

## Hibiscus Eco-district

by Pierre Bouin / 2019-06-17 17:15:19 / France / 8904 / FR



**Address 1 - street :** 97300 MATOURY 97351, CAYENNE, GUYANE FRANÇAISE, France

**Gross density :** 37.48 logt/ha

**Population :** 3 000 hab

**Number of jobs :** 2 080 emplois

**Starting year of the project :** 2006

**Delivery year of the project :** 2016



25 ha



40 000 000 €

**Certifications :**



### ID CARD

The project is part of the manufacturing dynamic of the new "Hibiscus University district" in Cayenne. It must allow on the one hand the development of the sector and the insertion in the city of the University Pole of Guyana, on the other hand the creation of housing, activities and equipment.

The area of approximately 130 hectares, the equivalent of the historic center of Cayenne, is located 2km east of the city center. The eco-district Hibiscus represents a land opportunity of 25ha.

The ambition of the project is to build a piece of city that is not an enclave: that is to say, a district fully integrated with the city of Cayenne, and which takes into account the peculiarities of the territory of Guyana (demographic situation and land, natural risks, climate ...). For that, several principles dictated its conception: to favor the opening to the city through an efficient street network, to offer housing and the social mix, to create animation and finally to answer the flood risk to create a real landscape and social added value.

As such, the project received in 2015 the "Grand Prize for development: better build in floodplains".

In terms of housing, it was to offer a large share of assisted housing, collective housing, individual and student rooms. New equipment was installed: a school

group, a nursery, a retirement home, sports equipment ... Finally, it was to offer animation with the installation of a neighborhood house, shops and restaurants. services, and the creation of public spaces. The central square, the urban boulevard, the developed streets, the large pool and its fitness trail are the unifying elements of meetings and sharing of the new neighborhood.

The city of Cayenne has not seen the construction of a new structured neighborhood for several decades. Ultimately, it is 5% of the population of Cayenne that will inhabit the Hibiscus district.

## Programme

- Housing
- Offices
- Businesses and services
- Public facilities and infrastructure
- Public spaces
- Green spaces
- Others

## Project progress

- Management phase
- Delivery phase

## Key points

- Governance
- Quality of life
- Energy /Climate

## Approaches used

- Ecodistrict national label

## Certifications

- Ecodistrict national label

## More info

<https://youtu.be/O8OS0PbNoOI>

## Data reliability

Self-declared

# TERRITORY

## Type of territory

French soil of South America, Guyana has extraordinary geographical and human characteristics, creating special needs.

With an area of 84,000 km<sup>2</sup>, or 16% of metropolitan France, Guyana is the largest department in France. The majority of inhabitants, however, focuses on the coastal fringe between Cayenne and Saint-Laurent du Maroni.

Its exceptional forest biodiversity covers 95% of the territory. Its first-rate fishing, forestry, mining and energy resources, and of course the Kourou Space Center, give it many advantages.

Unlike other French regions whose population is aging, half of the Guyanese population is under 25 years old. Population pressure is high (+ 2.6% per year according to INSEE), mainly due to an exceptional birth rate. In 2016 the population of Guyana is according to the INSEE of 268 000 inhabitants and its projection to 2040 is 540 000 inhabitants.

## Climate zone

[Am] Tropical Monsoonal

## KEY FIGURES

### Green areas, roofs included

Green areas, roofs included : 55 000 m<sup>2</sup>

### Public spaces area

Public spaces area : 110 000 m<sup>2</sup>

### Office floor area

Office floor area : 4 651 m<sup>2</sup>

### Commercial floor area

Commercial floor area : 5 700 m<sup>2</sup>

### Public facilities floor area

Public facilities floor area : 4 289 m<sup>2</sup>

### Housing floor area

Housing floor area : 71 595 m<sup>2</sup>

### Number of residential units

Number of residential units : 937

### Number of social housing units

Number of social housing units : 600

### Green spaces /inhabitant

18.33

### Public spaces/inhabitant

36.67

### Total of subsidies

Total of subsidies : 14 895 404 € HT

## GOVERNANCE

### Project holder

Name : EPFA Guyana

Type :

General description :

Project owner (legal structure) EPAG - Public Establishment Establishment of Guyana became EPFA Guyana, Establishment Public Land and Development of Guyana in 2016, is a legal person under public law with administrative autonomy and financial giving it the capacity and the flexibility of action of private operators to carry out missions of general interest. It intervenes in the areas of land action, sustainable urban development, sustainable economic development and agricultural development of the territory.

### Project management

Description :

Diversified housing and economic and commercial programming was strengthened by the signing of a charter for housing for all in 2012. The signatories were:

- The city of Cayenne

- The Regional Council
- The General Council
- SEMSAMAR
- SIGUY
- SIMKO
- Guyanese habitat
- The EPAG
- The Caisse des Dépôts et Consignations
- The DEAL

They pledged to promote the creation of housing for all, including through assistance to the constitution of loan guarantees for social landlords by local authorities. The last ones have also invested in a shared and concerted way in the allocation of new housing. Finally, the partners wanted to facilitate the professional integration of unemployment people by including specific clauses in works contracts. It was the first time that a charter grouping all development and construction partners was concluded with such an operational scope for a particular development project. It was able to instil a collective impetus into the act of building that allowed the neighborhood to quickly achieve its occupancy goals.

