

## SITE DETAILS:

ARCHITECT: STEVEN HOLL

STRUCTURAL ENGINEER:  
NORDENSON & ASSOCIATES

DESIGNED IN: 2003-2005

BUILT IN: 2005-2009

BUILT-UP AREA: 220,000M<sup>2</sup>

LOCATION:  
DONGZHIMEN SUBDISTRICT,  
DONGCHENG DISTRICT,  
BEIJING, CHINA.

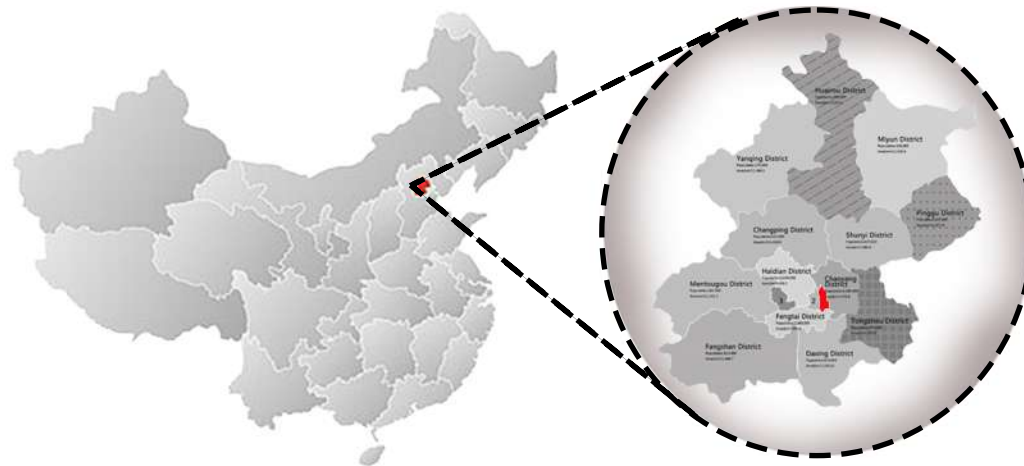
PRIMARY USE: TOWERS 1-8:  
RESIDENTIAL, TOWER9: HOTEL

OTHER USE: RETAIL, OFFICE,  
PUBLIC SPACE

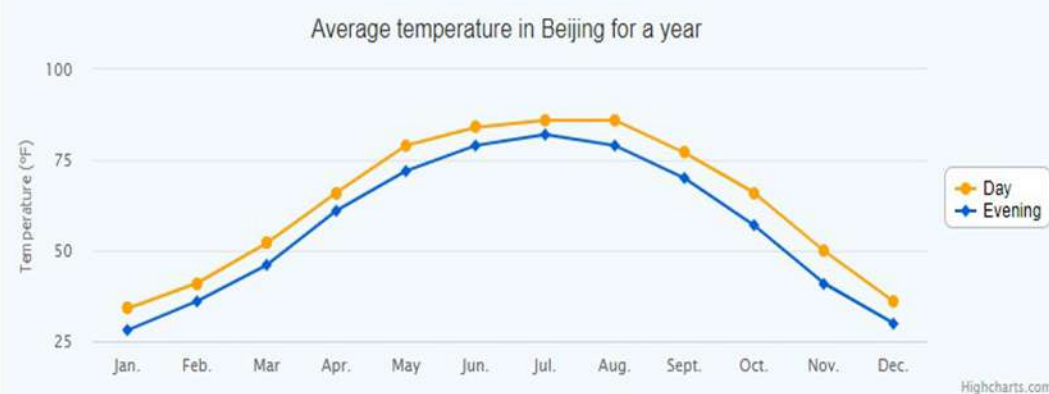
OWNER/DEVELOPER: MODERN  
GREEN DEVELOPMENT CO.LTD.



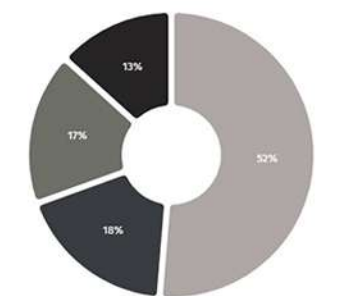
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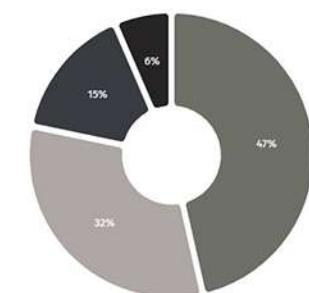
## SITE ANALYSIS:



Average day and night temperatures graph in Beijing for the history of our observations.



