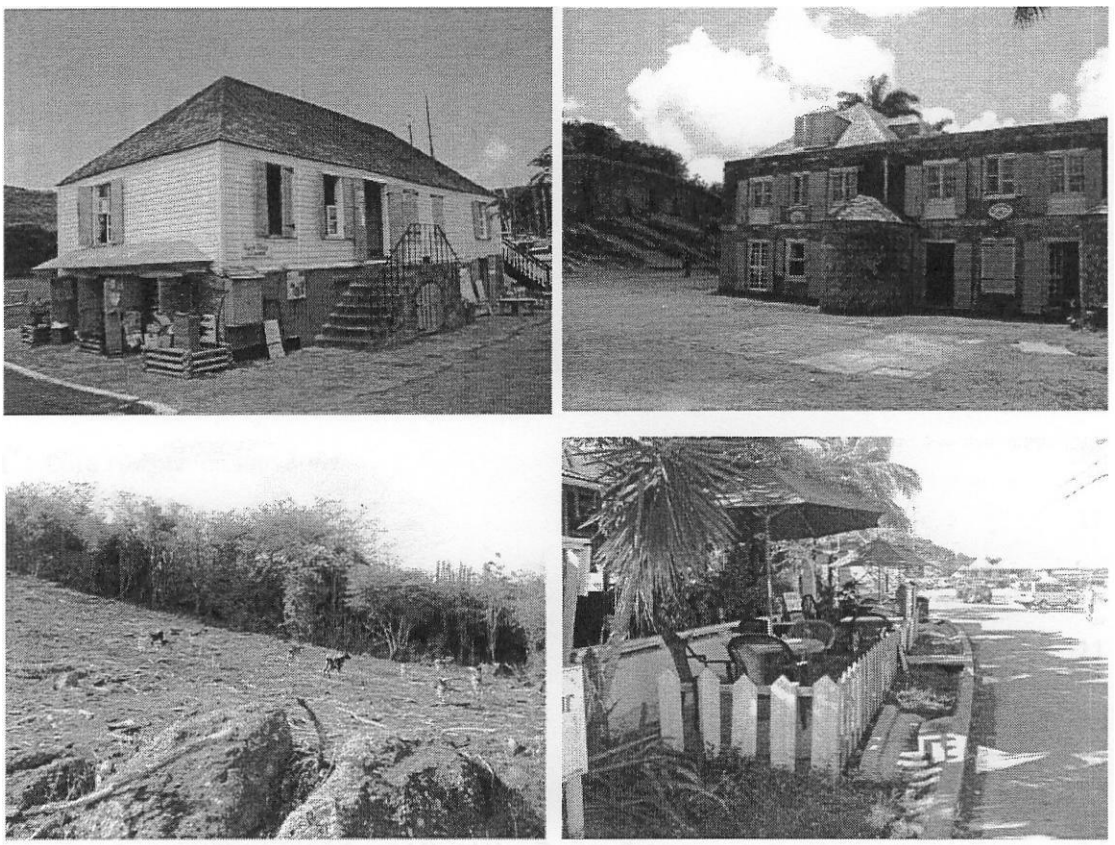
LAND DEVELOPMENT AND BUILDING GUIDELINES

NELSON'S DOCKYARD NATIONAL PARK



Prepared for the National Parks Authority (NPA)

March, 2010

Ivor Jackson & Associates, Landscape Architecture& Planning

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Background

Introduction

These guidelines are intended to assist architects, draught-persons and home builders in meeting visual and historic qualities for buildings in different parts of the Nelson's Dockyard National Park (NDNP). And will be used to help the NPA carry out its mandate for the preservation and management of the natural and historic heritage of the National Park.

Under The National Parks Act, 1984, Part IV, Section 21 (1) "...no permission approval, authority, subdivision, lease or permission relating to any land or property whether Crown land or otherwise within the Park shall be granted or made...." without the prior written approval of the NPA. Part VI Section 26 of the Act, allows the responsible Minister to make regulations for the preservation, management and development of the Park.

This document updates and expands an initial report on roof design guidelines that was prepared by IJA and submitted to the NPA in 2006. The additional work done was agreed in separate meetings with some members of the NPA Board and the Parks Commissioner.

Report Presentation

The guidelines are presented in six chapters:

- Chapter One: Roof Design and Colour
- Chapter Two: Building Height and Elevation
- Chapter Three: Streets, Sidewalks and Building Setback
- Chapter Four: Vegetation and Soil Protection
- Chapter Five: Building next to Headlands, Ridges and Water courses
- Chapter Six: Landscape Treatment

Each chapter begins with an explanation of the aims and objectives to be achieved in the administration and enforcement of the guidelines. This is followed with details on the guidelines, supported by photographs or illustrations as appropriate. Where necessary, references are made of other relevant documents that should be considered by persons or their agents making applications for development approval. A proposed Land Clearance Permit and a Drainage Basin Map are included in this report on the Land Development and Building Guidelines. The map will be prepared subsequently at a larger scale and as a stand-alone product.

Application and Relevance

The term guidelines differ from standards, in that they are intended as steps the NPA wants developers to follow and which it has discretionary powers to enforce. Standards are mandatory requirements

which must be followed and are enforced by law. Sections of these guidelines could eventually become standards through passage into law if NPA and Government decide to pursue this course.

These Guidelines do not replace the Antigua and Barbuda Building Guidelines administered by the Development Control Authority (DCA) but rather compliment them by addressing specific heritage resources management requirements of the National Park. In effect, the guidelines seek to encourage the adoption of historic design and building practices in appropriate areas of the National Park and to protect, preserve or conserve scenic landscapes, soil and water. Developers should therefore make reference to other relevant documents that provide the legal and administrative mandate for development occurring within the National Park, namely: (i) Antigua and Barbuda Building Code, (ii) Land Development Regulations, (iii) Physical Planning Act 2003, and (iv) National Parks Act, 1984.

Relevance of Georgian and Vernacular Architecture to the Guidelines

A significant reason for the creation of Nelson's Dockyard National Park is the area's historical significance as a naval base and military fortification in the 17th to 19th centuries. The NPA has as a matter of policy to honor the architecture of historic buildings in Nelson's Dockyard, which are distinctly Georgian in design and style. Developers and homeowners are asked to capture the essence of Georgian architecture and its Antiguan Vernacular derivative in relevant design elements of new structures planned for some sections of the National Park.

Vernacular architecture is evidenced in historic buildings in St. John's and old estate houses around the island. Specific reference is made to relevant design elements of both architectural forms that should or can be considered in buildings construction. However, respect for Georgian and Vernacular architecture does not mean denial of modern and other forms of architecture.

Georgian architecture is associated with a period between 1720 and 1840, during the reign (in continuous succession from 1714 to 1830) of the first four British Monarchs, George I, George II, George III and George IV. Buildings designed in Nelson's Dockyard and other parts of Antigua during and after this period captured this architectural style and to a large extent exist in a stature of historical significance. Such structures are characterized by proportion and balance in the building and symmetry in the positioning of windows and doors, use of decorative features from ancient Rome and Greece, brick or stone construction, and use of red, tan or white colours. The latter two are specific to the UK but Georgian architecture of Antigua and other parts of the region have been influenced by climate, availability of materials, and construction methods, and evolved in response to environmental, cultural and historical circumstances. For example, houses in Antigua were constructed with wood in many instances.

Buildings were normally 1-2 storey, two rooms deep. Cornices (horizontal moldings used over doors, windows and eaves (edge of roofs) are common. Another common feature was the double sash windows (generally 3 panes across x 2 panes up for each sash) appearing symmetrically across the front of the building and placed in proportion or balance with the door (s).

1.0 Chapter One: Roof Design and Colour

1.1 Objectives

This chapter of the guidelines addresses roof design and use of materials and is intended to promote relevant aspects of design principles inherent in the historic architecture and building practices associated with Nelson's Dockyard and other parts of the country. The specific objectives sought are to:

- Promote distinct gable, hip and other historically relevant roof forms
- Achieve greater hurricane resistance through minimum standards in roof pitch and eaves overhand and use of hurricane clips
- Achieve conformity with roof material and colour used on historic buildings in the Park

The National Parks Authority (NPA) believes that to the extent possible, building design should be respectful of the visual and historic integrity of structures in Nelson's Dockyard and the traditional architecture that shaped vernacular buildings in other parts of the country for selected areas of the Park. For example, NPA will require strict adherence to the design principles and use of colour for buildings in the Core Historic Design Zone, the Mast Pond to Chapel Hill Mixed Use Design Zone and Headlands and Ridges, particularly those with historic significance.

