

VIRGINIA MASON SEATTLE CAMPUS | LANDSCAPE MASTER PLAN



PROJECT TEAM

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SWIFT COMPANY LLC

Special thanks to the Virginia Mason Community Advisory Council, and First Hill Improvement Association for providing insightful ideas and feedback. Thank you also to the Virginia Mason staff members who answered questions, and offered invaluable ideas, observations and wisdom.

EXECUTIVE SUMMARY

THE VIRGINIA MASON LANDSCAPE MASTER PLAN (VMLMP) OVERVIEW

INTRODUCTION PAGES 9-13

Virginia Mason has articulated a desire to upgrade its Seattle campus landscape in order to elevate its quality to a level that reflects the organization's high standard of care, offers an asset to Virginia Mason's constituents and the First Hill neighborhood, and reflects the *Major Institution Master Plan's* goals. Vegetation plays a critical role in developing a cohesive campus district and overall sense of place. The purpose of this document is to provide a clear, concise, measurable framework for managing and improving vegetation and associated landscape areas. It includes a strategy for ongoing planting maintenance to ensure continued landscape health and positive user experience.

See pages 9-13 for master plan focus, products, process, goals, objectives, and assumptions.

PROCESS AND SITE ANALYSIS PAGES 15-27, APPENDIX A PAGES 56-73

An extensive existing conditions inventory and analysis was conducted, involving numerous site visits. Given the focus of the master plan is on Virginia Mason's vegetated landscape, the inventory and analysis placed an emphasis on studying the species, health and location of existing plant material. Simultaneously, meetings with key Virginia Mason staff and First Hill community members clarified project scope, goals, and design strategies. A code and planning review provided a guide for how the Virginia Mason Landscape Master Plan could best respond to the City of Seattle's zoning code and regulatory framework, and complement future campus and public realm development.

See pages 15-27 for site analysis summary, and Appendix A pages 56-73 for detailed analysis documents.

DESIGN RECOMMENDATIONS PAGES 28-55, APPENDIX B PAGES 74-101

Site specific, targeted design recommendations directly respond to opportunities and constraints identified in the site analysis. Recommendations address the campus holistically from a larger campus perspective, and at a finer grain. To support the objective of clear campus districts, recommendations are structured according to landscape zones. For each landscape zone, a site plan, associated plant list, and detailed design recommendations are included.

See pages 36-41 for campus planting character.

See pages 42-53 for recommended plans for each landscape zone.

See Appendix B pages 74-89 for detailed design recommendations.

See Appendix B pages 90-99 for plant lists for each landscape zone.

SPECIFICATIONS APPENDIX C PAGES 102- 145

To guide the installation of design interventions and ongoing maintenance of the campus landscape, restoration and landscape maintenance outline and materials specifications are provided. These cover Restoration (page 104) Irrigation (page 108) Planting (page 120) and Maintenance (page 131), which includes specific recommendations for Integrated Pest Management (page 139) and a Management Schedule (page 141).

CONCLUSION

This tool, along with the *Major Institution Master Plan* and the *Public Realm Action Plan* will create a more cohesive, dynamic, pedestrian friendly, ecologically diverse campus landscape.

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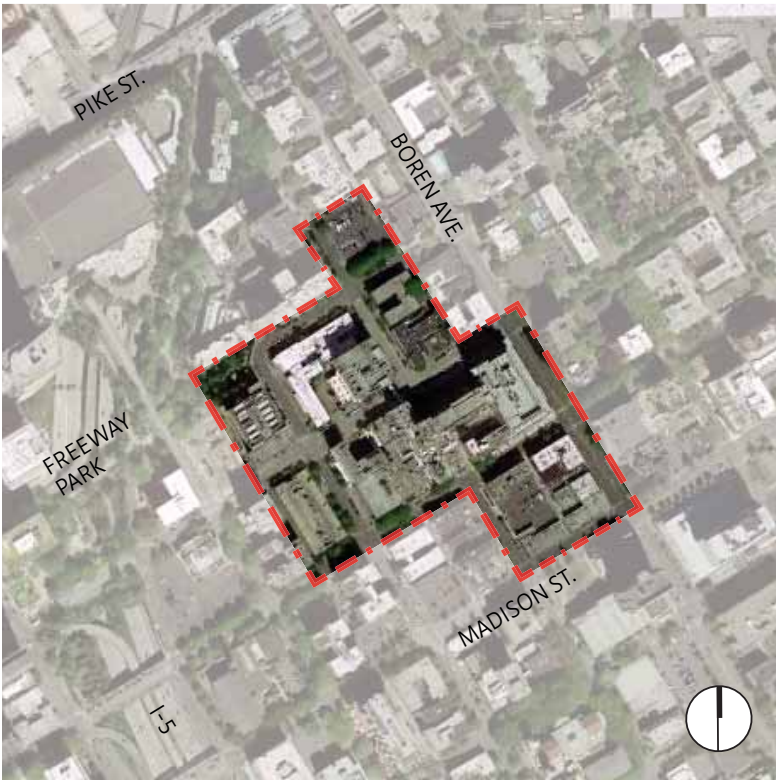


FIGURE 1: SITE CONTEXT PLAN

INTRODUCTION

STATEMENT OF PURPOSE

Virginia Mason has recently completed an extensive visioning process to update its *Major Institution Master Plan* (MIMP, 2014) used to plan campus redevelopment of the Seattle First Hill campus. The effort has resulted in a number of tools to guide long term improvements. These include a desire to upgrade the campus landscape in order to elevate its quality to a level that reflects Virginia Mason's high standard of care, and offer an asset to Virginia Mason's constituents and the neighborhood.

The purpose of this document is to provide a clear, concise, measurable framework for managing vegetation and associated landscape areas, as well as a strategy for ongoing planting maintenance to ensure continued landscape health and positive user experience.

FOCUS

While this document focuses on Virginia Mason's campus landscape design holistically, recommendations specifically address improving campus vegetation, including both the maintenance and improvement of existing tree and understory plant material, as well as the planting, establishment and continued care of new trees and understory planting. Vegetation plays a critical role in developing a clear, cohesive landscape and campus identity and overall sense of place. Campus planting also provides numerous environmental, and sociocultural ecosystem services, which range from supporting biodiversity, to creating a sense of health and well-being.

PRODUCTS

The following products have been produced as a result of this effort:

- A plan for the improvement of the campus landscape, which includes:
 - An inventory of existing site conditions
 - A campus-wide landscape master plan
 - Annotated landscape design plan for each campus landscape zone.
 - Detailed landscape design plans for specific areas within each landscape zone.
 - Materials list including plant species, soils, mulch and associated materials for each landscape zone.
- A tool for the maintenance and management of the campus landscape, which includes Materials and Outline Specifications that detail sustainable practices for the installation and maintenance of planting, soils, and irrigation.
- A framework for measuring landscape performance

“Our vision is to be the Quality Leader and transform health care.

To become the Quality Leader, we must first change the way health care is delivered. Our aspiration is not to be the biggest, but to be the best. We will differentiate ourselves on the basis of quality.”

“Our mission is to improve the health and well-being of the patients we serve .

Healing illness is our first priority and is what gives our people the energy for our vision. We are also committed to providing a broad range of services that improve one’s sense of well-being and which prevent illness.”

VIRGINIA MASON MISSION STATEMENT

INTRODUCTION

PROCESS

An extensive existing conditions inventory and analysis was conducted, involving numerous site visits over a two month period from December 2014, to February 2015. Concurrently, meetings with key Virginia Mason Staff and First Hill Community Members clarified project scope, goals, and design strategies. Meetings included: an initial goal setting session with Virginia Mason project managers, a review of work associated the *Public Realm Action Plan* with key contributors, and a Public Presentation at the Virginia Mason Citizens Advisory Committee / First Hill Improvement Association Community Meeting.

A code and planning review provided an approach for how the Virginia Mason Landscape Master Plan could best respond to the City of Seattle's Zoning Code and regulatory framework. The *Major Institution Master Plan and Design Guidelines* (MIMP, 2014), and the *Public Realm Action Plan* (PRAP, 2015) were also closely reviewed to understand how this scope of work can best complement future campus and public realm development.

The existing conditions analysis, feedback and knowledge gained from project meetings, along with the code and planning review were used to inform site specific, targeted landscape design interventions and maintenance strategies.

GOALS AND OBJECTIVES

The Virginia Mason Landscape Master plan (VMLP) aims to provide a clear, concise, easy to follow framework for the management, enhancement, and implementation of Virginia Mason's landscape, over a 3-5 year period. Following the initial implementation years, this document will act as a tool for the ongoing management and improvement of the campus landscape, which supports the institutional goals, and those listed below. Objectives listed below each goal describe a specific means to meet the desired outcome .

- Create a cohesive campus landscape character that supports Virginia Mason's mission and role in the larger First Hill community.
 - Develop a plant palette that is structured by landscape zones to ensure a cohesive design at the neighborhood scale.
- Improve the quality and safety of the pedestrian public realm.
 - Ensure existing and future planting complies with Crime Prevention Through Environmental Design Principles.
- Inspire a sense of vitality, rejuvenation, generosity, and well- being through plant and material selections.
 - Choose plant species and combinations that provide seasonal interest throughout the year.
- Improve short-term and long-term plant health.
 - Provide a structured, easy to follow plan for landscape improvements, restoration, and maintenance.

INTRODUCTION

- Integrate ecologically sustainable landscape design interventions, which respond to specific site conditions and the larger First Hill urban context.
 - Choose native / adaptive plants that tolerant of urban conditions, and well-suited to micro-climate conditions
 - Implement ecologically sensitive pest management and maintenance practices
- Encourage patients, visitors and employees at Virginia Mason's campus to go outdoors, and experience the joy and poetry that exists within our urban landscape.
 - Provide opportunities to sit, socialize and relax through the thoughtful integration and placement of comfortable seating areas, public art and planting.

ASSUMPTIONS

A number of assumptions are embedded within this document's research and recommendations. These include:

- The understanding that not all of the goals, objectives, and design recommendations included in this document can and will be met at any one time. The improvement of the campus landscape will be an ongoing, dynamic process.
- This document will be used as an attachment to the procurement documentation that includes a set of clear, measurable expectations for landscape improvement and maintenance.
- The existing and future landscape areas are limited and should be managed and maintained to the highest level in support of the institution's mission and values.
- The existing landscape is a resource to build upon, steward, and with selective directed action increase the benefits to the institution and community.
- This document will be used to inform future development efforts and coordination with neighbors and partners. It will be used in conjunction with applicable planning documents and standards.

SUMMARY

The production of the VMLMP, in concert with the *Major Institution Master Plan* and the *Public Realm Action Plan*, is step towards a more cohesive, dynamic, pedestrian friendly, ecologically diverse, campus landscape. The implementation of the strategies included in this document will create a campus landscape that is an asset to Virginia Mason, its constituents, and the First Hill neighborhood.



LINDEMAN PAVILION PLAZA



THE INN AT VIRGINIA MASON COURTYARD



UNIVERSITY ST. PUBLIC REALM



CASSEL CRAG COURTYARD AND ENTRY

SITE ANALYSIS

OVERVIEW

The existing conditions inventory and analysis occurred over a two month period between December 2014, to February 2015. The goal of the analysis was to gain a greater understanding of existing campus landscape character, urban design elements, materials, topography, micro-climate conditions, circulation patterns, and infrastructure systems.

Given that the focus of this project is Virginia Mason's vegetated landscape, the existing conditions analysis placed a considerable emphasis on studying existing plant material. The extent, species, health, history, and age of existing trees and understory plants were documented, as well as the scope, type and functionality of the existing irrigation system, in order to inform recommendations for future expansion and improvement.

Existing conditions data was gathered using the available Virginia Mason Landscape base map, and survey. Numerous site visits were conducted, to collect information, including a focused tree inventory and an irrigation survey conducted with a representative from Virginia Mason's Engineering Department.

Following the existing conditions inventory, the scale, type, and health of existing trees and understory were assessed to determine whether planting positively or negatively contributed to achieving project goals, with an emphasis on measuring contribution to both a cohesive campus character, as well as a safe, comfortable pedestrian environment. Unplanted areas were also considered, in order to target locations for new tree species, and expansion of planting beds.

See pages 16-27, and Appendix A pages 56-73 for analysis documents.

SITE ANALYSIS

EXISTING LANDSCAPE URBAN DESIGN FRAMEWORK

The development of an existing campus urban design framework illustrates how the many varied parts of Virginia Mason’s campus currently function to contribute to the collective campus identity.

This analysis builds upon the neighborhood contextual analysis that was produced in Part A of the *Major Institution Master Plan Design Guidelines*, to identify Virginia Mason’s urban design landscape framework at the urban block, building, and courtyard scale.

In order to best design for a cohesive campus identity within the First Hill neighborhood, it is important to first understand the existing campus identity. The campus is comprised of corridors, gateways, building entries, and various landscape areas. These are perceived in a hierarchical sequence, where some elements are functioning to their full potential, and others perform their functions weakly, or not at all. This variation offers opportunities for targeted improvements to bring all of the elements up to a consistently high level of performance.


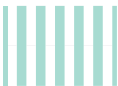






At the block scale, Boren Street and Spring Street though quite different in pedestrian environment and traffic patterns, both have a distinct campus edge quality. Recommended design interventions in these zones aim to create a more permeable, inviting edge to the campus by both responding to neighborhood context and announcing the transition into the Virginia Mason Campus.

Conversely, Seneca Street, as a primary campus multi-modal corridor, has a very different character from University Street, which is less steep and more intimate with residential uses abutting the right of way (R.O.W.) The difference in vehicle traffic, pedestrian use, and building scale between these streets should be acknowledged and designed for.

At the building scale, existing campus building entries each presently have a unique identity and design approach. However, treating each building entry as part of a larger suite, through the use of similar landscape materials, plantings, furniture and signage, could improve campus wayfinding, visitor experience, and the creation of a cohesive campus identity.

Figure 2, on the opposite page, illustrates the clear hierarchy and organization of the campus. This tool is used to evaluate the existing landscape to identify actions, and inform design strategies that will satisfy the master plan goals.

LEGEND

-  CAMPUS EDGE
-  MAJOR CORRIDOR
-  SECONDARY CORRIDOR
-  COURTYARD
-  CAMPUS ENTRY
-  CAMPUS GATEWAY PRIMARY
-  CAMPUS GATEWAY SECONDARY
-  BUILDING ENTRY

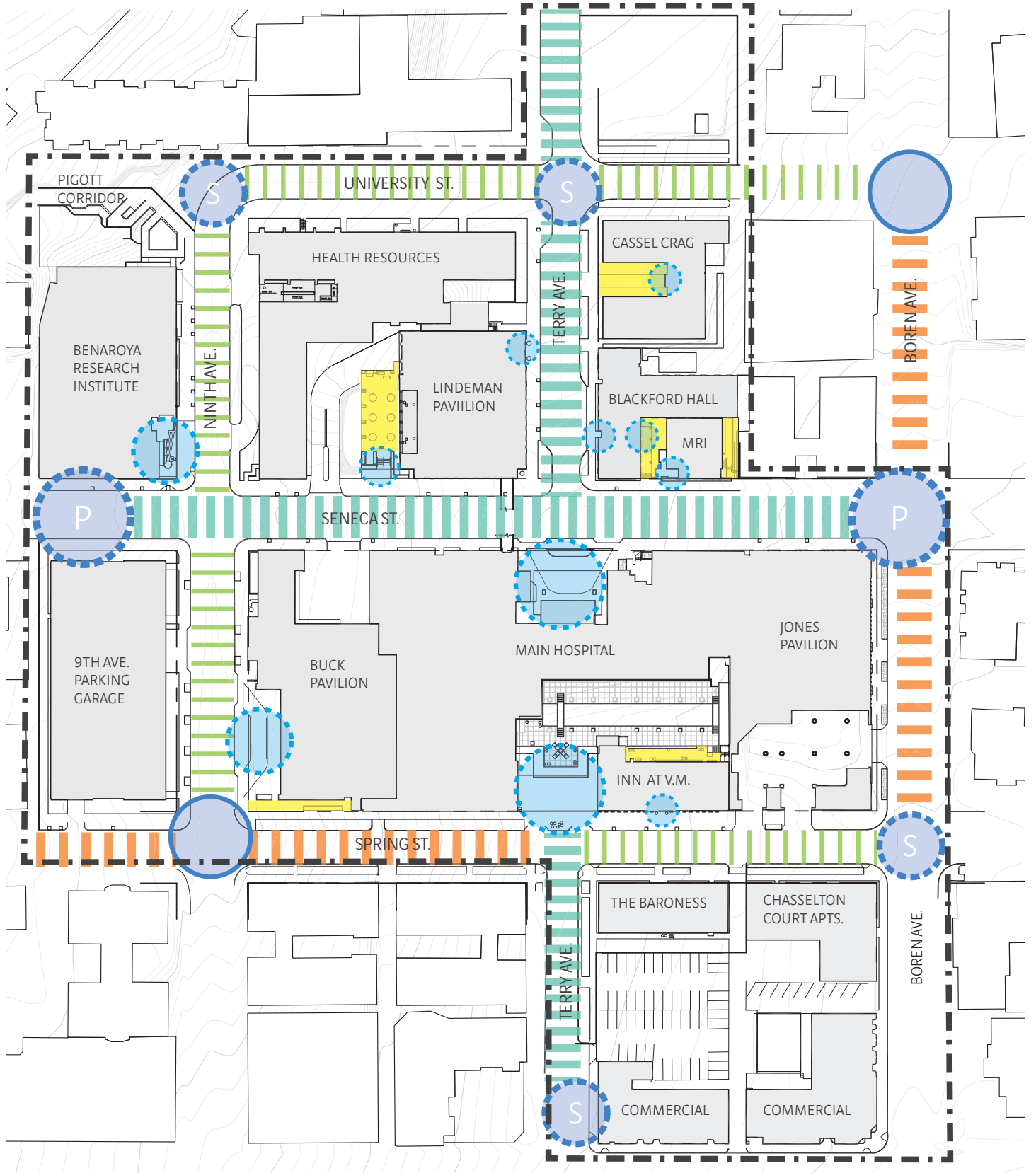


FIGURE 2: EXISTING LANDSCAPE URBAN DESIGN FRAMEWORK



SITE ANALYSIS

EXISTING CAMPUS LANDSCAPE MOSAIC

The Virginia Mason campus is a heterogeneous mix of landscape types, creating a mosaic of spaces that are not currently united. Each of these types has a distinct function, and collectively contributes to the greater campus identity and fabric. The campus landscape mosaic identifies each part of the neighborhood landscape at a finer grain, to inform nuanced design strategies. The mosaic is to be used in conjunction with the urban design framework to understand how these pieces of the landscape should be addressed at both the finer and neighborhood scale, in order to achieve the master plan goals. Given the limited landscape area, it is essential that all spaces be designed and maintained to contribute to a cohesive campus experience.

PATHWAY / PASSAGE ●

Pathways and passages are spaces that primarily function to provide a safe, comfortable path of travel for pedestrians. In the existing campus landscape, most of the pathways only allow pass-through activity; they do not offer moments to sit and enjoy the public realm. Pathways should be considered as both active and static spaces to create a lively, human-scale streetscape.

SERVICE / PARKING ●

Service and parking areas are zones which function to accommodate the needs of cars, emergency, and service vehicles. The intention of this study is not to alter the existing service or vehicle access. However, views and materiality of these zones should be considered in order to minimize their impact on the pedestrian experience.

INTERSTITIAL / BUFFER / EDGE ●

Interstitial / Buffer / Edge zones do not neatly fit into any category. They can be considered 'leftover' spaces, which are mainly characterized by an adjacent use. These spaces should be evaluated for potential improvement and integration into the surrounding landscape fabric.

BUILDING ENTRY ●

Building entries primarily function to provide convenient, accessible, clearly marked entry ways. Currently, there are a variety of entry treatments employed at Virginia Mason. Entries should be considered as part of a unified design approach, in order to improve campus way-finding, pedestrian experience, and a unified campus character.

LANDSCAPE THRESHOLD ●

Landscape thresholds are transitional exterior spaces which function as bridges from one place to another. In the existing campus landscape, these are often characterized by steps, or ramps. These spaces should be assessed for pedestrian comfort levels, sight lines and should be enhanced to create more guided transitions.

COURTYARD / TERRACE ●

Courtyards and terraces are smaller, more intimate spaces that are semi-removed from the streetscape. These are important assets for the Virginia Mason campus, in providing a safe comfortable, respite for campus staff, patients, and visitors. Efforts should be made to both improve existing courtyard / terrace spaces, and to create new ones that respond to specific building uses and site conditions.

LEGEND

- PATHWAY / PASSAGE
- SERVICE / PARKING
- INTERSTITIAL / BUFFER / EDGE
- BUILDING ENTRY
- THRESHOLD
- COURTYARD / TERRACE

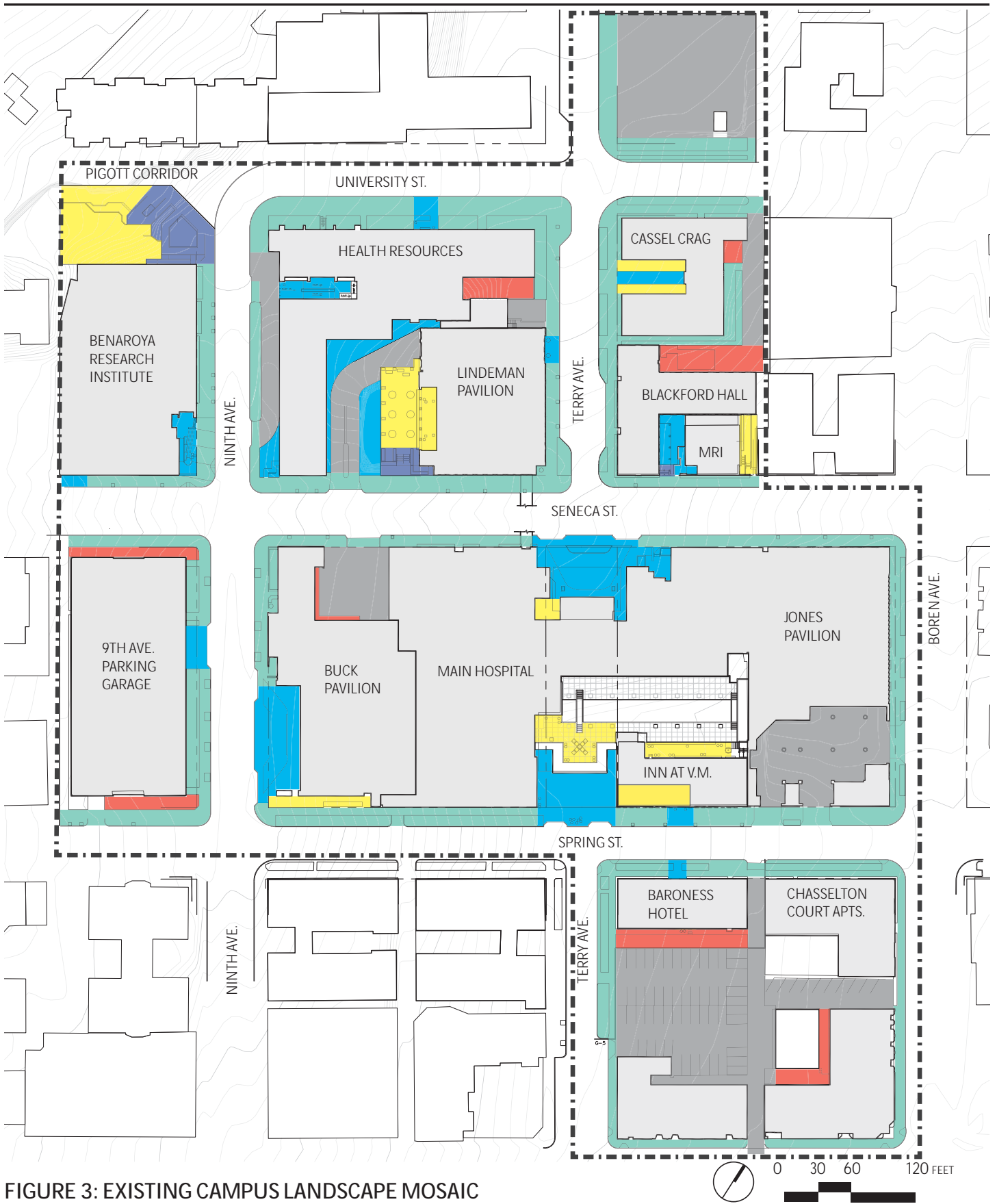


FIGURE 3: EXISTING CAMPUS LANDSCAPE MOSAIC

SITE ANALYSIS

EXISTING TREES

One of Virginia Mason's largest landscape assets is its extensive mature tree canopy. The *Major Institution Master Plan* recommends retaining as much of the existing mature tree canopy as possible. A mature tree canopy in the urban context provides myriad landscape services, which include improving air quality, reducing atmospheric greenhouse effects, conserving water and soil quality, reducing noise pollution, and creating wildlife and plant diversity.

In December 2014, an on-site tree inventory was conducted to determine tree species, health, and relative age of each existing tree on campus. 135 trees were surveyed in total. See Appendix A Page 60-61 for Overall Tree Inventory. Trees were analyzed to determine whether their condition, species, or scale either contributed or detracted from the development of a cohesive campus identity.

Trees that positively contribute to cohesive campus identity meet one or more of the following criteria:

- They are historically significant
- They are mature and healthy
- They are part of a cohesive grouping
- They provide seasonal color and /or interest

Trees with limited contribution to creating a cohesive campus identity meet one or more of the following criteria:


- The species does not contribute to cohesive character
- The tree is unhealthy or in poor condition
- The scale of the tree inappropriate for the location.


Trees with a positive designation should be prioritized for retention, while those with a negative association should be scheduled for removal and replacement. 97 trees are suitable for retention, and 38 trees have been identified for removal.

Street and courtyard areas were also evaluated to determine whether or not they were suitable for additional tree planting. 131 total replacement / new trees have been proposed, which equals an additional 93 trees for the campus.

This information was used to develop Figure 4 on the opposite page. See pages Appendix A pages 58-65 for detailed tree inventory

LEGEND

 EXISTING TREE : POSITIVE CONTRIBUTING CHARACTER

 EXISTING TREE TO BE REMOVED / REPLACED

 PROPOSED LOCATION FOR NEW TREE

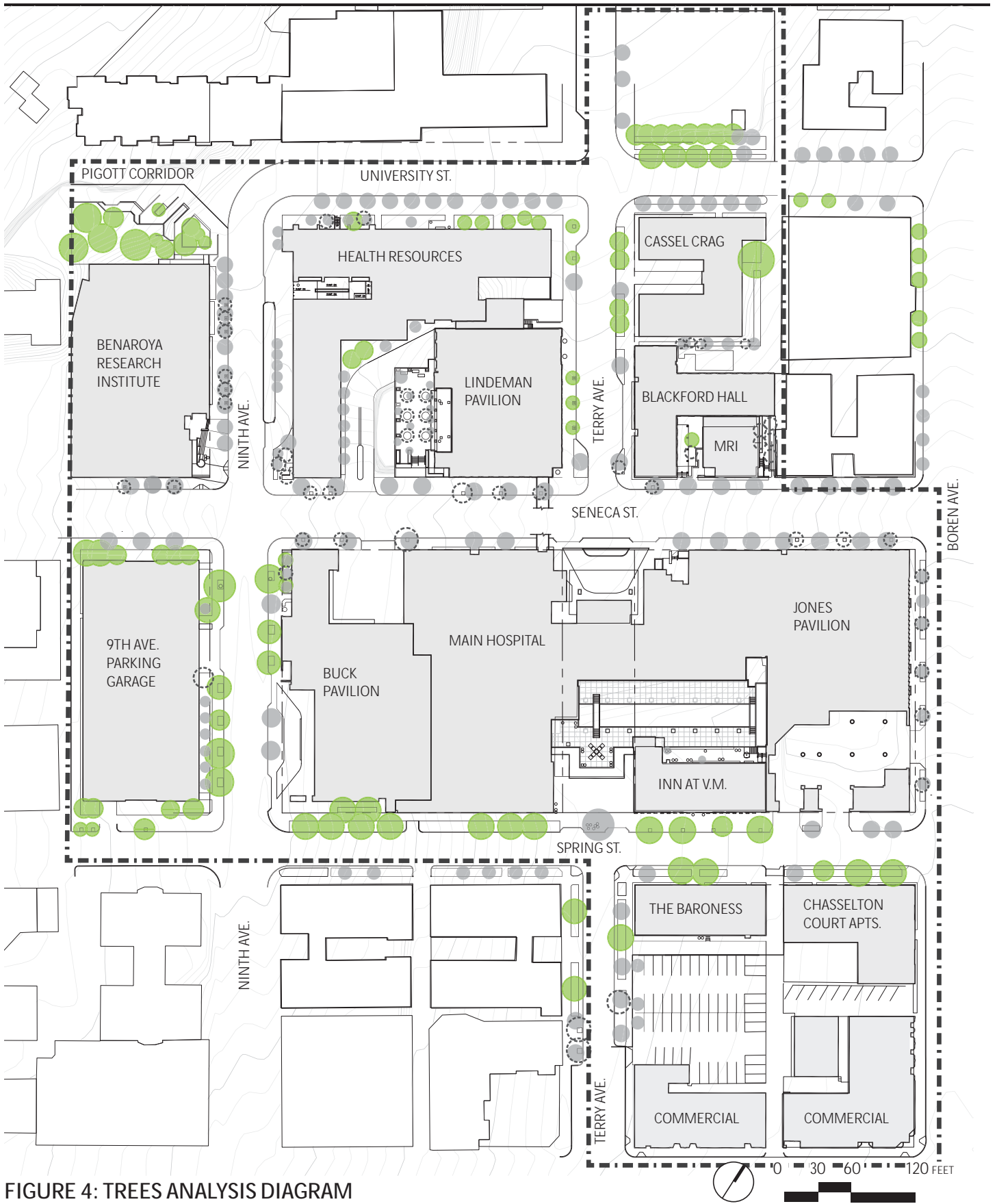


FIGURE 4: TREES ANALYSIS DIAGRAM

SITE ANALYSIS

EXISTING LANDSCAPE BEDS

An inventory of understory planting bed conditions was conducted, in order to best inform recommended site-specific design interventions. Beds were analyzed to determine whether their condition, species, or scale either contributed or detracted from the development of a cohesive campus identity.

Planting beds that positively contribute to cohesive campus identity meet one or more of the following criteria:

- They contribute to a human-scaled landscape
- They are generous in width or size, and have potential for a variety of species to flourish.
- They are healthy or well maintained
- They are historically significant.

Planting beds that detract from the development of a cohesive campus identity meet one or more of the following criteria:





- Their materiality does not contribute to a unified character.
- Planting is in poor condition or is failing
- They obstruct visibility or provide places for enclosure (do not comply with Crime Prevention Through Environmental Design / CPTED) principles.

It is important to note that some beds may fall into more than one category. For example, the planted area to the east of the Ninth Avenue Parking Garage is an asset to the campus given the mature planting, and width of the planting bed, which could have high landscape potential. Some of the mature shrubs, however, do not allow for clear sight lines, or street level transparency, and do not meet CPTED principles. CPTED principles include: Surveillance, Legibility, Territoriality, Ownership of Outcomes, Management, Vulnerability.

Unplanted landscape beds have also been included in this analysis. For a detailed inventory of unplanted bed conditions see Appendix A, page 71.

This information was used to develop Figure 5 on the opposite page.

LEGEND

-  LANDSCAPE BED: COHESIVE WITH POSITIVE CONTRIBUTING CHARACTER
-  LANDSCAPE BED: CONDITION, SPECIES, SCALE DETRACTS FROM COHESIVE CAMPUS IDENTITY
-  PLANTING BED DOES NOT COMPLY WITH CPTED PRINCIPLES
-  PLANTING: PROPOSED NEW PLANTING BEDS LOCATION

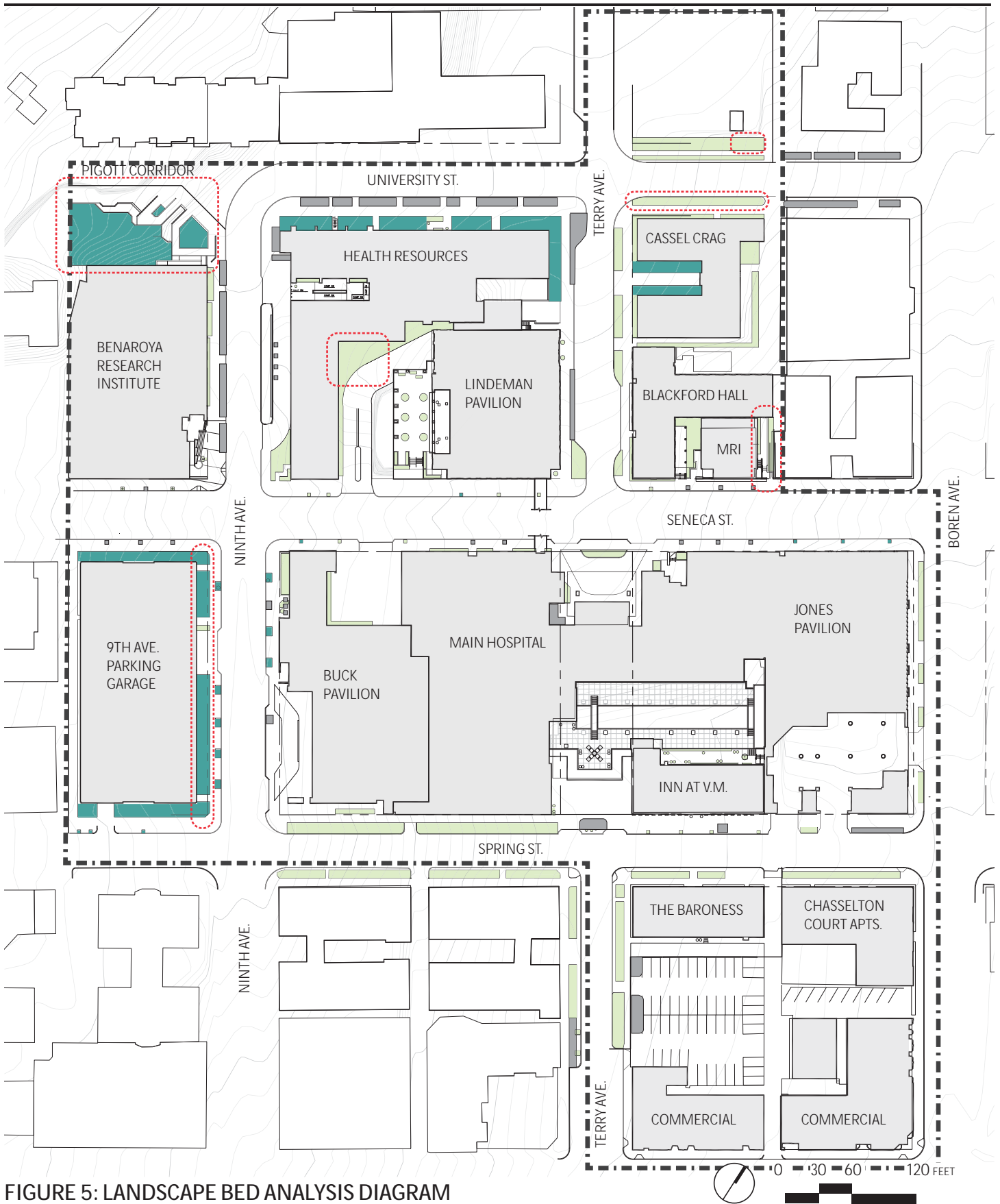


FIGURE 5: LANDSCAPE BED ANALYSIS DIAGRAM

SITE ANALYSIS

EXISTING IRRIGATION SYSTEM

Given the ongoing nature of development and change on the Virginia Mason campus, the level of irrigation provided varies greatly from block to block. In January, 2015, an on-site irrigation inventory was conducted to determine the extent, type, and functionality of the existing irrigation system. This information was used to inform Figure 6 on the opposite page.

Blocks where more recent construction has occurred are well-serviced, such as areas surrounding the Jones Pavilion and Benaroya Research Institute. Blocks that include historic structures or older construction, however, are not as well serviced. These include Terry Ave between Seneca St. and University, and the Lindeman Pavilion / Health Resources block between University, Seneca, Ninth and Terry.

AREAS FOR FUTURE EXPANSION AND RESEARCH




The expansion of the irrigation system to all landscape beds is recommended, to ensure regular watering can occur during the initial two year plant establishment period and summer months. Although water-wise landscaping is a high priority, and has influenced plant recommendations (as shown in Appendix B) Seattle's climate brings long periods of drought in the summer months. Without water, permanent damage to plant material can occur. A thorough analysis of the existing system is recommended to determine whether or not the most water-efficient irrigation layout and system have been installed.

An evaluation of the level of condensate produced on Virginia Mason's campus annually is recommended, in order to further study the feasibility of using collected condensate for irrigation. Areas for future research include:

- Where exactly is condensate collected?
- Where can a cistern be installed to store collected condensate?
- Since condensate typically drains out of the bottom of the buildings, what type of pump system would be required to push water up to landscape grade ?
- Where are the most appropriate connection points to the existing irrigation system?
- Has condensate treated with Steamate NA 9680 been used for irrigation on other sites? Has this been a successful application with no negative affects on plant health?

Refer to pages 30-31 for sustainable landscape design strategies related to irrigation.

LEGEND

-  PLANTING BEDS WITH IRRIGATION
-  PLANTING BEDS WITH NO IRRIGATION
-  PLANTING BEDS WITH IRRIGATION SYSTEM THAT IS OLD, DECOMMISSIONED OR NOT IN USE

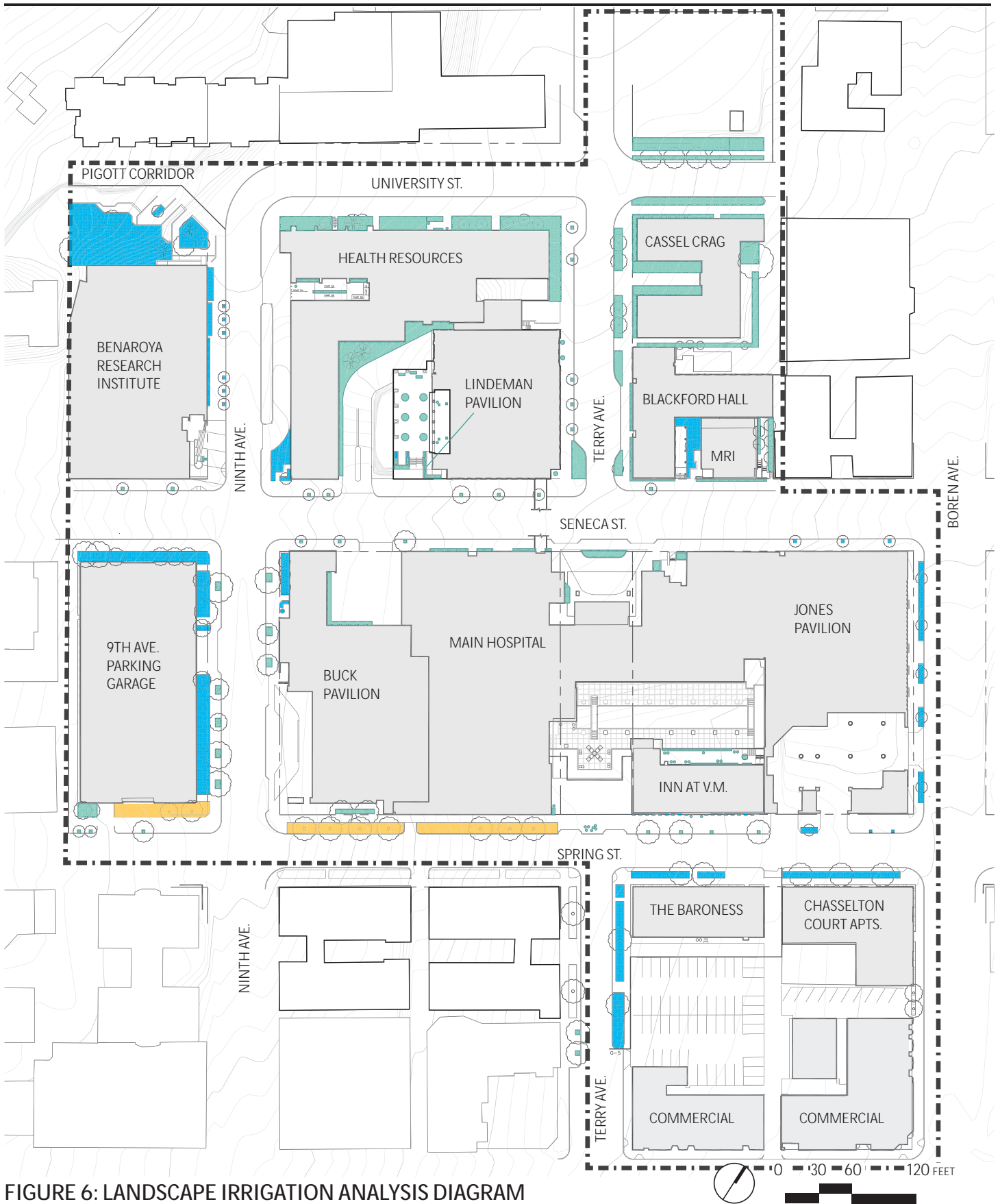


FIGURE 6: LANDSCAPE IRRIGATION ANALYSIS DIAGRAM

SITE ANALYSIS

CONCLUSIONS AND OBSERVATIONS

The existing landscape of the Virginia Mason campus has great potential. There are a variety of types of landscape spaces, mature trees, and active pedestrian use. The spaces, however, are disconnected, and do not provide a sense of continuity within the campus or the First Hill neighborhood.

- 1 A large portion of the existing tree canopy and understory plant material do not support a unified, cohesive campus character, or the development of landscape zones. In most instances, planting beds are comprised of multiple varying species, resulting in visually complex, and apparently disorganized circumstances. Areas which are aesthetically and spatially cohesive provide a sense of visual calm and become campus landmarks
- 2 There are areas where mature trees and wide planting beds can and do contribute to a positive campus experience.
- 3 Street trees are critical to establish a strong pedestrian environment, and species should be selected to address the scale of their surroundings.
- 4 A significant amount of planting is in poor condition, due to micro-climate site conditions, soil quality / and or maintenance practices, and does not contribute to a sense of healing or rejuvenation.
- 5 There are numerous places where plant type and / or size negatively impacts pedestrian safety by obstructing sight-lines or providing places for enclosure (planting does not comply with CPTED principles). Selected maintenance and / or plant replacement will increase the sense of safety.
- 6 There is an opportunity for the landscape design and maintenance regimes to integrate ecologically sustainable practices.
- 7 The existing irrigation system should be evaluated for functionality and expansion.
- 8 There are opportunities to integrate more activity into the public realm, such as socializing, pausing, or simply experiencing the urban fabric.
- 9 Given the neighborhood's busy, urban character, courtyards and terraces are positive assets to the neighborhood fabric. As such, existing courtyards terraces should be given an elevated design treatment, and a priority placed on creating new additional outdoor public spaces associated with buildings.

Design recommendations will specifically target the above observations in order to work towards the achievement of all master plan goals, and to create a more cohesive, visually appealing, safe, sustainable, healthy, engaging, generous landscape.



1 TERRY AVE. RIGHT-OF-WAY



2 UNIVERSITY ST. LANDSCAPE



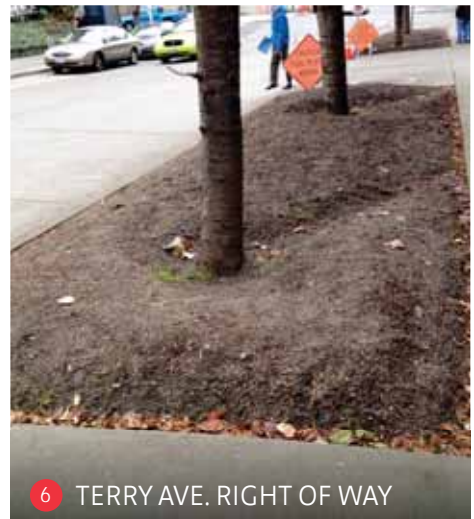
3 UNIVERSITY ST. MATURE TREES



4 CASSEL CRAG WALKWAY



5 UNIVERSITY ST. RIGHT OF WAY



6 TERRY AVE. RIGHT OF WAY



7 BOREN AVE. IRRIGATION



8 NINTH AVE. RIGHT OF WAY



9 LINDEMAN PAVILION PLAZA

DESIGN RECOMMENDATIONS

INTRODUCTION

The existing conditions analysis, feedback from VMLMP project meetings, along with the code and planning review directly informed the development of site-specific, landscape design interventions and maintenance strategies. All recommendations strive to elevate the existing quality of the campus landscape and to meet the master plan goals.

The design recommendation portion of the document includes:

- A proposed landscape master-plan
- An overview of sustainable landscape principles embedded in the landscape master plan
- A description of campus landscape zones used to frame and organize block-scale design recommendations
- Plant understory character images and descriptions
- Tree canopy character images and descriptions
- A strategy for prioritizing design interventions
- A landscape plan for each landscape unit, which describes:
 - Existing trees and understory to be retained
 - New or revised planting bed layouts
 - Extent and type of new trees and understory planting
 - Recommended irrigation expansion areas
 - Recommended areas for seating and public art in the R.O.W.
 - Zones for future detailed design

In addition to the documents listed in the Design Recommendations Chapter, Landscape Appendix B contains:

- Conceptual landscape designs for each detail design area
- A detailed plant list for each landscape zone
- Materials and furnishings recommendations.

