



Oudens Ello Architecture

September 13, 2023

Mr. Ara Yogurtian
Assistant Director
Town of Belmont – Community Development
Homer Municipal Building
19 Moore Street, 2nd Floor
Belmont, Massachusetts 02478

Re: Belmont Public Library – Design and Site Plan Review Application, Supplemental Information

Dear Ara,

We appreciated the opportunity to present the Belmont Public Library project to the Planning Board on September 5, 2023. We provide this letter and supplemental information in response to the Planning Board's comments received during the hearing. We look forward to reviewing these topics in more detail at our continued hearing on September 19, 2023.

The supplemental submission addresses the following items:

1. Contractor Use of the Underwood Pool 'Golden Bowl' at 325 Concord Ave

The land in front of the Underwood Pool, known as the Golden Bowl, will be utilized for temporary contractor parking and trailers during the construction of the new library. The Select Board approved this use on July 17, 2023. Consolidating contractor parking at this location alleviates the need for off-site parking on surrounding streets and allows the future library parking lot to serve as a dedicated laydown area for construction equipment and material deliveries. The temporary parking area will be restored to its existing condition at the conclusion of construction.

The proposed plan provides for:

- Anticipated 20-50 contractor vehicles per day with a proposed workday of 7:00am-3:30pm
- Contractor access from Cottage St in the vicinity of the existing Underwood Pool parking area
- Fencing with screening around the full perimeter of the temporary parking area
- Continued maintenance access to the Wellington Brook culvert
- Reduced Underwood Pool parking from 10 to 7 spaces
- No alteration to the existing bus stop at the corner of Cottage St

Please refer to the enclosed Civil drawing package prepared by Nitsch Engineering (dated September 13, 2023) indicating the proposed limit of work, construction entrance, construction fencing, and erosion control locations for the library site and Golden Bowl.

2. Landscape Design and Wellington Brook

Please refer to the enclosed Landscape Design Presentation prepared by Stimson (dated September 13, 2023) for additional information regarding the proposed landscape design and protection of Wellington Brook. The provided information supplements the landscape drawings submitted with the original DSPR application dated August 2, 2023.

3. Exterior Lighting

Exterior lighting will be provided in the parking area, building entrance, and pathways directly behind the building. Lighting will be designed to meet the requirements of Section 5.4.3 of the Zoning By-Law.

Please refer to the enclosed Site Photometric Report prepared by HLB Lighting (dated August 29, 2023) and proposed exterior lighting locations and fixture types.

4. Rooftop Equipment Noise

The library will comply with the Belmont Noise By-Law and MassDEP maximum allowable noise levels. A community noise survey was conducted in June 2023 to measure background noise levels and determine appropriate mitigation measures to control rooftop equipment noise.

Please refer to the enclosed Community Noise Control Update prepared by Acentech (dated September 13, 2023) and the proposed acoustic barrier product data and installation detail.

We welcome your questions and comments on the enclosed submission package. Please contact me at 617-422-0980, if you have questions prior to the hearing.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'Conrad Ello', with a stylized flourish extending from the end.

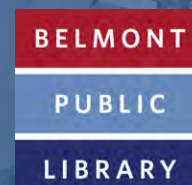
Conrad Ello, AIA, LEED AP

Enclosures:

2023 0913 DSPR - Belmont Public Library - Supplemental Information Package.pdf

Belmont Public Library

Design and Site Plan Review



**SUPPLEMENTAL INFORMATION
FOR SEPTEMBER 19, 2023 HEARING**

Submitted September 13, 2023

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4. **ROOFTOP EQUIPMENT NOISE**

An aerial photograph of the Belmont Public Library and the Underwood Pool area, overlaid with a semi-transparent blue filter. The image shows the library building, a large parking lot, and the pool area. The text "1. CONTRACTOR USE OF THE UNDERWOOD POOL 'GOLDEN BOWL' AT 325 CONCORD AVE" is prominently displayed in white, bold, sans-serif font across the center of the image.

1. CONTRACTOR USE OF THE UNDERWOOD POOL 'GOLDEN BOWL' AT 325 CONCORD AVE

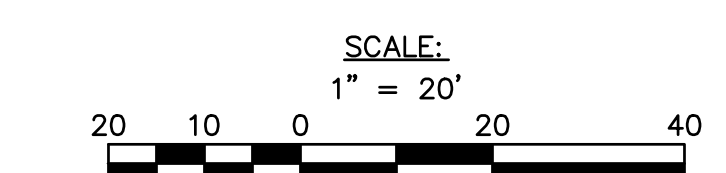


Nitsch Engineering

[illegible]

Date:	06/30/23
Scale:	1" = 20'
Drawn:	JMK
Checked:	AC
Project No:	2301

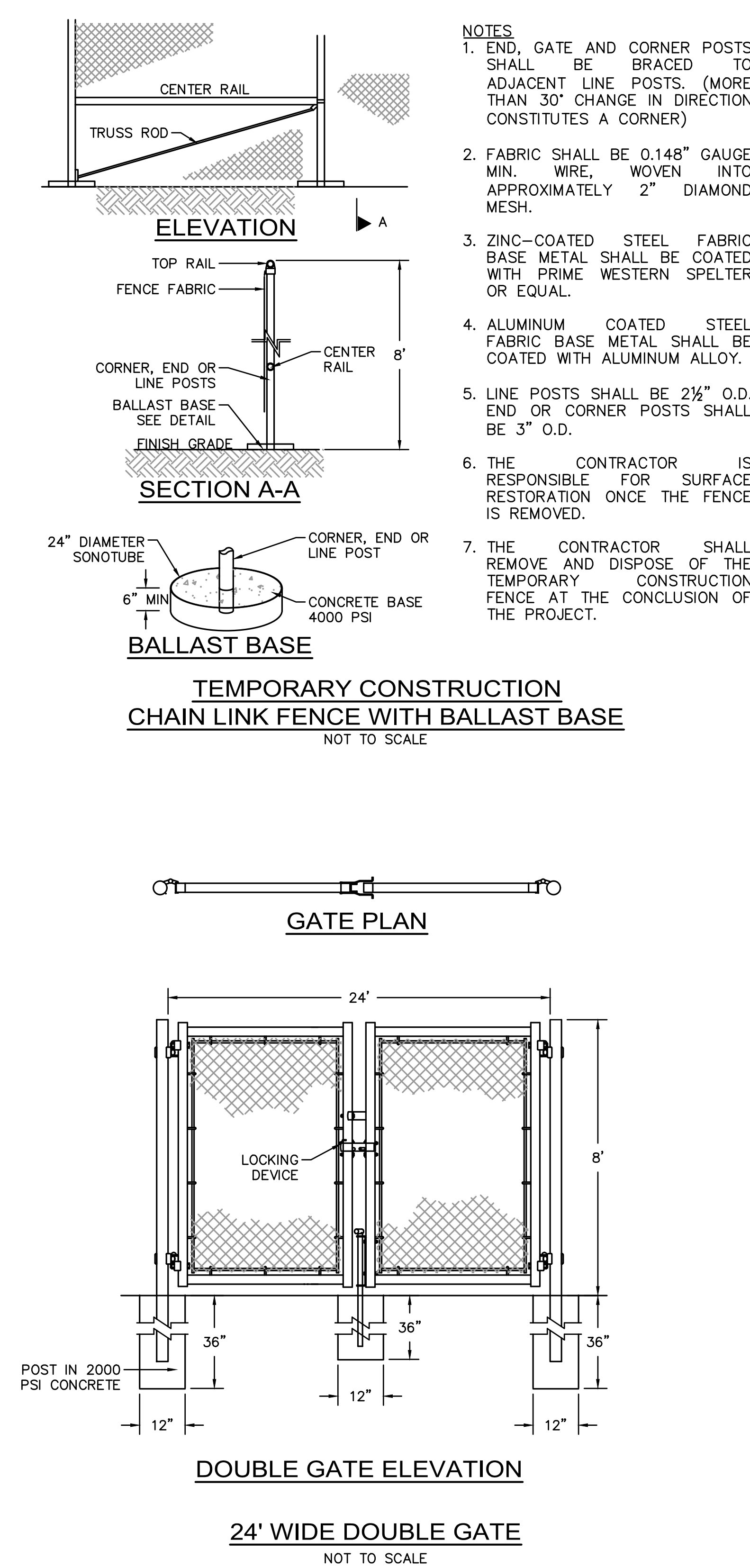
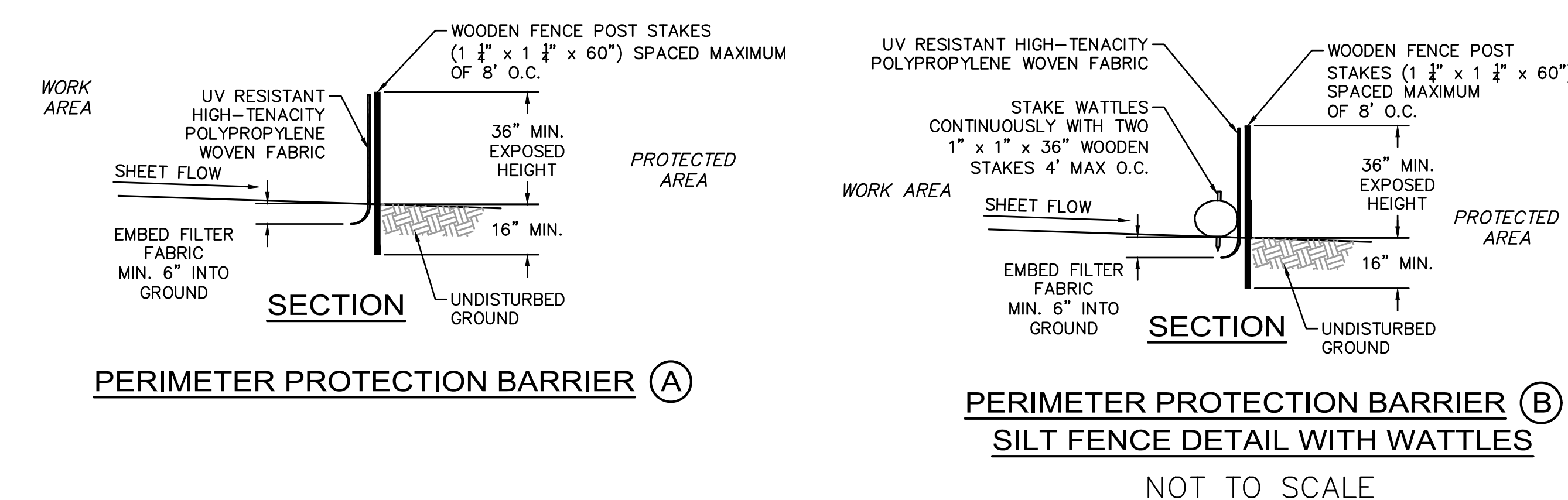
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SITE EROSION AND SEDIMENT CONTROL DETAILS

