

# CHINOOK-MANCHESTER LOW CARBON SUSTAINABLE DISTRICT

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EVDS 616 Urban Infrastructure and Land Use

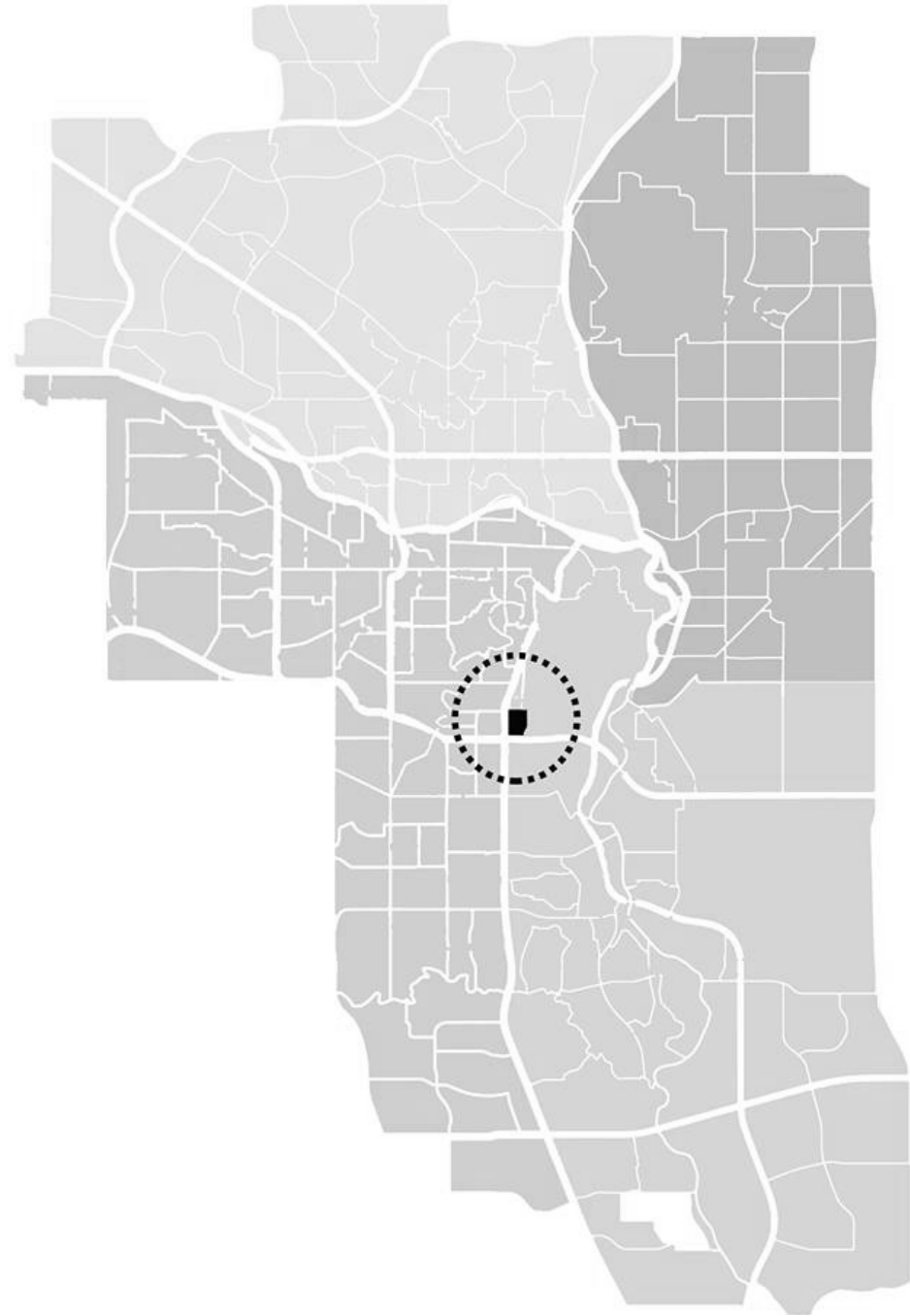
Winter 2018



# VISION

"Our vision for Manchester District is to create a nexus approach of infrastructure that includes energy, water and transportation. Designed as a multifaceted community and amplified with high quality public and green spaces that precede conventional car space, the proposed scheme can transform Manchester District into a place where every Calgarian will like to be."

