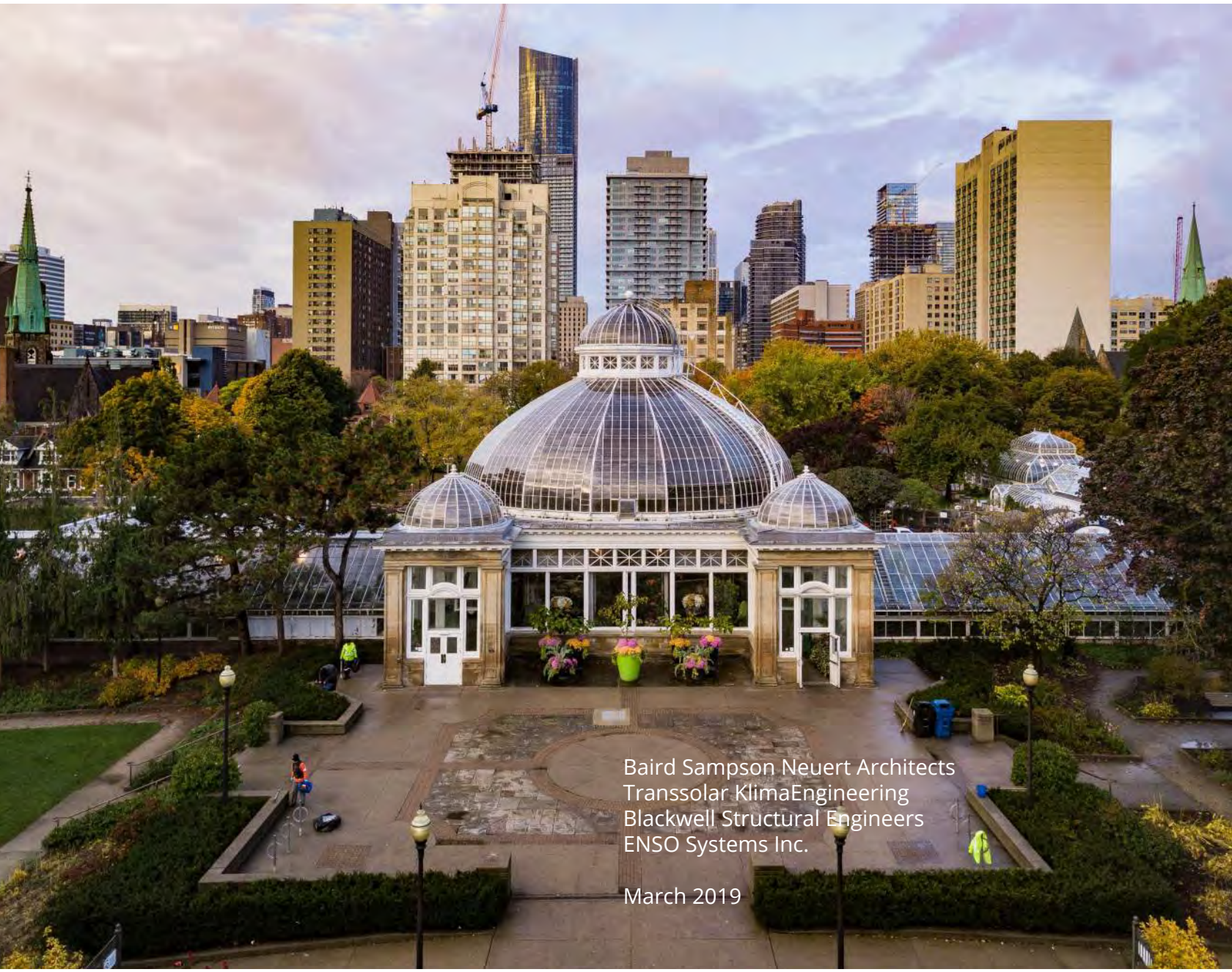


ALLAN GARDENS ARCHITECTURAL VISUALIZATION STUDY



Baird Sampson Neuert Architects
Transsolar KlimaEngineering
Blackwell Structural Engineers
ENSO Systems Inc.

March 2019

ACKNOWLEDGEMENTS

The land on which Allan Gardens exists has been the traditional land of the Huron-Wendat, Petun, Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still home to many Indigenous people from and across Turtle Island and we are grateful to have the opportunity to work in the community, on this territory. We are mindful of broken covenants and the need to strive to make right with all our relations.

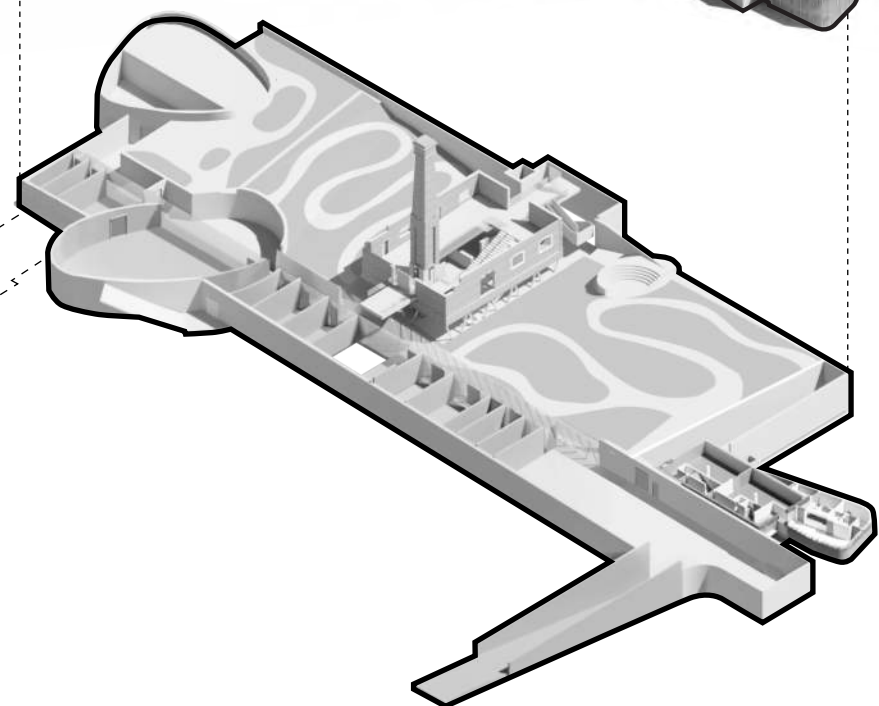
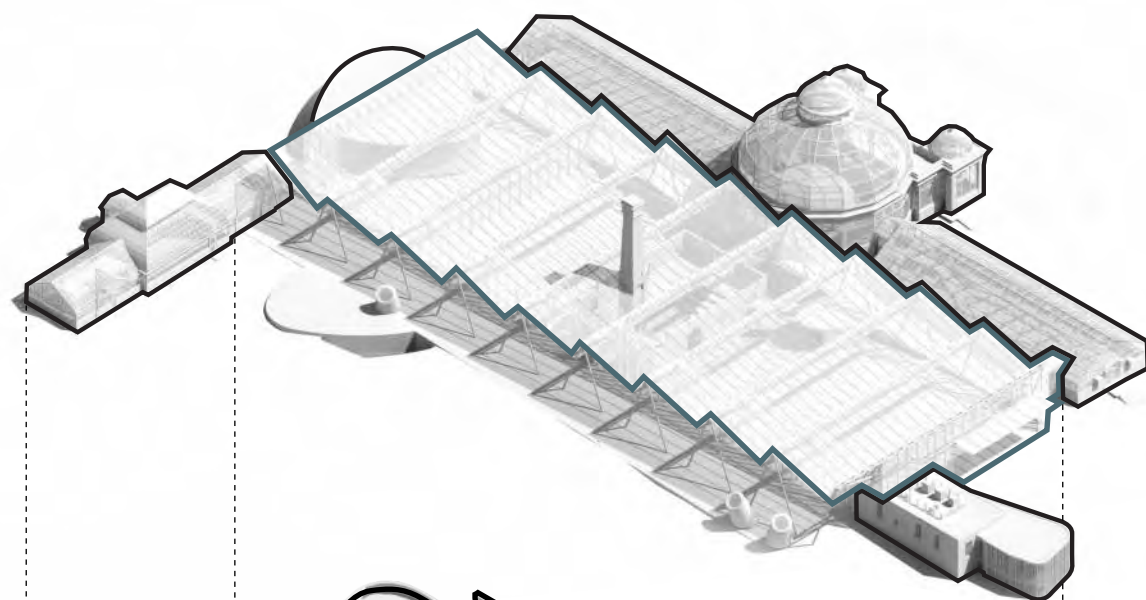
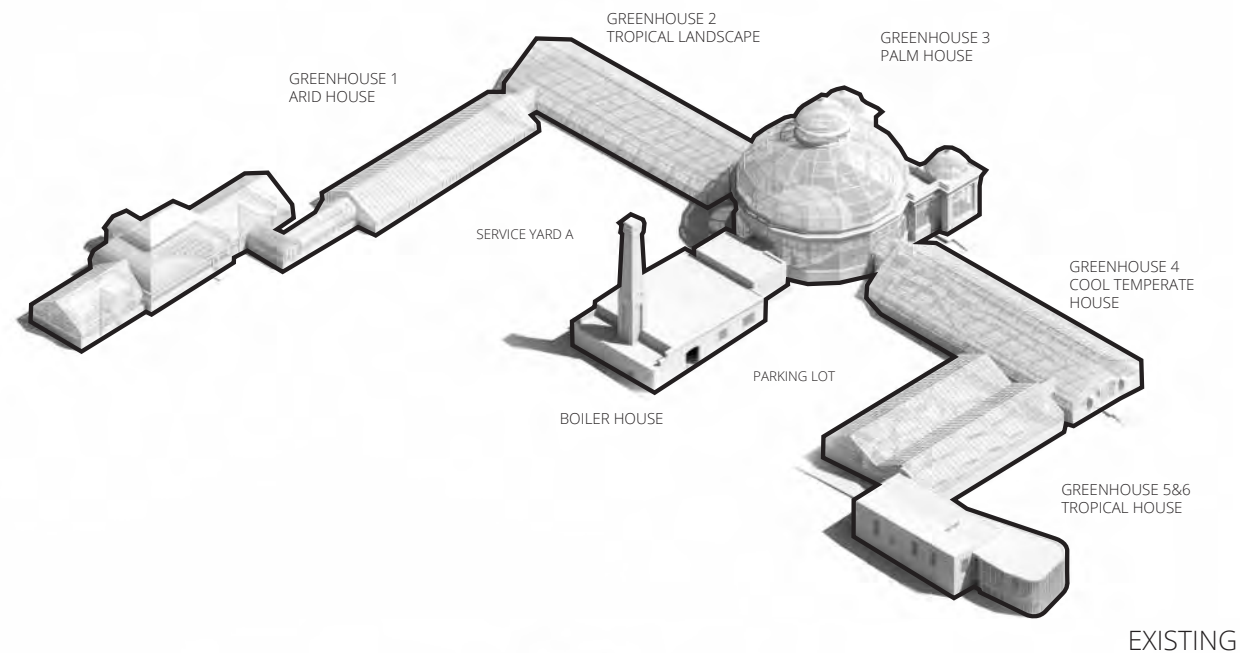
Ideas and recommendations set forth in this study report were collaboratively developed using input and guidance provided by various stakeholders at the City of Toronto, Friends of Allan Gardens (FOAG), and outside organizations. Project study participants are noted below:

Steering Committee

Tara Coley (Project Manager)	City of Toronto
Garth Armour	City of Toronto
Curtis Evoy	City of Toronto
Doug Bennet	City of Toronto
Michelle Reid	City of Toronto
Michael McClelland	Friends of Allan Gardens
David Winterton	Friends of Allan Gardens

Consultants

Jon Neuert (Project Lead)	BSN Architects
Joseph Kan (Project Architect)	BSN Architects
Adeline Chum (Team Member)	BSN Architects
David Bowick (Structural)	Blackwell Engineering
Renee Mackay-Lyons (Structural)	Blackwell Engineering
Erik Olsen	Transsolar KlimaEngineering
Felix Thumm	Transsolar KlimaEngineering
Jacqueline Rueping	ENSO Systems Inc.
Alex Turkewitsch	Greenhouse Engineering



EXECUTIVE SUMMARY

Over the years a series of masterplans and revitalization studies have been commissioned for Allan Gardens, which have recently culminated into a new vision document authored by Friends of Allan Gardens entitled “Refresh”, which sets out a call for action and a holistic vision of opportunities for revitalizing Allan Gardens.

The Allan Gardens Visualization Study focuses exclusively on the conservatory, outlining and synthesizing stakeholders’ aspirations into an architectural proposal for expanding the Conservatory as a 21st century model for horticultural excellence and sustainability. The conservatory addition will extend its capacity to serve as a local and regional destination that is inclusive and accessible. It incorporates programming initiatives outlined in the *2018 Best Uses and Operational Model Study* which was developed in tandem with this study.

Connecting people, plants, and place, the conservatory addition will establish a flexible community hub. Retaining and amplifying the essential heritage architectural elements of the historic Sherbourne Street frontage, the addition provides a major expansion to the conservatory’s horticultural experience, while accommodating new capacity for hands-on learning, diverse educational, cultural and community programming. It establishes a new civic presence and entrance facing Jarvis Street, which serves to interconnect the east and west sides of the park, while reaffirming the Palm House as the architectural focal point of the Gardens. Conceived to holistically advance sustainability objectives outlined in the report *Growing Opportunities: Investing In, Revitalizing and Sustaining Opportunities in Allan Gardens*, the design concept supports long-term financial stability and growth through flexible adaptive programming that enables concurrent operations of private functions and public visitation, promotes long-term maintainability/ state of good repair initiatives, and establishes a bold leadership position regarding environmental stewardship based on a carbon free / net zero energy future.

The key design principles and features of the conservatory expansion concept plan include:

- Developing an experientially immersive horticultural environment that showcases globally important communities of plants and enables cross cultural connections, storytelling, horticultural and stewardship education, and spaces for personal reflection.
- Increasing horticultural display space by nearly 70%, experienced from diverse and accessible pathways. Proposed new biomes include a Fern House, an Orchid House, Fruits and Spices collection, an expanded Arid Collection, and a Tropical Rainforest House.

- Re-evaluating, re-conceptualizing and re-connecting the collection of exotic plants with indigenous culture locally and globally.
- Providing new capacity to deliver inclusive educational programming, outreach opportunities, bookable community space, and new park operations facilities.
- Preserving the pre-eminence of the historical landmark building by limiting the height of the addition below the spring point of the Palm House.
- Limiting the footprint of the 43,000 sq. ft. addition to fit within existing parking and building areas, so as to not diminish park space.
- Removing existing production greenhouses 1, 4, and 5 due to inadequate ceiling height and general unsuitability as a horticultural display environment.
- Providing new urban linkages that strengthen the Garden District and establish a civic presence for the Conservatory along the Jarvis St. frontage that allows visitors to view the collection at an urban and intimate scale.
- Extending Horticultural Lane as pedestrian walkway and urban scaled colonnade that extends across the western side of the addition.
- Maintaining and activating the traditional Palm House Entry by linking it with a new Jarvis Entry that together establishes a through route that interconnects the eastern and western sides of the park.
- Providing a 250 seat Community Hall with direct access on Carleton St. to enable separate programming opportunities with the conservatory.
- Delivering new educational and service facilities that preserve the transparency of the Conservatory and reduce impacts on the park through the development of below grade spaces that are provided with views to the Conservatory and direct public access.
- Repurposing and re-imagining the Boiler House as a garden pavilion, central organizing, and orientation space.
- Enable a unique food and cafe opportunity that is situated along the addition’s southern exposure and extends and connects to the park with an outdoor patio.
- Creating an exemplar for sustainable design - demonstrating that it is possible to operate a modern conservatory without adding demand for energy, water or carbon emissions, and further ‘green’ parks operations through the use of electric vehicles on-site.
- Achieving net-zero energy and carbon neutral design outcomes using on-site renewable energy from integrated building photovoltaics and geothermal heating and cooling.
- Harvesting rainwater from the glass roof into a rain garden and cisterns that will provide all the irrigation and water needs for the addition.
- Recycling and treating sewage using a plant based ‘Living Machine’ which will enable sustainable use of water.



1. PROJECT PROCESS & METHODOLOGY

Major objectives and activities outlined in the terms of reference issued by the City for the Visualization Study are summarized following:

- Incorporate findings of the *Allan Gardens Best Uses and Operating Model Study* (separately commissioned by the City ahead of the visualization study)
- Explore how new spaces and infrastructure will relate and coexist with the current heritage buildings, and provide solutions to existing space limitations
- Determine the look and feel of a conservatory addition and provide a Class D construction cost estimate

The Study was organized into an initial Stage 1 information gathering phase which included meetings with stakeholders. A Stage 2 design included a costing and reporting phase. The Visualization Study was developed concurrently with the Allan Gardens Best Uses and Operational Study which was separately commissioned by the City and undertaken by Lord Cultural Resources, which enabled interaction across the two studies. This study commenced in January 2018 and concluded in March 2019.

At the direction of the City and confirmed with key stakeholders, the Visualization Study focused exclusively on the Conservatory (i.e. architecture) and does not address overall park design, outdoor programming, site access considerations, or interior horticultural design and programming. Similarly, landscape design elements were excluded from the Study's terms of reference. These contextual considerations inevitably arise when planning for major facility expansion and have been briefly addressed in this study to support the design rationale for the proposed concept plan.

The planning and concept design process evolved through a close working relationship between the integrated design team, project steering committee, the general public, and stakeholders as outlined following:

Integrated Design Team

The design was developed by a team and included consultants lead by Baird Sampson Neuert Architects, Transsolar, and Greenhouse Engineering.

- BSN collaborated closely with Lord Cultural Resources on the development of the Functional Program Report (See Appendix E) that was informed by the needs and concerns of stakeholders and the general public. It also took into consideration the constraints of the existing site regarding appropriate facility size and scale.

Priority was placed on establishing a framework for sustainability at the early stages of design. BSN and Transsolar led a sustainability workshop in September 2018. A core idea was to strive for a net zero carbon and energy building design. Findings and recommendations are summarized in *Section 3.5 Steering Committee*.

Steering Committee

The study's recommendations were developed through a series of six consultation sessions with the steering committee, consisting of City of Toronto Staff and Friends of Allan Gardens (FOAG). This included a design workshop, that was held with FOAG to establish key urban concepts.

A questionnaire was also circulated to City Staff to understand the challenges of the Conservatory.

