The Sanriku Project

summer 2012

cover: photo of Shizugawa taken 16 month after the tsunami

below: photo of Shizugawa taken 3 month after the tsunami

summer 2011

introduction

Mission

We are a multi-disciplinary team of Harvard-affiliated researchers and designers working in collaboration with various Japanese universities and local community leaders. Our mission is to help facilitate the recovery and rebuilding process along the Sanriku Coast through empowering local residents and building community resilience.

Anthropology

Ted Bestor | Anthropology
Andrew Littlejohn | Anthropology
Jade Luo | Anthropology
Andrea Murray | Anthropology
Grace Song | Regional Studies East Asia Program

Business

Sophia Xuejie Jiang | Small Business Entreprenuership

Design

Chen Chen | Landscape Architecture
Kenya Endo |Landscape Architecture
Takuya Iwamura | Landscape Architecture
Yoshihiro Hiraoka | Architecture
Miho Mazereeuw |Architecture/Landscape Architecture
Josh Margul | Urban Planning
Shota Mori | Architecture
Sky Milner | Architecture
Nicola Saladino | Urban Design/Landscape Architecture
Tristie Tajima | Architecture
Jean You | Urban Design

Governance

Ted Gilman | Political Science
Ayumi Kanamoto | Political Science
Ryoji Watanabe | Political Science

Medical

Hiroko Kumaki | Boston-Japan Medical Relief Initiative
Yusuke Tsugawa | Boston-Japan Medical Relief Initiative

Technology

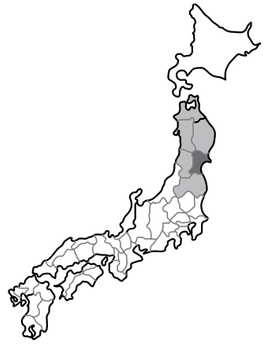
Hikari Senju | Computer Science

context

Minami Sanriku

The 2011 Great East Japan Earthquake was both one of the most powerful ever recorded as well as the most costly, completely destroying coastal cities and crippling infrastructure. Although the tsunami would have had an even more devastating impact if it wasn't for Japan's highly regarded emergency preparedness plans, the Tohoku earthquake and subsequent tsunami still utterly overwhelmed the nation's formal capacities. While a natural event of such magnitude occurs rarely, it nonetheless serves to highlight the limitations of our current infrastructure and technology to safeguard those in harm's way and reveals the inherent vulnerability in our current patterns of development. Planning both safeguards and inherent resilience requires sustained debate and reconsideration of fundamental approaches in order to be improved -- bigger and stronger cannot be our only solution. Therefore, in addition to our immediate contributions, our involvement aims to have a positive influence to long-term ongoing reassessment of developmental strategies and practices for the region.

Minami Sanriku is a coastal city located in Miyagi prefecture, nestled within a hilly topography dotted with naturally forming bays. During the tsunami this terrain amplified its impact by constricting its path and funneling the wave thousands of meters into the valley. These smaller valleys are typically each home to one of the many semi-independent fishing hamlets, whose residents have historically organized under their own Keiyakukai, or community contract, making it challenging to participate in existing governmental structures for planning. To compound the stress in these divisions, the city of Minami Sanriku is itself an agglomeration of four former cities, Shizugawa, Utatsu, Togura, and Iriya, forced together by the recent Heisei Merger in 2005 despite each having their own unique historical identity, culture, and bureaucratic organization. This physical and social fragmentation is often the cause for tension between community groups and individuals, a problem that has been magnified by the disaster.



Tohoku Region

Miyagi Prefecture

Minami Sanriku

Regional Impact

38m highest wave run-up

24,000 reported dead or missing (early May 2011)

76,000 houses completely destroyed

5th most powerful earthquake ever recorded

Regional Statistics

Population
Total: 17,815 (March 2009)

Area
163.74 sq. km

Climate
Avg. Annual Temperature: 11.5 C
Maximum Temperature: 32 C
Minimum Temperature: -5.4 C

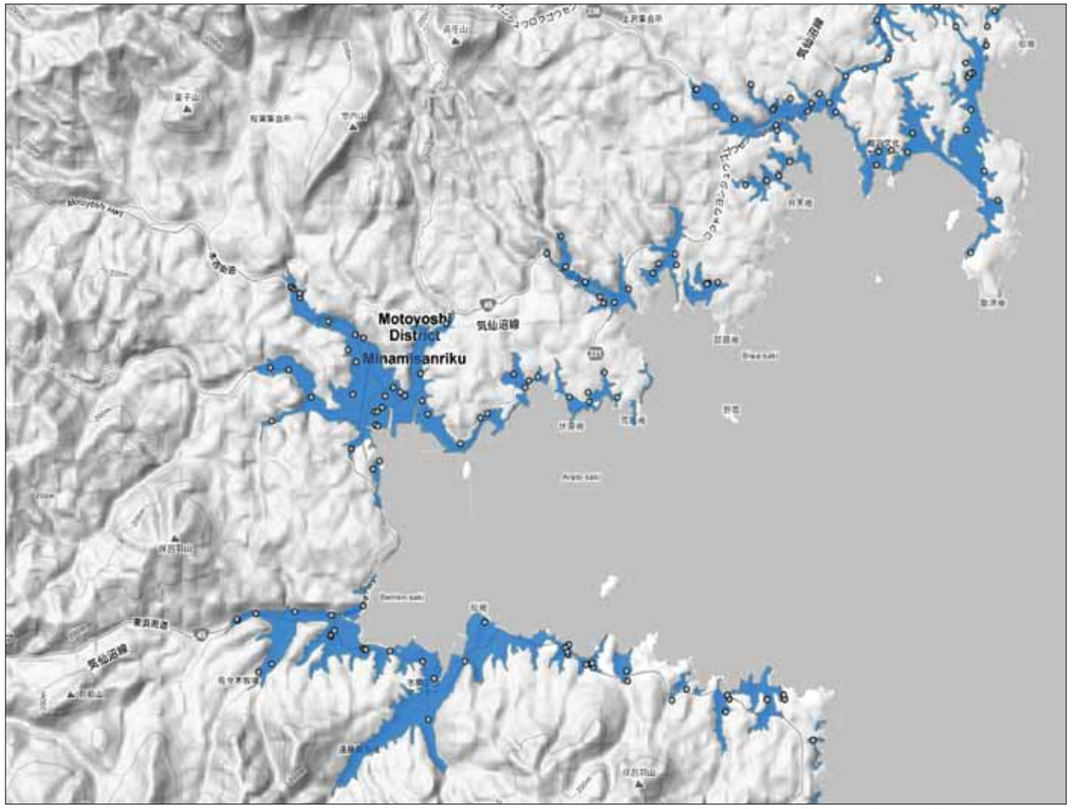
% of Population over 65
Total: 5,365 (March 2009)

Number of Households
Total: 5,365 (March 2009)

Politics
The town on Minami Sanriku was made in 2005 as a part of the Great Heisei Merger, which merged the towns of Shizugawa and Utatsu

Source:
http://www.pref.miyagi.jp/dobokusom/2012
0209symposium/PDF/12_pdf.pdf

History of Tsunamis in Minami Sanriku



Tsunami innundation along Minami Sanriku Coast, Source: JD Archive Project / Reischauer Institute

summer 2012

Our interdisciplinary team for the Summer of 2012 was comprised of members from several recovery efforts being carried out across Harvard since the earthquake. The ambition of our team was to organize a single concerted effort that coincided with the shift from restoration to reconstruction, a critical juncture in the process of rebuilding in which small decisions have cascading long-term impacts. Drawing on our team's range of backgrounds, the coupling of methods from the social sciences with those of design -- while often difficult to negotiate -- was structured as a way to dislodge our conventional disciplinary approaches and translate the local knowledge we gained into tangible results. This productive tension, effectively slowed the process of reaching a conclusion, and when successful, led to innovative ways of engaging and responding. Building on ties fostered during the previous year with local community leaders, universities, and NGOs, our group focused on the following two distinct efforts.

The first was to work with the communities of Niranohama and Yoriki, two small port communities of less than a hundred households each, to assess the concerns of residents in regard to their harbor and seawall. Through meetings with the community leaders, workshops, and surveys, we produced a report that documented the issues of reconstructing the port from the perspective of the residents, to be presented to local government bodies.

The second was to work with the local government and city planning consultants to enhance their current master plan by recommending specific design ideas for four distinct areas: residential, commercial, industrial, and green space. These proposals were used to stimulate a dialogue among local communities, towards considering several alternatives that would be aligned with the vision and goals of residents, many of whom were underrepresented in the official process.

Minami Sanriku's Reconstruction Plan

The following excerpts are taken from the reconstruction report prepared by the local government, 9-months after the earthquake. They are the compilation of concerns raised by the residents during community meetings held in the months following the earthquake and form the basis of the reconstruction schedule outlined in the following pages. Wherever possible, we have tried to address these issues, in balance, with the personal accounts we gathered while working directly with specific communities.

