

PROFESSIONAL STUDIO SPRING 2008- RNT ARCHITECTS - CARLSBAD HIGH SCHOOL
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Architecture

Spring 2008 Cal Poly Professional Studio

Publication of quarter long studio project in San Diego, Ca

Publication

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Thanks to Ralph Roesling and RNT Architects for giving us the opportunity to work and study in an open and creative environment. Thanks to Henri de Hahn for encouraging the creation of this book.



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This document is an accounting of the CalPoly School of Architecture's Fourth Year Professional Studio of Spring 2008 conducted in San Diego at the office of RNT Architects.

Four students worked as a team to design a high school project site within a sensitive environment in the north county area of San Diego. The New Carlsbad High School project is currently under design at RNT's San Diego office with a proposed campus of 1,500 students. The Cal Poly students were asked to design the same project utilizing a broad based research approach understanding region, culture, climate, and project program. They were asked to take a Socratic approach probing fundamental questions about what a high school should be within this kind of regional context. The students developed a project narrative that addressed this broad based approach to immediate site specifics, regional issues, existing development patterns, and their interpretation of the School District's criteria for an environmentally focused high school. They were encouraged to forge their own direction for this project and not be influenced by the direction of the design in the office.

The north county region of San Diego is a very sensitive environment with a series of coastal communities punctuated with coastal wetlands, canyons, lagoons, and various riparian habitats. There are also relatively new residential and commercial developments that encroach on many of these environmentally sensitive areas. The new Carlsbad high school site was purchased by the School District many years ago. It is adjacent to a Fish and Game wildlife preserve and is also on the periphery of the Lake Calaveras and Agua Hedionda Lagoon wetlands. The site is elevated and faces west to the ocean with open access to constant coastal breezes. The site is currently being used for agricultural purposes.

The students did a commendable job in assessing the regional and local context. This understanding allowed them to diagram the site with a level of sophistication and vision. They found that the site affords many design opportunities with an active watershed and riparian area running through it. The students chose to keep these zones intact and allow them to become a part of the organizing principles of the site. They also evaluated the man made and natural patterns within the site and as a part of the larger ecosystems and development patterns. They generated organizational diagrams as a response to these findings.

These overall site investigations and findings were done in a team format with all four of the students actively engaged in the effort. The result and required deliverable was highly developed site diagrams and other design artifacts depicting their project intentions. The entire RNT staff was asked to engage the students in a review / critique of these investigations.

At this point in the studio schedule, the students took on the campus building's design development based on their team site findings and their modified program. The buildings were divided among the four students. The studio required that campus program be based on the District's educational specification. However, each student corresponding to his or her view and proposed vision of the curriculum could adjust the program. I encouraged the students to develop the buildings of the campus to embrace the opportunities from their earlier site plan. In addition, they were asked to try to immerse themselves in the "life of the campus" by sketching perspective views and speculating through design media the experiences of the campus spaces. The students responded by incorporating many spaces for socialization and gathering on campus. They addressed the sense of pedestrian movement and arrival through the various zones and spaces of the campus with an attempt to crystallize the organization of indoor and outdoor spaces.

They were also very sensitive in dealing with the edges of their building working with the idea of permeability. This idea was carried forward in the development of the skin of the buildings and their orientation and focus to the adjacent coastal wetland / riparian environment.

The site has the challenge and opportunity of major topography associated with the drainage path. The students carefully studied the placement of the buildings to minimize grading and allow the major landforms to stay intact. This was achieved in great part by making a parking structure below the football stadium. This allowed the “campus footprint” to be much smaller and allowed the largest footprint to be placed at the most disturbed and flattest portion of the site. The gymnasium was “grafted on” to the end of the parking structure allowing for a common concrete structural system to be used for both large programmatic elements.

The other campus structures are placed strategically on the lower portions of the site allowing circulation, courtyards and special views to occur between the edges. The buildings are straightforward and somewhat restrained in keeping with the emphasis on the presence of student’s community and teachers within the spaces. The architectural moves have to do mostly with orchestrated transparency, circulation, and climate control.

The work product is mostly complete for a fourth year exercise. There could have been more investigation in the arrangement and configuration of the classroom spaces. The Socratic method of asking what is learning would have applied here. If the students had carried forward a similar investigation in the learning / classroom possibilities at the same level as the site and context investigations, this project would have excelled at another higher level.

This was a very commendable effort for 10 weeks. I am very thankful to these students for a wonderful studio teaching experience.

Ralph J, Roesling, FAIA
Lecturer, CalPoly School of Architecture, San Luis Obispo

October 11, 2008



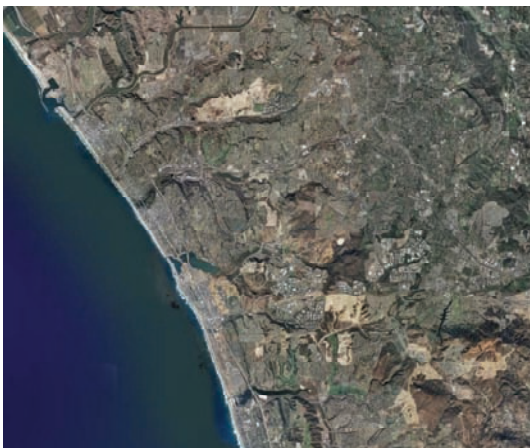
CALAVERAS HIGH SCHOOL THESIS INVESTIGATION

AT COLLEGE AND CANNON

Permeability between public and private space

Permeability of natural forces. Architecture to become an active part of the landscape

Recognition of one's part in an existing system.



CARLSBAD, CALIFORNIA

The project site is part of a larger wetlands drainage system running from inland San Diego County to the Pacific Ocean. The Agua Hedionda Lagoon Eco-System is no longer a continuous system, but contains a series of interruptions. These unnecessary interruptions reinforce the importance of permeability in culture and nature.



AGUA HEDIONDA LAGOON ECOSYSTEM



Intermediate Collection Point



Agua Hedionda Lagoon



Lake Calavera



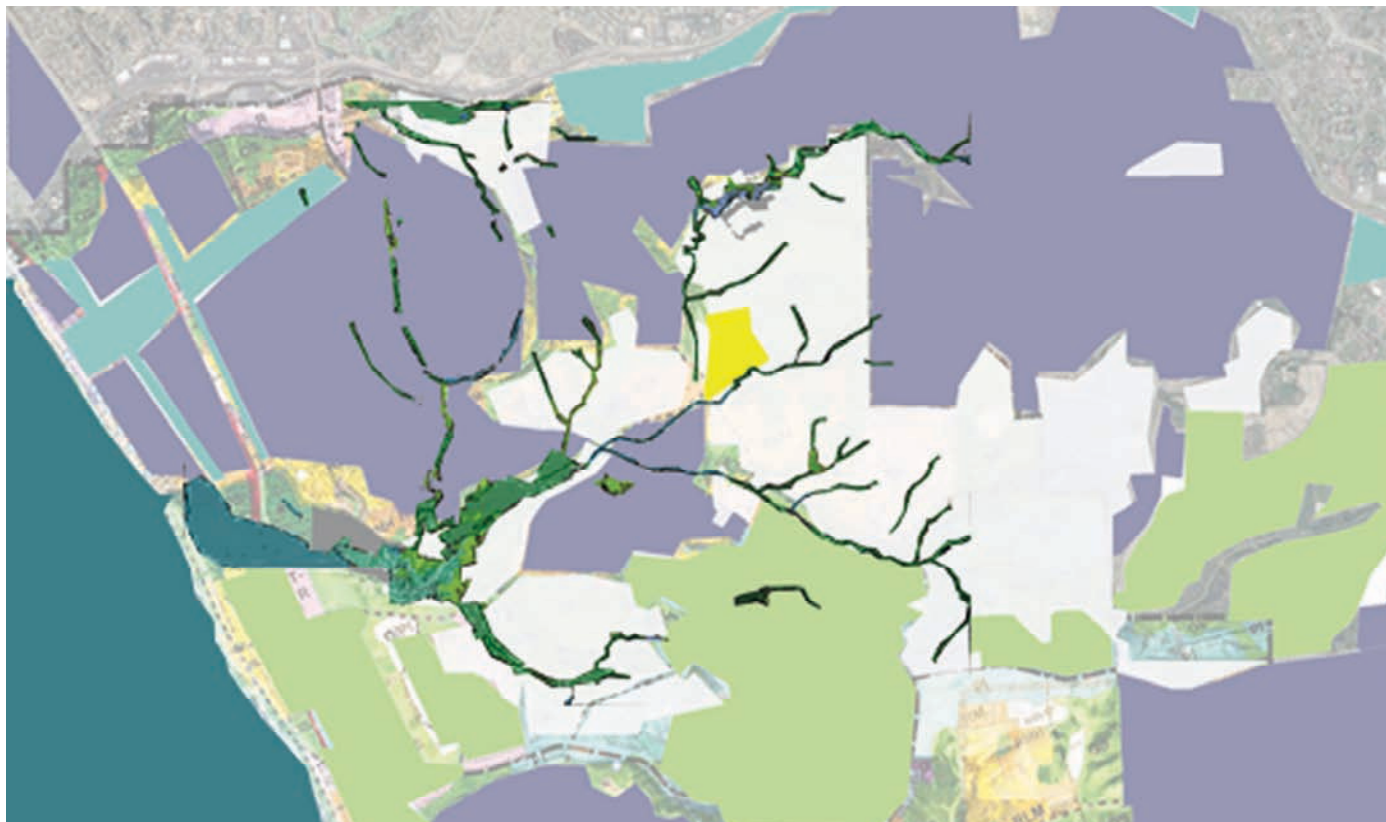
VICINITY DRAINAGE PATH



A wash runs through the middle of the site, westward, toward a non tidal wetland.

