

# Risk Assessment

Khar Danda

Allied Design

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## Risk:

A probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.

The possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.

## Disaster:

A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins.

## Disaster Management:

Organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of **disasters**.

## Vulnerability:

The quality or state of being exposed to the possibility of being attacked or harmed.

## Vulnerability Management:

Vulnerability management is and discusses all the stages involved, such as checking, verifying and patching vulnerabilities.

## Risk Assessment:

A risk assessment is the combination effort of 1. identifying and analyzing potential events that may negatively impact individuals, assets, and/or the environment; and 2. making judgements "on the tolerability of the risk on the basis of a risk analysis" while considering influencing factors.

## Awareness:

Having knowledge or discernment of something.

## Ecological Balance:

Ecological balance is a theory stipulating that natural conditions, including numbers of various animal and plant species, remain stable on their own through variations over time.

## Riparian Edge:

A riparian zone or riparian area is the interface between land and a river or stream.

## MSRDC:

Maharashtra State Road Development Organisation

## BMC:

Brihanmumbai Municipal Corporation



# KHAR DANDA

Khar Danda, is a fishing village located in the western suburbs of Mumbai and has existed since 300 years. A combination of three communities, namely Juhu koliwada, Gazdhar bandh and Danda village, surround a vacant land cover edged by a nala. The study initially focused on how the upcoming construction (the water treatment plant) has affected the nala and in turn affected the community and its immediate surroundings. The MSRDC ( Maharashtra State Road Development Organization) has proposed to build the coastal road which runs over the entire stretch in order to reduce the traffic congestion. This posed a major threat to the existing relationship of the community and its ecology. The study attempts to look at how the existing topography and natural features of the site have changed over the years and how has this affected the ecology of the area

Deriving conclusions from the study conducted and the previous development plans for the area, the project will attempt to unveil the effects of the urban external forces on the morphology and social relations of the area and strategically devise proposals for the same.



Fisherman jetty  
 Danda village  
 Existing greenland  
 Nala  
 Gazdharbandh  
 Juhu koliwada

## General observations

The three communities that surround the nala practice various professions. The Khar Danda community practices fishing. Earlier they would fish in the marshy area of the site that was later destroyed due to construction activities. Now they go deep in the sea for fishing. The gasdharbandh community comprises of migrant people who have come from various places like Bihar, Jharkhand, Chattisgarh, Kanpur etc. The Juhu Koliwada community majorly has casual labourers and small vendors.





# Land Cover Map

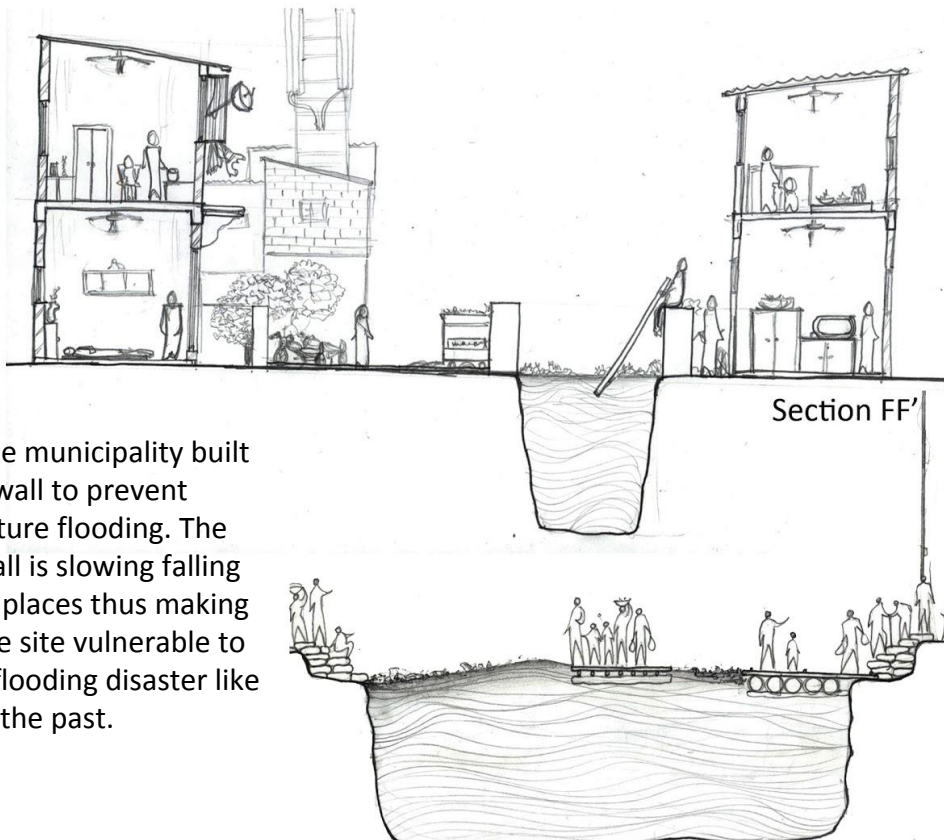
The land cover map shows the various kinds of textures of the site. Two contrasting observations are made on the either sides of the nala. The nala is flanked by informal settlements(built area) on three sides and is edged by open space that eventually leads to the sea on the others side. The open space comprises of various kinds of vegetation finally ending in beach vegetation. The nala used to be surrounded with mangroves before which were cut down and built upon by the BMC for the upcoming BRIMSTOWAD project. The mangroves used to be the most important part of the landcover of the site as it was very crucial to the ecological balance which has been greatly disturbed now.

