

Burlington Development Review Board

Department of Permitting & Inspections
645 Pine Street
Burlington, VT 05401
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BURLINGTON DEVELOPMENT REVIEW BOARD

Wednesday, July 5, 2023, 5:00 PM

PUBLIC HEARING NOTICE

Remote Meeting

Zoom: <https://us02web.zoom.us/j/83225696227?pwd=SGQ0bTdnS000Wkc3c2J4WWw1dzMxUT09>

Webinar ID: 832 2569 6227

Passcode: 969186

Telephone: US +1 929 205 6099 or +1 301 715 8592 or +1 312 626 6799 or +1 669 900 6833 or
+1 253 215 8782 or +1 346 248 7799

**1. ZAP-23-7; 16 South Winooski Avenue (FD5, Ward 8E) Ronald McDonald House Charities /
Kristine Bickford**

Appeal of zoning administrative denial (ZPF-23-27) to replace existing fence with six-foot-high fence.

Plans may be viewed upon request by contacting the Department of Permitting & Inspections between the hours of 8:00 a.m. and 4:30 p.m. Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Zoning office is considered public and cannot be kept confidential. This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/dpi/dr/ agendas or the office notice board, one week before the hearing for the order in which items will be heard.

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status, crime victim status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at (802) 540-2505.

Department of Permitting and Inspections

Zoning Division

645 Pine Street

Burlington, VT 05401

<http://www.burlingtonvt.gov/PZ/>

Telephone: (802) 865-7188

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William Ward, Director
Theodore Miles, Code Compliance Officer
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Planning Technician
Ted Boylan, Permit Administrator



MEMORANDUM

To: Development Review Board

From: Mary O'Neil, AICP, Principal Planner

Date: June 6, 2023, continued July 5, 2023.

RE: ZP-23-205; 655 Spear Street

Note: These are staff comments only. Decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

File: ZP-23-205

Location: 655 Spear Street

Zone: I **Ward:** 6S

Parking District: Shared Use

Date application accepted: May 2, 2023

Application revised: May 26, 2023 and June 16, 2023

Applicant/ Owner: Claire Forbes / UVM

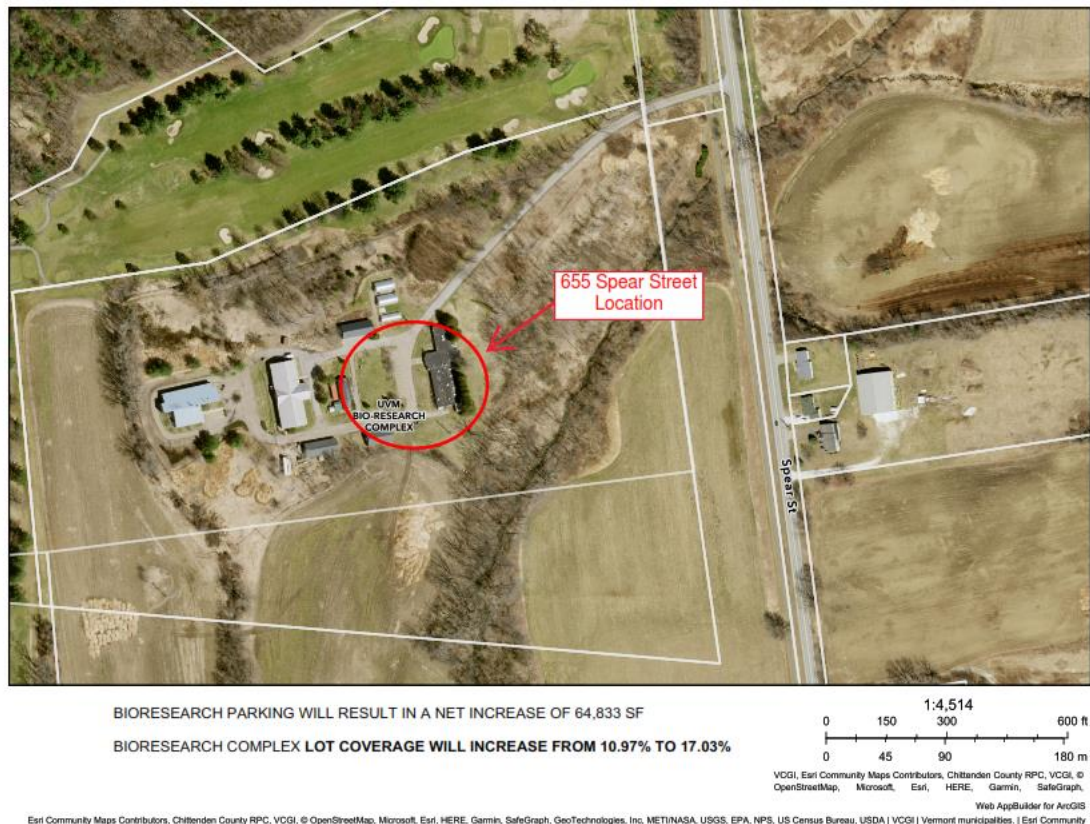
Request: Proposed construction of a parking lot (155 spaces, 10 of them for buses) with shed following the demolition and removal of the BioResearch Laboratory building. Parking waiver request withdrawn.

Background:

- **Zoning Permit 23-27;** Demolition, removal, and disposal of UVM's BioResearch Laboratory building. Site to be seeded and a silt fence installed to protect wetland buffer. February 2023.
- **Zoning Permit 96-446;** Installation of two 25'X 48'X 9' Greenhouses immediately to the north of the existing greenhouse for research and experimental purposes. April 1996.
- **Zoning Permit 93-014** Relocation of 18'X 48' (9' High) greenhouse from the Hills Science building to the Bio-Research complex near the Entomology Lab. July 1992.

Overview: The University of Vermont (UVM) is proposing the construction of a parking lot (now 155 spaces) at 655 Spear Street following the demolition and removal of the BioResearch Laboratory Building. A shed has been included to protect new electrical switchboard with bollards. The project will also include landscape improvements, a bioretention area, and a dry pond. This parking lot expansion was included in the approved Joint Institutional Parking

655 Spear Street, BioResearch Complex Parking Lot Location Map



Management Plan (JIPMP) that expired June 1, 2023, and is reflected in the current 2023-2028 proposal. The new parking area will contain spaces for buses (10), electric and motor vehicles. UVM is working to consolidate and create a campus-wide shared fleet program across departments as well as transition to an alternatively fueled fleet (primarily by electrification).

The BioResearch Complex site will help UVM reduce greenhouse gas emissions associated with the UVM fleet. Additionally, this parking lot will allow UVM more flexibility for campus-wide shared parking with the University of Vermont Medical Center, and the lot will create flexibility to keep transportation demand away from high-use city corridors, such as Pine Street, where UVM currently leases a parking lot. The project is expected to have minimal impacts to peak hour traffic along Spear Street, as the majority of employees accessing the fleet vehicles work from the hours of 7 am – 3:30 pm. Bike parking will be provided on site (the bike path

along Spear Street provides access from Main Campus.) UVM will be expanding its CATSride service (on-demand shuttle), to encompass the 7am – 3:30 schedule to collect any workers from public transport/carpool endpoints on UVM’s campus.

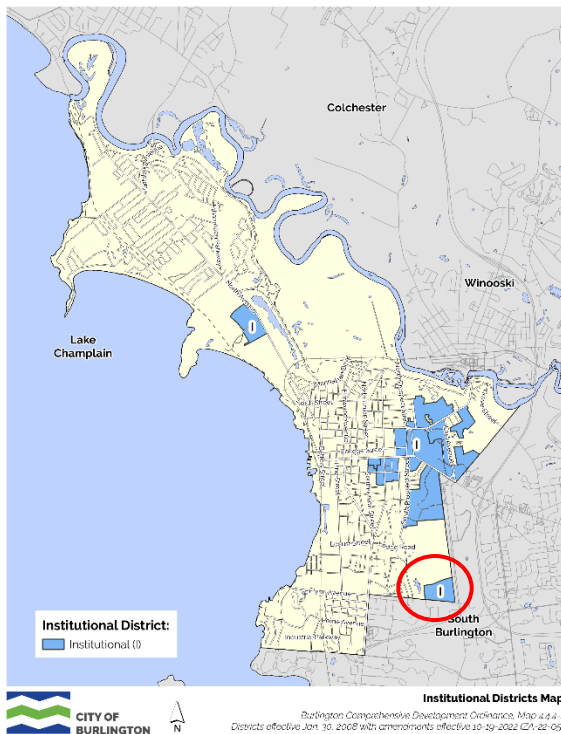
Recommended motion: Certificate of Appropriateness Approval, per the following Findings and Conditions:

I. Findings

Article 4: Zoning Maps and Districts
Sec. 4.4.4 Institutional District

(a)Purpose:

*The **Institutional District (I)** as illustrated in Map 4.4.4-1 allows for increased development scale and intensity than would typically be found in the adjacent residential districts to support continued growth and flexibility of the city’s major public and higher education and health care institutions within their respective institutional missions. New development is intended to be sensitive the historic development pattern of the existing campuses as well as the surrounding residential neighborhoods.*



This district is intended to support a broad range of related uses reflecting the resident institutions’ roles as either regional education, health care, cultural and research centers or municipal educational facilities. Buildings should be designed with a high level of architectural detailing to provide visual interest and create enjoyable, human-scale spaces. Sensitive transitions between adjacent lower scale residential and open space areas and larger scale institutional development should be provided. Sites should be designed to be pedestrian friendly and encourage walking between buildings. Where parking is provided onsite, it is intended to be hidden behind, to the side, within, or underneath structures.

(b) Dimensional Standards and Density:

The density and intensity of development, dimensions of building lots, the heights of buildings and their setbacks from property boundary lines, and the limits on lot coverage shall be governed by the following standards:

Table 4.4.4 -1 Dimensional Standards and Density

Districts	Max. Intensity	Max. Lot Coverage ¹	Building Setbacks ¹ (feet)			Max. Height ¹ (feet)
			Front ²	Side ³	Rear ³	
Institutional	20 du/ac (24 du/acre with inclusionary req.)	40% (48% with inclusionary req.)	<u>Minimum:</u> 15-feet	10% of lot width <u>Min:</u> 5-ft <u>Max required:</u> 20-feet	25% of lot depth <u>Min:</u> 20-feet <u>Max required:</u> 75-feet	35'
655 Spear Street Application	n/a	10.97% existing 15.42% proposed	<u>n/a</u>	The parking lot exceeds 5' from any property line.	n/a	Shed is approx.. 12' in height; < 35' max.

1 –Measurement of and exceptions to coverage, setback and height standards are found in Art 5.

2 –The calculation of the front yard setback shall be a percentage of lot width and depth or as defined and described in Art 5.

3 – Maximum allowable lot coverage, setbacks and building height in portions of this district may be modified by the provisions of the Institutional Core Campus Overlays in Sec. 4.5.2, where applicable.

Affirmative finding.

(c) Permitted and Conditional Uses:

The principal land uses that may be permitted, or conditionally permitted pursuant to the requirements of Article 3, within the Institutional district shall be as defined in Appendix A – Use Table and as modified by provisions of the Institutional Core Campus Overlays in Sec. 4.5.2 where applicable.

The proposed addition of a large parking area is accessory to the existing institutional use. This location is not within any of the ICC (Institutional Core Campus) overlay districts. **Affirmative finding.**

Article 5: Citywide General Regulations

Section 5.2.1 Existing Small Lots.

Not applicable.

Section 5.2.2 Required Frontage or Access

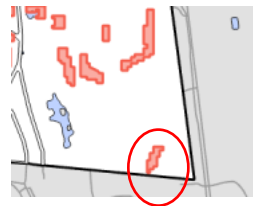
No changes are proposed to access. Not applicable.

Section 5.2.3 Lot Coverage Requirements

See Table 4.4.4 -1, above.

Section 5.2.4 Buildable Area Calculation & Steep Slopes

Buildable Area is not applicable for this parcel.



There is a portion of the parcel that is identified as having Steep Slopes, however it is outside this area of development. **Affirmative finding.**

Section 5.2.5 Setbacks

The new parking area exceeds the minimum 5' setback from any property line. (Section 5.2.5 (b) 5.) **Affirmative finding.**

Section 5.2.6 Building Height Limits

The proposed shed will not exceed the maximum allowable height limit. **Affirmative finding.**

Section 5.2.7 Density and Intensity of Development Calculations

Not applicable.

Part 3: Non Conformities

Not applicable.

Sec. 5.4.8 Historic Buildings and Sites

Not applicable.

Article 6: Development Review

Part 1: Land Division Design Standards

No land division is proposed. Not applicable.

Part 2: Site Plan Design Standards

Sec. 6.2.2 Review Standards

(a)Protection of Important Natural Features:

The site is relatively flat and drains overland to the south towards an existing drainage swale which outlets to an open meadow south of the project, and also drains overland to the east towards an abutting Class II wetland. The project will protect the existing Class II wetland and

wetland buffer based on consultation with a wetland specialist, Arrowwood Environmental, and will also install a silt fence for erosion control during construction and permanent buffer demarcation via boulders. **Affirmative finding.**

(b) Topographical Alterations:

Generalized site work is proposed; reference is made to Plan C 1.0 (Civil) for details. An Erosion Prevention and Sediment Control Plan is required; approval by the Stormwater Program engineer a condition of approval. **Affirmative finding as conditioned.**

(c) Protection of Important Public Views:

Not applicable.

(d) Protection of Important Cultural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Archeological sites likely to yield information important to the city's or the region's pre-history or history shall be evaluated, documented, and avoided whenever feasible. Where the proposed development involves sites listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8(b).

Not applicable.

(e) Supporting the Use of Renewable Energy Resources:

Not applicable.

(f) Brownfield Sites:

Not applicable.

(g) Provide for nature's events:

Special attention shall be accorded to stormwater runoff so that neighboring properties and/or the public stormwater drainage system are not adversely affected. All development and site disturbance shall follow applicable city and state erosion and stormwater management guidelines in accordance with the requirements of Art 5, Sec 5.5.3.

The plans include installation of Silt fence and barrier fencing to protect the adjacent wetland buffer. An EPSC plan has been prepared and provided to the Stormwater Engineering program for review. **Affirmative finding as conditioned.**

Design features which address the effects of rain, snow, and ice at building entrances, and to provisions for snow and ice removal or storage from circulation areas shall also be incorporated.

The shed will be protected by bollards to prevent any damage during snow plowing events. **Affirmative finding.**



(h) Building Location and Orientation:

A shed has been included on the interior of the parking area to protect new electrical switchboard. It will be protected with bollards. The site really has no visibility from any public right-of-way.

Affirmative finding.

(i) Vehicular Access:

No change to existing. **Affirmative finding.**

(j) Pedestrian Access:

The new parking lot provides connections to existing buildings. **Affirmative finding.**

(k) Accessibility for the Handicapped:

The new parking lot is intended primarily for fleet vehicles (busses, EV spaces) as well as accommodations for on-site staff. Revisions were made to the site plan to account for ADA. Any requirements towards ADA is under the jurisdiction of the building official. **Affirmative finding as conditioned.**

(l) Parking and Circulation:

The new parking area is accessed from the existing Bioresearch Drive. See Plan C 1.0.

To the extent possible, parking should be placed at the side or rear of the lot and screened from view from surrounding properties and adjacent public rights of ways.

The proposed parking area is significantly inside the site; outside the viewscape of any public rights-of-way or surrounding properties.

Surface parking and maneuvering areas should be shaded in an effort to reduce their effect on the local microclimate, air quality, and stormwater runoff with an objective of shading at least 30% of the parking lot. Shading should be distributed throughout the parking area to the greatest extent practical, including within the interior depending on the configuration. New or substantially improved parking areas with 15 or more parking spaces shall include a minimum of 1 shade tree per 5 parking spaces with a minimum caliper size of 2.5-3" at planting. Up to a 30% waiver of the tree planting requirement may be granted by the development review board if it is found that the standard requirement would provide impractical given physical site constraints and required compliance with minimum parking requirements. All new shade trees shall be of a species appropriate for such planting environments, expected to provide a mature canopy of no less than 25' in diameter, and selected from an approved list maintained by the city arborist. Existing trees retained within 25' of the perimeter of the parking area (including public street trees), and with a minimum caliper size greater than 3" may be counted towards the new tree planting requirement.

31 new Honeylocust trees will be planted in the parking islands and around the parking lot. This tree was chosen because it is exceptionally salt tolerant, it can grow quickly yet has a strong branch structure (per the application) that would be advisable if the trees tower over parked cars, and it tolerates wet areas.

Plan L1.1 has been revised to reflect the required tree planting (see calculation at right). Two additional trees have been added to eliminate the earlier request for a tree planting waiver. Parking lot shading continues to exceed the 30% requirement.

Affirmative finding.

(m) Landscaping and Fences:

Reference is made to Plans L 1.0 and L 1.1. The proposed caliper size is compliant with the standards. The application includes installation of a silt fence for erosion control during construction and permanent buffer demarcation with boulders. **Affirmative finding.**

Shade Calculations

Total new parking area = 64,600 SF
30% of new parking area ($64,600 \times .3$) = 19,380 SF
Total area shaded* by new tree planting = 18,296 SF
Total area shaded* by existing building = 1,461 SF
Total parking area shaded ($18,296 + 1,461$) = 19,757 SF

Shaded area provided > 30% total new parking area

**Shade analysis and calculations based on SketchUpPro shade analysis modeling assuming conditions on 12/21 at 12:00 noon.*

Tree Planting Requirements

Total new parking spaces = 155
Required 1 tree for every 5 parking spaces ($155/5 = 31$ trees)
Tree plantings provided = 31 new trees
Existing trees preserved = 2 existing trees
Total tree count = 33 trees

(n) Public Plazas and Open Space:

Not applicable.

(o) Outdoor Lighting:

Where exterior lighting is proposed the applicant shall meet the lighting performance standards as per Sec 5.5.2.

The application includes fixture information and a photometric plan. Light fixtures do not exceed the 25' maximum; parking lot lighting is reported within the photometric to conform to the 4.0 fc maximum. **Affirmative finding.**

(p) Integrate infrastructure into the design:

Not applicable.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

Not applicable.

Article 8: Parking

There are no longer any minimum parking standards per Zoning Amendment ZA22-07.

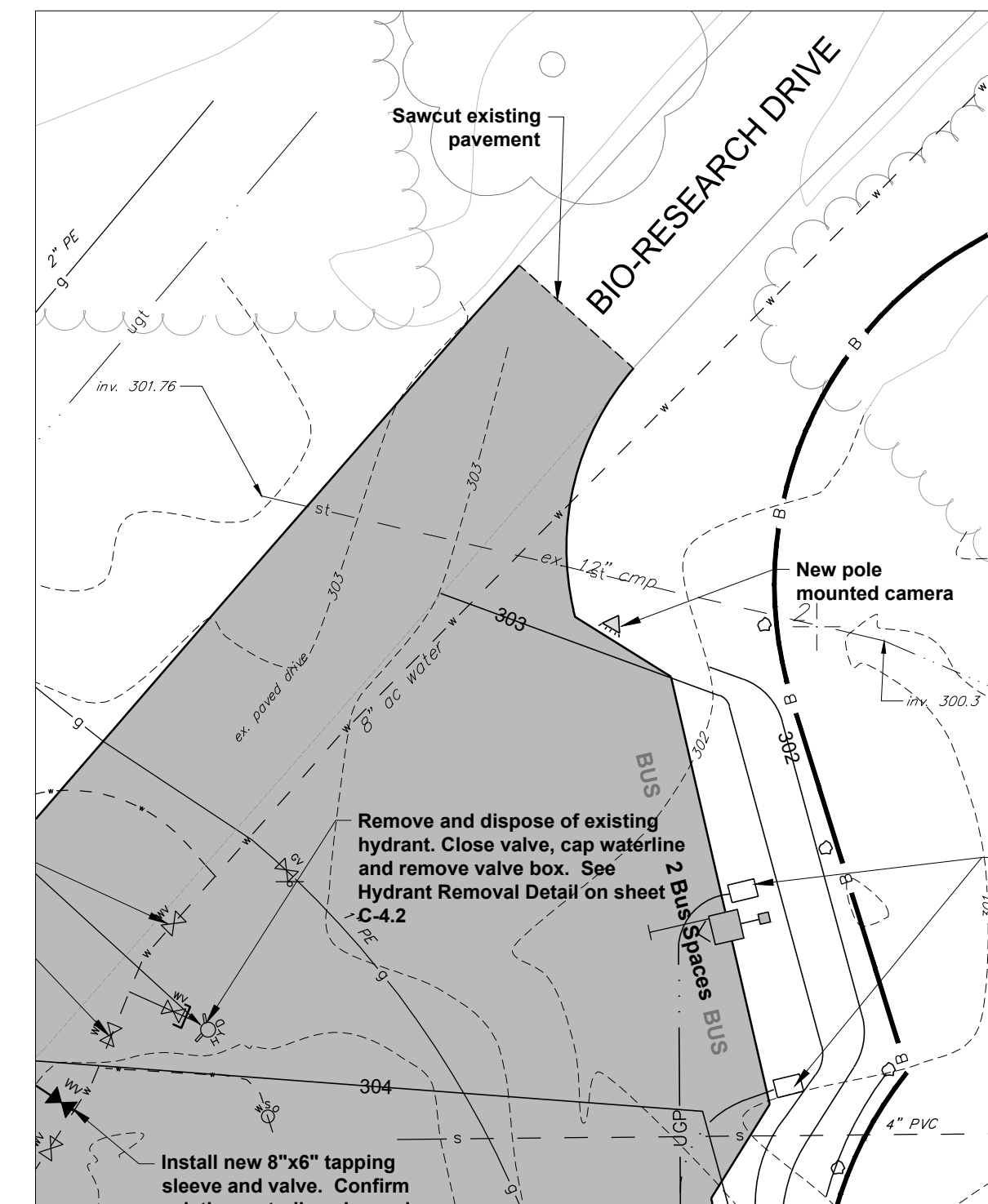
This newly proposed parking area has been included within the prior approved Joint Institutional Parking Management Plan, and the current 2023-2028 proposal currently before the DRB. Parking spaces provided within this application are reflected in that plan.

Affirmative finding.

II. Conditions of Approval

1. Any requirements relative to compliance with ADA standards are under the jurisdiction of the building official.
2. An Erosion Prevention and Sediment Control and Stormwater Plan shall be submitted and is subject to review and approval by the Stormwater Engineer **prior to release of the zoning permit.**
3. This parking area is included within the prior adopted Joint Institutional Parking Management Plan, and the current proposal under review by the Development Review Board.
4. Standard Permit Conditions 1-15.

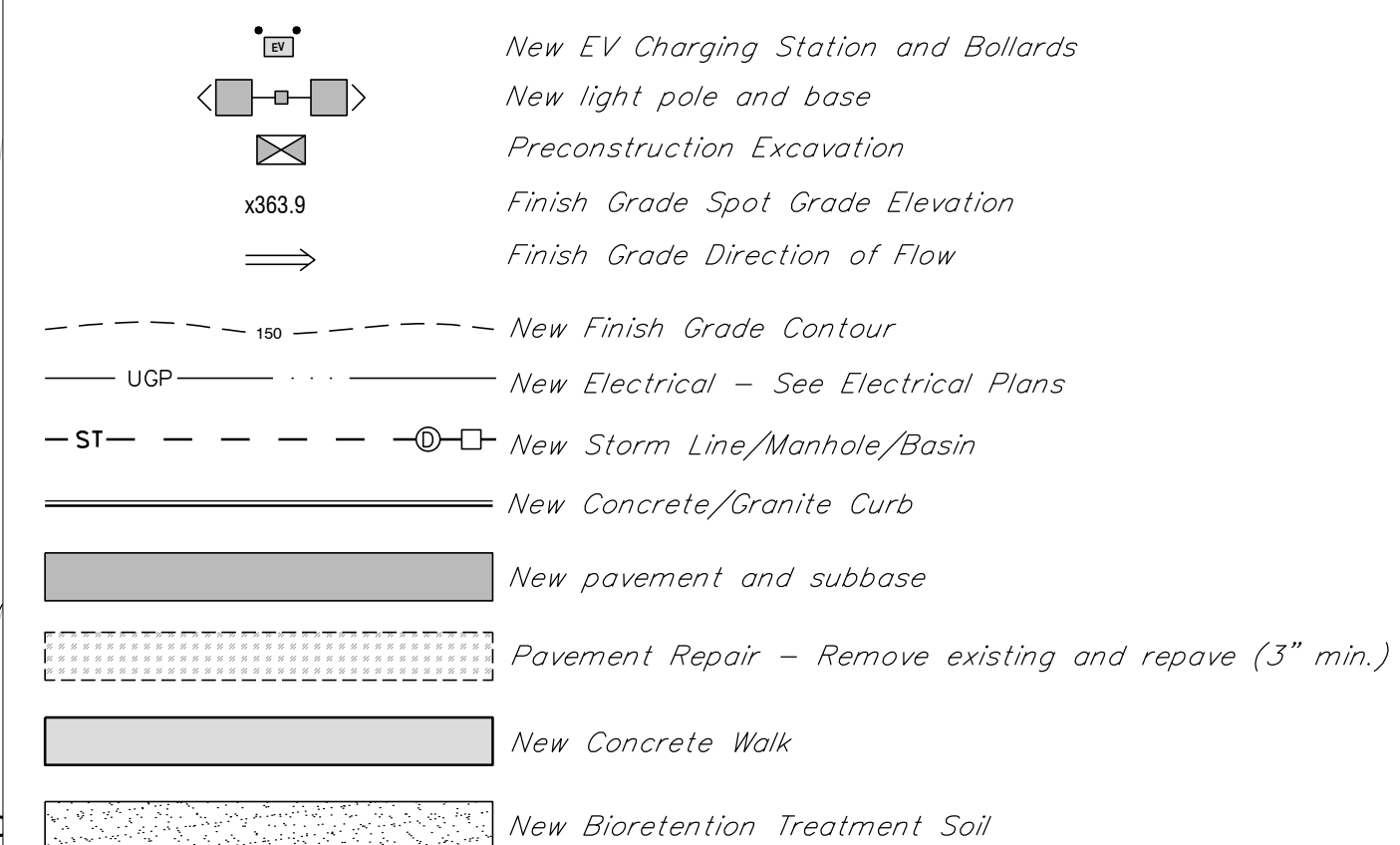
NOTE: These are staff comments only. The Development Review Board, who may approve, table, modify, or deny projects, makes decisions.

[illegible]

INSET A-A

1. The Contractor shall be responsible for repairing all disturbed areas back to original or better condition, including but not limited to curbing, sidewalks, road, parking areas, landscaping, site lighting, electrical, and etc. All asphalt shall be sawcut prior to paving.
2. All dumps, rock, and other non-approved trench backfill material discovered during construction is the exclusive property of the Contractor and shall be removed from UVM property and disposed of in a State approved disposal location. All existing soils reused for fill or trench backfill shall conform to all applicable sections of VTTRANS specifications Section 203-Excavation & Embankments. Fill soils that do not pass a subgrade proof roll shall be removed and replaced at the Contractor's expense.
3. All passing concrete and soil (sieve, proctor, and compaction) testing expenses shall be paid by Owner. Testing coordination, all other required testing, and expenses for failed tests shall be the Contractor's responsibility.
4. The Contractor shall contact the Burlington Electric Department prior to any work in the vicinity of the existing electric conduits.
5. This project requires coverage under the City of Burlington Standard Erosion Prevention & Sediment Control Permit. The Contractor shall be the On-site Coordinator for the project and shall be responsible for all required inspections, maintenance, and reporting. The Contractor shall be responsible for installing, maintaining and removing all erosion and sediment control devices shown on the plans or details and, to the maximum extent practical, to minimize potential contamination of stormwater runoff from the construction activities.
6. Contractor shall be responsible for all "As-built" measurement and drafting requirements as outlined on the Detail Sheets. All trench excavations shall remain open until all as-built survey shots have been taken. Progress Record Drawings shall be submitted to the Engineer as indicated in the Record Drawing specifications. In addition to the survey shots at least two swing-lines (± 1 ft accuracy) shall be provided for each gate valve (new and abandoned), curb stop and end cap.
7. The Contractor shall be responsible for all signage and fencing necessary to providing safe vehicular and pedestrian access through or around the site during construction. Signs shall meet sign requirements on detail sheets.
8. Contractor shall be responsible for importing topsoil as required to complete the project. Refer to Post Construction Soil Depth and Quality Notes on Sheet L-1.0.
9. Temporary groundwater and stormwater by-pass pumping and/or diversion is the responsibility of the Contractor. The Contractor is responsible for providing all necessary pumps and equipment to perform the work. Overnight pumping is not allowed.
10. Where plans indicate "RESTORE" to vegetation, Contractor shall remove and dispose of impervious surface and subsoils (assume 12"). For lawn areas rototill subgrade soil and fill to within 4" of finish grade, place 4" topsoil, and hydroseed. For planting areas, rototill subgrade soil and install 18" of topsoil and 2" of bark mulch (as approved by UVM Grounds). Refer to Post Construction Soil Depth and Quality Notes on Sheet L-1.0.
11. Removal of all erosion control matting and inlet protection is the responsibility of the Contractor.
12. Electrical and lighting lines are shown for coordination purposes. Refer to Electrical plans and specifications for design.
13. Contractor shall be responsible for all effort related to obtaining and closing out an Electrical Permit from the City of Burlington for the new light pole.
14. All water line and appurtenances shall be installed in accordance with the Champlain Water District Specifications and Details for the Installation of Water Lines and Appurtenances, current edition.
15. All gate valve and curb boxes shown on the plans or discovered in the field shall be inspected for condition, access, and operational status. Contact South Burlington Water Department for inspection. Raise gate valve and curb boxes to match new finish grade ($\frac{1}{2}$ " variance from flush, maximum). All curb boxes within the pavement area shall be placed in a gate valve box top cover section.

(See Sheet C-2.0 for existing conditions Legend)

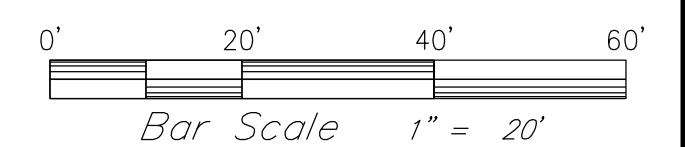
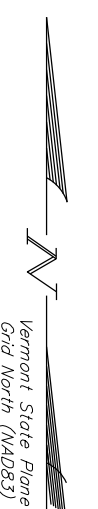


University of Vermont
PLANNING, DESIGN, & CONSTRUCTION
MARSH HALL SUITE 10
31 SPEAR STREET
BURLINGTON, VERMONT 05405



KREBS &
LANSING
CONSULTING ENGINEERS

STAMP:



BIORESEARCH COMPLEX PARKING IMPROVEMENTS

Scale 1" = 20'

Drawn by SLM

Checked by DMR

Date 04/28/2023

Revisions

No.	Date	Description
1	05/25/2023	ADA spaces, EV chargers, switchboard shed
2	06/16/2023	Bike racks

Drawing Title

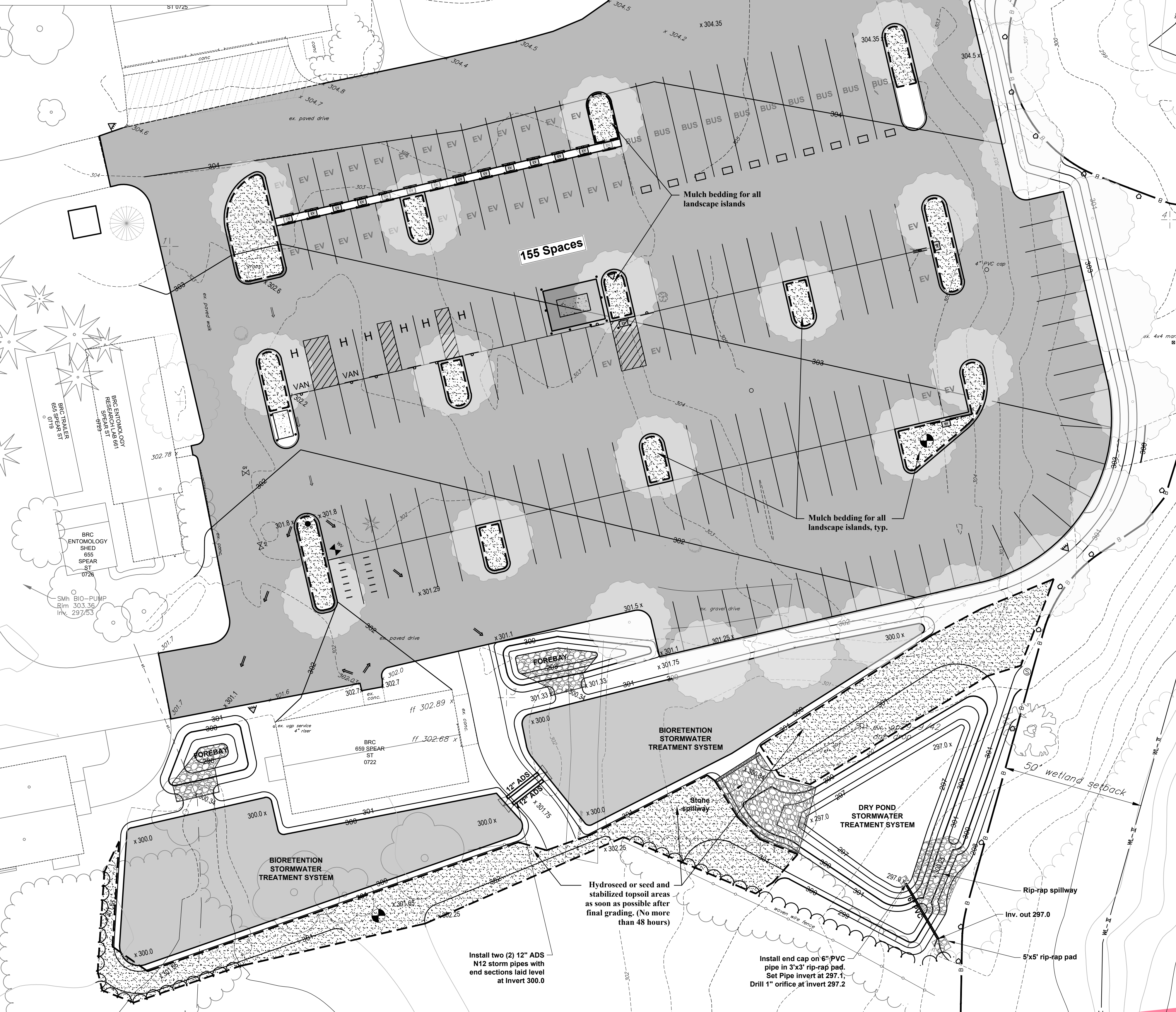
Site Plan

Drawing No.

C-1.0

Soils Restoration Legend

- POST-CONSTRUCTION SOIL DEPTH & QUALITY STANDARD VERIFICATION TEST PIT (MINIMUM 9/ACRE)
- SOILS SUBJECT TO POST-CONSTRUCTION SOIL DEPTH & QUALITY STANDARD
- PROJECT SITE AREA
- SOIL DEPTH AND QUALITY SHALL BE ESTABLISHED TOWARDS THE END OF CONSTRUCTION AND, ONCE ESTABLISHED, BE PROTECTED FROM COMPACTION.
 - THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF THE POST CONSTRUCTION SOIL DEPTH AND QUALITY.
 - VERIFICATION SHALL BE VIA A SAMPLING SCHEME IDENTIFIED ON THIS PLAN THAT INCLUDES 8" DEEP TEST HOLES PER ACRE OF AREA SUBJECT TO THE STANDARD.
 - TEST HOLES SHALL BE EXCAVATED USING ONLY A SHOVEL DRIVEN SOLELY BY THE INSPECTOR'S WEIGHT AND SHALL BE AT LEAST 50 FEET APART FROM EACH OTHER.
 - AFTER THE CONTRACTOR'S VERIFICATION OF THE POST CONSTRUCTION SOIL DEPTH AND QUALITY REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A LETTER CONFIRMING CONFORMANCE WITH THE STORMWATER PERMIT STANDARD.



Post-Construction Soil Depth and Quality Notes

Required Elements:

Soil retention: Retain, in an undisturbed state, the duff layer and native topsoil to the maximum extent practicable.

Soil quality: All areas subject to the Standard shall demonstrate the following:

- A topsoil layer with a minimum organic matter content of 4% dry weight in planting beds and turf areas. The topsoil layer shall have a minimum depth of 5 inches, except where tree roots limit the depth of incorporation of amendments needed to meet the criteria.
- Compost and other materials shall be used that meet the following requirements:
 - The compost or other materials shall have a carbon to nitrogen ratio below 25:1.
 - Compost shall meet the definition of "compost" in the Agency's Solid Waste Management Rules or shall meet the contaminant standards in the Vermont Solid Waste Management Rules §6-1104(g)(6-7), §6-1105(e)(8-9), and §6-1106(e)(7-9). Compost or other organic materials may be amended to meet the foregoing requirements.
 - Exceptional Quality biosolids (EQ biosolids) may be used as a soil amendment, at a maximum proportion of 35% of the total soil volume, and shall be well mixed with existing soil before or during application.
- The resulting soil shall be conducive to the type of vegetation to be established.
- The soil quality requirements shall be met by using one or a combination of the following methods:
 - Option 1: Leave undisturbed native vegetation and soil, and protect from compaction during construction. Failure to establish and maintain exclusionary controls around these areas during the construction phase may trigger the requirement to restore soils per one of the following options.
 - Option 2: Amend existing site topsoil or subsoil in place.
 - Scarify or till subsoils to 4 inches of depth or to depth needed to achieve a total depth of 8 inches of uncompacted soil after calculated amount of amendment is added. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification.
 - Amend soil to meet organic content requirements:
 - PRE-APPROVED RATE: Place 1 inch of composted material with an organic matter content between 40 and 65% and rototill into 3 inches of soil, or
 - CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of soil needed to achieve 4 inches of settled soil at 4% organic content. *Contractor to provide calculation and site sketch indicating areas used for calculations.
 - Rake beds to smooth and remove surface rocks larger than 2 inches in diameter; and
 - Water or roll to compact soil in turf areas to 85% of maximum dry density.
 - Option 3: Remove and stockpile existing topsoil during grading.
 - Stockpile soil on site in a designated controlled area, at least 50 feet from surface waters, wetlands, floodplains, or other critical resource areas;
 - Scarify or till subgrade to a depth of 4 inches. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification;
 - Stockpiled topsoil shall also be amended, if needed, to meet the organic content requirements:
 - PRE-APPROVED RATE: Compost shall be incorporated with an organic matter content between 40 and 65% into the topsoil at a ratio 1:3, or
 - CALCULATED RATE: Incorporate composted material or approved organic material at a calculated rate to achieve 4 inches of settled soil at 4% organic content.*
 - Replace stockpiled topsoil prior to planting, screen topsoil, and;
 - Rake to level, and remove surface rocks larger than 2 inches in diameter.
 - Option 4: Import topsoil mix, or other materials for mixing, including compost, of sufficient organic content and depth.
 - Scarify or till subgrade to a depth of 4 inches. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification;
 - Place 4 inches of imported topsoil mix on surface. The imported topsoil mix shall contain 4% organic matter. Soils used in the mix shall be sand or sandy loam as defined by the USDA; Shop drawing submittal is required. Find USDA sieve for sand and sandy loam.
 - Rake beds to smooth and remove surface rocks larger than 2 inches in diameter; and
 - Water or roll to compact soil in turf areas to 85% of maximum dry density.

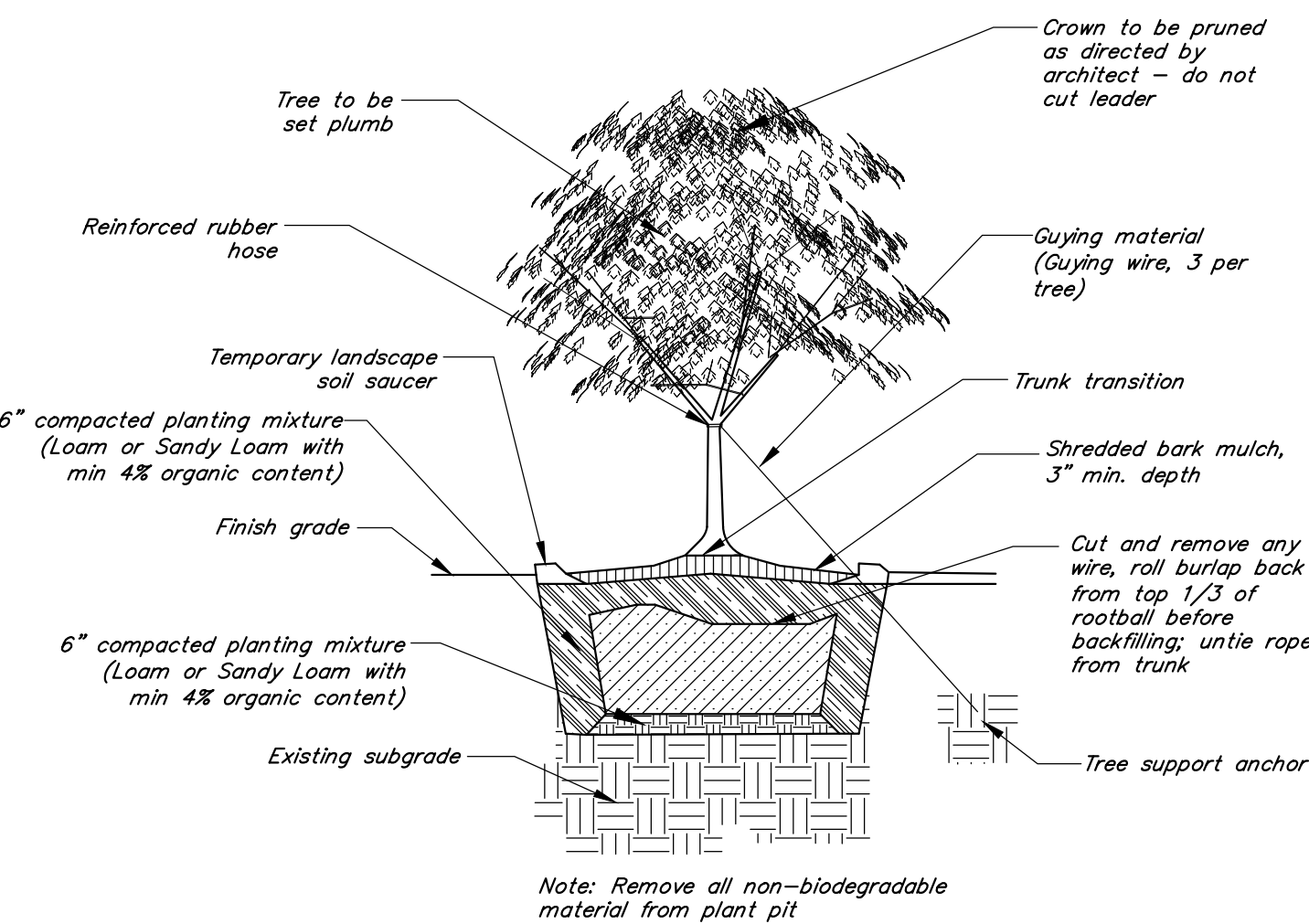
Soil Management:

- Identifies areas on the site subject to the Standard;
- Soil depth and quality shall be established toward the end of construction and once established, protected from compaction, such as from large machinery, vehicle traffic, and from erosion;
- After soil amendments and placement is complete, and prior to seeding and mulching, Contractor shall perform verification sampling in locations indicated on sampling plan. Verification sampling shall include nine, 8 inch deep (min) test holes per acre of area subject to the standard. Test holes shall be excavated using only a shovel driven solely by inspector's weight and shall be at least 50 feet apart from each other.
- A dense and vigorous vegetative cover shall be established over all turf areas.
- At the end of construction the Contractor shall provide the Engineer with a letter indicating that the Post Construction Soil Depth and Quality Standards have been met. This shall include the verification sampling, topsoil depths, and soil modifications.

Tree Planting Requirements

Total new parking spaces = 155
Required 1 tree for every 5 parking spaces (155/5 = 31 trees)
Tree plantings provided = 31 new trees
Existing trees preserved = 2 existing trees
Total tree count = 33 trees

PLANT SCHEDULE					
KEY	QTY.	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
DECIDUOUS TREES					
GT	29	Gleditsia Triacanthos Inermis	THORNLESS HONEYLOCUST	3" CAL	AS SHOWN



Tree Planting in Landscape Detail

N.T.S.



The
UNIVERSITY
of VERMONT
UVM

University of Vermont

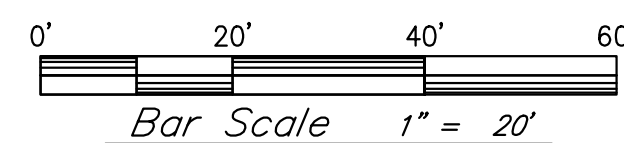
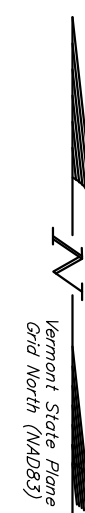
PLANNING, DESIGN, & CONSTRUCTION
MARSH HALL SUITE 10
31 SPEAR STREET
BURLINGTON, VERMONT 05405

Project Manager: Adam Frazier



164 Main Street, Suite 201 P: (802) 878-0375
Colchester, Vermont 05446 www.krebsdanslansing.com

STAMP:



Project:

BIORESEARCH COMPLEX PARKING IMPROVEMENTS

Project No. 22128

Scale 1" = 20'

Drawn by CPG/UBC

Checked by DMR

Date 04/28/2023

Revisions

No.	Date	Description
1	5/22/2023	Revised Post-Con Soil Depth & Quality areas
2	05/25/2023	ADA spaces, EV chargers, switchboard shed
3	06/16/2023	2 new trees; planting requirements, bike racks

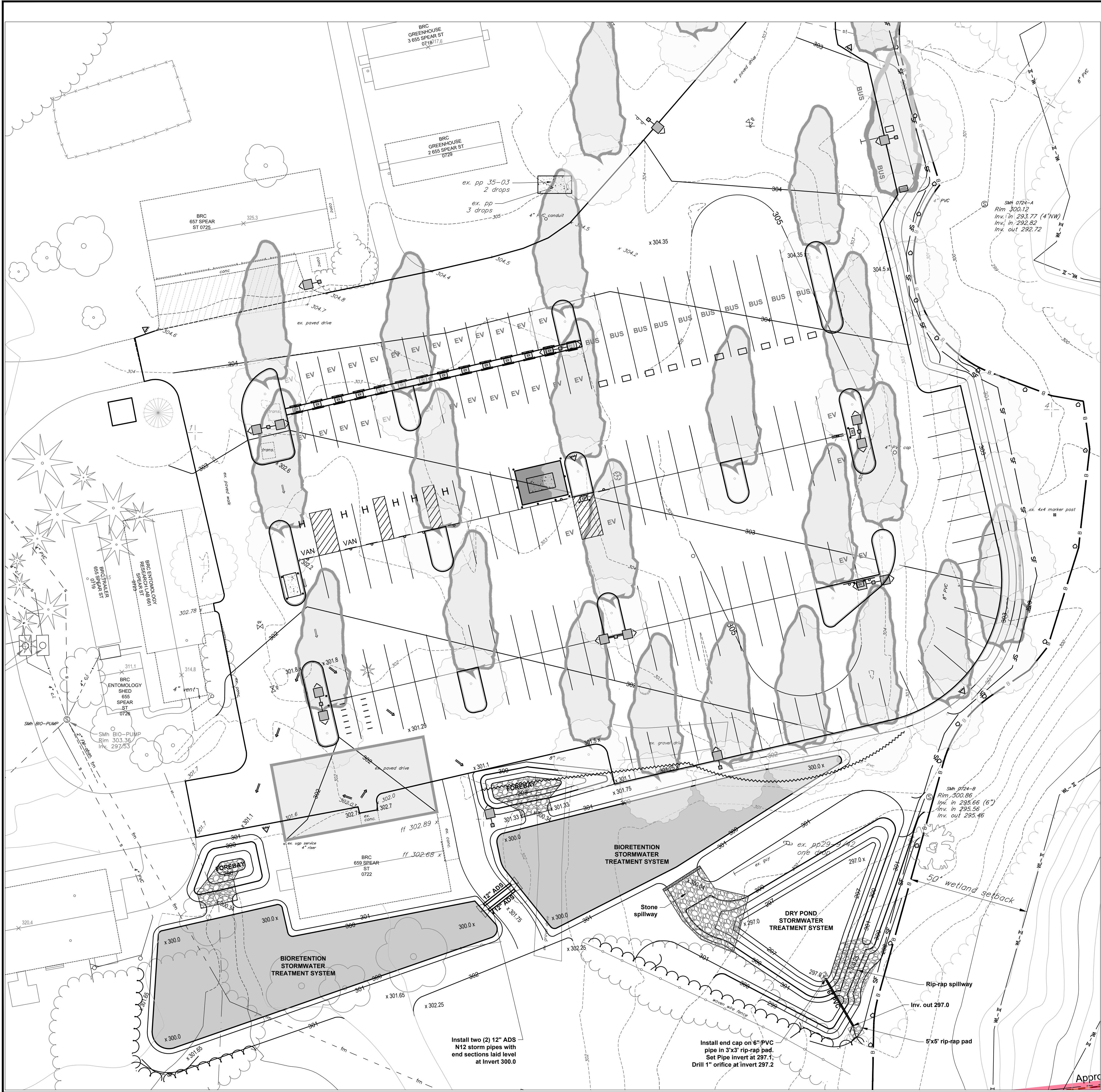
Drawing Title

Landscape and Post-Construction Soil Depth & Quality Plan

Drawing No.

L-1.0

22128\DWGS\UVM Bioresearch Parking.dwg



Shade Calculations

Total new parking area = 64,600 SF
30% of new parking area (64,600 x .3) = 19,380 SF
Total area shaded* by new tree planting = 18,296 SF
Total area shaded* by existing building = 1,461 SF
Total parking area shaded (18,296 + 1,461) = 19,577 SF

Shaded area provided > 30% total new parking area

*Shade analysis and calculations based on SketchUpPro shade analysis modeling assuming conditions on 12/21 at 12:00 noon.