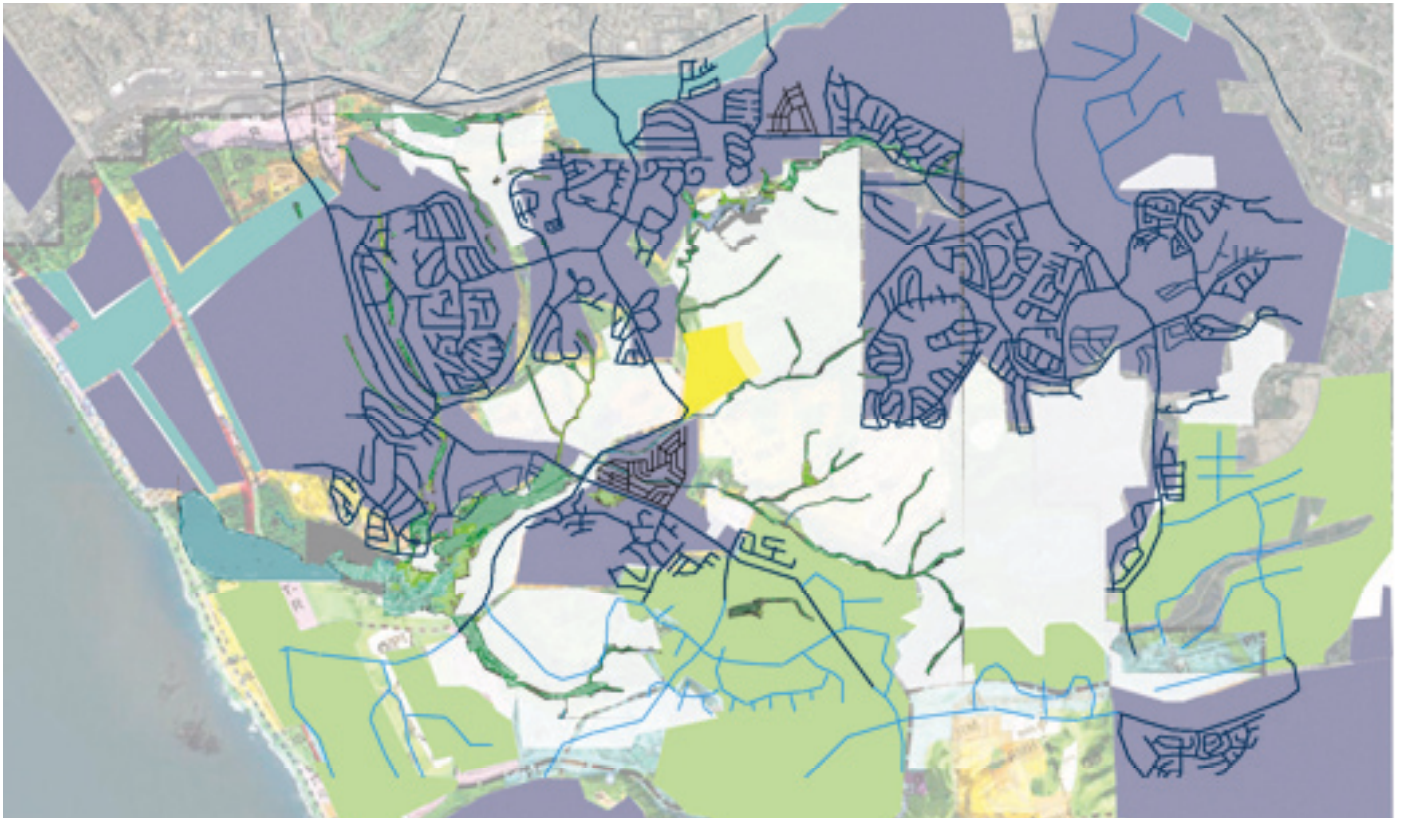


EXISTING SITE CONDITIONS



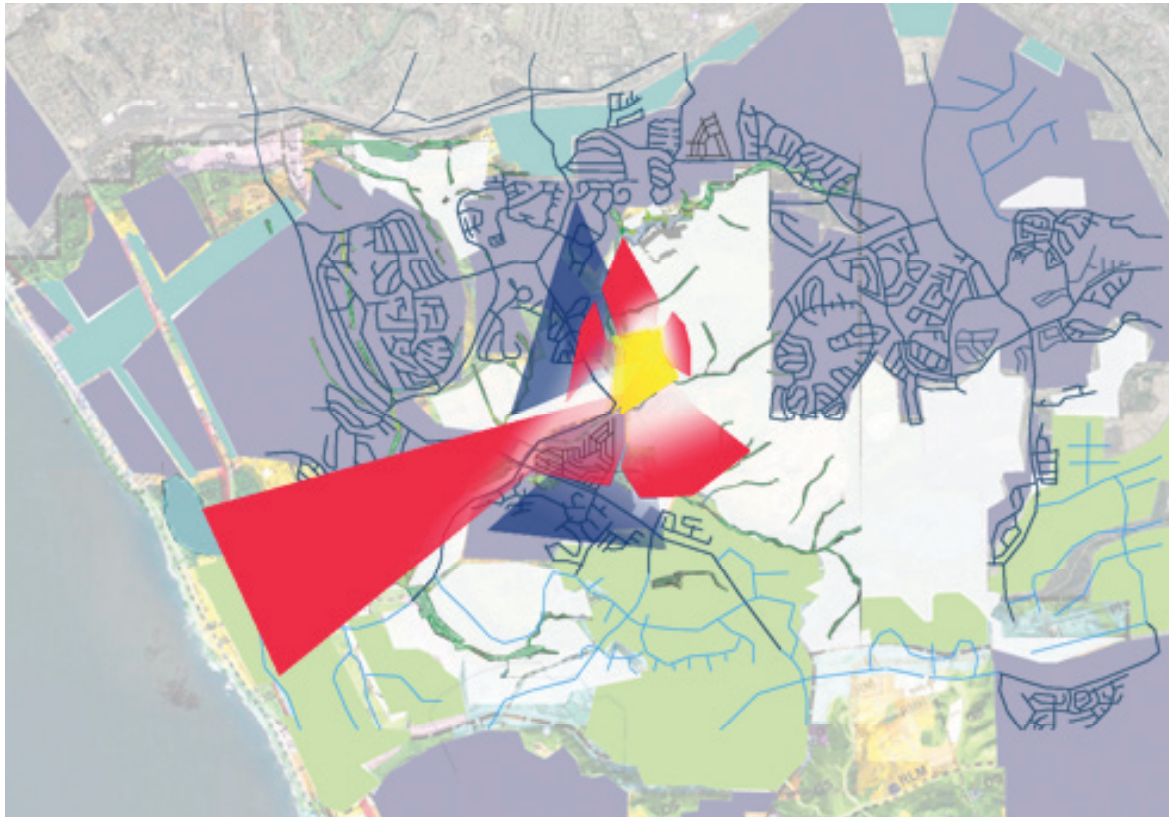
WATER COURSES

The site lies between Lake Calaveras and the Agua Hedionda Lagoon. A major tributary flows along the south side of the site, and minor water courses run through the site. Eventually, the water ends up in the Pacific Ocean.



The dark blue lines clearly show the development of the new communities of Carlsbad, and how they have been influenced by the reserve (in white) and the naturally flowing waterways. As the city becomes more dense newer communities are being built along major waterways, disrupting the waters movement to the sea.

COMMUNITY PATHWAYS



The site lies near the top of a valley leading toward the Pacific Ocean. Surrounded on three sides by low hills, the site safely overlooks the land falling away, and gives a clear view of the ocean. The land below shows the communities intersecting with the natural water drainage patterns.

 Project Site

 Natural & Reserve Views

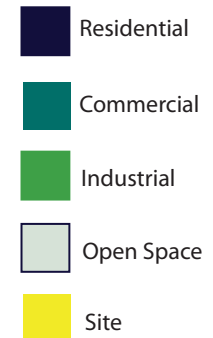
 Development Views

CLOSE VIEWS



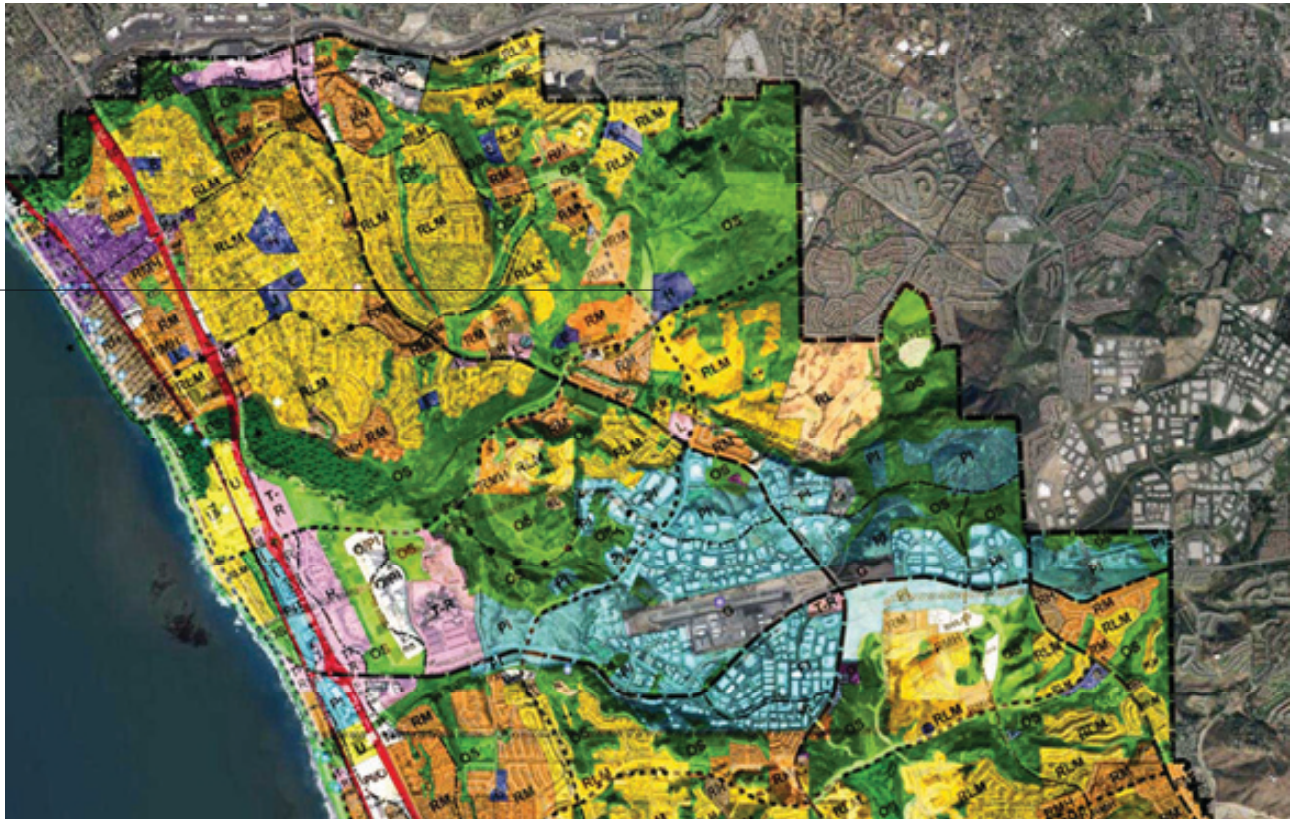


The city of Carlsbad remains largely residential. The residential area continues to grow into unbuilt space, leaving little open space. Within a years time at least 1/3 of the open white space shown will be newly completed tracts. To the right a zoning map show the high school site in blue, with the reduced open space in green.