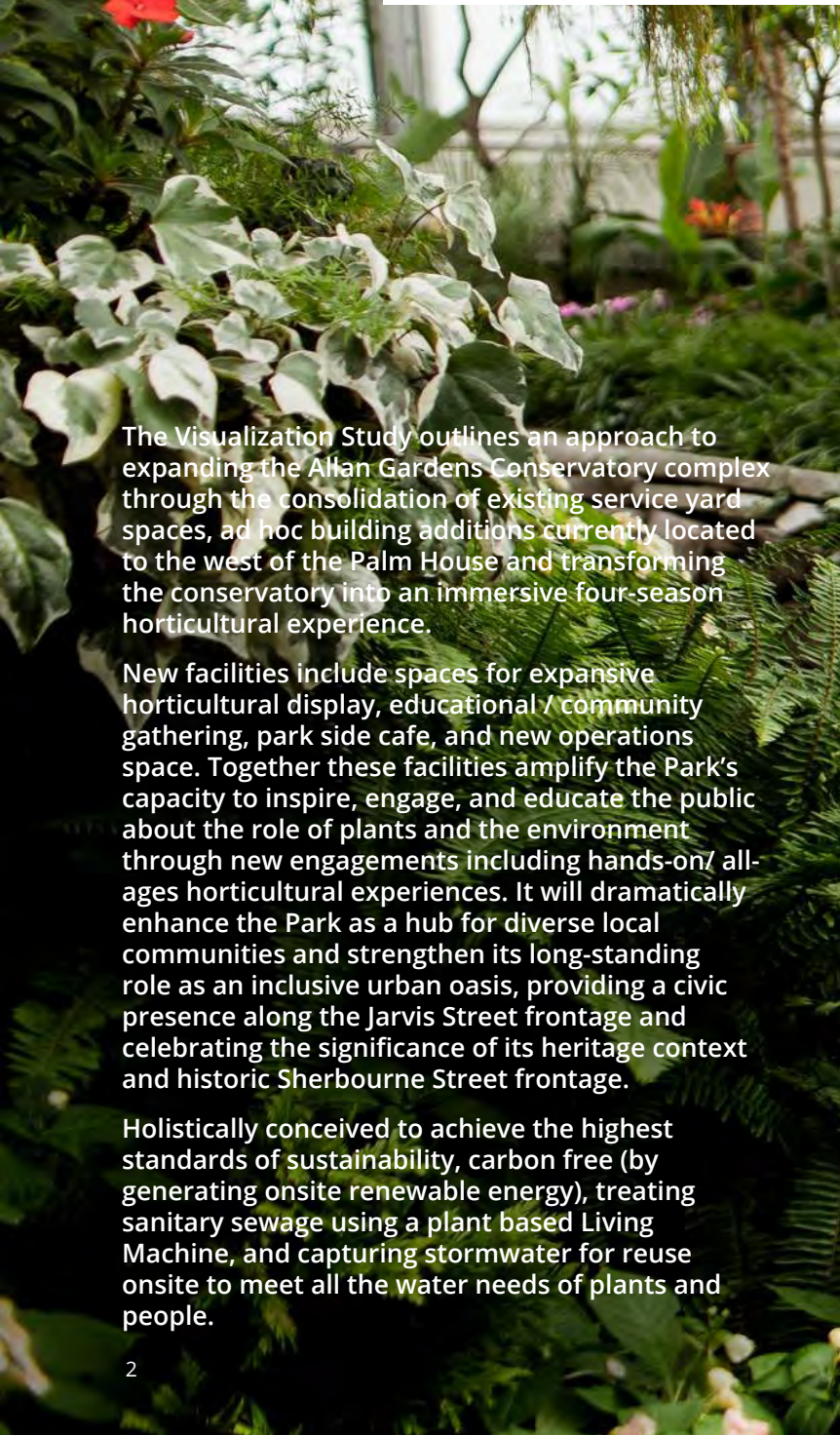
General Public and Stakeholders

Two meetings for community consultation were organized to listen to the concerns and needs of the general public. The first meeting held on May 9th invited all members of the community and had over 65 participants. This meeting focused on programming considerations.

Key stakeholders participated in a second meeting on August 16th and about 25 people attended.

Information was synthesized into a design concept, which was presented to the client steering committee group in October 2018.

The draft study report was provided to the City in December 2018 for final review and comments, with the final report issued in early 2019.



Note: Site improvements west of Addition are not shown

The Visualization Study outlines an approach to expanding the Allan Gardens Conservatory complex through the consolidation of existing service yard spaces, ad hoc building additions currently located to the west of the Palm House and transforming the conservatory into an immersive four-season horticultural experience.

New facilities include spaces for expansive horticultural display, educational / community gathering, park side cafe, and new operations space. Together these facilities amplify the Park's capacity to inspire, engage, and educate the public about the role of plants and the environment through new engagements including hands-on/ all-ages horticultural experiences. It will dramatically enhance the Park as a hub for diverse local communities and strengthen its long-standing role as an inclusive urban oasis, providing a civic presence along the Jarvis Street frontage and celebrating the significance of its heritage context and historic Sherbourne Street frontage.

Holistically conceived to achieve the highest standards of sustainability, carbon free (by generating onsite renewable energy), treating sanitary sewage using a plant based Living Machine, and capturing stormwater for reuse onsite to meet all the water needs of plants and people.

2. ASPIRATIONS FOR A RENEWED CONSERVATORY

Community aspirations and key findings from Stage 1, including information gathered from staff, users, and stakeholders on the Conservatory are summarized in the following (See Appendix F for further information):

A More Inclusive Space

Allan Gardens serves a wide range of the public, from neighboring residents, to horticultural lovers, Indigenous communities, tourists, school groups, seniors, as well as many vulnerable groups.

The following themes and priorities were identified by the community in two forums held in May and August of 2018.

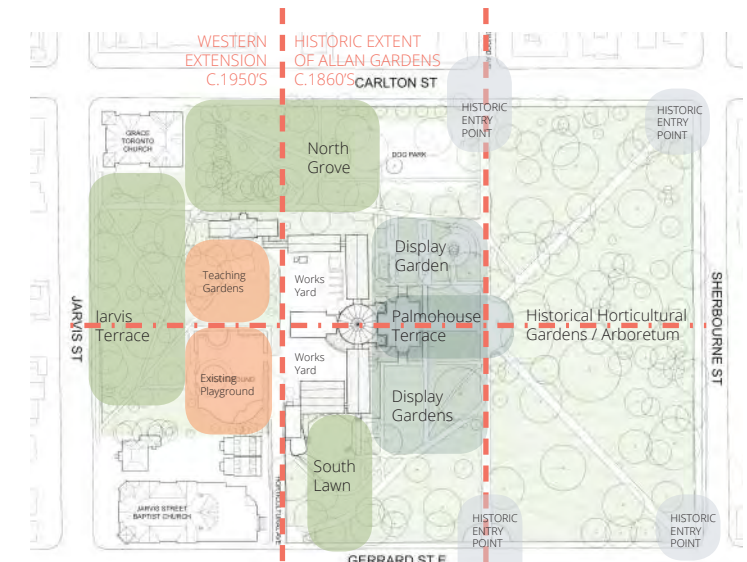
- Need for more Community and Public Space
- Inclusivity and Accessibility
- Public and Educational Programming
- Recognition and Reconciliation of Indigenous Peoples
- Interpretation and Collection
- Safety
- Partnerships & Collaboration with Educational & Community Service Providers
- Greater Social Imperative
- Better Amenities
- Better Communications (what is going on)
- Healing and Wellness
- Storytelling and Medicine Walks

These priorities were incorporated into the *Operating & Best Uses Study and Functional Program Report*, and forms the programming basis of the Conservatory expansion.

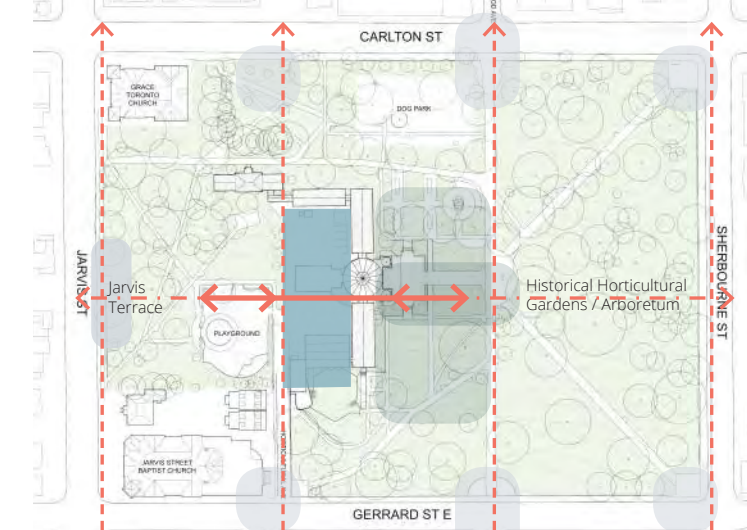
A Human Scaled Public Realm

In consultation with FOAG, urban design guidelines were developed for the expansion project:

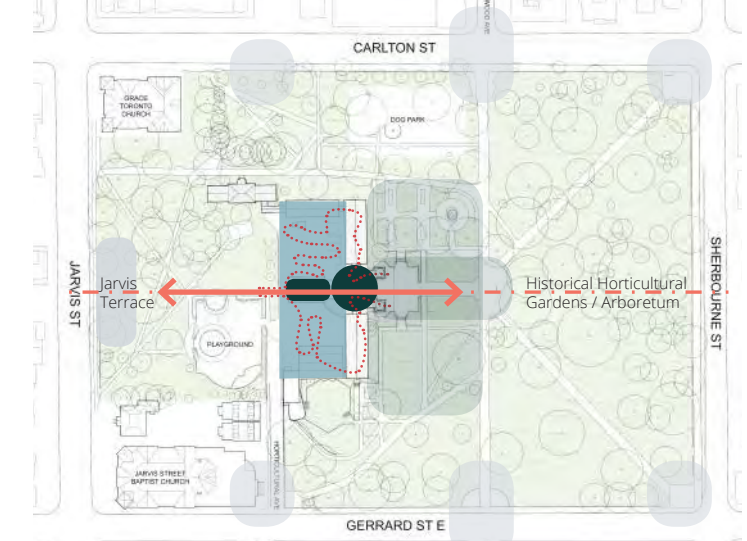
- Maintain Pre-eminence of 1910 Palm House
- Advance Design Excellence and Sustainability
- Limit Footprint East of Horticultural Avenue
- Improve East-West Park Connections
- Enhance Interior Circulation / Visitor Experience
- Provide Pedestrian Friendly Multi-Use Exterior Routes
- Complementary New Jarvis Entry
- Public Friendly Works Yard
- Adapt Boiler House for New Public Use
- Incorporate Existing Park Features
- Considers Programming Opportunities with Neighboring Buildings



Re-establish Civic Presence Along Jarvis St.



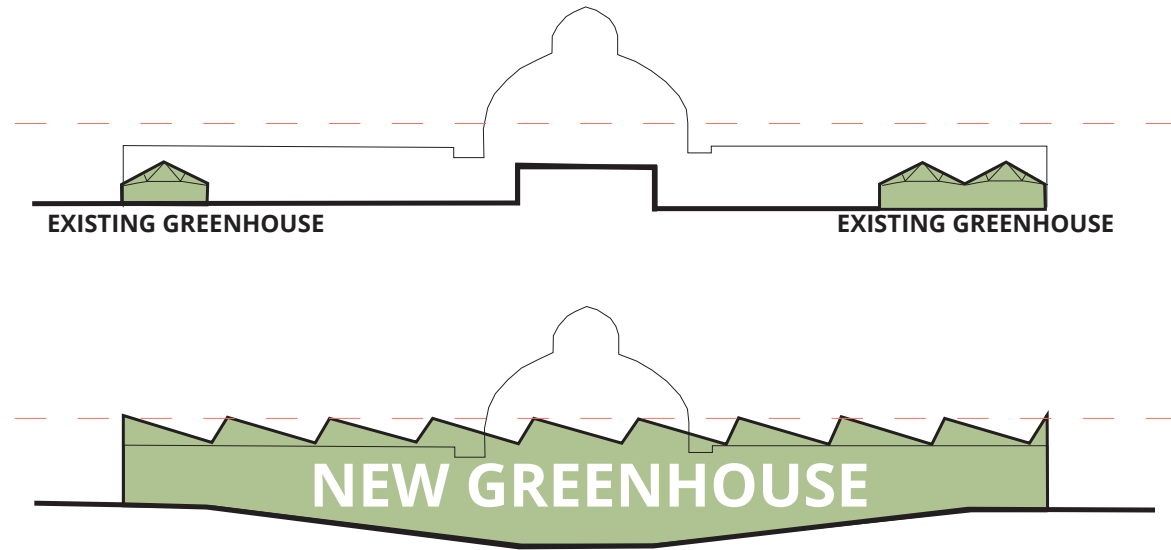
Historic Opportunity: Link Community, Building & Landscape



Historic Opportunity: Link Building / Horticultural Experience

3. PROJECT VISION

The concept expands the Conservatory's historic role as a place of horticultural excellence and inclusive social heart within a beloved urban park. As an exemplar of sustainable community development, it enables diverse learning opportunities that explore the connection between plants, people, and place - re-energizing the Gardens as a civic destination for the community and the city.



The expanded Conservatory provides an inclusive environment that engages our vital relationship with plants, leveraging its unique setting to promote strong community roots, health, and wellness, while providing learning opportunities that strengthen our relationship with plants and help to bring this relationship back into balance.

The conservatory expansion provides a major and timely opportunity to re-evaluate, re-conceptualize and re-connect 'exotic' plants with indigenous culture both locally and globally. The recent monumental mural project "Nindinawemaaganidok / All My Relations", which wove its way through Allan Gardens from 2012-2016, points to a new direction. It provides an inspirational pathway for interconnecting the exotic horticultural collection with the healing, spiritual, and cultural power for which many plants are recognized and are valued by indigenous global communities.

The expanded Conservatory will provide complementary new facilities that include:

- An experientially immersive horticultural environment that showcases globally important communities of plants and enables cross cultural connections, storytelling, horticultural and stewardship education,

- as well as intimate spaces for personal reflection.
- Community gathering spaces to enable healing, celebration, and engagement.
- Flexible 'hands-on' spaces for experiential learning, mentoring, and personal enrichment.
- Spaces to support community involvement and engagement with the broader park setting.
- Improved operational facilities for staff.

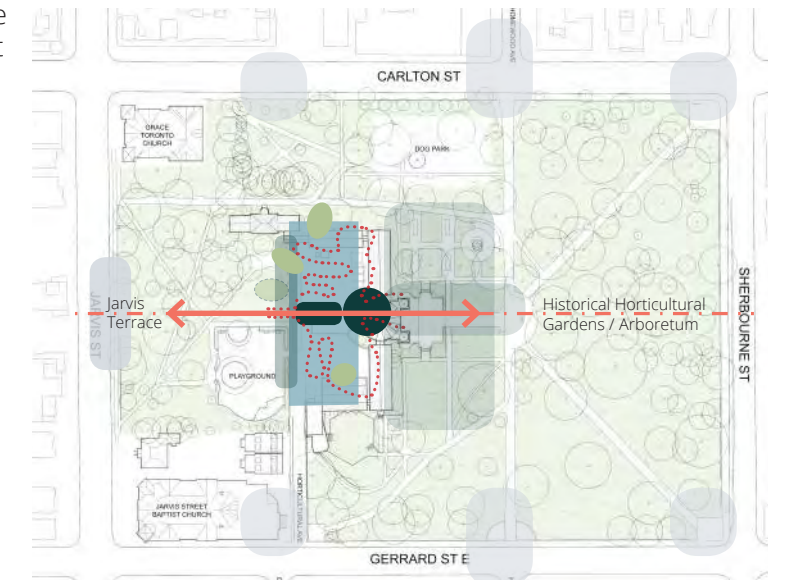
Limited Building Footprint and Height

As per design guidelines established at the outset with stakeholders and FOAG, the footprint of the expanded facility is proposed to be limited to areas east of Horticultural Avenue. The concept plan proposes nearly 70% expansion of horticultural display space without any reduction to parkland. This is achieved through the proposed removal and replacement of the ad-hoc commercial greenhouse additions to the west (i.e. greenhouses 1, 5, and 6 based on numbering system in current use) which were relocated from CNE grounds in the 1950s, and the reuse of existing parking, wheel trans drop-off, and service yard areas for the footprint area of the new conservatory addition. The existing greenhouses proposed for removal were designed and purpose built for commercial plant/agricultural production with low ceiling heights and were never intended either for permanent horticultural display nor access by the public.

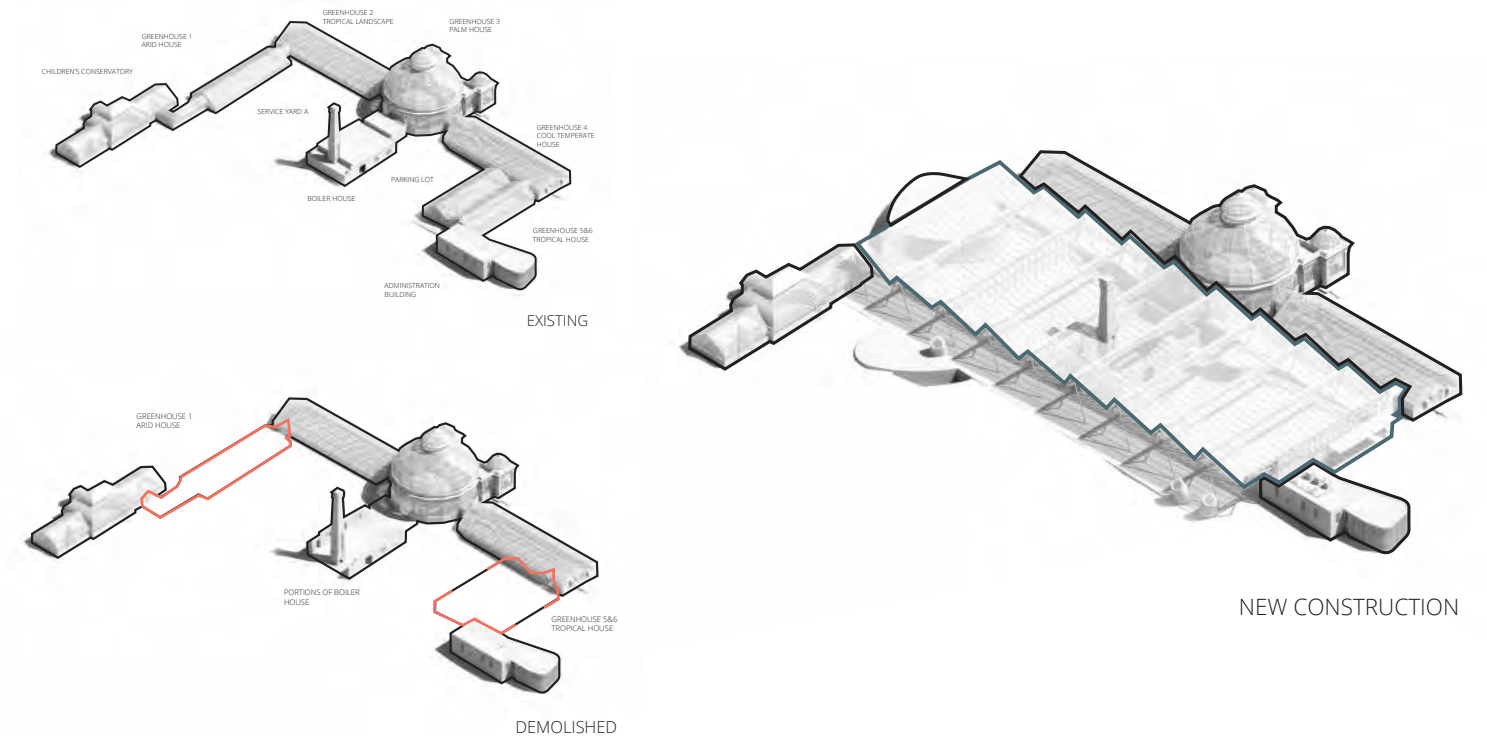
New Space to Grow

In order to preserve and maintain the pre-eminence of the historic Palm House, the height of the addition will be limited as per design guidelines established at the outset of the project and will not exceed the base of the Palm House dome. This height constraint, while significantly improved as compared to existing greenhouses proposed for removal, still presents implications for plant material selection, growth opportunities, and plant maintenance. To address this, two mitigation measures were adopted which also provide synergies and benefits for other aspects to the facility design concept. First, an inclined landscape topography is proposed which cuts down into the site to accommodate taller plants, and second, the saw-tooth roof profile will accommodate the canopy of large specimens growing to the full height of the roof when coordinated with the planting plan. Together, these measures enable significantly larger plant material than can be accommodated as compared to the previous existing greenhouses, as well as the Greenhouses 2 and 4 that flank the Palm House which only allow clearances from 5.5 meters up to 9 meters.

