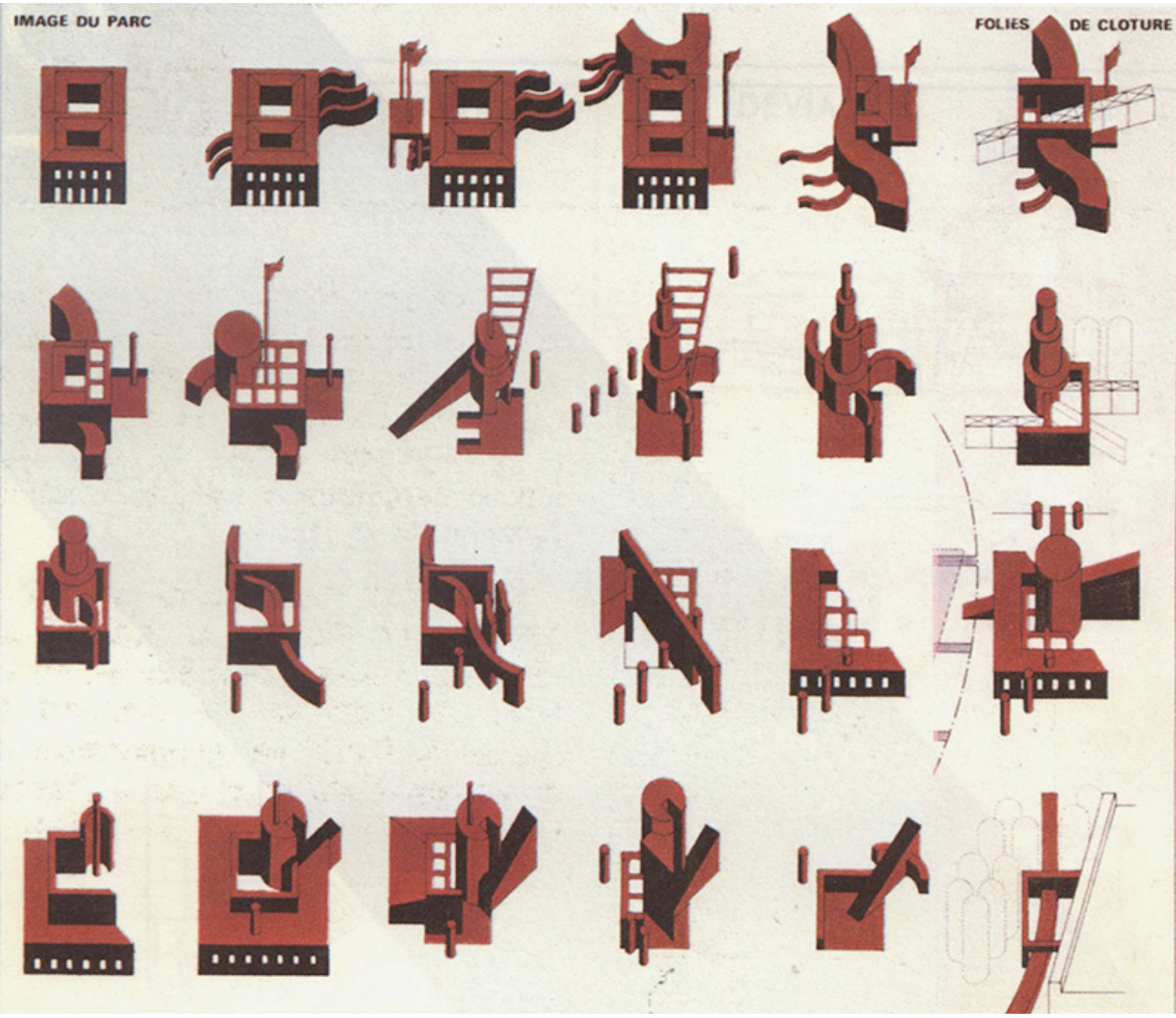
PS, Brooklyn

New Jersey School of Architecture / NJ SoA
Hillier College of Architecture and Design / HCAD / NJIT
Spring 2024
Architecture 502G Spring 2024 / M Arch Studio II
Carrie Bobo, RA, and Cleve Harp, RA, Studio Critics



https://socks-studio.com/2014/12/29/the-combinatorial-models-of-the-folies/

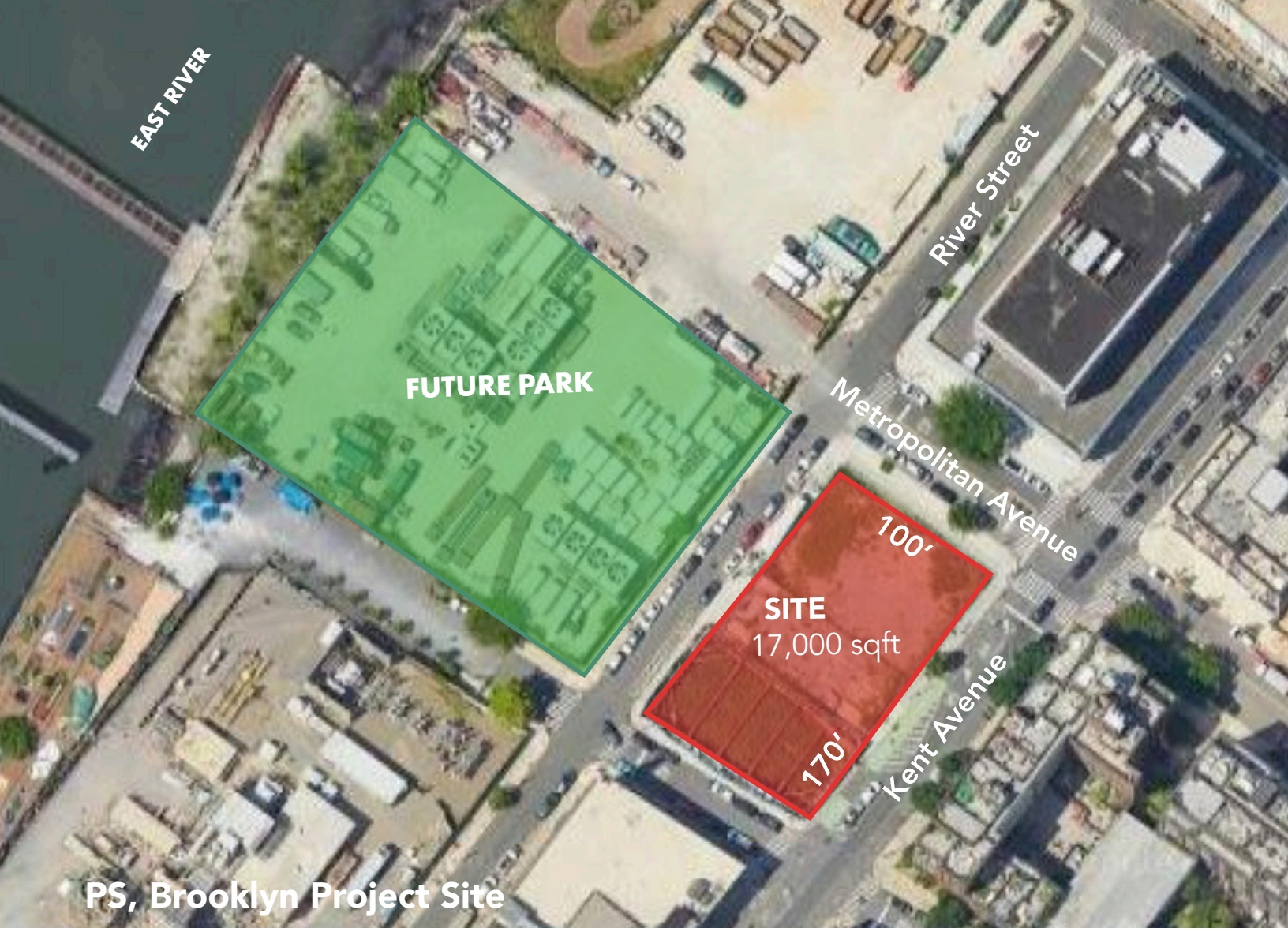
OVERVIEW

This Graduate design studio will explore the creation of a public elementary school, grades K-5, in Brooklyn, New York. Project design will include the building, its interior environment, and outdoor play areas and public spaces. The site will be a single block in the Williamsburg neighborhood overlooking the East River. The relationships of those project components to the sidewalk and the urban street edge will be an important factor.

As an urban elementary school, PS Brooklyn has multiple and overlapping goals – service to children, their community, and the city – and essential characteristics for an educational building: secure and sheltering, daylit, and welcoming.

The studio will investigate the value of architecture that is timeless, functional, responsive to climate and environment, and a meaningful contribution to the urban context of the Williamsburg neighborhood and the East River waterfront.