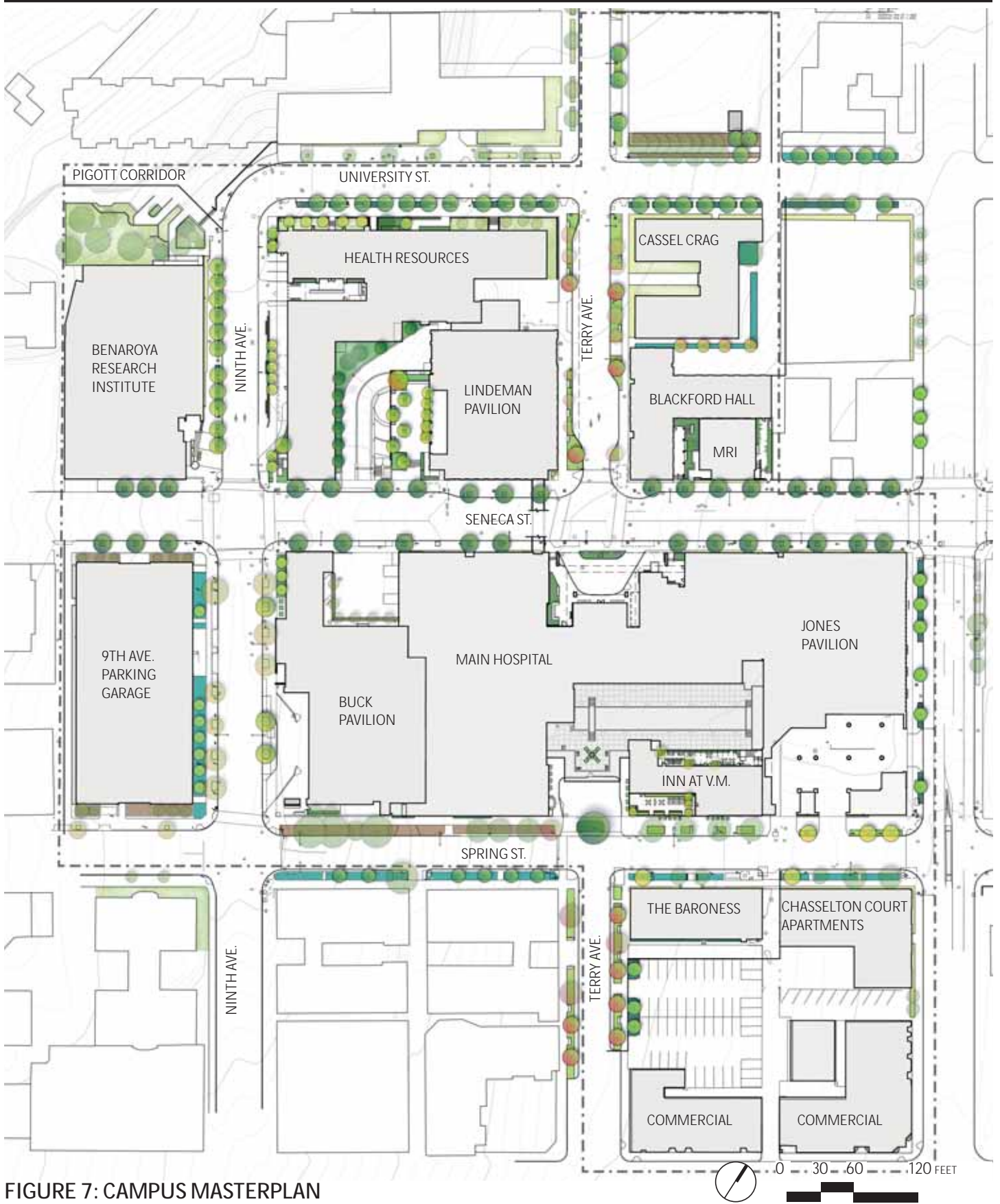


FIGURE 7: CAMPUS MASTERPLAN

DESIGN RECOMMENDATIONS

SUSTAINABLE DESIGN STRATEGIES

“Virginia Mason is committed to providing high quality healthcare while preserving our natural environment now and for future generations.”

Virginia Mason’s campus landscape is not fully performing at a level aligned with the organization’s environmental commitment to conserve energy, water, materials and contribute to the health of the First Hill Community. A number of sustainable design strategies are embedded in the planning and development of the landscape master plan, which specifically relate to Virginia Mason’s Commitment to Environmental Sustainability and to the sustainable goals listed in the Major Institution Maser plan.

HABITAT PLANTING ●

Campus planting has the potential to provide numerous environmental, and cultural ecosystem services. Planting native / adaptive plant species which will attract birds, bees, butterflies and beneficial insects will increase biodiversity and landscape health. Increasing biodiversity on the campus will also help elicit a sense of rejuvenation, health, vitality, and joy to patients, staff, and visitors throughout the seasons. While recommended plant lists for all landscape zones incorporate native / adaptive species, areas outlined in yellow in Figure 8 will have the highest level of species diversity, with a focus on pollinator friendly plants (see Terry Ave. page 46-47). These areas have been designated due to the scale of landscape beds in the R.O.W., solar orientation, and opportunities for pedestrian engagement.



STORMWATER PLANTING ●

The campus site analysis revealed several areas where stormwater was collecting, or landscape beds were not free-draining, which was in turn affecting plant and soil health. The campus master plan recommends implementing stormwater planting in these areas (outlined in green in Figure 8). Stormwater planting is beneficial because it helps to: minimize polluted stormwater entering Seattle’s rivers and streams; reduce impervious surfaces allowing stormwater to infiltrate and recharge groundwater and surface water and mitigate heat island effect, and improve air quality to increase pedestrian comfort.



WATER-WISE PLANTING AND SMART IRRIGATION ●

Native / adaptive, resilient, drought-tolerant plant species have been recommended, in effort to decrease water-use for irrigation. Seattle’s climate, however, brings long periods of drought in the summer months, and without water, permanent damage to plant material can occur. A thorough analysis of the existing irrigation system should be performed to determine the most water-efficient elements have been installed. Areas shown in blue in Figure 8 are priority areas for irrigation evaluation and expansion. These zones have either been deemed priority landscape zones, where continued healthy plant growth is crucial or are a detailed design development areas.

A high level of condensate is produced on Virginia Mason’s campus annually. Further study on the feasibility of using collected condensate for irrigation is recommended. See the irrigation analysis on pages 24- 25.



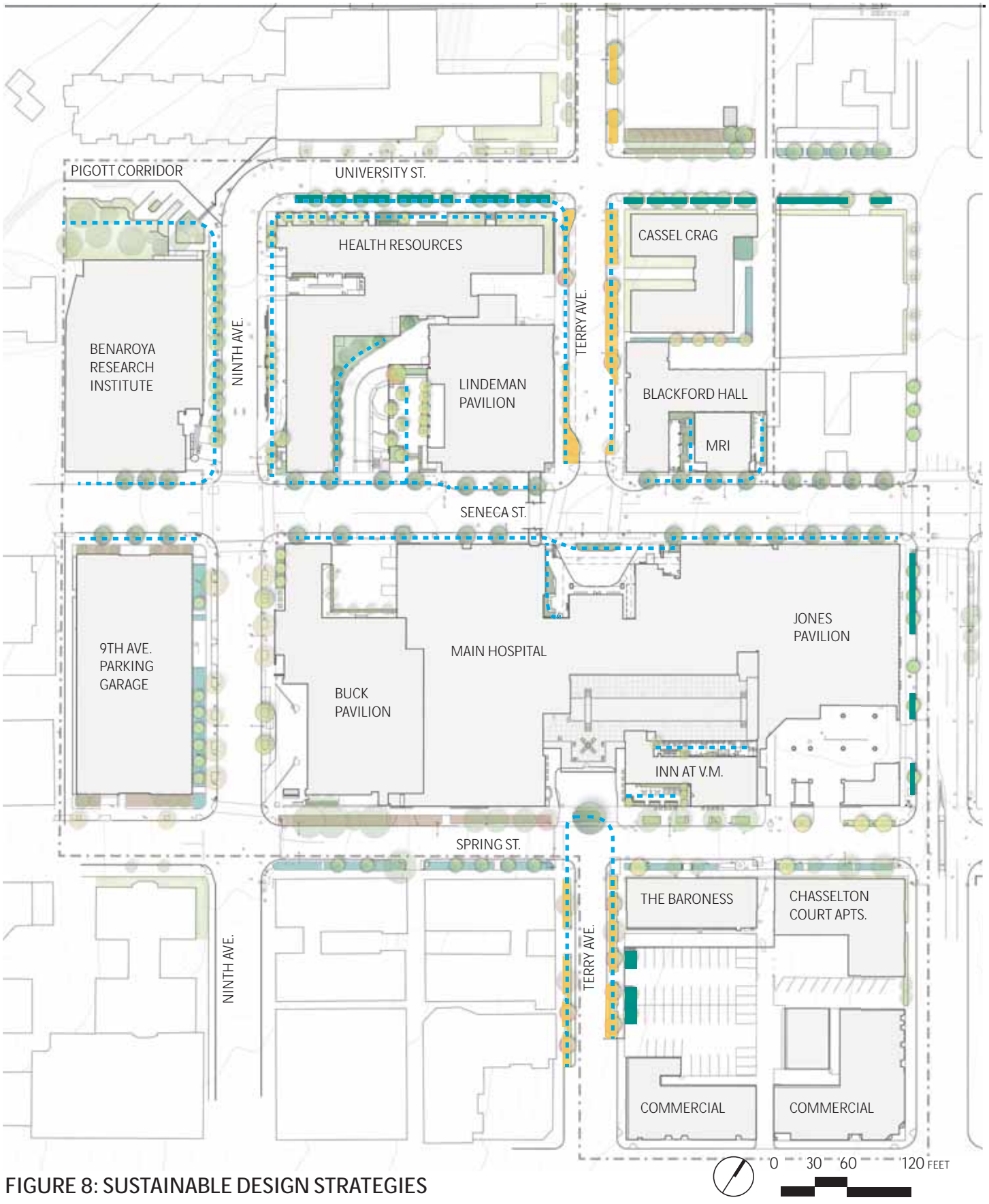


FIGURE 8: SUSTAINABLE DESIGN STRATEGIES

DESIGN RECOMMENDATIONS

CAMPUS LANDSCAPE ZONES

The campus is comprised of a series of distinct landscape zones. Each zone has a unique materiality, functionality, and relationship to campus buildings, which contributes to the overall campus identity. In order to improve the quality of the existing landscape and create a cohesive campus character, design recommendations are structured according to the existing landscape zones. The zones are as follows:

UNIVERSITY ST / NINTH AVE.

As one of the designated pedestrian streets in the *Major Institution Master Plan* (MIMP), the *First Hill Public Realm Action Plan* (PRAP), and the *First Hill Urban Center Park Plan* (City of Seattle, 2005), University St. provides a crucial pedestrian linkage between the downtown core, and the First Hill neighborhood, through Pigott Corridor. Ninth Avenue is a key north-south pedestrian passageway and an extension of the University streetscape. Both streets are relatively level, have favorable solar exposure, and are more intimate in scale, with residential uses abutting the R.O.W.

SENECA ST.

As the primary east-west pedestrian, vehicle, and transit arterial linking First Hill to downtown, Seneca St. is the campus's central spine, and as such it plays a key role in shaping campus identity. Buildings along Seneca St. are larger in scale than other areas of campus, which gives the street a corridor-like quality.

TERRY AVE.

The First Hill Urban Center Park Plan identifies Terry Ave south of Madison St. as a key neighborhood pedestrian passage. At both the north and south edges of campus, Terry Avenue is a primary gateway to the campus, directing pedestrian and vehicle traffic to the Main Hospital building entries. Like Ninth Avenue, Terry Street is relatively level and receives good solar exposure throughout the year.

BOREN AVE.

Boren Ave is a busy vehicle and transit thoroughfare and strong campus edge, the narrow existing R.O.W and heavy traffic on this arterial street give it a distinct urban character with a less than desirable pedestrian public realm. Existing buildings on the Madison block are situated especially close to the road, leaving very little room for landscape interventions.







SPRING ST.

Spring St. between Boren Ave and Terry Ave functions well as a secondary pedestrian corridor, activated by both transit commuters arriving to Virginia Mason campus, and visitors to the Inn at Virginia Mason and the Baroness Hotel. Spring St. west of Terry, however, is a distinct campus edge. Its steep terrain deters pedestrian travel, and there is little human-scaled interest.

PLAZAS, COURTYARDS AND ENTRIES

Each plaza, courtyard and entry has its own unique character, and programmatic requirements. While designs for each place should respond directly to site conditions and constraints, commonalities can help identify the space to users and make each area part of the larger campus experience.

LEGEND

-  UNIVERSITY ST. / NINTH AVE.
-  SENECA ST.
-  TERRY AVE.
-  BOREN AVE.
-  SPRING ST.
-  PLAZAS, COURTYARDS, ENTRIES

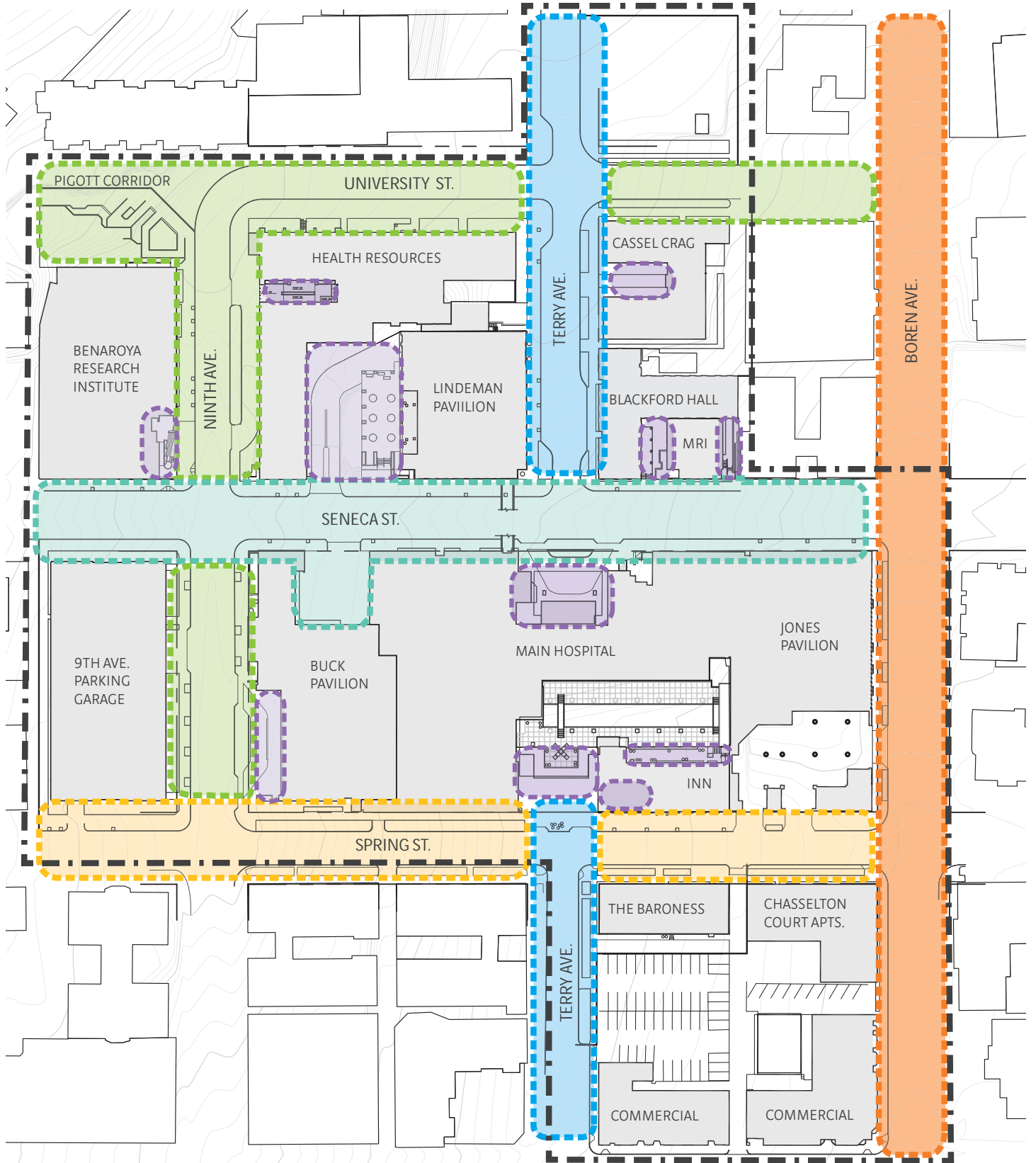


FIGURE 9: CAMPUS LANDSCAPE ZONES



DESIGN RECOMMENDATIONS

LANDSCAPE PRIORITY AREAS

Given the campus size and complexity, and the intended three to five year implementation period, a strategy for prioritizing certain improvement areas will help to structure future project planning and fund allocation. Campus zones were evaluated for prioritization based on three criteria: designation by the *Major Institution Master Plan* or the *Public Realm Action Plan* as key campus corridors, or landscape areas for future development; level of visibility; and opportunities for improvement. The following are priority design areas:

HIGH PRIORITY ZONE SENECA STREET ●

Seneca St. bisects the campus and connects visitors to the Main Hospital Building front entry. The majority of visitors to the campus travel along Seneca St. to enter and exit the campus, this corridor is highly visible. As such, improvements in this zone should be prioritized to ensure Virginia Mason's values are reflected in the campus landscape, and visually evident to pedestrian, vehicle and transit traffic. Several existing courtyards and terraces, which are current or future assets to the campus, also connect to Seneca St, such as the Lindeman Terrace, MRI entrance / courtyard, and main hospital entry landscape. Each should be improved to solidify the consistent campus character and support the VM community. Please refer to pages 48- 49 for Seneca St. design recommendations, and Appendix B for detailed conceptual design studies.



HIGH PRIORITY ZONE NINTH AVENUE SOUTH ●

With both the Ninth Avenue Parking Garage, and entry to the Buck Pavilion, Ninth Avenue South is a busy corridor for both pedestrians and vehicles. Design recommendations for this zone are prioritized to create a safe pedestrian environment in zones with mature planting, and improve the quality of the landscape at key building entries. See page 44 for Ninth Avenue South design recommendations.



MEDIUM PRIORITY ZONE UNIVERSITY STREET AND NINTH AVENUE NORTH ●

The University Street and Ninth Avenue zone is a main pedestrian gateway to the campus, and the intersection and has been designated a prototype park location in the *Public Realm Action Plan* (PRAP). The area does not provide a welcoming entry or pedestrian space. The landscape is dominated by impervious surfaces, and the existing planting beds do not have a cohesive character or are an inappropriate scale for the surroundings. Design recommendations for this zone are prioritized, to ensure that a safe, lively pedestrian environment can be created in concert with the PRAP efforts. Please refer to pages 42- 45 for University St. and Ninth Ave design recommendations and Appendix B for detailed conceptual design studies.



MEDIUM PRIORITY ZONE TERRY AVENUE ●

The *Major Institution Master Plan* (MIMP) identifies Terry Avenue as a Key Pedestrian Street, and a highly visible campus entry. Terry Avenue bisects the campus core, providing access to both the Main Hospital Building front entry, and the South Emergency Entry, and it is also a relatively level connection to the surrounding neighborhood. The Public Realm Action Plan (PRAP) proposes to redesign the south portion of Terry Ave between Spring St. to Madison St. as a curbsless pedestrian and vehicle thoroughfare. Presently, the landscape in the R.O.W. is varied in character and scale, but moments to pause and enjoy the public realm are lacking. Please refer to pages 46-47 for Terry Ave. design recommendations.

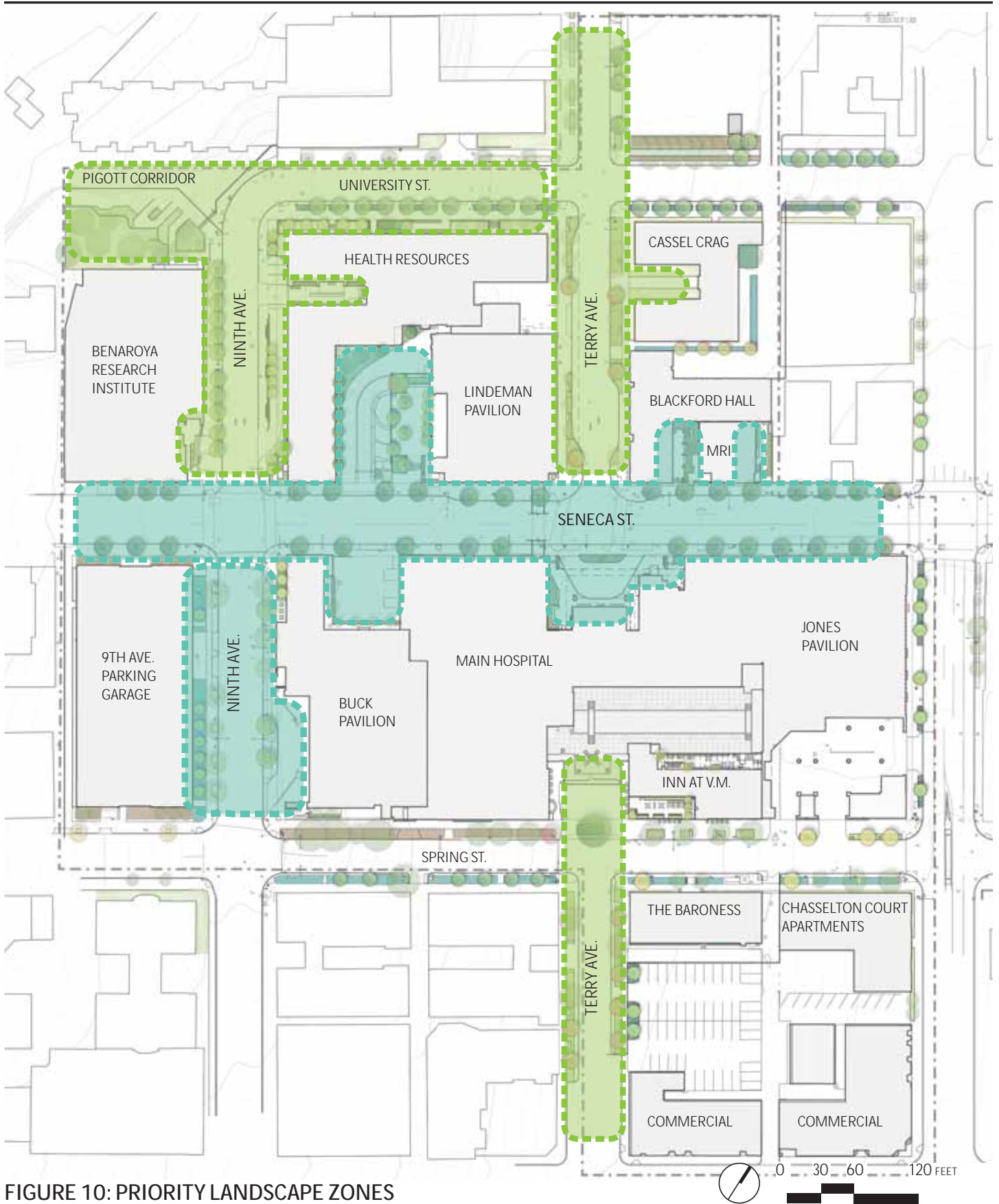


FIGURE 10: PRIORITY LANDSCAPE ZONES

DESIGN RECOMMENDATIONS

PLANTING CHARACTER

Planting design recommendations have been organized into groups, in order to create a cohesive, unified campus planting palette. Understory groups include, stormwater planting, habitat planting, edge planting, courtyard and entry planting (for sunny and shady conditions), shade planting, and vine planting. While each plant group uniquely responds to site micro-climate conditions, the groups are also comprised of plant species that have similar qualities, in order to ensure a unified approach. All plant species that have been chosen are native / adaptive, and tolerant of urban conditions.

A purposeful strategy for tree planting will also ensure the development of a cohesive campus landscape. Recommended tree species and planting locations have been informed by the following considerations: creating strong, cohesive allees; retaining healthy, mature trees; increasing user comfort and choosing an appropriate scaled trees for the site location.

The following pages describe tree planting and understory plant groups in more detail.

See pages 90-99 for plant lists for each landscape zone.

UNDERSTORY CHARACTER

STORMWATER PLANTING

Stormwater planting beds should include only water-loving native / adaptive species, and should be focused in areas on campus where they are part of an integrated system resulting in water uptake, treatment and release. Plants should be arranged in simple groupings or rows. Use species that are sun / shade tolerant, and max 3' height to ensure visibility in the R.O.W. Choose a min. 1 gal pot for size for groundcover and min. 2 gal for shrubs.



HABITAT PLANTING

While all planting supports species diversity, selected focus areas provide habitat corridors and campus interest. Habitat planting should have the highest species diversity of the plant groups. However, plant placement should still feel intentional - in organized groupings or rows. Refer to Seattle's Pollinator Pathway for planting plan precedents. Choose species that are tolerant in full sun and part shade, and max. 3' height to ensure clear sight lines. Choose a min. 1 gal pot for size for groundcover and min. 2 gal for shrubs.



DESIGN RECOMMENDATIONS

UNDERSTORY CHARACTER

EDGE PLANTING

Often used to frame sidewalks and at the edge of buildings, edge planting should be evergreen, simple and continuous in form. Arrange one plant species in linear, uninterrupted rows. Use species that are sun / shade tolerant. Choose a min. 3 gal. pot for size for shrubs.



ENTRY / COURTYARD PLANTING SUN / SHADE

Entry planting should function to punctuate edge and R.O.W. planting. Arrange plants in small groupings or organized swaths, using focal accents for interest (per below). Refer to plant lists and plans for sun / shade preference. Plant species should be max 3' height to ensure visibility. Choose a min. 1 gal pot for size for groundcover and min. 3 gal for shrubs. Plan beds accordingly to leave areas for annuals or other seasonal arrangements.



UNDERSTORY CHARACTER

SHADE PLANTING

Shade planting should flourish in partial to full shade. Since shade planting occurs mostly in the R.O.W, choose species that are max 3' to ensure visibility. Select a mixture of evergreen and perennial plants to ensure seasonal interest throughout the year. Arrange plants in simple, organized groupings or swaths. Choose a min. 1 gal pot for size for groundcover and min. 2 gal for shrubs.



VINE PLANTING

Vine planting should be full sun to partial shade tolerant. Choose fast-growing evergreen or semi-evergreen species to encourage a full, green screen. Min. 3 gal pot size for more mature vines. Choose Carl Stahl Facadescape stainless steel mesh trellis, or equivalent system. Ensure mesh opening size is non-climbable and securely mounted to facade.



DESIGN RECOMMENDATIONS

TREE PLANTING CHARACTER

STRONG, COHESIVE ALLEE

Street trees play a major role in developing a cohesive streetscape and campus by framing the space, and establishing a continued landscape rhythm. All new street tree species should be chosen to help create a strong, cohesive allee of the same tree type, in effort to develop a unified identity for each landscape zone and for the campus as a whole. Trees should be spaced equally, and logically to fit within existing infrastructure and street furniture. Tree root zones should meet or exceed that required by SDOT for maximum long term growth and performance



RETAIN MATURE, HEALTHY TREES

Retain mature, healthy street trees that are planted in cohesive groupings, and provide seasonal interest. As previously noted, mature trees help to improve air quality, reduce atmospheric greenhouse effects, conserve water and soil quality, reduce noise pollution, and create wildlife and plant diversity. The mature trees on Virginia Mason's campus also help to balance building scale, and soften urban edges.



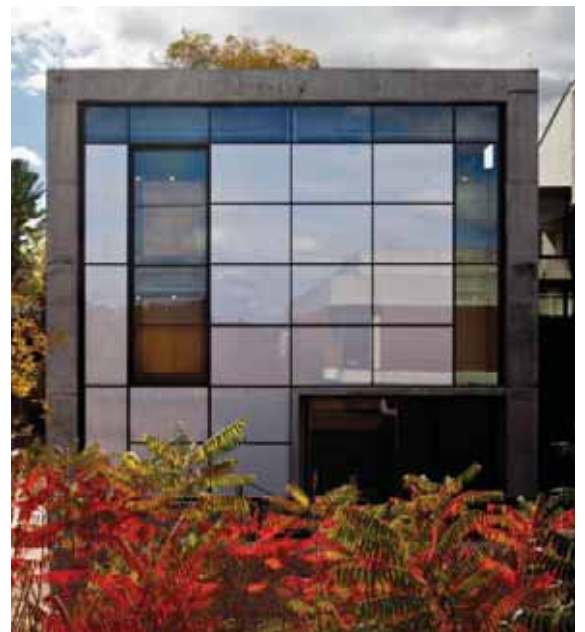
PEDESTRIAN / USER COMFORT

Both in the R.O.W. and at the campus terraces, courtyards and entries, trees should be used to improve user comfort by providing shade, sound dampening, a human-scale sense of enclosure, and improving air quality.



APPROPRIATE SCALE

All new trees should be carefully chosen and located to complement the scale of their surroundings. In courtyard spaces, choose tree species and locations that balance the space's height and width. Trees can also be used to highlight and frame view corridors, facades, and other elements of the built environment.



DESIGN RECOMMENDATIONS

UNIVERSITY STREET AND NINTH AVENUE NORTH

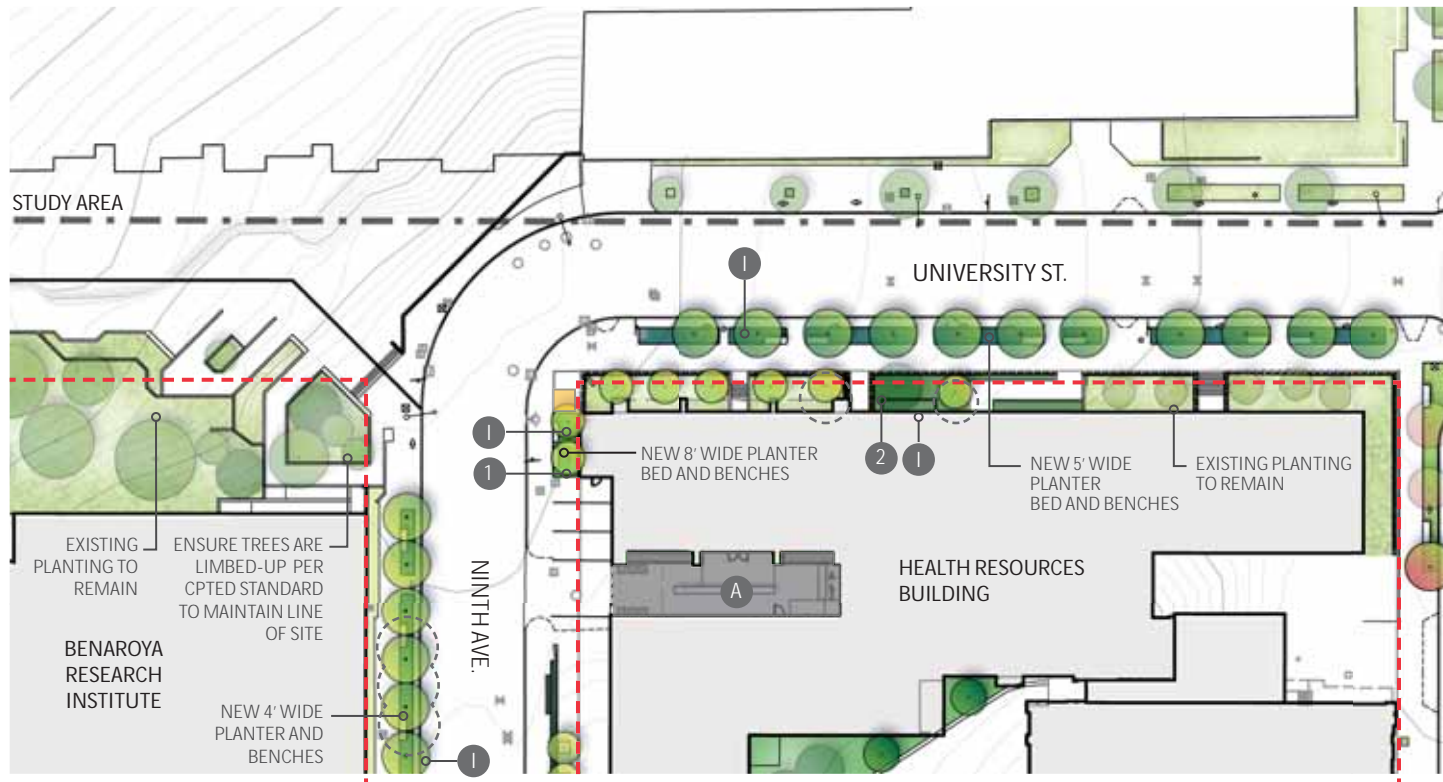
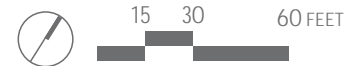


FIGURE 11: UNIVERSITY STREET PROPOSED PLAN WEST



The proposed streetscape design and layout addresses micro-climate plant conditions, existing plant communities, and current and future neighborhood uses. Design recommendations reflect the both the Major Institution Masterplan and Public Realm Action Plan’s goals to provide a safe, pedestrian and bicycle oriented streetscape with convenient seating areas for both personal reflection and social gathering.

The mature street tree canopy should be retained, and new street trees will function to provide a sense of continuity and rhythm. New stormwater planting beds along the south edge of University St. will decrease impervious surface area, and filter stormwater runoff, and heighten the pedestrian experience. Engineered green stormwater infrastructure beds are recommended for design and implementation in concert with the new Health Resources Building Design and construction. See page 90 for a complete University St.Plant List.

The University Street / Piggot Corridor intersection has purposefully been left untouched in order to accommodate a future implementation of the *Public Realm Action Plan* Interim Prototype Park , and long-term plaza plan.

All new planting should reflect CPTED principles of safety with open sight lines and avoidance of entrapment areas.

AREAS FOR FUTURE DETAILED DESIGN Please refer to Appendix B pages 76-77 for Landscape Detail Plans

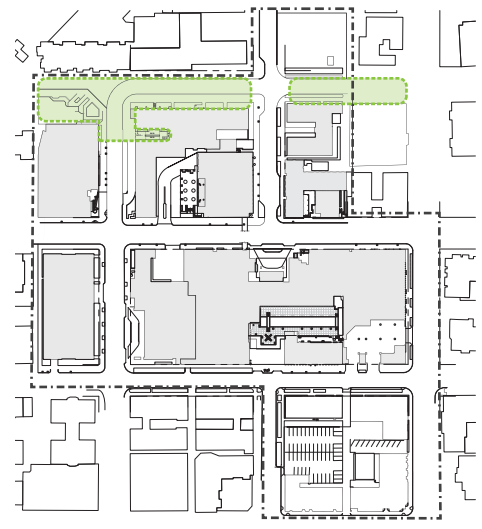
A HEALTH RESOURCES EXISTING ENTRY As one of the main pedestrian entries to the Health Resources building, this area is a high traffic gateway, however, the present design does not provide a welcoming or easily visible entry. The entry treatment should help to guide visitors toward this primary entrance in a comfortable way.



FIGURE 12: UNIVERSITY STREET PROPOSED PLAN EAST

LEGEND

- MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
- EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
- 1 **ENTRY PLANTING (sun / shade)**
- 2 **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
- STORMWATER PLANTING**
Native / adaptive species, water-loving, Sun / shade tolerant. Max 3' height
- HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
- SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
- VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
- NEW TREE**
See plant list for size and species
- EXISTING TREE TO REMAIN**
- EXISTING TREE TO BE REMOVED / REPLACED**
- POTENTIAL PUBLIC ART LOCATION**
- I **NEW IRRIGATION**
Expansion of automatic system
- H **Hose bib connection at minimum.**
- PROPOSED SEATING NOOK**
Area not to be planted
- PROPOSED POTS**
See plant list
- EXISTING R.O.W.**



KEY PLAN

DESIGN RECOMMENDATIONS

NINTH AVENUE

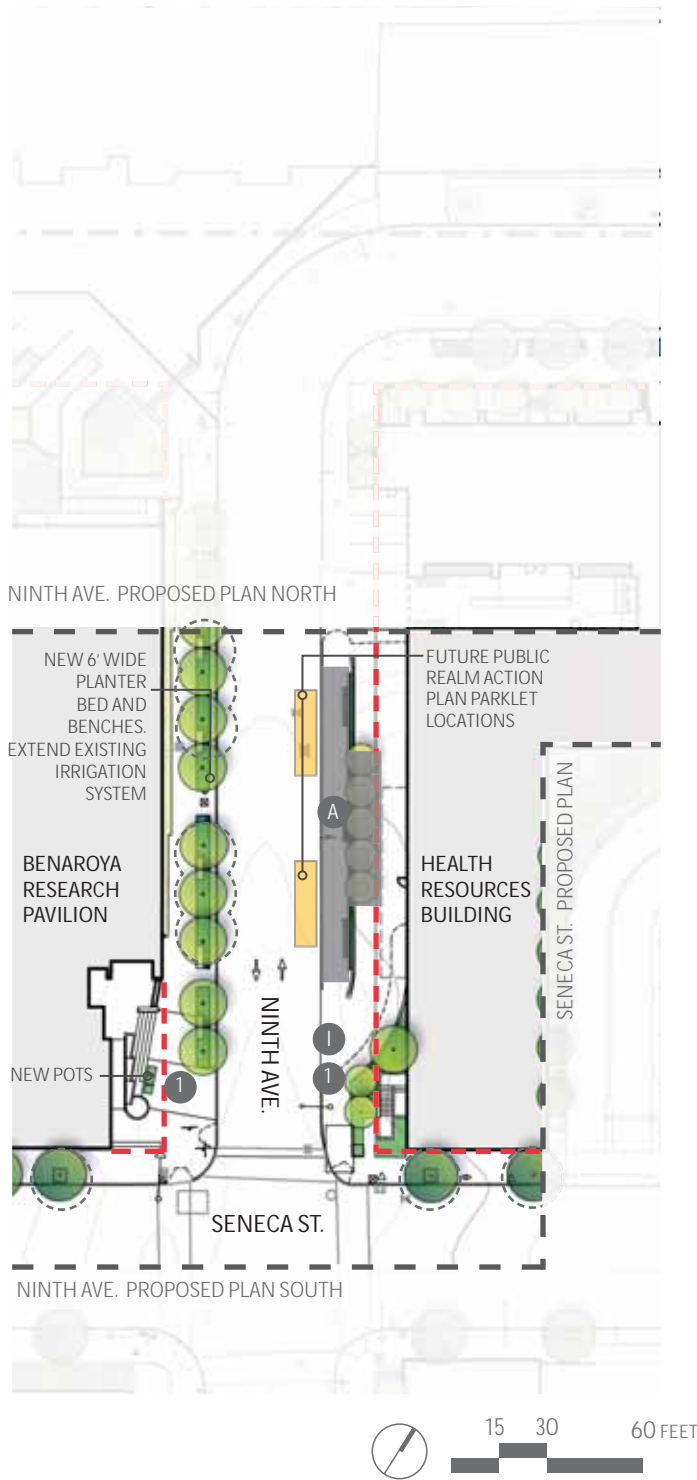


FIGURE 13: NINTH AVENUE PROPOSED PLAN

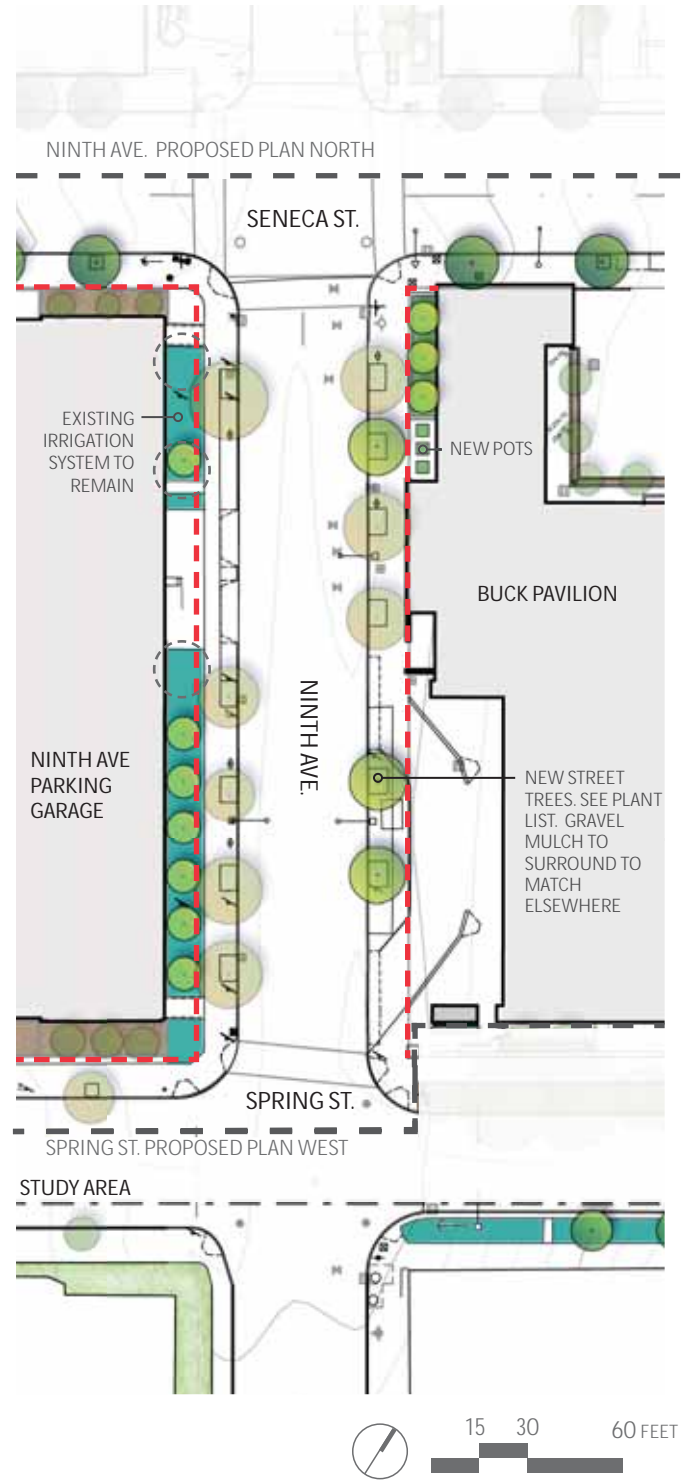


FIGURE 14: NINTH AVENUE PROPOSED PLAN SOUTH

Design interventions for this zone provide a smooth transition for future streetscape work associated with the *Public Realm Action Plan* (PRAP), and the future open space identified in both the PRAP and the *Major Institution Master Plan* (MIMP).

The primary proposed design objective for Ninth Avenue is to create a human-scaled landscape supporting pedestrian use, which minimizes the impact of driveways and garage entries on pedestrians, and decreases impervious surfaces. While the west side of the street is often in shade from both buildings and trees, the east side of the street receives afternoon sunlight at all times of year. The lack of street trees and R.O.W. planting along the east side, especially at the north block, increases heat island effect, and degrades the pedestrian experience. Street tree species and spacing should complement the building scale to soften the urban environment, and residual spaces should be activated with planting and seating to enliven the public realm. New movable planters have been placed to accommodate both the PRAP's interim and long-term concept plan. The PRAP recommends parklets on the west side of Ninth Avenue as part of its interim concept solution. Given that the east side of the street receives more afternoon sun, it is suggested to shift the proposed parklets to the east, further activating the Health Resources Building facade.

The design also aims to facilitate a smooth transition and unified character between University St and Ninth Avenue North, and the mature planting at the south block of Ninth Avenue. Please refer to Appendix B pages 92-93 for a complete Ninth Ave. Plant List.

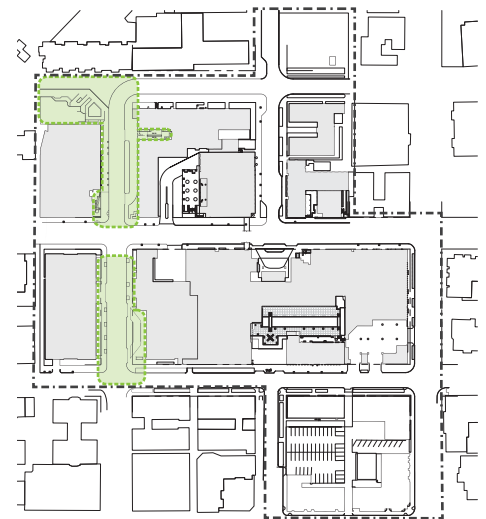
All new planting reflects CPTED principles of safety - good sight lines and avoidance of entrapment areas.

AREAS FOR FUTURE DETAILED DESIGN Please refer to Appendix B pages 76-79 for Landscape Detail Plans

A HEALTH RESOURCES BUILDING OCCUPATIONAL THERAPY ENTRY This retaining wall dominates the streetscape on the west side of Ninth Avenue. The large expanse of hardscape and lack of trees not only increases heat island effect, but also degrades the pedestrian experience. A re-design of this area could highly elevate the quality of the pedestrian public realm in this block.

