

Anderson Hall Renovation

University of Washington | DON Certificate of Approval Application | North Path Replacement and Tier 2 Tree Removal

P:\2022\22077P_UW Anderson Hall_ID_Regulatory\02_DON CoA - LPA Presentation\02_Graphic Exhibit\UWAH_CoA - Trees and N Path_Intro - 05/22/24

HISTORICAL SIGNIFICANCE | CA-B

SUMMARY OF HISTORY, SIGNIFICANCE, AND DESIGNATION

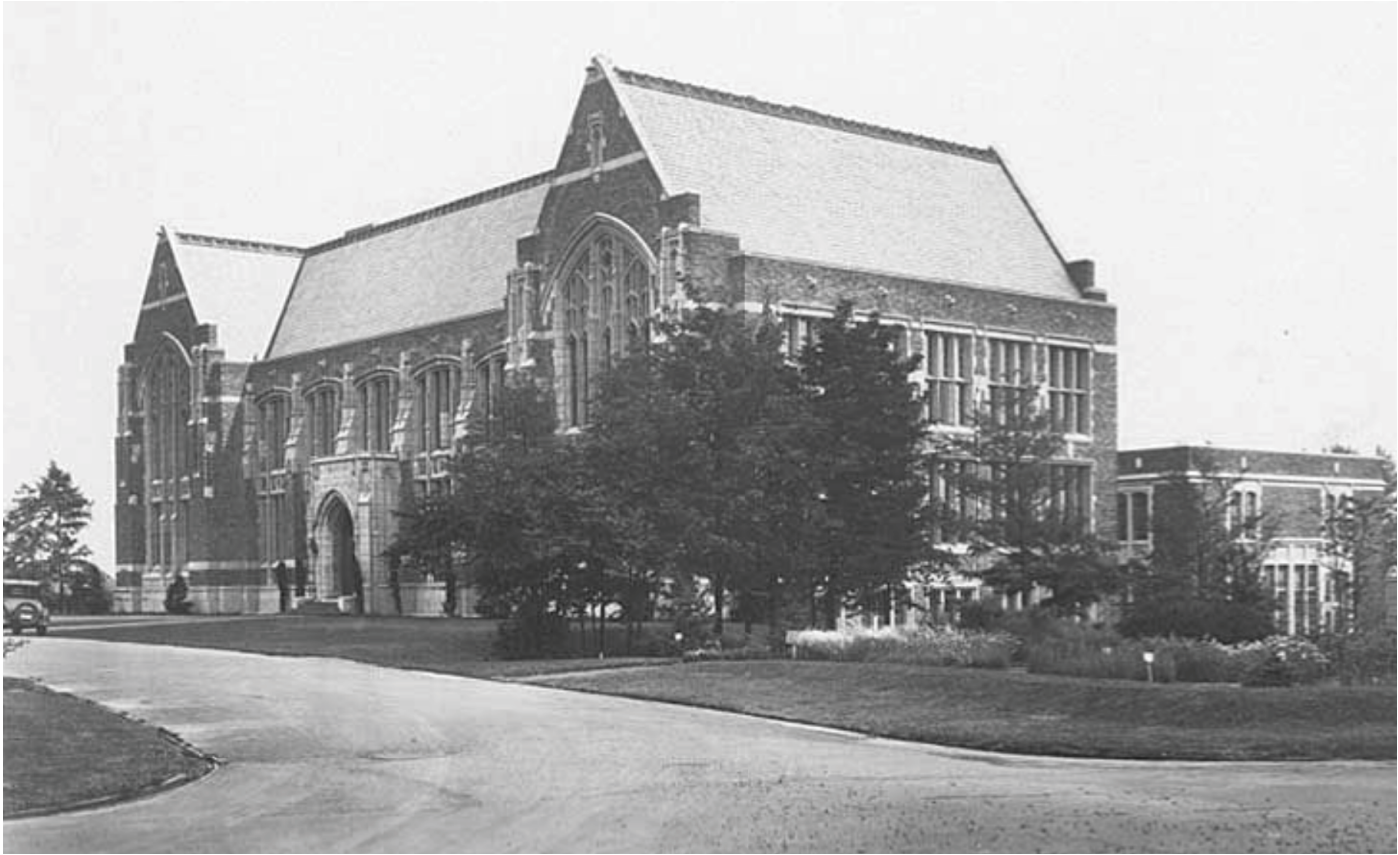
Anderson Hall was constructed in 1924-25 to house the School of Forestry. The building was made possible by a generous donation in 1923 from Agnes Healy Anderson, widow of the late lumberman and state legislator Alfred H. Anderson, for the purposes of housing the growing school. The building was designed by the architectural firm Bebb and Gould, in the Collegiate Gothic architectural style that dominated campus development through the first half of the 20th century.

Anderson Hall was locally designated a historic landmark by the Seattle Landmarks Preservation Board in May 2023. The Landmarks Preservation Board made its designation based on the building meeting the following criteria:

- It is associated in a significant way with a significant aspect of the cultural, political, or economic heritage of the community, city, state or nation.
- It embodies the distinctive visible characteristics of an architectural style, or period, or a method of construction.
- It is an outstanding work of a designer or builder.

Features and characteristics identified as contributing to the designation include:

- The site bound by W Stevens Way NE, 30 feet from the east and west building walls, and 15 feet from the south building wall into the modern-era courtyard between Anderson, Bloedel, and Winkenwerder.
- The exterior of the building, including all elevations and roof.
- Interior spaces retaining historic character including the primary entrance vestibule and corridor intersection, historic stairs in the east and west building wings, the Auditorium, and the Forest Club Room (also known as Reading Room).



North elevation, circa 1928, University of Washington Libraries Special Collections

P:\2023\22077P_UW Anderson Hall\02_Regulatory\02_DON CoJA - LPB Presentation\02_Graphic Exhibit\UWAH_CoJA - Trees and N Path_Intro - 05/22/24

HISTORIC COMPLIANCE | CA-C

The University of Washington Anderson Hall was designated a Seattle Historic Landmark in May 2023. Regulatory controls associated with this designation apply to:

- The site (as illustrated in Attachment A of the Landmarks Preservation Board Controls and Incentives Agreement).
- The exterior of the building.
- Historic interior spaces, including: the first floor main entryway and hall with vaulted ceilings, the east and west stairs from the ground floor up through the third floor (excluding the adjacent hallways), the Reading Room at the second and third floors, and the Auditorium/Lecture Hall at the second and third floors.

The Controls and Incentives Agreement further defines the building and site features subject to regulatory controls.

A Certificate of Approval, issued by the Landmarks Preservation Board, is a written authorization, much like a permit, that must be issued before any changes can be made to the designated features of Anderson Hall. When reviewing an application, the Board/ Commission uses its Landmark regulations, guidelines, and the Secretary of the Interior’s Standards for the Treatment of Historic Properties to evaluate proposed work.

A. The Design-Build team previously submitted the following Certificate of Approval Applications:

- Interior Renovation:
 - Preservation, restoration, and renovation (to meet code and programmatic requirements) within landmark designated interior spaces.
 - Seismic upgrades to building structure and work required within the building
 - Scope included in SDCI permit record # 6983948-CN and 6981621-CN
- Exterior & Site:
 - Site improvements to meet accessibility requirements and storm water code
 - Preservation and restoration of the building façade and roof
 - Seismic anchorage of façade stone and masonry elements and work required outside of the building
 - New building entry on the south façade
 - Scope included in SDCI permit record # 6983949-GR, 7003255-GR, 6983948-CN and 6981621-CN

B. After receiving DON feedback on the previous applications, the Design-Build team plans to submit the following Certificate of Approval Applications:

- North Path Replacement and Tier-2 Tree Removal (this application)
 - Replacement of north non-historic entry path
 - Removal of two exceptional trees within Landmarks Boundary
 - Scope included in SDCI permit record #6981621-CN, #6983949-GR, and #7003255-GR
- New South Entry
 - Demolition of non-historic infill
 - Addition of new accessible south entry
- Site and Exterior
 - Site improvements to meet accessibility requirements and storm water code
 - Preservation and restoration of the building façade and roof
 - Seismic anchorage of façade stone and masonry elements and work required outside of the building
 - Removal of non-exceptional trees
 - All exterior and site scope not covered in this application and the New South Entry Certificate of Approval
- Interior Rehabilitation
 - Preservation, restoration, and renovation (to meet code and programmatic requirements) within landmark designated interior spaces.
 - Seismic upgrades to building structure and work required within the building
- Removal of Forest Club Room Mezzanine (Historic Reading Room)
 - Mezzanine removal to address SDCI Life Safety concerns

HISTORIC COMPLIANCE | CA-D

THE SECRETARY OF THE INTERIOR’S STANDARDS

As a locally designated historic resource, all proposed work shall follow The Secretary of the Interior’s Standards for the Treatment of Historic Properties. Taken from the National Park Service’s Technical Preservation Services, the four treatment approaches are Preservation, Rehabilitation, Restoration, and Reconstruction.

The most appropriate treatment for Anderson Hall, based on continued use of the building for modern academic, program administration, and faculty office space, is rehabilitation. A rehabilitation approach to future repairs and alterations will prioritize retention and restoration of historic detailed features and spaces while allowing for changes necessary to function as a modern higher-education facility.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

THE SECRETARY OF THE INTERIOR’S STANDARDS FOR REHABILITATION

The Standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and the interior of historic buildings. The Standards also encompass related landscape features and the building’s site and environment, as well as attached, adjacent, or related new construction. The Standards for rehabilitation are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

PROJECT VISION AND GOALS | CA-E

PROJECT VISION

The Anderson Hall Renovation will celebrate the building’s historic significance while embodying the collaborative and innovative spirit of the School of Environmental and Forest Sciences. This will be achieved by maximizing programmatic improvements within the limitations of the available budget, balancing program and infrastructure needs (including accessibility upgrades and targeted seismic and system upgrades as able).

PROJECT GOALS

- 1. To provide welcoming and inclusive spaces enabling the brightest minds in science to work across disciplinary boundaries
- 2. To modernize classroom and office space, supporting impactful research cultivating a sense of community
- 3. To create flexible learning environments that promote innovation, engineering, and analysis in support of forest-dependent industries and culturally significant uses by Western and Indigenous populations
- 4. To respectfully, thoughtfully, and strategically renovate this historic building
- 5. To strategically reinvigorate the courtyard between Anderson Hall, Winkenwerder Hall & Bloedel Hall



Modern-day Anderson Hall, north elevation

P:\2022\22077P_UW Anderson Hall\02_Regulatory\02_DON CoFA - LPA Presentation\02_Graphic Exhibit\UWAH_CoFA - Trees and N Path_Intro - 05/22/24

PROPOSED SCOPE OF WORK | CA-F

SDCI PERMIT INFORMATION

This project will rehabilitate, seismically upgrade, and modernize Anderson Hall, a landmark building located on the University of Washington’s Seattle campus. The building will continue to function as higher education (Business and Assembly occupancies); no change in use is proposed. In addition to building infrastructure upgrades, spaces will be reconfigured to meet programming requirements. This rehabilitation project plans to attain LEED Silver certification.

This substantial alteration project is being submitted to the Seattle Department of Construction and Inspections in a phased manner as follows:

- #6983949-GR – Grading
 - Scope Description: Work for proposed storm water, sewer, and utilities connections to support building renovation and site improvements. Includes storm water code compliance for new and replaced hard surfaces and a new connection to a City of Seattle Storm main.
- #7003255-GR – Grading
 - Scope Description: Work for proposed storm water, sewer, and utilities connections to support building renovation and site improvements. Includes storm water code compliance for new and replaced hard surfaces and a new connection to a City of Seattle Storm main.
- #6983948-CN – Structure + Life Safety
 - Scope Description: Work for building structure improvements and fire, and life safety improvements in compliance to Seattle Building Code 2018. Includes masonry and stone anchorage, seismic upgrades to the building structure, and work to support building renovations.
- #6981621-CN – Building + Site Improvements
 - Scope Description: Interior renovation within historic landmark designated spaces and non-historic spaces to meet programmatic needs and code requirements. Site improvements to meet accessibility and programmatic needs.

Future packages: balance of work.

PROPOSED ALTERATIONS

This Certificate of Approval application is focused on two site improvements within the Landmarks Boundary.

1. NORTH PATH REPLACEMENT details our proposal to salvage and reinstall the non-historic north entry path as well as replace the non-historic handrails.
2. TIER 2 TREE REMOVAL explains the removal of two exceptional trees adjacent to the building.

All other proposed work within the Landmarks Boundary or within designated historic spaces will be included in future Certificate of Approval applications.

Anderson Hall Renovation

University of Washington | North Path Replacement and Tier 2 Tree Removal - Graphic Exhibit

P:\2023\22077P_UW Anderson Hall\0_Regulatory\012_DON Co\A - LPA Presentation\02_Graphic Exhibit\UW AH_Co\A - Trees and N Path_TOC - 05/22/24

TABLE OF CONTENTS

CA-01	Site - Historic Chronology
CA-02	Site - Historic Site Photos
CA-03	Site - Existing Conditions
CA-04	North Path - Historic Images
CA-05	North Path - Existing Conditions
CA-06	North Path - Proposed
CA-07	North Path - Details
CA-09	Trees & Plantings - Existing Conditions
CA-10	Tier 2 Tree Removal - Proposed
CA-13	Appendix

SITE | HISTORIC CHRONOLOGY | CA-01

1921 1925

1963

1971

2024

ANDERSON HALL
CONSTRUCTED

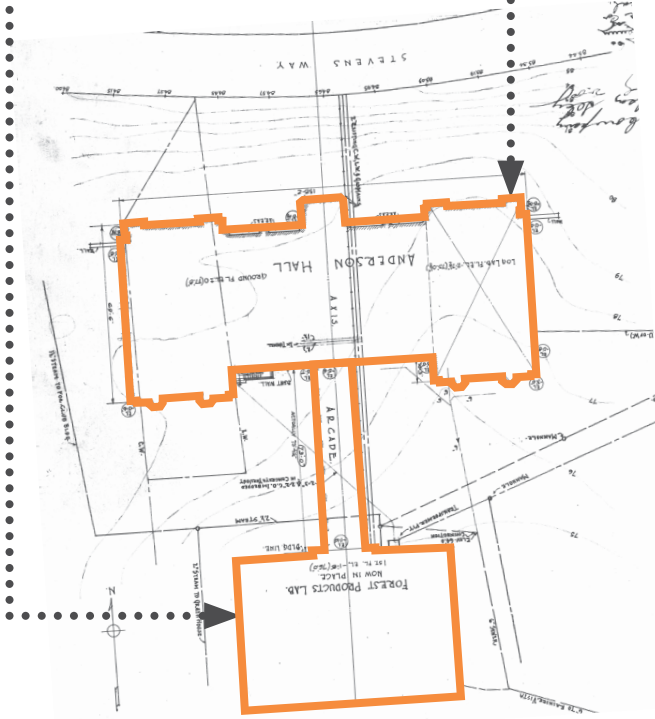
FOREST PRODUCTS LABORATORY
CONSTRUCTED

FOREST PRODUCTS LABORATORY &
ARCADE CONNECTING TO ANDERSON
HALL DEMOLISHED

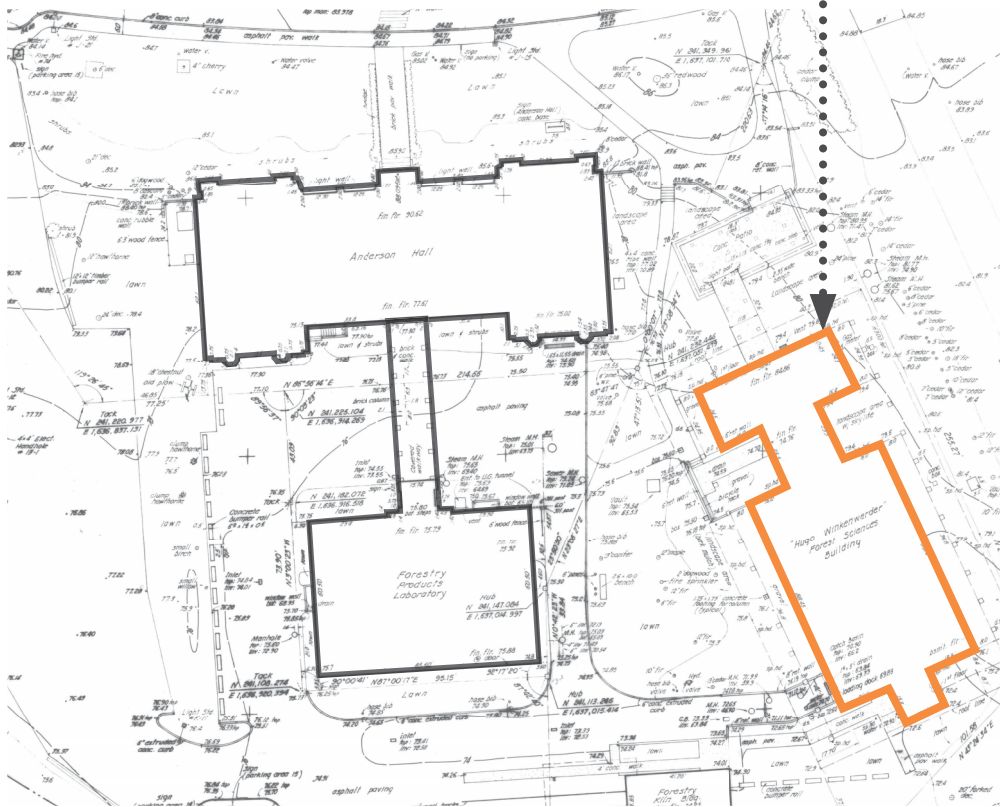
ANDERSON HALL EGRESS MODIFICATIONS:
X HISTORIC SOUTH ENTRANCE AND LOG
LABORATORY ENTRANCE SEALED
3 NEW EGRESS DOORS TO SOUTH
COURTYARD AND EAST WALKWAY ADDED

BLOEDEL HALL AND SOUTH
COURTYARD CONSTRUCTED

WINKENWERDER HALL
CONSTRUCTED



1924 PROPOSED BUILDING PLAN
NO KNOWN ORIGINAL SITE PLAN



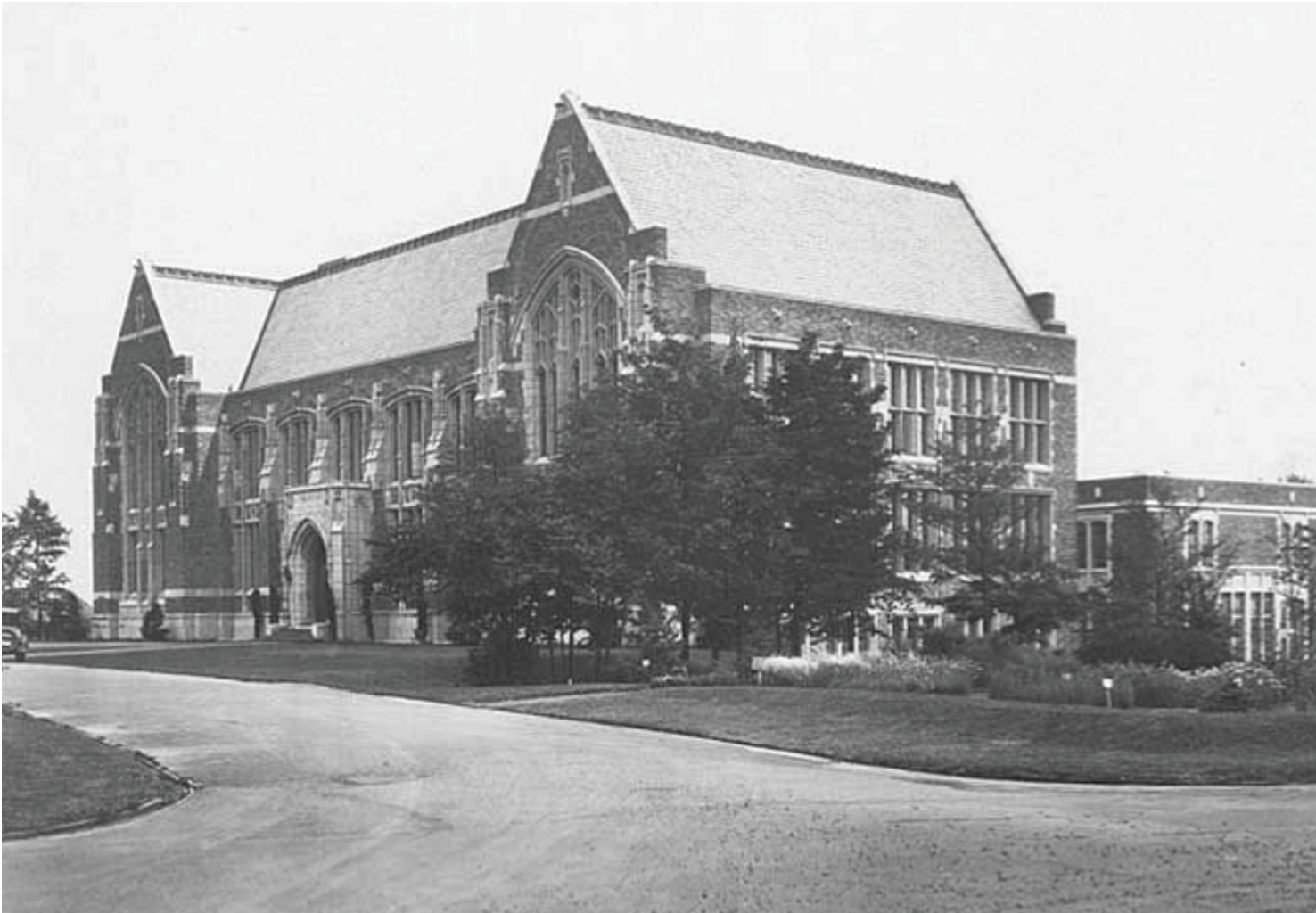
1968 EXISTING PLAN



1971 EXISTING PLAN

SITE | HISTORIC PHOTOS | CA-02

P:\2021\22077P_UW Anderson Hall\02_Regulatory\012_DON CoJA - LPB Presentation\02_Graphic Exhibit\UWAH_CoJA - N Path_Ex - 05\22\24



