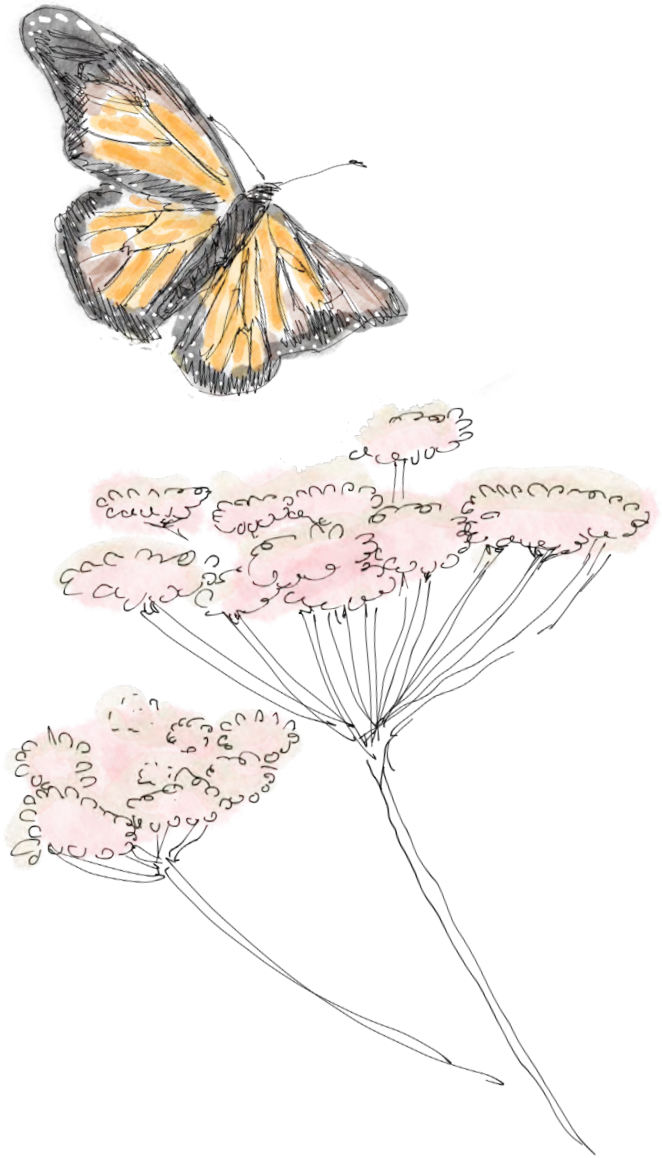

GREENING **SCHOOLYARDS**

ensuring all children have access to green spaces

> *I want to see children running like ponies on a large green area and exercise their spirit and the body.*

Sra. Zerrien-Lee - K1 dual language teacher at Aldama Elementary School

Regina Okasaki de Freitas
UCLA Extension Landscape Architecture Program
Summer 2020 - Capstone Design Project
Meg Rushing Coffee and Jim Pickel - instructors

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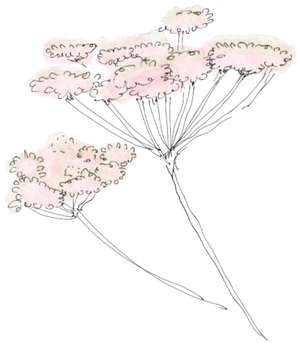
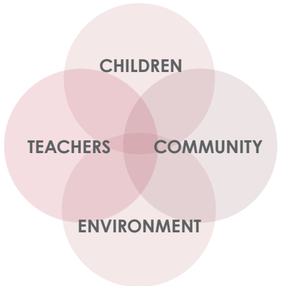


PROJECT
STATEMENT
JUSTIFICATION

PROJECT STATEMENT



This project intends to **reconnect children** living in urban areas **with the natural world** by **increasing green areas** in elementary schoolyards. Aligned with the tenets of the Green Schoolyard movement and the LAUSD guidelines for sustainable schoolyards, the aim is to **improve children's lives** in economically challenged urban neighborhoods.

The benefits of **school grounds where natural elements are abundant,** can have a lasting impact on **children's health and well-being.**

https://www.childrenandnature.org/wp-content/uploads/2017/10/CNN_2016GSY_AcadOut_d7-3.pdf

PROJECT JUSTIFICATION

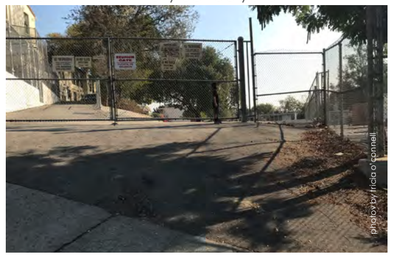
Living in an urban environment we are disconnected from the natural world and oblivious to how nature systems work. Oblivious to what nature can do for us, and what we can do to renew and preserve it.

A school should function as an oasis to a neighborhood. They are in the heart of their community and are the ideal place to introduce the concept of bringing nature into urban living.

The disconnection from the natural world is especially intense in economically challenged urban neighborhoods. By greening public schoolyards in these neighborhoods it is a way of spreading the well-being in a way only nature can provide.

Studies done by psychologists found that the sight of leaves rustling in trees, grasses rippling in the wind, and sunlight glinting off water reduces heart rate and stress and restores attention.[1]

Aldama Elementary Schoolyard



Common illness in children due to a sedentary lifestyle:

- stress
- anxiety
- depression
- diabetes
- obesity

LAUSD schools:

- 20% sit in asphalt without tree canopy[2]
- 50% of the students may suffer post-traumatic stress disorder[3]

1. Rachel and Stephen Kaplan,Landscape Architecture Magazine, June 2019
2. Study by Council for Watershed Health and the Center for Information Systems and Technology at Claremont Graduate University - LAM June 2019
3. Claire Latane - Landscape Architecture Magazine June 2019 - The Schoolyard is sick

PROPOSED SITE
BACKGROUND INFORMATION
LOCATION
PLAN VIEW
USERS & STAKEHOLDERS
PHOTOS

PROPOSED SITE
BACKGROUND INFORMATION

ALDAMA ELEMENTARY SCHOOL
Home of the Hawks

Is a school that C.A.R.E.S.!

Community, Academics, Respect, Environment, Success!

- Built in 1924 and It opened its doors in 1926.
- It was designed by architect Charles F. Plummer.
- It has a Spanish Colonial Revival Style with concrete exterior, gabled roof, asymmetrical plan and arcades at entrances.
- It serves approximately 500 students in grades K-5
- as well as an Expanded Transitional Kindergarten class (ETK)
- It has Dual Language Program attended by approximately half of the student body
- It is a Title One school

The intention of this project is to turn Aldama Elementary School's outdoor grounds into a green schoolyard.

The school's main concerns:

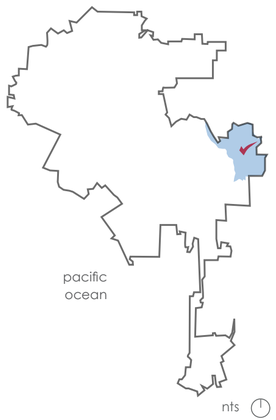
- lack of shade
- abundance of asphalt

https://aldamaes-lausd-ca.schoolloop.com/

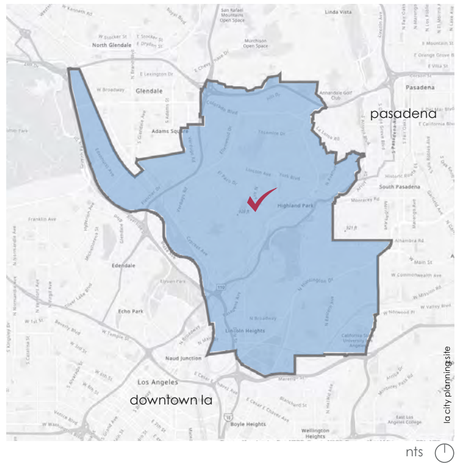
PROPOSED SITE
LOCATION

ALDAMA ELEMENTARY SCHOOL

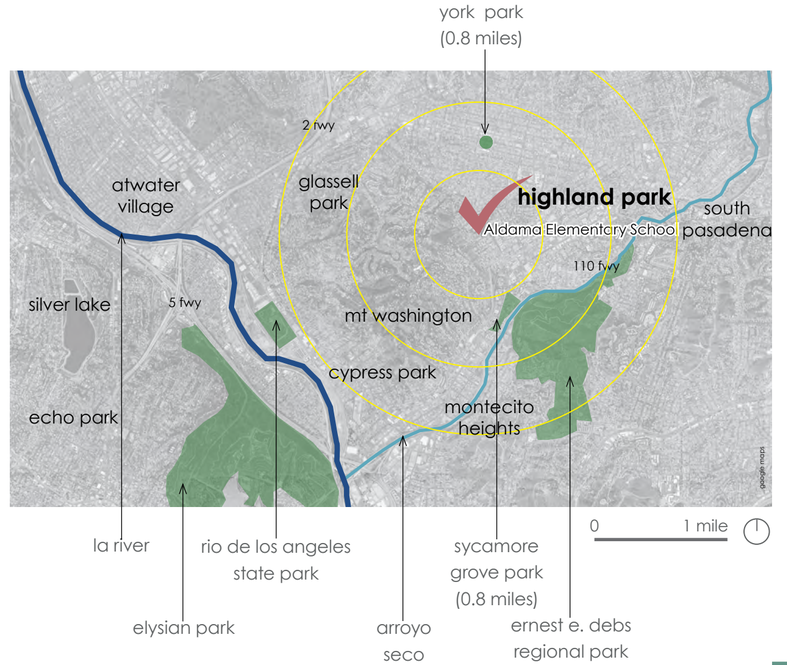
California



Los Angeles



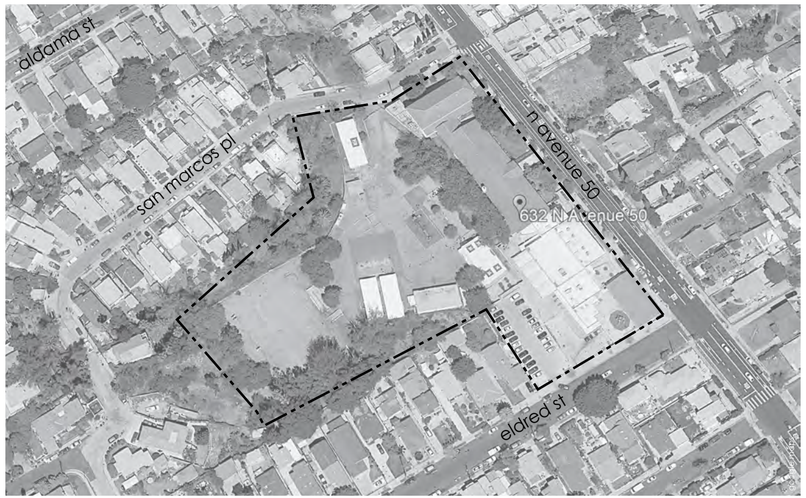
Northeast Los Angeles



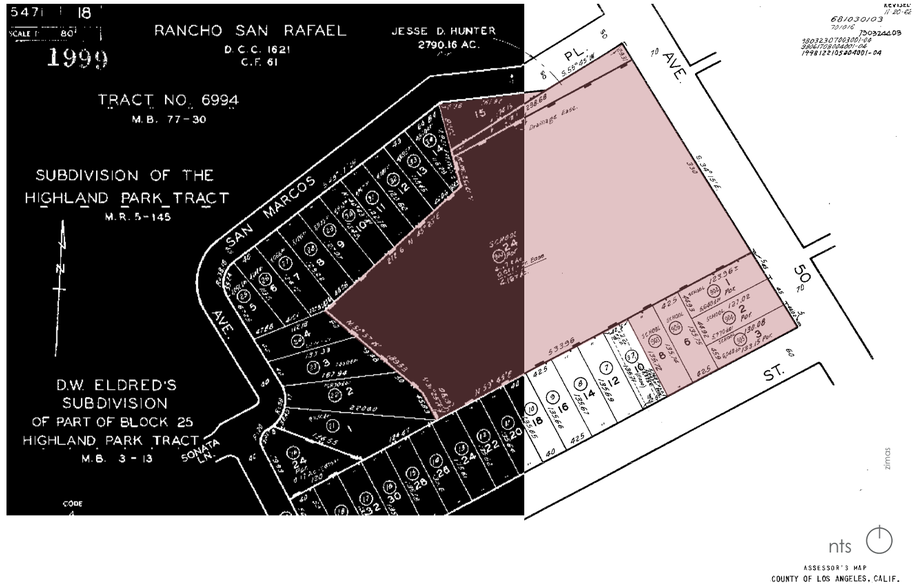
https://www.google.com/maps/place/Aldama+Elementary+School/@34.1103641,-118.2087639,17z/dat

PROPOSED SITE
PLAN VIEW

ALDAMA ELEMENTARY SCHOOL



PARCEL MAP



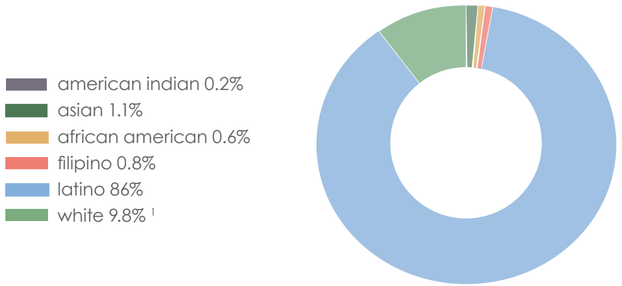
- **Ownership:** LAUSD Los Angeles Unified School District
- **Zoning:** PF-1
- **Parcel/APN number:** 5471018900
- **Size:** 207,174.9 sf / 4.756 ac

USERS & STAKEHOLDERS

USERS

student body

- children from 4 - 11 years old
- 70 % eligible for free lunch
- 14.9 % chronic absenteeism rate
- 0 % suspension rate
- 48.9% English is their second language
- 9 children enrolled in the special education program



OTHER USERS

teachers

- 24 teachers
- student : teacher / ratio 22 : 1

students families

administration

staff members

STAKEHOLDERS

users

neighborhood community

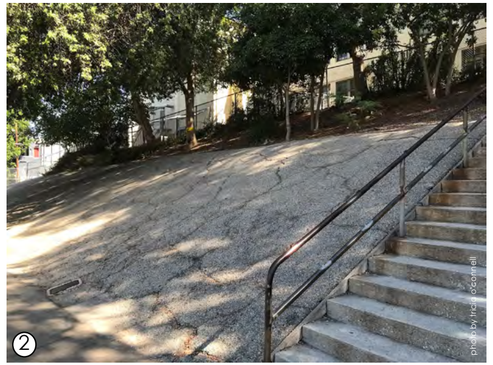
city of LA

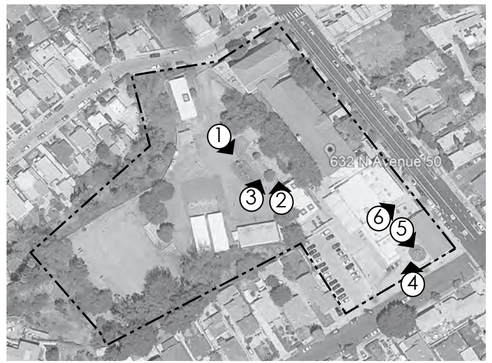
the environment

1. https://explorelausd.schoolmint.net/school-finder/schools/1092/aldama-elementary

SITE PHOTOS

Main yard



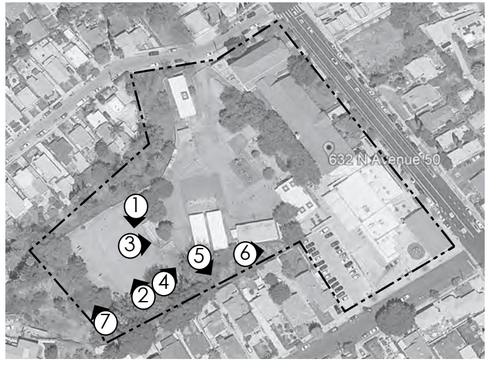


Early Transitional Kindergarten & Special Education courtyard

SITE PHOTOS

Lower yard

Vegetable Garden & Wild area

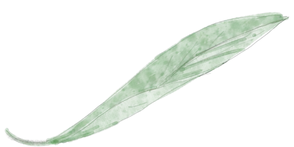


PROJECT
GOALS
METHODOLOGY & GUIDELINES
OBJECTIVES
ELEMENTS

PROJECT GOALS

The goals for greening Aldama Elementary Schoolyard are aligned with the principles of:

LEARNING GREEN LAUSD Sustainability Initiatives & GREEN SCHOOLYARDS AMERICA Methodology



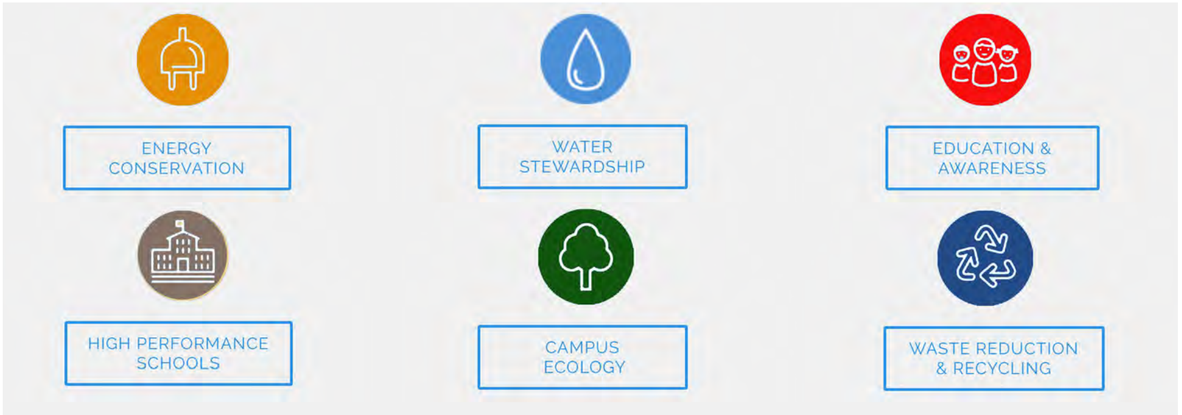
GUIDELINES

- WASTE REDUCTION & RECYCLING
- WATER STEWARDSHIP
- CAMPUS ECOLOGY
- ENERGY CONSERVATION
- HIGH PERFORMANCE SCHOOLS
- MENTAL HEALTH
- EDUCATION & AWARENESS
- WELL-BEING

LAUSD GUIDELINES

LEARNING GREEN LAUSD Sustainability Initiatives

GOALS



ENERGY CONSERVATION

- reduce energy consumption
- reduce our carbon footprint
- raise awareness about energy conservation and climate change

HIGH PERFORMANCE SCHOOLS

- Ensure a safe, healthy, and comfortable learning environment in energy and water efficient schools
- Raise awareness about sustainability in the built environment

WATER STEWARDSHIP

- reduce water consumption
- reduce the amount of potable water use
- reduce groundwater pollution & replenish underground aquifers
- Increase awareness of water stewardship

CAMPUS ECOLOGY

- Increase campus green space, school gardens, and outdoor learning spaces
- Increase permeable surfaces to encourage groundwater infiltration
- Reduce heat island effect
- Raise awareness of environmental stewardship and urban habitat

WASTE REDUCTION AND RECYCLING

- Increase the district's landfill diversion rate to 70% by 2020
- Raise awareness: Reduce, Reuse, Recycle, Rot

EDUCATION & AWARENESS

Raise awareness about:

- energy conservation and climate change
- water stewardship
- sustainability in the built environment
- environmental stewardship and urban habitat

Develop partnerships to:

- provide experiential and place-based learning opportunities
- promote Professional Development opportunities linking sustainability and STEM/Standards-Based curriculum
- link sustainability projects with opportunities for student training and workforce development

Encourage and celebrate:

- sustainability leadership
- school-based sustainability efforts
- environmental volunteerism and community engagement

