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11.307 Beijing Urban Design Studio  
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# 环境构架下的可变混合体

# flexible moduling in an environmental framework

## concepts

Viewing the environmental damage present on Shougang site as an opportunity rather than a hindrance to development, we have used the necessity of environmental reclamation to drive a new type of development. This new option for living in Beijing, allows not only the current residents who choose to remain on site, but also migrant workers, and environmentally conscious Beijingers the opportunity to live in a community committed to reclaiming both the environmental and social landscapes of the city.

The proposed environmental activities at Shougang give all residents the opportunity to make a difference in their environment. The modular expansion of housing provides smaller green spaces to all residents. In addition to providing income for Shougang, large-scale remediation efforts will also provide employment, income and training to migrant workers seeking to transition from a rural to an urban livelihood. The inclusivity of environmental action at Shougang will build a dynamic community, and this can be reflected in the development strategy.

Environmental remediation is the first phase of site development, necessitating large industrial spaces. As the initial development locations grow, these spaces are then subdivided to serve new functions. This gradual and adaptive programming allows the site to develop according to its needs over time.



## project principles

### environmental laboratory

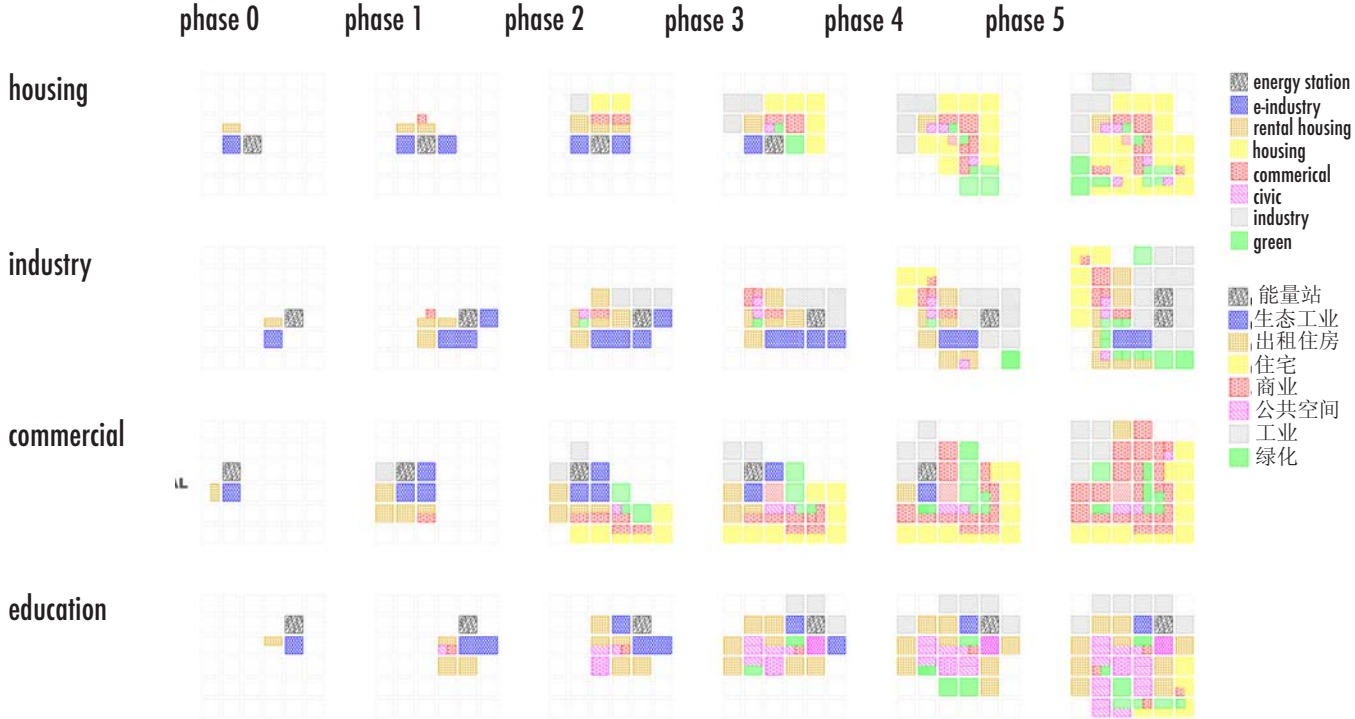
The site will develop as a laboratory and campus for the research and production of sustainable industries. The campus will provide vocational/technical training to both current residents and migrant workers. Additionally, it will provide integration support services to migrant workers, which would discourage the discrimination, manipulation and disenfranchisement that commonly occurs in the city

### modular framework

A flexible housing typology was created to help accommodate the shifting population needs and facilitate phaseal growth. These typologies take into account the shifting programs of large industrial buildings, and aims to provide all residents with the opportunity to work in the emerging green industries onsite.