Artificial Land Water Bare Soil Cropland



Overcast Sunny Cloudy Precipitation

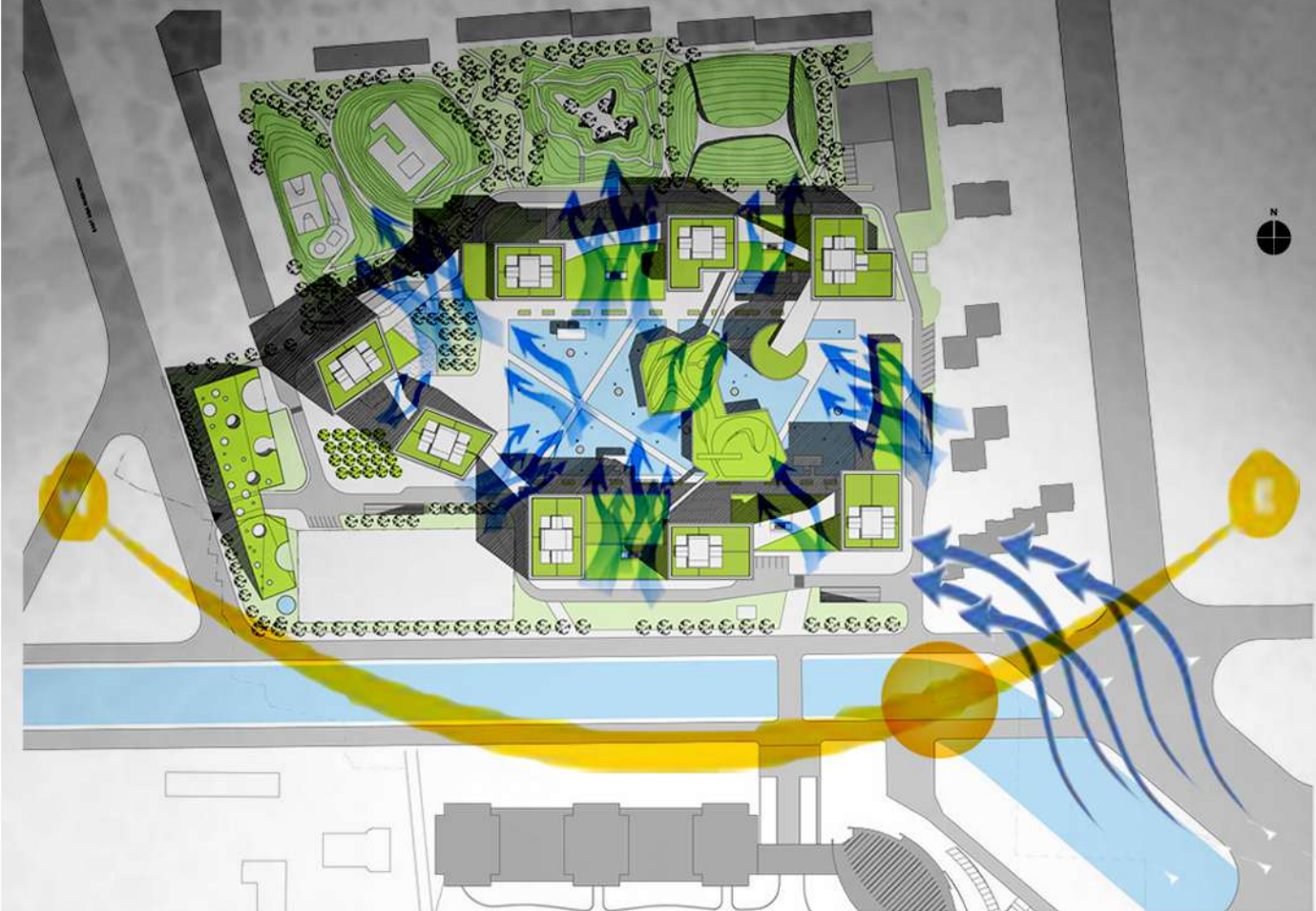
IN DONGCHENG, THE SUMMERS ARE QUITE HOT, OPPRESSIVE, WET AND MOSTLY CLOUDY WHEREAS THE WINTERS ARE VERY COLD, DRY AND MOSTLY CLEAR. OVER THE COURSE OF THE YEAR, THE TEMPERATURE TYPICALLY VARIES FROM 32°F TO 92°F AND IS RARELY BELOW 25°F OR ABOVE 95°F.

THE MONTH WITH THE MOST RAIN IS JULY WITH AN AVERAGE RAINFALL OF ABOUT 62 INCHES. THE SNOWY PERIOD OF THE YEAR LAST FOR ABOUT 2 WEEKS IN JANUARY, MOST OF THE TIMES. THE DIRECTION OF PROMINENT WINDS IS CONSIDERED FROM SOUTH-EAST DIRECTION.

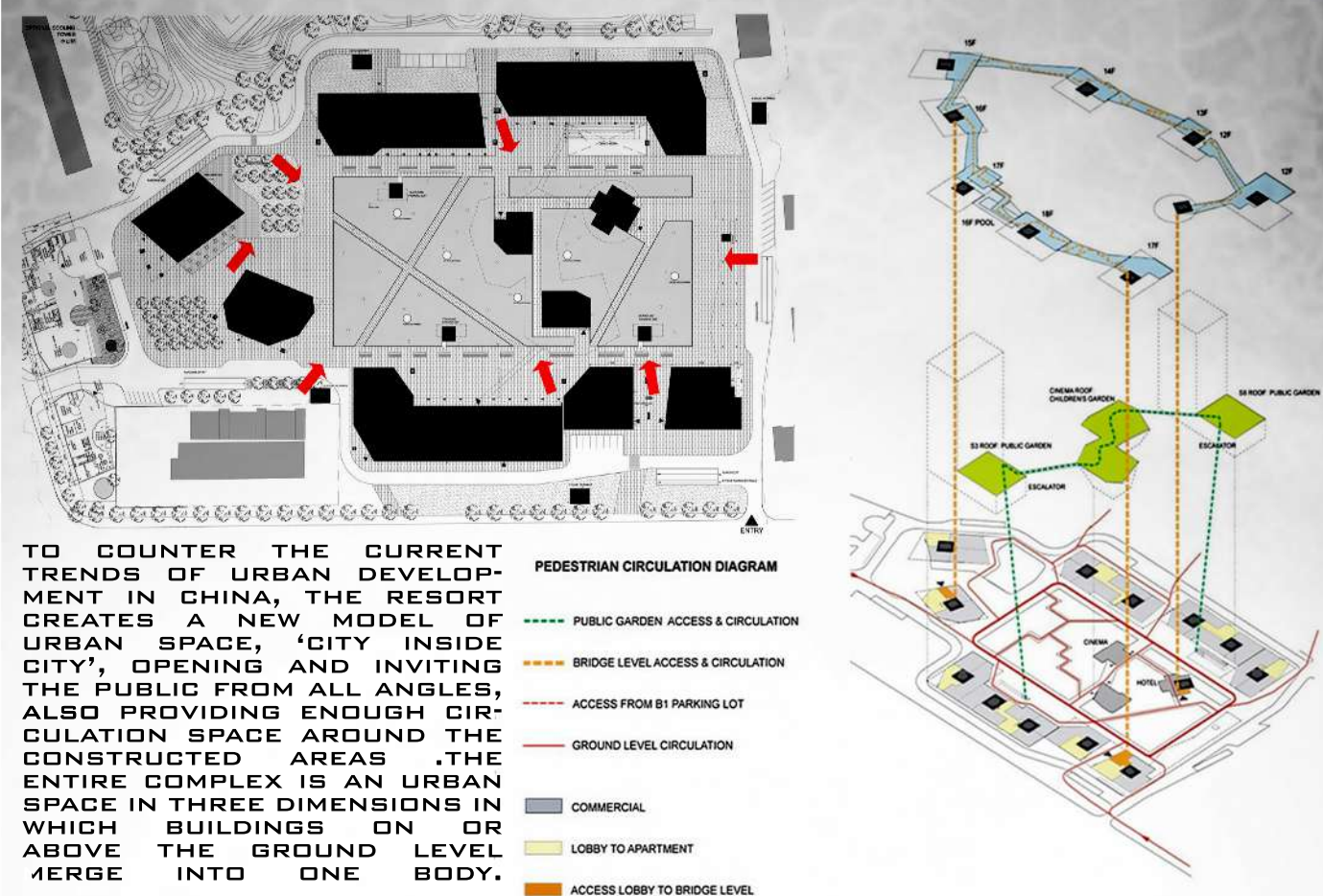
THE MUGGIER PERIOD OF THE YEAR LASTS FROM MAY TO SEPTEMBER, WHEN THE COMFORT LEVEL IS MUGGY, OPPRESSIVE, OR MISERABLE AT LEAST FOR 25% OF THE TIME, MOSTLY IN JULY.