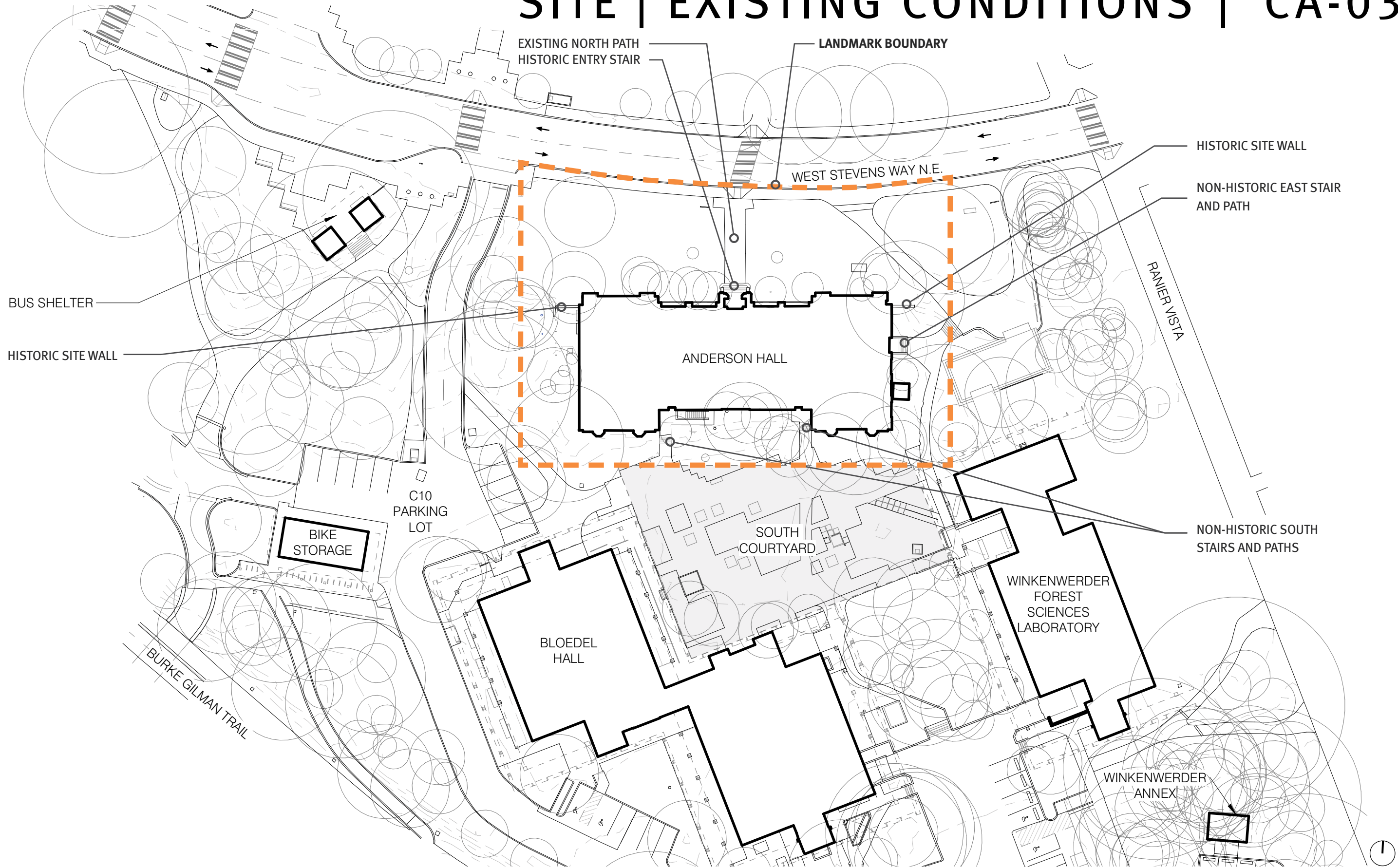
North & west elevation, c. 1928, University of Washington Libraries Special Collections



South & west elevations, c. 1940-1950, University of Washington Libraries Special Collections

P:\2021\22077P_UW Anderson Hall\02_Regulatory\02_DON CoFA - LPB Presentation\02_Graphic Exhibit\UWAH_CoFA - N Path_Ex - 05/22/24

SITE | EXISTING CONDITIONS | CA-03



NORTH PATH | HISTORIC IMAGES | CA-04



Colorized postcard, circa 1927, University of Washington Libraries Special Collections

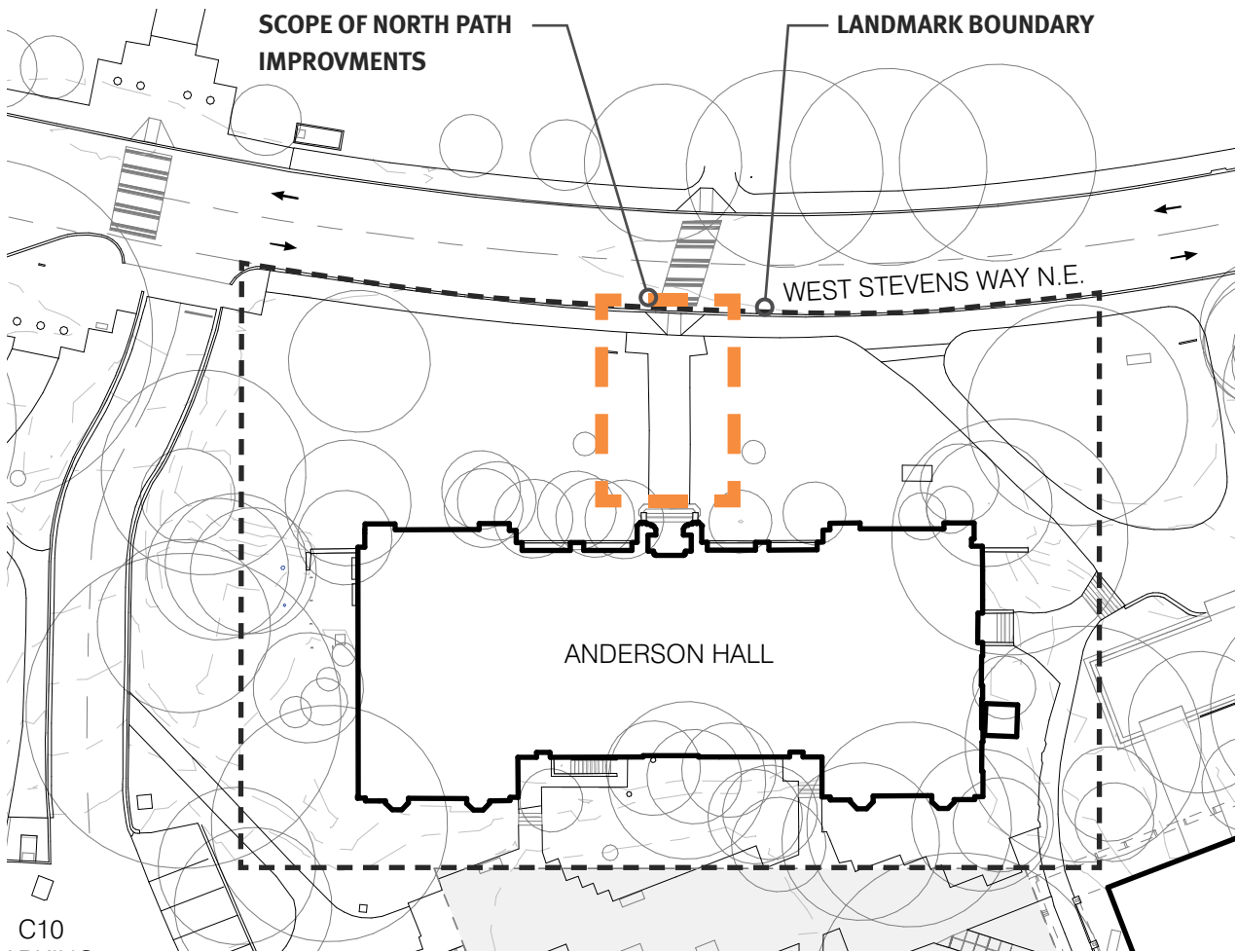


North entry, no date, University of Washington Libraries Special Collections

HISTORY OF THE PATH

Anderson Hall was built in 1925. The brick steps leading into the north entry were part of the original construction. Though a path to W. Stevens Way was included north of these steps originally, no pathway material or construction drawings were included in the 1925 drawings. The herringbone pattern brick path was likely constructed between 1964 - 1967, per the Landmark Designation Report. There is no documentation that details the installation of the stair handrail.

NORTH PATH | EXISTING CONDITION | CA-05



North elevation, entry walkway, and landscaping

EXISTING CONDITION OF THE PATH

The existing non-historic brick path is suffering deteriorating mortar, uneven surfaces, and is placed directly on grade. The path does not meet modern safety and accessibility criteria, as it does not meet requirements for slip resistance.

The condition is prohibiting maintenance vehicles and equipment from crossing the path without causing further damage. Replacement of the north path above a reinforced concrete base will provide an even walking surface for the safety of all users, allow for maintenance vehicles and equipment, and include accessibility improvements at the sidewalk and north entry stair through handrails.



Uneven surfaces at handrail and pathway



Non-historic painted metal handrail

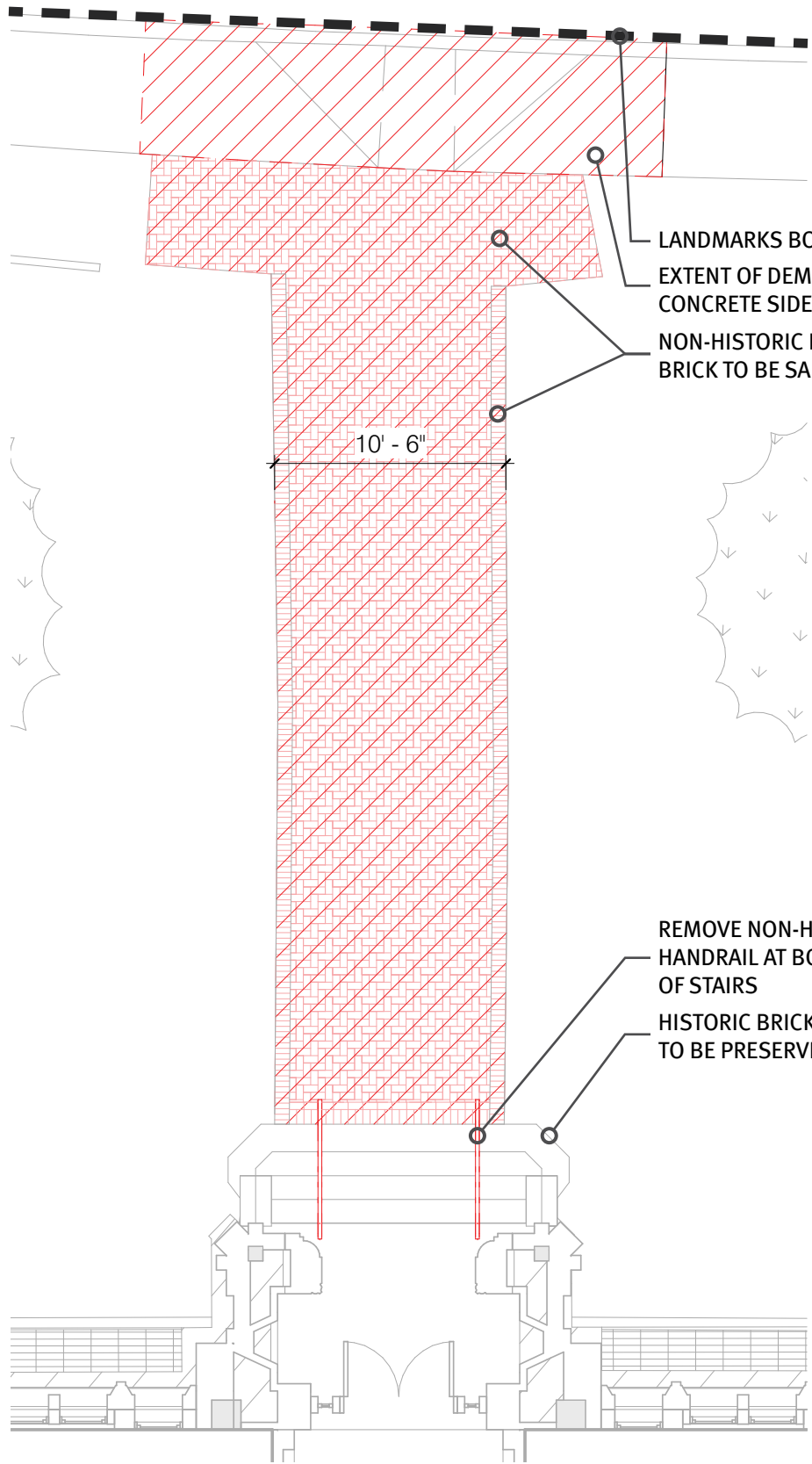
NORTH PATH | PROPOSED | CA-06

PROPOSED SCOPE OF WORK

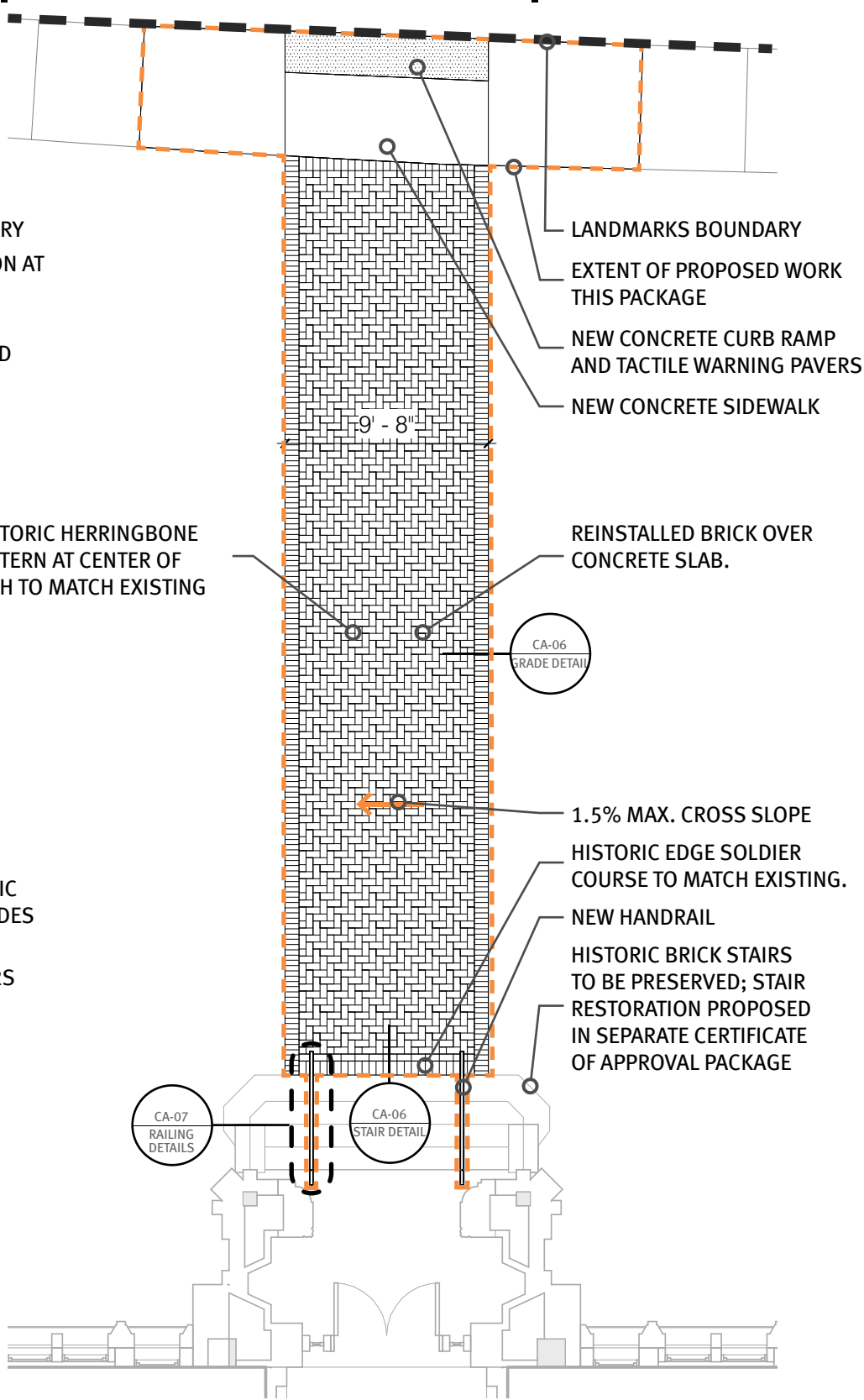
- Protect historic entry stair during path demolition
- Deconstruct, salvage, and store existing brick pavers for reinstallation
- Construct new path from historic entry stair to sidewalk with salvaged bricks reinstalled over a concrete base.
- Reconstruct adjoining sidewalk with new concrete curb ramp and tactile warning pavers
- Install new code-compliant metal handrails at historic entry stair in existing locations

Salvaged bricks will be reinstalled matching the existing pattern and mortar color. Salvaged brick will be cleaned (see specification in Appendix) and a mock up will be provided to show pattern and mortar match. The need for new bricks is not anticipated, but if required, will be included in the mock up to ensure a match. Mock up review and approval by the Landmarks coordinator will be required prior to proceeding with work.

The width of the path will be reduced to prevent additional Civil storm water interventions and to allow for landscape plantings to be adjacent to the path (to be submitted in a later Certificate of Approval application).