## Project stakeholders

Project management group design

**Function :** Construction manager

Grouping project management design with the following structures:

**Construction21 company page :**

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STOA

**Function :** Architecture agency

Architecture, urbanism, design

**Construction21 company page :**

<https://www.agencestoa.com/>

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Botanik Landscape

**Function :** Other

Grounds

**Construction21 company page :**

<https://www.facebook.com/botanikpaysage/>

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Guyana Technical Infrastructure (GTI)

**Function :** Technical consultancy agency

Representative

**Construction21 company page :**

<http://gti-guyane.fr/>

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B.T.C. - Technical Office and Coordination (Guyana)

**Function :** Technical consultancy agency

**Construction21 company page :**

<http://www.otg.fr/bureau/b-t-c/>

## SOLUTIONS

- Urban project governance

## QUALITY OF LIFE

### Quality of life / density

To understand the challenges of land policy at the intermunicipal level, the Communauté d'Agglomérations du Centre Littoral (CACL), it is necessary to return to what characterizes the Guyanese territory; this department has very specific characteristics that clearly distinguish it from the contexts of the metropolitan departments. Thus, the Guyanese city has dynamics that are partly similar to the dynamics of cities in the South, with urban development facing its own challenges.

- Guyana's territory is experiencing spectacular demographic and urban growth (high birth rate and high immigration are at the origin of this) accentuated by an unbalanced distribution of its population; the largest French department is a "plant void" that suffers from overcrowding on its coastal strip. Today, more than half of the population lives on the island of Cayenne, in the communes of Cayenne, Rémire-Montjoly and Matoury where, according to INSEE, the coastal population is expected to double in 2030 compared to 2008. This demographic and urban growth of the coastal strip is leading to increasingly sustained land pressure.
- Although the situation in Guyana is more favourable than in neighbouring countries, thanks to national solidarity, poverty is another major challenge for housing policy; 80% of the Guyanese population is eligible for social housing.
- Finally, the third challenge facing this territory is related to natural risks, in particular the risk of flooding; the spatial control of natural hazards regulated by the Risk Prevention Plan (RPP) severely accentuates the shortage of free plots of land for urban development on the Island of Cayenne.

Le développement durable du territoire guyanais semble donc être synonyme de recherche de nouveaux espaces à bâtir. C'est le cœur du Schéma de Cohérence Territoriale (SCOT) de la CACL qui préconise la densification des villes existantes et de leurs secteurs en renouvellement, et le développement urbain d'un «collier de perles» de petits bourgs au Sud.

L'opération qui nous concerne ici s'inscrit pleinement dans cette logique de renouvellement urbain d'un secteur de Cayenne préconisée par le SCOT. L'opportunité d'un foncier de 25 ha proche du centre historique, en continuité du Pôle Universitaire Guyanais, sous contrainte au regard du risque inondation mais constructible, font de ce nouveau quartier de Cayenne le lieu où développement urbain devrait rimer avec développement durable sur le territoire guyanais. Maintenant revenons à la genèse du projet pour comprendre comment le nouveau quartier Hibiscus s'est connecté au tissu existant. Dans un premier temps, une nouvelle trame viaire a été élaborée de façon à raccorder et ouvrir le Pôle Universitaire à la ville : un nouveau boulevard urbain le longe et le relie, la rue de l'Université se prolonge jusqu'à la route de Saint Antoine et enfin un bus en site propre (TCSP) viendra le connecter définitivement à la ville à l'horizon 2020.

Dans un second temps, plus que l'ouverture sur la ville, le projet propose de créer un nouveau morceau de ville, maillé à l'échelle du parcours piéton, comme doit l'être un centre urbain ; plus la maille est serrée, plus la liberté des pratiques urbaines est grande. Ainsi à long terme, ce morceau de ville pourra être ingéré sans bouleversement par l'extension urbaine de la ville de Cayenne.

Enfin, la nouvelle trame viaire doit gérer les différentes échelles de flux. Le maillage des voies passe par leur stricte hiérarchisation sans oublier le travail de coutures avec l'existant. La nouvelle trame orthogonale, calquée sur la trame historique de Cayenne permet alors un découpage en îlots cohérent ; l'îlot de 60x120m en moyenne résultant permet une grande pluralité architecturale et des parcours piétons variés. Ce nouveau quartier répond aux exigences de densité souhaitée par le programme au travers de son armature urbaine et d'un épannelage fin des bâtiments constitutifs de son tissu urbain.

Once this density was created, the project set out to reconcile it with the quality of life that a "piece of town" must offer. To know:

- a good relationship between free space and built space at the scale of the district and the block
- a mix of urban forms adapted to the context
- a homogeneity of architecture on the main tracks
- a strong presence of green spaces and water
- a qualitative treatment of public spaces
- a network of trips in soft modes

This "positive density" takes on its full meaning in the project's actions to develop the use of public spaces and the animation of the district. He proposes:

- a mix of functions,
- a qualitative layout of public spaces to encourage meetings and exchange,
- and finally, a wide range of shops and local activities.