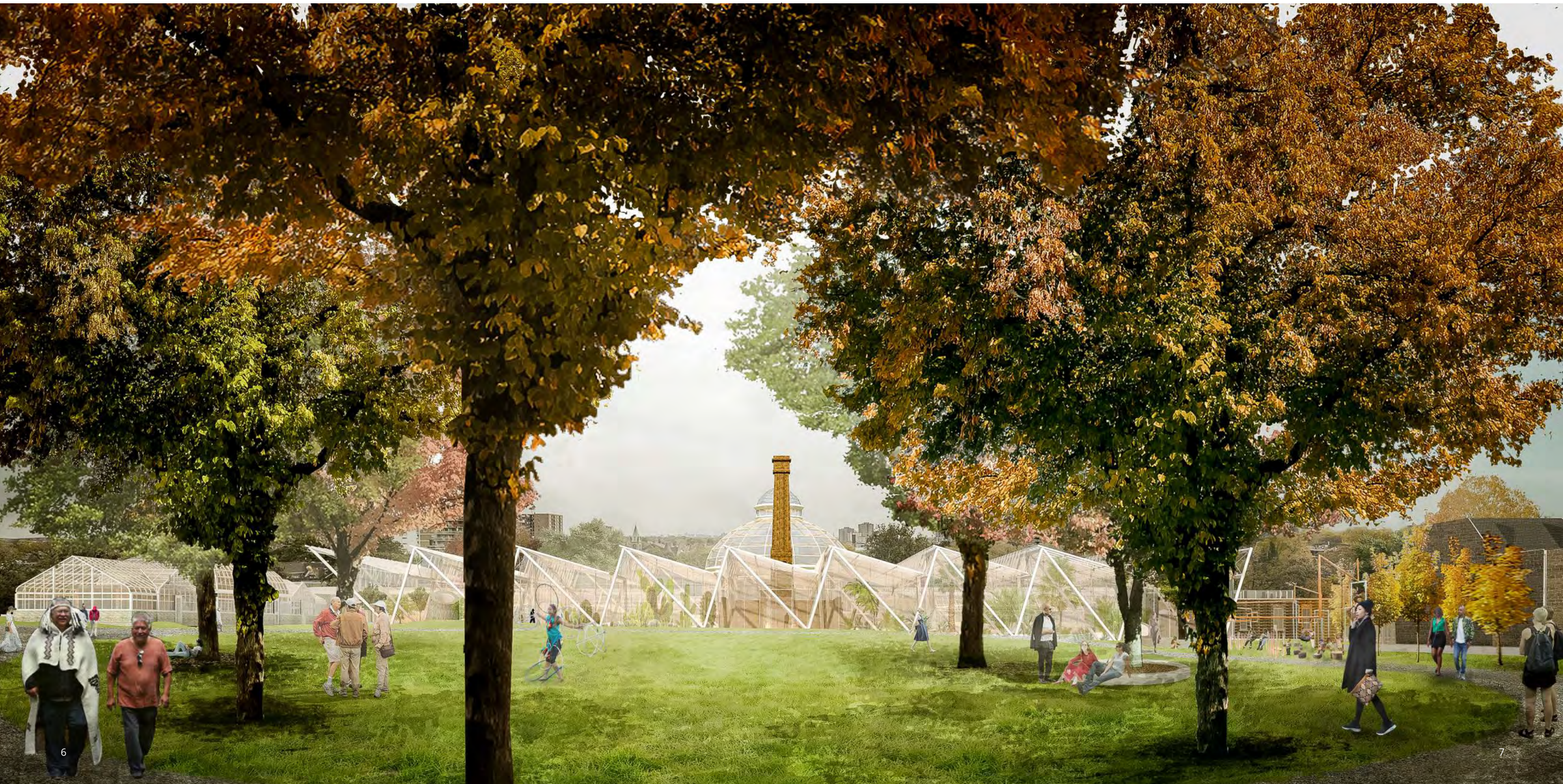
This inclined interior topography enables other opportunities including the development of an experientially rich and fully accessible three dimensional interior landscape. It also enables new programme spaces below the Horticultural Avenue promenade, with direct views into the Conservatory.

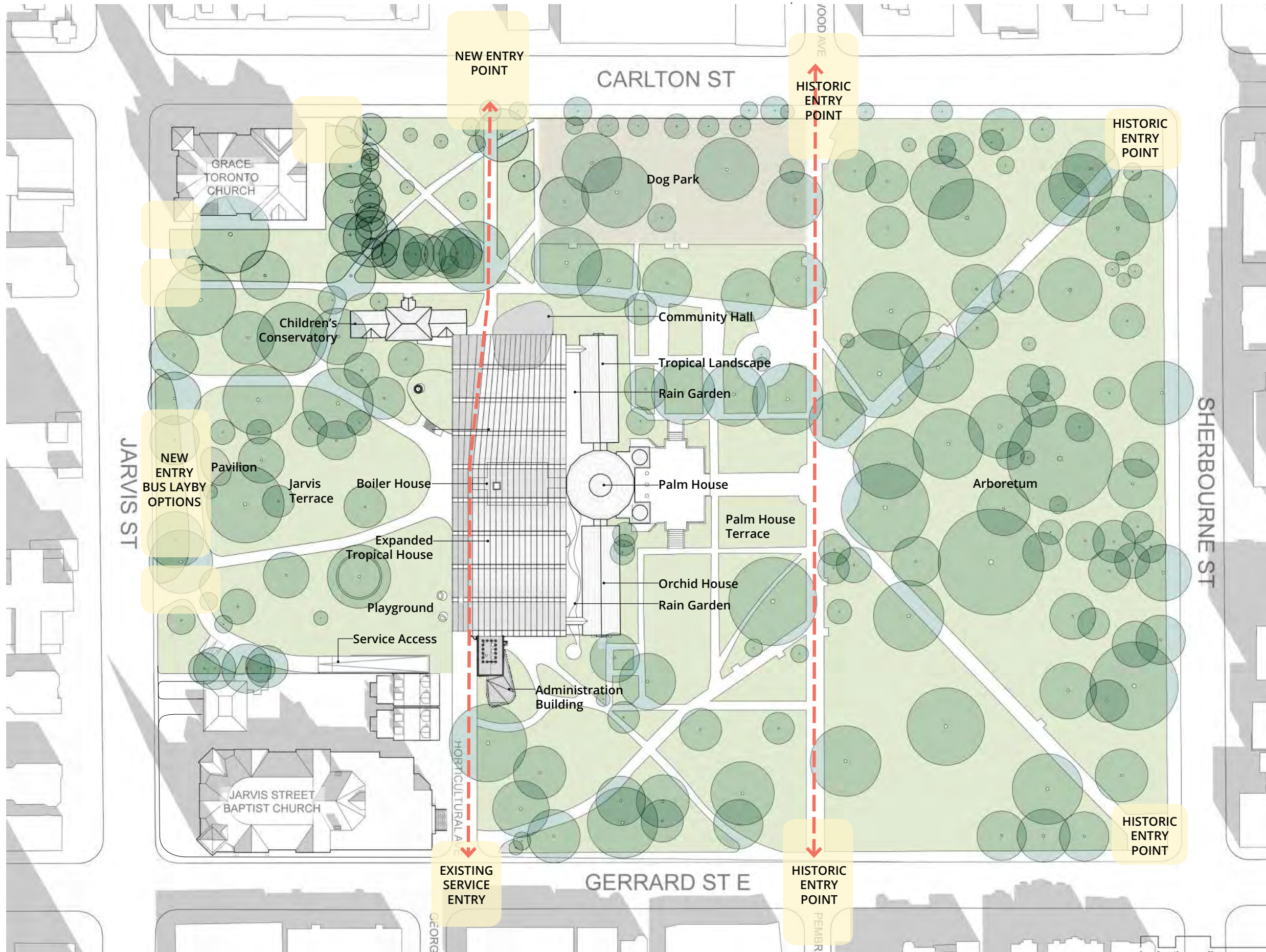


Historic Opportunity: Link Building & Complementary New Programming



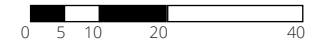
A CIVIC PRESENCE ALONG THE JARVIS STREET FRONTAGE IS ESTABLISHED BY CREATING AN URBAN PORCH AND TRANSPARENT FACADE THAT ALLOWS VISITORS TO VIEW THE CONSERVATORY COLLECTION AT AN URBAN AND INTIMATE SCALE.





HISTORIC
OPPORTUNITY: LINK
COMMUNITY / LINK
BUILDING

SITE PLAN (NTS)



- ENTRY POINT
- MAIN ROUTE

3.1 CONNECTING PARK AND CITY

Allan Gardens is part of the larger Garden District that extends southward to Moss Park. This idea dates back to the early lot system of the City and to keen horticultural interest of G. W. Allan for which the gardens are named. Allan Gardens and its park buildings have been designed to face easterly towards Sherbourne Street, with rear service areas facing what was formerly a mid-block laneway. The Jarvis Street frontage of today's Allan Gardens historically provided a major institutional and cultural presence through its churches and the former Toronto High School. Since the demolition of the School in 1928 and other buildings, there has never been a comprehensive plan implemented for this significant public space.

The conservatory addition represents a historic opportunity to consolidate and expand the legacy of the park and its presence within the urban fabric. It provides opportunities to create a new civic scaled presence along Jarvis Street, and to consolidate and extend north-south pedestrian linkages to further interconnect the Garden District. This initiative also provides opportunities to re-evaluate, reorganize and repurpose the existing conservatory complex to provide greater cohesiveness and linkages within the Park.

In its current configuration, the massing of the conservatory fragments the park into eastern and western areas. The new addition addresses the urban challenges of the site and enables new east-west park linkages, while enabling improved access for service and special needs vehicles.

1 North- South Pedestrian Promenade
Horticultural Avenue is proposed to be extended as a pedestrian friendly, multi-use urban promenade connecting George Street to the south and to Carlton on the north. Accommodating occasional use, one way vehicular service and special needs vehicles, it is intended to operate in a manner similar to the pedestrian walkway to the west connecting Homewood and Pembroke.

2 Complementary Jarvis Entry
The Horticultural Avenue promenade will extend across the face of the addition as a covered urban scaled porch that addresses the Jarvis Terrace and street beyond. It will include a new western facing Jarvis Entry to the conservatory complex.

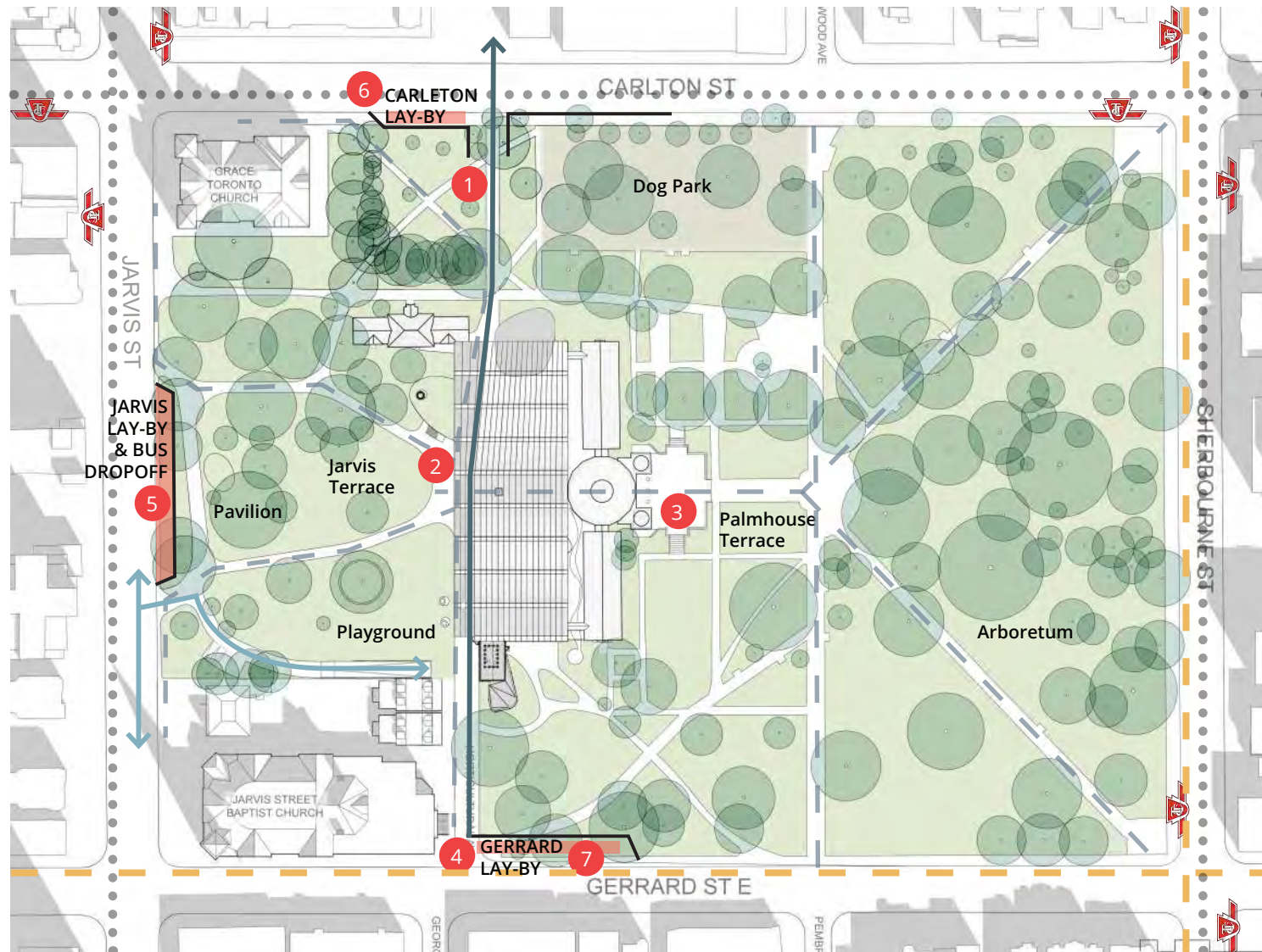
3 East-West Park Connection
The new Jarvis Entry will form part of a publicly scaled east-west park connection which utilizes and maintains the traditional role and prominence of the Palm House Entry addressing Sherbourne Street. Users of the park can now cross the park from Jarvis, through the building to Sherbourne on the east.

4 Gardens, Not Parking
While outside the terms of reference, parking access and drop off recommendations indicate that Allan Gardens parkland is not to be used for general public parking. This study recommends the City adopt planning policies to require the provision of publicly accessible parking when approving new development at the perimeter of the site. Parking on-site will be limited to special needs parking, emergency response, wheel-trans, and interim use City service vehicles. All parking, vehicle access, and drop off considerations require further study and feasibility analysis.

Potential Dropoff Locations

5 Jarvis Street:
This drop off location can be developed as a curbside layby / landscaped laneway for bus pick-up and drop-off for school groups. Development could include a covered entry canopy to provide amenity during inclement weather, increase civic presence along Jarvis, and serve as a multi-use structure for staging events in Jarvis Terrace. This drop-off system could also be developed as a route for both park service vehicles, wheel trans drop off, and limited special needs parking in close proximity to addition, as well as service access to below grade service functions.

6 Carleton Street / Gerrard Street:
7 Similar to the Jarvis Street drop off, these two landscaped drop off / lay-by locations could be developed for park service vehicles, wheel trans drop-off and limited special needs parking.



SITE PLAN (NTS)

- SERVICE VEHICLES
- WHEELTRANS (ONE WAY)
- TTC
- POTENTIAL BUS LAY-BY
- BICYCLE ROUTE
- PEDESTRIAN ROUTE



AT NIGHT, A LIGHT BOX WITH AN ILLUMINATED INTERIOR LANDSCAPE AND HERITAGE ARCHITECTURAL ELEMENTS WITHIN.



COMMUNITY HALL
BRITOMART'S E. COMPLEX ATRIUM BY NATIVE HABITATS



LOWER LEVEL EDUCATION STUDIO
DRAWING STUDIO, ARTS UNIVERSITY BOURNEMOUTH BY COOK
ROBOTHAM ARCHITECTURAL BUREAU STUDIO



LIVING MACHINE
WILDLANDS ADVENTURE ZOO EMMEN, NETHERLANDS



TERRACED SEATING
HIGHLINE, NEW YORK CITY



SOUTH FACING CAFE
BARBICAN CONSERVATORY CAFE, LONDON



LILY POND
KEW GARDENS WATERLILY HOUSE



LOWER LEVEL CORRIDOR VIEW OF CONSERVATORY
JUVET LANDSCAPE HOTEL BY JENSEN SKODVIN ARCHITECTS



PHOTOVOLTAIC COVERED WALKWAY
GALLERY OF CALIFORNIA ACADEMY OF SCIENCES BY RENZO PIANO
ARCHITECTS

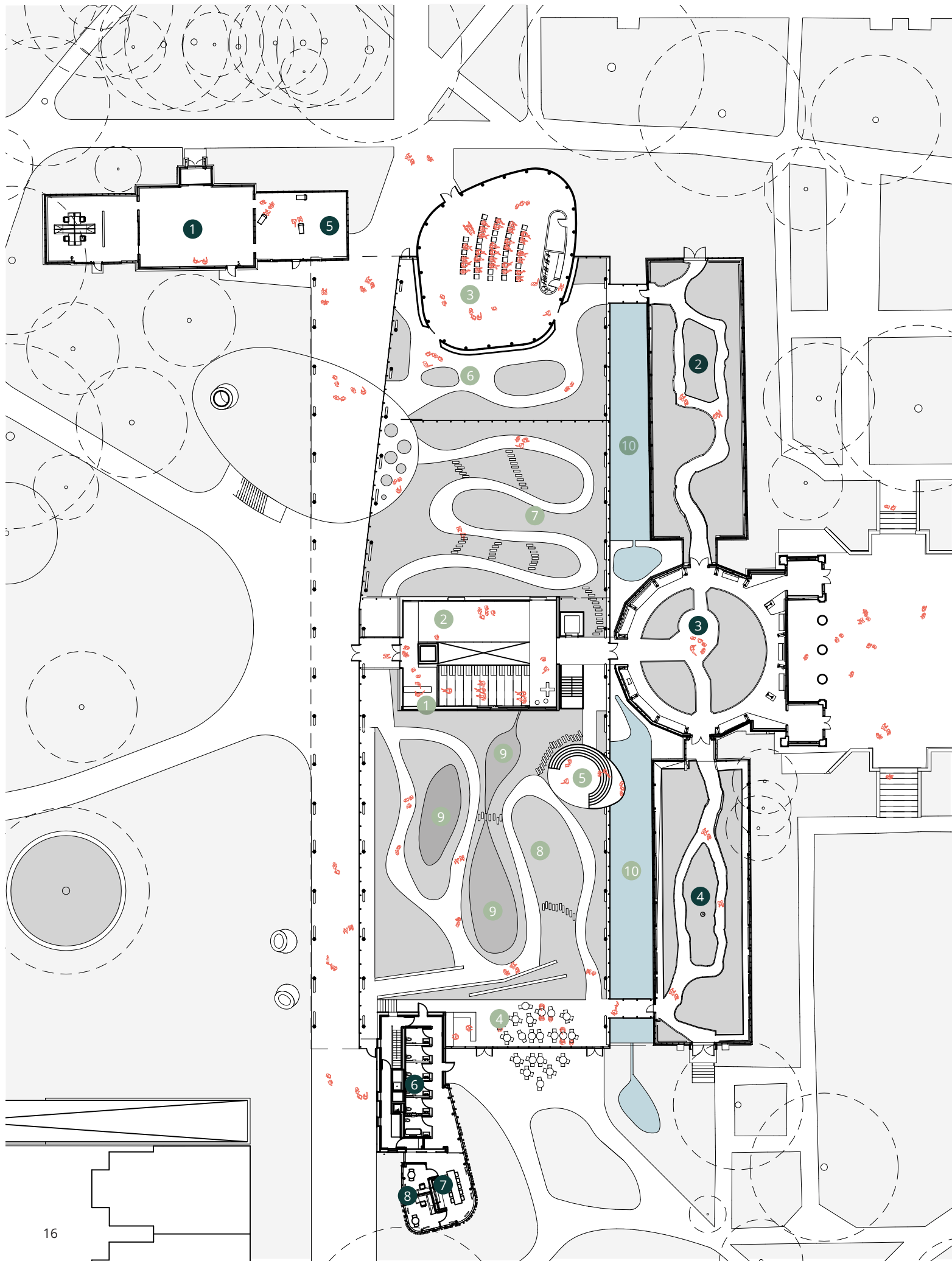
4. CONNECTING PEOPLE, PLANTS & PLACE

The new addition is envisioned as expansive open space and horticultural environment that enables an immersive visitor experience. This immersive space includes a range of active and passive programming nodes that are dispersed within the interior landscape to provide spaces of diverse capacity that can accommodate seating for small groups, spaces for contemplative personal moments, access to cafe, and other visitor amenities. Complementing the scale of historic ensemble of horticultural buildings facing Sherbourne Street, the expanded facility maintains the pre-eminence of the Palm House as the iconic architectural feature of the Gardens.