THE GEOGRAPHICAL COORDINATES OF DONGCHENG ARE 30.351° LATITUDE, 112.188° LONGITUDE, AND 128FT ELEVATION. THE TOPOGRAPHY WITHIN 2 MILES OF DONGCHENG IS ESSENTIALLY FLAT, WITH A MAXIMUM ELEVATION CHANGE OF 95 FEET AND AN AVERAGE ELEVATION ABOVE SEA LEVEL OF 114 FEET.

## SITE PLAN:



## SITE ACCESSABILITY



# CASE STUDY

## LINKED HYBRID, APARTMENTS, BEIJING, CHINA



## STYLE OF ARCHITECTURE:

CREATING A NEW STYLE OF CONSTRUCTION THAT CAN ATTRACT AS WELL AS INVITE PEOPLE FROM ALL AROUND THE PLACE TOWARDS ITS URBAN AND PUBLIC SPACE AND CONCEPT IS ACHIEVED BY FOLLOWING WAYS:  
THE POLYCHROME OF CHINESE BUDDHIST ARCHITECTURE INSPIRES A CHROMATIC DIMENSION BY WHICH THE UNDERSIDES OF THE BRIDGES AND CANTILEVERED PORTIONS ARE COLORED MEMBRANES THAT GLOW WITH PROJECTED NIGHTLIGHT. THE WINDOW JAMBS HAVE BEEN COLORED BY CHANCE OPERATIONS BASED ON THE 'BOOK OF CHANGES' WITH COLORS FOUND IN ANCIENT TEMPLES. THE CINEMATHEQUE ARCHITECTURE FLOATS ON ITS REFLECTION IN THE SHALLOW POND, AND PROJECTIONS ON ITS FACADES INDICATE FILMS PLAYING WITHIN.



## SITE DEVELOPMENT:

WORKERS' COMMUNITY  
WALL BETWEEN TWO COMMUNITIES  
NEWLY CONSTRUCTED WALL IN TANG STYLE



Beijing First Paper Mill (Before 2000)

MOMA communities (After 2000)



01/2005  
POP MOMA  
completed



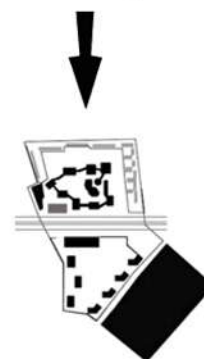
2000-2003  
Wangguocheng  
MOMA completed



1940s-1990s  
Beijing First Paper  
Mill



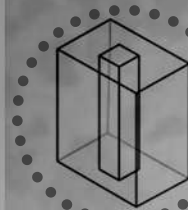
02/2007  
Airport expressway  
completed



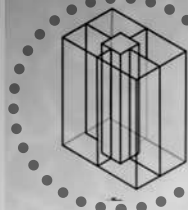
08/2008  
Dangdai MOMA  
(Linked Hybrid)  
completed,  
demolition of housing  
at the south

BETWEEN THE LATE 50'S AND 60 MAO ZEDONG AREA EARMARKED FOR INDUSTRIAL USE, SO TO BUILD THIS MODERN GREEN BUILDING DID NOT HAVE TO BRING DOWN ANY HOUSE, BUT HAD AN IDEA BEHIND IT BY STEVEN HOLL, WHICH WAS TO NOT MOVE THE PEOPLE ALREADY LIVING THERE AWAY FROM THEIR HOMES, BUT TO CREATE A SPACE TO LIVE FOR THEM EVEN YEARS AND YEARS AFTER ITS CONSTRUCTION. SHIFTING THE INDUSTRIES AND OTHER BUILDINGS SLOWLY OVER YEARS, CREATED A SPACE FOR THE MAIN BUILDING TO BE CONSTRUCTED FROM WHERE MOST OF THE COMMERCIAL, EDUCATIONAL, ENVIRONMENTAL, ECONOMICAL AND OTHER HUMAN NEEDS COULD BE FULFILLED WITHIN A CERTAIN DISTANCE.

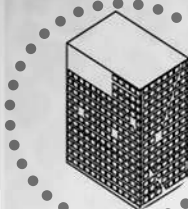
## STRUCTURAL SYSTEM:



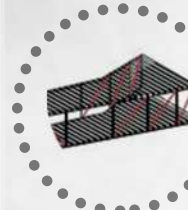
THE DESIGN CORE IS OF CONCRETE SHEAR WALLS. PROVIDES EASY ACCESS FROM LOBBY TO APARTMENT



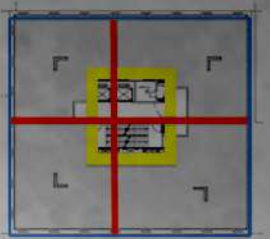
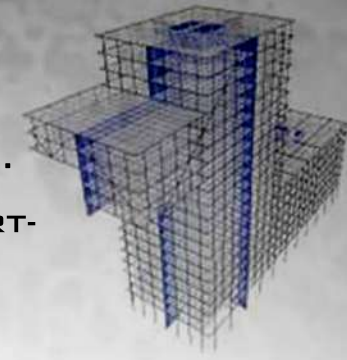
CROSSED CONCRETE SHEAR WALLS ADDING STIFFNESS AND STABILIZING DURING EARTHQUAKE.



