



# Abstract

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## Preface

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To begin my researches for my diploma project, I started with the state of the art. I discovered that the way public toilets are considered differs between countries. In some countries, women cannot occupy the public space because it was not thought for them, they are just considered like passers-by. Obviously, women do not have the same access to public toilets as men: there are not as many toilets for women as for men and the accessibility is paying. I was surprised by the differences of quantity of public toilets depending on the size and wealth of countries. I also discovered that culture has also a great impact on spatial design and that the brakes are not the same in all countries. My objective as an eco-designer is to reduce gender inequalities and propose dry public toilets.

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## Introduction

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Toilets are one of the most important everyday life facilities. J.Damon says in his article *Les toilettes publiques : un droit à mieux aménager*<sup>1</sup> that public toilets are inhospitable and unequal places while they permit everyone to satisfy a basic need. The three main needs are eating, drinking, and eliminating. The issue of my diploma project is how to make a dry public toilet a lively place in a rural context? To begin, why have chosen dry toilets rather than rainwater toilets? A rainwater toilet has two faults. First, it uses water. When excretions are mixed with water they cannot be salvaged to be recycled and turned into fertilizer. Secondly, water is a finite resource that is not necessary in a toilet. It is better if rainwater is used to cultivate or for other essential uses. Moreover, a rainwater toilet uses drinking water because it does not rain enough to flush 9 litres of water per use. Many kinds of dry toilet exist. There are differences between the principles of separating excretions like toilets with separation at the source, gravity-separated toilets and toilets without separation. There are also differences to manage excretions like compost toilet with wood chips and toilets with

1. Damon, J. « *Les toilettes publiques : un droit à mieux aménager* », *Droit social*, n°1, 2009, pp. 103-110.

earthworm composting. With every system, the excrements can be upcycled to make fertilizer because they are composed of nitrogen, phosphorus and potassium. Designing dry public toilets requires some management and to make this easier the context matters important, that is why I would like to working in a small town can make a difference. I work on Saint-Pierre-de-Frugie, a village of 440 inhabitants, in Dordogne, in France. The project will have to be next to a garden or a farm in order to use the compost made with excretions more easily. A town of this size is adapted for a dry system because the quantity of excretions produced is neither too big nor too small. Making dry public toilets does not rule out drinking water of the space because it is essential to wash hands, drink, freshen up or rinse a cup. The question is: how can spatial design change preconceptions about dry public toilets and attract users?

**Toilet: an essential place.**

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# I. Toilets: most important everyday life facilities but ignored by designers

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## 1. The design of public toilets in the world: an unequal consideration

In the world, the consideration for public toilets varies. According to the World Health Organization, 4.5 billion people do not have access to safe toilets. The conditions are extremely different in different parts of the world. The W.H.O. declared in 2018, that 892 million people practice open defecation. This practice is most widespread in poor countries like India and South Africa. This poses a problem of insecurity particularly for women and children. However, in some cultures, toilets are important and politicians pay attention to those infrastructures. In Japan, the culture of modesty implies the use of high-tech toilets. The extreme difference of interest on the politicians' part creates a real gap between people's compartments. On the one hand, the major preoccupation is security. On the other hand, the priority is comfort because security is already ensured. In European countries, public toilets exist but they are more or less pleasant to use because they are not always properly maintained and renovated. In some countries like the Netherlands, public toilets are paying and it creates social discrimination.



**Figure 1:** 17th International Architecture Exhibition at La Biennale di Venezia, Matilde Cassani, Ignacio G. Galán, Iván L. Munuera, and Joel Sanders designed *The restroom pavilion*.

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(Miguel de Guzman +  
Rocio Romero) and Natalia  
Guardia

In France, the legislation does not compel towns to install public toilets. That lack of law results in the designer's lack of interest for this space. Indeed, only a few designers in the world pay attention to the design of public toilets. In 2021, at the 17th International Architecture Exhibition at La Biennale di Venezia, Matilde Cassani, Ignacio G. Galán, Iván L. Munuera, and Joel Sanders designed *The restroom pavilion* (fig. 1 & app. 1). This project highlights the difference of consideration from politicians for a space devoted to a primary necessity. The different models exhibited highlight the discrepancies in public toilets around the world. The design of public toilets in Japan has been in expansion since 2019 with *Tokyo Toilet Project*. Indeed, the Tokyo Olympics implied political decisions about public spaces. 17 Toilets newly built in Tokyo have been designed by architects and designers. One of them has been designed by Masamichi Katayama the Kawa-ya toilets in Ebisu park (fig. 2 & app. 2). In France, the most widespread public toilets are the J.C. Decaux, *Sanisettes* (fig. 3). They are one-piece automatic toilets.