The addition will include three climatic biomes that will add needed space to expand the current horticultural collection, and are separated by floor to ceiling glass walls.

The design concept provides a robust framework for a wide spectrum of programming opportunities and varied daily-use scenarios- which are expected to seasonally change, evolve programmatically over time, and enable simultaneous operations for community use and private functions.





GROUND FLOOR PLAN (1:500)

- 1 INFO DESK
- 2 WELCOME LOBBY
- 3 COMMUNITY HALL
- 4 CAFE WITH SOUTH FACING PATIO
- 5 LILY POND INTERPRETATIVE ROOM
- 6 NEW FRUIT AND SPICES BIOME
- 7 NEW ARID BIOME
- 8 TROPICAL RAINFOREST BIOME
- 9 LIVING MACHINE
- 10 RAIN GARDEN
- 11 GREEN ROOF

EXISTING SPACES

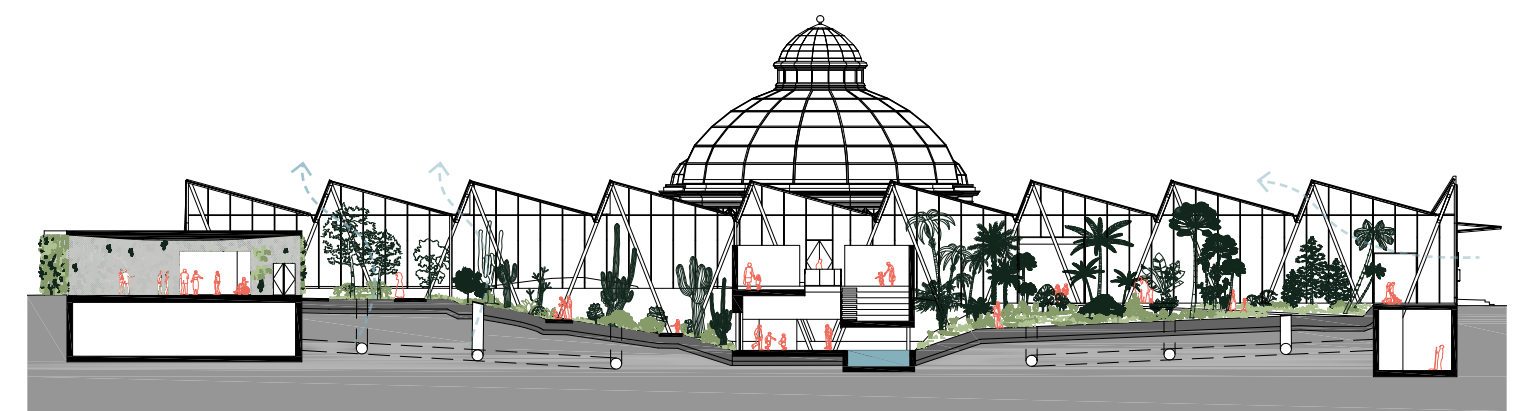
- 1 CHILDREN'S CONSERVATORY - COMMUNITY HUB
- 2 GREENHOUSE 2: CYCAD FERN HOUSE
- 3 GREENHOUSE 3: PALM HOUSE
- 4 GREENHOUSE 4: ORCHID HOUSE
- 5 BACK OF HOUSE GREENHOUSE
- 6 PUBLIC WASHROOMS
- 7 CONFERENCE ROOM (under construction)
- 8 PRIVATE OFFICES (under construction)
- 9 ADMINISTRATION (under construction)

A cafe is situated along the addition's southern exposure, with a facade that can fold open into a canopy to help shade a sunny outdoor patio and promote passive ventilation during peak summer conditions.

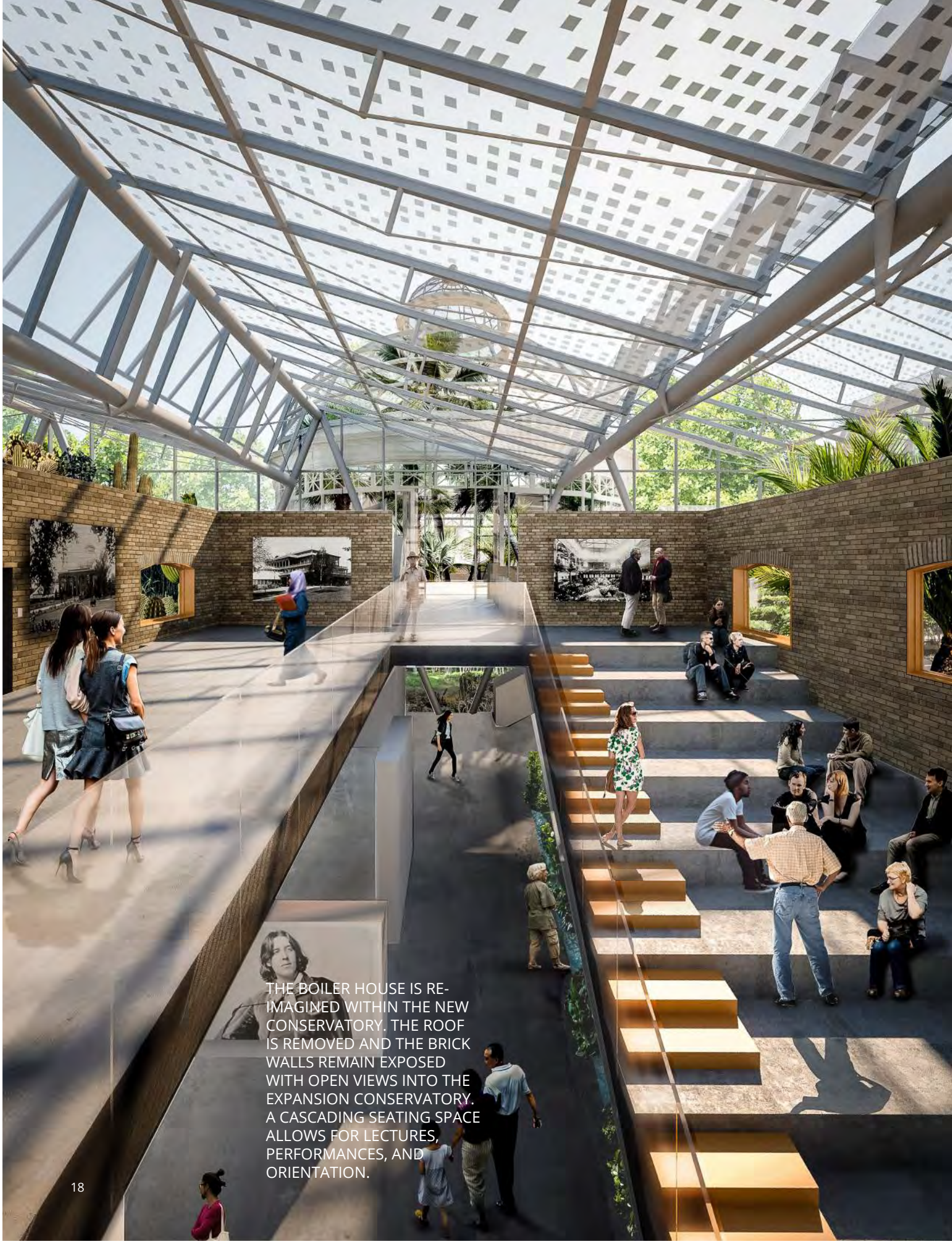
A multi-use community hall is positioned to the north, engaging and activating the Carlton Street side of the building. With curved glass walls, the space provides views to both the interior and exterior landscapes. The interior glass wall doubles up as vertical planted display space, camouflaging the form inside and contributing a new dimension to the immersive interior landscape. Large sliding doors allow for a continuous flow through the community hall and into the conservatory. A coat closet, storage, and universal washroom is provided.

As the site is easily accessible through public transit, to encourage staff and visitors to take transit, no parking spaces will be provided. The Children's Conservatory is an ideal space to be repurposed for Friends of Allan Gardens. As an independent structure it can operate as its own unit, with space that can accommodate administration, teaching areas for classes and seminars, washrooms, a central multipurpose space, a community 'drop-zone', tool shed for use by volunteers, and public events spaces which can function independently or have a close interaction with the main addition conservatory. With the new addition framing the parkland in front of the Children's Conservatory, there is a great opportunity for future development of a Children's Garden.

The public corridor features full height glass allowing views into the Conservatory beyond, reducing the feeling of being below grade.



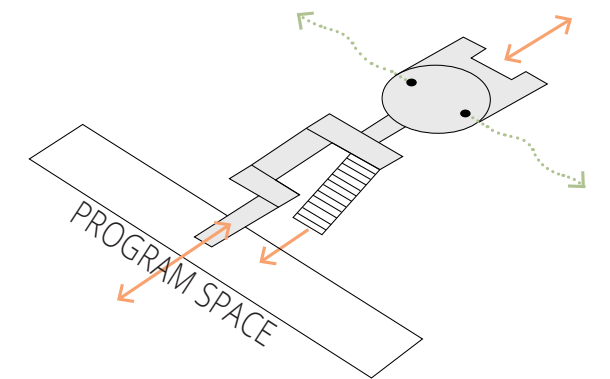
NORTH SOUTH SECTION



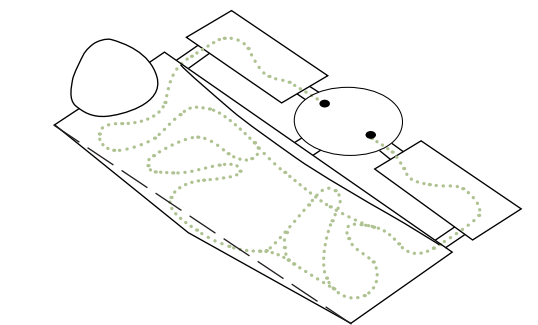
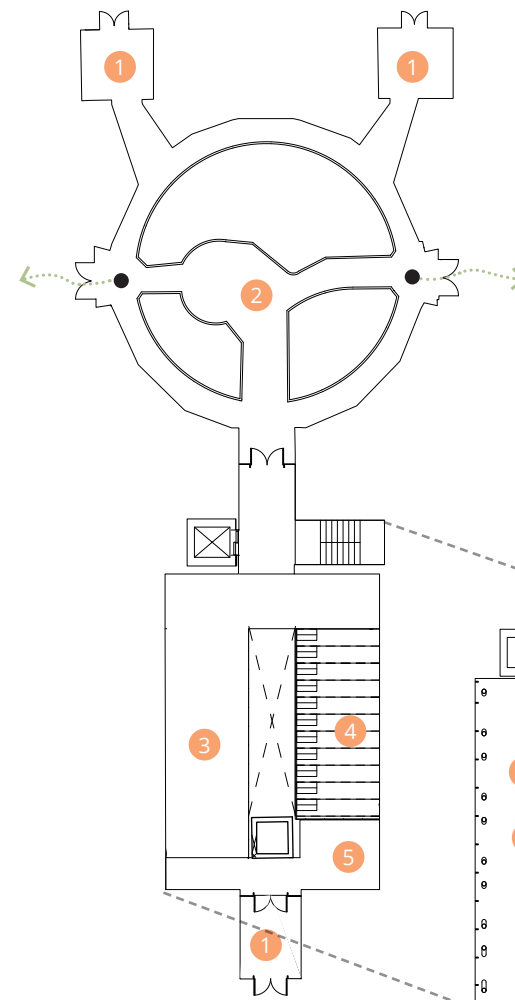
THE BOILER HOUSE IS RE-IMAGINED WITHIN THE NEW CONSERVATORY. THE ROOF IS REMOVED AND THE BRICK WALLS REMAIN EXPOSED WITH OPEN VIEWS INTO THE EXPANSION CONSERVATORY. A CASCADING SEATING SPACE ALLOWS FOR LECTURES, PERFORMANCES, AND ORIENTATION.

4.1 CIRCULATION SPINE

A new 'circulation spine' extends east-west through the centre of the facility and incorporates the historic Palm House and repurposed Boiler House. The circulation spine enables public entry from both sides of the park and establishes an interior promenade that interconnects the eastern and western sides of the park. The historic Palm House serves as the primary arrival and distribution node for the experience with armatures extending north and south into a looping circuit that begins and ends at the Palm House. The historic Boiler House is reconceived as a 'pavilion' within the new expansive greenhouse addition bridging the Palm House to lower level public programming / educational facilities. The Boiler House pavilion provides space for temporary exhibits, theatrical seating for informal talks, and for the gathering and assembly of school or tour groups, while providing direct access for washrooms and other amenities at the lower level.



EAST-WEST ACCESS AND CIRCULATION

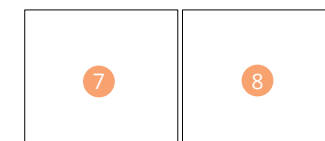


CONTINUOUS GARDEN CIRCUIT

Public circulation is organized around the former Boiler House. Starting at the Jarvis Street entry, a new continuous public loop weaves through the complex. Visitors walk over a garden bridge, glimpsing the plants beyond, and then greeted to an open air archeological space that doubles up as a meeting point and orientation hub. People can get information about the Conservatory, go down the cascading seating or glass elevator to the gift shop or the coat check, and get an orientation presentation.

CORE CIRCULATION (1:400)

- 1 VESTIBULE
- 2 PALM HOUSE ORIENTATION
- 3 LOBBY / TEMPORARY DISPLAY
- 4 GALLERY STAIR AND SEATING
- 5 RECEPTION
- 6 GIFT SHOP
- 7 WASHROOMS
- 8 COMMUNITY ROOMS
- 9 LIVING MACHINE





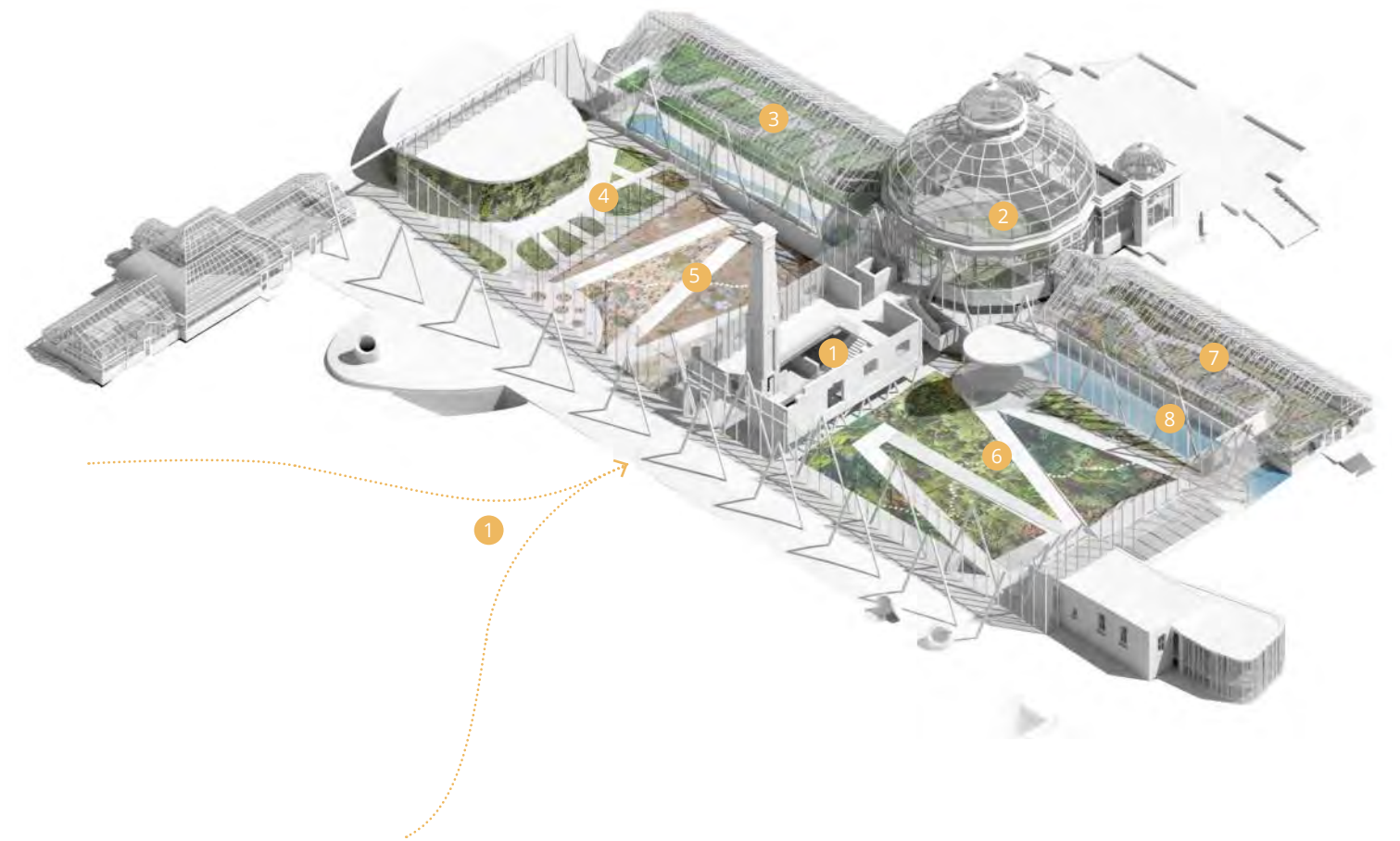
THE NEW CONSERVATORY
IS ENVISIONED AS AN
EXPANSIVE OPEN SPACE AND
HORTICULTURAL ENVIRONMENT
THAT PROVIDES AN IMMERSIVE
VISITOR EXPERIENCE.