Issues Raised by Residents

Earthquake

- A substantial number of residents neither expected nor considered that a tsunami would follow the earthquake.
- A substantial number of residents returned to their home to gather their valuables, despite the tsunami warning alarm, and were not able to evacuate in time.
- Residents later admitted that they were overconfident in the seawall and disaster prevention facilities.

Evacuation

- People with mobility impairments, such as the elderly, disabled, or visitors unfamiliar were the geography were not able to evacuate in time.
- The distance to the evacuation grounds were too far, and those who attempted to evacuate in cars were held in traffic by fallen utility posts and electric wires.
- Some residents were forced to evacuate several times to reach safe ground, as the tsunami rose above an expected height.
- Knowledge of the evacuation centers and how to get there was crucial.
- Access to information in the immediate aftermath was limited.

During the Tsunami

- The structures in the low-lying ground were completely destroyed.
- The town hall, hospitals, and other public infrastructures, as well as stories, factories, and residential houses were all washed away.
- The traffic network, water pipes, and the communication infrastructure were all damaged, exposing the vulnerability of basic support systems.
- Seawalls and fishing port functions were destroyed, due to land subsidence and ebb tide caused by the tsunami.

Rescue Work

- Due to the destruction of the town hall, administrative functions of the town were paralyzed and affected the primary rescue work.
- Road obstructions, damage, and lack of fuel delayed the transportation of rescue, emergency, and support materials.
- Due to the paralyzed communication network, confirmation of missing persons was delayed.
- The roads connected to evacuation centers were also obstructed, delaying the rescue efforts.

Life in the Evacuation Shelters

- Basic utility services did not recover for a while.
- Local communities became weak as people from villages were allocated to different evacuation centers.
- Disease history and medication information of patients were lost, affecting their treatment.
- It took a substantial amount of time to secure the land for temporary housing.
- It took a substantial amount of time to sort and clear debris.
- Many fishery facilities were damaged and tools were lost.
- Administrative information did not reach the community.

http://www.town.minamisanriku.miyagi.jp/uploads/ftp_common/sakuteikaigi/20111226honpen.pdf

Minami Sanriku's Reconstruction Plan

Restoration (2011-2013)

- Support service staff will be placed in the temporary houses for mental health and other services.
- Octopus and Salmon fisheries, as well as seaweed cultivation, will resume. Processing factories and markets will be reconstructed, activating the fishing ports.
- Temporary commercial areas will be erected to generate business.
- Preparation for the relocation to higher ground commences, with on-going community discussions.

Reconstruction (2012-2017)

- Houses will be constructed on higher grounds -- during the latter half of this period, construction of urban area in the high grounds is expected to be at its peak.
- Restoration of the industrial basis for the agricultural, forestry, and fishery industries will be complete, and full-fledged business resumes. New businesses will be established and employment opportunities will expand.
- The urban development for Shizugawa commences.

Development (2014-2020)

- Relocation to elevated grounds is completed.
- Public facilities, such as the town hall and hospitals will be built.
- A memorial park to the disaster will be constructed.
- Collaboration among the industries will advance along with experiential tourism, including green and blue tourism.
- In addition to the revitalization of the community, the number of tourists and visitors to the town will increase.

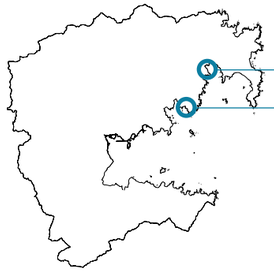
http://www.town.minamisanriku.miyagi.jp/uploads/ftp_common/sakuteikaigi/20111226honpen.pdf

Shizugawa Temporary Fish Market

Shizugawa Temporary Shopping Area

Temporary Housing Area

yoriki & niranohama



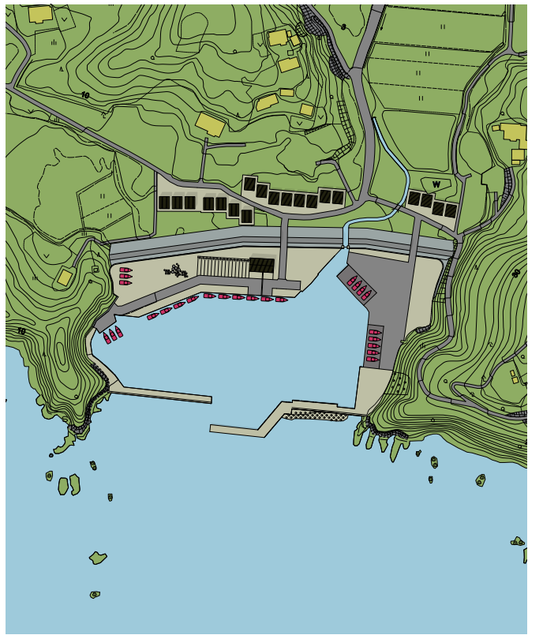
Niranohama Pier

Yoriki Pier

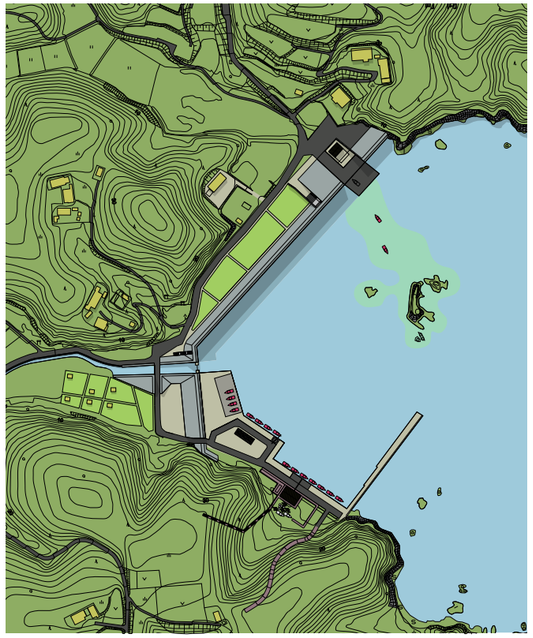
engagement

By the Summer of 2012, the communities of Niranohama and Yoriki were the only two communities of Utatsu that had collectively committed to the relocation of their residences to higher ground. While these housing developments were being developed by the officially appointed consultants, the redevelopment of their local harbors was stalled due to uncertainty surrounding the seawall and the lack of human resources. The harbor and associated communal workspaces are the principal source of livelihood for these communities and an important economic driver for the district of Utatsu, and as such this delay in their reconstruction was causing residents much anxiety over the future of their community. Through coordination with the consultants and direct engagement with the residents, we identified an opportunity to facilitate a process helping these communities communicate their specific concerns over the redevelopment of their harbor. Accordingly, with the permission of the local government and official consultants, we conducted a series of meetings and workshops from July-August of 2012 to assess the issues surrounding the harbor development from the perspective of local residents.

Through these discussions, it became increasingly clear that a principal concern for the majority of residents was that of the newly planned seawall, which may be up to 8.7 meters in height. To clarify these concerns, we distributed visual aids and administered a survey to assess the community's reaction to various seawall heights in relation to other priorities for the harbor development. Our findings were incorporated graphically into a harbor report to be used by the residents of each community as a means to facilitate discussion with the planning body.



NIranohama Site Plan

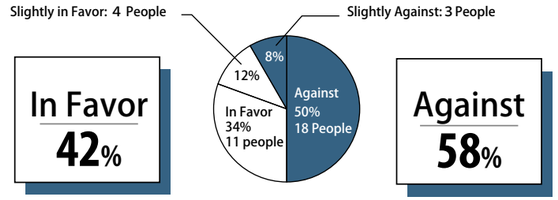


Yoriki Site Plan

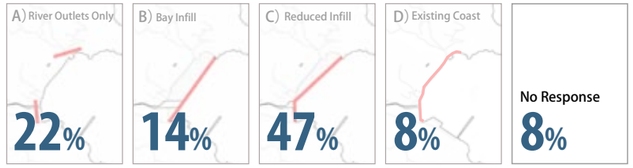
Survey Results

From early July until early August we carried out interviews with local residents and community leaders, which formed the basis of this survey. Forms were distributed to 45 households in Yoriki by community leaders, with 36 being returned for a response rate of 80%.