*Figure 2:*  
Masamichi Katayama,  
Kawa-ya toilets, Ebisu  
Park, Japan, 2020

©Kozo Takayama



*Figure 3:* Sanisettes,  
Paris, J.C. Decaux,  
2020

©OTCP



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## 2. Why is this subject important for an eco-designer?

The subject of public toilets is interesting for an eco-designer because it addresses one of the United Nations global goals for sustainable development. The principal item is the 6th item: clean water and sanitation. It means ensuring access for all to toilets to put an end to open defecation. To develop this item, the World Health Organisation has established 19th November as the World Toilet Day. It is also an interesting subject to reduce social and gender discrimination. Some toilets are paying contrary to urinals and it makes inequalities between women and men. Water is a finite resource: a toilet uses 9 litres of drinking water when it is flushed. Dry toilets are a good solution to preserve drinking water and to upcycle excretion into fertilizers. The designer can ease the work of maintenance staff with materials and shapes. It is a subject which is interesting for an eco-designer because the use can be made easier and the space more attractive. A designer can also contribute to a learning process in toilets for example with the cycle process.

## **Toilets: the bad image**

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## II. How can design change the bad image of public toilets?

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### 1. What are the hindrances and fears about dry public toilets

There could be many obstacles to designing dry public toilets because people generally have preconceived ideas about public toilets and it is even worse with dry public toilets. The brakes concerning public toilets are, for example, a feeling of insecurity or preconceptions about dirt. This idea is linked with the history. Indeed, in *Le miasme et la jonquille* written by A. Corbin<sup>2</sup>, he explained that in the 19th century the fear of excretions was at the centre of the attention. At that time, bad public hygiene with bad waste management made epidemics develop more easily. Nowadays, people are anxious about dirt because they imagine that only water can be a safe solution and they believe that the simple fact of seeing and smelling excrements is contagious and can contaminate them. In *Le propre et le sale*, G. Vigarello<sup>3</sup> explains that the middle class, in the 19th century, established gestures and the isolation of excretions because it referred to germs and it was frightening. This worry remains. It is not real contamination but just the idea that contact through excretions by senses are dangerous. In some dry toilets with wood chips, it is possible to see the excretions of one's predecessor. It creates discomfort because, in our society, excretions are extremely private. Seeing the most private waste may disturb the users.

2. Corbin, A. (2016). *Le miasme et la jonquille: L'odorat et l'imaginaire social XVIIIe-XIXe siècle*. France: Flammarion. 432p. (Champs histoire) ISBN 978-2-0813-8241-1

3. Vigarello, G. (2018). *Le propre et le sale: L'hygiène du corps depuis le Moyen Âge*. France: Points. 288p. (Point histoire) ISBN 978-2-7578-7453-0

In this context, the spatial designer can act with a layout where entrance and exit are different. The brakes about dry public toilets are mostly based on the ignorance of the dry systems. People think that those systems smell and attract pests like flies. They imagine that using it is more complicated because since childhood people have pressed a button to flush the toilet whereas, with dry toilets, they have to act differently. In reality, the movement is not more complicated. In the *Ecodomeo* system, for example, you just need to press a pedal (*fig. 4*). In toilets with wood chips you just need to add some chips after defecation to absorb humidity. The designer's role is to change the uses in order to make life easier, for example, in this case, to make it easier for people to learn about dry toilets.



**Figure 4:**  
gravity-separated  
toilets, Ecodomeo.

©Ecodomeo

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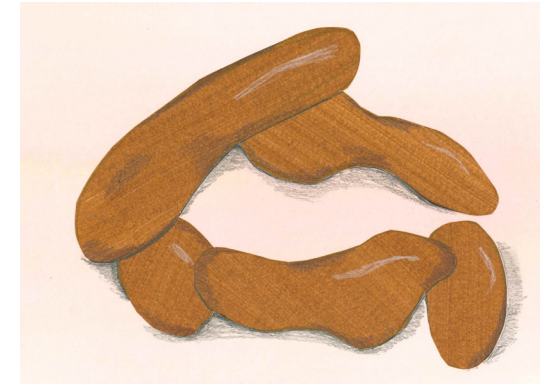
## 2. How can a designer fight against preconceptions and lift the brakes?

