Designing for Children's Outdoor Play and Learning Environments

How programming informs design

Planning a Schoolyard Habitat Workshop
August 2013

By Ilisa Goldman, RLA
San Diego Children and Nature Collaborative
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About Me

Education:

- **Rollins College, Winter Park, FL**
  BA in Environmental Studies, 1998
- **North Carolina State University, Raleigh, NC**
  Master of Landscape Architecture, 2002, Minor in Horticulture

Professional Practice since 2002:

- Ilisa Goldman Landscape Architecture and Consulting
- New School of Architecture and Design

Specializations:

- Children's Outdoor Play and Learning Environments
- Sustainable Design
- Educational Landscapes

"It is the spirit of the child that can determine the course of human progress and lead it perhaps even to a higher form of civilization."
–Maria Montessori

Steps in the Design Process

Rosa Parks Elementary
Berkeley, CA

1. **Program Development**
   - Gathering Input
   - Define Program Elements
2. **Site Assessment**
   - Local and Site Assessment
3. **Design Elements**
   - Basics of Schoolyard Habitat Design
4. **The Design**
   - Design Considerations
   - Developing a Final Plan
5. **Implementation**
   - Timeline, Budget, Funding
6. **Maintenance**
7. **Planting Design Tips**

1. Program Development

- **Forming a Team**
- **Survey**
  - Parents
  - Teachers
  - Non-teaching staff
  - Students
- **Student Workshop**
- **Other Ideas for Involvement**
- **Develop Visions, Goals and Objectives**
- **Defining Program Elements**

Poe Montessori School
Raleigh, NC

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Forming a Team

The long term success of a project is dependent upon creating a team that will help provide support, resources and an overall stronger end product.

- Teachers, parents, community members, maintenance team, student, staff, landscape professionals, local businesses, etc..
- Initiate the project
- Build momentum
- Connection to teachers and parents
- Consistency and follow through

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Tips for a Successful Team

- Allow for varying levels of participation
- Assign roles to help ensure that no one person is over burdened
- Work within any existing formal committee structure (PTA, Garden Committee, etc.)
- Identify achievable short-team goals (consider a simple short term project to build momentum)
- Allow people to join as they become interested
- Share updates with the school and parents (newsletters, emails, etc.)

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User Surveys

Gathering Information:

- **Students**
- **Parents**
- **Teachers**
- **Staff**
- **Community Members**

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Survey to Students

- What do you like about the outdoors of your school?
- What do you DISLIKE about the outdoors of your school?
- What would you like to see in the new outdoors of your school?
- What would you like to do in the New Outdoors of your school?

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Survey to Parents, Teachers and Non-Teaching Staff

- Which areas of the existing outdoors do you use with your children and what do you do there?
- What problems do you see with the existing outdoors?
- In the new outdoor environment, what ideal recreational/educational spaces would you like to see created?
- What general characteristics do you think the new outdoors should have?

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Engaging the Students

Find ways to get the students involved early on. Make them feel empowered. They usually know the school yard better than anyone!

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Student Workshop

- Split into Groups
- Site Safari
- Brainstorming
- Designing
- Presentations

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Site Safari

Students walk the site in groups and record:

- What they smell
- What they see
- What they touch
- Any other thoughts/observations

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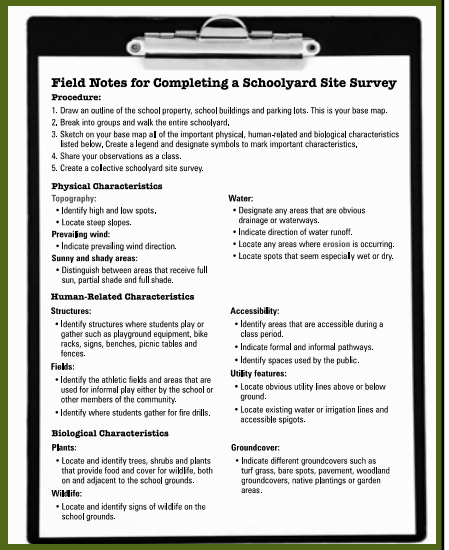
Site Survey

- Locate and Draw
  - Physical Characteristics
    - Topography
    - Wind
    - Sun vs. Shade
- Structures and Fields
- Plants
- Wildlife Inventory
- Other Observations



Field Notes for Completing a Schoolyard Site Survey

Procedure:

1. Draw an outline of the school property, school buildings and parking lots. This is your base map.
2. Break into groups and walk the entire schoolyard.
3. Sketch on your base map all of the important physical, human-related and biological characteristics listed below. Create a legend and designate symbols to mark important characteristics.
4. Share your observations as a class.
5. Create a collective schoolyard site survey.