Tree Planting Requirements

Total new parking spaces = 155
Required 1 tree for every 5 parking spaces (155/5 = 31 trees)
Tree plantings provided = 31 new trees
Existing trees preserved = 2 existing trees
Total tree count = 33 trees

PLANT SCHEDULE

KEY	QTY.	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
DECIDUOUS TREES					
GT	29	Gleditsia Triacanthos Inermis	THORNLESS HONEYLOCUST	3" CAL	AS SHOWN



The
UNIVERSITY
of **VERMONT**
UVM

University of Vermont
PLANNING, DESIGN, & CONSTRUCTION
MARSH HALL SUITE 10
31 SPEAR STREET
BURLINGTON, VERMONT 05405

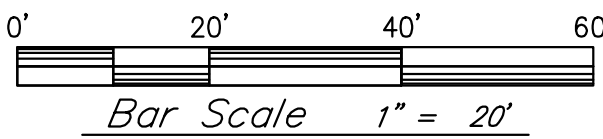
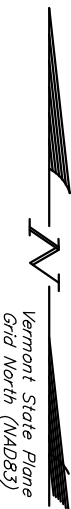
Project Manager: Adam Frazier



**KREBS &
LANSING**
CONSULTING ENGINEERS

164 Main Street, Suite 201 P: (802) 878-0375
Colchester, Vermont 05446 www.krebsandlansing.com

STAMP:



Project:

**BIORESEARCH
COMPLEX
PARKING
IMPROVEMENTS**

Project No. 22128
Scale 1" = 20'
Drawn by CPG
Checked by
Date 04/28/2023

Revisions		
No.	Date	Description
1	05/25/2023	ADA spaces, EV chargers, switchboard shed
2	06/16/2023	2 new trees; planting requirements, bike racks

Drawing Title

Shade Plan

Drawing No.

L-1.1



The University of Vermont
DEPARTMENT of PLANNING, DESIGN
and CONSTRUCTION

June 23, 2023

To:

Zoning Division, City of Burlington Department of Permitting & Inspections
645A Pine Street
PO Box 849
Burlington VT 05402-0849

**Re: University of Vermont (UVM) Zoning Permit Application Supplemental Materials for
BioResearch Parking Lot at 655 Spear Street**

Dear Zoning Division and Development Review Board (DRB),

In response to the DRB's request to provide information regarding a traffic study and how the lot fits within the current Joint Institutional Parking Management Plan (JIPMP), please see the following response:

- UVM is proposing the construction of a 155-space parking lot (130 net new spaces) at 655 Spear Street. The additional parking spaces at this lot will be used for fleet vehicles and buses. As the project will not be creating new campus trips, it will not trigger the 75 peak hour trips and a traffic study is not required (please see attached email from Chris Clow, Transportation Engineer at VTrans). UVM is working to consolidate and create a campus-wide shared fleet program across departments as well as transition to an alternatively fueled fleet (primarily by electrification). The BioResearch Complex site allows for this opportunity, and this will help UVM reduce greenhouse gas emissions associated with the UVM fleet. Additionally, this parking lot will allow UVM more flexibility for campus-wide shared parking with the University of Vermont Medical Center, the opportunity to phase housing development and/or redevelopment, and the lot will also create flexibility to keep transportation demand away from high-use city corridors, such as Pine Street, where UVM currently leases a parking lot. The project is expected to have minimal impacts to peak hour traffic along Spear Street, as the majority of employees accessing the fleet vehicles work from the hours of 7 am – 3:30 pm. Also, bike parking will be provided on site and the bike path along Spear Street provides access from Main Campus. UVM will be expanding its CATSride service (on-demand shuttle), to encompass the 7am – 3:30 schedule to collect any workers from public transport/carpool endpoints on UVM's campus.
- The 2020-2025 JIPMP included this parking lot as a future project, which was the currently approved JIPMP at the time the application was submitted and reviewed (see Table 4-6).

Table 4-6. Future construction plans for UVM with associated changes of building area and parking requirements.

Project Name	Change in Building Area	Associated Change in Parking	Est. Completion
Music Building Recital Hall Addition	4,544	3	2022
New Research Facility for COM ¹	75,000	-121	
Jeffords East Lower Lot	0	67	
University Road (East Ave to Compound)	0	15	
University Heights Road (Southwick)	0	7	
Pomeroy Barn & 172 South Prospect	-6,067	15	
Virtue Field Phase 2	5,000	0	
ADA Code Compliance	0	-20	2024
Blundell	0	5	
Fleming Museum	0	20	
Outing Club Relocation	13,250	5	
Southwick Hall	0	3	
Tarrant (Multi-Purpose) Event Center	119,099	0	2025
Interfaith Center Parking Lot	0	40	
Torrey Hall Addition	2,860	0	
Miscellaneous Parking Adjustments ²		25	Unknown
Bioresearch Complex	0	200	
Future Structured Parking	0	TBD	
Coolidge Hall	-30,510	-10	
Colchester Ave/Dewey	-82,622	-83	
Back 5 & Cottages (Trinity Campus)	-64,907	-243	
Colchester Research Facility ³	0	200	
Total	35,647	128	

¹ New Research Facility for COM has a separate Building Permit but has been approved by the RPR to COM. ² ³

This project is also included in the 2023-2028 JIPMP, that is currently under review. As part of UVM’s Climate Initiatives (p. 28) of the 2023-2028 JIPMP, UVM’s Facilities Sustainability Plan aims to ensure that fleet vehicles are rightsized, shared, and alternatively fueled, which this project allows UVM to do. This objective is also consistent with UVM’s recently completed Comprehensive Sustainability Plan, which includes the goal to increase sustainable commuting to campus by 10% by 2035 from a 2019 baseline. Also, the intent of the Institutional Parking Plans according to Sec. 8.3.1 in the CDO is to “a. Ensure that city streets in nearby neighborhoods are not unfairly burdened by parking demands from post-secondary educational or medical institutions; and, b. Recognize the unique ability of institutions to manage their own parking resources in a comprehensive and creative way.” The JIPMP under consideration, which includes the building of this lot, projects a healthy utilization rate of 90%. This will enable UVM to continue to meet the demands and not unfairly burden nearby neighborhoods. Not building this lot could affect that balance in the future (see Table 13).

Table 13 University of Vermont Future Parking Demand 2028

University of Vermont			
User Group	Number of Potential Users	Peak Parking Demand ¹	
		% of Users	Spaces
Employees ²	4,020	55.4%	2,226
On-Campus Students	6,375	16.8%	1,073
Off-Campus Students ³	7,425	17.8%	1,321
Visitors			185
Fleet ⁴			183
Peak Parking Demand			
Demand Based on Survey			4,988
Total Parking Supply			
Total UVM Managed			5,503
Total UVM + Ground-Lease Spaces			5,882
Net Spaces			
Peak Demand in UVM Managed Spaces			+515
Peak Demand in UVM + Ground-Lease Spaces			+894

The site plan has also been updated to include additional shade trees (31 total). A variance for this requirement is no longer required. Also, bike parking was added to the site plan and as a result the number of parking spaces decreased from 157 spaces to 155 spaces.

Thank you for reviewing this project. Please let us know if there is any further information needed.

Sincerely,

Claire Forbes, AICP

Claire Forbes, AICP
Associate Planner
University of Vermont, Department of Planning, Design & Construction

cc:

Lisa Kingsbury, Associate Director of Planning, Planning, Design & Construction
Luce Hillman, Executive Director of Facilities Management
Adam Frazier, Project Coordinator, Planning, Design & Construction

Claire Forbes (she/her)

Subject: FW: 655 Spear Street - UVM BioResearch Parking Lot

From: Clow, Christopher <Christopher.Clow@vermont.gov>

Sent: Thursday, June 8, 2023 9:55 AM

To: Claire Forbes (she/her) <Claire.Forbes@uvm.edu>

Subject: RE: 655 Spear Street - UVM BioResearch Parking Lot

Good Morning Claire,

VTrans has reviewed the parameters for the UVM proposed parking lot at the BioResearch facility at 655 Spear Street. The lot proposal will create 157 parking spaces with 132 net new spaces for the current building occupants and fleet vehicles. There will be no new UVM employees that will be utilizing this parking lot and there is not a new building proposed at this time.

Based on these parameters, VTrans will not be requiring a traffic impact study. A VTrans traffic impact study or TIS is required when a development is creating over 75 peak hour trips that impact a state road. Since this parking lot addition is to serve the needs of the existing UVM employees and current building occupants of the facility, there are no additional trips being created.

Christopher Clow, PE | Transportation Engineer
Policy, Planning, and Intermodal Development
Development Review and Permitting Services
Vermont Agency of Transportation
219 North Main Street | Barre, VT 05641
802-522-4901 phone | christopher.clow@vermont.gov
<http://www.vtrans.vermont.gov>



Department of Permitting & Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone: (802) 865-7188

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Ted Miles, Code Compliance Officer
Ted Boylan, DPI Administrator



TO: Development Review Board
FROM: Garret King
DATE: July 5, 2023
RE: ZP-23-100; 50 Howard Street

=====

Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: RM Ward: 5S

Owner/Applicant: ROGERS NEST LLC/Luke Clavelle

Request: Renovate historic cottage and convert to a dwelling unit.

Applicable Regulations:

Article 4 (Maps & Districts), Article 5 (Citywide General Standards), Article 6 (Development Review Standards), Article 8 (Parking), Article 11 (Planned Unit Development)

Background Information:

The proposed plan is to renovate and refurbish the cottage on the lot into an individual dwelling unit. Renovation includes new roof, windows, siding, and doors. The building started out as a garage and then was turned into a house/cottage but was then discontinued for over a year, and its status as a pre-existing nonconformity was lost. As the building is included in the Vermont Historic Sites and Structures Survey, reestablishing a dwelling unit within it may be possible under the Historic Building Rehabilitation Bonus of Sec 5.4.8. The building was a dwelling unit at the time of inclusion in the Sites and Structures Survey in 1977.

Prior zoning permit actions for this property.

- Zoning permit: ZP-14-783 Install new garage door

Recommendation: Consent approval as per, and subject to, the following findings and conditions:

I. Findings

Article 4: Maps & Districts

Sec. 4.4.5, Residential Districts:

(a) Purpose

(1) Residential Medium Density (RM)

The property is in the RM zone and is subject to the development standards of this zone. This district is intended primarily for medium density residential development in the form of single-family detached dwellings and attached multi-family apartment. Restoring the cottage into a

dwelling will need to comply with the Historic Building Rehabilitation Bonus in Sec. 5.4.8(e).
(Affirmative finding)

(b) Dimensional Standards & Density

Residential density will increase as allowed by Sec. 5.4.8(e).

Lot coverage will not be changing.

The minimum required yard setbacks will not be changing. Footprint of the building will not be changing.

Max height will not be changing for the building. **(Affirmative finding)**

(c) Permitted & Conditional Uses

The proposed residence will be a detached dwelling unit next to the existing duplex. Both are permitted in the RM zone. **(Affirmative finding)**

(d) District Specific Regulations

1. Setbacks

See Sec. 4.4.5 above

2. Lot Coverage

See Sec. 4.4.5 above

3. Accessory Residential Structures and Uses

No Accessory structures are proposed. **(Not applicable)**

4. Residential Density

Occupancy of the new dwelling unit is limited to that by a family as defined in the CDO.
(Affirmative finding as conditioned)

5. Uses

(Not Applicable)

6. Residential Development Bonuses

(Not Applicable)

Article 5: Citywide General Regulations

Sec. 5.4.8 Historic Buildings and Sites

(b). Standards and Guidelines.

1. A property will be used as it was historically or be given a new use that requires a minimal change to its distinctive material, features, spaces, and spatial relationships.

The structure was originally built as a garage but was converted to and used as a house historically, it will go back to being a housing unit. **(Affirmative finding)**

2. The Historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships.

The structure will be restored with materials that fit with the historical nature of the structure. The current vinyl siding is getting replaced with wood clapboard and the roof will get new asphalt shingles. Seven new replacement windows will all be aluminum clad wood windows. A new wood front door will replace the existing one. **(Affirmative finding)**

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

The new renovation aims to restore the building to its prior condition as a residence with new materials to match or approximate the original material. No conjectural features are proposed. **(Affirmative finding)**

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

The rehabilitation of the house is aimed to preserve the form, features respective to the use as a residence. **(Affirmative finding)**

5. Distinctive material, feature, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

The rehabilitation of the house is aimed to preserve the form, features, and materials that existed on the structure when it was made a residence. **(Affirmative finding)**

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible, materials recognizing that new technologies may provide an appropriate alternative in order to adapt to ever changing conditions and provide for an efficient contemporary use. Replacement of missing features will be substantiated by documentary and physical evidence.

The existing exterior materials include vinyl siding, asphalt shingles and original wood windows. The vinyl siding is not original to the building and will be replaced with wood clapboard siding. **(Affirmative finding)**

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

(Not Applicable)

8. Archeological resources will be protected and preserved in place. If such resources must be distributed, mitigation measures will be undertaken.

No ground disturbance is proposed. **(Not Applicable)**

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic material, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

The proposed renovations will remove the historically inappropriate vinyl siding and will replace it with new wood clapboard siding. The proposed work will result in exterior building materials consistent with what they were prior to the existing alterations. **(Affirmative finding)**

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

No new additions are proposed with this project. **(Not Applicable)**

(e)Historic Building Rehabilitation Bonus

In order to facilitate the rehabilitation and reuse of historic buildings in Residential and Intuitional districts, development in excess of the limits set forth in Tables4.4.4-1, 4.4.5-2 and 4.4.5-3 may be permitted by the DRB subject to all the following conditions:

i. *The principle building shall be listed or eligible for listing in the United States Department of the Interior`s National Register of Historic Places or the Vermont State Register of Historic Places; The Cottage is listed on the Vermont State Register as a converted house for the listing of 50 Howard Street. **(Affirmative finding)***

ii. *The density limits of the underlying zoning district in Sec. 4.4.4(b) and 4.4.5(b) shall not apply. The extent of development shall instead be limited to an expansion up to a total of 125% of pre-application gross floor area of the qualifying principle building in (i) above; The 3rd dwelling unit exceeds the standard residential density on this property. It may be allowed only per this historic building rehabilitation bonus. No expansion to the building is proposed. **(Affirmative finding)***

iii. *The rehabilitation conforms to the requirements of Sec 5.4.8 (b) above; See subsection (b) above.*

iv. *Neighborhood commercial uses may be permitted by the DRB subject to the applicable requirements of Sec. 4.4.5(d)(5)(A); **(Not Applicable)***

v. *Lot coverage shall not exceed:*

Table 5.4.8-1 Historic Building Rehabilitation Bonus

District	Maximum Coverage
RL, RL-W, I	Expansion up to a total of 125% of pre-application principal building coverage.
RM, RM-W	Expansion up to a total of 125% of pre-application principal building coverage.
RH	Expansion up to a total of 125% of pre-application principal building coverage.

(Not Applicable)

Sec. 5.5.2, Outdoor Lighting Standards

Proposed exterior lighting will be a full cut off barn light and will be located above the front door and will comply with all lighting standards. **(Affirmative finding)**

Article 6: Development Review Standards

Part 1, Land Division Design Standards

(Not Applicable)

Part 2, Site Plan Design Standards
(Not Applicable)

Part 3, Architectural Design Standards
Sec. 6.3.2, Review Standards
See Sec. 5.4.8.

Article 8: Parking

Sec. 8.1.9, Maximum On-Site Parking Spaces

The existing lot has roughly 400sf of parking area, Reinstating the 3rd dwelling does not include or require any additional parking. **(Affirmative finding)**

Article 11: Planned Unit Development

Sec. 11.1.1 Intent

(a) Promote the most appropriate use of land through flexibility of design and development of land.

The existing building has previously been used as a dwelling unit and returning the structure to a dwelling unit can help with the city's housing shortage. **(Affirmative finding)**

(b) Facilitate the adequate and economical provision of streets and utilities.

The existing building will retain access to streets and utilities in the same manner as before. **(Affirmative finding)**

(c) Preserve the natural and scenic qualities of open space

The building will be retaining the same dimensions and footprint and will not cause any reduction to scenic qualities of open space. **(Affirmative finding)**

(d) Provide for a variety of housing types.

The proposed conversion will add a single detached dwelling unit to the property currently containing a duplex. **(Affirmative finding)**

(e) Provide a method of development for existing parcels which because of physical, topographical, or geological conditions could not otherwise be developed.

(Not Applicable)

(f) Achieve a high level of design quality and amenities.

See Sec. 5.4.8 above.

Sec. 11.1.5 Approval Requirements

(a) The minimum project size requirements of Sec. 11.1.3 shall be met

In RM districts no minimum project size exists. **(Affirmative finding)**

(b) The minimum setbacks required for the district have been met at the periphery of the project

See Sec. 4.4.5 above

(c) The project shall be subject to design review and site plan review of Article 3, Part 4.
See Sec. 5.4.8 above

(d) The project shall meet the requirements of article 10 for subdivision where applicable.
(Not Applicable)

(e) Density, frontage, and lot coverage requirements of the underlying zoning district have been met as calculated across the entire project.
See Sec. 5.4.8 above. Allowable density is increased per the historic building rehabilitation bonus.

(f) All other requirements of the underlying zoning district have been met as calculated across the entire project.
See Sec. 5.4.8 above

(g) Open space or common land shall be assured and maintained in accordance with the conditions as prescribed by the DRB.
Open space within the property will be available for use by the residents. There is no set aside swath of open space as may be the case with much larger PUD's. **(Affirmative finding)**

(h) The development plan shall specify reasonable periods within which development of each phase of the planned unit development may be started and shall be completed. Deviation from the required amount of useable open space per dwelling unit may be allowed to provide such deviation shall be provided for in other section of the planned unit development.

This project is small, and there is no phasing schedule included in the application. The standard time frame of 3 years will apply to this project. **(Affirmative finding)**

(i) The intent as defined in Sec. 11.1.1 is met in a way not detrimental to the city's interests.
The refurbishment of the building into a unit is within the rules and regulations of the city's comprehensive development ordinance. **(Affirmative finding)**

(j) The proposed development shall be consistent with the municipal development plan
The proposed refurbished unit will create an additional housing type on the subject property. It will serve as a single family home in addition to the existing duplex onsite.

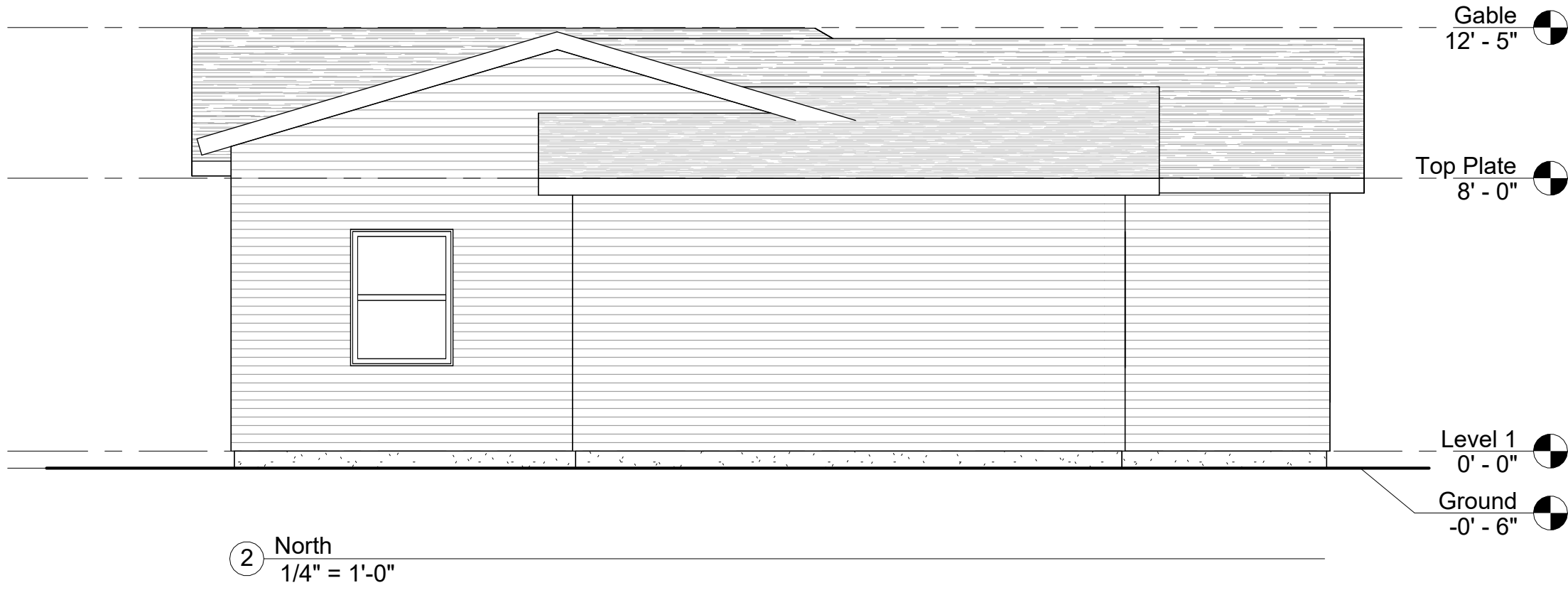
Housing cost in the city is also a focus for the development of housing. A smaller single dwelling home in the community should be more affordable than the other larger scale homes as well as provide as one more unit to assist in aiding the city's housing shortage. **(Affirmative finding)**

(k) Any proposed accessory uses and facilities shall meet the requirements of Sec. 11.1.6 below.
(Not Applicable)

II. Conditions of Approval

1. The refurbishment of the building shall be completed as part of one phase and standard permit timelines for construction and completion.
2. Vermont Residential Building Energy Standards apply to this project. Compliance with the standards is the Owner's responsibility. Prior to requesting a Certificate of Occupancy, a copy of a completed Vermont Residential Building Energy Standards Certificate shall be submitted with a Certificate of Occupancy (final or temporary) request, and filed in the Land Records located at the Clerk/Treasurers office in City Hall (149 Church Street). For more information, see http://publicservice.vermont.gov/energy_efficiency.
3. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state.
4. Standard permit conditions 1-15.

NOTE:
- ALL NEW WINDOWS SINGLE-UNIT, DOUBLE-HUNG
- CLAPBOARD SIDING THROUGHOUT
- ASPHALT SHINGLE ROOFING



5/23/2023 1:42:21 PM
E
1

2

3















8637401-12: Medium One Light Outdoor Wall Lantern



Collection: Barn Light

UPC #:785652069352

Finish: Black (12)

Dimensions:

Diameter:	12"	Extends:	17 1/8"
Width:	12"	Extends Max:	23 1/8"
Height:	10 5/8"	Wire:	6 1/2" (color/Black/White)
Weight:	1.8 lbs.	Mounting Proc.:	Cap Nuts
		Connection:	Mounted To Box

Bulbs:

1 - Medium A19 75w Max. 120v - Not included

Features:

- Dark sky friendly. Designed to emit no light above the 90° horizontal plane. Photometry unavailable.
- Easily converts to LED with optional replacement lamps
- Meets Title 24 energy efficiency standards
- Title 24 compliant if used with Joint Appendix (JA8) approved light bulbs listed in the California Energy Commission Appliance database.

Material List:

1 Body - Aluminum - Black

Safety Listing:

Safety Listed for Wet Locations

Instruction Sheets:

Trilingual (English, Spanish, and French) (990W8_37401-BRL)

Backplate / Canopy Details:

Type	Height / Length	Width	Depth	Diameter	Outlet Box Up	Outlet Box Down
Back Plate			1 1/4	5	4 1/8	6 1/2

Shipping Information:

Package Type	Product #	Quantity	UPC	Length	Width	Height	Cube	Weight	Frts. Class	UPS Ship
Individual	8537401EN3-12	1	785652069352	16.75	14.58	13.25	1.873	4.1	250	Yes
NJ Pallet		45		48	40	77	85.556	184		No
NV Pallet		45		48	40	77	85.556	184		No



This guide contains procedures for common user serviceable repair tasks found on interior and exterior doors. If a condition arises that is not covered in this guide, please contact us for professional help.

Interior and Exterior doors swing in or out on side hinges and may be single or double door configurations.

Do-It-Yourself

Technician



INTRODUCTION

CONTACT US

For questions, feel free to contact us by phone or email:

- Email: customerserviceagents@jeld-wen.com
- Phone: (800)-JELD-WEN/(800)-535-3936

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HANDING (SHOWN FROM TOP)

Single Panel Door

Exterior

Outswing



Left Hand

Right Hand

Inswing



Double Panel Door

Outswing



Passive

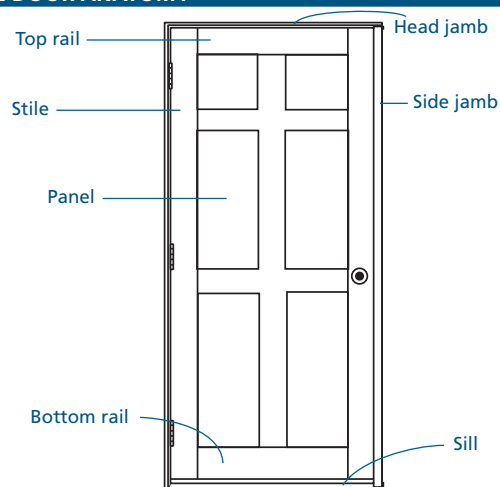
Active

Inswing

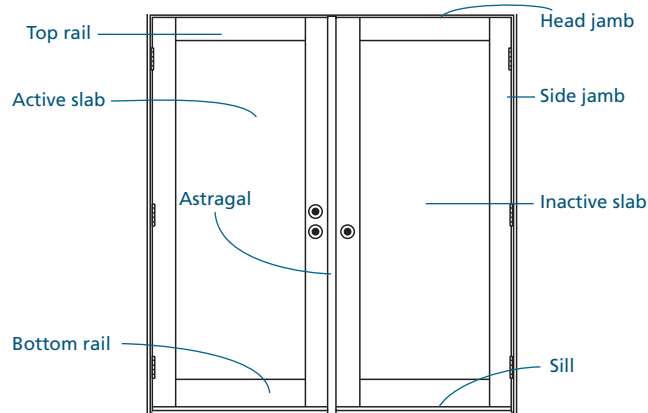


Interior

SINGLE DOOR ANATOMY



DOUBLE DOOR ANATOMY



The advice offered herein can be done by a homeowner with some mechanical aptitude. If you are unsure, it is recommended that you hire a trained service provider such as a competent and licensed construction contractor or building professional. JELD-WEN disclaims any and all liability associated with the use and/or provision of these instructions. Any reliance upon the information or advice is at the risk of the party so relying. The information contained herein may be changed from time to time without notification.

PRECAUTIONS & SAFETY

- Follow all manufacturers' instructions and labels.
- Use proper and safe equipment and precautions when cleaning and servicing the exterior side of patio doors above ground level.
- Insect screens are not security devices and will not prevent a child, other person, or pet from falling through.
- Use sharp tools with care to avoid damage to wood surfaces.

- Use extra care when driving screws near glass unit to avoid breakage.
- Use caution when tightening screws to avoid stripping the screw holes.
- Slab removal can be awkward and could cause physical injury or product damage; we recommend the help of a second person.

NEEDED TOOLS & MATERIALS

NEEDED TOOLS

Note! Each tool is not required for every task.

- #2 Phillips head, square drive, and/or flat head screwdrivers
- Hammer
- Nail set/punch
- Tape measure
- Level
- Utility knife
- Putty knives
- Allen wrenches
- Power drill with bits
- Chisel
- Gloves
- Pliers/side cutters

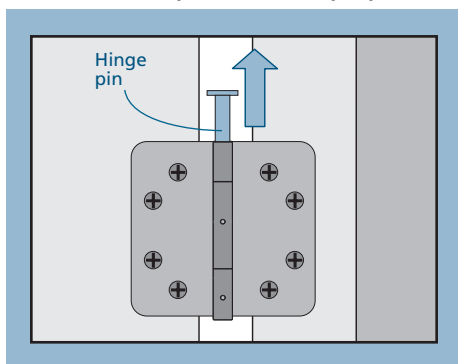
NEEDED MATERIALS

- String
 - Tape
 - Pencil & paper
 - Scissors
 - Brad nails
 - Shims
 - Replacement parts
- For Hardware Replacement:
- Wooden toothpicks or dowels
 - Wood glue
 - Wood putty
 - Fine sandpaper
 - Finishing supplies
 - Silicone sealant

SLAB & ASTRAGAL REMOVAL & INSTALLATION

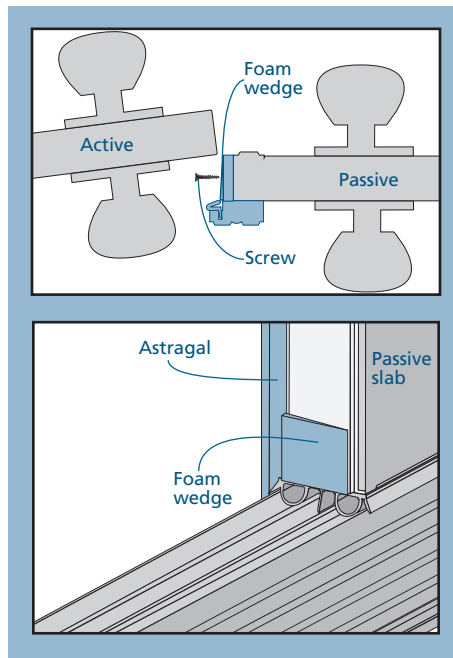
Because slab removal can be awkward and could cause physical injury or product damage, we recommend the help of additional people.

1. Open slab about half way and hold steady with the help of a second person.
2. Only inswing standard door hinges have removable hinge pins. With a small screwdriver or nail punch and hammer, drive hinge pin from bottom hinge, then working up to the top hinge. Doors with automatically closing hinges or outswing doors require removing the screws from one side of the hinge to remove the slab. Take extra precautions when removing the spring loaded automatically closing hinges.
3. Remove slab from frame.
4. To install slab, perform removal steps in reverse order.



ASTRAGAL REPLACEMENT

1. Open the active slab.
2. Remove the screws that attach the astragal.
3. If the astragal doesn't come off, there may be adhesive tape holding it in place. If so, carefully score the joint between the astragal and the slab.
4. Remove the astragal.
5. Fasten the new astragal through the pre-drilled holes in the same location as the old astragal.
6. Install a foam wedge on the passive slab at the bottom with the thick part against the leg of the astragal as shown.





Manufacturing
ACKNOWLEDGEMENT

www.harveywindows.com

BILL TO:

LANSING BURLINGTON VT
PO BOX 6649

SHIP TO:

LANSING BURLINGTON VT
71 LEROY RD

Phone: 804-266-8893

Fax: 8042616743

WILLISTON

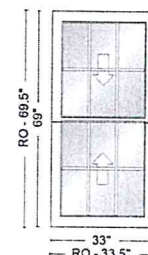
Phone: 802-660-8111

VT 05495-8917

Fax:

QUOTE NBR	CUST NBR	CUSTOMER PO	DATE CREATED	DATE ORDERED	ORDER TY
5549256	1141340		3/15/2023	Quote Not Ordered	
ORDERED BY	STATUS	SHIP VIA	DELIVERY AREA		
	None	Whse Delivery	Unknown Area		
CLERK		JOB NAME	COUPON		
webcp-bol - Bill Orosz					

LINE #	DESCRIPTION	QTY
10000-1	Majesty DH , Unit Size 33 x 69, RO 33.5 x 69.5, EXTENDED LEADTIME 1 Unit 1: U-Factor = 0.27, SHGC = 0.26, VT = 0.45, HII-M-26-00616-00002, Size Options = Custom Size, Transactional Order Type = Charge Order , New Construction Frame Width (Inches) = 33, Frame Height (Inches) = 69 Double Glazed, Double Low-E RS, Argon Filled Interior=White Prefinished Pine, Unit Color = White, Jamb Liner Color = White, Prefinished Color = White Program = None, Label Name = Harvey, Single , White, Loop - Field Applied, Handle Color = White Flex Full Screen, Fiberglass Mesh, Screen Shipping Separate Sim Div Lite, Colonial, A-White, Interior Finish = Prefinished White, 3W2H Applied Nail Fin Overall Frame Width (Inches) = 33, Overall Frame Height (Inches) = 69, Overall Rough Opening Width (Inches) = 33.5, Overall Rough Opening Height (Inches) = 69.5 Clear Opening Width = 29.125, Clear Opening Height = 28.25, Clear Opening Square Footage = 5.71 E.Star Zone:North=Yes, E.Star Zone:North-Central=Yes	



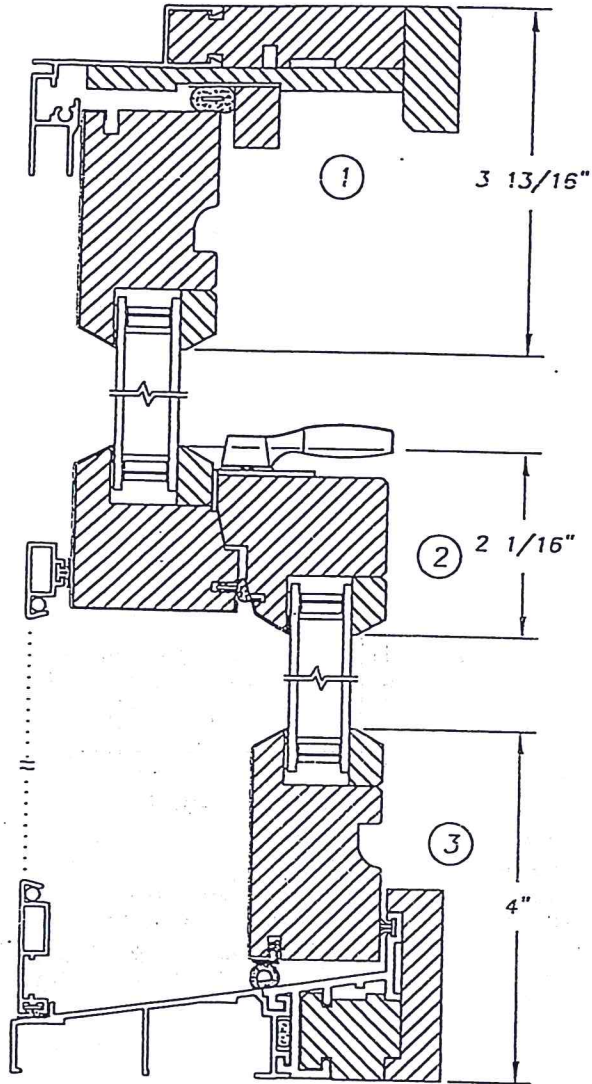
Room Location: None Assigned

****Note: Delivery charges may apply and are not included on this quote.**

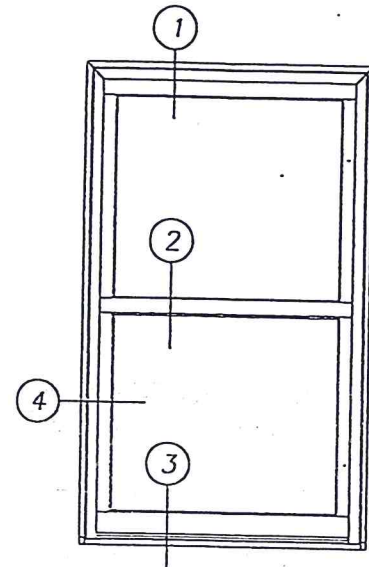
This quotation is based on our interpretation of the information provided. All quantities, sizes, extensions, grand totals, and specifications should be verified by the contractor prior to his/her bidding or ordering of materials. Harvey Building Products is responsible only for the items as quoted above. Any changes or addendums will be subject to a requote. We propose to supply the materials as described above, subject to the terms and conditions as required by our credit department. The prices are guaranteed for 30 days from the date of quotation unless otherwise noted. Delivery charges may apply and are not reflected on this quote. We appreciate the opportunity to quote this job. If you have any questions, please call your local warehouse.

CUSTOMER SIGNATURE _____ DATE _____

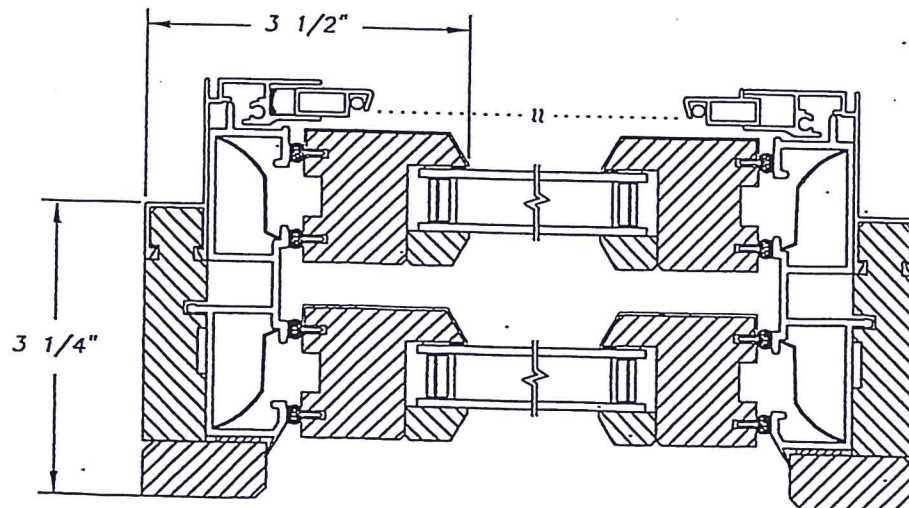
1-1



Harvey Building Products
Majesty Replacement
Double Hung
(1/2 Scale)



(1/20)



REV. 09/11

AS 182

Department of Permitting & Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone: (802) 865-7188

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Ted Miles, Code Compliance Officer
Ted Boylan, DPI Administrator



TO: Development Review Board
FROM: Garret King
DATE: July 5, 2023
RE: ZAP-23-7; 16 South Winooski Avenue

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Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: FD5 Ward: 8E

Owner/Applicant: Ronald McDonald House Charities/Kristine Bickord

Request: Appeal of zoning application denial ZPF-23-27 to install a 6-foot tall steel fence around the perimeter of the property.

Overview:

The appellant is seeking approval to install a 6-foot tall steel fence around the perimeter of the Ronald McDonald House on the corner of Pearl Street and South Winooski Avenue. Currently there is a 4ft fence around the frontage of Pearl St. and South Winooski Ave. with some chain link fencing in the rear of the property.

While new 6ft fencing is permissible in the rear and center of the property (2nd and 3rd lot layers), the taller fencing in the two front yards (1st lot layer) is not allowed in the FD5 district.

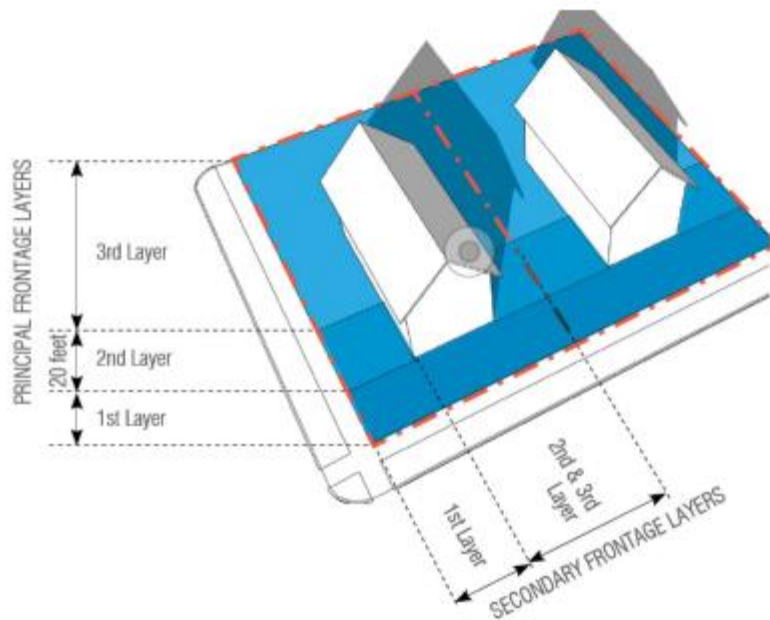
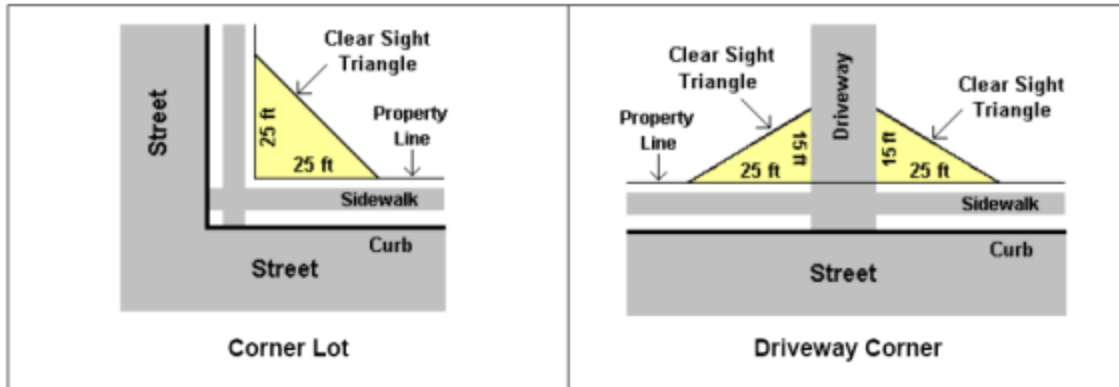
Recommendation: Uphold administrative zoning denial based on the following findings:

I. Findings:

The subject sign application was filed and completed May 10, 2023. The proposed fence was intended to go around the edge of the property and fully enclose the property with a gate for the driveway and pedestrian access. In the rear yard a section of chain link fence was to remain. Denial of the application was anticipated by the applicant.

The application was reviewed and administratively denied May 18, 2023. Denial was based on the following:

The proposed fence is subject to the standards of Sec. 5.2.6(c): Clear Sight Triangle, and Sec. 14.6.8 (b).(v).(A): Fences and free standing walls, of the Comprehensive Development Ordinance. Any fence within the clear sight triangle is limited to 3-feet in height above the curb in order to provide safe sight distances for pedestrians and vehicles. Fences and Free-standing Walls placed within the First Lot Layer shall not exceed 4-feet in height. For the street corner as well as the frontage of Pearl St. and South Winooski Ave. the fence would not be permitted over 4-feet in height.



The administrative denial was appealed May 24, 2023 (and completed May 26) within the 15-day appeal period.

The appellant has brought forth corrections and safety concerns that to not resolve all of the reasons of why the application has been denied. The applicant has proposed new plans that they would be willing to implement that would resolve the issues of Sec. 5.2.6(c): Clear Sight Triangle by removing the proposed fence from the clear sight triangle area. This alone would not make the proposal permissible.

The appellant argues that the fence should be allowed to be taller than the 4-foot height in the second and third lot layers which is accurate. The property is a corner lot with frontage on Pearl St. and South Winooski Ave. Both frontages contain first lot layers as per the standards of Sec. 14.6.3 illustration 14.6.3-A. The fence within these first lot layers may not 4-foot height limit.

The appellants comments regarding the need for the fencing to provide safety does not cite specific section or language in the CDO. While the intent of the fencing may be to create a barrier to prevent people from accessing the property, there is only limited provision within Article 14 to allow additional fence height. Sec 14.7.3 b) I, DRB Alternative Compliance enables up to 20%

relief from the applicable numerical standard. In this case, 4` could be increased to 4.8`. There is no provision in Article 14 that enables the requested 6` height within the first lot layer.

II. Recommended Motion:

Uphold administrative zoning denial of ZPF-23-27

Dear members of the Design Review Board,

June 4, 2023

Ronald McDonald House Charities of Burlington is seeking to appeal an original decision dated May 12, 2023 regarding our permit application to change/expand an existing fence on the property at 16 South Winooski Avenue in Burlington.

There were two reasons for the initial denial;

1. Section 5.2.6 (c) Clear sight triangle on corner
2. Section 14.6.8 (b) and Section 14.6.3 (c) Height of fence to 6 feet not allowed within second and third lot layer and Height of fence to 6 feet in first lot layer

We have changed the design of the fence in the corner to rectify this first point.

We respectfully disagree with the initial decision on changing our existing fence from 4 feet to a more secure situation with a 6 foot fence.

The reason for our appeal

We are a non profit charity that houses families who have sick children at UVM Med Center and need to be close to their child. RMHC has been available to those families for 39 years. Our responsibility is to provide a safe haven, ensuring the safety and security of our guests who are already overwhelmed. We allow the day care of the YMCA to come to the property and use our fenced in playground. Over the past 6 years we have attempted to keep up with the changing social landscape around the city of Burlington and particularly around our own property. In many areas our existing fence has either been kicked in, bent back, etc by people climbing over it. We have continually made costly upgrades in technology, lighting, locks and other security measures. This has been expensive for our charity. This has been frustrating for our charity. We have explored all avenues of resolution to ensure the security of our guests, our staff and our volunteers. A more secure/coded and taller fence is our last line of defense.

Please take the following into consideration and the impact on our Charity as a whole:

- Amount spent on security cameras \$28,600
- Amount spent Improving all locks and glass on doors and windows RM \$948
- Amount spent on Installation of window shutters in all first floor rooms \$14,051
- Concerns for above mentioned YMCA child safety
- Increase in public incidents of drug use/ attempting to camp
- Increase in individuals jumping fence to settle in for the night on our property
- Incidents of drug activity in our back parking lot and on playground
- Our playground figure was decapitated 2k to repair.
- Our playground figure defaced costing (amount)
- Individuals trying random doors to the property, asking for food, attempting entry, threatening staff

- individuals in our parking lot threatening staff
- Dumpster for House moved due to individuals using as a bathroom
- Auto's parking in our lot, despite signage
- Unable to expand our volunteer program due to the increase in these behaviors
- College students and bar closing/(sometimes harmless) attempting to get inside/jumping fence to get on playground/gardens and dark areas around the yard for alcohol consumption.
- Graffiti

The list goes on. It is becoming increasingly difficult to sustain our mission as we have for the last 39 years. Please help us to continue to provide a safe haven for our guests going through the hardest time of their lives with this much needed upgrade to our security and to maintain our private space.

Respectfully submitted by:



Executive Director- Ronald McDonald House Charities



City of
Burlington, Vermont
645 Pine Street

Zoning Permit – Reasons for Denial

ZPF #: 23-27

Tax ID: 044-4-076-000

Issue Date: 5/12/2023

Decision: Denied

Property Address: 16 South Winooski Avenue

Description: Replace four-foot-high aluminum fence with new six-foot-high steel fence. Proposal includes adding fencing around the perimeter of the property.

Reasons for Denial:

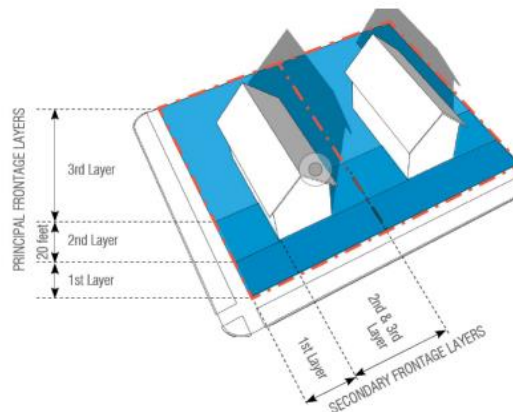
Section 14.6.8 b) Site standards of the Comprehensive Development Ordinance

v. Fences and Free-standing Walls:

- A. *Fences and Free-standing Walls placed within the First Lot Layer shall not exceed 4-feet in height. Fences and Free-standing Walls placed within the Second or Third Lot Layer shall not exceed 8-feet in height unless a different height limit is specified under the applicable Form District or Frontage type.*

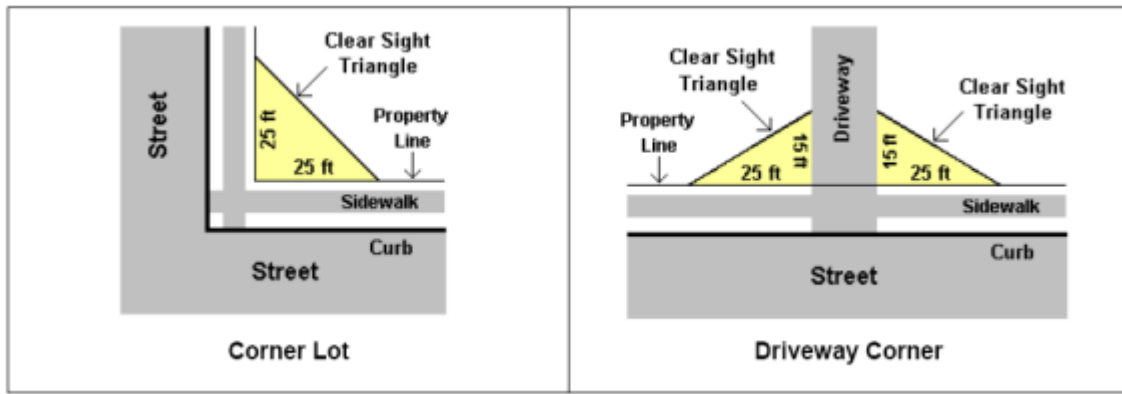
Section 14.6.3 c) Lot Layers

- i. *First Lot Layer: that portion of a Lot between the Frontage Line and the Façade of a Principle Building.*



Section 5.2.6 (c) Clear Sight Triangle

1. *Fences placed within a clear sight triangle along driveways and at street intersections, or between an existing building and the front property line, whichever is less, shall be limited to 3-feet in height above the curb in order to provide safe sight distances for pedestrians and vehicles*



The application proposes to change the existing 4 foot tall fence into a 6 foot tall fence of similar style. The proposed 6 foot tall fence height exceeds the 4 foot tall limitation of fence height in the First Lot Layer (the space between the building and the frontage lines).

The proposed 6 foot tall fence also exceeds the 3 foot height limitation for fences within the clear sight triangle at the corner of South Winooski Avenue and Pearl Street. The existing fence is nonconforming within the clear sight triangle a 4 feet tall. That nonconformity cannot be increased.

Lacking compliance with these two applicable standard, the application cannot be approved and therefor, denied.