## prototype for modular development

### 阶段开发原型



## 概念

对于首钢来说，现状的环境破坏是发展的机遇而非阻碍。我们希望通过环境更新来推动一种新的开发模式：一个在环境及社会景观上不断更新社区。除了“老北京”外，包括外来人口以及环保人士在内的北京人都有可能亲身体会这一新的城市景观。

环境产业的开发会为首钢场地内生活的人们带来多样的行为机会。一方面，将环境更新与住宅开发相结合，为住户们带来了拥有更多绿地的机会。另一方面，环境产业也可以为首钢提供经济利益以及再就业机会。此外，环境产业还能通过提供工作、收入及技能培训，使外来人口更好地经历由农村向城市的转型。因此，具有巨大包容性的环境产业将会为首钢创造一个动态中的社区，而以上的想法也会在未来的发展战略中得到体现。

为了获得大尺度的工业用地，环境更新是场地开发的第一步。随着第一阶段的逐渐推荐，一些工业空间将会被划分成若干新的功能区。这样分阶段具有高适应的开发模式提供了开发上不断与时俱进的可能性。



## phytoremediation techniques

### 植物修复技术

**Mechanics**  
Hydroponically raised plants placed in contaminated water concentrate the metals in their roots and shoots

Rhizofiltration

Contaminant migration via wind, rain, and groundwater prevented through planting

Phytostabilization

Plants absorb elemental metals from the soil and biologically convert them to gaseous metals and release them into the atmosphere

Phytovolatilization

Roots absorb contaminants and store them in above ground shoots

Phytoextraction

## 开发原则

**环境实验室**  
场地上将开发与环境产业相关的实验室及大学，为可持续产业的研究与生产服务。在提供职业教育的同时，大学会对住户及外来人口提供技能培训。此外，这一校园也会通过提倡平等有好的交流来为外来人口创造一个良好的成长环境。

## 模数框架

为了安置流动人口，同时推进场地的阶段性发展计划，我们设计了一个具有可变性的住宅原型。这一原型从大型工业建筑的可变性出发，努力让所有的住户都能参与到环境工业这一不断生长的产业中来。