To design, different possibilities exist, the designer can be inspired by examples and other designers. Designers can also use philosophical references. Helmer's<sup>4</sup> text analyses the philosophy of places. In his text, he refers to geography, literature, anthropology, and history. Helmer explains what are the different points that make a place. Those points are not concepts but practical solutions. A designer can apply those propositions in his work. For example, Helmer says that a place has limits. In this philosophical text, Helmer suggests theoretical aspects to make a place. His proposition are precise, in this way, a designer can be apply directly the solution in his work. In Katayama's toilet, many limits exist. To enter these toilets, the first step is the change of floor covering (*app. 2*). The second step is the passage between walls. The third step is the passage through an airlock before entering the toilets. He explains that a place has a name, the designer can name the place that he designs. For example, *Sanisettes* has a specific name and when we hear it, it is possible to imagine the form. Harpet<sup>5</sup> says that to change the way toilets are considered the scenography of cleanliness is important. Therefore the designer can work on two aspects like the consideration of

4. Helmer, E (2019) *Ici et là : Philosophie des lieux*. France : Éditions Verdier. 144p. ISBN 978-2-37856-038-6

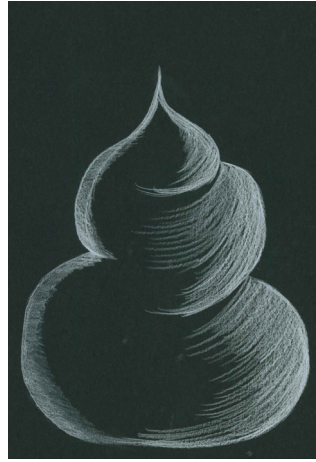
5. Harpet, C. (1999). *Du déchet : Philosophie des immondices*. France : L'harmattan. 608p. ISBN 978-2-7384-7456-8

excretions and the shape of the toilets. The designer can change the way excretions are considered and particularly the way faeces is represented (*fig. 5*). Drawing can be used to make markings in toilets or to explain the aim of the cycle. Those representations can be realistic or poetic. The different means of representation do not tell the same thing. Poo has a stereotyped shape but it is not a realistic shape, the means of representation can be more or less acceptable. If it is too realistic it can be shocking because in European society, it's not acceptable to show the wastes. To challenge preconceptions, I think that it is very important to represent it with realistic shapes and with technics that questions the viewers about it. If people think that it's beautiful at the first glance, it may change their point of view about that. A spatial designer can also change the representation of public toilets seen as dirty spaces into the idea that toilets are spaces which transformed excretions into humus. To make this, new shapes can be created or specific materials can be used. In addition, if users understand that by defecating they contribute to adding more raw materials, this space will be more used.



**Figure 5:**  
my own experiments  
of representation  
of excretions

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**Toilets: the next “place to be”**

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### III. The dry toilets: the next “place to be” in small towns

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#### 1. How to make it a lively place?

To attract users, toilet must become a lively place. To make a place lively, the first idea is to make a place. According to Helmer, a place has a name, limits, can welcome events, and permit users to learn. To make an attractive place, liveliness is important. Indeed, a place with people is more attractive than an empty place. Besides auto surveillance ensures security. For example, Masamichi Katayama's toilet is just next to a living place like a playground (*app. 1 & fig. 6*). The presence of people next to toilets dissuades drug dealers and muggers. Moreover, a place with people reassures the users; if a problem occurs, they can ask for help. To be attractive, the space must be accessible. Masamichi Katayama's toilet is easily accessible because it is situated at an angle of Ebisu park and a street. This toilet is placed in the principal alley of the park and just next to the entrance and exit. This toilet is accessible with different means of transport like feet, public transport, bicycle... A bicycle rack is located just next to the toilet. If the access and the parking area are close to the toilets, it is easier to find them. But to stay somewhere people have to be busy. Many things are possible like an exhibition or an information board. Outside *Sanisettes*, a map of the city helps people to take their bearing. They can find information. Moreover, *Sanisettes* are landmarks by their form. To make a place