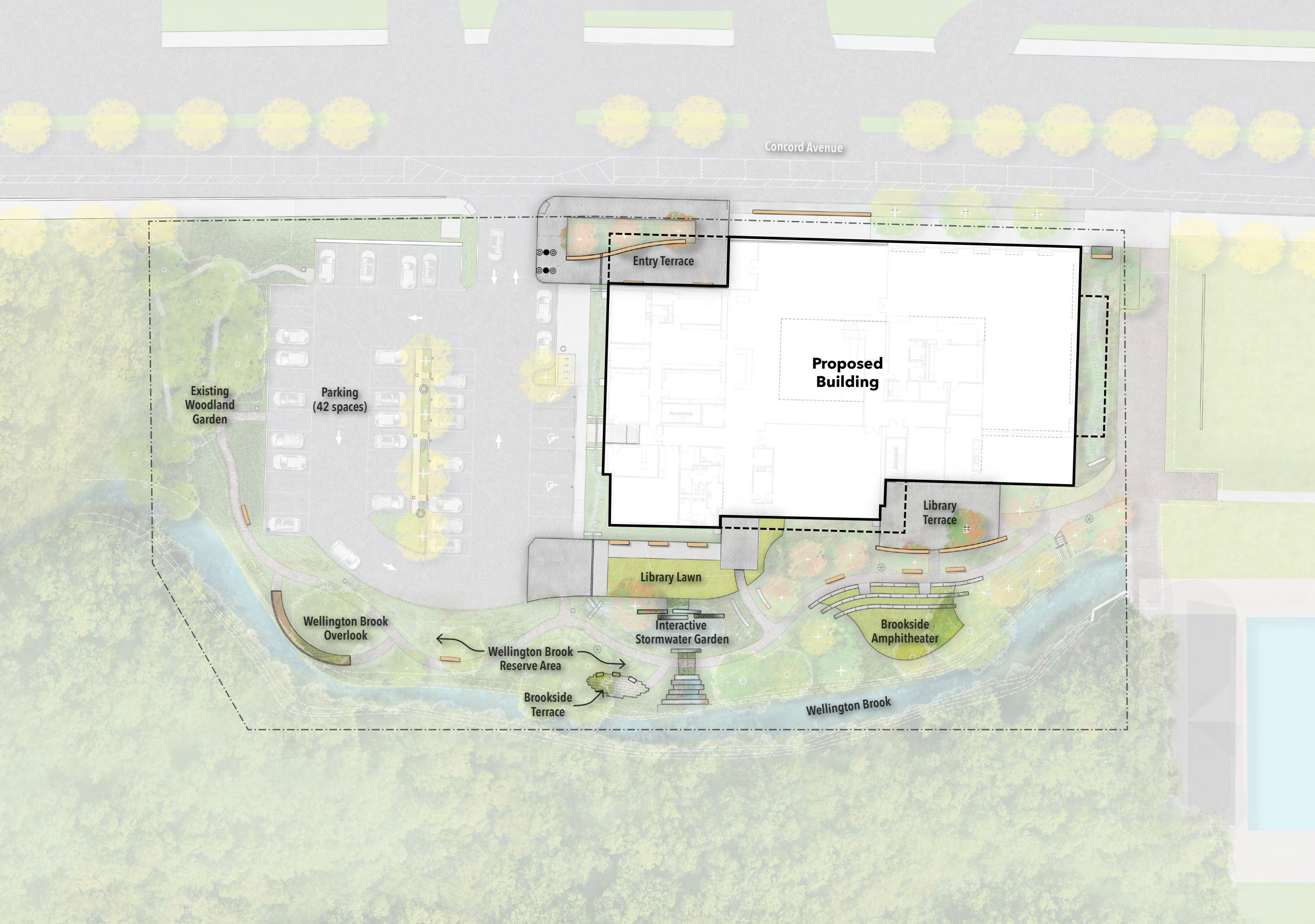
Sheet No.:

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An aerial photograph of a library building and its surroundings, including a parking lot, a road with cars, and a wooded area. The image is overlaid with a semi-transparent blue filter. The text "2. LANDSCAPE DESIGN AND WELLINGTON BROOK" is centered in white, bold, sans-serif font.

2. LANDSCAPE DESIGN AND WELLINGTON BROOK



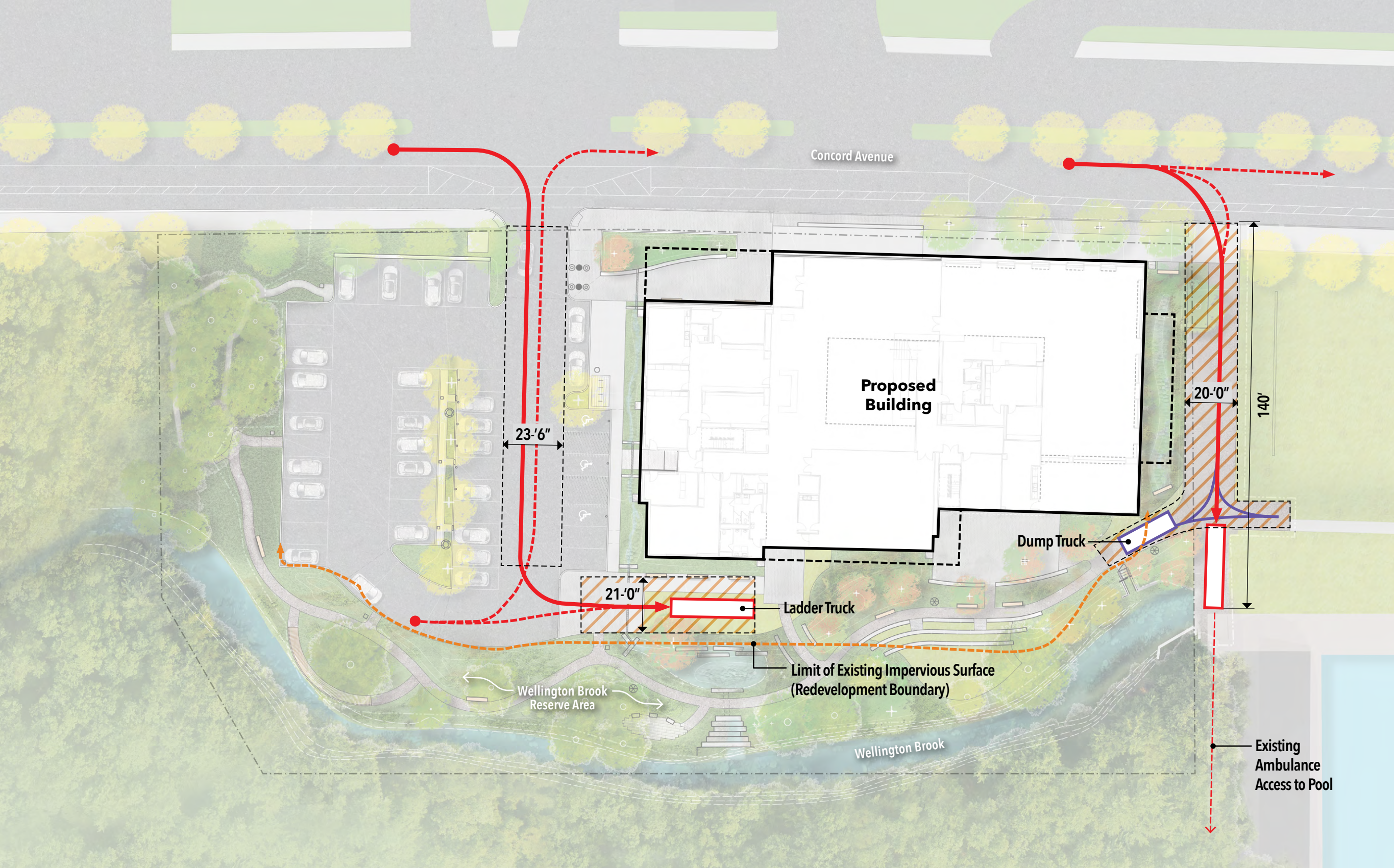


Note: All building roof drainage directed to bio-swales and bio-retention system

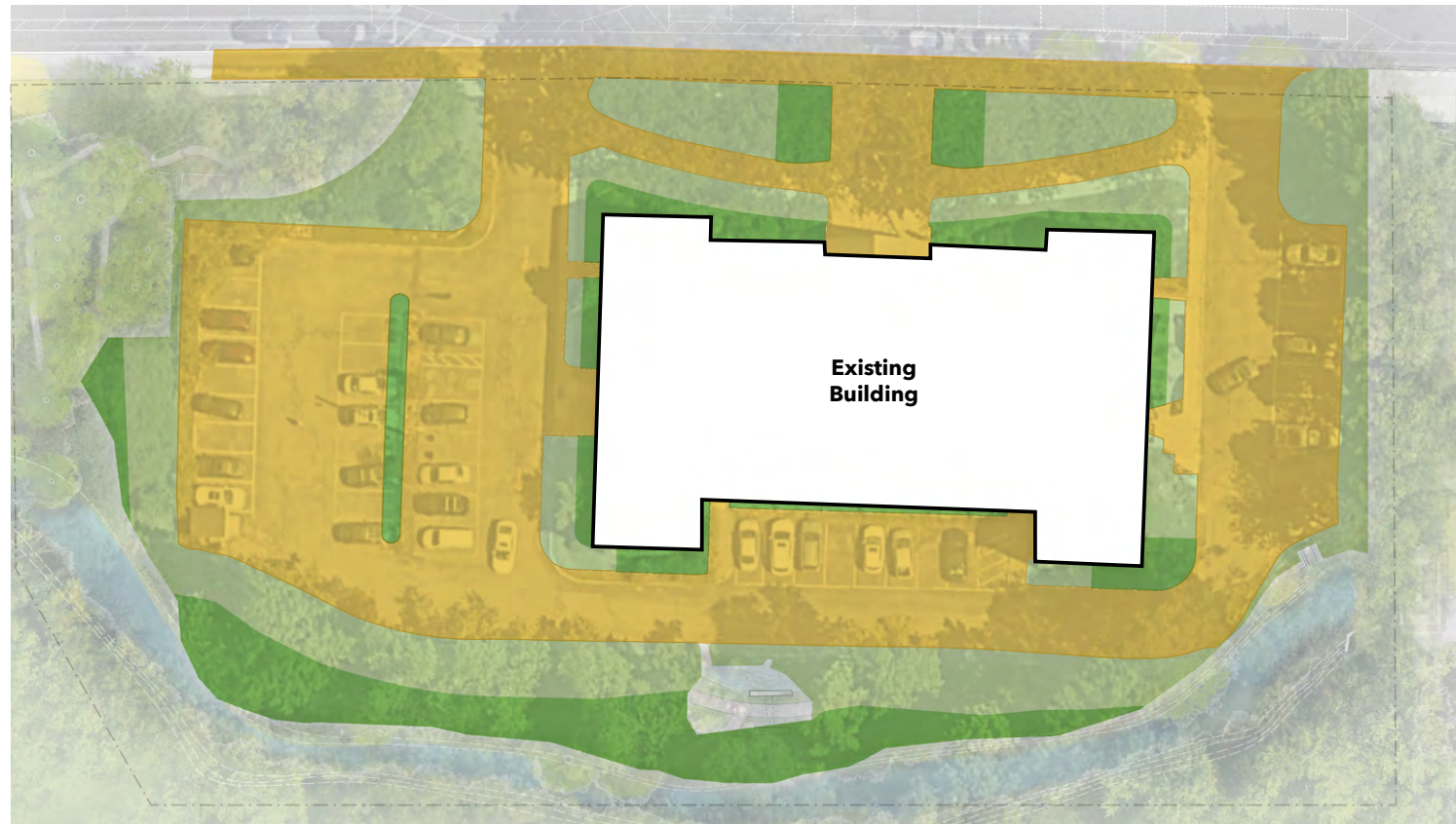
- Legend**
- Property Line
 - Directed to subsurface infiltration system with overflow to Concord Ave
 - Bio-swale and bio-retention system, directed to Wellington Brook
 - Softscape areas directed to Wellington Brook



- Legend**
- Impermeable Paved Areas
 - Permeable Paved Areas



- Legend**
- Property Line
 - Fire Access - Ingress (Ladder Truck, 40.67 length)
 - - - Fire Access - Egress (Ladder Truck, 40.67 length)
 - DPW Access to Culvert (10-Wheeler Dump Truck)



Existing

- Lawn Space - 14,168 SF
- Impervious Paved Areas - 29,443 SF
- Permeable Paved Areas - 0 SF
- Planted Areas - 7,421 SF



Proposed

- Lawn Space - 2,224 SF (*Reduction of 11,944 SF*)
- Impervious Paved Areas - 22,958 SF (*Reduction of 6,485 SF*)
- Permeable Paved Areas - 5,630 SF (*Addition of 5,630 SF*)
- Planted Areas - 16,652 SF (*Additional 9,231 SF*)



CONCORD AVENUE

L.O.W.