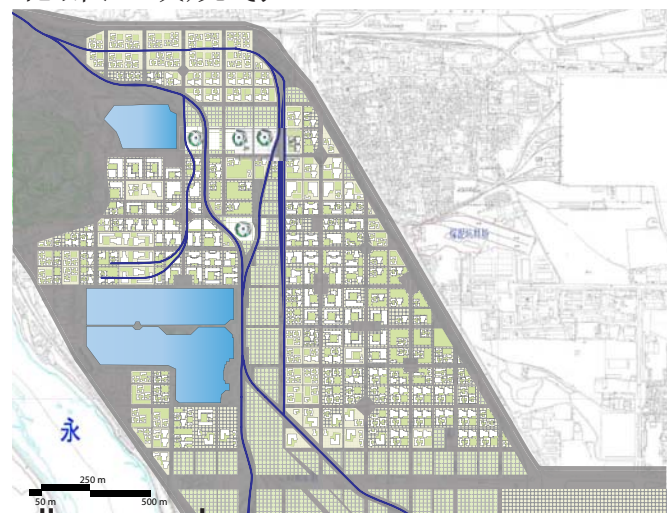


# 环境构架下的可变混合体

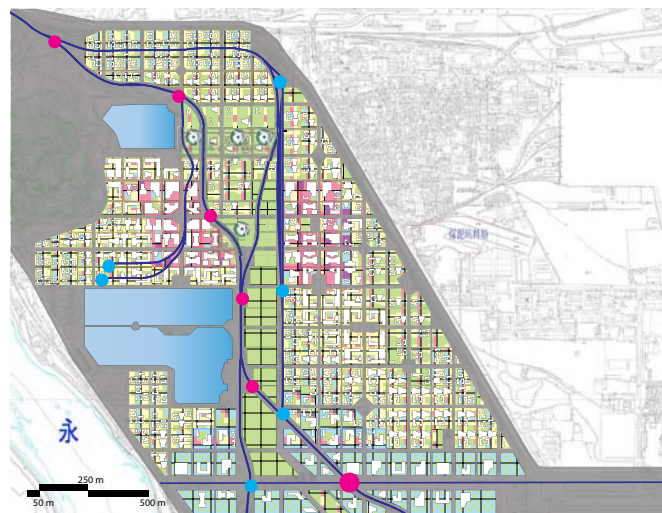
## flexible moduling in an environmental framework



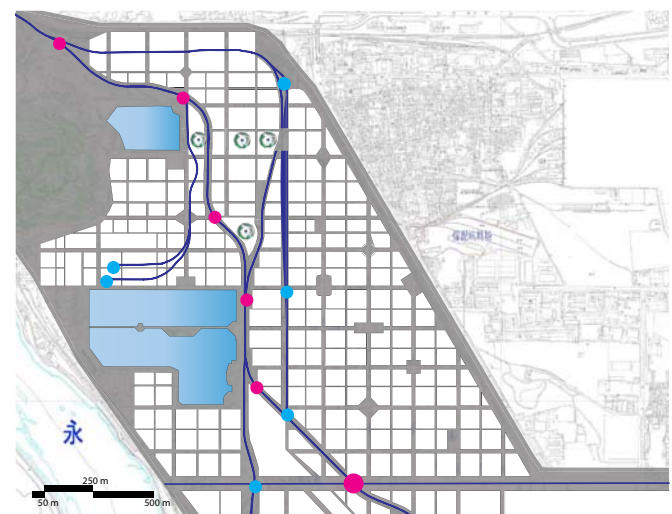
plans of northern area  
北部区域规划



illustrative plan  
规划示意图



land use  
用地示意图



open space and circulation  
开发空间与交通示意图

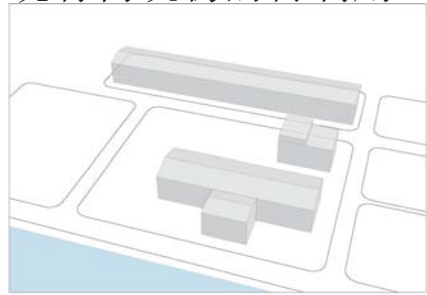


# 环境构架下的可变混合体

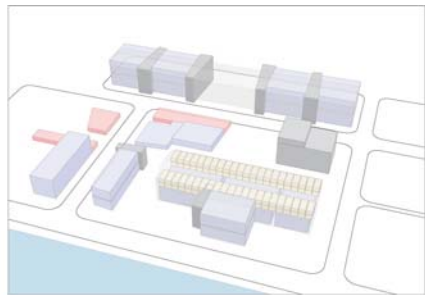
# flexible moduling in an environmental framework

## reprogramming of existing structures

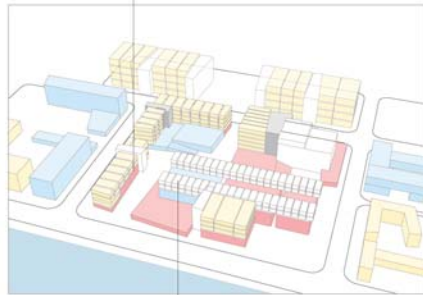
现有构筑物的再利用



Large existing buildings with adaptable interior space are reserved to first house soil remediation and related industries