## Net density

-0.01

## Culture and heritage

RESPECT THE LOCAL IDENTITY: REUSE OF THE PRINCIPLES OF THE BATI HERITAGE, VALORISATION OF THE NATURAL HERITAGE AND LANDSCAPING

The project site has its own identity. That is to say, that it possesses remarkable elements which deserve to be reused or preserved by the project and, in order to inscribe the new district in the local continuity, to insert it in the context . This re-appropriation of elements favors the integration of future inhabitants, thus improving their living environment.

The project proposes the reuse of a remarkable Guyanese built heritage: urban Creole architecture. These houses that we still see in the streets of Cayenne are very adapted to the natural and social environment. Their peripheral galleries, sheltered by large awnings, have a function of distribution but also of protection against the rain and the sun. The rooms on the ground floor are more or less public while those on the floor are strictly private. The private, tree-lined and more temperate courtyards are green island hearts. These elements, while responding to climatic and social constraints, have become signs of "the Guyanese house". They are reused by the architecture of the new district Hibiscus.

The project, through the planting of more than 1000 trees and 150 palms, all local species, contributes fully to the enhancement of the exceptional natural heritage offered by Guyana. And by the same, to the conservation of the Guyanese biodiversity. Thus, fruit plant species formerly planted in the Guyanese gardens have been reintroduced: ti-egg yolk, lagerstroemia, dwarf mango ... And other endemic species of wetlands have been planted around the basin and in the central square: tarpaulin palms, pinot palms, river cocoa ... The planting of endemic species opens a window on natural environments from the city, the use of ancient fruit species as for it, creates a link with the older generations.

Finally, the project by promoting an alternative management of rainwater, advocates the return of water in the city, and enhancement of the landscape of Guyana. In Guyana, water is an essential component of the landscape: coastal and mangrove areas, swampy areas, wetlands from which tarpaulin palm trees stand out, and of course large rivers.

## Social diversity

**SOCIAL DIVERSITY AT THE HEART OF THE CONCERNS OF THE HIBISCUS PROJECT** How can the project take into account the social context of the municipality while the social mix can only result from the will of a communal development project. The district procedure adopted for the creation of the Hibiscus district is the perfect framework to define, well in advance of the project, and in collaboration with local partners, a balanced program of diversified housing that perfectly reflects the local housing policy. Thus, the program of the Hibiscus district, in order to accommodate a diversity of households and lifestyles, offers a wide diversity of habitats based on different modes of accession and habitat types. Diversified housing offer should allow the municipality of Cayenne to support the residential mobility of its inhabitants. That is to say to offer at each stage of their lives a housing adapted to their needs, according to their social diversity (ages, household compositions: young households, singles, families ...) and their means. It is therefore proposed to propose a total of 1387 housing units, ie 973 equivalent housing units

- Housing in accession (from the studio to the individual house) and assisted rental
- Diversified habitat types: 695 collective dwellings, 18 individual dwellings and 674 student and young worker rooms.

It should be noted that the share of assisted housing is high: more than 600 homes, or 60% of the total housing. This reflects the willingness of the municipality to fight against the precariousness of a large part of the Guyanese population. In addition, to reach the goal of producing a new offer of assisted housing, the City of Cayenne, the Regional Council, the General Council and the social landlords of Guyana, in the presence of EPAG, developer of the district of the The University, and Caisse des Dépôts et Consignations, a privileged financial partner of social landlords, concluded in 2012, the charter for housing for all, which defines the concrete commitments of each partner.

**LIVING TOGETHER THOUGHT AT THE SCALE OF THE DISTRICT AND AT THE SCALE OF THE ISLAND** The urban structure of the Hibiscus district, because of its density and the fineness of its network at the scale of the pedestrian paths, favors the urban walk and thus the living together. In addition, the development of public spaces takes into account the characteristics of the climate of Guyana: in the end, all spaces will be shaded, ventilated and well open. The main streets are planted with 2 rows of trees of first magnitude favoring the pleasure of walking in the shade. Finally, this walk is embellished with many places generating animation and social interaction:

- the fitness trail laid out for sports activities, the raised central square offers platforms for the installation of terraces of coffee,
- finally, the urban boulevard should offer a succession of local shops.

The islands are relatively large (60x120m) and dense. They have a good balance between built space and free space. They function as "neighborhood units". A front built on a street allows to isolate the heart of block, several buildings are composed on the island thus allowing the crossed views from one building to another, and allowing the offer of a broad range of housing and the reception of office premises and activities. The heart of islands are composed of green spaces and shared car parks. Thus designed, the island offers a sharing of space while preserving the privacy of the inhabitants. SOLIDARITES The accessibility of the city to people with disabilities and reduced mobility is a requirement. It can be structured around three themes: travel, services and equipment, and housing. These themes are translated at the level of the urban project by the accessibility of buildings, roads, transport and equipment. Appropriate improvements to roads and public spaces (wide sidewalks, slightly sloping and equipped with tactile guides) allow people with disabilities or reduced mobility to move easily, freely and peacefully in the neighborhood. The project is also moving towards a more cohesive mobility with facilities for active modes and by 2020, with the service of the district by the future BHNS of the city of Cayenne. In Guyana, access to public transport is synonymous with mobility for a large part of the population in a precarious situation. Finally, facilities favorable to mutual aid, accommodation of young people and the elderly are provided:

- a neighborhood house,
- a playground for children,
- a retirement home, a shelter for young workers.
- a shelter for young workers
- 

## Social inclusion and safety

### DEVELOPMENT AND ANIMATION OF PUBLIC SPACES ARE SOURCE OF URBAN SECURITY

To increase the security and sense of security of the inhabitants, the project provides:

- good design of public spaces: rational and adapted lighting, planting trees to insulate sidewalks from motorized tracks, multiplying pedestrian crossings by taking care of co-visibility and equipping the crossings with tactile guides.
- And especially actions that encourage the animation in the center of the new district: creation of activities in the DRC on major roads, installation of cafe terrace on the central square, creation of recreational spaces

## Ambient air quality and health

### ATMOSPHERIC POLLUTION AND WATER POLLUTION

The overpopulation of the coastal strip and the polarization of urbanization on Cayenne have led to an increase in urban air pollution, induced by the strong growth of mobility and the average daily commuting distance. Added to this is the increase in space consumption and the increase in energy consumption.

The project proposes several ways to reduce atmospheric pollution:

- By reducing car travel. On the one hand, the neighborhood offers a plurality of functions: housing, but also equipment, offices, shops and services. On the other hand, it offers opportunities for alter mobility thanks to a good network of neighborhoods and amenities that promote active modes and serving the neighborhood as public transport. The Cayenne BHNS project is expected, the right of way is reserved, the stops are planned.
- By greening the neighborhood. Indeed, the trees purify the air by producing oxygen and by filtering the fine particles, they also act like natural air conditioner by decreasing the ambient temperature and by promoting a better ventilation. It is planned to plant more than 1000 trees along the tracks and 150 palms essentially around the basin, in the central square and in the valleys.

Sanitation is a complex subject in Guyana: the construction of wastewater treatment plants could not be achieved at the same pace as legal housing and the pockets of illicit housing are not sanitized. In this context, the sanitation of the Hibiscus sector appears exemplary. The Hibiscus wastewater network is composed of two "watersheds" each comprising a gravity collection network discharging into a discharge station. Each discharge station is then connected to the primary network of the CAEL. This primary network has an outlet for the STEP Leblond: activated sludge treatment plant.

## SOLUTIONS

Taking into account management and uses in the project design

### Description :

The space on which the Hibiscus University area was built is a low point, collecting water from several watersheds. This very dense natural space was not used directly by the local residents. It was a landscape of pleasure for the funds of parcels which adjoined it.

This use of landscape for the comfort of some residents has been transformed into a use of comfort for all the inhabitants of the city, especially through the realization of the pool and public spaces for games and amenities. Some individuals have therefore lost a connection to nature, to the benefit of the rest of the population.

In agreement with the city the water management, in addition to being used as reference element for the public space, has been simplified to the maximum, with the use of a central divide easily accessible and maintainable.

All requests from dealers, future owners, have been taken into account. This project is also the first on which the EPFAG has signed delivery agreements with the city and the CACL.

These work release agreements are intended to allow a re-management of the works, prior to the return to ownership. This makes it possible to accelerate the management by the communities, whose services are competent, even though the developer is not properly equipped to do so, and to ensure the final owner that the work done is in accordance with his wishes.

They precisely identify the works completed and to be handed over. They explain how the final owner is associated with the delivery of the books and can express themselves on the nature of the work carried out. Thus the city of Cayenne has accepted the re-commissioning of works, and even the relaunching of sections, while being able to express reservations which EPFAG has undertaken.

A final example of adaptation of the modes of management and use is the realization of complementary sports fields in the secondary basin, serving as spillway to the main basin during the most intense rainy events. This space was initially conceived as the most permeable possible and did not host activity. In consultation with the city and the water police, EPFAG and its project manager proposed to create sporting areas that can be used most of the time of the year. It is clear today that these sports fields are extremely successful.

## ECONOMIC DEVELOPMENT

### Local development

To understand to what extent the project contributes to the economic dynamism of the territory, we must once again return to the local context: the situation of land shortage in Guyana and conflict between uses resulting from it. As in the other DOMs, and perhaps even more here, it is the availability of land that appears to be the main obstacle to the installation of the Guyanese companies.

The land situation in Guyana is paradoxical: the territory is very large and sparsely populated, but the disparity in population density between the overcrowded littoral zone and the empty forest zone is at the origin of strong urban and land pressure on the coastal plain, especially on the island of Cayenne.

In addition, Guyana must simultaneously respond to the considerable and growing needs for housing, basic infrastructure brought about by population growth and lifestyle changes, as well as the need for new transport infrastructure to increase mobility. . And finally, Guyana has to face the development needs of its companies. Faced with such competition between sectors, the supply of commercial land tends to be singularly lacking in the department.

According to the Chamber of Commerce and Industry of Guyana (CCIG), economic activity areas represent only 1% of the departmental space (against 10% of the territory in metropolitan France), which is not enough according to her to meet the demands of businesses. Public actors seem to have become aware of the problem. The "strategic territorial diagnosis of Guyana prior to the development of European programs 2014-2020" considers that the development of "business reception infrastructures" is a key issue for strengthening the competitiveness of small businesses and SMEs. But also, the development of the offer of economic land is now part of the Strategic Plan and Actions for Economic Development.