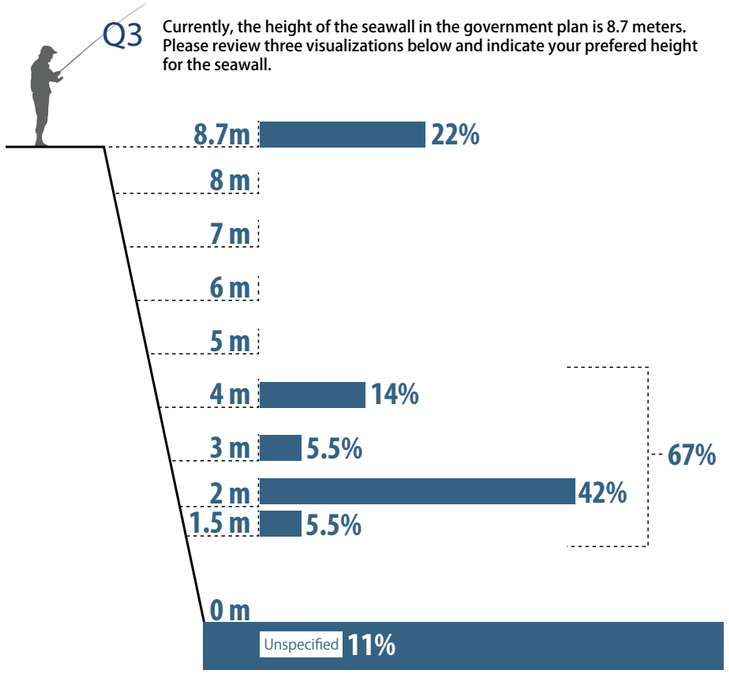
Q1 The current government plan for the Yoriki Seawall is specified at a height of 8.7m and a width of 20m. Please indicate your support for the current plan.



Q2 Among the three possible locations for the proposed seawall below (Diagrams A - C), please circle the option you consider most favorable. Please use the additional diagram D to freely propose or comment on the location.



Survey Results Front

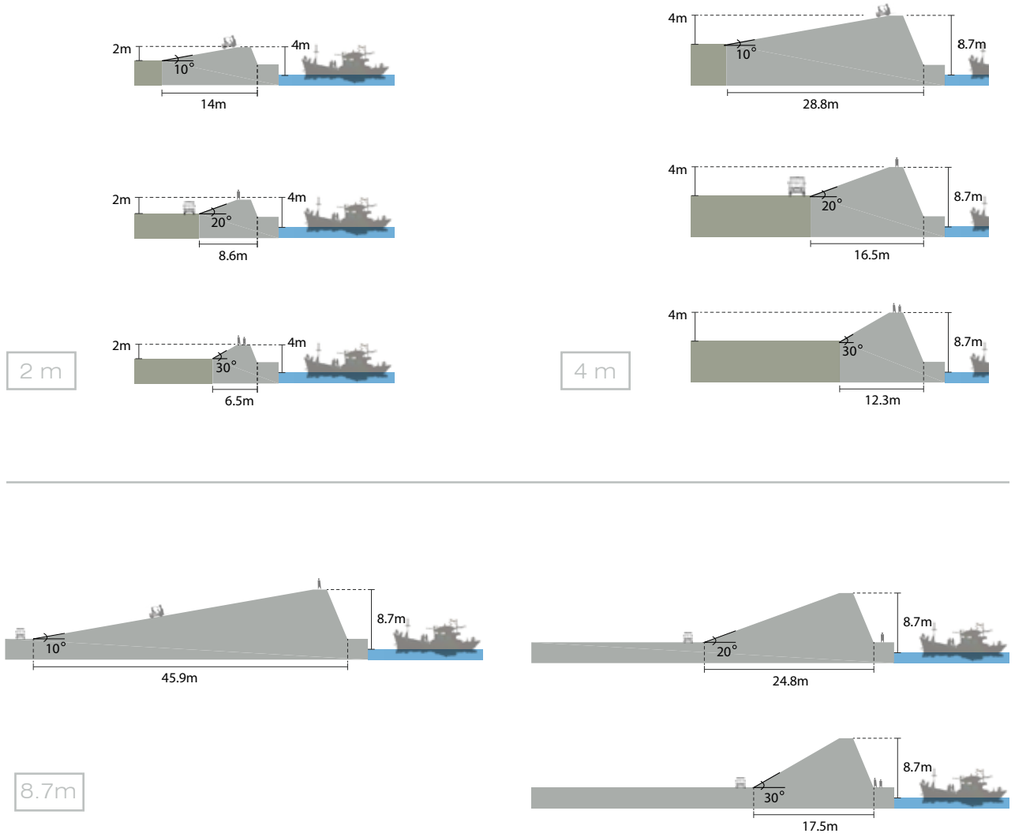


Q4 Please rank the five facilities listed below based on the order you wish the government to prioritize.

#1	#2	#3	#4	Other
Evacuation Routes	Seawalls	Communal Workspace	Leisure Facilities	Boat Lift

Survey Results Back

Seawall Visualizations

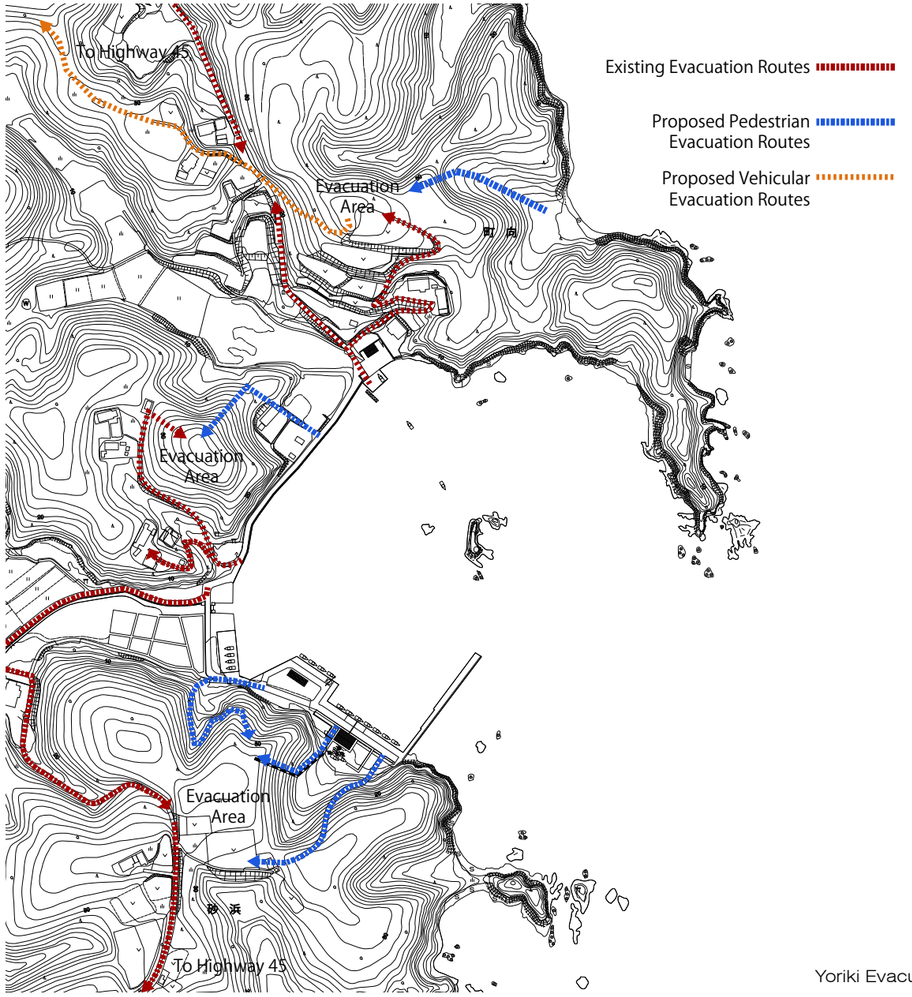


Yoriki Sightline Studies

Through conducting the survey, we learned that effective evacuation routes -- not a large seawall -- were the primary concerns for residents in the rebuilding of the harbor. Both communities are located in valleys with relatively immediate access to higher ground from any given location. A common reason for not wanting a high seawall was that the residents felt it would obscure their view of the ocean, boats and aquaculture lines. Residents preferred to be exposed to the sea while being as close as possible to an evacuation route. The architecture students of Miyagi University, led by Shota Mori, were able to conduct a workshop to record the routes used by the residents during the tsunami. This information, along with our proposals for alternative routes and residents' suggestions for vehicular connections to larger roads, forms the evacuation route map (pictured right), and is one among a number of maps produced for the report.

The final report presented to the communities draws together the materials created throughout our initial engagement as a record of the concerns raised by the residents. We hope that it will aid the residents in communicating with local officials as well as serving to spur discussion within the community itself, both important steps along the road towards recovery.

▲ Miyagi University students, led by Shota Mori, work with the local leaders to map the evacuation routes used during the tsunami.