An interested person may appeal a decision of the Zoning Administrator to the Development Review Board within 15 days after the decision date per Sec. 12.2.2, *Appeals of Administrative Officer Decisions*. Appeals may be filed online at [burlingtonvt.viewpointcloud.com/categories/1098](https://www.burlingtonvt.viewpointcloud.com/categories/1098) or in-person at 645 Pine Street, Burlington, Vermont. <https://www.burlingtonvt.gov/DPI/Appealing-a-Zoning-Decision>

Department of Permitting & Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone: (802) 865-7188

*William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Ted Miles, Code Compliance Officer
Ted Boylan, DPI Administrator*



TO: Development Review Board
FROM: Scott Gustin
DATE: July 5, 2023
RE: ZP-23-9; 98 Sunset Cliff Road – Permit condition regarding pickle ball court

=====

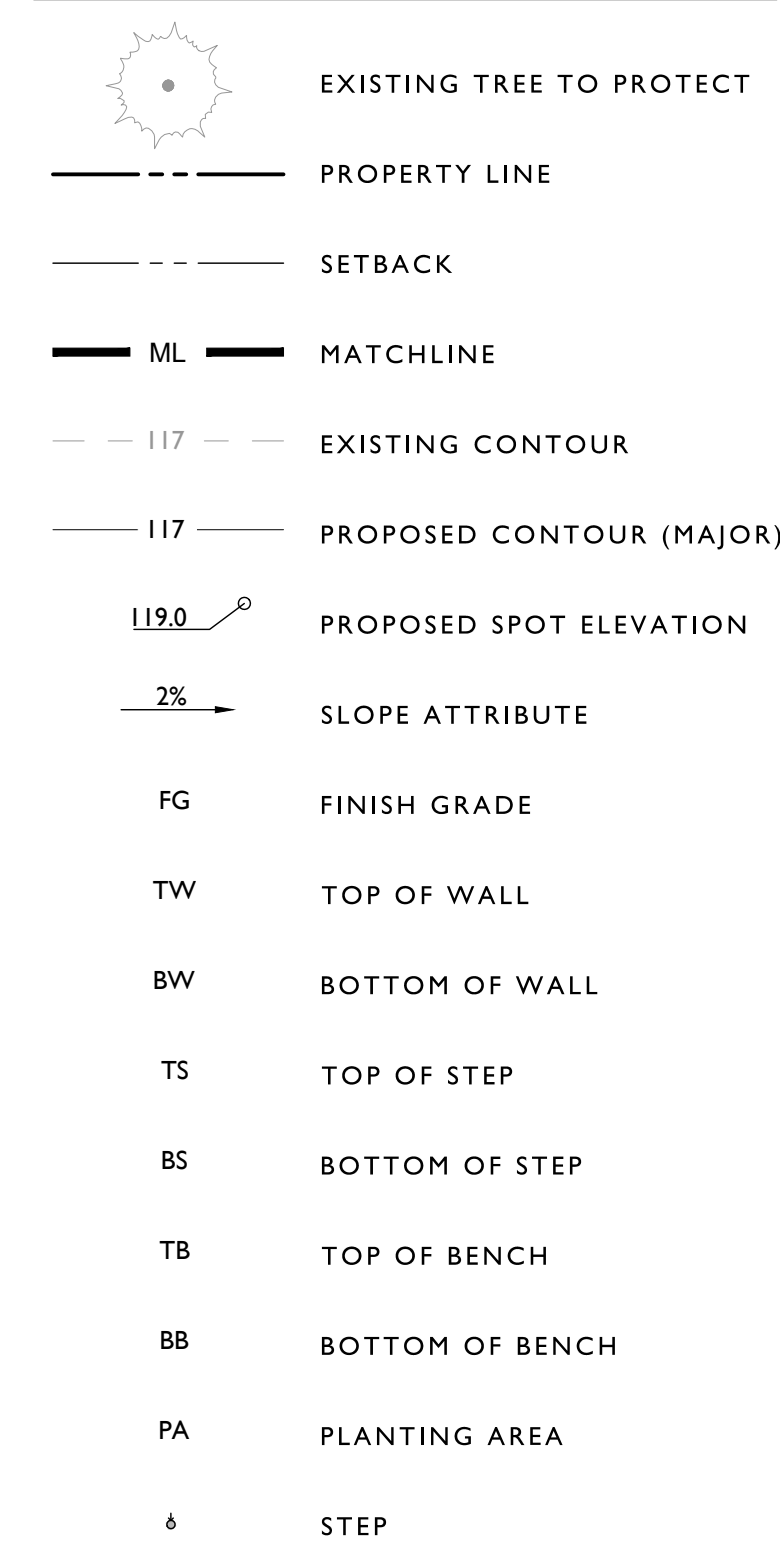
At their April 18, 2023 deliberative meeting, the Development Review Board granted certificate of appropriateness approval for demolition of the existing home and construction of a new home at the property. Due to neighbor concerns about noise impacts related to the pickle ball court included in the project, the DRB required additional review of the court by way of condition:

1. The applicant is required to come back to the Development Review Board with a noise mitigation plan prior to approval of the pickle ball court.

In an effort to address this condition, the applicant has provided updated project plans that include additional landscaping around the court for the DRB's review and consideration.

NOT FOR
CONSTRUCTION

SYMBOL	ITEM
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1. Contractor is responsible for all damage due to his operations inside and outside the contract limit line.
2. Contractor is responsible for checking spot elevations and verifying proposed grades by providing grade stakes. Grades must be approved by Landscape Architect prior to proceeding.
3. Contractor shall blend new work smoothly with existing grades at contract limit line and/or limit of construction line.
4. Contractor to verify that subgrades are 6 inches below finished grade prior to spreading top soil for seeded areas.
5. All walks shall have 2% cross pitch, and all step treads and wall caps shall have 1% cross pitch unless otherwise noted.
6. Light fixture locations may be field adjusted with prior Landscape Architect approval.
7. Walkway layout may be approved by Landscape Architect prior to construction.
8. Site furniture and wall locations to be verified by Landscape Architect prior to installation.
9. General Contractor is responsible for all erosion control measures during construction.
10. It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
11. Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
12. Fixtures, the location of all proposed hardscape, lighting and softscape with landscape architect and owner prior to construction.
13. Contractor shall contact the landscape architect immediately if the layout of materials cannot be installed as designed per plan due to existing conditions.
14. Base survey prepared by KREBS & LANSING CONSULTING ENGINEERS, INC.

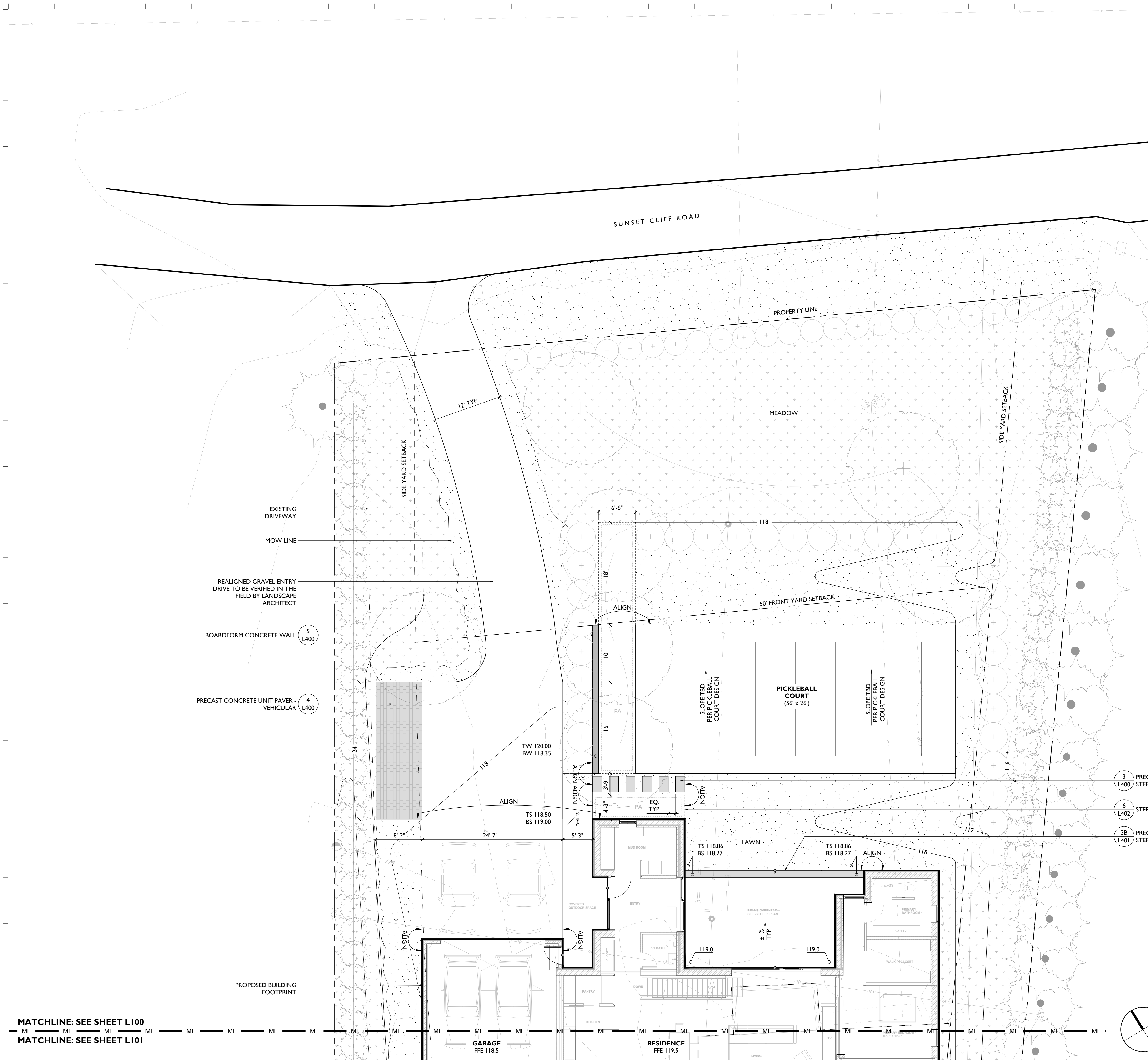
NO.	DESCRIPTION	DATE
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98 SUNSET CLIFF RD
BURLINGTON, VT 05408

LAYOUT, MATERIALS & CONCEPTUAL GRADING PLAN

JOB NO. 22-272
SCALE: 1/8"=1'-0"
DRAWN BY: XX
DATE: 05.10.2023

LI 00

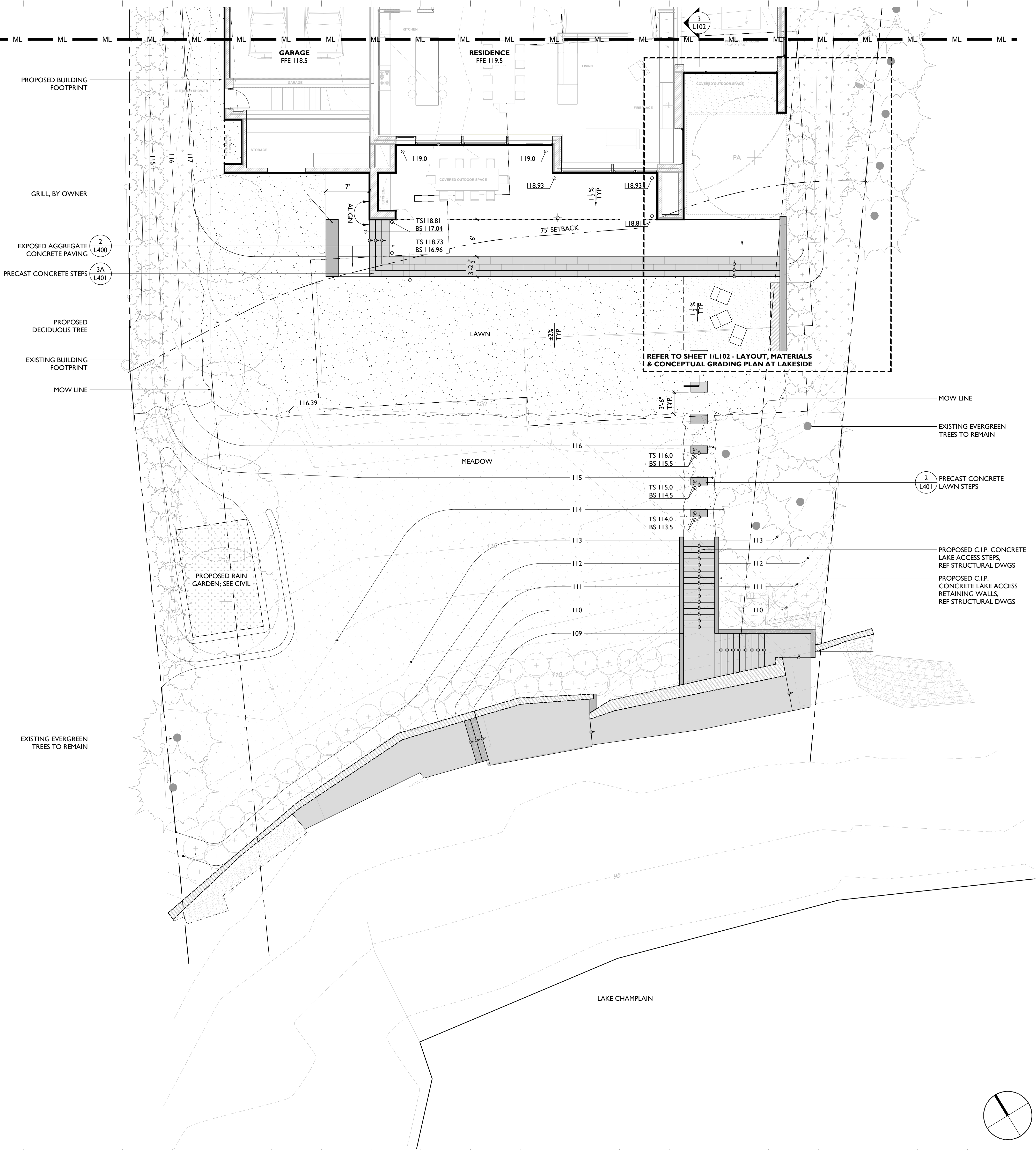


PLOT DATE: 5/10/2023 10:54 AM
FILE PATH: U:\22-272 WONG RESIDENCE\WHA\CAD\SHEETS\100 LAYOUT AND MATERIALS.DWG

MATCHLINE: SEE SHEET L100
MATCHLINE: SEE SHEET L101

PLOT DATE: 5/10/2023 10:54 AM
FILE PATH: U:\22-272 WONG RESIDENCE\WHLA\CAD\SHEETS\L00_LAYOUT_AND_MATERIALS.DWG

MATCHLINE: SEE SHEET L100
MATCHLINE: SEE SHEET L101



LEGEND	
SYMBOL	ITEM
	EXISTING TREE TO PROTECT
	PROPERTY LINE
	SETBACK
	MATCHLINE
	EXISTING CONTOUR
	PROPOSED CONTOUR (MAJOR)
	PROPOSED SPOT ELEVATION
	SLOPE ATTRIBUTE
	FINISH GRADE
	TOP OF WALL
	BOTTOM OF WALL
	TOP OF STEP
	BOTTOM OF STEP
	TOP OF BENCH
	BOTTOM OF BENCH
	PLANTING AREA
	STEP

WHLA
WAGNER HODGSON

LANDSCAPE ARCHITECTURE
VT802.864.0010 NY518.567.1791 wagnerhodgson.com

NOT FOR
CONSTRUCTION

DRAFT

NO.	DESCRIPTION	DATE
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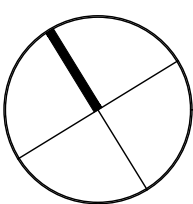
WONG RESIDENCE
98 SUNSET CLIFF RD
BURLINGTON, VT 05408

LAYOUT, MATERIALS
& CONCEPTUAL
GRADING PLAN

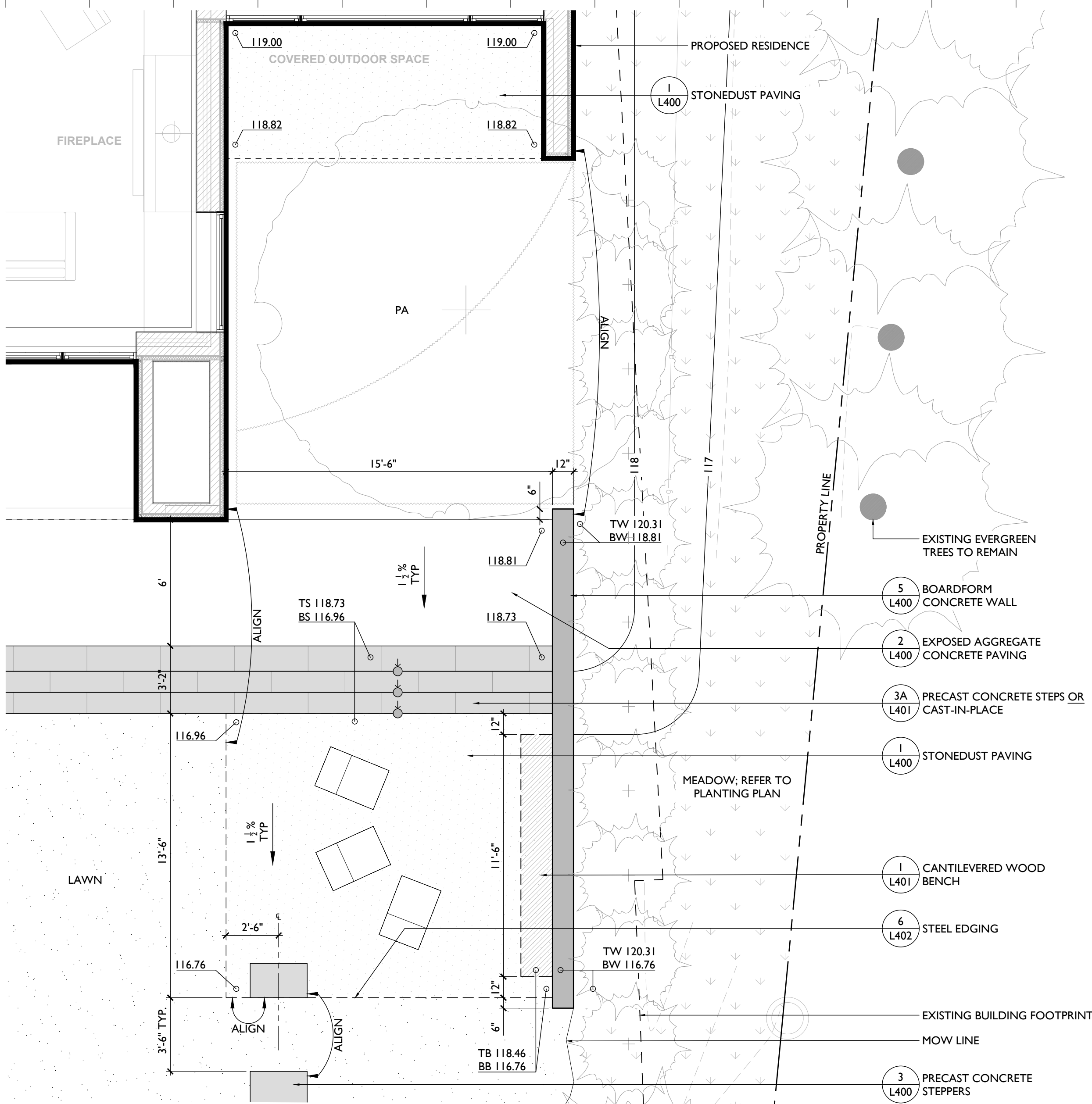
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DRAWN BY: XX
DATE: 05.10.2023

L101

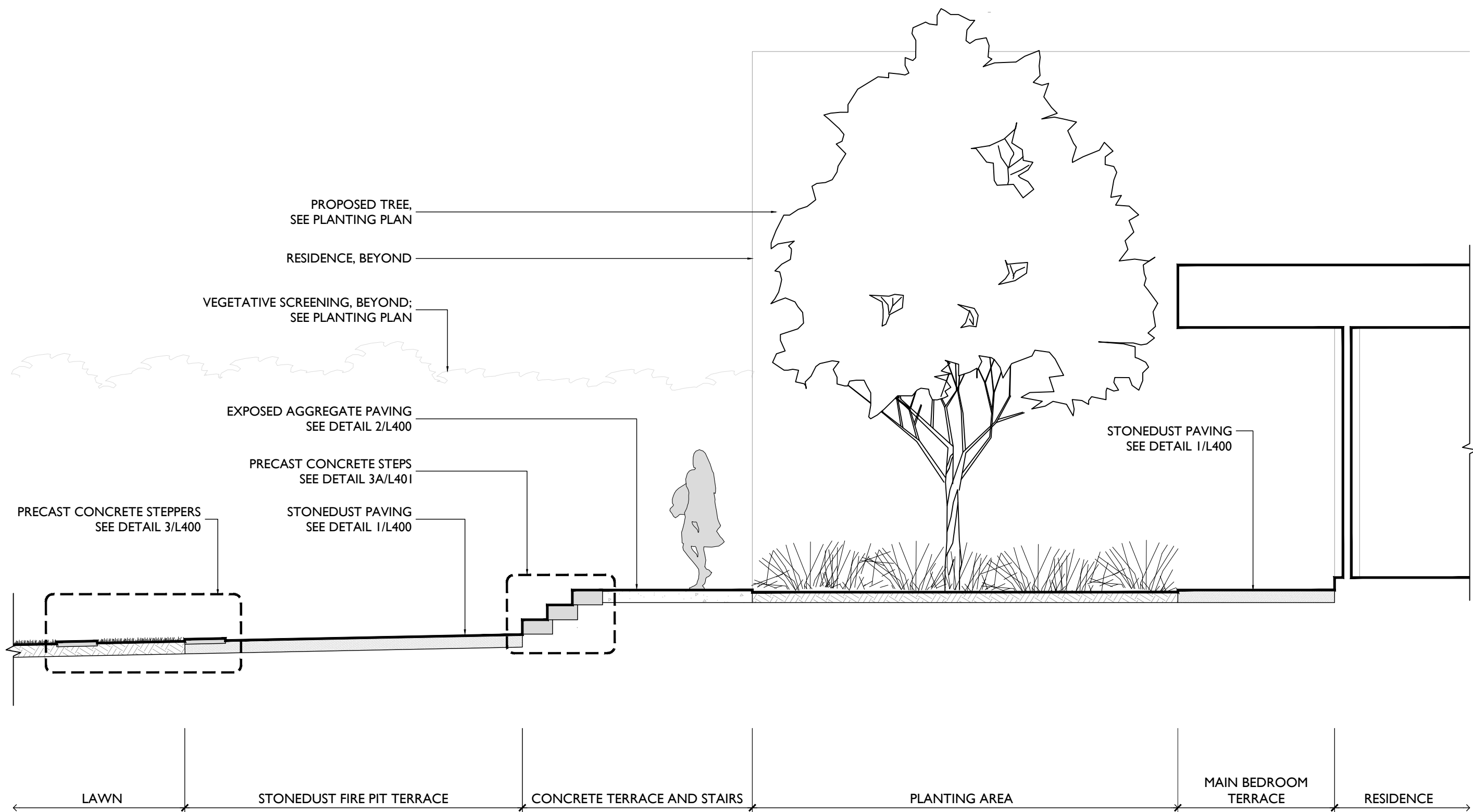
© WHLA. ALL RIGHTS RESERVED 2023



NOT FOR
CONSTRUCTION



1 MATERIALS, LAYOUT & CONCEPTUAL GRADING PLAN AT LAKESIDE TERRACE
1/4" = 1'-0"



2 SECTION AT LAKESIDE TERRACE
1/4" = 1'-0"

NO.	DESCRIPTION	DATE
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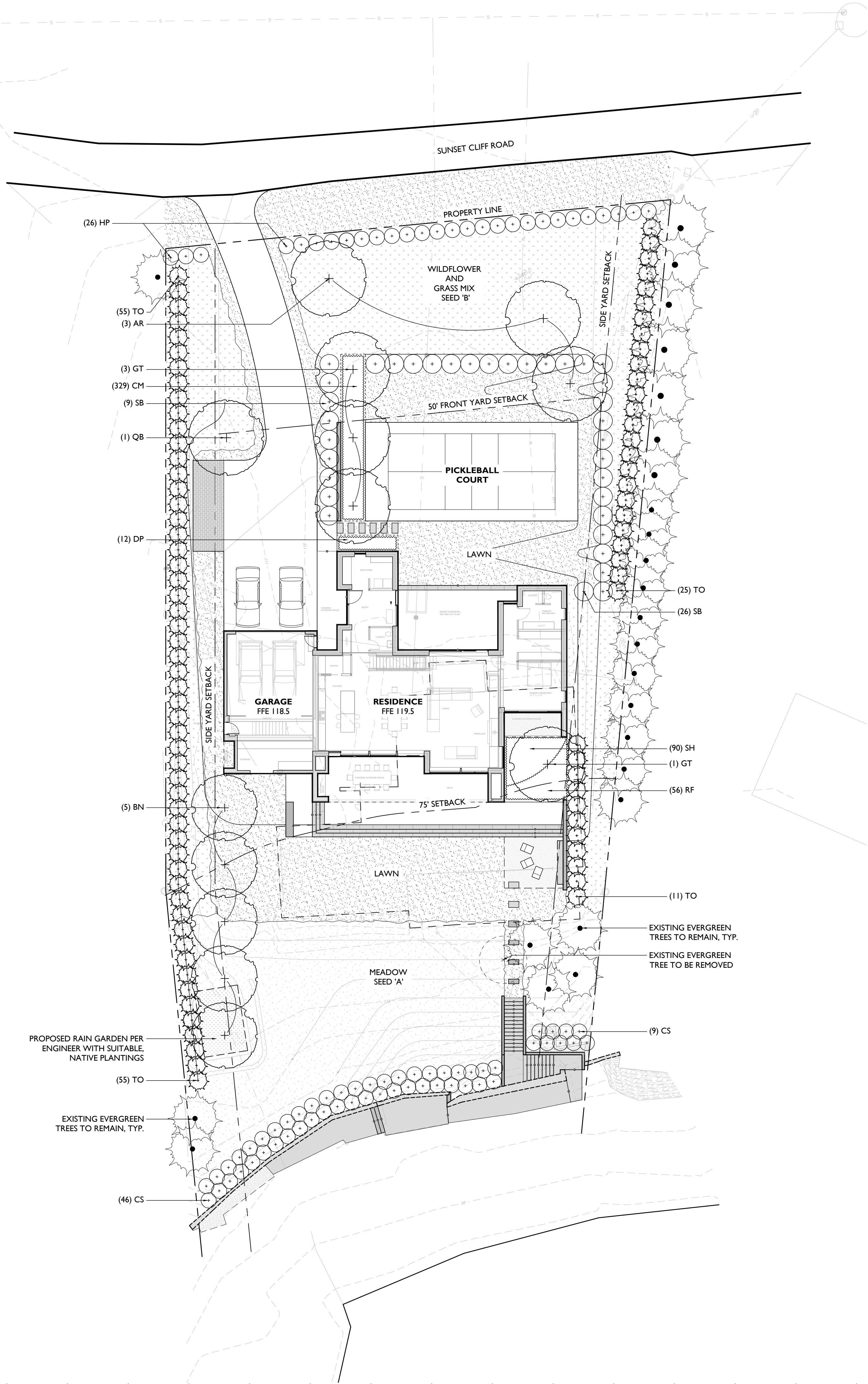
WONG RESIDENCE
98 SUNSET CLIFF RD
BURLINGTON, VT 05408

LAYOUT, MATERIALS
& CONCEPTUAL
GRADING PLAN AT
LAKESIDE

JOB NO. 22-272
SCALE: 1/4" = 1'-0"
DRAWN BY: XX
DATE: 05.10.2023

L102

PLOT DATE: 5/10/2023 10:55 AM
FILE PATH: U:\22-272 WONG RESIDENCE\WHLA\CAD\SHEETS\L200_PLANTING.DWG



PLANT SCHEDULE

KEY	QTY.	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
TREES					
AR	3	Acer rubrum 'Red Sunset'	RED MAPLE	6"-7" CAL.	AS SHOWN
BN	5	Betula nigra 'Heritage' (single stem)	HERITAGE RIVER BIRCH	6"-7" CAL.	AS SHOWN
GT	4	Gleditsia triacanthos inermis var. 'Shademaster'	SHADEMASTER HONEYLOCUST	6"-7" CAL.	AS SHOWN
TO	91	Thuja occidentalis 'Fairview'	FAIRVIEW ARBORVITAE	8'-10' HT.	AS SHOWN
QB	1	Quercus bicolor	SWAMP WHITE OAK	6"-7" CAL.	AS SHOWN

SHRUBS

CS	55	Cornus sericea 'Firedance'	FIREDANCE REDTWIG DOGWOOD	#5	AS SHOWN
HP	26	Hydrangea paniculata 'Limelight'	LIMELIGHT HYDRANGEA	#5	4' O.C.
SB	35	Syringa x Bloomerang	BLOOMERANG LILAC DARK PURPLE	#5	5' O.C.

ORNAMENTAL GRASSES

CM	329	Carex morrowii 'Ice Dance'	ICE DANCE SEDGE	1 GAL.	12" O.C.
SH	90	Sporobolus heterolepis	PRAIRIE DROPSEED	1 GAL.	18" O.C.

PERENNIALS

DP	12	Dennstaedtia punctilobula	HAY-SCENTED FERN	1 GAL.	18" O.C.
RF	56	Rudbeckia fulgida 'Goldsturm'	BLACK-EYED SUSAN	1 GAL.	18" O.C.

LEGEND

	LAWN
	MEADOW SEED 'A'
	WILDFLOWER AND GRASS MIX SEED 'B'

SEED NOTES

- MEADOW SEED 'A'**
TO BE VT CONSERVATION MIX, AVAILABLE FROM L.D. OLIVER SEED CO. INSTALL & ESTABLISH PER SUPPLIER'S REQUIREMENTS FOR SPECIFIC LOCATIONS INCLUDING SLOPE CONDITIONS, ETC. USE EROSION CONTROL METHODS PER SUPPLIER'S RECOMMENDATIONS TO ESTABLISH SEED. VERIFY INSTALLATION WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
L.D. OLIVER SEED CO.
26 SUNSET AVE., MILTON, VT 05468
www.ldoliverseed.com
- WILDFLOWER AND GRASS MIX SEED 'B'**
TO BE ERNST LOW-GROWING WILDFLOWER AND GRASS MIX, AVAILABLE FROM ERNST CONSERVATION SEEDS, INC. INSTALL AND ESTABLISH PER SUPPLIER'S REQUIREMENTS FOR SPECIFIC LOCATIONS INCLUDING SLOPE CONDITIONS, ETC. USE EROSION CONTROL METHODS PER SUPPLIER'S RECOMMENDATIONS TO ESTABLISH SEED. SEEDING RATE: 40 lb PER ACRE AS RECOMMENDED BY ERNST CONSERVATION SEEDS. VERIFY INSTALLATION WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
ERNST CONSERVATION SEEDS, INC.
8884 MERCER PIKE, MEADVILLE, PA 16335
www.ernstseed.com

LAWN NOTES

- SUBMIT EXTENT AND LAYOUT OF LAWN SEED AND/OR SOD WITH LANDSCAPE ARCHITECT AND OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
- SUBMIT LAWN SEED AND/OR SOD SPECIFICATIONS TO LANDSCAPE ARCHITECT AND OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
- INSTALL & ESTABLISH LAWN PER SUPPLIER'S REQUIREMENTS FOR SPECIFIC LOCATIONS INCLUDING SLOPE CONDITIONS, ETC. USE HYDROSEEDING FOR SEEDING APPLICATIONS. VERIFY INSTALLATION WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
- USE EROSION CONTROL METHODS AS REQUIRED TO ESTABLISH SEED. VERIFY INSTALLATION WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.

TREE PROTECTION NOTES

- Proposed methods, and schedule for effecting tree and plant protection shall be submitted for approval.
- Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization shall be submitted for approval.
- Certain specimen trees adjacent to construction areas and in other key locations will be identified by the Owner and the Architect, and marked with red tags. Loss of any of these trees will result in fines assessed at \$5,000 per tree. Damage to all other trees on the property will be assessed at the rate of \$500 per inch caliper of the tree.
- A fine of \$1,000 will be levied against the Contractor for each incident of construction inside tree protection areas.
- Damages to trees, shrubs, and other vegetation will be assessed by the Architect and Owner in accordance with the International Society of Arboriculture (ISA) Guide.
- Trees or roots visibly damaged will cause the Owner to withhold from the Contractor an assessed amount conforming to the requirements stipulated above for a period of two years. After that period the impact of the damaged to any tree will be assessed accordingly.
- If any trees or shrubs designated to be saved are damaged and replacement is required, a number and diameter of trees or shrubs of the same species and variety, as specified by the Owner and Architect, shall be furnished and planted by the Contractor. The total inch diameter of the replacement trees or shrubs shall equal the diameter of the tree or shrub to be replaced. The Contractor shall not be liable for any loss or damage which occurs while the Contractor is complying with instructions given by the Owner, Architect, or arborist working on the Project.
- The Contractor's attention is called to the fact that certain areas on the site exist as natural woodland spaces and are to remain as natural woodlands. Therefore, all construction operations must be performed in such a manner, which will preserve these existing natural environments as wood preserves.
- Designated areas of trees, understory, and wildflowers are to remain untouched and unharmed.
- Clearly mark all clearing limits in the field and accompany Architect on a joint review of clearing limits before clearing operations have commenced. Limit of clearing is generally defined as the limit of grading.
- Galvanized chain link fencing, 4 feet high. Stakes for fencing shall be 8 feet galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 10 feet on center maximum. Prior to start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed in accordance with the following:
- Fencing shall be installed at the tree protection areas indicated on the Drawings.
- Fencing shall be installed a minimum of 15 feet beyond the drip line of the trees to be protected, unless otherwise approved by the Architect.
- Where construction will be in close proximity to existing trees designated to remain, roots shall be pruned. Proximity shall be as determined in the field by the Landscape Architect or Arborist.
- Suitable means for root pruning include trenching, vibrating plow, and water jet pruning. Any method which tears roots or disturbs the soil beyond the grading limit is unacceptable.
- Trees to receive root pruning shall be reviewed by an arborist for canopy pruning, fertilization and trench backfill recommendations.
- Selective clearing within tree protection areas shall only be performed when and as directed by the Landscape Architect. Refer to Section 02115, selective clearing.
- Except as otherwise indicated or requested by Landscape Architect, temporary protection devices and facilities installed during course of the work shall be removed only after all work which may injure or damage trees and plants is completed.

PLANTING NOTES

- All plant material in the plant schedule shall be nursery grown in accordance with ANSI in accordance with Z.60.1 Standards for measurement of nursery stock.
- All plants shall be guaranteed by the Contractor for a period of one year from date of receipt of Provisional Acceptance of the completed installation by the Owner.
- Replacement plantings will be required prior to Final Acceptance for any plants which are missing, not true to specifications, have died or are unhealthy or uncharacteristic of the species (due to excessive pruning, dieback or other reasons).
- All plant materials shall be selected and tagged at the nursery by Landscape Architect.
- The Landscape Architect's approval is required for any plant material substitutions.
- The Contractor is responsible for immediately notifying the Landscape Architect if any plant quantity discrepancies exist between the planting plan and the plant list.
- All shrubs and trees will be sprayed with the anti-desiccant "Wilt-Pruf" (or approved equal) prior to the first Winter (no later than November 30).
- The Landscape Contractor shall have the General Contractor locate all underground utilities in areas to be landscaped prior to commencing any excavation. Adjustments to tree locations will be allowed where utility conflicts are clearly a problem and with prior site approval by Landscape Architect.
- All plant bed, shrub and tree location shall be staked in the field by Contractor for Landscape Architects approval prior to installation.
- Adjustments to plant beds shall be approved by Landscape Architect.
- General Contractor is responsible for all erosion control measures during construction.
- All disturbed areas are to be topsoiled and seeded or sodded, as indicated in the planting plan.
- Mulch shall consist of double-shredded hardwood mulch or approved equal and Contractor is responsible for providing samples of mulch to Landscape Architect. Mulch plant materials as shown on plan and details.
- It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
- Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
- During construction, and until the end of warranty period, existing trees that are showing signs of stress as determined by the Landscape Architect are to be deep root fertilized, two injections per caliper inch per tree at 18" - 24" depth with Peter's 20/20/20 fertilizer or Landscape Architect approved equal.
- Contractor is responsible for verifying and confirming all plant counts as supplied by the Landscape Architect with field conditions as constructed. Any discrepancies shall be reported to Landscape Architect for approval and direction.
- Tree transplanting shall be performed by a suitable hydraulic tree spade, sized as necessary to perform the work.
- Prior to commencement of any construction, all existing trees to remain shall receive tree protection fence at outer edge of dripline whenever possible.

GENERAL NOTES

- Contractor is responsible for all damage due to his operations inside and outside the contract limit line.
- Contractor is responsible for checking spot elevations and verifying proposed grades by providing grade stakes. Grades must be approved by Landscape Architect prior to proceeding.
- Contractor shall blend new work smoothly with existing grades at contract limit line and/or limit of construction line.
- Contractor to verify that subgrades are 6 inches below finished grade prior to spreading top soil for seeded areas.
- All walks shall have 2% cross pitch, and all step treads and wall caps shall have 1% cross pitch unless otherwise noted.
- Light fixture locations may be field adjusted with prior Landscape Architect approval.
- Walkway layout to be approved by Landscape Architect prior to construction.
- Site furniture and wall locations to be verified by Landscape Architect prior to installation.
- General Contractor is responsible for all erosion control measures during construction.
- It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
- Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
- Field verify the location of all proposed hardscape, lighting and softscape with landscape architect and owner prior to construction.
- Contractor shall contact the landscape architect immediately if the layout of materials cannot be installed as designed per plan due to existing conditions.
- Base survey prepared by KREBS & LANSING CONSULTING ENGINEERS, INC.

REFER TO L402 FOR PLANT DETAILS

NOT FOR
CONSTRUCTION

NO.	DESCRIPTION	DATE
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WONG RESIDENCE

98 SUNSET CLIFF RD
BURLINGTON, VT 05408

PLANTING PLAN

JOB NO. 22-272
SCALE: 1/16"=1'-0"
DRAWN BY: XX
DATE: 05.10.2023

L200



BOARDFORM
CONCRETE WALL

PRECAST CONCRETE
STEPPERS

PRECAST CONCRETE
STEP

PROPOSED BUILDING
FOOTPRINT

EXPOSED AGGREGATE
CONCRETE PAVING

PRECAST CONCRETE
STEPS

BOARDFORM
CONCRETE WALL

PRECAST CONCRETE
STEPPERS

PRECAST CONCRETE
LAWN STEPS

PROPOSED LAKE
ACCESS

SCALE: 1"=20'-0"
05.17.2023

WONG RESIDENCE | ILLUSTRATIVE PLAN



05.10.2023

WONG RESIDENCE | ENTRY DRIVE

WHLA
WAGNER HODGSON



05.10.2023

WONG RESIDENCE | PICKLEBALL COURT

WHLA
WAGNER HODGSON



05.10.2023

WONG RESIDENCE | LAKESIDE LANDSCAPE

WHLA
WAGNER HODGSON



05.10.2023

WONG RESIDENCE | LOWER TERRACE @ SUNSET

WHLA
WAGNER HODGSON



05.10.2023

WONG RESIDENCE | LAKE ACCESS @ SUNSET

WHLA
WAGNER HODGSON

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT
May 2023

Rhino Foods – Potential Expansion

The potential project is located at 179 Queen City Park Road in Burlington, VT. The project is located in the Light Manufacturing (E-LM) district. The project area consists of 2 separate parcels containing approximately 8.1 acres. One parcel contains the existing $\pm 44,000$ square foot Rhino Manufacturing Facility. The second parcel is currently undeveloped. The project would combine the two lots and add a $\pm 65,000$ square foot building expansion to the existing facility. The construction of the addition will require the relocation of the existing southern parking lot. The expansion will be served by new utility connections including water, sewer, electric, gas and communications. Two new gravel wetlands will be constructed to treat the stormwater from the project. There will also be a new bio-retention area on the north side of the existing site to treat some of the stormwater from the existing building. New site lighting and landscaping will also be part of the project. The existing curb-cut on Queen City Park Road will remain and a new curb cut will be installed on the southern portion of the project. This will allow trucks to enter the site via the existing curb cut and exit the site via the new curb cut.

The application package being submitted contains the following items:

- The Zoning Permit Application was submitted via the City of Burlington online permit portal.
- Property owner signature page.
- The application fee will be paid once we are notified of the total fee due.
- Photographs and satellite images of the property.
- Site plans showing the items required in the COA Level II Application Checklist.
- A coverage calculation is shown on sheet C-3 of the civil plan set. This table shows a proposed lot coverage of 64.5%.
- Building elevations along with color renderings from a birds-eye view and from street level near the new entrance.
- Specification sheets for loading dock shelters, insulated doors and the insulated metal panels that will make up the exterior of the building expansion.
- Landscaping and lighting plan set including lighting cut sheets. A landscaping narrative has also been provided.
- A stormwater package including a cover letter from Watershed Consulting, drainage maps, a maintenance plan and HydroCAD modeling data for Pre and Post Conditions for 1, 10, 25 and 100-year storms.
- An EPSC plan sheet is included in the civil drawing package as sheet C-11 and an EPSC detail sheet is included as sheet C-12.
- A Transportation Demand Management Plan.
- NPA Ward 5 Meeting Certification Statement and Meeting Minutes.

Article 4 Criteria

Article 4: Maps & Districts

Sec. 4.4.3, Enterprise Districts:

(a) Purpose

The project is located in the Light Manufacturing (E-LM) District. This district is primarily intended to provide for industrial uses. This project is the expansion of an existing food

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT
May 2023

processing facility. The use and purpose of the project is consistent with the intent of the E-LM Zoning District.

(b) Dimensional Standards & Density

i.
$$\text{FAR} = \frac{\text{GFA Structures}}{\text{Gross Site Area}} = \frac{109,000 \text{ sf}}{351,965 \text{ sf}} = 0.3$$

The maximum FAR allowed in the E-LM district is 2.0 so the project is well under the allowable FAR.

ii. The maximum allowable lot coverage in the E-LM district is 80%. The proposed lot coverage is 64.5%.

iii. The front yard setback for the proposed addition is 125' which is greater than the minimum 5' required front yard setback.

There are no minimum side yard setback requirements.

As the rear of the property is also a zoning district boundary with a residential zone, a 25' rear yard setback applies. The proposed rear building setback is 117'. The circulation pavement setback is 69'.

iv. The building height is 45' from the average grade in the 10' in front of the building to the roof.

(c) Permitted & Conditional Uses

Food and beverage processing use is permitted in the E-LM district.

(d) District Specific Regulations

Not applicable.

Article 5 Criteria

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

No lot coverage exception is being requested.

Sec. 5.2.4, Buildable Area Calculation

Not applicable.

Sec. 5.2.5, Setbacks

See above.

Sec. 5.2.6, Building Height Limits

Building Height = 45'. See above.

Sec. 5.2.7, Density and Intensity of Development Calculations

FAR = 0.3. See above.

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT

May 2023

Sec. 5.5.1, Nuisance Regulations

No nuisance impacts are associated with the proposed expansion.

Sec. 5.5.2, Outdoor Lighting

A lighting plan for the project is being submitted with this application. The plan includes fixture types, locations and illumination levels for the project. The illumination from the proposed project is down shielded and located to illuminate the loading docks, parking lot and driveway. No lighting over 0.1 lumens is projected to cross the property lines. The project is a cut site. The southwest corner of the project adjacent to the loading docks is approximately 10' below the existing grade at the property line. This helps to minimize light trespass from truck headlights going around the site.

Sec. 5.5.3, Stormwater and Erosion Control

The project will result in an increase of 2.5 acres of impervious surface. Therefore, the project is required to and will obtain State of Vermont 3-9050 Operational and 3-9020 Construction Stormwater permits.

The stormwater generated from the project will be treated via two new gravel wetlands and new a bio-retention area. A stormwater narrative is attached to this submission.

Over 400 square feet of land disturbance is proposed so an Erosion Prevention and Sediment Control (WPSC) plan is required. Sheet C-12 is an EPSC plan and Sheet C-13 contains the details associated with the EPSC plan. The EPSC plan utilizes a stabilized construction entrance, temporary sedimentation basins, stone check dams, erosion control blankets and silt fence. This plan will be submitted to the stormwater administrator via the online permit portal for review.

Article 4 Criteria

Article 6: Development Review Standards

Part 1, Land Division Design Standards

The project area consists of 2 separate parcels containing approximately 8.1 acres. One parcel contains the existing $\pm 44,000$ square foot Rhino Manufacturing Facility. The second parcel is currently undeveloped. The project would combine the two lots and add a $\pm 65,000$ square foot building expansion to the existing facility. The proposed project will merge two existing parcels into one. A survey plat that show the property boundary between the two lots being dissolved and the lots being merged will be filed at the appropriate time.

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

The property is not affected by any important natural features as identified in the Natural Resource Overlay map. The existing tree line along the westerly boundary will remain intact.

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT

May 2023

(b) Topographical alterations

The current site slopes gradually down from the southwest corner to the northeast corner towards the road. The finish floor elevation of the building expansion must match the finish floor elevation of the existing building. As a result, the site will be a cut site with an approximately 10' cut in the southwest corner of the site. Excess material will be disposed of off-site.

(c) Protection of important public views

There are no important public views on or through the subject property.

(d) Protection of important cultural resources

The site has no historical significance, nor are there any known archaeological resources.

(e) Supporting the use of alternative energy

While not part of the current proposal, the project is being evaluated to allow for the installation of a 40k solar array on the top of the building. Other alternative energy items that are being considered for the project include:

- A CO2 refrigeration system vs. a traditional hydrofluorocarbon refrigeration system.
- A heat recovery system for refrigeration that would heat water used for sanitation.
- Above code thermal insulation in walls, the roof and below the slab.
- Above code insulated dock doors, personnel door and MHE doors.

(f) Brownfield sites

The project site is not an identified brownfield site.

(g) Provide for nature's events

As noted above the stormwater generated from the project will be treated in two new gravel wetlands and a new bio-retention area.

There are green space areas adjacent to the parking areas that will allow for snow storage.

The existing sheltered building entrance will remain and be the primary building entrance.

(h) Building location and orientation

The existing building faces Queen City Park Road. The proposed addition is generally in-line with the existing building. The existing front entrance will remain and continue to be utilized as the primary entrance. Emergency exit doors are provided in the new building. Ten new loading dock doors are being provided on the south of the new building and they are screened from the road by a portion of the new building.

(i) Vehicular access

The existing driveway will remain and will provide ingress and egress to and from the property for passenger vehicles. It will also serve as the entry for truck deliveries. However, trucks will circulate around the building and exit from the new southerly curb cut. This new southerly curb cut was reviewed by the Department of Public Works during Sketch Plan Review, and they

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT

May 2023

found it acceptable. Sight lines at the existing driveway's intersection with the road remain essentially unchanged. Sight lines at the new driveway intersection with the road are clear. The ITE manual indicates 31 additional peak trip ends are associated with a building of this size. As an existing facility, Rhino is able to forecast their projected traffic associated with the expansion. Their internal estimates indicate approximately 11 additional peak hour trip ends associated with the expansion project. Both are below the 75 peak hour trip end threshold for requiring a comprehensive traffic analysis.

(j) Pedestrian access

There is no public sidewalk along this side of Queen City Park Road. Therefore, there is no requirement to provide a front walkway connecting to it. Pedestrian walkways provide access from the existing parking lot to building entries. A new walkway is proposed from the new parking area to the main entrance. An additional walkway is proposed at the existing driveway entrance that will assist people accessing the main entrance from the bus stop.

(k) Accessibility for the handicapped

There are four ADA parking spaces within the existing parking lot. No additional ADA spaces are required for the total number of parking spaces (92).

(l) Parking and circulation

The existing parking lots contain a total of 82 parking spaces. The proposed parking areas will contain a total of 92 parking spaces. All vehicles will enter the existing driveway. Passenger vehicles will also exit at the existing driveway. Trucks will enter the existing driveway and wrap around the building to access the loading docks. Trucks will then leave via a new south driveway. The existing parking lot on the east side of the existing building will remain. A new parking area will be constructed on the east side of the new building. This new parking location was discussed during the DAB and DRB sketch plan meetings. The new parking area is being proposed on the east side of the site to locate it as close to the existing main entrance as possible. This is needed to allow for controlled access to the building, which is a food manufacturing facility that has strict requirements regarding access and sanitation. Both the DAB and DRB were supportive of the location of the parking lot in the proposed location on the east side of the building.

The new parking area has landscaped islands as required.

The landscaping plan shows shade trees as required. The proposed percentage of shaded parking lot is 34.2% which is greater than the minimum required percentage of 30%.

The landscaping plan and site renderings show that the new parking area will be screened from the road. There is also a gravel wetland between the road and the new parking area.

(m) Landscaping, fences, and retaining walls

A landscaping plan has been prepared by Wagner Hodgson Landscape Architecture. The plan shows a mixture of new trees, shrubs, perennials, grasses and groundcover. A landscaping narrative is also provided.

(n) Public plazas and open space

No public plaza or open space is included or required in this proposal.

Rhino Foods - 179 Queen City Park Road – Potential Expansion

Zoning Permit/COA Level II Narrative

Burlington, VT
May 2023

(o) Outdoor lighting

Please refer to Section. 5.5.2.

(p) Integrate infrastructure into the design

Mechanical equipment is primarily located on the roof. Some equipment will be located inside of the building where feasible. The loading docks are located on a face of the building that is screened by the building itself.

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

The proposed building will be constructed with insulated metal panel siding. This is a typical method of construction and aesthetic in an industrial area. The insulated metal panels have stringent requirements for paints, colors and connections to the metal panels. Any changes to the colors of the panels, applying paint to the panels or attachment of external features such as signs or murals need to be reviewed with the panel manufacturer to ensure the warranty is not voided. The panel manufacturer needs to ensure that the insulative properties and efficiency of the building is not compromised due to dark colors absorbing heat or penetrations through the insulation.

The insulated metal wall panels will also help to reduce the energy utilization required for the refrigerated warehouse space.

The face of the building is located generally in line with the existing facility.

New trees located along the new parking lot and gravel wetland help to break up the massing of the building.

The main entrance for the new facility will be the existing main entrance at the existing building. This existing main entrance has prominent architectural features that allow for identification as the main entrance of the facility.

Article 8 Criteria

Article 8: Parking

Sec. 8.1.9, Maximum On-Site Parking Spaces

Within the Shared Use Parking District, the maximum number of onsite parking spaces is limited to 1 per 1,000 square feet GFA, plus 2 per 1,000 square feet GFA devoted to patron use. There is no patron use associated with this facility.

The existing GFA of the building is 43,666 square feet and the proposed 65,000 sf addition brings the GFA to 108,666 sf. This would allow for a maximum of 109 parking spaces. The proposed plan has a total of 92 parking spaces, which is below the maximum of 109 spaces.

Rhino Foods - 179 Queen City Park Road – Potential Expansion

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May 2023

Sec. 8.1.10, Off-Street Loading Requirements

The loading docks are located to the south side of the proposed addition. This allows for truck access to them from the public street. The loading docks are located away from parking and pedestrian circulation.

Sec. 8.1.11, Parking Dimensional Requirements

The proposed parking spaces are 18' deep by 9' wide with a 24' aisle width for 2-way circulation.

Sec. 8.1.12, Limitations, Location, Use of Facilities

(a) Shared Parking for Off-Site Use

There will be no parking provided for off-site users. The parking will serve onsite employees and visitors.

(b) Front Yard Parking Restricted & Residential Driveways

Not applicable.

(c) Availability of Facilities

The parking areas will not be used for the storage or display of vehicles or materials.

Sec. 8.1.13, Parking for Disabled Persons

There are four ADA parking spaces within the existing parking lot. No additional ADA spaces are required for the total number of parking spaces (92). The existing ADA spaces are located on an existing ADA accessible route to the main entrance.

Sec. 8.1.14, Stacked and Tandem Parking Restrictions

Not applicable.

Sec. 8.1.16, Transportation Demand Management

A Transportation Demand Management Plan has been developed and is included in this application package.

May 23, 2023

Department of Permitting and Inspections
Zoning Division 645 Pine Street Burlington, VT 05401

Re: Rhino Food Warehouse Addition, Landscape Concepts and Objectives



The primary objectives for the landscape of this site were as follows:

1. Screen the parking lot from Queen City Park Road

Screening of the parking lot was achieved using a mix of evergreen shrubs and tall ornamental grasses along the edge of the parking lot. These species mature to 4-6' tall. Small evergreen trees are sprinkled along the other side of the wetland to provide supplemental screening in the winter when grasses are dormant, and to brake up the edge of the wetland. Small install sizes are used on the steep slope to ensure proper establishment, and dwarf varieties are used to avoid interference with overhead electric lines.

2. Supplement screening of the development from the neighbors to the south-west

Evergreens trees are used along the southern property line, larger native species that will be installed larger are used where slopes and utilities allow. Tall shade trees are used along the edge of the drive to provide supplemental screening (and shading) in the summer.

3. Shade the parking lot

A mix of shade trees are used adjacent to the parking lot to provide shade. Larger trees are placed in the islands where they will have the most impact, while slightly smaller trees are placed along the edge where they can comfortably fit within the light poles.

4. Use appropriate species

All species selected are hardy to zone 4, drought tolerant, and non-invasive. Native species are used where possible, salt tolerant species are used where necessary. Disease resistant / trouble-free cultivars are specified to ensure long-term vitality. Available soil volume was also a consideration in species selection and placement.

If you should have any questions or comments, please do not hesitate to contact me.

Sincerely,

Ella Braco

Associate Landscape Architect
ebraco@wagnerhodgson.com



To: Ted Castle
Rhino Foods, Inc.
179 Queen City Park Road
Burlington, VT 05401

Date: December 19, 2022

Memorandum

Project #: 87004.22

From: Jenn Conley, PE
Nicole Rogers, PE

Re: Rhino Foods
Traffic Assessment
Burlington, VT

VHB has prepared this Traffic Assessment Study to evaluate the expected number of trips associated with the proposed warehouse development south of Rhino Foods Inc.'s existing facility located at 179 Queen City Park Road in Burlington, Vermont. The site includes the existing 45,000 square foot Rhino Foods, Inc. facility which currently serves as a production facility and the proposed 62,000 square foot warehouse. To estimate the volume of traffic to be generated by the 62,000 square foot warehouse, trip-generation rates published by the ITE Trip Generation Manual were researched. Vehicles generally access the site from US 7 via Queen City Park Road or Home Avenue. Access to the site is proposed via the existing full-access/egress driveway on Queen City Park Road.

The Traffic Assessment is summarized within this document, which contains:

- A description of the site and existing transportation network in the study area;
- A description of the proposed redevelopment program for the site;
- A trip generation and distribution estimate for the proposed redevelopment; and,
- A set of conclusions and recommendations to support the project.

Existing Conditions

A review of existing conditions focused on the project site and transportation network access to and from the site. The project site and network in the study area were summarized by the roadway characteristics and current and future trip generation.

Roadway Characteristics

Queen City Park Road is a Class 2 Town Highway situated at the southernmost edge of Burlington, Vermont, crossing over to South Burlington before reaching its eastern terminus at US-7 / Shelburne Road. On July 1st, 2019, the name of Industrial Parkway, from its southern terminus at Queen City Road to its northern terminus at Home Avenue, was changed to Queen City Park Road. With the name change came the renumbering of locations along the new section of Queen City Park Road, including 179 Queen City Park Road, where Rhino Foods' Inc.'s proposed warehouse expansion is located.

The posted speed limit in Burlington is 25 miles per hour (mph) unless otherwise posted. Queen City Park Road at the southern origin is posted as 25 miles per hour and is otherwise assumed to be 25 mph. In the immediate vicinity of the Rhino Foods site, Queen City Park Road has 28-feet of pavement width to accommodate two-way traffic. South of the project site, Queen City Park Road crosses a single lane bridge with no traffic control.

Advisory lanes are present in both directions on Queen City Park Road from Central Avenue to Home Avenue. Advisory lanes are similar to bike lanes that create a preferential space for people biking. Advisory lanes may be shared by people walking and biking where sidewalk does not exist, like in the case on Queen City Park Road. In addition to the advisory lanes, approximately 130 feet of sidewalk is provided along Green Mountain Transit's parcel and approximately 400 feet

of side path is provided from Central Avenue to a pedestrian bridge adjacent to the single lane bridge southeast of the project site. It should be noted that access to the Burlington Greenway Bike Path is located off of Queen City Park Road just west of the Pine Street intersection as well as the Greenway Bike Path's northern terminus with Home Avenue. Two transit stops are located in the nearby vicinity of the site. There is a Green Mount Transit stop located along Rhino Foods frontage that provides outbound service along the Jefferson Commuter Monday – Friday with buses departing at 4:05 pm and 4:55 pm. This stop also provides inbound/outbound service along GMT Bus 5 (Pine Street) to the Downtown Transit Center. Another stop is located along the Green Mountain Transit frontage which also provides stop service for GMT Bus 5 and another at Green Mountain Transit.

Home Avenue is similarly a 25-mph facility with a Class 3 Town Highway classification. Home Avenue is an east-west connection between Queen City Park Road and US-7, intersecting Pine Street and, in the future, the Champlain Parkway just east of Queen City Park Road. Currently, Home Avenue is affected by construction associated with the Champlain Parkway.

Trip Generation

The projects consists of an expansion of the existing 45,000 square foot office and production facility to include a 62,000 square foot warehouse facility. Upon completion, the shared facility will be approximately 107,000 square feet. Given the multiple uses to be serviced at the facility and operations schedule, VHB estimated the site generated vehicle trips based on ITE trips, as well as using information provided by Rhino Foods on the anticipated number of employees, numbers of daily deliveries, shift times, and delivery schedules.

ITE Published Rates

Trip generation estimates for the proposed development program were calculated using rates published by the Institute of Transportation Engineers (ITE) in Trip Generation as depicted in Table 1. The land use code (LUC) assumed for this project was LUC 150 – Warehousing. The addition of 62,000 sf of warehouse space is anticipated to generate 11 vehicle trips during the weekday AM peak hour (8 entering, 3 exiting), 11 trips during the PM peak hour (3 entering, 8 exiting), and 106 daily trips (53 entering, 53 exiting).

Table 1. ITE Warehouse Trip Generation

Time Period/Direction	LUC 150 Warehouse
Weekday Daily	
<i>Enter</i>	53
<i>Exit</i>	53
<i>Total</i>	106
Weekday AM	
<i>Enter</i>	8
<i>Exit</i>	3
<i>Total</i>	11
Weekday PM	
<i>Enter</i>	3
<i>Exit</i>	8
<i>Total</i>	11

Rhino Foods Data

Rhino Foods also provided information on the number of employees, shift times, number of deliveries, and delivery times for existing and proposed operations. Based on this information, the facility is operating 24 hours per day, 5 days per week with similar operations on each day. The facility operates three shifts: 7:00 AM – 3:00 PM, 3:00 PM – 11:00 PM, and 11:00 PM to 7:00 AM. Operation times are expected to remain the same following the expansion. Currently, approximately 4 large delivery trucks arrive between 7:00 AM and 3:00 PM and another 2 arrive between 11:00 PM and 7:00 AM. There are currently no large truck deliveries occurring between the hours of 3:00 PM and 11:00 PM. These current large truck deliveries represent goods shuttled to/from the existing shipping and receiving warehouse in Williston, VT. With the expansion on this site to include a warehouse, truck deliveries are expected to increase. Approximately 16 large delivery trucks are expected to arrive between 7:00 AM and 3:00 PM and another 4 are expected to arrive between 3:00 PM and 11:00 PM. No large truck deliveries are expected to occur between the hours of 11:00 PM to 7:00 AM.

Rhino Foods also provided existing and projected employee information. Many employees are said to utilize public transportation, carpool or get dropped-off/picked-up thus reducing the number trips and long-term vehicles on site. The number of employees and estimated vehicle trips were provided by Rhino Foods:

- Approximately 90 employees (estimated 70 cars) are assigned to the 1st shift. This is expected to increase to 110 (estimated 85 cars) employees with the warehouse expansion.
- Approximately 25 employees (estimated 15 cars) are assigned to the 2nd shift. This is expected to increase to 35 employees (estimated 25 cars) with the warehouse expansion.
- Approximately 70 employees (estimated 50 cars) are assigned to the 3rd shift. This is expected to increase to 80 employees (estimated 60 cars) with the warehouse expansion.

Rhino Foods provided information is summarized in Table 2.

Table 2. Rhino Foods Operations Summary

Shift Logistics	Current Operations (Existing Manufacturing)	Future Operations (Manufacturing + Warehouse Addition)	Net New (Warehouse Addition Only)
1st Shift (7:00 AM – 3:00 PM)			
<i>Employees</i>	90	110	20
<i>Cars</i>	70	85	15
<i><u>Trucks</u></i>	<u>4</u>	<u>16</u>	<u>12</u>
<i>Total Vehicles</i>	74	101	27
2nd Shift (3:00 – 11:00 PM)			
<i>Employees</i>	25	35	10
<i>Cars</i>	15	25	10
<i><u>Trucks</u></i>	<u>0</u>	<u>4</u>	<u>4</u>
<i>Total Vehicles</i>	15	29	14
3rd Shift (11:00 PM – 7:00 AM)			
<i>Employees</i>	70	80	10
<i>Cars</i>	50	60	10
<i><u>Trucks</u></i>	<u>2</u>	<u>0</u>	<u>0</u>
<i>Total Vehicles</i>	52	60	10

It should be noted that based on Queen City Park counts conducted in 2009, the Weekday AM and PM peak hours of adjacent street traffic were found to occur from 7:45 – 8:45 AM and 4:30 – 5:30 PM, respectively. However, the proposed development program is anticipated to experience its peak traffic in the AM from 6:30 to 7:30 AM as the third shift ends and the first shift begins and from 2:30 to 3:30 in the PM as the 1st shift ends and the 2nd shift begins. To provide a conservative (worse case) analysis scenario, the peak one-hour (6:30-7:30 AM) of site generated traffic in the morning was superimposed on the Weekday AM peak hour of adjacent street traffic (7:45 – 8:45 AM), and the peak one-hour (2:30 – 3:30 PM) of site-generated traffic in the afternoon was superimposed on the Weekday PM peak hour of adjacent street traffic (4:30 – 5:30 PM). Trip generation for the proposed use utilizing Rhino Foods provided data is summarized in Table 3. Utilizing the ITE ratio of PM peak trips to weekday daily trips (1:10), the site is expected to generate 300 daily trips (150 entering, 150 exiting).

Table 3. Warehouse Trip Generation (Rhino Foods Provided Data)

Warehouse Trip Generation based on Rhino Foods Provided Data			
Time Period/Direction	Employee Trips	Truck Delivery Trips	Total Trips
Weekday Daily			
<i>Enter</i>	130	20	150
<i>Exit</i>	130	20	150
<i>Total</i>	240	40	300
Weekday AM			
<i>Enter</i>	15 (Vehicles Arriving for 1 st Shift)	1	16
<i>Exit</i>	10 (Vehicles Leaving from 3 rd Shift)	3	13
<i>Total</i>	25	4	29
Weekday PM			
<i>Enter</i>	10 (Vehicles Arriving for 2 nd Shift)	5	15
<i>Exit</i>	15 (Vehicles leaving from 1 st Shift)	1	16
<i>Total</i>	25	6	31

A comparison of the ITE trip rates to the Rhino Foods provided trip generation information is summarized in Table 4 and the detailed trip generation calculations are provided in the Appendix.

Table 4. ITE vs. Rhino Foods Trip Generation Comparison

Time Period/Direction	ITE LUC 150 Warehousing	Rhino Foods Data
Weekday Daily		
<i>Enter</i>	53	150
<i>Exit</i>	53	150
<i>Total</i>	106	300
Weekday AM		
<i>Enter</i>	8	16
<i>Exit</i>	3	13
<i>Total</i>	11	29
Weekday PM		
<i>Enter</i>	3	15
<i>Exit</i>	8	16
<i>Total</i>	11	31

As shown in Table 4, the proposed development program experiences significantly different trip generation characteristics compared to a typical Warehouse as defined by ITE 150. This is likely contributed to varying shift times and delivery schedules. To provide the most accurate (and conservative) estimate of Project-generated traffic impacts, the Rhino Foods provided data on shifts times and delivery schedules was utilized to estimate the trips generated by the proposed development program.

As shown in Table 4, the proposed development program is anticipated to generate an increase in vehicle trips of 29 vehicles (16 entering and 13 exiting) during the weekday AM peak hour and 31 vehicles (15 entering and 16 exiting) during the weekday PM peak hour. Generally, a traffic impact study should be considered when the proposed development generates 75 or more peak hour trips directly accessing the State Highway System. Therefore, the development program will likely not require a formal traffic impact study.

Conclusions

The redevelopment of the Rhino Foods, Inc. site will accommodate the existing production facility and office in addition to a warehouse. As outlined above, conservatively high trip generation estimates are anticipated to increase site trips by 29 trips during the AM peak hour and 31 trips during the PM peak hour. Comparatively, ITE Trip generation traffic increases associated with the project are anticipated to be very minor (11 trips during the AM peak hour and 11 trips during the PM peak hour). Therefore, the development program will likely not require a formal traffic impact study.

APPENDIX

- ***Trip Generation Calculations***
- ***VTrans Traffic Data***

APPENDIX

- ***Trip Generation Calculations***

ITE TRIP GENERATION WORKSHEET

(11th Edition, Updated 2021)

LANDUSE: Warehousing
LANDUSE CODE: 150
LOCATION: General Urban / Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 62.0

WEEKDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	31	0.92	1.71	0.15	16.93	292	4	3,300	50%	50%
	AM PEAK OF GENERATOR	25	0.85	0.21	0.02	2.08	284	4	3,300	66%	34%
	PM PEAK OF GENERATOR	27	0.90	0.23	0.02	1.80	284	4	3,300	24%	76%
	AM PEAK (ADJACENT ST)	36	0.69	0.17	0.02	1.93	448	4	3,300	77%	23%
	PM PEAK (ADJACENT ST)	49	0.65	0.18	0.01	1.80	400	4	3,300	28%	72%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	106	53	53	136	68	68
AM PEAK OF GENERATOR	13	9	4	35	23	12
PM PEAK OF GENERATOR	14	3	11	30	7	23
AM PEAK (ADJACENT ST)	11	8	2	31	24	7
PM PEAK (ADJACENT ST)	11	3	8	34	9	24

SATURDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	3	--	0.15	0.01	1.58	226	56	420	50%	50%
	PEAK OF GENERATOR	2	--	0.05	0.01	0.22	129	56	201	64%	36%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	9	5	5	N/A	N/A	N/A
PEAK OF GENERATOR	3	2	1	N/A	N/A	N/A

SUNDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	3	--	0.06	0.03	0.32	226	56	420	50%	50%
	PEAK OF GENERATOR	2	--	0.04	0.02	0.11	129	56	201	52%	48%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	4	2	2	N/A	N/A	N/A
PEAK OF GENERATOR	2	1	1	N/A	N/A	N/A

Land Use: 150

Warehousing

Description

A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas. High-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas.

Source Numbers

184, 331, 406, 411, 443, 579, 583, 596, 598, 611, 619, 642, 752, 869, 875, 876, 914, 940, 1050

Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 31

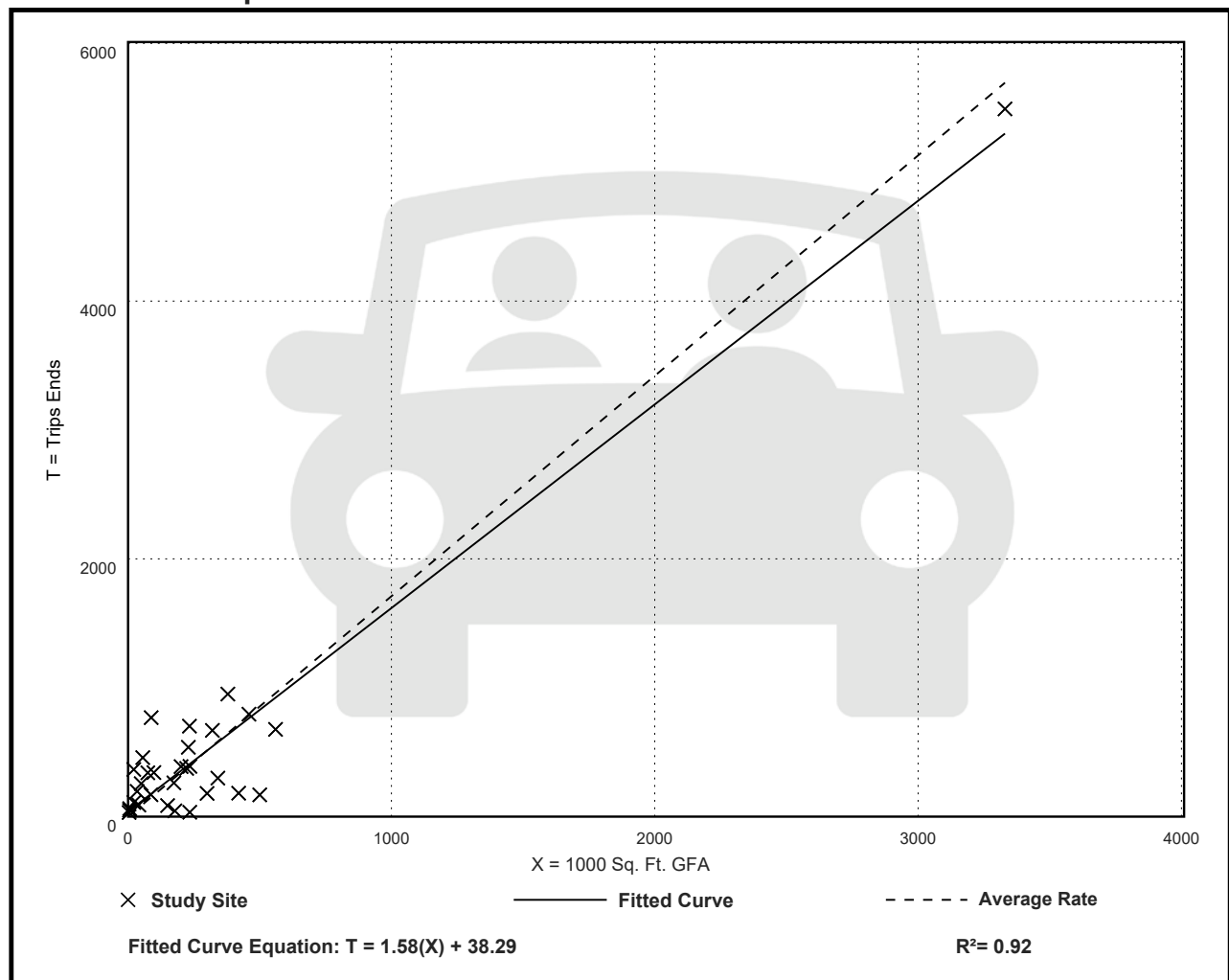
Avg. 1000 Sq. Ft. GFA: 292

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 36

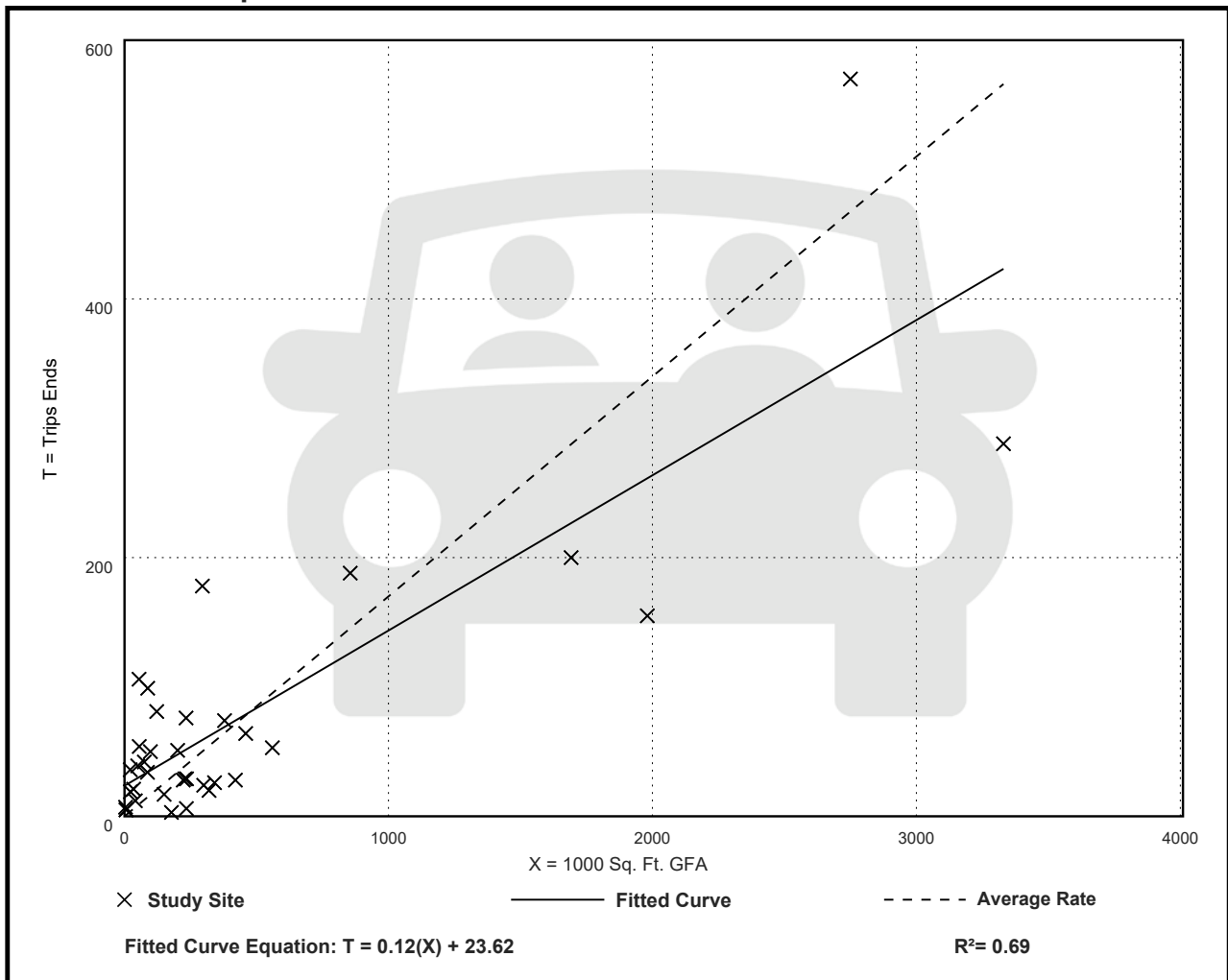
Avg. 1000 Sq. Ft. GFA: 448

Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 49

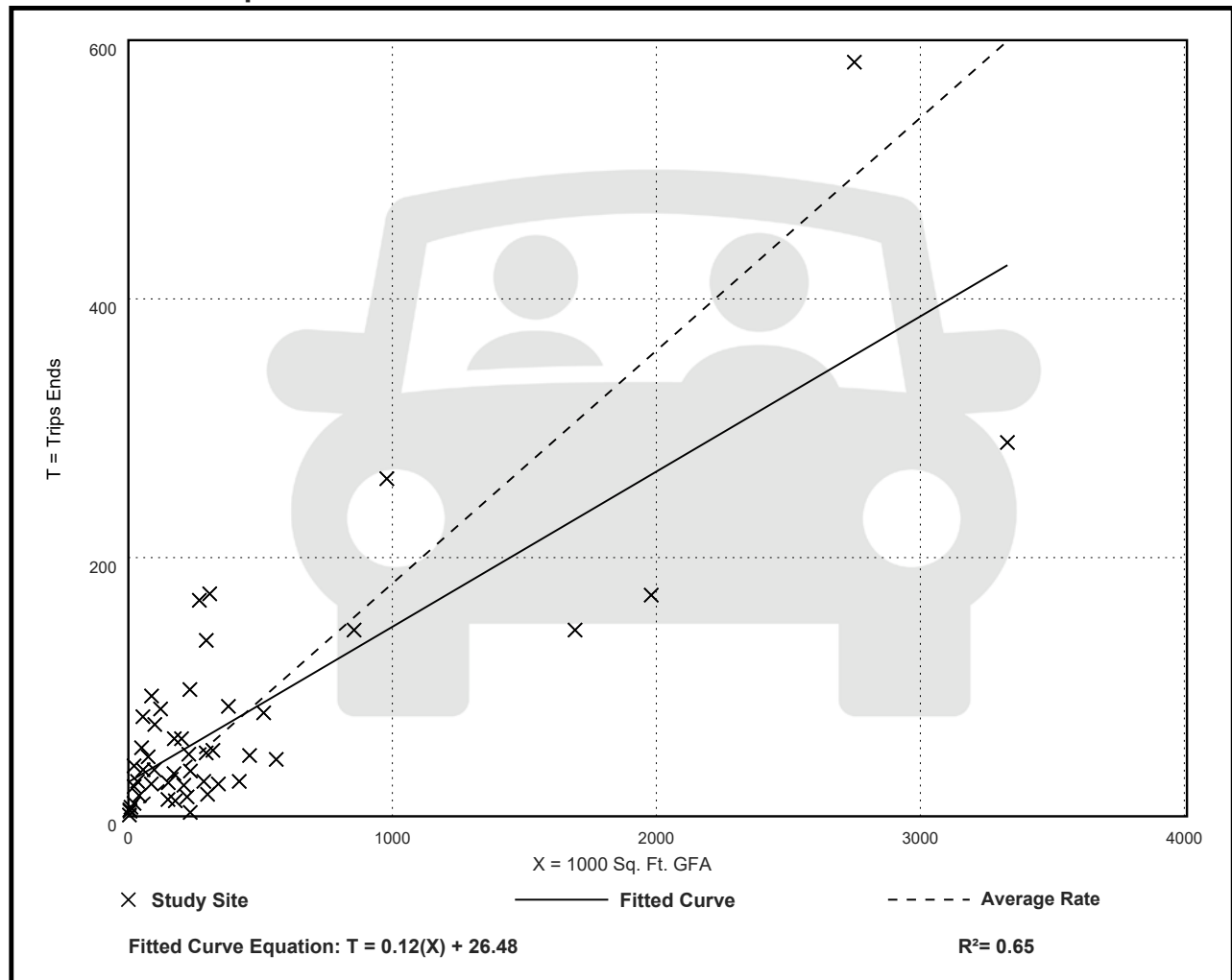
Avg. 1000 Sq. Ft. GFA: 400

Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 25

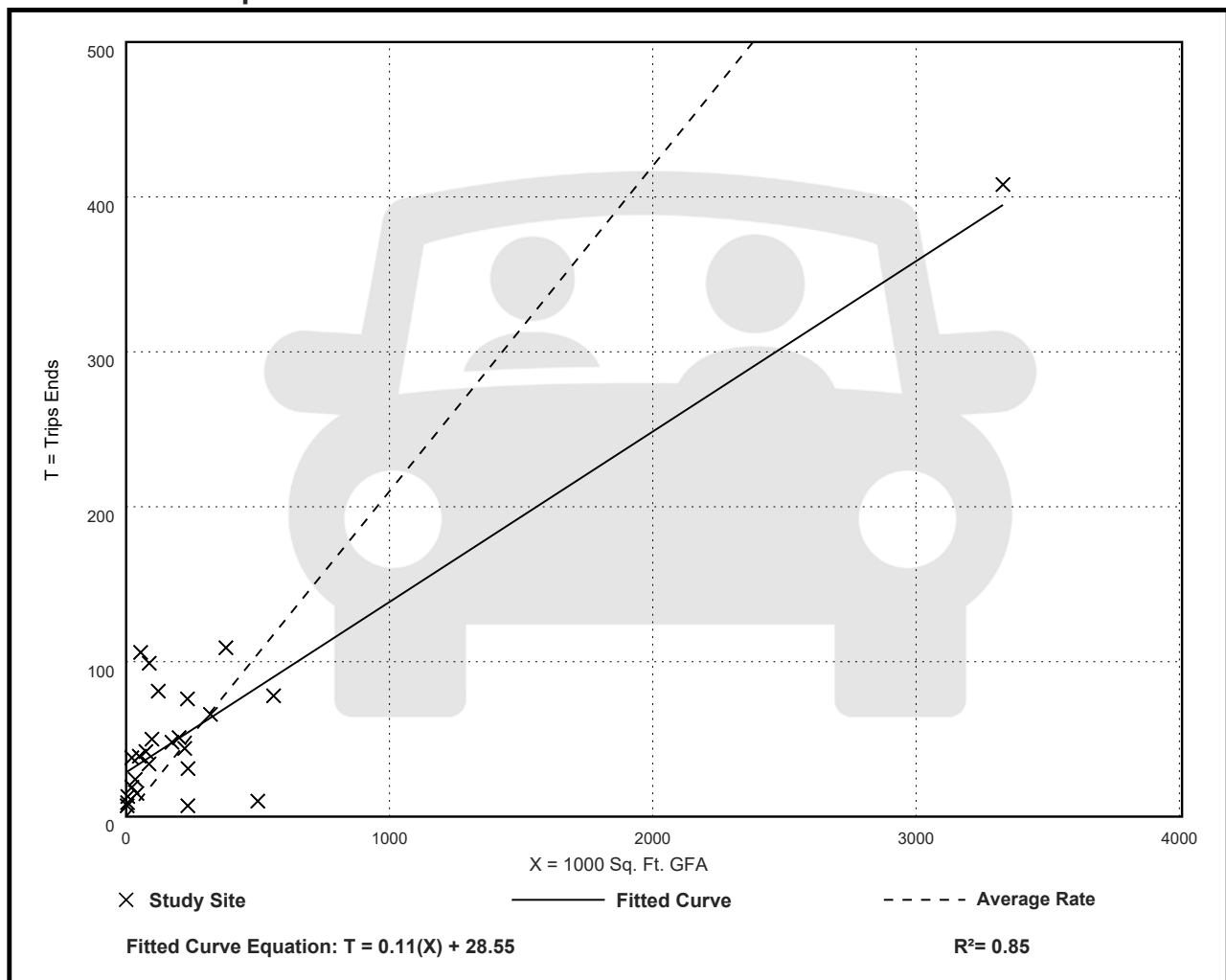
Avg. 1000 Sq. Ft. GFA: 284

Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.21	0.02 - 2.08	0.26

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 27

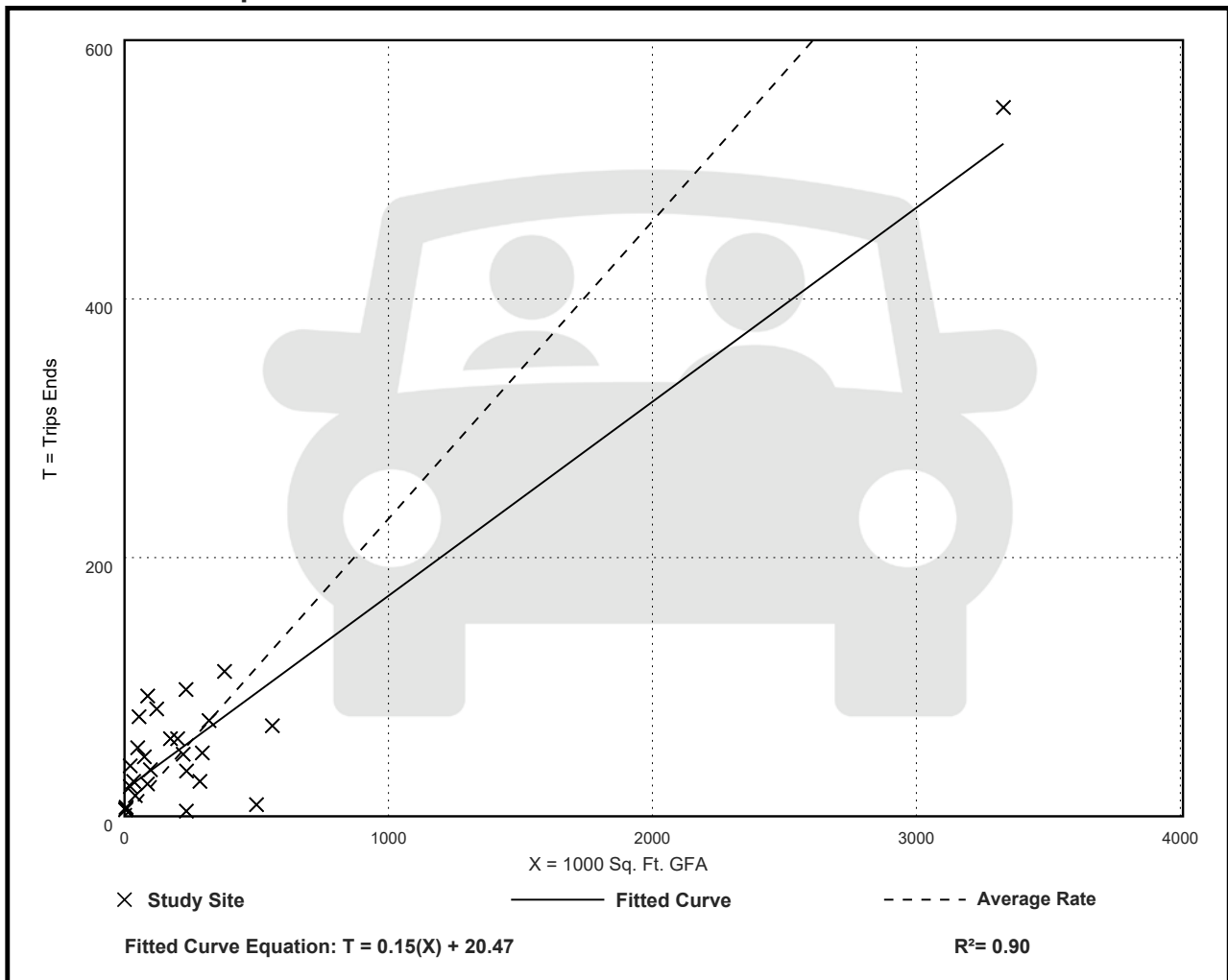
Avg. 1000 Sq. Ft. GFA: 284

Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.23	0.02 - 1.80	0.23

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Saturday

Setting/Location: General Urban/Suburban

Number of Studies: 3

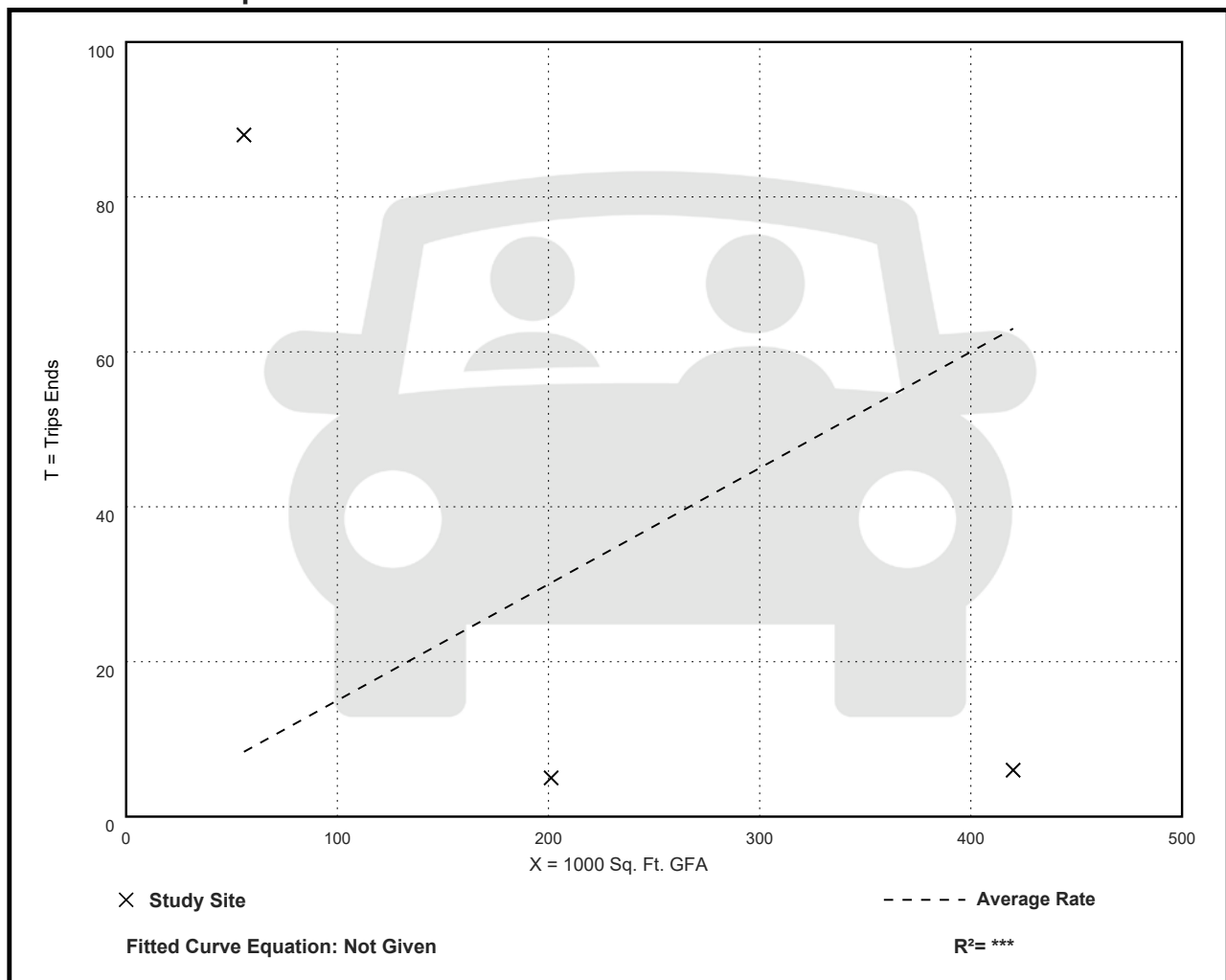
Avg. 1000 Sq. Ft. GFA: 226

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.01 - 1.58	0.53

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 129

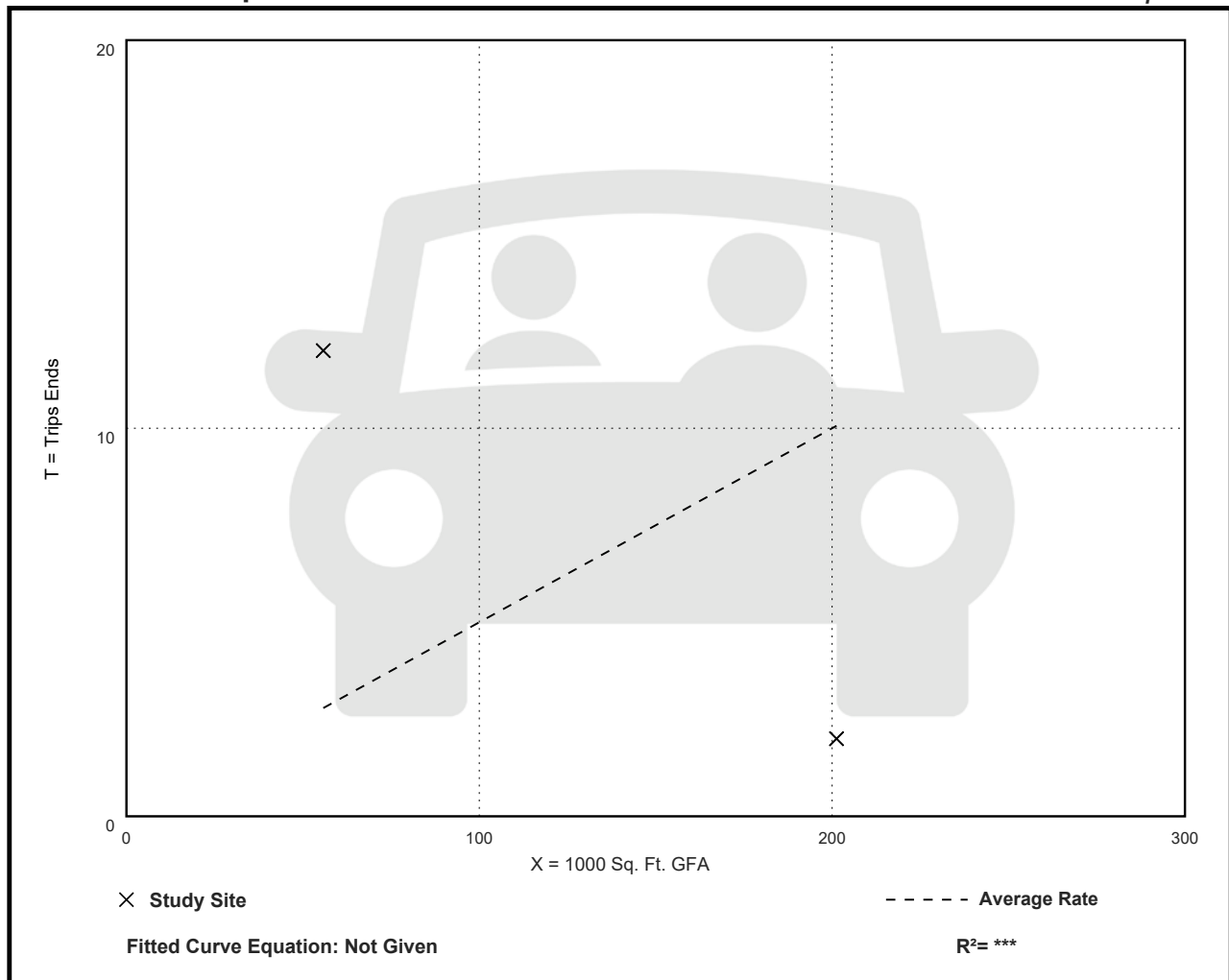
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.05	0.01 - 0.22	***

Data Plot and Equation

Caution – Small Sample Size



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Sunday

Setting/Location: General Urban/Suburban

Number of Studies: 3

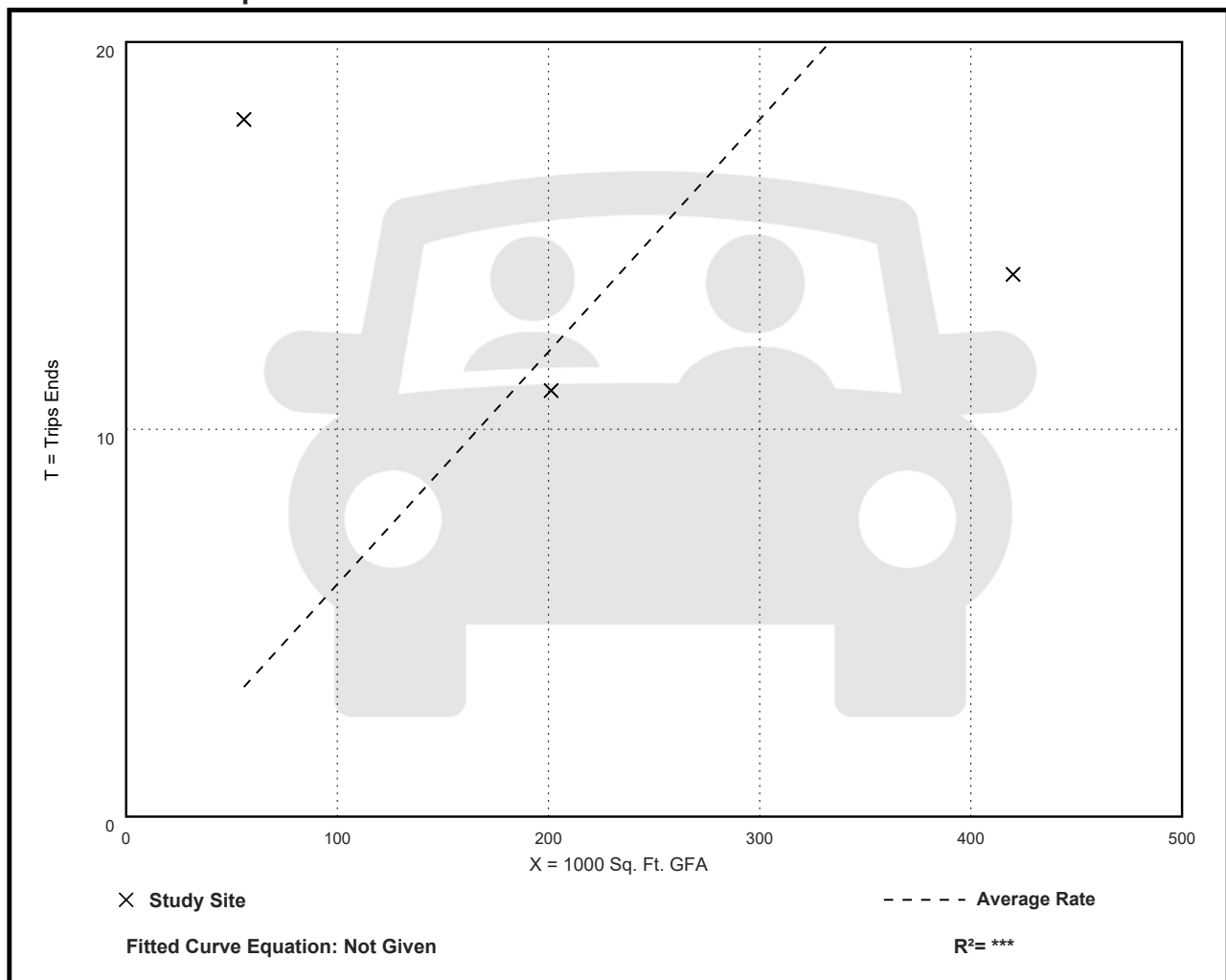
Avg. 1000 Sq. Ft. GFA: 226

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.06	0.03 - 0.32	0.10

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 129

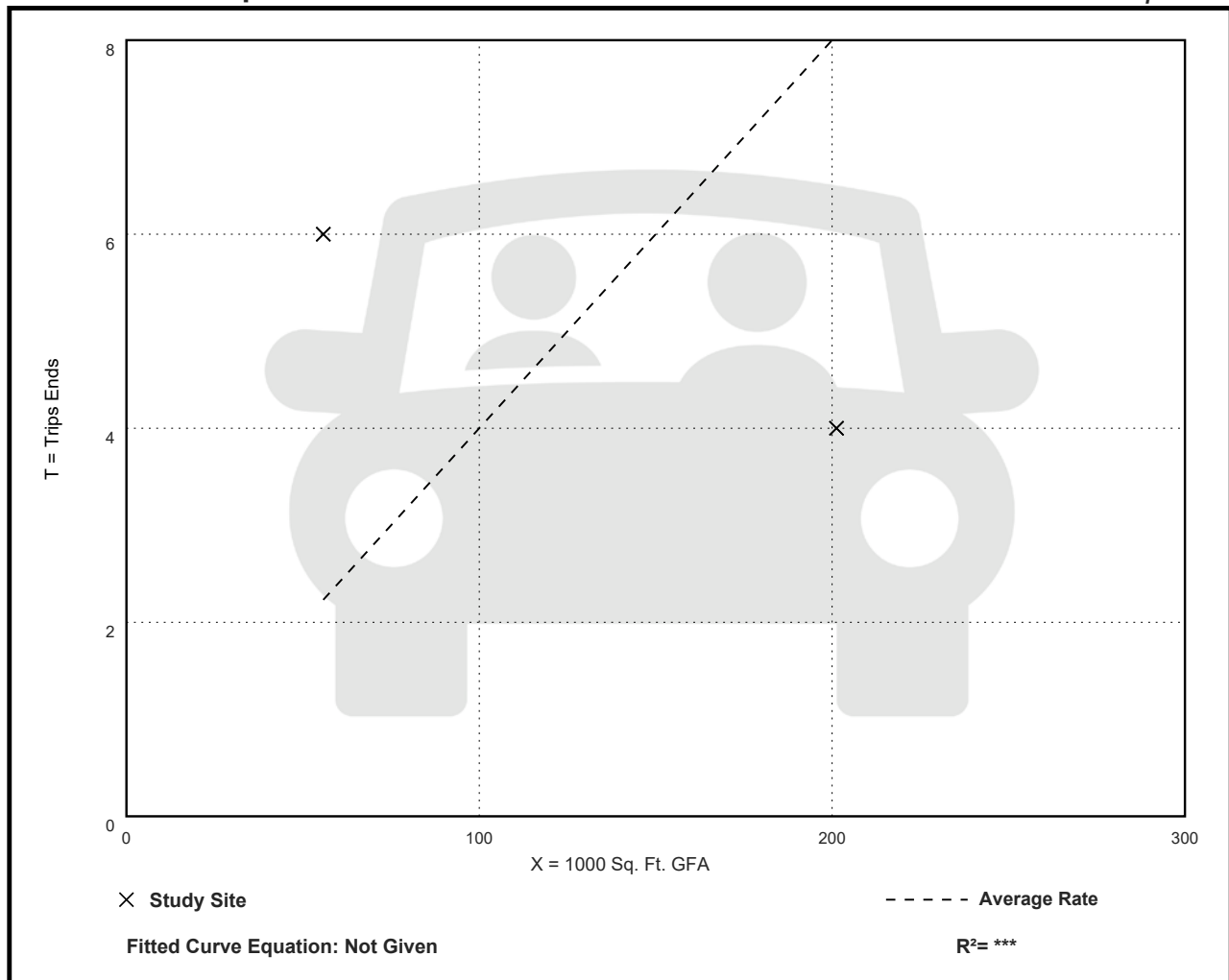
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.04	0.02 - 0.11	***