lively, the space has to be designed to welcome groups at the same time. The space may allow people to eat together, for example by offering picnic tables. It should also permit several people to use the equipment At the same time. Katayama's toilet can be used by five people at once. A lively place is a place where it's possible to spend a long time. To live, this space should meet the essential needs like eating, drinking and eliminating. In this way, it's important to offer A space with food and water. *Sanisettes* provide a drinking fountain. If users enjoy the space for a long time, their phone may run out of battery. That is why a living place should provide a recharging system, like in a station concourse. A living place must be adapted to all users and provide a good experience to all of them. If a family come with their baby, they will need to change and feed the baby. In Katayama's toilet, a cubicle is adapted for babies and people with reduced mobility. The equipment for babies is a baby-changing table and a baby chair. In this space, there are 3 washbasins and 3 trash cans. All this equipment is meant for different uses like washing hands just next to the baby or just next to toilet to rinse a cup.



**Figure 6:**  
location of public toilet  
in Saint-Pierre-de-  
Frugie, next to play area.

## 2. Why add services to toilets?

Toilets are sidelined and avoided but they are necessary spaces. To attract people the designer can provide an assembly of uses. In a small town, the disappearance of services is a huge problem. Services are a good solution to attract users. When a group of people comes, it entices others to come, it is a matter of social instinct. Finally, the place welcomes plenty of people. Providing a place with people reduces the obstacle of insecurity and makes more pleasant the use of toilets. Two possibilities exist to add services to toilets. First, services can have a special place in the natural cycle: eating, eliminating, upcycling and cultivating are directly linked. This method can raise awareness about waste upcycling. It may seem strange to propose food just next to toilets, but I think that it's logical because the basic needs are reunited. It may also change the perception people have of excretions, from wastes to resources. A brake exists because in our society, excretion is considered as a stain. If we get people to see it as a resource, a source of raw material to cultivate, the link between toilets and food becomes less awkward. This image of raw material makes the link between excretion and food logical and relevant. Then, new services like a basket of food cultivated with the compost could be proposed. Services could be either free or paying. In any case services in a town or village maintain social interactions.

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### 3. How can the services be integrated in the cycle or not?

Different types of service exist. Some services are directly linked with the biological cycle: eating, drinking, and eliminating. For example, services can inform and educate. In Saint-Pierre-de-Frugie school, a garden cultivated by children makes them aware of the cycle of compost. In this village, a shared garden, situated next to a rest area, is farmed by volunteers following the principles of permaculture. In this context, dry public toilets would have their place near the garden. In this proposition, all the cycle is visible at the same place. However, the link between food and excretion may disgust some people. If the cycle and the advantages of excretion in permaculture are explained there might be fewer preconceived ideas. In the book *Cradle to Cradle*<sup>6</sup> written by W.McDonough and M.Braungart, the notion of cycle is important. Indeed, “The Cradle to Cradle approach is to see waste as food, as a nutrient for what’s to come”. Following this principle, the excretions are not considered as waste but as nutrients for the soil. Indeed, with this process, people can change their views on excretions. They add that: “Nature operates according to a system of nutrients and metabolism in which there is no such thing as waste.” Nature works in autonomy within

6. McDonough, W. Braungart, M. (2011) *Cradle to cradle : Créer et recycler à l’infini*. France : Éditions Galli-mard. (Manifestô - Alternatives). 240p. ISBN 978-2-86227-672-4

a cyclical system. And to preserve nature, it’s important to return the body waste to enrich the soil and to continue the cycle. Natural waste like excretions, food or other organic waste is not waste but resources. If people consider excretions as waste it is the result of society’s evolution. This idea is reinforced by the different industrial revolutions because humans manufacture new products without thinking of their end of life. W. McDonough says that the current society functions on the “Cradle to Grave” model. It means that the end of life of a product equals waste. In this book, the authors explain another model which is “Cradle to Cradle”, this process is possible in design. This model is based on eco-efficiency: “Eco-efficiency would transform human industry from a system that takes, makes, and wastes into one that integrates economic, environmental, and ethical concerns.”. The objective is to produce without waste and to create benefits and balance for the ecosystem. To design with this process, the writers suggest using natural energy so as not to rely on fossil energy. To make virtuous design it is important to use local materials in order to limit “bio-invasion”. Moreover, local resources make the local economy work. “Employing these materials and the services of nearby craftsmen would generate local economic activity and support as many residents as possible. It would involve local people in building the community and keep them connected