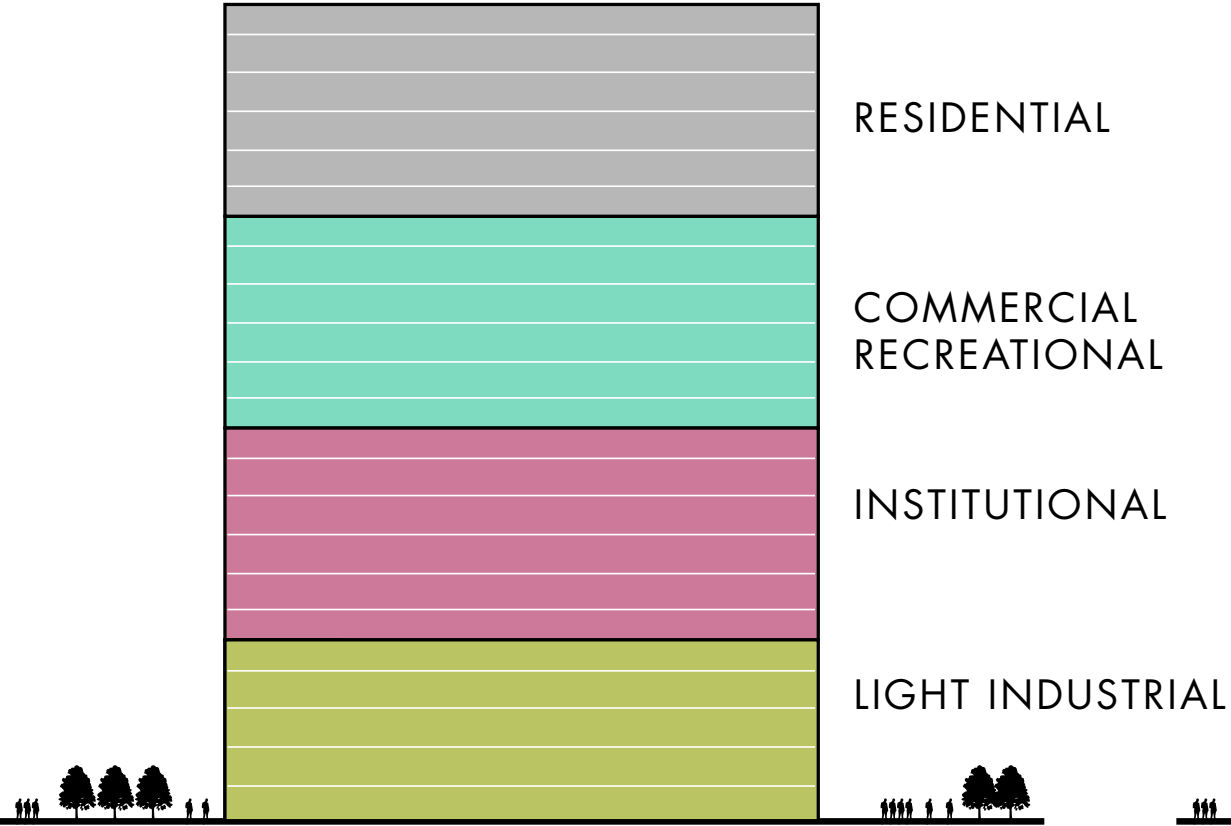
# SITE LOCATION



# DEVELOPMENT STRATEGY

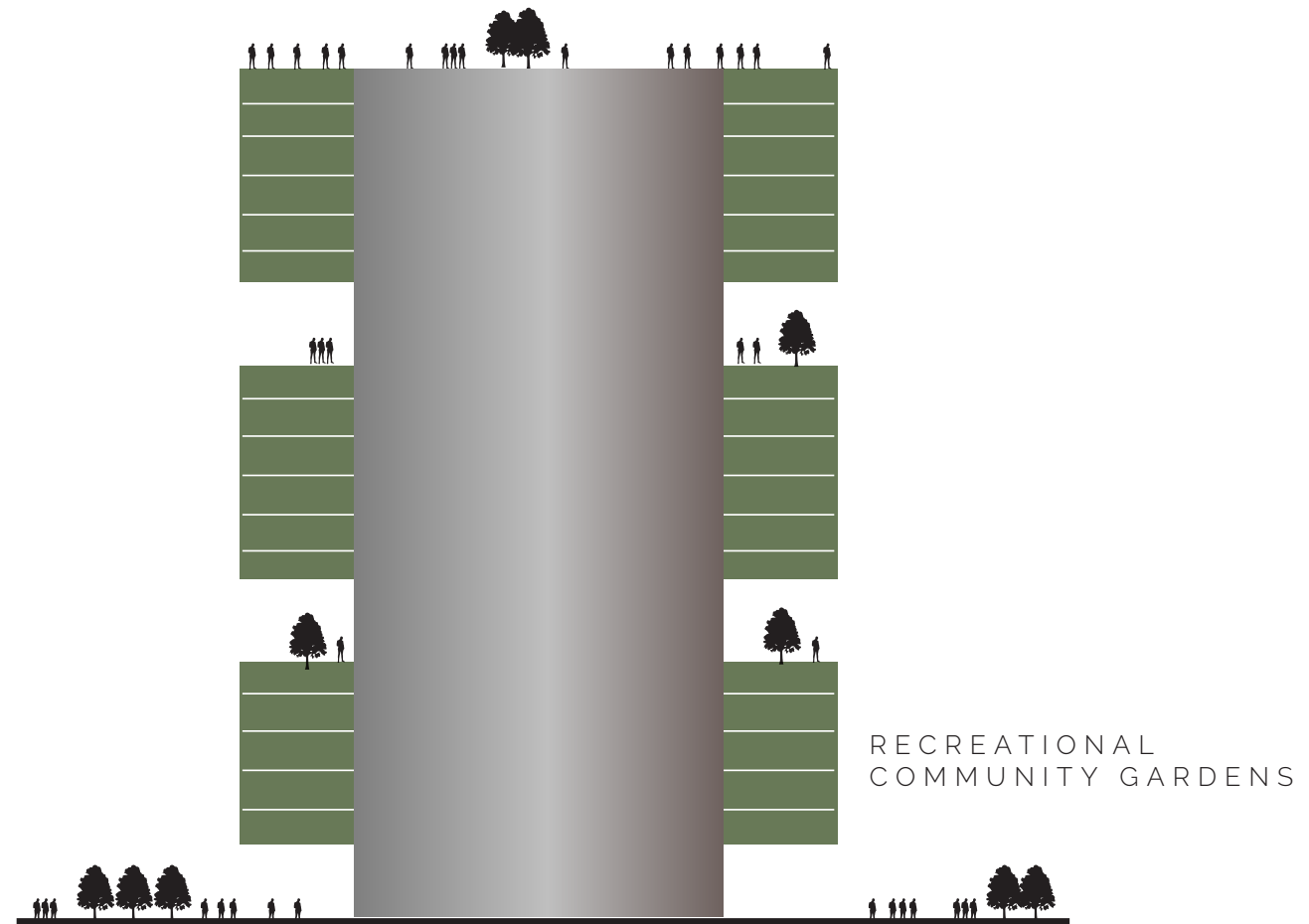
# CURRENT MODEL

CALGARY'S TYPICAL MODEL



# PROPOSED MODEL

- COMMERCIAL
- INSTITUTIONAL
- LIGHT INDUSTRIAL
- RESIDENTIAL



URBAN SECTION

# POPULATION



# JOBS



## JOBS BREAKDOWN

AREA= 968,190 M2  
NET AREA= 677,733 M2

10% OFFICE  
AREA PER PERSON= 67,773M2/ 12 M2  
OFFICE JOBS = 5,647

10% CULTURAL  
AREA PER PERSON= 67,773M2/ 36 M2  
CULTURAL JOBS = 1,882

10% SUPERSTORES  
AREA PER PERSON= 67,773M2/ 90M2  
SUPERSTORE JOBS = 753

15% FOOD INDUSTRY  
AREA PER PERSON= 101,660M2/ 18 M2  
FOOD INDUSTRY JOBS = 5,647

15% RETAIL  
AREA PER PERSON= 101,660M2/ 19 M2  
RETAIL JOBS = 5,350

15% ENTERTAINMENT  