LEGEND

-  **MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
-  **EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
-  **ENTRY PLANTING (sun / shade)**
-  **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
-  **STORMWATER PLANTING**
Native / adaptive species, water-loving,
Sun / shade tolerant. Max 3' height
-  **HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
-  **SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
-  **VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
-  **NEW TREE**
See plant list for size and species
-  **EXISTING TREE TO REMAIN**
-  **EXISTING TREE TO BE REMOVED / REPLACED**
-  **POTENTIAL PARKLET LOCATION**
-  **NEW IRRIGATION**
Expansion of automatic system
-  **Hose bib connection at minimum.**
-  **PROPOSED SEATING NOOK**
Area not to be planted
-  **PROPOSED POTS**
See plant list
-  **EXISTING R.O.W.**



KEY PLAN

DESIGN RECOMMENDATIONS

TERRY AVENUE

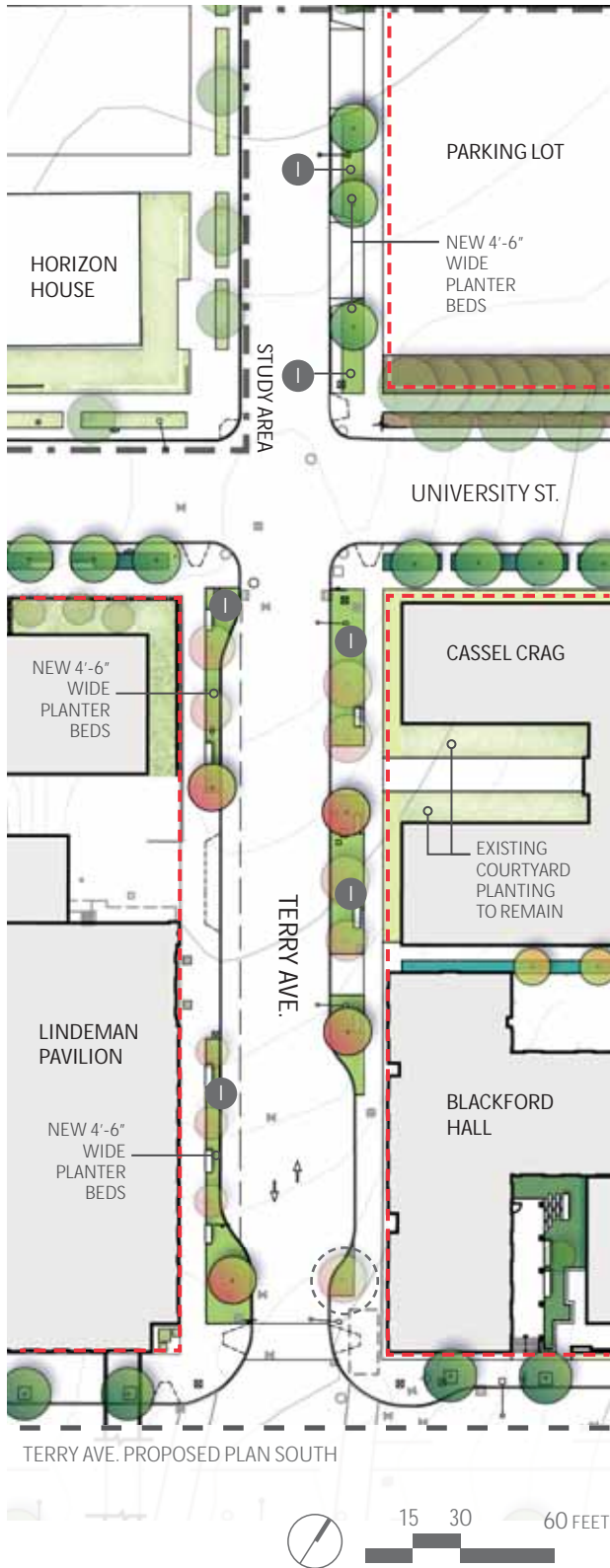


FIGURE 15: TERRY AVENUE PROPOSED PLAN NORTH

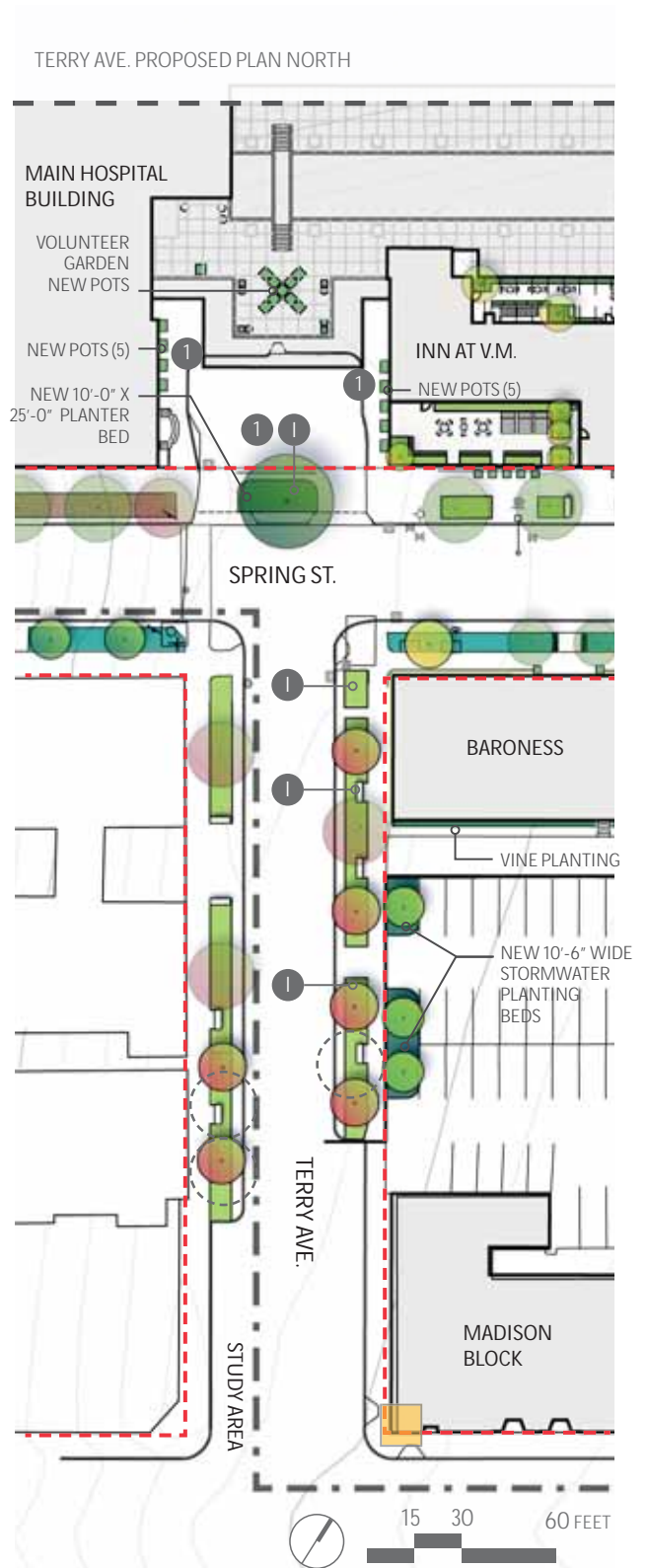


FIGURE 16: TERRY AVE. PROPOSED PLAN SOUTH







The design approach for the streetscape complements the *Public Realm Action Plan's* goals, including the provision of a lush, green environment, and moments to sit, enjoy and be an active participant in the public realm. Habitat planting in the R.O.W. will provide year-round seasonal interest, increase biodiversity by attracting pollinators and birds, and generate a sense of vitality, healing and rejuvenation. Stormwater planting areas have been appropriately located to capture and filter on-site stormwater run-off.

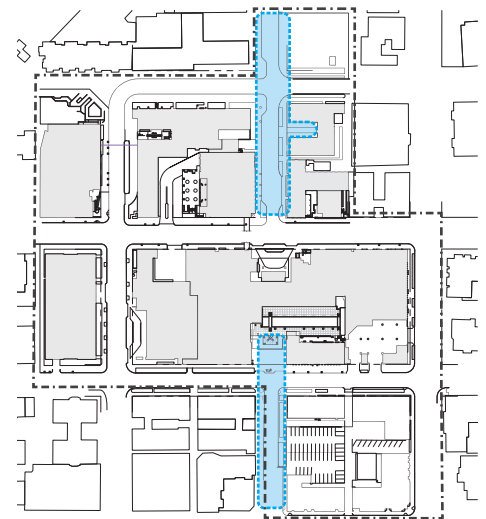
A specimen tree in a new planting bed at the intersection with Spring St. provides a landmark and simple, refined view. The mature cherry trees should be retained, given their historical significance to the campus. New cherry trees have been recommended in additional locations to form an alley. The R.O.W at the south end of Terry, and along Madison St. is not wide enough to allow street tree planting. Also, given the high potential of future development for the Madison Block, planting improvements along Madison st. between Boren Ave. and Terry Ave. are a low priority. Refer to Appendix B. page 94-95 for a complete Terry Avenue plant list.

In keeping with the Major Institution Master Plan, the corner of Terry and Madison is a suggested location for public art, to complement the Sorrento Court and announce the campus entry.

All new planting reflects CPTED principles of safety with open sight lines and avoidance of entrapment areas.

LEGEND

-  **MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
-  **EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
-  **ENTRY PLANTING (sun / shade)**
-  **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
-  **STORMWATER PLANTING**
Native / adaptive species, water-loving,
Sun / shade tolerant. Max 3' height
-  **HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
-  **SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
-  **VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
-  **NEW TREE**
See plant list for size and species
-  **EXISTING TREE TO REMAIN**
-  **EXISTING TREE TO BE REMOVED / REPLACED**
-  **POTENTIAL PUBLIC ART LOCATION**
-  **NEW IRRIGATION**
Expansion of automatic system
-  **Hose bib connection at minimum.**
-  **PROPOSED SEATING NOOK**
Area not to be planted
-  **PROPOSED POTS**
See plant list
-  **EXISTING R.O.W.**



KEY PLAN

DESIGN RECOMMENDATIONS

SENECA STREET

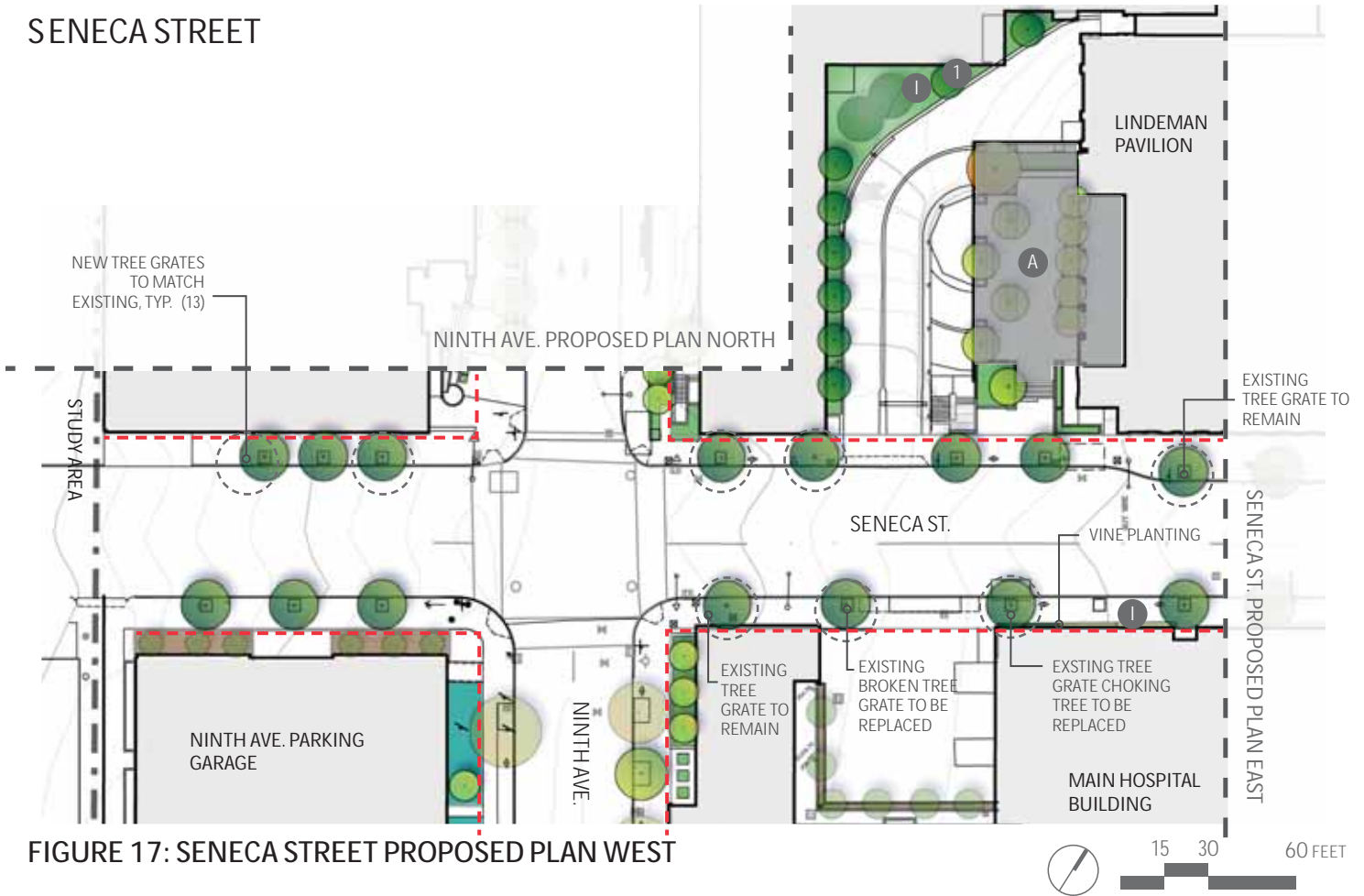


FIGURE 17: SENECA STREET PROPOSED PLAN WEST

Design objectives for this busy campus corridor target pedestrian safety, urban scale and design continuity, wayfinding, and simplified multi-modal circulation.

The existing streetscape is a patchwork of varied tree species, hardscape elements, and periphery planting. The planting design should function to produce a unified character. The proposed design recommends planting one species of street trees to create a strong allée. Columnar trees are preferred to maintain the view corridor to Elliot Bay, and mark a clear pedestrian path. Install City of Seattle standard tree grates in each tree well. Simple, uniform edge planting should be punctuated with contrasting species at building entries in order to clearly signify entries and thresholds. Please refer to Appendix B page 91 for a complete Seneca St. plant list.

All new planting reflects CPTED principles of safety with open sight lines and avoiding entrapment areas.

AREAS FOR FUTURE DETAILED DESIGN See Appendix Pgs 74-75 and 80-83 for Landscape Detail Plans

- A LINDEMAN PAVILION TERRACE** The largest public open space on the campus, the Lindeman Pavilion Terrace is well-used at all times of year, and is a valuable asset for the campus and the neighborhood.
- B BLACKFORD HALL ENTRY** Quiet respites for sitting or contemplation are lacking on the campus. The entry area offers an escape from the busy Seneca St. environment, yet the current condition does not provide a comfortable place to sit or pause.
- C ALLEY EAST OF MRI** Presently, this alley is a CPTED concern for the campus. Visibility is low, and existing trees are inappropriately scaled for the space. With improvement, this could be another retreat from the Seneca St. environment.
- D EXISTING NORTH ENTRY - SEATING NOOK** The paved nook east of the Main Hospital Entrance offers a quiet, human scale landscape room in an otherwise busy and automobile-oriented main entrance.

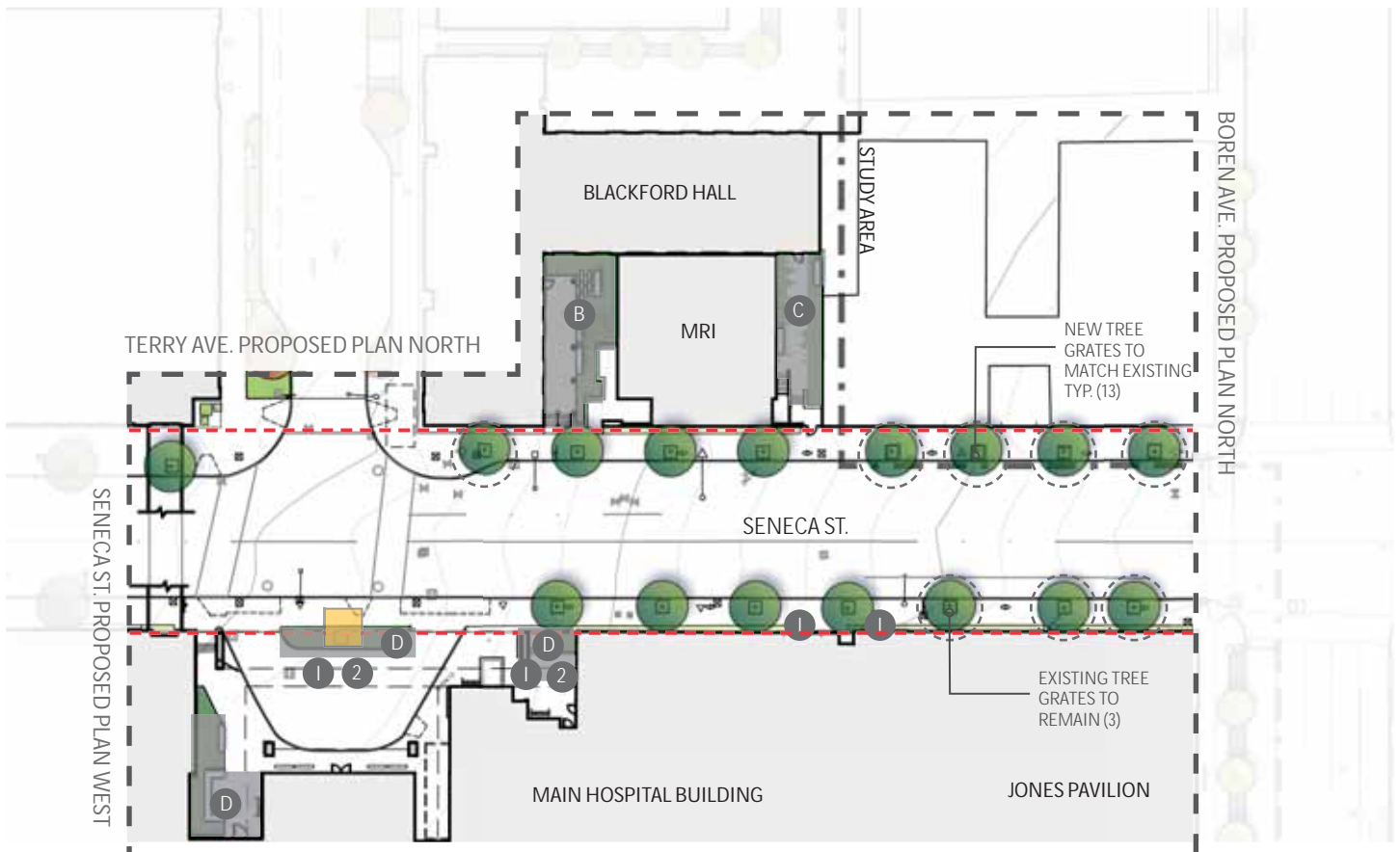
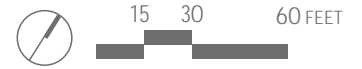
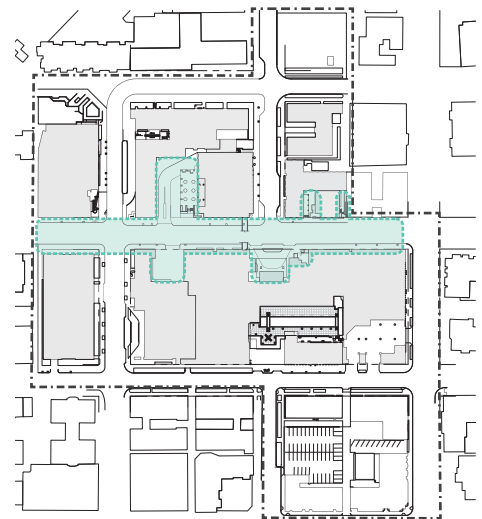


FIGURE 18: SENECA STREET PROPOSED PLAN EAST



LEGEND

- MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
- EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
- 1 **ENTRY PLANTING (sun / shade)**
- 2 **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
- STORMWATER PLANTING**
Native / adaptive species, water-loving,
Sun / shade tolerant Max 3' height
- HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
- SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
- VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
- NEW TREE**
See plant list for size and species
- EXISTING TREE TO REMAIN**
- EXISTING TREE TO BE REMOVED / REPLACED**
- POTENTIAL PUBLIC ART LOCATION**
- I **NEW IRRIGATION**
Expansion of automatic system
- H **Hose bib connection at minimum.**
- PROPOSED SEATING NOOK**
Area not to be planted
- PROPOSED POTS**
See plant list
- EXISTING R.O.W.**



KEY PLAN

DESIGN RECOMMENDATIONS

BOREN AVENUE

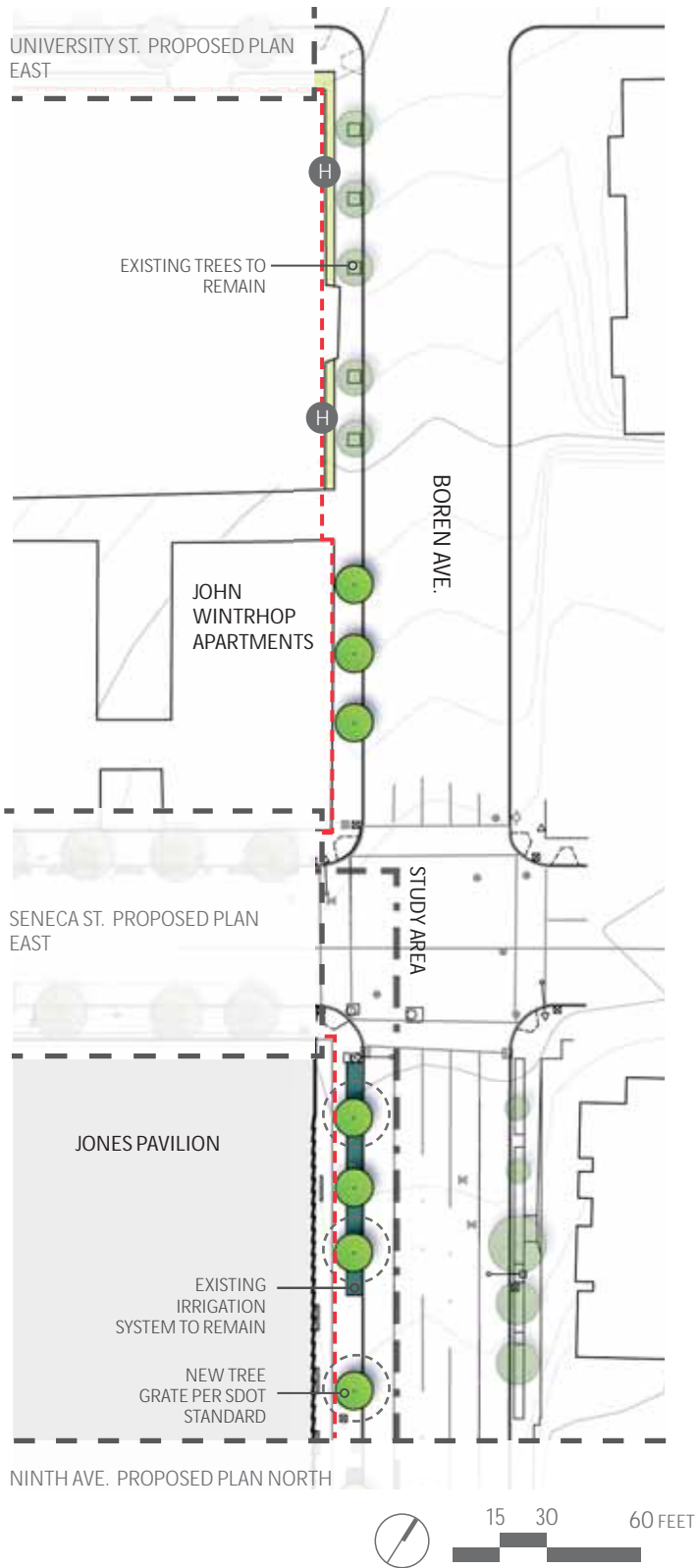


FIGURE 19: BOREN AVENUE PROPOSED PLAN NORTH

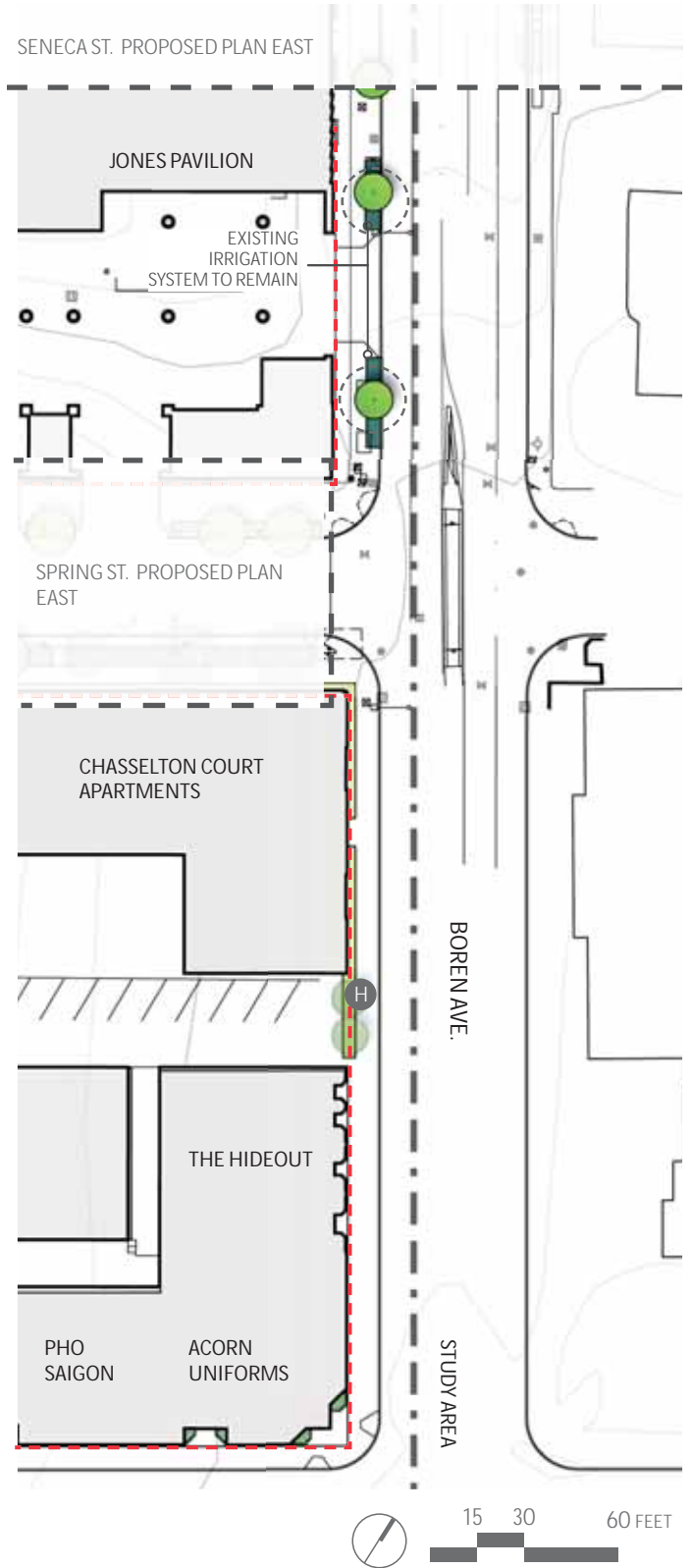


FIGURE 20: BOREN AVENUE PROPOSED PLAN SOUTH


















Design recommendations for Boren Avenue aim to enhance the pedestrian and transit user experience by providing human scale within the R.O.W. and softening the urban campus edge. Street trees are recommended at regular intervals to create a continuous rhythm; columnar species should be selected, given the narrow R.O.W. width .

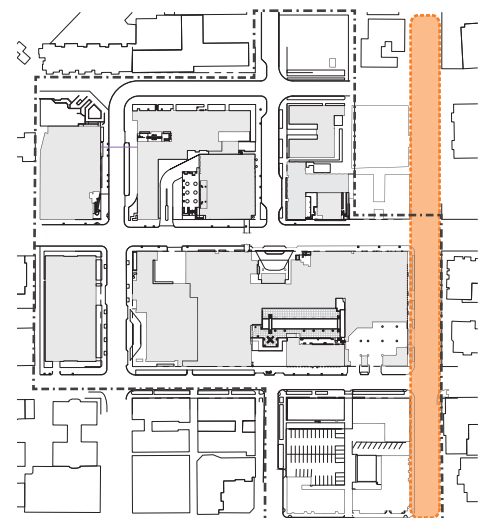
The east side of the Jones Pavilion between Seneca St. and Madison St. is a busy transit hub for commuter buses in the morning and evening rush hour. The proposed design recommends a decrease of the planter area in the right of way, in order to allow for more continuous hardscape at the bus stop. Coordinate exact placement and length of bus-stop pad with King County Metro proposed location. Landscape beds in this area appear heavily saturated with water and receive limited direct sun-light. Stormwater planting is recommended here to filter and capture stormwater and provide pedestrian-scale greenery. Care has been taken to select hardy, resilient species that can withstand urban stresses. Please refer to Appendix B, page 96 for a complete Boren Avenue plant list.

The R.O.W at the south end of Boren and along Madison St. is not wide enough to allow street tree planting. Also, given the high potential of future development for the Madison Block, planting improvements along Madison st. between Boren Ave. and Terry Ave. are a low priority.

All new planting reflects CPTED principles of safety with open sight lines and avoiding entrapment areas.

LEGEND

-  **MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
-  **EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
-  **ENTRY PLANTING (sun / shade)**
-  **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
-  **STORMWATER PLANTING**
Native / adaptive species, water-loving,
Sun / shade tolerant Max 3' height
-  **HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
-  **SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
-  **VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
-  **NEW TREE**
See plant list for size and species
-  **EXISTING TREE TO REMAIN**
-  **EXISTING TREE TO BE REMOVED / REPLACED**
-  **POTENTIAL PUBLIC ART LOCATION**
-  **NEW IRRIGATION**
Expansion of automatic system
-  **Hose bib connection at minimum.**
-  **PROPOSED SEATING NOOK**
Area not to be planted
-  **PROPOSED POTS**
See plant list
-  **EXISTING R.O.W.**



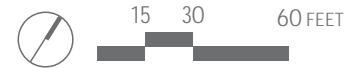
KEY PLAN

DESIGN RECOMMENDATIONS

SPRING STREET



FIGURE 21: SPRING STREET PROPOSED PLAN WEST



The recommendations for Spring Street aim to unify the quality of the public realm across the blocks, to create a more cohesive and inviting streetscape.

In a similar fashion to Seneca Street simple edge planting is recommended, punctuated by formal variety and color at main building entrances. Seating areas have been located at key intervals and at entries to allow for a more comfortable public realm experience.

The existing lawn and boxwood shrubs that are failing on the south side of the street should be removed in favor of a low, shade, loving plant palette. All of the mature tree canopy is to be retained. At the Western block, where planting is not feasible under the mature Sweetgum trees, a new clean, raked mulch layer is to be added. Street tree species and locations have been carefully chosen to create more cohesive groupings and complement the existing canopy. The Volunteer Garden on the rooftop over the South Surgery Entrance is a valuable asset to the hospital. A simple screen or vertical cable trellis is recommended to provide a visual and auditory barrier around the existing air handler. Design recommendations for the Volunteer Garden are consistent with other rooftop / terrace zones (see Lindeman Pavilion Terrace on Pg. 80 and Inn at Virginia Mason Roof Deck on page. 88 for reference). Please refer to Appendix B pages 98-99 for a complete Spring Street plant list.

All new planting reflects CPTED principles of safety by maintaining good sight lines and avoiding entrapment areas.

AREAS FOR FUTURE DETAILED DESIGN Please refer to Appendix B pages 84-89 for Landscape Detail Plans

- A BUCK PAVILION COURTYARD** This residual space could offer a human-scaled seating nook as an extension of the busy, vehicle-oriented, hardscape dominated entry to the Buck Pavilion.
- B INN AT VIRGINIA MASON COURTYARD** As the most quiet, private place on campus to sit and relax, the publicly accessible courtyard at the Inn is a valuable asset. An enhancement to the planting could make this a lush oasis in the urban environment.
- C INN AT VIRGINIA MASON ROOF DECK** With views to the sound and downtown, the roof deck at Virginia Mason is currently the only outdoor amenity on campus that offers a vista. The space is hardscape-dominated with no shade or weather protection. A reconsideration of layout and materiality could improve the deck from an experiential perspective.

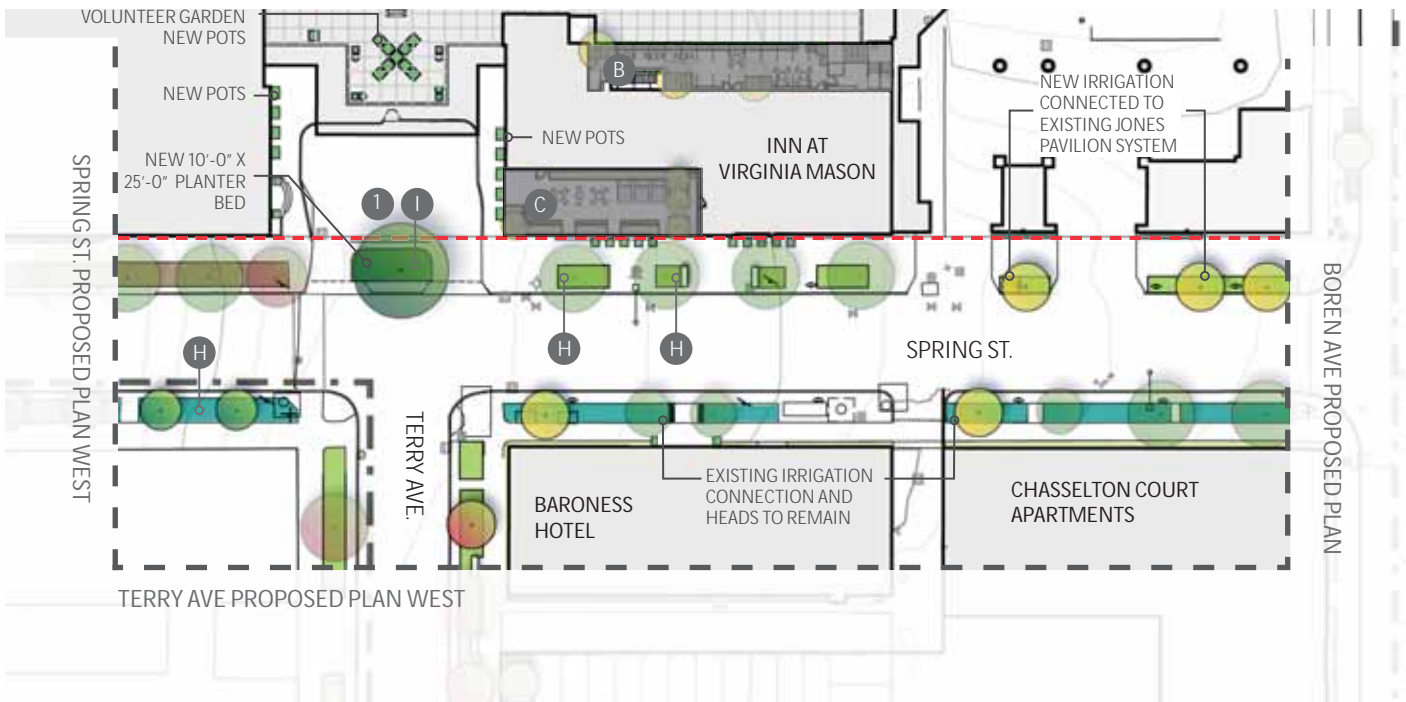
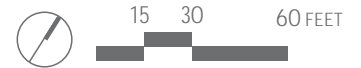
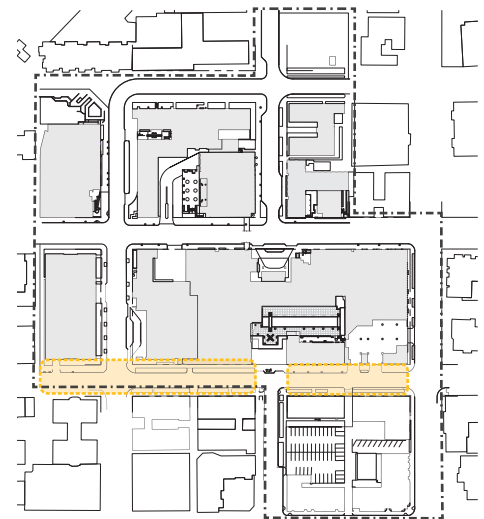


FIGURE 22: SPRING STREET PROPOSED PLAN EAST



LEGEND

- MULCH**
Rake planting bed clean. Install new compost and mulch layer. See specs.
- EDGE PLANTING**
Evergreen monoculture planting Sun / shade tolerant.
- 1 **ENTRY PLANTING (sun / shade)**
- 2 **ENTRY PLANTING (shade)**
Native / adaptive species
Max 3' height
- STORMWATER PLANTING**
Native / adaptive species, water-loving, Sun / shade tolerant Max 3' height
- HABITAT PLANTING**
Native / adaptive species
Sun / shade tolerant. Max. 3' height
- SHADE PLANTING**
Native / adaptive species
Shade tolerant. Max 3' height
- VINE PLANTING**
Evergreen / semi-evergreen species
Sun / shade tolerant.
- NEW TREE**
See plant list for size and species
- EXISTING TREE TO REMAIN**
- EXISTING TREE TO BE REMOVED / REPLACED**
- POTENTIAL PUBLIC ART LOCATION**
- I **NEW IRRIGATION**
Expansion of automatic system
- H **Hose bib connection at minimum.**
- PROPOSED SEATING NOOK**
Area not to be planted
- PROPOSED POTS**
See plant list
- EXISTING R.O.W.**



KEY PLAN

DESIGN RECOMMENDATIONS

LANDSCAPE SITE PLAN AND CONCLUSIONS

The Virginia Mason Seattle Campus landscape has great potential and can reflect the organization's values and high standard of care. The landscape recommendations illustrated in this document provide the tools to create a cohesive, safe, unified urban landscape. Recommendations include:

- The development of clearly defined planting groups to create a sense of order and rhythm and establish a welcoming, human-scaled environment.
- Identification and revision of areas that do not comply with CPTED principles to ensure that all new planting maintains clear sight lines and avoids entrapment zones. The result will be a campus that will feel safer and is more comfortable for users of all ages and abilities.
- Selection of native and adaptive plant species to attract a host of bees, birds, butterflies, and beneficial insect life. Increasing biodiversity on the campus, along with the implementation of a seasonally-diverse planting palette will enhance a sense of health, and rejuvenation throughout the year.
- The thorough analysis of the on-site micro-climate planting conditions, combined with the provision of specific, step by step, planting and landscape installation and maintenance instructions, will improve short-term and long-term plant health. This consistent, coordinated effort is essential to establishing a cohesive campus.
- Implementation of sustainable design interventions such as habitat-generating planting, increased tree canopy, stormwater planting, water-wise planting and sustainable irrigation practices complement Virginia Mason's commitment to environmental sustainability, and will contribute to the health of the ecological systems in the First Hill Community.

The design recommendations included in this document strive to encourage patients, visitors, and employees at Virginia Mason's Seattle campus to go outdoors to experience the joy and poetry that exists within our urban landscape.

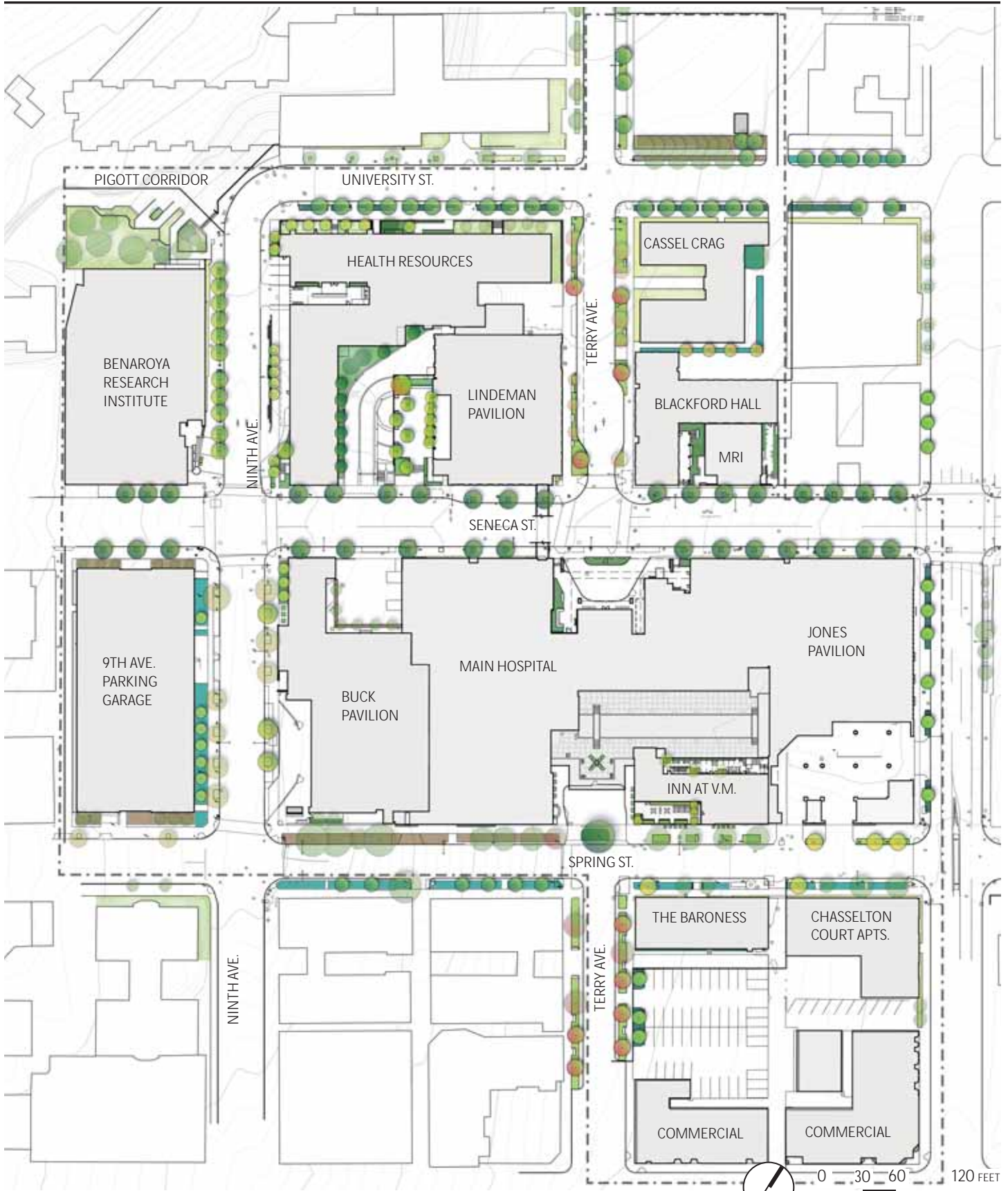
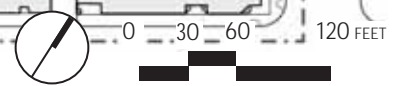


FIGURE 23: CAMPUS MASTER PLAN



APPENDIX A: SITE ANALYSIS

OVERVIEW

The following appendix includes more in-depth information about existing site conditions. The appendix includes:

- Detailed planting evaluation of existing trees and landscape beds for condition and contribution to a cohesive campus with associated plans and diagrams.
- The existing tree inventory, evaluation and identification
- A solar analysis using existing conditions to illustrate campus micro-climate conditions resulting from solar exposure; which ranges from very shady to sunny.

This analysis is used as a basis for design recommendations at all scales.



APPENDIX A: SITE ANALYSIS

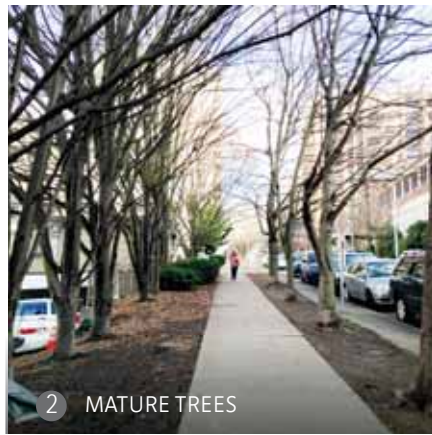
EXISTING TREES - POSITIVE CONTRIBUTING CHARACTER

An on-site tree inventory was completed to determine tree species, health, and age of each existing tree on campus. Following the inventory, trees were analyzed to determine whether their condition, species, or scale either contributed or detracted from the development of a cohesive campus identity.

Trees that positively contribute to cohesive campus character meet one or more of the following criteria:

- 1 Historically significant
- 2 Mature, healthy canopy
- 3 Cohesive grouping
- 4 Seasonal interest

97 out of 135 existing trees were deemed positive contributors. See photos below for specific neighborhood examples.



LEGEND

EXISTING TREES TO REMAIN

- CHERRY
- MAGNOLIA
- COAST LIVE OAK
- GREEN ASH
- SWEETGUM
- LINDEN
- STRIPED MAPLE
- ⊖ SUGAR MAPLE
- RED MAPLE
- ⊖ SYCAMORE MAPLE
- ⊖ JAPANESE MAPLE
- CONIFEROUS TREE
- OTHER DECIDUOUS TREE

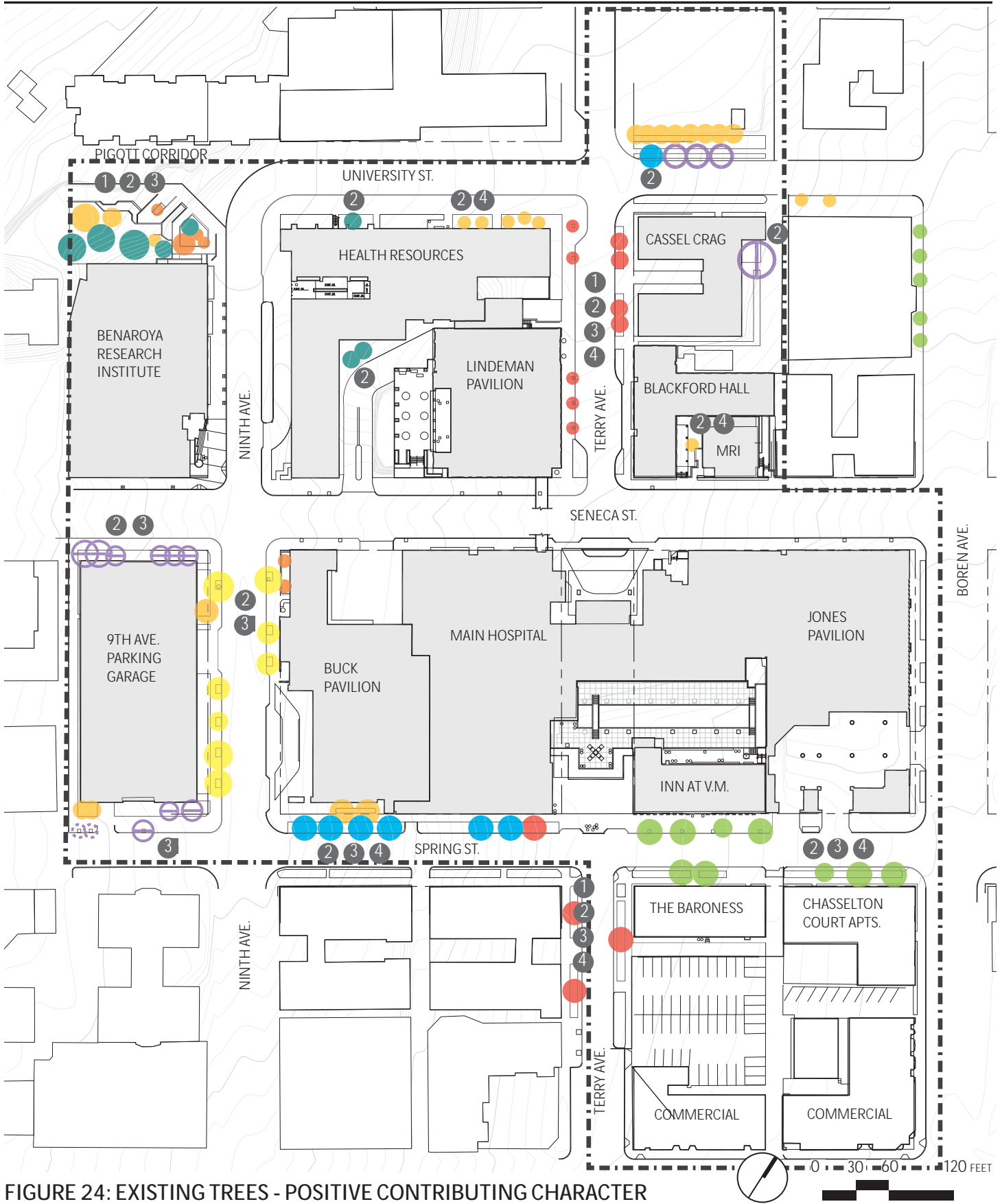


FIGURE 24: EXISTING TREES - POSITIVE CONTRIBUTING CHARACTER

APPENDIX A: SITE ANALYSIS

EXISTING TREES - LIMITED CONTRIBUTING CHARACTER

Trees with limited contributing character, and that detract from the creation of a cohesive campus environment meet one or more of the following criteria:

- ① Poor condition/ health
- ② Inappropriate scale for the space
- ③ Species does not contribute to a cohesive grouping, or is inappropriate for the micro-climate site conditions.

38 out of 135 existing trees were deemed negative contributors. Please refer to photos below for specific neighborhood examples.