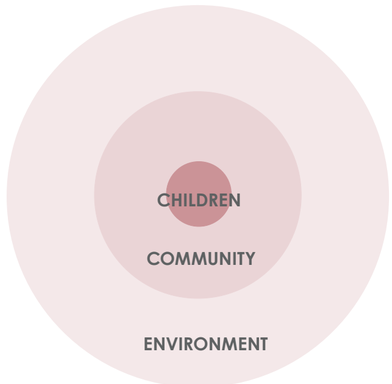
http://learninggreen.laschools.org/

PROJECT METHODOLOGY

> “Green Schoolyards America envisions a future in which public school grounds are used strategically to improve the well-being of children, their communities, and the urban environment at the same time.”
>
> **greenschoolyards.org**

GREEN SCHOOLYARDS AMERICA METHODOLOGY

- ECOLOGICAL INFRASTRUCTURE REPAIR
- ACCESS TO NATURE
- IMPROVED TEACHING AND LEARNING ENVIRONMENTS
- HEALTH AND WELLBEING
- COMMUNITY ENGAGEMENT



ECOLOGICAL INFRASTRUCTURE REPAIR

WATER

- bioswale /dry creeks
- permeable ground
- rain water catchment
- mulch

HABITAT

- native vegetation garden

CLIMATE

- plant trees and shrubs

ENERGY

- renewable energy demonstration systems

MATERIALS

- use sustainable, natural and recycled building materials

PROJECT METHODOLOGY

ACCESS TO NATURE

DAILY NATURE ACCESS

- brings high quality access to nature everyday into children's lives
- democratizes nature access across social-economic, racial and cultural lines

BALANCE

- hands-on access to nature
- balances real-world sensory experiences with an increasingly digital world

SENSE OF PLACE

- built with local, natural materials
- native plants that are unique to California
- reflects the geography, ecology and culture of the local community


photo from Getty


photo from Getty


photo from activ community

IMPROVED TEACHING AND LEARNING ENVIRONMENTS

EDUCATIONAL ATTAINMENT

- studies show that many children learn better with hands-on experiences in the types of outdoor settings Green Schoolyard afford[1]

IMPROVED TEACHER SATISFACTION

- outdoor teaching environment provides teachers with abundant teaching resources

REDUCED BULLYING

- promotes imaginative play
- provides variety and diverse social play environments
- reduces boredom
- shifts social leadership structures
- leads to less disciplinary problems[2]


photo from givingcompass.org


photo from nrdc.org


photo from nrdc.org

1. Children & Nature Network, "Children's Contact with the Outdoors and Nature: A Focus on Educators and Educational Settings," 2010.
2. Louv, Richard, keynote presentation for the San Francisco Green Schoolyard Alliance's Growing Greener School Grounds Conference. San Francisco, CA (2008).

PROJECT METHODOLOGY

HEALTH AND WELLBEING

OBESITY PREVENTION

- environment that allows for exploration and imagination; offers children play-based solutions to the obesity epidemic

HEALTHIER LIFESTYLES

- increases physical activity
- nutrition-oriented gardening and cooking programs
- promotes new skills that foster lifelong health

IMPROVED WELLBEING

- offers therapeutic properties that lower blood pressure
- provides a relaxing environment

COMMUNITY ENGAGEMENT

EMPOWERMENT

- children gain experience repairing their own local ecosystem and make a difference in our world
- students experience collaborative environmental action, building confidence in the power of working together

STEWARDSHIP

- transforms the idea of schoolyard "maintenance" into the broader concept of "stewardship"
- reduces management costs while fostering increased parental involvement and community building

PROGRAM OBJECTIVES

OBJECTIVES

ENVIRONMENTAL

- reduce site temperature
- reduce energy consumption
- reduce carbon foot print
- reduce water consumption
- manage stormwater
- manage waste
- increase campus green space

CHILDREN'S WELL-BEING

- shaded play areas
- outdoor classrooms with programming tied to curriculum
- different areas to promote play options
- free play area
- edible and native gardens
- nature observation and exploration areas
- emphasize comfort, health and safety

COMMUNITY

- environmental awareness and stewardship
- playground and garden for community access
- special events area
- amphitheater
- art display opportunities

PROGRAM ELEMENTS

program elements performance
• increase **free canopy by 20%**
• replace 30% of asphalt and concrete with **permeable surface**
• apply **solar reflective paint** on remaining impermeable surface
• **shaded courtyards** outdoor classrooms with different activities to tie to curriculum (each courtyard for 25 children)
• **shade 40% of teacher's courtyard**
• a **calm reading and hang out area** under trees for a quiet time for 25 children
• a **drought tolerant garden** of 10,800 sf **at the perimeter** of school, with 1,500 sf of bioswale area to welcome students
• **vegetable garden** and composting facility - 8,200 sf
• a **discovery garden** at the 36,500-sf wild area with a **wildlife observation deck** for 25 children, a watershed demonstration, and a 1,400 ft loop trail
• **green roofs** to manage stormwater
• **solar panels** demo for students and to conserve energy
• **rain barrels** by rain gutters spouts
• a **garden performance stage** for intimate music events under the trees for about 20 guests
• a **garden and playground** area of 6,800 sf to **open to the community** after school hours
• **amphitheaters** for 100 students
• **special events** multi use area for 650 people
• **murals for art expression** and exhibition
• **free play playground** with stumps and boulders 2,040 sf
• **climbing wall and seating areas** on existing slopes 2,700 sf
• **bilingual signage** throughout campus - identifying plants, circulation, and warnings

CASE STUDIES

EAGLE ROCK ELEMENTARY SCHOOL - Los Angeles
BRENT ELEMENTARY, Washington, D.C.
COWICK FIRST SCHOOL, Exeter, England

EAGLE ROCK ELEMENTARY Cool Schoolyard

LOS ANGELES

Designed by Studio MLA

Existing Condition

Final Plan

actions

- replaced 30% of school's asphalted play area[2]
- introduced green surfaces, plants, trees, logs and boulders[2]
- the remaining asphalt has a tan climate coating to reduce heat retention and radiation[1]
- trees subdivide the yard into smaller areas, and over time will provide shade
- small self contained areas in the periphery give children places to escape from the hectic atmosphere of competitive sports[1]

before

after

results

- sedentary behavior decreased
- vigorous activity increased
- girls became more active
- student's physical and verbal conflict declined[1]
- children spent more time engaging in physical activity in green space compared to hardscape play
- reduced temperature in garden by 18 °F compared to asphalted areas[2]

1. Landscape Architecture Magazine, June 2019 "The Schoolyard is Sick" - Study by kinesiologist professor Marcell Raney and students at Occidental College 2015
2. Studio-MLA - Metropolitan Water District Green Schoolyards Typology - June 2019

BRENT ELEMENTARY SCHOOLYARD GREENING Phase 1 - 2006-2010

WASHINGTON, D.C.

Designed by Sustainable Life Designs

WB MH

actions

- replaced 1,500 sf of asphalt play surface with a rain garden
- introduced "Nature Classroom" for subjects like science, art, music, and English

results

- summer daytime surface temperature decreased by 23%
- summer daytime air temperature decreased by 9%
- retains 79% of a 1 year storm event in the rain garden
- helped increase demand for enrollment
- increased attendance rate
- increased reading scores
- increase family engagement

cost comparison methods

- community volunteers save the school an estimated $18,000 in grounds maintenance costs each year compared to grounds that must be maintained entirely by paid staff.

before

after

source: https://www.landscapeperformance.org/case-study-briefs/brent-elementary-schoolyard

COWICK FIRST SCHOOL Stewardship Begins at School

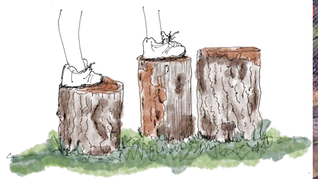
EXETER, ENGLAND

Design by the school partnered with a local landscape architect

WB MH

stewardship

- a master plan to "think big" but start small
- for 18 years the school has been building its ecological systems
- time has given them the opportunity to "grow" the budget, enact maintenance plans, and expand the curriculum along with site improvements
- new features of the site are continually added slowly over a long period of time
- the school has an opportunity to adjust to each addition
- a continued maintenance program was added into the curriculum
- "Ground Force" is an after school club that helps to keep the site in order
- annual maintenance costs are kept at an affordable rate



minifarm

a kitchen garden

free-play area

source: http://www.greenschoolyards.org/inspiring-precedents

ALDAMA ELEMENTARY SCHOOL

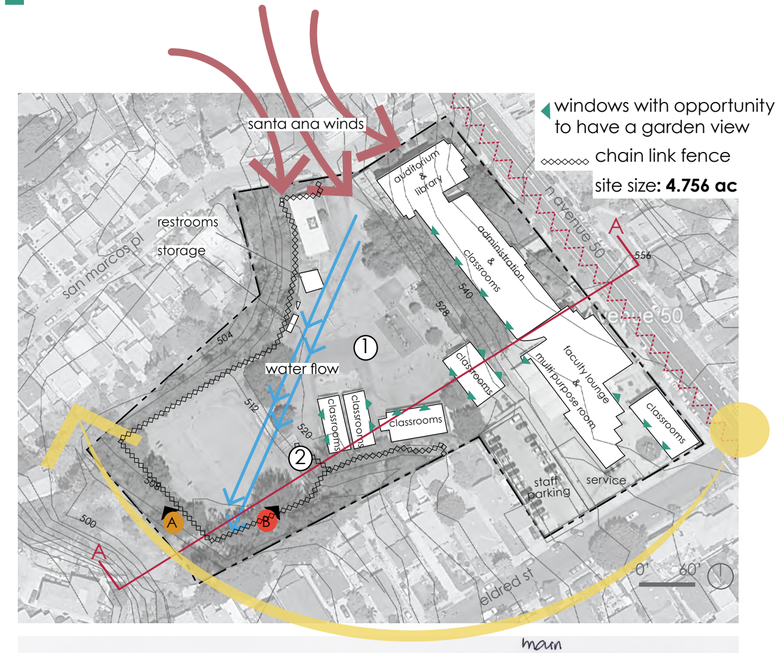
SITE ANALYSIS

NATURAL PHYSICAL FEATURES
AREA USE
PERMEABLE X IMPERMEABLE
TREE CANOPY
CONSTRAINTS
OPPORTUNITIES

NATURAL PHYSICAL FEATURES

① **wild area:** mature trees and shrubs, with a dry creek. Children don't have access to the area.

