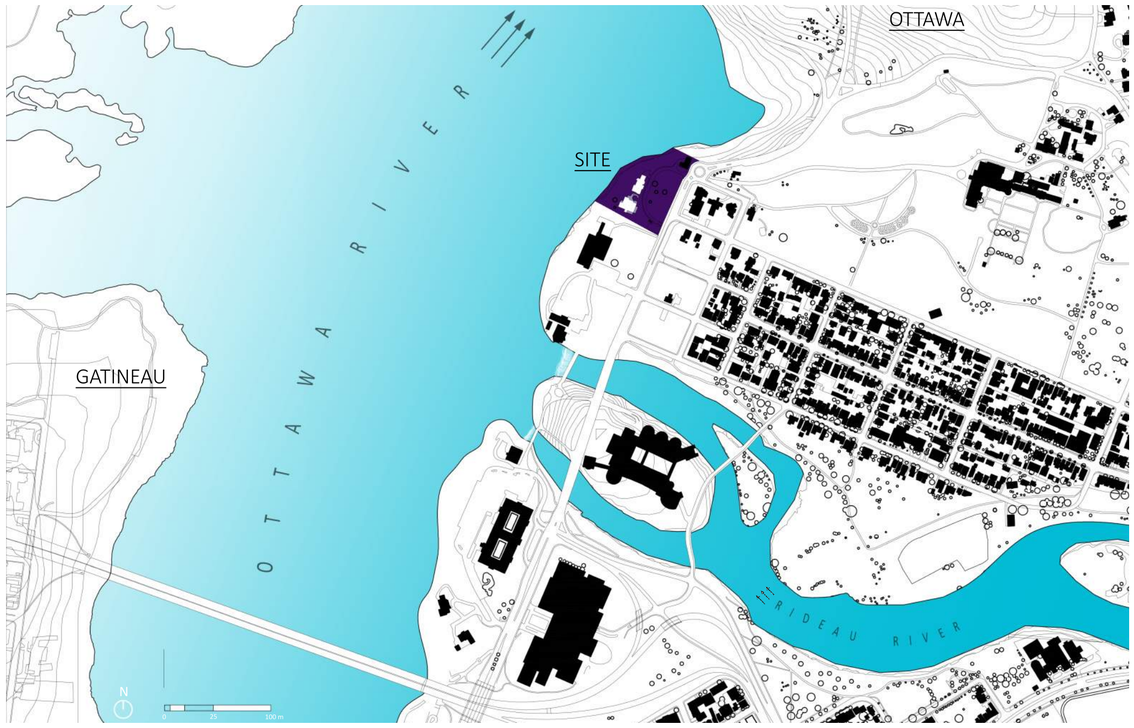
24 SUSSEX

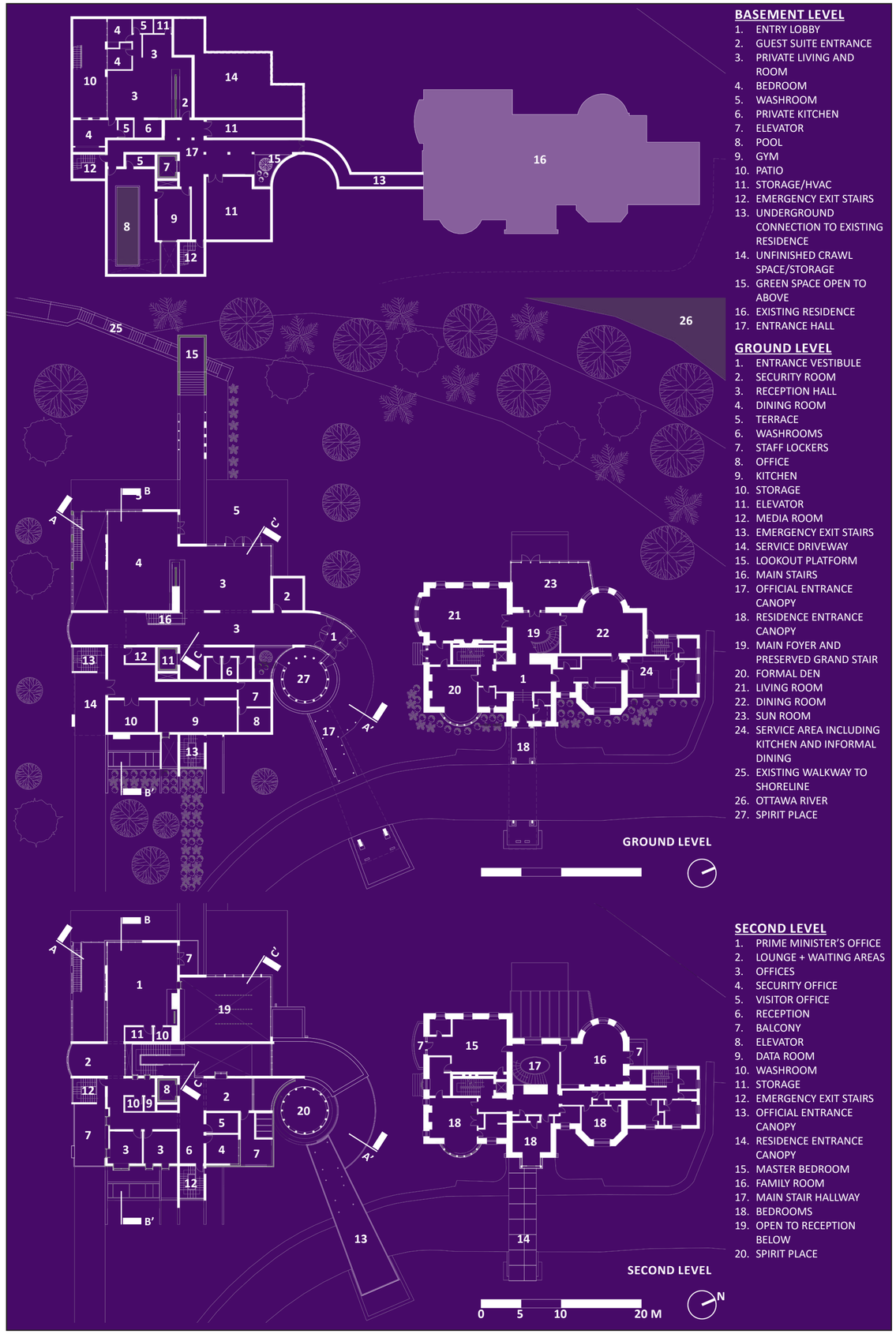
PLANS, SECTION & LOCATION

TRACE architectures

THIS UNSOLICITED CONTRIBUTION TO PUBLIC DISCOURSE CREATES AN INTERNATIONAL-LEVEL SHOWCASE OF CANADIAN SAVOIRE-FAIRE, TECHNOLOGIES AND CONSERVATION. IT MAKES BEST USE OF EXISTING RESOURCES, AND, THROUGH ITS NEW INTERVENTIONS, CONSERVATION AND SUSTAINABILITY TREATMENTS, TAKES THE PROPERTY TO A ZERO-CARBON LEVEL OF ENVIRONMENTAL RESPONSIBILITY. IN PRACTICING “LANDMARKS, NOT LANDFILL”, THIS PROPOSAL FOR CHANGE TO THIS RECOGNIZED FEDERAL HERITAGE ASSET DEMONSTRATES THAT HERITAGE CONSERVATION IS ALIVE AND WELL IN CANADA AND LIVING AT THE LEADING EDGE OF ECOLOGY PROTECTION. IT IS A MULTIVALENT SCHEME THAT IS AT ONCE PRACTICAL AND IMAGINATIVE..... AND ENHANCES PLACE. VERY CANADIAN...



SECTION A - A’ - SHOWING ENTRY CANOPY, CIRCULAR SPIRIT PLACE AND AXIAL INTERIOR CIRCULATION SPINE OF NEW WING