AREA PER PERSON= 101,660M2/ 70 M2  
ENTERTAINMENT JOBS = 1,452

25% LIGHT INDUSTRIAL  
AREA PER PERSON= 169,433M2/ 47M2  
LIGHT INDUSTRIAL JOBS = 3,604



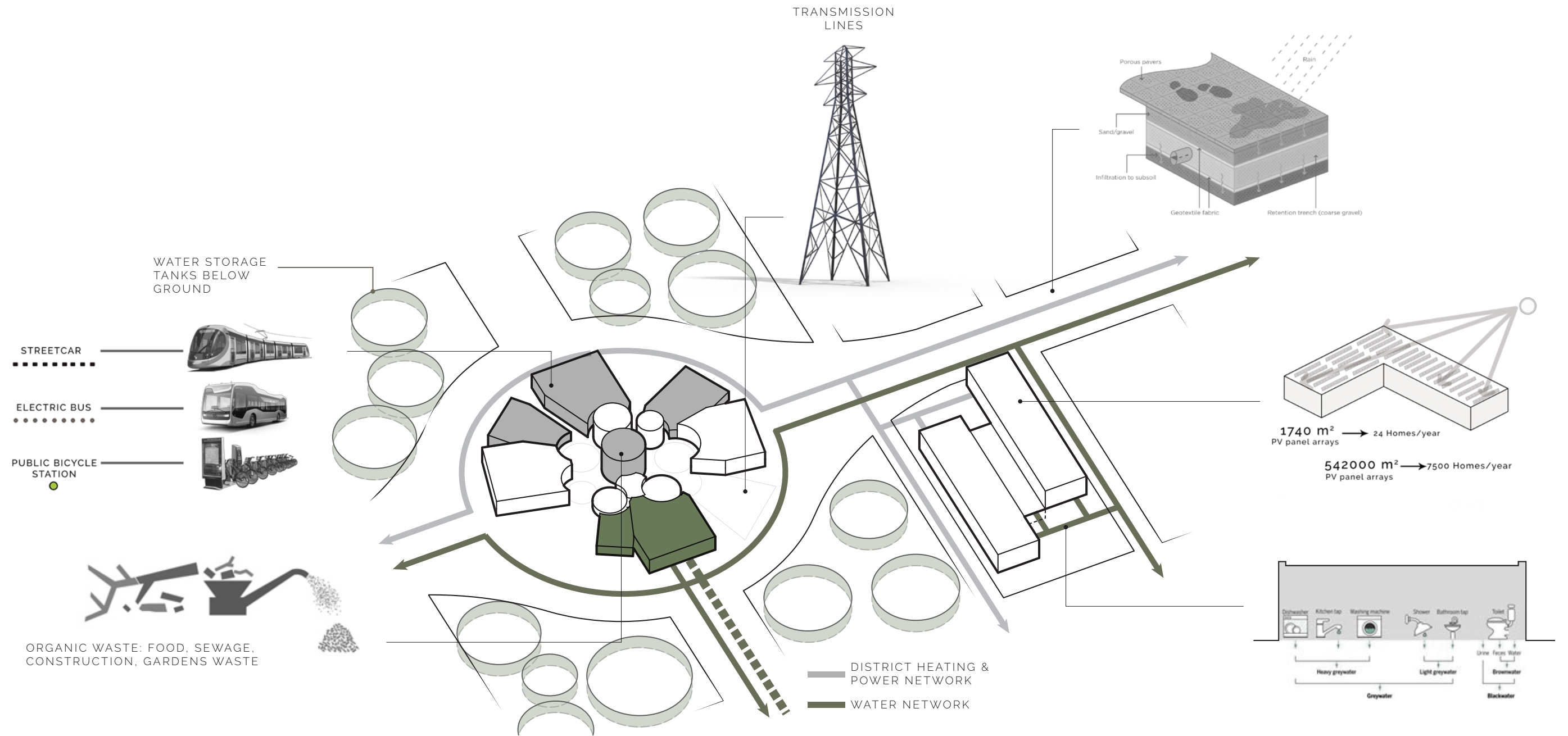
FOCUS

ENERGY

WATER

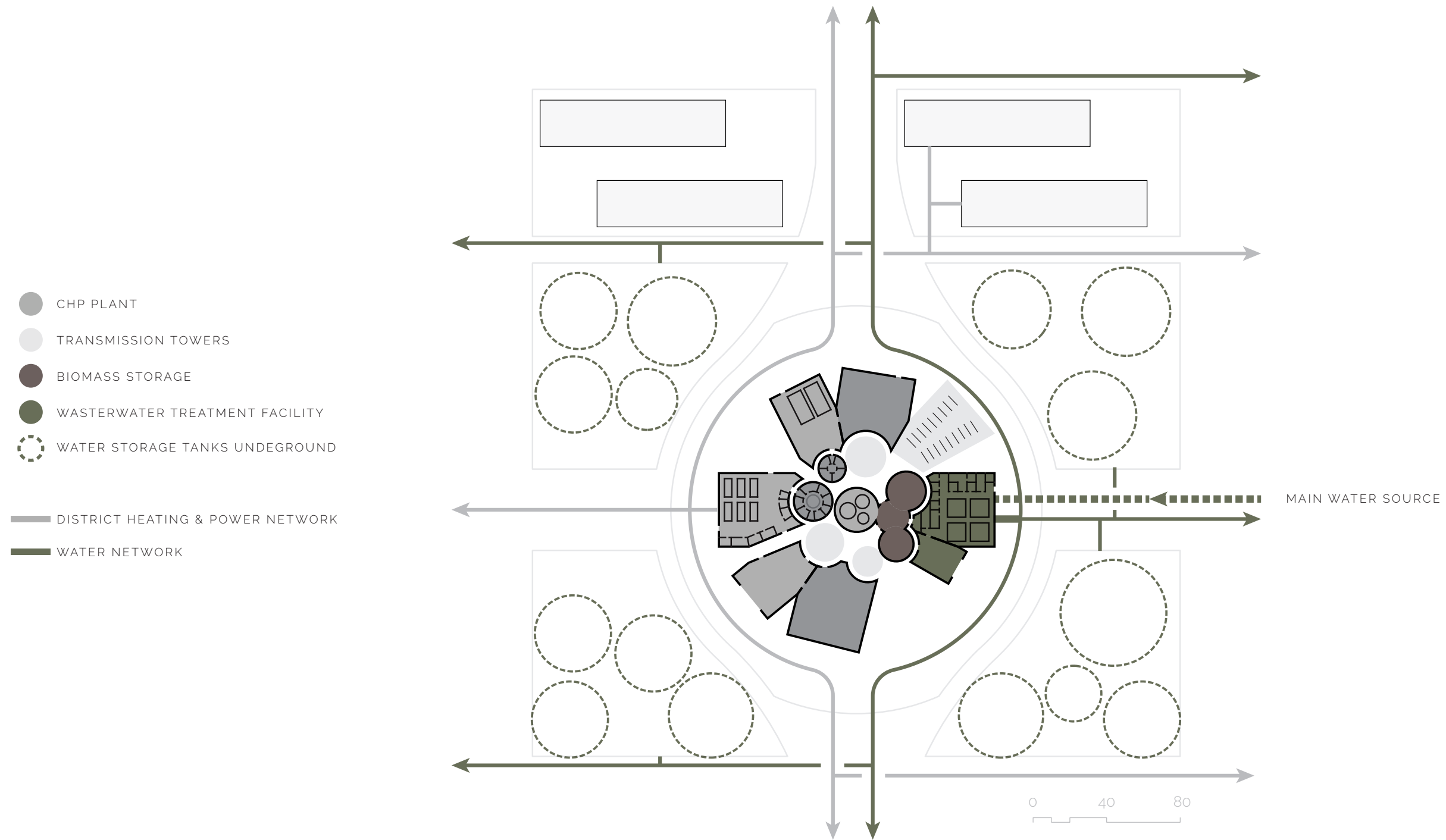
TRANSPORTATION

# INFRASTRUCTURE CONCEPTS



OVERALL CONCEPT AXONOMETRIC

# CENTRAL FACILITY



CENTRAL FACILITY FLOOR PLAN

HEAT + POWER

# PRECEDENTS



ENMAX DISTRICT ENERGY CENTRE, CALGARY

<https://www.gibbsgage.com/portfolio/enmax-district-energy>



SANDVIK CHP STATION, SWEDEN

<http://www.ramboll.com/projects/re/veab-sandvik-power-station-unit-3?alias=vaxjo>

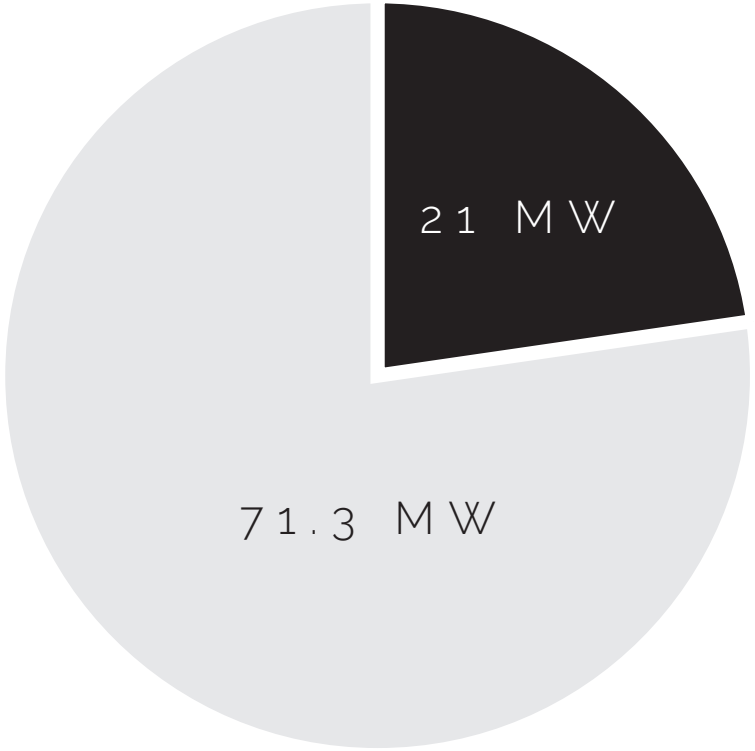
# DISTRICT ENERGY DEMAND

**ALBERTA ENERGY EFFICIENCY,**

APARTMENT UNIT (950 sqft.)