In this context, the mixed development project Hibiscus, which provides for the creation of a large commercial land, undeniably contributes to the economic dynamism of the territory. It provides for the creation of 4,600 m<sup>2</sup> of offices and 5,700 m<sup>2</sup> of shops and services in the DRG.

In addition, this offer of commercial real estate is at the heart of an attractive site, offering the living environment of a real neighborhood: centrality, developed routes, variety of landscapes and in terms of fast and comfortable public transport. This living environment is a factor of attractiveness for companies, well-being and comfort for workers.

### Functional diversity

Because they play a vital role in the lives of Guyanese, especially the most modest, because the department is under-equipped and suffering from a bad distribution in its territory, the equipment was placed at the center of the reflections when programming the neighborhood.

Thus, a panoply of equipment was planned to meet on the one hand the needs induced by the installation of the new inhabitants in the district, it is the "equipment of proximity", on the other hand to supplement those of the commune, even of intercommunality, even on the scale of the territory of Guyana if one considers a structure like the House of the forest and the wood of Guyana which found its place in the district.

Many local amenities have been created:

- Some in favor of early childhood, youth and education: a nursery association, a kindergarten in the central square and an 18-class school group, consisting of a kindergarten and a primary school .
- Others favorable to mutual aid and exchanges: a neighborhood house
- And, others for their recreational and relaxing role: neighborhood sports facilities, a fitness trail around the pool, landscaped green spaces.

Facilities for youth and elderly housing have been created. These have a wider radiation.

- A retirement home
- A shelter for young workers
- 600 rooms for students

In addition, the establishment of many shops, services and activities for the use of local residents and users has been favored.

Finally, with its 4600 m<sup>2</sup> of offices, the district is an area of employment and attractiveness, which may have a greater or lesser radiation depending on the companies that will settle there. For example, the Forest and Wood House of Guiana, which should be located in the district, is a multidisciplinary support structure serving the Forest & Wood sector for the whole of Guyana.

Finally, the question of access to equipment is crucial. Indeed, their radiation outside the neighborhood must be reinforced by a privileged position in the public transport network and travel in active mode. In addition, this question goes hand in hand with the question of the attractiveness and sustainability of the neighborhood's activities.

As of now, an active mode travel network has been created in the neighborhood. By 2020, links with the center of Cayenne will be facilitated by the arrival of BHNS in the heart of the district; his hold is already reserved. The facilities, services and shops of the new district will then be an integral part of the municipality.

## % of public spaces

44

## % of office area

2

## % of commercial area

2

## Circular economy

We must return to the specificities that make the territory of Guyana to understand the approach of the project in terms of saving resources and using local resources. In Guyana, due to the geographical distance of the department and the narrowness of the local market, domestic production of industrial and artisanal products is limited.

Also, in order not to be in a retrospective obligation to bulk import products coming from outside, it was agreed, in anticipation of the design, the need to evaluate local production capacities.

The study began by getting acquainted with all the Guyanese companies of public works and green spaces installed on the territory. An evaluation of the available processes and materials was also carried out on the basis of feedback from technical services and companies. Choices were made: choice of embankment material granulometry, choice of asphalt formulation, availability of wood in sawmills.

The process was not in vain. Today, the project can boast on the one hand of having managed to cope with local materials and know-how, on the other hand, given its magnitude, to have been to a certain extent a lever for restructuring the industrial and artisanal landscape, and promoting the local wood and stone sectors.

With regard to public works, the prescribed materials and processes are almost entirely controlled locally, both in their manufacture and their maintenance. This concerns:

- Class IV local woods (to limit pesticides) used for making tree surrounds, some furniture (garbage cans and benches), terraces and walkways.
- The big pebbles of the place and benches made of concrete on the spot. Only the mold has been imported.
- The asphalt made with a local granulate: gray granite, the only Guyanese stone.
- A soil treatment made with hydraulic binder dosed at 6% to a thickness of 40 cm for the formation of the form layer and foundation of the road to limit the use of GNT 2 (granite granite extracted at the quarry of EIFFAGE )
- The gabion retaining walls filled with granite pebble from Guyanese quarries.
- To limit the use of bitumen, which must be imported, the pavements of certain service roads and sidewalks were made of concrete.

On the other hand, for public lighting, the standard models used on the municipal territory have been installed and this in order to facilitate their maintenance.

Concerning green spaces, it was necessary to encourage local nurseries to anticipate the cultivation of the plants and trees needed for the project. The seedlings were sown and raised in Kourou; the concept of nursery in the ground did not exist before this project. All species selected for the project are local: old fruit species (ti-yolk, lagerstroemia, dwarf mango ...), but also palms and endemic trees wetlands: tarpaulin palms, pinot palms, river cocoa ... It will be necessary to develop a real know-how for their maintenance; Tree planting in the city is an underdeveloped concept in French Guiana.

Always, in a logic of economy of the resources, a fine management of the altimetry was carried out in order to optimize the earthworks, that is to say in order to balance at best the cubatures of cuttings / embankments. 51,000 m<sup>3</sup> of cuttings were reused to reach the earthworks and upgrade the green spaces.