to the region's cultural heritage, which the structure's aesthetic distinctiveness itself helps to perpetuate. In addition, enlisting local craftsmen to train young people in the use of local materials and techniques would encourage an intergenerational connection." It is also important to use the population's expertise and local technics to conserve them. This process of construction can foster education and social links. For example, if in Saint-Pierre-de-Frugie, dry toilets are constructed by the municipal staff and volunteers, some people can teach some building technics to others. Indeed, the process of passing on knowledge and know-how is a cycle too.

## Conclusion

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To conclude, toilets are useful places but unequally accessible in the world. Designing public toilets can help reduce gender and health inequalities. To change preconceptions about dry public toilets a spatial designer can work on the brakes to remove them. Insecurity in this space can be dealt with by a spatial designer by analysing the safest location, for example in a visible place. Adding services may attract users and make the place safer thanks to the presence of people near the space. The designer can attract users with the benefits of dry toilets. In Saint-Pierre-de-Frugie the benefits should be particularly important because this village is involved in ecology with permaculture. That is why it's important to highlight the cycle so as to teach users the positive impacts of their contribution. A cyclical approach may be adopted from the initial design phase to the construction phase and finally the uses.

## Appendices

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## Appendices

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*Appendice 1:*  
17th International  
Architecture  
Exhibition at La  
Biennale di Venezia,  
Matilde Cassani,  
Ignacio G. Galán, Iván  
L. Munuera, and Joel  
Sanders designed  
*The restroom pavilion.*





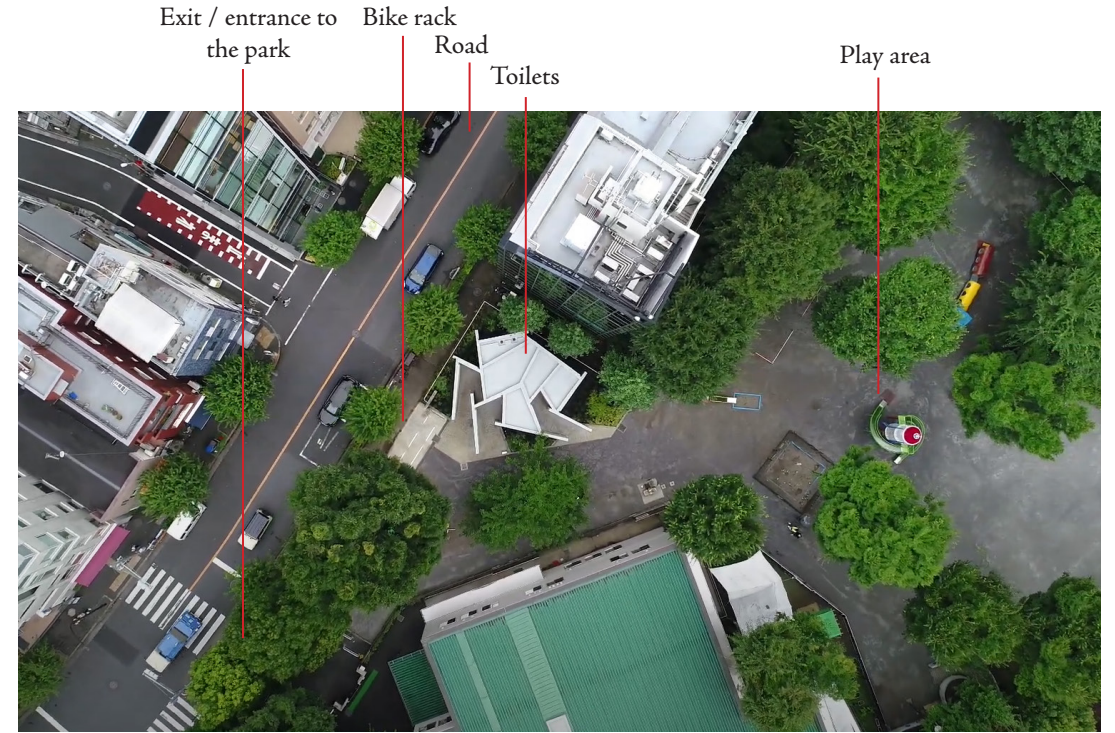
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## Location