Physical Characteristics

Topography:
- Identify high and low spots.
- Locate steep slopes.

Prevailing wind:
- Indicate prevailing wind direction.

Sunny and shady areas:
- Distinguish between areas that receive full sun, partial shade and full shade.

Water:
- Designate any areas that are obvious drainage or waterways.
- Indicate direction of water runoff.
- Locate any areas where erosion is occurring.
- Locate spots that seem especially wet or dry.

Human-Related Characteristics

Structures:
- Identify structures where students play or gather such as playground equipment, bike racks, signs, benches, picnic tables and fences.

Fields:
- Identify the athletic fields and areas that are used for informal play either by the school or other members of the community.
- Identify where students gather for fire drills.

Accessibility:
- Identify areas that are accessible during a class period.
- Indicate formal and informal pathways.
- Identify spaces used by the public.

Utility features:
- Locate obvious utility lines above or below ground.
- Locate existing water or irrigation lines and accessible spigots.

Biological Characteristics

Plants:
- Locate and identify trees, shrubs and plants that provide food and cover for wildlife, both on and adjacent to the school grounds.

Wildlife:
- Locate and identify signs of wildlife on the school grounds.

Groundcover:
- Indicate different groundcovers such as turf grass, bare spots, pavement, woodland groundcovers, native plantings or garden areas.

USFWS Guidebook page 29

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Brainstorming

Students list on paper:

- What activities they want to do.
- What they need to do them.
- Where they can be done.

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Designing

Students Design their Schoolyard:

- Split in Groups
- Students draw ALL their ideas on paper
- Materials: markers, glue, paper, plan of school (optional)

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Student Presentations

Team Presentations

- Have students name the school yard
- Students present their design to the other workshop participants.
- Materials: easel, camera, pointer

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Building Momentum

School Event / Parent Night

- Establishing a Presence
- Sparking Interest
- Meeting Parents
- Disseminating Information

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Case Studies

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Case Study Findings:

Blanchie Carter Discovery Park, Southern Pines Primary School

- **Location:** Southern Pines, NC
- **Designer**: Robin Moore
- **Date:** 1995 to present
- **Size:** 4 acres
- **School Information:**
  - Public School
  - 600 K-3 Students

Photo by the NLI

Photo by the NLI

Main Goals:

- Environmental Education
- Outdoor learning across the curriculum
- Universal Accessibility
- Community Heritage
- To create a dynamic play and learning environment

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Case Study Findings:

Blanchie Carter Discovery Park, Southern Pines Primary School

Photos by the NLI

Lessons Learned

- Implementation strategies
  - Raised $180,000
- Children's accessibility
- Local heritage
- Opening up to the community
  - Decrease in Vandalism
  - Increase in Community Involvement
- Restoration as education
  - Prescribed Burn

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Additional Case Study

Pre - School / Child Development Centers

Bright Horizon's Child Development Centers *Photos by the NLI*

- **Location:** Raleigh, NC
- **Designer:** The Natural Learning Initiative
- **Settings:** Sensory garden, Sand/Water Play connected to Bog Garden
- **Findings**: Children were more active when equipment and nature were integrated or "mixed".

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Additional Case Study

Murdock Elementary School

- **Location**: La Mesa
- **Settings:** Bio-regions of South California
- **Goals / Objectives:**
  - Morning Garden Club
  - After School Gardening Classes
  - School Wide Composting
  - Murdock Children's Farm Stand
  - Plant a Row for the Hungry
  - Garden to Cafeteria Program

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Additional Case Study

Monterey Heights Elementary School

- **Location:** Lemon Grove
- **Settings:** Shade Oak With Outdoor Classroom
- 2nd and 4th Grade Project: Design to Construction

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Additional Case Study

Fuerte Elementary School

- **Location:** Cajon Valley
- **Setting:** Slope Rehabilitation and Wildlife Habitat, Wildlife Mural at Student Entry
- **Cub Scouts:** Slope Planting
- **Roots and Shoots Club:** Mural of biomes of San Diego

Educational Philosophy

- **Montessori Method**
- **Reggio Emilia Approach**
- **Waldorf Methodology**
- **Teaching Approaches**

DCS Montessori Charter School
Castle Pines, CO

The Design Program

Creating a Vision

•Defined Statement(s): What the organization wants to be, or how it wants the world in which it operates to be.