Data Plot and Equation

Caution – Small Sample Size



Warehousing (150)

Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 14

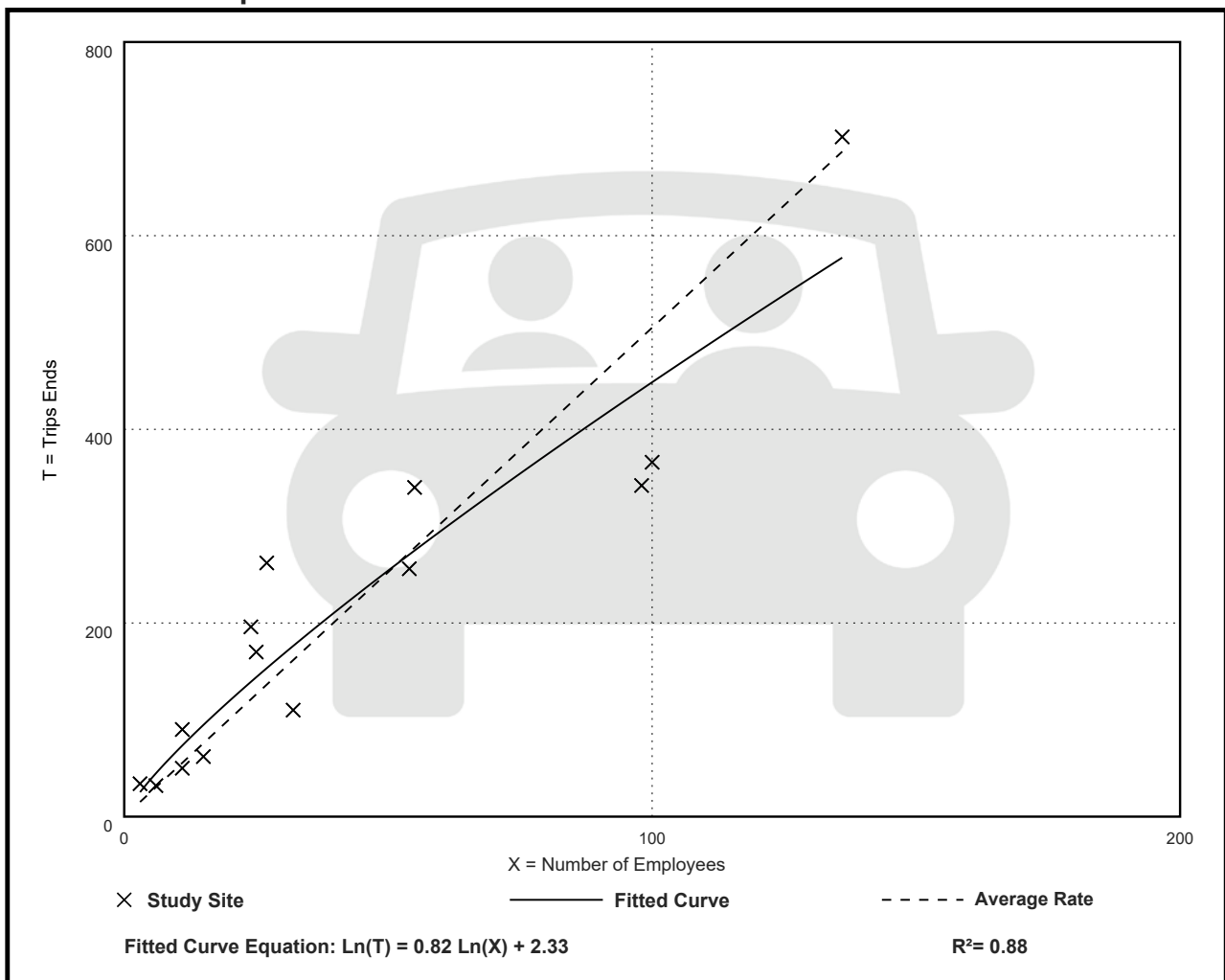
Avg. Num. of Employees: 43

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
5.05	3.44 - 11.33	1.77

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: Employees

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 14

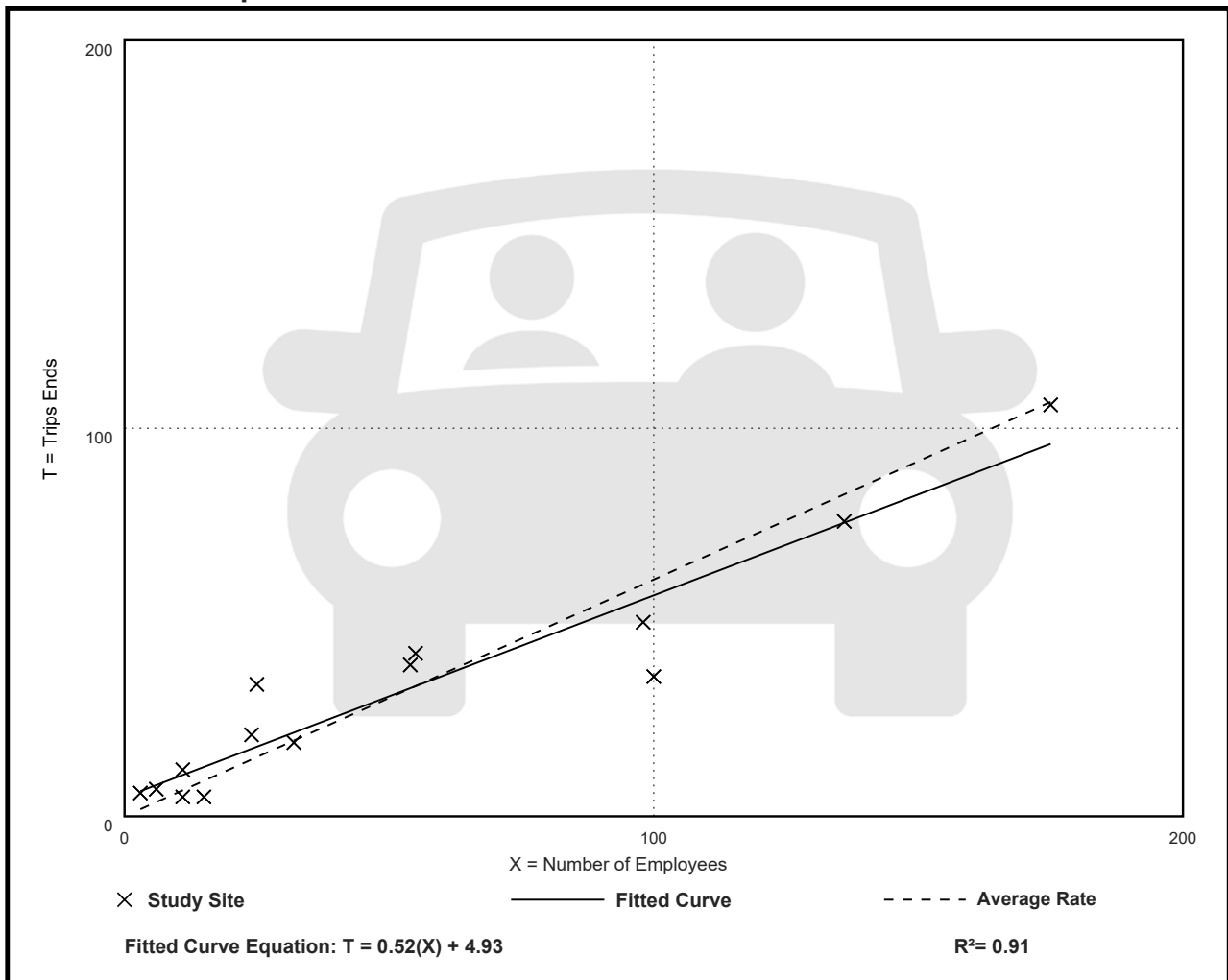
Avg. Num. of Employees: 53

Directional Distribution: 72% entering, 28% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.61	0.33 - 2.00	0.23

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: Employees

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 15

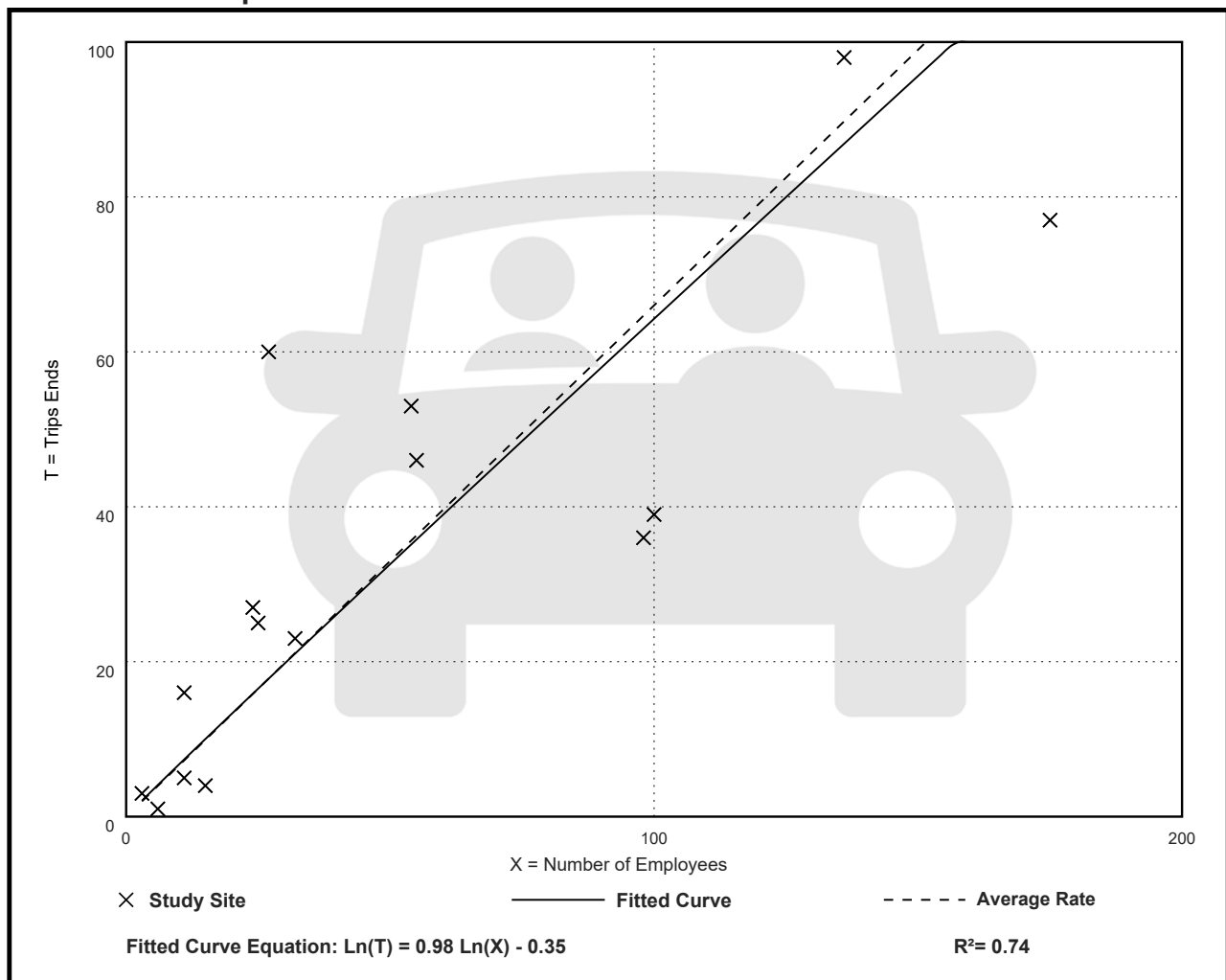
Avg. Num. of Employees: 51

Directional Distribution: 36% entering, 64% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.66	0.17 - 2.22	0.40

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: Employees

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 15

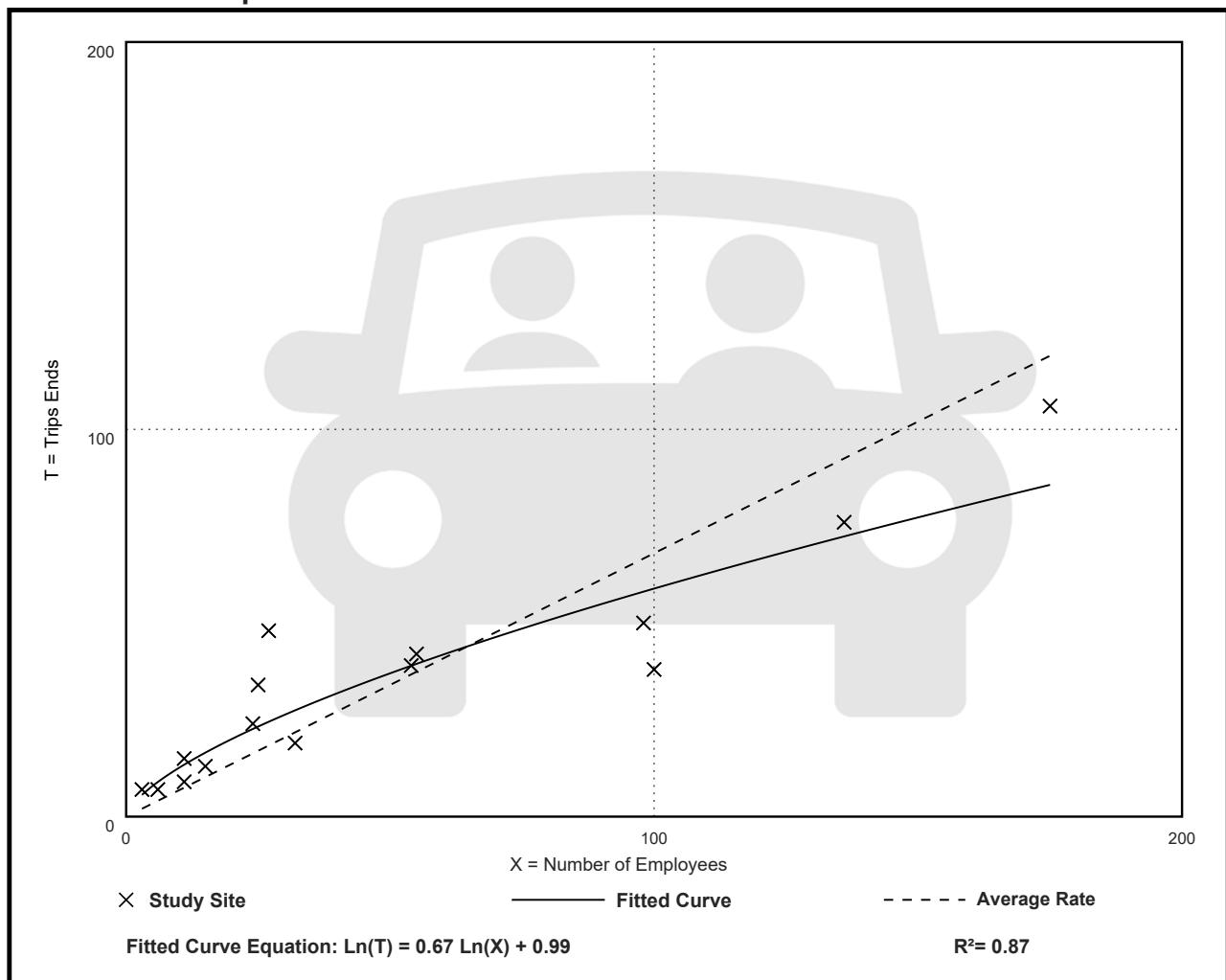
Avg. Num. of Employees: 51

Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.68	0.38 - 2.33	0.33

Data Plot and Equation



Warehousing (150)

Vehicle Trip Ends vs: Employees

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 15

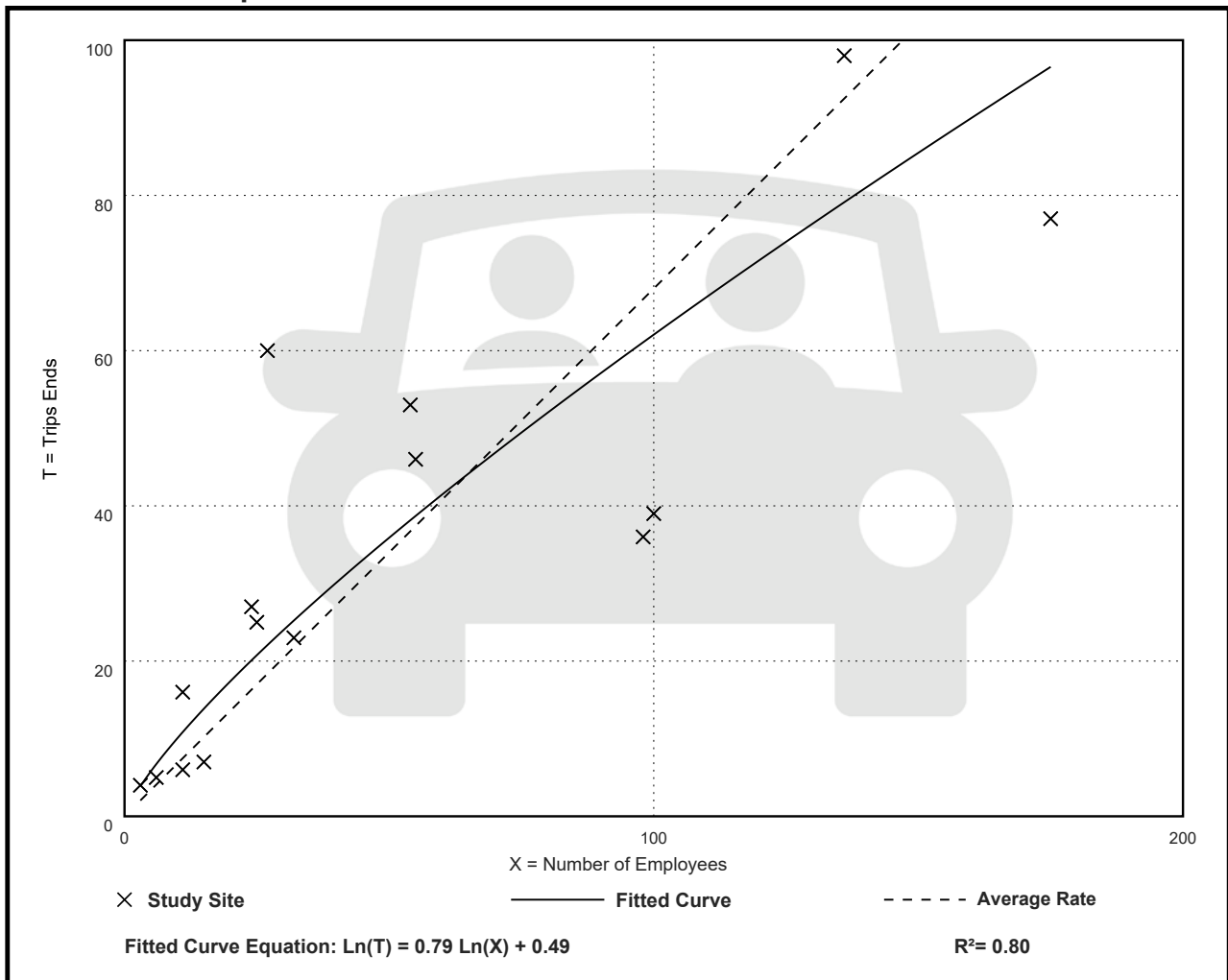
Avg. Num. of Employees: 51

Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.68	0.37 - 2.22	0.40

Data Plot and Equation



APPENDIX

- ***VTrans Traffic Data***



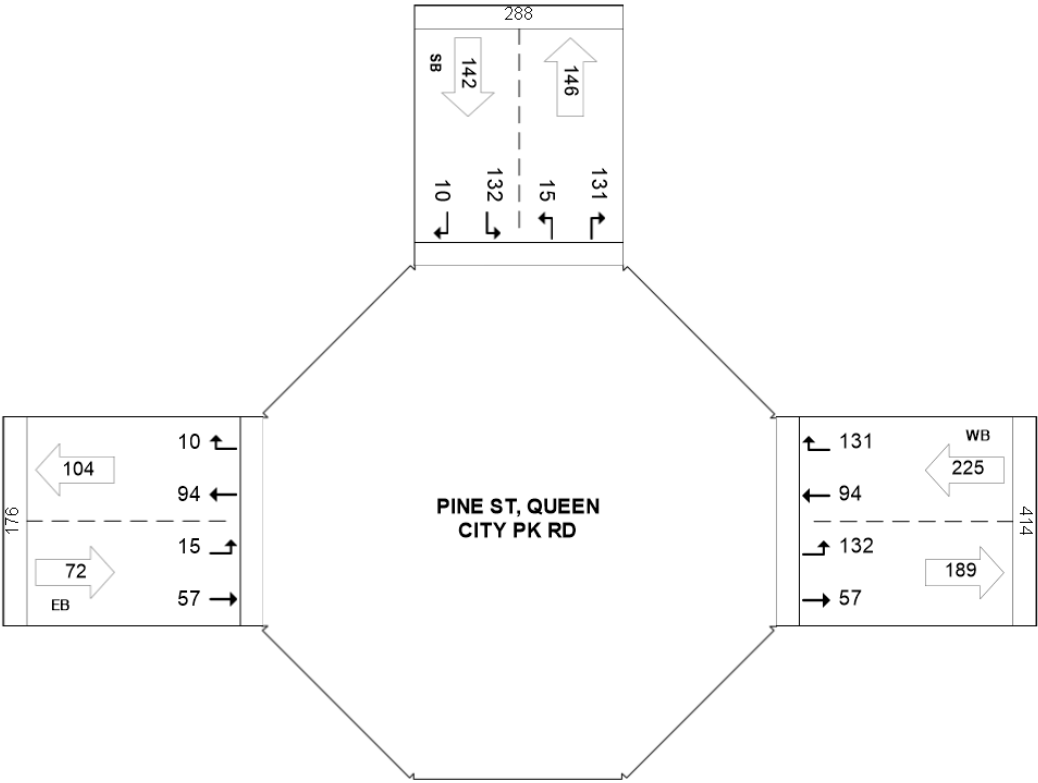
Peak Hour Data for Intersection

Int ID:	30403395	Zone:	N/A
Community:	BURLINGTON	Road 2:	QUEEN CITY PK RD
Road 1:	PINE ST	Road 4:	
Road 3:	QUEEN CITY PK RD		

AM Peak Hour (06/09/2009)

☒ Car ☒ Truck

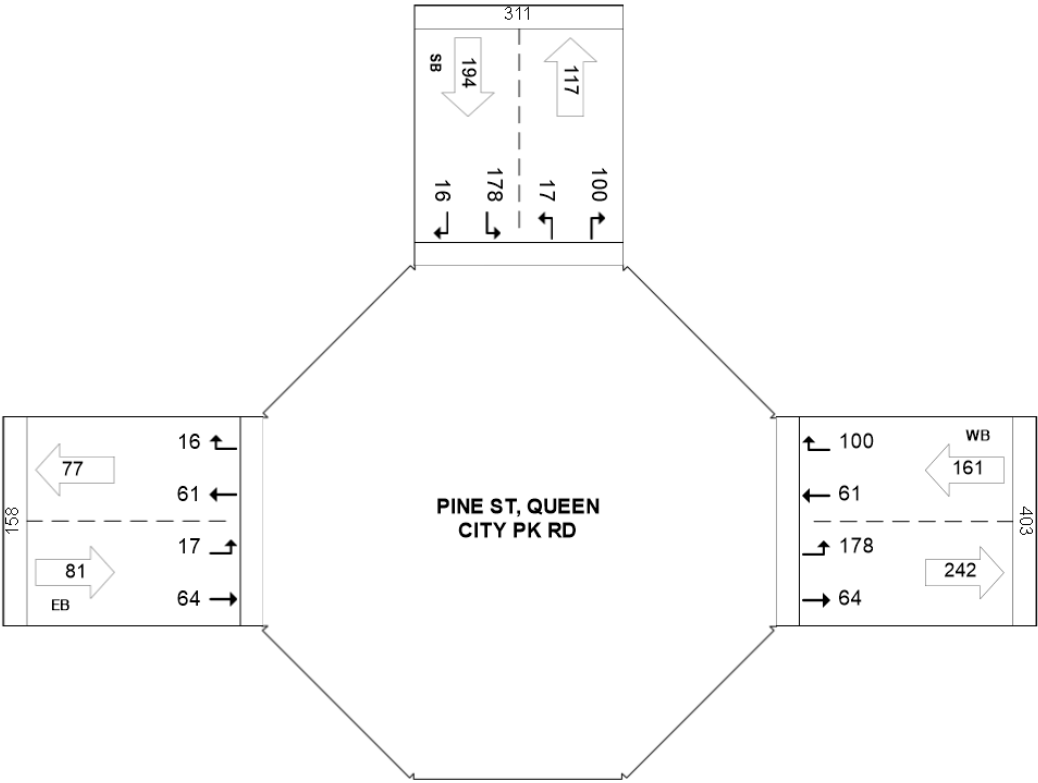
	EB				SB				WB			
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
7:45 AM	4	11	0	15	32	0	1	33	0	20	35	55
8:00 AM	4	15	0	19	32	0	2	34	0	23	36	59
8:15 AM	4	21	0	25	33	0	4	37	0	28	37	65
8:30 AM	3	10	0	13	35	0	3	38	0	23	23	46
Total	15	57	0	72	132	0	10	142	0	94	131	225
App %	21%	79%	0%		93%	0%	7%		0%	42%	58%	
PHF	0.94	0.68		0.72	0.94		0.63	0.93		0.84	0.89	0.87
HV %	13%	11%		11%	1%		30%	3%		7%	1%	4%
Total %	3%	13%	0%	16%	30%	0%	2%	32%	0%	21%	30%	51%



Midday Peak Hour (06/09/2009)

☒ Car ☒ Truck

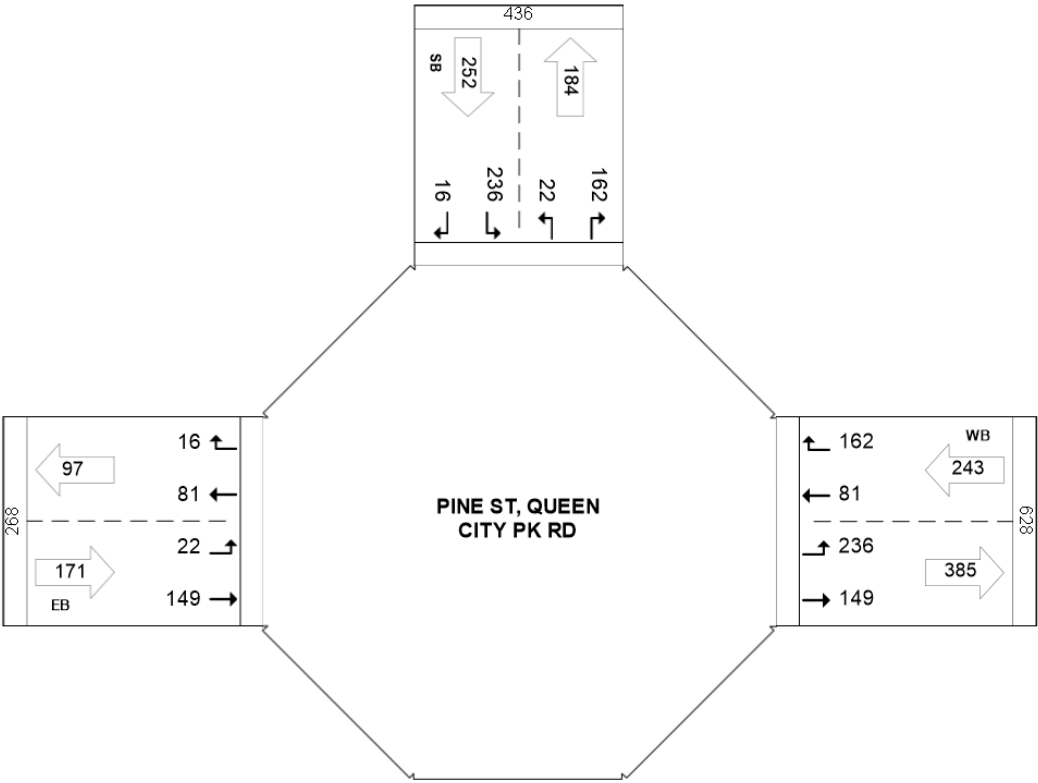
	EB				SB				WB			
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
11:00 AM	1	11	0	12	32	0	2	34	0	5	25	30
11:15 AM	5	15	0	20	35	0	1	36	0	14	16	30
11:30 AM	3	17	0	20	49	0	3	52	0	19	25	44
11:45 AM	8	21	0	29	62	0	10	72	0	23	34	57
Total	17	64	0	81	178	0	16	194	0	61	100	161
App %	21%	79%	0%		92%	0%	8%		0%	38%	62%	
PHF	0.53	0.76		0.70	0.72		0.40	0.67		0.66	0.74	0.71
HV %	29%	11%		15%	1%		19%	2%		7%		2%
Total %	4%	15%	0%	19%	41%	0%	4%	44%	0%	14%	23%	37%



PM Peak Hour (06/08/2009)

☒ Car ☒ Pedestrian ☒ Truck

	EB				SB				WB			
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
4:30 PM	6	33	0	39	54	0	3	57	0	17	30	47
4:45 PM	4	28	0	32	59	0	4	63	0	25	43	68
5:00 PM	6	44	0	50	69	0	2	71	0	18	48	66
5:15 PM	6	44	0	50	54	0	7	61	0	21	41	62
Total	22	149	0	171	236	0	16	252	0	81	162	243
App %	13%	87%	0%		94%	0%	6%		0%	33%	67%	
PHF	0.92	0.85		0.86	0.86		0.57	0.89		0.81	0.84	0.89
HV %	14%	2%		4%	0%			0%		4%		1%
Total %	3%	22%	0%	26%	35%	0%	2%	38%	0%	12%	24%	36%





1. Existing entrance for 179 Queen City Park Road



2. 179 Queen City Park Road entrance looking south



3. Existing parking looking northeast



4. Existing parking looking west



5. Potential expansion area looking north



6. Potential expansion area looking west



7. Potential expansion area looking southwest



8. Potential expansion area looking northeast



9. Satellite Image

RHINO FOODS

179 QUEEN CITY PARK ROAD

MAY 23, 2023

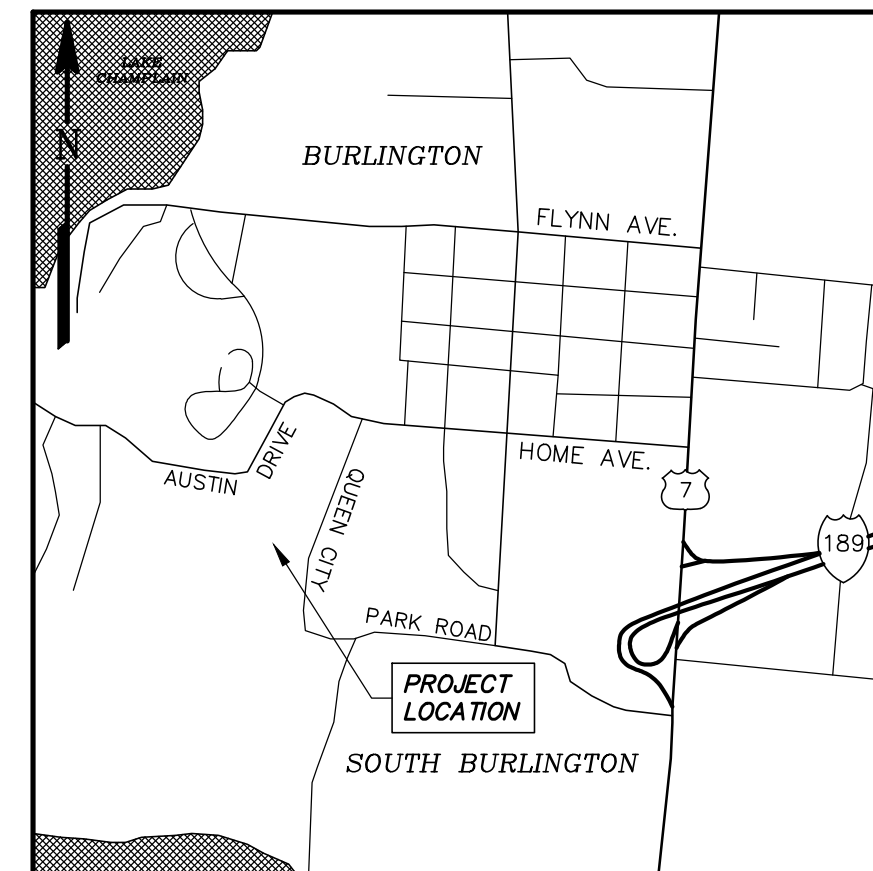
LIST OF DRAWINGS

CIVIL DRAWINGS:

C-1EXISTING CONDITIONS PLAN
C-2DEMO PLAN
C-3SITE PLAN
C-4GRADING PLAN
C-5UTILITY PLAN
C-6UTILITY PROFILES
C-7SITE DETAILS
C-8SITE DETAILS
C-9STORMWATER DETAILS
C-10.....STORMWATER DETAILS
C-11.....EPSC PLAN
C-12.....EPSC DETAILS
C-13.....SPECIFICATIONS
C-14.....SPECIFICATIONS

LANDSCAPE DRAWINGS:

L100LANDSCAPE KEY PLAN
L101LANDSCAPE PLAN-EAST ENLARGEMENT
L102LANDSCAPE PLAN-SOUTH ENLARGEMENT
L200PARKING LOT SHADING PLAN
L300PHOTOMETRIC PLAN
L401LIGHTING DETAILS



LOCATION MAP
N.T.S.

OWNERS

RHINO FOODS
179 QUEEN CITY PARK ROAD
BURLINGTON, VT 05401
CONTACT: BLAINE PAXTON
(802) 862-0252

CIVIL ENGINEER

CHAMPLAIN CONSULTING ENGINEERS
85 PRIM ROAD
P.O. BOX 453
COLCHESTER, VERMONT 05446
CONTACT: MARTIN E. COURCELLE, P.E.
(802) 863-8060

DESIGN SUMMARY:

1. PROJECT DESCRIPTION:
CONSTRUCTION OF A ±65,000 SQUARE FOOT WAREHOUSE
EXPANSION TO THE EXISTING MANUFACTURING FACILITY AT 179
QUEEN CITY PARK ROAD BURLINGTON, VERMONT.

GENERAL NOTES:

1. PRIOR TO COMMENCING SITE WORK, THE GENERAL
CONTRACTOR SHALL VERIFY EXISTING FIELD CONDITIONS. THE
PROJECT ENGINEER SHALL BE NOTIFIED IMMEDIATELY WHERE
DISCREPANCIES EXIST BETWEEN THE PROJECT DRAWINGS AND
ACTUAL FIELD CONDITIONS.
2. THE GENERAL CONTRACTOR SHALL CONTACT DIG SAFE
(1-888-344-7233) SEVENTY TWO HOURS PRIOR TO ANY
EXCAVATION TO ACCURATELY ESTABLISH THE LOCATION OF ALL
UNDERGROUND UTILITIES ON THE PROJECT SITE.
3. WHERE DIMENSIONS ON THE PROJECT DRAWINGS ARE
UNCLEAR, CONTACT THE PROJECT ENGINEER IMMEDIATELY FOR
CLARIFICATION.
4. IT IS THE GENERAL CONTRACTORS RESPONSIBILITY TO
ENSURE THAT THE PROJECT DRAWINGS REFLECT THE LATEST
REVISIONS.

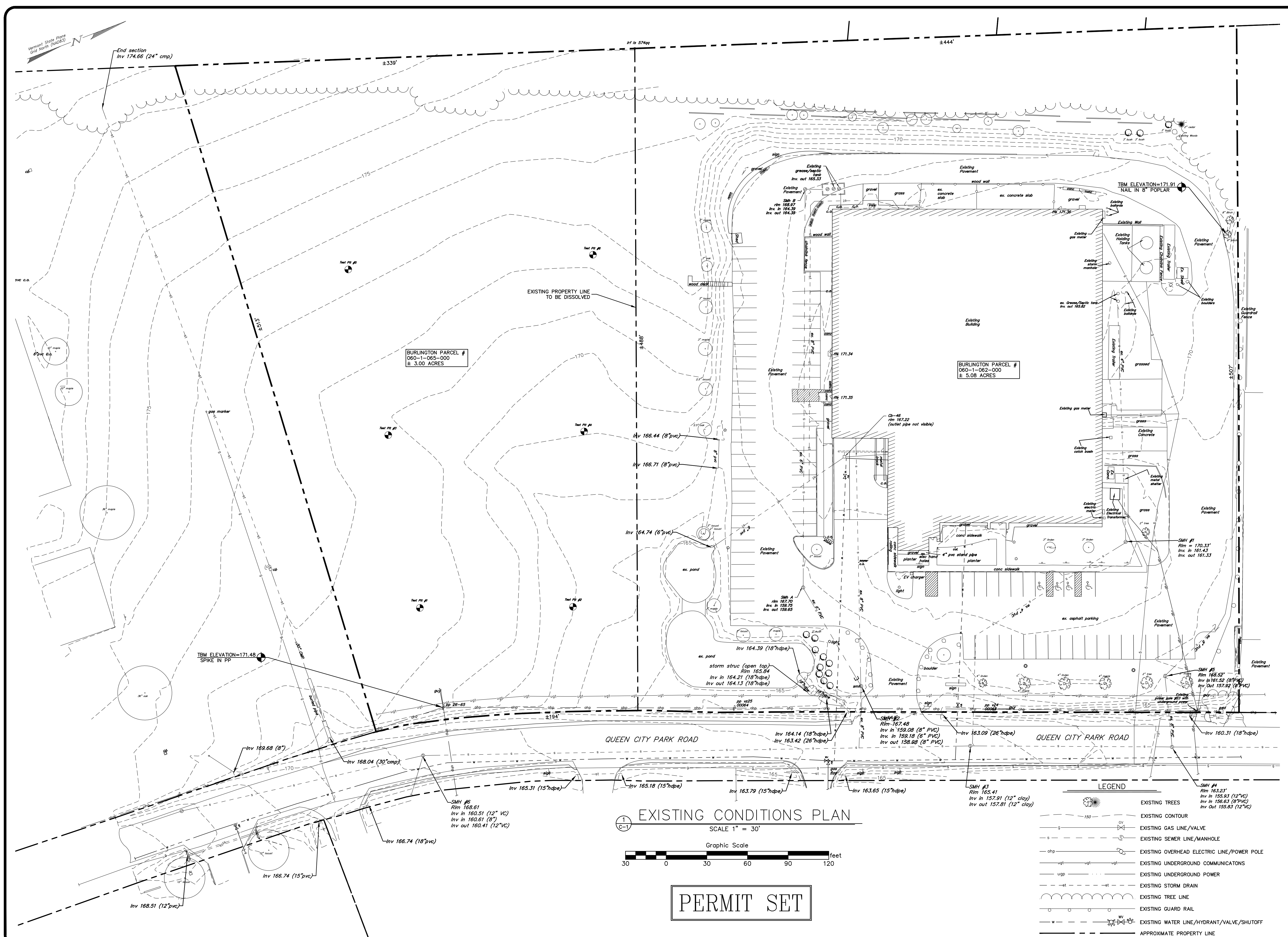
SURVEY NOTES:

1. THIS PLAN IS NOT A BOUNDARY SURVEY. PROPERTY LINES
ARE BASED ON DIGITAL TAX MAP INFORMATION FROM THE
VERMONT CENTER FOR GEOGRAPHICAL INFORMATION (VCGI) AND
CONSIDERED APPROXIMATE. THE TAX MAP DATA WAS ADJUSTED
SLIGHTLY TO MORE CLOSELY ALIGN WITH TWO PROPERTY
MONUMENTS LOCATED ALONG THE WEST LINE OF THE EXISTING
VACANT LOT, SOUTH OF THE RHINO FOODS PROPERTY.
2. THE HORIZONTAL COORDINATE SYSTEM IS BASED ON NAD83
VERMONT STATE PLANE 4400 (US SURVEY FEET). ELEVATIONS
ARE BASED ON NAVD88 DATUM (US SURVEY FEET).
3. EXISTING CONDITIONS ARE BASED ON A TOPOGRAPHIC
SURVEY COMPLETED BY KREBS & LANSING IN AUGUST 2022.
INFORMATION ALONG THE NORTH SIDE OF THE BUILDING IS
BASED ON A TOPOGRAPHIC SURVEY BY KREBS & LANSING IN
OCTOBER 2018 AND MAY NO LONGER BE ACCURATE OR
COMPLETE.
4. UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE VISIBLE
UTILITIES LOCATED DURING THE TOPOGRAPHIC SURVEY AND
PERMIT DRAWINGS BY DEWOLFE ENGINEERING ASSOCIATES, LAST
REVISED 7/25/2017. UTILITIES ARE NOT WARRANTED TO BE
EXACT OR COMPLETE. CONTRACTOR SHALL CONTACT DIG SAFE
AND OTHER NON-MEMBER UTILITIES PRIOR TO BEGINNING ANY
EXCAVATION.

PROJECT NOTES:

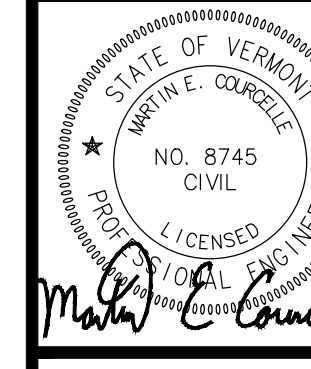
1. ALL EXISTING UTILITIES SHALL REMAIN UNDISTURBED UNLESS
SPECIFICALLY NOTED OTHERWISE OR DISPLACED BY NEW
CONSTRUCTION SPECIFIED WITHIN THESE PLANS. FIELD VERIFY
ALL LOCATIONS & DEPTHS PRIOR TO EXCAVATION.
2. ALL EXISTING PIPING, BITUMINOUS, CONCRETE, UTILITY
DEMOLITION DEBRIS OR UNSUITABLE BACKFILL MATERIAL
REMOVED DURING CONSTRUCTION SHALL BECOME THE
PROPERTY OF THE CONTRACTOR & SHALL BE DISPOSED OF IN
ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
3. EXCAVATED OR IMPORTED MATERIAL STOCKPILED ON SITE
SHALL BE PLACED ONLY IN AREAS SPECIFICALLY DESIGNATED
BY THE OWNER FOR THIS PURPOSE. STOCKPILE AREAS SHALL
BE MAINTAINED & RESTORED PER THE DETAILS &
SPECIFICATIONS.
4. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR
ALL REQUIRED SHORING OF EXCAVATIONS &
BRACING/PROTECTION OF SITE FEATURES TO REMAIN IN PLACE.