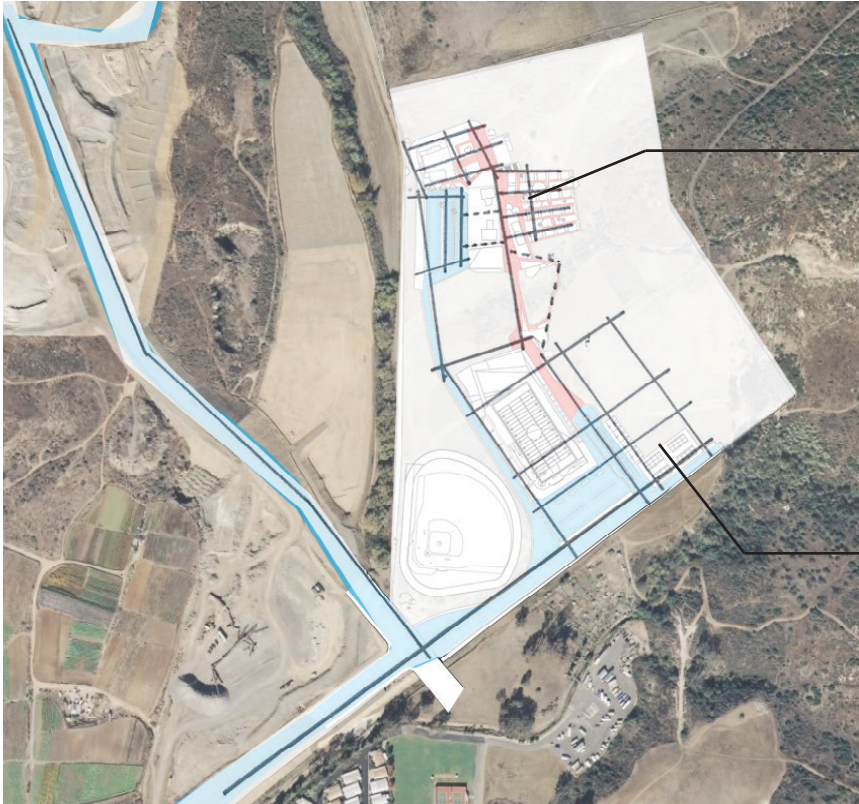
LAND USE

The Site

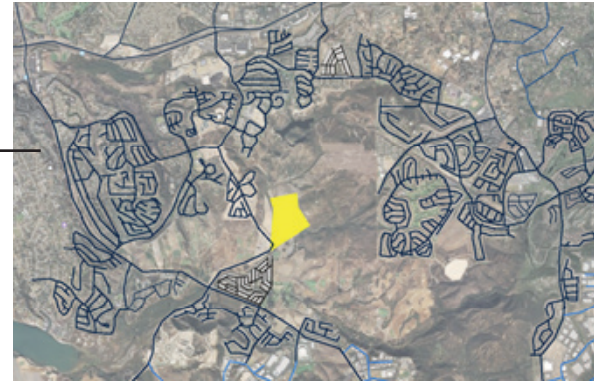


The zoning map for the City of Carlsbad shows a detailed plan of carlsbad's future land use. Yellow and orange demarcate low to medium density residential dominating the area surrounding the high school.

LAND USE



Site: Manipulation of Grid



Site Surroundings



Downtown Carlsbad

PERMEABILITY: CULTURE

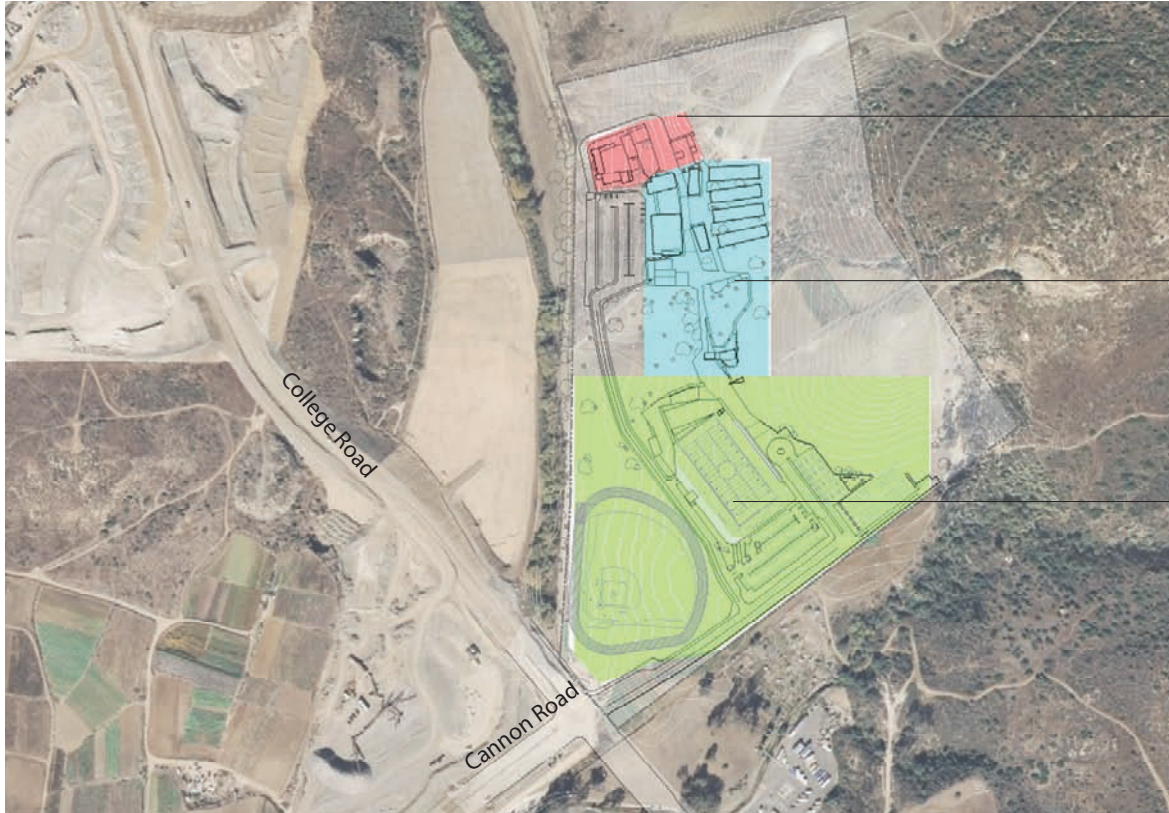
The City of Carlsbad can easily be divided into old and new growth based on the street systems. The older portion of the city contains the main commercial strip and has a visible grid system of streets. The grid has an easily discernible hierarchy and makes way finding very simple. Activity denotes privacy instead of confusion. This grid system lends itself to public use.

The new growth areas of Carlsbad rely on a winding and discontinuous street system to create private communities. These “dead worm communities” use confusion and dead ends to create quiet suburban neighborhoods. The nature of discontinuous streets causes problems of circulation on a larger scale by limiting through traffic, creating heavily used super streets. These large, loud commuting streets further isolate the new communities. The popularity of these communities also creates a problem by leaving no room for public community space.

A school site devotes large areas of land to physical use, creating open green space for sports and other activities. These activity spaces are used during very specific times, and are left open much of the time. The private academic functions of school require very isolated activity for safety reasons. These two seemingly opposing school functions can accommodate public park use, while still maintaining privacy in the academic portion.

Site Organization

The site is divided into public and private space, with the wash demarcating the two. The portions of the site off of College and Cannon follow the public grid that organizes downtown Carlsbad. At the wash the grid shifts to match the change in function and need. The private academic area of the school becomes a series of smaller street systems relying on the main promenade for movement in between. Three bridges (two pedestrian, and one vehicular) connect the public to the private.



Arts

Academics

Athletics

VICINITY PLAN

The diagram to the left shows the division of the site.

Athletics lie on the southern edge of the site off of the main road. The lower portion of the site provides easy public access, and is located near parking. The baseball field, football and soccer fields, basketball courts, and tennis courts all remain open as public parks after school hours and on weekends.

Three bridges separate the private academic portion of the site. The main pedestrian pathway connects off the student drop-off. The main gateway of the school passes by the administration building connecting to the cafeteria, classrooms, and main green. The faculty parking lot is located to the east of the classrooms.

The arts buildings lie on the northernmost edge of the site and consist of the P.A.C., arts classrooms, band, and the library.