Appendice 2:  
Masamichi Katayama,  
Kawa-ya toilets, Ebisu  
Park, Japan, 2020

## Accessibility

### Bike rack

Allows you to put your bike down to go to the toilet

The toilet easily signals the place where the bike is located



Arrangement in a park corner  
Accessible from the street and from the park

Vegetation  
Visual integration of toilets in the park



Play area  
Presence of many parents and children

## Transition

### Transition stage from public space to toilets

1/Change of floor coverings  
Marking a change in space typology

2/Presence signage on the walls  
Understanding that we are going to enter a closed space

3/Presence of a second wall like a corridor  
The corridor no longer leaves the choice in entering the space, to find out what is happening there you have to go to the end

4/Entrance through a door in an airlock with a roof  
The airlock allows a gradual passage from the outside to an intimate use

5/Entering the toilets



No roof  
The boundary between the inside and the outside is made gradually

Separation wall  
Separates the entrance to the different toilets (Disabled, man, woman)  
Hides people who enter from the sight of passers-by

Concrete coating  
Delimitation of the space between the passageway and the entrance to the toilet area: cold materials  
Contrast with the vegetation of the park

Gravel coating  
Incorporates the restroom into the landscape of the park

Vegetation  
Incorporates the restroom into the landscape of the park

The gradual transition allows the user to adapt and gradually move from the flow to a quieter space.

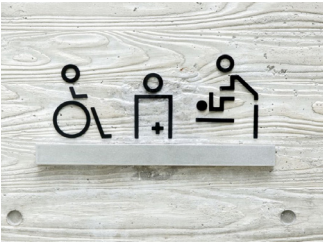
## Entries



Men's entrance

3 separate entrances  
The space is adapted to each user

Disabled entrance + children's area



Pictograms with lines and circles, gender neutral

Terminal with a plan  
Shows the spatial organization to identify and choose which space corresponds to the needs



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Women's entry

## Flows

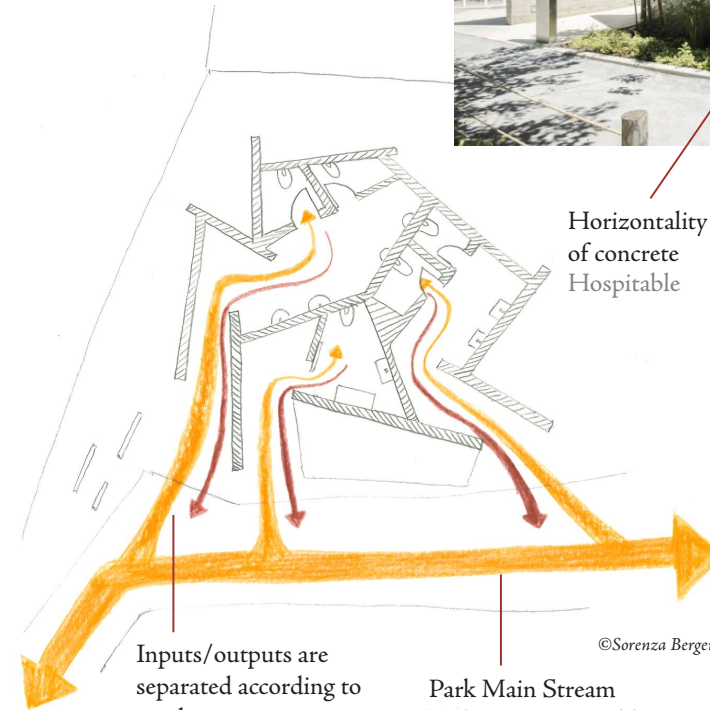


Horizontality of concrete  
Hospitable

Verticality of the wall  
Allows the building to fit into the verticality of the towers behind

The walls are shifted  
This gives dynamism and invites you to come in > hospitality