PERMIT SET



REVISION	DATE	DESCRIPTION

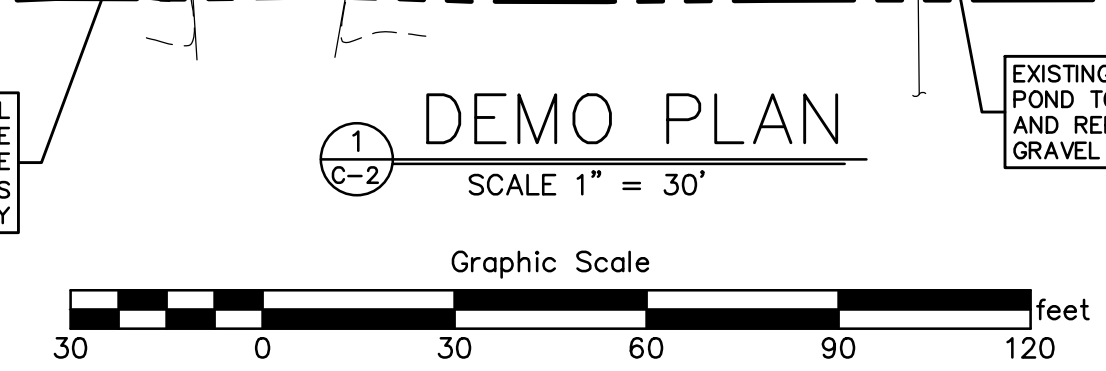
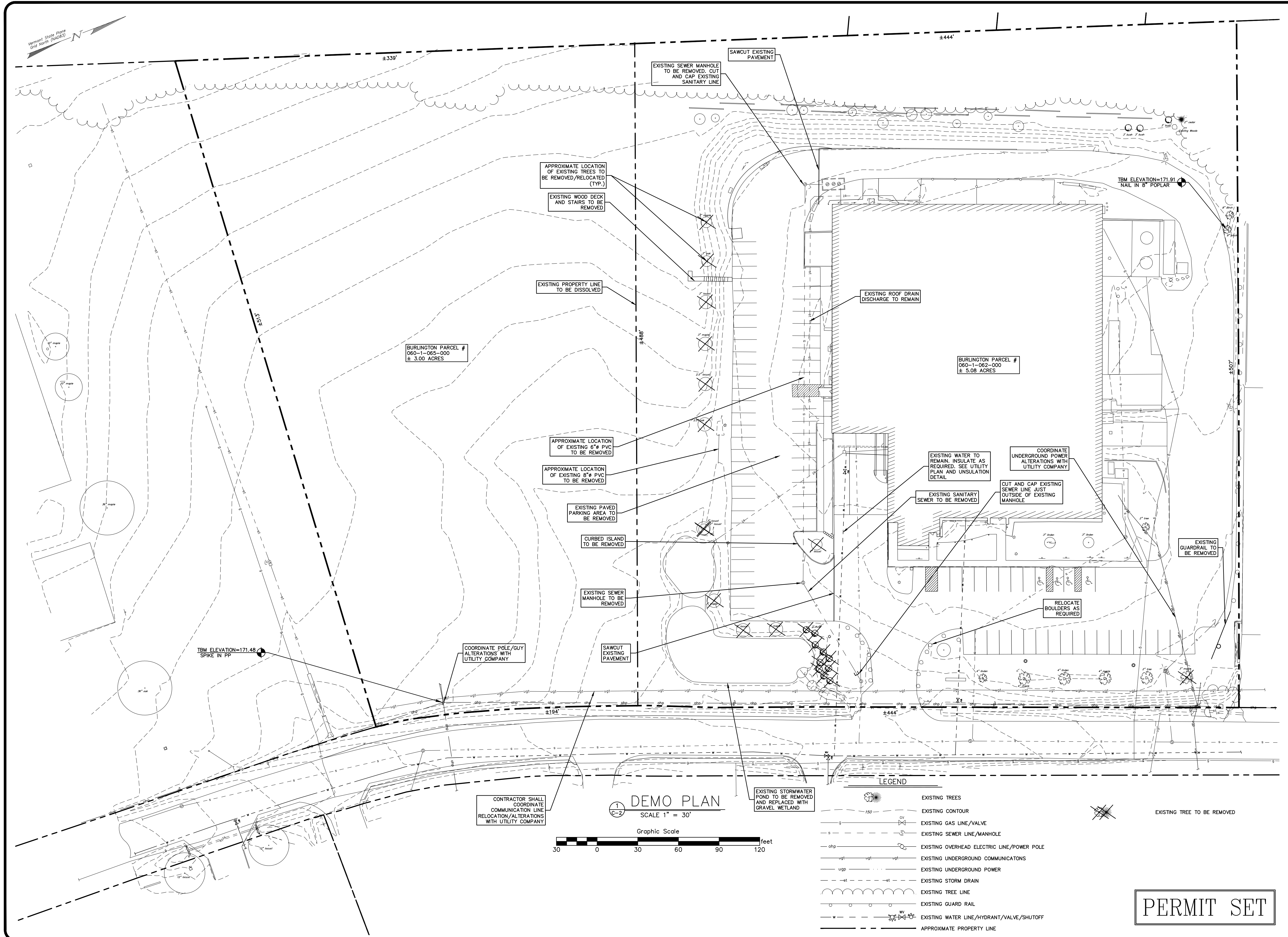
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ENGINEERS
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RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
EXISTING CONDITIONS PLAN

DRAWN	CCE
CHECKED	MEC
SCALE	1" = 30'
DATE	05/23/23
JOB NO.	2022.032
SHEET	

C-1
OF 14 SHEETS



- LEGEND
- EXISTING TREES
 - EXISTING CONTOUR
 - EXISTING GAS LINE/VALVE
 - EXISTING SEWER LINE/MANHOLE
 - EXISTING OVERHEAD ELECTRIC LINE/POWER POLE
 - EXISTING UNDERGROUND COMMUNICATIONS
 - EXISTING UNDERGROUND POWER
 - EXISTING STORM DRAIN
 - EXISTING TREE LINE
 - EXISTING GUARD RAIL
 - EXISTING WATER LINE/HYDRANT/VALVE/SHUTOFF
 - APPROXIMATE PROPERTY LINE

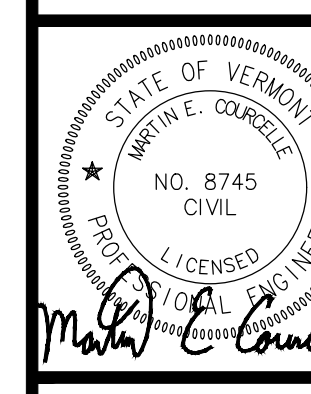
PERMIT SET

REVISION DATE & DESCRIPTION

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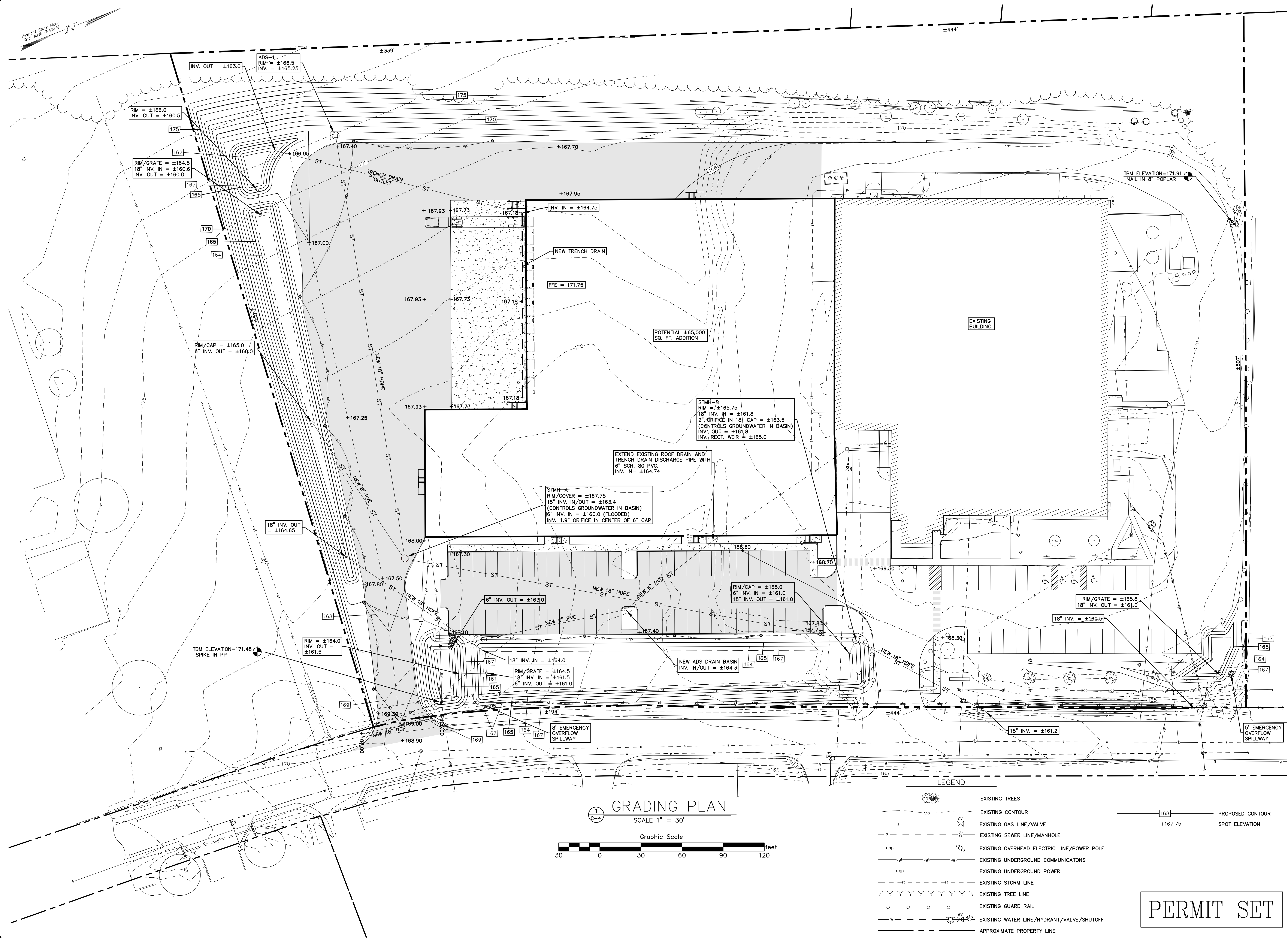
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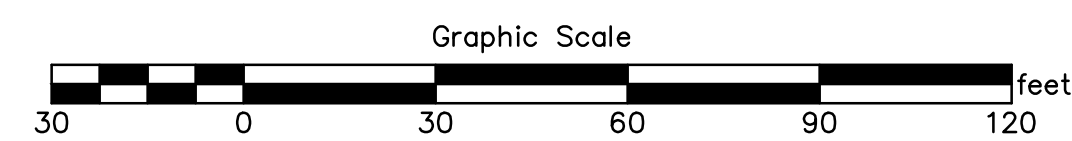
RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
DEMO PLAN

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CHECKED	MEC
SCALE	1" = 30'
DATE	05/23/23
JOB NO.	2022.032
SHEET	



1 GRADING PLAN
C-4

SCALE 1" = 30'

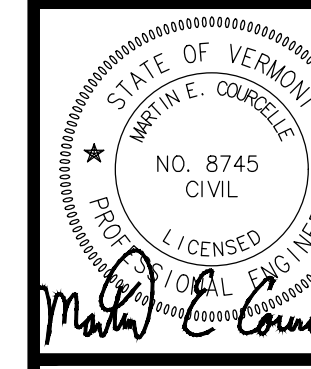


LEGEND	
	EXISTING TREES
	EXISTING CONTOUR
	EXISTING GAS LINE/VALVE
	EXISTING SEWER LINE/MANHOLE
	EXISTING OVERHEAD ELECTRIC LINE/POWER POLE
	EXISTING UNDERGROUND COMMUNICATIONS
	EXISTING UNDERGROUND POWER
	EXISTING STORM LINE
	EXISTING TREE LINE
	EXISTING GUARD RAIL
	EXISTING WATER LINE/HYDRANT/VALVE/SHUTOFF
	APPROXIMATE PROPERTY LINE
	PROPOSED CONTOUR
	SPOT ELEVATION

PERMIT SET

REVISION	DATE	DESCRIPTION

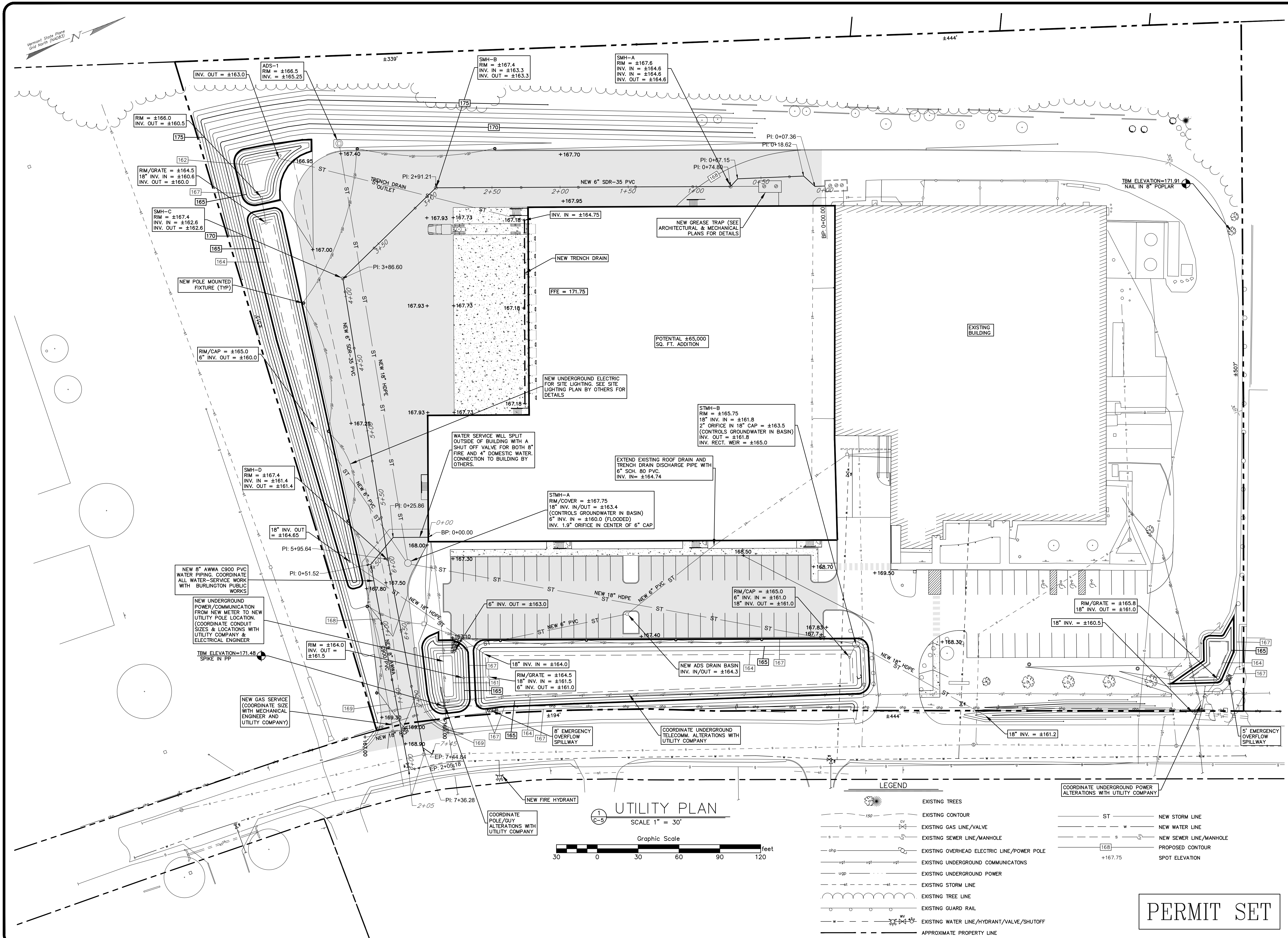
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RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
GRADING PLAN

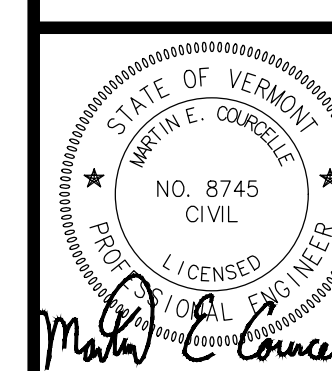
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SCALE	1" = 30'
DATE	05/23/23
JOB NO.	2022.032
SHEET	

C-4
OF 14 SHEETS



REVISION	DATE	DESCRIPTION

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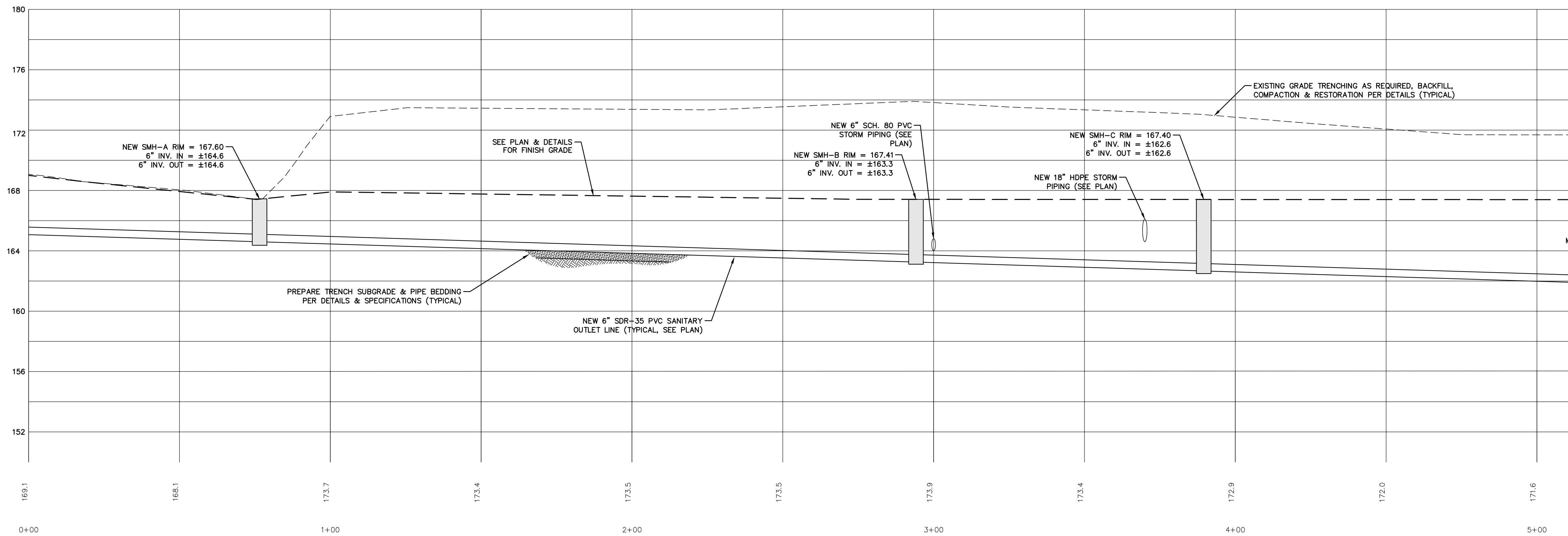


RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
UTILITY PLAN

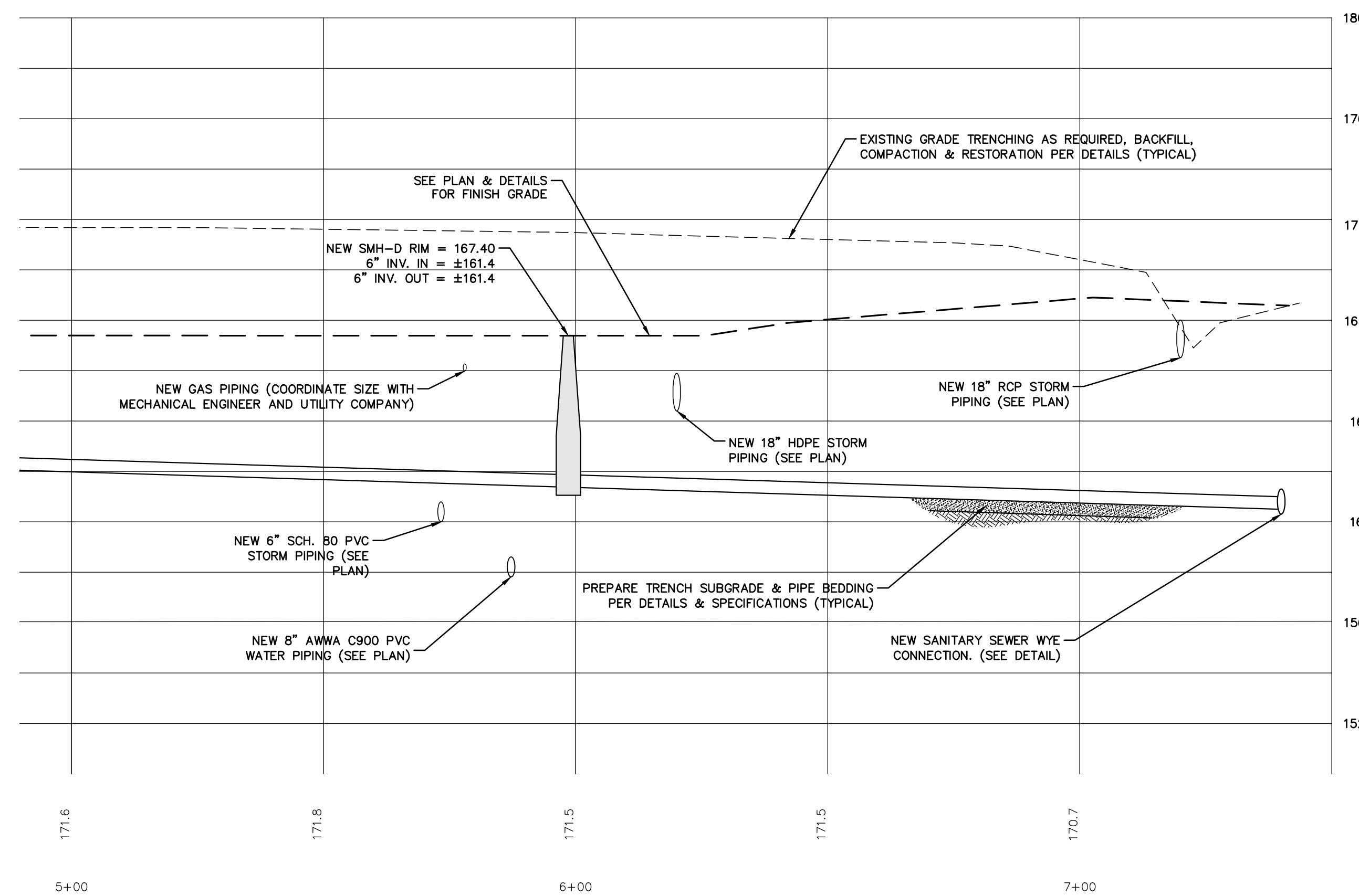
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DATE: 05/23/23
JOB NO.: 2022.032
SHEET

C-5
OF 14 SHEETS

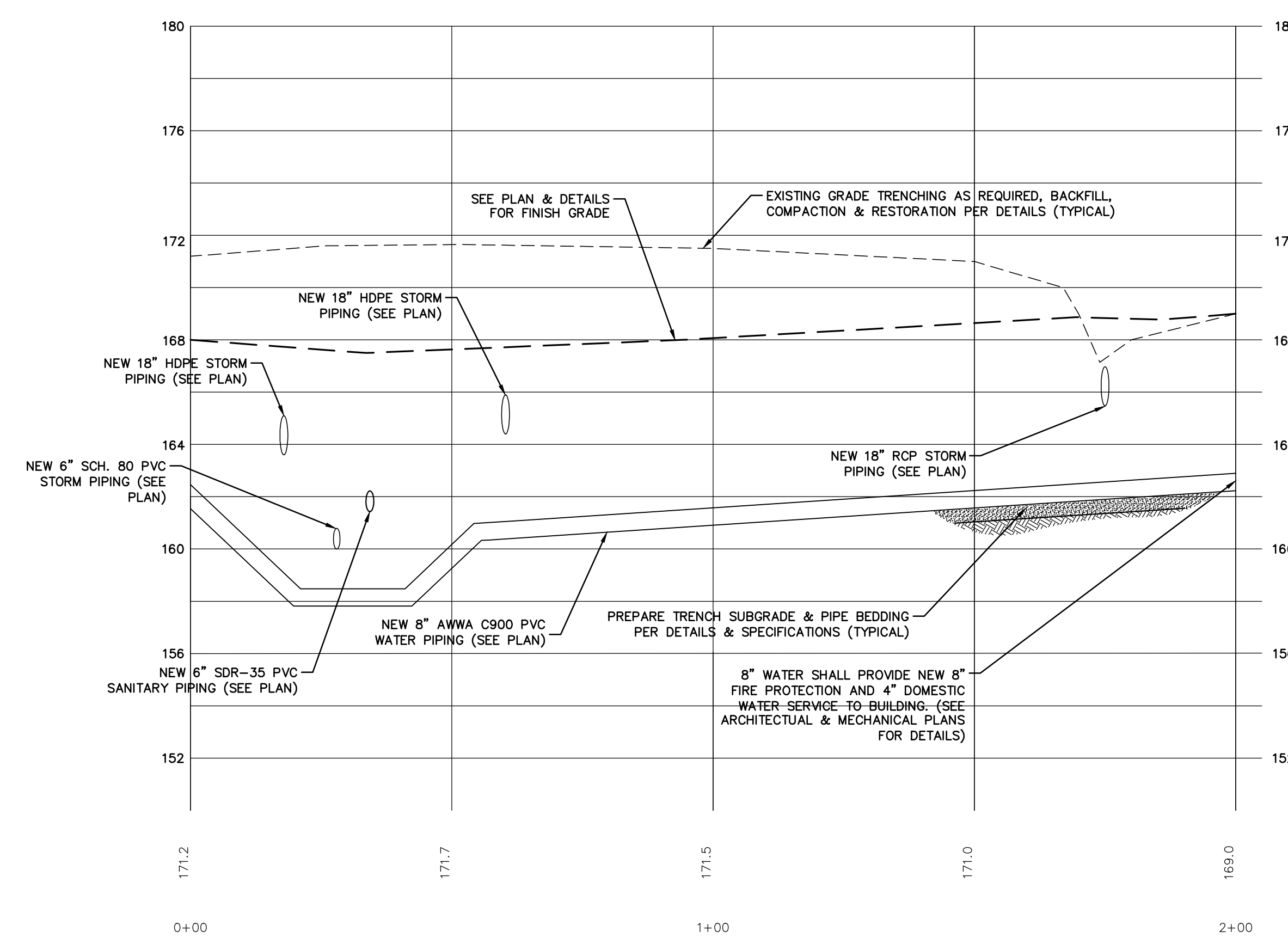
PERMIT SET



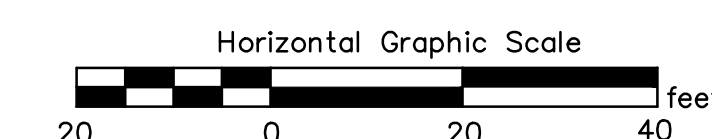
1
C-6
NEW SEWER PROFILE 0+00 - 5+00
SCALE 1" = 20' HORIZ. - 1" = 4' VERT.



2
C-6
NEW SEWER PROFILE 5+00 - 7+50
SCALE 1" = 20' HORIZ. - 1" = 4' VERT.



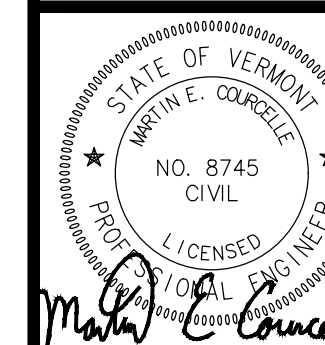
3
C-6
NEW WATER PROFILE
SCALE 1" = 20' HORIZ. - 1" = 4' VERT.



PERMIT SET

REVISION	DATE	DESCRIPTION

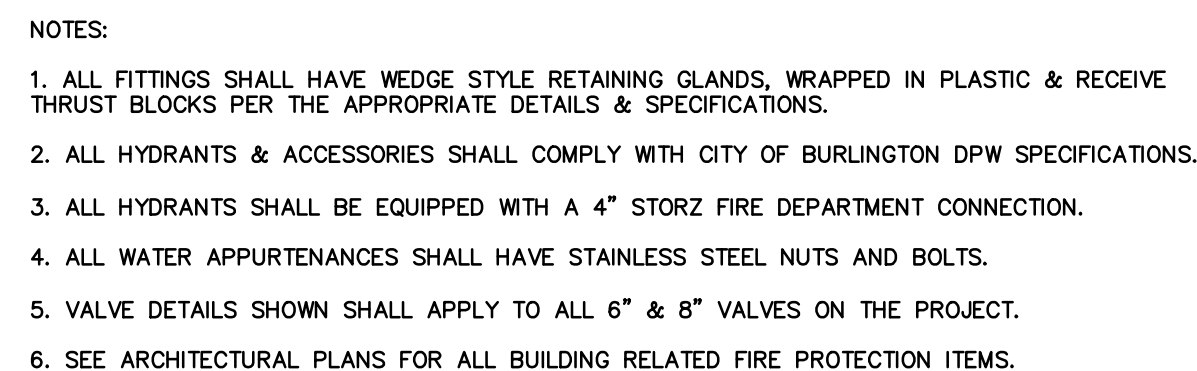
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RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
UTILITY PROFILES

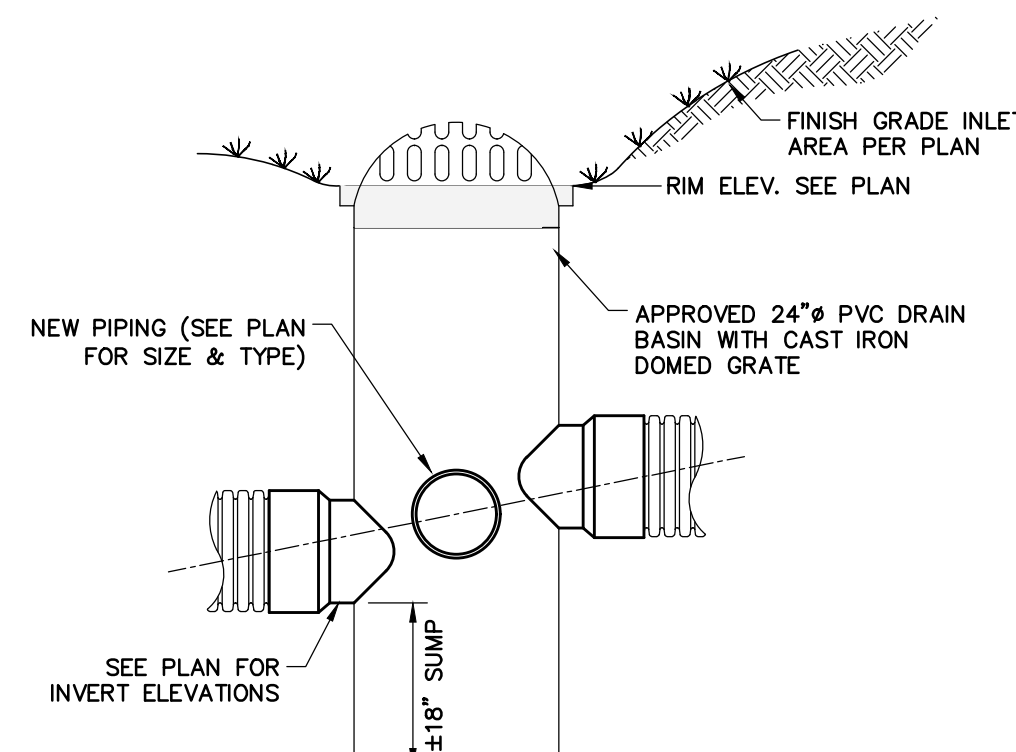
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SCALE
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DATE
05/23/23
JOB NO.
2022.032
SHEET

C-6



NOTES:

1. WHEN SEWER PIPING MUST BE LAID OVER A WATER MAIN & IT IS IMPOSSIBLE TO MAINTAIN THE 18 INCH MINIMUM VERTICAL SEPARATION, THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION MUST SPECIFICALLY APPROVE THE PLANS.
2. THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICHEVER IS GREATER.
3. THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS SHALL BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND 1 FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS.
4. THE FIRST SEWER PIPE JOINTS ON EITHER SIDE OF THE WATER MAIN CROSSING SHALL BE CONCRETE ENCASED.
5. ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER PIPE TO PREVENT DAMAGE TO THE WATER MAIN. SPECIAL STRUCTURAL SUPPORT FOR THE WATER MAIN MAY BE REQUIRED.



12" MIN.

6" MIN.

RIM ELEV. SEE PLAN

FINISH SURFACE PER PLAN & APPROPRIATE DETAILS

CAST-IN-PLACE CONCRETE PER BASIN MANUFACTURER'S SPECIFICATION FOR TRAFFIC LOADS (SEE PLAN)

APPROVED 24" PVC DRAIN BASIN WITH CAST IRON FRAME & PEDESTRIAN GRATE

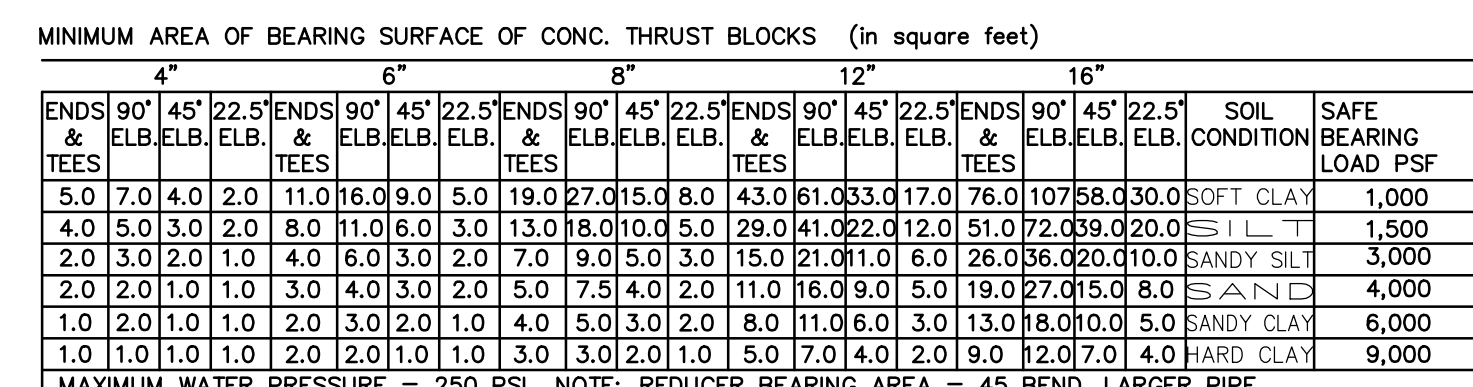
NOTES:

1. DRAIN BASIN BEDDING, SUBBASE & BACKFILL MATERIAL/COMPACTION PER MANUFACTURER'S SPECIFICATIONS.
2. ALL CONNECTIONS (PIPE JOINERY, STRUCTURE JOINTS, INLET/OUTLET ADAPTERS ETC.) SHALL BE SOIL TIGHT.
3. ANCHOR NEW BASIN AS REQUIRED TO PROVIDE STABILITY FOR THE STRUCTURE DURING INSTALLATION & BACKFILL.

Diagram illustrating the cross-section of a trench for a pipe installation. The trench is 3'-0" wide and 3'-0" deep. The pipe has a diameter of 6". The trench is filled with compacted sand fill, and the pipe is surrounded by rigid polystyrene (closed cell) insulation. The pipe is supported by normal pipe bedding. The distance from the pipe center to the trench wall is 6". The distance from the pipe center to the trench bottom is 6". The distance from the pipe center to the trench top is 3'-0".

NOTES:

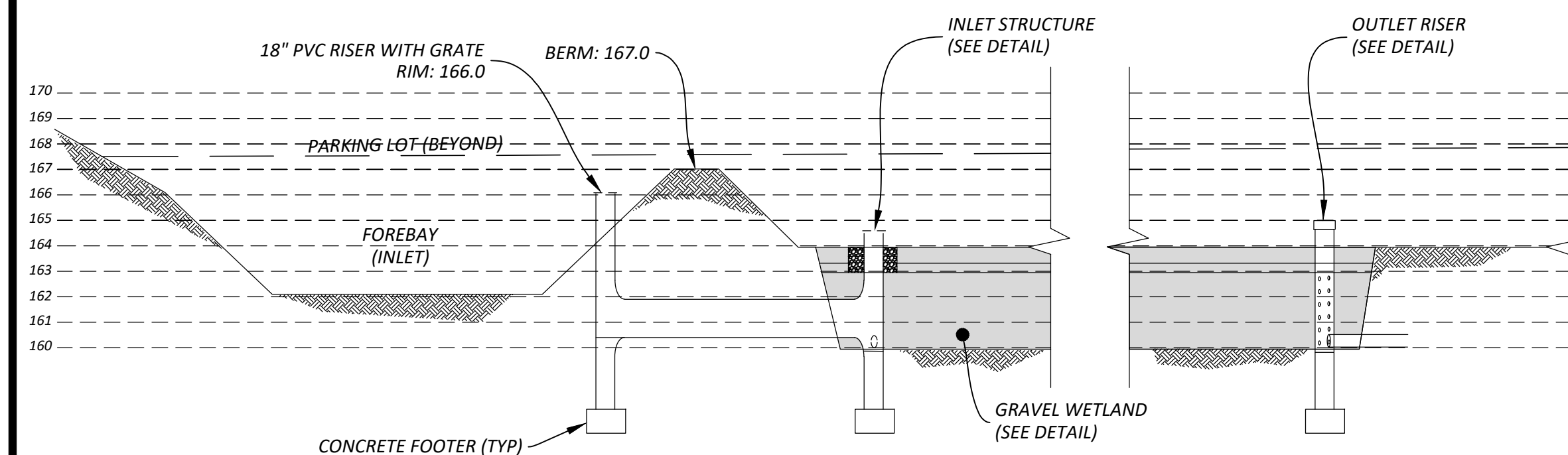
1. JOINTS SHALL BE OVERLAPPED SO THAT THERE IS NO GAP THAT WILL ALLOW FROST TO PENETRATE.
2. CARE SHALL BE EXERCISED DURING BACKFILL AND COMPACTION OVER THE POLYSTYRENE SHEETS TO PREVENT DAMAGE TO THE SHEETS.
3. THE POLYSTYRENE SHEETS SHALL MEET THE COMPRESSIVE STRENGTH REQUIREMENTS OF ASTM D1621-73.
4. CHAMPLAIN WATER DISTRICT SHALL BE CONTACTED 48 HOURS PRIOR TO CONSTRUCTION.



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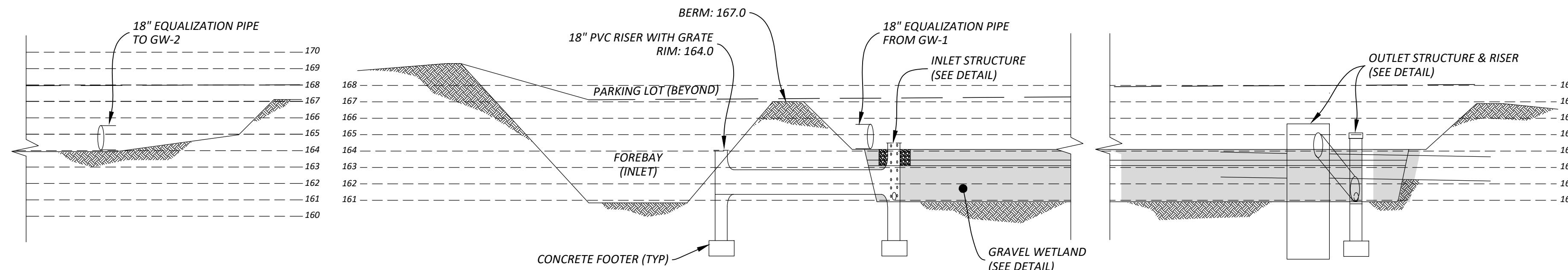
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OF 14 SHEETS



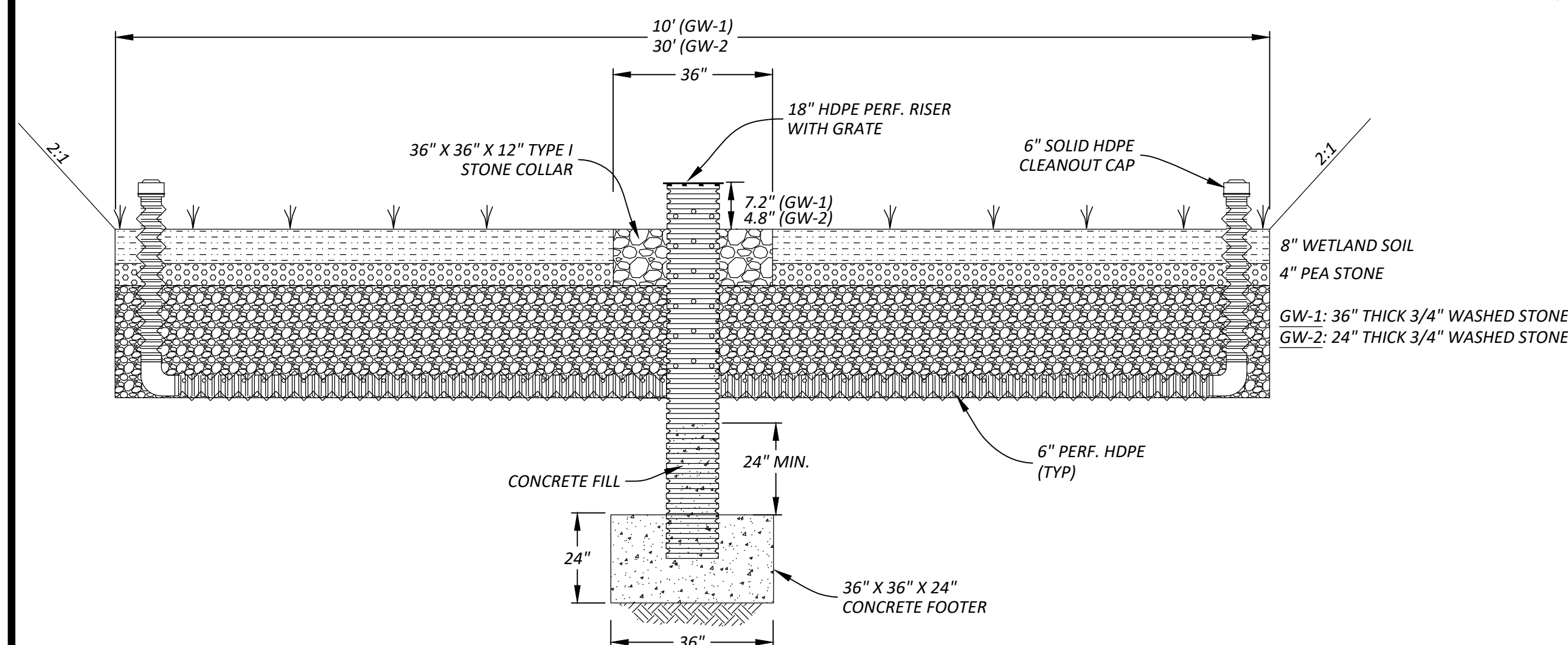
GW-1 PROFILE SCHEMATIC

NTS



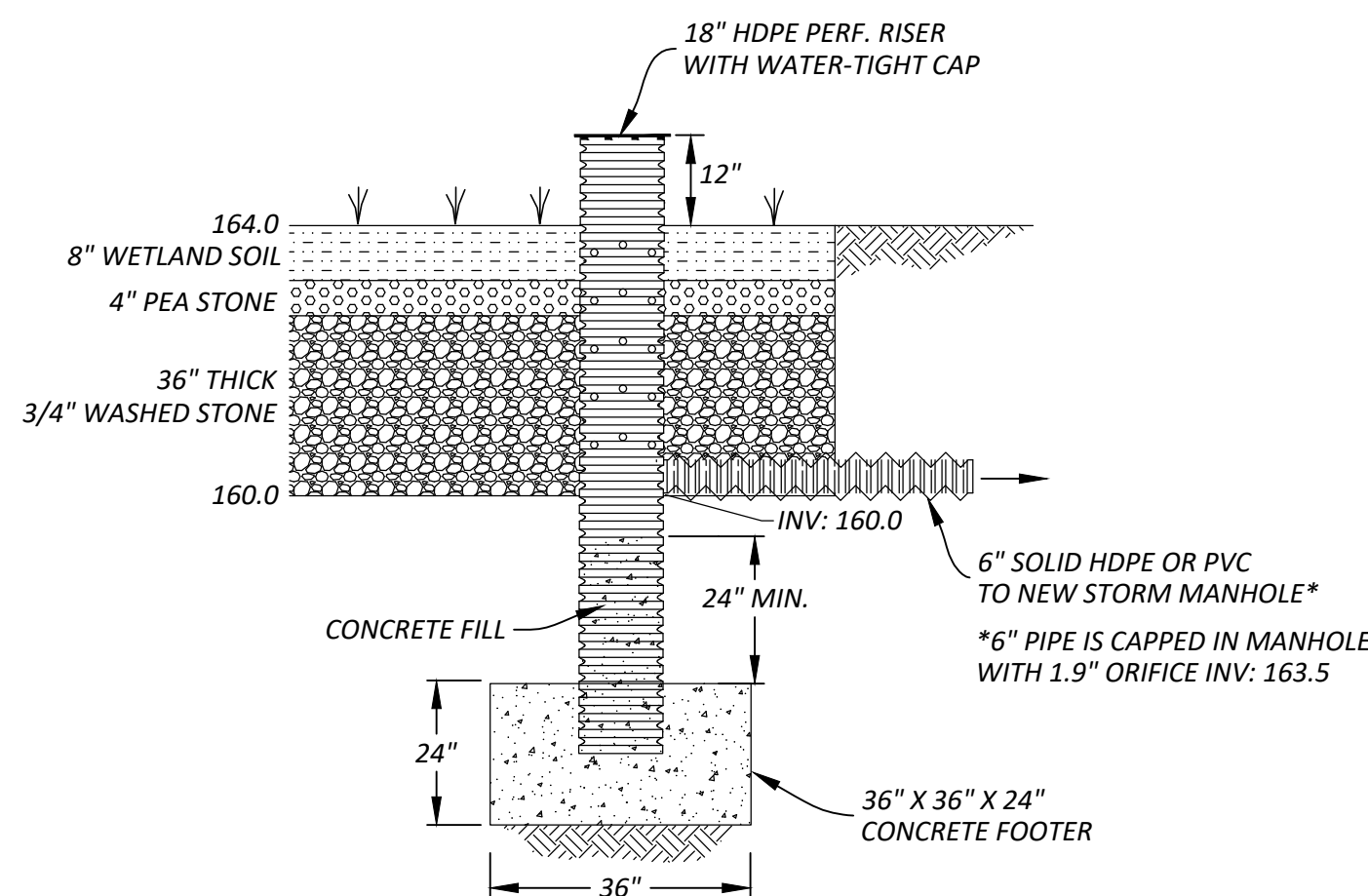
GW-2 PROFILE SCHEMATIC

NTS



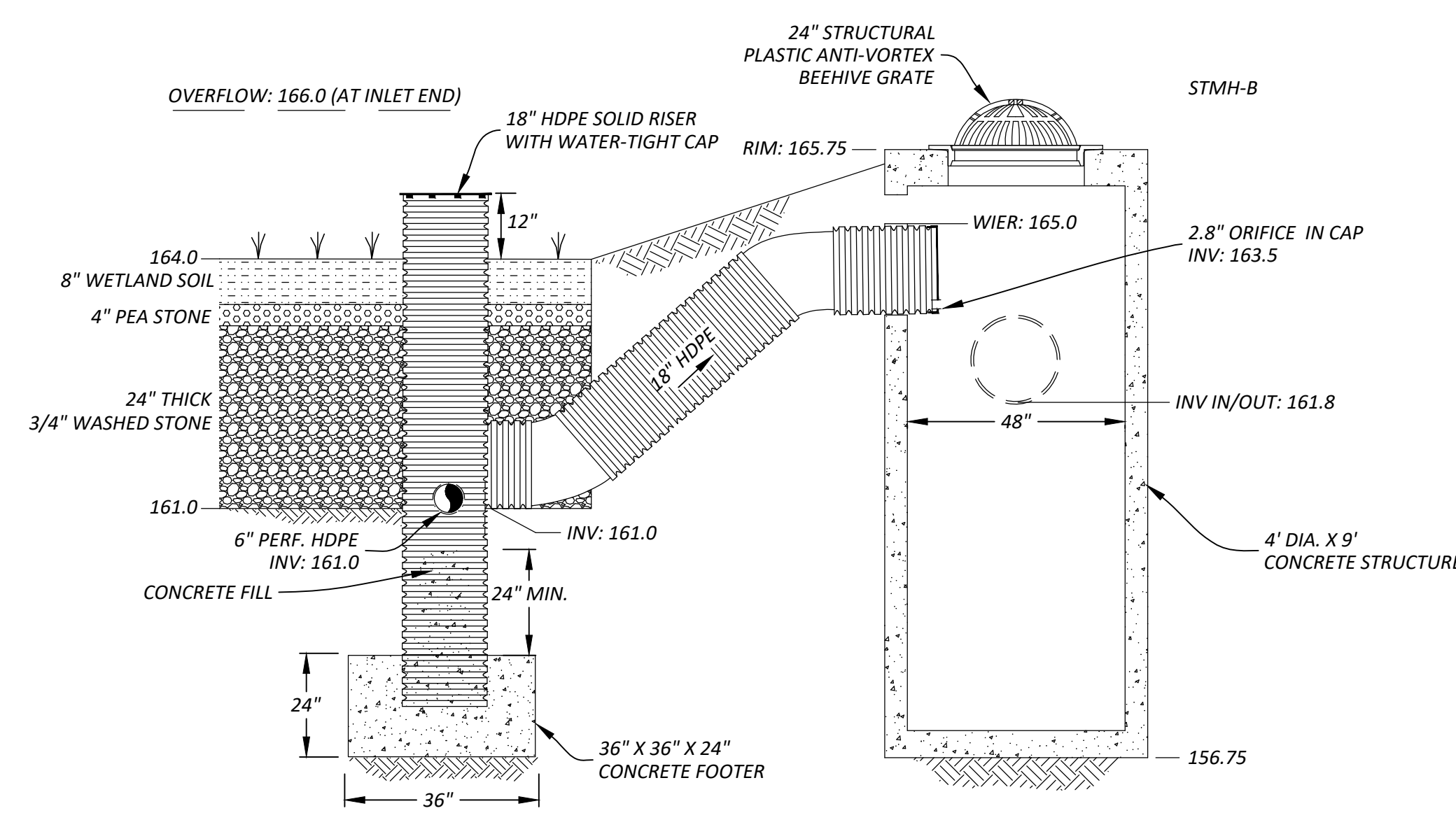
INLET STRUCTURE & RISER DETAIL

NTS



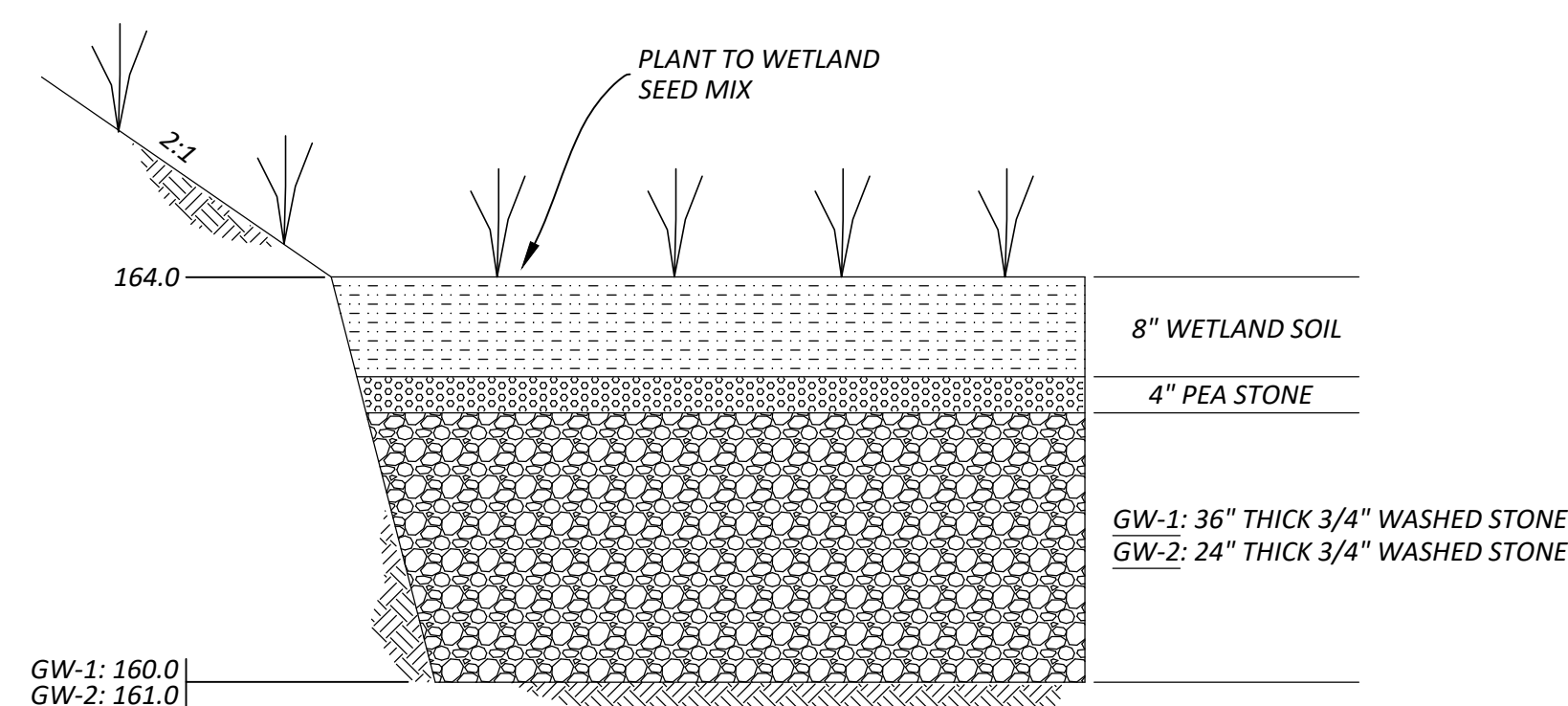
GW-1 OUTLET RISER DETAIL

NTS



GW-2 OUTLET STRUCTURE & RISER DETAIL

NTS



GRAVEL WETLAND DETAIL

NTS

Gravel Wetland/Muck Soil

- Wetland soil shall be a uniform low-phosphorus mix of compost, sand, and fine soil and have a minimum thickness of 8 inches.
- The Mehlich-3 Phosphorus Saturation Ratio (PSR) for the Wetland Soil shall be no more than 10%.
- Wetland soil shall have a pH of 6.0-7.0.
- Wetland soil shall have a low hydraulic conductivity between 0.1-0.01 ft/day.
- The organic portion of the Wetland Soil shall constitute 10-15% of the Total Wetland soil mixture. The organic portion shall be comprised of well pulverized and composted leaf mulch. Animal or poultry manure shall not be accepted.
 - The organic portion of the Wetland Soil shall be adjusted if soil testing demonstrates a PSR greater than 10%.
- Granular soil shall constitute 80-85% of total Wetland Soil mixture and meet the following gradation:

US Standard Sieve Size in/mm	% Passing by Weight
0.5/12.5	90-100%
#10/2.00	70-95%
#100/0.15	35-55%
#200/0.075	20-55%

- No materials or substances shall be mixed or dumped within the gravel wetland media harmful to plant growth or impede maintenance. Wetland soil that is stockpiled on site shall be stored away from potential sources of contamination and protected from precipitation.
- Wetland soil shall be free of noxious weeds.
- Contractor shall submit the following:
 - An analytical test showing compliance with the above requirements. A minimum of (1) Mehlich-3 test and a subsequent PSR test of the Mehlich-3 extraction for soil phosphorus. All tests shall be performed by the same testing facility.
 - Hydraulic conductivity test showing compliance with the above requirements.
- Onsite native soils may be utilized to formulate the wetland muck mix with some deviation from the specifications above subject to Engineer approval.