• It is a long-term view and concentrates on the future.

• It can be emotive and is a source of inspiration.

Examples:

•An environment that nurtures the development of the whole child

•An environment that nurtures the natural and cultural heritage of the community

•Emergence of the Montessori Method in an ecologically and educationally rich school yard.

Develop Goals

What are Goals?

•Goals are clearly written statements that will help future team members understand the purpose of the master plan.
•Goals are challenging but not unreasonable.

Examples:

•Meet the diverse play and learning needs of the students in a fun and dynamic setting

•Reconnect the community to the school

•Connect the schoolyard environment back to the larger ecological structure of the community

•Provide options to integrate the curriculum to the outdoors

Define Objectives

What are Objectives?

Objectives are the bite size pieces, the road map and manageable stepping stones to achieve vision.

Examples:

- Allow the community use of the school site during after school hours
- Provide opportunities for community interaction with school projects
- Encourage the community programs in the school yard
- Allow students and the community to participate in the design and construction of the schoolyard.

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2. Site Assessment

- **Neighborhood Assessment**
  - Watershed and Drainage
  - Parks and Open Space
  - Surrounding Community Activities
- **School Site Assessment**
  - Existing Site Uses
  - Physical Features

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Neighborhood Assessment

Hydrology and Water Sheds

What to look for

- Local or Regional Watershed (where does the site drain!)
- Where does the water enter and leave the site

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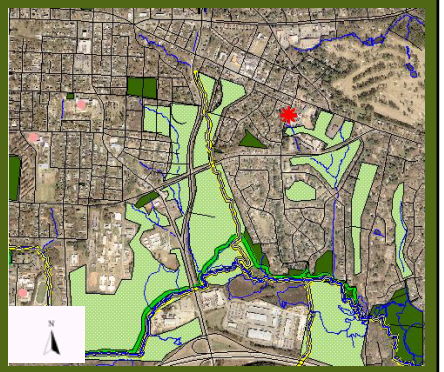
Neighborhood Assessment

Parks and Open Space

What to look for

- What are the adjacencies?
- Is there a need for neighborhood green space?
- Can your site connect a wildlife corridor?



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Neighborhood Assessment

Surrounding Community

What to look for

•Who / What surrounds a school?

•Are there views to be protected or obscured?

•What can the site offer to the community?

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School Site Assessment

Existing Site Uses

What to look for

•What and Where activities are taking place

•Locate areas of the site are used by Teachers/Students/community

•Identify gathering/waiting areas

•Identify entrances, pathways and boundaries

•Identify age separated areas

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School Site Assessment

Circulation

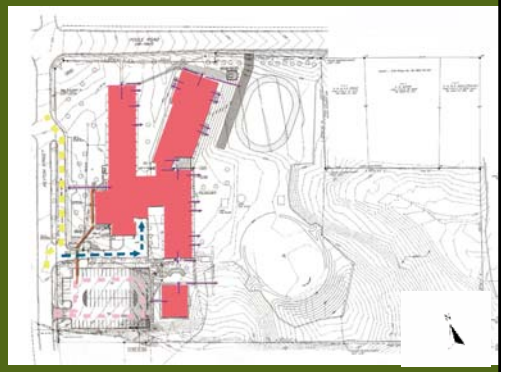
What to look for

•How do users enter and leave the site?

•How do users move through the site?

•Where are the indoor/outdoor connections?

•Are circulation patterns overlapping?