## Legend



# Risks on site

The nallah is a potential threat to the region. Ten years ago, during the heavy monsoons, it had overflowed thus causing immense flooding in the region in addition to the loss of property.



The municipality built a wall to prevent future flooding. The wall is slowly falling at places thus making the site vulnerable to a flooding disaster like in the past.

Section GG'



HISTORICAL TIMELINE OF THE NALLAH



2001 Construction of the dock began(green). A part of the Nala streamlined into the community forming a separation between Danda village and Gasdhar Bandh.



2003 Construction of a cemetery started(pink),marshy land round the Nala starts reducing.



2013 Settlement edge very close to the Nala edge,Empty area around Nala completely occupied.



2015 Dock and park completely built.Nala width increased over the years.



2014 Nala course remains the same along the longer stretch.



2016 Dock and park completely built.Nala width increased over the years.



2013 Settlement edge very close to the Nala edge,Empty area around Nala completely occupied.



2015 Dock and park completely built.Nala width increased over the years.



2014 Nala course remains the same along the longer stretch.



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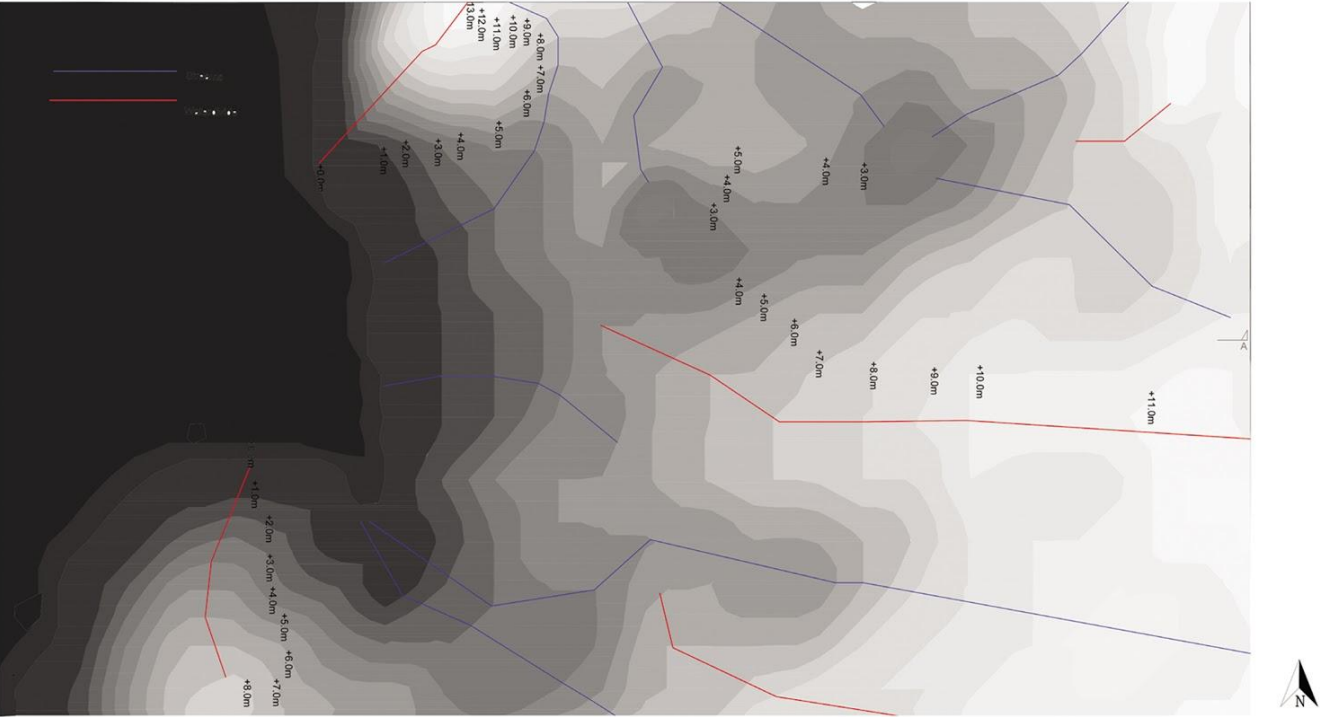
# FLOODING RISKS

Heavy flooding carry significant risks to people and their homes;

1. Risk of waterborne disease which causes due to contamination of water. Heavy rains can contaminate drinking water with sewage, petroleum products, pesticides, herbicides, and waste from farm animals.
2. Damage from floods is typically measured in terms of lives lost and the cost of damage to buildings and infrastructure.
3. Growth of toxic mold in homes after water damage, contamination of recreational water including lakes and beaches, and sewage backing up into basements after local sewage lines and septic tanks overflow.



CONTOUR MAP



The land gradually slopes towards the sea and the slope is very gradual.

LEGEND

+0.0 to +1.0m	+5.0m to +6.0m	+10.0m to +11.0m
+1.0 to +2.0m	+6.0m to +7.0m	+11.0m to +12.0m
+2.0 to +3.0m	+7.0m to +8.0m	+12.0m to +13.0m
+3.0 to +4.0m	+8.0m to +9.0m	+13.0m to +14.0m
+4.0 to +5.0m	+9.0m to +10.0m	