LEGEND

EXISTING TREES TO REMAIN

- CHERRY
- MAGNOLIA
- COAST LIVE OAK
- GREEN ASH
- SWEETGUM
- LINDEN
- STRIPED MAPLE
- ⊖ SUGAR MAPLE
- RED MAPLE
- ⊖ SYCAMORE MAPLE
- ⊖ JAPANESE MAPLE
- CONIFEROUS TREE
- OTHER DECIDUOUS TREE

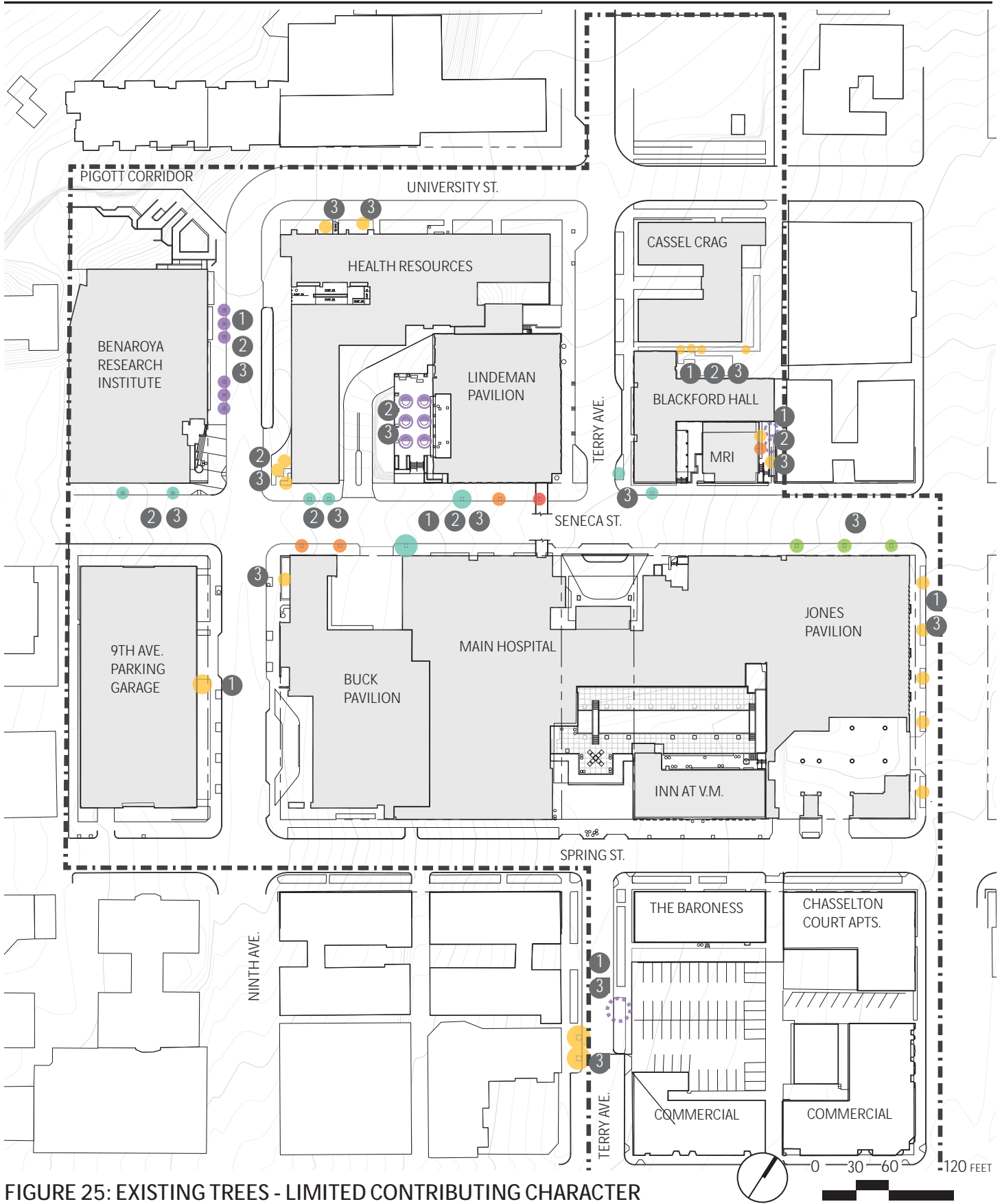


FIGURE 25: EXISTING TREES - LIMITED CONTRIBUTING CHARACTER

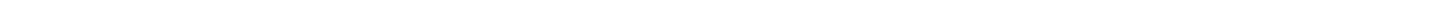
APPENDIX A: SITE ANALYSIS

EXISTING TREES INVENTORY

TREE #	SCIENTIFIC NAME	DBH	COMMON NAME	AGE	CONDITION	OBSERVATIONS	RECOMMENDATIONS
A-1.1	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.2	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.3	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.4	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.5	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.6	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.7	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.8	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-1.9	Carpinus caroliniana		American Hornbeam		Good		Prune deadwood > 2"
A-2.1	Acer rubrum		Red Maple		Good		Prune deadwood > 2"
A-2.2	Acer rubrum		Red Maple		Good		Prune deadwood > 2"
A-2.3	Acer rubrum		Red Maple		Good		Prune deadwood > 2"
A-2.4	Liquidambar styraciflua		Sweetgum		Good		Prune deadwood > 2"
B-1.1	Cedrus atlantica		Atlas Cedar				
B-1.2	Ilex sp.		Holly				
B-1.3	Cedrus atlantica		Atlas Cedar				
B-1.4	Larix sp.		Larch				
B-1.5	Cedrus atlantica		Atlas Cedar				
B-1.6	Populus sp.		Trembling aspen (?)				
B-1.7	Cedrus atlantica		Atlas Cedar				
B-2	Magnolia grandiflora		Southern Magnolia				
B-3.1	Magnolia (spp?) soulangeana		Magnolia				
B-3.2	Magnolia (spp?) soulangeana		Magnolia				
B-3.3	Tsuga pseudocanadensis		Hemlock				
B-3.4	Magnolia (spp?) soulangeana		Magnolia				
B-6	Acer sp.	3"	Maple sp. (striped?)		Fair		0
B-7	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-8	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-9	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-10	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-11	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-12	Acer sp.	3"	Maple sp. (striped?)		Fair		Assess trunk for damage, protect bed
B-17	Quercus agrifolia	2 3/4"	Coast Live Oak		Poor		Assess for trunk damage and soil compaction
B-18	Quercus agrifolia	2 3/4"	Coast Live Oak		Poor		Assess for trunk damage and soil compaction, protect bed
C-1	Rhododendron (spp?)		Rhododendron		Good		Prune deadwood, prune up base for increased visibility
C-2.1	Pinus sp.	20" +/-	Pine		Good		Prune deadwood > 2"
C-2.2	Prunus laurocerasus		Cherry Laurel		Good		Prune deadwood, prune up base for increased visibility
C-7.1	Hamamelis virginiana		American Witch Hazel		Good		Prune deadwood > 1", Remove Ivy from base of trunk
C-7.2	Hamamelis virginiana		American Witch Hazel		Good		Prune deadwood > 1", Remove Ivy from base of trunk
C-8.1	Hamamelis virginiana		American Witch Hazel		Good		Prune deadwood > 1", Remove Ivy from base of trunk
C-8.2	Hamamelis virginiana		American Witch Hazel		Good		Prune deadwood > 1", Remove Ivy from base of trunk
C-8.3	Hamamelis virginiana		American Witch Hazel		Good		Prune deadwood > 1", Remove Ivy from base of trunk
C-9	Prunus spp.		Cherry		Poor/Fair	Topped/pollard	
C-10	Prunus spp.		Cherry		Poor/Fair	Topped/pollard	
C-13	Prunus spp.		Cherry		Poor/Fair	Topped/pollard	
C-14	Prunus spp.		Cherry		Poor/Fair	Topped/pollard	
C-15	Prunus spp.		Cherry		Poor/Fair	Topped/pollard	
C-18	Prunus spp.	7"	Cherry		Poor/Fair	Topped/pollard	
C-19	Magnolia		Magnolia				
C-20	Quercus agrifolia	18"	Coast Live Oak			Multi-stemmed	Thin canopy, Prune deadwood > 1", assess for trunk damage and soil compaction
C-41.1						Conifer in bed beside parking ramp	
C-4.12						Conifer in bed beside parking ramp	
C-42	Quercus agrifolia	6"	Coast Live Oak				Thin canopy, Prune deadwood > 1", assess for trunk damage and soil compaction
C-43	Quercus agrifolia	8"	Coast Live Oak				Thin canopy, Prune deadwood > 1", assess for trunk damage and soil compaction
C-44	Carpinus caroliniana	2"	Hornbeam				
C-45.1	Acer japonica		Japanese Maple				
C-45.2	Carpinus caroliniana	2"	Hornbeam				
D-3	Acer Macrophyllum	30"	Big Leaf Maple			Large iron ring (girdle) at base.	
D-4.1	Prunus Laurocerasus (?)	1"	Cherry Laurel (?)				
D-4.2	Robinia pseudoacacia		Black Locust				
D-4.3	Robinia pseudoacacia		Black Locust				
D-4.4	Robinia pseudoacacia		Black Locust				
D-5.1	Acer saccharum		Sugar Maple				
D-5.2	Acer saccharum		Sugar Maple				
D-5.3	Betula populifolia		Grey Birch				
D-6.1	Carpinus sp.		Hornbeam				

Note: See Existing Trees Inventory Key Map on Page 62 for tree locations.

D-8	Cercis siliquastrum (?)		Judas Tree (?)				
D-9	Quercus agrifolia	10"	Coast Live Oak				
D-11	Prunus spp.	8+"	Cherry	30+	Poor/Fair	Topped/pollard	
D-14.1	Prunus spp.	8+"	Cherry	30+	Poor/Fair	Topped/pollard	
D-14.2	Prunus spp.	8+"	Cherry	30+	Poor/Fair	Topped/pollard	
D-17.1	Prunus spp.	8+"	Cherry	30+	Poor/Fair	Topped/pollard, built up tree well	
D-17.2	Prunus spp.	8+"	Cherry	30+	Poor/Fair	Topped/pollard, built up tree well	
E-1.1	Acer pseudoplatanus	5"+/-	Sycamore Maple (?)				
E-1.2	Acer pseudoplatanus	6"+/-	Sycamore Maple (?)				
E-1.3	Acer pseudoplatanus	5" - 8"	Sycamore Maple (?)				
E-1.4	Acer pseudoplatanus	5" - 8"	Sycamore Maple (?)				
E-1.5	Acer pseudoplatanus	5" - 8"	Sycamore Maple (?)				
E-1.6	Acer pseudoplatanus	5" - 8"	Sycamore Maple (?)				
E-2.1	<i>Tree not there</i>						
E-2.2	Cornus nuttallii	25"	Pacific Dogwood				
E-3	Tilia cordata	11"	Littleleaf Linden				
E-4	Cornus nuttallii	12"	Pacific Dogwood				
E-5	Tilia cordata	11"	Littleleaf Linden				
E-6	Tilia cordata	12"	Littleleaf Linden				
E-7	Cornus nuttallii	14"	Pacific Dogwood				
E-8	Tilia cordata	10"	Littleleaf Linden				
E-9	Tilia cordata	10"	Littleleaf Linden				
E-10.1	Acer pseudoplatanus	4"-5"	Sycamore Maple (?)				
E-10.2	Acer pseudoplatanus	4"-5"	Sycamore Maple (?)				
E-11	Acer pseudoplatanus	25"	Sycamore Maple (?)				
E-12	Acer saccharum	12"	Sugar Maple				
E-13	Acer saccharum	8"	Sugar Maple				
E-14.1	Cornus nuttallii		Pacific Dogwood				
E-14.2	Cornus nuttallii		Pacific Dogwood				
F-1	Magnolia	1 1/2"	Magnolia				
F-2	Magnolia	1 1/2"	Magnolia				
F-3	Quercus agrifolia	1 1/2"	California Live Oak			Outgrowing tree grate	Remove tree grate, Thin canopy, Prune deadwood > 1"
F-12	Fraxinus pennsylvanica	3"	Green Ash				
F-13	Fraxinus pennsylvanica	3"	Green Ash				
F-14	Fraxinus pennsylvanica	3"	Green Ash				
F-15.1	Betula sp.	2"	Birch sp.		Poor condition		Assess condition in spring
F-15.2	Betula sp.	2"	Birch sp.		Poor condition		Assess condition in spring
F-16	Betula sp.	2"	Birch sp.				
F-17	Betula sp.	2"	Birch sp.				
F-18	Betula sp.	2"	Birch sp.				
F-19	Fraxinus pennsylvanica	2"	Green Ash				Assess trunk for damage and root compaction, implement bed protection
F-20	Fraxinus pennsylvanica	3"	Green Ash				Assess trunk for damage and root compaction, implement bed protection
F-22	Fraxinus pennsylvanica	20" +/-	Green Ash				Assess trunk for damage and root compaction, implement bed protection
F-23	Fraxinus pennsylvanica	20" +/-	Green Ash				Assess trunk for damage and root compaction, implement bed protection
F-57	<i>Roof top Courtyard</i>						
F-95.1	Prunus	18" +/-	Cherry (Yoshino)				
F-95.2	Liquidambar styraciflua	18" +/-	Sweetgum				
F-95.3	Liquidambar styraciflua	18" +/-	Sweetgum				
F-96.1	Liquidambar styraciflua	18" +/-	Sweetgum				
F-96.2	Liquidambar styraciflua	18" +/-	Sweetgum				
F-96.3	Liquidambar styraciflua	18" +/-	Sweetgum				
F-96.4	Liquidambar styraciflua	18" +/-	Sweetgum				
F-97.1	<i>not noted</i>						
F-97.2	<i>not noted</i>						
F-98	Tilia cordata		Littleleaf Linden				
F-99	Tilia cordata		Tilia cordata				
F-102.1	Magnolia		Magnolia				
F-102.2	Rhododendron		Rhododendron				
F-102.3	Magnolia		Magnolia				
F-103	Tilia cordata		Littleleaf Linden				
G-1	Fraxinus pennsylvanica	2"	Green Ash				
G-2	Fraxinus pennsylvanica	2"	Green Ash				
G-5	Acer saccharinum	6.5"	Silver Maple			Poor condition	
G-8	Prunus sp.		Cherry (Accolade?)				



APPENDIX A: SITE ANALYSIS

EXISTING TREES - INVENTORY KEY MAP

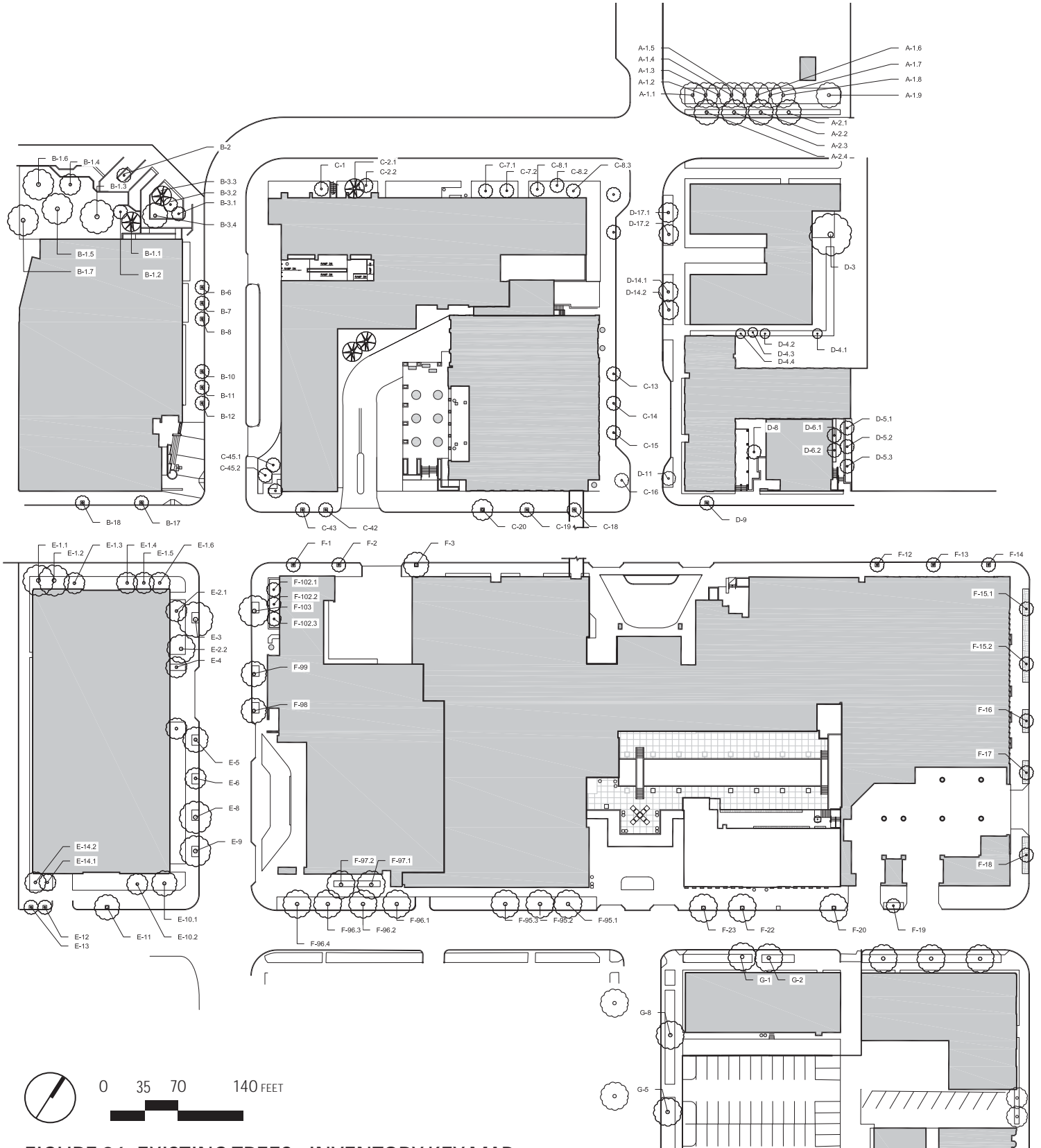


FIGURE 26: EXISTING TREES - INVENTORY KEY MAP

APPENDIX A: SITE ANALYSIS

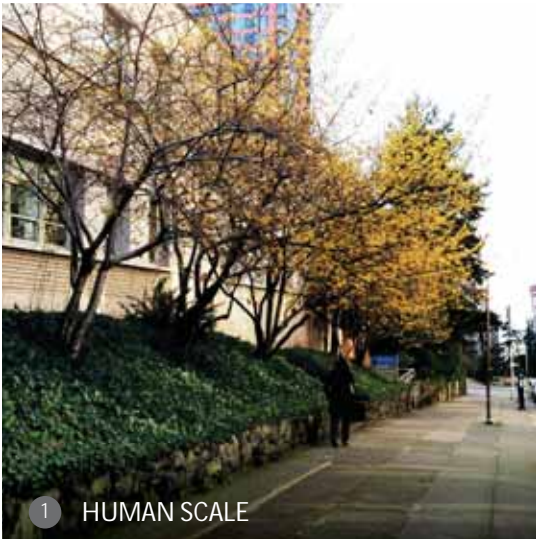
EXISTING LANDSCAPE BEDS - POSITIVE CONTRIBUTING CHARACTER

An on-site landscape bed analysis was completed to determine plant species, health, character, and materiality of each existing landscape bed on campus. Following the inventory, beds were analyzed to determine whether their condition, species, scale, or materiality either contributed or detracted from the development of a cohesive campus identity.

Beds that contribute to the development of a cohesive campus character meet one or more of the following criteria:

- 1 They contribute to a human-scaled landscape
- 2 They are generous in width or size, and have potential for a variety of species to flourish.
- 3 They are healthy or well maintained
- 4 They are historically significant.

Please refer to photos below for specific neighborhood examples.



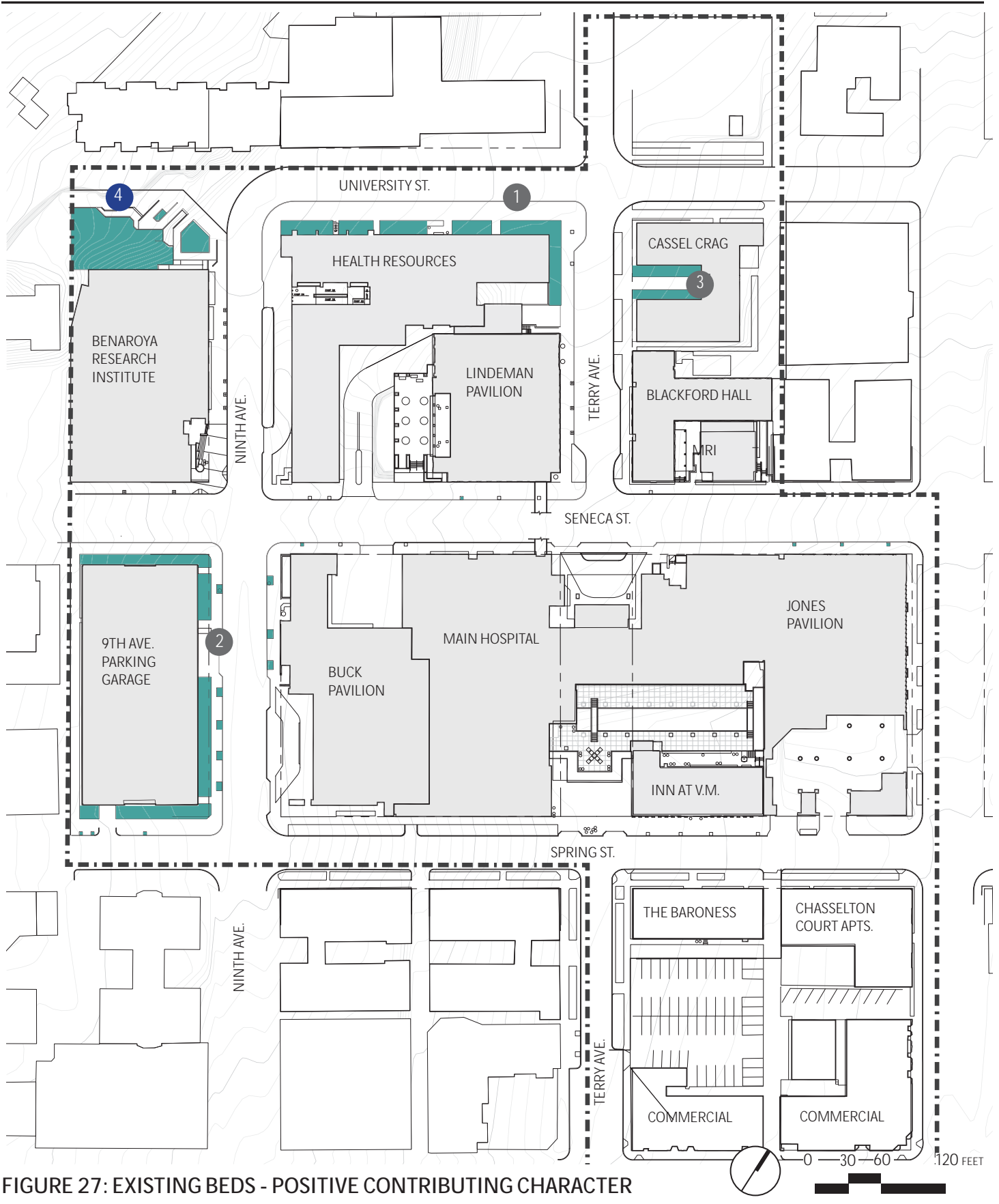


FIGURE 27: EXISTING BEDS - POSITIVE CONTRIBUTING CHARACTER

APPENDIX A: SITE ANALYSIS

EXISTING LANDSCAPE BEDS - LIMITED CONTRIBUTING CHARACTER

Beds that detract from the development of a cohesive campus character meet one or more of the following criteria:

- 1 Plant materiality does not contribute to a unified character.
- 2 Planting is in poor condition or is failing
- 3 Plants obstruct visibility or provide places for enclosure (do not comply with Crime Prevention Through Environmental Design / CPTED principles)

Please refer to photos below for specific neighborhood examples.



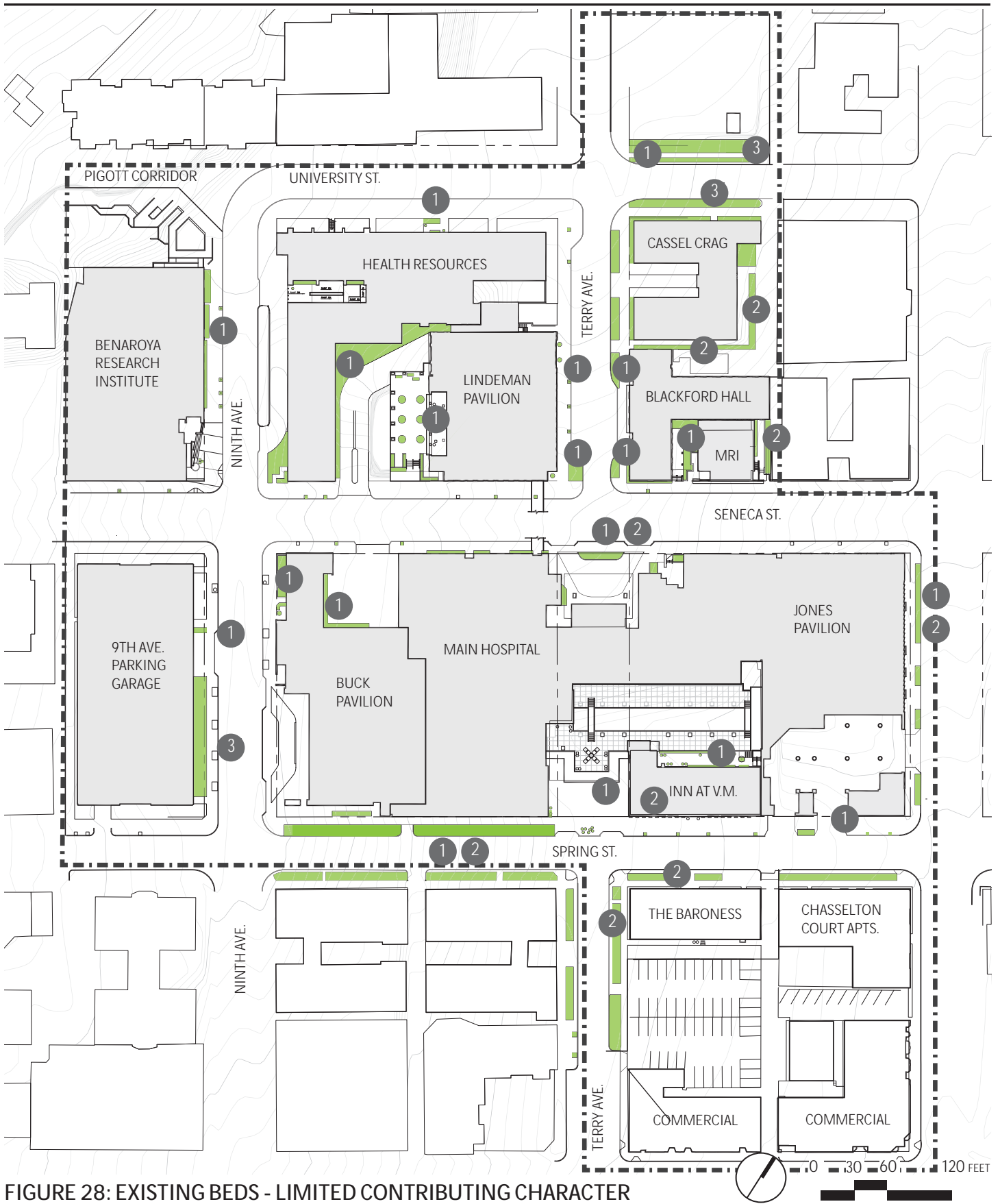


FIGURE 28: EXISTING BEDS - LIMITED CONTRIBUTING CHARACTER

APPENDIX A: SITE ANALYSIS

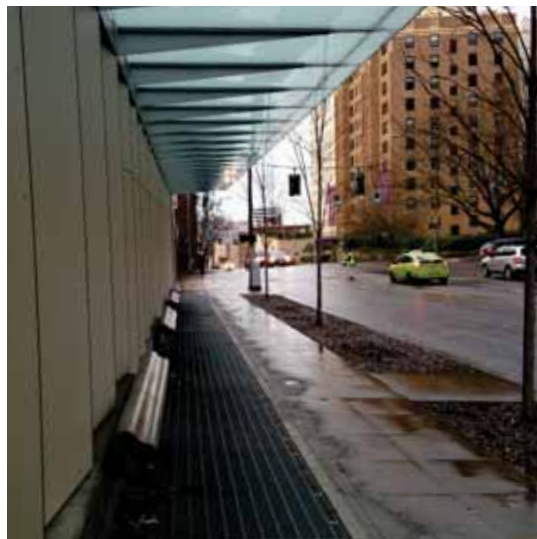
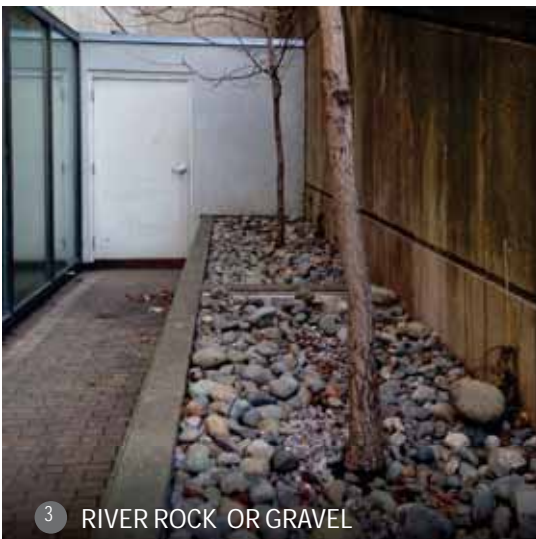
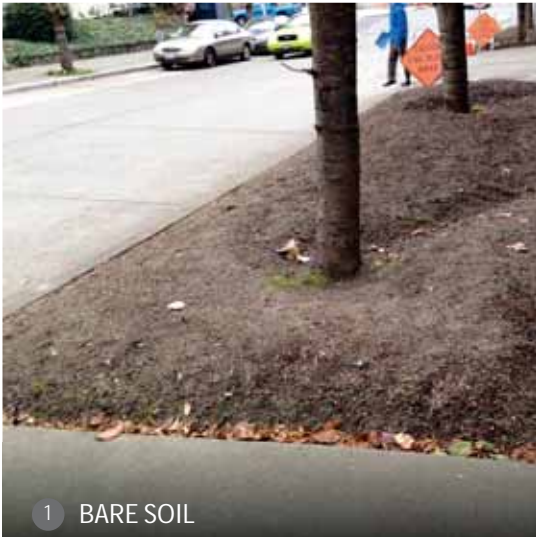
EXISTING LANDSCAPE BEDS - UNPLANTED

Unplanted beds were included in the campus inventory in order to understand the reasoning, intention and history behind the choice not to plant. Beds were categorized into the following groups:

- 1 Bare Soil
- 2 Tree Grate
- 3 River Rock / Gravel

Unplanted beds were included as either positive or negative contributors to the development of a cohesive campus identity as illustrated in the Existing Landscape Beds Analysis on pages 20-21. In some instances, in landscape beds with mature trees and poor sun exposure, it is not feasible for plants to establish and grow. In these cases, the best solution is to retain the unplanted character of the bed. However, recommendations can still be made to ensure the beds appear well kept and are contributing to the ongoing health of the campus's mature tree canopy.

Please refer to photos below for specific neighborhood examples.



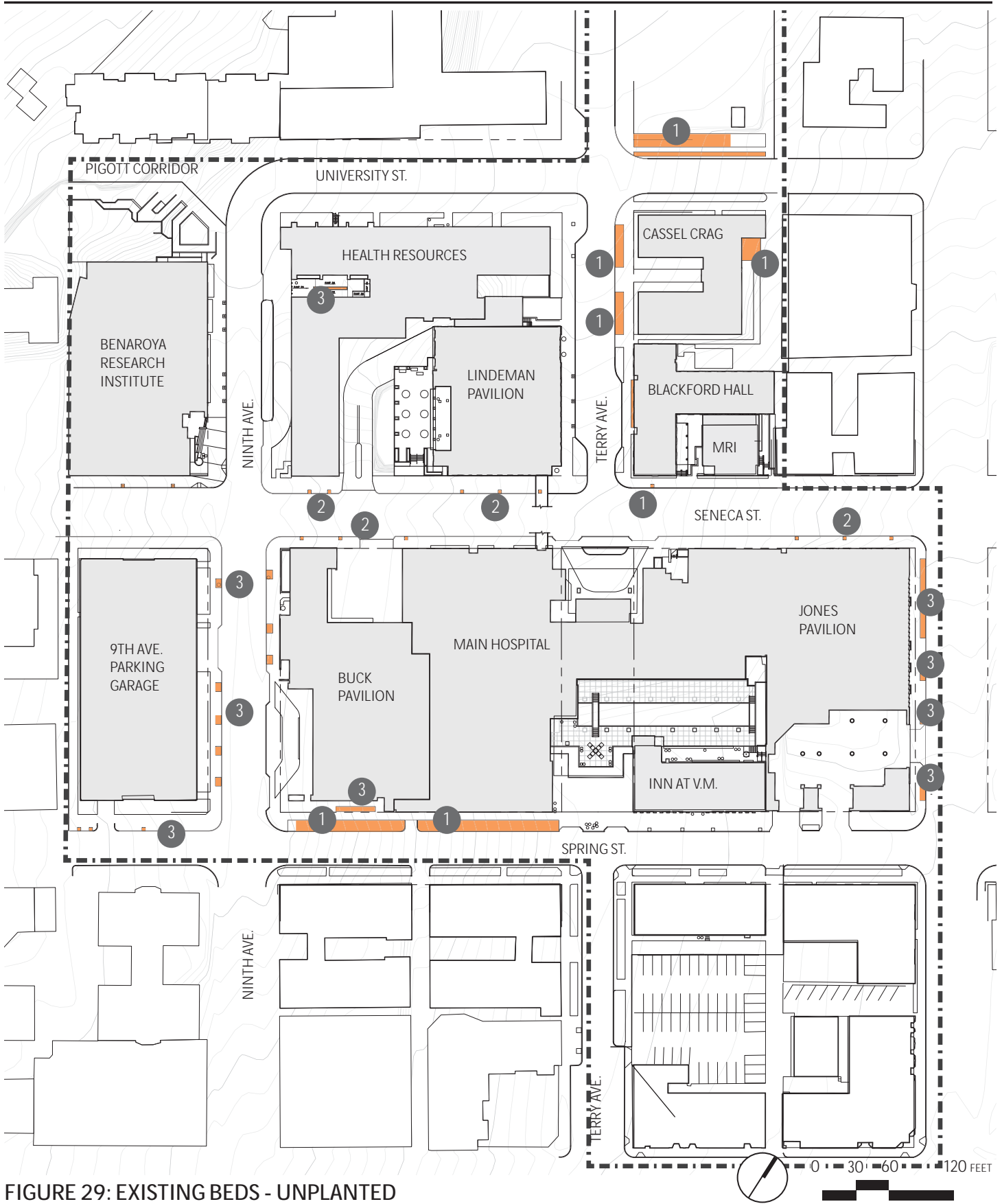


FIGURE 29: EXISTING BEDS - UNPLANTED

APPENDIX A: SITE ANALYSIS

SUN STUDIES

A solar analysis was conducted using existing conditions. The analysis explored solar conditions at noon, during Spring, Summer, Winter and Fall.

The purpose of the analysis is to illustrate campus micro-climate conditions in order to best inform design decisions and plant recommendations.

The results of the analysis reveal a range of solar exposure; from very shady to sunny. Seneca St. receives the most shade during the most times of year, while Terry Avenue and Ninth Avenue both receive direct or dappled sunlight throughout the year.

This analysis is used as a basis for design recommendations at all scales.

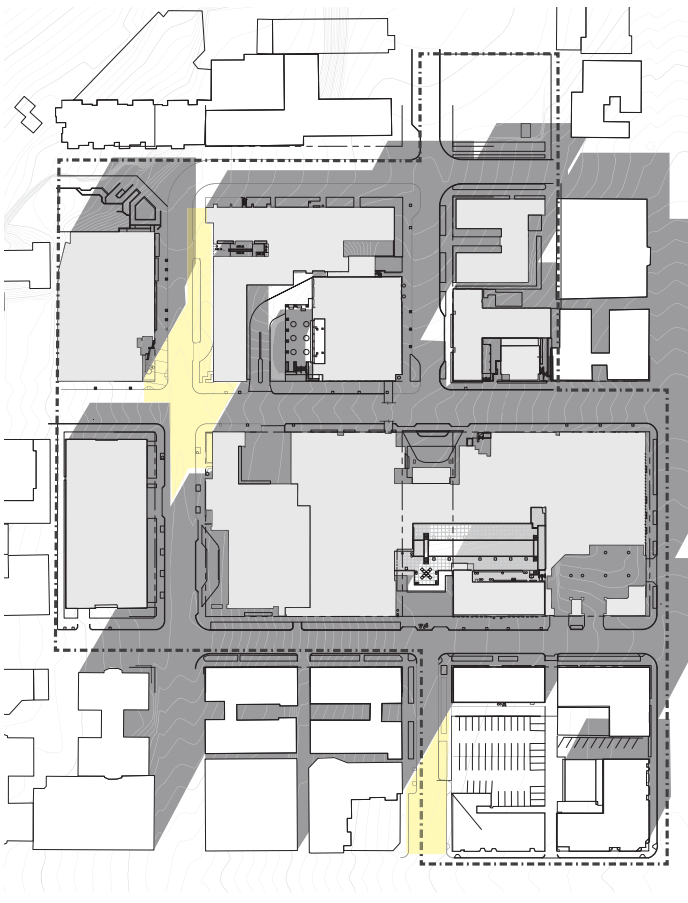


FIGURE 30: SUN STUDY - WINTER

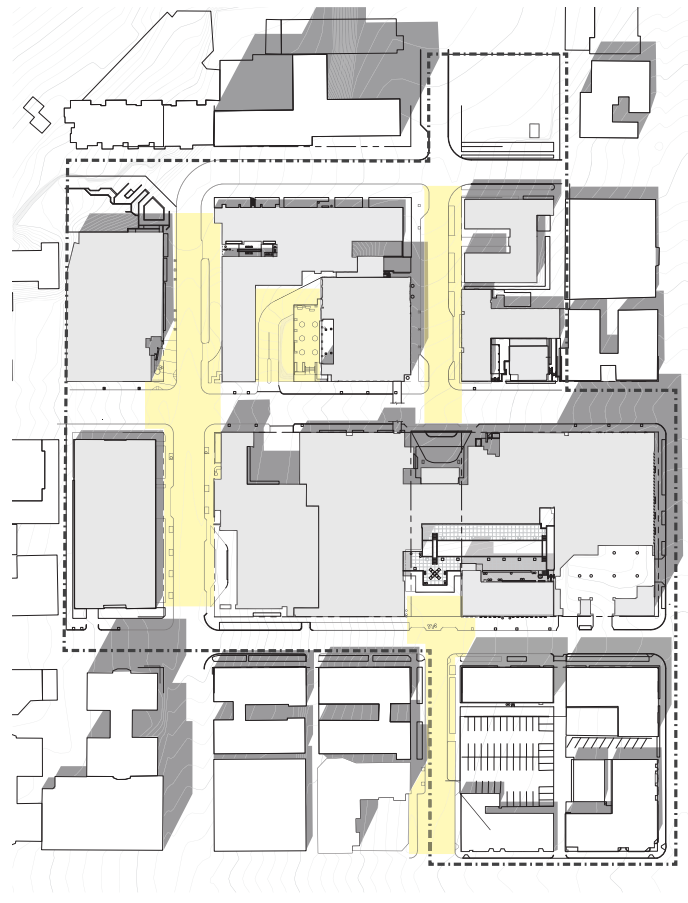


FIGURE 31: SUN STUDY - SPRING

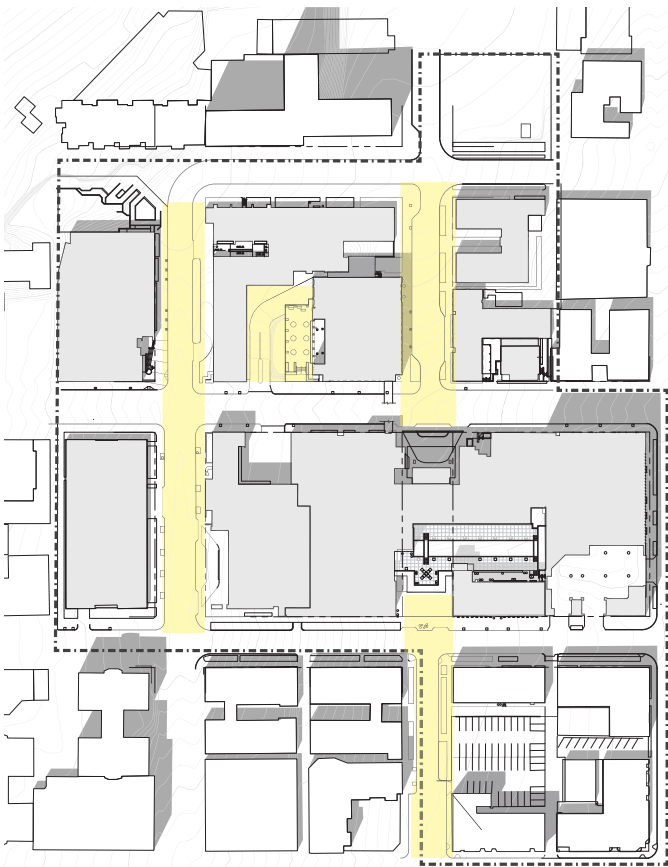


FIGURE 32: SUN STUDY - SUMMER

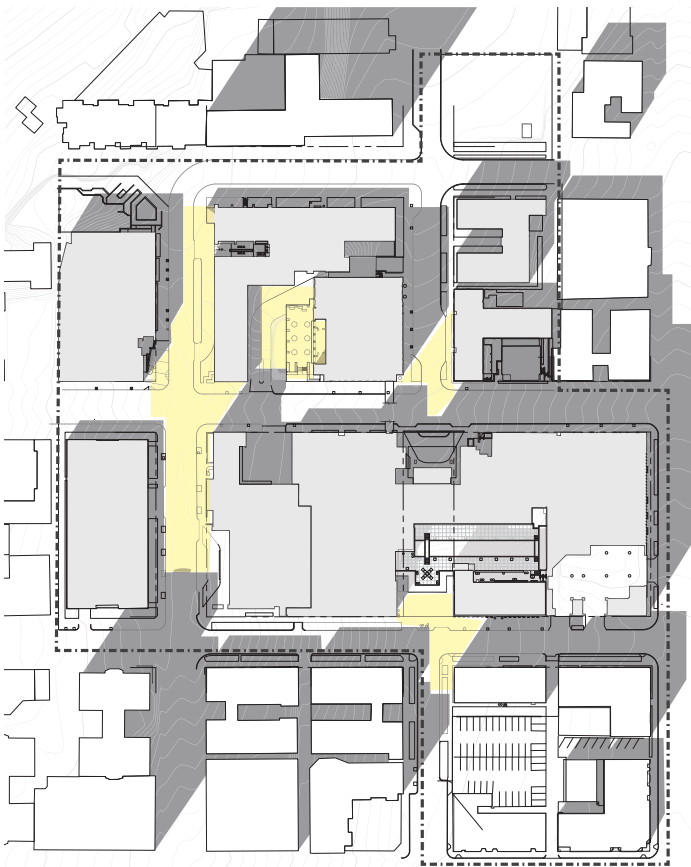


FIGURE 33: SUN STUDY - FALL

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

MAIN HOSPITAL BUILDING NORTH ENTRY

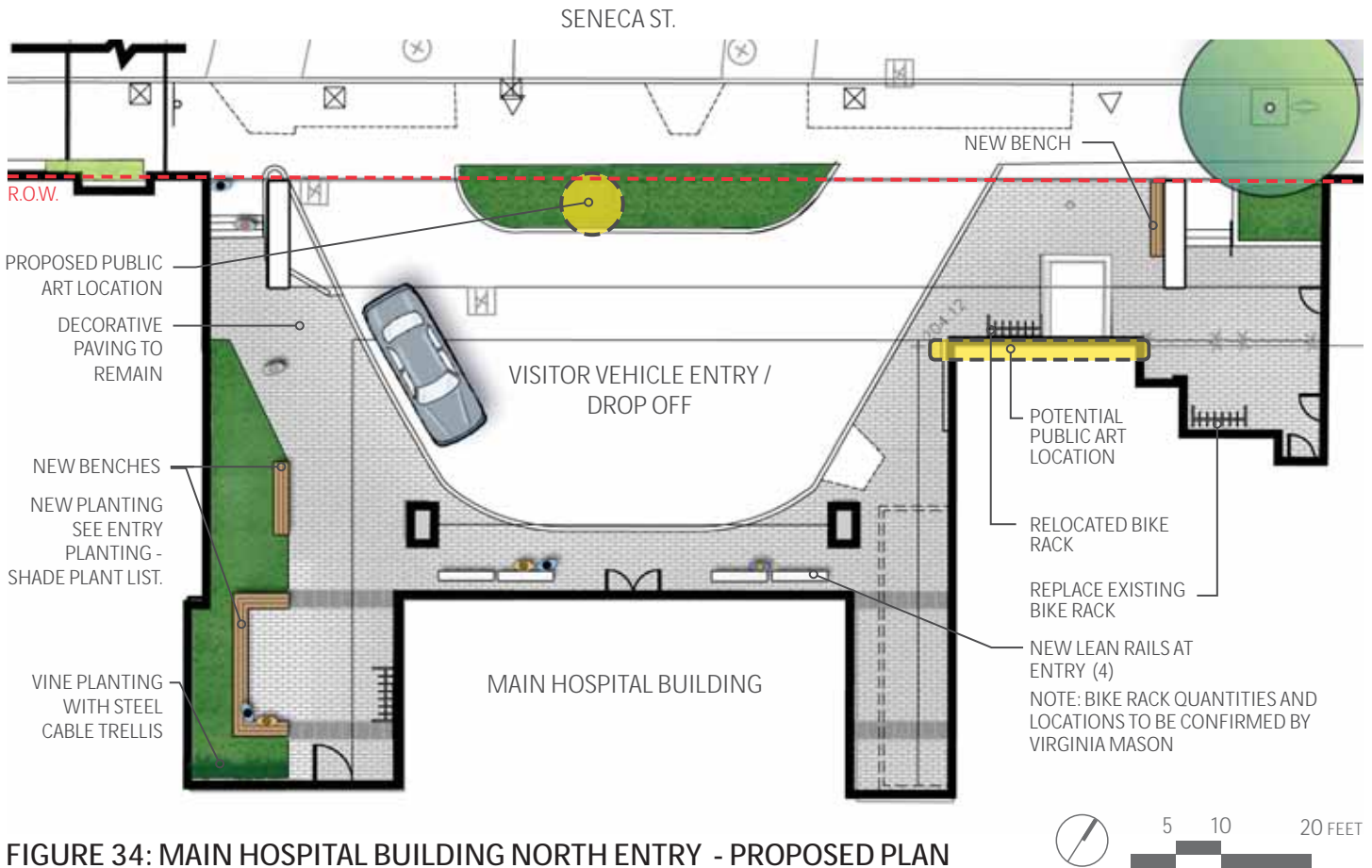


FIGURE 34: MAIN HOSPITAL BUILDING NORTH ENTRY - PROPOSED PLAN

The Main Hospital Building North Entry is one of the busiest areas of campus. As both the main vehicle drop-off, and pedestrian entrance to the hospital, this area is highly visible. As such, it is imperative that the landscape at the front entry be high quality, healthy, and welcoming.