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School Site Assessment

Site Hydrology

What to look for

•Understand site draining

•Locate low and high points

•Identify areas of erosion or water collection

•Identify areas of poor drainage

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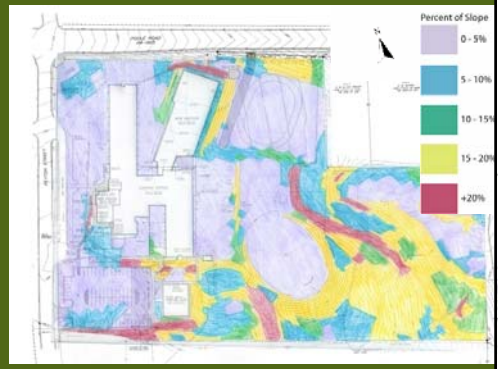
School Site Assessment

Slope

What to look for

- Locate any step slopes that can benefit from restoration
- Identify accessible routes / areas
- Understand how the topography starts to define usable space



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School Site Assessment

Vegetation

What to look for

- Identify invasive plant species
- Identify trees and vegetation to be preserved (may need to consult an arborist)
- Protect healthy local natives
- Identify any mature / venerated trees or plants

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School Site Assessment

Sun vs. Shade

- Identify Sun / Shade Patterns (length and intensity)
- Identify areas that are too shady for certain plants
- Identify areas where shade is needed for users and/or to cool the building

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School Site Assessment

Soil Analysis

- Identify Soil Type (texture and infiltration qualities)
- Professional Soil Test
- Have students test the soil to determine type

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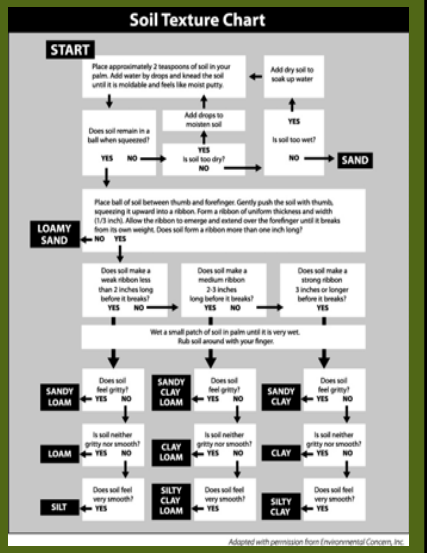
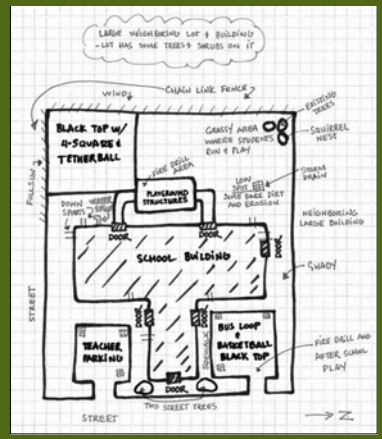


USFWS Guidebook
Page 46

Map the Site Assessment

- **Use an aerial photo, plot map, or plans of the school**
- **Translate elements from the site assessment and programming on to plan**
- **Identify all property lines, future expansion, utilities and "off limit" areas**
- **A great project for older students to complete**



3. Defining Design Elements

- **Assemble Programmatic and Site Assessment**
  - Gathered by the Team
    - Surveys, workshops, meetings
  - Ideas from Case Studies
  - Input from Design Professionals
- **Identify Design Elements**
  - Natural Elements
  - Educational Elements
  - Functional Elements
  - Overall character of the space

Natural Elements

- **Native Wildlife Habitat**
  - Woodland, Meadow, Chaparral, Wetland
    - Native Plants
    - Food, water, shelter and a place to raise young
  - Greenway Connections
  - Wildlife Corridors

Environmental Concern Inc. Maryland

Natural Elements

- **Wildlife Features**
  - Logs
    - Habitat for insects, amphibians, small mammals
  - Snags
    - Provide habitat, food, perching surface for birds
  - Brush Piles
    - Provide cover for small mammals and birds
  - Nesting Boxes
    - Birds, butterflies, bees and bats

Alexandria Public Schools, Alexandria, VA

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Natural Elements

- **Restoration Projects**
  - Rain Water Management
    - Rain Gardens, Rain Barrels, Bio Swales, Storm Water Retention basins
  - Xeriscaping
  - Slope Restoration with Native Plants
  - Energy Conservation Planting
  - Reduction of impervious surfaces

