CENTRAL LAKES LIMNOLOGY SCIENCE CENTER

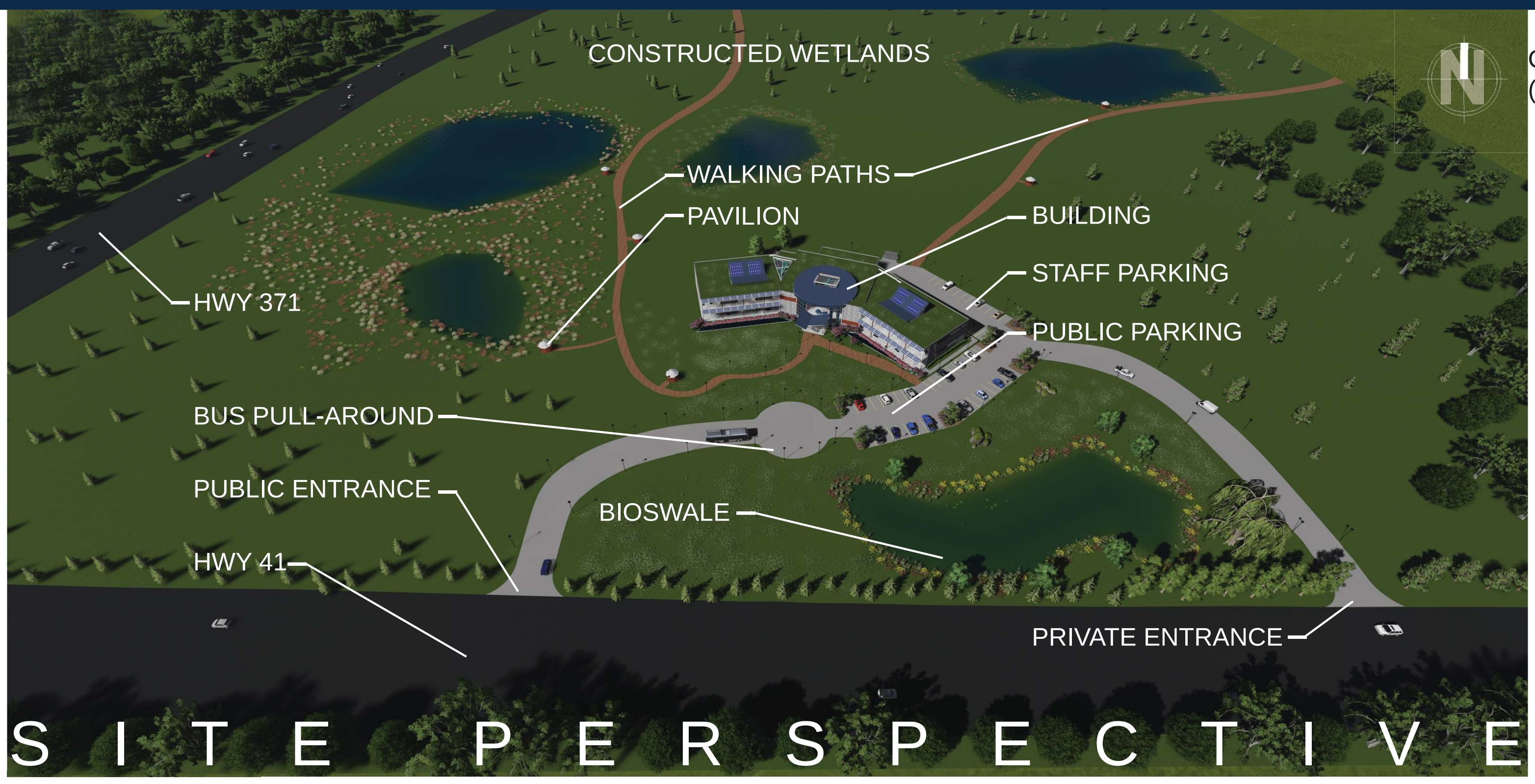
AWAKING WATERS

WHY	WHERE	WHAT	WHO	HOW
IGNITE PASSION AND EDUCATION FOR MINNESOTA WATER CONSERVATION AND RESEARCH	BRAINERD / BAXTER CENTRAL MINNESOTA LAKES REGION UPPER MISSISSIPPI RIVER WATERSHED	RESEARCH LABORATORIES CLASSROOMS PUBLIC EDUCATIONAL EXHIBITS	VISITORS STUDENTS RESEARCHERS	CREATE A LIVING BUILDING THAT FACILITATES EDUCATION AND RESEARCH SET A PRECEDENT FOR FUTURE DESIGN