1.2 Design Zones

The Draft Guidelines for Roofs, prepared May 2006, identified four (4) areas called design zones for which the guidelines will be applied, in varying degrees depending on historic relevance, topographical differences or visual potential visual impact. These zones are:

- Core Historic Design Zone (Zone 1)
- Mast Pond to Chapel Hill Mixed Design Zone (Zone 2)
- Special Areas (Headlands and Ridges) Zone (Zone 3)
- Community Design Zones (Zone 4)

These zones are mapped and presented as Figure 1.1, which also shows the approximate boundary of the National Park.

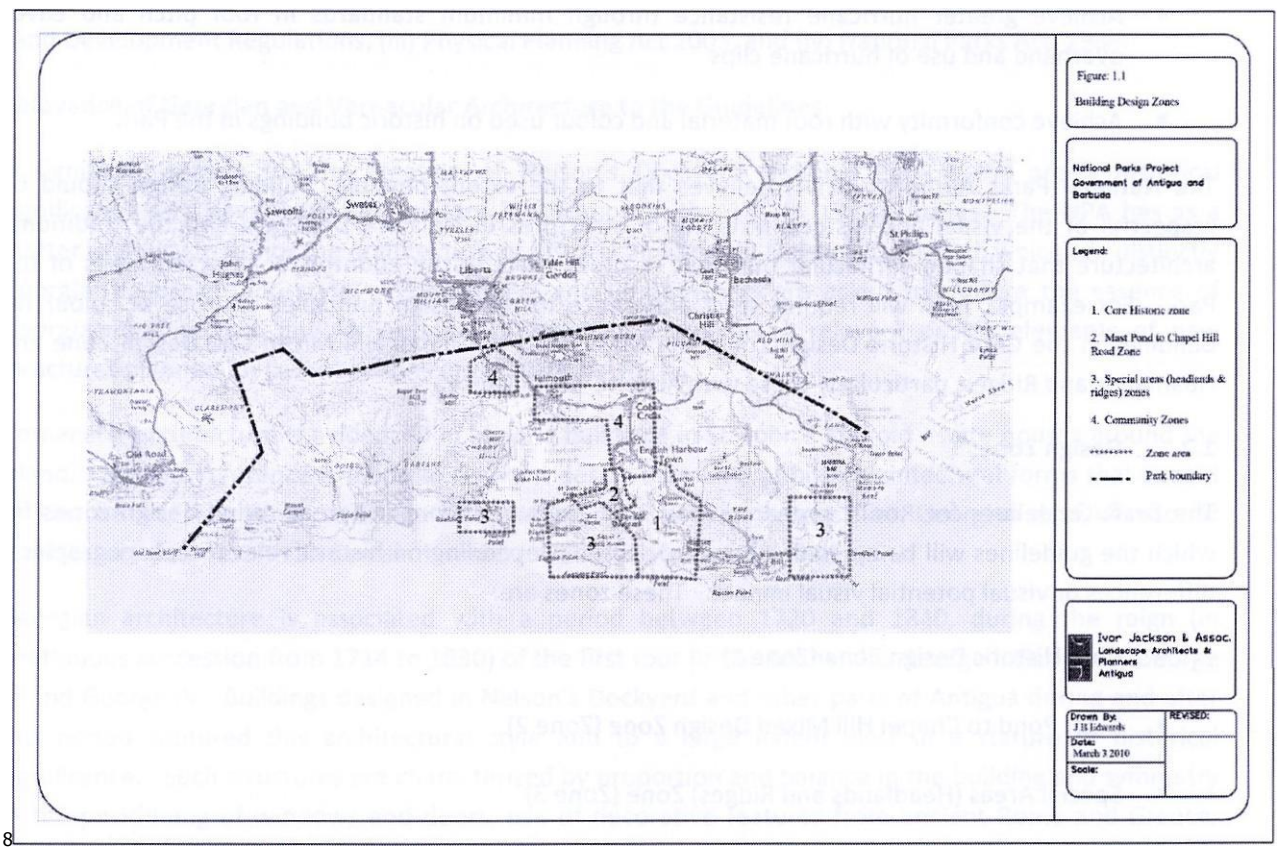


Figure: 1.1
Building Design Zones
National Parks Project
Government of Antigua and Barbuda
Legend:
1. Core Historic zone
2. Mast Pond to Chapel Hill Road Zone
3. Special areas (headlands & ridges) zones
4. Community Zones
Zone area
Park boundary
Ivor Jackson & Assoc.
Landscape Architects & Planners
Antigua
Drawn By:
J B Edwards
REVISED:
Date:
March 3 2010
Scale:
Swetes
Sawcolts
Liberta
Table Hill
Gordon
Bachoola
St Phillips
Christian Hill
Falmouth
Cobbs Cross
English Harbour Town
Old Road
1
2
3
4

1.5 Relevant Areas of Roof Guidelines

Design guidelines for roofs cover the following areas:

- Style (gable, hip or other types of roof) and pitch
- Material
- Colour
- Details (dormers, roof overhang, facia board)
- Gutters and downspouts

1.6 Guidelines for Design Zones

The Guidelines vary from one design zone to the next.

1.6.1 Core Historic Design Zone

This design zone includes Nelson's Dockyard and adjoining areas that together constitute a visual envelope, that is, areas close enough to Nelson's Dockyard to create visual interest. These include the Ordnance area and Galleon Bay. Design standards for the zone will be strictly applied to protect visual and historic integrity.

The guidelines for the zone are informed by the historic design and building practices in Nelson's Dockyard. For example, roof steepness in Nelson's Dockyard range from a low of 28° to a high of 42°.

a) Roof Style and Pitch

- The styles of roof to be allowed are hip and gable with or without parapet wall (stone or wood), or a version of the hip roof called the bonnet-type roof
- Roof slope should be no less than 28° and can be up to 45°
- No lean-to or flat roofs will be allowed, except where a lean-to is combined with a hip or gable roof of desirable pitch

b) Roof Material

- Wood shingles are encouraged
- Roof material can include other shingles and asphalt tiles as long as colour guidelines are respected

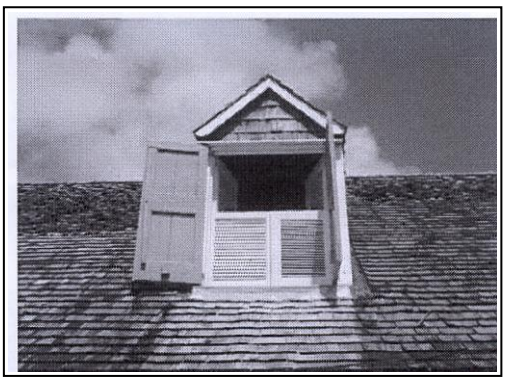
c) Roof Colour

- Roof color should to the extent possible be close to weathered wood shingle, that is, dark grey, grey or gray-black

- Grey, as in the case of grey asphalt tiles, is allowed
- Bright colours not in keeping with the visual value or practices evident in buildings of the historic period will not be allowed in the zone

d) Details

- Dormers are encouraged and can be used on both the short and long ends of the hip roof
- Shutters, louvered or class windows used historically with dormers, where an attic is part of the structure, can be constructed
- Roof overhang should be less than 1 ft
- Facia boards can be used to allow hanging of guttering for water catchment although this is not a feature of most buildings in Nelson's Dockyard



- Multiple hip or gable roofs covering one building are allowed

e) Gutters and Downspouts

- Gutters and downspouts are to be constructed in accordance with planning and building requirements of the Development Control Authority (DCA)

1.6.2 Mast Pond to Chapel Hill Road Mixed Use Design Zone

Mast Pond is believed to have been the first part of the Village of English Harbour and settled by poor whites. The area is evolving as a mixed used zone in which design must be relevant to demands for commercial space, including restaurant and bars. Architectural styles between Mast Pond and Chapel Hill Road include a mix of the vernacular and modern. Design guidelines encourage diversity in roof styles, material use and colour.

a) Roof Style & Pitch

- Hip and gable roofs of Georgian or vernacular styles are encouraged
- Parapet walls (stone or wood) can be used

- Bonnet-type roofs and lean-to configurations associated with other roof types of desirable pitch are allowed
- Roof slope should be no less than 28°

b) Roof Material

- Wood shingles are encouraged
- No restrictions are placed on roof material, so that other shingles, asphalt tiles and corrugated galvanize can be used as long as colour guidelines are respected

c) Roof Colour

- Dark grey, grey or gray-black and other sober colours are preferred
- Other colours in keeping with historical traditional building practices are allowed
- Excessively bright colours are not allowed

d) Details

- Dormers are encouraged and can be used on both the short and long ends of the hip roof
- Shutters and louvered windows used historically with dormers, where an attic is part of the structure can be constructed
- Roof overhang should be less than 1 ft
- Facia boards can be used to allow hanging of guttering for water catchment although this is not a feature of most buildings in Nelson's Dockyard
- Multiple hip or gable roofs covering one building are allowed

e) Gutters and Downspouts

- Gutters and downspouts are to be constructed in accordance with planning and building requirements of the Development Control Authority (DCA)

1.6.3 Special Areas (Headlands and Ridges) Design Zone

NPA has identified a number of ridges and headlands that qualify for the application of design guidelines for roofs and other parts of buildings. These have been selected for their historical significance and/or visual landscape value and include ridges and headlands.