SLOPE MAP



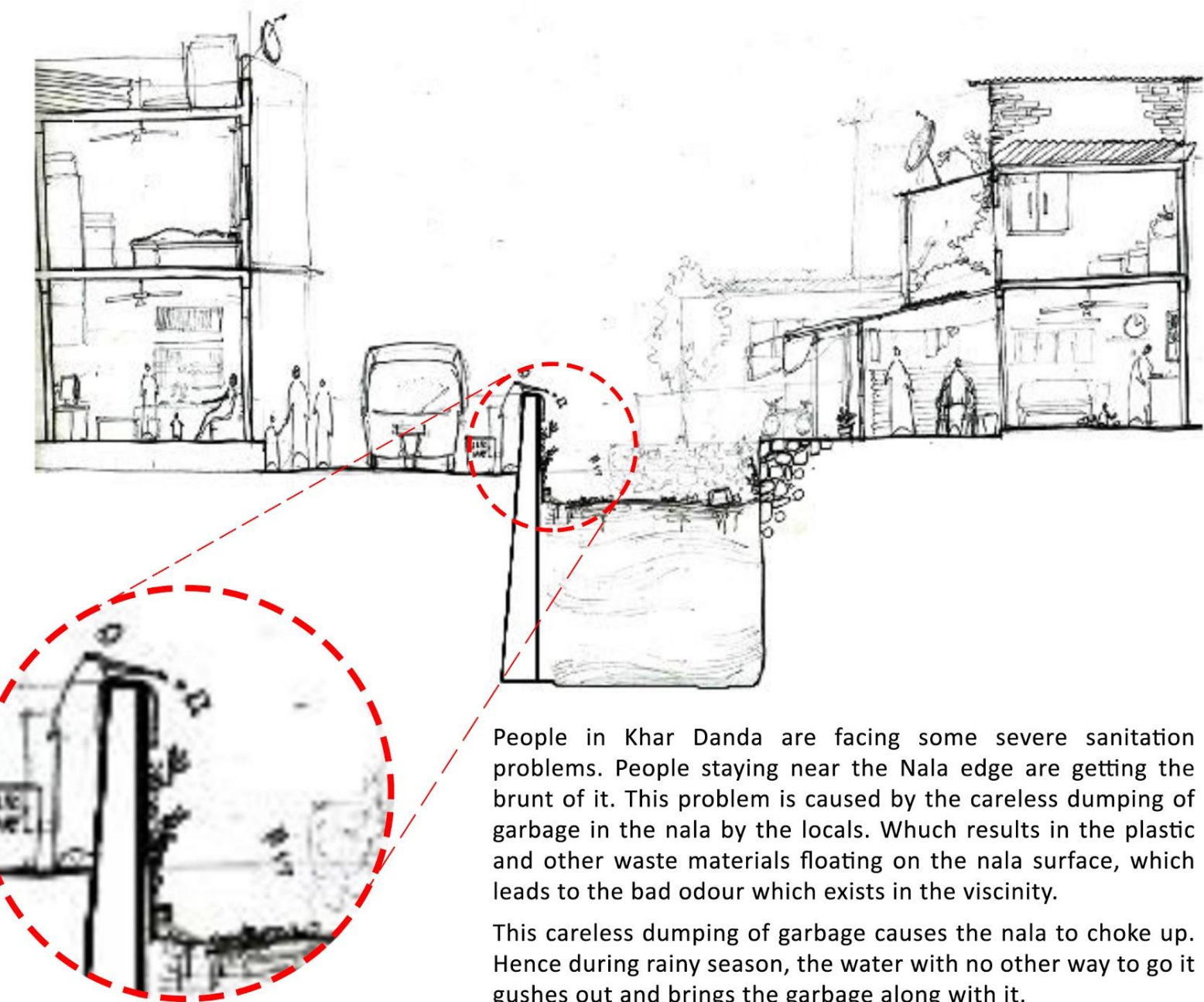
LEGEND

1:100 and below	1:400 to 1:500	1:700 and beyond
1:100 to 1:200	1:500 to 1:600	
1:200 to 1:400	1:600 to 1:700	



# SANITATION PROBLEMS

(from careless dumping of garbage into Nala)



People in Khar Danda are facing some severe sanitation problems. People staying near the Nala edge are getting the brunt of it. This problem is caused by the careless dumping of garbage in the nala by the locals. Which results in the plastic and other waste materials floating on the nala surface, which leads to the bad odour which exists in the vicinity.

This careless dumping of garbage causes the nala to choke up. Hence during rainy season, the water with no other way to go it gushes out and brings the garbage along with it.



These images shows how the site near nala is filled with garbage. And its not even during rainy season, one can imagine how much worse it'll be when it rains.