Yoriki Evacuation Route Map

shizugawa

Shizugawa, as viewed from the middle school

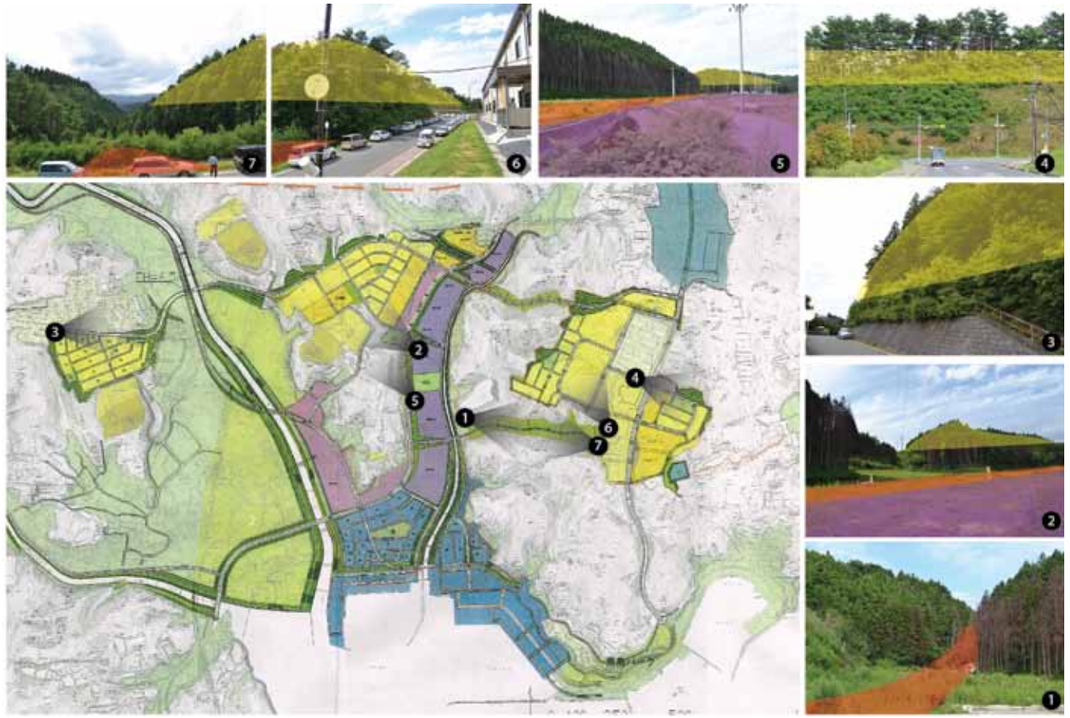
engagement

Shizugawa is by far the largest of the four districts within Minami Sanriku and the most complex regarding discussions on relocation. By July of 2012, the Shizugawa master plan had been through several iterations and finally resolved on a rezoning in which the residential neighborhoods were relocated to higher ground. This left the major portion of the former city center to be redesigned. While general zoning and the location of the seawall were decided, there was still the considerable question of the character and content for the newly created zones of the former city center.

Our group was tasked by the government's planning consultants, Pacific Consultants, to generate a possible design solution to jump-start the discussion with residents. We decided early in the process that we would work within the planning framework produced by Pacific Consultants, respecting their plans for an 8.7 m sea wall and four major land use zones: residential, commercial, industrial, and green space (pictured right).

Our final design proposal was presented at the city hall to a group of government officials and select members of the community.

The following sections deal specifically with our proposals for the four land-use zones in the framework provided to us by Pacific Consultants.



Pacific Consultants Site Plan

Pacific Consultants' new site plan for Shizugawa, relocates the housing to higher ground, freeing up the lowlands for mixed commercial, industrial, and park space.

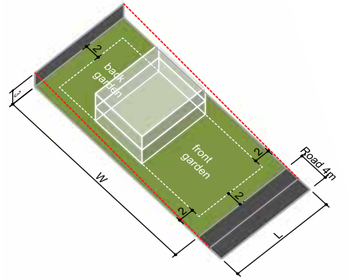
residential

Under the framework of the current master plan, the residential zones are planned to be relocated to three hilltops. While the details are still to be determined, the placement implies a radical modification of the original topography which would require extensive earthwork, leveling, and reinforcement. From careful analysis of existing topographic conditions, we identified access routes up the hill that were shallow enough to allow for a minimal amount of reworked earth while still fitting within the given residential zoning boundaries.

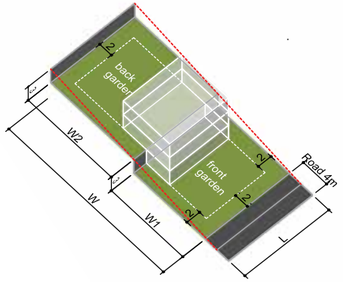
Our proposal for the newly created terraces permits greater variety of housing configurations and orientations when compared to the conventional approach of levelling hilltops. The combination of multiple housing typologies and varying slope conditions would bring out the unique characteristics of each site, creating a multi-functional and adaptive neighborhood with an increased connection to the natural environment.

Prototype ranges

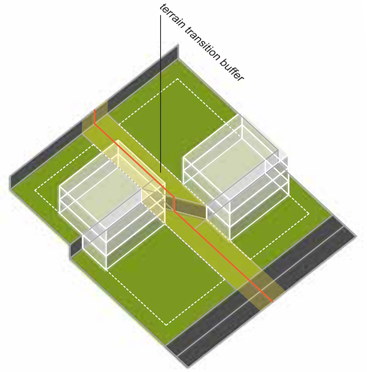
The exploration of all the possible geometric configurations of the prototype established the different typologies associated with the ranges of topographic slopes. Parameters such as minimum and maximum plot sizes, setback, building dimensions, etc. informed such analysis.



