

INCREMENTAL URBANISM: Ulaanbaatar's Ger Settlements

Rural Urban Framework
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Acknowledgements

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CHINGELTEI-16

- 1B Personal Geographies
- 1C District Transformation
- 1F Formal Infrastructure
- 1G Informal Infrastructure
- 1H Environmental Data

- 2A Initial Prototypes
- 2B Prototype Testing
- 2C Selected Prototypes

GER PLUG-IN 

 SMART COLLECTION POINT - MID

 Fringe Sample Site

 Mid Sample Site

 Urban Sample Site


SUKHBAATAR-16

- 1B Personal Geographies
- 1C District Transformation
- 1D Existing Initiatives
- 1F Formal Infrastructure
- 1G Informal Infrastructure

- 2A Initial Prototypes
- 2B Prototype Testing

 Mid Sample Site

 Fringe Sample Site

 Urban Sample Site

SONGINO KHAIRKHAN-31

- 1B Personal Geographies
- 2C Selected Prototypes

GER INNOVATION HUB 

SMART COLLECTION POINT - FRINGE



Executive Summary

For thousands of years, Mongolians have been living in *gers* – portable structures made of timber, felt and canvas. They are highly evolved designed objects, easy to disassemble, move and reassemble in a matter of hours without any tools or fixings. It is a perfect dwelling for the nomads. Yet, when this specific type of dwelling forms the basic unit of inhabitation for Mongolia's capital city, Ulaanbaatar, it has led to unsustainable urban development. [2] The increase of inward migration to the city since 1990 has been exacerbated by the ease and speed of replication of the ger, resulting in the creation of sprawling districts that lack basic urban infrastructure of water and sewage and contribute to toxic levels of air pollution in the city.

This report documents the process of transformation and spatial characteristics of selected ger districts describing how settlements densify by subdivision without improvements to infrastructure. It highlights the difficulties in implementing ger district development projects and positions the ger districts as a unique case study of an informal settlement because the majority of ger district inhabitants are land owners.

In response to these findings, the report proposes an alternative mechanism for ger district development in the form of an incremental urban strategy. The target is to demonstrate how these districts can be incrementally developed by the residents themselves to include infrastructure, better housing, and community facilities, each with improved environmental performance to improve air quality and reduce reliance on coal. This strategic framework for development includes:

- a design for an affordable housing prototype – the Ger Plug-In – as an adaptation of a traditional ger with embedded infrastructure and improved energy efficiency;
- a design for a waste collection and recycling building to improve solid waste collection within the districts
- a design for a community hub in response to resident and stakeholder feedback establishing the need for a community space to support after-school facilities and events
- scenario plans to increase density for three different ger district typologies: the central; mid and fringe areas
- an action plan for incremental development that conceptualises how Green Climate Funds can be accessed to support low interest rate mortgages to initiate development

In conclusion, it is clear that the only mechanism to improve the overall sustainability of the city is to provide an alternative to sprawl and the outward expansion of the city. However, although it has been reported that 60% of ger residents are willing to move to apartments if appropriate compensation can be delivered, that still leaves 40% of residents wishing to remain (2016, Capital City Housing Survey quoted in “Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project”, Project Data Sheet, ADB, 2018). These plots have to be able to densify without inhabitants giving up land tenure. In order to densify, this land has to become more valuable in order to stimulate development. Development can be made feasible for residents by providing access to low income mortgage products made possible through the Green Climate Fund (GCF), a fund set up by the United Nations Framework Convention on Climate Change (UNFCCC) or an 8% mortgage program sponsored directly by the Mongolian Government.



Households in the ger districts burning coal during winter.



The Ger districts of Ulaanbaatar in Winter.



A khashaa plot where gers are bounded by a fence.



Ger Plug-in



Ger Innovation Hub



Smart Collection Point

The next steps are to develop the incremental urban strategy established in this report into a Development Toolkit. This Toolkit would comprise of several marketable products, each proven to reduce carbon emissions by 20%, and therefore qualify for low interest mortgages offered by local banks and underwritten by the GCF. We propose that the Toolkit would be managed by a new entity - The Ger District Development Corporation comprised of an architect, contractor, financial and legal advisor and community coordinator in order to deliver development that complies with the terms of the loan and GCF criteria. If established successfully, it would allow thousands of households' access to housing with improved infrastructure with lower carbon emissions and less air pollution.

The long term objective is to build capacity for a healthier population offering Mongolia's young, upwardly mobile citizens a more sustainable urban future. This report sets out a strategy and recommended next steps for how this can be achieved.

Research Findings

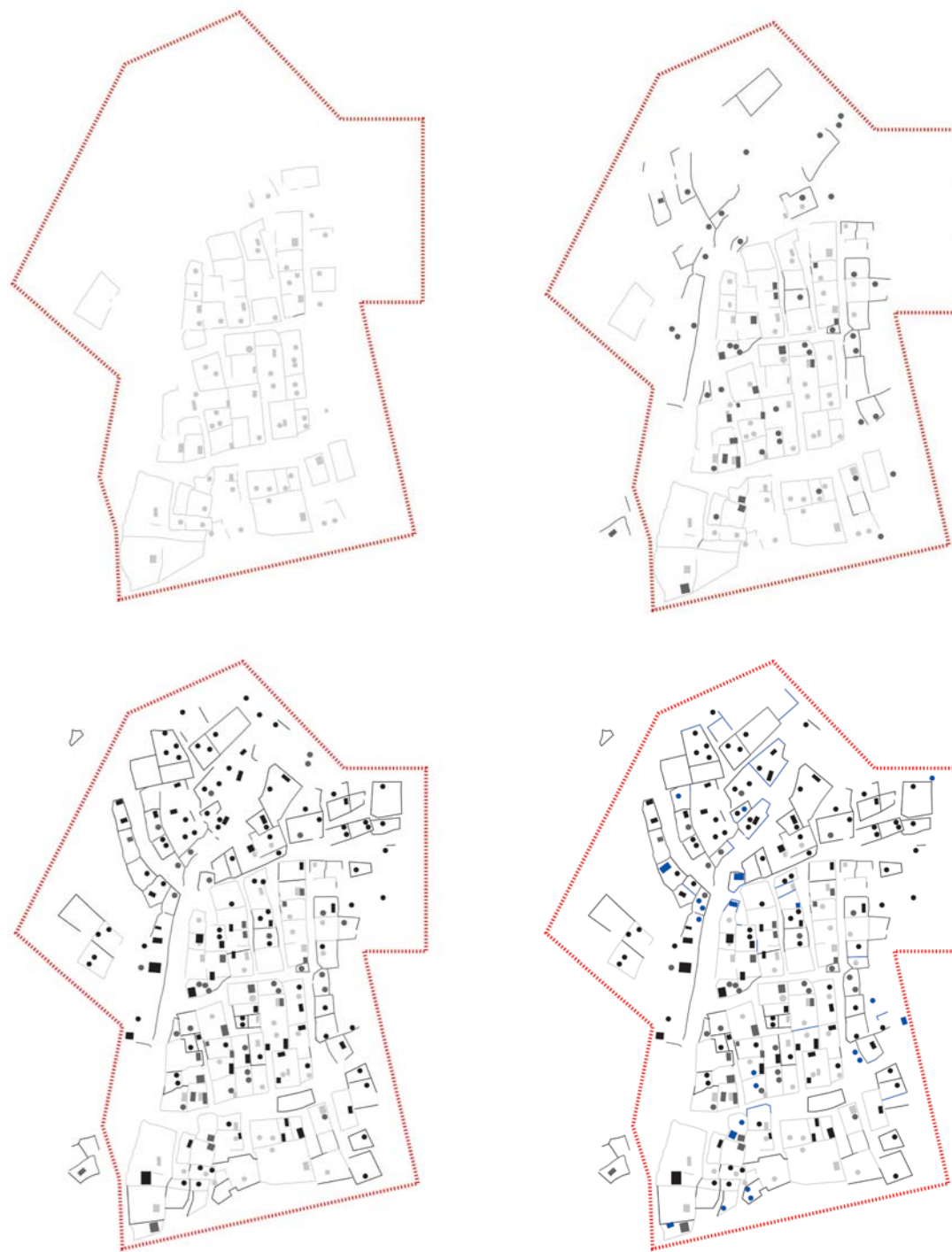
The research comprises three phases: ger district analysis; prototype development and an incremental strategic plan. The findings are summarized as follows:

Phase 1: Ger District Analysis

Background context

The 1990 democratic revolution propelled the country into a free market economy and restructuring that followed a neo-liberal model advocated by international financial organisations such as the International Monetary Fund and the World Bank. Herders, having operated under a state supported collective model, were now forced to operate under private ownership. Devastating winters or dzuds, killed many livestock, forcing many nomads to move to the city. The 2002 land law that allowed every Mongolian citizen the right to claim 0.07 hectares of land in urban areas, together with a lack of employment and educational opportunities in provincial cities, intensified the situation, leading to a massive influx of rural nomads to Ulaanbaatar. [1_Section 1A] As a result, the population of the city has increased from 629,000 in 1997 to about 1.2 million in 2012 with over 768,000 people living in about 200,000 households in the Ger districts. This is over 60% of Ulaanbaatar's population of 333,379 households and 1,267,024 inhabitants. Over 750,000 people in the ger districts depend on basic pit latrines and buy water at kiosks and transport it to their homes. Nearly 85 percent of ger dwellers use wood or coal-burning stoves for heating, spending between 25-40% of their income on fuel. [3] This produces some of the highest levels of air pollution worldwide, with ger districts experiencing winter PM2.5 concentrations more than 100 times the World Health Organization (WHO) 24-hour guideline (National Center for Public Health, and UNICEF 2018).

In order to document the unique characteristics of the ger districts we undertook fieldwork and community consultation in two districts: Chingeltei-16 and Sukhbaatar-16 and created maps documenting formal infrastructure including roads, bus stops and water kiosks, and informal infrastructure such as private water wells, illegal dump sites and roadside coal sellers. [1_Section 1F and 1G] Archival information of the historical transformation of Ulaanbaatar was collected showing how the city's administrative territory has expanded to over 30 times its original size and the urban population has doubled since the 1990 democratic revolution and Soviet withdrawal (Solongo, 2007). In terms of infrastructure in both districts, we understand that there is an average for each water kiosk to serve approximately 185 families with some families reporting that they collect 500 litres per week, visiting the kiosk twice a day, every other day. These districts also lack civic infrastructure; about 1000 children do not attend kindergarten in Chingeltei-16 due to insufficient supply and in Sukhbaatar-16 there is only 1 health clinic to serve a population of approximately 11,945. This is also the case in other districts: in Songino Khairkhan-31, there are no schools, only two kindergartens and no community spaces for the 3,000 households or approx. 12,000 inhabitants of the district. [1_Section 1F]



Transformation map of a sample fringe area in Chingeltei-16 (2009-2017)

By comparing google earth imagery from 2009-2017 with our own drone footage, we created maps for our two selected districts showing the process of densification through sub-division and the transformation of urban morphology over time. [1_Section 1C] Although it has been argued that the categorisation of the Central, Mid and Fringe districts, which equate to different densities and housing types, are directly related to distance from the city centre, (The World Bank, 2010), we have found that these typologies exist within single khoroos. For example: Chingeltei-16 contains all three forms of urban fabric. Some plots are densifying and subdividing to an average of 480m², residual sites are infilled, houses predominate, and the urban fabric is organised into back to back plots with a clearly defined street grid. [1_Section 1C] Chingeltei-16 is also expanding, with more haphazard fence lines forming plots of irregular shape, and an unresolved street pattern containing dead ends and awkward constrictions. Chingeltei-16 is therefore evolving constantly, with different patches transforming at different speeds. The Mid typology changes to the denser Central typology and the Fringe becomes more 'mid' in character, whilst new settlers encroach further into more mountainous and steep terrain seeding the beginnings of a new Fringe. [1_Section 1C]

Based on household surveys and drawing people's plots, we note that some residents have modified their ger adding simple wooden thresholds to prevent heat loss or building permanent concrete foundations to limit the cold from the ground. [1_Section 1B] Over 65% (Asia Pacific Investment Partners, 2017) of families build a simple house or baishin next to their ger, yet based on our fieldwork, many retain the organization of the ger, tending towards shared spaces rather than separate room divisions. [1_Section 1B] Most still lack internal toilets and showers, are ineffectively thermally insulated and are still reliant on coal, with over 85% of ger district residents using wood or coal-burning stoves for heating (The World Bank, 2010). Density is low, ranging between 2.1 structures/plot (plot size averaging 453m²) in the older districts to 1.6 structures/ plot (plot size averaging 734m²) in the outer, newest districts. [1_Section 1C]

This pattern was compared to examples of informal urban growth in sample sites of Paraisopolis, Brazil and Baishizhou, Shenzhen to position ger districts as a unique example of an informal settlement. These sites were chosen as they exhibit different forms of land tenure: Paraisopolis is an example of an illegal settlement with no security of tenure; Baishizhou, a form of illegal development but with legal land tenure, and the Ger districts an informal settlement but with legal land tenure undertaking legal development. In each case the process of transformation was documented and densities of built fabric and total population compared. [1_Section 1D]

Given the complexity of land tenure and the issues facing the ger districts, implementing masterplans has proven difficult; the 2020 master plan was amended in 2013. Although infrastructure was to be provided through the 2012 Chinggis Bond – a sovereign bond of US\$1.5 billion, the intention was to encourage capital investment through private developers (Economic Research Institute, 2013).

The collapse of the commodities markets amid global economic slowdown meant that developers were put-off from potentially slow projects involving multiple negotiations with stakeholders for low returns. In response, the current Development Directions 2030 emphasizes the need to integrate the ger areas into the city through the creation of four strategic subcentres. The Asia Development Bank (ADB) financed Urban Transport Development Investment Program involves the creation of a Bus Rapid Transport system (BRT) that will create new bus lanes that will transect the city connecting the subcentres to the city centre. The subcentre will be developed through another ADB project, the Ger Areas Development Investment Program (GADIP) that will provide \$USD 320 million to provide infrastructure including heating, water and sewerage; improve roads and public services; and develop capacity for businesses and economic opportunities. In turn, the Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project (AHURP) will create eco-districts at these subcentres containing 10,000 housing units creating a model for a mixed-use community comprising 15% social, 55% affordable and 30% market



Smart Collection Point , Chingeltei-16



Smart Collection Point , Khan-Uul

rate housing together with public amenities and open spaces. The eco-district increases the current household density by 3.6 times and sets environmental criteria for their thermal performance and energy consumption with a minimum apartment size of 35m². In preparation, multiple stakeholder workshops have taken place, conducted by consultants M.A.D. Investment Solutions as part of the ADB team to ascertain the market value of the land based on whether owners have improved their plots, built houses or operate businesses or rent their land. The mechanism for implementation will be through voluntary land swapping and at the two initial sub-projects the team has confirmed agreements in principal from 72.5% of residents at Selbe East and 83.8% of residents at Bayankhoshuu West. (Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, ADB, June 2018). It attempts to adjust the development model to appeal more to ger district residents by allowing residents access to land, providing greenhouses and incorporating business spaces at the ground floor of buildings. Financial tools have been reworked to encourage private developers to participate in the project delivery and attractive mortgage rates will be offered by channeling Green Climate Fund loans through the commercial banks. The strategy is to limit the risk for investors as much as possible, however ultimately, the success of the project is contingent on private developers and contractors to implement the project. These plans are reliant on loans from the Asian Development Bank that will ultimately have to be paid back, stretching the stabilization of Mongolia's economy which is reported to have \$2bn in external sovereign debt, (Koyanagi, Nikkei Asian Review, February 2017). Additionally, the uncertainty of the currency conversion from the GCF loans (in USD) to the local banks (in Tugriks, MNT), means that the promised low interest rates might not be as low as originally anticipated (meeting with XAC Bank, Eco-banking team, October 2018).

If successfully delivered the inter-connected ADB projects will bring much needed improvement to the designated subcentres with the aim to benefit 400,000 residents. The extent of the problems affecting the ger districts means that this still leaves approximately 440,000 ger district residents that live outside of these zones, lacking basic urban services and contributing to toxic levels of air pollution. As these areas are growing by an estimated 35,000-40,000 people each year, the analysis supports that a different form of ger district development must be sought in order to address the increasingly threatening urban risks associated with this form of settlement [4].

Phase 2: Prototype Development

Initially, a range of concept designs were developed that focused on urgent issues such as housing, unemployment and the lack of infrastructure. Each was conceived to allow for adaptation in anticipation of future changes to the context. These initial prototype designs were shared and tested with potential stakeholders and experts including university professors, various NGOs, policy think-tanks, the planning department and the mayor's office. Over a period of 3 years we developed and implemented three prototypes: a waste collection point; an affordable housing unit and a community centre. Each required several stages of development and feedback between the client body, residents, contractors and specialist consultants. Each was constrained by the demands of a limited budget, construction expertise, and the harsh climate and seasonal construction period. Each prototype involved galvanizing funding from different sources to pay for the construction costs.

Waste Collection Point [1_Section 2C]

The first prototype was the design and construction of a waste collection point. The project was commissioned by The Asia Foundation and the Mayor's Office, Ulaanbaatar. For rural nomads, waste, in the form of plastic bottles, glass and cans is an unfamiliar urban phenomenon and without clear systems of collection, garbage accumulates in gulleys, roadside verges and streams. The Asia Foundation produced an interactive community map of ger districts from data gathered through numerous meetings with local residents. The map showed areas of illegal dumpsites alongside official sites for waste collection. From this data, the Foundation identified the worst areas for rubbish build up within certain neighbourhoods that they had forged good relationships with local leaders.



The Ger Plug-in, Bayankhoshuu area

The aim was to create a demonstration project that could facilitate the hygienic collection of solid waste. Entitled, Smart Collection Points, the project engaged neighbourhood participation and outreach; improved the scheduling of trucks; and aimed to influence policy from the Mayor's office to alter how they administered city-wide waste collection. Based on their site research two locations were selected to implement and test the viability of the prototypes: one in the fringe district of Khan-Uhl and the other in the mid-ger area of Chingeltei.

At Chingeltei, the site was located by the side of a recently constructed road on an uneven dirt slope. The scheme took advantage of the height difference of the topography to form a ramp leading from the high ground to the road and bus stop with several places for rubbish drop off along the way. A recycling station was contained under the ramp adjacent to an open public space. At Khan-Uhl, the primary issue on this flat terrain was how to negotiate the ease for the public dropping off their trash with the ease for the collectors. The design created an artificial topography excavating 1.5m below ground for the collection and + 1.5m for the drop off with a retaining wall holding this new mound in place.

Both prototypes tackled the issue of solid waste collection by linking the daily routines of residents to waste and recycling facilities. Both projects address the immediate need to have somewhere to drop off rubbish, however each was designed so that spaces within the structure can adapt into community facilities if and when metropolitan door-to-door waste collection is introduced.

Ger Plug-In [1_Section 2C]

The affordable housing prototype was designed and implemented in 2017. It was funded by an international NGO, the Lorinet Foundation, and involved partnering with a local NGO, GerHub to assist in community engagement and in sourcing the family who would live and test the pilot project. Named, The Ger Plug-In, the project fuses the traditional structure of a ger with typical timber house construction. [5] A new truss suspends the ger from above, allowing the centrally placed columns to be removed and the stove to relocate within the thermal mass of a brick wall. This liberates the ger as a free-space providing the family with more options for how they wish to live. The project improves the environmental performance of the household testing low-tech, off-grid systems providing a septic treatment system and WC; water tank and shower; underfloor heating; an electric boiler and a passive solar trombe wall. Taking the principals of a trombe wall construction, the project tests how a screen wall placed behind a window can be designed that can collect radiant heat yet maintain transparency to the interior. The design was low cost and easy to construct, comprised of black PVC pipes filled with sand to increase the thermal mass, yet spaced to allow for visual and light penetration to the interior.

A couple, Urangua (age 33 in 2017) and Zulaa (age 26 in 2017), was selected to be the owner-occupiers of the Plug-In in exchange for allowing us to build on their land and having access to the building to monitor its performance. We had interviewed them for the Venice Biennale Installation in 2016 and learned they had moved from the countryside in 2001 in search of better job opportunities. Zulaa works at a printing company making wholesale cardboard boxes and Urangua at the Gobi Cashmere factory and their combined income is around 1,200,000 Tugriks or 490 USD per month after tax.

Construction was completed by September 2017 and we fitted the prototype with data loggers (UX100-003) to record the internal temperature in different parts of the structure. We also fitted a standard ger with the same loggers to construct a baseline to compare performance. As well as temperature we recorded water usage, coal consumption and electricity use in both locations. The Plug-In was also documented with a thermal imaging camera to locate any areas of heat loss.



Ger Innovation Hub, Songino Khairkhan-31

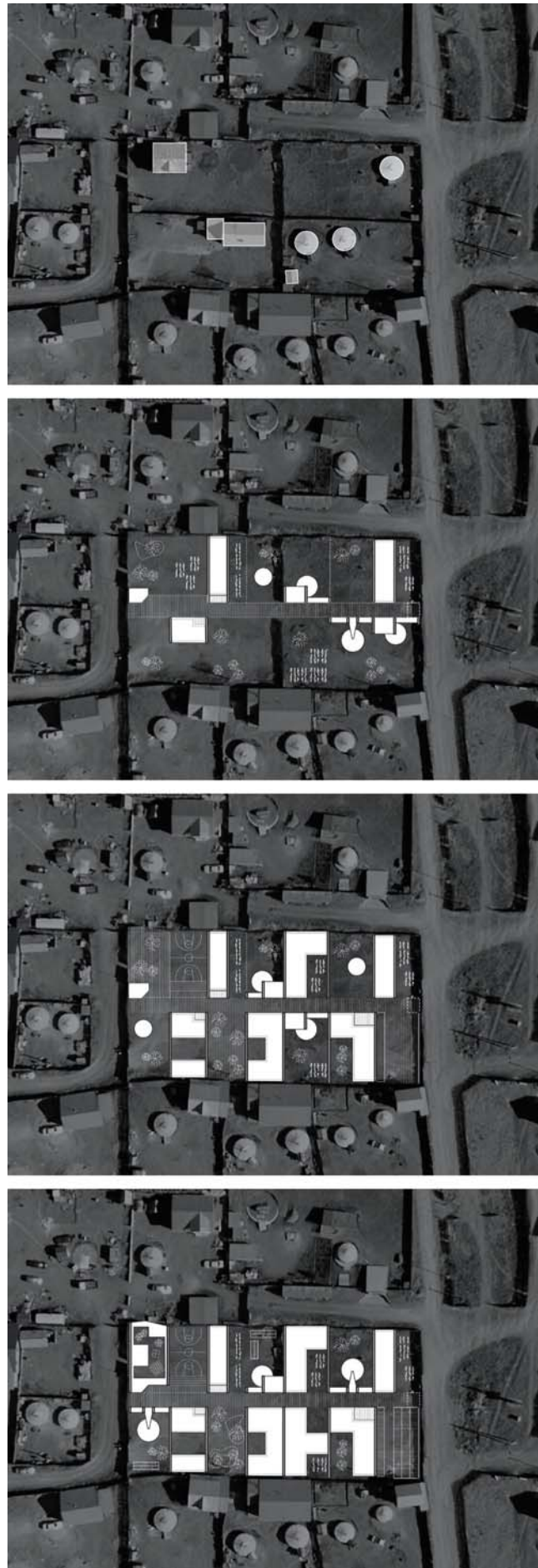
After a one year testing period, we can note that: from October to December 2017, when the external temperature was between -9.9°C and -19.8°C , the Plug-In was 2.48°C warmer than a traditional ger. The average daily temperature fluctuation in the Plug-In was 4.1°C compared to 10.2°C in a traditional ger. The thermal stability of the Plug-In, due to its additional thermal mass, meant that during a period of inoccupation when the temperatures ranged from -12.5°C to -23.4°C , it took five days for all parts of the interior to reach negative temperatures. During the winter, the residents used an estimated 93% less coal than their previous year living in a ger, an estimated 0.266 tonnes compared to an average of 3.8 tonnes, a coal reduction of 3.534 tonnes. If we extrapolate these numbers, if each of the 104,000 ger households (Mongolia Real Estate Report 2017, Asia Pacific Investment Partners) was replaced by a Plug-In this would result in an estimated saving of 27,664 tonnes of coal per year, a profound impact that would improve air quality to the entire city.

As well as coal use, the short term impact has been that the household has access to an internal toilet, has access to sanitation, and does not need to collect water on a daily basis. Instead of having to walk 30 minutes to collect water every day the couple have access to a 1 tonne water tank which is filled by a truck once every 10-14 days. This amounts to saving 2.5hrs per week of their available time, which can now be used to do something more productive. The access to water means that they do not have to go to the communal bathhouse and are able to take showers whenever they like. The couple also shares the shower with other families in the district. The next steps are to consider how this prototype can be scaled up, could be made more affordable and be constructed more easily.

Ger Innovation Hub [1_Section 2C]

The research findings show that ger districts desperately lack civic and social infrastructure. The Ger Innovation Hub is a pilot community centre that will provide a space for all sections of the community, supporting a crèche, youth facilities, vocational training and a place for screenings and performances. Over time, it can include small cooperative enterprises and demonstrate how an entire plot can be used to engage community needs and serve as a model to reduce carbon emissions.

Construction was partially funded by the Hong Kong Jockey Club and will be completed by June 2019. It will be managed and run by local NGO, Ger Hub. It is designed as a layered structure, comprised of an inner room that is wrapped in an outer layer of polycarbonate that creates a buffer space that traps radiant heat in the winter. The energy models indicate that during a winter's day, with an outside temperature of -20°C this buffer zone would be at -1.4°C , therefore the inner zone would only have to be heated to $+15^{\circ}\text{C}$ rather than make up the differential of 33.6°C , significantly lowering energy consumption. After construction is complete we will document how the building is used by the community as well as monitor its thermal performance.



Infrastructural Spine incremental scenario.

PHASE 3: Incremental Strategic Masterplan

The three prototypes are components within the incremental strategic plan. [1_Section 3A] This plan incorporates scenarios that are developed based on the three different types of urban fabric as observed in our initial analysis. Key concepts of the scenarios are:

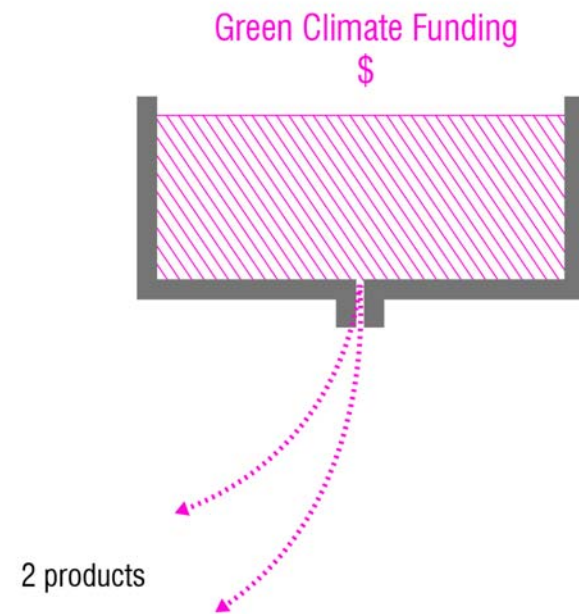
- to find ways to densify and provide affordable housing
- to create off grid infrastructural networks
- to create mechanisms for future growth and incremental upgrades
- to engage residents in forms of shared infrastructure
- to create feedback loops of investment encouraging future stages of development
- to create neighbourhood funds for community investment
- to seek financial mechanisms to provide residents with access to lower income loans based on improved environmental performance.

The first scenario is to develop an *Infrastructural Spine* in areas which have already developed back to back plots and have an established street grid. This spine is made from a series of prefabricated concrete sections with built in piping that connect to a septic tank and water tank with additional capacity for new residents. The initial investment is shared by four families who operate as a management company and seek new tenants to rent land within the plots. The access to infrastructure means that the land is more attractive than other plots. The rental income is used to pay back the loan and maintain the infrastructure. Over time the original owners decide to raise capital to invest in an apartment building. They can do this in two ways. Either through re-mortgaging their land or by selling off a piece of their land to another stakeholder. If another stakeholder joins they will become part of the shareholder group based on the % of land they have bought. For example: if the plots are subdivided into 12 sections and 2 are sold, the original owners become 21% stakeholders while new owners become 8% stakeholders each. In this way the original stakeholders maintain majority ownership. When new houses are built each plugs into the original infrastructural spine. Each property has to meet regulative controls on environmental provision including insulation, and reduction of coal usage. The income generated through rent or from selling apartments will be pooled back to the collective which will siphon off a proportion for maintenance, a proportion to a community improvement fund and a proportion of profit distributed proportionately to each stakeholder. The improvement fund could be used for renewable energy, greenhouses, community centres, kindergartens, playgrounds or whatever the stakeholders decide is necessary. These improvements will further increase the value of land and thereby rental returns, which further can feed into increased profits and the community fund.

The second scenario is to develop *Infrastructural Nodes* in the mid-ger typology and promotes increased density through multiple occupancy. The idea is for each resident of a defined patch of plots to join a collective as stakeholders. On joining, each agrees to provide an easement of 2m, off-set from the boundary of their plot. This land will be used to support infrastructure, a community byway and other activities related to the common good. Stakeholders agree the locations of infrastructural nodes which leads to a pattern of subdivision. Each core is designed to supply a septic tank and water supply for a projected increase of population. These nodes will be constructed from taking bank loans. Original residents become equity stakeholders based on proportion of ownership based on original area calculation of their original plots. Each node has wall extensions that act as the interface for new housing. The node and its increased provision of basic urban services increases the value of the land. At an initial stage they can simply rent spaces for new families in gers who will pay above average rent due to the increased provision of access to infrastructure. This money helps repay the loan. Each stakeholder can take further steps to develop the land through bank loans or re-mortgaging. They can choose whether they build a house for themselves or build a house with an additional rental unit. Properties are constructed with the

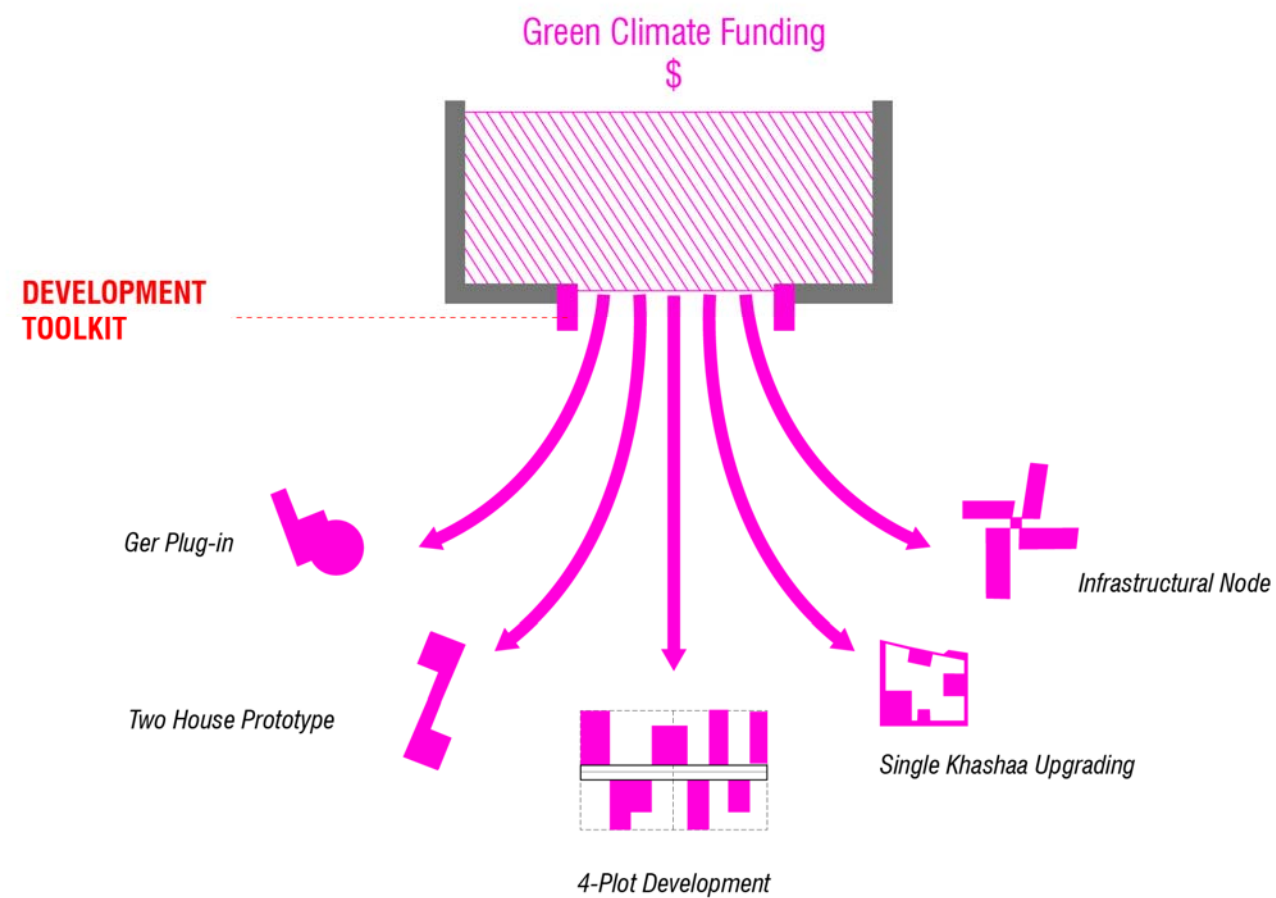
Current Model

Very little mortgage flow



Proposed Model

Unlock the gateway to GCF



Ger District Development Corporation Unlocking GCF Funding

capacity for future extensions. The income generated from properties that are sold or rented go back to original stakeholders. However, a percentage from the profit is fed back into the collective improvements to community infrastructure. This supports increases to rental process, the value of property and the value of the land. In the process of increasing the population capacity of the land, land banks need to be reserved in order to prevent over-density. These land banks can be used for community gardens, waste treatment facilities, playgrounds and kindergartens.

The third scenario is designated for fringe sites with larger plot areas and is based around the *Ger Plug-In* prototype. One family invests in a Ger Plug-In structure. The plug in structure would have its own heating, water tank, shower and WC. A septic tank would be built with additional capacity to serve 5 additional families. The family sets up an additional ger that can plug into the septic system. They rent this out and use the money to pay back their loan. With the additional income the family decides to build a house. When they vacate their original property they rent out the Plug-In to a new family. When each new family signs a tenancy agreement they agree to comply with environmental policy of zero coal use. They also will pay a service charge that will form a collective fund for maintenance and future community improvements such as spaces for a small shop, a greenhouse, planting trees, parking, or a small crèche or playground.

The scenarios were presented to numerous potential stakeholders who visited the Ger Plug-In pilot project in September 2017. Alison Nankivell (October, 2017), Vice President, Global Expansion Business Development Bank of Canada, BDC Capital, and part of a group of international investors who donate their time and expertise to mentoring fund managers in developing markets such as Mongolia, suggested that the innovative aspect of the project is to create a network effect within the non-profit sector. In meeting with Bold Magvan, the CEO of XacBank, (7th September 2017) he stated how his bank could help provide low interest mortgages to ger district residents via the Global Climate Change Fund (Green Climate Fund, 2017). This feedback led us to further develop the scenario into an implementation plan.

Implementation Plan and Next Steps

The Green Climate Fund approved programmes proposed by different local financial institutions in the form of bank loans in October 2018, (meeting with The Mongolian Sustainable Finance Association on 22nd Oct 2018). This allows local banks to create mortgage products to access these better loan rates, 10-12% compared to 18%, (meeting with Xac Bank 23rd Oct 2018), based on delivering housing that meets the criteria of a 20% reduction in CO2 emissions. The onus is on construction companies to create housing products that demonstrate that these criteria can be achieved. The mortgage is with individual residents who will agree on a product, then the money will go to the contractor to build the house. However, there are currently only two products available on the market eligible for these low interest loans. The proposal is to unlock this funding by creating a Development Toolkit – a series of different products serving a range of incomes and housing types that meet the criteria—thereby enabling residents to incrementally develop their own plots. [1_Section 3B]

The Ger-Plug-In demonstrates how the ger can be adapted and transformed into a viable low energy and low cost housing typology. Using the mechanism of the Green Climate Funds, the aim is to get the Plug-In accepted as a viable product eligible for low interest rate mortgages, in order to allow thousands of households’ access to improved infrastructure with lower carbon emissions.

However, as the scenarios demonstrated, the intention is not to rubber-stamp this product as a singular solution but to provide mechanisms to diversify housing typologies and increase density on each plot. The only mechanism to improve the overall sustainability of the city is to provide an alternative to sprawl and the outward expansion of

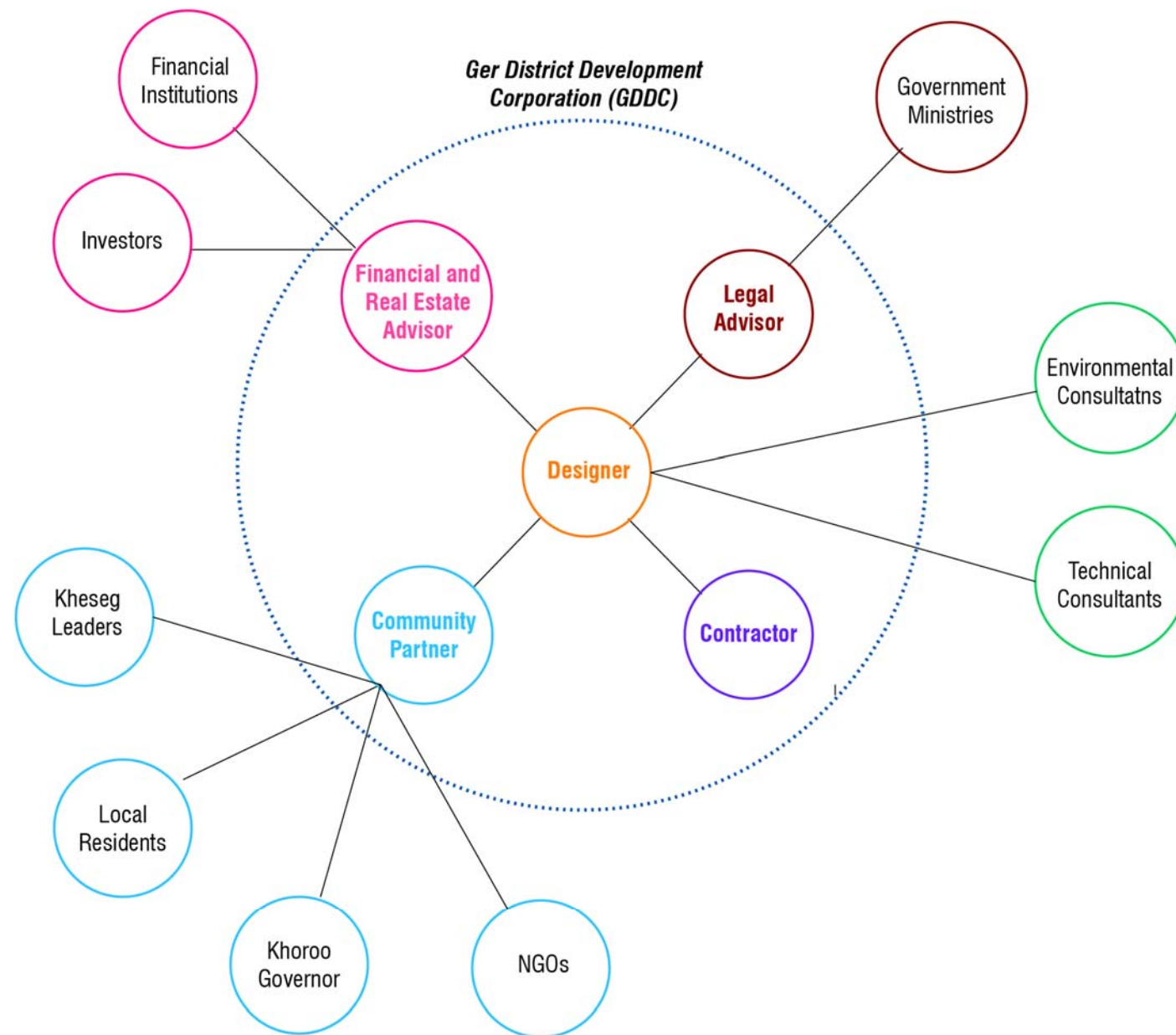
the city. If the land-law remains, and people are reluctant to give up their land, the city has to be able to densify. However, to densify, the land has to become more valuable in order to stimulate development. Land value can be increased by providing shared access to infrastructure, incentivizing residents to leverage development for themselves. In this way, by opening up access to low interest loans, we can incrementally transform the ger districts into a viable low carbon community while still maintain land ownership with the residents themselves.

The updated scenario for a one plot densification scheme is as follows. The land owner selects a product from the Development Toolkit linked to a mortgage with the local bank to build an energy efficient house and a septic tank and water tank with added capacity for two more households. The access to infrastructure on his plot means he can attract new residents to lease the land. These residents take a loan to pay for the rights of land use and to build a house, again selected from the Toolkit meeting the 20% reduction criteria. Income generated from the rent is used to pay back the initial loan, however a percentage is retained to contribute to a neighbourhood improvement fund. This fund is managed by the residents and used to invest in communal benefits such as landscaping, greenhouses, car parking or any necessary repairs to collective infrastructure. Additional income created through rentals can allow existing residents to further invest or co-invest in more housing or in profit-making ventures such as shops, car parking or workspaces. Critically, unlike other development models, land ownership resides with the residents themselves. In a city whereby 97.8% land is owner occupied by a population with an average monthly income of around \$80USD (The World Bank, 2017), the mechanism initializes a process to increase the value of their land.

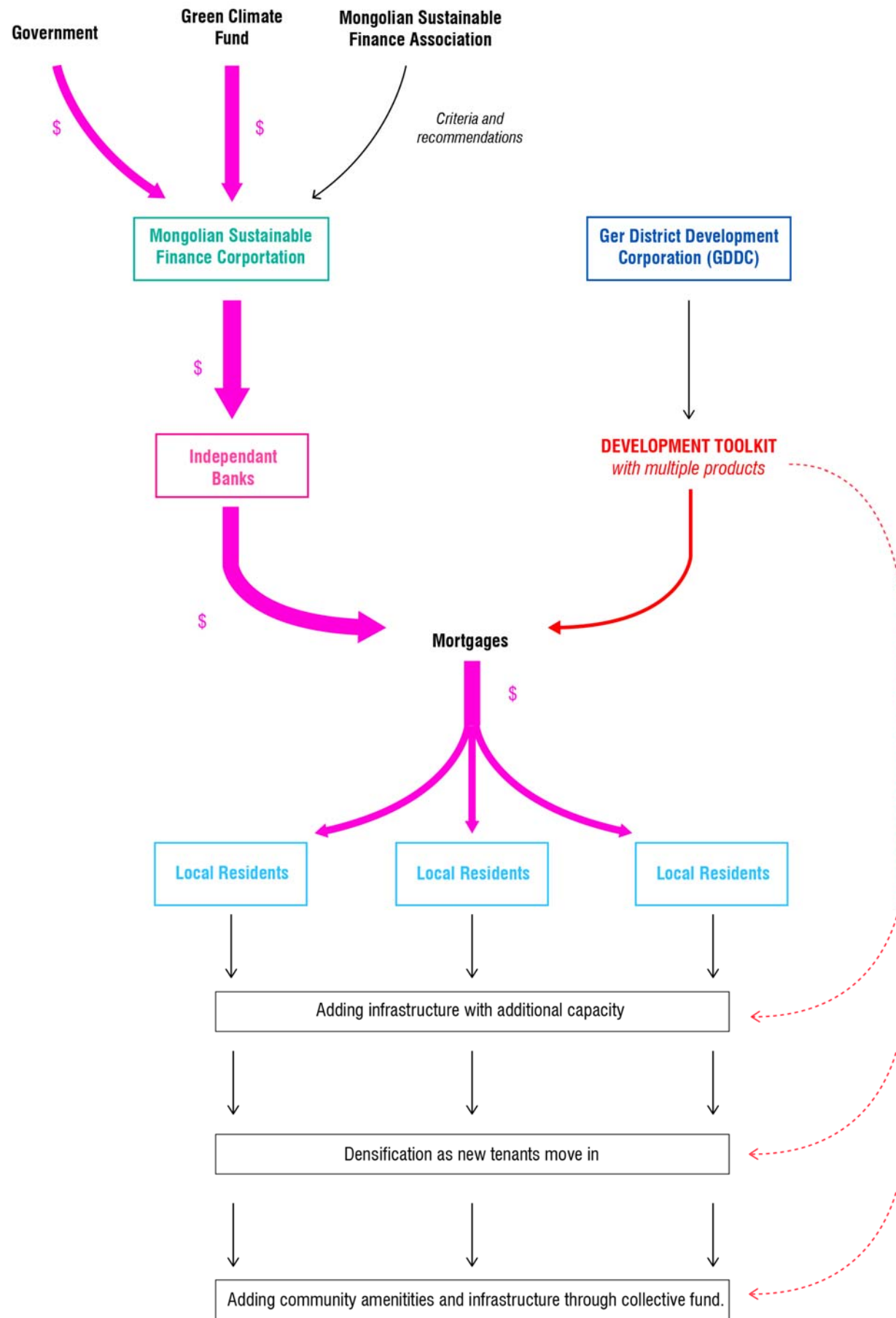
In order to implement this plan, the first step is to set up a Ger District Development Corporation comprised of an architect (Rural Urban Framework at the University of Hong Kong), a community advisor, a financial real estate expert, a lawyer and a contractor. It will act as a delivery agent, making sure the buildings that are constructed comply with improved environmental performance.

The second step is to obtain environmental verification on the Ger Plug-in by ARUP to qualify it as a viable product that meets the 20% emissions reduction criteria of the GCF. Once audited, we will partner with local financial institutions to have the Ger Plug-in accepted as a product, and released to market. Income to the Ger District Development Corporation will feed into the development and construction of new products from the Development Toolkit. The third step is to develop a new product to add to the Toolkit. Starting with fieldwork within the local communities, the scope and specifications of the next prototype will be determined. The design will undergo detailed technical evaluation with environmental engineers to improve its thermal efficiency and reduce carbon emissions. The design will also be verified with local contractors to ensure that the all materials and components specified are readily available and that methods of construction are within the capabilities of local workers. The design will then be built, environmentally verified, and presented to the financial institutions and linked to a mortgage product. The method of implementation will cycle through to the next product, and then the next.

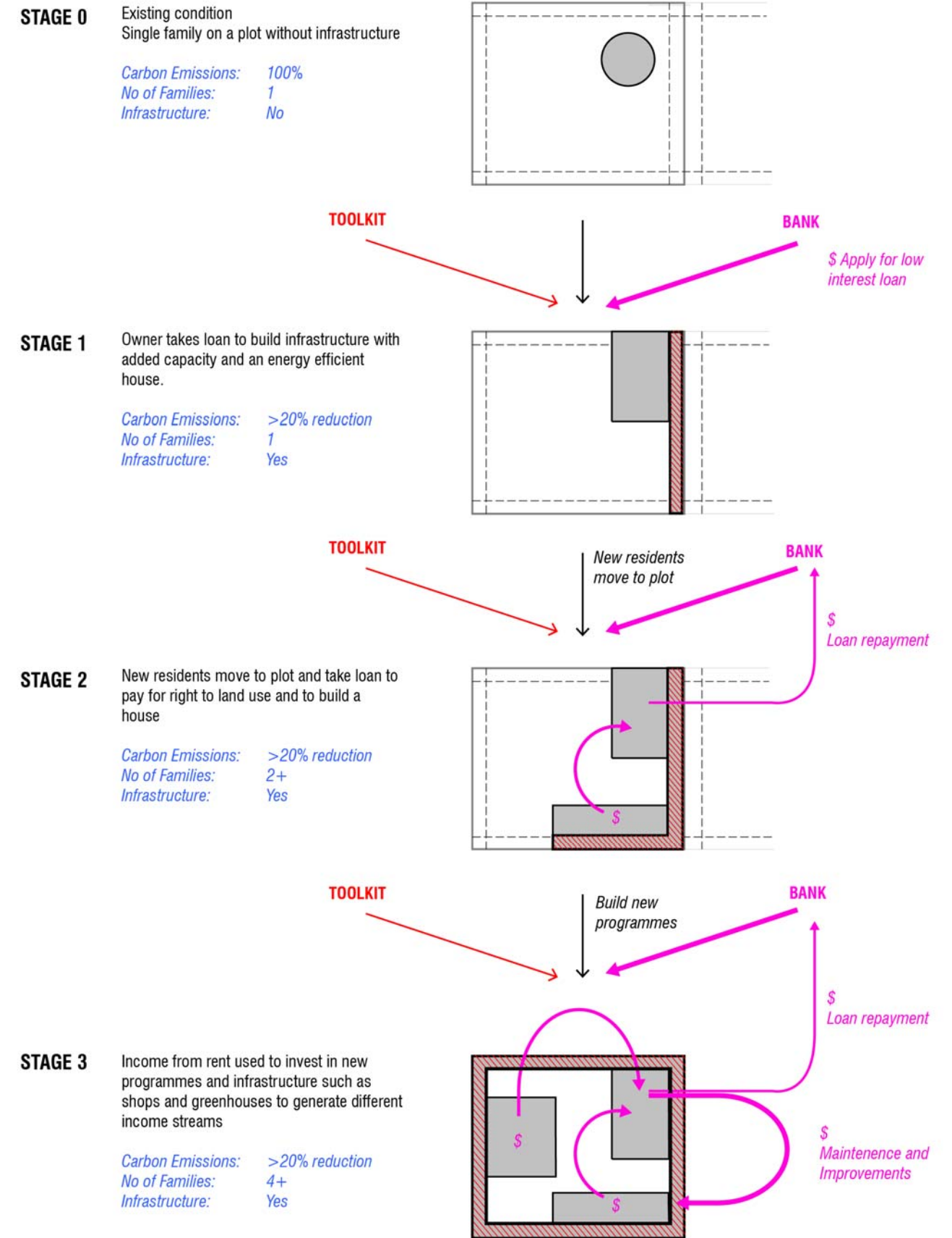
Each of the tested products will feature in the Development Toolkit. This will act as a guide for ger district upgrading by the residents themselves made affordable by unlocking multiple ways to access the Green Climate Funds. This would radically shift the policy for ger district redevelopment both within the government and by funding agencies such as the Asian Development Bank. The Development Toolkit presents a paradigm shift in the planning approach to a holistic and agile bottom-up solution that targets densification, improving infrastructure access, and releasing the value of residents' land to support community improvements and create new economic drivers for the districts. If taken up as a model for upgrading it has the potential to impact thousands of people in the ger districts. As the ger district phenomenon is not just specific to Ulaanbaatar, but exists in every urban area of Mongolia, it could have widespread ramifications for the entire country.



Ger District Development Corporation Stakeholders



Ger District Development Corporation Mechanism



Ger District Development Corporation 1-Plot Upgrading Strategy

References to the research

- [1] “Incremental Urbanism: Ulaanbaatar’s Ger Settlements: Final Report”, GRF funded research by the RGC, HKSAR, completion date January 2019.
- [2] “Settling the Nomads”, Joshua Bolchover in *Designing the Rural: A Global Countryside in Flux*, Architectural Design Series, guest edited by Joshua Bolchover, John Lin and Christiane Lange, Wiley London, 2016. ISBN 978-1-118-95105-7.
- [3] “City of Nomads” in *Fear and Love: Reactions to a Complex World* curated by Justin Mcguirk at The Design Museum, London, November 24, 2016 – April 27, 2017.
- [4] “Incremental Urbanism: Designing a Resilient Urban Strategy for the Ger Districts of Ulaanbaatar”, *Rethinking Urban Resilience Implementation: Aligning sustainability and resilience*, 11th International Forum on Urbanism, Barcelona. 2018
- [5] “Seeding the City in Ulaanbaatar’s Ger Districts: Urbanisation from the Inside-out”, Monu No. 27 Small Urbanism, Bruil, Netherlands, 2017
- [6] “Settling the Nomads” in *Reporting from the Front* curated by Alejandro Aravena at la Biennale di Venezia, Venice, May 28, 2016 – November 27, 2016
- [7] “Ger District Hub” in *Common Good*, Museum for Applied Arts and Sciences (MAAS), Sydney, March 2-Dec 2, 2018.

Bibliography

- Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, Ulaanbaatar, 2018. <https://www.adb.org/projects/49169-002/main#project-pds>
- Asian Development Bank, Voluntary Land Swapping Plan, Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, Ulaanbaatar, 2018
- Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Urban Services and Ger Areas Development Investment Program, Ulaanbaatar, 2017, <https://www.adb.org/projects/45007-003/main#project-pds>
- National Center for Public Health and UNICEF “Mongolia’s Air Pollution Crisis”. *Mongolia’s Air Pollution Crisis A call to action to protect children’s health*. Feb 2018. National Center for Public Health and UNICEF
- Solongo, Alгаа “Growth of Internal and International Migration in Mongolia” in *Migration, Development and Poverty Reduction*, 8th International Conference of Asia Pacific Migration Network, May 2007
- Kamata, Takuya, et al. “Managing Urban Expansion in Mongolia”. 2010 *Managing Urban Expansion in Mongolia*. World Bank. Washington DC. License: Creative Commons Attribution CC BY 3.0 IGO
- Gerelsaikhan, Gerelmaa. *Mongolia Real Estate Report 2017*, Asia Pacific Investment Partners LLC
- Economics Research Institute, “An Economic Impact Assessment Of The Committed Chinggis Bond Allocation”. Economics and Research Institute. 01 Dec 2013. <http://www.eri.mn/research/finished/345-ewohxidw>
- Koyanagi, Ken. “Battered Mongolia Faces Make-or-Break Moment.” *Nikkei Asian Review*, 2 Feb. 2017, <https://asia.nikkei.com/Economy/Battered-Mongolia-faces-make-or-break-moment>
- Asian Development Bank. “Mongolia: Ulaanbaatar Affordable Housing and Urban Renewal Project”. Asia Development Bank, 2015. <https://www.adb.org/projects/49169-001/main>
- Green Climate Fund. “GCF Begins Funds Transfer to Mongolia’s XacBank.” 11 May 2017, www.greenclimate.fund/-/gcf-begins-funds-transfer-to-mongolia-s-xacbank.
- Singh, Gayatri. 2017. *Urban Poverty In Ulaanbaatar: Understanding the Dimensions and Addressing the Challenges*. World Bank. Washington DC. License: Creative Commons Attribution CC BY 3.0 IGO

Credits

Total number of research trips:

33 (Principal Investigator and Research Assistants)

Total number of students taught:

123 (110 students visited Ulaanbaatar)

Total number of community presentations and workshops:

12

Total number of local residents engaged:

177 (263 incl. student surveys)

Total number of stakeholders engaged:

37

Total number of local organizations collaborated with:

7 (GerHub, The Asia Foundation, Tontoo Grand, ZAG LLC, Ecotown, Shonest LLC, Institute of Engineering and Technology)

Main Collaborators: Badruun Gardi, Enkhjin Batjargal

Filmmaker: Dulguun Bayasgalan

Ger Plug-in feedback meeting visitors

Undrakh Ganzorig, Senior Analyst, Schulze Global Investments

Alison Nankivell, Vice President for Global Scaling, BDC Capital

Sergelen Munkh-Ochir, President, Institute of Engineering and Technology

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Nemuun Gal, Chairman, GerHub,

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Onejin Wu, Environment, Science, and Health Officer, US Embassy

Tim Jenkins, Communications & Partnerships Officer, UNFPA

Judith Bruno, Deputy Country Representative, UNICEF

Bold Magvan, CEO, XacBank

Isabella Bersani, Project Development Officer of Eco Banking Department, XacBank LLC

Thomas Papazov, Director of Business Development, Engie Mongolia

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Tenuun Batzorig, Architect, Azzurra architectural firm

Christopher de Gruben, Co-founder and Managing Partner, M.A.D Urban Mongolia

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Oyungereel Munkhbat, Project and Partnership Manager, Mongolian Sustainable Finance Association

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Bulgan Buugii, Project Coordinator, UDC

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Bayasgalan Danzandorj, Chairman, Golomt Financial Group

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Saruul Bayar, Technical Coordinator, Geres

Orchlon Enkhtsetseg, CEO, Clean Energy Asia LLC

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Satomi Yoshino Senior Officer, JICA Mongolia Program

Ger Plug-in Residents:

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Urangua Shagdar

Participating staff and students from:

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The University of Hong Kong, Hong Kong

HKU School of Professional and Continuing Education, Hong Kong

The University of Columbia, New York, USA

The Berlage, Delft, Netherlands

Interview Participants (Existing Initiatives):

Khan-Uul -13 Governor

Khan-Uul - 13 Organiser

Chingeltei - 16 Governor

Chingeltei - 16 Kheseq Leaders

Mr. Delgerbayar, The Asia Foundation

Enkh-tsetseg Shagdarsuren , National Programme Manager, UN-HABITAT

Batdorj Gongor, Ger Community Mapping Center

Interview Participants (Films):

Oyunbat
Erdenechimeg Ishjamts
Munguntuya Odontungalag
Munkhbold Naran
Bold-Erdene Adiya
Anir-Erdene Mukhbat
Purevsaikhan Mukhbat
Ariunzaya Puntsag-Osor
Akhntur Batzaya
Enkhtur Batzaya
Adiya Bileg-Ulzil
Baasansuren Alexander
Oyungerel Tserenjav
Oyun-Erdene Baasansuren
Tsetsenjargal Baasansuren
Togtokhbayar Dambadarjaa
Lkhagvasuren Bazarsuren

Interview Participants (Personal Geographies - Chingeltei-16):

Otgonchimeg
Uranchimeg
Batsukh
Tungalag
Zultsetseg
Mungunchime
Ariunaa
Surenkhoro
Segelen
Bayarmagnai

Interview Participants (Personal Geographies - Sukhbaatar-16):

Dulamyumlaa
Ichinkhorloo
Enkhbaatar
Chintulga
Oyunbat
Narantsetseg
Bayasgalan
Altangerel
Buyankhishig

GER PLUG-IN

Design: Joshua Bolchover (Rural Urban Framework)
Project Team: Ben Hayes, Jersey Poon, Matthew Hung
Commissioning Donor: Lorinet Foundation
Contractor: ZAG Engineering Group LLC

GER INNOVATION HUB

Design: Joshua Bolchover and John Lin (Rural Urban Framework)
Project Team: Jersey Poon, Chiara Oggioni
Funding: Construction as partially funded by the Hong Kong Jockey Club Charities Trust as part of the Jockey Club HKU Rural Urban Design Project
Partner: GerHub
Collaborators: EcoTown, The University of Hong Kong, HKU SPACE, Shonest Co Ltd.

WASTE COLLECTION POINTS

Design: Joshua Bolchover (Rural Urban Framework)
Project Team: Matthew Hung, Yan Qian, Shivina Harjani, Johnny Cullinan
Client: The Asia Foundation, Mongolia and The Mayor's Office, Ulaanbaatar, Mongolia
Design Institute: Toonto Grand

Image Credits: Rural Urban Framework (RUF)

Rural Urban Framework is a not-for-profit design agency based at the Faculty of Architecture, The University of Hong Kong.

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January 2019



PHASE 1 - GER DISTRICT ANALYSIS

The objective of Phase 1 is to establish a knowledge base of the ger districts in terms of their process of urban transformation, their spatial characteristics, their access to infrastructure, the issues and problems that residents face every day, and the context of ger district redevelopment projects. The urban form of the city of Ulaanbaatar was drawn to show how the ger districts have grown, extending the city, over time. The process of transformation in two selected districts, Sukhbaatar-16 and Chingeltei-16, was analysed and mapped, and measured survey drawings of individual family plots or khashaas were drawn. Interviews were conducted with local residents to create an understanding of their daily lives and everyday routines. The findings have established that the ger districts are a unique spatial typology with respect to other “informal” settlements and the process of their transformation is very different to a favela in Brazil, or an urban village in China owing to the fact that the majority of residents hold legal land tenure.

The sample sites at Sukhbaatar-16 and Chingeltei-16 exhibit urban patterns undergoing different stages of growth. Over time, each district is growing in population through sub-division and, simultaneously, though extending into unpopulated land at the fringe areas. In each district, maps were produced of the formal infrastructure (bus stops, water kiosks, public services), and the informal infrastructure (private water sources, roadside coal and wood sellers, waste dump sites). At Chingeltei-16, an indicative environmental analysis showed that khashaa plots tend to be situated where there is the most sun and where land is the least steep.

In order to establish the range of stakeholders and initiatives involved in ger district redevelopment, multiple interviews were conducted, including: NGOs (the Asia Foundation, Ger Hub, Lorinet Foundation, Ger Community Mapping, EcoTown, Green Lake, and UN-Habitat); real estate and planning consultants (M.A.D Mongolia, Mongolian Green Urban Development and Research Institute); environmental private investors and local banks (Gund Investment, Xac Bank, Golomt Bank), and development agencies (Asian Development Bank and Group for the Environment Renewable Energy and Solidarity). Through this process, current top down development strategies involving the Mongolian National Government, the Municipality of Ulaanbaatar and the Asian Development Bank, were located and mapped alongside small scale initiatives by local district funds or NGOs. A summary of the context of ger district development was also undertaken to understand the difficulties in the implementation process and the current status of redevelopment plans.

Phase 1 sets out the current predicament of ger district development, the core issues that need to be addressed and the potential opportunities for innovation.

1A | SPATIAL TRANSFORMATION

Ulaanbaatar

AIMS

To document the historical transformation of the growth of the ger districts in Ulaanbaatar, Mongolia.

METHODOLOGY

Source historic development information and archival maps of Ulaanbaatar from Ulaanbaatar City Municipality, and the Atlas of Urban Expansion.

Draw the location of the ger districts over the current (2018) aerial map of the city to reveal their growth and extent over time.

Collect historical and current demographic data from the National Statistics Office of Mongolia.

RESULTS

The population of Ulaanbaatar has increased by 230% in the last 20 years. From 629,000 in 1997 to 1.4 million in 2016.

Over 60% of the population city live in the ger districts. This is over 850,000 inhabitants. (Asian Development Bank, 2018)

The extent of the administrative area of the city is now 30 times larger than the extent of the built up areas in 1990. (World Bank, 2010)

In 2018, the northern limit of the ger districts reached 20km from the city centre. This is 10km further than extent of the northern limit in 1998.

The population of Ulaanbaatar has been growing by an estimated 38,000 each year. (2015 Population and Housing By-Census of Mongolia)

Historical Transformation - Ulaanbaatar

Aims:

- Locate and obtain copies of historical maps of UB to show the evolution of the city
- Catalogue of key events that have influenced the development of the city
- Summarize in a chronology the development of the city

Methodology:

The researcher reviewed books, reports, and official websites to collate information to understand the historical transformation of Ulaanbaatar. Reliability and accuracy of information was cross checked between sources.

The main source of information was taken from “Ulaanbaatar-Urban Development, Construction, and Historical path” published by the Ulaanbaatar city municipality in 2006. Photos were collated from various official, non-official websites, and the Museum of Ulaanbaatar City’s mobile exhibition.

Ulaanbaatar’s Development History: Key events

- 1938: Ulaanbaatar’s improvement plan developed by B.Motoo and A.N.Vasiliev discussed and approved by the Ministers’ Council, and the first steps taken towards developing urban plans for the city.
- 1939: 114 streets and public spaces were newly named and addresses were officially registered.
- 1940: Following the prior meetings and work based from 1938-1940, the “Ulaanbaatar 10 year improvement plan 1940-1949: was developed and approved.
- 1946-1950: Sukhbaatar square area was developed according to the first improvement plan of 1940.1945: Mayor G.Bagaa stated the need for a master plan to be developed for Ulaanbaatar.
- 1952: The first master plan was developed at the GIPROGOR institute in Moscow with the involvement of Mongolia’s first architect B.Chimid.
- 1954: The first master plan was ratified by the Ministers’ Council.
The 2nd (1962), 3rd (1972), and 4th (1987) master plans were developed and ratified accordingly considering the economic and social circumstances of the
- 1990: Democratic revolution
- 1990-2002: Major political, economic, and social change
1992: The new Constitution of Mongolia was ratified, which granted citizens the right to freely move and live wherever they choose.
- 2002: The current Land Law along with Law on Allocation of Land to Citizens of Mongolia for Ownership was passed
These laws and their subsequent amendments represented an important step toward in land ownership and land use, especially regarding land tenure (i.e establishment of types of land tenure)
These laws and their related policies have been the main source for urban expansion and inefficient land consumption.
- 2002: The fifth master plan for the city was ratified by the parliament of Mongolia (Ulaanbaatar Master Plan 2020)
Due to economic and institutional challenges of the times, the plan was not followed. Instead, ad hoc “planning” that prioritized short-term private gain over long-term value creation in public goods.
- 2013: The 6th master plan for the city (Ulaanbaatar Master Plan 2020, Development approaches for 2030) was ratified by the parliament of Mongolia.
- 2017: A decree to restrict migrants from the rural areas to the city was passed by Mayor of Ulaanbaatar S.Batbold until 01/01/2018 due to concerns over air pollution.



Image 1: Ikh Khuree, 1911 (*Ulaanbaatar City Municipality. Ulaanbaatar- Urban Development, Construction, and Historical Path. Ulaanbaatar: Admon, 2006*)



Image 2: Ulaanbaatar, 1911 (*Ulaanbaatar from Gandan Hill. 1927. Museum of Ulaanbaatar City, Ulaanbaatar*)



Image 3: Ulaanbaatar from Gandan Hill, 1927 (*Ulaanbaatar. 1911. Museum of Ulaanbaatar City, Ulaanbaatar*)

Summary of Ulaanbaatar's history

Ulaanbaatar changed its name and locations various times throughout history. The city started as a nomadic, monastic settlement, functioning as the country's religious center. It moved 28 times before permanently settling in 1778 at its current location, the Selbe and Tuul river junction. Today, Ulaanbaatar is the political, religious, cultural, and social capital of Mongolia with over 1.3 million residents.

Urguu /1639-1691/

Urguu, a nomadic Buddhist monastic centre, was founded in 1639 as a response to the occupation of Inner Mongolians' under Manchus, who founded the Qing dynasty in China. The Mongol nobles of the time convened in what is now Burd, Uvurkhangai province to discuss the need for a national center to unite Mongol interests, where they decided to ordain Zanabazar as the religious leader of Mongolia. Urguu was founded with the intention to foster unity among the Khalkh Mongols under a consolidated ideology and flag.

1691: Khalkh Mongols submitted to Qing rule.

Ikh Khuree /1661-1778/

As a nomadic monastery-town, Urguu moved 28 times before settling down in 1778 in what is now Ulaanbaatar area. As the only major settlement, Urguu was the only stop in Outer Mongolia where merchants stopped along the Tea Road (from Beijing to Khyagta). During this time, Urguu expanded into Ikh Khuree (Great Khuree) and became the religious and trade center of Mongolia.

Traders and merchants influenced the development of Ikh Khuree greatly, settling permanently along with Ikh Khuree. While Ikh Khuree permanently settled, it still maintained the traditions of Urguu. The settlement neither had a city administrative body nor a governor that overlooked municipal affairs.

Ikh Khuree under Manchu rule /1778-1911/

During the Manchu rule, the Manchu king appointed a governor for Ikh Khuree to oversee internal affairs and implement the Qing policies. Ikh Khuree became the principal political and religious center.

Buddhist ceremonies started to become regular along with the construction of religious temples and buildings. From 1836-1838, the Gandantegchilen monastery was constructed on the Dalkh Denj, where a large number of monks started to settle in the area. Later, the area became to be referred as the Gandan area, taking its name from the monastery. On the east side of Ikh Khuree, Maimaa, a trade stop expanded to become the central trade center.

Niislel Khuree under Bogd Khan /1911-1924/

On December 29, 1911, with the fall of the Qing Dynasty in China, Mongolia declared its independence with the coronation of Bogd Khan Jebtsundamba Khutuktu as its religious and political ruler of Mongolia. On February 7, 1912, Ikh Khuree was declared as Niislel Khuree (Capital Khuree) of Mongolia.

This is a historic period in Niislel Khuree where Mongolia's sovereignty was at stake with China claiming the country's territories.

Following the imprisonment of Bogd Khan and capture of the city by Chinese forces in 1919, White Russian warlord Roman von Ungern-Sternberg led an army of mixed Russian/Mongolian soldiers to recapture the city and once again declare the Bogd Khan as the ruler of Mongolia. Ungern also organized the first clean up of the city by captured Chinese soldiers and Mongolians.



Image 4: Small ring road being built, 1951 (*Small ring road being built. 1951. Museum of Ulaanbaatar City, Ulaanbaatar*)



Image 5: View of Parliament building and Sukhbaatar Square, 1951 (*View of parliament building and Sukhbaatar Square. 1951. Museum of Ulaanbaatar City, Ulaanbaatar*)



Image 6: Peace Avenue comes into operation between 40k and 50k apartments, 1960 (*Peace avenue comes into operation between the 40k and 50k apartments. 1960. Museum of Ulaanbaatar City, Ulaanbaatar*)

At the same time, soviet-supported communist Mongolian force led by Damdin Sukhbaatar was forming up in Russia to take over Mongolia. Red Russian and Red Mongolians troops defeated Ungern's soldiers in June and became the second conquering force in six months to enter Niislel Khuree.

Ulaanbaatar under socialism /1924-1990/

In 1924, an interim administration for the city was established. Bayar Moonon was appointed as its governor. The city boundary was created and a proposal to allocate funding for the city was approved.

On November 26, 1924, the city was renamed to Ulaanbaatar, and in the following year, the city registered its permanent residents. From this point on, the city started to form administration structures, dividing areas into administrative units called "khoroo". In 1929, the city introduced a public transportation service, and while the city developed a development plan in 1930, due to World War 2, the plan could not be followed. After the war, the construction and developments began from the city's central area. For instance, the parliament building, the opera theatre, the ministry of foreign affairs building, central library, children's theater, Ulaanbaatar hotel, and Sukhbaatar Square along with its statue was built around this time.

Many of the monasteries and temples that were built in the pre-socialist Niislel Khuree were destroyed following anti-religious purges starting from 1937. For instance, some of the destroyed or damaged temples include Bogd Khan's Yellow Palace, Bogd Khan's White Palace, part of Chojin Lama Temple Museum, parts of Bogd Khan's Palace Museum, Dashchoinkhorlin temple, and Buyan Eruult temple.

The first four-story building, School #1, was built in 1940.

Urban planning began in the 1950s, and most of the buildings in the city today were built between 1960-1985. During this period, many ger areas were replaced by soviet style apartment blocks, commercial and cultural areas, schools, kindergartens, and universities. Furthermore, Ulaanbaatar became the biggest industrial center as more factories were constructed.

The foundation for contemporary Mongolia's political, economical, cultural, and educational institutions and administration structures were formed during this period.

Post-socialist, democratic Ulaanbaatar /1990-2002/

Mongolia decided to transition from a centrally planned, socialist system into a market led, democratic system in 1990. From 1990-2002, the government was preoccupied with reforming its social and political institutions, and dealing with government budget deficits. Not many new buildings or infrastructural developments were constructed during this time. With the decline of Soviet influence, Mongolia worked to establish and strengthen foreign relations with other democracies around the world. Following recommendations provided by multilateral development banks and international financial organizations, such as the International Monetary Fund (IMF), World Bank, and Asian Development Bank, the government of Mongolia implemented economic policies that can be described as a classic example of a 'neoliberal' policy package. This included price and trade liberalization, financial liberalization, privatization, and small government.

The city expanded rapidly with the ratification of the land law that provided every citizen of Mongolia to own 0.07 hectares of land for free in urban areas coupled with natural disasters known as "dzuds". Lack of rural revitalization policies that failed to provide jobs and higher educational opportunities in the provincial centers also contributed to the mass migration of people from rural areas to Ulaanbaatar and its neighboring cities, Darkhan and Erdenet. In 2002, the 5th masterplan of Ulaanbaatar was ratified.



Image 7: Circus Area, 1980s (Mongoltoli. "Ulaanbaatar" Accessed May 27, 2017. <https://mongoltoli.mn/history/h/698>)



Image 8: Chojin Lama Museum, Central Library, Central Post Office, 1981 (Chojin lama museum, Central library, Central post office. 1981. Museum of Ulaanbaatar City, Ulaanbaatar)



Image 9: View of parliament Building and Children's Park 2004 (Ulaanbaatar City Municipality. Ulaanbaatar- Urban Development, Construction, and Historical Path. Ulaanbaatar: Admon, 2006)

Present day Ulaanbaatar /2006-present/

The city's social and physical infrastructure could not keep pace with the number of in-migrants coming into the city. Lack of centrally connected affordable housing forced many people to live in the unplanned 'ger areas', where residents have to rely on informal sanitation and heating infrastructure along with inconvenient water access.

While the ger areas expanded, the urban core, which is restricted by its infrastructural boundary, has experienced and continues to experience profit-oriented developments. These developments have often appropriated public open space such as kindergartens and schools without public consultation or participation.

Large scale investments in the extractive industries, including the Oyu Tolgoi Investment Agreement of 2009, propelled a double digit economic growth for the country during times when the world economy was experiencing a downturn.

While growth has currently stalled due to various policy missteps and unfavourable world conditions in the commodities market, the materialization that resulted from the growth is most visible in the urban fabric of Ulaanbaatar.

Since 2010, 3,800,000 square meters of land has been developed for living, where majority of real estate investments went into mid-to-high end projects in the Zaisan and Stadium areas.

With the onset of major urban issues such as air pollution and traffic jams, urban planning has taken on a renewed focus with the approval of the 6th masterplan in 2013. However, poor urban governance and political continues to impede inclusive, accountable, and sustainable developments.

SOURCES

Ulaanbaatar City Municipality. *Ulaanbaatar- Urban Development, Construction, and Historical Path*. Ulaanbaatar: Admon, 2006

Department of Land Management. "Historical Timeline". <http://www.gazar.gov.mn/?p=8>

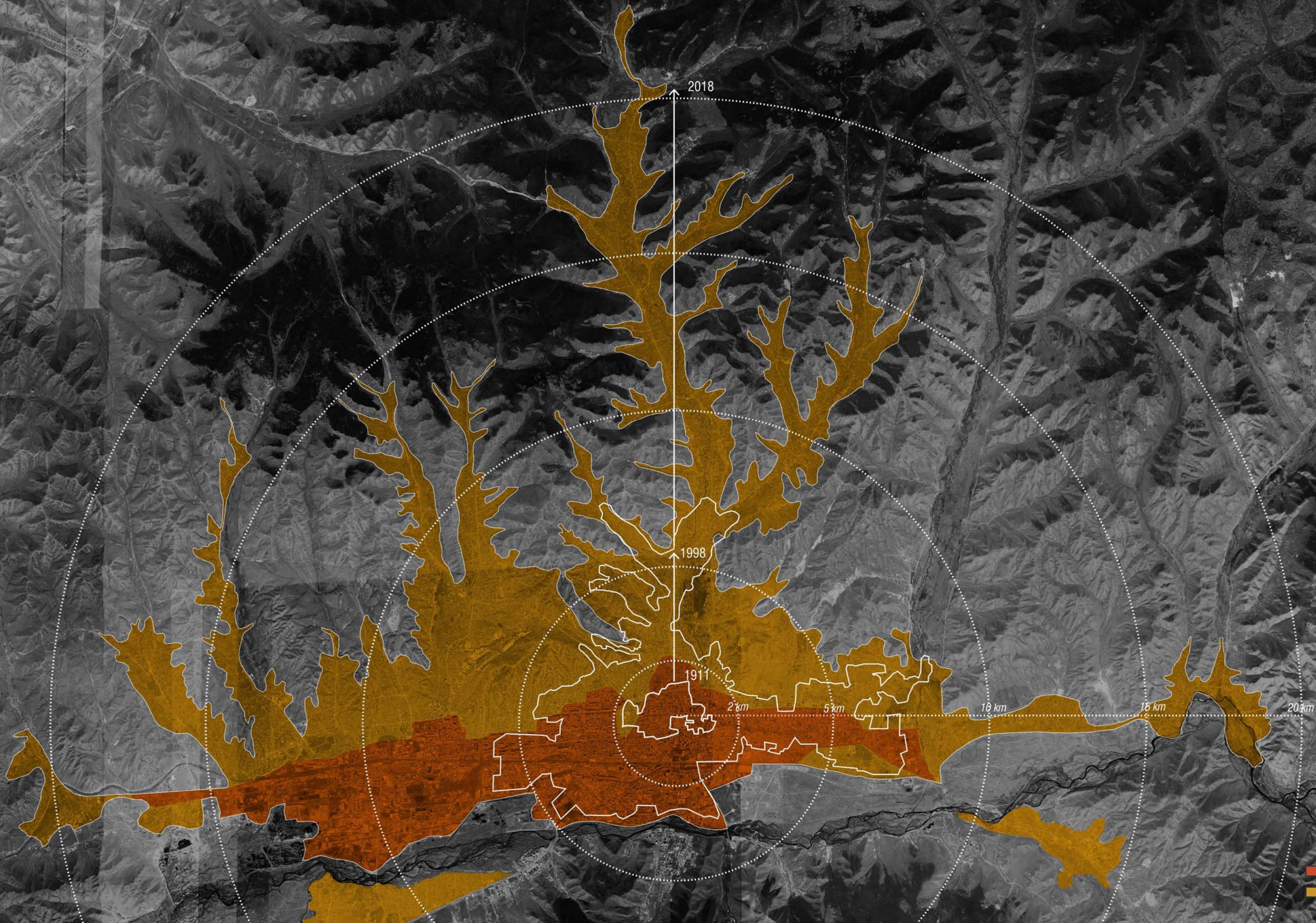
MAD Investment Solutions. "Affordable Housing and Ger Area Redevelopment in Ulaanbaatar". <http://mad-strategy.com/wp-content/uploads/2015/11/Affordable-Housing-and-Ger-Area-Redevelopment-in-Ulaanbaatar.pdf>

Mongolian National Broadcasting. "Ulaanbaatar's brief history". <http://www.mnb.mn/i/10338>

Shagdar, Enkhbayar. "Neo-liberal Shock Therapy Policy During the Mongolian Economic Transition". ERINA Discussion Paper No. 0703e. <http://www.erina.or.jp/en/wp-content/uploads/2014/11/0703e.pdf>

Wikipedia. "History of Ulaanbaatar". https://en.wikipedia.org/wiki/History_of_Ulaanbaatar

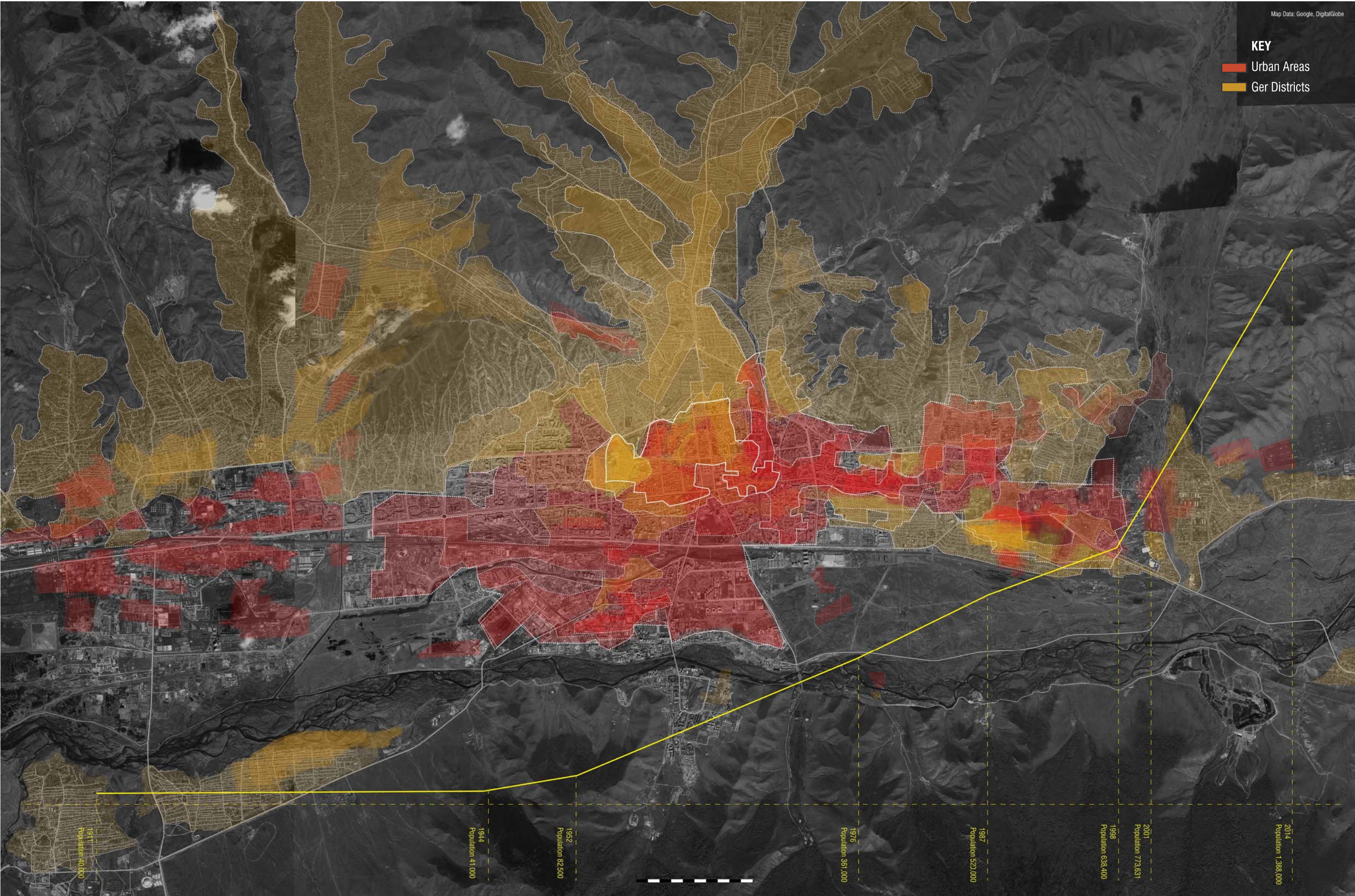
World Bank. "Land Administration and Management of Ulaanbaatar, Mongolia". <http://www.worldbank.org/en/country/mongolia/publication/land-administration-and-management-in-ulaanbaatar-mongolia>



KEY
■ Urban Areas
■ Ger Districts

KEY

- Urban Areas
- Ger Districts



1B | PERSONAL GEOGRAPHIES

Rural Urban Relationships and Visual Accounts of the Ger Districts

AIMS

To understand the daily lives and routine of ger district residents

To establish the relationship that ger district inhabitants' have between their lives in the city and their relatives in the countryside.

To determine the extent to which ger district residents maintain links with their home province.

To create a photographic record of interviewees plots and the public spaces that they frequent in Chingeltei-16 and Sukhbaatar-16.

To understand how residents use their plots and have added structures over time.

METHODOLOGY

Select 20 households in total from Chingeltei-16 and Sukhbaatar-16 to conduct in depth interviews to understand routines of ger district families in relation to the urban core and rural countryside.

Visually document individual khashaa plots of interviewees and public spaces in Chingeltei-16 and Sukhbaatar-16 to examine how the ger districts act as an intermediate space of adaptation and a place of assimilation between the rural and urban.

Map the most frequented places of ger district residents and trade hotspots on an aerial map of the city.

Draw panoramic diagrams to visually document the personal accounts of the ger districts.

Survey and draw khashaa plots in Songino Khairkhan- 31 and Sukhbaatar-16 to understand the transformation of individual plots over time and any plans the residents may have for future development.

Create video interviews with selected members of the community as portraits of ger district life.

Create a video interview that documents the relationship that select ger district residents maintain with the rural.

RESULTS

Ger district residents visit friends and family living in the countryside on an average of two times a year.

60% of the residents are plot owners, 25% tenants, whilst 15% do not have the right to the land that they occupy.

80% find that traffic is the biggest obstacle to visiting the city centre. Inhabitants do not spend much leisure time in the city, only going when it is necessary.

The top three places visited by the interviewees are Narantuul market, Khuchit shonkhor market, and the 3rd and 4th district. These are the biggest and busiest trade and service areas in the city, known for being affordable.

The number of places visited by ger district residents decreases as the weather gets colder.

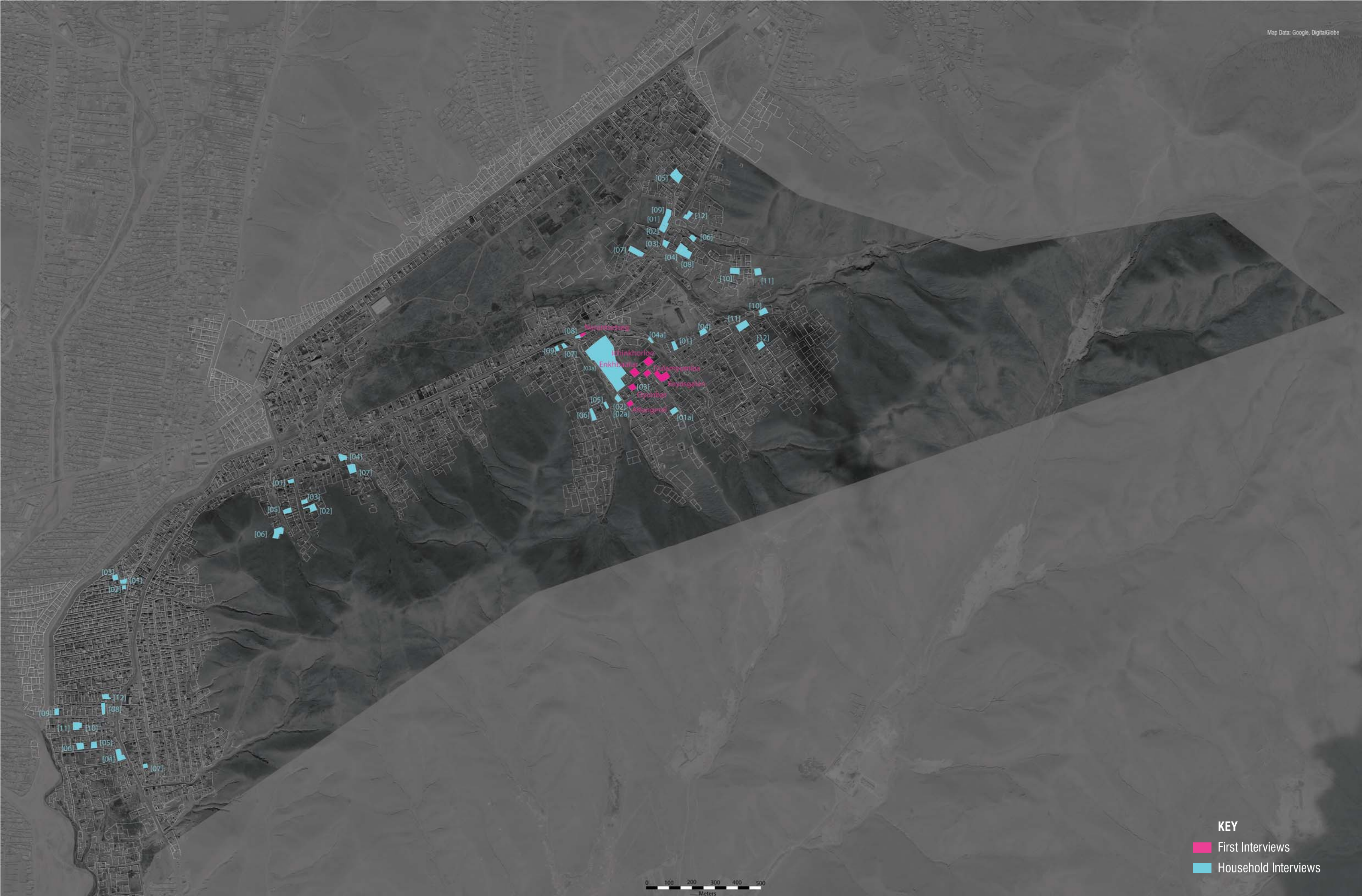
Recreational and cultural services are almost non-existent in the ger districts of Chingeltei-16 and Sukhbaatar-16

There is a high level of exchange between residents in the city and their relatives in the countryside. However, there is little in the form of direct monetary remittances. 65% of the ger district residents send household items, medicine and animal medicine to the countryside. In return, 50% of the ger district residents receive meat and dairy products from the countryside.



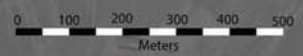
KEY

- First Interviews
- Household Interviews



KEY

- First Interviews
- Household Interviews



Rural Urban Relationships - First Interviews

Methodology:

In depth interviews with Chingeltei 16 and Sukhbaatar 16 residents were conducted using the guidance of questions provided by the Rural Urban Framework. The interviews ranged between 10-30 minutes, depending on how much the respondent felt comfortable discussing about the given subjects. While consideration was given to gender and age, the majority of the respondents are female. Kheseg leaders (unofficial government workers employed by khoroo administration) assisted in selecting the respondents in both khoros. A total of 19 out of 20 people were interviewed. The kheseg leader for one of the khoros took a break and went to visit their family in the countryside, and could not accompany to do the remaining one interview. Interviews were done on both weekends and weekdays.

Respondent demographics		
1	Khoroo	
	1.1 Chingeltei 16	10
	1.2 Sukhbaatar 16	9
2	Gender	
	2.1 Male	7
	2.2 Female	12
3	Age	
	3.1 20-29 years	4
	3.2 30-39 years	5
	3.3 40-49 years	4
	3.4 50-59 years	4
	3.5 60 over	3
4	UB 'natives' vs migrants	
	4.1 UB born	6
	4.2 In-migrants	13

General conclusions

Relationship with urban/rural:

Urban core-Ger district

- The top three places visited by the interviewees are Narantuul market, Khuchit shonkhor market, and 3rd and 4th district. These are the biggest and busiest trade and service areas in the city known for being affordable. Narantuul market area has a few neighboring shopping centers and offers variety of goods including food + clothes, Khuchit shonkhor is a meat market + flour and rice in bulk, and 3rd and 4th microdistrict is another area full of indoor shops and restaurants.
- People go into the city center for various reasons, including shopping, meeting friends and colleagues, work, and hospital visits.
- Many of the interviewees admitted to having no time to going around the city, and visit only when necessary. The number of places visit decrease as the weather gets colder.
- Going to the city on a regular basis depends on various factors including their employment status, job location, access to a personal car, age, and having small children.

Rural-Ger district

- Most of the respondents have kin or friendship ties to the rural areas regardless of whether they consider themselves UB 'native' or migrant. However, their relationships vary. Those who have immediate family living in the countryside maintain closer ties, receiving meat and other financial and non-financial support, while those who have non-immediate ties do not get much support.

- For most of the respondents who have immediate ties, it's also common to send items from the city to their families living in the countryside. Usually, their rural counterparts transfer the money via banks. Those who visit regularly take the goods with them, and those who don't visit regularly will send the goods via private drivers that go back and forth the provinces.
- Most of the respondents host visitors from rural areas for short stay, and if possible/necessary, for longer stay. Longer stay visitors often stay for medical or educational reasons. Since many visiting family members have other family members living in the city, they try to allocate their time in the city between them.
- Most visits to the countryside happen during the summer months when the weather is warmer, and when people take their holiday time.
- Respondents who have closer and immediate ties will visit during spring time, a period where there is a lot of work for herders due to livestock offspring and cashmere combing.
- Majority of the respondents agree that life is better in the countryside if you have livestock, and that their rural counterparts will not move to city unless they have no choice (i.e no livestock). Even in the soum and province centers, cost of living is much lower compared to UB.
- From observation, many families have moved to the city due to accommodation costs for their children when they enter university. It's especially burdensome when you have more than one child going to university.
- Majority agree that life in the countryside has improved substantially, except for education and health services.
- Air quality in the countryside always mentioned as a benefit in the countryside.

Frequency:

- Most of the interviewees go into the city center not more than twice a week.
- Most of the interviewees go to the countryside at least once a year to visit family members and relatives in the summertime.

Issues:

- Majority of the respondents perceive traffic to be the main obstacle for going around the city. However, some point that the number of bus lines, multiple transfers, bus fees, and uncertain bus schedules as barriers for going around the city.
- Many say that addresses in foreign languages is a barrier to going around the city.
- Recreational and cultural services is almost non-existent in the ger areas.
- Air pollution is at a hazardous level in the ger areas.
- While street lights have been improved in both khoros, respondents still feel the ger areas are much darker compared to the urban core. Due to the number of guard dogs, the ger areas also have a large number of stray dogs that pose public health and safety risks.

Further notes:

- While groceries are bought locally, food items such as flour, rice, and meat are likely to be bought from the markets in bulk. However, the most vulnerable families buy goods on a daily basis in small amounts.
- While traffic is an issue for the whole city, the limited directions of buses that go from the selected locations might influence where people visit in the city.
- Southern parts of the city and new developments that are typically known as 'high-end' real estates were not mentioned as places that are visited during the interviews.
- Coal and wood are one of the main costs for the respondents' families during the colder months. Other expenses include food, clothes, and tuition expenses if families have university children.
- Most families share their khashaa plot with other family members. This is a way for families to keep each other company, and support each other. It is not customary to charge family members for rent. Ownership status varies. While some families do not own or have user rights (belongs to other family member), others are living in plots that are not allowed by authorities due to the areas being classified as vulnerable to floods or being under power lines.
- Recreational and cultural services is almost non-existent in the ger areas.