NORTH PATH - DEMOLITION PLAN

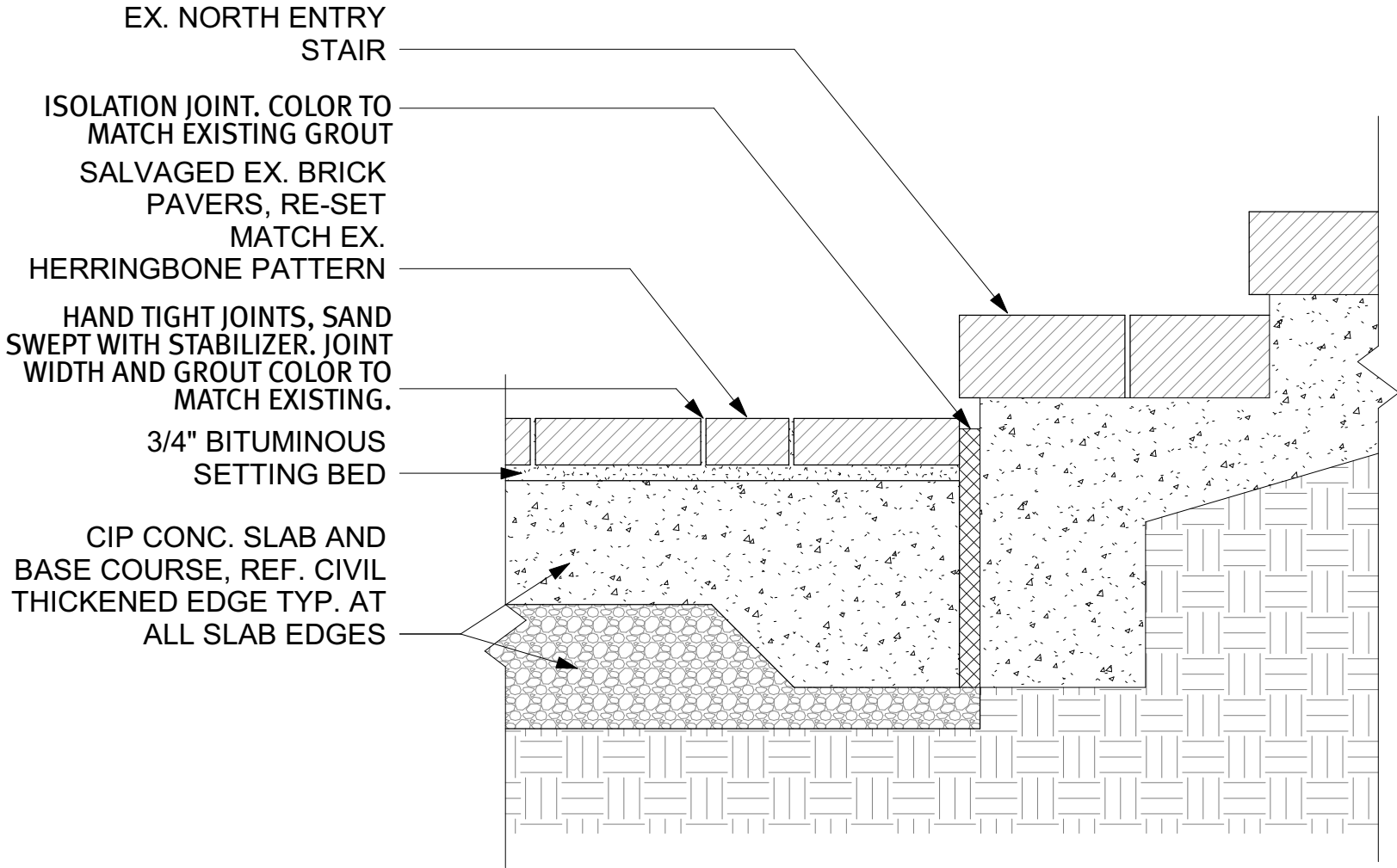


NORTH PATH - PROPOSED PLAN

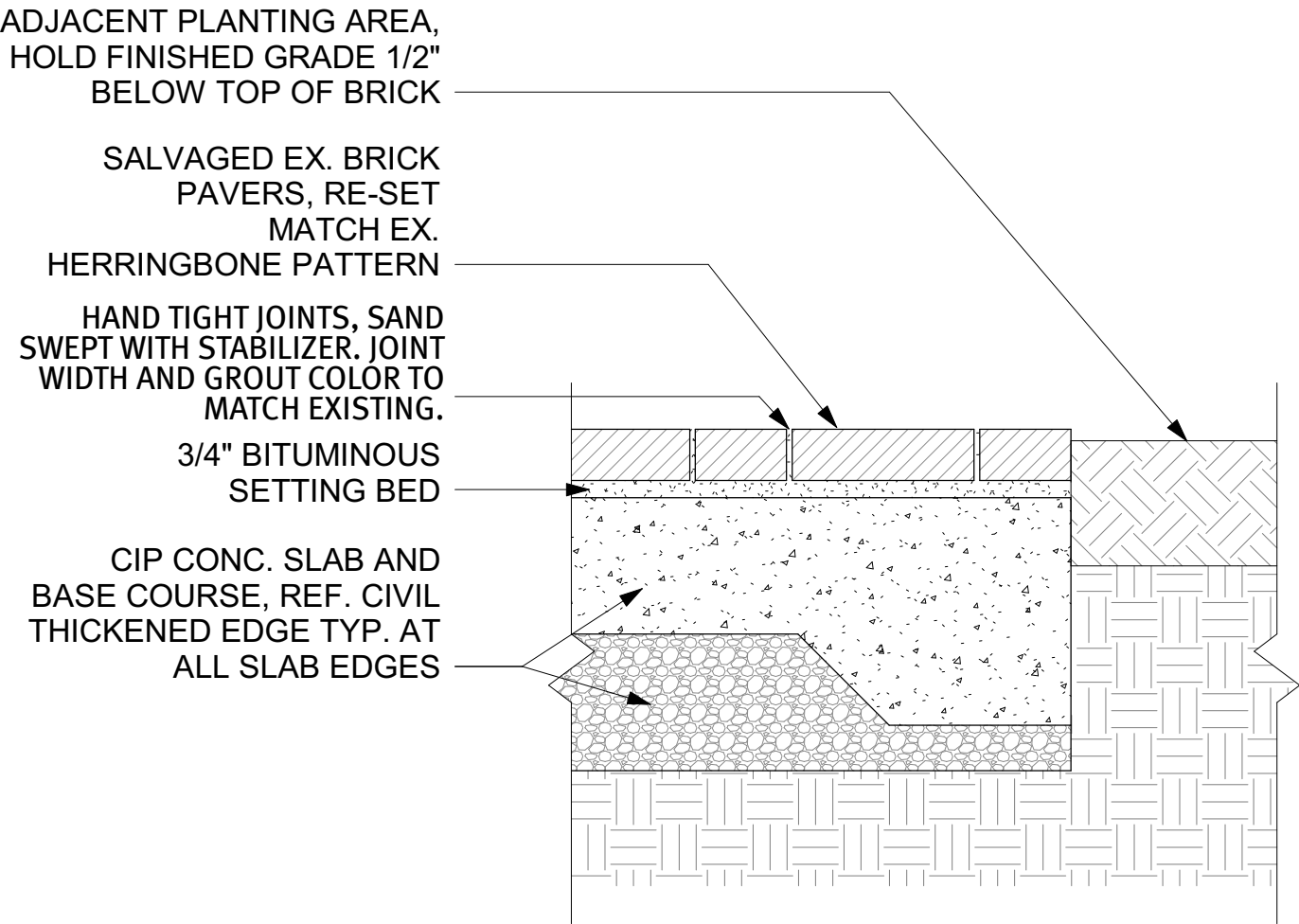
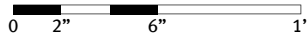
P:\2021\22077P_UW Anderson Hall\02_Regulatory\02_DON CoJA - LPB Presentation\02_Graphic Exhibit\UWAH_CoJA - N Path_Ex - 05/22/24

NORTH PATH | PROPOSED | CA-07

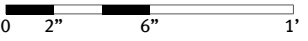
PROPOSED PATHWAY DETAILS



BRICK PATH AT HISTORIC STAIR



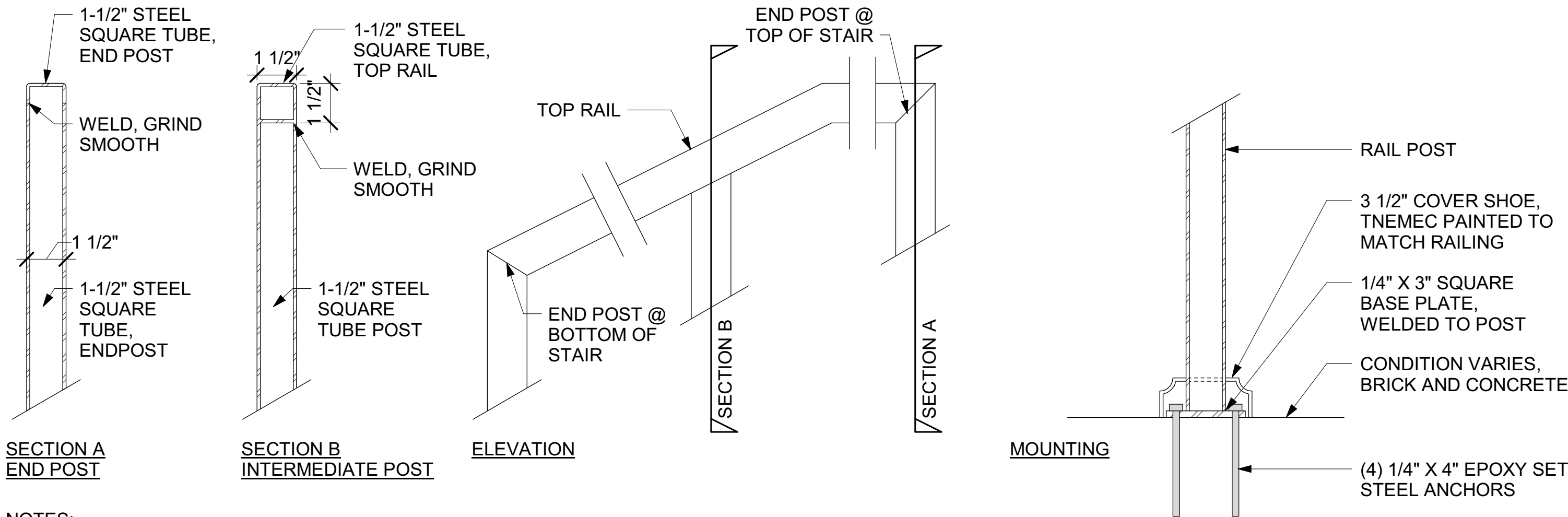
BRICK PATH AT PLANTING



P:\2021\22077P_UW Anderson Hall\02_Regulatory\012_DON CoJA - LPB Presentation\02_Graphic Exhibit\UWAH_CoJA - N Path_Ex - 05/22/24

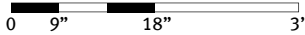
NORTH PATH | PROPOSED | CA-08

PROPOSED RAILING DETAILS



- NOTES:
1. PAINTED STEEL, TNEMEC COATED
 2. TNEMEC COLOR TO BE DARK BRONZE 72 MT (RGB 61,75,6)
SEE PROPOSED MATERIALS AND FINISHES ON CA-15 FOR SAMPLE IMAGE.

HANDRAIL DETAILS



TREES & PLANTINGS | EXISTING CONDITIONS | CA-09

P:\2021\22077P_UW Anderson Hall\ID_Regulatory\012_DON Co\A - LPB Presentation\02_Graphic\Exhibit\UW AH_Co\A - Trees_Ex - 05/22/24



North elevation facing W Stevens Way



South elevation facing south courtyard

EXISTING VEGETATION

Plantings and trees are overgrown throughout the site, and much of the vegetation is growing directly against the face of the building. Vegetation in contact with the facade creates moisture and restricts air circulation necessary for the longterm health of the enclosure. The close proximity of vegetation may also impact the building foundation.



West elevation and path



Southeast corner

PL1202122077P_UWAnderson HallID_Regulatory012_DON CoJA -LP8 Presentation102_GraphicExhibitUW AH_CoJA -Trees_Ex-05/22/24

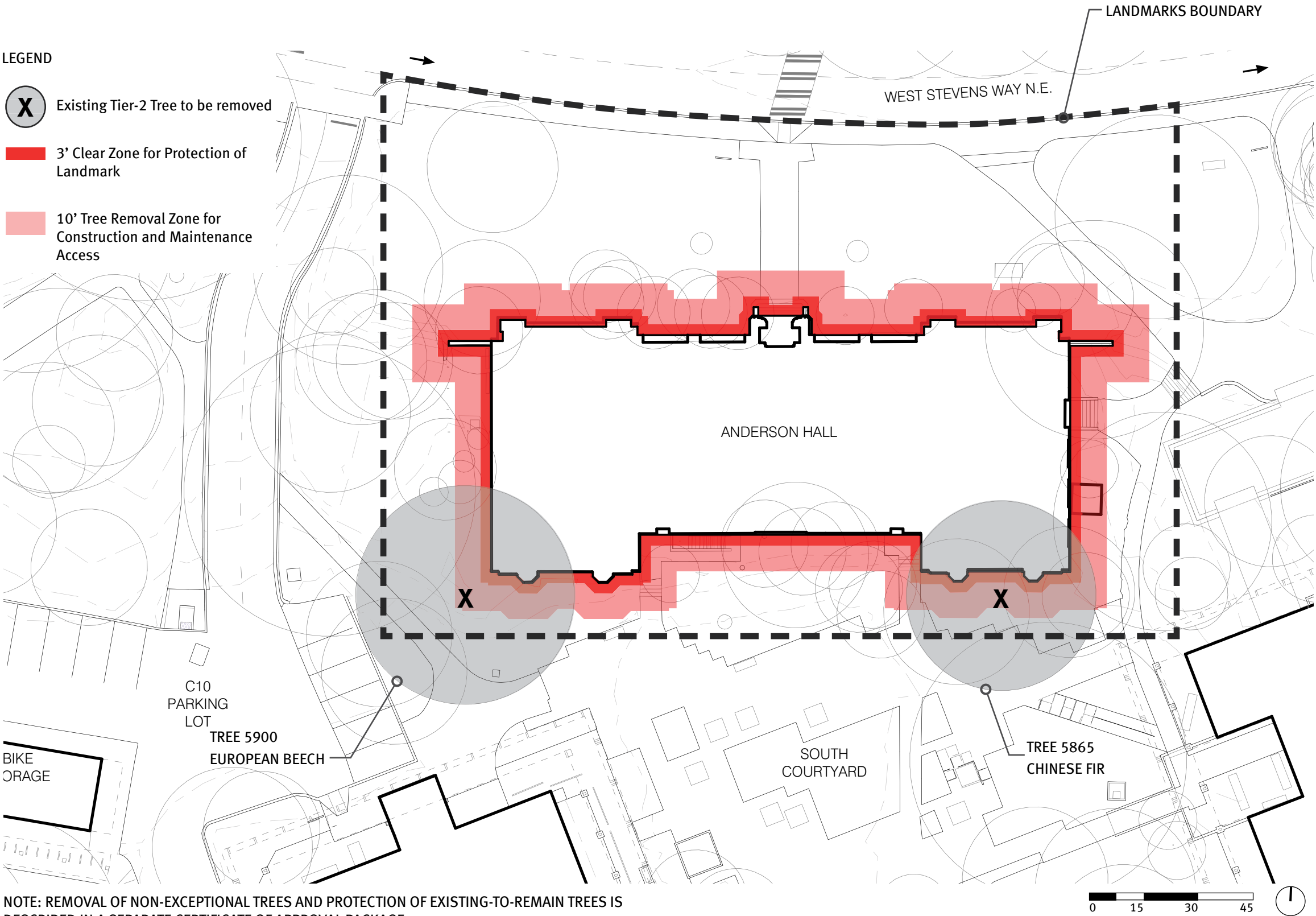
TIER 2 TREE REMOVAL | PROPOSED | CA-10

EXISTING TREE + PLANTING REMOVAL STRATEGY

Removal of existing trees and plantings within a 10' zone surrounding Anderson Hall is required to meet logistical needs and access to the building during construction. Removal of this material will allow for essential restoration work to occur to maintain the long term health of the building.

After renovation work on Anderson Hall is complete, a 3' planting offset zone will need to be maintained around the edges of the building to protect the health of the building. Existing trees that remain with canopies that currently impact the building will be pruned to keep branches outside of this zone, and may also require root pruning and the installation of root barrier. No new plantings or trees will infringe on this 3' zone.

Two Tier-2 trees are being considered for removal by the design team for preservation of the historic facade, for maintenance access, and to accomodate new accessible pathways. Four significant trees near or within this 10' zone are being considered by the design team for preservation. Feasibility of retaining these trees is being coordinated with a certified Arborist and UW Process Partners. Four additional trees within the site boundary but outside of this 10' zone are also being considered for preservation, but may be impacted by other site improvements, such as re-grading for accessible pathways.



TIER 2 TREE REMOVAL | CA-11



TREE 5865 - CHINESE FIR RATIONALE FOR REMOVAL:

- Tree is within 3' of the façade and has branches in contact with building windows; roots are a potential foundation risk
- Pruning for façade longevity and safe maintenance access is not feasible and would require most of the tree to be removed per arborist input

TIER 2 TREE REMOVAL | CA-12



TREE 5900 - EUROPEAN BEECH RATIONALE FOR REMOVAL:

- Tree is within 10’ of the façade and impedes safe maintenance access
- Pruning tree back 5’ or more from the façade would jeopardize the tree’s health per arborist input
- Beech tree nuts currently create a seasonal maintenance and accessibility issue, creating a “carpet” of nuts at the proposed accessible path

Anderson Hall Renovation

University of Washington | North Path Replacement and Tier 2 Tree Removal - Appendix

TABLE OF CONTENTS

CA-15	Proposed Materials and Finishes
CA-16	Arborist Report
CA-36	024296 FL - Historic Removal and Dismantling
CA-42	040310 FL - Historic Masonry Cleaning
CA-47	040322 FL - Historic Brick Unit Masonry Repair
CA-58	040323 FL - Historic Brick Unit Masonry Repointing

PROPOSED MATERIALS & FINISHES | CA-15

MATERIALS AND SPECIFICATIONS

See the specifications on the following pages for the process of brick salvage and cleaning protocols before re-installation. Visible mortar color will match existing at historic north brick entry steps.

See handrail details on CA-08.



Historic north entry with brick stairs to be preserved. Non-historic railing to be removed and replaced.



Non-historic brick pathway to be dismantled, salvaged, and re-installed. The original herringbone pattern with soldier course edge to be recreated. No new brick anticipated to be introduced as part of this rehabilitation project.



Sample photo for proposed paint color for railings. Exact color and finish to be coordinated with existing historic metal finishes.

Temec
Dark Bronze
72MT
RGB: 61 75 66

Preliminary Arborist Report

To: Lease Crutcher Lewis c/o Duncan Howard
Site: UW Anderson Hall
Re: Development Tree Inventory and Assessment
Date: August 22, 2023
Project Arborist: Charlie Vogelheim
ISA Certified Arborist PN-9375A
ISA Qualified Tree Risk Assessor
George White
ISA Certified Arborist PN-8908A
ISA Qualified Tree Risk Assessor
References: Memorandum – *Cladrastis kentukea* Advanced Assessment. Tree Solutions Inc. 12/1/2024
Attached: Table of Trees
Tree Site Map

Summary

I inventoried, tagged and assessed 161 trees¹ within the project boundaries

There were several tree groves² on-site. Trees 12 inches or greater comprising a tree grove are regulated as tier 2 trees.

Of the trees on-site, 73 met the criteria of tier 2. This includes both trees in tree groves as well as trees large enough to qualify per the definition in Seattle Director's Rule 07-2023.

I have not reviewed final plans for tree retention feasibility.

If these plans are approved, 37 trees will be removed. Of these removals, 10 are tier 2 trees.

All other trees will require tree protection measures.

¹ Trees with diameter at standard height (DSH) ≥6"

² Tree grove is eight or more trees each with a DSH of ≥12 inches with continuously overlapping canopies (SMC 25.11.130), excluding certain species and trees growing entirely in "the public place", also known as the right-of-way.

Assignment and Scope of Work

This report documents the visit by Charlie Vogelheim of Tree Solutions Inc. on July 26, 2023 and February 22, 2024 to the above referenced site. We were asked to complete a tree inventory and assessment by Lease Crutcher Lewis in preparation for site development.

Observations

Site

The site is located on the main campus of the UW in the city of Seattle. Three higher education buildings currently exist on-site. The site also contains small, paved parking areas, landscape beds, natural landscape areas, and some areas of lawn.

The site is zoned as a major institution (MIO-37-LR1) and is generally governed by the University of Washington Master Plan.

According to the Seattle Department of Construction and Inspections GIS map, there are no environmentally critical areas onsite.

Trees

We inventoried and assessed 161 trees on-site, 144 of which are greater than or equal to 6-inches DSH. Seventeen trees are less than 6-inches DSH and were inventoried because they are located on the UW tree inventory map; these trees are included for informational purposes.

Of the regulated trees we assessed, 75 met the Tier 2 tree criteria laid out in Director's Rule 7-2023.