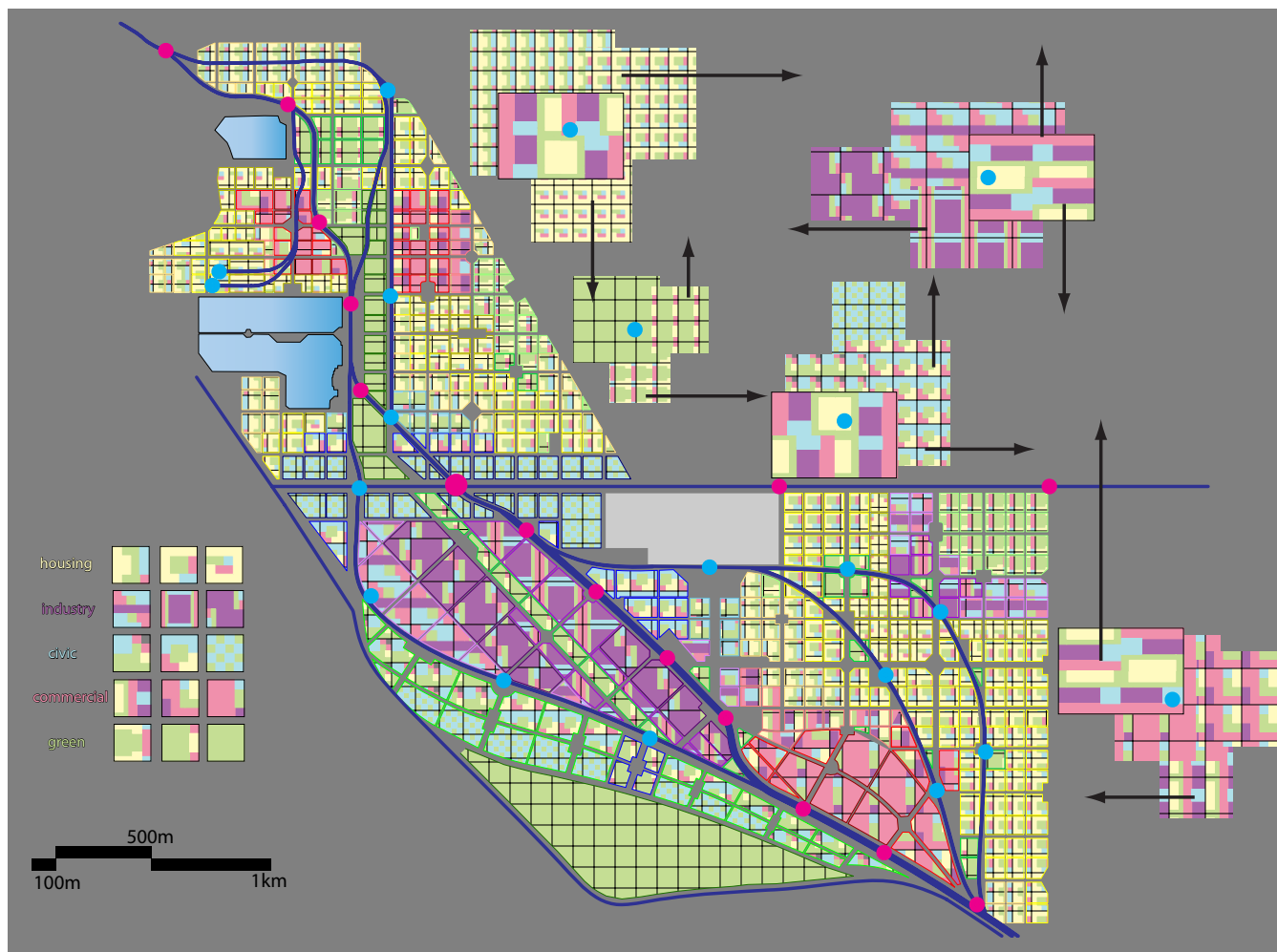
As soil remediation moves out of the major spaces, other industrial uses as well as migrant housing will move in provisionally as the rest of the site is developed into industrial and light commercial enterprises.



As the remediation activities move elsewhere on the Shougang site, the remaining industrial volume can be broken up into smaller commercial and residential spaces while larger spaces will become civic and entertainment venues.