PS, BROOKLYN Project Site in the Context of the greater New York City area



FORMAT

Weeks 1-2: Introduction and Foundations

Weeks 3-5: Research, Context, Program, and Climate
Review 1- Week 3
Review 2 - Week 4

Weeks 6-8: Concept and Form Exploration: Shapers of Form and Experience
Review 3 – Week 7
Review 4 – Week 8

Week 9: Spring Break

Weeks 10-15: Project Drawings and Models: Tools for Representation and Documentation
Review 5 – Week 10
Review 6 – Week 14

Week 16: Final Presentation
Review 7 - Week 16

SITE

Site Context

The project site is a rectangular block overlooking a public park, being planned by the City, and the East River which separates Brooklyn from the island of Manhattan. The Williamsburg waterfront, until recent decades, was a site for industry and manufacturing, favorable for the shipping of goods, as have historically been the edges of all five boroughs which make up greater New York City, consolidated as a single governmental entity in 1898.

For over twenty-five years the area has been transforming into a sought-after, mixed-use community of adaptive re-use, new construction, and public amenities, with a focus on housing, galleries, and dining, drinking, music, and club venues It has evolved from a neighborhood of traditional middle-income families in single-family residences and low to midrise warehouses and light manufacturing to a mix of artists, young professionals, and aspirational city dwellers in mid-rise and high-rise housing, seeking an escape from the confines and prohibitive costs of Manhattan big-city living.

Still primarily a low-to-midrise district, Williamsburg has now become expensive real estate, and the affordable market for new residents continues to shift further to the east and to the north, gentrifying and welcoming new levels of development for Brooklyn and its neighboring borough to the north, Queens. The Williamsburg riverfront district has mushroomed with stylish high-rise apartment buildings and a reputation for youthful energy, ambition, artistic activity, and nightlife. The one subway line serving the district is a ten-minute walk from the project site and a short hop on the east-west L-line under the East River to Manhattan and all the major avenues and north-south subway lines serving that island. The L-line extends westward, across the island, to the Hudson River and Manhattan's equivalent of a bustling and upscaling riverfront neighborhood, focused on parks and recreational activities along the water's edge. This is urban leisure living at top form and desirability.

Site Description

The block for the new primary school is bounded on four sides by sidewalks and city streets, making for ready access to students arriving on foot, via car drop-off, and by schoolbus service. The new public park planned for the block between the school and the river is intended to complement the high-density housing development along the East River, stretching north and south. Ferry service crisscrossing the river will bring tourists, weekend visitors, and seekers of dining and nightlife venues back and forth. Residents will find job opportunities easily accessible across, up-and-down the river.

The site measures 100 ft by 170 ft, approximately 0.4 acres. Recent mid-rise construction fronts the three blocks forming the three building edges defining the project site and its space. Views to the west/northwest from the site to the river and the Manhattan skyline are enviable. Solar orientation will play a critical role in the design of school buildings and open spaces on the site. Access to the site for children, parents, teachers, staff, visiting public, and for building/site services must be well-sorted and optimized.

Building footprints and coverage of the site may not exceed 60% of the site which allows for low-rise construction and ample open space. Outdoor open space at grade serving outdoor recreation and public-oriented events and use are to be well integrated with building location, form, and solar orientation. All site access for pedestrians and for vehicles will be at curb-side, with no curb cuts on the four edges outlining the block and no parking provided on the site. This will be a dominantly pedestrian environment - planned, designed, and detailed for health, safety, security, and well-being.

Building form, façade materials and treatments, outdoor spaces, and associated landscaping on the site are to present the school as a welcoming place, an inviting and aesthetically pleasing addition to the civic and community life of the neighborhood, the district, and the city. The architecture and its siting should match the highest principles and values of the public realm in a democratic society.

PROGRAM

4,000 sqft	**Lobby / Entry / Security**
	Security Desk
	Classrooms
770 sqft x (4)	**K-1** (2) Kindergarten and (2) First Grade
770 sqft x (4)	**2-3** (2) Second and (2) Third Grade
770 sqft x (4)	**4-5** (2) Fourth and (2) Fifth Grade
1000 sqft x (2)	**(1) Art Room and (1) Music Room**
	The school often groups the students for activities in the grade groupings shown above.
	Congregating
3000 sqft	**Gym / Auditorium** With pull out seating that can accommodate parents of all students
4000 sqft	**Cafeteria** With seating for each classroom group
2000 sqft	**Kitchen** With dietician's office, storage
2000 sqft	**Library**
	Administrative
1200 sqft	School Office
	Teacher Mailboxes, Storage room, Principals office with conference table, and 6 open workstation seats
100 sqft	Counselor's Office
770 sqft	Teachers' Lounge including two restrooms
1000 sqft	Storage Room for Teaching Materials and Building Decorations
770 sqft	Copy Room for Teachers Use

30,000	**Net Square Feet Built Interior includes all heated and cooled spaces**
39,000	**Gross Square Feet = NSF x 1.3**

Individual program numbers are minimum desired square feet.
Assume 20-30% additional including circulation, wall thicknesses, mechanical spaces.
GSF includes vertical circulation (stairs and elevators), horizontal circulation (hallways), restrooms, wall thicknesses, mechanical room, vertical service shafts, electrical closets, janitors closets, general storage room, water fountains

Outdoor Space/ Playground - 40% of Site Coverage (non-conditioned air)

Support

Bathrooms (quantity per IBC code)

- Children and adults cannot share the same bathrooms.
- Kindergarten classrooms require 1 private bathroom per 2 classrooms.
- A minimum of 1single occupancy adult bathroom per floor is required.
- 2 single occupancy adult bathrooms for visitors should be provided in the Lobby

Water fountains (quantity per code)

Janitors closet

Vertical Circulation

Elevators

Stairs

EDUCATION SPACES

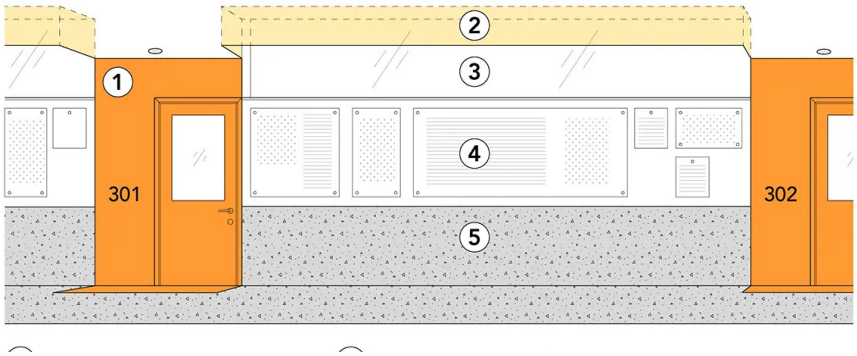
Ideal Learning Environments
https://www.edutopia.org/article/architecture-ideal-learning-environments/
Brown's Point Elementary
https://www.archdaily.com/984647/browns-point-elementary-school-tcf-architecture
A School with Open Space
https://www.archdaily.com/782854/school-with-open-space-beijing-n61-high-school-huilongguan-branch-eijing-insititute-of-architectural-design-6th-division
School Buildings Detail Magazine
https://issuu.com/detail-magazine/docs/978-3-95553-516-2_bk_schoolbulidings_en_2020
Post Pandemic School Circulation
https://issuu.com/perkinswill/docs/postpandemicschools_circulation_space_update
Top Ten Educational Buildings
https://www.designboom.com/architecture/top-10-schools-educational-buildings-12-13-2021/
The School as a Metaphor for the World
https://www.domusweb.it/en/architecture/2012/09/21/the-school-as-a-metaphor-for-the-world.html

Lincoln School Honors a Massachusetts Town's Modernist Past and its Net-Zero Future
https://www.architecturalrecord.com/articles/16445-lincoln-school-honors-a-massachusetts-towns-modernist-past-and-its-net-zero-future?oly_enc_id=6012A8614490C5Z

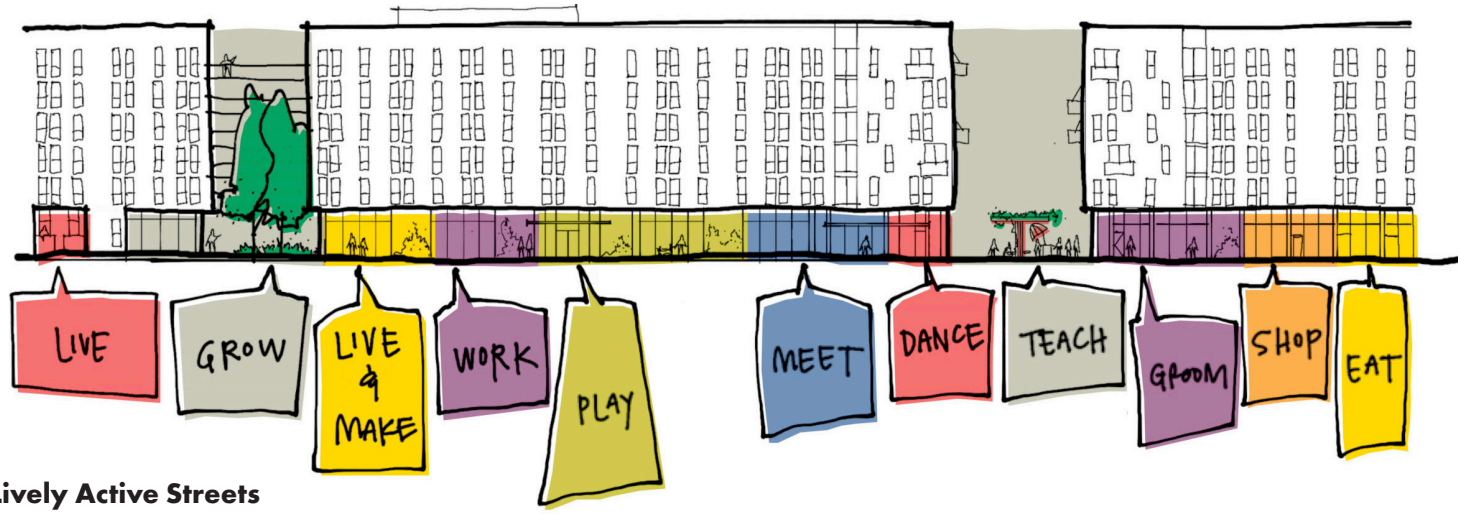
Ehrman Crest Elementary and Middle School in Cranberry Township, Pennsylvania
https://www.architecturalrecord.com/articles/16448-a-school-where-every-day-is-like-a-field-trip-to-the-museum