Several trees were growing within 10 feet of Anderson Hall or retaining walls attached to the building structure including trees 5860, 5861, 5864, 5865, 5868, 5869, 5874, 5900, 5917, 5918, 5919, 5920, 5921, O, Q, and U. These trees likely have roots in contact with the foundation structure and may be impacted if the adjacent building foundation or retaining walls are removed, altered, or replaced.

Tree 5911 is an American yellowwood tree (*Cladastris kenkukea*) that had a large wound from a codominant stem failure on the southwestern side. This tree was tested with a microresistance drill to see if decay from the wound had spread and was impacting the stability of the tree. Tests suggested decay was only present at the wound site and had not spread (Memorandum – *Cladrastis kentukea* Advanced Assessment. Tree Solutions Inc. 12/1/2024)

Several trees inventoried on the southern side of the project area were adjacent to a parking lot that appeared to have recently been paved in the past few years. The trees were mostly in good/excellent health condition, however it is possible that the recent repaving had impacted roots of adjacent trees and they may not yet be showing signs of stress from these impacts.

Due to the age of the two buildings on-site many of the surrounding trees are mature with large overlapping canopies. There were four groves onsite, one was on the western side of Anderson Hall in the natural space across from Garfield Lane. Another was directly east of Anderson Hall and included a line of several Lawson cypress (*Chamaecyparis lawsoniana*). And there were two groves on the southern side of the project site.

We have attached an annotated aerial photograph of the site to serve as the site map and a table of trees that has detailed information about each tree.

Municipal Regulations

Tree Removal

Private Property Trees (SDCI)

Seattle Municipal Code classifies privately-owned trees under a four-tiered system, which are regulated by Seattle Department of Construction and Inspections (SDCI) based on size and species. This includes trees located in parks and managed by public entities. It does not include trees managed by Seattle Department of Transportation (SDOT).

Table 1. Tree Classifications (SMC 25.11.050)

Tree category	Definitions	During development – Related to SDCI permit	Not part of a SDCI permit application
Tier 1	Includes <ul style="list-style-type: none">heritage trees	May not be removed unless deemed hazardous or in need of emergency action*.	May not be removed unless deemed hazardous or in need of emergency action*.
Tier 2	Includes <ul style="list-style-type: none">trees ≥ 24 in DSHtrees in grovestrees < 24" for tree species listed in Director's Rule 07-2023	May be approved for removal as part of overall development permit.	May not be removed unless deemed hazardous or in need of emergency action.
Tier 3	Includes <ul style="list-style-type: none">all other trees ≥ 12" DSH not considered Tier 2 trees	May be approved for removal as part of the overall development permit.	May not be removed unless deemed hazardous or in need of emergency action.
Tier 4	Includes <ul style="list-style-type: none">all other trees > 6" DSH	May be approved for removal as part of the overall development permit.	May not be removed unless deemed hazardous or in need of emergency action.

*Documentation is required for all hazardous and emergency removals.

A basic tree protection area (BTPA) for trees regulated by SDCI is calculated using a radius that is equal to one foot for every inch DSH of a tree (SMC 25.11.060). The BTPA is used to determine if a tier 2 tree is allowed to be removed based on the conditions in SMC 25.11.070.

Tree Protection

Private Property Trees (SDCI)

A tree protection area (TPA) is required for all tier 1, 2, and 3 trees that are proposed for retention. This is a protection zone surrounding a tree where excavation, access and material storage cannot occur (SMC 25.11.030). Tree protection areas are also required for trees (tier 1, 2, 3) growing adjacent to the project with canopies and/or roots extending into the project area. TPAs are determined using a multiplier of trunk diameter based on the International Society of Arboriculture's Best Management Practices Managing Trees During Site Development and Construction Third Edition.

BTPAs and TPAs are listed in the attached table of trees.

Tree protection measures (see Appendix F) should be implemented during construction and are intended to help maintain soil integrity (reduce soil compaction), limit root loss, protect overhead canopy, and maintain tree health. These measures can include (but are not limited to) mulching, temporary irrigation, soil protection, construction monitoring by the project arborist and tree protection fencing. The location of tree protection fencing should be along the edges of the TPA. Once in place, the fence should not be moved unless the project arborist is present.

Tree Replacement Requirements

Private Property Trees (SDCI)

On private property, a minimum of one tree replacement must be planted for each tier 1, 2 and 3 tree removed (SMC 25.11.090). Replacement tree species must have a mature canopy that is proportional to the one removed. If on-site replanting is not feasible, the applicant may make a payment in-lieu.

Maintenance and monitoring of all replacement trees is required for five years after planting. Maintenance and monitoring include sufficient action to ensure survival of replacement trees, replacement of failed trees, photographic documentation of planting success retained for the five-year period after planting (SMC 25.11.090.B).

Table 2. Replanting Requirements / Payment In-Lieu

Tree category*	Replacement Qty	Replacement Requirements**		Payment In-Lieu Amount***
Tier 1, Tier 2 which are $\geq 24"$ DSH	1	5-yr maintenance & monitoring period <ul style="list-style-type: none"> 80% survival is required if 2 or more replacement trees are required. 100% survival is required if only 1 replacement is required. 	OR	\$17.87 / in ² of tree removed, not less than \$8,080
Tier 1, Tier 2 which are $< 24"$ DSH	1	5-yr maintenance & monitoring period <ul style="list-style-type: none"> 80% survival is required if 2 or more replacement trees are required. 100% survival is required if only 1 replacement is required. 	OR	\$8,080 per tree
Tier 3	1	5-yr maintenance & monitoring period <ul style="list-style-type: none"> 80% survival is required if 2 or more replacement trees are required. 100% survival is required if only 1 replacement is required. 	OR	\$2,833 per tree
Tier 4	0			none

* Classification based on definitions in Seattle Municipal Code (SMC) 25.11.050 and Director's Rule 7-2023

** Tree Replacement based on requirements outlined in SMC 25.11.090, Director's Rule 8-2023, and Executive Order 2023-03.

***Payment In-Lieu fees are defined in Director's Rule 8-2023.

Discussion – Construction Impacts

Proposed Plans

This report is preliminary as we have not reviewed design or construction plans for this area.

The project team has informed me that the façade of Anderson Hall will need to be clear of branches and vegetation for improvements, and that several trees will need to be removed.

Removals

If plans are permitted, 37 trees will require removal. Of these, 10 are designated as tier 2.

Table 3. Tree Replacement Summary (SDCI / Private Property)

Classification	Removal Qty	Replacement Qty Required*		Payment In-Lieu Amount
Tier 2 ≥ 24" DSH	2	2	OR	\$17.87 / in removed**
Tier 2 < 24" DSH	8	8	OR	\$8,080 per tree
Tier 3	11	11	OR	\$2,833 per tree
Tier 4	14	0		
Tree total:	37	21		

*Must be a tree with proportional canopy cover at maturity.

** Fee cannot be less than \$8,080 per tree.

Recommendations

Planning Phase

- Provide Tree Solutions Inc. with a full plan set (including demolition, grading, excavation, and landscape) so we can assess tree retention feasibility. These plans are needed prior to finalization of this report.
- Follow all requirements outlined in SMC 25.11.060³ for site planning.
- Include tree IDs, BTPAs, TPAs, and an 'X' over tree removals on Tree Protection Plan, TESC or TVSPP.
- Add tree protection specifications to all permitting drawings and construction plans.
- Add callouts / notes to plan set that specify monitoring by project arborist within the TPA of retained trees.

Construction Phase

- Have the project arborist present at pre-construction meeting on site to discuss tree protection.
- Maintain fencing and signage at edge of tree protection area for the duration of the project.
- Mulch trees BEFORE construction.
- Irrigate trees DURING and AFTER construction.

³ Seattle Municipal Code 25.11.060. Requirements for Trees when Development is Proposed

- Hire a Registered SDCI Tree Service Provider to perform all pruning, which should follow the methods outlined in ANSI A300 standards.⁴

Post-Construction

- Plant tree replacements.
- Maintain and water replacement trees for a minimum of five years. Replace failed plantings.
- Maintain photographic documentation of planting for the duration of the five-year period and be prepared to submit to SDCI upon request.

Respectfully submitted,

Charlie Vogelheim,
Consulting Arborist

⁴ Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Appendix A Glossary

ANSI A300: Standards for Tree Care. American National Standards Institute (ANSI).

Diameter at Standard height (DSH): diameter of the tree trunk measured 54 inches (4.5 feet) above grade. (SMC 25.11.130)

Dripline: an area encircling the base of a tree, the minimum extent of which is delineated by a vertical line extending from the outer limit of a tree's branch tips down to the ground. The dripline may be irregular in shape to reflect the variation in branch outer limits. (SMC 25.11.130)

Feeder Root Zone: an area encircling the base of a tree equal to twice the diameter of the dripline (SMC 25.11.130)

Interior Critical Root Zone (ICRZ): inner critical root zone radius equals $\frac{1}{2}$ of the dripline radius no work may occur within a SDOT street tree's inner critical root zone without specific authorization from SDOT Urban Forestry. If more than 30 percent of the dripline area is impacted by construction activities, a site review by SDOT Urban Forestry is required. All areas to be impacted by construction activities must be shown on the plan and reviewed prior to construction. (Standard Plan 133)

ISA: International Society of Arboriculture

Regulated Tree: A tree required by municipal code to be identified in an arborist report (SMC 25.11.130).

Tier 1 tree: A heritage tree. A heritage tree is a tree or group of trees as defined in Title 15 (SMC 25.11.130)

Tier 2 tree: Any tree that is 24 inches in diameter at standard height or greater, tree groves, each tree comprising a tree grove, and specific tree species below 24 inches in diameter at standard height as provided by Director's Rule 7-2023 "Designation of Tier 2 Trees". (SMC 25.11.130)

Tier 3 tree: Any tree that is 12 inches in diameter at standard height or greater but less than 24 inches in diameter at standard height and is not defined as a Tier 1 or Tier 2 tree. (SMC 25.11.130)

Tier 4 tree: Any tree that is 6 inches or greater in diameter at standard height but less than 12 inches in diameter at standard height and is not defined as a Tier 1 or Tier 2 tree. (SMC 25.11.130)

Tree Protection Area (TPA): the area surrounding a tree defined by a specified distance, in which excavation and other construction-related activities must be avoided unless approved by the (SDCI) Director. The TPA is variable depending on species, age and health of the tree, soil conditions, and proposed construction. (SMC 25.11.130)

Tree Protection Area, Basic (BTPA): the area surrounding a tree defined by a specified distance, in which excavation and other construction-related activities must be avoided unless approved by the (SDCI) Director. This area is delineated using a radius that is equal to one foot for every inch DSH of the tree. (SMC 25.11.130)

Tree Service Provider: means any person or entity engaged in commercial tree work. (SMC 25.11.130)

Visual Tree Assessment (VTA): method of evaluating structural defects and stability in trees by noting the pattern of growth. Developed by Claus Mattheck (Harris, *et al* 1999)

Appendix B References

Accredited Standards Committee A300 (ASC 300). *ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning)*. Londonderry: Tree Care Industry Association, 2017.

Council of Tree and Landscape Appraisers, *Guide for Plant Appraisal, 10th Edition, Second Printing*. Atlanta, GA: The International Society of Arboriculture (ISA), 2019.

Harrell, B. *Executive Order 2023-03: One Seattle Tree Plan: Growing and Fostering an Equitable tree Canopy on Public Land*. City of Seattle, 2023.

Matheny, N., E. Smiley, R. Gilpin, R. Hauer. *Best Management Practices – Managing Trees During Site Development and Construction, Third Edition*. International Society of Arboriculture (ISA), 2023.

Mattheck, Claus and Helge Breloer, *The Body Language of Trees.: A Handbook for Failure Analysis*. London: HMSO, 1994.

Seattle Municipal Code 25.09.070. Standards for Trees and Vegetation in Critical Areas.

Seattle Municipal Code 25.11.050. General Provisions for Regulated Tree Categories

Seattle Municipal Code 25.11.060. Requirements for Trees When Development is Proposed

Seattle Municipal Code 25.11.070. Tree Protection on Sites Undergoing Development in Neighborhood Residential, Low-rise, Midrise, and Seattle Mixed Zones

Seattle Municipal Code 25.11.080. Tree Protection on sites in Major Institution Overlay Districts

Seattle Municipal Code 25.11.090. Tree Replacement, Maintenance, and Site Restoration

Seattle Municipal Code 25.11.100 Tree Service Provider Registration

Seattle Department of Transportation. "Street Tree Manual". City of Seattle, 2014.

Standard Plans for Municipal Construction. Plan sheets 132a, 132b, 133. City of Seattle, 2023.

Standard Specifications for Roads, Bridges, and Municipal Construction. Section 8-01.3(2)B. City of Seattle, 2023.

Torgelson, N. "Director's Rule 7-2023 - Designation of Tier-2 Trees". Seattle, WA, 2023.

Torgelson, N. "Director's Rule 8-2023 - Payment in Lieu of Tree Replacement Pursuant to the Tree Protection Code". Seattle, WA, 2023.

Appendix C Photographs



Photo 1. Tree 5921 growing one foot north of a retaining wall. This tree will be impacted if this wall is removed or replaced.



Photo 2. The grove of Lawson cypresses growing east of Anderson Hall.



Photo 3. Tree 5911. Advanced testing suggested that decay from this wound has not spread to the rest of the tree and that this tree's structural condition has not been impacted by this wound.



Photo 4. Tree 5759 is on the south side of the project area. This is one of several trees directly adjacent to a parking lot and curbs that appear to have recently been installed. These trees' health and/or structure may have been impacted by this recent adjacent development.

Appendix D Assumptions & Limiting Conditions

- 1 Consultant assumes that the site and its use do not violate, and is in compliance with, all applicable codes, ordinances, statutes or regulations.
- 2 The consultant may provide a report or recommendation based on published municipal regulations. The consultant assumes that the municipal regulations published on the date of the report are current municipal regulations and assumes no obligation related to unpublished city regulation information.
- 3 Any report by the consultant and any values expressed therein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event, or upon any finding to be reported.
- 4 All photographs included in this report were taken by Tree Solutions, Inc. during the documented site visit, unless otherwise noted. Sketches, drawings and photographs (included in, and attached to, this report) are intended as visual aids and are not necessarily to scale. They should not be construed as engineering drawings, architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.
- 5 Unless otherwise agreed, (1) information contained in any report by consultant covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring.
- 6 These findings are based on the observations and opinions of the authoring arborist, and do not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described and assessed.
- 7 Measurements are subject to typical margins of error, considering the oval or asymmetrical cross-section of most trunks and canopies.
- 8 Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the site's soil should be obtained by a qualified professional if an additional understanding of the site's characteristics is needed to make an informed decision.
- 9 Our assessments are made in conformity with acceptable evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.

Appendix E Methods

Measuring

Tree diameter at standard height (DSH) is measured at 54 inches (4.5 feet) above grade. If a tree had multiple stems, each stem was measured individually, and a single stem equivalent was calculated as the root of the sum of each diameter squared (example with 3 stems: $DSH = \text{square root} [(stem)^2 + (stem)^2 + (stem)^2]$). A multi-stem tree is regulated based on this single-stem equivalent diameter value. Because this value is calculated in the office following field work, some trees in our data set may have diameters smaller than 6 inches. These trees are included in the tree table for informational purposes only and not factored into tree totals discussed in this report.

Tagging

Each tree was tagged with a circular aluminum tag at eye level. Each tree was assigned a numerical identifier on our map and in our tree table, corresponding to this tree tag. Alphabetical identifiers were used for trees off-site when applicable.

Trees growing in the ROW planting strips have previously been identified by the Seattle Department of Transportation (SDOT) and been given an identification (ID) number by that department with the prefix TRE. Those trees were not tagged by Tree Solutions Inc.

Evaluating

Tree health and structure was assessed utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. An understanding of the uniform stress allows the arborist to make informed judgments about the condition of a tree.

Rating

Tree health ratings take into consideration crown indicators such as foliar density, size, color, stem and shoot extensions. Tree structure ratings take into consideration form, as well as structural defects (including past damage and decay). Tree Solutions has adapted our ratings based on the Purdue University Extension formula values for health condition (*Purdue University Extension bulletin FNR-473-W - Tree Appraisal*). These values are a general representation used to assist arborists in assigning ratings.

Health

Excellent - Perfect specimen with excellent form and vigor, well-balanced crown. Normal to exceeding shoot length on new growth. Leaf size and color normal. Trunk is sound and solid. Root zone undisturbed. No apparent pest problems. Long safe useful life expectancy for the species.

Good - Imperfect canopy density in few parts of the tree, up to 10% of the canopy. Normal to less than $\frac{3}{4}$ typical growth rate of shoots and minor deficiency in typical leaf development. Few pest issues or damage, and if they exist they are controllable or tree is reacting appropriately. Normal branch and stem development with healthy growth. Safe useful life expectancy typical for the species.

Fair - Crown decline and dieback up to 30% of the canopy. Leaf color is somewhat chlorotic/necrotic with smaller leaves and "off" coloration. Shoot extensions indicate some stunting and stressed growing conditions. Stress cone crop clearly visible. Obvious signs of pest problems contributing to lesser condition, control might be possible. Some decay areas found in main stem and branches. Below average safe useful life expectancy

Poor - Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting of shoots is obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe and uncontrollable. Extensive decay or hollows in branches and trunk. Short safe useful life expectancy.

Structure

Excellent - Root plate undisturbed and clear of any obstructions. Trunk flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.

Good - Root plate appears normal, with only minor damage. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure and less than 25% of bark section missing. Good branch habit; minor dieback with some signs of previous pruning. Codominant stem formation may be present, requiring minor corrections.

Fair - Root plate reveals previous damage or disturbance. Dysfunctional roots may be visible around the main stem. Evidence of trunk damage or cavities, with decay or defects present and less than 30% of bark sections missing on trunk. Co-dominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.

Poor - Root plate disturbance and defects indicate major damage, with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important branches dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective action required.

Advanced Testing

I used a micro-resistance drill to test for decay in the trees. These drill systems measure the amount of resistance presented to the drilling needle as it is driven into the wood, perpendicular to the annual rings. The drilling needle is driven into the wood, at a constant rate, up to ½ meter deep, and can detect minute changes in wood density. The data is recorded as a graphic resistance profile using a vertical scale that represents wood density. It is then analyzed.

Appendix F Tree Protection Specifications

The following is a list of protection measures which should be employed before, during, and after construction to ensure the long-term viability of retained trees. This specification can be copied onto the site plan or into contract documents.

1. **Project Arborist:** The project arborists shall at minimum have an International Society of Arboriculture (ISA) Certification and ISA Tree Risk Assessment Qualification.
2. **Tree Protection Area (TPA):** TPA is the area surrounding a tree defined by a specified distance, in which excavation and other construction-related activities must be avoided unless approved by the Director (SMC 25.11.130).
3. **Tree Protection Fencing:** Tree protection fencing shall consist of 6-foot-tall chain-link fencing installed at the edge of the TPA as approved by the project arborist and City of Seattle. Fence posts shall be driven into the ground or bolted to existing hardscape surfaces at 8-foot maximum intervals. Fencing must be installed prior to demolition or ground disturbance and be kept in place for the duration of construction.
 - a. Where trees are being retained as a group the fencing shall encompass the entire area including all landscape beds or lawn areas associated with the group.
 - b. Per arborist approval, TPA fencing may be placed at the edge of existing hardscape within the TPA to allow for staging and traffic.
 - c. Where work is planned within the TPA, install fencing at edge of TPA and move to limits of disturbance at the time that the work within the TPA is planned to occur. This ensures that work within the TPA is completed to specification.
 - d. Where trees are protected at the edge of the project boundary, construction limits fencing shall be incorporated as the boundary of tree protection fencing.
4. **Access Beyond Tree Protection Fencing:** The project manager or project arborist shall be present when tree protection areas are accessed.
5. **Tree Protection Signage:** Tree protection signage shall be affixed to fencing every 20 feet. Signage shall be fluorescent, at least 2' x 2' in size. Signage must include all information in the PDF located here: <http://www.seattle.gov/Documents/Departments/SDCI/Codes/TreeProtectionAreaSign.pdf> in addition to the contact information for the project manager and instructions for gaining access to the area.
6. **Filter / Silt Fencing:** Filter / silt fencing within or at the edge of the TPA of retained trees shall be installed in a manner that does not sever roots. Install so that filter / silt fencing sits on the ground and is weighed in place by sandbags or gravel. Do not trench to insert filter / silt fencing into the ground.
7. **Monitoring:** The project arborist shall monitor all ground disturbance at the edge of or within the TPA.
8. **Soil Protection:** Retain existing paved surfaces within or at the edge of the TPA for as long as possible. No parking, foot traffic, materials storage, or dumping (including excavated soils) are allowed within the TPA. Heavy machinery shall remain outside of the TPA. Access to the tree protection area will be granted under the supervision of the project arborist. If the project arborist allows, heavy machinery can enter the area if soil is protected from the load. Acceptable methods of soil protection include placing 3/4-inch plywood over 6 inches of wood chip mulch, or use of AlturnaMats® (or equivalent product approved by the project arborist). Compaction of soils within the TPA must not occur.
9. **Soil Remediation:** Soil compacted within the TPA of retained trees shall be remediated using pneumatic air excavation according to a specification produced by the project arborist.