Small Footbridge

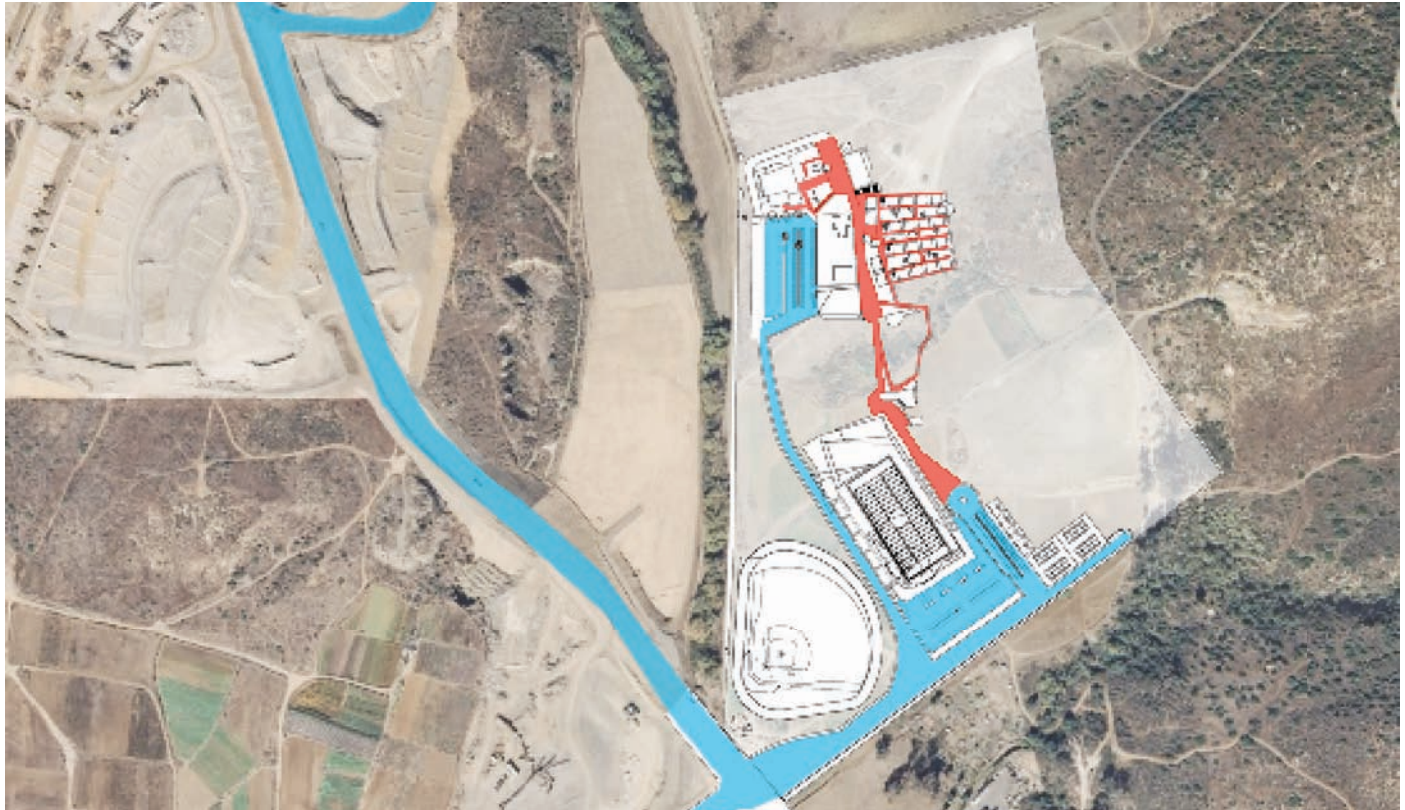
Primary Footbridge

Vehicular

Wash



BRIDGES OVER WASH



The blue area shows vehicular pathways. Red shows pedestrian pathways.

PERMEABILITY BETWEEN PUBLIC AND PRIVATE



SITE PLAN

Library

PAC

Classrooms

Administration

Gym

Drop-Off

80 ft
160 ft



PAC

Library

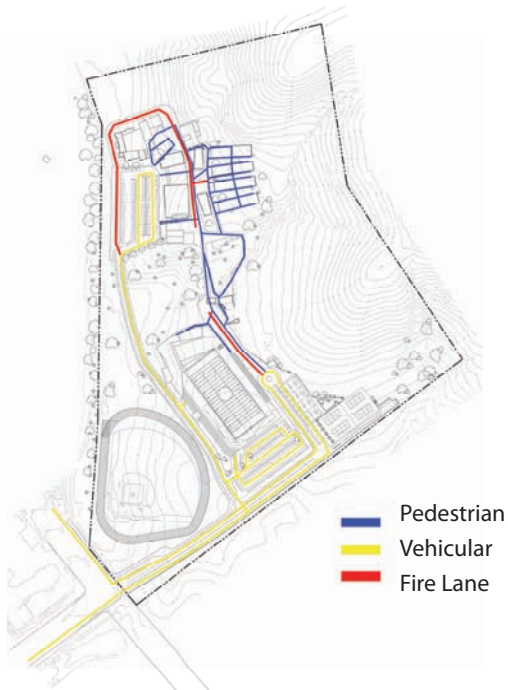
Classrooms

Administration

Gym

Drop off

SITE PLAN



CIRCULATION



WATER COURSES

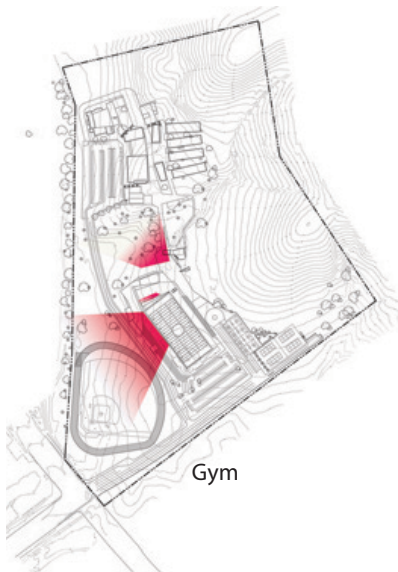


PRESERVED LAND

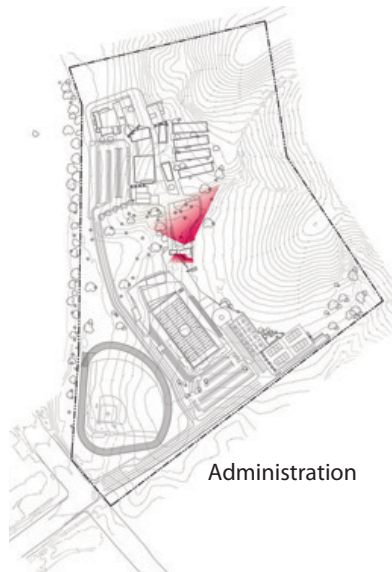


The high school is designed to allow the user to experience a variety of edges with the natural environment. The edges of the existing wash were consciously left natural. The rest of the site considers building function, and desired relationship to the wash as a determining factor for whether a soft or hard edge is appropriate. The edges also denote physical or visual relationships with the site.

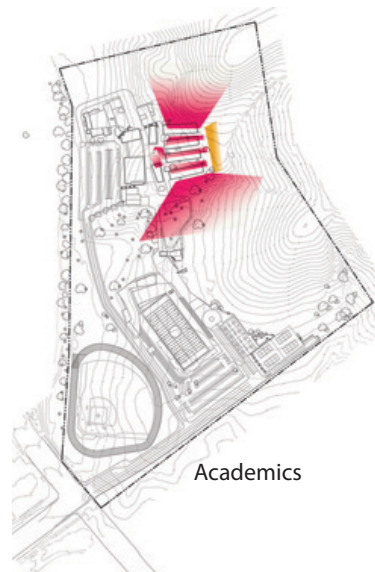
EDGES



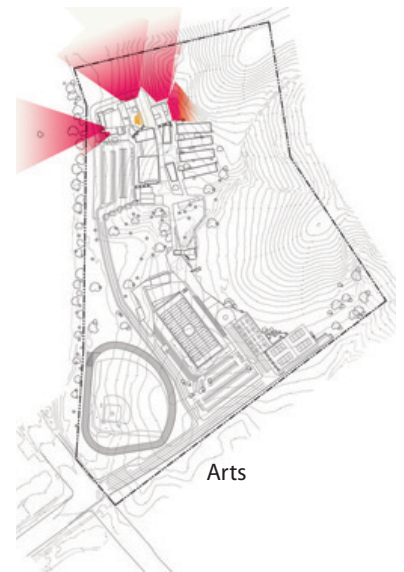
Gym



Administration



Academics



Arts



HARDSCAPE

In dealing with permeability and the maintenance of the preserve, we condensed the buildings on the site through multiplicity of use in the public realm and density in the private realm, creating a minimal building foot print.



Site Landscaping relies heavily on already existing foliage, native to San Diego County. The yellow dots represent the existing foliage that the students will be exposed to.

LANDSCAPE



Existing Wash looking West toward the ocean



Existing Western Site Edge: Non-Tidal Wetlands



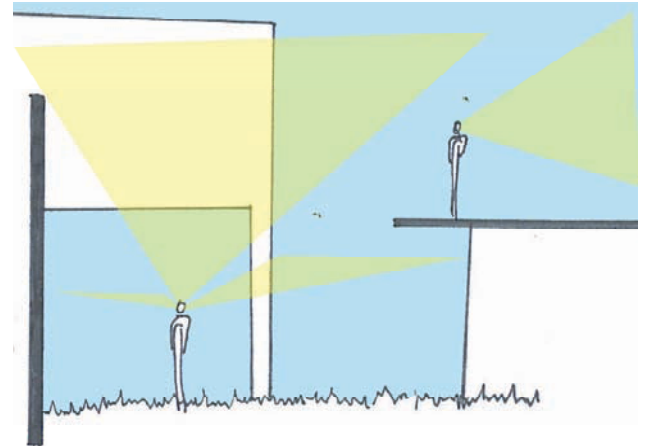
Within the school environment, students interact with all the elements of the site in a variety of ways. The sites permeability within the larger context becomes a permeability of light, water, and views within the campus.

Each individual building contributes different opportunities for interaction. Varying levels of permeability regarding light offer students increasing levels of exposure to the reserve. Differing heights also change the students perspective on gathering spaces and the reserve.

The green spaces (shown to the left) offer differing environments for students to gather.