For such areas, design guidelines are expected to achieve harmony between the built and natural environment and to reduce the visual impact of buildings on the natural landscape. Where there is historical significance to a subject area, another design objective is to pay respect to the period of history in consideration.

In addition to roofs, building height and the use of material and colour for the rest of the structure would be subject to design guidance. An example of structures that achieves the desired harmony with the environment and landscape is the buildings that comprise the home of Eric Clapton at Isaac Hill Point.

a) Roof Style & Pitch

- There are no restrictions on the styles of roofs, except where the subject area is of historical significance that requires relevant design gesture
- Where this is the case, the NPA encourages the developer to consult with the Authority for further guidance
- So as to reduce the visual impact from buildings on the landscapes of ridges and headlands, the maximum allowed roof pitch is 35°

b) Roof Material

- Wood shingles are encouraged
- Roof material can include other shingles and asphalt tiles as long as colour guidelines are respected
- No plain corrugated galvanize sheeting should be used since this may reflect light causing unnecessary attention to structures or otherwise a visual nuisance

c) Roof Colour

- Roof color should to the extent possible be close to weathered wood shingle, that is, dark grey, grey or gray-black, or otherwise earth tones reflective of the colours in the subject landscape
- Bright colours not in keeping with the visual value of rocks, earth or vegetation in the area are not allowed
- Vegetation green in likeness to the colour of foliage in the subject area can be considered

d) Details

- Dormers and other roof details are left to the discretion of the developer, except that visual harmony between the structure and landscape should be achieved
- Shutters and louvered windows can be used with dormers, where an attic is part of the structure can be constructed
- Roof overhang should be less than 1 ft
- Facia boards should be used to allow hanging of guttering for water catchment and mitigation of storm water impacts
- Multiple hip or gable roofs covering one building are allowed

e) Gutters and Downspouts

- Gutters and downspouts are to be constructed in accordance with planning and building requirements of the Development Control Authority (DCA)

1.6.4 Community Design Zones

Community areas for the purpose of these guidelines are defined as villages or related residential areas within the Park not covered in the other zones. The guidelines allow more flexibility in the use of roof styles, material and colour. However, the NPA reserves the right to apply stricter standards for areas within communities considered to be of historical, landscape or visual significance.

a) Roof Style & Pitch

- Hip and gable roofs of Georgian or vernacular styles are encouraged
- There are no restrictions on roof styles
- There are no restrictions on the pitch of roofs

b) Roof Material

- Wood shingles are encouraged
- No restrictions are placed on roof material, so that other shingles, asphalt tiles and corrugated galvanize can be used as long as colour guidelines are respected

c) Roof Colour

- Dark grey, grey or gray-black and other sober colours are preferred for areas close to the Core Historic Design Zone
- Other colours are allowed in keeping with traditional building practices

d) Details

- Dormers are encouraged and can be used on both the short and long ends of the hip roof
- Shutters and louvered windows used historically with dormers, where an attic is part of the structure can be constructed
- Roof overhang should be less than 1 ft
- Facia boards should be used to allow hanging of guttering for water catchment
- Multiple hip or gable roofs covering one building are allowed

e) Gutters and Downspouts

- Gutters and downspouts are to be constructed in accordance with planning and building requirements of the Development Control Authority (DCA)

1.7 Conclusion and References

Roof shape is one of the visible elements of structures within Nelson's Dockyard. High pitched hip and gable roofs some with parapet walls are therefore part of the design signature of the Park. Steep roofs were however influenced by their value to effective air flow, ventilation and comfort and their hurricane resistance qualities.

United Insurance Company Limited publishes a **Guide to Making your Home Hurricane Resistant** and gives generous rebates on premiums to homeowners complying with resistant measures for roofs, shutters, and for using straps and plates to tie various structural and non-structural elements of buildings together. The typical historical roof type of the Park is without significant overhang; a factor that also helps with hurricane resistance.

Hurricane resistant measures included in the United Insurance booklet are also repeated in the Pan American Health Organization (PAHO) publication, ***Disaster Mitigation for Health Facilities, Guidelines for Vulnerability Appraisal and Reduction in the Caribbean.***

Other references include:

- Antigua and Barbuda Building Guidelines
- OECS Building Code (refer to Section 18, Small Buildings and Section 19, Development Standards for design, structural and planning codes)
- The Land Development and Control; Regulations 1996, Antigua and Barbuda Statutory Instruments No 20, 1996
- Antigua and Barbuda Physical Planning Act, 2003 No. 6 of 2003

Space for P-18

- Where permission is given to build on ridges, the single storey building should be constructed with a maximum height from floor to apex or building ridge of 16 ft

b) Building Material

- Developers, architects and builders should recognize that the original Georgian buildings were constructed mainly from stones and/or bricks but such buildings in the US and Caribbean were constructed from local and imported materials; vernacular dwellings were most often constructed of wood

- Buildings in the relevant zones can therefore be constructed of concrete blocks, poured concrete, wood or other material as long as the finished colours are consistent with those recommended

- Thatched roofs may be considered for some buildings, particularly tourism facilities wanting to present a tropical ambiance and feel; bars, wedding and information kiosks are suited for this purpose

c) Windows

- Sash windows of glass framed with wood are allowed in accordance with historical practice; a typical window is made of two (2) sash, each with 3 panes of glass on the horizontal x 2 panes on the vertical; sash windows of a more contemporary type framed with metal are also allowed

- Louvered wooden jalousie windows are typical of Caribbean Georgian buildings and are encouraged as a way of capitalizing on cooling winds for natural ventilation and to avoid dependence on air conditioning

- The number of windows used for the front or any other elevation of the house should be determined by the size of the structure, proportion, balance or symmetry sought in design and use of the building or floor

- Sash windows are not effective for displaying merchandise, so that businesses may want to use other window types, on ground floors in particular for display purposes

- Hurricane shutters are a feature introduced to Georgian structures in the Caribbean for resistance to hurricane force winds and flying objects associated with storms; shutters are strongly recommended, particularly for sash and other glass windows, for historic relevance but more so as mitigation against hurricane damage

- Louvered wooden jalousie windows are better suited for natural ventilation and hurricane resistance than sash windows and are the preferred choice for homes and hotels where they can help in avoiding or lowering the cost of AC

- Sash windows of wood or metal frame are less effective in natural cooling, particularly where they must be fully closed when it rains; full closure is usually needed for windows on the windward side of buildings
- Louvered wooden jalousie windows should be fitted with screens against mosquitoes where possible

d) Disaster Risk Reduction

- Raising the floor levels of buildings off grade, a practice credited to European influences is encouraged to reduce flood risks
- For buildings that must be located in flood prone areas and close to low lying coastlines, the practice of building on stilts, done historically in other parts of the region, should be considered as mitigation against storm use and flash floods
- Strict adherence to building codes is advised to reduce risk to earthquakes
- Hurricane resistant building practices are required and must be applied in accordance with the Building Codes, as appropriate

e) Detailing and Ornamentation

Details and ornamentation was prevalent in Georgian architecture and adopted by the Caribbean in both Georgian styled and vernacular structures. A summary of such features pulled from a review of literature on the subject is supplied below in Box 2.1.