©Kozo Takayama

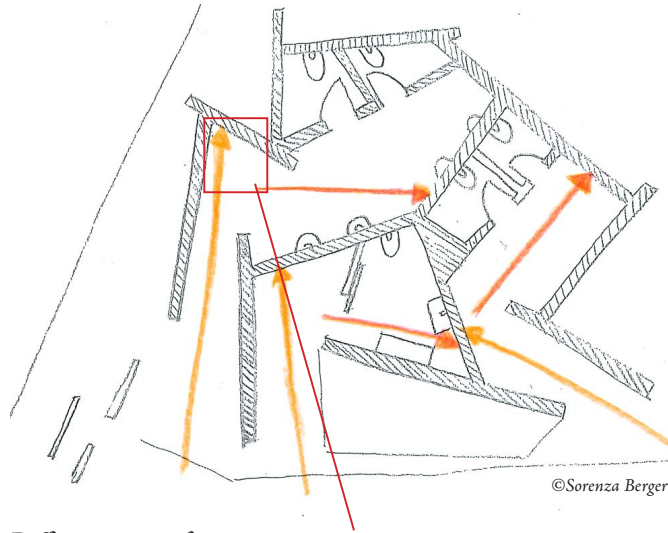


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Inputs/outputs are separated according to gender  
The users of each space do not meet

Park Main Stream  
Toilets are visible from the main flow and are inviting

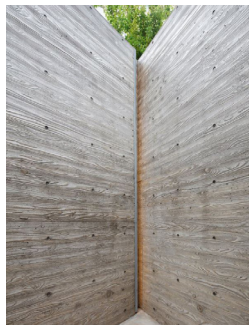
## Views



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Different views of empty spaces  
Provides privacy.  
Going through a long process

The toilet is visible only after going through several stages and movements. The user is put in condition to enter the toilet.



©Kozo Takayama

### The different views and actions of the users of the public space towards the toilets

- 1/When the user enters the toilet, he first sees a wall  
This first point of view makes it possible to hide from passers-by what is happening in the toilets so that modesty is preserved.
- 2/He must then turn 90° to the right to enter the airlock  
This movement of the body provides intimacy
- 3/Once turn he sees again on a wall  
This view keeps the confidentiality of the person leaving the toilet in order to avoid being face to face
- 4/He must then turn to his left  
This movement of the body provides new point of view
- 5/He sees the toilet

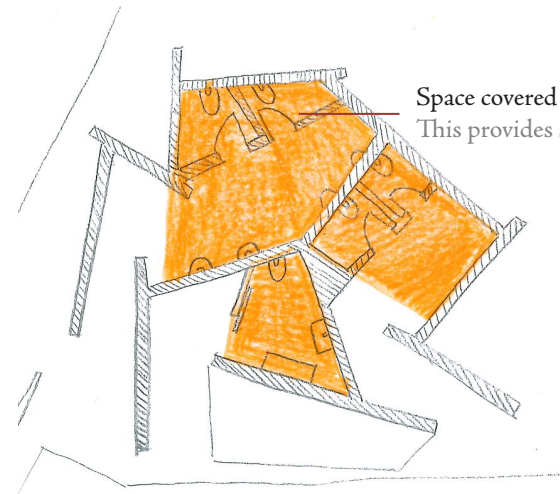
## Roof

From the path, the roof is invisible  
It looks like the toilets are going to be open air and not sheltered

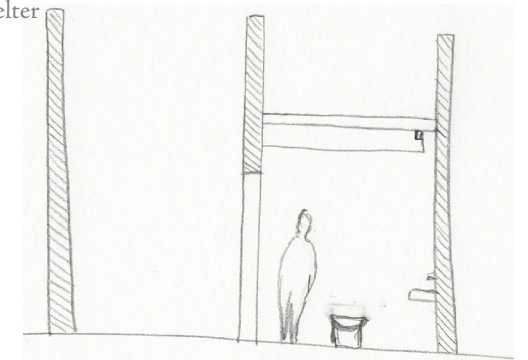
Game with the finite or infinite dimension of the ceiling  
When there is a ceiling, the feeling of security is present and privacy is guaranteed.