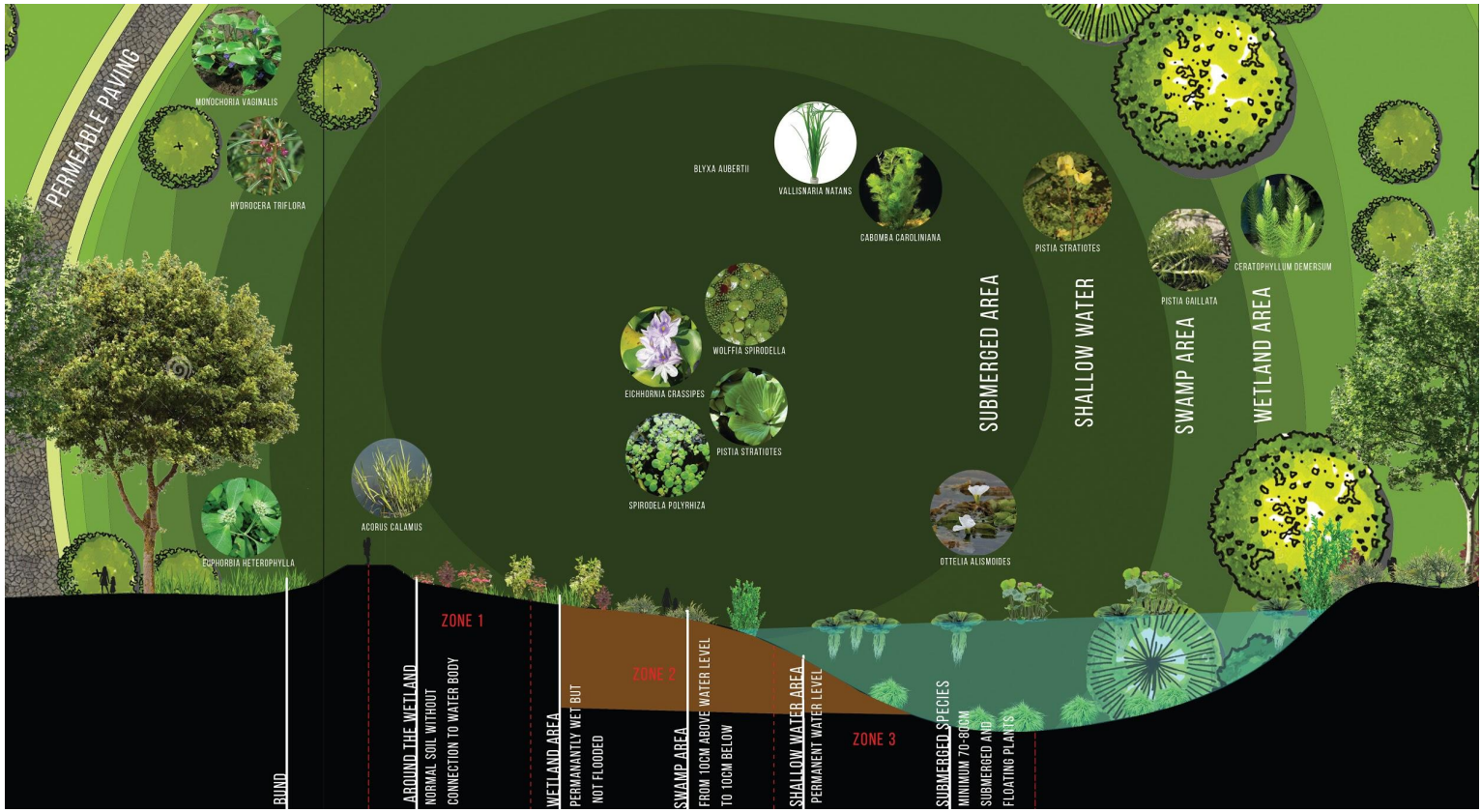
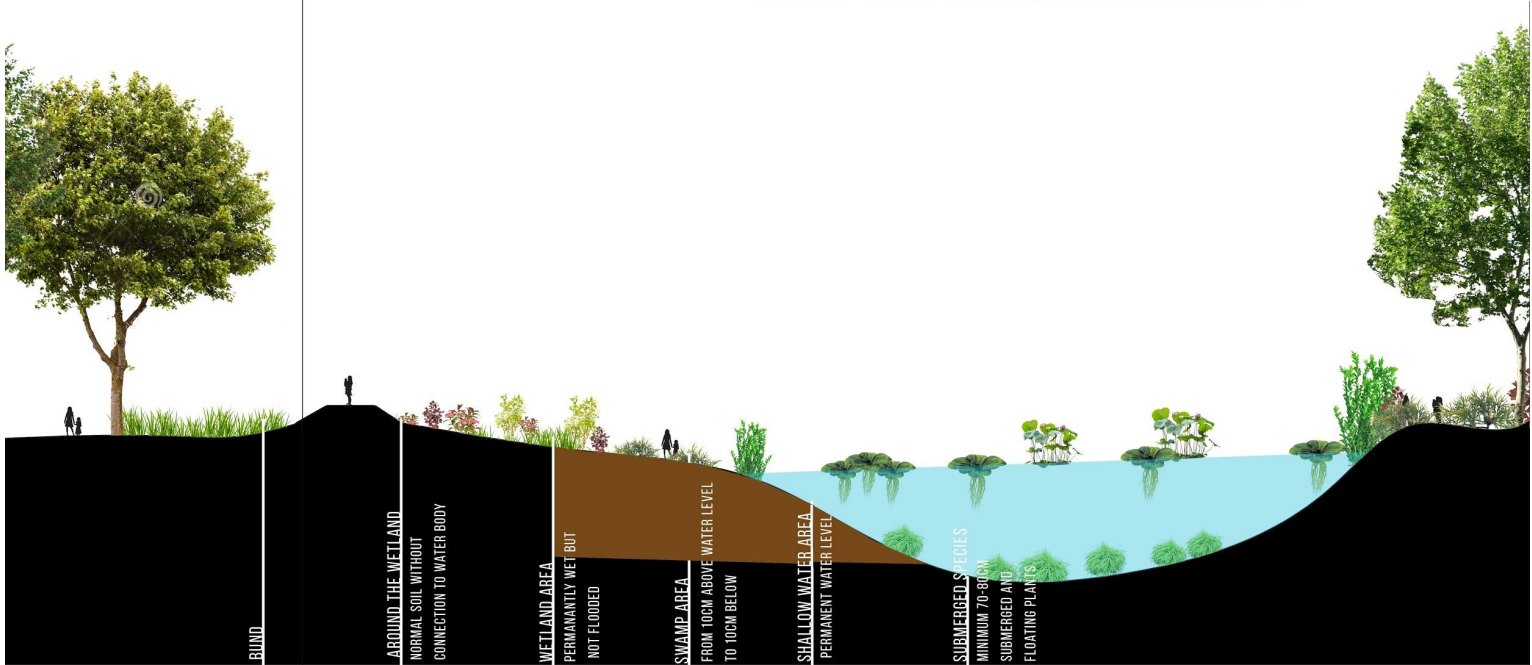
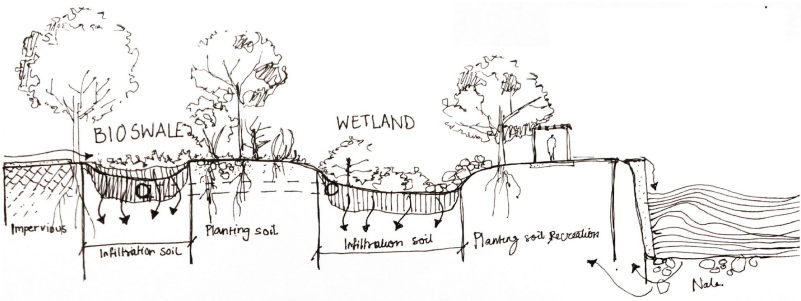
This problem is not going to get solved on its own. people need to make a genuine effort from their side. There is an obvious lack of awareness in people when it comes to hygiene.