At present, the entry is dominated by hardscape and is consistently in shade, resulting in an undesirable condition. The planting that does exist is not cohesive in nature, is in poor health, and is inappropriately scaled for the space. There are limited comfortable places to step out to make or receive a phone call, wait for a pick-up, or simply take a break from the intense interior hospital environment. The paved nook east of the Main Hospital Entrance is an under utilized asset to the entry landscapes. The nook offers a quiet, human scale space, which feels both separate and visibly connected to the entry. At present, the area is primarily functioning as a bike parking zone. Bike parking is an important programmatic element to retain. However, current bike rack locations could be revised in order to allow for other programmatic activities such as gathering with one or two other people, or telephone conversations to occur.

This proposed redesign extends the existing planting at the west side of the entry into the corner. The C shaped bench helps to frame the space and provide informal seating opportunities. Vine planting on the south wall dampens noise, and creates a softened view. A public art element at the central planter bed acts as a focal point at the Terry Ave terminus. Finally, a new bench at the NE edge of the entry allows users to have a more clear view of the street. One bike rack has been moved from the west nook to the east side of the entry for easy access to and from Seneca St. The existing rack that is in poor condition has been replaced.

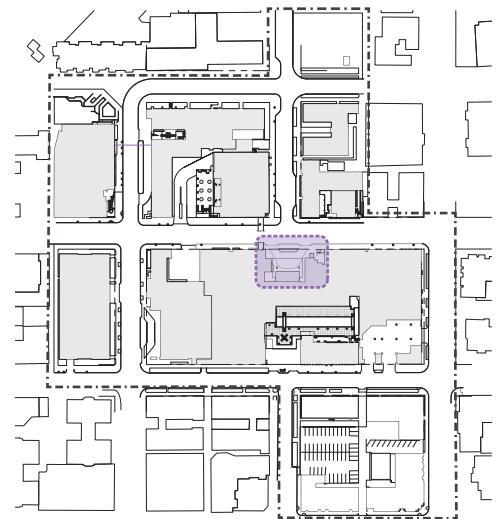
A high efficiency irrigation system is recommended for all planted areas at the entry, to ensure continued healthy plant growth.



FIGURE 35: MAIN HOSPITAL BUILDING NORTH ENTRY - PROPOSED PERSPECTIVE



EXISTING CONDITIONS



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

NINTH AVENUE AND UNIVERSITY STREET

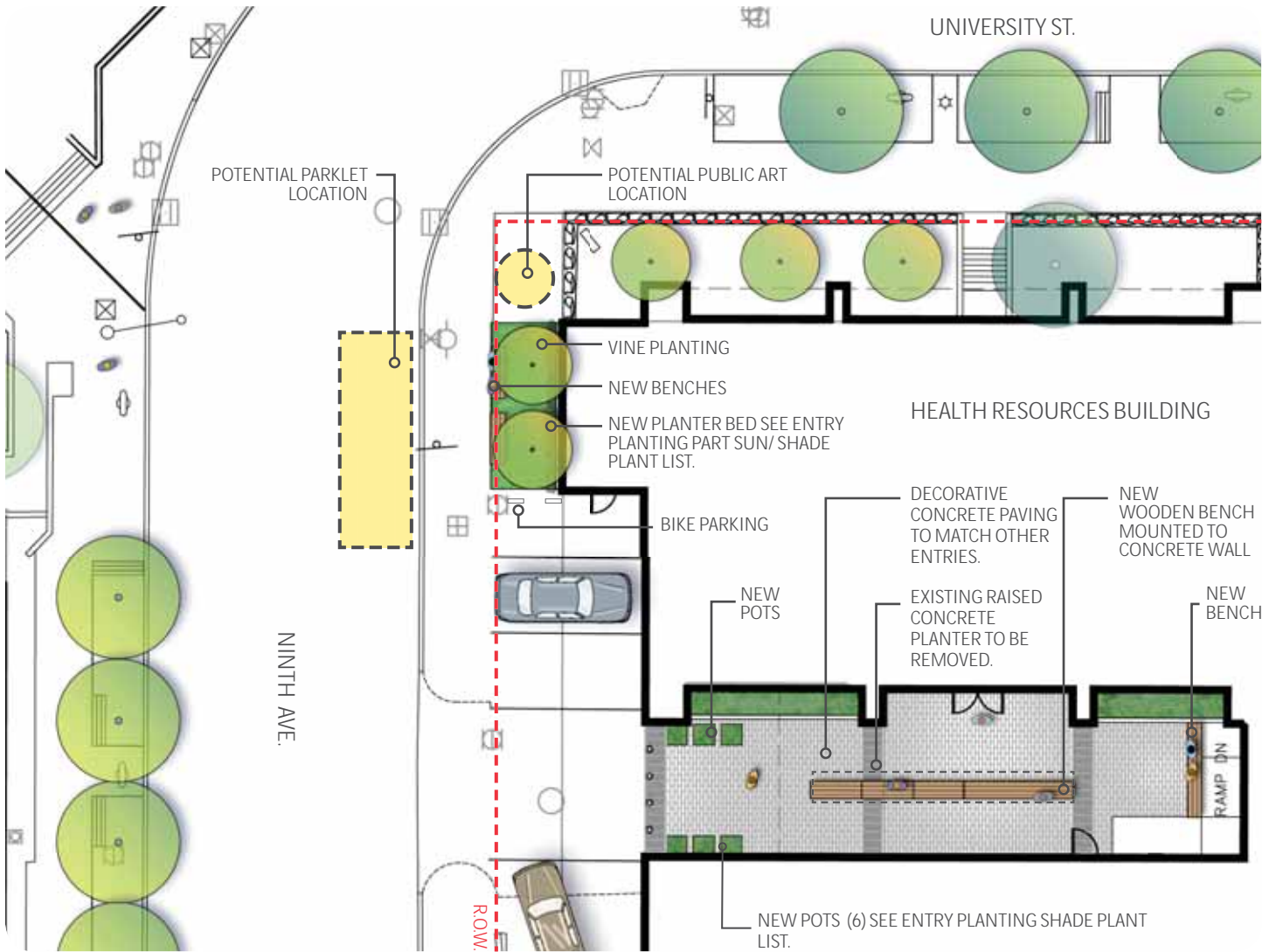


FIGURE 36: HEALTH RESOURCES BUILDING (HRB) NORTH ENTRY

HEALTH RESOURCES BUILDING NORTH ENTRY

As one of the main pedestrian entries to the Health Resources Building, this area is a high traffic gateway. The present design, however, does not provide a welcoming or easily visible entry. The proposed scheme improves the entry experience for both pedestrians arriving at Virginia Mason's campus from the Pigott Corridor, or from the vehicle drop off. A planter bed, seating, and public art has been proposed for the Health Resources facade directly across from Pigott Corridor as a beacon at this important campus gateway. This scheme proposes to remove the existing concrete planter that divides the walk. Decorative paving has been added to match other building entries, and planting is retained or proposed for areas that do receive sunlight. Furnishings and materials in this zone should be match other campus entry areas.

PROPOSED PUBLIC REALM ACTION PLAN PARKLETS

The Public Realm Action Plan recommends parklets on the west side of Ninth Ave, as part of its interim concept solution. Given that the east side of the street receives more afternoon sun, it is suggested to shift the proposed parklets to the east, which would also activate the Health Resources Building facade.

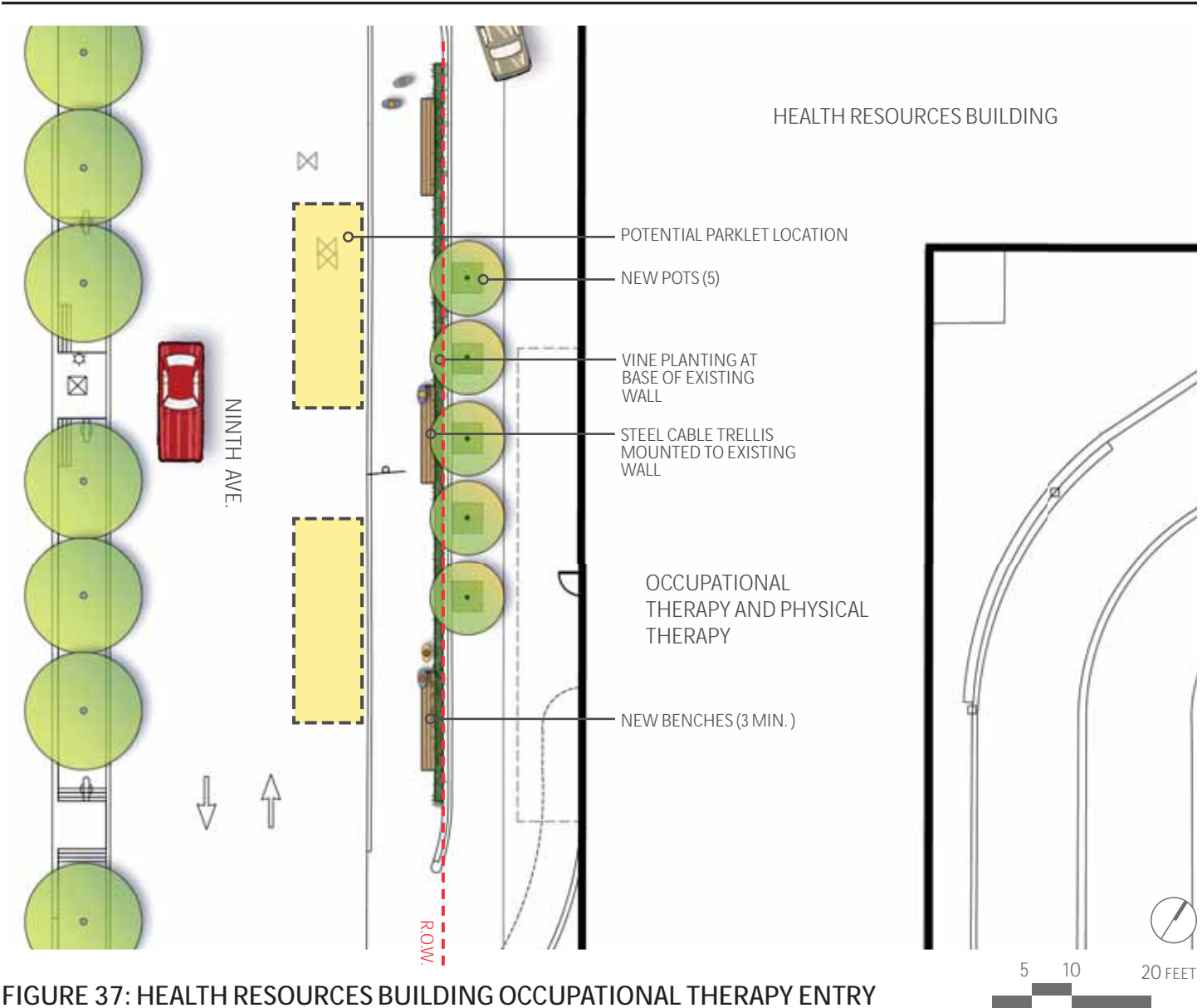
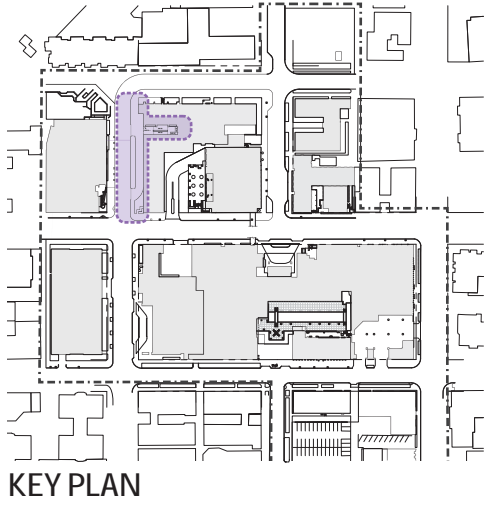


FIGURE 37: HEALTH RESOURCES BUILDING OCCUPATIONAL THERAPY ENTRY

Since the *Major Institution Master Plan* designates this area as the preferred location for future open space once the Health Resources Building is demolished, design interventions propose to activate the space in the interim and are complementary to the recommendations in the *Public Realm Action Plan*. Movable planters have been added to the Health Resources Building entry pull-in to continue the allée of existing Witch Hazels along University St. to Ninth Ave. Not only will the Witch Hazels help to provide continuity and establish a landscape rhythm, they will also provide shading in the hot summer months to decrease heat island effect.

A stainless steel cable trellis and evergreen vine planting at the base of the existing retaining wall, along with bench seating, adjacent to proposed PRAP parklet locations help to activate the R.O.W. and soften the existing hardscape. A high efficiency irrigation system is recommended for all planting areas, to ensure continued healthy plant growth.



APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

HEALTH RESOURCES BUILDING OCCUPATIONAL THERAPY ENTRANCE



FIGURE 38: HEALTH RESOURCES OCCUPATIONAL THERAPY ENTRANCE - PROPOSED ELEVATION

FAST-GROWING EVERGREEN VINE
PLANTING

NEW WOODEN BENCH
AT BASE OF EXISTING WALL

NEW ENTRY
PLANTING



APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

LINDEMAN PAVILION PLAZA

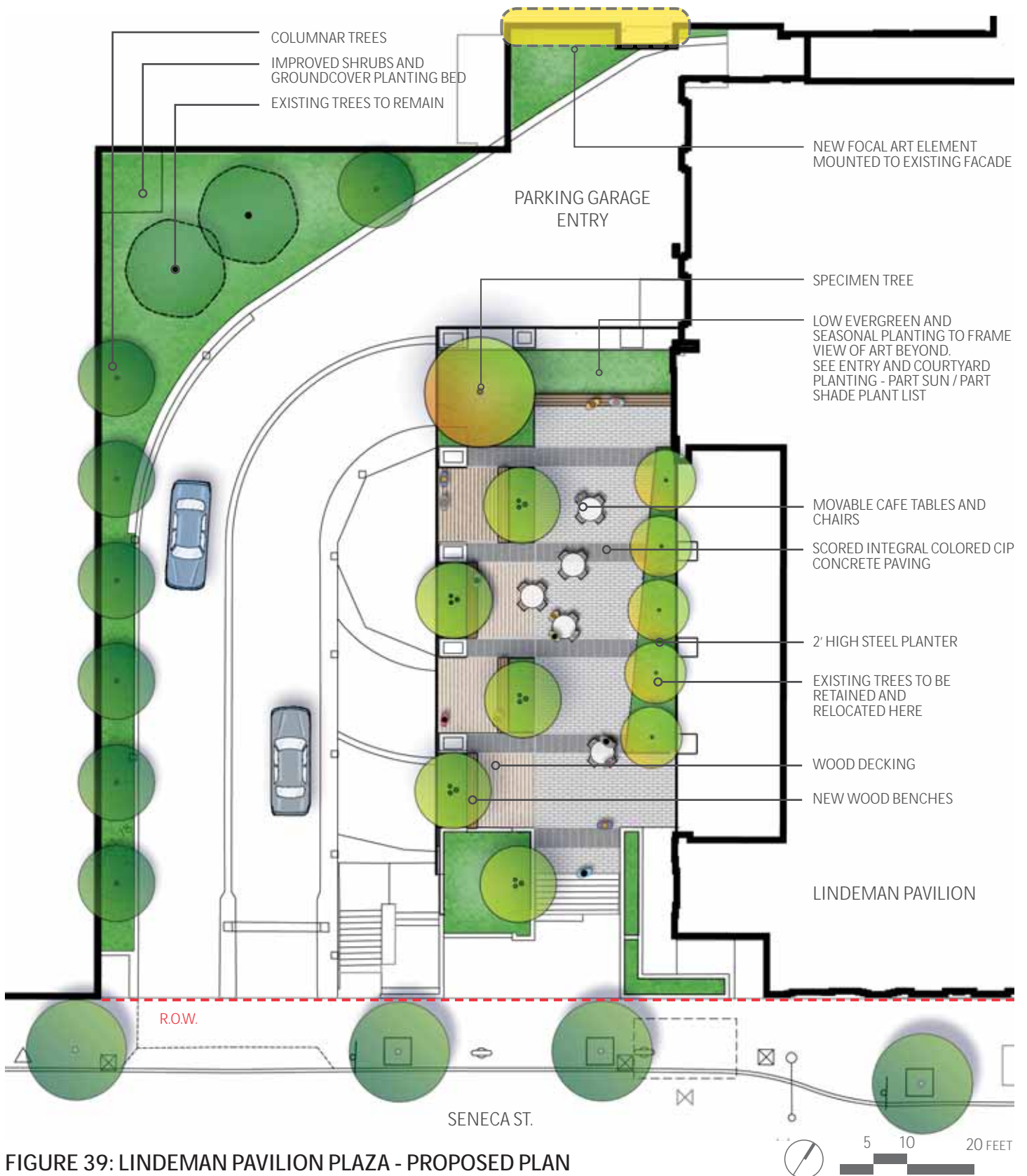


FIGURE 39: LINDEMAN PAVILION PLAZA - PROPOSED PLAN



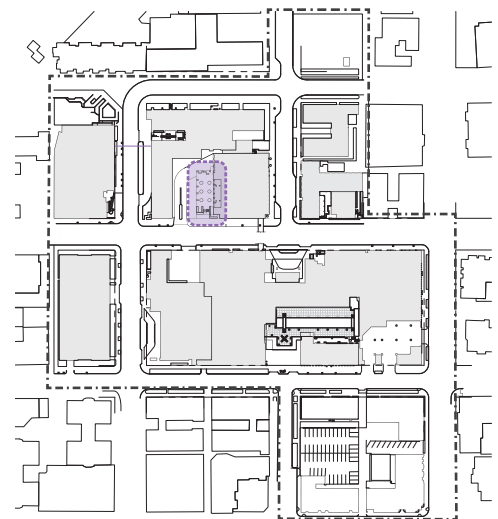
FIGURE 40: LINDEMAN PAVILION PLAZA - PROPOSED PERSPECTIVE VIEW

As the largest public open space on the campus, the Lindeman Pavilion Terrace is well-used at all times of year and is a valuable asset for the campus and the neighborhood. At present, the plaza is mostly hardscape with limited planting. The fixed seating that is provided is generous, but does not encourage social engagement.

The proposed design creates a more comfortable gathering space for staff, patients and visitors. Planting more trees, and species with a broader branching form and canopy will provide cooling and shade in the summer months to reduce heat island effect and glare. Trees have been placed purposefully to frame views to the surrounding buildings and landscape. Increasing the square footage of planter beds not only helps to generate biodiversity and provide seasonal interest, but also defines smaller-scale landscape rooms at the terrace's west edge. See Entry and Courtyard planting sun / shade plant list. A high-efficiency irrigation system is recommended for all planted areas to ensure continued, healthy plant growth.

The proposed design frames the view north to a public art element adjacent to the parking entry, which activates an otherwise blank building face. Movable cafe tables and chairs allow the central plaza space to remain programmatically flexible, encouraging a host of different activities to occur.

Prior to any recommendations being implemented, a structural assessment should be conducted to identify the location and size of main structural members, as well as the terrace's maximum live and dead load, and how to build and locate any planters.



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

SENECA ST. COURTYARDS AND ENTRIES

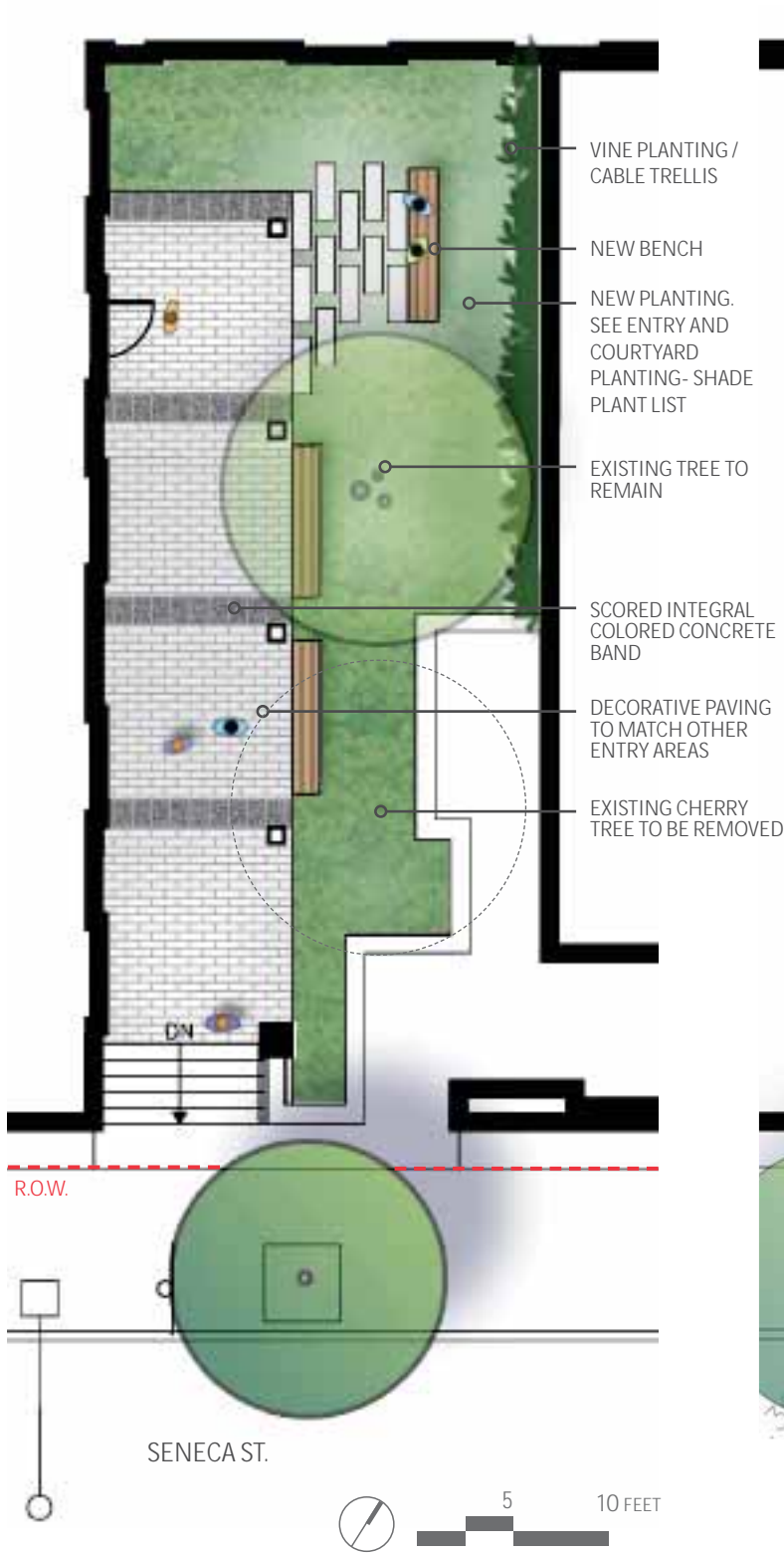


FIGURE 41: BLACKFORD HALL ENTRY - PROPOSED PLAN

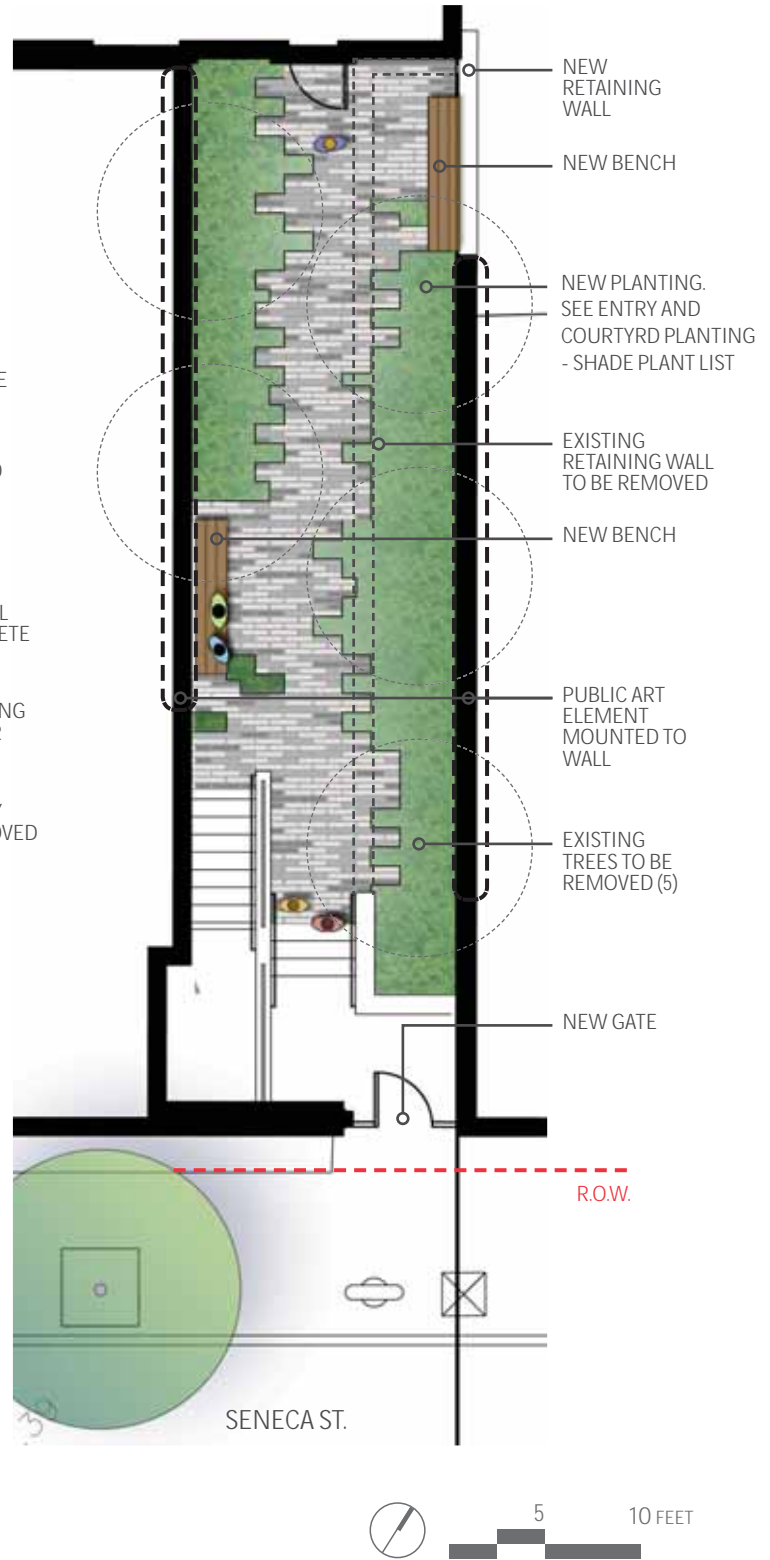
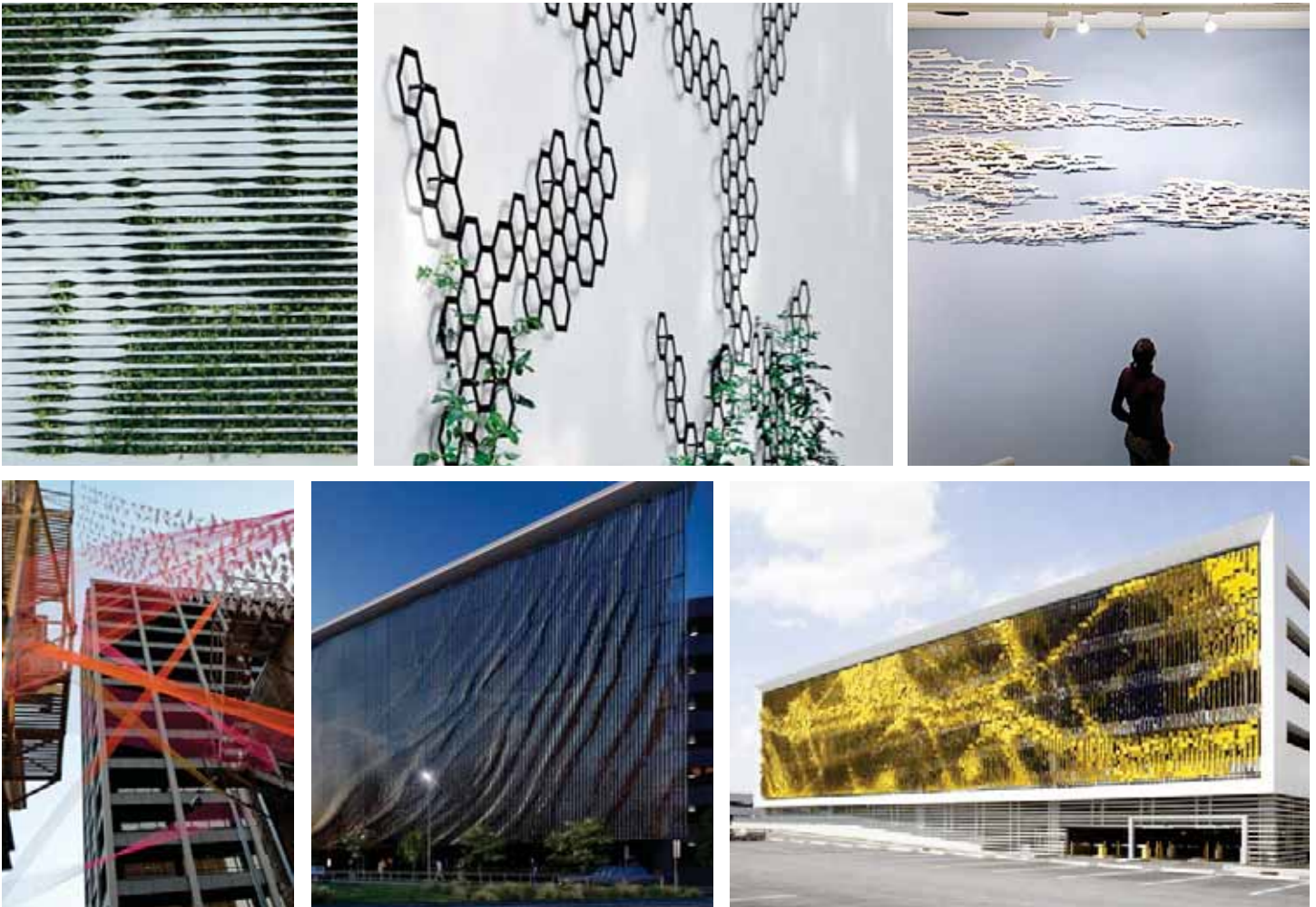


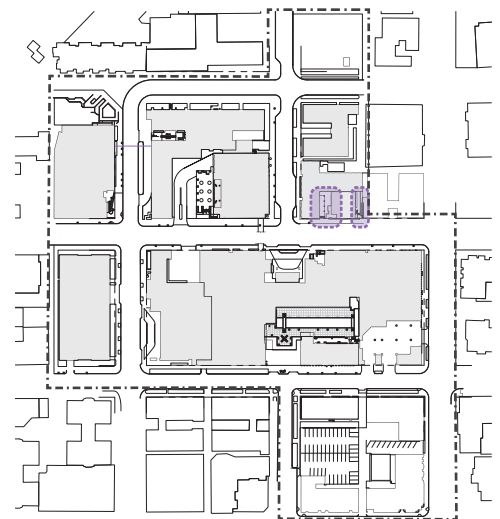
FIGURE 42: MRI COURTYARD - PROPOSED PLAN



MRI COURTYARD - DYNAMIC PUBLIC ART PRECEDENTS

BLACKFORD HALL ENTRY Quiet respites for sitting or contemplation are lacking on the campus. This entry area offers an escape from the busy Seneca St. environment, yet the current condition does not provide a comfortable place to pause. The proposed scheme adds seating options both directly adjacent to the entry walk, and slightly tucked within the planting, for more privacy. The blank wall adjacent to the entry is activated with a cable trellis and evergreen vine planting. Decorative pre-cast concrete pavers and integral colored concrete bands match other entry zones to develop a cohesive entry character.

MRI WALKWAY Presently, this alley is a CPTED concern for the campus. Visibility is low, and existing trees are inappropriately scaled for the space. With improvement, however, this residual space could become a quiet human-scale retreat. The proposed design creates a viewing space, or an escape zone, in which staff members, patients, visitors and passers-by can view and experience a public art element, which visually and acoustically changes given the weather, wind, and orientation of the sun. The dynamic art piece mimics the calming, therapeutic movements of gently moving grasses, clouds, streams or other landscape systems. The existing retaining wall is removed to open up the space, and decorative paving is integrated with simple shade planting. A gate has been added at the top of the stairs to limit access.



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

BUCK PAVILION ENTRY COURTYARD

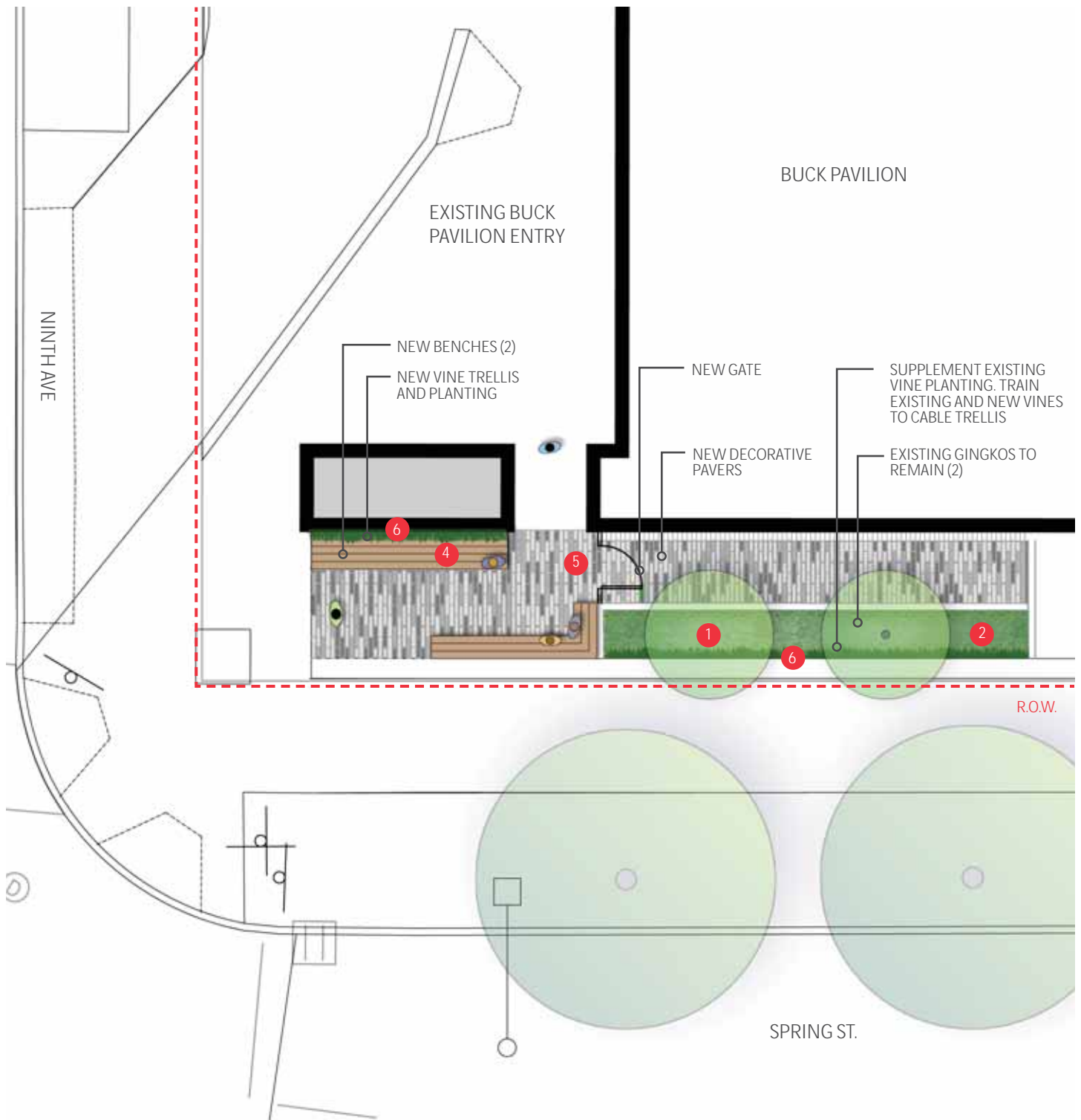


FIGURE 43: BUCK PAVILION ENTRY COURTYARD - PROPOSED PLAN





1 GINKGO TREES



2 FERN UNDERSTORY



3 VINE PLANTING



4 BENCH SEATING



5 PAVERS

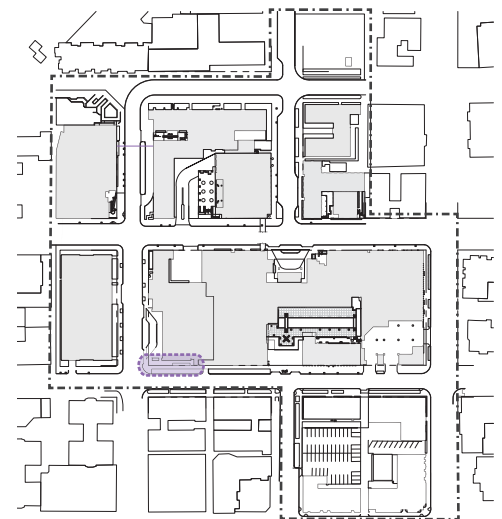


6 CABLE TRELLIS

BUCK PAVILION ENTRY COURTYARD - MATERIALS, FURNISHINGS AND CHARACTER

Presently, the Buck Pavilion Entry is busy and vehicle-oriented. There is a lack of comfortable places to sit or pause, to make a phone-call, or wait for a pick-up. The entry's tight scale does not allow for design interventions to occur. The existing adjacent landscape area is presently being under-utilized, and with improvement could fulfill such programmatic needs. The area feels slightly separated from the entry, yet is also physically and visually connected. The current design provides some visual interest, but does not invite users to enter or inhabit the space close to the sidewalk.

The proposed scheme adds decorative concrete paving to match other courtyard areas, as well as wooden benches, which are arranged to encourage social interaction. The existing planter bed and Ginkgo trees have been retained, and a simple fern understory has been added to soften the space and provide visual relief. A vine trellis and evergreen shade-loving vine planting is recommended for the base of the existing column. Existing vine planting in the planter should be supplemented with more plants, and a more robust trellis structure to ensure vines are properly trained up the wall. A high efficiency irrigation system is recommended for all planted areas to ensure continued, healthy plant growth.



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

INN AT VIRGINIA MASON COURTYARD

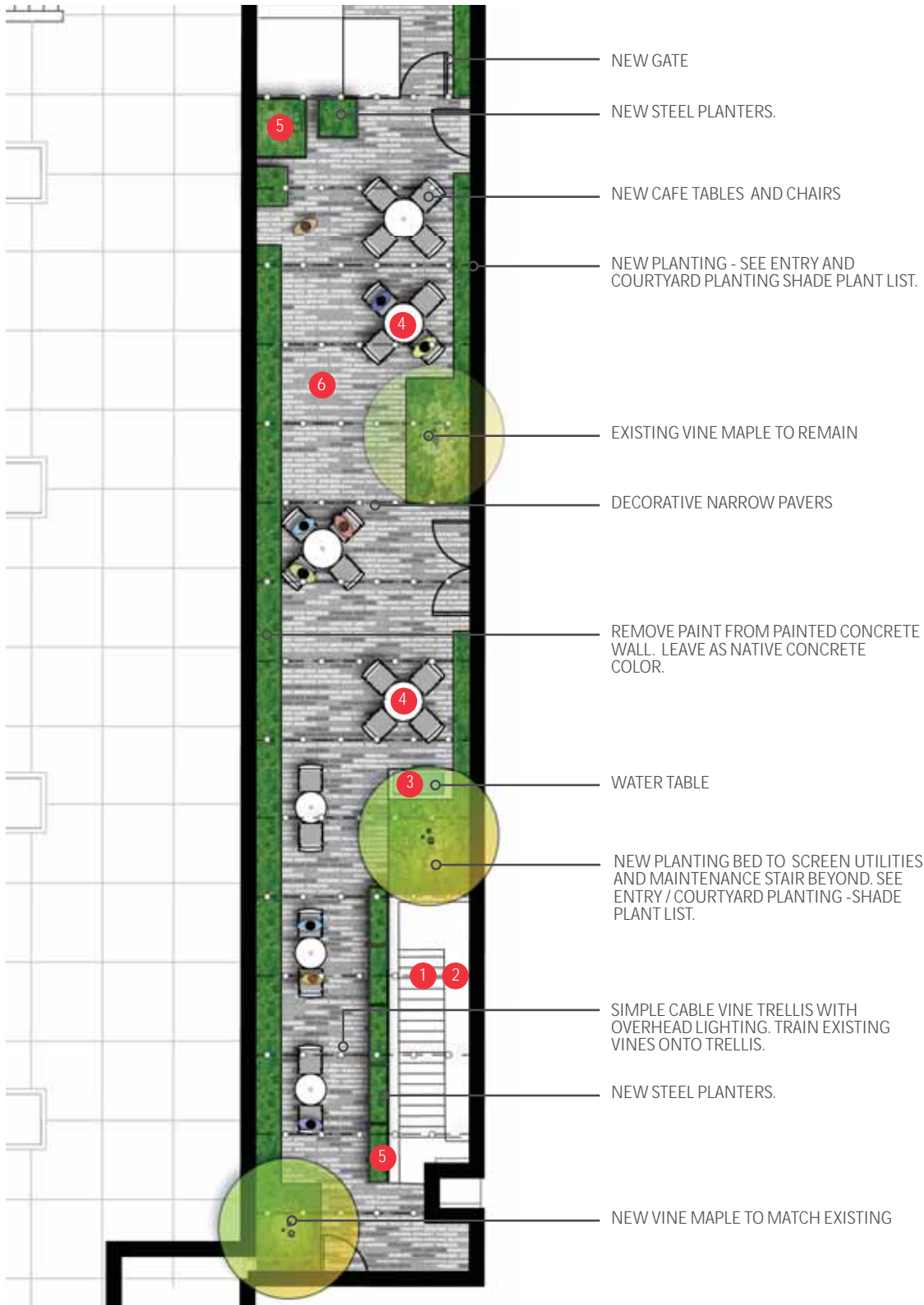
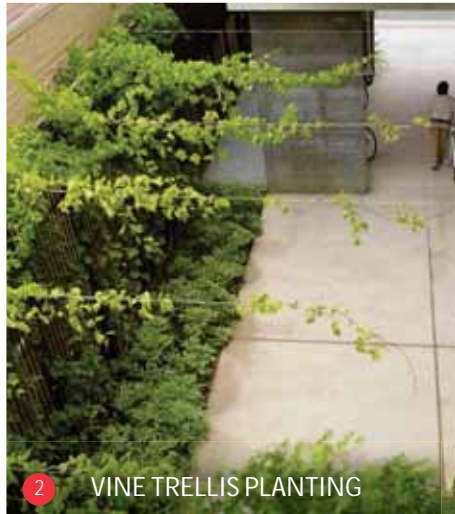


FIGURE 44: INN AT VIRGINIA MASON COURTYARD - PROPOSED PLAN





1 OVERHEAD CATENARY LIGHTS



2 VINE TRELLIS PLANTING



3 WATER FEATURE



4 CAFE TABLES AND CHAIRS



5 PLANTERS



6 PAVERS



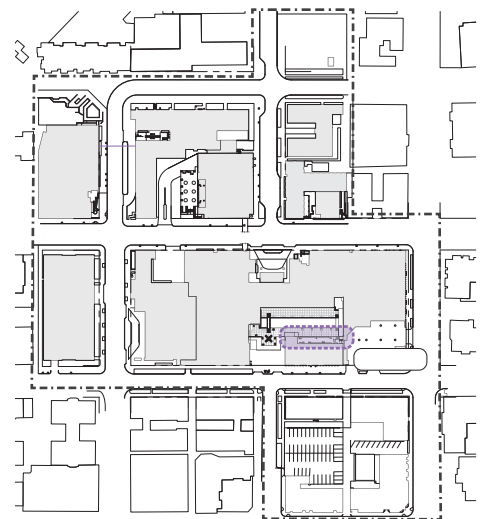
DESIGN CHARACTER

INN AT VIRGINIA MASON COURTYARD - MATERIALS, FURNISHINGS AND CHARACTER

As the most quiet and private place on campus to sit and relax, the cafe courtyard at the Inn is a valuable asset. Aside from the Inn's roof deck, this is the only outdoor public space that is completely separated from the busy campus streetscape. At present, the courtyard functions very well as an area of respite for visitors to Virginia Mason and the Inn, however, updated materials, furnishings, and planting will contribute to a cohesive campus design character, and to create an even more relaxing urban oasis for patrons to enjoy.

The design scheme includes decorative precast concrete pavers to match other courtyard areas. The existing vines growing on the eastern wall have been trained on a new overhead cable vine trellis, with complementary catenary lighting. The simple trellis will provide a sense of enclosure, while also allowing dappled light to filter into the courtyard on sunny days. A new planter bed and pots have been added to screen the existing maintenance stair at the SE end of the courtyard. A high efficiency irrigation system is recommended for all planted areas to ensure continued, healthy plant growth.

New cafe tables and chairs of varied sizes are more appropriately scaled for the space, and can be easily moved to allow for larger groupings, or to shift tables according to the light or weather.