10. **Canopy Protection:** Where fencing is installed at the limits of disturbance within the TPA, canopy management (pruning or tying back) shall be conducted to ensure that vehicular traffic does not damage canopy parts. Exhaust from machinery shall be located 5 feet outside the dripline of retained trees. No exhaust shall come in contact with foliage for prolonged periods of time.
11. **Duff/Mulch:** Apply 6 inches of arborist wood chip mulch or hog fuel over bare soil within the TPA to prevent compaction and evaporation. TPA shall be free of invasive weeds to facilitate mulch application. Keep mulch 1 foot away from the base of trees and 6 inches from retained understory vegetation. Retain and protect as much of the existing duff and understory vegetation as possible.
12. **Excavation:** Excavation done within the TPA shall use alternative methods such as pneumatic air excavation or hand digging. If heavy machinery is used, use flat front buckets with the project arborist spotting for roots. When roots are encountered, stop excavation and cleanly sever roots. The project arborist shall monitor all excavation done within the TPA.
13. **Fill:** No fill is to be placed within the TPA of retained trees without the approval of the project arborist.
14. **Root Pruning:** Limit root pruning to the extent possible. All roots shall be pruned with a sharp saw making clean cuts. Do not fracture or break roots with excavation equipment.
15. **Root Moisture:** Root cuts and exposed roots shall be immediately covered with soil, mulch, or clear polyethylene sheeting and kept moist. Water to maintain moist condition until the area is back filled. Do not allow exposed roots to dry out before replacing permanent back fill.
16. **Hardscape Removal:** Retain hardscape surfaces for as long as practical. Remove hardscape in a manner that does not require machinery to traverse newly exposed soil within the TPA. Where equipment must traverse the newly exposed soil, apply soil protection as described in section 8. Replace fencing at edge of TPA if soil exposed by hardscape removal will remain for any period of time.
17. **Tree Removal:** All trees to be removed that are located within the TPA of retained trees shall not be ripped, pulled, or pushed over. The tree should be cut to the base and the stump either left in place or ground out. A flat front bucket can also be used to sever roots around all sides of the stump, or the roots can be exposed using hydro or air excavation and then cut before removing the stump.
18. **Irrigation:** Retained trees with soil disturbance within the TPA will require supplemental water from June through September. Acceptable methods of irrigation include drip, sprinkler, or watering truck. Trees shall be watered three times per month during this time.
19. **Pruning:** Pruning required for construction and safety clearance shall be done with a pruning specification provided by the project arborist in accordance with American National Standards Institute ANSI-A300 2017 Standard Practices for Pruning. Pruning shall be conducted or monitored by an arborist with an ISA Certification.
20. **Plan Updates:** All plan updates or field modifications that result in impacts within the TPA or change the retained status of trees shall be reviewed by the senior project manager and project arborist prior to conducting the work.
21. **Materials:** Contractor shall have the following materials on-site and available for use during work in the TPA:
 - Sharp and clean bypass hand pruners
 - Sharp and clean bypass loppers
 - Sharp hand-held root saw
 - Reciprocating saw with new blades
 - Shovels
 - Trowels
 - Clear polyethylene sheeting
 - Burlap
 - Water



Table of Trees
Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim
Date of Inventory: 7/26/23
Table Prepared: 3/1/24

DSH (Diameter at Standard Height) is measured 4.5 feet above grade, or as specified in the *Guide for Plant Appraisal, 10th Edition*, published by the Council of Tree and Landscape Appraisers.
DSH for multi-stem trees are noted as a single stem equivalent, which is calculated using the method defined in the *Director's Rule X-2023*.
Fees-in-Lieu for removed trees are calculated using the methods defined in the *Director's Rule X-2023*.
Letters are used to identify trees on neighboring properties with overhanging canopies.
Dripline is measured from the center of the tree to the outermost extent of the canopy.

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
4660	<i>Styrax japonicus</i>	Japanese snowbell	14.0		Good	Good	22.6	12.0		2	14	7		#N/A	#N/A	Some pockets of decay at old pruning wounds.
4661	<i>Cedrus deodara</i>	Deodar cedar	44.1		Good	Excellent	34.8	24.0	Grove	2	44	22		#N/A	#N/A	Small reiterive branch to north.
4662	<i>Cedrus deodara</i>	Deodar cedar	39.4		Fair	Fair	43.1	24.0	Grove	2	39	20		#N/A	#N/A	Codominant reiteration at 10 feet, in contact with structure. Buried base. Thin crown.
4663	<i>Pinus sylvestris</i>	Scots pine	18.1		Good	Good	17.8	24.0		3	18	9		#N/A	#N/A	Phototrophic lean to east, corrected. Codomonant at 20 feet. Ivy and blackberry around base.
5632	<i>Pinus monticola</i>	Western white pine	6.3		Good	Good	6.3	24.0		4	6	3		#N/A	#N/A	Ivy at base.
5633	<i>Pinus monticola</i>	Western white pine	12.3		Good	Good	14.5	24.0	Grove	2	12	6		#N/A	#N/A	Ivy on trunk and at base, grove conditions.
5634	<i>Pinus monticola</i>	Western white pine	13.1		Good	Good	10.5	24.0	Grove	2	13	7		#N/A	#N/A	Grove conditions, ivy at base.
5636	<i>Pinus monticola</i>	Western white pine	10.2		Good	Good	13.9	24.0		4	10	5		#N/A	#N/A	Ivy and blackberry at base and on trunk.
5638	<i>Picea abies</i>	Norway spruce	26.4		Good	Good	13.1	24.0		2	26	13		#N/A	#N/A	Canopy sparse to north due to shade.
5640	<i>Sequoia sempervirens</i>	Coast redwood	55.2		Good	Good	41.3	24.0	Grove	2	55	28		#N/A	#N/A	Secondary leader at 40 feet. Adjacent to sidewalk, roots under pavement.
5641	<i>Sequoia sempervirens</i>	Coast redwood	56.8	55.7, 11.2	Good	Good	28.4	24.0	Grove	2	57	28		#N/A	#N/A	Adjacent to pavement. Roots under pavement. Failed codominant stem.
5644	<i>Pinus sylvestris</i>	Scots pine	10.9		Good	Fair	16.5	24.0		4	11	5		#N/A	#N/A	Low live crown ratio.
5647	<i>Sequoia sempervirens</i>	Coast redwood	11.2		Excellent	Excellent	17.5	24.0		4	11	6		#N/A	#N/A	
5649	<i>Pinus ponderosa</i>	Ponderosa pine	37.0		Good	Good	24.5	24.0	Grove	2	37	19		#N/A	#N/A	Grove-like conditions.
5650	<i>Pinus ponderosa</i>	Ponderosa pine	20.9		Good	Good	20.9	24.0	Grove	2	21	10		#N/A	#N/A	Phototrophic lean to east, ivy at base and on trunk. Grove conditions, low crown ratio.
5651	<i>Larix decidua</i>	European larch	12.1		Fair	Good	14.5	24.0	Grove	2	12	6		#N/A	#N/A	Canopy somewhat sparse and large cone crop. Base is crowded with redwood stems up to 15 feet.
5654	<i>Pinus ponderosa</i>	Ponderosa pine	24.1		Good	Good	20.0	24.0	Grove	2	24	12		#N/A	#N/A	Most of canopy to south.
5655	<i>Pinus radiata</i>	Monterey pine	28.5		Good	Good	20.2	24.0	Grove	2	29	14		#N/A	#N/A	Phototrophic lean to south.
5656	<i>Pinus sylvestris</i>	Scots pine	18.5		Good	Good	21.8	24.0	Grove	2	19	9		#N/A	#N/A	Phototrophic lean to southeast.
5712	<i>Pinus attenuata</i>	Knobcone pine	45.3		Good	Fair	26.9	24.0	Grove	2	45	23		#N/A	#N/A	At the top of the slope, several reiterations with narrow unions.
5714	<i>Pinus attenuata</i>	Knobcone pine	20.4		Good	Fair	25.9	24.0	Grove	2	20	10		#N/A	#N/A	
5715	<i>Acer macrophyllum</i>	Bigleaf maple	24.2	19, 15	Good	Fair	29.0	24.0	Grove	2	24	12		#N/A	#N/A	Top of slope, codominant from the base.
5716	<i>Ulmus procera</i>	English elm	13.6	4.8, 12.7	Good	Good	23.6	24.0	Grove	2	14	7		#N/A	#N/A	Top of slope.
5717	<i>Ulmus procera</i>	English elm	9.8		Good	Good	27.4	24.0		4	10	5		#N/A	#N/A	Top of slope.
5718	<i>Ulmus procera</i>	English elm	25.4	16, 12.2, 10.5, 11.3	Good	Fair	28.1	24.0	Grove	2	25	13		#N/A	#N/A	Top of slope, codominant from the base with narrow unions.
5722	<i>Pinus attenuata</i>	Knobcone pine	27.2		Good	Good	29.1	24.0	Grove	2	27	14		#N/A	#N/A	
5724	<i>Malus domestica</i>	Apple	5.0		Good	Good	13.2	20.0		Not Regulated	5	3		#N/A	#N/A	At the base of the slope.

Table of Trees

Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim
Date of Inventory: 7/26/23
Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
5730	<i>Cedrus atlantica</i>	Atlas cedar	21.1		Excellent	Excellent	29.9	24.0	Grove	2	21	11		#N/A	#N/A	Most canopy on west side.
5731	<i>Acer platanoides</i>	Norway maple	24.5	13.2, 17.5, 11	Good	Fair	31.0	-	Grove	3	25	12	Remove	Yes	2833.00	Codominant from the base.
5732	<i>Crataegus phaenopyrum</i>	Washington hawthorn	9.1		Good	Good	18.4	9.0		2	9	5	Remove	Yes	369.95	Subdominant and shade-suppressed.
5733	<i>Pseudotsuga menziesii</i>	Douglas-fir	8.7		Good	Good	16.4	24.0		4	9	4		#N/A	#N/A	Grovelike conditions, low live crown ratio.
5735	<i>Pseudotsuga menziesii</i>	Douglas-fir	14.8		Good	Good	16.6	24.0	Grove	2	15	7		#N/A	#N/A	Grovelike conditions.
5736	<i>Ulmus americana</i>	American elm	9.9	8.5, 5	Good	Fair	30.4	24.0		4	10	5		#N/A	#N/A	Codominant from the base.
5737	<i>Sequoia sempervirens</i>	Coast redwood	22.9		Excellent	Excellent	29.0	24.0	Grove	2	23	11		#N/A	#N/A	
5738	<i>Ulmus americana</i>	American elm	24.3	6.7, 15.7, 12.7, 10.2, 5.7	Good	Fair	31.0	24.0	Grove	2	24	12		#N/A	#N/A	Codominant from the base.
5757	<i>Pinus ponderosa</i>	Ponderosa pine	21.5		Good	Fair	17.9	24.0		3	22	11		#N/A	#N/A	Low live crown ratio. Codominant at 50 feet.
5759	<i>Ulmus americana</i>	American elm	41.4		Good	Good	35.7	24.0		2	41	21		#N/A	#N/A	2 feet south of recently installed parking lot.
5784	<i>Pinus ponderosa</i>	Ponderosa pine	17.7		Good	Fair	21.7	24.0	Grove	2	18	9	Remove	Yes	1399.62	Codominant at 30 feet with narrow union.
5785	<i>Aesculus hippocastanum</i>	Horsechestnut	20.8		Good	Good	28.9	-	Grove	3	21	10		#N/A	#N/A	1 foot south of recent repaving.
5788	<i>Cedrus deodara</i>	Deodar cedar	23.3		Excellent	Excellent	29.0	24.0	Grove	2	23	12		#N/A	#N/A	
5832	<i>Camellia sp.</i>	Camellia	9.0	7.3, 5.2	Good	Good	19.4	24.0		4	9	4		#N/A	#N/A	
5834	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	5.6		Good	Good	8.2	24.0		Not Regulated	6	3		#N/A	#N/A	
5835	<i>Prunus armeniaca</i>	Apricot	7.6	4.1, 4, 5	Good	Fair	18.3	24.0		4	8	4		#N/A	#N/A	Codominant at base.
5836	<i>Pseudotsuga menziesii</i>	Douglas-fir	18.0		Good	Good	16.8	24.0		3	18	9		#N/A	#N/A	Heavy pitch flow around base on all sides. 8 feet northeast of retaining wall.
5837	<i>Pseudotsuga menziesii</i>	Douglas-fir	23.8		Good	Good	24.0	24.0		3	24	12		#N/A	#N/A	1 foot north of retaining wall and sidewalk.
5838	<i>Pseudotsuga menziesii</i>	Douglas-fir	27.1		Good	Excellent	26.1	24.0		2	27	14		#N/A	#N/A	
5839	<i>Pseudotsuga menziesii</i>	Douglas-fir	9.3		Good	Fair	15.9	24.0		4	9	5		#N/A	#N/A	Subdominant form. No tag found.
5840	<i>Pseudotsuga menziesii</i>	Douglas-fir	26.0		Good	Good	21.1	24.0		2	26	13		#N/A	#N/A	
5841	<i>Prunus laurocerasus</i>	Cherry laurel	8.2		Good	Good	15.3	-		4	8	4		#N/A	#N/A	
5842	<i>Cedrus deodara</i>	Deodar cedar	32.6		Good	Good	1.4	24.0		2	33	16		#N/A	#N/A	Crown somewhat sparse, codominant at 60 feet. Pavement 2 feet north with root conflicts.
5843	<i>Acer pseudoplatanus</i>	Sycamore maple	16.2		Good	Good	22.7	24.0		3	16	8		#N/A	#N/A	
5844	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	3.5		Good	Good	7.1	24.0		Not Regulated	4	2		#N/A	#N/A	
5845	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	7.4		Good	Good	12.3	24.0		4	7	4		#N/A	#N/A	Retaining wall one foot north.
5846	<i>Sequoia sempervirens</i>	Coast redwood	66.1		Excellent	Excellent	2.8	24.0		2	66	33		#N/A	#N/A	Root conflicts with patio pavers to west..
5847	<i>Acer circinatum</i>	Vine maple	4.4	2.8, 2.3, 2.5	Good	Good	13.2	8.0		Not Regulated	4	2		#N/A	#N/A	
5848	<i>Acer circinatum</i>	Vine maple	8.8	3.1, 3.3, 3.5, 2.7, 2.4, 3.4, 3.1. 3.2	Good	Good	13.4	8.0		2	9	4		#N/A	#N/A	
5849	<i>Acer glabrum var. douglasii</i>	Rocky Mountain maple	0.5		Good	Poor	4.0	6.0		Not Regulated	1	0		#N/A	#N/A	8 foot sprouts from cut stump.

Table of Trees

Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim

Date of Inventory: 7/26/23

Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
5850	<i>Acer palmatum</i>	Japanese maple	5.2	4, 3.3	Good	Good	14.7	12.0		Not Regulated	5	3		#N/A	#N/A	Limited rooting area. Compact soil at base.
5851	<i>Quillaja saponaria</i>	Soapbark	10.1	9.2, 4.2	Good	Good	15.4	24.0		4	10	5		#N/A	#N/A	Limited rooting area, compact soil.
5853	<i>Populus trichocarpa</i>	Black cottonwood	9.5		Good	Good	15.4	-		4	10	5		#N/A	#N/A	Several sprouts around tree. Stump of former stem at base has decay.
5854	<i>Populus trichocarpa</i>	Black cottonwood	11.4	6.5, 9.4	Fair	Fair	18.5	-		4	11	6		#N/A	#N/A	Canker on main stem. Codominant at base with included bark.
5855	<i>Corylus cornuta</i>	Beaked hazelnut	2.2	1, 1, 1, 1, 1	Good	Good	12.6	24.0		Not Regulated	2	1		#N/A	#N/A	Small shrub.
5856	<i>Corylus cornuta</i>	Beaked hazelnut	8.6	4.8, 3, 3.4, 2.8, 2.9, 2.5, 2.2	Good	Good	14.4	24.0		4	9	4		#N/A	#N/A	
5857	<i>Corylus cornuta</i>	Beaked hazelnut	3.4	2.5, 1.5, 1.5, 1	Good	Good	10.1	24.0		Not Regulated	3	2		#N/A	#N/A	
5858	<i>Arbutus unedo</i>	Momi fir	22.4	11.1, 10, 10.8, 7.5, 6.2, 8.3	Good	Good	19.9	24.0		3	22	11	Remove	Yes	2833.00	Growing 5 feet south of building. Utilities at base. Roots intertwined with tree 5860.
5859	<i>Arbutus unedo</i>	Strawberry tree	13.2	7.3, 7.9, 7.6	Good	Good	22.5	24.0		3	13	7	Remove	Yes	2833.00	3 feet south of building, utilities at base.
5860	<i>Cunninghamia lanceolata</i>	Chinese Fir	15.5		Good	Good	14.6	24.0		3	16	8	Remove	Yes	2833.00	4 feet south of building.
5861	<i>Cunninghamia lanceolata</i>	Chinese Fir	16.9		Good	Good	15.7	24.0		3	17	8	Remove	Yes	2833.00	2 feet south of building.
5862	<i>Prunus sp.</i>	Cherry	8.4	4.8, 4.9, 4.8	Good	Fair	15.3	23.0		4	8	4	Remove	No	-	Multistem at base.
5863	<i>Amelanchier alnifolia</i>	Serviceberry	2.8		Good	Good	14.1	6.0		Not Regulated	3	1	Remove	Yes	#N/A	
5864	<i>Abies firma</i>	Momi fir	17.5		Fair	Good	26.7	24.0	Grove	2	18	9	Remove	Yes	1368.17	Growing 10 feet south of building. Dieback in canopy.
5865	<i>Cunninghamia lanceolata</i>	Chinese Fir	27.2	15.6, 22.3	Good	Good	23.1	24.0	Grove	2	27	14	Remove	Yes	3308.85	Growing 6 feet south of building, north branches in contact with building.
5868	<i>Arbutus unedo</i>	Strawberry tree	14.5	11.1, 9.3	Good	Good	25.6	24.0	Grove	2	14	7	Remove	Yes	936.83	5 feet south of building.
5869	<i>Arbutus unedo</i>	Strawberry tree	14.1	8.8, 11	Good	Fair	20.6	24.0	Grove	2	14	7	Remove	Yes	886.53	Codominant at base, lean to north. 10 feet southeast of building corner.
5872	<i>Styrax japonicus</i>	Japanese snowbell	6.1		Good	Good	14.3	12.0		4	6	3		#N/A	#N/A	
5873	<i>Quercus palustris</i>	Pin oak	26.4		Good	Excellent	38.1	24.0	Grove	2	26	13		#N/A	#N/A	3 feet from sidewalk.
5874	<i>Chamaecyparis pisifera</i>	Sawara cypress	13.0		Good	Good	13.0	24.0	Grove	2	13	7	Remove	Yes	755.01	Growing 7 feet east of building.
5879	<i>Acer circinatum</i>	Vine maple	3.2	2.1, 2.4	Good	Good	14.1	8.0		Not Regulated	3	2		#N/A	#N/A	
5881	<i>Cedrus deodara</i>	Deodar cedar	25.0		Excellent	Excellent	32.0	24.0	Grove	2	25	13		#N/A	#N/A	Large branches extend over building to north.
5882	<i>Cedrus deodara</i>	Deodar cedar	28.2		Good	Fair	34.2	24.0	Grove	2	28	14		#N/A	#N/A	Strong phototropic growth to the southeast.
5883	<i>Cedrus deodara</i>	Deodar cedar	10.7		Good	Good	8.4	24.0		4	11	5		#N/A	#N/A	
5884	<i>Cedrus deodara</i>	Deodar cedar	23.7	8.4, 22.2	Good	Fair	37.0	24.0	Grove	2	24	12		#N/A	#N/A	Subdominant, overextended branches to the southeast.
5885	<i>Cedrus deodara</i>	Deodar cedar	25.1		Good	Fair	31.0	24.0	Grove	2	25	13		#N/A	#N/A	Branches extending over building to north.