	Gender	Age	Years lived in the city	Location prior to moving to UB	Residency	Occupation/Location	Where in the city do visit mostly?	Reasons for going to the city	How many times per day/week/month?	Obstacles for going to the city	Where in the countryside do you visit on a regular basis? (reasons)	How many times per year?	Family/friends connections in the countryside	Sending and receiving monetary and non-monetary remittances	Hosting family/friends in the city
1	Male	76	76	not relevant	Ch-16	pensioner	School 24	pick up grandchildren from school; pick up medicine	once a week	the quality of roads and traffic; winter months are difficult	Uvurkhangai (holiday)	1	Wife's family members	Don't send anything, but sometimes receive meat and dairy products	Sometimes host wife's family when they visit the city for short stay
2	Female	38	9	Uvurkhangai province	Ch-16	self-employed	Narantuul market, Khuchit Shonkhor market	to get shop supplies and personal chores	2-3 times a week	none	Bayankhongor, Bulgan, and Umnugovi provinces (holiday)	1-2 times	friends	Not sending or receiving	Yes; hosts for short stay and has hosted a student
3	Female	40	40	not relevant	Ch-16	self-employed	Narantuul market, Khuchit Shonkhor market, Chingeltei District Administration	Supplies for her shop in Ch-16 and other private business	once a month	Traffic	Bulgan province (holiday)	1	family relatives and friends; stay in touch through phone	Sends medicine/medical supplies and necessary household items 2-3 times a year; does not receive	Yes; whenever they decide to visit for short stay
4	Male	32	32	not relevant	Ch-16	on welfare	3rd and 4th district, Narantuul market	to meet with friends and acquaintances; shopping	four times a week	Bus fee	Khuvsgul province (holiday)	1	family relatives and friends; stay in touch through phone	Sends necessary household items once a year	No
5	Female	31	31	not relevant	Ch-16	tailor	Narantuul market, Khuchit Shonkhor market	for shopping, meeting with people, personal chores	2 times a week	Traffic, limited bus lines (only two directions), having to transfer	Uvurkhangai and Tuv provinces (holiday)	2-3 times	family relatives	Sends household items when necessary (not regularly); receives none	Yes; hosts 1-2 times per year for short stay and has hosted a student before
6	Male	65	55	Uvs province	Ch-16	mini-bus driver	Narantuul market	for work	3 times a day	Traffic	Bulgan and Khuvsgul provinces (holiday and sometimes work)	1	family relatives and friends; stay in touch through phone	Sends necessary household items 1-2 a year; receives meat and dairy products 1-2 a year	Yes; hosts 3-4 per year; hosts for longer periods as well if necessary
7	Male	40	11	Tuv province	Ch-16	construction contractor	100 Ail; Huuhdiin 100	for work	once a month	Traffic	Tuv province (holiday)	4-5 times	family members; stays in touch through phone	Sends necessary household items (flour, rice, and medical supplies) 1-2 a year; receives meat and dairy products 1-2 a year	Yes, hosts 3-4 per year
8	Male	36	16	Uvs province	Ch-16	Car wash	Chingeltei district hospital, Narantuul market, 3rd and 4th district	for hospital, work, and leisure	everyday of the week	Traffic	Uvs province (holiday)	once every 4 y	family members and relatives	Does not send or receive	Yes
9	Male	32	4	Nalaikh	Ch-16	Automobile repair	MUBIS, 13th district	work	once a week	Traffic, cost of gas, quality of public transportation	Khovd and Khentii provinces (holiday and visit family)	4 times	family members and relatives	Sends household items, animal feed; receives meat and dairy products 4 times a year	Yes; hosts regularly for short stay and has also hosted for longer periods
10	Male	25	16	Uvs province	Ch-16	Car wash	Narantuul market, Shar khad, Sapporo (10th district)	work and leisure	every day of the week	Traffic	Uvs and Umnugovi provinces (holiday and work)	1	family members and relatives	Sends medical supplies and clothes 1-2 times a year; does not receive	Yes; hosts 1-2 a year for short stay
11	Female	31	10	Arkhangai, Selenge, Darkhan provinces	SB-16	Public officer	3rd and 4th district, Sapporo (10th district), Tolgoit, Sansar	for work and leisure	3-4 times a week	no obstacles	Arkhangai, Khuvsgul, and Tuv province (holiday and work if there are good positions available)	2-3 times	family relatives and friends; stay in touch through phone	Sends necessary household items 1-2 per year; receives monetary assistance 4 times a year	Yes; hosts 2-3 per year
12	Female	33	10	Dundgobi province	SB-16	Kheseg leader	NUM-2, Sansar, Sapporo (10th district), 5 shar	for visiting sister in university and for leisure	2-3 times a week	Traffic	Dundgobi and Umnugobi provinces (holiday and visit family)	4	family members and relatives	Sends household items and receives meat and dairy products 4 times a year	Yes; hosts 4 times per year
13	Female	36	11	Khentii province	SB-16	Kheseg leader	Sapporo (10th district), 5 shar, Khar Khorin market	leisure and socializing with friends	1-2 times a week	Traffic	Khentii and Selenge provinces	1	family members; stays in touch	Sends household items 1-2 times a year; receives monetary assistance 4 times a year	Yes; hosts once a month
14	Female	49	11	Arkhangai province	SB-16	Teacher	Dambadarjaa market	work and personal chores	2 times a week	Traffic, uncertainty of bus schedule	Arkhangai province (holiday and visit family)	1	family members and relatives	Does not send or receive	Yes; hosts for short stay and is hosting a student right now
15	Male	26	26	not relevant	SB-16	unemployed	Ulaanbaatar department store, Officer's palace, 1st district	personal chores	2 times a week	none	Tuv province (holiday and visit family)	12	family members and relatives	Does not send anything; receives meat and dairy products once a month	Does not host
16	Female	38	38	not relevant	SB-16		Sukhbaatar district administration, 100 Ail, Jukov area, 3rd and 4th district, Narantuul market, Khuchit Shonkhor Market, Zaisan	work and leisure	5 times a week	Traffic	Dornogovi province (holiday)	1-2 times	family relatives	Does not send but receives meat once a year	Yes; hosts 1-2 times per year for short stay (has hosted college student before)
17	Female	58	24	Sukhbaatar province	SB-16	Tailor	Bayanzurkh district administration, Soldier's hospital, Sukhbaatar district administration, Khan-Uul district administration, Yaarmag area, 3rd and 4th district, Zuragt(Chingeltei district)	work and leisure	3-4 times a week	Traffic	Bulgan, Erdenet, Selenge, Khentii, Sukhbaatar (holiday and work)	4	family members and relatives	Sends household items 2 times a year; receives meat and dairy products 4-5 times a year	Yes; host for short stay and for longer stay
18	Female	51	16	Tuv province	SB-16	Custodian	100 ail; Narantuul market	work and personal chores	1-2 times a month	Traffic	Arkhangai and Tuv provinces (holiday)	2	family members and relatives	Sends household items and money 1-2 times a year; receives meat and dairy products 1-2 a year	Yes; hosts once a month
19	Male	33	18	Darkhan city	SB-16		3rd and 4th district, 100 ail, Sapporo (10th district), Botanical park area	work and personal chores	3-4 times a week	none	Don't visit anymore	-	none	Does not send or receive	No
20	Male	29	18	Uvs province	SB-16	Seasonal construction contractor	MUBIS, Ministry of Agriculture, Sukhbaatar square, 13th district	pick up wife; meetings; work	2-3 times a week	Traffic	Tuv province (holiday)	24 times a year	family members	Sends necessary household items once a year; receives meat once a year	Yes; hosts for short stay

How many years have they lived in the city?		
0-4 years	1	5%
5-9 years	3	15%
10-14 years	4	20%
15-20 years	5	25%
20+ years	7	35%

How many moved from the countryside?		
Other provinces	13	65%
Darkhan city	1	5%
(not relevant)	6	30%

How many rent/own?		
Own	12	60%
Rent	5	25%
No right to land	3	15%

80% (16/20) Find that traffic is the biggest obstacle for going to and around the city

- Quality and cost of public transportation
- Frequency of schedule and routes
- Quality of roads

55% (11/20) Work in the city (one of the main reasons for travelling to the city).

- Followed by leisure – meeting friends/ shopping
- Personal chores/purchasing supplies
- Picking up children/spouse

90% (18/20) Named markets/commercial areas as the most frequented places within the city.

70% (14/20) Lived elsewhere before moving to UB

1. OTGONCHIMEG

Chingeltei-16

Female (age: 30-40)

Employment status: unemployed

Urban core: rarely goes to the center (Sukhbaatar square, Khuchit Shonkhor market, Narantuul market, Tuul river)

Rural tie: no ties

Khashaa ownership status: owns the khashaa plot, lets family relative (Otgonchimeg's family) live in her khashaa for free

2. URANCHIMEG

Chingeltei-16

Female (age: 40-50)

Employment status: seasonal work, currently unemployed

Urban core: 13th microdistrict, Narantuul market area

Rural tie: no ties

Khashaa ownership status: does not own, does not rent

3. BATSUKH

Chingeltei-16

Male (age: 55-65)

Employment status: runs minimarket

Urban core: goes every now and then, hospital, Khuchit shonkhor, Wrestling palace

Rural tie: Weaker tie (Sibling lives in Choir, Govisumber province and family relatives live in Dundgovi province)

Khashaa ownership status: owns khashaa plot

4. ZULTSETSEG

Chingeltei-16

Female (age: 30-40)

Employment status: kheseg leader

Urban core: visits center often, State Department Store, Narantuul Market, Sky Department Store, Chingeltei district office, 3rd and 4th microdistrict, Ulaanbaatar Department Store

Rural tie: Maintains close relationship with family relatives in Bul-gan province

Khashaa ownership status: owns khashaa plot



5. TUNGALAG
Chingeltei-16

Female (age: 55-65)
Employment status: khoroo government
Urban core: Narantuul market, District office, District hospital, Bumber market, Gandan
Rural tie: older siblings in Govi-Altai but does not maintain close ties
Khashaa ownership status: does not own, lives in in law's khashaa plot

6. MUNGUNCHIMEG
Chingeltei-16

Female (age: 30-40)
Employment status: khoroo administration office
Urban core: doesn't go out much, visits chingeltei district office for work
Rural ties: close ties, sister and extended family members in Buutsagaan, Bayankhongor province
Khashaa ownership status: not allowed to be there due to their plot being under a power line, but they settled there anyway. Does not have user rights or ownership rights.

7. ARIUNAA
Chingeltei-16

Female (age: 35-45)
Employment status: runs minimarket at brother's plot
Urban core: does not visit so much, Khuchit shonkhor and Burd markets, the central park in the summer with kids.
Rural tie: weak ties, some distant relatives and friends in Uvurkhan- gai province
Khashaa ownership status: owns khashaa plot

8. SURENKHORLOO
Chingeltei-16

Female (age: 55-65)
Employment status: retired, but runs a physical therapy place near the bus stop
Urban core: lives with kids in the winter (Altai khotkhon complex, Bichil area, 10th microdistrict, Ikh Mongol complex)
Rural tie: weak ties, some family in the countryside, visits nearby sites for sightseeing in the summer months
Khashaa ownership status: son's khashaa



9. SERGELEN

Chingeltei-16

Male (age: 35-45)
Employment status: minibus driver
Urban core: Narantuul market route
Rural tie: Sibling lives in Khovd, does not maintain very close ties
Khashaa ownership status: owns khashaa plot



10. BAYARMAGNAI

Chingeltei-16

Male (age: 35-45)
Employment status: minibus driver
Urban core: Narantuul market route
Rural tie: friends living in the countryside, not close ties
Khashaa ownership status: brother's khashaa plot
Did not want photos to be taken.

TRADE AND SERVICE CLUSTER AT THE BUS STOP

Chingeltei-16



Video rent, stationary store, print shop, pawn shop, toys, cosmetics, hair salon, clothing, dairy products, repair shop



Baker, hair salon



Minimarkets, coal and wood shop, fast food place



Coal Shop



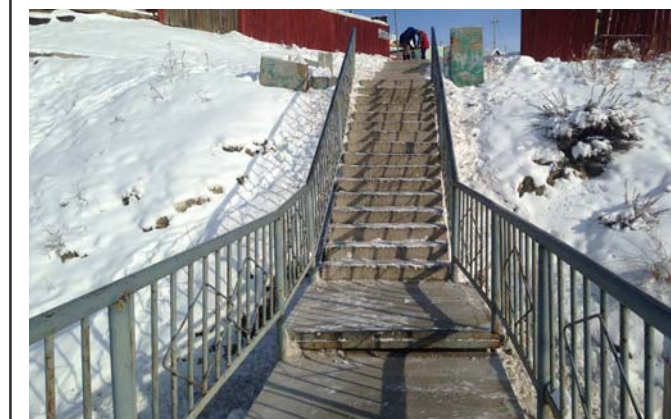
Minibus



Emergency muster point

INFRASTRUCTURE

Chingeltei-16



Pedestrian staircase and bridge



Improved road newar khoroo administration



Parking lot near khoroo administration

1. DULAMYUMLAA

Sukhbaatar-16

Interviewee and Husband, male and female (age: 20-30)
Employment status: salesperson
Urban core: Husband and wife both work in areas in the urban core, commutes daily (Bagshyn Deed, E-mart, Narantuul market, 3rd and 4th microdistrict, "Sunday" market, 19th microdistrict)
Rural tie: Strong ties due to immediate family living in the countryside as herders (Tuv province)
Khashaa ownership status: does not own, pays no rent

2. ICHINKHORLOO

Sukhbaatar-16

Female (age: 50-60)
Employment status: retired
Urban core: goes 3-4 times a month for shopping, leisure, and health care (E-mart, Narantuul market, Orgil supermarket, Bagshyn Deed area, UB Palace)
Khashaa ownership status: owners (parents/in laws of Dulamyumlaa's family)

3. CHINTULGA

Sukhbaatar-16

Male: (age: 20-30)
Employment status: currently unemployed (seasonal construction worker)
Urban core: leisure and work (13th microdistrict, 3rd and 4th microdistrict)
Rural tie: Weak tie (older sister living in Baganuur)
Khashaa ownership status: user rights, haven't gone through the ownership process yet, shares khashaa plot with another family

4. ENKHBAATAR

Sukhbaatar-16

Male (age: 50-60)
Employment status: unemployed
Urban core: Does not go often, goes to School 58 for dropping off and picking up his grandkids, Khuchit shonkhor market, Sukhbaatar square
Rural tie: No ties although moved from the countryside
Khashaa ownership status: son's khashaa, son's ger + Enkhbaatar's detached house



5. OYUNBAT
Sukhbaatar-16

Female (age: 60-70)
Employment status: kheseg leader
Urban core: Does not go often, goes to Sukhbaatar district office occasionally for work, Sukhbaatar square area, Khuchit Shonkhor market once a month
Rural tie: Strong, visits regularly (kids live in Tuv and Khuvsgul provinces)
Khashaa ownership status: owns khashaa plot, singular family

6. NARANTSETSEG
Sukhbaatar-16

Female (age: 50-60)
Employment status: retired, but privately sells coals and wood
Urban core: does not go often, if visits then goes to Sansar, 3rd and 4th microdistrict, Orbit area
Rural tie: Weak tie, but maintains some relationships (sister lives in Sumber soum, Tuv province)
Khashaa ownership status: user rights, singular family

7. ALTANGEREL
Sukhbaatar-16

Male (age: 25-35)
Employment status: works in a leather and wool factory
Urban core: Does not go around much (Sukhbaatar square, Tengis cinema, Narantuul market)
Rural tie: Family relatives, maintains close ties but does not visit often
Khashaa ownership status: owns khashaa plot, relatives live together
(Last image - Dairy products from the countryside)

8. BAYASGALAN
Sukhbaatar-16

Male (age: 55-65)
Employment status: retired
Urban core: Does not go around much (Dambadarjaa area and 7 Station area)
Rural tie: Family relatives, maintains close ties but does not visit often
Khashaa ownership status: owns khashaa plot, 2 sons and their families live together



9. BUYANKHISHIG

Sukhbaatar-16

Female (age: 20-30)

Employment status: unemployed, has small baby

Urban core: goes to the center more when her husband is in town with a car, mostly visits 13th microdistrict, 3rd and 4th microdistrict, 1st microdistrict, uildver kombinat (19th microdistrict)

Rural tie: Strong ties, In laws live in Altanbulag soum, Tuv province

Khashaa ownership status: does not own, in the process of buying it from the owner, just came to the place and settled here.



TRADE AND SERVICE CLUSTER

Sukhbaatar-16



Minimarket, pharmacy, karaoke bar



Pedestrian staircase



Telmen center (houses various services)



Coal truck



Various services housed in the orange building



Bags of coal (2 kinds, Sharyn Gol mine coal, Nalaikh mine coal)



Chingeltei Khashaa



Site Plan

OCCUPANT INFO

- He bought the land in 2010. It is smaller than most Khashaas.
- He built the house in the same year from bricks/timber.
- It has 2mm of fibreglass insulation.
- A relative is temporarily staying on his plot in the Ger.



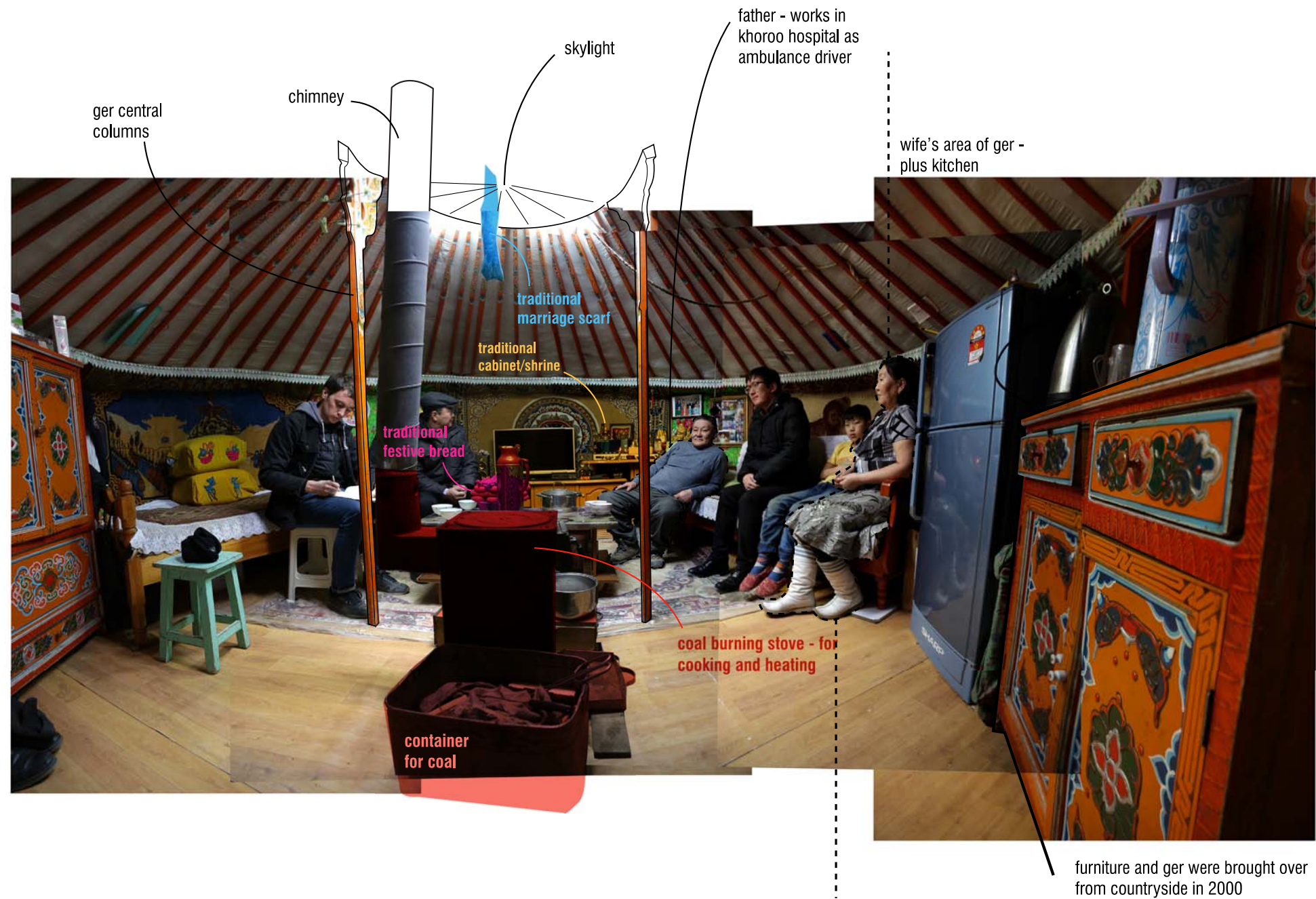
Chingeltei Ger Interior



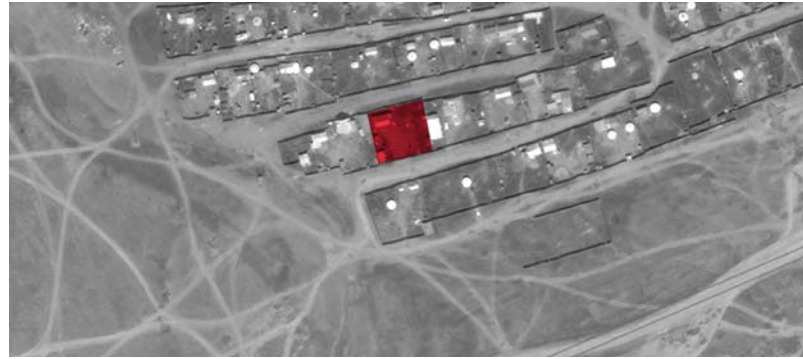
Site Plan

OCCUPANT INFO

- They moved from the western province in 2000, over 1000km from UB.
- They built the Khashaa fence in the same year but didnt acquire land ownership.
- They have one elder son in High School and one younger son.
- They want to move back to the countryside after retirement, around 100km from UB.



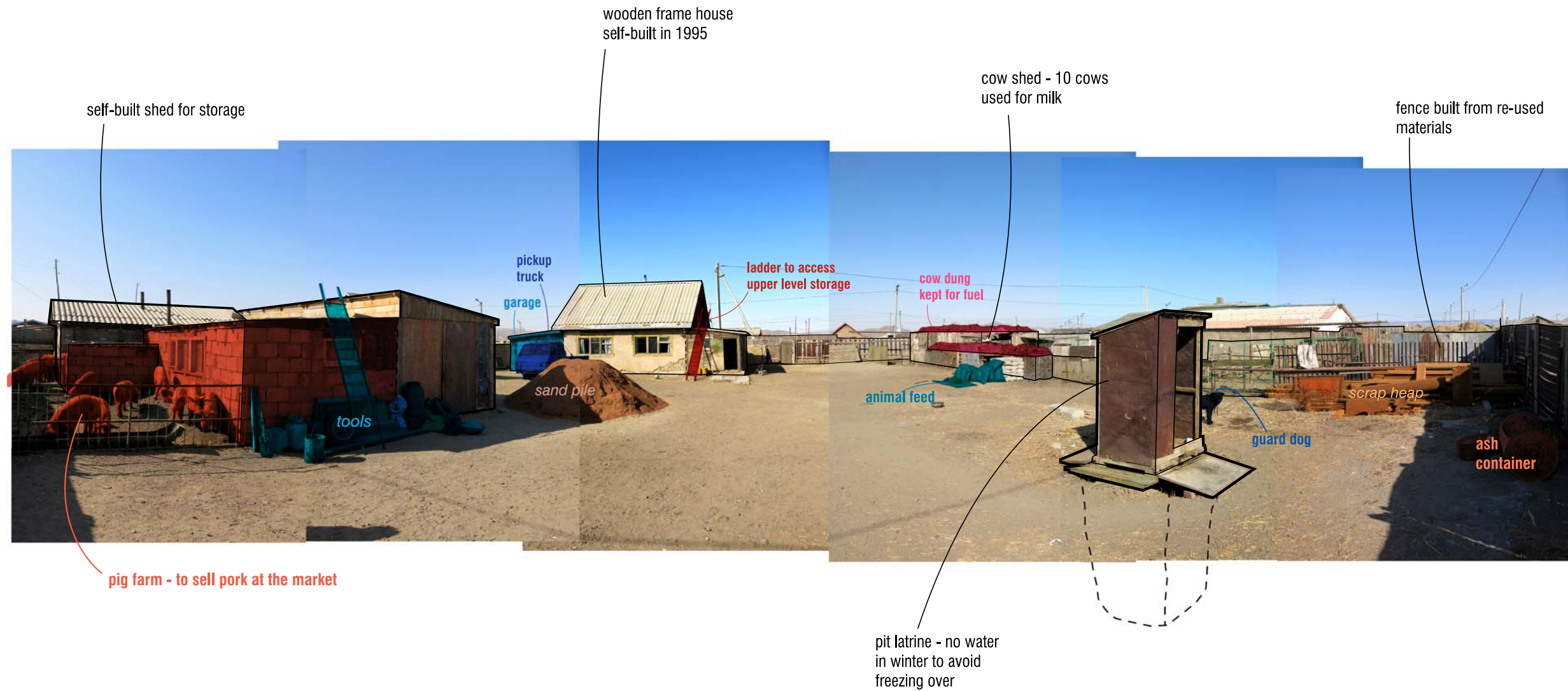
Khan Uul Khashaa



Site Plan

OCCUPANT INFO

- The family moved to the plot 20 years ago.
- They have lived in the Khoroo for 50 years.
- They use the plot to farm pigs and cows during the winter.
- In the summer, the father trains horses in the countryside.



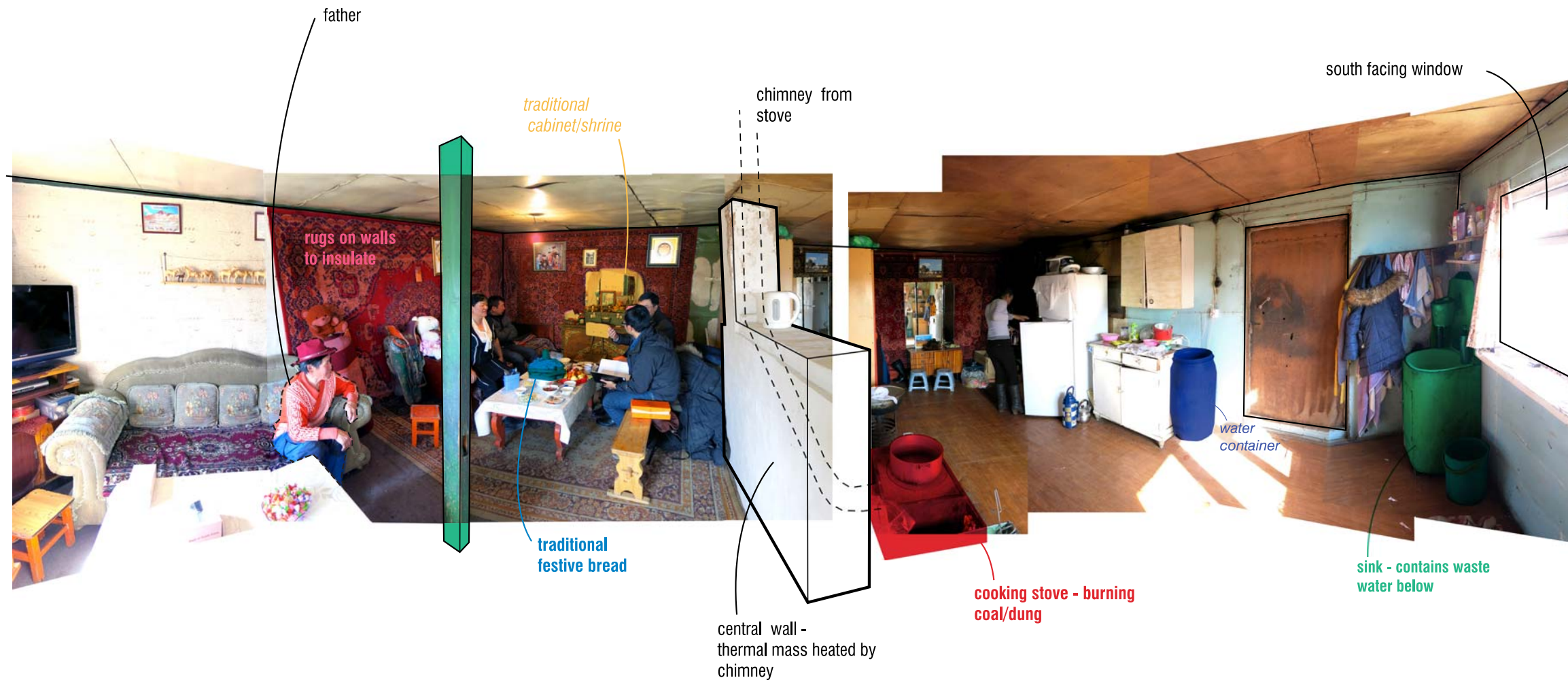
Khan Uul House Interior

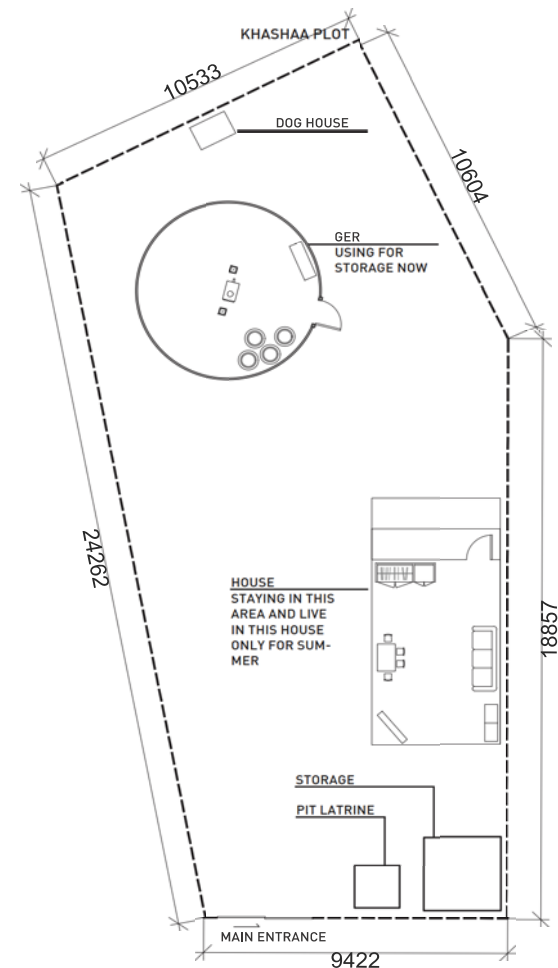
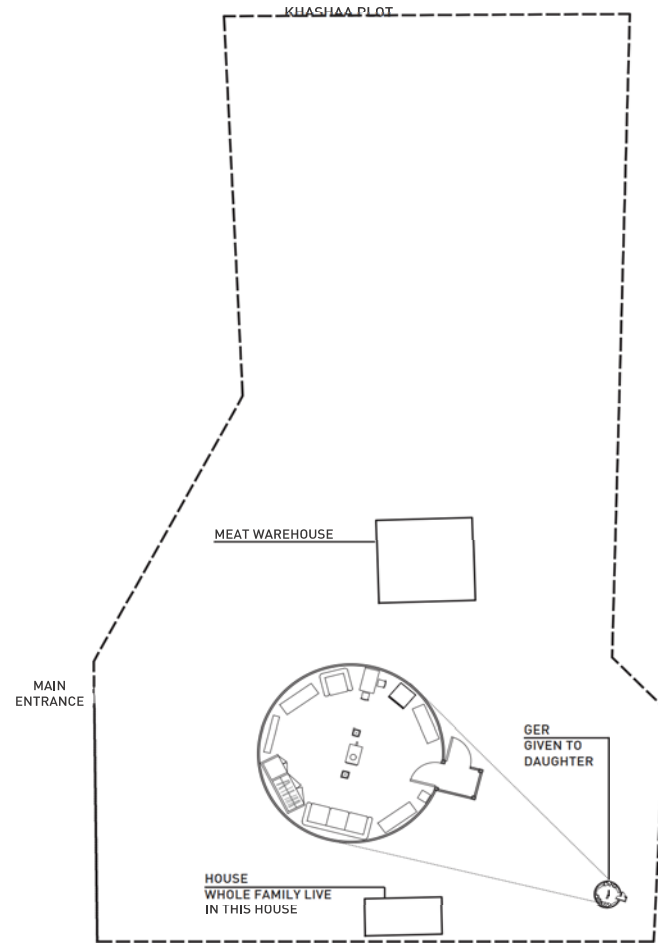
FAMILY INFO

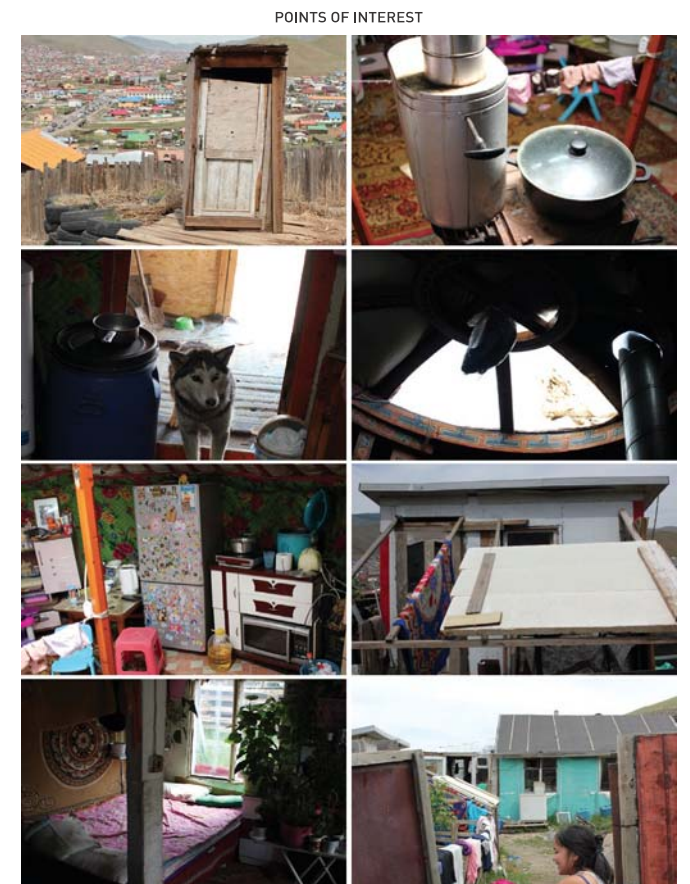
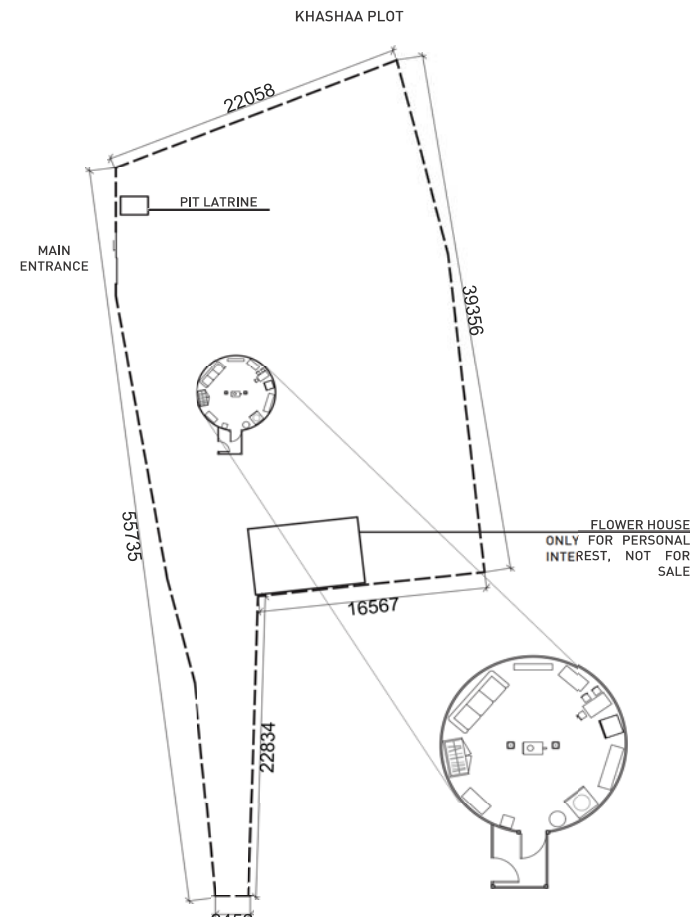
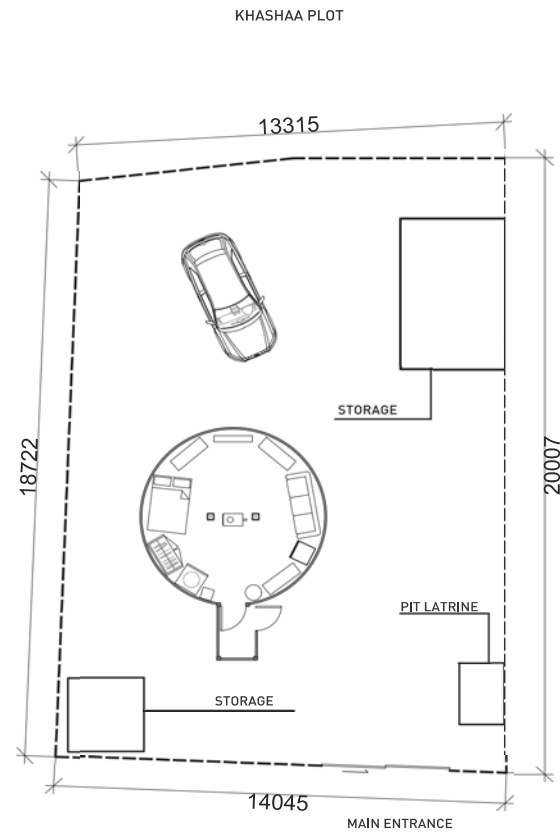
- They built the house themselves 20 years ago, but haven't modified it since.
- Family has three children that all grew up in this house.
- They plan to knock it down and contract some builders to make them a new house.
- It will be multi storey with separate rooms and made using a 'Canadian' timber frame construction.

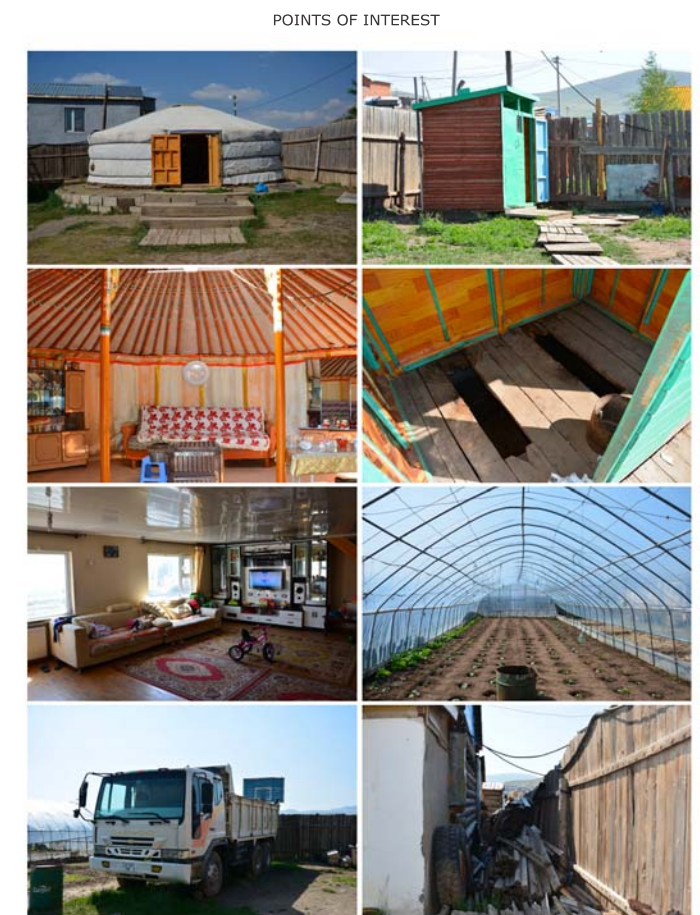
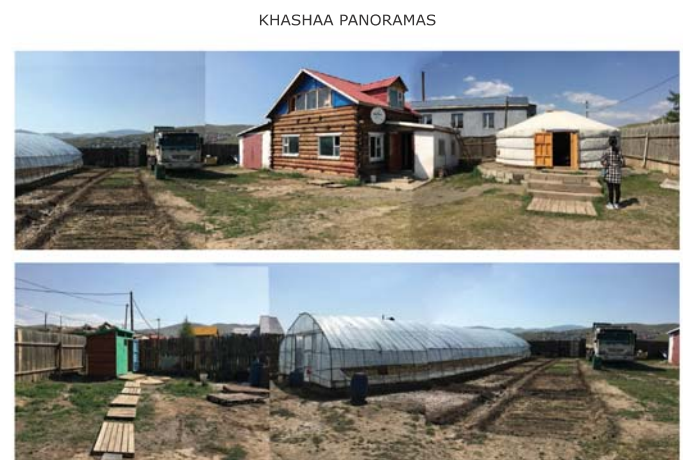
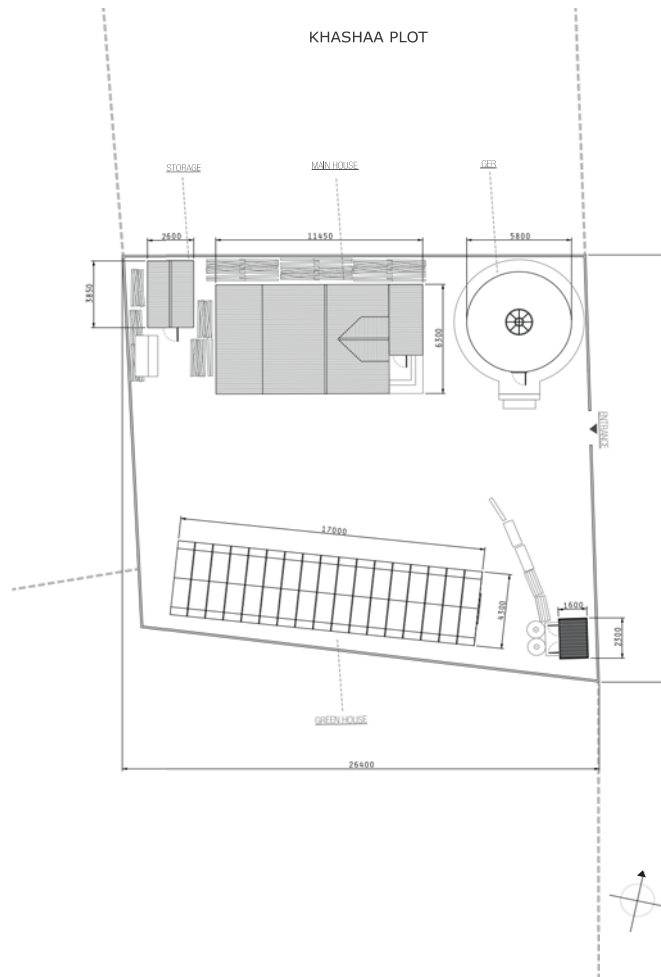
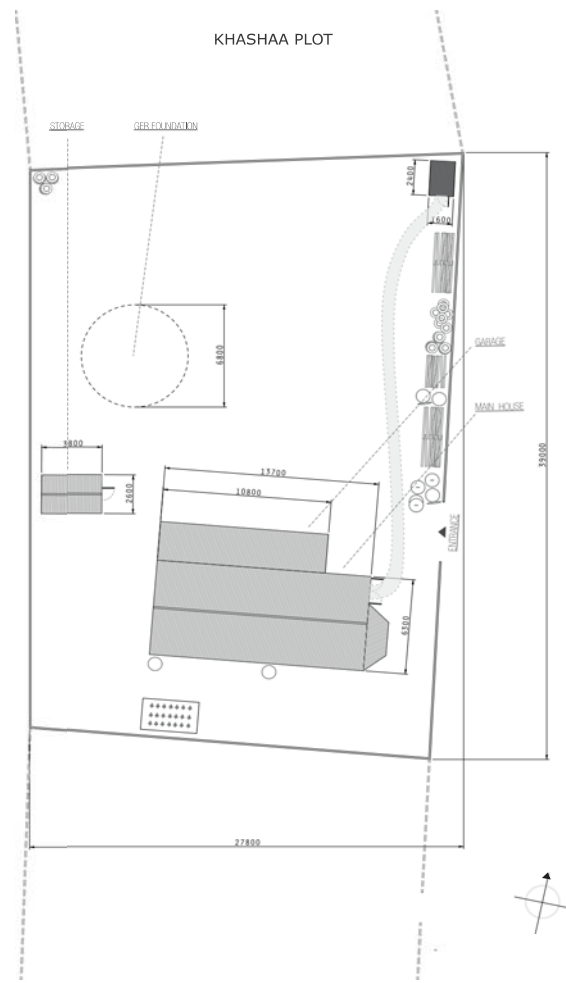
FATHER INFO

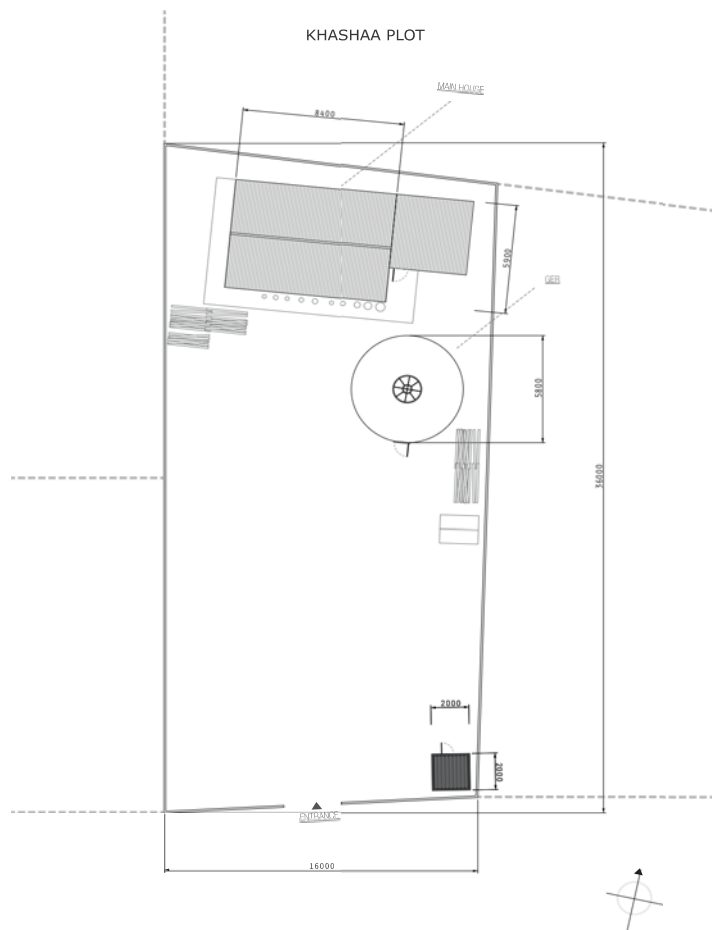
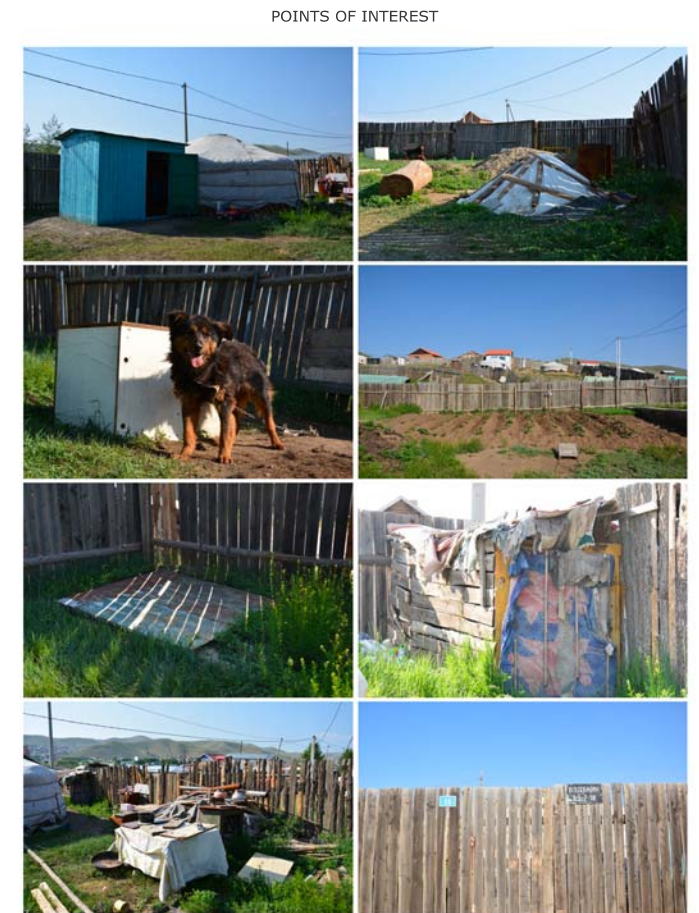
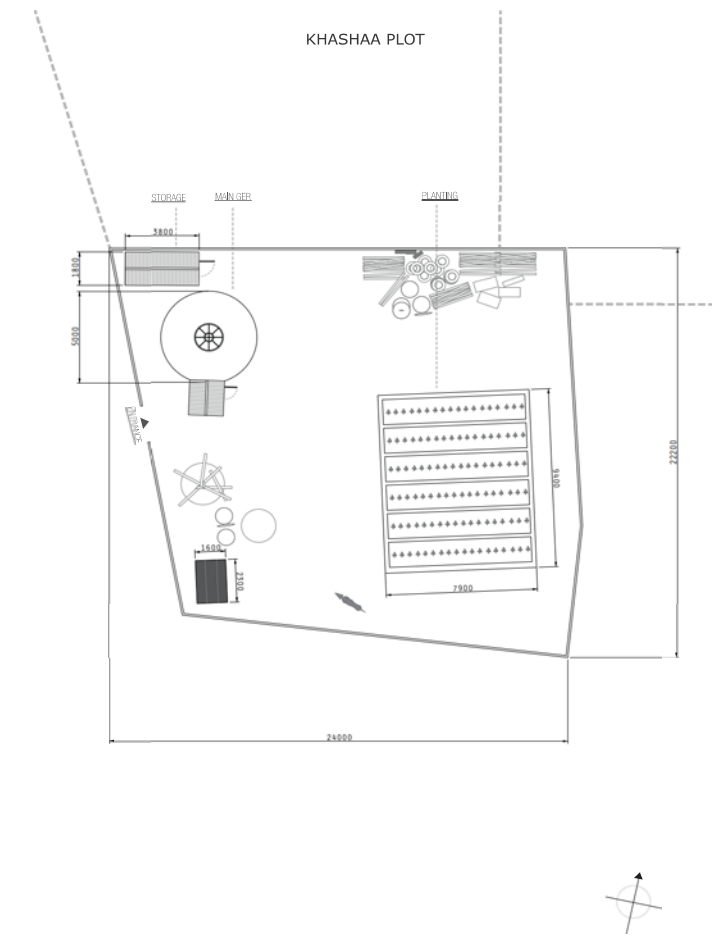
- Trains 70-80 horses far away in the countryside during the summer
- Graduated in russia, then went to join the army
- Used to work in the local chicken factory as an electrician
- Started farming pigs in order to buy a horse.





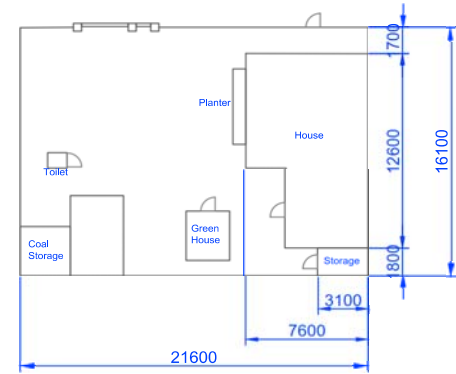








KHASHAA PLOT



KHASHAA PANORAMAS



GER PANORAMAS

(NO GER IS INCLUDED)

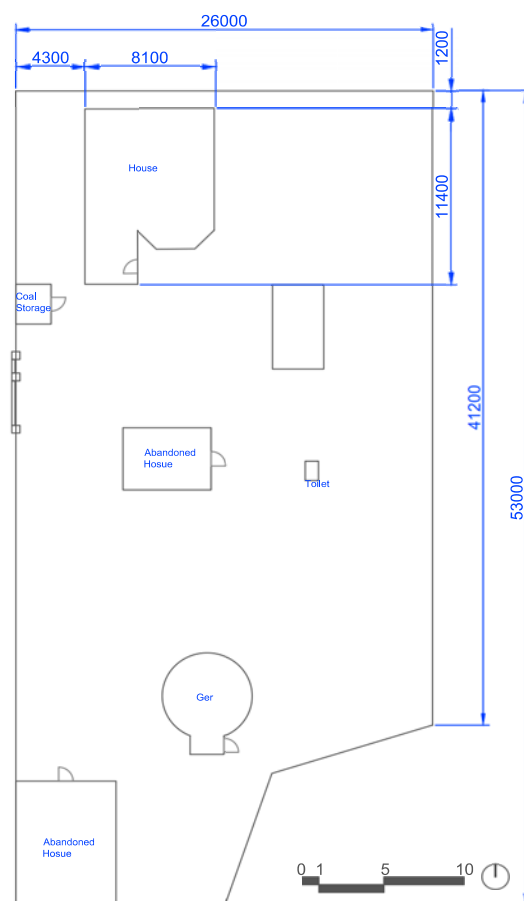
(NO GER IS INCLUDED)



POINTS OF INTEREST



KHASHAA PLOT



KHASHAA PANORAMAS



GER PANORAMAS

(FORBIDDEN TO ENTER)

(FORBIDDEN TO ENTER)

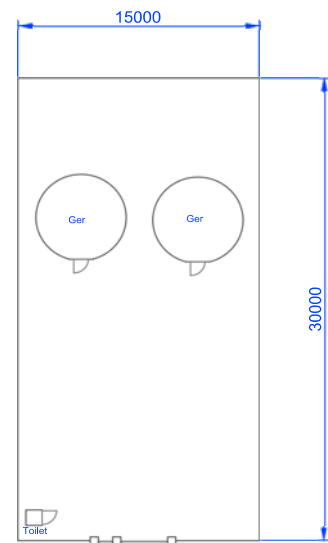


POINTS OF INTEREST





KHASHAA PLOT



KHASHAA PANORAMAS



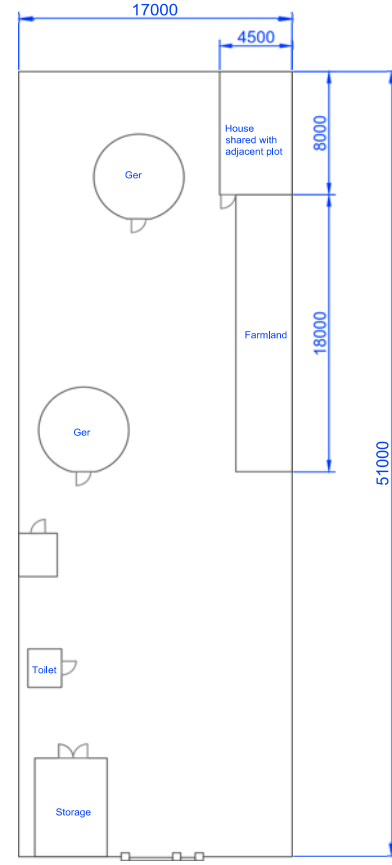
POINTS OF INTEREST



GER PANORAMAS



KHASHAA PLOT



KHASHAA PANORAMAS



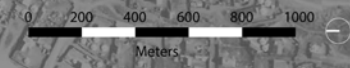
POINTS OF INTEREST



GER PANORAMAS



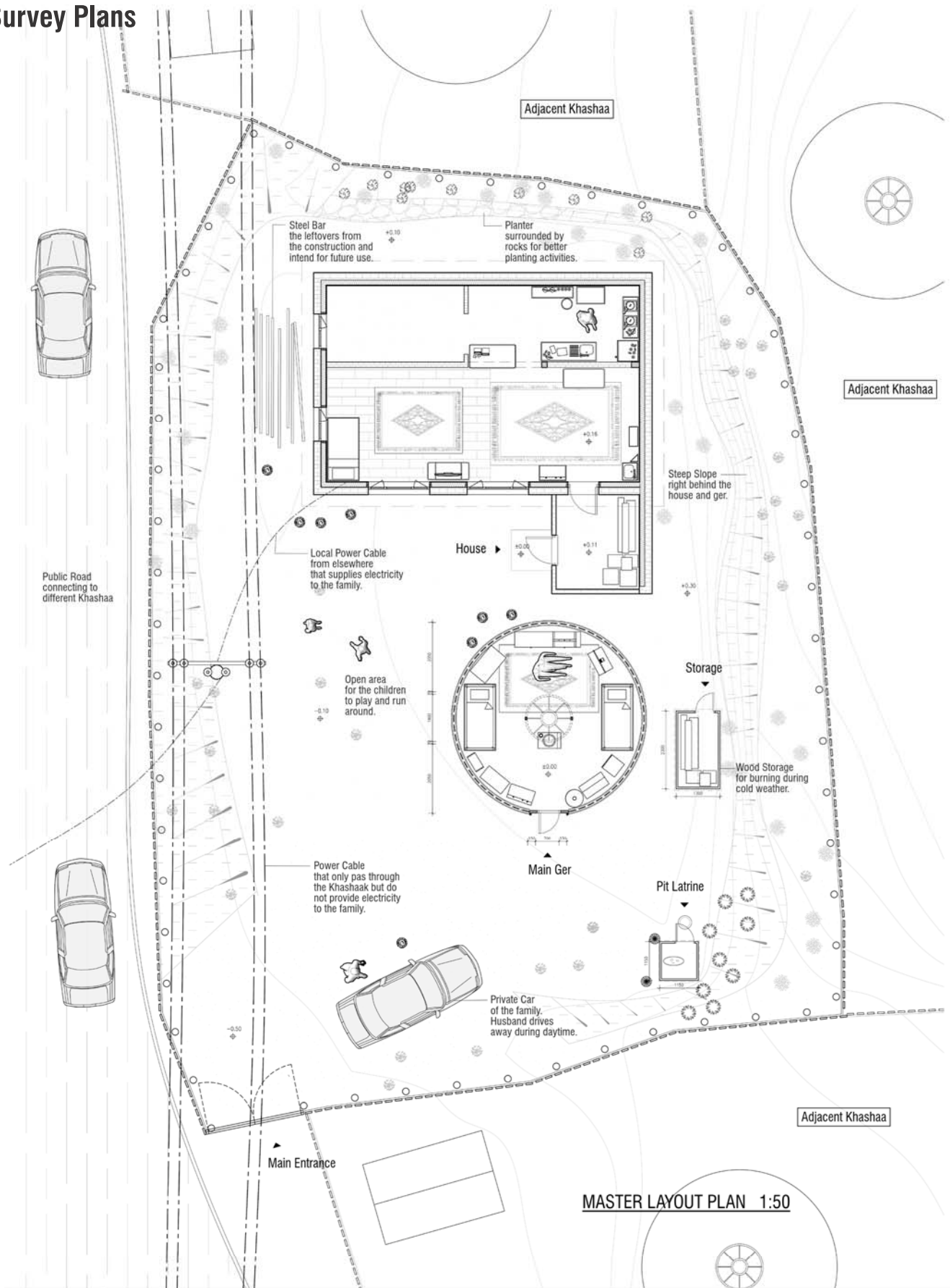
GER INNOVATION HUB



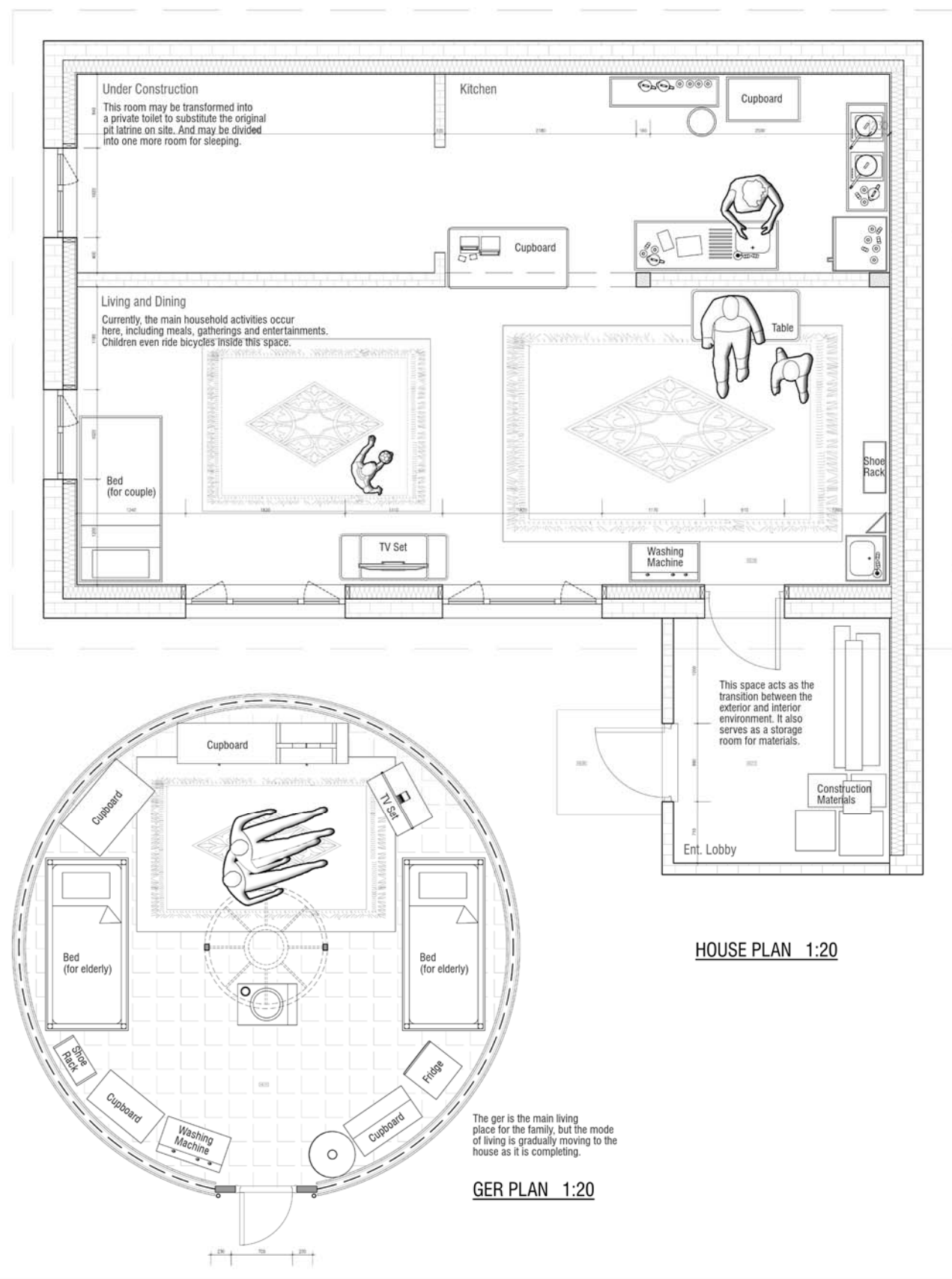
KEY

Surveyed Households

A1 - Survey Plans



MASTER LAYOUT PLAN 1:50



HOUSE PLAN 1:20

GER PLAN 1:20

Household size:

2 Elderly Couple
2 Young Couple
2 Children



Khashaa size:

507.706 m²

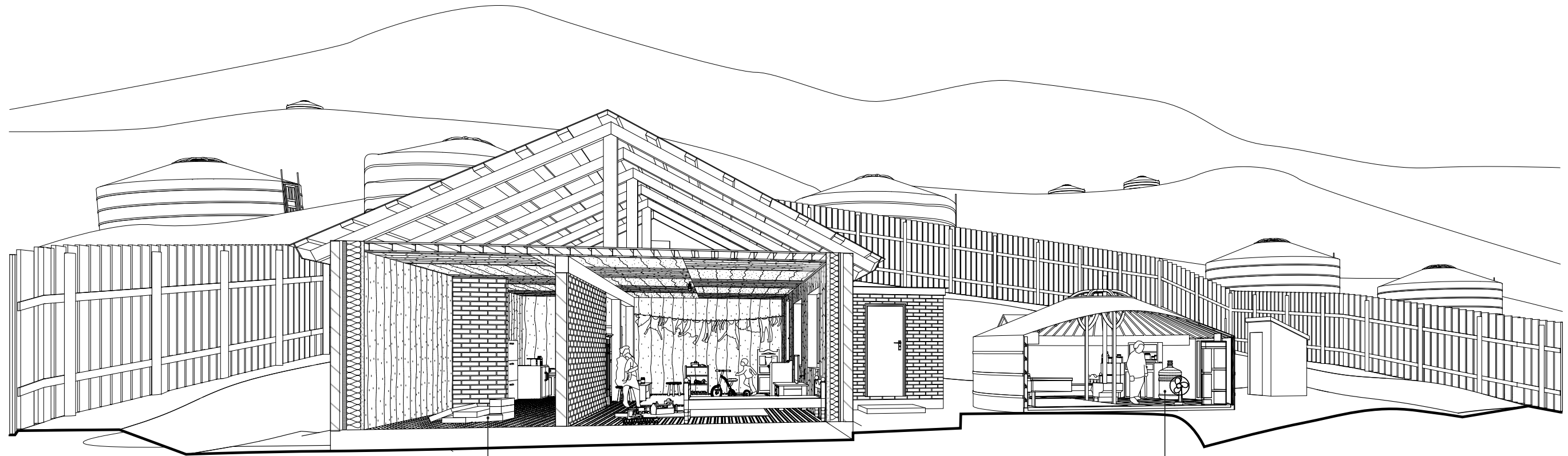
Living size:
74.703 m² (House)
26.000 m² (Ger)

Living since:

2012

Water usage:
60-70 Litre per Day
(For entire family)





Future shower and washroom
*using an individual water tank to
 provide water for showering and toilet system*

Water container (60 L for daily usage)
*for drinking water, cleaning clothes,
 bathing children and cooking*

Household size:
 2 Elderly Couple
 2 Young Couple
 2 Children



Khashaa size:
 507.706 m²

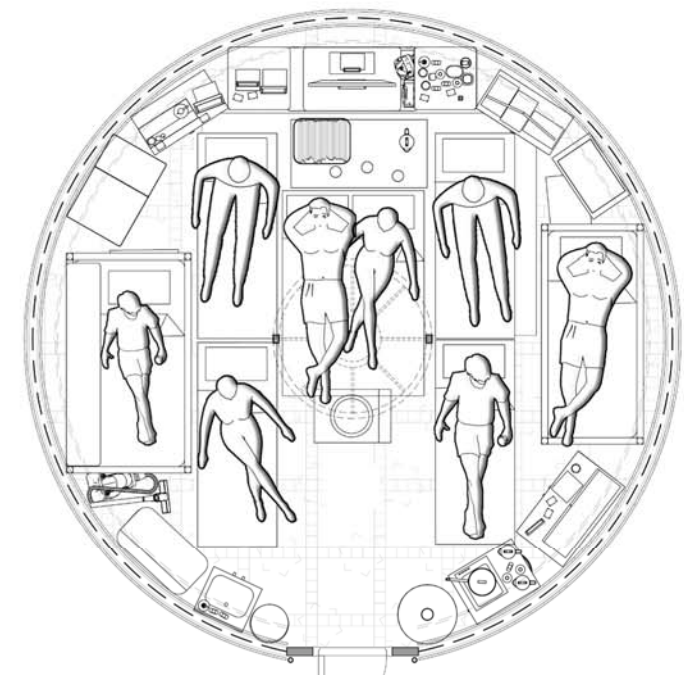
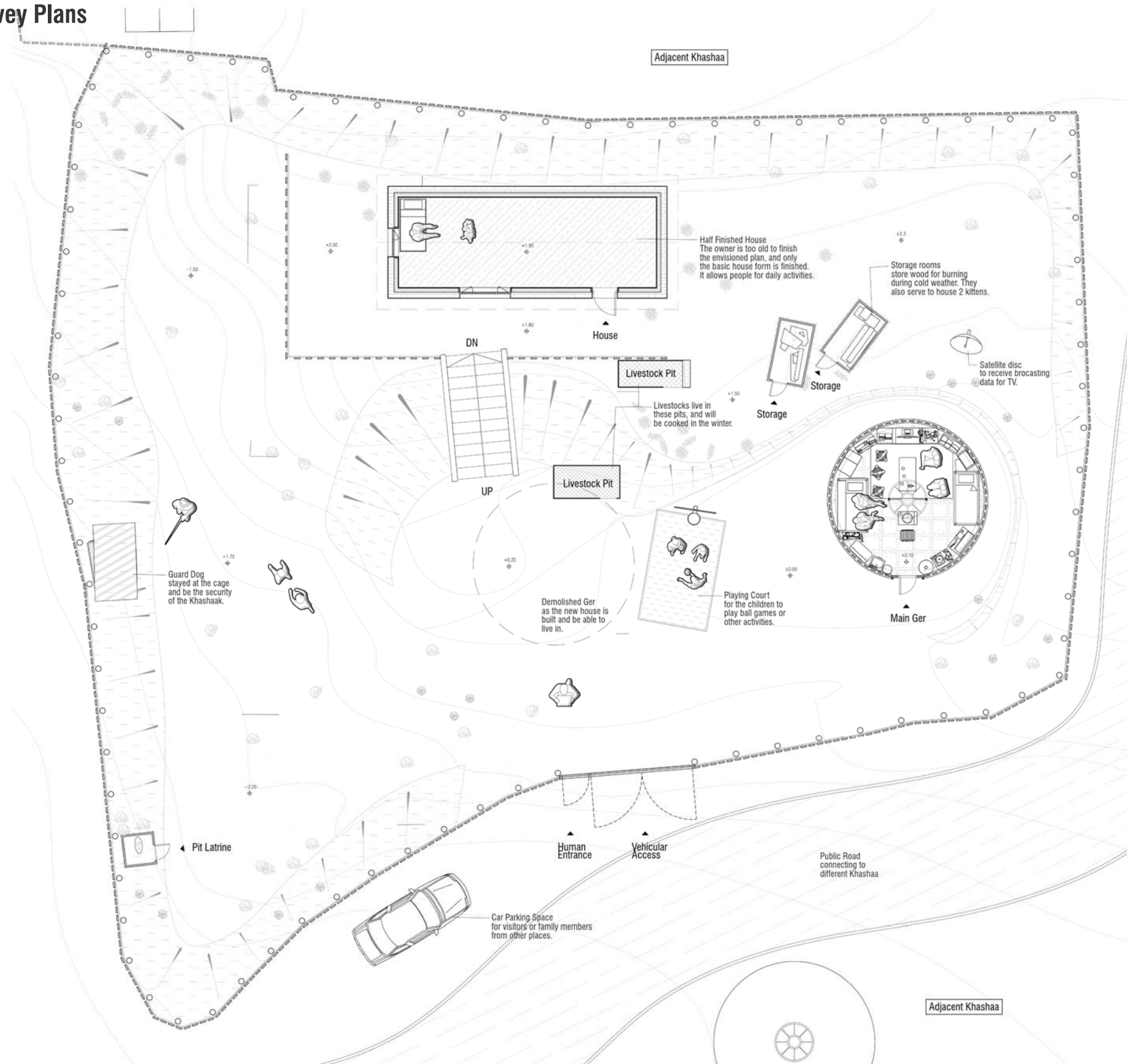
Living size:
 74.703 m² (House)
 26.000 m² (Ger)

Living since:
 2012

Water usage:
 60-70 Litre per Day
 (For entire family)



A2- Survey Plans



NIGHTTIME GER PLAN 1:20



DAYTIME GER PLAN 1:20

Household size:
2 Elderly Couple
6 Young Couple
7 Children

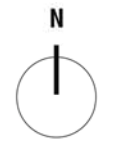


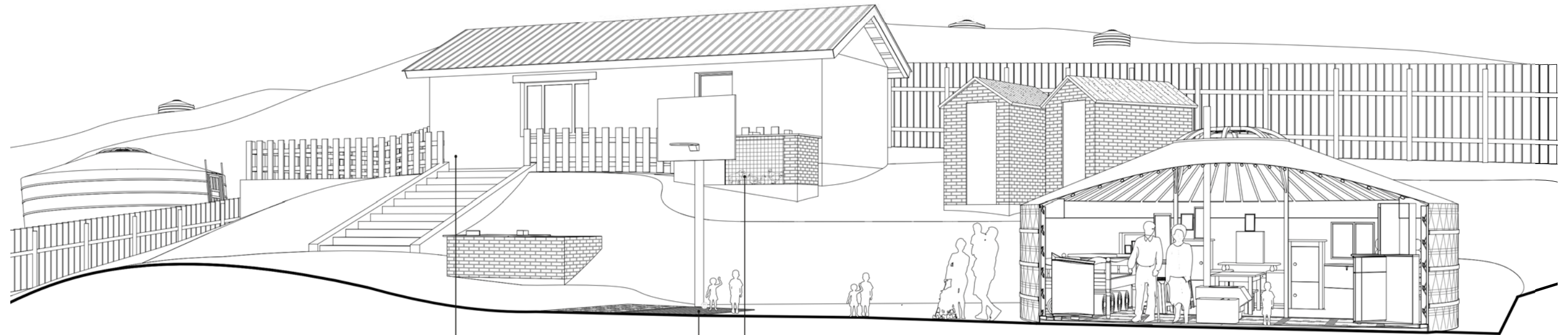
Khashaa size:
922.726 m2

Living size:
40.000 m2 (House)
26.000 m2 (Ger)

Living since:
2004

Water usage:
250 Litre per Day
(For entire family)





Regular house under construction
the construction is on hold due to the builder (grandfather)'s old age

Livestock
the family herd their own livestock for food

Basketball area
the family's own leisure court

Household size:
 2 Elderly Couple
 6 Young Couple
 7 Children

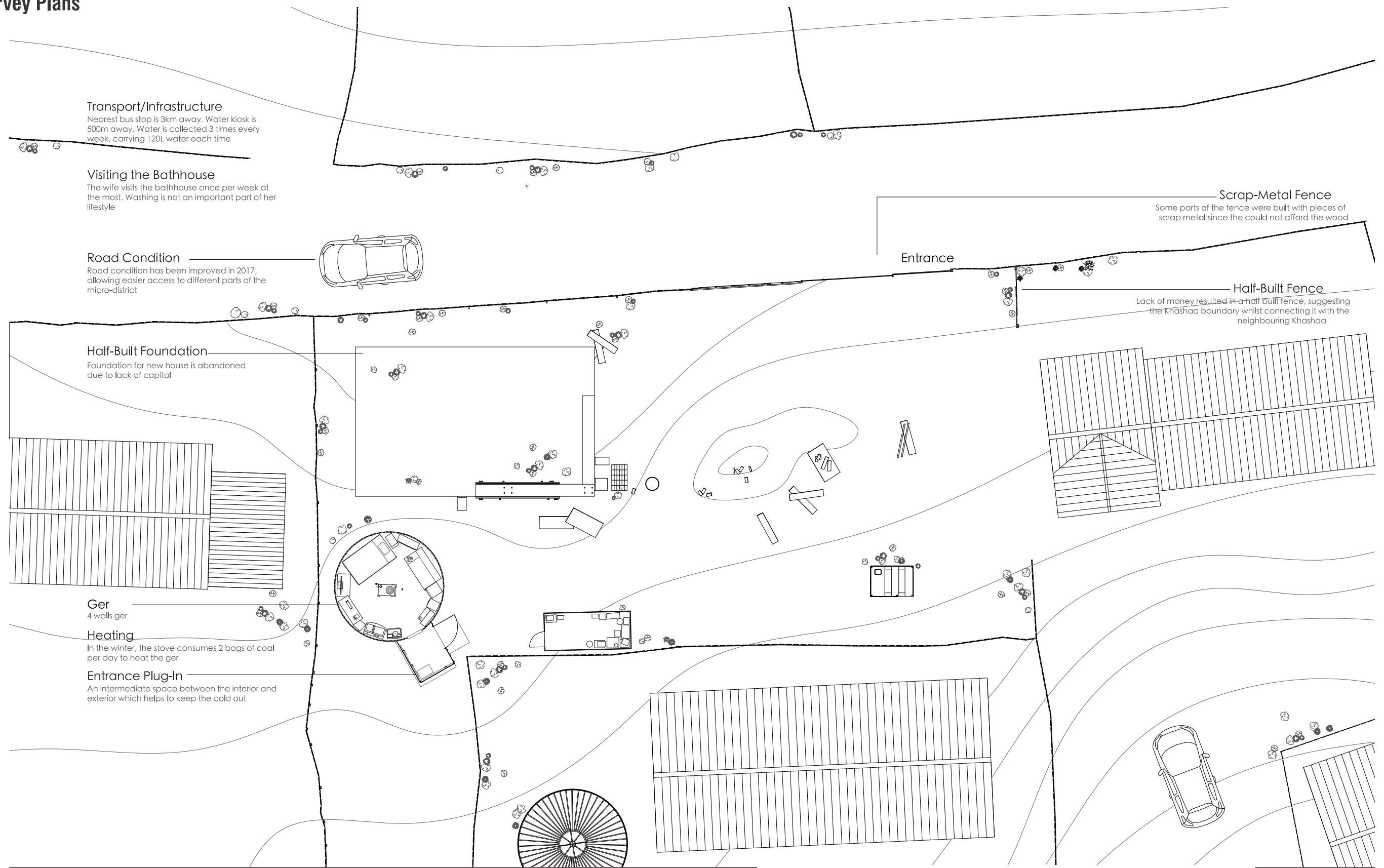


Khashaa size:
 922.726 m²
Living size:
 40.000 m² (House)
 26.000 m² (Ger)

Living since:
 2004
Water usage:
 250 Litre per Day
 (For entire family)



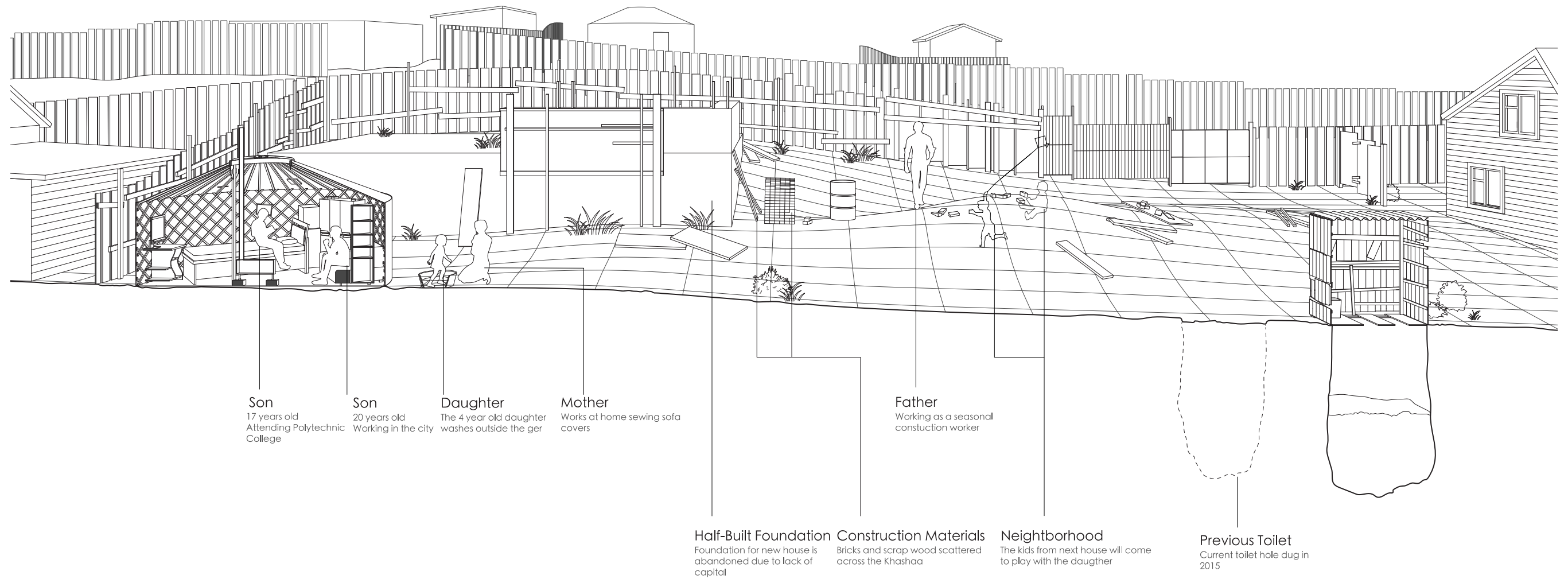
A3 - Survey Plans



[Ger 1]

Family of 5 - the husband, the wife, 2 son, 1 daughter
 Wife was came from countryside since the husband was came form city, they moved in after marriage in 1998
 The Husband is a seasonal construction worker, the wife is a sewer which usually works in home, the youngest daughter went to the baby sitting service instead of kindergarten



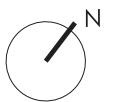


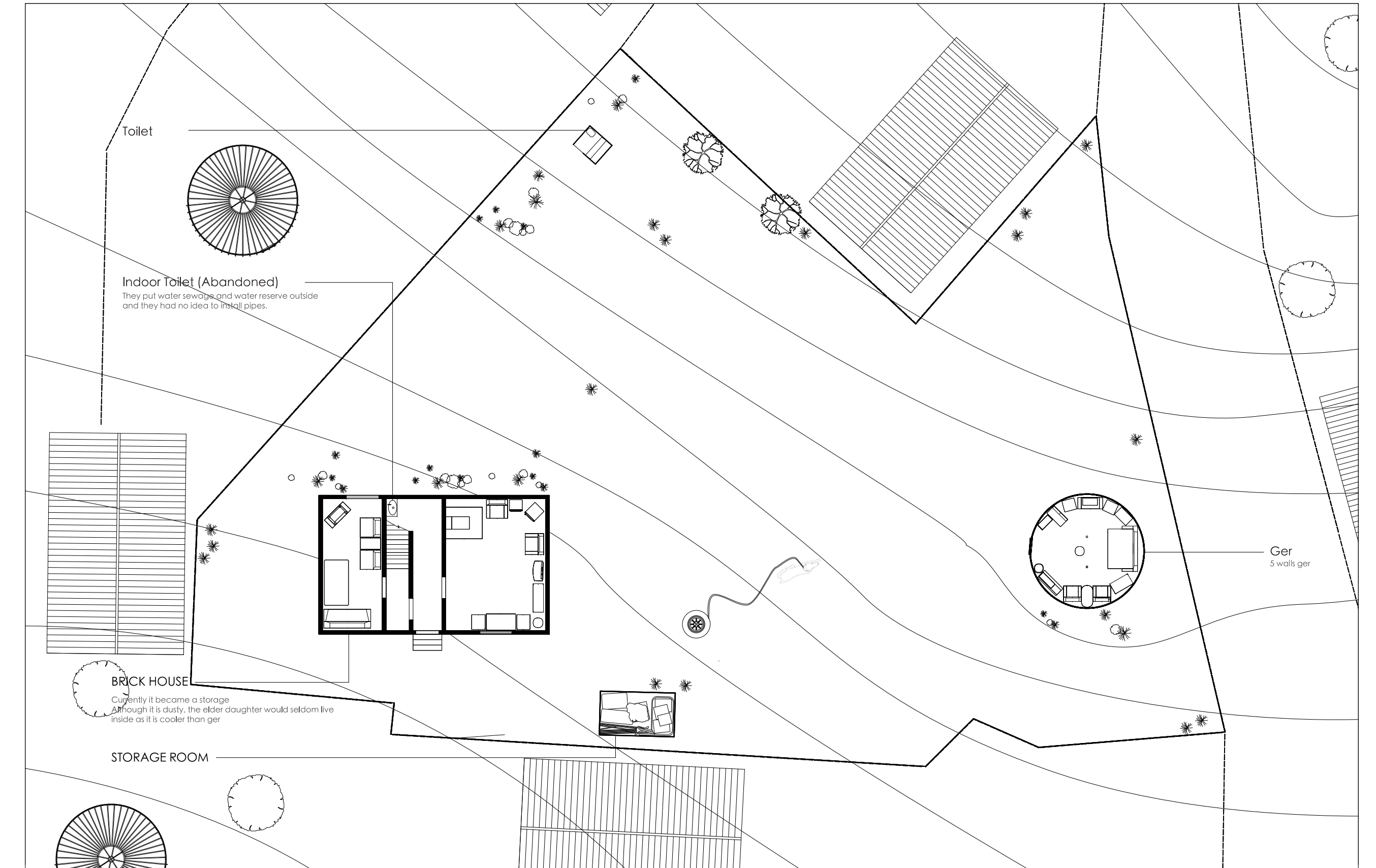
[Ger 1]

Family of 5 - the husband, the wife, 2 son, 1 daughter

Wife was came from countryside since the husband was came form city, they moved in after marriage in 1998

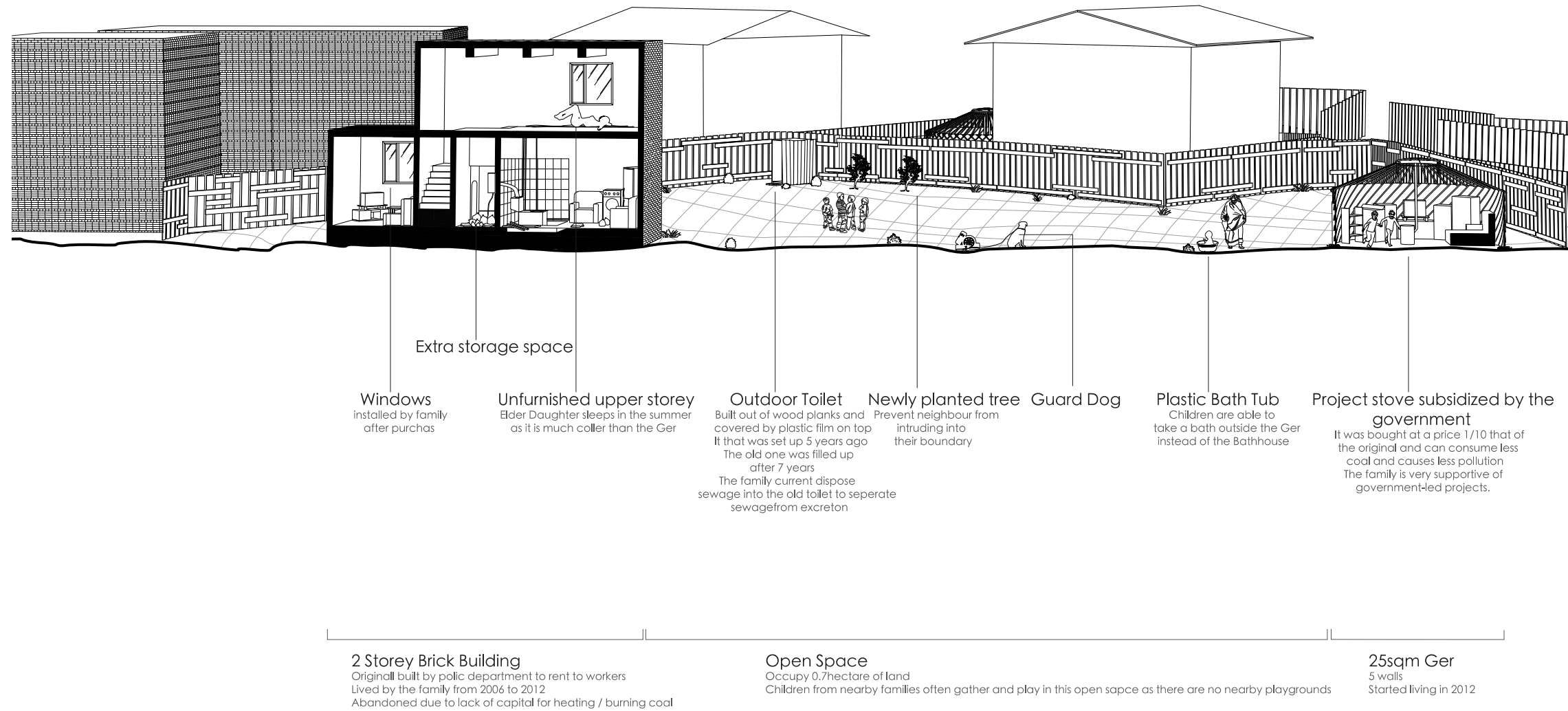
The Husband is a seasonal construction worker, the wife is a sewer which usually works in home, the youngest daughter went to the baby sitting service instead of kindergarten





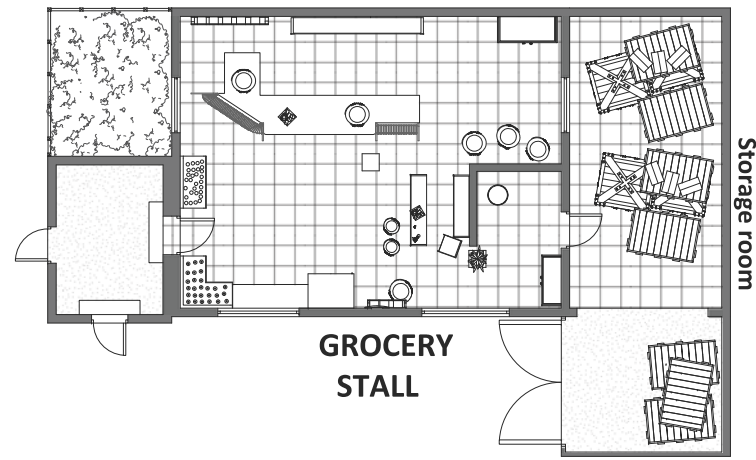
[Ger 2]
 Family of 5 - the grandmother, 2 daughters, 2 grandchildren
 Lived in apartment before 2006, moved to Brick Building in 2006 after a fraud, further moved to Ger in 2012 due to the high expense of coal
 Likes the proximity of the location to city and is positive that the land could be sold out easily in case she regained the capital
 to move back to the city Family is supported by mother's pension and children subsidy provided by the government



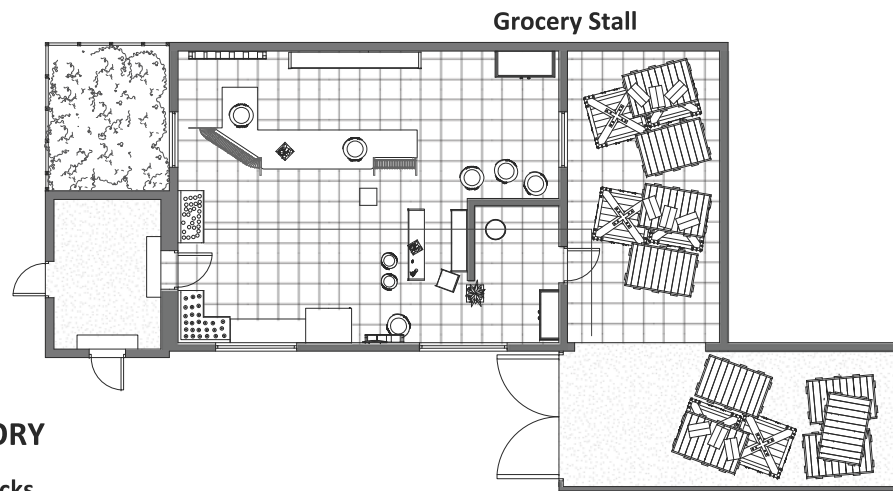


[Ger 2]
 Family of 5 - the grandmother, 2 daughters, 2 grandchildren
 Lived in apartment before 2006, moved to Brick Building in 2006 after a fraud, further moved to Ger in 2012 due to the high expense of coal
 Likes the proximity of the location to city and is positive that the land could be sold out easily in case she regained the capital to move back to the city Family is supported by mother's pension and children subsidy provided by the government





GROUND FLOOR

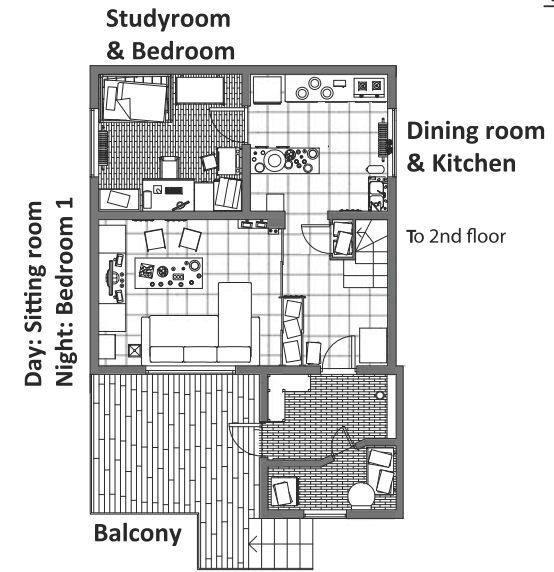


FACTORY

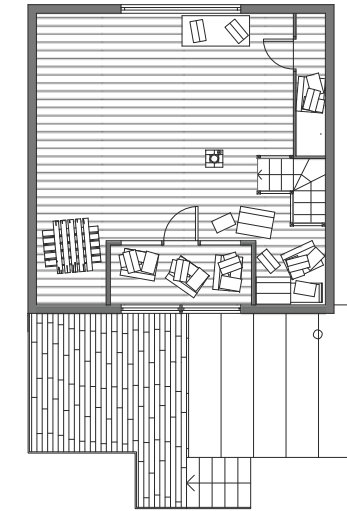
ECO Blocks

The father and the eldest son are fond of furniture making. The factory contains some basic tools and machines for them to make crafts. Recently, the son and his classmates discovered a new building material, which they call "ECO block". It is made of natural mud, straw and hay. It is still under the testing stage. The eco-block is a great insulator during winter. However, it could absorb water easily, which is a major problem that is yet to be solved.

CURRENT SITUATION



FIRST FLOOR

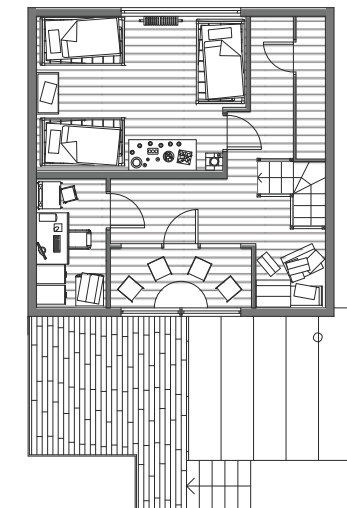


SECOND FLOOR



Larger Sitting Room

The family wish to pull down the partition wall between the original sitting room and study room, and maximise the sitting room area. More seats could be provided for guests and gathering purpose.



Brothers' Bedroom

The second floor will be renovated into the brothers' bedroom. As the two brothers will soon be college students, the father wish to provide them a private space to study.

FUTURE PROSPECTS

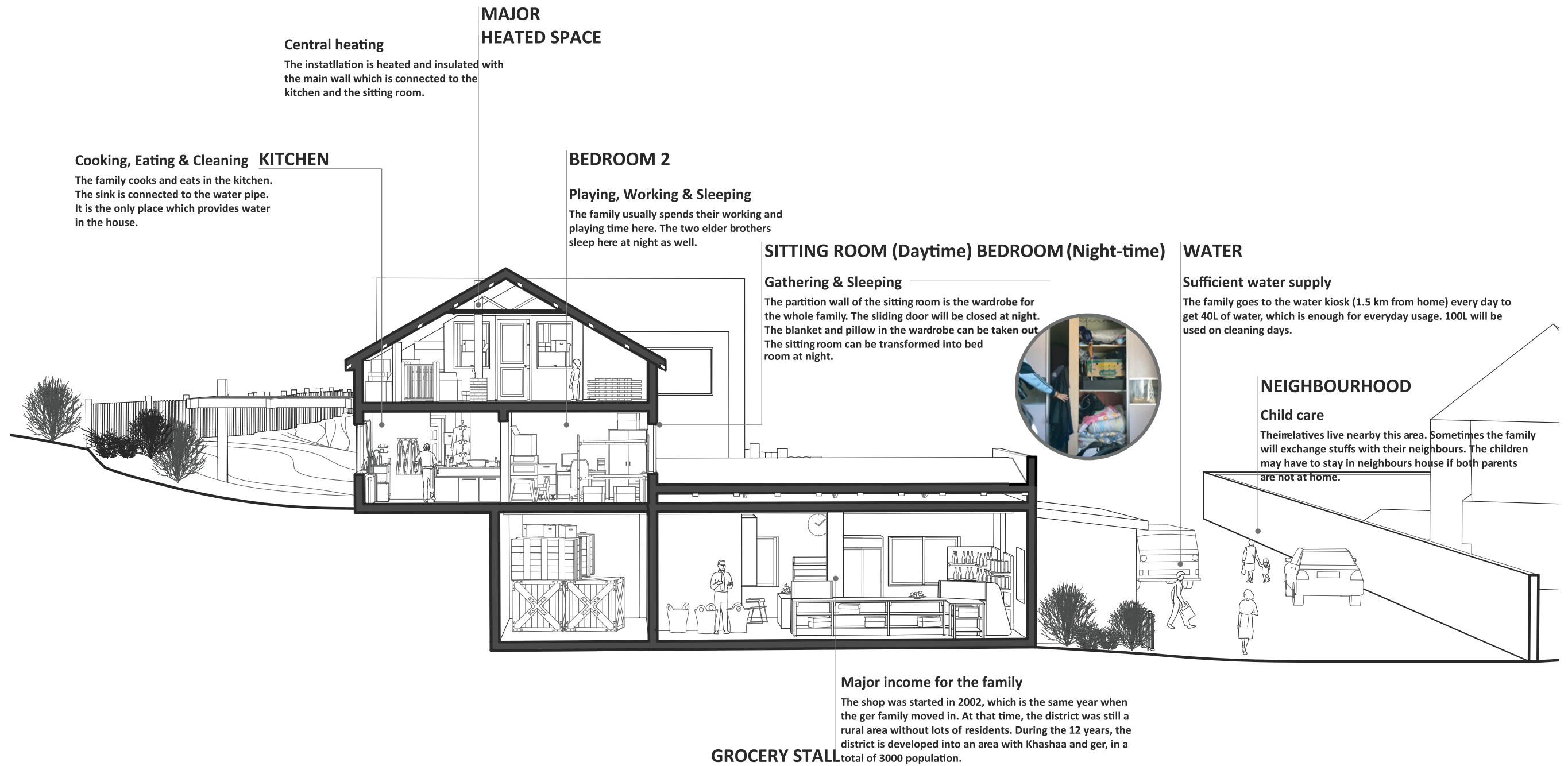
FLOOR PLAN

SCALE 1:125

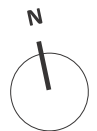
[Observations/Notes/Comments]

A household of 6 family members, including 4 children
 Occupation: Grocery store owner & Construction worker (Dad: Age 56), Mathematics Teacher (Mum: Age 48)
 Moved in year: 2004
 Estimated Khashaa size: 247.8m²
 Plan to re-decorate the second floor for the boys bedroom.