L.O.W.

EX

L.O.W.

PRESERVE
EXISTING
VEGETATION

L.O.W.

EX

EX

EX

EX

EX

EX

EX

EX

EX

EX

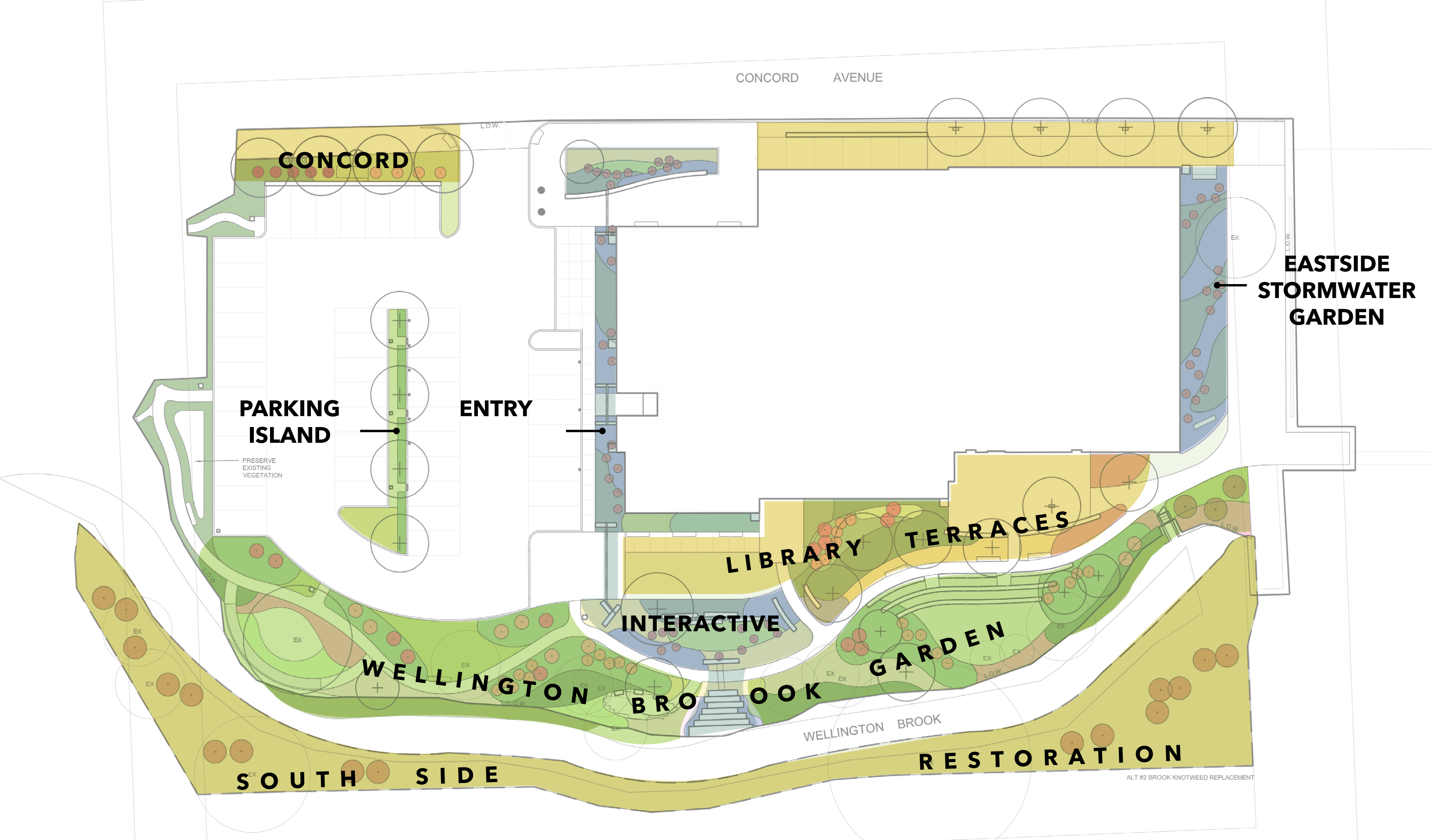
L.O.W.

L.O.W.

WELLINGTON BROOK

EX

ALT #2 BROOK KNOTWEED REPLACEMENT





 Inkberry Holly
Ilex glabra



 Virginia sweetspire
Itea virginica



 Pawpaw
Asimina triloba



 Pinkshell Azalea
Rhododendron vaseyi



 Flame Azalea
Rhododendron calendulaceum



 Drooping Leucothoe 'Nana'
Leucothoe fontanesiana



 American Umbrellaleaf
Dipylleia cymosa



 Switchgrass
Panicum virgatum



 Little Bluestem
Schizachyrium scoparium



 Tussock Sedge
Carex stricta



 Soft Rush
Juncus effusus



 Restoration Planting (SLO-PESIDE)



 Cardinal Flower
Lobelia cardinalis



 Blue Flag Iris
Iris prismatica



 Hay-Scented Fern
Dennstaedtia punctilobula



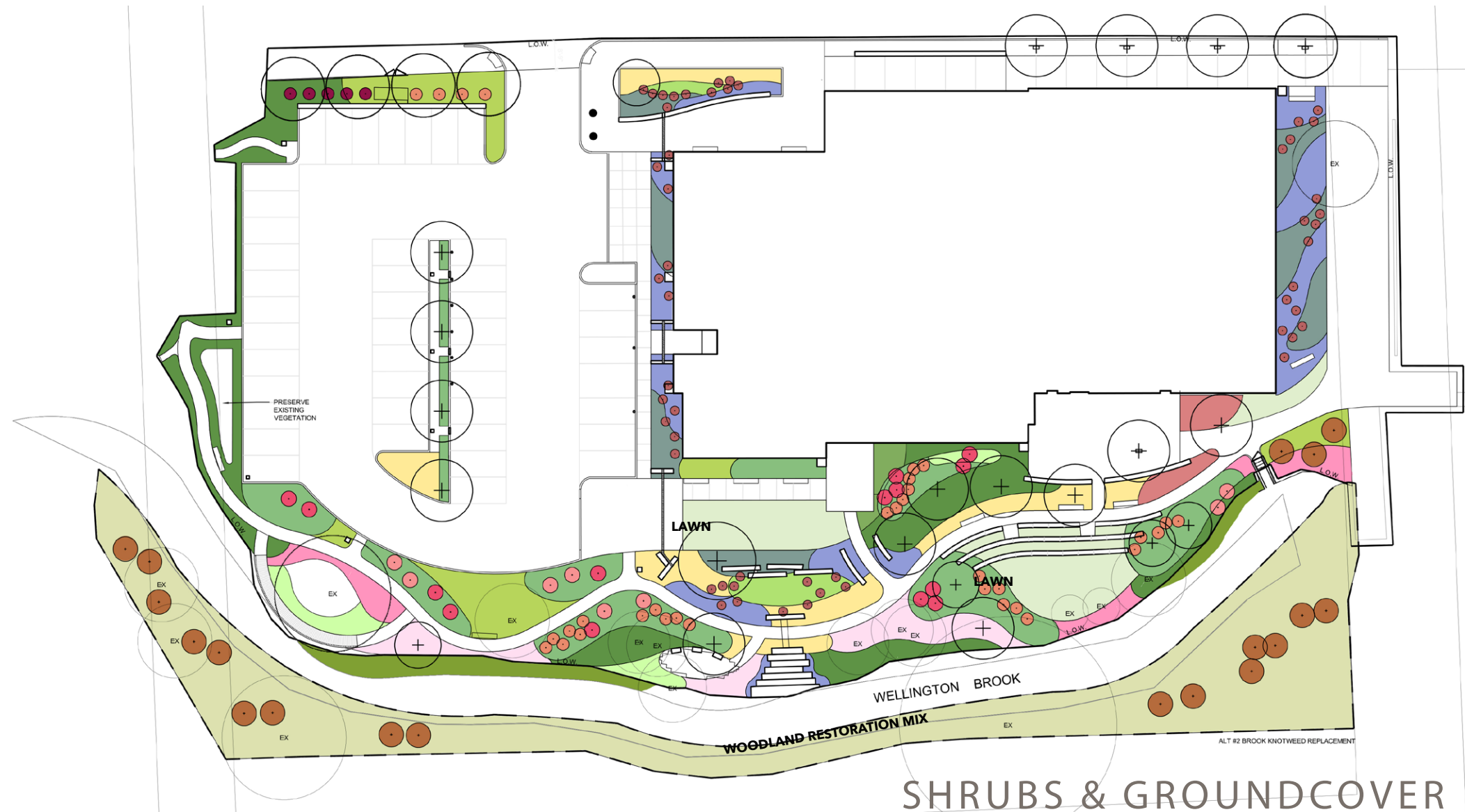
 Marginal Wood Fern
Dryopteris marginalis



 Low Wood Aster
Eurybia divaricata



 Allegheny Spurge
Pachysandra procumbens





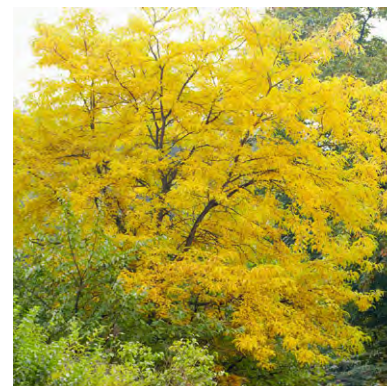
 Dawn Redwood
Metasequoia glyptostroboides



 Red Maple
Acer rubrum



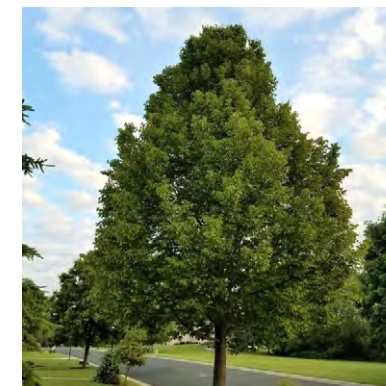
 Sugar Maple
Acer saccharum



 Shademaster Honeylocust
Gleditsia triacanthos inermis



 Tupelo
Nyssa sylvatica



 American Linden
Tilia americana



 Red Oak
Quercus rubra



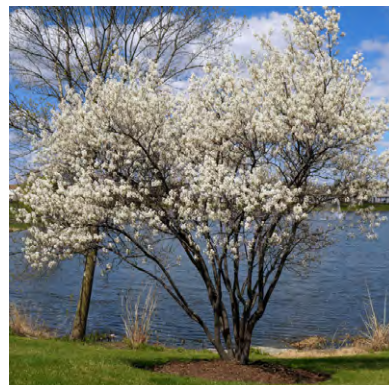
 Tulip Poplar
Liriodendron tulipifera



 American Hophornbeam
Ostrya virginiana



 Cornelian Cherry Dogwood
Cornus mas



 Canadian Serviceberry
Amelanchier canadensis



 Crabapple
Malus sylvestris



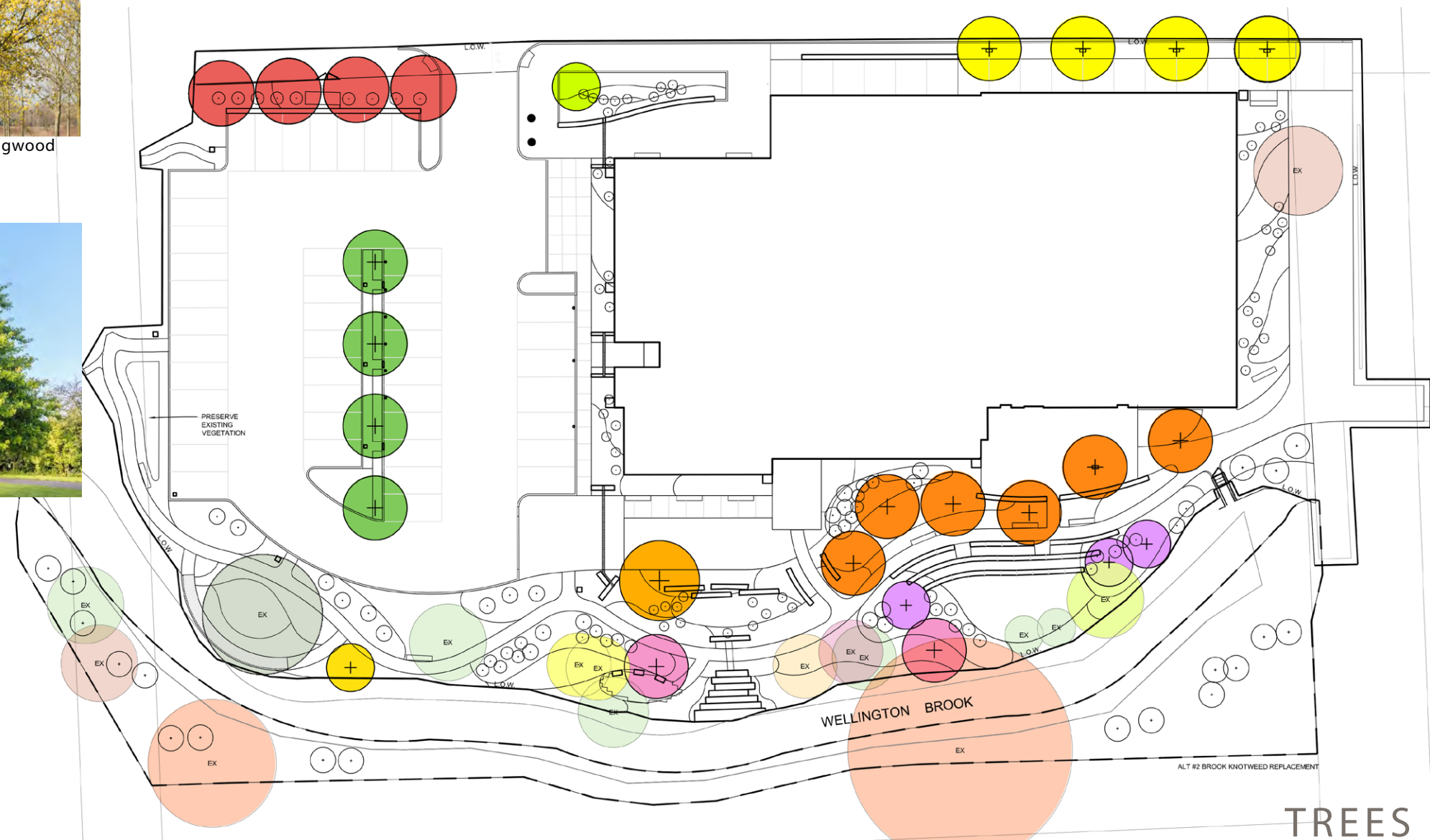
 Pin Oak
Quercus palustris



 Umbrella Magnolia
Magnolia tripetala

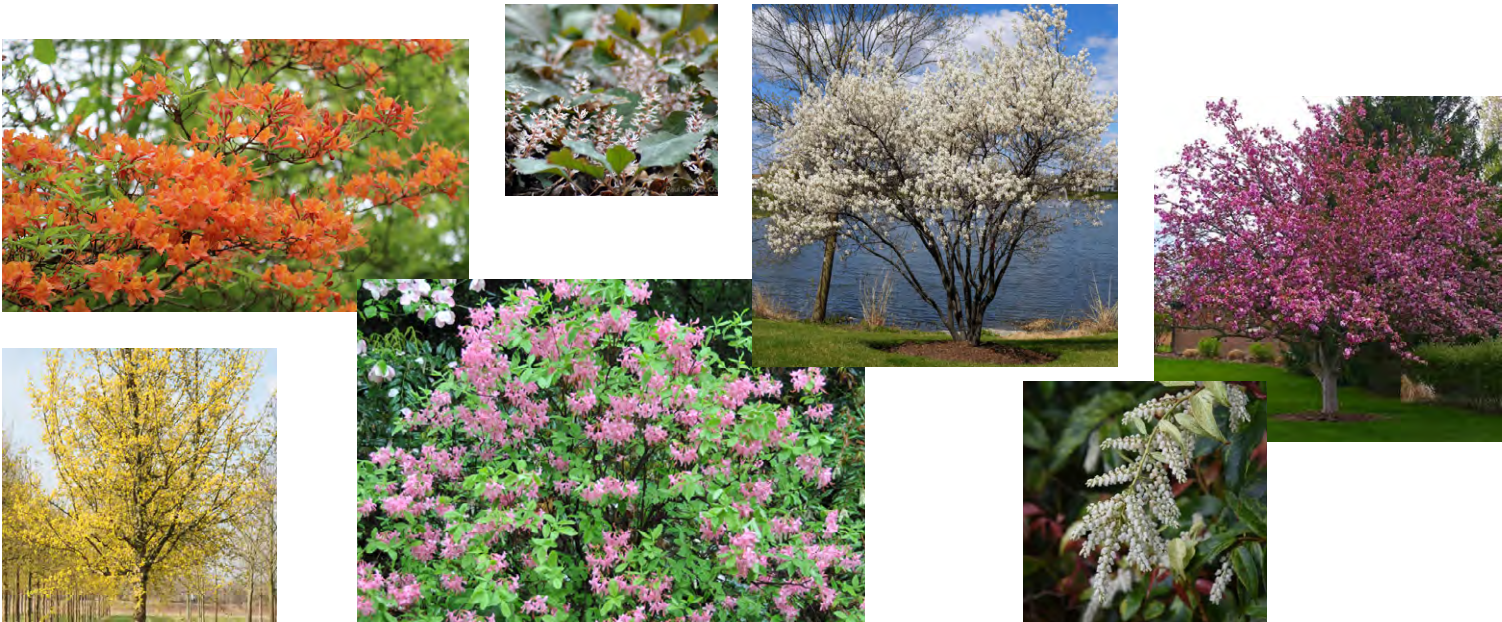
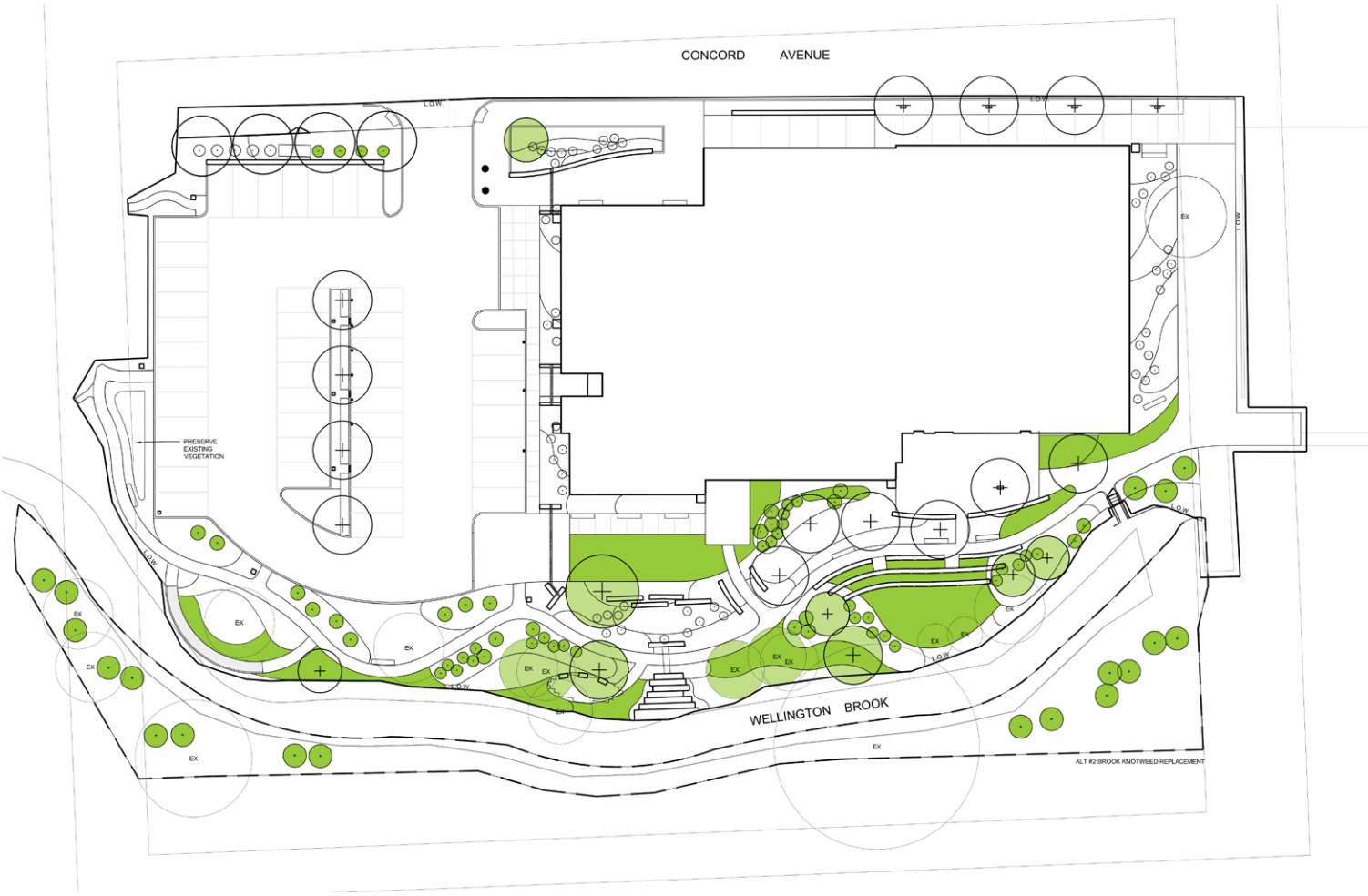


 Witch Hazel
Hamamelis virginiana

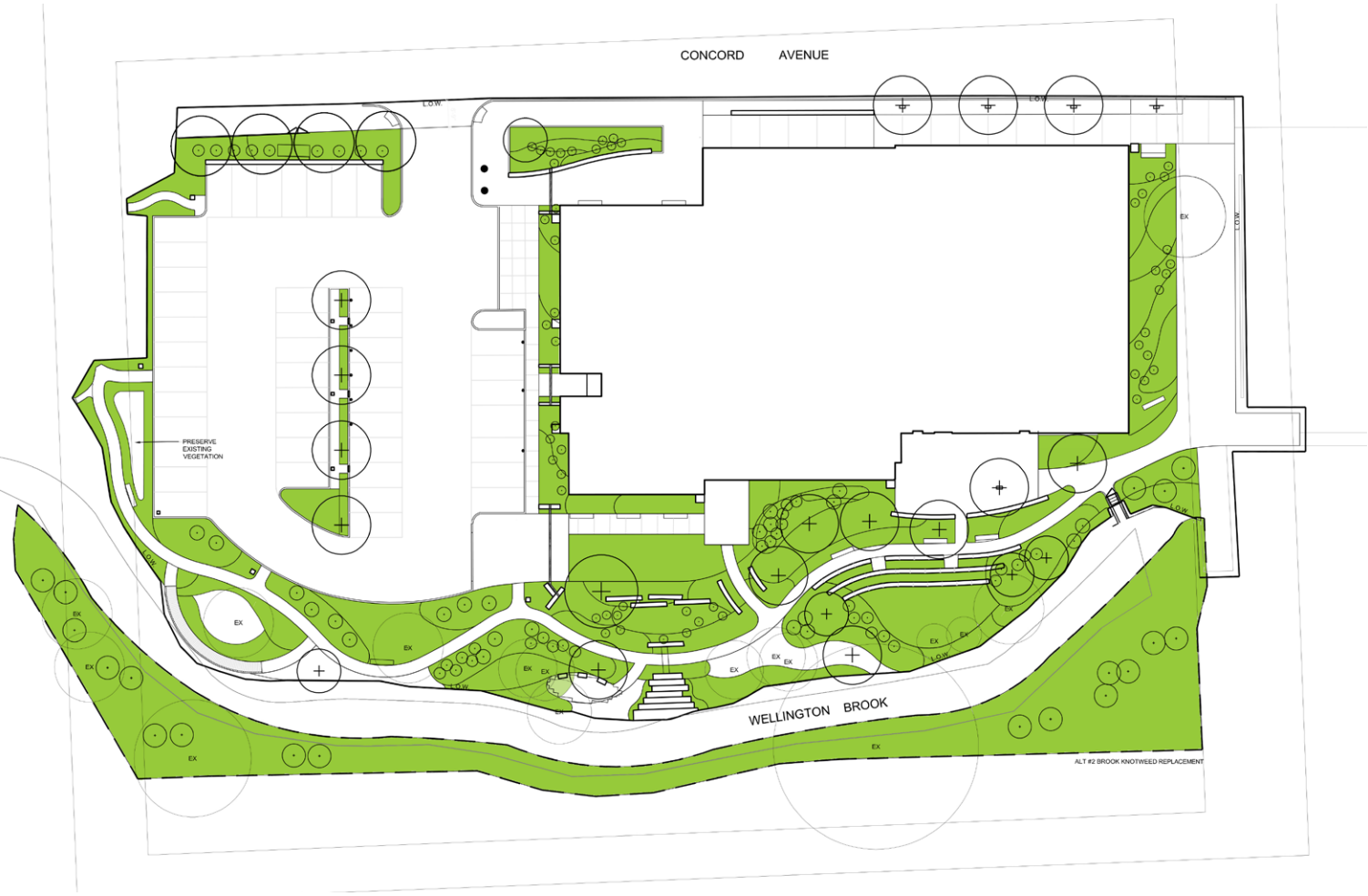


TREES

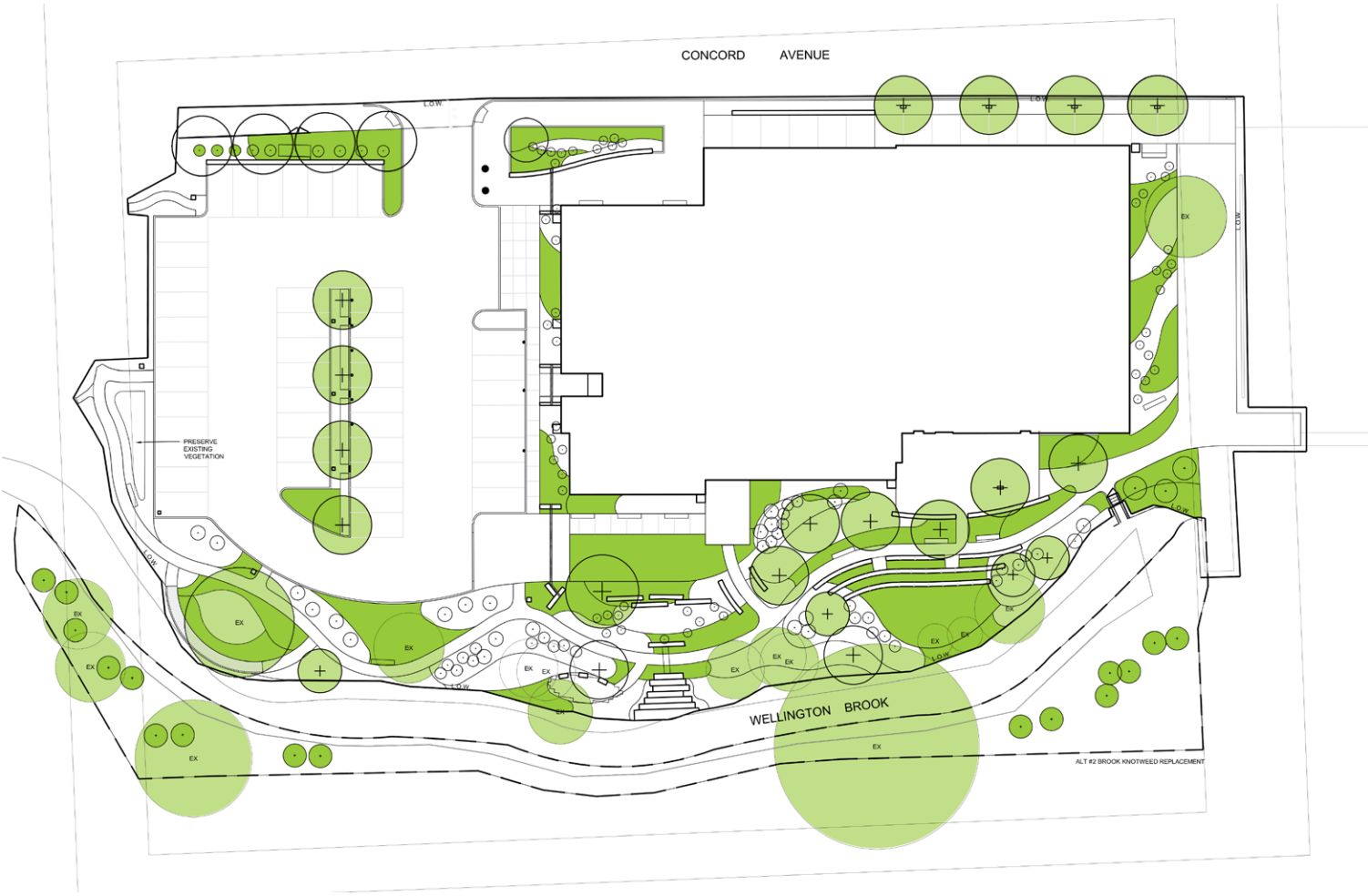
SPRING



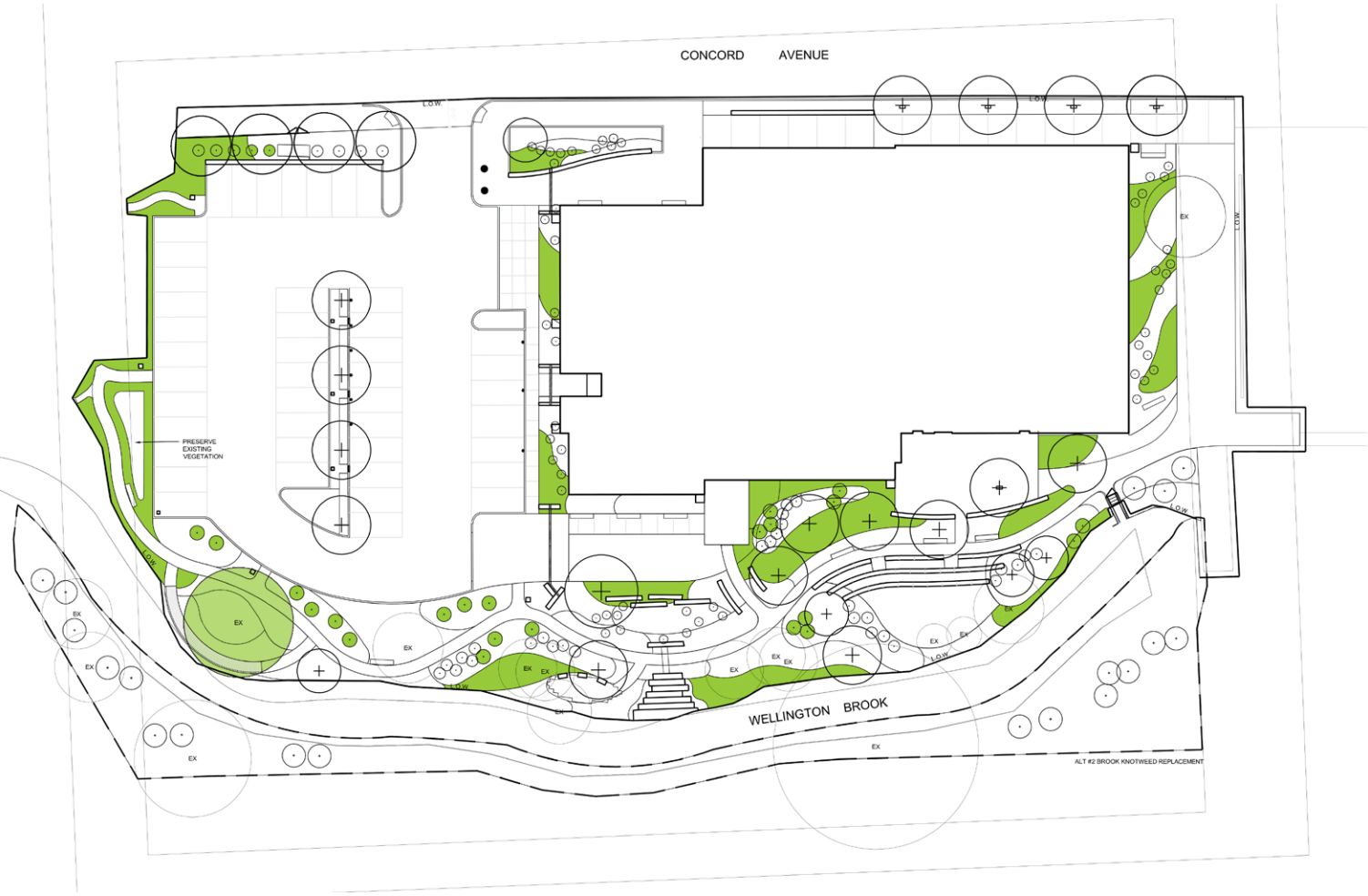
SUMMER



AUTUMN



WINTER



An aerial photograph of the Belmont Public Library and its surroundings, including a parking lot, a road with cars, and a large building. The image is overlaid with a semi-transparent blue filter. The text "3. EXTERIOR LIGHTING" is prominently displayed in white, bold, sans-serif font across the middle of the image.

3. EXTERIOR LIGHTING



Note: Code required egress lighting not shown, to be provided at egress doors / exit discharge locations

Legend

- **G1** Parking Pole Light (Philips Roadstar GPLS LED)
- **G2** Pedestrian Pole Light (Bega 7172 LED)
- **G3** Flagpole In-Ground Light (Bega 84115 LED)
- **EX1** Soffit Lighting (Lumenwerx Cluster Recessed Linear LED)
- **S1** Signage Lighting (Backlit pin-mounted letters)

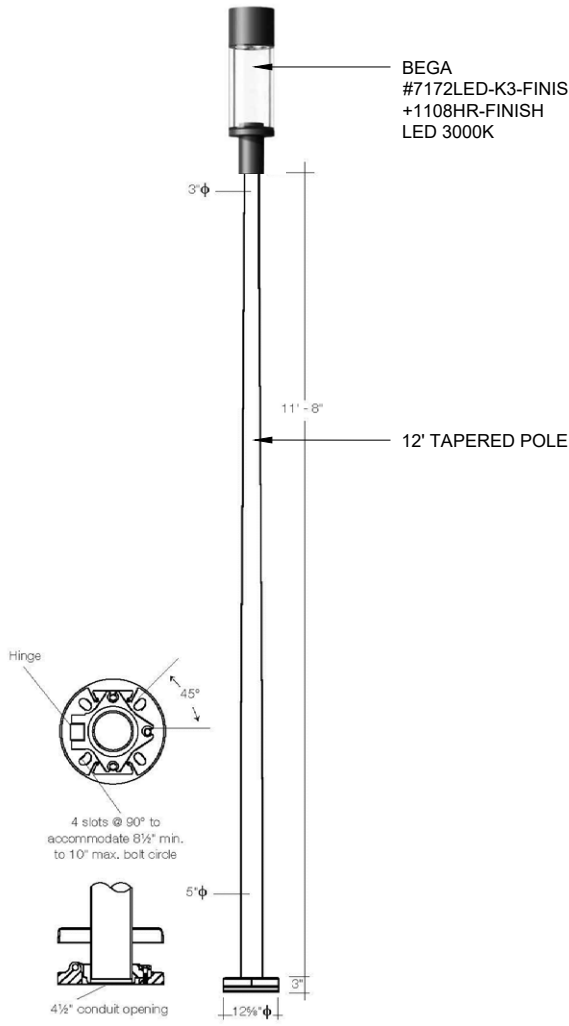
Site Plan Exterior Lighting



PHILIPS "ROADSTAR GPLS"
#GPLS-40w30LED4K-
LE3-volt-PH8-FINISH
LED 4000K

18' POLE
BLACK

G1 Parking Pole Light
Philips Roadstar GPLS LED
Full cutoff, Dark Sky compliant



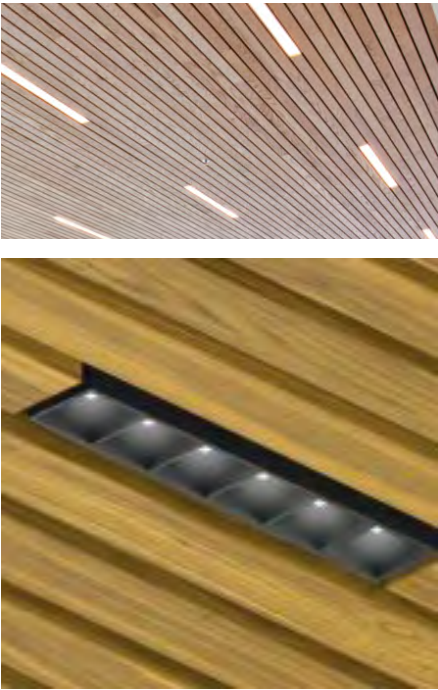
G2 Pedestrian Pole Light
Bega 7172 LED



G3 Flagpole In-Ground Light
Bega 84115 LED



S Signage Lighting
Backlit pin-mounted letters

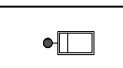


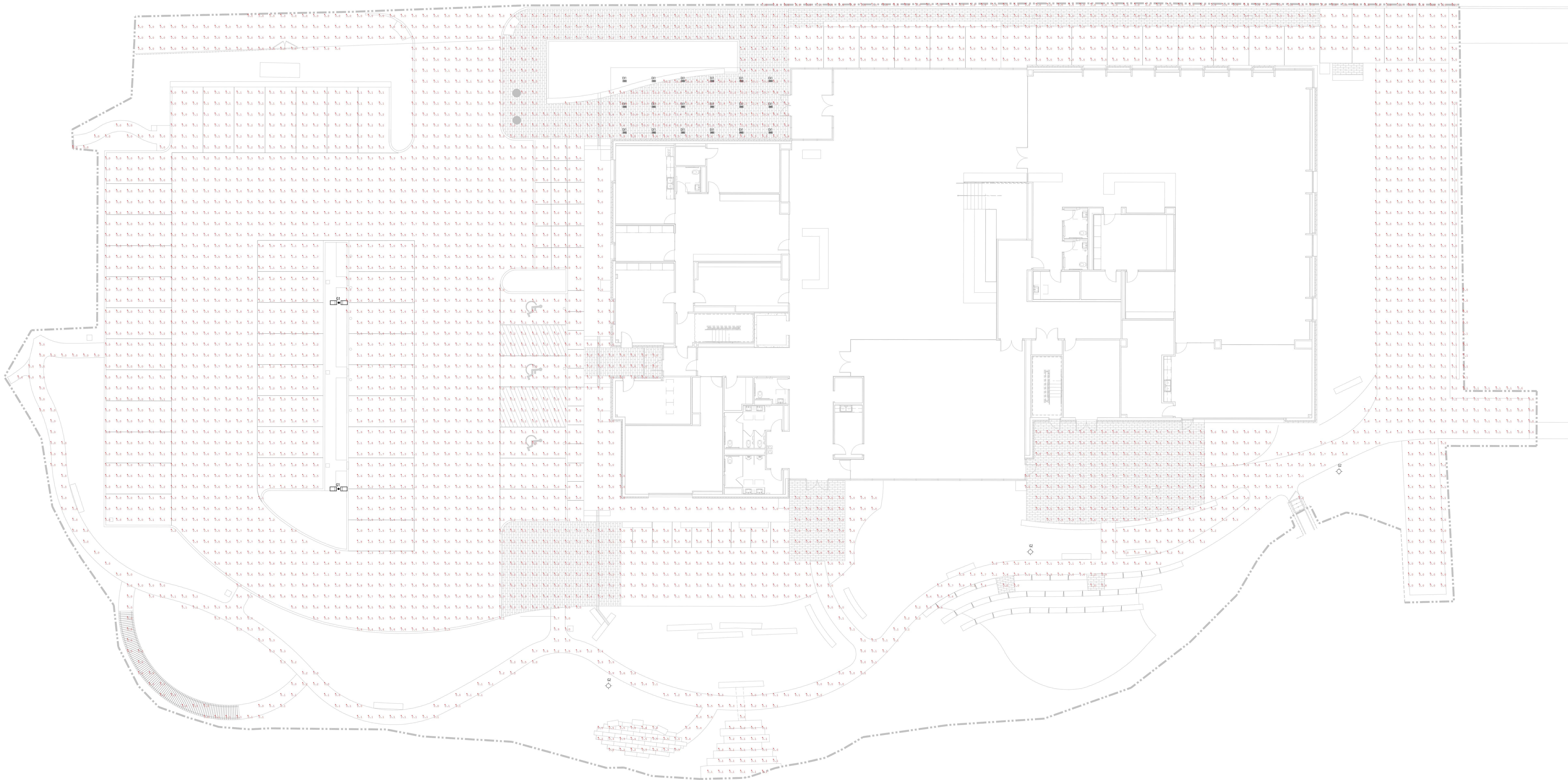
EX1 Soffit Lighting
Lumenwerx Cluster Recessed Linear LED

P:\2022\21236.000 BELMONT PUBLIC LIBRARY\0200 DWG\0200 SITE PHOTOMETRIC LIGHTING PHOTOMETRIC PLANDWG

Disclaimer
Illuminance or luminance calculations are for lighting design aid purposes only. All calculations performed by Horton Lees Brogden Lighting Design have been based on IESNA standards, lighting manufacturers' data and good practice. Some differences between measured values and calculated results may occur due to tolerances in calculation methods, testing procedures, component performance, measurement techniques and field conditions such as voltage and temperature variations. Input data used to generate the calculations such as room dimensions, reflectances, furniture and architectural elements significantly affect the lighting calculations. If the real environment conditions do not match the input data, differences will occur between measured values and calculated values.

Assumed Surface Reflectance:
- Floor: 0.4
- Green Areas: 0.2

Luminaire Schedule			
Tag	Symbol	Label	
G1		Philips Roadstar GPLS #GPLS-16L700NW-G2-R35	Total Watts 38W Total Lamp Lumens 3886lms LLF 0.8
G2		Bega #7172LED-K3-FINISH + 110BHR-FINISH-LED-3000K	44.2W 3230lms 0.8
EX1		Lumenwerk Cluster Recessed Linear #CLUR05-INSTALLATION TYPE MOUNTING-TLMW-INTEGRAL-VOLTAGE-923-D1 (Mounting) + CLUR05-TLMW-SW-SOF-WFL-30-30-TMB-WYP-MDOW (Light)	10.3W 803lms 0.8



A	Date	Description
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Scale	3/32"=1'-0"
Issuance	50% DD
Issued	29 August, 2023



4. ROOFTOP EQUIPMENT NOISE



September 13, 2023

Noel Murphy
Associate
Oudens Ello Architecture, LLC
46 Waltham Street, Suite 4A
Boston, MA 02118

Via Email: noel@oudens-ello.com

Subject: **Community Noise Control Update**
Belmont Public Library
Belmont, MA
Acentech Project No. 636500

Dear Noel:

The following report summarizes the results of our community noise survey conducted June 14 through June 21, 2023, at the Belmont Library project site in Belmont, MA. The results of this survey informed which of the state and local noise ordinances apply to the project, as discussed below (and previously in our Community Noise Site Survey report, dated 6/29/2023). The project rooftop equipment is being selected, and we will review those sound levels to recommend appropriate mitigation measures to meet the applicable noise code.

NOISE CODES

The following noise codes would apply to this project. Due to the nature of the Belmont Noise Code, determining which noise regulation will control for this project is tied to the results of our site noise survey measurements – we discuss this under that section below.

Commonwealth of Massachusetts Noise Policy

The Massachusetts Department of Environmental Protection (MassDEP) policy establishes project noise limits at the property lines based on existing site background sound levels, defined in terms of the 90th percentile A-weighted sound level (LA_{90}). A sound source or facility which causes the background sound level to increase by more than 10 dB is in violation of the MassDEP noise policy. In addition, the MassDEP policy prohibits the creation of a “pure-tone condition”, wherein the sound pressure level in an octave band exceeds the sound pressure level in both adjacent bands by 3 dB or more.

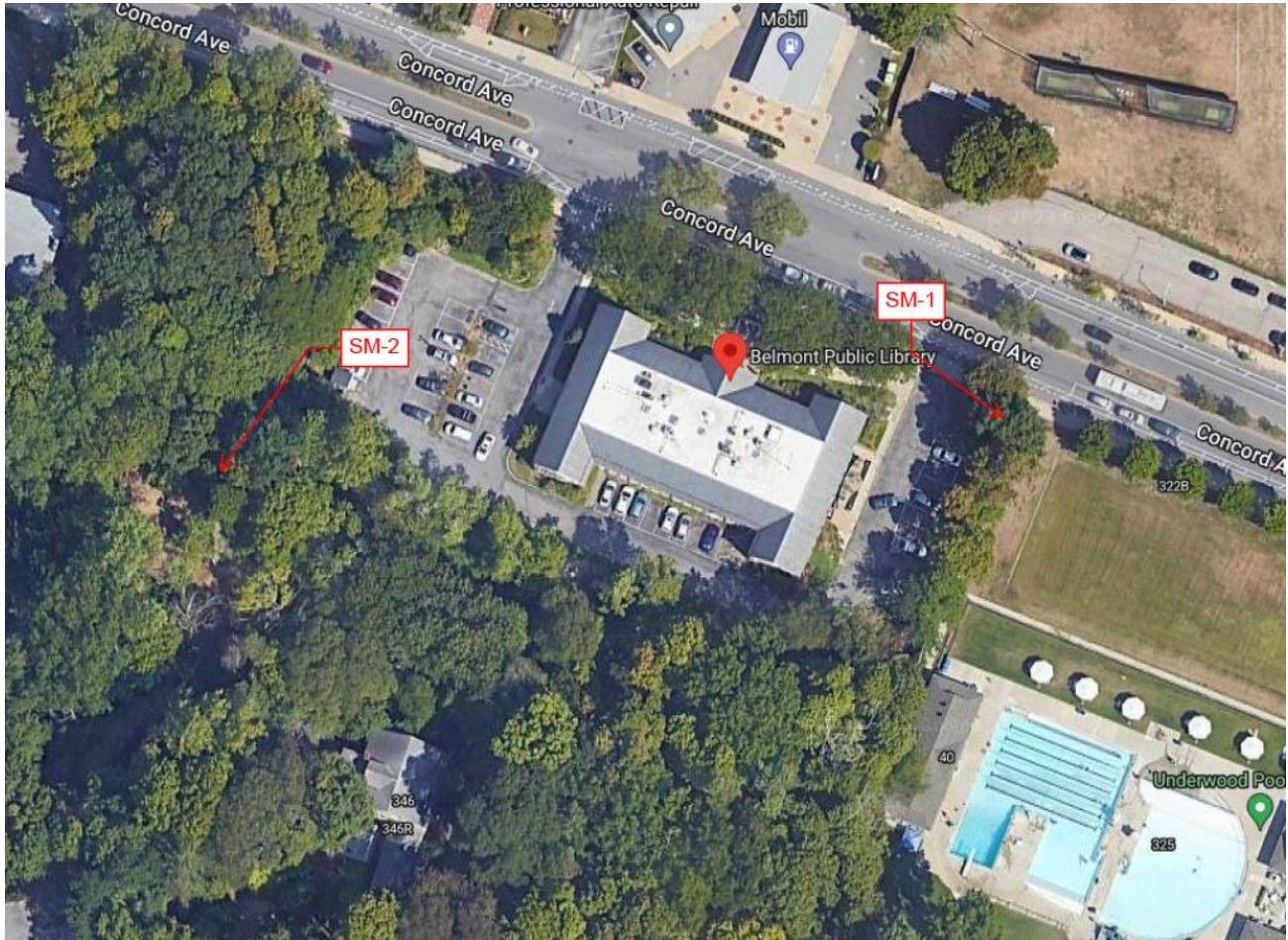
Town of Belmont, MA Noise Code

The town of Belmont, MA noise ordinance requires exterior sound levels not to exceed the **greater** of:

1. Maximum allowable exterior sound levels: 55 dBA during daytime (7am-10pm) and 45 dBA during nighttime (10pm-7am) at Noise Zone 1 properties (residences, school grounds, hospitals and health care institutions, houses of worship, libraries, Cemetery and Open Space Subdistricts); or
2. 5 dB above the background sound level.

SITE NOISE MEASUREMENTS

To quantify the current background noise levels on site, we installed two Type I sound level meters at representative locations around the project site, as shown in the image below.



These meters measured noise levels for a total of seven days, during both weekdays and weekend days, to quantify the quietest hour during this measurement period for both daytime and nighttime hours. Table 1 (below) shows the lowest measured hourly background noise level (LA_{90}) for both locations.

Table 1. Lowest Measured Hourly Background Noise Levels.

Monitor	Lowest Measured Daytime ¹ Hourly LA_{90}	Lowest Measured Nighttime ² Hourly LA_{90}
SM-1	42 dBA	32 dBA
SM-2	37 dBA	29 dBA

¹ Daytime is defined as the hours from 7:00 am to 10:00 pm.

² Nighttime is defined as the hours from 10:00 pm to 7:00 am.

Controlling Noise Regulation

According to the Belmont Noise Code, the maximum allowable Daytime (55 dBA) and Nighttime (45 dBA) limits would apply. However, this would be much more than 10 dB (13 to 18 dB) above the quietest background noise levels measured onsite.

Therefore, the MassDEP noise policy, allowing noise levels at the property line and nearby residences to exceed the background noise level by no more than 10 dB, will control for this project. We have calculated these maximum allowable community noise levels for the project in Table 2 below. We recommend designing with at least a 1-dB safety factor (designing not to exceed 9 dB above the background noise level).

Table 2. Maximum Allowable Noise Levels per MassDEP (the project's controlling noise regulation).

Location near...	Maximum Allowable Community Noise Levels per MassDEP		Maximum Recommended Project Noise Goals (with 1-dB safety factor)	
	Daytime	Nighttime	Daytime	Nighttime
SM-1	52 dBA	42 dBA	51 dBA	41 dBA
SM-2	47 dBA	39 dBA	46 dBA	38 dBA

ROOFTOP EQUIPMENT NOISE MITIGATION

As the project design continues, and rooftop mechanical drawings and equipment selection sound power level data are available for our review, we will review these levels and provide exterior sound mitigation measures (e.g., sound attenuators, noise barriers) as necessary, to meet the MassDEP noise policy. We reviewed the 100% DD selections for the ERU and ACCUs, and the ERU fans are now in the process of being reselected to decrease tonal noise. Included already in the design is an acoustical barrier around the outdoor equipment well, which will be beneficial in blocking some noise from the ERU and ACCUs to the community. We have reviewed the BOD acoustical barrier product (IAC Acoustics Type FS, rated STC 30 and NRC 1.05), and it meets our recommendations.

The design team is attuned to the community noise requirements the project equipment needs to meet, and we will continue to provide our expertise and work with the team to meet those requirements.

* * * * *

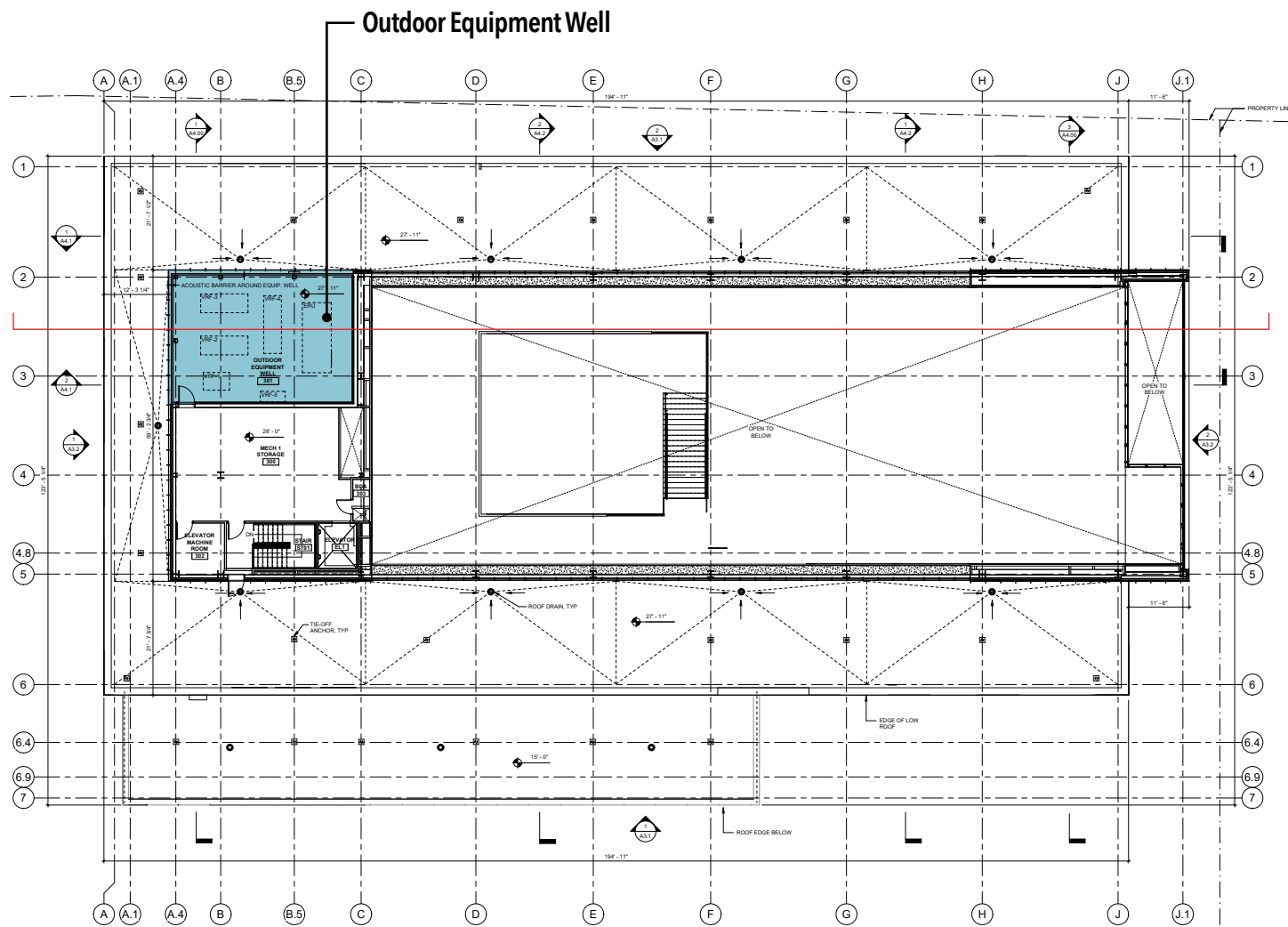
I trust that this letter provides the information you need at this time. Please do not hesitate to contact us to discuss the contents of this report further. I can be reached at 617-499-8061 or kzaman@acentech.com.

Sincerely,

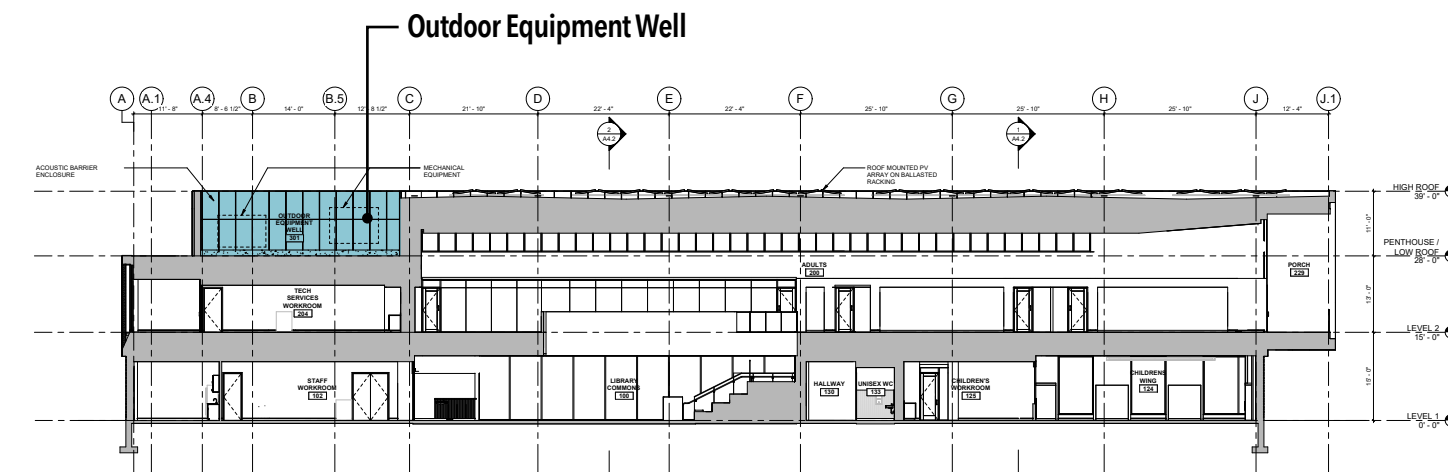


Khaleela Zaman
Senior Consultant

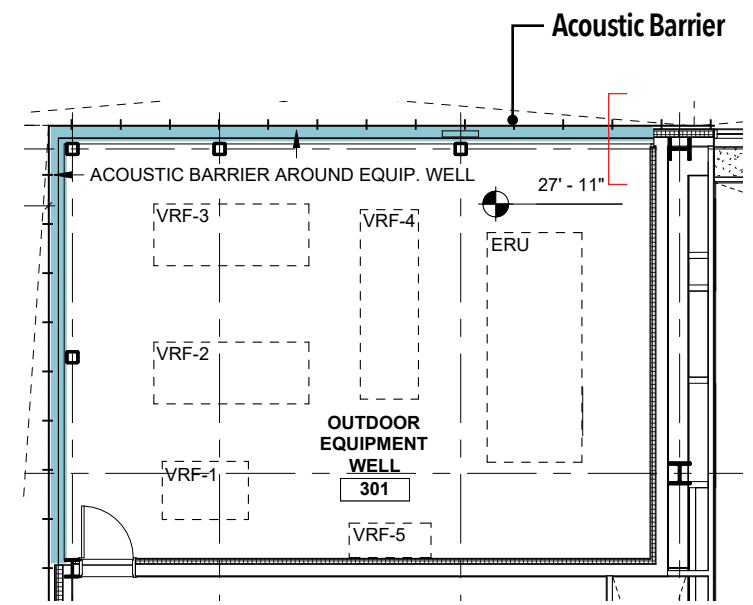
CC: Ben Markham (Acentech)