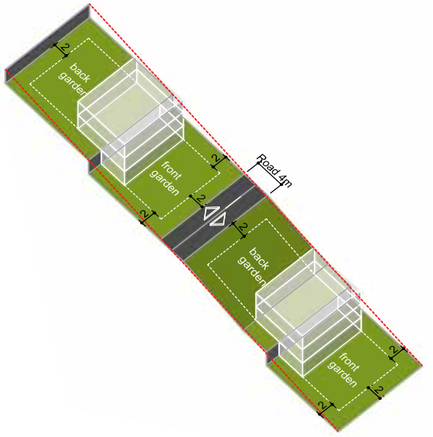
Single-terrace Plot



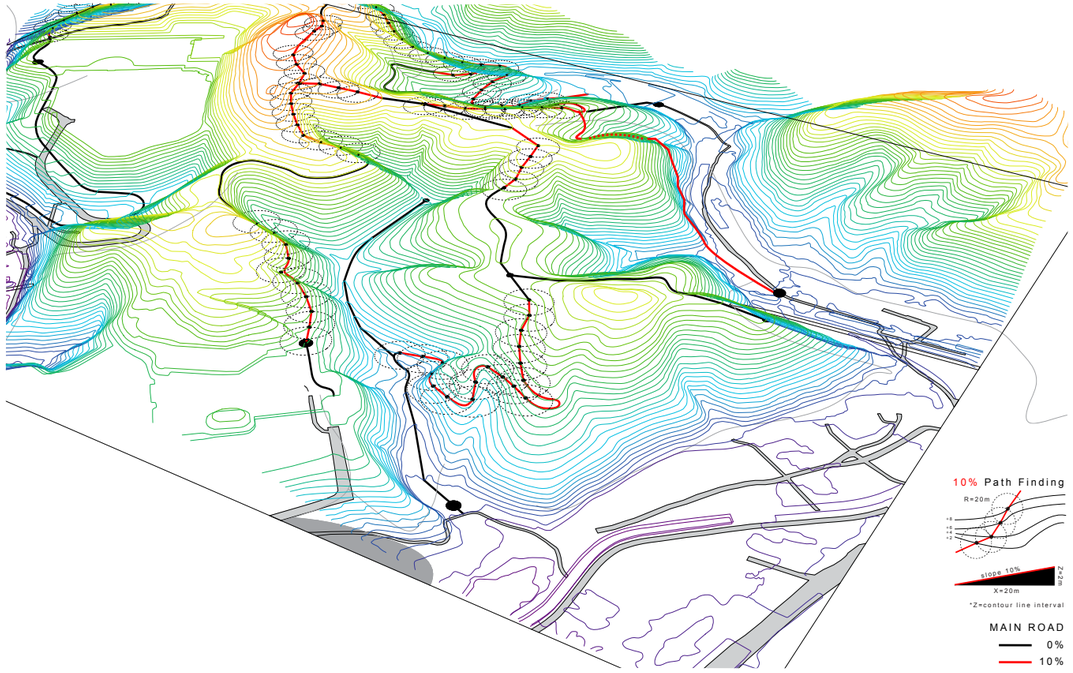
Double-terrace Plot



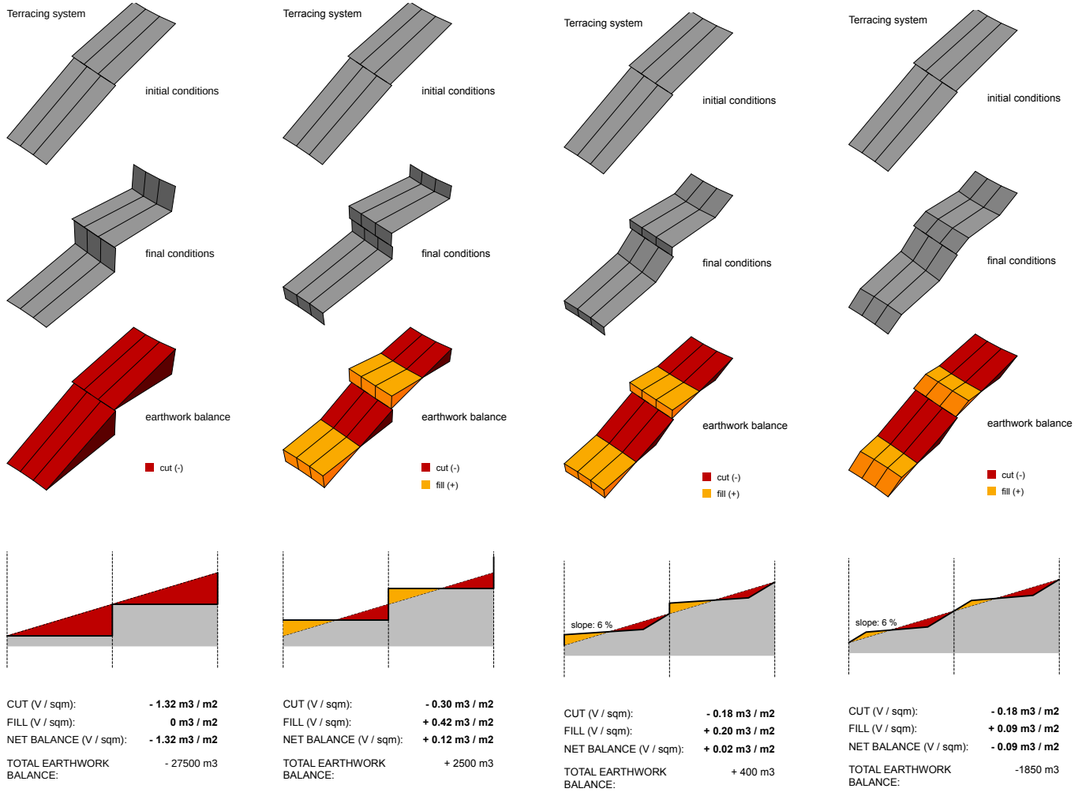
Adjacent Neighbors:
A buffer area provides for flexible transitions



Facing Neighbors:
Shared roads create upper and lower access



The reworking of the residential area was able to maintain the central points of access determined by Pacific Consultant's master plan.



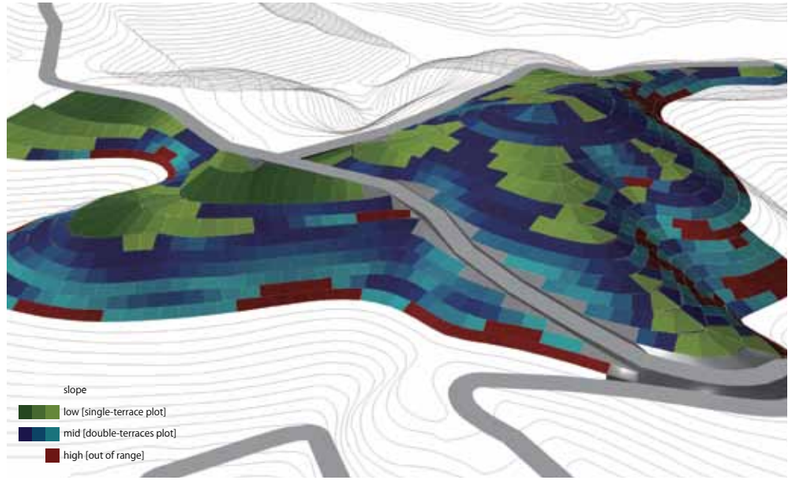
Typology of terracing systems based on the desired amount of earthwork to fill lower lying inundated areas.

Although our terraced housing scheme challenged the conventional approach to residential development in the region, it generated an important discussion with local residents and planning officials around issues of equity, mobility, access, and orientation. For example, one concern brought up among residents was the current plan's failure to provide all homes the equal opportunity to enjoy a south facing orientation. This concern highlights the importance for a community discussion about the trade-offs, for example between uniformity and diversity, that the residents will need to negotiate as part of their relocation.

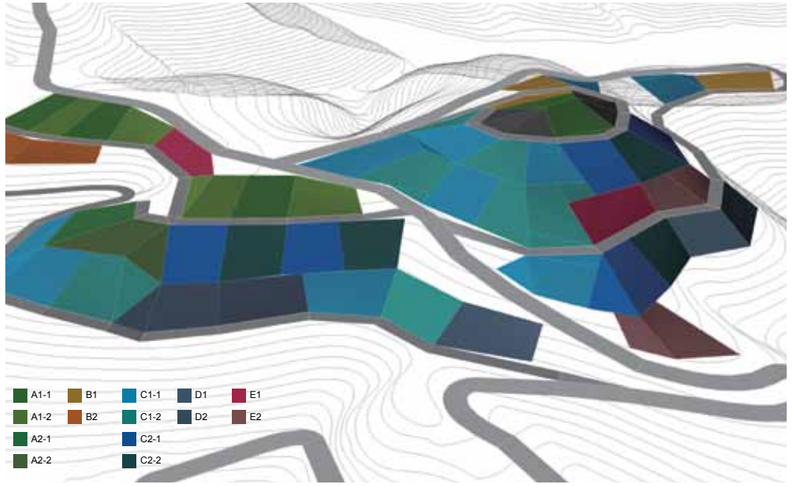
In general, we believe that the greater variation afforded by the design plan for relocation, the greater chance that it will be able to meet the natural variation of preferences among residents. The idea of a diversity in housing types was generally welcomed, serving as a good sign that the residents are open to reconsidering important aspects of their living circumstances.

Program Diversity

One of the added benefits to using a terracing system with different typologies associated with different slopes over a system that more uniformly cuts the top of the mountain, is the diversity of program within a given area.



Plot slope analysis



Distribution by typology

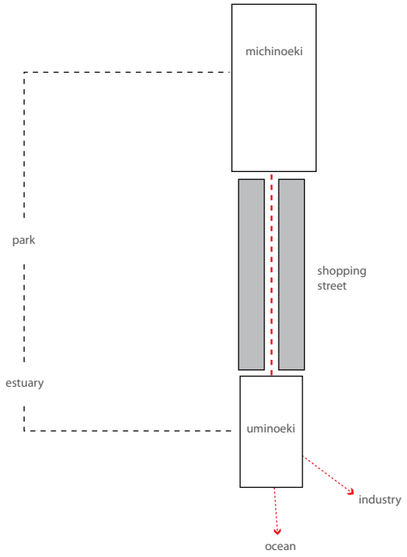
commercial

The commercial center of the city is anchored on one end by the Michinoeki, a recreational roadside rest area, which is situated at the crossing of two major roads, Route 45 and Route 398, and on the other end by the Uminoeki, a commercial and recreational pier, which is perched near the top of the sea wall. A pedestrian-only retail corridor connects these two anchors and functions as an evacuation route when needed. The strategic use of fill to gradually ramp the earth toward the seawall from the interior of the city provides an opportunity to reconnect people with the ocean, despite the construction of an 8.7m seawall. The Uminoeki's privileged location on higher ground allows it to be seen from many parts of the city, thereby becoming the commercial focus of a city with strong cultural ties with the ocean and local aquaculture industry.

From the michinoeki looking toward the shoutengai and uminoeki beyond.

Uminoeki Network

The introduction of an Uminoeki in Minami Sanriku would spur the development of local aquaculture industry through increasing tourism. Uminoeki throughout the rest of Japan provide precedent for a variety of activities that could take place in Minami Sanriku's new commercial district.



michinoeki

"road-station" - a government-designated rest area found along roads and highways. In addition to providing places for travelers to rest, they also provide business opportunities for local residents. Shops may sell local produce, snacks, souvenirs, and other goods.

uminoeki

"sea-station" - a government designated rest area found along the coast. They provide residents and tourists with information about activities on the ocean and local aquaculture activities and products.

Commercial Activities

The images below provide examples of other activities that could take place in the commercial district, including: tidal salt water pools, playgrounds, outdoor foot onsens, kakigoya (oyster huts), or kayaking.