Example Green - RNT Mater Dei High School



Concept Sketch - Permeability of Views and Light

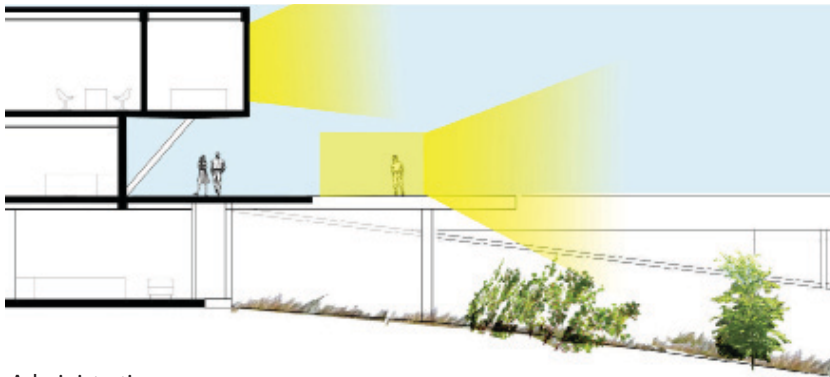


MAIN QUAD



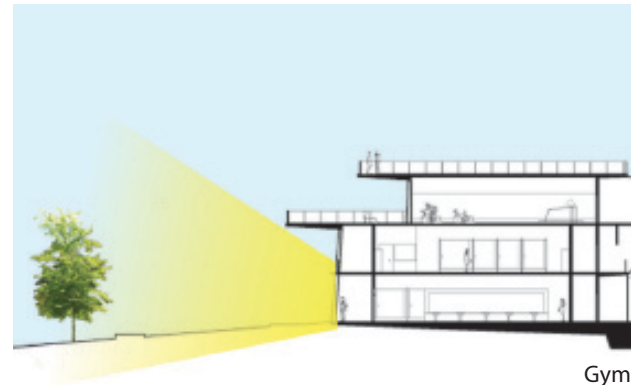
GATHERING SPACES WITH VIEWS

CONVERSATIONS WITH THE SITE



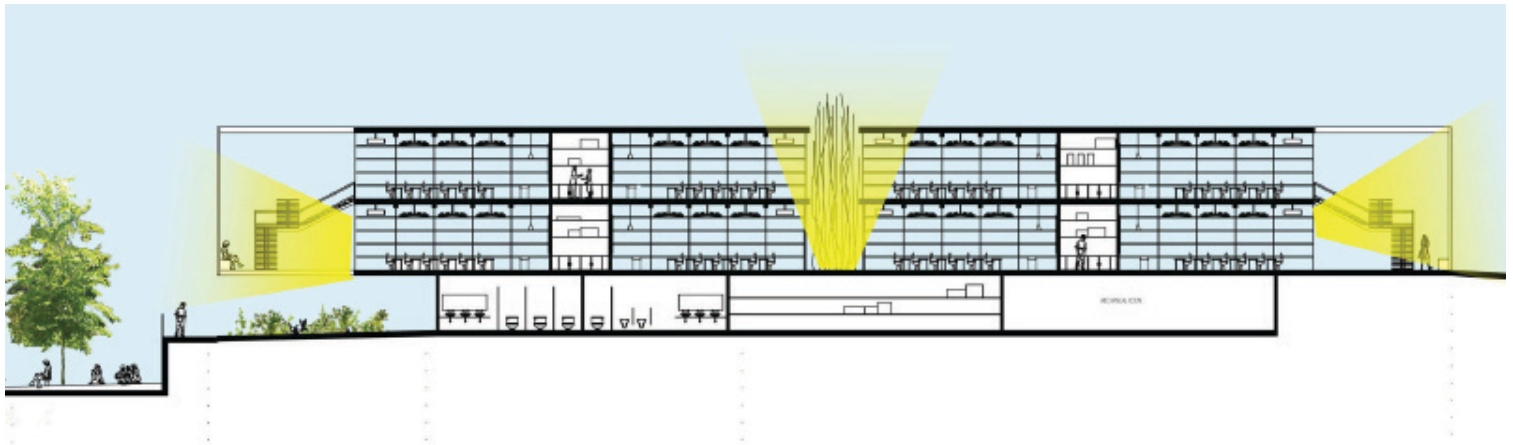
Administration

At a school where the emphasis is placed on one's place in an existing ecosystem, the administration building not only overlooks the campus but has a direct connection both physically through the paths as well as visually through its openness to the reserve. The playfulness of the circulation leads the user under, over, and throughout the buildings to allow new perspectives of the natural surroundings. The high school administration system serves as an interpreter and enabler of the wishes and demands of local, state, and federal governments; of parents; and of students themselves.



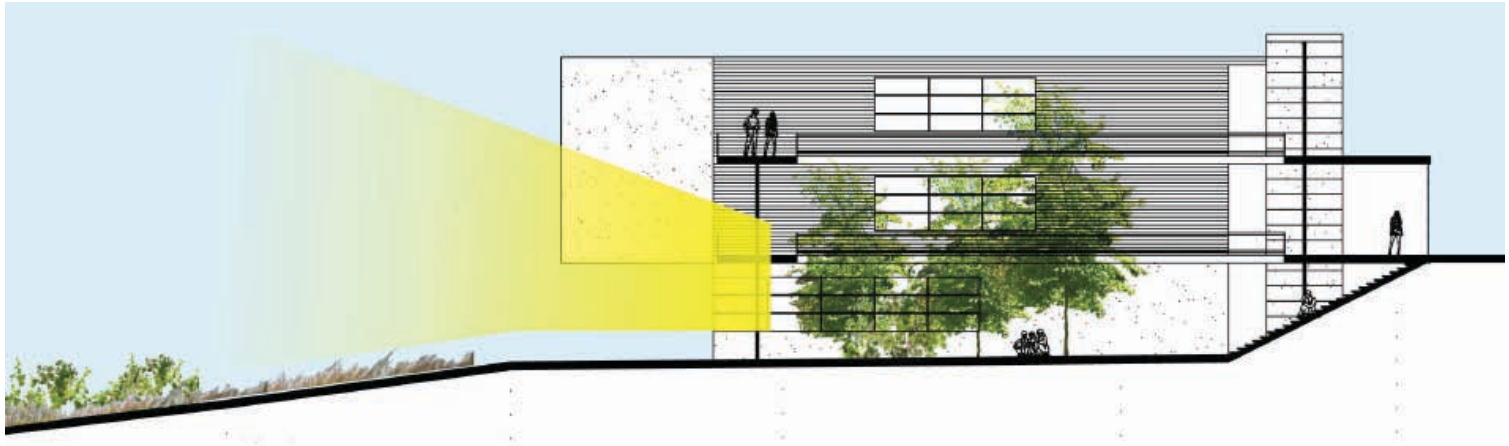
Gym

The gym facilitates the ability to experience the site with a path that leads you around the mass of the building. Specific parts open to the wash leaving the spectator to enjoy the interaction between themselves and the natural Landscape.



Classrooms

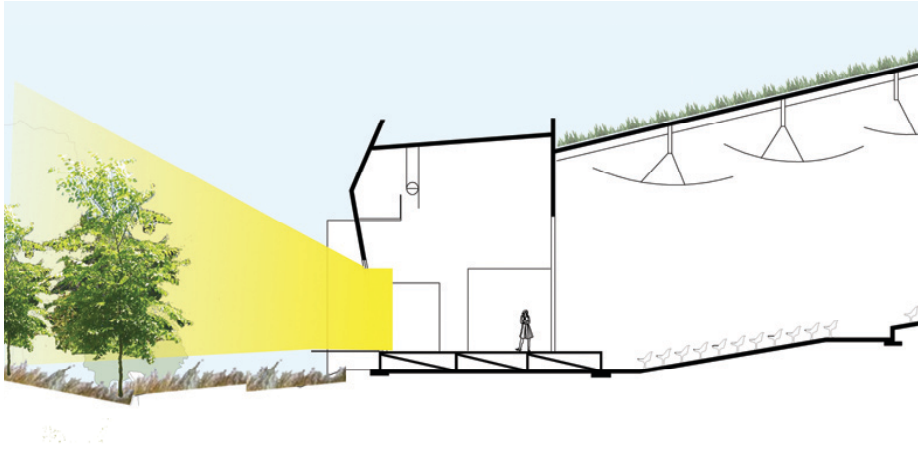
Conceptually a classroom is a place for learning. In a school in which it must coexist with its natural surroundings (nature preserve), the relationship of the built environment was carefully thought. Its permeability exists within its use- for example- the idea of the original site growing within the buildings played a crucial role.



Science

The science frames views towards the reserve and disconnects the built environment with the natural landscape. The reserve becomes part of the experience as another spectator. It also helps define the premises and demonstrates its ability to work with-not against- its surroundings.

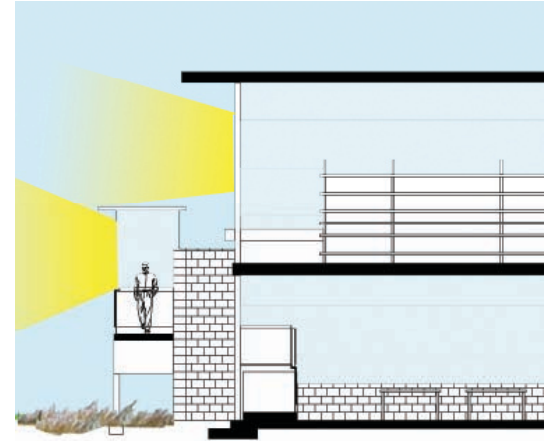
CONVERSATIONS



Performing Arts Center

The arts were placed to overlook the reserve. The reserve gives the students an opportunity to study the natural environment through physical representation. The arts frame the view of the reserve, while also allowing students close physical access.

The P.A.C. (shown above) functions to interpret life in the form of a play. The actors then experience the reserve in a similar way. The stage opens up to the existing wetlands, and allows students one close view of the reserve, but limits actual physical submersion.

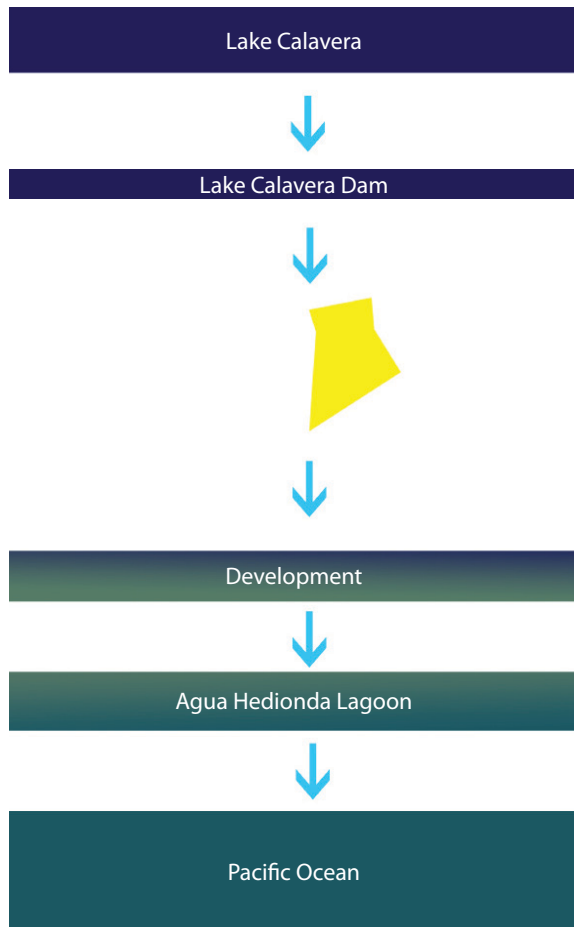


Library

The library changes the experience based on the path, revealing more as you move through. The library is not a transition, but it juxtaposes different aspects of the reserve to the built environment. The rough, open reserve contrasts the orderly, enclosed environment of the library.