BASEMENT LEVEL

1. ENTRY LOBBY
2. GUEST SUITE ENTRANCE
3. PRIVATE LIVING AND ROOM
4. BEDROOM
5. WASHROOM
6. PRIVATE KITCHEN
7. ELEVATOR
8. POOL
9. GYM
10. PATIO
11. STORAGE/HVAC
12. EMERGENCY EXIT STAIRS
13. UNDERGROUND CONNECTION TO EXISTING RESIDENCE
14. UNFINISHED CRAWL SPACE/STORAGE
15. GREEN SPACE OPEN TO ABOVE
16. EXISTING RESIDENCE
17. ENTRANCE HALL

GROUND LEVEL

1. ENTRANCE VESTIBULE
2. SECURITY ROOM
3. RECEPTION HALL
4. DINING ROOM
5. TERRACE
6. WASHROOMS
7. STAFF LOCKERS
8. OFFICE
9. KITCHEN
10. STORAGE
11. ELEVATOR
12. MEDIA ROOM
13. EMERGENCY EXIT STAIRS
14. SERVICE DRIVEWAY
15. LOOKOUT PLATFORM
16. MAIN STAIRS
17. OFFICIAL ENTRANCE CANOPY
18. RESIDENCE ENTRANCE CANOPY
19. MAIN FOYER AND PRESERVED GRAND STAIR
20. FORMAL DEN
21. LIVING ROOM
22. DINING ROOM
23. SUN ROOM
24. SERVICE AREA INCLUDING KITCHEN AND INFORMAL DINING
25. EXISTING WALKWAY TO SHORELINE
26. OTTAWA RIVER
27. SPIRIT PLACE