Leca Swimming Pools | Leca, Portugal | 1966


Leca Swimming Pools | Leca, Portugal | 1966


Natatorium | Honolulu, Hawaii
35x100 m


子供の遊び場

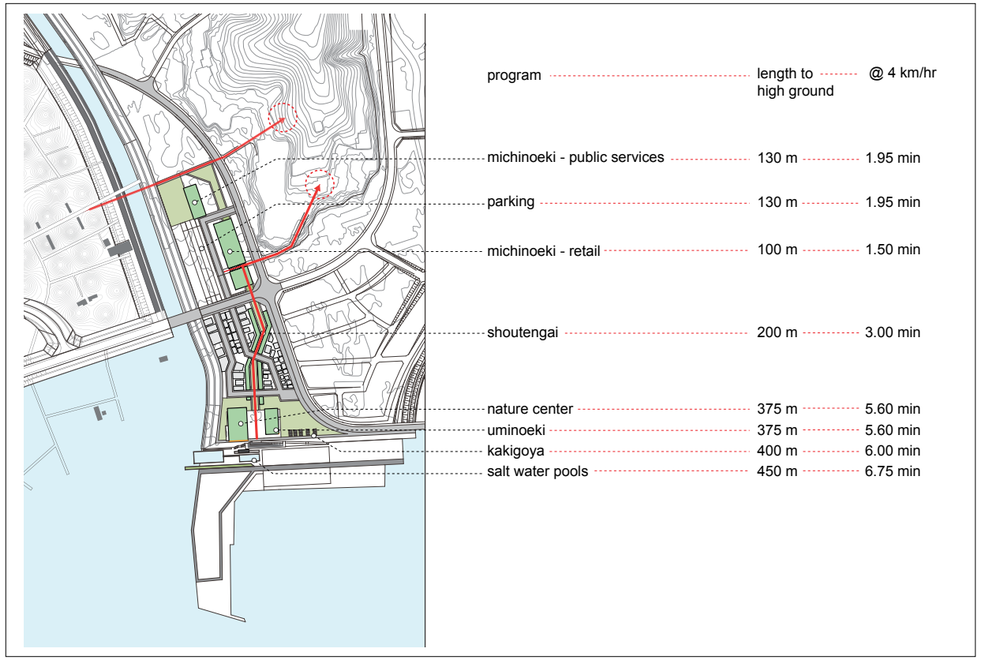

小浜温泉（長崎県雲仙市）


海水プール（カナリー諸島 ラ・パルマ島）


商店街（東京都桐屋敷）


牡蠣小屋（宮崎県高鍋町）


カヤック（三陸海岸）



Evacuation route map

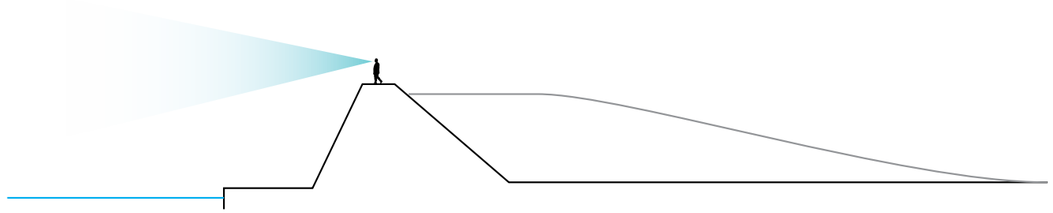
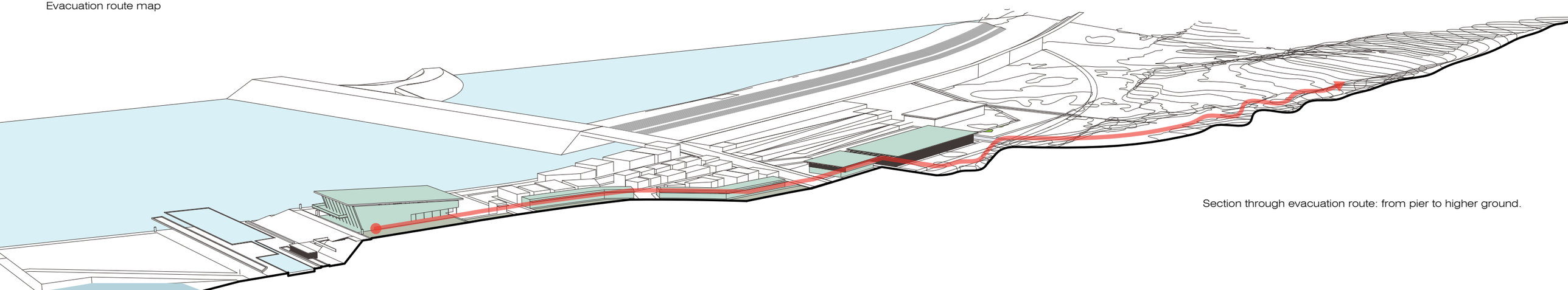


Diagram of fill creating an shallow incline to the seawall

The commercial corridor that connects the Michinoeki with the Uminoeki will also serve as the primary evacuation route during emergencies.

The use of fill strategically ramps the commercial corridor upwards to within 1 meter of the top of the sea wall, situating the Uminoeki as the highest building and a visual icon of the harbor.

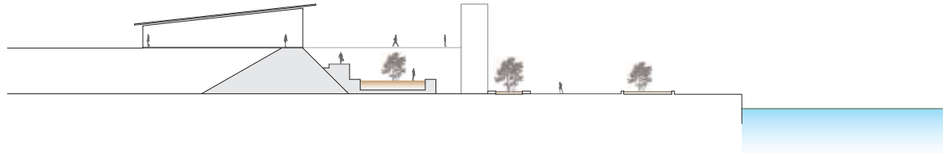


Section through evacuation route: from pier to higher ground.

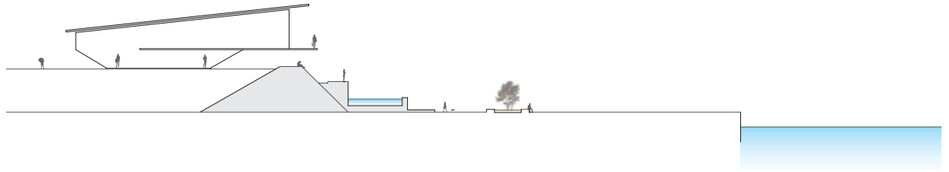
Our attempt to integrate aspects of architecture, landscape, and terracing with the infrastructure of the seawall were met with opposition from local officials, who were concerned about maintenance, liability, and ownership ambiguities that are incompatible with the siloed political and administrative structure of Japan. After creating several alternatives to conform to the conventional structures, we decided that our goal should be to stimulate discussion on how to minimize the negative daily impacts of imposing structures like the seawall and harnessing the benefits of multi-use developments. To enable any aspects of our proposed integrated approach to be realized, important work must be continued to construct means of overcoming current political and structural constraints.

View of the Waterfront Park

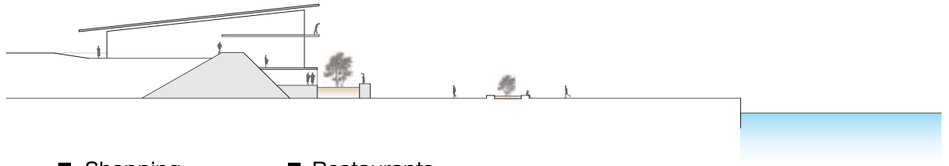
Sections through the Proposed Waterfront



■ Information and ticketing for water activities ■ Direct access to water via elevator



■ Nature Center ■ Classrooms ■ Exhibition Space

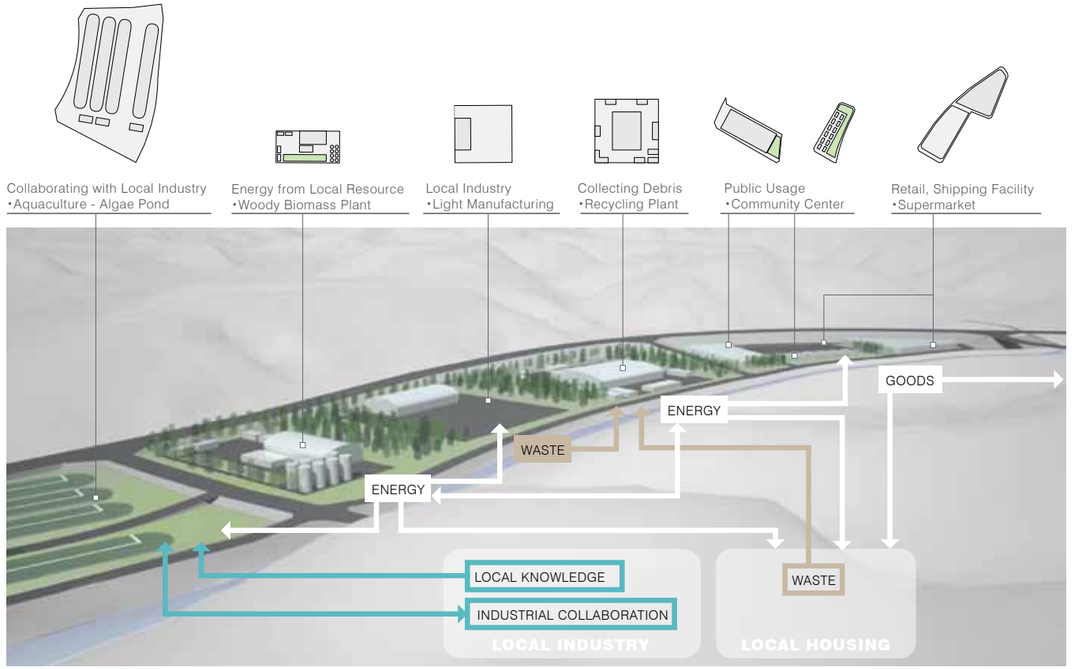


■ Shopping ■ Restaurants

industrial

The new industrial zone of the city is bounded by Route 45 to the West, the relocated river to the East, and the fishing/aquaculture processing zone to the South. Given the early stage of planning, we focused on a spatial utilization study of the 90,000 square meter zone, in which we found that an industrial ecology can emerge here between waste and recycling stations, the debris burning facility, aquaculture, and algae farming and biofuel extraction, all supplying the town with sustainable and affordable energy in a country where electricity is expensive.

