PLANNING DEPARTMENT
6101 SE Johnson Creek Blvd
Milwaukie OR 97206

PHONE: *503-786-7630*
FAX: *503-774-8236*
E-MAIL: *planning@milwaukieoregon.gov*

Application for Land Use Action

CSU-2018-001; NR-2018-001; DR-2018-001; P-2018-002 **Master File #:** _____

Review type*: ☐ I ☒ II ☒ III ☐ IV ☐ V

CHOOSE APPLICATION TYPE(S):

- Community Service Use
- Natural Resource Review
- Downtown Design Review
- Parking: Quantity Modification
- ...

Use separate application forms for:
- Annexation and/or Boundary Change
- Compensation for Reduction in Property Value (Measure 37)
- Daily Display Sign
- Appeal

RESPONSIBLE PARTIES:

APPLICANT (owner or other eligible applicant—see reverse): Tyler Nishitani

Mailing address: Hacker Architects 733 SW Oak St., Suite 100 Portland OR Zip: 97205

Phone(s): 503 227 1254 E-mail: tnishitani@hackerarchitects.com

APPLICANT'S REPRESENTATIVE (if different than above):

Mailing address: Zip:

Phone(s): E-mail:

SITE INFORMATION:

Address: 10660 SE 21st Ave Map & Tax Lot(s): 11E36BB01800

Comprehensive Plan Designation: P Zoning: DMU Size of property: 75,716.00 Sq Ft

PROPOSAL (describe briefly):

The Milwaukie Ledding Library proposal is a complete structural improvement resulting in a new, approximate 20,000 square foot one story library on the existing library site. Site improvements include a reconfigured parking lot, stormwater planters, and other landscape elements . The library is an existing use in the DMU zone.

SIGNATURE:

ATTEST: I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by: Tyler Nishitani Date: Jan 17, 2018

IMPORTANT INFORMATION ON REVERSE SIDE

RESET

*For multiple applications, this is based on the highest required review type. See MMC Subsection 19.1001.6.B.1.

WHO IS ELIGIBLE TO SUBMIT A LAND USE APPLICATION (excerpted from MMC Subsection 19.1001.6.A):

Type I, II, III, and IV applications may be initiated by the property owner or contract purchaser of the subject property, any person authorized in writing to represent the property owner or contract purchaser, and any agency that has statutory rights of eminent domain for projects they have the authority to construct.

Type V applications may be initiated by any individual.

PREAPPLICATION CONFERENCE:

A preapplication conference may be required or desirable prior to submitting this application. Please discuss with Planning staff.

REVIEW TYPES:

This application will be processed per the assigned review type, as described in the following sections of the Milwaukie Municipal Code:

- Type I: Section 19.1004
- Type II: Section 19.1005
- Type III: Section 19.1006
- Type IV: Section 19.1007
- Type V: Section 19.1008

THIS SECTION FOR OFFICE USE ONLY:

FILE TYPE	FILE NUMBER	FEE AMOUNT*	PERCENT DISCOUNT	DISCOUNT TYPE	DEPOSIT AMOUNT	DATE STAMP
Master file		$			$	
Concurrent application files		$			$	
		$			$	
		$			$	
		$			$	
SUBTOTALS		$			$	
TOTAL AMOUNT RECEIVED: $			RECEIPT #:			RCD BY:

Associated application file #s (appeals, modifications, previous approvals, etc.):

Neighborhood District Association(s):

Notes:

*After discount (if any)

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For all Land Use Applications
(except Annexations and Development Review)

Submittal Requirements

All land use applications must be accompanied by a signed copy of this form (see reverse for signature block) and the information listed below. The information submitted must be sufficiently detailed and specific to the proposal to allow for adequate review. Failure to submit this information may result in the application being deemed incomplete per the Milwaukie Municipal Code (MMC) and Oregon Revised Statutes.

Contact Milwaukie Planning staff at 503-786-7630 or planning@milwaukieoregon.gov for assistance with Milwaukie's land use application requirements.

1. **All required land use application forms and fees**, including any deposits.

   Applications without the required application forms and fees will not be accepted.

2. **Proof of ownership or eligibility to initiate application** per MMC Subsection 19.1001.6.A.

   Where written authorization is required, applications without written authorization will not be accepted.

3. **Detailed and comprehensive description** of all existing and proposed uses and structures, including a summary of all information contained in any site plans.

   Depending upon the development being proposed, the description may need to include both a written and graphic component such as elevation drawings, 3-D models, photo simulations, etc. Where subjective aspects of the height and mass of the proposed development will be evaluated at a public hearing, temporary on-site "story pole" installations, and photographic representations thereof, may be required at the time of application submittal or prior to the public hearing.

4. **Detailed statement** that demonstrates how the proposal meets the following:

   A. All applicable development standards (listed below):

      1. **Base zone standards** in Chapter 19.300.
      2. **Overlay zone standards** in Chapter 19.400.
      3. **Supplementary development regulations** in Chapter 19.500.
      4. **Off-street parking and loading standards and requirements** in Chapter 19.600.
      5. **Public facility standards and requirements**, including any required street improvements, in Chapter 19.700.

   B. All applicable application-specific approval criteria (check with staff).

   These standards can be found in the MMC, here: www.qcode.us/codes/milwaukie/

5. **Site plan(s), preliminary plat, or final plat** as appropriate.

   See Site Plan, Preliminary Plat, and Final Plat Requirements for guidance.

6. **Copy of valid preapplication conference report**, when a conference was required.

APPLICATION PREPARATION REQUIREMENTS:

- Five hard copies of all application materials are required at the time of submittal (unless submitted electronically). Staff will determine how many additional hard copies are required, if any, once the application has been reviewed for completeness.
- All hard copy application materials larger than 8½ x 11 in. must be folded and be able to fit into a 10- x 13-in. or 12- x 16-in. mailing envelope.
- All hard copy application materials must be collated, including large format plans or graphics.

ADDITIONAL INFORMATION:

- Neighborhood District Associations (NDAs) and their associated Land Use Committees (LUCs) are important parts of Milwaukie's land use process. The City will provide a review copy of your application to the LUC for the subject property. They may contact you or you may wish to contact them. Applicants are strongly encouraged to present their proposal to all applicable NDAs prior to the submittal of a land use application and, where presented, to submit minutes from all such meetings. NDA information: www.milwaukieoregon.gov/citymanager/what-neighborhood-district-association.
- Submittal of a full or partial electronic copy of all application materials is strongly encouraged.

As the authorized applicant I, Tyler Nishitani, attest that all required application materials have been submitted in accordance with City of Milwaukie requirements. I understand that any omission of required items or lack of sufficient detail may constitute grounds for a determination that the application is incomplete per MMC Subsection 19.1003.3 and Oregon Revised Statutes 227.178. I understand that review of the application may be delayed if it is deemed incomplete.

Furthermore, I understand that, if the application triggers the City's sign-posting requirements, I will be required to post signs on the site for a specified period of time. I also understand that I will be required to provide the City with an affidavit of posting prior to issuance of any decision on this application.

Applicant Signature: _____

Date: January 17, 2018

Official Use Only

Date Received (date stamp below):

RESET

LEDDING LIBRARY

VIEW FROM 21ST & HARRISON

PROJECT TEAM

COMMISSIONING

Green Building Services
421 SW 6TH AVE, SUITE 450
PORLTAND, OR 97204-1629
CONTACT: RICHARD MANNING
PHONE: 503-467-4710

CMGC

Swinerton Builders
308 SW 2ND AVE, SUITE 210
PORTLAND, OR 97204
CONTACT: WILLIAM SILVA
PHONE: 503-224-6888

FINANCE DIRECTOR

City of Milwaukie
10722 SE MAIN ST
PORTLAND OR, 97222
CONTACT: HALEY KG FISH
PHONE: 503-786-7522

LANDSCAPE

PLACE
735 NW 18TH AVE
PORLTAND, OR 97209
CONTACT: CHARLES BRUCKER
PHONE: 503-334-2080

CIVIL

HHPR
205 SE SPOKANE, ST #200
PORTLAND, OR 97202
CONTACT: RON PETERSON & JANELLE BRANNAN
PHONE: 503-334-2080

ACOUSTICS

Listen Acoustics
1001 SW 5TH AVE #100
PORTLAND OR, 97204
CONTACT: TOBIN COOLEY
PHONE: 503-241-5255

LIGHTING

O-Lighting
5304 N ALBINA ST
PORTLAND, OR 97217
CONTACT: MARK GODFREY
PHONE: 503-341-7882

SUSTAINABILITY

Lensa Consulting
7205 SE 18TH AVE
PORTLAND, OR 97202
CONTACT: KATRINA SHUM MILLER
PHONE: 503-467-1239

ENVIRONMENTAL GRAPHICS & SIGNAGE

Felt Hat
4072 N WILLIAMS AVE #B
PORTLAND, OR 97227
CONTACT: DON ROOD
PHONE: 503-222-0068

CITY OF MILWAUKIE

City of Milwaukie
6101 SE JOHNSON CREEK BLVD
MILWAUKIE, OR 97206

LIBRARY DIRECTOR

Katie Newell
Milwaukie Public Library
10660 SE 21ST AVE
MILWAUKIE, OR 97222
PHONE: 503-786-7584

ARCHITECT & INTERIOR DESIGN

Hacker
733 SW OAK ST, SUITE 100
PORTLAND OR, 97205
CONTACT: TYLER NISHITANI
PHONE: 503-227-1254

PROJECT MANAGEMENT

Plan B Consulting
CONTACT: AMY WINTEROWD
PHONE: 503-850-9876
503-832-7612

STRUCTURAL

ABHT
1640 NW JOHNSON ST
PORTLAND, OR 97209
CONTACT: CLINTON AMBROSE
PHONE: 503-243-6682

MECH/ELEC/PLMBG

PAE
522 SW 5TH AVE #1500
PORTLAND, OR 97204
CONTACT: RUWAN JAYAWEERA
PHONE: 503-226-2921

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Project Statement – Milwaukie Ledding Library - Type III Land Use Review Submittal

List of land use reviews requested

- Downtown Design Review (Type III)
  - Parking Modification (Type II) - Page 2
- Major Modification of a Community Service Use (Type III) - Page 2
- Natural Resources (Type III) – Exhibit 1
- Comprehensive Plan text amendment - Scott Park (Type V) Adjustment – Not included. Initiated by City.

Project Vision

The vision for the new Milwaukie library is driven by four main principals:

People
Provide a vibrant community information hub that brings people together, stimulates imagination and enriches lives.

Prosperity
Provide an innovative, state of the art, future thinking library that supports both community and individual endeavors.

Planet
The architecture enhances the experience of the surrounding landscape and is a model of sustainable and environmentally restorative design.

Place
The library is a welcoming, civic focal point that promotes education and understanding of Milwaukie's culture, community and history.

Project Description

The Milwaukie Ledding Library proposal is a complete structural improvement resulting in a new, approximate 20,000 square foot one-story library on the existing library site. Site improvements include a reconfigured parking lot, stormwater planters, and other landscape elements . The site is not ideal for on-site stormwater infiltration. Stormwater will be treated for quality on site and one planter will discharge into the creek and the other planters will flow to the municipal storm system on site. Post-development runoff does not exceed the pre-development. The electrical transformer will be located underground in a vault as pre-approved by the utility. See Pre-Application Conference notes for street frontage requirements.

Site Opportunities

The site occupies a unique position in the downtown area between a natural area, a city park and City Hall. The proposed design has a civic presence and at the same time takes advantage of the natural park setting.

The civic design elements include:

- a gateway colonnade and direct path to the main library entry and continuing on to Scott Park.
- the building meets the SW urban street corner with large windows providing views out from the library to City Hall while also creating views into and through the library to the wooded area beyond.

The park setting design elements include:

- Parking lot has been reconfigured to occupy the western edge of the site. The building and landscaped areas have also be consolidate to the west, against the narrowed parking lot, minimizing disturbance to natural resource areas on the East edge of the site.
- The park setting inspired the selection of wood siding material and finish.
- The window openings of the proposed façade highlight natural features while being responsive to sun path to prevent unwanted heat gain and glare.
- Sensitivity to the natural setting with no HVAC equipment on the roof or visible on site preserving tree canopy views with a minimum roof height.
- Exterior HVAC units are located on the ground in an enclosed courtyard to effectively mitigate noise pollution.

This project replaces the existing two-story library with a larger, single-story building. A single-story configuration will deliver Milwaukie a more flexible library at a better value for the following reasons:

- Library interior engages more of the park and provides daylight and views to all occupied spaces.
- It is more universally accessible to be on one level. Elevators and stairs can provide code compliant accessibility to a two-story configuration, but stairs used as the primary circulation between floors represent a barrier for equipment, strollers, visitors and staff that don't handle stairs well.
- Most flexible for a long life. No program needs to be upstairs where floor area adjustments are physically limited. With one story space partition adjustments can be more easily made as library needs change over time.
- A two-story solution requires the additional expense of 2 stairs plus 1 elevator equal 1000 sqft. Therefore one story without these requirements gives the library more usable floor area within the budget.

Sustainable Design

This project is enrolled in the Energy Trust of Oregon's Path to Net Zero program. Net Zero Energy means ultimately generating as much energy on the library site through solar photovoltaic panels as the building uses. 'Path' means that a project team first establishes a clear energy-efficiency target and a plan of approach. Through design and specifications of robust insulation and efficient mechanical systems in the design phase, the goal is to drive energy demand down so less solar energy in the future will need to be generated to get to net zero.

State requirement requires 1.5% of the construction cost be spent on green technology. This requirement is met by installing a photovoltaic array on the roof in this project scope.

Energy modeling in the design phase indicates this building will exceed the national library average energy use by 70% and exceed Oregon Energy Code.

MODIFICATION

MMC 19.605.2 **Modification to exceed the maximum number of parking spaces.**

Requirement: Table 19.605.1 requires for Library, museum, art gallery: 1 space per 1,000 sqft of floor area minimum and 1.2 spaces per 1,000 sqft maximum. For this project that is 20 parking spaces minimum and 24 maximum. Parks have no specified minimum or maximum requirement.

Purpose: To ensure that development provides adequate, but not excessive, vehicle parking based on their estimated parking demand. All modifications and determinations must demonstrate that the proposed parking quantities are reasonable.

Proposal: The applicant proposes Per 19.605.C.1 to exceed the maximum of 24 spaces by four for a total of 28 (including 2 ADA spaces and 2 carpool spaces per 19.610). The applicant proposes that the 4 additional spaces are required due to special circumstances of this site (19.605.2.C.3.c) to accommodate visitors to Scott Park without impacting the 24 spaces allowed to meet typical library parking demand. (19.605.2.C.3.a). The existing lot that currently serves Scott Park and the Ledding Library contains 38 spaces. The events at the amphitheater create a seasonal parking demand that further support exceeding the maximum number of spaces by a modest amount.

DEVELOPMENT STANDARDS

Table 19.304.4 Downtown Zones—Summary of Development Standards

A. Lot Standards

1. Minimum lot size (sq ft) 750 Complies
2. Minimum street frontage (ft) 15 Complies

B. Development Standards

1. Floor area ratio 1:1 . Building area 20,000 sqft Site Area: Complies per Habitat Conservation Area and Water Quality Resource reduction of site area.
2. Building height Minimum 25 Complies. Building is 27'-9" measured from the top of sidewalk at Harrison St.

4.a Street setbacks/build-to lines (ft) 0.
Complies. Setback at SE corner = 2'-4" and SW Corner= 9'-10"

4c. Side and rear setbacks not applicable

5. 19.508 Frontage occupancy requirements. The park creates an unusual site shape. Proposed building frontage on Harrison is similar to existing library. See site plan.
6. Primary Entrances. Complies.
7. Off Street Parking. See Proposed Parking Modification Loading space not required per Pre App Conference Notes.

Public Facility Improvements

19.702 Applicability

D. New construction

E. Modification or expansion of an existing structure or a change or intensification in use … section is applicable.

19.708.1 General Street Requirements and Standards

C. Development in Downtown Zones Required improvements will be coordinated and implemented by the City of Milwaukie under a separate improvement project process.

Major Modification of a Community Service Use (Type III)

19.904.4 Approval Criteria

An application for a community service use may be allowed if the following criteria are met:

A. The building setback, height limitation, and off-street parking and similar requirements governing the size and location of development in the underlying zone are met. Where a specific standard is not proposed in the CSU, the standards of the underlying zone are met; See the above responses to "Table 19.304.4 Downtown Zones—Summary of Development Standards"

B. Specific standards for the proposed uses as found in Subsections 19.904.7-11 are met; See the below responses to "19.904.9 Specific Standards for Institutions..."

C. The hours and levels of operation of the proposed use are reasonably compatible with surrounding uses; Complies. Proposed operational hours are to remain the same as the existing facility.

D. The public benefits of the proposed use are greater than the negative impacts, if any, on the neighborhood; Complies. The proposed project is an update and complete improvement of an existing library facility that better addresses the needs of staff and community.

E. The location is appropriate for the type of use proposed. Complies. The location is very appropriate, on the edge of downtown, immediately adjacent to business areas, residential areas, city hall and a school.

19.904.6 Application Requirements

An application for approval of a community service use shall include the following:

A. Name, address and telephone number of applicant and/or property owner; on Application

B. Map number and/or subdivision block and lot; on Application

C. Narrative concerning the proposed request; on Application

D. Copy of deed, or other document showing ownership or interest in property. on Application owner, the written authorization from the owner for the application shall be submitted;

E. Vicinity map and F. Comprehensive plan and zoning designations; page 17

G. A map showing existing uses, structures, easements, and public utilities and showing pages 17 and 19

G.1 proposed development, placement of lot lines, etc. and H. Detailed plans for the specific project; pages 21 and 23

I. Any information required by other applicable provisions of local, state or federal law; see page 3 Pre Application Notes

K. Additional drawings, surveys or other material necessary to understand the proposed use may be required. All pages.

MAJOR MODIFICATION OF A COMMUNITY SERVICE USE SUMMARY

19.904.9 Specific Standards for Institutions—Public, Private, Religious, and Other Facilities Not Covered by Other Standards

A. Utilities, streets, or other improvements necessary for the public facility or institutional use shall be provided by the agency constructing the use. Complies. Refer to Civil drawing series.

B. When located in or adjacent to a residential zone, access should be located on a collector street if practicable. If access is to a local residential street, consideration of a request shall include an analysis of the projected average daily trips to be generated by the proposed use and their distribution pattern, and the impact of the traffic on the capacity of the street system which would serve the use. Uses which are estimated to generate fewer than 20 trips per day are exempted from this subsection. Complies. Site access is from SE Harrison Street, a "Major Road" per the Milwaukie Transportation System Plan.

C. When located in a residential zone, lot area shall be sufficient to allow required setbacks that are equal to a minimum of ⅔ the height of the principal structure. As the size of the structure increases, the depth of the setback must also increase to provide adequate buffering. Not applicable, not located in a residential zone.

D. The height limitation of a zone may be exceeded to a maximum height of 50 ft provided Subsection 19.904.9.C of this subsection is met. Complies. Proposed project does not exceed the zone's maximum height.

E. Noise-generating equipment shall be sound-buffered when adjacent to residential areas. Complies. Exterior noise-generating equipment to be isolated within the mechanical courtyard.

F. Lighting shall be designed to avoid glare on adjacent residential uses and public streets. Complies. Modern exterior light fixtures have been selected to minimize light pollution, especially toward the adjacent residences.

G. Where possible, hours and levels of operation shall be adjusted to make the use compatible with adjacent uses. Proposed operational hours are to remain the same as the existing facility: Open 7 days a week, Monday-Thursday 10:00am – 9:00pm, Friday-Saturday 10:00am – 6:00pm, Sunday 12:00pm – 6:00pm.

H. A spire on a religious institution may exceed the maximum height limitation. For purposes of this subsection, "spire" means a small portion of a structure that extends above the rest of the roofline, or a separate structure that is substantially smaller than the main structure and extends above the roofline of the main structure. "Spire" includes but is not limited to ornamental spires, bell towers, other towers, minarets, and other similar structures or projections. The number of spires on a religious institution property is not limited, so long as the spires remain only a small portion of the area of the structures. Not applicable. Proposed project is not a religious institution.

I. The minimum landscaping required for religious institutions is the lesser of 15% of the total site area and the percentage required by the underlying zone. Not applicable. Proposed project is not a religious institution.

J. Park-and-ride facilities may be encouraged for institutions along transit routes that do not have days and hours in conflict with weekday uses (e.g., religious institutions or fraternal organizations). Such uses may be encouraged to allow portions of their parking areas to be used for park-and-ride lots. No part of this project is being proposed as a park-and-ride facility. Majority of library use hours conflict with a park-and-ride facility use.

INSTITUTIONAL STANDARDS SUMMARY

INTENTIONALLY BLANK

CITY OF MILWAUKIE
PRE-APPLICATION CONFERENCE REPORT

PreApp Project ID #: 17-018PA

This report is provided as a follow-up to a meeting that was held on 9/21/2017 at 10:00am

Applicant Name: Tyler Nishitani
Company: Hacker Architects
Applicant 'Role': Architect
Address Line 1: 733 SW Oak St, Ste. 100
Address Line 2:
City, State Zip: Portland OR 97205

Project Name: Ledding Library Expansion
Description: Ledding Library expansion
ProjectAddress: 10660 SE 21st Ave
Zone: Downtown Mixed Use DMU
Occupancy Group: A-3 Section 303.4
ConstructionType: Minimun Type 1 construction per table 503
Use: Public (P)
Occupant Load: 200-400 Table 1004.1.2
AppsPresent: Scott Mannhard, Tyler Nishitani, Janelle Brannan, Sterling Rung, Amy Winterowd, Andrew Schilling
Staff Attendance: Denny Egner, Vera Kolias, Alma Flores, Chuck Eaton, Alex Roller, Samantha Vandagriff, Leila Aman, Matt Amos, Haley Fish, Katie Newell

BUILDING ISSUES

ADA: This building shall be fully ADA compliant. Chapter 11

Structural: A minimum of two unobstructed exits that are fully ADA complaint shall be provided. If the occupant load exceeds 500, a third exit shall be provided. Additional exits may be required based on travel distance and the common path of egress.

Mechanical:

Plumbing: A backflow device shall be provided at the connection of the fire line to protect the potable water system.

Plumb Site Utilities:

Electrical:

Notes: All code sections are from the 2014 Oregon Structural Specialty Code (OSSC).

Please note all drawings must be individually rolled. If the drawings are small enough to fold they must be individually folded.

FIRE MARSHAL ISSUES

Fire Sprinklers: Fire Sprinklers are required for any fire area over 12,000 sq ft for a type A-3 occupancy, or for an occupant load of 300 or more. 903.2.1.3

Fire Alarms: A manual fire alarm system shall be provided in any group A occupancy with a occupant load of 300 or more. Alarms may be required dependent on layout and final occupant load count. 907.2.1

Fire Hydrants:

Turn Arounds:

Addressing:

Fire Protection:

Fire Access:

Hazardous Mat.:

Fire Marshal Notes:

PUBLIC WORKS ISSUES

Water: A City of Milwaukie 8-inch water main on SE Harrison Street and on the west side of the property provides service to the proposed development. The water System Development Charge (SDC) is based on the size of water meter serving the property. The corresponding water SDC will be assessed with installation of a water meter. Water SDC credit will be provided based on the size of any existing water meter serving the property removed from service. The water SDC will be assessed and collected at the time the building permits are issued.

Sewer: A City of Milwaukie 8-inch wastewater main on SE Harrison Street provides service to the proposed development. Currently, the wastewater System Development Charge (SDC) is comprised of two components. The first component is the City's SDC charge of $1,100 and the second component is the County's SDC for treatment of $6,295 that the City collects and forwards to the County. Both SDC charges are per connection unit. The wastewater SDC will be assessed and collected at the time the building permits are issued.

Storm: Projects that develop or redevelop over 1000 sq feet of impervious surface are required to comply with stormwater management requirements for the new or redeveloped impervious area at the site. The City of Milwaukie has adopted the City of Portland 2016 Stormwater Management Manual for design of water quality facilities. Submission of a storm water management plan by a qualified professional engineer is required as part of the proposed development. The plan shall conform to Section 2 - Stormwater Design Standards of the City of Milwaukie Pubic Works Standards. The storm water management plan shall demonstrate that the post-development runoff does not exceed the pre-

Figure 19.304-5 First-Floor Build-To Lines; Subsection 19.304.5.D Street Setbacks/Build-To Lines; Subsection 19.304.5.I Transition Measures; Subsection 19.501.2 Yard Exceptions

Landscape: In the DMU:
a. When a building is set back from the sidewalk, at least 50% of the setback area shall provide usable open space, such as a public plaza or pedestrian amenities, that meets the standards of this subsection. Building setbacks cannot exceed the maximum setbacks established by Subsection 19.304.5.D and the frontage occupancy requirements of Subsection 19.304.5.E.
b. Usable open space shall be abutted on at least two sides by retail shops, restaurants, offices, services, or residences with windows and entrances fronting on the space.
c. Usable open space must be accessible at grade adjacent to the sidewalk.
d. Open space may be hardscaped or landscaped, including plazas, courtyards, gardens, terraces, outdoor seating, and small parks.

Parking: Minimum parking requirements per MMC 19.600 do not apply to the proposed project. All nonresidential uses are exempt from the off-street parking requirements in the DMU Zone. However, if off-street parking is provided, then the maximums and the rest of MMC 19.600 applies. It appears that the proposed number of parking spaces will exceed the maximum number. A parking quantity modification application will be required. Please see Application Procedures section for more details.

Transportation Review: Please see the Public Works notes for any information about the requirements of MMC 19.700

Application Procedures: The proposed work is a complete structural improvement of the Ledding Library and associated site improvements.

Land use applications required:
- Natural Resources (Type III)
- Major Modification of a Community Service Use (Type III)
- Downtown Design Review (Type III)
- Parking Modification (Type II)
- Comprehensive Plan text amendment - Scott Park (Type V)

Natural Resources (MMC 19.402): The regulations in Section 19.402 apply to all properties that contain, or are within 100 ft of a WQR and/or HCA as shown on the Milwaukie Natural Resource Administrative Map. The area of work contains both WQR and HCA and is entirely within 100 ft of the WQR. The proposed work exceeds 150 sf within the HCA and is within 100 ft of a WQR, and therefore is subject to Type III review and approval by the Planning Commission under Section 19.1006.

The application materials should include the following information:

•Information found required in 19.402.9 Construction Management Plans
•Demonstrate compliance with 19.402.11 Development Standards
•Type III Natural Resource review is subject to 19.402.12 General Discretionary Review.
o19.402.12.A describes the Impact Evaluation and Alternatives Analysis. The applicant is encouraged to review this section carefully. A thorough alternatives analysis will be required in order for the City to make a decision on the Natural Resources application.
o19.402.12.B identifies the approval criteria for Type III applications. Application materials should demonstrate how the proposal complies with the listed criteria. The applicant is encouraged to prepare the application with careful thought paid to the code direction for projects to first avoid, then minimize, then mitigate; a demonstration that no practicable alternative is possible is a key point in this application.

Community Service Uses (CSUs)

The library is a Community Service Use (CSU) in the Downtown Mixed-Use Zone. The proposed work constitutes a major modification to a CSU. Applications for major modification to existing CSUs are subject to Type III review as per MMC Subsection 19.904.3. The applicant is encouraged to review the procedures for review a CSU (19.904.5) and the application requirements (19.904.6). The proposal is subject to both the approval criteria for CSUs as well as the specific standards for Institutions (19.904.4 and 19.904.9). The procedures for Type III review are established in MMC Section 19.1006.

Downtown Design Review:

Downtown design review generally includes review of the proposed structure(s) and site improvements for compliance with applicable design standards. Per MMC 19.906.2.B, Type II development review does not apply to development proposals in the downtown zones as these zones have a separate downtown design review process.

Given the nature of the proposal, a civic building that would not likely meet most of the design standards in MMC 19.508, Downtown Site and Building Design Standards, this application would be reviewed through a Type III process.

Through Type III review, applicants address downtown design review requirements through a combination of satisfying certain design standards and, in instances where they elect not to utilize design standards, satisfying the purpose statement of the applicable standard or standards and the applicable design guidelines instead. The applicant is encouraged to focus the design on these aspects, rather than strict adherence to the design standards. The public hearing and decision will focus on whether or not the project satisfies the requirements of the applicable design guidelines.

Per MMC 19.508.5, variances cannot be granted for the design standards of Section 19.508. Projects that cannot meet the design standards in this section must be reviewed through a Type III downtown design review and demonstrate compliance with the Milwaukie Downtown Design Guidelines, pursuant to Section 19.907. A Type III review process would include a review by the Design and Landmark Committee in addition to the Planning Commission.

Applicant is encouraged to carefully review the following zoning code sections applicable to this project:

1. MMC 19.304 – Downtown zones
2. MMC 19.508 – Downtown site and design standards
3. MMC 19.600 – Off-street parking
4. MMC 19.907 – Downtown design review

Comprehensive Plan Text Amendment

The library is located in Scott Park, which has an adopted Master Plan from 1990 and is an ancillary document within the Comprehensive Plan. In the document the site is referred to as the “Scott Park/Ledding Library site”. The Scott Park Master Plan was adopted by City Council 1990 as an “Implementing Document of the Milwaukie Comprehensive Plan”. The Master Plan is quite specific and did not anticipate an expansion of the library as proposed. To move forward with the proposed project, the master plan will need to be amended to acknowledge the proposed expansion.

The City will initiate the Type V application either slightly ahead of, or concurrent with, the remainder of the land use applications.

development, including any existing storm water management facilities serving the development property. Also, the plan shall demonstrate compliance with water quality standards.
Applicant indicated that the groundwater was very shallow, in which case this site would be allowed to flow to the storm main on site. If applicant elects to direct flow to the creek then a downstream analysis would have to be completed. The downstream existing storm pipe system has been analyzed and determined to be insufficiently sized. A capital improvement project has been identified and is on the current Capital Improvement Plan. Private stormwater facilities require the submittal of an Operation and Maintenance plan that is approved by the City and recorded with Clackamas county.
The storm SDC is based on the amount of new impervious surface constructed at the site. One storm SDC unit is the equivalent of 2,706 square feet of impervious surface. The storm SDC is currently $845 per unit. The storm SDC will be assessed and collected at the time the building permits are issued. Sites that provide for quality for the entire site are eligible for a reduced monthly rate of their stormwater fee.

Street: The proposed development fronts the north side of SE Harrison Street, an arterial street. The portion of Harrison fronting the proposed development has a right-of-way width of 60 feet and a paved width of 36 feet with curb and sidewalk improvements on both sides of the street.

Frontage: Chapter 19.700 of the Milwaukie Municipal Code, hereafter referred to as "Code", applies to partitions, subdivisions, and new construction.

Transportation Facility Requirements, Code Section 19.708, states that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner.

SE HARRISON STREET
According to the Public Works Standards Public Area Requirements, the cross section for this portion of Harrison Street includes the following:

- 11-foot travel lanes
- 5-foot bike lane
- 10-foot curb tight sidewalks
- Street lighting

Applicant will be responsible for the construction of the above components on Harrison Street, from 21st Avenue to the west edge of SE 24th Avenue. Site is eligible for fee in lieu of construction (FILOC). Fee $1,002 per lineal foot (Section 6 of the Master Fee Schedule). See attached FILOC request form.

Right of Way: The existing right-of-way on SE Harrison Street fronting the proposed development is of adequate width to accommodate the required improvements. If applicant elects to have parking on the north side of Harrison, then a 9-foot dedication will be required. Applicant will be responsible for dedication of the portion of taxlot 1800 that extends into the Harrison Street right-of-way to match the radius that has been established on taxlot 1600.

Driveways: Without any dedication of 21st Avenue the improvement required on the Harrison Street frontage will be the construction of a driveway approach. This driveway approach will conform to public area requirements in depth. Code Section 12.16.040.A states that access to private property shall be permitted with the use of driveway curb cuts and driveways shall meet all applicable guidelines of the Americans with Disabilities Act (ADA). Driveway approaches shall be improved to meet the requirements of Milwaukie's Public Works Standards.

Erosion Control: Per Code Section 16.28.020(C), erosion control and grading permits are required prior to placement of fill, site clearing, or land disturbances, including but not limited to grubbing, clearing or removal of ground vegetation, grading, excavation, or other activities. Erosion control permit is required for any work results in the disturbance or exposure of soils exceeding five hundred square feet. The grading permit trigger is the movement of 10 cubic yards or more of material.

Code Section 16.28.020(E) states that an erosion control permit is required prior to issuance of building permits or approval of construction plans. Also, Section 16.28.020(B) states that an erosion control plan that meets the requirements of Section 16.28.030 is required prior to any approval of an erosion control permit.

Traffic Impact Study: The Engineering director has determined that a traffic impact study will not be required.

PW Notes:

TRANSPORTATION SDC
The Transportation SDC will be based on the increase in trips generated by the new use per the Trip Generation Handbook from the Institute of Transportation Engineers. The SDC for transportation is $1,921 per trip generated. Credits will be given for any demolished structures, which shall be based upon the existing use of the structures.

PARKS & RECREATION SDC
The parks & recreation System Development Charge (SDC) is triggered when application for a building permit on a new dwelling is received. Currently, the commercial parks and recreation SDC is $60 per employee. Credit is applied to any demolished structures and is based upon the existing use of the structures. The parks and recreation SDC will be assessed and collected at the time the building permits are issued.

REQUIREMENTS AT FINAL PLAT
-Utility easement requirements are covered in the Milwaukie Public Works standards for each utility. Generally, a minimum 15-foot wide easement is required. Multiple utilities may be in one easement.
-If fee in lieu of construction option is selected, then fees must be paid before building permits are approved. If applicant elects to construct the public improvements, then the following is the public improvement process:
•Engineered plans for public improvements (street, sidewalk, and utility) are to be submitted and approved prior to start of building construction., Full-engineered design is required along the frontage of the proposed development.

•Improvements will be completed under a right-of-way permit. The applicant shall pay an inspection fee of 5.5% of the cost of public improvements prior to start of construction.

•The applicant/contractor shall provide a payment and performance bond for 100% of the cost of the public improvements prior to the start of construction.

•The applicant/contractor shall provide a final approved set of Mylar "As Constructed" drawings to the City of Milwaukie prior to the final inspection.

•The applicant/contractor shall provide a maintenance bond for 100% of the cost of the public improvements prior to the final building inspection.

PLANNING ISSUES

Setbacks: In the Downtown Mixed Use (DMU) Zone: Minimum street setback = 0 feet; maximum street setback = 10-20 feet. Please review the following sections in the zoning code for additional information:

Parking Modification

MMC 19.605.2 provides the process and approval criteria for applications seeking a modification from the maximum allowed parking as calculated in Table 19.605.1. The approval criteria are found in 19.605.2.C.1 (reasonableness) and 19.605.2.3 (specific to the site and use). The applicant is encouraged to include parking for Scott Park as part of the description of the use of the site in order to determine needed off-street parking for the library site.

All applications may be filed together and they will be reviewed concurrently. A concurrent application review consolidates the review of multiple applications into a single review process. The applications shall be processed according to the highest numbered review type required for any part of the application. For example, a concurrent review of a Type II review and a Type III review would be processed through a Type III review. A single decision shall be issued that includes findings for all of the applications that are part of the concurrent review.
The applicant shall submit an application form and application fee for each application type being reviewed. The application shall contain the information and documentation required for each individual application type.

Application fees are based on the current fee schedule. Fees are typically updated on July 1st of each year. Current application fees are as follows: Type I = $200; Type II = $1,000; Type III = $2,000. Note: as the City will initiate the Type V application, no fees will be charged. For concurrent applications, a 25% discount is applied (no discount for the most expensive application).

For the City's initial review, the applicant should submit 5 complete copies of the application, including all required forms and checklists. A determination of the application's completeness will be issued within 30 days. If deemed incomplete, additional information will be requested. If deemed complete, additional copies of the application may be required for referral to other departments, the Historic Milwaukie Neighborhood District Association (NDA), and other relevant parties and agencies. City staff will inform the applicant of the total number of copies needed.

For Type III review, once the application is deemed complete, a public hearing with the Planning Commission will be scheduled. Staff will determine the earliest available date that allows time for preparation of a staff report (including a recommendation regarding approval) as well as provision of the required public notice to property owners and residents within 300 ft of the subject property, at least 20 days prior to the public hearing. A sign giving notice of the application must be posted on the subject property at least 14 days prior to the hearing.

Type III applications are quasi-judicial in nature and are decided by the Planning Commission at a public hearing. The Downtown Design Review application includes a meeting with the DLC, which will scheduled to occur prior to the first Planning Commission hearing so that the DLC may review the application and submit formal comments for consideration.

The Planning Commission hears land use applications on the second and fourth Tuesdays of every month, and completed applications need to be submitted to the Planning Department no later than 45 days prior to the target Planning Commission hearing. In general, staff recommends that applications be submitted one to two weeks before the 45-day deadline in order to ensure that there is time to make the applications complete if they are initially deemed incomplete. Once the Planning Commission renders a decision, there is a fifteen calendar-day appeal period. Permits submitted during the appeal period may be reviewed but are not typically approved until the appeal period has ended.

Prior to submitting the application, the applicant is encouraged to present the project at a regular meeting of the Historic Milwaukie NDA.

Natural Resource Review: The project area includes a designated Water Quality Resource (WQR) area and a Habitat Conservation Area (HCA), extending from the creek up onto the area of work. The proposed project will disturb both the WQR and HCA and is subject to Type III Natural Resources review.

Please refer to application procedures above.

Lot Geography: The subject property is an irregular shaped lot with frontage on Harrison Street and 21st Avenue.

Planning Notes: The applicant submitted questions with the application materials. Select responses are as follows:

1.Is the proposed pedestrian path along the west edge of the pond approvable? Subject to the required Natural Resources review, the path is approvable. Staff notes that 19.402.4.17 describes the requirements for the establishment of trails in the WQR or HCA that would be exempt from review.
2.Regarding the requirement for loading spaces, the library has noted that the size of a required loading space in 19.608.3, is much larger than the size the library needs. A variance, in this case, would not be required, as the Planning Director has the authority to determine whether or not to require off-street loading spaces. Given the nature of the proposed use, the alternate size loading space is acceptable without a variance.

Neighboring properties within 300 ft of the site will receive notice of the proposed development and may submit comments or testify at the hearing. As noted above, it is recommended that the applicant discuss the project with the Historic Milwaukie NDA to gauge support for the project. The NDA's webpage is on-line at http://www.milwaukieoregon.gov/citymanager/historic-milwaukie-nda. Their meetings are held at 6:30pm on the second Monday of the month at Libbie's Restaurant at 11056 SE Main St. The NDA Chairperson is Ray Bryan (503-794-9354, ray1bryan2@gmail.com). Please contact the Chair to coordinate a meeting to discuss the proposal.

The preapplication conference is valid for purposes of submitting future land use applications as described in MMC 19.1002.4. A preapplication conference is valid for 2 years.

The full zoning code is available online at:
http://www.qcode.us/codes/milwaukie/view.php?topic=19&frames=on

ADDITIONAL NOTES AND ISSUES

County Health Notes:

Other Notes:

This is only preliminary preapplication conference information based on the applicant's proposal and does not cover all possible development scenarios. Other requirements may be added after an applicant submits land use applications or building permits. City policies and code requirements are subject to change. If you have any questions, please contact the City staff that attended the conference (listed on Page 1). Contact numbers for these staff are City staff listed at the end of the report.

Sincerely,

City of Milwaukie Development Review Team

BUILDING DEPARTMENT
Samantha Vandagriff - Building Official - 503-786-7611
Vacant - Permit Specialist - 503-786-7613

ENGINEERING DEPARTMENT
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CLACKAMAS FIRE DISTRICT
Mike Boumann - Lieutenant Deputy Fire Marshal - 503-742-2673
Matt Amos - Fire Inspector - 503-742-2661

Clackamas County Fire District #1
Fire Prevention Office

E-mail Memorandum

To: City of Milwaukie Planning Department

From: Matt Amos, Fire Inspector, Clackamas Fire District #1

Date: 9/25/2017

Re: Ledding Library 10660 SE 21st Ave, 17-018PA

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

COMMENTS:

A Fire Access and Water Supply plan is required for subdivisions and commercial buildings over 1000 square feet in size or when required by Clackamas Fire District #1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291, and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority.

Access:

1) Provide address numbering that is clearly visible from the street.
2) No part of a building may be more than 150 feet from an approved fire department access road.
3) Provide an approved turnaround for dead end access roads exceeding 150 feet in length.
4) Fire Department turnarounds shall meet the dimensions found in the fire code applications guide.

OVERLAY ZONE STANDARDS
19.508 DOWNTOWN SITE AND BUILDING DESIGN STANDARDS

The design standards contained in this section are intended to encourage building design and construction with durable, high-quality materials. The design standards will support the development of a cohesive, attractive, and safe downtown area and encourage private investment. The design standards do not prescribe a particular building or architectural style.

19.508.1 PURPOSE

All buildings that meet the applicability provisions in Subsection 19.508.2 shall meet the following design standards. An architectural feature may be used to comply with more than one standard.

19.508.4 BUILDING DESIGN STANDARDS

A. Building Façade Details

1. Purpose: To provide cohesive and visually interesting building façades in the downtown, particularly along the ground floor.

RESPONSE: ELECTIVELY NOT APPLICABLE - PER MILWAUKIE DOWNTOWN DESIGN GUIDELINES PERTAINING TO ARCHITECTURAL CONTRAST:

"CONTRAST IS ESSENTIAL TO CREATING AN INTERESTING URBAN ENVIRONMENT. USED WISELY, CONTRAST CAN PROVIDE FOCUS AND DRAMA, ANNOUNCE A SOCIALLY SIGNIFICANT USE, HELP DEFINE AN AREA AND CLARIFY HOW THE DOWNTOWN IS ORGANIZED. ... CONTRAST EMPLOYED AT A LARGE SCALE SHOULD BE RESERVED EXCLUSIVE FOR CIVIC BUILDINGS"

2. Nonresidential and Mixed-Use Buildings - The following standards apply only to nonresidential and mixed-use buildings.

a. Vertical Building Façade
Nonresidential and mixed-use buildings 2 stories and above shall provide a defined base, middle, and top.

RESPONSE: NOT APPLICABLE - PROJECT IS ONE STORY

(1) Base - The base extends from the sidewalk to the bottom of the second story or the belt course/string course that separates the ground floor from the middle of the building. The building base shall be defined by providing all of these elements:
(a) The street-facing ground floor shall be divided into distinct architectural bays that are no more than 30 ft on center. For the purpose of this standard, an architectural bay is defined as the zone between the outside edges of an engaged column, pilaster, post, or vertical wall area.
(b) The building base shall be constructed of brick, stone, or concrete to create a "heavier" visual appearance.
(c) Weather protection that complies with the standards of Subsection 19.508.4.C.
(d) Windows that comply with the standards of Subsection 19.508.4.E.
(2) Middle - The middle of a building extends from the top of the building base to the ceiling of the highest building story. The middle is distinguished from the top and base of the building by use of building elements. The middle of the building shall be defined by providing all of the following elements:
(a) Windows that comply with the standards of Subsection 19.508.4.E.
(b) One of the following elements:
(i) A change in exterior cladding, and detailing and material color between the ground floor and upper floors. Differences in color must be clearly visible.
(ii) Either street-facing balconies or decks at least 2 ft deep and 4 ft wide, or a 6-ft minimum building step-back on the third floor or higher, for at least 25% of the length of the building.
(c) A change in wall plane of not less than 24 in. deep and 24 in. wide. Breaks may include but are not limited to an offset, recess, window reveal, pilaster, pediment, coursing, column, marquee, or similar architectural feature.
(3) Top - The top of the building extends from the ceiling of the uppermost floor to the highest vertical point on the roof of the building, and it is the roof form/element at the uppermost portion of the façade that visually terminates the façade. The top of the building shall provide roofs that comply with the standards of Subsection 19.508.4.F.

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

b. Horizontal Building Façade
(1) Horizontal datum lines—such as belt lines, cornices, or upper floor windows—shall line up with adjacent façades if applicable.

RESPONSE: BECAUSE OF ITS CIVIC USE, THE PROPOSED DESIGN USES "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO DIFFERENTIATE ITSELF FROM NEIGHBORING BUILDINGS.

(2) Significant breaks shall be created along building façades at least every 150 linear ft by either setting the façade back at least 20 ft or breaking the building into separate structures. Breaks shall be at least 15 ft wide and shall be continuous along the full height of the building. The area or areas created by this break shall meet the standards of Subsection

RESPONSE: DOES NOT COMPLY. THE WEST ELEVATION IS BROKEN INTO TWO DISTINCT FACADES AT THE MAIN ENTRY. THE GLASS AT THE ENTRY PROVIDES A FULL BUILDING HEIGHT BREAK. REFER TO BUILDING ELEVATIONS.

3. Residential Buildings
a. Stand-alone multifamily residential buildings are subject to the objective standards of Subsection 19.505.3.D.6 Building Façade Design, with the exception of the private and public open space requirements of Subsections 19.505.3.D.1 and 2. The open space requirements of Subsection 19.508.5 apply to stand-alone multifamily residential buildings in downtown.
b. Rowhouses are subject to the objective standards of Subsection 19.505.5 Rowhouses, as revised by Subsection 19.304.3.B.
c. Live/work units are subject to the objective standards in Subsection 19.505.6 Live/Work Units.

RESPONSE: NOT APPLICABLE - PROJECT IS NOT RESIDENTIAL

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

B. Corners

1. Purpose: To create a strong architectural statement at street corners and establish visual landmarks and enhance visual variety.

2. Nonresidential or Mixed-Use Buildings - Nonresidential or mixed-use buildings at the corner of two public streets—or at the corner of a street and a public area, park, or plaza—shall incorporate two of the following features (for the purposes of this standard an alley is not considered a public street):

a. The primary entry to the building located within 5 ft of the corner.

RESPONSE: DOES NOT COMPLY. FOR PROGRAMMATIC DEMANDS, THE BUILDING'S PRIMARY ENTRANCE IS LOCATED MID-BLOCK, NORTH OF THE INTERSECTION OF SE HARRISON AND 21ST. REFER TO THE "CORNER DOORS" WRITTEN RESPONSE WITHIN THE MILWAUKIE DOWNTOWN GUIDELINES RESPONSES BELOW.

b. A prominent architectural element, such as increased building height or massing, a cupola, a turret, or a pitched roof at the corner of the building or within 20 ft of the corner of the building.

RESPONSE: COMPLIES. THE UNDULATING ROOF FORM PITCHES UPWARD TOWARD THE SOUTHWEST CORNER OF THE SITE, CREATING A TALLER BUILDING VOLUME AT THE CORNER FACING CITY HALL AND THE REST OF DOWNTOWN.

c. The corner of the building cut at a 45° angle or a similar dimension "rounded" corner.

RESPONSE: SOMEWHAT COMPLIANT. THE PROPOSED BUILDING FEATURES BUILDING "CUT," THAT IS AT A SHALLOWER ANGLE (12.3 DEG.), BUT THE ANGLE STRETCHES ACROSS THE ENTIRE SOUTH FACADE, NOT SIMPLY THE SW CORNER. THIS IS ANOTHER EXAMPLE OF *"ARCHITECTURAL CONTRAST."*

d. A combination of special paving materials; street furnishings; and, where appropriate, plantings, in addition to the front door.

RESPONSE: COMPLIES. A BROAD EXTERIOR CANOPY, IN CONJUNCTION WITH (2) LARGE PLANTING AREAS WITH INTEGRAL SEATING, FORM A WELCOMING AND MEMORABLE ENTRANCE GATEWAY TO THE LIBRARY SITE. THE CANOPY EXTENDS ALL THE WAY TO THE PRIMARY MID-BLOCK ENTRANCE CREATING A SHELTERED PATH FOR PATRONS.

C. Weather Protection

1. Purpose

Create an all-season pedestrian environment.

2. Weather Protection Required - All buildings shall provide weather protection for pedestrians as follows:

a. Minimum Weather Protection Coverage

(1) All ground-floor building entries shall be protected from the weather by canopies or recessed behind the front building façade at least 3 ft.

RESPONSE: COMPLIES. A BROAD CANOPY (11' TO 13' DEEP) PROTECTS PATRONS ALONG THE PRIMARY PEDESTRIAN PATH FROM HARRISON TO THE LIBRARY'S MAIN ENTRANCE, WHICH PROTECTS BOTH THE PUBLIC AND STAFF/DELIVERY ENTRANCES.

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

(2) Permanent awnings, canopies, recesses, or similar weather protection shall be provided along at least 50% of the ground-floor elevation(s) of a building where the building abuts a sidewalk, civic space, or pedestrian accessway.

RESPONSE: COMPLIES. OF THE COMBINED ~351' OF FACADE FRONTING SIDEWALK (TO THE SOUTH ALONG SE HARRISON AND TO THE WEST SE 21ST *DRIVEWAY*), ~193' IS COVERED BY A BROAD CANOPY, WHICH EQUATES TO 85% OF FRONTAGE SIDEWALKS BEING PROTECTED.

(3) Weather protection used to meet the above standard shall extend at least 4 ft, and no more than 6 ft, over the pedestrian area, and a maximum of 4 ft into the public right-of-way. Balconies meeting these dimensional requirements can be counted toward this requirement.

RESPONSE: THE PROPOSED DESIGN USES "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO DIFFERENTIATE ITSELF FROM OTHER DOWNTOWN PEDESTRIAN AREAS. THE PROPOSED PEDESTRIAN AREA ON THE WEST SIDE OF THE BUILDING HAS BEEN DESIGNED TO BE SIGNIFICANTLY LARGER THAN A STANDARD DOWNTOWN SIDEWALK INDICATING ITS CIVIC SCALE, APPROPRIATE FOR THE ENTRANCE TO THE LIBRARY AS WELL AS THE PRIMARY ACCESSWAY TO SCOTT PARK BEYOND. IN AN EFFORT TO REINFORCE THE CIVIC SCALE AND PROTECT PARTONS ARRIVING BY VEHICLE, THE CANOPY HAS BEEN EXTENDED BEYOND THE PRESCRIBED MAXIMUM 6 FT. NO PART OF THE CANOPY EXTENDS INTO THE PUBLIC RIGHT OF WAY.

(4) In addition, the above standards do not apply where a building has a ground-floor dwelling, as in a mixed-use development or live-work building, and the dwelling entrance has a covered entrance.

RESPONSE: NOT APPLICABLE, NO PROPOSED DWELLING UNITS.

b. Weather Protection Design - Weather protection shall comply with applicable building codes and shall be designed to be visually compatible with the architecture of a building. Where applicable, weather protection shall be designed to accommodate pedestrian signage (e.g., blade signs) while maintaining required vertical clearance.

RESPONSE: COMPLIES. *REFER TO BUILDING ELEVATION DRAWINGS*

D. Exterior Building Materials

1. Purpose - To encourage the construction of attractive buildings with materials that evoke a sense of permanence and are compatible with downtown Milwaukie and the surrounding built and natural environment.

RESPONSE: COMPLIES. EXTERIOR CLADDING OF THE PROPOSED BUILDING IS COMPRISED PRIMARILY OF SEMI-TRANSPARENT STAINED, VERTICALLY-ORIENTED CEDAR SIDING, FIBERGLASS-FRAMED, INSULATED GLAZING UNITS, AND SOME DARK GREY, MATTE-FINISH PAINTED SHEET METAL PANELS AND METAL TRIM. ALTHOUGH WE WILL UTILIZE HIGH-PERFORMANCE AND DURABLE EXTERIOR WALL ASSEMBLIES, BEING ON THE EDGE OF THE DESIGNATED DOWNTOWN AREA, WE'RE PROPOSING THE USE OF WOOD SIDING TO MORE CLOSELY RELATE THE BUILDING TO THE ADJACENT NATURAL AREA TO THE EAST AND ACT AS A TRANSITION FROM A HARDENED DOWNTOWN PALETTE TO A SOFTER, MORE HUMANE RESIDENTIAL PALETTE.

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

2. Exterior Wall Standards - The following standards are applicable to the street-facing façades of all new buildings. For the purposes of this standard, street-facing façades are those abutting streets, courtyards, and/or public squares in all of the downtown. Table 19.508.4.D specifies the primary, secondary, and prohibited material types referenced in this standard.

a. Buildings shall utilize primary materials for at least 65% of each applicable building façade.

b. Secondary materials are permitted on no greater than 35% of each applicable building façade.

c. Accent materials are permitted on no greater than 10% of each applicable building façade as trims or accents (e.g. flashing, projecting features, ornamentation, etc.).

d. Buildings shall not use prohibited materials on any exterior wall, whether or not it is a street-facing façade.

RESPONSE: COMPLIES. PROJECT UTILIZES, WOOD SIDING AND GLAZING AS PRIMARY MATERIALS WITH LESS THAN 25% SHEET METAL PANELING, GUTTERS AND TRIM AS A SECONDARY MATERIAL.

E. Windows and Doors

1. Purpose - To enhance street safety and provide a comfortable pedestrian environment by adding interest to exterior façades, allowing for day lighting of interior space, and creating a visual connection between interior and exterior spaces.

2. Main Street - For block faces along Main St, 50% of the ground-floor street wall area must consist of openings; i.e., windows or glazed doors. The ground-floor street wall area is defined as the area up to the finished ceiling height of the space fronting the street or 15 ft above finished grade, whichever is less.

RESPONSE: NOT APPLICABLE. PROJECT DOES NOT FRONT MAIN STREET.

3. Other Streets - For all other block faces, the exterior wall(s) of the building facing the street/sidewalk must meet the following standards:

a. 40% of the ground-floor street wall area must consist of openings; i.e., windows or glazed doors.

RESPONSE: THE SOUTH FACADE AFFRONTING HARRISON IS COMPLIANT (44% GLAZING). THE WEST FACADE USES "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO REINFORCE THE DESIGN CONCEPT OF EMPHASIZING A STRONG CONNECTION TO THE NATURAL AREAS ON THE EAST SIDE OF THE BUILDING. MORE OPENINGS ARE PROVIDED ON THE EAST SIDE TO ALLOW FOR VIEWS OF THE POND AREA FROM THE PUBLIC OPEN LIBRARY AREAS. FEWER OPENINGS ARE PROVIDED ON THE WEST SITE TO LIMIT SOLAR THERMAL GAIN AND TO RELATE TO THE LESS PUBLIC (RESIDENTIAL) NATURE OF THE SPACES ALONG THAT FACADE.

b. Along McLoughlin Blvd the required coverage is 30%.

RESPONSE: NOT APPLICABLE, PROJECT DOES NOT AFFRONT McLOUGHLIN

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

4. Upper Level - Along all block faces, the following standards are applicable on the upper level building façades facing a street or public space.

a. Upper building stories shall provide a minimum of 30% glazing. For the purposes of this standard, minimum glazing includes windows and any glazed portions of doors.

b. The required upper-floor window/door percentage does not apply to floors where sloped roofs and dormer windows are used.

c. A minimum of 60% of all upper-floor windows shall be vertically oriented. This vertical orientation applies to grouped window arrays as opposed to individual windows.

RESPONSE: NOT APPLICABLE. BUILDING DOES NOT HAVE UPPER LEVELS

5. General Standards

a. Windows shall be designed to provide shadowing. This can be accomplished by recessing windows 4 in into the façade and/or incorporating trim of a contrasting material or color.

RESPONSE: COMPLIES. *REFER TO DETAILS*

b. All buildings with nonresidential ground-floor windows must have a visible transmittance (VT) of 0.6 or higher.

RESPONSE: COMPLIES.

c. Doors and/or primary entrances must be located on the street facing block faces and must be unlocked when the business located on the premises is open. Doors/entrances to second-floor residential units may be locked.

RESPONSE: COMPLIES.

d. The bottom edge of windows along pedestrian ways shall be constructed no more than 30 in above the abutting walkway surface.

RESPONSE: COMPLIES IN THE MAJORITY OF LOCATIONS. THE EXCEPTION OCCURS WHEN THE FINISH FLOOR HEIGHT INSIDE THE BUILDING IS SIGNIFICANTLY HIGHER THAN THE ABUTTING WALKWAY SURFACE (40" AT ITS LARGEST DISPARITY). THIS DISPARITY IS A DIRECT RESULTANT OF A DESIGN PRIORITY TO MAXIMIZE UNIVERSAL SITE AND BUILDING ACCESSIBILITY.

e. Ground-floor windows for nonresidential buildings shall allow views into storefronts, working areas, or lobbies. No more than 50% of the window area may be covered by interior furnishings including, but not limited to, curtains, shades, signs, or shelves.

RESPONSE: COMPLIES.

f. Signs are limited to a maximum coverage of 20% of the required window area.

RESPONSE: COMPLIES. *REFER TO SIGNAGE DRAWINGS / DETAILS.*

19.508.4 BUILDING DESIGN STANDARDS CONTINUED

6. Prohibited Window Elements - For all building windows facing streets, courtyards, and/or public squares in the downtown, the following window elements are prohibited:

a. Reflective, tinted, or opaque glazing.
b. Simulated divisions (internal or applied synthetic materials).
c. Exposed, unpainted metal frame windows.

RESPONSE: COMPLIES.

F. Roofs and Rooftop Equipment

1. Purpose - To create a visually interesting condition at the top of the building that enhances the quality and character of the building.

2. Roof Forms

a. The roof form of a building shall follow one (or a combination) of the following forms:

(1) Flat roof with parapet or cornice.
(2) Hip roof.
(3) Gabled roof.
(4) Dormers.
(5) Shed roof.

RESPONSE: THE ROOF DESIGN DESIGN USES "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO DIFFERENTIATE THE BUILDING FROM ADJACENT BUILDINGS.

b. All flat roofs, or those with a pitch of less than 4/12, shall be architecturally treated or articulated with a parapet wall that projects vertically above the roofline at least 12 in and/or a cornice that projects from the building face at least 6 in.

RESPONSE: THE PROPOSED DESIGN USES "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO DIFFERENTIATE ITSELF FROM ADJACENT BUILDINGS. THE UNDULATING SHED ROOF FORM HAS VARYING SLOPES, THE MAJORITY OF WHICH ARE FLATTER THAN 4:12. NO PARAPET IS USED TO REINFORCE THE SCULPTURAL FORM OF THE BUILDING AND TO MAXIMIZE THE VISIBILITY OF THE ROOF-MOUNTED SOLAR PV PANELS.

c. All hip or gabled roofs exposed to view from adjacent public or private streets and properties shall have a minimum 4/12 pitch.

RESPONSE: NOT APPLICABLE. THE BUILDING DOES NOT UTILIZE A GABLED OR HIP ROOF FORM.

MILWAUKIE DOWNTOWN DESIGN GUIDELINES

MILWAUKIE CHARACTER GUIDELINES

A. Milwaukie Character Guidelines - These guidelines address Milwaukie's unique "sense of place," its special quality and personality. People's image of Milwaukie is that of an All-American riverfront town which is hospitable and family oriented. The guidelines address what gives Milwaukie this feeling, this "character" as a unique collection of spaces and buildings, not simply a group of individual projects that could be anywhere. The Milwaukie Character Guidelines consist of the following sections:

1. Reinforce Milwaukie's Sense of Place: Strengthen the qualities that make Milwaukie a unique place.

RESPONSE: COMPLIES. REFER TO THE *PROJECT DESIGN NARRATIVE* FOR A BROADER EXPLANATION

- ORIENTATION AND CONNECTION TO THE WATER
- RESPECT OF NATURAL RESOURCES
- HIGH ENERGY PERFORMANCE + ON-SITE GENERATION
- REINFORCEMENT OF URBAN EDGES
- HUMBLE HUMAN SCALE
- NATURAL MATERIALITY
- LARGE SPACES DESIGNED SPECIFICALLY FOR CHILDREN AND TEENS

2. Integrate the Environment: Building design should build upon environmental assets.

RESPONSE: COMPLIES. THE BUILDING DESIGN TAKES ADVANTAGE OF ITS LOCATION ON THE BANK OF SPRING CREEK POND, FLANKING THE EAST SIDE OF THE SITE.

- LARGE GLAZING AREAS ON THE EAST AND NORTH FACADES OPEN THE LIBRARY UP TO THE VERDANT NATURAL AREAS SURROUNDING SPRING CREEK POND AND SCOTT PARK.
- EXTERIOR WINDOWS AND INTERIOR RELIGHTS HAVE BEEN ALIGNED TO ALLOW FOR VIEWS ALL THE WAY THROUGH THE BUILDING FROM THE PARKING LOT TO THE TREE CANOPY ON THE EAST
- RAINWATER MANAGEMENT FEATURES PUT THE NATURAL FILTRATION PROCESS ON DISPLAY

3. Promote Linkages to Horticultural Heritage: celebrate Milwaukie's heritage of beautiful green space.

RESPONSE: COMPLIES. NEW LANDSCAPED AREAS UTILIZE PLANT SELECTIONS THAT HONOR MILWAUKIE'S HORTICULTURE HERITAGE

4. Establish or Strengthen Gateways: Projects should use arches, pylons, arbors, or other transitions to to mark special entries and/or borders between public and private spaces.

RESPONSE: COMPLIES. A LARGE, CIVICALLY-SCALED CANOPY, ACTS AS THE PRIMARY GATEWAY TO THE LIBRARY ENTRANCE

- CANOPY CREATES A SENSE OF ARRIVAL AT THE PROMINENT SOUTHWEST CORNER OF THE SITE, SHELTERING PEDESTRIANS TO THE LIBRARY ENTRANCE.
- BECAUSE THERE IS A PEDESTRIAN WAY CONNECTING MAIN STREET TO THE WEST SIDE OF THE LIBRARY SITE (ALIGNED WITH SCOTT ST.), A CROSSWALK AND SIDEWALK, FLANKED BY LANDSCAPED AREAS HAS BEEN PROVIDED, LEADING DIRECTLY TO THE LIBRARY ENTRANCE.

5. Consider View Opportunities: Building designs should maximize views of natural features or public spaces.

RESPONSE: COMPLIES. BEYOND THE PRIMARY CONCEPT TO VISUALLY CONNECT THE LIBRARY'S MAIN PUBLIC SPACES TO THE NATURAL AREA SURROUNDING SPRING CREEK POND, A NUMBER OF OCCUPIABLE SPACES HAVE BEEN CAREFULLY LOCATED ALONG THE PERIMETER OF THE BUILDING TO TAKE ADVANTAGE OF PARTICULAR VIEWS OF THE SURROUNDING LANDSCAPE AND URBANSCAPE.

- ACROSS FROM THE MAIN ENTRY FOYER, THE POINT OF THE CHEVRON, HAS BEEN POSITIONED TO ALIGN WITH AN EXISTING BREAK BETWEEN LARGE OAK TREES, AFFORDING EXCEPTIONAL VIEWS OF THE POND AND IMPROVED DAYLIGHTING
- IN THE SOUTH EAST CORNER OF THE BUILDING, GLAZING AND SEATING ALLOWS FOR VIEWS OF THE ADJACENT, PROMINENT LARGE OAK.
- IN THE SOUTH WEST CORNER, THE LARGE GLAZING AND SEATING AREAS ARE ORIENTED TO CREATE A VIEW TOWARDS CITY HALL AND THE REST OF DOWNTOWN WHILE SIMULTANEOUSLY CREATING AN ACTIVE URBAN EDGE FOR THE LIBRARY SITE

6. Consider Context: A building should strengthen and enhance the characteristics of its setting, or at least maintain key unifying patterns.

RESPONSE: COMPLIES. THE IMMEDIATE SITE CONTEXT CONSISTS OF (4) DISTINCT CONDITIONS THAT HAVE IMPACTED THE DESIGN OF THE BUILDING'S MASSING, PROGRAMMING AND FENESTRATION LAYOUT. BECAUSE OF ITS CIVIC USE AND UTILIZATION OF LARGE SCALE ARCHITECTURAL CONTRAST, HOW THE BUILDING RELATES TO THE BUILT CONTEXT, DIFFERS FROM OTHER MORE COMMON BUILDING USES.

- SOUTH: *URBAN* - THE SOUTH SIDE OF THE SITE, FRONTING HARRISON STREET AND JUST A BLOCK OFF OF MAIN STREET, IS THE MOST PROMINENT EDGE OF THE PROPERTY. IN CONTRAST TO THE EXISTING LIBRARY'S SIGNIFICANT SETBACK FROM HARRISON AND BUFFERING LANDSCAPE, THE IMPROVED LIBRARY BOLDLY OCCUPIES THE SOUTH WEST CORNER OF THE SITE AND FEATURES LARGE WINDOWS REVEALING A CAFE-STYLE, READING ROOM. THE GOAL IS TO CREATE A HIGHLY-VISIBLE, INVITING SYMBOL OF THE LIBRARY WITH THIS ACTIVE URBAN SPACE. *REFER TO SOUTH RENDERINGS.*
- WEST: *MID-RISE RESIDENTIAL, LIVE-WORK, DRIVEWAY, AND PARKING* - OUT OF RESPECT FOR THE PRIVACY FOR THE RESIDENTIAL PROPERTIES AND IN SUPPORT OF THE CONCEPT OF HAVING THE INTERIOR PUBLIC SPACES OPEN UP TO THE NATURAL SITE RESOURCES RATHER THAN THE PARKING LOT, THE WEST FACADE HAS BEEN CRAFTED TO BE MORE OPAQUE, WHICH ALSO HELPS TO LIMIT AFTERNOON HEAT GAIN. TO AVOID CREATING AN INHOSPITABLE PEDESTRIAN ENTRYWAY, BUILDING FENESTRATION HAS BEEN ORCHESTRATED TO PROVIDE SLICES ALL THE WAY THROUGH THE BUILDING, AFFORDING INTRIGUING VIEWS FROM THE WESTERN SIDEWALK THROUGH TO THE TREE CANOPY ON THE EAST. *REFER TO THE BUILDING ELEVATIONS AND "VIEWS THROUGH FLOOR PLAN DIAGRAM".*
- NORTH: *SCOTT PARK AND THE AMPHITHEATER* - ALTHOUGH THE AMPHITHEATER AND PARK AREAS ARE OCCASIONALLY WELL-ATTENDED DURING PROGRAMMED EVENTS SUCH AS CONCERTS, THE PARK SUFFERS FROM BEING LARGELY HIDDEN FROM THE EXISTING LIBRARY AND ISOLATED FROM REST OF DOWNTOWN. BY EXTENDING THE IMPROVED LIBRARY NORTHWARD, MUCH CLOSER TO THE AMPHITHEATER, THE GOAL IS TO HAVE MORE EYES ON THE PARK THROUGH MORE REGULAR, PUBLIC ACTIVITY NEAR AND WITHIN THE PARK. THE CHILDREN'S AREA OF THE LIBRARY WAS LOCATED AT THE NORTH END OF THE BUILDING SO THAT CHILDREN'S PROGRAMS CAN CONVENIENTLY SPILL OUTSIDE FOR ACTIVITIES AND EVENTS.
- EAST: *SPRING CREEK POND AND NATURAL AREA* - BECAUSE OF THE QUALITY AND BEAUTY OF THIS NATURAL RESOURCE, THE BUILDING'S FUNDAMENTAL MASSING, HAS LARGELY BEEN INFORMED BY THE DESIRE TO PROTECT, AND CONNECT THE LIBRARY'S PRIMARY PUBLIC SPACE TO THIS ASSET.

7. Promote Architectural Compatibility: Buildings should be "good neighbors." They should be compatible with surrounding buildings by avoiding disruptive excess. New buildings should not attempt to be the center of attention.

RESPONSE: COMPLIES. BECAUSE OF ITS CIVIC USE AND UTILIZATION OF LARGE SCALE ARCHITECTURAL CONTRAST, MORE TYPICAL COMMERCIAL OR RESIDENTIAL ARCHITECTURAL VOCABULARY, HAS BEEN CONSIDERED TO A LESSER DEGREE. SCALE HOWEVER, AND HOW IT RELATES TO THE VARYING, SURROUNDING SITE CONDITIONS, IS A FOCUS OF THE ARCHITECTURAL DESIGN. THE UNDULATING ROOF FORM, IN COMBINATION WITH DISTRIBUTION OF GLAZED AREAS, ARE THE TWO PRIMARY MOVES THAT CREATE THE SCALE RESPONSES. *REFER TO ARCHITECTURAL MASSING DIAGRAMS.*

8. Preserve Historic Buildings: Historic building renovation, restoration, or additions should respect the original structure.

RESPONSE: COMPLIES. NOT APPLICABLE. THIS PROJECT DOES NOT INVOLVE THE RENOVATION, RESTORATION, OR ADDITION OF A HISTORIC STRUCTURE.

9. *Use Architectural Contrast Wisely: Contrast is essential to creating an interesting urban environment. Used Wisely, contrast can help to provide focus and drama, announce a socially significant use, help define an area and clarify how the downtown is organized.*

Description
... Contrast employed at a large scale should be reserved exclusively for civic buildings. ...

Recommended
- *Building contrast created by a unique site*
- *Civic building contrast on a large scale*

RESPONSE: COMPLIES. BECAUSE OF ITS CIVIC USE, THE DESIGN OF THE BUILDING, LANDSCAPE, AND PEDESTRIAN ENVIRONMENT UTILIZE "*LARGE SCALE ARCHITECTURAL CONTRAST*" TO DIFFERENTIATE THE LIBRARY FROM OTHER MORE COMMON BUILDING USES. THIS CONTRAST HAS BEEN CAREFULLY CRAFTED IN RESPONSE TO SITE CONDITIONS, EXISTING ARCHITECTURAL VOCABULARY, MILWAUKIE HISTORY AND CULTURE. *REFER TO THE 'PROJECT STATEMENT' FOR A BROADER EXPLANATION OF THE DESIGN'S USE OF CONTRAST.*

10. *Integrate Art: Public art should be used sparingly. It should not overwhelm outdoor spaces or render building mere backdrops. When used, public art should be integrated into the design of the building or public open space.*

RESPONSE: COMPLIES. THE PROJECT BUDGET INCLUDES A BUDGET FOR INTEGRATED ARTWORK. THE ARTIST AND ARTWORK HAVE YET TO BE IDENTIFIED, BUT WILL BE TASTEFULLY SELECTED AND INTEGRATED INTO THIS PROJECT.

PEDESTRIAN EMPHASIS GUIDELINES

In Downtown Milwaukie, the pedestrian is the priority. These guidelines address the ways in which buildings and spaces may be designed to create a convenient, comfortable, human-scaled environment that people will want to be in.

1. *Reinforce and Enhance the Pedestrian System: Barriers to pedestrian movement and visual and other nuisances should be avoided or eliminiated, so that the pedestrian is the priority in all development.*

RESPONSE: COMPLIES. PEDESTRIAN ACCESS TO BOTH THE LIBRARY AND SCOTT PARK BEYOND IS DIRECT, CLEAR AND INVITING.
- THE EXISTING LIBRARY ENTRANCE IS ELEVATED A FEW FEET ABOVE THE SIDEWALK REQUIRING PATRONS TO CLIMB MULTIPLE STAIR RUNS OR TAKE A CIRCUITOUS RAMP. THE FINISHED FLOOR ELEVATION OF PROPOSED DESIGN IS ESSENTIALLY FLUSH WITH ENTRY WALKWAY.
- THE EXISTING PATH TO SCOTT PARK ZIGZAGS AROUND THE PARKING LOT AND EXISTING BUILDING WHICH COMPLICATES WAYFINDING FOR PEDESTRIANS ENTERING THE SITE FROM HARRISON. THE PROPOSED SITE PLAN STRAIGHTENS THE PEDESTRIAN ACCESSWAY, PRIORITIZING IT BEFORE THE PARKING LOT.

2. *Define the pedestrian environment: Provide human scale to the pedestrian environment, with variety and visual richness that enhance the public realm.*

RESPONSE: COMPLIES. MARKED WITH A GRAND, SHELTERING CANOPY WITH ELEGANT SUPPORTING COLONNADE AND A SERIES OF LANDSCAPED AREAS FEATURING NATIVE AND SYMBOLIC PLANT SPECIES, THE PEDESTRIAN PATH IS THE PRIMARY CIRCULATION FOCUS.

REGARDING THE WEST BUILDING ELEVATION AND ITS IMPACT TO THE PEDESTRIAN ENVIRONMENT, [FROM THE '*CONSIDER CONTEXT*' RESPONSE ABOVE] OUT OF RESPECT FOR THE PRIVACY FOR THE RESIDENTIAL PROPERTIES AND IN SUPPORT OF THE CONCEPT OF HAVING THE INTERIOR PUBLIC SPACES OPEN UP TO THE NATURAL SITE RESOURCES RATHER THAN THE PARKING LOT, THE WEST FACADE HAS BEEN CRAFTED TO BE MORE OPAQUE, WHICH ALSO HELPS TO LIMIT AFTERNOON HEAT GAIN. TO AVOID CREATING AN INHOSPITABLE PEDESTRIAN ENTRYWAY, BUILDING FENESTRATION HAS BEEN ORCHESTRATED TO PROVIDE FENESTRATED SLICES ALL THE WAY THROUGH THE BUILDING, AFFORDING INTRIGUING VIEWS FROM THE WESTERN SIDEWALK THROUGH TO THE TREE CANOPY ON THE EAST. *REFER TO THE BUILDING ELEVATIONS AND "VIEWS THROUGH FLOOR PLAN DIAGRAM".*

3. *Protect the Pedestrian from the Elements: Protect pedestrians from wind sun and rain.*

RESPONSE: COMPLIES. A GRAND, SHELTERING CANOPY EXTENDS FROM THE BUILDING TO CONTINUOUSLY PROTECT PEDESTRIANS ALL THE WAY FROM HARRISON TO THE MAIN ENTRY. *REFER TO SITE ENTRY RENDERINGS*

4. *Provide Places for Stopping and Viewing: Provide safe, comfortable places where people can stop to sit and rest, meet and visit with each other and otherwise enjoy the downtown surroundings.*

RESPONSE: COMPLIES. A PAIR OF BENCHES NEAR THE MAIN ENTRANCE GIVE PEDESTRIANS AN OPPORTUNITY TO SIT AND REST, WAIT FOR THE LIBRARY TO OPEN OR WAIT FOR A RIDE.

5. *Create Successful Outdoor Spaces: Spaces should be designed for a variety of activities during all hours and seasons.*

RESPONSE: COMPLIES. OUTDOOR SPACES, AND PATHWAYS HAVE BEEN SCALED TO REFLECT A PROMINENT CIVIC USE AND HAVE BEEN DESIGNED TO SUPPORT A RANGE OF ACTIVITIES AND GROUP SIZES.
- LARGER ACCESSWAYS CAN SUPPORT MORE ACTIVITIES, AND AMENITIES THAN A TYPICAL SIDEWALK SECTION
- OCCUPIABLE LANDSCAPE AREAS, PARTICULARLY THE CHILDREN'S GARDEN WITHIN PHASE II OF THE LANDSCAPE INSTALLATION, ARE DESIGNED TO SUPPORT A VARIETY OF ACTIVITIES AND GROUP SIZES.

6. *Integrate Barrier-free Design: Accommodate handicap access in a manner that is integral to the building and public right-of-way and not designed merely to meet minimum building code standards*

RESPONSE: COMPLIES. ONE OF THE PRIMARY FACTORS IN SELECTING A SINGLE STORY LIBRARY WAS TO PROVIDE UNIVERSAL ACCESS FOR PATRONS. THE DESIGN, UNLIKE THE EXISTING LIBRARY PROVIDES, DIRECT, BARRIER-FREE SITE ACCESS, INCLUDING THE ENTIRETY OF THE LIBRARY INTERIOR.

ARCHITECTURAL GUIDELINES

The Architecture Guidelines promote quality development while reinforcing the individuality and spirit of Milwaukie. The guidelines promote architectural types indigenous to Milwaukie and/or the Northwest. Buildings in Milwaukie should seem to be "at home" there, reflecting its character and heritage, suiting its climate, landscape and downtown street grid. Within each downtown planning area, building proposals must consider and respond to selected requirements from the following architectural criteria:

1. *Corner Doors: Locate Entry doors on corners of commercial and retail buildings wherever possible.*

RESPONSE: LIBRARY PATRONS CAN GENERALLY BE DIVIDED INTO THREE GROUPS BASED ON THEIR PRIMARY REASON FOR VISITING: KIDS LIBRARY, ADULTS LIBRARY, COMMUNITY EVENTS. IDEALLY, EACH OF THESE GROUPS, ENTERING FROM A COMMON POINT FOR SECURITY PURPOSES, CAN DIRECTLY ACCESS EACH OF THEIR RESPECTIVE AREAS WITHOUT NEEDING TO DISRUPTIVELY CIRCULATE THROUGH ANOTHER GROUP'S AREA. ITS FOR THIS REASON, THE ENTRANCE WAS NOT LOCATED AT CORNER OF THE BUILDING, BUT CLOSER TO THE MIDDLE. ADDITIONAL ASPECTS: UNIVERSAL ACCESS, BUILDING MASSING, CONSTRUCTION COST AND OPERATIONAL EXPENSE LIMITATIONS, WHICH ARE DESCRIBED WITHIN THE MAIN WRITTEN STATEMENT, HAVE ALSO CONTRIBUTED TO THE PREFERENCE OF A MID-BLOCK ENTRANCE.

TO COMPENSATE, EMPHASIS HAS BEEN PLACED ON A WELCOMING BUILDING PRESENCE AND PEDESTRIAN ENVIRONMENT AT THE SOUTHWEST CORNER OF THE SITE, WHICH AIMS TO CREATE A HEIGHTENED SENSE OF ARRIVAL. [FROM THE '*CONSIDER CONTEXT*' RESPONSE ABOVE] "IN CONTRAST TO THE EXISTING LIBRARY'S SIGNIFICANT SETBACK FROM HARRISON AND BUFFERING LANDSCAPE, THE IMPROVED LIBRARY BOLDLY OCCUPIES THE SOUTH WEST CORNER OF THE SITE AND FEATURES LARGE WINDOWS REVEALING A CAFE-STYLE, READING ROOM. THE GOAL IS TO CREATE A HIGHLY-VISIBLE, INVITING SYMBOL OF THE LIBRARY WITH THIS ACTIVE URBAN SPACE." THE PEDESTRIAN ACCESSWAY,

[FROM THE '*DEFINE THE PEDESTRIAN ENVIRONMENT*' RESPONSE ABOVE] MARKED WITH A GRAND, SHELTERING CANOPY WITH ELEGANT SUPPORTING COLONNADE…" CREATES A GATEWAY AND MEMORABLE ENTRANCE TO THE LIBRARY AND SCOTT PARK SITE. *REFER TO THE BUILDING ENTRY RENDERINGS.*

2. *Retail and Commercial Doors: Doors should create an open and inviting atmosphere.*

RESPONSE: COMPLIES. GLAZED DOORS, ARE PART OF A LARGE GLAZED STOREFRONT, THROUGH WHICH, VISITORS CAN SEE THE TREE CANOPY OF SCOTT PARK STRAIGHT THROUGH THE FOYER AND CENTRAL AREA OF THE LIBRARY. *REFER TO THE FLOOR PLAN AND "VIEWS THROUGH FLOOR PLAN DIAGRAM"*

3. *Residential Doors: Residential front doors should define and friendly transition between the public and private realm.*

RESPONSE: NOT APPLICABLE. NO RESIDENTIAL DOORS INCLUDED IN THIS PROJECT.

4. *Wall Materials: Use materials that create a sense of permanence.*

RESPONSE: OUR PRIMARY WALL ASSEMBLY, A WELL-INSULATED, CEDAR SIDING CLAD, RAIN SCREEN IS A DURABLE, HIGH PERFORMANCE ASSEMBLY. CEDAR, A RENEWABLE, ROT AND INSECT RESISTANT, MATERIAL WAS SELECTED TO BETTER RELATE TO THE ADJACENT SCOTT PARK NATURAL AREA. OTHER PRIMARY AND SECONDARY MATERIALS INCLUDE INSULATED GLAZING UNITS, AND SHEET METAL SIDING AND TRIM

5. *Wall Structure: Use scale defining devices to break up the longitudinal dimensions of buildings, creating a comfortable sense of enclosure by establishing an uninterrupted street edge.*

RESPONSE: COMPLIES. VERTICAL, GLAZING AND SHEET METAL PANEL BANDS, OCCASIONALLY INCLUDING DOORS, PUNCTUATE BUILDING FACADES, OFFERING VIEWS INTO FURNISHED OCCUPIED INTERIOR SPACES.

6. *Retail Windows: Use windows that create an open and inviting atmosphere.*

RESPONSE: NOT APPLICABLE. PROJECT IS NOT RETAIL. THE BUILDING DESIGN DOES HOWEVER, USE WINDOWS TO CREATE AN OPEN, INVITING ATMOSPHERE.

7. *Residential Bay Windows: Provide Bays to add visual interest to facade and interesting views and outdoor spaces from the interiors*

RESPONSE: NOT APPLICABLE. PROJECT IS NOT RESIDENTIAL

8. *Silhouette and Roofline: Create interest and detail in silhouette and roofline*

RESPONSE: COMPLIES. THIS IS A PRIMARY ASPECT OF THE LARGE SCALE ARCHITECTURAL CONTRAST. THE UNDULATING ROOF DESIGN DISTINCTLY CREATES A UNIQUE SILHOUETTE AND ROOFLINE. *REFER TO RENDERINGS*

9. *Rooftops: Integrate rooftop elements into the building design*

RESPONSE: COMPLIES. TO ACCOMMODATE UNSIGHTLY, OTHERWISE ROOFTOP-MOUNTED MECHANICAL UNITS, AN OUTDOOR MECHANICAL COURTYARD HAS BEEN CREATED TO CONCEAL EXTERIOR UNITS.

10. *Green Architecture: New construction or building renovation should include sustainable materials and design*

RESPONSE: COMPLIES. REFER TO THE MAIN WRITTEN STATEMENT FOR OUR APPROACH TO SUSTAINABILITY.

- COMMITTED TO AND TRACKING THE ENERGY TRUST OF OREGON'S PATH TO NET ZERO PROGRAM AND ENERGY USE TARGET
- PHOTOVOLTAIC SOLAR PANEL ARRAY, SIZED IN ACCORDANCE WITH THE STATE OF OREGON'S GREEN TECHNOLOGY REQUIREMENT
- EXTENSIVE USE OF RENEWABLE MATERIAL: CEDAR SIDING AND CEILINGS
- OPTIMIZED DAYLIGHTING, TAKING ADVANTAGE OF SITE CONDITIONS
- HIGHLY EFFICIENT, CLEAN, (COMFORTABLE, AND QUIET) RADIANT SLAB HEATING AND COOLING
- HIGHLY EFFICIENT WALL AND ROOF ASSEMBLIES
- OPTIMIZED SHADING VIA THE BROAD CANOPY AND VERTICAL WOOD SCREENS TO CONTROL PROBLEMATIC SOUTHERN AND WESTERN SOLAR GLARE AND THERMAL GAIN.

11. *Building Security: Buildings and site planning should consider and employ techniques that create a safe environment.*

RESPONSE: COMPLIES. WELL-ILLUMINATED PEDESTRIAN AND PARKING AREAS HELP TO KEEP THE SITE SAFE AFTER HOURS. A SECURITY SYSTEM, INCLUDING VIDEO SURVEILLANCE AND INTRUSION DETECTION HELP TO DETER MISCHIEF. THE BUILDING'S FOOT PRINT EXTENDS SIGNIFICANTLY FARTHER NORTH THAN THE EXISTING BUILDING PROVIDING MORE REGULAR ACTIVITY AND PUBLIC PRESENCE CLOSE TO THE NORTH END OF SCOTT PARK INCLUDING THE AMPHITHEATER.

12. *Parking Structures: Parking structures should be designed so that they appear like most other buildings in the downtown.*

RESPONSE: NOT APPLICABLE. PROJECT DOES NOT INCLUDE A PARKING STRUCTURE

LIGHTING GUIDELINES

Lighting should not only provide nighttime security, but also encourage nighttime patronage of businesses and restaurants. Lighting should create an atmosphere of festivity and activity - especially where special elements or places are concerned. Utilitarian application of glaring, offensively colored lights is not appropriate for downtown. Each development proposal must consider and respond to selected requirements from the following lighting criteria:

1. *Exterior Building Lighting: Architectural lighting should be an integral component of the facade composition*

RESPONSE: NOT APPLICABLE. SOLELY-AESTHETIC LIGHTING OF THE BUILDING HAS BEEN AVOIDED TO MINIMIZE ENERGY CONSUMPTION AND REDUCE DISRUPTION TO ADJACENT HABITATS AND WILDLIFE MIGRATION.

2. *Parking Lot Lighting: Ornamental street lights should be used to be compatible with downtown streetlight standards identified in the Public Area Requirements.*

RESPONSE: THE SITE DESIGN FEATURES SIMPLE CONTEMPORARY STREET FIXTURES IN LIEU OF ORNAMENTAL STREET LIGHTS TO BETTER CONTROL LIGHT DISTRIBUTION AND LIMIT LIGHT POLLUTION ALONG THE WEST SIDE OF THE SITE WHICH ABUTS RESIDENTIAL BUILDINGS.

3. *Landscape Lighting: Lighting should be used to highlight sidewalks, street and other landscape features. Landscape Lighting is especially appropriate as a way to provide pedestrian safety during holiday periods.*

RESPONSE: COMPLIES. *REFER TO THE LANDSCAPE SITE PLAN FOR SITE LIGHTING AND THE ARCHITECTURAL FLOOR PLAN FOR CANOPY MOUNTED LIGHTS*

4. Sign Lighting: Sign Lighting should be designed as an integral component of the building and sign composition

RESPONSE: COMPLIES. EXTERNAL SIGNS TO BE SENSITIVELY AND MINIMALLY ILLUMINATED TO AVOID LIGHT POLLUTION.

SIGN GUIDELINES

Signs should make it easy to locate and identify businesses as well as providing other information relevant to getting around and doing business in downtown; however, signs should never overwhelm either buildings or landscape. Moreover, signs should provide information in a highly graphic format that is complementary to downtown architecture. Tasteful logos, symbols and graphics are encouraged. A strong pedestrian orientation should be encouraged for all signs. Development proposals must consider and respond to selected requirements from the following sign criteria:

1. Wall Signs: Signs should be sized and placed so that they are compatible with the building's architectural design

RESPONSE: COMPLIES. REFER TO PAGES 44 & 45 FOR SIGNAGE DETAILS

2. Hanging or Projecting Signs: Hanging signs should be oriented to the pedestrian, and highly visible from the sidewalk

RESPONSE: NOT APPLICABLE. HANGING OR PROJECTING SIGNS NOT INCLUDED IN THIS PROJECT

3. Window Signs: Window Signs should not obstruct views through windows.

RESPONSE: NOT APPLICABLE. WINDOW SIGNS NOT INCLUDED IN THIS PROJECT

4. Awning Signs: Awning signs should be used as alternatives to building or wall signs. They should be designed as a means to attract attention to a shop, office or residential entrance

RESPONSE: NOT APPLICABLE. AWNING SIGNS NOT INCLUDED IN THIS PROJECT

5. Information and Guide Signs: Directional signs should be small scale and of consistent dimensions, and located in a visually logical order. These signs also should provide on-site directional information.

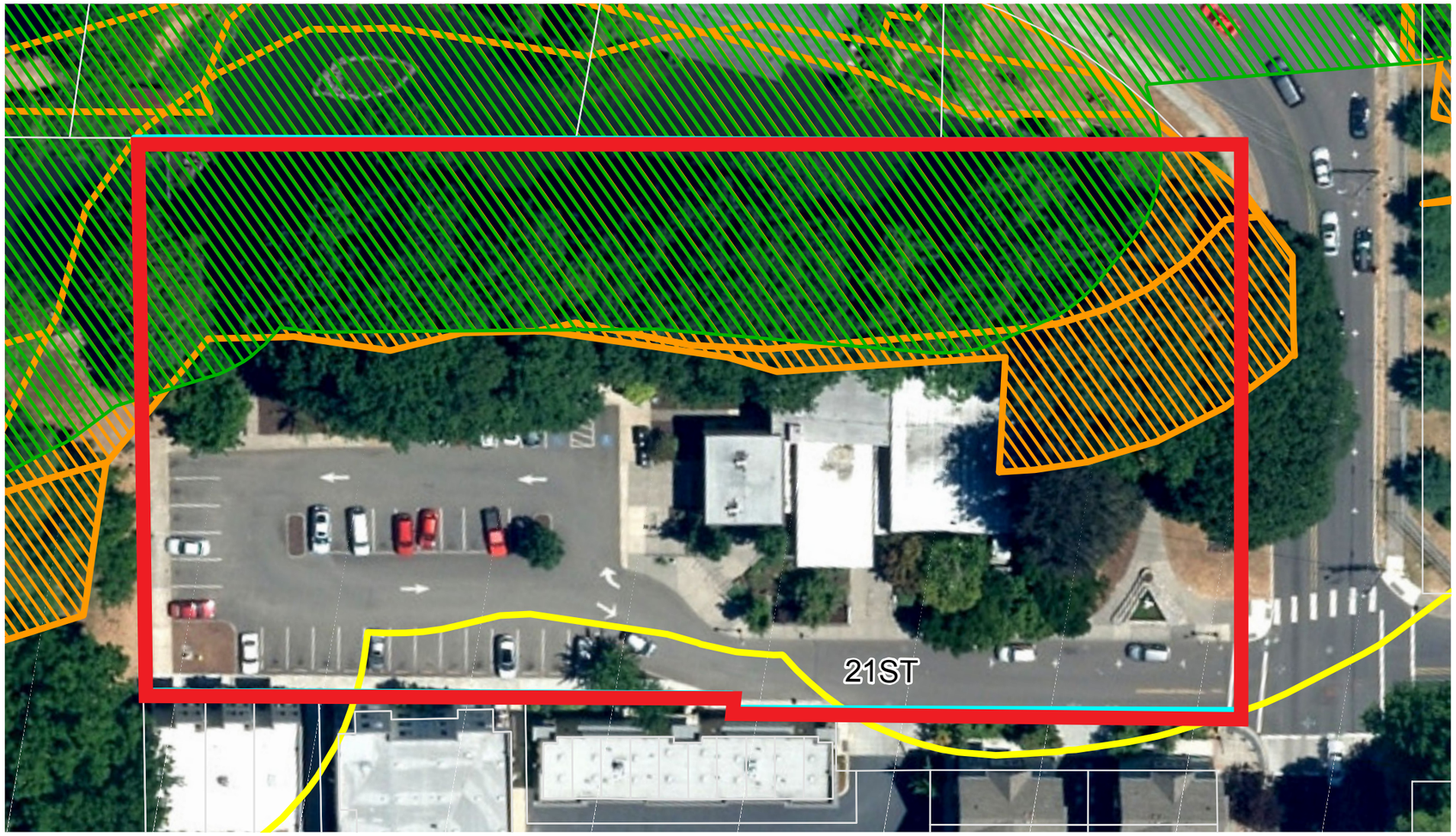
RESPONSE: COMPLIES. PROPOSED GUIDE / DIRECTIONAL SIGN PACKAGE IS GRAPHICALLY CONSISTENT FROM EXTERIOR TO INTERIOR AND LOCATIONS OPTIMIZED FOR WAYFINDING.

6. Kiosks and Monument Signs: Directory monument information signs should illustrate the layout of a development, and list and locate uses or tenants within.

RESPONSE: NOT APPLICABLE. EXTERIOR HANGING OR PROJECTING SIGNS NOT INCLUDED IN THIS PROJECT

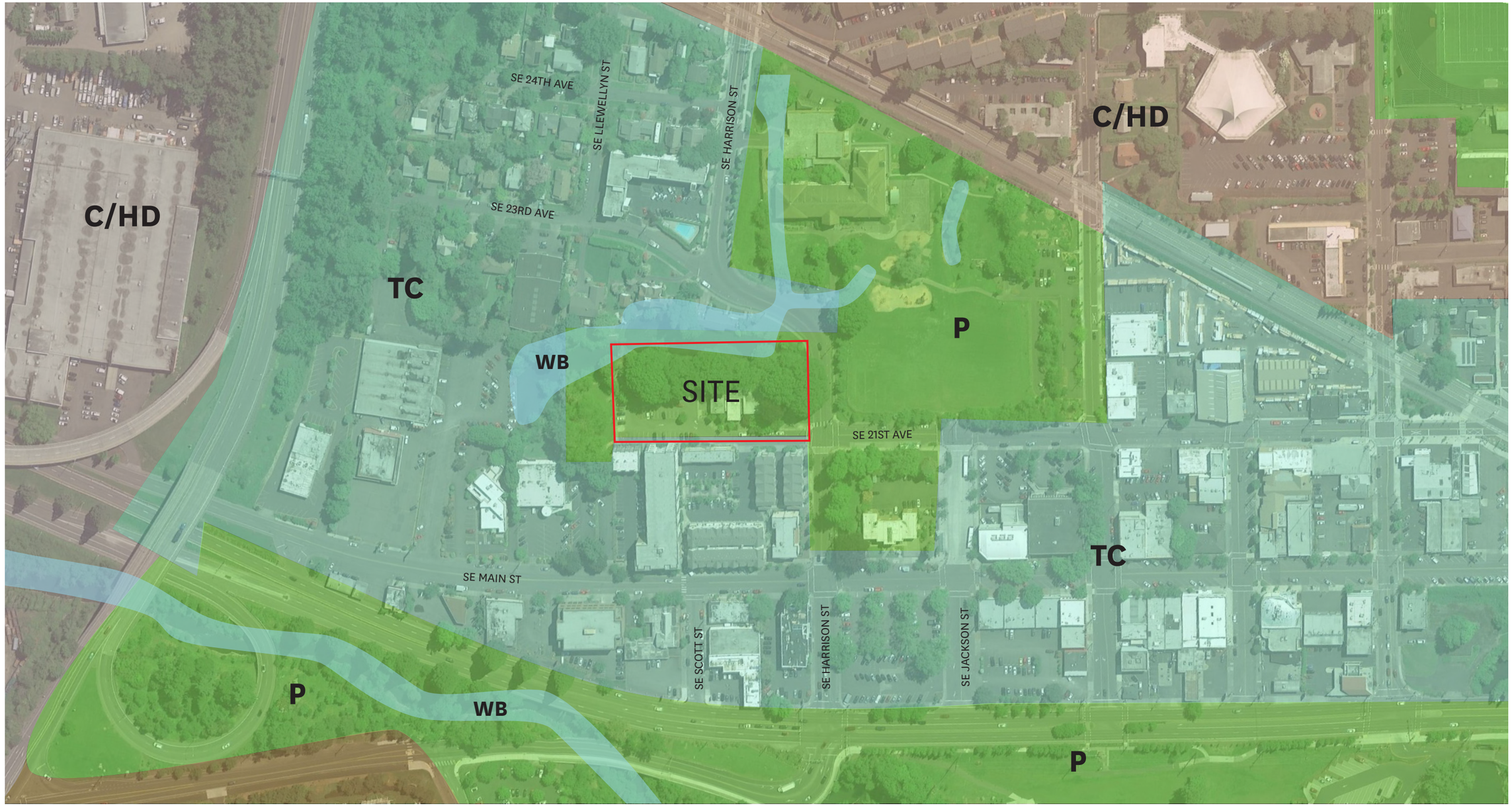
7. Temporary Signs: Signs identifying the short-term uses or activities should be allowed on a temporary basis if consistent with the design character of the surrounding area.

RESPONSE: THE DESIGN AND SCALE OF TEMPORARY ACTIVITY SIGNAGE IS CONSISTENT WITH OTHER PERMANENT SIGNAGE



Legend

- Vegetated Corridors
- Habitat Conservation Areas
- 100-ft Compliance Line



TC TOWN CENTER

C/HD MIXED USE

P PUBLIC

WB WATER BODY

HD HIGH DENSITY

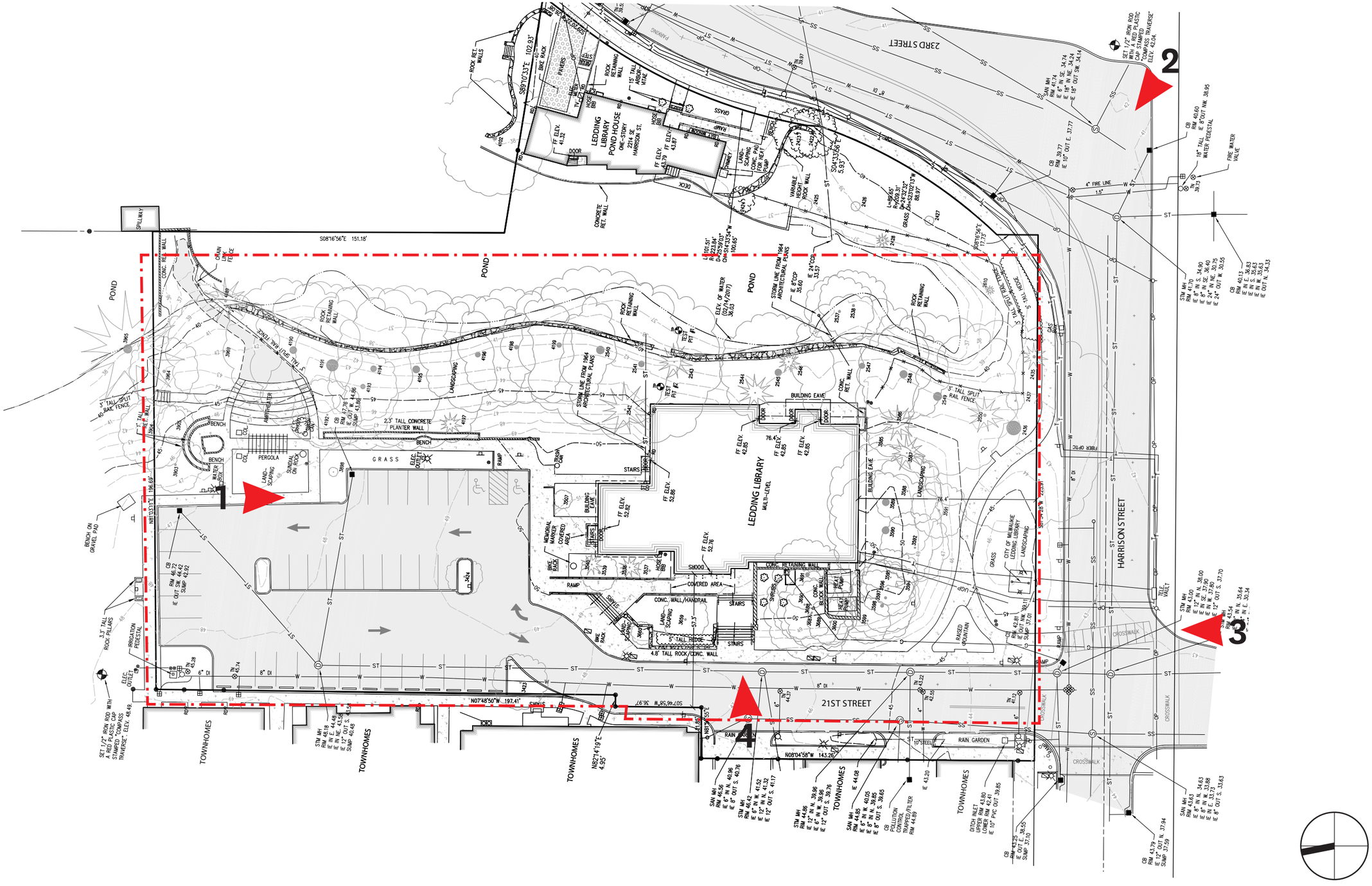
VICINITY & ZONING PLAN

EXISTING STREET VIEW 1 - LOOKING SOUTH TOWARD LEDDING LIBRARY FROM PARKING LOT

EXISTING STREET VIEW 2 - LOOKING SOUTHWEST ON HARRISON ST

EXISTING STREET VIEW 3 - LOOKING WEST ON 21ST ST

EXISTING STREET VIEW 4 - LOOKING NORTH TOWARD THE EXISTING LEDDING LIBRARY ENTRANCE



SITE SURVEY AND EXISTING STREET VIEW KEY

CONNECTED TO MILWAUKIE'S LANDSCAPE

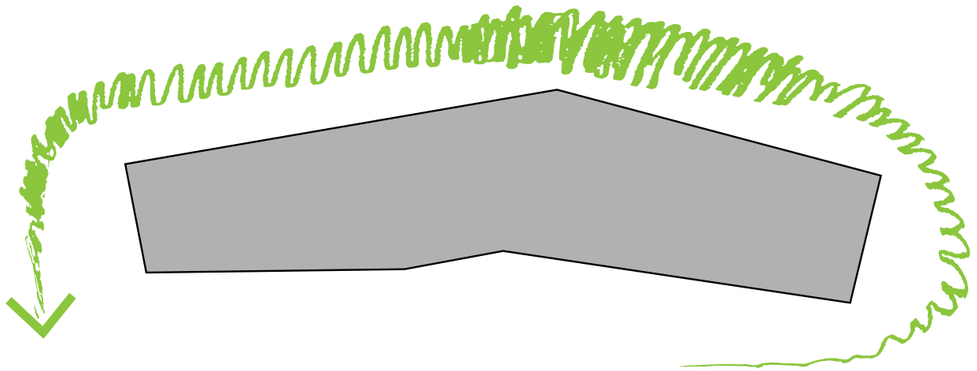
In Milwaukie, waterways move through the landscape in a fluid way. The proposed library shape is inspired by a river bend: a long, flowing, and continuous interior space that navigates the natural features of the wetland site.

AERIAL OF MILWAUKIE

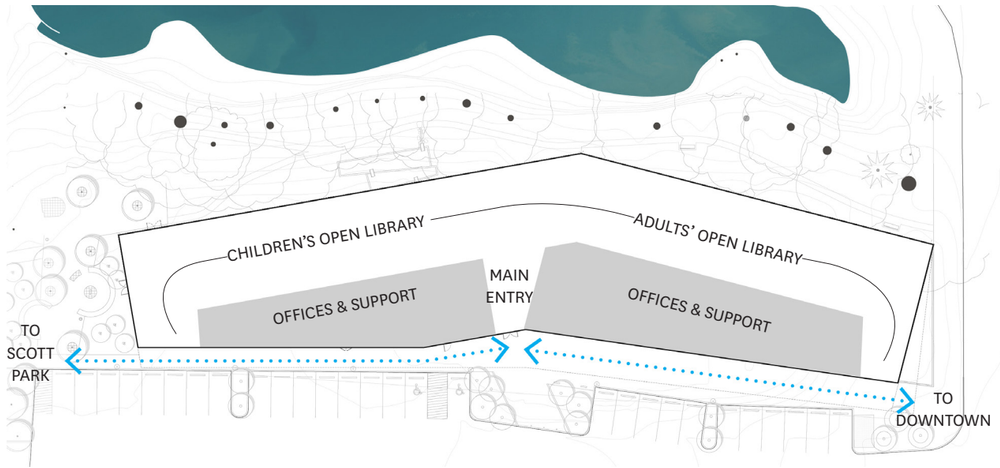
THE BREAK IN THE TREES AND BEST POND VIEW

THE BIG OAK TREE

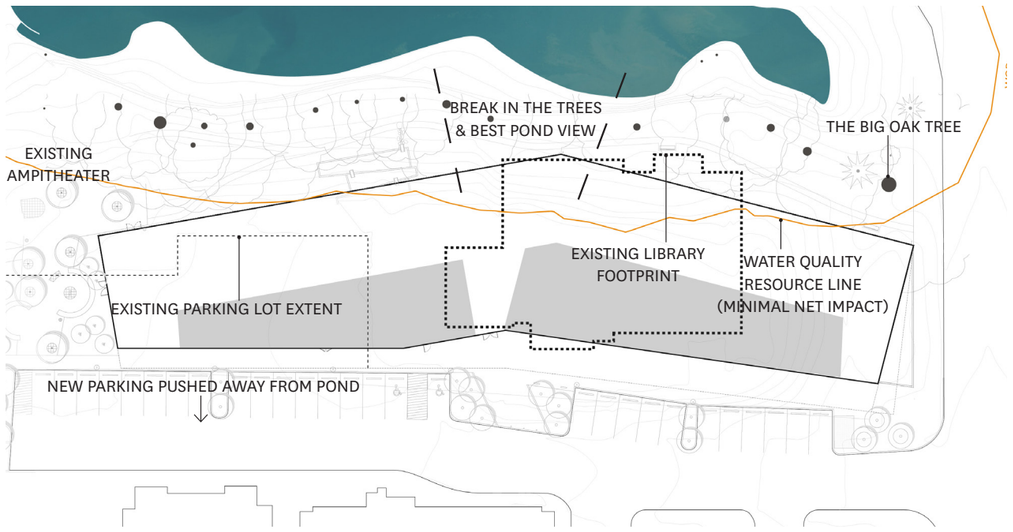
LANDSCAPE SITE PLAN



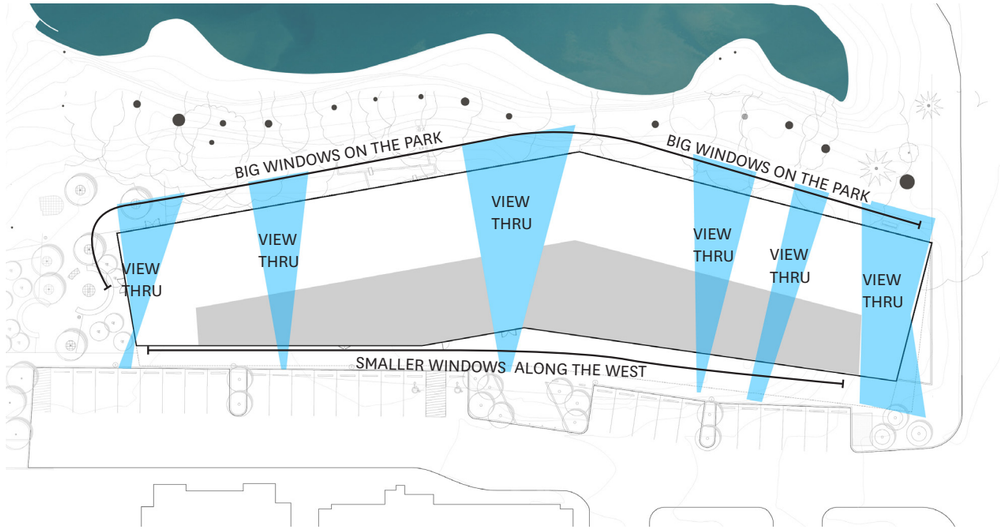
SURROUND THE LIBRARY WITH NATURE



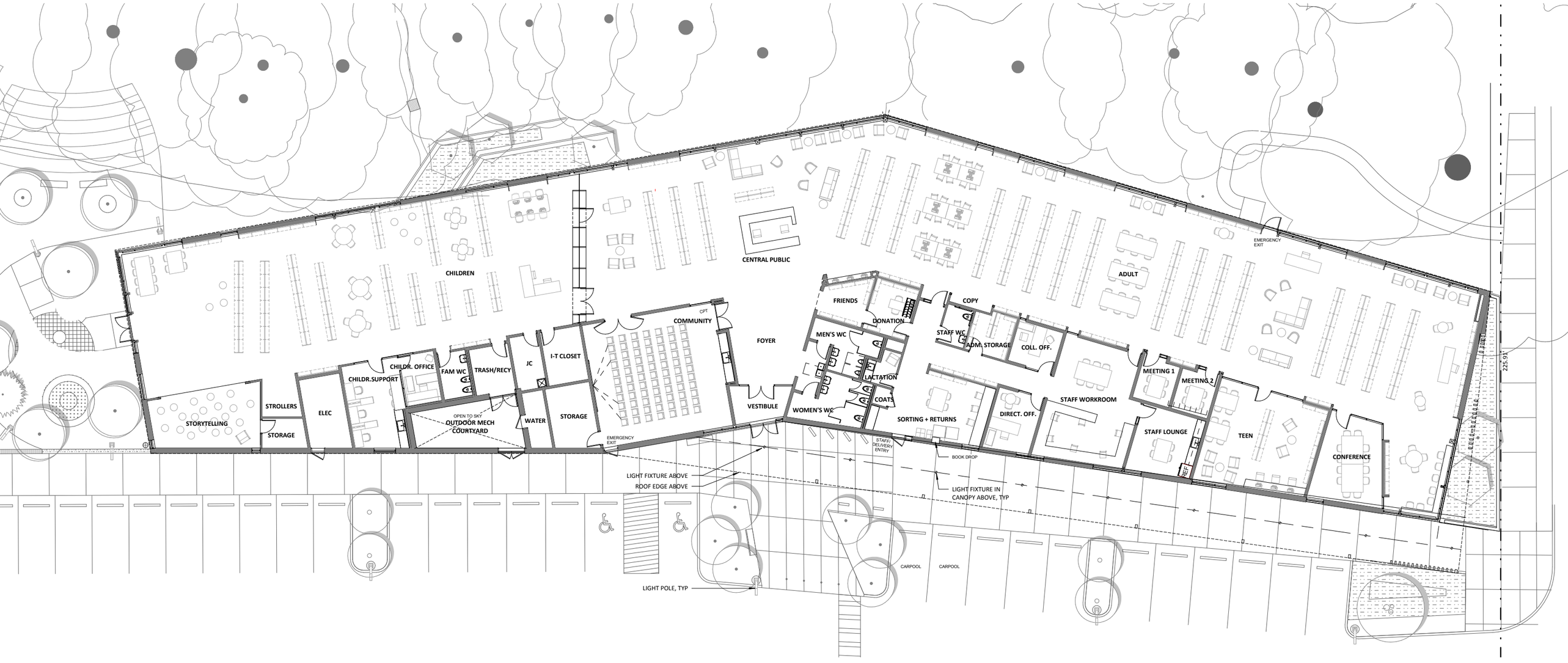
CENTRALIZE MAIN ENTRY & WRAP THE OPEN INTERIOR SPACES AROUND THE BUILDING CORE



SHAPE THE NEW FOOTPRINT TO NAVIGATE NATURAL SITE FEATURES



USE WINDOWS FOR VIEWS THROUGH TO PARK & TO OPTIMIZE ENERGY CONSERVATION

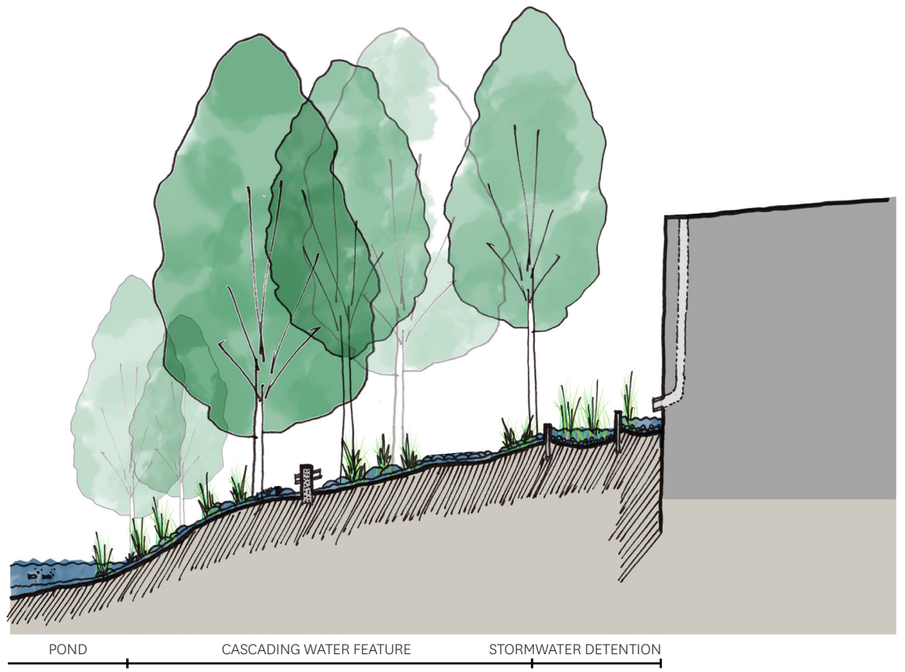


0′ 4′ 8′ 16′ 32′

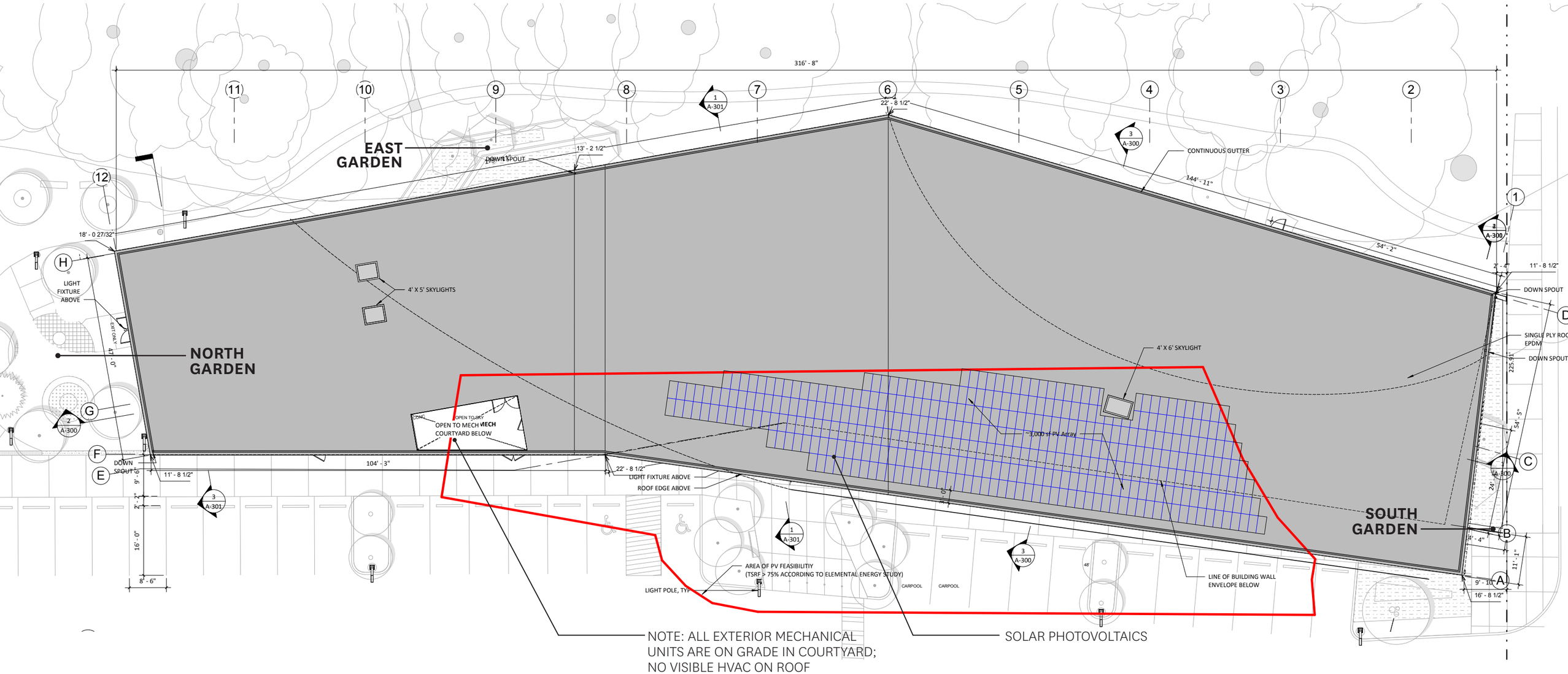
LIBRARY FLOOR PLAN

EAST GARDEN PLAN

PRECEDENT IMAGES



EAST GARDEN SECTION A



NOTE: ALL EXTERIOR MECHANICAL UNITS ARE ON GRADE IN COURTYARD; NO VISIBLE HVAC ON ROOF

SOLAR PHOTOVOLTAICS

ROOF PLAN

VIEW OF NORTH GARDEN

NORTH GARDEN

North Garden manages stormwater from building roof and maintains a connection to the amphitheater

TREES

Cercidiphyllum - Katsura
2” cal, multistem

GARDEN PLANTING

Arctotaphylos uva-ursi - Kinnikinnick
1 gal.

Confederate - Jasmine - Star Jasmine
1 gal.

STORMWATER PLANTING

carex obnupta - slough sedge
1 gal.

juncus patens - rush
1 gal.

ribes sanguineum - red flowering currant
3 gal.

cornus kousa - japanese dogwood
2” cal, multistem

NORTH GARDEN PLAN

WOOD SOFFIT ON CANOPY WITH DOWN LIGHTS

METAL TRIM

EXTERIOR SHEET METAL FASCIA

WOOD SIDING - SEMI-OPAQUE STAINED, TIGHT-KNOT CEDAR BOARD AND BATTEN SIDING

WOOD SCREEN - 1 X 4 AND 1 X 6 CEDAR STAINED TO MATCH SIDING

FIBERGLASS WINDOW SYSTEM - BLACK

STORMWATER PLANTER- CAST IN PLACE CONCRETE

WALKWAY TO MAIN LIBRARY ENTRY

VIEW FROM HARRISON STREET

TREES

acer circinatum - vine maple
1.5” cal, multistem

ulmus propinqua - EMERALD SUNSHINE ELM
4” cal, well branched

GARDEN PLANTING

bouteloua gracilis - blonde ambition grass, 1 gal.

mahonia nervosa - creeping oregon grape
2 gal.

nandina domestica ‘ gulf stream’ - heavenly bamboo, 2 gal.

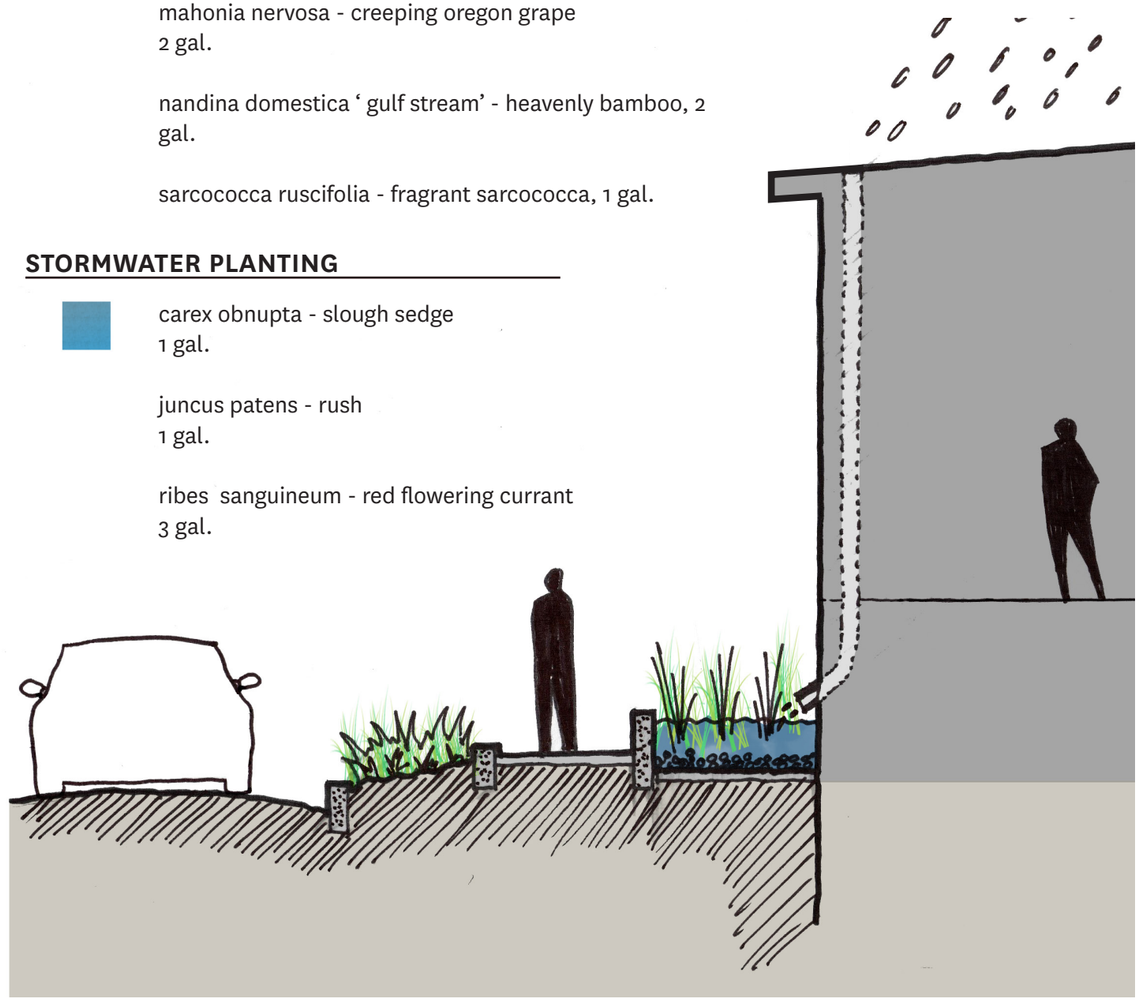
sarcococca ruscifolia - fragrant sarcococca, 1 gal.

STORMWATER PLANTING

carex obnupta - slough sedge
1 gal.

juncus patens - rush
1 gal.

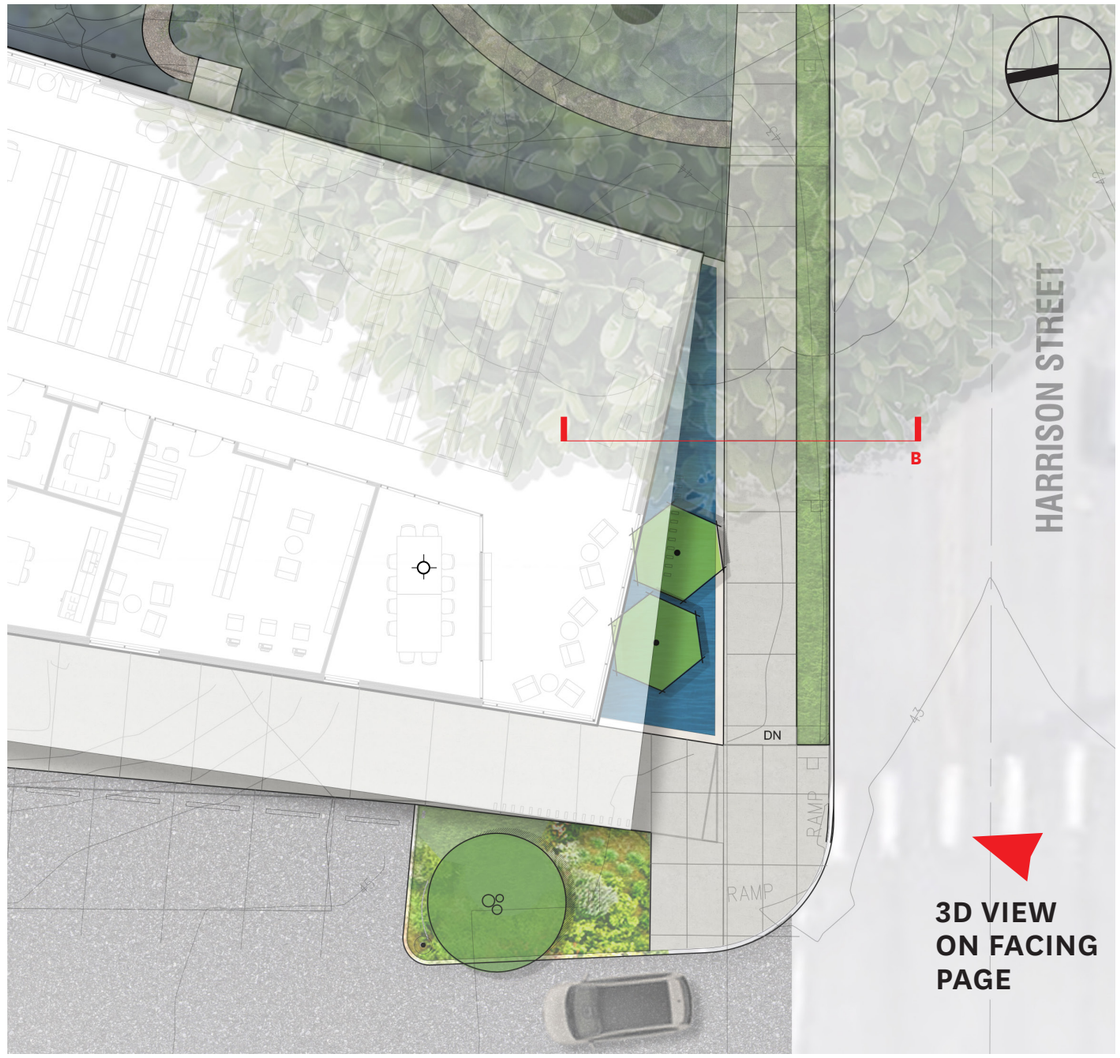
ribes sanguineum - red flowering currant
3 gal.

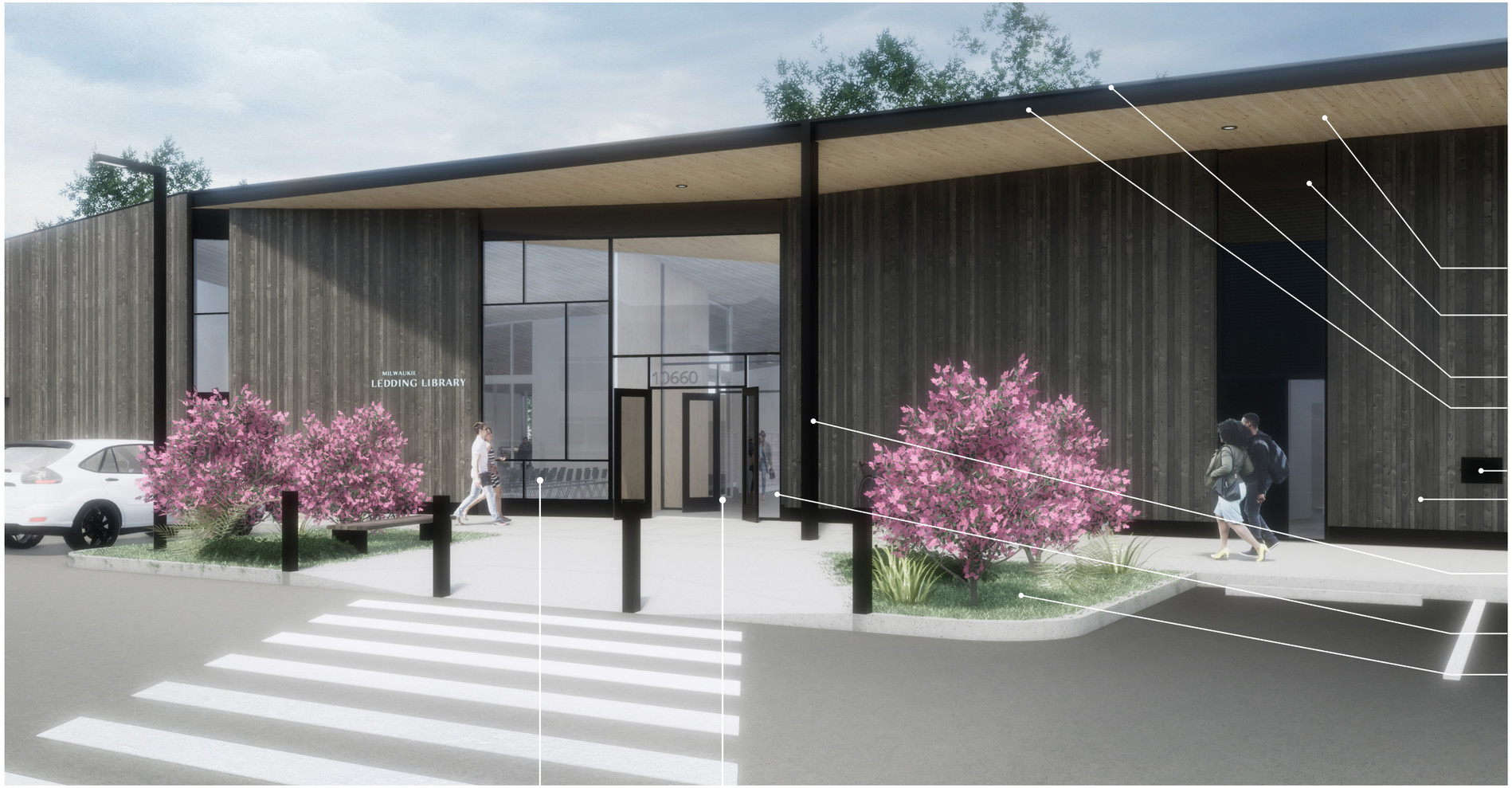


SOUTH GARDEN SECTION B

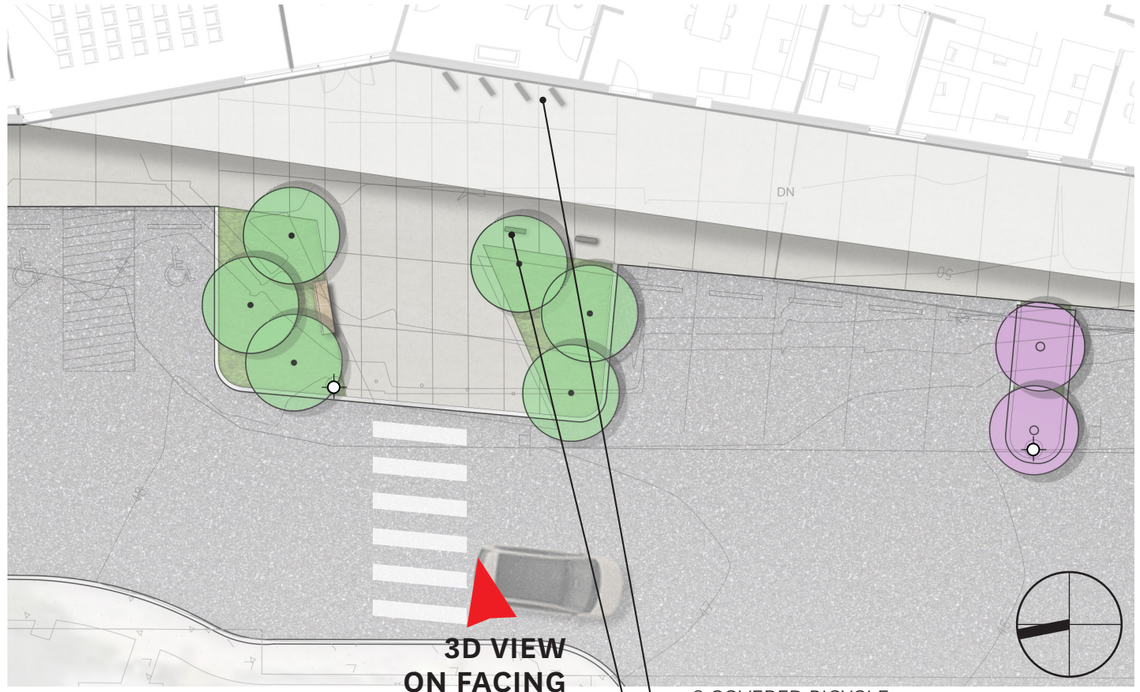
SOUTH GARDEN

North Garden manages stormwater from building roof and maintains a connection to the amphitheater





VIEW FROM PARKING AT MAIN ENTRY



TREES

cornus kousa - japanese dogwood
2” cal, multistem

lagerstroemia x ‘natchez’ - natchez crape myrtle
2” cal, multistem

GARDEN PLANTING

bouteloua gracilis - blonde ambition grass, 1 gal.

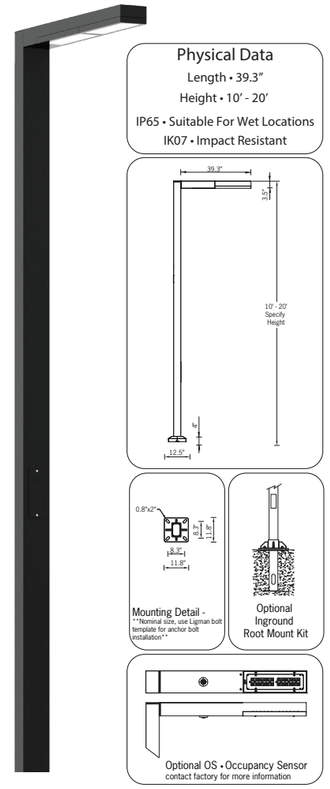
mahonia nervosa - creeping oregon grape, 2 gal.

nandina domestica ‘ gulf stream’ - heavenly bamboo, 2 gal.

sarcococca ruscifolia - fragrant sarcococca, 1 gal.

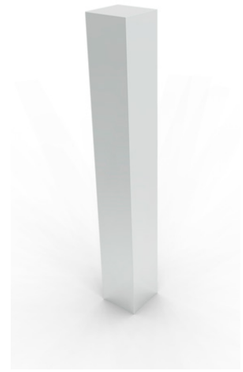
spiraea betulifolia - birchleaf spirea
1 cal.

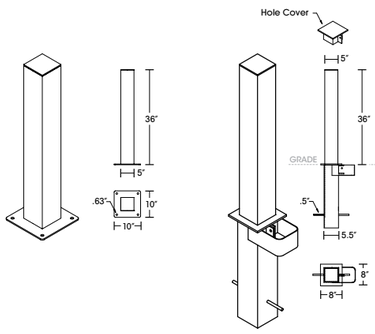
ULI-21171
Light Linear PT3



PARKING LOT AND SITE LIGHTING

BICYCLE PARKING

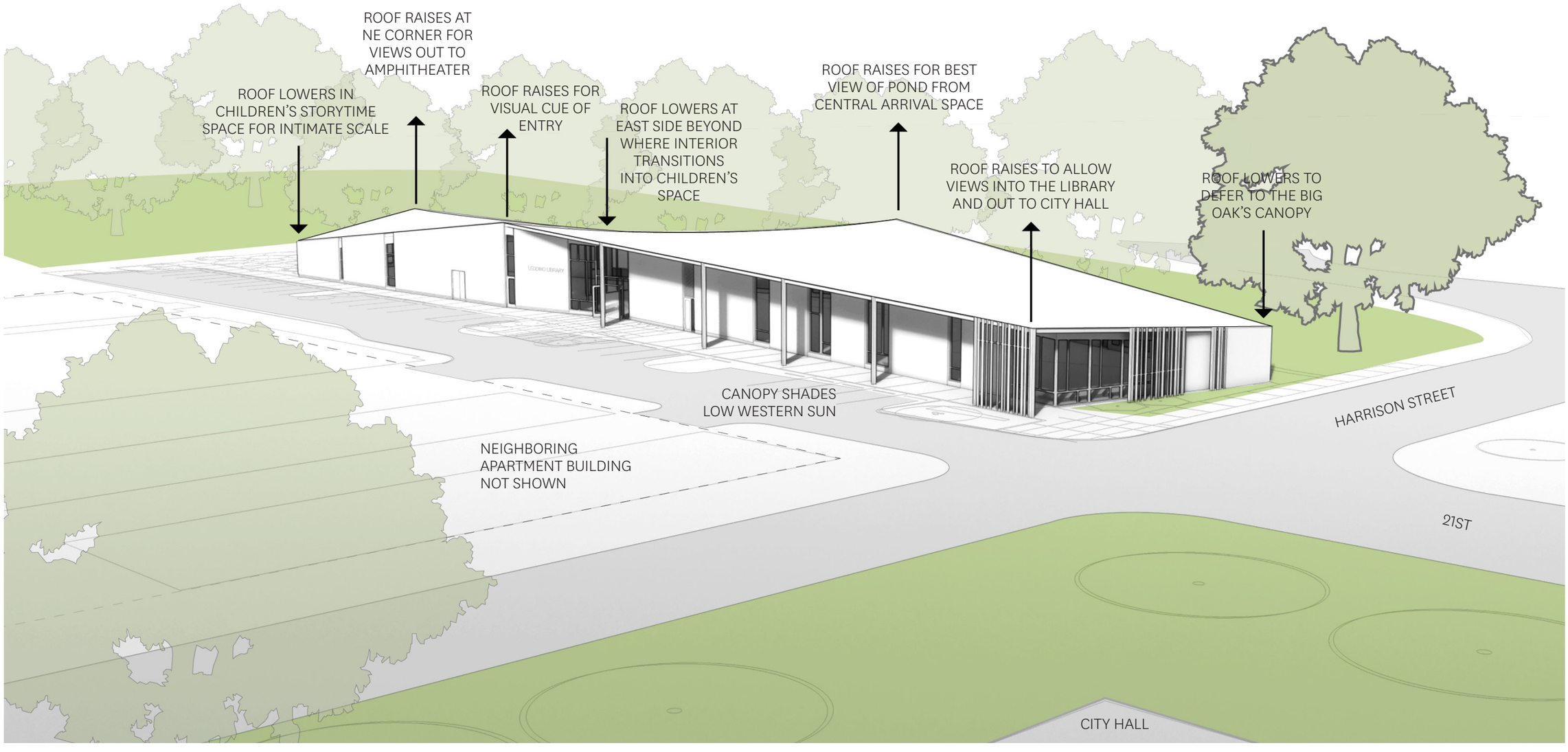




FLAT TOP SQUARE BOLLARDS: HUNTCO 5” FLAT TOP; BLACK

CONNECTED TO MILWAUKIE'S LANDSCAPE

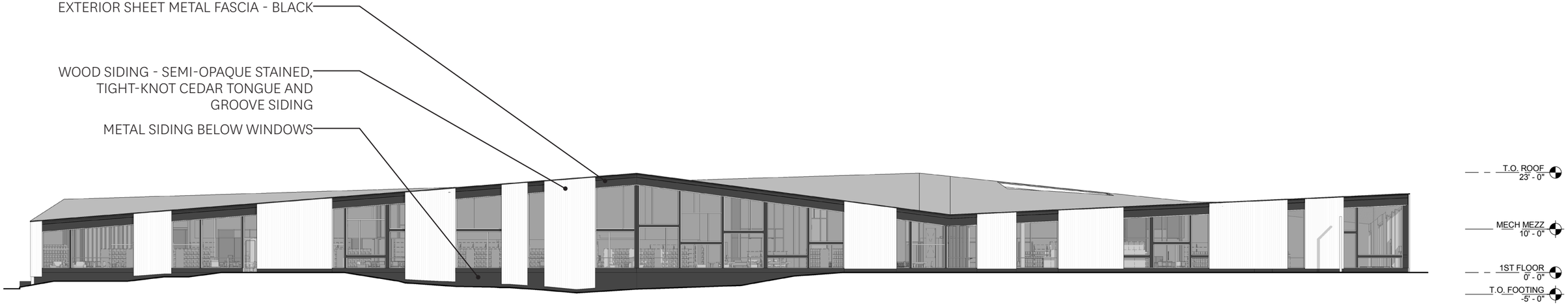
The undulating roof form continues the fluid river shape concept. The continuous roof rises and falls in response to the site's context and natural features



ROOF FORM DIAGRAM

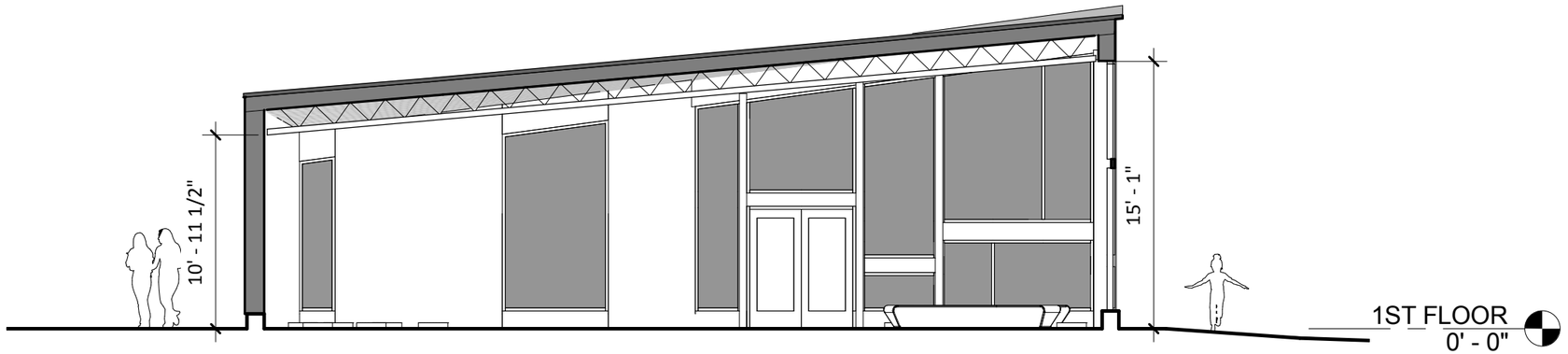
WEST ELEVATION

23% GLAZING

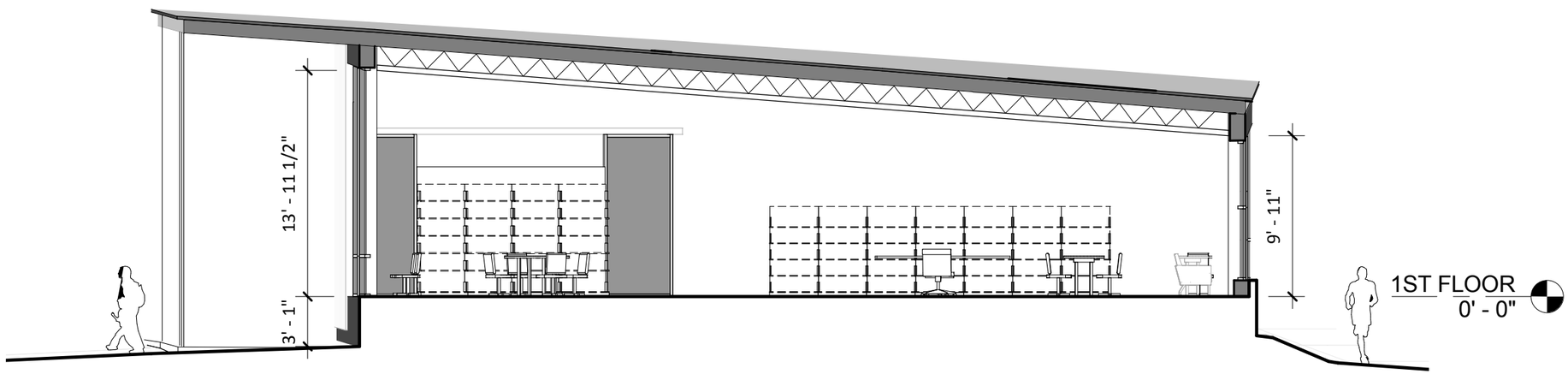


EAST ELEVATION

51% glazing

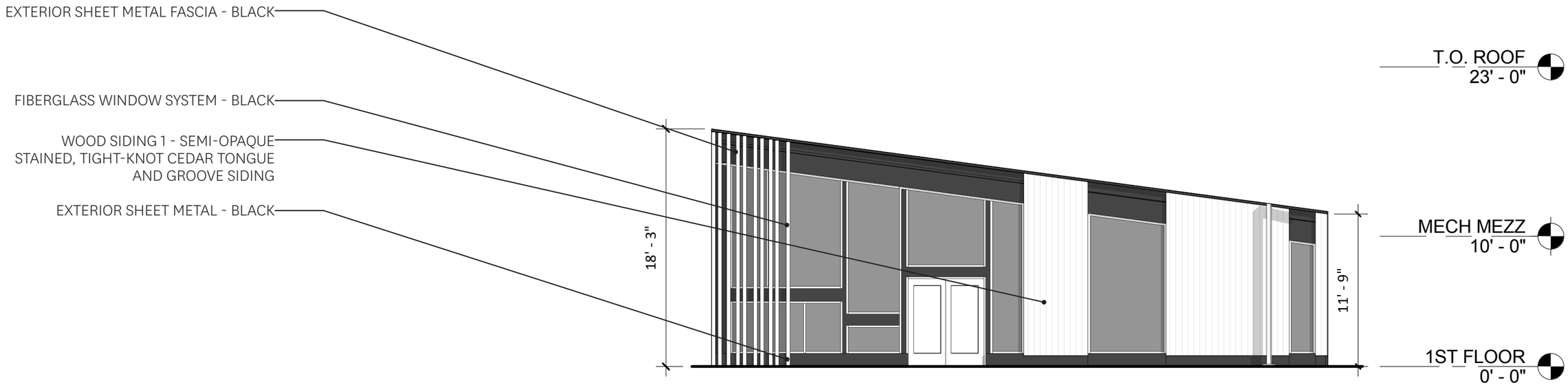


E-W SECTION NEAR READING GARDEN LOOKING NORTH

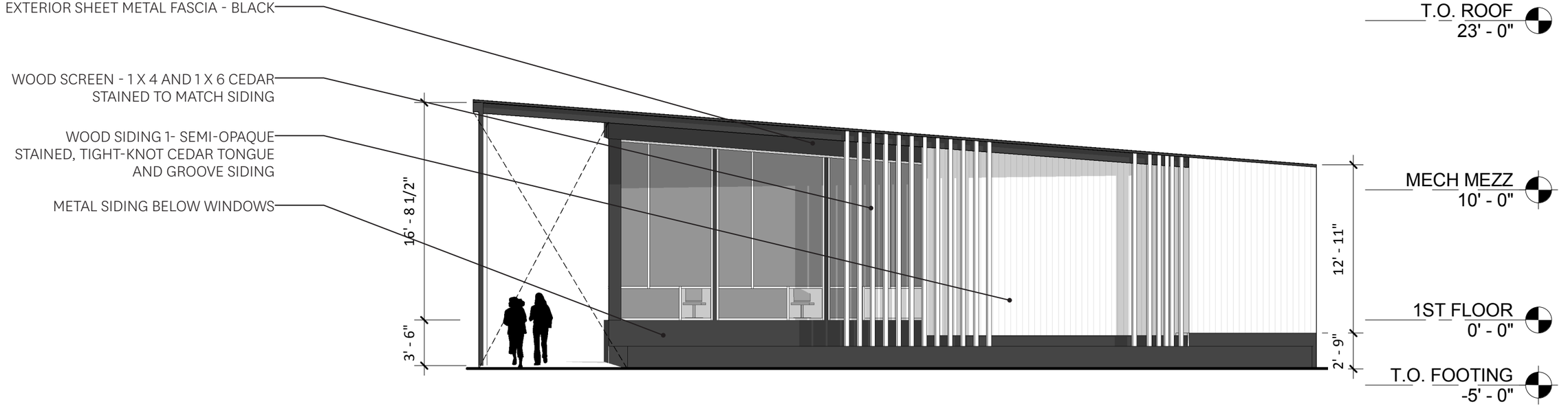


E-W SECTION NEAR HARRISON LOOKING NORTH

0′ 2′ 4′ 8′ 16′

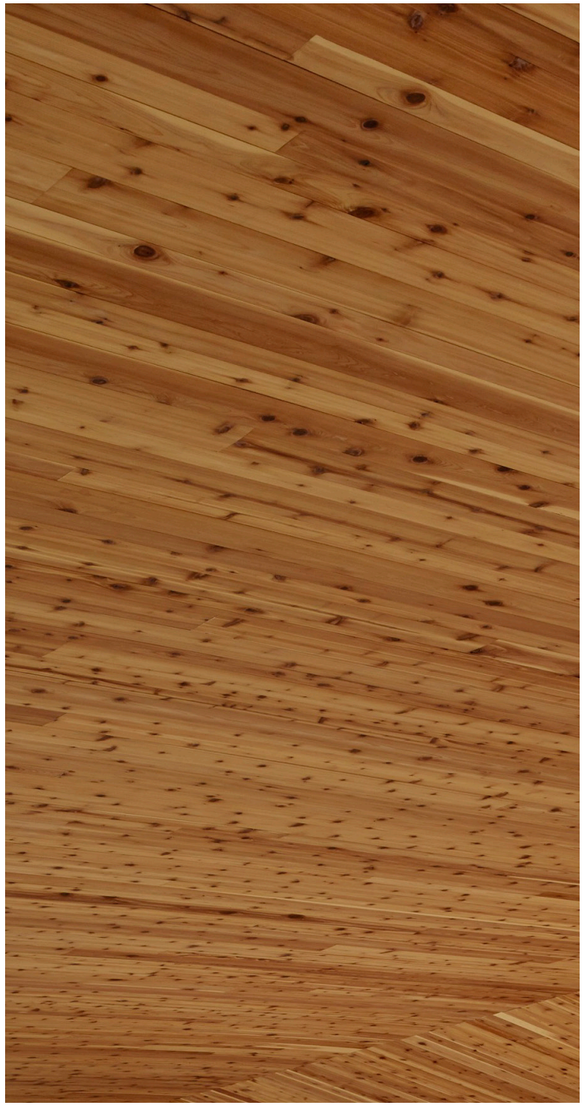


NORTH ELEVATION AT READING GARDEN
53% GLAZING

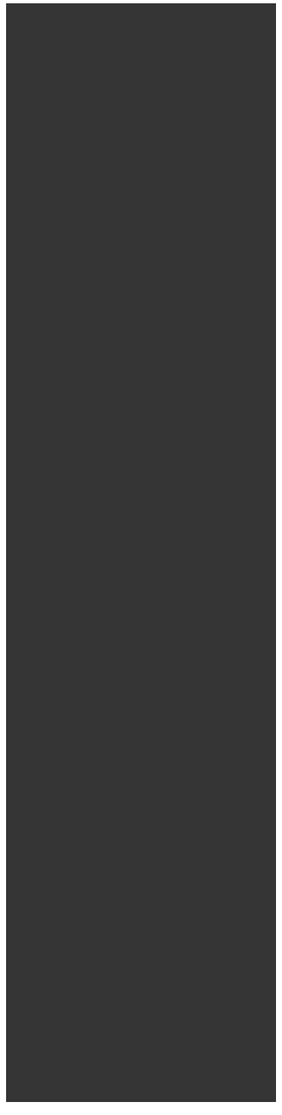


SOUTH ELEVATION AT HARRISON
35% glazing

EXTERIOR BUILDING ELEVATIONS

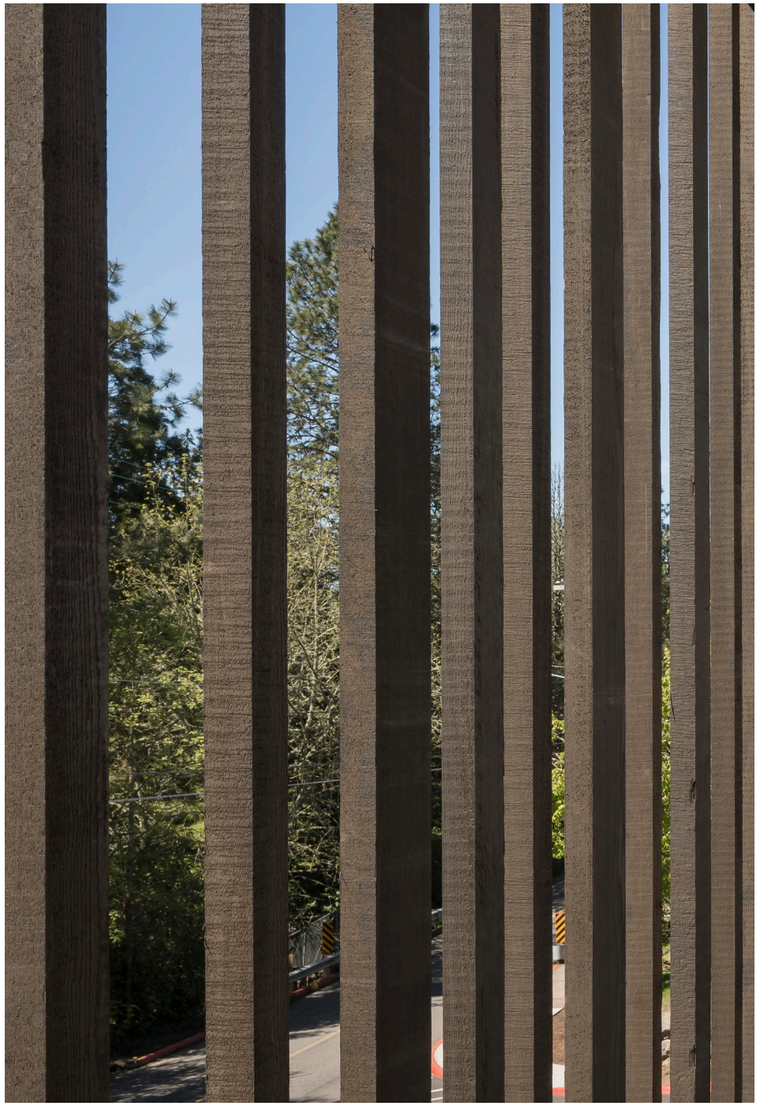


WOOD SOFFIT



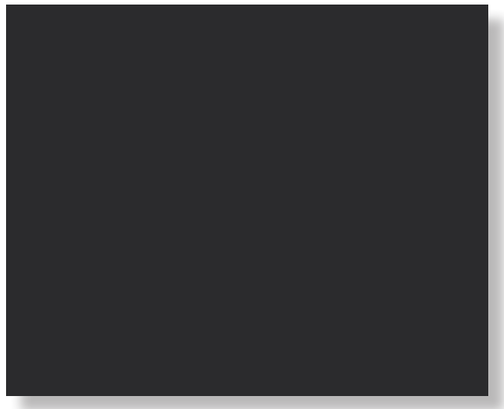
FIBERGLASS WINDOW FRAME & METAL TRIM COLOR

WD SIDING 1 - SEMI-OPAQUE STAINED TOUNGE & GROOVE CEDAR SIDING



WOOD SCREEN

WOOD SCREENS AT HARRISON



SHEET METAL FLASHINGS AND PAINTED STEEL

PREFINISHED, KYNAR COATED STEEL - COLOR TO MATCH WINDOWS AND STOREFRONT

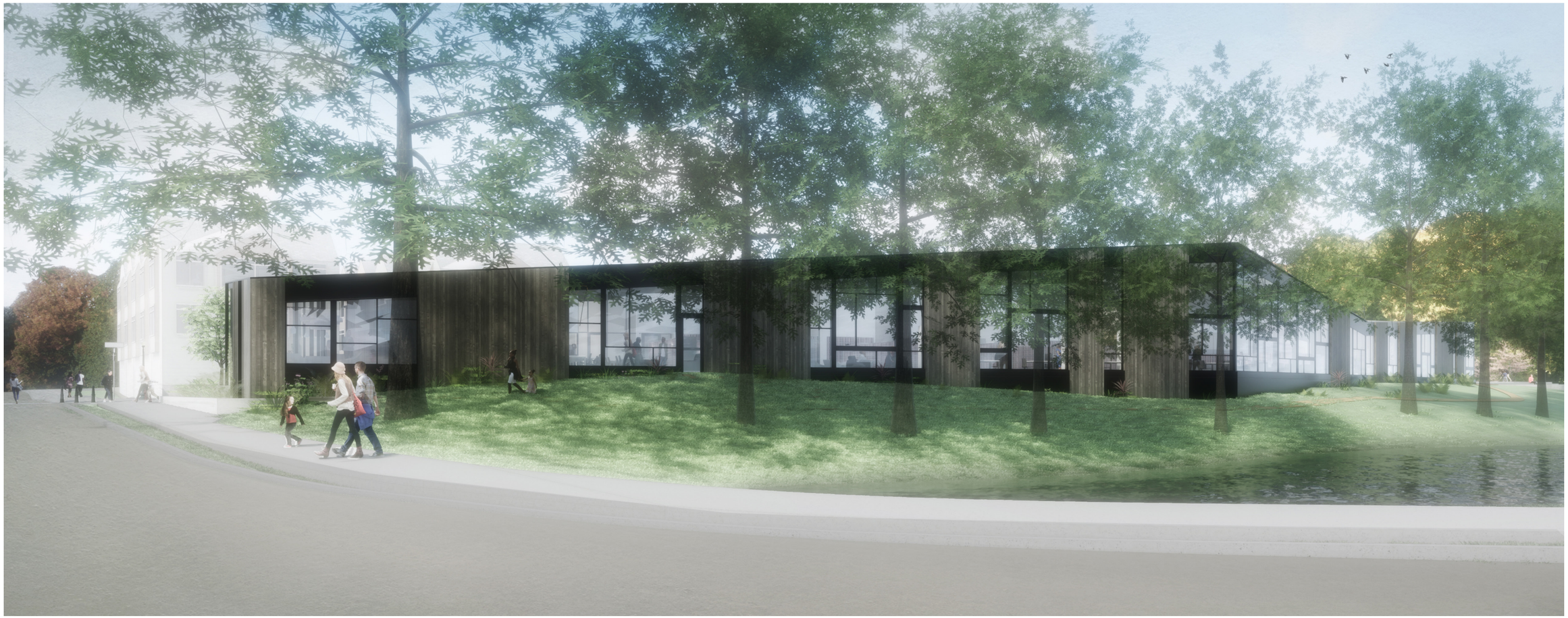
GAUGE PER SCHEDULE, UNLESS NOTED OTHERWISE

- TYPICAL FLASHINGS - 22 GA
- COPING - 18 GA
- PARAPET FASCIA - 20 GA
- CURB FASCIA - 20 GA

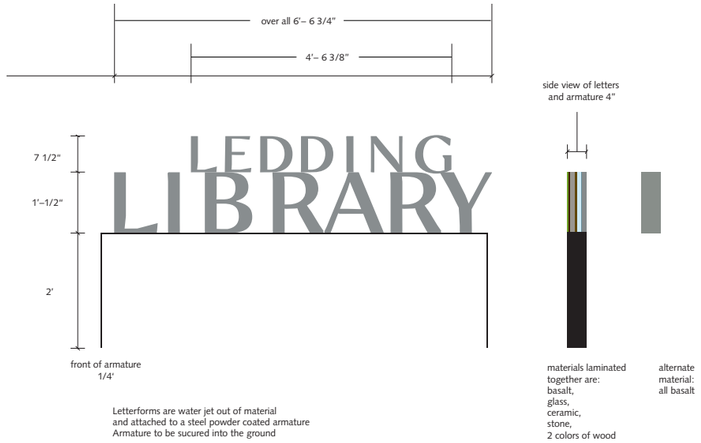
FIBERGLASS WINDOWS AND DOORS - CASCADIA

SHEET METAL PANEL- SMOOTH FINISH - PAINTED BLACK TO MATCH VINYL WINDOWS - FACE-FASTENED IN SMALL PANELS WITHOUT INTERMEDIATE JOINTS. SEALED WITH BLACK SEALANT TO MATCHING SHEET METAL FLASHINGS.

VIEW FROM SCOTT PARK

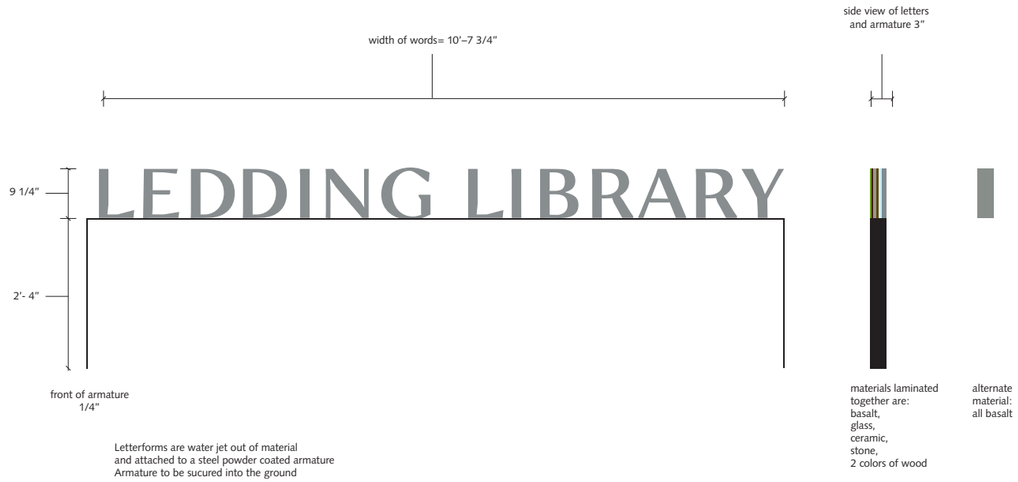


VIEW OF EAST FACADE FROM HARRISON



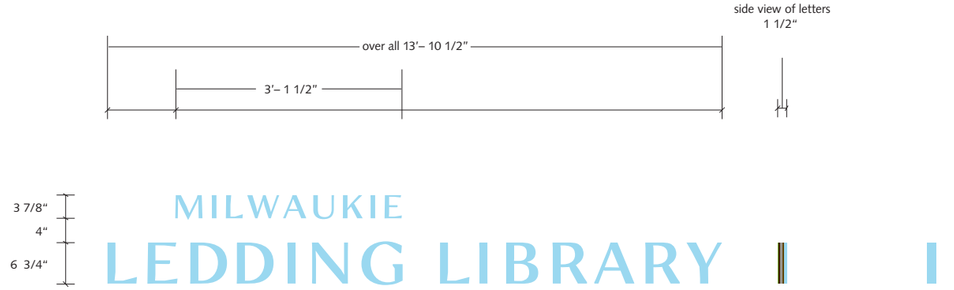
11 EXTERIOR SINGAGE- STREET VIEW (VERSION 1)

QTY: 1



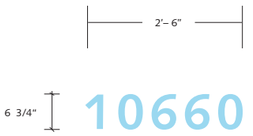
11 EXTERIOR SINGAGE- STREET VIEW (VERSION 2)

QTY: 1



12 EXTERIOR SINGAGE- ENTRY

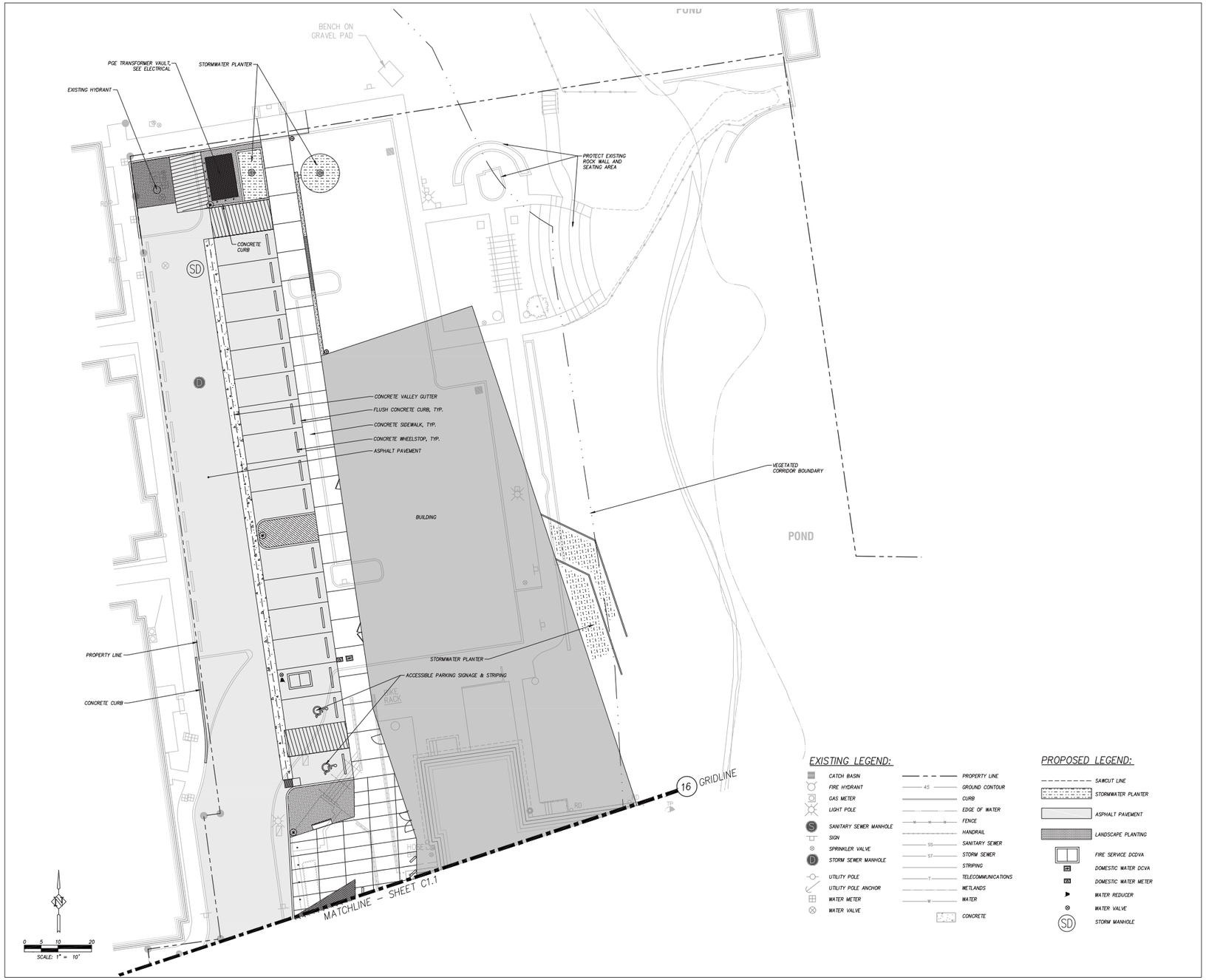
QTY: 1



Vynil adhered to glass above door

13 EXTERIOR SINGAGE- ADDRESS

QTY: 1 1" =1'-0"



ARCHITECTS
HACKER
733 SW Oak, Portland, OR 97205
CONSULTANT
Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS

STAMP

NOT FOR CONSTRUCTION

REVISION NO. DATE

KEY PLAN - (NTS)

TRUE NORTH PLAN NORTH

Milwaukie Ledding Library

City of Milwaukie
10660 SE 21st Ave, Milwaukie, OR 97206

ISSUANCE
Design Review Set

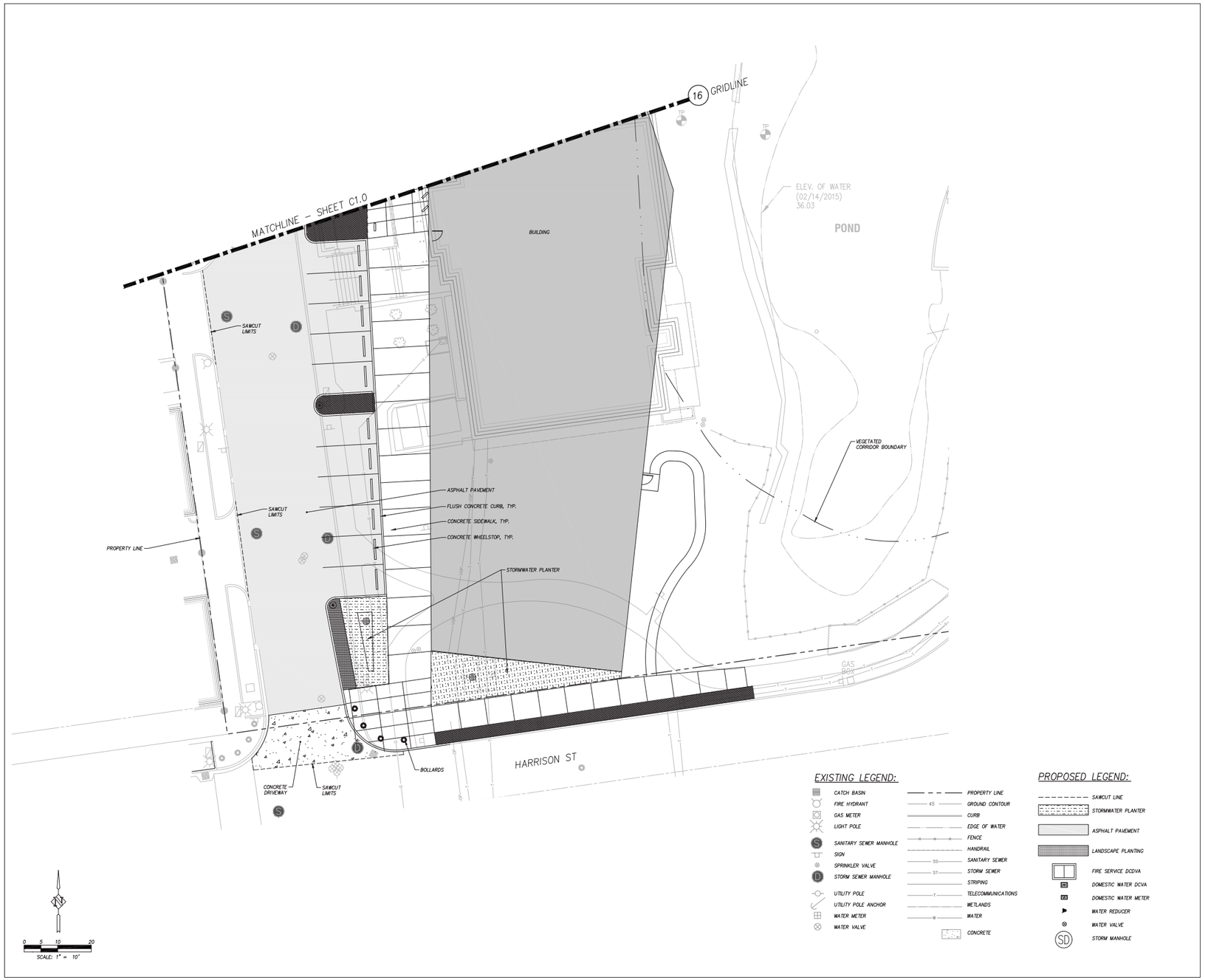
PROJECT NUMBER
1635

DATE
January 12, 2018

SCALE

DRAWING TITLE
SITE PLAN - NORTH

SHEET NUMBER
C1.0



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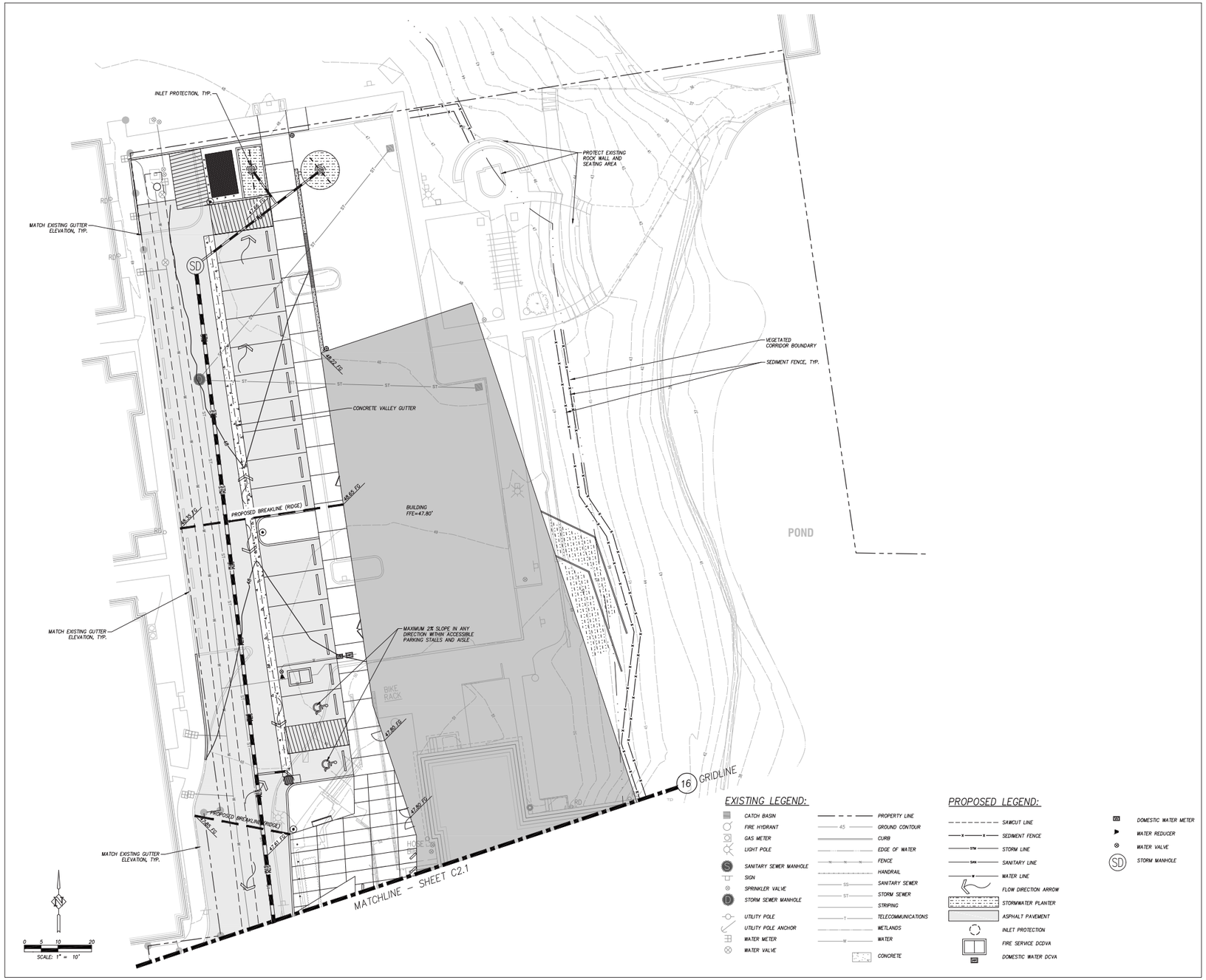
DRAWING TITLE

SITE PLAN - SOUTH

SHEET NUMBER

C1.1



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PROJECT NUMBER
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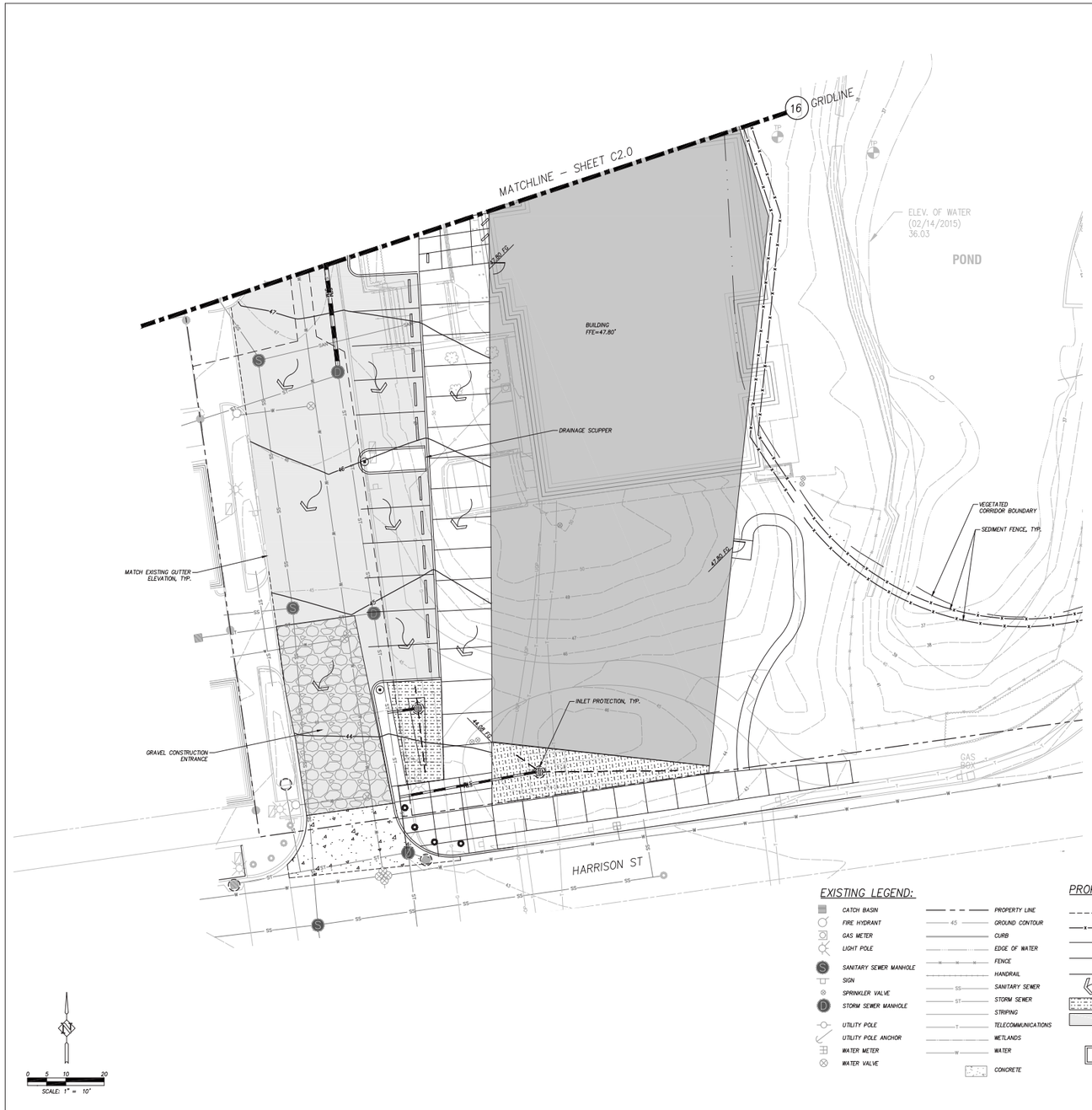
DATE
January 12, 2018

SCALE

DRAWING TITLE
GRADING & EC PLAN - NORTH

SHEET NUMBER
C2.0



EXISTING LEGEND:

- CATCH BASIN
- FIRE HYDRANT
- GAS METER
- LIGHT POLE
- SANITARY SEWER MANHOLE
- SIGN
- SPRINKLER VALVE
- STORM SEWER MANHOLE
- UTILITY POLE
- UTILITY POLE ANCHOR
- WATER METER
- WATER VALVE
- PROPERTY LINE
- GROUND CONTOUR
- CURB
- EDGE OF WATER
- FENCE
- HANDRAIL
- SANITARY SEWER
- STORM SEWER
- STRIPING
- TELECOMMUNICATIONS
- WETLANDS
- WATER
- CONCRETE

PROPOSED LEGEND:

- SAWCUT LINE
- SEDIMENT FENCE
- STORM LINE
- SANITARY LINE
- WATER LINE
- FLOW DIRECTION ARROW
- STORMWATER PLANTER
- ASPHALT PAVEMENT
- INLET PROTECTION
- FIRE SERVICE DCDVA
- DOMESTIC WATER DCVA
- DOMESTIC WATER METER
- WATER REDUCER
- WATER VALVE
- STORM MANHOLE

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KEY PLAN - (NTS)

TRUE NORTH PLAN NORTH

Milwaukie Ledding Library

City of Milwaukie
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ISSUANCE
Design Review Set

PROJECT NUMBER
1635

DATE
January 12, 2018

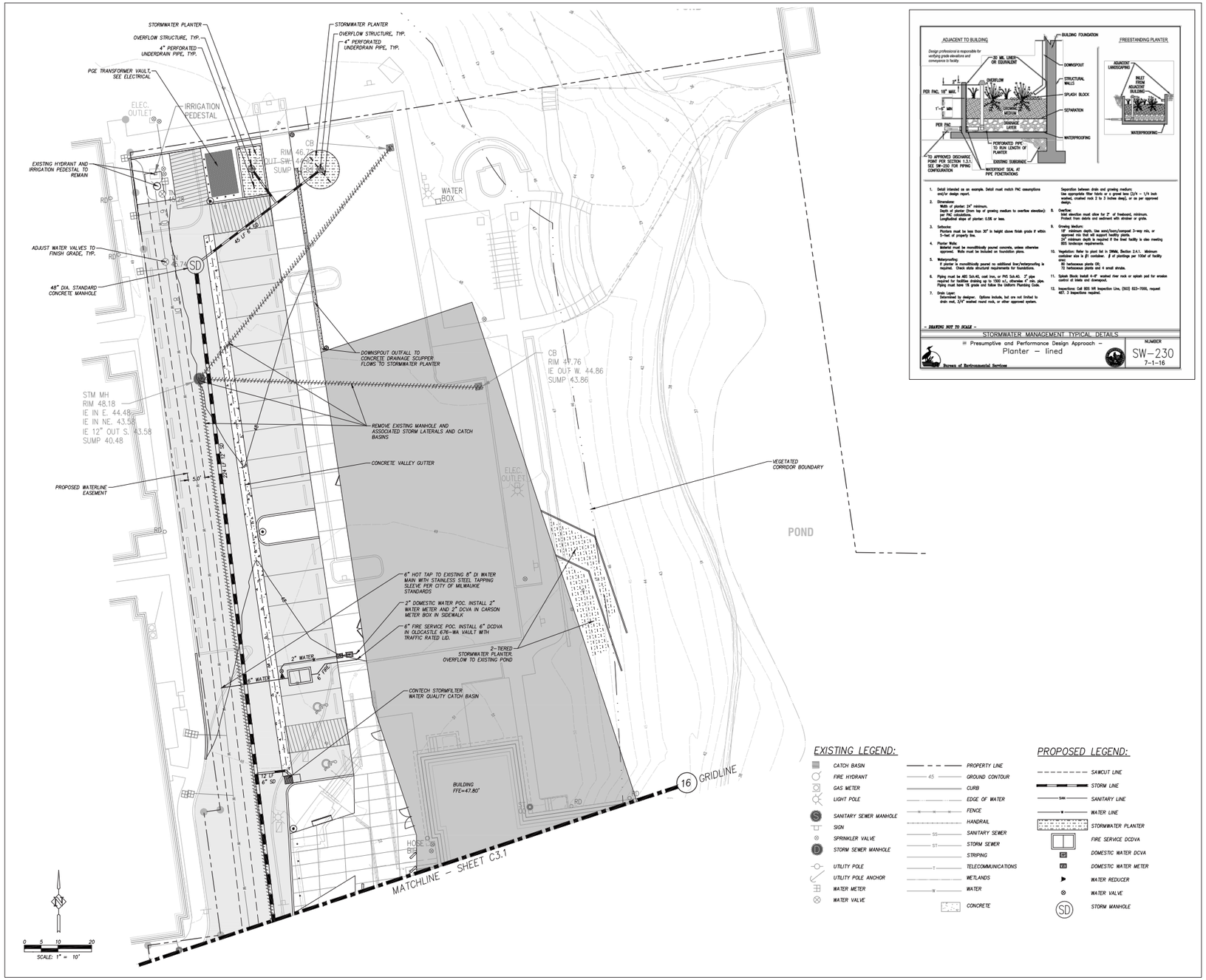
SCALE

DRAWING TITLE

GRADING & EC PLAN - SOUTH

SHEET NUMBER

C2.1



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TRUE NORTH PLAN NORTH

Milwaukie Ledding Library

City of Milwaukie
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ISSUANCE
Design Review Set

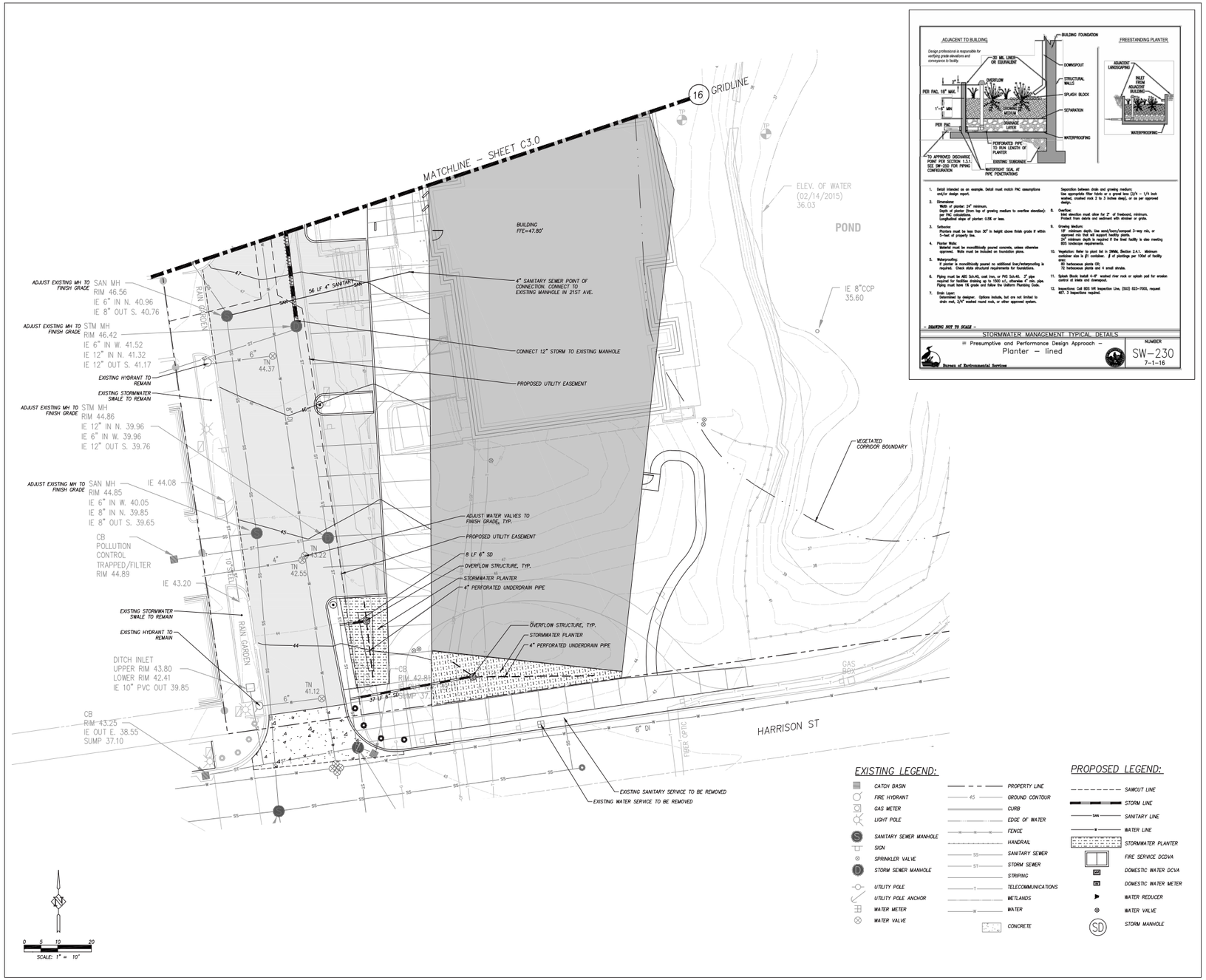
PROJECT NUMBER
1635

DATE
January 12, 2018

SCALE

DRAWING TITLE
UTILITY PLAN - NORTH

SHEET NUMBER
C3.0



EXISTING LEGEND:

- CATCH BASIN
- FIRE HYDRANT
- GAS METER
- LIGHT POLE
- SANITARY SEWER MANHOLE
- SIGN
- SPRINKLER VALVE
- STORM SEWER MANHOLE
- UTILITY POLE
- UTILITY POLE ANCHOR
- WATER METER
- WATER VALVE
- PROPERTY LINE
- 45 GROUND CONTOUR
- CURB
- EDGE OF WATER
- FENCE
- HANDRAIL
- SS SANITARY SEWER
- ST STORM SEWER
- STRIPING
- T TELECOMMUNICATIONS
- W WETLANDS
- W WATER
- CONCRETE

PROPOSED LEGEND:

- SAWCUT LINE
- STORM LINE
- SAN SANITARY LINE
- WATER LINE
- STORMWATER PLANTER
- FIRE SERVICE DCDVA
- DCDVA DOMESTIC WATER DCVA
- DWM DOMESTIC WATER METER
- WATER REDUCER
- WATER VALVE
- SD STORM MANHOLE

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City of Milwaukie
10660 SE 21st Ave, Milwaukie, OR 97206

ISSUANCE
Design Review Set

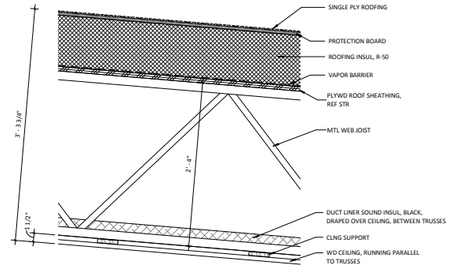
PROJECT NUMBER
1635

DATE
January 12, 2018

SCALE

DRAWING TITLE
UTILITY PLAN - SOUTH

SHEET NUMBER
C3.1



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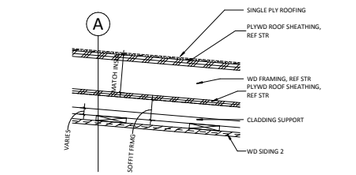

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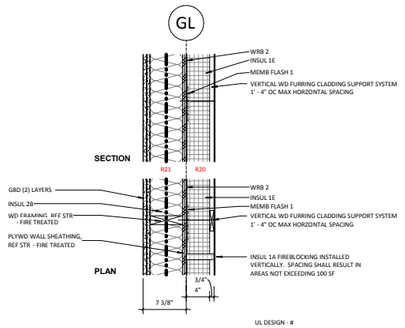

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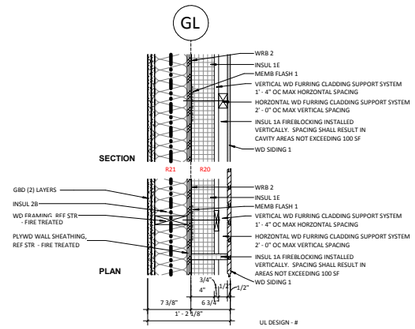

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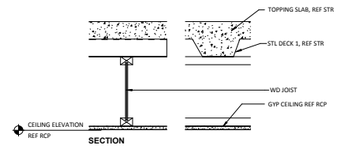

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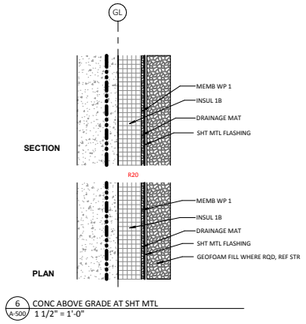

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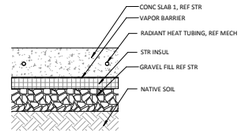


2 A-500 SLAB ON GRADE WITH RADIANT HEAT
1 1/2" = 1'-0"

ARCHITECTS

HACKER

733 SW Oak, Portland, OR 97205

CONSULTANT

STAMP

NOT FOR CONSTRUCTION

REVISION NO. DATE

KEY PLAN - (NTS)

TRUE NORTH PLAN NORTH

Milwaukie Ledding Library

City of Milwaukie
10660 SE 21st Ave, Milwaukie, OR 97222

ISSUANCE
100% Design Development

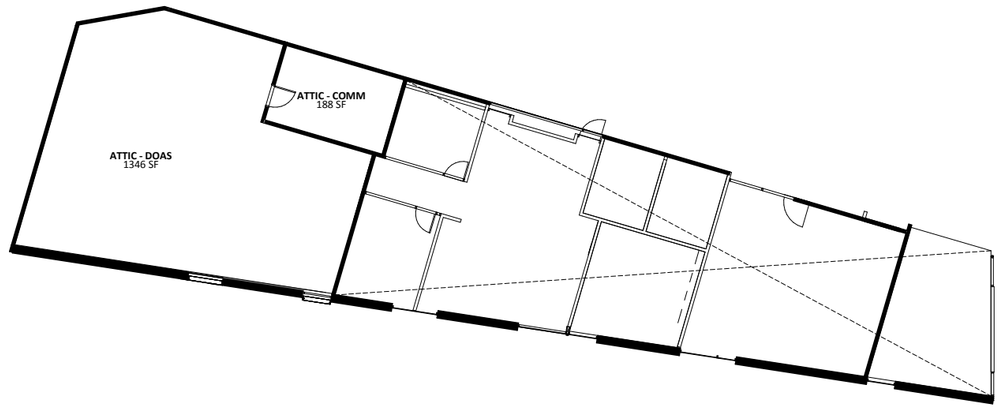
PROJECT NUMBER
1635

DATE
February 6, 2018

SCALE
As indicated

DRAWING TITLE
EXTERIOR ASSEMBLIES

SHEET NUMBER
A-500



MECHANICAL MEZZANINE PLAN

Exhibit 1

Natural Resource Review for the City of Milwaukie Ledding Library Milwaukie, Oregon

(Township 1 South, Range 2 East, Section 25CC, TL 900
Township 1 South, Range 2 East, Section 36BB, TL 1600 and 1800)

Prepared for

City of Milwaukie
10722 SE Main St.
Milwaukie, Oregon 97222

Prepared by

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PHS Project Number: 6314

January 17, 2018

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1.0 INTRODUCTION

The City of Milwaukie proposes to replace the existing Ledding Library located at 10660 SE 21st Avenue with another library building in the same location. The area of work contains both Water Quality Resource (WQR) and Habitat Conservation Area (HCA) and is entirely within 100 feet of the WQR. The proposed work exceeds 150 square feet within the HCA and is within 100 feet of a WQR, and therefore is subject to Type III Natural Resources Review and approval by the Planning Commission. Pacific Habitat Services, Inc. (PHS) has prepared a Natural Resource Review in accordance with Milwaukie Municipal Code (MMC) Section 19.402 to support this application.

The project site is approximately 1.83 acres located on SE 21st Avenue just north of SE Harrison Street. The approximate location of the site is shown on the USGS Gladstone, Oregon topographic quadrangle, which is included as Figure 1, and the tax lot map, which is included as Figure 2. All figures are in Appendix A. The site includes a portion of Spring Creek and an associated wetland. Apex Companies, LLC delineated the jurisdictional limits of Spring Creek and associated wetland in February 2017 and described the results in a Wetland Delineation Report dated March 2, 2017. The surveyed locations of Spring Creek and associated wetlands are depicted on Figure 3. The applicant has submitted the wetland delineation report to the Oregon Department of State Lands (DSL) for concurrence; review of the wetland delineation is currently pending.

Spring Creek is a tributary of Johnson Creek, which is located approximately 800 feet downstream of the project site. Spring Creek and its associated wetland are primary protected water features, as defined in the City of Milwaukie's Natural Resources Code (MMC 19.402). This project is subject to discretionary review under MMC Subsections 19.402.8 and 19.402.12, and an impact evaluation and alternatives analysis are required per MMC Subsection 19.402.12.A. This Natural Resource Review describes the existing WQR and HCA on the site and demonstrates project compliance with the applicable sections of the municipal code. This Natural Resource Review includes an evaluation of the condition of the WQR on the site, an analysis of potential impacts on the WQR and the HCA from the proposed development, and a mitigation plan to compensate for those impacts.

2.0 EXISTING WQR AND HCA ON THE PROJECT SITE

A WQR is defined in MMC Subsection 19.201 as a protected water resource and its vegetated corridor. Spring Creek and its associated wetland are primary protected water features, and as described in Table 19.402.15, Determination of WQR Location, in MMC Subsection 19.402.15, primary protected water features have an associated vegetated corridor of 50 to 200 feet wide, depending on the slopes adjacent to the resource. Because the slopes adjacent to Spring Creek and its associated wetland are less than 25 percent, as depicted on Figure 3), the associated vegetated corridor is 50 feet wide. The extent of the vegetated corridor on the project site, based on the surveyed boundaries of wetlands and waterways is depicted on Figure 3. The total area of vegetated corridor on the site is approximately 21, 389 sq.ft. (0.49 ac.).

Spring Creek also has an associated HCA. The City of Milwaukie Natural Resource Administrative Map (adopted in August 2011) shows HCA along the eastern portion of the site. Previous correspondence with the City of Milwaukie planning staff has indicated that the mapped HCA may be used to comply with MMC 19.402. Therefore, the City's GIS-mapped HCA, as provided by the City of Milwaukie, is depicted on Figure 3. The total area of HCA on the project site is approximately 34,026 sq.ft. (0.78 ac.); however, the mapped HCA boundaries closely correspond to the WQR boundaries such that only a portion of the mapped HCA (approximately 1,630 sq.ft. (0.04 ac.)) extends beyond the limits of the WQR. This HCA is used in the impact evaluation and alternatives analysis below.

3.0 COMPLIANCE WITH MILWAUKIE MUNICIPAL CODE

MMC 19.402.12 - General Discretionary Review

A. Impact Evaluation and Alternatives Analysis

An impact evaluation and alternatives analysis is required to determine compliance with the approval criteria for general discretionary review and to evaluate development alternatives for a particular property. A report presenting this evaluation and analysis shall be prepared and signed by a knowledgeable and qualified natural resource professional, such as a wildlife biologist, botanist, or hydrologist. At the Planning Director's discretion, the requirement to provide such a report may be waived for small projects that trigger discretionary review but can be evaluated without professional assistance.

The alternatives shall be evaluated on the basis of their impact on WQRs and HCAs, the ecological functions provided by the resource on the property, and off-site impacts within the subwatershed (6th Field Hydrologic Unit Code) where the property is located. The evaluation and analysis shall include the following:

1. ***Identification of the ecological functions of riparian habitat found on the property, as described in Subsection 19.402.1.C.2.***

MMC Subsection 19.402.1.C.2 identifies seven functions and values that contribute to water quality and to fish and wildlife habitat in urban streamside areas. Descriptions of the functions and values provided by the riparian habitat on the project site are provided below.

Vegetated corridors to separate protected water features from development - The vegetated corridor west of Spring Creek provides a buffer that separates existing development from the primary protected water feature. The existing tree cover, shrub, and herbaceous ground cover vegetation provide wildlife habitat and water quality benefits to the stream and effectively buffer the stream from the existing development.

Microclimate and shade - The trees within the WQR are large and established. Closest to the existing library on the north side of the building, the tree canopy cover is approximately 50 percent; however, the canopy cover is approximately 80 to 85 percent throughout much of the vegetated corridor. The tree canopy provides shade to the stream and helps to regulate the microclimate within the riparian corridor.

Streamflow moderation and water storage – Much of Spring Creek was culverted with increased urbanization of the area in the mid-1900s so that only that portion of Spring Creek on the project site, on parcels immediately north of the site, and parcels to the east of the site remain above ground. With the development, the remaining reaches of Spring Creek have been impounded so that in the project area, Spring Creek has little flow and functions as a pond rather than a stream. Because of the constricted outlet, Spring Creek provides some streamflow moderation and water storage functions. Because the vegetated corridor adjacent to the stream occurs on moderately steep slopes that rise approximately ten feet above the elevation of the stream and wetland, the vegetated corridor provides little streamflow moderation and water storage functions.

Water filtration, infiltration, and natural purification – Vegetation within the vegetated corridor slows runoff from adjacent areas and filters sediments and other pollutants from the runoff before it reaches the creek. By slowing the runoff, the vegetation also increases the potential for water to infiltrate into the soil before reaching the stream. Much of the vegetated corridor is densely vegetated under existing conditions and provides good water filtration, infiltration, and natural purification functions. Portions of the vegetated corridor where native ground cover and shrub vegetation has been replaced by mulched landscaped plantings and mowed lawns provide these functions at a lower level.

Bank stabilization and sediment and pollution control – Within the project area, streambanks and slopes above the stream and wetland are generally well-vegetated with trees and shrubs. This vegetation helps to stabilize the banks. Due to the dense vegetation on the banks and slow flows within the stream, there is little evidence of active bank erosion within the project site.

Large wood recruitment and retention and natural channel dynamics - Within the project area, mature trees occur within much of the vegetated corridor west of Spring Creek. These trees have the potential to become large woody material. However, because there's no active channel and the stream is currently ponded with little flow, any large woody material that falls into the stream is likely to remain on the project site rather than be carried downstream.

Organic material resources -Vegetation within the vegetated corridor provides organic material that serves as the basis for the aquatic food web. Under the existing conditions, the vegetated corridor within the project site is vegetated with a mixture of native and non-native trees, shrubs, and herbaceous species that contribute organic materials to the Spring Creek.

2. An inventory of vegetation, sufficient to categorize the existing condition of the WQR per Table 19.402.11.C, including the percentage of ground and canopy coverage materials within the WQR.

The existing library building, parking lot, walkways, stone planters, and concrete seating area encroach into the western portion of the vegetated corridor; total existing encroachment into the WQR is approximately 5,260 sq.ft. (0.12 ac.). The remainder of the vegetated corridor, between the existing encroachment and wetlands associated with Spring Creek, is largely forested. The vegetated corridor contains a dense canopy formed by large trees, predominantly northern red oak (*Quercus rubra*) and Douglas-fir (*Pseudotsuga menziesii*). The area has a relatively dense understory of tree saplings and shrubs. Common species in the understory include vine maple (*Acer circinatum*), snowberry (*Symphoricarpos albus*), red osier dogwood (*Cornus sericea*),

oceanspray (*Holodiscus discolor*) and Indian plum (*Oemleria cerasiformis*). Because of the lo light conditions from the dense tree canopy and landscape maintenance and mulching in portio of the vegetated corridor area, herbaceous ground cover is absent or relatively sparse througho much of the vegetated corridor. Small amounts of Himalayan blackberry are present on the site Himalayan blackberry is listed as invasive, noxious weed by the Oregon Department of Agriculture. Other non-native species, including northern red oak, which is the predominant tr species on the site, are present within the plant community, but they are not listed as invasive o noxious weeds at this time.

PHS identified two plant communities within the on-site vegetated corridor based on the predominance of native woody species and the extent of the tree canopy within the communiti PHS took three sample points to characterize the plant communities within the vegetated corridor. Brief descriptions of the characteristics that define the vegetated corridor plant communities and an evaluation of the condition of each of the communities are provided belov

Class A Plant Community

The vegetated corridor plant community south of the existing asphalt path and concrete seating area and north of the south edge of the existing library building has tree canopy coverage of approximately 80 to 85 percent. The combined tree, shrub and ground cover layers provide coverage that exceeds 80 percent, and most of the plants species within the plant community a native species. As such, the existing condition of the WQR west of Spring Creek meets the definition of a Class A ("Good") WQR, as defined in Table 19.402.11.C of the municipal code Sample Points 1 and 3 (Tables 1 and 2, respectively) characterize this plant community.

Table 1. Class A (Good) Plant Community, Sample Point 1

Botanical Name	Common Name	Cover (%)
Trees		
Quercus rubra	Northern red oak	75
Pseudotsuga menziesii	Douglas-fir	10
	TOTAL:	**85**
Shrubs and Saplings		
Cornus sericea	Red osier dogwood	25
Acer circinatum	Vine maple	15
Symphoricarpos albus	Snowberry	10
Rubus spectabilis	Salmonberry	10
Rosa nutkana	Nootka rose	10
Oemleria cerasiformis	Indian plum	10
Mahonia nervosa	Cascade Oregon grape	5
Holodiscus discolor	Oceanspray	5
	TOTAL:	**90**

Table 2. Class A (Good) Plant Community, Sample Point 3

Botanical Name	Common Name	Cover (%)
Trees		
Quercus rubra	Northern red oak	70
Thuja plicata	Western red cedar	10
	TOTAL:	**80**
Shrubs and Saplings		
Oemleria cerasiformis	Indian plum	20
Holodiscus discolor	Oceanspray	20
Acer circinatum	Vine maple	20
Rhododendron macrophyllum	Pacific rhododendron	10
	TOTAL:	**70**

Class B Plant Community

Portions of the vegetated corridor to the north of the asphalt path and concrete seating area, near the northeast corner of the existing library building, and south of the existing library consist predominantly of manicured landscape plantings. Many of the plant species in these areas are non-native species commonly used in landscape plantings. Ground cover in these areas is either sparse due to mulching and landscape maintenance or consists of mowed grasses. Himalayan blackberry, which is listed as an invasive, noxious weed by the Oregon Department of Agriculture, is present in small amounts in some of these areas. None of the other non-native species present within the plant community are listed as invasive or noxious weeds at this time. Sample Point 2 (Table 3) characterizes the species composition within the plant community.

As shown by Sample Point 2, this plant community has a canopy coverage of approximately 50 percent. The combined coverage of tree, shrub and ground cover layers provide coverage that exceeds 80 percent. Therefore, the existing condition of the plant communities in these areas meets the definition of a Class B ("Marginal") WQR, as defined in Table 19.402.11.C of the municipal code.

Table 3. Class B (Marginal) Plant Community, Sample Point 2

Botanical Name	Common Name	Cover (%)
Trees		
Quercus rubra	Red oak	50
	TOTAL:	**50**
Shrubs and Saplings		
Symphoricarpos albus	Snowberry	50
Lonicera nitida	Box honeysuckle	20
Pieris japonica	Japanese andromeda	20
Rubus armeniacus	Himalayan blackberry	10
Potentilla fruticosa	Bush cinquefoil	5
Alnus rubra	Red alder	5
	TOTAL:	**110**
Ground Cover		
Equisetum arvense	Field horsetail	20
Poa sp.	Bluegrass	20
	TOTAL:	**40**

3. An assessment of the water quality impacts related to the development, including sediments, temperature and nutrients, sediment control, and temperature control, or any other condition with the potential to cause the protected water feature to be listed on DEQ's 303(d) list.

Construction of the proposed library and associated infrastructure will result in impacts to WQR and HCA (Figure 4); however, much of the proposed construction within mapped WQR and HCA will occur within the footprint of the existing building and parking lot. Construction of the new building, path, and stormwater planter will result in permanent disturbance to approximately 1,705 sq.ft. (0.04 ac.) of WQR and 1,926 sq.ft. (0.04 ac.) of HCA outside the footprint of the existing building and parking lot. Temporary disturbance to approximately 3,494 sq. ft. (0.08 ac.) of WQR and approximately 3,185 sq.ft. (0.07 ac.) of HCA will result from the construction of the proposed library building, stormwater planter, and stormwater outfall and the removal of portions of the existing building and walkways that are outside the footprint of the proposed structure. Measures will be taken to limit temporary disturbance to the minimum area necessary for the construction of the new facilities and the removal of existing structures. All temporarily disturbed areas will be planted with native plant species, as described below, to minimize impact to the resources. The areas of permanent and temporary disturbance within the WQR and HCA are summarized in Table 4, below, and depicted on Figure 4.

Table 4. Summary of Permanent and Temporary Disturbance in the Water Quality Resource and HCA

Resource	Permanent Disturbance (sq.ft./ac.)	Temporary Disturbance (sq.ft./ac.)
Water Quality Resource	1,705 / 0.04	3,494 / 0.08
HCA	1,926 / 0.04	3,185 / 0.07

The proposed project is not anticipated to have any adverse impacts to water quality. The use of erosion and sediment controls during construction will prevent the transport of sediments to water resources and sediment-related impacts to water quality. The proposed project is not anticipated to result in additional nutrient inputs to the stream. A proposed stormwater planter east of the new building will treat runoff from the library roof and discharge the treated stormwater to the WQR. Boulders and plantings placed downslope of the outfall will dissipate flows preventing erosion and sedimentation and potential impacts to water quality. Additional stormwater planters located outside the WQR will collect and treat stormwater from other areas of the site and discharge the treated stormwater to the City's municipal storm sewer system. The proposed project also includes the installation of path within the WQR.

Construction of the proposed project will result in the removal of three trees six inches or greater in diameter from the western portion of the vegetated corridor. Because the tallest trees closest to the stream and adjacent wetlands will not be affected by the proposed project, the proposed tree removal will not result in decreased stream shading, and the proposed project is not anticipated to have an adverse effect on water temperature.

4. An alternatives analysis, providing an explanation of the rationale behind choosing the alternative selected, listing measures that will be taken to avoid and/or minimize adverse impacts to designated natural resources, and demonstrating that:

a. No practicable alternatives to the requested development exist that will not disturb the WQR or HCA.

In 2016, the City of Milwaukie passed a bond measure to fund improvements and expand the Ledding Library, and as a result, the City proposes to replace the existing library with a new, larger library building. The proposed improvements and expansion are required to meet community needs. Both the existing and proposed buildings are partially located within WQR and mapped HCA. As part of the design process, a two level design alternative was considered in order to reduce the overall footprint of the new building and minimize disturbance to the WQR and HCA. However, a two-story building was determined to be not practicable for the following reasons:

- The addition of a second floor to a library building would increase the distance that materials must be moved through the building to provide the expected service. The use of elevators and dumbwaiters to transport materials between floors would increase the time needed to move materials and result in a loss of efficiency.
- The addition of a second floor to the library would require increased staff to provide direct supervision in all public areas. This additional staffing would result in increased costs to operate the library.
- The addition of a second floor would result in an increase in ongoing expenses associated with maintenance of an elevator and additional restrooms and work spaces.

For these reasons, a one-story building was selected as the preferred alternative for the library improvement and expansion. The existing library is approximately 12,000 sq.ft.; the City proposes a new building of approximately 20,000 sq.ft. to meet community needs.

As depicted on Figure 3, the WQR and mapped HCA occupy almost all of the eastern half of the project site. Because of the location and extent of the resources on the site, it is not possible to construct a library building large enough to meet the community's needs and to provide the required parking, walkways, and other required infrastructure and totally avoid impacts to the WQR and HCA.

b. Development in the WQR and/or HCA has been limited to the area necessary to allow for the proposed use.

Development within the WQR and HCA has been limited to the area necessary to allow for the proposed use. The proposed building has been sited as far west on the site as possible in order to allow for the required parking spaces, provide the minimum amount of space necessary for the

construction of a library building of a size that meets community needs, and minimize disturbance to the WQR and mapped HCA. Much of the proposed library building will be constructed within the existing footprint of the existing building and parking lot, in order to minimize impacts to the vegetated portion of the WQR. The eastern side of the building foundation will be constructed in a manner that minimizes the extent of temporary encroachment into the WQR. Figure 4 depicts a temporary disturbance area that extends up to five feet from the proposed structures to conservatively estimate the limits of disturbance; however, measures will be taken to minimize the proposed stormwater planter east of the building is the minimum size necessary to provide the required treatment of the rooftop runoff in order to minimize permanent disturbance in the WQR. Proposed parking areas will be located entirely outside the WQR and HCA.

c. If disturbed, the WQR can be restored to an equal or better condition in accordance with Table 19.402.11. C; and the HCA can be restored consistent with the mitigation requirements of Subsection 19.402.11. D.2.

All areas of WQR and mapped HCA temporarily disturbed as a result of the proposed project will be restored to equal or better condition in accordance with Table 19.402.11.D.2. All temporarily disturbed areas will be planted with native tree, shrub and herbaceous ground cover species to restore temporarily disturbed areas. Additionally, areas within the footprint of the existing library building and parking area but outside the footprint of the proposed building, will be restored and planted with native tree, shrub, and ground cover species. Mitigation is described in more detail below.

d. Road crossings will be minimized as much as possible.

Not applicable. This project does not include any proposed road crossings.

5. Evidence that the applicant has done the following, for applications proposing routine repair and maintenance, alteration, and/or total replacement of existing structures located within the WQR:

a. Demonstrated that no practicable alternative design or method of development exists that would have a lesser impact on the WQR than the one proposed. If no such practicable alternative design or method of development exists, the project shall be conditioned to limit its disturbance and impact on the WQR to the minimum extent necessary to achieve the proposed repair/maintenance, alteration, and/or replacement.

The proposed project is the total replacement of an existing structure that is partially located within the WQR. As described above, there is no practicable alternative design or method of development that would result in less impact to the WQR. As described above, the proposed project has been designed to minimize disturbance to the WQR to the minimum necessary to achieve the replacement of the existing library building with a new building sufficient to meet the community's needs.

b. Provided mitigation to ensure that impacts to the functions and values of the WQR will be mitigated or restored to the extent practicable.

Mitigation for proposed disturbance is described below.

6. A mitigation plan for the designated natural resource that contains the following information:

a. A description of adverse impacts that will be caused as a result of development.

Construction of the proposed library and associated infrastructure will result in impacts to WQR and HCA (Figure 4); however, much of the proposed construction within mapped WQR and HCA will occur within the footprint of the existing building and parking lot. Construction of the new building, path, and stormwater planter east of the proposed building will result in permanent disturbance to approximately 1,705 sq.ft. (0.04 ac.) of WQR and 1,926 sq.ft. (0.04 ac.) of HCA outside the footprint of the existing building and parking lot. Temporary disturbance to approximately 3,494 sq. ft. (0.08 ac.) of WQR and approximately 3,185,372 sq.ft. (0.07 ac.) of HCA will result from the construction of the proposed library building, stormwater planter, and stormwater outfall and the removal of portions of the existing building and walkways that are outside the footprint of the proposed structure. Measures will be taken to limit temporary disturbance to the minimum area necessary for the construction of the new facilities and the removal of existing structures.

b. An explanation of measures that will be taken to avoid, minimize, and/or mitigate adverse impacts to the designated natural resource; in accordance with, but not limited to, Table 19.402.11.C for WQRs and Subsection 19.402.11.D.2 for HCAs.

As discussed above, it is not possible to construct the proposed project and avoid impacts to the WQR or mapped HCA.

The following measures are included in the project design to minimize adverse impacts to natural resources:

- Siting the proposed library building to overlap the footprint of the existing building and parking lot to the extent practicable to minimize disturbance to the WQR and mapped HCA, as described above.
- A stormwater management plan to insure that the post-development runoff does not exceed the pre-development runoff.
- Stormwater planters will treat stormwater runoff to meet Section 2, Stormwater Design Standards of the City of Milwaukie Public Works Standards.
- Tree protection measures to prevent impacts to existing trees to remain within the vegetated corridor. Protective measures will include a 6-foot-high fence installed at a distance of one foot per one inch of trunk diameter at breast height (dbh) to protect the tree's root zone. Pedestrian and vehicular access will also be limited within the tree protection zones to protect the roots of the trees.

Mitigation for the unavoidable impacts will be provided through the inventory of man-made debris and noxious materials that might be present within the WQR and the removal of any such material present; the implementation of a stormwater plan that meets City requirements for runoff rates and water quality; the removal of non-native, invasive plants from the vegetated corridor; and installation of tree and shrub plantings within the vegetated corridor to enhance and restore a diverse, native plant community. Compliance with the mitigation requirements outlined in Table 19.402.11.C and Subsection 19.402.11.D.2 to compensate for proposed impacts to the WQR and HCA are described below.

As depicted on Figure 3, the existing condition of WQR on the west side of Spring Creek is a combination of Class A ("Good") and Class B ("Marginal"). Mitigation requirements for disturbance in a Class A and Class B WQR, as listed in Table 19.402.11.C, are described below, as are the components of the project design that have been incorporated to insure compliance with the mitigation requirements.

- ***Submit a plan for mitigating water quality impacts related to the development, including: sediments, temperature, nutrients, or any other condition that may have caused the protected water feature to be listed on DEQ's 303(d) list.***

  Hacker Architects submitted a Preliminary Stormwater concept in the Building Program document (dated June 13, 2017) as well as the schematic design site development drawings dated October 24, 2017. The proposed stormwater management facilities treat runoff to meet the City of Milwaukie's water quality requirements and detain post-development runoff at or below pre-development release rates.

- ***Inventory and remove debris and noxious materials.***

  At the time of site construction, the Applicant will identify man-made debris and noxious materials that may be present within the WQR. Any such debris or materials will be removed from the WQR.

Mitigation requirements for disturbance in Class A and B WQR, as listed in Table 19.402.11.C, are described below, as are the components of the project design that have been incorporated to insure compliance with the mitigation requirements.

- ***Restore and mitigate disturbed areas with native species from the Milwaukie Native Plant List, using a City-approved plan developed to represent the vegetative composition that would naturally occur on the site.***

  All disturbed areas within the WQR will be restored with native trees and shrubs and seeded with a native seed mix. Trees and shrubs will be planted within areas designated as "Native Planting Area" and "Restoration Planting Area" (Figure 5) to enhance and restore a native plant community within the WQR.

  The number of trees and shrubs to be planted in Mitigation Area was determined in accordance with MMC Subsection 19.402.11.D.2. Three trees six inches or larger in diameter at breast height (dbh) will be removed from the HCA and WQR, as shown on Figure 4. As prescribed by Table 19.402.11.D.2.a, 14 trees and 36 shrubs would be required under Mitigation Option 1 to mitigate for the trees to be removed. Under Mitigation Option 2, 19 trees (1,926 sq.ft. impact area x 5 trees per 500 sq.ft. of impact area = 19 trees) and 96 shrubs (1,926 sq.ft. impact area x 25 shrubs per 500 sq.ft. of impact area = 96 shrubs) would be planted to mitigate for impacts to 1,926 sq.ft. of HCA impact. Because Mitigation Option 2 results in more tree plantings, Mitigation Option 2 was used to determine the number of trees and shrubs to be planted in accordance with MMC Subsection 19.402.11.D.2. A list of trees and shrubs proposed for planting are provided in Table 5, below.

Table 5. Proposed Riparian Restoration Planting List

Species	Common Name	Quantity	Stock Type	Plant Size
TREES				
Acer macrophyllum	Bigleaf maple	6	Container or field-grown	1/2 in. caliper
Alnus rubra	Red alder	6	Container or field-grown	1/2 in. caliper
Thuja plicata	Western red cedar	7	Container or field-grown	1/2 in. caliper
SHRUBS				
Cornus sericea	Red-osier dogwood	32	1 gallon	12 in
Oemlaria cerasiformis	Indian plum	32	1 gallon	12 in
Symphoricarpos albus	Snowberry	32	1 gallon	12 in

Trees and shrubs listed in Table 5 will be planted in areas designated as "native planting area" and "restoration planting area" on Figure 5. Because these areas are vegetated with trees and shrubs under existing conditions, the designated trees and shrubs will be planted in areas of temporary disturbance, in areas where invasive species are removed, and in areas where understory vegetation is sparse under existing conditions.

In addition, there are areas within the pond itself that have yellow flag iris that will be removed. Yellow flag iris is listed as a noxious weed by the Oregon Department of Agriculture.

These mitigation plantings meet the requirements of MMC Subsection 19.402.11.D, as follows:

- All areas temporarily disturbed will be restored and permanent impacts will be mitigated by the tree and shrub plantings, as described above.
- All species proposed for planting are native species, as identified on the Milwaukie Native Plant List.
- Trees to be planted will average at least a 1/2-in caliper (measured at 6 inches above the ground level for field-grown trees or above the soil line for container-grown trees). Shrubs shall be at least 1-gallon size and 12 inches high.
- Trees will be planted between 8 and 12 feet on center. Shrubs will be planted between 4 and 5 feet on center or clustered in single-species groups of no more than 4 plants, with each cluster planted between 8 and 10 feet on center. When planting near existing trees, the dripline of the existing tree shall be the starting point for plant spacing measurements.
- More than two species of shrubs are proposed, and not more than 50 percent of the trees to be planted are of the same genus.

- All mitigation will occur on site
- Invasive non-native or noxious vegetation will be removed within the mitigation area prior to planting, including, but not limited to, species identified as nuisance plants on the Milwaukie Native Plant List.
- Bare or open soil areas remaining after the required tree and shrub plantings will be seeded to 100% surface coverage with grasses or other ground cover species identified as native on the Milwaukie Native Plant List. Revegetation will occur during the next planting season following the site disturbance.

- ***Plant and/or seed all bare areas to provide 100% surface coverage.***

  All disturbed soil surfaces and low understory areas will be seeded with a native seed mix. Areas temporarily disturbed for the construction of the proposed project and due to the removal of invasive plant species will be seeded with this seed mix.

- ***Inventory and remove debris and noxious materials.***

  At the time of site construction, the Applicant will identify man-made debris and noxious materials that may be present within the WQR. Any such debris or materials will be removed from the WQR. This will occur within Mitigation Area, as shown on Figure 6.

c. Sufficient description to demonstrate how the following standards will be achieved:

(1) Where existing vegetation has been removed, the site shall be revegetated as soon as practicable.

Following the completion of the construction, temporarily disturbed soils will be reseeded with a native seed mix. Within the proposed planting areas, soils disturbed as a result of the removal of non-native invasive plants will be seeded with the native seed mix described in Table 5 as soon as practicable following the removal of the invasive plants. Planting of woody material is anticipated to occur in late winter 2019 to maximize the survival of the plantings.

(2) Where practicable, lights shall be placed so that they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.

Lights will be placed so that they do not shine directly into the WQR. The type, size, and intensity of lighting will be selected so that impacts to habitat functions are minimized.

(3) Areas of standing trees, shrubs, and natural vegetation will remain connected or contiguous; particularly along natural drainage courses, except where mitigation is approved; so as to provide a transition between the proposed development and the designated natural resource and to provide opportunity for food, water, and cover for animals located within the WQR.

With the exception of the removal of invasive plants from the designated planting areas, existing trees, shrubs, and natural vegetation within the WQR will remain undisturbed during the proposed construction. No trees or shrubs will be removed for the construction of the proposed bark mulch trail.

d. A map showing where the specific mitigation activities will occur. Off-site mitigation related to WQRs shall not be used to meet the mitigation requirements of Section 19.402.

Figure 5 depicts the location of proposed mitigation plantings. No mitigation is proposed to occur off site.

e. An implementation schedule; including a timeline for construction, mitigation, mitigation maintenance, monitoring, and reporting; as well as a contingency plan. All in-stream work in fish-bearing streams shall be done in accordance with the allowable windows for in-water work as designated by ODFW.

Construction of the proposed project is anticipated to begin in the summer of 2018. Activities associated with the WQR/HCA mitigation are anticipated to begin in summer 2018. Removal of any existing man-made debris and noxious materials from the WQR will occur in summer 2018, as will the removal of invasive plants from the planting areas (Figure 5). Restoration plantings will be installed in late winter 2019.

Monitoring of the restoration area will be conducted in the late summer of 2019 and again in summer 2020. An annual monitoring report documenting the survival of the restoration plantings will be submitted to the City of Milwaukie by December 31 of each monitoring year. Plants that die shall be replaced in kind as needed to ensure the minimum 80percent survival rate.

No in-stream work is proposed to occur as part of this project.

B. Approval Criteria

1. Unless specified elsewhere in Section 19.402, applications subject to the discretionary review process shall demonstrate how the proposed activity complies with the following criteria:

a. Avoid

The proposed activity avoids the intrusion of development into the WQR and/or HCA to the extent practicable. The proposed activity shall have less detrimental impact to the designated natural resource than other practicable alternatives, including significantly different practicable alternatives that propose less development within the resource area.

The proposed project avoids development within the WQR and HCA to the maximum extent practicable. Much of the proposed construction will occur within the footprints of the existing library building and parking lots. The proposed building has been sited as far to the west as possible in order to minimize disturbance to vegetated portions of the WQR. As discussed above, a two-story building design was considered to minimize disturbance to the WQR and HCA, but such a design was determined to be not practicable due to efficiency and budgetary constraints.

b. Minimize

If the applicant demonstrates that there is no practicable alternative that will avoid disturbance of the designated natural resource, then the proposed activity within the resource area shall minimize detrimental impacts to the extent practicable.

(1) The proposed activity shall minimize detrimental impacts to ecological functions and loss of habitat, consistent with uses allowed by right under the base zone, to the extent practicable.

Implementation of the proposed mitigation will ensure the proposed project minimizes adverse effects to the ecological functions of the WQR and loss of habitat, as follows:

- The minimization of impacts as well as the proposed plantings to restore a native plant community within the vegetated corridor will ensure that the WQR continues to provide a vegetated corridor that separates protected water features from development.
- The diverse native plant community within the WQR will continue to provide water filtration, infiltration, and natural purification functions. The proposed project will not adversely affect these functions.
- The proposed restoration plantings and the resulting diverse native plant community within the WQR will continue to provide bank stabilization and sediment and pollution control functions. The proposed project will not adversely affect these functions.
- Trees will remain within the vegetated corridor following construction, and therefore, the WQR will continue to provide the potential for large wood recruitment.
- Because the WQR will continue to be vegetated with a diverse plant community, the proposed project will not adversely affect the resource's ability to provide organic inputs to the stream and riparian area.

(2) To the extent practicable within the designated natural resource, the proposed activity shall be designed, located, and constructed to:

(a) Minimize grading, removal of native vegetation, and disturbance and removal of native soils; by using the approaches described in Subsection 19.402.11.A, reducing building footprints, and using minimal excavation foundation systems (e.g., pier, post, or piling foundation).

In accordance with MMC Subsection 19.402.11.A, the following measures will be implemented to minimize impacts to the WQR on the site:

- Work areas will be marked to reduce potential damage to the WQR.
- Trees in the WQR will not be used as anchors for stabilizing construction equipment.
- Native soils disturbed during development shall be conserved on the property.
- Prior to the start of any construction activities, the applicant will apply for a grading and erosion control permit, consistent with the standards required by the City's Public Works Department.

- The Applicant will implement best management practices on site to prevent the drainage of hazardous materials, erosion, pollution or sedimentation within the resources and the vegetative corridors.
- The Applicant has prepared a stormwater detention and water quality plan for the project which has been designed to prevent flows within and to natural drainage courses which might exceed pre-developed conditions.
- Prior to construction, the WQR that is to remain undeveloped will be flagged, fenced, or otherwise marked and shall remain undisturbed. Such markings will be maintained until construction is complete.
- The construction phase of the development shall be done in such a manner as to safeguard the resource portions of the site that have not been approved for development.
- Lights will be placed so that they do not shine directly into the WQR.
- The Applicant has prepared a Preliminary Grading and Erosion Control Plan which will conform to the requirements of 19.402.9. The Final Construction Grading and Erosion Control Plan will be provided to the City's Engineering Department prior to the commencement of construction activities.

(b) Minimize adverse hydrological impacts on water resources.

The implementation of the proposed stormwater management plan, which detains post-development runoff at or below pre-development release rates, will ensure that hydrologic impacts to the water resource are minimized.

(c) Minimize impacts on wildlife corridors and fish passage.

The proposed project does not involve any work in water resources that might adversely affect fish passage. Restoration of a diverse native plant community within the vegetated corridor will ensure that impacts to wildlife habitat are minimized.

(d) Allow for use of other techniques to further minimize the impacts of development in the resource area; such as using native plants throughout the site (not just in the resource area), locating other required landscaping adjacent to the resource area, reducing light spill-off into the resource area from development, preserving and maintaining existing trees and tree canopy coverage, and/or planting trees where appropriate to maximize future tree canopy coverage.

Impacts to the on-site resources have been minimized to the extent practicable, as described above.

c. Mitigate

If the applicant demonstrates that there is no practicable alternative that will avoid disturbance of the designated natural resource, then the proposed activity shall mitigate for adverse impacts to the resource area. All proposed mitigation plans shall meet the following standards:

(1) The mitigation plan shall demonstrate that it compensates for detrimental impacts to the ecological functions of resource areas, after taking into consideration the applicant's efforts to minimize such detrimental impacts.

As described above, implementation of the proposed mitigation will ensure the proposed project minimizes adverse effects to the ecological functions of the WQR and loss of habitat, as follows:

- The minimization of areal impacts as well as the proposed plantings to restore a native plant community to the west side of Spring Creek will ensure that the WQR continues to provide a vegetated corridors that separates protected water features from development.
- The diverse plant community within the WQR will continue to provide water filtration, infiltration, and natural purification functions. The proposed project will not adversely affect these functions.
- The proposed restoration plantings and the resulting diverse native plant community within the WQR will continue to provide bank stabilization and sediment and pollution control functions. The proposed project will not adversely affect these functions.
- Trees will remain within the vegetated corridor following construction, and therefore, the WQR will continue to provide the potential for large wood recruitment and retention functions.
- Because the WQR will continue to be vegetated with a diverse plant community, the proposed project will not adversely affect the resource's ability to provide organic inputs to the stream and riparian area.

(2) Mitigation shall occur on the site of the disturbance, to the extent practicable. Off-site mitigation for disturbance of WQRs shall not be approved. Off-site mitigation for disturbance of HCAs shall be approved if the applicant has demonstrated that it is not practicable to complete the mitigation on-site and if the applicant has documented that they can carry out and ensure the success of the off-site mitigation as outlined in Subsection 19.402.11.B.5.

In addition, if the off-site mitigation area is not within the same subwatershed (6th Field Hydrologic Unit Code) as the related disturbed HCA, the applicant shall demonstrate that it is not practicable to complete the mitigation within the same subwatershed and that, considering the purpose of the mitigation, the mitigation will provide more ecological functional value if implemented outside of the subwatershed.

All mitigation will occur on site.

(3) All revegetation plantings shall use native plants listed on the Milwaukie Native Plant List.

Only native species will be installed in the revegetation plantings. A list of species to be planted is provided in Table 5, above.

(4) All in-stream work in fish-bearing streams shall be done in accordance with the allowable windows for in-water work as designated by ODFW.

No in-stream work is proposed to occur with this project.

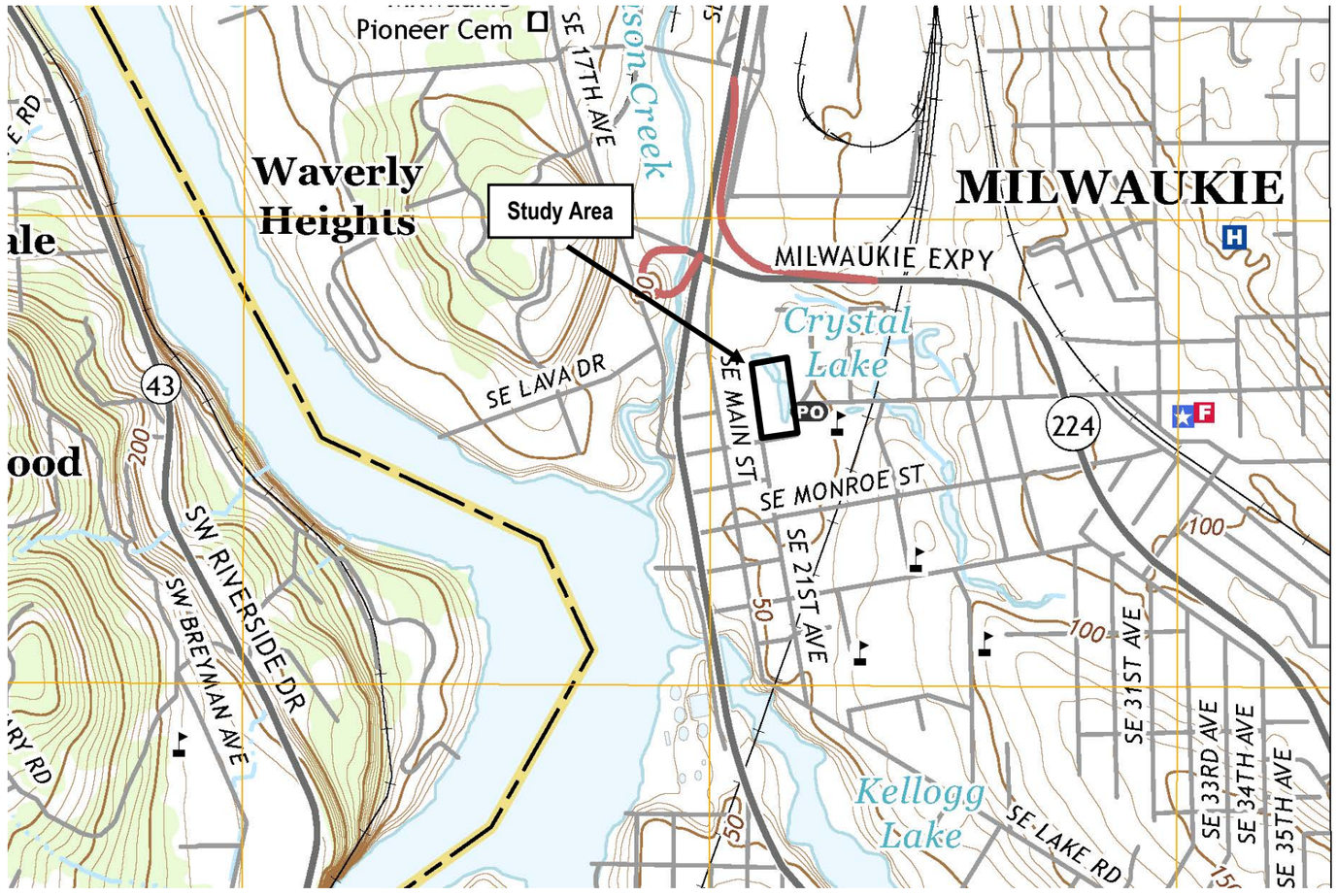
(5) A mitigation maintenance plan shall be included and shall be sufficient to ensure the success of the planting. Compliance with the plan shall be a condition of development approval.

The Applicant will undertake the following mitigation maintenance measures to insure a minimum of 80 percent of the trees and shrubs planted remain alive two years after the mitigation planting is completed.

- New plantings will be mulched to a minimum of 3-inch depth and 18-inch diameter to retain moisture and discourage weed growth.
- Non-native or noxious vegetation will be removed or controlled throughout the maintenance period.
- Plant sleeves or fencing will be used to protect trees and shrubs against wildlife browsing and the resulting damage to plants.
- New plantings will be watered at a rate of 1 inch per week between June 15 and October 15 for the first two years following planting.

Appendix A

Figures



Project #6314
1/18/18

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

General Location and Topography
Milwaukie Ledding Library - Milwaukie, Oregon
United States Geological Survey (USGS) Lake Oswego, Oregon 7.5 quadrangle, 2017
(viewer.nationalmap.gov/basic)

FIGURE
1

Project # 6314
1/18/18

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

Tax Lot Map
Milwaukie Ledding Library - Milwaukie, Oregon
The Oregon Map (ormap.net)

FIGURE
2

Base provided by Compass Surveyors

Pacific Habitat Services,Inc.
9450 SW Commerce Circle, Suite 180 Wilsonville, Oregon 97070
Phone: (503) 570-0800 Fax (503) 570-0855

Existing Conditions
Milwaukie Ledding Library - Milwaukie, Oregon

FIGURE 3

1-16-2018

TREES PROPOSED TO BE REMOVED FROM THE WQR AND HCA

TREE ID	SPECIES	DIAMETER (inches)
2542	Pine	8
3589	Deciduous	36
3591	Rhododendron	9

Site Plan Provided by Hacker
Base provided by Compass Surveyors

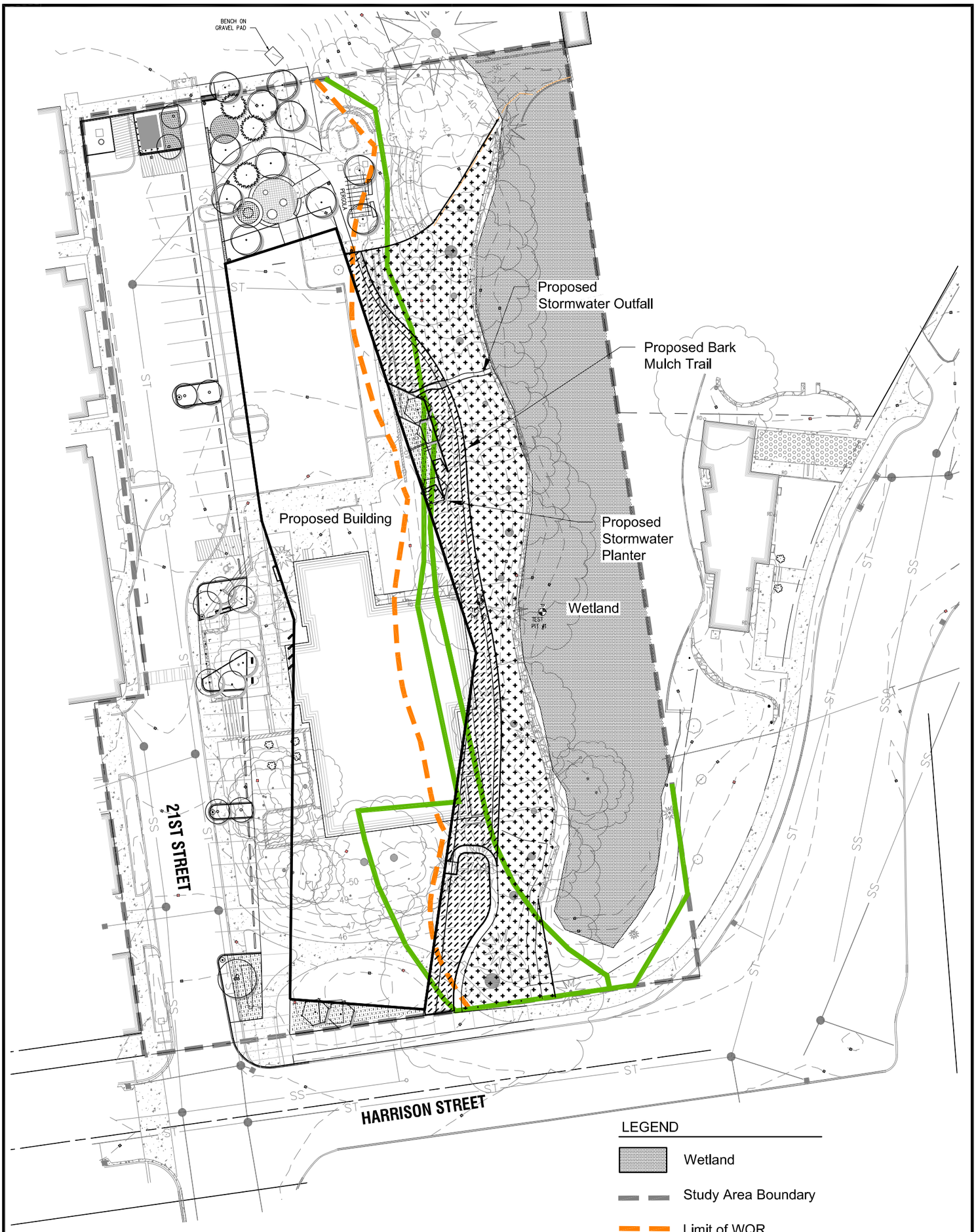
Pacific Habitat Services,Inc.
9450 SW Commerce Circle, Suite 180 Wilsonville, Oregon 97070
Phone: (503) 570-0800 Fax (503) 570-0855

Site Planwith WQR and HCA Disturbance
Milwaukie Ledding Library - Milwaukie, Oregon

FIGURE 4

2-7-2018

X:\Project Directories\6300\6314 Milwaukie Ledding Library\AutoCAD\Plot Dwgs\Fig4 SitePlan.dwg, 2/7/2018 3:07:37 PM, CutePDF Writer



Site Plan Provided by Hacker
Base provided by Compass Surveyors

Pacific Habitat Services,Inc.
9450 SW Commerce Circle, Suite 180 Wilsonville, Oregon 97070
Phone: (503) 570-0800 Fax (503) 570-0855

Mitigation Plan
Milwaukie Ledding Library - Milwaukie, Oregon

FIGURE 5

2-7-2018

X:\Project Directories\6300\6314 Milwaukie Ledding Library\AutoCAD\Plot Dwgs\Fig5 MitigationPlan.dwg, 2/7/2018 4:14:48 PM, CutePDF Writer

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

Fully completed and signed report cover forms and applicable fees are required before report review timelines are initiated by the Department of State Lands. Make checks payable to the Oregon Department of State Lands. To pay fees by credit card, go online at https://apps.oregon.gov/DSL/EPS/program?key=4.

Attach this completed and signed form to the front of an unbound report or include a hard copy with a digital version (single PDF file of the report cover form and report, minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail DSL instructions on how to access the file from your ftp or other file sharing website.

Contact and Authorization Information

☒ Applicant ☐ Owner Name, Firm and Address:
City of Milwaukie
10722 SE Main Street
Milwaukie, Oregon 97222

Business phone # (503) 786-7555
Mobile phone # (optional)
E-mail:

☐ Authorized Legal Agent, Name and Address (if different):

Business phone #
Mobile phone # (optional)
E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: _____ **Signature:** _____
Date: _____ Special instructions regarding site access: _____

Project and Site Information

Project Name: City of Milwaukie Ledding Library

Latitude: 45.4902119 Longitude: -122.6663887
decimal degree - centroid of site or start & end points of linear project

Proposed Use: City Library and Parking

Tax Map #
Tax Lot(s)

Tax Map #
Tax Lot(s) 1600, 1800, 900

Project Street Address (or other descriptive location):
10660 SE 21st Avenue
Milwaukie, Oregon 97222

Township 1S, 1S Range 1E, 1E Section 36, 25 QQ BB, CC
Use separate sheet for additional tax and location information

City: Milwaukie County: Clackamas

Waterway: Spring Creek River Mile: N/A

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
Carmen Owens, Apex Companies, LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Phone # (503) 924-4704
Mobile phone # (if applicable)
E-mail: cowens@apexcos.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.
Consultant Signature: _____ Date: 12-1-17

Primary Contact for report review and site access is ☐ Consultant ☒ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: 2.06 acres | Total Wetland Acreage 0.29

Check Applicable Boxes Below

☐ R-F permit application submitted
☐ Mitigation bank site
☐ Industrial Land Certification Program Site
☐ Wetland restoration/enhancement project (not mitigation)
☐ Previous delineation/application on parcel
If known, previous DSL # _____

☒ Fee payment submitted $ $ 419
☐ Fee ($100) for resubmittal of rejected report
☐ Request for Reissuance. See eligibility criteria. (no fee)
DSL # _____ Expiration date _____
☐ LWI shows wetlands or waters on parcel
Wetland ID code _____

For Office Use Only

DSL Reviewer: _____ Fee Paid Date: ____/____/____ DSL WD # _____

Date Delineation Received: ___/___/___ Scanned: ☐ Electronic: ☐ DSL App.# _____

Wetland Delineation Report
10600 SE 21st Avenue
Milwaukie, Oregon

Prepared for:
City of Milwaukie

March 2, 2017
2331-00

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Prepared for:
City of Milwaukie

March 2, 2017
2331-00

Carmen Owens
Project Biologist

John Foxwell, LHg
Senior Associate Hydrogeologist

Table of Contents

Figures

Appendices

I. Introduction

The purpose of this assessment is to review the property at 10600 SE 21st Avenue and two adjacent parcels located within the City of Milwaukie, Oregon (the Site) for wetlands and regulated waters of the United States (U.S.) and the State of Oregon. The results of the assessment are described in the Sections below, as well as documented on Figures 1 through 6. Data sheets and site photos are presented in Appendices A and B, respectively.

II. Findings

A. Landscape Setting and Use

The Site is a 2.03-acre property located at 10600 SE 21st Avenue in Milwaukie, Oregon, compromising the entirety of Clackamas County tax lots 11E36BB01800 (Ledding Library Parcel), 11E36BB01600 (Silver Parcel), 11E25CC00900 (Pond House Parcel; Figures 1 and 2). The Ledding Library parcel contains an 11,800 square feet three-level municipal library on an estimated 1.77-acres. The rest of the parcel includes a parking lot, vegetated land and Spring Creek. Sliver Parcel is a 2,750 square feet vegetated parcel with no structures. The Pond House parcel contains three-level residence, converted garage, landscaped yard, and Spring Creek on an estimated 0.20-acres. Properties to the west of the subject property are residential use and light commercial use. A small park and Spring Creek are present just north of the subject property, with commercial use buildings across the creek. West and south of the subject property is a school and associated sports field, residential apartments, and Milwaukie City Hall.

Elevation of the Site is approximately 50 feet above mean sea level (MSL). In general, the topography of the Site is flat with a slight decrease in elevation from the east side of the currently Ledding Library building to the Spring Creek. Elevations of the adjacent properties are similar to those at the Site. The Site is located within the Lower Willamette major watershed (HUC 8 17090012) and the Lower Johnson Creek subwatershed (HUC 12 17090012020) (EPA, 2016). The nearest surface water body is Johnson Creek which is approximately 500 feet west of the Site at its nearest location. The Willamette River is located approximately 800 feet west of the Site. The nearest mapped wetland is a freshwater forested/shrub wetland located 75 feet northeast of the Site (USFWS, 2014). This wetland can be seen on Figure 3. The Site is not located within the FEMA 100-year floodplain.

The Site is located within the Portland/Vancouver Basin (3a) Level IV Ecoregion within the Willamette Valley (3) Level III Ecoregion as mapped by the Environmental Protection Agency Level III and IV Ecoregions of Oregon poster (Thorson et al., 2003). The Portland/Vancouver Basin is a depression at the base of the Portland Hills fault block. It contains the confluence of the Columbia and Willamette Rivers and is composed of deltaic sands and gravels deposited by Pleistocene floods. Today, many wetlands, oxbow lakes, and ponds still occur, but, overall, the Portland/Vancouver Basin (3a) is dominated by urban and suburban development, pastures, and nurseries. The climate is usually marine-influenced but, periodically, easterly

winds entering via the Columbia River Gorge bring continental temperature extremes to the Portland/Vancouver Basin. (Thorson et al., 2003).

The Site is located within a dense urban landscape. Historically the vegetation type was Prairie Terraces and Valley Foothills. The Prairie Terraces and Valley Foothills vegetation type covers the Willamette River valley and foothills from Beaverton to Eugene, Oregon (WPN, 1999). Plants associated with these vegetation types historically included Douglas-fir, Oregon ash, madrone, western red cedar, Oregon white oak savanna and prairies, and grand fir wetland vegetation. Current vegetation may be urban and suburban native and exotic vegetation, pasture grasses, grass seed, grain, some forested riparian areas, pastureland, conifer and deciduous forests, vineyards, and orchards.

B. Site Alterations

The Site appears undeveloped on aerial photography in 1914. The Ledding Library parcel was developed as a residential property between 1914 and 1928. The Pond House parcel was developed as a residential property between 1948 and 1952. The Ledding Library was converted from a residential farm house to a municipal library in 1964. Since that date, it has undergone two renovations in 1987 and 1997. No other known improvements have taken place since 1997.

According to United States Geological Survey (USGS) topographic maps, one blue-line tributary is located within the Site. No additional potential tributaries or linear features not delineated as USGS blue-lines were identified on aerial imagery. The one blue-line tributary is labeled as Spring Creek on topographic maps. Historical topographic maps show Spring Creek as a north-northwest flowing blue-line tributary of Johnson Creek. Starting in the 1950s, development of the area increased and became more urban. Corresponding to this time, Spring Creek becomes ponded and segmented on topographic maps, likely signifying the tributary has been culverted between the ponded areas. The most recent topographic map (2014) shows the creek is almost entirely culverted with a few non-culverted ponding locations such as that on Site. As Spring Creek has become a highly engineered system, with little contact with the natural hydrology of the area, there is little flow except at times of significant precipitation. This creates conditions that allow the ponded section of Spring Creek on the Site to have little to no channelization.

C. Precipitation Data and Analysis

Weather conditions on February 8, 2017 were partly sunny with intermittent precipitation. Total precipitation for the day was 2.10 inches. The total rainfall for February 1 through February 8 was 6.40 inches. The table below summarizes the total precipitation and percentage of average for the three months prior to the field reconnaissance. All data is from Natural Resources Conservation Service (NRCS) Agricultural Applied Climate Information System (AgACIS) for the Tillamook Station (NRCSb, 2017).

Month	Average Precipitation	30% Chance Will Have		Observed Precipitation	Percent of Average
		Less Than Average	More Than Average		
November 2016	19.26	15.18	22.18	13.30	69%
December 2016	16.64	12.16	19.58	19.80	119%
January 2017	19.89	12.55	21.24	8.50	43%

D. Methods

Prior to the field investigation, a detailed desktop Geographic Information System (GIS) analysis was conducted to determine the locations of potential areas on the Site that required field inspection. USGS topographic maps were used to identify the locations of potential tributaries and wetlands that may be impacted by the Site, as well as to identify the flow regime of the Site to determine downstream connectivity to a traditional navigable water. The National Wetland Inventory (NWI; USFWS, 2014) was reviewed to identify previously delineated or predicted wetlands on Site and adjacent properties. These wetlands are presented on Figure 3. The soil survey for Clackamas County was reviewed to identify hydric soils located on the Site or adjacent properties (USDA, current). The soil types mapped on this survey for the Site are presented on Figure 4. Aerial imagery of the Site was reviewed for evidence of wetland and channel characteristics, including inundation, saturation, sparsely vegetated surfaces, changes in vegetation type, clearly defined channels, and manmade disturbances. An aerial photograph of the Site is presented on Figure 5.

Following the GIS study, an Apex biologist performed pedestrian field reconnaissance on February 8, 2017 to compare background data to existing conditions and to determine the current extent of waters of the U.S. within the Site. Field investigations were performed in accordance with the USACE Wetland Delineation Manual (USACE, 1987) and with the Western Mountains, Valleys, and Coast Region (USACE, 2010) regional supplement. The limits of ordinary high water (OHW) were delineated based on an evaluation of observed physical characteristics, as described in the USACE Regulatory Guidance Letter No. 05-05 (USACE, 2005).

Wetland and stream field notes were recorded on the appropriate regional supplement wetland data sheet. The Western Mountains, Valleys, and Coast Region (USACE, 2010) regional supplement datasheets for test pit (TP)-1 and TP-2 are shown in Appendix A. The sample locations and wetland boundary were flagged and locations recorded with a hand-held global positioning device (GPS) device.

E. Description of All Wetland and Other Non-Wetland Water

Spring Creek

Spring Creek enters the Site through a culvert on the southeast corner of the property. Flow is northward along the east side of the Ledding Library parcel. This creek is defined on the NWI as a freshwater pond

(PUBK). The feature is a palustrine pond with an unconsolidated bottom that is artificially flooded (USFWS, 2014). The are of Spring Creek is approximately 12,340 square feet (sq ft) or 0.28 acres on the Site.

Within the Site, Spring Creek averages 20 to 30 feet wide at ordinary high water (OHW), though the feature is approximately 60 feet across at it's widest, which includes portions both on and off the Site. Substrate within the pond was silt underlain by sand and gravel. Water depth varied with water approximately 2.5 feet deep in the middle of the pond during the site visit.

Wetland LL001

One emergent wetland was identified on the Site during field reconnaissance, encompassing approximately 4,850 sq ft (0.1 acre) of the Site, bordering Spring Creek. Indicators of this wetland, which includes hydrophytic vegetation, hydric soils, and wetland hydrology, were observed during field investigations. Hydric soils identified within the wetland meet the criteria for Hydrogen Sulfide Indicator (A4) as a sulfur smell was evident at multiple locations. The vegetation at LL001 included red oak, western red cedar, lady fern, English ivy, Himalayan blackberry, Oregon grape, scouring rush, and sweet flag. The wetland boundary and sample points are presented on Figure 6.

F. Deviation from LWI or NWI

Spring Creek is listed as a freshwater pond on the NWI. The identified wetland bordering Spring Creek is not listed on the NWI. The small area of the wetland is likely the reason it is not listed on the NWI. There is no LWI for Milwaukie, Oregon.

G. Mapping Method

Sample locations and the wetland boundary were flagged. The locations of the samples and boundary were recorded with a sub-meter accuracy Trimble Geo7X.

H. Additional Information

None.

I. Results and Conclusion

Following desktop analysis and field reconnaissance, one Water of the US and one wetland was identified on the Site. The freshwater pond, Spring Creek, occupies 0.28 acres of the Site. The freshwater emergent and palustrine open water wetland encompasses 0.1 acres acres of the Site. Hydrophytic vegetation, hydric soils, and wetland hydrology were observed within LL001.

Based on this finding, a PCN would need to be submitted to the USACE if the proposed project results in the permanent loss of greater than 0.50 acre of feature LL 001. If impacts exceed one-half acre, an Individual Permit (IP) from the USACE would be required. In addition, removal of more than 50 cubic yards of material in any waters of the state of Oregon requires an ORDSL Removal-Fill Permit.

Findings within this report are based on information collected from observations made on the day of the site reconnaissance and from reasonably ascertainable information obtained from public agencies and other referenced sources. The services provided by Apex should not be construed as implied confirmation regarding the suitability of the Site for its eventual use.

J. Required Disclaimer

This report documents the investigation, best professional judgment, and the conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-005.

III. References

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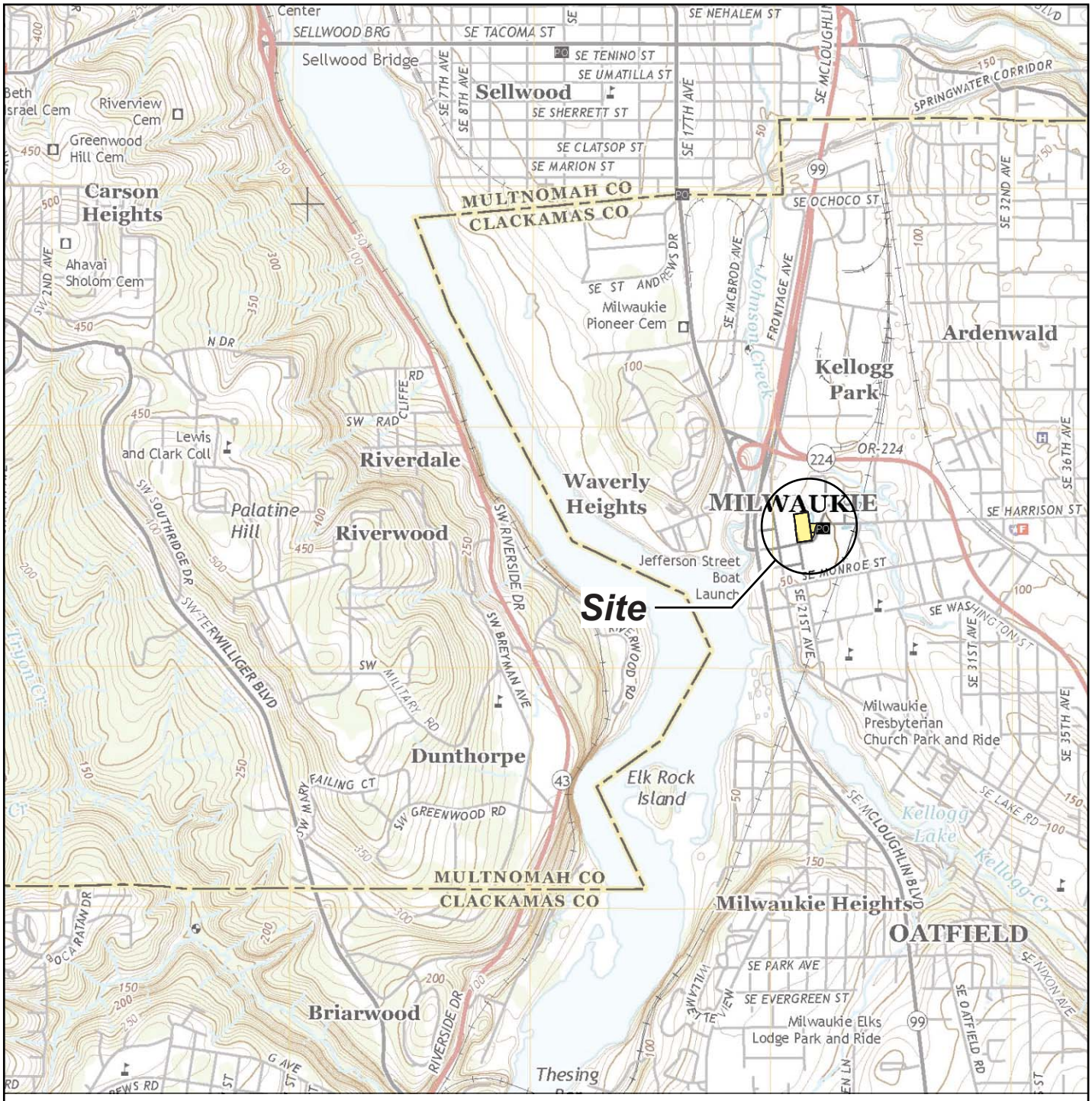
(WPN) Watershed Professionals Network. 1999. *Oregon Watershed Assessment Manual.* June 1999. Prepared for the Governor's Watershed Enhancement Board, Salem, Oregon.



Note: Base map prepared from USGS 7.5-minute quadrangle of Lake Oswego, OR, dated 2014 as provided by USGS.gov.

0 2,000 4,000

Approximate Scale in Feet

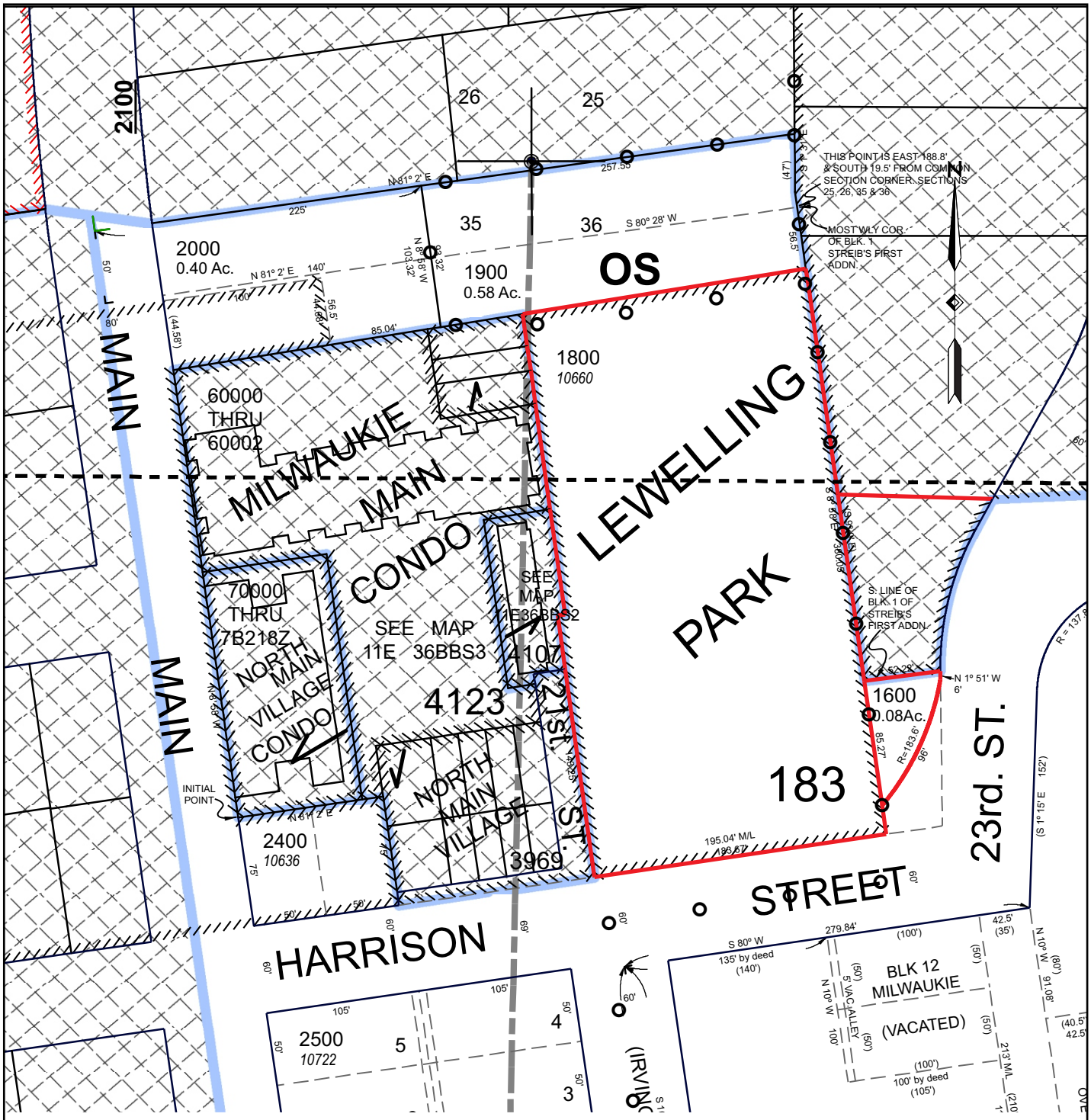
N

Location Map

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	2331-00	Figure
March 2017		1



Legend:

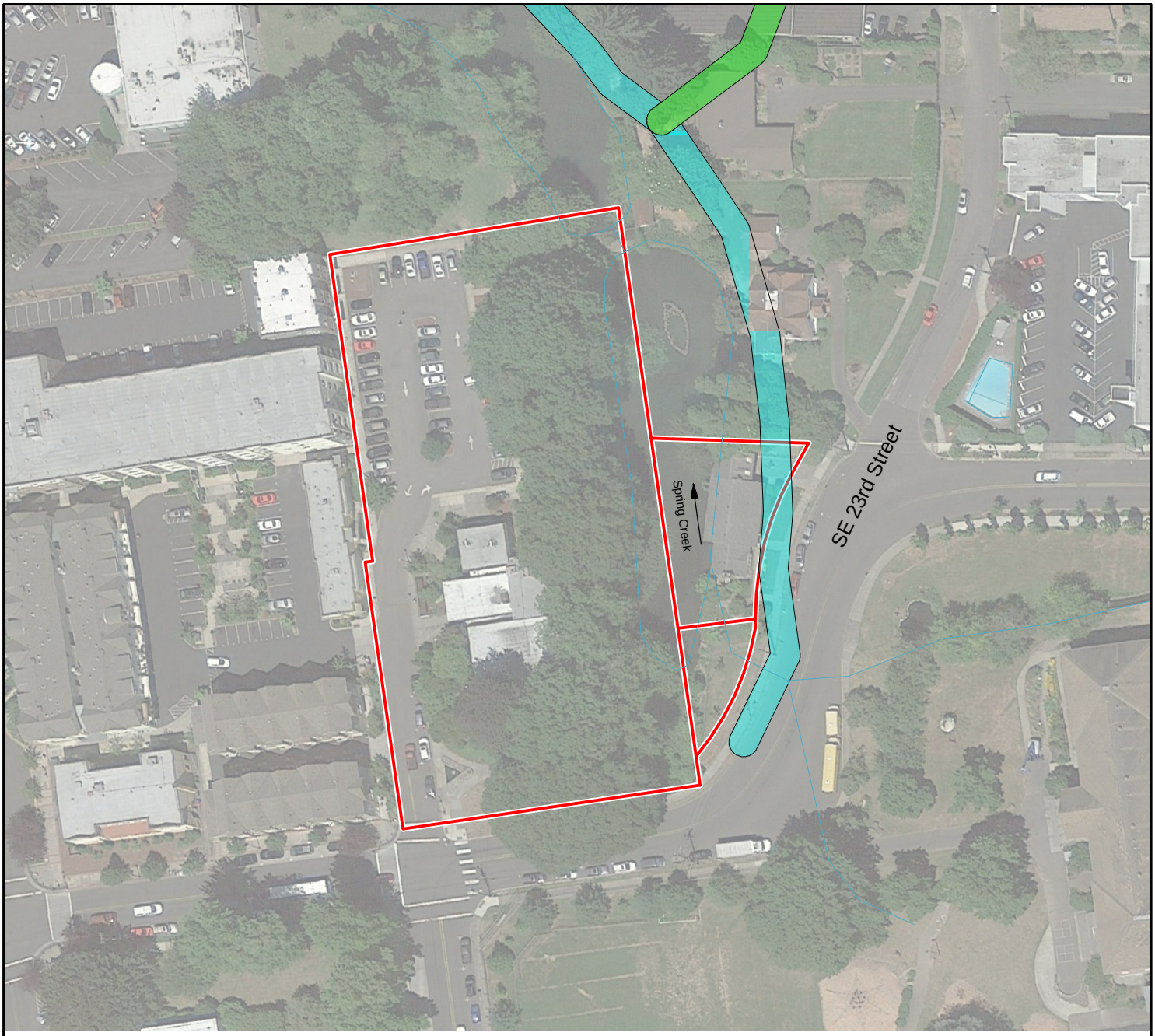
Site Boundary

Note: Base map prepared from a Clackamas County Tax Lot Map: 1 1 E 36BB, N.W.1/4 N.W.1/4 SEC.36 T.1S. R.1E. W.M.

Tax Lot Map

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	2331-00	Figure 2
	March 2017		



NOTE: Base map prepared from Google Earth Pro Imagery. Aerial dated July 23, 2016. Tax Lot, road, and stream information from © Oregon Metro www.oregonmetro.gov/rlis (8-2016).

N

0 100 200

Scale in Feet

Legend:

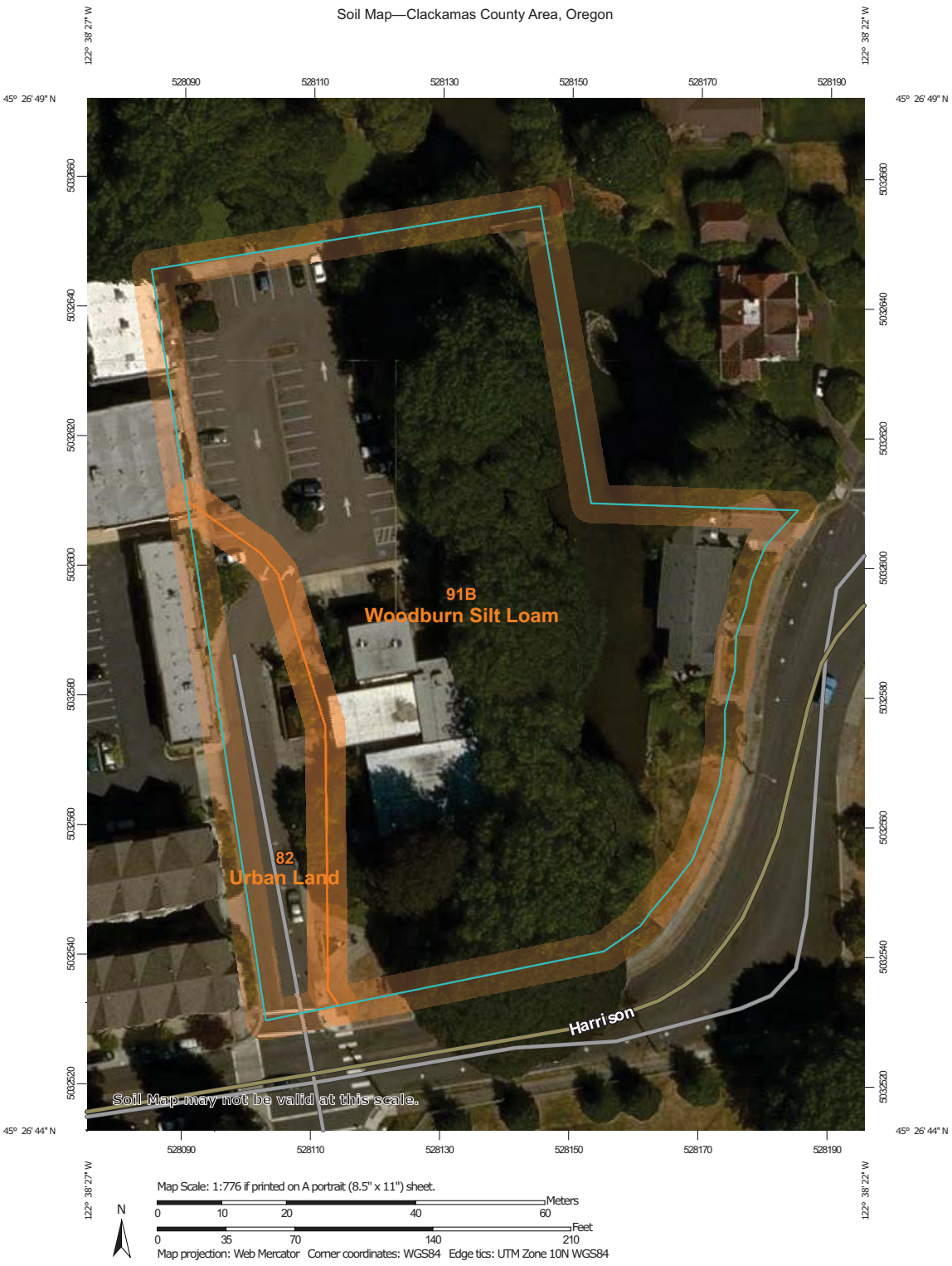
- Site Boundary
- Flow Direction
- Freshwater Pond (USFW)
- Freshwater Forested/Shrub Wetland

U.S. Fish and Wildlife Service. Publication date October 2017. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/

NWI/LWI Map

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	2331-00	Figure 3
	March 2017		



USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

12/3/2017
Page 1 of 3

County Soil Survey Map

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	2331-00	Figure 2
	March 2017		

NOTE: Base map prepared from Google Earth Pro Imagery. Aerial dated July 23, 2016. Tax Lot, road, and stream information from © Oregon Metro www.oregonmetro.gov/rlis (8-2016).

0 60 120

Scale in Feet

Legend:

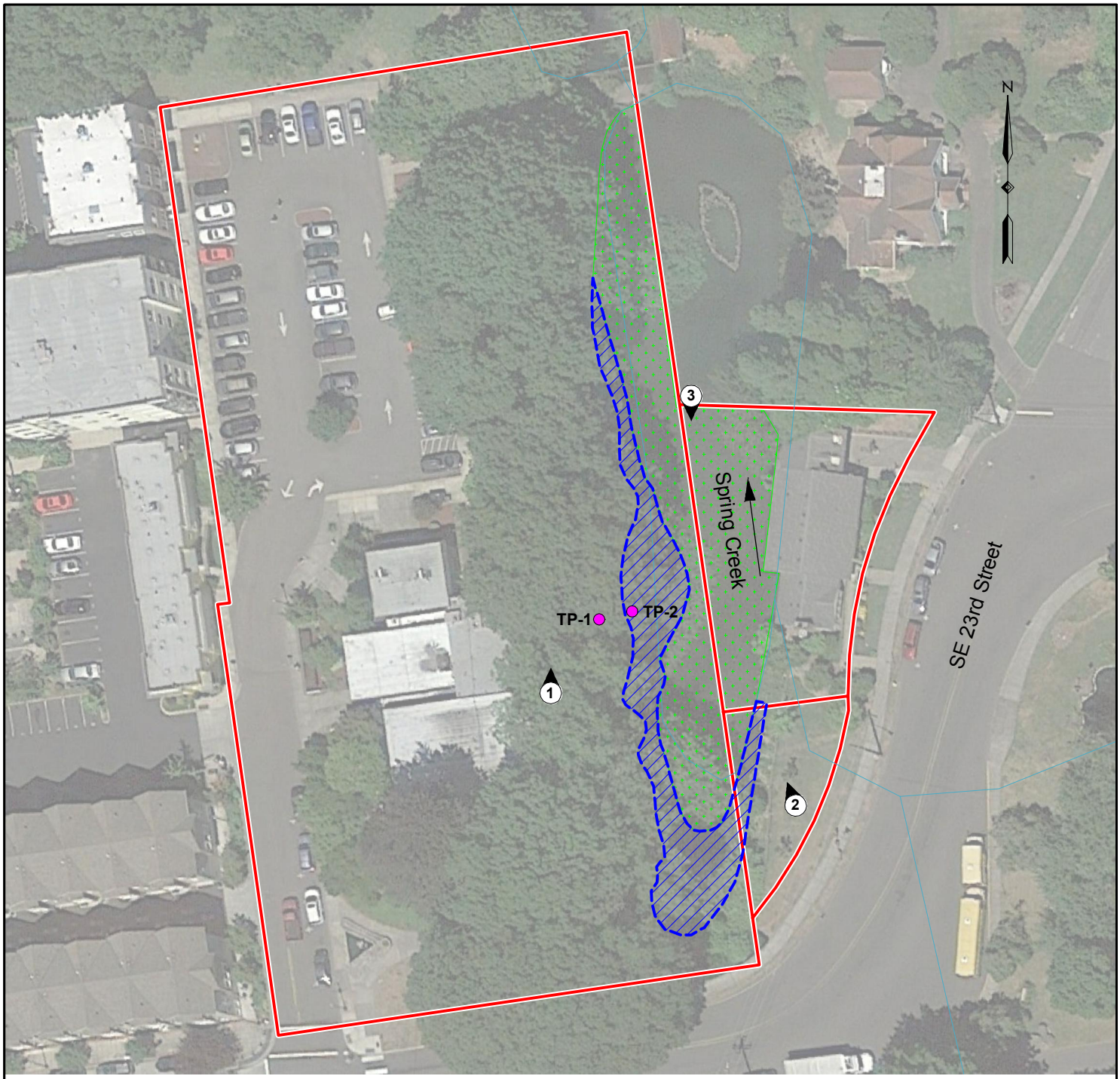
Site Boundary

Flow Direction

Aerial Photography

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	2331-00	Figure 5
	March 2017		



NOTE: Base map prepared from Google Earth Pro Imagery. Aerial dated July 23, 2016. Tax Lot, road, railroad, and stream information from © Oregon Metro www.oregonmetro.gov/rlis (8-2016).

Legend:

- Site Boundary
- Flow Direction
- Emergent Wetland (BH001) *Note: Boundaries recorded using a sub-meter hand held GPS unit.*
- Waters of the State/US
- TP-1 Sample Point
- 1 Photograph Location, Number, and Direction Taken (See Appendix B for Details)

0 60 120

Scale in Feet

Wetland Delineation Map

Wetland Delineation Report
10660 SE 21st Avenue
Milwaukie, Oregon

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	2331-00	Figure 6
March 2017		

Appendix A

Wetland Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ledding Library City/County: Milwaukie/Clackamas Sampling Date: 2/8/17

Applicant/Owner: City of Milwaukie State: Oregon Sampling Point: TP-1

Investigator(s): Carmen Owens Section, Township, Range: NW1/4NW1/4, Sec. 36, T1S R1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Urban Land/Woodburn Silt Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	30	Y	FACU
2. *Thuja plicata*	15	Y	FAC
3.			
4.			
	45 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1. *Mahonia aquifilium*	5	Y	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. *Acorus calmus*	50	Y	OBL
2. *Equisetum hyemale*	20	Y	FACW
3. *Hedera helix*	10	N	FACU
4. *Athyrium filix-femina*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Rubus armeniacus*	30	Y	FAC
2.			
	30 = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 2.5/1	100						
6-10	5 YR 3/2	100						sulfide smell in this layer
10-								hard gravel layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ledding Library City/County: Milwaukie/Clackamas Sampling Date: 2/8/17

Applicant/Owner: City of Milwaukie State: Oregon Sampling Point: TP-2

Investigator(s): Carmen Owens Section, Township, Range: NW1/4NW1/4, Sec. 36, T1S R1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Urban Land/Woodburn Silt Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	60	Y	FACU
2. *Thuja plicata*	10	N	FAC
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1. *Mahonia aquifilium*	2	Y	FACU
2.			
3.			
4.			
5.			
	2	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Hedera helix*	30	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Rubus armeniacus*	40	Y	FAC
2.			
	40	= Total Cover	

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	92	x 4 =	368
UPL species	0	x 5 =	0
Column Totals:	142 (A)		518 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 3/4	100						
3-18	7.5 YR 4/4	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix B

Photograph Log

APPENDIX B
PHOTOGRAPH LOG

Project Name: Wetland Delineation Report
Project Number: 2331-00

Client: City of Milwaukie
Location: 10600 SE 21st Ave, Milwaukie, OR

Photo No: 1	
Photo Date: 2/19/2017	
Orientation: North	
Description: Wetland LL001 Facing north on west side of wetland.	

Photo No: 2	
Photo Date: 2/19/2017	
Orientation: South	
Description: Spring Creek and Wetland LL001. Facing north along Spring Creek from the southeast corner of the Site. Wetland LL001 can be seen on the banks of the creek on both sides.	

APPENDIX B
PHOTOGRAPH LOG

Project Name: Wetland Delineation Report
Project Number: 2331-00

Client: City of Milwaukie
Location: 10600 SE 21st Ave, Milwaukie, OR

Photo No: 3	
Photo Date: 2/19/2017	
Orientation: North	
Description: Spring Creek. Facing south along Spring Creek from center of the Site's eastern boundary.	

Harper
Houf Peterson
Righellis Inc.

Milwaukie Ledding Library

Preliminary
Stormwater Management Report

January 11, 2018

Prepared For:

Hacker Architects
733 SW Oak St
Portland, OR 97205

THA-29

Prepared By:

Harper Houf Peterson Righellis Inc.
205 SE Spokane Street, Suite 200
Portland, OR 97202
P: 503-221-1131 F: 503-221-1171

Alex Simpson, PE

HHPR

ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Design Review – Preliminary Stormwater Management Report
Milwaukie Ledding Library

Prepared by: Harper Houf Peterson Righellis, Inc.
Date: January 11, 2018

Project Overview and Description:

The new Milwaukie Ledding Library project is located at 10660 SE 21st Avenue in Milwaukie, OR. The total site area is 1.77 acres. It is bordered to the west by private apartments, to the south by SE Harrison St and to the east by an existing pond and Spring Creek. The proposed project will construct a new library building with associated parking lot and stormwater management facilities.

Methodology

The site's impervious surfaces will be managed per the City of Milwaukie's Stormwater Design Standards, updated in January 2014. The City of Milwaukie refers to the 2016 City of Portland Stormwater Management Manual (SWMM) for design of water quality and flow control facilities. Per the SWMM, the Stormwater Infiltration and Discharge Hierarchy is to be used to determine the feasibility of the stormwater option to be used for the site. The following addresses each category in the Hierarchy:

Category 1: Requires total onsite infiltration with vegetated infiltration facilities.

> *On-site infiltration with vegetated infiltration facilities is not feasible for this project due to the low infiltration rates on site (less than 1 in/hr.) and existing site constraints.*

Category 2: Requires total onsite infiltration with a vegetated facility that overflows to a subsurface infiltration facility.

> *On-site infiltration with vegetated infiltration facilities is not feasible for this project due to the low infiltration rates on site (less than 1 in/hr) and existing site constraints.*

Category 3: Requires onsite detention with vegetated facilities that overflow to a drainage way, river, or storm-only pipe.

> ***This category applies to the site. The entire site, with the exception of a portion of the building roof, discharge to a storm-only pipe. Therefore, the SWMM requires that post-developed peak flows be maintained at their respective pre-developed peak flows for the 2, 5, 10-year events. The portion of building roof that discharges directly to the existing pond must limit the 2-year post-developed rate to ½ of the 2-year pre-developed rate, as well as match the post-developed peak rate to the respective pre-developed 5, 10, and 25 year rates.***

Category 4: Requires onsite detention with vegetated facilities that overflow to the combined sewer system.

> *This category does not apply, as there is not a combined sewer system nearby and category 3 will be met.*

Drainage Design & Analysis:

Pre-developed conditions, as stated in the City of Milwaukie standards, are the existing conditions prior to redevelopment. The existing project area consists of the library and asphalt pavement parking lot.

The existing library building had a roof area of approximately 7,300 SF and discharged directly to the pond without flow control or water quality treatment. The proposed development only contributes a portion of the new building roof (Basin E = 6,270 SF) to the pond and provides both water quality and flow control. Therefore, the peak flow conveyed to the pond is reduced per City requirements. The total project's impervious area is increased by approximately 9,144 SF (0.21 ac). Flow control is provided through the stormwater planters and the overall peak flows leaving the site are decreased to meet City requirements. See EX-1, EX-2 and the 'Stormwater Flow Control' section of this report for additional information.

Stormwater facilities were sized using the City of Portland SWMM and Presumptive Approach Calculator (PAC) to provide both water quality and flow control for the project. They are all designed with 2" of freeboard, a varying amount of ponding depth (see PAC printouts), 18" of treatment growing medium, and 12" of drain rock with a perforated underdrain pipe that will connect to the site's storm system. The planters are also lined with an impervious liner due to poor site infiltration and proximity to the building.

There are two existing stormwater swales located in the SW corner of the site that provide stormwater management for a portion of SE 21st Avenue. These existing swales were constructed as part of the N. Main Streetscape Improvement Project in 2005. According to the approved stormwater design, these swales provide existing stormwater management for 5,600 SF (0.13 ac) of impervious drive aisle. These swales will be retained and will provide management for a reduced area of approximately 4,200 SF (0.10 ac) from the proposed drive aisle. See exhibit EX-2 for further clarification.

Stormwater Quality Treatment

In order to provide water quality treatment for the new parking lot and building roof, stormwater planters and a Contech Stormfilter catch basin are used. See Table 1 below and refer to the basin map and PAC output attached for clarification.

Table 1: Stormwater Basin Summary

Basin	Impervious Area (sf)	Treatment Method	Stormwater Facility Size
A (North prkg lot)	4,900	Stormwater Planter	120 sf
B (Center prkg lot)	4,400	Stormfilter WQ Catch Basin	1-cartridge
C (South prkg lot)	3,150	Stormwater Planter	150 sf
D (North bldg. roof)	5,266	Stormwater Planter	100 sf
E (East bldg. roof)	6,270	Stormwater Planter	300 sf
F (South bldg. roof)	11,858	Stormwater Planter	490 sf
G (South prkg lot)	4,200	Existing Swales (SW)	425 sf

Stormwater Flow Control

Flow control is provided through the stormwater planters in order to meet City of Portland requirements. See Table 2 below for a flow control summary. Per the City of Portland 2016 Stormwater Management Manual, on-site infiltration is not feasible when the site has infiltration rates less than 2.0 inches per hour. This site has infiltration rates of 1" per hour or less (without a factor of safety). Refer to the infiltration section 3.4 of the geotechnical report completed by GeoDesign, Inc. on August 25, 2017.
The SWMM requires that post-developed peak flows be maintained at their respective pre-developed peak flows for the 2, 5, 10-year events when discharging to the storm only system. Basins A, B, C, D, and F all meet this criteria.

Flows that discharge directly to the existing pond must limit the 2-year post-developed rate to ½ of the 2-year pre-developed rate, as well as match the post-developed peak rate to the respective pre-developed 5, 10, and 25-year rates. Basin E (east building roof) meets this criteria.

Table 2: Flow Control Summary

Basin	Pre-dev. 2-year peak (cfs)	Pre-dev. 5-year peak (cfs)	Pre-dev. 10-year peak (cfs)	Post-dev. 2-year peak (cfs)	Post-dev. 5-year peak (cfs)	Post-dev. 10-year peak (cfs)
A (North prkg lot)	0.069	0.084	0.100	0.069	0.084	0.100
B Center prkg lot)	0.062	0.076	0.090	0.062	0.076	0.090
C (South prkg lot)	0.044	0.054	0.064	0.009	0.009	0.020
D (North bldg. roof)	0.074	0.091	0.107	0.074	0.091	0.107
F (South bldg. roof)	0.072	0.105	0.140	0.023	0.042	0.124
TOTAL	**0.321**	**0.410**	**0.501**	**0.237**	**0.302**	**0.441**

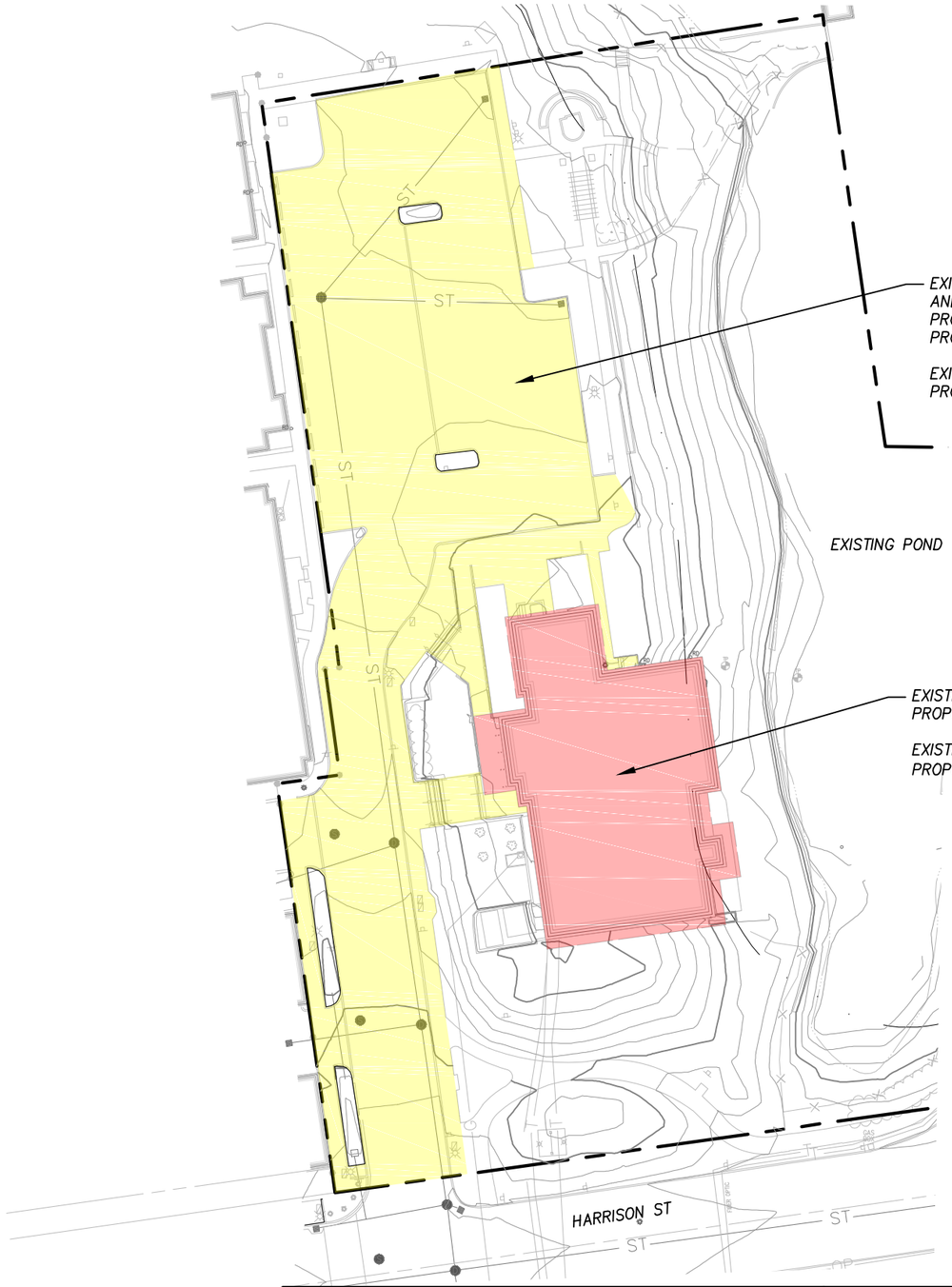
Basin	Pre-dev. ½ of 2-year peak (cfs)	Pre-dev. 5-year peak (cfs)	Pre-dev. 10-year peak (cfs)	Pre-dev. 25-year peak (cfs)	Post-dev. 2-year peak (cfs)	Post-dev. 5-year peak (cfs)	Post-dev. 10-year peak (cfs)	Post-dev. 25-year peak (cfs)
E (East bldg. roof)	0.038	0.097	0.118	0.138	0.014	0.014	0.026	0.076

As seen in the tables above, the total post-developed release rates for the project are less than their respective pre-developed release rates as required by the City of Portland's SWMM.

Engineering Conclusions:

The proposed development has appropriate stormwater facilities and a system that fulfills the required conveyance, water quality and water quantity based on City of Milwaukie and City of Portland requirements and standards. No downstream deficiencies are expected.

BASIN MAP



DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: AJS
DRAWN: HHPR
CHECKED: HHPR
DATE: JAN. 2018

Harper Houf Peterson Righellis Inc.
ENGINEERS♦PLANNERS
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EXISTING STORMWATER EXHIBIT

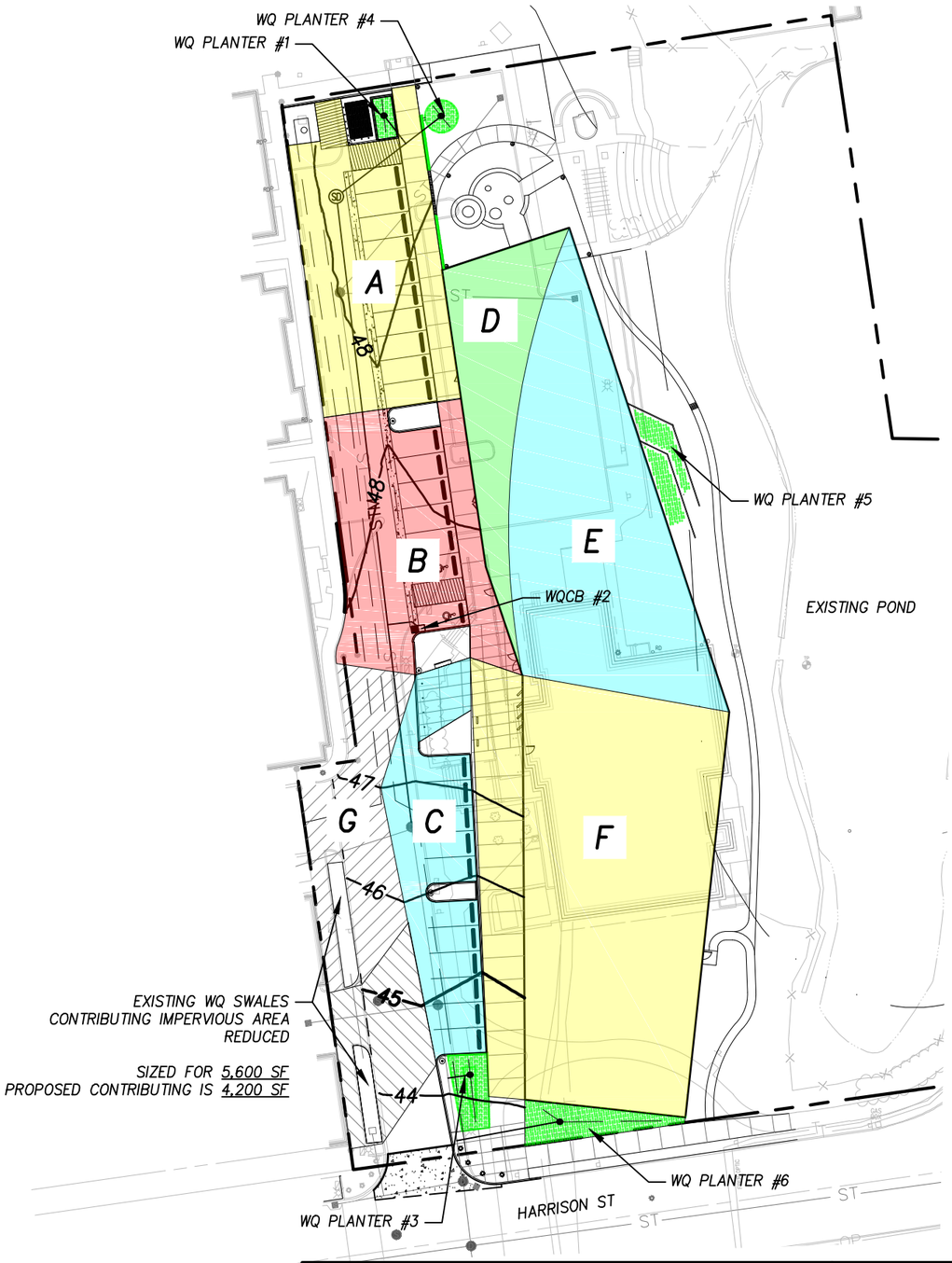
MILWAUKIE LEDDING LIBRARY

MILWAUKIE, OR

SHEET NO. EX-1

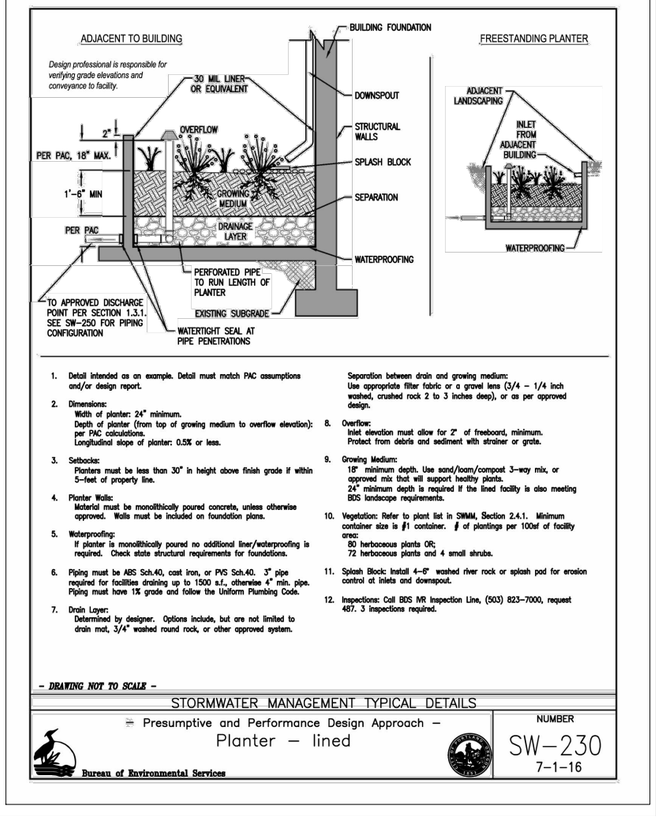
JOB NO. THA-29

P:\THA (THA Architecture)\THA-29 (Ledding Library)\THA29-DWGS\Exhibit\ THA29-Storm Exhibit EXISTING.dwg



Basin	Impervious Area	WQ Facility	Ultimate Discharge Location
A (North prkg lot)	4,900 SF	1	Storm Sewer (Harrison St)
B (Center prkg lot)	4,400 SF	2	Storm Sewer (Harrison St)
C (South prkg lot)	3,150 SF	3	Storm Sewer (Harrison St)
D (North bldg roof)	5,266 SF	4	Storm Sewer (Harrison St)
E (East bldg roof)	6,270 SF	5	Existing Pond (East)
F (South bldg roof)	11,858 SF	6	Storm Sewer (Harrison St)

WQ Facility	Stormwater Facility Type	Basin Area	Proposed Facility Size
1	WQ Planter (Flat)	4,900 SF	120 SF
2	WQ CB (1-CART)	4,400 SF	1-cartridge
3	WQ Planter (Flat)	3,150 SF	150 SF
4	WQ Planter (Flat)	5,266 SF	100 SF
5	WQ Planter (Flat)	6,270 SF	300 SF
6	WQ Planter (Flat)	11,858 SF	490 SF



1. Detail intended as an example. Detail must match PAC assumptions and/or design report.
2. Dimensions:
   Width of planter: 24" minimum.
   Depth of planter (from top of growing medium to overflow elevation): per PAC calculations.
   Longitudinal slope of planter: 0.5% or less.
3. Setbacks:
   Planters must be less than 30" in height above finish grade if within 5-feet of property line.
4. Planter Walls:
   Material must be monolithically poured concrete, unless otherwise approved. Walls must be included on foundation plans.
5. Waterproofing:
   If planter is monolithically poured no additional liner/waterproofing is required. Check state structural requirements for foundations.
6. Piping must be ABS Sch.40, cast iron, or PVS Sch.40. 3" pipe required for facilities draining up to 1500 s.f., otherwise 4" min. pipe. Piping must have 1% grade and follow the Uniform Plumbing Code.
7. Drain Layer:
   Determined by designer. Options include, but are not limited to drain mat, 3/4" washed round rock, or other approved system.
8. Separation between drain and growing medium:
   Use appropriate filter fabric or a gravel lens (3/4 - 1/4 inch washed, crushed rock 2 to 3 inches deep), or as per approved design.
9. Overflow:
   Inlet elevation must allow for 2" of freeboard, minimum.
   Protect from debris and sediment with strainer or grate.
10. Growing Medium:
    18" minimum depth. Use sand/loam/compost 3-way mix, or approved mix that will support healthy plants.
    24" minimum depth is required if the lined facility is also meeting BDS landscape requirements.
11. Vegetation: Refer to plant list in SWMM, Section 2.4.1. Minimum container size is #1 container. # of plantings per 100sf of facility area:
    80 herbaceous plants OR;
    72 herbaceous plants and 4 small shrubs.
12. Splash Block: Install 4-6" washed river rock or splash pad for erosion control at inlets and downspout.
13. Inspections: Call BDS IVR Inspection Line, (503) 823-7000, request 487. 3 inspections required.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT TYPICAL DETAILS
- Presumptive and Performance Design Approach -
Planter - lined
Bureau of Environmental Services
NUMBER SW-230 7-1-16

0 25 50 100
SCALE: 1" = 50'

DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: AJS
DRAWN: HHPR
CHECKED: HHPR
DATE: JAN. 2018

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STORMWATER EXHIBIT
MILWAUKIE LEDDING LIBRARY
MILWAUKIE, OR

SHEET NO. EX-2
JOB NO. THA-29

P:\THA (THA Architecture)\THA-29 (Ledding Library)\THA29-DWGS\Exhibit\ THA29-Storm Exhibit.dwg

PAC CALCULATIONS

PAC Report

Project Name Milwaukie Ledding Library	Permit No.	Created 12/4/17 1:03 PM
Project Address 10660 SE 21st Avenue Milwaukie, OR 97222	Designer HHPR	Last Modified 1/11/18 1:26 PM
	Company HHPR	Report Generated 1/11/18 1:26 PM

Project Summary

New public library and site.

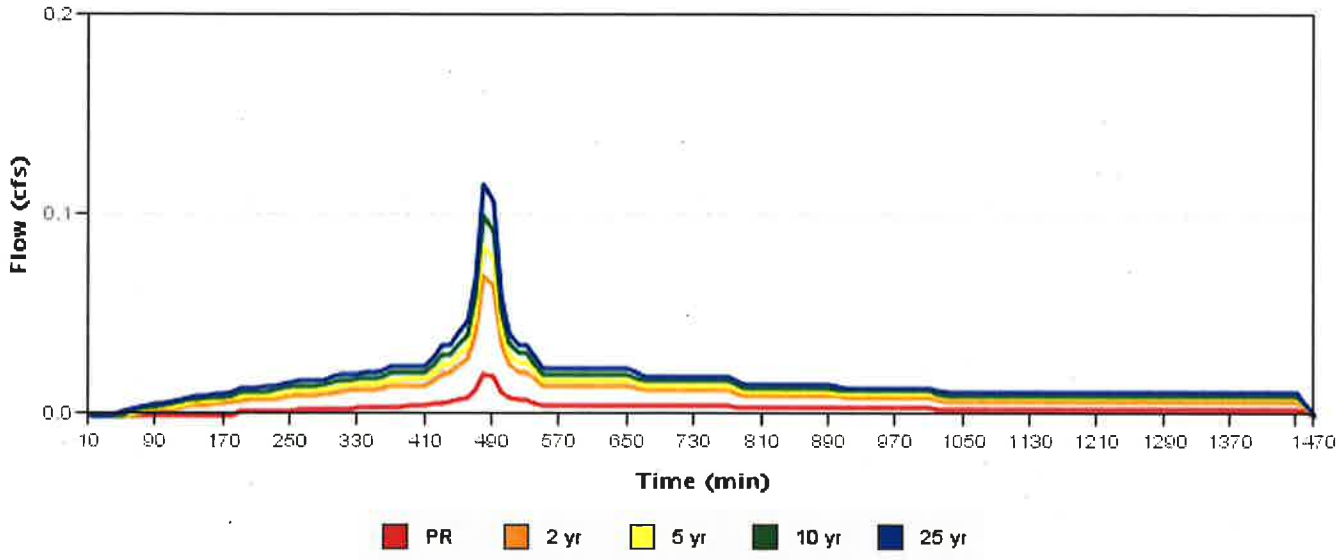
Catchment Name	Impervious Area (sq ft)	Native Soil Design Infiltration Rate	Hierarchy Category	Facility Type	Facility Config	Facility Size (sq ft)	Facility Sizing Ratio	PR Results	Flow Control Results
North Parking Lot	4900	0.00	3	Planter (Flat)	D	100	2%	Pass	Pass
East Roof	6270	0.00	3	Planter (Flat)	D	300	4.8%	Pass	Pass
South Roof	11858	0.00	3	Planter (Flat)	D	490	4.1%	Pass	Pass
North Roof	5266	0.00	3	Planter (Flat)	D	100	1.9%	Pass	Pass
Center Parking Lot	4400	0.00	3	WQ Catch Basin					
South Parking Lot (New Planter)	3150	0.00	3	Basin	D	51	8.1%	Pass	Pass

Catchment North Parking Lot

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**C**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.**
	Impervious Area	**4900 sq ft** **0.112 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**98**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



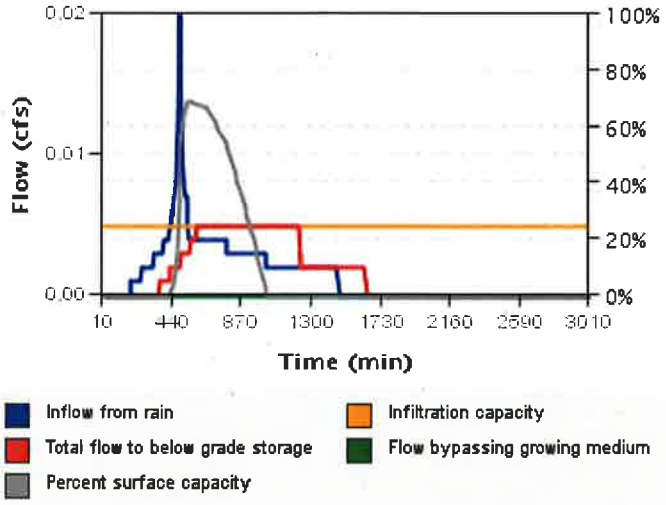
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.02	256.039	0.02	256.039
2 yr	0.069	886.635	0.069	886.635
5 yr	0.084	1089.719	0.084	1089.719
10 yr	0.1	1293.106	0.1	1293.106
25 yr	0.115	1496.686	0.115	1496.686

Facility North Parking Lot

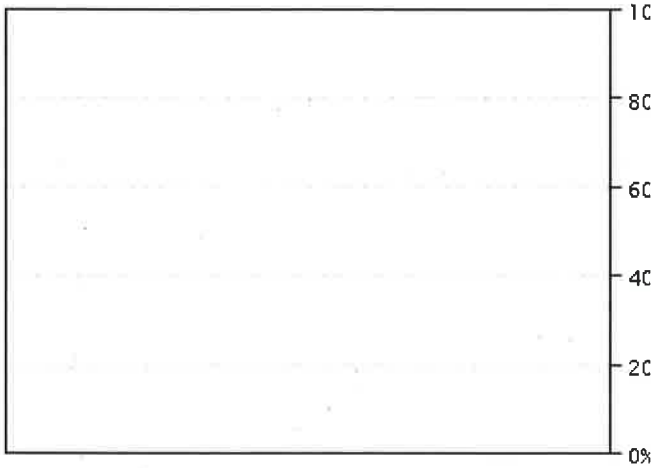
Facility Details	Facility Type	**Planter (Flat)**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Planter**
	Above Grade Storage Data	
	Bottom Area	**100 sq ft**
	Bottom Width	**4.00 ft**
	Storage Depth 1	**6.0 in**
	Growing Medium Depth	**18 in**
	Surface Capacity at Depth 1	**50.0 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.005 cfs**
Facility Facts	Total Facility Area Including Freeboard	**100.00 sq ft**
	Sizing Ratio	**2%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**260.433 cf**
	Surface Capacity Used	**69%**
Flow Control Results	Flow Control Score	**Pass**
	Overflow Volume	**1292.309 cf**
	Surface Capacity Used	**100%**

	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.069	≤	0.069	**Pass**
5 year	0.084	≤	0.084	**Pass**
10 year	0.1	≤	0.1	**Pass**

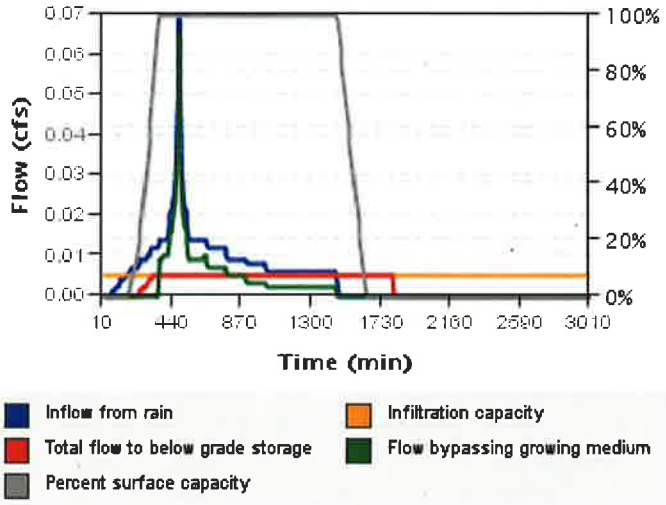
Pollution Reduction Event Surface Facility Modeling



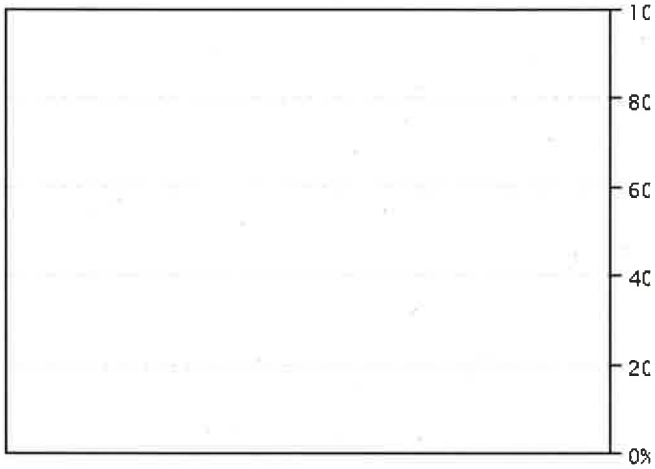
Pollution Reduction Event Below Grade Modeling



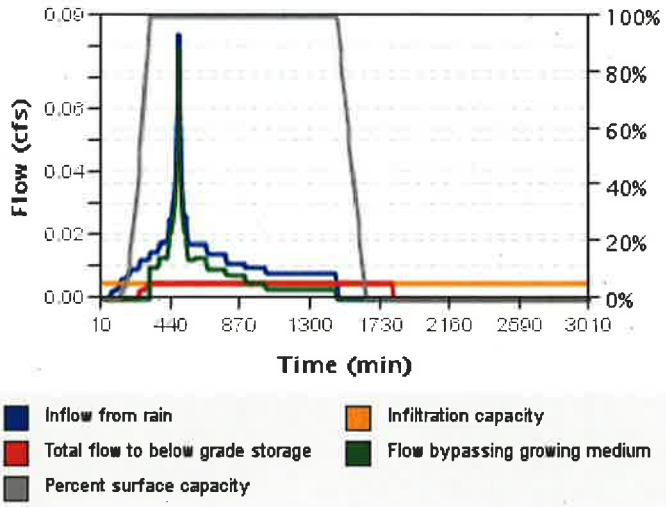
2 Year Event Surface Facility Modeling



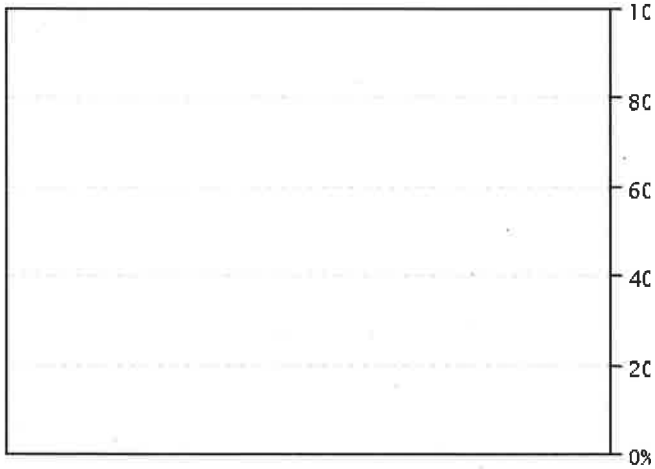
2 Year Event Below Grade Modeling



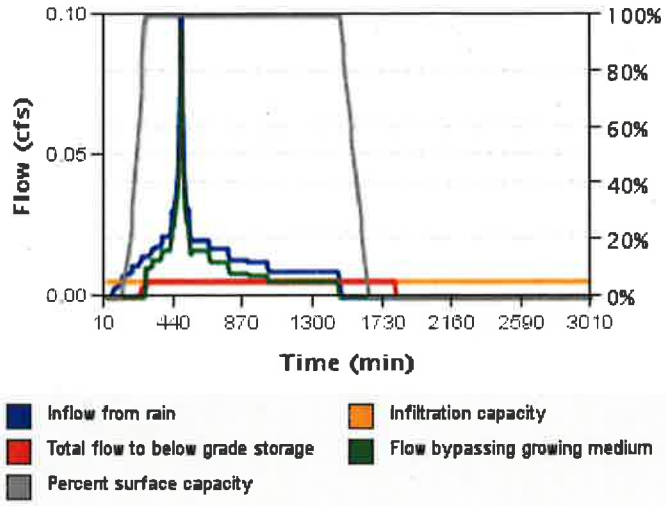
5 Year Event Surface Facility Modeling



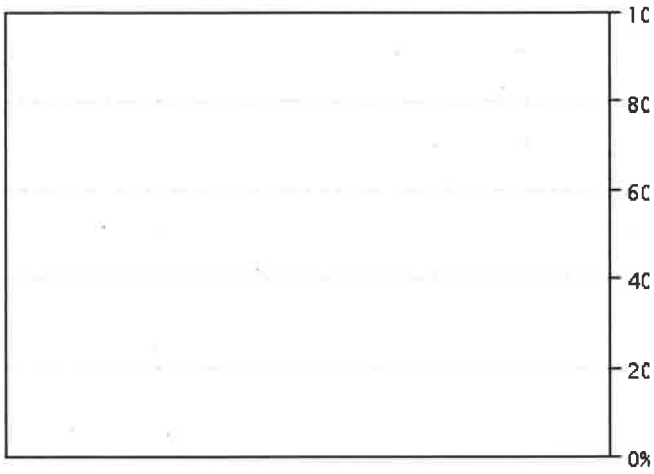
5 Year Event Below Grade Modeling



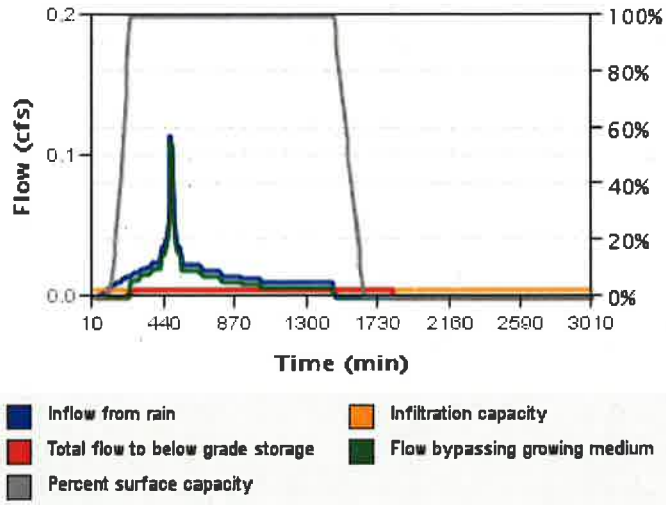
10 Year Event Surface Facility Modeling



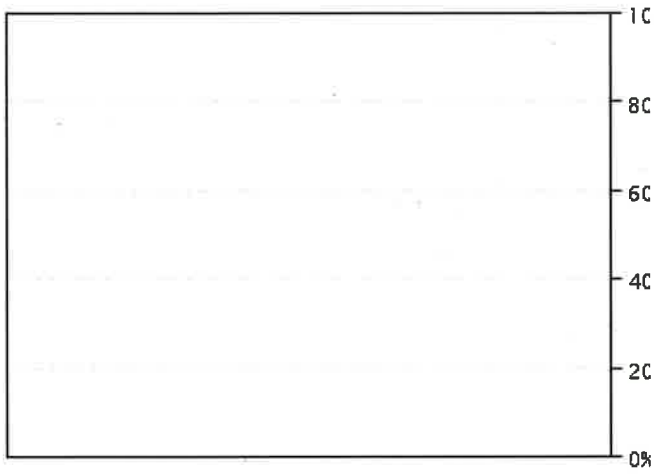
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling

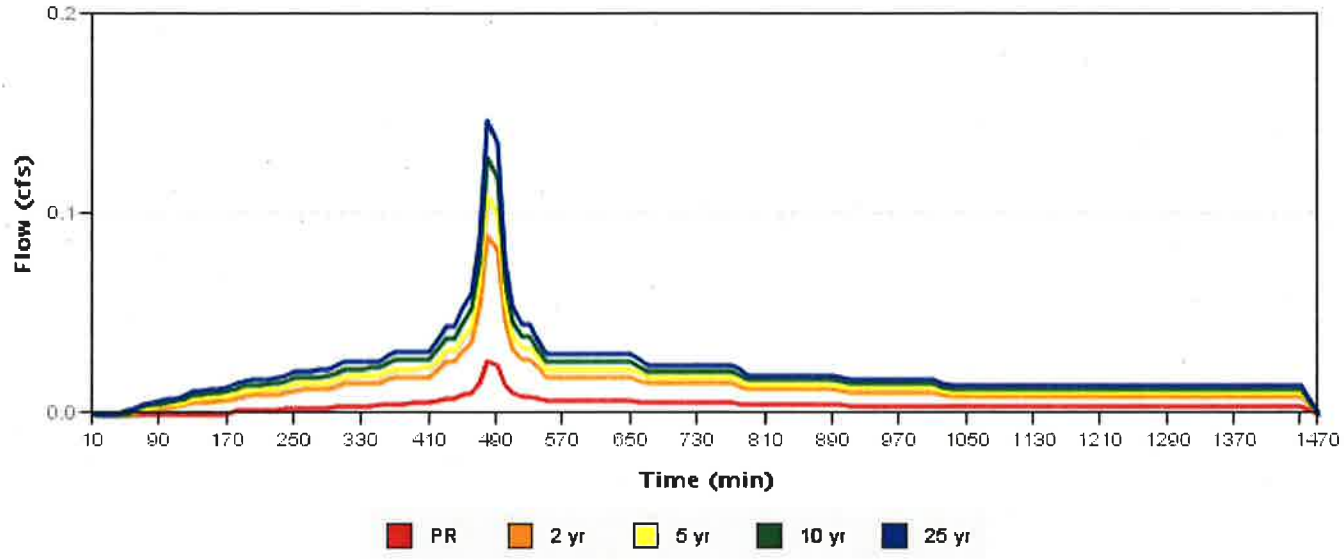


Catchment East Roof

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**B**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**If discharging to an overland drainage system or to a storm sewer that discharges to an overland drainage system, including streams, drainageways, and ditches, the 2-year post-development peak flow must be equal or less than half of the 2-year pre-development rate and the 5, 10, and 25-year post-development peak rate must be equal or less than the pre-development rates for the corresponding design storms.**
	Impervious Area	**6270 sq ft** **0.144 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**95**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



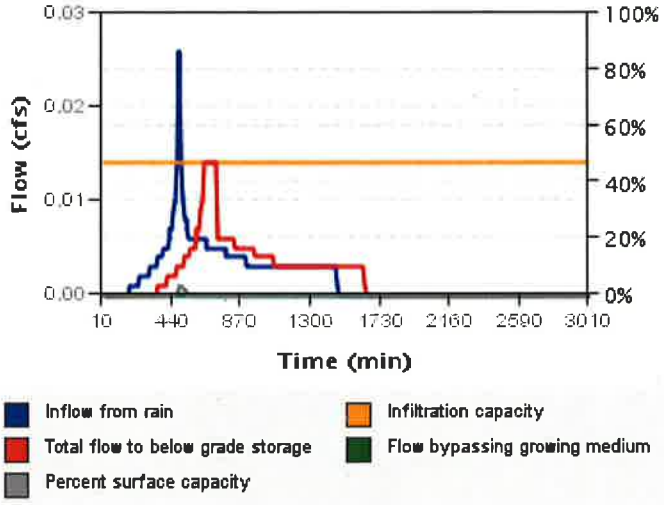
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.015	219.367	0.026	327.625
2 yr	0.077	975.306	0.089	1134.531
5 yr	0.097	1228.832	0.108	1394.395
10 yr	0.118	1484.379	0.128	1654.648
25 yr	0.138	1741.246	0.147	1915.147

Facility East Roof

Facility Details	Facility Type	**Planter (Flat)**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Planter**
	Above Grade Storage Data	
	Bottom Area	**300 sq ft**
	Bottom Width	**5.00 ft**
	Storage Depth 1	**18.0 in**
	Growing Medium Depth	**18 in**
	Surface Capacity at Depth 1	**450.0 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.014 cfs**
Facility Facts	Total Facility Area Including Freeboard	**300.00 sq ft**
	Sizing Ratio	**4.8%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**331.758 cf**
	Surface Capacity Used	**3%**
Flow Control Results	Flow Control Score	**Pass**
	Overflow Volume	**1651.338 cf**
	Surface Capacity Used	**100%**

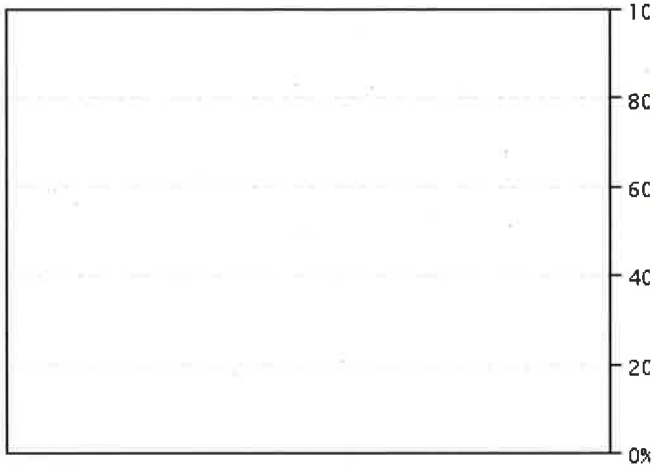
	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.014	≤ ½ of	0.077	**Pass**
5 year	0.014	≤	0.097	**Pass**
10 year	0.026	≤	0.118	**Pass**
25 year	0.076	≤	0.138	**Pass**

Pollution Reduction Event Surface Facility Modeling

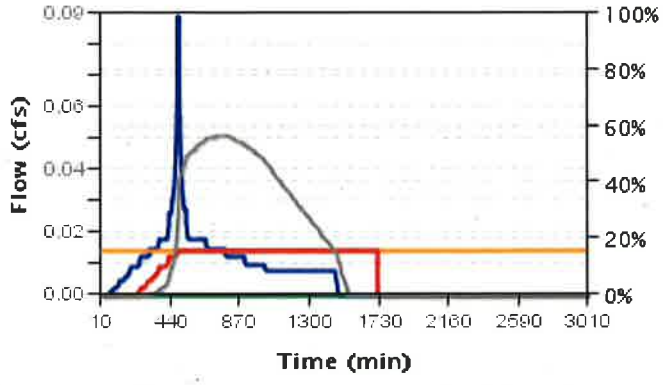


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

Pollution Reduction Event Below Grade Modeling

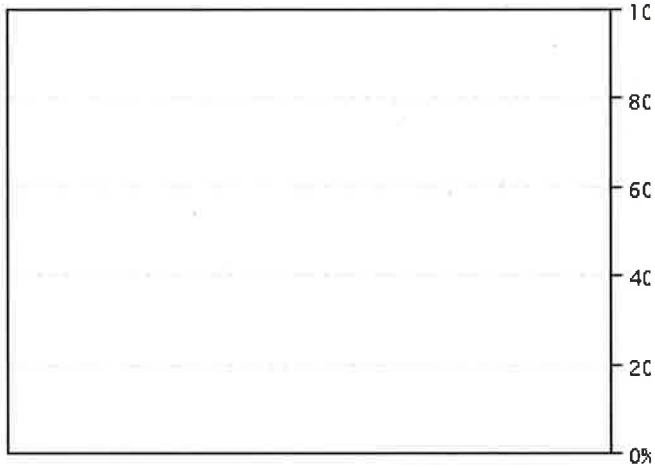


2 Year Event Surface Facility Modeling

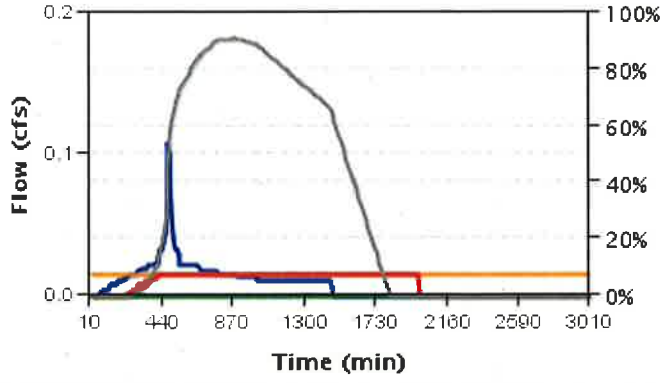


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

2 Year Event Below Grade Modeling

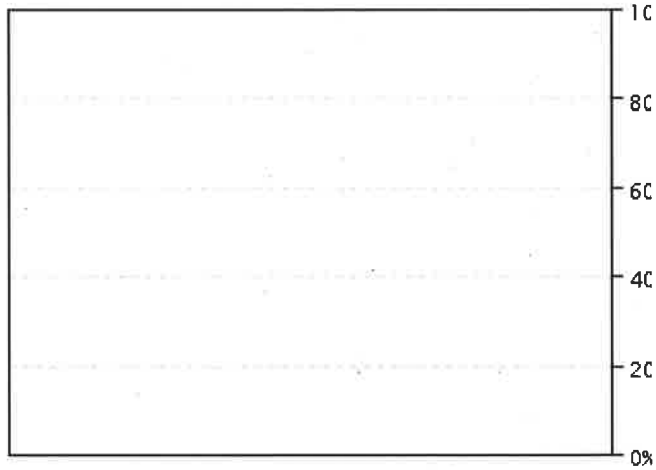


5 Year Event Surface Facility Modeling

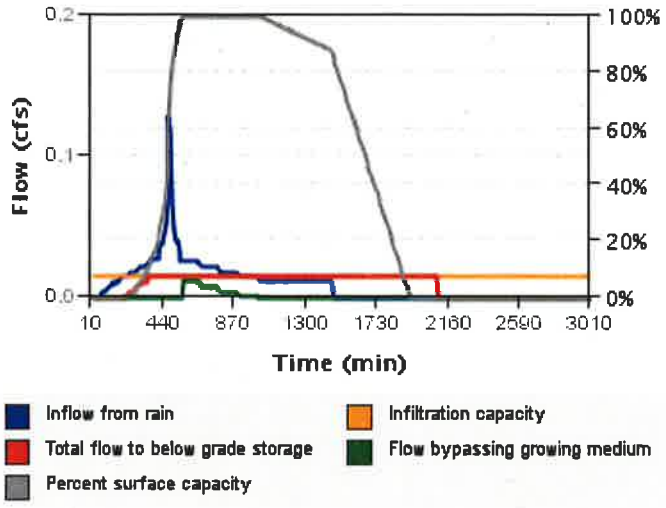


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

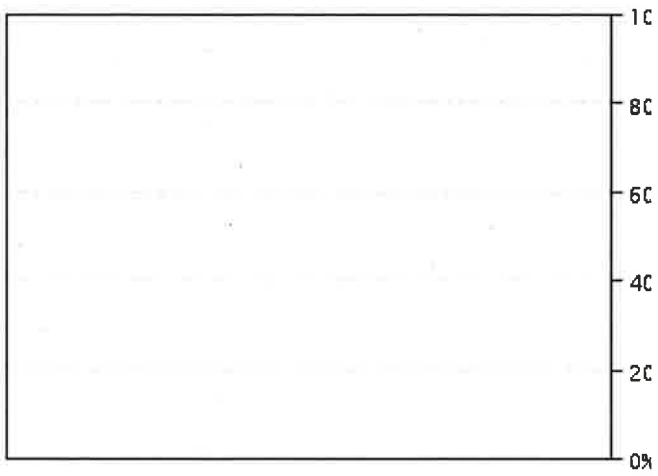
5 Year Event Below Grade Modeling



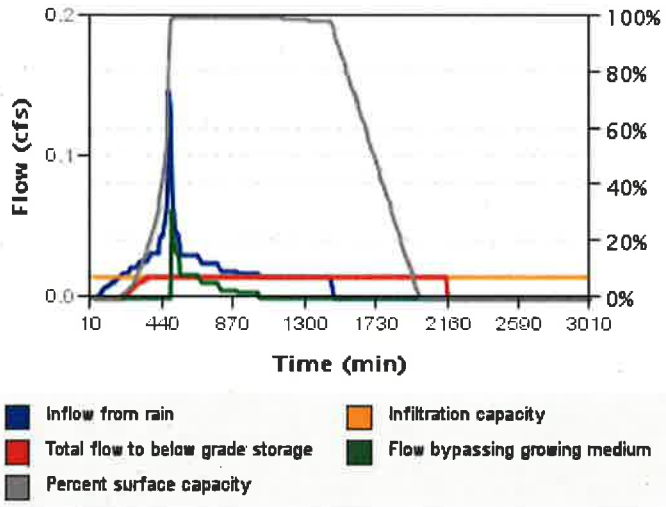
10 Year Event Surface Facility Modeling



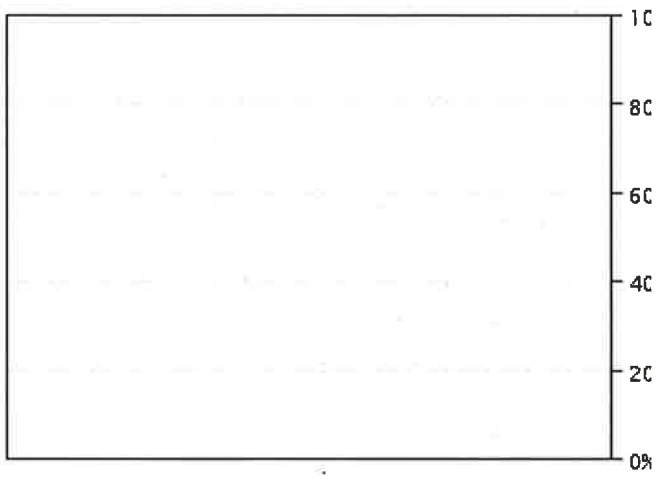
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling

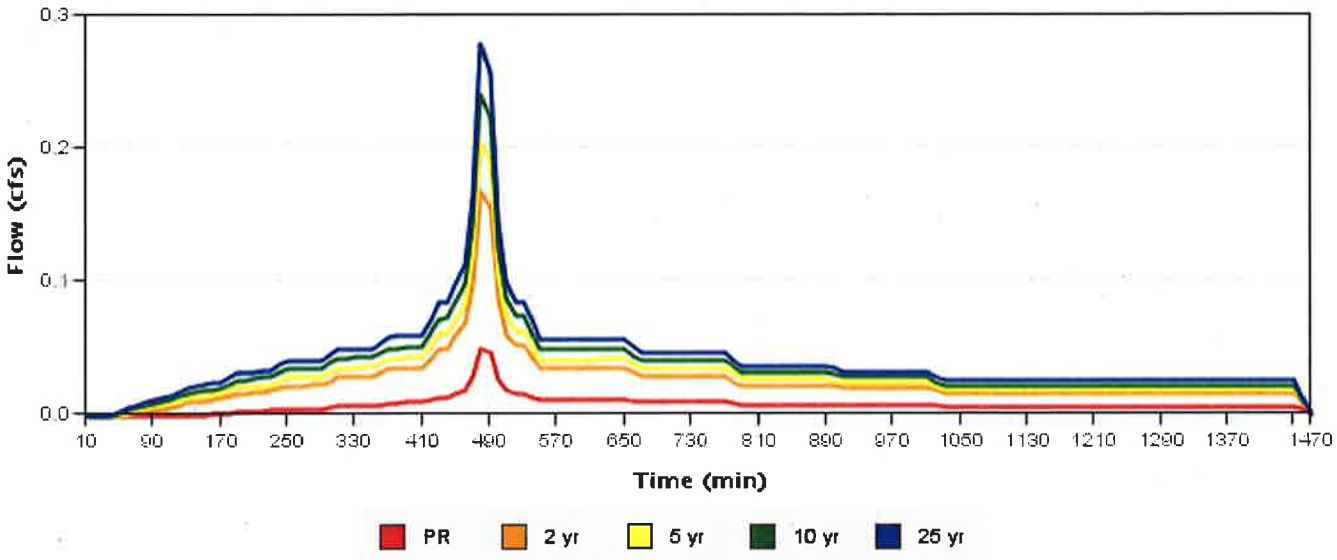


Catchment South Roof

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**C**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.**
	Impervious Area	**11858 sq ft** **0.272 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**85**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



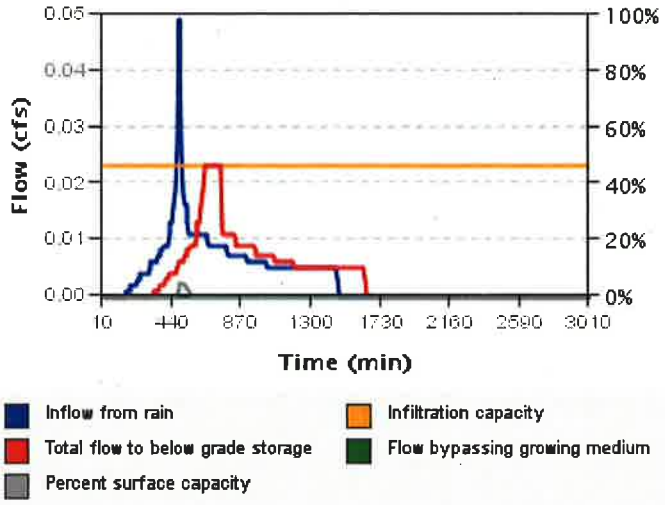
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.002	100.319	0.049	619.614
2 yr	0.072	1086.337	0.167	2145.656
5 yr	0.105	1486.802	0.204	2637.119
10 yr	0.14	1906.723	0.241	3129.317
25 yr	0.176	2340.605	0.278	3621.979

Facility South Roof

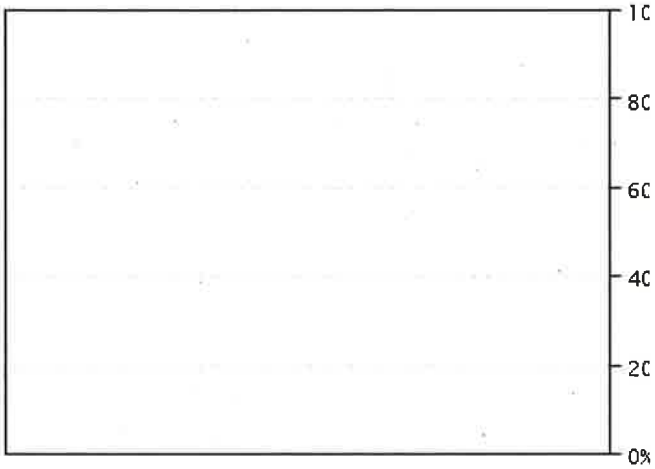
Facility Details	Facility Type	**Planter (Flat)**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Planter**
	Above Grade Storage Data	
	Bottom Area	**490 sq ft**
	Bottom Width	**5.00 ft**
	Storage Depth 1	**18.0 in**
	Growing Medium Depth	**18 in**
	Surface Capacity at Depth 1	**735.0 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.023 cfs**
Facility Facts	Total Facility Area Including Freeboard	**490.00 sq ft**
	Sizing Ratio	**4.1%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**622.548 cf**
	Surface Capacity Used	**5%**
Flow Control Results	Flow Control Score	**Pass**
	Overflow Volume	**3144.533 cf**
	Surface Capacity Used	**100%**

	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.023	≤	0.072	**Pass**
5 year	0.042	≤	0.105	**Pass**
10 year	0.124	≤	0.14	**Pass**

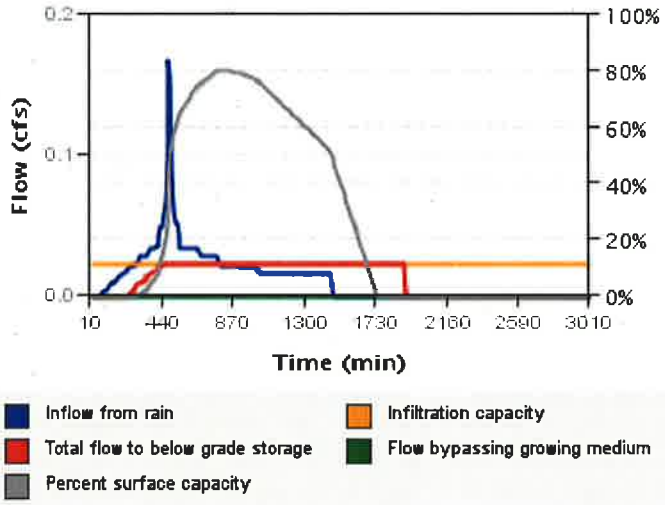
Pollution Reduction Event Surface Facility Modeling



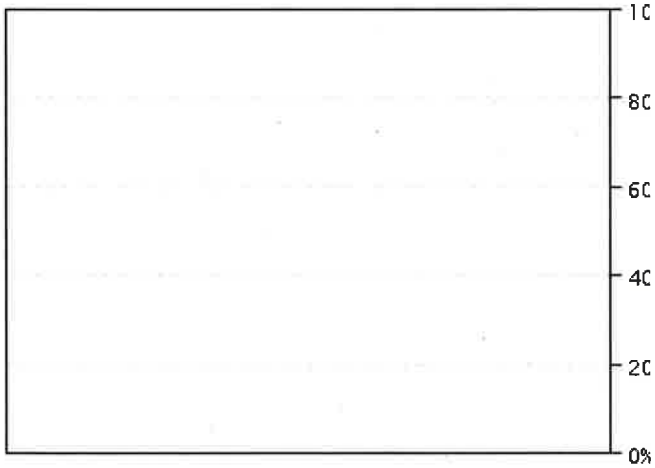
Pollution Reduction Event Below Grade Modeling



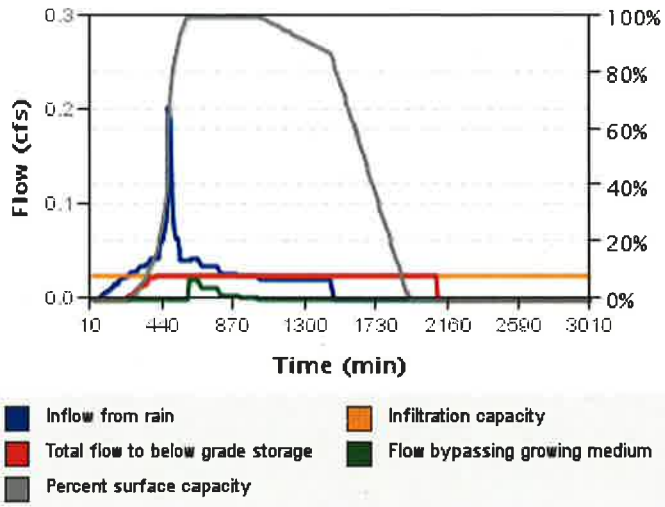
2 Year Event Surface Facility Modeling



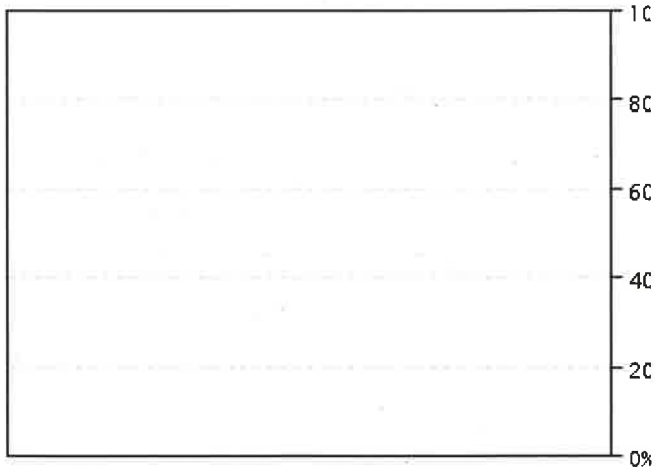
2 Year Event Below Grade Modeling



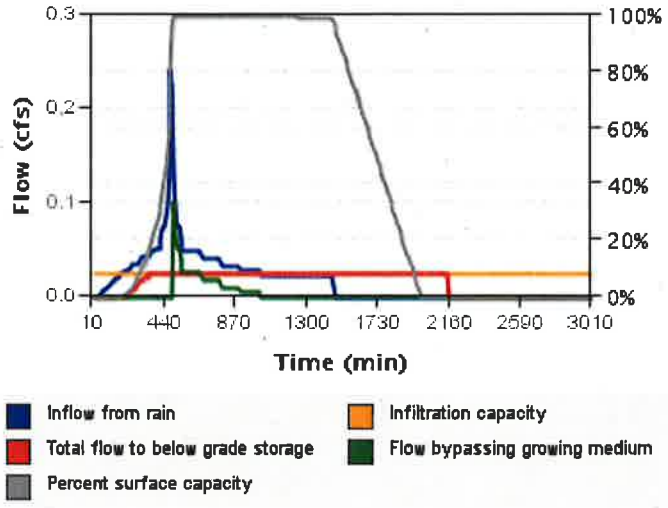
5 Year Event Surface Facility Modeling



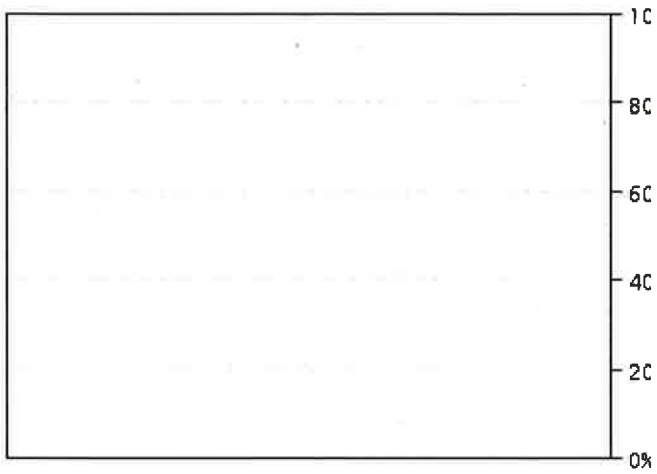
5 Year Event Below Grade Modeling



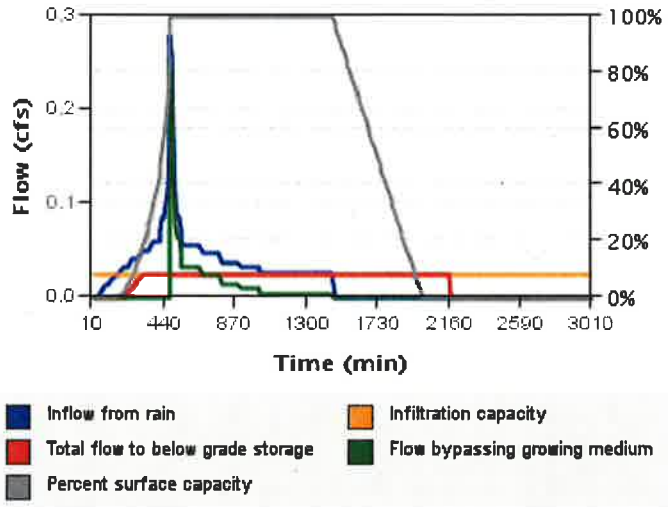
10 Year Event Surface Facility Modeling



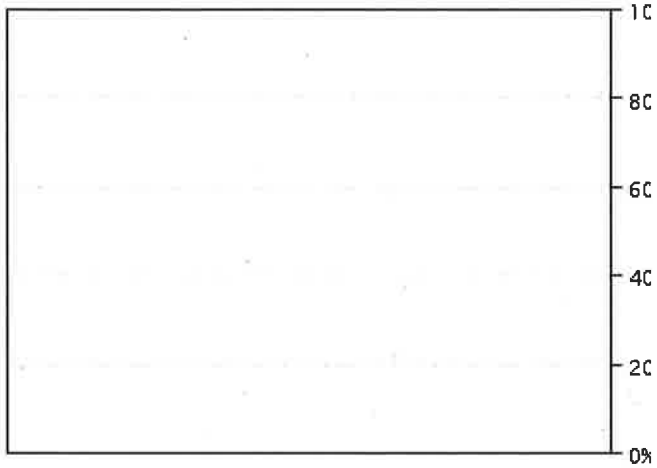
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling

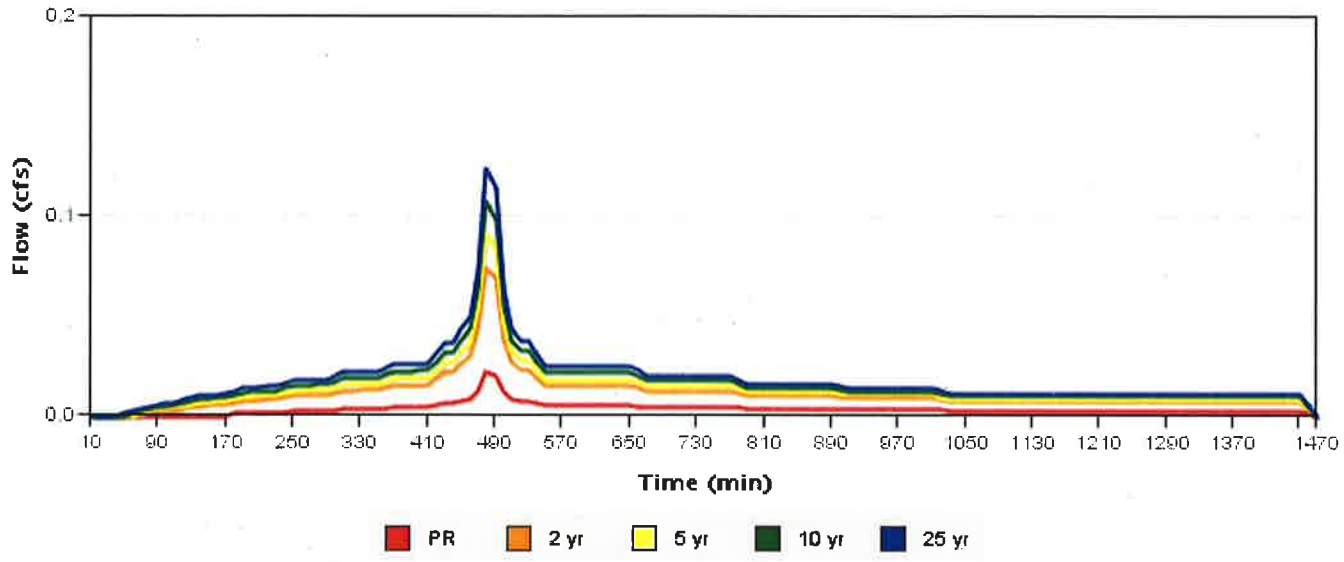


Catchment North Roof

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**C**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.**
	Impervious Area	**5266 sq ft** **0.121 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**98**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



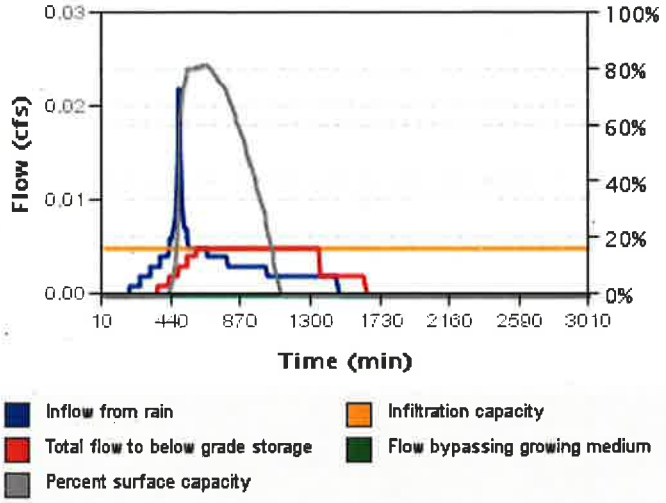
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.022	275.163	0.022	275.163
2 yr	0.074	952.861	0.074	952.861
5 yr	0.091	1171.114	0.091	1171.114
10 yr	0.107	1389.693	0.107	1389.693
25 yr	0.124	1608.479	0.124	1608.479

Facility North Roof

Facility Details	Facility Type	**Planter (Flat)**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Planter**
	Above Grade Storage Data	
	Bottom Area	**100 sq ft**
	Bottom Width	**10.00 ft**
	Storage Depth 1	**6.0 in**
	Growing Medium Depth	**18 in**
	Surface Capacity at Depth 1	**50.0 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.005 cfs**
Facility Facts	Total Facility Area Including Freeboard	**100.00 sq ft**
	Sizing Ratio	**1.9%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**283.446 cf**
	Surface Capacity Used	**82%**
Flow Control Results	Flow Control Score	**Pass**
	Overflow Volume	**1391.158 cf**
	Surface Capacity Used	**100%**

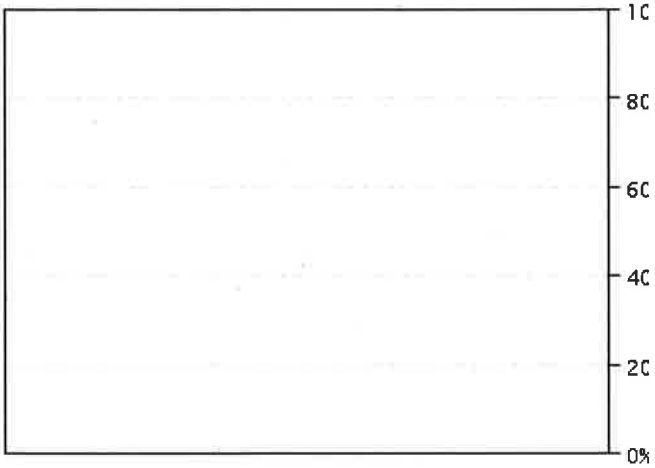
	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.074	≤	0.074	**Pass**
5 year	0.091	≤	0.091	**Pass**
10 year	0.107	≤	0.107	**Pass**

Pollution Reduction Event Surface Facility Modeling

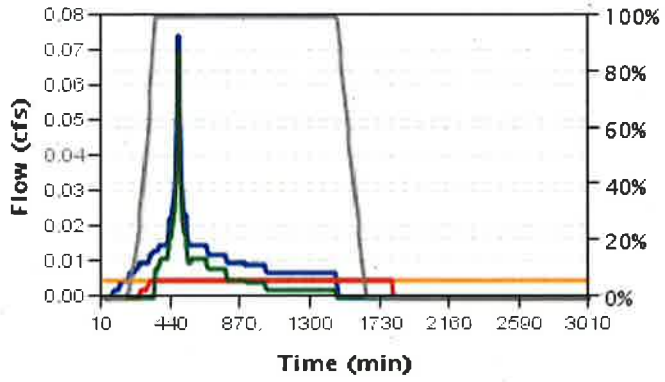


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

Pollution Reduction Event Below Grade Modeling

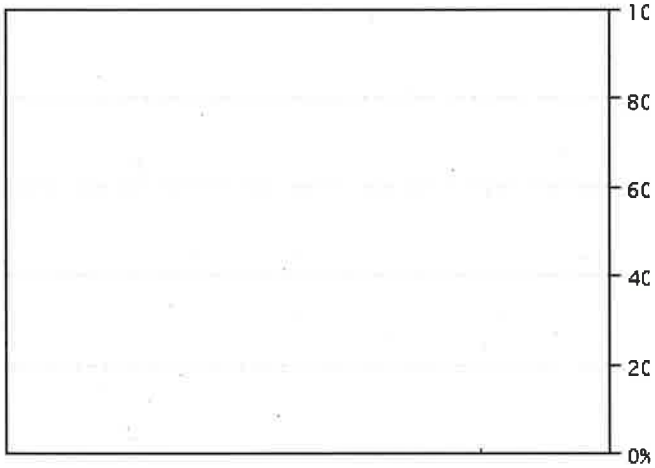


2 Year Event Surface Facility Modeling

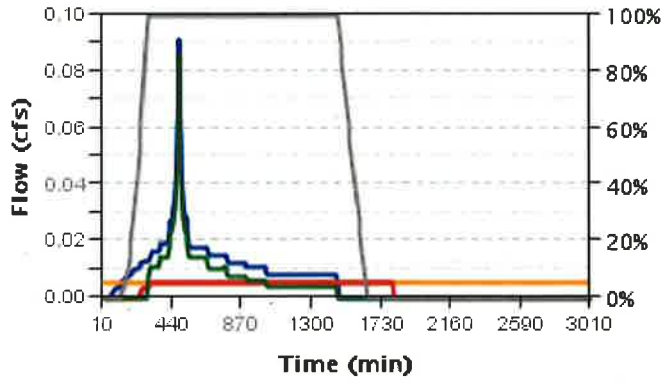


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

2 Year Event Below Grade Modeling

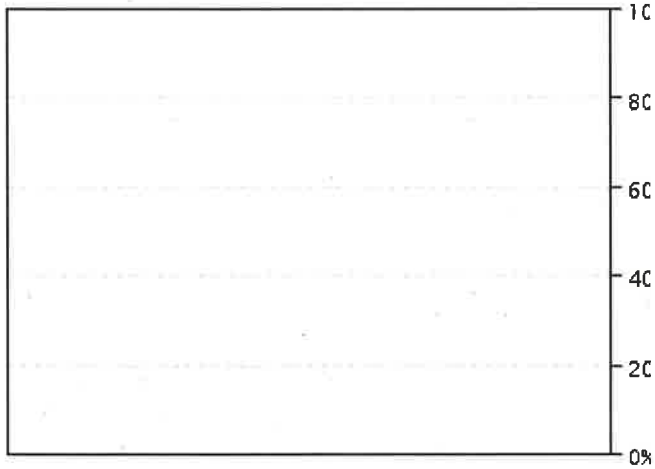


5 Year Event Surface Facility Modeling

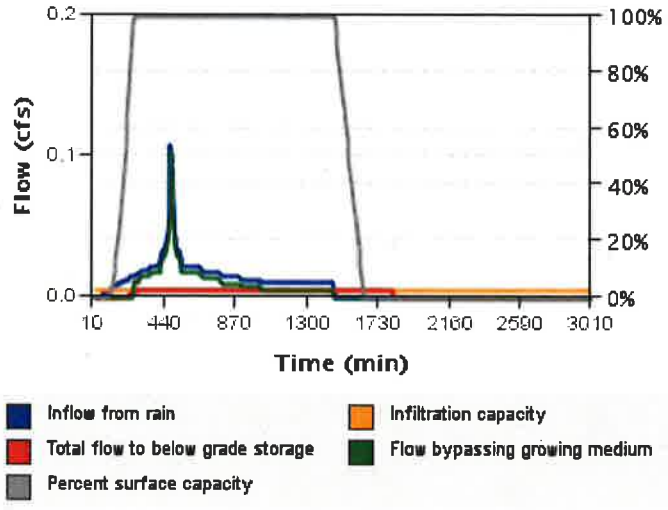


Inflow from rain
Total flow to below grade storage
Percent surface capacity
Infiltration capacity
Flow bypassing growing medium

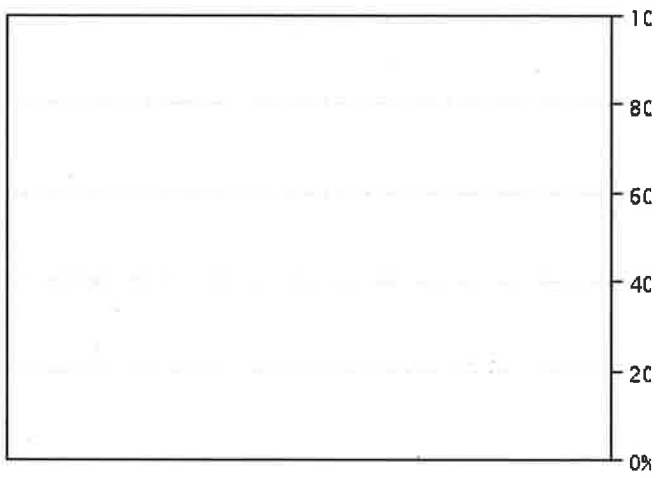
5 Year Event Below Grade Modeling



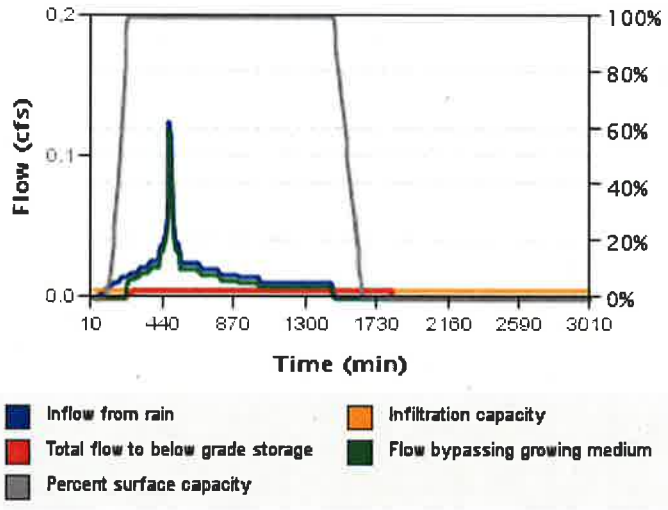
10 Year Event Surface Facility Modeling



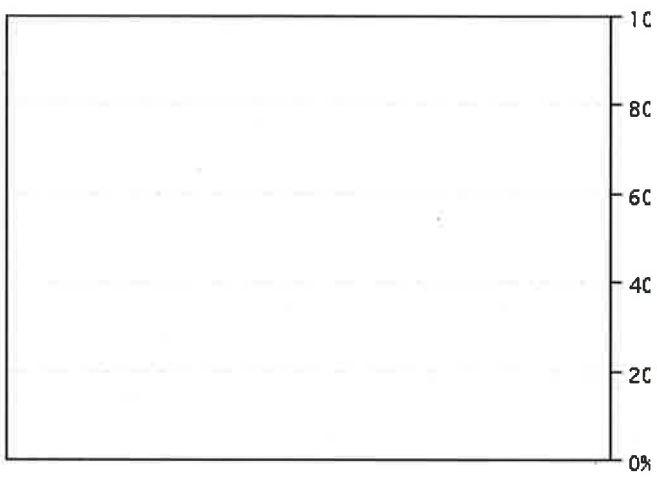
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling

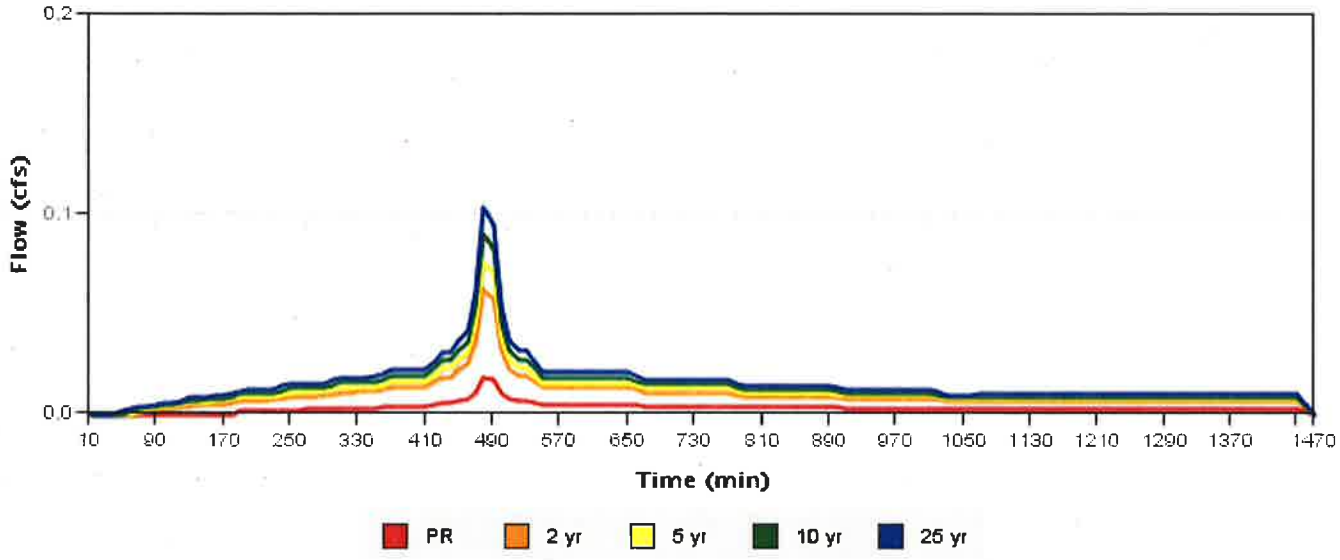


Catchment Center Parking Lot

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**C**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.**
	Impervious Area	**4400 sq ft** **0.101 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**98**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



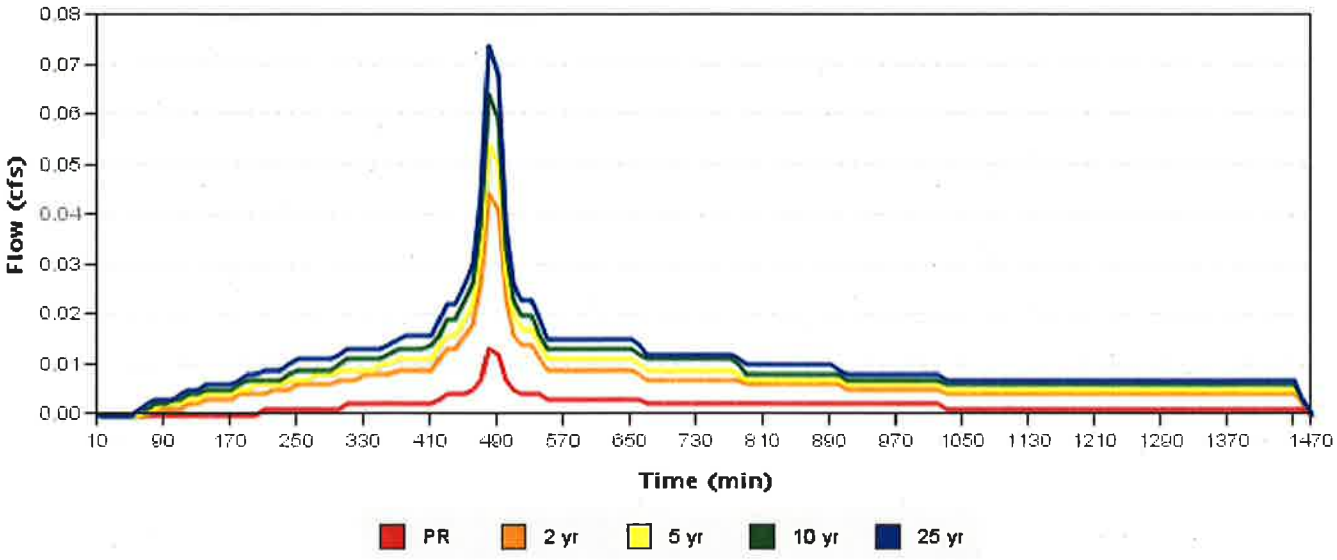
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.018	229.912	0.018	229.912
2 yr	0.062	796.162	0.062	796.162
5 yr	0.076	978.523	0.076	978.523
10 yr	0.09	1161.157	0.09	1161.157
25 yr	0.103	1343.962	0.103	1343.962

Catchment South Parking Lot (New Planter)

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Open Pit Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**C**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.**
	Impervious Area	**3150 sq ft** **0.072 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**98**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



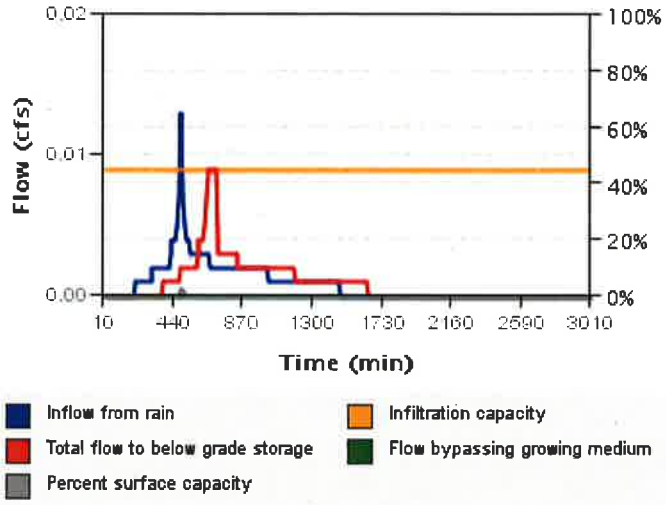
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.013	164.596	0.013	164.596
2 yr	0.044	569.98	0.044	569.98
5 yr	0.054	700.533	0.054	700.533
10 yr	0.064	831.283	0.064	831.283
25 yr	0.074	962.155	0.074	962.155

Facility South Parking Lot (New Planter)

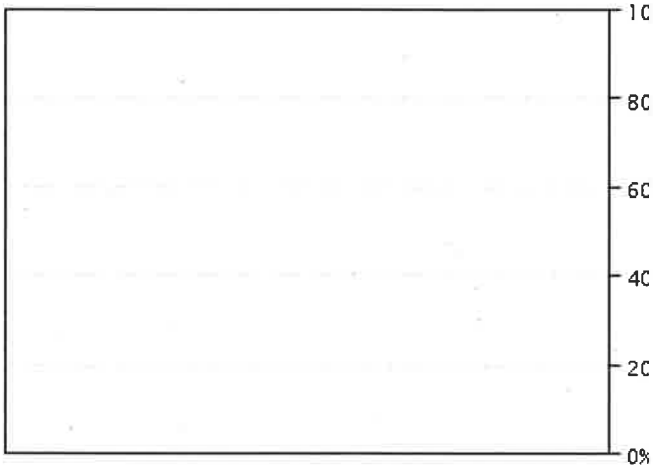
Facility Details	Facility Type	**Basin**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Amoeba**
	Above Grade Storage Data	
	Bottom Area	**51 sq ft**
	Bottom Perimeter Length	**41.00 ft**
	Side Slope	**3.0:1**
	Storage Depth 1	**18.0 in**
	Growing Medium Depth	**18 in**
	Freeboard Depth	**2.00 in**
	Surface Capacity at Depth 1	**168.8 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.009 cfs**
Facility Facts	Total Facility Area Including Freeboard	**256.00 sq ft**
	Sizing Ratio	**8.1%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**168.826 cf**
	Surface Capacity Used	**3%**
Flow Control Results	Flow Control Score	**Pass**
	Overflow Volume	**834.416 cf**
	Surface Capacity Used	**100%**

	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.009	≤	0.044	**Pass**
5 year	0.009	≤	0.054	**Pass**
10 year	0.02	≤	0.064	**Pass**

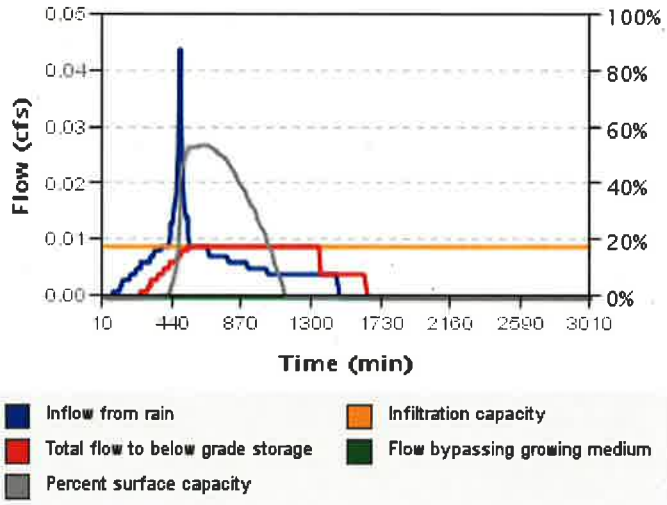
Pollution Reduction Event Surface Facility Modeling



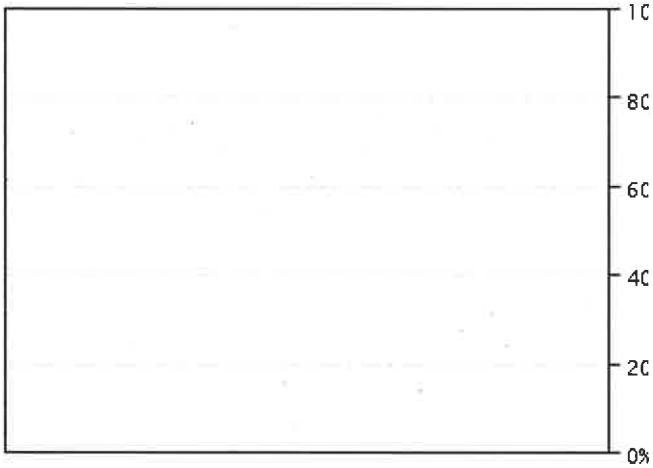
Pollution Reduction Event Below Grade Modeling



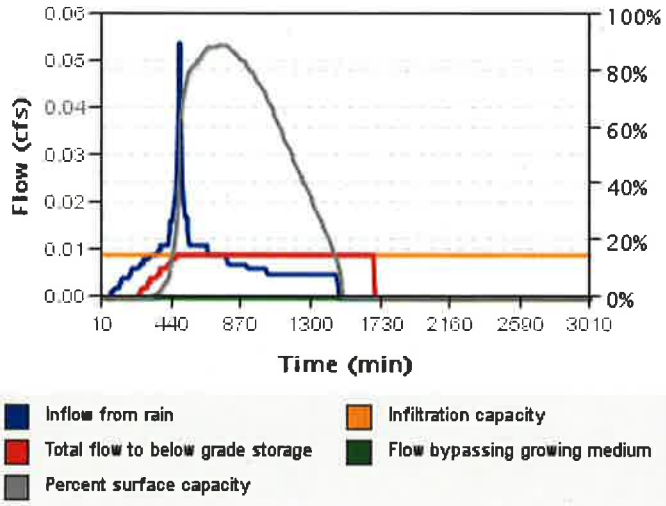
2 Year Event Surface Facility Modeling



2 Year Event Below Grade Modeling

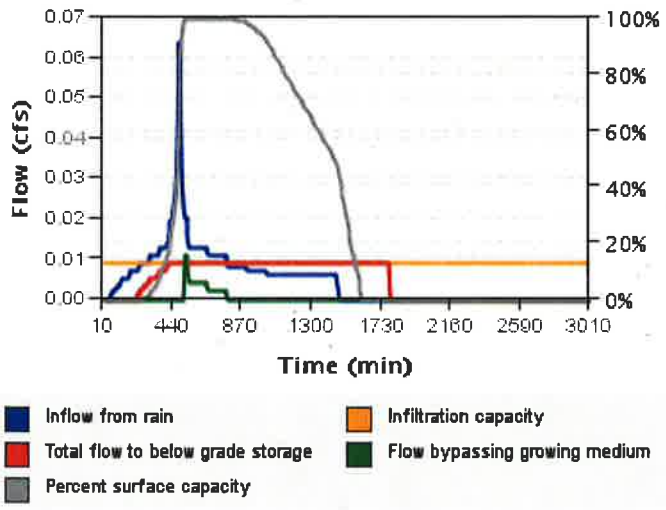


5 Year Event Surface Facility Modeling

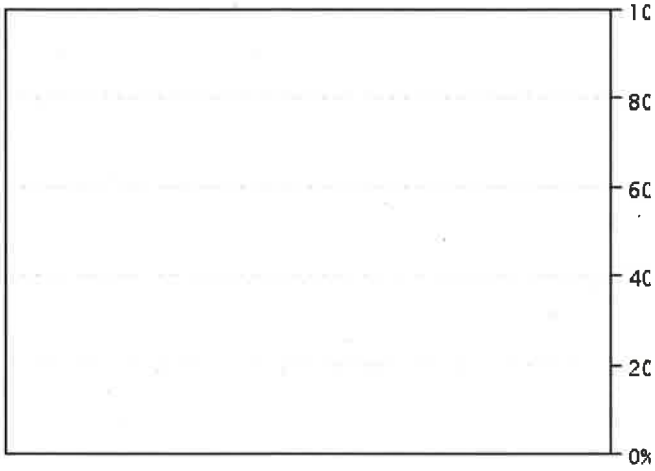


5 Year Event Below Grade Modeling

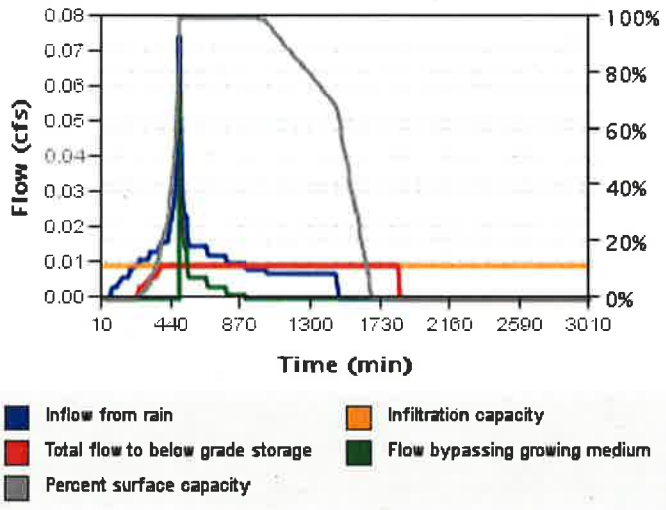
10 Year Event Surface Facility Modeling



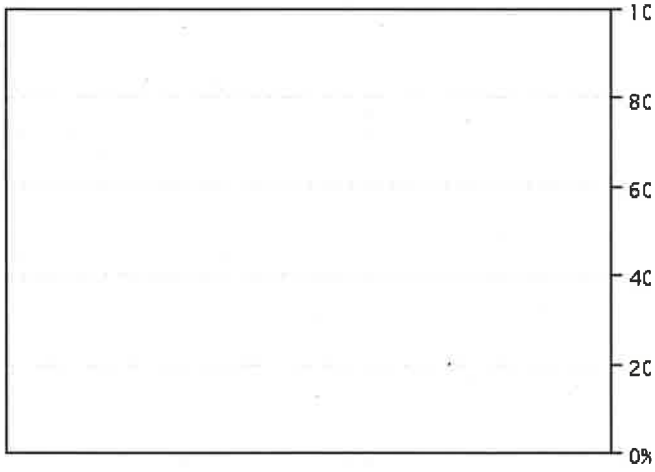
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling



GEOTECHNICAL REPORT

GeoDesign INC

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Ledding Library of Milwaukie Renovation and Expansion
10660 SE 21st Avenue
Milwaukie, Oregon

For
City of Milwaukie
August 25, 2017

GeoDesign Project: CMilwaukie-2-01

GeoDesign INC

August 25, 2017

PlanB Consultancy
696 McVey Avenue
Lake Oswego, OR 97034

Attention: Amy Winterowd

Report of Geotechnical Engineering Services
Ledding Library of Milwaukie Renovation and Expansion
10660 SE 21st Avenue
Milwaukie, Oregon
GeoDesign Project: CMilwaukie-2-01

GeoDesign, Inc. is pleased to submit THIS report of geotechnical engineering services for the proposed renovation and expansion of the Ledding Library of Milwaukie located at 10660 SE 21st Avenue in Milwaukie, Oregon. Our services for this project were conducted in accordance with our proposal dated March 24, 2017.

We appreciate the opportunity to be of service to you. Please call if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

Brett A. Shipton, P.E., G.E.
Principal Engineer

cc: Jordan Henderson, PlanB Consultancy (via email only)

JTW:BAS:kt
Attachments
One copy submitted (via email only)
Document ID: CMilwaukie-2-01-082517-geor.docx

EXECUTIVE SUMMARY

The following is a summary of our findings and recommendations for design and construction of the proposed library renovation and expansion. This executive summary is limited to an overview of the project. We recommend that the report be referenced for a more thorough description of the subsurface conditions and geotechnical recommendations for the project.

- Based on the assumed foundation loads, the proposed structures can be supported on shallow foundations bearing on granular pads constructed on firm native soil or soil compacted as structural fill as presented in the "Shallow Foundations" section.

- The on-site soils can be sensitive to small changes in moisture content and difficult, if not impossible, to adequately compact during wet weather or when the moisture content of the soil is more than a couple of percent above the optimum required for compaction. As discussed in the report, the moisture content of the soils currently is above optimum and drying will be required if used as structural fill.

- The on-site soils will provide inadequate support for construction equipment during periods wet weather or when above optimum moisture. Granular haul roads and working pads should be employed if earthwork will occur during the wet winter months.

- Based on our explorations, the near-surface soils at the site generally consist of fine-grained silt and clay. Based on our infiltration testing, the site has little to no infiltration capacity.

- The soils encountered during our subsurface explorations are not susceptible to liquefaction under design levels of ground shaking

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1.0 INTRODUCTION

GeoDesign, Inc. is pleased to submit this geotechnical engineering report for the proposed renovation and expansion of the Ledding Library of Milwaukie located at 10660 SE 21st Avenue in Milwaukie, Oregon. Figure 1 shows the site relative to existing topographic and physical features. Figure 2 shows the approximate site boundaries and our approximate exploration locations.

The exploration logs and laboratory testing results are presented in Appendix A. Our site-specific seismic evaluation is presented in Appendix B. Acronyms and abbreviations used herein are defined at the end of this document.

1.1 PROJECT UNDERSTANDING

The site encompasses Tax Lot 11E36BB011800, Parcel Number 00026803. The parcel is currently developed with the existing Ledding Library building and includes an AC-paved parking area and landscaped areas with walkways. We understand that plans are preliminary and currently being developed; however, they may consist of expansion of the library into the existing parking areas and/or landscaped areas. In addition, development plans will also include renovations to the existing library building.

Based on preliminary information provided by ABHT Structural Engineers, isolated column loads are anticipated to be between 150 and 200 kips and continuous wall loads are anticipated to be between 3 and 6 kips per linear foot. We anticipate maximum floor loads will be 100 psf. The building addition will be classified as a special occupancy structure and will require a site-specific seismic evaluation per the current SOSSC.

2.0 SCOPE OF SERVICES

The purpose of our geotechnical engineering services was to characterize site subsurface conditions and provide geotechnical engineering recommendations for use in design and construction of the proposed development. Our scope of work is presented as follows:

- Reviewed readily available published geologic data and our in-house files for existing information on subsurface conditions in the site vicinity.
- Explored subsurface conditions by drilling five borings to depths ranging between 8.0 and 16.5 feet BGS.
- Classified the materials encountered in the explorations, and maintained a detailed log of each exploration.
- Completed laboratory testing on disturbed soil samples collected from the explorations as follows:
  - Twenty-one moisture content determinations in general accordance with ASTM D 2216
  - Four particle-size determinations in general accordance with ASTM C 117 and ASTM D 1140
  - One Atterberg limits tests in general accordance with ASTM D 4318

- Provided recommendations for site preparation and grading, including clearing and grubbing, demolition, temporary and permanent slopes, fill placement criteria, suitability of on-site soil for fill, subgrade preparation, and recommendations for wet weather construction.
- Provided foundation support recommendations for the proposed building addition. Our recommendations include preferred foundation type, allowable bearing capacity, and lateral resistance parameters.
- Provided recommendations for use in design of conventional retaining walls, including backfill and drainage requirements and lateral earth pressures.
- Evaluated groundwater conditions at the site, and provided general recommendations for dewatering during construction and subsurface drainage.
- Provided pavement design recommendations for AC paving, including subbase, base course, and AC paving thickness.
- Provided recommendations for seismic design factors in accordance with the procedures outlined in the 2012 IBC and 2014 SOSSC.
- Conducted a site-specific seismic hazard evaluation as required for the public "occupied structure" in accordance with procedures in the 2014 SOSSC.
- Prepared this geotechnical engineering report that presents our findings, conclusions, and recommendations.

3.0 SITE CONDITIONS

3.1 SURFACE CONDITIONS

The approximately 1.8-acre property is currently developed with the existing Ledding Library building and includes an AC-paved parked area and landscaped areas with walkways. The building expansion will likely extend to the south of the existing structure into the landscape area or north into the existing parking lot. The site is relatively level with grade changes between approximately 42 and 47 feet MSL.

3.2 SUBSURFACE CONDITIONS

3.2.1 General

Our subsurface exploration program consisted of drilling five borings (B-1 through B-5) to depths ranging between 8.0 and 16.5 feet BGS. Borings B-1 through B-3 were drilled in the AC parking lot and B-4 and B-5 were drilled in existing landscape areas. Drilling refusal was encountered in all borings on the underlying gravel and silty gravel. We conducted infiltration testing in B-5 at a depth of 6.0 feet BGS. The approximate locations of the explorations are shown on Figure 2. A more detailed description of the exploration and laboratory testing programs, the exploration logs, and results of our laboratory testing are presented in Appendix A.

Subsurface conditions generally consist of silt and clay, over silty sand and sand with interbeds of silt, overlying medium dense to dense gravel. The following sections provide a more detailed description of the units encountered.

3.2.2 Pavement Section

Borings B-1 through B-3 were completed in the existing AC-paved parking lot. The AC varied from 3.0 to 6.0 inches thick and the aggregate base was observed to be 7.0 to 11.0 inches thick. Table 1 presents the thickness of the AC and aggregate base encountered at the boring locations.

Table 1. Existing Pavement Thicknesses

Boring	AC Thickness (inches)	Base Thickness (inches)
B-1	3.0	11.0
B-2	6.0	7.0
B-3	3.0	9.0

3.2.3 Silt and Clay

Below the AC and aggregate base and from the surface in B-4 we encountered brown to gray medium stiff to stiff silt and clay with trace to minor amounts of sand to depths ranging between 8.0 and 9.5 feet BGS in B-1 through B-4. A layer of very stiff silt was also observed between depths of 11.0 and 14.0 feet BGS in B-4. Laboratory analysis of the silt and clay indicates the moisture content ranged between 19 and 39 percent at the time of testing.

3.2.4 Sand

Loose to medium dense, brown silty sand and sand with silt was observed at depths ranging between 8.0 and 13.0 feet BGS below the silt and from the ground surface to a depth of 6.5 feet BGS in B-5. Interbedded layers of silt were observed throughout the silty sand and sand with silt. Laboratory analysis of the silty sand and sand with silt indicates the moisture content ranged from 14 to 39 percent at the time of testing.

3.2.5 Gravel

We encountered medium dense, brown to gray, silty gravel to gravel with sand starting at depths ranging between 6.5 and 14.0 feet BGS and extending to the maximum depth explored of 16.5 feet BGS. Laboratory testing indicates the moisture content ranged from 12 to 19 percent at the time of testing.

3.3 GROUNDWATER

Groundwater was observed in the three deeper borings during drilling. The depths to the observed groundwater are summarized in Table 2.

Table 2. Groundwater Measurements

Boring	Depth (feet BGS)
B-1	13.0
B-3	14.3
B-4	13.3

The depth to groundwater may fluctuate in response to seasonal changes, prolonged rainfall, changes in surface topography, and other factors not observed in this study. In addition, we expect the depth to groundwater may be associated with the water level of the pond and Spring Creek located along the east side of the property.

3.4 INFILTRATION TESTING

Infiltration testing was completed to assist in the evaluation of potential stormwater infiltration facilities for the project. We conducted one infiltration test in B-5 at a depth of 6.0 feet BGS. The infiltration test was performed using the encased falling head method using a 6-inch-inside diameter casing and approximately 12 inches of water head. Laboratory testing was performed to determine the percent fines content at the infiltration test depth. Table 3 summarizes the unfactored infiltration test results and the amount of fines present at the depth of the infiltration test.

Table 3. Infiltration Test Results

Boring	Depth (feet BGS)	Material	Observed Infiltration Rate[1] (inches per hour)	Percent Fines[2]
B-5	6.0	Sand with Silt	0.3	27

1. Infiltration rates are measured rates with no factor of safety.
2. Fines content: material passing the U.S. Standard No. 200 sieve

Given the infiltration test results, fine-grained soils present across the site, relatively shallow groundwater, and without additional testing, it is our opinion that the site has little to no infiltration capacity.

4.0 CONCLUSIONS

Based on the results of our subsurface explorations and engineering analyses, it is our opinion that the site can be developed as proposed. The primary geotechnical considerations for the project are summarized in the "Executive Summary." Our specific recommendations are provided in the following sections.

5.0 DESIGN

5.1 GENERAL

The following sections provide our design recommendations for the project. All site preparation and structural fill should be prepared as recommended in the "Construction" section.

5.2 SHALLOW FOUNDATIONS

5.2.1 General

Based on the results of our explorations and analysis, the proposed library addition can be supported by conventional spread footings resting on granular pads underlain by undisturbed

native soil or structural fill overlying firm native soil. Foundations should not be established on undocumented fill, soft soil, or soil containing deleterious material. If present, this material should be removed and replaced with granular pads.

The granular pads should be a minimum of 4 inches thick, increasing to a minimum of 6 inches thick during the wet winter months, and extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footing. The granular pads should consist of imported granular material, as defined in the "Structural Fill" section. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557, or, as determined by one of our geotechnical staff, until well-keyed. We recommend that a member of our geotechnical staff observe the prepared footing subgrade and the prepared granular pad.

5.2.2 Dimensions and Capacities

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The bottom of interior footings should be established at least 12 inches below the base of the slab.

Footings bearing on subgrade prepared as recommended above should be sized based on an allowable bearing pressure of 2,500 psf. This is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and may be doubled for short-term loads such as those resulting from wind or seismic forces.

5.2.3 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of the footings. Our analysis indicates that the available passive earth pressure for footings confined by native soil and structural fill is 250 pcf, modeled as an equivalent fluid pressure. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent, unpaved areas should not be considered when calculating passive resistance. The passive resistance should be reduced to 120 pcf below groundwater.

For footings in contact with native soil, a coefficient of friction equal to 0.30 may be used when calculating resistance to sliding. For footings in contact with granular fill, a coefficient of friction equal to 0.40 may be used when calculating resistance to sliding.

5.2.4 Settlement

Based on the anticipated foundation loads, post-construction settlement of footings and floor slabs founded as recommended is anticipated to be less than 1 inch. Differential settlements between similarly loaded, newly constructed foundation elements should be approximately one-half of the total settlement. Differential settlement between new and existing foundation elements that are structurally tied together will likely be negligible and approaching the total settlement if structurally isolated.

5.2.5 Subgrade Observation

All footing and floor subgrades should be evaluated by a representative of GeoDesign to evaluate the bearing conditions. Observations should also confirm that all loose or soft material, organics, unsuitable fill, prior topsoil zones, and softened subgrades (if present) have been removed. Localized deepening of footing excavations may be required to penetrate deleterious material.

5.3 FLOOR SLABS

Satisfactory subgrade support for building floor slabs supporting up to 100 psf areal loading can be obtained on the existing undisturbed native silt and clay or on structural fill. To help reduce moisture transmission and slab shifting, we recommend a minimum 6-inch-thick layer of floor slab base rock be placed and compacted over a subgrade that has been prepared in conformance with the "Site Preparation" section. The floor slab base rock should meet the requirements in the "Materials" section and be compacted to at least 95 percent of ASTM D 1557.

While groundwater is unlikely to be encountered within the slab subgrade material, the native soil is fine grained and will tend to maintain a high moisture content. In areas where moisture-sensitive floor slab and flooring will be installed, the installation of a vapor barrier is warranted in order to reduce the potential for moisture transmission through and efflorescence growth on the slab and flooring. In addition, flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives and they will warrant their product only if a vapor barrier is installed according to their recommendations.

Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Load-bearing concrete slabs may be designed assuming a modulus of subgrade reaction, k, of 150 psi per inch.

5.4 RETAINING STRUCTURES

5.4.1 Assumptions

Retaining walls may be needed to address grade changes. Our retaining wall design recommendations are based on the following assumptions: (1) the walls consist of conventional, cantilevered retaining walls, (2) the walls are less than 8 feet in height, (3) the backfill is drained, and (4) the backfill has a slope flatter than 4H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

5.4.2 Wall Design Parameters

For unrestrained retaining walls, an active pressure of 35 pcf equivalent fluid pressure should be used for design. For embedded building walls, a superimposed seismic lateral force should be calculated based on a dynamic force of $7.0H^2$ pounds per lineal foot of wall, where H is the height of the wall in feet, and applied a distance of 0.6H from the base of the wall. Where retaining walls are restrained from rotation prior to being backfilled, a pressure of 55 pcf equivalent fluid pressure should be used for design.

If surcharges (e.g., retained slopes, building foundations, vehicles, steep slopes, terraced walls, etc.) are located within a horizontal distance from the back of a wall equal to twice the height of

the wall, additional pressures will need to be accounted for in the wall design. Our office should be contacted for appropriate wall surcharges based on the actual magnitude and configuration of the applied loads.

The base of the wall footing excavations should extend a minimum of 18 inches below lowest adjacent grade. The footing excavations should then be lined with a minimum 4-inch-thick layer of compacted imported granular material, as described in the "Materials" section.

The wall footings should be designed in accordance with the guidelines provided in the appropriate portion of the "Shallow Foundations" section.

5.4.3 Wall Drainage and Backfill

The above design parameters have been provided assuming that back-of-wall drains will be installed to prevent buildup of hydrostatic pressures behind all walls. If a drainage system is not installed, our office should be contacted for revised design forces.

The backfill material placed behind the walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of retaining wall select backfill placed and compacted in conformance with the "Structural Fill" section.

A minimum 6-inch-diameter, perforated collector pipe should be placed at the base of the walls. The pipe should be embedded in a minimum 2-foot-wide zone of angular drain rock that is wrapped in a drainage geotextile fabric and extends up the back of the wall to within 1 foot of the finished grade. The drain rock and drainage geotextile fabric should meet specifications provided in the "Materials" section. The perforated collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe(s) should not be tied directly into stormwater drain systems, unless measures are taken to prevent backflow into the drainage system of the wall.

Settlement of up to 1 percent of the wall height commonly occurs immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of flatwork adjacent to retaining walls be postponed at least four weeks after backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

5.5 SEISMIC DESIGN CONSIDERATIONS

5.5.1 IBC Parameters

Based on our explorations, the following design parameters can be applied if the building is designed using the applicable provisions of the 2012 IBC and 2014 SOSSC. The parameters in Table 4 are appropriate for code-level seismic design obtained from USGS seismic design maps (USGS, 2014). We performed a site-specific seismic evaluation study, the results of this study are presented in Appendix B.

Table 4. IBC Seismic Design Parameters

Seismic Design Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.984 g	S_1 = 0.421 g
Site Class	D	
Site Coefficient, F	F_a = 1.11	F_v = 1.58
Adjusted Spectral Acceleration, S_M	S_{MS} = 1.088 g	S_{M1} = 0.665 g
Design Spectral Response Acceleration Parameters, S_D	0.726 g	0.443 g

5.6 PAVEMENTS

5.6.1 Design Assumptions and Parameters

We anticipate some re-grading and re-paving may be needed to accommodate the building addition and site improvements. Pavements should be installed on undisturbed native subgrade, scarified and re-compacted soil, or new engineered fills described in the "Site Preparation" and "Structural Fill" sections.

Our pavement recommendations are based on the following assumptions:

- The top 12 inches of soil subgrade is compacted to at least 92 percent of its maximum dry density, as determined by ASTM D 1557, or until proof rolling with heavy equipment indicates that is it firm and unyielding.
- Resilient moduli of 3,700 psi and 20,000 psi were assumed for the subgrade and base rock, respectively.
- No traffic growth.
- A pavement design life of 20 years.
- Initial and terminal serviceability indices of 4.2 and 2.5, respectively.
- Reliability of 75 percent and standard deviation of 0.49.

We do not have specific information on the frequency of vehicles expected at the site. Consequently, we have provided pavement sections for automobile parking and heavy-duty areas with high automobile traffic and occasional heavy vehicles (i.e., garbage trucks, delivery trucks, semi-trucks, etc.). The breakdown of the type and frequency of the trucks used in our analysis are presented in Table 5. If any of these assumptions vary from project design values, our office should be contacted with the appropriate information so that the pavement designs can be revised.

Table 5. Truck Traffic Breakdown

FHWA Class Group	Description	Percent
5	2-axle, single unit	60
6	3-axle, single unit	30
7	4-axle, single unit	0
8	tractor/trailer 3- to 4-axle	10
9	tractor/trailer 3- to 4-axle	0
10	tractor/trailer 3- to 4-axle	0
11	5-axle, multi-trailer	0
12	6-axle, multi-trailer	0

Our pavement design recommendations assuming a maximum of five trucks per day are presented in Table 6.

Table 6. Recommended Standard Pavement Sections

Pavement Use	Trucks per Day[1]	ESALs	AC (inches)	Base Rock (inches)
Automobile Parking	0	10,000	2.5	8.0
Heavy Duty[1]	5	30,000	3.0	9.0

1. See Table 5 for the assumed breakdown of the trucks.

All thicknesses are intended to be the minimum acceptable. The design of the recommended pavement section is based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base. The AC and aggregate base should meet the requirements outlined in the "Materials" section.

Construction traffic should be limited to non-building, unpaved portions of the site or haul roads. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed road sections, an allowance for this additional traffic will need to be made in the design pavement section. The aggregate base does not account for construction traffic, and haul roads and staging areas should be used as described in the "Construction" section.

If any of these assumptions are incorrect, our office should be contacted with the appropriate information so that the pavement designs can be revised.

5.7 DRAINAGE

5.7.1 Surface Water Control

The ground surface around the structure should be sloped away from its foundations at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts should discharge into solid, smooth-walled drainage pipes that carry the collected water away from the building

foundations. Trapped planter areas should not be created adjacent to buildings without providing means for positive drainage (e.g., swales or catch basins).

5.7.2 Foundation Drainage

We recommend installing footing drains around the perimeter of the proposed building addition. The footing drains should consist of a filter fabric-wrapped, drain rock-filled trench that extends at least 2 feet below the lowest adjacent grade (i.e., slab subgrade elevation). A minimum 4-inch-diameter, perforated pipe should be placed at the base to collect water that gathers in the drain rock. The drain rock and drainage geotextile fabric should meet the specifications outlined in the "Materials" section.

5.8 PERMANENT SLOPES

Permanent cut and fill slopes should not exceed 2H:1V. Slopes within stormwater facilities should not exceed 3H:1V. Access roads and pavements should be located at least 5 feet from the top of cut and fill slopes. The setback should be increased to 10 feet for buildings. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

6.0 CONSTRUCTION

6.1 SITE PREPARATION

6.1.1 Demolition

Demolition should include removal of existing structures, pavements, and utilities that are present underneath areas to be improved. Demolished material should be transported off site for disposal or recycled and used on site if the material is acceptable for use as structural fill. Excavations remaining from site preparation activities should be backfilled with structural fill where below planned site grades. The base of excavations should be excavated to expose firm subgrade before filling. Utility lines abandoned under new structural elements should be completely removed and backfilled with structural fill in accordance with the recommendations provided in the "Structural Fill" section.

6.1.2 Stripping and Grubbing

The existing topsoil and vegetation should be stripped and removed from all proposed building and pavement areas and for a 5-foot margin around such areas. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas. Greater depths may be necessary to remove localized zones of organic material or deeper root zones.

Trees should also be removed from improved areas. Root balls should be grubbed out to the depth of the roots. Based on our experience, the grubbing depth required to remove tree root balls will be approximately 2.5 to 3 feet BGS and the grubbing depth to remove brush roots will be approximately 1 foot to 2 feet BGS. Depending on the methods used to remove the root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend that soil disturbed during grubbing operations be removed to expose firm subgrade. The resulting excavations should be backfilled with structural fill.

6.1.3 Subgrade Evaluation

Upon completion of stripping and subgrade stabilization, and prior to the placement of fill or pavement improvements, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similarly heavy, rubber-tired construction equipment to identify soft, loose, or unsuitable areas. A member of our geotechnical staff should observe the proof rolling to evaluate yielding of the ground surface. During wet weather, subgrade evaluation should be performed by probing with a foundation probe rather than proof rolling. Areas that appear soft or loose should be improved in accordance with subsequent sections of this report.

6.2 CONSTRUCTION CONSIDERATIONS

The fine-grained soils present on this site are easily disturbed. If not carefully executed, site preparation, utility trench work, and excavations can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during or extends into the wet season, or if the moisture content of the surficial soil is more than a couple percentage points above optimum, site stripping and cutting may need to be accomplished using track-mounted equipment. Likewise, the use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above optimum. The base rock thickness for pavement areas is intended to support post-construction design traffic loads. This design base rock thickness will likely not support construction traffic or pavement construction when the subgrade soil is wet. If construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of base rock will be required.

The amount of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and type/frequency of construction equipment. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. A geotextile fabric is commonly placed below the imported granular material. The actual thickness will depend on the contractor's means and methods and should be the contractor's responsibility. The imported granular material, stabilization material, and geotextile are described in the "Materials" section.

6.3 EXCAVATION

6.3.1 Excavation and Shoring

Temporary excavation sidewalls should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the excavation are cut at a slope of 1.5H:1V and groundwater seepage is not present. At this inclination, the slopes with loose sand may ravel and require some ongoing repair. Excavations should be flattened if excessive sloughing or raveling occurs. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and

dewatering systems are available. Consequently, we recommend that the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. All excavations should be made in accordance with applicable OSHA and state regulations.

6.3.2 Trench Dewatering

Shallow excavations (less than 5 feet) will not likely encounter groundwater. However, perched groundwater may be encountered after prolonged wet periods. Dewatering systems are best designed by the contractor. It may be possible to remove groundwater encountered by pumping from a sump in the trenches. More intense use of pumps may be required at certain times of the year and where more intense seepage occurs. Removed water should be routed to a suitable discharge point.

If groundwater is present at the base of utility trench excavations, we recommend placing up to 12 inches of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the "Structural Fill" section.

We note that these recommendations are for guidance only. The dewatering of excavations is the sole responsibility of the contractor, as the contractor is in the best position to select these systems based on their means and methods.

6.3.3 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

6.4 MATERIALS

6.4.1 Structural Fill

6.4.1.1 General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic matter or other unsuitable material and should meet the specifications provided in OSSC 00330 (Earthwork), OSSC 00400 (Drainage and

Sewers), and OSSC 02600 (Aggregates), depending on the application. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill is provided below.

6.4.1.2 On-Site Soil

The material at the site should be suitable for use as general structural fill provided it is properly moisture conditioned; free of debris, organic material, and particles over 4 inches in diameter; and meets the specifications provided in OSSC 00330.12 (Borrow Material).

Based on laboratory test results, the moisture content of the on-site soil will be significantly above the optimum required for compaction. Therefore, moisture conditioning (drying) will be required to use the on-site fine-grained soil for structural fill. Extended dry weather and sufficient area to dry the soil will be required to adequately condition the soil for use as structural fill. The on-site fine-grained soil should not be used as structural fill during the wet season. We note that during summer the near-surface (within 2 to 3 BGS) soils can become dry and require the addition of water to moisture condition for compaction.

When used as structural fill, the on-site fine-grained soils should be placed in lifts with a maximum uncompacted thickness of 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 1557.

6.4.1.3 Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.14 (Selected Granular Backfill) or OSSC 00330.15 (Selected Stone Backfill). The imported granular material should also be angular, fairly well graded between coarse and fine material, have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and have at least two fractured faces.

Imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557. During the wet season or when wet subgrade conditions exists, the initial lift should be approximately 18 inches in uncompacted thickness and should be compacted by rolling with a smooth-drum roller without using vibratory action.

6.4.1.4 Stabilization Material

Stabilization material should consist of pit- or quarry-run rock, crushed rock, or crushed gravel and should meet the specifications provided in OSSC 00330.16 (Stone Embankment Material). In addition, the material should have a maximum particle size of 6 inches, less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, and at least two mechanically fractured faces. The material should be free of organic matter and other deleterious material. Stabilization material should be placed in lifts between 12 and 18 inches thick and compacted to a firm condition.

Where the stabilization material is used for staging or construction haul roads, a geotextile should be placed as a barrier between the soil subgrade and the imported granular material. The

placement of the imported granular fill should be done in conformance with the specifications provided in OSSC 00331 (Subgrade Stabilization). The geotextile fabric should meet the specifications provided below for subgrade geotextiles. Geotextile is not required where stabilization material is used at the base of utility trenches.

6.4.1.5 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1½ inches and less than 7 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.13 (Pipe Zone Material). The pipe zone backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department.

Within roadway alignments, the remainder of the trench backfill up to the subgrade elevation should consist of well-graded granular material with a maximum particle size of 2½ inches and less than 7 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.14 (Trench Backfill; Class B, C, or D). This material should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department. The upper 3 feet of the trench backfill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D 1557.

Outside of structural improvement areas (e.g., roadway alignments or building pads) trench backfill placed above the pipe zone may consist of general fill material that is free of organics and material over 6 inches in diameter and meets the specifications provided in OSSC 00405.14 (Trench Backfill; Class A, B, C, or D). This general trench backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer or local building department.

6.4.1.6 Floor Slab Aggregate Base

Imported granular material used as base rock for building floor slabs should consist of ¾- or 1½-inch-minus material (depending on the application) and meet the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders). In addition, the aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

6.4.1.7 Pavement Aggregate Base

Imported granular material used as base rock for building floor slabs should consist of ¾- or 1½-inch-minus material (depending on the application) and meet the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders). In addition, the aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

6.4.1.8 Retaining Wall Select Backfill

Backfill material placed behind retaining walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of select granular material that meets the requirements provided in OSSC 00510.12 (Granular Wall Backfill). We recommend the select granular wall backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the specifications provided below for drainage geotextiles.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D 1557. However, backfill located within a horizontal distance of 3 feet from a retaining wall should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D 1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as a jumping jack or vibratory plate compactor). If flatwork (sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D 1557.

6.4.1.9 Drain Rock Material

Drain rock should consist of angular, granular material that meets the specifications provided in OSSC 00430.11 (Granular Drain Backfill Material) and the aggregate should have at least two fractured faces. The drain rock should be wrapped in a drainage geotextile that meets the specifications provided below for drainage geotextiles.

6.4.1.10 Retaining Wall Leveling Pad

Imported granular material placed at the base of retaining wall footings should consist of select granular material that meets the specifications provided in OSSC 00510.13 (Granular Structure Backfill). The granular material should meet either the 1"-0 or ¾"-0 aggregate size listed in OSSC Table 02630-1 – Grading Requirements for Dense-Graded Aggregate and have at least two mechanically fractured faces. The leveling pad material should be placed in a 6- to 12-inch lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

6.4.2 AC

6.4.2.1 ACP

The AC should be Level 2, ½-inch, dense ACP according to OSSC 00744 (Asphalt Concrete Pavement) and compacted to 91 percent of the theoretical maximum density of the mix, as determined by AASHTO T 209. The minimum and maximum lift thickness is 2.0 and 3.0 inches, respectively, for ½-inch ACP. Lift thicknesses desired outside these limits should be discussed with the design team prior to design or construction. Asphalt binder should be performance graded and conform to PG 64-22 or better.

6.4.2.2 Cold Weather Paving Considerations

In general, AC paving is not recommended during cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress.

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold-weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

6.4.3 Geotextile Fabric

6.4.3.1 Subgrade Geotextile

The subgrade geotextile should meet the specifications provided in OSSC Table 02320-4 - Geotextile Property Values for Subgrade Geotextile (Separation). The geotextile should be installed in conformance with OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles. All drainage aggregate and stabilization material should be underlain by a subgrade geotextile. Geotextile is not required where stabilization material is used at the base of utility trenches.

6.4.3.2 Drainage Geotextile

Drainage geotextile should meet the specifications provided in OSSC Table 02320-1 - Geotextile Property Values for Drainage Geotextile. The geotextile should be installed in conformance with OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

6.5 EROSION CONTROL

The site soil is susceptible to erosion; therefore, erosion control measures should be carefully planned and in place before construction begins. Surface water runoff should be collected and directed away from slopes to prevent water from running down the slope face. Erosion control measures (such as straw bales, sediment fences, and temporary detention and settling basins) should be used in accordance with local and state ordinances.

7.0 OBSERVATION OF CONSTRUCTION

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface exploration. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect if subsurface conditions change significantly from those anticipated.

We recommend that GeoDesign be retained to observe earthwork activities, including stripping, proof rolling of the subgrade and repair of soft areas, footing subgrade preparation, performing

laboratory compaction and field moisture-density tests, observing final proof rolling of the pavement subgrade and base rock, and asphalt placement and compaction.

8.0 LIMITATIONS

We have prepared this report for use by the City of Milwaukie, PlanB Consultancy, and members of the design and construction teams for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other nearby building sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or location, configuration, design loads, or type of construction for the buildings, and walls, the conclusions and recommendations presented may not be applicable. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

The scope does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No warranty, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to be of service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

GeoDesign, Inc.

Joe T. Westergreen, P.E. (Washington)
Project Engineer

Brett A Shipton, P.E., G.E.
Principal Engineer

REFERENCES

International Building Code, 2012.

ODOT, 2015. *Oregon Standard Specifications for Construction,* Oregon Department of Transportation, 2015 Edition.

State of Oregon, 2014. *Oregon Structural Specialty Code.*

USGS, 2014. *U.S. Seismic Design Maps.* Obtained from website: http://earthquake.usgs.gov/hazards/designmaps/. Last accessed August 22, 2017. Website last updated on June 12, 2014.

FIGURES

GeoDesign Inc 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	CMILWAUKIE-2-01	**VICINITY MAP**	
	AUGUST 2017	LEDDING LIBRARY OF MILWAUKIE MILWAUKIE, OR	**FIGURE 1**

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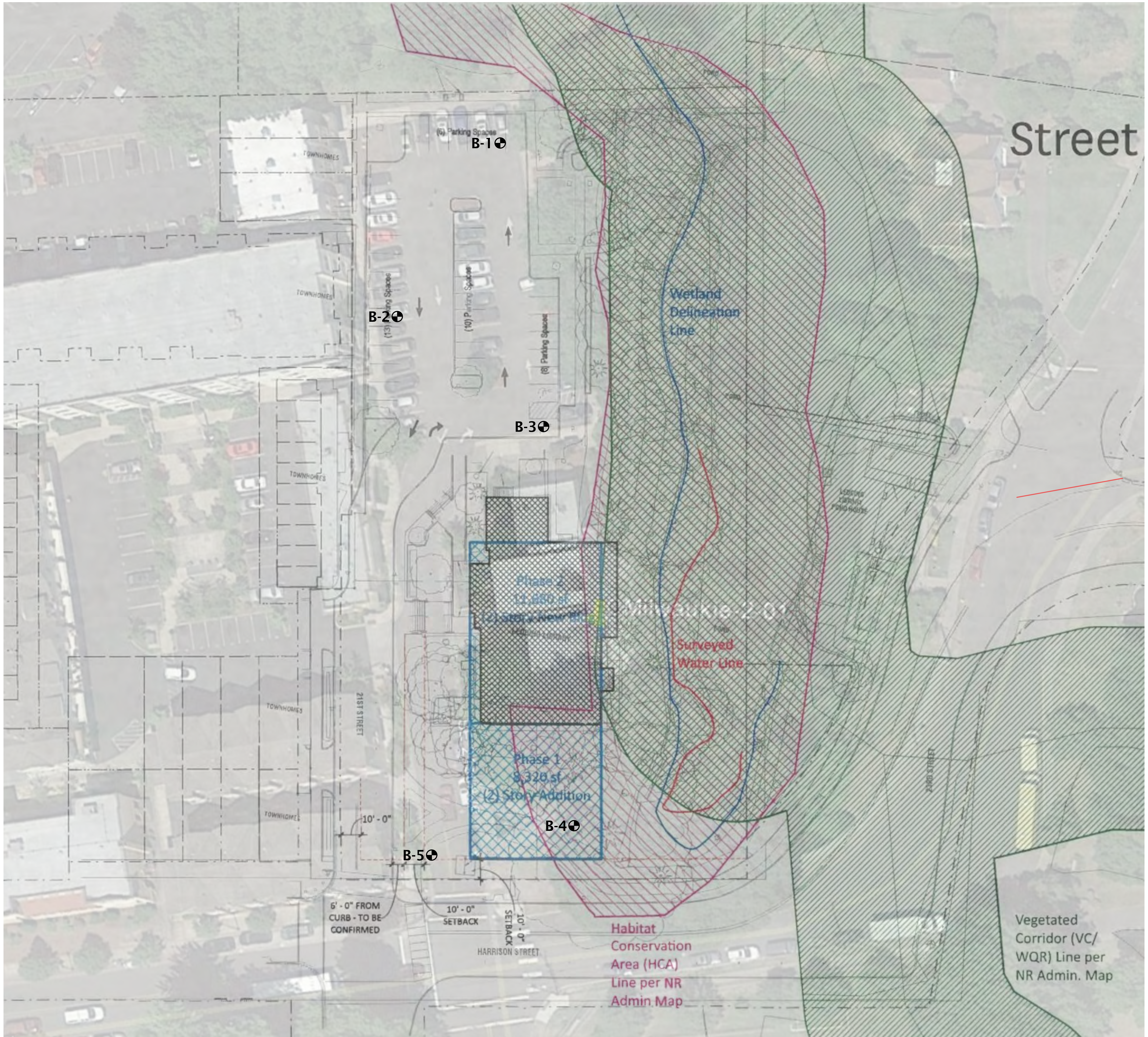
File Name: J:\A-D\CMilwaukie\CMilwaukie-2\CMilwaukie-2-01\Figures\CAD\CMilwaukie-2-01-VM01.dwg | Layout: FIGURE 1



LEGEND:

B-1 BORING

N

0 50 100

(SCALE IN FEET)

SITE PLAN BASED ON IMAGE OBTAINED FROM PLAN B CONSULTANCY

FIGURE 2

SITE PLAN

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APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored the site by drilling five borings (B-1 through B-5) to depths ranging between 8.0 and 16.5 feet BGS. Drilling services were provided by Dan J. Fischer Excavating Inc. of Forest Grove, Oregon, using a trailer-mounted drill rig with solid-stem auger drilling methods. The exploration logs are presented in this appendix.

Approximate locations of our explorations are shown on Figure 2. The exploration locations were determined by pacing from existing site features and should be accurate implied by the methods used.

SOIL SAMPLING

A member of our geology staff observed the explorations. We collected representative samples of the various soils encountered in the explorations for geotechnical laboratory testing. Soil samples were collected by conducting SPTs in general conformance with ASTM D 1586. The sampler was driven with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler 1 foot, or as otherwise indicated, into the soil is shown adjacent to the sample symbols on the exploration logs. Disturbed soil samples were collected from the split barrel for subsequent classification and index testing. Sampling methods and intervals are shown on the exploration logs.

We understand that calibration of the SPT hammer used by Dan J. Fischer Excavating, Inc. has not been completed. The SPT blows completed by Dan J. Fischer Excavating, Inc. were conducted using two wraps around a cathead.

SOIL CLASSIFICATION

The soil samples were classified in the field in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this appendix. The exploration logs indicate the depths at which the soil characteristics change, although the change actually could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

ATTERBERG LIMITS

The plastic limit and liquid limit (Atterberg limits) of a selected soil sample were determined in accordance with ASTM D 4318. The Atterberg limits and the plasticity index were completed to aid in the classification of the soil. The test results are presented in this appendix.

MOISTURE CONTENT

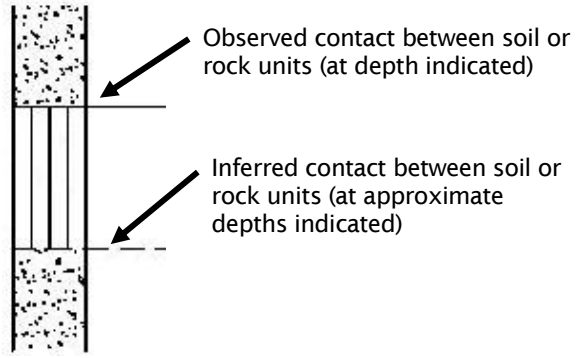
We tested the natural moisture content of selected soil samples in general accordance with ASTM D 2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

PARTICLE-SIZE ANALYSES

Particle-size analyses were completed on selected soil samples in general accordance with ASTM C 117 and ASTM D 1140. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample obtained in general accordance with ASTM D 1586 Standard Penetration Test with recovery
	Location of sample obtained using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D 1587 with recovery
	Location of sample obtained using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample obtained using Dames & Moore and 140-pound hammer or pushed with recovery
	Location of sample obtained using 3-inch-O.D. California split-spoon sampler and 140-pound hammer
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	PP	Pocket Penetrometer
CBR	California Bearing Ratio	P200	Percent Passing U.S. Standard No. 200 Sieve
CON	Consolidation		
DD	Dry Density	RES	Resilient Modulus
DS	Direct Shear	SIEV	Sieve Gradation
HYD	Hydrometer Gradation	TOR	Torvane
MC	Moisture Content	UC	Unconfined Compressive Strength
MD	Moisture-Density Relationship	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal
P	Pushed Sample		

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

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EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOILS

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 – 4	0 - 11	0 - 4
Loose	4 – 10	11 - 26	4 - 10
Medium Dense	10 – 30	26 - 74	10 - 30
Dense	30 – 50	74 - 120	30 - 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOILS

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 – 6	2 - 5	0.25 - 0.50
Medium Stiff	4 - 8	6 – 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 – 25	9 - 19	1.0 - 2.0
Very Stiff	15 - 30	25 – 65	19 – 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVELS (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVELS WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SANDS (<5% fines)	SW or SP	SAND
		SANDS WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SANDS WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOILS			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soils	Silt and Clay In: Coarse-Grained Soils	Percent	Sand and Gravel In: Fine-Grained Soils	Sand and Gravel In: Coarse-Grained Soils
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

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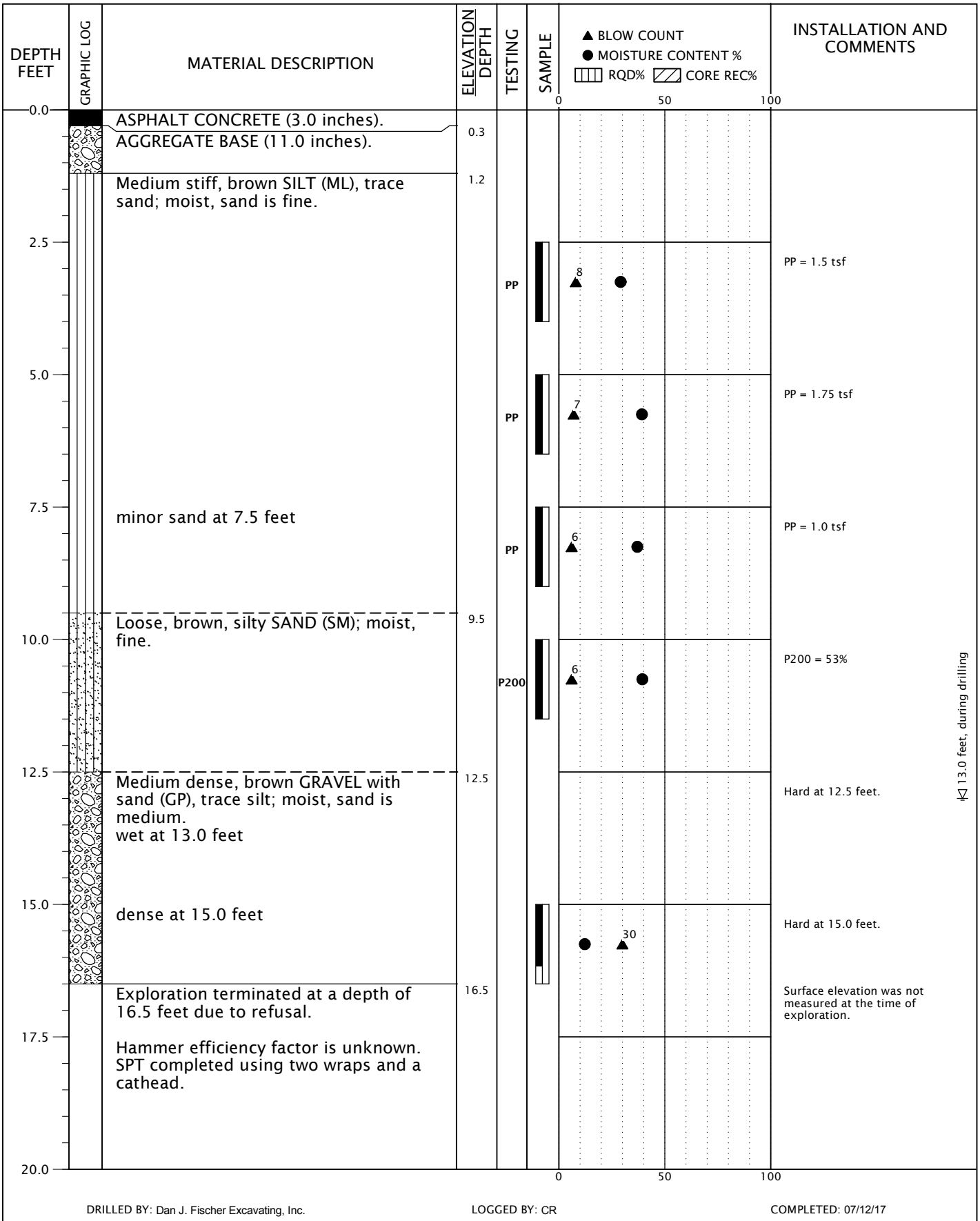
SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CR COMPLETED: 07/12/17

BORING METHOD: solid-stem auger (see document text) BORING BIT DIAMETER: 4 inches

BORING LOG CMILWAUKIE-2-01-B1_5.GPJ GEODESIGN.GDT PRINT DATE: 8/25/17:RC:KT

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BORING B-1

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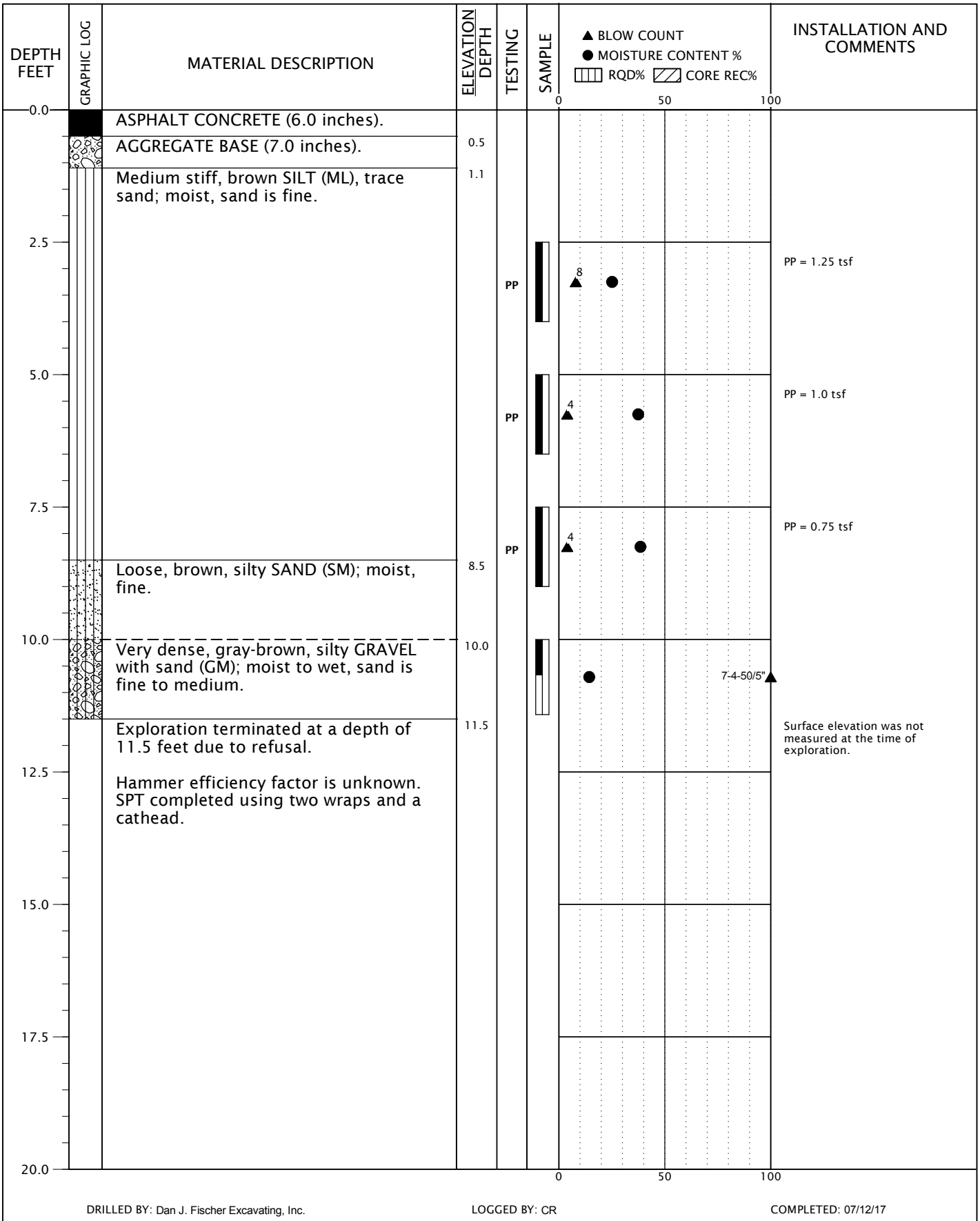
FIGURE A-1



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CR COMPLETED: 07/12/17

BORING METHOD: solid-stem auger (see document text) BORING BIT DIAMETER: 4 inches

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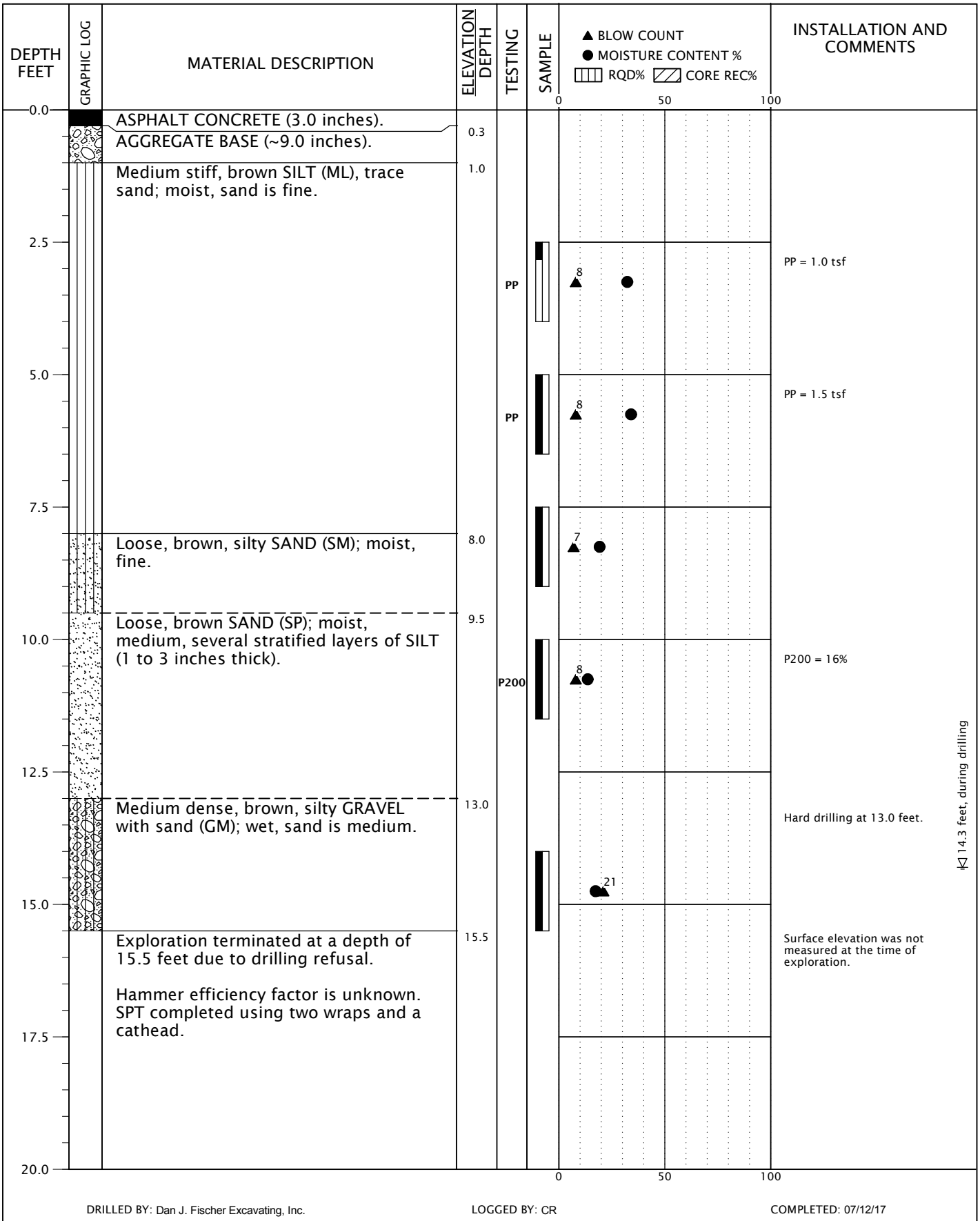
FIGURE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CR COMPLETED: 07/12/17

BORING METHOD: solid-stem auger (see document text) BORING BIT DIAMETER: 4 inches

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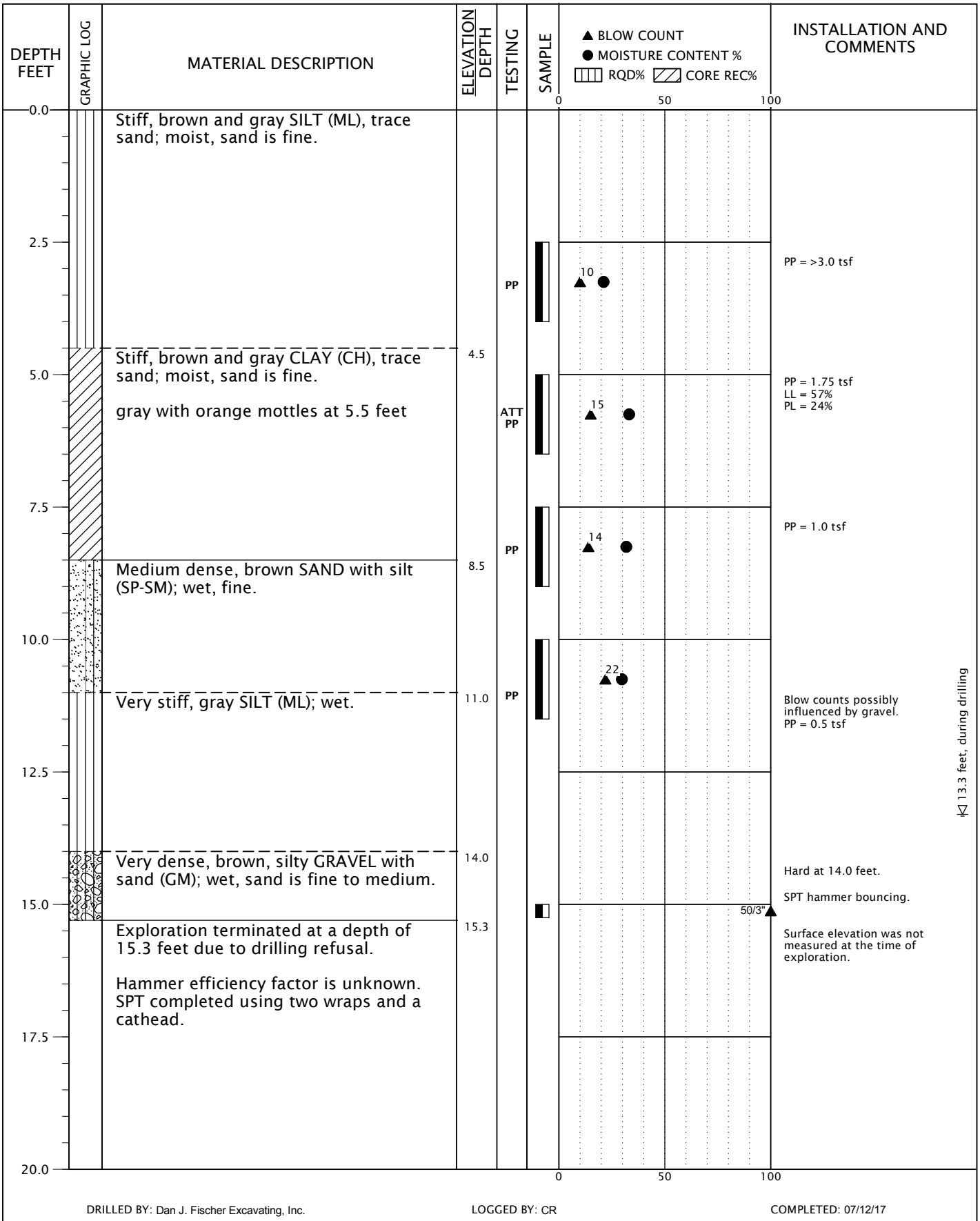
FIGURE A-3



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CR COMPLETED: 07/12/17

BORING METHOD: solid-stem auger (see document text) BORING BIT DIAMETER: 4 inches

BORING LOG CMILWAUKIE-2-01-B1_5.GPJ GEODESIGN.GDT PRINT DATE: 8/25/17:RC:KT

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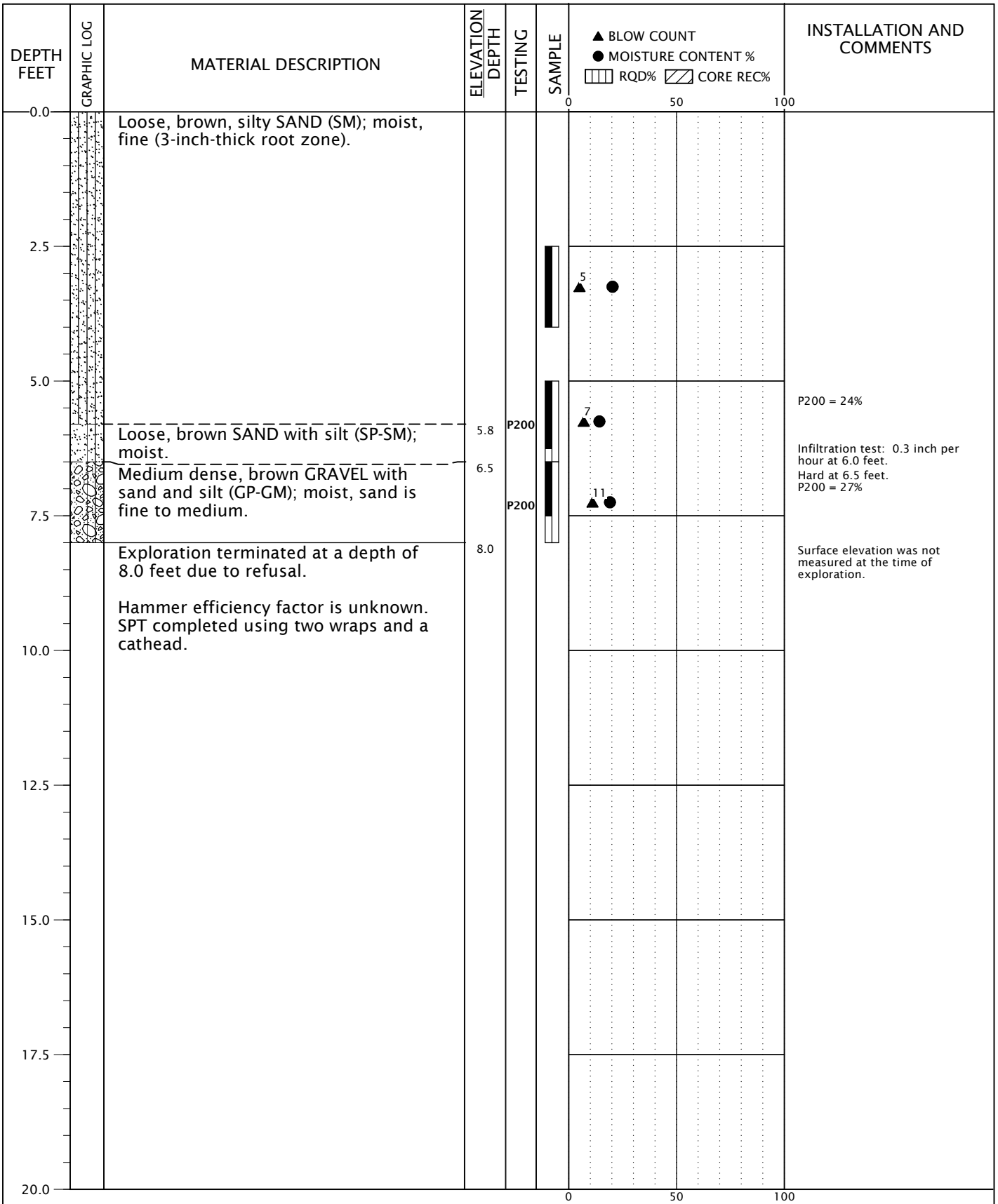
FIGURE A-4



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: CR

COMPLETED: 07/12/17

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

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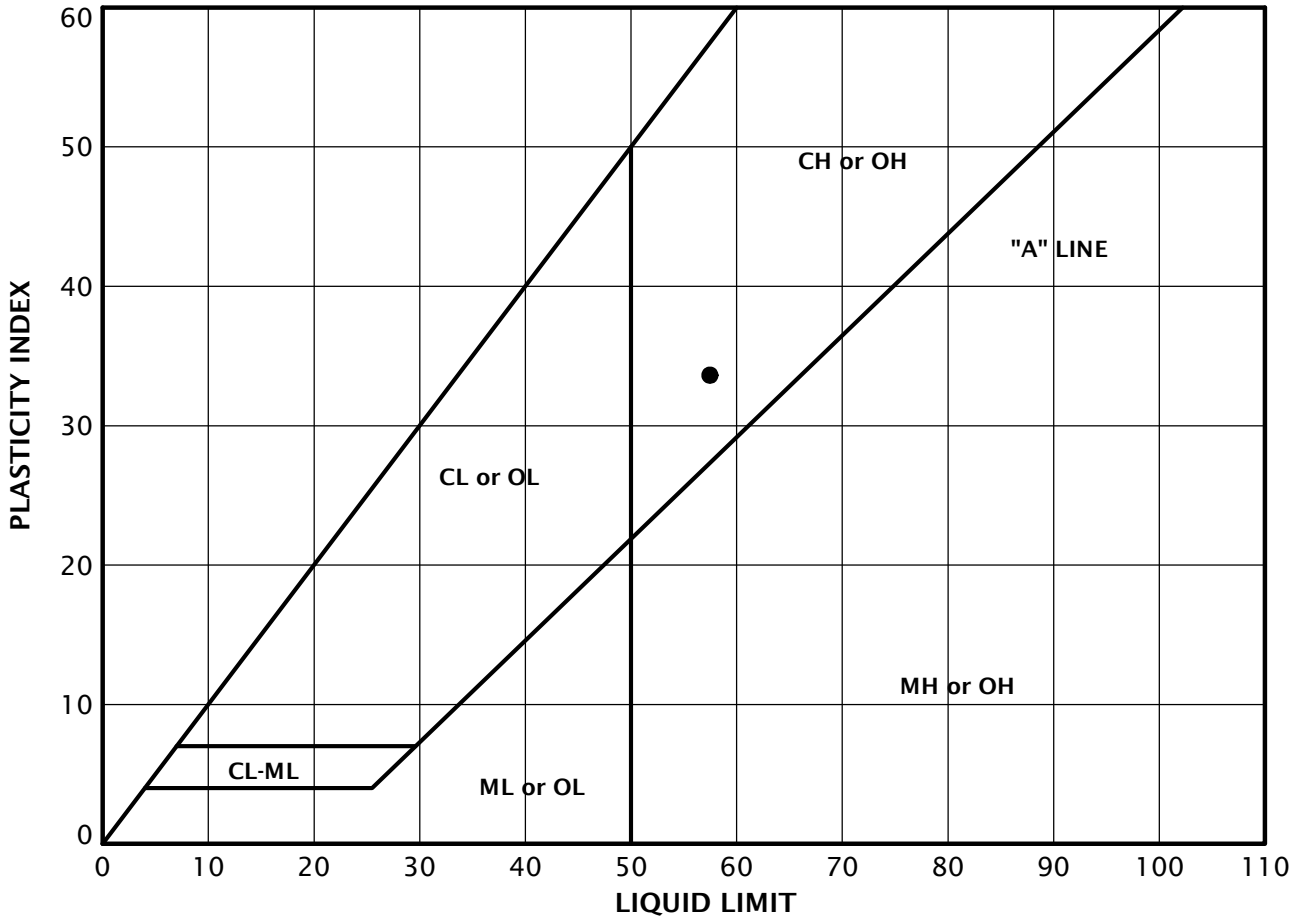
FIGURE A-5

BORING LOG CMILWAUKIE-2-01-B1_5.GPJ GEODESIGN.GDT PRINT DATE: 8/25/17:RC:KT



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-4	5.0	43	57	24	33

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ATTERBERG LIMITS TEST RESULTS

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FIGURE A-6

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.5		29							
B-1	5.0		39							
B-1	7.5		37							
B-1	10.0		39				53			
B-1	15.0		12							
B-2	2.5		25							
B-2	5.0		37							
B-2	7.5		39							
B-2	10.0		14							
B-3	2.5		32							
B-3	5.0		34							
B-3	7.5		19							
B-3	10.0		14				16			
B-3	14.0		17							
B-4	2.5		21							
B-4	5.0		33					57	24	33
B-4	7.5		32							
B-4	10.0		30							
B-5	2.5		20							
B-5	5.0		14				24			
B-5	6.5		19				27			

LAB SUMMARY CMILWAUKIE-2-01-B1_5.GPJ GEODESIGN.GDT PRINT DATE: 8/4/17:KT

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CMILWAUKIE-2-01

SUMMARY OF LABORATORY DATA

AUGUST 2017

LEDDING LIBRARY OF MILWAUKIE
MILWAUKIE, OR

FIGURE A-7

APPENDIX B

APPENDIX B

SITE-SPECIFIC SEISMIC HAZARD EVALUATION

INTRODUCTION

The information in this appendix summarizes the results of a site-specific seismic hazard evaluation for the proposed improvements at Ledding Library in Milwaukie, Oregon. This seismic hazard evaluation was performed to meet the requirement of the 2014 SOSSC.

SITE CONDITIONS

REGIONAL GEOLOGY

The site is located within the Portland Basin, which is separated from by the Tualatin Basin by the Tualatin Mountains (Portland Hills) to the west. Geologic mapping by Ma et al. (2012) and Beeson et al. (1989) shows the near-surface geology mapped as catastrophic Missoula flood deposits (channel facies). The Missoula flood deposits generally consists of a varying mix of unconsolidated deposits of sand, silt, and gravel sediment, which were deposited in major flood events. Since being deposited, the deposits have been modified by recent alluvium (Beeson et al., 1989). The Missoula flood deposits are underlain by undifferentiated sediments, which are commonly fine-grained sediments that overlay basalt bedrock in the site vicinity. The thickness is highly variably and ranges from less than 15 feet to greater than 200 feet (Beeson et al., 1989). The undifferentiated sediments are underlain by Eocene (54 million to 33 million years old) Basalt of Waverly Heights, a sequence of subaerial basaltic lava flows and associated undifferentiated sedimentary rocks (Beeson et al., 1989).

SUBSURFACE CONDITIONS

A detailed description of site subsurface conditions is presented in the main report.

SEISMIC SETTING

Earthquake Source Zones

Three scenario earthquakes were considered for this study consistent with the local seismic setting. Two of the possible earthquake sources are associated with the CSZ, and the third event is a shallow local crustal earthquake that could occur in the North American plate. The three earthquake scenarios are discussed below.

Regional Events

The CSZ is the region where the Juan de Fuca Plate is being subducted beneath the North American Plate. This subduction is occurring in the coastal region between Vancouver Island and northern California. Evidence has accumulated suggesting that this subduction zone has generated eight great earthquakes in the last 4,000 years, with the most recent event occurring approximately 300 years ago (Weaver and Shedlock, 1991). The fault trace is mapped approximately 50 to 120 km off the Oregon Coast.

Two types of subduction zone earthquakes are possible and considered in this study:

1. An interface event earthquake on the seismogenic part of the interface between the Juan de Fuca Plate and the North American Plate on the CSZ. This source is reportedly capable of generating earthquakes with a moment magnitude of between 8.5 and 9.0.
2. A deep intraplate earthquake on the seismogenic part of the subducting Juan de Fuca Plate. These events typically occur at depths of between 30 and 60 km. This source is capable of generating an event with a moment magnitude of up to 7.5.

Local Events

A significant earthquake could occur on a local fault near the site within the design life of the facility. Such an event would cause ground shaking at the site that could be more intense than the CSZ events, though the duration would be shorter. Figure B-1 shows the locations of faults with potential Quaternary movement within a 20-mile radius of the site (USGS, 2014a; PNSN, 2014). Figure B-2 shows the interpreted locations of seismic events that occurred between 1833 and 2014 (USGS, 2014b). The most significant faults in the site vicinity are the Oatfield fault and Portland Hills fault. Table B-1 presents the closest mapped distance and mapped length of these faults.

Table B-1. Closest Crustal Faults

Source	Closest Mapped Distance[1] (km)	Mapped Length[1] (km)
Oatfield fault	1.0	24
Portland Hills fault	2.3	49

1. Reported by USGS (USGS, 2014a)

Oatfield Fault

The northwest-striking Oatfield fault forms northeast-facing escarpments in volcanic rocks of the Miocene CRBG in the Tualatin Mountains and northern Willamette Valley. The fault may be part of the Portland Hills-Clackamas River structural zone. The Oatfield fault is primarily mapped as a very high-angle, reverse fault with apparent down-to-the-southwest displacement, but a few kilometer-long reach of the fault with down-to-the-northeast displacement is mapped in the vicinity of the Willamette River. This apparent change in displacement direction along strike may reflect a discontinuity in the fault trace or could reflect the right-lateral, strike-slip displacement that characterizes other parts of the Portland Hills-Clackamas River structural zone. The fault has also been modeled as a 70-degree, east-dipping reverse fault. Reverse displacement with a right-lateral, strike-slip component is consistent with the tectonic setting, mapped geologic relations, and microseismicity in the area. Fault scarps on surficial deposits have not been described, but exposures in a light rail tunnel showing offset of approximately 1 M_a Boring Lava across the fault indicate Quaternary displacement (Personius, 2002a).

Portland Hills Fault

The northwest-striking Portland Hills fault forms the prominent linear northeastern margin of the Tualatin Mountains (Portland Hills) and the southwestern margin of the Portland Basin; this basin

may be a right-lateral, pull-apart basin in the forearc of the CSZ or a piggyback synclinal basin formed between antiformal uplifts of the Portland fold belt. The fault is part of the Portland Hills-Clackamas River structural zone, which controlled the deposition of Miocene CRBG lavas in the region. The crest of the Portland Hills is defined by the northwest-striking Portland Hills anticline. Sense of displacement on the Portland Hills fault is poorly known and controversial. The fault was originally mapped as a down-to-the-northeast normal fault. The fault has also been mapped as part of a regional-scale zone of right-lateral oblique slip faults and as a steep escarpment caused by asymmetrical folding above a southwest-dipping blind thrust. Reverse displacement with a right-lateral, strike-slip component may be most consistent with the tectonic setting, mapped geologic relations, aeromagnetic data, and microseismicity in the area. Fault scarps on surficial Quaternary deposits have not been described along the fault trace, but some geomorphic (steep, linear escarpment, triangular facets, over-steepened, and knick-pointed tributaries) and geophysical (aeromagnetic, seismic reflection, and ground penetrating radar) evidence suggest Quaternary displacement (Personius, 2012b).

DESIGN EARTHQUAKE

We determined acceleration response spectra for the three postulated scenarios discussed above by using the USGS Interactive Mapping Project that provides a probabilistic site response spectrum for the site assuming bedrock conditions. We assumed an MCE that has a 2 percent probability of exceedance in a 50-year period, as required by the 2014 SOSSC. Some of the major contributing sources to the PGA reported by USGS are presented in Table 2.

Table 2. Partial List of Faults Considered

Source	Magnitude[1] (M_w)	Distance[1] (km)
Cascadia Megathrust (Deep Interface)	9.10	82.70
Portland Hills	6.75	2.93
Cascadia Megathrust (Middle Interface)	8.92	132.72
Grant Butte 50	6.19	8.23

1. Reported by USGS (USGS, 2014)

Figure B-3 shows the site-specific bedrock spectrum as reported by USGS. The soil profile at the site is classified as a Site Class D as prescribed by Section 1613 of SOSSC. Accordingly, the bedrock response spectrum has been amplified using the factors prescribed by SOSSC for Site Class D. Table 3 presents the factors.

Table 3. SOSSC Seismic Design Parameters

Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.984 g	S_1 = 0.421 g
Site Coefficient, F	F_a = 1.107	F_v = 1.579
Adjusted Spectral Acceleration, S_M	S_{MS} = 1.088 g	S_{M1} = 0.665 g

Figure B-3 shows adjusted spectrum appropriate for use in design of structures at the site.

GEOLOGIC HAZARDS

In addition to ground shaking, site-specific geologic conditions can influence the potential for earthquake damage. Deep deposits of loose or soft alluvium can amplify ground motions, resulting in increased seismic loads on structures. Other geologic hazards are related to soil failure and permanent ground deformation. Permanent ground deformation could result from liquefaction, lateral spreading, landsliding, and fault rupture. The following sections provide additional discussion regarding potential seismic hazards that could affect the planned development.

FAULT SURFACE RUPTURE

The Oatfield fault is mapped 0.6 mile northeast of the site and the Portland Hills fault is mapped 1.4 miles southwest of the site. Consequently, it is our opinion that the probability of surface fault rupture beneath the site is low.

LIQUEFACTION

Liquefaction is caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. In general, loose, saturated sand soil with low silt and clay content is the most susceptible to liquefaction. Silty soil with low plasticity is moderately susceptible to liquefaction under relatively higher levels of ground shaking

Based on a review of the available information, soil types encountered, and groundwater depth, it is our opinion that liquefaction is not considered a hazard under design levels of ground shaking.

LATERAL SPREAD

Lateral spread is a liquefaction-related seismic hazard. Development areas subject to lateral spreading are typically gently sloping or flat sites underlain by liquefiable sediments adjacent to an open face, such as riverbanks. Liquefied soil adjacent to open faces may “flow” in that

direction, resulting in surface cracking and lateral displacement towards the open face (i.e., riverbank). Since the site has low susceptibility to liquefaction, lateral spreading is expected to be negligible at this site.

GROUND MOTION AMPLIFICATION

The soil profile at the site is classified as a Site Class D as prescribed by Section 1613.5.5 of SOSSC. Accordingly, the bedrock response spectrum has been appropriately amplified using the factors prescribed by the code for Site Class D.

LANDSLIDE

Earthquake-induced landsliding generally occurs in steeper slopes comprised of relatively weak soil deposits. The site and surrounding area are relatively flat, and seismically induced landslides are not considered a site hazard.

SETTLEMENT

Settlement due to earthquakes is most prevalent in relatively deep deposits of dry, clean sand. We do not anticipate that seismic-induced settlement in addition to liquefaction-induced settlement will occur during design levels of ground shaking.

SUBSIDENCE/UPLIFT

Subduction zone earthquakes can cause vertical tectonic movements. The movements reflect coseismic strain release accumulation associated with interplate coupling in the subduction zone.

Based on our review of the literature, the locked zone of the CSZ is located in excess of 90 miles from the site. Consequently, we do not anticipate that subsidence or uplift is a significant design concern.

LURCHING

Lurching is a phenomenon generally associated with very high levels of ground shaking, which cause localized failures and distortion of the soil. The anticipated ground accelerations shown on Figure C-3 are below the threshold required to induce lurching of the site soil.

SEICHE AND TSUNAMI

The site is inland and elevated away from tsunami inundation zones and away from large bodies of water that may develop seiches. Seiches and tsunamis are not considered a hazard in the site vicinity.

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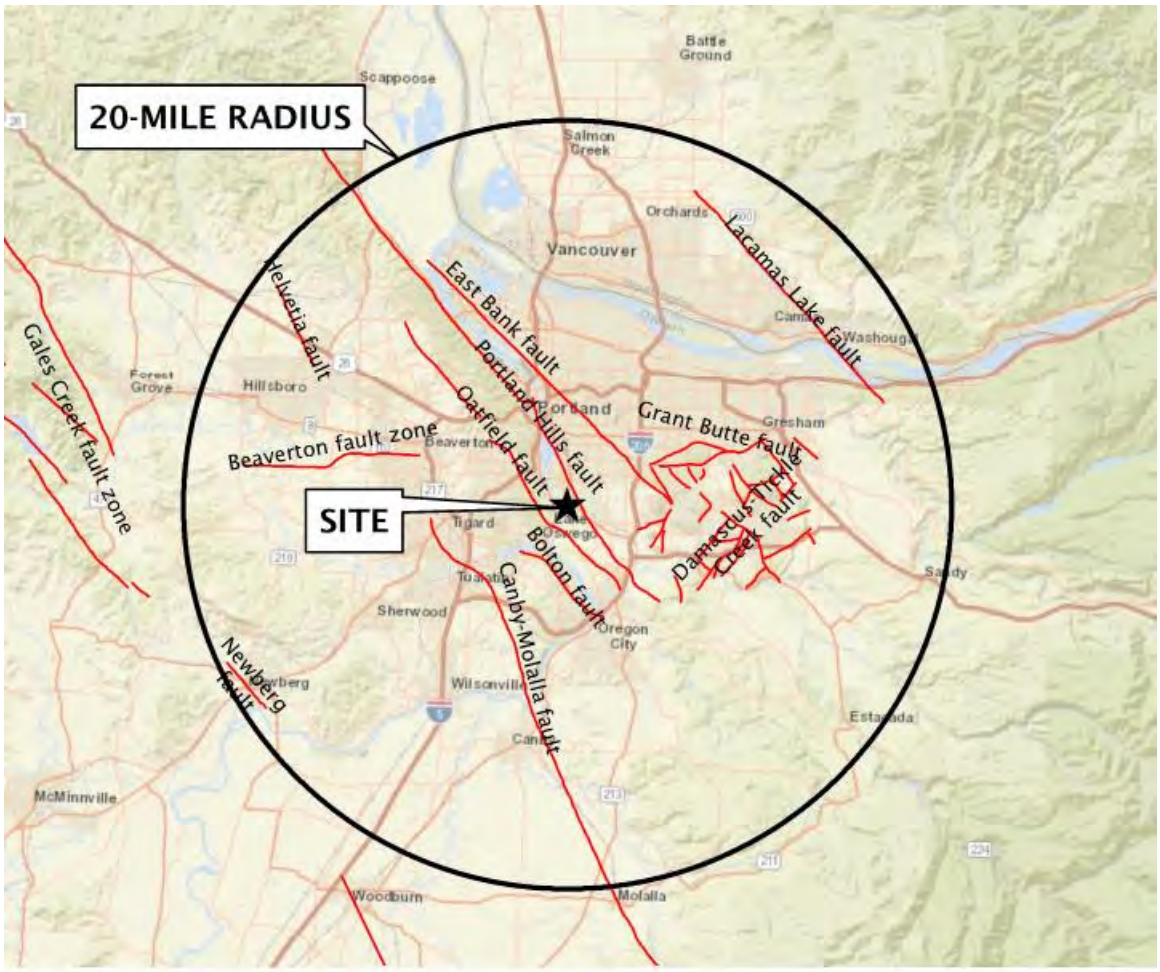

LEGEND

QUATERNARY FAULT

FAULTS PROVIDED BY THE USGS FAULT AND FOLD DATABASE (2006)

N

0 5 10

(SCALE IN MILES)

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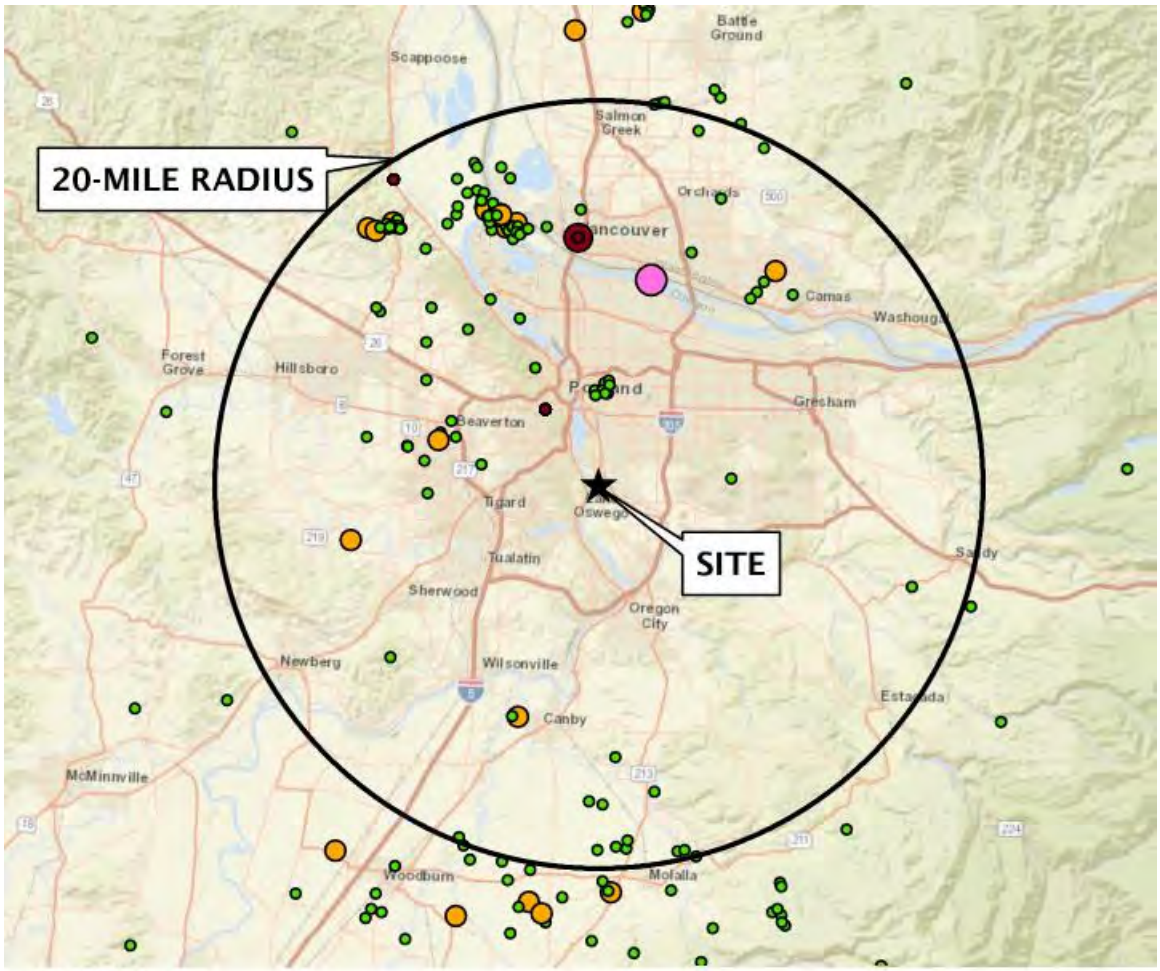
GEODESIGN INC 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	CMILWAUKIE-2-01	**QUATERNARY FAULT MAP**	
	AUGUST 2017	LEDDING LIBRARY OF MILWAUKIE MILWAUKIE, OR	**FIGURE B-1**



LEGEND

EARTHQUAKE MAG	MAXIMUM MODIFIED MERCALLI INTENSITY (MMI)
2.0 - 3.0	VI
3.0 - 4.0	VII
4.0 - 5.0	VIII
> 6.0	

N

0 5 10

(SCALE IN MILES)

HISTORICAL MMI DATA FROM NGDG (2010)

INSTRUMENTAL MAGNITUDE FROM USGS (2009), PNSN (2017)

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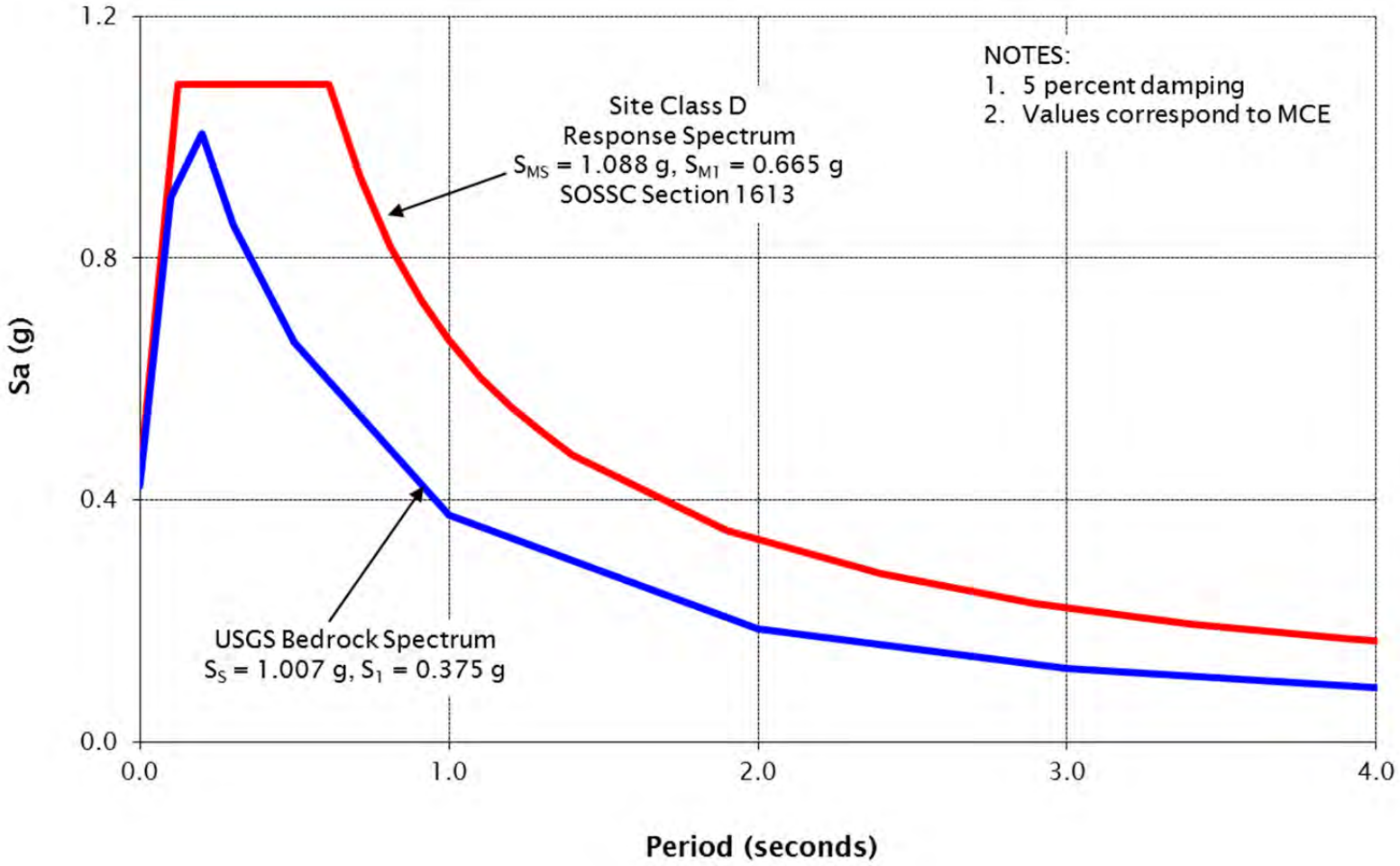
GEODESIGN INC 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	CMILWAUKIE-2-01	**HISTORICAL SEISMICITY MAP**	
	AUGUST 2017	LEDDING LIBRARY OF MILWAUKIE MILWAUKIE, OR	**FIGURE B-2**



GEODESIGN INC 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	CMILWAUKIE-2-01	**SITE RESPONSE SPECTRA**	
	AUGUST 2017	LEDDING LIBRARY OF MILWAUKIE MILWAUKIE, OR	**FIGURE B-3**

ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACP	asphalt concrete pavement
ASTM	American Society for Testing and Materials
BGS	below ground surface
CRBG	Columbia River Basalt Group
CSZ	Cascadia Subduction Zone
ESAL	equivalent single-axle load
FHWA	Federal Highway Administration
g	gravitational acceleration (32.2 feet/second^2)
H:V	horizontal to vertical
IBC	International Building Code
km	kilometers
MCE	maximum considered earthquake
MSL	mean sea level
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Standard Specifications for Construction (2015)
pcf	pounds per cubic foot
PG	performance grade
PGA	peak ground acceleration
psf	pounds per square foot
psi	pounds per square inch
SOSSC	State of Oregon Structural Specialty Code
SPT	standard penetration test
USGS	U.S. Geological Survey