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

INN AT VIRGINIA MASON ROOF DECK

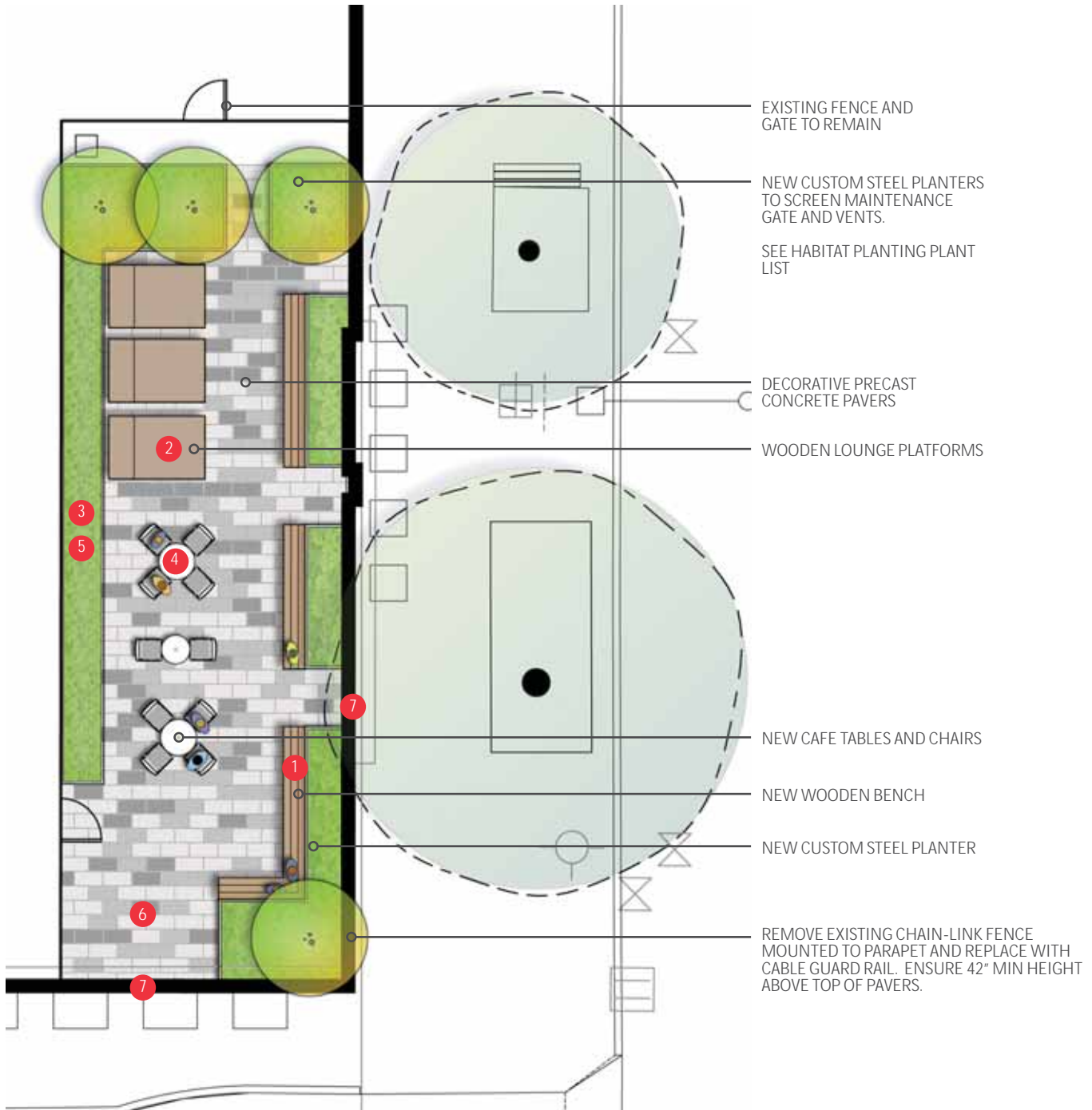


FIGURE 45: INN AT VIRGINIA MASON ROOF DECK - PROPOSED PLAN





1 BENCH SEATING



2 WOODEN LOUNGE PLATFORMS



3 PLANTING CHARACTER



4 CAFE TABLES AND CHAIRS



5 PLANTERS



6 PAVERS



7 CABLE RAIL MOUNTED TO PARAPET

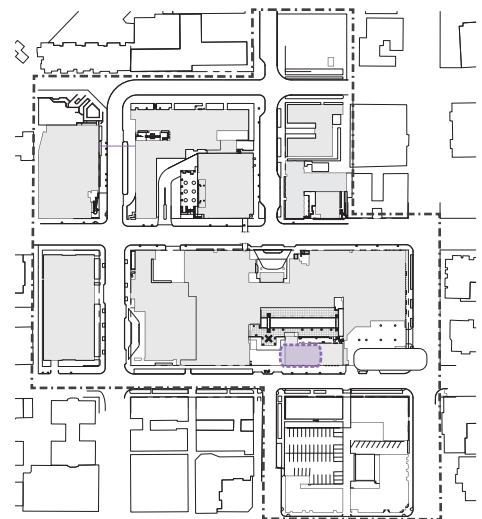
INN AT VIRGINIA MASON ROOF DECK - MATERIALS, FURNISHINGS, AND CHARACTER

Similar to the Inn at Virginia Mason courtyard, the roof deck is a valuable amenity for visitors to the Inn. The roof provides sweeping views of downtown, First Hill and Elliot Bay. Aside from the Inn Courtyard, this is the only publicly accessible outdoor space that is removed from the busy streetscape environment. The space has great potential, however, the existing plants are suffering from over-exposure to the sun, and the lack of shade and prevalence of hardscape are contributing to heat island affect.

The proposed design increases the square footage of planter area and decreases the amount of hardscape to encourage passive heating and cooling and combat heat island effect. Only sun-loving species should be planted. A stand of small multi-stemmed trees at the south edge provide a lush backdrop and screen maintenance access and vents. A high efficiency irrigation system is recommended for all planter beds in this zone to ensure continued, healthy plant growth.

A variety of fixed and movable seating options have been provided to allow for individuals and groups to comfortably use the space simultaneously.

The existing chain-link fence that surrounds the deck has been removed to allow an unobstructed view. A non-climbable cable guardrail has been mounted to the existing parapet to ensure a safe, protective barrier while maximizing visibility.



KEY PLAN

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

UNIVERSITY STREET PLANT LIST

Virginia Mason Medical Center UNIVERSITY ST. ZONE		NATIVE / ADAPTIVE	DEEP SHADE	PARTIAL SUN / SHADE	EVERGREEN	HABITAT
STREET TREES *See plans for location						
<i>Acer rubrum</i> 'Scarsen'	Scarlet Sentinel Maple					
<i>Liquidambar styraciflua</i> 'Moraine'	Moraine Sweetgum					
<i>Carpinus caroliniana</i>	American Hornbeam					
TALL SHRUBS						
Hamamelis x intermedia 'Arnold Promise'	Arnold Promise Witch Hazel					Birds
STORMWATER PLANTING						
<i>Adiantum aleuticum</i>	Western maidenhair fern	N				
<i>Carex</i> spp.	Sedges	N				
<i>Cornus sericea kelseyi</i>	Kelseyi Redtwig Dogwood					Birds, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Juncus effusus</i>	Soft Rush				E	Birds
<i>Juncus ensifolius</i>	Dagger-Leafed Rush				E	Birds
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	N				Birds
ENTRY AND COURTYARD PLANTING - PART SUN / PART SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass					
<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus					Birds, Bees, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass	N				Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry				E	Bees, Birds
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				Bees, Butterflies
<i>Pennisetum alopecuroides</i> 'Hameln'	Fountain Grass					
<i>Vaccinium delicosum</i>	Cascade Bilberry	N				Bees, Birds
LOW SHRUBS						
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Lavandula</i> spp.	Lavendar					Bees, Beneficial Insects, Butterflies
<i>Lonicera pileata</i>	Box-leaf Honeysuckle				E (s)	Bees, Birds, Butterflies
<i>Hebe</i> sp.	Hebe					
<i>Rosmarinus officinalis</i> 'Collingwood Ingram'	Dwarf Rosemary				E (s)	Bees, Butterflies Birds
ENTRY AND COURTYARD PLANTING - SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Blechnum spicant</i>	Deer Fern	N				
<i>Dryopteris erythrosora</i>	Autumn Fern				E	
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				Bees, Birds
<i>Pachysandra terminalis</i> 'Green Sheen'	Green Sheen Japanese spurge				E	
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
LOW SHRUBS						
<i>Cornus kelseyi</i>	Redtwig Dogwood					Birds, Butterflies
<i>Daphne odora</i>	Winter Daphne					Bees, Beneficial Insects
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox				E	Bees
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds
EDGE PLANTING						
<i>Buxus sempervirens</i> 'Aureovariegata'	Variiegated Boxwood				E	
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging Boxwood				E	
<i>Gautheria shallon</i>	Salal	N			E	Birds, Butterflies,
<i>Sarcococca ruscifolia</i>	Sweetbox				E	Bees
<i>Taxus baccata</i> 'Fastigiata'	Spreading Yew				E	
<i>Taxus x media</i> 'Everlow'	Everlow Yew				E	
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

SENECA STREET PLANT LIST

Virginia Mason Medical Center SENECA ST. ZONE		NATIVE / ADAPTIVE	DEEP SHADE	PARTIAL SUN-SHADE	EVERGREEN	HABITAT
PREFERRED STREET TREES *see plans for location						
<i>Fraxinus pennsylvanica</i>	Green Ash					
<i>Quercus coccinea</i>	Columnar Scarlet Oak					
<i>Acer saccharum</i> 'Commemoration'	Commemoration Sugar Maple					
<i>Ulmus parviflora</i> 'Emer II'	Allee Elm					
SDOT ACCEPTED TREES FOR UNDER WIRES *if requirement applies						
<i>Carpinus caroliniana</i>	American Hornbeam					
<i>Styrax japonica</i>	Japanese Snowbell					
TERRACE / COURTYARD / ENTRY TREES						
<i>Cornus</i> 'Eddie's White Wonder'	Eddie's White Wonder Dogwood					
<i>Stewartia pseudocamellia</i>	Japanese Stewartia					
<i>Styrax japonica</i>	Japanese Snowbell					
SPECIMEN TREE						
<i>Ginkgo biloba</i>	Ginkgo Tree					
1 ENTRY AND COURTYARD PLANTING - PART SUN / PART SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass					
<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus					Birds, Bees, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			E	Bees, Birds
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				Bees, Butterflies
<i>Pennisetum alopecuroides</i> 'Hameln'	Fountain Grass					
<i>Vaccinium delicosum</i>	Cascade Bilberry	N				Bees, Birds
LOW SHRUBS						
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Gaultheria shallon</i>	Salal	N			E	Bees, Beneficial Insects, Butterflies
<i>Lavandula</i> spp.	Lavendar					Bees, Birds, Butterflies
<i>Lonicera pileata</i>	Box-leaf Honeysuckle				E (s)	
<i>Hebe</i> sp.	Hebe					Bees, Butterflies Birds
<i>Rosmarinus officinalis</i> 'Collingwood Ingram'	Dwarf Rosemary				E(s)	
2 ENTRY AND COURTYARD PLANTING - SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Blechnum spicant</i>	Deer Fern	N				
<i>Dryopteris erythrosora</i>	Autumn Fern				E	
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				Bees, Birds
<i>Pachysandra terminalis</i> 'Green Sheen'	Green Sheen Japanese spurge				E	
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
LOW SHRUBS						
<i>Cornus stolonifera</i> 'Kelsey'	Kelsey Dogwood					Birds, Butterflies
<i>Daphne odora</i>	Winter Daphne					Bees, Beneficial Insects
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox				E	Bees
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds
EDGE PLANTING						
<i>Buxus sempervirens</i> 'Aureovariegata'	Variiegated Boxwood				E	
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging Boxwood				E	Birds, Butterflies,
<i>Gaultheria shallon</i>	Salal	N			E	Bees
<i>Sarcococca ruscifolia</i>	Sweetbox				E	
<i>Taxus baccata</i> 'Fastigiata'	Spreading Yew				E	
<i>Taxus x media</i> 'Everlow'	Everlow Yew				E	Birds, Bees, Hummingbirds
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	
VINES						
<i>Akebia quinata</i>	Five-leaf Akebia				E(s)	
<i>Ampelopsis brevipedunculata</i> 'Elegans'	Variiegated Porcelainberry					
<i>Holboellia coriacea</i> 'China Blue'	Evergreen Holboellia				E	Birds
<i>Parthenocissus henryana</i>	Silvervein Creeper					
<i>Parthenocissus tricuspidata</i> 'Vetchii'	Boston Ivy				E	
<i>Schizophragma hydrangeoides</i>	Japanese Climbing Hydrangea				E	

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

NINTH AVENUE PLANT LIST

Virginia Mason Medical Center NINTH AVE. ZONE		NATIVE / ADAPTIVE	DEEP SHADE	PARTIAL SUN / SHADE	EVERGREEN	HABITAT
STREET TREES *See plans for location						
<i>Tilia cordata</i> 'Greenspire'	Greenspire Littleleaf Linden					
<i>Liriodendrum tulipifera</i> 'Fastigiatum'	Columnar Tulip Tree					
<i>Acer rubrum</i> 'Bowhall'	Bowhall Maple					
<i>Acer rubrum</i> 'Karpick'	Karpick Maple					
SHADE PLANTING						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass	N				Birds
<i>Helleborus foetidus</i>	Stinking Hellebore					
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
<i>Rubus pentalobus</i>	Creeping Bramble	N			E	Bees, Butterflies, Birds
<i>Vaccinium crassifolium</i> 'Well's Delight'	Creeping Blueberry	N				Bees, Birds
<i>Vancouveria planipetala</i>	Evergreen inside-out flower	N				Bees
LOW SHRUBS						
<i>Gaultheria shallon</i>	Salal	N			E	Birds,
<i>Mahonia nervosa</i>	Low Oregon Grape	N				Bees, Birds
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox				E	Bees
<i>Symphoricarpos albus</i>	Snowberry	N				Birds, Beneficial Insects, Hummingbirds
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds
TALL SHRUBS * See plans for location						
<i>Hamamelis X intermedia</i> 'Arnold Promise'	Arnold Promise Witch Hazel					Birds
ENTRY AND COURTYARD PLANTING - PART SUN / PART SHADE						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass					
<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus					
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			E	
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				
<i>Pennisetum alopecuroides</i> 'Hameln'	Fountain Grass					
<i>Vaccinium delicosum</i>	Cascade Bilberry	N				
LOW SHRUBS						
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Gaultheria shallon</i>	Salal	N			E	Birds, Butterflies
<i>Lavandula</i> spp.	Lavendar					
<i>Lonicera pileata</i>	Box-leaf Honeysuckle				E (s)	
<i>Hebe</i> sp.	Hebe					
<i>Rosmarinus officinalis</i> 'Collingwood Ingram'	Dwarf Rosemary				E s)	
ENTRY AND COURTYARD PLANTING - SHADE						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Blechnum spicant</i>	Deer Fern	N				
<i>Dryopteris erythrosora</i>	Autumn Fern				E	
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				Bees, Birds
<i>Pachysandra terminalis</i> 'Green Sheen'	Green Sheen Japanese Spurge				E	
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
LOW SHRUBS						
<i>Cornus stolonifera</i> 'Kelseyi'	Kelseyi Dogwood					Birds, Butterflies
<i>Daphne odora</i>	Winter Daphne					Bees, Beneficial Insects
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox				E	Bees
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds
EDGE PLANTING						
<i>Buxus sempervirens</i> 'Aureovariegata'	Variiegated Boxwood				E	
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging Boxwood				E	
<i>Gaultheria shallon</i>	Salal	N			E	Birds, Butterflies
<i>Sarcococca ruscifolia</i>	Sweetbox				E	Bees
<i>Taxus baccata</i> 'Fastigiata'	Spreading Yew				E	
<i>Taxus x media</i> 'Everlow'	Everlow Yew				E	
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds

VINES						
<i>Akebia quinata</i>	Five-leaf Akebia				E(s)	
<i>Ampelopsis brevipedunculata</i> 'Elegans'	Variegated Porcelainberry					
<i>Holboellia coriacea</i> 'China Blue'	Evergreen Holboellia				E	Birds
<i>Parthenocissus henryana</i>	Silvervein Creeper					
<i>Parthenocissus tricuspidata</i> 'Vetchii'	Boston Ivy				E	
<i>Schizophragma hydrangeoides</i>	Japanese Climbing Hydrangea				E	

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

TERRY AVENUE PLANT LIST

Virginia Mason Medical Center TERRY AVE. ZONE		NATIVE / ADAPTIVE	DEEP SHADE	PARTIAL SUN / SHADE	EVERGREEN	HABITAT
BIORETENTION TREES						
<i>Acer circinatum</i>	Vine maple	N				
<i>Alnus rubra</i>	Red Alder	N				
<i>Betula papyrifera</i>	Paper Birch	N				
<i>Corylus cornuta</i>	Beaked Hazelnut	N				
<i>Fraxinus latifolia</i>	Oregon Ash	N				
STREET TREE						
<i>Prunus sp.</i>	Cherry					
SPECIMEN TREE						
<i>Cercidiphyllum japonicum</i>	Katsura Tree					
<i>Ginkgo biloba 'Magyar'</i>	Magyar Ginkgo					
<i>Ulmus 'Homestead'</i>	Homestead Elm					
HABITAT PLANTING						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Achillea millefolium</i>	Common Yarrow	N				Bees, Beneficial Insects
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			E	Bees, Birds
<i>Iris "Pacific Coast Hybrids"</i>	Pacific Coast Iris	N				Bees, Butterflies
<i>Lupinus sp.</i>	Lupin	N				Bees, Butterflies
<i>Nepeta</i>	Catmint					Bees, Beneficial Insects, Butterflies
<i>Rubus pentalobus</i>	Creeping Bramble	N			E	Bees, Butterflies, Birds
<i>Vaccinium delicosum</i>	Cascade Bilberry	N				Bees, Birds
SHRUBS						
<i>Cistus corbariensis</i>	White Rockrose					Birds, Butterflies, Birds
<i>Gautheria shallon</i>	Salal	N				Birds, Butterflies,
<i>Lonicera pileata</i>	Box-leaf Honeysuckle					Birds, Butterflies, Hummingbirds
<i>Mahonia nervosa</i>	Low Oregon Grape	N				Bees, Birds
<i>Potentilla fruticosa 'Abbotsford White'</i>	White Shrubby Cinquefoil	N				Bees, Beneficial Insects
<i>Symphoricarpos albus</i>	Snowberry	N				Birds, Beneficial Insects, Hummingbirds
STORMWATER PLANTING						
<i>Adiantum aleuticum</i>	Western maidenhair fern	N				
<i>Carex spp.</i>	Sedges	N				
<i>Cornus sericea kelseyi</i>	Kelseyi Redtwig Dogwood					
<i>Deschampsia cespitosa 'Northern Lights'</i>	Tufted Hairgrass					Birds
<i>Juncus effusus</i>	Soft Rush				E	
<i>Juncus ensifolius</i>	Dagger-Leafed Rush				E	
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	N				
ENTRY AND COURTYARD PLANTING - PART SUN / PART SHADE						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora 'Karl Foerster'</i>	Feather reed grass					
<i>Ceanothus gloriosus 'Point Reyes'</i>	Point Reyes Ceanothus					Birds, Bees, Butterflies
<i>Deschampsia cespitosa 'Northern Lights'</i>	Tufted Hairgrass					Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			E	Bees, Birds
<i>Iris "Pacific Coast Hybrids"</i>	Pacific Coast Iris	N				Bees, Butterflies
<i>Pennisetum alopecuroides 'Hameln'</i>	Fountain Grass					Bees, Birds
LOW SHRUBS						
<i>Euonymus alatus 'Little Moses'</i>	Little Moses burning bush					
<i>Lavandula spp.</i>	Lavendar					Bees, Beneficial Insects, Butterflies
<i>Lonicera pileata</i>	Box-leaf honeysuckle				E (s)	Bees, Birds, Butterflies
<i>Hebe sp.</i>	Hebe					
<i>Rosmarinus officinalis 'Collingwood Ingram'</i>	Dwarf Rosemary				E(s)	Bees, Butterflies Birds

2	ENTRY AND COURTYARD PLANTING - SHADE					
	GROUNDCOVER / GRASSES / PERENNIALS					
	<i>Blechnum spicant</i>	Deer Fern	N			
	<i>Dryopteris erythrosora</i>	Autumn Fern			E	
	<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			Bees, Birds
	<i>Pachysandra terminalis</i> 'Green Sheen'	Green Sheen Japanese spurge			E	
	<i>Polystichum munitum</i>	Western Sword Fern	N		E	
	LOW SHRUBS					
	<i>Cornus stolonifera</i> 'Kelseyi'	Kelseyi Dogwood				Birds, Butterflies
	<i>Daphne odora</i>	Winter Daphne				Bees, Beneficial Insects
	<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush				
	<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox			E	Bees
	<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N		E	Birds, Bees, Hummingbirds
	EDGE PLANTING					
<i>Buxus sempervirens</i> 'Aureovariegata'	Variiegated Boxwood			E		
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging Boxwood			E		
<i>Gautheria shallon</i>	Salal	N		E	Birds, Butterflies,	
<i>Sarcococca ruscifolia</i>	Sweetbox			E	Bees	
<i>Taxus baccata</i> 'Fastigiata'	Spreading Yew			E		
<i>Taxus x media</i> 'Everlow'	Everlow Yew			E		
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N		E	Birds, Bees, Hummingbirds	
VINES						
<i>Akebia quinata</i>	Five-leaf Akebia			E(s)		
<i>Ampelopsis brevipedunculata</i> 'Elegans'	Variiegated Porcelainberry					
<i>Holboellia coriacea</i> 'China Blue'	Evergreen Holboellia			E	Birds	
<i>Parthenocissus henryana</i>	Silvervein Creeper					
<i>Parthenocissus tricuspidata</i> 'Vetchii'	Boston Ivy			E		
<i>Schizophragma hydrangeoides</i>	Japanese Climbing Hydrangea			E		

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

BOREN AVENUE PLANT LIST

Virginia Mason Medical Center BOREN AVE. ZONE		NATIVE / ADAPTIVE	DEEP SHADE	PARTIAL SUN - SHADE	EVERGREEN	HABITAT
STREET TREES *See plans for location						
<i>Acer glabrum</i>	Rocky Mountain Maple	N				
<i>Betula papyrifera</i>	White Birch	N				
<i>Fraxinus latifolia</i>	Oregon Ash	N				
<i>Populus tremuloides</i>	Quaking Aspen					
STORMWATER PLANTING						
<i>Adiantum aleuticum</i>	Western Maidenhair Fern	N				
<i>Carex spp.</i>	Sedges	N				
<i>Cornus sericea kelseyi</i>	Kelseyi Redtwig Dogwood					Birds, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Juncus effusus</i>	Soft Rush				E	Birds
<i>Juncus ensifolius</i>	Dagger-Leafed Rush				E	Birds
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	N				Birds
ENTRY AND COURTYARD PLANTING - PART SUN / PART SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N			E	Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather reed Grass					
<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus					Birds, Bees, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N			E	Bees, Birds
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				Bees, Butterflies
<i>Pennisetum alopecuroides</i> 'Hameln'	Fountain Grass					
<i>Vaccinium delicosum</i>	Cascade Bilberry	N				Bees, Birds
LOW SHRUBS						
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Gaultheria shallon</i>	Salal	N			E	Bees, Beneficial Insects, Butterflies
<i>Lavandula spp.</i>	Lavendar					Bees, Birds, Butterflies
<i>Lonicera pileata</i>	Box-leaf Honeysuckle				E(s)	
<i>Hebe sp.</i>	Hebe					Bees, Butterflies Birds
<i>Rosmarinus officinalis</i> 'Collingwood Ingram'	Dwarf Rosemary				E(s)	
EDGE PLANTING						
<i>Buxus sempervirens</i> 'Aureovariegata'	Variiegated Boxwood				E	
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging Boxwood				E	
<i>Gaultheria shallon</i>	Salal	N			E	Birds, Butterflies,
<i>Sarcococca ruscifolia</i>	Sweetbox				E	Bees
<i>Taxus baccata</i> 'Fastigiata'	Spreading Yew				E	
<i>Taxus x media</i> 'Everlow'	Everlow Yew				E	
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N			E	Birds, Bees, Hummingbirds

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

SPRING STREET PLANT LIST

Virginia Mason Medical Center SPRING ST. ZONE		Native / Adaptive	Deep Shade	Partial Shade	Evergreen	Habitat
STREET TREE						
<i>Fraxinus pennsylvanica</i>	Green Ash					
<i>Tilia cordata</i> 'Greenspire'	Greenspire Littleleaf Linden					
<i>Liriodendrum tulipifera</i> 'Fastigiatum'	Columnar Tulip Tree					
<i>Acer rubrum</i> 'Bowhall'	Bowhall Maple					
SPECIMEN TREE						
<i>Cercidiphyllum japonicum</i>	Katsura Tree					
<i>Ginkgo biloba</i> 'Magyar'	Magyar Ginkgo					
<i>Ulmus</i> 'Homestead'	Homestead Elm					
SHADE PLANTING						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass	N				Birds
<i>Helleborus foetidus</i>	Stinking hellebore					
<i>Polystichum munitum</i>	Western Sword Fern	N				E
<i>Rubus pentalobus</i>	Creeping Bramble	N				E Bees, Butterflies, Birds
<i>Vaccinium crassifolium</i> 'Well's Delight'	Creeping Blueberry	N				Bees, Birds
<i>Vancouveria planipetala</i>	Evergreen inside-out flower	N				Bees
LOW SHRUBS						
<i>Gaultheria shallon</i>	Salal	N				E Birds, Butterflies,
<i>Mahonia nervosa</i>	Low Oregon Grape	N				Bees, Birds
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox					E Bees
<i>Symphoricarpos albus</i>	Snowberry	N				Birds, Beneficial Insects, Hummingbirds
<i>Vaccinium ovatum</i>	Evergreen Huckleberry	N				E Birds, Bees, Hummingbirds
HABITAT PLANTING						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N				E Birds, Bees, Beneficial Insects, Hummingbirds
<i>Achillea millefolium</i>	Common Yarrow	N				Bees, Beneficial Insects
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				E Bees, Birds
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				Bees, Butterflies
<i>Lupinus</i> sp.	Lupin	N				Bees, Butterflies
<i>Nepeta</i>	Catmint					Bees, Beneficial Insects, Butterflies
<i>Rubus pentalobus</i>	Creeping Bramble	N				E Bees, Butterflies, Birds
<i>Vaccinium delicosum</i>	Cascade bilberry	N				Bees, Birds
SHRUBS						
<i>Cistus corbariensis</i>	White Rockrose					Birds, Butterflies, Birds
<i>Gaultheria shallon</i>	Salal	N				Birds, Butterflies,
<i>Lonicera pileata</i>	Box-leaf honeysuckle					Birds, Butterflies, Hummingbirds
<i>Mahonia nervosa</i>	Low Oregon Grape	N				Bees, Birds
<i>Potentilla fruticosa</i> 'Abbotsford White'	White Shrubby Cinquefoil	N				Bees, Beneficial Insects
<i>Symphoricarpos albus</i>	Snowberry	N				Birds, Beneficial Insects, Hummingbirds
ENTRY PLANTING - PART SUN / PART SHADE						
GROUNDCOVER / GRASSES / PERENNIALS						
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	N				E Birds, Bees, Beneficial Insects, Hummingbirds
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather reed grass					
<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus					Bees, Birds, Butterflies
<i>Deschampsia cespitosa</i> 'Northern Lights'	Tufted Hairgrass					Birds
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				E Bees, Birds
<i>Iris</i> "Pacific Coast Hybrids"	Pacific Coast Iris	N				Bees, Butterflies
<i>Pennisetum alopecuroides</i> 'Hameln'	Fountain Grass					
LOW SHRUBS						
<i>Euonymus alatus</i> 'Little Moses'	Little Moses burning bush					
<i>Lavandula</i> spp.	Lavendar					Beneficial Insects, Bees, Butterflies
<i>Lonicera pileata</i>	Box-leaf honeysuckle					E (s) Bees, Birds, Butterflies
<i>Hebe</i> sp.	Hebe					
<i>Rosmarinus officinalis</i> 'Collingwood Ingram'	Dwarf Rosemary					E(s) Bees, Butterflies, Birds

2

ENTRY PLANTING - SHADE						
GROUND COVER / GRASSES / PERENNIALS						
<i>Blechnum spicant</i>	Deer fern	N				
<i>Dryopteris erythrosora</i>	Autumn fern				E	
<i>Fragaria chiloensis</i>	Wild or Coastal Strawberry	N				Bees, Birds
<i>Pachysandra terminalis</i> 'Green Sheen'	Green Sheen Japanese spurge				E	
<i>Polystichum munitum</i>	Western Sword Fern	N			E	
LOW SHRUBS						
<i>Cornus stolonifera</i> & cultivars	Redtwig & Yellowtwig dogwood					Birds, Butterflies
<i>Daphne odora</i>	Winter daphne					Bees, Beneficial Insects
<i>Euonymus alatus</i> 'Little Moses'	Little Moses Burning Bush					
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	Sweetbox				E	Bees
<i>Vaccinium ovatum</i>	Evergreen huckleberry	N			E	Birds, Bees, Hummingbirds
EDGE PLANTING						
<i>Buxus sempervirens</i> 'Aureovariegata'	Variegated boxwood				E	
<i>Buxus sempervirens</i> 'Suffruticosa'	Edging boxwood				E	
<i>Gautheria shallon</i>	Salal	N			E	Birds, Butterflies,
<i>Sarcococca ruscifolia</i>	Sweetbox				E	Bees
<i>Taxus baccata</i> 'Fastigiata'	Spreading yew				E	
<i>Taxus x media</i> 'Everlow'	Everlow yew				E	
<i>Vaccinium ovatum</i>	Evergreen huckleberry	N			E	Birds, Bees, Hummingbirds
VINE PLANTING						
<i>Akebia quinata</i>	Five-leaf akebia					
<i>Ampelopsis brevipedunculata</i> 'Elegans'	Variegated porcelainberry					
<i>Holboellia coriacea</i> 'China Blue'	Evergreen holboellia					
<i>Parthenocissus henryana</i>	Silvervein creeper					
<i>Parthenocissus tricuspidata</i> 'Vetchii'	Boston ivy					
<i>Schizophragma hydrangeoides</i>	Japanese climbing hydrangea				E	

APPENDIX B: DETAILED DESIGN RECOMMENDATIONS

LANDSCAPE MATERIALS AND FURNISHINGS

The following Landscape Materials and Furnishings, or approved equal are recommended in order to create a cohesive character for campus courtyards and entries

BENCHES AND LEAN RAILS

MultipliCITY by Landscape Forms



CAFE TABLES AND CHAIRS

Park City by Landscape Forms



PLANTERS

Sorella by Landscape Forms



PAVERS

Narrow Modular Paver by Stepstone



APPENDIX C: SPECIFICATIONS

LANDSCAPE RESTORATION STANDARDS AND SPECIFICATIONS

OVERVIEW

The purpose of restoration standards is to establish a method and framework for restoring, renovating, and stewarding the landscape areas of the Virginia Mason campus. The objective is to create a consistent, healthy and attractive condition that contributes to the larger community, the Virginia Mason Medical Center campus, and supports the institutional mission.

The urban conditions of the campus put extreme environmental pressures on all planting areas—subgrade compaction around buildings, soil compaction from foot traffic, limited soil area, limited availability of light, and concentration of pollutants - all contribute to creating a challenging environment and the potential for declining plant health. The following standards and specifications address these challenges by identifying evaluation issues, processes for renovation and recommended actions.

All planting areas on campus should have an initial evaluation so that a baseline of general health of each area can be established and a priority list for restoration can be compiled. Assessments should include subsurface investigation, as well as investigations into other environmental conditions that are influencing long and short term plant growth and health.

The basis of any effort to rehabilitate a landscape area starts with an investigation of the sub grade conditions. By having a soil analysis test performed, digging test pits or conducting a bore test, adverse soil conditions such as compacted soils, drainage issues, presence of utilities, depth of plant soil areas, etc. can be identified.

Good soil conditions are essential for plant performance. Improving soil quality often involves a combination of treatments. The first involves mechanically loosening the existing soil by digging and ripping to loosen soil particles while retaining the soil structure and creating voids for air, water and biota. The second step involves integrating amendments and nutrients that are recommended as the result of a soils test. This may include mixing organic matter into the loosened existing soil (or imported topsoil if soil tests indicate incompatible soil conditions) or adding other recommended nutrients. Soil amendment with compost increases water holding and retention capacity, improves infiltration, reduces surface runoff, increases soil fertility, supports the development of beneficial biota and enhances vegetative growth. Compost also increases pollutant-binding properties of the soil properties, which improves the quality of the water passing through the soil mantle and into the groundwater.

Other adverse site conditions may need to be addressed in order to improve plant establishment and long term viability. Additional evaluations of individual landscape areas that are failing (or have repeatedly failed) should also include assessments of the following: possibility of pollutant runoff; excessive runoff directed to bed; pedestrian circulation through the bed; incorrect plant type for the location; vandalism; use of bed by dogs; over/under watering from irrigation.

After the site condition are understood, a strategy for improving or revising site issues must be determined. A plan for soil improvement, revising or accommodating other site elements, and planting appropriate species for the site conditions should be implemented. This will assure that underlying negative conditions are remediated, the right plants are selected and a baseline understanding of site conditions is established for use in evaluating performance and developing ongoing management actions.

It is the expectation that the Contractor's proposal will comply with these standards and specifications. It should be the Contractor's expectation that the Owner will only consider awarding the contract to a Contractor whose bid shows compliance. The Contractor should also expect to be held to these standards throughout the course of the contract.

The following document outlines the scope of services and responsibilities required of the Contractor for renovating existing landscape beds on the Virginia Mason campus. New construction projects will have separate contracts and guidelines. Other parts of the contract may provide definitions of terms used and

other contract requirements such as insurance and licensing standards, code enforcement, hours of work, work authorizations, site locations, etc. The following is structured to reflect the sequence of work per best practices, starting with the establishment of general standards, followed by the evaluation of the specific site and development of basic site rehabilitation plan. This is then followed by planting soil preparation, irrigation and planting procedures.

APPENDIX C: SPECIFICATIONS

LANDSCAPE RESTORATION SPECIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. This document is intended as a benchmark of the Owner's minimum standards for landscape improvements. However, the Owner respects the Contractor as a professional and as such, will take under consideration, any and all recommendations made by the Contractor.
- B. Restoration projects shall include: demolition and removal from site all elements in the designated areas; subgrade remediation and preparation, soil procurement and preparation, soil installation, finish grading; plant procurement and installation; irrigation installation and/or adjustments, mulch procurement and installation; drainage element installation, where necessary.
- C. The Contractor shall prepare not-to-exceed pricing proposals for individual or combination of landscape beds to be restored. If the Restoration Contractor is also the Maintenance Contractor, the Owner may choose to consider these one-time installation projects an Add Service to that contract.
- D. Contractor shall protect all public and private property adjacent to the work. Exercise due caution to avoid damage to such property. Provide barricades and restrict access as appropriate to prevent damage to work in place.
- E. Repair or replace any or all existing surface improvements that are damaged or removed as a result of operations of work under this contract. Restoration shall be of at least equal quality and identical in dimension to original improvement, unless specifically specified otherwise.
- F. When performing any work requiring subsurface excavation, Contractor shall take care to avoid damage to existing utilities and vegetation. Contractor shall contact Utility Locate at 1-800-424-5555.

1.2 CONTRATOR STAFF TRAINING AND EXPERIENCE

- A. Contractor will provide staff able to perform work at the highest standards of horticultural practice. Key staff shall have current knowledge of best management practices (BMP's) regarding: plant health, pruning, integrated pest management, pesticide application, irrigation maintenance, and safety procedures. Owner reserves the right to demand the replacement of Contractor's staff who do not meet the owner's standards for safety, professionalism, or horticultural knowledge.
- B. All work shall be performed under the direct on-site supervision of a qualified landscape professional with a minimum of three years combined horticultural education and experience. Preference is for the individual to have at least a two year horticultural degree or Certified Landscape Technician (CLT), combined with work experience, or greater.
- C. All restoration plans shall comply with the Virginia Mason Compiled Major Institutional Master Plan (February, 2014) as well as the Virginia Mason Landscape Master Plan (February, 2015) documents. The plans may be prepared by an outside consultant or by the Contractor, per the Owner's discretion.
- D. Contractor shall obtain all permits necessary for the restoration of existing improvements.

1.3 WARRANTY AND ESTABLISHMENT PERIOD

- A. Warranty and Establishment Period shall consist of providing adequate and proper care for plant materials and landscape areas within the Contract limits for a minimum period of 1 year to ensure healthy, vigorous growth of planted material. The Contractor is responsible to maintain the irrigation system for the entire Warranty and Establishment period.

1.4 PROJECT CONDITIONS EVALUATION AND RESTORATION PLAN DEVELOPMENT

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- A. Assess all influences that may be affecting plant growth and performance, including, but not limited to: health of soil, compaction of soil, incompatible cultural conditions for plant types, possibility of pollutant runoff; excessive runoff directed to bed; pedestrian circulation through the bed; vandalism; use of bed by dogs; amount of water availability; over/under watering from irrigation, etc.
 - B. Conduct soil test on existing soil a minimum of one month before embarking on excavation and replanting, or as directed by Owner.
 - C. Submit restoration plan to Owner for approval, including proposed soil treatments and amendments, procurement of amendments, proposed additional drainage structures (if needed), plant procurement and or addition of other site amenities (plant guards, stepping stones, etc.)
 - D. Maintain the site in an orderly condition during the progress of the Work. Continuously and promptly remove excess and waste materials; keep parking areas, walks, and roads clear. Store materials and equipment where directed. Immediately remove rejected materials from the site. Promptly remove equipment, surplus material, debris and trash resulting from operations under this Contract upon completion and prior to initial review of the Work. Leave the site in a neat, orderly condition, broom clean.

PART 2 MATERIALS

- 2.1 SOIL AND SOIL AMENDMENTS: see planting specification
- 2.2 IRRIGATION: see Irrigation specification
- 2.3 OTHER MATERIALS: to be approved by Owner before installation

PART 3 EXECUTION

3.1 Evaluation and Assessment: Planting bed should be assessed for the following conditions:

- A. Subsurface conditions:
 - a. Soil type determination
 - b. Soil testing for nutrient availability
 - c. Assessment of soil texture
 - d. Areas of compaction from foot traffic
 - e. Compaction of soil from vehicles or heavy equipment (or sim.)
 - f. Investigation of subsoil (composition, infiltration rate, etc.)
 - g. Location of subsurface utilities
 - h. Depth of soil in plater area
 - i. Excessively wet or dry soil
- B. Surface conditions:
 - a. Possible excessive runoff directed into bed
 - b. Possible pollutants entering planting area
 - c. Pedestrian circulation through bed
 - d. Use of beds by dogs
 - e. Presence of irrigation system and condition
 - f. Daily availability of sun
 - g. Level of importance/visibility by the public and VM patients and staff

3.2 SOIL TESTING

- A. Soil testing methods: See Planting specification

APPENDIX C: SPECIFICATIONS

3.3 SOIL PREPARATION

- A. Subsoil Tilling
 1. Remove the existing soil to a depth of at least 18" (depending on locations and site issues to be addressed); stockpile soil (if recommended by the soil test) or dispose offsite to a recycling facility. Be aware not to undermine foundations or base layers of any adjacent paving or structures.
 2. It is recommended that excavation be done by hand; if excavation is done by machine, do not allow the machine to compact any surrounding soil; machinery should be situated on adjacent paved areas that can bear the weight of the machine without damage.
 3. After the existing soil is removed, the subsoil surface shall be scarified; using a tiller, to 8" depth min.
 4. Perform an infiltration test in the bed by flooding the scarified soil and observing subsoil infiltration rates. If Owner's Representative determines that drainage is not satisfactory to healthy plant growth, additional excavation and drainage efforts must be made before soil preparation continues.
 5. Install amended planting soil (existing soil mixed with compost or prepared topsoil mix) in 6" lifts; after each lift, till new layer into placed soil to a depth of 8".
 6. Fine grade top of soil to 3" below adjacent paved surfaces and slope to drain, per plan.

- B. Amending soil
 1. If soil compaction is not considered to be a detrimental condition in an existing landscape bed, the existing planting soil can be amended in place. The existing soil should be turned by shovel or bucket to a depth of at least 12". Large clumps of soil should be broken down to no larger than 6" dia.
 2. A 6" lift of compost shall be added over the top of the disturbed soil (amount determined by $(\text{bed length} \times \text{width} \times .5) / 27$). A tiller shall be used to turn the compost into the existing soil, then fine grading by hand-tamping and raking.
 - 3.

- C. Soil preparation at vegetation to remain
 1. Soil and root mass around existing plantings to remain should not be disturbed, to the fullest extent possible.
 2. A 2" depth layer of compost should be spread over estimated critical root zone, then mulch shall be installed.
 3. When annual maintenance indicates re-mulching of beds, a 2" layer of compost shall be installed in these areas before mulch installation

3.4 DRAINAGE OPTIONS

- A. French drain: for use in small scale beds that are self contained (no drains)
 1. Dig trench into subgrade, with width to allow installation of drainage pipe and drain rock surround. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.
 2. Lay flat-style geotextile filter fabric in trench and overlap trench sides. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches. Wrap drainage conduits without integral geotextile filter fabric with flat-style geotextile filter fabric before installation. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.

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3. Fill to Grade: Place satisfactory soil fill material over drainage course. Place material in loose-depth layers not exceeding 6 inches. Compact each layer by hand tamping. Fill to finish grade.
- B. Gravel trenches: for use in larger-scale beds with higher runoff needs that are self contained (no drains); excavate a trench min. 12"Wx12" D x length of bed , perpendicular to slope, at lowest line of slope; place rounded gravel (1-2" washed rock) to level of surrounding paving or adjacent mulch of planting bed.
- C. Augering: for use where possible due to soil conditions; before installing planting soil, drill 6" diameter auger holes into subsoil through clay or densely compacted material. Perform drainage test on auger hole to assure that water is infiltrating; auger holes should be located 24" OC minimum for entirety of planting bed to a depth that allows infiltration; after drilling, fill auger holes with prepared planting soil before installing left of soil into bed.
- D. Rain gardens: for use in isolated beds with an overflow drain connection ; Excavate to minimum of 18" and install French drains that slope toward and connect to storm sewer; install biofiltration soil mix to level and create a depressed basin to collect runoff form adjacent paved areas.

APPENDIX C: SPECIFICATIONS

IRRIGATION SPECIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes specifications for furnishing and installing automatically controlled irrigation systems and associated equipment.
- B. This Section includes a Warranty Period for the irrigation systems for 1 year.
- C. Each irrigation system consists of a completely automatic, electrically controlled sprinkler and/or drip irrigation system. The system is designed to provide complete coverage with minimum maintenance and without overspray onto walks, pavements, and structures.
- D. If an irrigation Master Plan is developed for the Virginia Mason campus, all irrigation parts and equipment shall conform to the established standards.
- E. Avoid conflicts between the irrigation system layout and plant materials, lighting fixtures, sign posts, architectural features, above and below ground utilities, and drainage systems. The irrigation system layout is schematic. Locate pipes in planting areas unless shown in sleeves under pavements between planting areas.
- F. This Section includes maintenance and operation of the irrigation systems during the planting Warranty Period of 1 year duration to ensure the health and resumption of growth of planted materials.

1.2 REFERENCES

- A. This Section incorporates by reference the latest revision of the following documents.
 - 1. American Society of Mechanical Engineers (ASME):
 - a. ASME B16.3 Malleable Iron Threaded Fittings.
 - 2. American Society for Testing and Materials (ASTM):
 - a. ASTM A53/A53M Pipe, Steel, Black and Hot-Dip Zinc-Coated, Welded and Seamless.
 - b. ASTM B3 Soft or Annealed Copper Wire.
 - c. ASTM B33 Tinned Soft or Annealed Copper Wire for Electrical Purposes.
 - d. ASTM D1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - e. ASTM D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - f. ASTM D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - 3. American Water Works Association (AWWA):
 - a. ANSI/AWWA C500 Metal Seated Gate Valves for Water Supply Service.
 - 4. National Electrical Manufacturers Association (NEMA):
 - a. NEMA WC5 Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- B. Local Standards: Construct irrigation system segments that are to be owned or maintained by jurisdictions other than the Owner to the applicable requirements of the jurisdictional agency's standard drawings and specifications. The Contractor is responsible for obtaining all such standards and for compliance with such standards as applicable.

1.3 SUBMITTALS

- B. Product Data: Include manufacturer's product literature for all products to be installed in this system. Include material showing manufacturer's name, catalog numbers, catalog cuts, technical data, and installation, operation, and maintenance instructions for each product.
- C. Point of Connection Water Pressure Tests: Test water pressure at each irrigation point of connection. Submit written results of test to the Owner's Representative.

D. Record Drawings:

1. Record accurately in red ink on 1 set of black-line prints all changes in the Work constituting departures from the Contract Drawings.
2. Record the changes and dimensions in a legible manner to the satisfaction of the Owner's Representative. Before Final Completion of the Work, submit Record Drawings to the Owner's Representative for review.
3. Dimension from 2 permanent points of reference (buildings, monuments, sidewalks, curbs, and pavements). Record data on Record Drawings daily as the Work is being installed.
4. Show locations, depths, size, and information as applicable, of the following items:
 - a. Point of connection and available static water pressure.
 - b. Routing of mainline, lateral pipes and sleeves.
 - c. Gate valves.
 - d. Remote control valves.
 - e. Quick coupling valves.
 - f. Sprinklers.
 - g. Dripperline, air/vacuum relief valves, and flush valves.
 - h. Routing of control wires.
 - i. Other irrigation system component locations necessary to accurately represent authorized changes to the irrigation system.
5. Maintain Record Drawings on site.

- E. Submit controller chart, operation and maintenance manuals, special tools, and spare parts in accordance with Article 1.6 TURNOVER ITEMS.

1.4 SEQUENCING AND SCHEDULING

- A. Coordinate installation of irrigation as shown on the Contract Drawings with all other Work.
- B. Coordinate layout and installation of irrigation sleeves, conduits, and pipes under paved areas and other features prior to their construction.
- C. Coordinate installation of irrigation system with installation of planting areas. Refer to Planting Specification, for requirements. Install the irrigation system after planting areas have been prepared.
- D. Install and test the irrigation system before installation of plant material or as noted otherwise on the Contract Drawings. Coordinate layout and installation of irrigation system with location and installation of plant material to ensure complete and full irrigation coverage of planting areas.
- E. Stake tree locations in the field prior to installation of irrigation pipe and sprinklers. Refer to the Planting Plans & Details on the Contract Drawings for plant setbacks and spacing requirements. Trees shall be located and planted prior to the installation of the irrigation system.

1.5 TURNOVER ITEMS

- A. Controller Charts:
 1. Provide 1 irrigation zone location chart, sized to fit inside of controller door. Show the area covered by the irrigation controller. The chart is a reduced size copy of the Record Drawings. In the event that the controller sequence is not legible when the print is reduced, enlarge to a readable size.
 2. Record Drawings require approval by the Owner's Representative before charts are prepared.
 3. Mark the chart with a different color to show the area of coverage for each zone.
 4. When completed and approved, seal chart between 2 pieces of transparent plastic. Install chart in controller enclosure using Velcro fasteners.
 5. Complete irrigation zone location charts 10 days prior to Final Completion.

APPENDIX C: SPECIFICATIONS

- B. Operation and Maintenance Manuals: Within 10 days prior to Final Completion, prepare and deliver to the Owner's Representative the required descriptive materials, properly prepared in 2 individually bound copies of the operation and maintenance manual. Describe the material installed in sufficient detail to permit operating personnel to understand, operate, and maintain equipment. Include spare parts lists and related manufacturer's information for each equipment item installed. Include the following information in the manual:
 - 1. Index sheet listing Contractor's address and telephone number, and names and addresses of local manufacturer's representatives.
 - 2. Complete operating and maintenance instructions on major equipment.
- C. Special Tools and Spare Parts:
 - 1. Supply the following items as part of Contract:
 - a. Provide 4 percent additional sprinklers and nozzles of each type and spray pattern shown on the Contract Drawings.
 - b. Provide 2 wrenches for disassembly and adjustment of each type of sprinkler head installed.
 - c. Provide 2 keys for the irrigation controller.
 - d. Provide 1 coupler with 3/4 inch bronze hose bib, bent nose type with hand wheel, and 1 coupler key for each 5 quick couplers installed.
 - e. Provide 1 valve box cover key for each 10 valve boxes.
 - 2. Deliver tools and spare parts to the Owner's Representative at conclusion of Final Completion.
- D. Provide the following additional documentation at close of Contract:
 - 1. Record Drawings.