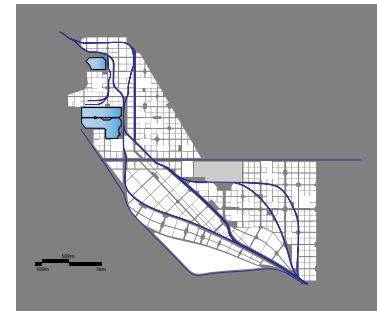
## land use diagram

用地分析图



## modular growth

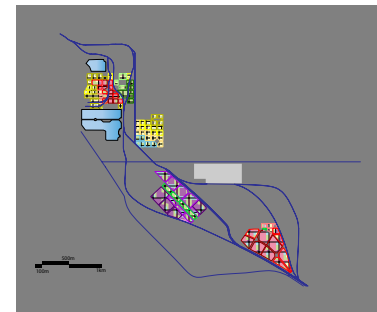
模数化生长



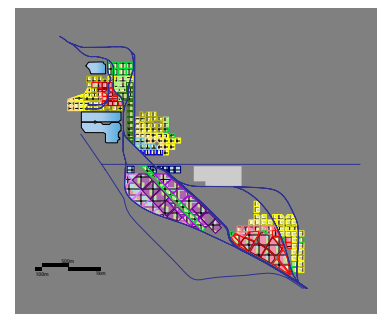
phase 0



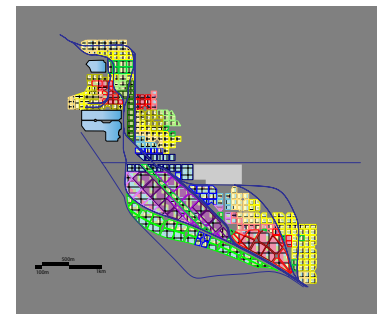
phase 1



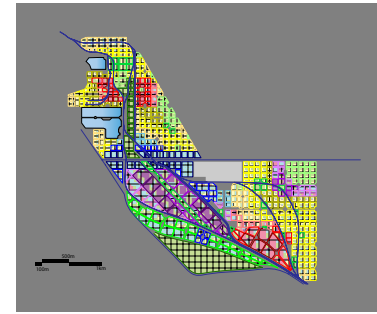
phase 2



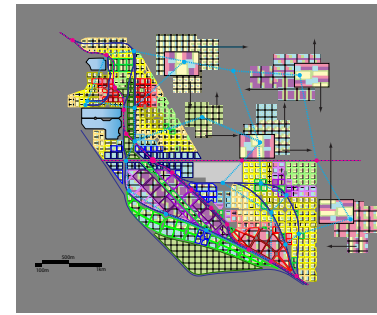
phase 3



phase 4



phase 5



phase N



Every resident can contribute to soil remediation of Shougang. 每一位住户可以为首钢的土壤更新贡献力量。  
By providing chances for residents to take polluted soil back home, people can plant vegetable as well as remediate soils. The trading relationship between companies and residents will encourage this social behavior. 土壤净化公司可与住户之间建立长期合作关系，住户们在进行园艺之类的休闲活动的同时便可净化土壤。

The villagers and migrants nearby can get cheap soil from Shougang. Finally, they can sell the remediated soil back to the company. 首钢附近的农户和打工者可以在这里购得廉价的土壤，他们将在家附近的土壤将会由公司再回收。