In the proposal, the industrial lots are surrounded by forested patches to help manage unfiltered stormwater runoff from reaching the river and the bay, protecting the nutrient exchange processes between the mountains and the sea upon which the town's fishing industry is deeply reliant. Finally, the area's proximity to residential zone is considered with the addition of a small shopping arcade, a supermarket, and a community recreation center.



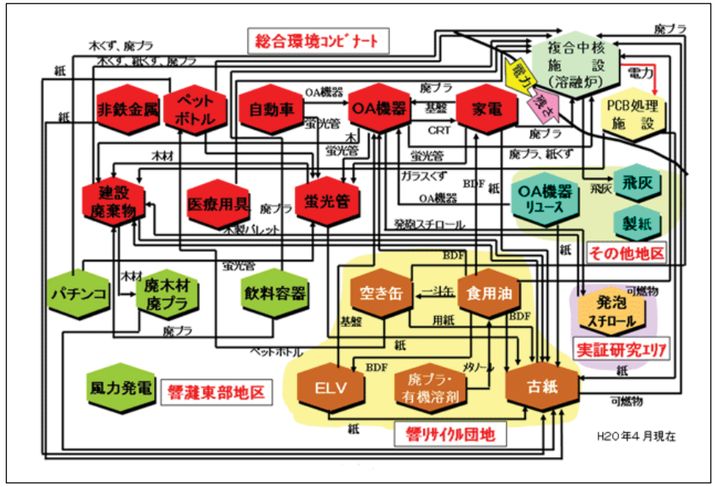
Industrial zone system diagram

Wind-power Generation

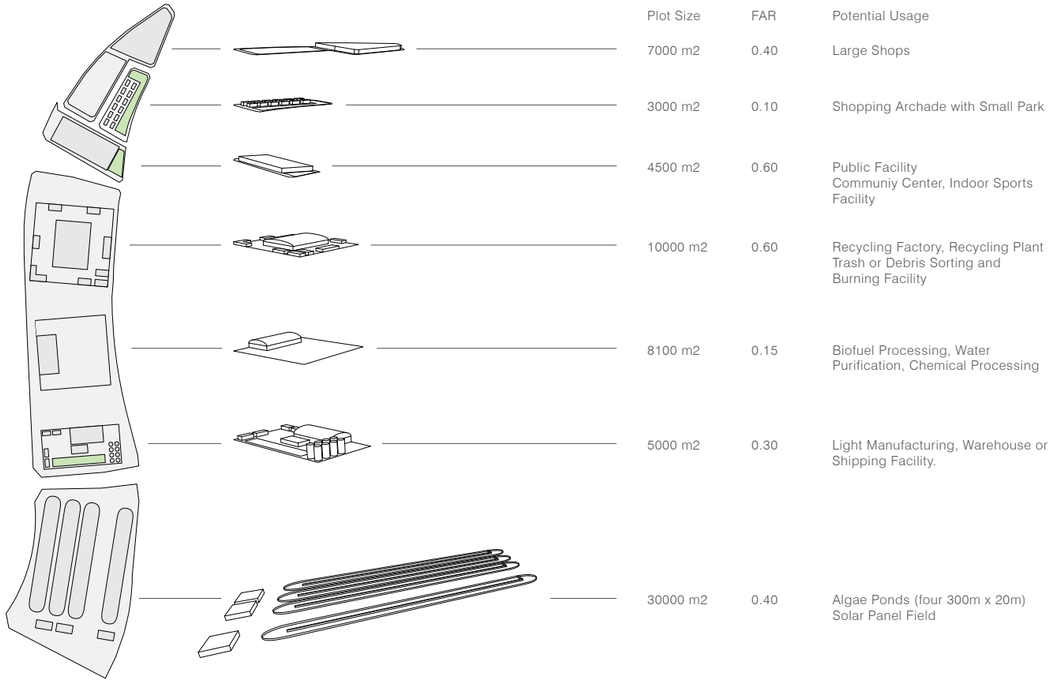
Solar Energy Generation

Power Generation by Woody Biomass

Kuzumaki town in Iwate prefecture, provides an example of utilizing local renewable sources and existing industrial wastes to decentralize town's energy sources.



Case of industrial park in Kita-Kyushu represents a circulation system of recycling waste and heat from one company to another.



	Plot Size	FAR	Potential Usage
	7000 m2	0.40	Large Shops
	3000 m2	0.10	Shopping Archade with Small Park
	4500 m2	0.60	Public Facility Communiy Center, Indoor Sports Facility
	10000 m2	0.60	Recycling Factory, Recycling Plant Trash or Debris Sorting and Burning Facility
	8100 m2	0.15	Biofuel Processing, Water Purification, Chemical Processing
	5000 m2	0.30	Light Manufacturing, Warehouse or Shipping Facility.
	30000 m2	0.40	Algae Ponds (four 300m x 20m) Solar Panel Field

The industrial zone, showing different footprints and what programs are common and feasible for those given lot sizes

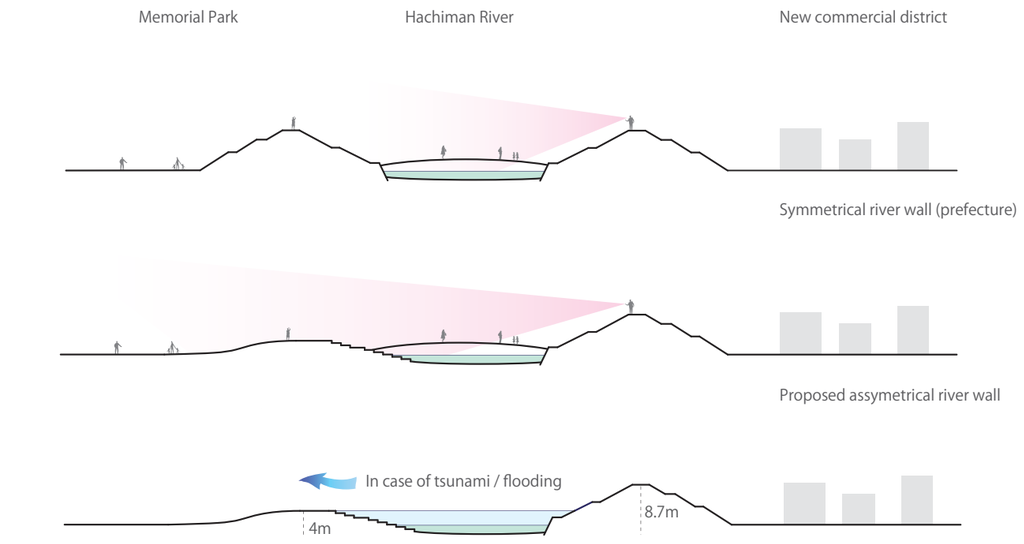
memorial park

With the relocation of residences and businesses to higher ground, the western lowlands of Shizugawa have been reconceived as a public park to both honor tsunami victims and provide a recreational space for visitors and residents. Taking as a given the necessary placement of the seawall surrounding the sea-facing sides of the park, whereby the park is effectively isolated from the city, we sought to overcome this challenge to public access by designing ways in which the park could be reconnected with its surroundings while remaining safe for daily use. Our proposal addresses this issue in several ways: first, by adjusting the heights of the riverwall in select areas to provide views into the park; second, by minimizing the visual impact of the remaining riverwall through planting strategies; and third, by creating a number of evacuation alternatives in the case of another tsunami. In the case that a future tsunami should overtake the seawall, the parks undulating terrain, composed of debris and earth fill from the proposed hillside excavations, would slow the rate of inundation to provide a few vital moments of defense.

Through our discussions with local residents, we found that it was the magnitude of the tsunami and its impact on the city that the residents wished to memorialize rather than the ruins themselves which were often too painful a memory. Therefore we proposed that foundations remaining from buildings that had been destroyed could become the site of various park activities, including areas for prayer and contemplation. Lamp posts throughout the park were designed to become a constant reminder of the height of the tsunami.

Footprints of former buildings are converted into memorials and activity spaces

Discussions with residents throughout our engagement repeatedly raised the concern over the massive visual imposition that the 8.7m seawall and riverwall would create in the landscape. The idea of lowering the riverwall along the Eastern edge of the park which did little to protect the majority of development had been suggested by both community residents and members on our team. Doing so would allow for a visual connection from the residences and commercial districts to the park and possibly even minimize the strain exerted on the residential riverwall during a tsunami by allowing the wave to disperse into the park. However, the current national river embankment law does not allow for an asymmetrical profile in which one side is respectively lower than the other. While these standardization measures limit complications and therefore liability, they also function as an impediment towards better planned and designed reconstruction.