Table of Trees

Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim

Date of Inventory: 7/26/23

Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
5886	<i>Pinus rigida</i>	Pitch pine	5.1		Good	Fair	13.2	24.0		Not Regulated	5	3		#N/A	#N/A	Most of canopy is to the southwest
5887	<i>Pinus attenuata</i>	Knobcone pine	26.7		Good	Fair	32.1	24.0	Grove	2	27	13		#N/A	#N/A	Strong phototropic growth to the south, Codominant at 30 feet with narrow unions
5894	<i>Cunninghamia lanceolata</i>	China Fir	24.1	12, 12.7, 16.6	Good	Fair	22.0	24.0		2	24	12		#N/A	#N/A	Western stem touching eave of building.
5895	<i>Thuja plicata</i>	Western redcedar	15.5		Good	Good	15.6	24.0		3	16	8		#N/A	#N/A	
5897	<i>Arbutus unedo</i>	Strawberry tree	14.1	5.7, 8.9, 6.2, 7	Good	Good	25.6	24.0		3	14	7	Remove	Yes	2833.00	Roots under parking lot to west and sidewalk to east.
5898	<i>Arbutus unedo</i>	Strawberry tree	14.4	8.1, 7.1, 9.5	Good	Good	18.1	24.0		3	14	7	Remove	Yes	2833.00	Roots under sidewalk to east and parking lot to west.
5900	<i>Fagus sylvatica</i>	European beech	25.5		Excellent	Excellent	30.1	24.0		2	26	13	Remove	Yes	2904.99	Growing 10 feet southwest of building corner.
5904	<i>Cunninghamia lanceolata</i>	Chinese Fir	0.0		Good	Fair	3.0	24.0		Not Regulated	0	0	Remove	Yes	#N/A	Main stem appeared to be cut, tree is now three stump sprouts.
5906	<i>Arbutus unedo</i>	Strawberry tree	6.7		Good	Poor	12.3	24.0		4	7	3	Remove	No	-	Failed at base after tree to north fell on it. Several sprouts from roots, and canopy.
5908	<i>Stewartia pseudocamellia</i>	Japanese stewartia	6.5	4.7, 4.5	Good	Fair	16.3	24.0		4	7	3	Remove	No	-	Codominant at base. Shaded out by adjacent trees.
5911	<i>Cladrastis kentukea</i>	American yellowwood	27.7		Good	Fair	32.2	24.0		2	28	14		#N/A	#N/A	Decay from old failure wound at base, strong response.
5912	<i>Crataegus laevigata</i>	English hawthorn	16.0	9.1, 13.2	Good	Poor	12.7	24.0		3	16	8	Remove	Yes	2833.00	Decay from old wound at base appears extensive.
5913	<i>Fagus sylvatica</i>	European beech	29.7		Excellent	Excellent	34.2	24.0		2	30	15		#N/A	#N/A	Concrete ring around base.
5914	<i>Abies grandis</i>	Grand fir	7.5		Good	Good	14.3	24.0		4	8	4		#N/A	#N/A	Shaded by adjacent tree. 8 feet east of road.
5917	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	21.4	13.3, 15.6, 6.2	Good	Good	9.9	24.0		3	21	11	Remove	Yes	2833.00	Multistem from base. 2 feet from building edge and retaining wall. Roots/base reliant on retaining wall for stability.
5918	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	22.9		Good	Fair	12.0	24.0		3	23	11	Remove	Yes	2833.00	Broken dead top. 5 feet northwest of building.
5919	<i>Chamaecyparis pisifera</i>	Sawara cypress	11.0		Good	Excellent	12.0	24.0		4	11	6		#N/A	#N/A	10 feet north of building.
5920	<i>Chamaecyparis pisifera</i>	Sawara cypress	22.8	10.5, 20.2	Good	Fair	19.9	24.0	Grove	2	23	11	Remove	Yes	2315.46	Phototropic lean to east. 8 feet northeast of building.
5921	<i>Acer macrophyllum</i>	Bigleaf maple	23.6	9.4, 12.5, 12.4, 12.6	Good	Fair	21.0	24.0	Grove	2	24	12	Remove	Yes	2488.98	Codominant at base, narrow union. Growing one foot north of retaining wall, dependent on wall for structure.
5922	<i>Sequoia sempervirens</i>	Coast redwood	71.2		Excellent	Excellent	28.0	24.0	Grove	2	71	36		#N/A	#N/A	Roots likely under sidewalks and road.
5923	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	19.3		Good	Good	18.8	24.0	Grove	2	19	10		#N/A	#N/A	Roots under sidewalk and road. Grove condition.
5924	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	17.7		Good	Good	14.7	24.0	Grove	2	18	9		#N/A	#N/A	Same tree as 5926
5925	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	16.7		Good	Good	18.7	24.0	Grove	2	17	8				

Table of Trees

Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim
Date of Inventory: 7/26/23
Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
5926	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	12.7		Good	Good	13.5	24.0	Grove	2	13	6		#N/A	#N/A	Same tree as 5924
5927	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	10.2		Good	Fair	14.4	24.0		4	10	5		#N/A	#N/A	Eastern stem is dead.
5928	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	12.0		Good	Good	12.5	24.0	Grove	2	12	6		#N/A	#N/A	
5930	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	13.8		Good	Good	13.6	24.0	Grove	2	14	7		#N/A	#N/A	
5931	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	9.0		Good	Good	13.4	24.0		4	9	5		#N/A	#N/A	
5932	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	6.6		Good	Fair	15.3	24.0		4	7	3		#N/A	#N/A	Crooked stem
5933	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	8.6		Good	Good	16.4	24.0		4	9	4		#N/A	#N/A	
5934	<i>Pseudotsuga menziesii</i>	Douglas-fir	17.8		Good	Fair	16.7	24.0	Grove	2	18	9		#N/A	#N/A	Subdominant form
5935	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	10.0		Good	Good	17.4	24.0		4	10	5		#N/A	#N/A	
5936	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	25.3		Good	Good	15.1	24.0	Grove	2	25	13		#N/A	#N/A	
5937	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	21.0		Good	Good	14.9	24.0	Grove	2	21	11		#N/A	#N/A	
5938	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	23.3		Good	Good	18.0	24.0	Grove	2	23	12		#N/A	#N/A	
5939	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	13.5		Good	Good	15.6	24.0	Grove	2	14	7		#N/A	#N/A	
5940	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	10.6		Good	Good	13.4	24.0		4	11	5		#N/A	#N/A	
5942	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	11.8		Good	Good	15.5	24.0		4	12	6		#N/A	#N/A	
5943	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	5.6		Poor	Good	6.2	24.0		Not Regulated	6	3		#N/A	#N/A	Mostly shaded out.
5944	<i>Cedrus deodara</i>	Deodar cedar	19.7		Good	Good	26.8	24.0	Grove	2	20	10		#N/A	#N/A	Grove conditions.
5946	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	8.3		Good	Good	10.3	24.0		4	8	4		#N/A	#N/A	Grove conditions.
5947	<i>Sequoia sempervirens</i>	Coast redwood	14.9		Good	Excellent	14.6	24.0	Grove	2	15	7		#N/A	#N/A	
5949	<i>Pinus coulteri</i>	Coulter pine	47.0		Good	Good	32.0	12.0	Grove	2	47	24		#N/A	#N/A	Canopy sparse. No tag.
5950	<i>Prunus lusitanica</i>	Portuguese cherry laurel	16.1		Good	Good	20.2	24.0	Grove	2	16	8		#N/A	#N/A	In contact with railing.
5951	<i>Styrax japonicus</i>	Japanese snowbell	8.0		Good	Good	16.3	12.0		4	8	4		#N/A	#N/A	Phototrophic lean to north.
5955	<i>Pseudotsuga menziesii</i>	Douglas-fir	17.0		Good	Good	17.7	24.0	Grove	2	17	9		#N/A	#N/A	Grove conditions.
5956	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	14.6		Good	Good	20.6	24.0	Grove	2	15	7		#N/A	#N/A	
5957	<i>Pseudotsuga menziesii</i>	Douglas-fir	33.8		Good	Good	26.4	24.0	Grove	2	34	17		#N/A	#N/A	Pitch flow on northeast side originating at 15 feet.
5958	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	8.5		Good	Good	12.4	24.0		4	9	4		#N/A	#N/A	

Table of Trees

Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim
Date of Inventory: 7/26/23
Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
5959	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	24.0		Good	Fair	19.0	24.0	Grove	2	24	12		#N/A	#N/A	Codominant at 10 feet.
5962	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	21.0		Good	Good	16.9	24.0	Grove	2	21	11		#N/A	#N/A	
12837	<i>Thuja plicata</i>	Western redcedar	0.3		Fair	Excellent	2.0	24.0		Not Regulated	0	0		#N/A	#N/A	1 inch caliper. Chlorotic foliage, drought stressed. 6 foot tall sapling.
13019	<i>Larix kaempferi</i> 'Jacobsen's Pyramid'	Japanese larch	3.8	3.4, 1.6	Good	Fair	4.2	24.0		Not Regulated	4	2		#N/A	#N/A	Codom at 2 feet.
13020	<i>Larix kaempferi</i> 'Jacobsen's Pyramid'	Japanese larch	3.5		Excellent	Excellent	9.1	24.0		Not Regulated	4	2		#N/A	#N/A	
13467	<i>Amelanchier x grandiflora</i>	Autumn brilliance serviceberry	1.5		Fair	Good	3.1	24.0		Not Regulated	2	1		#N/A	#N/A	Some early fall color and shothole fungus. Drought stress.
13634	<i>Calocedrus decurrens</i>	Incense cedar	10.5	5.7, 8.8	Good	Fair	8.4	24.0		4	10	5	Remove	No	-	Codominant at 3 feet. 3 feet north and west of building.
A	<i>Pinus sylvestris</i>	Scots pine	15.5		Excellent	Good	13.6	24.0	Grove	2	16	8		#N/A	#N/A	Ivy at base.
B	<i>Fagus sylvatica</i>	European beech	13.0		Excellent	Excellent	17.5	24.0		3	13	7		#N/A	#N/A	
C	<i>Pinus ponderosa</i>	Ponderosa pine	34.2				28.4	24.0		2	34	17		#N/A	#N/A	
D	<i>Arbutus unedo</i>	Strawberry tree	8.9	5.1, 5.2, 5.1	Good	Good	15.9	24.0		4	9	4		#N/A	#N/A	Ivy at base.
E	<i>Arbutus unedo</i>	Strawberry tree	10.3	7.2, 5.5, 4.9	Good	Good	16.4	24.0		4	10	5	Remove	No	-	Not on survey.
F	<i>Arbutus unedo</i>	Strawberry tree	10.6		Good	Poor	20.4	24.0		4	11	5	Remove	No	-	Completely failed and fell to south. Still alive.
G	<i>Arbutus unedo</i>	Strawberry tree	10.2		Good	Good	18.4	24.0		4	10	5	Remove	No	-	
H	<i>Arbutus unedo</i>	Strawberry tree	13.8	11, 8.4	Good	Good	18.1	24.0		3	14	7	Remove	Yes	2833.00	
I	<i>Camellia sp.</i>	Camellia	9.6	3.8, 4.5, 3.2, 3.2, 3, 4.3, 3	Good	Good	14.4	24.0		4	10	5		#N/A	#N/A	Camellia species.
J	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	13.5		Good	Fair	14.6	24.0	Grove	2	14	7		#N/A	#N/A	Swept base to west.
K	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	12.0		Fair	Fair	18.5	24.0	Grove	2	12	6		#N/A	#N/A	Being shaded out, shared canopy with tree 5955, subdominant form.
L	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	6.0		Good	Good	10.3	24.0		4	6	3		#N/A	#N/A	
M	<i>Chamaecyparis lawsoniana</i>	Lawson cypress	6.1		Good	Good	11.3	24.0		4	6	3		#N/A	#N/A	
N	<i>Thuja plicata</i>	Western redcedar	8.9		Good	Good	12.4	24.0		4	9	4		#N/A	#N/A	Drip irrigation wrapped around base.
O	<i>Rhododendron sp.</i>	Rhododendron	8.1	3.6, 4.1, 3.8, 4.6	Good	Good	10.3	24.0		4	8	4	Remove	No	-	2 feet north of building.
P	<i>Rhododendron sp.</i>	Rhododendron	9.4	4.8, 6.6, 4.6	Good	Good	16.4	24.0		4	9	5	Remove	No	-	
Q	<i>Rhododendron sp.</i>	Rhododendron	8.2		Good	Good	13.3	24.0		4	8	4	Remove	No	-	3 feet north and east of building.





Table of Trees
Anderson Hall, UW Campus, Seattle, WA

Arborist: Charlie Vogelheim
Date of Inventory: 7/26/23
Table Prepared: 3/1/24

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Drip Radius	Tier 2 Threshold	Grove	Tier Level*	Basic Tree Protection Area (feet)	Minimum Tree Protection Area (feet)	Proposed Action	Replacement Trees Required	Fee-In-Lieu	Notes
R	<i>Rhododendron sp.</i>	Rhododendron	10.6	7.7, 7.3	Good	Fair	16.9	24.0		4	11	5	Remove	No	-	Strong phototropic lean to northeast with some wounding on north stem.
S	<i>Rhododendron sp.</i>	Rhododendron	9.3	6.9, 6.2	Fair	Good	15.4	24.0		4	9	5	Remove	No	-	Chlorotic leaves, dedicated appearance.
T	<i>Rhododendron sp.</i>	Rhododendron	8.4	3.3, 4.1, 3.3, 2.3, 2.7, 3.6, 2.5	Fair	Good	10.3	24.0		4	8	4	Remove	No	-	Dieback in canopy.
U	<i>Acer circinatum</i>	Vine maple	6.2		Good	Good	16.3	8.0		4	6	3	Remove	No	-	One stem at base. 8 feet north of building.
X	<i>Viburnum sp.</i>	Viburnum species	6.5	3.6, 3.7, 3.9	Fair	Good	12.3	24.0		4	6	3		#N/A	#N/A	Unknown shrub species.



LEGEND	
SYMBOL	DESCRIPTION
	LIMIT OF WORK
	EXISTING CONTOUR

LEAVE BLANK FOR CITY APPROVAL STAMP

EXISTING TREE LEGEND

PRELIMINARY,
NOT FOR
CONSTRUCTION

Hennebery Eddy
Architects

HENNEBERY EDDY ARCHITECTS, INC.

PORTLAND OFFICE
921 SW WASHINGTON ST, SUITE 250
PORTLAND OREGON 97205
503 227 4860 TEL
503 227 4920 FAX

BEND OFFICE
1465 SW KNOLL AVE, SUITE 210
BEND OREGON 97701
541 313 6779 TEL

BOZEMAN OFFICE
109 NORTH ROUSE AVE., SUITE 200
BOZEMAN MONTANA 59717
406 585 1112 TOLL FREE 1 800 541 1112

www.hennebryeddy.co

UNIVERSITY OF WASHINGTON

ANDERSON HALL

3715 W Stevens Way NE,
Seattle, WA 98195

HEA Project no. 2207

Date: 12/20/202

20% Coordination Se

Revisions:

Drawn by: SC

Checked by: VS

Sheet:

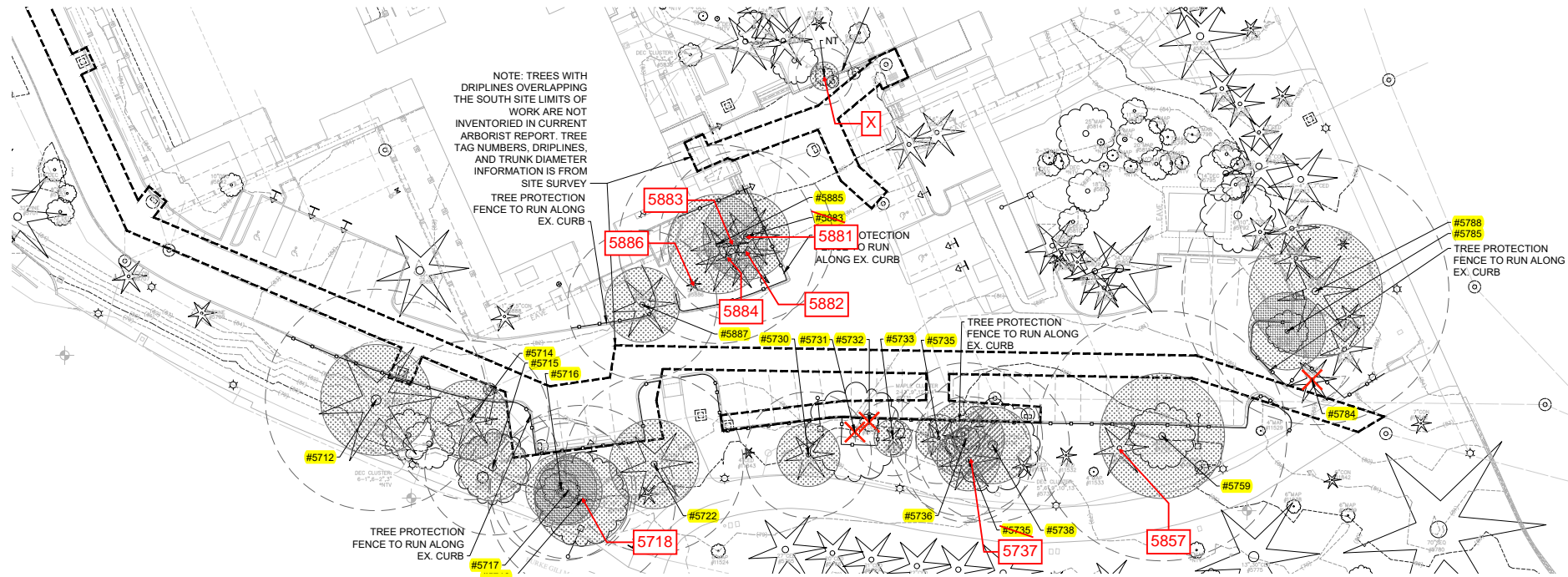
Tree Removal and

Protection Plan .

North

L-011

Copyright 2022 Hannebery Eddy Architects, Inc.



1 TREE REMOVAL AND PROTECTION PLAN - SOUTH
SCALE: 1" = 20' - 0"

TREE & VEGETATION PROTECTION

TREE PROTECTION FENCING AND SIGN

- CHAIN LINK FENCE REQUIRED (NO ORANGE CONSTRUCTION FENCE OR PLYWOOD)
- MINIMUM 6' HIGH
- FENCE SHALL BE SUPPORTED BY RIGID POSTS DRIVEN INTO THE GROUND AT 8' MAXIMUM INTERVALS
- MUST BE INSTALLED PRIOR TO DEMOLITION OR GROUND DISTURBANCE
- KEPT IN PLACE FOR THE DURATION OF CONSTRUCTION
- NO DUMPING OF ANY MATERIALS IN THE PROTECTION AREA
- NO SOIL DISTURBANCE OR ACTIVITY ALLOWED WITHIN FENCED AREA: MATERIAL STORAGE/STOCKPILING, PARKING, EXCAVATION, DUMPING, OR WASHING
- MODIFICATIONS OF THESE REQUIREMENTS BY APPROVAL OF SDCI PLANNER ONLY
- IF ROOTS GREATER THAN 2 INCH FOUND OUTSIDE OF FENCING, PROTECT BY HAND EXCAVATION AND, IF NECESSARY, CUT CLEANLY AND KEEP MOIST
- USE 3 INCHES OR DEEPER WOOD CHIP MULCH OUTSIDE FENCED AREAS TO PROTECT FEEDER ROOTS

VEGETATION PROTECTION (DOES NOT APPLY TO TREES)

- ORANGE MESH OR SIMILAR OPEN MATERIAL
- PROTECT VEGETATION OUTSIDE CONSTRUCTION ZONE WITH FENCING AS SHOWN

SYMBOL:

LINK TO REQUIRED TREE PROTECTION SIGNAGE:

2 CITY OF SEATTLE TREE PROTECTION DETAIL
SCALE: NTS

Tree Solutions Inc.
Arborist: Charlie Vogelheim
206-528-4670

Tree Inventory Dates:
2/22/24

Regulated trees 6-inches diameter or greater on the site are identified with a number. This number corresponds with the metal tree tag unless otherwise noted.

Trees without a tag or not on the University of Washington survey are identified by a letter.

Dripline measurements, species, and other tree specifics are listed in the tree table produced by Tree Solutions Inc.