Gluck+ Creates a School as a Social and Spatial Crossroads
https://www.architecturalrecord.com/articles/16441-gluck-creates-a-school-as-a-social-and-spatial-crossroads

1. Highlighted classroom entrance
2. Ceiling cutout for lighting
3. Clerestory glass windows
4. Pinup board for each classroom
5. Concrete floor and wainscoting



THE STREET EDGE



Lively Active Streets
https://commonedge.org/activating-the-edges-how-to-create-lively-active-streets/?utm_medium=website&utm_source=archdaily.com
Aukland Design Manual - Positive Street Edge
https://www.aucklanddesignmanual.co.nz/sites-and-buildings/mixed-use/guidance/streettofrontdoor/createapositivestreetedge#/sites-and-buildings/mixed-use/guidance/streettofrontdoor/createapositivestreetedge
Urban Street Design Guide
https://nacto.org/publication/urban-street-design-guide/street-design-elements/
Jan Gehl
https://www.gehlpeople.com/

"The hard edges are easy to define. If you have a blank wall or just glass, maybe black glass or whatever, you can, as a human being, do nothing and there's no interest. The words "soft edge" mean a façade where a lot of things happen. It could be many doors, niches, or the vegetable seller putting out his tomatoes on the street. Soft edges could be the front yard where the kids are playing and grandma is sitting knitting just behind the hedge. We have found, of course, the ground floor is where the communication between building inside and outside occurs. That's what you see. So if the ground floor is rich, the city is rich and it doesn't matter what you do further up. Ralph Erskine said always make the ground floor very rich, use all the money on the ground floor, it doesn't matter what's further up because nobody sees that." - Jan Gehl

PLACES FOR PLAY

The Architecture of Modern Play
https://artsandculture.google.com/story/the-architecture-of-modern-play-royal-institute-of-british-architects/BwWBUl3cmPrANw?hl=en

The Story Behind Isamu Noguchis Playscapes
https://www.hermanmiller.com/stories/why-magazine/the-story-behind-isamu-noguchis-playscapes-in-atlanta/

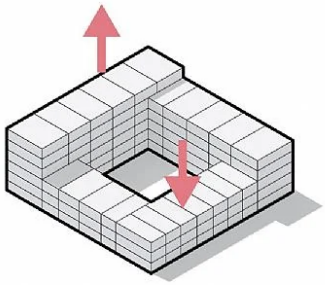
The Story of a Monster - Niki de Saint Phalle
https://nikidesaintphalle.org/the-story-of-a-monster/

Models of Follies
https://socks-studio.com/2014/12/29/the-combinatorial-models-of-the-folies

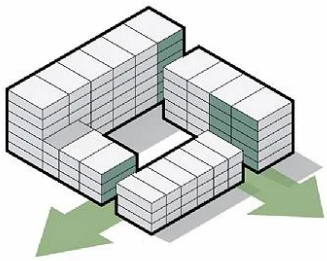
DIAGRAMS

Diagrams both communicate and clarify, the process of diagramming architecture can help to refine it.

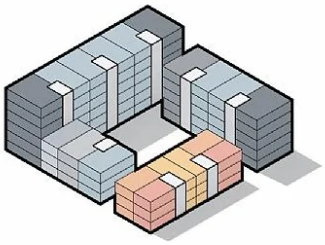
Architectural Diagrams
https://www.novatr.com/blog/architectural-diagrams



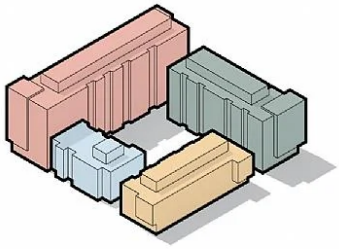
1. Bebyggelsen tager udgangspunkt i den typiske københavnske karré. Højder tilpasses de omkringliggende grønne rum og gyder, samt udsigt mod havnen.



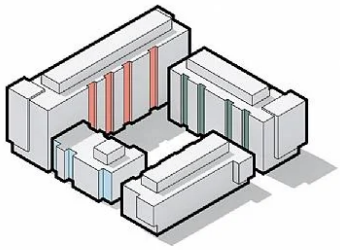
2. Bygningsvolumenen skæres for at etablere passager mellem det grønne gårdrum og de øvrige byrum.



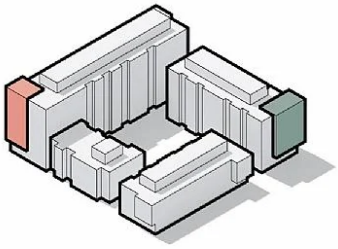
3. Bebyggelsen inddeles i boligenheder, med to til tre enheder per trappe-og elevatorkerne.



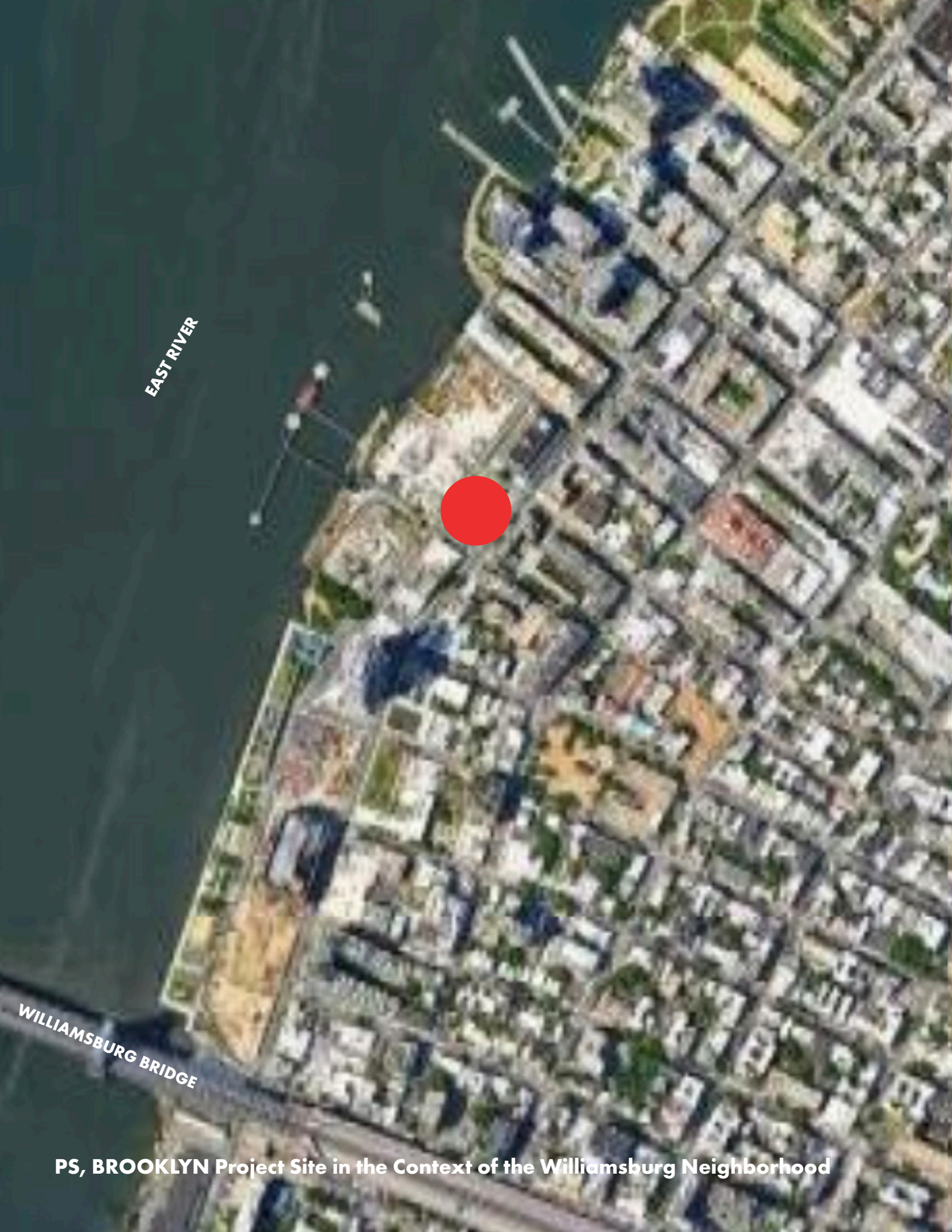
4. Bebyggelsens fire volumner markeres som adskilte bygninger gennem farvenueancer, materialitet og facaderytmer.



5. Bebyggelsens vertikalitet fremhæves gennem slisser og udformning af facade..



6. Markante hjørnemotiver markerer bebyggelsen mod Kanalpladsen og Haverne.



PS, BROOKLYN Project Site in the Context of the Williamsburg Neighborhood

STUDIO PROCESS & SCHEDULE

Weeks 1 Introduction

Week **1** (Jan 18) **Intro Week**

Thursday: Course Introduction
Workshop: 3 Spaces Modelling Exercise
Assignment: Education Park Tower - Due at Review 1 / Week 3
Assignment: Education Theory / Philosophy PPT - Due at Review 2 / Week 4
Lecture: Introduction to Building Surveying

Weeks 2-3 Education Center

Week **2** (Jan 22) **Survey + Design**

Monday: **Super Jury**
Progress Review: Surveys
Progress Review: Tower Design
Readings Due: Language of Architecture Chapter 1 **Analysis** and Chapter 2 **Concept**

Thursday: Final Pinup: Surveys
Progress Review: Tower Design

Week **3** (Jan 29) **Design**

Monday: Readings Due: Language of Architecture Chapter 3 **Representation** and Chapter 4 **Program**
Progress Reviews: Tower Design

Thursday: **Review One -** Final Presentations - Education Park Tower
Discussion: PS Research - How and what to research? PS Site Model - How and what to build?
Assignment: PS Research + Site Model (physical and digital)

Weeks 4-6 Research / Program / Site

Week **4** (Feb 5) **Research Week**

Monday: Presentation of Research + Site (physical and digital) Model Progress
Readings Due: Language of Architecture Chapter 5 **Context** and Chapter 6 **Environment**
Discussion: Sustainability
Assignment: Reading: *Design with Climate*
Assignment: Analyze and Design a PS building massing in response to local climatic conditions.

Thursday: **Review Two** - Solar/Climate Responsive Massing and Education Theory Presentations
Discussion: Programming
Assignment: Prepare 2D (InDesign) and 3D (Rhino) representations of the PS program components

Week **5** (Feb 12) **Programming and Diagramming**

Monday: Readings Due: Language of Architecture Chapter 21 **Order**
Discussion: Programming, Problem Seeking, Pena & Parshall
Assignment: Prepare a Matrix of (6) 2D and (6) 3D bubble Diagrams applied to the Site

Thursday: **Site Visit**: photography, sketching, diagramming, and group conversation re Site and Context followed by public school tour

Week **6** (Feb 19) **Site Models**

Monday: Readings due: Language of Architecture Chapter 22 **Grid**
Progress Reviews: Pinup Presentation of Program Diagrams
Discussion: Regulations - IBC and ADA
Assignment: Program Diagram Revisions + Final Site Models (Physcial and Digital)

Thursday: Final Reviews: Program Diagrams and Site Models
Discussion: Diagramming
Assignment: Prepare Design Polarities model matrix

Weeks 7-11 Concept and Form

Week **7** (Feb 26) **Design Polarities**

Monday: Readings due: Language of Architecture Chapter 23 **Geometry**
Progress Reviews: Design Polarities
Discussion: Spaces for Education

Thursday: **Review Three** - Design Polarities
Discussion: The Building Street Edge
Assignment: Rhino Modeling - 6 Concepts including design Parti hand sketches, digital Models, and building Sections, considering Program, Solar, and Climate

Week **8** (March 4) **Design Concepts**

Monday: Readings due: Language of Architecture Chapter 7 **Mass**
Progress Reviews: Rhino Modeling 6 Concepts

Thursday: **Review Four** Rhino Modeling 6 Concepts and Architectural Precedent Presentations
Discussion: Drawing the Plan
Assignment: 3 Scales of Plans - PS Site Plan, Floor Plans, and Detail Plans

Week **9** (March 11) **Spring Break**

Week **10** (March 18) **Scales of Plan**

Monday: Readings due: Language of Architecture Chapter 8 **Structure**
Progress Reviews: Pre-Mid Term

Thursday: **Review Five** Mid Term Presentations - 3 scales of Plan, 3D Model, Building-Site Sections

Week **11** (March 25) **Formal Confirmations**

Monday: Readings due: Language of Architecture Chapter 9 **Surface** and 10 **Materials**
Discussion: Understanding Building Forms Climate Implications: Sefaira
Discussion: Board Layouts (Determine the Final Project Presentation Requirements)
Assignment: Survey Detail Magazine Online and Identify 5 projects with inspirational wall sections

Thursday: **Final Site Visit**
Assignment: Final Rhino Model + Draft "Design Intention" Text and Images

Weeks 12-16 Final Models and Drawings

Week **12** (April 1) **Plan and Section Drawings**

Monday: Readings due: Language of Architecture Chapter 11 **Space** and 12 **Scale**
Progress Review: Site Plan, Floor Plans, Building/Site Sections (2) with Titles and Labels

Thursday: Progress Reviews: Site Plan, Floor Plans, and Building Site Sections (2) with Titles and Labels

Week **13** (April 8) **Elevations + Axonometric Drawings**

Monday: Reading due: Language of Architecture Chapter 13 **Light**
Progress Review: Elevations (4) and Axonometrics (2)

Thursday: Progress Reviews: Elevations (4) and Axonometrics (2)

Week **14** (April 15) **Review Six Final Presentation**

Monday: All Drawings on Final Board

Thursday: Reading due: Language of Architecture Chapter 14 **Movement**
Revisions to Presentation

Week **15** (April 22) **Physical Model**

Monday: Progress Review: Final Physical Model

Thursday: Completion of Final Physical Model

Week **16** (April 29) **Review Seven Revised Final / Public Presentations**

Monday: Final Presentations - All required Drawings an Presentation Boards and Physical Model

Thursday: Required Canvas/Kepler Postings Complete

Readings

Language of Architecture Simitch and Warke

https://ebookcentral-proquest-com.libdb.njit.edu:8443/lib/njit/detail.action?docID=3399961

Design with Climate

https://primo.njit.edu/permalink/01NJIT_INST/1g6efgv/alma995098128105196

Detail Magazine

https://inspiration-detail-de.libdb.njit.edu:8443/startseite.html

Problem Seeking an Architectural Programming Primer

https://primo.njit.edu/permalink/01NJIT_INST/1g6efgv/alma995065517805196

Workshop: Three Spaces Week One

Anticipation, Transition, Arrival
How does one design experience?

Using the provided color swatches (3 colors max) model three experiential spaces in sequence.
Model these on the provided base.

Assignment: Education Park Tower Week Three

The first project will be a design for an Education Park Tower. This tower will provide viewing platforms in the park at various heights and will also provide community bathrooms.

Each student will survey significant architectural components at Weston Hall:

Survey and draft at 1/2" = 1'-0" in plan include dimensions and ceiling heights

Fire Stairs including doors and windows and tread rise and run (one floor)
Elevators including the enclosure and the waiting space
Bathroom (either gender)
The Studio Space

Survey and draft at 1/2" = 1'-0" in section

Fire Stairs including doors and windows (one floor)
The Studio Space including window sills, ducts, lighting, sprinklers, beams, etc.

These basic building blocks will then be composed into an Educational Tower:

A series of viewing platforms connected by a stair and elevator modeled after Weston Hall.
Bathrooms and janitors closet are also provided.
The max size of the tower will be 35'-0" square and 72'-0" tall

Design the Education Tower!

What is elegant in form? What can serve as icon for the community?

Provide drawings at 1/8" = 1'-0" - using Rhino, AutoCad, or Hand Drafting

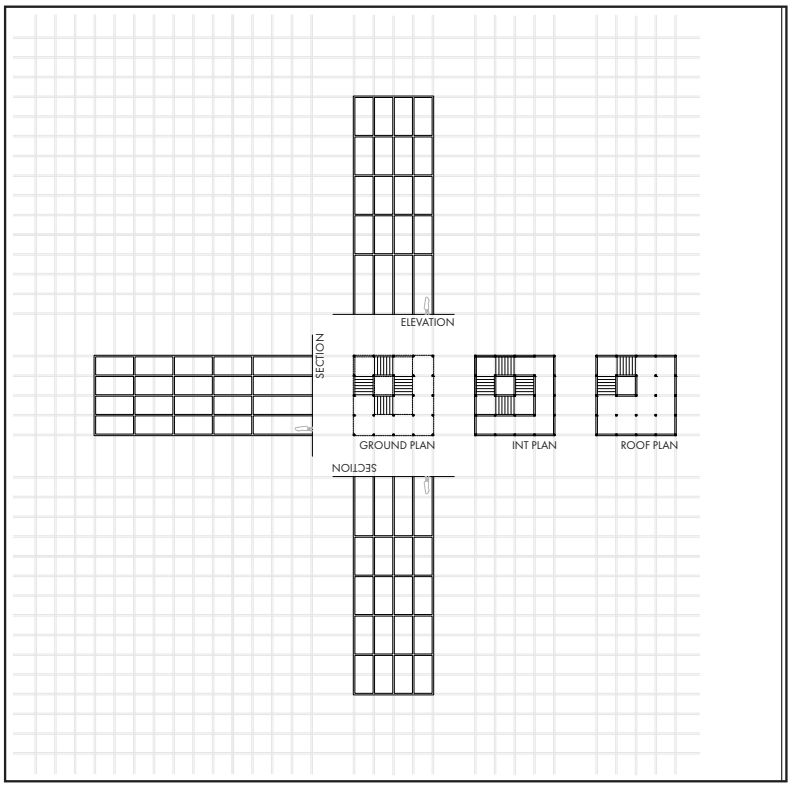
Compose the final presentation board (32"X32") as shown in the provided diagram, with central ground floor plan, upper floor plans to the right, and elevations and sections to the left, above, and below

Consider the orientation of the plan(s) to allow for the best elevation and sections.

Draft the building's corresponding sections and elevation around the plan showing construction lines.

Construction lines **MUST** be included as part of the final drawing.

Using your index cards, provide a model at 1/8" = 1'-0"



Layout Template for Presentation Board 32" x 32". Design shown is a sample for layout purposes, and is not reflective of design criteria, students will each develop their own tower design proposal.

Assignment: Design Polarities Week 7

Each student will create a matrix of modeled design concepts.
Each concept is considered as the opposite of another concept (as a polarity).

How do we create architectural form that represents a design idea?

- Using your paper index cards create a matrix of (30) 4"x4"models
- These models will be without scale.
- Arrange the models into a 6x6 matrix to create a 24"x 24" wall hung presentation.
- Where the spaces of the matrix are the intersection of two opposites, leave these spaces empty.
- Use the template provided.

Keep in mind craft, these models should be beautiful.
If you struggle to understand how these conceptual ideas can be represented through architectural form, discuss with your critic and your peers.

The boards these are mounted on should be blank. The models should speak for themselves and not need labels.

Each model should be built on a 4"x4" chipboard base that is attached to the 24"x 24" white matboard. The matboard will need to be purchased larger and then cut down to precisely 24"x24".

Supplies / Softwares

4x6 Blank Index Cards - 3 packs - No Lines
4x4 Chipboard Bases (Chipboard is available at the AIAS store)
White Mat Board 24x24 Bristol Surface
White Eraser
Sketchbook - 5x8
https://design.njit.edu/admitted-m-arch-students
According to university policy you are required to have
Rhino, Illustrator, and InDesign available for your use during class time.
A license for Sefaira for Sketchup will be provided.
Revit is NOT allowed on any assignment.

Course Grading

REVIEW 1	Education Park Tower	10 points
REVIEW 2	Climate Form and Education Theory	10
REVIEW 3	Design Polarities Modeling	10
REVIEW 4	Arch Precedents and PS Concepts	10
SPRING BREAK		
REVIEW 5	Mid-Term Schematic Design	15
REVIEW 6	Final Presentation	10
REVIEW 7	Revised Final Presentation	20
READINGS	Language of Architecture	15
	Total	100 points total

Note that the grading system is based upon cumulative points of each assignment and not an average assignment of grades. Therefore, missing one assignment or receiving no or few points can greatly affect the final course grade. Historically the average grade for the Graduate Studios is between "B and B+" For each of the three years' pairs of studio courses, an average of "B" is a requirement to move onto the next year. The studio grades for the Fall and Spring studios each year must be B or higher. The graduate courses require that completing all the Final Presentation Requirements is a prerequisite for a passing Final Studio Grade. Submissions of late work, non-participation in studio or class discussions, interim critiques, and formal presentations can significantly impact your course grade.

Assignment: HISTORY/THEORY PRESENTATIONS

Each student is to choose one of the topics under **EDUCATION THEORY** and one under **ARCHITECTURAL PRECEDENTS**.
Your presentations in context of PS, BROOKLYN will include the following:

Research of topic – Littman Library and online (Google Scholar is a good resource)
Preparation of on screen presentation to consist of six slides, including a citations page
Slides are to contain: images with titles and links, brief explanatory text, and (5) summary bullet points
(5) slides per presentation, plus (1) Citation slide
Every slide is to include at least one image
First slide to show one image with label and link, title of presentation,
Name of the course **ARCH 502G Studio PS, BROOKLYN Spring 24** and your name
A verbal presentation to the class, 4-5 minutes in length
Use of ARIAL typeface

EDUCATION THEORY PRESENTATIONS Week 4

https://www.harapnuik.org/?p=6344
https://www.schools.nyc.gov/learning/student-journey/grade-by-grade/elementary-school-learning

Friedrich Froebel Game Theory	(1782-1852)
John Dewey Pragmatism	(1859-1952)
Maria Montessori Montessori Method	(1870-1952)
Lev Vygotsky Sociocultural Theory	(1896-1934)
Jean Piaget Cognitive Development Theory	(1896-1980)
Carl Rogers Humanism	(1902-1987)
Erik Erikson Psychosocial Development	(1902-1994)
B F Skinner Behaviorism	(1904-1990)
Abraham Maslow Hierarchy of Needs	(1906-1970)
David Kolb Experiential Learning	(1939-
Howard Gardner Multiple Intelligences	(1943-