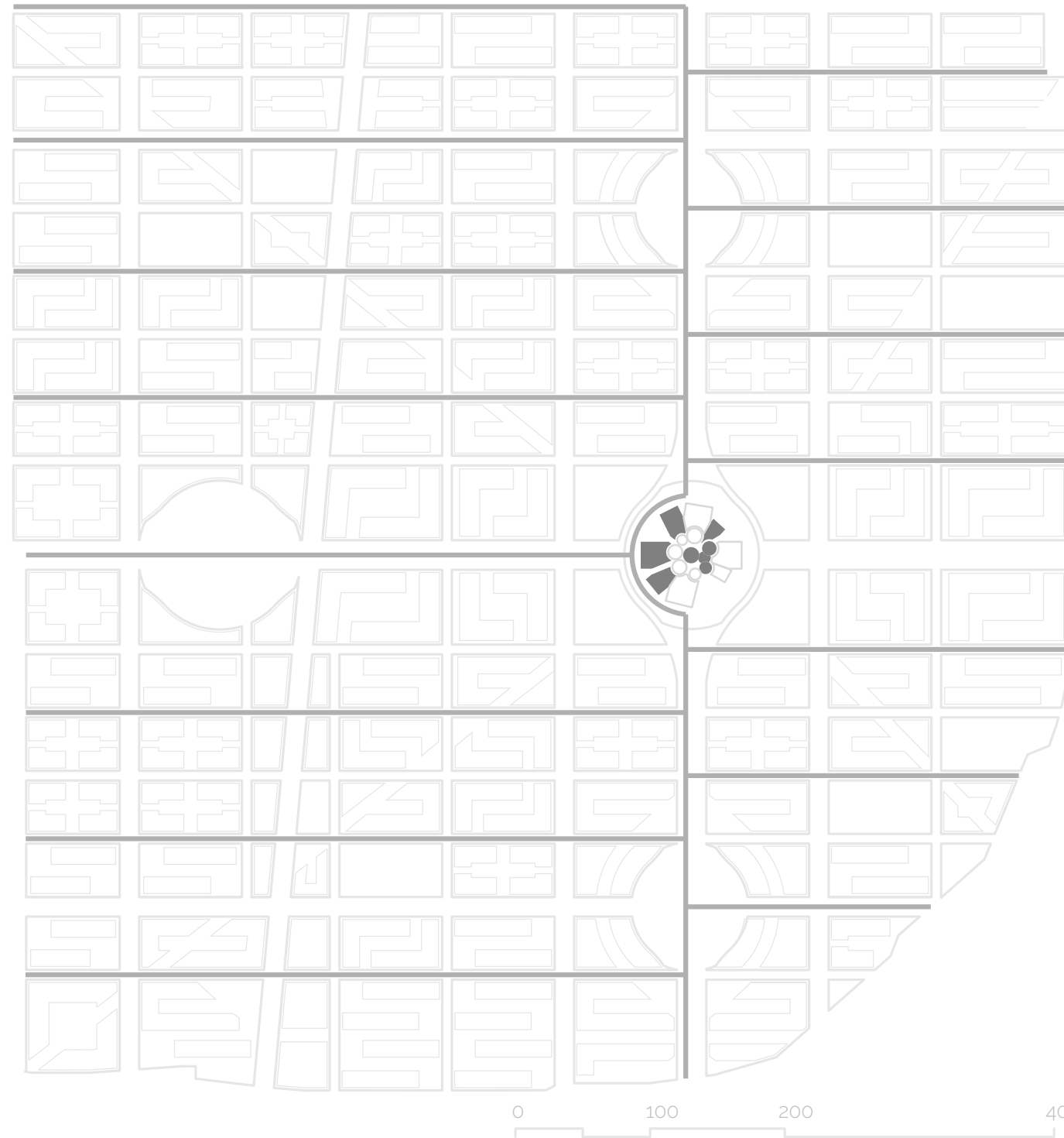
Annual Natural Gas  
0.063GJ/ft<sup>2</sup> (188.37 kwh/sqm)

Annual Electricity Use  
5.9 kWh/ft<sup>2</sup> (55.54 kwh/sqm)