Survey and site plans should be updated to include tree identifiers and accurate dripline data prior to any design related to tree protection.

LEAVE BLANK FOR CITY APPROVAL STAMP

PRELIMINARY.
NOT FOR
CONSTRUCTION

Hennebery Eddy Architects

HENNEBERY EDDY ARCHITECTS, INC.

PORTLAND OFFICE
921 SW WASHINGTON ST, SUITE 250
PORTLAND OREGON 97205
503 227 4860 TEL
503 227 4920 FAX

BEND OFFICE
1465 SW KNOLL AVE, SUITE 210
BEND OREGON 97702
541 313 6779 TEL

BOZEMAN OFFICE
109 NORTH BRIDGE AVE, SUITE 1
BOZEMAN MONTANA 59715
406 585 1112 TEL

www.henneberyeddy.com

UNIVERSITY OF WASHINGTON

ANDERSON HALL

3715 W Stevens Way NE,
Seattle, WA 98195

HEA Project no. 22077
Date: 12/20/2023
20% Coordination Set

Revisions:

Drawn by: SC
Checked by: VS
Sheet: Tree Removal and Protection Plan - South

20% Coordination Set

L-012

Copyright 2022 Hennebery Eddy Architects, Inc.

SECTION 02 42 96
HISTORIC REMOVAL AND DISMANTLING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Historic treatment procedures for removal and dismantling work for designated historic spaces, areas, rooms, and surfaces and the following specific work:
 - a. Removal and dismantling of indicated portions of building or structure for reuse, salvage, or debris hauling.
 - b. Removal and dismantling of indicated site elements for reuse, salvage, or debris hauling.
 - c. Salvage of existing interior items for reinstallation or salvage.

1.2 RELATED REQUIREMENTS:

- A. Section 01 35 15 - LEED Requirements
- B. Section 01 81 19 - Construction IAQ Management
- C. Section 01 74 19 - Construction Waste Management and Disposal
- D. Section 01 35 91 "Historic Treatment Procedures" for general historic treatment requirements.

1.3 DEFINITIONS

- A. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- B. Existing to Remain: Existing items that are not to be removed or dismantled, except to the degree indicated for performing required Work.
- C. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- D. Retain: To keep an element or detail secure and intact.
- E. Salvage: To protect removed or dismantled items and deliver them to Owner.

1.4 PRECONSTRUCTION MEETINGS

- A. Preconstruction Conference(s): Conduct conference(s) at Project site.
 - 1. Review minutes of Preliminary Historic Treatment Conference that pertain to removal and dismantling procedures and protection of historic areas and surfaces.
 - 2. Review list of items indicated to be salvaged.
 - 3. Verify qualifications of personnel assigned to perform removal and dismantling.
 - 4. Inspect and discuss condition of each construction type to be removed or dismantled.
 - 5. Review requirements of other work that depends on condition of substrates exposed by removal and dismantling work.
 - 6. Review methods and procedures related to removal and dismantling work, including, but not limited to, the following:
 - a. Historic removal and dismantling specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Fire prevention.
 - d. Coordination with building occupants.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Statements: For historic removal and dismantling specialist and historic removal and dismantling specialist's field supervisors.
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's removal and dismantling operations.
- C. Removal and Dismantling Historic Treatment Program: Submit 30 days before work begins.
- D. List of Items Indicated To Be Salvaged or Reinstalled: Prepare a list of items indicated on Drawings to be salvaged for Owner's use or for reinstallation. Submit 15 days before preconstruction conference.
- E. Inventory of Salvaged Items: After removal or dismantling Work is complete, submit a list of items that have been salvaged for reinstallation or return to Owner.
 - 1. Include item description, item condition, number of items if more than one of a type, and tag number. Include photo of item in original location.
 - 2. As work proceeds, include on the inventory items that were indicated to be salvaged and items of historic importance discovered during the work. Document reasons, if any, why an item indicated to be salvaged was not salvaged.

1.6 QUALITY ASSURANCE

- A. Historic Removal and Dismantling Specialist Qualifications: A qualified historic treatment specialist. General selective demolition experience is insufficient experience for historic removal and dismantling work.
- B. Removal and Dismantling Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of removal and dismantling work, including protection of surrounding and substrate materials and Project site.
 - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
 - 2. Debris Hauling: Include plans clearly marked to show debris-hauling routes, turning radii, and locations and details of temporary protective barriers.

1.7 MOCKUPS

- A. Prepare mockups of specific historic removal and dismantling procedures specified in this Section to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Typical Dismantling Work, Limited Mockups: Dismantle an approximately 2 sq. ft. area of typical masonry or wood components, but not less than is required to understand the assembly and the methods and results of dismantling.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- B. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as long as practicable.
 - 1. Before removal and dismantling, Owner will remove the following items:

- a. INSERT ITEMS TO BE REMOVED BY OWNER.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Hazardous Materials:
 - 1. It is unknown whether hazardous materials will be encountered in the Work.
 - a. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.
 - b. In the case of asbestos, stop work in the area of potential hazard, shut off fans and other air handlers ventilating the area, and rope off area until the questionable material is identified. Resume work in the area of concern after safe working conditions are verified.
- D. Storage or sale of removed or dismantled items on-site is not permitted unless otherwise indicated.

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.1 LEED EXECUTION REQUIREMENTS

- A. Refer to Section 01 35 15, LEED Requirements for additional information relating to execution of the following LEED credits:
 - 1. Sustainable Sites – Construction Activity Pollution Prevention: Comply with provisions of 01 57 13 Temporary Erosion and Sedimentation Controls.
 - 2. Materials & Resources – Construction Waste Management: Comply with provisions of Section 01 74 19 Construction Waste Management and Disposal.

3.2 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

- A. Removal Equipment: Use manual, handheld tools. Handheld power tools may be permitted on a case-by-case basis with approval by Architect.
- B. Dismantling Equipment: Use manual, handheld tools, except as follows or otherwise approved by Architect on a case-by-case basis:
 - 1. Handheld power tools are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
 - 2. Pry bars more than 18 inches long and hammers weighing more than 2 lb are not permitted for dismantling work.

3.3 EXAMINATION

- A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures are necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.
 - 1. Verify that affected utilities are disconnected and capped.
 - 2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage. Enter this information on the inventory of salvaged items.
 - 3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

- B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
- C. Perform surveys as the Work progresses to detect hazards resulting from historic removal and dismantling procedures.

3.4 HISTORIC REMOVAL AND DISMANTLING

- A. General: Have removal and dismantling work performed by a qualified historic removal and dismantling specialist. Ensure that historic removal and dismantling specialist's field supervisors are present when removal and dismantling work begins and during its progress.
- B. All paints and coatings, including accessories, applied on site must comply with the VOC limits, emissions testing and Submittal requirements for IEQ Credit Low-Emitting Materials as specified in Section 01 35 15 LEED Requirements.
- C. Comply with requirements in Section 01 35 91 "Historic Treatment Procedures" for identifying and storing historic items.
- D. Perform work according to the historic treatment program and approved mockup(s).
 - 1. Perform removal and dismantling to the limits indicated.
 - 2. Provide supports or reinforcement for existing construction that becomes temporarily weakened by removal and dismantling work, until the Project Work is completed unless otherwise indicated.
 - 3. Perform cutting by hand or with small power tools as permitted by Architect wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.
 - 4. Do not operate air compressors inside building unless approved by Architect in each case.
 - 5. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.
 - 6. Dispose of removed and dismantled items off-site unless indicated to be salvaged or reinstalled.
- E. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment according to the historic treatment program to ensure that such water does not create a hazard or adversely affect other building areas or materials.
- F. Unacceptable Equipment: Keep equipment that is not permitted for historic removal or dismantling work away from the vicinity where such work is being performed.
- G. Removing and Dismantling Items on or Near Historic Surfaces:
 - 1. Use only dismantling equipment and procedures within 12 inches of historic surface. Protect historic surface from contact with or damage by tools.
 - 2. Wherever possible, unfasten items in the opposite order from which they were installed.
 - 3. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
 - 4. Dismantle anchorages.
- H. Masonry Walls:
 - 1. Remove masonry carefully, and erect temporary bracing and supports as needed to prevent collapse of materials being removed.

2. Stop removal work and immediately inform Architect and Contractor's professional engineer if any structural elements above or adjacent to the work show signs of distress or dislocation during any phase of removal work.
 3. Remove wall in easily managed pieces.
 4. During removal, maintain the stability of the partially remaining wall.
- I. Steelwork:
1. Expose structural steel for examination by Architect and Contractor's professional engineer before proceeding with removal or dismantling.
 2. If distress in structure is apparent during performance of the work, stop removal or dismantling and take immediate precautionary measures to ensure safety of the structure. Inform Architect and Contractor's professional engineer of the problem, steps taken, and proposed corrective actions.
 3. Brace and support structural steel being removed and remaining during removal and dismantling.
 4. Concrete-Encased Steel: Where steel is known to be encased by concrete that is being removed, saw cut with blades that can cut no deeper than the thickness of the concrete cover, with an adequate margin for error in the location of the steel. Isolate sections of concrete by saw cutting before beginning removal.
- J. Anchorages:
1. Remove anchorages associated with removed items.
 2. Dismantle anchorages associated with dismantled items.
 3. In nonhistoric surfaces, patch holes created by anchorage removal or dismantling according to the requirements for new work.
 4. In historic surfaces, patch or repair holes created by anchorage removal or dismantling according to Section that is specific to the historic surface being patched.
- 3.5 CLEANING
- A. Dispose of all waste material in compliance with project's Waste Management Plan in accordance with Section 01 74 19 - Construction Waste Management and Disposal.
- 3.6 HISTORIC REMOVAL AND DISMANTLING SCHEDULE
- A. Existing Items to Be Dismantled and Salvaged:
1. Interior paneled wood doors
- B. Existing Items to Be Dismantled and Reinstalled:
1. Exterior:
 - a. Brick masonry at central south window (becoming a door)
 - b. Cast stone units at gutter parapet (where indicated)
 - c. North entry and vestibule historic light fixtures
 2. Interior:
 - a. Auditorium - Wood ceiling components requiring removal to execute structural, electrical, and FLS work
 - b. Reading Room - Wood ceiling components requiring removal to execute structural, electrical, and FLS work
 - c. Reading Room - Wood wall paneling and closet doors requiring removal to execute structural work
 - d. Reading Room - Wood stair and balcony railing components requiring removal to execute structural work
- C. Existing Items to Remain:
1. Historic steel windows
 2. Historic terrazzo flooring

Anderson Hall Renovation
University of Washington
UW Facility # 1351 | UW Project # 203203
Hennebery Eddy Project # 22077
12 April 2024

HISTORIC REMOVAL AND DISMANTLING
02 42 96 - 6

3. Historic plaster walls and ceilings at north vestibule, hall, and vaulted area.
4. Historic stairs
5. Woodwork in historic Auditorium and Reading Room unless noted otherwise

END OF SECTION

SECTION 04 03 10
HISTORIC MASONRY CLEANING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes historic treatment work consisting of cleaning historic clay brick and cast stone masonry surfaces.

1.2 RELATED REQUIREMENTS:

- A. Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.

1.3 DEFINITIONS

- A. Very Low-Pressure Spray: Less than 100 psi.
- B. Low-Pressure Spray:
 - 1. Pressure: 100 to 400 psi.
 - 2. Flow Rate: 4 to 6 gpm
- C. Medium-Pressure Spray:
 - 1. Pressure: 400 to 800 psi.
 - 2. Flow Rate: 4 to 6 gpm.
- D. High-Pressure Spray:
 - 1. Pressure: 800 to 1200 psi.
 - 2. Flow Rate: 4 to 6 gpm.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review minutes of Preliminary Historic Treatment Conference that pertain to masonry historic treatment and cleaning.
 - 2. Review methods and procedures related to cleaning historic masonry, including, but not limited to, the following:
 - a. Historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, and sequencing.
 - c. Quality-control program.
 - d. Fire-protection plan.
 - e. Cleaning program.
 - f. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

- A. Work Sequence: Perform historic masonry cleaning work in the following sequence:
 - 1. Remove plant growth.
 - 2. Inspect masonry for open mortar joints. Where repairs are required, delay further cleaning work until after repairs are completed, cured, and dried to prevent intrusion of water and other cleaning materials into the wall.
 - 3. Remove paint.
 - 4. Clean masonry.
- B. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to historic masonry repair Sections. Patch holes in mortar joints according to historic masonry repointing Sections.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include material descriptions and application instructions.
2. Include test data substantiating that products comply with requirements.

1.7 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: A qualified historic masonry cleaning specialist. Experience cleaning new masonry work is insufficient experience for historic treatment work.
- B. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
 1. Cleaning: Clean an area approximately 25 sq. ft. for each type of masonry and surface condition.
 - a. Test cleaning methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
 - b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry cleaning work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Clean masonry surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least seven days after completion of cleaning.

PART 2 PRODUCTS

2.1 PAINT REMOVERS

- A. Low-Odor, Solvent-Type Paste Paint Remover: Manufacturer's standard low-odor, water-rinsable, solvent-type paste, gel, or foamed emulsion formulation for removing paint from masonry; containing no methanol or methylene chloride.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Building Restoration Products, Inc.
 - b. Cathedral Stone Products, Inc.
 - c. Dumond Chemicals, Inc.
 - d. PROSOCO, Inc.

2.2 CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).
- C. Chemical cleaners not allowed.

2.3 ACCESSORY MATERIALS

- A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Building Restoration Products, Inc.
 - b. PROSOCO, Inc.

- B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.
 - 2. Minimal possibility of damaging exposed surfaces.
 - 3. Consistency of each application.
 - 4. Uniformity of the resulting overall appearance.
 - 5. Do not use products or tools that could do the following:
 - a. Remove, alter, or harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
 - b. Leave residue on surfaces.

2.4 CHEMICAL-CLEANING SOLUTIONS

- A. Chemical cleaning not allowed.

PART 3 EXECUTION

3.1 HISTORIC TREATMENT SPECIALIST

- A. Historic Treatment Specialist Firms: Subject to compliance with requirements, provide historic masonry cleaning by one of the following:
 - 1. Pioneer Masonry Restoration Co.
 - 2. Technical Waterproofing

3.2 CLEANING MASONRY, GENERAL

- A. Have cleaning work performed only by qualified historic treatment specialist.
- B. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 20 feet (6 m) away by Architect. Like new appearance is not expected.
- C. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.
- D. Use only those cleaning methods indicated for each masonry material and location.
 - 1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
 - 2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
 - a. Equip units with pressure gauges.
 - b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
 - c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
 - d. For high-pressure water-spray application, use fan-shaped spray that disperses water at an angle of at least 40 degrees.
 - e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.
 - f. For steam application, use steam generator capable of delivering live steam at nozzle.
- E. Perform each cleaning method in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
 - 1. Keep wall wet below area being cleaned to prevent streaking from runoff.

- F. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.
- G. Water-Spray Application Methods:
 - 1. Water-Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
 - 2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from masonry surface, and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- H. Steam Cleaning: Apply steam to masonry surfaces at very low pressures indicated for each type of masonry. Hold nozzle at least 6 inches (150 mm) from masonry surface, and apply steam in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- I. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.3 PRELIMINARY CLEANING

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open masonry joints to whatever depth they occur.
- B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, caulking, asphalt, and tar.
 - 1. Carefully remove heavy accumulations of rigid materials from masonry surface with sharp chisel. Do not scratch or chip masonry surface.
 - 2. Remove paint and caulking with solvent-type paint remover.
 - a. Comply with requirements in "Paint Removal" Article.
 - b. Repeat application up to two times if needed.

3.4 PAINT REMOVAL

- A. Paint-Remover Application, General: Apply paint removers according to paint-remover manufacturer's written instructions. Do not allow paint removers to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.
- B. Paint Removal with Solvent-Type Paste Paint Remover:
 - 1. Remove loose and peeling paint using low-pressure water spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
 - 2. Apply thick coating of paint remover to painted surface with natural-fiber cleaning brush, deep-nap roller, or large paint brush. Apply in one or two coats according to manufacturer's written instructions.
 - 3. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
 - 4. Rinse with hot water applied by low-pressure spray to remove chemicals and paint residue.

3.5 CLEANING BRICKWORK

- A. Hot-Water Wash: Use hot water applied by low-pressure spray.

- B. Steam Cleaning: Apply steam at very low pressures not exceeding 30 psi (207 kPa). Remove dirt softened by steam with wood scrapers, stiff-nylon or -fiber brushes, or cold-water wash, as indicated by cleaning tests.

3.6 CLEANING CAST STONework

- A. Hot-Water Wash: Use hot water applied by low-pressure spray.
- B. Steam Cleaning: Apply steam at very low pressures not exceeding 30 psi (207 kPa). Remove dirt softened by steam with wood scrapers, stiff-nylon or -fiber brushes, or cold-water wash, as indicated by cleaning tests.

3.7 FINAL CLEANING

- A. Clean adjacent non-masonry surfaces of spillage and debris. Use detergent and soft brushes or cloths.
- B. Remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- C. Remove masking materials, leaving no residues that could trap dirt.

3.8 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION

SECTION 04 03 22
HISTORIC BRICK UNIT MASONRY REPAIR

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes historic treatment work consisting of repairing historic clay brick masonry as follows:
 - 1. Repairing unit masonry.
 - 2. Removing abandoned anchors.
 - 3. Painting steel uncovered during the work.
 - 4. Reanchoring veneers.

1.2 RELATED REQUIREMENTS:

- A. Section 01 35 91 "Historic Treatment Procedures" for general historic treatment requirements.
- B. Section 02 42 96 "Historic Removal and Dismantling" for historic removal and dismantling work.
- C. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal flashing installed in or on repaired masonry.

1.3 DEFINITIONS

- A. Low-Pressure Spray:
 - 1. Pressure: 100 psi.
 - 2. Flow Rate: 4 to 6 gpm.
- B. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.
- C. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of bricks to freezing and thawing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review minutes of Preliminary Historic Treatment Conference that pertain to masonry historic treatment and repair.
 - 2. Review methods and procedures related to repairing historic brick masonry, including, but not limited to, the following:
 - a. Historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Fire-protection plan.
 - e. Unit masonry historic treatment program.
 - f. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

- A. Order sand and gray portland cement for colored mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.
- B. Work Sequence: Perform masonry historic treatment work in the following sequence, which includes work specified in this and other Sections:
 - 1. Remove plant growth.
 - 2. Inspect masonry for open mortar joints and permanently or temporarily point them before cleaning to prevent intrusion of water and other cleaning materials into the wall.

3. Remove paint.
 4. Clean masonry.
 5. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 6. Repair masonry, including replacing existing masonry with new masonry materials.
 7. Rake out mortar from joints to be repointed.
 8. Point mortar and sealant joints.
 9. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in bricks according to "Brick Masonry Patching" Article. Patch holes in mortar joints according to Section 04 03 23 "Historic Brick Unit Masonry Repointing."

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 2. Include recommendations for product application and use.
 3. Include test data substantiating that products comply with requirements.
- B. Shop Drawings:
1. Include plans, elevations, sections, and locations of masonry repair work on the structure.
 2. Show full-size patterns with complete dimensions for new and their jointing, showing relationship of existing units to new units.
 3. Show provisions for expansion joints or other sealant joints.
 4. Show provisions for flashing, lighting fixtures, conduits, and weep holes as required.
 5. Show replacement and repair anchors. Include details of anchors within individual bricks, with locations of anchors and dimensions of holes and recesses in units required for anchors.
 6. Show locations of scaffolding and points of scaffolding in contact with masonry. Include details of each point of contact or anchorage.
- C. Samples for Initial Selection: For the following:
1. Colored Mortar: Submit sets of mortar that will be left exposed in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels.
 - a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching existing, cleaned mortar when cured and dry.
 - b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.
 2. Sand Types Used for Mortar: Minimum 8 oz. (240 mL) of each in plastic screw-top jars.
 - a. For blended sands, provide Samples of each component and blend. Identify blend ratio.
 - b. Identify sources, both supplier and quarry, of each type of sand.
 3. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.
 - a. Have each set contain a close color range of at least three Samples of different mixes of patching compound that match the variations in existing masonry when cured and dry.
 4. Include similar Samples of accessories involving color selection.

- D. Samples for Verification: For the following:
1. Each type of brick to be used for replacing existing units. Include sets of Samples to show the full range of shape, color, and texture to be expected.
 - a. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.
 2. Each type of patching compound in the form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.
 3. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For historic treatment specialist including field supervisors and workers.
- B. Preconstruction Test Reports: For existing bricks and mortar and replacement bricks.
- C. Quality-control program.
- D. Unit masonry historic treatment program.