ARCHITECTURE PRECEDENTS Week 8

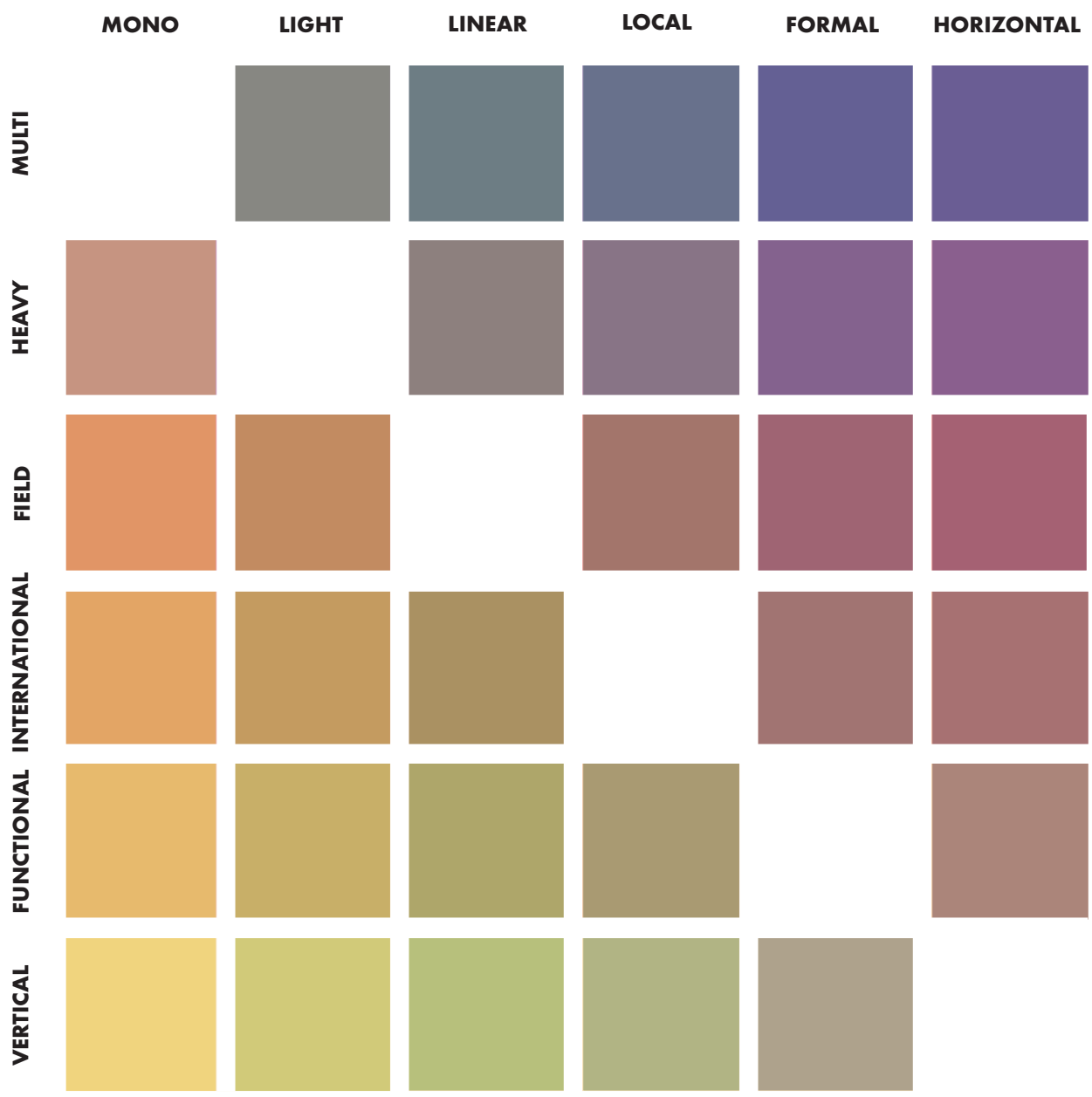
Group A

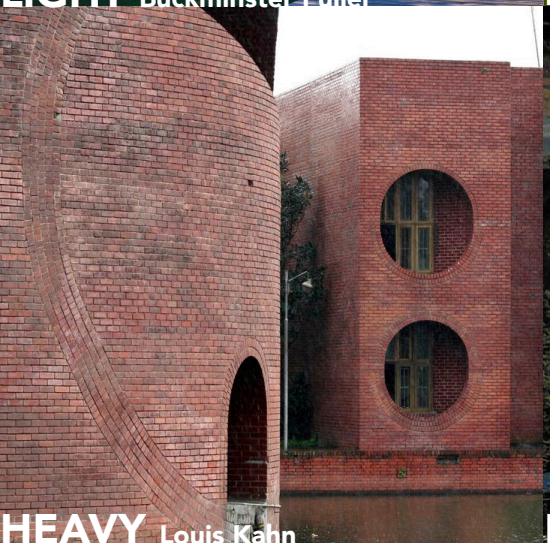
Walter Gropius, Bauhaus, Dessau, Germany	1926
Piklonis, Experimental School, Thessaloniki, Greece	1937
Alison & Peter Smithson, Hunstanton School, Norfolk, England	1954
Aldo Van Eyck, Amsterdam Orphanage, Netherlands	1960
Paul Rudolph, Yale School of Architecture, New Haven, CT	1963
James Stirling, Leicester School of Engineering, England	1963
Louis Kahn, Exeter Library, New Hampshire	1972
Woods & Scheidhelm, Berlin Free University, Germany	1973
Aldo Rossi, Fagnano Olona, Italy	1976

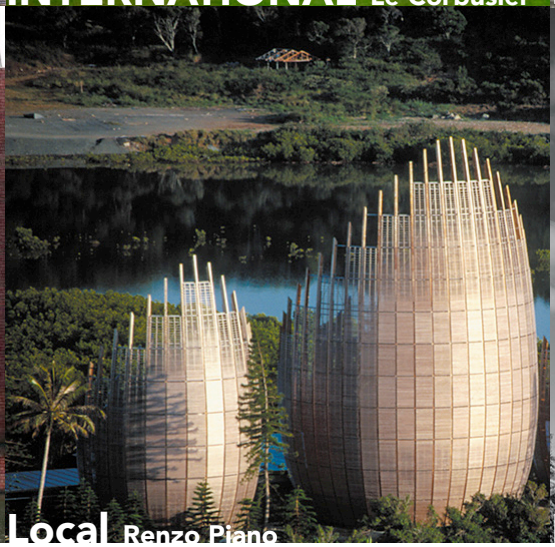
Group B

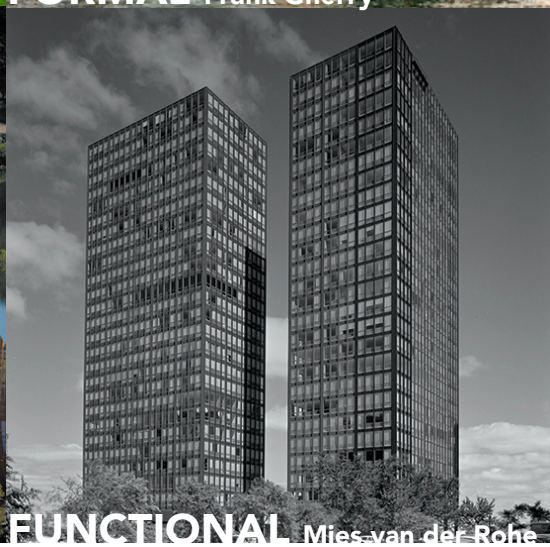
Buttrick White Burtis, St Thomas Choir School, New York	1987
Cooper Robertson, Stuyvesant HS, New York	1992
Patkau, Strawberry Vale Elementary School, British Columbia	1995
Morphosis, Diamond Ranch HS, California	1999
Matthias Klotz, Altamira School, Santiago, Chile	2000
Claudio Sat, Furadouro School, Obidos, Portugal	2008
Zaha Hadid, Evelyn Grace Academy, London	2010
Herman Hertzberger, I Mosaici School, Rome	2012
Steven Holl, Glassell School of Art, Houston, TX	2018

Assignment: Design Polarities Template Week 7









CONCEPTS / CONTRASTS

MONO/MULTI:
a singular expression of form / a composition of unique or multifaceted forms

LIGHT/HEAVY:
a skeletal frame and thin, often transparent, skin / Mass bearing walls

LINEAR/FIELD:
a spinal structure /a grid or dispersed area organization

LOCAL/INTERNATIONAL:
Reflective of specific neighborhood or regional character / a design based on universal adaptable structure that is as efficient as possible

FORMAL/FUNCTIONAL:
the shaping of form in order to elicit emotional connection / the shaping of form in adherence to programmatic requirements

HORIZONTAL/VERTICAL:
a low long expression / a narrow elongated expression

NJIT School of Architecture Criteria

Architectural History and Theory:

1. **Theory and Practice**
   How does the design's **conceptual, theoretical, and technical development** relate to contemporary architectural thought and praxis, illustrating a level of sophistication and rigor appropriate to graduate level work within a professional degree in architecture?
2. **Response to Dynamic Context**
   How does the design, and its presentation, illustrate the development of contemporary architecture which appropriately responding to the **dynamics of architecture** including seasonal variation, changes in weather and time of day, enhancing and relating to the uniqueness of its specific site and context?
3. **Temporality**
   Will the proposed architecture be **valued over time**?

Aesthetics and Architectural Design:

1. **Architecture**
   Is there a consensus that the proposed design is **Architecture** as opposed to simply building?
2. **Concept**
   Is there a clear **concept** that can be applied at **all scales** of the project? Is the proposed project intent clearly legible, and illustrating rigorous conceptual thinking?
3. **Human Scale**
   Does the design illustrate and apply a sensitive understanding of **human and contextual scale**?
4. **Ordering Systems**
   Does the design illustrate appropriate architectural **ordering systems,** beyond simply functional relationships or abstract geometric forms?
5. **Nature of Materials**
   Does the proposed design express the nature of its materials?
6. **Experience**
   Does the proposed design illustrate a purposeful set of **visual experiences** including natural light and shadow, variations in mood or settings?

Process and Representation:

1. **Design Inquiry and Iteration**
   Has there been rigorous **design inquiry** and **iteration**?
2. **Design Process**
   Is there a clearly articulated **design process**? Is this process visually represented?
3. **Comprehensive Presentation**
   Does the final presentation fully and accurately illustrate the **concept, context, program, experience and aesthetic** along with the **technical aspects of the design** proposal including the required range of architectural drawings, images, diagrams, and statements?
4. **Visual Narrative**
   Is the experience of the project told through **visual narrative**?
5. **Presentation Design**
   Is the project conveyed through a **well designed presentation**, organized to maximize the relationships between drawings including professional quality 2d plans, sections, and elevations that are each presented within the context of the site?

National Architectural Accrediting Board Criteria

SC.5 Design Synthesis—

How the program ensures that students develop the ability to make design decisions within architectural projects while demonstrating synthesis of user requirements, regulatory requirements, site conditions, and accessible design, and consideration of the measurable environmental impacts of their design decisions.

Site Conditions

Considerations: Pedestrian and Vehicular Movement, Topographic Conditions including Steep Slopes, Protection of Environmentally Critical Areas, Integration of Surrounding Architectural, Urban and Landscape Contexts, Integration with Functions of Adjoining Neighborhoods, Historical and Cultural Context, Responding to Specific Seasonal Conditions, Diurnal Variation, Variations in Weather, and Solar Access and Control. Municipal Zoning Regulations: Yard Setbacks, Maximum Impervious Coverage, Maximum Building Coverage, Maximum Floor Area Ratios, Maximum Building Height and Stories, etc., Protection of Wetlands and Water Courses, Land Use and Planning Policy and Historical District Requirements

1. **Zoning and Land Use**
   Does the design comply with zoning and land use policies such as setbacks, maximum height, maximum floor area ratios, maximum lot coverage, maximum impervious coverage, etc.?
2. **Response to Context**
   How does the design respond to the character of the surrounding physical contexts including: relationship to existing buildings, topography, natural landscape, principal views, scale, pedestrian and vehicular movement systems? In what ways does the proposed design respond to differences in orientation, relationship to urban and/or natural landscapes, sunrise-sunset, significant views and panoramas, below grade, at grade, above grade and rooftop activities and characteristics, pedestrian paths and access? And, are the exterior facades of the proposed architectural designed to respond to these differences?
3. **Response to Environmental Conditions**
   How does the design respond to environmental conditions of the site including solar orientation, seasonal variation, variations in weather, sunlight, exterior temperature and humidity, wind, precipitation?
4. **Site Improvement**
   Overall, is the proposed design an **appropriate and skillful addition** to the existing landscape and/or urban context?