©Kozo Takayama



Space covered by a roof  
This provides shelter



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## Light



Warm color lights  
Signal the entrances  
Make you want to enter

The light strips are vertical  
Mark the height of the  
building



©Kozo Takayama

## Light



Natural light  
Allows to  
delimit the  
inside and of the  
toilets

Breakthroughs of  
artificial light  
Indirect softer light  
yellow light  
Warm appearance

©Kozo Takayama

## Interior

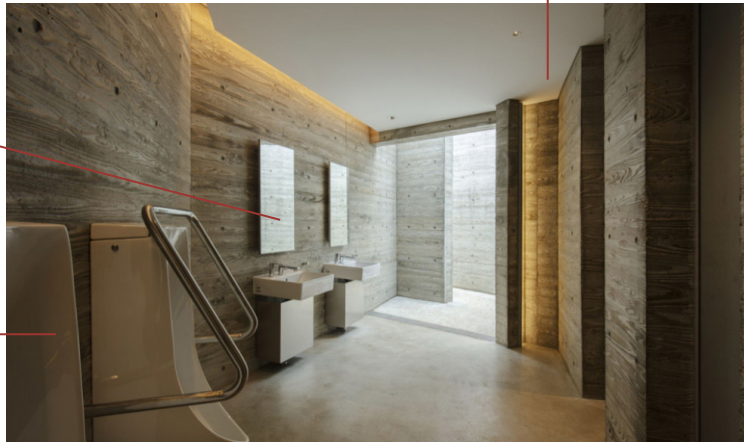


Breakthroughs of light,  
artificial light  
Indirect softer light  
Ceiling suspension  
appearance  
Wood look tile  
Easy to maintain  
Warm  
Feeling of «like at home»  
Waiting area  
Covered therefore  
sheltered  
Warm  
Hospitable

Low ceiling  
Cosy looking,  
comfortable, comforting

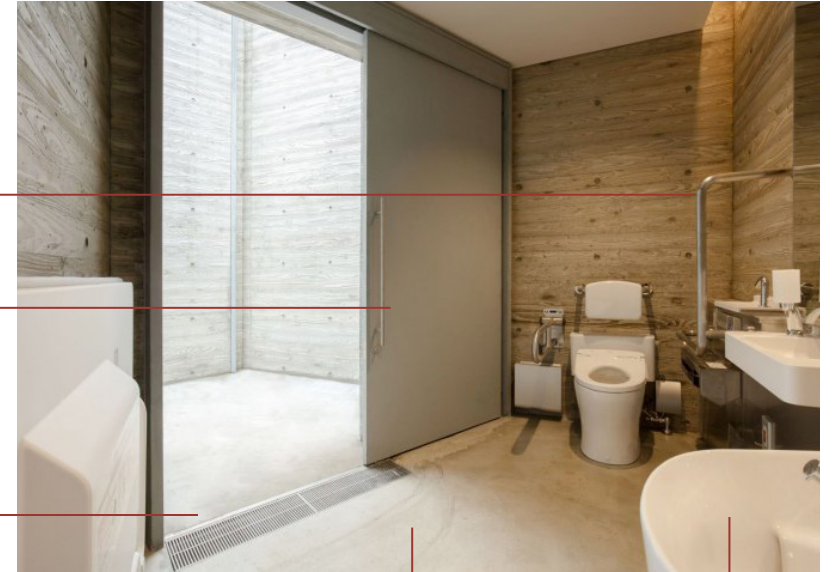
2 sinks and mirror  
Allows you to free the toilet  
more quickly  
Allows you to comb your hair  
while waiting

2 urinals, one with a grab bar  
In plain sight  
Quickly accessible



©Kozo Takayama

## Interior



Aluminum support  
equipment  
Conveys the notion of  
robustness  
Pocket door  
Less waste of space  
Easier to open

Gate  
Easy cleaning



Concrete floor  
Easy maintenance

White equipment  
Conveys the notion of  
hygiene and  
cleanliness

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## Summary

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Public toilets are useful places but are unequally accessible throughout the world. In this abstract the international context is broad with huge differences, for example, between toilets in India or in Japan. The current design production is analysed with the Restroom Pavilion in La Biennale di Venezia and with an inspiring example at the Olympic games of Tokyo. This text explains the hindrances and fears caused by dry public toilets in particular. Some solutions are displayed to make it a lively place and attract users. One of the solutions is more developed and consists in adding services next to the toilets. Dry public toilets imply a cycle: eating, eliminating and cultivating. The cycle is particularly significant in Saint-Pierre-de-Frugie's toilet project. Besides, the "Cradle to cradle" principle is crucial in the whole process of design of dry public toilets from the initial design phase to the construction phase and finally the uses.