PERIMETER MOMENT CONCRETE FRAME IS A GRID OF UNIFORM DIMENSIONS AND HAS DIAGONAL BRACING RESISTS THE LATERAL LOAD.



SKY BRIDGES HAVE PAIR OF PARALLEL STEEL TRUSSES TO RESIST FLEXURE.



TWO SYSTEMS TO RESIST LATERAL LOADS.

8 towers

core of concrete shear walls

perimeter concrete moment frame

crossed concrete shear wall

7 sky bridges

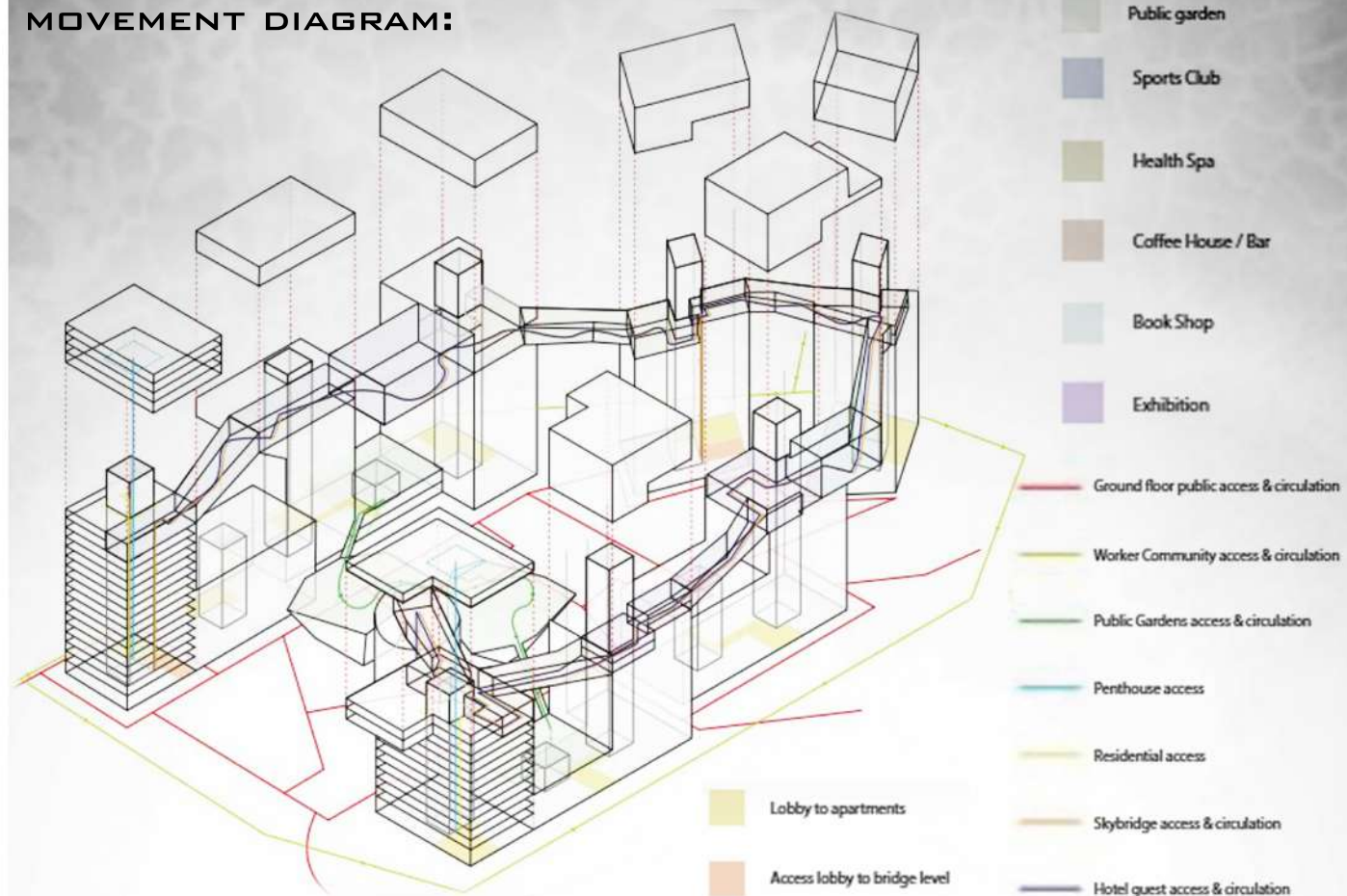
steel truss bridges

friction pendulum seismic isolators

5 cantilevers

steel and concrete composite framing

## MOVEMENT DIAGRAM:



# CASE STUDY

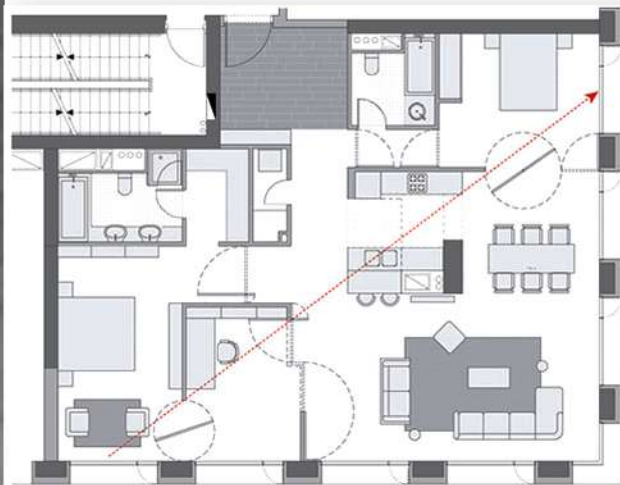
## LINKED HYBRID, APARTMENTS, BEIJING, CHINA



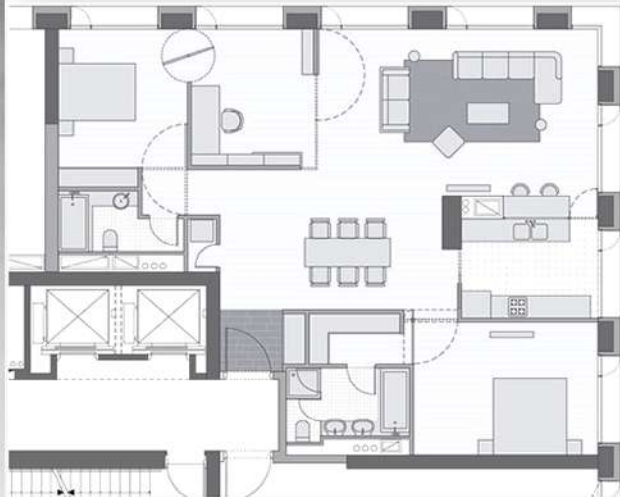
## CONCEPT:

THE INSPIRATION FOR DESIGN IS TAKEN FROM "DANCERS", ONE OF THE WORKS OF THE FAMOUS PAINTER MATISSE. STEVEN HOLL NAMED THIS PROJECT AS "MINI CITY" OR "CITY WITHIN A CITY". THE OBJECTIVE IS TO PROVIDE A PUBLIC SPACE THAT CAN SUPPORT ALL KIND OF ACTIVITIES AND PROGRAMS OF DAY TO DAY LIVES. IT IS ABOUT BEING SUSTAINABLE AND MAKING CONNECTIONS WITH THE URBAN CONTEXT.

## APARTMENTS FLOOR PLANS:



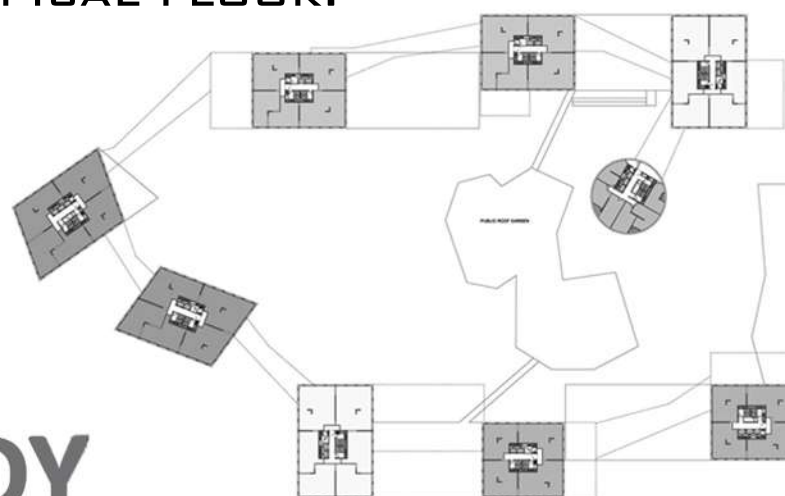
EACH FLOOR OCCUPY FOUR APARTMENTS. EVERY UNIT IS INSTALLED IN ITS OWN QUADRANT AND HAS VIEWS IN TWO DIRECTIONS. TYPICAL UNIT SIZE RANGES FROM 74 TO 150 SQUARE METERS AND ONE TO THREE BEDROOM. THE WINDOWS ALLOW CROSS VENTILATION BY OPENING ON TWO FRONTS. THE BUILDING ALSO PROVIDES MECHANICAL VENTILATION AND RADIANT COOLING.



- 1 Entry
- 2 Bedroom
- 3 Master bedroom
- 4 Kitchen
- 5 Dining
- 6 Living
- 7 Multi space: study room/guest room
- 8 Bathroom

10'

## TYPICAL FLOOR:



## FORM AND FUNCTION:

THE DESIGN FOR THE MINI CITY IS BASED OF THE PRINCIPLE OF FORM FOLLOW FUNCTION. IT CONSISTED OF NINE TOWERS CONNECTED BY SKY BRIDGES AT THE UPPER FLOORS. THE PROJECT PROMOTES INTERACTIVE RELATIONS BETWEEN THE PUBLIC SPACES THAT VARY FROM COMMERCIAL, RESIDENTIAL AND EDUCATIONAL TO RECREATIONAL.

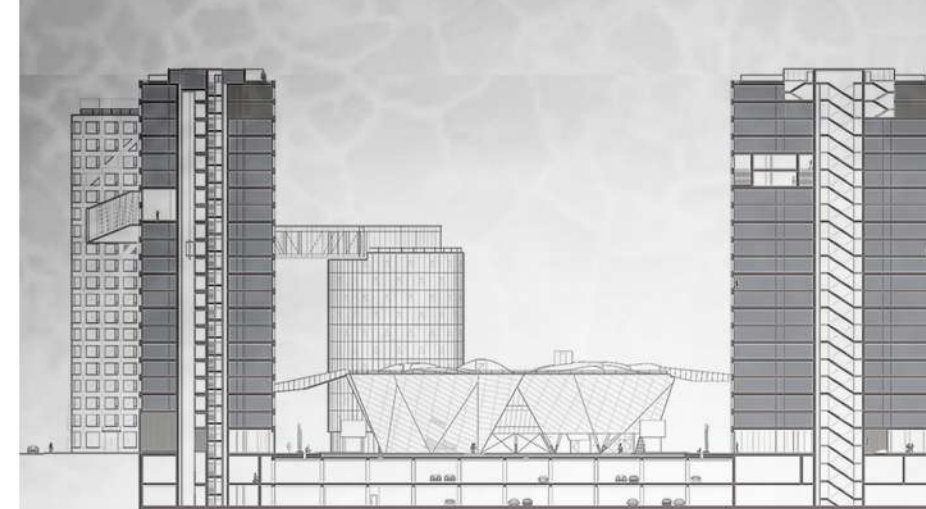
THE ENTIRE COMPLEX IS THREE DIMENSIONAL URBAN SPACE IN WHICH BUILDINGS ARE ON ALL THREE LEVELS, ARE FUSED TOGETHER.

THE PROJECT INCLUDES 750 APARTMENTS, PUBLIC GREEN SPACE, COMMERCIAL ZONES, CINEMATEQUE, KINDER GARTEN, MONTESSORI SCHOOL, AND UNDERGROUND PARKING.