PERMEABILITY: THE SITE AS AN ACTIVE PART OF THE LANDSCAPE



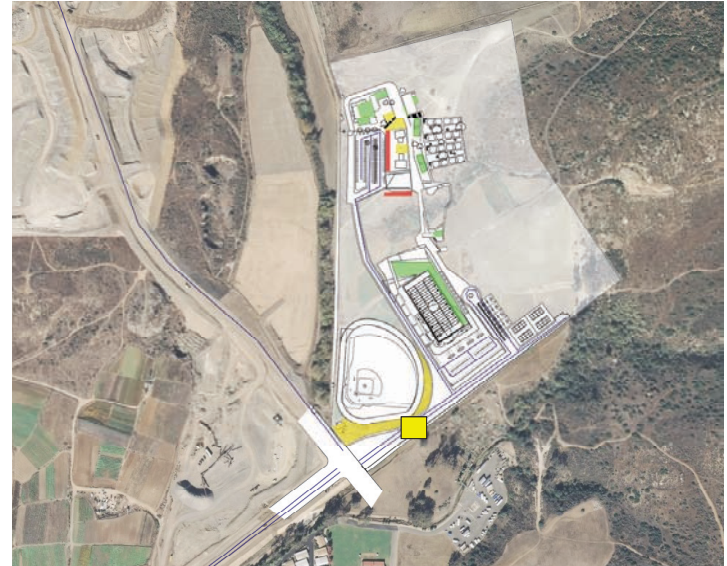


PERMEABILITY: NATURE



In order to create a permeable architecture the hard surfaces of the site must maintain some natural functions. The surfaces have been manipulated to continue the idea of permeability, and also maintain the natural flow of water into the ground.

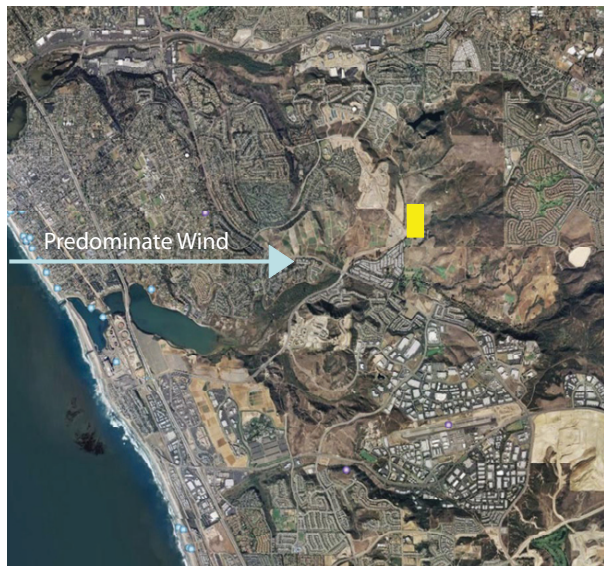
- Overlapping Functions: Basketball courts double as overflow traffic lane
- Walkways and parking lots paved with permeable concrete
- Fire Lane not used as a walkway paved with grasscrete pavers
- Double layer parking covered by Football Field



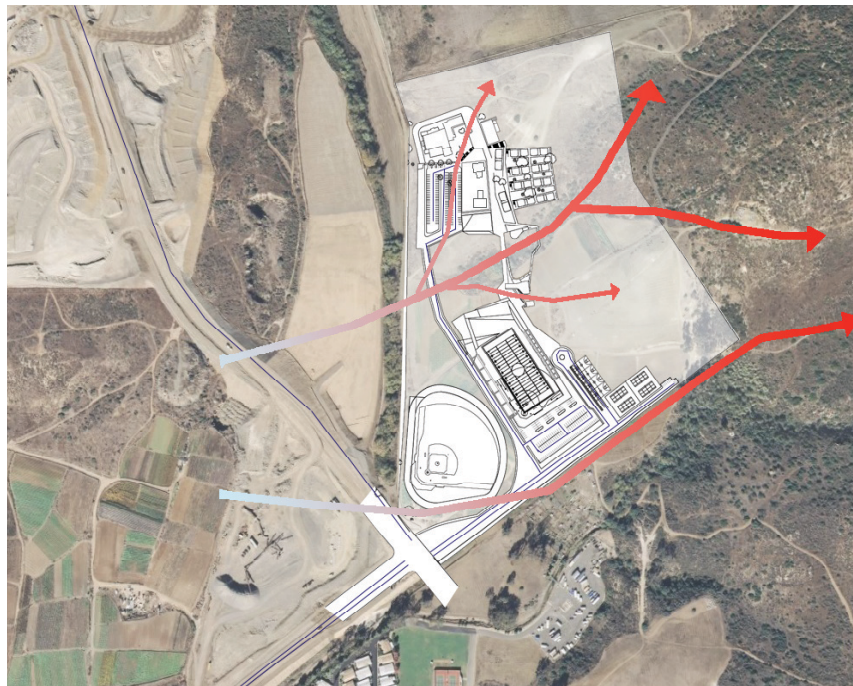
The landscaped sections of the site were limited to the main gathering spaces, allowing the natural landscape to come into the site. Where it is paved, the attempt was to minimize water consumption, and reduce the heat island affect.

- Native Vegetation
- Edible Landscaping: tomatoes, oranges, peppers and peas
- Green Roof

HARDSCAPE/LANDSCAPE



The wind blowing off the ocean funnels through the wetland valley bringing cool air onto the site.



AIR MOVEMENT

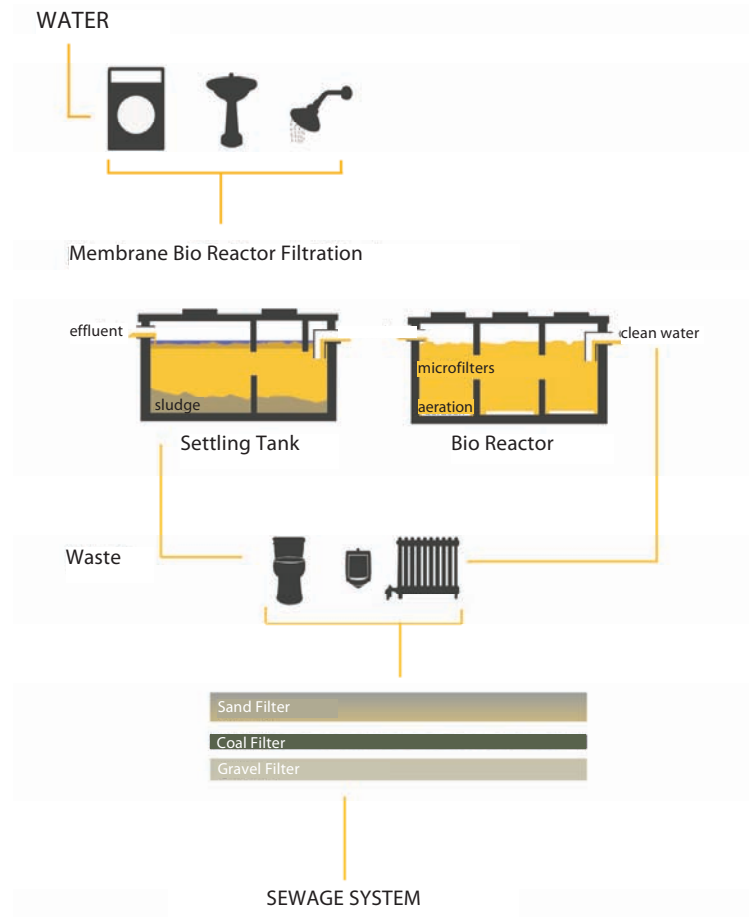


WATER

As a culture, our experience with water is perhaps very warped from reality. Our water runs like rapids quickly disappearing into storm drains and leaving nothing left to account for it. Our goal for the school is to allow students to see water and its effects working with the architecture, changing the landscape as it runs through, as a well as causing a temporary change in color and atmosphere.

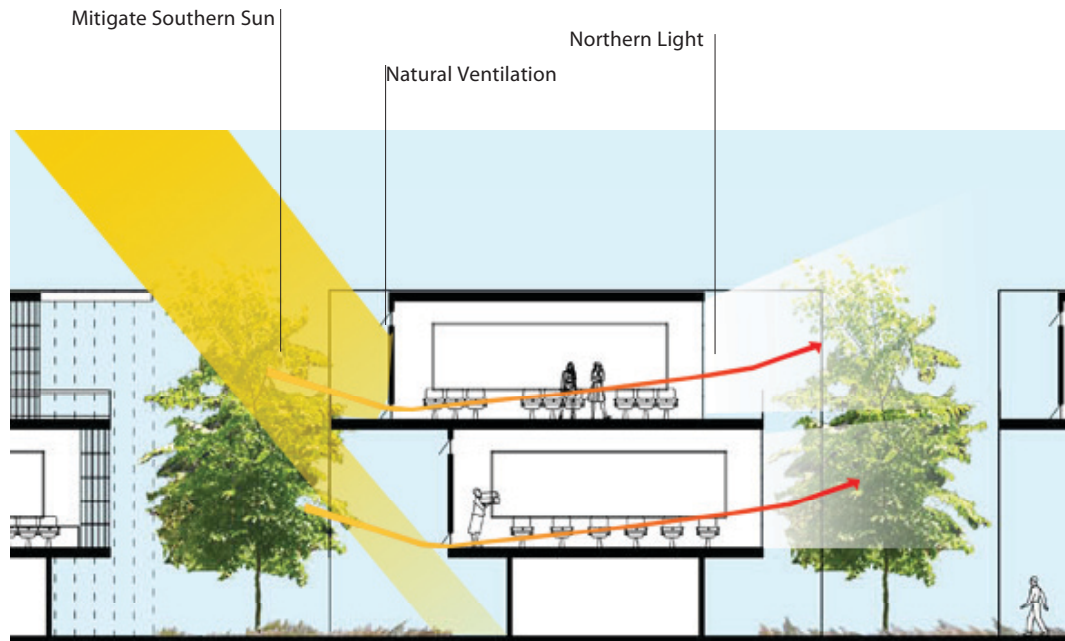
First, we retained the entire wash. The water that seasonally runs through the site continues to support the increased animal and plant life that rely on it. Other water that drains into the site is caught, filtered, used on site, and released back into the drainage system leading through the wetlands.