AGGREGATE SPECIFICATIONS

Aggregates specified for this project shall comply with the following specifications unless waived in writing by the project engineer.

Type

Type I Stone Fill
(VAOT Sec. 706.04(a))

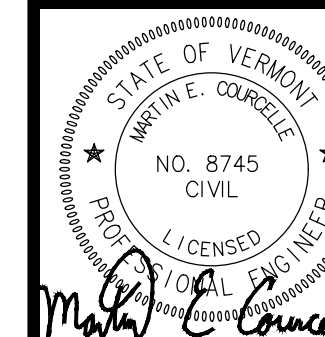
The longest dimension of the stone shall vary from 1 inch to 12 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 4 inches.

Aggregate	Sieve	% Passing
Pea Stone (VAOT Table 704.11)	3/4"	100
	5/8"	90-100
	No. 4	0-5
3/4" Stone (VAOT Table 704.02B)	Sieve	% Passing
	1"	100
	3/4"	90-100
	3/8"	20-55
Crushed Gravel (VAOT Table 704.05A)	No. 4	0-10
	No. 8	0-5
	Sieve	% Passing
	4"	95-100
	No. 4	25-50
	No. 100	0-12
	No. 200	0-6

PERMIT SET

REVISION	DATE	DESCRIPTION

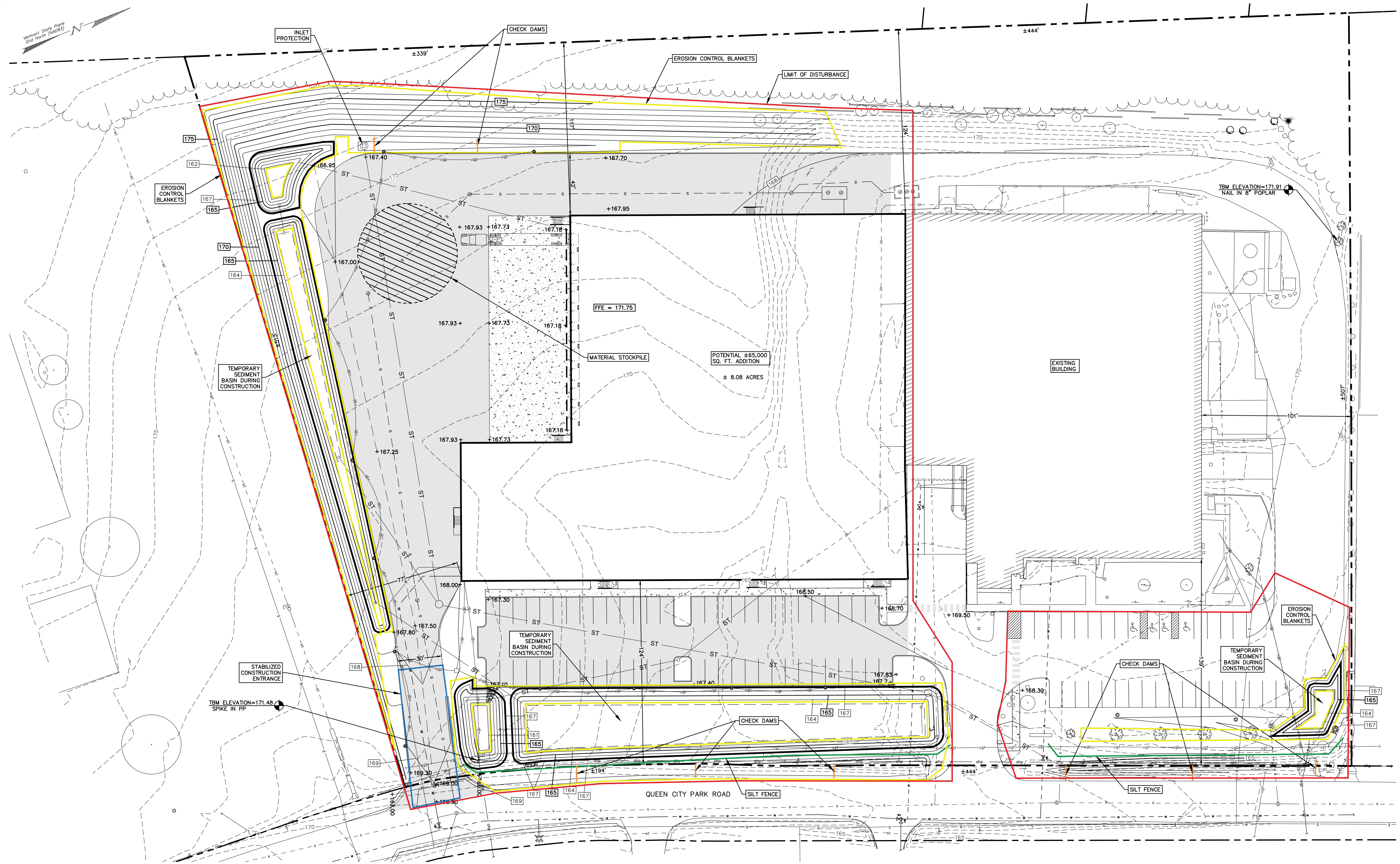
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RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
STORMWATER DETAILS

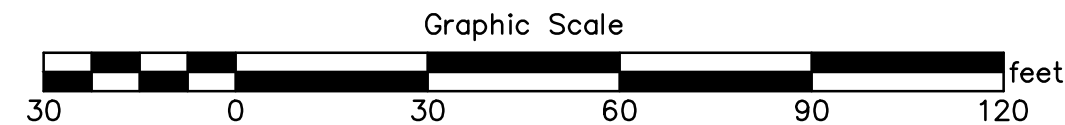
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C-9



EPSC PLAN

SCALE 1" = 30'



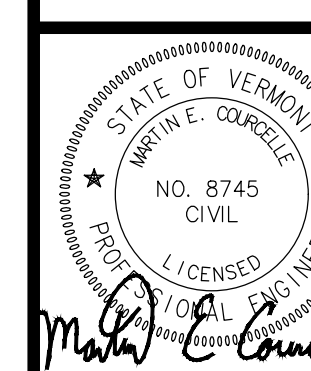
LEGEND

- SILT FENCE EROSION CONTROL
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION CONTROL BLANKETS
- LIMIT OF DISTURBANCE
- CHECK DAM

PERMIT SET

REVISION DATE & DESCRIPTION

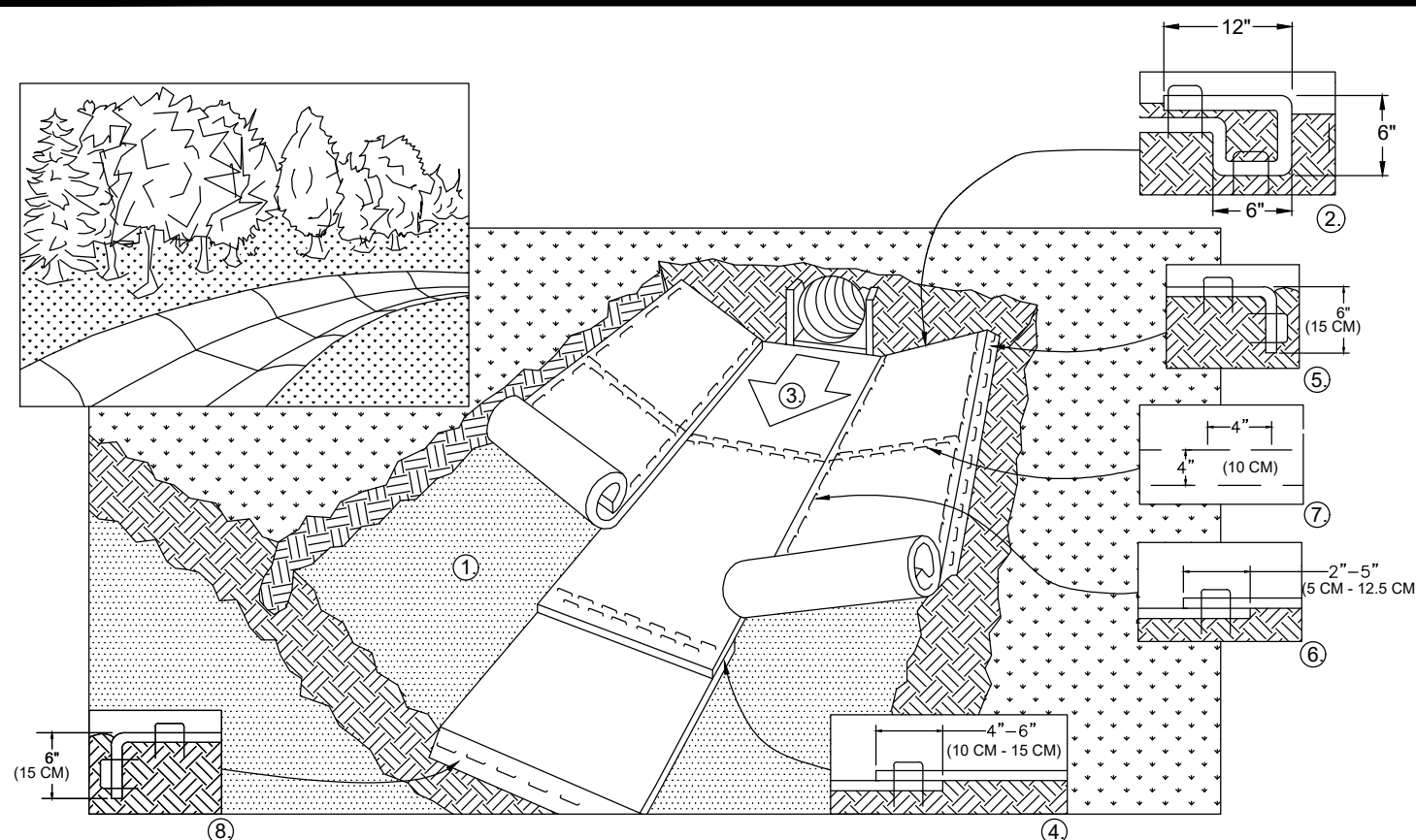
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RHINO FOODS
 179 QUEEN CITY PARK ROAD
 POTENTIAL EXPANSION
 EPSC PLAN

DRAWN	CCE
CHECKED	MEC
SCALE	1" = 30'
DATE	05/23/23
JOB NO.	2022.032
SHEET	

C-11



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.

2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE BLANKET.

3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4" - 6" (10 CM - 15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE BLANKETS.

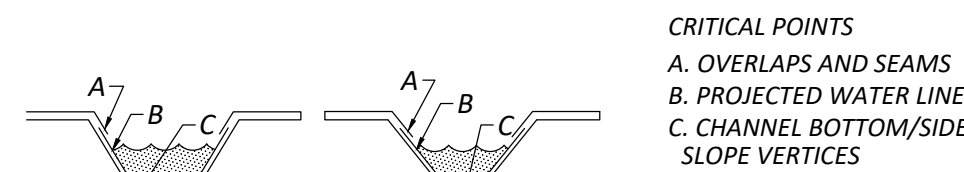
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) (DEPENDING ON BLANKET TYPE) AND STAPLED.

7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M - 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.

8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

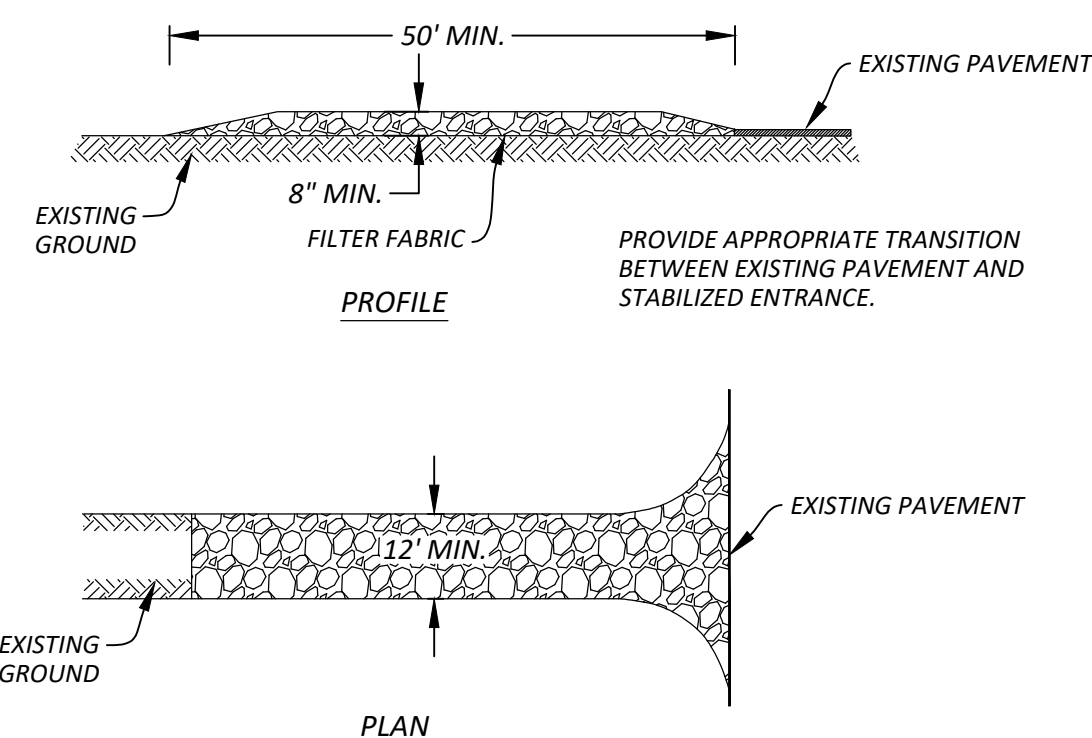


NOTE: OVERLAPPING BLANKETS ON SIDE SLOPES SHOULD NOT BE REQUIRED.

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET CHANNEL INSTALLATION DETAIL

NTS

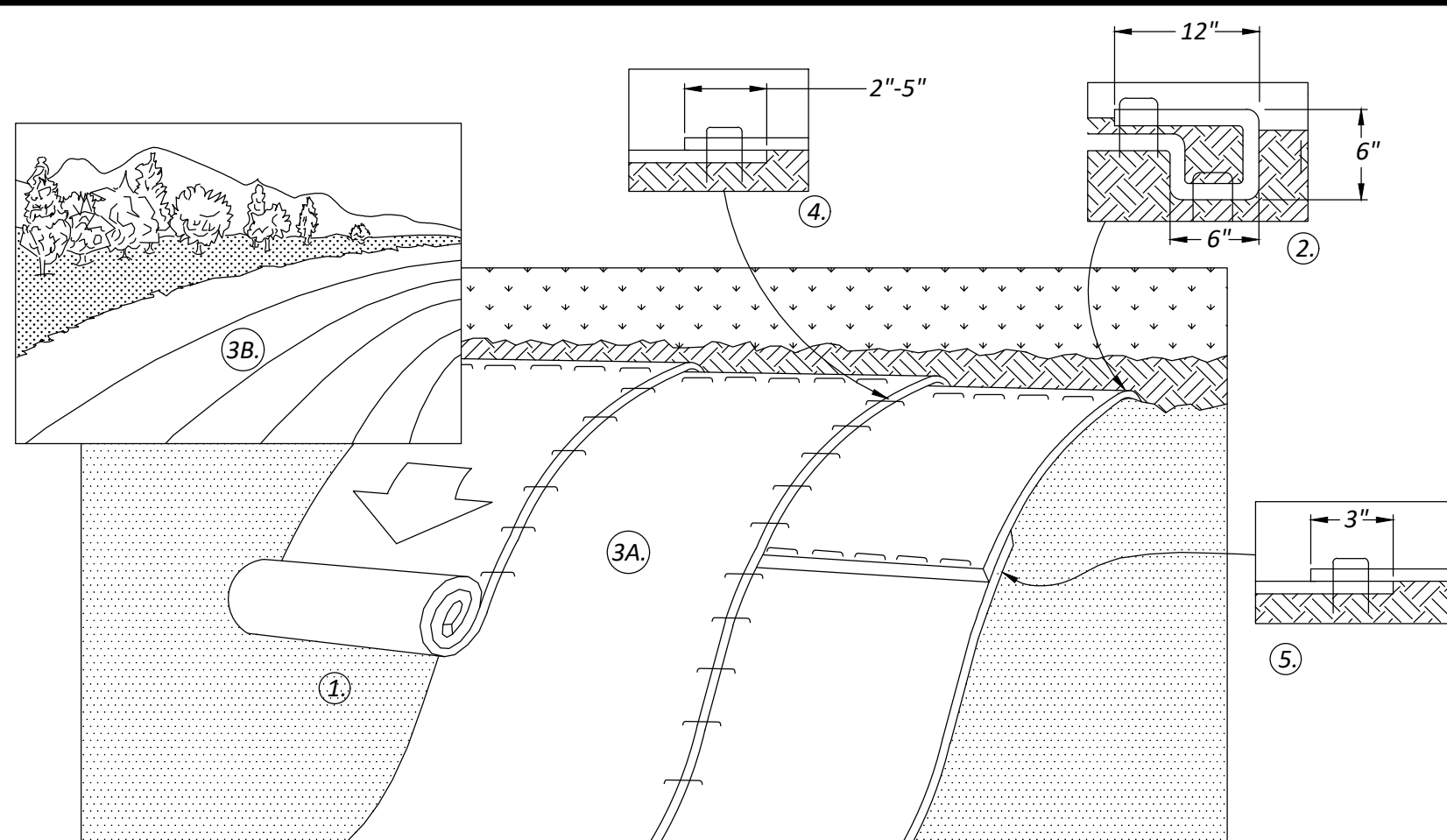


NOTES

- STONE SHALL BE 1.5 TO 4 INCHES WITH A MINIMUM THICKNESS OF 8 INCHES.
- LENGTH, WIDTH AND RETURN RADII/USES SHALL BE AS SHOWN ON THE APPLICABLE CONSTRUCTION STABILIZATION PLAN.
- MAINTAINANCE OF ENTRANCE WILL BE NECESSARY TO PREVENT TRACKING OF SEDIMENT OFF SITE. THIS MAY INCLUDE ADDING STONE, AND/OR REMOVING AND REPLACING STONE.
- THE EMPLOYMENT OF APPROVED ALTERNATIVE METHODS OF REMOVING SEDIMENT FROM VEHICLE PRIOR TO EXITING SITE IS ENCOURAGED TO MINIMIZE REQUIRED MAINTAINANCE OF STABILIZED ENTRANCE.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

NTS



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30CM) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE BLANKET.

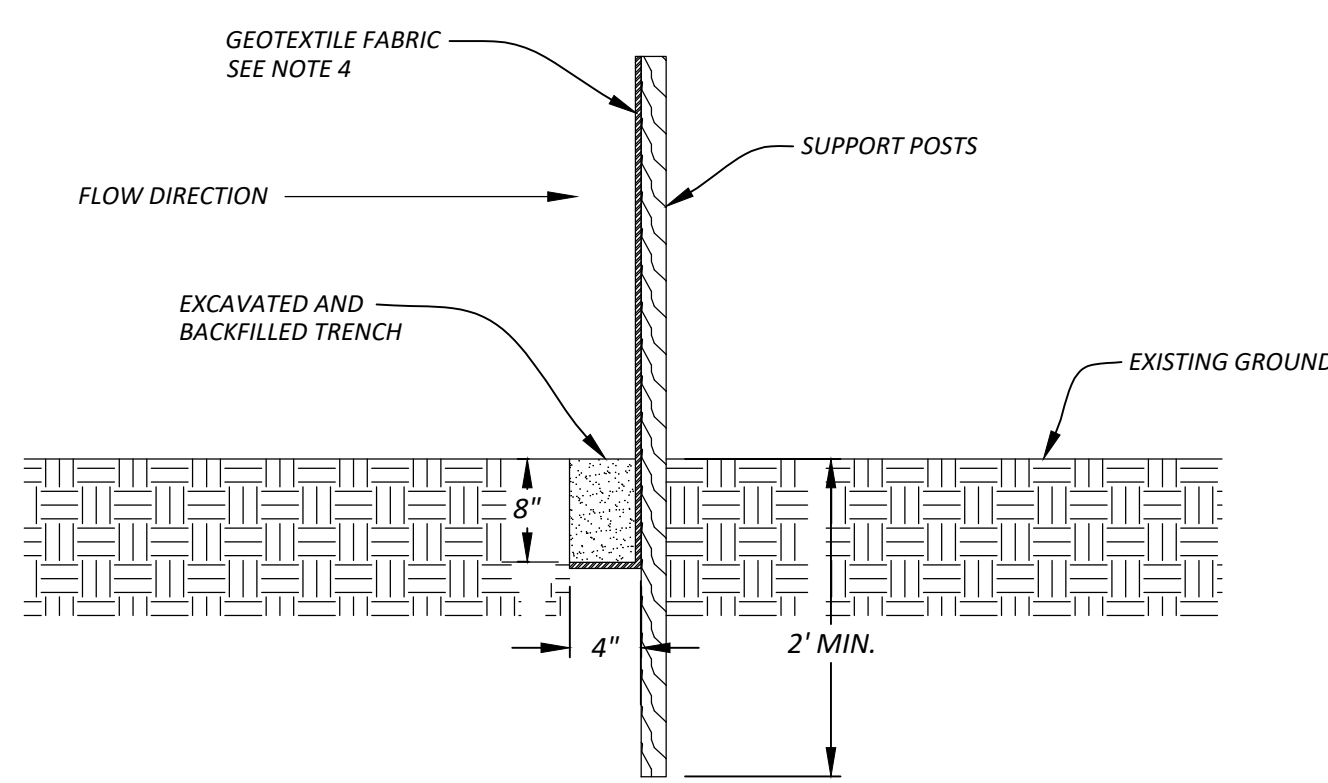
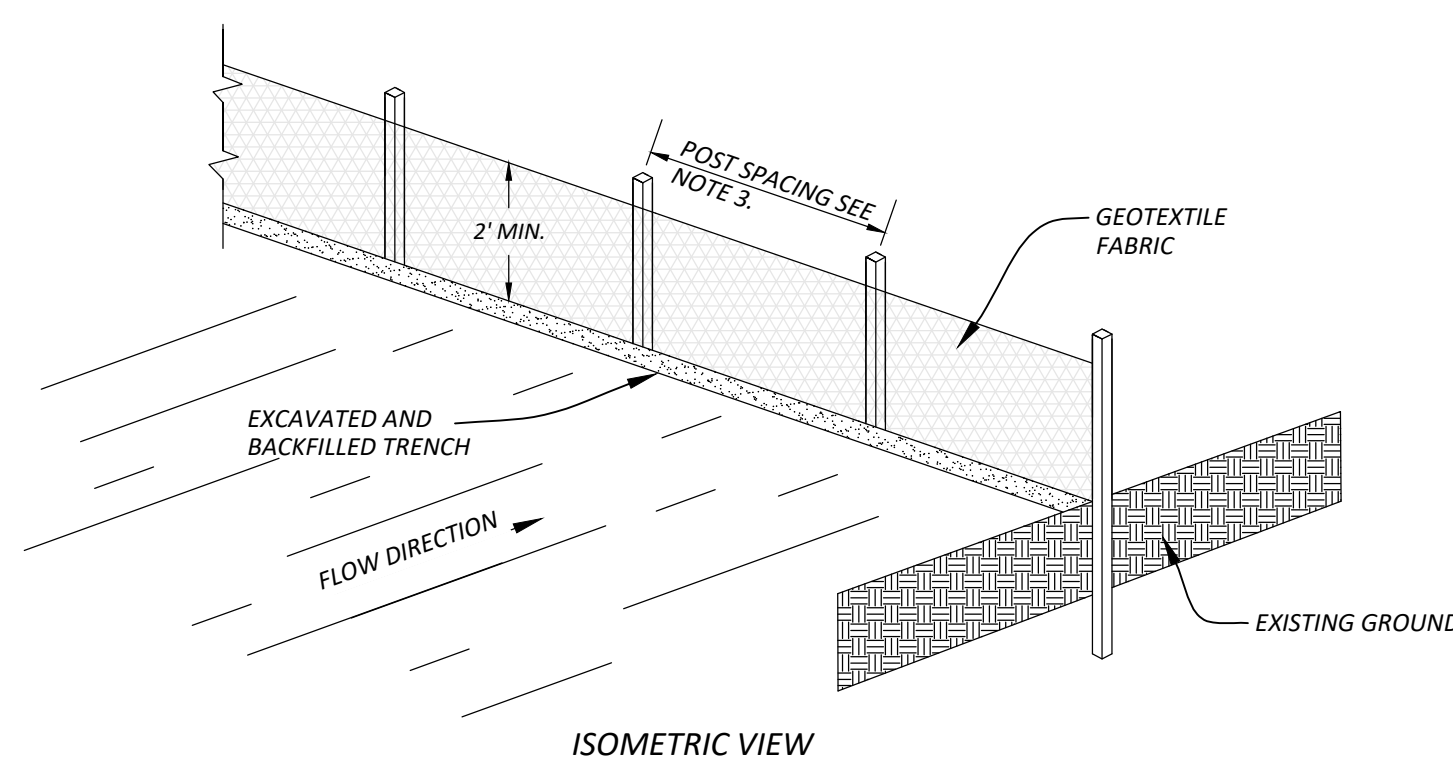
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON BLANKET TYPE.

5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET SLOPE INSTALLATION DETAIL

NTS



SILT FENCE DETAIL

NTS

SILT FENCE NOTES

- SILT FENCE WILL BE USED IN AREAS TO PREVENT SEDIMENT TRANSPORT FROM UPSLOPE AREAS AWAITING STABILIZATION. IT SHALL ALSO BE USED AS PART OF THE TEMPORARY EROSION CONTROL MEASURES AROUND MATERIAL STOCKPILES AND DOWN SLOPE OR EQUIPMENT STAGING AREAS.
- THE GEOTEXTILE FABRIC SHALL BE PLACED IN THE EXCAVATED TRENCH, BACKFILLED AND COMPACTED TO THE EXISTING GROUND SURFACE.
- WOODED SUPPORT POSTS SHALL BE A MINIMUM DIMENSION OF 1-1/8" X 1-1/8" AND 4 FEET LONG. STEEL POSTS SHALL BE STUDDERED "TEE" OR "U" TYPE AND 5 FEET LONG. POST SPACING SHALL BE A MAXIMUM OF 8 FEET FOR WOVEN FABRIC AND 3 FEET FOR NON-WOVEN FABRIC.
- THE GEOTEXTILE FABRIC SHALL BE ATTACHED DIRECTLY TO THE UPSLOPE SIDE OF WOODEN POSTS WITH 0.5 INCH STAPLES IN AT LEAST 3 PLACES, OR WITH WOODEN LATH AND NAILS. ATTACHMENT TO STEEL POSTS WILL BE BY WIRE FASTENERS OR 50 POUND PLASTIC TIE STRAPS ON THE UPSLOPE SIDE.
- THE GEOTEXTILE FABRIC SHALL CONSIST OF EITHER WOVEN OR NON-WOVEN POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE, OR POLYVINYLIDENE CHLORIDE. NON-WOVEN FABRIC MAY BE NEEDLE PUNCHED, HEAT BONDED, RESIN BONDED, OR COMBINATIONS THEREOF.
- SILT FENCE SHALL BE INSTALLED AS SHOWN ON PLAN.
- SILT FENCES BARRIERS SHALL BE INSPECTED FOR ANY TEARS OR BREAKS. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
- SEDIMENT SHOULD BE REMOVED WHEN IT REACHES 1/3 HEIGHT OF THE FENCE. THE REMOVED SEDIMENT MAY BE USED AS FILL ELSEWHERE ON SITE AND SHALL BE VEGETATED OR OTHERWISE STABILIZED.
- REMOVE SILT FENCE, AS DIRECTED, WHEN NO LONGER NEEDED. BEFORE THE SILT FENCE IS REMOVED, STABILIZE WITH VEGETATION ANY SEDIMENT WHICH IS PERMITTED TO REMAIN IN PLACE.

EROSION CONTROL NOTES

This project has been scored as low risk per risk scoring analysis in Appendix A of General Permit 3-9020 (Version 2021-04) for stormwater runoff from construction sites. To preserve the low-risk classification landowner/contractor shall comply with items listed below.
Landowner/contractor shall read and understand the terms of general permit 3-9003 (2020) and the Vermont Low Risk Site Handbook for Erosion Prevention and Sediment Control (Vermont DEC, 2020).

All earth work contractors must obtain co-applicant status on the 3-9020 permit obtained for this project and comply with all permit requirements.

All exposed overburden must have temporary or permanent stabilization within 7 days of initial disturbance. After this time any disturbance in the area must be stabilized at the end of each workday.

The following exceptions apply:
-Stabilization is not required if work is to continue in the area within the next 24 hours and there is no precipitation in the forecast.
-Stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of 2 feet or greater.

All temporary erosion control measures must be inspected at a frequency of every 7 days or runoff to leave construction site, and replaced or repaired as necessary.

All BMPs shall be installed and maintained in strict conformance with the Vermont Low Risk Site Handbook for Erosion Prevention and Sediment Control (Vermont DEC, 2020).

All proposed vegetated areas which do not exhibit a minimum of 70% vegetative growth by October 15th shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing minimum 2 inches of mulch, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.

The perimeter of the site and all BMPs will be inspected at the end of each workday to ensure that sediment will not leave the site. If sediment has travelled beyond the site boundary, it shall be swept up or otherwise removed and deposited on-site in an upgradient area at the end of each work day.

Dewatering activities must conform with guidelines put forth by the Low Risk Site Handbook, in particular the specification to use a filter sock or similar to filter dewatering water prior to discharge back into the stream. Filter sock must be placed in an upland area away from the stream channel to further filter water through streamside vegetation.

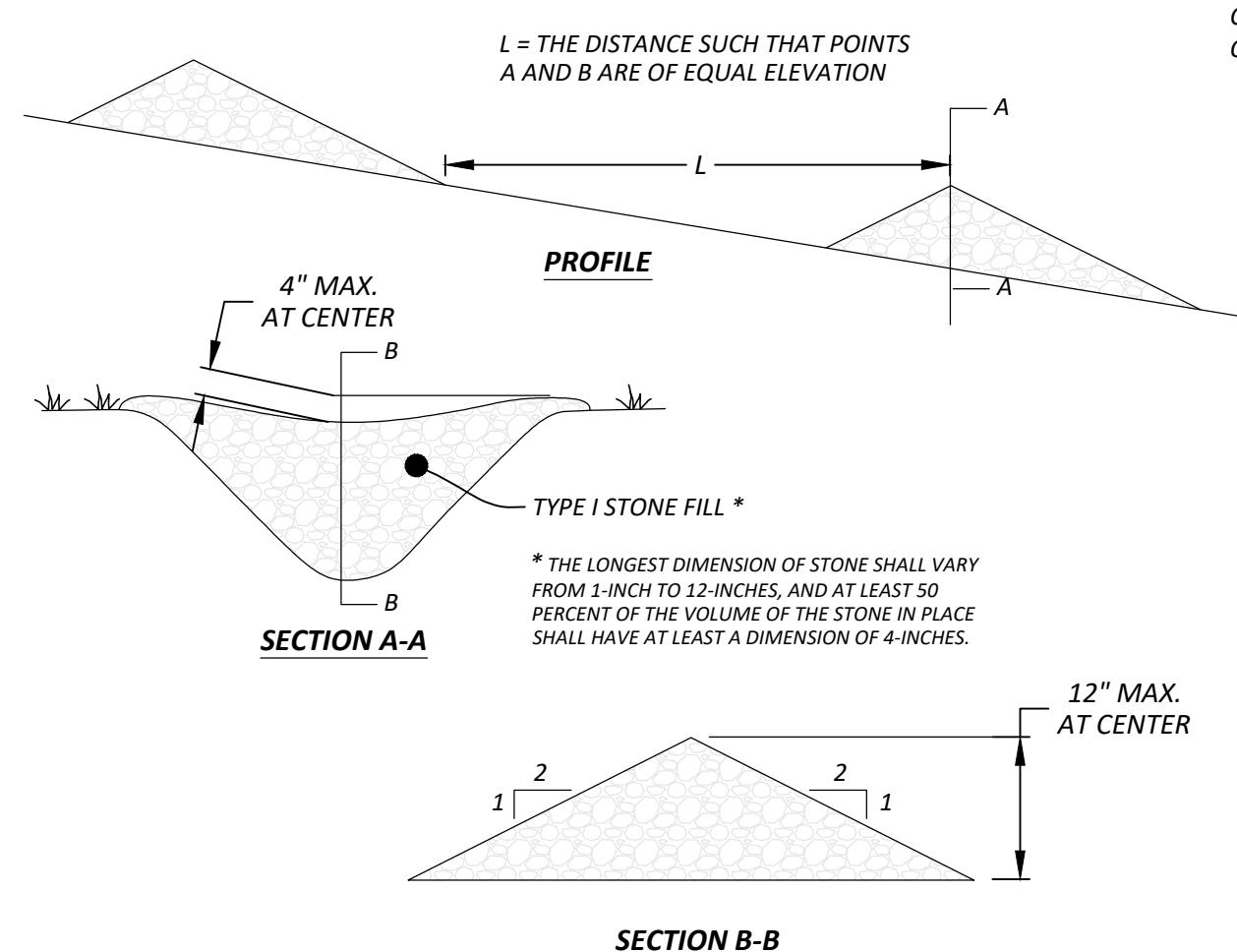
TIMING AND SEQUENCING NOTES

- Install all perimeter controls including limit of disturbance cord and silt fence
- Strip and stockpile soil and stabilize in place
- Excavate gravel wetland 1 and 2 and bioretention without stone and planting media to create traps for sediment control during construction
- Once collection structures are installed, fix coir inlet covers onto catchbasins with zip ties
- Grade and seed channels and slopes and install erosion blankets
- Install media and outlet works for gravel wetlands and bioretention area
- Once fully stabilized direct runoff to the treatment system s

LIMITS OF DISTURBANCE:

PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH 3-FOOT HIGH ORANGE "CONSTRUCTION" SAFETY FENCE OR 4-INCH THICK ORANGE CONSTRUCTION CORDON, AND SHALL BE LOCATED AS SHOWN ON PLAN.

- FENCE SHALL BE SUPPORTED BY STEEL OR WOOD TYPE POSTS PLACED AT MAXIMUM 16-FOOT INTERVALS.
- FENCE SHALL BE WIRED OR "ZIP" TIED TO THE SUPPORT POSTS.
- THE FENCE SHALL BE MAINTAINED IN A WORKMAN LIKE MANNER, AND SHALL REMAIN IN PLACE UNTIL FINAL SITE STABILIZATION IS ACHIEVED.



CONSTRUCTION REQUIREMENTS

- PLACE STONE TO THE LINES, GRADES AND LOCATIONS AS SHOWN ON THE PLAN OR AS DIRECTED.
- SET SPACING OF STONE CHECK DAMS SO THAT THE ELEVATION OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION AS THE TOE OF THE UPSTREAM DAM.
- EXTEND THE STONE TO A POINT BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
- PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS NEEDED OR DIRECTED.

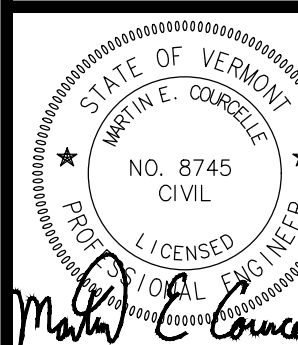
STONE CHECK DAM DETAIL

NTS

PERMIT SET

REVISION	DATE	DESCRIPTION

Champlain Consulting ENGINEERS
85 PRIM ROAD, P.O. BOX 453
COLCHESTER, VERMONT 05446
(802) 863-8060 - 864-1878 FAX
www.champlainconsulting.net



RHINO FOODS
179 QUEEN CITY PARK ROAD
POTENTIAL EXPANSION
EPSC DETAILS

DRAWN	CCE
CHECKED	MEC
SCALE	N.T.S.
DATE	05/23/23
JOB NO.	2022.032
SHEET	

C-12

NO.	DESCRIPTION	DATE
1	City Permit Set	05.23.2023

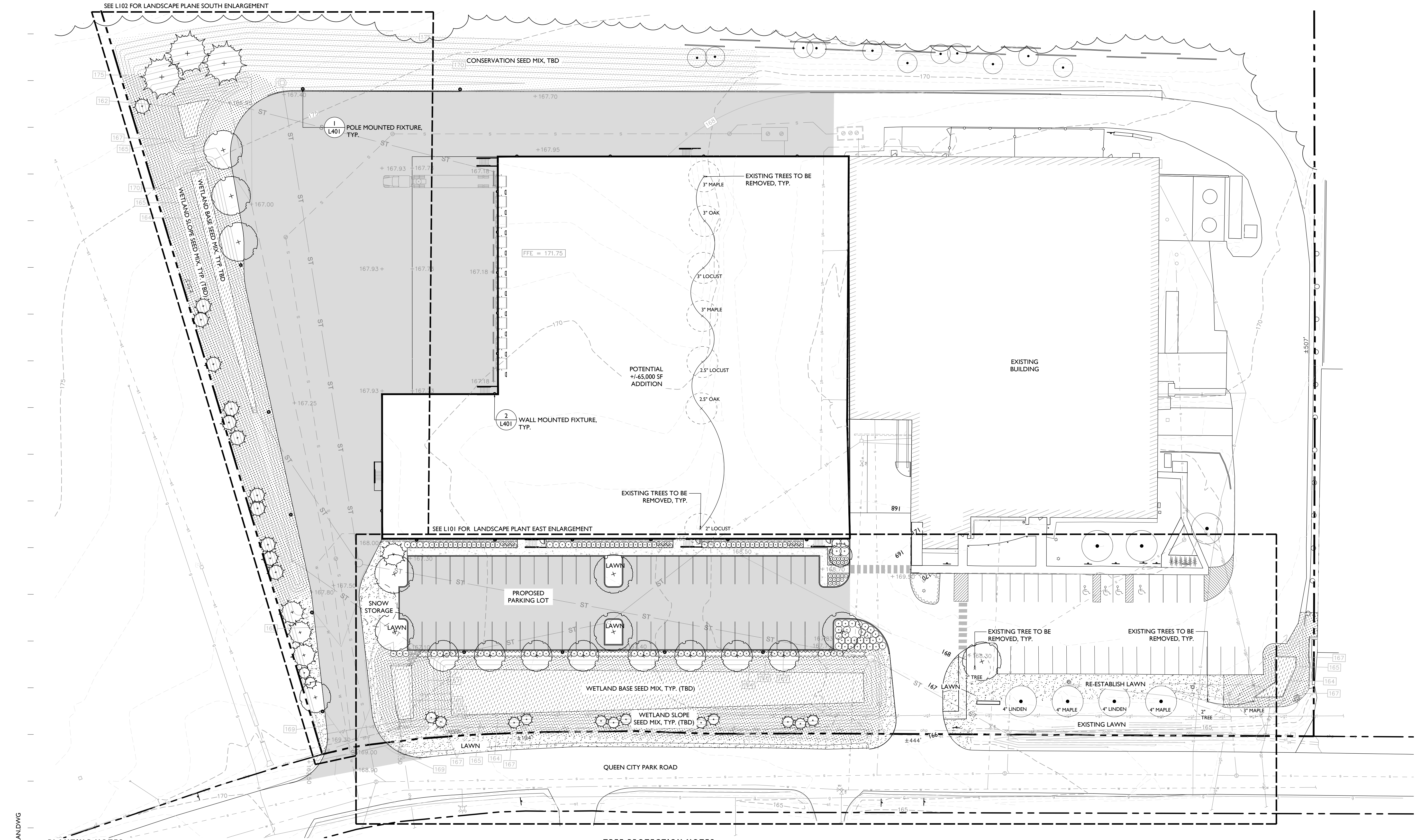
RHINO FOODS

179 QUEEN CITY PARK ROAD

LANDSCAPE KEY PLAN

JOB NO. 23-343
SCALE: 1"=30'
DRAWN BY: EB
DATE: 05.23.2023

L100

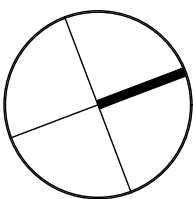


PLANTING NOTES

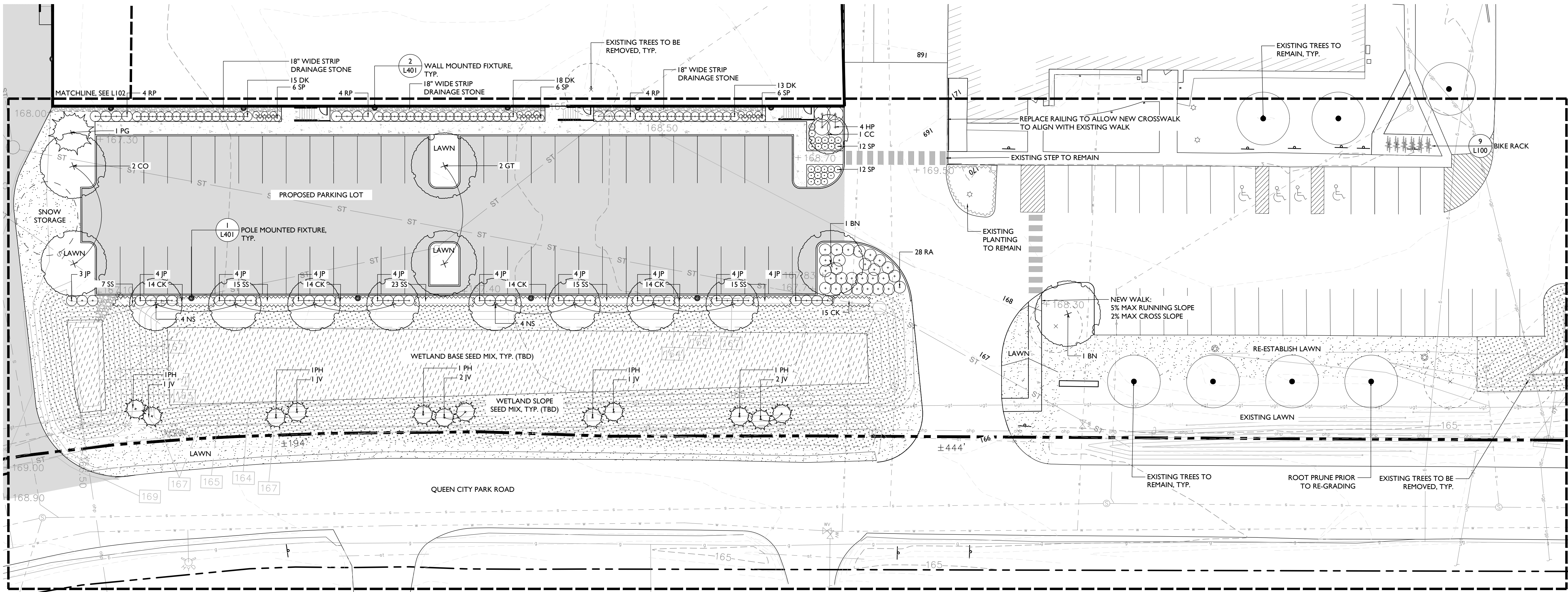
- All plant material in the plant schedule shall be nursery grown in accordance with ANSI in accordance with Z.60.1 Standards for measurement of nursery stock.
- All plants shall be guaranteed by the Contractor for a period of one year from date of receipt of Provisional Acceptance of the completed installation by the Owner.
- Replacement plantings will be required prior to Final Acceptance for any plants which are missing, not true to specifications, have died or are unhealthy or uncharacteristic of the species (due to excessive pruning, dieback or other reasons).
- All plant materials shall be selected and tagged at the nursery by Landscape Architect.
- The Landscape Architect's approval is required for any plant material substitutions.
- The Contractor is responsible for immediately notifying the Landscape Architect if any plant quantity discrepancies exist between the planting plan and the plant list.
- All shrubs and trees will be sprayed with the anti-desiccant "Wilt-Pruf" (or approved equal) prior to the first Winter (no later than November 30).
- The Landscape Contractor shall have the General Contractor locate all underground utilities in areas to be landscaped prior to commencing any excavation. Adjustments to tree locations will be allowed where utility conflicts are clearly a problem and with prior site approval by Landscape Architect.
- All plant bed, shrub and tree location shall be staked in the field by Contractor for Landscape Architects approval prior to installation.
- Adjustments to plant beds shall be approved by Landscape Architect.
- General Contractor is responsible for all erosion control measures during construction.
- All disturbed areas are to be topsoiled and seeded or sodded, as indicated in the planting plan.
- Mulch shall consist of double-shredded hardwood mulch or approved equal and Contractor is responsible for providing samples of mulch to Landscape Architect. Mulch plant materials as shown on plan and details.
- It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
- Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
- During construction, and until the end of warranty period, existing trees that are showing signs of stress as determined by the Landscape Architect are to be deep root fertilized, two injections per caliper inch per tree at 18" - 24" depth with Peter's 20/20/20 fertilizer or Landscape Architect approved equal.
- Contractor is responsible for verifying and confirming all plant counts as supplied by the Landscape Architect with field conditions as constructed. Any discrepancies shall be reported to Landscape Architect for approval and direction.
- Tree transplanting shall be performed by a suitable hydraulic tree spade, sized as necessary to suit the work.
- Prior to commencement of any construction, all existing trees to remain shall receive tree protection fence at outer edge of dripline whenever possible.

TREE PROTECTION NOTES

- Proposed methods, and schedule for effecting tree and plant protection shall be submitted for approval.
- Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization shall be submitted for approval.
- Certain specimen trees adjacent to construction areas and in other key locations will be identified by the Owner and the Architect, and marked with red tags. Loss of any of these trees will result in fines assessed at \$5,000 per tree. Damage to all other trees on the property will be assessed at the rate of \$500 per inch caliper of the tree. A fine of \$1,000 will be levied against the Contractor for each incident of construction inside tree protection areas.
- Damages to trees, shrubs, and other vegetation will be assessed by the Architect and Owner in accordance with the International Society of Arboriculture (ISA) Guide.
- Trees or roots visibly damaged will cause the Owner to withhold from the Contractor an assessed amount, conforming to the requirements stipulated above for a period of two years. After that period the impact of the damage to any tree will be assessed accordingly.
- If any trees or shrubs designated to be saved are damaged and replacement is required, a number and diameter of trees or shrubs of the same species and variety, as specified by the Owner and Architect, shall be furnished and planted by the Contractor. The total inch diameter of the replacement trees or shrubs shall equal the diameter of the tree or shrub to be replaced. The Contractor shall not be liable for any loss or damage which occurs while the Contractor is complying with instructions given by the Owner, Architect, or arborist working on the Project.
- The Contractor's attention is called to the fact that certain areas on the site exist as natural woodland spaces and are to remain as natural woodlands. Therefore, all construction operations must be performed in such a manner, which will preserve these existing natural environments as wood preserves.
- Designated areas of trees, understorey, and wildflowers are to remain untouched and unharmed.
- Clearly mark all clearing limits in the field and accompany Architect on a joint review of clearing limits before clearing operations have commenced. Limit of clearing is generally defined as the limit of grading.
- Galvanized chain link fencing, 4 feet high. Stakes for fencing shall be 8 feet galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 10 feet on center maximum.
- Prior to start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed in accordance with the following:
- Fencing shall be installed at the tree protection areas indicated on the Drawings.
- Fencing shall be installed a minimum of 15 feet beyond the drip line of the trees to be protected, unless otherwise approved by the Architect.
- Where construction will be in close proximity to existing trees designated to remain, roots shall be pruned. Proximity shall be as determined in the field by the Landscape Architect or Arborist.
- Suitable means for root pruning include: trenching, vibrating plow, and water jet pruning. Any method which tears roots or disturbs the soil beyond the grading limit is unacceptable.
- Trees to receive root pruning shall be reviewed by an arborist for canopy pruning, fertilization and trench backfill recommendations.
- Selective clearing within tree protection areas shall only be performed when and as directed by the Landscape Architect. Refer to Section 02115, selective clearing.
- Except as otherwise indicated or requested by Landscape Architect, temporary protection devices and facilities installed during course of the work shall be removed only after all work which may injure or damage trees and plants is completed.



30 0 30 60
SCALE OF FEET



PLANT SCHEDULE

KEY	QTY.	SCIENTIFIC NAME	COMMON NAME	INSTALLED SIZE	SPACING
TREES					
AF	1	Acer x freemanii 'Sienna' PP11,322	SIENNA GLEN® MAPLE	2.5" CAL	AS SHOWN
BN	2	Betula nigra 'Cully' Heritage®	HERITAGE RIVER BIRCH	2.5" CAL	AS SHOWN
CO	2	Celtis occidentalis 'Prairie Pride'	PRARIE PRIDE HACKBERRY	2.5" CAL	AS SHOWN
CC	1	Cercis canadensis 'MN Strain'	NORTHERN STRAIN REDBUD	2.5" CAL	AS SHOWN
GT	2	Gleditsia triacanthos inermis 'Halka'	HALKA HONEYLOCUST	2.5" CAL	AS SHOWN
JV	16	Juniperus virginiana 'Emerald Sentinel'	EASTERN RED CEDAR	15 GAL	8-12" O.C.
PA	3	Picea abies	NORWAY SPRUCE	8' HT.	AS SHOWN
PG	4	Picea glauca	WHITE SPRUCE	7' HT.	AS SHOWN
PH	10	Picea glauca 'Hudsonii'	HUDSON WHITE SPRUCE	15 GAL	8-12" O.C.
NS	8	Nyssa sylvatica	BLACK TUPELO	2.5" CAL	30" O.C.
UT	3	Ulmus 'Morton Glossy'	TRIUMPH™ ELM	2.5" CAL	30" O.C.
52					
SHRUBS					
DK	46	Diervilla x Kodiak® Orange	KODIAK ORANGE BUSH HONEYSUCKLE	3 GAL	4' O.C.
HP	4	Hydrangea paniculata 'Little Quick Fire'	LITTLE QUICK FIRE HYDRANGEA	5 GAL	5' O.C.
JP	39	Juniperus x pfitzeriana 'Sea Green'	SEA GREEN JUNIPER	5 GAL	4' O.C.
RP	12	Rhododendron P.J.M. 'Aglo'	AGLO RHODODENDRON	3 GAL	4' O.C.
RA	28	Rhus aromatica 'Gro-low'	GROW-LOW SUMAC	2 GAL	4' O.C.
SP	42	Spiraea betulifolia	BIRCHLEAF SPIREA	2 GAL	30" O.C.
SY	9	Syringa 'Bloomerang'	BLOOMERANG LILAC	5 GAL	5' O.C.
PERENNIALS, GRASSES, & GROUND COVER					
CK	71	Calamagrostis acutiflora 'Karl Foerster'	FEATHER REED GRASS	1 GAL	24" O.C.
MS	75	Schizanthus scoparium 'The Blues'	LITTLE BLUESTEM	1 GAL	24" O.C.