For comparison, detailing and ornamentation on the front of historical buildings of St. John's in a case study reviewed from an OAS document (The Conservation of Buildings of Historic and Architectural Interest in

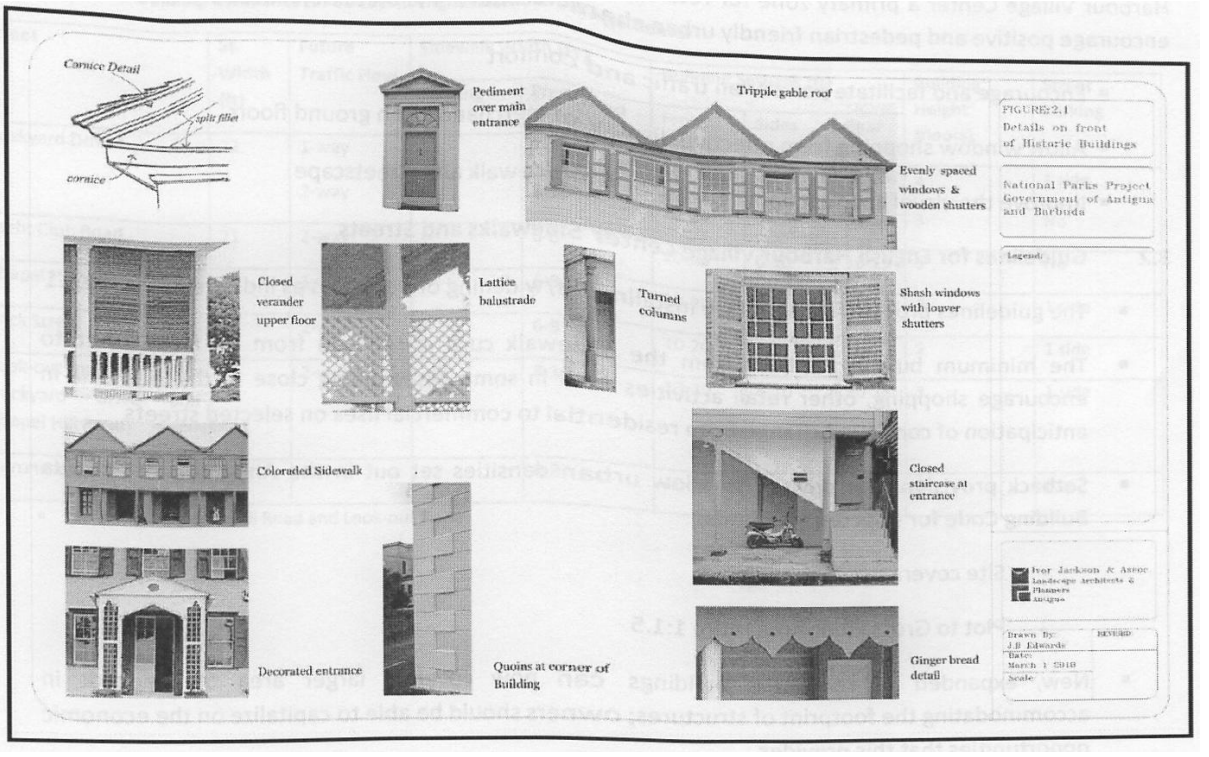
Downtown St. John's: Antigua and Barbuda, OAS, 1989) are provided in Box 2.2). Some of these features are illustrated Figure 2.1. Such details or features are historically relevant and functional and are encouraged where appropriate for buildings in the National Park.

Box 2.1: Features of Georgian Architecture

- Door centered on Front Elevation of the building, sometimes with a decorated crown
- Rectangular windows (called "transom lights") above front door, historically common to more upscale versions of the Style; windows above doors can be used with good effect on 2 storey single and multi family residences and common buildings in hotels
- Roof balustrade (like a "window walk"); (image needed)
- Portico (small front porch) with wooden arched crown; more evident in the Colonial Revival Period (18766 —1910) in the USA
- Decorative ***cornice*** (dentil moldings that look like teeth)
- Unpainted shingle siding and painted or unpainted Lapside of pine or other wood using a variety of colours
- Decorative ***quoins*** (blocking) at side of building
- Pilasters (flattened columns) on decorative doorways or corner of buildings
- Hip roof with dormers at front elevation
- Buildings with gables at the side elevations.
- Buildings with gables at front elevations

(source: www.historichomesmarketplace.com/index.php?option); see architecture guide

Figure 2.1


Cornice Detail
split fillet
cornice
Pediment over main entrance
Tripple gable roof
Evenly spaced windows & wooden shutters
Closed verander upper floor
Lattice balustrade
Turned columns
Shash windows with louver shutters
Coloraded Sidewalk
Closed staircase at entrance
Decorated entrance
Quoins at corner of Building
Ginger bread detail
FIGURE:2.1
Details on front of Historic Buildings
National Parks Project
Government of Antigua and Barbuda
Legend:
Ivor Jackson & Assoc
Landscape Architects & Planners
Antigua
Drawn By:
J.B Edwards
Date:
March 1 2018
Scale:
REVISED

3.0 Chapter Three: Streets, Sidewalks and Building Setback

3.1 Aims and Objectives

This chapter of the guidelines addresses the relationship between streets, sidewalks and the setback requirements for buildings. The relationship changes depending on traffic volume (vehicle and pedestrian), location and width of the street. The guidelines recognize the evolution of the English Harbour Village Center a primary zone for retail, commerce and services. They anticipate and seek to encourage positive and pedestrian friendly urban characteristics in the area. Objectives are to:

- Encourage and facilitate pedestrian traffic and comfort
- Allow window shopping from effective display of merchandise on ground floors
- Improve the visual and functional quality of the sidewalk and streetscape

3.2 Guidelines for English Harbour Village Center Sidewalks and Streets

- The guidelines provide for the future installment/widening of sidewalks as indicated in Table 3.1
- The minimum building setback from the sidewalk curb is reduced from 20 ft to 10 ft to encourage shopping, other retail activities and in some cases dining close to the sidewalk in anticipation of continued change from residential to commercial uses on selected streets

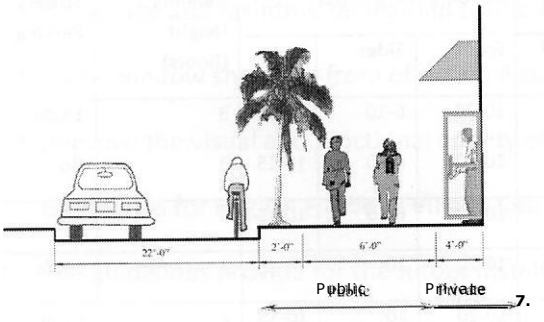
- Setback provisions are devised to allow urban densities set out in the Antigua and Barbuda Building Code for selected standards:
    - Site coverage: 75%-100%
    - Plot to Gross Floor Area ratio: 1:1.5
- New, expanded or renovated buildings can now cover a larger area of the plot in accommodating the footprint of structures; owners should be able to capitalize on the economic opportunities that this provides
- NPA will work with Public Works and the Transport Board to improve the quality of sidewalks by installing pedestrian lighting and street trees on selected streets as illustrated in Figure 3.1

Table 3.1: Building Guidelines for Streets in English Harbour Village Center

Street	St. Width (ft)	Future Traffic Flow	Sidewalk Width (ft)		Building Setback (ft)			Building Height (floors)	Street Parking
			Existing	Preferred	Front	Sides	Rear		
Dockyard Drive*	22	1-way 2-way	4 4	8-10 8-10	10-20 10-20	6-10 6-10	10-15 10-15	3 3	1 side No
Yacht Club Road	21	2-way	--	6-8	10-20	6-10	10-15	3	No
Chapel Hill Road	16	1-way	--	6-8	10-20	10	10-15	2	1 side
Back Street	15	1-way	--	6-8	10-20	10	10-15	2	1 side
Look-out Road (Between Dockyard Drive and Chapel Hill Road)		2-way	---?	8-10	10-20	6-10	10-15	3	1 side
Veronica Michael Road	14	2-way		6-8	10-20	10	10-15	3	No

- Junction of Chapel Hill Road and Look-out Road

Figure 3.1: Streetscape Illustrations



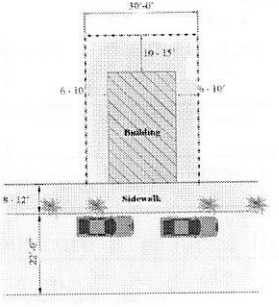
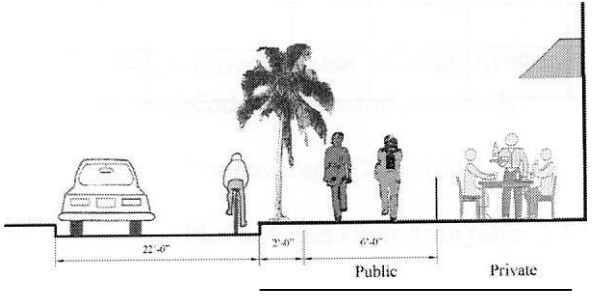


Figure: 3.1

Streetscape illustration

National Parks Project
Government of Antigua and Barbuda

Legend:



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Landscape Architects &

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DDrawn By:
J. B. EDWARDS.