## GROUND FLOOR LAYOUT:

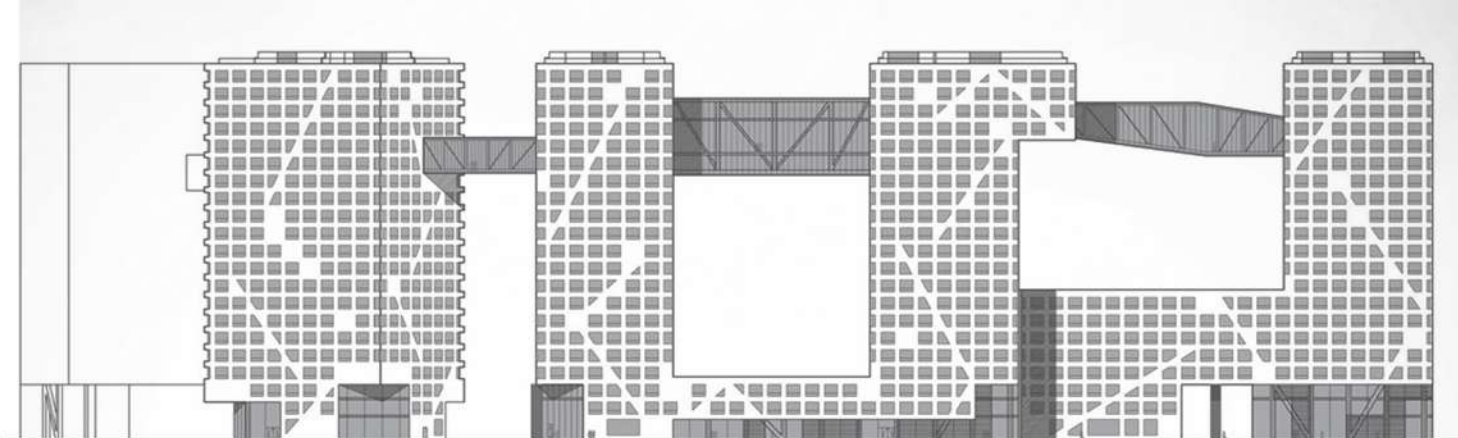


## SECTION:



THE GROUND FLOOR CONSIST OF NUMBER OF PASSAGES, OPEN TO ALL PERSONS, SURROUNDING THE CENTRAL BIG POND. ALL THE PUBLIC FUNCTIONS HAVE CONNECTIONS WITH SURROUNDING GREEN SPACES. AT THE MIDDLE LEVEL OF THE LOWER BUILDINGS, GREEN ROOF OFFER QUITE SPACE FOR RECREATION. FROM LEVEL 12 TO 18 A SERIES OF COVERED BRIDGES CONNECTING THE RESIDENTIAL TOWERS, OFFER SPECTACULAR VIEWS OF THE CITY.

## ELEVATION:



# CASE STUDY

## LINKED HYBRID, APARTMENTS, BEIJING, CHINA

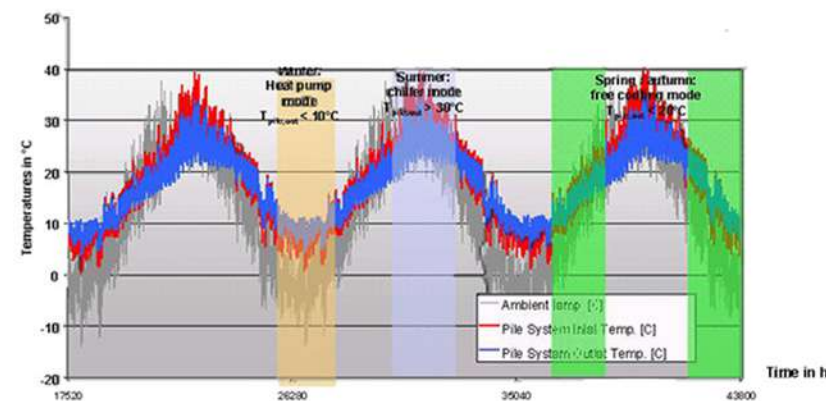


## SUSTAINABILITY

THIS PROJECT USES 650 WELLS WHICH ARE GEOTHERMALLY DUG 100 METRES DEEP. THESE PROVIDE 5600 KILOWATT HOURS OF ENERGY ANNUALLY AND ARE DISTRIBUTED INSIDE THROUGH THE CONCRETE SLABS OF DEPARTMENTS.

THIS DESIGN USES GROUND HEAT PUMP EQUIPMENT SYSTEM FOR TEMPERATURE CONTROL. COMES UNDER GREEN RESIDENTIAL BUILDING.

PLUMBING SYSTEM RECYCLES WASTE WATER FOR IRRIGATION OF PLANTATION WHEREAS REFLECTING POOL FUNCTIONS AS A RETENTION POND.



## MATERIALS



USE OF GLASS ALONG WITH DIAGONAL STEEL BRACING IN SKY BRIDGE



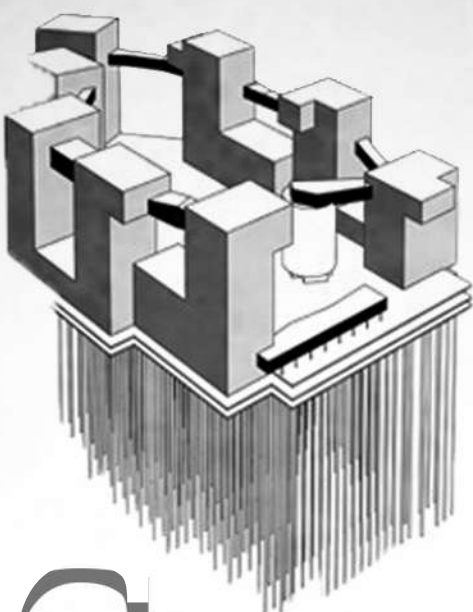
STRUCTURAL GLAZED CURTAIN WALL WITH LOW-E COATED IGU TO AVOID RADIATION TO COME INSIDE BUILDING



EXOSKELETON OF CONCRETE FRAME ALONG WITH ANODIZED AND SANDED ALUMINIUM CLADDING.