Rain Garden at Mt Tabor Middle School Portland, OR

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Educational Elements

Mason Pilot Elementary, Roxbury, MA

- **Curriculum Connections**
  - Connect all Subjects to the School Yard / Demonstration Site
  - Encourage Teacher Training
- **Outdoor Classroom Space**
  - Provide seating/gathering for classes and individuals
  - Surfaces for writing, eating, art projects

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Educational Elements

Louisiana State University

- **Wildlife Observation Areas**
  - Provide habitat, food, perching surface for birds
  - **Educational and Interpretative Signage**
- **Nature Trails**
- **Outdoor Art**
  - Sculptures, murals, pinup space

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Functional Elements

- **Site Selection**
  - Considerations
    - microclimate
    - water availability
    - noise
    - movement and access
    - ease of maintenance
    - existing activities
- **Multi-Functional Design**
  - Garden walls as benches
  - Vine trellis for shade
  - Pathways as delineation

Lewis Elementary School
Portland, OR

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Functional Elements

- **Comfort**
  - Design for the Change in Temperature and Seasons
  - Rain/Sun Shelters
  - Noise Considerations
- **Movement and Access**
  - Pathways of varying widths
    - accessible routes
    - maintenance
  - Narrow Pathways
    - slower movement
    - exploration
  - Vehicular Access

Lawndale Library
Lawndale, CA

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Functional Elements

- **Storage and Clean up**
  - Storage of materials
  - Clean-up area
    - hose
    - sink
    - raised counter space
  - Accessible to student and teachers
- **Space Definition**
  - Clear Boundaries
  - Protect sensitive areas
  - Separate conflicting uses

24th Street Elementary School
Los Angeles, CA

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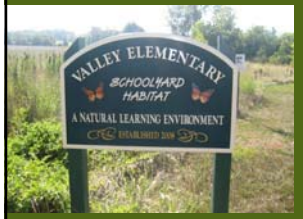
Character of Space

Lower Columbia School Gardens
Longview, WA



- **Create a Sense of Place**
  - Special Entry markers
    - Gates, fences, etc.
  - Signage
  - Reflect school or neighborhood
    - History and/or culture,
    - Environmental commitment
  - Focus on Local Ecology
    - Watershed
    - Habitat and wildlife issues

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Character of Space

Harvest Park Middle School
Pleasanton, CA

- **Identify Overall Character**
  - Respect for Nature
  - Connections to Nature
  - Peaceful
  - Rustic vs. Refined
  - Professional vs. Grass roots
  - Inviting
  - Safe
  - Fun

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4. Design Details

- **Create a Concept /Master Plan**
- **Design Considerations**
  - Large Scale vs. Small Scale projects
  - Long term use
  - Achievable maintenance
  - Budget
- **Basic Design Principles**

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Developing a Concept Plan

- Use an Aerial Photo, Plot Map, or plans of the school
- Start to locate circulation routes, major features, programmatic element
- Incorporate ideas collected from the programming phase (students, teachers, community, etc.)
- Propose locations of equipment items, planting and site features
- Explore the option of "phasing"

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Design Considerations

- **Ecological Demonstration project**
  - Small Scale Project
  - Used as a Teaching Tool
  - Shorter Life Span
  - Ex: wildlife garden, outdoor classroom, rain barrels and composting
- **Larger Scale Environmental Design**
  - Site Approach to Design
  - Improves School overall Environmental Impact
  - School Site is a Teaching Tool (full curriculum integration)
  - Longer Life Span
  - Ex: Habitat Revitalization, storm water management systems, ecological schoolyard

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Design Considerations

- **Life Span of Project**
  - Short Term - 1-5 Years
  - Long Term - 5+ years
  - Support from the school, community, parents, etc.
- **Achievable Maintenance**
  - Short Term
    - annual pruning, watering, fertilizing, mulching, etc.
  - Long Term
    - Maintenance Strategy
    - Continued support
    - Replacement of Equipment and unhealthy vegetation
    - On Going Budget Development

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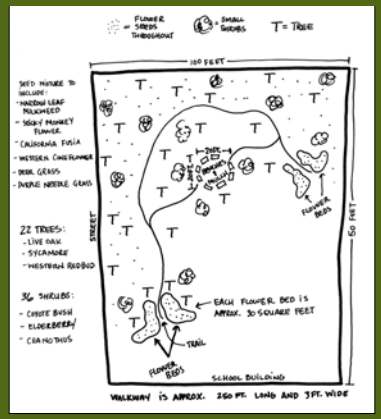
Developing the Final Plan