March 10, 2010

- Wider sidewalks should benefit businesses in the area and property owners are expected to respond by seizing opportunities to improve the interface between retail/business spaces (generally privately owned) and sidewalks (publicly owned) as pedestrian traffic grows on the streets (See Figure 3.1)

- Introduction of 1- way vehicular traffic is contemplated for some streets (or sections thereof) to allow curbside parking in certain areas; this will help property owners and business

- Measures to limit vehicular traffic in areas of heavy pedestrian traffic are also being contemplated for sections of Dockyard Drive and for Yacht Club Road; one such measure will be to encourage the use of bicycles in such areas

- Building height of 3 floors are allowed for streets shown and takes into account topography and visibility; for example height is limited to 2 floors on Chapel Hill to reduce undesirable visual impacts from the sea

- Larger side and rear setbacks for streets shown are intended to reduce plot coverage on building lots in areas where topography may require additional room for wastewater treatment

- NPA reserves the right to impose stricter density limits on plots in the Village Center where soil conditions could be problematic for wastewater treatment using traditional treatment methods (example, septic tank and soak-ways or drain-fields)

- Soil percolation tests will be required to confirm the suitability of such areas to accommodate and "treat" wastewater to be generated; the procedure for conducting such tests is provided in Appendix 2.

- One-way traffic on streets, as shown, will allow for curbside parking and reduce the demand for off-street parking, allowing property owners to optimize the use of their property for retail or rental purposes

- 2 storey buildings are encouraged in preference to 1 storey buildings on Dockyard Drive, Yacht Club Road, Look-out Road (between the junctions with Dockyard Drive and Chapel Hill Road) to allow the option of having commercial use on the ground floor and residential use in the upper floor

- As pedestrian traffic increases on these streets, provisions should be made to ensure the privacy of ground floor residents in buildings with shorter setback distances from the road

- Where room allows, sidewalks will be developed with a pedestrian light and street tree strip to improve the visual quality (day and night time) and ambiance of the streetscape

- Property owners are encouraged to build in a manner that achieves a uniformed building line favorable to displays of merchandise and pedestrian traffic and pedestrian safety

- As an option to building to maintain a uniformed building line, property owners may choose to use the space between an existing or new building and the sidewalk for café type dining; this is encouraged in areas with heavy pedestrian traffic, such as Dockyard Drive between the junction with Yacht Club Road and the Police Station

- NPA will consider granting approval for buildings with second floors cantilevered over the sidewalk on rounded wood or concrete columns, as done in many historic buildings in St. Johns

3.3 Other Areas of the National Park

a) The older section of Falmouth (Falmouth Village Center), was laid out as a town and the grid system of streets lends itself well to commercial and mixed use; Sidewalk, building setback, building height, plot and side coverage arrangements are devised to achieve a mixed use zone for the convenience of residential dwellings north of the main road.

b) The Cobbs Cross junction, with the Primary School, Health Center, Computer Center, disused Hotel, Barber Shop, Ital shop and weekend vendor outlet, shall be treated as a Village Center and allowed density appropriate for mixed use

c) Standards set out in the Building Codes will apply for other areas of the National Park

3.4 Fences

- Corrugated galvanize fences are not allowed for safety or aesthetic purposes within all settlements in the NDNP

- Concrete, wooden or wrought iron fences can be constructed to a maximum height of four ft

- Fences constructed up to existing sidewalks or to the reserved sidewalk line should where possible be installed on a uniformed line and uniformed height

3.5 Signs

Guidelines for signs are of particular interest within the Village Centers but are also critical for other areas of the National Park. Signs vary in their purpose and function and may include (i) directional or traffic signs, place (building) signs, information or interpretive signs, street signs.

- Directional or traffic signs within the National Park is the responsibility of the Transport Board

- Street signs in areas close to Nelson's Dockyard (English Harbour Village Center) will be the responsibility of the NPA and will have a colour scheme approved by the NPA and will also feature the NPA logo

- Building signs erected by businesses must be done in accordance with rules set out by the NPA

4.0 Chapter Four: Vegetation and Sale Protection

4.1 Aims and Objectives

This chapter of the guidelines seeks to promote vegetation and soil conservation practices. Guidance is provided for the clearing of building sites, including what trees should be protected, methods to be used in excavation, stockpiling of soil and aggregates on construction sites, use of clearing and excavation equipment, measures to avoid soil compaction, containment of newly created embankments, stabilization of newly cut areas, trapping soil, use of soil for soak-ways and drain-fields, etc.

Plate # 3.1: ***Indiscriminate clearing of vegetation leading to habitat loss and accelerated erosion***

The objectives are to:

- Protect vegetation
- Reduce water runoff, floods and manage storm water
- Protect soil, manage sediment and stabilize slopes
- Protect and preserve historic ruins, significant geological features

4.2 Submissions

The Applicant is required as part of the submissions for development approval to provide:

- A completed Land Clearance Permit (See Appendix 1). The form forces developers to become fully knowledgeable about the site, by requiring information on types of plants, topographical characteristics, special features such as boulders, outcropped rocks, water courses, historic ruins etc.

- An aerial photograph of the site, obtained from the Lands and Survey Department, showing the parcel boundary of the site, vegetation, other physically discernable features of the site sufficient to provide useful information on topographical characteristics, including surface drainage where possible

- A contour plan with contour intervals of 10 ft or less. For small developments, such as residential buildings of no more than 2,000 sq ft, a DOS map can be used to show contours but must be overlaid by the boundary shown on the land survey plan of the site. Larger developments on steep slopes should at the discretion of the NPA and DCA provide a topographical survey (with contours) of the site prepared by a qualified Land Surveyor

- On sites with dry woodland or cactus scrub vegetation, the topographical survey should show the location of all trees with diameter >or = to 20 cm at breast height, indicate the actual tree size, define the outside edge of tree canopy, and identify the tree species

- For sites containing watercourses, the topographical plan (large developments) should delineate the centerline of the watercourse and top of the banks of the watercourse; a DOS contour map (small developments) should identify the watercourse

- For sites with wetlands, the topographical plan should define the boundaries of the wetland, provide spot elevations of height above sea level

- For sites with freshwater wells, topographical plan should identify the well's location and the extent of the well field should be approximated where hydrological information allows

- For sites containing steep slopes or cliffs, where major cut and fill activities are contemplated:
  - A topographical survey should show existing contours
  - Cut and fill areas should be identified by being overlaid on the plan; the aim being to reduce or limit earthworks as much as possible
  - Existing direction of surface drainage should be identified
  - A sediment control plan should be outlined, with the aim of limiting sediment transport and avoiding deposit into watercourses or wetlands
  - Location, height and thickness of retaining walls contemplated should be provided

- Copy of the Site Plan of the project

- Indicate any water courses, including the discharge point of surface water leaving the site to be developed
- Location of buildings on lots down-slope of the area proposed for development
- A description of the vegetation of the site, a list of large trees (trunk size 1 ft diameter or more)
- Description of soil types. For large developments, a soil survey may be required to provide a soil profile and description of soil characteristics, enough to understand load bearing capacities and percolation rates
- For steep areas or land considered to pose a problem for subsurface drainage in the use of septic tanks and drain fields, a percolation test should be undertaken and the results submitted; the method for undertaking the test are described in Appendix 3.2.
- Large outcrop rocks or other geological features should be delineated on the topographical survey or DOS contour maps for sites on which they exist
- Historic sites and known sites of archaeological interest or significance should be delineated; where there is doubt about the historical or archaeological significance of a site, developers should consult the NPA and seek advice from its archaeologist

4.3 Vegetation

4.3.1 Value and functions

Vegetation provides important habitat for birds and other wildlife, protects soil from accelerated erosion, helps to conserve water, stores carbon and when cut or destroyed will release CO2 into the atmosphere, promotes scenic value and scenic qualities of the landscape within the national park, provides shade and influences climatic conditions in ways that benefit humans, reduces the impact of rainfall on soils hence reducing the quantities of soil that get displaced by raindrops.