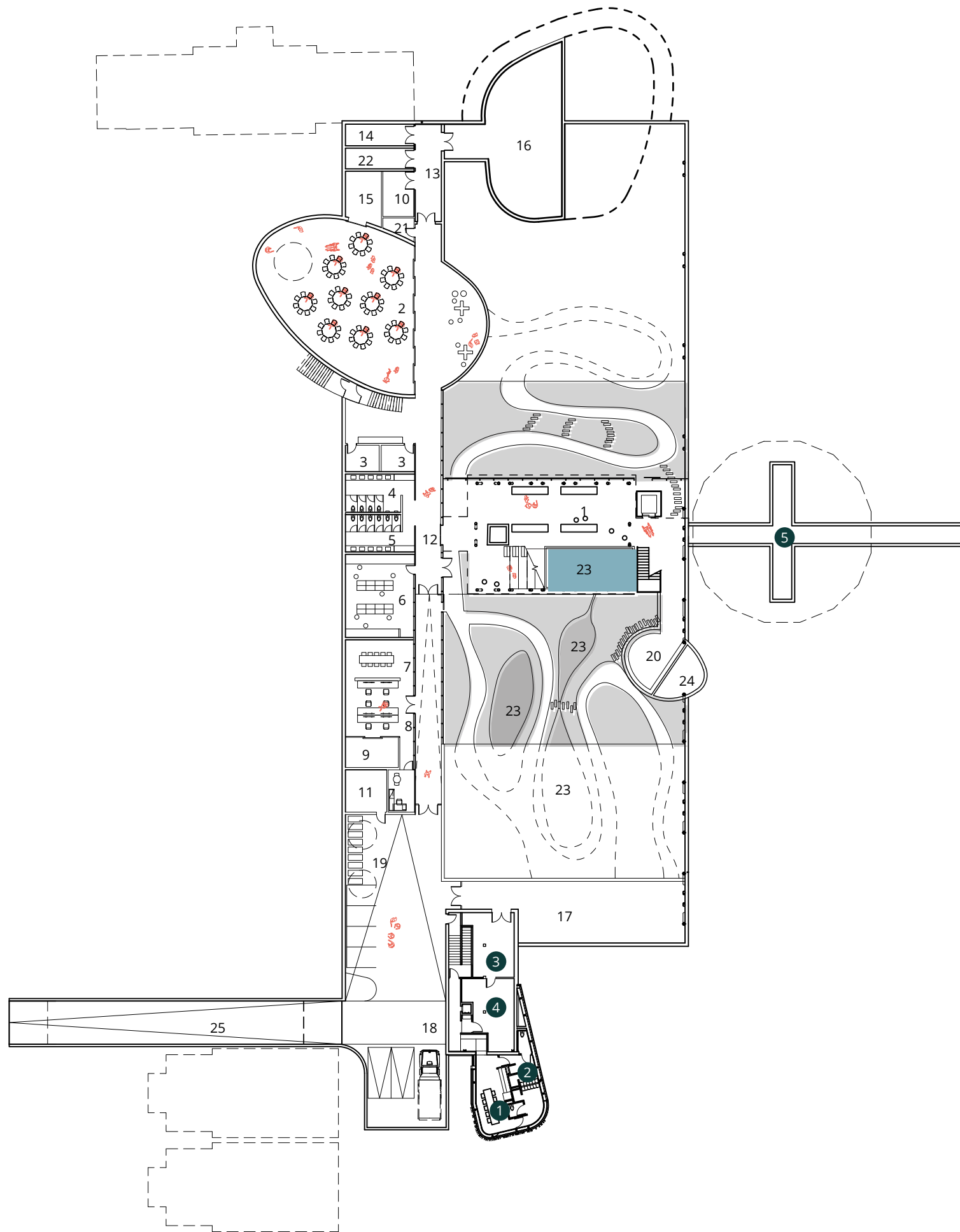
4.2 THROUGH THE COLLECTION

The new addition will effectively double the plant collection spaces, creating new opportunities for display. A continuous path will finally link all the spaces into a single loop. The following is based on speculative programming prepared by the City. The collection would be developed further at later design stages.

The conservatory is historically a colonial idea - to display and cultivate plants from around the world, often from Indigenous lands. The *Refresh* and future gardens provides an opportunity to invert this colonial history and to re-conceptualize the plant collection to engage with global Indigenous culture.

- 1 Native Landscape**
By curating both outdoor and indoor indigenous landscapes, this will anchor and exemplify First Nations cultural presence on the Allan Gardens site. The interior collection will share the stories of healing and sacred narratives of plants from global Indigenous communities, while the exterior collection could flow and be integrated throughout the playground.
- 2 Palm House**
The historic Palm House is now transformed into a new seasonal display greenhouse, with large palms in movable pots. The space can be converted into a memorable event space in between horticultural shows.
- 3 Fern House**
As visitors turn north, they enter into a Cycad Fern House which would include tropical and sub-tropical ferns and gymnosperms (Cycads). These plants represent some of the oldest and most unique plants on Earth, reflecting an ancient era.
- 4 Fruit and Spices Collection**
This greenhouse could showcase tropical fruits and spices from around the world like bananas, coffee plants, chocolate trees, papayas, ginger, and dragon fruit.
- 5 Arid House**
The Arid collection will be doubled in size. It is one of our most popular greenhouses because of the uniqueness of the plants. The expansion will allow for more and larger agave, succulent, and cacti exhibits.
- 6 Tropical Rainforest House**
This biome will be hot and humid to highlight international equator plants. This is an opportunity to provide further knowledge of the currently threatened exotic ecosystems.
- 7 Orchid House**
Greenhouse 4 could be converted into the Bromeliad and Orchid or Epiphyte House - showcasing the epiphytes that grow in trees and rocks and the outstanding blooms and fragrances of orchids. There are between 25 000 and 35 000 orchid species from around the world and approximately another 40 000 hybrid species.
- 8 Lily Ponds**
The Lily ponds would be a hydrological landscape in between the old and new buildings and act as a catchment reservoir for rainwater from the sawtooth roof of the building.





4.3 EXPERIENTIAL LEARNING & SUPPORT SPACES

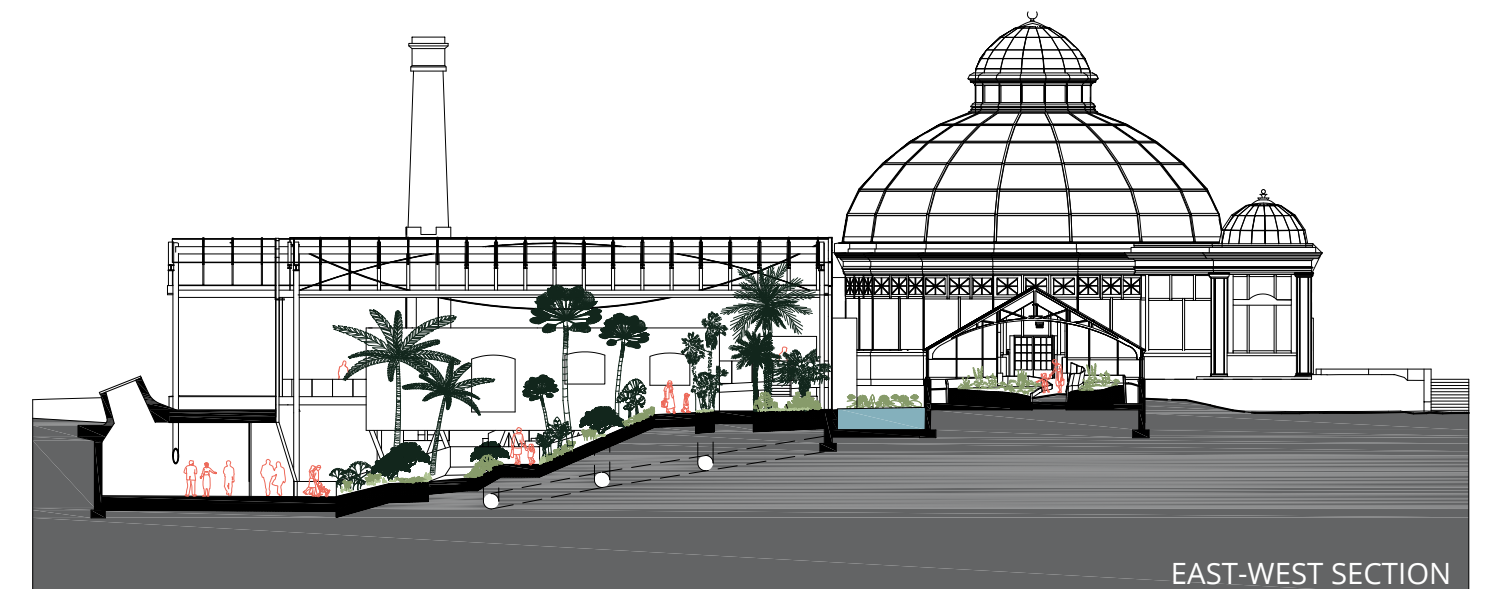
LOWER FLOOR PLAN (1:500)

- ① GIFT SHOP / DISPLAY
- ② EDUCATION STUDIO
- ③ FAMILY WC
- ④ MEN'S WC
- ⑤ WOMEN'S WC
- ⑥ PLANT COLLECTION WORKROOM
- ⑦ CONFERENCE ROOM
- ⑧ OPEN OFFICES / WORK ROOM
- ⑨ FILE STORAGE
- ⑩ EVENT STORAGE
- ⑪ TOOL STORAGE
- ⑫ CORRIDOR
- ⑬ SERVICE CORRIDOR
- ⑭ FACILITY STORAGE
- ⑮ EDUCATION PREP AND STORAGE
- ⑯ MECHANICAL ROOM
- ⑰ GENERAL STORAGE
- ⑱ SHIPPING/RECEIVING (LOADING AREA)
- ⑲ DEBRIS AND COMPOST PROCESSING
- ⑳ COAT STORAGE
- ㉑ FIRST AID
- ㉒ GIFT SHOP STORAGE
- ㉓ LIVING MACHINE
- ㉔ LOBBY STORAGE
- ㉕ SERVICE RAMP

EXISTING SPACES

- ① BREAK ROOM (under construction)
- ② STAFF CHANGE/WC (under construction)
- ③ SUPPLIES STORAGE
- ④ ADMIN MECHANICAL
- ⑤ SERVICE TUNNEL

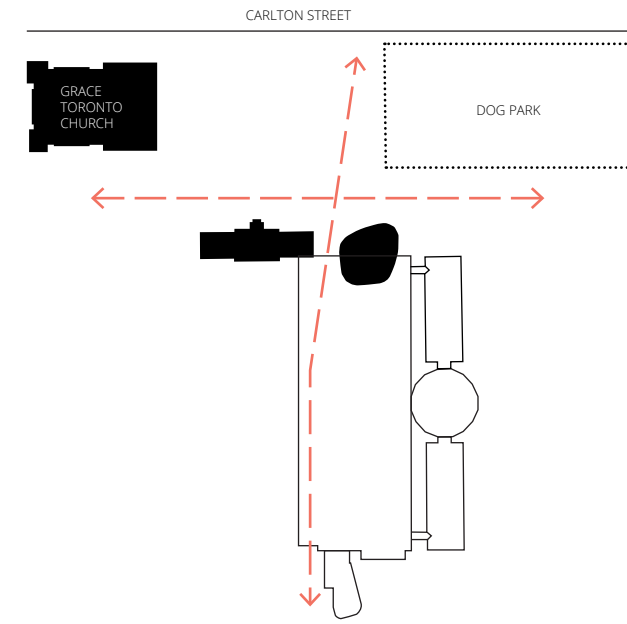
The lower level facilities act like a flexible “cell” serving as a support area for the Conservatory. It is comprised of education, community, and storage spaces that are malleable - expanding or compression to create varying scales of spaces - allowing for large group lectures or classes to small community gatherings. The main corridor servicing these facilities is proposed to have full height glazing facing into the conservatory providing a sense of openness and natural lighting into the lower level. By designing a large skylight facing onto the park in the education studio, guests are able to engage with the plants of conservatory (i.e. through potting classes), and surrounding landscape.



EAST-WEST SECTION

4.4 COMMUNITY HALL

The egg shaped Community Hall, located along the north side of the addition facing Carlton Street, is part of a collection of local community use facilities, including the Children's Conservatory, and Grace Toronto Church, which frames to create a plaza entry from Carlton Street. Sited to connect, interact, and provide access from both the park and interior garden, the Community Hall accommodates a wide range of events, ceremonies, performances, and gatherings. With views into the adjoining landscapes, the space is enclosed by living green walls which showcase medicinal plants, vertical farming, and other opportunities to advance horticultural education. The living green wall and bottom-up blinds allows for control of viewing and privacy levels, flexibly adapted to suit particular events and ceremonies, while enabling day-to-day public use of the park and conservatory. The vertical stainless steel rods and a curving facade of the Community Hall mirror the Administration Building and create a cohesive and complimentary series of elements along Horticultural Avenue.



FRAMING COMMUNITY FACILITIES AT CARLTON ST. FRONTAGE



4.5 A DISCREET SERVICE YARD

Various options were considered for the service yard, which is an important hub of activity for the building, for loading and unloading, and for garbage pickup. The current scheme is designed around an underground service yard, hiding all these functions. Locating the works yard completely in the lower level liberates more of the park for the public and is the recommended option. However, if this is not feasible, there are other at-grade options which are outlined below, and would impact the design and planning of the new addition, as well as the landscape of the park.

Option 1: Below-Grade Service Yard

In this preferred scenario, maintenance vehicles will drive down a ramp from the Jarvis side. The space will include maintenance parking, processing, and loading activities. The ceiling clearance height will be minimum 3.2m to allow for small trucks (eg. 17' delivery truck) to enter. The yard will be directly accessible to the greenhouse space by means of large sliding doors to allow for ease of servicing. Debris would be shuttled up the ramp to a small fenced above-grade area. However, if these activities are required underground, then additional height clearance is needed and a traditional raised loading dock with a small lift and a longer vehicular ramp would need to be considered.

Option 2: Exterior Service Yard East of Horticultural Lane

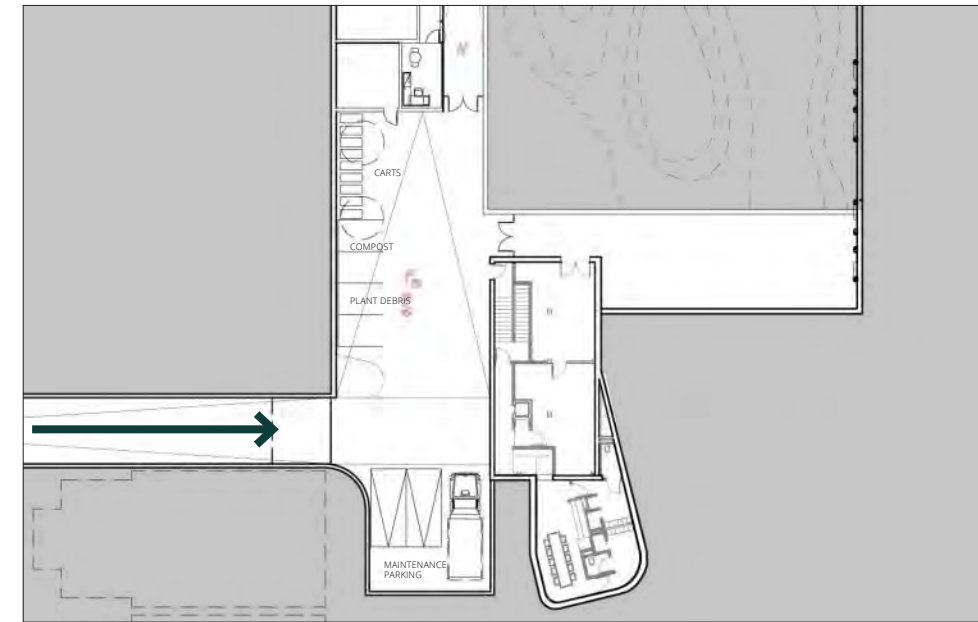
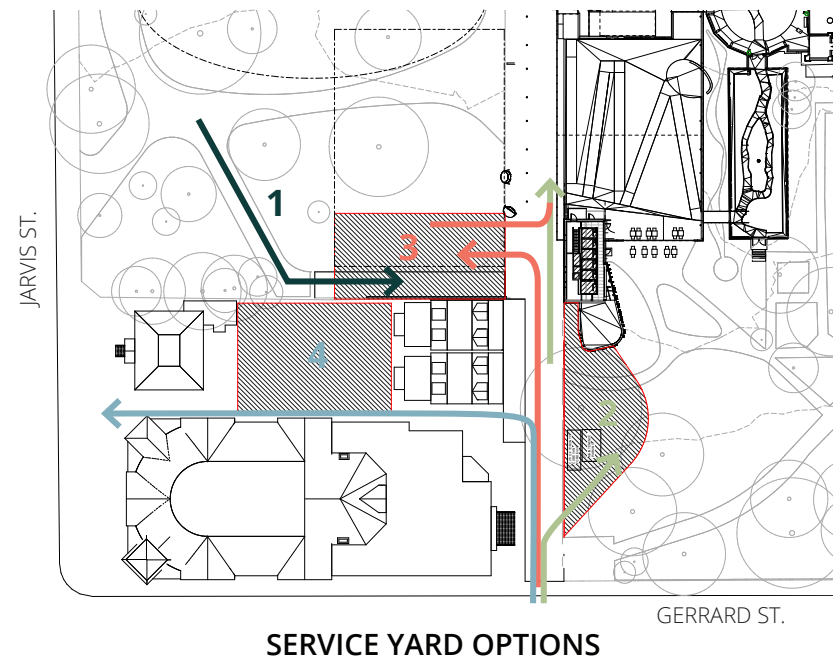
A second option would be locating the service yard in the southeast corner of the park, just east of Horticultural Lane, enclosed with a 2400mm high wood perimeter fence that would be designed as public seating with areas for vertical planting surface. An automatic sliding gate would let maintenance vehicles enter the yard. Carts would need to be shuttled to the south face of the new addition.

Option 3: Exterior Service Yard in Jarvis Terrace

Previous masterplans have located the service yard in this area. A similar fence with a gate would be required. Vehicles will need to enter and exit via Horticultural Lane.

Option 4: Exterior Service Yard in Parking Lot

Jarvis St. Baptist Church parking lot would be converted into a works yard, which preserves park space. In this option, there would need to be an agreement to annex this part of the adjacent property.



OPTION 1: BELOW GRADE SERVICE YARD



OPTION 2: EXTERIOR SERVICE YARD

5. TOWARDS A SUSTAINABLE FUTURE

Sustainability is the main driver of the design concept and it is important that Allan Gardens exemplify the highest ideals of environmental stewardship. How can a modern Conservatory make the least impact on the environment, while ensuring a high quality visitor experience and optimal plant growing conditions?

First and foremost, the new addition is envisioned to be completely Net Zero Energy and near carbon neutral, where site-generated energy provides the necessary energy required to operate the new addition.

The Conservatory's unique architectural characteristics will be restored to its original intents- old technologies that are prescient today.

The expanse of roof is designed to harvest rainwater, which is collected within the linear interstitial space between new and existing conservatories. This Rain Garden also serves as a storage reservoir for enough water to be collected for irrigating the new addition without requiring additional water. Graywater is proposed to be recycled for use as irrigation using a Living Machine that uses plant based bio-filtration as a teaching tool and educational system, integrated as part of the Conservatory landscape.

Please refer to Appendix B for further information.