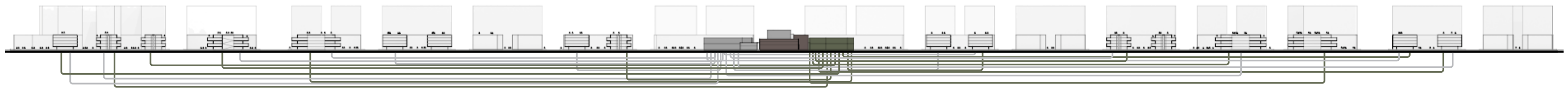


■ THERMAL ENERGY REQUIRED  
■ POWER REQUIRED

# HEAT + POWER NETWORK

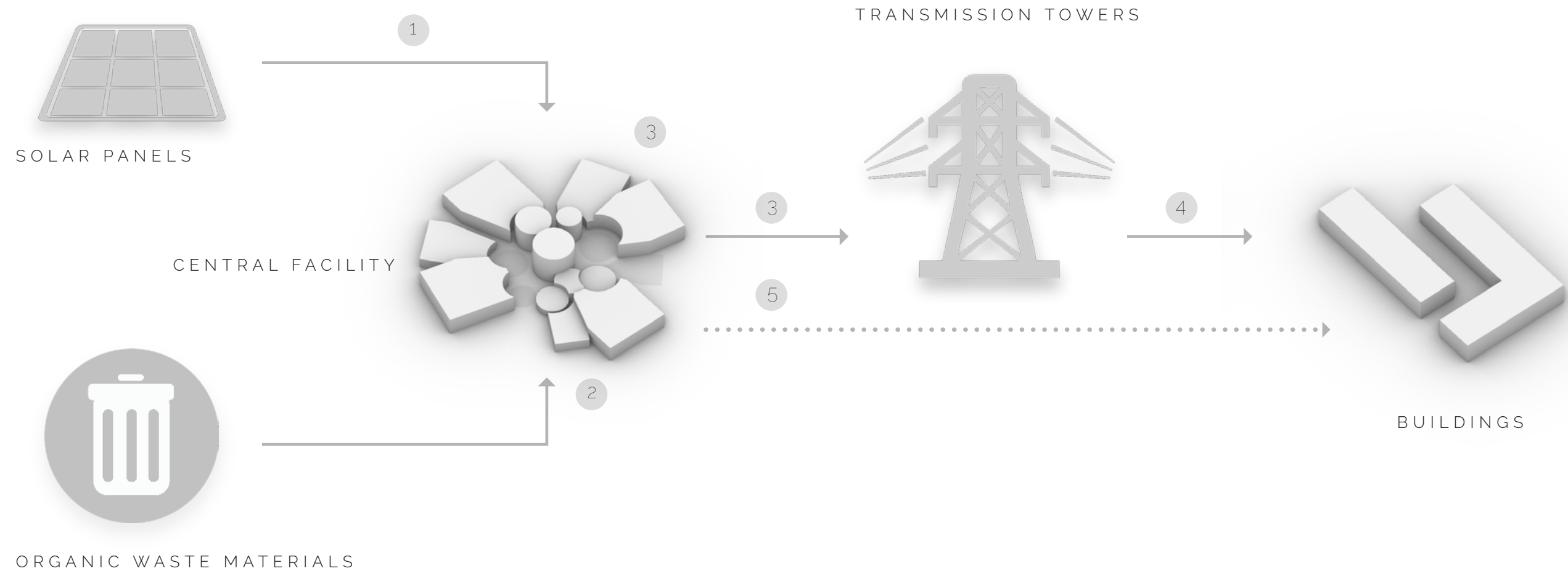


# HEAT + POWER NETWORK



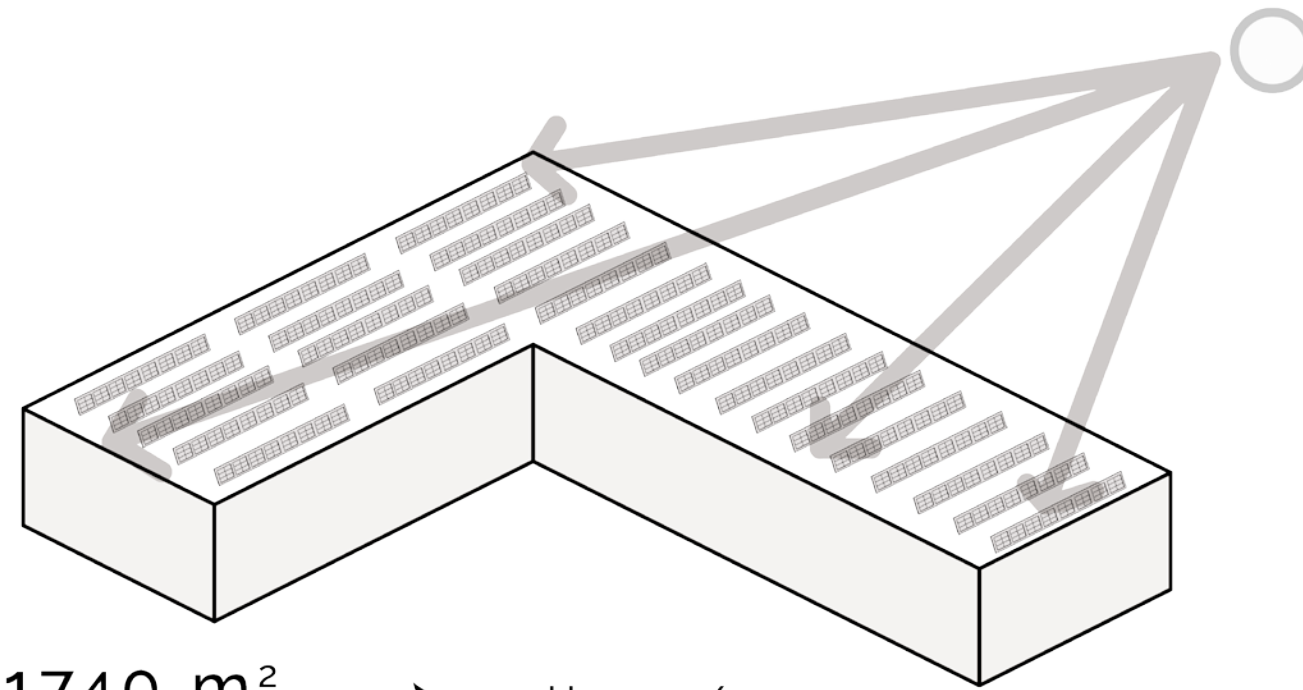


# ENERGY GENERATION PROCESS



- 1 THERMAL ENERGY IS COLLECTED THROUGH SOLAR PANELS AND STORED IN THE FACILITY
- 2 BIOMASS SUCH AS ORGANIC WASTE IS CONVERTED INTO FUEL TO GENERATE HIGH PRESSURE STEAM
- 3 HIGH PRESSURE STEAM POWERS TURBINE TO GENERATE ELECTRICITY
- 4 GENERATED ELECTRICITY IS DISTRIBUTED TO THE DISTRICT
- 5 EXCESS HEAT FROM GENERATING ELECTRICITY IS RECOVERED AND USED TO PROVIDE SPACE HEATING TO THE DISTRICT