NPA recognizes and wish to create awareness of the diversity of plants that comprise the endemic and introduced vegetation heritage of the National Park.

4.3.2 Vegetation Types and Measures to be Considered

Development activity will affect various vegetation types, depending on location, existing land use, topography and soil conditions. Such vegetation may include established native plants of existing forests (mainly woodland and scrub forests) in areas identified or zoned for development, various other trees, shrubs and vines, emerging or re-colonizing plants, and ornamentals. The guidelines cover various areas where mitigation is required, namely:

a) protection and preservation,

b) salvaging of plants that cannot be protected or preserved in their located habitats,

c) reducing the risk from plants that are considered a hazard to life and property, and replacement of vegetation that has to be removed or destroyed in the course of development.

4.3.2.1 Vegetation Protection and Preservation

- Priority attention should be given to endemic species, plants that together constitute habitat for endemic species of birds and other wildlife, large trees, old and /or slow growing trees, plants providing a source of food or nutrients to birds and animals active in the pollination of fruit trees, etc.

- Vegetation protection and preservation is not only saving plants from total destruction but also maintaining the health of the plant by protecting its root structure and areas of known water infiltration

- Specific actions to be taken:

- The construction area(s) of the site should be delineated and marked off; such areas should include building pads, driveways, walkways, all areas to be paved or rendered impervious from development; in delineating such areas, reasonable allowance should be made for the maneuvering of heavy equipment commissioned for use in land clearance and site preparation

- Areas to be landscaped, meaning sections of the site in which existing vegetation is to be cleared or cleaned to install introduced plants should be designated

- All large trees >1 ft in diameter to be saved should be tagged or otherwise marked

- All other areas of the site should be made non-accessible to heavy equipment to avoid damage to plants and compacting of soils

4.3.2.2 Salvaging of Plants that cannot be Protected in their Location

- Where there are no other alternative than to clear or remove plants of the size or status that would not normally be allowed, a request must be made to the NPA giving the reasons

- NPA will then decide with the help of an experienced landscaper if such plants can be transplanted

- If yes, a transplanting plan must be devised and approved by the NPA for excavating, stabilizing the root and associated soil and transporting the plant for replanting on the affected site or at another site to be agreed

- An experienced landscaper should be engaged to provide the technical advice needed to ensure the plant survive the salvaging procedure, which may involve protection of the root by rapping, pruning of roots, foliage and branches, sizing the new hole in which the plant will be installed and initial supply of water (moisture)

4.3.2.3 Reducing Risks from Plants to Life and Property

- Homeowners should be aware that certain plants can constitute a risk to life and property, particularly as the result of natural disasters
- A prime example is the Ficus commonly used as a hedge. This plant when grown as a tree, is weak and susceptible to strong winds. Being a softwood, it breaks easily and can damage roofs, spouting, doors and windows
- This species or variety of Ficus should not be planted near the buildings because its root system will penetrate cracks in concrete and will enter and clog water or sewage pipes
- White Cedar and neem should not be planted close to houses because they will drop their leaves in dry and drought conditions on roofs, resulting in clogged spouting
- Agave plants that produce "daggers" should not be planted close to the house, where the dried dagger may fall and damage the property
- Similarly, the Spanish Bayonet if allowed to grow into thick trunks can become dangerous in storm conditions by breaking and damaging property; Spanish Bayonet also harbors termites in the trunks, which can then lead to termite attacks on untreated wood in houses
- The Flambouyant also attracts termites and should be planted away from homes and other wooden structures susceptible to termite attacks

4.3.2.4 Replacement of Vegetation that must be removed in the Course of Development

- Where no other practical option is available to removing trees that should be kept, the first course of action should be for the developer to transplant the plant (s) to another part of the property as indicated previously
- Secondly, plants that cannot be saved should in principle be replaced by similar species, or by other species preferably serving similar functions
- It is critical that plants that function to slow the rate of erosion, stabilize slopes and attenuate runoff are used as replacement species on steep slopes
- Similarly, plants that attract birds, provide fruits, or help to maintain the diversity of species should be considered for replacement by plants that provide these functions

4.3.3 Land Clearing and Excavation Equipment

Land clearing and excavation should be done with the aim to protect and preserve as much of the site vegetation as possible, reduce soil loss and protect the stability of slopes where they exist. In this case, developers or home builders and their contractors are expected to act in accordance with the following guidelines:

Equipment used

- A Backhoe is the preferred earth moving equipment to be used on construction sites
- Excavators and bulldozers should be used only when necessary and in such cases prior approval should be sought from the NPA
- When excavating for building pads, foundations of buildings, retaining walls, roads, driveways, etc., the equipment should be operated and managed to confine vegetation clearing and earth movement to targeted areas and their immediate surroundings, enough to achieve the purpose of the excavation intended
- The backhoe of backhoes should be used for selective removal of trees, such as acacia, neem and other plants that have been approved by NPA for removal
- The indiscriminate clearing of plants, particularly on slopes is not allowed **4.3.4**

Soil Removal, Storage and Reuse

- The topsoil layer of the site, often 1 ft or less from the surface, should be skimmed off and stockpiled separately for storage and reuse in landscaping; This section of the soil profile is rick in organic materials and nutrients beneficial to growing plants; sediment below the topsoil layer should be stored separately
- All excavated soil (top and subsoil layers) should be stockpiled for storage in areas where it would not be affected by runoff and excessive winds; if storage must be done on sloping areas or in places where runoff could be a problem, appropriate containment devices, concrete blocks, wood, or metal sheets should be temporarily installed at the foot of the stockpiled slope to prevent soil loss
- Soil such be stored in areas that are not overly exposed to winds; under no circumstances should soil be stored in watercourses or drainage swales
- Soil brought unto the site for landscaping should be similarly protected from runoff and wind
- Placing introduced soil on steep slopes with shallow and stoney soils and/or exposed bedrock could result in accelerated erosion unless some form of terracing is done to help with its containment; in some cases, money can be saved by terracing or soil containment without introducing new soil; this works in particular when drought tolerant species of plants, particularly natives of the area, are used
- For steep sites, it is best to store soil intended for landscaping offsite until it is to be used
- If soil is to be brought onto the site to grow plants and not grass, it should not be taken from areas where grass seeds are prevalent in the soil

4.3.5 Water Management and Control

Water management and water control, particularly critical for sloping lands, during the construction anc use phases should be applied to:

- Prevent excess water leaving the site and affecting other properties
- Prevent or reduce soil erosion from surface water wash

Developers and their agents should recognize the major drainage basins of the National Park (which are shown on Figure 4.1), their watercourses and discharge points into various bays. NPA will not allow natural water courses to be altered normally. Where this must be done, relevant justification must be produced by the developer and approval south from NPA. Any such alteration must be based on a study and design recommendations of an experienced engineer.