# Adaptive strategies

## RIPARIAN EDGE

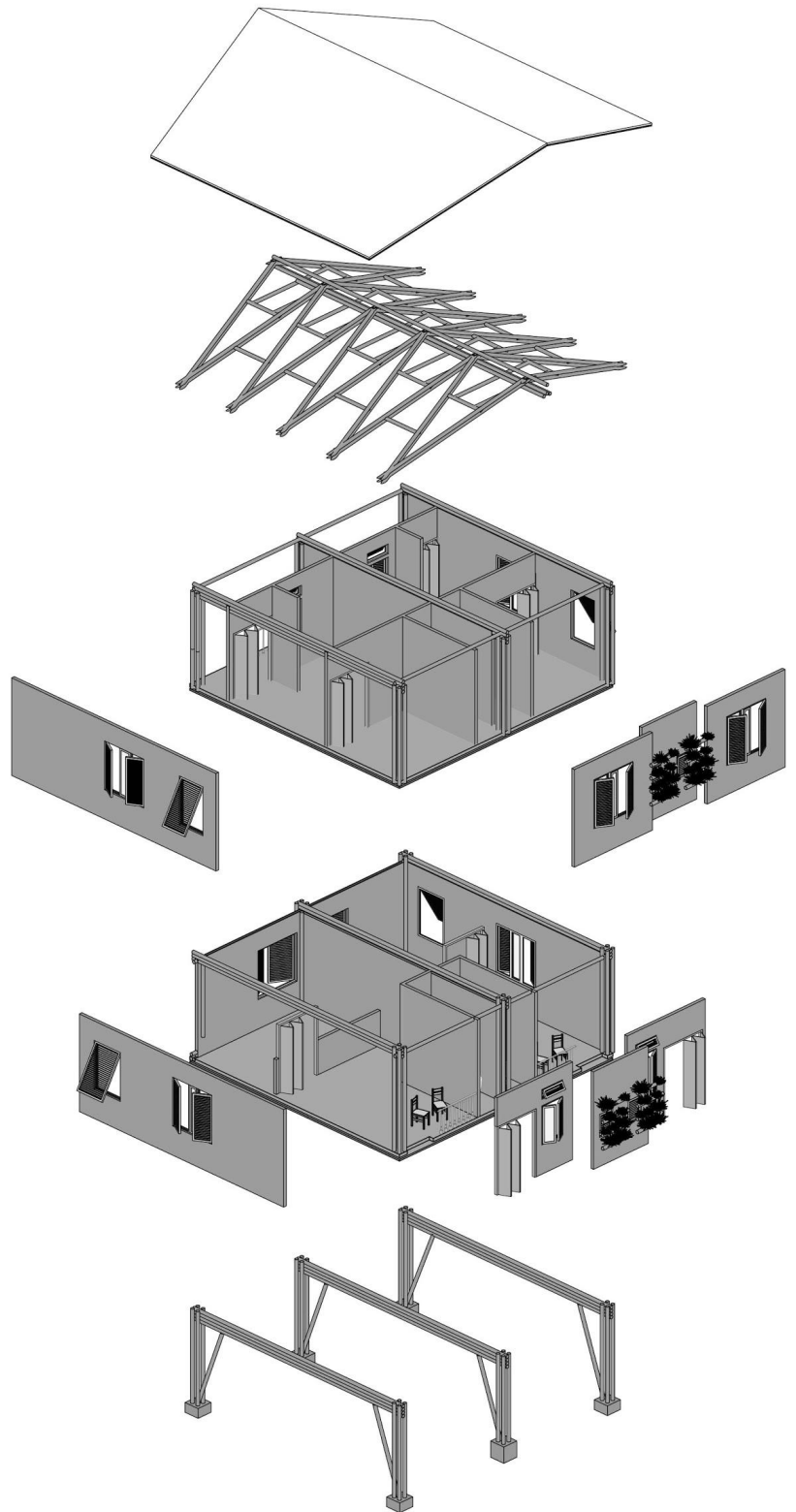
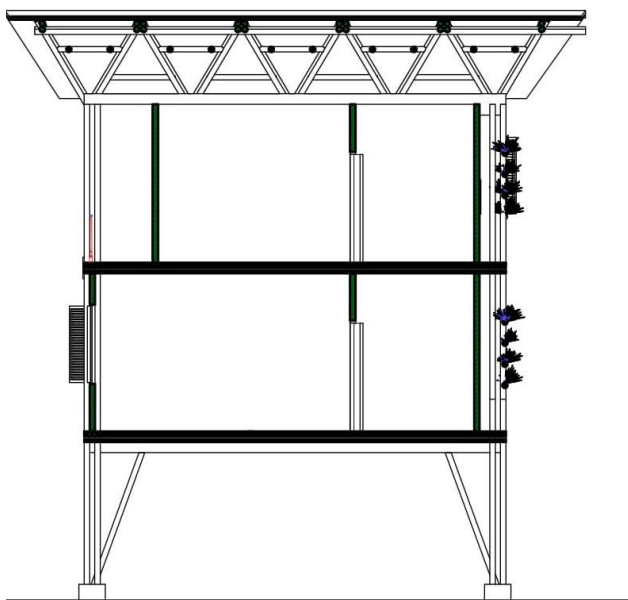
Creating a riparian edge and constructed wetlands between the settlement and a water body is mutually beneficial for both the entities. The settlement has a buffer from the water body which acts as an amenity as well as reduces risks of flooding. Similarly, the water body is given a chance to continue the natural processes without the immediate concretisation of the edges and the linkages of the water body. This also helps reduce pollution in the water body and allows for many kinds of flora and fauna that exist in these unique conditions.