STEEL USED EXTENSIVELY IN DIAGONAL BRACINGS IN SKY TOWER



## GREEN ROOF OFFER SPACE FOR RECREATION

CAFE OFFERS SPACE FOR COMMUNITY INTERACTION

BOOK EVENT SPACE- GREAT WAY TO SHARE COMMON INTEREST

DINING DECK IN SKY BRIDGE GIVES IMMENSE VIEWS AND IS GREAT FOR INTERACTIONS

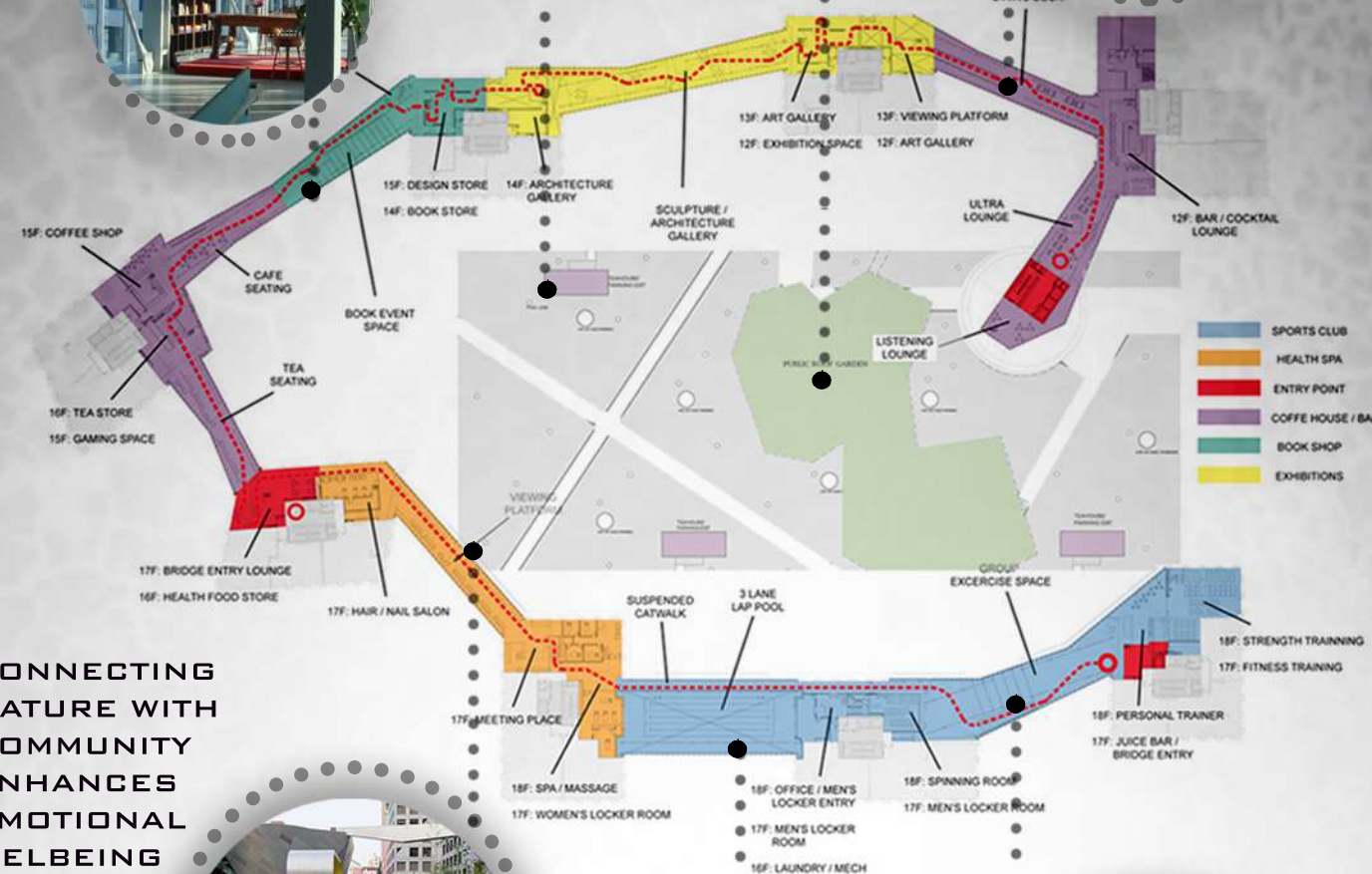
CONNECTING NATURE WITH COMMUNITY ENHANCES EMOTIONAL WELBEING OF PEOPLE.



SWIMMING POOL IN SKY BRIDGE MOTIVATES PEOPLE IN PHYSICAL WELLBEING



GROUP EXERCISE SPACE ENGAGES COMMUNITY IN WELLNESS AND INTERACTIONS







## INFERENCES:

THIS PROJECT CLEARLY SIGNIFIES AN OPEN CITY WITHIN A CITY WITH A FRESH AND BREATHABLE SPACE FOR THE WHOLE COMMUNITY. IT ENGAGES PEOPLE AND MAKE A MORE INTERACTIVE ZONE ALONG WITH KEEPING IN MIND THE SUSTAINABILITY ASPECT AS WELL AS BY HAVING GEO-THERMAL WELLS WITH COOLING IN SUMMERS AND HEATING IN WINTERS. ALL OF THIS MAKES LINKED HYBRID ONE OF THE LARGEST GREEN RESIDENTIAL PROJECTS IN THE WORLD, MAKING IT QUALIFIED FOR LEED GOLD CERTIFICATION.