# SOLAR ENERGY



**1740 m<sup>2</sup>** → 24 Homes/year  
PV panel arrays

**542000 m<sup>2</sup>** → 7500 Homes/year  
PV panel arrays

WATER

# PRECEDENTS



WASTE WATER TREATMENT FACILITY, DOCKSIDER GREEN

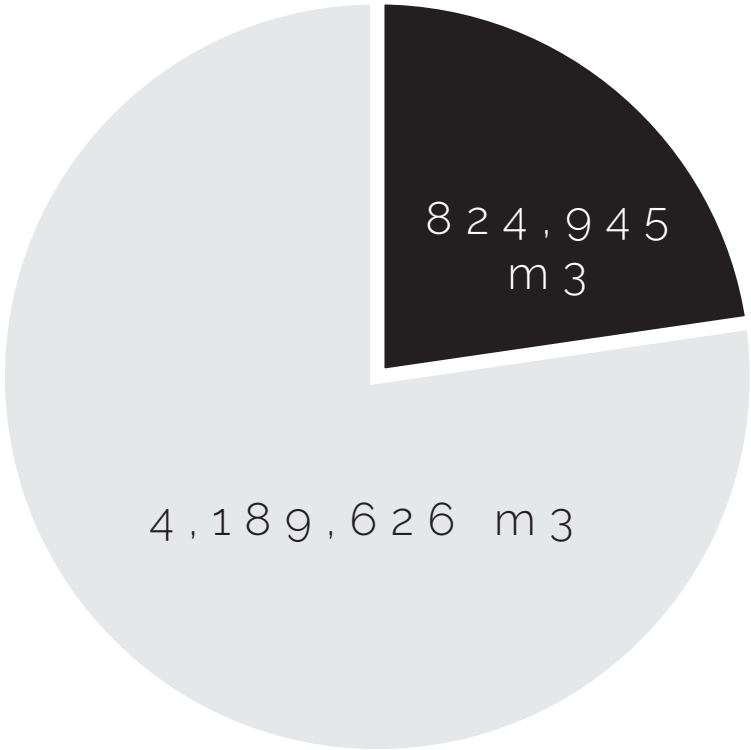


SOUTHEAST FALSE CREEK ENERGY CENTRE, VANCOUVER