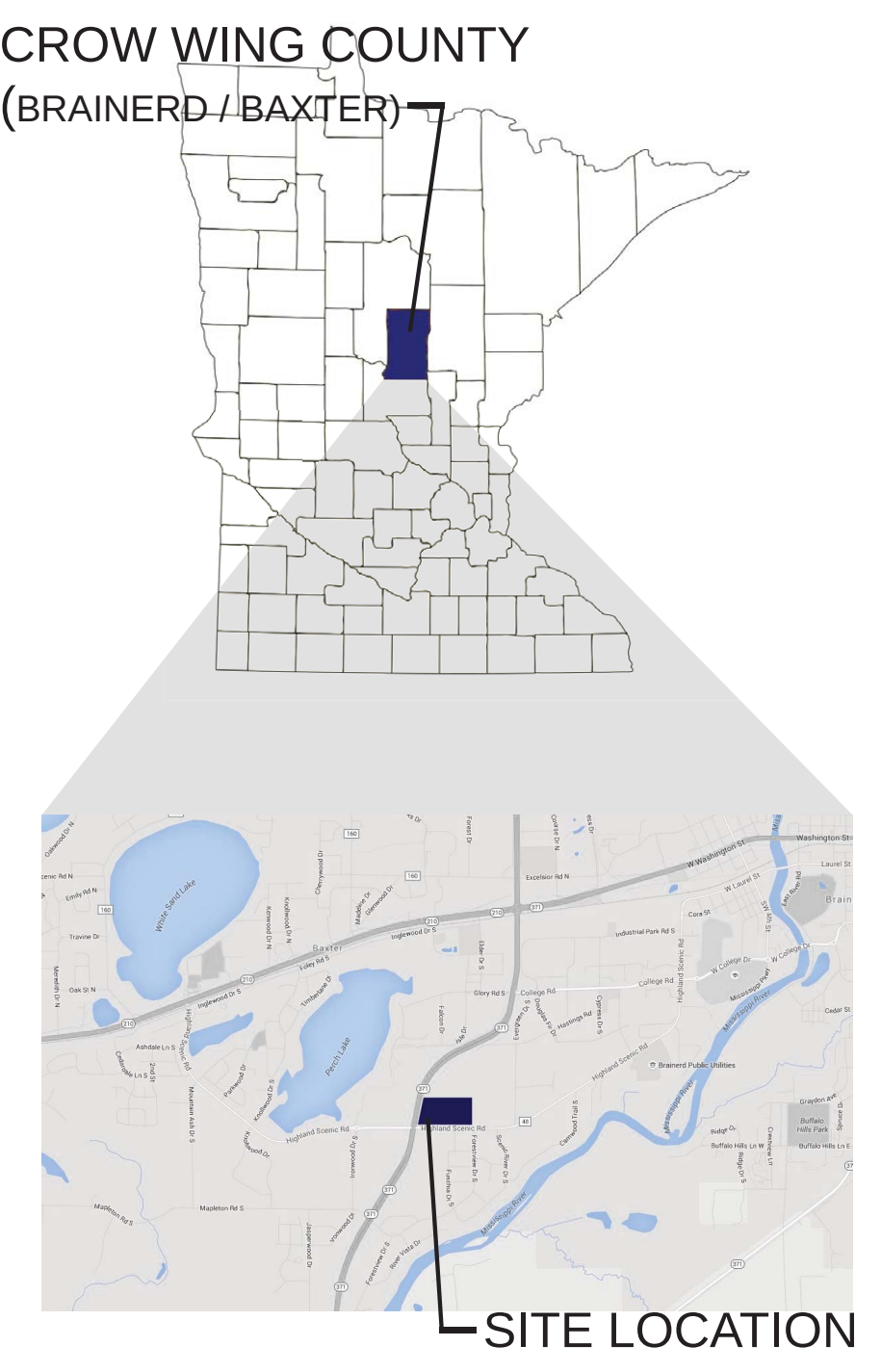
FLOOR PLAN KEY

🟪 PUBLIC 🟩 PRIVATE 🟨 CIRCULATION ⬜ SUPPORT

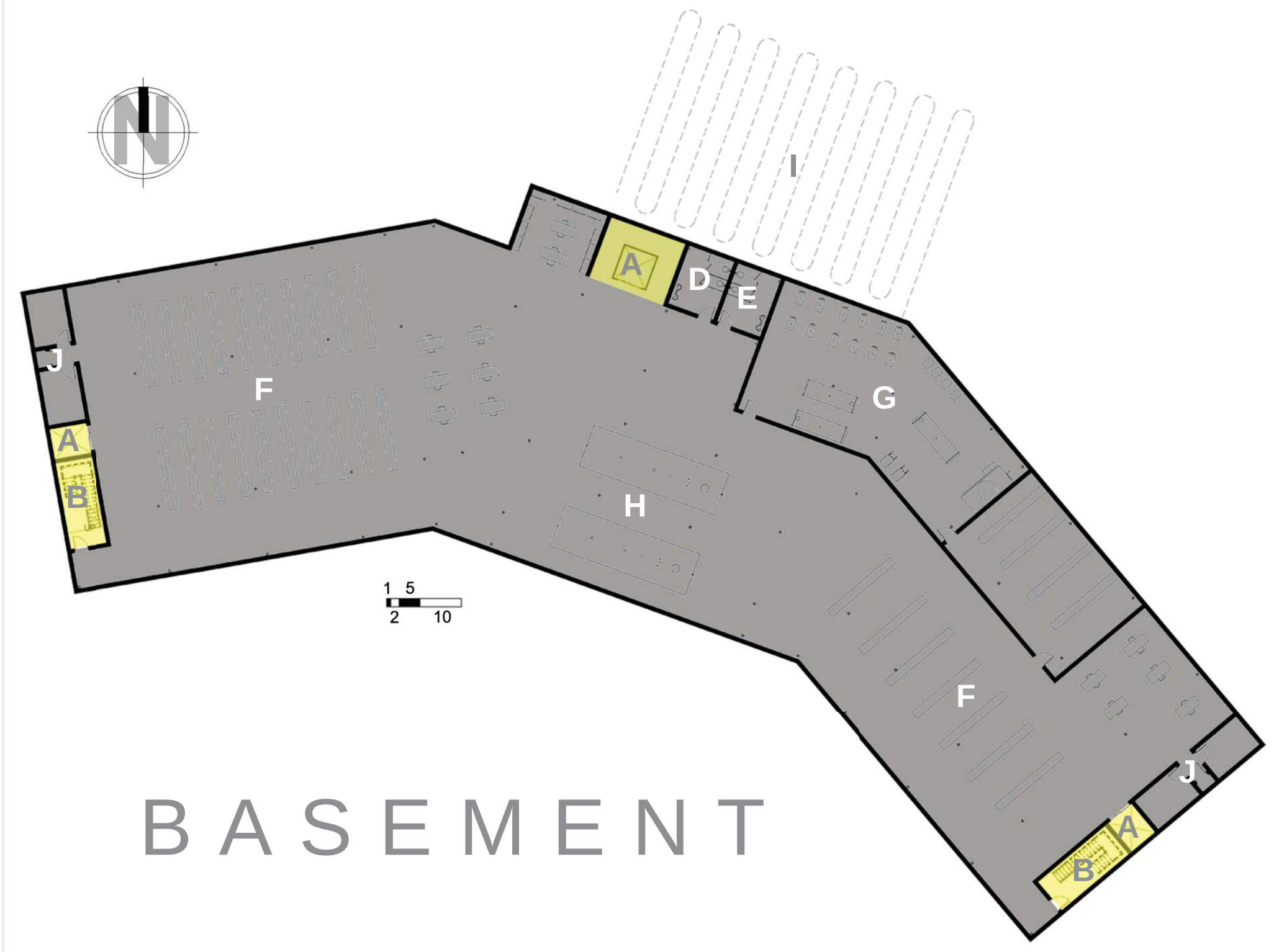
A- ELEVATOR
B- STAIRS
C- VESTIBULE
D- MEN'S RESTROOM
E- WOMEN'S RESTROOM
F- LONG-TERM STORAGE
G- MECHANICAL
H- WATER STORAGE
I- GEOTHERMAL WELL FIELD
J- HAZARDOUS MATERIALS
K- PUBLIC CORRIDOR
L- PUBLIC ATRIUM / EXHIBITION
M- CLASSROOM
N- TEACHING LAB
O- CAFETERIA
P- CONFERENCE ROOM
Q- DIRECTOR'S OFFICE
R- ADMIN. OFFICE
S- GRADUATE STUDENTS
T- RESEARCHER OFFICE
U- GARAGE
V- PLANT LAB
W- GREENHOUSE
X- FISH LAB
Y- AQUARIUM
Z- SHORT-TERM STORAGE
AA- OVERNIGHT RESEARCH



