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## 美国加利福尼亚州旧金山默塞德公园社区 Parkmerced in San Francisco, California, USA

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1. 邻里公园
2. 总体鸟瞰图
1. Neighborhood park view
2. Aerial view of the site

### 摘要 ……

默塞德公园社区是对一个建于20世纪40年代的街区进行的再开发项目，以实现旧金山西南部一个面积为89hm<sup>2</sup>的街区的宜居性、环境可持续性和生态振兴为愿景。这一项目力图通过收集、回收和再利用雨水来重建景观。它将以汽车为主导的街区转变为一种整体的城市生态系统——一个以步行为主导的社区，其将拥有生产性的开放空间网络，应用新兴环境技术减少能耗与水耗，通过重新调整公共交通来减轻对汽车的依赖性，旨在成为美国首批零碳排放社区之一。

### 关键词 ……

雨水和渗透；街区宜居性；都市农业；环境可持续性；生态振兴；步行社区

### Abstract ……

Parkmerced is a re-development of a 1940s' neighborhood based on a vision of neighborhood livability, environmental sustainability and ecological revitalization for a 220-acre community in southwest San Francisco. The project seeks to capture, recycle and reuse stormwater to regenerate a landscape. It transforms a car-centric neighborhood into a holistic urban ecology — a pedestrian-focused community that establishes a productive network of open space, applies evolving environmental technologies to reduce energy and water usage, and resolves automobile dependency by realigning public transit. The goal is to be one of America's first net-zero carbon communities.

### Key words ……

Stormwater and Infiltration; Neighborhood Livability; Urban Farming; Environmental Sustainability; Ecological Revitalization; Pedestrian Community

项目地址：美国加利福尼亚州旧金山市  
项目面积：89hm<sup>2</sup>  
项目委托：Stellar管理公司  
景观设计：汤姆·里德景观设计事务所、SOM建筑设计事务所  
首席设计师：Tom Leader  
设计团队：Akiko Ono、Gabe Meil、Sarah Cowles Gerhan、Roman Chiu、Sara Peschel、Marguerite Graham  
设计时间：2010~2011年  
施工时间：2011~2015年  
建成时间：2015年（一期）  
所获奖项：2013年美国建筑师协会旧金山分会荣誉奖

Location: San Francisco, California, USA  
Area (size): 220 acres  
Client: Stellar Management Corporation  
Landscape Architecture: Tom Leader Studio, SOM  
Chief Designer: Tom Leader  
Project Team: Akiko Ono, Gabe Meil, Sarah Cowles Gerhan, Roman Chiu, Sara Peschel, Marguerite Graham  
Design Period: 2010 ~ 2011  
Construction Period: 2011 ~ 2015  
Completion Time: 2015 (Phase 1)  
Award: 2013 AIA San Francisco — Honor Award

### 背景

20世纪40年代，面对第二次世界大战后激增的家庭数量，美国陷入房源短缺危机。而伴随着当时文化的转型，郊区成为了美国人的理想之地，人们纷纷在远离城市的低密度开发区建造带有精心修剪的草坪的独户家庭住宅。如今，旧金山湾的许多区域呈现出蔓延式发展的特点。这导致了不可持续性消费的住宅文化和不对水资源和化学肥料加以控制的景观。默塞德公园社区就是其中的一个典型代表。

现在，默塞德公园社区被重建为以居民为本的社区，体现了旧金山文化的多样性以及城市对社会和经济公平的承诺。通过在现有城市环境中建设新住宅，默塞德公园社区将有助于扭转旧金山湾区当前的低密度发展格局，以及相关的扩张性土地消耗与自然栖息地破坏等现状。它将作为旧金山现有城市基础设施和运输系统改造计划的一部分，为居民的生活带来便利。

### 现状与愿景

当该场地于20世纪40年代首次被开发为居住区时，其起伏的地形被平整为大体向默塞德湖倾斜的平坦地面。原始的排水道被填埋，取而代之的是典型的地下水排水系统。雨水经由管道排到场地之外，汇入城市中的雨水及污水系统。这样一来，每年的降雨将无法为景观所利用。为了养护构成大部分开放空间的大片草坪——这是当时典型的景观潮流——城市中大量的可饮用水被用来灌溉人工景观。场地中贫瘠的土壤需要大量的化肥才能维持其肥力。部分化肥流入周边的河流，最终汇入默塞德湖，导致富营养化，并引发赤潮。这种做法绝不是一条可持续之路。

默塞德公园社区再生的自然系统和生物多样性将使这个地方发生一系列相关的实质性转变，主要涉及水和地形方面。纵观湾区的自然地形，季节性干旱的起伏丘陵间的裂缝和排水道由于全年湿润的土壤



和深层、丰富的冲积土堆积其中，往往成为了植物和动物的栖息之地。默塞德公园社区起伏的原始地貌使之拥有了许多裂缝状的排水道——“河岸走廊”。

策略

水体的流动框架将成为新的“树枝状”（如树枝般的）网络，将屋顶上的水引导至默塞德湖，并将这个地方的每一滴水都收集起来，用于调节气候和降雨。水流从屋顶的落水管流向生物沟，接着流入更大的生物洼地，然后再流入拥有“阶梯式”池塘和拦河坝的季节性河流中，最后汇入终端湿地/池塘，流入默塞德湖。在整个排水系统中，水在地表流动，并同时在流动的过程中向下渗透，从而提高土壤湿润度并补给含水层，提供乡土植被所需的水分，在新建的河岸走廊中为本地野生动物营造一片栖息之地。

水收集系统

一系列本土的、具有生物过滤作用的植物和草类可以在水流向默塞德湖和含水层的过程中对水体进行净化。地下车库上方的庭院将重现自然景观中的草甸和起伏丘陵。种植季节性耐水湿物种可为居民提供更广阔的开放空间。项目通过一系列与水有关的景观元素对水体进行处理，包括生物沟、生物洼地、新的河岸走廊、湿地和池塘。

此外，所有的街道和庭院均采用透水性铺装材料，使水能够渗透到硬质景观区域中。由于水能够被更加有效地分配到景观之中，加之乡土或适应性植物的种植，灌溉水的需求量将会减少50%。上游流域的水在流经洼地网络后，将被地下蓄水池吸收，用于补给上层地面的中央池塘/水库。蓄水池还可以收集场地外部的回收雨水。蓄水池的水将通过生物过滤河流对水库进行补给，有助于维持一定的水位高度以供养自发湿地物种和鱼类。池塘中的水可以通过重力供给对位于低处的农场进行灌溉。同时池塘溢流还将汇入新的河岸走廊。

生态走廊

栖息地恢复将以河岸走廊为主体，其丰富的环境资源将吸引大批包括昆虫和鸟类在内的本土野生动物。它还养育着当地流域常见的乡土植物——红桉木、接骨木、黑柳、大叶枫等，以及灌木、多年生植物和蕨类植物等下层乡土植物。

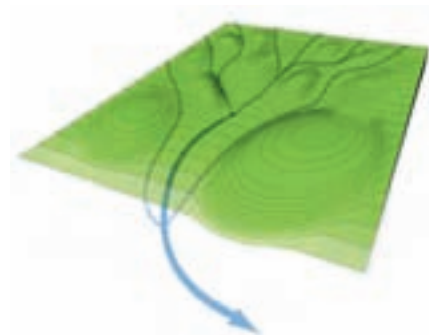
随着走廊的开发，以及一条与默塞德湖相连的、可以让居民亲身体验植物覆盖空间的游径系统的建立，本土野生动物——各种鸟类和小动物——将可以寻觅到许多遮蔽物和栖息地。通过维持害虫与其捕食者之间的平衡，这条走廊的存在还将有助于对整个区域进行综合虫害治理。

为了保护其生物多样性和公共健康，景观维护将按照综合的虫害治理和有机耕作方法进行操作。任何化学除草剂、杀虫剂或肥料将禁止在此地使用。

此外，景观将建立包括湿地、滨海林地和草甸等在内的多种生态区域。这一地区只种植乡土的或适应性的物种，以尽量减少耗水量，吸引本土野生动物。景观维护和耕种产生的绿色垃圾将被用做代替化学肥料。

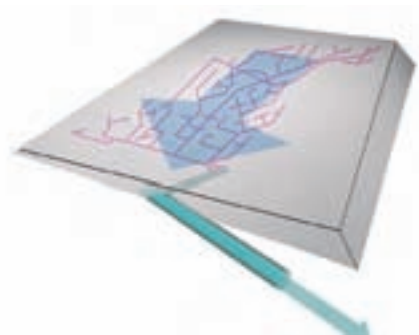
当地粮食生产

该社区将建设约1.6hm<sup>2</sup>的有机都市农场和果园来推动当地的粮食生产。它们将成为经生物过滤的再生水灌溉的自然系统的一部分。以水岸走廊为边界，农场将种植适应本地微气候的蔬菜和水果。肥料源自该地产生的绿色垃圾，这样既提供了有机肥料，也减少了该地倾倒的垃圾。农场生产的农产品将供应位于农田附近的餐厅。农场和餐厅将在默塞德公园社区内提供一种独一无二的“从农场到餐桌”的体验。此外，这里还为个体居民提供了种植植物和蔬菜的机会——从个人花园到社区药草园，从公寓阳台上的花盆到农场和屋顶上的温室，都将成为场地的组成部分。LAF



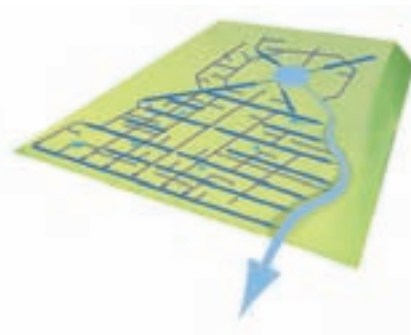
ORIGINAL 原始地形

Natural drainage system allowed for infiltrating and filtering of rainfall. Topographic channels runoff to Lake Merced. 原始地形为可渗透并过滤雨水的自然排水系统。由地形自然形成的排水道将雨水引流至默塞德湖中。



当前地形

Site was graded to flat "tabletop" condition for development in 1940s. Currently all stormwater pipes to treatment plant or overflows into bay or ocean. 因发展需要，场地于20世纪40年代被平整为如“桌面”般平坦的地块。当前所有的雨水都经由管道流向污水处理厂，或溢流至海湾、海洋中。



PROPOSED 规划地形

Proposed drainage system of rain gardens, bioswales and biogutters mimics natural system, water is channeled to new riparian corridor, riparian corridor filters water and restores connection to Lake Merced. 通过由雨水花园、生物洼地、生物水槽组成的规划排水系统模拟了自然系统，使得雨水可以经由渠道流入新的河岸走廊中。这条河岸走廊具有净化水体的功能，并与默塞德湖相连接。 3

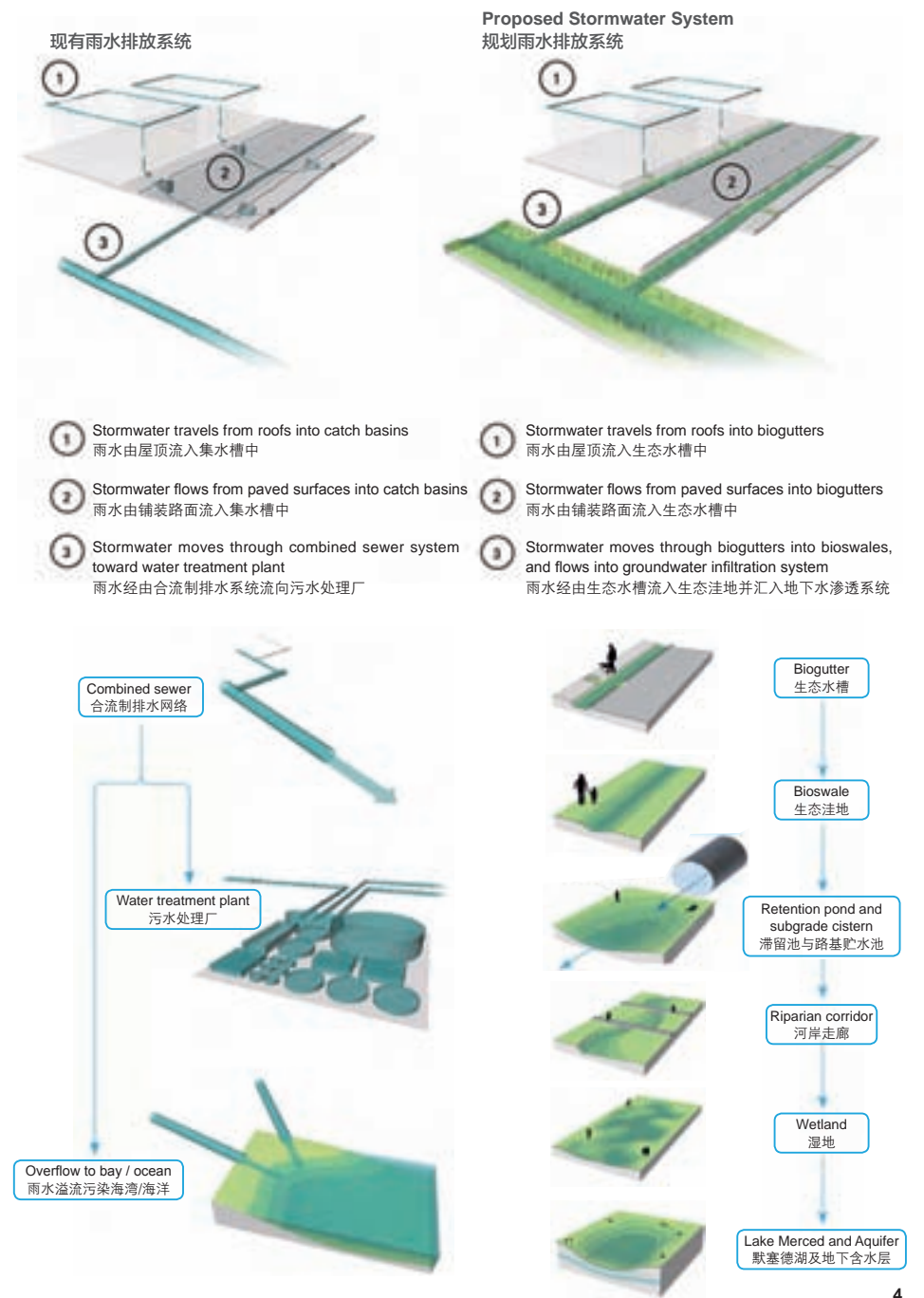
Background

The 1940s was a time when the United States faced a crisis precipitated by the need to accommodate an explosion of new households following World War II. This moment was accompanied by a cultural shift in which the American ideal became the suburban. This ideal was embodied in the single family house constructed in low-density developments, with manicured lawns, removed from the city. Today, much of the San Francisco Bay Area is characterized by the sprawling development pattern. The result is a housing culture of unsustainable consumption and a landscape based on unlimited resources of water and synthetic fertilizers. Parkmerced was typical of that viewpoint.

Parkmerced now is regenerated to be a resident-oriented community that reflects the richness of San Francisco's cultural diversity and the city's commitment to social and economic equity. By providing new homes within an existing urban environment, Parkmerced will help to reverse the Bay Area's current model of low density development and the associated sprawling consumption of land and destruction of natural habitats. It will participate in the improvement of San Francisco's existing urban infrastructure and transportation system on which its residents will be able to conveniently rely.

Current Conditions and Vision

When the site was initially developed as housing in the 1940s, this rolling topography was graded into a basically flat tabletop that tilted towards Lake Merced. The original drainage ways were filled in and replaced by a typical underground storm drain system in which water was diverted into pipes and directed off-site into the city's combined storm and sewer system. In doing this, the landscape was deprived of the benefit of nearly all of its



- 3. 地形分析
- 4. 改进的雨水排放系统
- 3. Topography
- 4. Improved stormwater system

annual rainfall. In order to support the vast areas of lawn that comprised most of the open space, typical of the landscape fashion at that time, huge amounts of potable city water were then needed to irrigate this artificial landscape. Large quantities of chemical fertilizers were necessary to maintain soil

fertility in this sterile monoculture. Some of this fertilizer runs off into surrounding streams and, eventually, into Lake Merced, causing algae blooms from nutrient overload. These practices can no longer be sustained.

Regenerated natural systems and biodiversity at Parkmerced will emerge from

an interrelated series of physical changes to the site, primarily concerning water and topography. Looking at the natural topography of the Bay Area, the clefts and drainage ways between the seasonally dry rolling hills typically support the most flora and fauna due to year-round soil moisture and deeper, richer alluvial soils that collect there. In its original state, Parkmerced had this rolling topography with several cleft-like drainage ways — “riparian corridors”.

**Strategy**

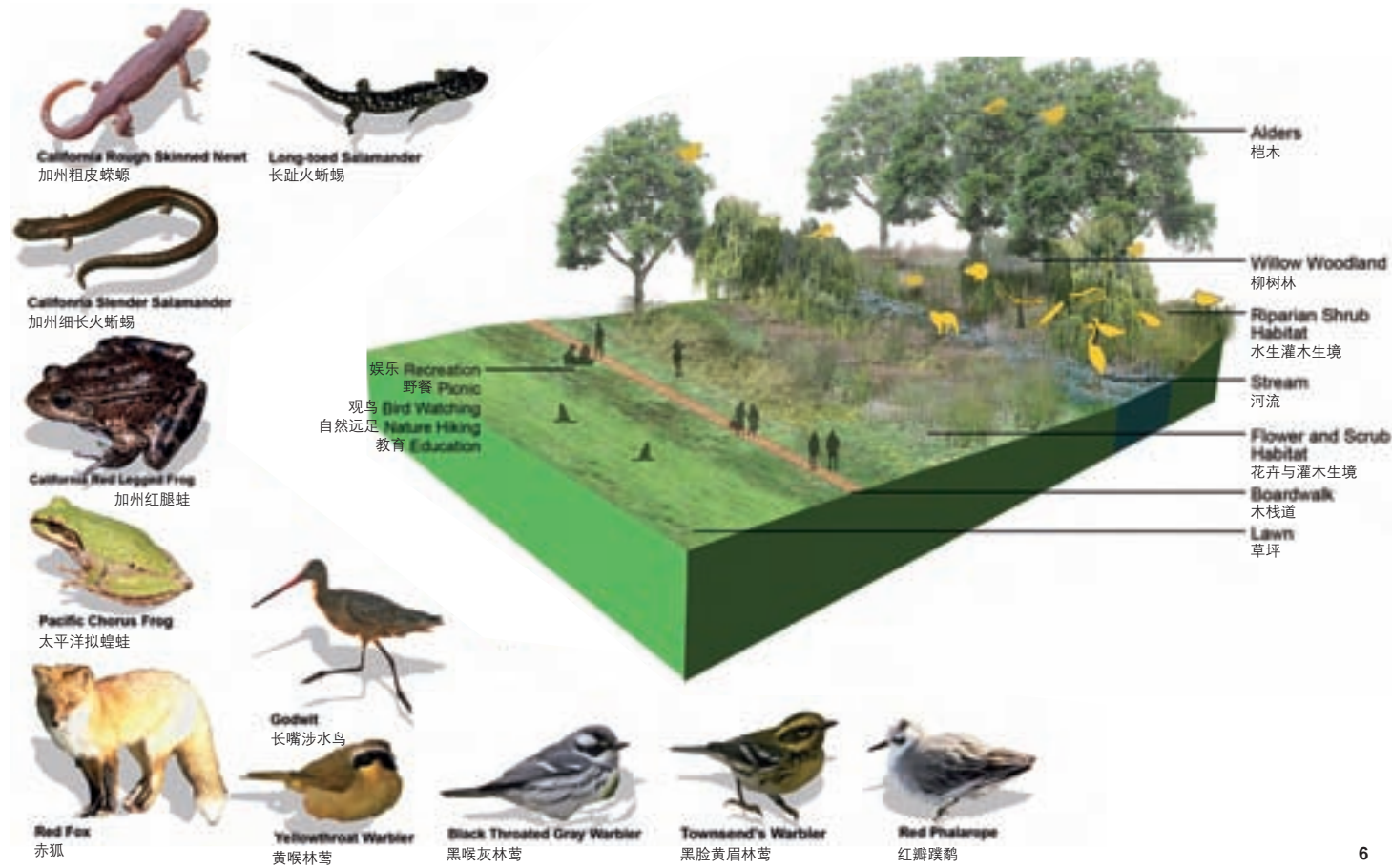
The armature for this water movement would be a new “dendritic” (branchlike) network leading from rooftops all the way to Lake Merced, to conserve every drop of



- ① Check dams slow water, allow ponding and infiltrating  
拦砂坝使水流减速, 从而实现积水成池、雨水下渗
- ② Stream channel profile maximizes biodiversity  
河道将使生物多样性最大化
- ③ Riparian corridor planted with diverse palette of native species to increase habitat: canopy, understory and grasses  
河岸走廊在乔木、林下层与地被层种植了一系列乡土物种以增加栖息地
- ④ Organic farm  
有机农场
- ⑤ Pedestrian path  
步行道

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- 5. 规划滨水廊道
- 6. 野生动物示意图
- 7, 8. 邻里公园雨水回收利用系统
- 5. Proposed riparian corridor
- 6. Wildlife diagram
- 7, 8. Neighborhood park stormwater system



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water that the site receives and put it to use in balance with the climate and rainfall. The water would travel from roof downspouts to bio-gutters, to larger bio-swales, to a seasonal stream with a “laddered” series of ponds and check dams, and finally, to a terminal wetland / pond that outflows to Lake Merced. Throughout this drainage system, water would move across the surface of the ground, infiltrating as it goes, recharging soil moisture and aquifer, supporting native vegetation, and providing habitat for native wildlife in a newly created riparian corridor.

**The Water Collection System**

A palette of native, bio-filtering plants and grasses will be used to cleanse the water as it makes its way to Lake Merced and the aquifer. The courtyards, perched over subterranean garages, will act as the meadows and rolling hills of the displaced natural landscape, planted with species adapted to the seasonal water availability and providing broader open spaces for residents. The water will be treated through a series of water-related landscape

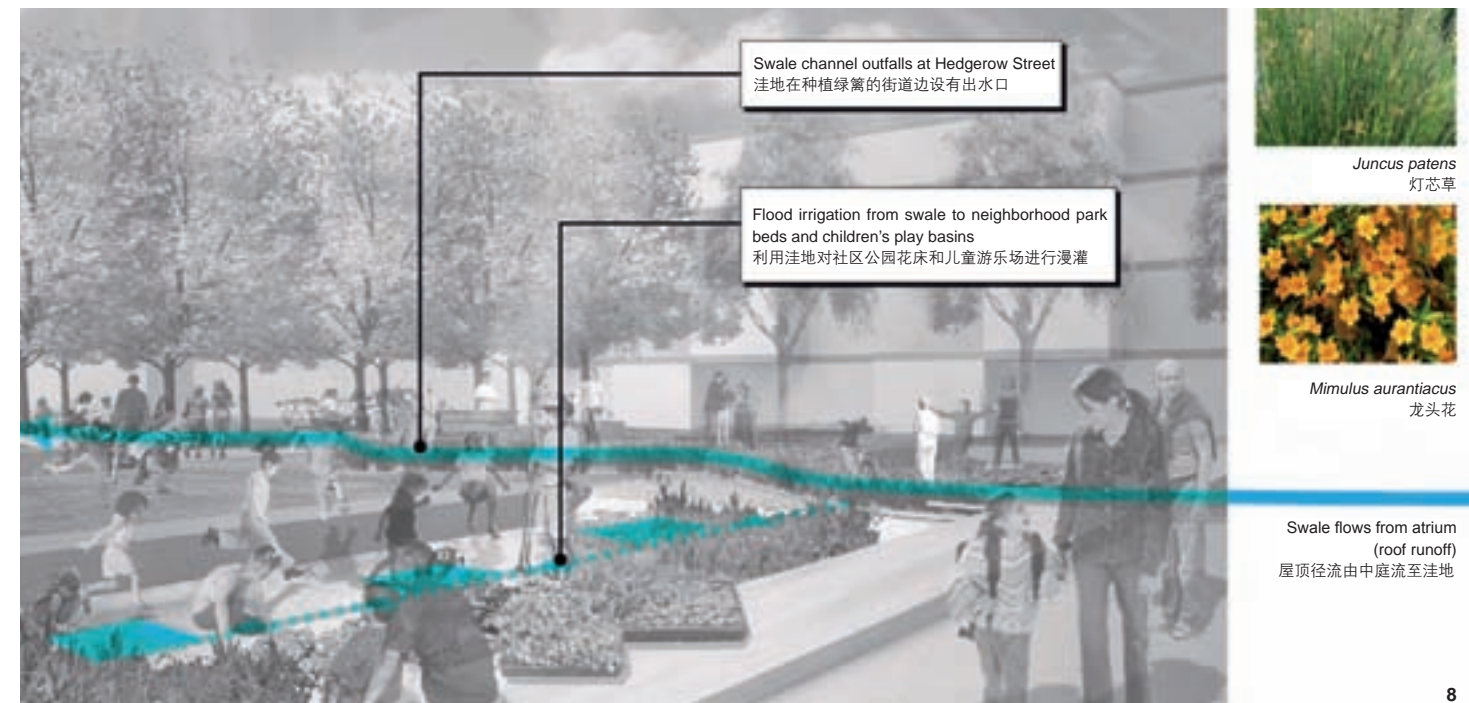


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elements including bio-gutters, bio-swales, a new riparian corridor, wetlands and ponds.

In addition, permeable paving will be installed at all the alley streets and courtyards, to allow water to infiltrate at these hardscape areas. Because water will be more efficiently distributed to the landscape and native or adapted plants will be used, irrigation needs

will be reduced by 50%. After passing through the network of swales, the water within the upper watershed will be received in an underground cistern that will feed an above ground central pond / reservoir. Off-site recycled water can also be received at the cistern. Water from the cistern will fill the reservoir via a bio-filtered stream and serve to



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maintain a consistent water level in support of emergent wetland species and fish. Water from the pond can also irrigate the farm below on a gravity feed. Surface flow leaving the pond will enter the new riparian corridor.

**The Ecological Corridor**

The riparian corridor will be the backbone of the habitat restoration, its rich

environmental resources will attract an array of native wildlife from insects to birds. It will also support native vegetation typically found in local streams — red alders, elderberry, black willow, big leaf maple, etc., along with an understory layer of native shrubs, perennials and ferns.

Native wildlife, a variety of birds and small animals, can find plenty of cover and

habitat as the corridor develops and a trail system will allow residents to experience the canopied space as well as connect to Lake Merced. The existence of this corridor also lends assistance to integrated pest management over the entire site as a balance between pests and predators emerges. In order to protect biodiversity and public health, landscape maintenance will follow integrated pest management and organic farming methods. No chemical herbicides, pesticides, or fertilizer will be used on site.

In addition, the landscape will create a variety of ecological zones including wetlands, coastal woodlands, and meadows. Only native or adapted plant species will be used on site, both to minimize water consumption and to attract native wildlife. All green waste created by landscape maintenance as well as farming will be composted on site and used in place of commercial fertilizers.

**Local Food Production**

Locally based food production will also be promoted on a four-acre organic urban



9, 10. 庭院雨水回收利用系统  
11, 12. 河岸走廊与都市农业雨水回收利用系统  
9, 10. Courtyard storm water system  
11, 12. Riparian corridor and farm storm water system

farm and orchard. They will be folded into this natural system irrigated by bio-filtered recycled water. Bounded by the riparian corridor, the farm will grow vegetables and fruit that are well suited to the site's microclimate. Compost created from green waste generated on the grounds will provide

organic fertilizer and reduce the amount waste trucked off the site. The produce from the farm will be used to supply a new restaurant located adjacent to the farm parcel. The farm and restaurant will provide a unique farm-to-table experience within Parkmerced. In addition, a variety of opportunities for

individual residents to cultivate plants and vegetables will be incorporated into the site, from individual garden plots to community herb gardens, and from apartment terrace planters to greenhouses within the farm and on the roofs of the buildings. **LAF**