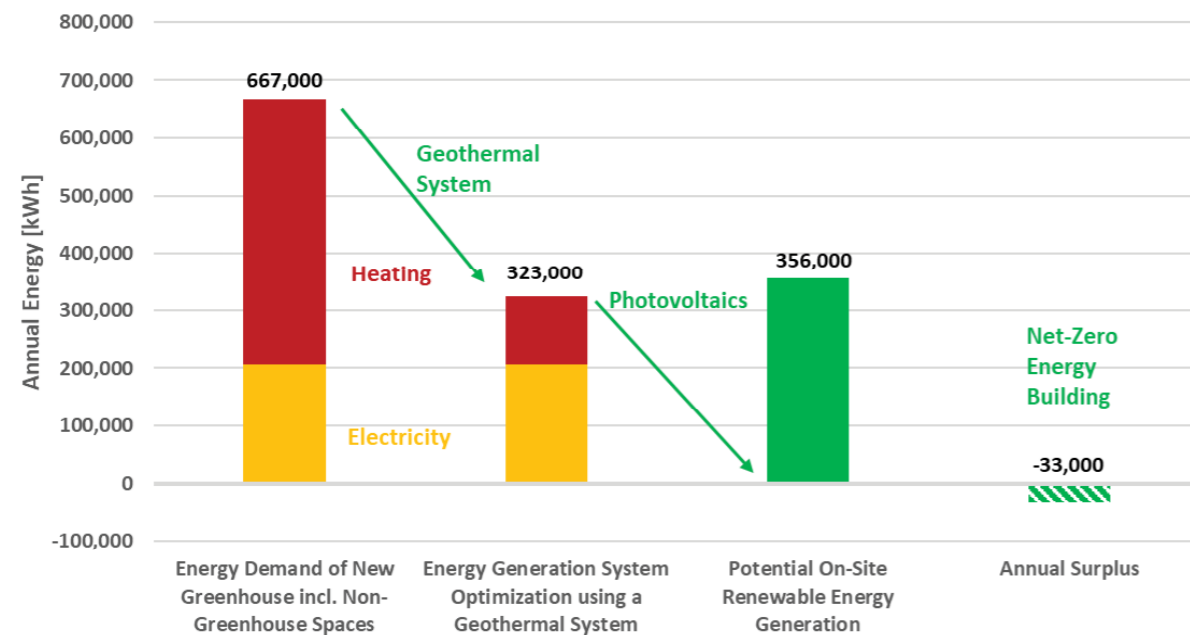
Site Specific Opportunities and Challenges

Unique to all Greenhouses

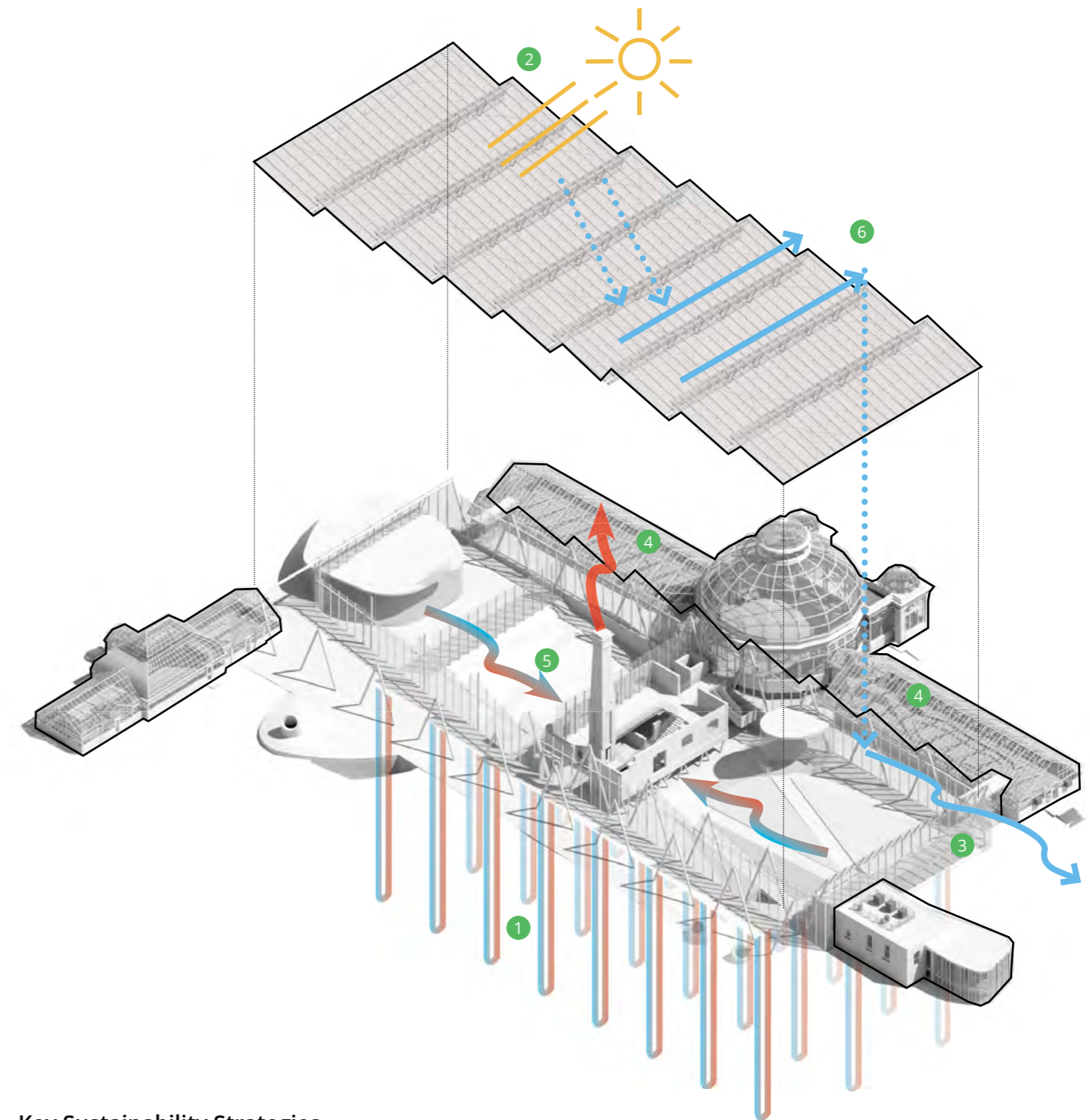
- Plants dictate the indoor environmental criteria more than human comfort
- Maximize daylight during winter while controlling solar gains during summer
- Horizontal and vertical facades should be mainly transparent (in conflict with on-site renewable energy generation, which require opaque surfaces)
- High heating demand during winter, high overheating potential during summer
- High solar gains during the day, high energy losses during the night
- Façade concept determines the indoor climate

Unique to Allan Gardens Conservatory

- Remarkable architectural value that needs to be preserved
- Existing earth duct system
- Re-utilization of boiler house with chimney
- Reuse and adapt historic ideas that worked – improve where technology has advanced



ROAD TO NET ZERO ENERGY



Key Sustainability Strategies

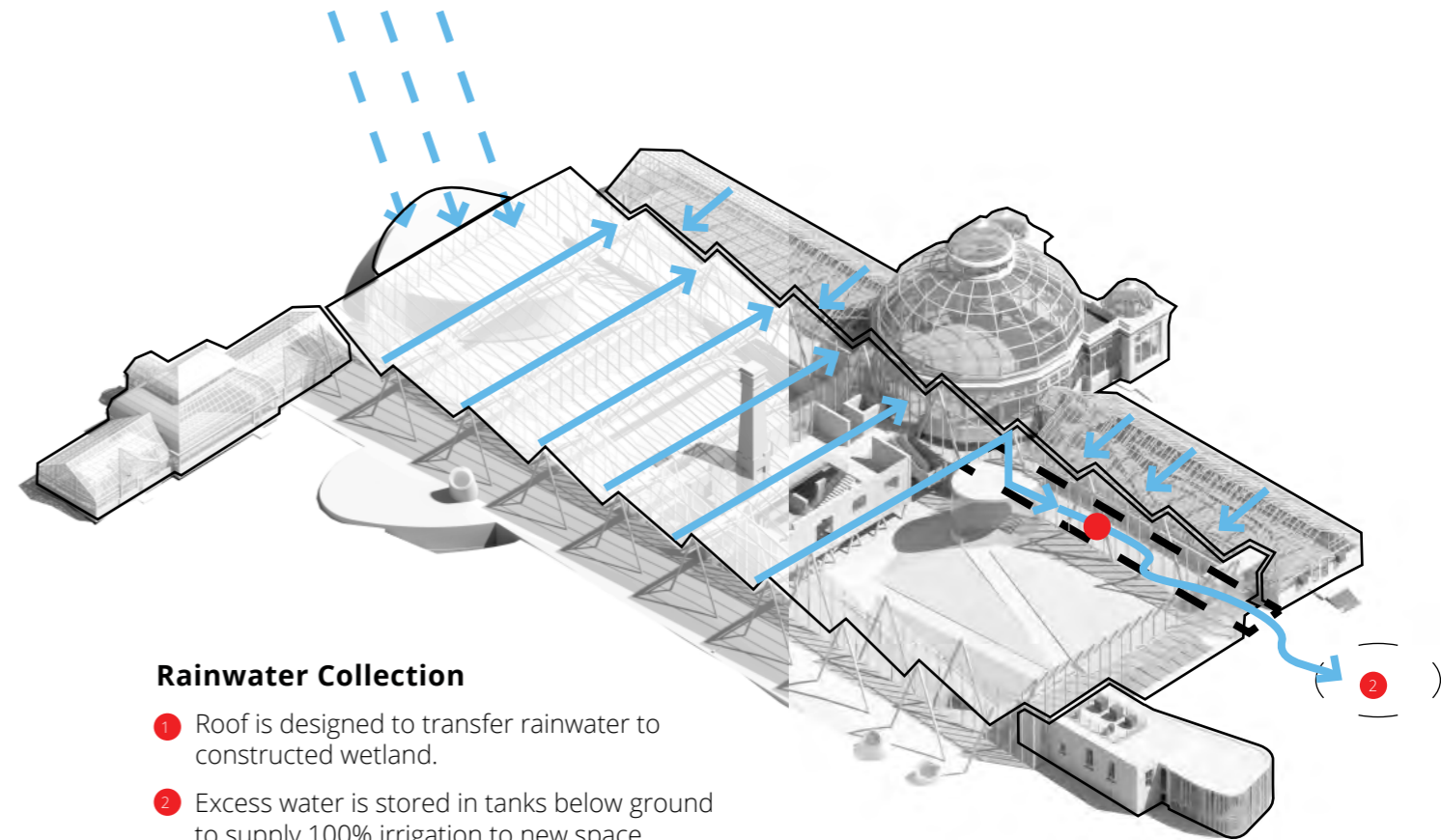
- 1 A 100 borehole geothermal system harnesses the ground as an energy battery to buffer seasonal and daily loads.
- 2 South facing sawtooth roof with photovoltaic solar cells mounted on retractable solar shades at the roof of the new addition that will offset the operation electrical energy required.
- 3 High Performance Glass facade.
- 4 Thermal improvement of the existing greenhouse envelope.
- 5 Fully natural ventilated greenhouse spaces in the summer and energy recovery in the winter. Restoration of existing earth duct system to cool and temper incoming air and re-utilization of boiler house chimney as an air exhaust.
- 6 Rainwater collection system can supply 100% irrigation needs for the new addition. Any surplus of water can be used to irrigate the park.

5.1 RAINWATER HARVESTING

A Conservatory will require significant amounts of water for irrigating its plant collection. By capturing rainwater, not only are irrigation needs met, but water is diverted from the city's overstretched stormwater system.

The total roof area of the new greenhouse and half of the roof of the existing greenhouses 2 and 4 can be used for rainwater harvesting. Calculations show that the available precipitation on-site and the available roof area are sufficient to cover the water use for irrigation for the new addition, both monthly and annually. Any surplus of rainwater can be used to irrigate the park.

Water is scuppered to a wetland landscape between the existing Conservatory and the new addition. Visitors can experience the water landscape from an interior viewing "pod" and learn more about the hydrology of the site. Excess rainwater is stored in tanks below grade for future irrigation use.



Rainwater Collection

- 1 Roof is designed to transfer rainwater to constructed wetland.
- 2 Excess water is stored in tanks below ground to supply 100% irrigation to new space



Annual precipitation collection: 1,850 m³
Annual Water Use for Irrigation: 1,020 m³

5.2 BIOCLIMATIC DESIGN

As a Conservatory, the indoor environment has paramount importance as a series of micro-climates that need to sustain a diversity of plants. A large transparent glass envelope, although good for daylighting, can admit unwanted solar gain in the summer and lose a significant amount of energy in winter. The current buildings consume a high amount of electricity to run its operations. It is therefore essential to implement a comprehensive energy and environmental strategy.

WINTER

In a Canadian winter climate, it is crucial to bring down the heating demand by improving the thermal performance of the existing greenhouse envelope, as well as increasing daylight levels. The major potential lies in improving the airtightness of the façade by replacing the glazing from single glazed to double glazed and improving the seals. The new greenhouse addition will have a high performance glass envelope. The PV solar shade at the roof will be folded down during the winter months, to maximize daylight.

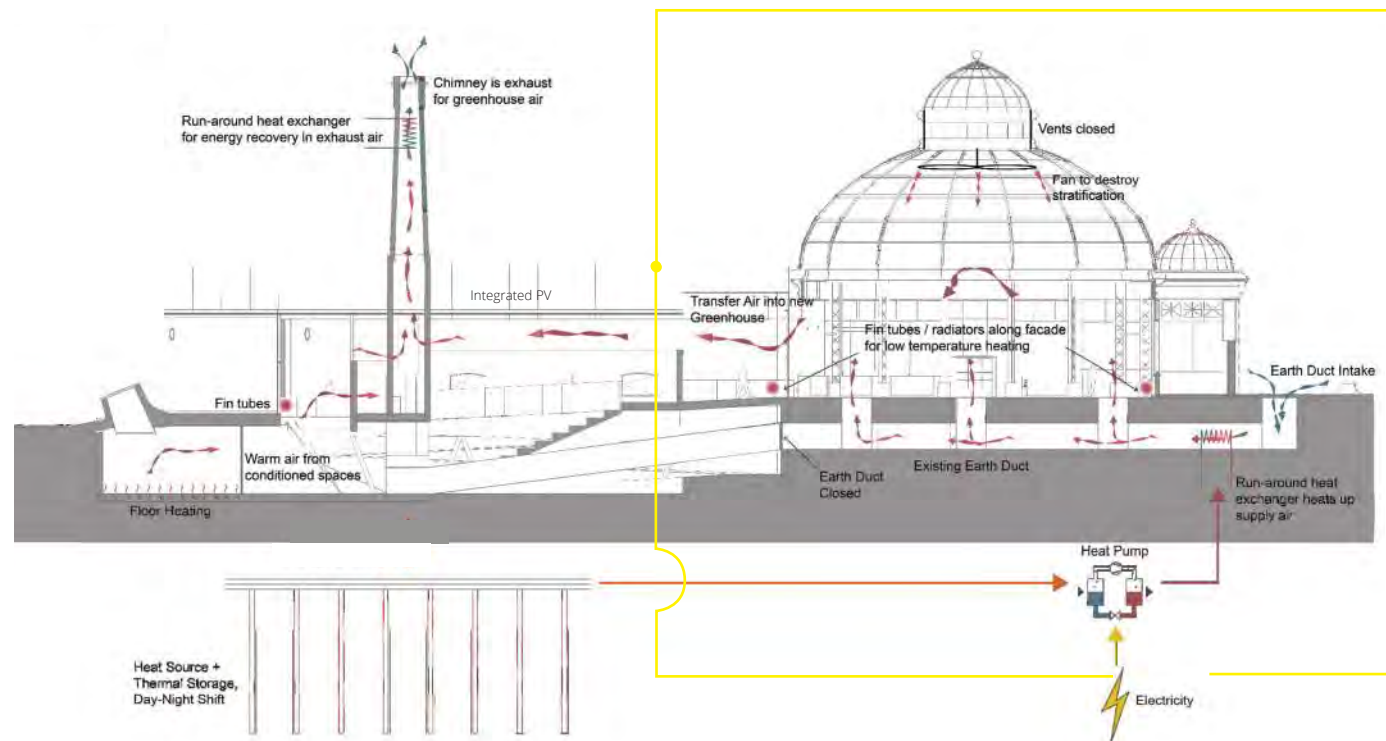
Controlled natural ventilation is essential for a low-energy concept during the winter. Ventilation air will be provided and distributed into the greenhouses through the existing new earth tunnel systems. A heating coil in the intake air stream will increase the temperature of

supply air. Vents in the Palm House will be closed and all air will be transferred to the new greenhouse through the connecting visitor pathways. In addition, in contrast to the summer case, air stratification in tall spaces (e.g. Palm House) will be prevented by pushing warm air from the top to the bottom using ceiling fans. The chimney of the existing boiler house, along with additional roof vents in the new greenhouse functions as the exhaust chimney. A heat exchanger in the exhaust air stream provides energy recovery- the recovered energy is used to heat incoming air.

The idea of the winter ventilation concept consists of controlled minimum ventilation air for plants and visitors (0.5 air changes per hour), using the exhaust chimney to drive the natural ventilation and provide energy recovery for the system.

An additional, plant-friendly, low-temperature space heating system in the form of fin tube radiators will be installed along the façade.

A geothermal field of closed loop boreholes underneath the new greenhouse in combination with a heat pump functions as the heat source for the low temperature heating system that provides energy for the supply air heating coil, fin tube perimeter heating, and space heating for non-greenhouse spaces.



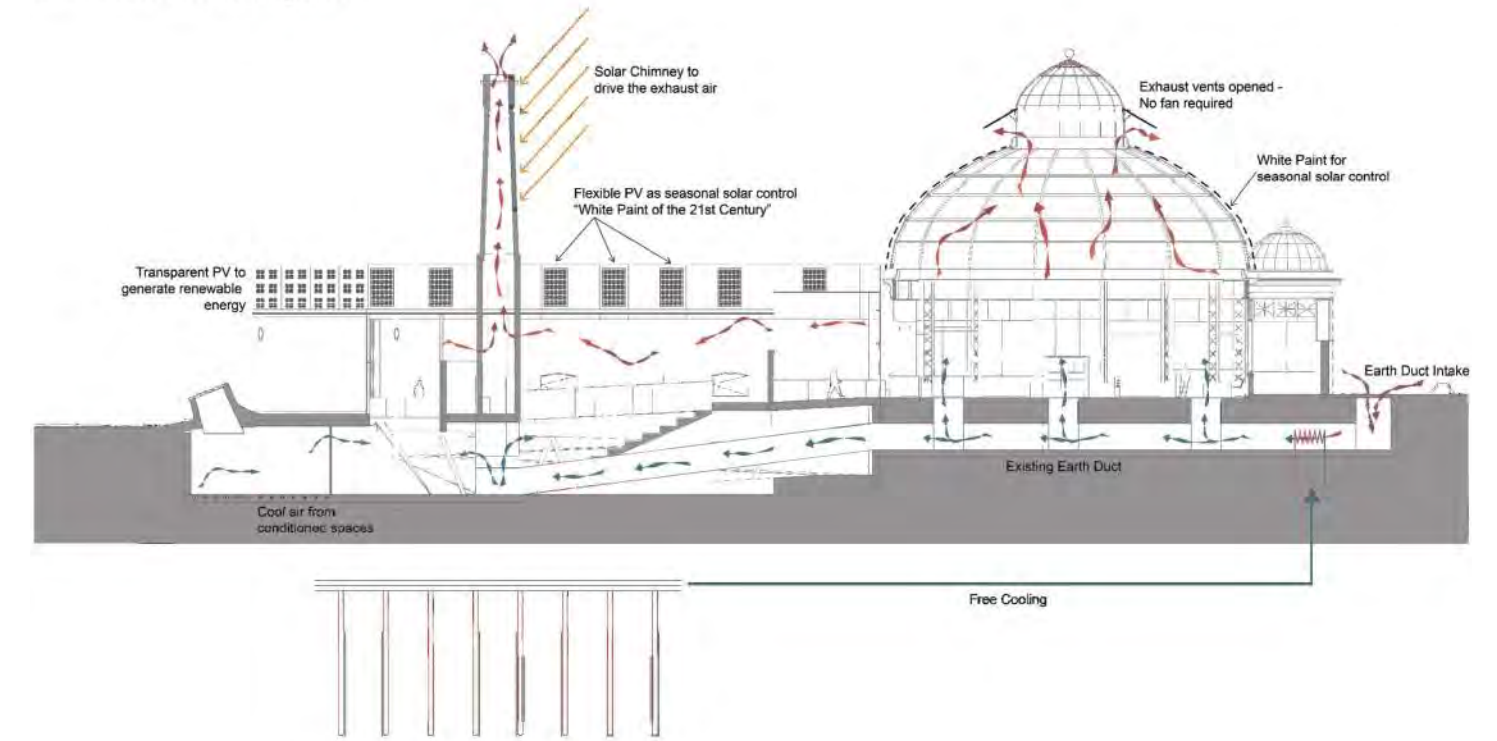
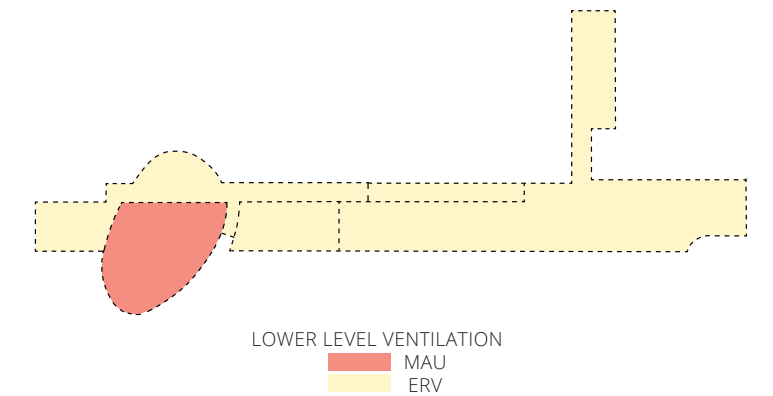
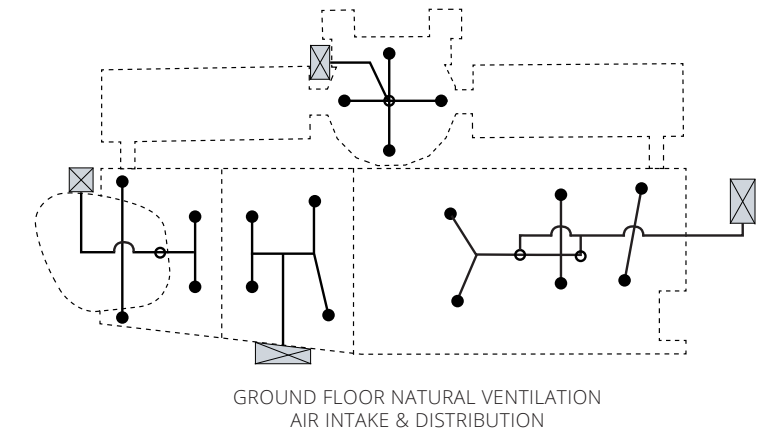
WINTER

SUMMER

In order to keep the indoor air cool in the summer, a naturally driven ventilation system using air stratification is proposed. Fresh air at 10 air changes per hour is supplied by low intakes around the complex, and tempered by existing concrete earth ducts in the Palm House. Warm air is exhausted via motorized vents in the Palm House in the existing greenhouses. In the new addition, the air vented out through Boiler House Chimney, as well as vents in the sawtooth roof.

To control high solar gains in the existing greenhouses, a high performance whitewash – a traditional greenhouse strategy - will be applied from the outside as current practice. To control solar gains in the new greenhouse addition, a shade system will be used. Flexible PV fabric below the glass roof will block a portion of unwanted solar energy while harnessing it into electricity.

The volume of space within the conservatory is too much to mechanically cool. To reduce the energy required, the free cooling potential of the ground using a geothermal field conditions the fresh air in the earth ducts. As well, fans, evaporative cooling, and cool surfaces like a water wall and hydronic tubing will be employed.



SUMMER

5.3 A HIGH PERFORMANCE ENVELOPE

The conservatory's building envelope is a key contributor to its bioclimatic design approach and incorporates design innovations developed by both the commercial greenhouse and curtain wall glazing sectors to create a hybrid building envelope uniquely suited to the conservatory and its design context. The envelope consists of a high performance double glazed enclosure with building integrated photovoltaics, large distributed areas of operable glazing for passive ventilation, an integrated gutter system for interior condensation control, and an exterior gutter system for rain water harvesting. An interior shade and energy curtain incorporating flexible thin film PV is mounted below the roof. It can be retracted in the winter to maximize light for plant growth, and during the summer can be deployed to reduce heat gain and harvest solar energy (rather than simply reflecting and rejecting usable solar energy).

The saw-tooth roof profile is asymmetrically organized with larger surfaces facing south to maximize solar harvesting and increase the surface area for photovoltaic installation. Building integrated photovoltaics are deployed in a variable manner throughout the roof in response to the specific lighting needs of interior spaces and biomes below the roof. Unlike a commercial greenhouse where maximizing plant production yields are the main driver for envelope design, conservatories can benefit from more varied and diverse lighting conditions as found in natural systems, and enable the development of micro-climates within a single biome area, less aggressive plant growth, and reduced maintenance cycles. The saw-tooth roof profile incorporates rows of operable glazing on the north side, which are motorized and operated by the building automation system and weather data. These large areas of operable vents

promote passive cooling throughout the interior spaces of the conservatory and are coupled with 'free' ground-source cooling provided by the geothermal and earth tube air distribution system.

Alternative glazing materials were evaluated including the use of inflatable ETFE double or triple glazed 'cushions' with integrated shading. Glass was recommended as the primary glazing material due to its higher thermal performance (double glazed with low-e coating U-value= 1.3 W/m²K, triple glazed ETFE U-value= 1.96 W/m²K), lower energy demand (ETFE must be maintained under pressure using pumped air), overall lower construction cost, and overall material compatibility with the adjoining heritage conservatory complex. While the weight reduction of ETFE compared to glass is frequently cited as a source for significant reductions to structural requirements, the sizing of structural members are determined by snow load requirements and the 'inversion' of ETFE cushions into a concave shape under snow loads, resulting in no significant structural savings in our climate zone (as per Blackwell Engineering).

A clear span structure enables a column free interior space for design and long term flexibility. The landscaped ground plane within the addition is proposed to be a varied three-dimensional topography that is gently inclined, fully accessible, and without railings (i.e. pathways designed as 1:20 inclined walkways rather than steeper ramps). Furthermore, there will be a more intimate stepped pathway in between the plant collection and lead to more intimate gathering spaces and seating. As described in the text provided by Allan Gardens' Horticultural Manager, Curtis Evoy, (refer to Appendix K: Horticultural Plant Collection) the conservatory addition will include three biomes: Arid House, Fruit & Spices, Tropical Rainforest in the new addition.

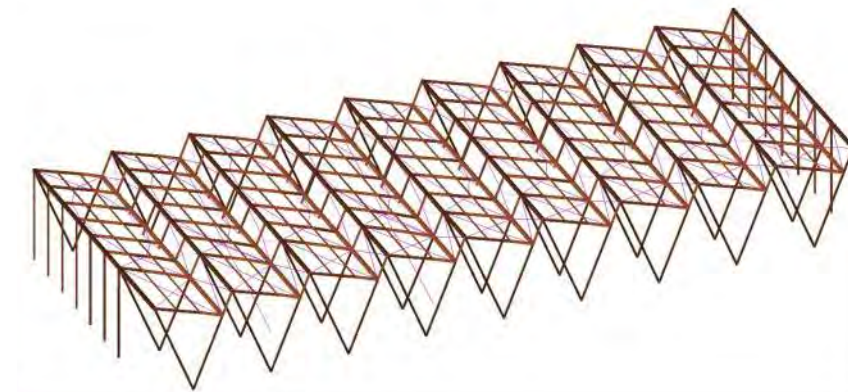
5.4 ICONIC STRUCTURE - EXPANSIVE EXPERIENCE

The steel structure of the new addition allows for column free space within the new greenhouse and becomes a visually iconic element along Jarvis St.

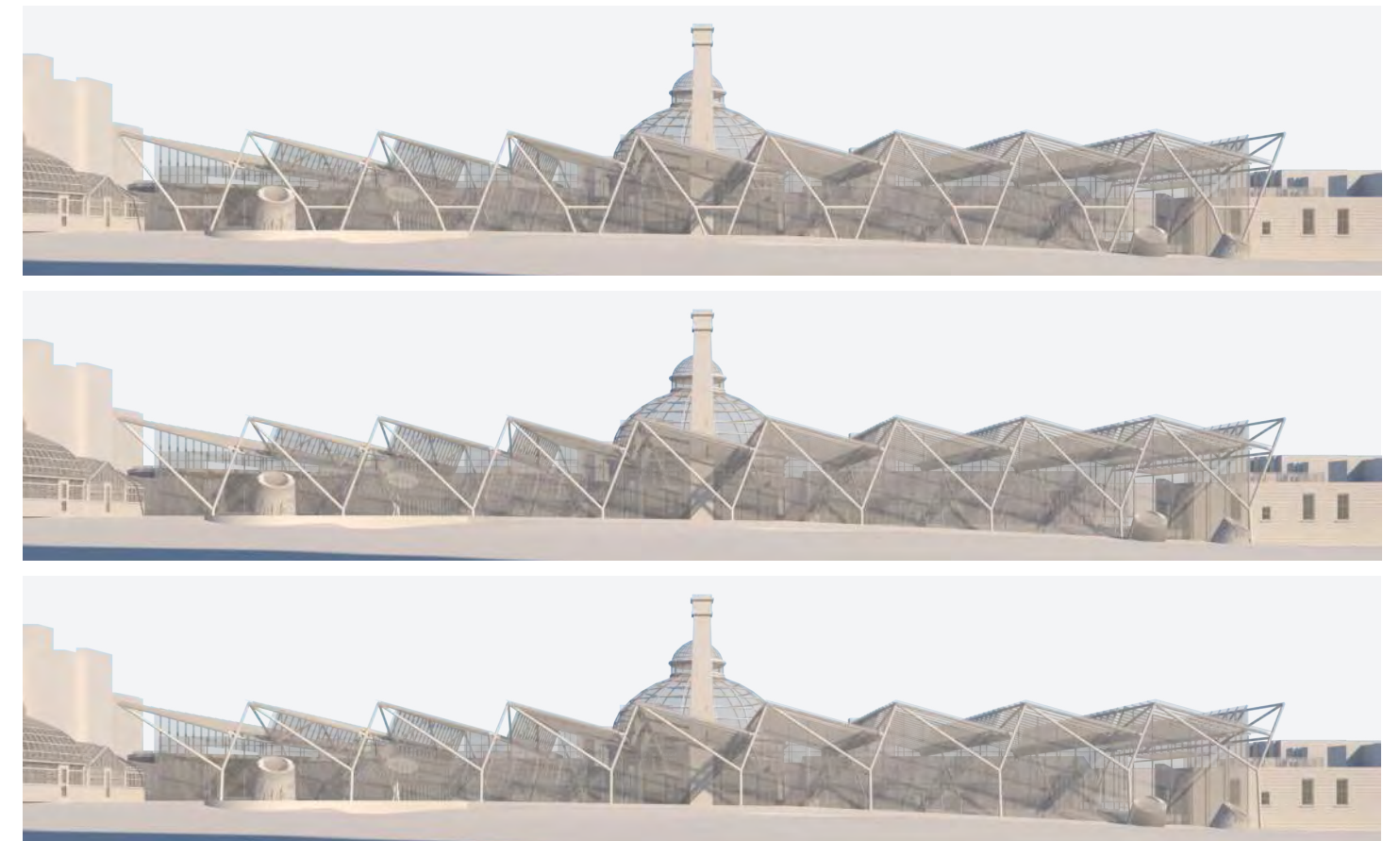
The sawtooth roof consists of pretensioned lenticular trusses spanning 26m in the east-west direction. Larger steel members define the peak and valleys of the roof, and steel cables between these members form the convex lens shape on both faces of each saw tooth. Such

a structure is efficient and lightweight compared to other long span systems.

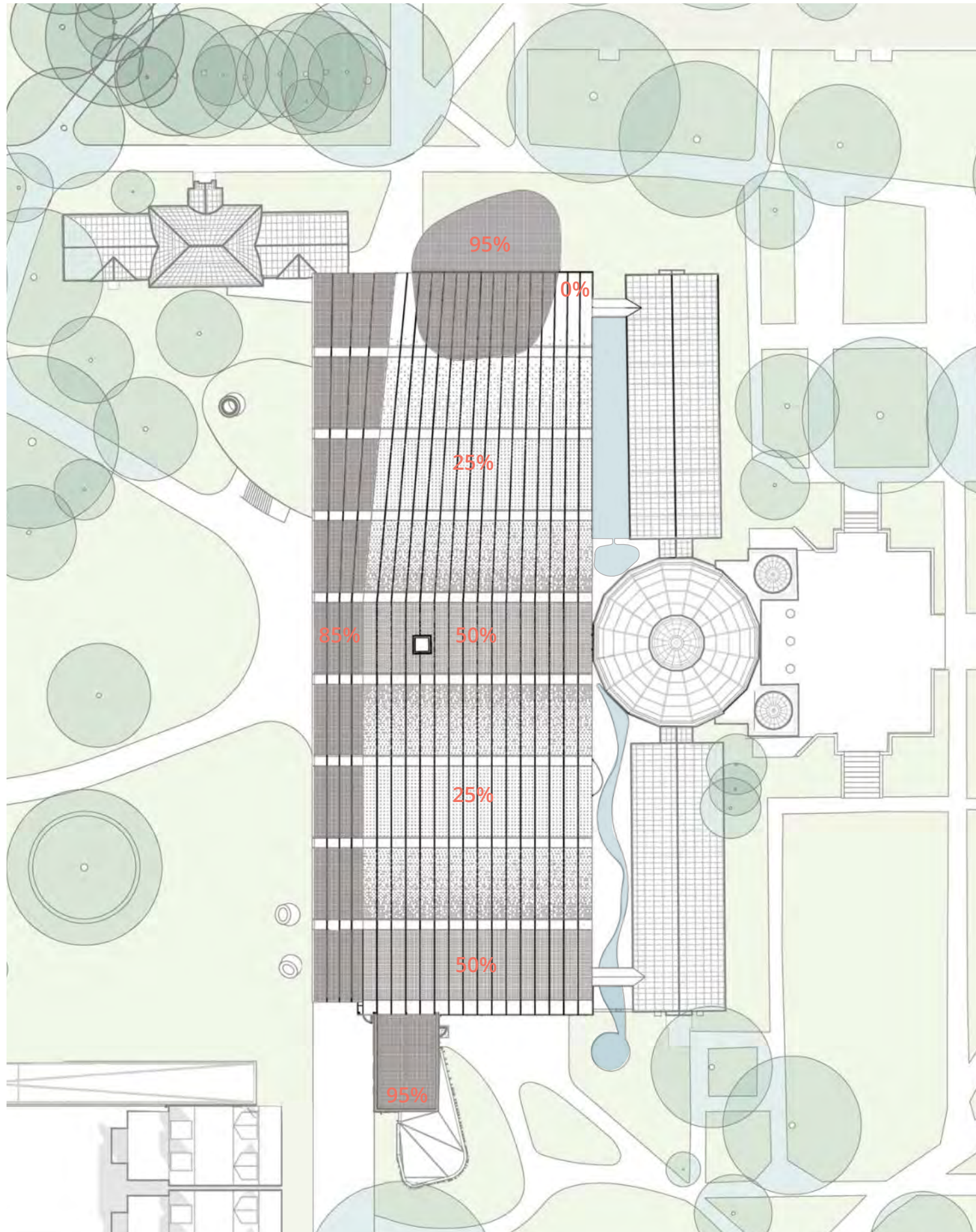
V shaped columns run along the east and west elevations support the roof structure above, as well as provide lateral support. Cross bracing along the greenhouse interior glass walls provide additional lateral support.



AXONOMETRIC DIAGRAM OF SAWTOOTH STRUCTURE



STUDY OPTIONS FOR V BRACING



OPACITY LEVELS OF PHOTOVOLTAIC SHADING

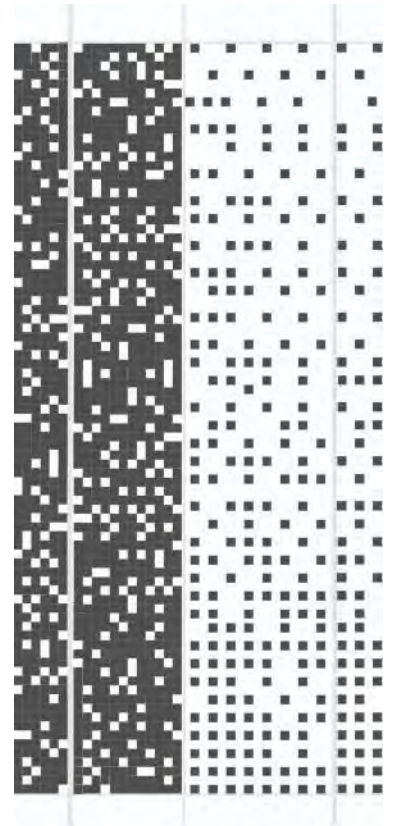
5.5 SOLAR POWER

In order to achieve Net Zero Energy, two main steps are involved. First, energy use must be reduced to a minimum. The second step requires the use of renewable resources to cover all operational energy on an annual basis. Combustion systems, like natural gas boilers, are generally not allowed (except for emergencies).

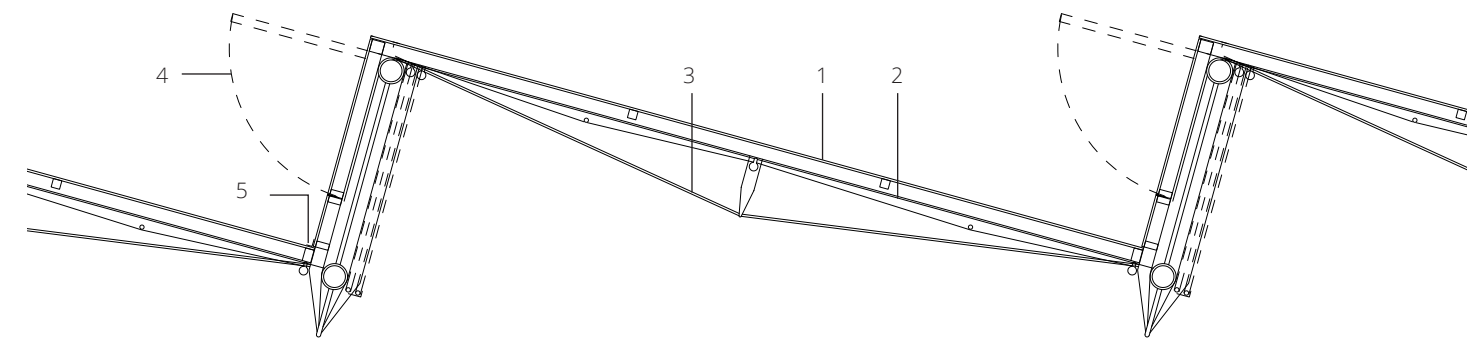
Geothermal systems will provide energy benefits of harnessing the energy reservoir of the ground. Photovoltaic (PV) systems will be used to provide the required electrical energy to drive the geothermal system, and electrical systems in the building.

To achieve this, the south facing roof of the new addition becomes a great opportunity for solar energy harvesting. However, since PV is opaque, it cannot be fully covered in PV, since daylight is required. Therefore, flexible solar cells are mounted on a transparent back sheet, and cells are arranged to pattern with graduated densities between 25 and 95% depending on the uses below. As a result, solar energy is harvested while still admitting adequate light for plant growth. As well, it doubles up as a solar shade in the summer.

The available roof surface of the new addition has enough PV area to power the new greenhouse addition without any additional electrical input, allowing Net Zero Energy.

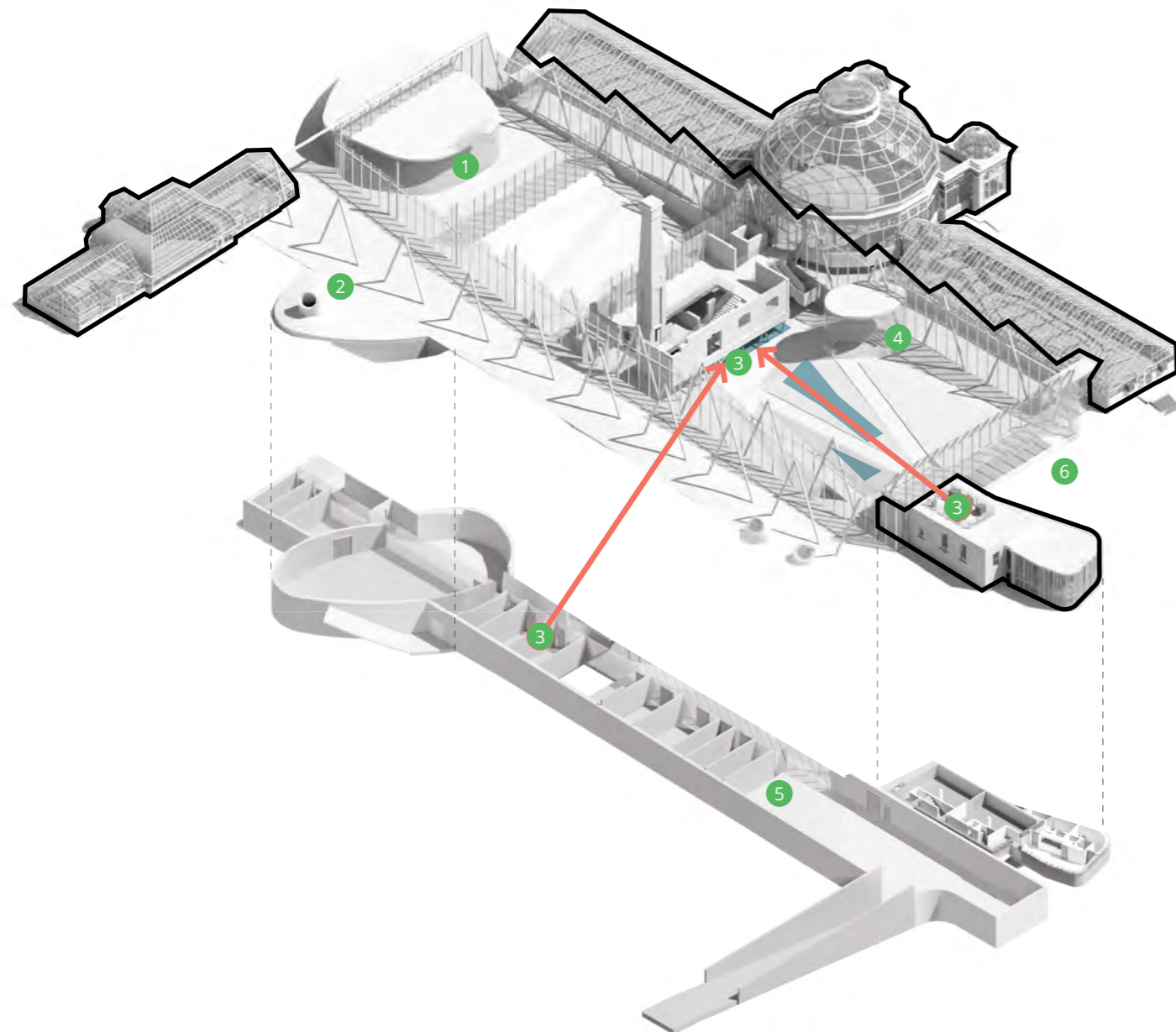


PV CELL PATTERN



DETAIL SECTION OF ROOF

- 1 DOUBLE GLAZED
- 2 RETRACTABLE PHOTOVOLTAIC FABRIC
- 3 STEEL STRUCTURE
- 4 MOTORIZED OPERABLE VENT
- 5 RAINWATER GUTTER



5.6 ADDITIONAL SUSTAINABLE STRATEGIES

1 GREEN MATERIALS

The project will have materials chosen to be effective and efficient, with long term durability, vandal resistant, excellent thermal qualities, high recycled content, and low embodied energy. For example, the community hall can be a mass timber structure, exemplifying renewable materials while capturing carbon from the environment. Concrete pavers will be made from recycled materials. Below grade concrete walls will have high fly ash content. Curtain wall along perimeter to be tempered and laminated for security.

2 ENERGY EFFICIENT SPACES

Non-greenhouse spaces will be characterized by energy efficiency. Heating and cooling will come from low temperature radiant heating. Return air will be transferred into the adjacent greenhouse spaces and can be used for local cooling/heating features. Skylights bring natural light to the spaces below grade. Other features will include energy-efficient lighting fixtures and systems, smart controls (daylight sensors, occupancy sensors), reduced plug loads, and energy-efficient equipment.

3 LIVING MACHINE

A system to treat collected graywater will be designed as an educational exhibit, demonstrating natural ecological processes like the nitrogen cycle, bacterial and root symbiosis, and wetland function. 1000 gallons a day will be treated in large visible planted landscapes to produce water for reuse in irrigation and toilet flushing.

4 LOCAL COOLING STRATEGIES

Mechanically cooling the total volume of the greenhouse is not appropriate and would be very energy intensive. Strategies can include shading (with landscape or artificial), fans, evaporative cooling such as plants, water walls, dry mist systems, water features, and hydronic tubing.

5 PLANT COMPOST

Plant composting in the lower service area is visible to the public to demonstrate the need divert waste away from landfills through skylights.

6 SUSTAINABILITY CAFE

Products and food sold in the cafe could be sustainably sourced, and any packaging could be 100% biodegradable or recyclable.

HORTICULTURAL AVENUE IS EXTENDED
NORTH UNDER A GENEROUS GLASS
CANOPY CREATING A NEW CONNECTION
THROUGH THE GARDENS.



6. SEQUENCING & PHASING

While the focus of the Visualization Study relates to the conservatory addition, the integrated nature of existing and proposed new facilities raises a number of sequencing and phasing considerations which are outlined below. This Study has advanced recommendations related to the conservation and upgrade of existing conservatories (GH 2 & 4) flanking the central Palm House, which could be implemented as a separate project ahead of the new addition, or be implemented as a combined single project.

Recommendations for the existing conservatories (GH 2 & 4) of this Study include the upgrade of glazing envelopes to include thermally insulated laminated glazing to reduce energy use and advance broad sustainability objectives for energy and carbon reductions. This recommendation expands upon recommendations outlined in the 2017 State of Good Repair Report that outlines a 'comprehensive upgrade approach' for these greenhouses and central Palm House (GH 3) that includes glazing replacement using laminated safety glass. Insulated glass is not recommended for the Palm House due to negative impacts this change would have on the heritage glazing system of the historic Palm House which has a complex profile and curvature.

The City has also made recommendations to change the horticultural collection within the existing spaces, which raise other timing considerations regarding how plants are protected, removed, and / or replaced in this larger sequence of construction (i.e. upgrade plants as part of and/ or immediately following the comprehensive upgrade of GH 2, 3 & 4, or defer planting upgrades for completion as part of the larger addition project).

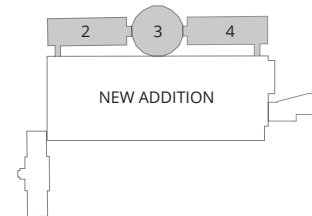
SCENARIO 1 - SEPARATE PROJECT(S) / 2 PHASES

This scenario anticipates the upgrade of GH 2, 3 and 4 as a separate project (phase 1), that when complete, permits their use by the public during the construction of the proposed addition (phase 2). Washroom access would rely upon a temporary arrangement using the proposed public washroom upgrades associated with the Administration Building.

During phase 2 construction, heating systems within the Boiler House would need to be maintained operational - until such time as new replacement systems proposed in the new service location are constructed, commissioned and switched over. At this time the Boiler House would be decommissioned and renovated.

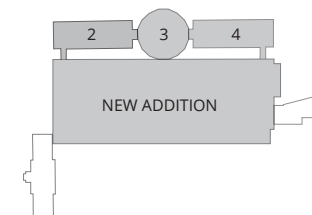
Advanced planning and coordination of select systems is necessary for such an approach to be successful including building controls and automation systems which would be connected to a new / comprehensive greenhouse specific control system at a later date (phase 2).

The phase 2 conservatory addition would need to provide appropriate protection to the public on all sides of the project including the occupied conservatory building to the east. Planting protection and timing of planting collection changes, would need to be assessed based in City priorities and project timing considerations which are currently unknown.



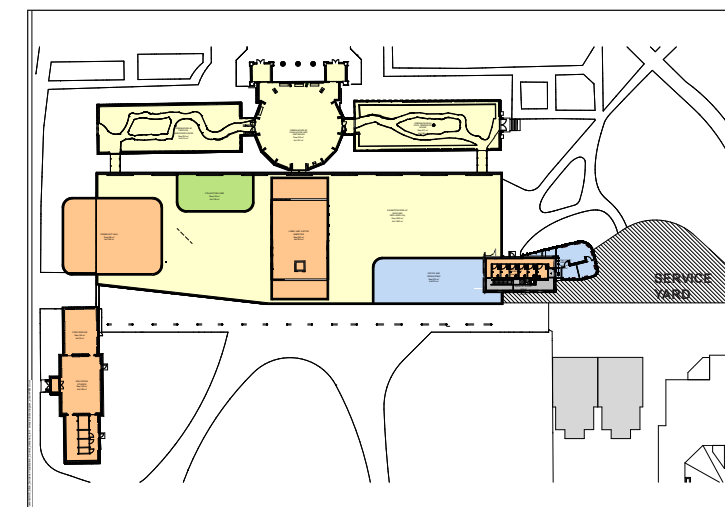
SCENARIO 2 - CONCURRENT PROJECT IMPLEMENTATION

From purely a logistical perspective, organizing the comprehensive upgrade and new addition as concurrent projects is the most straight forward way of implementing the larger project, and reducing the duration of major construction activity in the Park. Assuming the existing plant collection is being comprehensively upgraded in GH 2, 3 & 4, this would eliminate temporary heating provisions as well as plant protection procedures during construction. This would necessitate the complete shutdown of the conservatory complex during construction.

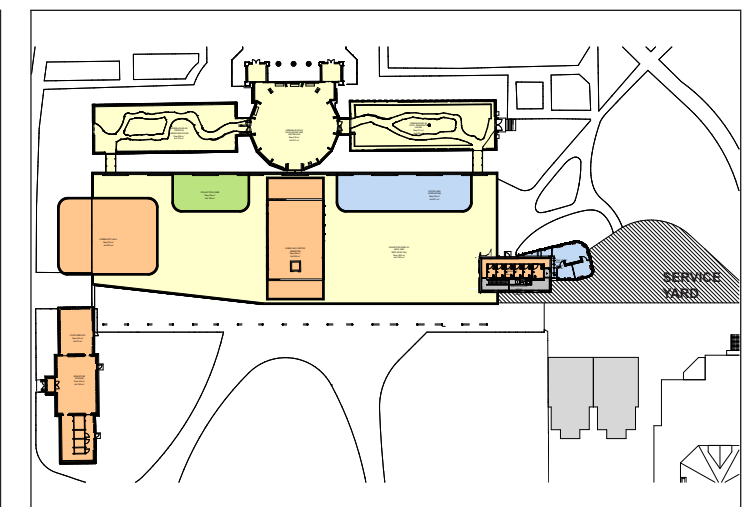


7. ALTERNATIVE SCHEMES

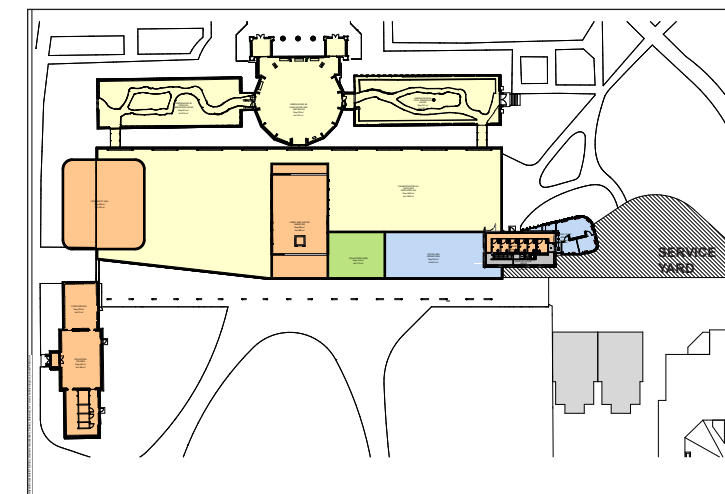
Alternative schemes were evaluated during the design process. As the footprint of the project is constrained by the site design guidelines, the program from the Functional Program Report would not completely fit within a one storey format. Portions of the program therefore require two levels. Options to locate program areas above grade were considered. However, the character of the greenhouse will be transformed by an overwhelming presence of compartmentalized space. This arrangement also requires the service yard to be located at grade and extend outside the footprint guidelines. Four options below show how the spaces might be organized.



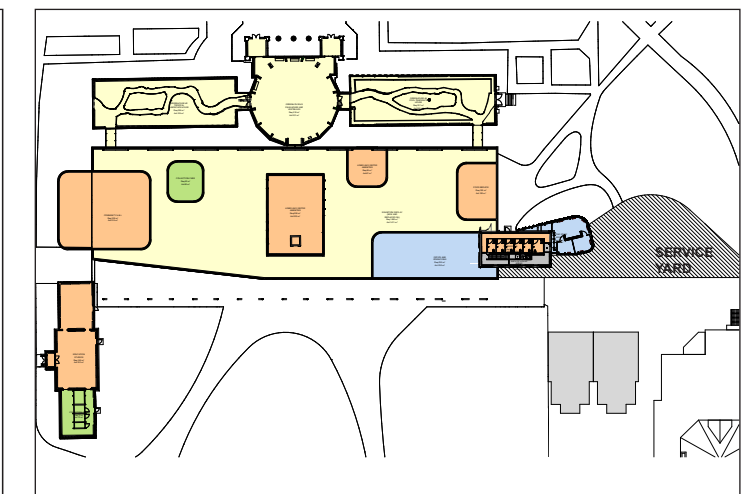
STAGGERED



BACK



FRONT



SCATTERED

8. PROGRAM SUMMARY

Connecting people, plants, and place, the conservatory addition will establish a flexible community hub that is inclusive and accessible, and expands the conservatory's core horticultural experience, while accommodating new capacity for hands-on learning, diverse educational, cultural and community programming. The conservatory addition extends its capacity to serve as a local and regional destination. It incorporates programming initiatives outlined in the *2018 Best Uses and Operational Model Study* which was developed in tandem with this study. The programming elements from this study are summarized below:

Overall Building Areas:	Net Area	Gross Area
New Addition	(sqft)	(sqft)
Ground Floor	24,318*	26,000*
Lower Floor	10,533	13,000
Service	5,126	5,500
Mechanical Room	1,483	1,600
Subtotal	41,460	46,100
Renovated Existing		
Fern House	3,426	3,600
Palm House	3,448	4,000
Orchid House	3,476	3,600
Children's Conservatory	2,820	3,200
Administration Building	2,126	4,000
Subtotal	15,296	18,400
Grand Total	56,756	62,800

* Includes 10,700 sqft to replace demolished Greenhouses 1,4,5

Program Area Breakdown:

Space Name	Net Area		Space Name	Net Area	
	(sqm)	(sqft)		(sqm)	(sqft)
Conservatory Display Areas			Office and Operations		
New Tropical Rainforest Biome	910	9794	Food Services Kitchen	12	134
New Fruit & Spices Biome	285	3064	General Storage (Lower Level)		
New Arid House Biome	494	5315	Includes Food Services Food Storage, Moving Equipment Storage Room, Exhibit Support Storage, and Park Supplies	128	1378
Living Machine	49	526	Mechanical Room (Lower Level)	138	1483
Existing Greenhouse #2 - New Cycad Fern House	318	3426	Service Corridor (Lower Level)	28	298
Existing Greenhouse #3 - Palm House & Vestibules	320	3448	Manager (Private Office - Head) (Lower Level)	12	132
Existing Greenhouse #4 - New Orchid House	323	3476	Open Offices (Lower Level)	42	450
Exhibition / Collection Care			Storage Area	21	230
Plant Collection Workroom (Lower Level)	62	670	Conference Room	29	308
Existing Support Space (Greenhouse #7)	73	782	Gift Shop Storage (Lower Level)	15	165
Existing Planting Storage (Greenhouse #7)	73	789	Education Prep and Storage (Lower Level)	20	211
Public Areas			Debris & Compost Processing (Lower Level)	62	666
Welcome Lobby	16	170	Shipping / Receiving (Lower Level)	258	2781
Vestibule	14	151	Lobby Storage (Lower Level)	16	173
Information Desk (Group Check-in / Ticketing Desk)	16	170	Event Storage (Lower Level)	15	165
Cafe	75	807	Custodial Maintenance Storage	6	61
Community Hall	260	2795	Facility Storage (Lower Level)	16	173
Community Hall - Coat Storage	10	106	Tool Storage (Site Maintenance) (Lower Level)	19	203
Passenger Elevator	3	32	File Storage (Server, IT and equipment) (Lower Level)	17	186
Gallery Stair and Seating (Orientation Theatre)	44	469	Communal Area (Admin building)	29	308
Gift Shop / Display (Lower Level)	136	1460	Supplies Storage (Admin building)	31	329
Coat Storage & Lockers (Lower Level)	27	288	Private Offices - Managers (Admin building)	21	224
Men's WC (Lower Level)	29	307	Custodial Closets (Admin building)	3	31
Women's WC (Lower Level)	28	299	Freight Elevator (Admin building)	1	9
Gender Neutral / Family Restroom (Lower Level)	19	207	Staff Room (Admin building)	25	273
First Aid Room (Lower Level)	6	61	Staff Changeroom and Restroom (Admin building)	24	261
Education Studio (Lower Level)	224	2410	Mechanical Room (Admin building)	33	350
Existing Public Washrooms (Admin building)	32	341	Existing Children's Conservatory- Community Hub	116	1249