•Use an Aerial Photo, Plot Map, or Plans of the School

•Full School Site or Project Area

•Locate Hardscape and Planting

•Indicate Any Phasing



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Developing the Final Plan

Poe Montessori Elementary Illustrative Plan
By Ilisa Goldman

Illustrative Plans:

•Fund development

•Project momentum

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Developing the Final Plan

Hilltop Child Development Center
By Ilisa Goldman

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Implementation Strategies

- Identify Needs, Materials and Resources
- Budget
  - Create an estimated budget for the project(s)
  - Include Installation, Maintenance and Use
  - Fundraising, Donations, Grants
- Timeline
  - Determine time frame for all phases of the project
- Decide on a First Project
  - Spread the word, get volunteers
  - Create a work plan
- Teacher Training

Maintenance Strategies

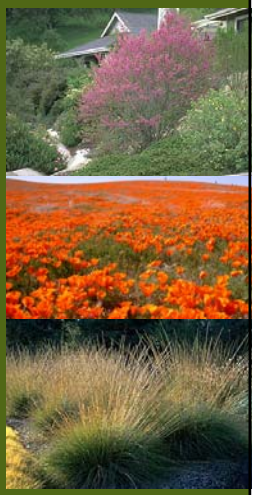
- **Maintenance Strategies**
  - Determine Needs
  - Develop a maintenance plan
    - Short term Maintenance
      - Watering
      - Mulching
      - Weeding
      - Pruning
      - Replanting
    - Long term Maintenance
      - Invasive plant removal
      - Maintenance of structures and other features
      - Ongoing Curricular Support

Basic Design Principles

- **Canopy Planting**
  - Identify locations of the tallest plants and focal points first
- **Shrub Planting**
- **Ground Cover Planting**
- **Void Space**

Basic Design Principles

- **Considerations**
  - Height x Spread (75% mature size)
  - Form
  - Scale and proportions
  - Complementary or contrasting textures and colors
  - Site Conditions and Plant Needs
    - Water, Sun, Soils



SIZE MATTERS

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SIZE MATTERS

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Basic Design Principles

- **Balance**
  - Symmetrical vs. asymmetrical
  - Formal vs. informal
- **Repetition**
  - Textures, forms, curves
  - Helps unify the design
- **Contrast**
  - Creates variety
  - Big leaves / fine texture
  - Color Contrast

Kwekerij, Hummelo, Netherlands by Piet Oudolf

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Basic Design Principles

- **Color**
  - Seasonal Change
  - Mass color planting
    - Visual Impact
    - Attracts Pollinators
- **Shapes**
  - Curves vs. Straight Lines
  - Natural vs. Formal
  - Curves can make a space seem larger

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RESOURCES

- **Websites**
  - SD Children and Nature Collaborative
    - www.sdchildrenandnature.org/designpro.php
  - The Natural Learning Initiative
    - www.naturalearning.org
  - National Wildlife Federation Schoolyard Habitat Program
    - www.nwf.org/schoolyard
  - The Children and Nature Network
    - www.ChildrenandNature.org

RESOURCES

- **Websites**
  - Master Gardeners of San Diego
    - www.mastergardenerssandiego.org/schools/schools.php
    - Local information about school gardens
  - Green Hearts: Institute for Nature in Childhood
    - http://www.greenheartsinc.org
    - Nature Play Ideas for early childhood
  - The Boston Schoolyard Initiative
    - www.schoolyards.org

RESOURCES

- **Books**
  - Asphalt to Ecosystems, by Sharon Danks
  - Greening School Grounds , by Tim Grant and Gail Littlejohn
  - Creating and Retrofitting Play Environments, by The Natural Learning Initiative and PlayCore, Inc.
  - The Schoolyard Habitat Project Guide, by U.S. Fish and Wildlife
  - Growing up Wild: Exploring Nature with Young Children, by Project Wild

RESOURCES

- **Local Organizations**
  - San Diego Children and Nature Collaborative
  - SD American Society Of Landscape Architecture
  - SD Master Gardeners
  - The New School of Architecture and Design
  - Cuyamaca College, Department of Ornamental Horticulture