Control measures can be exercised by:

- Directing runoff from facilities under construction to existing vegetated areas, natural drains, temporary retention ponds, ditches and away from cut, cleared or excavated areas
- As much of the natural vegetation as possible down-slope of water discharge sources should remain untouched during the construction phase (until the implementation of the landscaping plan) and used to intercept and slow surface water movement
- Temporary retention ponds can be used to collect water, catch sediment during the construction phase; such devices can be integrated into the landscape plan for the property to serve the same functions
- Catching water from the roofs of buildings for storage in cisterns
- Directing water from finished roads, driveways and other areas of low-permeability to natural drains, preferable and storm drains/sewers where necessary; for large properties and /or difficult sites developers may be required to have a storm water drainage plan prepared by a qualified professional
- New cut slopes and cleared areas should be vegetated as soon as possible. Aloes when planted and bunched in rows along the contours of steep slopes work to check soil movement down-slope
- Residences and other properties built on slopes on lots over $^1/_4$ acre should separate water from bathroom and kitchens and have it flow into landscaped areas; bananas have been used traditionally to absorb household grey water

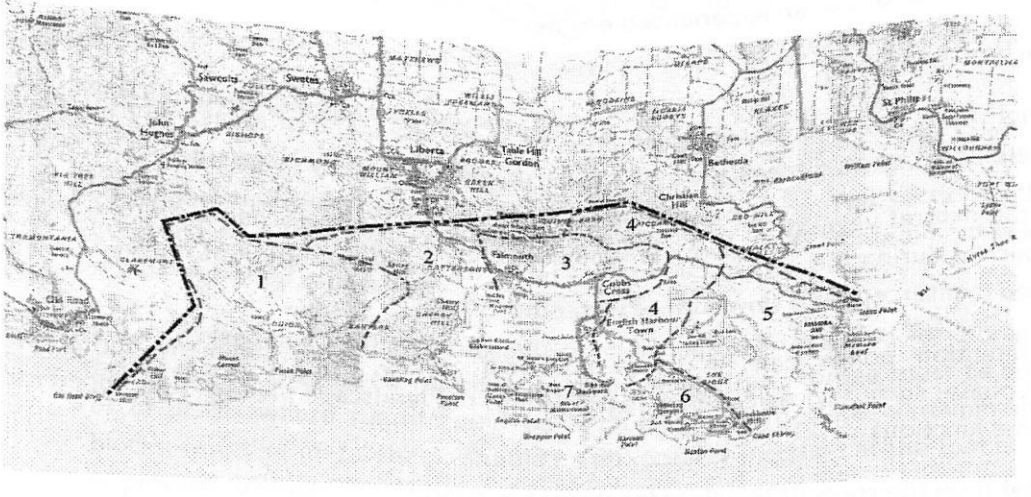

Figure: 4.1
Drainage areas of National Park

National Parks Project
Government of Antigua and Barbuda

Legend:

1. Dorgs / Barters
2. Sugar Loaf / Cherry Hill
3. Falmouth / Cobbs Cross
4. Savannah / Picadilly
5. Dow Hill / Mamora
6. Shirley Heights / Block House
7. Middle Ground / Dockyard

Park boundary

Drainage area boundary

Ivor Jackson & Assoc.
Landscape Architects & Planners
Antigua

Drawn By:	REVISED:
J B Edwards	
Date:	
March 2 2010	
Scale:	

5.0 Chapter Six: Building Next to Headlands and Ridges and Watercourses

5.1 Aims

This chapter will focus on how to protect the visual values of scenic headlands and ridges and the capacity of watercourses to carry storm water. With respect to headlands and ridges, guidelines focus on scale, massing, height and elevation (including number of floors) of buildings, vegetation clearance and landscaping. Of necessity, there is some degree of overlapping with other chapters.

5.2 Objectives

- Maintain as much of the vegetation, rock forms and other natural and or scenic qualities of ridges and headlands, particularly in highly visible areas of the National Park
- Protect water courses and maintain their natural functions in runoff and sediment transport
- Protect vegetation along watercourse banks and within the bed of water courses

5.3 Building on or next to Ridges

- NPA will strictly prohibit any development on ridges on government owned lands within the National Park
- Publicly owned ridges currently designated as sections of conservation areas will remain in conservation status even if rezoning of other lands occurs
- Strict measures will be taken to maintain the scenic qualities on ridgelines in private ownership; namely:
  - Buildings sited on ridgelines should be no more that 1 storey in height
  - The dimension (height) of the structure from eave to ridge should be a maximum of 6 ft
  - The material and colour of the roof and outer walls of structures should be such as to produce a visually harmonious relationship with the building and surrounding environment
  - Structures built on upper slopes below ridgeline of an area that has been determined to have scenic and visual values worth preserving should have a maximum height of 2 floors; with the basement floor allowed to accord with the practice of having basement level space on a sloping terrain
- The visual impact of 2 storey structures below the ridgeline should be mitigated with landscaping using trees preferably native to the site

5.4 Building Next to Headlands

- NPA will strictly prohibit any development within 100 ft from the edge of headlands on government owned lands within the National Park
- Publicly owned headlands currently designated as sections of conservation areas will remain in conservation status even if rezoning of surrounding lands occurs
- Strict measures will be taken to maintain the scenic qualities at the headlands in private ownership; namely:
  - The material and colour of the roof and outer walls of structures should be such as to produce a visually harmonious relationship with the building and surrounding environment
  - A setback limit of structures from the edge of headlands should be enough to prevent breaking the visual line of the edge of the headland; so that a setback distance of 100 ft could be applied as a rule of thumb

5.4 Building Next to Watercourses

NPA will take the necessary measures to protect the major water courses within the National Park.

- Developers or applicants are required to show on their Site Plan the alignment of any water course that traverses over the site for which development is being sought
- A watercourse located on the boundary of a development site, or receives surface water from said site should also be shown on the Site Plan submitted with the development application
- Natural watercourses are not to be altered, or modified in anyway without prior approval of the NPA or DCA; this is to ensure that changes resulting will not adversely affect properties adjacent to or down-slope from the site
- Removal of vegetation, defacing of the slope between the bank and bed of the watercourse is to be avoided unless permission is granted for alteration
- NPA in collaboration with the DCA have decided that a minimum setback of 40ft from the edge of the watercourse bank will be required for all permanent structures; anyone requiring a variation from this rule must seek approval by providing the necessary justification

5.6 Use of Covenants

- NPA encourages developers of subdivisions to use covenants that commit home owners to build in accordance with these guidelines

6.1 Aims and Objectives

The aim of landscaping guidelines is to ensure that landscape plans are designed and installed to reduce negative impact on the natural environment. The objectives are to:

- Limit the removal or clearing of existing natural vegetation of the site
- Avoid the use of invasive species that could crowd out native plants
- Encourage diversity in the use of native and naturalized species of plants attractive to birds
- Maximize the use of plants that help to conserve soil and water and that can withstand appreciable moisture stress

6.2 Landscaping Plan

Landscaping requirements should vary from one site to the next and in relation to densities prescribed for the areas in which developments occur. Larger low density lots will normally require more attention than smaller lots with higher density. In any case, plant selection in landscape planning should be done in consideration of functions they serve:

a) ***Examples of plants that are considered important to bio-diversity (see list of plants provided in Appendix 3)***

b) ***Examples of plants that can be used to stabilize slopes and reduce soil erosion:*** Aloes when plated in rows on the contour of the land, yucca, loblolly, various ground covers

c) ***Examples of plants that attract birds:*** Pride of Barbados, Antiguan Heath, Oleander

d) ***Examples of plants that bear fruit and have reasonable canopy cover:*** Mango, Soursop, Sugar Apple, Gunip, Avacado

e) ***Examples of ornamental and other plants that can withstand moisture stress:*** Bougainvilla, Oleanda, Spanish Bayonnet, Yucca (several species), Aloes, Date Palm

6.3 Lot Related Guidelines

Guidelines should mainly be viewed in relation to lot size and lot location. Obviously, lots in emerging urban areas of the National Park would require, because of smaller areas and topography, less landscape planning, installation and maintenance than lots in other parts of settlements and rural areas:

- On all lots, one of the primary focus should be to use plants to avoid grey water from the development site affecting other properties and to help reduce the amount of surface water leaving the site
- Wherever there is sufficient space, plants should also be used for other functional and beneficial purposes such as food, fragrance, birds, erosion control, aesthetics, shade, and spiritual reasons
- On large lots, measures can be undertaken with varying degrees of commitment depending on topography and soil conditions (drainage, rocky and stony characteristics). Generally, property owners, builders or landscapers should:
  - Remove only enough of the natural vegetation of the site to accommodate the building, driveway, garage, storage areas and enough of the area surrounding the building(s) for landscaping, air flow, light, and security concerns
  - Use colorful ground covers in preference to grass to achieve diversity, aesthetic effect and reduce maintenance costs
  - Stabilize cut slopes as soon as possible by planting ground covers and other species known for their soil holding qualities
  - Terrance slopes using various available retainers to conserve soil and water
  - Use various mulch for moisture retention
  - Plant species that can withstand moisture stress and hence require less water for survival
  - Use plants like bananas to catch and absorb grey water moisture from kitchens and bathrooms
- On all lots, care should be exercised in avoiding excess moisture around building foundations resulting from excessive watering of "foundation" plants; seepage of moisture through foundation walls is often a problem with basement units of buildings
- Suitable foundation plants can however be useful in screening foundation walls
- On lots of highly visible slopes, headlands and ridges, plants can be used to mitigate negative visual impacts, namely:
  - Mature trees can be transplanted to afford immediate screening of 2 storey structures
  - Running or climbing vines or other vegetation can be used to cover unattractive retaining walls

Appendix 1: Land Clearance Permit Form

The Applicant is required to fill out the attached Land Clearance Form to demonstrate sufficient knowledge of site characteristics that would allow for mitigation (reduction or avoidance) of impacts resulting from clearing or developing the site for the purposes stated in the development application.