Professional Remediation Companies

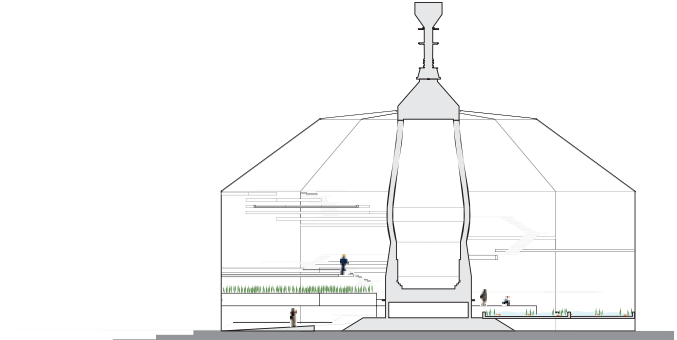
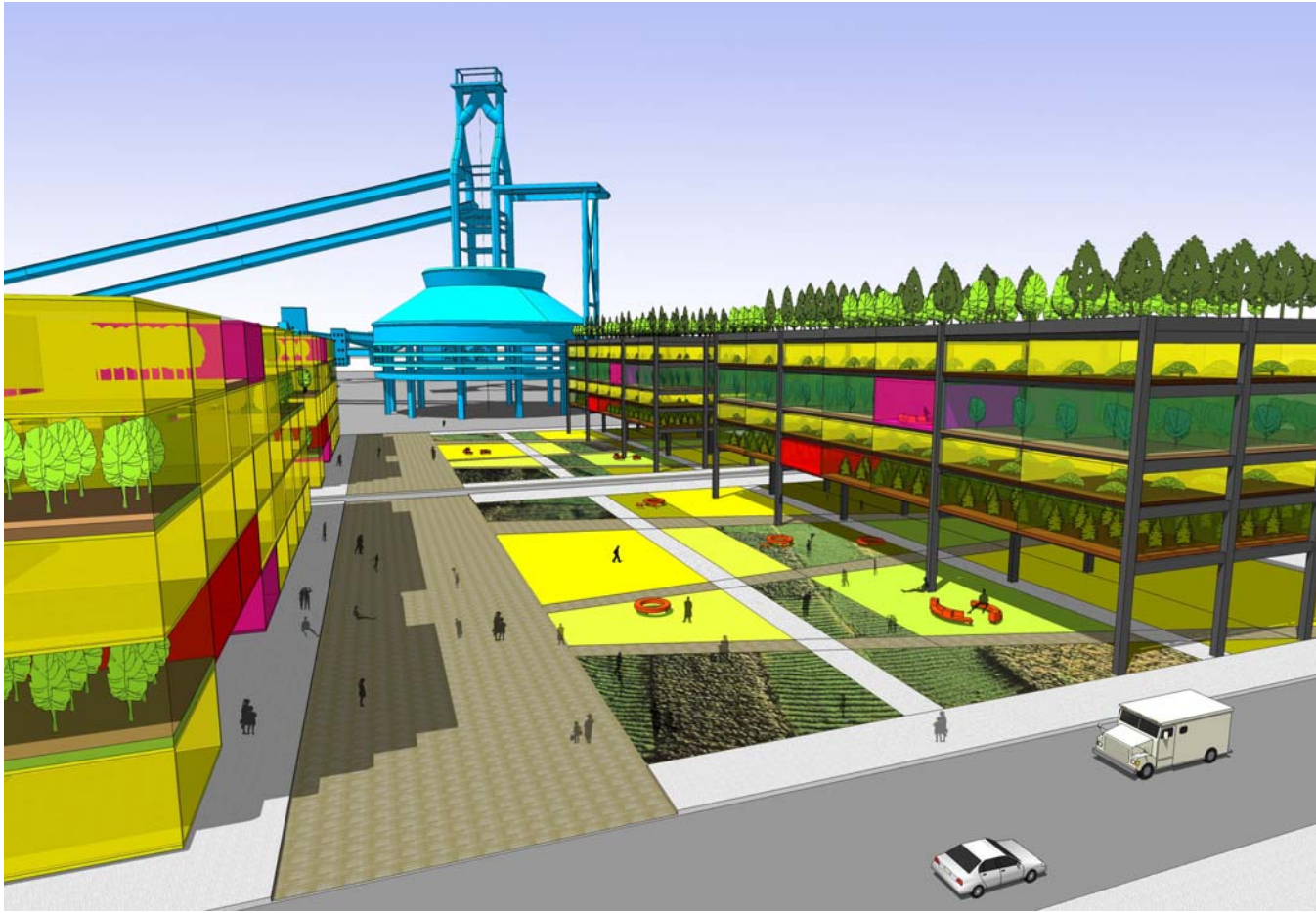
Three Major Forces in Soil Remediation | 土壤净化的三大主力



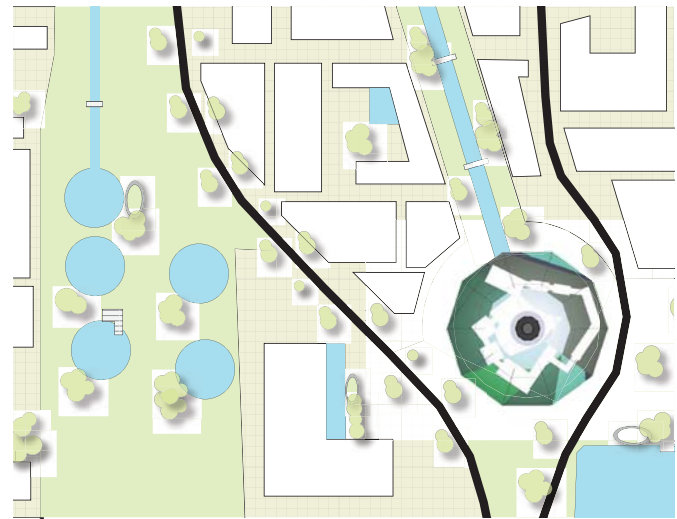
# 环境构架下的可变混合体

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furnace repurposed as a living machine  
高炉再利用设计-废水处理站

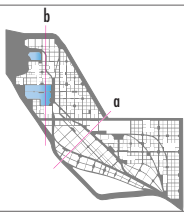
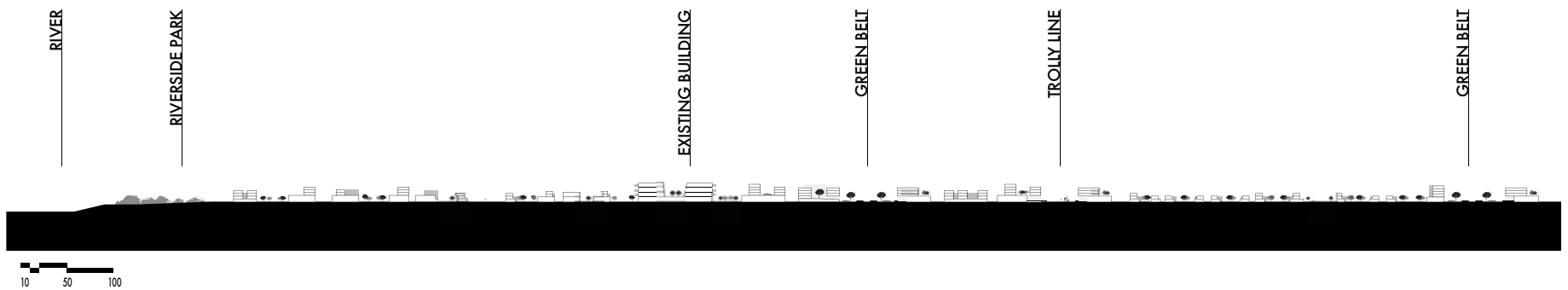