1.6 WARRANTY

- A. General Warranty: The Special Warranty specified in this Section shall not deprive the Owner of other rights which the Owner may have under other provisions of the Contract Documents, and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Make repairs and replacements and guarantee the satisfactory operation of the entire system in every detail for the 1 year Warranty Period. All warranty repairs and replacements are part of the Contract.
- C. Fees:
 - 1. Fees for normal reviews or observations by the Owner's Representative will be paid for by the Owner.
 - 2. Additional reviews, travel expenses, administrative costs, and tests required because of defective work or ill-timed notices will be made at the Contractor's expense.
- D. Additional Requirements:
 - 1. Repair settling of trenches. Restore plantings, mulch, grades, pavements or other improvements in accordance with the Contract Documents.
 - 2. Correct irrigation system problems or damage within 24 hours of notice until the Final Completion of the Work.
 - 3. During the first irrigation season, be available within 1 day for required repairs to the system.
 - 4. Provide a written statement to Owner and Owner's Representative stating that the Contractor shall:
 - a. Warrant the satisfactory operation of the entire irrigation system including performance, parts, assemblies, and workmanship.
 - b. Return to the job site at the beginning of the first winter season to perform a general review of the system; test valves and sprinklers; repair leaks and faulty work; check

operation of the system; adjust spray patterns for full coverage; drain system; show grounds staff location of drain valves and blow out points; restore areas where trenches have settled; and adjust irrigation controller scheduling if necessary.

- c. Return in spring after the first winter season for a system check, and, if necessary, restore system for spring and summer operation. Explain system and operation methods to grounds staff and have the grounds supervisor furnish a signed statement of compliance with this requirement. Adjust automatic controller scheduling if necessary.

PART 2 PRODUCTS

2.1 MATERIALS

- A. All materials and equipment shall be new and the best grade of its kind. All items of equipment or material shall be as indicated or specified by patent or proprietary name or names of manufacturer, or accepted equal.
- B. Proposed substitutions for products listed shall be submitted for approval by Owner.

2.2 PIPING

- A. Pipe for buried irrigation systems shall be PVC except where noted otherwise.
- B. PVC Pipe:
1. Schedule 40 for mainline and lateral pipes: ASTM D 1785, PVC 1120 compound.
 2. Schedule 80 for portions of irrigation system as noted on the Contract Drawings: ASTM D 1785, PVC 1120 compound.
- C. Brass Pipe: Complying with ASTM B43, Schedule 40.
- D. PVC Threaded Nipples: 1/2 inch diameter, Schedule 80, complying with ASTM D1785.
- E. Sleeves: PVC pipe, Schedule 40. Sized as noted on the Contract Drawings.

2.3 PIPE FITTINGS

- A. PVC Pipe Fittings
- B. Schedule 40: Socket type, ASTM D 2466, threaded type, ASTM D 2464.
- C. Schedule 80: Socket type, ASTM D 2466, threaded type, ASTM D 2464.
- D. Brass Fittings: Medium brass, 125 pound class.

2.4 PVC PIPE JOINT COMPOUND AND PRIMER

- A. Joint compound: Slow drying, heavy-duty PVC solvent cement.
- B. Primer: Tinted, compatible with joint compound, as recommended by manufacturer of PVC pipe.

2.5 IRRIGATION SPRINKLERS

- A. Pop-up Bodies: Use sprinkler pop-up bodies constructed of ultraviolet-resistant plastic construction, an integral check valve that holds up to 8 feet of head (3.50 psi), heavy duty retract spring, and pressure regulation capability in either the pop-up stem or under the nozzle. Pop-up bodies shall regulate pressure to 40 psi.
- B. Use sprinkler nozzles constructed of high strength, ultraviolet-resistant and impact-resistant plastic with anti-clogging valve adjustment screw for flow and radius adjustment. Use nozzles that have matched precipitation rates for individual irrigation zones. Provide nozzles to match radius shown on the Contract Drawings.

APPENDIX C: SPECIFICATIONS

- C. Provide sprinklers as shown on the Contract Drawings. Use riser nipples for all sprinklers the same size as the threaded opening in the sprinkler body. Sprinklers of the same type shall be by the same manufacturer.
- D. Swing Joints: 1 schedule 80 threaded nipple and 2 threaded street ells at each end, as shown on the Contract Drawings.

2.6 IRRIGATION CONTROL VALVES

- A. Remote control valves shall be compatible with the controller, provided with a straight or angle pattern, and manufactured for irrigation systems. Remote control valves shall meet the following requirements:
 1. Normally closed, solenoid actuated globe pattern diaphragm type with valve pressure rating not less than 200 psi.
 2. Valve body and bonnet: Glass-filled nylon, with nylon reinforced rubber diaphragm. Encapsulate solenoid coil in molded epoxy. Provide for internal parts to be removable from top of valve without disturbing valve installation.
 3. Actuated by a low power, 2.0 watt, 24-V ac, 60 Hertz solenoid actuator.
 4. Flow control stem and cross handle for regulating and shutting off water flow and bleed screw for manual operation without electrically energizing solenoid coil.
 5. Manufacturer and size: To match existing campus system, or accepted equal.. Size as noted on the Contract Drawings.

2.7 MASTER VALVE

- A. Master Valve: heavy duty, brass or bronze construction, capable of operation from the irrigation controller, installed at point of connection with unions, equipped with standard cross handle operating wheel. Normally closed, solenoid actuated globe pattern diaphragm type with valve pressure rating not less than 200 psi.

2.8 IRRIGATION VALVE BOXES AND VALVE KEYS

- A. For irrigation control valves: Minimum size shall be 16 inches by 12 inches by 10-3/4 inches, black with snap lock black cover. Size valve boxes to ensure 3 inches clearance around and between all connections and valves. Multiple valves may be installed in 1 box, provided that clearances are met. Color: black. Carson, or accepted equal.
- B. For quick coupler valves: as shown on Contract Drawings. Color: black.
- C. For gate valves: as shown on the Contract Drawings. Color: black.
- D. For backflow preventer: as shown on the Contract Drawings.
- E. Provide keys required for valves, valve box covers and protective sleeve caps.

2.9 IRRIGATION CONTROLLER

- A. Provide controller for complete automatic operation of irrigation system: commercial grade, in weatherproof, lockable box or cabinet, UL listed and with adequate number of stations to operate system. Provide stations with independent time controls with 1 minute incremental settings up to 60 minutes maximum per zone. Provide controller to allow easily made changes on zone timing and programs start time without tools or disassembling. Stations may be omitted with time setting of zero minutes. Provide rapid advance between stations and override on each zone for manual operation. Provide for schedules up to 1 week and permit multi-cycle operation as often as every hour. Equip controller with manual start switch for activation of semi-automatic watering cycle.
- B. Capable of operating 24-V remote control valves.

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- C. Provide a UL listed 24-V transformer with controller. Color-code zone wiring with irrigation zone indicator key visibly imprinted. Include pump start or master valve control with controller and circuit overload protection to prevent damage due to voltage surges.
 - D. Controller housing: powder-coated pedestal steel cabinet.
 - E. Controller: To match existing campus system, or accepted equal.
- 2.10 FLOW SENSOR
- A. Manufacturer: To match existing campus system, or accepted equal.
 - B. Size: TBD. Confirm flow range with manufacturer matches zone flows on Contract Drawings.
- 2.12 IRRIGATION CONTROL WIRE
- A. Provide thermoplastic insulated, solid copper conductor conforming to ASTM B3, suitable for continuous operation at 24-V ac.
 - B. Direct burial control wires to remote control valves: NEC Type UF or G.E. Co. No. SI-58-51 or approved equivalent. Size wire to each remote control valve to not exceed 5 percent voltage drop from impressed voltage, not less than No. 14 AWG.
 - C. Common wire: white. Control signal wire: red. Spare signal wire: orange. Master valve signal wire: yellow.
 - D. Wire Splice connections: 3M DBY, or accepted equal.
- 2.13 WIRE SLEEVE
- A. Wire sleeve below pavement: Schedule 40 PVC sized in accordance with irrigation details, or as required to accommodate the number of control wires at each sleeve.
- 2.14 GATE VALVES
- A. Bronze body, bronze mounted, non-rising stem with solid wedge gates; type to match existing campus system, or accepted equal.
- 2.15 QUICK COUPLING VALVES
- A. Quick coupling valves shall be two-piece body type of heavy-duty brass or of heavy-duty bronze, and watertight both before and after the coupler is inserted. The valve mechanism shall be designed to ensure the valve seat is closed before the coupler is removed. Each valve shall have the manufacturer's identification cast or stamped on the valve.
 - B. Type: To match existing campus system, or accepted equal.
 - C. Swing Joint: as shown on Contract Drawings.
- 2.16 BACKFLOW PREVENTER
- A. Double check valve assembly with the following:
 1. Internally spring-loaded isolation valves, two ball valves, and four field test cocks.
 2. All check valve internal parts to be easily accessible from top of device without removing check valve body from line.
 3. Assembly to be rated 175 psi working pressure.
 4. Install washed gravel under assembly to provide adequate drainage.
 5. Febco, Watts, or accepted equal.
- 2.17 WATER METER
- A. Use existing or install new, per city of City of Seattle Code.
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APPENDIX C: SPECIFICATIONS

2.18 DRIP IRRIGATION

- A. Furnish all product materials required for full and efficient drip irrigation operation. All products shall be of 1 manufacturer for parts compatibility and ease of installation. Product components shall be the most current models and equipment available, and shall supersede obsolete models and equipment that may be specified in these Specifications.
- B. Dripperline shall consist of nominal sized 1/2 inch low-density linear polyethylene tubing with internal pressure compensating, continuously self-cleaning, integral drippers spaced at 18 inches on center. Dripperline shall have integral check valves. The tubing shall be brown in color and conform to an outside diameter (O.D.) of 0.67 inch and an inside diameter (I.D.) of 0.57 inch. Individual pressure compensating drippers shall be welded to the inside wall of the tubing as an integral part of the tubing assembly. These drippers shall be constructed of plastic with a hard plastic diaphragm retainer and a self-flushing/cleaning elastomer diaphragm extending the full length of the dripper. Dripperline flow rate shall be 0.4 gph with emitters at 12 inch spacing. Netafim Techline CV.
- C. Space dripperline as shown on Contract Drawings.
- D. Header line downstream of the remote control valves shall be PVC lateral pipes unless noted otherwise on the Contract Drawings. If polyethylene blank tubing is noted, provide nominal sized 1/2 inch low-density polyethylene blank tubing. The tubing shall be brown in color and conform to an outside diameter (O.D.) of 0.67 inch and an inside diameter (I.D.) of 0.57 inch.
- E. All drip irrigation valves shall be equipped with the following:
 - 1. Pressure Regulator: The pressure regulator is a spring-operated piston-type regulator with an externally accessible regulation unit. The body is molded black plastic with a combination of male/female pipe threaded inlet and outlet. The pressure regulator shall have a built-in indicator that shows when it is operating.
 - 2. Disc Filter: A multiple disc filter equipped with size 120 mesh and constructed of chemical-resistant thermoplastic for corrosion resistance. The body shall be molded of black plastic with male pipe threads for both inlet and outlet. The disc filter shall be capable of periodic servicing by unscrewing a threaded cap or unlatching the band.
- F. Integral Dripperline Components:
 - 1. Dripperline Fittings: All fittings shall be constructed in one of the following end configurations: barbed insert fittings only; male pipe threads (MPT) with barbed insert fittings; or female pipe threads (FPT) with barbed insert fittings. All fittings shall be constructed of molded brown plastic having a nominal inside dimension (I.D.) of 0.57 inch. Female and male threaded ends shall be capable of mating to standard PVC pipe with tapered threads.
 - 2. Soil Staples: Hold dripperline in place with 6 inch long steel soil staples.
 - 3. Automatic Flush Valve: constructed of brown molded plastic with 1/2 inch MPT or insert inlet with collar end configurations. Type: Netafim, or accepted equal.
 - 4. Air Relief Valve: constructed of brown molded plastic with 1/2 inch MPT or insert inlet with collar end configurations. Type: Netafim, or accepted equal.

PART 3 EXECUTION

3.1 GENERAL

- A. Verify static pressure as noted on the Contract Drawings at point of connection before installing irrigation system. Report any discrepancy to the Owner's Representative.
- B. The irrigation system layout shown on Contract Drawings is schematic, unless noted otherwise. With acceptance of the Owner's Representative, make adjustments where necessary to conform

to actual field conditions. Irrigation system shall be operational, with uniform and adequate coverage of areas to be irrigated prior to planting.

- C. Service connections: Notify the Owner's Representative at least 3 weeks before electrical and water services are required. Furnish labor and materials to connect to service connection.
- D. Water Supply: Connect to water supply at location shown on the Contract Drawings.
- E. Electrical Service: Install irrigation electrical work for service connections in accordance with Division 26, Electrical.
- F. Code Requirements: Before Work of this Section, carefully inspect installed Work of other trades and verify that the Work is complete to the point where irrigation system installation may commence. Verify irrigation system may be installed in accordance with pertinent codes and regulations, original design, referenced standards and manufacturer's recommendations.
 - 1. Immediately notify the Owner's Representative of conflicts between equipment or methods indicated or specified with local codes, prior to start of installation. If Contractor fails to give notification, assume responsibility for cost of revisions necessary to comply with code.
- G. Grades: Before starting Work, carefully review grades to determine if irrigation Work may proceed. Keep within specified material depths with respect to finish grade.
- H. Coordination with Work of other trades. Make necessary measurements in field to ensure precise fit of items in accordance with original design. Coordinate installation of irrigation materials with other Work. Coordinate piping locations with tree and shrub locations to avoid conflicts.

3.2 INSTALLATION

- A. Excavating and Backfilling:
 - 1. Perform excavation and backfilling as specified in Section 312000, Earth Moving. Restore existing surfaces to original condition.
 - 2. Trenching of mainline and lateral pipes shall be straight and without abrupt grade changes.
 - 3. Trenches shall be free from rock, debris or sharp articles, with a minimum depth as shown on the Contract Drawings. Trench width must allow a minimum of 2 inches between parallel pipes. Stacking of pipes is not permitted. Trench bottoms shall have a uniform slope of 1/2 percent minimum grade.
 - 4. Backfill any excess excavation with suitable materials in accordance with Earth Moving and Planting, which is free of rocks, organic material, or other materials that may damage pipe. Thoroughly compact to give full support to pipe. Backfill when pipe is not in an expanded condition due to heat or pressure. Place backfill material in 6 inch lifts and compact each lift. Backfill to ensure no future settlement of the trench. Thoroughly backfill around sprinkler heads and be especially attentive to the restriction of movement of sprinklers by external force. Repair trench settlement during the warranty of this Contract. Backfill trenches uniform with the surrounding grade.
 - 5. Backfill in irrigation sleeve trenches shall be mechanically compacted in 2 lifts to a dry density equal to 95 percent of adjacent undisturbed soil. Backfill will conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities.
 - 6. If settlement occurs and subsequent adjustments in pipe, valves, sprinklers, lawn or planting, or pavements are necessary, the Contractor shall make all required adjustments.
 - 7. Compaction: Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Compact initial backfill material surrounding pipes and conduits to 90 percent maximum density. For pipes, conduits, and sleeves under roads or slabs, compact backfill as specified in Section 312000, Earth Moving.
- B. PVC Pipe Assembly:

APPENDIX C: SPECIFICATIONS

1. Handle plastic materials carefully, store under cover and prevent damage to pipe. Provide support beds for full lengths of pipe when transporting and storing pipe. Do not install damaged or dented pipe.
2. Cut PVC pipe square and remove burrs. Clean pipe and fittings using primer and cleaner recommended by PVC pipe manufacturer. Use tinted primer to aid in visual confirmation.
3. Apply a thin, even flow coat of PVC solvent cement to outside of male fitting. Cure joints as recommended by manufacturer and keep pipe and fitting out of service during curing period. Construct watertight joints equal to or greater in strength than pipe. Do not tap pipe and fittings.
4. Wipe off excess PVC solvent cement with a clean rag. Let welded joints cure at least 15 minutes before moving them and at least 24 hours before water is permitted into pipe.
5. Install pipe fittings for sprinklers, remote control valves, and quick coupler valve outlets horizontally and facing the exterior of the planting area.
6. Do not vertically stack pipes in trenches. Install piping side by side with a 2 inch separation between parallel pipes.

C. Backflow Preventer:

1. Install unit as indicated on the Drawings. Verify exact location with the Owner's Representative before installation. Coordinate with water meter location and other utilities in the area noted on the Contract Drawings.
2. The backflow prevention assemblies will be inspected and tested before use in accordance with the applicable portions of the Washington Administrative Code and other applicable regulations as set forth by the Washington State Department of Health and the City of Federal Way. No water is to flow through the assembly until testing and reviewed by the Owner's Representative.
3. These inspections and tests are to be completed and the results recorded by a licensed Backflow Assembly Tester (BAT) Operator or by a Contracting Agency Certified Water Works Operator with a CCS-1 or CCS-2 Classification. Document that the devices are in good operating condition prior to flushing and testing of any downstream water lines.
4. Installations must be according to procedures outlined in the current edition of Accepted Procedure and Practice in Cross-Connection Control Manual," published by the Pacific Northwest Section, American Water Works Association.

E. Pipe Sleeves:

1. Place pipe to be installed under pavement or through walls in a PVC pipe sleeve that has an inside diameter not less than twice the outside diameter of pipe or 2 inches larger than the combined outside diameter of pipes installed. Sleeves through the building walls shall have watertight seals.

F. Irrigation Control Valves:

1. Thoroughly flush mainline pipe prior to installation of remote control valves.
2. Use valve box extensions by same manufacturer to ensure that box extends completely below the bottom of the valve. Install locking cover bolts.
3. Valve boxes shall be installed perpendicular to walks and curbs. Placed a minimum of 3 feet from curbs, walks, and pathways.
4. Stake location of valve boxes for review by Owner's Representative prior to installation.

G. Sprinklers:

1. Install sprinklers as indicated on Contract Drawings.
2. Install rotary spray sprinklers a minimum of 2 inches and a maximum of 4 inches from hard surface edges. Install rotary spray sprinklers a minimum of 12 inches from walls.
3. Thoroughly flush lateral pipes and swing joints prior to installation of sprinklers.
4. Upon completion of installation, adjust sprinklers to properly distribute water to all planting areas. Rotate individual sprinkler nozzles to keep sprays within planting areas and eliminate overspray onto pavements, walls, site features and the building.

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- H. Swing Joints: Connect sprinklers to lateral pipes using a swing joint assembly as shown on Contract Drawings.
- I. Control Wire:
1. Tape control wires together at 5 foot intervals with electrical tape. Tape this bundle to the bottom of the mainline at 10 foot intervals with at least one full wrap of duct tape. Tie a loose 24 inch loop in all wiring runs at changes of direction greater than 30 degrees. Untie all loops after all connections have been made.
 2. Install wire under pavement in PVC pipe sleeves.
 3. Install 2 orange spare wires to run from the controller to the furthest ends of each branch of the mainline. Provide an extra 4 foot length of coiled wire in the valve box.
 4. Splice connectors: Encapsulate all splices with wire splice connectors. Wire runs between remote control valves and controller shall be continuous with no splices unless noted otherwise on the Contract Drawings. Leave a minimum of 4 feet of excess conductor at splices. Install splices in valve boxes when splices are required between the irrigation controller and remote control valves.
- J. Controller Installation:
1. Install in accordance with manufacturer's instructions.
 2. Coordinate electrical service to controller location. Install controller in a wall-mount enclosure.
 3. Install conduit for control wires from the controller to an exterior wall. Provide sealed sleeve through wall.
 4. Coordinate and install rain sensor.
 5. Coordinate and install flow sensor.
 6. Program with "WeatherTRAK Everywhere" subscription ET data service. Coordinate transfer and renewal of subscription with Owner.
 7. Program irrigation system to operate after plants have been installed, without conflict with other Work.
- K. Flow Sensor:
1. Install flow sensor downstream from the backflow prevention assembly as shown on the Contract Drawings and in accordance with the manufacturer's written specifications.
- L. Water Meter:
1. As provided by City of Seattle
- M. Drip Irrigation:
1. Install all dripperline as indicated on Contract Drawings. Use Teflon tape on all threaded connections. Make adjustments to alignments to accommodate large trees and shrubs. Ensure alignment adjustments do not reduce amount of water supplied to each plant.
 2. Install one 6 inch long metal wire staple every 3 linear feet and 2 staples on each change of direction (tee, elbow, or cross).
 3. Dripperline fittings shall be mated with dripperline by pushing the fitting into the tubing while twisting side to side until the tubing abuts to either adjoining tubing or a fitting stop.
 4. Cap or plug all openings as soon as lines have been installed to prevent the entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.
 5. Thoroughly flush mainline and lateral pipes before installing valves and other accessories.
 6. Pipe Sleeves:
 - a. Install supply header pipes and laterals in PVC pipe sleeves at least twice the interior pipe diameter under all paved areas, drives and roads.
 - b. Extend sleeves 1 foot minimum beyond edge of curbs and pavement, cap ends and flag.
 7. Automatic Flushing Valve: Install in valve box with a gravel sump adequate to drain 1 gallon of water.
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APPENDIX C: SPECIFICATIONS

8. Air Relief Valve and automatic flushing valves: install one of each for each isolated area of dripperline to ensure drainage of each dripperline area without air locks.

3.3 INSPECTION

- A. At completion of installation, and before planting of shrubs or groundcover, inspect overall coverage of system. Demonstrate the working system to the Owner's Representative.
- B. Do not cover installed Work before the Owner's Representative has reviewed installation. Uncover covered Work at no additional cost to the Owner.
- C. Completely check system operation within 5 days before Final Completion. Properly align sprinklers and adjust for coverage. Clear system of foreign materials. Properly adjust valves. Check sprinkler controller valve chart for accuracy.
- D. At end of Warranty Period, schedule a final review of system with the Owner's Representative.

3.4 TESTING

- A. Perform tests in presence of the Owner's Representative. Give at least 48 hours advance notice of tests.
- B. Hydrostatically test irrigation system pipes as follows:
 1. Leave all system joints, connections, and other fittings exposed until after completion and review of the pressure test. All subsequent breaches of integrity of the mainline shall require re-testing.
 2. Mainline pipes: Test mainline pipe at 120 psi for 60 minutes. Test will fail if pressure loss is greater than 5 psi during the duration of the test. Ensure means of air release at terminations and bleeding of all trapped air.
 3. Laterals: Test lateral pipes at 80 psi for 30 minutes. Lateral test will include all swing joint assemblies with temporary threaded caps on the downstream Marlex fitting. Wrap caps with 3 wraps of Teflon tape. Ensure means of air release at terminations and bleeding of all trapped air. Test will fail if pressure loss is greater than 5 psi during the duration of the test.
 4. Center load pipe with small amount of backfill to prevent arching and movement under pressure. Leave joints exposed for review during pressure test. No water is permitted in pipe for pressure testing until a period of at least 24 hours has elapsed for solvent weld setting and curing.
 5. Test by capping each outlet, filling pipes with water, and applying pressure with a pump. Measure pressure with a pressure gauge. Correct leakage from pipes, fittings or joints, and retest prior to review by the Owner's Representative. After piping has been tested to satisfaction of the Owner's Representative, backfill pipe trenches.
 6. Furnish necessary force pump, pressure gauge and other test equipment necessary for tests.
- C. Irrigation Controller:
 1. Test controller for 7 days just before end of the Warranty period. Operate system automatically in manner indicated.
 2. Test the electronic operation of the irrigation system after installation. Test will include operation of remote control valves and master valve via the controller.
- G. Drip irrigation: The Contractor must make a full inspection with the Owner's Representative of all components of the system, including the visual inspection of each emitter under operating conditions. Adjustments, flushing, cleaning of filters, replacements to the system must be made immediately to ensure the proper operation of each emitter. Once drip irrigation is successfully tested, cover the dripperline as indicated on the Contract Drawings.

3.5 SYSTEM PROTECTION

- A. Deactivate and drain the system prior to the onset of autumn and reactivate at the onset of spring. Coordinate specific dates with the Owner's Representative. Accomplish each at least once during the Warranty Period. If construction is completed when the system is not in use, winterize after testing. Certify by letter the dates of winterization and activation. Repair damage from failure to comply.
- B. When using compressed air to winterize the system, do so in short cycles at no more than 40 psi air pressure. Do not allow pipe close to the compressor to get hot to the touch.

3.6 CLEAN UP

- A. Upon completion of Work, clean up excess materials, equipment, and rubbish resulting from Work. Leave premises in a clean, neat and orderly condition.
- B. TRAINING
 - 1. The Contractor shall provide a training course to the maintenance staff on the use, adjustment, and maintenance of the automatic controller and irrigation system within 30 days of Final Completion. The instructions shall be given in 1 course of one 4 hour session on-site, as arranged by Owner.
 - 2. Approximately 2 maintenance persons will attend the course. The Contractor shall schedule the course through the Owner's Representative at a time convenient to the Owner. The Contractor shall notify the Owner's Representative of the proposed course dates at least 6 weeks before those scheduled dates.

END OF SECTION

APPENDIX C: SPECIFICATIONS

PLANTING SPECIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes specifications for: soil preparation of all planting areas to include discing, installation, amending, incorporation, and mixing to prepare soils; testing of prepared planting soil; fine grading; furnishing, installation, and maintenance of plantings; staking and guying of trees; mulching of planting areas; fertilization; cleanup; and warranty of all trees, shrubs, groundcovers.
- B. This Section also includes a Warranty and Establishment Period of 1 year duration to ensure the health and resumption of growth of planted materials.

1.2 REFERENCES

- A. This Section incorporates by reference the latest version of the following documents.
 - 1. American Association of Nurserymen (AAN): American Standard for Nursery Stock, ANSI Z60.1 (ASNS)
 - 2. American Joint Committee on Horticultural Nomenclature: Standardized Plant Names (SPN)

1.3 DEFINITIONS

- A. Soils:
 - 1. Topsoil: Imported soil used as a component of prepared planting soil, conforming to the product description in this Section.
 - 2. Prepared Planting Soil: Mixture of native soil and topsoil as described in this Section.
 - 3. Native Soil: Existing, undisturbed soil.
 - 4. Planting Backfill: Prepared Planting Soil, or, where excavation exceeds depth of prepared planting soil, a mix of Native Soil and Topsoil as described in this Section.
 - 5. Finish Grade: Elevation of finished surface of planting soil.
- B. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.4 SUBMITTALS

- B. Source of Supply Plan: Submit plan for the procurement of plant material
 - 1. Plant List; Documentation that deposits have been provided to nurseries to ensure availability for all plants on the Plant List; Name and contact information of growers for all plants on the Plant List
 - 2. Documentation of supply source for compost, prepared topsoil and mulch with supplier's recent testing of material.
- D. Delivery, Storage, and Handling Plan: Submit at least 1 week prior to landscape installation the proposed Delivery, Storage, and Handling Plan. Indicate:
 - 1. Proposed location for on-site plant holding.
 - 2. Water source.
 - 3. Protection measures during various seasonal and location-specific conditions.
- E. Schedule and Work Plan: Submit at least 1 week prior to landscape installation the proposed Schedule and Work Plan.
- F. Product Data: Submit product literature or tear sheets giving name of product, manufacturer's name, and compliance with the Specifications.
 - 1. Commercial fertilizer.
 - 2. Mychorrhizae inoculant.

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- I. Prepared Planting Soil Test Report:
 - 1. Schedule testing such that it does not interfere with installation schedule. Test report submittals for all areas must be reviewed prior to any planting.
 - 2. Employ an approved agricultural testing laboratory to perform soil testing. The soil testing laboratory must be approved by the Owner's Representative in advance. The testing lab must be a member of the Soil Science Society of America's North American Proficiency Testing Program (NAPT).
 - 3. Submittal for existing soil:
 - a. Take samples of existing soil from two locations within bed/location. Follow soil testing lab's instructions for soil sample collection.
 - b. The test shall provide the following: pH and buffer pH; percent organic content by oven dried weight; nutrient levels by parts per million including nitrogen, electrical conductivity of a 1:2 soil water sample measured in Milliohm per cm; and Cation Exchange Capacity (CEC).
 - c. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the prepared planting soil. Chemical analysis shall include recommendations from the soils laboratory as to ranges of each chemical element appropriate for the types of plants to be grown in the prepared planting soil.
 - d. If soil does not meet criteria established by the agricultural chemist for growth of healthy plantings, submit a program of additional amendments based on recommendations of the agricultural chemist.

 - K. Tree Pit Drainage Test Report: Include amount of time required for complete drainage of standing water in each tree pit.

 - L. Program for Maintenance of Planting during Warranty and Establishment Period: If different than ongoing maintenance contract, submit variances to the Owner for approval at the time of submitting proposal, before demolition or installation occurs.

1.5 MEETINGS AND REVIEWS

- A. Preconstruction Meeting: Arrange a preconstruction meeting to take place at least 2 weeks before commencement of earthwork and soil preparation between the Owner's Representative, Landscape Architect, and Planting Subcontractor to review the proposed landscape schedule, source of plants, consideration of substitutions, review of specifications, and planting procedures.

- B. Review for Final Completion: As specified in this Section.

1.6 QUALITY ASSURANCE

- A. Landscape Contractor: Licensed in the State of Washington with at least 3 years of experience on projects of similar scope and experienced in landscape work of the highest professional quality. Firm shall have equipment and personnel adequate to perform the Work specified.

- B. Underground Utilities: Protected. Repair any damage to original condition.

- C. Protection: For all Work in progress. Protect adjoining property, and be responsible for protection from bodily injury due to construction operations.

- D. Restoration of existing vegetation areas to remain: Restore areas damaged during construction as approved by Owner's Representative. Restore all turf areas, planting, trees and irrigation in surrounding areas damaged during construction according to accepted horticultural practice.

- E. Permits, Codes and Regulations: Assure all work is in accordance with all applicable codes, regulations, and all related documents.

- F. Quality of Work: Equal to best accepted trade practices.

APPENDIX C: SPECIFICATIONS

1.7 REGULATORY REQUIREMENTS

- A. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress, and egress at the site. Ship landscape materials with certificates of inspection required by governing authorities. Conform to all governmental regulations regarding the transportation of materials.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements: Do not plant when the ground is frozen, or the soil is otherwise in an unsatisfactory condition for planting. Do not plant during periods of excessive heat, drought, moisture and cold. Do not disc, rototill, or work soil when ground is frozen, excessively wet, or in otherwise unsatisfactory condition. Correlate planting with specified maintenance periods from date of Substantial Completion.
- B. Existing Conditions:
 - 1. Carefully examine the site before submitting a Bid. Be informed as to the nature and location of the Work; general and local conditions including climate, adjacent properties and utilities; confirmation of the ground; the nature of subsurface conditions; and the character of equipment and facilities needed prior to and during execution of the Work.
 - 2. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify the Owner's Representative before planting.
 - 3. Utilities: Determine location of underground utilities and perform work to avoid possible damage. Hand excavate, as required.
 - 4. Should the Contractor, in the course of work, find discrepancies between the Drawings and physical conditions or omissions or errors in the Drawings, or in layout as furnished by the Owner's Representative, inform the Owner's Representative immediately in writing for clarification. Work done after such discovery, unless authorized by the Owner's Representative, is at the Contractor's risk.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate Work of this Section with other area projects and maintenance.
- B. Planting Time: Install plants in the planting season beginning October 1 through April 30, unless otherwise approved by the Owner's Representative.
- C. Coordinate earthwork and soil preparation. Do not expose soil stockpiles to wet weather without temporary cover.
- D. Landscape work shall not begin until structures, utilities, paving, and other improvements which require access to, or through, planting areas have been installed and reviewed by the Owner's Representative. Planting work shall not begin until the landscape irrigation system is installed in place, tested, and reviewed by the Owner's Representative.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Deliver fertilizer and plant treatment materials to the site in original unopened containers bearing manufacturer's guaranteed chemical analysis, weight, manufacturer's name, trademark, and conformance with state law.
 - 2. Prevent injury and windburns to plants during transportation. Provide adequate protection so that trunks are not scarred in transport and branches are not broken.
 - 3. Notify the Owner's Representative in advance of delivery of plant materials and submit an itemized list of the plants in each delivery.
- B. Plant Selection and Review:

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1. Tagging Plant Material: Attach legible labels to each individual plant, or container containing one or more plants. Provide the necessary detailed information as to horticultural name, size, or other data required to identify as conforming to specifications on the label. When the label is attached to a container containing more than one plant, mark quantity as well as other required information on the label. Refer to American Standards for Nursery Stock regarding labeling of plant material. The Owner's Representative will reject plant material with illegible or missing tags.
 2. Review of Plant Material: Allow the Owner's Representative opportunity to review plant material at nursery or offsite holding area prior to arrival on site. All plant materials will be reviewed by Owner's Representative after arrival on site. Notify the Owner's Representative 4 working days prior to the proposed arrival of plant materials on site. Arrange for adequate manpower and equipment on site at the time of plant material review and installation to provide a complete staked layout and to unload, open, and handle plant material during the review. Immediately remove plants not meeting the requirements herein specified or matching approved representative photographs from the project and replace.

C. General Temporary Storage:

1. If planting is delayed more than 24 hours after delivery, set balled and burlapped plants on the ground, cover root ball (heel-in) with soil, wet peat, mulch or other acceptable means of retaining moisture as reviewed by the Owner's Representative. Protect balls and roots and container grown material from freezing, sun, drying winds, and mechanical damage.
2. Water plants as necessary until planted. Immediately install plant material delivered and reviewed.
3. Plants stored under temporary conditions reviewed by the Owner's Representative are the sole responsibility of the Contractor.
4. Do not heel in plants for more than 1 week. Provide temporary storage, in accordance with approved Delivery, Storage, and Handling Plan.
5. Plants temporarily stored are subject to review prior to planting.
6. Immediately remove rejected plant material from the site.
7. Do not remove container-grown stock from containers until planting time.

D. Handling:

1. Exercise care in handling, loading, unloading and storing of plant materials. Plant materials damaged in any way shall be discarded and replaced with undamaged materials.
2. Protect packaged materials from deterioration during storage. Fertilizer and plant treatment materials shall not be stored with any other landscape material.

1.11 SUBSTANTIAL COMPLETION

- A. General: The Owner's Representative will make a review for Substantial Completion of the work of this Section.
1. Submit a written request for review at least 4 days prior to the day on which the review is requested.
 2. All planting shall be alive, healthy, and installed as specified.
 3. Upon completion of planting, and prior to receipt of certificate of Substantial Completion, remove from site excess soil and debris and repair all damage resulting from planting operations.
 4. The Contractor is to prepare a list of items to be completed or corrected for review by the Owner's Representative.
 5. Upon completion of the review, the Owner's Representative will amend the list of items to be completed or corrected, and indicate the time period for their completion or correction.
 6. The Warranty Period will not begin until all items have been completed or corrected.

1.12 WARRANTY AND ESTABLISHMENT PERIOD

- A. Warranty and Establishment Period shall consist of providing adequate and proper care for plant materials and landscape areas within the Contract limits for a minimum period of 1 year to ensure

APPENDIX C: SPECIFICATIONS

healthy, vigorous growth of planted material. The Contractor is responsible to maintain the irrigation system for the entire Warranty and Establishment period.

- B. Make warranties in addition to and not in lieu of all other liabilities, which manufacturers or Contractor may have by law or by other provisions of the Contract Documents.
- C. Warranty for plants:
 - 1. Replace at no additional cost for a period of 1 year after the establishment of the beginning date of Warranty Period, plants that have died or that are, in the opinion of the Owner's Representative, in unhealthy or unsightly condition, or that have lost their natural shape due to dead branches, excessive pruning, or excessive defoliation. Make replacement within 7 days of notification from the Owner's Representative. Remove dead plants within 2 days of notification and mark planting plan showing the exact location of replaced plants.
 - 2. Replace unacceptable plants in accordance with original Specification. Warrant all replaced material for a period of 1 year from date of replacement.
 - 3. Warrant plants for 1 year against all defects of material and workmanship.
 - 4. Any tree and shrub material that is 25 percent or more dead or disfigured shall be considered dead and must be replaced at no charge. A tree is considered dead when the main leader has died back or there is 25 percent of the crown dead. Plants are considered disfigured when excessive dead wood had been removed or when the symmetry, typical habit of growth, or sculptured form has been impaired by the removal of dead wood.
 - 5. The above warranty is applicable to any growing conditions through which plants of like kind could be expected to survive and any deformity or cause of death which could be attributed to, or affected by, the physiological conditions of the plant. The warranty would not apply to plant losses due to abnormal weather conditions such as floods, excessive wind damage, drought, severe freezing, or abnormal rain, as determined by the National Weather Service.
- D. Maintenance shall begin immediately after each plant is planted. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected until Substantial Completion. Tree ties and stakes shall be tightened and repaired as required. Correct defective work as soon as possible after it becomes apparent and weather and season permit. Reset settled plants to proper grade and position, and remove dead material.
- E. Watering: Water plants as needed to keep them in a healthy growing condition. The contractor shall be responsible for the watering patterns and timing, including the setting of automatic sprinkler controls. Automatic irrigation systems shall be operated fully automatically during the Warranty Period. Perform automatic watering during the periods of 4 a.m. to 7 a.m. or as otherwise specified. If water restrictions are established, develop watering schedules in consultation with the Owner's Representative. The Contractor is responsible for acquiring a water source for any hand-watering. Before commencement of the Warranty Period, furnish in writing a watering schedule to the Owner's Representative. Any change in watering schedule shall require a minimum 1 working day advance notice to the Owner's Representative.
- F. Mulch: Supplemental mulch shall be applied and replaced in order to return planting areas to conformance with Contract Document requirements. The final mulch application shall be made within 1 week before review for completion of the Warranty and Establishment Period.
- G. Cleanup and Litter Removal: Clean up after any work performed by the Contractor. Remove all litter in order to provide a clean appearance at the time of review for completion of the Warranty and Establishment Period.
- H. Weed Control: Maintain mulched planting areas around trees, shrubs, and groundcovers in a weed-free condition during initial planting and during the Warranty Period. At the time of request for completion of the Warranty and Establishment Period, submit a weed control plan identifying the means, manner, methods, and timing intervals to ensure weed control. This weed control plan will be subject to revisions dependent on results of the implemented plan.

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- I. Reviews for the Warranty and Establishment Period:
 1. Planting areas will be reviewed quarterly by the Owner's Representative during the Warranty and Establishment Period. Plants to be replaced shall be flagged during the review. Corrective work lists will be prepared by the Owner's Representative based on those reviews.
 2. The Contractor shall correct the deficiencies within (14) days of receiving the list, unless other scheduling arrangements have been agreed upon with the Owner's Representative. Replacement plants shall be flagged after planting.
 3. In addition, the Owner's Representative may make periodic reviews at other times during the Warranty and Establishment Period. Should the Owner's Representative determine at any time that the Contractor is not providing adequate and proper care of plant materials or is performing substandard Work; the Owner's Representative may order the Contractor in writing to make necessary corrections.
 4. The Contractor shall make corrections within 7 days immediately following receipt of such Notice.
 5. Reviews shall continue until the completion of all areas, including extended warranty areas due to plant replacement during the initial Warranty and Establishment Period.

PART 2 PRODUCTS

2.1 COMPOST/ORGANIC AMENDMENT

- A. Compost shall be pure composted plant waste material, a well decomposed, humus-like material derived from the decomposition of grass clippings, leaves, branches, wood and other organic materials. Only use plant waste that has composted for a minimum of 1 year and is composed of 98 percent by volume material derived from the aerobic decomposition of recycled plant waste. The material must come from a King County approved manufacturer:
- B. Approved compost products must meet related state and federal chemical contaminant (e.g., heavy metals, pesticides, etc.) and pathogen limit standards pertaining to source materials in which it is derived.
- C. Composted plant waste physical criteria:
 1. 100 percent passing through a 1 inch sieve.
 2. pH range between 5.0 and 8.5.
 3. No more than 2 percent foreign materials (including plastic, concrete, or metal) on a dry weight basis.
 4. Free of viable weed seeds and other plant propagules (except airborne weed species).
 5. Moisture content that has no visible free water or dust produced when handling material.

2.2 TOPSOIL

- A. 3-way topsoil composed as 60 percent sandy loam, 25-30 percent organic amendment and 10-15 percent peat with 100 percent passing through a ½ inch screen as supplied by Pacific Topsoils, Inc. (425) 514-3499, Cedar Grove (877) 764-5748, Sawdust Supply Co. (888) 622-4321, or accepted equal.

- 2.3 MULCH: Fine fir or hemlock bark of uniform color for use in planting or tree and shrub saucers; free from weed seed, sawdust and splinters; not containing resin, tannin, wood fiber or other compounds detrimental to plant life.
 - A. Bagged mulch: Moisture content not in excess of 22 percent.
 - B. Bulk mulch: Size range of ½ inch to 1-1/4 inch with a maximum of 20 percent passing a ½ inch screen.

2.4 SOIL AMENDMENTS

- A. Fertilizers:
 1. General: Packaged in new, waterproof, non-overlaid 80 pound bags clearly labeled as to weight.
 2. Fertilizers shall be either organically derived or slow-release synthetic products, to minimize water pollution and feed plants over a longer period of time. Fertilize in early

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spring. Use 1-2-2 nutrient ratio (N-P-K), or similar, per manufacturer's recommended rates (not to exceed 5-10-10). Water immediately after applying to move the fertilizer into the soil and wash the fertilizer off of plant surfaces

B. Plant Treatment Materials:

1. Mycorrhizae: Mycogrow Gel as manufactured by Fungi Perfecti, Olympia, WA, (800) 780-9126; Mycorrhizal Landscape Inoculant as manufactured by BioOrganics, Santa Monica, CA, (888) 332-7676; or Biovam as manufactured by Brock Probiotics and available through T&J Enterprises, Spokane, WA (888) 769 3878, or accepted equal.
2. For any soil amendments, including but not limited to fertilizers and/or pH balancers, suggested by the soil testing, provide product literature or tear sheets giving name of product, manufacturer's name, and manufacturers suggested application rate and method.
3. Staking and Guying:
 - a. Stakes: Wood
 - b. Tree Ties: Recycled polyethylene, Dimex ProLock Poly Chain Lock, or accepted equal.
 - c. Twine: 3-ply jute.

2.5 SOURCE QUALITY CONTROL: Substitutions will not be permitted unless substantiated written proof is supplied that a specified plant is not obtainable. In this situation, submit a proposal to use the nearest equivalent size or variety with an equitable adjustment of the Contract for review by Owner's Representative.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to preparation of planting areas, ascertain the location of all electric cables, conduits, under drainage systems and utility lines. Take proper precautions to not disturb or damage sub-surface elements. If sub-surface elements are uncovered, promptly notify the Owner's Representative. Contractor is responsible for making requisite repairs to damaged utilities at his own expense if this procedure is not followed.
 1. Verify that required underground utilities are available, in proper location, and ready for use. Coordinate with other trades.
 2. Verify that subgrades are at lines and grades appropriate to provide specified depth of prepared planting soil.

3.2 PREPARATION

- A. Protection of Existing Conditions:
 1. Use every possible precaution to prevent damage to existing conditions to remain, such as structures, utilities, trees and plant materials, and walks on, or adjacent to, the site of the Work.
 2. Provide barricades, fences, or other barriers to protect existing conditions to remain from damage during construction.
 3. Do not store materials or equipment, permit burning, or operate or park equipment under the branches of existing plants to remain.
 4. Submit written notification of damaged plants and structures to the Owner's Representative immediately.
- B. Preparation of Planting Areas:
 1. Subgrade Preparation:

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- a. Completely remove and dispose of all structural fill, gravel, quarry spall, constructions debris, and other obstructions in the area to receive planting to a minimum depth of 12 inches, including areas where native soils have been removed and replaced with structural materials adjacent to buildings and paved areas. Remove debris and rocks over 4 inches in size to a depth of at least 12 inches in all areas to receive planting.
 - b. If native soil in areas to receive planting is free from structural fill, gravel, quarry spall, construction debris, and other deleterious materials, establish subgrade lines and grades appropriate to provide for specified depth of prepared planting soil.
 - c. If subgrades need to be raised to establish lines and grades appropriate to provide for specified depth of prepared planting soil, use accepted Engineered Fill.
 - d. After subgrade lines and grades are established, scarify exposed soils to a depth of at least 12 inches. Moisture condition if necessary. Compact to 85 percent maximum of dry weight density.
 - e. Finish subgrades will be reviewed by Owner's Representative before installation of soil.
2. Prepared Planting Soil:
 - a. Place soil per restoration specifications and design parameters.
 - b. Ensure prepared planting soil is free of stones, clods of earth larger than 1 inch in diameter and other deleterious matter.
 - c. Re-test prepared planting soil.
 - d. Mix additional amendments into the soil as recommended by the testing laboratory
 - e. Incorporate amendments thoroughly into the prepared soil to assure uniform distribution.
 3. Obstructions Below Grade: In the event that roots, rocks, underground construction work, utilities, or obstructions are encountered during discing and tilling operations under this Contract, continue mixing by hand with shovel or fork.
 4. Perform Settlement Test for prepared planting soil as specified.
- C. Finish Grading:
1. After natural settlement and light rolling, complete work to conform strictly to the lines, grades and elevations indicated. Elevations and landform configuration is critical to project design intent. Supply additional prepared topsoil as needed to give the specified depths and grade.
 2. Grades in planting areas not otherwise indicated shall have uniform levels or slopes between points established by pavements, curbs, catch basins or other utility lids. Finish grade shall be smooth, even and on a uniform plane with no abrupt change in surface and have no erosion scars.
 3. Slope all planting areas to drain. If drainage conditions are questionable, request review and direction from the Owner's Representative. Adjustments to accommodate drainage concerns must be approved by the Owner's Representative. Drainage problems discovered after plant material is installed shall be corrected to the satisfaction of the Owner's Representative as part of the Contract.
 4. Ensure finish grading accounts for depth of mulch in relation to adjacent grade conditions.
 5. Protect all planting areas against compaction by construction equipment.
- D. Planting Layout:
1. Stake out new planting where shown on Construction Documents except where obstructions exist below ground, overhead, or where changes have been made during construction. Complete layout of planting beds, plants and pits before seeking review by the Owner's Representative.
 2. Coordinate layout and installation of plant material with installation of the irrigation system to ensure that there will be complete and full irrigation coverage of the planting areas.
- E. Planting Backfill: Where planting pits exceed the depth of prepared planting soil, mix 50 percent native topsoil dug from planting pit with 50 percent topsoil.