- Clean Water Drainage
- Water Catchment below Permeable Walkways
- Bio-Filters for Parking run-off



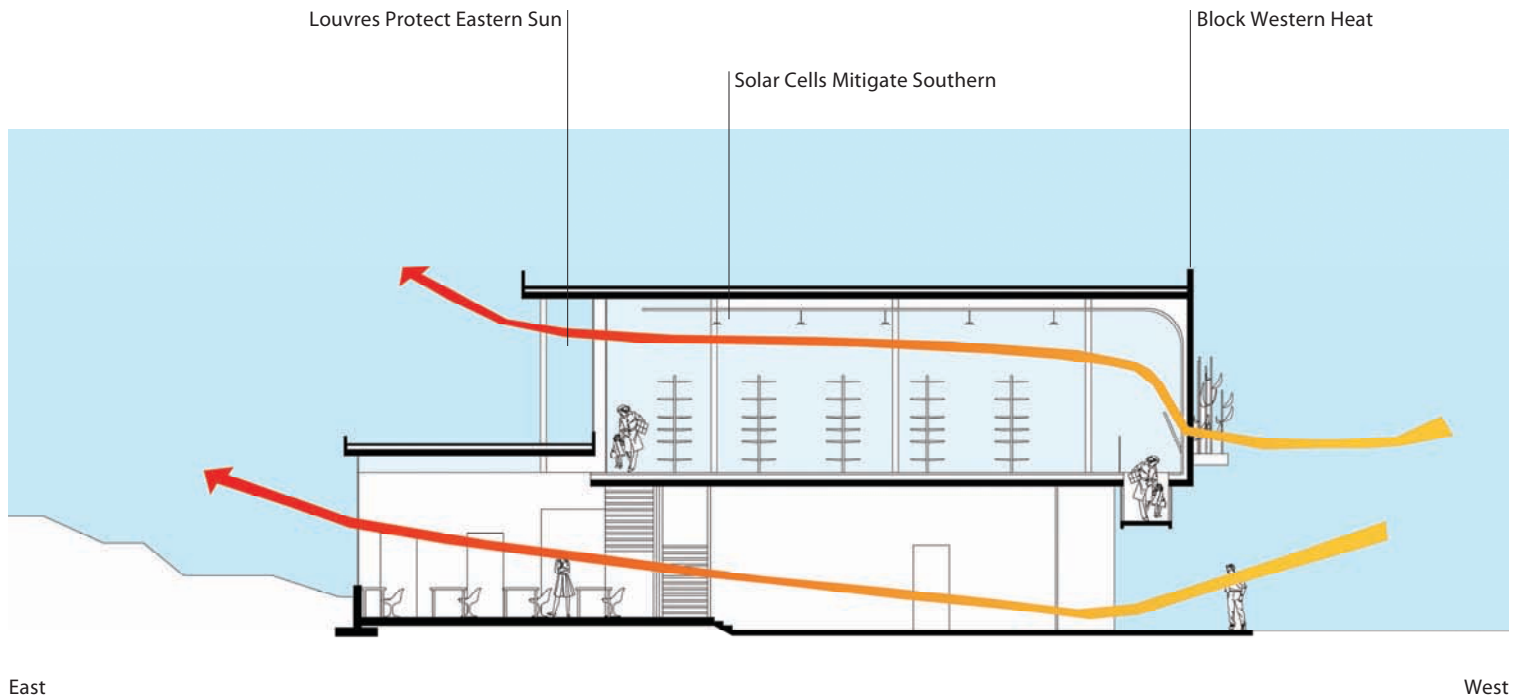
WATER

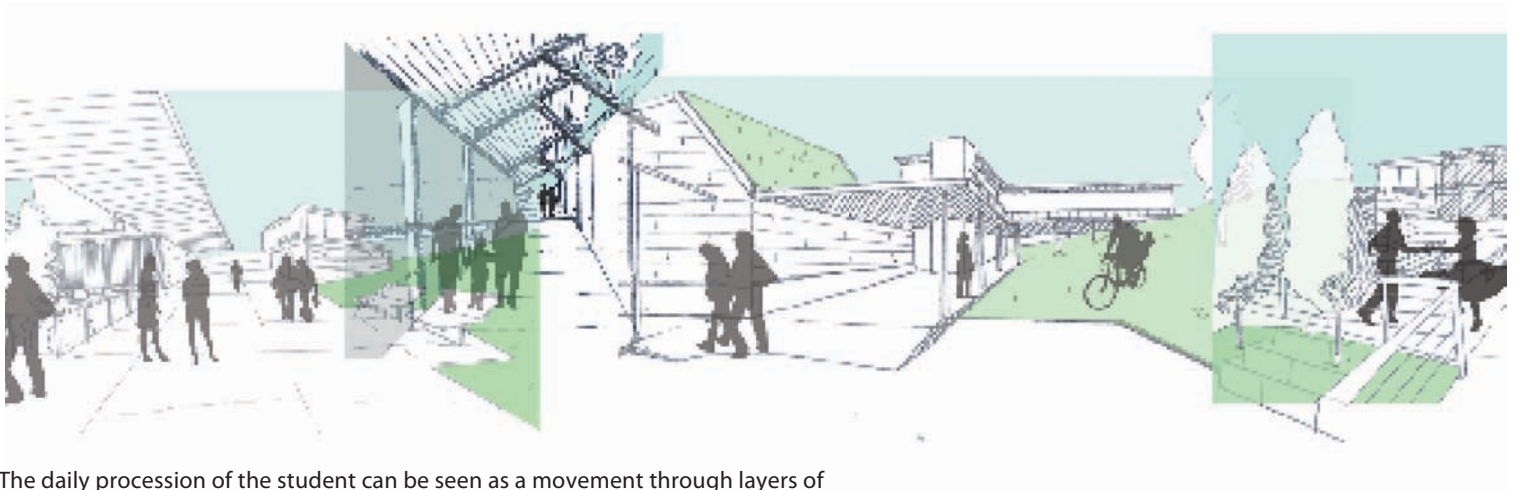
ENERGY STRATEGIES



- Natural Ventilation
- Solar Orientation
- Solar Energy
- Natural Light
- Minimized Footprint
- Passive Heating & Cooling
- High Efficiency Mechanical Units
- High Efficiency Light Fixtures
- Low Flush Water Closets
- Waterless Urinals
- Automatic Faucets
- Bicycle Racks

WATER





The daily procession of the student can be seen as a movement through layers of where each moment in space creates a different situation in the day.



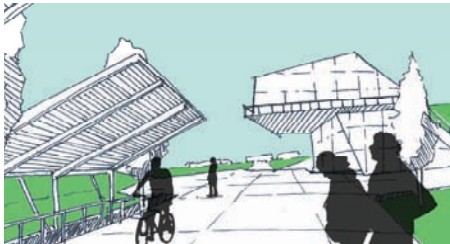
General School Entry



Drop-Off Procession



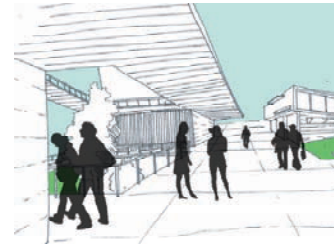
Parking Structure Entry



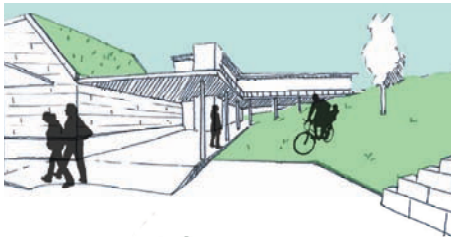
Student Reconnection Space



Academic Space/ Over Wash



Science and Library



Teacher Parking Entry



Leaving Campus

CAMPUS PROCESSION

INDIVIDUAL BUILDINGS



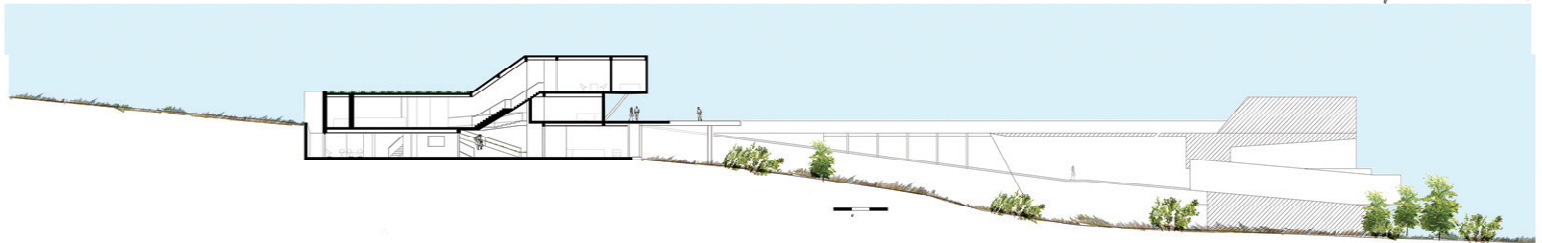
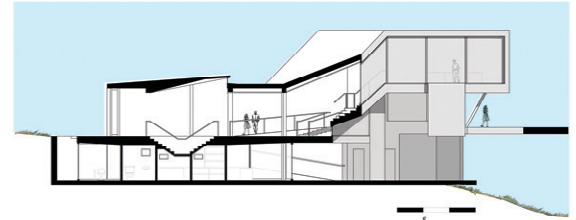
ADMINISTRATION AND CAFETERIA

GYMNASIUM

CLASSROOMS

PERFORMING ARTS CENTER AND LIBRARY

The high school administration system serves as an interpreter and enabler of the wishes and demands of government, parents, and students. At a school where the emphasis is placed on one's place in an existing ecosystem, the administration not only overlooks the campus but has a direct connection both physically through the paths as well as visually through its north facing glass façade. Circulation leads the user under, through and even above the building to allow new perspectives of the reserve to surface.

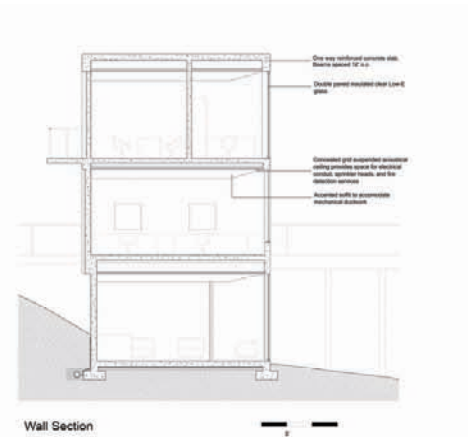
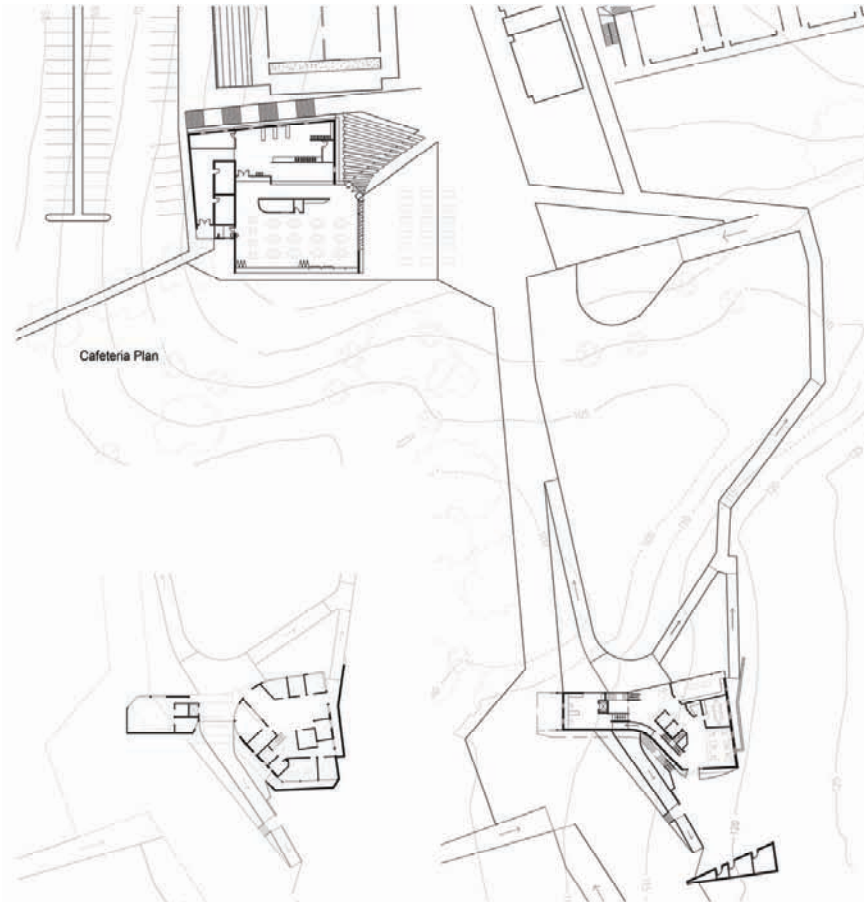