# WATER SUPPLY



BOW RIVER



■ WATER FROM BOW RIVER

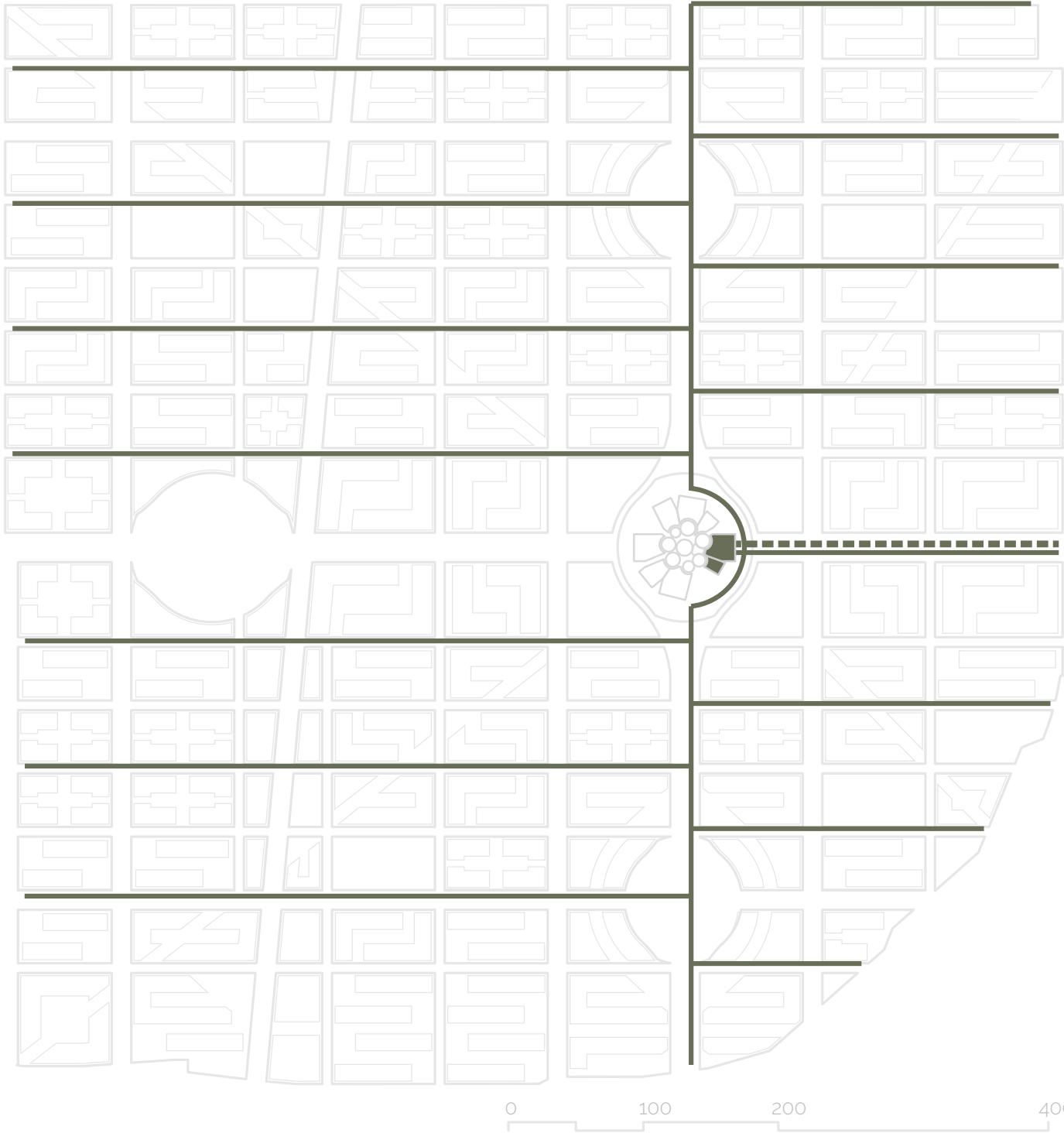
■ WATER FROM PRECIPITATION



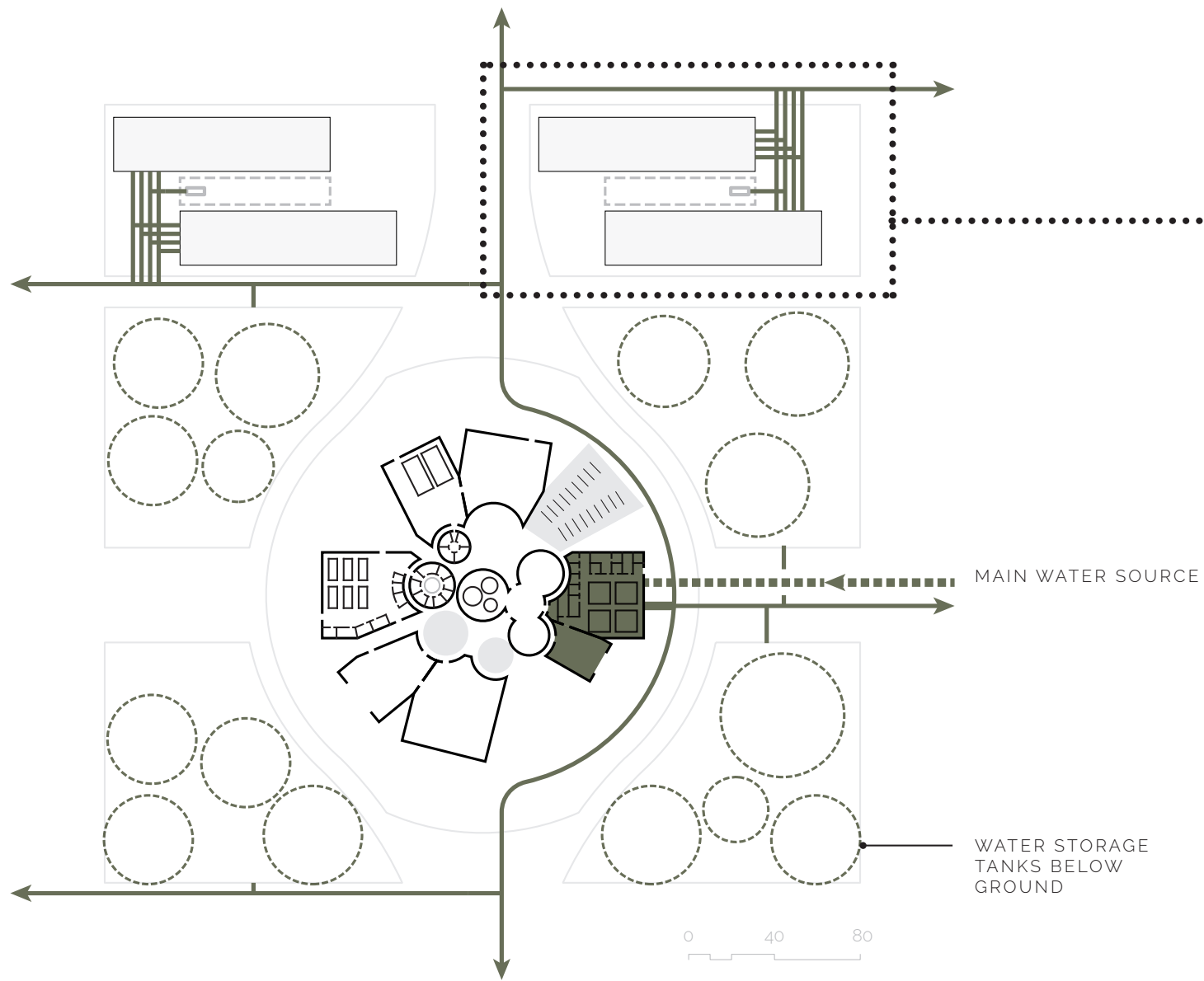
PRECIPITATION



# WATER NETWORK

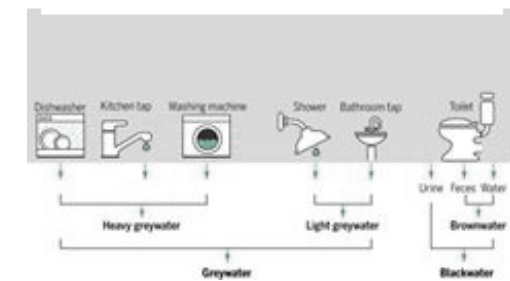
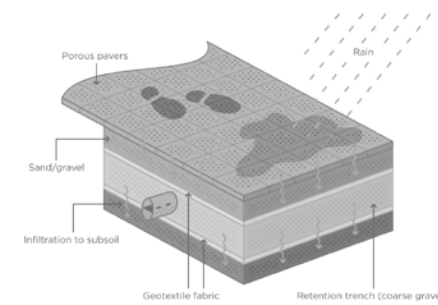
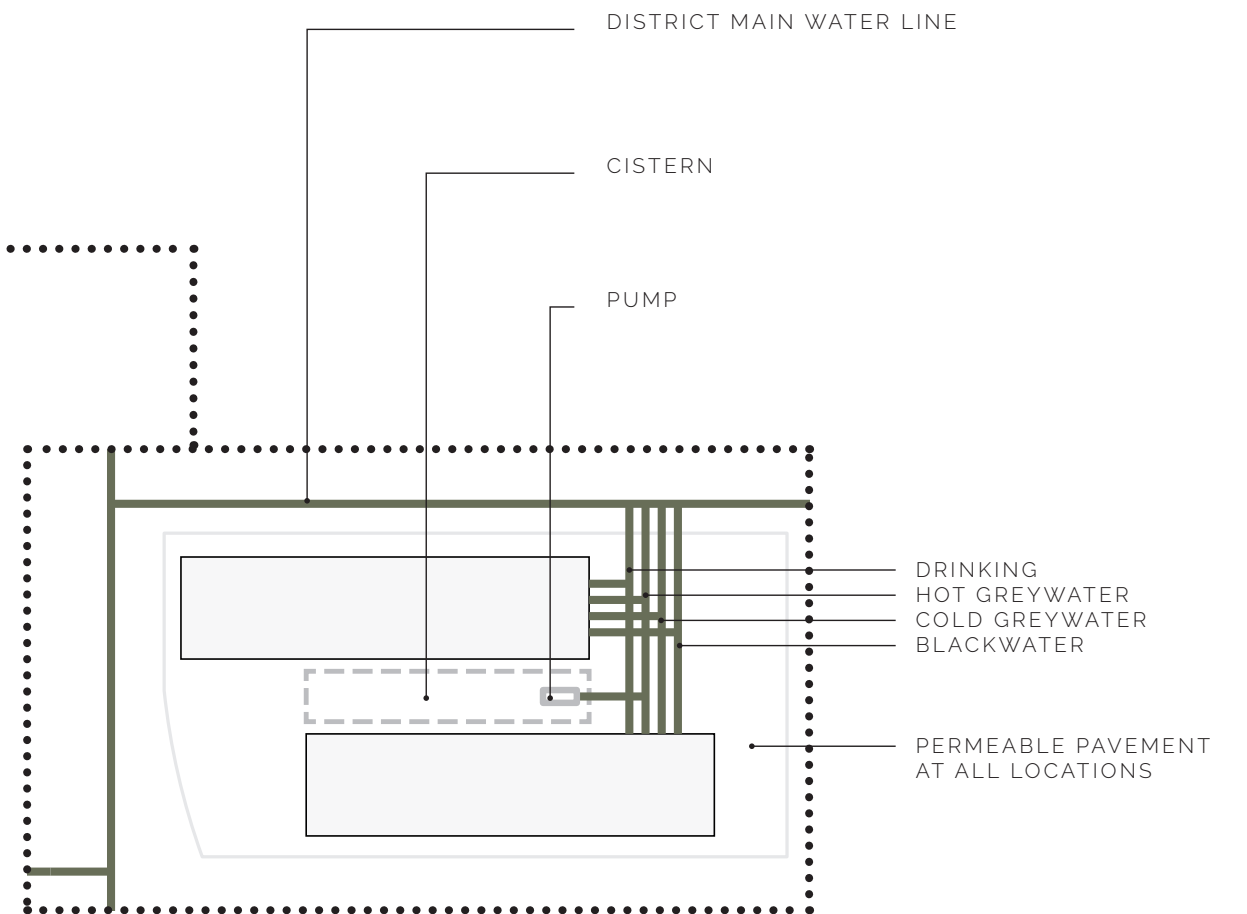