3.3 PLANTING INSTALLATION

- A. Excavation:

APPENDIX C: SPECIFICATIONS

1. Excavate all plant pits in accordance with the Drawings after review of staked locations by the Owner's Representative. Excavate plant pits only after prepared planting soil has been tested, analyzed, amended, and reviewed by the Owner's Representative.
 2. Excavate pits and beds with sloping sides. Loosen sides and bottoms by scarifying.
 3. For bare root plants, excavate at least 12 inches wider than the root spread and deep enough to accommodate vertical roots for bare-root stock.
 4. Excavate pits and beds within critical root zones of existing trees and shrubs by hand. Notify Owner's Representative immediately if dense root mats or structural or feeder roots are encountered. Owner's Representative will make adjustments to planting locations if new planting excavation will potentially adversely impact existing plant material.
 5. Fill tree pits with water prior to planting to test drainage. Owner's Representative shall review plant pits prior to planting. If Owner's Representative determines that drainage is not satisfactory to healthy plant growth, additional excavation and drainage efforts must be made at direction of Owner's Representative.
 6. Underground Obstructions: In the event that rock, underground construction work, utilities or obstructions are encountered in any plant pit excavation work under this Contract, alternate locations may be selected by the Owner's Representative.
 7. Where locations cannot be changed, remove the obstruction, subject to the Owner's Representative review, to a depth of not less than 3 feet below grade and no less than 6 inches below bottom of ball or roots when plant is properly set at the required grade. Payment shall be made in accordance with the Contract.
- B. Inoculation: Inoculate all plants with mycorrhizae in accordance with manufacturer's recommendations.
- C. Placement of Plants:
1. Do not plant until the Owner's Representative at site has reviewed plant material on site.
 2. Set plants in centers of pits plumb and straight, in accordance with the planting details, and faced to give best appearance and relationship to adjacent plants and structures.
 3. Check top of tree and shrub root ball for root flare. If roots are not found, scrape away excess root ball soil until root flare is exposed.
 4. When planting on slopes, set the plant so that the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.
 5. Plant to such depth that the finished grade level of the plant, after settlement, will be the same as that at which the plant was grown and indicated by the root flare. Plant bare root material with the highest roots just below the soil surface so that the seedling is planted at the same level as grown in the nursery.
 6. Do not pull burlap out from under balls, but peel back 2/3 of burlap covering, cut along base, and remove. If root ball wrap is non-biodegradable, remove completely. Remove platforms, wire, and surplus binding from top and sides of ball. Cleanly cut off all broken or frayed roots. Tease out existing roots on perimeter of root ball without disturbing structure of root ball. Cut all girdling roots.
 7. Clip and remove wire basket from top and sides of root ball.
 8. Remove plants from containers by cutting or inverting the container.
 9. Keep bare root plants moist until installation. Protect from wind.
 10. For bare root plants, cleanly prune broken roots over one half inch diameter. Do not prune top of plants to compensate for root loss unless otherwise directed by the Owner's Representative.
 11. Set and support bare root stock in the center of planting pit or trench. Spread roots without tangling or turning toward the surface, and carefully work backfill around roots by hand. Roots shall be directed down or spreading out from the main stem. No J or V shaped roots shall be created while planting. No roots shall be left exposed. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots.
 12. Backfilling:

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- a. Compact planting backfill around bases of root balls to fill all voids. Remove all non-biodegradable materials from the plant pit.
 - b. Install planting backfill in layers of not more than six inches. Thoroughly compact by hand to ensure planting backfill is free of voids before next layer is installed.
 - c. Where planting pits exceed the depth of prepared planting soil, mix 50 percent native topsoil dug from planting pit with 50 percent topsoil.
 - d. Water thoroughly until the root ball and planting pit is saturated.
 - e. After planting bare root stock, the hole shall be completely filled and/or soil adequately tamped to avoid leaving air pockets around roots.

D. Mulching:

1. Do not mulch until soil testing and prescribed soil measures indicated in the testing results have been successfully implemented.
2. Furnish all equipment and labor to load, haul, and place mulch. Mulch within 2 days of planting. Cover tree and shrub beds with a continuous layer of 3 inches mulch. Keep mulch 3 inches away from tree and shrub root flare.

3.4 REPAIR AND RESTORATION

A. Pruning:

1. Remove dead or broken branches with a clean cut, in a manner appropriate to the particular requirements of each plant, and at the time designated by, and to the satisfaction of, the Owner's Representative. Perform pruning with clean, sharp tools.
2. Promptly trace and treat accidental damage to trees and shrubs occurring during the course of planting operations which is not so great as to require removal of a branch or the replacement of the plant in accordance with recognized horticultural practices as directed by the Owner's Representative.

B. Watering: Upon completion of planting operation, water plant material thoroughly. Apply water slowly to penetrate and saturate the entire root system while avoiding runoff.

C. Restoration of Existing Vegetation: Should existing vegetation to remain be damaged by construction activity, restore native soil, plant material and mulch to a condition equal or greater to that found at the commencement of construction.

3.5 PROTECTION

A. Guying and Staking:

1. Stake or guy trees as detailed to stand plumb immediately after planting.
2. Remove and replace damaged stakes. Any tree or shrub thrown out of plumb by wind or other causes shall be replanted by loosening the soil around the root system and righting the tree or shrub by adjusting the position of the root system. Adjustment shall not be made by pushing or restraining the trunk or stem. If, in the opinion of the Owner's Representative, damage to the root system has occurred as a result of righting a tree or shrub, the tree or shrub shall be replaced by the Contractor.

3.6 ADJUSTING AND CLEANING

A. Maintain the site in an orderly condition during the progress of the Work. Continuously and promptly remove excess and waste materials; keep parking areas, walks, and roads clear. Store materials and equipment where directed. Immediately remove rejected materials from the site. Promptly remove equipment, surplus material, debris and trash resulting from operations under this Contract upon completion and prior to initial review of the Work. Leave the site in a neat, orderly condition, broom clean.

B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors, trades, and trespassers. Maintain protection during installation and maintenance periods. Provide adequate and proper care of all plant material and work done on this project until the Contract is completed and reviewed by the Owner's Representative. Adequate and proper

APPENDIX C: SPECIFICATIONS

care means keeping all plant material in a healthy, growing condition and also includes removing the weeds, litter, and other debris along with retaining the finished grades in a neat uniform condition.

3.7 FINAL COMPLETION

- A. Review for Final Completion will be conducted at the end of the Warranty Period. Submit notice to the Owner's Representative requesting final review at least 7 days prior to the anticipated review date.
- B. At the final review, the Owner's Representative will determine the condition of the plants and improvements. Review of this Work will be contingent upon proper maintenance and the establishment of vigorous plant materials. Plants which are dead, unhealthy, or missing, whether by disease, neglect, vandalism, or any other reason, shall be replaced with the same species and sizes originally specified and following the same specifications for installation.
- C. Provide plant replacements within 2 weeks after final review, and extend the Warranty Period for an additional 30 days after replacement planting has been reviewed by the Owner's Representative. The Owner's Representative will then repeat the final review for the replaced plants at the end the extended Warranty Period.

END OF SECTION

LANDSCAPE MAINTENANCE STANDARDS AND SPECIFICATIONS

OVERVIEW

The goal of this maintenance plan is to restore and retain the landscape elements of the Virginia Mason campus in a healthy and attractive condition and to form a visually inviting environment. Planting beds should define pedestrian circulation and facilitate wayfinding within the campus, as well as create inviting outdoor use areas. Public safety is of important concern and plantings should be monitored so that clear sight lines are maintained. Additionally, to protect the health of patients, workers, and neighborhood residents, as well as the environment, minimizing the use of pesticides (herbicides, insecticides, fungicides, and rodenticides) should be managed through "Integrated Pest Management" (IPM) methods (described below).

It is the Owner's expectation that the Contractor's proposal will comply with these standards and specifications. It should be the Contractor's expectation that the Owner will only consider awarding the contract to a Contractor whose bid shows compliance. The Contractor should also expect to be held to these standards throughout the course of the contract.

The following document outlines the scope of services and responsibilities required of the Contractor. Other parts of the contract may provide definitions of terms used and other contract requirements such as insurance and licensing standards, code enforcement, hours of work, work authorizations, site locations, etc.

MAINTENANCE SPECIFICATION

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. This document is intended as a benchmark of the Owner's minimum standards for maintenance, repair and improvements. However, the Owner respects the Contractor as a professional and as such, will take under consideration, any and all recommendations made by the Contractor.
- B. Contractor shall furnish all labor, equipment, and materials necessary to complete the maintenance of turf and plantings, as specified herein. It is the intent of the Owner that this site be maintained in a resource-efficient, sustainable, and cost-effective manner.
- C. Maintenance shall consist of weeding and landscape bed maintenance, fertilization, soil building, pruning, mowing, irrigation, IPM, insect/disease control, litter control and any other procedures consistent with good horticultural practice necessary to ensure normal, vigorous, and healthy growth of turf and landscape plantings.
- D. When performing any work requiring subsurface excavation, Contractor shall take care to avoid damage to existing utilities and vegetation. Contractor shall contact Utility Locate at 1-800-424-5555.

1.2 CONTRACTOR STAFF TRAINING AND EXPERIENCE

- A. Contractor will provide staff able to perform work at the highest standards of horticultural practice. Key staff shall have current knowledge of best management practices (BMP's) regarding: plant health, pruning, integrated pest management, pesticide application, irrigation maintenance, and safety procedures. Owner reserves the right to demand the replacement of Contractor's staff who do not meet the owner's standards for safety, professionalism, or horticultural knowledge.
- B. All work shall be performed under the direct on-site supervision of a qualified landscape professional with a minimum of three years combined horticultural education and experience. Preference is for the individual to have at least a two year horticultural degree or Certified Landscape Technician (CLT), combined with work experience, or greater.
- C. The on-site supervisor should have special training and/or working knowledge of IPM assessments and treatment strategies in urban landscape conditions.
- D. All irrigation maintenance and repairs shall be performed by, or under the direct supervision of, a Certified Irrigation Technician (CIT) or Certified Irrigation Auditor.

APPENDIX C: SPECIFICATIONS

- E. All pesticide applications shall be performed by a Contractor (or sub-contractor) licensed and insured as a Washington State Commercial Applicator. In addition, the staff doing the pesticide application shall be licensed as Commercial Operators. License numbers will be provided to the Owner prior to award of contract.
- F. All pruning will be performed by, or under the direct on-site supervision of, staff with documented education and training in proper and naturalistic pruning techniques. Pruning of trees greater than six inches DBH will only be performed by an ISA certified Arborist.

1.3 OWNER/CONTRACTOR COMMUNICATION

- A. Contractor to provide a supervisor to act on Owner's behalf regarding all matters pertaining to the performance of the Landscape Service. Contractor must notify Owner when the supervisor will be on vacation or other leave of absence and who will serve as a substitute.
- B. Provide Owner with an emergency contact list identifying the names, positions held, and phone numbers of key maintenance personnel. Provide mobile and pager numbers for the landscape maintenance manager and site supervisor.
- C. Attend meetings and site inspections of the grounds as requested by Owner.

1.4 LANDSCAPE SERVICE SCHEDULING

- A. Establish a schedule for regular maintenance activities by area and submit to Owner for review (See Addendum 1). Contractor to review proposed schedules with Owner at the regularly scheduled meetings and adjust as necessary to avoid conflicts.

1.5 MAINTENANCE RECORD KEEPING

- A. Contractor shall maintain a computerized log of activities performed, schedules, pest and disease monitoring, additional service repairs, and documentation of each application of fertilizer, pesticide (includes herbicides), and/or other chemicals. Provide electronic copies to the Owner, monthly.
- B. On an annual basis, the Contractor shall perform a plant count and provide review of landscape areas, including areas of concern or anticipation of more/less maintenance, for Owner.
- C. Pesticide application records shall be kept in accordance with RCW 17.21, Section 100. Records shall be kept by the Contractor on all pesticide (includes herbicide) applications for a minimum of seven (7) years. Such records shall be completed in accordance with all applicable laws and regulations and on forms as provided in the Washington Administrative Code, WAC 16-228-190. (<http://agr.wa.gov/pestfert/Pesticides/docs/RecForm4226.pdf>) The following information shall be recorded at a minimum for each application:
 - D. The location where the pesticide or herbicide was applied.
 - E. The year, month, day, and time the pesticide or herbicide was applied.
 - F. Purpose of application.
 - G. The person or firm who supplied the pesticide or herbicide which was applied.
 - H. Trade name of the pesticide or herbicide which was applied, amount and concentration.
 - I. Method and rate of application.
 - J. The temperature and direction and estimated velocity of the wind at the time the pesticide or herbicide was applied.
 - K. The name and license number of the pesticide or herbicide applicator.
 - L. Applicator apparatus license plate number or equipment number (if applicable).
 - M. Any other information reasonably required by the Owner.
 - N. Supply the Owner with written copies of chemical application records monthly.
 - O. Owner shall supply the Contractor with a set of current record drawings of the existing irrigation system. The contractor shall indicate any changes, updates or repairs made to the system and shall submit a copy of these records to the Owner on an annual basis.

1.6 GUARANTEE AND REPLACEMENT

- A. Contractor is not responsible for losses, repair or replacement of damaged work or plant material resulting from theft, extreme weather conditions, vandalism, vehicular incidents (other than Contractor's vehicles) or the acts of others over whom they have no reasonable control.

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- B. Contractor shall replace, at no additional cost to Owner, any turf or plant materials damaged as a result of improper maintenance attention or procedures. Replacement material shall be of the same size and variety as the dead or damaged material. Replace plant material within two weeks of identification of damage. Alternatives to size, variety and scheduling of replacement only by written permission of Owner.
 - C. Contractor shall inform Owner on a monthly basis of plant losses not covered by warranty and unrelated to the maintenance activities. Provide Owner with the cause of the plant loss, and provide recommendations for replacement along with pricing for replacement.

PART 2 MATERIALS AND EXECUTION - GENERAL AREA MAINTENANCE

2.1 LANDSCAPE TRASH REMOVAL

- A. Remove all trash from landscaping beds, turf areas and parking lot to an approved trash or recycling container onsite on a weekly basis. For large amounts of trash, or if there is no approved trash container onsite, Contractor shall haul it away for appropriate disposal.

2.2 LEAF AND BRANCH REMOVAL

- A. Keep walks, patios, planting beds, roadway gutters and lawn areas free of leaves and branches on a weekly basis throughout the year.
- B. Leaves shall be mulch mowed, if on turf, or left in planting areas throughout winter, spring and summer when leaf fall is not excessive and plant health is not adversely affected. As much as possible, leaves can be blown or raked under the shrubs or groundcover and into the wood chip mulch.
- C. In autumn, leaf removal shall occur at each visit as needed to prevent smothering of turf and groundcovers and excessive clumping when mulch mowing. Remove leaves from site only as needed to maintain a neat appearance and the health of the plantings.
- D. Contractor is encouraged to use non-polluting devices like rakes and brooms when feasible. Blowers and other power equipment should be low-decibel, low-fossil fuel consumption, and low-emissions models.
- E. Excessive branch and debris cleanup from storm damage is not included in the contract work and is considered an additional service at Owner's request.

2.3 LANDSCAPE DEBRIS REMOVAL

- A. When applicable, remove biodegradable landscape debris (turf clippings (limited to only those times when mulch mowing is not possible), leaves, branches, annuals, dead plant material, etc.) to a yard refuse recycling facility. Acceptable sites include topsoil producing facilities and/or other facilities, which utilize yard waste for landscape purposes. No biodegradable material should be disposed of as garbage, except noxious weed debris.
- B. Remove and properly dispose of moss from curbs, stairs and walkways.

2.4 MULCH REPLACEMENT

- A. Contractor shall replenish mulch regularly to maintain a depth of no less than two inches (2") in all planting areas, including tree wells. Established beds where plant foliage or groundcover completely covers the soil surface require no additional mulch. Keep mulch at least two to three inches (2 – 3") away from the crown of plants and trees.
- B. Mulch shall be medium or fine shredded bark mulch or, compost, etc. When replacing existing mulch, use a mulch product that is similar in appearance to that already at the site. No "red" bark mulch or dust, or bark nuggets, shall be used.

2.5 SPECIALIZED AREA MAINTENANCE

- A. Any specialized landscape areas, such as water features, annual planting beds, rockeries, bioswales, and raingardens, require specialized maintenance plans and shall be agreed upon by the Owner and Contractor before starting work.

APPENDIX C: SPECIFICATIONS

PART 3 MATERIALS AND EXECUTION – TREES, SHRUBS, VINES, GROUND COVER MAINTENANCE

3.1 FERTILIZATION

- A. Fertilizers shall be either organically derived or slow-release synthetic products, to minimize water pollution and feed plants over a longer period of time. Fertilize in early spring. Use 1-2-2 nutrient ratio (N-P-K), or similar, per manufacturer's recommended rates (not to exceed 5-10-10). Water immediately after applying to move the fertilizer into the soil and wash the fertilizer off of plant surfaces.
- B. For ornamental grasses: Fertilize in October with turf fertilizer approved in turf section below, per manufacturer's recommended rates.
- C. Do not fertilize plantings in swales, biofiltration planters or rain gardens.
- D. When applying granular fertilizers to drip-irrigated areas, the fertilizer must be washed in by hand or rainfall before turning on the drip system. Running the drip system immediately after application will push the fertilizer away from the emitters, resulting in a high concentration of fertilizer at the edge of the wetted zone. It is recommended that granular fertilizers be applied to drip-irrigated areas only in early spring, just prior to a moderate rainfall.

3.2 PRUNING

- A. Prune plantings only as necessary, appropriate to site, need, season and plant species. Discuss significant pruning work with Owner prior to work beginning.
- B. Pruning must only be performed by trained personnel in accordance with accepted horticultural practices. Prune to enhance the natural growth and shape of plant materials and intended function of the planting. Replace plant materials that are disfigured or damaged due to improper pruning at no additional cost to Owner.
- C. Shrub plantings are designed to grow together and to the edges of the beds to minimize weed infestation and maximize water conservation. Prune to encourage a dense, continuous planting, with natural shape and branches reaching fully to the ground. Shearing is only permitted for formal hedges. Do not shear shrubs into topiary (shapes). Prune back branches as needed when interfering with walks, buildings, signage, fire control utilities, site lighting, security/safety visibility, site lighting, and vehicular circulation. Prune dead and broken branches quarterly and more frequently as required.
- D. Ground covers are to be trimmed so they meet but do not grow over walkways or outside any of the planters.
- E. Vines shall be encouraged to climb in appropriate areas. They shall be pruned to keep free from window recesses.
- F. Once a year, assess all trees for necessity or recommendation of pruning. Street trees shall be pruned to maintain adherence to City sight distance requirements, to maintain visibility of street name signs, protect trees from vehicle damage, and maintain pedestrian safety. Remove all non-structural branches between the ground and 6-8' above the ground level. A vertical clearance of 114 inches is required above all parking spaces; a vertical clearance of 80 inches is required above all walkways. Trees shall not be 'topped'.
- G. The Additional Services of an ISA-certified arborist are required for pruning on any trees larger than six inches DBH (diameter at breast height as measured at four and one-half feet about the existing grade at the base of the tree) and any branches larger than four inches in diameter. This is considered an additional service.
- H. All sucker growth from trunk and base of trees shall be removed monthly or as required up to twelve feet (12') from the ground to maintain a clean appearance.
- I. Periodically inspect and adjust tree staking and guying to prevent damage to the cambium layer. Remove guys and stakes as soon as trees are established and self-supporting (generally one year after installation).
- J. When pruning shrubs known or suspected to be diseased, the cutting blades shall be sterilized after each cut.

3.3 WEED, PEST AND DISEASE CONTROL

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- A. Control of Weeds: Use cultural methods (mulch, proper pruning, proper irrigation) to encourage plant health and growth and discourage weeds. Keep planter beds and tree wells free of weeds and debris on a rotational basis, weekly throughout the year by hand pulling or other mechanical means. Entire site shall be weeded by hand or mechanical weeding methods that remove the roots at least once monthly.
 - B. Use of pre-emergent herbicides is not permitted without prior written approval of Owner on an incident by incident basis. Pre-emergent herbicides may only be used on sites with at least two years of plant establishment. Areas considered for pre-emergent use are limited to tree wells and mulch-only beds without groundcover. Standard maintenance practices called for in this contract must be documented in areas where pre-emergent use is being considered before approval for use will be given (hand weeding, edgings, mulch application, proper pruning) Pre-emergent herbicides are not allowed in planted shrub beds or graveled pedestrian walkways.
 - C. Control of Insects and Diseases: Apply insecticide or fungicide to trees, shrubs and ground covers only when significant plant damage would result from not addressing the infestation. Calendar-based spraying is not allowed. Base pesticide application decisions on monitoring for damage, specific pest identification, and proper timing. Control of major disease and insect infestations for trees, shrubs and ground covers is not a part of the contract work and is considered an Additional Service. Regularly monitor all plant material and immediately notify Owner of any need for such control. Contractor is responsible for any damage to plant material incurred as a result of failure to immediately notify Owner of correctable disease and/or insect problems, and Contractor must replace any such damaged plant material at no additional cost to Owner.

PART 4 MATERIALS AND EXECUTION – TURF MAINTENANCE

4.1 MOWING

- A. All turf will be mowed with professional quality mulching mower equipment. Pricing assumes that bagging and removing clippings will be required only when excessive leaf debris is present, turf is too long to mulch, or when moisture conditions are too high to allow effective mulching without substantial clumping of turf debris.
- B. Prior to each mowing remove all litter and debris from lawn areas. Formal turf areas shall be mowed per the schedule below and maintained at a height of no less than 1-1/2 inches and no more than 2-1/2 inches. Coordinate mowing schedules with Owner. Alternate mowing direction where feasible every mowing. Maintain a uniform lawn height free from scalping.
- C. Contractor is responsible for any damages incurred as a result of mower damage to trees and shrubs and must repair or replace any such damage at no cost to Owner. Properly maintained tree wells are encouraged to minimize such damage.
- D. Clippings will be swept or blown from hardscapes after each mowing. Sweeping is encouraged when feasible.

4.2 MOWING SCHEDULE

- A. Mowing schedule: Mow weekly during active growth periods (approx. April-October) and at least once a month during winter. Keep mower blades sharp.

4.3 EDGING AND TRIMMING

- A. Mechanically trim all landscape turf edges every other mowing. Edges include all formal lawn perimeters and tree wells in lawn areas. Twice annually redefine all formal lawn edges with a mechanical blade-type edger or hand spade. Clean debris from hardscapes and non-turf landscape areas, remove larger debris.
- B. Trim all formal lawn areas that cannot be reached by a mower every other mowing. Areas to be trimmed include any lawn adjacent to poles, signs, bollards, trees, walls and all other obstacles. Perform trimming to the same height as mowing. Clean debris from hardscapes and non-turf landscape areas, remove larger debris.
- C. Contractor is responsible for any damages incurred as a result of trimmer and edger damage to trees and shrubs and must repair or replace any such damage at no cost to Owner. Properly maintained tree wells are encouraged to minimize such damage.

APPENDIX C: SPECIFICATIONS

4.4 TURF FERTILIZATION

- A. Beginning the first year of the contract, Contractor shall provide soils tests performed by an authorized laboratory at least once every three years to determine fertility and pH requirements of turf areas. Submit soil test analysis and recommendations to Owner.
- B. Fertilize landscape turf areas with a well-balanced, slow release fertilizer as required to provide vigorous deep rooting and a healthy green appearance year-round. Determine fertilizer application rates and materials from soil test results. Generally, turf fertilizer should not exceed a 3-1-2 nutrient (N-P-K) ratio.
- C. Submit a fertilizer schedule, listing proposed materials, application rates and application times with your Proposal and immediately prior to performing the work. Contractor shall provide pricing for use of slow-release chemically based or "bridge" fertilizer AND natural-organic fertilizer. Owner may choose a schedule that includes either one or both types of fertilizer.
- D. Approved fertilizer schedule must include three to five applications per year (or less if supported by soil test results), no more than one pound of nitrogen per thousand square feet per application, and no more than four pounds of nitrogen per thousand square feet applied annually. Nitrogen applications in excess of four pounds per thousand annually are allowed only if supported by soil test results.

4.5 TURF LIME APPLICATION

- A. Apply agricultural grade pellet form lime at a rate of up to 40 lbs/1000 sq. ft. in turf areas only as recommended by soil test results, and no more than once annually in the spring. Do not apply lime and fertilizer at the same time. Lime should go on first: wait at least 30 days after applying lime before fertilizing.

4.6 TURF WEED, PEST AND DISEASE CONTROL

- A. Control of weeds: Use cultural methods (mulch mow, fertilize, aerate, irrigate) to minimize weed cover on all turf. Owner shall identify turf areas considered high-quality, all other areas shall be treated as standard-quality turf. If weed cover increases to over 20% of turf on high-quality area or up to 40% on standard-quality areas, then spot applications of contact herbicide may be considered during the growing season to control broadleaf weeds. A maximum of two spot applications annually for all turf areas are allowed and included in the work. Use health and environmental hazard information to choose most effective and least hazardous product. Single active ingredient products are preferred if they are available and meet other criteria for safety and effectiveness. "Weed and Feed" products are not allowed.
- B. Control of insects: Monitor all turf areas for infestation of crane fly or other harmful insects. Use cultural and mechanical means for control, including reducing irrigation in fall, fertilizing to outgrow damage, and aerating in spring to reduce larvae population. Pesticide application for crane fly control will only be allowed if documented monitoring shows more than 25 crane fly larvae per square foot. Apply pesticides only to specific areas where insect infestations have been identified by the Contractor and pose significant risks to the health and appearance of turf. Use health and environmental hazard information to choose most effective and least hazardous product.
- C. Control of moss: Monitor for moss at levels that diminish turf quality. If found, apply moss control product containing no more than 10% iron or a fatty-acid soap active ingredient on affected turf areas up to once annually, only if needed. Avoid contact with hardscape surfaces and immediately clean any staining. Combination moss control + fertilizer products are not allowed.
- D. Control of diseases: Monitor for Red Thread and other fungal diseases. No fungicide treatments for Red Thread are allowed. Treat the cause, nitrogen deficiency, with nitrogen fertilizer instead. If other diseases are determined to be causing significant risks to the health and appearance of the turf after cultural improvements are tried, then use health and environmental hazard information to choose most effective and least hazardous product.

4.7 TURF AERATION AND OVERSEEDING

- A. Aerate 30% of the square footage of turf areas once annually in the spring. Rotate applications to achieve 100% coverage of all turf areas at least every 5 years. Adjust areas to be aerated based

on need (some areas may be aerated every year and others only as required to meet the 5 year minimum rotation). Aerate with a vertically operating core aerator utilizing shaft mounted 1/2" hollow tines. Cores shall be made 4" on center to a 3" depth.

- B. Overseed immediately after aeration with a quality Northwest seed blend adapted to the site. Use at recommended overseeding rate.
- C. Drag turf areas to break up plugs and mix with the seeds.
- D. After aeration and overseeding, high-use or worn lawn areas should be topdressed in spring or fall for greatest improvement. General lawn should be topdressed with pure compost or a compost-sand mixture, 1/4 to 1/2 inch thick, to improve both drainage and soil fertility. Use a weed-free mature compost from a reputable supplier, screened to 3/8 inch minus particle size. Dragging or raking after application can help get compost down into the aeration holes and break up aeration cores and compost clumps.

4.8 TURF THATCHING

- A. Mechanical thatch removal is not part of this contract and is considered an additional service. Monitor for thatch once annually in the fall. If 30% or more of the turf has thatch build up of over one inch, Owner may approve thatching of that area. If approved, mechanically remove thatch from approved areas in the fall. Rake or vacuum to remove debris. If mulch mowing will break down debris enough to allow it to stay on the turf area as organic matter, that is allowed.

PART 5 MATERIALS AND EXECUTION - IRRIGATION

5.1 GENERAL IRRIGATION SYSTEM OPERATION

- A. Contractor is responsible for providing a staff completely trained and familiarized with the setup, monitoring and maintenance of the irrigation system at Owner's sites.
- B. Contractor is responsible for understanding the capacities and capabilities of the irrigation system and ensuring that system modifications do not cause landscape water demand to exceed the hydraulic capacity of the system.
- C. Contractor will establish appropriate time intervals for each valve zone in the irrigation systems and adjust during the operating season as necessary.
- D. Adjustments should be based on local evapo-transpiration (ET) data as much as possible.
- E. Operate systems only during night hours. Daytime operation is permitted only when inspecting or testing the system, after fertilizer application, for new installations and during extreme temperatures.
- F. Run times shall be sufficient to allow for saturation of the root zone without run off. This may require "cycle and soak" scheduling in spray zones. Allow adequate run times in drip irrigation zones.
- G. Contractor will manage all irrigation systems for peak efficiency and water conservation. Check for proper water application rates by inspecting soil moisture and health of plant materials on a weekly basis. Adjust the irrigation frequencies as required to correct over or under watering.
- H. Contractor shall manage irrigation schedules so that irrigation is applied more deeply, but less frequently, rather than small amounts on a daily basis.
- I. Contractor and Owner will work in collaboration during water supply shortages and under drought conditions to develop an irrigation strategy that best preserves and protects the site's landscape investment.

5.2 IRRIGATION SYSTEM MONITORING

- A. Irrigation system monitoring and inspections to include the following:
- B. Visually inspect all irrigated landscape areas once weekly from April through September to identify potential leaks as evidenced by water related plant stress, surface water or erosion, broken or damaged equipment, and paved surfaces or building walls/windows affected by irrigation spray.
- C. Visually inspect the operation of all irrigation valve zones once monthly from April through September to identify coverage problems, misdirected nozzles, broken or damaged equipment, hard-scape or building overspray, pressure problems and system leaks.
- D. Perform two-wire path loop resistance test on each site once annually during winter shutdown.

APPENDIX C: SPECIFICATIONS

- E. Provide the following written irrigation system management reports to Owner's Project Manager.
- F. Summary of additional services, system repairs and renovations, general operations and recommendations once monthly from April through September.
- G. Summary of major renovations, replacements and equipment changes along with proposed renovations/upgrades and associated budget recommendations once annually.

5.3 IRRIGATION SYSTEM MAINTENANCE, WINTERIZATION AND RE-ACTIVATION

- A. Run-off of water from irrigation systems into or onto streets, sidewalks, stairs, or gutters is not permitted. Immediately make adjustments, repairs, or replacements required to correct the source of the run-off.
- B. Clean and adjust heads, nozzles and valves as required. Clean drip irrigation valve strainers as required. Properly prune plantings and remove sod and debris affecting head performance from all zones once during the months of April and May. Properly prune plantings and sod or debris affecting access to valves, and reset/raise valve boxes, which have settled during the winter shutdown months.
- C. Winterization: Prior to freezing weather and no later than November 1, deactivate the irrigation systems. Vacate all water from the systems using an air compressor and adjust/set all valves and back flow prevention devices for winterization per manufacturer's recommendations.
- D. Spring start-up: Open the main valve(s), inspect and adjust all sprinkler heads, re-program and check battery backup in controller, and troubleshoot the entire system. Flush out lateral lines and adjust heads and nozzles. Test sensors (rain, soil moisture, weather) and zone coverage while running. Set ET-based, seasonal, or weather-based manual or automatic programs. Post spring/summer/fall schedules (runtimes x days / zone) and train staff as needed to monitor through season.
- E. Contractor shall be responsible for all costs associated with damage resulting from improper irrigation winterization and re-activation procedures, and for all damage resulting from failure to winterize or re-activate in a timely fashion. The Contractor is not responsible for freeze damage to piping left pressurized year around per the direction of Owner.
- F. Provide for inspection and testing of backflow prevention valves annually, as required by law.

5.4 IRRIGATION SYSTEM REPAIR AND RENOVATION

- A. Provide 24 hour per day, 7 days a week emergency response to immediately replace or repair broken, damaged or inoperable irrigation components which pose damage or safety hazards to persons or property. Prepare Proposals for all other repair or replacement work.
- B. Rain sensors, soil moisture sensors, and rain shut-off devices are encouraged in renovation work when not already installed in irrigation system.
- C. All repairs to the system shall be identical to the original installation, unless approved otherwise in advance by the Owner. If a change to the installation will result in lower future maintenance costs, less frequent breakage, or an increase in public safety, request authorization to make the change from the Owner.
- D. The following repair activities are considered additional services:
 - E. Troubleshooting and repair of controller components.
 - F. Damage by other than Contractor vehicles.
 - G. Pedestrian or vandalism damage.
 - H. Special event damage.
 - I. Construction related damage by other than Contractor's activities.
 - J. Storm related damage.
 - K. Product failure.
 - L. Provide the following repair or replacement work at no cost to Owner:
 - M. Damage due to Contractor maintenance activities.
 - N. Damage due to work by Contractor's construction activities.
 - O. Inform Owner if shutting off the systems during emergencies.
 - P. Redline all irrigation repairs or renovations which represent changes to the existing irrigation on current record drawing prints and submit to Owner.

PART 6 MATERIALS AND EXECUTION – INTEGRATED PEST MANAGEMENT AND PESTICIDE APPLICATIONS

6.1 INTEGRATED PEST MANAGEMENT (IPM)

- A. Owner strongly encourages environmentally sensitive maintenance practices. The principles of integrated pest management (IPM) shall be employed. The intent is to limit any pesticide (including herbicide) applications through healthy landscape management practices.
- B. IPM is an approach to pest control that utilizes regular monitoring to determine if and when treatments are needed and employs physical, mechanical, cultural, biological, and educational tactics to keep pest numbers low enough to prevent unacceptable damage or annoyance. Additional treatments, such as pesticide applications, are made only when and where monitoring has indicated that the pest will cause unacceptable economic, medical, or aesthetic damage. Treatments are not made according to a predetermined schedule. Treatments are chosen and timed to be most effective and least-hazardous to non-target organisms and the general environment. (adapted from Bio-Integral Resource Center) (see Appendix 2).
- C. Contractor shall consider pesticide applications only as a last resort and only after other methods of control are proven ineffective.

6.2 PEST MONITORING

- A. Pest monitoring and inspections to include the following:
- B. Contractor shall visually inspect all landscape areas once weekly from April through September, and once monthly from October to March to identify potential pest problems. Pest problems include insect, disease, and weed infestations. The presence of a pest does not necessarily mean there is a problem. Contractor shall keep written records of pests identified and areas where problems may be developing.
- C. Contractor staff and on-site supervisor shall visually inspect all landscape areas once monthly from April through September with the Owner. Review written monitoring records at this time.
- D. Cooperatively identify any area where non-chemical IPM control methods should begin.
- E. Contractor shall provide the following written pest monitoring reports to Owner on a monthly basis.
- F. Summary of pests identified during pest monitoring inspections, status of infestations, and description of controls implemented (e.g., “applied wood chip mulch”, “mechanically pulled weeds”, “adjusted irrigation”).
- G. Noxious Weeds identified. See section below for Noxious Weed Control specifications.
 - i. Contractor shall provide proposals for renovations, replacements and other changes, along with associated budget recommendations, once annually.

6.3 PESTICIDE APPLICATIONS

- A. Pesticides include all herbicides, insecticides, fungicides, and various other substances used to control pests.
- B. All pesticide applications shall be preceded by monitoring and positive pest identification. Submit these findings in writing to Owner prior to any pesticide application.
- C. Under no circumstances will combination products be allowed (“weed and feed”, weed control + fertilizer, insect control + fertilizer, etc.).
- D. Under no circumstances will regularly scheduled calendar-based applications of pesticides be allowed without written prior approval of Owner.
- E. Under no circumstances will preventative “blanket” applications of pesticides be allowed without written prior approval of Owner.
- F. If Contractor determines that calendar-based or “blanket” applications may be needed, Contractor shall provide Owner two weeks notice of request. Owner will determine if such applications will be allowed. Contractor shall provide Owner the following information in a request for calendar-based or “blanket” application of any pesticide:
- G. Identification of pest and reasons control is required.
- H. Description of the cultural, non-chemical, and/or spot application of pesticides already tried and assessment of success or failure of those remedies.

APPENDIX C: SPECIFICATIONS

- I. Product recommendation and information on health and environmental hazards of that product. City of Seattle and King County Pesticide Tier Tables, and “Grow Smart Grow Safe” may be helpful in locating this information.
<http://www.seattle.gov/environment/TierTablesFriendlyFormat.xls>
http://www.govlink.org/hazwaste/interagency/ipm/ipm_prod_eval.html#tierinreport
<http://www.govlink.org/hazwaste/publications/growSmart2006web.pdf>
- J. Owner will determine if calendar-based or “blanket” application will be allowed and if so may request that Contractor use alternate product, based on health and environmental information.
- K. All pesticides must be EPA approved and applied by a licensed Washington State Pesticide Applicator or Operator per the label directions. All applications must be posted as per WSDA regulations for 24 hours after application. All chemicals used must have a MSDS filed with Owner. Pesticide application records shall be kept in accordance with RCW 17.21, Section 100 and copies provided to owner.
- L. Contractor is responsible to verify that pesticides are appropriate for use with the respective plant materials. Contractor is responsible for any damages incurred as a result of applications and shall repair or replace any such damage at no cost to Owner.

6.4 NOXIOUS WEED CONTROL

- A. Noxious Weed Control is mandated by the King County [Noxious Weed Control Board](#) based on the state weed control law, Chapter 17.10 RCW. Assistance and weed lists (Class A, B, C, Non-designate, and Weeds of concern) are available from the King County Noxious Weed Control Program at <http://dnr.metrokc.gov/wlr/lands/weeds/>, or 206-296-0290.
- B. Contractor shall begin control of any King County Class A, B, or C Weeds upon identification. Control will follow non-chemical IPM control techniques outlined in King County’s Best Management Practices, Alerts, and other documents posted on the Noxious Weed website. Pesticide applications can only be considered as a last resort when non-chemical methods have proved ineffective. Follow the specifications listed in section 3.3 Pesticide Applications, above.
- C. All other non-designated weeds shall be controlled with ongoing IPM and healthy landscape management techniques.

LANDSCAPE MANAGEMENT TYPICAL SCHEDULE

January:

- Prune any tree branches that interfere with public safety or sight lines. Have arborist inspect all trees for recommended selective pruning for health or structure of tree trunk and branches. Do not top trees.
- Mulch mow all turf areas, once per month.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month (see endnote).
- Inspect and weed landscape beds, twice per month.

February:

- Apply slow-release granular fertilizer around trees or shrubs in late February. Make application prior to a moderate rainfall so the rain will wash the fertilizer in. Do not fertilize swale/biofiltration plantings.
- After fertilizing, add new mulch to planters where the mulch depth has been reduced to less than 2 inches (5 cm) thick. Mulch not required where shrubs or groundcover completely hide the soil surface from view.
- Install spring annual flower installations; fertilize and check irrigation.
- Review and update accent pot plantings for spring; fertilize and check irrigation.
- Mulch mow all turf areas once per month.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month.
- Inspect and weed landscape beds, twice per month.

March:

- Pre-season irrigation system check: Flush out irrigation systems as needed, run and check for proper operation of each valve zone. Test sensors (rain, soil, or weather sensors). Remove and clean WYE filter screens. Clean or replace plugged sprinkler nozzles. Replace plugged drip emitters; Replace irrigation controller program back-up batteries.
- Mulch mow all turf areas twice per month.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month.
- Inspect and weed landscape beds, twice per month.

April:

- Mulch mow all turf areas, weekly.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.
- Inspect and weed landscape beds, weekly.

May:

- Turn on irrigation system, run and visually inspect for proper zone coverage. Set ET-based, weather or soil sensor-based, or seasonal programs.
- Install summer annual flower installations; fertilize and check irrigation
- Review and update accent pot plantings for summer; fertilize and check irrigation.
- Mulch mow all turf areas, weekly.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.
- Inspect and weed landscape beds, weekly.
- Prune perennial bulbs back to ground level as soon as leaf blades yellow and wilt

June:

- Prune spring & winter-flowering shrubs as needed to maintain proper shape (natural, touching, not hedged or topiary except where specified by owner).
- Mulch mow all turf areas weekly.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.

APPENDIX C: SPECIFICATIONS

- Inspect and weed landscape beds, weekly.
- Prune perennial bulbs back to ground level as soon as leaf blades yellow and wilt.

July:

- Monitor and adjust irrigation schedule as necessary.
- Mulch mow all turf areas weekly.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.
- Inspect and weed landscape beds, weekly.
- Prune vines as needed
- Prune perennial bulbs back to ground level as soon as leaf blades yellow and wilt

August:

- Mulch mow all turf areas weekly.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.
- Inspect and weed landscape beds, weekly.
- Prune perennial bulbs and other herbaceous perennials back to ground level as soon as leaf blades yellow and wilt

September:

- Inventory all plant materials. Inventory shall include an exact count of all shrubs and trees, itemized by planter. Replace any dead or missing plants subject to the terms of these specifications.
- Install fall/winter annual flower installations; fertilize and check irrigation
- Review and update accent pot plantings for fall/winter; fertilize and check irrigation.
- Start fall leaf cleanup as needed: fallen leaves should be raked weekly (see endnote).
- Mulch mow all turf areas weekly.
- Aerate and/or top dress lawn areas, if applicable.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, weekly.
- Inspect and weed landscape beds, weekly.
- Prune perennial bulbs and other herbaceous perennials back to ground level as soon as leaf blades yellow and wilt
- Prune vines as needed

October:

- Turn off and prepare irrigation system for winter. Make sure backflow preventer is well-insulated or drained prior to first freeze. Blow out pipes using compressed air in areas where freezing could result in breakage. Drain drip irrigation lines as recommended by manufacturer. Have backflow preventer (on irrigation water supply) tested annually by approved plumbing technician.
- Continue fall leaf cleanup as needed: fallen leaves should be raked weekly.
- After the majority of fall leaves have fallen and been collected, replenish mulch to any areas of bare soil in planters.
- Mulch mow all turf areas twice per month.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month.
- Inspect and weed landscape beds, twice per month.

November:

- Continue fall leaf cleanup as needed: fallen leaves should be raked weekly.
- Mulch mow all turf areas once per month.
- Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month.
- Inspect and weed landscape beds, twice per month.

December:

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- Mulch mow all turf areas once per month.
 - Prune summer and fall-blooming shrubs as needed to maintain proper shape.
 - Clean landscape beds and adjacent pedestrian access areas of trash, leaves and/or other debris, twice per month.
 - Inspect and weed landscape beds, twice per month.

General grounds maintenance – all outdoor areas

Clean-up:

- Remove biodegradable landscape debris, including turf clippings (limited to only those times when mulch mowing is not possible), leaves, branches, annuals, dead plant material, potting soil, etc., to an approved onsite yard waste container. No biodegradable material should be disposed of in garbage to land fill sites.
- Remove all trash and other non-biodegradable debris and dispose of in an approved onsite trash or recycling container.
- Debris shall not be carried into patios, entryways or doorways.
- Mulch is to be maintained clear of building foundations and paved areas, and off utility covers.
- Sweep patios, entry walks and sidewalks.
- All trash and sticks are to be picked up from lawn areas prior to mowing.

Fall leaf removal (approx. September through November):

- Remove leaves from lawn areas to prevent heavy build-up and damage to turf by smothering. A single layer of leaves may be mulch-mowed into the turf. Thicker accumulations should be removed.
- Remove leaves from landscape beds by raking (so mulch and soil are not blown away). Collect and dispose of in an approved onsite yard waste container.
- Sweep leaves from patio at least weekly.

APPENDIX C: SPECIFICATIONS

INTEGRATED PEST (WEED, INSECT, AND DISEASE) MANAGEMENT

Definition: “Integrated Pest Management, or IPM, is an approach to pest control [weeds, insects, and diseases] that uses regular monitoring to determine if and when treatments are needed, and employs physical, mechanical, cultural, and biological tactics to keep pest numbers low enough to prevent intolerable damage or annoyance. Least-toxic chemical controls are used as a last resort.”

Daar, Olkowski & Olkowski: IPM Training Manual for Landscape Gardeners, 1992

General IPM Steps and Methods

- Prevention first: plant vigorous, pest-resistant, site-adapted varieties. Plan cultural practices to minimize pests (watering, mulching, pruning, etc.).
- Identify/know the pest (weed, etc.) life cycle.
- Set action thresholds – tolerate some damage.
- Monitor regularly (keep records of monitoring).
- When pests exceed threshold, use control method with the least non-target impact. (Try cultural, physical, or biological methods first. As a last resort, use spot applications of least toxic chemical.) Only treat when the pest is most vulnerable and its natural enemies are in their least susceptible life stage.
- Keep records of control methods and results, evaluate, and adapt cultural practices.
- Replace problem plants/designs with more pest, disease, and weed-resistant varieties

Weed Control Methods – General Guidelines:

- Crowd out weeds with dense healthy plantings, ground covers and shade canopies.
- Accept a few weeds – target the problem ones.
- Mulch beds in fall, winter, or early spring.
- Control weeds before they go to seed.
- Hoe, pull, mow, or till (mulch makes hoeing easier).
- Use flame or radiant heat weeders over pavement, cracks, fence lines, and building edges, or over mulch on rainy days (use fire precautions as per equipment labeling).
- Use barriers: newspaper or cardboard covered with mulch, root barriers for spreading plants. Landscape fabric can create problems as weeds grow through it– paper or cardboard is better.
- Don't over-fertilize – it promotes weeds and pests.
- Spot apply the least-toxic chemical (e.g. soap and vinegar-based weed killers, or cut-and-paint stems with systemic herbicides) to minimize non-weed impacts.
- If a pesticide must be used, post signs for at least 24 hours stating: area affected; date/time applied; specific pesticide used; re-entry cautions (from label); and phone number to call with questions. Always follow label for application and protection. Professional applicators (including users of “weed & feed,” or even low risk herbicides like vinegar) must be licensed by State law, see <http://agr.wa.gov/PestFert/Pesticides/> .

Weed Control for Trees, Shrubs, Vines, and Groundcovers

- Weeds in planted areas, sidewalks, curbs, gutters, or pavement shall be removed or killed weekly as the weeds emerge. Weeds shall be removed (not just killed) if they are larger than 2 inches (5 cm) in height or diameter. Dispose of weeds offsite. The cost of all weed control work shall be included in the contract price for landscape maintenance. Regular maintenance of the mulch layer will help minimize weeds in shrub and groundcover areas.
- Contractor is strongly encouraged to use Integrated Pest Management techniques for controlling weeds. Techniques include mulching, pulling, allowing plantings to grow densely and shade ground, heat and hot water controls. If herbicides must be used, choose the least toxic available and spot apply on weeds. Pre-emergent herbicides are not allowed – maintaining a thick mulch layer combined with mechanical weeding is as effective.

Weed, Insect, and Disease Control for Turf

- Weed invasion can be effectively prevented or reversed by growing dense lawn, through the above ‘Turf Care’ recommended practices. Tolerate some broad-leaved plants in lawn areas. Identify problem (invasive) weeds and target only those species.

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- Control weeds in turf by removal where practical (long-handled weed-pullers do this quickly), and remove them regularly before they go to seed. If weeds have over-run an area, spot-application of the least-toxic herbicide is permitted.
 - No broadcast herbicide or “weed-and-feed” products may be applied.
 - Moderately fertilized turf on well drained organic-rich soils rarely has serious disease problems. Correcting poor soil conditions or cultural practices (like overwatering or overfertilization) will prevent diseases.
 - Insects are rarely a problem on lawn in Seattle—the European crane fly is the only one in this area. IPM techniques of monitoring, setting tolerance levels, and least toxic control can be applied effectively. Proper fertilization and overseeding will reduce crane fly damage.