② **asphalted slope:** opportunity for climbing wall and seating area built in slope



① main yard recess
- 65 - 110 kids
- 5 - 7 year-old kids
- 5 special ed kids

② main yard adjacent
- kids play in the recently installed 2,000 sf dg area

③ expanded transitional kindergarten & special education area recess
- 65 kids
- 4 - 5 year-old kids
- multi-aged kids from special education class

④ staff parking
- 28 vehicles

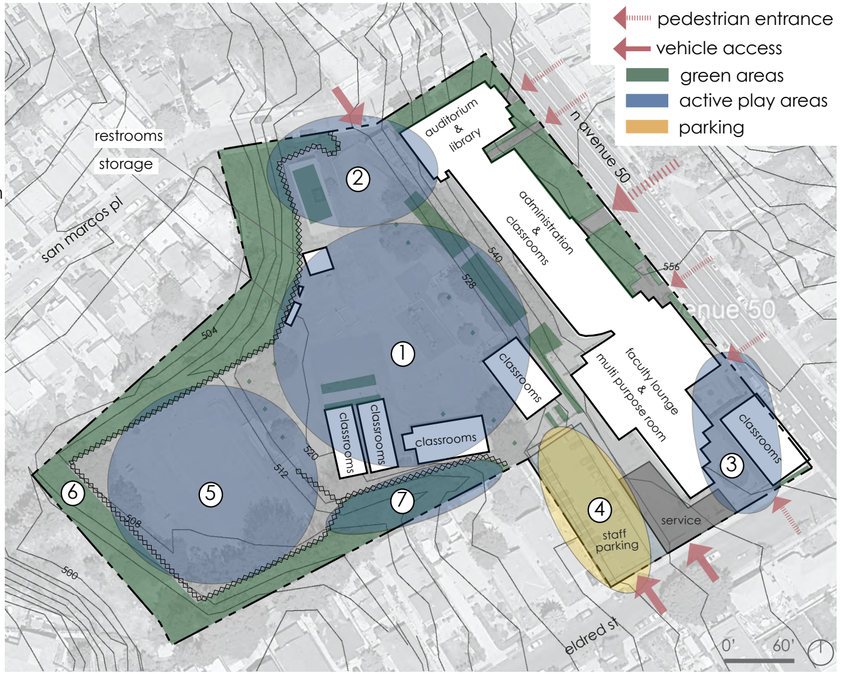
⑤ lower yard recess
- 65 - 90 kids
- 8 - 10 year-old kids
- 5 special ed kids

lower yard special events
- 750 people

⑥ wild area
- NOT IN USE

⑦ garden area
- 15 - 20 kids at time with teacher only

AREA USE DIAGRAM



PERMEABLE X IMPERMEABLE
DIAGRAM

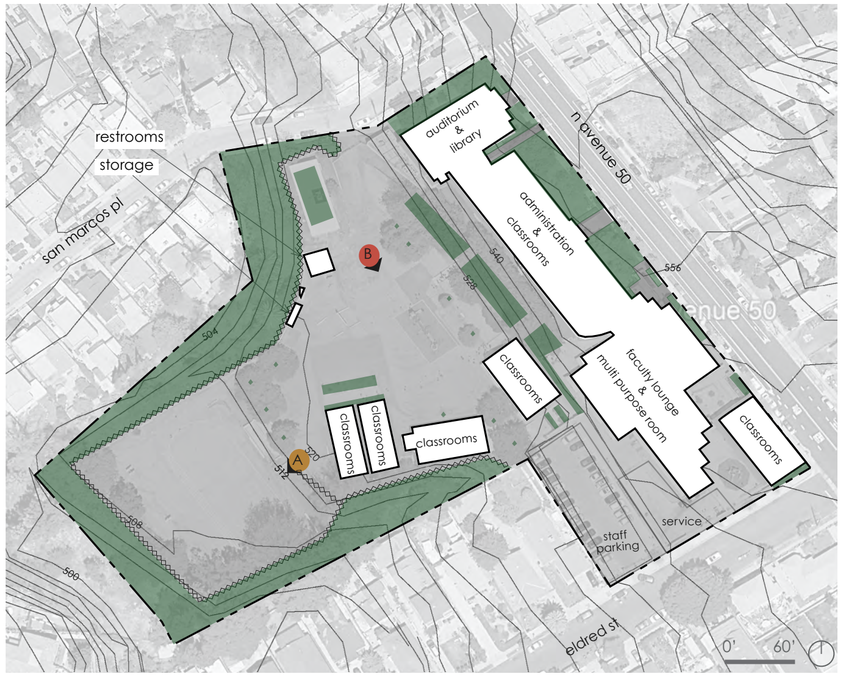
26% **of permeable surface**

planted or DG areas

74% **of impermeable surface**

buildings

asphalt or concrete



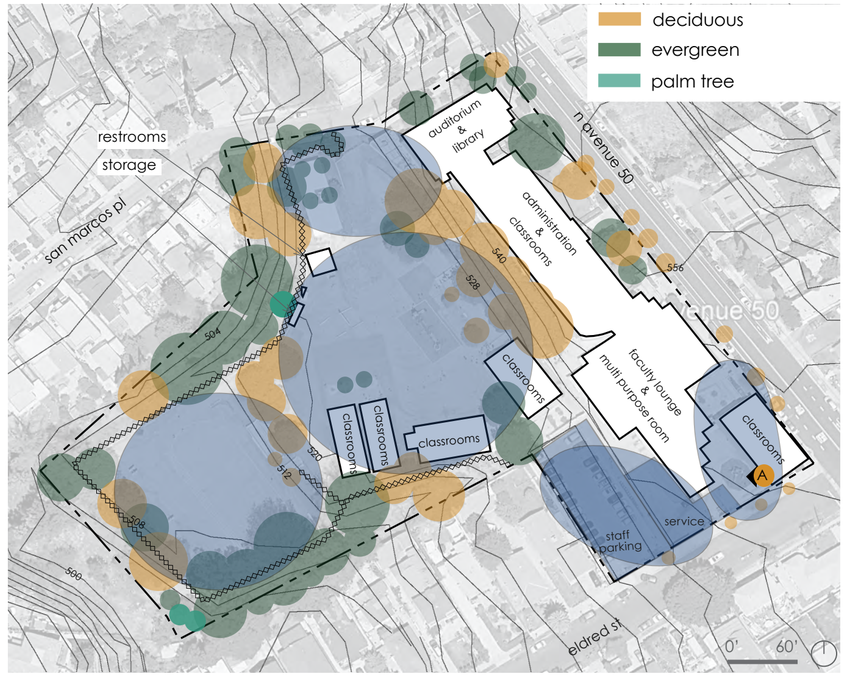
1. Surface cover derived by Council for Watershed Health from visual analysis of 2011 LARIAC 1 ft. imagery, LA County GIS Building roof line, CAMS Street data and school site data provided by LAUSD.

TREE CANOPY
DIAGRAM

29.5 % of school site has tree canopy cover[1]

ONLY 6.5 % of play area has tree canopy cover[1]

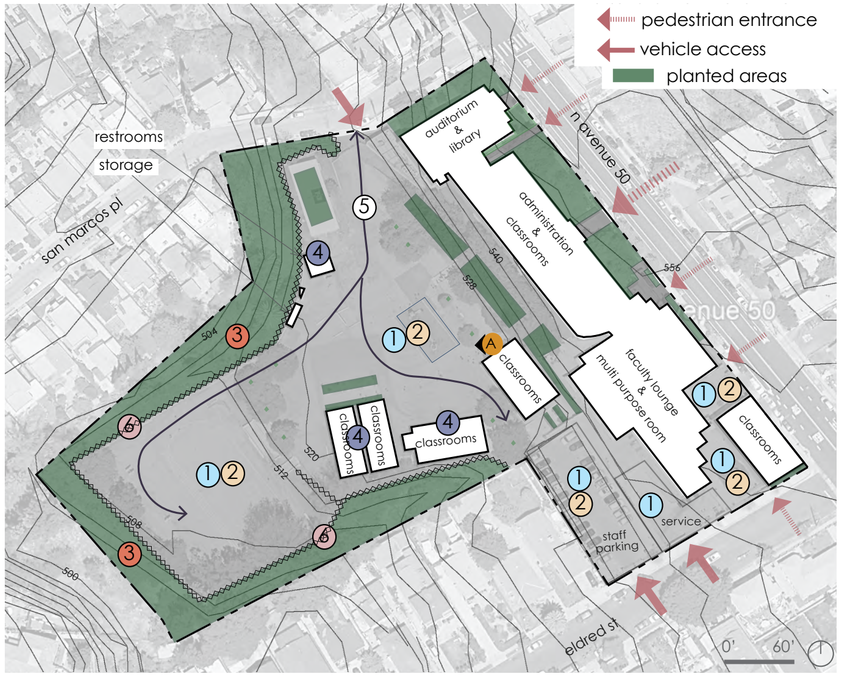
opportunity to increase tree canopy in areas used by students and staff



1. Tree canopy cover derived by Council for Watershed Health from visual analysis of 2011 LARIAC 1 ft. imagery, LA County GIS Building roof line, CAMS Street data and school site data provided by LAUSD.