## Proposal for housing

As the site is close to the shore line and the nala flows right next to the existing houses where garbage is not segregated which led to choking of drains and eventually flooding.

Stilted housing can be provided creating a second ground for the people living there. Ground floor can be used for public functions and first floor for housing. Also, locally available materials like steel can be used for construction making it low cost housing.





## Case study- Public Toilet- Outside CST station



- The public toilet near Chatrapati Shivaji Maharaj Terminus is a very good example of a working toilet.
- The toilet is used by 500-600 people on a daily basis.
- There are sufficient and equal numbers of toilets and bathrooms provided for both men and women.
- Handicap access is also provided.
- It is a paid public toilet.
- There are cleaners cleaning the toilet every 4-5 hours.
- Due to frequent cleaning there was no foul smell and there was no breeding of mosquitos.
- The idea of introducing plants on the outer facade keeps the washroom environment fresh.

### Inference:

- This case gives one clues on how to maintain a public toilet, and what basic features can be incorporated to enhance the experience of the toilet.
- Simple planning solutions such as locating the washrooms in a slightly opened out area, can enhance the quality of ventilation inside the washroom and reduce the foul smell factor automatically.
- Storage spaces for cleaning appliances should be provided so that the cleaner can clean easily.
- The schedule for the cleaning should be set and signature sheets should be kept to keep track of the cleaners.
- Its a community utility, and as long as the community is supportive and strives to keep it clean it becomes very difficult to maintain the quality of the structure.



# PROPOSAL FOR BETTERMENT OF PUBLIC TOILETS



## PLANNING OF NEW TOILET PLACEMENTS

- The number of public toilets need to be incresed
- The Khar Danda village is spread across 500 x 200 mts. Initiating public toilets at a distance of 100 mts across the Khar danda stretch will help in resolving the sanitation problems of the urban village.
- Proposing these toilets along the edges of the village along the nalas will help to prevent the danger of pipe bursts of the drainage line if caused any.
- The toilet blocks need to have seperate mens and womens sections along with Handicap toilets.
- The maintenance should be taken care by the municipal authorities.
- There should be seperate care takers rooms in all the public toilets which which in the cleaning of toilets from time to time.
- The government should provide efficient wages to the care takers.
- There should be timings alloted to specific number of families to use the toilet during the peak hours.
- The location of the toilets is such that it is placed next to the entry lanes of the village, making it an incentive for them to aid in keeping it clean as one does not appreciate odour while entry their houses.



- The existing toilet in the urban village are in poor conditions.
- The proximity of the toilet to the houses, releases the foul smell in the houses.
- The windows have very tiny jali opening, which could be replaced with exhaust fans to control the odour.
- Also the washrooms are so close to the houses, that the water spills over into the lanes.
- The entry of the men and women could also be from opposite sides as a common entry can result into men looking into the womens section.

Gautami Bhoite

Siddhi Katvi

Jeel Makwana

Sanchita Pawar

Riddhi Sagar

Abhishek Sawardekar

Dhruvi Shah

Riya Shah

Satyanarayan Venkateshan

Komal Wavhal