Environmental Impact

Considerations: Minimum Carbon Footprint, Use of Sustainable Materials, Water Conservation, Application of Renewable Energy Sources, Climate Responsive Building Forms

1. **Sustainability**
   Does the proposed design demonstrate an understanding of sustainability in its selection and use of materials and systems as well as the building's form and window placement?
2. **Positive Impact**
   Does the design have an overall positive effect on the natural and built environment?
3. **Demonstration of Measurable Environmental Impact**
   Based upon a measurable analysis of the design's exterior envelope in form and composition, illustrate and prove: the comparable global warming impact of the design and technical improvements and the non-renewable verses renewable energy demand for the building enclosure and systems.

User Requirements

Considerations: Appropriate Relationships of Functions - both Interior and Exterior, Accommodation of Building Services, Clarity of Way-Finding, Accomplishing Specific Requirements of Each Functional Type as well as for the needs of a Diverse Range of Occupants including variation in Age, Needs for Privacy, and Overall Comfort.

1. **Functionality**
   Does the design accomplish the functional needs of the client, and various groups of users? Are the rooms and spaces designed to include finish materials, interior design elements such as furnishings, and designed for the technical and architectural characteristics for each of the specified functions?
2. **Service**
   Does the design include service spaces, mechanical spaces, service access required for the functioning of the

building?

3. **Circulation**
   Are public areas and the circulation systems logical, clearly understandable by the occupants, and overall part of the architectural concept and form?
4. **Size and Proportions**
   Are the rooms and spaces appropriately sized and proportioned, fitting the needs of the functional program, and overall part of the architectural concept and form?
5. **Spatial Relationships**
   Are the various interior and exterior functions of the building appropriately related, interconnected, or isolated?
6. **Accommodation of Diverse Needs**
   Is the design successful in accommodating the needs of various users such as: visitor, employee, owner, neighbor, child, senior citizen, or passersby?

Regulatory Requirements:

Considerations: International Building Code 2021: Occupancy Classification, Mixed Use Requirements, Required Type of Construction, Allowable Maximum Floor Areas, Maximum Building Height and Number of Stories, Site Determined Building Area Modifications, Building Separations, Atrium Requirements, Fire and Smoke Barriers, Prescriptive Fire Ratings of Building Construction, Fire Smoke and Sprinkler System Requirements, Restroom Requirements and Stair Design.

1. **Zoning & Code Compliance**
   Has the design addressed the requirements of various occupancy types, construction types, and limitations to building dimensions, number of stories and floor areas? Do mezzanine spaces meet the requirements of the IBC?
2. **Fire Safety**
   Does the design accommodate fire safety, including fire rated materials based upon the function class, maximum floor areas, heights and number of stories of the proposed design? Are the various portions of the building appropriately fireproofed?
3. **Insulation**
   Are the various exterior elements of the building appropriately thermally insulated, and acoustically designed for sound transmission?
4. **Daylighting**
   Does each room or space have natural light as required by the IBC? Does the daylighting design enhance each functional space under all solar conditions and functional uses?
5. **Natural Ventilation**
   Does each room or space have natural ventilation or fresh air as required, and as is appropriate to each function?

Accessible Design:

Considerations: 2010 ADA Standards for Accessible Design: Ramp Slopes and Safety Areas, Wheel Chair Access, Turning Circles and Maneuvering Clearances, Doors and Doorways Requirements, Refuge Area Requirements, Restroom Design, Elevator and Platform Lift Design, Accessible Roots, Equivalency of Design and Accessibility.

1. **Accessible Circulation**
   Does the circulation system (path of travel) within the building meet general ADA requirements including ramps widths, maximum ramp pitches and landings, access to elevators, stair, exit stair, elevator refuge areas, accessible seating and toilet room facilities, wheel chair accessibility?
2. **Accessible Restrooms**
   Are restrooms designed to meet the IBC and ADA requirements? Is consideration given to attendants?
3. **Equitable Accessibility**
   Is accessiblity provided equitably? ie are accessible routes as or more convenient than those with steps? Do accessible routes and routes with stairs start and end in the same places?

SC.6 Building Integration—

How the program ensures that students develop the ability to make design decisions within architectural projects while demonstrating integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.

Building Envelope Systems and Assemblies:

Considerations: Selection and Design of Building Envelope Systems, Thermal Insulation and Bridging Standards, Material and Product Specification, Fire Rating of Assemblies, Water and Moisture Protection, Sound Transmission and Acoustics, Integration of Mechanical Systems (for the selected portion of the building).

1. **Building Envelope Concept**
   Does the building envelope illustrate the design concept and form, visually enhancing the design intent? Does the design illustrate a knowledge and suitable development of technical and design precedents? Overall, is the enclosure system sophisticated in concept, function, and relationship to the physical and environmental context, esthetics and construction?
2. **Building Envelope Context**
   Is the building envelope appropriate to its context, including the surrounding buildings and natural landscape?
3. **Building Envelope Climate**
   Is the building envelope appropriate to its climate, seasonal variation, weather conditions, solar access and shading?
4. **Building Envelope Integrity + Code Compliance**
   Is the building envelope system waterproofed, appropriately insulated and fireproofed to meet the basic IBC requirements? Is the building envelope logical, functional and stable?
5. **Building Envelope Presentation**
   Is the building envelope illustrated with specific and appropriate materials, assemblies and systems, at level of detail associated with the scale 1 1/2" = 1'-0", including vertical dimensions, materials specifications, from foundation to sky?
6. **Building Assemblies**
   Does the building design and detailing illustrate a basic knowledge of the construction assembly process? Does the design illustrate the selection of specific construction materials, products and assemblies that are consistent to and enhance the design's performance, concept and intent?

Structural Systems:

Considerations: Criteria for selection and design of Foundations, Primary and Secondary Structural Systems, Load Bearing Walls and Columns, Girders and Beams, Floor Slab Design, Lateral Stability, Deflection Limitations of Structural Elements, Maximum Slenderness Ratios of all Structural Members, Accommodation of Required Live and Dead Loads, Continuity of Load Paths to Subsoil.

1. **Structural Concept**
   Does the structural system serve the design intent and concept? Is the choice of the structural form and materials consistent with other characteristics of the architecture? Do structural system elements working logically as a system?
2. **Structural Loading Requirements**
   Have the requirement minimum Live, Dead and Wind Loads for the various functions been determined?
3. **Deflection Requirements**
   Have the required maximum deflections of all structural components been determined?
4. **Lateral Stability / Sheerwalls**
   Is the lateral stability for the structure logical and clearly presented in all directions?
5. **Structural Performance**
   Is the structural performance of the building proven through one of the following?
   - Calculation of typical elements including foundations, load bearing walls, columns, girders, beams, slabs, frames while assuring deflection criteria compliance and lateral stability.
   - Detailed comparison to similar structural precedents, explain the logic of your structural systems behavior?
6. **Structural Sizing**
   Are the structural systems and members appropriately proportioned to all structural forces and spans? Are the structural systems and member design consistent with the performance of the specific materials selected, (wood, steel, concrete, etc.)?
7. **Structural Integration**
   Is the structural system integrated with mechanical and other building systems? Does the structural system support and is it integrated with the building enclosure system?
8. **Load Paths**

Are the vertical and lateral structural forces (loads) of the building effectively transferred to foundations and subgrade, through logical load paths?

9. **Foundations**
   Does the design adequately address lateral foundation forces and subsoil conditions?

Life Safety Systems:

Considerations: International Building Code 2021: Exit Access, Exit Access Maximum Travel Distances, Aisle Minimum Widths and Combined Widths (Corridors & Stairs), Min and Max Separation of Exits within a space, Maximum Dead End Exit Distances, Number of Required Exits, Maximum Common Exit Path Distances, Means of Egress Minimum Widths and Minimum Widths by Capacity, Corridor Continuity, Horizontal Exits, Exit Discharge, Egress Court and Exit Lobby Restrictions, Required Door Widths and Swing Directions, Direct Exit Paths.

1. **Egress Requirements**
   Does the building ensure safe egress to exit discharge from all occupied interior and exterior portions of the building?
2. **Egress Requirement Illustration**
   Illustrate and prove by measurement in the final proposed design all primary life safety requirements, listed above.

Environmental Control Systems:

Considerations: Criteria for Selection and Design of Heating, Cooling and Ventilation Systems: System Type and Distribution Systems, Ventilation, Solar Control, Elevators / Escalators.

1. **Mechanical Concept**
   In what way does the mechanical systems enhance the design intent and concept? Are the selection and general design of the mechanical systems appropriate to the function, architectural concept and form? Are the mechanical systems integral to the design concept including lighting, heating, cooling, and ventilation?
2. **Mechanical Strategy**
   Are all spaces appropriately natural and artificially lit, heated, cooled and ventilated by natural and/or artificial means?
3. **Mechanical Presentation**
   Are the distribution and functioning of the various mechanical systems logical, and integrated into each occupied space and clearly presented/illustrated.
4. **Sustainable Environmental Controls**
   Are design and technology strategies integrated to create a sustainable proposal, including passive and active systems?

Building Performance:

Considerations: Performance of Energy Consumption, Day-lighting, Solar Protection, Natural Ventilation, Natural Cooling, Building Insulation-Thermal Mass, Building Form and Orientation, Climate, Weather and Diurnal Response, Solar Access, and Alternative Energy Sources.

1. **Measurable Building Performance**
   Does the proposed design illustrate and analytically prove using measurable analysis, design and technical modifications to minimize the energy consumption of the project, while maintain thermal and visual comfort?
2. **Annual Energy Use**
   How does the annual building energy use compare to the average energy use of a similar building functions and locations?

Passive Systems

Does the design minimize the use of energy consuming systems through the accurate design of solar control devices by orientation, use of natural ventilation, design of day lighting and use of alternative energy sources, as may be appropriate to each building function and in relationship to the design intent and form? Are the non-critical environmentally controlled spaces cooled through natural ventilation? Does the design provide sufficient levels and uniformity of daylight in the selected portion of the project?

3. **Code Required Energy Use**
   Does the design comply with the ASHRAE 90.1 maximum annual energy use standard? How close to the Architecture 2030 Energy Standard does the design accomplish?
4. **Energy Consumption**
   Which aspects of the architectural design are most and least efficient in terms of annual energy consumption?
5. **Building Performance Development**
   What design and technical changes where most influential in accomplishing minimum energy consumption? Compare the preliminary and final energy analysis data, illustrating relative importance of the design and technical changes of the design?

STUDIO CULTURE

The studio presumes a very high level of engagement and commitment to architectural design.

All students are required to review the HCAD Studio Culture Policy and the Learning and Teaching Culture Policy at the start of the semester. These documents can be found here: https://kepler3.njit.edu/SitePages/Studio%20Culture%20Policy.aspx and here: https://design.njit.edu/learning-and-teaching-culture-policy

Design studio is a time to not only learn design skills, but also to cement professional working practices that will become the basis of your working life as an architect. To this end, the studio should be a place of mutual respect where students treat each other with professional courtesy. This means that time spent in studio is spent on academic work and that distractions are kept to a minimum. It also means that as much energy and effort is put into consideration of and response to other students work during critiques as to one's own presentations. Just as in the workplace, assignments not submitted on time are of little value and absences should be preceded by professional communication with legitimate justifications.

The best projects will be the result of continuous sustained effort throughout the semester and will not require sleep deprivation. Studio should be an incredible energizing time. Late hours, while sometimes productive and enjoyable, can easily become the foundation of unhealthy lifestyles and should be traded in for consistent daily work schedules.

Assignments are provided as suggested minimum requirements and, as in all things design, outstanding work will exceed the requirements.

The use of cell phones, texting, emailing, etc. in the studio during studio hours is prohibited. Emergency calls should be taken outside of the studio environment. Entertainment including movies, social networking, games, etc., in the studio during studio hours is prohibited.

All students are to take detailed notes of studio design group and individual discussions with faculty and critics.

It is the responsibility of each student to seek architectural criticism, references and general guidance throughout the entire semester from their studio critic, other members of the HCAD faculty, guest critics and utilize HCAD library resources.

Class attendance is defined to mean presence in the classroom, or for synchronous classes actively and continually online, during the entire scheduled class period. Lateness or leaving class early is not complying with attendance policies. The instructor must be notified at the beginning of the semester if a student will miss a session (or more) due to religious observance.

Non-participation in studio discussions, reviews, critiques or formal presentations can significantly impact the course grade.

KEPLER

http://kepler4.njit.edu/Pages/Home.aspx
Projects should be uploaded with 48 hours of the final review. Grades will be held and not recorded with the Registrar until a student's work is uploaded to Kepler and google drive. All files must be resized and renamed. Images must retain their original proportions. All work must be archived as individual images, drawings, model photographs etc., and as complete multi-image boards as presented at the Final Presentation. All PowerPoint or PDF work must be converted to JPG format. JPG is the only image file format which is acceptable. File name: Student'sFirstName_ Student'sLastName_###.jpg

ADMINSTRATIVE POLICIES

Grading:
https://www5.njit.edu/registrar/policies/grading.php

Attendance and Tardiness:
All absences are to be reported to the Dean of Students so that they can determine if they may be excused and/or accommodated.

Academic Integrity / Plagiarism:
https://www.njit.edu/dos/code-student-conduct-article-11-university-policy-academic-integrity

Resources on Mental Health & Covid-19
https://researchguides.njit.edu/mentalhealth
https://www.njit.edu/pandemicrecovery/vaccination-requirement-njit-community-members

Students with Disabilities:
It is the school's moral, ethical, and legal obligation to provide appropriate accommodations for all students with physical and/or learning disabilities. If students need an accommodation related to disabilities, all official documentation must be filed with the Dean of Students and the Disability Support Service Office. It is the responsibility of the student to notify the instructor at the beginning of the semester if accommodations are warranted.
Dean of Students: https://www.njit.edu/doss/
Disability Support Service: http://www.njit.edu/studentsuccess/disability-support-services-0/

Well-being:
Taking care of yourself is as important as your other responsibilities to your classes, work, family and anything else that is part of your life. If you are struggling, please feel free to reach out to your instructor. NJIT has the Center for Counseling and Psychological Services (C-Caps) which offers online help https://www.njit.edu/counseling/

Citations:
The HCAD librarian Maya Gervits has assembled excellent resources on copyright, plagiarism citing, and avoiding plagiarism: http://researchguides.njit.edu/c.php?g=671665&p=4727920

Copyright, Rights and Publication:
All student work, both digital and physical, may be retained by the New Jersey School of Architecture, HCAD, NJIT for accreditation purposes, academic reference, design competitions, conferences, papers, institute publications, public display, and publicity both in print and online. NJSoA/HCAD/NJIT retains the right to a copy of all academic material prepared by students in conjunction with all courses and research. Only students enrolled in this specific course are to have access to the educational and reference materials provided. This includes, but is not limited to, videos, music, sounds, books, e-book links, journal and magazine articles, online images, and links to any other publication and tutorials from any source. Students are to comply with all intellectual property laws. Academic materials and references are not to be transmitted, shared, posted online, to be accessible, seen or used by any third party. Nor are they to be used beyond the academic assignments of the course. All materials including images, videos, recordings, live presentations, which are part of this course, are not to be screen captured or recorded and made public at any time or in any manner. All educational and reference materials are to be deleted completely, included from all storage devices before the last day of the semester. Registration or participating in any manner in this course constitutes implicit agreement with all these requirements.

AI, Artificial Intelligence
The use of AI is supported with appropriate citations and as a tool for creating. Any student presenting AI generated text or images as their own (i.e. without citation/attribution to how the work was generated) will receive an immediate F on the assignment and be reported to the Dean of Students.

OBJECTIVES

This design studio, ARCH 502G, meets all the National Architectural Accrediting Board Student Performance Criteria, with particular emphasis on:

PC.2 Design:
How the program instills in students the role of the design process in shaping the built environment and conveys the methods by which design processes integrate multiple factors, in different settings and scales of development, from buildings to cities.
Through the design of an elementary school in a complex, evolving, urban district students gain insight, skills, and knowledge that prepares them to design better, safer, more equitable, resilient, and sustainable buildings and communities. The site allows them to consider how to best respond to an existing urban context.
PC.3 Ecological Knowledge and Responsibility
How the program instills in students a holistic understanding of the dynamic between built and natural environments, enabling future architects to mitigate climate change responsibly by leveraging ecological, advanced building performance, adaptation, and resilience principles in their work and advocacy activities.
The course foregrounds formal response to climate, introducing students to foundational approaches: sun angle diagrams, wind roses, and climate zones and their specific design responses. The class also introduces schematic computer modeling for energy performance in early formal decision making.
How the program ensures that students understand the histories and theories of architecture and urbanism, framed by diverse social, cultural, economic, and political forces, nationally and globally.
The course situates the project in a diverse urban environment and encourages conversations on urban responses to social and cultural conditions.
PC.5 Research and Innovation
How the program prepares students to engage and participate in architectural research to test and evaluate innovations in the field.
Students are encouraged to research and innovate. They are given the opportunity to develop their own research agendas relative to the project and to present that research to the group of students.
PC.6 Leadership and Collaboration
How the program ensures that students understand approaches to leadership in multidisciplinary teams, diverse stakeholder constituents, and dynamic physical and social contexts, and learn how to apply effective collaboration skills to solve complex problems.
Students are offered opportunities to work collaboratively and are given tools and methodologies for finding success in collaborative work. Students are also introduced to methodologies for trans-disciplinary research and co-production and stakeholder participation in design processes, working with a client and with participatory design integrating a child's perspective. .
PC.7 Learning and Teaching Culture:
How the program fosters and ensures a positive and respectful environment that encourages optimism, respect, sharing, engagement, and innovation among its faculty, students, administration, and staff.
PC.8 Social Equity and Inclusion:
How the program furthers and deepens students' understanding of diverse cultural and social contexts and helps them translate that understanding into built environments that equitably support and include people of different backgrounds, resources, and abilities.
Students deepen their understanding of diverse cultural and social contexts and how those contexts shape the built environment. They also broaden their awareness of inclusion through considering equitable building design relative to both physical ability and cultural, racial, and economic barriers to access.