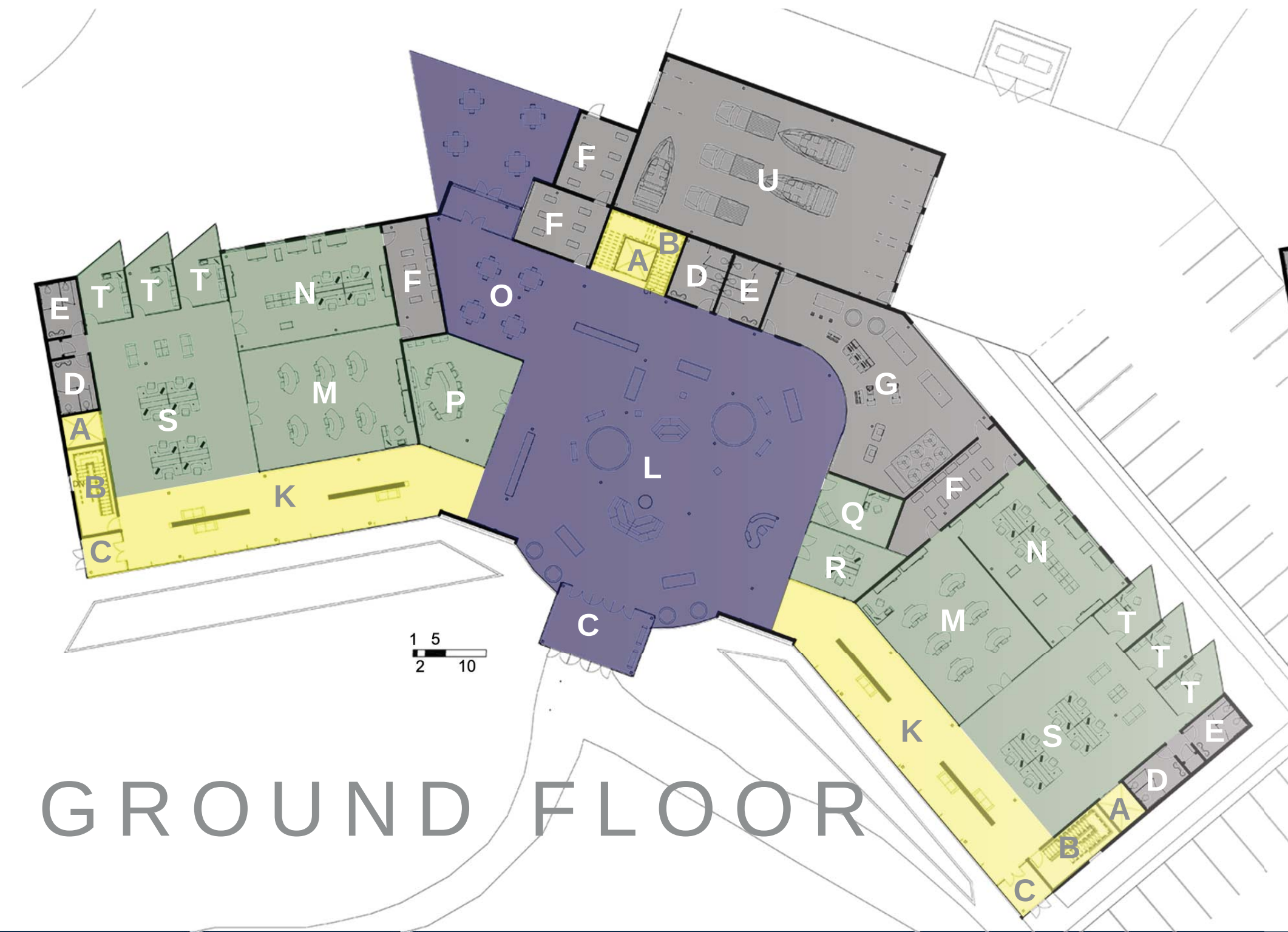
SITE PERSPECTIVE



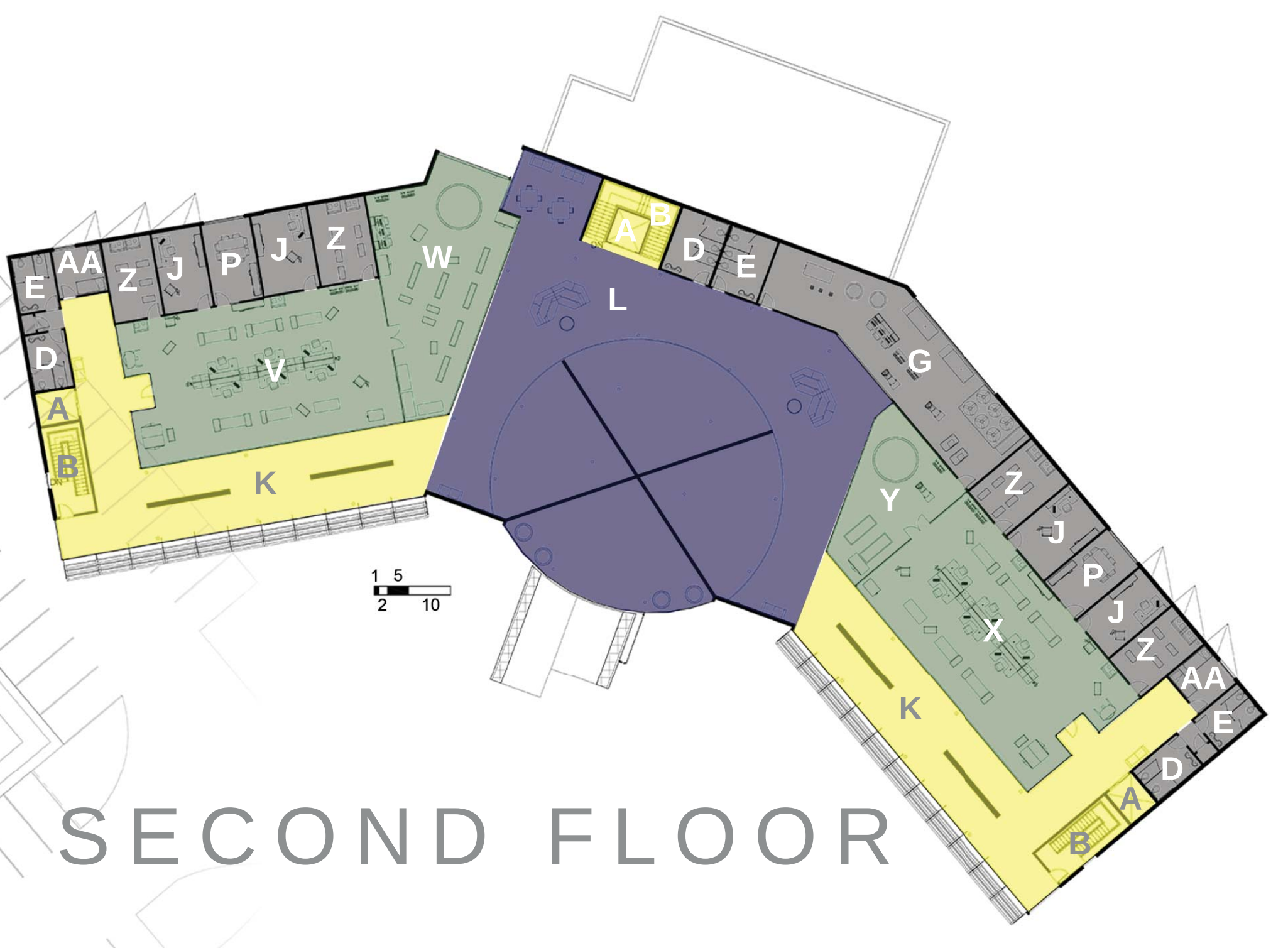
SITE PHOTOS



BASEMENT



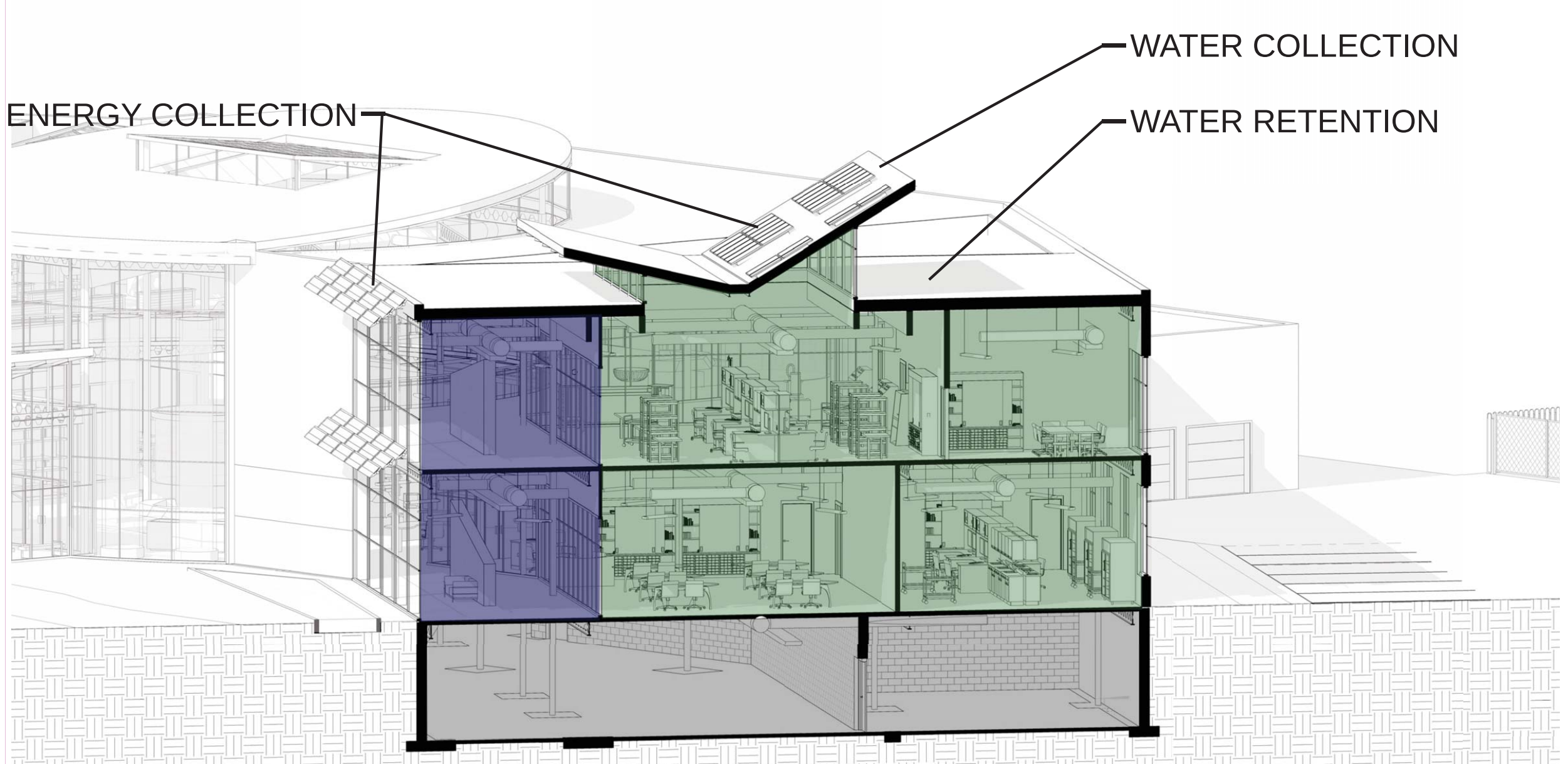
GROUND FLOOR



SECOND FLOOR

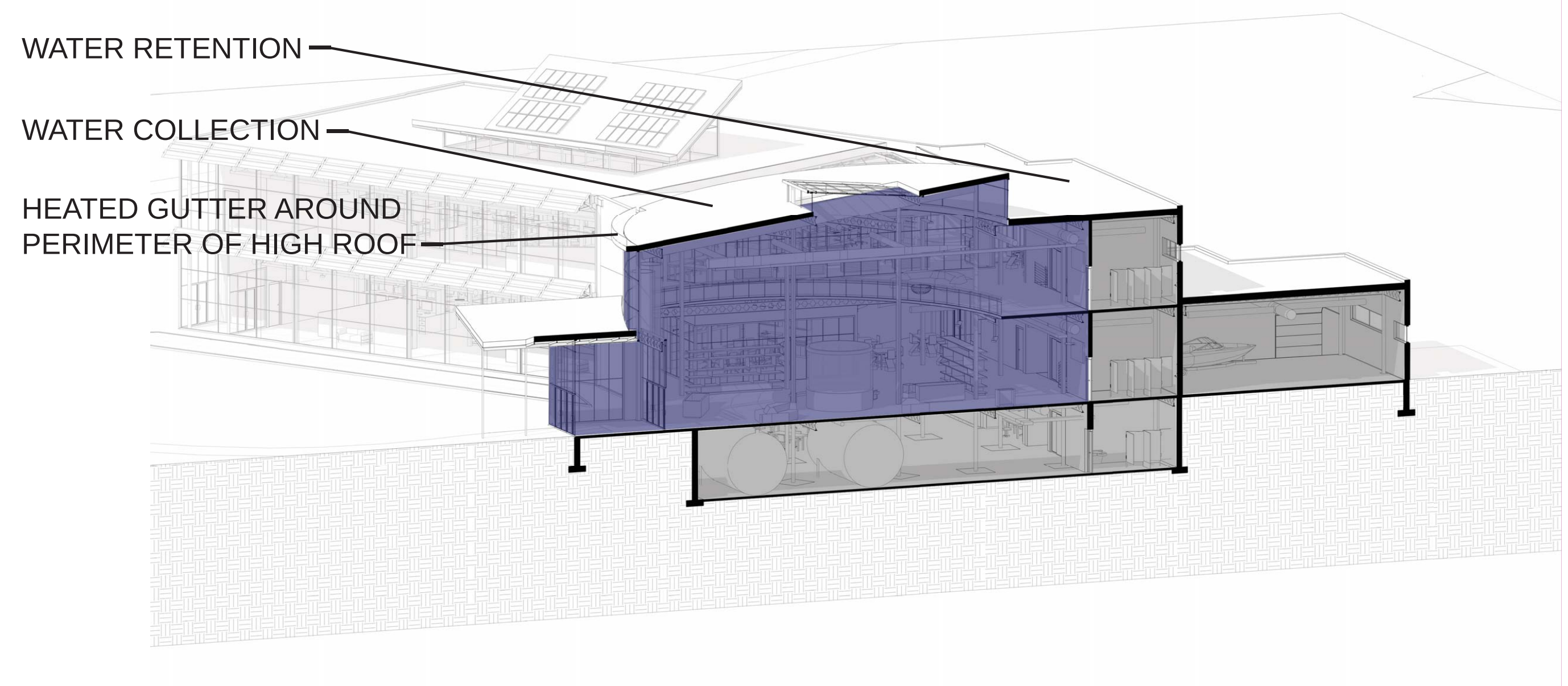
> " WE NEVER KNOW THE WORTH OF WATER UNTIL THE WELL IS DRY"
> -THOMAS FULLER HISTORIAN

MUCH LIKE AN ECOSYSTEM IN NATURE, A BUILDING MUST BE A SUM OF ITS PARTS. AWAKING WATERS DRAWS INSPIRATIONS FROM THE PASSIVE QUALITIES OF A WETLAND, THE ACTIVE QUALITIES OF A RIVER, AND THE SYSTEMS REQUIRED IN A FUNCTIONAL BUILDING DESIGN. BY DOING SO, THE CENTER PROVIDES STATE-OF-THE-ART RESEARCH FACILITIES AND INVITES THE PUBLIC IN TO LEARN ABOUT NATURE WHILE LIMITING THE BUILDING'S IMPACT ON THE LANDSCAPE.



SECTION PERSPECTIVE
(THROUGH CORRIDOR AND LABS)

🟪 PUBLIC
🟩 PRIVATE
⬜ SUPPORT



SECTION PERSPECTIVE
(THROUGH ATRIUM AND GARAGE)

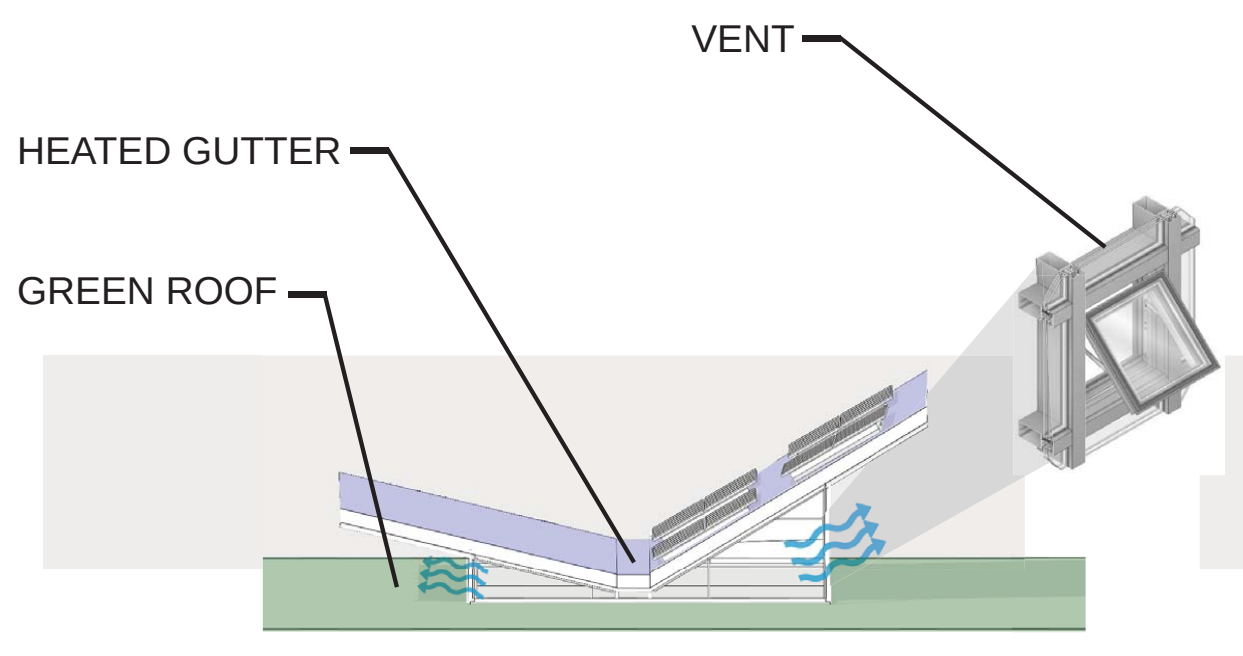
ENERGY STUDY

WATER TROMBE WALL

WATER IN LARGE TANKS ACTS AS THERMAL MASS, REGULATING INTERIOR TEMPERATURES

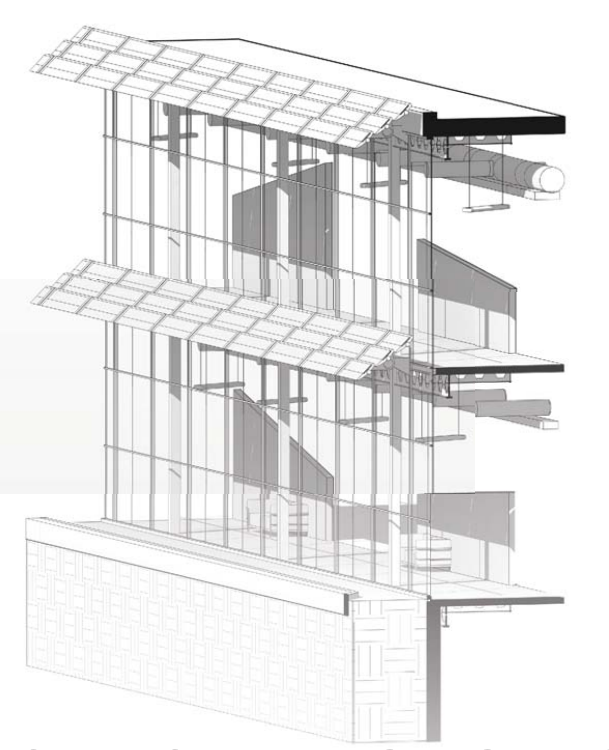
TROMBE WALL

A STONE VENEER AND SAND CREATES A THERMAL MASS THAT ABSORBS AND RELEASES ENERGY.



WATER COLLECTION & VENTING

WATER IS GUIDED INTO A HEATED GUTTER SYSTEM OR RETAINED IN THE GREEN ROOF. OPERABLE VENTS ALLOW THE CLERESTORIES TO OPEN AND VENTILATE THE LABS BELOW NATURALLY.

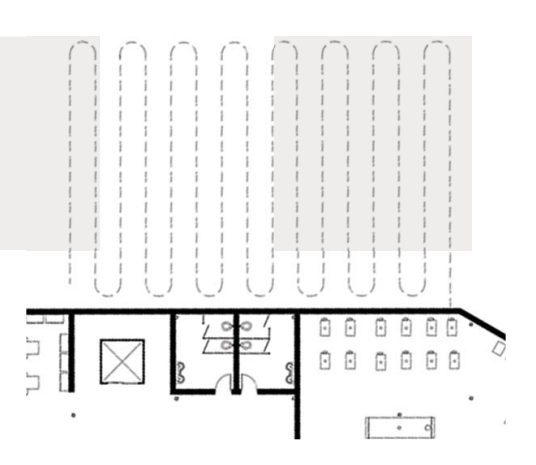


PHOTOVOLTAIC PANELS & SUN SHADES

A PV PANEL SYSTEM CAPTURES SUNLIGHT TO POWER THE PHOTOCHROMIC GLASS AND OTHER NEEDS OF THE BUILDING WHILE SHADING THE INTERIOR WHEN THE SUN IS AT ITS HIGHEST.

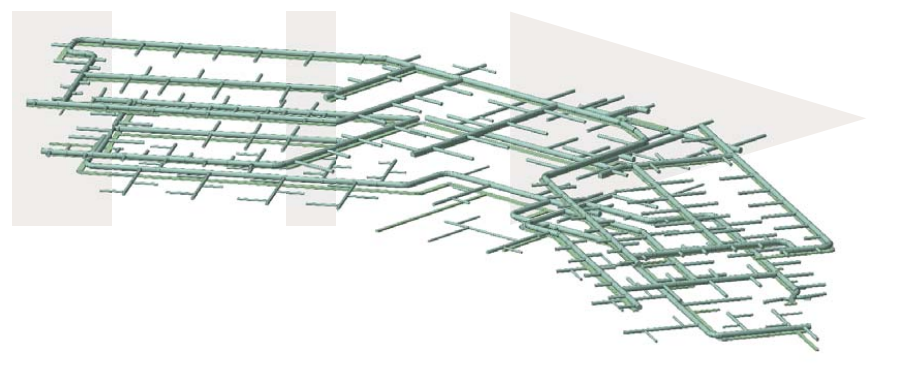
CISTERN

TWO 20,000 GALLON CAPACITY TANKS RETAIN GRAY WATER TO BE FILTERED AND REUSED THROUGHOUT THE BUILDING.



GEOTHERMAL WELLS

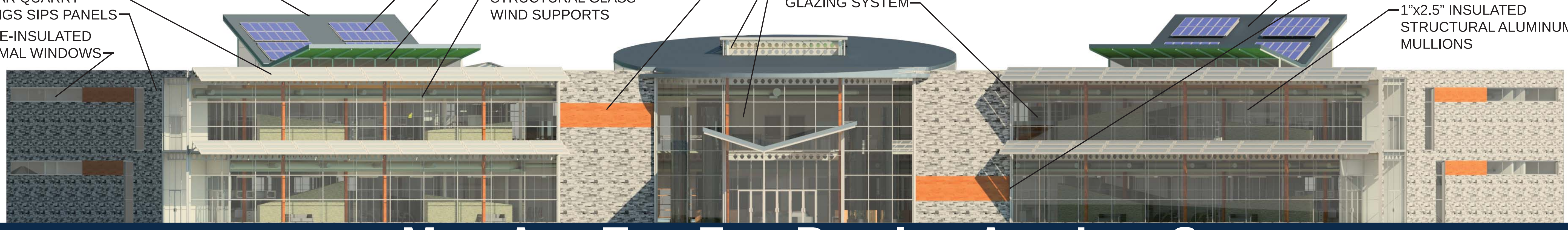
HEAT PUMPS CIRCULATE WATER AT A CONSTANT TEMPERATURE TO THERMALLY REGULATE THE BUILDING.



HVAC DUCT SYSTEM

FRESH AIR IS MECHANICALLY CIRCULATED THROUGHOUT THE BUILDING. FLOORS ARE ISOLATED TO PROTECT SEPARATE FUNCTIONS.

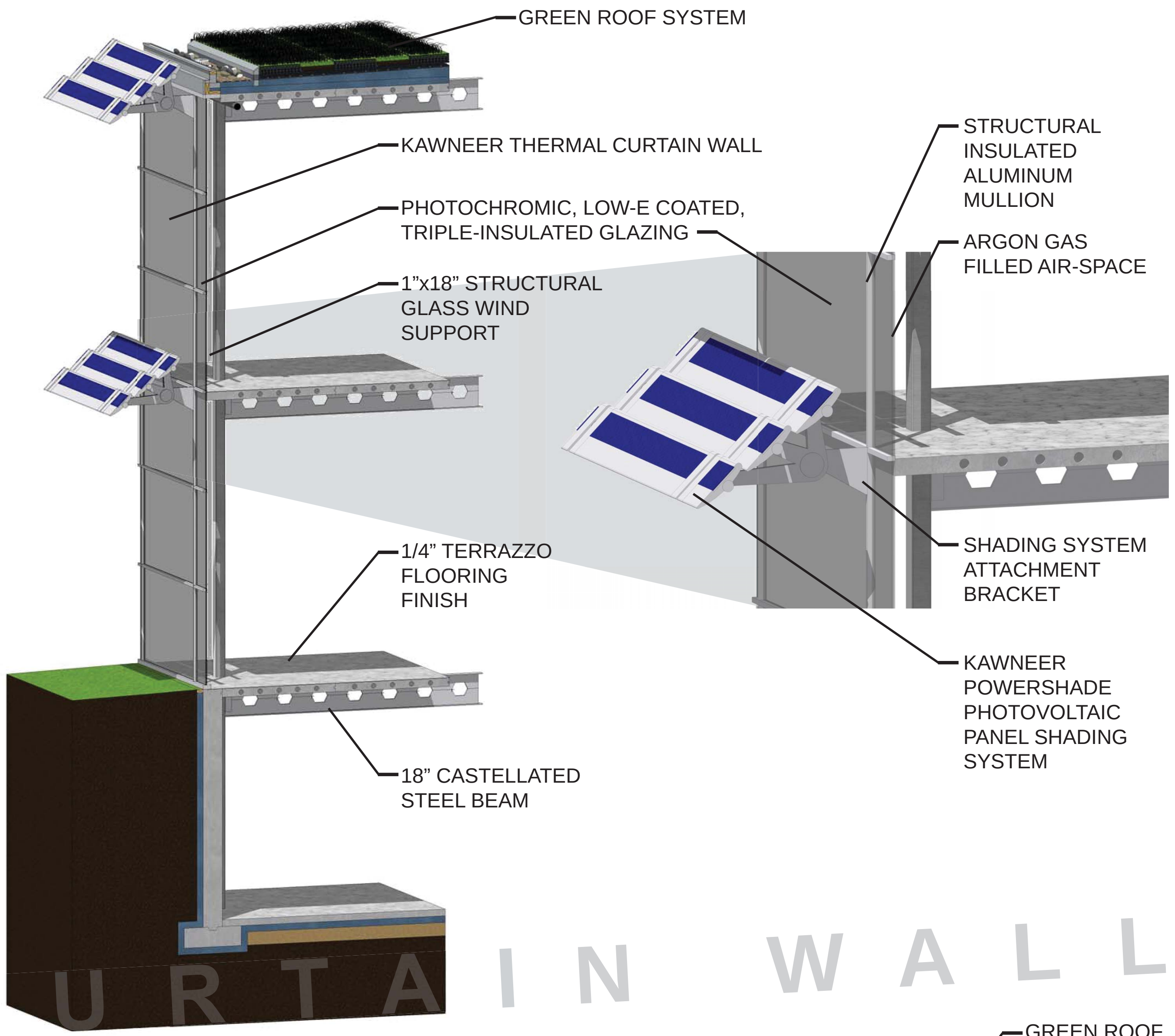
PASSIVE STRATEGIES ▶ ACTIVE STRATEGIES



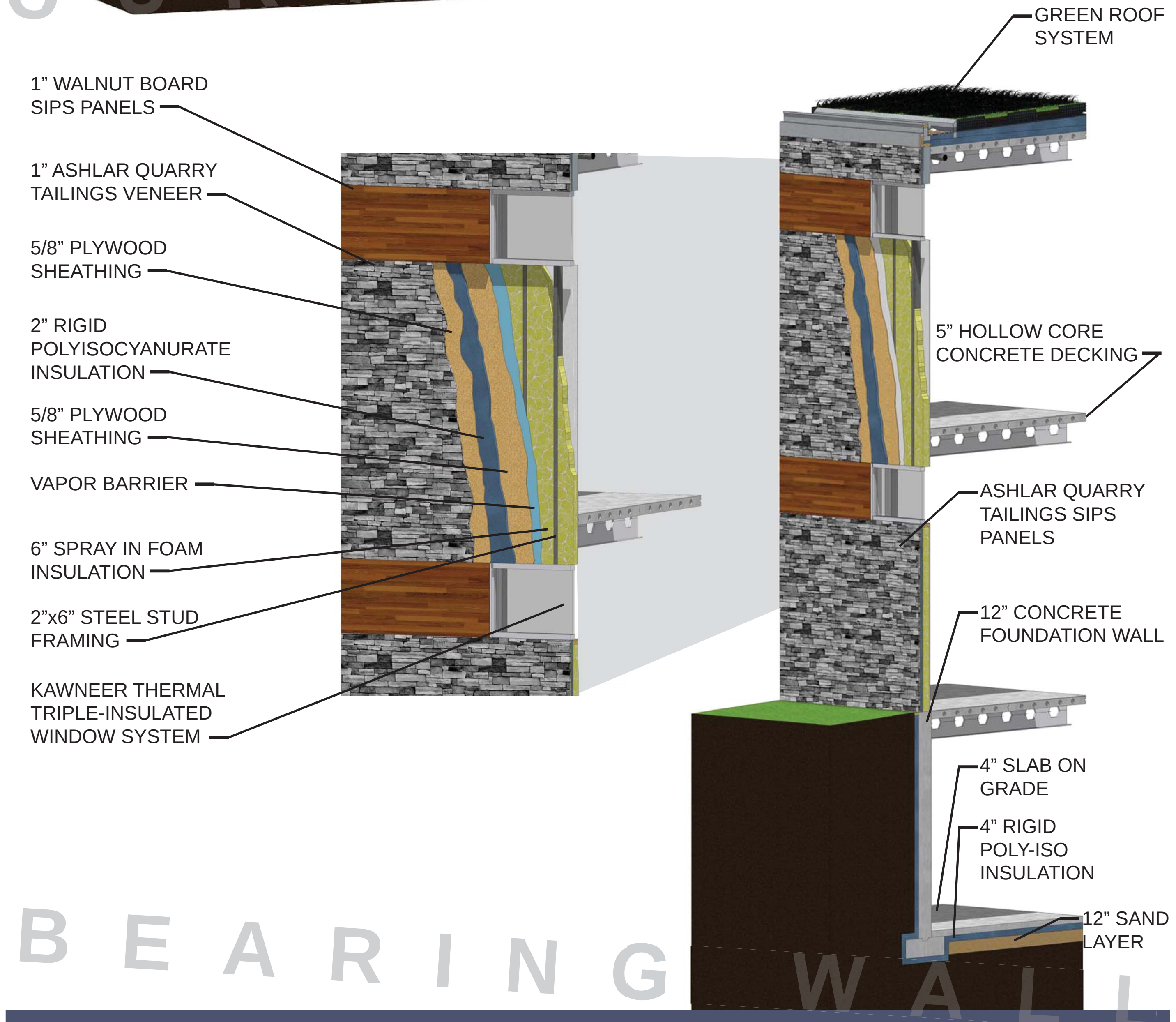
MATERIALS

AWAKING WATERS CHARLOTTE HAUGH ARCH 772 PROFESSOR STEVE MARTENS 4-21-16

SYSTEMS

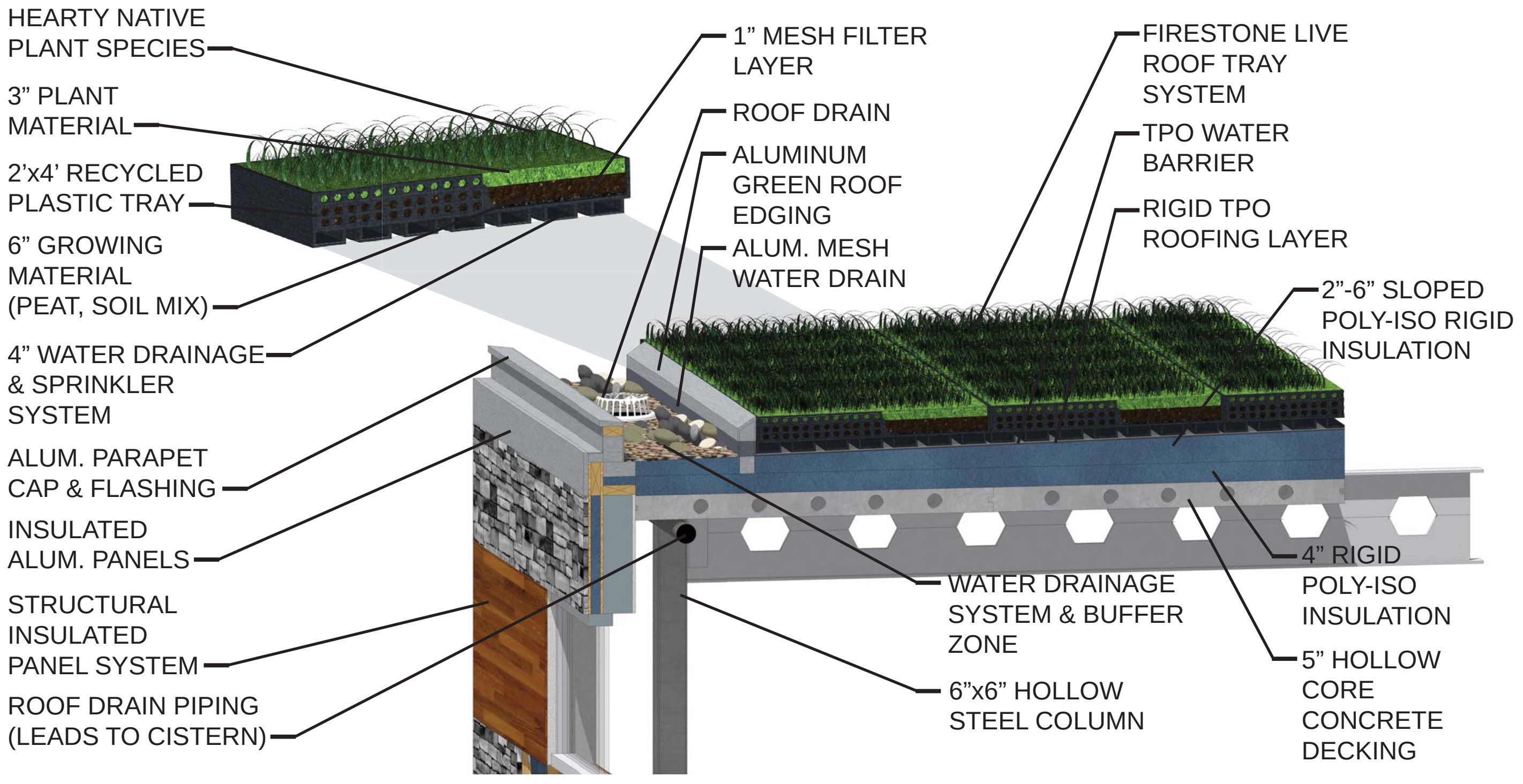


CURTAIN WALL



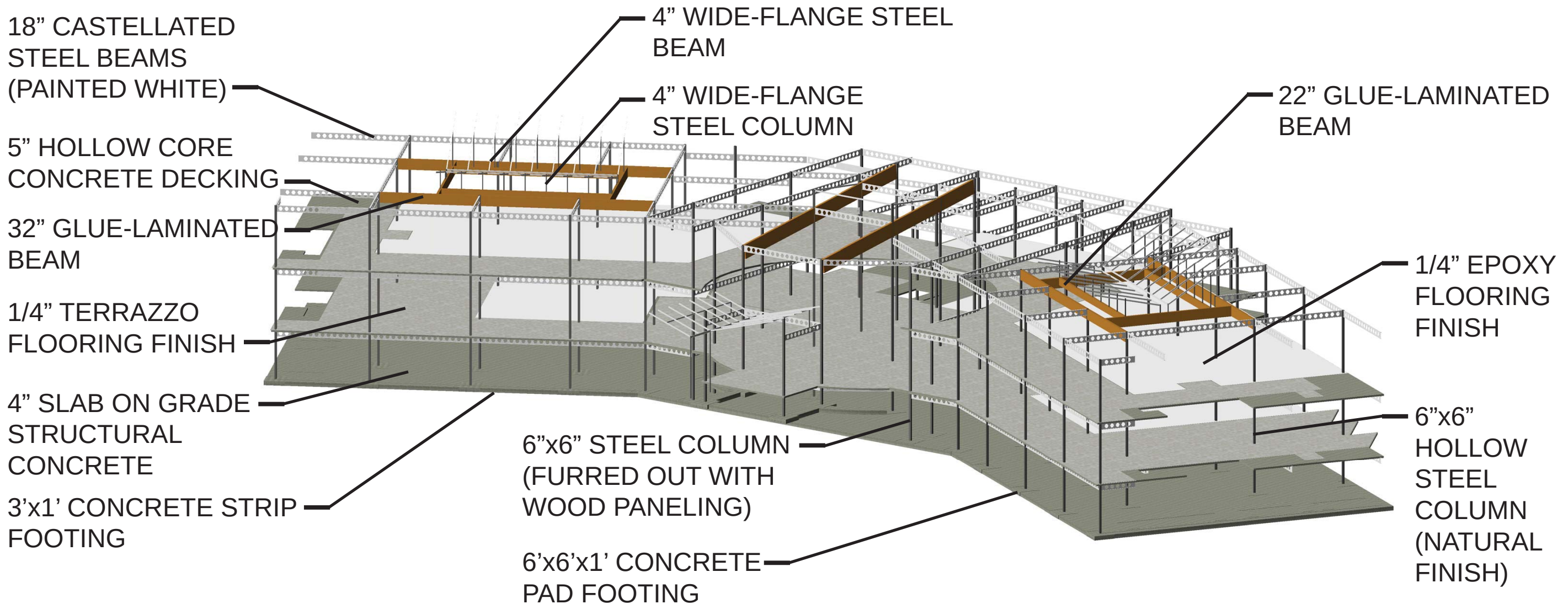
BEARING WALL

ENERGY



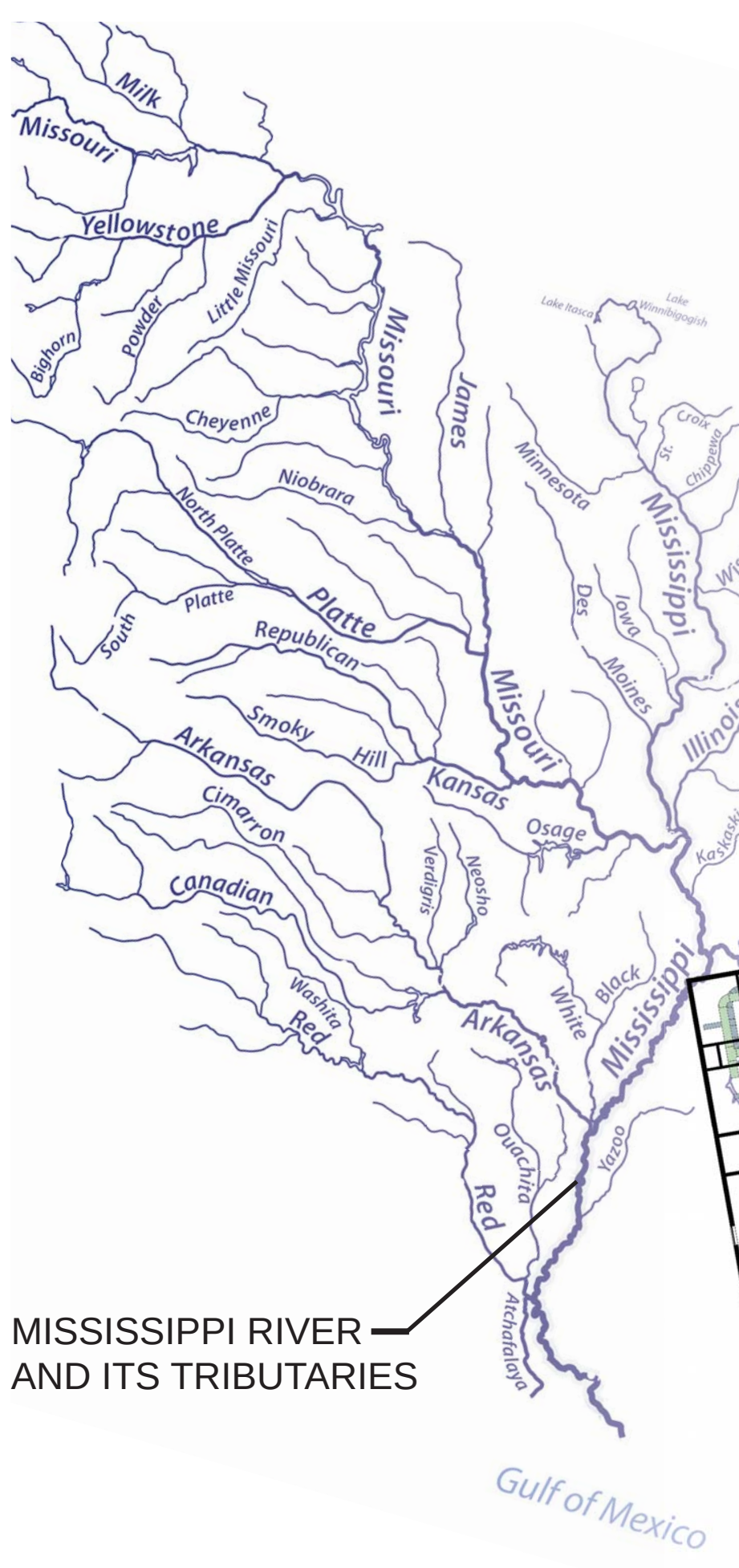
GREEN ROOF ASSEMBLY

RETENTION

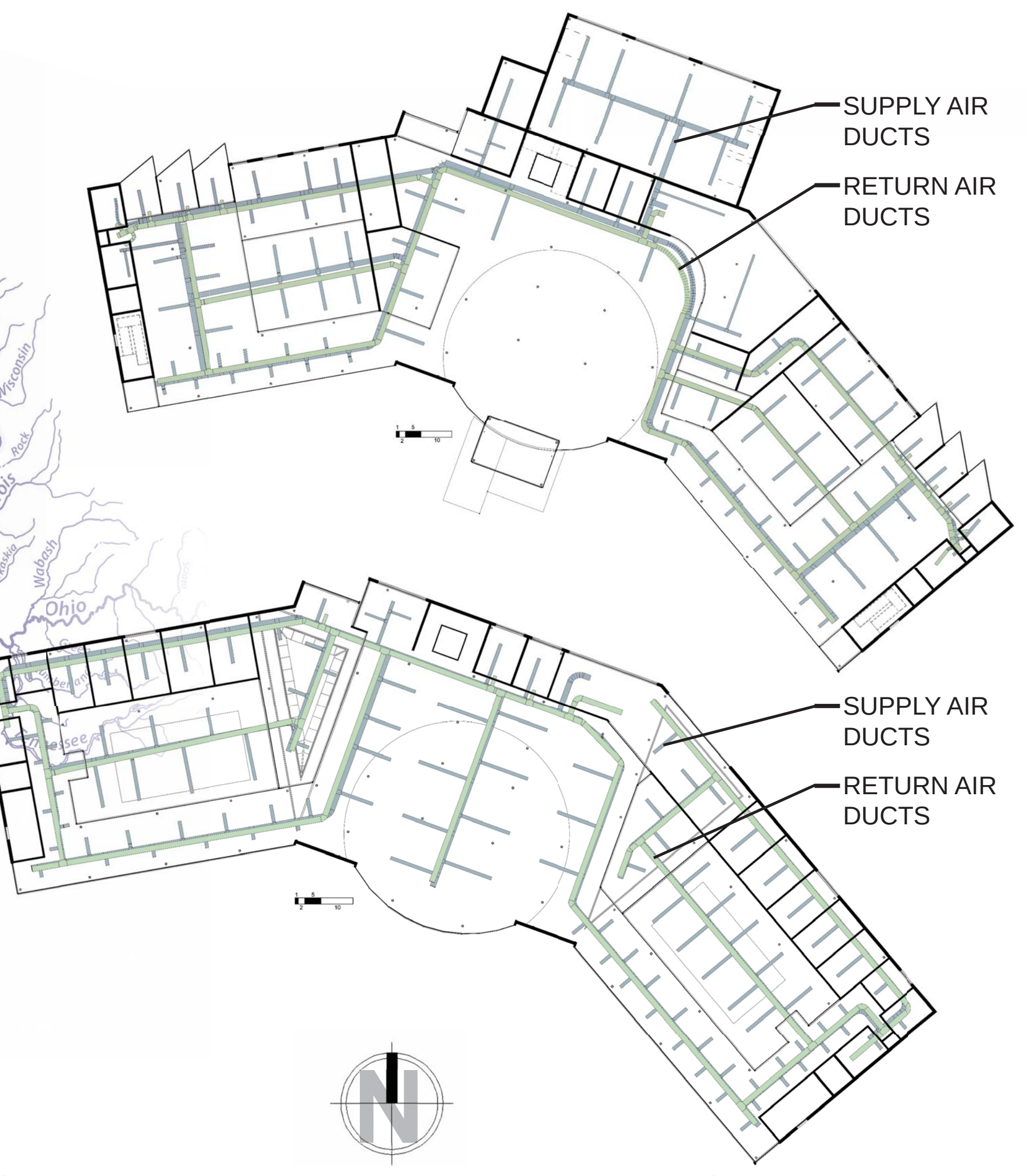


STRUCTURAL ASSEMBLY

BALANCE



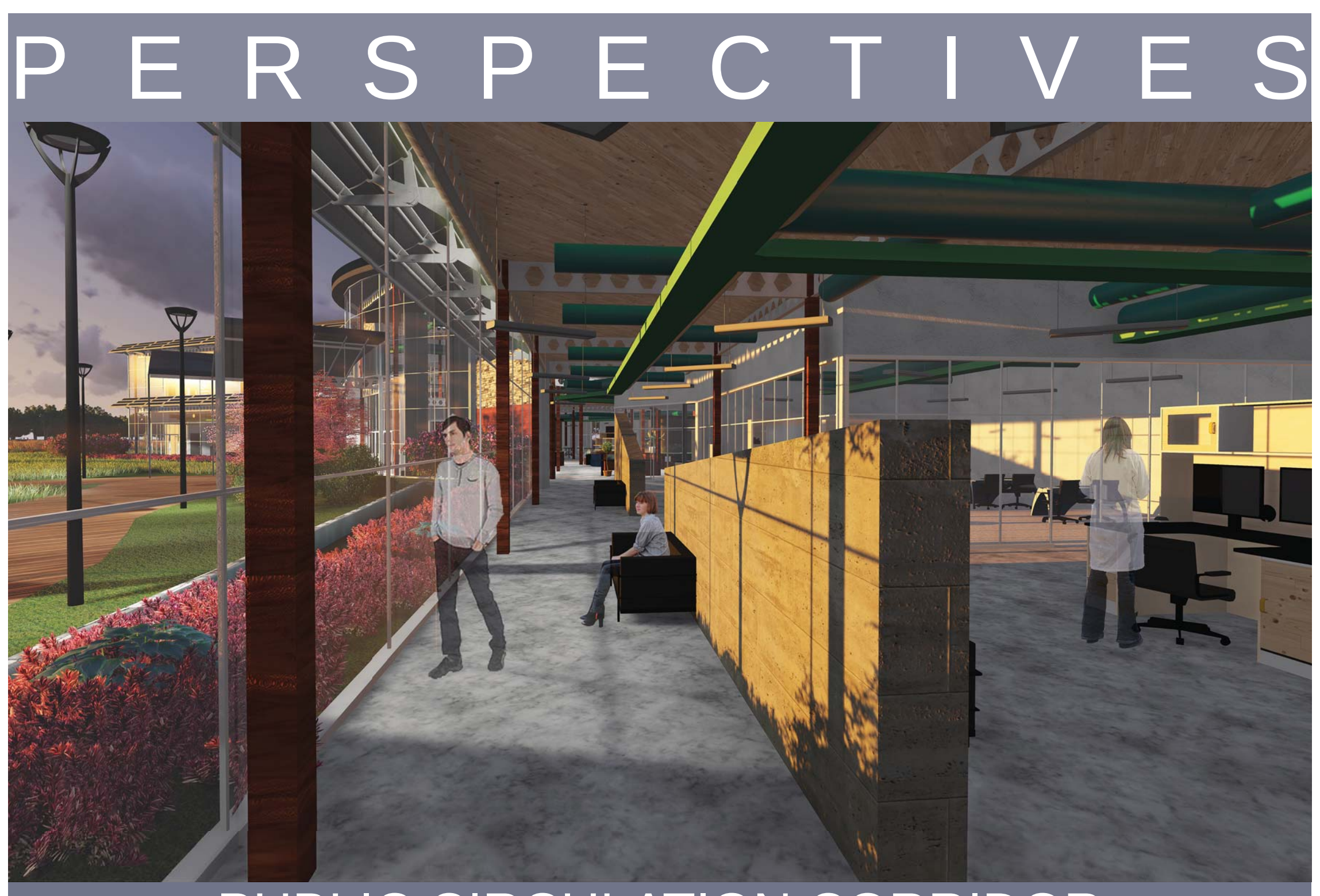
MISSISSIPPI RIVER AND ITS TRIBUTARIES



HVAC LAYOUT

TRIBUTARIES

PERSPECTIVES



PUBLIC CIRCULATION CORRIDOR

PUBLIC AND PRIVATE USERS CROSS PATHS IN SPACIOUS, SOUTH-FACING CORRIDORS

EXHIBITION

LARGE DISPLAYS AND AQUARIUMS EDUCATE THE PUBLIC ABOUT MINNESOTA WATER ECOSYSTEMS AND THEIR INHABITANTS

LABORATORY

SPACIOUS AND FLEXIBLE, LABORATORIES PROVIDE A PLACE FOR RESEARCH AND ARE TRANSPARENT TO THE PUBLIC

ENTRY PATH

WOODEN PATHWAYS LEAD FROM THE PARKING LOT TO THE BUILDING AND OUT TO THE PRAIRIE PLOTS AND CONSTRUCTED WETLANDS

ATRIUM

WITH CLERESTORIES AROUND THE PERIMETER, A LARGE SKYLIGHT IN THE CENTER, AND A SOUTH-FACING CURTAIN WALL, THE DOUBLE-HEIGHT ATRIUM IS AN INVITING GATHERING PLACE

GREENHOUSE

A TEMPERATURE AND SUNLIGHT CONTROLLED GREENHOUSE PROVIDES YEAR-ROUND RESEARCH AND EDUCATES THE PUBLIC ABOUT INVASIVE PLANTS

ADAPT

DISCOVER

E N G A G E

LIFE IN A WATER WISE WETLAND

LED CRANE
LES
USH
4 MIDGE LARVA/ BLOODWORM
5 DAMSELFLY NYMPH
6 AFRICAN JACANA
7 BUTTERFLY
8 MOSQUITO LARVAE
9 SCAVENGER BEETLE
10 STRAIGHTFIN BARB
11 WATER STRIDER
12 GREEN WATER SNAKE
13 WHIRLIGIG BEETLE
14 AFRICAN SPOONBILL
15 DRAGONFLY
16 EGYPTIAN GOOSE
17 MIDGE
18 BACKSWIMMER
19 FRESHWATER CRAB
20 DABCHICK
21 GREY HERON
22 MOSQUITO
23 COMMON RIVER FROG
24 MOORHEN
25 WATER MONGOOSE
26 BLUE CRANE
27 MAYFLY
28 MAYFLY NYMPH
29 DAMSELFLY
30 RED BISHOP

The Mississippi River

ENCSS

What are the challenges we currently face?

Sources of pollution

Specific and workable solutions

3. Fighting Global Warming

Ocean Acidification — As atmospheric CO_2 levels have risen, ocean CO_2 levels have risen even more, thus increasing the acidity level of the ocean. At a minimum, this trend will negatively affect organisms with shells, which may dissolve or become malformed if the pH drops low enough.

Comparison : Mississippi & Yangtze

Though the Mississippi River and Yangtze River are quite far away from each other, they share many similarities. Both of them are faced with similar threats. That is why American scientists partner with their Chinese counterparts to share knowledge about river health and management.

Collaboration

"They each serve an important role in the historical development. Through this event. We also wish to build a platform for communication and cooperation between the administrators of two rivers, and economic cooperation between the two regions."

--MARAD Administrator David T. Matsuda to deliver keynote address at the Inaugural Yangtze Mississippi Strategic Cooperation Forum