1.8 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: A qualified historic brick masonry repair specialist. Experience installing standard unit masonry is insufficient experience for masonry historic treatment work.
 1. Historic Treatment Worker Qualifications: When bricks are being patched, assign at least one worker per crew who is trained and certified by manufacturer of patching compound to apply its products.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising worker performance and preventing damage.
- C. Unit Masonry Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of historic treatment work, including protection of surrounding materials and Project site.
 1. Include methods for keeping exposed mortar damp during curing period.
 2. If materials and methods other than those indicated are proposed for any phase of historic treatment work, add to the quality-control program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project.
- D. Mockups: Prepare mockups of historic treatment to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
 1. Masonry Repair: Prepare sample areas for each type of masonry material indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 48 inches (1200 mm) in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
 - a. Replacement: One brick unit replaced.
 - b. Reanchoring Veneers: Install three masonry repair anchors in mockup wall assembly of each anchor type required.
 - c. Patching: Three small holes at least 1 inch (25 mm) in diameter for each type of brick indicated to be patched, so as to leave no evidence of repair.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on brick masonry as follows:
 1. Provide test specimens as indicated and representative of proposed materials and existing construction.
 2. Existing Mortar: Test according to ASTM C1324, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength. Use X-ray diffraction, infrared spectroscopy, and differential thermal analysis to supplement microscopical methods. Carefully remove existing mortar for testing from within joints at three locations designated by Architect.
 3. Temporary Patch: As directed by Architect, provide temporary materials followed by permanent repairs at locations from which existing samples were taken.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bricks to Project site strapped together in suitable packs or pallets or in heavy-duty cartons and protected against impact and chipping.
- B. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- E. Store lime putty covered with water in sealed containers.
- F. Store sand where grading and other required characteristics can be maintained and contamination avoided.
- G. Handle bricks to prevent overstressing, chipping, defacement, and other damage.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit repair work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits: Repair brick masonry only when air temperature is between 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:
 1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
 2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for seven days after repair.

- D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above unless otherwise indicated.
- E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Source Limitations: Obtain each type of material for repairing historic masonry (face brick, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 OWNER-FURNISHED MATERIAL

- A. Salvaged brick from area surrounding central south window at grade level.

2.3 MASONRY MATERIALS

- A. Face Brick: Units, including molded, ground, cut, or sawed shapes as required to complete masonry repair work.
 - 1. Brick Matching Existing: Units with colors, color variation within units, surface texture, size, and shape that match existing brickwork and with physical properties within 10 percent of those determined from preconstruction testing of selected existing units.
 - a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.
 - 2. Special Shapes:
 - a. Provide molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position, and where shapes produced by sawing would result in sawed surfaces being exposed to view.
 - b. Provide specially ground units, shaped to match patterns, for arches and where indicated.
 - c. Mechanically chopping or breaking brick, or bonding pieces of brick together by adhesive, are unacceptable procedures for fabricating special shapes.
 - 3. Tolerances as Fabricated: [According to tolerance requirements in ASTM C216, Type FBX] [According to tolerance requirements in ASTM C216, Type FBS] <Insert requirement>.
 - 4. Date Identification: Emboss in the clay body on a concealed, interior surface of each unit in easily read 1/2-inch- (13-mm-) high characters, "MADE 2025." Manufacturer's name may also be embossed.
- B. Salvaged Brick: Obtain salvaged brick from location indicated on Drawings. Clean off residual mortar.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II; white or gray or both where required for color matching of mortar.
 - 1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Factory-Prepared Lime Putty: ASTM C1489.

- D. Quicklime: ASTM C5, pulverized lime.
- E. Mortar Sand: ASTM C144 unless otherwise indicated.
 - 1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
 - 2. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.
 - 3. For exposed mortar, provide sand with rounded edges.
- F. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars.
- G. Water: ASTM C270, potable.

2.5 MANUFACTURED REPAIR MATERIALS

- A. Brick Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching brick masonry.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cathedral Stone Products, Inc.
 - b. Conproco Corporation.
 - c. Edison Coatings, Inc.
 - 2. Use formulation that is vapor and water permeable (equal to or more than the brick), exhibits low shrinkage, has lower modulus of elasticity than the bricks being repaired, and develops high bond strength to all types of masonry.
 - 3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.
 - 4. Formulate patching compound used for patching brick in colors and textures to match each unit being patched. Provide not less than three colors to enable matching the color, texture, and variation of each unit.

2.6 ACCESSORY MATERIALS

- A. Masonry Repair Anchors, Expansion Type: Mechanical fasteners designed for masonry veneer stabilization consisting of 1/4-inch- (6-mm-) diameter, [Type 304] [Type 316] stainless-steel rod with brass expanding shells at each end and water-shedding washer in the middle. Expanding shells shall be designed to provide positive mechanical anchorage to veneer on one end and backup masonry on the other.
 - 1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
- B. Masonry Repair Anchors, Spiral Type: Driven-in, [Type 304] [Type 316] stainless-steel spiral rods designed to be installed in drilled holes and relying on screw effect rather than adhesive to secure them to backup and veneer. Anchors are flexible in plane of veneer but rigid perpendicular to it.
 - 1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
- C. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of bricks, less the required depth of pointing materials unless removed before pointing.
- D. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.
- E. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer according to [MPI #23 (surface-tolerant, anti-corrosive metal primer)] [or] [SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating] <Insert requirement>.

1. Surface Preparation: Use coating requiring no better than SSPC-SP 2, "Hand Tool Cleaning," surface preparation according to manufacturer's literature or certified statement.
- F. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 1. Previous effectiveness in performing the work involved.
 2. Minimal possibility of damaging exposed surfaces.
 3. Consistency of each application.
 4. Uniformity of the resulting overall appearance.
 5. Do not use products or tools that could do the following:
 - a. Remove, alter, or harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in Contract.
 - b. Leave residue on surfaces.

2.7 MORTAR MIXES

- A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C5 and manufacturer's written instructions.
- B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
- C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent, unless otherwise demonstrated by a satisfactory history of performance.
- D. Do not use admixtures in mortar unless otherwise indicated.
- E. Mixes: Mix mortar materials in the following proportions:
 1. Rebuilding (Setting) Mortar by Volume: ASTM C270, Proportion Specification, [1 part portland cement, 2 parts lime, and 7 parts sand] [1 part portland cement, 4 parts lime, and 12 parts sand] <Insert proportions>.
 2. Rebuilding (Setting) Mortar by Type: ASTM C270, Proportion Specification, Type N unless otherwise indicated; with cementitious material limited to portland cement and lime.
 3. Rebuilding (Setting) Mortar by Property: ASTM C270, Property Specification, [Type N] [Type O] <Insert type> unless otherwise indicated; with cementitious material limited to portland cement and lime.
 4. Rebuilding (Setting) Mortar by ASTM C1713 Composition: ASTM C1713, with binder material limited to [portland cement and lime] <Insert binder(s)>, and with a volume ratio of [1 part portland cement, 1 part lime, and 6 parts sand] <Insert proportions>.
 5. Colored Mortar: Add mortar pigments to produce exposed, setting (rebuilding) mortar of colors required.

PART 3 EXECUTION

3.1 HISTORIC TREATMENT SPECIALIST

- A. Historic Treatment Specialist Firms: Subject to compliance with requirements, firms that may provide historic brick repair include, but are not limited to, the following:
 1. Pioneer Masonry Restoration.
 2. Technical Waterproofing

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
 - 2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
 - 3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

3.3 MASONRY REPAIR, GENERAL

- A. Have repair work performed only by qualified historic treatment specialist.
- B. Repair Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 (6) feet (m) away by Architect.

3.4 ABANDONED ANCHOR REMOVAL

- A. Remove abandoned anchors, brackets, wood nailers, and other extraneous items no longer in use unless indicated to remain.
 - 1. Remove items carefully to avoid spalling or cracking masonry.
 - 2. Notify Architect before proceeding if an item cannot be removed without damaging surrounding masonry. Do the following where directed:
 - a. Cut or grind off item approximately 3/4 (20) inch(es) (mm) beneath surface, and core drill a recess of same depth in surrounding masonry as close around item as practicable.
 - b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.
 - 3. Patch the hole where each item was removed unless directed to remove and replace brick.

3.5 BRICK REMOVAL AND REPLACEMENT

- A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
 - 1. When removing single bricks, remove material from center of brick and work toward outside edges.
- B. Support and protect remaining masonry that surrounds removal area.
- C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- D. Notify Architect of unforeseen detrimental conditions, including voids, cracks, bulges, loose masonry units in existing backup, rotted wood, rusted metal, and other deteriorated items.
- E. Remove in an undamaged condition as many whole bricks as possible.
 - 1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
 - 2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
 - 3. Store brick for reuse. Store off ground, on skids, and protected from weather.
 - 4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.
- F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.
- G. Replace removed damaged brick with other removed brick and salvaged brick in good condition, where possible, or with new brick matching existing brick. Do not use broken units unless they can be cut to usable size.
- H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.
- I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.). Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
 2. Rake out mortar used for laying brick before mortar sets according to Section 040323 "Historic Brick Unit Masonry Repointing." Point at same time as repointing of surrounding area.
 3. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.
- J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
 1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.6 BACKUP MASONRY REMOVAL AND REPLACEMENT

- A. Where backup masonry is fractured or unstable and at locations indicated, remove mortar and masonry units that are broken or deteriorated and rebuild with whole, new brick or whole salvaged backup masonry units. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
- B. Support and protect remaining masonry that surrounds removal area.
- C. Maintain flashing, reinforcement, anchors, lintels, and adjoining construction in an undamaged condition. Coordinate with new flashing, reinforcement, and lintels, which are specified in other Sections.
- D. Notify Architect of unforeseen detrimental conditions, including voids, cracks, bulges, loose masonry units beyond the removal area, rotted wood, rusted metal, and other deteriorated items.
- E. Remove in an undamaged condition as many whole bricks as possible.
 1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
 2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
 3. Store brick for reuse. Store off ground, on skids, and protected from weather.
 4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.
- F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.
- G. Replace removed damaged brick with salvaged backup brick in good condition, where possible, or with new building brick matching existing backup brick. Do not use broken units unless they can be cut to usable size.
- H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
- I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of

more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.). Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

- J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
 - 1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.7 REANCHORING VENEERS

- A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Space anchors not more than [16 inches (400 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally] <Insert requirement> apart unless otherwise indicated. Install at locations to avoid penetrating flashing.
- B. Recess anchors 5/8 inch (16 mm) or more from surface of mortar joint, and fill recess with pointing mortar according to Section 040323 "Historic Brick Unit Masonry Repointing."

3.8 PAINTING STEEL UNCOVERED DURING THE WORK

- A. Notify Architect if steel is exposed during masonry removal. Where Architect determines that steel is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
 - 1. Surface Preparation: Remove paint, rust, and other contaminants according to SSPC-SP 2, "Hand Tool Cleaning," as applicable to comply with paint manufacturer's recommended preparation.
 - 2. Antirust Coating: Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).
- B. If on inspection and rust removal, the thickness of a steel member is found to be reduced from rust by more than 1/16 (1.6)inch(es) (mm), notify Architect before proceeding.

3.9 BRICK MASONRY PATCHING

- A. Patch the following bricks unless another type of repair or replacement is indicated:
 - 1. Units indicated to be patched.
 - 2. Units with holes.
- B. Remove and replace existing patches where indicated.
- C. Patching Bricks:
 - 1. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 (6) inch(es) (mm) thick, but not less than recommended in writing by patching compound manufacturer.
 - 2. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of brick.
 - 3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
 - 4. Rinse surface to be patched and leave damp, but without standing water.
 - 5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
 - 6. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
 - 7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the brick. Shape and finish surface before or after curing, as determined by testing, to best match existing brick.

8. Keep each layer damp for 72 hours or until patching compound has set.

3.10 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
 1. Do not use metal scrapers or brushes.
 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.11 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

3.12 MASONRY-WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.
- B. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

END OF SECTION

SECTION 04 03 23
HISTORIC BRICK UNIT MASONRY REPOINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes historic treatment work consisting of repointing brick masonry as follows:
 - 1. Repointing joints with mortar.

1.2 RELATED REQUIREMENTS:

- A. Section 01 35 91 "Historic Treatment Procedures" for general historic treatment requirements.

1.3 DEFINITIONS

- A. Low-Pressure Spray:
 - 1. Pressure: 100 psi
 - 2. Flow Rate: 4 to 6 gpm.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review minutes of Preliminary Historic Treatment Conference that pertain to masonry historic treatment and repointing.
 - 2. Review methods and procedures related to repointing historic brick masonry, including, but not limited to, the following:
 - a. Historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Fire-protection plan.
 - e. Unit masonry historic treatment program.
 - f. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

- A. Order sand and gray portland cement for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.
- B. Work Sequence: Perform masonry historic treatment work in the following sequence, which includes work specified in this and other Sections:
 - 1. Remove plant growth.
 - 2. Inspect masonry for open mortar joints and permanently or temporarily point them before cleaning to prevent intrusion of water and other cleaning materials into the wall.
 - 3. Remove paint.
 - 4. Clean masonry.
 - 5. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 - 6. Repair masonry, including replacing existing masonry with new masonry materials.
 - 7. Rake out mortar from joints to be repointed.
 - 8. Point mortar joints.
 - 9. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in bricks according to Section 040322 "Historic Brick Unit Masonry Repair." Patch holes in mortar joints according to "Repointing" Article.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include recommendations for product application and use.
 - 3. Include test data substantiating that products comply with requirements.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and locations of repointing work on the structure.
 - 2. Show provisions for expansion joints or other sealant joints.
 - 3. Show locations of scaffolding and points of scaffolding in contact with masonry. Include details of contact or anchorage.
- C. Samples for Initial Selection: For the following:
 - 1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels.
 - a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching existing, cleaned mortar when cured and dry.
 - b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.
 - 2. Sand Type Used for Pointing Mortar: Minimum 8 oz. (240 mL) of each in plastic screw-top jars.
 - a. For blended sands, provide Samples of each component and blend. Identify blend ratio.
 - b. Identify sources, both supplier and quarry, of each type of sand.
 - 3. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For the following:
 - 1. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels.
 - a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.
 - 2. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For historic treatment specialist including field supervisors and workers.
- B. Preconstruction Test Reports: For existing bricks and mortar.
- C. Quality-control program.
- D. Unit masonry historic treatment program.

1.8 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: A qualified historic masonry repointing specialist. Experience in pointing or repointing only new or nonhistoric masonry is insufficient experience for masonry historic treatment work.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising worker performance and preventing damage.

- C. Unit Masonry Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of historic treatment work, including protection of surrounding materials and Project site.
 - 1. Include methods for keeping pointing mortar damp during curing period.
 - 2. If materials and methods other than those indicated are proposed for any phase of historic treatment work, add to the quality-control program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project.
- D. Mockups: Prepare mockups of historic treatment on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Repointing: Rake out joints in two separate areas, each approximately 36 inches (900 mm) high by 48 inches (1200 mm) wide as indicated for each type of repointing required, and repoint one of the areas.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on brick masonry as follows:
 - 1. Provide test specimens as indicated and representative of proposed materials and existing construction.
 - 2. Existing Mortar: Test according to ASTM C1324, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength. Use X-ray diffraction, infrared spectroscopy, and differential thermal analysis to supplement microscopical methods. Carefully remove existing mortar for testing from within joints at three locations designated by Architect.
 - 3. Temporary Patch: As directed by Architect, provide temporary materials at locations from which existing samples were taken.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- D. Store lime putty covered with water in sealed containers.
- E. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit repointing work to be performed according to product manufacturers' written instructions and specified requirements.

- B. Temperature Limits: Repoint mortar joints only when air temperature is between 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.
- C. Cold-Weather Requirements: Comply with the following procedures for mortar-joint pointing unless otherwise indicated:
 - 1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
 - 2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for seven days after pointing.
- D. Hot-Weather Requirements: Protect mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above unless otherwise indicated.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Source Limitations: Obtain each type of material for repointing historic masonry (cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II; white or gray or both where required for color matching of mortar.
 - 1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Factory-Prepared Lime Putty: ASTM C1489.
- D. Quicklime: ASTM C5, pulverized lime.
- E. Mortar Sand: ASTM C144 unless otherwise indicated.
 - 1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
 - 2. Color: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.
 - 3. Provide sand with rounded edges.
- F. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars.
- G. Water: ASTM C270, potable.

2.3 ACCESSORY MATERIALS

- A. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.
- B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.
 - 2. Minimal possibility of damaging exposed surfaces.
 - 3. Consistency of each application.
 - 4. Uniformity of the resulting overall appearance.

5. Do not use products or tools that could do the following:
 - a. Remove, alter, or harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in Contract.
 - b. Leave residue on surfaces.

2.4 MORTAR MIXES

- A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C5 and manufacturer's written instructions.
- B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black, which is limited to 2 percent, unless otherwise demonstrated by a satisfactory history of performance.
- D. Do not use admixtures in mortar unless otherwise indicated.
- E. Mixes: Mix mortar materials in the following proportions:
 1. Pointing Mortar by Volume: ASTM C270, Proportion Specification, [1 part portland cement, 2 parts lime, and 7 parts sand] [1 part portland cement, 4 parts lime, and 12 parts sand] <Insert proportions>.[Add mortar pigments to produce mortar colors required.]
 2. Pointing Mortar by Type: ASTM C270, Proportion Specification, [Type N] [Type O] <Insert Type> unless otherwise indicated; with cementitious material limited to portland cement and lime.[Add mortar pigments to produce mortar colors required.]
 3. Pointing Mortar by Property: ASTM C270, Property Specification, [Type N] [Type O] <Insert Type> unless otherwise indicated; with cementitious material limited to portland cement and lime.[Add mortar pigments to produce mortar colors required.]
 4. Pointing Mortar by ASTM C1713 Composition: ASTM C1713, with binder material limited to [portland cement and lime] <Insert binder(s)>, and with a volume ratio of [1 part portland cement, 1 part lime, and 6 parts sand] <Insert proportions>.[Add mortar pigments to produce mortar colors required.]

PART 3 EXECUTION

3.1 HISTORIC TREATMENT SPECIALIST

- A. Historic Treatment Specialist Firms: Subject to compliance with requirements, firms that may provide historic masonry repointing include, but are not limited to, the following:
 1. Pioneer Masonry Restoration.
 2. Technical Waterproofing

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding masonry and other surfaces.
 1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.

2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

3.3 MASONRY REPOINTING, GENERAL

- A. Have repointing work performed only by qualified historic treatment specialist.
- B. Appearance Standard: Repointed surfaces are to have a uniform appearance as viewed from 20 (6)feet (m) away by Architect.

3.4 REPOINTING

- A. Rake out and repoint joints to the following extent:
 1. All joints in areas indicated.
 2. Joints indicated as sealant-filled joints.
 3. Joints at locations of the following defects:
 - a. Holes and missing mortar.
 - b. Cracks that can be penetrated 1/4 inch (6 mm) or more by a knife blade 0.027 inch (0.7 mm) thick.
 - c. Cracks 1/8 (3) inch(es) (mm) or more in width and of any depth.
 - d. Hollow-sounding joints when tapped by metal object.
 - e. Eroded surfaces 1/4 inch (6 mm) or more deep.
 - f. Deterioration to point that mortar can be easily removed by hand, without tools.
 - g. Joints filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
 1. Remove mortar from joints to depth of 2-1/2 times joint width and not less than that required to expose sound, unweathered mortar. Do not remove unsound mortar more than 2 (50)inches (mm) deep; consult Architect for direction.
 2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 3. Do not spall edges of bricks or widen joints. Replace or patch damaged bricks as directed by Architect.
 - a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Architect's written approval based on approved quality-control program.
 - b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar in bed joints and mortar in head joints by hand with chisel and resilient mallet. Strictly adhere to approved quality-control program.
- D. Notify Architect of unforeseen detrimental conditions, including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Pointing with Mortar:
 1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 (9) inch(es) (mm) until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than 3/8 (9) inch(es) (mm). Fully compact each layer and allow it to become thumbprint hard before applying next layer. Where existing brick have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
 4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
 5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
 - a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
 - b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
 6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Remove mortar and repoint.
- F. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.5 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
 1. Do not use metal scrapers or brushes.
 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage qualified testing agencies to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
- B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- C. Notify testing agency and Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors and Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION