

RE-CHARGE: RESEARCH PARK

ADAPTIVE REUSE AND GREENWAY

FOR A DESERVING COMMUNITY

Vicki Rand | Capstone Project Studio | Summer 2021 | Instructors: Pamela Brief, Meg Coffee, Jim Pickel

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VICKI RAND, UCLA EXTENSION LANDSCAPE ARCHITECTURE CERTIFICATE PROGRAM
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<https://www.latimes.com/california/story/2020-10-16/exide-bankruptcy-decision-vernon-cleanup>

INTRODUCTION

PROJECT STATEMENT

Unregulated dumping of hazardous chemicals used in the manufacturing of batteries for over fifty years on this abandoned industrial site seriously degraded and contaminated the soil and polluted the neighboring community.

Ecological remediation and a regenerative design plan will revitalize this toxic site for adaptive reuse while encouraging biodiversity and creating a greenway to benefit the community.



<https://www.latimes.com/california/story/2020-10-16/exide-bankruptcy-decision-vernon-cleanup>

PROJECT JUSTIFICATION

Although undergoing a previous bankruptcy reorganization, in 2015 the Georgia-based Exide company admitted to years of environmental crimes and in an agreement with the U.S. Attorney's Office for the Central District of California and was allowed to permanently close the plant to avoid prosecution. Work began to close and clean the site in 2017, but stopped in March 2020, citing the COVID-19 pandemic. The company filed for bankruptcy protection again in May 2020 with plans to liquidate its assets leaving the property abandoned and the state of California responsible for the clean-up.

The facility remains half-demolished and partially covered in white plastic sheeting, scaffolding and a negative pressure system designed to prevent the release of more lead, arsenic and other hazardous pollutants into the air and the soil.

The predominately Latino communities who surround the site have suffered with ongoing health issues and have fought for decades with the company and its environmental regulators to restrict harmful pollution, shut down illegal operations and clean up the toxic mess.

Thousands of yards of soil are still contaminated with lead and other toxic chemicals requiring an honest and ambitious effort to restore it to health. Using landscape architectural and environmental best practices of adaptive reuse, water stewardship, site restoration and remediation, this landscape should become an example of a socially equitable green space benefitting the community.



BACKGROUND

CALIFORNIA



- 15 Acres, 3 Parcels
- Industrial City of Vernon
- Major railway hub/ distribution center
- Factories, manufacturing and processing plants
- Main streets: E. 26th Street, Bandini Blvd and Indiana Ave
- Residential area of Boyle Heights/ East LA to the north
- Residential area of Maywood/ Huntington Park to the south
- Adjacent to LA River

LOS ANGELES



VERNON





1. BANDINI BLVD ENTRANCE



2. BANDINI BLVD ENTRANCE



1. BANDINI BLVD LOOKING WEST



2. BANDINI BLVD ENTRANCE



3. FACTORY FROM E 26TH ST



4. FACTORY FROM E 26TH ST



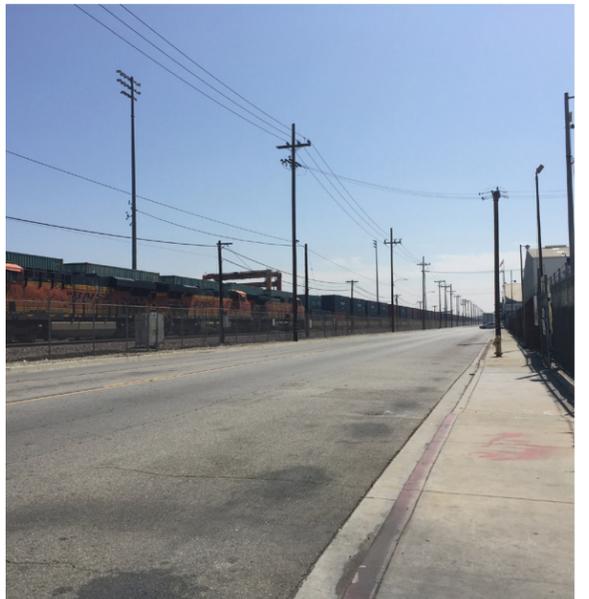
5. FACTORY FROM INDIANA AVE



3. BANDINI AND INDIANA LOOKING NORTH



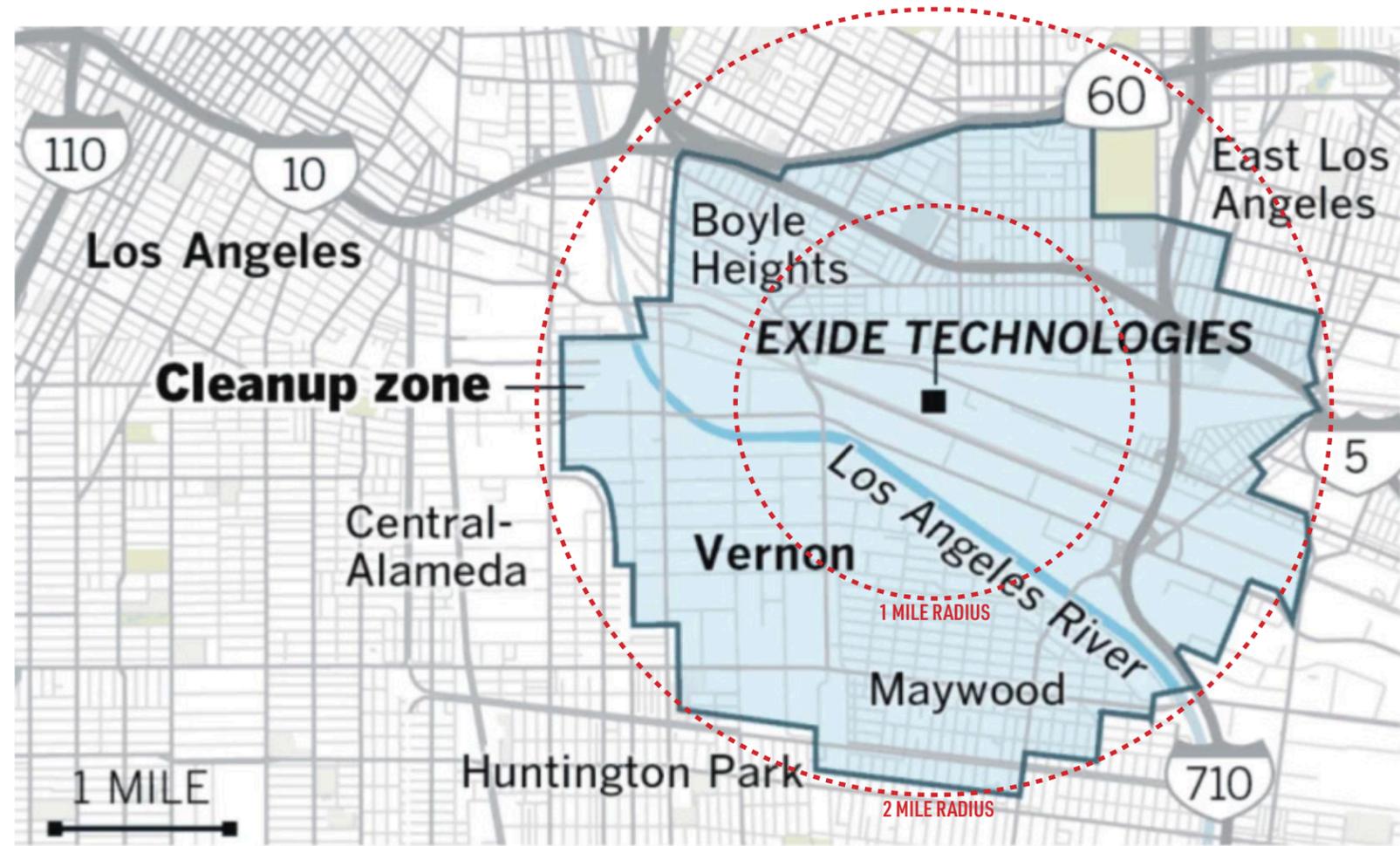
4. INDIANA STREET LOOKING WEST



5. E 26TH ST RAILYARDS

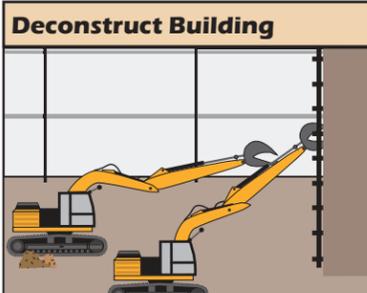
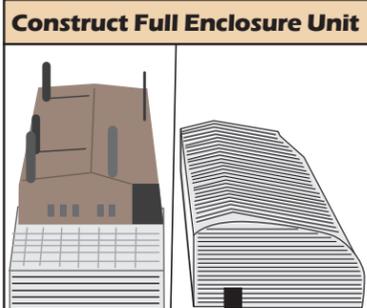
Over 11 million used lead batteries were processed each year. The plant emitted toxic metal dust over decades that contaminated as many as 10,000 homes in the working-class Latino communities near the plant — Boyle Heights, Maywood, East Los Angeles, Commerce, Bell, and Huntington Park. Lead is a neurotoxin that causes harm to most organs, but it most commonly causes cognitive deficits, neuro-developmental delays, and psychological impairments. The soil beneath the facility tests high for toxic metals. The groundwater was also polluted from the operation of the plant and corrosive and irritating sulfates drained onto public streets.

- 1981 California regulators issue Gould Inc. a permit to operate the Vernon battery recycling plant under “interim status” while documented violations were already occurring. The smelter had been in operation since 1922.
- 2000 Exide took ownership of the smelter when they purchased the Gould National Battery Company and its assets.
- 2002 Exide files for Chapter 11 bankruptcy protection facing default on more than \$2.5 billion in debt.
- 2008 Air quality officials order Exide to cut production by almost half.
- 2013 Exide under federal criminal investigation for emitting high levels of harmful pollutants. The state Department of Toxic Substances Control issues an emergency order directing Exide Technologies to clean up lead and other metals that have been deposited near its Vernon plant.
- 2014 State regulators greatly expand the area of homes, schools and parks that will be tested for lead-tainted soil. Crews begin removing contaminated soil from homes in Boyle Heights. Exide Technologies receives a subpoena from a federal grand jury in connection with a criminal investigation involving its Vernon plant. Governor Jerry Brown signs a bill setting a deadline for the state Department of Toxic Substances Control to either grant the Exide company a full hazardous-waste permit by the end of 2015 or shut the facility down.
- 2015 Exide is cited for hazardous-waste violations after inspections find the plant was treating and storing contaminated sludge in unauthorized tanks that lacked an adequate containment system to prevent spills. Inspectors also find holes in the facility’s walls and roof, among other problems. The company signs an agreement with the U.S. Attorney’s Office to close permanently allowing them to avoid prosecution for environmental crimes while agreeing to pay \$50 million to demolish and clean the plant and surrounding communities including \$9 million set aside for removing lead from homes. Authorities say the removal of lead-contaminated soil from thousands of homes near the Exide plant would be the largest cleanup of its kind in California and among the biggest conducted nationwide.
- 2016 Governor Brown signs legislation directing \$176.6 million to expedite the sampling of approximately 10,000 residential and other sensitive land use properties within the Parcel Impact Assessment (PIA) area and to cleanup as many as 2500 properties with the highest levels of lead in soil and greatest risk of exposure.
- 2017 Community activists are driving a growing national conversation about environmental justice, the idea that communities of all races and incomes should have the same kind of environmental quality and protection. One of the leaders of this movement, mark! Lopez receives the 2017 Goldman Environmental Prize, for the work he did with his Southeast L.A. based community group, East Yard Communities for Environmental Justice.
- 2018 Exide files for Chapter 11 bankruptcy protection.
- 2019 California Dept of Toxic Substances Control intervenes after Exide fails to fully investigate contamination.
- 2020 Exide Technologies stops cleanup citing Covid-19 Pandemic. Court approves bankruptcy. Taxpayers will fund the cleanup.
- 2021 Governor Newsom budget proposes \$454M for Vernon battery plant site.



Source: California Department of Toxic Substances Control @latimesgraphics



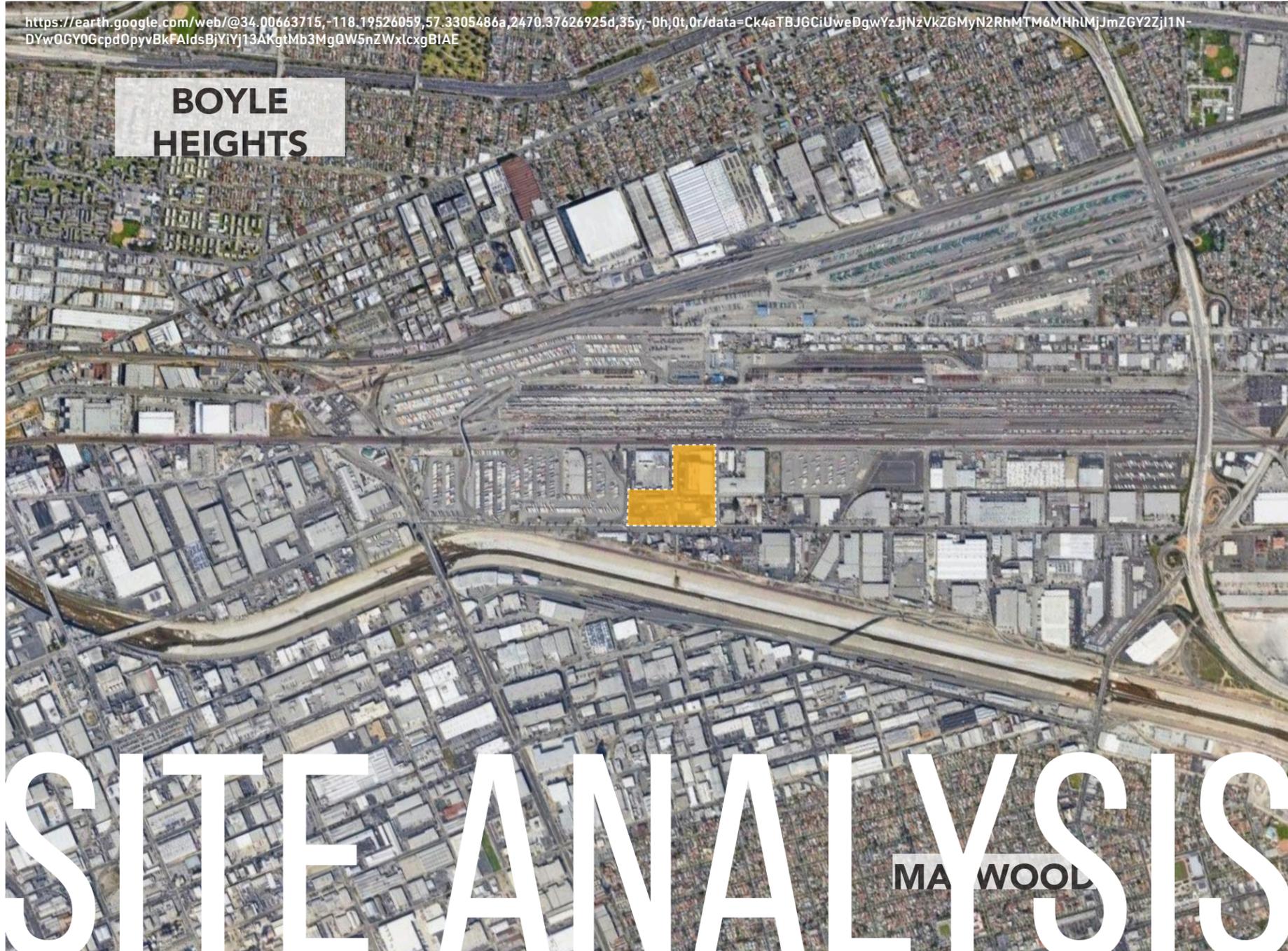
<p>Preparation</p>  <p>CAUTION</p> <p>To protect the community, a barrier fence and warning signs have been put up around the former Exide facility. Workers must have health and safety training to work on site.</p>	<p>Waste Disposal</p>  <p>Workers will transport hazardous waste to a specialized landfill and decontaminated metal to a recycling center. The trucks carrying the waste have a yellow flag attached to the back and avoid driving in residential areas.</p>
<p>Deconstruct Building</p>  <p>Deconstruction is done under negative air pressure to prevent dust from moving off site. Workers will deconstruct the building by using excavators to cut metal and tear down each piece of the building.</p>	<p>Decontaminate Building</p>  <p>Once the enclosure units are built, workers will vacuum and power wash the buildings then remove all interior materials.</p>
<p>Construct Full Enclosure Unit</p>  <p>Contractors built full enclosure units around the buildings to be deconstructed.</p>	<p>Post Deconstruction</p>  <p>After deconstruction is done, workers will pave the area of the removed buildings. After this is complete, they will wash, dismantle, and safely dispose of the full enclosure units.</p>

<https://www.epa.gov/ca/former-exide-battery-recycling-facility-vernon-california>

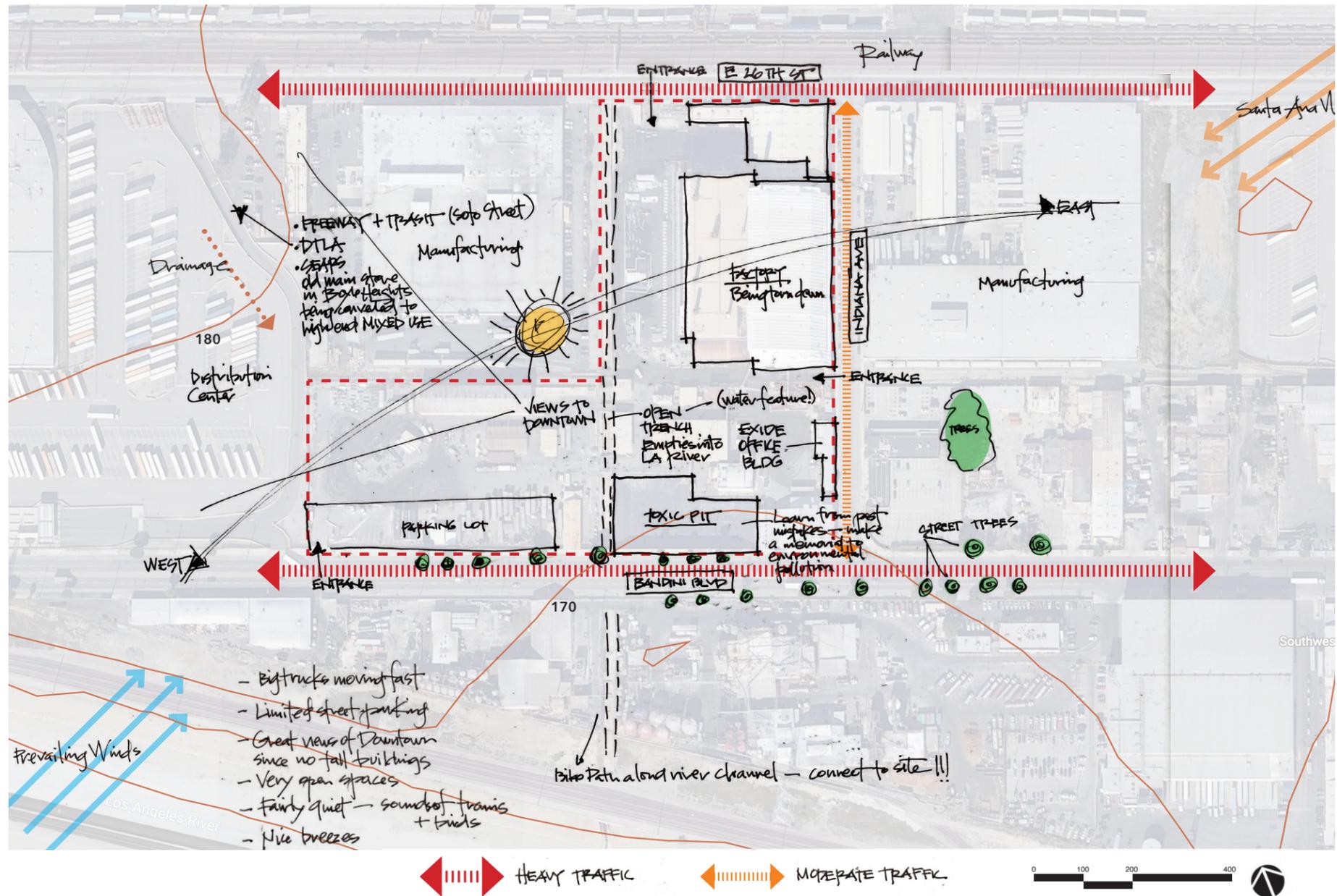
DECONTAMINATION AND DECONSTRUCTION

In a settlement resolved in the U.S. Federal Court in 2020, EPA is to oversee the work of the of the Vernon Environmental Response Trust for the decontamination and deconstruction of the Exide facility. The estimated date of completion of the work at the facility is December 2023. Then, a two-year period of operations and maintenance will follow at the site where the support buildings will remain boarded up as the funds are no longer available to deconstruct and decontaminate them.

DTSC leads the residential soil sampling and cleanup program.

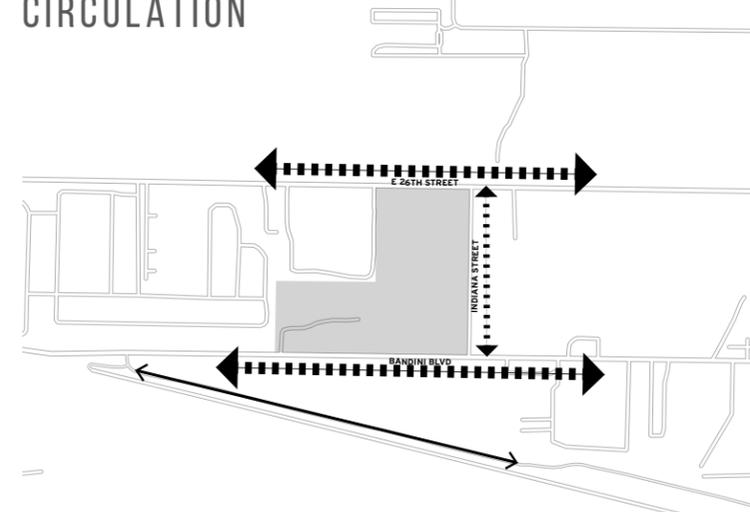


CONTEXT : FIELD OBSERVATION

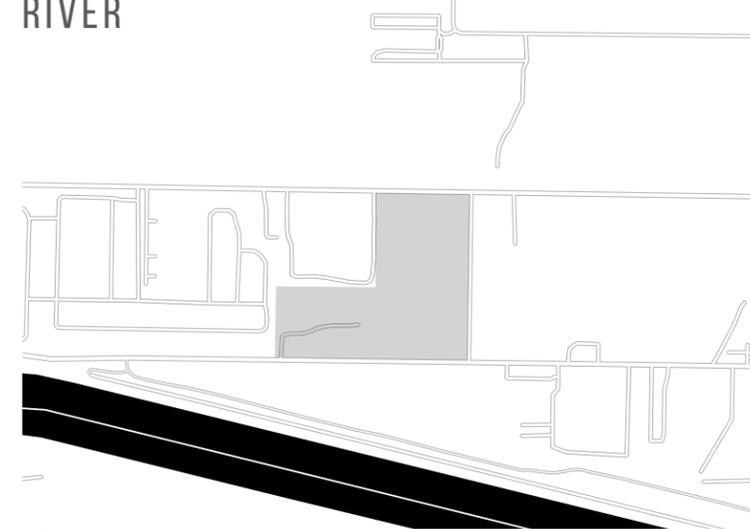


ANALYSIS DIAGRAMS

CIRCULATION



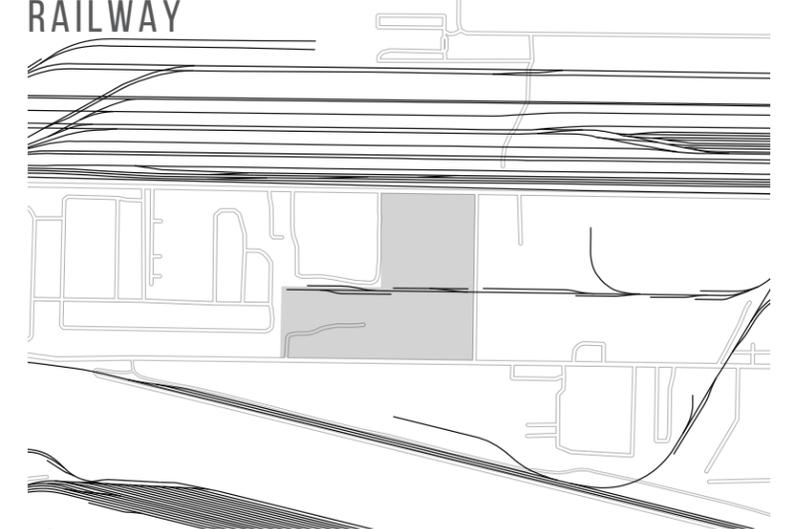
RIVER



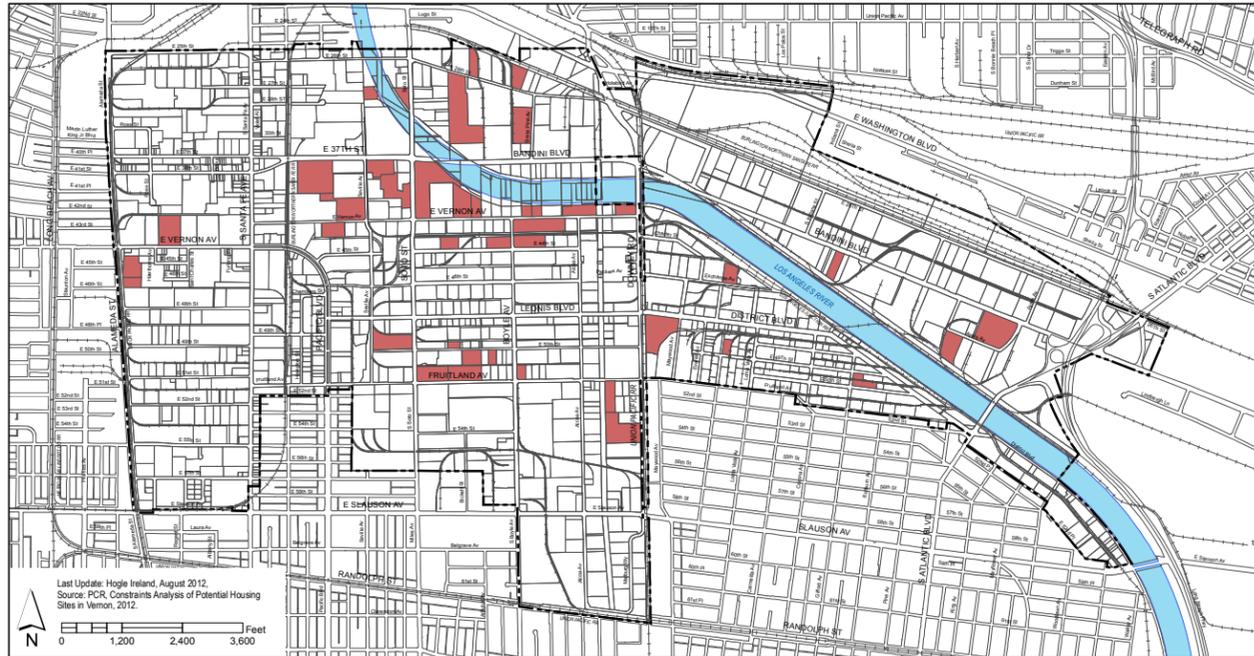
BUILDINGS



RAILWAY



TOXIC SUBSTANCE REGULATION



LEGEND

Companies with Regulated Substances Exceeding Threshold Quantities California Accidental Release Prevention (CaiARP) Program

City Boundaries

— Vernon City Boundary

- - - - - Vernon Sphere of Influence

Figure H-2
Highly Toxic Regulated Substances

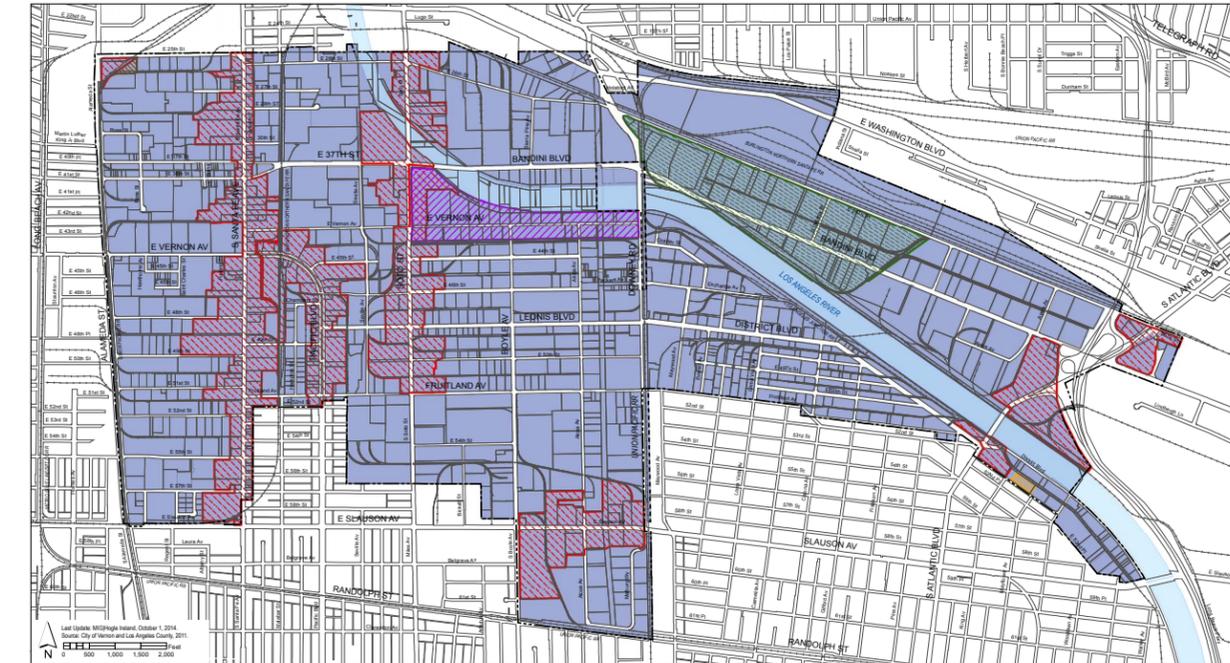
Since 1903, heavy and prolonged industrial use in Vernon the following conditions show:

A high concentration of both underground and above-ground hazardous material storage tanks throughout the City. There are also 20 leaking underground storage tank clean-up sites.

Approximately 570 businesses handle/store hazardous materials. Thirty-eight of these businesses handle high levels of extremely dangerous materials regulated by the State.

Numerous underground pipelines throughout the city, many carrying potentially explosive materials.

Land Use Element



LEGEND

Land Use Designation

Industrial

Overlay Districts

Housing

Emergency Shelter

Commercial

Manufacturing

Slaughtering

Base Map

Vernon City Boundary

Vernon Sphere of Influence

Freeway

Railroad

Los Angeles River

Figure LU-2
LAND USE POLICY MAP
Land Use Element - 7

ZONING MAP

Vernon has been 'exclusively industrial' since the city was founded in 1905. Vernon's 1,800 businesses include food processors, fashion apparel manufacturers, furniture manufacturers, electronics manufacturers, paper products producers and business logistics companies. Familiar firms with significant operations in Vernon include Farmer John, Seven for All Mankind and Tapatío Hot Sauce.



METHODOLOGY

RESEARCH + METHODS

BROWNFIELDS

Any previously developed land not currently in use potentially contaminated which may have been previously used for industrial or commercial purposes with known or suspected pollution including soil contamination due to hazardous waste

ADAPTIVE REUSE

There are environmental, economic, and community benefits from the reuse of vacant and blighted property. Reusing, recycling, converting existing buildings for a purpose other than which it was originally built or designed is a form of historical preservation.

FORM AND FABRIC IN LANDSCAPE ARCHITECTURE

DEE, CATHERINE

Hierarchical systems which create connected network of spaces – Paths, edges, thresholds, etc.

SCIENCE-BASED ECOLOGICAL SYSTEM STRATEGIES

Bioremediation is the use of microorganisms or other forms of life to consume and break down environmental pollutants in order to clean up a polluted site

Phytoremediation is a bioremediation process that uses various types of plants to remove, transfer, stabilize, and/or destroy contaminants in the soil and groundwater – ie. Carbon Sequestration Fields - Long-term removal, capture or sequestration of carbon dioxide from the atmosphere to slow or reverse atmospheric CO2 pollution and to mitigate or reverse global warming

A PATTERN LANGUAGE - TOWNS, BUILDING CONSTRUCTION

CHRISTOPHER ALEXANDER

Positive design choices can help us build better environments and relationships – a networking system of patterns can be used in the design of almost anything and everything: 55: Raised Walk, 56: Bike Paths and Racks, 119: Arcades, 120: Paths and Goals, 121: Path Shape, 122: Building Fronts

FORD RIVER ROUGE

WILLIAM MCDONOUGH, JULIE BARGMANN, D.I.R.T. STUDIO, CLAYTON RUGH



[google.com/maps/uv?pb=!1s0x883b330723efc9b5%3A0xf26b083661e8bfc4!3m1!7e115!4shttps%3A%2F%2Flh5.googleusercontent.com%2Fp%2FAF1QipPecQhbWgbOd-hUYAAMylg-63JC0zT370HkgdaFH%3Dw213-h160-k-no!5sfor%20river%20rouge%20plant%20-%20Google%20Search!15sCglgAQ&imagekey=!1e2!2sF6FDZloYApXx90EDVYhN-vQ&hl=en&sa=X&ved=2ahUKEwiQwZm-pYTxAhVsAp0JHbt5DzAQoiowIXoECGAQAw](https://www.google.com/maps/uv?pb=!1s0x883b330723efc9b5%3A0xf26b083661e8bfc4!3m1!7e115!4shttps%3A%2F%2Flh5.googleusercontent.com%2Fp%2FAF1QipPecQhbWgbOd-hUYAAMylg-63JC0zT370HkgdaFH%3Dw213-h160-k-no!5sfor%20river%20rouge%20plant%20-%20Google%20Search!15sCglgAQ&imagekey=!1e2!2sF6FDZloYApXx90EDVYhN-vQ&hl=en&sa=X&ved=2ahUKEwiQwZm-pYTxAhVsAp0JHbt5DzAQoiowIXoECGAQAw)

The Ford Motor Company’s Dearborne Assembly Plant, located on the banks of the Rouge River, produced the 1932 Model B, the original Mercury, the Ford Thunderbird, Mercury Capri, and four decades of Ford Mustangs. By the late 1980s, the original plant was only producing the Mustang and closed in 2004 to be demolished leaving only the assembly plant building the Ford-150 trucks on the entire 1200 acre site.

In 1999 the company decided that the truck plant needed to expand and comissioned William Mc-Donough to work on the plan. Rather than only building another expanded assembly plant, the entire site was considered as a whole landscape.

The roof of the new 1.1-million-square-foot Dearborn truck assembly plant was covered with more than 10 acres of sedum, a low-growing groundcover which retains and cleanses rainwater and moderates the internal temperature of the building, saving energy and is part of a rainwater treatment system designed to collect and clean rainwater annually, eliminating the need for a mechanical treatment facility.

TAKEAWAY/ RELEVANCE

After a century of manufacturing and producing waste, the site was transformed into something culturally and ecologically productive. Storm water channels and porous paving retention beds were built. Native shrubs and phytoremediation research plots were established. Still unfinished, it is a work-in-progress.



mfvainc.com/project.php?id=21&c=cultural

HERMAN MILLER LANDSCAPE, ATLANTA, GEORGIA

MICHAEL VAN VALKENBURGH ASSOCIATES

The Herman Miller furniture manufacturing and assembly plant is a 70-acre site in rural Georgia. Parking for 550 cars and 120 semi-trailers—a total area of 10 acres was desired by the client before Van Valkenburgh came to the project. Runoff from the parking surfaces, the roadway, and the roof of the 330,000 square-foot facility would have had a devastating impact on the surrounding fragile creek ecosystems. Treating and slowly releasing the massive runoff in the landscape became an essential priority for the project.

The building site was graded at five percent to place the factory on a level base. Water could drain from impervious areas into constructed wetlands, eliminating the need for curbs and pipes. The parking lot bays drain into wetlands planted with grasses, forbs, and sedges—the edges transition to 10 to 15-foot-wide thickets of floodplain trees. When dry, these areas become meadows.

TAKEAWAY/ RELEVANCE

The integration of ecology into acres of hardscape was a simple approach to a low-cost, low-maintenance and environmentally sound landscapes which could be applied easily to other projects. It is an example of landscape architecture linking effective hydrological management with good design.



http://mesadesigngroup.com/portfolio_page/pump-house/

TURTLE CREEK PUMP HOUSE, HIGHLAND PARK, TEXAS

MESA DESIGN GROUP AND JULIE BARGMANN, DIRT STUDIO

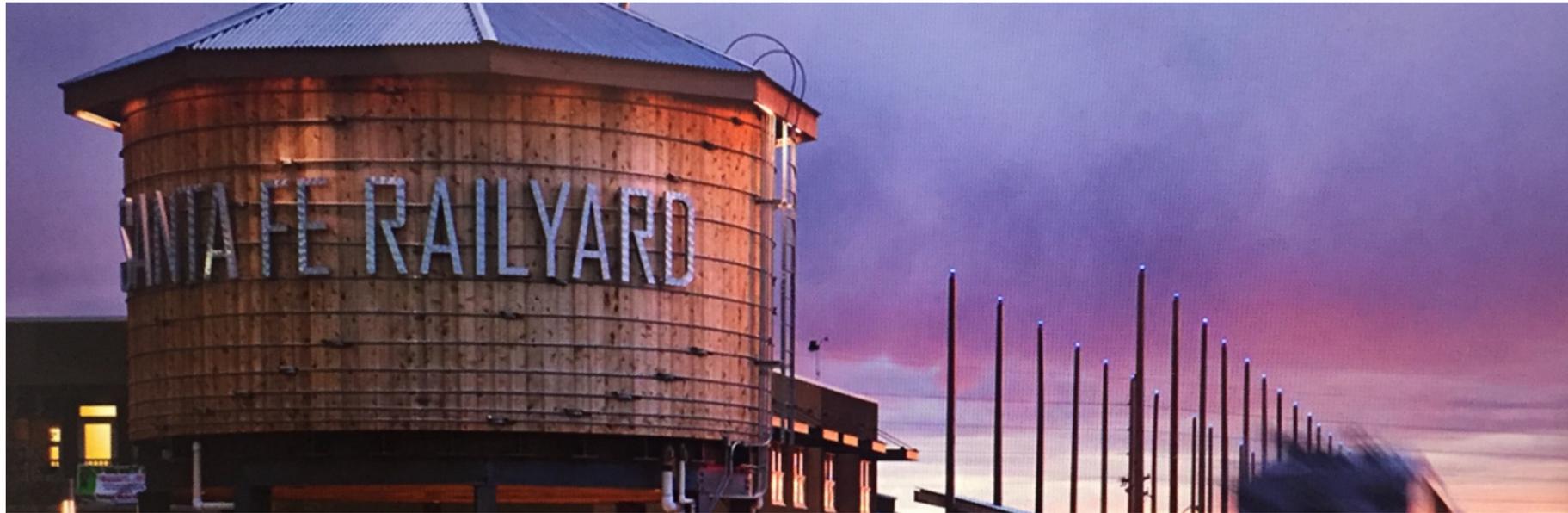
Originally a pump station supplying water to the Town of Highland Park, the Pump House is now a space for art, a venue for intellectual discussion, a temporary apartment, and playground.

This project is an example of an adaptive reuse of a former water pumping station into a garden which reflects its industrial roots by incorporating its artifacts into a space for art and sculpture, an event venue, a private residence and a playground.

MESA, in collaboration with Julie Bargmann of D.I.R.T. Studio, worked closely with a native grass expert for advice on appropriate plant species of native Texas grasses and perennials.

TAKEAWAY/ RELEVANCE

This project is an example of an abandoned site becoming a very desirable public/ private space.



kensmithworkshop.com/work.html

SANTA FE RAILYARD PARK, SANTA FE

KEN SMITH, LANDSCAPE ARCHITECT

The park is the public core of a new mixed-use district redeveloped from the historic train yards near Santa Fe's downtown. Originally opened in 1880, the railyard was long a central hub of Santa Fe's community life. The redevelopment of the 50-acre site includes the Santa Fe Farmers Market; arts institutions, restaurants, shops and galleries; an active depot for excursion and commuter trains; and Railyard Park, a new public park designed by a team led by Ken Smith. The railyard reopened in 2008.

Constructed around the features of the train yards, Railyard Park contains 13 acres of open space, several "pocket" parks scattered throughout the development, bike trails, picnic areas and a children's playground.

TAKEAWAY/ RELEVANCE

Ken Smith believes that all public spaces are gardens — pushing beyond the expected design solutions of urban spaces in hopes of finding an unexpected abstract way to tell the collective stories of the people in these spaces.



REVIVE FOR ADAPTIVE REUSE

BENEFIT THE COMMUNITY

ESTABLISH WATER STEWARDSHIP

REMEDiate LANDSCAPE

CREATE GREEN SPACE

ENCOURAGE BIODIVERSITY

PROJECT OBJECTIVES

ADD REVENUE RESOURCES

Design business park, retail and event destination

ATTRACT VISITORS

Connect community with bike path

MANAGE STORMWATER SUSTAINABILITY

Capture and reuse water runoff and annual rainfall

INCREASE HABITAT/ BIODIVERSITY

Re-vegetate with native and non-native plant species

ENHANCE HEALTH AND WELL-BEING OF COMMUNITY

Restore soil and air quality with bioremediation methods

IMPROVE SCENIC QUALITY

Plant a forest of trees

PROJECT ELEMENTS

15 ACRES TOTAL

RESEARCH PARK	2.0
AMPHITHEATER/ EVENT VENUE	0.2
ART GALLERY/ EXHIBIT SPACE	1.3
EATERIES, CAFES, KIOSKS	0.5
CONFERENCE CENTER/ RETREAT	0.5
BIKE STATION	0.2
ELEC CAR CHARGING STATION	0.5
CONSTRUCTED WETLAND	1.0
RAIN GARDEN	0.5
SWALE	0.3
BOTANIC GARDENS	2.0
SEQUESTRATION FIELD	1.0
WOODLANDS	2.0
MEADOW	2.0
PARKING	3.0



Guadalupe Valdovinos (left) and her mother Lourdes in their backyard in East Los Angeles. Their home is among hundreds that have been cleaned by the state due to elevated lead levels in the soil. However, Guadalupe Valdovinos still feels like she's in danger.
Photo by Benjamin Gottlieb.
<https://www.kcrw.com/news/shows/greater-la/recycling-facility-east-la-pollution-county-board-supervisors-art/exide-plant-lead-poison-health-residents>

SURROUNDING COMMUNITY

LOCAL WORKERS

STARTUP ENTREPRENEURS

ESTABLISHED BUSINESSES

CORPORATE EVENT AND CONFERENCE VISITORS

EDUCATION LAB/TEACHERS AND STUDENTS

SCIENTISTS

BIOLOGISTS

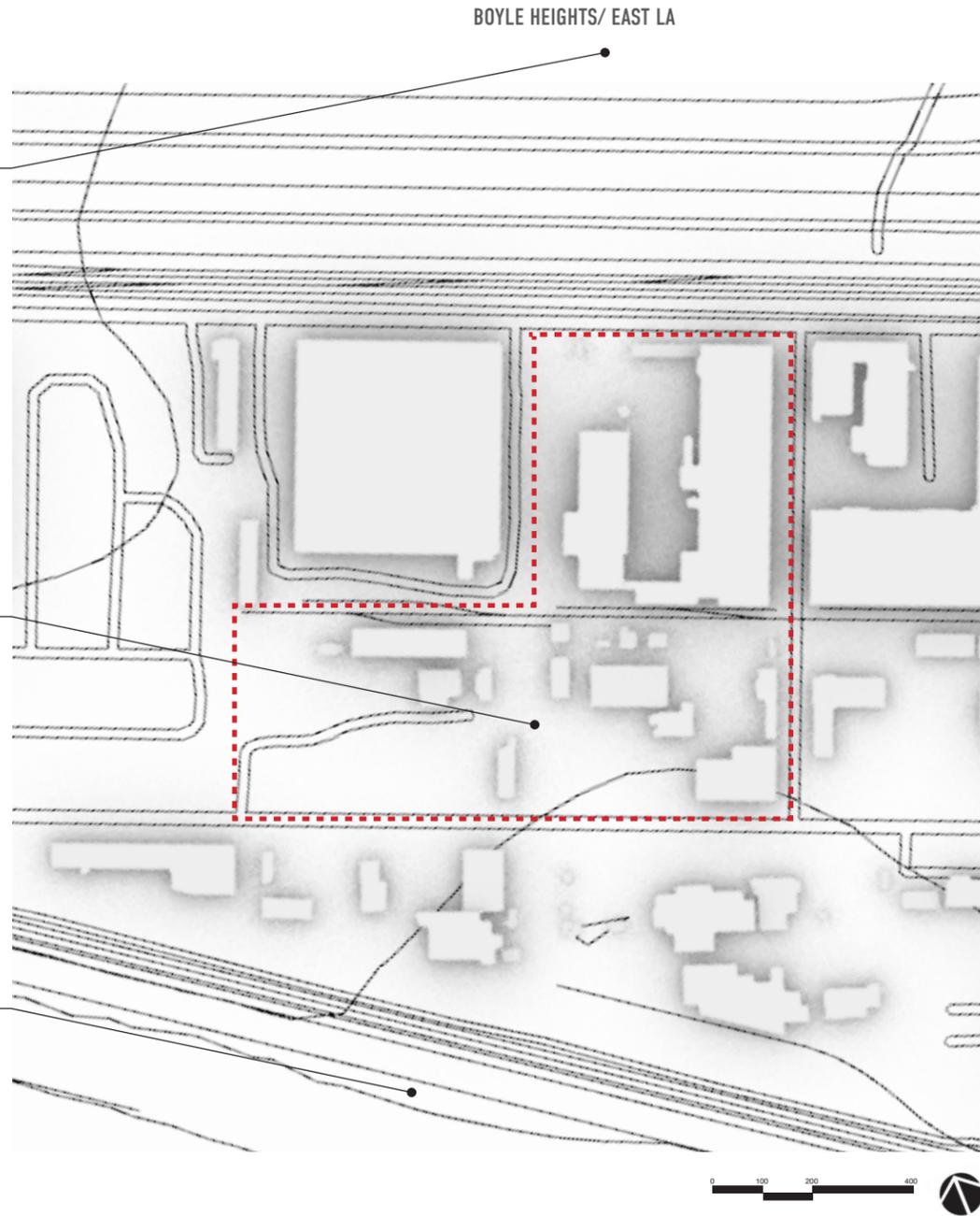
ECOLOGISTS

ENVIRONMENTALISTS

OPPORTUNITIES



- CONNECT TO COMMUNITY
- BIG VIEWS/
OPEN BIG SKY
NO TALL BUILDINGS/
VIEWS OF DTLA/
ADJACENT TO
RE-DEVELOPMENT
- OPEN CHANNEL
SHIP OPPORTUNITIES
- NO OPEN
GREEN SPACE/
CREATE SPACES
TO RESTORE
BIODIVERSITY
- ADJACENT TO
LA RIVER/
CONNECT TO
BIKE PATH



OPPORTUNITY : OPEN CHANNEL

Opportunity to create a soil and plant based infiltration feature as it currently flows unfiltered directly into the river.

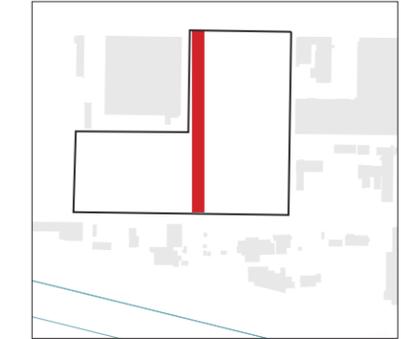
SITE PHOTO



INSPIRATION



<https://www.latimes.com/california/story/2020-10-16/exide-bankruptcy-decision-vernon-cleanup>



KEYMAP
NTS

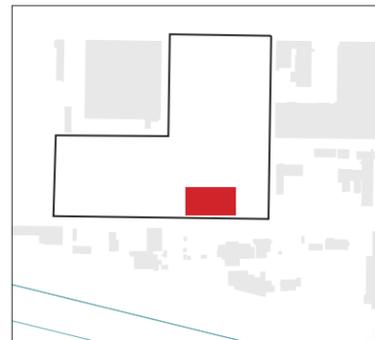
OPPORTUNITY : CAPPED FORMER TOXIC DUMP PIT

Memorial addressing past toxic practices on the site. Signage on raised walls telling the story and educating public on best practices for water stewardship, biodiversity and community justice.

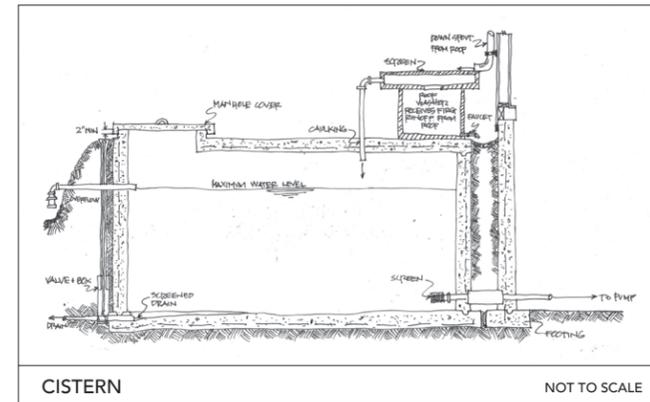
SITE PHOTO



INSPIRATION

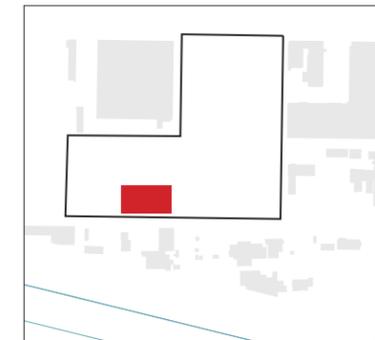


KEYMAP



CISTERN
NOT TO SCALE
For use in non-potable applications, rainwater can be harvested for reuse and stored in larger volumes in tanks.

SITE PHOTO



KEYMAP



OPPORTUNITY : CAR CHARGING STATION

Re-Charge for fossil fuel alternative electric vehicles.

INSPIRATION

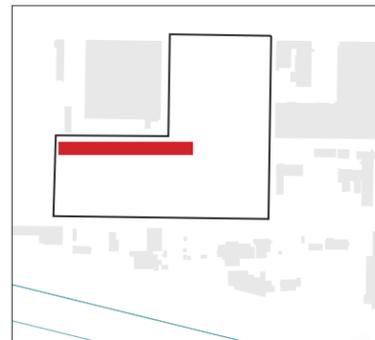


<http://88designbox.com/architecture/ultra-fast-charging-stations-for-vehicles-designed-by-cobe-3409.html>

OPPORTUNITY : VIEWS OF DOWNTOWN

A raised walking platform along the newly planted forest would create views toward the downtown skyline and the river.

SITE PHOTO



KEYMAP



INSPIRATION



OPPORTUNITY : CONNECT TO BIKE PATH

The site is adjacent to the LA River and would be a healthy connection to the community.

SITE PHOTO



KEYMAP



INSPIRATION



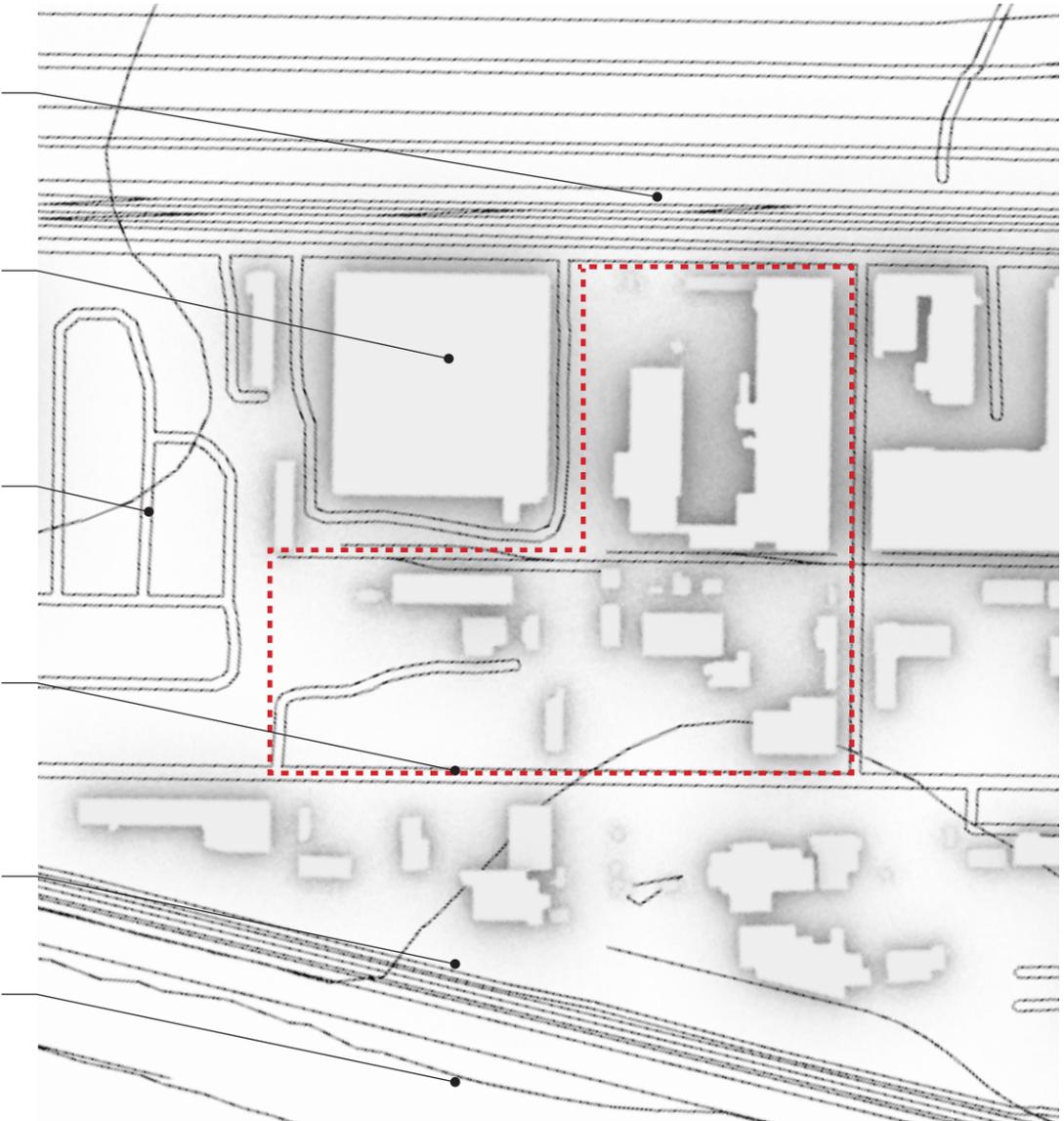


<https://hildalsolis.org/community-efforts-lead-to-state-regulators-action-against-exide-plant-in-vernon/>

CONSTRAINTS



- MAIN LA RAILYARDS/
NO TRAIN STATIONS
(METROLINK
OR AMTRAK)
- SURROUNDED BY
MANUFACTURING/
HEAVY INDUSTRY
- DISTRIBUTION
CENTER/
24/7
- MAJOR
BOULEVARD/
NO TRANSIT
CONNECTIONS
- UNUSED RAIL/
HEAVILY TRASHED
- LA RIVER/
NOT MAINTAINED



A battery or fuel cell should store (and be able to deliver) the maximum amount of energy at the desired rate (power level) from a device that has the smallest possible weight and volume.

The most well-known storage cell is the lead-acid cell, which was invented by Gaston Planté in 1859 and which is still the most widely used device of its type. Their main drawback as power sources for electric vehicles is the weight of the lead.

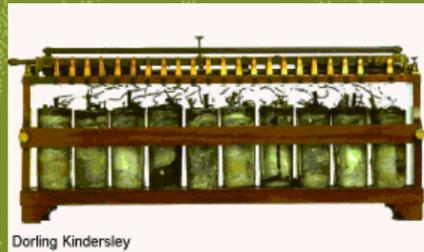
A fuel cell is a special type of battery in which the reactants are supplied from an external source as power is produced. Batteries and fuel cells designed to power vehicles and portable devices need to have high charge-to-weight and charge-to-volume ratios.

Tesla is planning to announce its own plan for large-scale battery manufacturing of its own cells and plans to announce some updated battery chemistry, but the extent of the improvements is unclear.

This graphic was used as a background on Tesla's website announcing the 2020 Annual Meeting of Stockholders and Battery Day. The image is similar to silicon nanowires, a nanostructure that has been used to create batteries with higher performance though it has yet to be commercialized.

<https://electrek.co/2020/08/24/tesla-teases-nanowire-technology-battery-day/>

1859 - Gaston Planté (French)

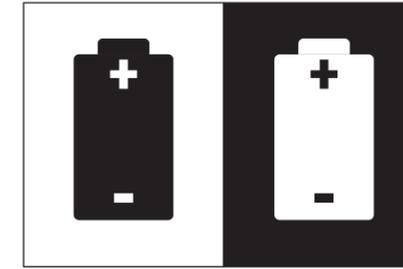


Dorling Kindersley

Invents the first lead-acid storage cell which consisted of two sheets of lead separated by a rubber sheet, rolled into a spiral and immersed in dilute sulfuric acid.

[https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_Chem1_\(Lower\)/16%3A_Electrochemistry/16.07%3A_Time-line_of_Battery_Development](https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_Chem1_(Lower)/16%3A_Electrochemistry/16.07%3A_Time-line_of_Battery_Development)

CONCEPTS



THE BIG IDEA: RE-CHARGING THE SITE



A POSITIVE CHANGE FOR
A NEGATIVE TOXIC SITE

Exide produced batteries for over 50 years without concern to the environmental landscape — emitting toxic fumes into the air and dumping hazardous chemicals into the soil. The site has a negative connotation to the surrounding community who have been affected by the contamination and who have been engaged in opposition of the factory over the years even before its recent closure.

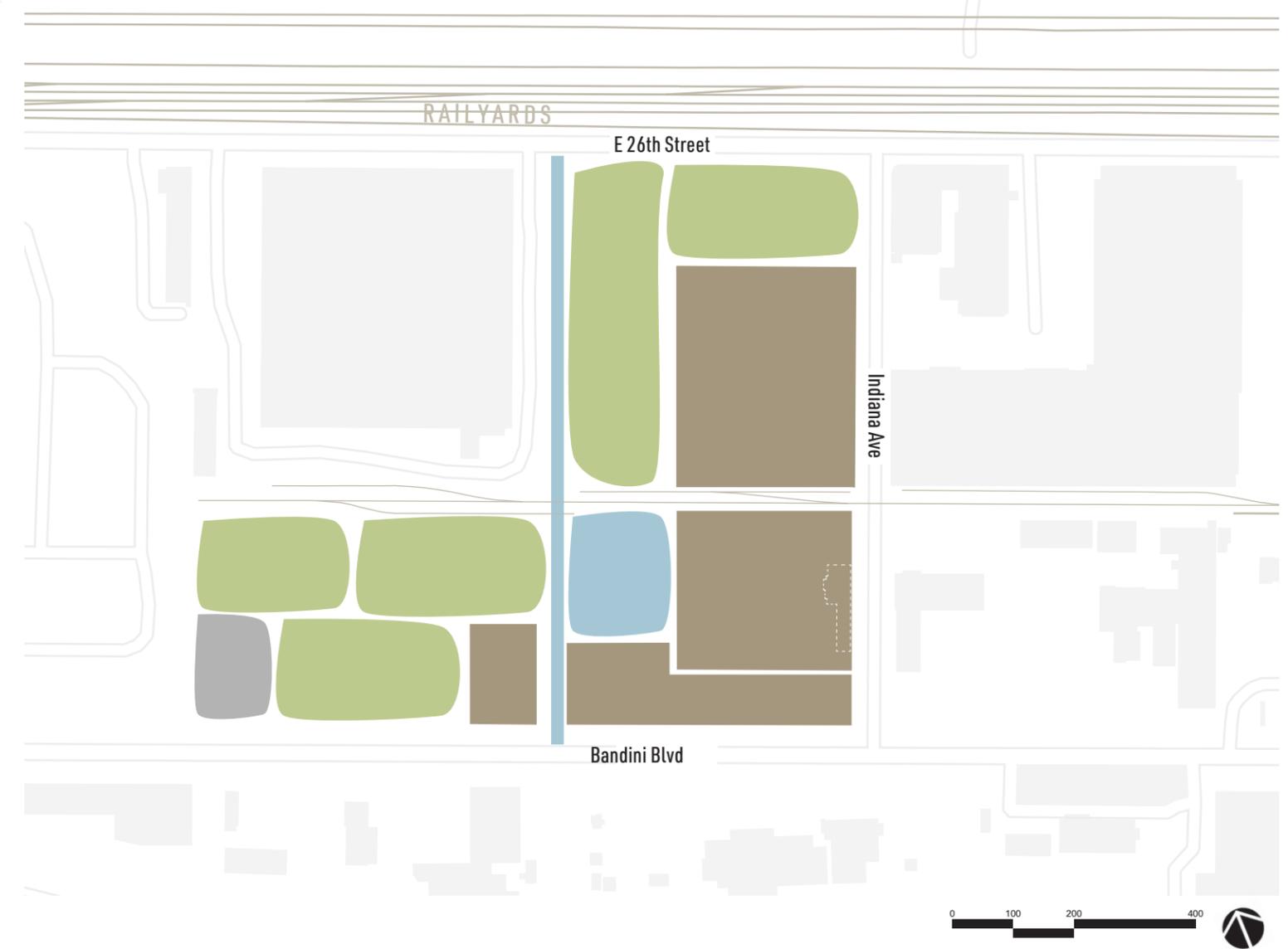
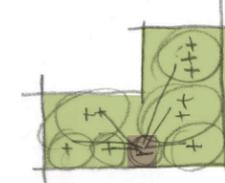
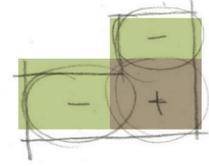
The Re-Energizing of the site — the clean-up and remediation of the landscape, the engaged access with the community and the development of an open green space — is a positive from this negative which are also the nodes of a typical battery. The active spaces of the site might be considered to have positive recharging energy effects — business, commerce, enterprise — while the passive spaces have spa-like relaxing qualities that drain stress and recharge our sense of peace and calm.

CONCEPT #1

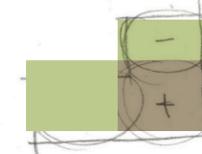
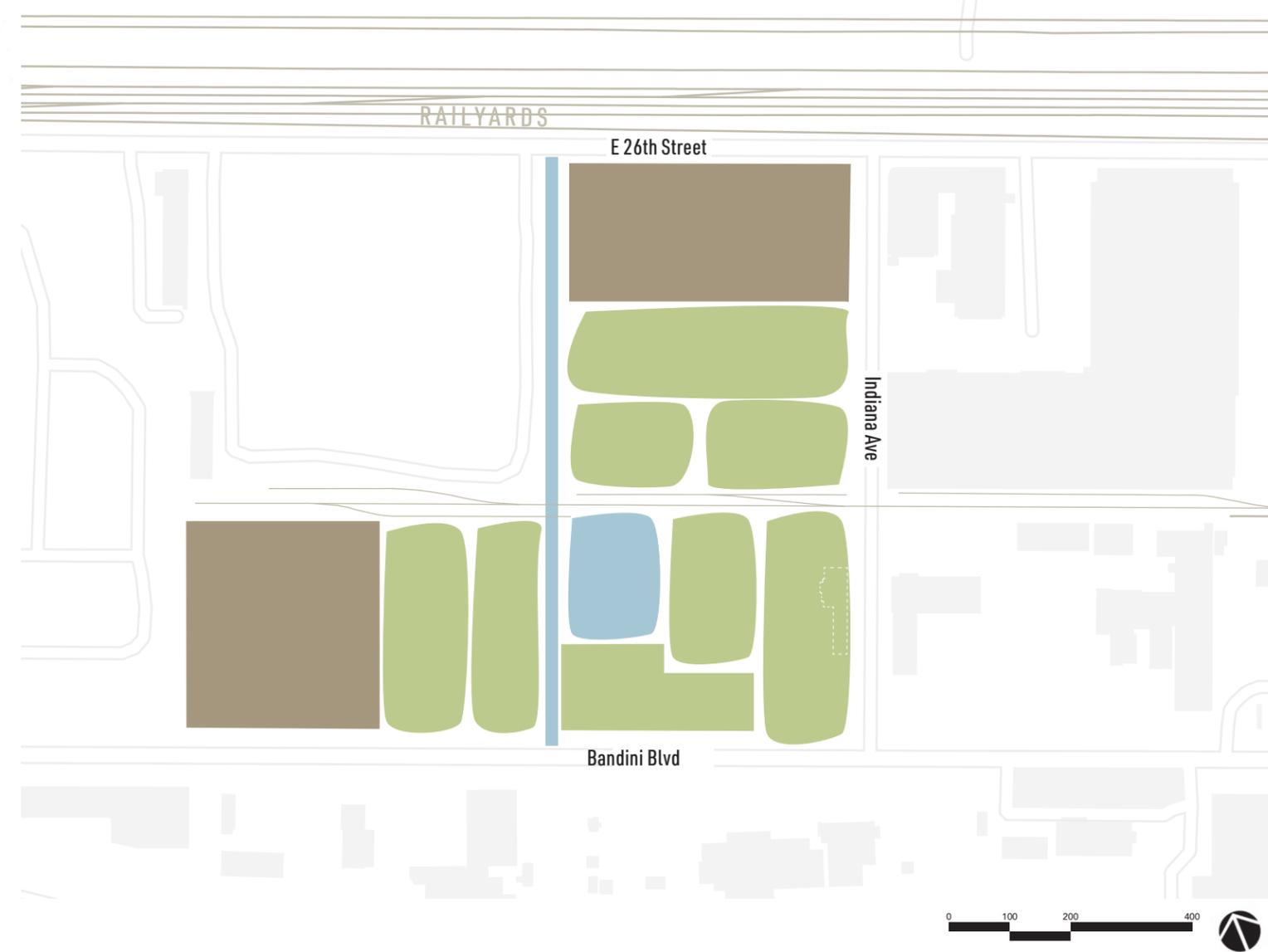
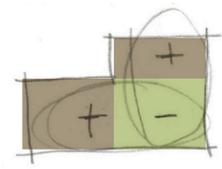
CONCEPT #2

ACTIVE ENERGIZED CORE SURROUNDED BY PASSIVE SPACES

RESTORATIVE REGENERATION CORE INFORMS THE SITE

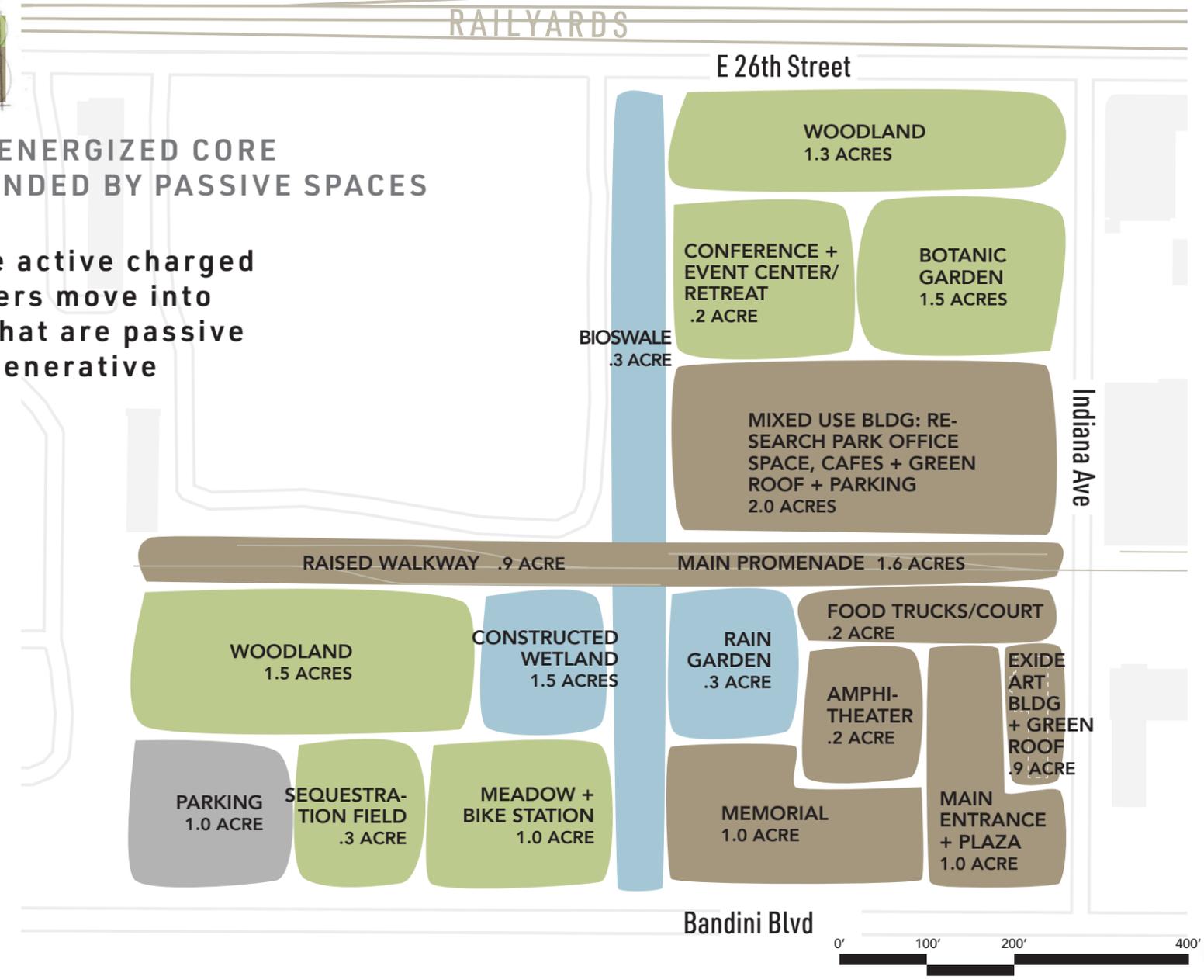


PASSIVE RECHARGES ACTIVE SPACES

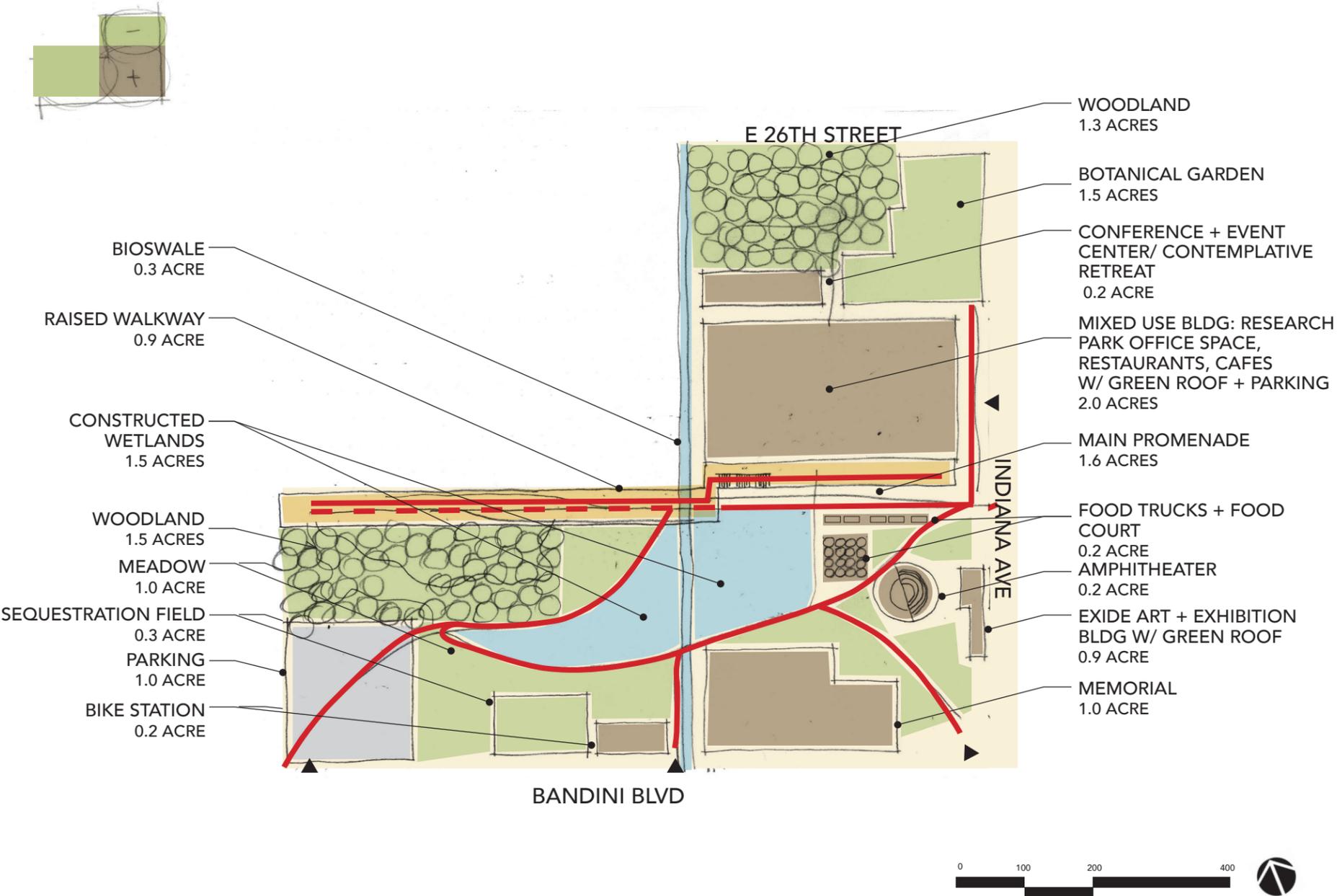


ACTIVE ENERGIZED CORE SURROUNDED BY PASSIVE SPACES

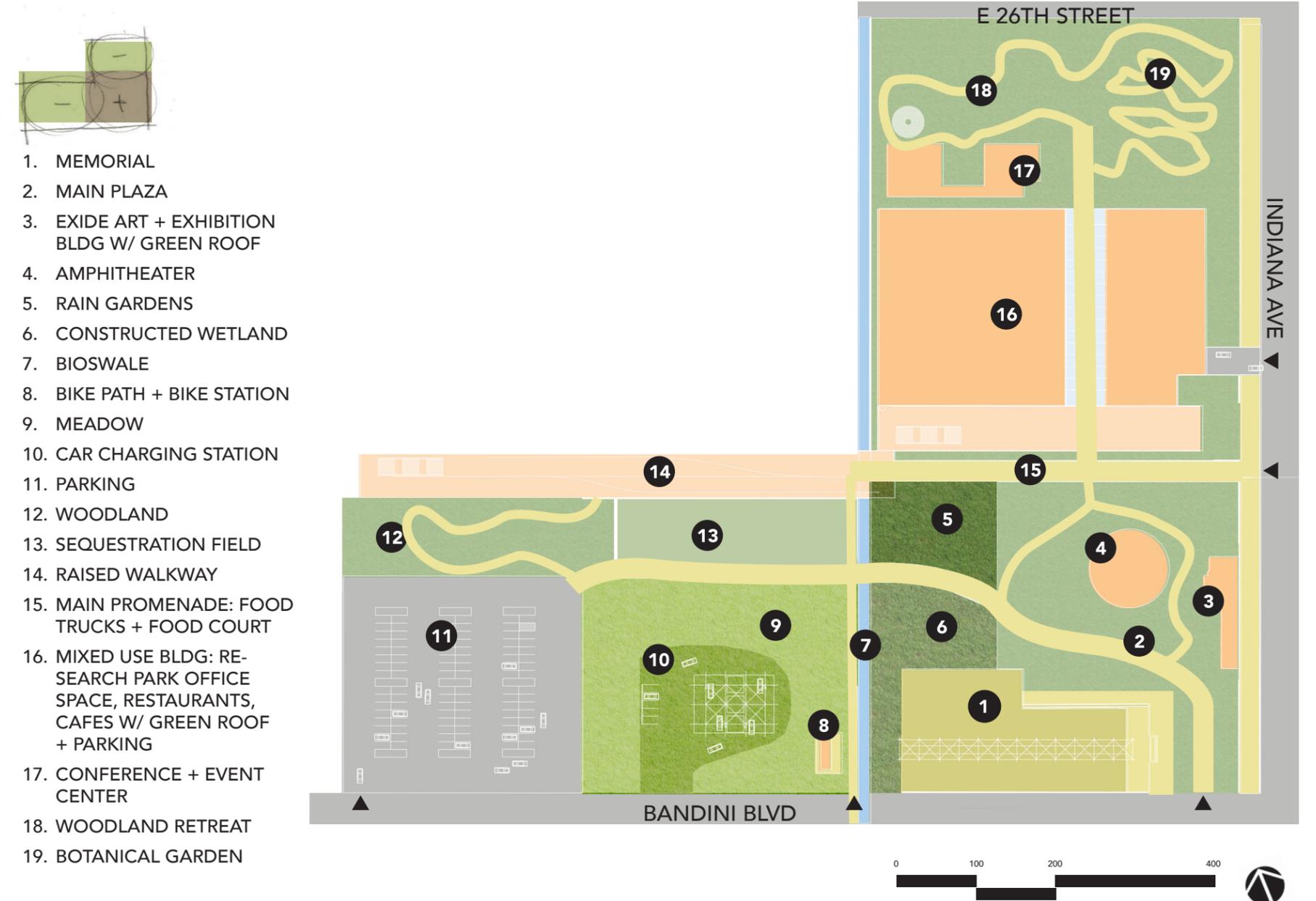
From the active charged core, users move into spaces that are passive and re-generative



CONCEPT DEVELOPMENT FOR SITEPLAN



CONCEPTUAL DESIGN PLAN

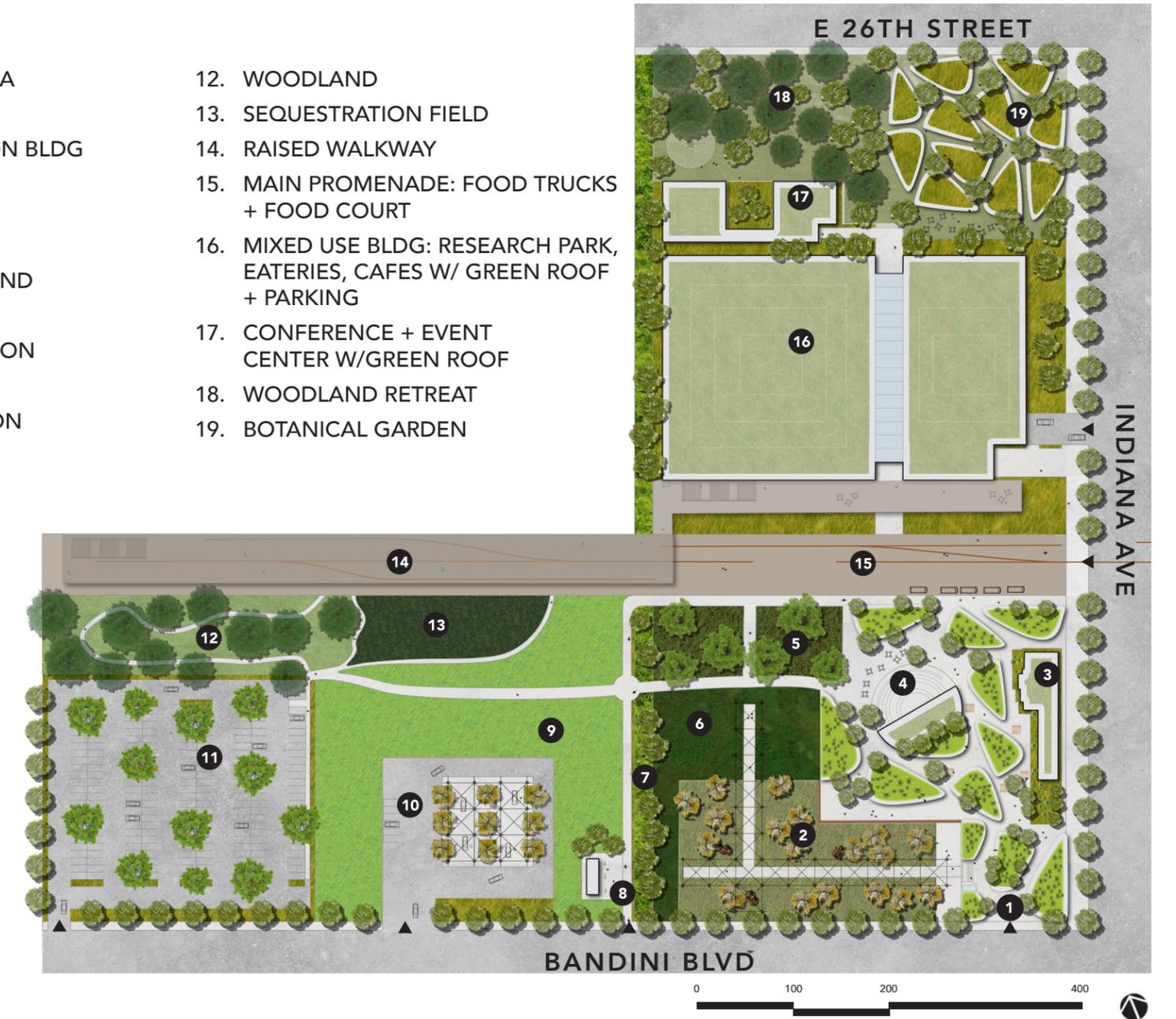




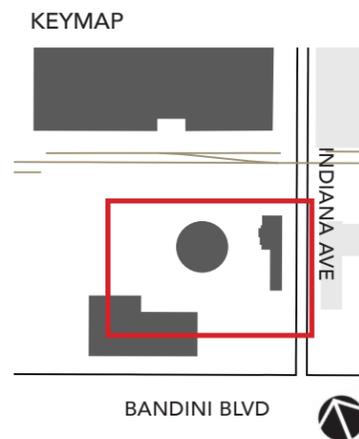
SITE DESIGN

- 1. MAIN ENTRANCE PLAZA
- 2. MEMORIAL
- 3. EXIDE ART + EXHIBITION BLDG W/ GREEN ROOF
- 4. AMPHITHEATER
- 5. RAIN GARDENS
- 6. CONSTRUCTED WETLAND
- 7. BIOSWALE
- 8. BIKE PATH + BIKE STATION
- 9. MEADOW
- 10. CAR CHARGING STATION
- 11. PARKING LOT
- 12. WOODLAND
- 13. SEQUESTRATION FIELD
- 14. RAISED WALKWAY
- 15. MAIN PROMENADE: FOOD TRUCKS + FOOD COURT
- 16. MIXED USE BLDG: RESEARCH PARK, EATERIES, CAFES W/ GREEN ROOF + PARKING
- 17. CONFERENCE + EVENT CENTER W/GREEN ROOF
- 18. WOODLAND RETREAT
- 19. BOTANICAL GARDEN

ILLUSTRATIVE SITE PLAN

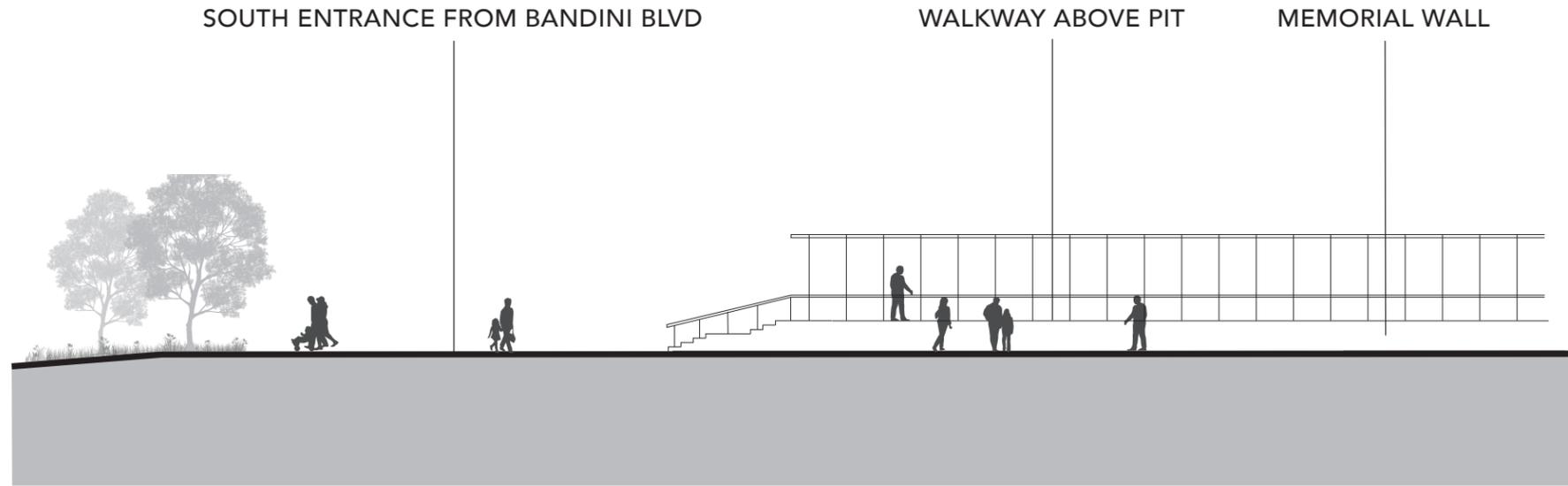


- 1. MAIN ENTRANCE PLAZA
- 2. MEMORIAL
- 3. MEMORIAL WALL
- 4. CONSTRUCTED WETLAND
- 5. AMPHITHEATER
- 6. OUTDOOR WORK STATIONS
- 7. EXIDE ART + EXHIBIT BLDG W/ GREEN ROOF

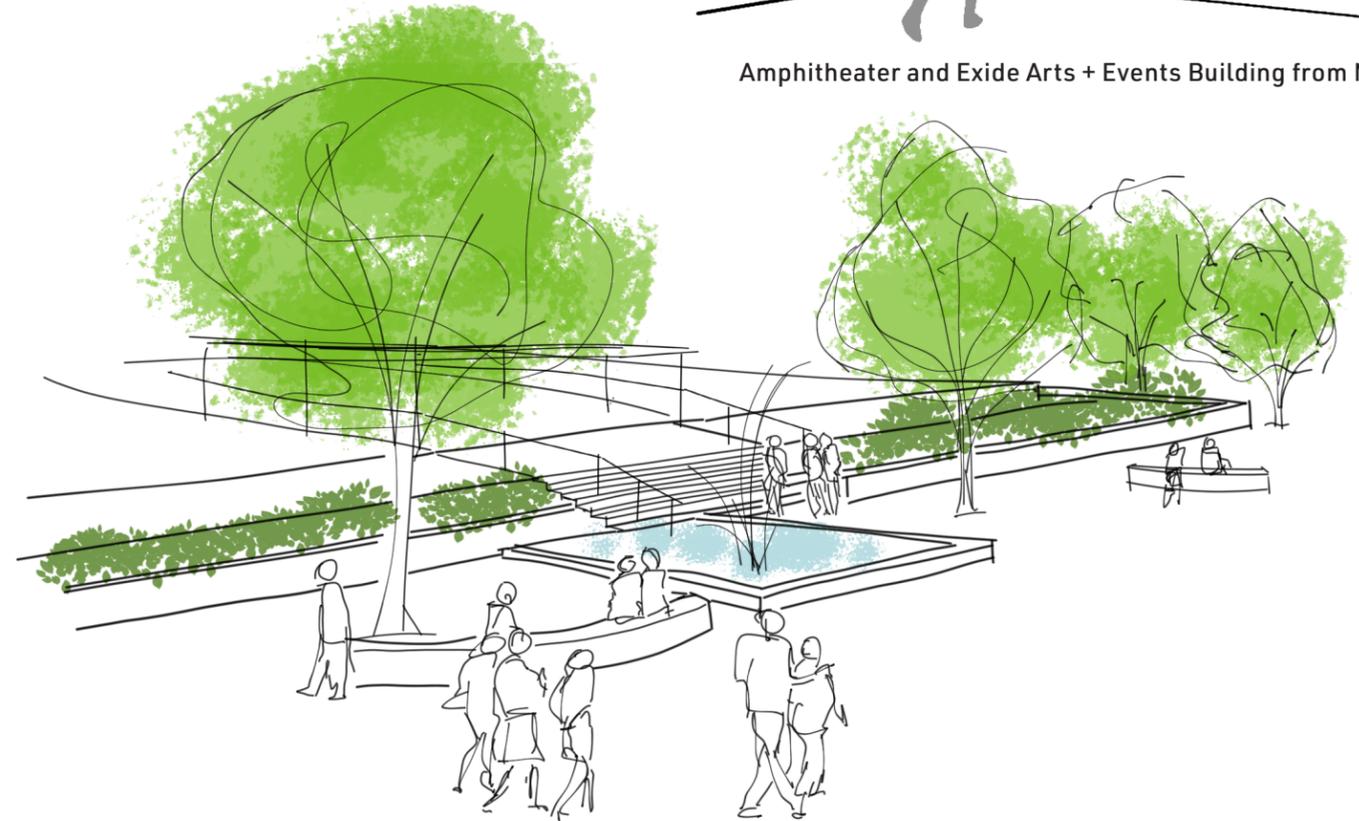
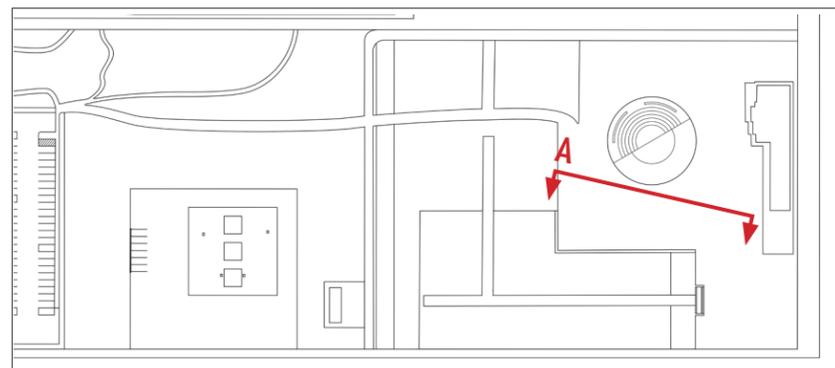


SECTION A : MEMORIAL + EXIDE PLAZA

SKETCHES



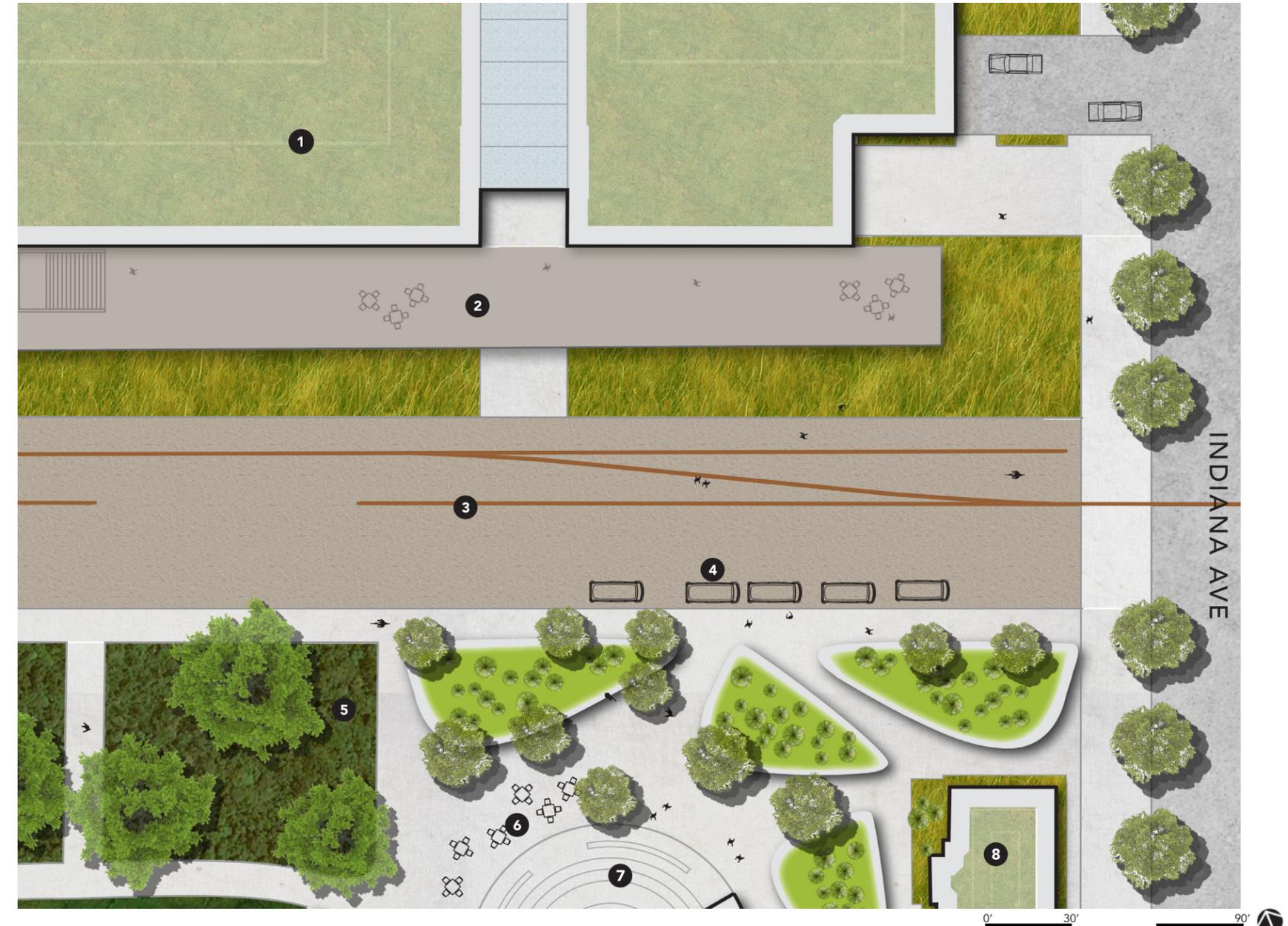
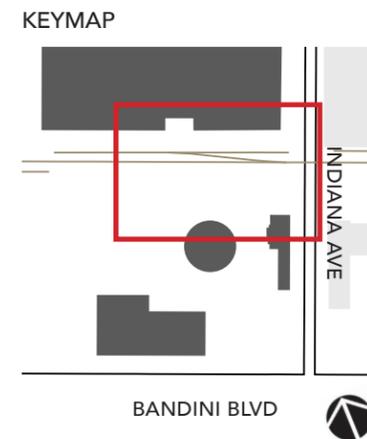
Amphitheater and Exide Arts + Events Building from Main Plaza and Memorial



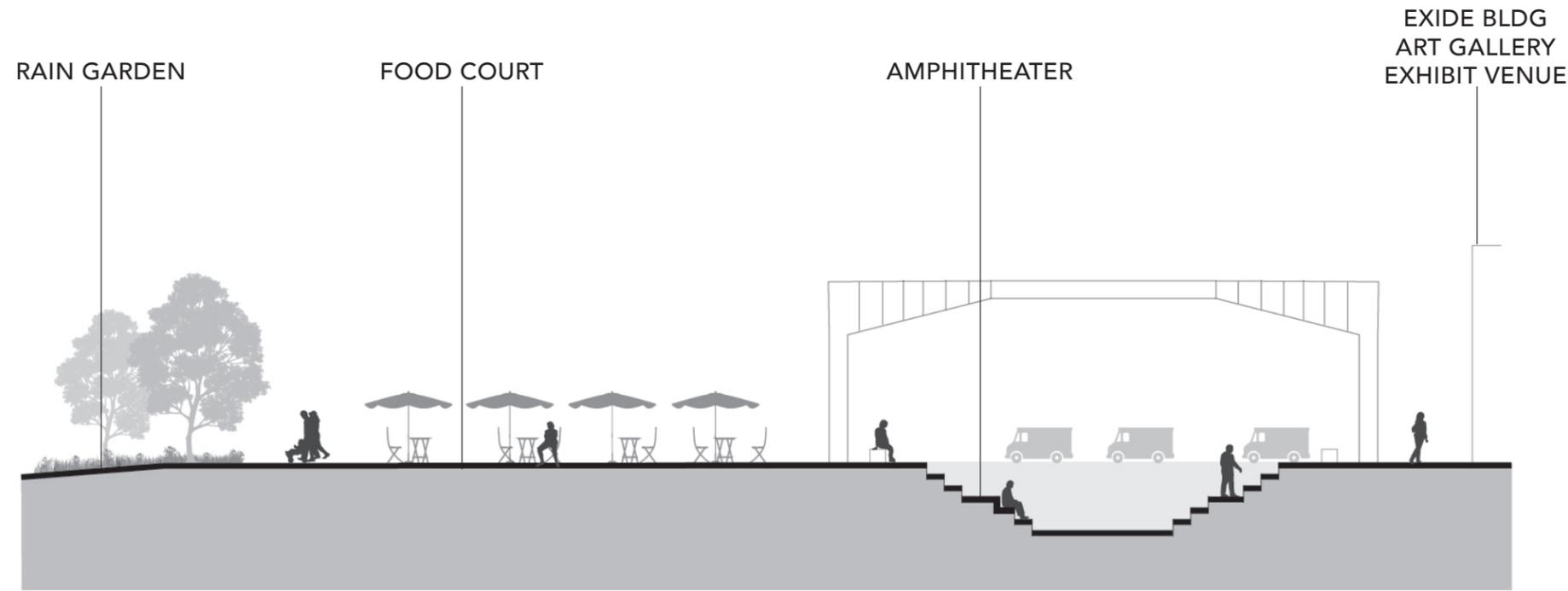
Memorial from Main Plaza Entrance at Bandini Blvd

ENLARGEMENT : FOOD TRUCK COURTYARD

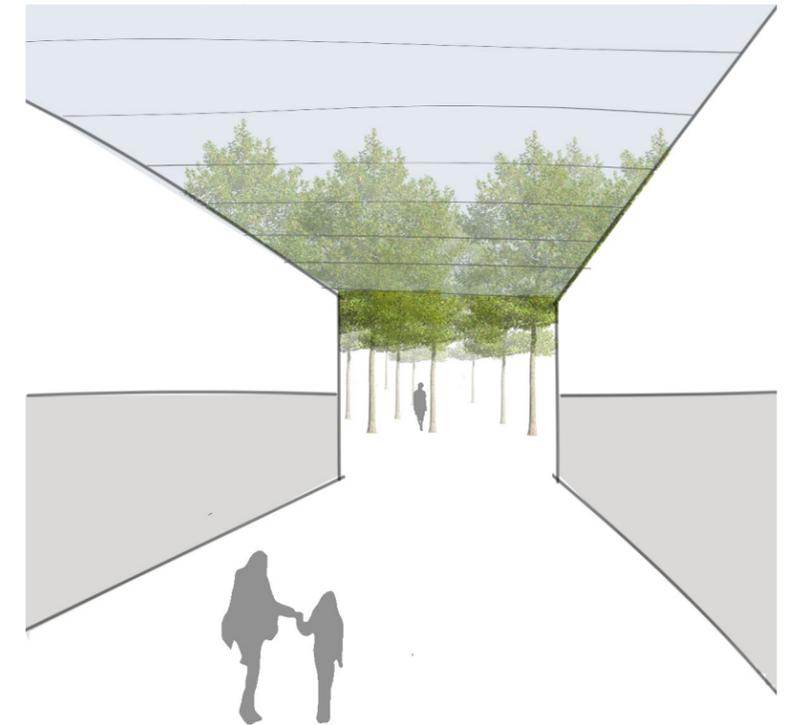
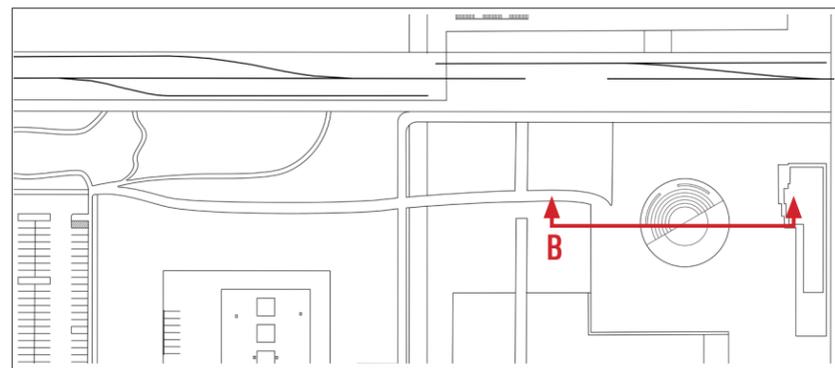
1. MIXED USE BLDG: RESEARCH PARK OFFICE SPACE, EATERIES, CAFES W/ GREEN ROOF + PARKING
2. RAISED WALKWAY
3. MAIN PROMENADE
4. FOOD TRUCKS
5. RAIN GARDEN
6. FOOD COURT
7. AMPHITHEATER
8. EXIDE ART + EXHIBITION BLDG W/ GREEN ROOF



SECTION B : AMPHITHEATER AND FOOD COURTYARD

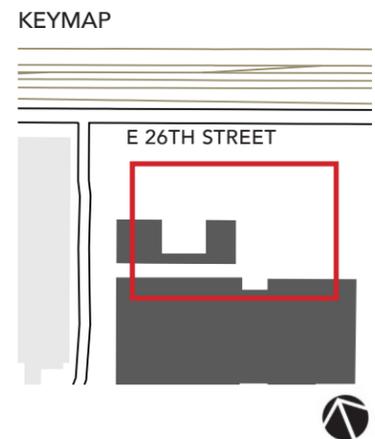


View to Mixed Use Building, Amphitheater, Food Truck Courtyard from Main Plaza



View to Woodland Retreat, Conference Center and Botanical Garden through Mixed Use Building

1. MIXED USE BLDG: RESEARCH PARK OFFICE SPACE, EATERIES, CAFES W/ GREEN ROOF + PARKING
2. CONFERENCE CENTER/ WOODLAND RETREAT
3. LABYRINTH
4. WOODLAND RETREAT
5. BOTANICAL GARDENS
6. FOOD COURT

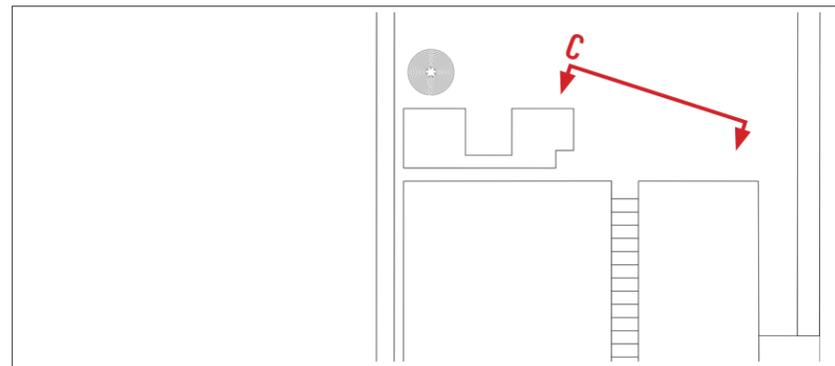
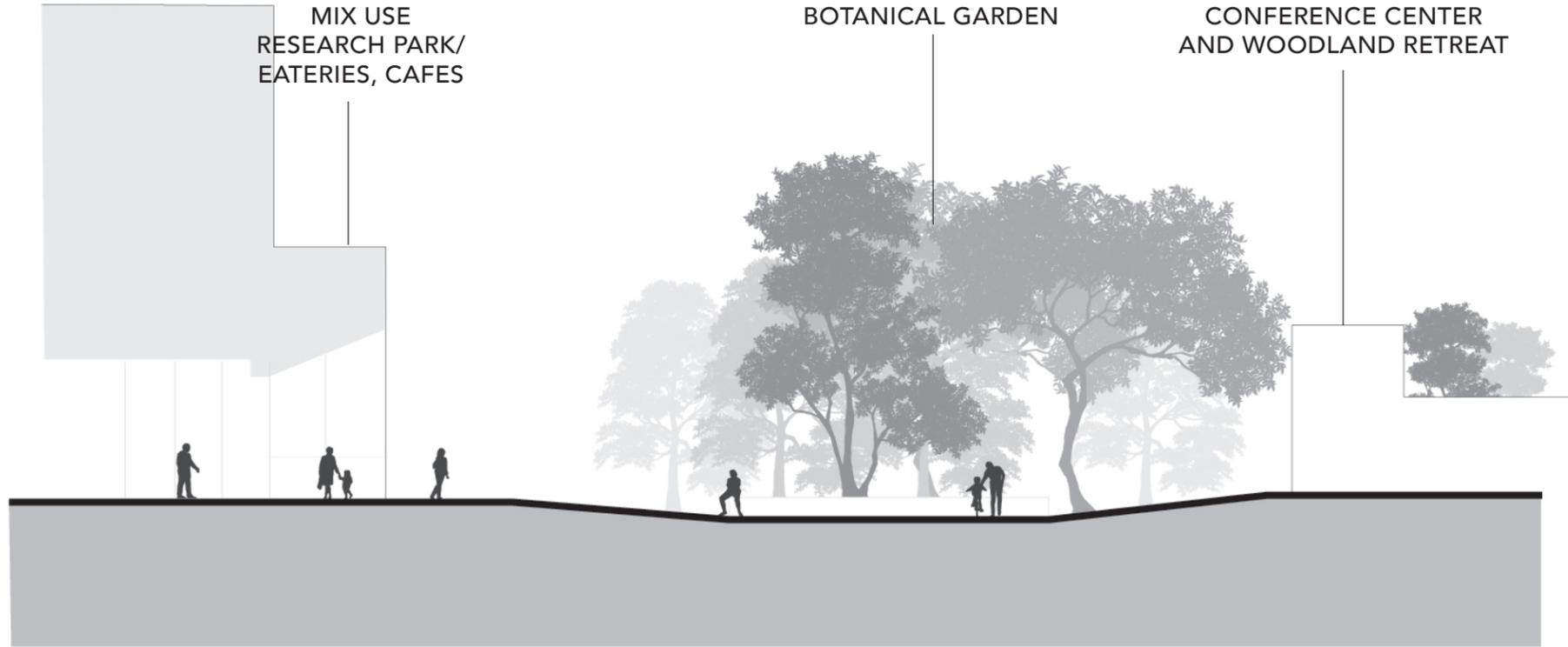


ENLARGEMENT : CONFERENCE CENTER + BOTANICAL GARDENS



SECTION C - CONFERENCE CENTER + WOODLAND RETREAT

SKETCHES



MATERIALS

Inspired by the railyards and the railroad tracks that run through the site, the use of weathered steel is an appropriate choice of materials which can be applied in many interesting ways.

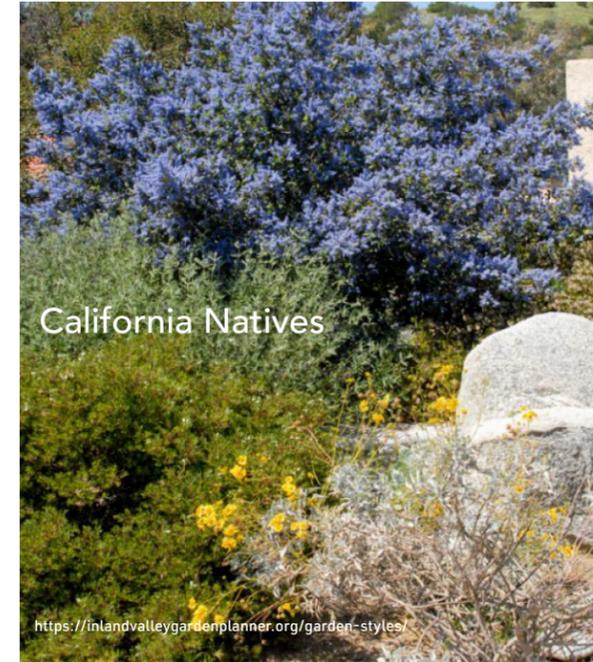
Weathering Steel

Memorial Wall, Sculpture, Wayfinding Signage



PLANTING PALETTE

This palette would be appropriate for the areas of the site which are part of the stormwater management program as well as the planters in the public spaces and in the Botanical Garden. The plantings in the Sequestration Field and the Constructed Wetland would be chosen by consulting experts in the field.



Plants that thrive in dry streambeds, infiltration basins, and swales are plants that are tolerant of the periodic flooding of these features during and immediately after rain events:

- Alkalai sacaton, Sporobolus airoides
- Berkeley sedge, Carex tumulicola
- California gray rush, Juncus patens
- California meadow sedge, Carex pansa
- Common yarrow, Achillea millefolium
- Deer grass, Muhlenbergia rigens
- Pink muhly, Muhlenbergia capillaris 'Regal Mist'
- Small cape rush, Chondropetalum tectorum
- Western meadow sedge, Carex praegracilis



Plants that thrive along the rim or nearby dry streambeds, infiltration basins, and swales are plants that will do well in areas where their roots will have access to the seasonally wetter zone adjacent to infiltration features, but do not want to be in the area that actually fills with water:

- Alkalai sacaton, Sporobolus airoides
- Allen Chickering sage, Salvia 'Allen Chickering'
- Autumn sage, Salvia greggii
- Baja fairy duster, Calliandra californica
- Berkeley sedge, Carex tumulicola

- Bladderpod, Isomeris arborea
- California bay, Umbellularia californica
- California bush sunflower, Encelia californica
- California fescue, Festuca californica
- California gray rush, Juncus patens
- California strawberry, Fragaria vesca
- Canyon Prince Wild rye, Leymus condensatus 'Canyon Prince'
- Common yarrow, Achillea millefolium
- Creeping barberry, Berberis repens
- Deer grass, Muhlenbergia rigens
- Desert mallow, Sphaeralcea ambigua
- Desert willow, Chilopsis linearis
- Golden currant, Ribes aureum
- Hummingbird sage, Salvia spathacea
- Incienso, Brittlebush, Encelia farinosa
- Island bush poppy, Dendromecon harfordii
- Lilac verbena, Verbena lilacina 'De La Mina'
- Mexican daisy, Erigeron karvinskianus
- Mountain marigold, Tagetes lemmonii
- Pink muhly, Muhlenbergia capillaris
- Pozo Blue sage, Salvia 'Pozo Blue'
- Red buckwheat, Eriogonum grande var. rubescens
- Showy penstemon, Penstemon spectabilis
- Small cape rush, Chondropetalum tectorum
- Toyon, Heteromeles arbutifolia
- Western Redbud, Cercis occidentalis
- Western sycamore, Platanus racemosa

BIOREMEDIATION/ PHYTOREMEDIATION

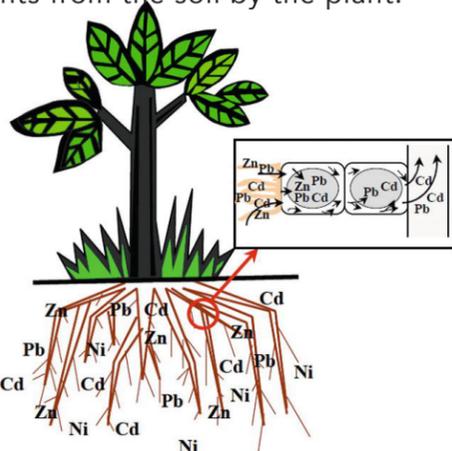
From the Greek bio (life), phyto (plant) and Latin remedium (restoring balance)

Bioremediation is defined as the use of either naturally occurring or deliberately introduced microorganisms or other forms of life to consume and break down environmental pollutants in order to clean up a polluted site.

Phytoremediation is a bioremediation process that uses living green plants to remove, transfer, stabilize, and/or destroy contaminants in the soil and groundwater. There are several different types of phytoremediation mechanisms:

- Rhizosphere biodegradation**
- Phyto-stabilization**
- Phyto-accumulation (also called phyto-extraction) - can be used to remove heavy metals from soil using its ability to uptake metals which are essential for plant growth (Fe, Mn, Zn, Cu, Mg, Mo, and Ni).**
- Hydroponic Systems for Treating Water Streams (Rhizofiltration)**
- Phyto-volatilization**
- Phyto-degradation**

An ecological method, it does not need special equipment and will result in re-usable land. Root depths and climatic conditions play an important role in the efficiency of the system. The soil must be appropriate to the needs of the plant for the removal of the contaminants from the soil by the plant.



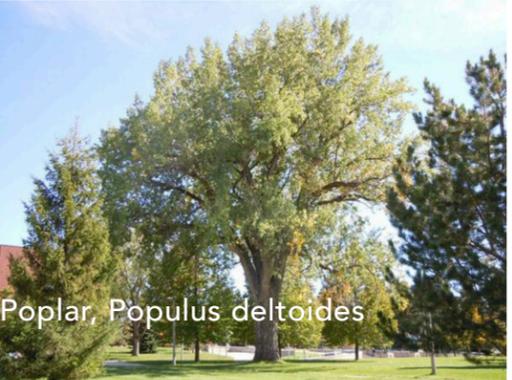
[intechopen.com/books/advances-in-bioremediation-and-phytoremediation/heavy-metal-removal-with-phytoremediation](https://www.intechopen.com/books/advances-in-bioremediation-and-phytoremediation/heavy-metal-removal-with-phytoremediation)

Plants that are good choices for phytoremediation of heavy metal contaminants need to be efficient in the uptake of the metal and sequestering it in tissues that are easily harvested — plants with proven qualities to naturally reduce, degrade or remove contaminants from soil and water.

It is also desirable for the plant, or plants, to be native plants.



Willow, *Salix* species



Poplar, *Populus deltoides*

NOTE: Indian Mustard, *Brassica juncea*, is not native to North America. Although it is considered to be a good plant for phytoremediation, it is an introduced species from central Asia.



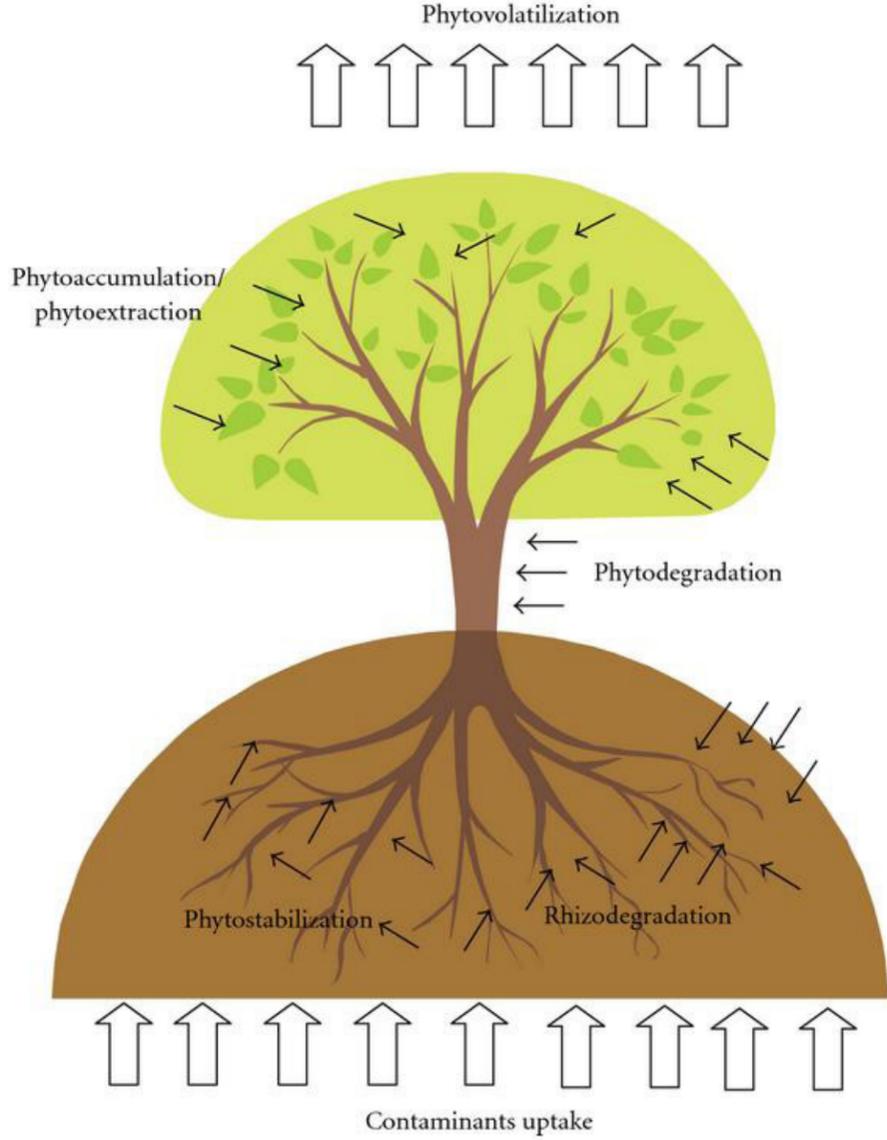
Indian Mustard, *Brassica juncea*



Indian Grass, *Sorghastrum nutans*



Sunflower, *Helianthus Annuus*



<https://www.hindawi.com/journals/ijce/2011/939161/>

STORMWATER MANAGEMENT

Rainwater Harvesting Rainwater harvesting systems reduce stormwater pollution by slowing runoff and collecting rainfall for later use. The variety of systems range from the backyard rain barrel and the commercial building cistern to ground level pits, aquifers and even nets that capture dew and fog. These types of systems have been implemented world-wide.

Rain Gardens Rain gardens are small, shallow, sunken areas of plantings that collect stormwater runoff from roofs, streets, and sidewalks. Also known as bioretention cells, they are designed to mimic the natural ways water flows over and absorbs into land to reduce stormwater pollution.

Planter Boxes Planter boxes are urban rain gardens with vertical walls and either open or closed bottoms. They collect and absorb runoff from streets, sidewalks, and parking lots.

Bioswales Bioswales are essentially rain gardens placed in long narrow spaces such as the space between the sidewalk and the curb. Bioswales use vegetation or mulch to slow and filter stormwater flows.

Permeable Pavements Permeable pavements infiltrate, treat, and/or store rainwater where it falls. They can be made of pervious concrete, porous asphalt, or permeable interlocking pavers.

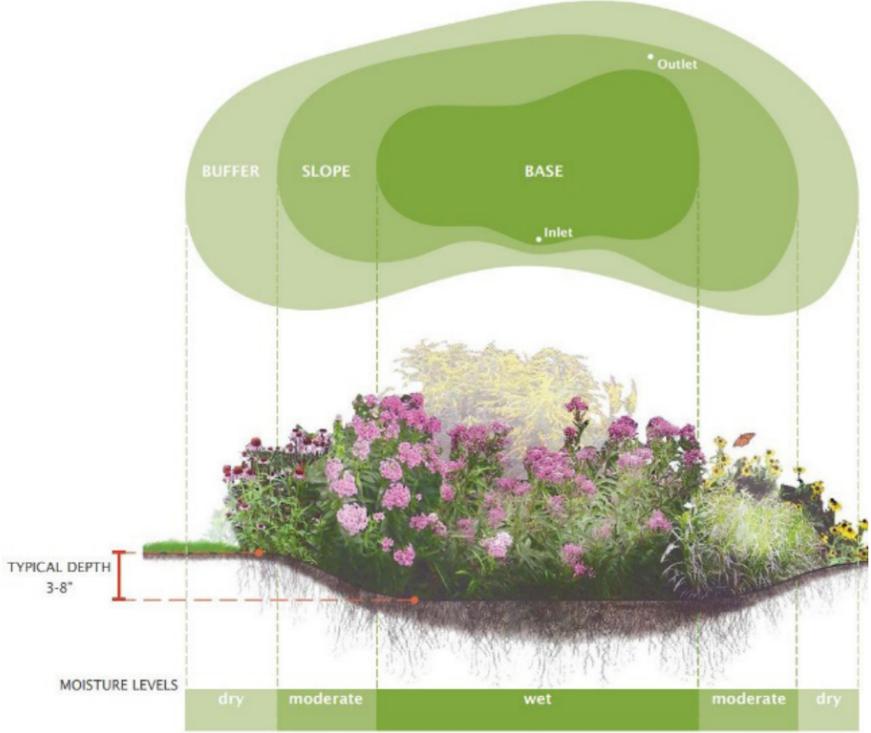
Green Streets and Alleys Green streets and alleys are created by integrating green infrastructure elements into their design to store and filter stormwater. Permeable pavement, bioswales, planter boxes, and trees are among the elements that can be woven into street or alley design.

Green Parking Many green infrastructure elements can be seamlessly integrated into parking lot designs. Permeable pavements can be installed in sections of a lot and rain gardens and bioswales can be included in medians and along the parking lot perimeter. When built into a parking lot, these elements also reduce the heat island effect and improve walkability in the area.

Green Roofs Green roofs are covered with growing media and vegetation that enable rainfall infiltration and evapotranspiration of stored water. They are particularly cost-effective in dense urban areas where land values are high and on large industrial or office buildings where stormwater management costs are likely to be high.

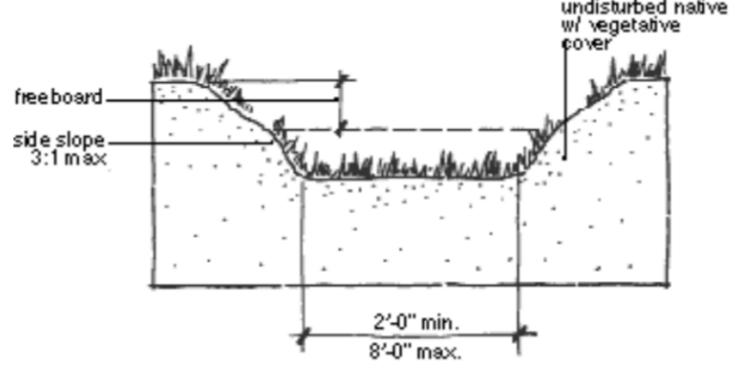
Tree Canopy Trees absorb stormwater in their leaves and branches. Many cities have set tree canopy goals to restore the benefits of trees lost when the areas were developed. Homeowners, businesses, and community groups can participate in planting and maintaining trees throughout the urban environment.

RAIN GARDEN



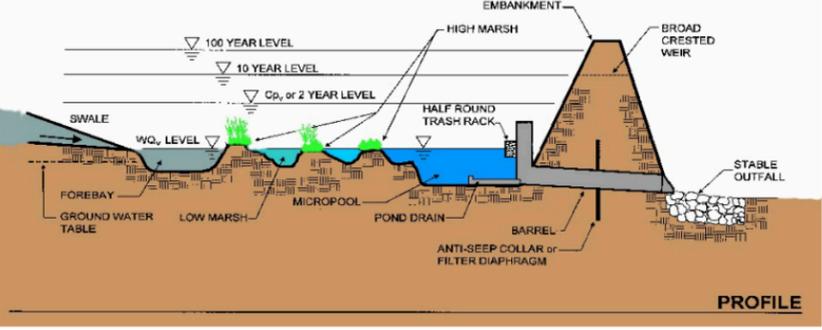
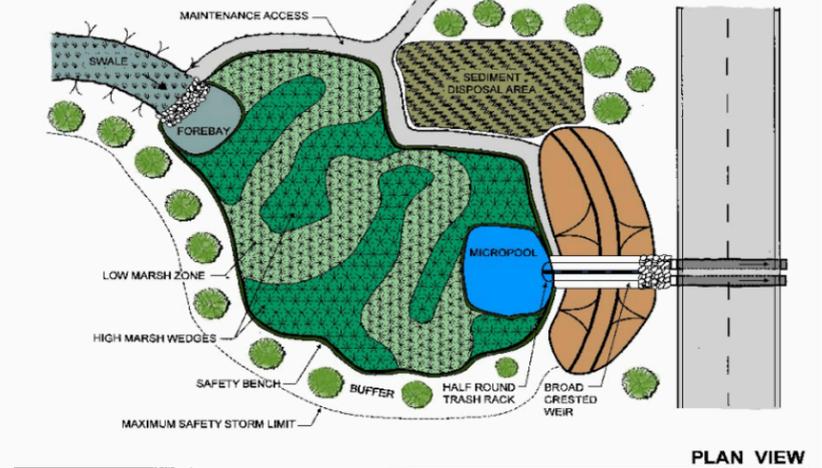
<https://thewatershed.org/green-infrastructure-rain-gardens/>

BIOSWALE



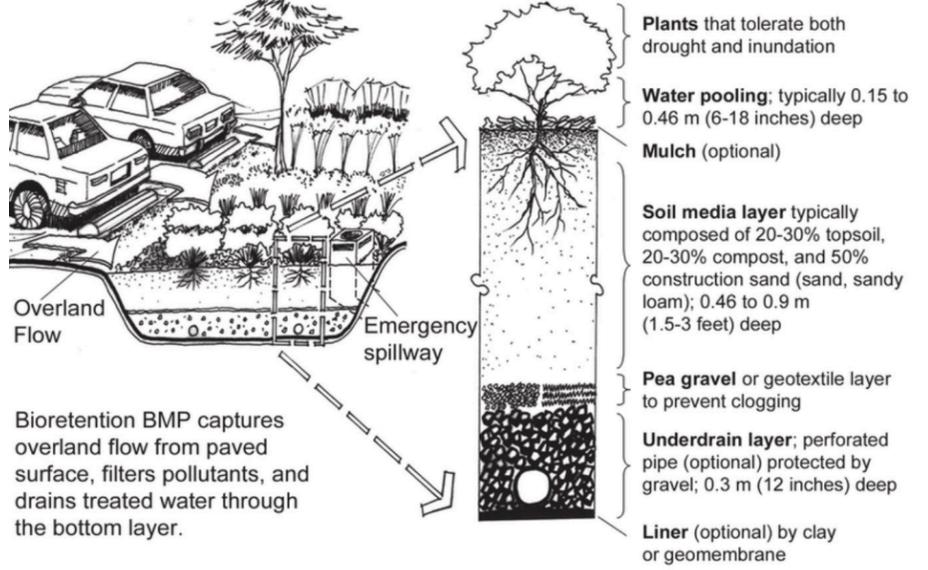
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CONSTRUCTED WETLAND



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PARKING LOT



Detail of bioretention best management practice (illustration: Ming-Han Li). https://www.researchgate.net/figure/3-Detail-of-bioretention-best-management-practice-illustration-Ming-Han-Li_fig3_257925917

Exide Technologies processed over 10,000 batteries per year on this site for over 50 years. Lead, arsenic and other toxic chemicals were dumped directly into the soil and fumes were broadcast into the air affecting the health and well-being of the neighboring communities. In spite of protests over the decades, the concerns of the working class mostly Latino people were not heard and there was no government agency oversight. Eventually the facility was abandoned by the company leaving the site toxic.

This project brings focus to restoring the entire landscape — creating a green space to benefit the community and an adaptive reuse of the site reflecting the past and taking it into the future. Using science based strategies for remediation and best management practices for stormwater management sets the bar high for the surrounding industries encouraging them to take steps toward an honest desire to respect and steward the environment while still being able to have a successful business.

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Julie Bargmann, DIRT Studio
dirtstudio.com

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