section  
高炉剖面图

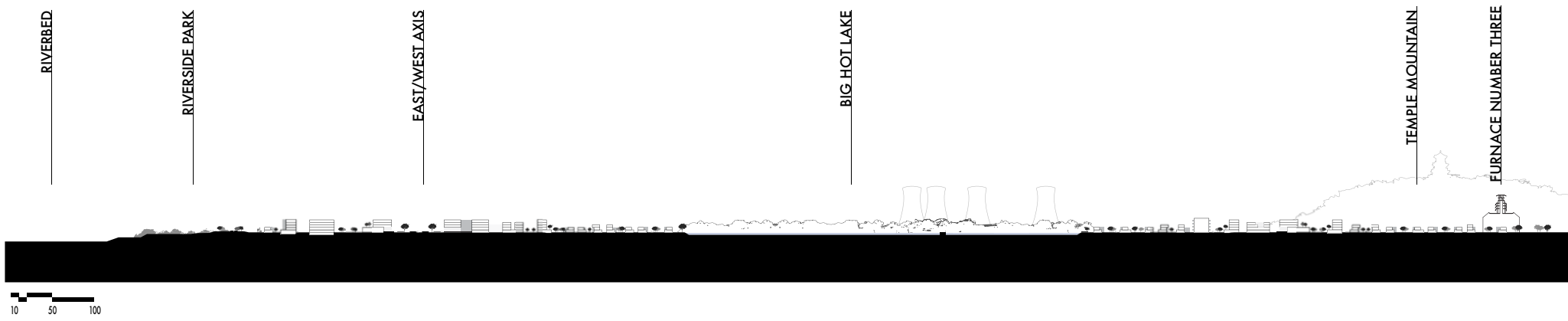


plan  
高炉周边场地设计

section a  
剖面a



section b  
剖面b

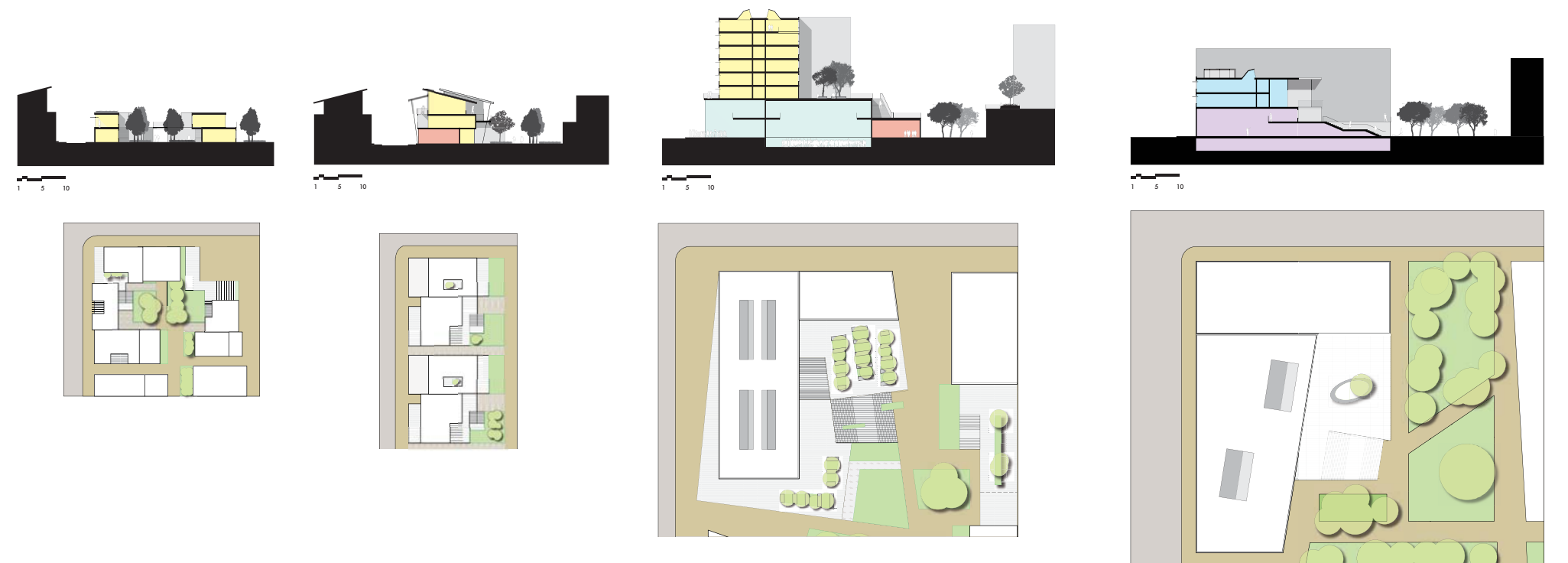




# 环境构架下的可变混合体

## flexible moduling in an environmental framework

housing typologies  
居住原型研究



building styles developed with flexible module logic  
混合可变体逻辑下的建筑类型研究

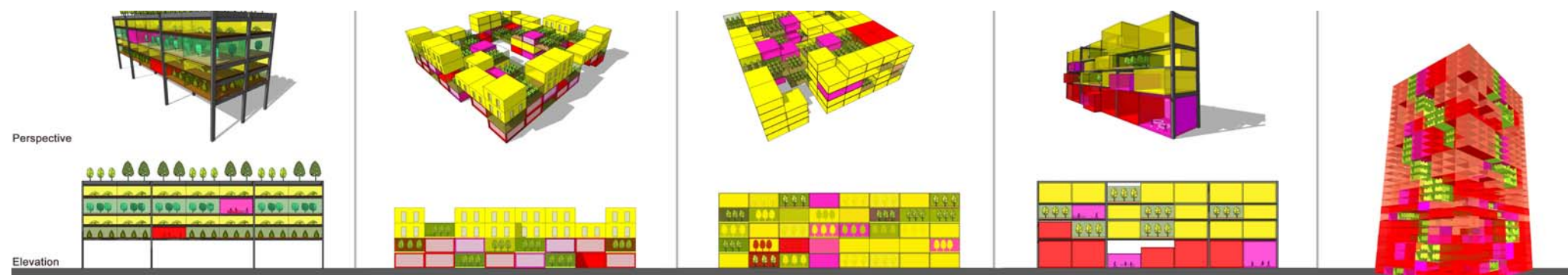
environmental industry

mixed use housing

housing

housing in repurposed structures

business tower



Environmental Industry | 土壤净化工业  
Building Styles Developed with FLEXIBLE MODULE Logic | 可变混合体逻辑下的建筑形式

Mix-Use Housing | 底商住宅

Housing | 住宅

Renovated Housing with Reserved Structure  
旧构造物开放新住宅

Business Tower | 商务写字楼

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