Land Clearance Permit Form

Name of Applicant _____

Parcel and Section and Number:_____

Size of Parcel to be developed: _____

Area of site to be covered by buildings, roads, driveways, parking spaces and other hard cover:
(Attach a copy of the Site Plan for the development) _____

What is the plan landscaping the site; describe type of plants to be introduced, how much of the site material will be retained, if top soil will be brought onto the site for planting purposes

Describe vegetation of the site by type, name, height and size: _____

Describe topographical features of the site, such as boulders, outcrop rocks, water course, steep slopes, stoney or rocky soils, etc: _____

Site Development and Mitigation

Describe machines and methods to be used in clearing of the site: _____

_____

_____

9. Describe how site clearance is to be managed; by whom, etc.:

Appendix 2: Conducting a Percolation Test

Steps in the Test Procedure		
Step 1	Dig 3 holes 1 ft x 1ft to depth of approx $2^1/_2$ft in area of proposed drain field or soakaway	
Step 2	Remove all loose material	
Step 3	Add 6 inches of fine gravel to protect the bottom from scouring or from sediment	
Step 4	Fill with clean water and saturate overnight	
Step 5	Fill holes with clean water the next day and time how long it takes in minutes for the water level to drop 1 inch	
Step 6	Determine size of tile drain field using the information below	
Step 7	Use the average time for the water to fall for the 3 holes; fall rates of longer than 60 minutes per inch are not suitable for drain fields; fall rates of longer than 30 minutes per inch are not suitable for soakaways	
Applying Fall Rates to Tile Fields		
Time to fall 1 inch (in minutes)	**Required Square ft of trench per bedroom**	
< 2 minutes	75	
3	85	
4	95	
5	105	
6-10	135	
11-15	160	
16-30	205	
31-45	245	
46-60	275	
Applying Fall Rates to Soakaways		
Time to fall 1 inch (in minutes)	**Required area of pit walls per bedroom (sq ft)**	

<2 minutes	40	
3	50	
4	55	
5	60	
10	75	
15	90	
30	150	

(Source: OECS, Grenada Building Guidelines)

Appendix 3: Plants for Landscaping, NDNP

Plant		Type			Landscape Benefit						Method of Propagation		
Common name	Botanical Name	Tree	Shrub	Vine	Shade	Erosion Control	Birds / Wildlife	Colour	Aroma	Fruits	Seeds	Cuttings	Suckers
Cinnamon	*Canella winterana*	✓			✓				✓				
Soursop	*Annona muricata*	✓								✓	✓		
Sugar Apple	*Annona squamosa*	✓					✓			✓	✓		
Dancing Lady Orchid	*Tolumnia urophylla*						✓	✓					✓
Aloes	*Aloe vera*		✓			✓	✓						✓
Snake Dagger	*Sanseviera sp.*		✓			✓	✓						✓
Dagger	*Agave karatto*	✓				✓	✓	✓					✓
Giant Air Plant	*Tillandsia utriculata*							✓					✓
Love Bush	*Bryophyllum pinnatum*		✓									✓	✓
Lathberry	*Eugenia cordata var. sintenisii*	✓					✓				✓	✓	
Lignum Vitae	*Guaiacum officinale*	✓					✓	✓			✓		

Appendix 3 Ctd: Plants for Landscaping, NDNP

Plant		Type			Landscape Benefit						Method of Propagation		
Common name	Botanical Name	Tree	Shrub	Vine	Shade	Erosion Control	Birds / Wildlife	Colour	Aroma	Fruits	Seeds	Cuttings	Suckers
Warri Bush	*Caesalpinia bonduc, C. ciliate*		✓								✓		
Black Dog	*Senna atomaria*	✓					✓	✓			✓		
Tamarind	*Tamarindus indica*	✓			✓	✓				✓	✓	✓	
Bread and Cheese	*Pithecellobium unguis-cati*		✓					✓			✓		
Jumbie Bead	*Abrus precatorius*			✓							✓		
Indigo	*Indigofera suffruticosa*		✓				✓	✓					
Dogwood	*Piscidia carthagenensis*	✓					✓	✓			✓	✓	
Ironwood	*Krugiodendron*	✓					✓	✓					
Dumps	*Ziziphus*	✓					✓	✓		✓	✓		
White go Holler	*Erythroxylum areolatum*	✓					✓	✓			✓		
Balsam	*Croton flavens*		✓										

Plant		Type			Landscape Benefit						Method of Propagation		
Common name	Botanical Name	Tree	Shrub	Vine	Shade	Erosion Control	Birds / Wildlife	Colour	Aroma	Fruits	Seeds	Cuttings	Suckers
Mutton Porridge	*Phyllanthus epiphyllanthus*		✓				✓	✓					
Cabrita (Elsie Bush)	*Bunchosia glandulosa*		✓						✓				
Clam Cherry	*Byrsonima lucida*	✓			✓		✓	✓			✓		
West Indian Cherry	*Malpighia emarginata*		✓				✓	✓		✓	✓		
	stigmaphyllon floribundum	✓		✓			✓						
Black Willow	*Capparis Cynophallophora*	✓					✓	✓			✓		
Bottle Brush (Jamaican Dogwood?)	*Capparis flexuosa*		✓				✓						
	Capparis hastata	✓	✓				✓						✓
Willow (close to Black Willow)	*Capparis indica*	✓					✓	✓			✓		✓
Turpentine Tree	*Bursera simaruba*	✓				✓		✓					

Appendix 3 (cont'd): Plants for Landscaping, NDNP

Plant		Type			Landscape Benefit						Method of Propagation		
Common name	Botanical Name	Tree	Shrub	Vine	Shade	Erosion Control	Birds / Wildlife	Colour	Aroma	Fruits	Seeds	Cuttings	Suckers
Guinep	*Melicoccus bijugatus*	✓	✓							✓	✓		
West Indian Mahogany	*Swietenia mahagonii*	✓			✓						✓		
Myrtle Lime	*Triphasia trifolia*		✓						✓		✓		
White Greenheart	*Zanthoxylum spinifex*		✓						✓				
Seaside Mahoe	*Thespesia populnea*	✓						✓					
Pigeon Plum (Wild Grape)	*Coccoloba sp.*	✓	✓							✓	✓		
Sugar Grape	*Coccoloba venosa*	✓	✓				✓			✓			
Turks Head Cactus	*Melocactus intortus*							✓					
Dul Dul	*Pilosocereus royenii*		✓									✓	
Black Loblolly	*Guapira fragrans*	✓			✓	✓							
Loblolly	*Pisonia subcordata*	✓			✓	✓							
Pie Crust	*Jacquinia*	✓	✓				✓	✓			✓		

Appendix 3 (cont'd): Plants for Landscaping, NDNP

Plant		Type			Landscape Benefit						Method of Propagation		
Common name	Botanical Name	Tree	Shrub	Vine	Shade	Erosion Control	Birds / Wildlife	Colour	Aroma	Fruits	Seeds	Cuttings	Suckers
Wild Coffee	*Psychotria nervosa*		✓				✓				✓		
Ironwood	*Exostema caribaeum*	✓					✓	✓					
Black Chink	*Guettarda scabra*	✓											
Purple Allamanda	*Cryptostegia grandiflora*		✓										
Wild Frangipani	*Plumeria alba*	✓						✓					
Chinkswood	*Bourreria succulents*	✓					✓	✓		✓	✓		
Calabash	*Crescentia cujete*	✓											
Cats Claw	*Macfadyena unguis-cati*	✓						✓					
White Cedar	*Tabebuia heterophylla*	✓			✓		✓	✓					✓
Golden Seal	*Tecoma stans*		✓					✓					
Fiddlewood	*Citharexylum fruticosum*	✓					✓	✓					
Privy	*Cherodendrum aculeatum*		✓					✓					