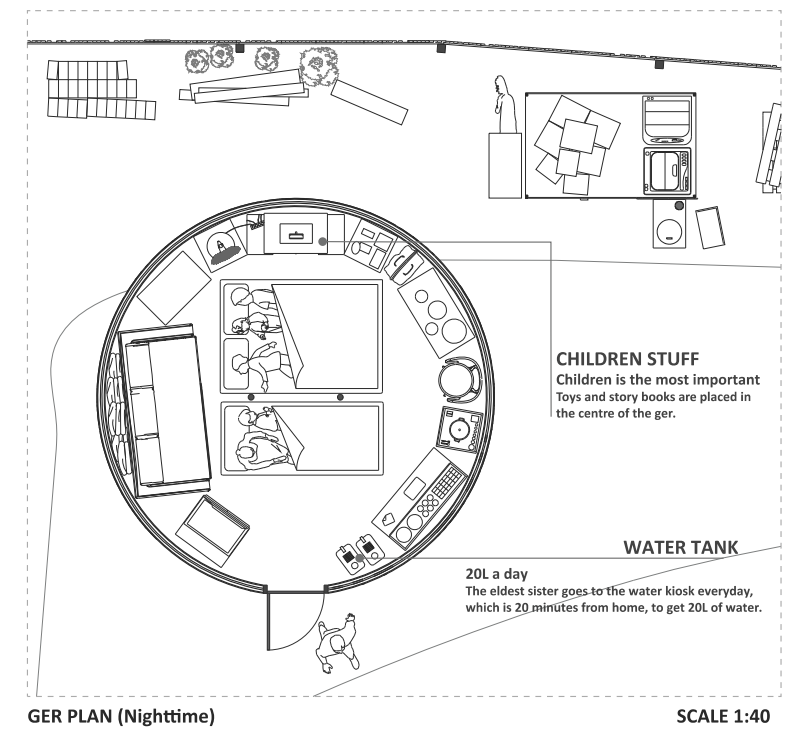
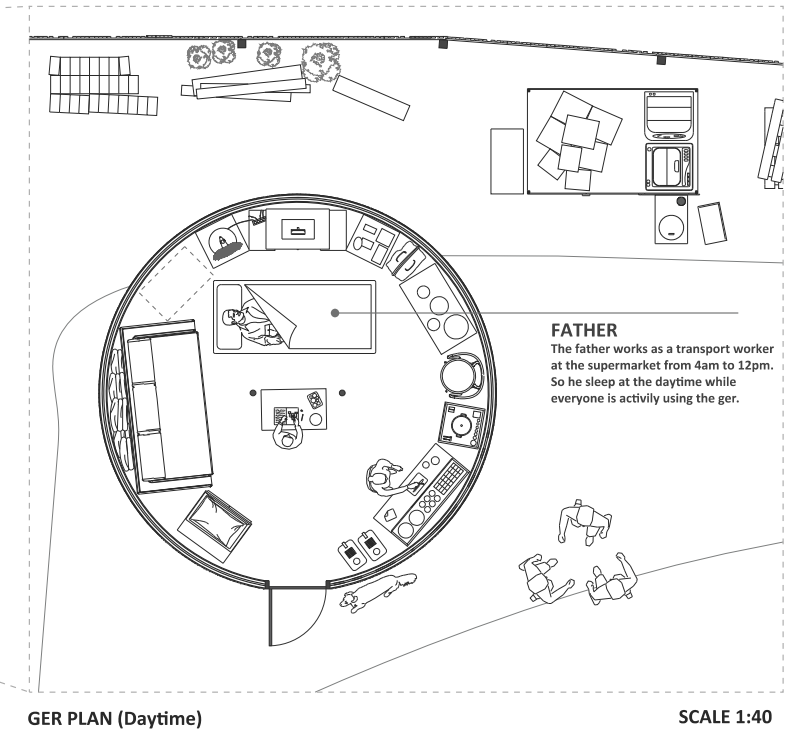
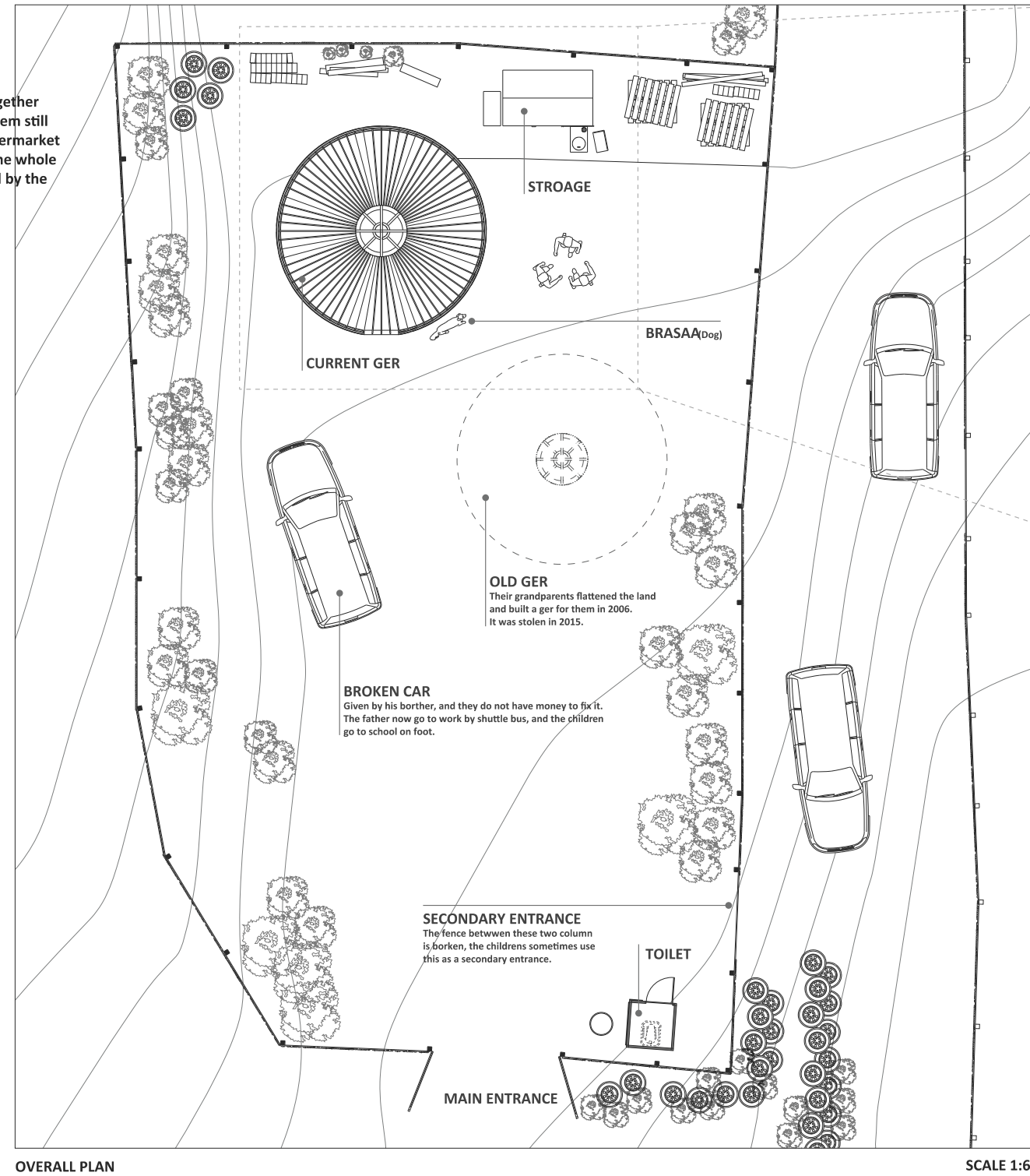
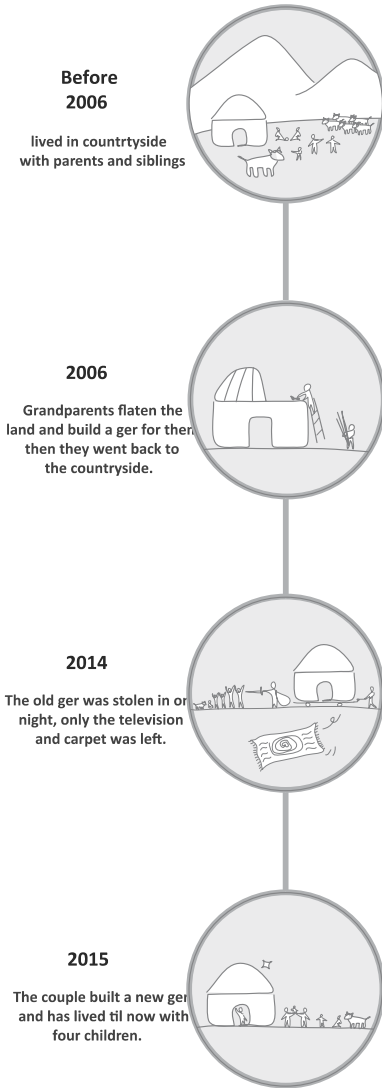
[Observations/Notes/Comments]



KHASHAA SURVEY

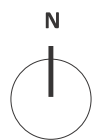
A family of 6 people

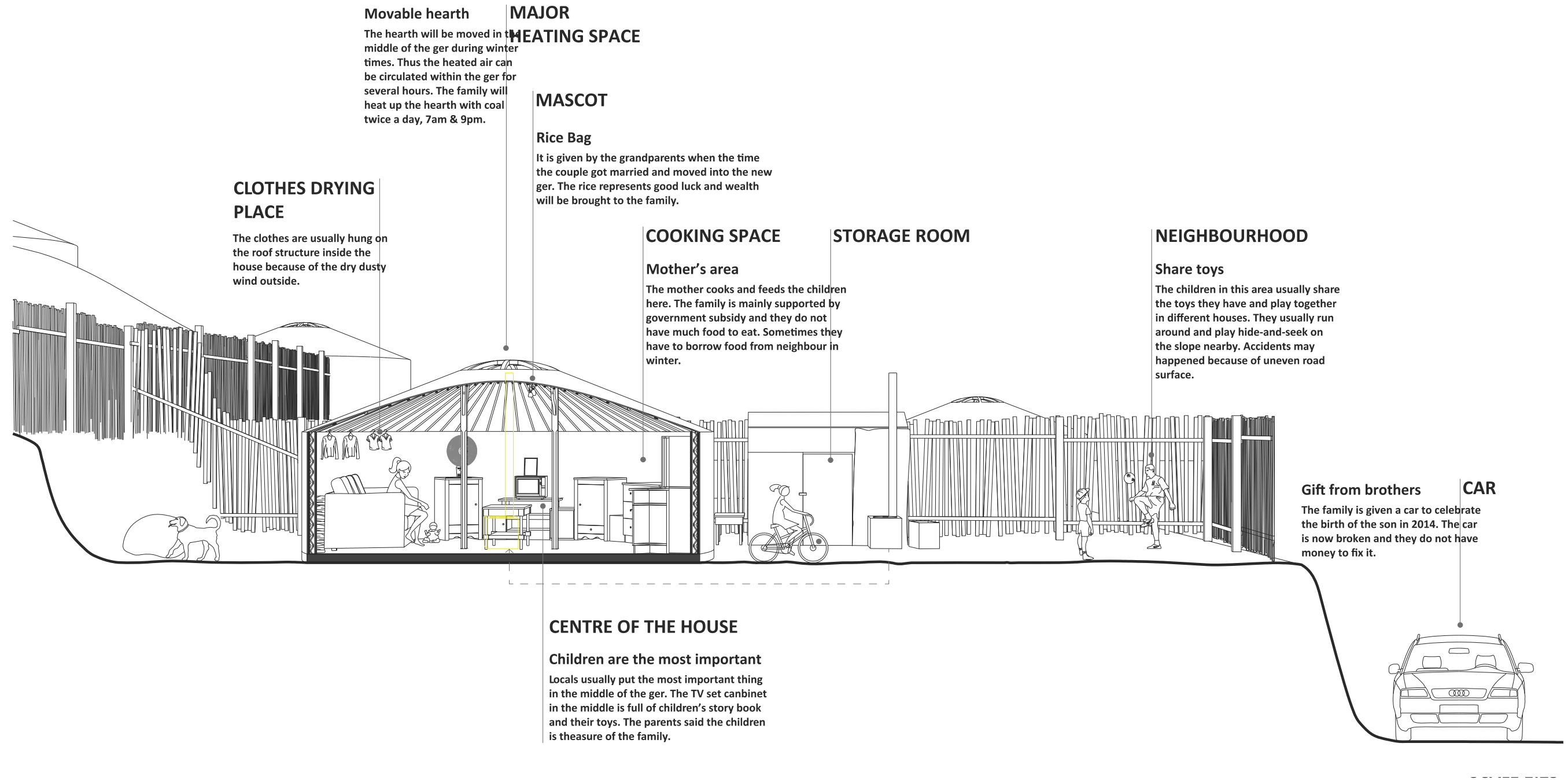
This young family currently lives in a 17m² ger together with 4 children, two are below age of 3. One of them still has to be breastfed. The father works in a supermarket in the city and the two elder sisters take care of the whole family in day time. The family is mainly supported by the government subsidy.



[Observations/Notes/Comments]

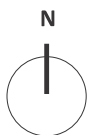
A household of 6 family members
Occupation: Transport worker (Dad: Age 45), Housewife (Mum: Age 41)
Moved in year: 2002





[Observations/Notes/Comments]

Lived in the old ger before 2006, their grandparents flattened the land and built the new ger and the family has lived in the new ger until now
Family is supported by the dad and children subsidy provided by the government.
Plan to enlarge the ger to provide study area for the children.



Transcript for interview with Zulaa

Where is the nearest water kiosk?

I get water from the back of the store. I spend 15 minutes to get 40 liters of water.

What's your typical day like?

I spend most of the day at work. Urangua and I wake up around 6:20am and leave around 6:40am for work. We walk to the bus stop which takes about 20 minutes. It takes about 40-50 minutes on the bus to get to work. The bus leaves regularly in intervals of 10 minutes. The buses are quite packed in the morning, but if you get on the bus before 7:20am, it's usually good.

Work starts with a meeting with our supervisor, who allocates the tasks for the day. We do whatever needs to be done at the factory. I am usually in charge of pressing recycled paper in 160kg bulks and sort the brown and white paper bulks. The brown bulks are sent to recycling, and the whites are sent to egg packaging companies. The tasks at the factory all have different rates, so I get paid per the tasks I perform. The work hours are from 8am-7pm. I get a break from 12-12:40pm and from 4-4:30pm for tea break. As for salary, due to the rates, it varies from month to month. However, on average, I get about 700,000-800,000 MNT after taxes.

What about Urangua?

She only has day shifts. I have day shifts for a week and night shifts for two weeks. Urangua works as quality control specialist at Gobi Cashmere Factory. My night shifts are from 7pm-8am. Urangua works until 8pm sometimes, and sometimes until 5pm. She gets one day off, on a Saturday or a Sunday, it depends. She earns around 600,000 MNT per month if she works overtime. Without overtime, she earns around 480,000 MNT.

How much do you spend on fuel during the winter months on average?

We prepare our fuel in the Fall before winter starts. Last winter, we got 2 porters of coal for about 200,000 MNT last winter. For wood, we get it from the countryside. I also bring leftover cartons from my work. For the winter, I guess we spend around 700,000 MNT in total. The winter is from October

How old are you guys?

I am 26 and Urangua is 33.

Why did you move to UB?

It's difficult to say (ha!). I have trouble answering that question to myself. Urangua is basically from Ulaanbaatar. She grew up here. We were family friends. We've been married for 5 years. Before we got married, I was in the countryside as a herder.

How did you guys meet?

Our families knew each other for a long time. But I guess it goes back to Urangua's younger brother's wedding. We officially met there, and kept in touch, and got married later. Urangua didn't want to move to countryside, so I moved to the city. She was born in Govi-Altai and studied there until 4th grade, and then moved to the city.



Where did you stay when you first lived together in the city?

We lived in a public dormitory without even telling our parents. It was near Ikh Nyalkhas. We worked and saved up to buy a ger.

When did you move here? How did you choose this plot?

This plot belongs to three people. It belongs to Urangua's mum, brother, and Urangua. Urangua's mum settled and acquired this plot first and they just extended it over time.

When did Urangua's mum get the plot?

It's been a long time I think. She's been in and out of the city, so it's probably been over 10 years since she got the plot.

Does she own it?

Yes, she has the right to abode here.

How many years?

Indefinite. Every Mongolian citizen has the right to "own" land. It's our property.

What were you doing in the countryside?

I was a herder.

Did you own the livestock?

Yes. My parents have livestock. When I had a family, they gave me some. I gave it back to my parents when I moved to the city.

Do you miss anything from the city?

I miss everything really. It feels good to be near livestock.

What's a typical day like in the countryside?

In the summer, the day begins around 5am. We have to graze the herd when the day is not too hot to fatten them up. In the winter, it's more lax.

How often do you have to move during the summer?

It depends on the pasture. If it's a good summer, we don't have to move much. We'll stay until Fall. If the pasture is bad, we have to move to change pasture, once or twice a month even. In the winter, we just stay in one place.

What would you do with the old ger?

Since the ger is small, it's suitable for moving. I think we'll send it to the countryside to my parents. We'll use a truck to move the ger.

How long do you intend to stay here?

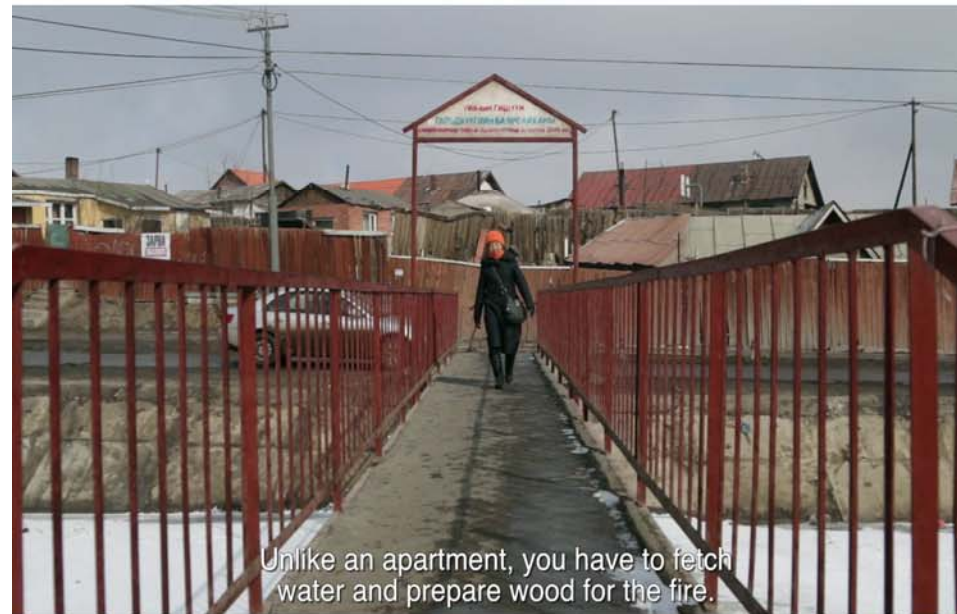
For a long time, I think.

Where do you think you're gonna place the furniture?

I'll take care of what's outside of the plug-in, and Urangua will take care of what's inside the plug-in. We don't have the means to put a lot of furniture right now, so it will be quite minimal. In the khashaa, I plan to plant some trees in October. I've already prepared the trees.



I don't have much to do now. Sometimes I'll babysit my grandkids, but I mostly sit at home.

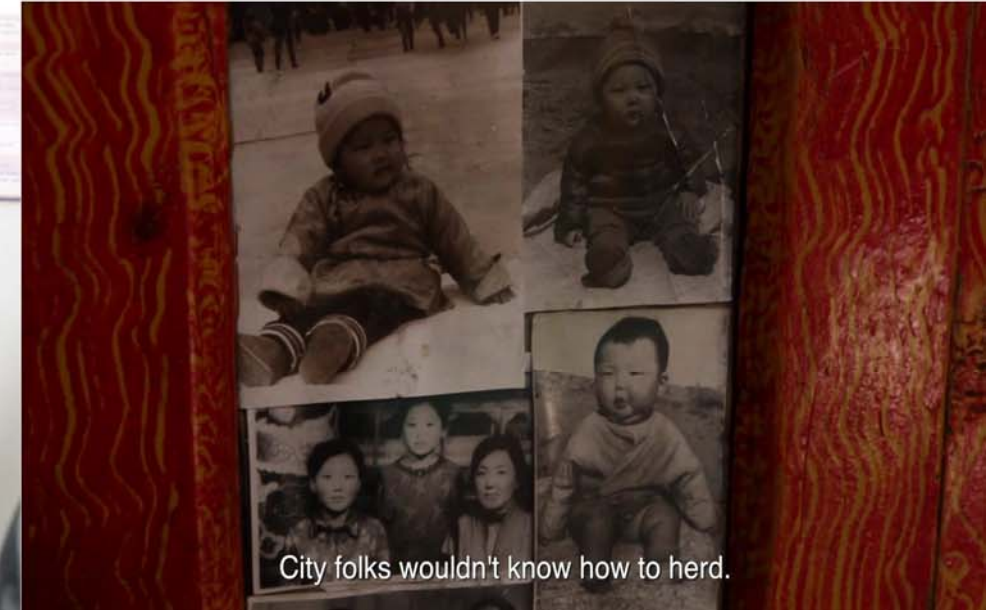


Unlike an apartment, you have to fetch water and prepare wood for the fire.

On the other hand, it's hard to abandon the Mongolian ger.



It would be ideal if gers had central heating like apartment buildings.



City folks wouldn't know how to herd.

Erdenechimeg Interview Transcript (London Design Museum film)

Firstly, could you please introduce yourself?

My name is Erdenechimeg Ishjamts. I'm 60 years old. I'm an Ulaanbaatar resident. My parents are from Undurkhangaï soum in Uvs province. I finished high school in Uvs and came to Ulaanbaatar. I attended the Trade and Commerce Polytechnic College. We got married in 1979 and lived in building 9 in Khoroolol 1. We got an apartment from the Industry Committee of Shoes and Footwear. In 2002, we fell on hard times, lost our jobs, sold our apartment and moved to the ger district.

Back then the Russians built many residential complexes and awarded apartments to those who worked hard. We were awarded our apartment then and lived there from 1986 to 2002. Then we fell on hard times and sold the apartment. Most of the people who were awarded apartments back then did the same. They sold their apartments and moved to the ger district. Since 2002, we've been living in the ger district.

Tell us about your experience and memories from living in an apartment

When we lived in apartments, we all had jobs. Everything was convenient and comfortable. We had running hot water. Our kids all went to school and everything was organized and followed a program. It was comfortable.

But we had kids to raise so we sold the apartment to help out our kids and we moved to the ger district ourselves. Now we have to get our own water and wood to burn in the winter. The ger districts don't have heating or water so we have to do all of the work manually. Now that we're over 60, the work is getting hard. We have to heat the home ourselves and get the water manually. There's no hot water. That's life in the ger district. We have to constantly deal with wood and coal in the winter. You burn fire 3 times a day. You physically bring the water. Now that we're old, the labour is a hard.

What was the community like in an apartment? Did you all know each other?

We all knew each other in the apartments that the state gave us. People who worked in the same place were put together so the neighbors were like family. We lived in entrance 9 of block 9. Everyone who lived in the same entrance all sold their apartments when economic times got hard. Now everyone is spread out. We didn't have savings so all we had was the apartment. We sold those to raise our kids and moved to the ger districts.

Back then, the state looked after us. Your workplace provided you with an apartment. We don't have that anymore. But we're considering moving back into an apartment now. We're both retired.

Tell us about a fond memory you have of your time in the apartment.

We had a lot of free time. We had heating and running water so we were comfortable. All the schools were public and you could send your kid off to the daycare from the 8 months old and dedicate your time to your work. We didn't have to worry about heating the home or getting cold or anything like that. Everything was readily available and accessible.

What did you do in your free time?

We used to go to shows and do recreational sports in the winter. No need to worry about the house freezing over. It was great. We could go to various lessons and classes. We had lots of free time. Now we're retired, and most of our time is spent heating the home and getting water and taking care of our grandkids.

Living in the ger district takes away a lot of your free time.

Yes, we're always busy. We always have to heat the house and manually bring water. Plus we have to take our kids to school. We never have free time now, especially in the winter.

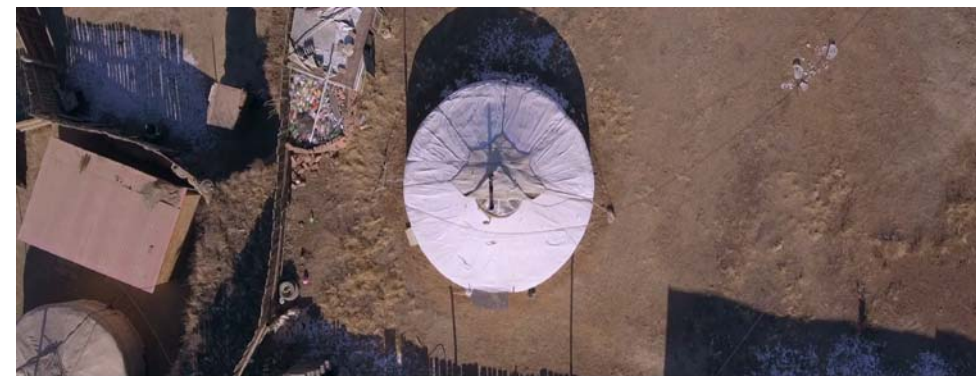
Tell us a fun story or an anecdote from your days of living in an apartment

Most of these stories would be about our kids because I was in the countryside until I was 8. The boys on our block all hung over together. When I got my salary, my son used 100 tugriks, which was a lot of money at the time, and bought all of his buddies ice cream and fancy yellow buttons that they all wore on their shoes for some reason. So all the boys on the block were running around with yellow buttons on their shoes.

What about some of your fears of living in the city?

I guess the first thing would be the pollution in the winter. Everyone is burning coal day and night so the pollution is very heavy. If everyone had apartments like the old days, the city would probably be a lot cleaner. All of this pollution would probably go away. Or if the ger district had centralized heating, people wouldn't have to burn coal anymore. If we had running water, the soil pollution problem would also go away. The ger districts just keep spreading out even onto hilltops. Even when they build an apartment block, nobody can afford them. Even if young folks want to buy apartments, they can't get their 30% apartment loans. So everyone ends up in the ger areas or in public housing. I guess that would be the fear or disadvantages of living in the city.

The advantage of living in the ger district is that you don't have to pay bills. In the summer, you don't have to heat your home so there's very low housing cost. If the ger districts had running water and central heating, then it's quite a suitable place for older folks to live.



What are the advantages of living in an apartment versus the ger district?

Well, apartments are comfortable, but living in an apartment makes you lazy. You forget how to do work. You just live inside 4 walls. If the ger district had heating and running water, then it's just as comfortable and convenient as an apartment. You have your own land and you're free to leave the house whenever you want. It can be like the houses abroad. Just the heating and running water is the reason it's hard in the ger districts.

Are you more restricted in an apartment?

Yes, well you don't know how to work because you never to labour. If ger districts modernize and figure out the heating and running water situation, that would be good. The government can't move everyone into apartments anyway, and people can't afford apartments themselves, so if they build infrastructure for the ger district households, then it's not a problem.

You mentioned that neighbors really knew each other well.

That's right. You knew everyone who lived in the same entrance as you. Even now, our kids are in touch with the neighbors. They grew up together as kids so they all stay in touch and know how everyone is doing even to this day. They know about their families and everything.

Were there any activities you did as a block or a community?

We did community patrolling. You did a lot of things together in your workplace, like lectures and courses and shows and cultural experiences.

What are some specific things that your apartment block did as a group?

For example, in school, classes did community clean ups together.

Oh yes, we did community clean ups as an apartment. A lot of those were organized.

Ulaanbaatar was different back then. Now there's no community activities in the apartments.

I don't think people know their neighbors anymore. Everyone just holes up in their apartments. People don't work at the same place so there's no sense of community, and you don't know who's who. During Tsagaan Sar (Mongolian New Year) when you're visiting families, you ask people if they know where he or she lives and they wouldn't. Back then, you knew everyone and all of their family because everyone worked at the same place and all the kids went to the same school. Everyone hung out on the playground with their kids. Everyone knew everyone and asked how you were. Now that doesn't exist. The old timers in our block 9 apartment all played chess outside. That probably doesn't exist anymore. I wouldn't know. It's been over ten years.

How would you compare the city back then as opposed to now?

Ulaanbaatar was a beautiful city when I was young. All of the fences were painted and no one stepped on the grass. If you stepped on the grass, you were fined 5 tugriks. Everything was orderly. The city was so green. Our place was located behind Ulaanbaatar Hotel. My father was a carpenter at Ulaanbaatar hotel and my mother was a seamstress. Back then, the air was in Ulaanbaatar. We didn't have crowded ger districts. There was no migration to the city back then. Everyone had jobs and services they needed in the countryside. They had timber factories and everything back then. They had no need to come to the city. Then when the communist system collapsed, the unions disappeared and all the factories were laid to waste. We even used to make our own shoes and make the wood to build our houses. There was the Socialist Labor Brigade where we would go to each other's houses and help each other build our houses. My father was the head of the brigade. There were a lot of cultural shows and dances and parties organized by the community. That's how I spent my youth. And the streets by the hotel were lined with trees. And everything was painted, and a water truck watered the roads every morning, so there was the smell of wet earth and pavement every morning. It was beautiful. It was truly the pearl of Asia. When the revolution happened, all the buildings became dilapidated and abandoned. Now there's no urban planning, and there isn't even space to put your foot down outside. The areas around 1st and 10th khoroolol were wide open spaces. Now it's full of random buildings and you don't know how to get through them. There's no organization or planning. It was so open and free. It was truly the pearl of Asia. There were many factories. Our job was to monitor the products coming out of the factory lines, like shoes, leather, furniture, felt. Everything was produced here. First we were located at the white 1-story shoe factory, and then we moved to the new 9-story shoe factory. The staff and employees were sent to Czechoslovakia for training. Everything was new. Then when the free market came around, all of the factories closed down and the workers all became jobless. Just in the shoe factory alone, 3,000 - 4,000 people worked there. On the night shift, there were crowds of healthy young men at 1 in the morning waiting for the busses. Everyone was employed and worked hard. There was no time for alcohol. Everyone worked towards building Mongolia. This was the '70s and '80s. Up until 1992, everyone had jobs and communities. No one had time to idle around. Then in 1992, that ended. This huge system of supply and inventory that covered Ulaanbaatar as well 18 aimags disappeared within two years. All the workers became unemployed, and the factories and things went to just a handful of people when it became private. 3,000 or 4,000 workers went jobless. The free market system started all wrong. The transition was handled poorly. We're only 3 million people, and if we had all of the factories and everything now, we would have been like a bear. Our old president Ochir-Bat said he'd make our country a bear. Now it's more like a bar. If you want to improve the ger districts, all we need is running water and heating. You can't build everyone apartments so all we need is water and heat. Then you wouldn't even need to build apartments.



How long have you been living in this house?

We sold our 4-room apartment and started a grocery store here. We eventually kept building on it and now it's a two-story structure. We used to live on the second floor. Then in 2012, we build this extended house here, leased out the second floor, and moved in here. With our store, my husband used to manage sales and I used to gather the products. But now we're old and we just do the heating and we rent it out to someone. We're retired but our pension isn't enough so we have to have another source of income. We have kids to raise.

What are your hopes for the future?

I hope in the future the ger districts are connected to infrastructure so that we have running water and heat. Then there would be less pollution. They can't build apartments for everyone. Ulaanbaatar is getting bigger and bigger. No one can afford apartments. Jobs are scarce. Life in the ger district is hard. When we had our little shop, there were people who couldn't afford to cooking oil. They had to get it a few grams at a time. People are living hand to mouth. In the winter, heating is a real problem. People don't have jobs or a salary so people are starting to use alcohol more. When people had jobs, they'd work 8 hours a day and get a salary. You were happy. Now, even if you work, it's hard to get paid. Men work in construction, and then they don't pay them for their work. They get discouraged and they're not interested in finding work anymore. I just hope our people, especially young people get jobs and salaries. Young folks without jobs just hang around the streets and start getting involved in crimes. They just look for ways to get their next drink. I hope they'd get jobs. If they get jobs, their lives will get better. If you don't have a job, then how are you going to spend your days? This potential workforce just hangs out on the streets and idles away the days.

Back in the day, people hardly ever drank alcohol. If someone starting drinking too much, the community would get together and stage an intervention. Your boss would get upset and help out. If someone was struggling, the others helped look after their kids and whatnot. We don't have that anymore so everyone just struggles to look after themselves. In the summer, there are odd constructions jobs that the ger district men take on. In the winter, there's no work to be had. They just idle around. So maybe if we revitalized our industry and provided employment to all these young people, then their lives would improve. Otherwise, how can your life get better if you don't have a job?

They can't get an apartment so they just put up a ger anywhere, even on hilltops. So if you at least solved the infrastructure problem, then it would at least improve Ulaanbaatar's pollution problem.

There's also soil pollution. If we were connected to the central sewage system, then we wouldn't have that. I mean, Mongolia has a very small population compared to other countries that have hundreds of millions of people. We're just 3 million people. We have plenty of land. We have plenty of livestock and natural resources. You'd think it would be enough for 3 million people to live prosperously. If we had the right administration and right government, we would.

That's about all the questions I have.

That's my life and my opinions. I reminisce about the past and how everyone had jobs and worked hard. I wish we could be like that now. We had every kind of factory. We don't have them now. We have all the resources. We would make our own clothes and we have the land to plant our own crops. We have the livestock. It's entirely possible to live prosperously. If only our country can get organized. It's regrettable that we lost what we had. We had an industry. The clothing factories were wonderful. Thousands of people worked there and worked in shifts. In the socialist days, we had plans and worked towards them. There was no time to drink and party. Everyone scrambled to work back then. Now that there's no work, what's the people going to do? Everyone is trying to get higher education, and even with that you just end up working in a shop. Back then, we had a small number of high quality colleges and quality workforce. We had all kinds of polytechnic institutions that taught all kinds of trades. We learned all of these things from the Russians. Now they're privately doing something. Those days are over now with no legacy. People were well trained back then. People who made shoes worked in the shoe factories and made good quality products. We just don't have jobs now.



Oyunbat Interview Transcript (London Design Museum Film - PART 1)

How are you? How is your work?

Work is good. I moved in to the city and I've been working in the city and it's great! I have a community and I'm always busy so it's great that I have work no matter how big or small. Sitting at home idly is not very easy for me. I get bored easily! I am getting old now and I'm retired, but I don't want to sit alone at home all day. Rather than do the same housework everyday I would rather have a workplace with colleagues and a community and develop and modernize along with the city. The countryside is nice too.

Is the retiring age 55 for women in Mongolia?

I have 6 kids so I retired at 50. But in fact, because of how we're compensated, I retired when I was just 36-years-old! [Laughs] It was the '90s so because of compensation I retired at 36, but still I kept working until I was 50. Women with many kids retired early at age 50. But I wasn't going to sit home all day when I was only 50. I wanted to work and contribute to society when I was still strong and able-bodied. Working and being part of a community is much better for me. So even after 50 I've been constantly working at various places. 50 is still very young. In the 90s I retired at 36 because of compensation. I was dreaming about my work and my colleagues. I hadn't done any herding for years but I decided to get some livestock and try herding. I only did herding when I was a child with my grandparents. Later, I went to school and started working in the public sector until I retired young with 6 children. The 90s was the transition period so everything was being privatized and the economy wasn't in good shape. Then I thought it might be a good idea to get some livestock and become a herder. When I became a herder, it was quite nice actually. It's perfect for a Mongolian to live in a ger and be a herder. You learn all kinds of new things. Being a herder requires a lot of skill and intuition. It's not just work for the unemployed. The Mongolian heritage is truly in being a herder. Being a herder is almost like a kind of college. For example, there's a lot to learn when the babies are born. I have a funny story actually. It was just around the eve of the lunar new year. When I was a kid, we would usually just herd for the summer and spend the rest of the year at home so we didn't know about the spring season when the offspring were born. Our son brings in a goat saying that it just gave birth. My late husband was preparing for the new year at the time. All of a sudden the goat starts kicking at the floor and going crazy. We all started to panic and thought that it was going to die. It start making all these strange noises and suddenly, it gives birth to another baby goat. It was a twin goat. We brought the goat and its newborn inside because we were worried that it would get cold when it suddenly had its twin! We were all running around in a panic. We had some fun times in the beginning when we were learning. After a while you get used to it and learn how to be a herder. It's wonderful. Like I said before, spring is a herder's bliss. Offspring are being born and the weather is starting to get warm. Green grass begins to peak out from underneath the melting snow. You hear the trickling of water everywhere from the melting snow. Birds begin to sing their songs. You open your ger door and watch your livestock grazing as you drink your tea. You can see for miles and miles. It's beautiful. Even now on a quiet spring

afternoon I think about the countryside and I can almost hear it. It's truly beautiful.

And then we were hit with a dzud! Our livestock were starting to grow and everything was looking up. We had almost 300 sheep and goat, around 40 cows, we had a couple of bulls and everything. Then we had dzud two years in a row. It really takes a toll on your. We were outnumbered. Someone would take the cows and go look for a place with good pastures. Some would take the sheep and go. Someone would stay and look after the ger with a few young animals to feed and take care of. I stayed behind with 11 calves. The horses would only produce half of the usual manure because they don't eat much. We almost collected it straight from their rear, mix it with the nutrients, and feed it to the calves. They're always hungry and cold outside in the winter. We wake up in the morning and one of them would be dead. It wasn't easy. After the dzud, we only had one calf and 5 cows left. We sold them off and moved to the city.

I was retired by then but I decided just to do some regular work instead of being a herder. In the beginning living in a ger in the city wasn't great. But we managed. Once you get into the society and flow of the city you start adapting and growing with the city. Then the city is nice as well. In a sense, you're much closer to everything. You also start becoming more refined. You have to adapt if you want to live shoulder to shoulder with everyone else.

I lived in a ger when I first moved to the city. In the '90s, we had 6 kids, my late husband and I were both unemployed, so we decided we should started moving to the city and we moved to Tseel soum in Tuv aimag from Arkhangai. We came to Tseel in 1996, and he died in 1997. I became a single mother with 6 kids so what did I do? I worked. I worked like you wouldn't believe! [Laughs] I surrounded myself with my friends and I started to meet lots of people. It's always good to treat people well. If your heart is good, then so is your fate/fortune. Everything turned out all right. My kids all went to school. Now they're all grown up and they have families of their own. Even now I'm still working!

Did you herd when you were very young?

My grandparents had livestock. My mother's brother-in-law also had livestock. Their kids would stay at our place during the school year and in the summer and the breaks, we would stay with them with the herd. So the winter would be spent at our place and the summer would be spent at theirs. The summers in the countryside were beautiful. The days were long. Back then we milked the sheep and goats twice a day. The grown ups herded the sheep and goats while the children herded the lambs and the kids. We used to take them to the river and play all day. We took turns herding them, but mostly we just played at the banks of the river building mud gers. Before we know it, the sheep would be back and the lamb would all go running towards



them with their tails up in the air as soon as they heard bleating in the distance. We'd go running after them, but of course they were much faster than us. Then the sheep and the lambs would be all mixed up and we would get scolded. Usually the lambs would just graze on their own and they would all bunch together and lay on the grass on warm days. In the meantime, we chased butterflies and hunted gophers. We would take a 5-liter bucket with us. One of us would bring water from the river and pour it into one hole in the ground while someone else waited at the other hole. Eventually all the water would push the gopher out and one of us would grab it and yell "hit it! Hit it!" Someone would bash the thing on the head and we'd have ourselves a dead gopher. The reason we had to kill the gopher is because of school. Back then there was a 'national plan'. They told us to bring 5 or 10 gopher furs. The parents would obviously be too busy to hunt gopher for us so we would have to do it ourselves. It was our homework, and there was no way we weren't going to do our homework. When school started, we also used to flatten and dry flowers, leaves and butterfly in between the pages of our notebook. I guess it was a way of learning about nature. We would pick leaves that were as big as our hands and put it in our notebooks. We'd ask our parents for their names and write their names underneath. We sewed butterflies straight onto the paper and dried it. Underneath that we would write their names as well. We did the same with flowers. The flowers back then were beautiful. They were huge and colorful. We also got competitive with how we dried it. If someone had a nicer flower than yours, you'd go looking for an even nicer one. We dried plants and butterflies. We hunted gophers. We herded lamb. That was what kept us busy in the summers. We were kids so of course we got in trouble.

I once found a couple of bird eggs. I had no idea what bird it was. Once I found a couple of grey eggs about this big. I took them home and my mother started exclaiming that they were crane eggs and that I have to put them back where I found them immediately. She said, "cranes will slap you dizzy and curse you if you don't put them back!" I ran back out with the eggs and of course I don't know where I found them so I just laid them down on some rocks and ran back. I could see the cranes circling in the sky but they didn't attack me. I learned my lesson then and didn't mess with bird eggs again.

We were kids so we got into a lot of trouble. We were also taught not to urinate on the headspring. We could mix anything white into the waters. We should stir water with our milk spoons. We shouldn't urinate on the headspring. I wondered what would happen if I did so I tried it and I got three warts right across my bladder! I think I was a real rebel. I couldn't walk. My mother had to 'cleanse' me with incense and everything. She scolded me for being such a troublemaker. "I told you not to pee on the headspring!" My sister ratted on me. She told me she would but I did it anyway! Who knows what actually caused the warts but I was little and I believed it was because I peed on the headspring.

Sometimes we would get water. We were little so we would only get them 2 or 3 liters at a time. We got them from the river but we ended up just playing at the river. Our parents called after us but we couldn't hear them because we were so caught up in our games. A grown up would come with a horse and herd us back home. We would go running with a couple of liters of water each. It was fun when we were kids. The nature was so beautiful back then. The day was so long. We went herding the lambs in the morning and the day seemed endless. We had more times in the day. It wasn't just morning, day and night. There was morning. Then we had pre-noon. I guess it was around 11 o'clock. Then around 2 o'clock it was afternoon. Then around 6 or 7 it was evening. But it seems so long just between those hours. The sun took forever to set. It would hang lazily in the sky for eternity. It was hot too, but it wasn't oppressively hot. It was beautiful. We couldn't fill those long days no matter how much we played and how much we herded the lambs. Then we gathered the sheep, fed the lambs, milked the goats, and herded them again. We did it once, sometimes twice a day back then. The time gathering the sheep was also lunchtime for us. In the evening we brought back the lambs with the sheep. They would then go grazing in the open for hours. Then we rested. The ended and the next morning, we would do it all over again. As kids our only job was herding the lambs and looking after the cattle. Then in autumn, we'd be off to school again and we'd return to the center. Then over winter break and during the break of every semester we would go back to the herd. We would help with the livestock as much as we could.

After I graduated, I lived in the aimag center for 20 or so years. I worked in the center until I retired and became a herder again. Then of course there was the dzud. The dzud was really very hard. A natural disaster like that really wears you down. You're helpless against it. Animals will even eat each other. When the sheep go by the cows, they have to scurry. Otherwise, the cows will try to take a bite out of them. When someone comes by for a cup of tea, they'll tie their horse outside. If there's a calf around, the calf will have eaten the horse's tail until there's nothing left. Sometimes you can even see the tailbone sticking out. A horse's tail doesn't grow back so you have to keep checking that your horse's tail doesn't get eaten. While it's standing their having it's tail eaten, it'll produce a bit of manure that the livestock can actually eat. Horses are very useful animals.

During a dzud, everything becomes blindingly white. You can't tell where it's hilly and where it's plains. The sky and ground all melt into one monotonous white sheet. When there's a dzud, you know what happens? It's always windy. Even when there's no storm, the wind is always blowing. Ripples of snow wash over the ground all the time. When it's windy like that, the snow becomes rock hard. In the winter, livestock use their hooves to dig through the snow for grass. When the snow is rock hard, they can't do that anymore. The animals' hooves starting cracking and they start limping. Then there's nothing they can do except lay on the ground and you feed them on the ground.



The grass begins to grow from underneath the melting snow...



And the air quality in Ulaanbaatar back then was incredible.



You didn't have crowded ger districts like we do now.



They had everything they needed...

The dzud is very hard. Cars can't go in the winter but horses manage to make it. The snow is rock hard and it can support the weight of a horse. So the only way you can travel is on horseback. The livestock cannot graze so the only way to feed them is to do it manually. When they can't graze, they don't move so they can't warm their own body. They have to keep moving in order to stay warm. So you when you feed them when they're just standing still, they get cold. Eventually, they just die. Dzud isn't easy. But when there's no dzud, the countryside is beautiful in the spring, summer and fall. You have nothing to worry about. You become relaxed and at peace. You never have to stress about what's going to happen tomorrow. The livestock graze on their own. It's not like you have to manually feed them. As long as they don't get mixed up with a neighbor's livestock, being a herder is a very peaceful occupation. The animals just eat until they're full, and when they're done eating, they just turn back and you pick them up.

On the other hand, there are wolves! Wolves are the enemy of livestock. I had an encounter once. We had just settled into our winter settlement. It was a hilly place. We had just erected the ger and the housing for the calves. I figured it was about time the cattle were coming home so I decided to go check. It was around 5 o'clock. It was still light out. I got on this little hill and surveyed the area. They were nowhere in sight. I decided to go out a little further and the calves just come running back home. There was a little brown calf. That one fell, got up, and tried to run, but then it just double over again. It kept tripping over until it barely made it back into the gate. I was wondering why it was tripping like that. It kind of looked like something was pulling it down. It was about the distance from here to "Telmuun" center, which is where you got off the bus. So I got on a hilltop about that distance and I saw that it was a wolf. It just kept pulling the calf down. The calf fought back until it was released. And then the wolf would catch up and drag it down again. Wolves aren't frightened of women. I yelled my lungs out. The wolf just looked at me and casually paced back into the woods. When I got home, all the meat in the brown calf's leg was gone. The skin was intact, but the meat was gone. It's like the wolf sucked the meat out. The calf just stood there for a moment, shivered, and died in 5 minutes. I don't know if the wolf's saliva is venomous or something. The calf just died right then and there. Where there are livestock, there are wolves, so we do have to deal with wolves.

That's my encounter with a wolf! They really don't care for women. I yelled as loud as I could, but it just looked at me with a 'what are you going to do? You don't even have a gun' look. It can tell the difference between a man and a woman's voice. No matter how loud you yell, it's unfazed by a woman's voice. It'll just throw you a couple of glances and walk away. When you're a herder, you have to face the wolves.

Weren't you afraid?

What have I got to be afraid of? There was still daylight. There's no point in being afraid. I was close to my house anyway. The wolf and I were about the distance from the bus stop to my house. And my ger was just here. But wolves are always around. They'll stand just outside your sheep corral and howl. Maybe they're calling the others. I don't know. But the dogs start barking, and it's unmistakable. When a man goes out and yells all goes quiet. When a woman does it, nothing. Wolves know the difference.

It's smart.

That's right. It's very smart.

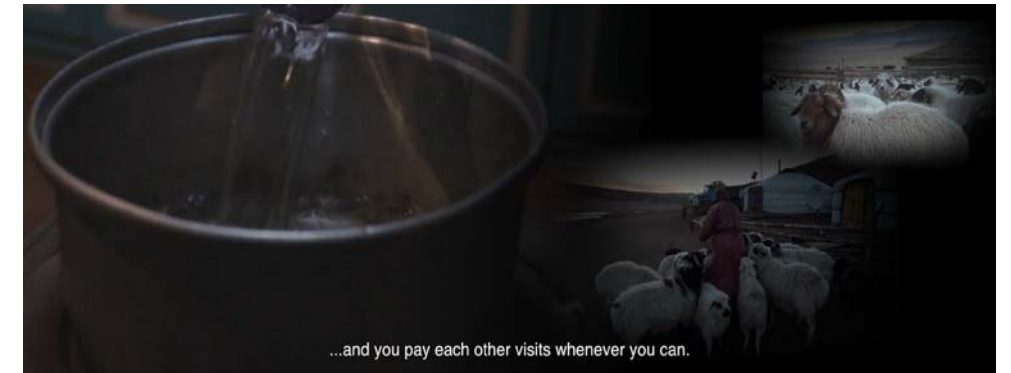
But I guess wolves are commonplace in the countryside.

They are. They're supposed to be there. The reason is they help weed out any of the sick animals. In that sense, they serve a purpose. They cleanse the livestock. If there were no wolves, who knows what kind of epidemics are viable to spread. The wolves eat and eradicate any sick animals or their carcasses so they also play a role in the ecosystem. But there's a legend with wolves. The gods told wolves to eat one sheep and leave the others, but the wolves are hard of hearing and thought that they were supposed to leave one and take the others. So if a wolf gets into your livestock, it bites all of the sheep in the neck and takes the last one to eat. The sheep scatter in all directions so the wolf goes for whatever it can get, and just ends up with its last catch. But it'll always kill more than one. One wolf kills at least ten. If its 2 or 3 wolves, it'll wreak havoc. 50 or 60 sheep dead. That's where the story comes from. It's a nasty animal.

The dzud is truly scary. After dzud you moved to the city.

Yes. We moved to the city after the dzud. Only the strongest animals survive a dzud. We had one calf that survived from my ten, four 3-year-old cows, and 5 fully grown cows. And we only had 70 or 80 sheep and goats. It was too few to sustain us so we gave the cattle to my son-in-law who was a herder and sold the sheep and goats. We also had a handful of horses. Maybe 7 or 8. All of our horses survived actually. That was purely because we had a good stallion to look after the team. During a dzud, the stallion leads the others to the safest, most sheltered place with plentiful grass. When the horses went off, we didn't even have the strength to ask after them. We thought they were gone. There was no one who could go after them in such a brutal winter and no horse that could bear the trip so we just let them go. Then, in the spring, all the snow melted. All of that snow melts away in just two days. When all of that snow melts, the valleys start flooding with water, so everyone has to move their gers to higher ground and collect the livestock that survived. Then when the weather started to clear, we thought we would start asking after our horses. During the dzud, horses just died en masse in trenches. They died almost 70 or 80 at a time. Horses always follow the first one in the team and they just followed them to their deaths.

We thought our horses had met the fate. There was a river that created the pastures where all the animals grazed. One day, every single one of our horses plus two foals showed up from the distance at the top of the river. Our horses were the only ones to survive the dzud. We were so happy. It was



...and you pay each other visits whenever you can.



When we lived in an apartment, we all had jobs...



You never had to build a fire or manually bring water...



When the system changed, we fell on hard times and sold our apartment.

because they were lead by such a good stallion. None of our horses died that year. But we had already decided to move to the city by then so we sold our horses anyway. Then we moved to the city and our kids went to school and got jobs. I got a job operating a little shop. That's how my life in the city started!

The city is also nice. A lot can fit in between these four mountains, for better or for worse. Maybe it was because I worked at the aimag center but I adapted to the city fairly easily. I got a job and became part of a community, so it was great for me. Sometimes I miss the countryside, and of course I visit. I have family there so I try to go whenever I can. I try to go get some rest and breathe some fresh air every now and then.

PART 2

What kind of relationship did you have with your neighbors in the countryside?

It was nice. Country folks are very compassionate and kind people. They openly share whatever is on their minds and celebrate and grieve together. We reminisce about the past over a cup of tea. We ask after one another and always try to stay in touch. Country folks don't usually harbor malice or dark intentions.

People think herders live isolated from others, but there is a community within the same valley, right?

Households in the countryside have to keep their distance from their neighbors because there's the danger that your livestock will get mixed up. But of course you could visit each other and share a cup of tea so it is possible to have a community in the countryside. You have a lot of friends in the countryside. They're always asking about how everyone is doing. Country folks always look after each other like that. If you live in the same valley, but haven't seen or heard from them in a while, then they'll pay them a visit just to check if everything is okay.

What about communities in the city?

Life in the city is rather isolated. If you work, then your workplace will become your community, but if you just stay at home, then your whole life takes place inside the fences of your plot. Maybe under certain circumstances you'll have to ask your neighbor something, but otherwise, it's a solitary life. Maybe you'll meet your friends from school or from your hometown, but that's about the greatest extent of your social circle. It's as open as in the countryside. You're restricted to your own space. You couldn't walk down your street and visit anyone on your street.

Why is it like that?

Maybe it's because people don't trust each other or every one is too caught up in their own lives and they don't have time. For example, the older folks have to take care of their grandkids. Compared to the countryside, it's not as peaceful. I think it's mostly because of that. No one has time to visit each other and talk for hours. Maybe if you've lived on the same street for

years, you'll see each other in the street and make some small talk, but you wouldn't go to their house and talk over a cup of tea like the country folks. No one has time. Older folks spend most of their time taking care of their kids. City folks don't have time to spare visiting each other like country folks. Plus, there are no public spaces for elders to get together in the Ulaanbaatar suburbs. Maybe there are places like that towards the center of town, but we don't have any places like that in the ger districts. There's nowhere you can get together to talk and meet one another and play in the warm summer days. That's also another reason. Everyone's lives are restricted to their own homes. That's the difference.

[Banter about the dogs barking]

That's what the city's like. Everyone is laid-back. No one stresses about work or the time. If you don't finish your work today, you can just finish it tomorrow.

So there aren't any public spaces in the ger districts.

That's right. For example, at our khoroo, there's only the citizen's theatre for the elders to meet. In my opinion, every heseg should have a space like that.

What would you call a place like that?

Elders' Recreational Center. It's a place where elders' can convene and converse. The biggest obstacle is that there is no space in the city, which is why it's hard to create a place like that. If we had enough space, we could plant trees there and have a garden. The elders could go there in the morning and do morning exercises and play chess. They could bring a thermal of tea. That way, the elders in the community would start to know each other and spend their time well. Otherwise, they all just stay at home all day. The conditions don't exist for them to have a life outside of home. There's no space.

In the countryside, you just go to each other's gers.

Exactly. In the countryside, you don't have fences like in the city. It's all out in the open. You just ride over on your horse, tie your horse outside their ger, and they will come out and greet you. They invite you inside, make some tea or food, get comfortable, and chat away. It's free. There's no place like that.

Also, your plot inside your fence is your private property.

Exactly. But of course, since you're Mongolian, you're welcome to visit each other, but city folks just don't have the time. In my opinion, it seems like city folks have certain restrictions. You don't want to go to someone's house and make them make food. I would rather visit a poor man's ger and chat with them than visit a rich man's ger for some food. But of course you can't have people over to your house and not offer them any tea or food. It just becomes a great imposition for everyone. That's perhaps one of the reasons people don't visit each other as much. Maybe if you see each other in the street, but it's not very intimate.



What hardships did you face when you first moved to the city and lived in a ger?

Oh, there were many. The countryside was so free. The first thing was water. You have to queue at the water kiosk. If the water kiosk was closed, then you didn't have water. In the countryside, you could get water whenever you wanted. In the city, you go out in the morning with your bag and money in your pocket for water. There's none of that in the countryside. You go collect your groceries. In the countryside, you just grab everything in bulk and you're set. You make your own biscuits. In the countryside, you usually made your own food. In the city, you have to buy it from the store. When you first come to the city, you don't have a job so you don't have money. You can't move a muscle without spending money. There're a lot of hardships. There's all of the noise. People have a selfish attitude. In the countryside, maybe it's because the store is far away, but if you need a nail, you just ask your neighbor and they'll give it to you if they have it. In the city, it's hard to go across town to get a nail. It's hard to ask your neighbor. Then you're forced to go to the store for even the smallest thing. And you have to get on the bus and everything. In the beginning, coming to the city was very frustrating. When you walk around the city, there's all of this noise as well. Then winter comes around and there's pollution. And there are alcoholics passed out on the storefronts. That doesn't happen in the countryside so you're afraid. You think of how awful it is. These are some of the differences.

Last question. The ger is originally made to move around, but how suitable do you think a ger is in the city where it can't move around?

Living in a ger in the city isn't suitable. Of course a Mongolian ger is nice, but it's not suitable for the city. I think an apartment is more suited in the city. You're not going to be moving around in the city anyway. A ger was originally made to move around. So it's not like that's going to happen in the city. A warm and cozy house or apartment is much better. In the countryside, you're always moving. You have to go where your livestock go every season. Since being a herder requires you to move, a ger is suited for that. It's actually perfect for it. A ger in the city isn't. You also have to move a ger to let the wood and the felt breathe. In the city, it's trapped in this little fence. And who has time to take it apart a perfectly fine ger and put it back up in the exact same place? So because that doesn't happen, the ger rots and dilapidates easily. It doesn't breathe and get any air. So a ger in the city isn't suitable. A house or apartment is better. It's much more comfortable.



And you need money for everything. It was quite frustrating!



The air pollution is a real problem in the ger districts.



Now we're both over sixty and retired. It's not easy.



A lot can fit in between these four mountains!

1C | DISTRICT TRANSFORMATION

Chingeltei-16, Ulaanbaatar

AIMS

To document the spatial transformation of three sample sites in Chingeltei-16 to understand the process and form of urban growth.

METHODOLOGY

Source aerial imagery of the entire district of Chingeltei-16 from 2009, 2012, and 2016.

Map the plot boundaries from each of the aerial images of the district to understand how the district has transformed from 2009-2016.

Select sample sites from Chingeltei-16 that represent the different conditions of the ger districts (urban, mid, and fringe).

Source aerial imagery of the selected sample sites from 2009, 2012, and 2016. Conduct drone mapping of the selected sample sites in 2017.

Map the plot boundaries, gers, and other built structures in the sample district to demonstrate how the sample sites have transformed over time through analytical drawings.

Extract data from the maps such as numbers of gers, numbers of houses, and plot sizes to compare the growth of the sample sites.

Use the data and drawings to compare with another khoroo (Sukhbaatar-16).

RESULTS

Growth in the khoroo is concentrated at the end of the road at the last bus stop between 2009-2016.

The rate of change in the urban sample fluctuates. There is low structure growth rates between 2009-2016 of 9.85 structures/year, but much higher in 2016-2017 of 52 structures/year.

The density of plots in 2017 in the urban area is almost three times more than in the fringe areas. The urban areas has a 14.96 plots/10,000m², whilst the fringe areas have a ratio of 5.17 plots/10,000m².

The density of structures (houses and gers) in 2017 of the urban area is much higher than in mid and fringe areas. The urban areas has a 27.6 structures/10,000m², whilst the mid and fringe areas only have a ratio of 17.5 and 9.6 respectively.

There are a lot more gers compared to houses in the fringe area than in the urban area. In the fringe districts, for every 10 houses there are 16 gers. In the urban districts, for every 10 houses there are 3 gers.

Chingeltei-16 is a well-established khoroo that is growing at a slower rate than others. The urban areas of the khoroo are reaching capacity with hardly any space for new plots. The rate of change for new plots is 2.4 plots per year. Each plot has completed fence walls.

Subdivision is the most common way of growth across all three sample sites, but occurring at a smaller scale in the urban areas. In the fringe areas the average plot size shrinks from 982m² in 2009 to 748m² in 2017, whilst in the urban area the average plot size was 500m² in 2009 and 480m² in 2017.



- KEY**
- 2009
 - 2012
 - 2016





TRANSFORMATION DATA

Chingeltei-16, Ulaanbaatar

	Fringe				Mid				Urban			
	2009	2012	2016	Drone 2017	2009	2012	2016	Drone 2017	2009	2012	2016	Drone 2017
Sample Site Size (~m2)	243,600				204,000				219,900			
No. of Gers	45	65	133	142	81	115	128	142	99	109	114	131
No. of Houses	23	40	81	92	138	168	195	216	387	409	440	475
Ger to House Ratio	1.96	1.63	1.64	1.54	0.59	0.68	0.66	0.66	0.26	0.27	0.26	0.28
Total No. of Structures	68	105	214	234	219	283	323	358	486	518	554	606
% of previous	-	154%	204%	109%	-	129%	114%	111%	-	107%	107%	109%
Rate of Change/ Year	-	12.3	27.3	20.0	-	21.3	10.0	35.0	-	10.7	9.0	52.0
Total No. of Complete Plots	50	59	125	126	133	152	180	191	308	315	327	329
% Change from Previous Set	-	118%	212%	101%	-	114%	118%	106%	-	102%	104%	101%
Rate of Change/ Year	-	3.0	16.5	1.0	-	6.3	7.0	11.0	-	2.3	3.0	2.0
No. of Occupied Plots	41	52	107	115	126	148	177	189	298	308	321	325
No. of Empty Plots	9	7	18	11	7	4	3	2	10	7	6	4
No. Incomplete Plots	16	28	21	24	10	5	5	4	0	0	0	0
Total Fenced Area (~m2)	49,100	58,100	93,100	94,200	134,500	138,500	145,500	149,700	154,100	155,300	156,700	157,800
% of previous	-	118%	160%	101%	-	103%	105%	103%	-	101%	101%	101%
Average Plot Size (~m2)	982	985	745	748	1011	911	808	784	500	493	479	480
% of previous	-	100%	76%	100%	-	90%	89%	97%	-	99%	97%	100%
% of Sample Site as Plots	17%	20%	32%	32%	43%	44%	46%	47%	62%	63%	63%	64%
Plots/10000m2	2.05	2.42	5.13	5.17	6.52	7.45	8.82	9.36	14.01	14.32	14.87	14.96
Buildings and Gers/10000 m2	2.8	4.3	8.8	9.6	10.7	13.9	15.8	17.5	22.1	23.6	25.2	27.6
Buildings and Gers/ Plot	1.36	1.78	1.71	1.86	1.65	1.86	1.79	1.87	1.58	1.64	1.69	1.84

Observations

Growth in the khoroo is concentrated at the end of the road at the last bus stop between 2009-2016.

The rate of change in the urban sample fluctuates. There is low structure growth rates between 2009-2016 of 9.85 structures/year, but much higher in 2016-2017 of 52 structures/year.

The density of plots in 2017 in the urban area is almost three times more than in the fringe areas. The urban areas has a 14.96 plots/10,000m2, whilst the fringe areas have a ratio of 5.17 plots/10,000m2.

The density of structures (houses and gers) in 2017 of the urban area is much higher than in mid and fringe areas. The urban areas has a 27.6 structures/10,000m2, whilst the mid and fringe areas only have a ratio of 17.5 and 9.6 respectively.

There are a lot more gers compared to houses in the fringe area than in the urban area. In the fringe districts, for every 10 houses there are 16 gers. In the urban districts, for every 10 houses there are 3 gers.

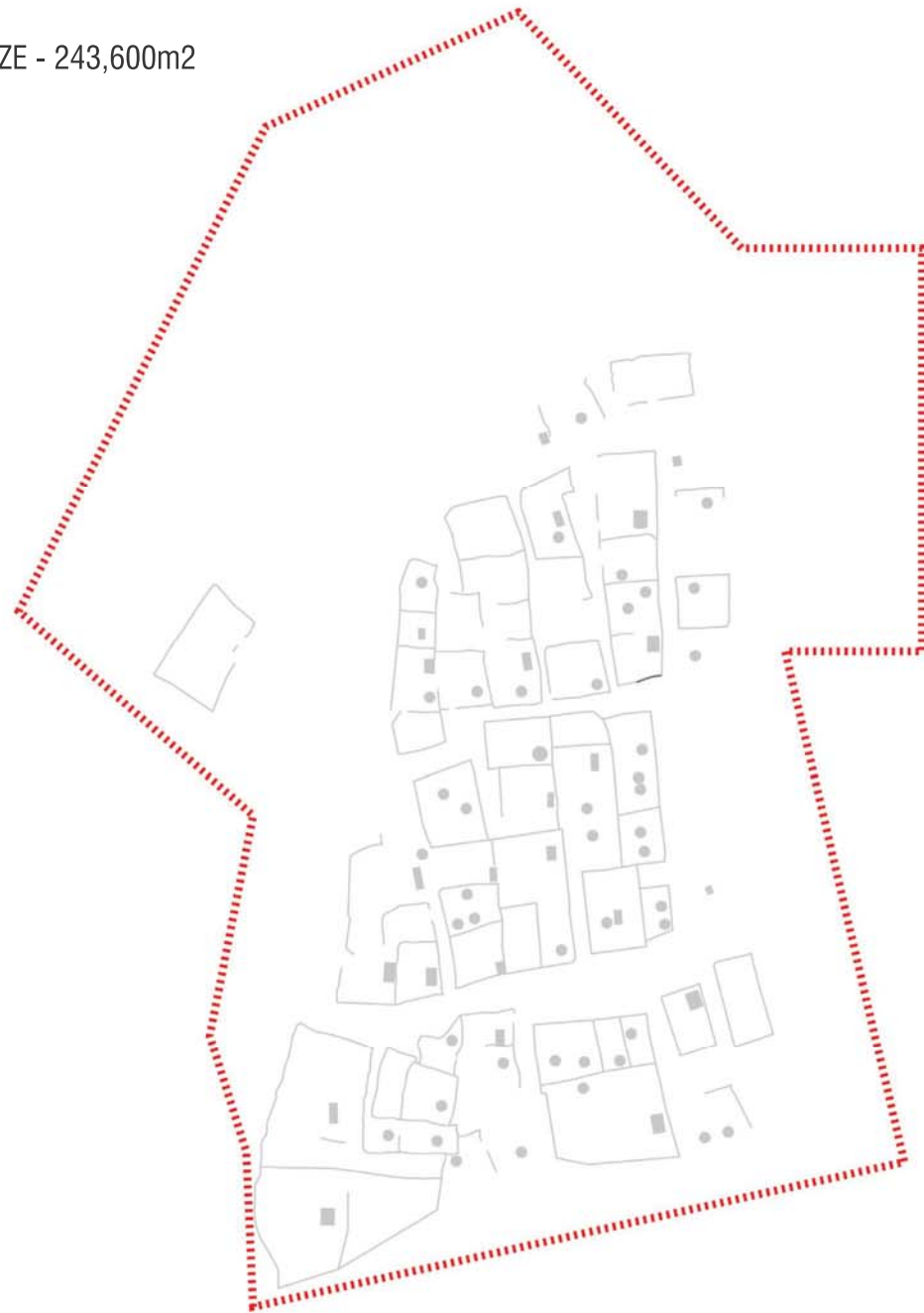
Chingeltei-16 is a well-established khoroo that is growing at a slower rate than others. The urban areas of the khoroo are reaching capacity with hardly any space for new plots. The rate of change for new plots is 2.4 plots per year. Each plot has completed fence walls.

Subdivision is the most common way of growth across all three sample sites, but occurring at a smaller scale in the urban areas. In the fringe areas the average plot size shrinks from 982m2 in 2009 to 748m2 in 2017, whilst in the urban area the average plot size was 500m2 in 2009 and 480m2 in 2017.

2009

Chingeltei-16 [FRINGE]

SAMPLE SITE SIZE - 243,600m²



No. of Gers	45
No. of Houses	23
Ger to House Ratio	1.96
No. of Plots	50
Total Fenced Area	49,100m ²
Average Plot Size	982m ²
% of Site as Plots	17%
Plots/10,000m²	2.05
Structures/10,000m²	2.8
Structures/Plot	1.36

Observations

- Average plot size is very large, decreases in size through the years. Losing a quarter of the current area by 2016
- Fences appear first, gers and houses built later

2012

Chingeltei-16 [FRINGE]

SAMPLE SITE SIZE - 243,600m²



No. of Gers	65
No. of Houses	40
Ger to House Ratio	1.63
No. of Plots	59
Total Fenced Area	58,100m ²
Average Plot Size	985m ²
% of Site as Plots	20%
Plots/10,000m²	2.42
Structures/10,000m²	4.3
Structures/Plot	1.78

Observations

- Many isolated gers and portions of fencing
- Long fences that will later be divided to form different plots
- Visual change since 2009, fences where it was empty
- Empty areas of the plots are subdivided

2016

Chingeltei-16 [FRINGE]

SAMPLE SITE SIZE - 243,600m²



No. of Gers 133
No. of Houses 81
Ger to House Ratio 1.64

No. of Plots 125
Total Fenced Area 93,100m²
Average Plot Size 745m²

% of Site as Plots 32%
Plots/10,000m² 5.13
Structures/10,000m² 8.8
Structures/Plot 1.71

Observations

- Number of buildings and plots doubled since 2012. Many of the new plots were subdivided from an existing one or completed missing parts of a cluster.
- Roads became a lot more apparent as new plots grew from the end of rows.

2017

Chingeltei-16 [FRINGE]

SAMPLE SITE SIZE - 243,600m²



No. of Gers 142
No. of Houses 92
Ger to House Ratio 1.54

No. of Plots 126
Total Fenced Area 94,200m²
Average Plot Size 748m²

% of Site as Plots 32%
Plots/10,000m² 5.17
Structures/10,000m² 9.6
Structures/Plot 1.86

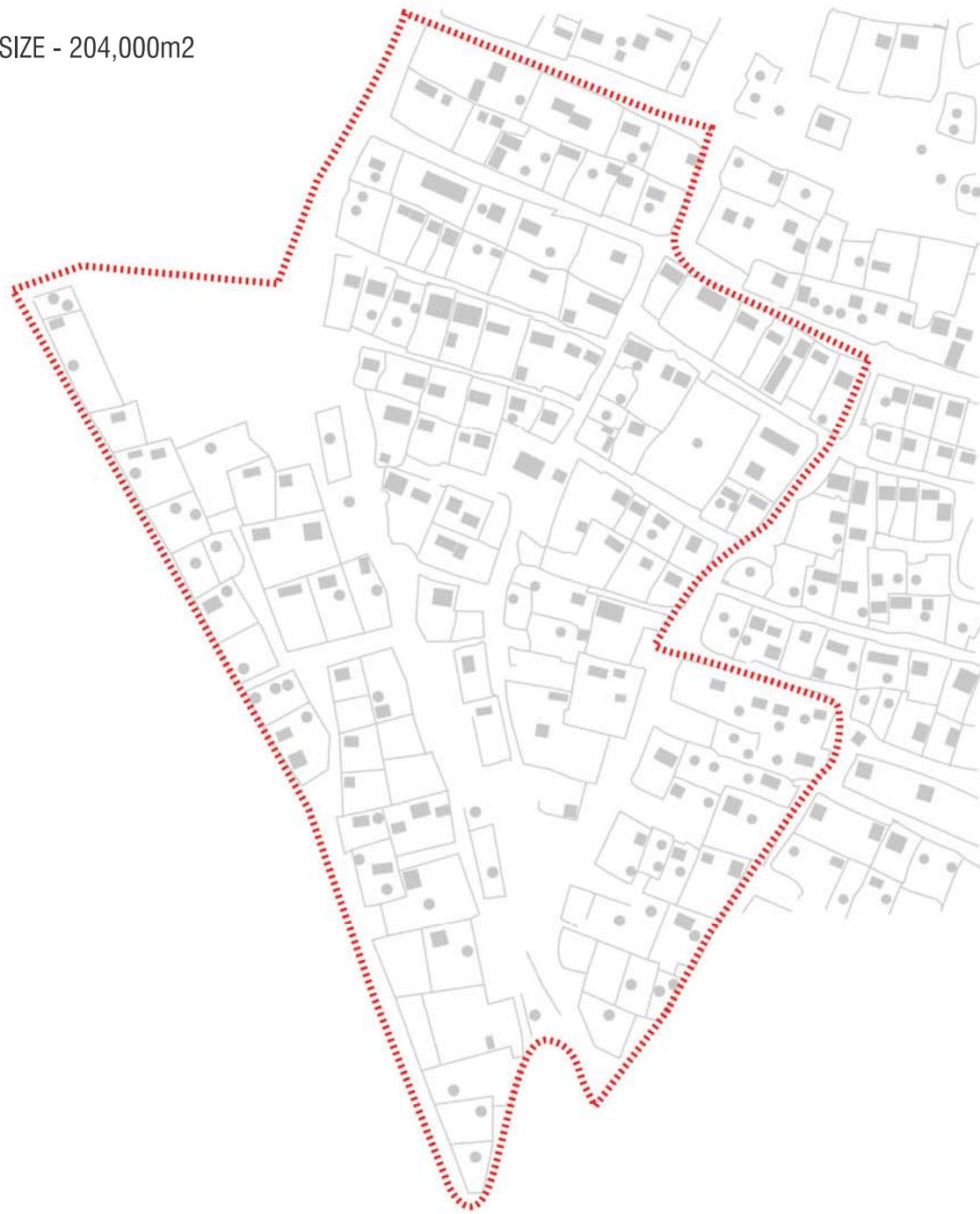
Observations

- Very little change between 2016 and 2017
- A few plots have expanded by relocation of fences, contributing to increase of average plot size.

2009

Chingeltei-16 [MID]

SAMPLE SITE SIZE - 204,000m2



No. of Gers 81
No. of Houses 138
Ger to House Ratio 0.59

Observations

- Density is similar to 2017 of the fringe areas.

No. of Plots 133
Total Fenced Area 134,500m2
Average Plot Size 1011m2

% of Site as Plots 43%
Plots/10,000m2 6.52
Structures/10,000m2 10.7
Structures/Plot 1.65

2012

Chingeltei-16 [MID]

SAMPLE SITE SIZE - 204,000m2



No. of Gers 115
No. of Houses 168
Ger to House Ratio 0.68

Observations

- New plots subdivided from existing, reducing average sizes
- Plots formed around existing buildings. Starts as a large plot with multiple buildings then divided to have smaller plots for each building.

No. of Plots 152
Total Fenced Area 138,500m2
Average Plot Size 911m2

% of Site as Plots 44%
Plots/10,000m2 7.45
Structures/10,000m2 13.9
Structures/Plot 1.86

2016

Chingeltei-16 [MID]

SAMPLE SITE SIZE - 204,000m2



No. of Gers 128
No. of Houses 195
Ger to House Ratio 0.66

No. of Plots 180
Total Fenced Area 145,500m2
Average Plot Size 808m2

% of Site as Plots 46%
Plots/10,000m2 8.82
Structures/10,000m2 15.8
Structures/Plot 1.79

Observations

- Growth a mix between subdivision of plots and portions of fencing being moved further into the street.

2017

Chingeltei-16 [MID]

SAMPLE SITE SIZE - 204,000m2



No. of Gers 142
No. of Houses 216
Ger to House Ratio 0.66

No. of Plots 191
Total Fenced Area 149,700m2
Average Plot Size 784m2

% of Site as Plots 47%
Plots/10,000m2 9.36
Structures/10,000m2 17.5
Structures/Plot 1.87

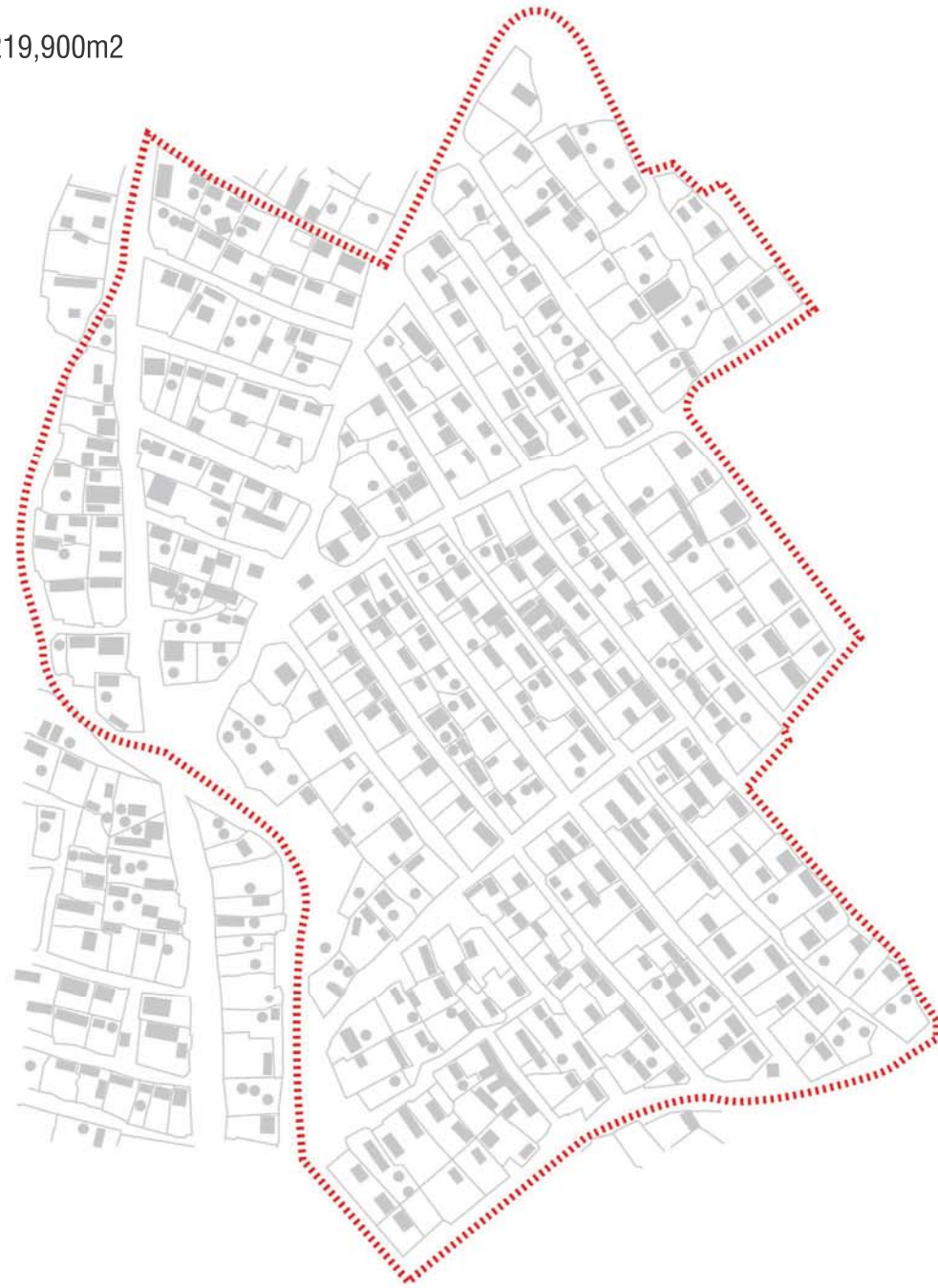
Observations

- Rate of change higher than the fringe.
- Percentage of building increase within a year similar to the four-year period between 2012 and 2016.

2009

Chingeltei-16 [URBAN]

SAMPLE SITE SIZE - 219,900m2



No. of Gers	99
No. of Houses	387
Ger to House Ratio	0.26
No. of Plots	308
Total Fenced Area	154,100m2
Average Plot Size	500m2
% of Site as Plots	62%
Plots/10,000m2	14.0
Structures/10,000m2	22.1
Structures/Plot	1.58

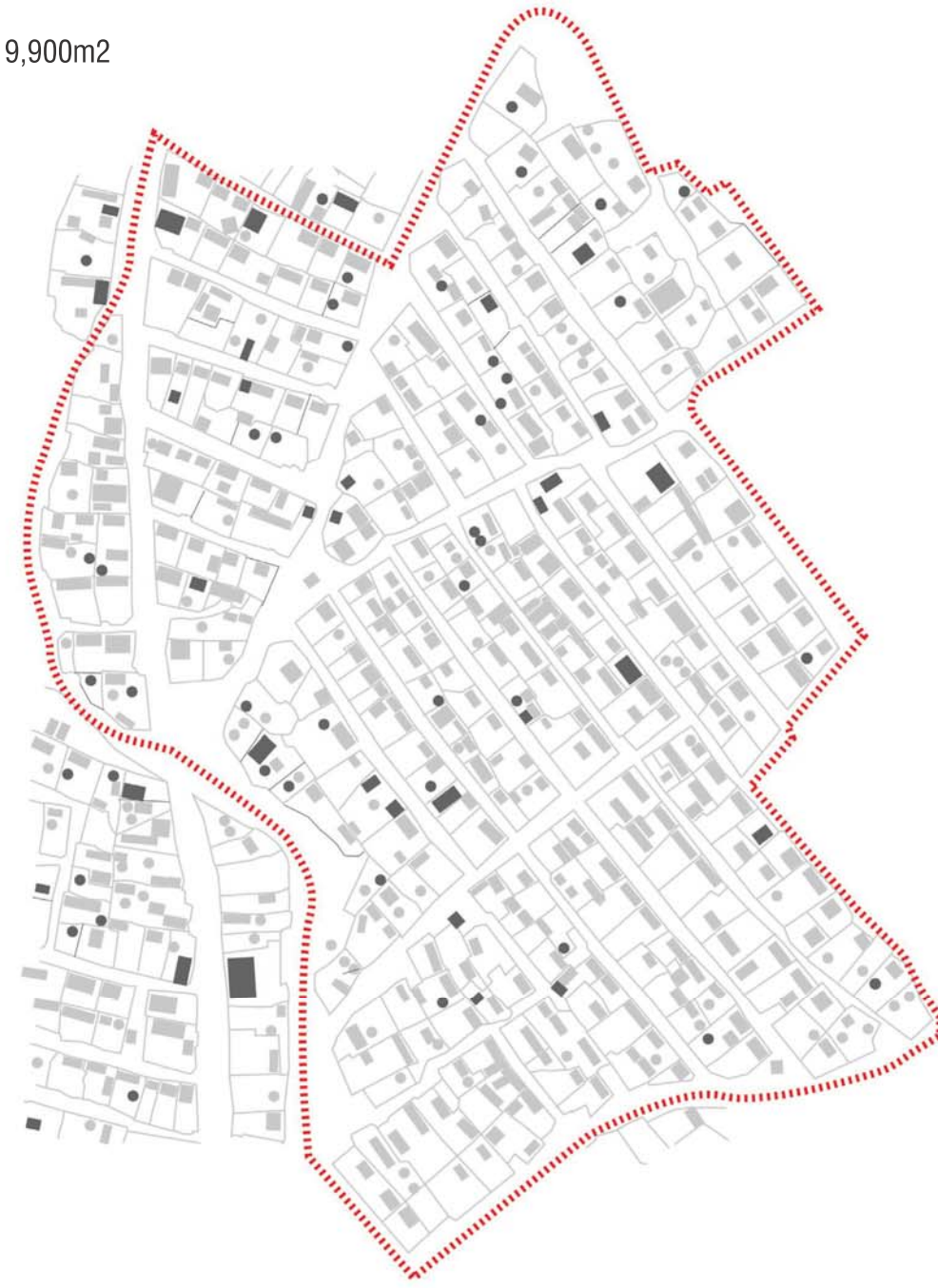
Observations

- Plots are much smaller and denser than the fringe and mid.
- No incomplete plots.
- Roads are clearly defined and narrow, there are very little free spaces left.
- The fenced area does not change much, changes occur within the plots.

2012

Chingeltei-16 [URBAN]

SAMPLE SITE SIZE - 219,900m2



No. of Gers	109
No. of Houses	409
Ger to House Ratio	0.27
No. of Plots	315
Total Fenced Area	155,300m2
Average Plot Size	493m2
% of Site as Plots	63%
Plots/10,000m2	14.3
Structures/10,000m2	23.6
Structures/Plot	1.64

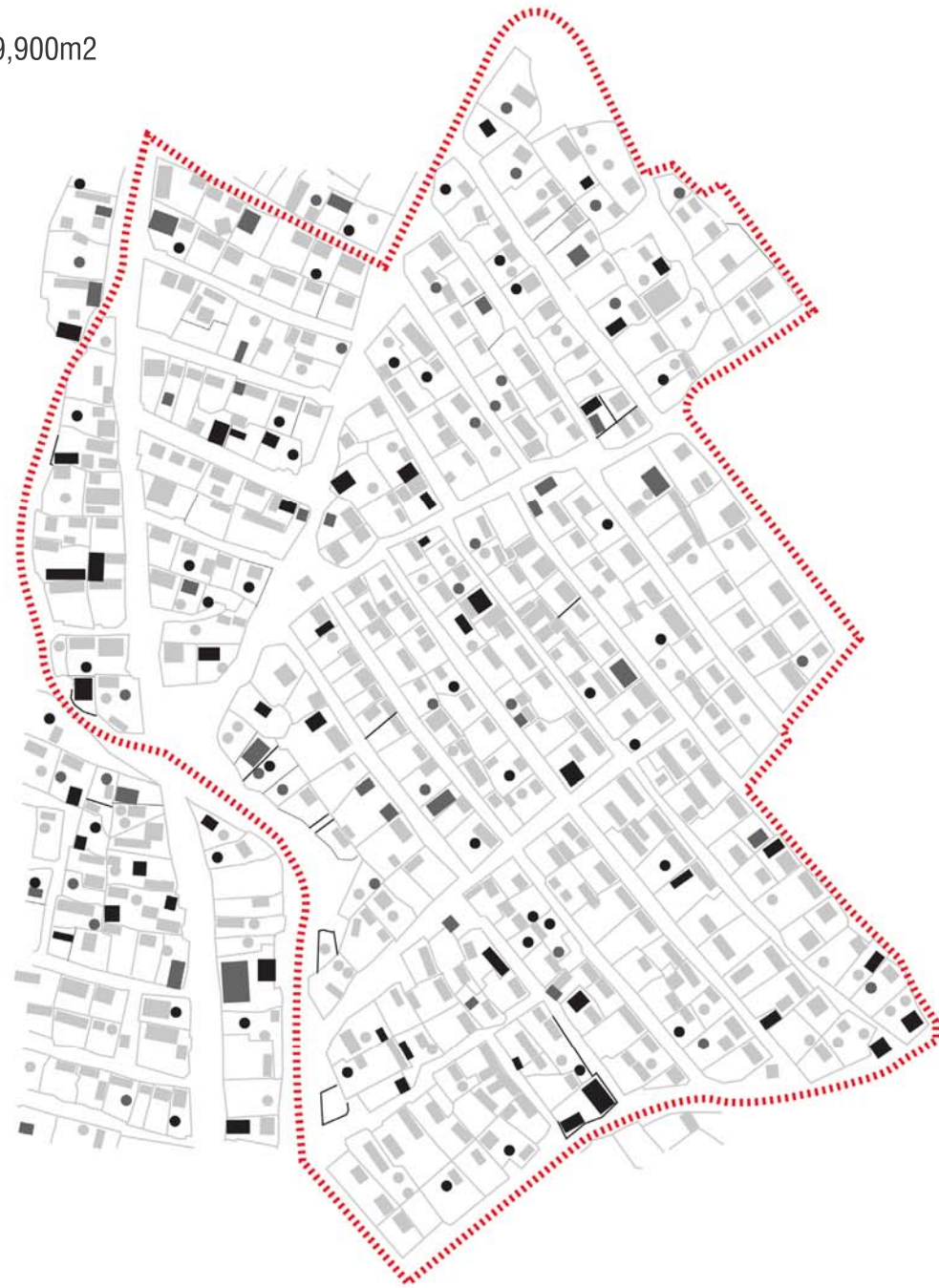
Observations

- Many gers become houses, but there are also additional gers within plots.
- A few cases of plot subdivision.
- Empty plots remain empty for a long time.

2016

Chingeltei-16 [URBAN]

SAMPLE SITE SIZE - 219,900m²



No. of Gers	114
No. of Houses	440
Ger to House Ratio	0.26
No. of Plots	327
Total Fenced Area	156,700m ²
Average Plot Size	479m ²
% of Site as Plots	63%
Plots/10,000m²	14.9
Structures/10,000m²	25.2
Structures/Plot	1.69

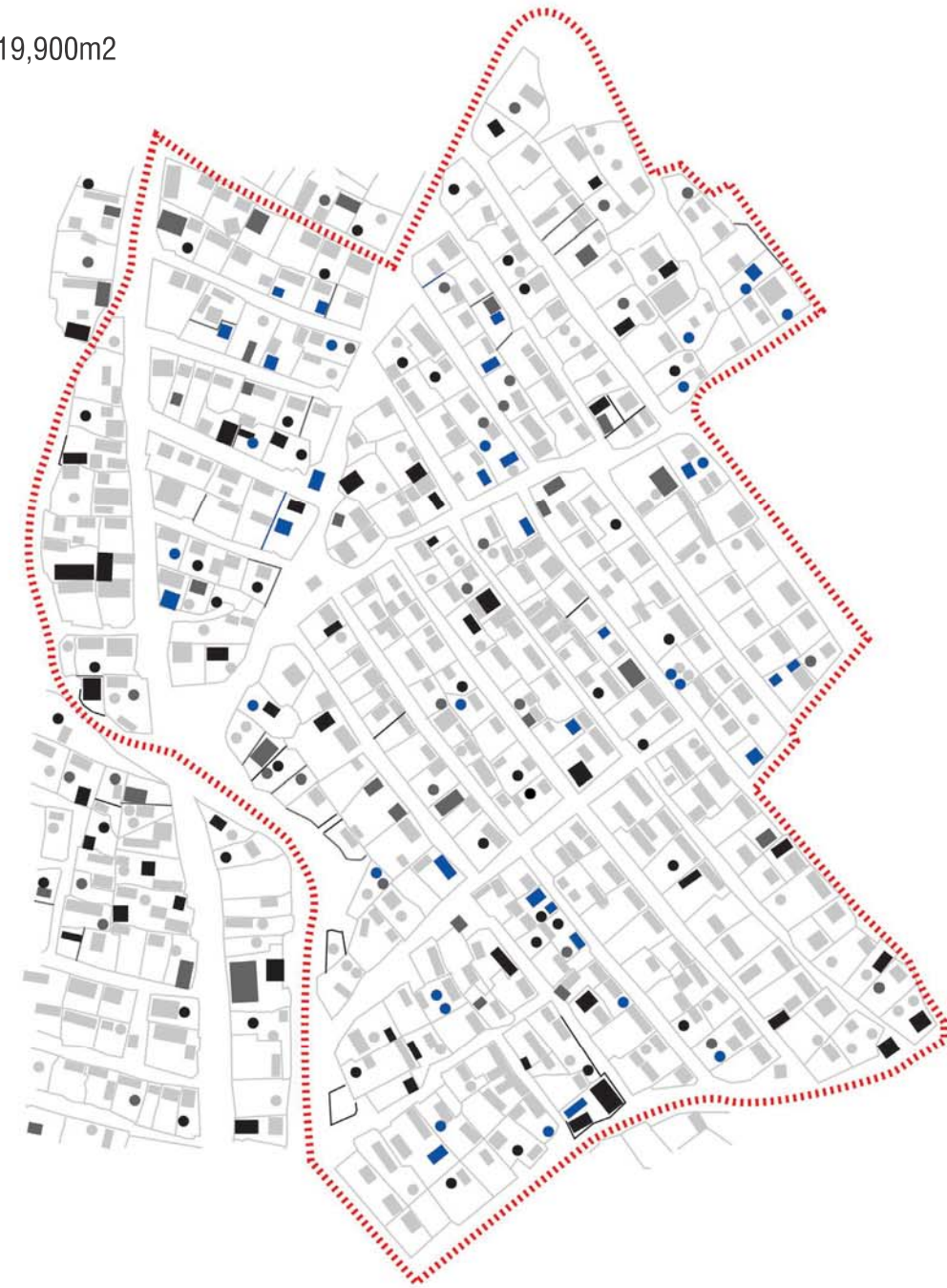
Observations

- New plots from filling corners and edges of clusters.
- Building rate is consistent since 2009.