# SCHEMATIC PLAN

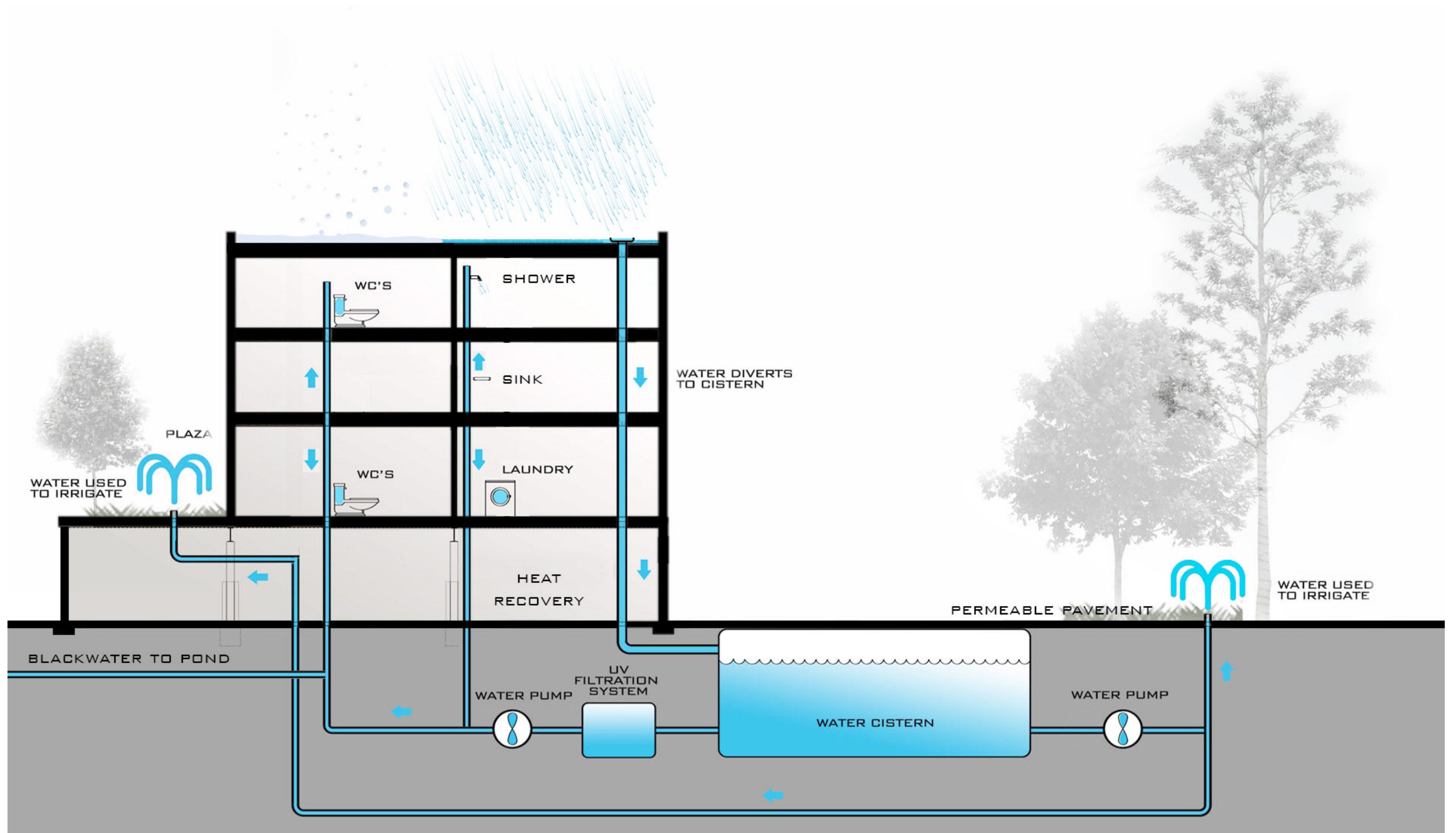


CENTRAL FACILITY FLOOR PLAN

— WATER NETWORK



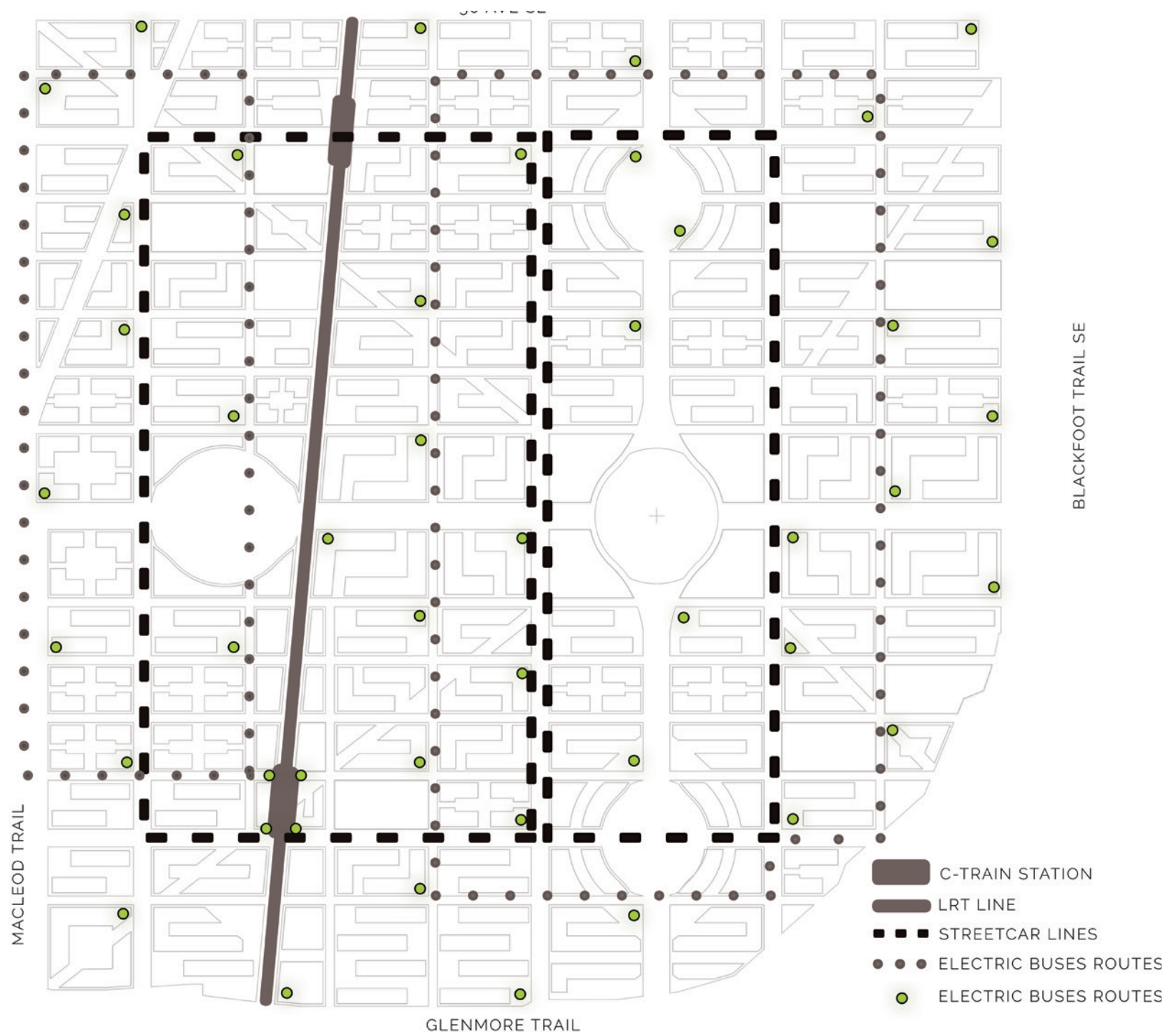
# SCHEMATIC SECTION





TRANSPORTATION

# PROPOSED CIRCULATION



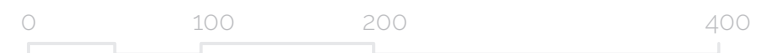
STREETCAR



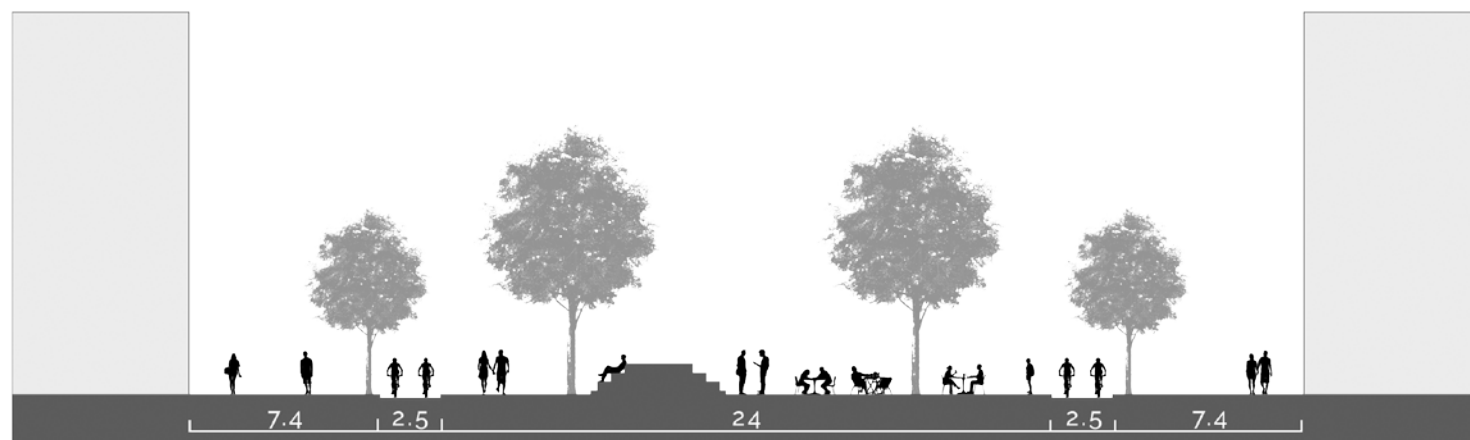
ELECTRIC BUS



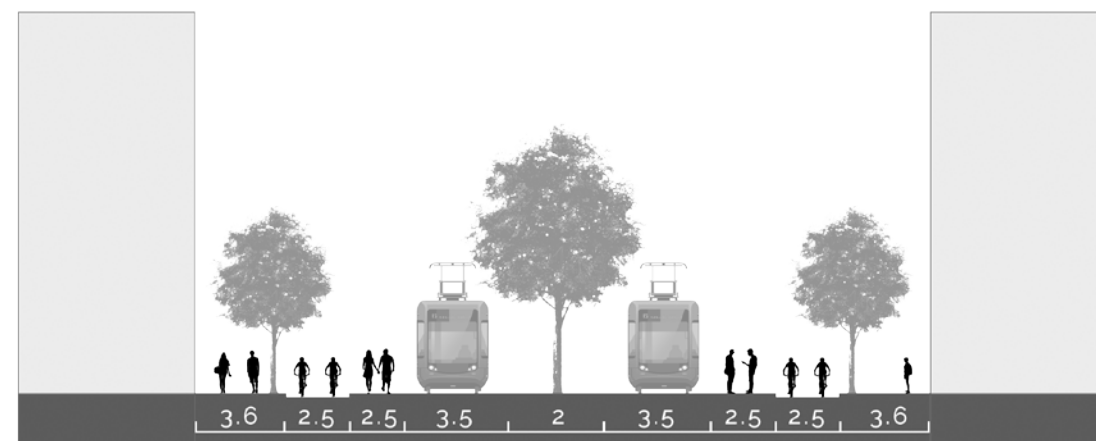
PUBLIC BICYCLE  
STATION



# STREET SECTIONS



GREENWAY  
2 Streets

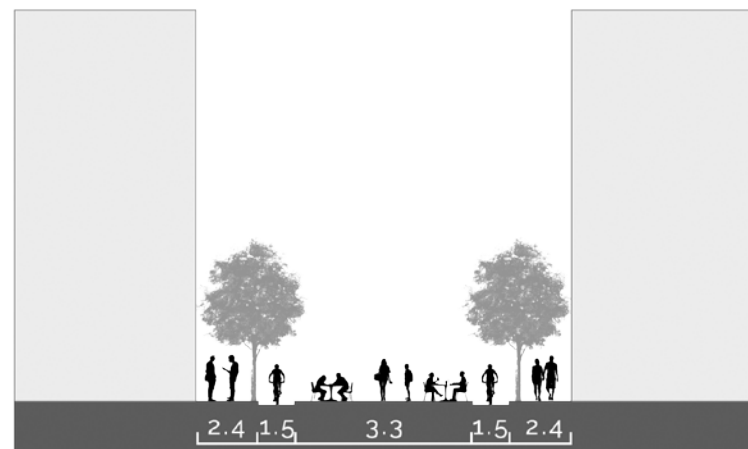


STREETCAR WAY  
5 Streets

# STREET SECTIONS



ELECTRICAL BUS STREET  
8 Streets



TYPICAL STREET