Lastly, regarding the valorization of short circuits, there was no political or associative will in their favor to design the project. On the other hand, the project has set out to create substantial spaces that can accommodate local producers' markets for example; with the arrival of 3000 new inhabitants, the demand could be strong.



## Mobility strategy

In order to encourage active mode travel and the use of public transit, both within the neighbourhood and to neighbouring neighbourhoods, several principles have guided the development of the area. The very principle of designing the neighbourhood's road network reflects the desire to offer an alternative to car travel. On the one hand, the viaduct has been designed in line with the existing site in order to facilitate travel in active modes with the rest of the city. On the other hand, it is meshed and hierarchical like that of a "piece of city"; the meshing is tightened, thus offering greater freedom of urban practices and therefore a greater choice of means of transport. In addition, to promote inter-modality, the urban organisation of the district has been designed in conjunction with the future public transport network which should connect the district with the whole of Matoury/Cayenne/Rémire-Montjoly territory. Thus, a reserved right-of-way has been maintained for the passage of the future High Level Service Bus of Cayenne (BHNS), a project currently under study by the CACL. The BHNS stops were positioned at strategic points in the district: at the western and southern entrances, on the central square, in the centre of the University Centre. In this way, almost all the parcels created are located less than 500m from a stop and the heart of the district is directly connected to the city centre of Cayenne. To ensure that inter-neighbourhood trips to the stops are made on foot or by bicycle, everything possible is done during the development of the roadway so that cyclists and walkers can walk safely in a pleasant environment. It is also planned to set up numerous bicycle spaces near stops/exchange points to facilitate the transition from one mode to another. Finally, the prioritisation and treatment of lanes are fundamental to the urban character of the district, to its overall understanding by all, to its efficient service, and to its sharing among all users. The urban boulevard and the university street are the two main axes, they structure the composition of the new grid. Their central position allows to distribute the whole area, they cross in the heart of the district, where the central square is located. The other roads irrigate the district, while tracing the building blocks.

Three types of track profiles are proposed:

- The structuring axes, in zone 50, of 7m of pavement
- the secondary roads, in zone 30, of 6 m
- the service streets, in the meeting area, of 3.5 m in one direction
- and finally the pedestrian paths.

In order to promote walking, the project proposes:

- to position the living area in the centre of the district, 500m on average from all the plots,
- to allow pedestrian continuity between the PUG (Pôle Universitaire Guyanais) and the urban fabric,
- to give pedestrian space: sidewalks along all lanes, sidewalks on both sides, developed and accessible intersections, continuity along the streets,
- to promote walking: a comfortable and pleasant route, secured by continuous lighting, air-conditioned by trees,
- to reinforce the permeability of the lanes in zone 50, by multiplying pedestrian crossings, ensuring covisibility, providing continuous and homogeneous lighting of the pavements, equipping the crossings with podotactile guides...

Cycling facilities have been built to ensure the cohabitation of vehicles/cycles and pedestrians/cycles:

- on structuring roads, cyclists are placed on sidewalks, protected from traffic by the planted valley. It does not seem necessary to physically separate the two flows given the low attendance expected. Dutch specialists have empirically determined the pedestrian density thresholds above which pedestrian/bicycle separation is recommended to avoid conflicts and mutual inconvenience. We see that below 100 pedestrians/m/hour, conflicts are considered tolerable.
- In Zone 30, on service roads, the coexistence of bicycles and vehicles on the roadway is the rule, with sidewalks reserved for the sole benefit of pedestrians.
- In the Meeting Zone, the pavement space is common to all users.

The reduction in the place of the car should be an additional gesture in favour of other modes of transport: active modes and public transport. It can be done on two levels: spatially, the spaces intended for the car are reduced and socially, the use of the car is discouraged. However, to compensate for the lack of public transport, the project does not go in this direction: there is a significant supply of parking along the tracks. Ultimately, after the HQPT is commissioned, the parking strategy will be reassessed.

## SMART CITY

### Smart City strategy

At the time of the programming and the design of the district, the stakes related to the deployment of the networks with Very High-speed have not been identified. Nothing has been planned in this direction.

On the other hand, to limit urban travel, via digital, coworking spaces have been programmed.

## RESOURCES

### Water management

#### WATER PARTNER OF THE URBAN DESIGN OF THE DISTRICT

Over the last thirty years, a change in water management has occurred. While we were in a logic of waterproofing the soil and total disappearance of the water element, and this for reasons of public health, today water is rehabilitated in the city. Water now appears to carry newfound virtues: recreational, hydraulic, ecological and especially landscaped.

The development project is fully committed to this approach; Water is apprehended as a central partner of the urban design of the new Hibiscus district. The management of the technical constraint has thus become an asset in the design of this piece of city, offering legitimacy and wealth to the project. Thus, the central

compensation pool is the support of a quality public space, urban breathing dedicated to relaxation, walking and sports practices. The flood-lit central square is a place of meeting and conviviality in the heart of the district. These unique places meet a strong demand from the inhabitants.

The project is located in the heart of the St Antoine / Hibiscus watershed. For the good management of rainwater, an essential topic in the management of development projects in French Guiana, it was necessary to take into account all the zones built on the sector and its surroundings. Thus, on the one hand, the hydraulic works performed are those provided for in the Master Plan for Stormwater Sanitation (SDAP) and, on the other hand, they take into account the constraints set by the PPRI on the sector.

For the management and the purification of rain water of the sector, the following hydraulic works were realized:

- the establishment of two compensation basins in low hazard zone of the PPRI: the main Hibiscus basin (retention of 32000m<sup>3</sup>) and the small basin, which works in equilibrium with the large basin (retention of 2500m<sup>3</sup>). To fight against dengue fever, the impact study recommended water basins with a height of about 1.20m.
- the resizing of existing drainage structures,
- the creation of vegetated valleys for the collection of rainwater (total linear of 1400m),
- the creation of a draining ditch for the drainage of runoff from the St Antoine watershed,
- for the recovery of surface water, the establishment of a rainwater network buried between the valleys to the basin or draining ditch.
- the extension of an underground compensation network to the collective plots upstream of the buried recovery network. Each developer must then consider retention solutions at the scale of his project (green spaces, parking in evergreen ...).

To better understand the stormwater management project, we need to get to the heart of the matter. The main constraint for topographic rigging of the development project was the stormwater discharge and drainage constraint. It was necessary to proceed with a major reloading of the natural terrain to obtain consistent roof heights.

In addition, the development of the sector is associated with hydraulic works related to the realization of works planned in the SDAP in the project area. To know :

- a Montabo retention pond (in the form of two Hibiscus and Montabo caissons),
- the resumption of downstream sections of Montabo Creek,
- the achievement of compensatory measures to maintain a maximum waterprooing of 35%.

Finally, the measures with respect to the PPRI and the hydraulic operation of the basin had to be respected:

- the constructive measures of low hazard and precautionary zones: respect of the level of the floors (3.90 m above sea level) and the level of the urban boulevard which must also be out of water.
- the restoration of the East / West draining drainage ditch draining the Saint Antoine watershed, the dimensions of which correspond to the decennial flow.

Regarding the wastewater network of the Hibiscus sector, it is connected to a municipal gravity collector whose outlet is an activated sludge treatment plant. This collector had been sized taking into account the volumes of wastewater estimated for the Hibiscus project. When planning the Hibiscus project, nothing has been planned for the reduction of drinking water consumption.

## Soil management

The prevention of risks, in particular the flood risk to which the sector is subject, is one of the main constraints with which the development project has had to contend. For the exemplarity of its approach to flood risk, the project received in 2015 the "Grand Prize for development: better building in floodplains" awarded by the Ministries of Ecology and Housing. The prize was designed to promote innovations in development projects that strengthen "individual or collective resilience" to floods.

Cayenne Island is a very vulnerable territory; flood risk is important and the population is relatively concentrated. The spatial extent of flood natural hazards regulated by the Risk Prevention Plan (PPRI) covers a large part of the island. However, in the coming years, the risk could be reassessed upwards. The work coordinated by the Bureau of Geological and Mining Research (BRGM) shows that the possible impacts of global climate change for Guyana could concern, among other things, natural risks. However, the BRGM also specifies that the study of the evolution of these risks requires a lot of precautions because of the joint effects of climate change and the development of urbanization, correlated to the deforestation of the hills.

The project focused on responding to the flooding nature of the area specified by the Guiana Stormwater Master Plan and by the PPRI of Cayenne Island. The sector is located in low risk and precautionary area of the PPRI.

In terms of safety, the hydraulic developments carried out on the project perimeter thus meet the regulatory constraints imposed by these two documents. But not only. The facilities have been designed to also address the flood risk of the entire area. And finally, they constitute a real added value landscape and social for the sector and the city.

In Guyana, traditionally, the question of flood risk is approached as a technical element of the project, which results in a compensation pool, fenced, whose maintenance is rarely assured. We are then faced with an urban neglect, more or less important, with an aggravating health risk related to the proliferation of mosquito larvae during the rainy season.

The Hibiscus project has a reverse approach that makes it original. Suddenly, water appears as a pacifying element from several points of view:

- At the level of the landscape, the creation of a water basin of 3 ha allows prospects in a neighborhood of dense habitat,
- At the health level, the permanent presence of water eliminates the risk factor for the development of mosquito larvae,
- At social and societal level, the development around the basin allows to create the first urban health course of Cayenne, enlightened in the evening,
- At the security level, it regulates the leakage rates towards an existing canal, and regulates the risks of flooding of the whole sector,
- At the technical level, the basin has been designed to remain in water all year long, with a volume located above the impoundment reference coast calculated to absorb the stormwater of the district in flood centennial,
- At the financial level, the additional cost consists mainly of additional earthworks and the realization of an "urban" riverbank in gabion for less than 5% of the total cost of the development of the district.

Throughout French Guiana, it is the Flood Risk Management Plan (PGRI) that provides the broad guidelines for the flood risk management policy. On the island of Cayenne, 5 strategic axes are retained, including those to improve the knowledge and culture of flood risk. In this sense, in recent years, several actions have been conducted on the territory to raise awareness. Among them, the "risk days" are an annual operation to raise awareness of major risks. They are an opportunity to bring the preventive information to the population, to make him feel the reality of the risks present on the territory while indicating the conduct to take.

The next edition could be held in the heart of the Hibiscus district with the backdrop of the large landscaped pool.

## Waste management

To limit the production of green waste, a careful choice of species planted and to be conserved has been made:

- upstream of the development of the sports course, cleaning of the existing undergrowth and selection of the most remarkable subjects to preserve,
- tree planting adapted to the site to limit size and root space,
- Planting shrubs with high resistance to limit replacements in case of excess water or drought.

Selective sorting of household waste has recently been introduced in French Guiana. As for green waste, it is recovered via the composting platform, which then sells the compost.

## SOLUTIONS

- Water management

## BIODIVERSITY

### Biodiversity and natural areas

As part of the Hibiscus Impact Study, the biodiversity and environmental issues were assessed as low on the sector.

Indeed, both studies show that none of the site's habitats are of primordial level (for the most part it is a regrowth), that there is no presumption of protected species and that the level of anthropization of the site is high, level 4. The first study was conducted by the NFB's Office of Environmental Studies Sylvétude Guyane, the second is an inventory of mammals in Canada. right of the zone, realized by the association Kwata in March 2008. It shows a poor richness of the diversity of the species.

In addition, the sector is separated and isolated from natural areas protected or of ecological interest listed on the territory of the municipality (registered site, site of the conservatory of the littoral, ZNIEFF).

Finally, the challenges of preserving the biodiversity of the sector with regard to the challenges of urban renewal in the city of Cayenne, appear all the more negligible. Indeed, this sector presenting the opportunity of a land of 25ha in continuity of the University Pole of Cayenne, is the opportunity for the capital city Amazon to renew itself through a new piece of structured city, comfortable, very close from its historic center. Transport times and the implementation of expensive networks are limited. The rainwater management of the entire watershed is ensured by the hydraulic developments of the new district. Neighborhood amenities complement those of the deficit city.

Actions have been taken for the preservation and enhancement of biodiversity: Before the deforestation of the site, environmental associations have intervened to recover the animals present. On the other hand, resources have been mobilized to ensure that programming and design enable restoration and enhancement of biodiversity at the project scale:

- the area of green spaces created is important,
- more than 1000 trees and 150 palms were planted on the site in respect of local species. The planted plant palette consists essentially of endemic species: tarpaulin palms, pinot palms, river cocoa ... and old fruit species.
- Only two layers of vegetation are planted. In Guyana, the vegetation must be channeled, green spaces are therefore composed exclusively of trees and herbaceous layer easy to mow to facilitate maintenance and allow good visibility.
- an artificial wetland has been created in the heart of the district: the retention pond and its vegetated surroundings attract many sinful birds and other waders,
- the approach and QEA label (Amazonian environmental quality) set up by ADEME Guyane wishes, is an approach adapted to the context of Guyana helping the owners to define and prioritize the different environmental themes of their project.

## ENERGY/CLIMATE

### Energy sobriety

#### SOBRICITY AND EFFECTIVENESS - A BIOCLIMATIC APPROACH IN URBAN AND ARCHITECTURAL DESIGN

In French Guiana, the equatorial climate is both hot and humid. The relative humidity remains very high all the year: between 80 and 90% according to the seasons.

To cope with such climatic conditions and in order to reduce the electrical consumption of buildings (air conditioning), a bioclimatic approach in urban design and building architecture has been implemented:

- A strong vegetation of the tracks by trees of first size allows the creation of a more comfortable microclimate within the district: the temperature is more moderate, the trees shade the soil and the facades of the buildings, thus limiting the reflection and heat.
- sod planting on public spaces to limit solar reflection. The central square is raised, totally grassed, the terraces of the cafes are installed on wooden platforms.
- The layout and orientation of the buildings have been thought through to promote natural ventilation. This is the most important principle in equatorial climate. The wind can refresh the housing naturally. The most favorable orientation is between - 45 ° and + 45 ° of the prevailing wind direction, usually

ENE. In addition, the dwellings must be through to let in and out the air.

- Achieving effective sun protection is the second fundamental principle of bioclimatic housing design. The sunshine is really strong in French Guiana. The contribution of heat by the walls is the main cause of overheating of buildings. This solar protection must therefore concern all the outer walls of the house: roof, walls and windows. It is therefore necessary to isolate, ventilate (with raised roofs constituting ventilated roofs) and protect the walls from solar radiation by creating enough roof overhangs to shade most of the day. Finally, it is necessary to vegetate the facades.

## Contest

### Reasons for participating in the competition(s)

The design of Hibiscus is based on three planning principles:

- the opening to the city and the university through a street network that promotes soft traffic;
- openness to the Other through intergenerational and cultural social mix;
- and openness to nature with a predominance of green spaces, a combination of plantations and buildings around a vast pond.

This technical work provides an effective solution to rainwater management while enhancing the landscape aspect and boosting the public space. The district Hibiscus offers a mix of housing to meet the different needs and a typology of shops relevant to the area. The Hibiscus Eco-neighborhood is the result of a joint reflection, between the city of Cayenne, the EPFA and its partners, where each element of the neighborhood has been conceived through a global project structuring and integrating into its environment.

### Building candidate in the category



Grand Prix Ville Durable



Prix du public