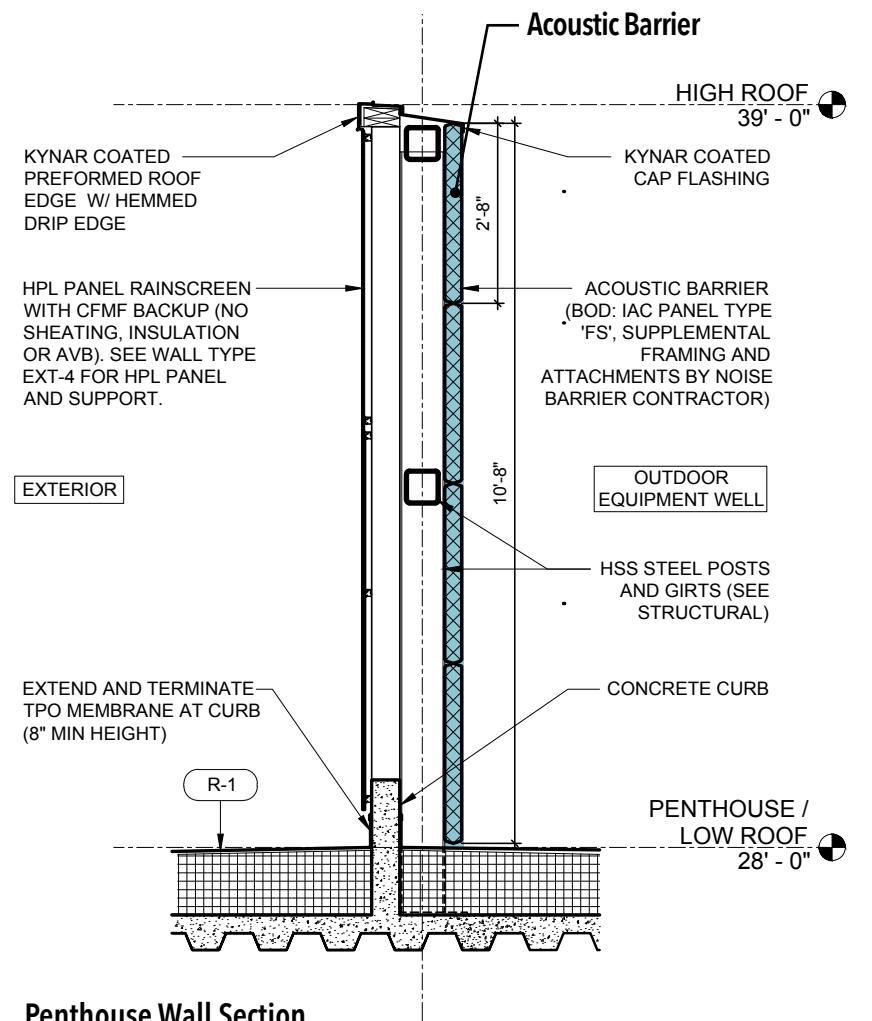
Roof Plan



Building Section



Penthouse Plan



Penthouse Wall Section

IAC Acoustics

Making the World a Quieter Place

Founded on an unrivalled history of engineering with some of the most pioneering discoveries in the industry, the IAC Acoustics brand is synonymous with technological innovation.

From controlling noise at a power station to tuning the sound in a TV or radio studio, IAC Acoustics has had a positive impact on society and helped to shape what can be achieved to make speech more intelligible, music more enjoyable, reduce the impact of industrial noise and protect people's sense of hearing.

The continual success of our products and services over the decades has brought the brand a reputation for quality and reliability among customers, whether they are multinational corporations or independent family businesses. This is supported by the expertise and passion of our workforce, the people behind the products, including designers, engineers and industry specialists.

To face the ever increasing noise reduction demands of the future, we will strive to further enhance our ability to reduce excessive noise. We aim to focus on developing tomorrow's solution today, innovating faster and delivering solutions that meet the requirements of the next generation. In doing so, we will stay true to our key values and founding philosophy to make the world a quieter place.

Acoustic Barriers

A complete range of certified, high performance solid and louvred acoustic barriers to solve a wide variety of environmental noise pollution problems.

- Guaranteed, proven, sound reduction
- Sound absorptive surfaces minimise reflected noise
- Rugged, abuse-resistant, long-lasting steel construction
- Weather resistant and almost maintenance-free
- Wide choice of finishes to blend with individual landscapes

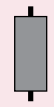
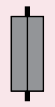
A Complete Range of Barrier Systems

Absorptive

Free standing barrier systems - Type FS and SFS - are sound absorptive on one or both sides, offer excellent sound transmission loss (STL) characteristics and are rapidly assembled from prefabricated components. Panels are simply stacked between steel posts to achieve the desired height.

Louvre Screens

Our range of Noishield™ and Slimshield™ louvres provide highly effective, stylish acoustic screens for mechanical services plant (such as pumps, compressors and chillers) and are particularly suitable when ventilation air must pass freely through the barrier (see the complete range in our acoustic louvres catalogue).

		Type FS	Type SFS	Type C	Type C12	Type C38
Configuration		 127mm Thick	 127mm Thick	 64mm Thick	 76mm Thick	 102mm Thick
Weight (Kg/m²)	Steel	FS/S - 29.9	SFS/S - 36.7	C/S - 9.8	C12/S - 11.2	C38/S - 13.7
	Aluminium	FS/A - 22.0	SFS/A - 25.4	C/A - 5.4	C12/A - 6.8	C38/A - 9.3
Application		Freestanding alongside noisy equipment	Freestanding between multiple noise sources	Apply to new or retrofit existing metal, wood, brick, concrete, stone or other noise-reflecting walls. Select Types C12 & C38 for enhanced 125 Hz sound absorption.		

Applications

- Data Centres
- Suitable for an extensive range of applications including:
- Screening Mechanical Plant such as Generators, Compressors and Chillers
- Roads and Railways
- Car Washes / Drive Thru's
- Aircraft Pens and Airport Boundaries
- Power Stations
- Electricity Transformers
- Factories and other Manufacturing Sites
- Loading Bays
- Railways





Acoustic Performance

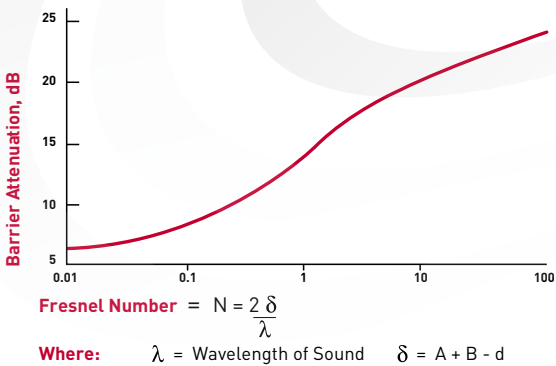
All IAC Acoustics Noishield™ barriers offer exceptional transmission loss characteristics and incorporate proven, sound absorbing materials which prevent noise reflections. Detailed, laboratory-tested acoustic ratings for free standing barriers appear in the table below.



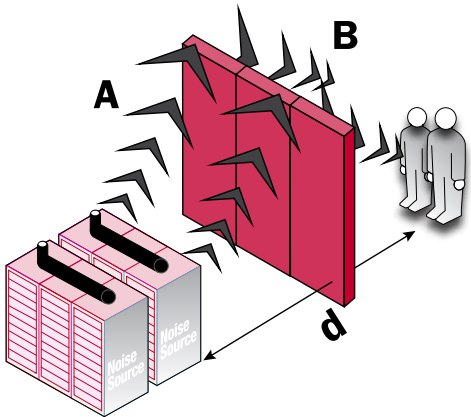
Free-standing Solid Barriers

Barrier Attenuation

Theoretical attenuation, provided by solid barriers, is shown on the graph below. In practice, the maximum barrier attenuation cannot be greater than the barrier's sound transmission loss (STL).



Sound absorptive surfaces reduce reverberant build-up between parallel barriers and other reflective surfaces and increase the ability of barriers to attenuate noise.



Sound Transmission Loss Data, dB

1/3 Octave Band Centre Frequency, Hz	125	250	500	1k	2k	4k	8k	STC
FS/S and SFS/S	21	34	40	33	32	26	37	30
FSt/S	24	38	40	41	35	29	34	33
FS/A and SFS/A	21	32	37	30	37	28	30	31

Sound Absorptive Coefficients

1/3 Octave Band Centre Frequency, Hz	125	250	500	1k	2k	4k	8k	NRC
FS/S FS/A & FSt/S	1.12	1.12	1.10	1.01	0.89	0.76	0.57	1.05
SFS/S & SFS/A	0.49	1.04	1.14	1.05	0.96	0.95	0.87	1.05
C/S & C/A	0.30	1.05	1.07	1.01	0.96	0.88	0.78	1.00
C12/S & C12/A	0.48	1.08	1.10	0.99	0.92	0.83	0.78	1.00
C38/S & C38/A	0.68	1.19	1.10	1.03	0.90	0.81	0.76	1.05

All data in accordance with ISO standard 354, ASTM C 423 and E 413 with 11.15m² test sample in 262m³ reverberation room. Coefficients greater than 1.0 result from edge diffraction effects. Do not use sound absorption values greater than 0.95.

Acoustic Barriers

Installation & Maintenance

We offer a full design, delivery and installation service, which can also include all necessary structural steelwork. Barriers can be erected by IAC's own, trained personnel. Alternatively, they can be installed by others (contractors, end users etc), preferably under the supervision of an IAC Acoustics engineer.

All IAC Acoustics barriers have guaranteed, rust-proof finishes. Periodic cleaning can be undertaken using water/mild detergent. More stubborn stains and graffiti can be removed using harsher cleaning chemicals, though we only recommend these are applied to Polyester Powder Coated (PPC) surfaces.

Finishes

IAC Acoustics Noishield™ barriers are available in a wide range of standard finishes and colours. These include:

- Galvanised Steel
- Aluminium
- Polyester Powder Coating (PPC)
- Vinyl Coated Steel

Special, optional finishes are also available. For example, barriers can be faced with brick, stone, wood, slate and other materials.

Features & Benefits

- Proven, certified, sound transmission loss (noise reduction)
- Sound absorption to minimise reflected sound
- Tough, abuse-resistant steel/aluminium construction
- Weather-resistant, rust-proof, durable finishes which blend sympathetically with the surrounding landscape
- Very low maintenance and easy to clean
- Assembled from prefabricated components for fast on-site installation
- Structural steelwork included on request



Applications

IAC Acoustics Noishield™ barrier systems give communities effective protection from a large range of noise pollution sources.

These include:

- Utilities: Power Stations, Electricity Transformers, Gas Regulator Centres, Water Pumping Stations
- Transport: Railways, Roads and Airports
- Mechanical Plant: Generators, Compressors, Pumps, Motors and Chillers
- Manufacturing and Distribution: Factories and other Industrial Facilities, Loading/Unloading Bays, Building Construction Sites