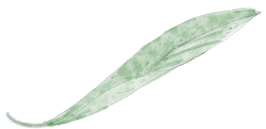
CONSTRAINS
DIAGRAM

1. impermeable surface on most of the accessible area
2. lack of shade
3. wild area inaccessible to the students
4. buildings in main yard constraint some opportunity for circulation
5. vehicle circulation: emergency and delivery vehicles must have access to yard
6. chain link fence: blocks kids access to the green wild area



OPPORTUNITIES
DIAGRAM

1. main yard: create areas with permeable surface
2. main yard adjacent: create a park for community access
3. etk area: create shaded areas
4. staff parking & service area: replace concrete with permeable surface and add trees for shade & redesign parking
5. lower yard: create areas with permeable surface
6. wild area: open the wild area for children to explore



DESIGN PROCESS
METAPHOR
CONCEPTS
FINAL CONCEPT

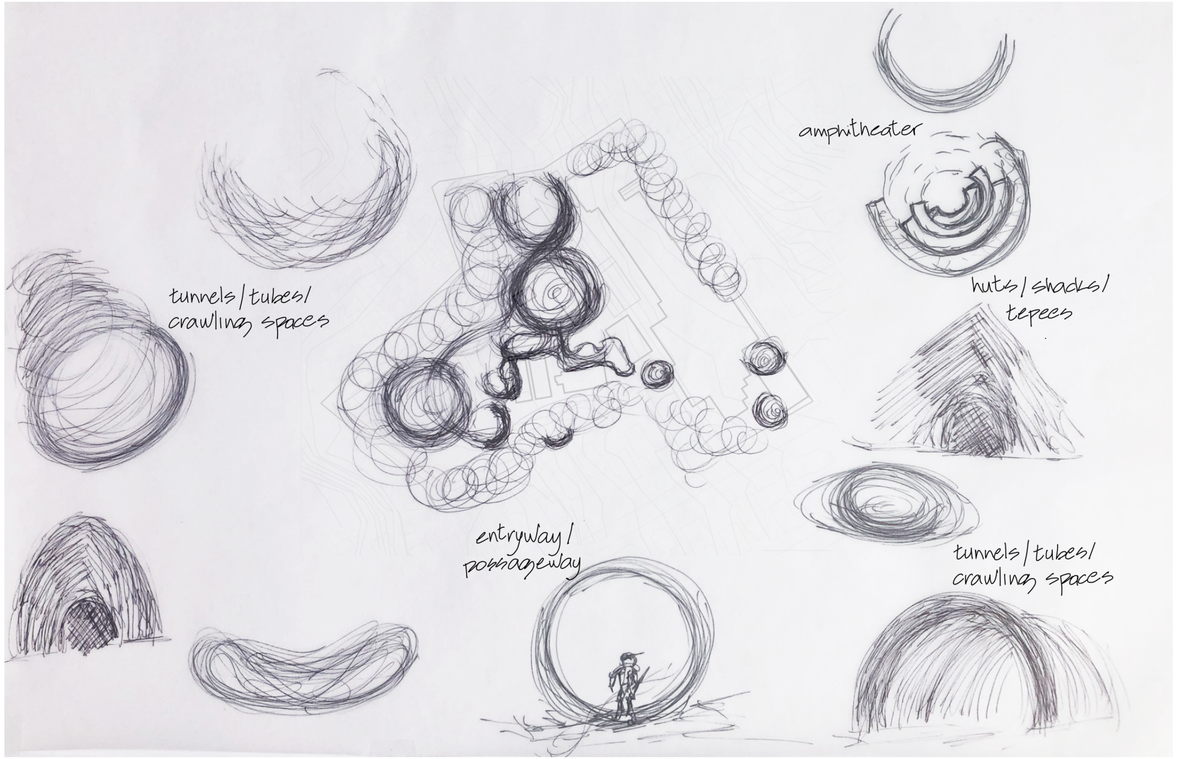
DESIGN **METAPHOR**

ALDAMA ELEMENTARY SCHOOL is the **HOME** of the hawks

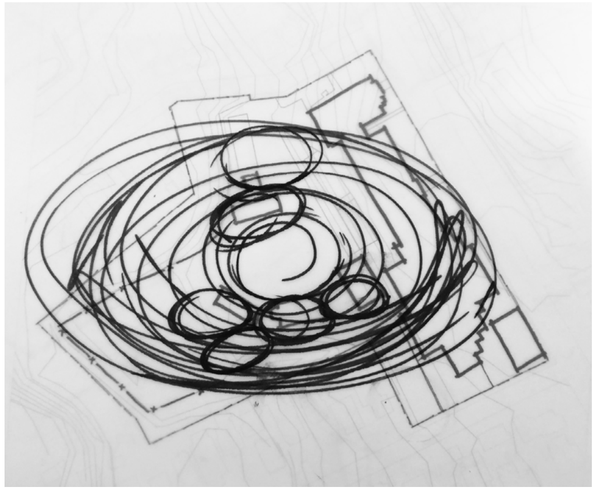
THE HAWKS **NEST** as an inspiration

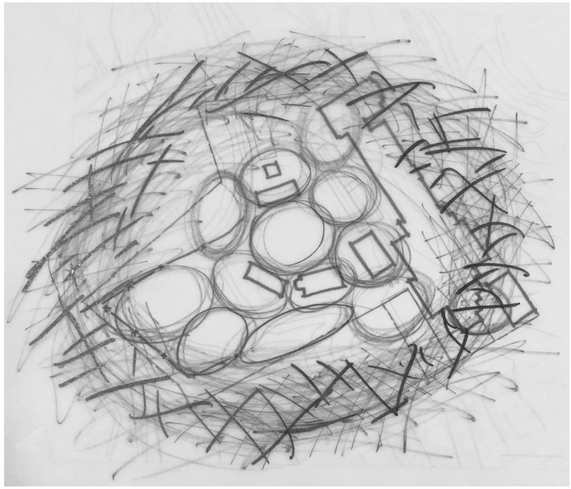
"...home is our space in the world. It is our first universe. In truth it is a cosmos."
"...It is a setting for our dreams and day dreams, and memories" Gaston Bachelard - "The Poetics of Space"

The nest provides comfort, security, inspiration and care (and fun!)



THE HAWKS **NEST** as an inspiration





The main yard becomes the core of the nest.
The core of the nest is where children grow and thrive.

DESIGN **CONCEPTS**

DIAGRAM **A**

DIAGRAM **B**

DIAGRAM **C**

DIAGRAM **A**

DIAGRAM B

community park:
- dg free play area
- bioswale and native garden

wild area:
- birds observation deck
- watershed demo
- exploration trail

lower yard:
- sports court and bleachers
- amphitheater
- free play hangout area

- native garden
- bioswale
- seating and climbing wall

kindergarten
- butterfly garden
- amphitheater / outdoor classroom

teacher's courtyard

etk & special ed
- courtyard sensorial garden
- shade structure

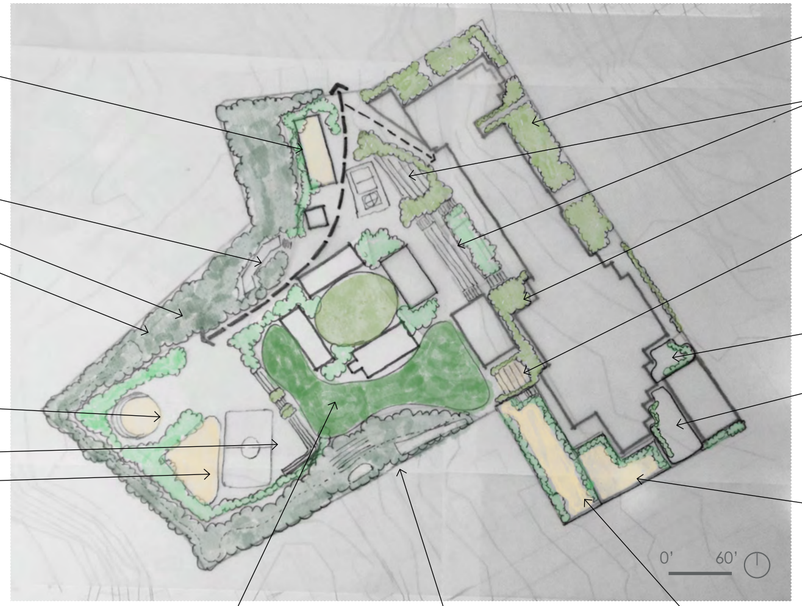
service area
- dg surface
- hedge

courtyard / outdoor classroom

outdoor classroom
- vegetable garden
- native garden

staff parking
- dg surface
- trees for shade

DIAGRAM C



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kindergarten
- butterfly garden
- amphitheater / outdoor classroom

teacher's courtyard

etk & special ed
- courtyard sensorial garden
- shade structure

service area
- dg surface
- hedge

connected courtyard / outdoor classrooms

outdoor classroom
- vegetable garden
- native garden
- small stage
- seating area

staff parking
- dg surface
- trees for shade

FINAL DESIGN CONCEPT

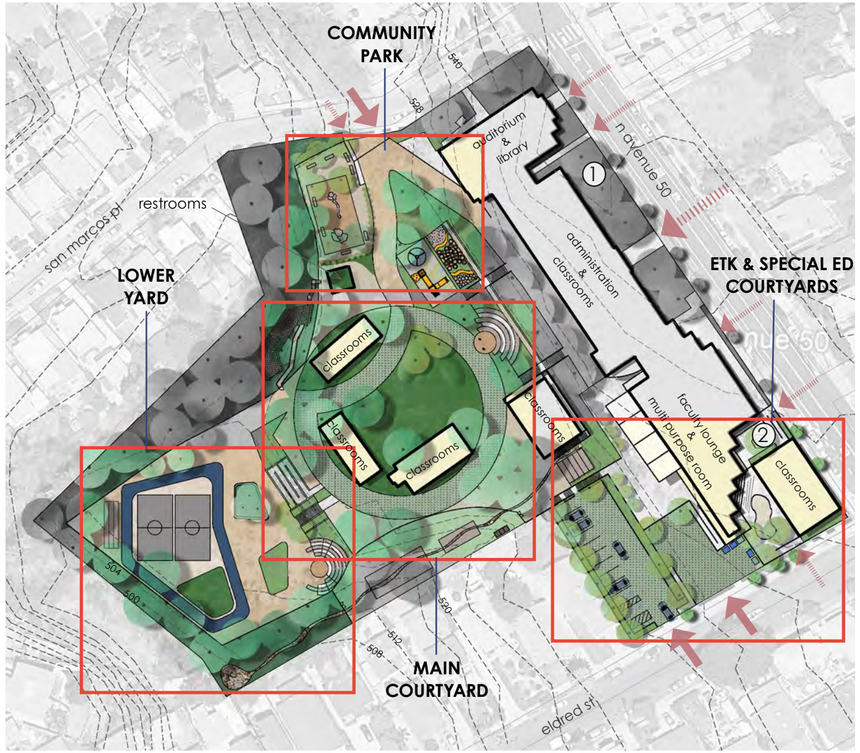
1. drought tolerant garden w/ bioswale
2. teacher's courtyard
3. etk & special education courtyard
   - sensorial garden
   - shade structure
4. service area & parking
   - permeable surface
   - small trees
5. kindergarten
   - butterfly garden
   - watershed demo
   - amphitheater
6. shaded hang out area
7. climbing wall & amphitheater
8. play apparatus
9. community park
10. grassy main yard / drivable edges
11. outdoor classroom courtyard
12. outdoor classroom
    - vegetable garden
    - native garden
    - small stage & seating
13. wilderness observation deck
14. lower yard:
    - sports court and bleachers
    - amphitheater
    - free play hangout area
15. wild area:
    - trail
    - outdoor classroom
    - watershed demo

1"=100'

0' 50' 100'

ENLARGEMENTS

ETK & SPECIAL EDUCATION COURTYARD
COMMUNITY PARK
MAIN COURTYARD
LOWER YARD
NATURE OBSERVATION DECK



EXPANDED TRANSITIONAL KINDERGARTEN & SPECIAL EDUCATION

COURTYARD

1. shaded teacher's courtyard

2. sensorial sand pool surrounded by tree log and boulders

3. overhead trellis with vine growing over an area with tables for outdoor gathering

4. small size trees in planters over tree stumps for seating and playing

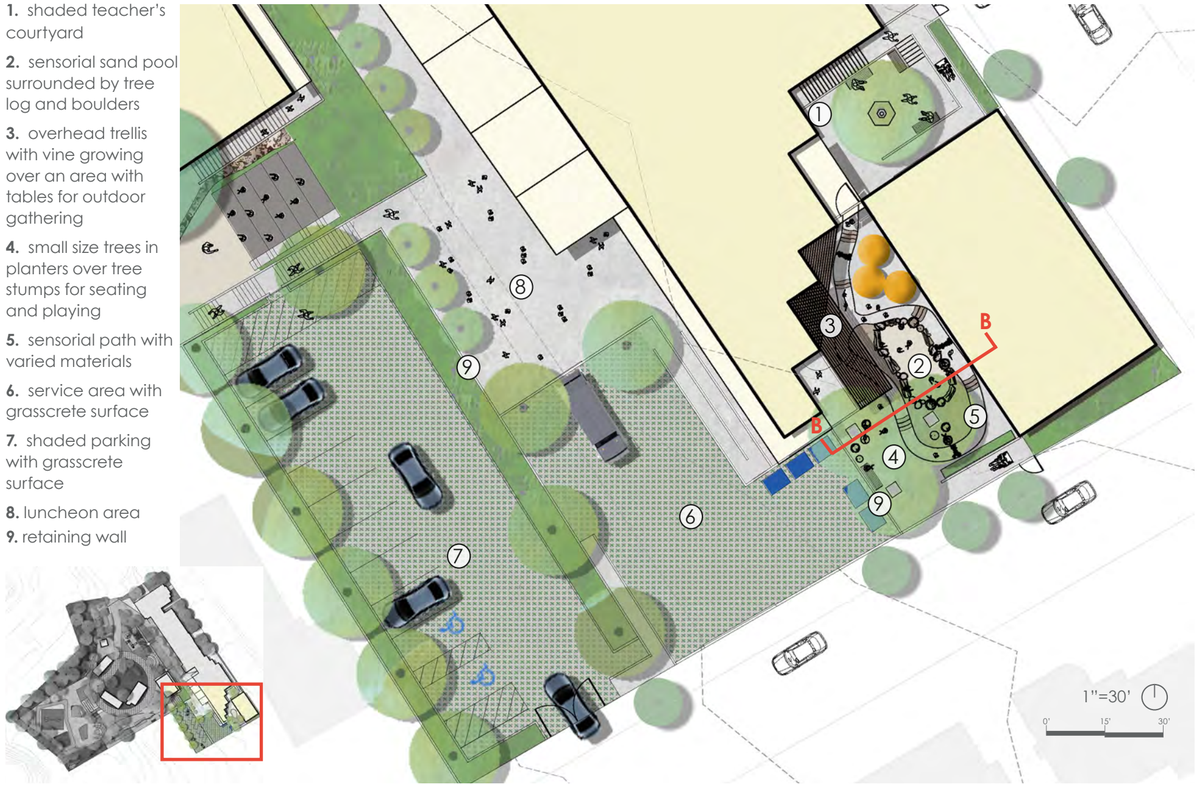
5. sensorial path with varied materials

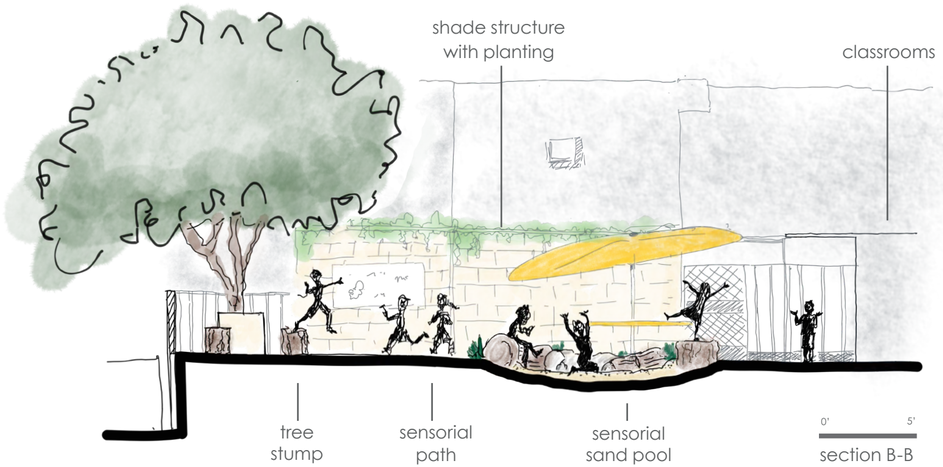
6. service area with grasscrete surface

7. shaded parking with grasscrete surface

8. luncheon area

9. retaining wall

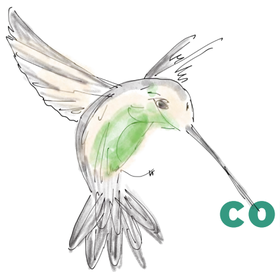




Sensorial path with various materials

Sensorial sand pool

Experimental musical instrument



COMMUNITY PARK

1. entrance to community park

2. nest inspired arc to enter the park

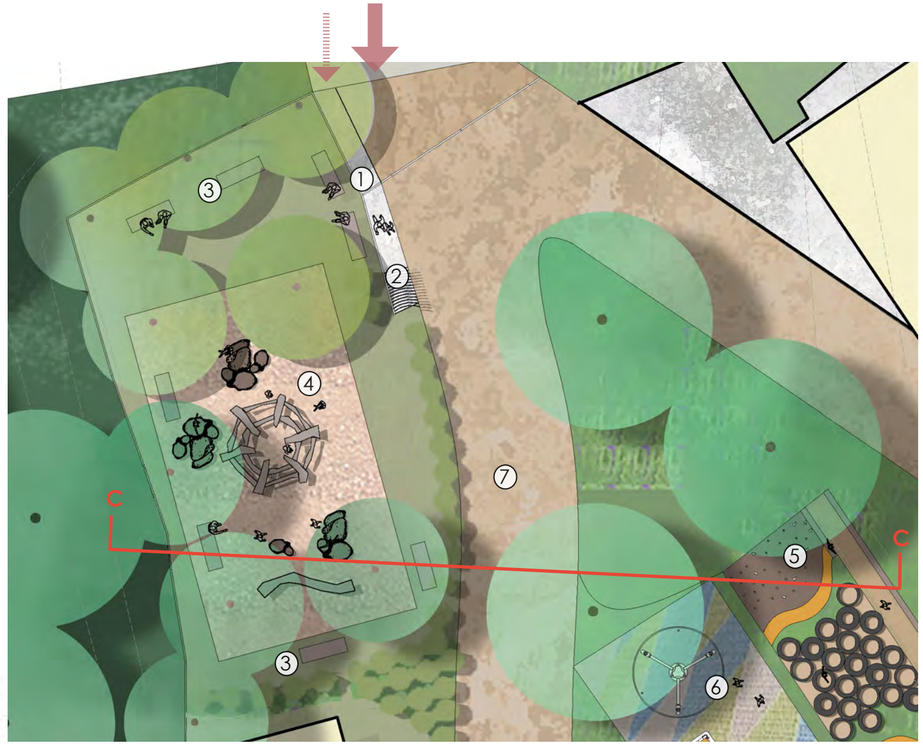
3. seating area under trees

4. nature like playground with boulders, stumps and nest-inspired play apparatus

5. seating, slide, and climbing wall with recycled material

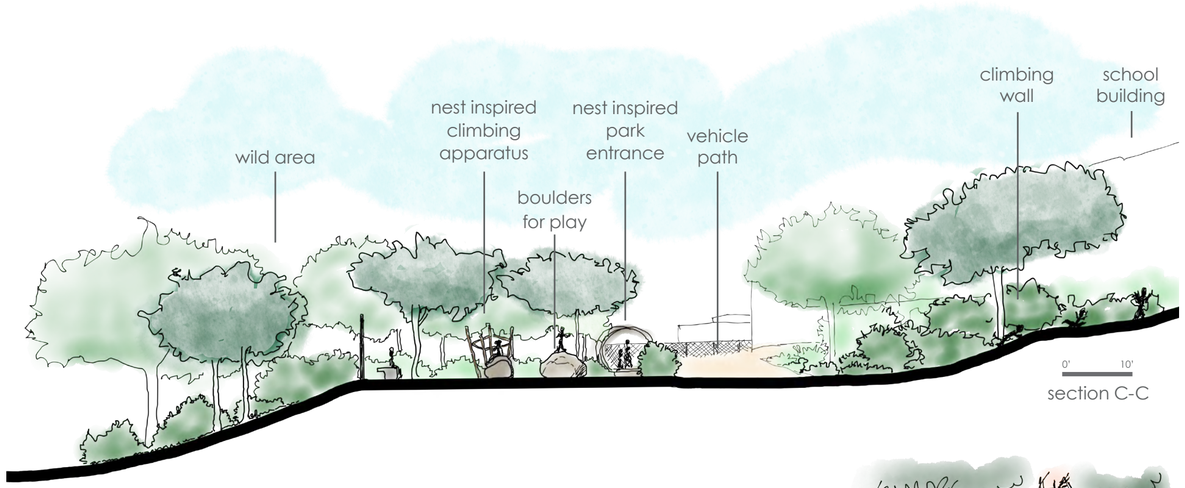
6. existing playground apparatus relocated

7. asphalt painted with reflective coating to reduce solar-induced heat build-up



1"=20'

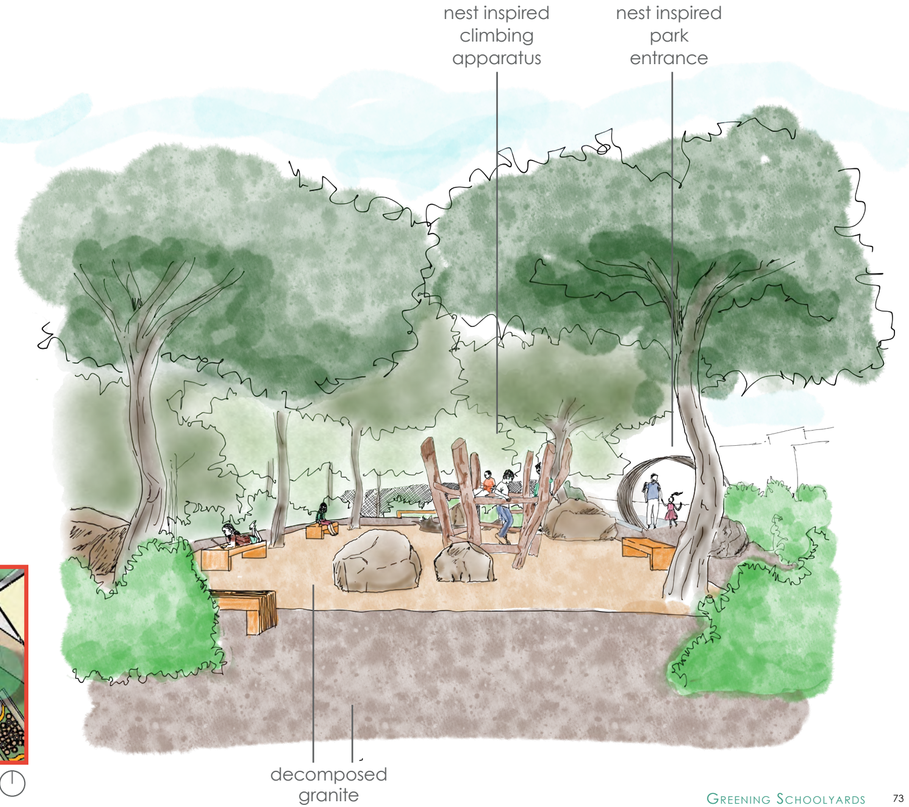
0' 10' 20'



section C-C

Climbing wall

Sustainable way to use materials



MAIN COURTYARD

1. open lawn courtyard with mounds and trees for playing and gathering

2. nest inspired amphitheater / outdoor classroom

3. courtyards & outdoor classroom with mulch surface

4. butterfly garden with amphitheater & outdoor classroom

5. edible garden area / compost bins / outdoor classroom

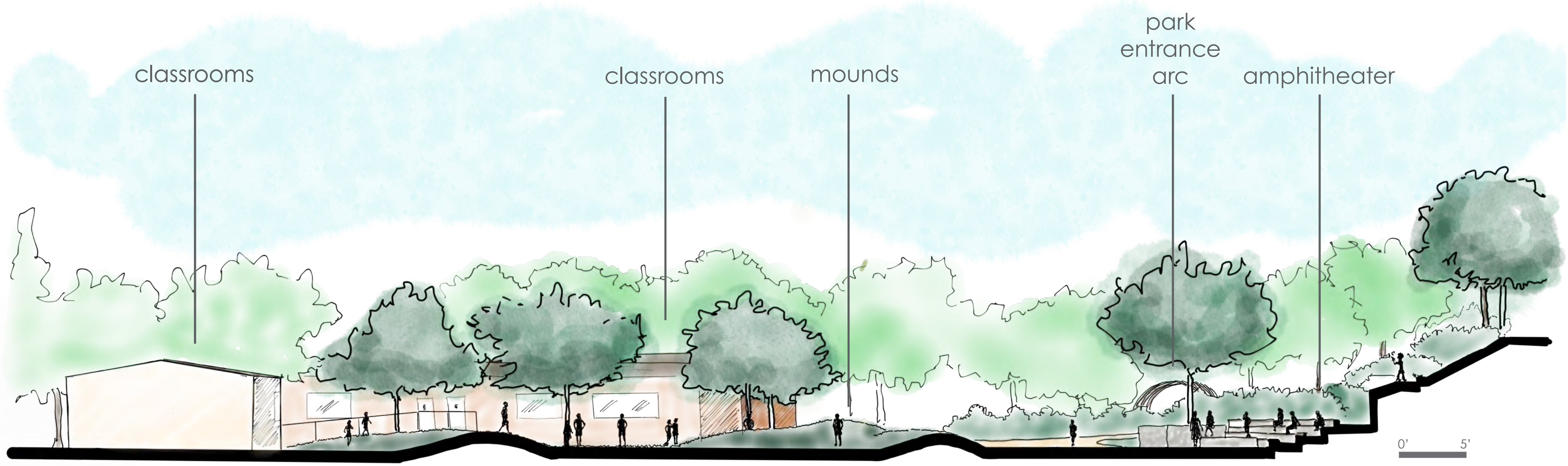
6. grasscrete path for delivery and emergency vehicles

7. courtyard under the trees with asphalted surface with solar reflective paint

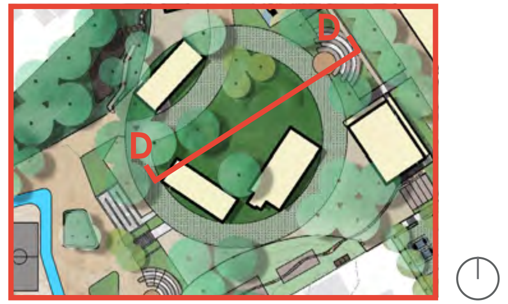
8. wildlife observation deck

1"=40'

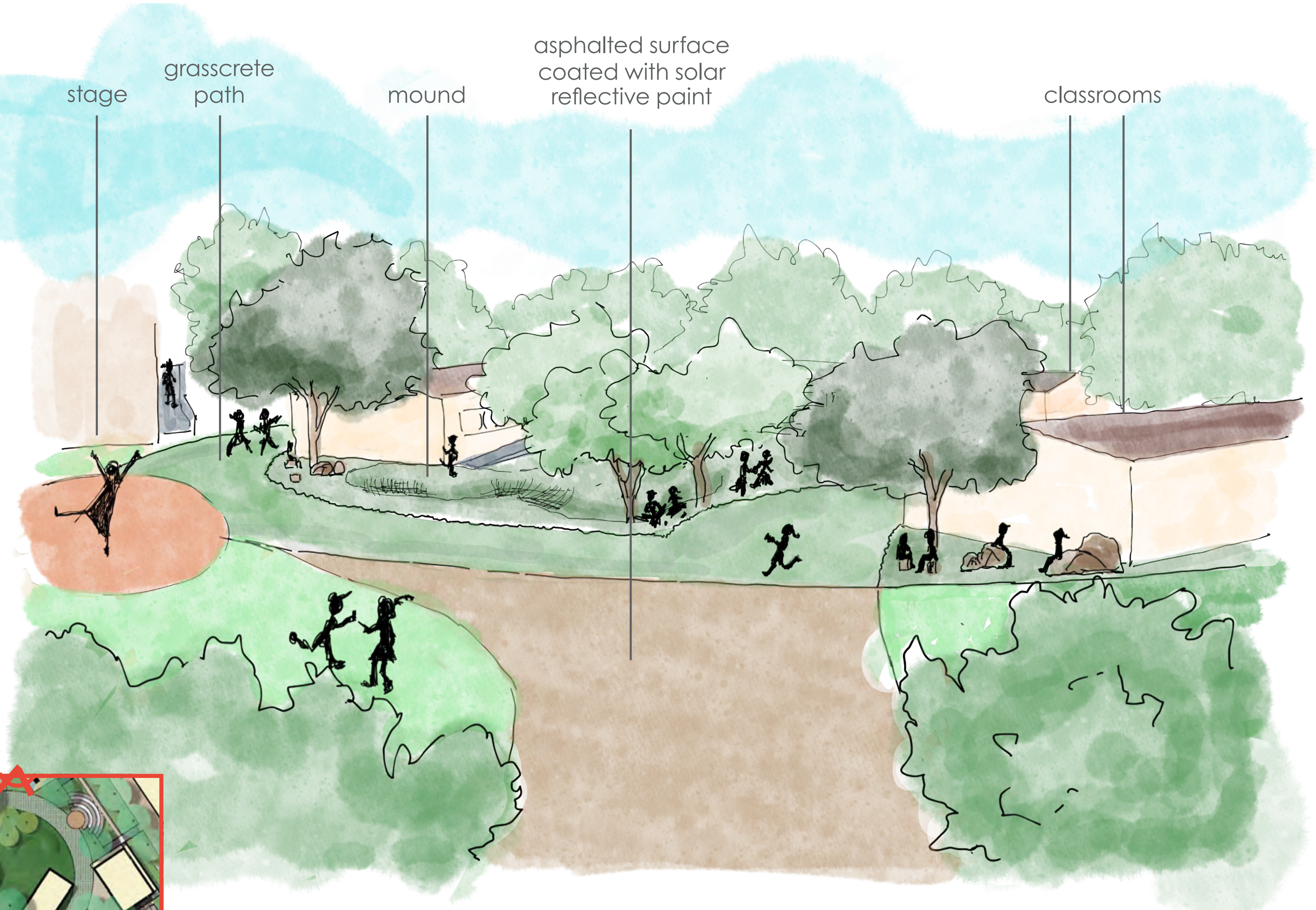
0' 20' 40'

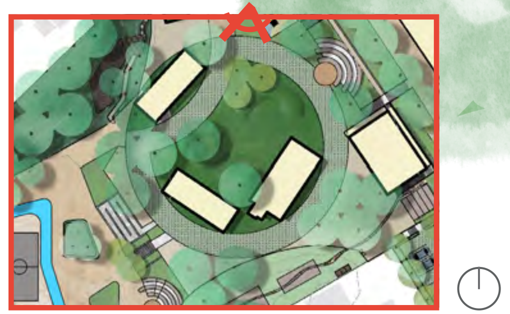


section D-D



courtyard / outdoor classrooms





LOWER YARD

1. asphalted surface painted with reflective paint

2. universally accessible ramp

3. tree planter with seating

4. nest inspired amphitheater / outdoor classroom

5. planting area/ mound to give privacy to amphitheater

6. watershed demonstration

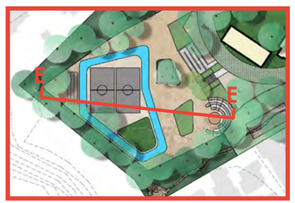
7. hang out lawn area with seating

8. running track

9. bleachers seats / outdoor classroom

10. nature exploration trail with CA native plants and a dry creek

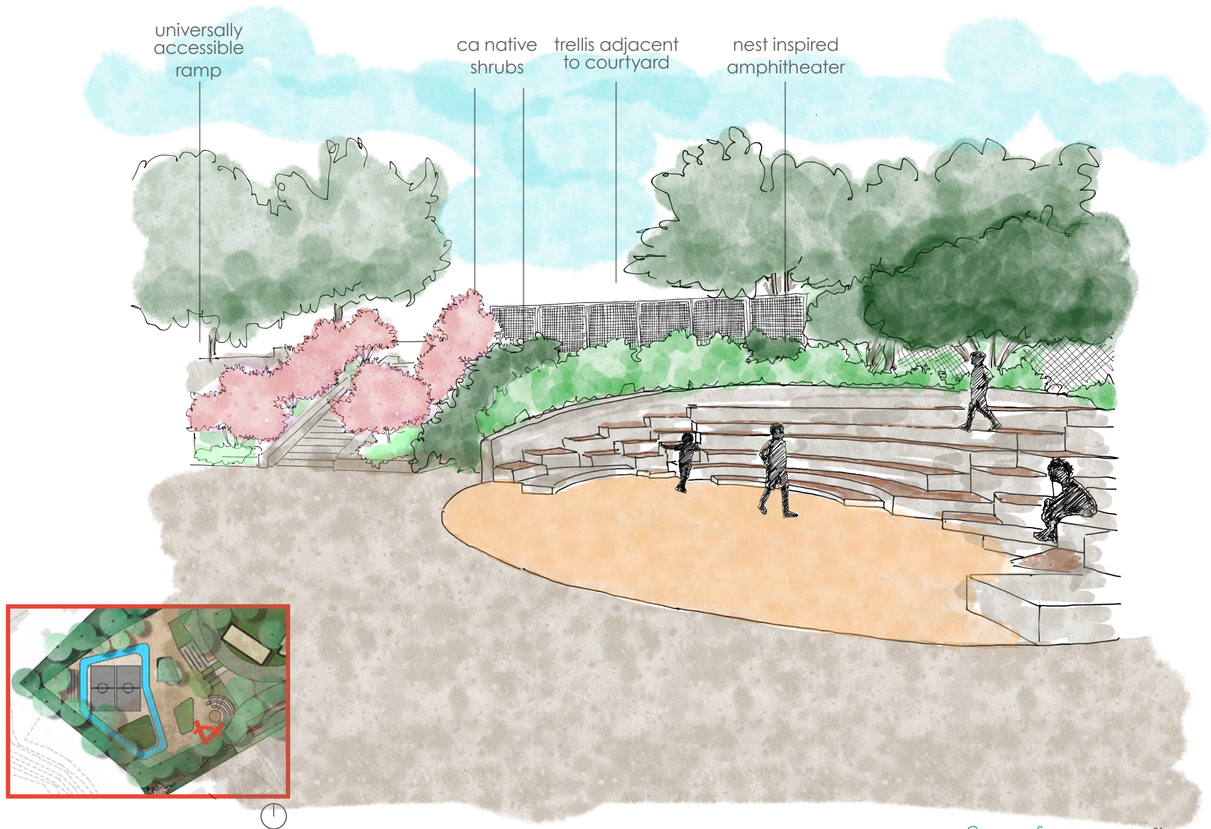
section E-E



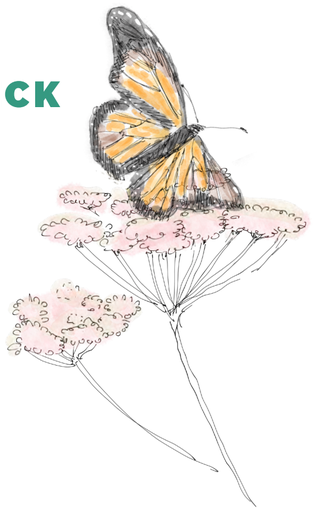
the "chatterbox"

bilingual signs

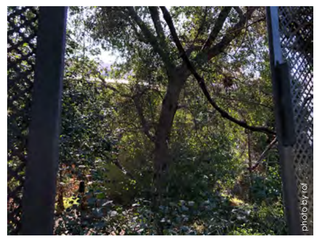
natural material playground



NATURE OBSERVATION DECK



section F-F



window to wilderness

CONCLUSION
PERMEABILITY & TREE CANOPY

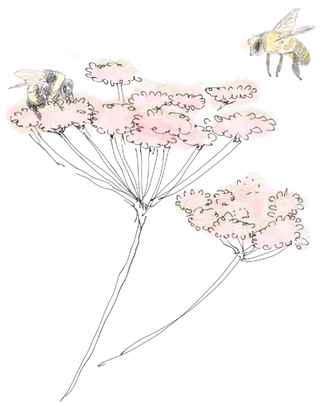
PERMEABILITY
BEFORE GREENING SCHOOLYARD

PERMEABILITY & TREE CANOPY
BEFORE GREENING SCHOOLYARD

PERMEABILITY & TREE CANOPY
CONCLUSION

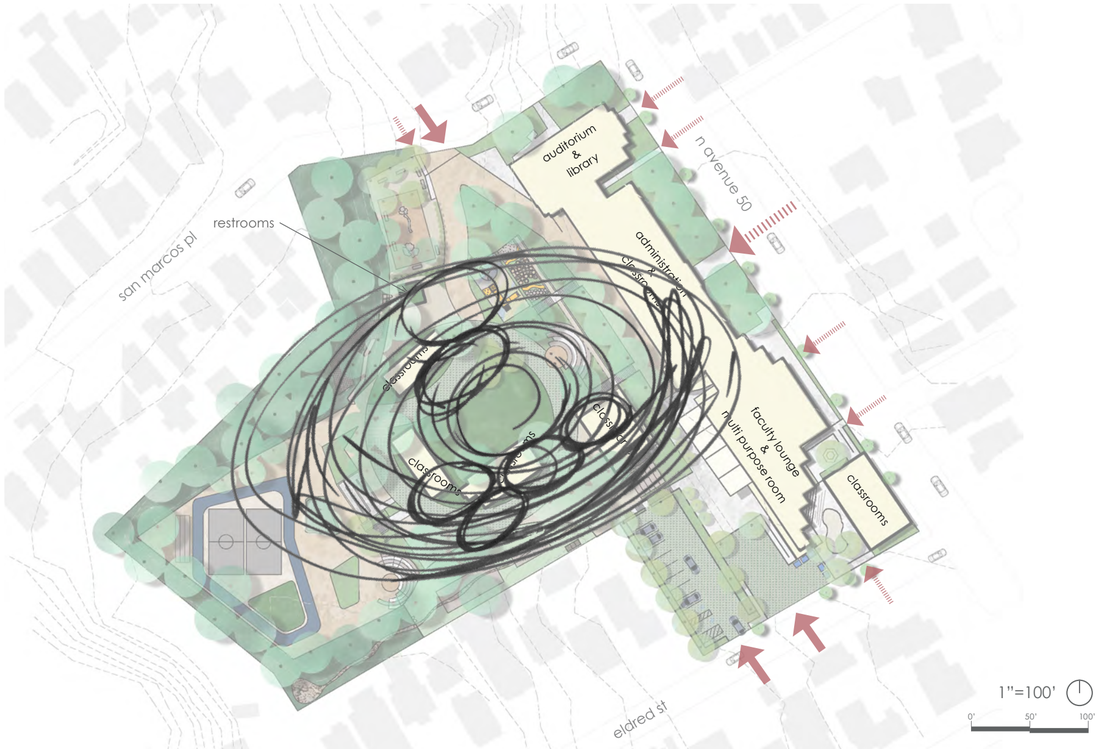
PERMEABILITY & TREE CANOPY **AFTER** GREENING THE YARD

- **25 %** increase of permeable surface
- **30 %** increase of tree canopy
- **29,000 sf** extra wild green area that kids will have access



FINAL DESIGN CONCEPT
ALDAMA ELEMENTARY SCHOOL

THE NEST
ALDAMA ELEMENTARY SCHOOL



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THANKS TO

Mr. Sergio Corral, Mr. Nicolas Coronel, Ms. Danis Cybulski, Ms. Jacqueline de los Santos, Ms. Anne Zerrien-Lee, Tricia O'Connell, Kamren Curiel, Brie Wakeland, Sandy Betts, Nora Petersen, Theodore Augustus Bell, Amanda Millett, Claire Latane, Patty Gum, Pedro Baz Chustz, Claudette Contreras, Hughes Winborne, Wyatt Winborne, Rosa Okasaki de Freitas, Diogo de Freitas Ascêncio, Melinda Taylor, Meg Coffee, Jim Pickel, Stephanie Landregan, Melissa McDonald, E. Allen Spulecki, James Curtis, Pamela Brief; all the teachers and cohorts I had through out my years in the Landscape Architecture program at UCLA Extension for their knowledge, inspiration and support; all the landscape architects that have paved the path to greening schoolyards, their work guided and inspired me through this project; and a final special thanks to the person who has been a life inspiration from the moment we first met, Diego Antônio Freitas-Bell.