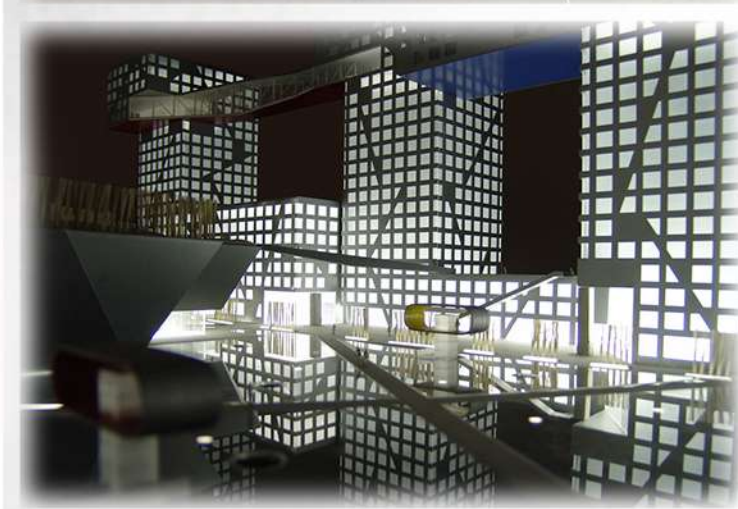
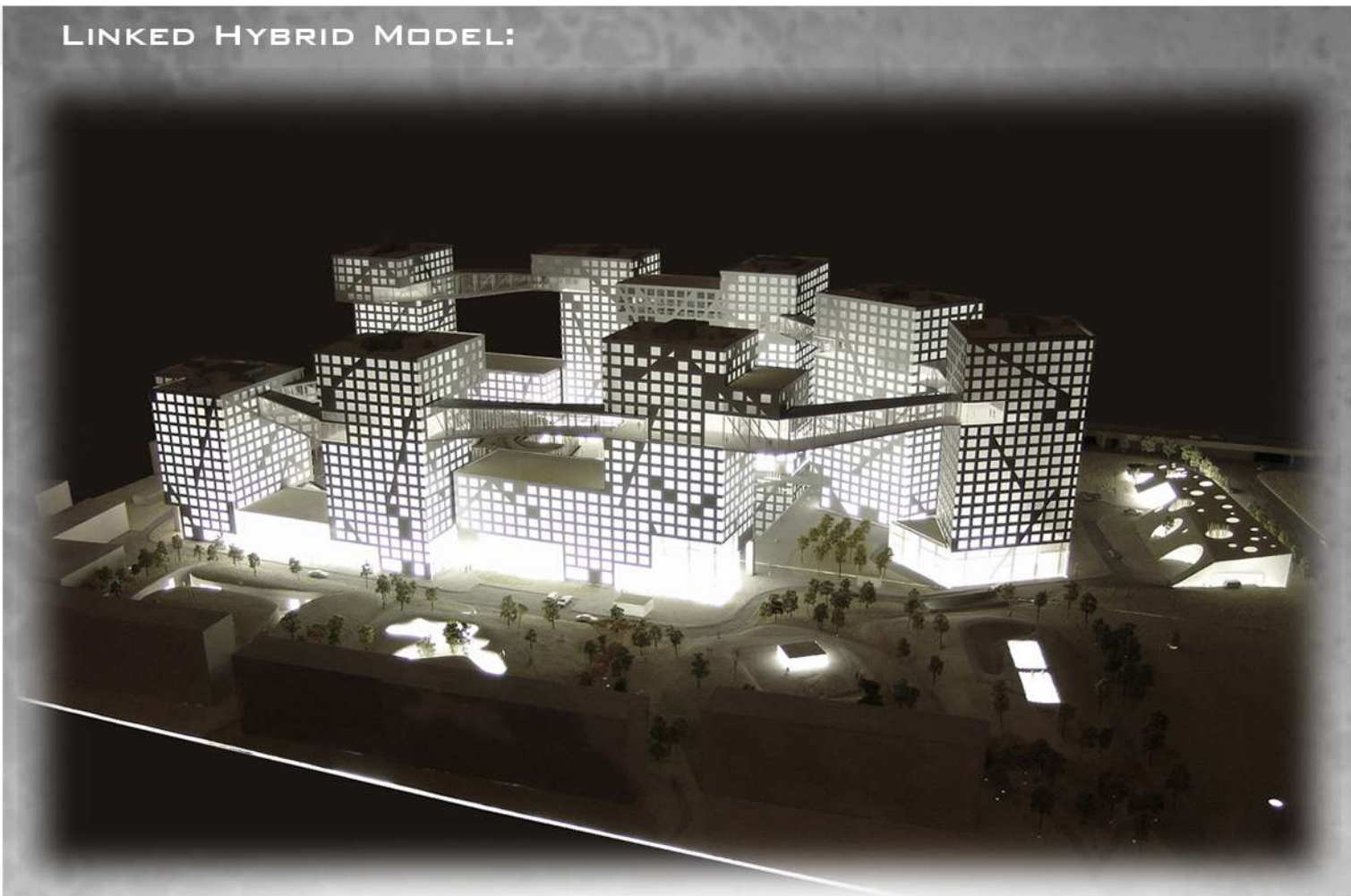
IT GIVES CITY LIFE A NEW DIRECTION WITH MULTI-FACED PUBLIC SPACES INSIDE. SKY-BRIDGES ACT AS SOCIAL CONDENSORS AND ARE GREAT WAY TO INTERACT WHILE IN A LOUNGE, FITNESS AREA OR EVEN WHILE READING A BOOK. IT CAN BE PERCEIVED THAT WORK FROM WHOME SITUATION CAN ALSO BE EASILY MANAGED WHILE TAKING INTO CONSIDERATION THE APARTMENT DESIGNS AS IT HOLDS A SPECIFIC AREA FOR OFFICE WORKERS.

THE DESIGN ASPECT IS ALSO GREAT WHEN IT COMES TO MAKING THE STRUCTURE EARTHQUAKE PROOF BY PROVIDING STRONG FRAMEWORK OR STEEL TRUSSES. SEVERAL MOUNDS INTEGRATED IN LINKED HYBRID, MAKES IT MORE ACCESSIBLE FOR ALL USER GROUPS AS IT INCLUDES TENNIS COURTS, KINDERGARTEN, TEA-HOUSE GYMS AND MOST IMPORTANTLY, MEDITATION SPACES.

THIS PROJECT NOT ONLY BRINGS TOGETHER THE COMMUNITY BUT ALSO INCULCATES A SENSE OF CONNECTION TOWARDS NATURE IN A DENSE CITY OF CHINA.



## LINKED HYBRID MODEL:



# CASE STUDY

LINKED HYBRID, APARTMENTS, BEIJING, CHINA