East-West Section Down Wash



South-North Section Across Wash

ADMINISTRATION AND CAFETERIA



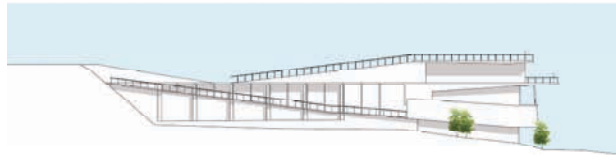
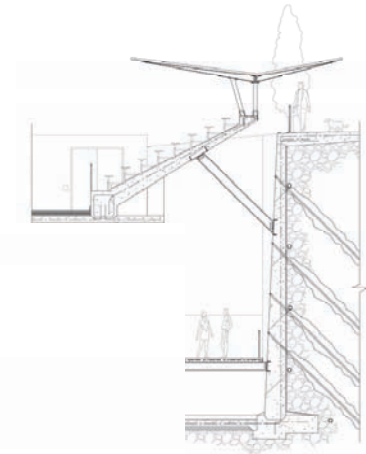
Wash Level

Path Level

Office Level

The high school athletic facilities' concentration derives from the concept of an open park to the surrounding community which holds free space for activity and safe play.

A major function of the facility is to provide an entry and access to the school. Its accessibility to the public and private portions of the facility is simplified by the order of the human and vehicular procession. The building allows for full functioning sport areas, but allows a creative adaptation to the warped site.

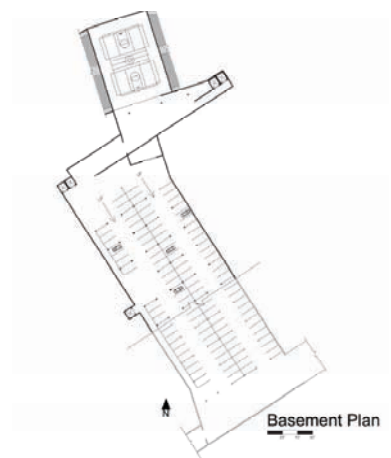
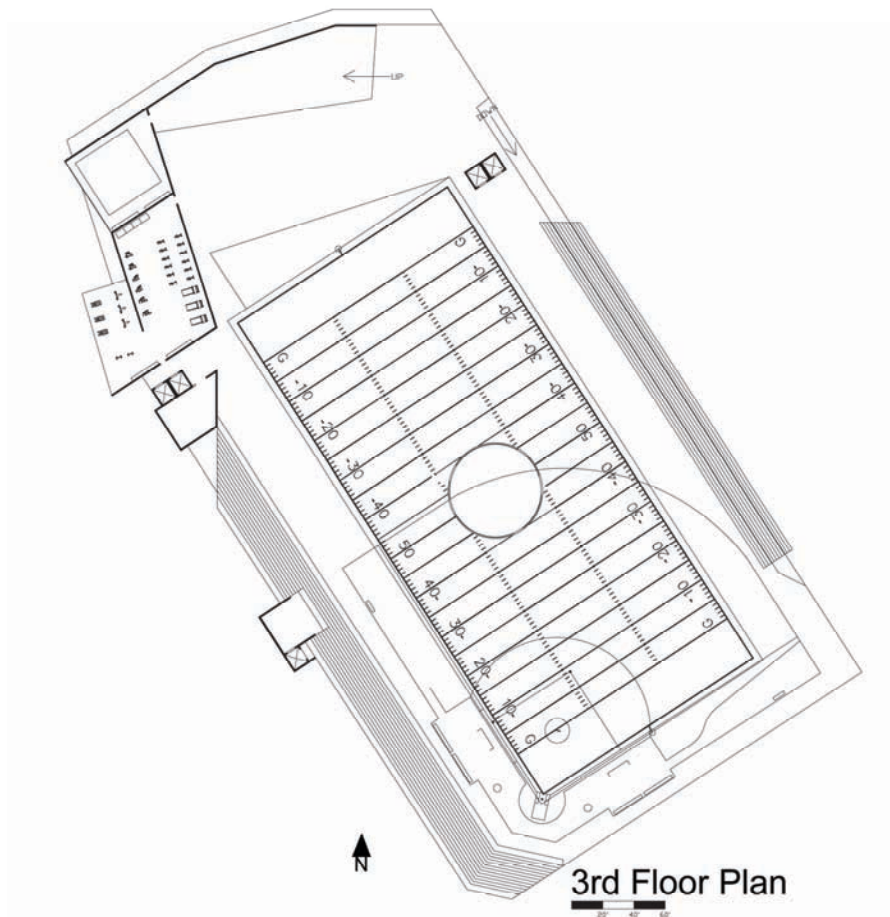


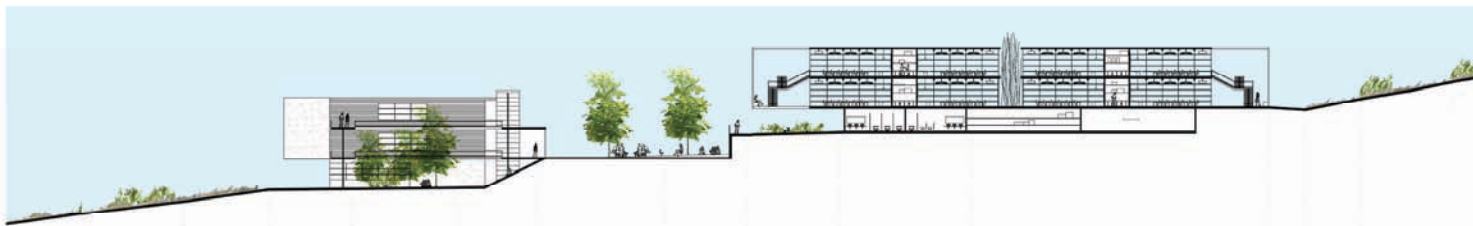
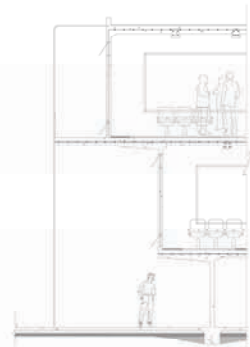
North/West Elevation



South/West Elevation

GYMNASIUM

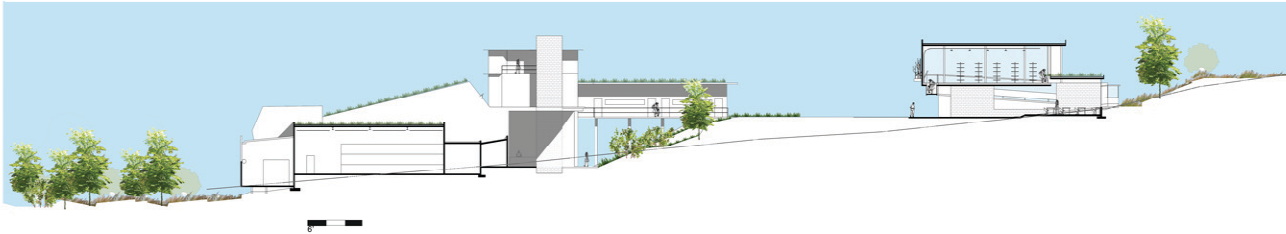
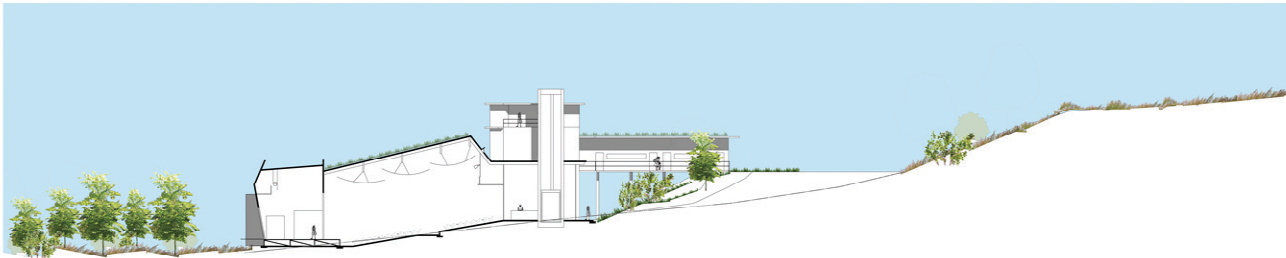




CLASSROOMS Classroom sections show the gradation of the landscape and the main path cutting through the academic portion of campus.



Plan of Classrooms shown along the main path



The P.A.C. and Library lie on the northern most edge of the site, and the terminus of the school. Between them they create a quieter green space, and allow interaction with the unaffected areas of the preserve. The arts have the most obvious connection with the preserve allowing students to study it based on each respective discipline. The Library allows students to experience the site in sections, revealing more as you move through.

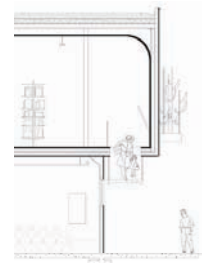
PERFORMING ARTS CENTER AND LIBRARY



Plan of P.A.C. and Library



Library Elevations: North (top) and East



Wall Sections: P.A.C. and Library

Specific areas of the building allow varying levels of permeability with the site, allowing students a variety of interactions, and understandings.