Section showing the lowering of the park riverwall with incorporated seating.

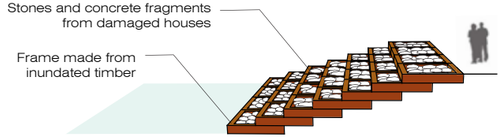
From Hachman River Riverwall toward the Park

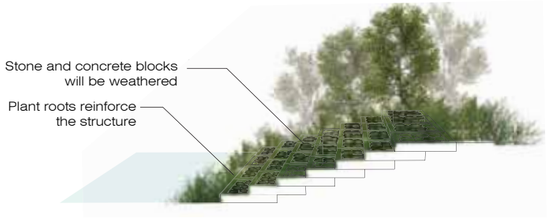
Connection to the Park

Our proposal follows this drawing of the connection between the park and the residential neighborhood created by Ms. Kudo, section leader of the Machizukuri Kyogikai. It highlights the importance of evacuation routes and views. The wide evacuation route leads directly from the park, through the neighborhood, towards higher ground. The left seawall is lowered to create views to the park and ocean.

Semi-natural River Bank

A self-maintaining embankment would minimize the maintenance cost over time. Use of the traditional civil engineering method Sodachin-shoukou would enable the bank to become increasingly structurally bound by plant roots over the years. The structure could be constructed using salvaged material, e.g. inundated cedar timber and concrete debris from the wreckage.





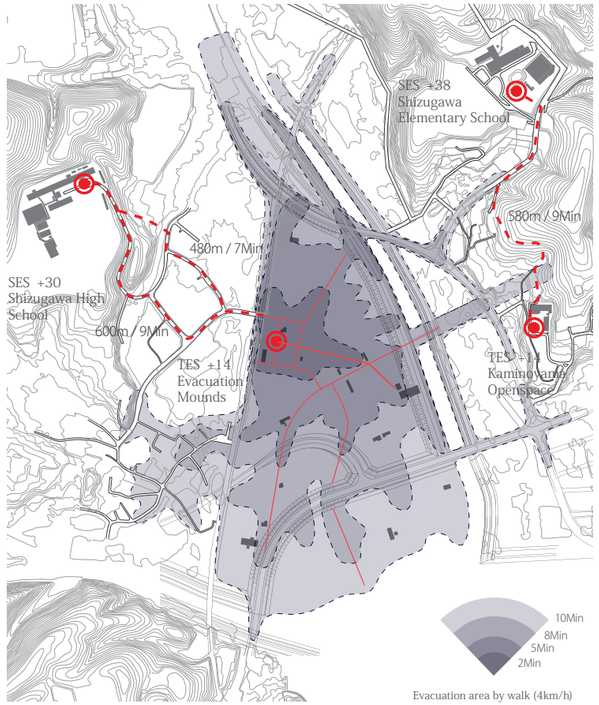
Under the current masterplan proposal, the southern portion of the park is enclosed by two seawalls. By removing the redundant seawall, we have the opportunity to create an area of the park which would be open to the influences of the ocean. This environment would be a rich habitat for salt marsh flora and fauna, as well as a site for clam collecting activities attractive to both locals and visitors.

Seawall Estuary

The border between the park and ocean is planned to be flexible and ephemeral. The park border gradually fades into the wet habitat space, embracing nature instead of forging a hard edge against it.

View of estuary from the seawall

The park considers a number of safety measures in the event of another emergency: first, a temporary evacuation station situated on the 14m high mound will offer immediate safety, including a water tank for emergency usage; second, an alternative evacuation station functions as a backup resource; third, evacuation routes throughout the park lead to the temporary evacuation stations within ten minutes from any point; and fourth, the former streets are used as memorial pathways to connect that interconnect the recreational sites to the evacuation routes.



Site map highlighting the evacuation routes

Evacuation Route (Inside Park)

Evacuation Route (Outside Park)

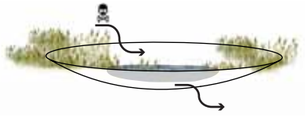
Distance	Evacuation TIme (4km/h)
1. 316.7 m	4 min 45 sec
2. 263.0 m	5 min 57 sec
3. 629.2 m	9 min 26 sec
4.436.8 m	6 min 32 sec

Evacuation route and storm water collecting pond

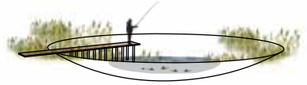
Similar to the issues of management and ownership faced in the proposal for the commercial district, the multiple uses of the riverwall in the design of the memorial park raise concerns over the construction, maintenance, and liability costs associated with public development in Japan. Overcoming these impasses towards an integrated approach will require a restructuring of conventional design and construction practices which can only be achieved by engendering necessary political will.

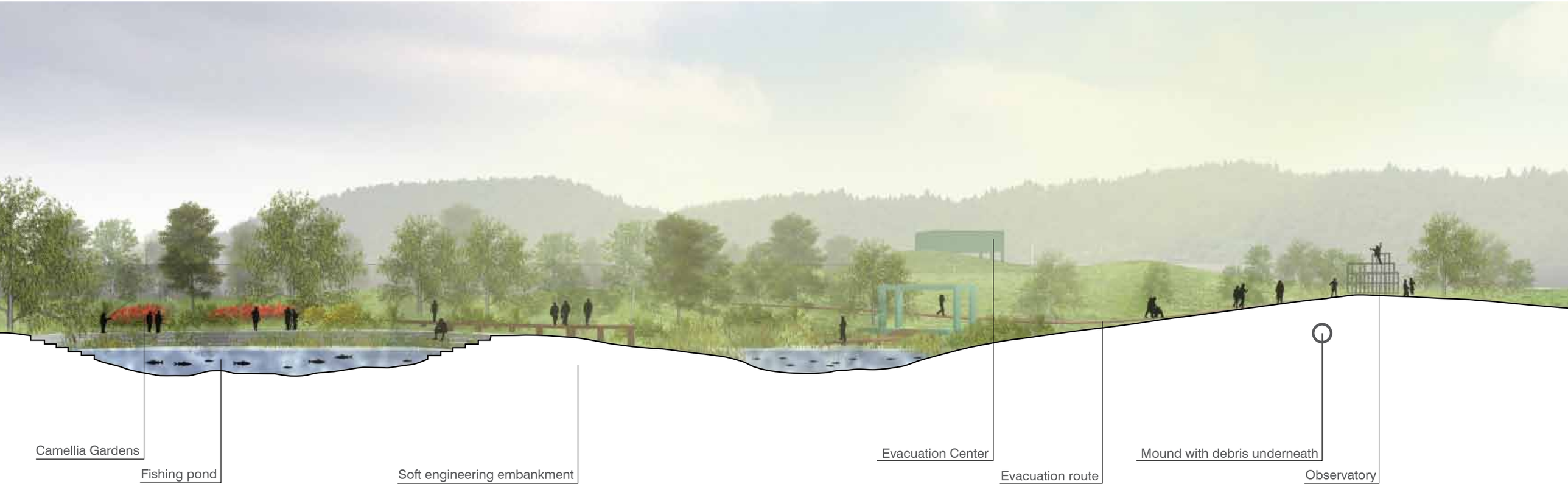
Fresh Water Fish Ponds

Water Purification Pond



Fishing Pond





moving forward

Since our direct involvement over the Summer, members of the Minami Sanriku community have communicated to us that the documents have been put to productive use. Our seawall reports for Niranohama and Yoriki are now being requested by other small fishing communities along the coast, and the task is being taken up with our affiliates at Miyagi University. The Yoriki Village has officially put in a request to the government to slow down the decision making process on the height of their seawall until they can reach an agreement. Copies of our Shizugawa proposal have been used by various community leaders within Minami Sanriku for discussions about the future of redevelopment. The wetland area in the proposal has now adopted the name “Kamome no Koen” and pursuing ideas about lowering and vegetating the river walls lining the evacuation park have become a priority for community leaders. Nationally, the public opposition to massive seawalls also seems to be increasing, with prominent members of the science and disaster planning community speaking out against their construction. It is our hope that these documents continue to provide the residents of Minami Sanriku with a way to address and communicate their concerns in this process.

By the Summer of 2013, we hope that the community of Minami Sanriku will have successfully transitioned, as planned, into the reconstruction phase of redevelopment. If this is the case, it will be critical that these developments both minimize the resident’s exposure to future risk and, perhaps more importantly, provide an equitable and livable environment that can adapt to the larger socio-economic challenges facing the region. This will require new innovative solutions to existing problems and an openness to change.

One thing remains clear: the future course of development for the city and supporting infrastructure must continue to include the input of the people. This will be the key in helping the residents of Minami Sanriku to build increasingly resilient communities for both present and future generations.

We would like to warmly thank the following:
Residents of Minami Sanriku, especially the Oikawa and Endo families
Residents of Yoriki and Niranohama
Leaders of the Machizukuri Kyogikai, especially Ms. Kudo
Pacific Consultants, especially Mr. Masami Chida
Minami Sanriku Gov., especially Mr. Akihiro Dazai

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