SECOND LEVEL

1. PRIME MINISTER’S OFFICE
2. LOUNGE + WAITING AREAS
3. OFFICES
4. SECURITY OFFICE
5. VISITOR OFFICE
6. RECEPTION
7. BALCONY
8. ELEVATOR
9. DATA ROOM
10. WASHROOM
11. STORAGE
12. EMERGENCY EXIT STAIRS
13. OFFICIAL ENTRANCE CANOPY
14. RESIDENCE ENTRANCE CANOPY
15. MASTER BEDROOM
16. FAMILY ROOM
17. MAIN STAIR HALLWAY
18. BEDROOMS
19. OPEN TO RECEPTION BELOW
20. SPIRIT PLACE

24 SUSSEX

RESIDENCE & OFFICIAL WING

PRIME MINISTER'S RESIDENCE, 24 SUSSEX REVITILIZATION

CONCEPT: THE HISTORIC PLACE IS TO BE RETURNED TO WHAT IT WAS INTENDED TO BE, EVEN THROUGHOUT ALL ITS CHANGES: A SINGLE-FAMILY RESIDENCE. TO PROVIDE FOR A GROWING LIST OF "OFFICIAL FUNCTIONS", THE AGING INDOOR SWIMMING POOL BUILDING IS DISASSEMBLED, PARTS REUSED, AND IN ITS PLACE A NEW ADDITION, CONNECTED BY A SHORT BASEMENT LEVEL TUNNEL TO THE HOUSE, PROVIDES FOR THE PM'S "HOME OFFICE" AND OTHER OFFICIAL REQUIREMENTS. WHILE ESSENTIALLY UNSEEN FROM THE ROAD AND THE RIVER ON EACH SIDE OF THE PROPERTY, THE NEW WING INTERPRETS CONTEMPORARY CANADIAN DESIGN IN A SYMPATHETIC WAY TO THE HISTORIC PLACE, THROUGH SCALE, MATERIALS AND FORM. THE EXISTING BUILDING IS CAREFULLY REHABILITATED, PROTECTING CHARACTER-DEFINING ELEMENTS, WHILE INTERJECTING A TRIAD OF NEW INTERVENTIONS AT FRONT THAT REPLACE/REINTERPRET PREVIOUS LOST OR DEGRADED ELEMENTS. THESE ELEMENTS HELP THE BUILDING TO COMFORTABLY "TALK" TO THE COMPLEMENTARY NEW STRUCTURE BUILT NEARBY. OFFICIAL WING: CEREMONIAL ENTRY AND SPIRIT-PLACE GUIDE ONE TO THE PRINCIPAL RECEPTION ROOMS. CANADIAN MATERIALS (PRIMARILY LOCAL) ARE USED THROUGHOUT. IN SHORT, A DUAL EMPHASIS ON BOTH NATURAL AND CULTURAL CONSERVATION.

BIRD'S EYE VIEW FROM SOUTEAST SHOWING NEW OFFICIAL WING AND REHABILITATED EXISTING RESIDENCE AT RIGHT

VIEW FROM SUSSEX DRIVE

NEW OFFICIAL WING AND REHABILITATED RESIDENCE AT RIGHT

NEW OFFICIAL ENTRANCE CANOPY AND REHABILITATED RESIDENCE AT RIGHT

ACCESSIBLE ENTRY AND SPIRITUAL SPACE AT NEW OFFICIAL WING

NEW OFFICIAL WING FROM FRONT LAWN

24 SUSSEX

RESIDENCE & OFFICIAL WING

PRIME MINISTER'S RESIDENCE, 24 SUSSEX REVITILIZATION

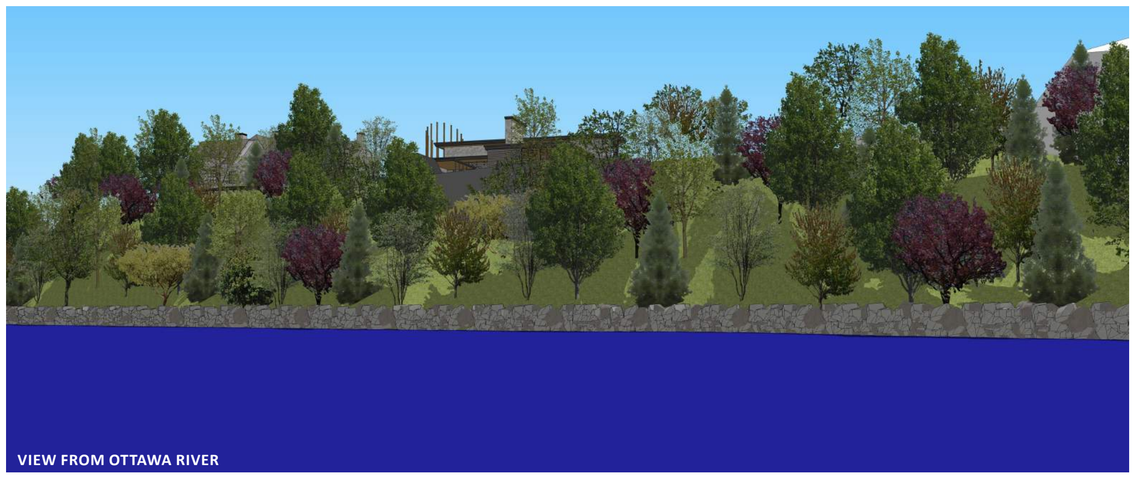
TAKING ADVANTAGE OF ITS DRAMATIC CLIFF-TOP SITE OVERLOOKING OTTAWA RIVER AND VILLAGE OF POINTE-GATINEAU, THE NORTH-FACING SIDE OF THE NEW WING, LIKE THE HERITAGE BUILDING, BALANCES SOLID AND GLAZED COMPONENTS TO PLAY OFF VIEWS AGAINST ENERGY CONSERVATION. THE LARGE PROPERTY EASILY TAKES ANOTHER BUILDING COMFORTABLY, WITHIN ITS LANDSCAPED GROUNDS AND WITHIN THE BROADER HISTORIC CULTURAL LANDSCAPE. EXISTING SET OF STAIRS TO SHORE IS CONNECTED TO THE NEW WING THROUGH ITS CROSS-AXIAL CIRCULATION SPINES. A COMPOSITION OF GREEN ROOFS, NATIVE LIMESTONE AND HARDWOODS IS COMPLEMENTED BY AN ELEMENT OF LODGEPOLES ARRANGED IN CIRCULAR LAYOUT IN EACH OF THE REHABILITATED RESIDENCE AND THE NEW OFFICIAL WING. WHILE SINGULAR HISTORIC ELEMENTS SUCH AS THE DINING ROOM AND STAIR HALL ARE MAINTAINED IN THE HERITAGE BUILDING, THE INTERIORS OF THE NEW WING FORM AN EASY TRUCE WITH CANADIAN IMAGERY AND FORMS. THE STRATEGIES FOR BOTH HERITAGE CONSERVATION AND IMPROVEMENT TO ZERO CARBON ENVIRO PERFORMANCE ARE SUMMARIZED IN THE NEXT THREE PANELS.

BIRD'S EYE VIEW FROM NORTHWEST, SHOWING EXISTING RESIDENCE REHABILITATED, AND NEW OFFICIAL WING AT RIGHT

REHABILITATED RESIDENCE SHOWING TRIAD OF NEW LIGHT INTERVENTIONS REINTERPRETING NOW-MISSING ELEMENTS, INTEGRATE WELL

NEW OFFICIAL WING (SERVICE ENTRY AT LEFT) WITH REHABILITATED EXISTING RESIDENCE AT RIGHT

SECTION B - B' THROUGH NEW WING AND SITE, SHOWING THE CLIFF LOOKOUT & STAIR AND THE INTERLOCKING SPACES INCLUDING LOWER LEVEL POOL



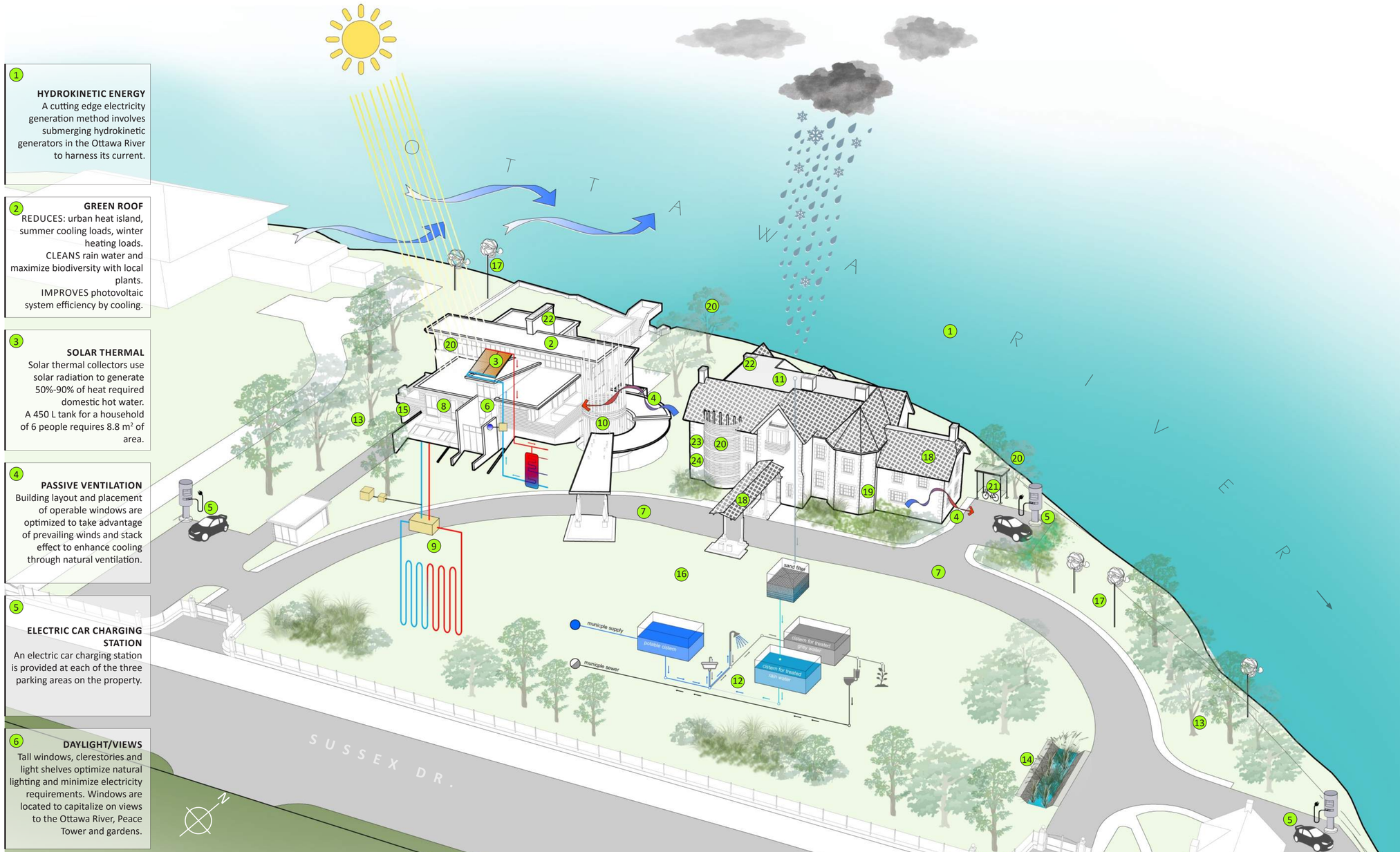
VIEW FROM OTTAWA RIVER

SECTION C - C' - NEW OFFICIAL WING SHOWING PRINCIPAL RECEPTION SPACE

24 SUSSEX
SUSTAINABILITY STRATEGIES

PRIME MINISTER'S RESIDENCE, 24 SUSSEX REVITILIZATION

THE PRIME MINISTER'S RESIDENCE IS A NATIONAL MODEL OF **LEADERSHIP**, ASSERTING AN **ECONOMICAL**, **LOGICAL**, **ENVIRONMENTAL**, AND **CULTURAL** MANDATE FOR SUSTAINABLE CONSERVATION AND NET POSITIVE DESIGN. REHABILITATION OF THE HISTORIC HOME AND A NEW OFFICIAL WING WILL FEATURE A "WHOLE-BUILDING ECOLOGY" APPROACH, GUIDING A SELECTION OF STRATEGIES WHICH WORK TOGETHER TO REGENERATE THE NATURAL ENVIRONMENT AND ENHANCE THE HERITAGE VALUES. THESE SUSTAINABLE STRATEGIES MAKE IT A SHOWCASE FOR ENVIRONMENTAL STEWARDSHIP AND ACHIEVING ZERO NET CARBON PERFORMANCE.



1 **HYDROKINETIC ENERGY**
A cutting edge electricity generation method involves submerging hydrokinetic generators in the Ottawa River to harness its current.

2 **GREEN ROOF**
REDUCES: urban heat island, summer cooling loads, winter heating loads.
CLEANS rain water and maximize biodiversity with local plants.
IMPROVES photovoltaic system efficiency by cooling.

3 **SOLAR THERMAL**
Solar thermal collectors use solar radiation to generate 50%-90% of heat required domestic hot water.
A 450 L tank for a household of 6 people requires 8.8 m^2 of area.

4 **PASSIVE VENTILATION**
Building layout and placement of operable windows are optimized to take advantage of prevailing winds and stack effect to enhance cooling through natural ventilation.

5 **ELECTRIC CAR CHARGING STATION**
An electric car charging station is provided at each of the three parking areas on the property.

6 **DAYLIGHT/VIEWS**
Tall windows, clerestories and light shelves optimize natural lighting and minimize electricity requirements. Windows are located to capitalize on views to the Ottawa River, Peace Tower and gardens.

7 **PERMEABLE PAVING**
The benefits of permeable paving are numerous. It allows for stormwater management, prevents runoff and associated pollution, and replenishes groundwater supply.

8 **SUSTAINABLE MATERIALS**
Maintenance and maximum reuse of existing materials. New materials are selected based on: low/no-VOC; local sourcing; cradle to cradle; renewable; durable/repairable.

9 **GEOTHERMAL ENERGY**
Ground-source heat pump uses ground temperature to supply 70% of heat in the winter and 100% of cooling in the summer. System will consist of six 300m deep wells.

10 **INTERIOR FOREST MICROCLIMATES**
(New Build Interior)
Result in significant reductions in building energy use, operation costs, and resource consumption, while improving building air quality, and occupant well-being.

11 **RAINWATER COLLECTION**
(Existing)
Rain water is captured from the roof, passes through a filter to be purified for potable use and is stored in an underground cistern.
Meets 100% of water requirements.

12 **GREYWATER RECYCLING**
(Existing + New Build)
Greywater comes from sinks, showers and baths, providing 200% of requirements for toilet flushing and irrigation. These systems will reside in the 2 basements.

13 **VEGETATION**
Mature trees protect the escarpment from erosion, provide shelter from wind and enhance passive solar strategies.
Native plants are selected to enhance biodiversity and reduce need for irrigation.

14 **BIOSWALES**
Bioswales collect, filter and infiltrate contaminated stormwater and excess greywater to replenish groundwater and eliminate surface runoff.

15 **COMMISSIONING/ SUBMETERING**
(Existng + New build)
Tracking and analyzing resource consumpton data allows for quick identfcaton of ways to further enhance sustainable performance.

16 **NET ZERO CARBON (ZNC)**
Following from the Government of Canada's *Pan-Canadian Framework on Clean Growth and Climate Change* and using the CaGBC's *'Zero Carbon Building Initiative'*, the design of the rehabilitated house and new Official Wing achieves ZNC.

17 **WIND TURBINES**
The "energy ball" wind turbine is well suited for this site due to its quiet operation and high efficiency at low wind speeds. Six turbines annually produce approximately 600 kWh net.

18 **SOLAR PHOTOVOLTAIC**
Photovoltaic solar panels capture radiation from the sun to generate electricity. A combination of panels and thin film solar shingles provide 200% of electricity requirements.

19 **THERMAL MASS**
(Existing + New Build)
Existing stone walls, placed concrete and stone absorb and store solar heat, keeping the building cool in the day and releasing heat for warmth at night.

20 **SHADING DEVICES**
(Existing + New Build)
Roof overhangs and deciduous trees control solar radiation and heat entering the building to keep it cool in the summer and warm in the winter.

21 **BIKE SHELTER (ALTERNATIVE TRANSPORTATION)**
24 Sussex has easy access to bus route 9 located on Sussex/ Alexander.
The neighbourhood is pedestrian and cyclist friendly Shelter easily stores bikes to encourage family to cycle.

22 **BIOMASS**
(Existing + New Build)
High efficiency boilers burn pellets made from waste sawdust or rice husks to generate supplementary heat. Wood pellets are carbon neutral, renewable and burn cleanly.

23 **SUSTAINABLE REHABILITATION - A**
The existing building is retained, avoiding more landfill, and leveraging embodied energy and carbon.

24 **SUSTAINABLE REHABILITATION - B**
"Building Resiliance: Practical Guidelines for the Sustainable Rehabilitation of Buildings in Canada" is followed for the existing structures. Refer to Conservation Strategies.

24 SUSSEX

CONSERVATION STRATEGIES

PRIME MINISTER'S RESIDENCE, 24 SUSSEX REVITILIZATION

UNDERSTANDING THE BUILDING AS AN INTERCONNECTED ENVIRONMENTAL SYSTEM HELPS IDENTIFY THE OPTIMAL CHANGES AND INTERVENTIONS THAT HAVE THE LEAST IMPACT UPON HERITAGE VALUE AND THE MOST IMPACT UPON SUSTAINABLE PERFORMANCE. THIS "WHOLE BUILDING ECOLOGY" APPROACH GUIDES THE SELECTION OF STRATEGIES WHICH WORK TOGETHER TO REGENERATE THE NATURAL ENVIRONMENT WHILE SIMULTANEOUSLY PRESERVING AND ENHANCING THE HERITAGE VALUES OF THE HISTORIC HOME. THESE "SUSTAINABLE REHABILITATION" HERITAGE CONSERVATION STRATEGIES MAKE IT A SHOWCASE FOR CULTURAL CONSERVATION STEWARDSHIP WHILE FOLLOWING *THE STANDARDS AND GUIDELINES FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA.*

1 SUSTAINABLE REHABILITATION - A
Retaining the existing building reduces landfill, and leverages embodied carbon and energy. It is rehabilitated according to the *"Standards and Guidelines for the Conservation of Historic Places in Canada."*

2 SUSTAINABLE REHABILITATION - B
"Building Resiliance: Practical Guidelines for the Sustainable Rehabilitation of Buildings in Canada" is followed for the existing structures. Go to: Building Resilience

3 MINIMAL INTERVENTION
The retrofit and rehabilitation is executed using a "minimum intervention" approach which aligns and integrates new interventions to minimize disruption to the existing building fabric.

4 INHERENTLY SUSTAINABLE FEATURES
Inherently sustainable design features and systems are evaluated and where possible new interventions work with the historic design intent

5 PRESERVE CHARACTER
A fully integrated design team with heritage and sustainability specialists is employed to thoroughly understand the overall building and site character, character-defining elements, and interrelationships.

6 PAST INTERVENTIONS
Previous interventions, their successes, failures, and performance impacts are evaluated for opportunities to work with new and hybrid solutions to optimize sustainable upgrades and help achieve minimal intervention.

24 AIR-TIGHTNESS
Air leakage sources are investigated and addressed in a manner which limits the impact on character-defining elements.

23 WATER EFFICIENCY
Water and waste efficiency is improved with minimally invasive means such as flow rate regulators, aerators, and more efficient (non-character-defining) fixtures.

22 DURABLE MASONRY
Full rehabilitation of the stone masonry walls and an ongoing maintenance program ensures optimal performance and durability.

21 MAINTAIN ROOF ELEMENTS
Roof elements which have a functional use and/or contribute to character-definition are maintained. This includes cupolas, domes, chimneys and dormers.

20 PROTECT WALLS
Maintenance and/or reinstatement of elements which shield exterior walls and openings, including eaves, soffits and downspouts which limits material degradation.

19 ENERGY GENERATION
Sustainable energy generating equipment is only installed where it respects the exterior form and is compatible with the heritage character of the site.

18 INHERENT ENERGY-CONSERVING FEATURES
Features such as operable windows, louvered blinds are maintained in good operating condition or installed to conserve energy. Interior storms are installed to maintain appearance of original windows.

17 LOCAL MATERIALS
Locally sourced durable materials are use, which are compatible with the local climate and are also considered historically appropriate and sustainable (due to low embodied energy).

7 SUSTAINABLE MATERIALS
Existing materials are maintained and reused to the maximum extent. New materials are selected based on: low/no-VOC; local sourcing; cradle to cradle; renewable; durable/repairable.

8 REINTERPRETING MISSING ELEMENTS
Only three major new exterior interventions (oriel window, bow window and porte cochere) are incoporated, all of which reference and interpret previous elements of the historic building.

9 RETROFIT WOOD WINDOWS
Historic windows are repaired and upgraded with low-e glass, weather stripping and storm windows for energy and cost saving exceeding new double glazed windows.

10 ANOTHER HOUSE ON THE STREET
The new addition is separated from the historic building and is scaled and modelled to be like another house on Sussex. Massing, distance, material harmony and design keep new elements compatible.

11 THERMAL MASS
(Existing + New Build)
Existing stone walls and strategically placed concrete absorb and store solar heat, keeping the building cool in the day and releasing heat for warmth at night.

12 MAINTAIN LANDSCAPE
Large scale landscape elements which shade the building, moderate climate impact and erosion are maintained. This includes mature trees, other vegetation and hardscape patterns.

13 PASSIVE VENTILATION HEATING AND COOLING
Contemporary HVAC strategies, augmented by layout and operable windows to take advantage of air flow, shade and sunlight. Monitoring equipment allows mechanical systems to adjust to local conditions.

14 LOCALIZED CONTROLS
Opportunities to locally control systems with central overrides ensures that the building system is the "right size."

15 INSULATION
By studying how the building envelope and systems behave together, thermal insulation can be installed in non-character defining spaces, (ex. the attic), without adversely affecting the building envelope (ex. thermal bridge, new dew point).

16 ACTIVE HEATING AND COOLING
More efficient heating/cooling sources which reuse the same ductwork, conduits and/or piping replace less-efficient and or designated-substance containing systems.

24 SUSSEX

STANDARDS AND GUIDELINES

PRIME MINISTER'S RESIDENCE, 24 SUSSEX REVITILIZATION

THE PRIME MINISTER'S RESIDENCE WILL BE A NATIONAL MODEL OF CULTURAL CONSERVATION AND NET POSITIVE DESIGN. REVITALIZATION OF THE HISTORIC HOME IS DESIGNED AND EXECUTED ACCORDING TO THE "STANDARDS AND GUIDELINES FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA" (SGCHPC) AND WITH RESPECT FOR THE STATEMENT OF HERITAGE VALUE. THE CONSERVATION APPROACH INCLUDES AN EMPHASIS ON THE BUILDING'S COLOURFUL EVOLUTION; THE PROPOSAL IS THE LATEST CHAPTER IN ITS HISTORY. SPECIFIC APPLICABLE STANDARDS AND THEIR CONSERVATION/DESIGN RESPONSE ARE OUTLINED HERE.

ADOPT AN APPROACH OF MINIMAL INTERVENTION (STANDARD 3)

Most of the historic building is simply repaired and preserved with no other intervention.

NEW WORK IS REVERSIBLE (STANDARD 12)

Interventions are not destructive to the historic house so that in the event that the new work is removed in the future, the historic form and integrity will be preserved.

NEW WORK SHOULD BE PHYSICALLY AND VISUALLY COMPATIBLE WITH , SUBORDINATE TO AND DISTINGUISHABLE FROM THE HISTORIC PLACE (STANDARD 11)

Only three new exterior interventions are incorporated, all of which reference and interpret previous elements of the historic building such as the bow window, oriel window and porte cochere. These contemporary interventions are compatible through proportion, scale, massing, "light touch," and materials palette. They visually connect with the new Official Wing, harmonizing the two.

The new addition is separated from the historic building (connected by an underground tunnel) and is scaled, modeled to be compatible, somewhat like another home on the street, despite its more formal use. Careful massing and distancing are complemented by material harmony and design elements that help to keep all new elements compatible with, subordinate to and distinguishable from the historic place. Character-defining views from the street and river are retained essentially unchanged while the addition blends in with the surrounding landscape.

Photos of building evolution show key elements of bay window/tower (purple); entry protection (green); and feature window (gold). The new rehab takes its cues from these historic elements and expresses them using contemporary cultural ideas and technologies.

FIND A COMPATIBLE USE WHICH REQUIRES MINIMAL CHANGE TO ITS CHARACTER-DEFINING ELEMENTS (STANDARD 5)

24 Sussex was originally a single family home, first for the lumber barons, and then for the Prime Ministers. Rather than forcing the ever-expanding functional requirements of the Prime Minister's Residence into the historic house, a new Official Wing (1600 m2) is proposed, allowing the house to revert to a purely residential function and retain maximal heritage character. Due to a variety of factors, the existing pool house is in poor condition and a candidate for dismantling. This helps to further minimize disturbance to the historic landscape, and in fact, the contemporary grows out of the landscape.

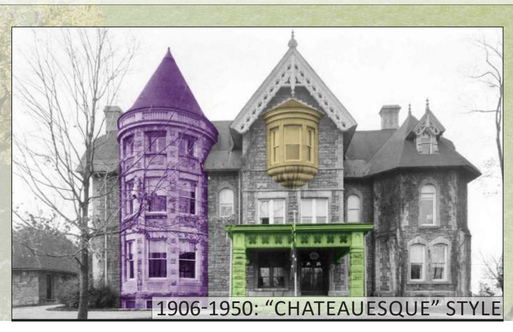
CONSERVE CHANGES THAT OVER TIME HAVE BECOME CHARACTER-DEFINING IN THEIR OWN RIGHT (STANDARD 2)

The evolutionary nature of the home - from Gothic Revival to "chateauesque" to a formal and restrained design – is one of its key character-defining features. Although the 1949 changes are typically associated with a significant loss of heritage character, features from this era such as the grand staircase and front entrance tympanum have become associated with the identity of 24 Sussex and are preserved in the proposed design.

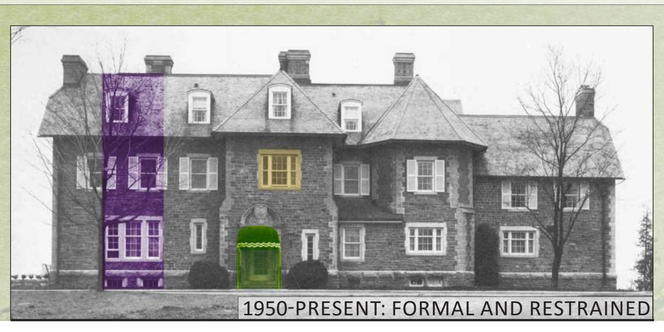
MAINTAIN AND REPAIR CHARACTER-DEFINING ELEMENTS (STANDARD 8)

The vast majority of the house's fabric and character-defining elements are preserved. Rigorous maintenance reduces long term costs and the frequency of major interventions. Prioritizing maintenance and repair ensures maximum retention of historic materials and character-defining elements. This is critical to the sustainability strategy because it conserves the embodied energy/carbon of existing materials.

1866-1905: GOTHIC REVIVAL



1906-1950: "CHATEAUESQUE" STYLE



1950-PRESENT: FORMAL AND RESTRAINED

2018 & BEYOND: ZERO NET CARBON REHABBED HERITAGE HOME