2017

Chingeltei-16 [URBAN]

SAMPLE SITE SIZE - 219,900m²



No. of Gers	131
No. of Houses	475
Ger to House Ratio	0.28
No. of Plots	329
Total Fenced Area	157,800m ²
Average Plot Size	480m ²
% of Site as Plots	64%
Plots/10,000m²	15.0
Structures/10,000m²	27.6
Structures/Plot	1.84

Observations

- Rate of change is very high, similar to the mid area the percentage of buildings that have increased between 2016 and 2017 is similar with that from 2012 to 2016

FENCED AREA

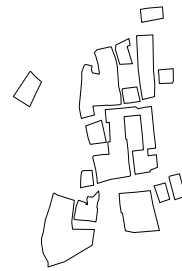
PLOTS

BUILDINGS

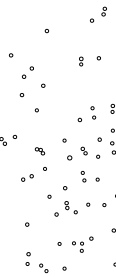
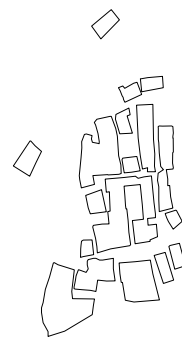
GERS

SAMPLE SITE

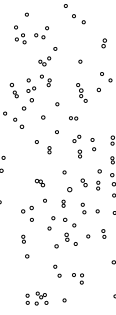
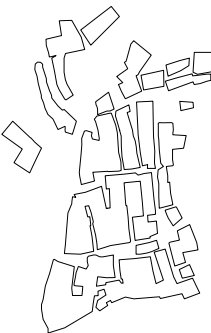
2009



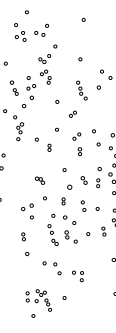
2012



2016



2017



FENCED AREA

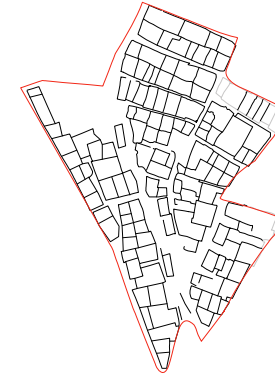
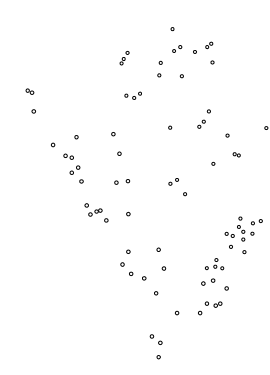
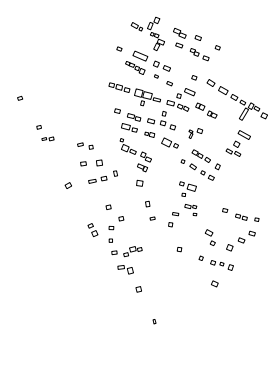
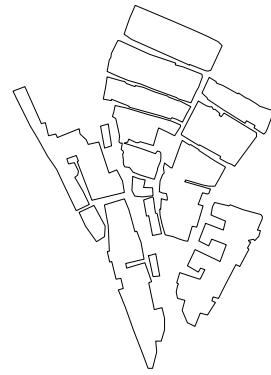
PLOTS

BUILDINGS

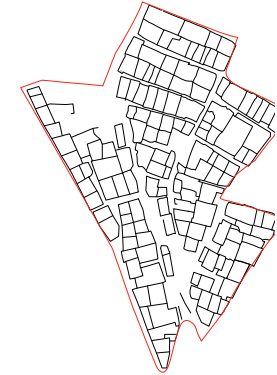
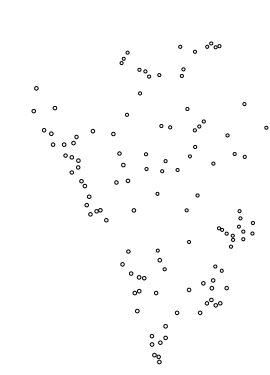
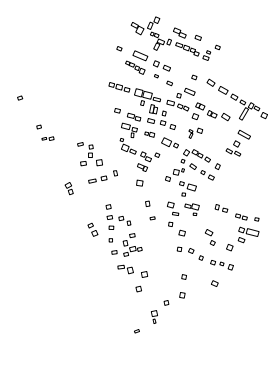
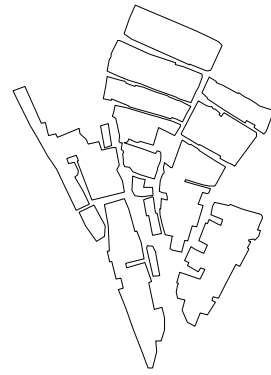
GERS

SAMPLE SITE

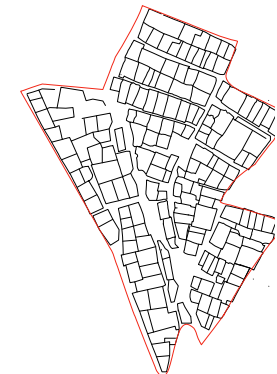
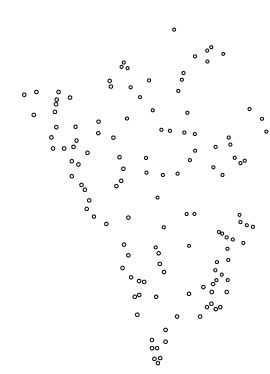
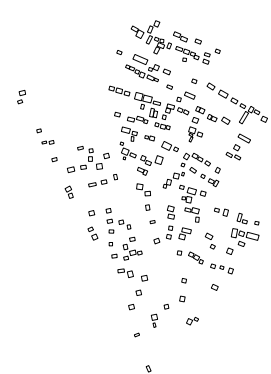
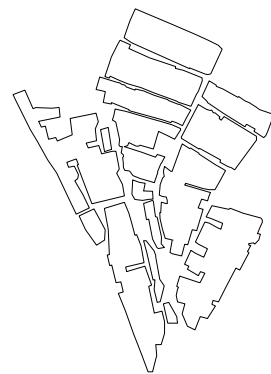
2009



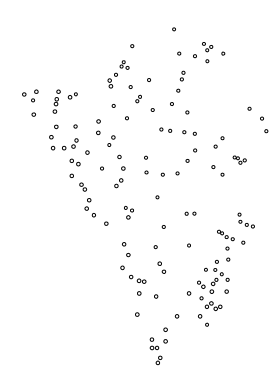
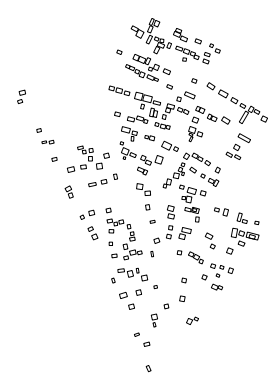
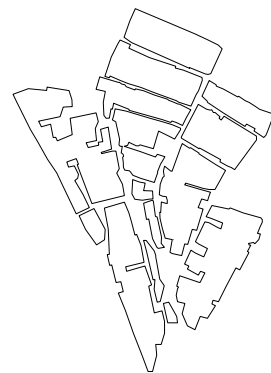
2012



2016



2017



FENCED AREA

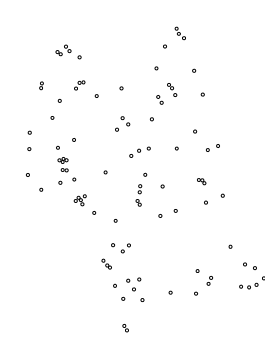
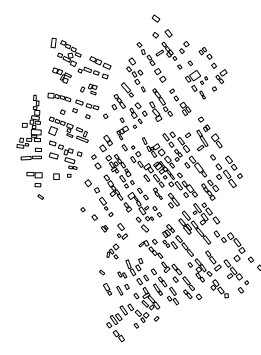
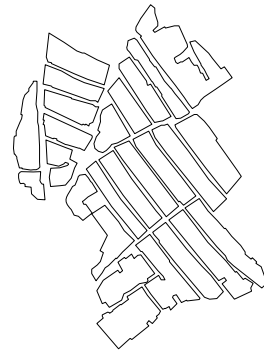
PLOTS

BUILDINGS

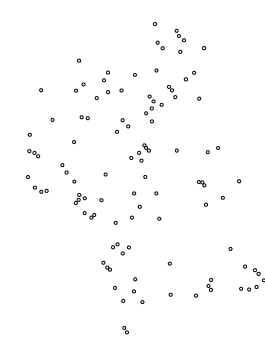
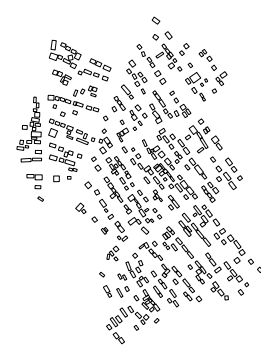
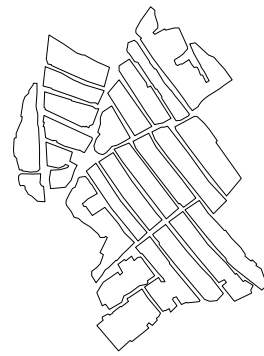
GERS

SAMPLE SITE

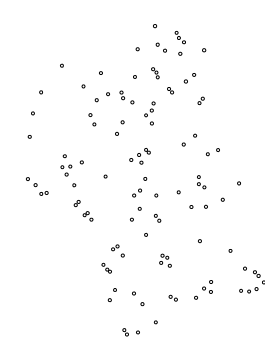
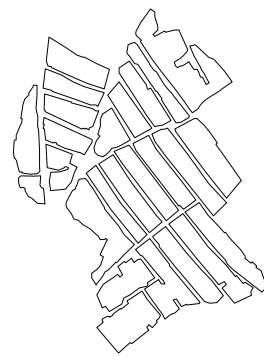
2009



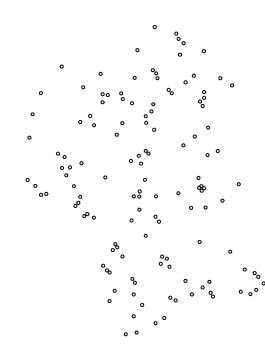
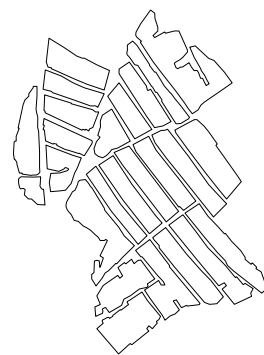
2012



2016



2017



1C | DISTRICT TRANSFORMATION

Sukhbaatar-16, Ulaanbaatar

AIMS

To document the spatial transformation of three sample sites in Sukhbaatar-16 to understand the process and form of urban growth.

METHODOLOGY

Source aerial imagery of the entire district of Sukhbaatar-16 from 2009, 2012, and 2016.

Map the plot boundaries from each of the aerial images of the district to understand how the district has transformed from 2009-2016.

Select sample sites from Sukhbaatar-16 that represent the different conditions of the ger districts (urban, mid, and fringe).

Source aerial imagery of the selected sample sites from 2009, 2012, and 2016. Conduct drone mapping of the selected sample sites in 2017.

Map the plot boundaries, gers, and other built structures in the sample district to demonstrate how the sample sites have transformed over time through analytical drawings.

Extract data from the maps such as numbers of gers, numbers of houses, and plot sizes to compare the growth of the sample sites.

Use the data and drawings to compare with another khoroo (Chingeltei-16).

RESULTS

There is a lot of empty space in the middle of the khoroo. There are some areas in the khoroo which are unsuitable for new migrants to set up their khashaas because they are either too steep or in the river flood area.

The highest amount of growth between 2009-2016 occurred at the end of the road around the last bus stop.

The rate of growth for in the khoroo was the highest between 2009-2012.

The highest rate of growth occurred in the fringe area between 2009-2012 with the total number of plots increasing by 205%, whereas the percentage of change was 133% in mid areas and 109% in urban areas.

The density of plots in 2017 in the urban area is almost double when compared to the mid and fringe areas. The urban areas has a 16.85 plots/10,000m², whilst the mid and fringe areas only have a ratio of 8.71 and 9.11 respectively.

The density of structures (houses and gers) in 2017 of the urban area is more than double of the mid and fringe areas. The urban area has a 35.6 structures/10,000m², whilst the mid and fringe areas only have a ratio of 13.9 and 15.6 respectively.

There are more gers compared to houses in the fringe area than in the urban area. In the fringe districts, for every 10 houses there are 18 gers. In the urban districts, for every 10 houses there are 4 gers.

Sukhbaatar-16 is still growing, not having reached its capacity. There are still empty plots in the urban areas for new residents with a rate of growth of 52 plots between 2016-2017. All these plots were a result of subdivision as the total amount of fenced area has only increased by around 400m².

The rate of change in the fringe area between 2016 and 2017 is at 27 plots, which is almost half of the mid and urban areas which are both over 50 plots.



KEY

— 2009

— 2012

— 2016

0 100 200 300 400 500
Meters

INCREMENTAL URBANISM: Ulaanbaatar's Ger Settlements
Rural Urban Framework

DISTRICT TRANSFORMATION
Sukhbaatar-16, Ulaanbaatar



TRANSFORMATION DATA
Sukhbaatar-16, Ulaanbaatar

	Fringe				Mid				Urban			
	2009	2012	2016	Drone 2017	2009	2012	2016	Drone 2017	2009	2012	2016	Drone 2017
Sample Site Size (~m2)	294,300				315,800				246,900			
No. of Gers	84	174	241	229	107	133	173	188	193	222	244	234
No. of Houses	42	83	139	180	163	225	280	305	501	533	580	645
Ger to House Ratio	2.00	2.10	1.73	1.27	0.66	0.59	0.62	0.62	0.39	0.42	0.42	0.36
Total No. of Structures	126	257	380	409	270	358	453	493	694	755	824	879
% of previous	-	204%	148%	108%	-	133%	127%	109%	-	109%	109%	107%
Rate of Change/ Year	-	43.7	30.8	29.0	-	29.3	23.8	40.0	-	20.3	17.3	55.0
Total No. of Complete Plots	95	195	241	268	148	215	224	275	306	339	364	416
% Change from Previous Set	-	205%	124%	111%	-	145%	104%	123%	-	111%	107%	114%
Rate of Change/ Year	-	33.3	11.5	27.0	-	22.3	2.3	51.0	-	11.0	6.3	52.0
No. of Occupied Plots	82	178	225	249	123	181	199	254	298	334	362	414
No. of Empty Plots	13	17	16	19	25	34	25	21	8	5	2	2
No. Incomplete Plots	19	21	9	13	35	13	17	11	7	7	5	2
Total Fenced Area (~m2)	79,000	146,500	174,800	183,567	121,900	168,700	172,900	189,507	167,900	172,900	177,300	177,700
% of previous	-	185%	119%	105%	-	138%	102%	110%	-	103%	103%	100%
Average Plot Size (~m2)	832	751	725	685	824	785	772	689	549	510	487	427
% of previous	-	90%	97%	94%	-	95%	98%	89%	-	93%	96%	88%
% of Sample Site as Plots	27%	50%	59%	62%	39%	53%	55%	60%	68%	70%	72%	72%
Plots/10000m2	3.23	6.63	8.19	9.11	4.69	6.81	7.09	8.71	12.39	13.73	14.74	16.85
Buildings and Gers/10000 m2	4.3	8.7	12.9	13.9	8.5	11.3	14.3	15.6	28.1	30.6	33.4	35.6
Buildings and Gers/ Plot	1.33	1.32	1.58	1.53	1.82	1.67	2.02	1.79	2.27	2.23	2.26	2.11

Observations

There is a lot of empty space in the middle of the khoroo. There are some areas in the khoroo which are unsuitable for new migrants to set up their khashaas because they are either too steep or in the river flood area.

The highest amount of growth between 2009-2016 occurred at the end of the road around the last bus stop.

The rate of growth for in the khoroo was the highest between 2009-2012.

The highest rate of growth occurred in the fringe area between 2009-2012 with the total number of plots increasing by 205%, whereas the percentage of change was 133% in mid areas and 109% in urban areas.

The density of plots in 2017 in the urban area is almost double when compared to the mid and fringe areas. The urban areas has a 16.85 plots/10,000m2, whilst the mid and fringe areas only have a ratio of 8.71 and 9.11 respectively.

The density of structures (houses and gers) in 2017 of the urban area is more than double of the mid and fringe areas. The urban area has a 35.6 structures/10,000m2, whilst the mid and fringe areas only have a ratio of 13.9 and 15.6 respectively.

There are more gers compared to houses in the fringe area than in the urban area. In the fringe districts, for every 10 houses there are 18 gers. In the urban districts, for every 10 houses there are 4 gers.

Sukhbaatar-16 is still growing, not having reached its capacity. There are still empty plots in the urban areas for new residents with a rate of growth of 52 plots between 2016-2017. All these plots were a result of subdivision as the total amount of fenced area has only increased by around 400m2.

The rate of change in the fringe area between 2016 and 2017 is at 27 plots, which is almost half of the mid and urban areas which are both over 50 plots.

2009

Sukhbaatar-16 [FRINGE]

SAMPLE SITE SIZE - 294,300m2



No. of Gers	84
No. of Houses	42
Ger to House Ratio	2
No. of Plots	95
Total Fenced Area	79,000m2
Average Plot Size	832m2
% of Site as Plots	27%
Plots/10,000m2	3.23
Structures/10,000m2	4.3
Structures/Plot	1.33

Observations

- The amount of empty and incomplete plots are relatively higher than in Chingeltei-16.

2012

Sukhbaatar-16 [FRINGE]

SAMPLE SITE SIZE - 294,300m2



No. of Gers	174
No. of Houses	83
Ger to House Ratio	2.1
No. of Plots	195
Total Fenced Area	146,500m2
Average Plot Size	751m2
% of Site as Plots	50%
Plots/10,000m2	6.63
Structures/10,000m2	8.7
Structures/Plot	1.58

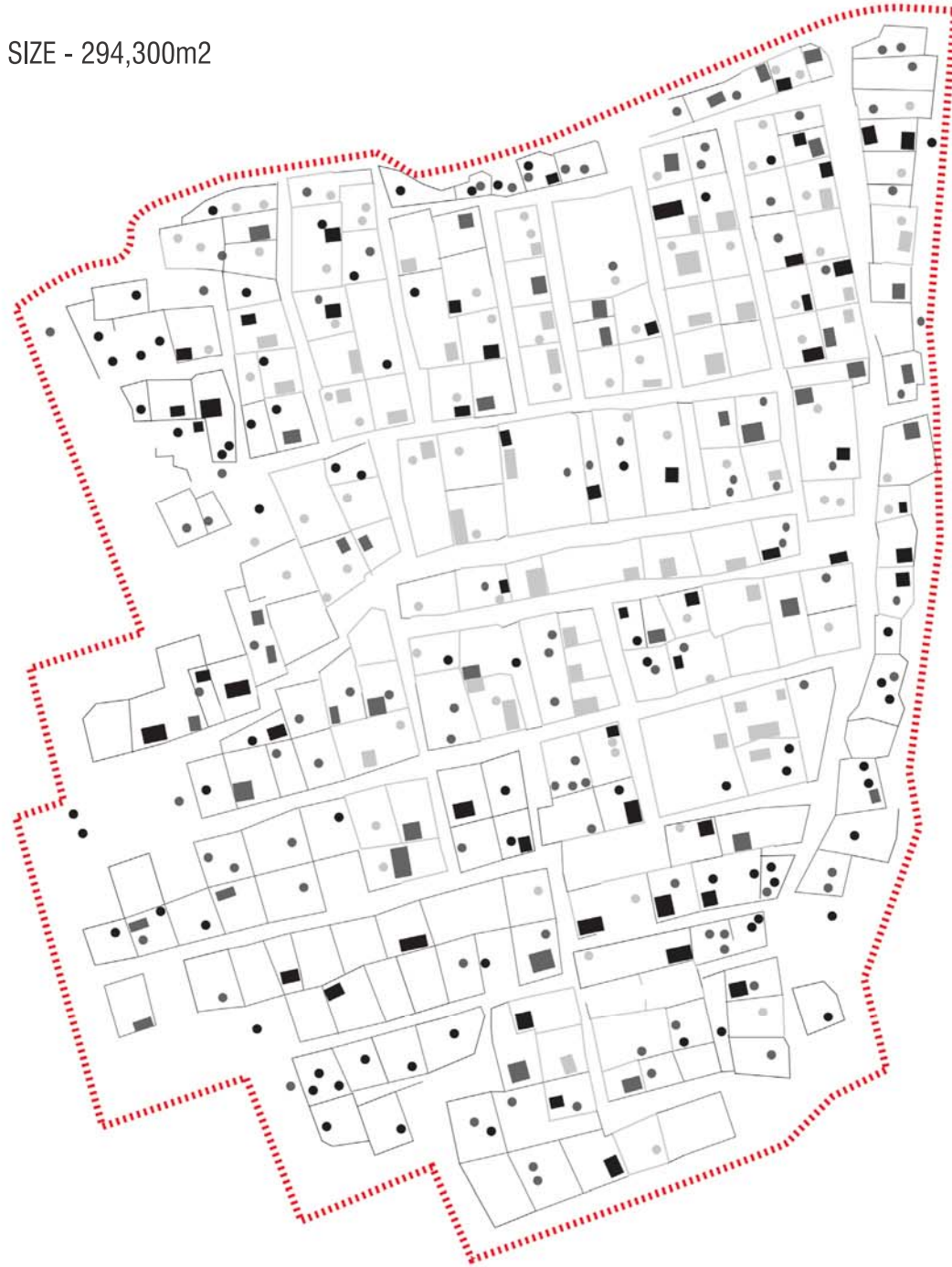
Observations

- The amount of plots and structures has doubled. This is the highest rate across all three sites and across the sample years.
- Roads become plots
- Large central plots become subdivided.
- Most of the empty plots are around the edge.

2012

Sukhbaatar-16 [FRINGE]

SAMPLE SITE SIZE - 294,300m²



No. of Gers 241
No. of Houses 139
Ger to House Ratio 1.73

No. of Plots 241
Total Fenced Area 174,800m²
Average Plot Size 725m²

% of Site as Plots 59%
Plots/10,000m² 8.19
Structures/10,000m² 12.9
Structures/Plot 1.58

Observations

- The site has become a lot denser. There has been a high increase of structure but a relatively small change in the number of plots.
- Plots at the edges of the sample site, and along the roads are smaller.

2017

Sukhbaatar-16 [FRINGE]

SAMPLE SITE SIZE - 294,300m²



No. of Gers 229
No. of Houses 180
Ger to House Ratio 1.27

No. of Plots 268
Total Fenced Area 183,567m²
Average Plot Size 685m²

% of Site as Plots 62%
Plots/10,000m² 9.11
Structures/10,000m² 13.9
Structures/Plot 1.53

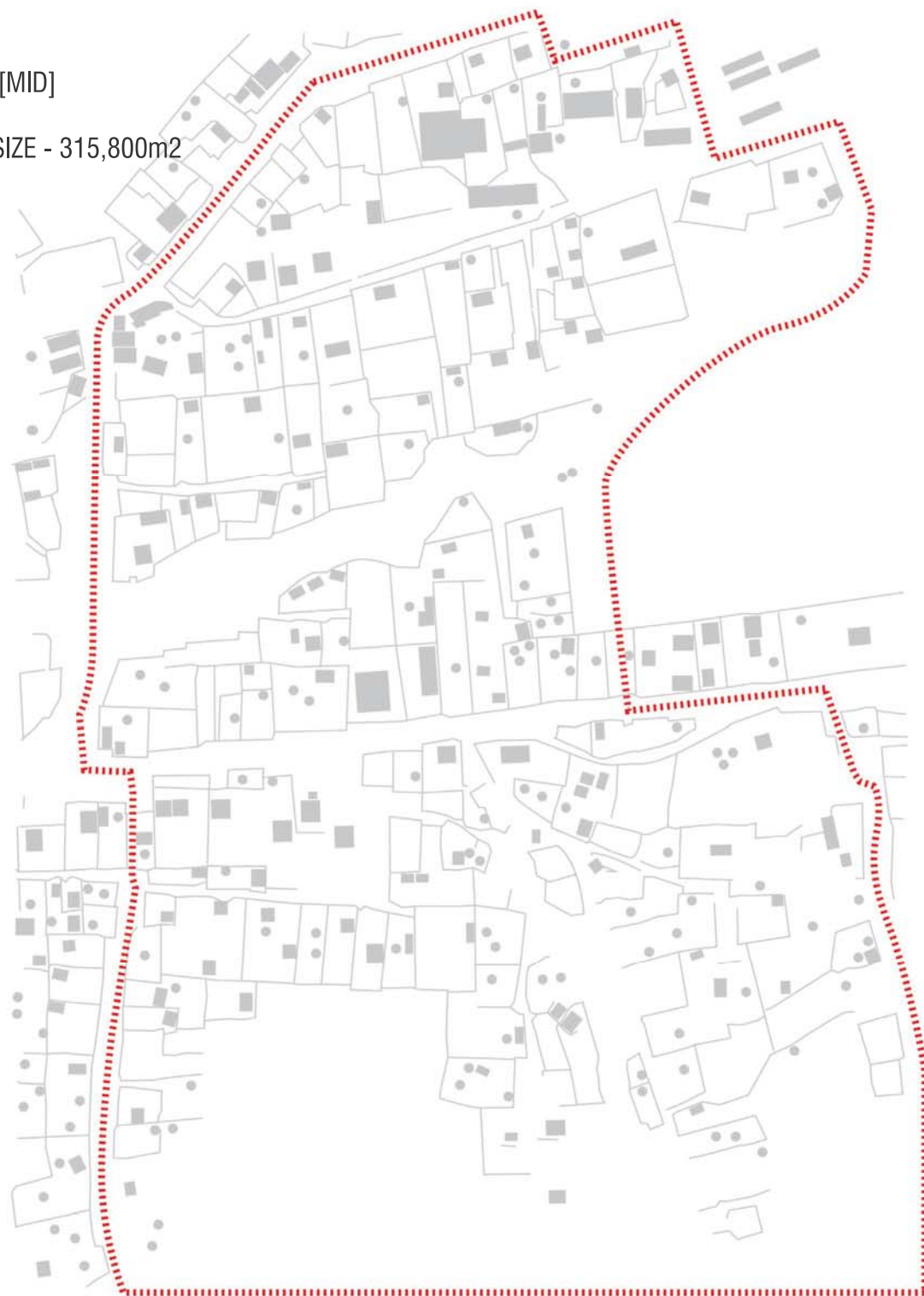
Observations

- The rate of change for the number of plots from 2016-2017 is a lot higher than previous years.
- There has been a reduction in the number of gers, but an overall increase in the number of structures due to a high amount of new buildings.
- The total fenced area has not increased by a lot despite the high rate of change of the number of plots.

2009

Sukhbaatar-16 [MID]

SAMPLE SITE SIZE - 315,800m²



No. of Gers	107
No. of Houses	163
Ger to House Ratio	0.66
No. of Plots	148
Total Fenced Area	121,900m ²
Average Plot Size	824m ²
% of Site as Plots	39%
Plots/10,000m²	4.69
Structures/10,000m²	8.5
Structures/Plot	1.32

Observations

- Unclear plot boundaries - there are many large semi-fenced areas with multiple structures
- There are also a lot of incomplete plots.

2012

Sukhbaatar-16 [MID]

SAMPLE SITE SIZE - 315,800m²



No. of Gers	133
No. of Houses	225
Ger to House Ratio	0.59
No. of Plots	215
Total Fenced Area	168,700m ²
Average Plot Size	785m ²
% of Site as Plots	53%
Plots/10,000m²	6.81
Structures/10,000m²	11.3
Structures/Plot	1.67

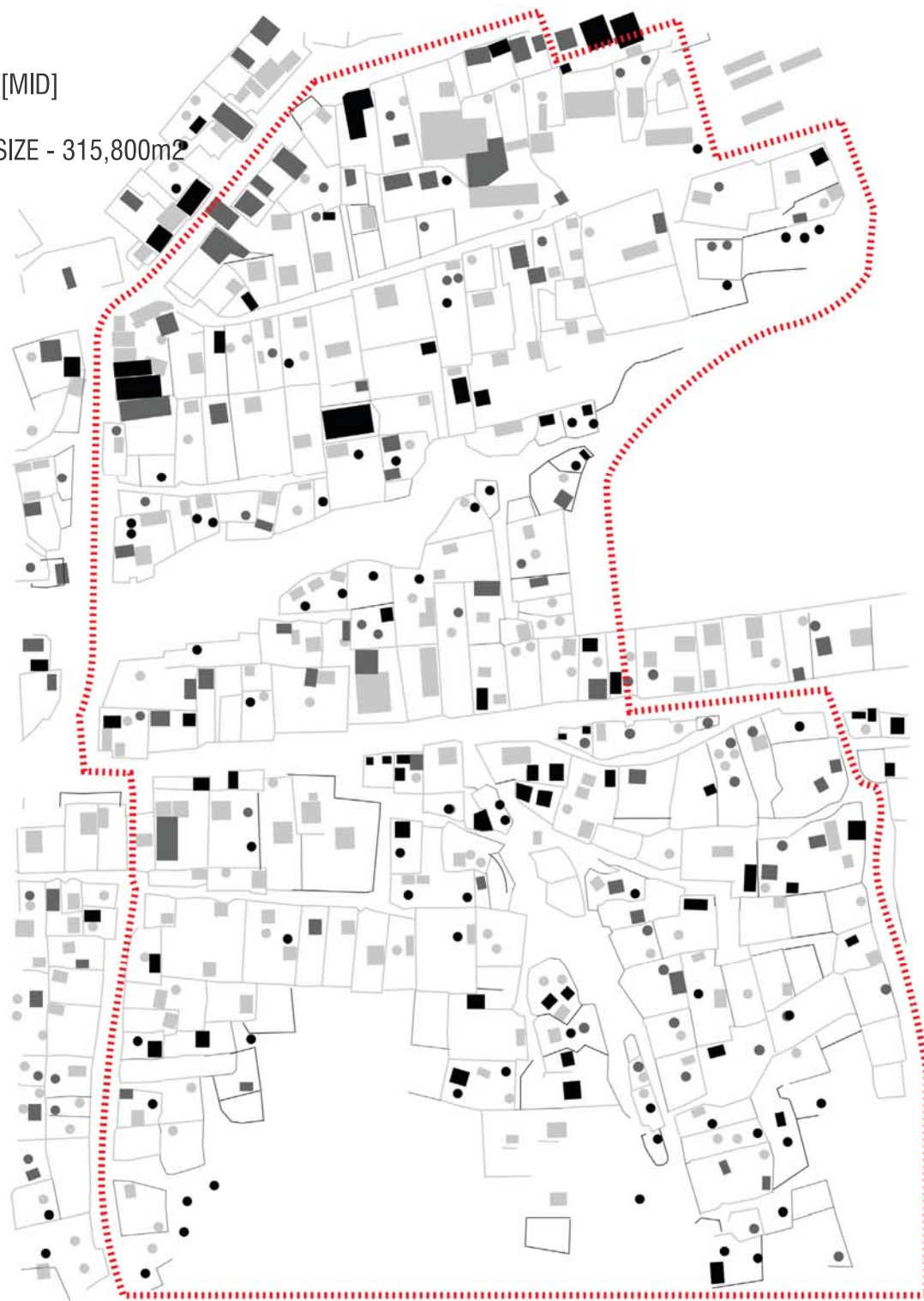
Observations

- The amount of fenced area, and number of plots has increased more between 2009/2012 than 2012/2016. This is mostly due to the - semi-fenced areas being fully enclosed around the existing buildings.
- There are a lot of new plots being added on to the ends of clusters and filling out corners

2016

Sukhbaatar-16 [MID]

SAMPLE SITE SIZE - 315,800m²



No. of Gers	173
No. of Houses	280
Ger to House Ratio	0.62
No. of Plots	224
Total Fenced Area	172,900m ²
Average Plot Size	772m ²
% of Site as Plots	55%
Plots/10,000m²	7.09
Structures/10,000m²	14.3
Structures/Plot	2.02

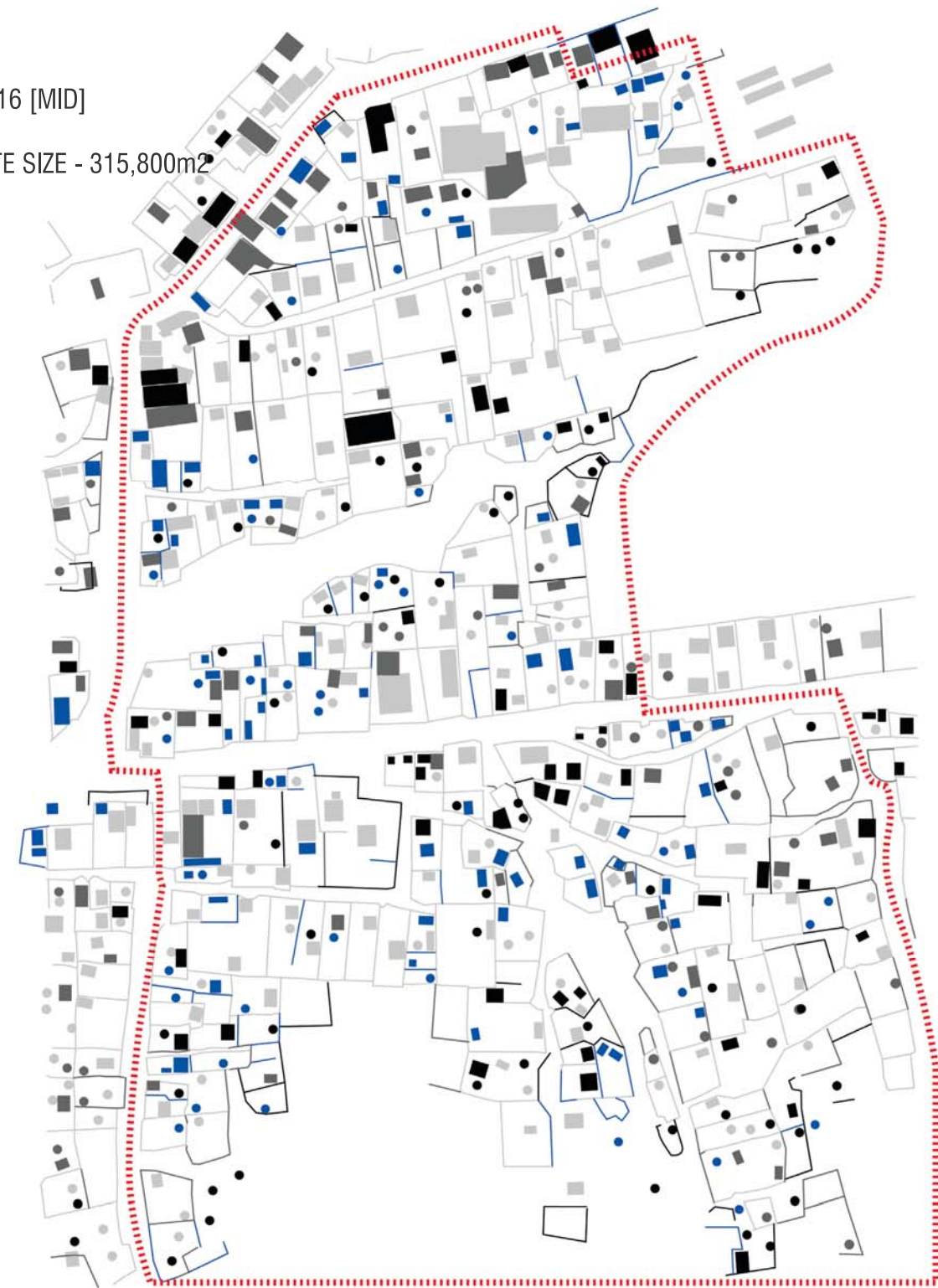
Observations

- Density is very high, much higher than in Chingeltei-16 due to the sample site being located near a service centre.
- There has been hardly any change in the number of plots..

2017

Sukhbaatar-16 [MID]

SAMPLE SITE SIZE - 315,800m²



No. of Gers	188
No. of Houses	305
Ger to House Ratio	0.62
No. of Plots	275
Total Fenced Area	189,507m ²
Average Plot Size	689m ²
% of Site as Plots	60%
Plots/10,000m²	8.71
Structures/10,000m²	15.6
Structures/Plot	1.79

Observations

- Ger to house ratio remains constant even though the rate of change is a lot higher.
- The rate of change for the number of plots is significantly higher than the previous years.
- The plot sizes have been clearly reduced, at a large scale than in the Fringe. Many plots have been subdivided even though the total fenced area has increased.

2009

Sukhbaatar-16 [URBAN]

SAMPLE SITE SIZE - 246,900m²



2012

Sukhbaatar-16 [URBAN]

SAMPLE SITE SIZE - 246,900m²



No. of Gers 193
No. of Houses 501
Ger to House Ratio 0.39

No. of Plots 306
Total Fenced Area 167,900m²
Average Plot Size 549m²

% of Site as Plots 68%
Plots/10,000m² 12.4
Structures/10,000m² 28.1
Structures/Plot 2.27

Observations

- Rate of growth is very consistent.
- Unlike in Chingeltei-16, there are a few incomplete plots.
- There is a service centre within the sample site.

No. of Gers 222
No. of Houses 533
Ger to House Ratio 0.42

No. of Plots 336
Total Fenced Area 172,900m²
Average Plot Size 510m²

% of Site as Plots 70%
Plots/10,000m² 13.7
Structures/10,000m² 30.6
Structures/Plot 2.23

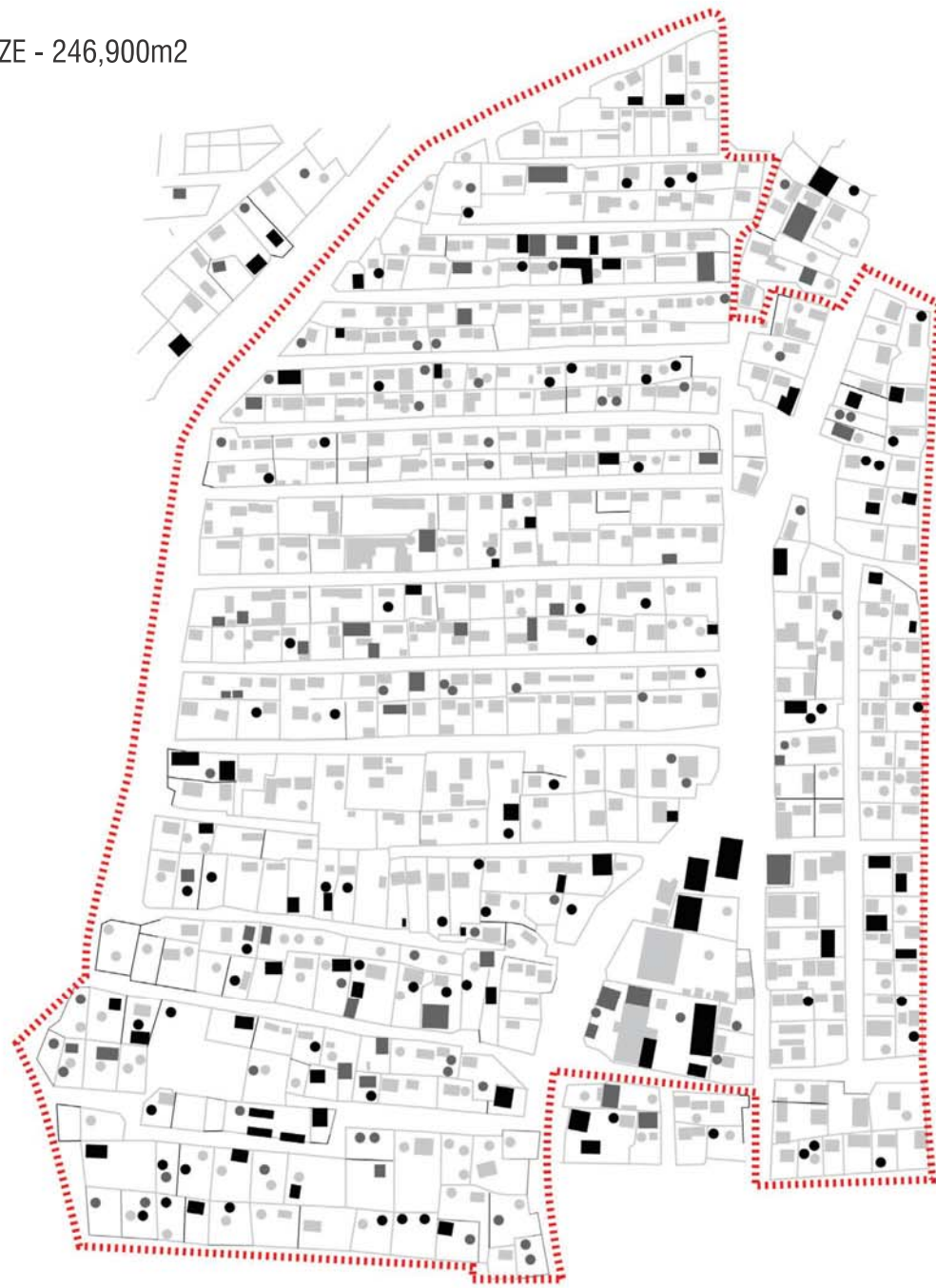
Observations

- Subdivision of plots where there are existing buildings. Some plots divide into three plots.
- The number of new gers is relatively higher than those of new houses, increasing the ger to house ratio.

2016

Sukhbaatar-16 [URBAN]

SAMPLE SITE SIZE - 246,900m²



No. of Gers	244
No. of Houses	580
Ger to House Ratio	0.42
No. of Plots	364
Total Fenced Area	177,300m ²
Average Plot Size	487m ²
% of Site as Plots	72%
Plots/10,000m²	14.74
Structures/10,000m²	33.4
Structures/Plot	2.26

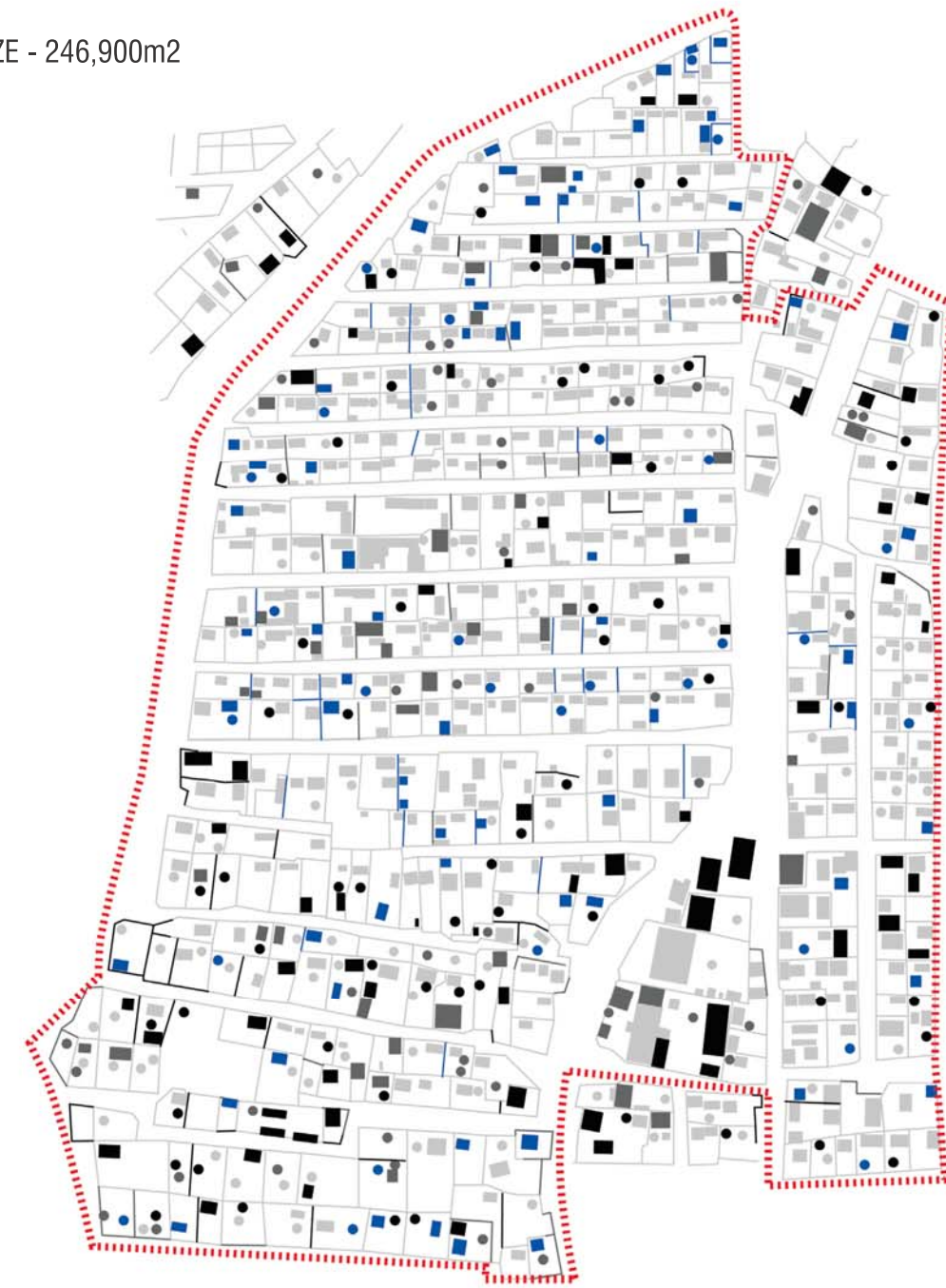
Observations

- Subdivision of plots where there are existing buildings. Some plots divide into four new plots.
- Plot areas change with the shifting of edges.

2017

Sukhbaatar-16 [URBAN]

SAMPLE SITE SIZE - 246,900m²



No. of Gers	234
No. of Houses	645
Ger to House Ratio	0.36
No. of Plots	416
Total Fenced Area	177,700m ²
Average Plot Size	427m ²
% of Site as Plots	72%
Plots/10,000m²	16.85
Structures/10,000m²	35.6
Structures/Plot	2.11

Observations

- Slower growth rate than the Fringe and Mid sites, but it is still higher than previous years.
- There is not a lot of change in the amount of fenced area but the number of plots has increased more than it has before, increasing the density significantly within a year.

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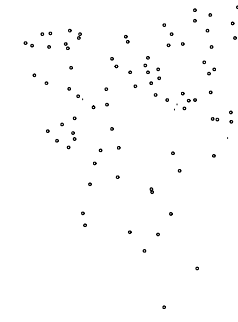
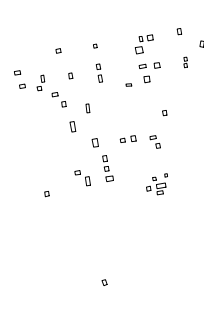
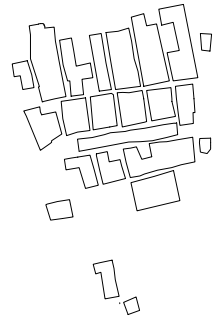
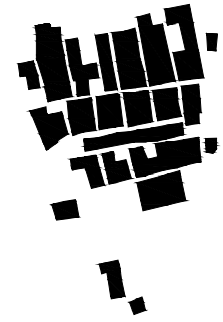
PLOTS

BUILDINGS

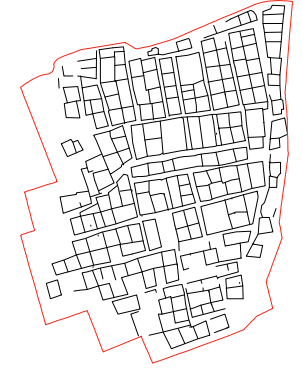
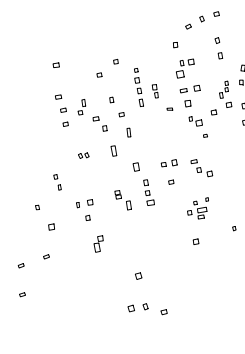
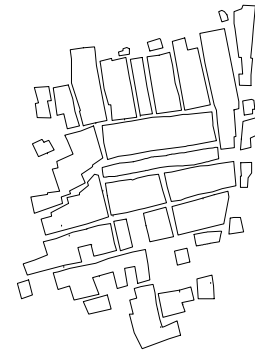
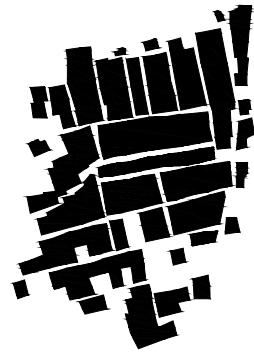
GERs

SAMPLE SITE

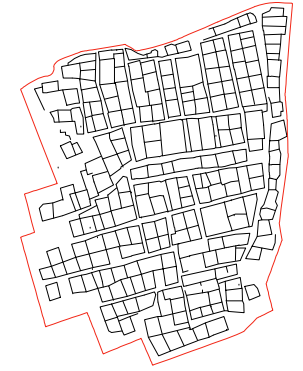
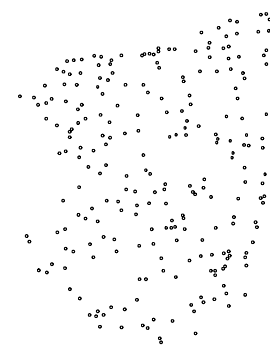
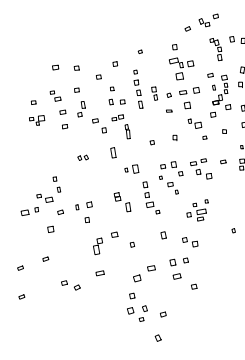
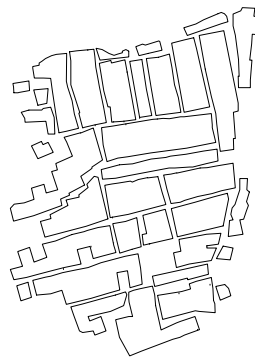
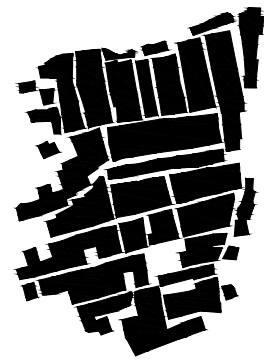
2009



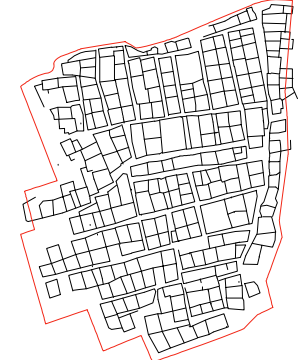
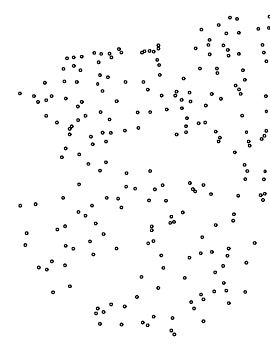
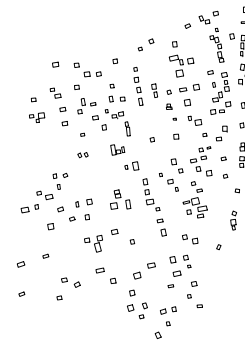
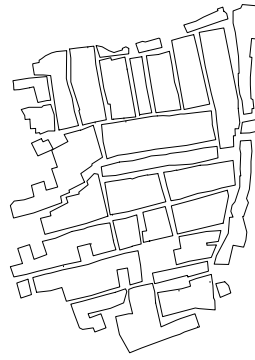
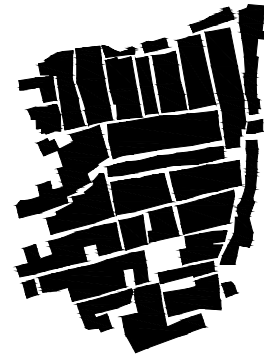
2012



2016



2017



FENCED AREA

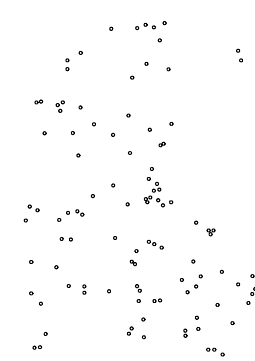
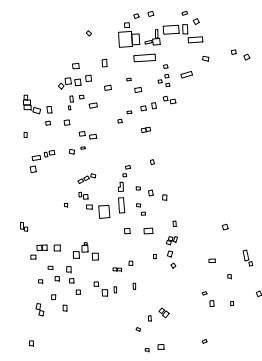
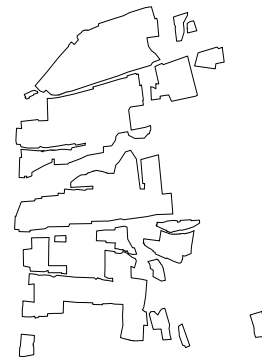
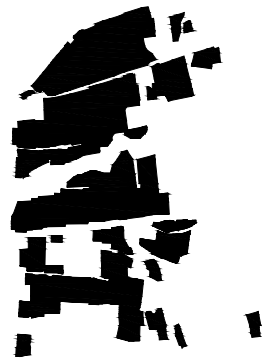
PLOTS

BUILDINGS

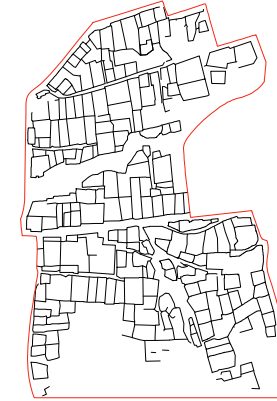
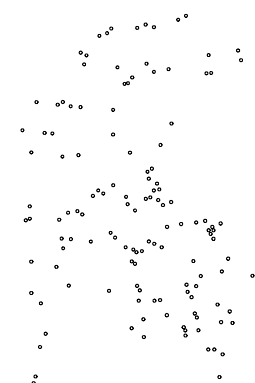
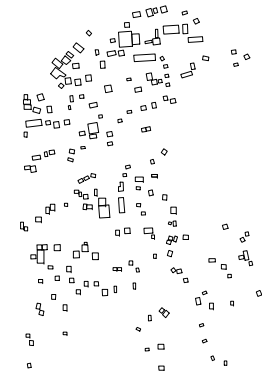
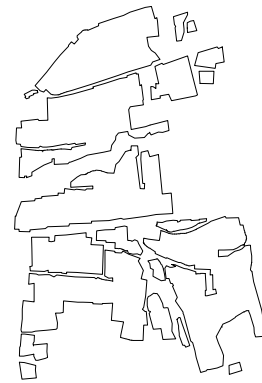
GERS

SAMPLE SITE

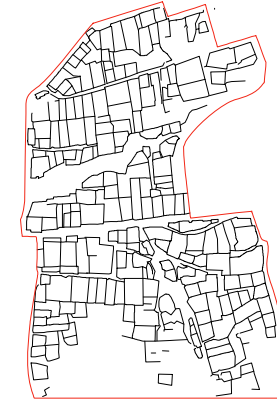
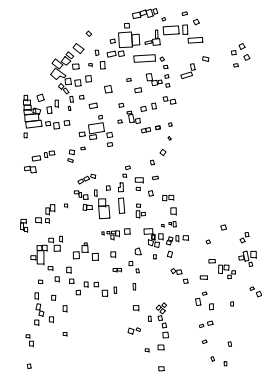
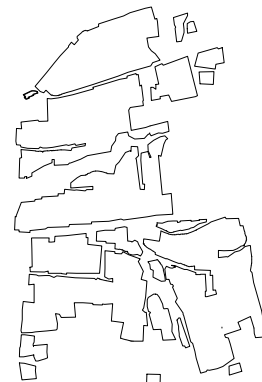
2009



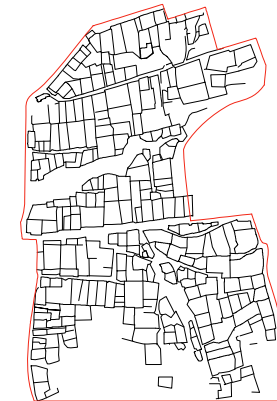
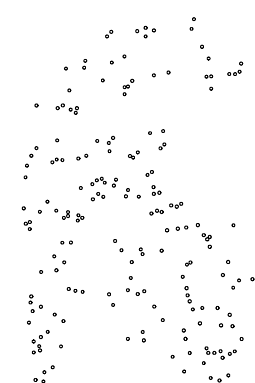
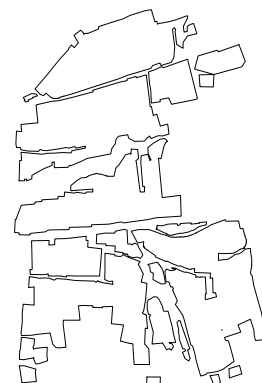
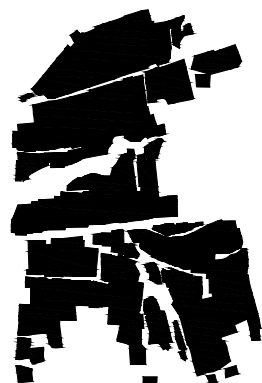
2012



2016



2017



FENCED AREA

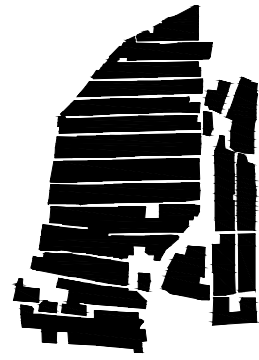
PLOTS

BUILDINGS

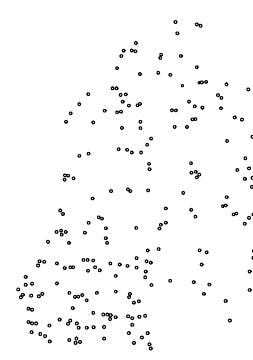
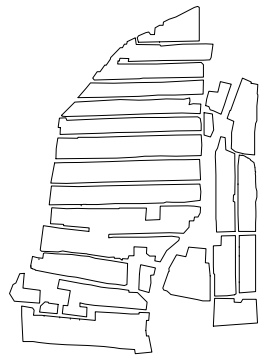
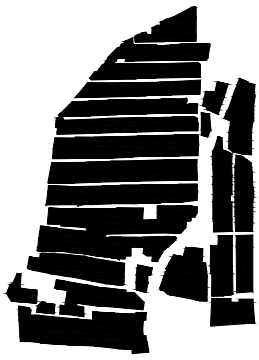
GERs

SAMPLE SITE

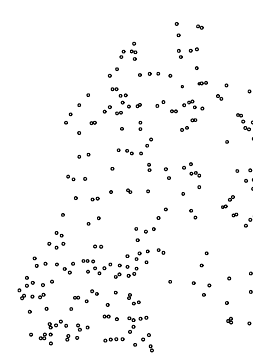
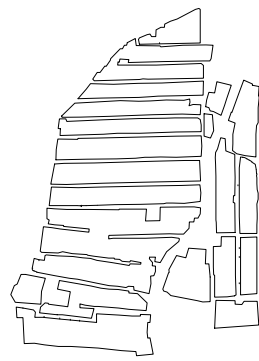
2009



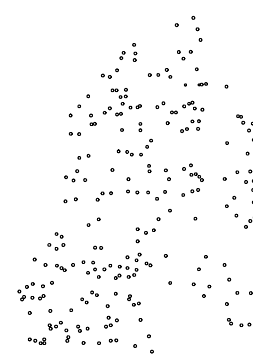
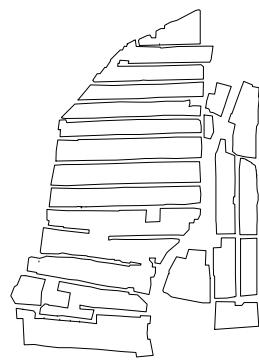
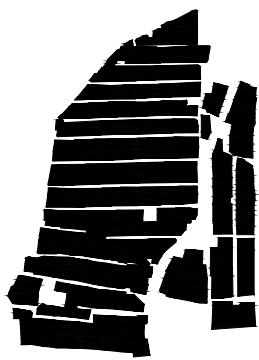
2012



2016



2017



1D | INFORMAL SETTLEMENTS

Typologies

AIMS

To position the ger districts of Ulaanbaatar as a third typology of informal, although legal settlement, distinct from prior academic research into the slums of South America or Africa (illegal informal settlements) or the urban villages of China (semi-legal informal settlement).

METHODOLOGY

Identify the scope for comparison - formation, access to infrastructure, land tenure, spatial characteristics, and owner vs occupier relationships.

Source information on favelas and urban villages from publications and reports.

Compare favelas and urban villages with the ger district, using information collected as part of this research project.

Select sample sites from the different types of informal settlements and source current aerial imagery- Paraisopolis (Brazil), Baishizhou (China), Chingeltei-16 (Mongolia).

Draw figure ground drawings of each sample site and source demographic data to compare the densities of built fabric and total population.

Produce diagrams that explain the transformation process of each of the sample sites.

RESULTS

The formation of the three typologies of informal settlements are triggered by similar factors - migrants coming to work in the city and needing affordable places to live. However, the way that these settlements transform, their density, and their model of land tenure make the ger districts a unique third typology.

The population density in the Chingeltei-16 (ger districts) is much lower with 2,328 people per km² compared to 18,919 people in Baishizhou (urban village) and 125,000 people in Paraisopolis (favela).

Transformation in the ger districts occur horizontally, through the subdivision of plots, rather than vertically as seen in urban villages and favelas where floors are added on top of existing structures.

The sites exhibit different forms of land tenure: Paraisopolis is an example of an illegal settlement with no security of tenure, Baishizhou, a form of illegal development but with legal land tenure, and the ger districts, an informal settlement but with legal land tenure undertaking legal development.

<i>Informal Settlements</i> 3 Typologies	Illegal and Informal Paraisopolis, Sao Paolo, Brazil	Semi-legal and Informal Baishizhou, Shenzhen, China	Legal and Informal Ulaanbaatar Ger Districts, Mongolia ¹
How is it formed?	<ul style="list-style-type: none"> - Belonged to one family, subdivided for development. But never implemented – only the 100x200m grid exists. - 1950s São Paulo industrial manufacturing growth attracted migrants to the city, but the city did not have a low cost housing policy - 1970-1980, population increased by the real estate boom during military dictatorship - 	<ul style="list-style-type: none"> - Existing village, urban development encompasses it. - Influx of migrant workers into the SEZ (Special Economic Zone) in Shenzhen – villagers build rental homes/opening shops and restaurants, started as 3-storey, became 6-10 stories. - <i>“Buildings are illegal structures in that they violate many building codes that Shenzhen subsequently implemented to regulate urban construction.”</i> 	<ul style="list-style-type: none"> - Migration of nomadic herders into the city – mostly after harsh winters (dzuds)/ pursue education for children/access to healthcare/jobs² - All nomadic herders have a ger, it makes it unnecessary to have the finance to purchase housing before moving to the city. - <i>“About 70 % of the resent rapid growth of population has been caused by in-migration... Given the fact that the ger-housing offers the cheapest way of living for new comers and poor families, the overpopulation causes the increase of unplanned as well as planned ger-settlements in the city and conditioned urban expansion by this kin settlements. New plots are formed as nomads become sedentary and settle on land they claim.”</i>³
Access to Infrastructure	<ul style="list-style-type: none"> - Some residents connect to the city’s infrastructure– such as tapping into the grid or water/sewage system by themselves. - 64,16% of the houses have a regular water supply⁴ - 2,66% of the houses have regular sewer system - 40% of the houses benefits from the electricity grid - 50% of the road system have drainage infrastructure - 50% of the road system is paved - 50% of the trash is regularly collected. 	<ul style="list-style-type: none"> - <i>“Buildings are illegal structures in that they violate many building codes that Shenzhen subsequently implemented to regulate urban construction.”</i>⁵ - Central location – close to road and subway networks - Most connected to electricity and internet - High pressure on electrical capacity - All connected to water supply but lack facilities - private toilets and kitchens 	<ul style="list-style-type: none"> - Lacking formal infrastructure – heating/sewage networks. - No central heating – 85% of ger residents use wood or coal-burning stoves for heating⁶ - 98% Have electricity access. Those that don’t have just moved in and could not afford to connect yet. - Electricity supply is unstable. - Electricity is free during the night in winters. - Most of the roads in the ger districts are unpaved and unlit. Only main roads. - 98.9% Don’t have centralised water supply⁷ - 98.6% Don’t have water access within their plot/house - 100% Don’t have access to sanitation connected to central sewaging - 8.6% Have no access to garbage collection services - 67.3% Don’t have regular garbage collection services (or don’t know) - 29.2% Are more 15 minutes away from the bus stop - 20.1% Are more than 60 minutes away from workplace - 95% use pit latrines ⁸
Land Ownership/tenure/Legality of Land	<ul style="list-style-type: none"> - Insecure tenure. - Was illegal - Residents don’t have property rights - There is a government initiative that is beginning to give them land rights. (Urban Land Regularization Program 2002) 	<ul style="list-style-type: none"> - Legal status of villages eliminated. – rural hukou became urban <i>“This meant that villagers owned their buildings but not the land that they built on”</i>⁹ - Villagers developed their land- goes against city planning, causing the government to want to eliminate them. - <i>“The major form of tenure is informal rental housing, which accommodates 69 per cent of households.”</i>¹⁰ 	<ul style="list-style-type: none"> - Privatization of land ¹¹ - People have the right to own the land – 700sqm. (2002 Law on Allocation of Land to Mongolian Citizens for Ownership) - Have to apply and pay a fee. - Not all land can become private – there is a regulatory system but not always followed. - Residents can buy/sell/rent the land.

¹ Information collected through RUF Interviews/research - 'Incremental Urbanism: Ulaanbaatar's Ger Settlements', funded by the Research Grants Council of the Hong Kong Special Administrative Region

² Williams, Christopher R., "The Ties That Bind: Urban Migration, Family Networks, and Cultural Change in Modern Mongolia" (2009). *Independent Study Project (ISP) Collection*. Paper 718.

³ Badamdorj, Chinbat. "Changes in the Internal Structure of Ulaanbaatar, Mongolia." *Scientific Annual of Korea Mongolian Economic Association* 14 (2004)

⁴ Sao Paolo City Housing Department, 2011 Census

⁵ Bolchover, Joshua, and John Lin. *Rural Urban Framework: Transforming the Chinese Countryside*, Birkhauser, 2013

⁶ Kamata, Tukuya, et al. *Managing Urban Expansion in Mongolia: Best practices in Scenario-Based Urban Planning*. World Bank 2010

⁷ Ulaanbaatar Survey Data (World Bank, 2012)

⁸ Leblanc, Maryanne E., Reed, Robert A., with Kingdom, William, Gambriell, Martin P., and Rodriguez, Diego J. 2017. Challenges and Opportunities for Improving Household Sanitation in the Ger Areas of Ulaanbaatar. Washington, DC: World Bank

⁹ Fulong Wu (2016): Housing in Chinese Urban Villages: The Dwellers, Conditions and Tenancy Informality, Housing Studies

¹⁰ Fulong Wu (2016): Housing in Chinese Urban Villages: The Dwellers, Conditions and Tenancy Informality, Housing Studies

¹¹ Kamata, Tukuya, et al. *Managing Urban Expansion in Mongolia: Best practices in Scenario-Based Urban Planning*. World Bank 2010

Spatial Characteristics	<ul style="list-style-type: none"> - Initially timber and cardboard. Material changes to brick and concrete over time – permanence but still poor quality and ad-hoc - First moved to highest topography – safest, best access, furthest from vulnerable areas *(bottom of valleys, steep hills, banks of the stream) - Becomes denser as more people move in, they find leftover spaces where they can build - The original area gets built up (which can become leasable spaces). - Commercial spaces on the ground - Edges of the plot are the most 'popular' – best access to infrastructure. Center of plots are less valuable. With poor access to infrastructure. - Informally adding floors to their property (ground commercial, housing middle, rooftop access) - 	<ul style="list-style-type: none"> - Urban villages are enclaves that do not grow outwards as there is no additional ownership of land. - Dense and small rooms. - Buildings very close together. (handshakes) - Rare to have more than two rooms. Facility accessibility varies (toilet/kitchen/heating etc.)– Guangzhou has much better facilities than Beijing and Shanghai ¹² But not all buildings have services connected. - Informal and mixed programs, 	<ul style="list-style-type: none"> - Growth through the increase of migrants, causing densification of districts as plots closer to the city are subdivided and new plots are added in the fringe. - Migration of nomadic herders into the city – mostly after harsh winters (dzuds)/ pursue education for children/access to healthcare/jobs - All nomadic herders have a ger, it makes it unnecessary to have the finance to purchase housing before moving to the city. - Houses are built over time and the gers are replaced. - Plots form along topography, and road networks. As it becomes denser, it becomes more gridded. - Houses are built as residents manage to save money. - Some khashaas have extended family members living on it.
Residents – owner vs occupier	<ul style="list-style-type: none"> - Owners (original family) adds to their property vertically. Other families move into the spaces above. - One 'block' may have multiple families, either new residents or a growing family. 	<ul style="list-style-type: none"> - Villagers build rental homes/open shops and restaurants - From a 2-3 storey building to a 6-10 storey block - Owned by local villager but units/flats reneled to migrant workers who come to the SEZ. - Not self-help housing (housing built by low-income for own consumption) the tenants are rural migrants. 	<ul style="list-style-type: none"> - Owner of the plot – single stakeholder regarding transformation of the plot. - People subdivide and sell/rent parts of their plot for income.

¹² Fulong Wu (2016): Housing in Chinese Urban Villages: The Dwellers, Conditions and Tenancy Informality, Housing Studies

INFORMAL AND ILLEGAL
 PARAISÓPOLIS, SÃO PAULO, BRAZIL



FAVELA



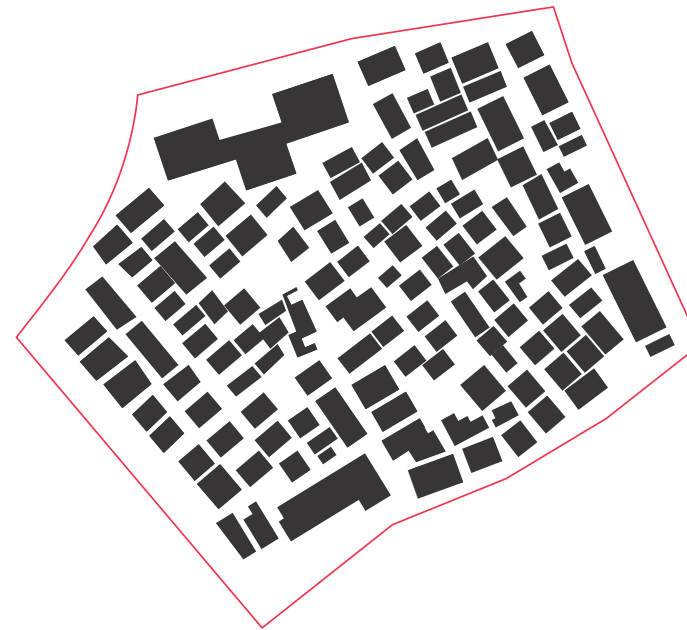
Sample Site Size: 21,500 m²
 Population in Sample: 2,688

Population Density: 125,000/km²
 Area per person: 8m²

INFORMAL AND SEMI-LEGAL
 BAISHIZHOU, SHENZHEN, CHINA



URBAN VILLAGE



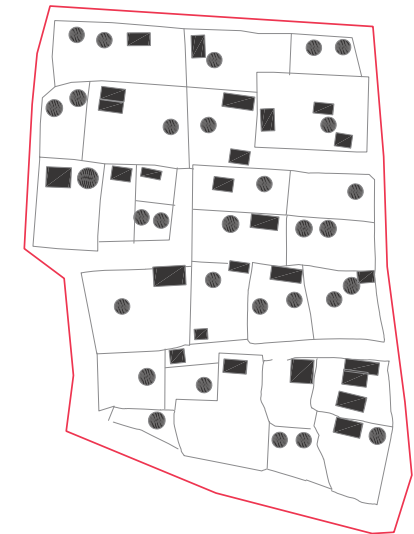
Sample Site Size: 43,200 m²
 Population in Sample: 817

Population Density: 18,919/km²
 Area per person: 52.9m²

INFORMAL AND LEGAL
 CHINGELTEI-16, ULAANBAATAR, MONGOLIA



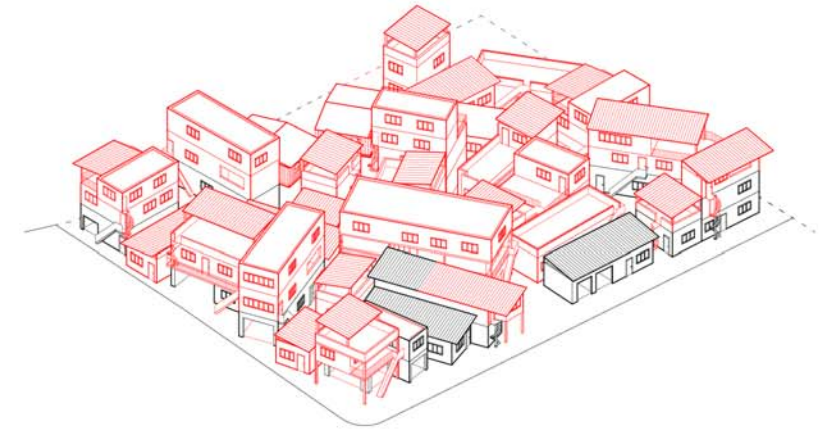
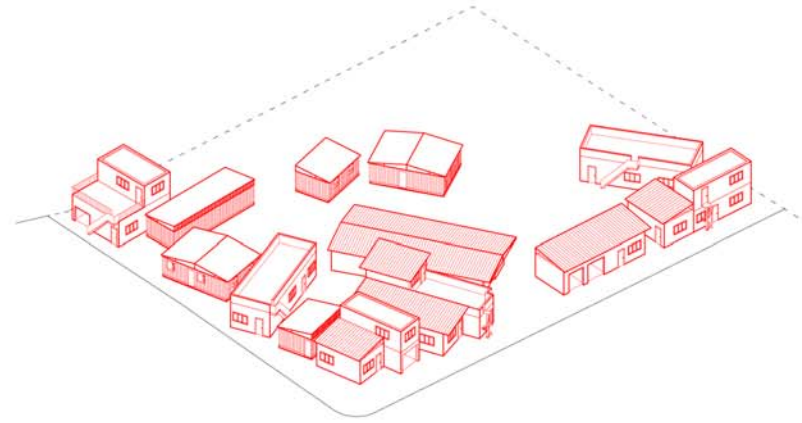
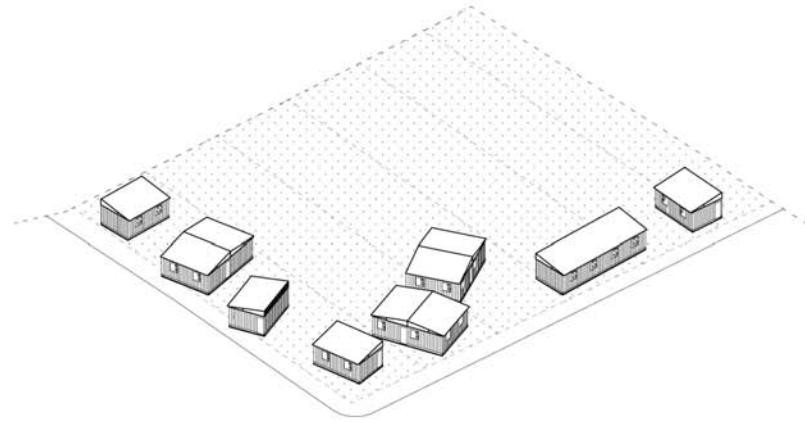
GER DISTRICT



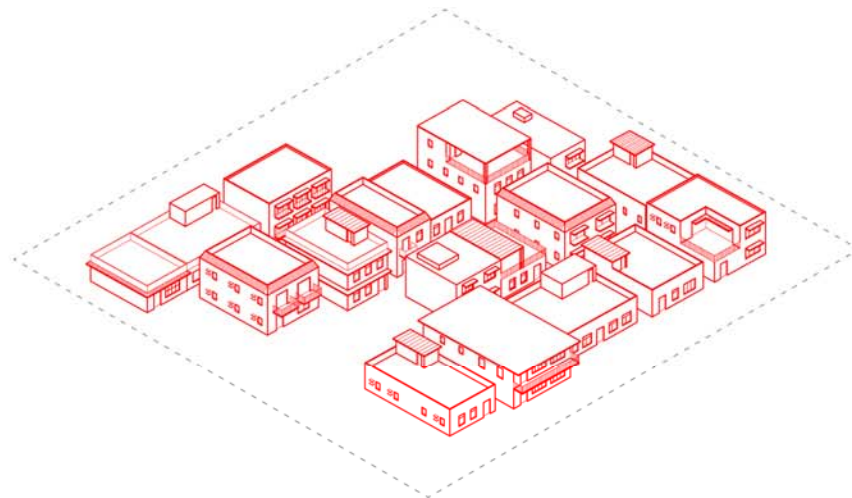
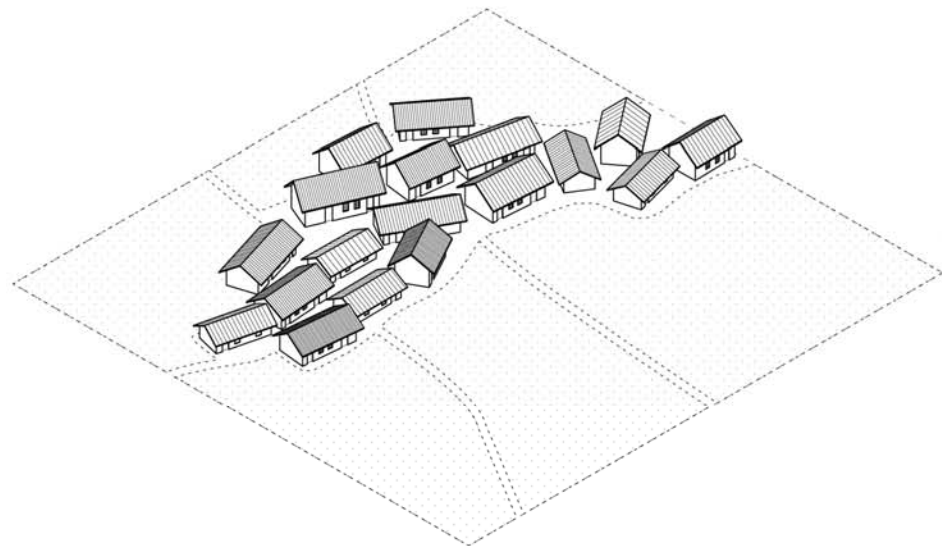
Sample Site Size: 27,500 m²
 Population in Sample: 64

Population Density: 2,328/km²
 Area per person: 429.7m²

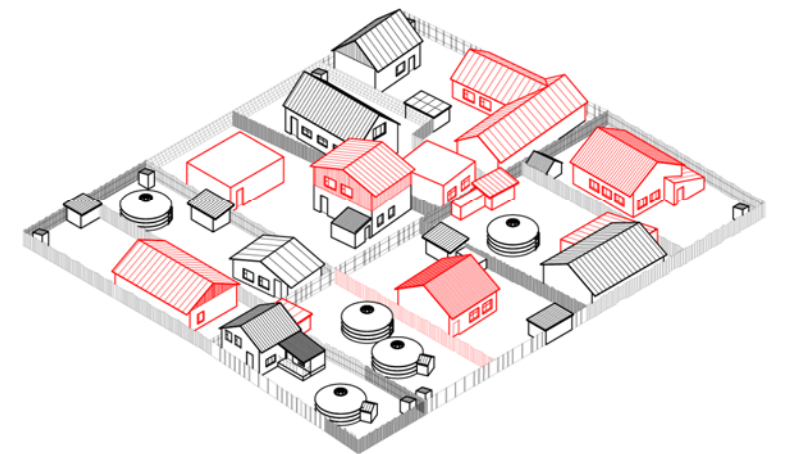
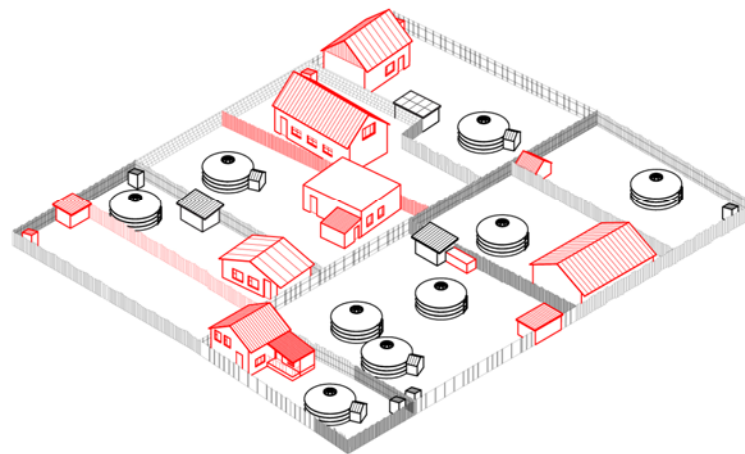
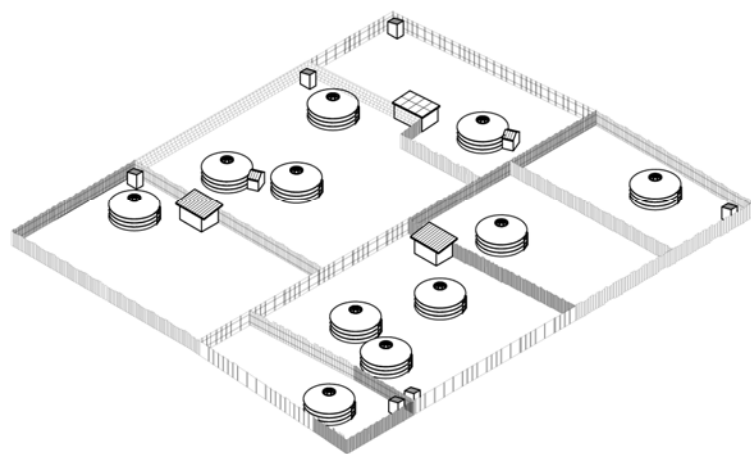
FAVELAS
SÃO PAULO, BRAZIL



URBAN VILLAGE
SHENZHEN, CHINA



GER DISTRICTS
ULAANBAATAR, MONGOLIA



1E | Existing Initiatives and Ger District Development Plans

AIMS

To understand the urban development context and current plans that are proposed or are underway.

To identify the key stakeholders involved in ger district development projects and have an overview on how large scaled development plans will be funded.

To identify community led ger district development projects

METHODOLOGY

Extract information from official masterplans of the city including the Ulaanbaatar 2020 Master Plan and the updated 'Ulaanbaatar 2020 Master Plan, Development Approaches for 2030' document.

Meet with governors of Chingeltei-16, Khan-Uul-13, and UN-Habitat to identify issues in the districts and any community initiatives that are existing, underway or proposed.

Discuss with Arnaud Heckman, Principal Urban Specialist for the Asian Development Bank (ADB), on the current ADB strategies for ger district redevelopment and consult corresponding ADB documentation and reports, including the Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, Ulaanbaatar Urban Services and Ger Areas Development Investment Program, and Ulaanbaatar Urban Services and Ger Areas Development Investment Program.

Map existing initiatives on current (2018) aerial map of the city.

Map local development funded projects in Sukhbaatar-16.

RESULTS

The population growth puts extreme stress on basic urban services including transportation, water, sewage and district heating as well as public services such as hospitals and schools which are mostly operating over capacity.

The Ulaanbaatar 2020 Master Plan was approved in 2002. According to the Technical Summary of the 'Ulaanbaatar 2020 Master Plan, Development Approaches for 2030' the most critical issues in the implementation of the 2020 Master Plan are "the lack of comprehensive demographic and economic strategies to address Ulaanbaatar's unplanned increasing population." The legal context, insufficient financial investment, and inconsistent regional and city decision making also made it difficult to implement the 2020 Master Plan.

The 2030 Master Plan was approved in 2013, and expands upon the 2020 Master Plan and sets out revised actions needed for implementation, including a legislative and management framework, and a socio-economic policy strategy. The master plan promotes sub-centre development connected to district heating; a new Bus Rapid Transit system connecting these sub-centres to the city centre and ger area redevelopment proposals. This includes: high to mid density residential apartments that are connected to central public infrastructure in the urban ger areas; mid to low density residential areas with utilities supplied from central or decentralised infrastructure systems in the mid-ger areas; and low density private housing with independent infrastructure in the fringe areas.

The 'Mongolia Sustainable Development Vision 2030' states nationwide development objectives. It sets out development phases for economic, social, and environmental development, as well as governance principles for sustainable development. These are in line with the development aims from the 'Ulaanbaatar 2020 Master Plan, Development Approaches for 2030'. There are objectives under Energy and Infrastructure, and Ecosystem Balance, which are specific to urban development. They include: introducing green development standards; providing greater independence to urban areas and settlements; building roads and transportation; improving planning of cities and urban settlements; enhancing the quality of and accessibility to infrastructural facilities, increasing green facilities in urban areas and settlements, and promoting recycling.

The Asian Development Bank 'Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project' (Project No 49169), will leverage private sector investment to create 20 eco-districts that provide 10,000 affordable green housing units. It will be conducted in five phases. The first two core sub projects in Phase 1 will be located in Bayankhoshuu and Selbe.

There are two tranches for the Asian Development Bank 'Ulaanbaatar Urban Services and Ger Areas Development Investment Program' (Project No 45007). The project supports the Ulaanbaatar City Master Plan in upgrading priority services and economic hubs in ger areas. Tranche 1 covers the Bayankhoshuu and Selbe subcenters, and is currently being implemented (June 2018). Tranche 2 will target Dambadrjaa and Denjiin as well as extending urban infrastructure upgrading and spatial reconstructing to the sites. Each subcenter will influence 30,000-100,000 people.

The Asian Development Bank 'Ulaanbaatar Urban Services and Ger Areas Development Investment Program' (Project No 39256), supports the Municipality of Mongolia's (MUB) city master plan to develop the city infrastructure, including urban roads, utility network, transport system, and services, through an investment program that covers three tranches to widen and renovate roads and bridges, improve intersections, establish an east-west Bus Rapid Transit route.

Other government led projects include new housing and flats in Chingeltei-16 (identified during a meeting with the Governor in December 2014) and the 2013 Ministry of Construction's infrastructure project. However, in a meeting with UN-Habitat National Programme Manager, Enkh-tsetseg Shagdarsuren (December 2014), it was explained the project is on hold due to the amount of time needed for negotiating with 160 families for the routing of the network. During that time, the initial designer/contractor has become bankrupt.

From 2009-2013, UN-Habitat worked on Community-Led Ger Area Upgrading in Ulaanbaatar City to organize the community and facilitate how the local residents can realise solutions themselves. Feedback included how community projects can empower residents to believe that they can improve their situations on their own. (Meeting with UN-Habitat National Programme Manager, December 2014)

Chingeltei-16 has around 60 families that operate small businesses from their khashaas. There is a small pool of money which can assist them by providing loans. (Meeting with Governor of Chingeltei-16 in December 2014).

The Governor of Chingeltei-16 indicated that khorooos have little power in decisions that are made at the district or municipal level during a meeting in December 2014.

The Local Development Fund (LDF) 2013 is a district level initiative to improve small scale infrastructural projects such as bridges, stairs, and the paving of roads in the ger districts. It is a participatory system where resident input is collected every year. However, according to the Governor of Chingeltei-16 (meeting in November 2016), some residents complained that the system is not transparent, and the results were of poor quality and were not user friendly.



Medium to high density apartment complexes for the inner/urban ger areas.



Medium to low density residential areas for the middle ger areas.



Low density private housing district.

Ulaanbaatar 2020 Master Plan, Development Approaches for 2030

Ulaanbaatar has had five master plans. The first was in 1954, and the 6th master plan is titled “Ulaanbaatar 2020 Master Plan, Development Approaches for 2030” which was approved by the State Great Khural in 2013

The 5th master plan - ‘Ulaanbaatar 2020 Master Plan’ was approved in 2002. *“However many challenges were faced during the implementation of the plan...the lack of comprehensive demographic and economic strategies to address Ulaanbaatar’s unplanned increasing population was the most critical issue in the implementation of the 2020 Master Plan. During the implementation of the 2020 Master Plan, the legal environment did not facilitate a democratic city planning process and system to implement the 2020 Master Plan. Several additional factors also contributed Ulaanbaatar’s inconsistent urban planning strategy, including insufficient financial investment to implement the plan, and regional and city decision making that was inconsistent with the 2020 Master Plan.”*

The “Ulaanbaatar 2020 Master Plan and Development Approaches for 2030” expands and aims to implement the ‘Ulaanbaatar 2020 Master Plan’. It was approved in February 2013.

Development Challenges

- Migration from the countryside
- Lack of engineering infrastructure
- Weak land use legislation

Issues

- Unplanned expansion of the city, inappropriate land use and ger areas
- Lack of housing supply with basic amenities
- Damaged environment, including polluted air, water and soil
- Inadequate of municipal funding, institutional capacity and legal environment
- Traffic and congestion
- Inappropriate centralized settlement

Vision

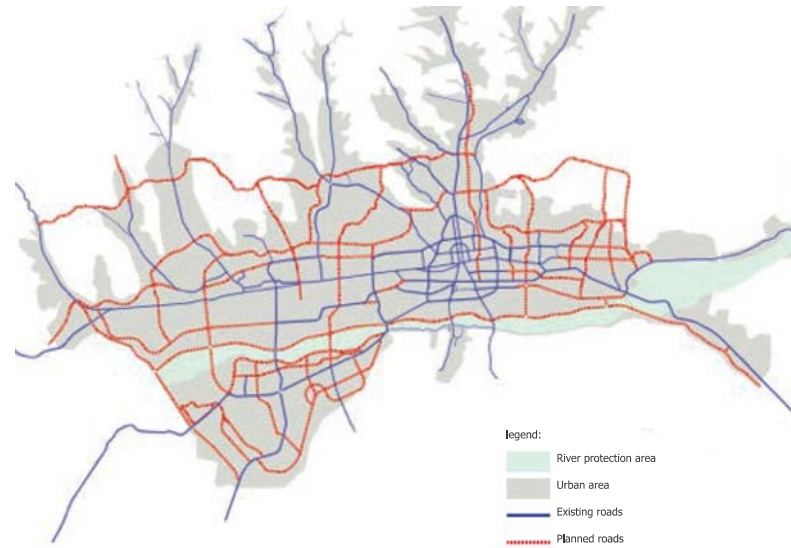
“Ulaanbaatar will be the capity city of Mongolia, that respects the nomadic heritage which has endured many centrueties, values its people, embraces its geographic characteristics, is environmentally friendly , has industries and an economy that are globally competitive and technologically advanced, and is a smart ciy with a unique Mongolian characer.”

Ulaanbaatar City urban Structure

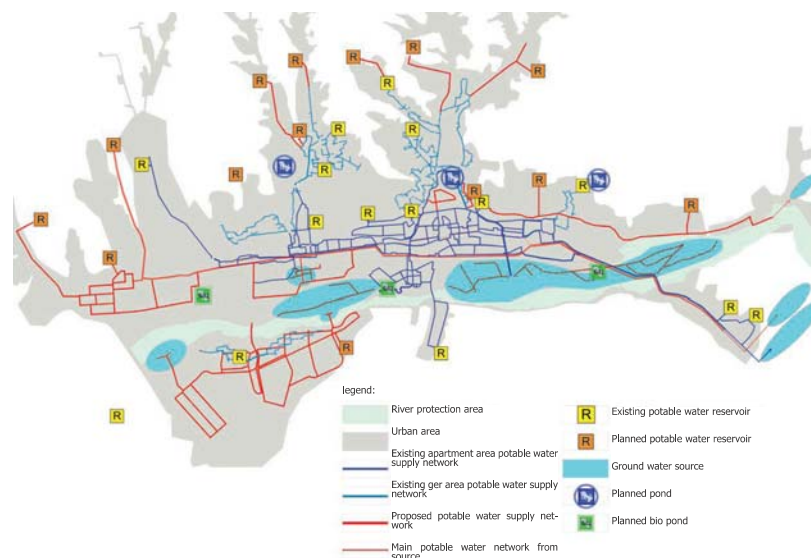
- Decentralization
- 4 level hierarchy – city centers, sub-city centers, district centers, and community centers

Apartment Complexes and Ger Areas Planning

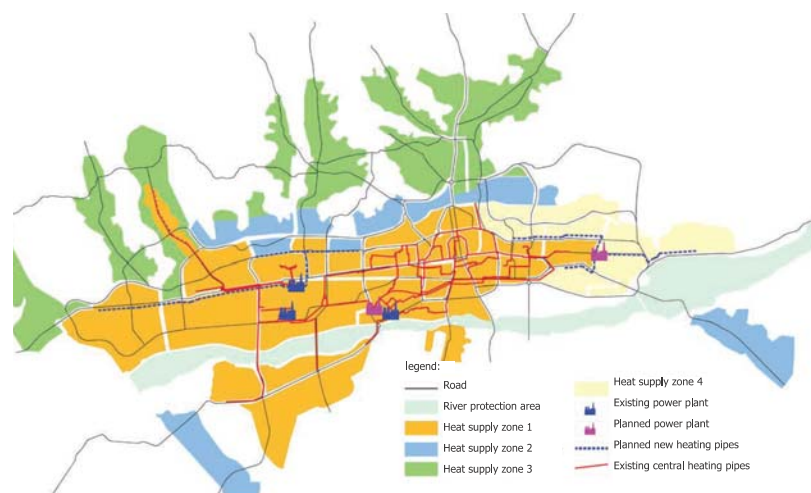
Housing Type	2010 (%)	2020 (%)	2030(%)
	100%	100%	100%
Housing with full utility services	43.0%	55.2%	61.8%
Housing with partial utility services	0.3%	3.3%	16.7%
	32.0%	32.5%	18.9%
	24.7%	9.0%	2.6%



Road and street network



Water supply and network



Heating supply network

Redevelopment of the ger areas

- The inner ger redevelopment areas (Urban) will be connected to central public utility infrastructure and redeveloped as medium and high density apartment complexes
- The middle ger redevelopment areas (Mid) will be redeveloped as medium or low density residential areas with utilities partially supplied from the central system or through an independent utility infrastructure
- The fringe ger areas will be developed as a low density private housing district with independent utility infrastructure

Road and Public Transport

- New city centers and sub-centers to redistribute traffic and reduce traffic congestion
- They will be connected by 9 vertical corridors, 6 horizontal corridors, and 4 ring roads.
- Public transport system – BRT (refurbish existing buses and adding new routes.) Light rail transit on existing railways to connect satellite towns – to be upgraded to a LRT metro system.

Heating Supply

- New heating supply infrastructure – thermal power plant, and heat-only plant, and smaller thermal power sources.

Water Supply

- Planned reservoirs along Tuul, Selbe, and Uliastai Rivers
- Greywater will be treated at wastewater treatment plants
- Increase wastewater treatment capacity – new treatment technology, facilities, and pipelines

Electricity

- 20-25% of electricity to residential areas and social facilities will be renewable energy sources by 2020.

The Master Plan also addresses sustainable environment management, tourism and recreation facilities, stormwater and flood management.

Implementation

Requires actions to address Legislative and Management Framework, and Socio-economic policy strategies.

- *Legislative and management framework*
Introduce suitable administrative and management structure for Ulaanbaatar's local government, including independent investment and planning functions.
Capital City, Ulaanbaatar City, Ulaanbaatar Region territory jurisdictions and description and classifications of towns and city classifications will be defined and legislated.
- *Socio-economic policy strategy*
Achieve economic independence of the city
Enable financing of future projects, build cooperation between the government and private sectors and increase the opportunities for long-term financing.
Establish a financial corporation for the maintenance of infrastructure
Reduce taxes for regional cities and towns, adapting high technologies and public participations for the Master Plan 2030.

Asian Development Bank Projects

Urban Transport Development Investment Program

ADB Project 39256

Project Outcome

Efficient, safe, and affordable urban transport services developed in Ulaanbaatar.

The Government of Mongolia (MUB) proposed an investment program to develop a sustainable urban transport system in Ulaanbaatar, the capital city of Mongolia.

The investment program aims to:

- Improve road infrastructure bottlenecks in Ulaanbaatar to maximize the road network capacity;
- Apply traffic management measures to increase traffic flow efficiency and safety;
- Develop and implement parking, traffic, and travel demand management policies;
- Develop a bus rapid transit (BRT)-based public transport system;
- Improve the public transport management and quality of services.

The project supports the city master plan prepared by the Municipality of Ulaanbaatar (MUB) that aims to develop the city infrastructure. It will also help the MUB to develop a transport policy and investment program, pilot a clean energy-based transport model, and prepare a performance based BRT operation contract.

Tranche 1

- Develop BRT infrastructure
- Expand the Peace bridge
- Install 14 km of electric trolleybus infrastructure (electric wires, feeder cables, and substations) for the BRT system;
- Introduce a 14 km BRT line in the north-south corridor of Ulaanbaatar;
- Construct 3 bus stations in ger area subcenters
- Install an intelligent transport system (ITS) component: bus management system (BMS);
- Provide resources for project management, detailed engineering design, and institutional development.

Source

Asian Development Bank, Project Data Sheet, Mongolia: Urban Transport Development Investment Program, Ulaanbaatar, 2018, <https://www.adb.org/projects/39256-023/main#project-pds>

Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project

ADB Project 49169

Project Outcome

Access to low-carbon and climate-resilient eco-districts and green affordable housing in Ulaanbaatar ger areas increased.

The project will have three outputs:

- Resilient urban infrastructure, public facilities, and social housing units in ger areas constructed (public sector component)
- Long-term financing to developers for low-carbon affordable housing market rate housing, and economic facilities in ger areas and to households for green mortgages increased (financial intermediation loan [FIL] component).
- Sector policy reforms implemented and capacity strengthened

Conducted in five phases.

- Phase 1
2 core sub projects (10 ha total) Bayankhoshuu and Selbe Subcenters
- Phase 2 + 3
8 sub projects (40 ha total)
- Phase 4 + 5
10 subprojects (50 ha total)
- 10,000 affordable green housing units
- 100 hectares to become eco-districts
- 30% public spaces
- 20 eco-districts (5 ha/project)
- Each sub-project to be completed within 5 years
- Each with a mix of 15% social housing, 55% affordable housing, 30% market rate housing
- Uses the Voluntary Land Swapping Plan (VLSP) – does not require all residents to agree to the project.

Source

Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, Ulaanbaatar, 2018. <https://www.adb.org/projects/49169-002/main#project-pds>

Ulaanbaatar Urban Services and Ger Areas Development Program

ADB Project 45007

Project Outcome

A network of liveable, competitive, and inclusive subcenters in Ulaanbaatar's ger areas.

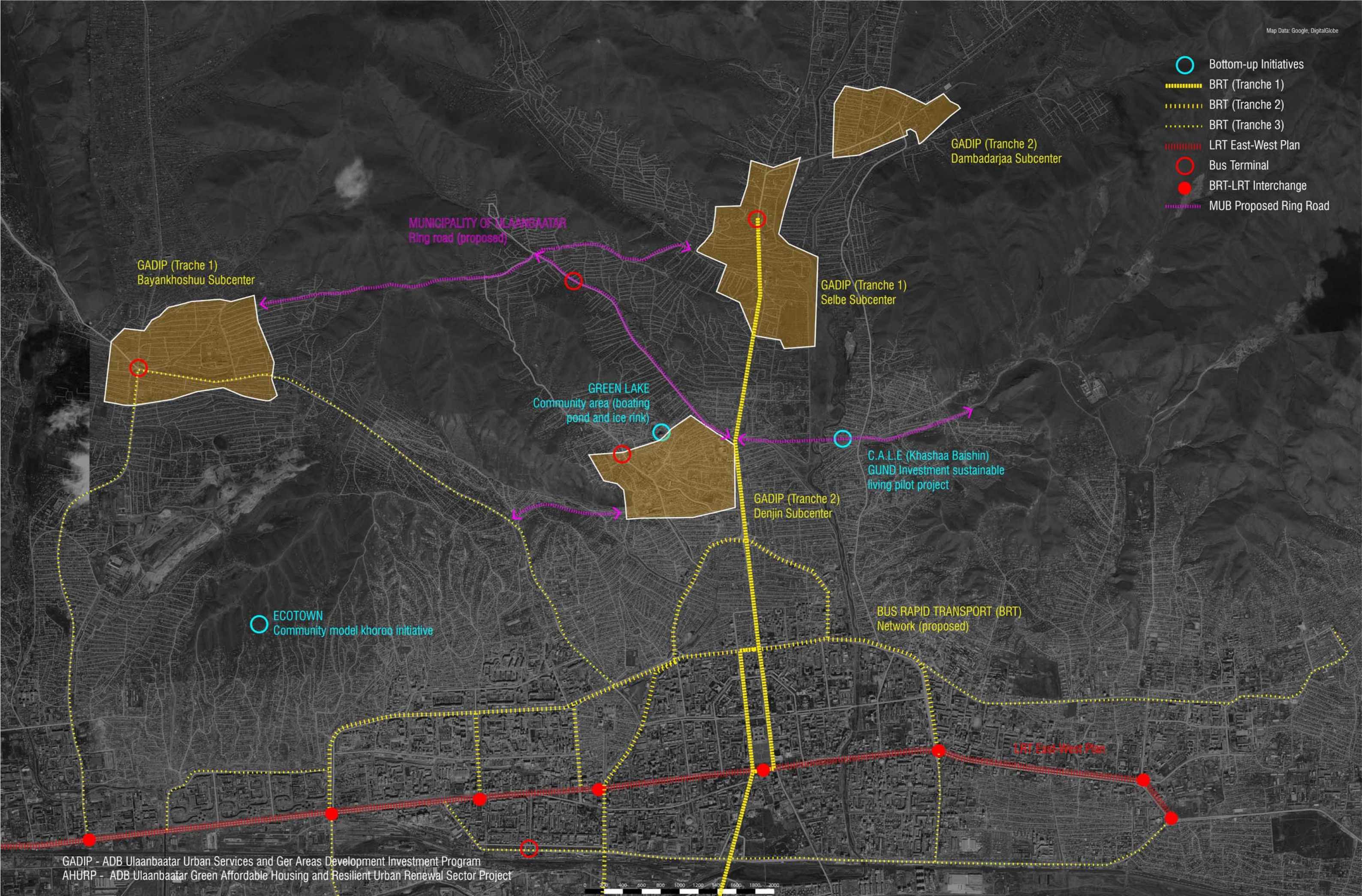
There are four strategic objectives:

- Expand roads and basic urban services (water, sewerage, and heating) within subcenters and improve connectivity to initiate land use transformation
- Increase economic and public services through investments and socioeconomic facilities to meet population needs, increase urban functions, and encourage job creation
- Increase service provider efficiency by improving water supply, sewerage, and heating service operations
- Strengthen institutions and capacity by improving urban planning and subcenter development, community awareness participation and empowerment, service provider operations and management, and program implementation capacity.
- The multi-tranche project supports the Ulaanbaatar city masterplan in upgrading priority service and economic hubs (subcenters) in ger areas.
Tranche 1 - Bayankhoshuu and Selbe
Tranche 2 - Dambadrjaa and Denjiin
- Extend urban infrastructure upgrading and spatial reconstructing to sites
- Subcenter influence is around 30,000 – 100,000 people
- Supported by three ADB –financed projects
A bus rapid transit line from the city center to Selbe subcenter
Support for housing and micro-, small-, and medium-sized enterprise financing in ger areas targeted by the program
Capacity development technical assistance to strengthen MUB (Municipality of Ulaanbaatar) urban planning capacity.

Source

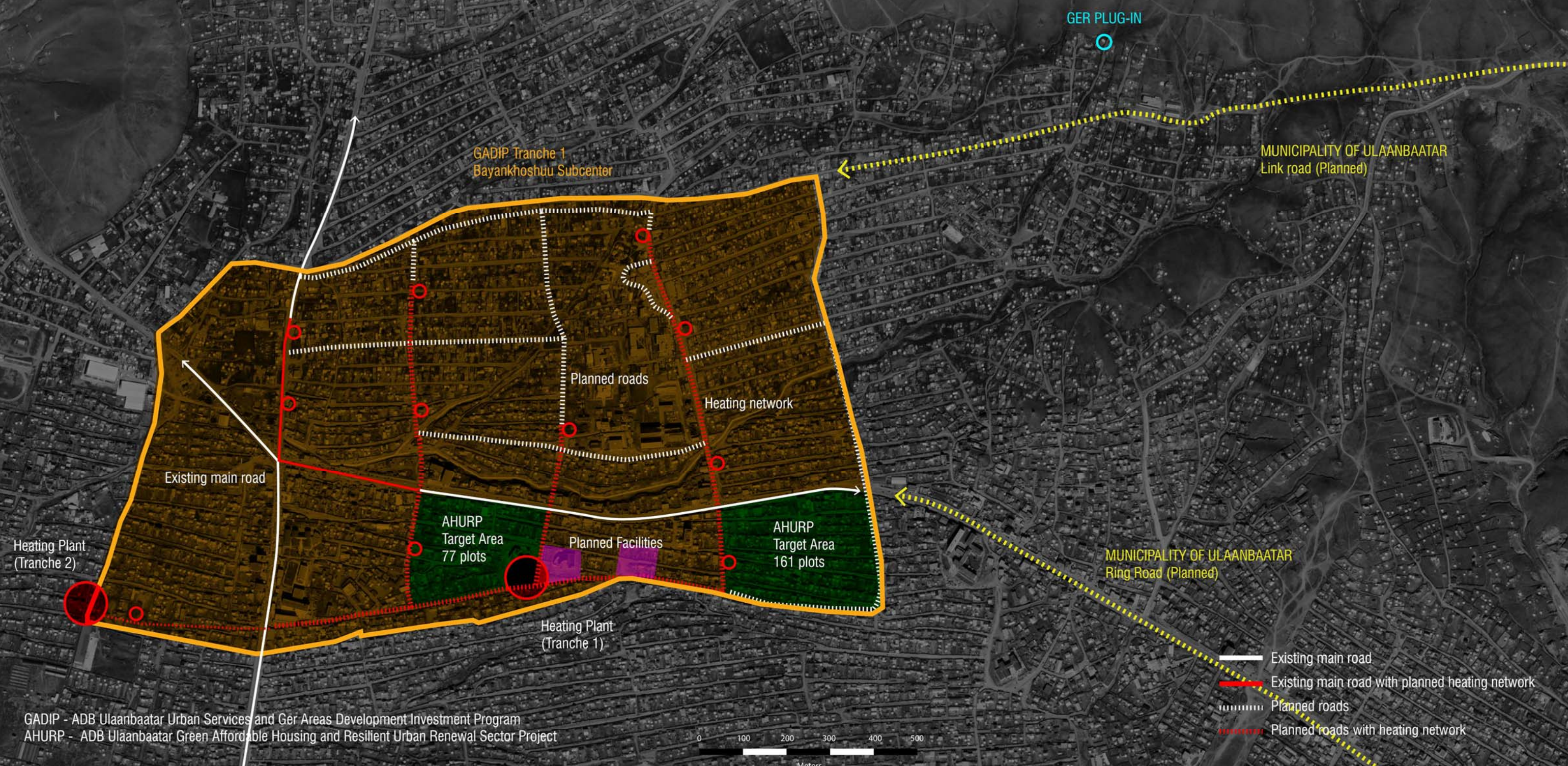
Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Urban Services and Ger Areas Development Investment Program, Ulaanbaatar, 2017, <https://www.adb.org/projects/45007-003/main#project-pds>

- Bottom-up Initiatives
- ⋯ BRT (Tranche 1)
- ⋯ BRT (Tranche 2)
- ⋯ BRT (Tranche 3)
- ⋯ LRT East-West Plan
- Bus Terminal
- BRT-LRT Interchange
- ⋯ MUB Proposed Ring Road



GADIP - ADB Ulaanbaatar Urban Services and Ger Areas Development Investment Program
 AHURP - ADB Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project





GADIP Tranche 1
Bayankhoshuu Subcenter

GER PLUG-IN

MUNICIPALITY OF ULAANBAATAR
Link road (Planned)

Existing main road

Planned roads

Heating network

Heating Plant (Tranche 2)

AHURP Target Area
77 plots

Planned Facilities

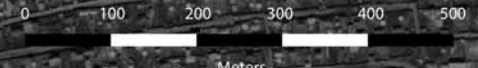
AHURP Target Area
161 plots

Heating Plant (Tranche 1)

MUNICIPALITY OF ULAANBAATAR
Ring Road (Planned)

- Existing main road
- Existing main road with planned heating network
- ⋯ Planned roads
- ⋯ Planned roads with heating network

GADIP - ADB Ulaanbaatar Urban Services and Ger Areas Development Investment Program
AHURP - ADB Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project



Meeting with Chingeltei Khoroo-16 Governor

12-12-2014

In attendance:

Khoroo-16 Governor

Two kheseg leaders from Khoroo-16 (Community/ Street Head)

Mr. Delgerbayar (The Asia Foundation)

What are your relationships with the Khoroo?

The governor is not living in the Khoroo and has been governor for the past 5 years

One kheseg leader has been living there for 15 years

The other kheseg leader has been living there for 36 years (since 1978)

How have you seen it change since you have been part of the area?

Governor- Changes since 2009:

When he started out as governor there were 9,600 residents in 2200 households. Now there is 12,000 residents in 3400 households. This increase is a result of migration to the city.

Also, the Infrastructure in the Khoroo is also now very well developed:

1.1 km of paved roads, built 3km of side walk, and 300 streetlights

Has the increase in population caused many problems in the area?

There has been a few difficulties:

Firstly, further migrations from the countryside and the limited amount of suitable land for these new migrants to form their khasha has meant that there is lots of semi-legal occupations of land. Although it is constitutionally legal to settle anywhere in Mongolia, it is not possible to claim and possess land that this not suitable settlement.

Environmental issues are another problem caused by migration to the Khoroo. The lack of infrastructure for such waste water, grey water, and waste is causing problems.

The stress on urban services such as household hospitals and community schools is another issue.

Are there fluctuations in the numbers of households in the khoroo with people leaving or being removed from semi-legal sites?

City's policy is to remove those settled on semi-legal sites but the residents do not want to move. This means that the government can only deal with these areas when the residents voluntarily leave.

What sets this Khoroo apart from other Khoroo's?

There is a shoe factory in the Khoroo. Comparatively, there are also many more shops and grocery stores. The khoroo is also on of the closest to the urban core. Much of the inhabitants work in the city.

Are there a fluctuation of people in the Khoroo; day/night, seasonal?

During the day there are a lot of older retired people. There are also lots of children. However, it is generally very quiet during the day.

There is also a lot a jobless people in the khoroo which lends itself to alcoholism. This is partially related to the seasonality of the construction industry with Ulaanbaatar having a short construction season due to the cold. The number of unemployed people therefore fluctuates but is generally an average of 600 people.

Are there any social facilities and activities that occur in the Khoroo?

There is a citizens hall in the khoroo government building which can accommodate 150-200 people. Social activities and skills workshops are held in there.

There are two NGOs also working in the Khoroo: "Good Neighbourhood" and "Good Neighbourhood (in mongolian)"

Are there any family based entrepreneurial activities in the area?

There are around 60 families which run small businesses from within their khasha. Generally they are making Mongolia traditional goods: crafts, clothes, souvenir, furniture, ger wood wheels. The whole district produces these kinds of crafts. This is because the district has a pot of money to provides loans to those who want to participate.

Some of these goods are then sold in markets in the centre whilst some are ordered directly.

What shoes does the shoe factory make?

Builders hoes are produced there. The factory looks quite big.

Are you aware of any redevelopment plans?

There are recently planned new schools and kindergartens. The land for these have already been acquired and will be built next year.

The government is also planning to redevelop this area by increasing infrastructure to this area, building new housing and flats, people seems to want to be part of this redevelopment. This is done under a voluntary process whereby 70% approval from the affected population is required before redevelopment can go ahead. Incentives include compensation for land and a property within the development.

What are your strategic visions for the area?

The dream is to be able to make decision for everything at the Khoroo level. At the moment the Khoroo has little power with decision being made at a district and municipal level.

The dream is also to improve living conditions through improved infrastructure and in doing so allowing residents to the further improve their own situations. Infrastructure such as hot water, mains sewers, bathing facilities.

What the governor doesn't want is for the neighbourhood to be redeveloped into flats. He cannot see how the people in the khoroo would want to give up their land for an apartment.

Meeting with Khan-Uul Khoroo 13 Governor

12-12-2014

In attendance:

Khoroo 13 Governor
Khoroo 13 Organiser
Mr. Delgerbayar (The Asia Foundation)

What is your relationship to this particular Khoroo? Did you migrate to the Khoroo?

Both the khoroo governor and the khoroo organiser were born in the area

How have you seen the area change?

He became governor in 2012. Prior to 2012:
-the area was very dirty and there were a lot of illegal dumps
-there were also a lot of gravel mining nearby
-construction waste from the city would be dumped and gravel used for concrete aggregate loaded

The governor managed to obtain 40 million Tughrig (20,000 USD) in funding support the Khoroo
The Khoroo is also part of The Asia Foundation's "Model Khoroo Project"

Commercially the village produces:

-chicken and eggs
-village products are also on the increase

Since they were are child, how have they seen the Khoroo change?

When they were very young, the area only had one chicken factory and employed 600 people. The Khoroo then only had 1000 people living in it.

There are now 13 chickens factories that produces 1,000,000 chickens now and also produces eggs. The growth in the number of factories have attracted many migrants to the Khoroo.
Population has increased in the past two years by 10%

The city mayor recently visited the Khoroo and designated the area for growth. Currently the population is 4,300 with the city mayor planning to increase it to 60,000. The upgrading of the khoroo expand it to the size of a small town. Currently, the government is updating the general plan for the area and the governor is involved in it.

The environmental conditions have also changed in the area. The mining of gravel has degraded the Tuul River in the Khoroo. This is caused by runoff from the mining industry is causing the river to not be as clean as it once was. The water was previously drinkable but is now only intended for livestock. The physical characteristic of the river has also changed due to gravel flowing into the water courses. This gravel mining start around 10 to 20 years ago.

The governor tried to improve this situation by sending letters to the Environmental Agency, the Ministry of Mining, and the Ministry of Environment. In doing so, the managed to affect mining policy. Mining companies are now required to remediate the land. Prior to 2012, there was no monitoring of mining activities but since policy changes the Khoroo government is now doing so.

Can you talk a little more about the commercial activities that occur in the village?

Commercial activity primarily involve farming:

-vegetables
-animal stocks
-milk products
-beef products

This is due to the amount of land that is available in the Khoroo and its surrounds. The Khoroo also shares a boundary with neighbouring minor provinces.

Do people commute to the city or just work in the village?

Most of the population work in the village, only 5% work in the city. 90% work within the Khoroo. Business in the area tend to be home businesses such as agriculture on their own khassha; planting vegetables, stocks of animals, small amount of crafts production. Some of the population also look after the family.

Would an increase of 60,000 residents affect the "family business" model of commercial activity?

In their opinion, this will not have a huge effect. The government policy is exactly to increase the number of family businesses. The number of community businesses also increases as the families form cooperatives

What is the intention of the new plans? How is it spatially planned?

According to the plans the area is designated to be for agriculture and farming

Will the centre of the village be developed?

The natural environment in this Khoroo is very nice; fresh air, green pastures, the Tuul river

The people are very kind and hardworking

Chickens and eggs from the factories in the area supply the rest of the city

Meeting with UN-habitat

11-12-2014

In attendance:

Enkh-tsetseg Shagdarsuren , National Programme Manager

Recent History

2000 - Number of plans for the city produced

2003 - Land privatisation where Mongolian nationals have a once in a lifetime opportunity to claim a piece of land in Mongolia

2006 - Upgrading strategy for the city produced

2007 - Strategy approved

The ger area strategy for central areas relies on the private sector with the government providing infrastructural connections.

The strategy for middle ger areas would be for redevelopment to be a voluntary process. Infrastructure is not provided outright with priorities on fundamental issues such as flood control.

The approach to outer ger areas would be to relocate those settled on dangerous areas.

2013-Ongoing- Project: Ministry of Construction Infrastructure Project

Aims:

To help the Ministry of Construction connect the Ger community with infrastructure

Process:

Assist the Ministry of Construction in negotiating with 160 families in coming to an agreeable routing of infrastructure.

Status:

Due to the length of time it has taken to negotiate with all the affected stakeholders in the Ger area, the initial designer/contractor had become bankrupt and the project is on hold.

2009 - 2013 - Project: Community-led Ger Area Upgrading in Ulaanbaatar City Project

Aims:

- Access and Infrastructure
- Small to medium size facilities

Process:

- Ger areas selected with the help of UB city, district government, and planning department - choice was to work within different types of Ger areas:

- 1) Sukhbaatar District, 17th Khoroo
High Income Area- Pensioners (regular income), river basin area
- 2) Songinokhairkhan District, 12th-17th Khoroo
Newly formed settlement- Newcomes (Unemployment high), plenty of time, actively engaging in upgrading project
- 3) Songinokhairkhan District, 11th Khoroo
20 to 30 year olds, older settlement, less wanted to relinquish land or allow development on their land, people in this community implemented and maintain their own self-made streetlights
- 4) Bayanzurkh District, 9th and 17th Khoroo
Car market area- Lots of part time workers, alcoholic rate higher
- 5) Chingeltei District, 17th Khoroo
Problems with water supplies as water trucks have difficulty driving up, whilst ground wells are not too profitable

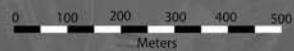
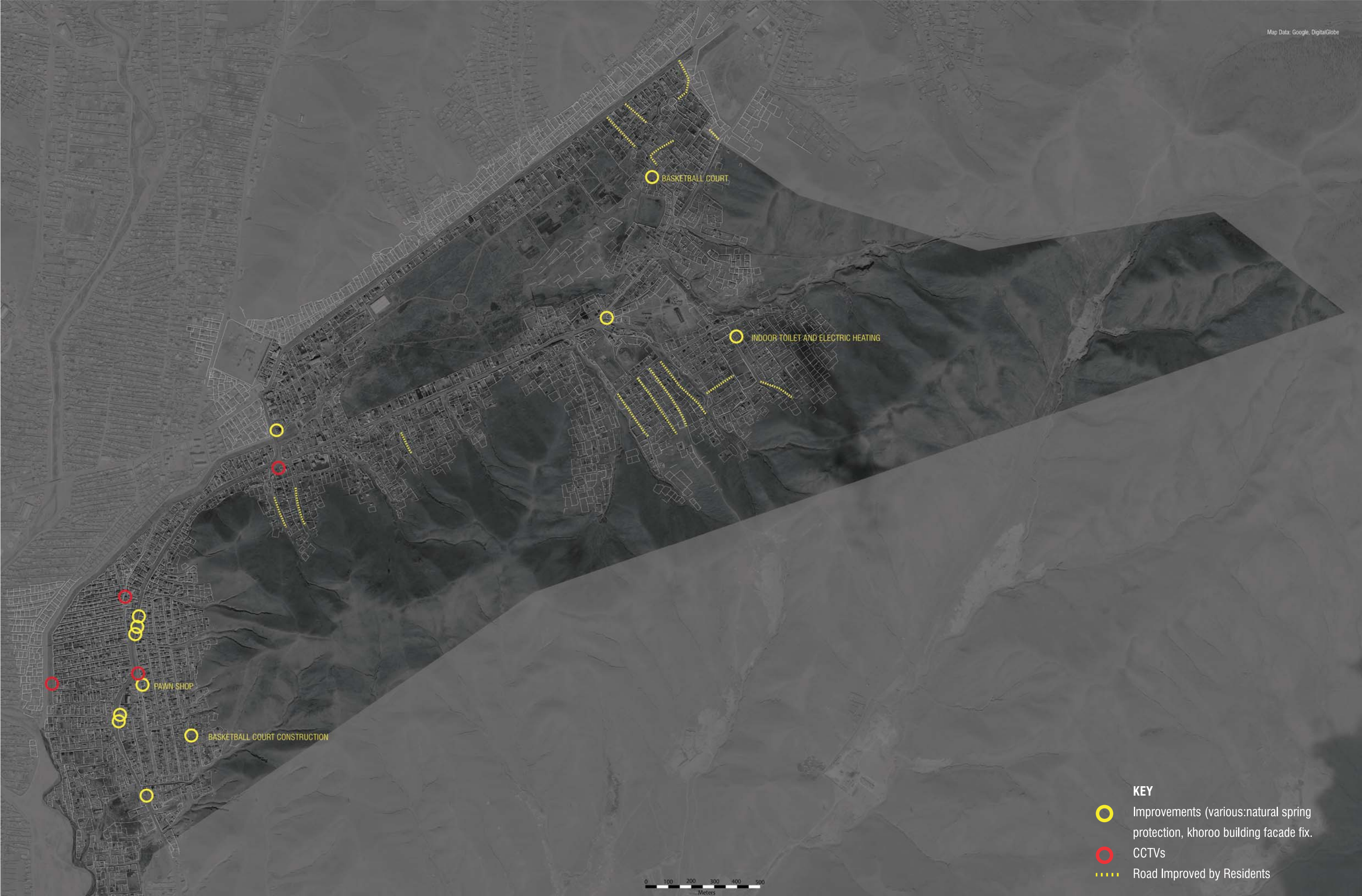
- Community mobilisation
- Organise in primary groups- existing local community categorised with parties willing to drive the project identified
- UN-habitat's role is to facilitate how the local people could realise the solution themselves

Feedback:




The local community from this project become empowered- a change in mentality where they now believe they can improve their own situation

Middle Income Economy

Mongolia has since been classed as a middle income economy. This means that UN-habitat receives less funding for such projects. Instead the funding model becomes one which is based on soft loans rather than technical assistance.



KEY

-  Improvements (various: natural spring protection, khoroo building facade fix.)
-  CCTVs
-  Road Improved by Residents

1F | FORMAL INFRASTRUCTURE

AIMS

To map both formal infrastructure such as those relating to energy, waste, water, transport, communication, but also relating to education, health, leisure, and culture in Chingeltei-16 and Sukhbaatar-16.

METHODOLOGY

Use Manaikhoroo, a community mapping website launched by The Ulaanbaatar City Municipality and The Asia Foundation, to locate formal infrastructure in the sample areas Chingeltei-16 and Sukhbaatar-16.

Meet governors of Chingeltei-16, and Sukhbaatar-16 to identify any infrastructure that is not mapped on Manaikhoroo.

Map formal infrastructure in Chingeltei-16 and Sukhbaatar-16.

RESULTS (CHINGELTEI-16)

Bus stops are added at the request of residents. The location of the last stop was extended to the current location in 2011.

There are three parking lots in the khoroo.

There is only one service centre near the middle of the district where trade and public services are concentrated.

There are about 1,000 children who do not attend kindergarten due to the insufficient supply. There are two kindergartens in the khoroo.

There are 21 water kiosks, and 3 bath houses. Water kiosks are added as the population grows around a certain area.

RESULTS (SUKHBAATAR-16)

Like Chingeltei-16, bus stops are added at the request of residents. The last stop is at the core of one of the service centres.

Parking is insufficient, there are no parking lots in the khoroo.

There are three service centres in the khoroo along the beginning, middle, and end of the main road.

There are no elementary or secondary schools in the khoroo. There are 6 kindergartens and 3 baby-sitting services but they are still operating overcapacity.

Water kiosks are added as the density around a certain area increases. Sukhbaatar-16 has 13 water kiosks. They are all within 5 minutes' walk from each other.

RESULTS (GENERAL)

Infrastructure of bus stops and water kiosks are reactive to the growth of the ger districts. This is born out of necessity as opposed to the implementation of pre-existing plans.

Formal Infrastructure Methodology

Interviews were done with both governors Oyunchimeg L. (07/11/2016) of Chingeltei-16 and Yadamjav D. (18/11/2016) of Sukhbaatar 16 regarding the developments being planned in their respective areas. Due to the timing of the research (right after elections), the plans for the khoros were not confirmed, and the budget for both khoros were not ratified at the district and municipal levels. The district council meetings for 2017 have been organized respectively on 09/12/2016 (Chingeltei district) and 19/12/2016 (Sukhbaatar district). The detailed report of the meetings have not been made available to the public as of yet.

The information gathered for the khoros came from meetings with Chingeltei 16 khoroo organizer Gantsetseg whom the new elected governor referred after being approached, and khoroo governor Oyunchimeg L. for Sukhbaatar 16. She also recommended meeting with Batdorj G. for additional meetings for mapping out and collating additional data for Sukhbaatar 16.

Data on infrastructure built between 2013-2015 in Chingeltei 16 was obtained from the district office from a meeting with Urantsetseg M., specialist at the Economy and Planning Department at the Chingeltei District Office. Sukhbaatar district official from the Economy and Planning Department declined to be interviewed without approval from the department head and an official request letter. Public reports were also not available at the office. However, the reports of implemented projects between 2013-2015 for Sukhbaatar 16 was obtained through Batdorj G. who had a copy of the printed book.

Most of the projects implemented between 2013-2015 had already been mapped on manaikhoroo.mn for both khoros.

The following maps on manaikhoroo.mn have been modified:

Chingeltei-16

- Education (added kindergarten and kindergarten + elementary school complex)
- Emergency (added muster point)
- Pedestrian bridge and staircases (khesegs that have added pedestrian bridge and staircases have been highlighted, actual locations were difficult to obtain on google maps for the kheseg leader)
- Trade and services (cluster area has been highlighted, photos available on “research photos with captions” file)
- Waste (smart collection waste collection point added)
- Water accessibility map (detailed map obtained from Batdorj G.)

Sukhbaatar-16

- Water accessibility (detailed map obtained from Batdorj G., added new water kiosks in yellow)
- Danger zone (added gas station)
- Finance and economy (clusters added)
- Education (new kindergarten extension and new 240-kid kindergarten highlighted, but already exist on the manaikhoroo.mn)
- Health and Law (khoroo police unit and hospice added)
- Trade and Services (cluster highlighted)

1F | **FORMAL INFRASTRUCTURE**
Chingeltei-16, Ulaanbaatar

Assessment of Existing Infrastructural Provision - Chingeltei-16, Ulaanbaatar

		Date of establishment	Main stakeholders	Short description	Associated Problems	Further notes
1 Public transportation						
	Bus stops	n/a The last stop was extended to its current location in 2011.	There is government owned companies as well as private companies.	<ul style="list-style-type: none"> - There are four bus stops that serve the khoroo. Bus stops are added by the request of the residents. The bus service is free for seniors, university students, police officers, and people with disability. The "U Money" card, a 'smart' card introduced last year to change the way users pay transportation fees, is being widely used and allows people to transfer free within 30 minutes. - New bus stops are added when paved roads are constructed. 	<ul style="list-style-type: none"> - There are settlements beyond the last bus stop, so people have to walk long distances to their home. - Due to this, informal taxis are in operation from the last bus stop that charge 1000 MNT to transport residents to places near their homes. - More roads have been constructed in the area in the past few years, but bus stops haven't been added. - While there is a schedule for the buses, the intervals between buses are long, sometimes lasting up to 40 minutes. - The 30 minutes transfer time is sometimes not enough, especially when you're transferring multiple times. 	<ul style="list-style-type: none"> - The buses are usually not in good shape and drivers do not care much for safety of passengers while driving. The bus stops are not travel friendly for disabled people, and the buses do not offer disability service.
	Parking	2013-2015	Government	<ul style="list-style-type: none"> - Is parking needed? Enough? Parking lots have been constructed in order to prevent road blockages. The current number of parking lots is considered enough. It's considered us	<ul style="list-style-type: none"> - It's unclear who is in charge of the maintenance of the parking lots. During winter, the parking lots can become snowy and icy becoming unsafe to walk on. - There have been instances where children have been hit by cars. 	<ul style="list-style-type: none"> - Site observation: inefficient use of space. The parking lots have had only one or two cars every time I've visited the area.
	Roads	2013-2015	Government	<ul style="list-style-type: none"> - Road construction and maintenance managed by government? Quality? A number of pedestrian staircases, bridges, and roads were built in the past few years (one bridge each in kheseq 9 and 12, and one staircase in kheseq 7). Most of the dirt roads were improved. Road construction is financed by the government and built by private contractors. Guarantee of 6 months to 1 year is given.	<ul style="list-style-type: none"> - The design of the roads/bridges/staircases often does not consider users and the climate. - The stairs often become very slippery in the winter months, so it's difficult to use. - While roads are better than before, they often are built not to last. In the summer months, some wear down due to rain. 	-
2 Water + Sewage						
	Water kiosk	n/a	Government	<ul style="list-style-type: none"> - How many water kiosks? - Managed by? How many water kiosks per household? <ul style="list-style-type: none"> - There are 19 water kiosks that serve about 3400 households. There are 8 individuals that have registered their private deep water boreholes (1 for industrial and others for individual use). Households prefer to get their water from state provided water kiosks where quality is regularly tested. 5 of the water kiosks are connected to the central line, and there are 13 mobile water kiosks that deliver water to households that are located on fringe areas where access to a water kiosk is limited. - Water kiosks used to operate between certain hours of the day by personnel, which limited access, but now are being upgraded to have 'smart' systems, where users can get water 24 hours a day. Not all water kiosks have been upgraded. 	<ul style="list-style-type: none"> - There is more need for the construction of water kiosks in the khoroo. - During winter, some water kiosks become very icy and slippery. This causes minor accidents and injuries. - Operating a car wash service does not require complicated permissions. Car wash services usually get private boreholes in their respective spaces for industrial use. The consequences for allowing this have not been thought through yet. 	Observation: Due to the limited number of community/public spaces, water kiosks have become one of the few public places people 'run' into each other.
3 Education						
	Elementary/secondary school	2016	Government	<ul style="list-style-type: none"> - Schools are operated by the state? Supply? How many shifts? There are no schools in the khoroo yet, but an elementary school+kindergarten complex is currently in construction and is scheduled to open December 2016. Children of the khoroo go to Secondary School 72 located in khoroo 15, a neighboring khoroo. The school has been recently connected to wireless internet. Overall, schools are short in supply throughout the city, and operate over capacity. On average there are 30-40 students per class and the schools operate in 3 shifts.	<ul style="list-style-type: none"> - Secondary school 72 operates over capacity, so quality is compromised. - Due to lack of unoccupied, centrally located land, building schools becomes costly. The government has to negotiate with private individuals to acquire land. 	In the ger districts, the government is the main stakeholder for providing educational services.
	Kindergarten	2015 (private kindergarten)	Government, private, international NGOs	<ul style="list-style-type: none"> - Kindertartens are operated by the state? Private? How many kids per class? Supply enough? There are two kindertartens in khoroo 16 (one private and one soon to be opened that is state owned).	<ul style="list-style-type: none"> - There are about 1000 children who do not attend kindertarten due to insufficient supply of kindertarten. - Like schools, due to the complications related to land acquirement, building additional kindertartens is challenging. - State schools and kindertarten is free of charge, while private ones cost depending on quality and prestige. 	

4 Health					
	Local clinic	2004	Government	There is one local clinic that serves the khoroo, which staffs nurses and 4 doctors. Residents of Mongolia are entitled to universal healthcare. Local clinics provide primary healthcare needs of the local communities.	<ul style="list-style-type: none"> - The clinic also operates over capacity. - The khoroo has received requests that there is a need for a nearby general hospital to be built where they can get more specialized treatments. - The district general hospital receives the khoroo's patients and is usually operating overcapacity, so waiting time and service quality is compromised. - Land and human capacity issues.
5 Public services					
	Recycling shop	one opened in 2016	Private	There are two recycling shops in the khoroo. They buy plastic bottles, aluminum cans, alcohol bottles, and metal. They are privately owned and operated.	<ul style="list-style-type: none"> - Many of the recyclable goods collectors in the city are homeless and come from financially vulnerable groups. - Recycling activities in the city are not organized. It is said that about 240 small-scale recycling shops operate in the city, and all of them are located in the ger districts due to complaints received by residents in the built up core areas of the city.
	Public bath house	n/a	Private	How much does it cost to use? What services are provided? Demand and supply? There are three bathhouses that serve the area, and all of them are privately owned and operated. A shower costs on average 2,750 MNT. Usually, bathhouses have a salon operating in the same place.	<ul style="list-style-type: none"> - While there are set standards for running bathhouses, it is not strictly enforced. Therefore, majority of the bathhouses are not user friendly for elderly, disabled people, and children. Ventilation system is poor, and hygiene is not very good. - Due to low supply, residents who live close to the bathhouses usually use it the most. - Residents usually have a family relative living in an apartment, so people visit their families to use their showers.
6 Economy + Finance					
	Banks		Private	How many banks? What kind of services? A Khaan Bank branch used to be located at the last the bus stop, but recently closed down.	<ul style="list-style-type: none"> - No nearby banks and ATMs.
7 Waste					
	Legal waste collection site?		Government/ Landscaping and service company (TYK, local acronym)	How many sites in the area? There is one legal waste collection site in the khoroo that is also functioning as a recycling shop. Waste is collected from individual 'khashaa' plots on scheduled days of the month. Concerted efforts that have been put to specifically target waste management problems in the past few years have resulted in the dramatic reduction of waste collection related problems in the area.	Any problems? While the khoroo administration still receives calls from residents from time to time regarding waste collection, it's not considered to be at a significant level.
	Illegal waste dump sites			How many? Why? Any plans to address it? Illegal dumping sites have been cleaned, and no major problems related to illegal dumping have been observed as of this year. People still litter due to habit.	<ul style="list-style-type: none"> - While illegal dumping of waste has decreased significantly, more work needs to be done regarding littering.

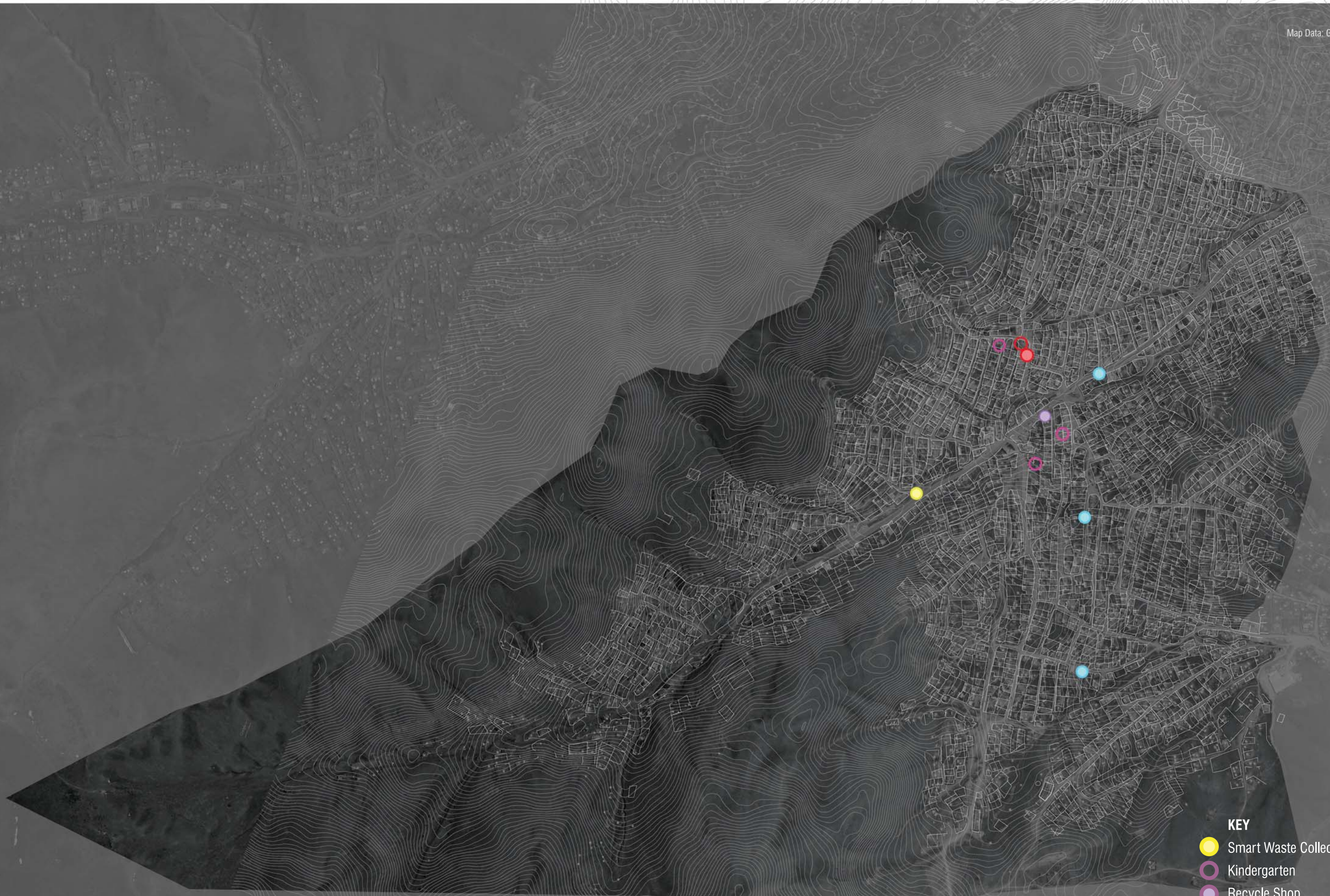
8 Law enforcement						
	Police station		Government	How many officers on duty? There is one police station serving the khoroo. It has 2 officers on duty. There are also paid patrols that are hired by the police. They are usually residents of the khoroo, and work to prevent or report crimes.		
9 Children's welfare						
	Religious organization/International organizations	2011	International	How many religious organizations? Good Neighbors NGO has a program in the khoroo that targets children from vulnerable families. Dream Center, which cares for 835 sponsored children ages 6-13 and was established in early 2011. The Dream Center's programs include after-school activities, school meals, and access to libraries. For local residents, vocational training programs including welding and make-up skills helps individuals generate more income for their family.		World Vision is another organization that primarily works in the ger districts and rural Mongolia. Most projects and programs target the most vulnerable population.
	Daycare center /өдөр өнжүүлэх/		Private	Difference between kindergarten and daycare centers? Who runs and funds? Daycare centers provide children with homework help, and operate longer hours than kindergartens. This offers flexibility for parents who work irregular hours. It's usually owned and operated privately.	- Issues with quality and price (250,000-280,000 MNT per month) - Standards are not consistent. For instance, some places have been criticized for being very strict and overworking kids.	
10 Public spaces and land						
	Street lighting	2013-2015	Government	How many streets have street lighting? Who maintains? Streetlights have drastically improved in the past few years. Most streets (90%) now have light except for areas that are not connected to electricity. The companies that installed the lights do the maintenance.	- No major issues and complaints have been raised.	
	Playgrounds	2015-2016	Government, private	How many playgrounds? Is it used for any other purposes? There are two playgrounds for children in the whole khoroo. One is located in front of a private kindergarten, and another being constructed in the new school+kindergarten complex.	- There is a lack of playgrounds for children in the khoroo. - Like schools, clinics, and other public infrastructure, land is the main issue that complicates procedures related to the construction of public spaces in the ger districts.	
	CCTV	2013-2015	Government	Who monitors? What do you use it for? Has it been useful? CCTVs have been installed in certain areas that have been identified as risky places in the area. The goals were to prevent crimes and prosecution easier. 9 CCTVs were installed along the road and every room of the khoroo administration building.	- The CCTVs are not in operation.	
	Muster point	2013-2015	Government	What's a muster point? A muster point is used in the case of an emergency (i.e fire, ambulance). They were created in the ger districts due to the lack of address and difficulty in finding khashaa plots.	- The muster point created in the khoroo is not currently in function due to land related issues. Someone has claimed the land and has put up fence surrounding it. - Awareness of muster points and their use amongst residents is low. - Regarded as a waste of valuable land and money.	
	Basketball court	2016		How many basketball courts? Who maintains? One outdoor basketball court was recently built near the 'old' last bus stop.	- There are no public spaces to play sports in the khoroo.	

12 Roads					
	Pedestrian bridge	2013-2015	Government	Pedestrian bridges and staircases have been built in the past few years with the creation of the Local Development Fund (LDF) in 2013. It is a discretionary fund at the district level that has allowed many small-scale infrastructural projects to go forward, including roads, streetlights, cctvs, pedestrian staircases and bridges. The LDF is a participatory budgeting tool where residents' inputs are collected every year at the khoroo level, prioritized, and sent to the district to be approved by the district representatives' meeting.	<ul style="list-style-type: none"> - Pedestrian bridges and staircases have been criticized as not very user-friendly. Some of them do not have handles and are very steep, for elderly and children. In the winter, they become very slippery. - The improved roads are also not built for lasting. Often, they wear down after heavy summers. Also, due to the angle of the slopes, cars have difficulty going up in the winter when roads are slippery and snowy.
	Pedestrian staircase	2013-2015			
	Improved dirt road	2013-2015			
13 Cable					
	Internet cable			The khoroo administration has been connected to internet. Around 20% (200-300 households) of households have access to internet through their phones. Internet penetration in the khoroo is low.	
14 Trade and services					
	6 item shops	n/a	Private	There are number of small shops that are allowed to sell 6 types of items. Setting up and running shops that sell everyday items is one of the main forms of business that support residents' livelihoods.	
	Other	n/a	Private	Service clusters are near the 'new' last bus stop. Bakery, salon, printing shop, pawn shop, electric appliance repair shop, toy store, cosmetics and clothing stands, and tea shops are located near the bus stop.	-small businesses that are often housed in poor housing constructions.
15 Other					
	Improvements	2013-2015		<ul style="list-style-type: none"> - Major infrastructural improvements from past few years include waste collection and management, the construction/improvements made to roads, streetlights, construction of elementary school+ kindergarten complex, and bus transportation payment system. The creation of the Local Development Fund has allowed residents to participate in local planning. 	<ul style="list-style-type: none"> -There are still areas in the khoroo where residents are not connected to electricity. These areas are the least connected to any form of infrastructure. - Bus stops end where the road ends, so access to public transportation is limited for households located far from roads.



- KEY**
- Bus Stop
 - Carpark

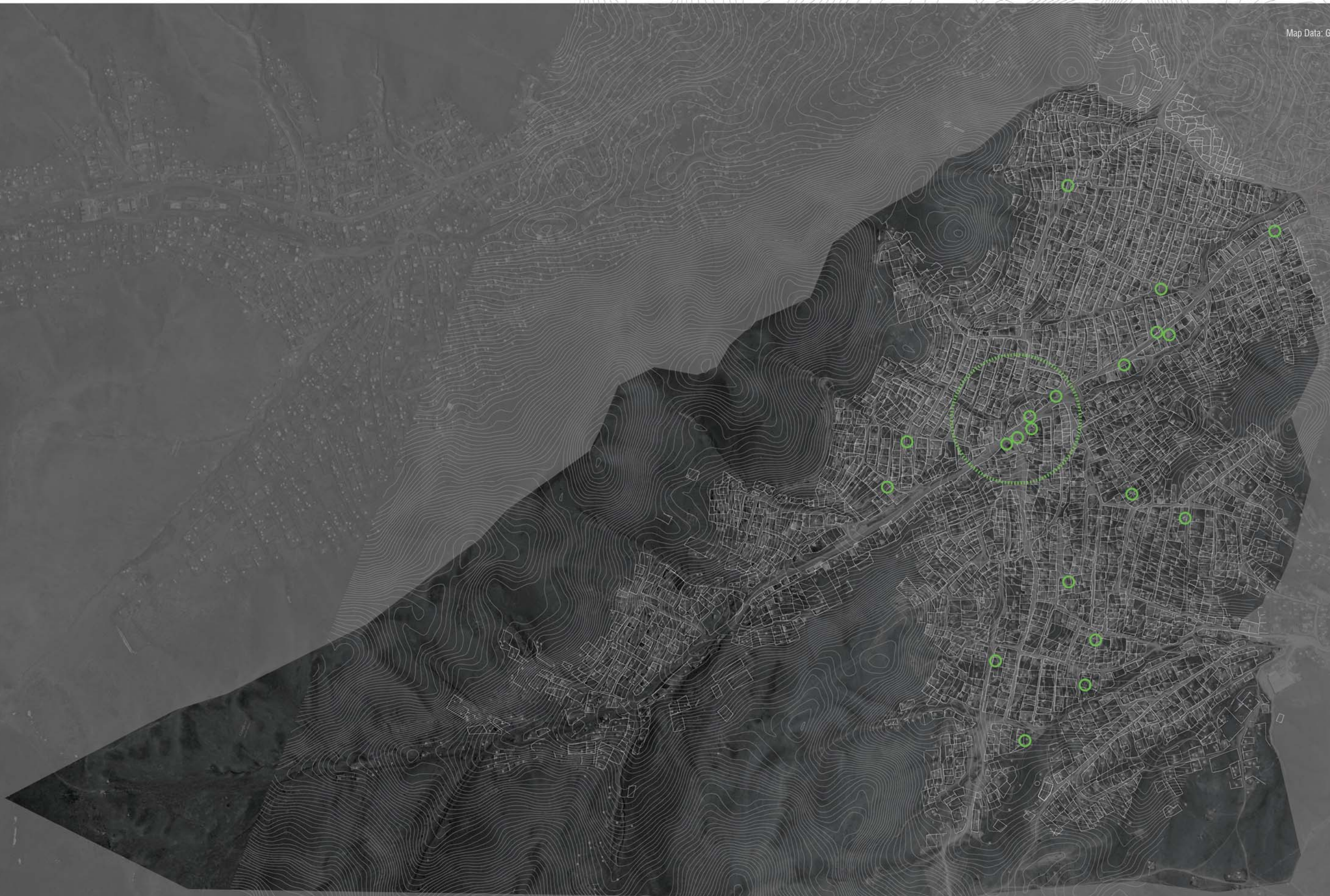




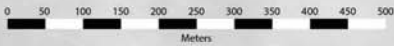
KEY

- Smart Waste Collection Point
- Kindergarten
- Recycle Shop
- District Police Station
- Local Clinic
- Bath House








- KEY**
- Minimarket
 - Service Cluster



- KEY**
- Water kiosk (pre 2000)
 - Water kiosk (2001-2005)
 - Water kiosk (2006-2010)
 - Water kiosk (2011-2015)
 - Water kiosk (2016-present)
 - 5-minute walking distance



- KEY**
-  Private water source
 -  Water kiosk
 -  5-minute walking distance

1F | FORMAL INFRASTRUCTURE
Sukhbaatar-16, Ulaanbaatar

Assessment of Existing Infrastructural Provision - Sukhbaatar-16, Ulaanbaatar

		Date of establishment	Main stakeholders	Short description	Associated Problems	Further notes
1 Public transportation						
	Bus stops	n/a	Government/private	The current number of bus stops is considered sufficient for the area. Like Chingeltei 16, bus stops are added at the request of the residents. However, that also depends on whether there is a road to service buses. There are informal taxis that serve people from the last bus stop for 1000 MNT.	<ul style="list-style-type: none"> - Bus stops are not user friendly. It's difficult to wait in the winter cold for a long time outside. - Due to traffic, road accidents, bus malfunctions, it's common that buses are delayed. 	
	Parking	n/a		<ul style="list-style-type: none"> - Is parking needed? Enough? Parking is insufficient. No parking lots exist in the khoroo.	<ul style="list-style-type: none"> - Parking lots need to be added in front of public buildings. Schools, kindergartens, and other public places often don't have any parking space, which leads to road congestions. 	
	Roads	2013-2015	Government	<ul style="list-style-type: none"> - Road construction and maintenance managed by government? Quality? Some roads have been improved in the past two years, but overall, there haven't been any major improvements. Quality is not very good, and quality guarantee period is short.	<ul style="list-style-type: none"> - The roads are generally bad, especially areas that are more isolated from the central road. - The poor quality of roads create a lot of dust when it's dry, muddy when it rains, and slippery in the winter. 	The khoroo is not currently included in any of the redevelopment plans of the city.
2 Water + Sewage						
	Water kiosk	2013-2015	Government	<ul style="list-style-type: none"> - How many water kiosks? - Managed by? How many water kiosks per household? There are 14 water kiosks that serve around 2700 households. While some kiosks have been automated allowing residents more access to water any time of the day, the water kiosks in isolated areas are still operating on scheduled hours. In the past 2 years, three deep water wells were created in the khoroo.	<ul style="list-style-type: none"> - Khoroo area is large, so water accessibility is an issue for many residents, especially households located on steeper slopes. - There are several car-washing businesses that have boreholes in their plots. The regulation concerning their use is loose. 	
3 Education						
	Elementary school	n/a	Government	<ul style="list-style-type: none"> - Schools are operated by the state? Supply? How many shifts? The khoroo does not have any schools. Children from the khoroo go to schools in neighboring khoros.	<ul style="list-style-type: none"> - Throughout the city there is a shortage of schools. However, the situation is worse in the ger areas. - Schools operate over capacity. 	
	Kindergarten	2013-2015	Government, private	<ul style="list-style-type: none"> - Kindergartens are operated by the state? Private? How many kids per class? Supply enough? There are 4 state owned and 2 private kindergartens. There are also 3 children's baby-sitting service places (2-6 year old) in the khoroo that receive government subsidy for every child they enroll. A kindergarten with a capacity of 240 kids was built in the khoroo in recent years.	<ul style="list-style-type: none"> - Due to the lack of supply for kindergartens, the places are often packed and operating overcapacity. - There are services like children's daycare and baby sitting, but they operate haphazardly. 	
4 Health						
	Local clinic		Government, private	There is one clinic in the khoroo staffing 4 doctors and nurses. There is also a hospice in the khoroo that serves people from all over the country. Residents have to use the district hospital for getting inpatient services, and getting tests done.	<ul style="list-style-type: none"> - The khoroo land size is big, and the local clinic is close to only one part of the khoroo. This limits access to the clinic for many residents. General issues such as the necessity of a general hospital also exists. Land and human capacity is an issue. 	
5 Public services						
	Recycling shops	n/a	Private	<ul style="list-style-type: none"> - How many people use it? What do people recycle? How is their daily earning? There are 3-4 recycling shops in the khoroo operated by private individuals. The products they collect are the same as the shops in Chingeltei 16.	see Chingeltei 16.	
	Public bath house	n/a	Private	<ul style="list-style-type: none"> - How much does it cost to use? What services are provided? Demand and supply? Public baths are under supply. Many residents visit family relatives living in apartments to take showers. It's common among residents to shower once every two weeks, or less. Most people opt to heat up water in their homes to wash.	<ul style="list-style-type: none"> - Isolated areas of the khoroo do not have any access to bathhouses. - Bathhouses are not up to standards, and have subpar quality. - Standards are unrealistic and hard to achieve. 	
	Other			Sanitation is a major issue in the ger areas in general. It hasn't been considered a priority issue by the sector. Construction and maintenance of pit latrines are of poor quality, and pose public health risks when the city experiences flash floods in the summer. A minority of ger areas near the urban center have been connected to the central sewerage system.	<ul style="list-style-type: none"> - It is especially hard to use the pit latrines during the winter months when temperatures are below freezing. Since majority are squat pit latrines, it is difficult to use for young children and elderly. - Most, if not all, households do not coat the insides of their pit latrines. Th 	

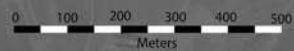
6 Economy + Finance						
	Banks	n/a	Private	How many banks? What kind of services? Several commercial banks have their branches in the khoroo, including Khan Bank, Kapital Bank, and the State Bank. The khoroo also has 4 pawnshops.	<ul style="list-style-type: none"> - The bank services are slow due to poor connection to the servers. It takes a long time for people to use the banks as the queue time is long. - Many of the ger area residents are lower income people who get welfare benefits from the state. The benefits are usually collected from banks. This also creates traffic at the banks. 	
7 Waste						
	Legal waste collection site	n/a	Government	How many sites in the area? Waste collection sites have been cleared in the past four years. Waste collection trucks collect waste from individual khashaa plots every month on a scheduled date.	The Asia Foundation worked with the city waste management stakeholders to address waste in the ger areas.	
8 Law enforcement						
	Police station	n/a	Government	How many officers on duty? There is one police station and one police unit in the khoroo administration building. The unit employs 3 members from the community as community patrols.	<ul style="list-style-type: none"> - Not very effective. - Crime solving rate is low, and even if the culprit is found compensation is rarely given to the victim. 	
9 Children's welfare						
	Religious organization/international organizations	n/a	International	There are several religious organizations that do charity work in the area. AGRA implements livelihood improvement project with selected households. Mormon missionaries also do some work. 'Ойн гэрэл', which translates to Forest Light, also work with vulnerable families.	Foreign religious organizations often do not strictly do missionary work as the government heavily restricts and monitor their activities. Missionary work is not well received by the public, and is criticized heavily if the sole purpose of the organization is evangelism.	
	Daycare centers /өдөр өнжүүлэх/		Private		The legal framework for operating a daycare center does not exist. The quality of the centers varies drastically from place to place. They charge between 250,000-350,000 MNT per month.	
10 Emergency						
	Muster point	2013-2015	Government	A muster point is used in the case of an emergency (i.e fire, ambulance). They were created in the ger districts due to the lack of address and difficulty in finding khashaa plots.	Awareness among how muster points are supposed to be used is low. In some areas, the points were created in locations that are not easily found.	
11 Public spaces and land						
	Street lighting	2013-2015	Government	How many streets have street lighting? Who maintains? Streetlights are sufficient in the areas located near the main Dari Ekh road, but are considered not sufficient in the isolated areas. Streetlights are maintained by private companies when issues are reported at the khoroo administration building. Additional streetlights have been installed in the khoroo.	Significant street lighting work has been done in the ger areas in the past few years with the Local Development Funds. However, ger areas remain considerably darker than built up areas.	
	Playgrounds		Government	How many playgrounds? Is it used for any other purposes? Playgrounds are located only in kindergartens.	<ul style="list-style-type: none"> - Not sufficient - Same as Chingeltei 16, land is a major issue. - Residents don't really pursue the issue very much. 	
	CCTV	2013-2015	Government	Who monitors? What do you use it for? Has it been useful? CCTVs have been installed at several areas near the khoroo administration building in the past two years.	They're not in operation.	Apparently, the locations of CCTVs are considered classified by the police.
	Basketball court	2013-2015	Government	How many basketball courts? Who maintains? Two public outdoor basketball courts have been constructed at different parts of the khoroo.	<ul style="list-style-type: none"> - Because they're outdoor basketball courts, they can't be used during the colder seasons. - Insufficient number of recreational spaces in the khoroo. - School gym is often used for public sport events. 	Ger areas generally lack sport facilities and spaces.

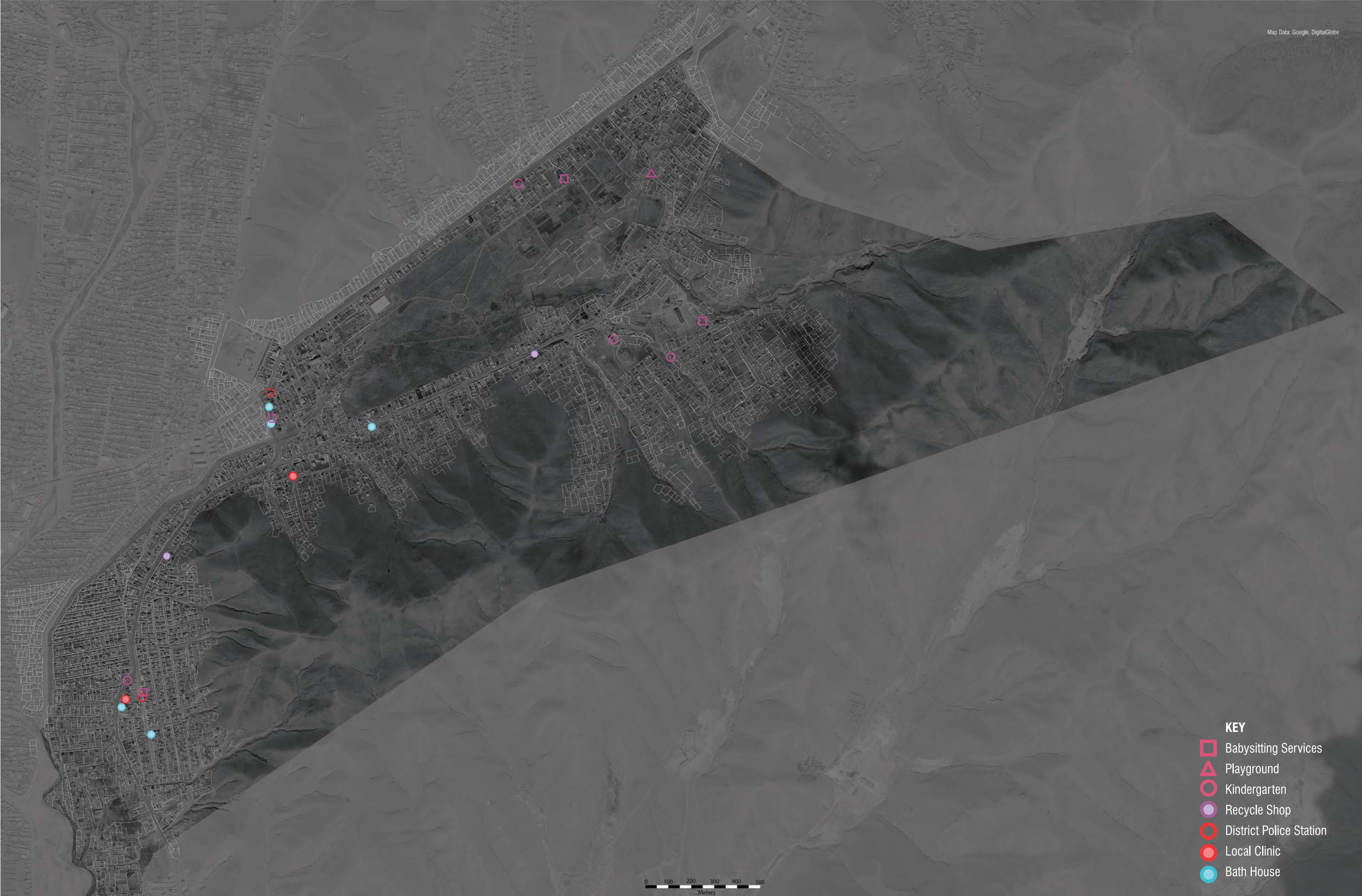
	Other	2013-2015	Government	<p>Citizens' Hall have been established in the khoroo buildings. Their purpose is engage residents with khoroo affairs and encourage participation in planning and developments in the khoroo.</p> <p>Public land and space is a major issue in the city. The city lacks community centers, libraries, and other social spaces.</p>	<ul style="list-style-type: none"> - Awareness of their purpose is low among residents. - Used as space for political party meetings. 	
12 Roads						
	Pedestrian bridge	2013-2015	Government	Three pedestrian bridges were built in past few years in the khoroo (refer to map).	The bridges, staircases, and roads are not very good quality. Companies that execute the project provide very short guarantee periods.	
	Pedestrian staircase	2013-2015	Government	Two pedestrian staircases were built in the past few years (refer to map).		
	Improved dirt road	2013-2015	Government	Dirt roads have been improved in locations that are prone to getting damaged during wet months, and areas where dust is bad.		
13 Cable						
	Fiber optic cable			Partially connected to fiber optic cable in areas along the main Dari Ekh road. Residents can connect to the internet through either data on their smart phones or purchase mobile wifi devices.	<ul style="list-style-type: none"> - Largely not connected to the internet due to costs associated. - Facebook is widely known and used. 	
14 Trade and services						
	6 item shops	n/a	Private	Small family owned shops are dispersed throughout the khoroo along the main road. Most of them are minimarkets where they can sell 6 kinds of items. The shops usually sell cell phone units, basic grocery items, and household items. Coal cannot be sold in markets that sell grocery items. However, shops that are isolated sell coal in their khashaa plot.		Operating shops is one of the ways ger area residents support their livelihoods, and since there aren't many public spaces, they are also places where people run into each other.
	Construction materials store	n/a	Private	There are several stores that sell construction materials, some offering construction services. Most are located along the Dari Ekh road.		
	Other			Services and shops are clustered around the Dari Ekh and Dambadarjaa crossroad. (see research photos for reference).		
15 Other						
	Improvements /тохижилт/	2013-2015		<ul style="list-style-type: none"> -Improvements have been made to a limited number of roads that cause a lot of dust and/or prone to becoming damaged during the wet summer months. - A natural spring in the area where residents gather to collect water was reclaimed - Four power lines were upgraded - Address signs were put up 	<ul style="list-style-type: none"> - Like Chingeltei 16 construction of roads are of poor quality - According to Batdorj, some funds are inefficiently spent 	



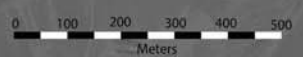
KEY

- Bus Stop
- Carpark





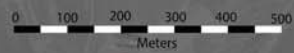
- KEY**
- Babysitting Services
 - △ Playground
 - Kindergarten
 - Recycle Shop
 - District Police Station
 - Local Clinic
 - Bath House

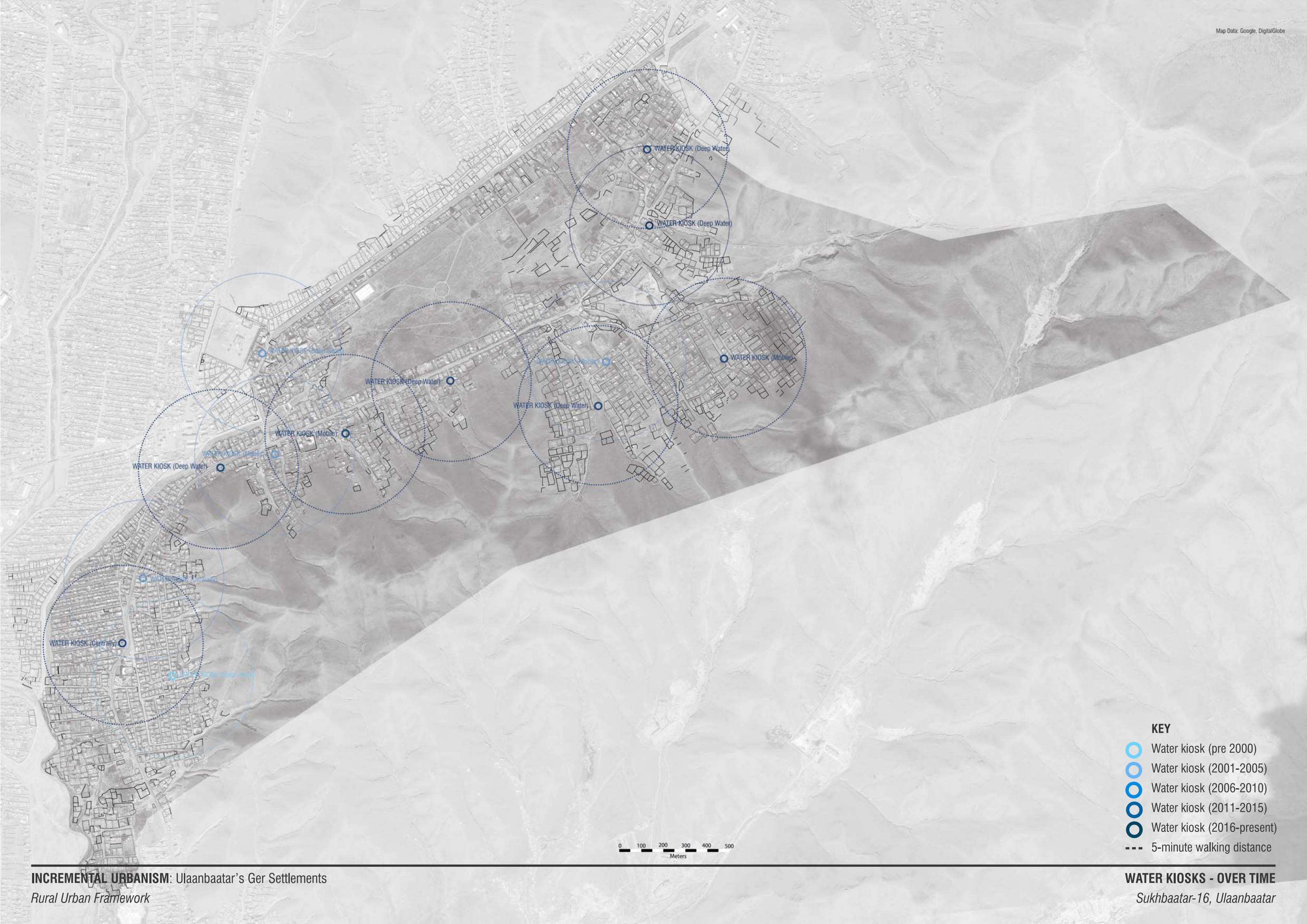





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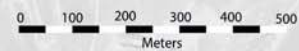
- Minimarket
- Gas Station
- Bank
- - - Service Cluster

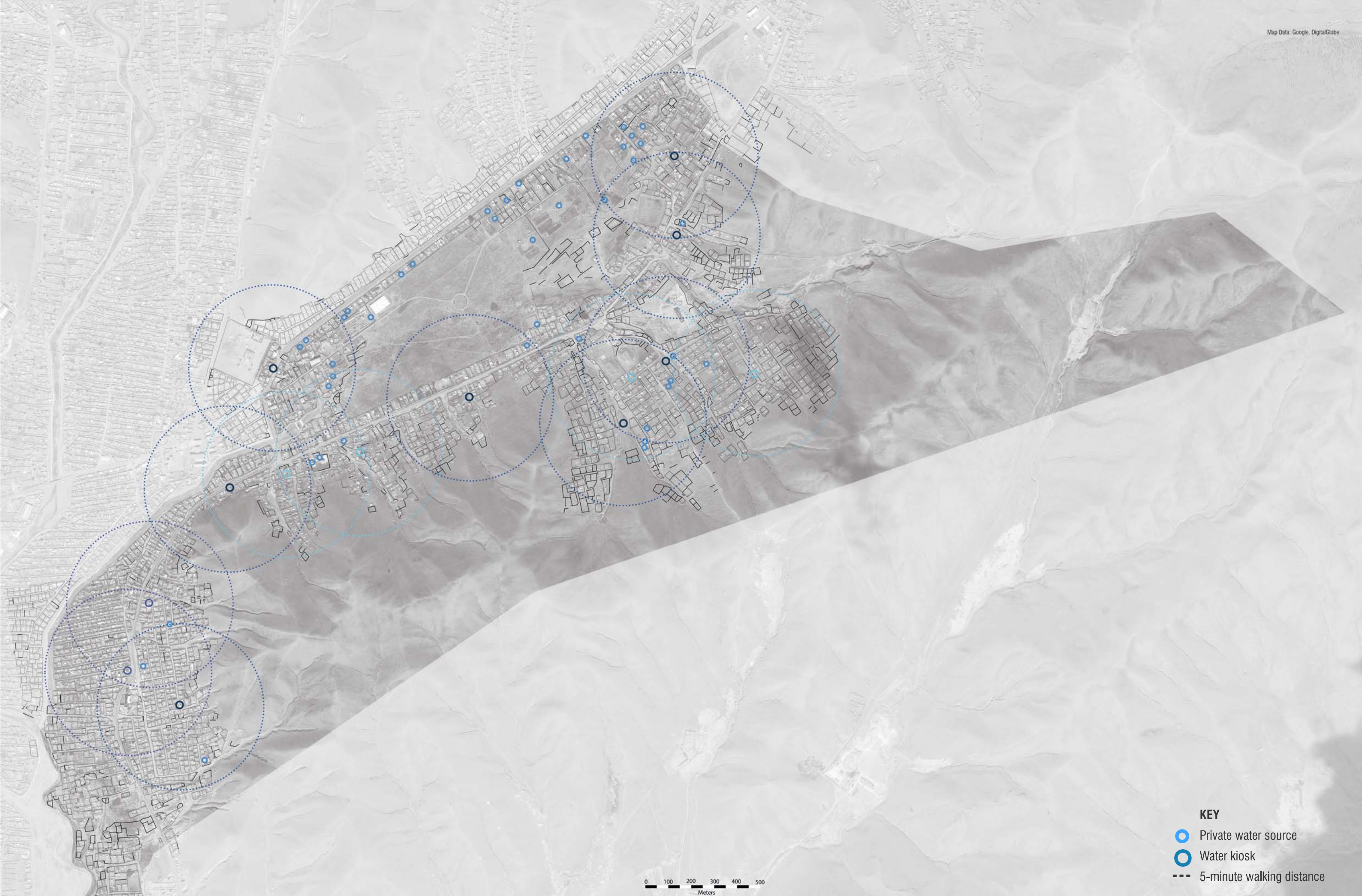







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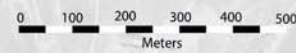
-  Water kiosk (pre 2000)
-  Water kiosk (2001-2005)
-  Water kiosk (2006-2010)
-  Water kiosk (2011-2015)
-  Water kiosk (2016-present)
-  5-minute walking distance





KEY

-  Private water source
-  Water kiosk
-  5-minute walking distance



1G | INFORMAL INFRASTRUCTURE

AIMS

To map informal infrastructure such as those relating to energy, waste, water, transport, communication, but also relating to education, health, leisure, and culture in Chingeltei-16 and Sukhbaatar-16.

METHODOLOGY

Meet governors of Chingeltei-16, and Sukhbaatar-16 to identify any infrastructure that has not been mapped on Manaikhoroo.

Meet representative from Ger Community Mapping Center to source additional data for Sukhbaatar-16.

Map informal infrastructure in Chingeltei-16 and Sukhbaatar-16.

RESULTS (CHINGELTEI-16)

Chingeltei-16 has a higher ratio of illegal waste dump sites than Sukhbaatar-16. They are found in the denser areas of the khoroo.

There are 3 private schools in the khoroo.

There is a water reservoir which 3 khashaas are connected to and 6 khashaas with private wells.

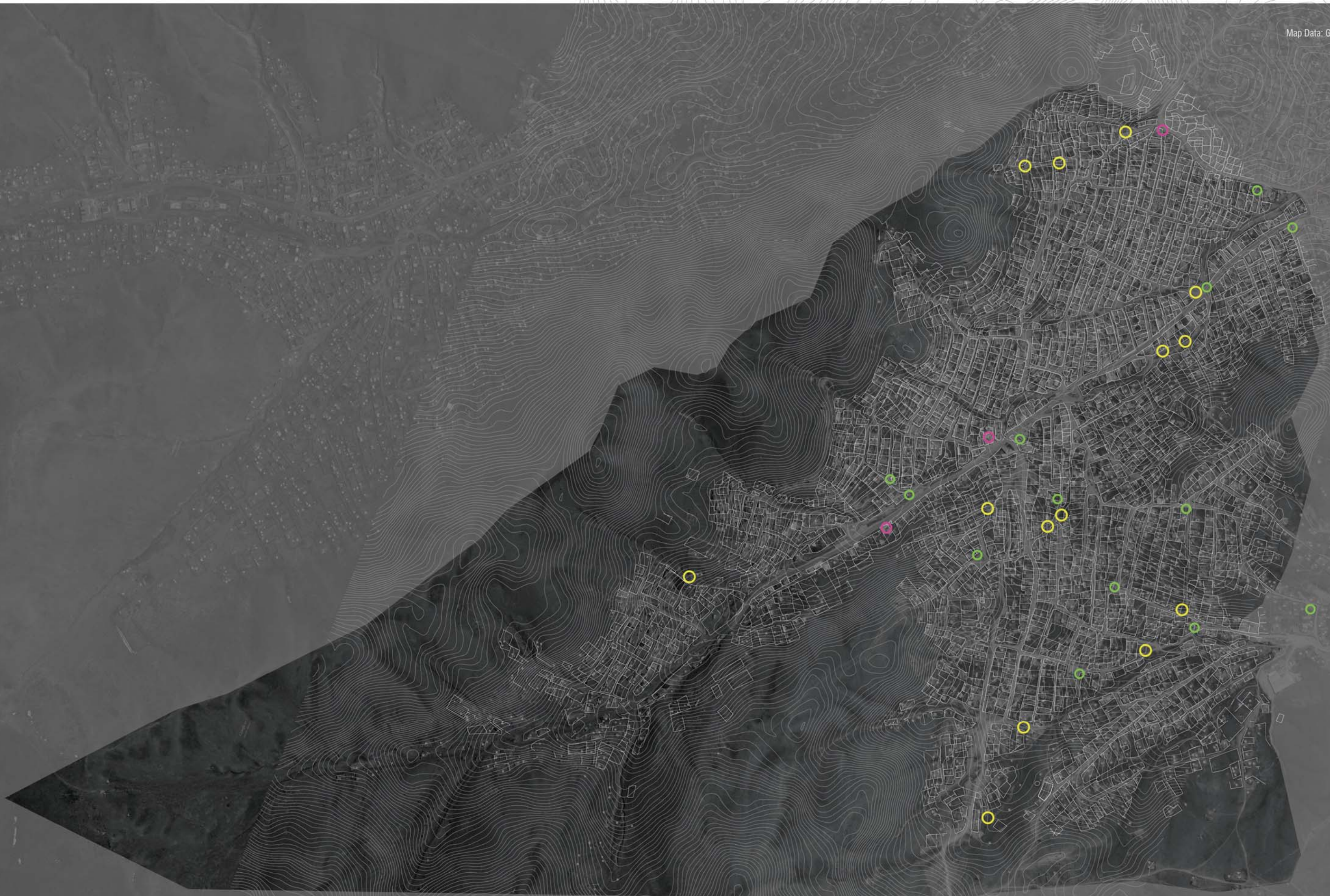
RESULTS (SUKHBAATAR-16)

Sukhbaatar-16 has good access to ground water. There are 35 khashaas with private wells as well as a natural spring where residents can collect water from.

There are 11 khashaas with indoor toilets.

There are 3 private schools in the khoroo.

1G | INFORMAL INFRASTRUCTURE
Chingeltei-16, Ulaanbaatar



- KEY**
- Yellow circle: Illegal Waste Dump
 - Green circle: Coal and Wood Shop
 - Pink circle: Private School





- KEY**
- Khashaa with private well
 - Khashaa connected to water reservoir
 - Water reservoir



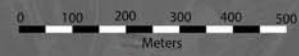
1G | **INFORMAL INFRASTRUCTURE**

Sukhbaatar-16, Ulaanbaatar



KEY

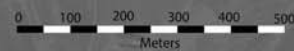
- Waste dump sites along gullies
- Illegal Waste Dump
- Coal and Wood Shop
- Private School





KEY

-  Khashaa with private well
-  Khashaa with indoor toilet (no well)
-  Khashaa with indoor toilet (with well)



1H | ENVIRONMENTAL DATA

Chingeltei-16, Ulaanbaatar

AIMS

Collect environmental information for the sample site Chingeltei-16 to establish development constraints and potentials.

METHODOLOGY

Map environmental factors, such as solar gain, water accumulation, and slope change against the current topographical data and current aerial image of the khoroo. .

RESULTS

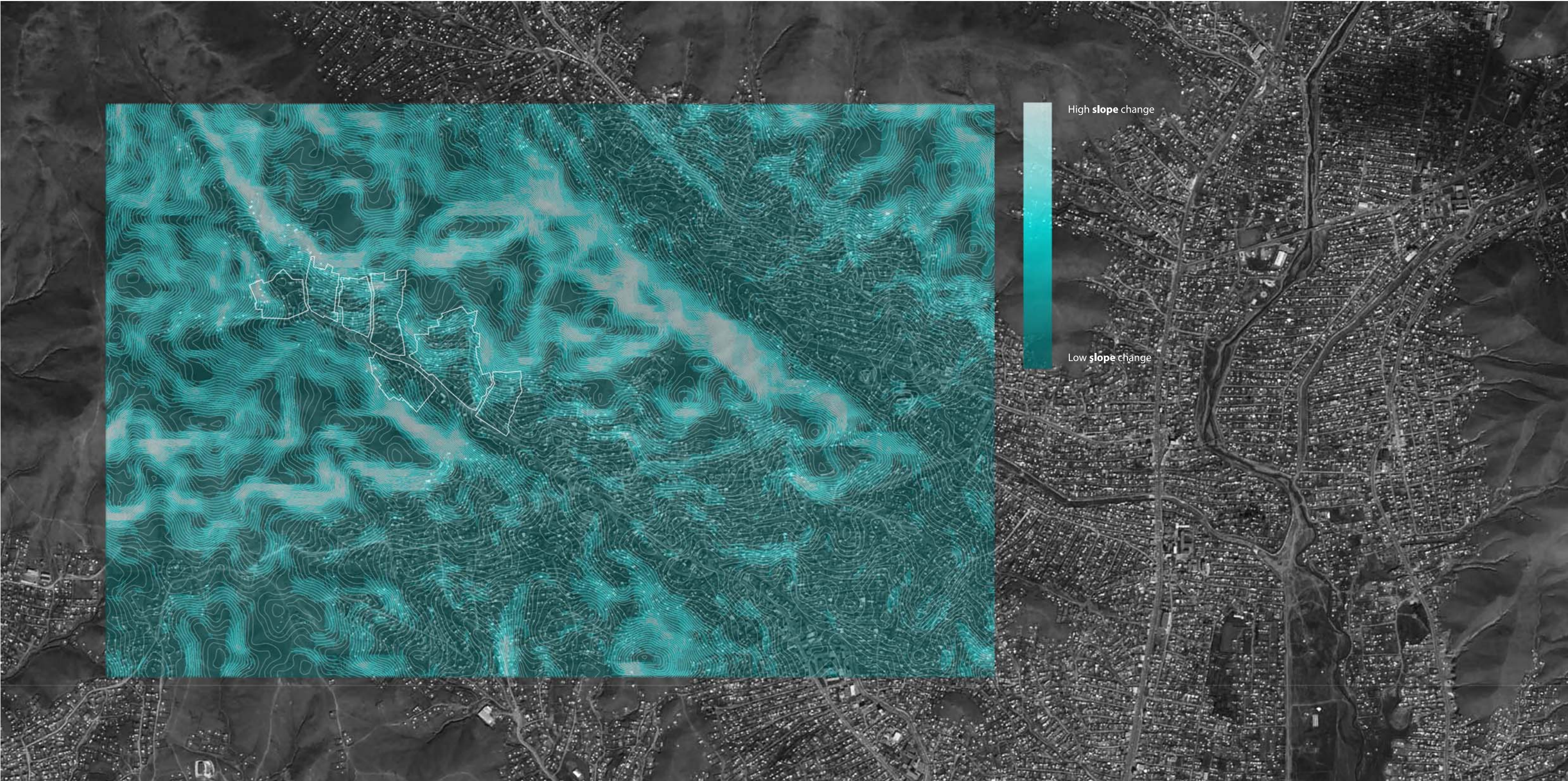
Khashaas are densest at areas of the least slope change. There are no khashaas at the highest elevations.

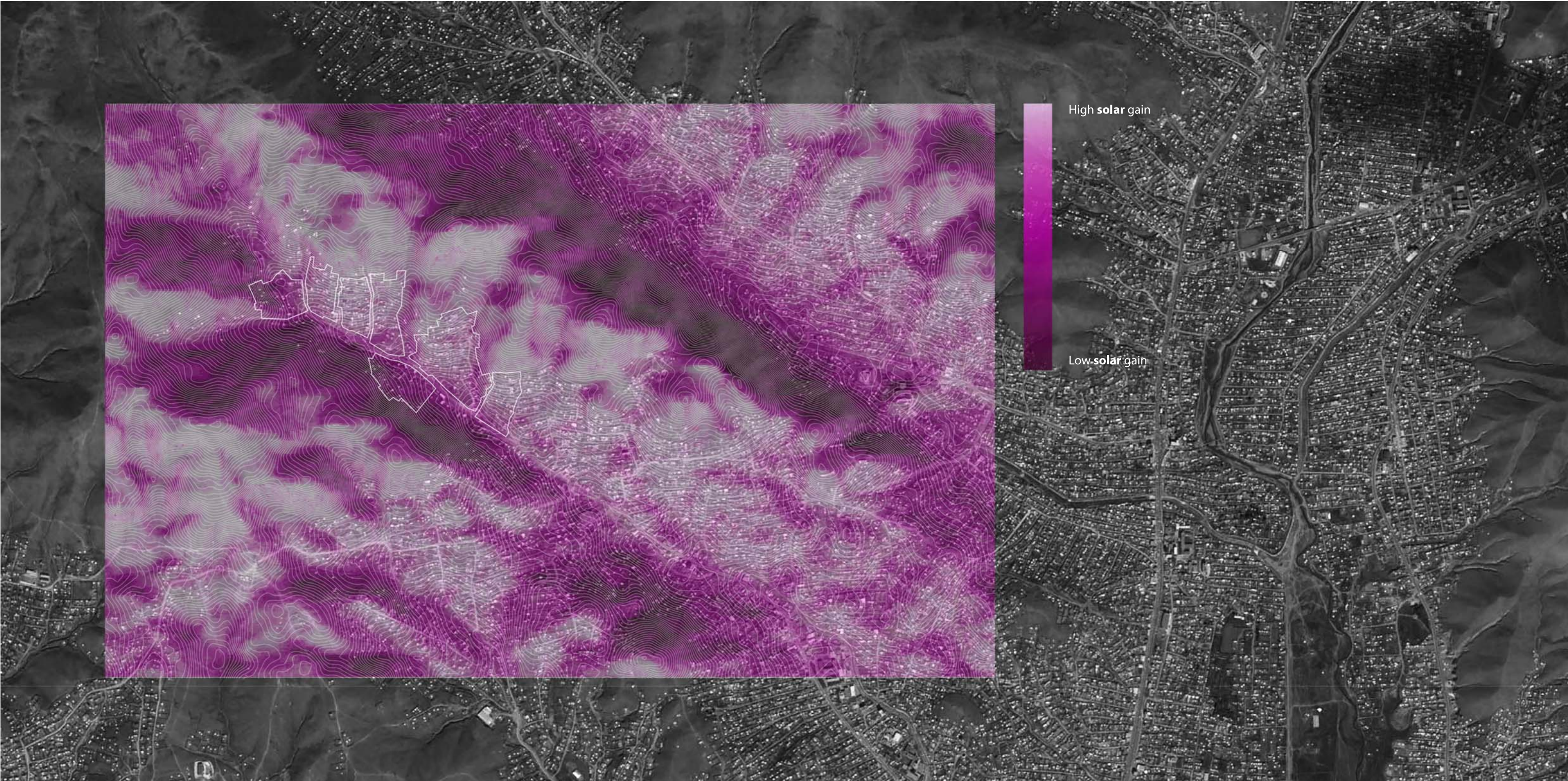
More khashaas are built on higher elevations on slopes with high solar gains.

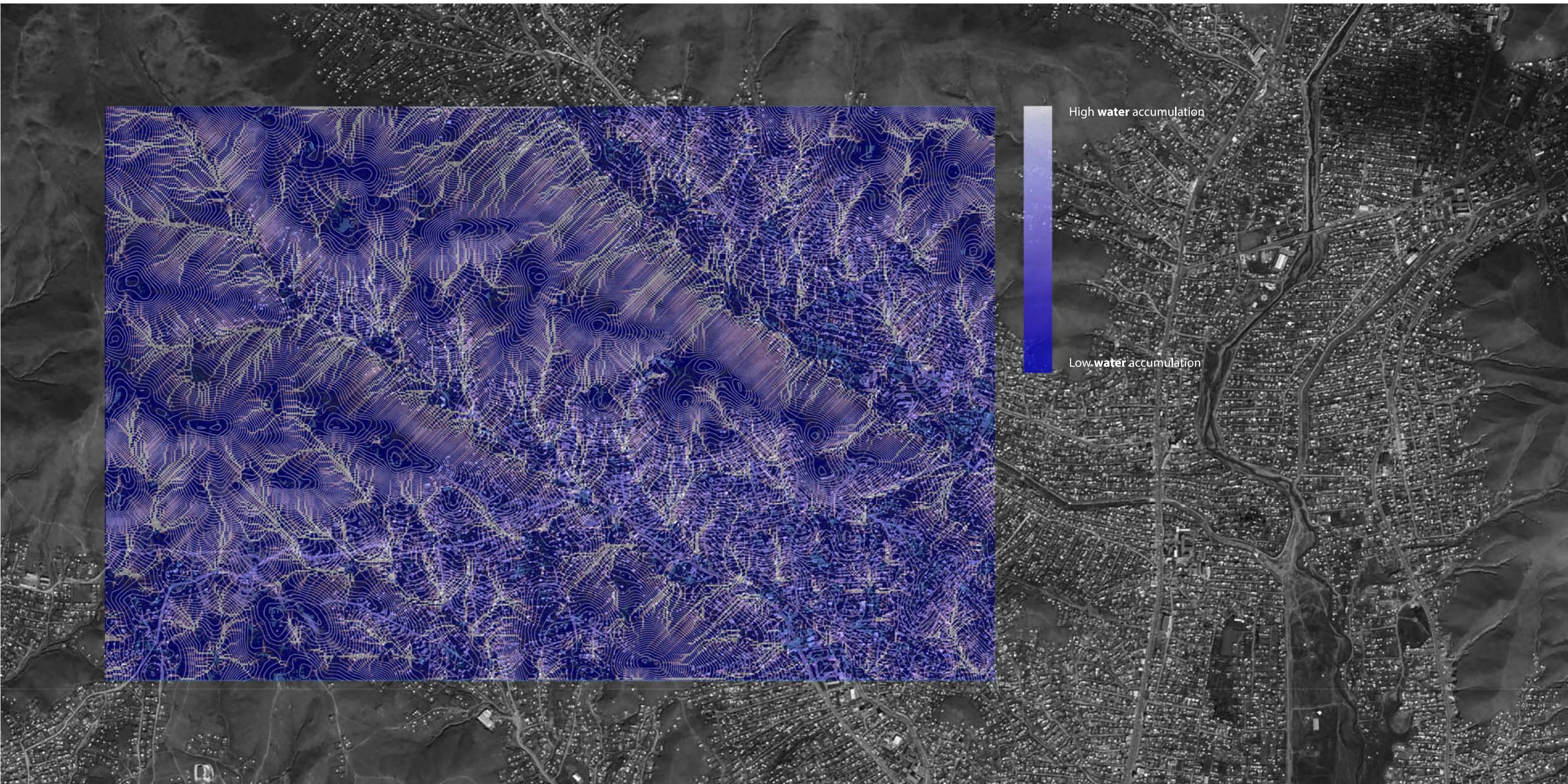
Water accumulates at the foot of the slopes, along the main roads which are built at areas with the least slope change.

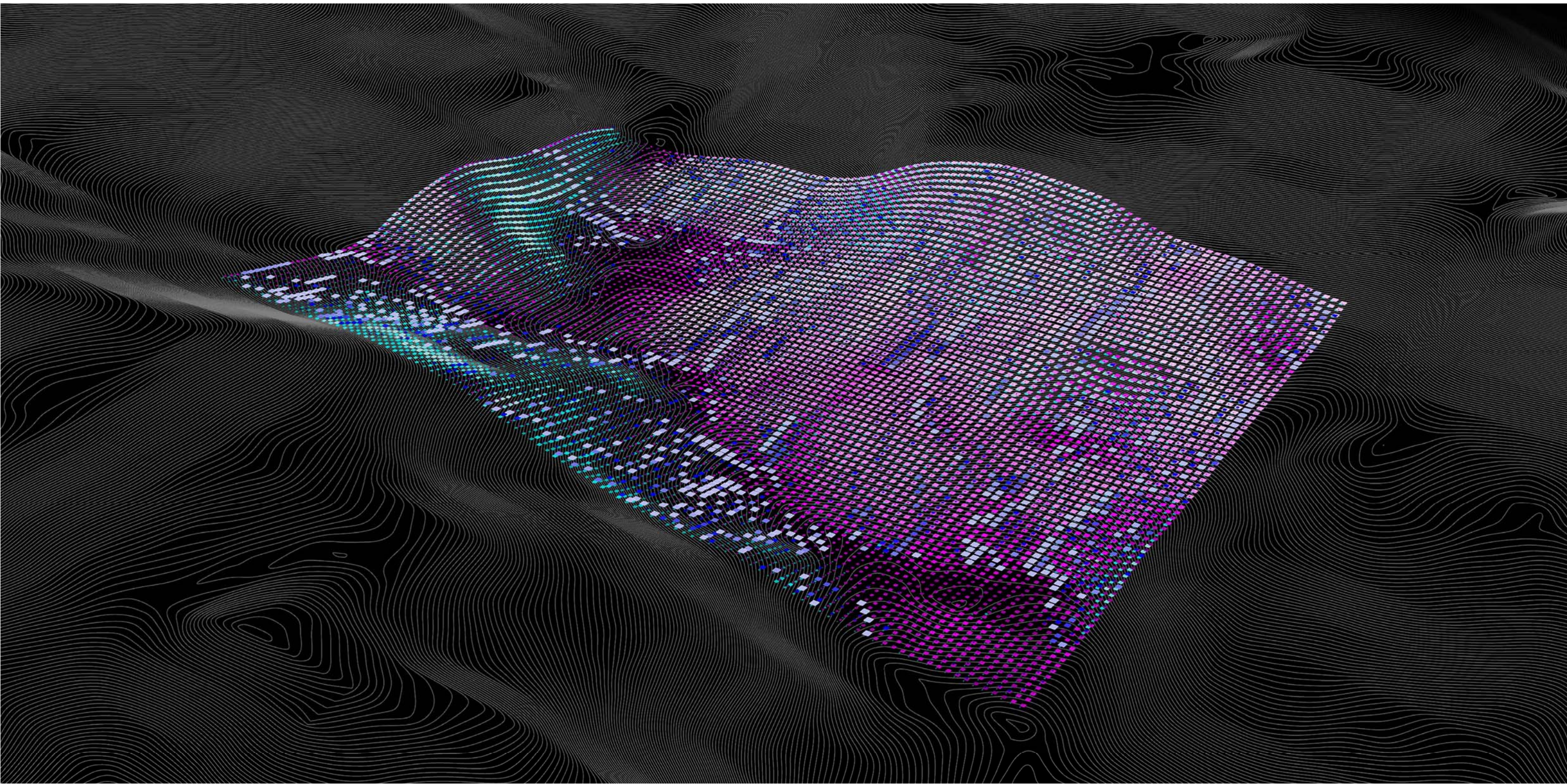
Water accumulation does not affect how khashaas are located in the districts. The main environmental factors are the amount of sunlight the area receives and the steepness of the slope.

The gradient of the slope also affects how high up residents are willing to locate their khashaas. The locations are limited by whether vehicles can access the area, especially when the roads freeze and become slippery in winter.









PHASE 2 - PROTOTYPE DEVELOPMENT

Based on the findings of Phase 1, the aim of Phase 2 is to develop a series of designs of prototypes that can address the pressing needs of the ger districts. These include access to infrastructure; sewage; solid waste collection, housing, and community facilities. Preliminary designs were tested with stakeholders including: NGOs such as the Zorig Foundation, Asia Foundation, GerHub, the Lorinet Foundation, and UNICEF; district leaders; and officials from the Mayors' office from the Municipality of Ulaanbaatar. Additionally four community workshops were conducted with residents at Chingeltei-16, (February 2015, March 2017), Sukhbaatar-16 (February 2016) and Khan Uul (February 2015) in order to gain local resident feedback and input on the design ideas. Based on this feedback, the designs were further revised and potential partners were sought to secure implementation funding. Three were selected for detailed design development: a design for an affordable housing prototype – the Ger Plug-In – as an adaptation of a traditional ger with embedded infrastructure and improved energy efficiency; a design for a waste collection and recycling building to improve solid waste collection within the districts; and a design for a community hub in response to resident and stakeholder feedback establishing the need for a community space to support after-school facilities and events.

The detail designs included technical details, material specification, and cost plans. In order to produce these documents, various consultants provided input including local contractors, engineers and local design institutes. Additionally appropriate sites for realisation were investigated with project partners and land was acquired or made available to commence construction. The Waste Collection prototype was built with the Municipality of Ulaanbaatar and the Asia Foundation in 2015, the Ger-Plug was completed in 2017 and the Ger Innovation Hub (Phase 1 and 2) was completed in December 2018, with the final phase due for completion by Summer 2019. Once implemented, each project will be monitored and evaluated for their effectiveness in terms of use and, in the case of the Ger Plug-In, its thermal and environmental performance. Based on this knowledge, further improvements to the prototype designs can be recommended. Additionally, a post completion workshop was organised with residents so that they could visit the Plug-in to gauge their opinion and gather feedback. Other stakeholders from financial institutions, private equity firms, NGOs and contractors also participated in a workshop at the Plug-In to consider the prototype's future development and large scale implementation plan.

2 | PROTOTYPE DEVELOPMENT

AIMS

Develop architectural prototypes that engage with multiple issues facing the ger districts, such as solid waste collection, sewage, housing, and community facilities.

Test prototypes and their foreseeable effects with partners, consultants, potential stakeholders, and residents through community workshops and expert consultation meetings.

Select prototypes and undertake detailed design development in consultation with experts.

Ascertain partner organisations and source funding for implementation.

Establish sites for realisation and potential partners and contractors to undertake construction.

Organise and consult during site construction to make sure detailed drawings are being adhered to.

Monitor and evaluate built prototypes.

METHODOLOGY

Use primary and secondary research gathered in phase one to site initial prototypes.

Conduct prototype development and feedback meetings with khoroo governors, The Asia Foundation, and kheseg leaders, to present and receive feedback on the design of selected prototypes.

Conduct community workshops with local residents to receive feedback on prototype development, and to encourage local residents to raise suggestions for developing their neighbourhood.

Test different material, spatial, and tectonic ideas for the prototypes.

Implement selected prototypes after partner organisations, contractors and suitable sites have been established.

Present completed prototypes to the local community to raise awareness about what it is, how it is used and managed.

Monitor the performance of prototypes in terms of use and environmental performance in the case of the Ger Plug-In.

Conduct prototype feedback meetings stakeholders to introduce the prototype to representatives of different organizations working in Mongolia, and to receive feedback and initiate conversations about the next steps.

RESULTS

The set of initial prototypes were developed and tested with local stakeholders. Feedback included: children and youth facilities are lacking; hot water access is limited; sharing infrastructure such as a shared bath house or private shower could be a good way to pool resources. Communal gardening is popular, however only those residents who live close to the water kiosks are currently able to do so. Community facilities need to address the different needs of residents and so a building that could allow for a variety of uses would be more beneficial.

Three prototypes were selected to be further developed based on the identification of the most pressing issues within the ger districts.

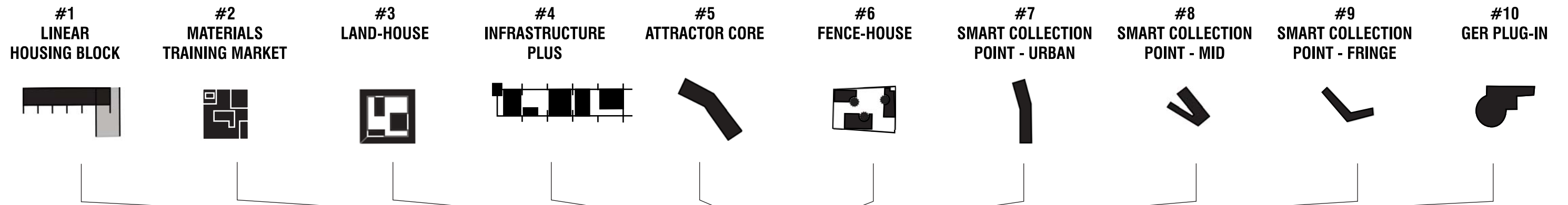
Completed prototypes (The Smart Collection Point, and the Ger Plug-in) were monitored and evaluated to build knowledge and experience on incremental upgrading in the ger districts.

The Ger Innovation Hub is currently being constructed and will be completed by Summer 2019.

2A | INITIAL PROTOTYPES

Site and further development of prototypes

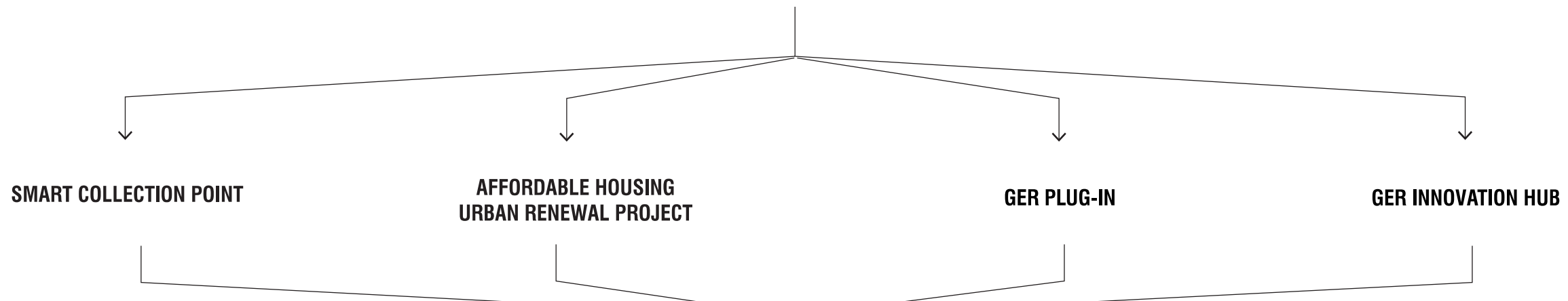
Initial Prototypes



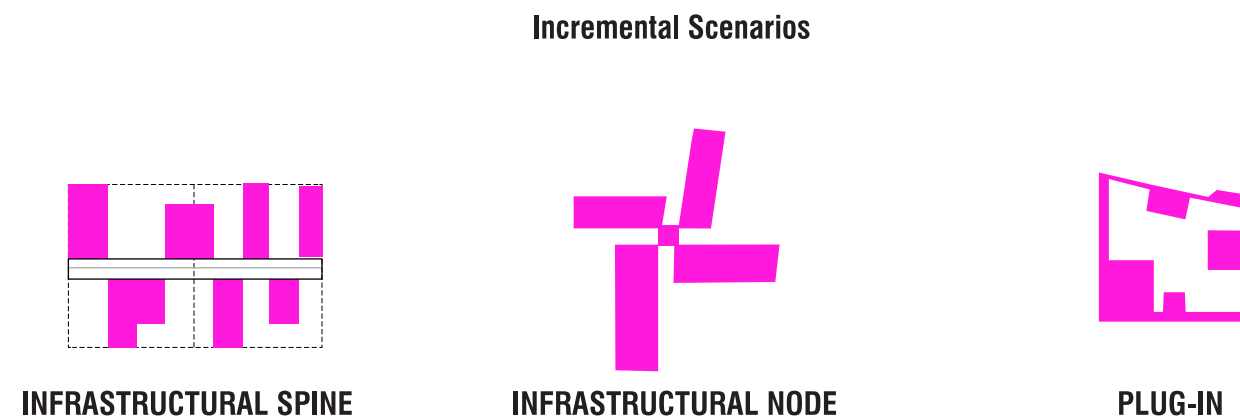
Testing with Stakeholders and Siting



Prototype Development and Testing



Incremental Strategic Masterplan





Prototype #

1

Linear Housing Block

Description

Housing block designed to accommodate self-built infill, which can be programmed and customised by residents according to their needs. Shared community spaces encouraging are located in the core sections of the block, with shops on the street level to facilitate commercial enterprise and interactions with the larger community. The cores provide the infrastructural needs of the blocks including water collection and distribution, heating, and waste collection.

Issues

Housing, Leisure, Waste, Sewage, Water, Energy

Programme

Housing, Self-built infill, Production units, Commercial units, Extended housing
Shared community space

Scenario

The inner-ger areas become increasingly pressurized to develop. Residents pool their land and take a share-holding of the overall development with the main investor - either the housing authority or developer. Open areas are intentionally left for future occupation for shops or businesses.

Stakeholders

ADB (Asian Development Bank)
Government
Ger residents
District residents (for provision of goods and services)

Research Questions

What are the present and desired square footages for homes?

What are the most common businesses in ger districts? Is there a demand for new business types?

What goods do ger district shops sell?

What goods do ger district home workshops produce?

Location

Selbe Sub-Centre, Chingeltei-18, Ulaanbaatar



Prototype #

2

Materials Training Market

Description

Building materials market and vocational training center encourage self-build culture in the ger districts that is supplanted by expertise from international materials and engineering companies through their sponsorship of the training center. The primary programmes respond to the seasonality of the construction market, with the training center taking precedence in the winter and the market taking precedence in the summer.

Issues

Culture, Education

Programme

Building materials market
Built-in transportation infrastructure (loading and unloading areas)
Vocational training center and Workshops
Library

Scenario

1 The Zuun Ail market is redeveloped under the 2020 plan, the present collection of shop fronts is relocated and redesigned as a market in which the vaerious sellers have a relationship to each other. Market is funded by the government under the 2020 plan.
2 Insert a vocational training center into the current market. The training center is sponsored by a large local and/or foreign building technology and materials company, whose goods will be used and promoted in the training center.

Stakeholders

Government
Ger residents
Students and trainees
Local materials companies + Foreign materials and technology companies
Mongolian Builders Association
Mongolian Housing Finance Corporation

Research Questions

Who operates the materials markets in Ulaanbaatar?
Where are the materials markets located?
Who are the primary consumers of the materials market?
Are foreign materials and goods sold here?
What are the alternatives to this materials market, such as for high end developers?
How do the shops that make up the market change during the winter?

Location


Chingeltei-16, Ulaanbaatar



<u>Prototype #</u>	3
Land-House	
<u>Description</u> A collective housing prototype that maintains a connection to the land through providing a common ground for livestock, farming, or recreation. A lower level contains shared community programs such as shops, kindergartens or restaurants whilst the ground level is left open as an enterprise zone that can be infilled by the inhabitants for workshops, stalls or other business ventures. The upper levels are for housing. One idea could be that each resident is offered 2 units as a live-work mix and can barter, lease or use the work unit according to their needs and occupation.	
<u>Issues</u> Housing, Leisure	
<u>Programme</u> Dwelling units Work units Enterprise zone Public programs: greenhouse, restaurants, kindergarten, recreation	
<u>Scenario</u> 20 Ger families decide to pool their land to create a common shared resource and build their homes on the periphery. Government provides finance for infrastructure and public community facilities and families pay for their house. Additionally the work units are sold or leased and manages by the collective.	
<u>Stakeholders</u> Government Ger residents Housing authority Developers	

Research Questions
 What is the basic unit size for dwelling or work units?
 How could land be accumulated?
 What is the process of land development?
 Who could manage such a project?
 Could it be public-private partnership?

Location
 Sukhbaatar-16, Ulaanbaatar



Prototype #

4

Infrastructure Plus

Description

Over-land pipe infrastructure embedded in earthworks that can be implanted with community based programs such as gardens; sports facilities; bathhouses; water kiosks; and water filtration systems. Houses are built around the infrastructure and plug-in to water supply lines. The system can work off-grid and be supplied via truck or natural spring or eventually plug in to a mains-network.

Issues

Water, Leisure

Programme

- Water infrastructure
- Playgrounds
- Gardens and recreation areas
- Kiosks

Scenario

Phased plan to gradually implement water infrastructural solutions. Expand water kiosks into an off-grid infrastructure that manages water through grey water and filtration systems and to additionally provide shared community resources. Future phases can link back to mains water infrastructure when it becomes economically viable.

Stakeholders

- District government
- Community leaders
- Water companies
- Developers

Research Questions

- Possibility of overground water pipes?
- Issues of water infrastructure and management?
- Seasonal uses and overall water needs?
- What is current infrastructural plan and who are the stakeholders?

Location

Bayankhoshuu Area, Ulaanbaatar



Prototype #

5

Attractor Core

Description

Ger areas suffer from lack of water and waste collection infrastructure. The prototype provides a community hub that can form part of the resident's daily ritual: deposit waste rubbish; take shower; buy supplies; eat something; read something; take water then return home. Each hub can adapt to the needs of each location but always should include waste collection point; water distribution kiosk and additional community facilities.

Issues

Water, Waste, Culture, Education

Programme

Waste collection and recycling; water kiosk; bath house.

Additional community programs such as library; kindergarten; shop; restaurant; meeting hall.

Scenario

NGO develops pilot project to test and evaluate prototype with key stakeholders. Additional program to be determined with local residents and NGO.

Stakeholders

Ger residents

Water and waste management companies

Government

NGO's

Research Questions

How is waste managed? Why not collect directly at source?

Is recycling possible?

How to change current attitudes towards waste?

Location


Sukhbaatar-16, Ulaanbaatar



<u>Prototype #</u>	6
Fence-House	
<u>Description</u> A housing prototype that retains the khashaa boundary and increases density through the provision water and heating infrastructure. The self-built fence walls are replaced by an infrastructural wall which allows multiple housing units to be plugged in. There are three housing types which the prototype supports - ground house, shop house, and tower house. They are connected by a perimeter wall which thickens to accommodate communal facilities such as greenhouses, storage, piping, and waste collection. Over time, multiple prototypes can be connected and more public services introduced, such as basketball courts, water kiosk, and bath houses.	
<u>Issues</u> Housing, Water, Waste, Sewage, Energy, Leisure	
<u>Programme</u> Dwelling units Waste collection and recycling; water kiosk; bath house, grey and black water treatment, heating infrastructure . Public programs: greenhouse, shops	
<u>Scenario</u> 5 Ger families decide to pool resources to build on one khashaa plot. Government or NGOs provide finance for infrastructure and community facilities at a later stage. Additionally, families may sell or lease the khashaa plots that they used to occupy.	
<u>Stakeholders</u> Government Ger residents Housing authority NGOs	

Research Questions
 What is the basic unit size for dwelling units?
 How could land be sold or leased?
 What is the process of land development?
 Who could manage such a project?
 Could it be public-private partnership?

Location
 Chingeltei-16, Ulaanbaatar



Prototype #

7

Urban - Smart Collection Point

Description

Ger areas suffer from lack of waste collection infrastructure. The prototype is located in a dense urban ger district that has been identified by The Asia Foundation. The waste collection point is combined with an outdoor playspace and recycling centre. Residents trolley their waste up a ramp and dispose of it through a shoot. The truck accesses the waste from the exterior, thereby creating a clear division between the drop-off point and retrieval area. The top of the structure features a roof garden which can be used as both a viewing deck and public space. The exterior concrete walls are cast with the graphic imprints of numerous sports which activate the surrounding space. It includes a basketball net, football goal, a tennis net and rockclimbing wall.

Issues

Waste, Leisure

Programme

Waste collection and recycling;

Scenario

NGO develops pilot project to test and evaluate prototype with key stakeholders. Additional program to be determined with local residents and NGO.

Stakeholders

Ger residents
Waste management companies
Government
NGO's

Research Questions

How is waste managed? Why not collect directly at source?

Is recycling possible?

How to change current attitudes towards waste?

Who will manage the collection point?

How is waste managed differently in the urban compared to the mid and fringe?

Location

Bayanzurkh-27, Ulaanbaatar



Prototype #

8

Fringe - Smart Collection Point

Description

Ger areas suffer from lack of waste collection infrastructure. The prototype is located in a fringe ger district that has been identified by The Asia Foundation. The collection vessel is buried under earth to build up the landscape, creating a level difference as well as preventing access from dogs and limiting smell. The truck stops at the lower level and waste is deposited at the top.

Issues

Waste

Programme

Waste collection and recycling;

Scenario

NGO develops pilot project to test and evaluate prototype with key stakeholders. Additional program to be determined with local residents and NGO.

Stakeholders

Ger residents

Waste management companies

Government

NGO's

Research Questions

How is waste managed? Why not collect directly at source?

Is recycling possible?

How to change current attitudes towards waste?

Who will manage the collection point?

What is the difference between waste management in the fringe areas compared to the urban and mid?

Location

Khan Uul-13, Ulaanbaatar



<u>Prototype #</u>	9
Mid-Smart Collection Point	
<u>Description</u> Ger areas suffer from lack of waste collection infrastructure. The prototype is located in a mid ger district that has been identified by The Asia Foundation. This site was located by the side of a recently constructed road on an uneven dirt slope. The scheme took advantage of the height difference of the topography to form a ramp leading from the high ground to the road and bus stop with several places for rubbish drop off along the way. A recycling station was contained under the ramp which splayed apart to create an open public space.	
<u>Issues</u> Waste, Leisure	
<u>Programme</u> Waste collection and recycling; Other community programs can be added,; shop, community center	
<u>Scenario</u> NGO develops pilot project to test and evaluate prototype with key stakeholders. Additional program to be determined with local residents and NGO.	
<u>Stakeholders</u> Ger residents Waste management companies Government NGO's	

Research Questions
 How is waste managed? Why not collect directly at source?
 Is recycling possible?
 How to change current attitudes towards waste?
 Who will manage the collection point?
 What is the difference between waste management in the mid areas compared to the urban and fringe?

Location
 Chingeltei-16, Ulaanbaatar



<u>Prototype #</u>	10
Ger Plug-in	
<u>Description</u>	
<p>The prototype is designed as a thickened infrastructural wall containing water and septic tanks that the ger plugs into. Currently, each household lacks basic urban infrastructure: water is fetched from kiosks; pit latrines are dug on site; and district heating is unavailable. Air pollution is one of the worst in the world as ger residents burn coal to stay warm in double-digit negative figures in the winter months. The prototype tests new designs for low tech, affordable, environmental systems including underfloor heating, a cleaner dual fuel efficient boiler and a trombe wall. In this way, the project is conducted as a live experiment: a family will move in and we will record the temperature of different zones of the building, water usage, coal consumption and interview the inhabitants.</p>	
<u>Issues</u>	
Housing, Water, Waste, Sewage, Energy	
<u>Programme</u>	
<p>Housing unit that provides infrastructure for heating, water, and sewage.</p> <p>Over time, the ger can be completely removed and the family can add additional rooms. This harnesses the incremental and self-build culture that exists in the ger districts, allowing families the flexibility to adapt as they see fit.</p>	
<u>Scenario</u>	
<p>A single family can build the plug-in which will provide improved infrastructural services whilst maintaining the ger as a living space. They may opt to share the infrastructural wall with their neighbours as well as removing their ger and expanding from the core.</p>	
<u>Stakeholders</u>	
<p>Government</p> <p>Ger residents</p> <p>Housing authority</p> <p>NGOs</p>	

Research Questions

- What is the basic unit size for dwelling units?
- How can services be shared?
- What are the costs of building a house in the ger districts?
- What are the government plans regarding infrastructure in the ger districts?

Location

Bayankhoshuu Area, Ulaanbaatar



2B | PROTOTYPE TESTING
Community Workshops and Feedback Meetings

Prototype Development Meetings

Date

Chingeltei and Khan Uul - June 2014

In attendance

Meeting 1

The Asia Foundation
Khoroo Governor of Khan Uul- 13
Tontoo Grand (Local Design Institute)
Kheseg Leaders (9 people)

Meeting 2

The Asia Foundation
Representatives from a local recycling company (6 people)

Objectives

To present and receive feedback about the waste collection prototype designs from NGOs and different government collaborators, and local residents.



Meeting 1



Meeting 2

Ger District Community Presentation

Date

Chingeltei - January 2015

In attendance

Prototype Opening

The Asia Foundation
Khoroo Governor of Chingeltei-16
Tontoo Grand (Local Design Institute)
Kheseg leaders and local residents (15-20 people)

Community Presentation

Khoroo Governor of Chingeltei-16
The Asia Foundation
Kheseg leaders and local residents (20-25 people)

Objectives

To introduce the prototype to the local residents.
To educate them about how it is to be used and managed.
To raise awareness for the prototype beyond the local community.



Prototype Opening



Community Presentation

Khashaa Research Workshops

Date

Khan Uul and Chingeltei- February 2015

In attendance

Khashaa Research Workshop x 2

Kheseg leaders and local residents (9 from Khan Uul-13, 7 from Chingeltei-16)

Objectives

To understand the operation of the household and how they spatially occupy their Khasha Plot.

To understand how these plots have changed over time from their initial occupation to the present and the reasons for these changes.

Summary

Most of the Khan Uul residents plant vegetables either in their khashaas or nearby. Even those who do not would like to do so when they have the time. The soil in Chingeltei is not good enough for planting, residents need to bring in soil from elsewhere to grow vegetables if they want to.

It is common to find multiple structures (houses and gers) in Chingeltei, with multiple families (whether relatives or friends) living in the same khashaa.

Most residents have plans for their plots, whether it is planting, or construction of additional structures.



Community Feedback Meeting

Date

Chingeltei - February 2015

In attendance

Community Feedback meeting

Khoroo Governor of Chingeltei-16

The Asia Foundation

Kheseg leaders and local residents (10-15 people)

Objectives

To gain feedback on the use of the waste collection point so far.

Summary

It has been relatively successful, residents use the prototype as an access route, and the amount of waste in the gulleys has decreased. But there were some residents who were unsure of what to do with their rubbish and simply put their rubbish around rather than inside it. The residents need to be educated more on how to use the Smart Collection Point. It would be easier if there was someone that was in charge of the prototype, to educate people but also to call the rubbish truck when it is full, and make sure no one damages it. The glass of the shop space was vandalized and broken shortly after opening. Many residents also throw their ashes into the waste collection point, causing a possible fire hazard. There have been a few fires reported at the Smart Collection Point.



Community Workshop - Sukhbaatar

Date

Sukhbaatar-16 - February 2016

In attendance

Community Workshop

Joshua Bolchover and Research Assistants, The University of Hong Kong

GerHub representatives

Students from The University of Hong Kong (12 people)

Kheseg leaders and local residents (25 people)

Objectives

To understand issues within the district at different scales through drawings with local residents.

To receive feedback on initial prototypes.

To encourage local residents to raise suggestions for developing their neighbourhood.

Summary

There are not enough spaces for children or elderly in the district. The only meeting places are at the water kiosks.

The area is too steep for the rubbish truck, and people throw rubbish into crevasses. If there is something there and someone is in charge then it will be kept in a good condition. An idea that came from the residents was a bridge with play spaces as well as green spaces that connect across a dip in the hill.

Mixed use spaces are better as there will be something for everyone.

Plot sharing is fine as long as there is an attractive benefit for both sides, or some sort of exchange between the residents that are sharing.

People want to plant things but only those who live close to the water kiosks are able to do so. Communal gardening is a popular idea, it might also help with unemployment.



Community Workshop - Chingeltei

Date

Chingeltei-16 - March 2017

In attendance

Community Workshop

Joshua Bolchover, The University of Hong Kong

GerHub representatives

Students from Columbia University (12 people)

Kheseg leaders and local residents (15-20 people)

Objectives

To understand issues within the district at different scales through drawings with local residents.

To receive feedback on initial prototypes.

To encourage local residents to raise suggestions for developing their neighbourhood.

Summary

Waste is a big problem, especially when the number of people in the khoroo keep increasing.

Children and youth facilities are lacking. Any educational or vocational facilities, or playspaces would be great for the khoroo. Vocational training will help new migrants who find it difficult to find jobs without many skills.

There are small kiosks which are convenient, especially in winter, but more expensive than the main street shops because the goods have to be delivered further and in smaller quantities. If there are more shops the prices might go down, as well as giving residents more options.

The roads are uneven and dangerous. There are no crossing points or lighting. It is also very steep so when it is wet or icy it is both difficult and dangerous to walk.

There are very few hot water facilities in the khoroo. Shared water tanks that can allow for hot water facilities like a shared bath house or private shower could be a popular idea.



Prototype Feedback Meeting

Date

Bayankhoshuu - July 2017

In attendance

Prototype Development Meeting

Joshua Bolchover and Research Assistants, The University of Hong Kong

GerHub representatives

ZAG Engineering LLC (Contractor in charge of the plug-in)

Teachers and students from the Insitutute of Engineering and Technology (8 people)

Students from The University of Hong Kong (12 people)

Local residents (5 people)

Representatives from M.A.D Urban Mongolia (4 people)

Objectives

To present and receive feedback about the prototype from development collaborators, local academics, and professionals.

To discuss the ideas for further prototype development

Summary

The perception of what the Ger Plug-in may affect resident's attitude to change. There are those who see houses and apartments as urban. The prototype presents a different lifestyle to that which the residents are used to, but also what they anticipate.

There is potential for the Ger Plug-in be self built and to become more affordable by reducing the number of market transactions involved if residents can purchase directly from a supplier. The idea of residents being able to expand their living space by themselves was also brought up during the conversation.

On the topic of affordability, breaking down the Ger Plug-in into modular components was discussed. It would allow the prototype to suit more people - whether it is based on their needs or income.



Ger Plug-In Prototype Open House

Date

Bayankhoshuu - September 2017

In attendance

Joshua Bolchover, The University of Hong Kong

Undrakh Ganzorig, Senior Analyst, Schulze Global Investments,

Alison Nankivell, Vice President for Global Scaling, BDC Capital

Sergelen Munkh-Ochir, President, Institute of Engineering and Technology

Byambasuren Chuluunbat, Project Manager for Energy Efficiency Project, GIZ,

Nemuun Gal, Chairman, GerHub,

Amarbayasgalan Enkhsaikhan, CEO, Golomt Capital,

Onejin Wu, Environment, Science, and Health Officer, US Embassy

Tim Jenkins, Communications & Partnerships Officer, UNFPA

Judith Bruno, Deputy Country Representative, UNICEF

Bold Magvan, CEO, XacBank

Isabella Bersani, Project Development Officer of Eco Banking Department, XacBank

Thomas Papazov, Director of Business Development, Engie Mongolia

Jon Lyons, VP of Regulatory Affairs & Strategy, Erdene Resource Development Corp

Ilgel Bold, CEO, Novaterra LLC,

Aldaraa Tuvshinbat, Country Representative, Oyun Foundation

Bolor Enkhbat, Construction Director, Shonest LLC

Tenuun Batzorig, Architect, Azzurra architectural firm

Objectives

To introduce the prototype to representatives of different organizations working in Mongolia.

To receive feedback on the design and initiate conversations about the next step for the prototype.

Summary

One of the innovative aspects of the project is its ability to create added value. It could create a network effect within the non-profit sector, to create value through belonging to a larger community. Resident's reliance on coal will be reduced and the infrastructure will increase the value of their land.

Low interest mortgages from the Global Climate Change Fund could be made accessible to the ger district residents through the Ger Plug-in prototype. It is considered essential as it allows the residents themselves to become active stakeholders that are responsible for the development of their own districts.

Community Workshop - Post Occupancy and Community Open House

Date

Bayankhoshuu - July 2018

In attendance

Post Occupancy and Community Open House

GerHub representatives

Students from The University of Hong Kong and HKU School of Professional and Continuing Education (8 people)

Local residents (10 people)

Plug-in Inhabitants (2 People)

Objectives

To gain feedback and evaluate the performance of the Plug-in so far.

To introduce the prototype to the residents beyond the local community and to educate them about how it is to be used and managed.

To present the prototype to kheseq leaders from different khoroos and receive feedback on the design and ideas for further development.

Summary

The water tank and septic tank are popular with the residents, they think that there is even potential for it to be shared with other families, especially if the tank is larger it would be more efficient.

There are concerns about the permanence of the materials used, mainly the canvas which needs cleaning. A more 'solid' material like brick or metal is preferred as it would also be more sturdy and give the appearance of a 'nice' house.

Even though a fully electrical system is attractive, there were concerns about the cost and reliability of electricity. Coal is still seen as a necessary backup option.

Expansion and customization were concepts that were brought up multiple times, especially with regards to more family members moving in. The current mode of expansion is by building a new house, but it would be great if the prototype could adapt and everyone can still share the infrastructure.

Plot boundaries are negotiable to some residents who already remove a fence between them and a close neighbour to gain playspace for children or gardening space.



20 | **SELECTED PROTOTYPES**
Design Reports

Smart Collection Point - Mid



Location

Chingeltei-16, Ulaanbaatar

Issues

Waste, Leisure

Programme

Waste collection and recycling;

Other community programs can be added,; shop, community center

Stakeholders

Ger residents

Waste management companies

Government

NGO's

Description

The prototype was to design a waste collection point. For rural nomads, waste, in the form of plastic bottles, glass and cans is an unfamiliar urban phenomenon and without clear systems of collection, garbage accumulates in gulleys, roadside verges and streams. The Asia Foundation identified the worst areas for rubbish build up alongside certain neighbourhoods or Khoros that they had forged good relationships with local leaders. The aim was to create a demonstration project that could facilitate the hygienic collection of rubbish. They named the project Smart Collection Points as the project had to engage neighbourhood participation and outreach; improve the scheduling of trucks; and influence policy from the Mayor's office to alter how they administered city-wide waste collection.

This site was located by the side of a recently constructed road on an uneven dirt slope. The scheme took advantage of the height difference of the topography to form a ramp leading from the high ground to the road and bus stop with several places for rubbish drop off along the way. A recycling station was contained under the ramp which splayed apart to create an open public space.

This project represents a step towards more embedded urban organisations that can anchor the future growth of the community.

DESIGN: Joshua Bolchover (Rural Urban Framework, The University of Hong Kong)

PROJECT DETAILS:

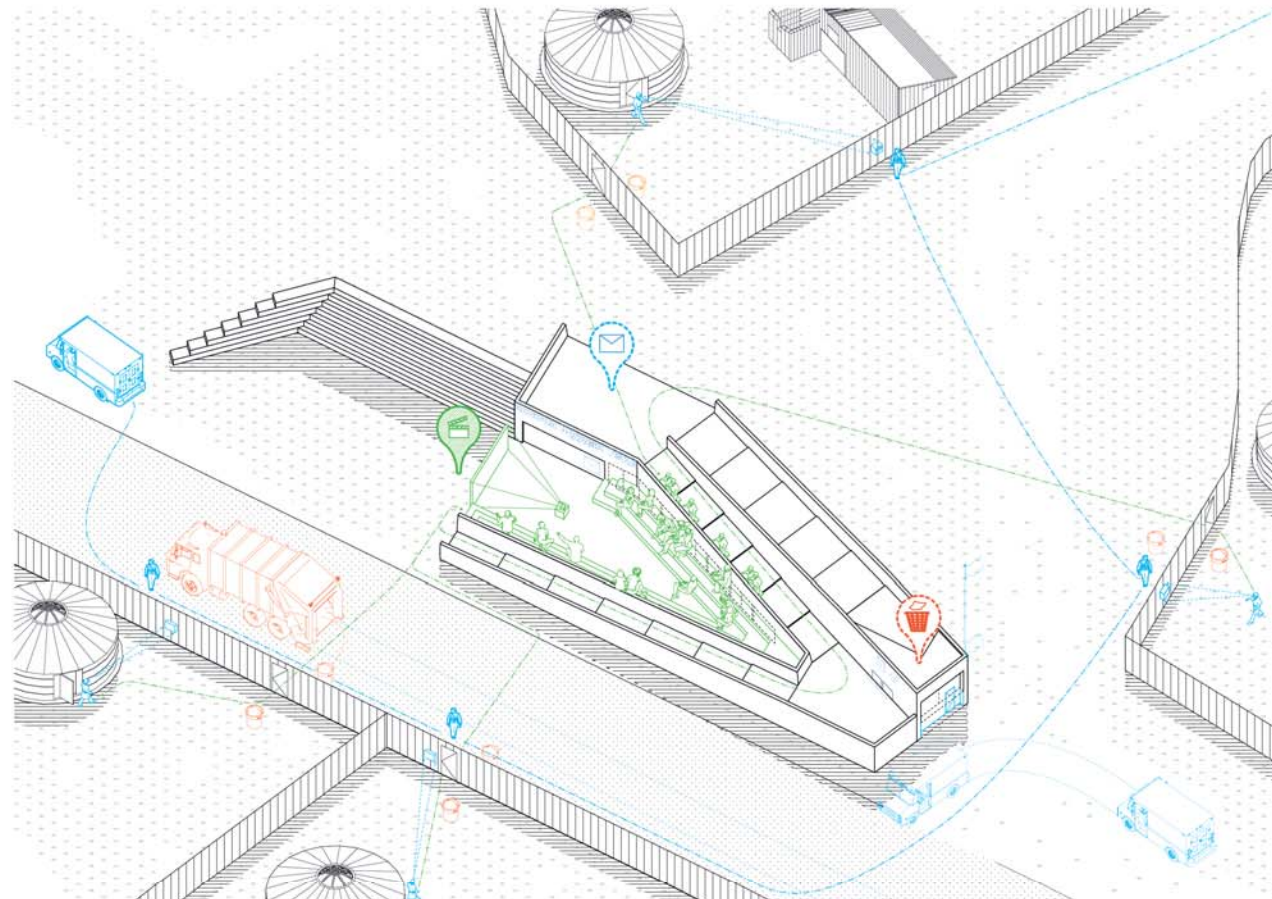
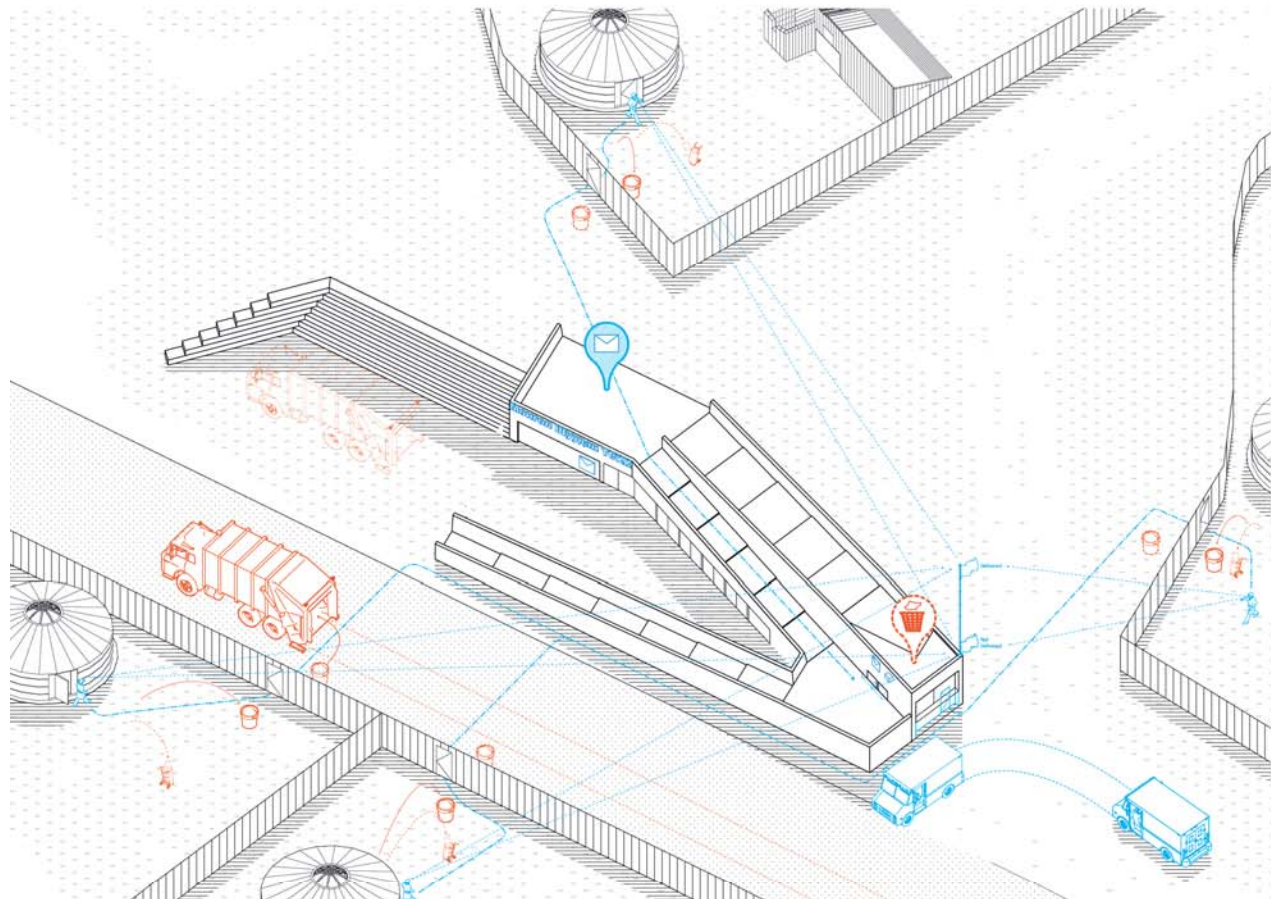
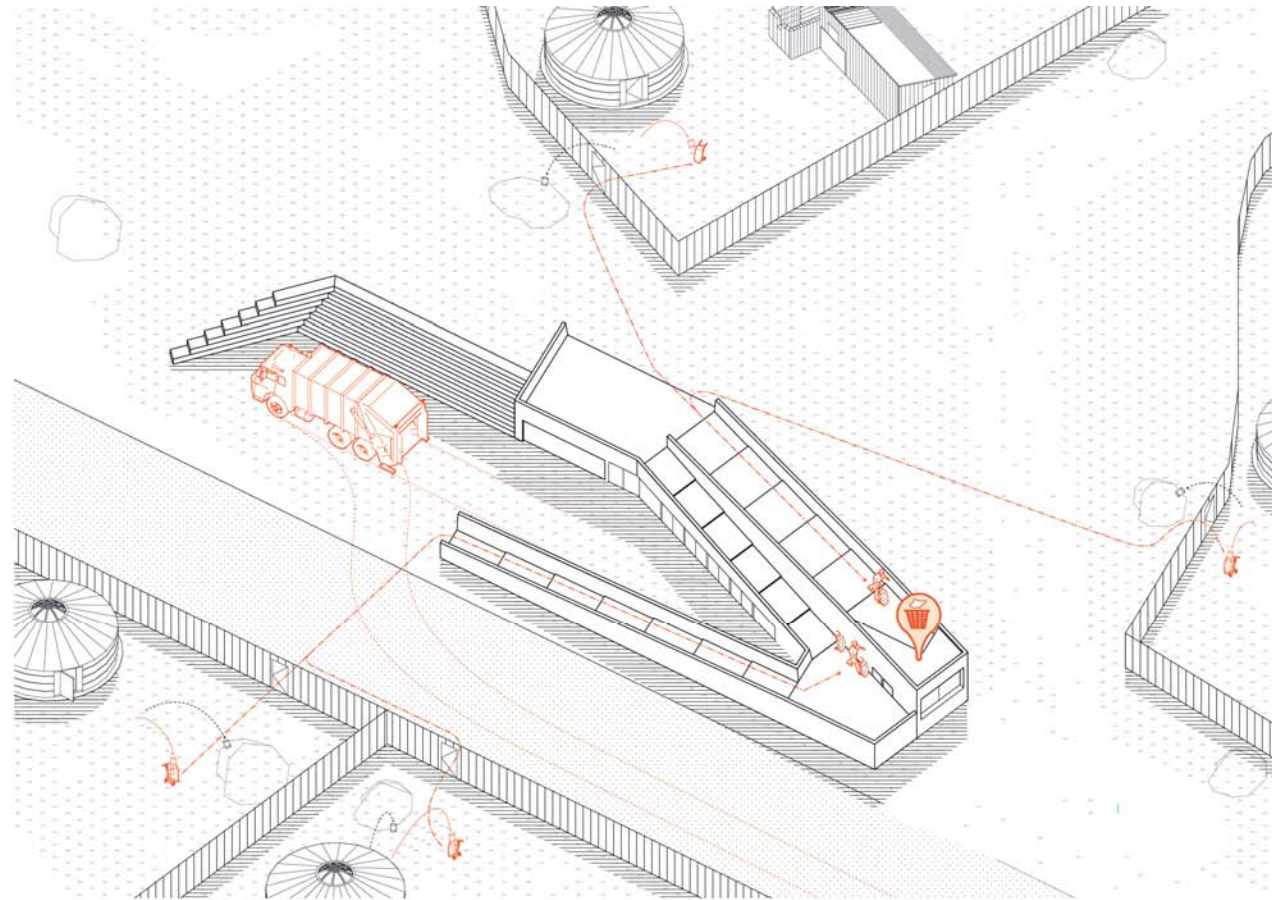
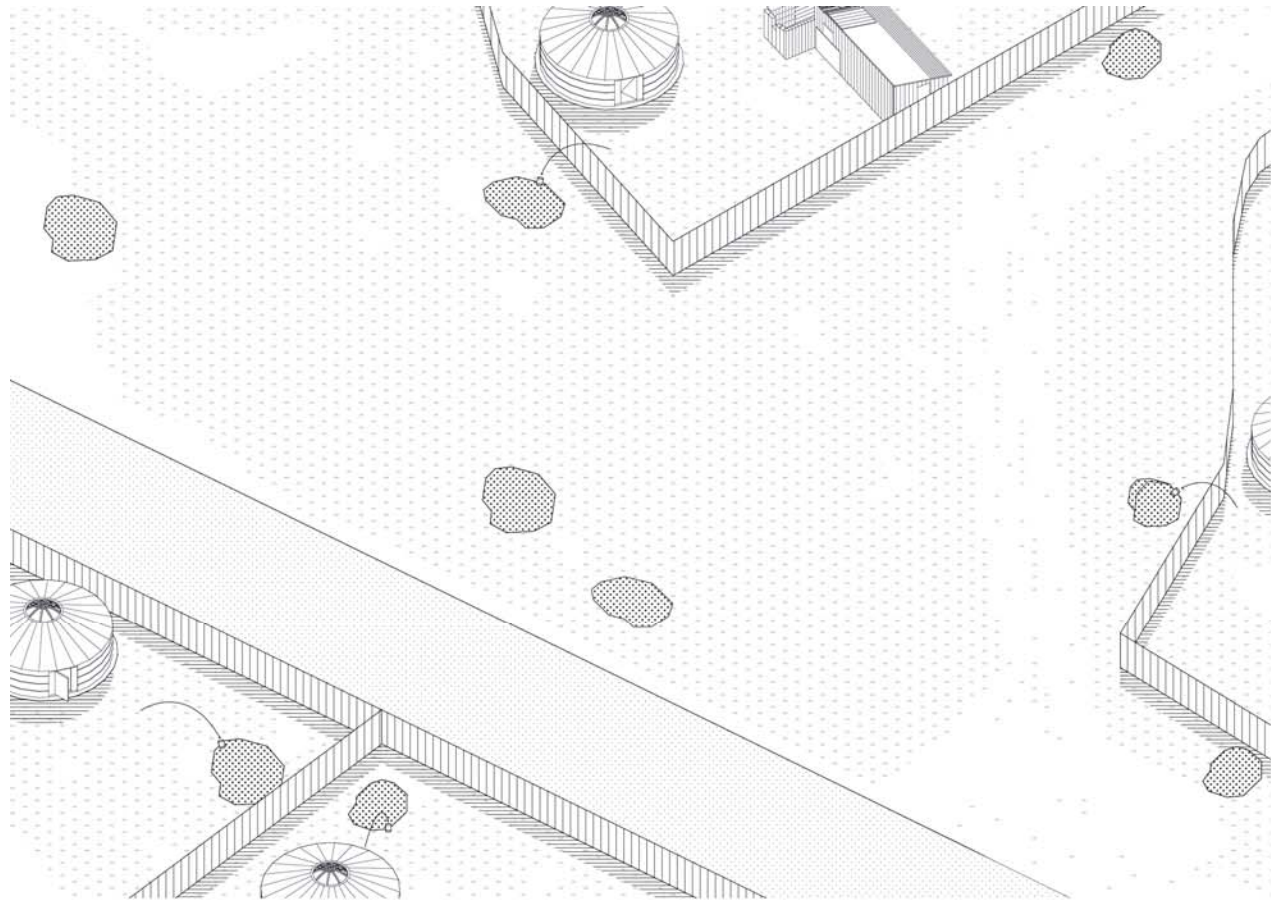
Cost: 40,000 USD/ Collection Point

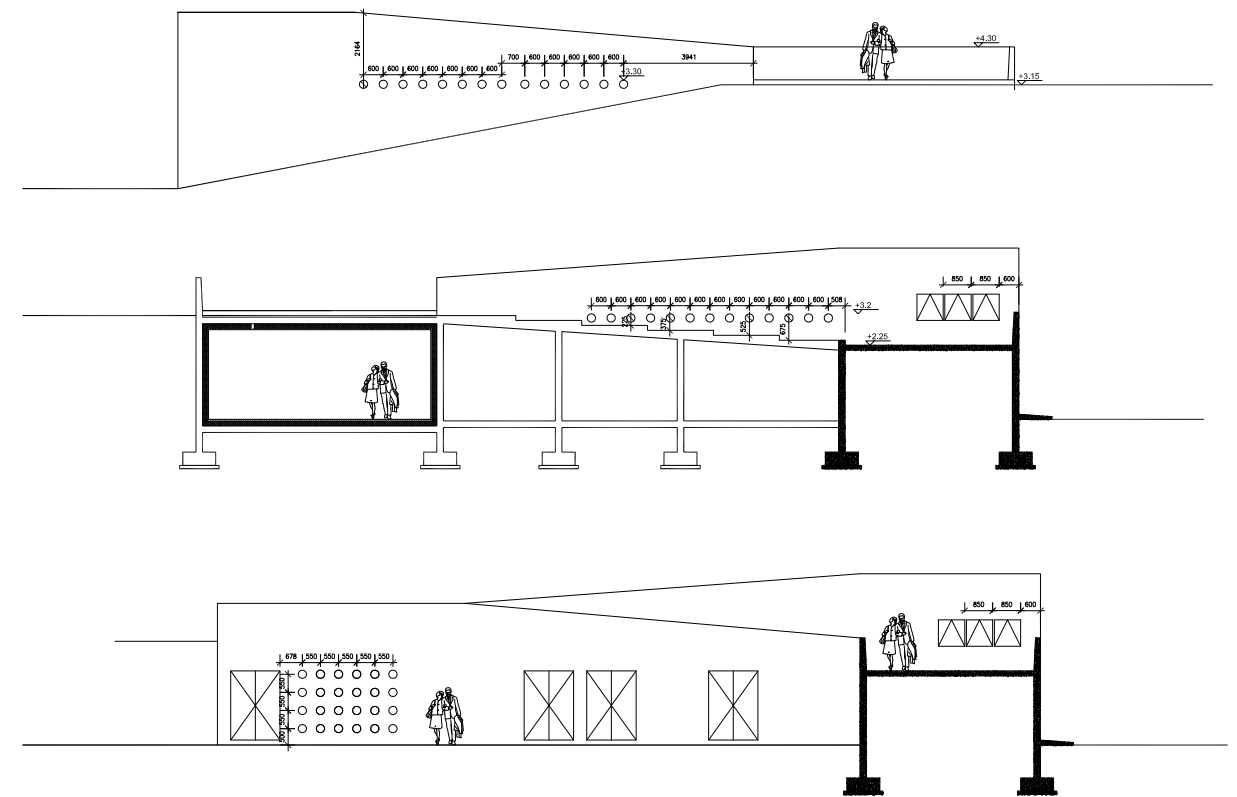
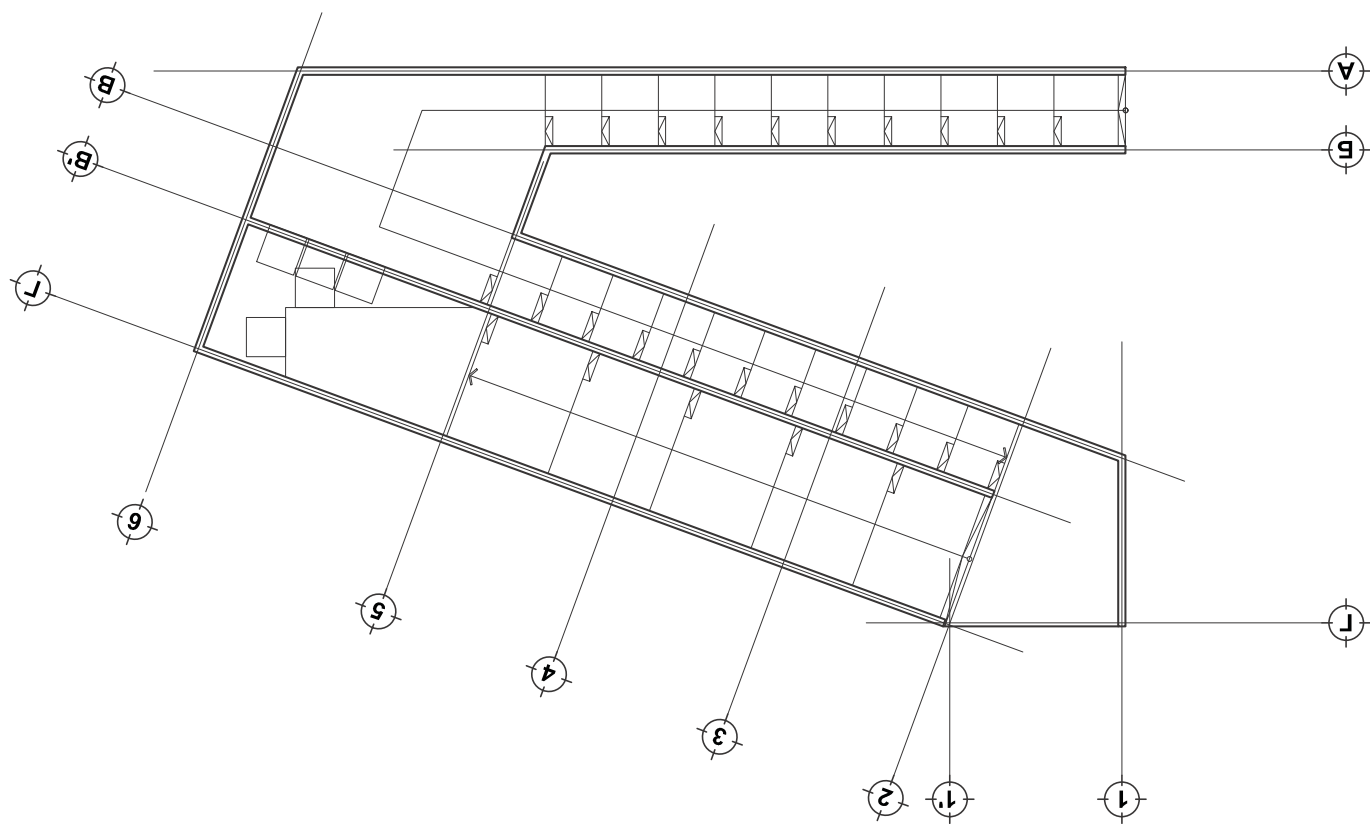
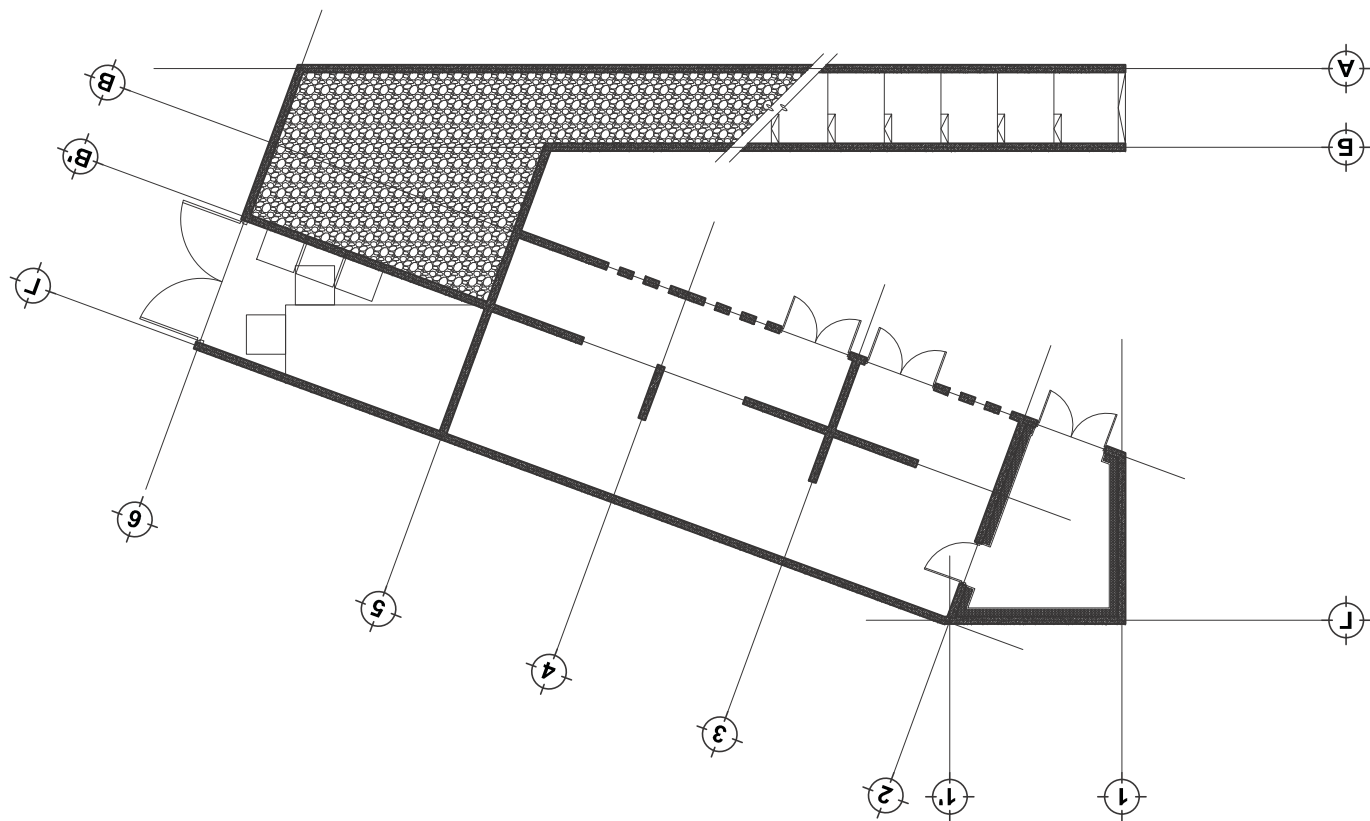
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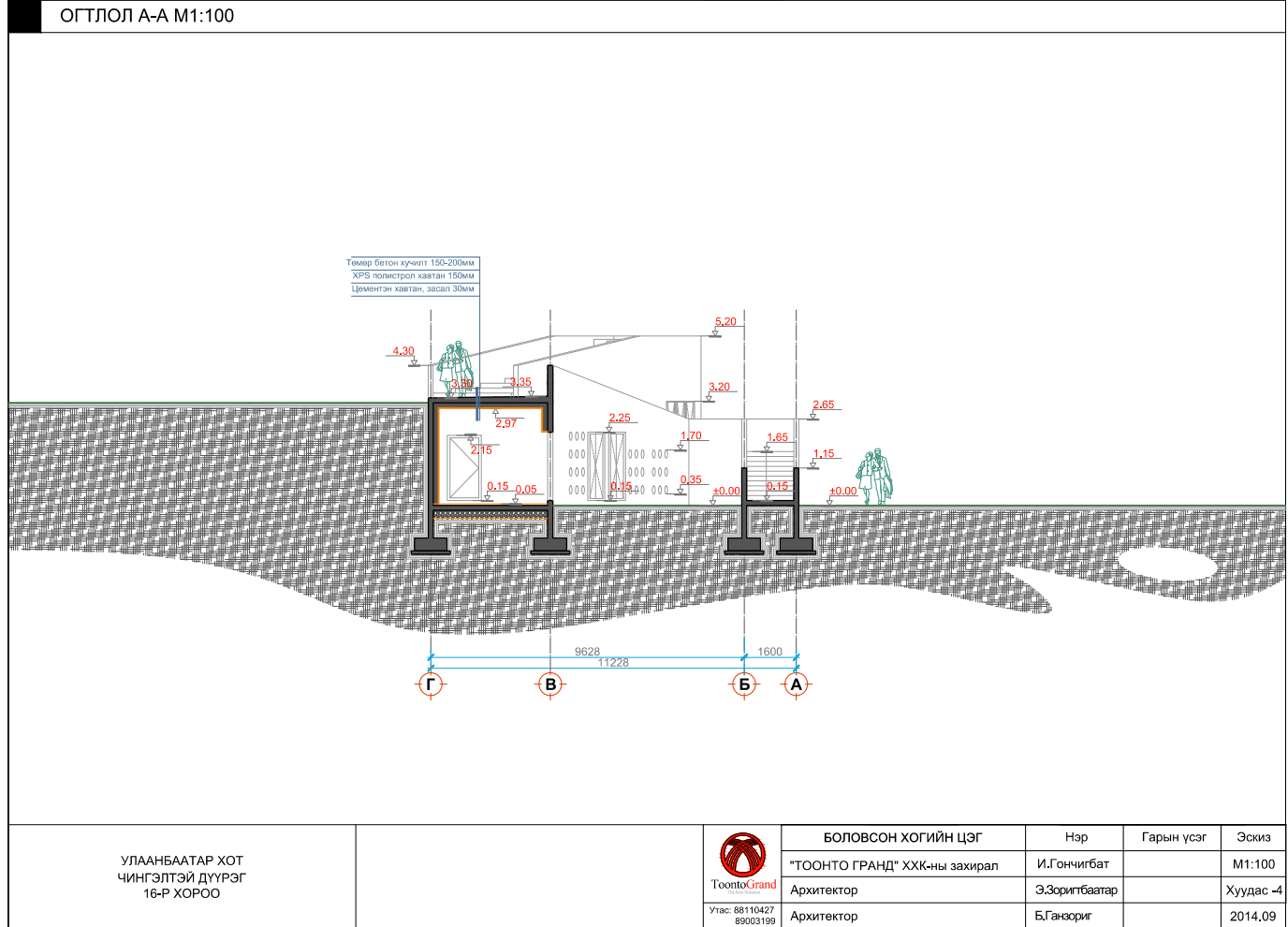
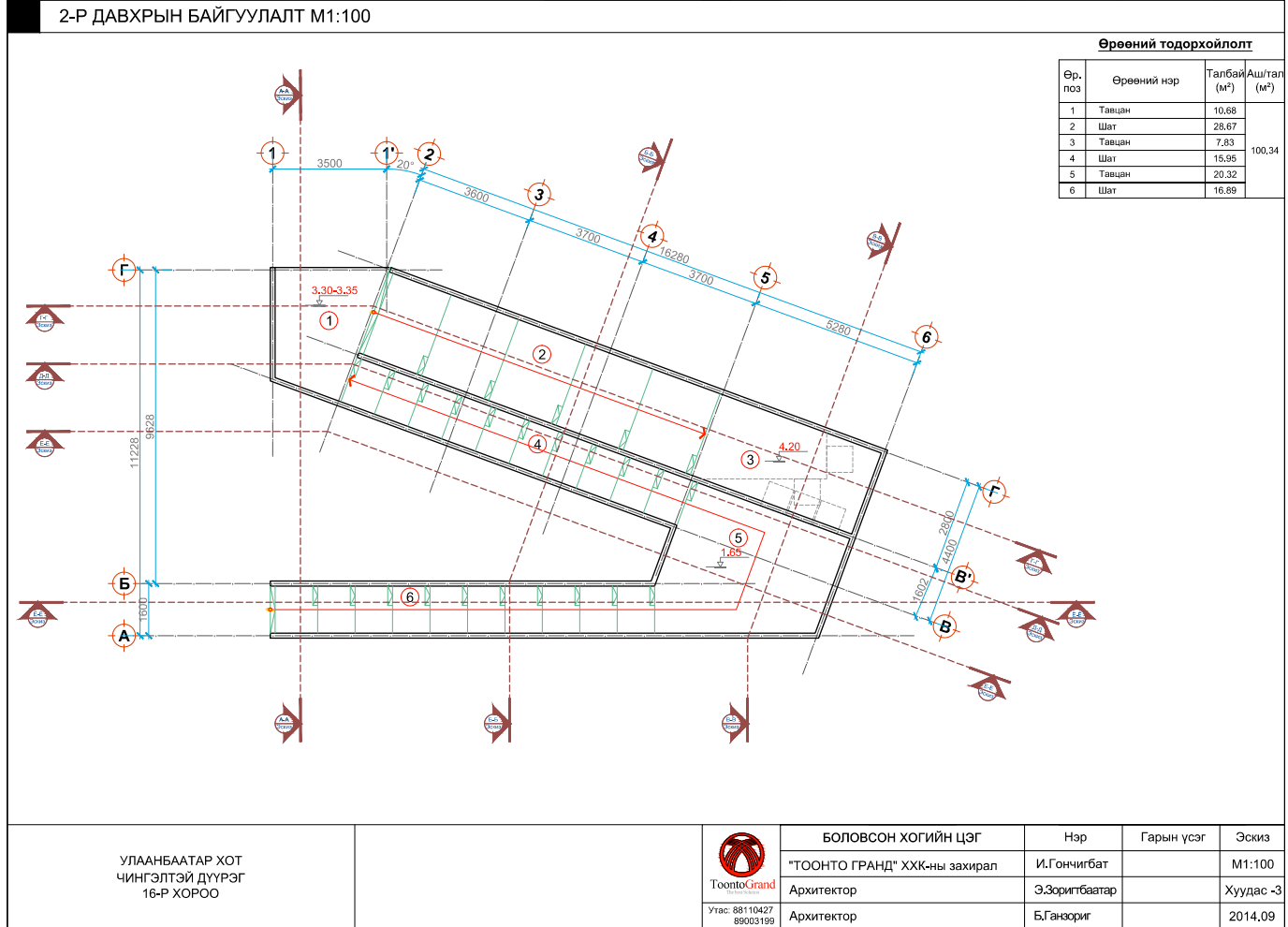
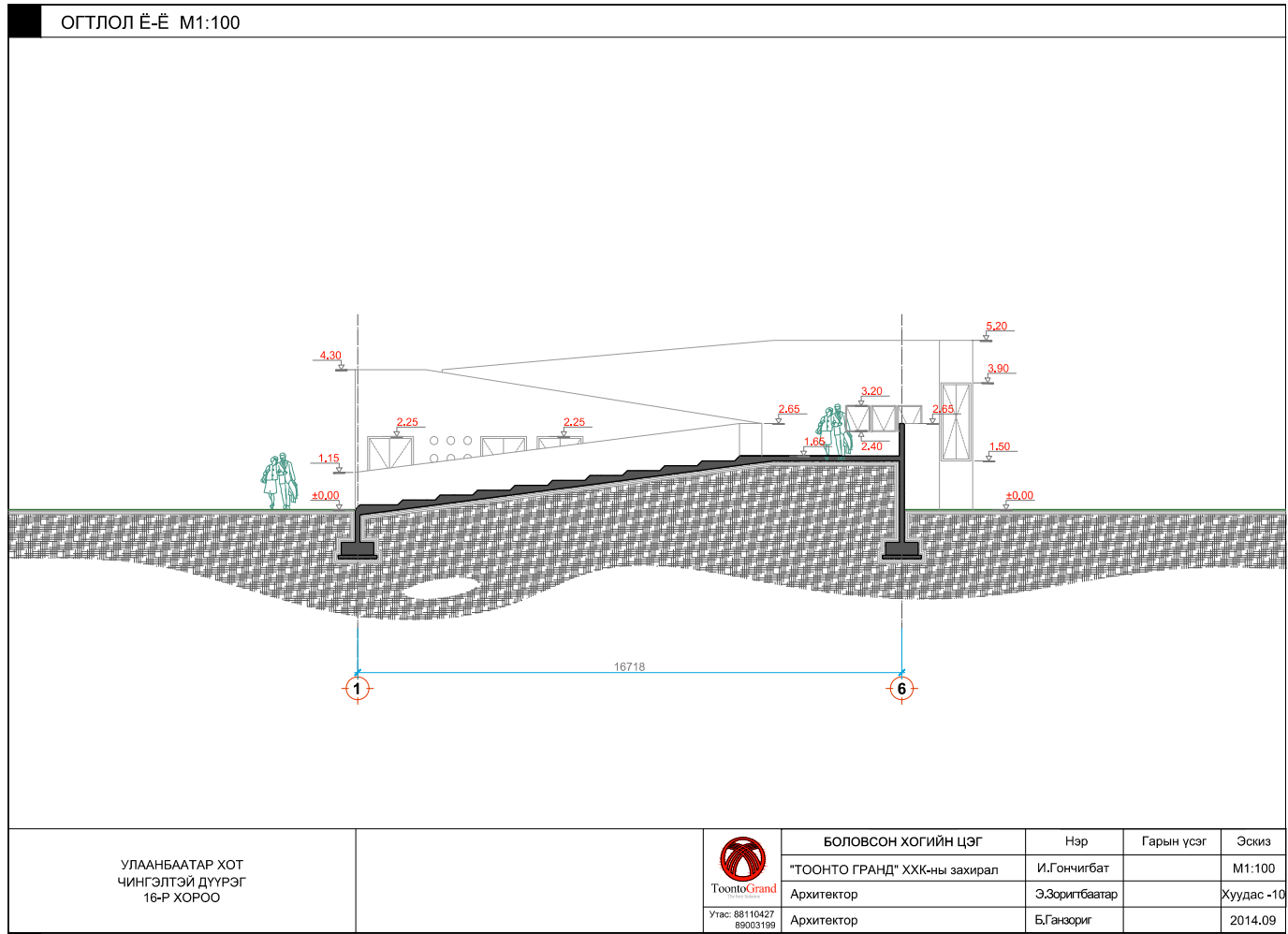
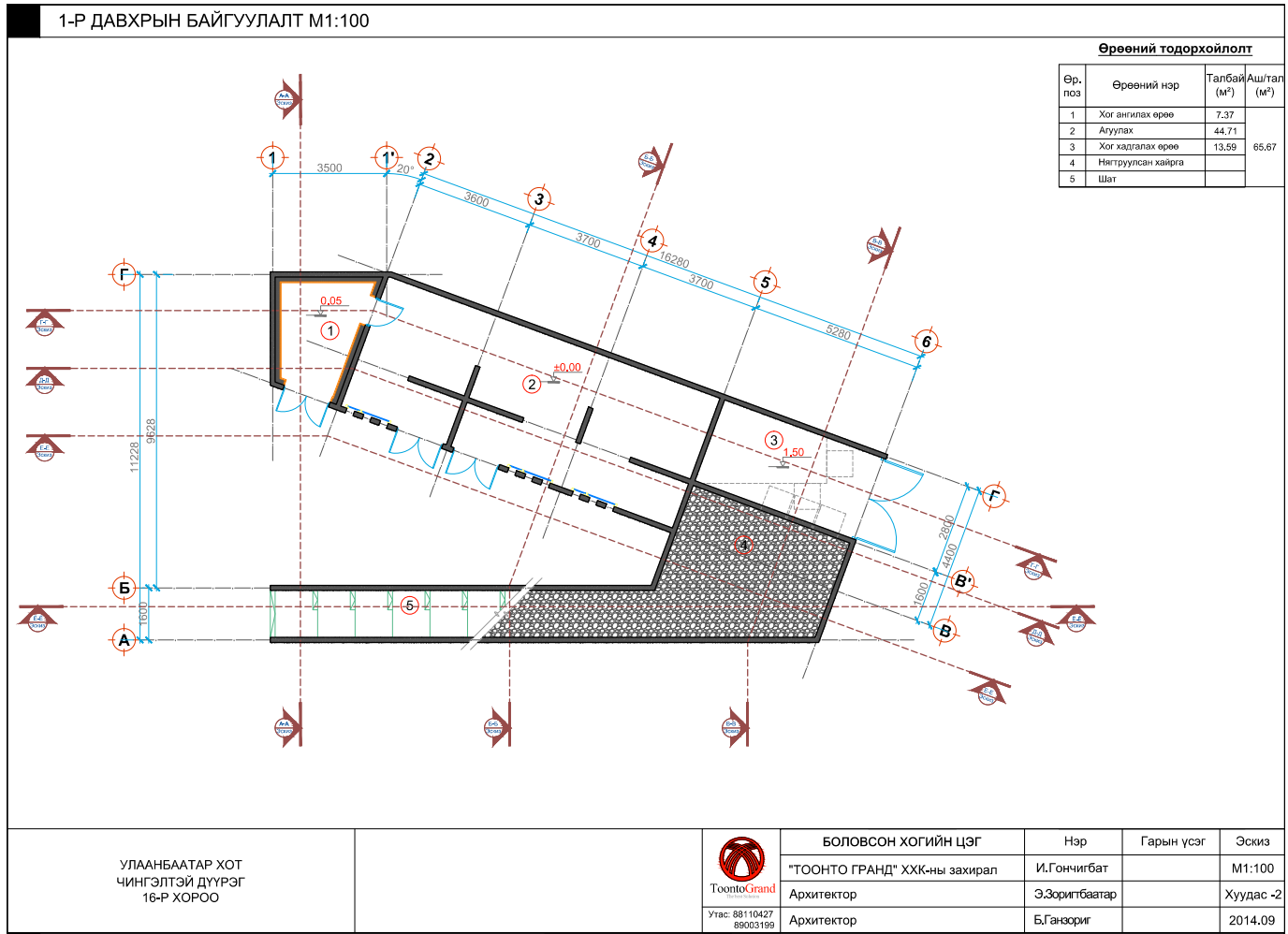
CLIENT: The Asia Foundation, Mongolia and The Mayor's Office, Ulaanbaatar, Mongolia

DESIGN INSTITUTE: Toonto Grand

Adaptation











Smart Collection Point - Fringe



Location

Khan Uul-13, Ulaanbaatar

Issues

Waste

Programme

Waste collection and recycling;

Other community programs can be added,; shop, community center

Stakeholders

Ger residents

Waste management companies

Government

NGO's

Description

Waste is an issue that affects all ger districts. In parallel to the mid district prototype in Chingeltei-16, a waste collection prototype was also designed for Khan-Uul 13, a fringe district area.

The primary issue on the flat terrain was how to ensure easy access for the public dropping off their trash as well as for the collectors. An artificial topography was created by excavating 1.5 meters below the ground for collection and building up by 1.5 meters for the drop-off with a retaining wall holding the new mound in place.

DESIGN: Joshua Bolchover (Rural Urban Framework, The University of Hong Kong)

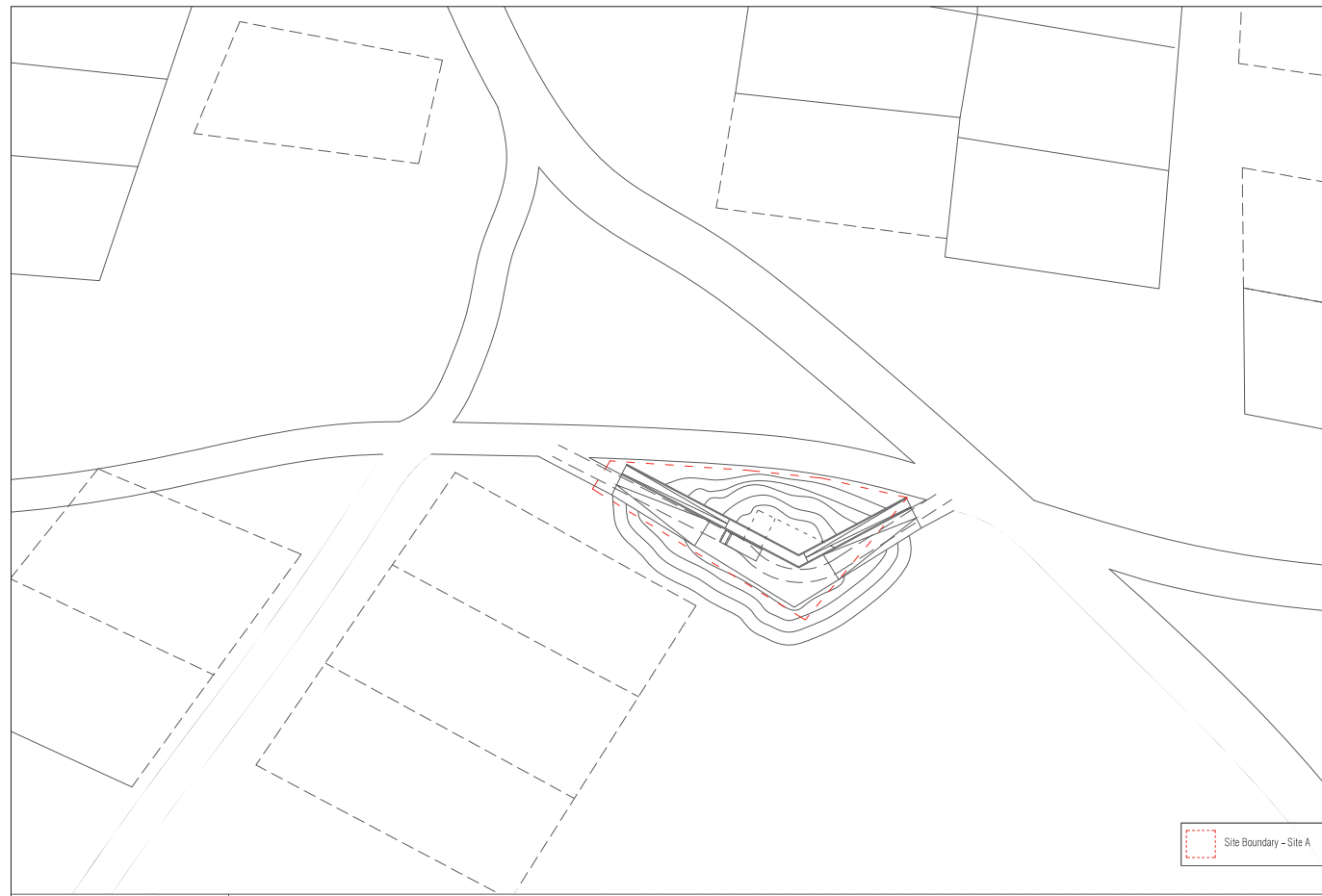
PROJECT DETAILS:

Cost: 40,000 USD/ Collection Point

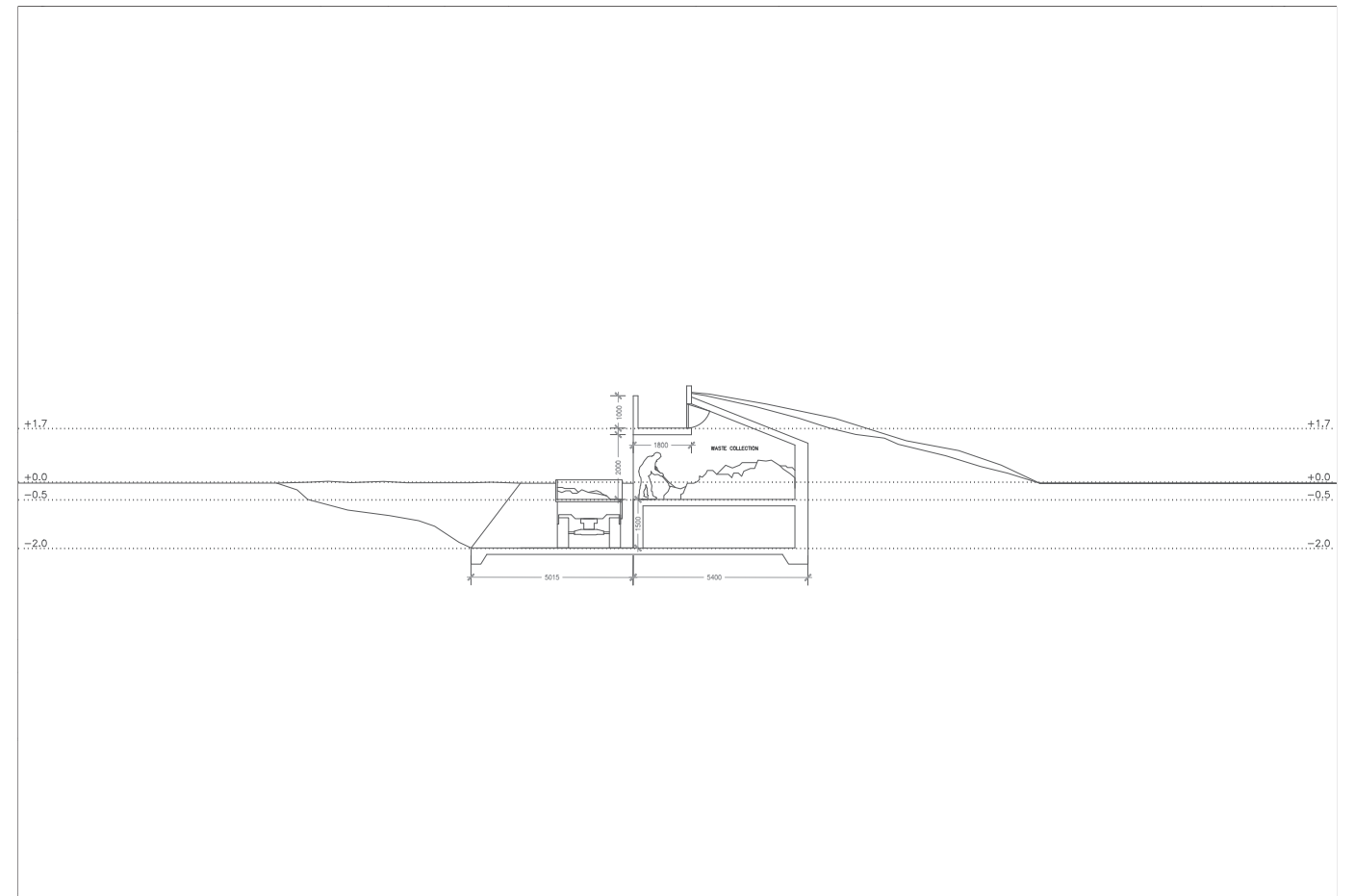
Date: February 2014 – February 2015

CLIENT: The Asia Foundation, Mongolia and The Mayor's Office, Ulaanbaatar, Mongolia

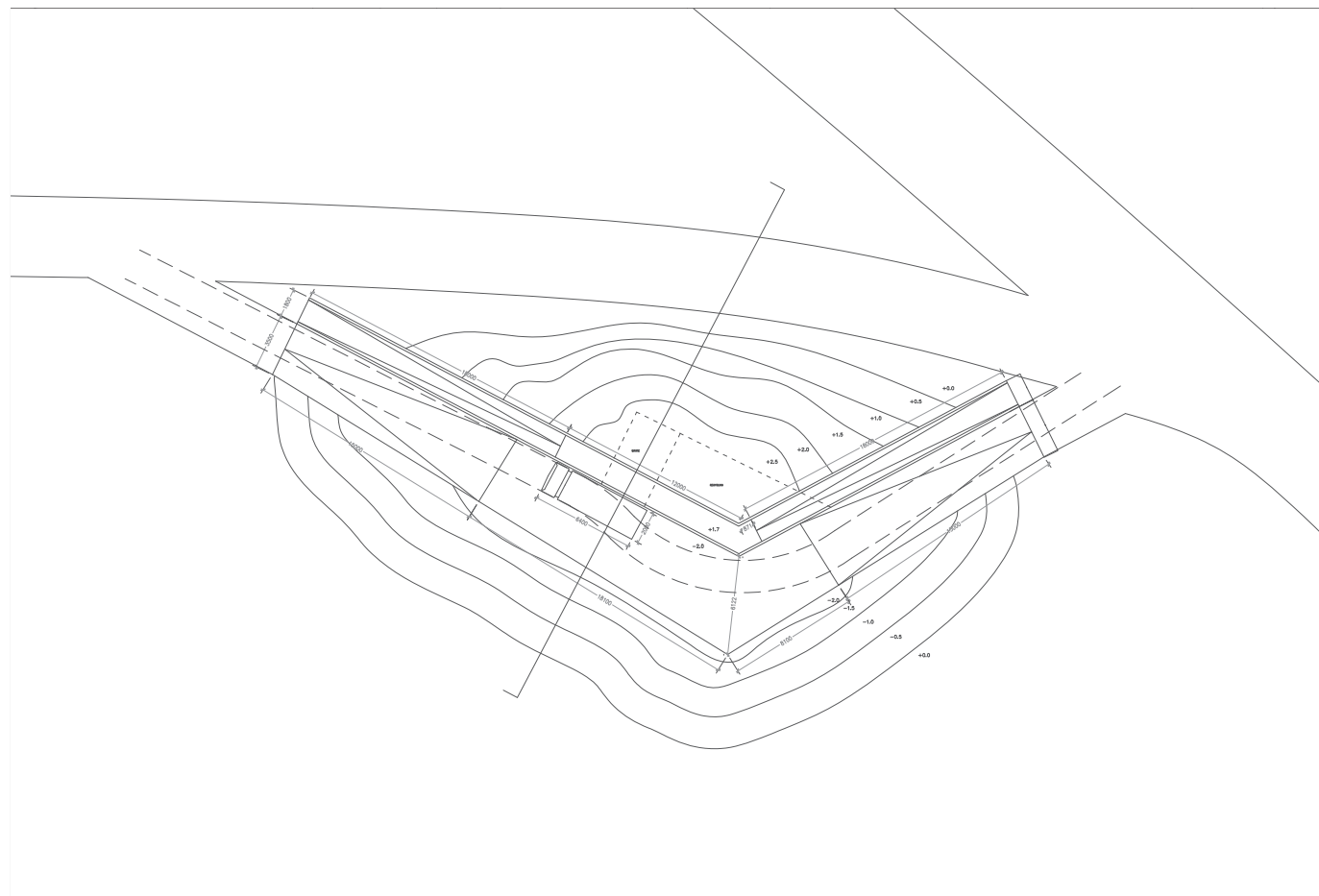
DESIGN INSTITUTE: Toonto Grand



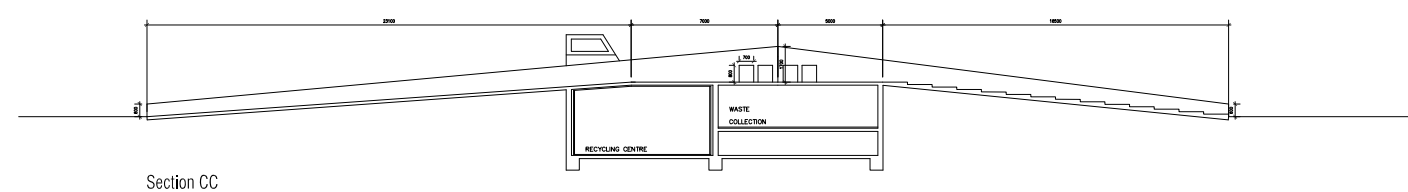
Joshua Bolchover ENR: jbolcho@hkust.edu.hk TEL: +852 6390 9847
 Rural Urban Framework, Faculty of Architecture, University of Hong Kong
 Project Title: Khan Uul Waste & Recycling Collection Point Date of Issue: 18 July 2014 Drawn by: YQ Scale: 1:500 - A3 DWG name: Site Plan, Option 1 DWG no.: A0.01



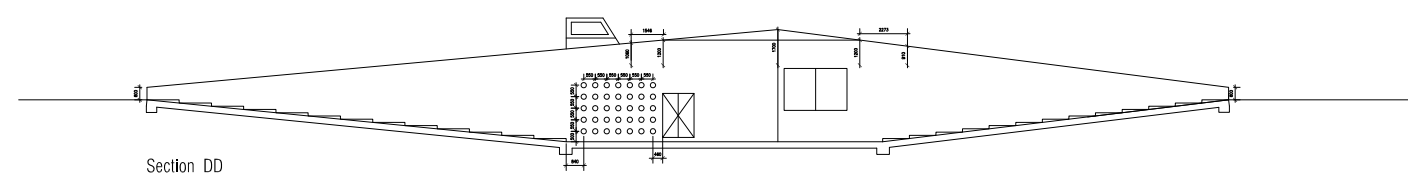
Joshua Bolchover ENR: jbolcho@hkust.edu.hk TEL: +852 6390 9847
 Rural Urban Framework, Faculty of Architecture, University of Hong Kong
 Project Title: Khan Uul Waste & Recycling Collection Point Date of Issue: 18 July 2014 Drawn by: JC Scale: 1:100 - A3 DWG name: Section - Option 1 DWG no.: A2.01



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 Rural Urban Framework, Faculty of Architecture, University of Hong Kong
 Project Title: Khan Uul Waste & Recycling Collection Point Date of Issue: 18 July 2014 Drawn by: JC Scale: 1:200 - A3 DWG name: Site Plan, Option 1 DWG no.: A1.01

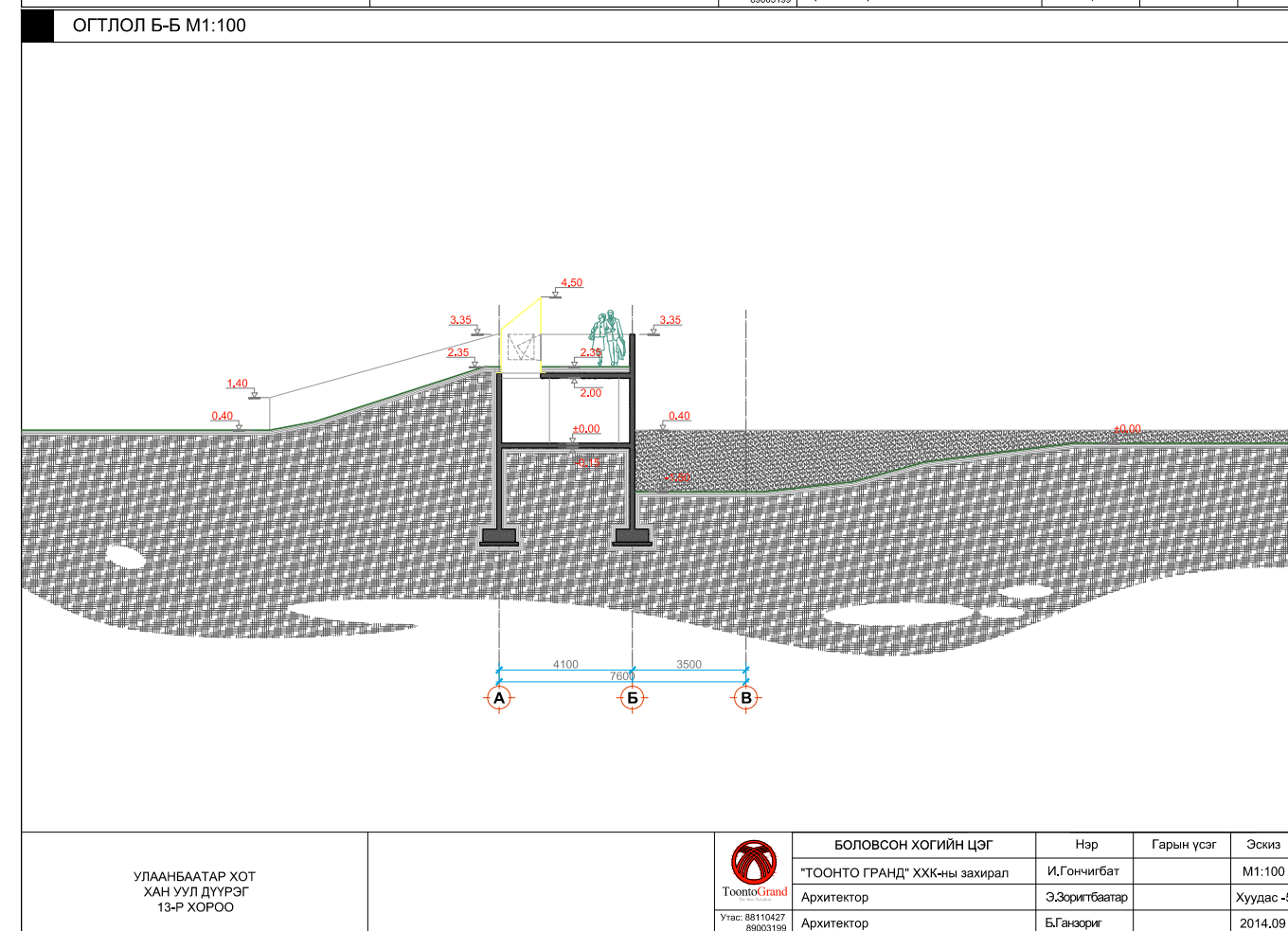
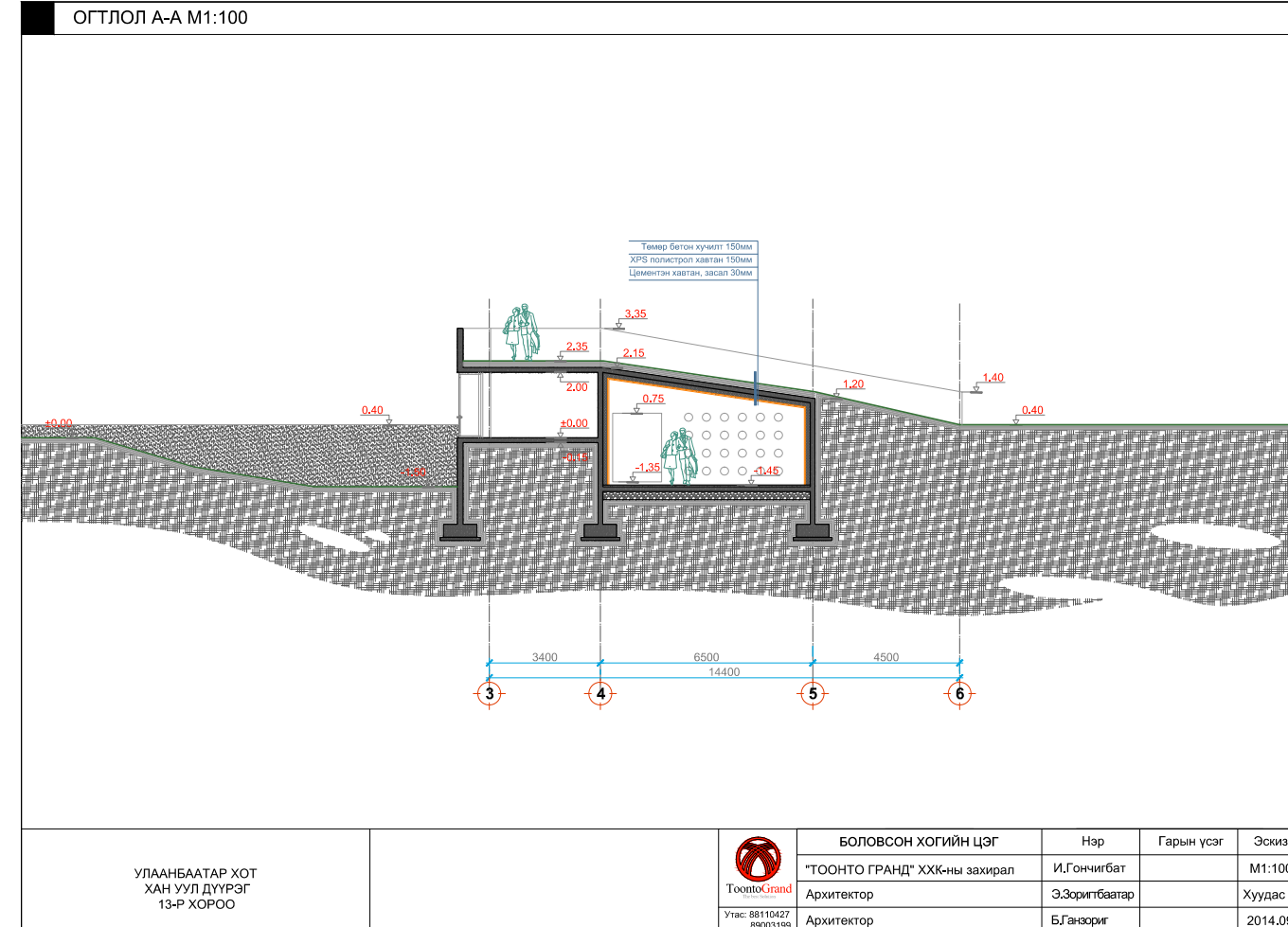
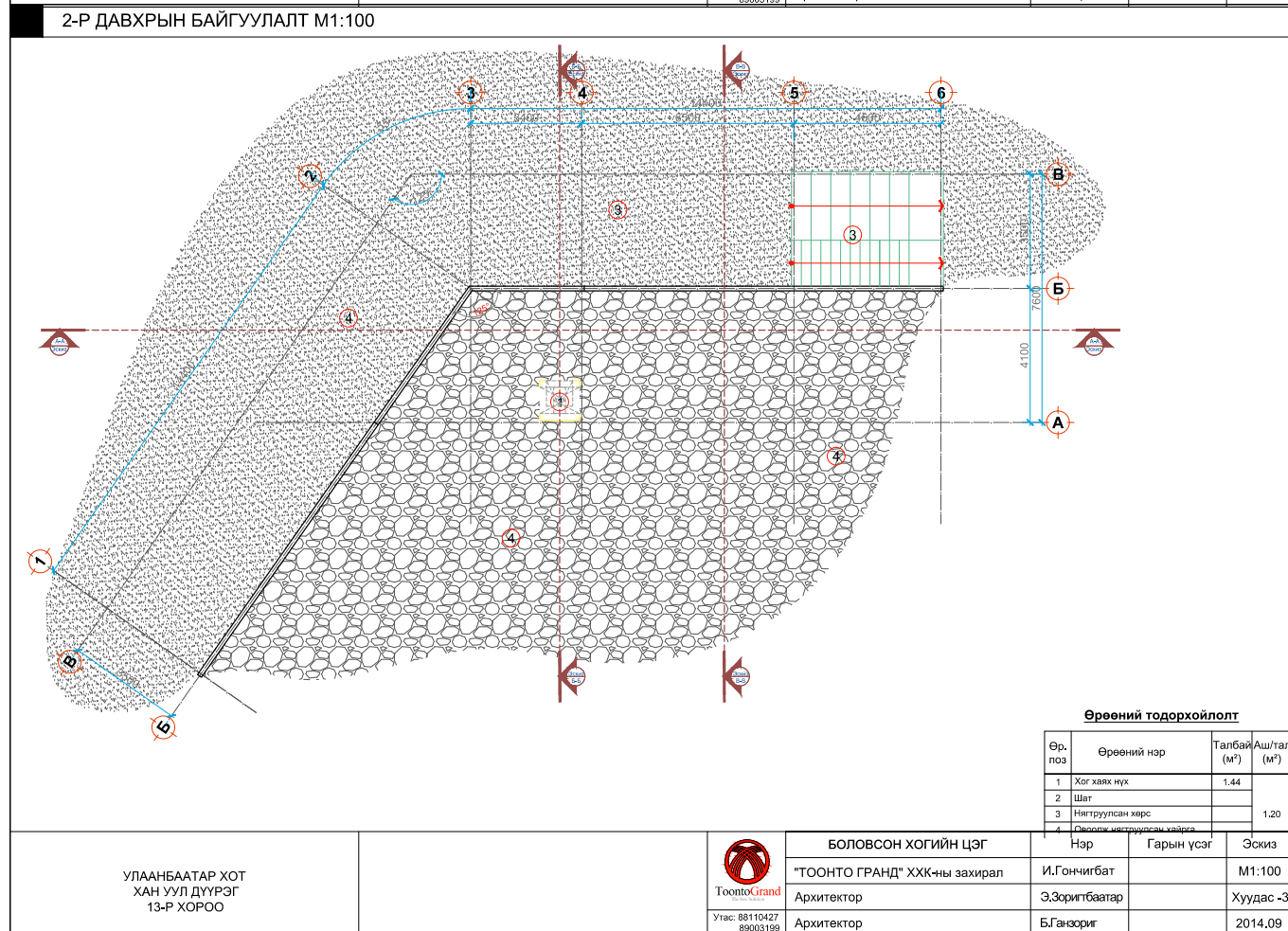
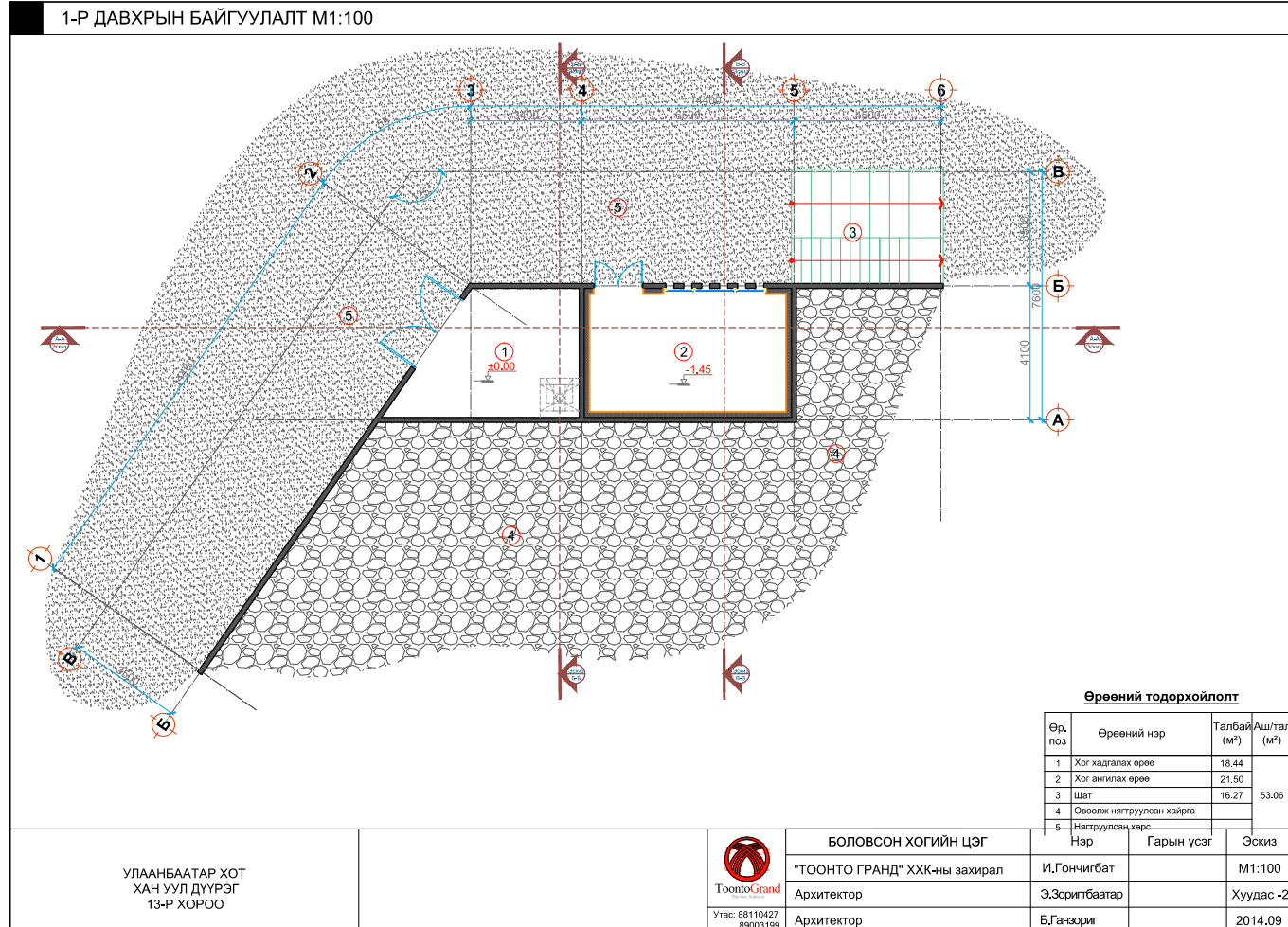


Section CC



Section DD









Ger Plug-in



Location

Bayankhoshuu Area, Ulaanbaatar

Issues

Housing, Water, Waste, Sewage, Energy

Programme

Housing unit that provides infrastructure for heating, water, and sewage.

Over time, the ger can be completely removed and the family can add additional rooms. This harnesses the incremental and self-build culture that exists in the ger districts, allowing families the flexibility to adapt as they see fit.

Stakeholders

Government

Ger residents

Housing authority

NGOs

Description

The prototype is designed as a thickened infrastructural wall containing water and septic tanks that the ger plugs into. Currently, each household lacks basic urban infrastructure: water is fetched from kiosks; pit latrines are dug on site; and district heating is unavailable. Air pollution is one of the worst in the world as ger residents burn coal to stay warm in double-digit negative figures in the winter months. The prototype tests new designs for low tech, affordable, environmental systems including underfloor heating, a cleaner dual fuel efficient boiler and a trombe wall. In this way, the project is conducted as a live experiment: a family will move in and we will record the temperature of different zones of the building, water usage, coal consumption and interview the inhabitants.

The Ger Plug-In is conceived as being in-between a ger and a house and will be constructed in March 2017. The purpose of the project is to impact the urbanization process through transforming the component part, the ger itself. Through addressing the ger, we can inform urbanisation through incremental change from the private realm to one that is public. By creating a structure with integrated environmental systems and designing it to allow for growth and adaptation, the aim is to “seed a transformation process that can lead to the creation of decentralised infrastructural networks.

Over time, the ger can be completely removed and the family can add additional rooms. This harnesses the incremental and self-build culture that exists in the ger districts, allowing families the flexibility to adapt as they see fit.

DESIGN: Joshua Bolchover (Rural Urban Framework, The University of Hong Kong)

PROJECT DETAILS:

Commission Date: April 2012

Size: 53 m²

Total Cost: 13,600 USD

Unit Cost: 260 USD/sqm

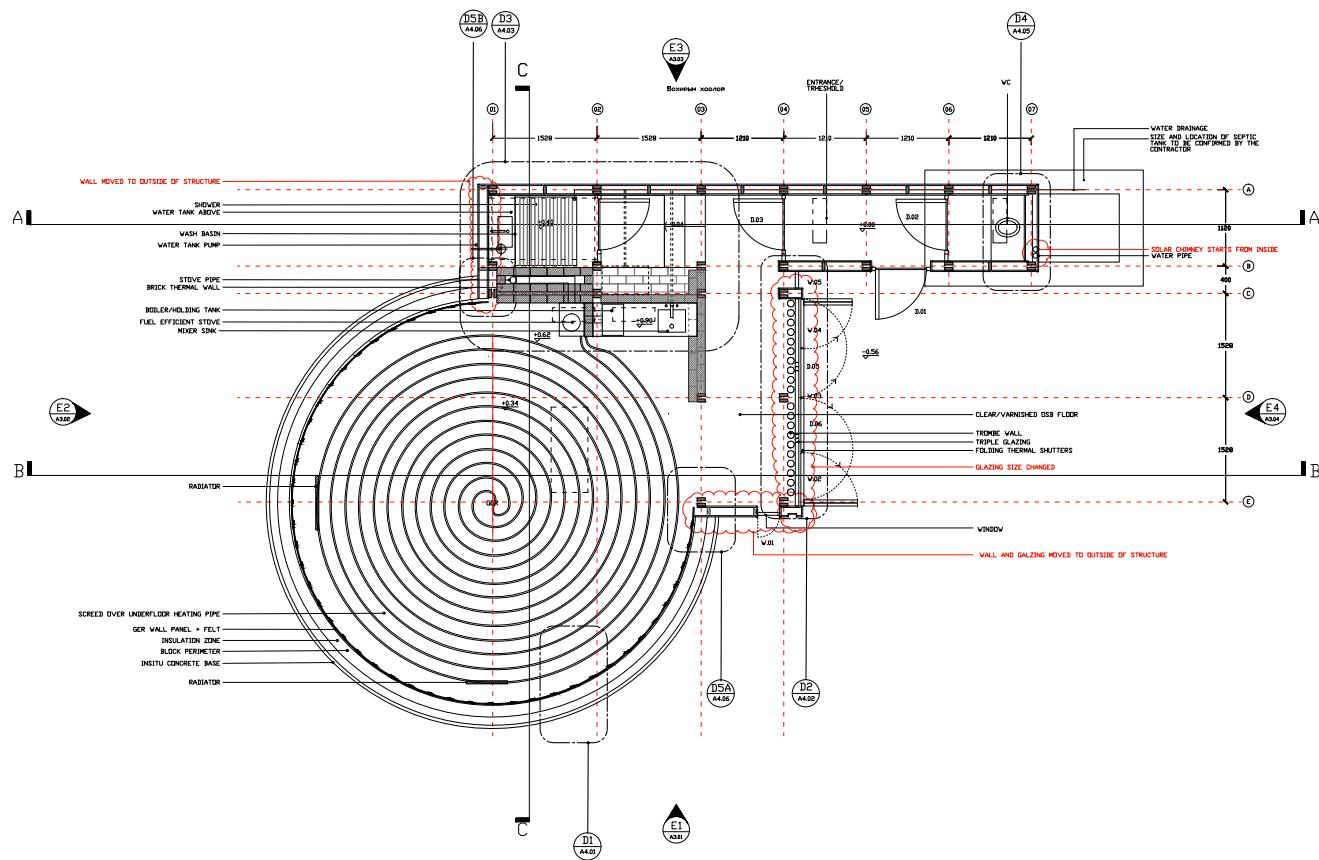
COMMISSIONING DONOR: Lorinet Foundation

ADDITIONAL DONORS: General Research Fund, HKSAR

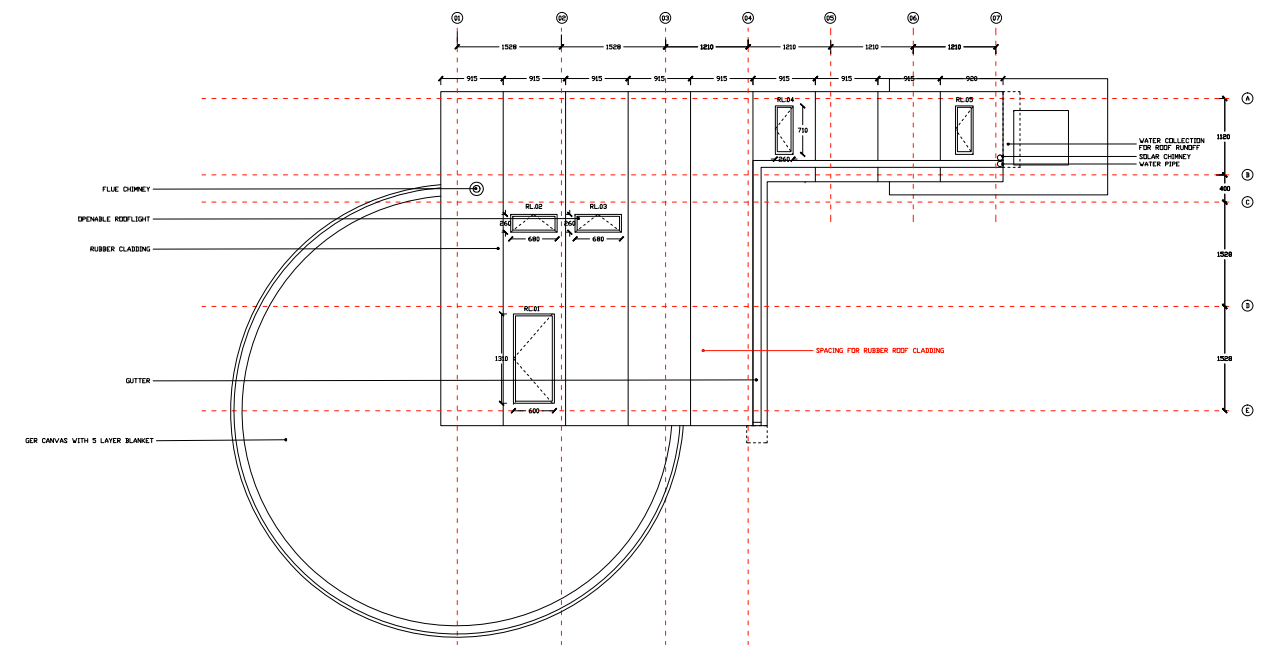
On Site Structure and Material Testing

Working with the Institute of Engineering and Technology to develop and test the structure at 1:1

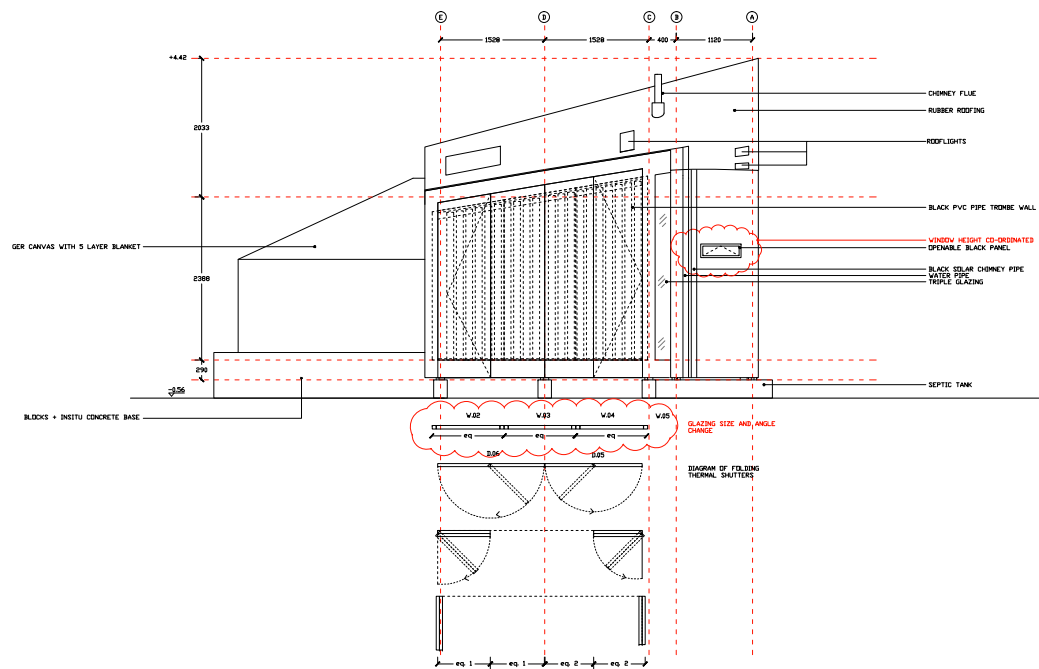




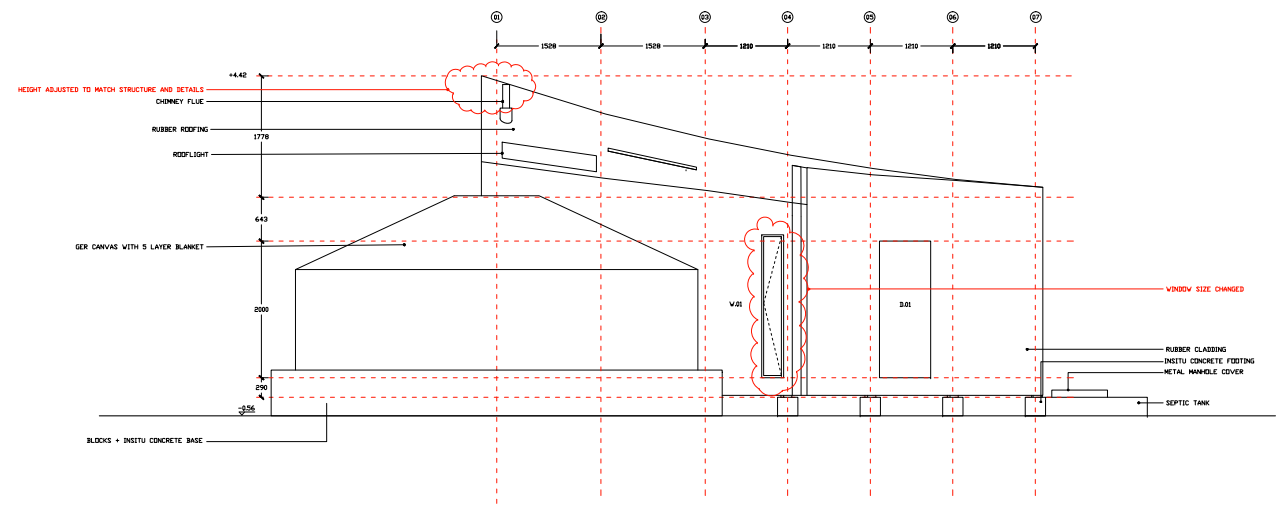
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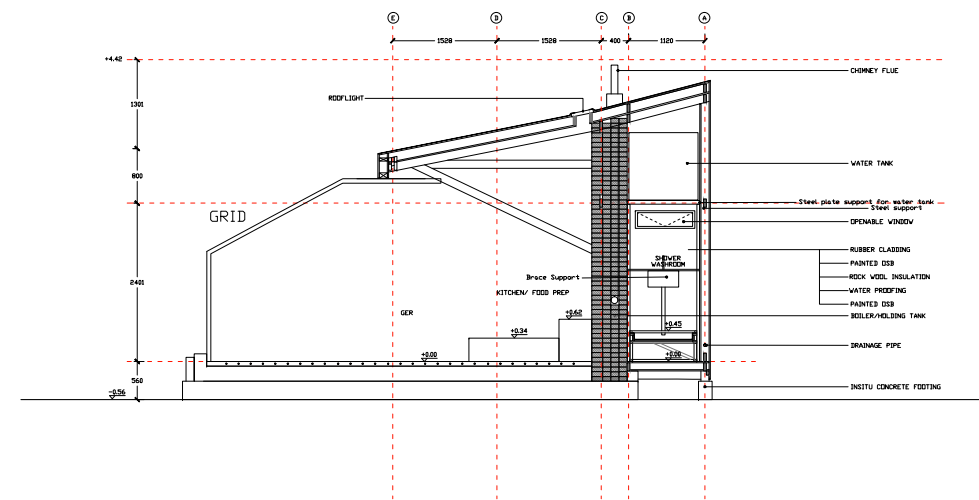
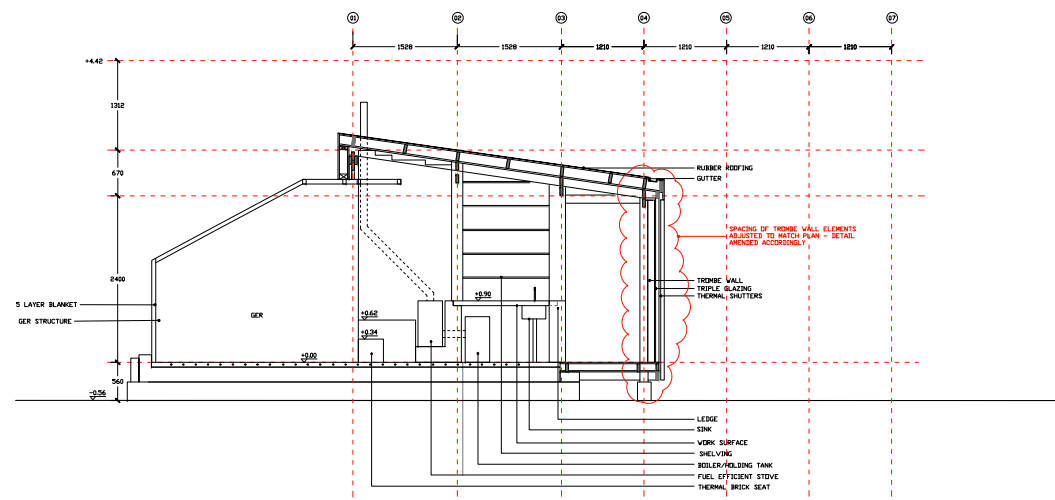
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NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bolchover jpbarch@nu.hk	PROJECT: GER PLUGIN DRAWING: ELEVATION 4	DATE: 31-03-2017 SCALE: 1:50 @A3	ORIENTATION: LANDSCAPE NUMBER: A3.04
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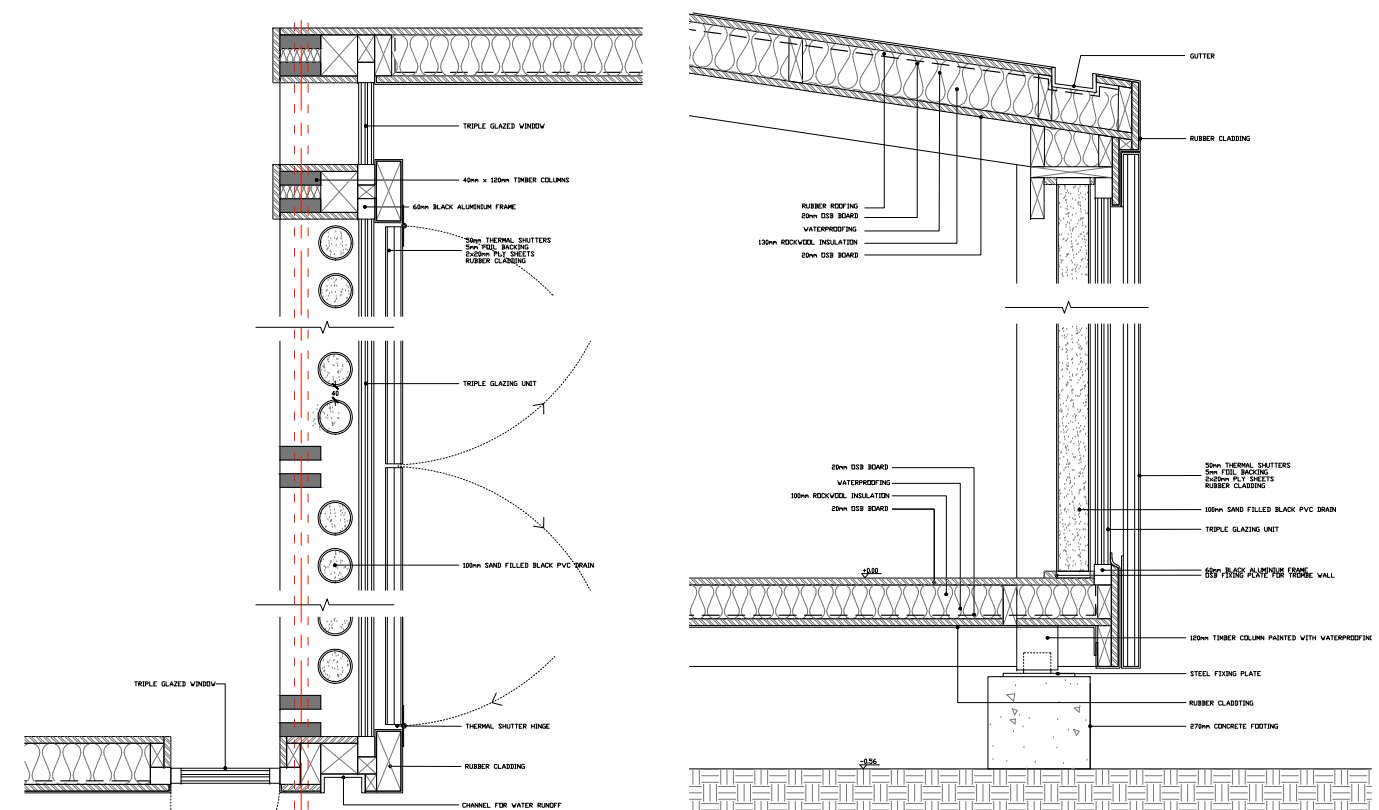
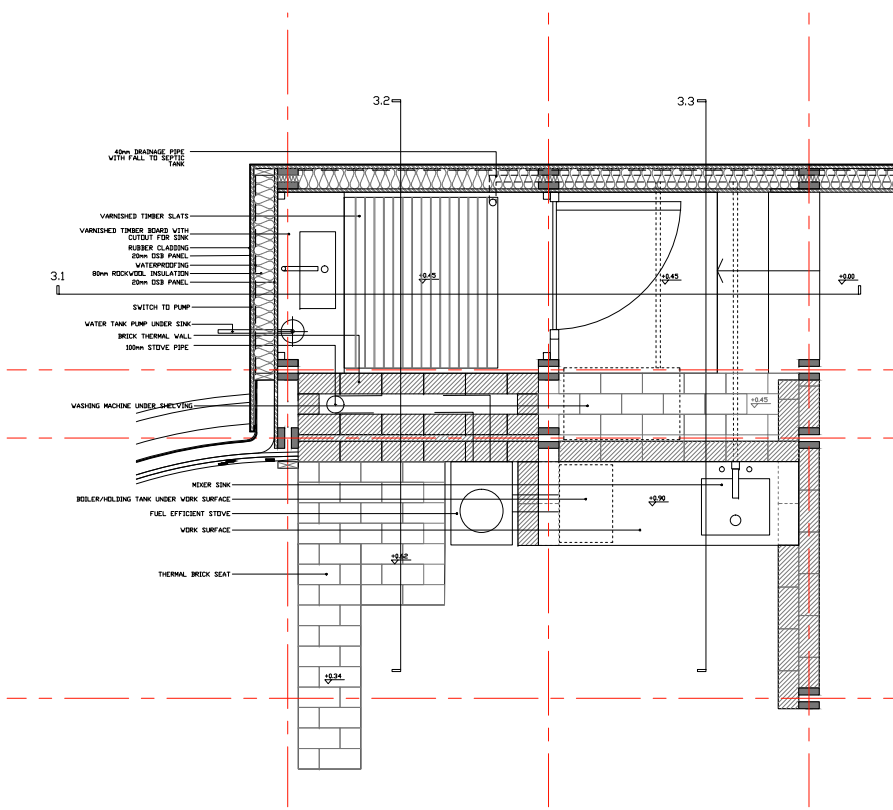


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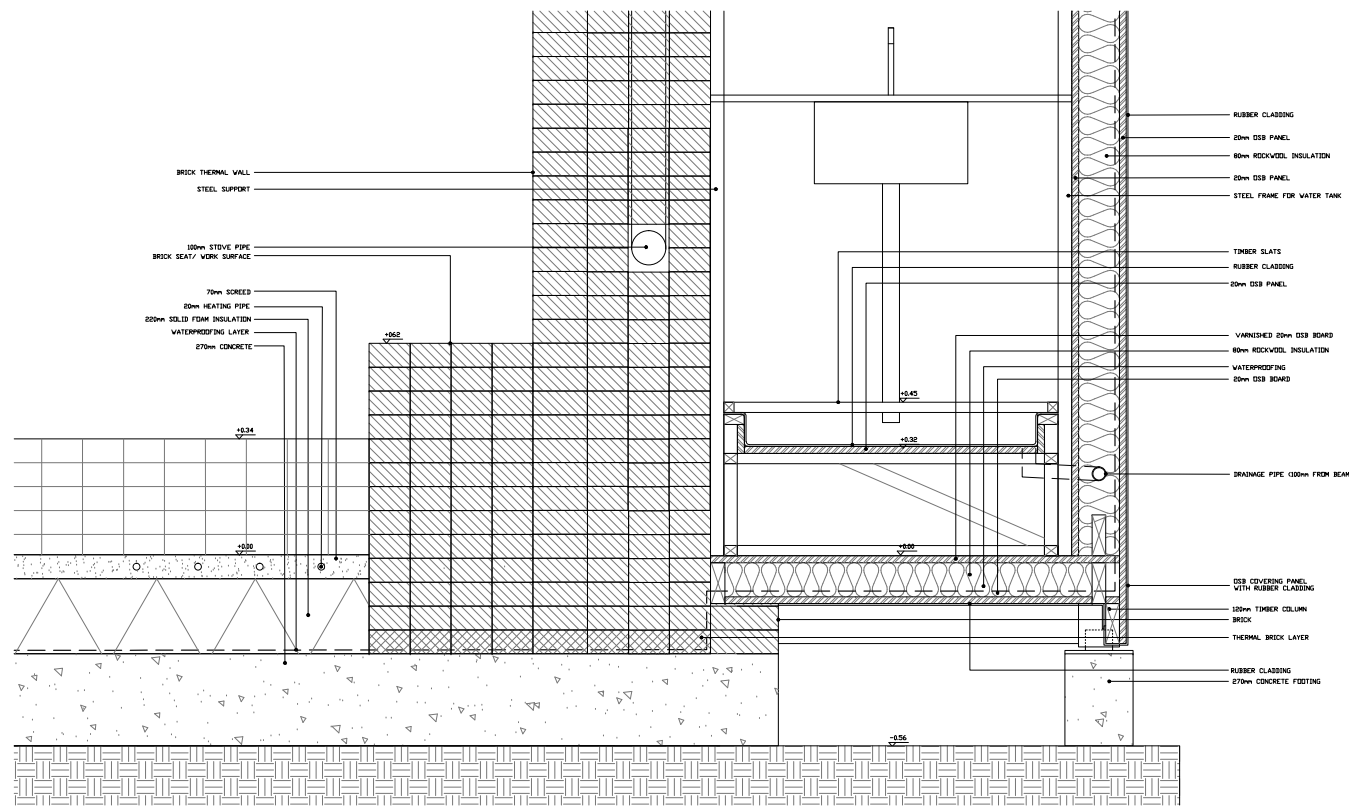
NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bolchover jbarch@hku.hk	PROJECT: GER PLUG-IN	DATE: 31-03-2017	ORIENTATION: LANDSCAPE
		DRAWING: SECTION B	SCALE: 1:50 @A3	NUMBER: A2.02

NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bolchover jbarch@hku.hk	PROJECT: GER PLUG-IN	DATE: 31-03-2017	ORIENTATION: LANDSCAPE
		DRAWING: SECTION C	SCALE: 1:50 @A3	NUMBER: A2.03



NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bolchover jbarch@hku.hk	PROJECT: GER PLUG-IN	DATE: 31.03.2017	ORIENTATION: LANDSCAPE
		DRAWING: DETAIL 3.1	SCALE: AS SHOWN	NUMBER: A4.03

NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bolchover jbarch@hku.hk	PROJECT: GER PLUG-IN	DATE: 31.03.2017	ORIENTATION: LANDSCAPE
		DRAWING: DETAIL 2	SCALE: AS SHOWN	NUMBER: A4.02



SECTION
1:10 @ A3

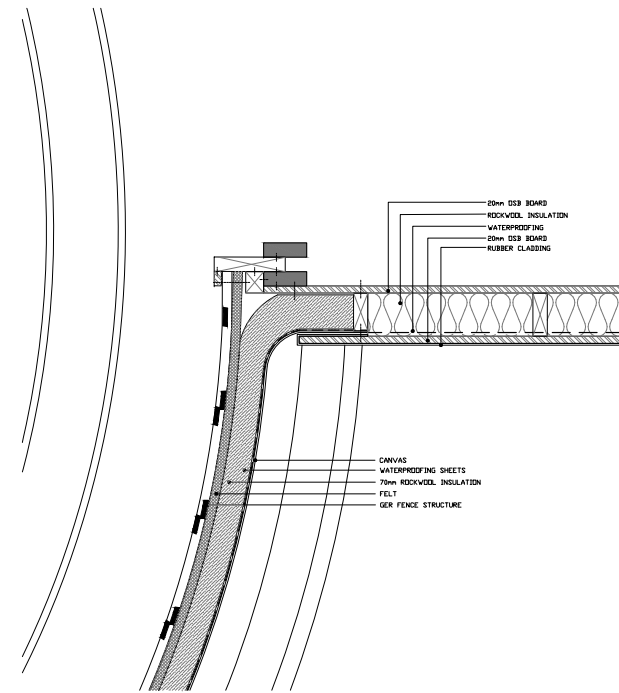
NOTES: DESIGN INTENT ONLY

CONTACT:
Joshua Bolchover
jbarch@hku.hk

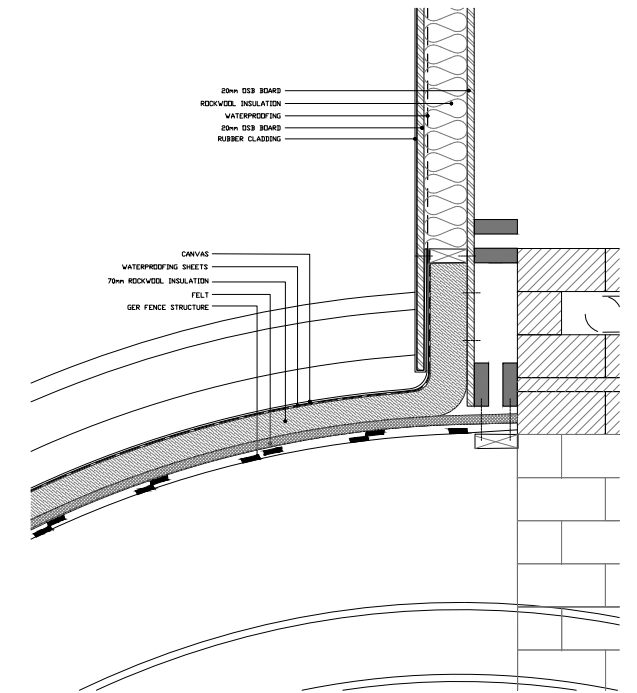
PROJECT:
GER PLUG-IN
DRAWING:
DETAIL 3.3

DATE: 31.03.2017
SCALE: AS SHOWN

ORIENTATION:
LANDSCAPE
NUMBER: A4.04



DETAIL 5A - PLAN
1:10 @ A3



DETAIL 5B - PLAN
1:10 @ A3

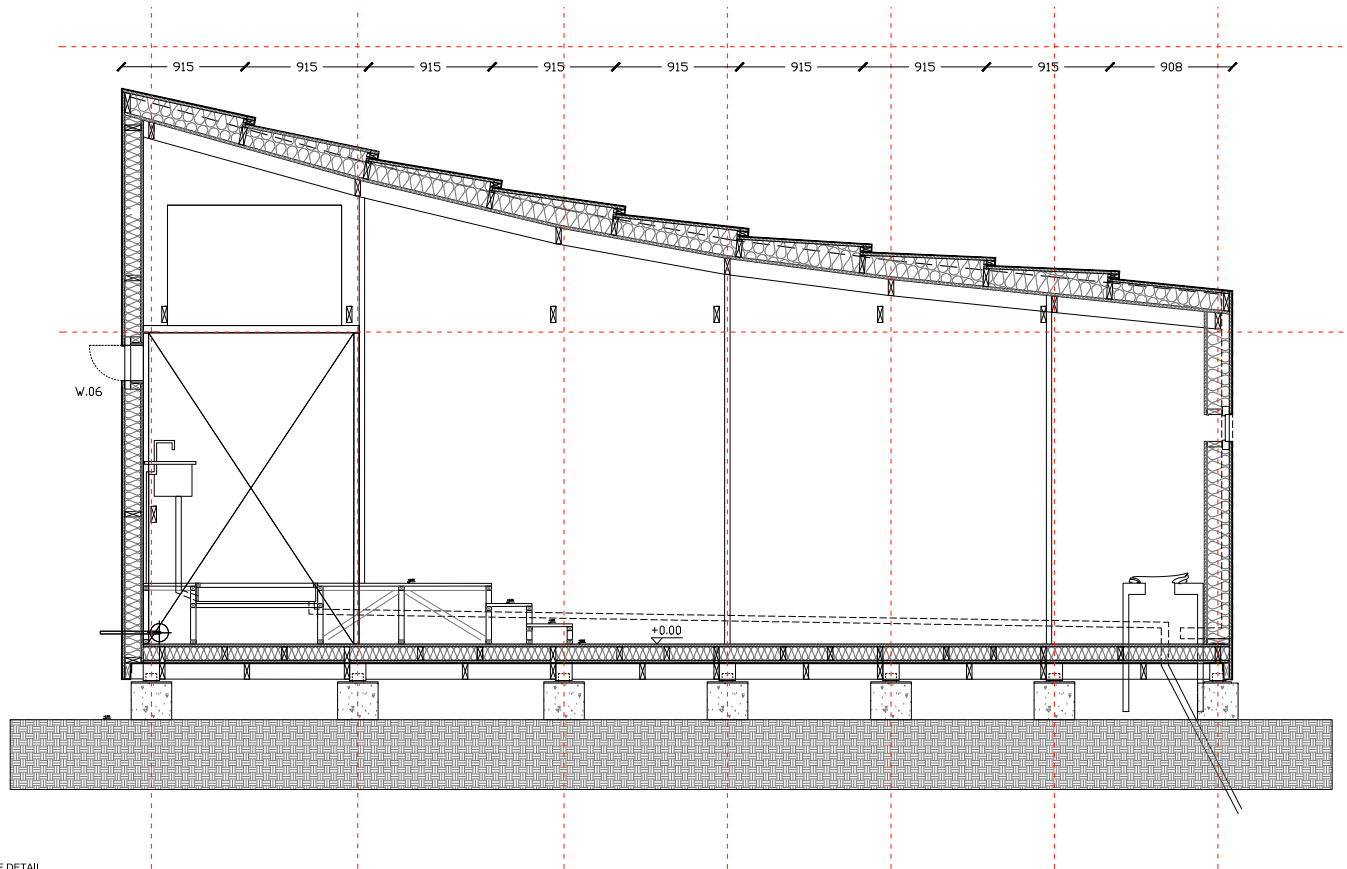
NOTES: DESIGN INTENT ONLY

CONTACT:
Joshua Bolchover
jbarch@hku.hk

PROJECT:
GER PLUG-IN
DRAWING:
DETAIL 5 - GER AND PLUG-IN CONNECTION

DATE: 31.03.2017
SCALE: AS SHOWN

ORIENTATION:
LANDSCAPE
NUMBER: A4.06



ROOF DETAIL
1:25 @ A3

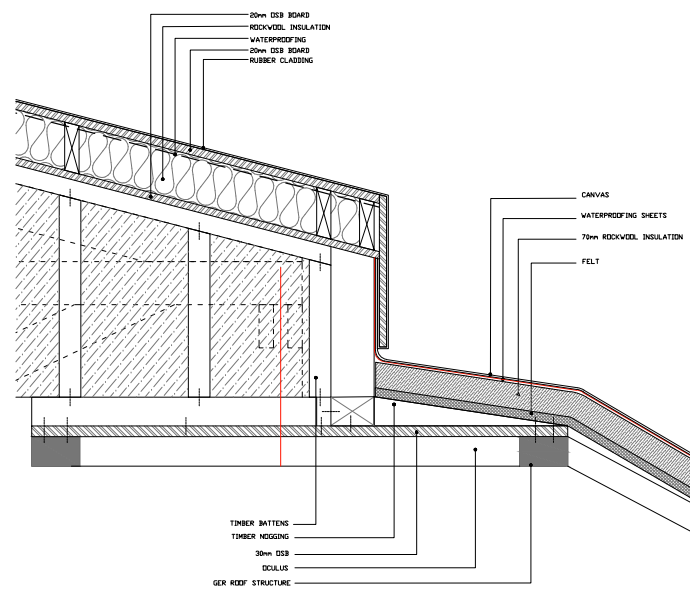
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CONTACT:
Joshua Bolchover
jbarch@hku.hk

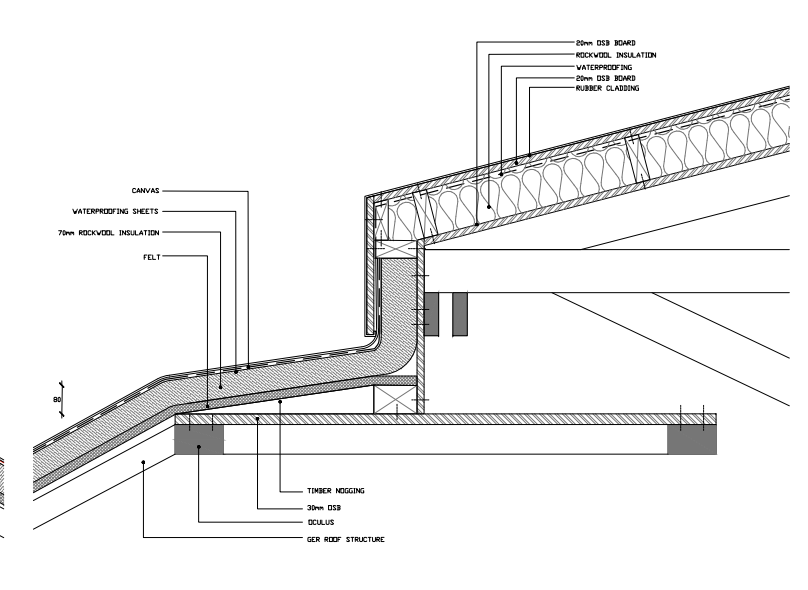
PROJECT:
GER PLUG-IN
DRAWING:
ROOF CLADDING DETAIL

DATE: 31.03.2017
SCALE: AS SHOWN

ORIENTATION:
LANDSCAPE
NUMBER: A7.01



SECTION 6.1 - THROUGH TIMBER OCULUS SUPPORT
1:10 @ A3



SECTION 6.2 - OF TIMBER OCULUS SUPPORT ON TOP OF OCULUS
1:10 @ A3

NOTES: DESIGN INTENT ONLY

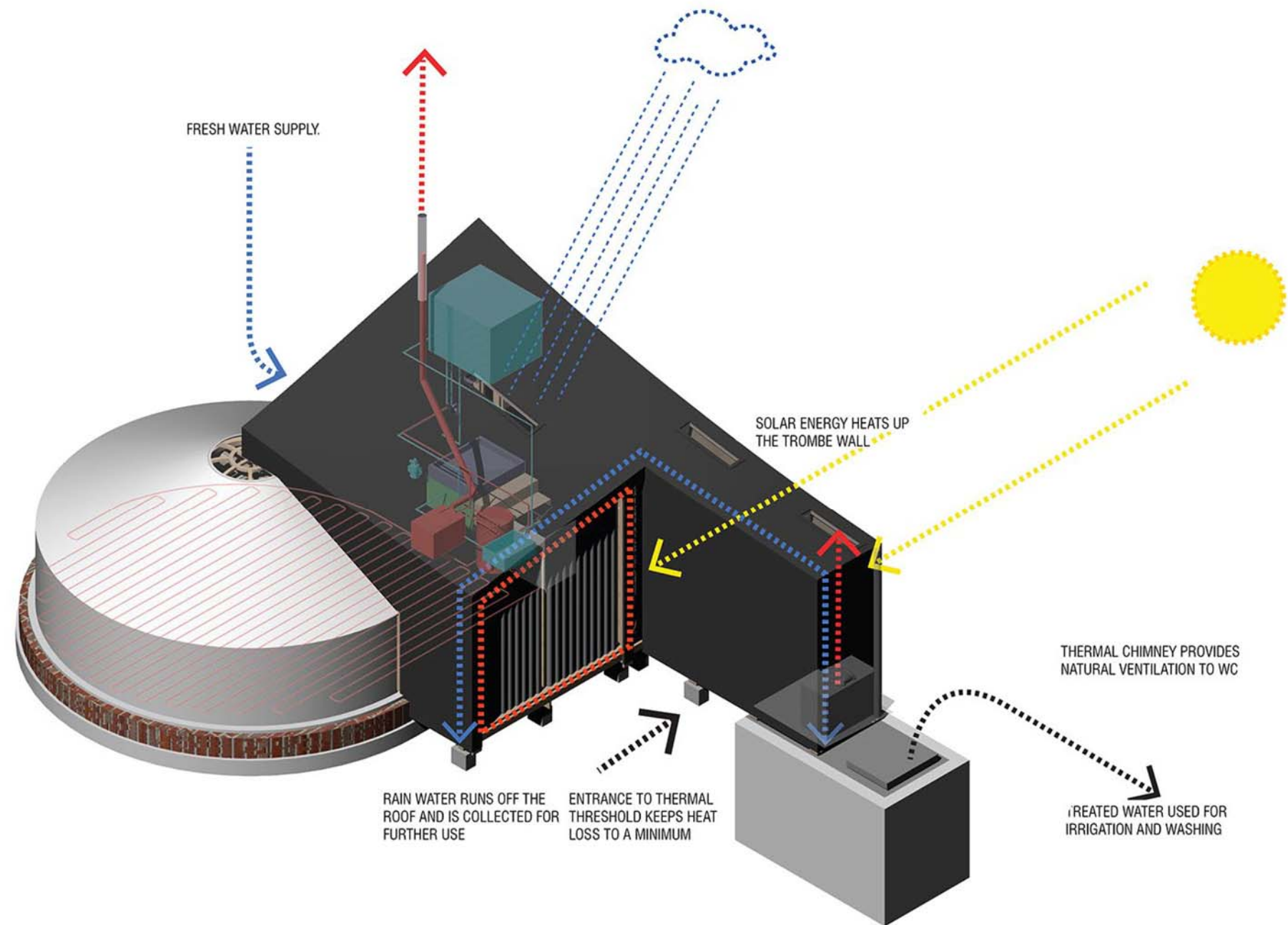
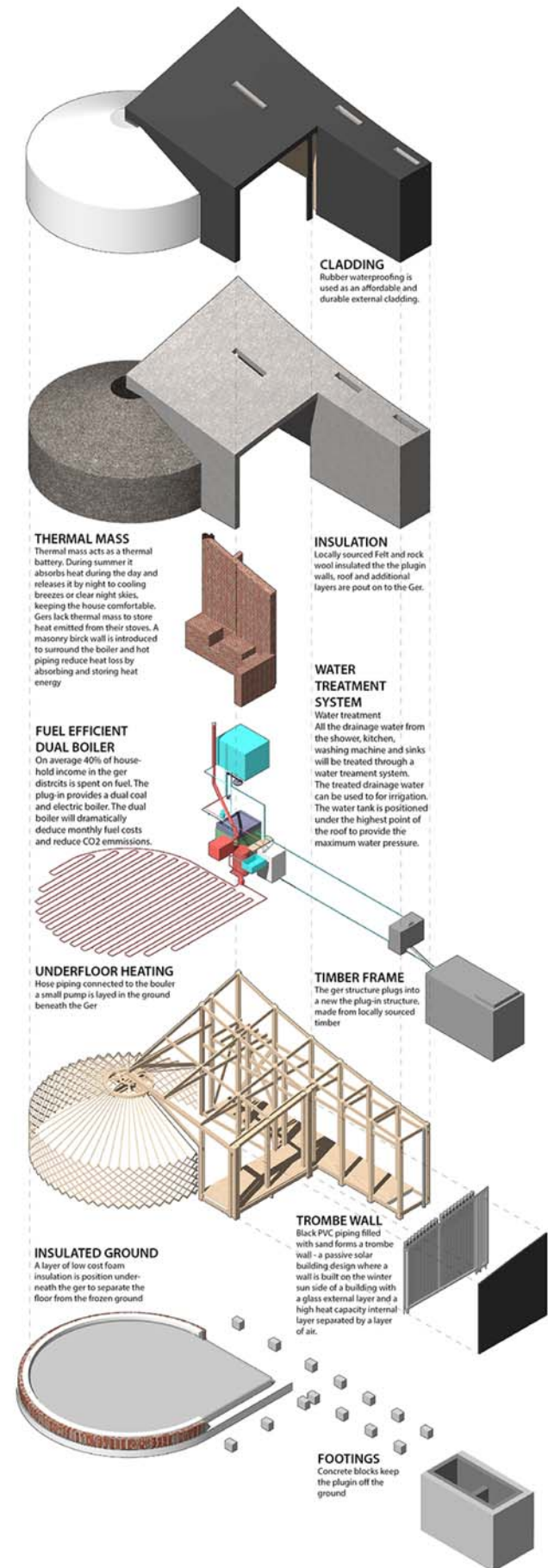
CONTACT:
Joshua Bolchover
jbarch@hku.hk

PROJECT:
GER PLUG-IN
DRAWING:
DETAIL 6 - OCULUS

DATE: 31.03.2017
SCALE: AS SHOWN

ORIENTATION:
LANDSCAPE
NUMBER: A4.08

Systems Diagram



Advantages

- The plug-in allows the couple to use electricity to heat their home. They don't have to use coal.
- They use electricity for radiators, underfloor heating, and heating water for the shower. The electrical costs were 174,380 MNT per month on average for the winter (2017/18).
- The temperature is more stable throughout the day and stays warm for longer periods.
- The couple do not have to go to the bathhouse. They take three showers a week in winter, and everyday during summer.
- They also share the shower with other families in the district.
- During the harsh winter they no longer have to leave the house to access the toilet.
- Instead of having to walk 30 minutes to collect water every day the residents have access to a 1 ton water tank which is filled by a truck once every 10-14 days.

Environmental Specifications

Wall and ger insulation:	120mm Rockwool
Tonoo (oculus):	Custom double glazing
Windows:	Double glazing with thermal shutters
Septic Tank:	150L multiple compartment treatment system that removes ammonia
Heating System:	2 radiators and underfloor heating pipes
Hybrid Stove:	Cooper OVK-10 mark low-pressure heating furnace. High fuel-efficient fuel heating furnace with combined electrical and fuel system.
Thermal mass:	Cavity brick wall around stovepipe, concrete slab.

Consumption Data

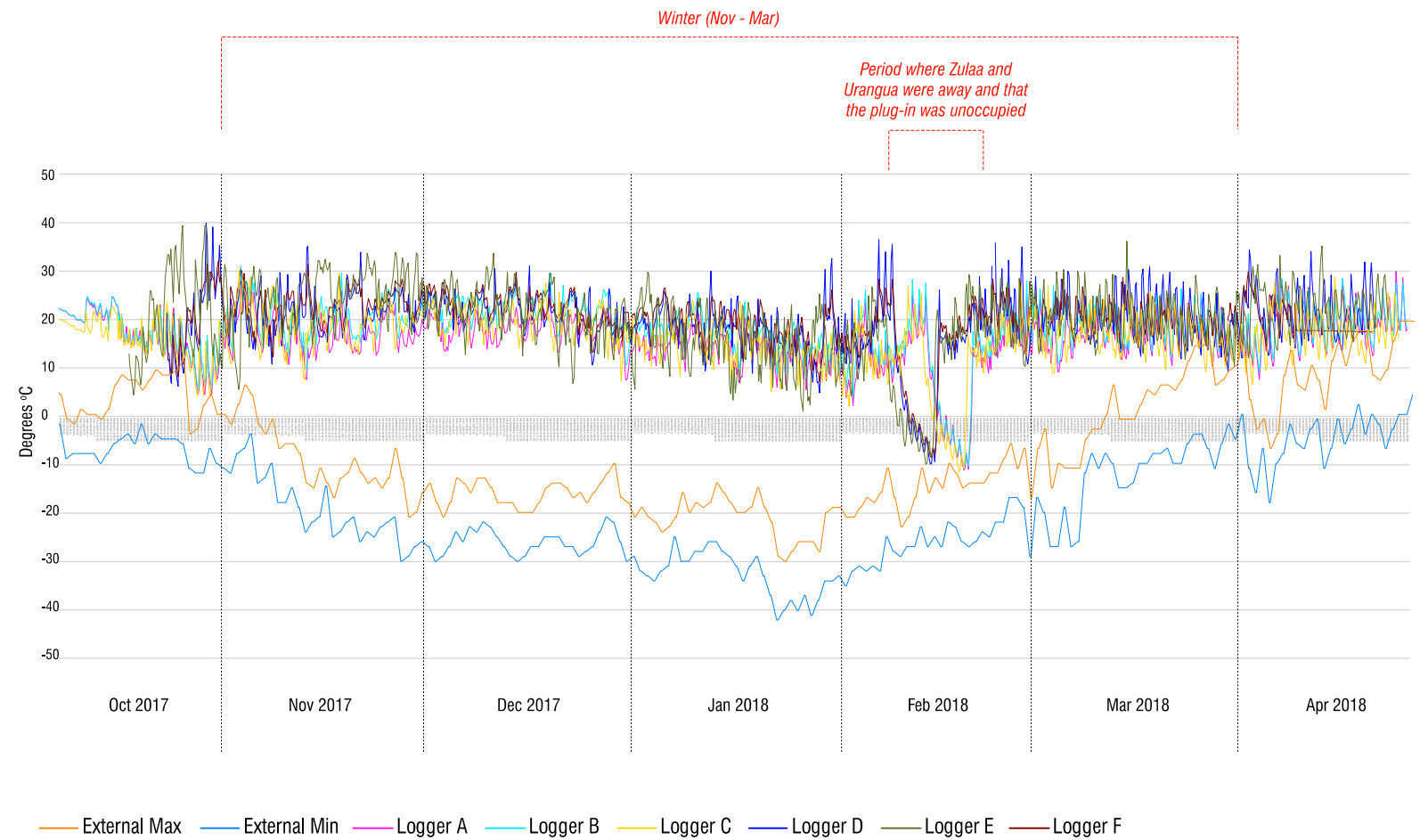
- 92.8% reduction in coal/ fuel purchase.

Info	Traditional Ger	Before Plug-in	Ger Plug-in
Electricity Costs	Cost (MNT)	Cost (MNT)	Cost (MNT)
Nov-17			79,900
Dec-17			183,000
Jan-18			280,000
Feb-18			240,000
Mar-18			89,000
Apr-18			30,000
Average per month	26,000		174,380
Coal Consumption	Cost (MNT)	Cost (MNT)	Cost (MNT)
November - March	800,000	700,000	50,000
Water Consumption			
	500L/ week	280L/ week	1,000L/10 days
Showers			
			3/week winter Everyday summer

Family Size 2 adults, 3 children 2 adults 2 adults

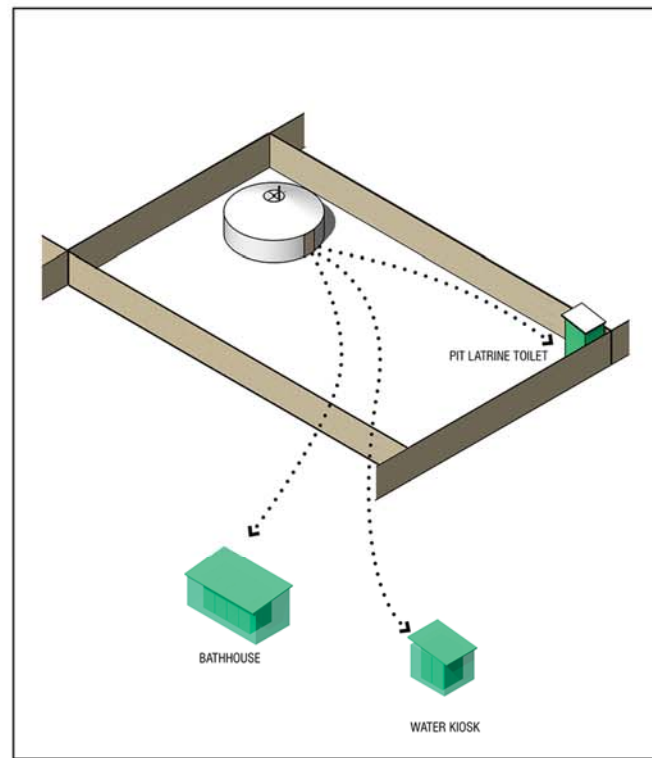
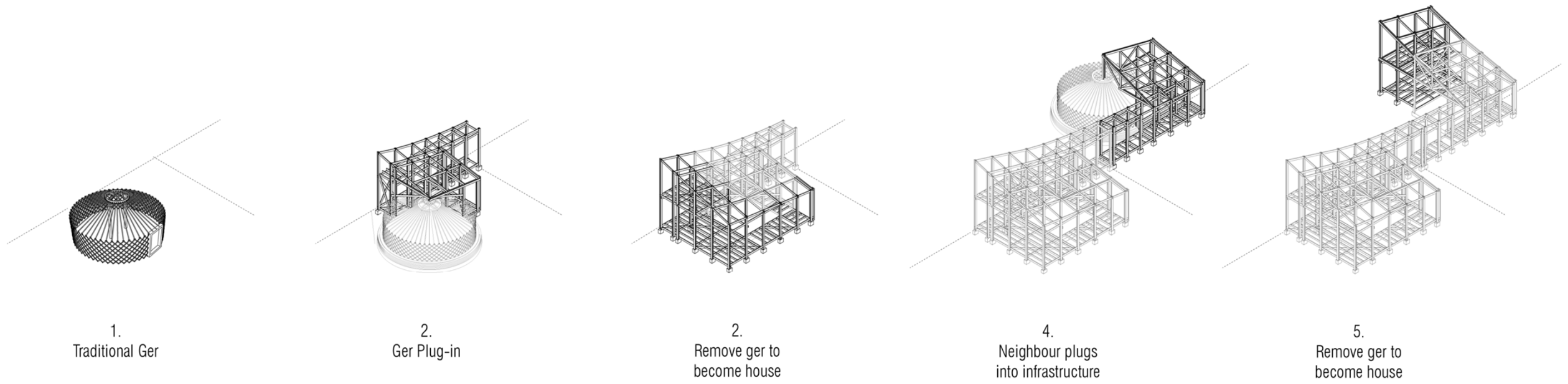
Climate Data

Ger Plug-In Temperature Logger Data
(Oct 2017 - Apr 2018)

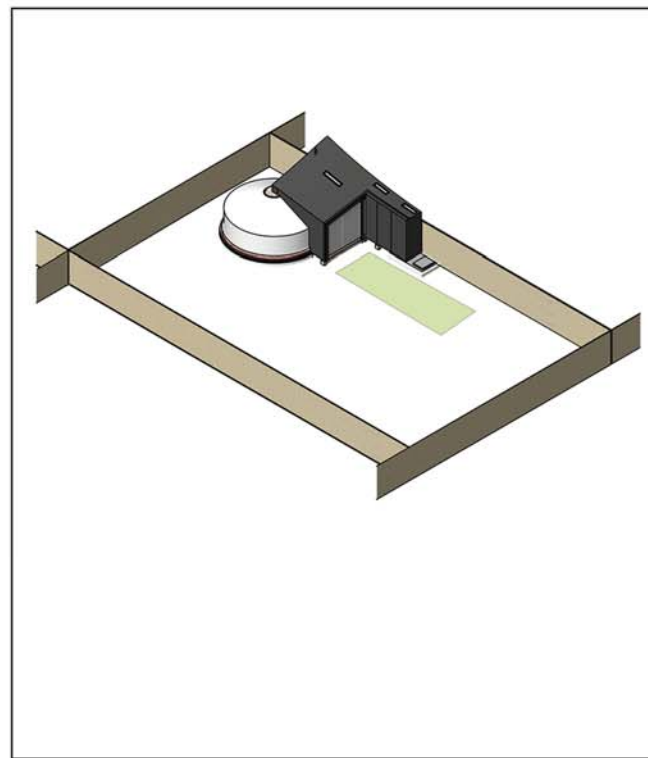


- From Oct 2017 to Dec 2017, when the external temperature was between -9.9°C and -19.8°C. The Plug-in was 2.48°C warmer than that of a traditional ger.
- The average daily temperature fluctuation is a traditional ger is 10.2°C, whereas it is only 4.1°C in the Plug-in.
- There was a period when the Plug-in was unoccupied during February 2018 (external temperatures average between -12.5°C and -23.4°C). Heat loss occurred in the threshold by the door (Logger E) primarily, then at the glazed area (Logger D) and the brick cavity wall (Logger F). Overall, it took five days for all parts of the interior to reach negative temperatures.
- Once the heating is switched off, the Plug-in remains at comfort level (above 15°C) for up to 12 hours.

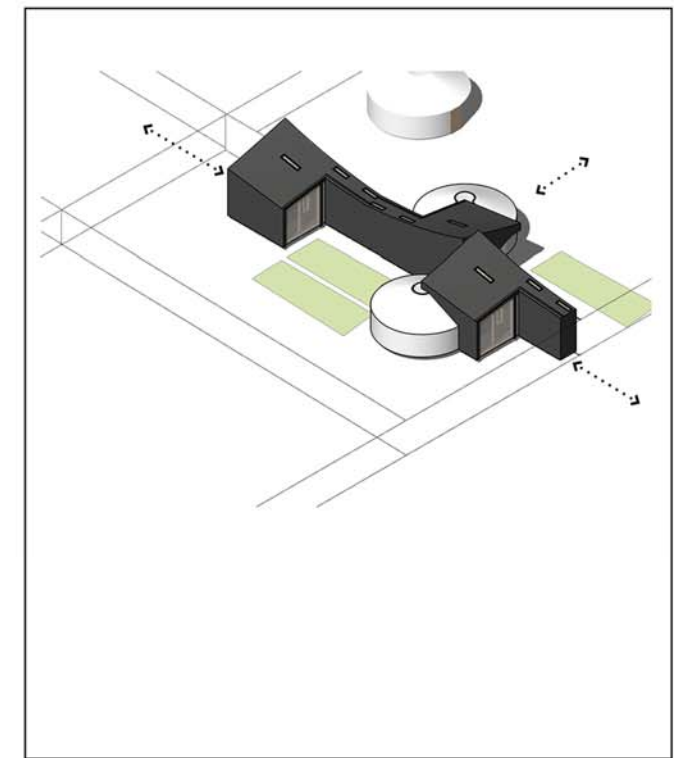
Adaptation



CURRENT CONTEXT



GER PLUG-IN



INSIDE-OUT URBANISM







Ger Innovation Hub



Location

Songino-Khairkhan 31, Ulaanbaatar

Issues

Community infrastructure, energy

Programme

Community space that offers crèche, after-school club, performance space and educational workshops for talks and vocational training.

Stakeholders

Government
Ger residents
NGOs

Description

The Ger districts of Mongolia desperately lack civic and community infrastructure. As the majority of this population has no prior experience of living among others — there is no word for ‘community’ in Mongolian - it’s a unique and urgent situation. Working with local NGO, Ger Hub, the aim is to create a new district focal point to enable residents to strengthen their own community.

The building will provide: a space for workshops and events; a reading area; computer stations and children’s play area. It will be a place for all sections of the community supporting: a crèche for the very young; after school and youth facilities; vocational training; and a place for screenings, performances or community meetings. Over time it can include small cooperative enterprises and demonstrate how an entire plot can be used to engage community needs.

Our starting point is the uniqueness of the ger as a structural and material system of wood, felt and canvas. Designed as a layered structure, the inner room is surrounded by an outer layer of polycarbonate, creating a buffer space that traps radiant heat in the winter. This reduces energy consumption and serves as a model for the district to reduce coal use, which contributes to levels of air pollution in the city that are some of the worst in the world.

Construction work began when teams of students joined forces with local workers and local NGOs and residents to assemble the trusses and raise the timber structure. In just two weeks the team engaged with local people to learn about their issues and hardships and were confronted with the constraints and difficulties of construction. Working collaboratively, the team lifted the structure in place and the entire structure will be completed by Spring 2019.

DESIGN: Joshua Bolchover and John Lin (Rural Urban Framework, The University of Hong Kong)

PROJECT DETAILS:

Size: 172 m² (Inner layer 83m²)

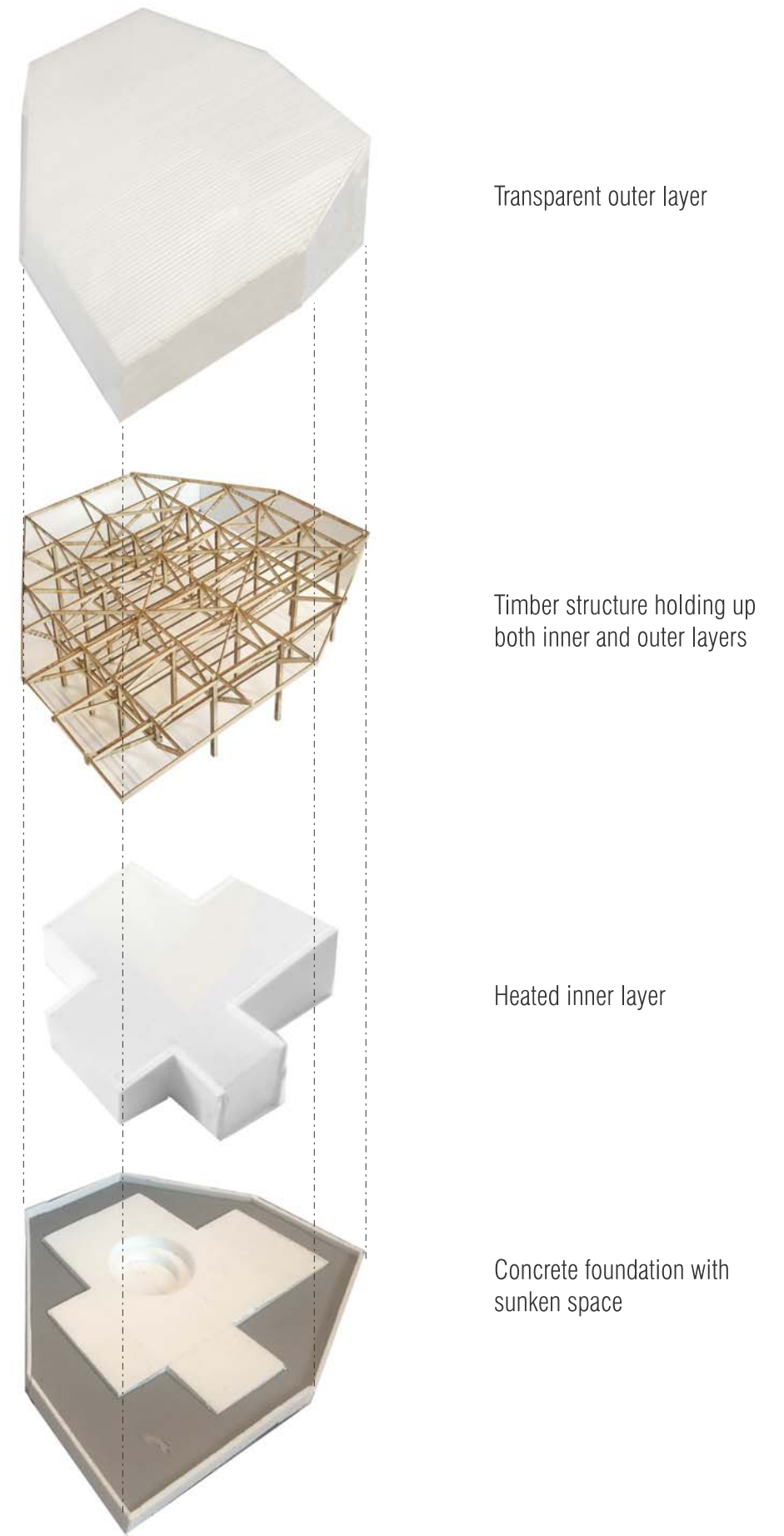
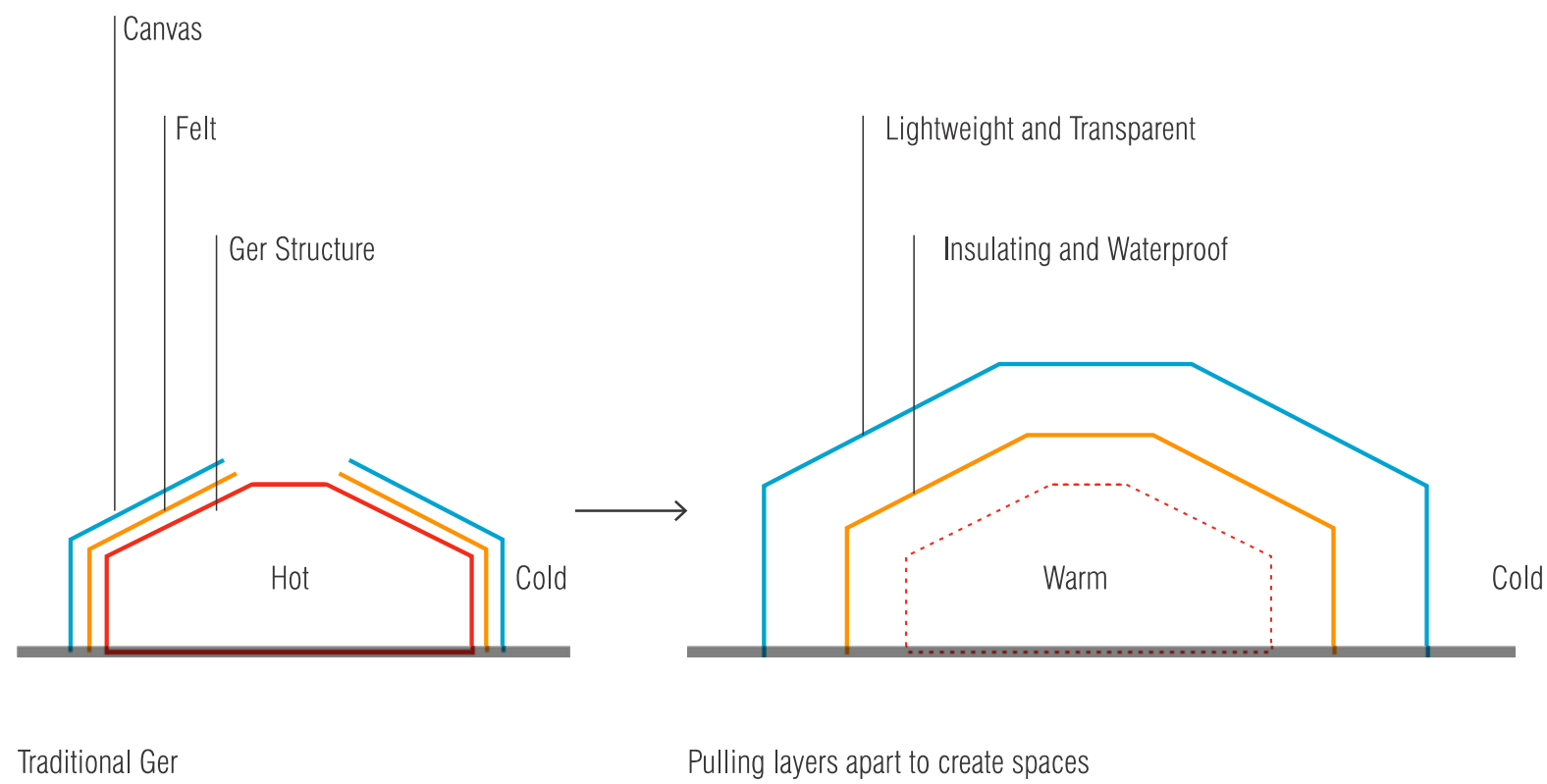
Construction Start: June 2018

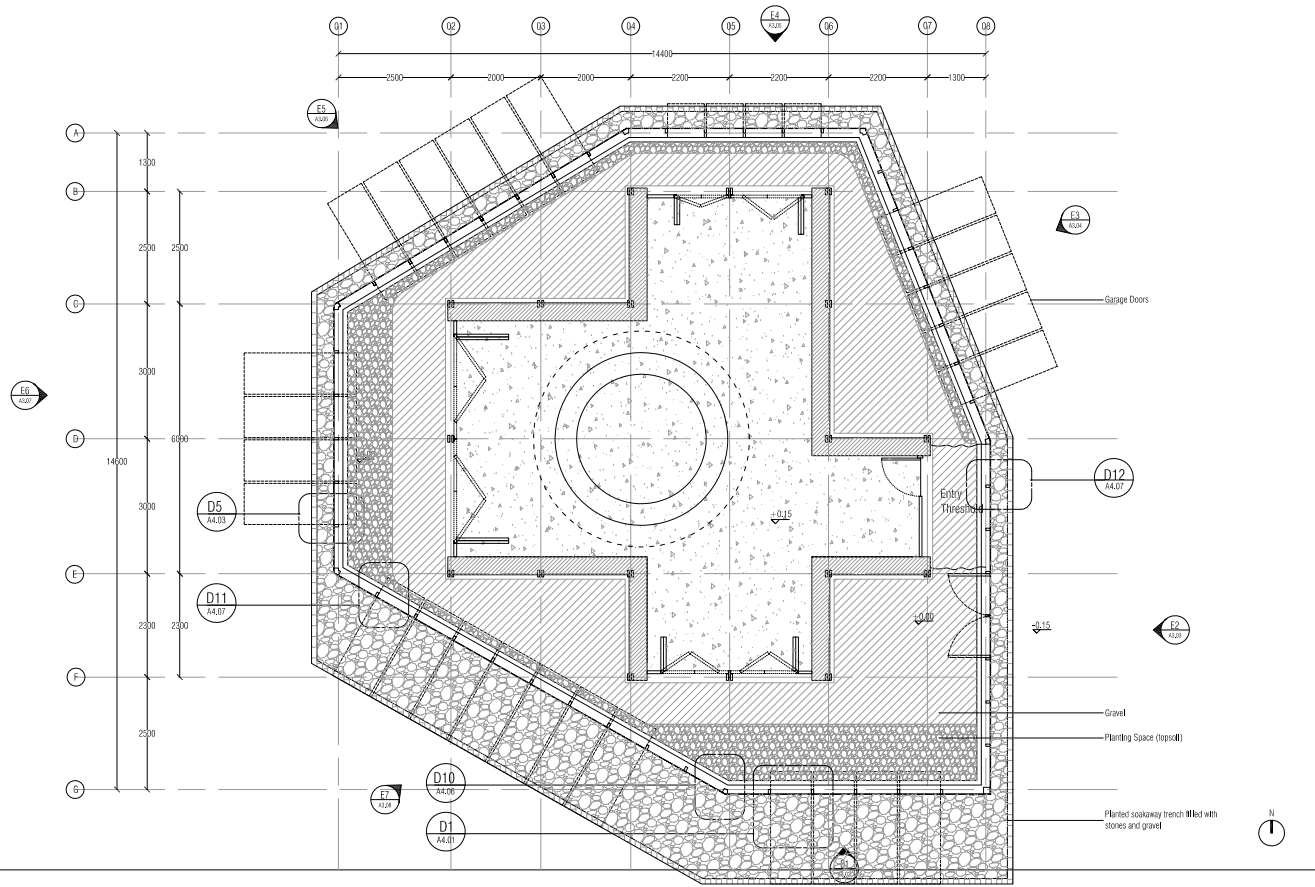
Expected Completion: Summer 2019

CLIENT: GerHub

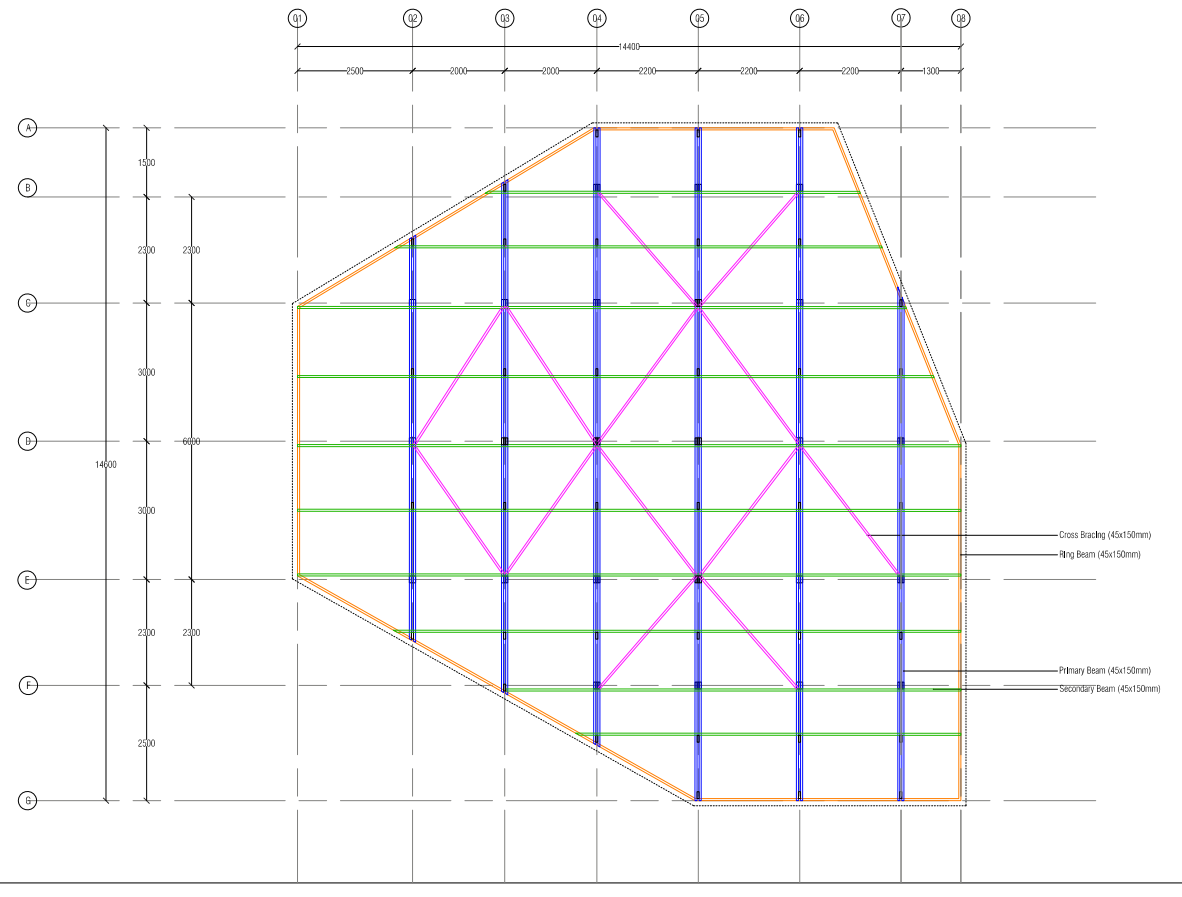
COLLABORATORS: EcoTown, Shonest

FUNDING (Phase 1 and 2, student workshop): The Hong Kong Jockey Club Charities Trust

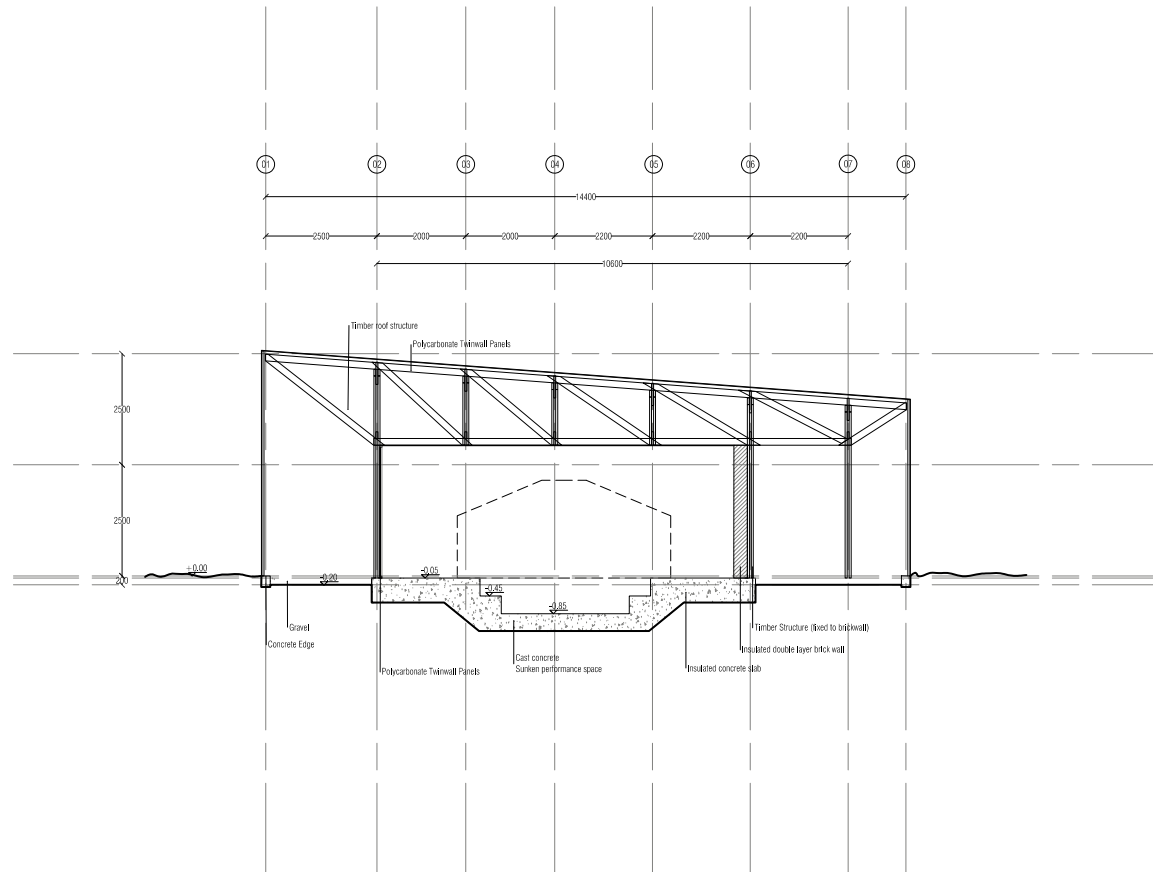




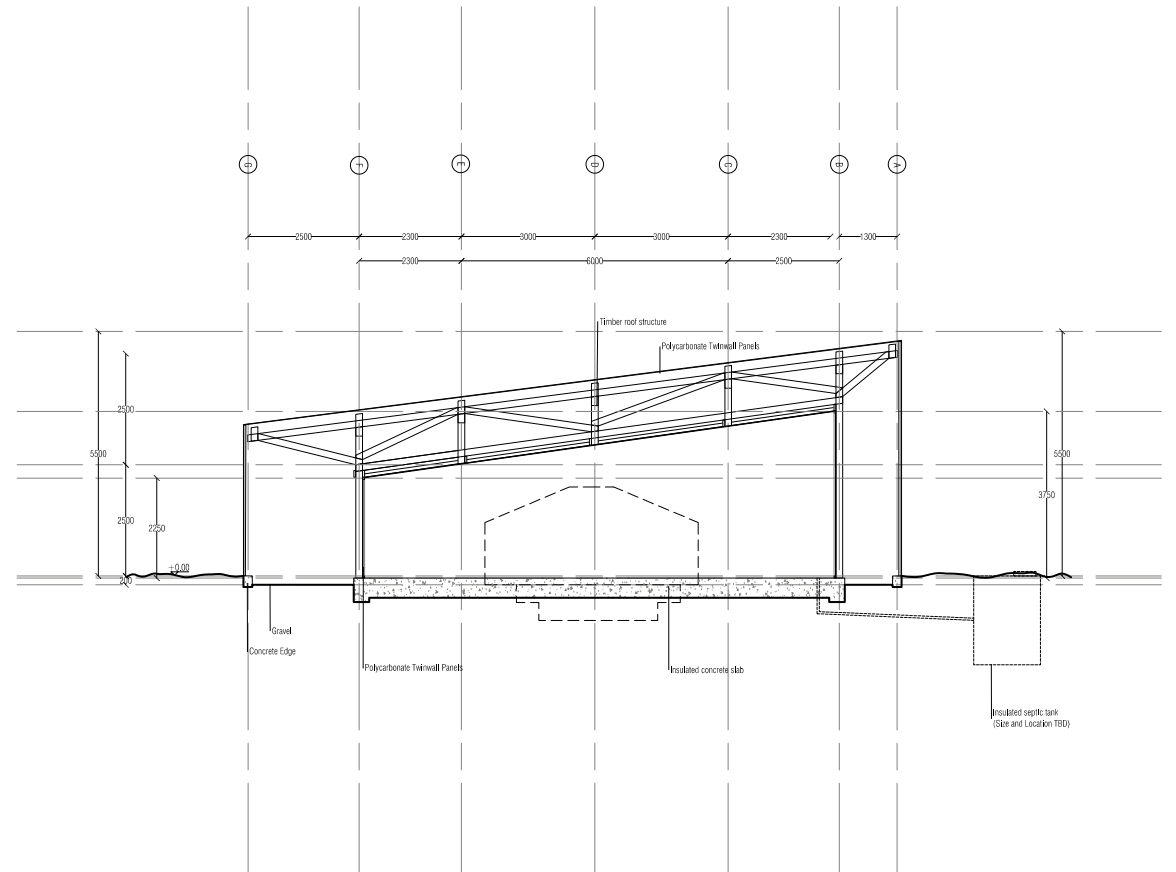
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	John Lin johnl@nu.kz	DRAWING: PLAN	SCALE: 1:75@A3	NUMBER: A1.01



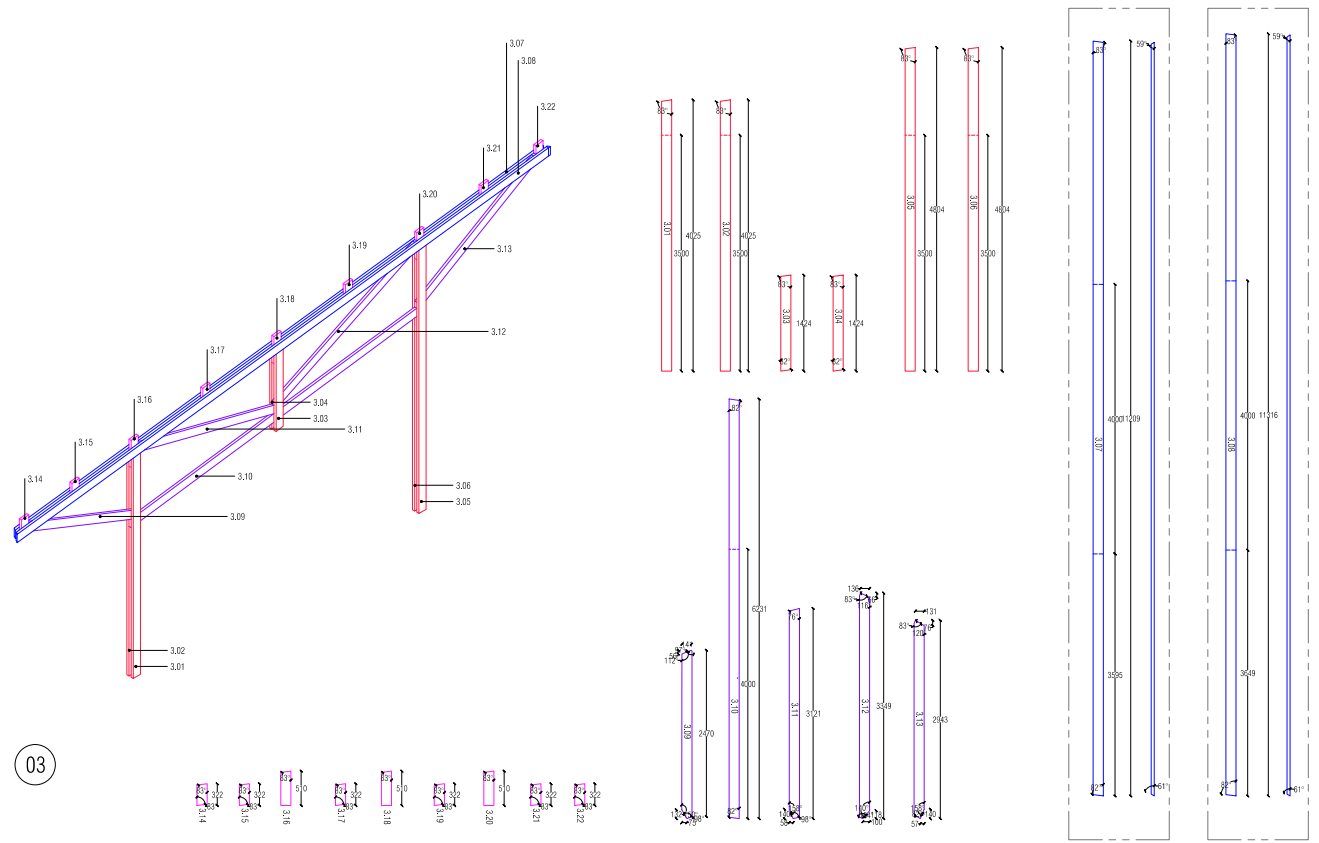
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	John Lin johnl@nu.kz	DRAWING: ROOF PLAN (MAIN STRUCTURE)	SCALE: 1:75@A3	NUMBER: A1.04



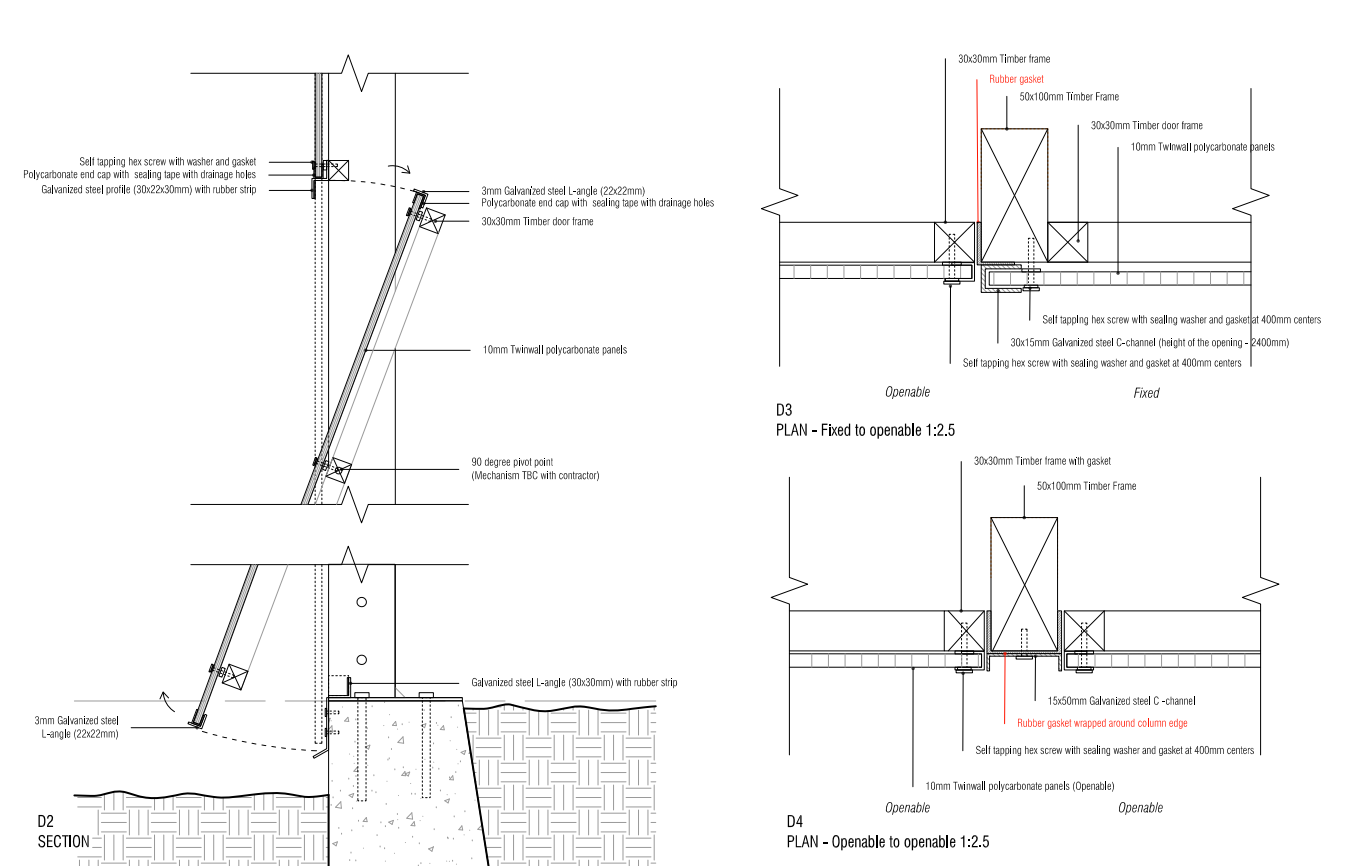
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	John Lin johnl@nu.kz	DRAWING: SECTION A	SCALE: 1:75@A3	NUMBER: A2.01



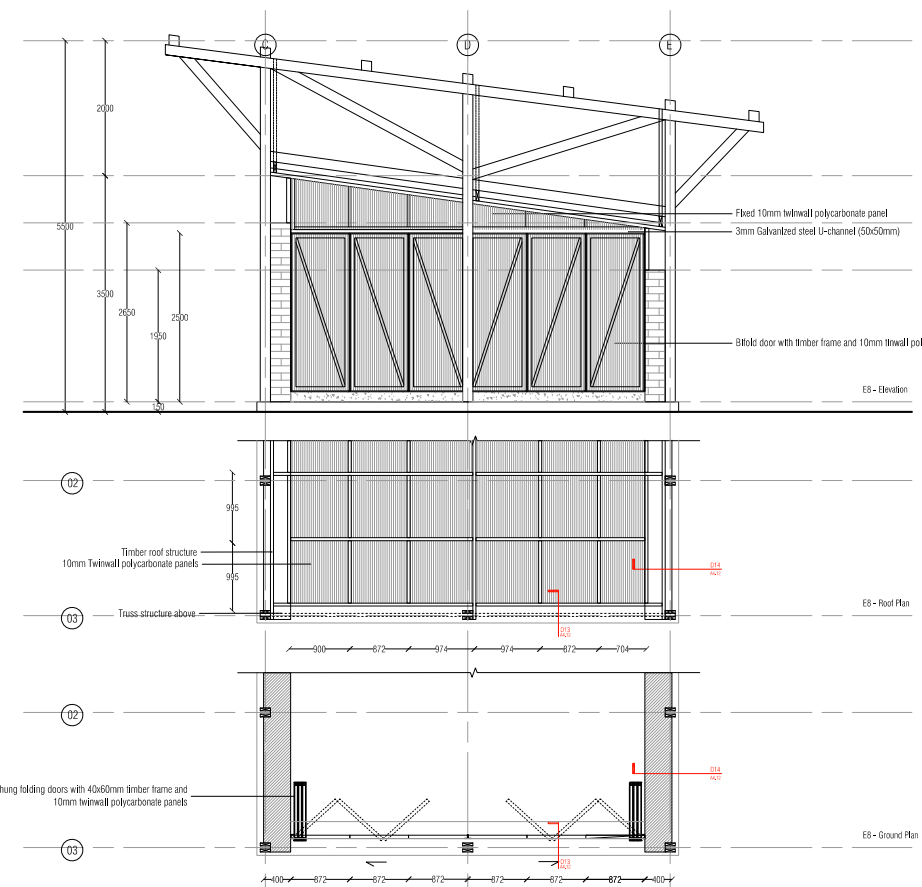
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	John Lin johnl@nu.kz	DRAWING: SECTION B	SCALE: 1:75@A3	NUMBER: A2.01



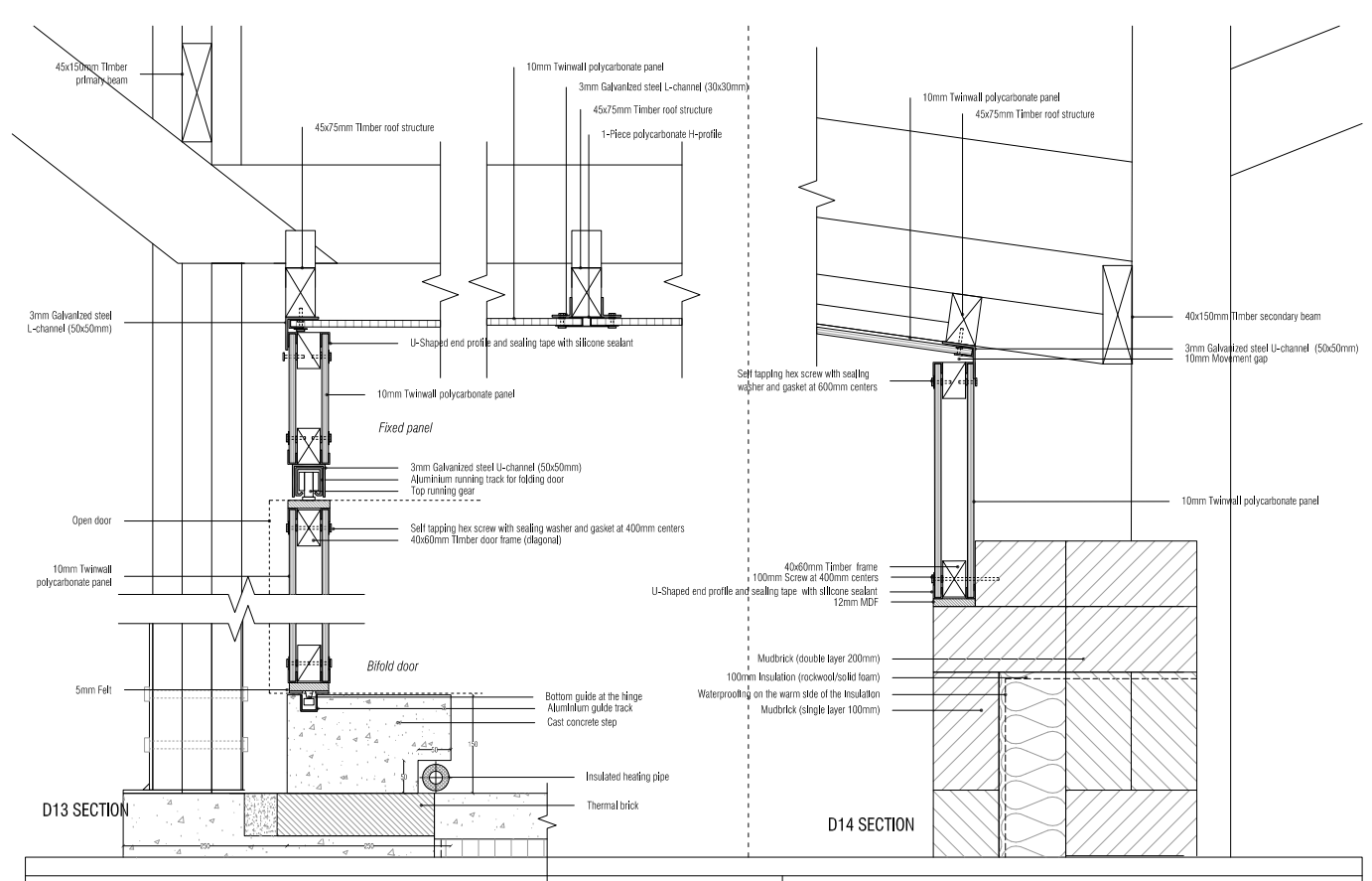
NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bokor jbokeh@kuu.zk	PROJECT: GER INNOVATION HUB	DATE: 07.06.2018	ORIENTATION: LANDSCAPE
	John Lin jolin@kuu.zk	DRAWING: TRUSS 03 CUTSHEET	SCALE: 1:50@A3	NUMBER: A6.02



NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bokor jbokeh@kuu.zk	PROJECT: GER INNOVATION HUB	DATE: 06.09.2018	ORIENTATION: LANDSCAPE
	John Lin jolin@kuu.zk	DRAWING: Outer Layer Openings (D2/D3/D4)	SCALE: 1:5@A3	NUMBER: A4.02



NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bokor jbokeh@kuu.zk	PROJECT: GER INNOVATION HUB	DATE: 28.11.2018	ORIENTATION: LANDSCAPE
	John Lin jolin@kuu.zk	DRAWING: E8 - Inner Layer Elevation	SCALE: 1:50@A3	NUMBER: A4.03



NOTES: DESIGN INTENT ONLY	CONTACT: Joshua Bokor jbokeh@kuu.zk	PROJECT: GER INNOVATION HUB	DATE: 28.11.2018	ORIENTATION: LANDSCAPE
	John Lin jolin@kuu.zk	DRAWING: Inner Layer Roof (D13/D14)	SCALE: 1:5@A3	NUMBER: A4.11





PHASE 3 - INCREMENTAL STRATEGIC MASTERPLAN

The prototypes developed in phase two will be modified and composed into an incremental strategic master plan. The results provided in Phase 1 and Phase 2 have evidenced the need for an alternative development strategy for the ger districts that could be initiated by the residents themselves. The strategic plan incorporates scenarios that are developed based on the three different types of urban fabric as observed in our initial analysis. Key concepts of the scenarios are to: find ways to densify and provide affordable housing; create off grid infrastructural networks; create mechanisms for future growth and incremental upgrades; engage residents in forms of shared infrastructure; create feedback loops of investment encouraging future stages of development; create neighborhood funds for community investment; seek financial mechanisms to provide residents with access to lower income loans based on improved environmental performance. Three scenarios were developed based on the three typologies of ger districts. The densest districts involve a scenario for an infrastructural spine, the mid density a scenario for infrastructural nodes and the least dense fringe districts, a scenario to extend and expand the Plug-In.

The scenarios were presented to numerous potential stakeholders including members of international investors; local banks, development agencies and NGOs. This feedback led us to further develop the scenario into an implementation plan and recommendations for next steps.

Recommendations included the creation of a Development Toolkit. This will act as a guide for ger district upgrading by the residents themselves made affordable by unlocking multiple ways to access low interest mortgage products. This would radically shift the policy for ger district redevelopment both within the government and by funding agencies such as the Asian Development Bank. If taken up as a model for upgrading it has the potential to impact thousands of people in the ger districts.

3A | INCREMENTAL SCENARIOS

AIMS

Innovate incremental scenarios for upgrading the ger districts.

METHODOLOGY

Testing incremental strategies using video to demonstrate change over time. One focused on a plot scale and the other a building scale.

Develop upgrading strategies that address different situations that can be seen across the ger districts - urban, mid, and fringe districts.

Map out development trajectory and transformation over time on selected sample sites.

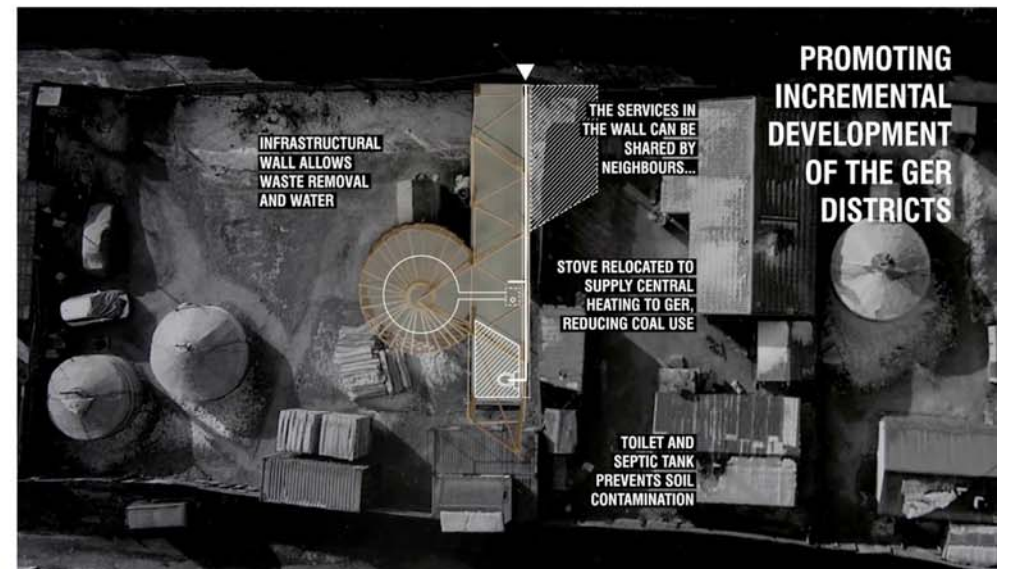
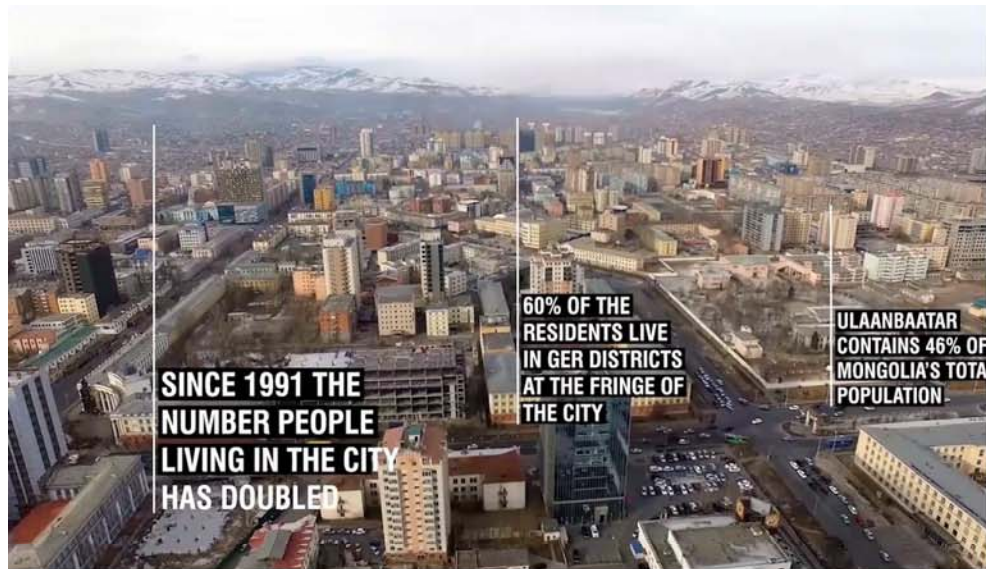
RESULTS

Three scenarios (Infrastructural Spine, Infrastructural Node, and Plug-in) were proposed. Each is specific to a certain formation of the ger districts, for example the Infrastructural Spine is located in the mid/central areas where there is an established grid. The spatial analysis from Phase 2 informed how we approached each typological condition of ger district.

The scenarios come together to become a master plan strategy for the ger districts that reacts as well as anticipates urban sprawl and rural-urban migration.

The incremental master plan is a bottom up approach that seeds change within the ger districts through three types of scenarios which all tackle the relationship between housing and infrastructure.

For infrastructure to be affordable and effective, the master plan proposes models where residents share their resources - whether it is land, finance, or access to implemented infrastructure. Districts have to become denser and community ties stronger so that they can become more economically independent and can drive the improvements that they want.



UPGRADING STRATEGIES - SCENARIO A: INFRASTRUCTURAL SPINE

Location: Mid/Central gers/ established grid

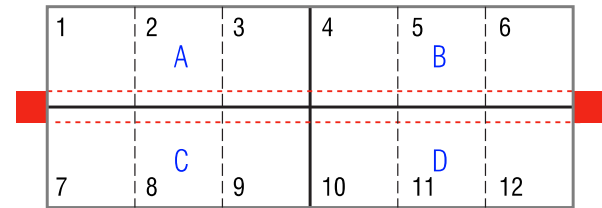
STEP

TRANSFORMATION

1. Four families agree to invest in a septic tank and water tank. These components are connected together using an above-ground infrastructural spine. This spine is made from a series of prefabricated concrete sections which can be removed or replaced with another module. There are different spine modules according to how other programs and components plug into this spine.

The funding could be managed through a bank loan that accesses the preferential rates offered by the Green Climate Fund to reduce carbon emissions.

2. The four families operate as a management company and seek new tenants to rent land within the plots. The access to infrastructure means that the land is more attractive than other plots. The rental income is used to pay back the loan and maintain the infrastructure.

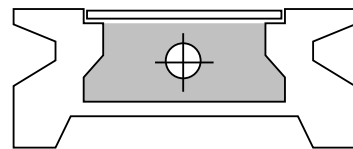


← SLOPE

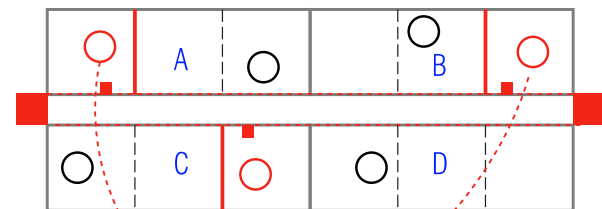
Components: Septic Tank
Water Tank
Infrastructural Connector

Built for capacity = 12 Families
= 50 People

Cost + Size =
Funding: Loan
Payback Time:

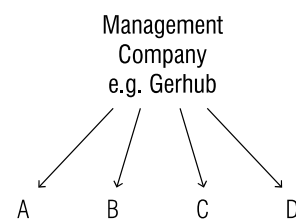


Investment Cost:
Return:
Population:



- Maintenance Cost

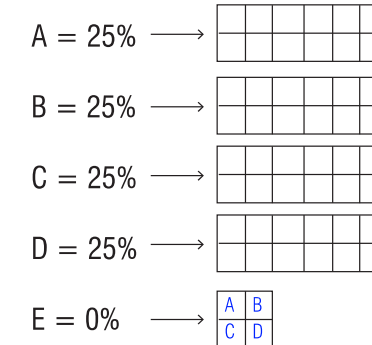
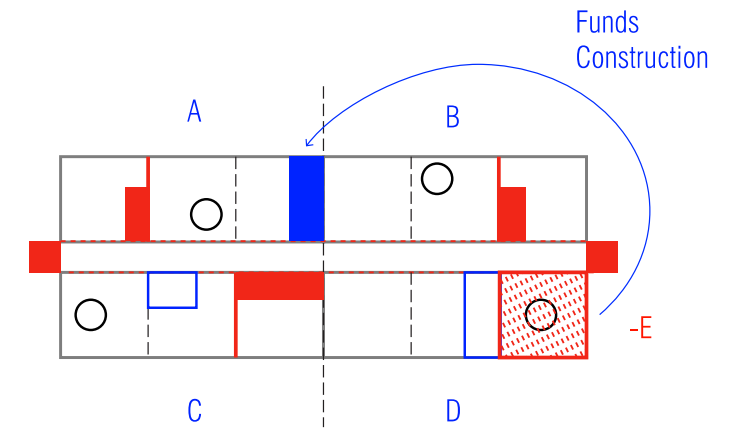
New tenants pay rent to the company.
A,B,C,D split money evenly.



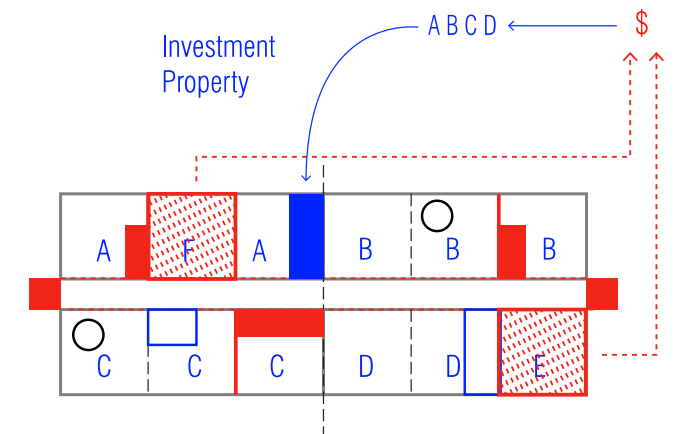
STEP

TRANSFORMATION

3. Over time the original owners decide to raise capital to invest in an apartment building. They can do this in two ways. Either through re-mortgaging their land or by selling off a piece of their land to another stakeholder. If another stakeholder joins they will become part of the shareholder group based on the % of land they have bought. For example: if the plots are subdivided into 12 sections and 2 are sold, original owners ABCD become 21% stakeholders while new owners become 8% stakeholders each. In this way the original stakeholders maintain majority ownership.



STRUCTURE PRINCIPLE
Main stakeholders/Original
landowners maintain majority
ownership.



A = 2.5/12	5/24	= 21%
B = 2.5/12	5/24	= 21%
C = 2.5/12	5/24	= 21%
D = 2.5/12	5/24	= 21%
E = 1/12	2/24	= 8%
F = 1/12	2/24	= 8%

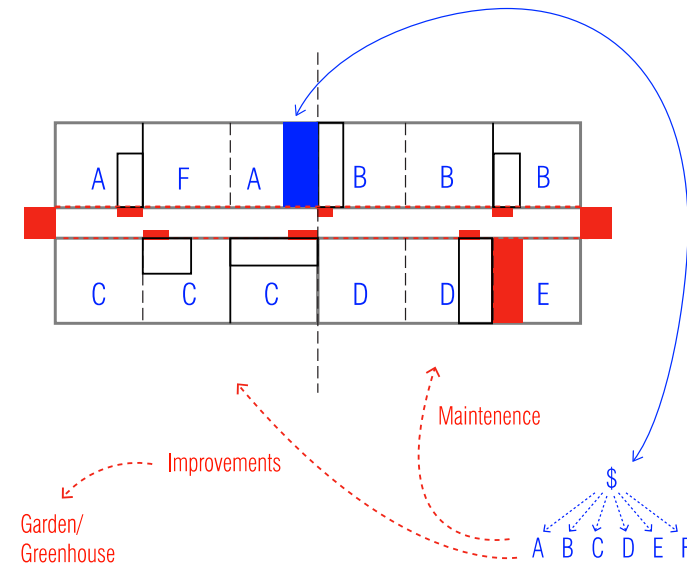
UPGRADING STRATEGIES - SCENARIO A: INFRASTRUCTURAL SPINE

Location: Mid/Central gers/ established grid

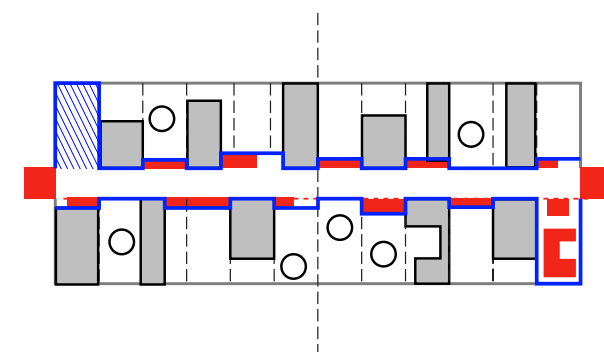
STEP

TRANSFORMATION

4. When new houses are built each plugs into the original infrastructural spine. Each property has to meet regulative controls on environmental provision including insulation, and reduction of coal usage. The income generated through rent or from selling apartments will be pooled back to the collective which will siphon off a proportion for maintenance, a proportion to a community improvement fund and a proportion of profit distributed proportionately to each stakeholder.



5. The improvement fund could be used for renewable energy, greenhouses, community centres, kindergartens, playgrounds or whatever the stakeholders decide is necessary. These improvements will increase the value of land and rental returns which further can feed into increased profits and the community fund.



IMPROVEMENTS

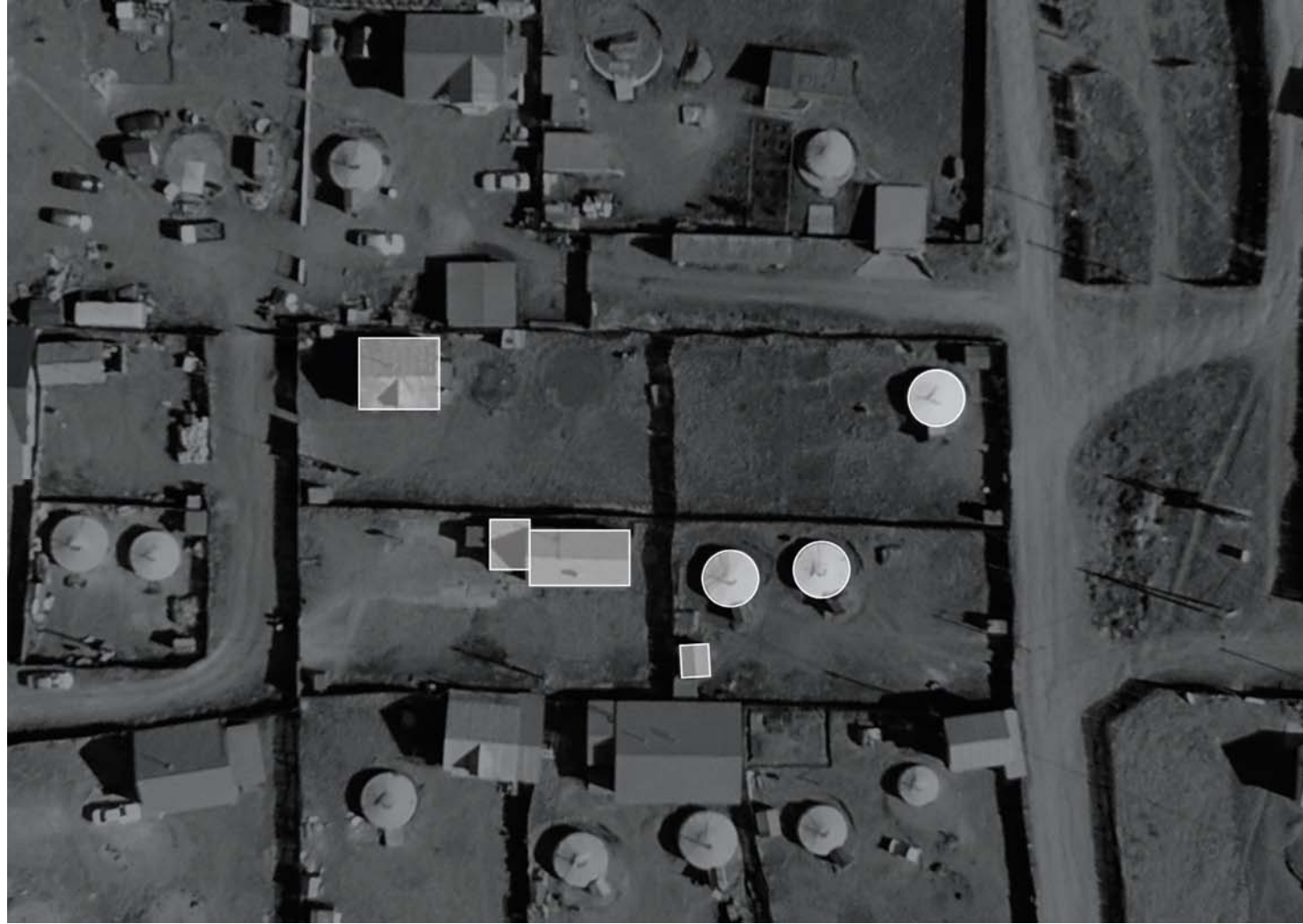
Solar
Radiant Water Heaters
CHP
Air Filters
Playgrounds/ Creche

COMMERCIAL PROGRAMS

Shops
Office
Workshop
Restaurants

DEVELOPMENT TRAJECTORY - SCENARIO A: INFRASTRUCTURAL SPINE

Location: Mid/Central gers/ established grid



PHASE 1 - CURRENT

Plots: 4

Households: 4

People: 16.8

No. of households connected to infrastructure: 0

No. of community facilities: 0



PHASE 2 - SHORT TERM

Plots: 6

Households: 7

People: 29.4

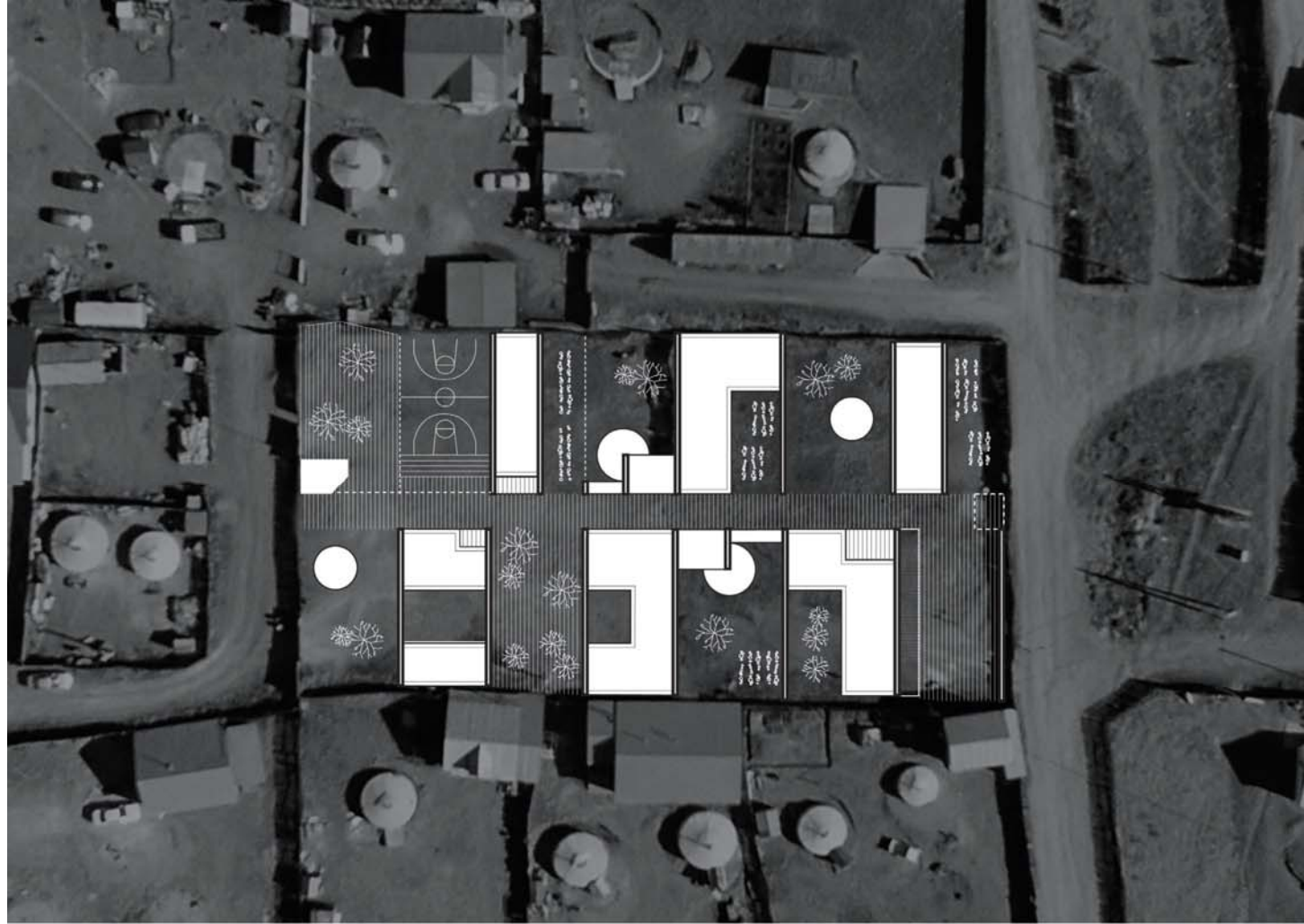
Percentage increase of population: 75%

No. of households connected to infrastructure: 6

No. of community facilities: 0

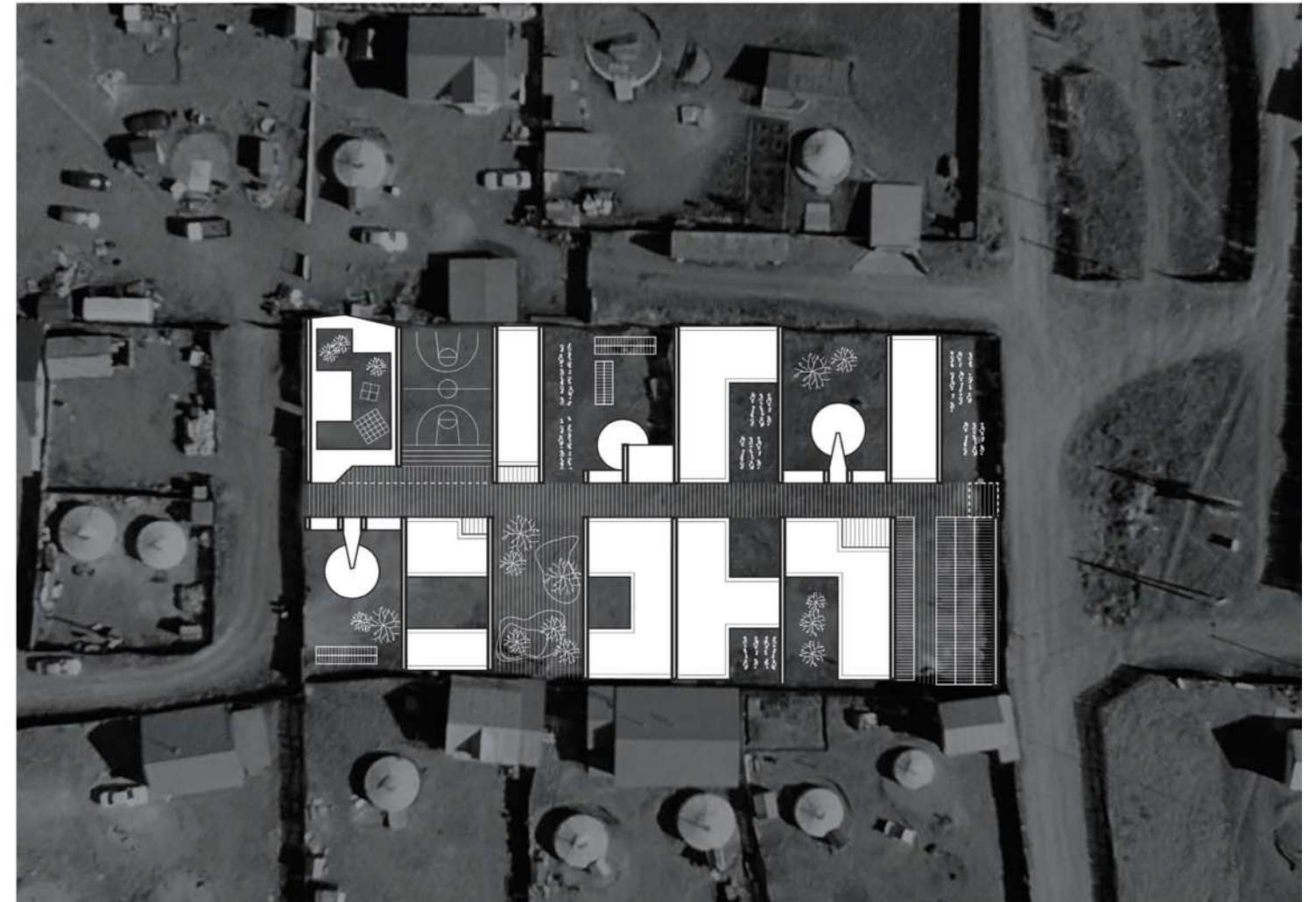
UPGRADING STRATEGIES - SCENARIO A: INFRASTRUCTURAL SPINE

Location: Mid/Central gers/ established grid



PHASE 3 - MID TERM

Plots: 14
Households: 9
People: 37.8
Percentage increase of population: 28.6%
No. of households connected to infrastructure: 8
No. of community facilities: 2 (e.g. Community hub, shops)



PHASE 4 - LONG TERM

Plots: 14
Households: 10
People: 42
Percentage increase of population: 11.1%
No. of households connected to infrastructure: 10
No. of community facilities: 4 (e.g. Community hub, shops, waste collection point, greenhouses)

Total percentage of population increase from Phase 1: 150%

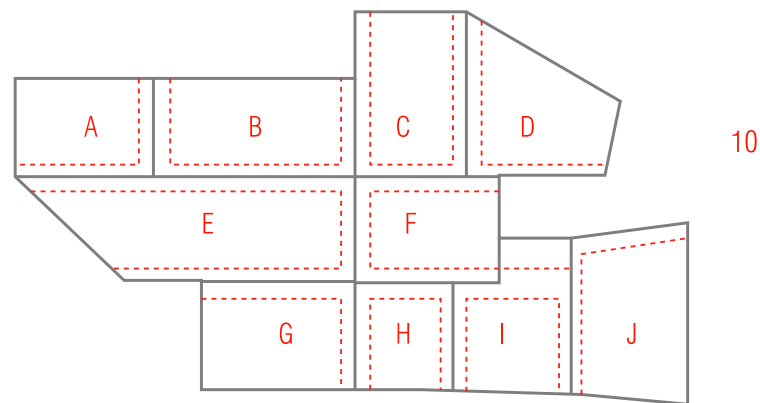
UPGRADING STRATEGIES - SCENARIO B: INFRASTRUCTURAL NODE

Location: Mid ger/ Patch

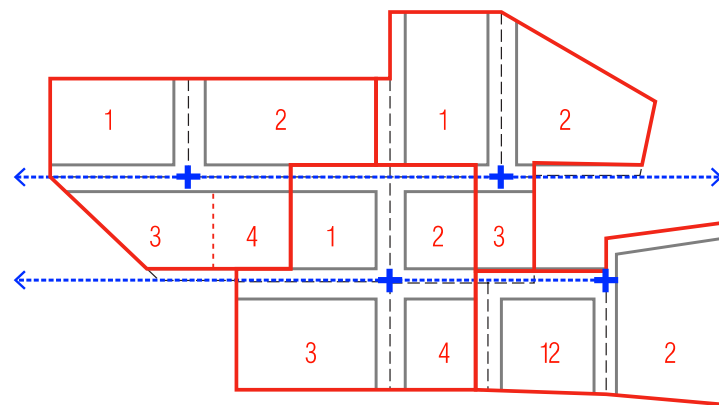
STEP

TRANSFORMATION

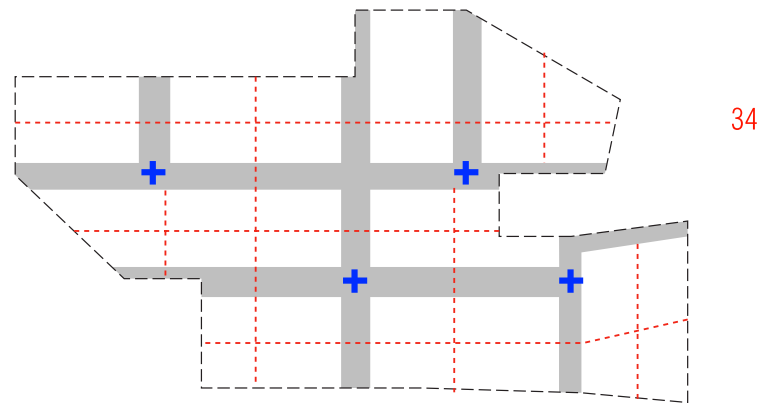
1. Residents of patch agree to join the collective as stakeholders. On joining, each agrees to provide an easement of 2m, off-set from the boundary of their plot. This land will be used to support infrastructure, a community byway and other activities related to the common good.



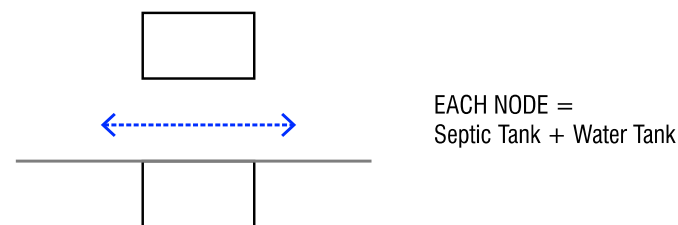
2. Stakeholders agree location of infrastructural nodes which leads to a pattern of subdivision. Each core is designed to supply a septic tank and water supply for a projected increase of population. These nodes will be constructed from taking bank loans.



3. Original residents become equity stakeholders based on proportion of ownership based on original area calculation of their original plots. (m2 %)



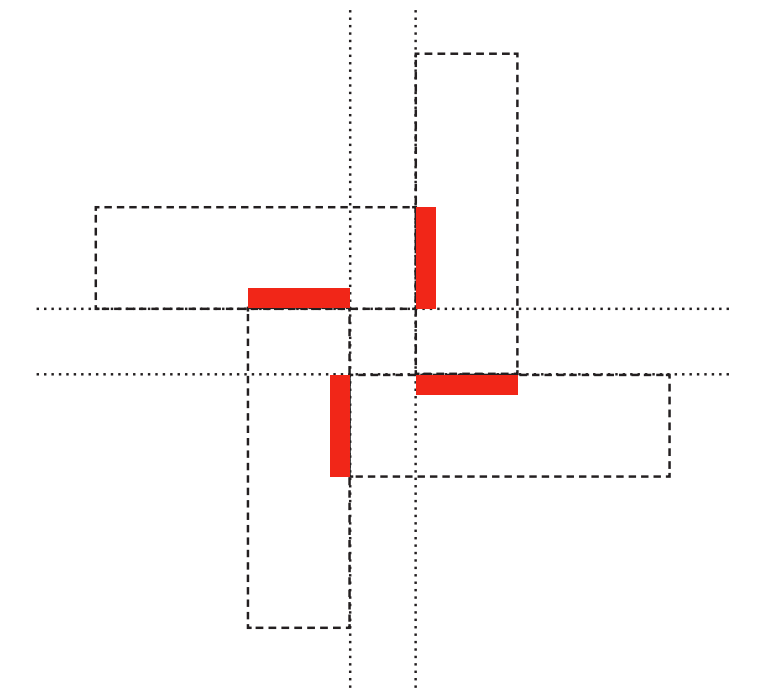
4. This strategy is less about increased density through subdivision but increased density through multiple occupancy.



STEP

TRANSFORMATION

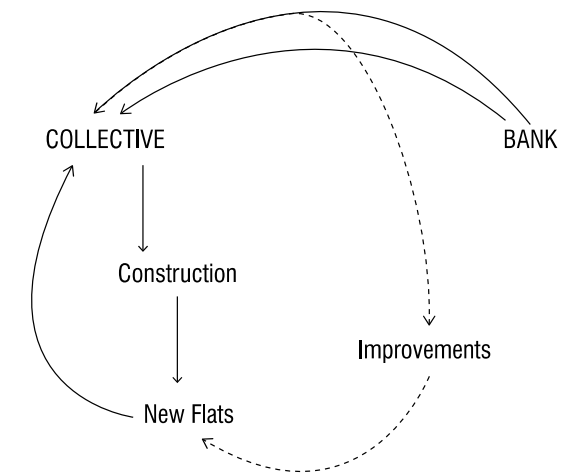
5. Each node has wall extensions that act as the interface for new housing. The node and its increased provision of basic urban services increases the value of the land. At an initial stage they can simply rent spaces for new families in gers who will pay above average rent due to the increased provision of access to infrastructure. This money helps repay the loan.



6. Each stakeholder can take further steps to develop the land through bank loans or re-mortgaging. They can choose whether they build a house for themselves or build a house with an additional rental unit. Properties are constructed with the capacity for future extensions.

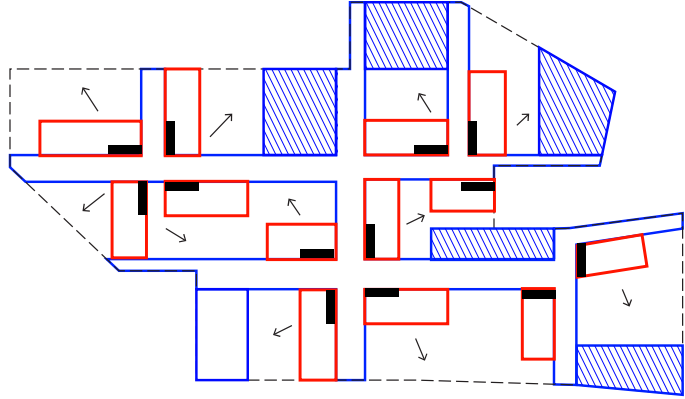


7. The income generated from properties that are sold or rented go back to original stakeholders. However, a percentage from the profit is fed back into the collective improvements to community infrastructure. This supports increases to rental process, the value of property and the value of the land.



UPGRADING STRATEGIES - SCENARIO B: INFRASTRUCTURAL NODE

Location: Mid ger/ Patch

STEP	TRANSFORMATION
<p>8. In the process of increasing the population capacity of the land, land banks need to be reserved in order to prevent over-densification. These land banks can be used for community gardens, waste treatment facilities, playgrounds and kindergartens.</p>	

DEVELOPMENT TRAJECTORY - SCENARIO B: INFRASTRUCTURAL NODE

Location: Mid ger/ Patch



PHASE 1 - CURRENT

Plots: 10
Households: 15
People: 63
No. of households connected to infrastructure: 0
No. of community facilities: 0



PHASE 2 - SHORT TERM

Plots: 11
Households: 19
People: 79.8
Percentage increase of population: 26.7%
No. of households connected to infrastructure: 15
No. of community facilities: 0

DEVELOPMENT TRAJECTORY - SCENARIO B: INFRASTRUCTURAL NODE

Location: Mid ger/ Patch



PHASE 3 - MID TERM

Plots: 11
Households: 25
People: 105
Percentage increase of population: 31.6%
No. of households connected to infrastructure: 22
No. of community facilities: 5 (e.g. waste collection point, basketball court, community hub, greenhouse, playground)



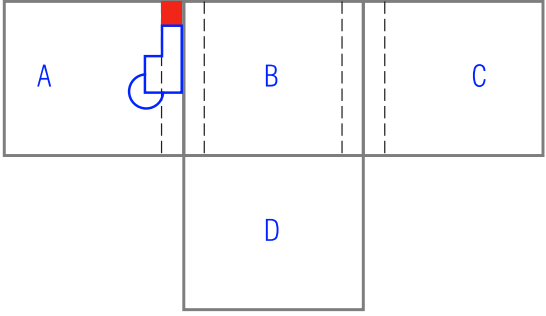
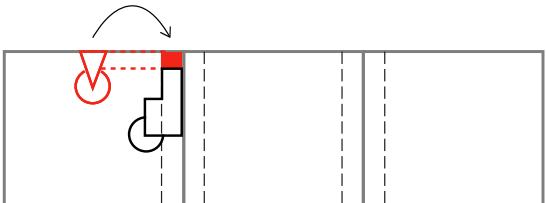


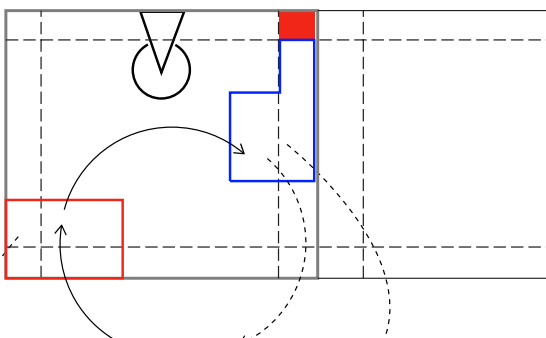
PHASE 4 - LONG TERM

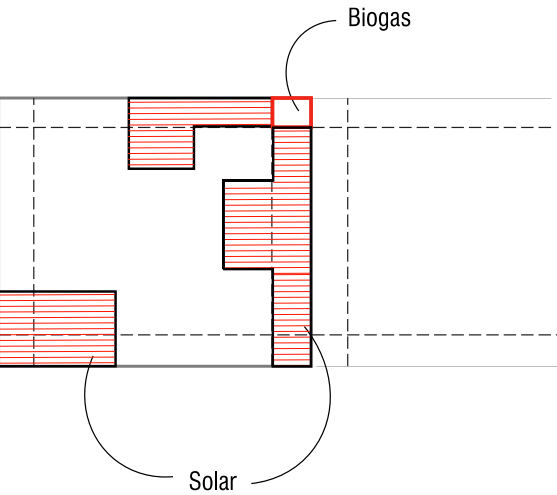
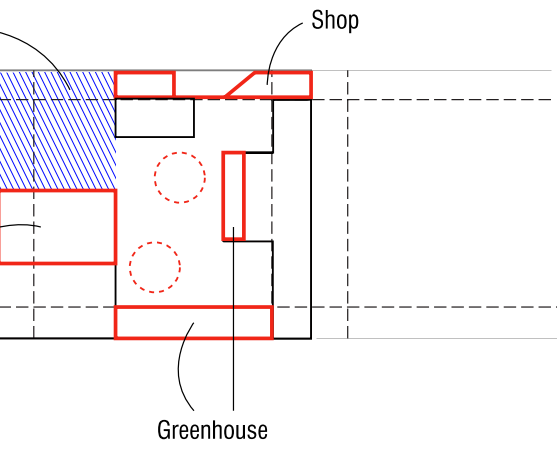
Plots: 11
Households: 31
People: 130.2
Percentage increase of population: 24%
No. of households connected to infrastructure: 31
No. of community facilities: 10 (e.g. waste collection point, basketball court, community hub, greenhouse, playground, solar panels, shops, CHP, creche, air filters)

Total percentage of population increase from Phase 1: 140%

UPGRADING STRATEGIES - SCENARIO C: PLUG-IN

Location: Fringe/ Larger plot sizes/ No subdivision

STEP	TRANSFORMATION
<p>1. One family invests in a Ger Plug-In structure. The plug in structure would have its own heating, water tank, shower and WC. A septic tank would be built with additional capacity to serve 5 additional families. The total capacity of the plot would capped at 25-30 people.</p>	
<p>Mortgage loans would be offered on preferential rates based on the Green Climate Fund.</p>	
<p>2. The family sets up an additional ger that can plug into the septic system. They rent this out and use the money to pay back their loan.</p>	
<p>3. With additional income the family decides to build a house. When they vacate their original property they rent out the Plug-In to a new family.</p>	
<p>4. When each new family signs a tenancy agreement they agree to comply with environmental policy of no coal use. They also will pay a service charge that will form a collective fund for maintenance and future community improvements.</p>	

STEP	TRANSFORMATION
<p>5. Additional financing from the Green Climate Fund could provide solar cells and storage batteries that could provide a renewable energy source for residents. Additional infrastructure could include a bio-gas generator.</p>	
<p>6. The collective could decide together to provide additional amenities. They could create space for a small shop, add a greenhouse, plant trees, make a parking area, or a small crèche or playground.</p>	

DEVELOPMENT TRAJECTORY - SCENARIO C: PLUG-IN

Location: Fringe/ Larger plot sizes/ No subdivision



PHASE 1 - CURRENT

Plots: 4

Households: 5

People: 21

No. of households connected to infrastructure: 0

No. of community facilities: 0



PHASE 2 - SHORT TERM

Plots: 4

Households: 6

People: 25.2

No. of households connected to infrastructure: 3

No. of community facilities: 1 (e.g. Shop)

DEVELOPMENT TRAJECTORY - SCENARIO C: PLUG-IN

Location: Fringe/ Larger plot sizes/ No subdivision



PHASE 3 - MID TERM

Plots: 4

Households: 9

People: 37.8

Percentage increase of population: 50%

No. of households connected to infrastructure: 9

No. of community facilities: 4 (e.g. Shop, parking, greenhouse, playground)



PHASE 4 - LONG TERM

Plots: 4

Households: 12

People: 50.4

Percentage increase of population: 33.3%

No. of households connected to infrastructure: 12

No. of community facilities: 6 (e.g. Shop, parking, greenhouse, playground, bio-gas generator, creche)

Total percentage of population increase from Phase 1: 140%

3B | IMPLEMENTATION PLAN AND NEXT STEPS

AIMS

Test viability of implementation plan with key stakeholders.

METHODOLOGY

Initiate meetings with potential partners to test feasibility of implementation.

Meet with financial institutions, such as the Mongolian Sustainable Finance Association, eco-banking sector, local banks, mortgage lenders, property developers, and NGOs to test the proposal, gather more information about funding opportunities in Mongolia and initiate conversations about the next steps.

Extract key concepts from the Incremental Scenarios.

Develop incremental upgrading strategy for the ger districts.

RESULTS

A Development Toolkit is proposed as the mechanism for development involving density and improving access to infrastructure in the ger districts.

An implementation plan is conceived that involves setting up a new entity provisionally entitled, Ger District Development Corporation, that acts as a delivery agent of the Development Toolkit.

Create actions for future steps.

TESTING VIABILITY

Mongolian Sustainable Finance Association (MSFA)

Date

22nd October 2018 (10:30am)

In attendance

Naidalaa Badrakh, Board Member (MSFA)

Enkhlin Davaajav, Project and Partnership Manager (MSFA)

Oyungerel Munkhbar, Project and Partnership Manager (MSFA)

Gerhub (Enkhjin Batjargal)

RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about funding opportunities in Mongolia.

Summary

- MSFA is a not for profit formed by the Mongolian Banking Association (MBA) to set up policy framework for banks to access non-banking finances (such as green climate funding) to make progress on sustainable development.
- MSFA tries to be a platform that brings the stakeholders together to one concept and for partners to collaborate on projects in the ger areas.
- There is a 15 million USD fund that should be approved in April 2019 and available at the end of the year – Green Finance Corporation. It is split between the Green Climate fund, the Mongolian Government, and banks.
- The aim is to provide loans to finance green developments in Ulaanbaatar including sanitation, septic tanks, and affordable housing. – they need housing pilot projects.
- MSFA collecting designs which meet the energy requirements and in turn the loan requirements. They will perform energy audits and provide housing options that meet the green housing standards and criteria.
- Banks will be provided with these options, as they do not know what is considered ‘green’ development that the Mongolian Green Climate Fund will provide loans for.
- Main requirements for the loans are energy efficiency and low emissions.
- Shifting from loans to developers to household loans for residents.
- The approved model is to build 5-10 prototype housing projects through a developer which will be trained to meet the energy and construction requirements.
- 8% annual mortgage rate can be achieved with green climate funding, however it has not been done for the ger areas yet.
- Average income level in the ger districts is estimated to be 800,000MNT (Gerhhub), 1,000,000MNT (ADB)
- All capacity and efficiency have to improve. There are strict requirements of at least a 20% energy saving compared to a typical baishiin.
- MSFA will not fund the design but will accept and audit the design. If it meets requirements it will include the design in the approved models for the banks, and possibly fund the pilot project.
- The Green Climate Fund, Mongolian Government, and MSFA provide the fund and criteria for the Mongolian Sustainable Finance Corporation. The MSFC distributes the funds to the individual banks who provide loans for individuals and houses.

Green affordable housing requirements

1. Complies with Mongolian Building Code 23-02-09
2. Energy consumption of 38.9 kWh/m² (or less) per day // 252 kWh/m² (or less) per year
3. Affordable for ger district residents, limit price of 1m² to 1,000,000 MNT
4. The housing blueprint to be developed according to building norms and standards
5. The blueprint designs must be expertise and energy audited
6. The blueprint shall include maximized natural lighting, air circulation, wind flow, and insulation.
7. Must incorporate independent heat, water and sanitation systems
8. Construction materials must meet standard requirements and be environmentally friendly
9. Support domestic manufacturing of construction materials
10. Construction design shall be simple and take minimal amount of building time.
11. Must incorporate green building elements (reusing gray water, waste management, vegetation)



TESTING VIABILITY

Gund Investment LLC

Date

23rd October 2018 (10:00am)

In attendance

Gund Investment (Bat-Ireendui Jargalsaikhan - CEO)

UDC LLC (Bulgan Buugii and 2 others)

Gerhub (Enkhjin Batjargal)

RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about current projects.

- Gund Investment is an investment company that is interested in sustainable development, they also provide management consultancy services. UDC LLC is part of the group that is a project development company.
- Since 2010, they have invested in multiple pilot projects, such as the House Doctor (a one stop shop that provides financials and retrofitting of existing houses) and C.A.L.E (testing of different technologies on the redevelopment and densification of one plot)
- There are many green finance initiatives, making many ideas technologically and financially viable.
- Gund Investment has a foundation which supports UDDC and help them reach both the private sector and green climate finances.
- Affordable does not mean cheap. The increase in income through rental rooms or shops can make a more expensive solution 'affordable'.
- Affordability is based on income, education, and the understanding of their own needs. The 'cost-benefit' of the design.

C.A.L.E (Create Accord Living Environment)

- Aim to find an optimal solution for Mongolia that is affordable and sustainable.
- 1 Khashaa, 5 houses with shared infrastructure, rental rooms, garages, and a shop space.
- Working with ARUP HK for environmental consultancy (Jimmy Tong, Vincent, Jason)
- Heat loss movements were studied and different technologies installed in different houses to draw performance comparisons.
- 708,000 MNT/ m² (275 USD/m²)
- Average 70m² per house
- The format is similar to UB plans for increasing density on a single plot, but implemented differently. The residents are given a redevelopment mortgage so they still own their land rather than having land swaps.
- A lot of work goes into preparing the residents, educating them and building the community,
- In Mongolia contractor and developer are usually seen as the same, but C.A.L.E has UDC LLC which is the developer who ensures that the project meets international standards but outsources the construction.
- Unsure about the 'return' at the moment. This is a prototype that is not expecting a profit, just minimum pay back. Calculated to take 9 years to break even.
- Some residents did not have money for the down payment. Their relatives sold their land to pay for it so that the family can live together using the income from the land sale. Relatives coming to live together is easier to reach an agreement.
- A completely new way of living as the 5 families didn't know each other before.
- Residents signed an agreement before the mortgage to comply with policies set down for living in the khashaa baishin.

- There wasn't a ready to go community engagement plan or way to manage public space.
- There is a 'khashaa leader' who manages the public areas. The residents pay a management fee.
- It works at this scale, but if it scales up then a company will be needed to manage it.
- There is currently a shared septic tank that is emptied once a month
- One house has 3 rental units (dorm-like). The income per room is 150,000MNT/month which covers the mortgage. And these units are very popular, it is always full.
- Each rental room has a prepaid utility card that covers electric and heating.
- Water is connected to the grid due to proximity.
- Materials are aerated concrete block, metal sandwich panels, and timber roof structure.
- People don't mind living together e.g. families or people doing the same trade – economic benefits as they build businesses together, they need property.
- Do they have to subdivide? People want to own the land in which their house is built on. Acquiring ownership is quite easy you just need drawings, the right documents, and payment of tax. Relatives can give it to each other tax-free.
- Recycling could be a profitable business.
- Residents could get access to low rate mortgages that can support waste management, public space, and energy efficiency.
- There is an idea to test a project where residents build then they become the contractor for the next as it is expensive for a construction company to build, and the residents would already have the expertise. It will also allow them to generate additional income through acquired skill.
- The rough cost to build a house without infrastructure is:
 - 10 million MNT (wooden house)
 - 20-30 million MNT (brick/concrete)
 - 400,000-600,000 MNT/m² (150-230 USD/m²)



C.A.L.E Khashaa Baishin Project

TESTING VIABILITY

XacBank LLC (Ecobanking Division)

Date:

24th October 2018 (11:00am)

In attendance:

XacBank (Greg Zegas)
Gerhub (Enkhjin Batjargal)
RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about funding opportunities in Mongolia.

Summary

- The Green Climate Fund (GCF) has just approved the Energy Efficient Consumption Loan Programme (10 million USD for <1000 Houses) under three categories:
 - 1) Energy efficient heating
 - 2) Energy Efficient Housing Retrofit
 - 3) Energy Efficient Housing ConstructionSuited for housing pilots that have agreements and designs with the contractor. The resident applies for the mortgage but the contractor receives the money as it is a loan to construct the design and the contractor have to meet requirements
- Each EE housing type has a contractor agreement with XacBank.
- There needs to be a solution that is sustainable to live in the ger districts but not in an apartment. There have been proposals e.g. Row Housing (refer to ADB and Greg's email below)
- Loans would potentially be open in Dec/Jan 2019. The residents would apply for the loan. The approval will be based on the resident. If granted the money will go to the contractor based on the housing sale agreement between the resident and contractor.
- The Plug-in is a single product – how can it meet the EE housing requirements? Produce a feasibility study that proves that it works as an EE housing type. Loans could be given to separate components.
- 12% mortgage rates. Potentially lower but the interest rate is affected by the currency swap rate between the banks and the GCF. (5-7% of the mortgage rate is for risk mitigation)
- The Government is providing 8% loan rates on apartments.
- The Energy Efficient Consumption Loan Programme does not target density. There is a project in development that might kick off within the next few months that is about a mini/off grid system. Mini infrastructure centers that residents pay to plug into it or acts as a pay as you go system.
- There are now two streams that can be pursued. (plug-in vs. off grid system)
- There is an opportunity to tie the two programmes together to create a more holistic model.
- Plug-in vs ger – the distinction that it is permanent and doesn't move has to be made. It is difficult to understand that the plug-in is not a movable structure. Show that it can become a house over time.
- XacBank has funding to do housing/resident workshops
- The Mongolian Green Climate Fund governance structure and relation with the bank is still unclear – whether they are the ones to approve products or just provide recommendations.
- 4-plots is more difficult. How would the legal agreements work. Is it jointly or individual applications for loans? Need to consider these.

Email Correspondence (25/10/2018)

Below I've written some general steps in the process of someone applying for one of these loans as well as the criteria for a potential contractor entering into a Cooperation Agreement with XB under this program. Please note these are by no means official / finalized processes and are subject to change.

Process:

1. Submission of loan application form and supporting documents required in the Bank's lending procedure
2. Provision of a Housing Sale Agreement for the chosen house to prove whether the proposed construction is for eligible house of eligible construction companies
3. EE housing construction loan will be disbursed to households/individuals, however, the payment (in that case the loan amount) will be transferred directly to Construction Company according to Housing sale agreement to avoid loan misuse. In other words, the borrower will not receive loan by cash, the payment shall be transferred to Construction Company and the company will execute the construction work for borrower while the borrower repays the principal and interest to XacBank.
4. After disbursement, a property deed must be developed and signed by both construction company and loan recipient verifying that the EE house was constructed and handed over to the loan recipient.

Cooperation agreement:

Each supplier company entering into a Cooperation Agreement with the Bank must comply with the following two eligibility criteria. First, the company's product must achieve minimum energy savings and/or CO2 reduction of 20% relative to the baseline.

Second, the company must meet all of the following Cooperation Agreement requirements based on XacBank's policies.

1. Must have been doing the business for at least one year
2. Must have specific sales channel
3. Must be able to provide a product warranty (must submit official letter confirming product warranty is provided to the client along with a repair guarantee page)
4. Must be able to provide maintenance and repair for the product during the warranty period or be able to recommend a specific repair service provider

All supplier companies entering into Cooperation Agreements will also be required to adhere to the Bank's KYC processes and AML/CFT policies.

And re: the other types of eligible housing, I can tell you the currently-eligible EE housing are characterized by ~5 housing units in a plot with each unit being 60-80 square meters in area.

TESTING VIABILITY

Itgel Bold

Date

12th January 2019 (11:00am)

In attendance

Itgel Bold (Novaterra LLC, Mobicom)

RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about funding opportunities in Mongolia.

Summary

GDDC Proposal

- Government has 8% mortgage for independent families (to confirm which type of mortgage)
120 m2 units (detached housing)
Meet green climate and specific building requirements
Central bank allocates to other banks (MSFA?)
Energy efficient with engineering solutions – details in building standards
- *The GDDC seen as a solution provider*
Including engineering solutions
Application procedures
Financials – how much and what it is, mortgage package
- Usually banks require 20-30% down payments – how would the residents save up to that amount, what is this amount?
- The products offered by the GDDC have to be seen as more economic
- What is needed to make the proposal ‘bullet proof’ and what is the next step to make it real
The financials have to be clear – investment and return costs
Standardize the data for the plug-in and prove the ‘usage’ costs
It should be seen as a Turnkey Product that opens the process for other products

Setting up a company in Mongolia

- Roles of the parties have to be clear
- If it is commercialized (which it should be) then it would need revenue – that feeds back into it for R&D and the next product
- Typically the housing sale/mortgage agreement with the banks is -
30% down payment by customer to the developer
70% bank payment to customer or directly to the developer
- There is no legal obligation between the GDDC and customer in relation to the mortgage.
- The repayment is an agreement between the customer and the bank based on the housing sale agreement
- When applying for a loan you need:
Home purchase agreement/housing sale agreement (between the customer and GDDC)
Pay slip to prove down payment (just to prove it, does not have to be the physical exchange. It is just for the bank to see the customer’s financial capability)
The resident should know their purchasing power before entering into the agreement

Convincing the banks

- Have demo products – so it is real and not just on paper (e.g. the plug-in)
- Funding inside the GDDC to demonstrate financial capability to start and maintain 2-3 projects (mainly the ability to pay for the construction works and not default)
Offer outright solution to begin – it is more convincing
The banks would be more trusting if there is money to build even without funding so that the GDDC is not relying on the external funds.
A percentage of the project cost could be enough e.g. US\$40,000 – US\$50,000 in the account
Or commitment in the form of investment
- It could also be possible that the project is partially funded by the bank and partially by an investor (6k investor, 14k bank loan), the bank would give them an interest in seeing the project succeed.
- GDDC should be designed with the interest of the bank in mind
- Market cost is just a whole cost that includes interest, costs, fees, profit, VAT
Financial plan for the product and total cost
VAT in Mongolia – corporate income tax is not deductible
Product price is exclusive of VAT but final will include – there is no hidden cost
VAT is passed directly to the government

Email Correspondence (20/01/2019)

You may also want to include in your document the possibility of households to take advantage of the 8% mortgage program sponsored by the Mongolian government. In the past only apartment buildings were qualified for the 8% mortgage, but now households in the ger district can enroll in this program provided that:

- unit is not to exceed 120 sq. meters
- the loan amount shall be less than MNT 60 mn
- the term is 360 months
- the housing unit has to be energy efficient and that land plot must be designated for redevelopment in the - revised master plan.

<https://ikon.mn/n/1g6p>

Above is the link to the program and press release by the Minister of Construction and Urban Development.

TESTING VIABILITY GERES

Date:

12th January 2019 (12:30pm)

In attendance:

Geres (Beatriz Maroto-Izquierdo - Country Director/ SWITCH Project Manager) (Saruul Bayar – Technical Coordinator)
RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about current projects.

Summary

SWITCH Project

- EU Funded 4 year project
- Market approach that focuses on detached housing – low tech
Has to be a realistic business model
- Sustainability of detached housing – retrofitting – insulation and stove improvement
Project is now researching and understanding the resilience to changes that residents have
And finding reasons that will motivate people to participate
- Work with:
Mongolian University of Science and Technology – Building Energy Efficiency Council (BEEC)
Mongolian National Contractor Association (MNCA) - Work with craftsmen and those who want to form small/medium enterprises
People in Need (PIN) - Campaigning and mobility organization
Ger Community Mapping Center (GCMC – Batorj) - Community base contact
- Provide energy advising and financial intermediation
- No funds to subsidize but able to motivate – subsidizing is not the market approach – needs to be sustainable
- Idea of an App with the motivation and solution
It is linked to a software that shows the solutions
Energy advisors can visit the detached houses to audit then show which solution applies to which person based on the post energy audit, and advise on financials to fit.
- 6 months into the project, with a 6 month delay
Plan that in March there is a business model and craftsmen will be selected
May to June to implement the pilot and begin craftsmen training
The insulation project first then move onto the stove

Orchlon Enkhsetseg

Date:

12th January 2019 (6:30pm)

In attendance:

Orchlon Enkhsetseg (Clean Energy Asia LLC)
RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about funding opportunities in Mongolia.

Summary

GDDC

- There are difficulties working with the Green Climate Fund (GFC) as it is very bureaucratic
The transactions have to go through an agent bank
There are added risks and interest
- Joint Credit Mechanism (JCM) – Associated with JICA and the Japanese government
They give up to 50% of the funding if it meets the requirements.
Works with any country that has signed up
- Look into the European Bank of Research and Development (EBRD)
Almost the biggest investors in Clean Energy Asia's projects
They are acutely aware of the context
Has institutional memory and understand how to work in Mongolia
Works with many former soviet cities that try to become 'green'
- Consider partnering up with an organization (e.g. EBRD) as it is important to have a 'backer' in Mongolia
However, the idea is very new so they will not automatically know what to do
But they have knowledge and ability to find out
Non banking finance can provide much lower rates than banks – banks are LLCs that have to make a profit
A solid marketable concept has to have critical mass and reduces pollution
Work with partners like EBRD that has representation and institutionally strong that can provide low loans (cheap capital)
They can also help with public and political buy-in
- The whole business model has to be considered, this is a completely new idea. Consider it from first principles
- EBRD has grants for organizations to hire consultants to form business models

TESTING VIABILITY

Asian Development Bank (ADB)

Date:

16h January 2019 (10am), Skype Interview

In attendance:

Arnaud Heckman (ADB, Principal Urban Specialist)

RUF (Joshua Bolchover, Jersey Poon)

Objectives

To present and receive feedback about the incremental upgrading strategy and gather more information about current projects.

Summary

- Does not think that land tenure is a negative issue. It is an asset that the residents can use
- People are keen to redevelop. E.g. out of 800 plots that have been asked to move, only 4 refused
People are 'sick' of their way of life and they will go for change if there is fair compensation
There is a land swap mechanism for the development of eco-districts that require 100% agreements
Reluctance is due to distrust. People have been promised a lot before without much happening.
- World Bank report – data only that accepts the situation. Not a representation of what is actually happening.
- Instead of showing it is an issue, it should be presented as opportunities.
- Within GADIP (Ulaanbaatar Urban Services and Ger Areas Development Investment Program – ADB Project 45007)
There is a pilot that is for 3 town houses
As a demo to private sectors that the model would work.
It is very small and still under development
GADIP is about extending infrastructural connections and creating sub centers.
2 subcenters to be finalized this year.
Already being implemented.
- GADIP is not AHURP (Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project– ADB Project 49169)
AHURP is a different and larger model from the pilot townhouses
It is in the implementation stage
Land swapping for apartments
100 hectare scope
- Opportunity basis, does not require 100% agreement. There is a VLSP (Voluntary Land Swapping Plan)
36m² is the minimum compensation – it is asset based.
Translate the plot and housing into apartments. Some can get up to 180m² depending on the assets that they have.
- What is missing in the city is affordable housing.
- Eco districts (AHURP) vs. subcenters (GADIP)
- ADB is a financial mechanism



Ger Plug-In
Ulaanbaatar, Mongolia

3C | CONCLUSION

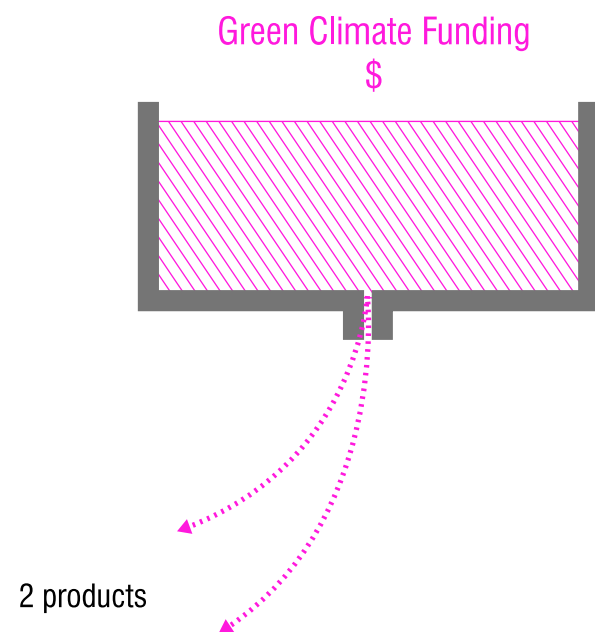
Ger District Development Project

The incremental strategic plan incorporates scenarios that are developed based on the three different types of urban fabric as observed in our initial analysis. Key concepts of the scenarios are:

- to find ways to densify and provide affordable housing
- to create off grid infrastructural networks
- to create mechanisms for future growth and incremental upgrades
- to engage residents in forms of shared infrastructure
- to create feedback loops of investment encouraging future stages of development
- to create neighborhood funds for community investment
- to seek financial mechanisms to provide residents with access to lower income loans based on improved environmental performance.

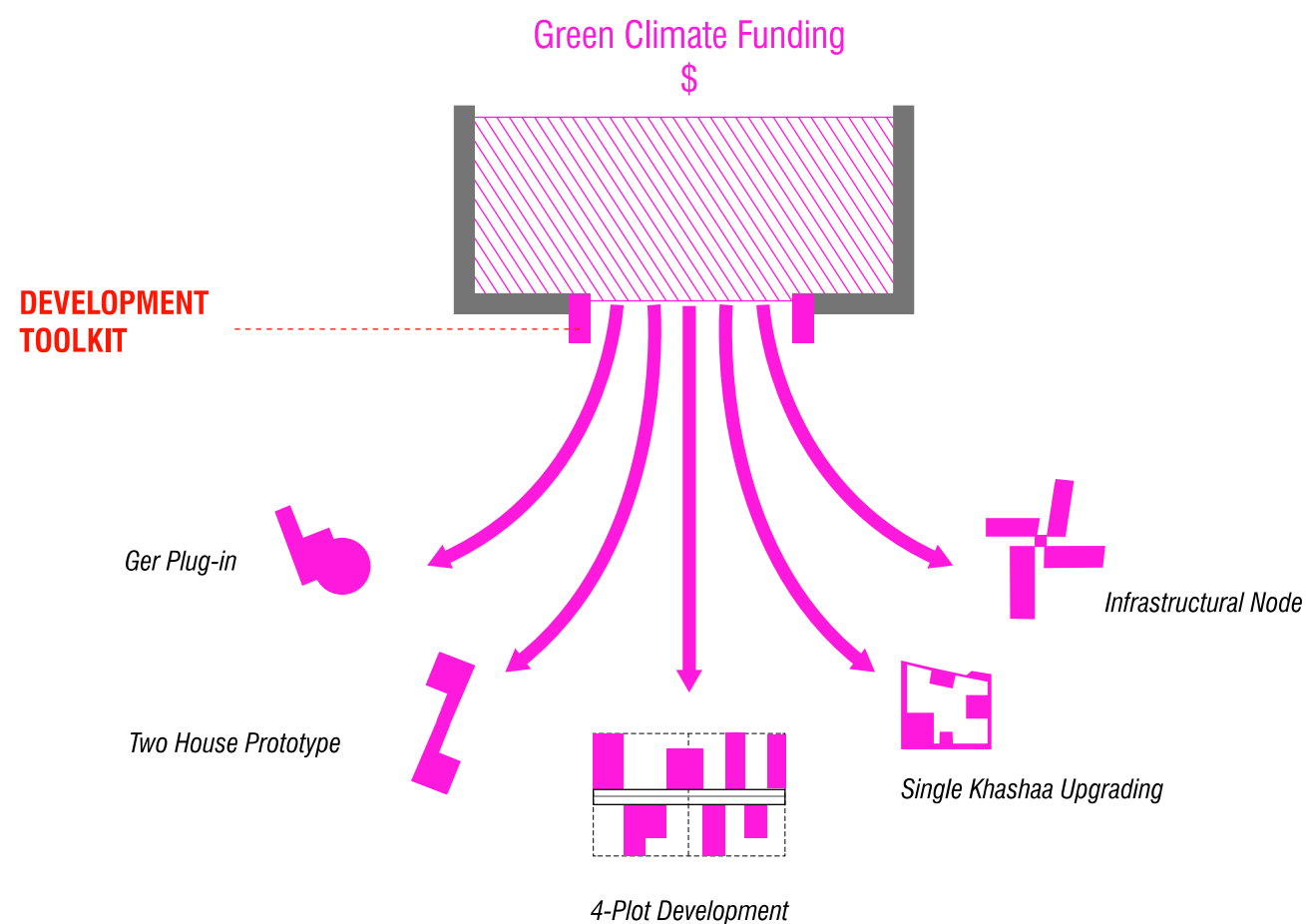
Current Model

Very little mortgage flow



Proposed Model

Unlock the gateway to GCF



The Green Climate Fund approved programmes proposed by different local financial institutions in the form of bank loans in October 2018, (meeting with The Mongolian Sustainable Finance Association on 22nd Oct 2018). This allows local banks to create mortgage products to access these better loan rates, 10-12% compared to 18%, (meeting with Xac Bank 23rd Oct 2018), based on delivering housing that meets the criteria of a 20% reduction in CO2 emissions. The onus is on construction companies to create housing products that demonstrate that these criteria can be achieved. The mortgage is with individual residents who will agree on a product, then the money will go to the contractor to build the house. However, there are currently only two products available on the market eligible for these low interest loans. The proposal is to unlock this funding by creating a Development Toolkit – a series of different products serving a range of incomes and housing types that meet the criteria—thereby enabling residents to incrementally develop their own plots.

The Ger-Plug-In demonstrates how the ger can be adapted and transformed into a viable low energy and low cost housing typology. Using the mechanism of the Green Climate Funds, the aim is to get the Plug-In accepted as a viable product eligible for low interest rate mortgages, in order to allow thousands of households' access to improved infrastructure with lower carbon emissions.

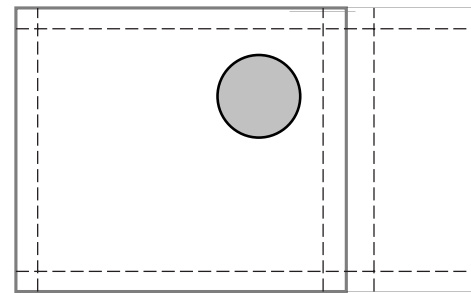
The intention is not to rubber-stamp this product as a singular solution but to provide mechanisms to diversify housing typologies and increase density on each plot. The only mechanism to improve the overall sustainability of the city is to provide an alternative to sprawl and the outward expansion of the city. If the land-law remains, and people are reluctant to give up their land, the city has to be able to densify. However, to densify, the land has to become more valuable in order to stimulate development. Land value can be increased by providing shared access to infrastructure, incentivizing residents to leverage development for themselves. In this way, by opening up access to low interest loans, we can incrementally transform the ger districts into a viable low carbon community while still maintain land ownership with the residents themselves.

The updated scenario for a one plot densification scheme is as follows. The land owner selects a product from the Development Toolkit linked to a mortgage with the local bank to build an energy efficient house and a septic tank and water tank with added capacity for two more households. The access to infrastructure on his plot means he can attract new residents to lease the land. These residents take a loan to pay for the rights of land use and to build a house, again selected from the Toolkit meeting the 20% reduction criteria. Income generated from the rent is used to pay back the initial loan, however a percentage is retained to contribute to a neighborhood improvement fund.

This fund is managed by the residents and used to invest in communal benefits such as landscaping, greenhouses, car parking or any necessary repairs to collective infrastructure. Additional income created through rentals can allow existing residents to further invest or co-invest in more housing or in profit-making ventures such as shops, car parking or workspaces. Critically, unlike other development models, land ownership resides with the residents themselves. In a city whereby 97.8% land is owner occupied by a population with an average monthly income of around \$80USD (The World Bank, 2017), the mechanism initializes a process to increase the value of their land.

STAGE 0 Existing condition
Single family on a plot without infrastructure

Carbon Emissions: 100%
No of Families: 1
Infrastructure: No



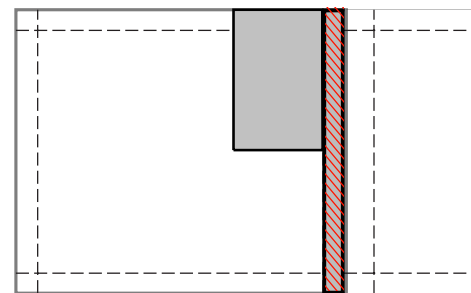
TOOLKIT

BANK

\$ Apply for low interest loan

STAGE 1 Owner takes loan to build infrastructure with added capacity and an energy efficient house.

Carbon Emissions: >20% reduction
No of Families: 1
Infrastructure: Yes



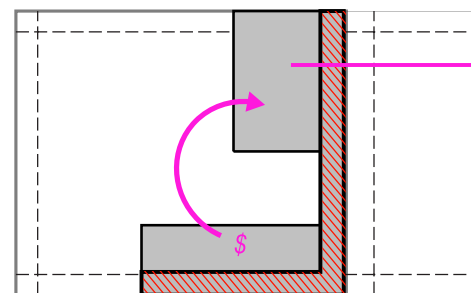
TOOLKIT

BANK

\$ Loan repayment

STAGE 2 New residents move to plot and take loan to pay for right to land use and to build a house

Carbon Emissions: >20% reduction
No of Families: 2+
Infrastructure: Yes



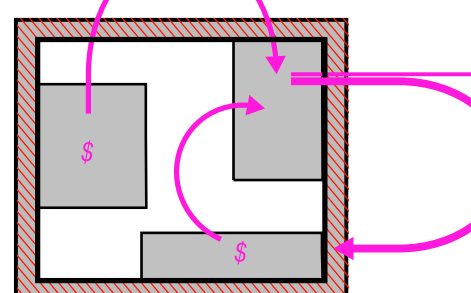
TOOLKIT

BANK

\$ Loan repayment

STAGE 3 Income from rent used to invest in new programmes and infrastructure such as shops and greenhouses to generate different income streams

Carbon Emissions: >20% reduction
No of Families: 4+
Infrastructure: Yes



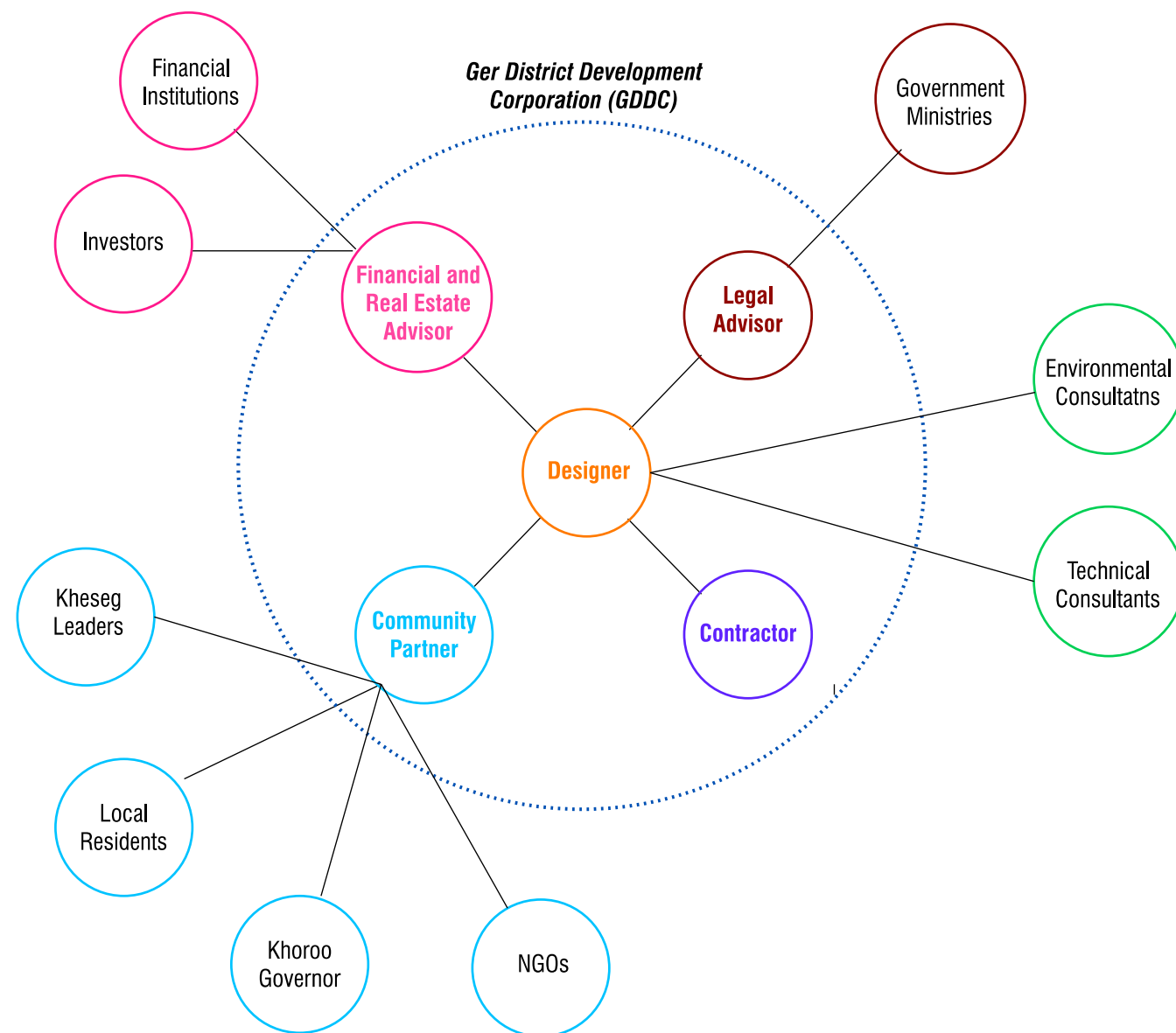
\$ Maintenance and Improvements

Implementation Plan

In order to implement this plan, the first step is to set up a Ger District Development Corporation comprised of an architect (Rural Urban Framework at the University of Hong Kong), a community advisor, a financial real estate expert, a lawyer and a contractor. It will act as a delivery agent, making sure the buildings that are constructed comply with improved environmental performance.

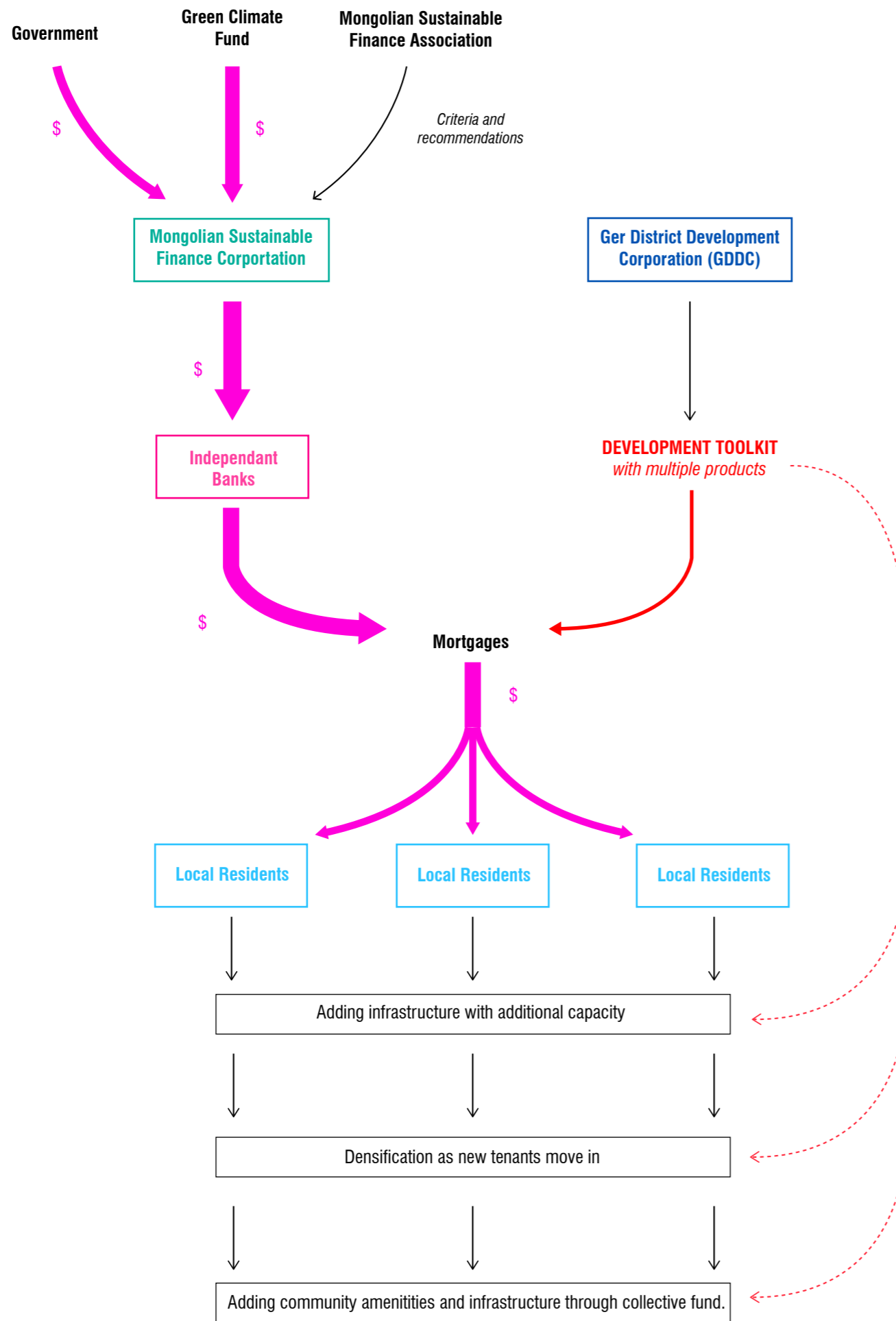
The second step is to obtain environmental verification on the Ger Plug-in by ARUP to qualify it as a viable product that meets the 20% emissions reduction criteria of the GCF. Once audited, we will partner with local financial institutions to have the Ger Plug-in accepted as a product, and released to market. Income to the Ger District Development Corporation will feed into the development and construction of new products from the Development Toolkit. The third step is to develop a new product to add to the Toolkit. Starting with fieldwork within the local communities, the scope and specifications of the next prototype will be determined. The design will undergo detailed technical evaluation with environmental engineers to improve its thermal efficiency and reduce carbon emissions. The design will also be verified with local contractors to ensure that the all materials and components specified are readily available and that methods of construction are within the capabilities of local workers. The design will then be built, environmentally verified, and presented to the financial institutions and linked to a mortgage product. The method of implementation will cycle through to the next product, and then the next.

Each of the tested products will feature in the Development Toolkit. This will act as a guide for ger district upgrading by the residents themselves tied made affordable by unlocking multiple ways to access the Green Climate Funds. This would radically shift the policy for ger district redevelopment both within the government and by funding agencies such as the Asian Development Bank. The Development Toolkit presents a paradigm shift in the planning approach to a holistic and agile bottom-up solution that targets densification, improving infrastructure access, and releasing the value of residents' land to support community improvements and create new economic drivers for the districts. If taken up as a model for upgrading it has the potential to impact thousands of people in the ger districts. As the ger district phenomenon is not just specific to Ulaanbaatar, but exists in every urban area of Mongolia, it could have widespread ramifications for the entire country.



ROLES

Designer	<ul style="list-style-type: none"> Development of business plan for 1-plot upgrading strategy with expert advice from members of GDDC Design of 1-plot upgrading strategy Design and production of project Toolkit. Co-ordinate with members of GDDC Monitoring and evaluation of project after implementation.
Community Partner	<ul style="list-style-type: none"> Locate 1-plot pilot site and family Conduct research on site and families. Conduct community engagement workshops. Communicate and co-ordinate meetings with district officials, khoroo heads, and members of government ministries.
Legal Advisor	<ul style="list-style-type: none"> Provide legal advice for the set-up of the GDDC and project. Creation of contracts Assist with legal procedures for implementation.
Real Estate and Financial Advisor	<ul style="list-style-type: none"> Provide financial analysis services for the pilot project Assist with the creation of a financial plan with investment opportunities, loan periods, and returns.
Contractor	<ul style="list-style-type: none"> Assist with determining the technical specifications for the project. Provide technical advice e.g. electrical, plumbing, and heating. Conduct cost estimations Evaluate design and provide construction advice. Produce construction drawings.
Private Equity Investor	<ul style="list-style-type: none"> Provide seed funding for the GDDC.



Next Steps

- Look at the legal and operational structure of the proposed Ger District Development Corporation
- Gain commitment from partners
- Make a business plan
- Get the Ger Plug-In audited as a viable product that could be supported by Green Climate Fund mortgages
- Make necessary changes to the Ger Plug-In to improve performance and ease of construction
- Design a new housing typology involving shared infrastructure between two families.

Bibliography

Planning Reports

Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project, Ulaanbaatar, 2018. <https://www.adb.org/projects/49169-002/main#project-pds>

Asian Development Bank, Project Data Sheet, Mongolia: Ulaanbaatar Urban Services and Ger Areas Development Investment Program, Ulaanbaatar, 2017, <https://www.adb.org/projects/45007-003/main#project-pds>

Asian Development Bank, Project Data Sheet, Mongolia: Urban Transport Development Investment Program, Ulaanbaatar, 2018, <https://www.adb.org/projects/39256-023/main#project-pds>

Capital City Master Planning Agency, Ulaanbaatar 2020 Masterplan and Development Approaches for 2030, General Summary for the Public, 2014 <https://asiafoundation.org/resources/pdfs/1-MasterPlanPublicSummaryEnglish.pdf>

Japan International Cooperation Agency. The Study on City Master Plan and Urban Development Program of Ulaanbaatar City: Final Report. Ulaanbaatar, 2009

Kamata, Takuya, et al. "Managing Urban Expansion in Mongolia". World Bank. Washington DC. License: Creative Commons Attribution CC BY 3.0 IGO, 2010

Kamata, Takuya, et al. "Mongolia Enhancing Policies and Practices for Ger Area Development in Ulaanbaatar". World Bank Publications, Washington DC. 2010

UN-Habitat. Citywide Pro-Poor Ger Area Upgrading Strategy of Ulaanbaatar City. (Mongolia, 2010)

Chinzorig, Batbileg. "Briefly About Planning In Mongolia". In Joint FIG Commission 3, UN/ECE Working Party on Land Administration and UN/ECE Committee on Housing and Land Management Workshop: Spatial Information Management toward Legalizing Informal Urban Development and Informal Settlements – Real Estate Market Needs for Good Land Administration and Planning, 2007. Sounio, Greece, March 28-31, 2007.

Reeves, Jeffrey. "Development Planning in Mongolia: Failure and Potential". Asia-Pacific Center for Security Studies. January, 2014. < <http://www.apcss.org/development-planning-in-mongolia-failure-and-potential/> > (26 September 2014)

Master Planning Agency of the Capital City, "Technical Summary, Ulaanbaatar, 2020 Master Plan and Development Approaches for 2030". Ulaanbaatar, 2014.

Economy

Economics Research Institute, "An Economic Impact Assessment Of The Committed Chinggis Bond Allocation". Economics and Research Institute. 01 Dec 2013. <http://www.eri.mn/research/finished/345-ewohxidw>

Green Climate Fund. "GCF Begins Funds Transfer to Mongolia's XacBank." 11 May 2017, www.greenclimate.fund/-/gcf-begins-funds-transfer-to-mongolia-s-xacbank.

Koyanagi, Ken. "Battered Mongolia Faces Make-or-Break Moment." Nikkei Asian Review, Nikkei Asian Review, 2 Feb. 2017, asia.nikkei.com/Politics-Economy/Economy/Battered-Mongolia-faces-make-or-break-moment.

Nixon, Frederick and Bernard Walters. "Privatization, Income Distribution, and Poverty: The Mongolian Experience." World Development 34 (2006): 1557-1579

Health

Leblanc, Maryanne E., Reed, Robert A., with Kingdom, William, Gambrill, Martin P., and Rodriguez, Diego J. 2017. Challenges and Opportunities for Improving Household Sanitation in the Ger Areas of Ulaanbaatar. Washington, DC: World Bank.

World Health Organization. Health Service Delivery Profile: Mongolia (Manila: W.H.O. Western Pacific Region, 2012)

Land + Housing

Badamdorj, Chinbat. "Changes in the Internal Structure of Ulaanbaatar, Mongolia." Scientific Annual of Korea Mongolian Economic Association 14 (2004)

Byambadorj, Tserengmaa and Marco Amati and Kristian J. Ruming. "Twenty-first century nomadic city: Ger districts and barriers to the implementation of the Ulaanbaatar City Master Plan," Asia Pacific Viewpoint 52 (2011): 165-177

Byambadorj, Tserengmaa and Marco Amati and Kristian J. Ruming. "Twenty-first century nomadic city: Ger districts and barriers to the implementation of the Ulaanbaatar City Master." Asia Pacific Viewpoint 52 (2011): 165-177

Caldieron, Jean. "Ger Districts in Ulaanbaatar, Mongolia: Housing and Living Condition Surveys," International Journal of Innovation and Applied Studies 4 (2013): 465-476

Choi, Choongik. "Inexorable Rise of Ger in Mongolia: Demolition for Redevelopment or Conservation for Improvement?" International Review of Public Administration 17 (2012): 121-141

Kawagishi, Umekazu and Susumu Ishii and Yoshimichi Tsubor and Noboru Yuasa and Kazuo Usugi and Ishjamts Gonchigbat and Bardrakh Batbold and Koki Kitano and Hirofumi Sugimoto. "Study on the Living Space Planning in Ulaanbaatar, Mongolia Part 3: Perceptions of Apartment Residents," Journal of Asian Architecture and Building Engineering 4 (2005): 415-422

Kawagishi, Umekazu and Susumu Ishii and Yoshimichi Tsubor and Noboru Yuasa and Kazuo Usugi and Ishjamts Gonchigbat and Bardrakh Batbold and Mitsuhiro Hasegawa. "Study on the Living Space Planning in Ulaanbaatar, Mongolia Part 2: Residential and Living Environments in Apartment Complexes," Journal of Asian Architecture and Building Engineering 4 (2005): 151-159

Miller, Joel Eric. Nomadic and domestic: dwelling on the edge of Ulaanbaatar, Mongolia (PHD Thesis, University of California, 2013)

National Board for Children, Save the Children UK and UNICEF. The Living Conditions of Children in Peri-Urban Areas of Ulaanbaatar (Ulaanbaatar: Sogoo Nuur Publishers, 2003)

Sneath, David. "Land Use, the Environment and Development in Post-socialist Mongolia," Oxford Development Studies 31 (2003): 421-459

Sugimoto, Hirofumi and Umekazu Kawagishi and Koki Kitano and Ishjamts Gonchigbat and Naoyuki Hirota. "Living Environment of Nomads Residing on the Outskirts of Ulaanbaatar, Mongolia: Dispositional Characteristics from the Perspective of a Comparison of Nomads and People Living in Ger Fixed Residences in the City," Journal of Asian Architecture and Building Engineering 6 (2007): 283-290.

Upton, Celine. "'Custom' and Contestation: Land Reform in Post-Socialist Mongolia," World Development 37 (2009): 1400-1410.

Pastoralism

Fernandez-Gimenez, Maria. "Sustaining the Steppes: A Geographical History of Pastoral Land Use in Mongolia," The Geographical Review 89 (1999): 315-342

Mearns, Robin. "Sustaining Livelihoods on Mongolia's Pastoral Commons: In Insights from a Participatory Poverty Assessment," Development and Change 35 (2004): 107-139

Migration

Williams, Christopher R., “The Ties That Bind: Urban Migration, Family Networks, and Cultural Change in Modern Mongolia” (2009). Independent Study Project (ISP) Collection. Paper 718.

Save the Children. Shifting Livelihoods: Trends of Pastoralist Drop-Out and Rural to Urban Migration in Mongolia (Mongolia: Save the Children Japan, Mongolia Office, 2013)

Solongo, Alгаа “Growth of Internal and International Migration in Mongolia” in Migration, Development and Poverty Reduction, 8th International Conference of Asia Pacific Migration Network, May 2007

Planning + Infrastructure

Chinzorig, Batbileg, “Briefly About Planning in Mongolia,” presented at Joint FIG Commission 3, UN/ECE Working Party on Land Administration and UN/ECE Committee on Housing and Land Management Workshop, Sounio, Greece, March 28-31, 2007.

Eurasia Capital. Infrastructure in Mongolia: Challenges and Opportunities (Mongolia, 2009)

Pollution + Waste

Engineering and Consulting Firms Association, Maeda Corporation, Nihon Suido Consultants Company, Nishihara Environment Technology, RECS International Inc. Mongolia: Investigation of Water and Sewer Improvement Projects for Two Cities in Northern Mongolia (2006)

Guttikunda, Sarath K. and Sereeter Lodoysamba and Baldorj Bulgansaikhan and Batdorj Dashdondog. “Particulate pollution in Ulaanbaatar, Mongolia,” Air Quality, Atmosphere & Health 6 (2013): 589-601

National Center for Public Health and UNICEF “Mongolia’s Air Pollution Crisis”. Mongolia’s Air Pollution Crisis A call to action to protect children’s health. Feb 2018. National Center for Public Health and UNICEF

The World Bank, “Better Air Quality in Ulaanbaatar Begins in Ger Areas.” The World Bank, Feature Story, 26 June 2018, www.worldbank.org/en/news/feature/2018/06/26/better-air-quality-in-ulaanbaatar-begins-in-ger-areas.

Zoljargal, M. “Ulaanbaatar City Administration’s costly clean up plan,” UB Post News, 17 October 2013.

Informal Settlements + Urban Fringe

Angélil, Marc and Rainer Hehl, eds. Building Brazil! The Proactive Urban Renewal of Informal Settlements (Berlin: Ruby Press, 2011)

Angélil, Marc and Rainer Hehl, eds. Cidade de Deus – City of God: Working with Informalized Mass Housing in Brazil (Berlin: Ruby Press, 2013)

Bolchover, Joshua, and John Lin. Rural Urban Framework: Transforming the Chinese Countryside, Birkhauser, 2013

Censo Demografico 2010, Instituto Brasileiro de Geografia e Estatística (IBGE). Rio de Janeiro, 2010. https://biblioteca.ibge.gov.br/visualizacao/periodicos/92/cd_2010_aglomerados_subnormais.pdf

Fernandez Rosa F. Physical and Spatial Characteristics of Slum Territories Vulnerable to Natural Disasters. Les Cahiers de l’Afrique de l’Est, 2011, 44, p.5-p.22.

Fulong Wu “Housing in Chinese Urban Villages: The Dwellers, Conditions and Tenancy Informality, Housing Studies” 2016

Gallent, Nick and Johan Anderson and Marco Bianconi. Planning on the Edge (London: Routledge, 2006)

Garreau, Joel. Edge City: Life on a New Frontier (Anchor Books, 1991)

Gestao Urbana – Sao Paulo. Zona Especial de Interesse Social ZEIS <http://gestaourbana.prefeitura.sp.gov.br/zona-especial-de-interesse-social-zeis/>

Habitasampa. A cidade informal no Seculo XXI. 2011. http://www.habitasampa.inf.br/documentos/publicacoes/catalogo_exposicao/index.html

Magalhães, Fernanda, editor. Slum Upgrading and Housing in Latin America. Inter-American Development Bank, 2016.

Nova Paraisopolis. Mapa de Intervencoes. 2013. <http://paraisopolis.org/conselho-gestor-de-urbanizacao/mapa-de-intervencoes/>

Prefeitura de Sao Paulo. Secretaria da Habitacao. Programas. Urbanizacao das Favelas. 2017., <https://www.prefeitura.sp.gov.br/cidade/secretarias/habitacao/programas/index.php?p=237077>

Soja, E.S. “Inside Exopolis: Scenes from Orange County”, in Variations on a Theme Park, edited by M.Sorking (New York: Noonday Press, 1992), 94-122

UN-HABITAT, Chapter 1: Development Context and the Millennium Agenda .”The Challenge of Slums: Global Report on Human Settlements, 2003, Earthscan Publications, 2003. Revised and updated - April 2010

Other relevant work

2013 Household Registry Data, National Statistical Office of Mongolia, <http://www.en.nso.mn/>

2015 Population and Housing By-Census of Mongolia: National Report, National Statistical Office of Mongolia, Ulaanbaatar, 2016

Barilga MN. Construction and Real Estate Research Report 2016. Ulaanbaatar: Munkhiin Useg, 2016

Gerelsaikhan, Gerelmaa. Mongolia Real Estate Report 2017, Asia Pacific Investment Partners LLC

Singh, Gayatri. 2017. Urban Poverty In Ulaanbaatar: Understanding the Dimensions and Addressing the Challenges. World Bank. Washington DC. License: Creative Commons Attribution CC BY 3.0 IGO

Terence Edwards “Mongolian parliament ousts prime minister in latest reshuffle”, Reuters, September 7, 2017 accessed September 10 2017. <https://www.reuters.com/article/us-mongolia-politics/mongolian-parliament-ousts-prime-minister-in-latest-reshuffle-idUSKCN1BI270>.

Credits

INCREMENTAL URBANISM: Ulaanbaatar's Ger Settlements

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Tim Jenkins, Communications & Partnerships Officer, UNFPA
Judith Bruno, Deputy Country Representative, UNICEF
Bold Magvan, CEO, XacBank
Isabella Bersani, Project Development Officer of Eco Banking Department,
XacBank
Thomas Papazov, Director of Business Development, Engie Mongolia
Jon Lyons, VP of Regulatory Affairs & Strategy, Erdene Resource Development
Corp
Itgel Bold, CEO, Novaterra LLC,
Aldaraa Tuvshinbat, Country Representative, Oyun Foundation
Bolor Enkhbat, Construction Director, Shonest LLC
Tenuun Batzorig, Architect, Azzurra architectural firm
Christopher de Gruben, Co-founder and Managing Partner, M.A.D Urban Mon-
golia

Ger Plug-in Residents:

Zul-Erdene Sharavjamts (Zulaa)
Urangua Shagdar

Participating staff and students from:

Institute of Engineering and Technology, Ulaanbaatar, Mongolia
The University of Hong Kong, Hong Kong
HKU School of Professional and Continuing Education
The University of Columbia

Interview Participants (Existing Initiatives):

Khan-Uul -13 Governor
Khan-Uul - 13 Organiser
Chingeltei - 16 Governor
Chingeltei - 16 Kheseq Leaders
Mr. Delgerbayar, The Asia Foundation
Enkh-tsetseg Shagdarsuren , National Programme Manager, UN-HABITAT

Interview Participants (Films):

Oyunbat
Erdenechimeg Ishjamts
Munguntuya Odontungalag
Munkhbold Naran
Bold-Erdene Adiya
Anir-Erne Mukhbat
Purevsaikhan Mukhbat
Ariunzaya Puntsag-Osor
Akhntur Batzaya
Enkhtur Batzaya
Adiya Bileg-Ulzil
Baasansuren Alexander
Oyungerel Tserenjav
Oyun-Erdene Baasansuren
Tsetsenjargal Baasansuren
Togtokhbayar Dambadarjaa
Lkhagvasuren Bazarsuren

Interview Participants (Personal Geographies - Chingeltei-16):

Otgonchimeg
Uranchimeg
Batsukh
Tungalag
Zultsetseg
Mungunchime
Ariunaa
Surenkhорloo
Segelen
Bayarmagnai

Interview Participants (Personal Geographies - Sukhbaatar-16):

Dulamyumlaa
Ichinkhorloo
Enkhbaatar
Chintulga
Oyunbat
Narantsetseg
Bayasgalan
Altangerel
Buyankhishig

GER PLUG-IN

Design: Joshua Bolchover (Rural Urban Framework)

Project Team: Ben Hayes, Jersey Poon, Matthew Hung

Commissioning Donor: Lorinet Foundation

Contractor: ZAG Engineering Group LLC

GER INNOVATION HUB

Design: Joshua Bolchover and John Lin(Rural Urban Framework)

Project Team: Jersey Poon, Chiara Oggioni

Funding: Construction as partially funded by the Hong Kong Jockey Club
Charities Trust as part of the Jockey Club HKU Rural Urban Design Project

Partner: GerHub

Collaborators: EcoTown, The University of Hong Kong, HKU SPACE, Shonest Co
Ltd.

WASTE COLLECTION POINTS

Design: Joshua Bolchover (Rural Urban Framework)

Project Team: Matthew Hung, Yan Qian, Shivina Harjani, Johnny Cullinan

Client: The Asia Foundation, Mongolia and The Mayor's Office, Ulaanbaatar,
Mongolia

Design Institute: Toonto Grand

Image Credits: Rural Urban Framework (RUF)

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Architecture, The University of Hong Kong.*

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Rural Urban Framework is a not-for-profit design agency based at the Faculty of Architecture, The University of Hong Kong.

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