PLANTING NOTES

- All plant material in the plant schedule shall be nursery grown in accordance with ANSI in accordance with Z60.1 Standards for measurement of nursery stock.
- All plants shall be guaranteed by the Contractor for a period of one year from date of receipt of Provisional Acceptance of the completed installation by the Owner.
- Replacement plantings will be required prior to Final Acceptance for any plants which are missing, not true to specifications, have died or are unhealthy or uncharacteristic of the species due to excessive pruning, dieback or other reasons.
- All plant materials shall be selected and tagged at the nursery by Landscape Architect.
- The Landscape Architect's approval is required for any plant material substitutions.
- The Contractor is responsible for immediately notifying the Landscape Architect if any plant quantity discrepancies exist between the planting plan and the plant list.
- All shrubs and trees will be sprayed with the anti-desiccant "Wilt-Pruf" (or approved equal) prior to the first Winter (no later than November 30).
- The Landscape Contractor shall have the General Contractor locate all underground utilities in areas to be landscaped prior to commencing any excavation. Adjustments to tree locations will be allowed where utility conflicts are clearly a problem and with prior site approval by Landscape Architect.
- All plant bed, shrub and tree location shall be staked in the field by Contractor for Landscape Architects approval prior to installation.
- Adjustments to plant beds shall be approved by Landscape Architect.
- General Contractor is responsible for all erosion control measures during construction.
- All disturbed areas are to be topsoiled and seeded or sodded, as indicated in the planting plan.
- Mulch shall consist of double-shredded hardwood mulch or approved equal and Contractor is responsible for providing samples of mulch to Landscape Architect.
- Mulch plant materials as shown on plan and details.
- It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
- Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
- During construction, and until the end of warranty period, existing trees that are showing signs of stress as determined by the Landscape Architect are to be deep root fertilized, two injections per caliper inch per tree at 18" - 24" depth with Peter's 20/20/20 Fertilizer or Landscape Architect approved equal.
- Contractor is responsible for verifying and confirming all plant counts as supplied by the Landscape Architect with field conditions as constructed. Any discrepancies shall be reported to Landscape Architect for approval and direction.
- Tree transplanting shall be performed by a suitable hydraulic tree spade, sized as necessary to perform the work.
- Prior to commencement of any construction, all existing trees to remain shall receive tree protection fence at outer edge of dripline whenever possible.

TREE PROTECTION NOTES

- Proposed methods, and schedule for effecting tree and plant protection shall be submitted for approval.
- Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization shall be submitted for approval.
- Certain specimen trees adjacent to construction areas and in other key locations will be identified by the Owner and the Architect, and marked with red tags. Loss of any of these trees will result in fines assessed at \$5,000 per tree. Damage to all other trees on the property will be assessed at the rate of \$500 per inch caliper of the tree. A fine of \$1,000 will be levied against the Contractor for each incident of construction inside tree protection areas.
- Damages to trees, shrubs, and other vegetation will be assessed by the Architect and Owner in accordance with the International Society of Arboriculture (ISA) Guide.
- Trees or roots visibly damaged will cause the Owner to withhold from the Contractor an assessed amount, conforming to the requirements stipulated above for a period of two years. After that period the impact of the damaged to any tree will be assessed accordingly.
- If any trees or shrubs designated to be saved are damaged and replacement is required, a number and diameter of trees or shrubs of the same species and variety, as specified by the Owner and Architect, shall be furnished and planted by the Contractor. The total inch diameter of the replacement trees or shrubs shall equal the diameter of the tree or shrub to be replaced. The Contractor shall not be liable for any loss or damage which occurs while the Contractor is complying with instructions given by the Owner, Architect, or arborist working on the Project.
- The Contractor's attention is called to the fact that certain areas on the site exist as natural woodland spaces and are to remain as natural woodlands. Therefore, all construction operations must be performed in such a manner, which will preserve these existing natural environments as wood preserves.
- Designated areas of trees, understory, and wildflowers are to remain unexcavated and unharmed.
- Clearly mark all clearing limits in the field and accompany Architect on a joint review of clearing limits before clearing operations have commenced. Limit of clearing is generally defined as the limit of grading.
- Galvanized chain link fencing, 4 feet high. Stakes for fencing shall be 8 feet galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 10 feet on center maximum.
- Prior to start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed in accordance with the following:
- Fencing shall be installed at the tree protection areas indicated on the Drawings.
- Fencing shall be installed a minimum of 15 feet beyond the drip line of the trees to be protected, unless otherwise approved by the Architect.
- Where construction will be in close proximity to existing trees designated to remain, roots shall be pruned. Proximity shall be as determined in the field by the Landscape Architect or Arborist.
- Suitable means for root pruning include: trenching, vibrating plow, and water jet pruning. Any method which tears roots or disturbs the soil beyond the grading limit is unacceptable.
- Trees to receive root pruning shall be reviewed by an arborist for canopy pruning, fertilization and trench backfill recommendations.
- Selective clearing within tree protection areas shall only be performed when and as directed by the Landscape Architect. Refer to Section 02115, selective clearing.
- Except as otherwise indicated or requested by Landscape Architect, temporary protection devices and facilities installed during course of the work shall be removed only after all work which may injure or damage trees and plants is completed.

NO.	DESCRIPTION	DATE
1	City Permit Set	05.23.2023

RHINO FOODS
179 QUEEN CITY PARK ROAD

LANDSCAPE PLAN -
EAST ENLARGEMENT

JOB NO. 23-343
SCALE: 1"=20'
DRAWN BY: EB
DATE: 05.23.2023

L101

NO.	DESCRIPTION	DATE
I	City Permit Set	05.23.2023

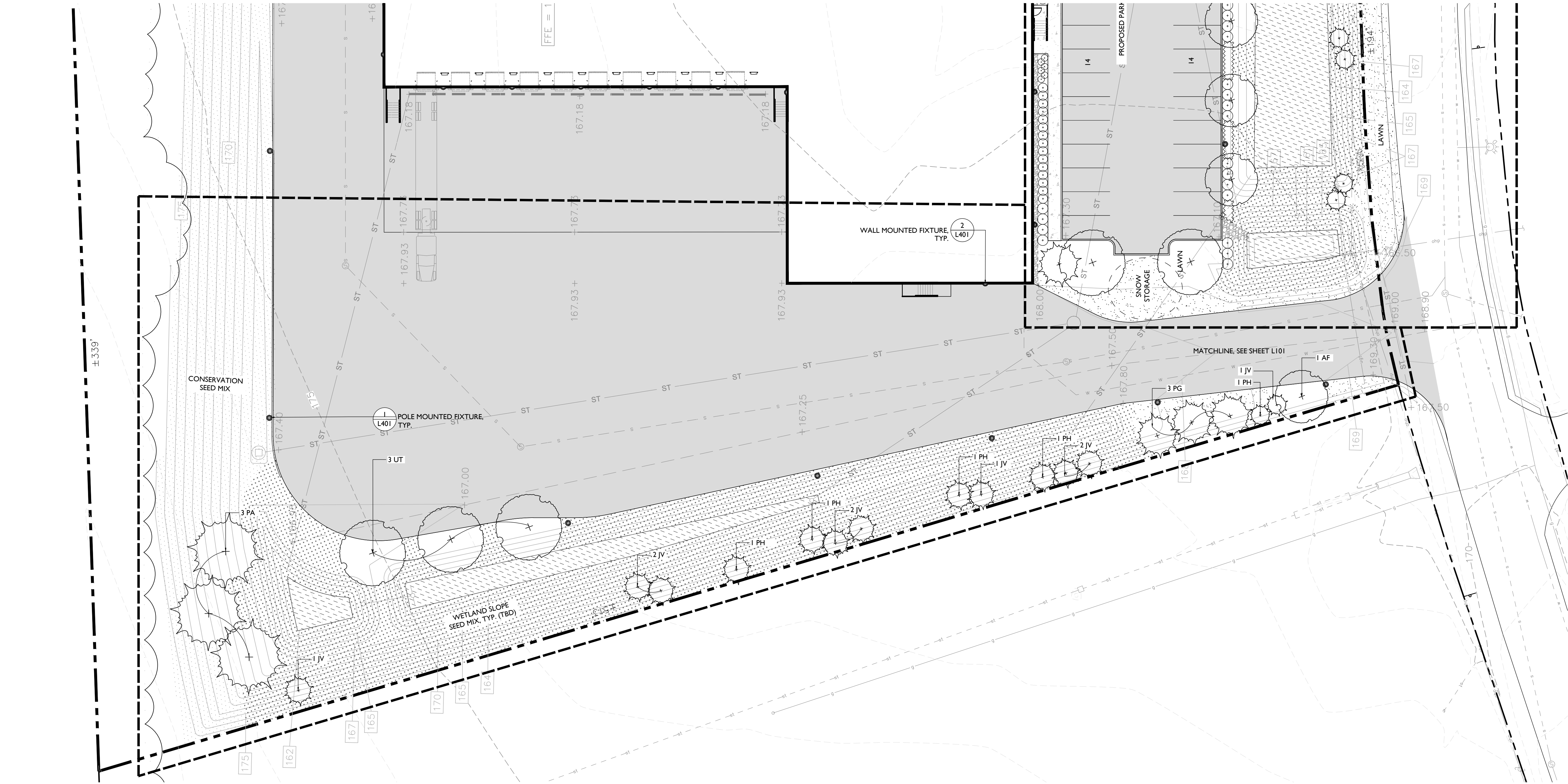
RHINO FOODS

179 QUEEN CITY PARK ROAD

LANDSCAPE PLAN - SOUTH ENLARGEMENT

JOB NO. 23-343
SCALE: 1"=20'
DRAWN BY: EB
DATE: 05.23.2023

L102



KEY	SCIENTIFIC NAME	COMMON NAME	INSTALLED SIZE	SPACING
TREES				
AF	Acer x freemanii 'Sienna' PP11, 322	SIENNA GLEN® MAPLE	2.5" CAL	AS SHOWN
BN	Betula nigra 'Cully' Heritage®	HERITAGE RIVER BIRCH	2.5" CAL	AS SHOWN
CO	Celtis occidentalis 'Prairie Pride'	PRARIE PRIDE HACKBERRY	2.5" CAL	AS SHOWN
CC	Cercis canadensis 'MN Strain'	NORTHERN STRAIN REDBUD	2.5" CAL	AS SHOWN
GT	Gleditsia triacanthos inermis 'Halia'	HALKA HONEYLOCUST	2.5" CAL	AS SHOWN
JV	Juniperus virginiana 'Emerald Sentinel'	EASTERN RED CEDAR	15 GAL	8-12' O.C.
PA	Picea abies	NORWAY SPRUCE	8' HT.	AS SHOWN
PG	Picea glauca	WHITE SPRUCE	7' HT.	AS SHOWN
PH	Picea glauca 'Hudsonii'	HUDSON WHITE SPRUCE	15 GAL	8-12' O.C.
NS	Nyssa sylvatica	BLACK TUPELO	2.5" CAL	30' O.C.
UT	Ulmus 'Morton Glossy'	TRIUMPH™ ELM	2.5" CAL	30' O.C.

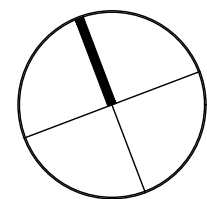
PLANTING NOTES

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- All plants shall be guaranteed by the Contractor for a period of one year from date of receipt of Provisional Acceptance of the completed installation by the Owner.
- Replacement plantings will be required prior to Final Acceptance for any plants which are missing, not true to specifications, have died or are unhealthy or uncharacteristic of the species (due to excessive pruning, dieback or other reasons).
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- The Landscape Architect's approval is required for any plant material substitutions.
- The Contractor is responsible for immediately notifying the Landscape Architect if any plant quantity discrepancies exist between the planting plan and the plant list.
- All shrubs and trees will be sprayed with the anti-desiccant "Wilt-Pruf" (or approved equal) prior to the first Winter (no later than November 30).
- The Landscape Contractor shall have the General Contractor locate all underground utilities in areas to be landscaped prior to commencing any excavation. Adjustments to tree locations will be allowed where utility conflicts are clearly a problem and with prior site approval by Landscape Architect.
- All plant bed, shrub and tree location shall be staked in the field by Contractor for Landscape Architects approval prior to installation.
- Adjustments to plant beds shall be approved by Landscape Architect.
- General Contractor is responsible for all erosion control measures during construction.
- All disturbed areas are to be topsoiled and seeded or sodded, as indicated in the planting plan.
- Mulch shall consist of double-shredded hardwood mulch or approved equal and Contractor is responsible for providing samples of mulch to Landscape Architect. Mulch plant materials as shown on plan and details.
- It is the intent of this contract to avoid any disturbance to existing trees or shrubs on site other than those specifically designated for transplant or removal.
- Liquidated damages for trees damaged by construction operation shall be \$500 per caliper inch. Shrubs shall be \$100 each.
- During construction, and until the end of warranty period, existing trees that are showing signs of stress as determined by the Landscape Architect are to be deep root fertilized, two injections per caliper inch per tree at 18" - 24" depth with Peter's 20/20/20 fertilizer or Landscape Architect approved equal.
- Contractor is responsible for verifying and confirming all plant counts as supplied by the Landscape Architect with field conditions as constructed. Any discrepancies shall be reported to Landscape Architect for approval and direction.
- Tree transplanting shall be performed by a suitable hydraulic tree spade, sized as necessary to perform the work.
- Prior to commencement of any construction, all existing trees to remain shall receive tree protection fence at outer edge of dripline whenever possible.

KEY	SCIENTIFIC NAME	COMMON NAME	INSTALLED SIZE	SPACING
SHRUBS				
DK	Dierilla x Kodiak® Orange	KODIAK ORANGE BUSH HONEYSUCKLE	3 GAL	4' O.C.
HP	Hydrangea paniculata 'Little Quick Fire'	LITTLE QUICK FIRE HYDRANGEA	5 GAL	5' O.C.
JP	Juniperus x pfitzeriana 'Sea Green'	SEA GREEN JUNIPER	5 GAL	4' O.C.
RP	Rhododendron P.J.M. 'Aglo'	AGLO RHODODENDRON	3 GAL	4' O.C.
RA	Rhus Aromatica 'Gro-low'	GROW-LOW SUMAC	2 GAL	4' O.C.
SP	Spirea Betifolia	BIRCH-LEAF SPIREA	2 GAL	30" O.C.
SY	Syringa 'Bloomerang'	BLOOMERANG LILAC	5 GAL	5' O.C.
PERENNIALS, GRASSES, & GROUND COVER				
CK	Calamagrostis acutiflora 'Karl Foerster'	FEATHER REED GRASS	1 GAL	24" O.C.
MS	Schizanthus scoparium 'The Blues'	LITTLE BLUESTEM	1 GAL	24" O.C.

TREE PROTECTION NOTES

- Proposed methods, and schedule for effecting tree and plant protection shall be submitted for approval.
- Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization shall be submitted for approval.
- Certain specimen trees adjacent to construction areas and in other key locations will be identified by the Owner and the Architect, and marked with red tags. Loss of any of these trees will result in fines assessed at \$5,000 per tree. Damage to all other trees on the property will be assessed at the rate of \$500 per inch caliper of the tree. A fine of \$1,000 will be levied against the Contractor for each incident of construction inside tree protection areas.
- Damages to trees, shrubs, and other vegetation will be assessed by the Architect and Owner in accordance with the International Society of Arboriculture (ISA) Guide.
- Trees or roots visibly damaged will cause the Owner to withhold from the Contractor an assessed amount, conforming to the requirements stipulated above for a period of two years. After that period the impact of the damaged to any tree will be assessed accordingly.
- If any trees or shrubs designated to be saved are damaged and replacement is required, a number and diameter of trees or shrubs of the same species and variety, as specified by the Owner and Architect, shall be furnished and planted by the Contractor. The total inch diameter of the replacement trees or shrubs shall equal the diameter of the tree or shrub to be replaced. The Contractor shall not be liable for any loss or damage which occurs while the Contractor is complying with instructions given by the Owner, Architect, or arborist working on the Project.
- The Contractor's attention is called to the fact that certain areas on the site exist as natural woodland spaces and are to remain as natural woodlands. Therefore, all construction operations must be performed in such a manner, which will preserve these existing natural environments as wood preserves.
- Designated areas of trees, understory, and wildflowers are to remain untouched and unharmed.
- Clearly mark all clearing limits in the field and accompany Architect on a joint review of clearing limits before clearing operations have commenced. Limit of clearing is generally defined as the limit of grading.
- Galvanized chain link fencing, 4 feet high. Stakes for fencing shall be 8 feet galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 10 feet on center maximum.
- Prior to start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed in accordance with the following:
- Fencing shall be installed at the tree protection areas indicated on the Drawings.
- Fencing shall be installed a minimum of 15 feet beyond the drip line of the trees to be protected, unless otherwise approved by the Architect.
- Where construction will be in close proximity to existing trees designated to remain, roots shall be pruned. Proximity shall be as determined in the field by the Landscape Architect or Arborist.
- Suitable means for root pruning include: trenching, vibrating plow, and water jet pruning. Any method which tears roots or disturbs the soil beyond the grading limit is unacceptable.
- Trees to receive root pruning shall be reviewed by an arborist for canopy pruning, fertilization and trench backfill recommendations.
- Selective clearing within tree protection areas shall only be performed when and as directed by the Landscape Architect. Refer to Section 02115, selective clearing.
- Except as otherwise indicated or requested by Landscape Architect, temporary protection devices and facilities installed during course of the work shall be removed only after all work which may injure or damage trees and plants is completed.



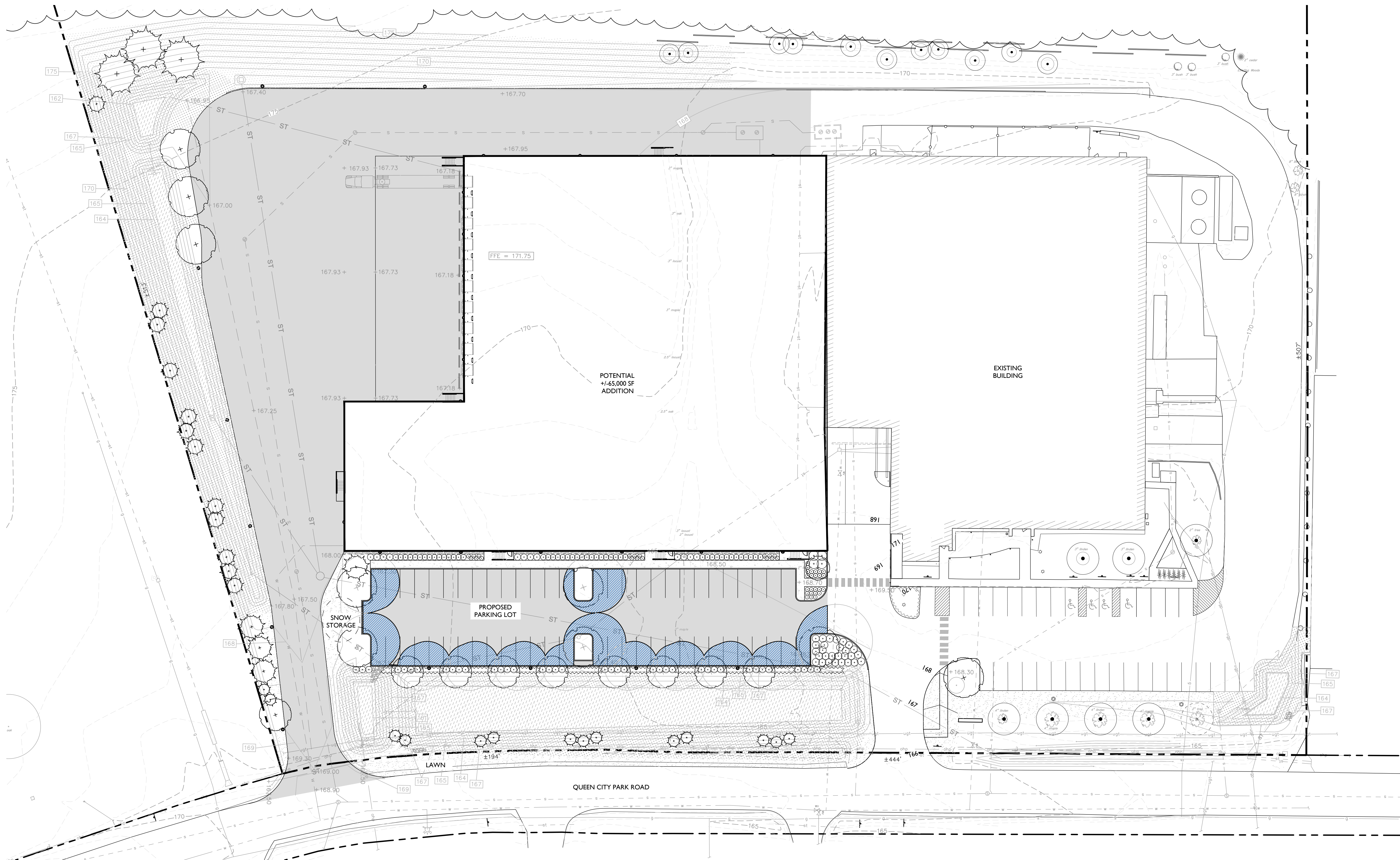
NO.	DESCRIPTION	DATE
I	City Permit Set	05.23.2023

RHINO FOODS
179 QUEEN CITY PARK ROAD

**PARKING LOT
SHADING PLAN**

JOB NO. 23-343
SCALE: 1"=30'
DRAWN BY: EB
DATE: 05.23.2023

L200



SUN ANGLE CALCULATION DATA FOR PROJECT LOCATION

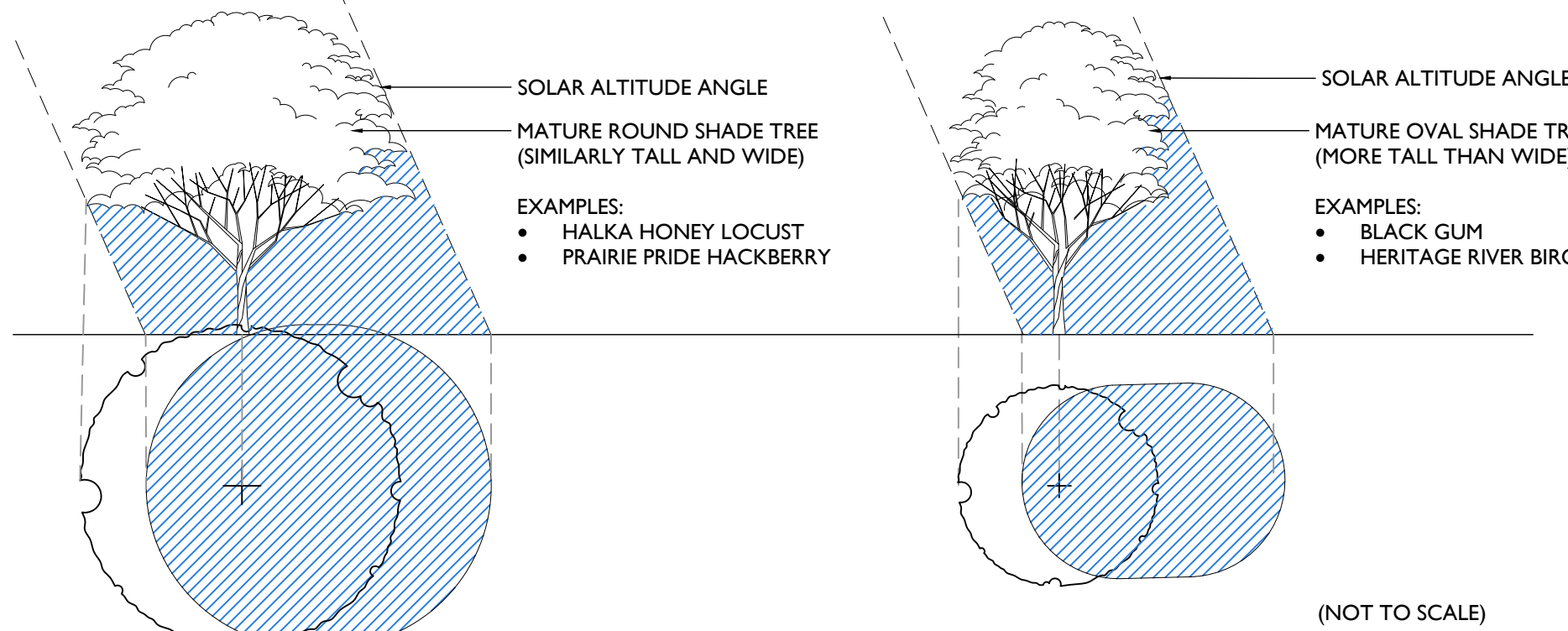
LONGITUDE: 73° 13' 41.5" WEST
LATITUDE: 44° 29' 26.9" NORTH
CALCULATION DATE: JUNE 21, 2017
ELEVATION: 200'
TIME: SOLAR NOON (12:24 PM EST)

RESULTING SUN
ALTITUDE ANGLE: 66.20°

MATURE TREE SIZES:

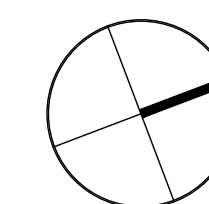
- BLACK GUM: 40' HEIGHT, 25' SPREAD
- HALKA HONEY LOCUST: 40' HEIGHT & SPREAD
- HERITAGE® RIVER BIRCH: 50' HEIGHT & 40' SPREAD
- PRAIRIE PRIDE HACKBERRY: 40' HEIGHT & SPREAD

NOTE: 10% REDUCTIONS FROM NUMBERS ABOVE APPLIED
TO ACCOUNT FOR TREES NOT REACHING MATURITY



SHADE CALCULATION TOTALS

- AREA OF PARKING LOT = 16,083 SF
- AREA SHADED BY MATURE TREES = 5,513 SF
- PROPOSED PERCENTAGE OF SHADED PARKING LOT = **34.2%**
- REQUIRED PERCENTAGE OF SHADED PARKING LOT = 30%



30 0 30 60
SCALE OF FEET

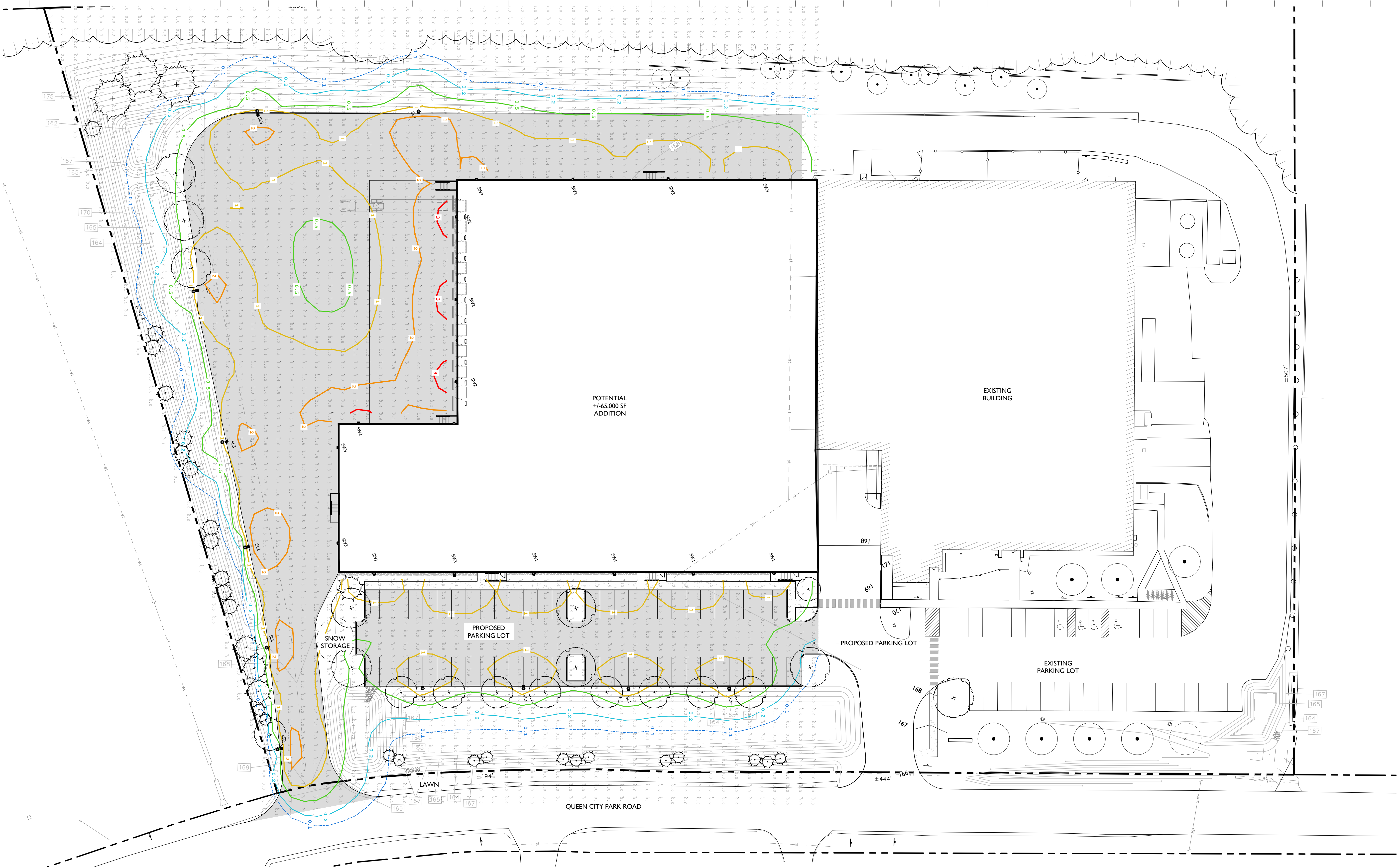
NO.	DESCRIPTION	DATE
1	City Permit Set	05.23.2023

RHINO FOODS
179 QUEEN CITY PARK ROAD

PHOTOMETRIC PLAN

JOB NO. 23-343
SCALE: 1"=30'
DRAWN BY: EB
DATE: 05.23.2023

L300

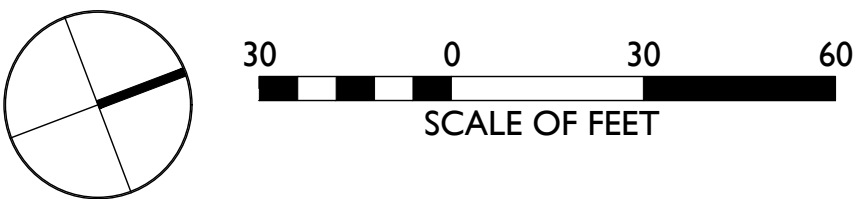


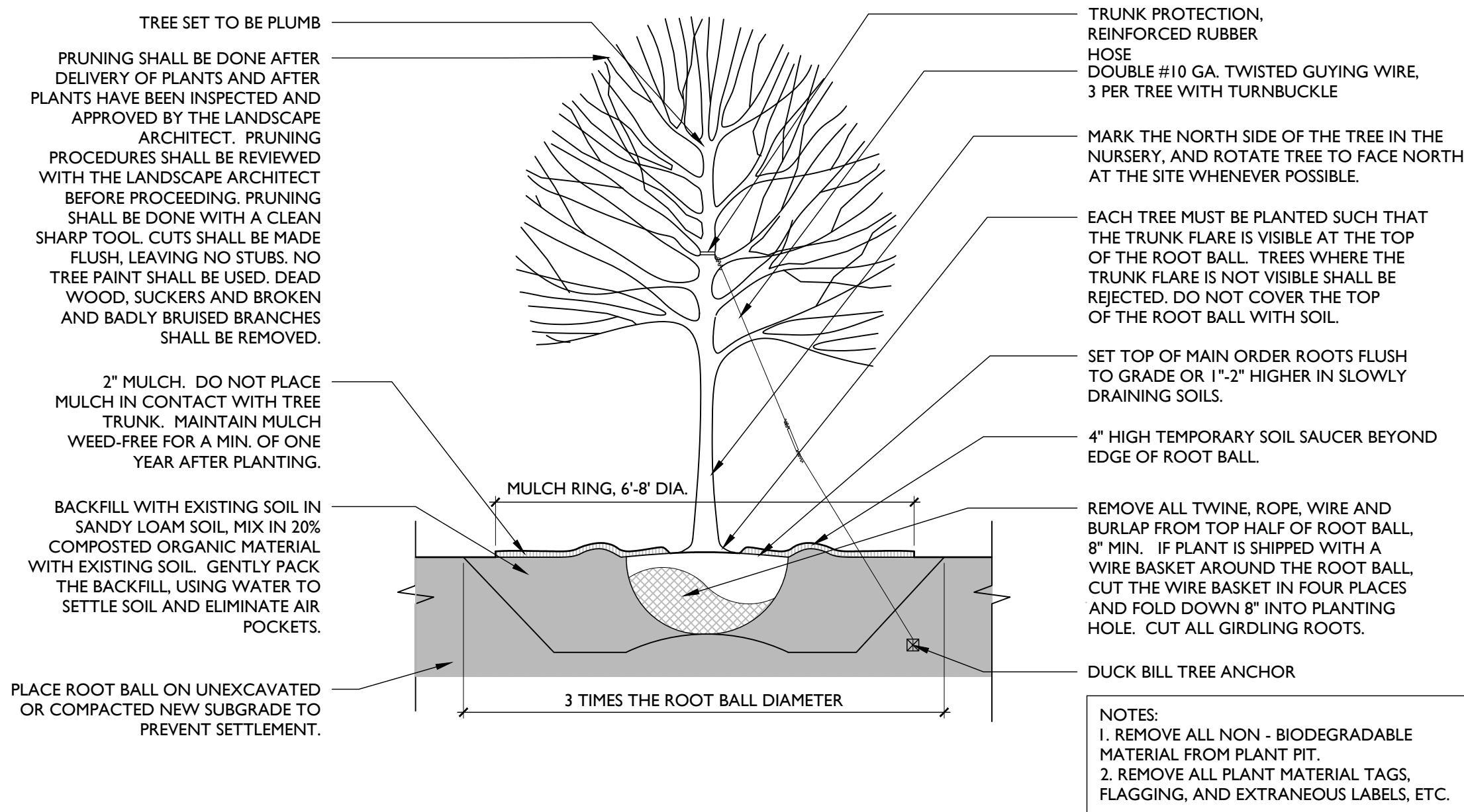
APEX LIGHTING SOLUTIONS
DATE: 5/18/2023
REFLECTANCES: NONE USED
WORKPLANE: @ GRADE

Luminaire Schedule					
Qty	Label	Wattage	Luminaire Lumens	LLF	Description
4	SL1	22.53333	3527	0.900	GARDCO OPF-S-P02-830-T4M-AR1-UNV-BL50-L2-FINISH Mounted to SRA-CA-4-188-18-D1-DTX-FINISH w/Optical Center @ ~18ft AFG
3	SL2	41.88	4316	0.900	GARDCO OPF-S-A01-830-BLC-AR1-UNV-BL50-L2-FINISH Mounted to SRA-CA-4-188-18-D1-DTX-FINISH w/Optical Center @ ~18ft AFG
4	SL3	92.84	9175	0.900	GARDCO OPF-M-A09-830-T4W-AR1-UNV-BL50-L3-FINISH-HIS Mounted to TRA-CA-6/4-188-25-D1-DX-FINISH w/Optical Center @ ~25ft AFG
6	SW1	22.2	2382	0.900	GARDCO 121-16L-400-WW-G4-3-UNV-BL-IMR13-FINISH Mounted to Structure @ 18ft AFG
4	SW2	70.2	7732	0.900	GARDCO 121-32L-700-WW-G4-4-UNV-BL-IMR13-FINISH Mounted to Structure @ 20ft AFG
6	SW3	38.4	3785	0.900	GARDCO 121-16L-700-WW-G4-3-UNV-BL-IMR13-FINISH Mounted to Structure @ 20ft AFG

Calculation Summary						
Label	Grid Height	Avg - FC	Max - FC	Min - FC	Avg/Min	Max/Min
NEW FRONT PARKING LOT		0.93	1.4	0.2	4.65	7.00
REAR DRIVE		1.08	2.1	0.3	3.60	7.00
TRUCK ENTRANCE		1.64	2.5	0.6	2.73	4.17
TRUCK YARD & LOADING		1.43	3.4	0.3	4.77	11.33

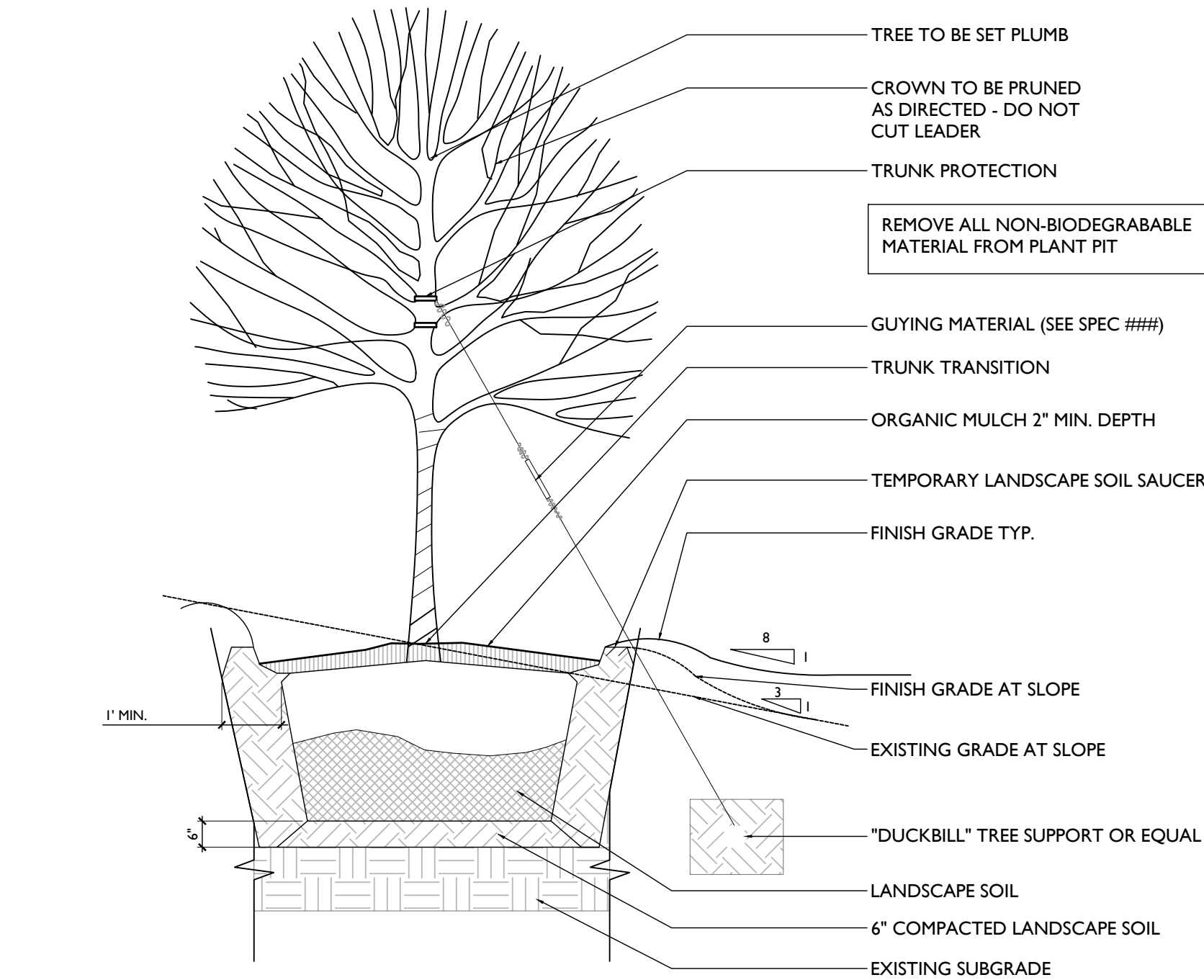
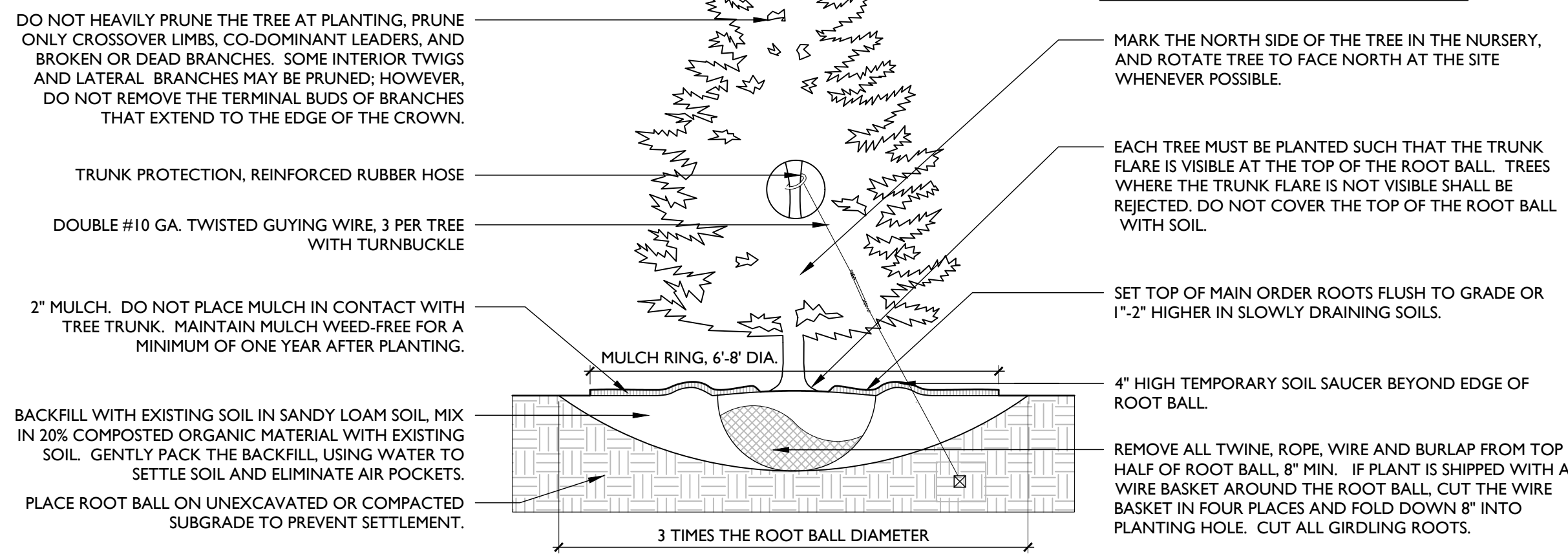
GENERAL DISCLAIMER:
Calculations have been performed according to IES standards and good practice. Some differences between measured values and calculated results may occur due to tolerances in calculation methods, testing procedures, component performance, measurement techniques and field conditions such as voltage and temperature variations. Input data used to generate the attached 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.
* LLF Determined Using Current Published Lamp Data
NOTE TO REVIEWER:
Total Light Loss Factor (LLF) applied at time of design is determined by applying the Lamp Lumen Depreciation (LLD) from current lamp manufacturer's catalog, a Luminaire Dirt Depreciation Factor (LDD) based on IES recommended values and a Ballast Factor (BF) from current ballast specification sheets. Application of an incorrect Light Loss Factor (LLF) will result in forecasts of performance that will not accurately depict actual results.
For proper comparison of photometric layouts, it is essential that you insist all designers use correct Light Loss Factors.





1 DECIDUOUS TREE PLANTING
NTS

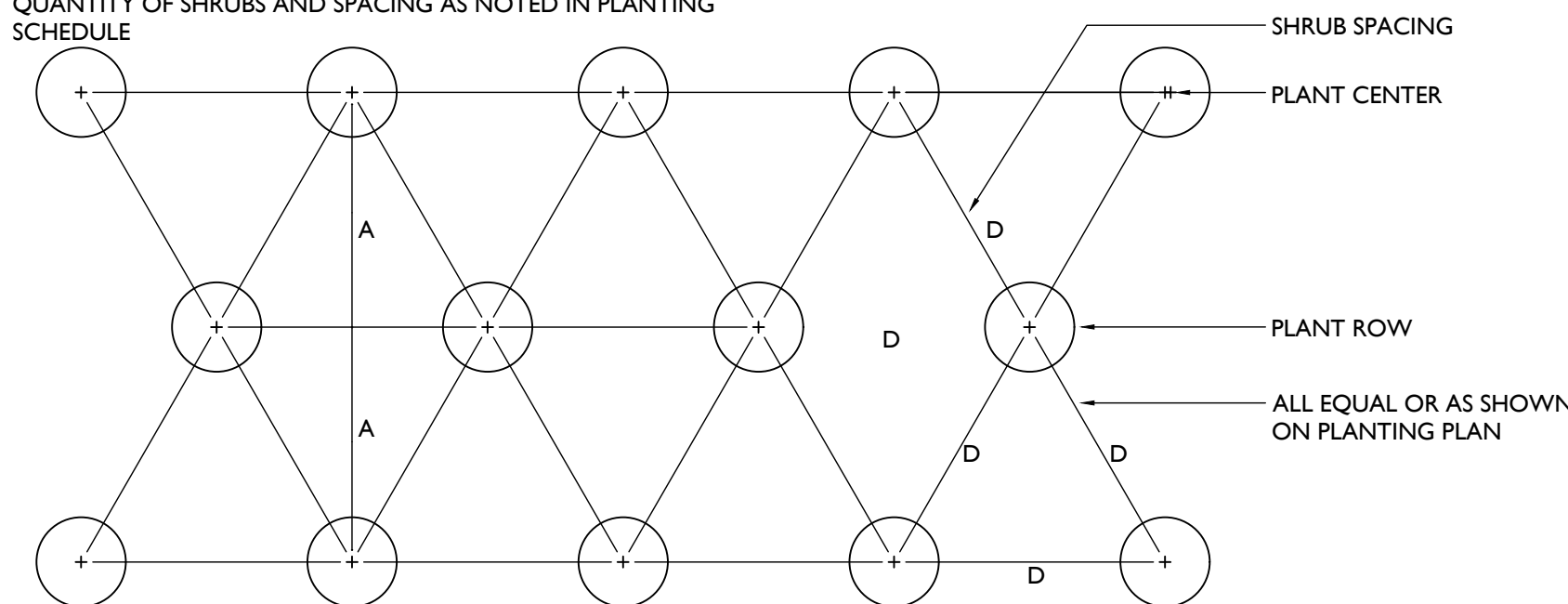
2 EVERGREEN TREE PLANTING
NTS



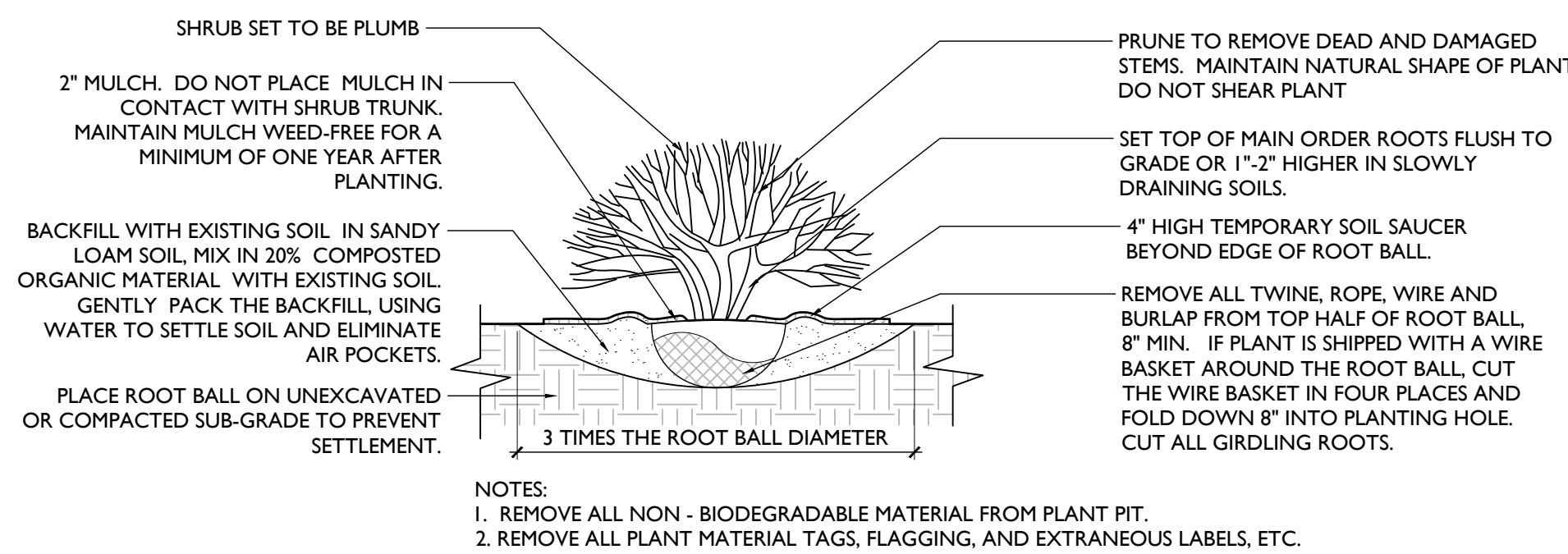
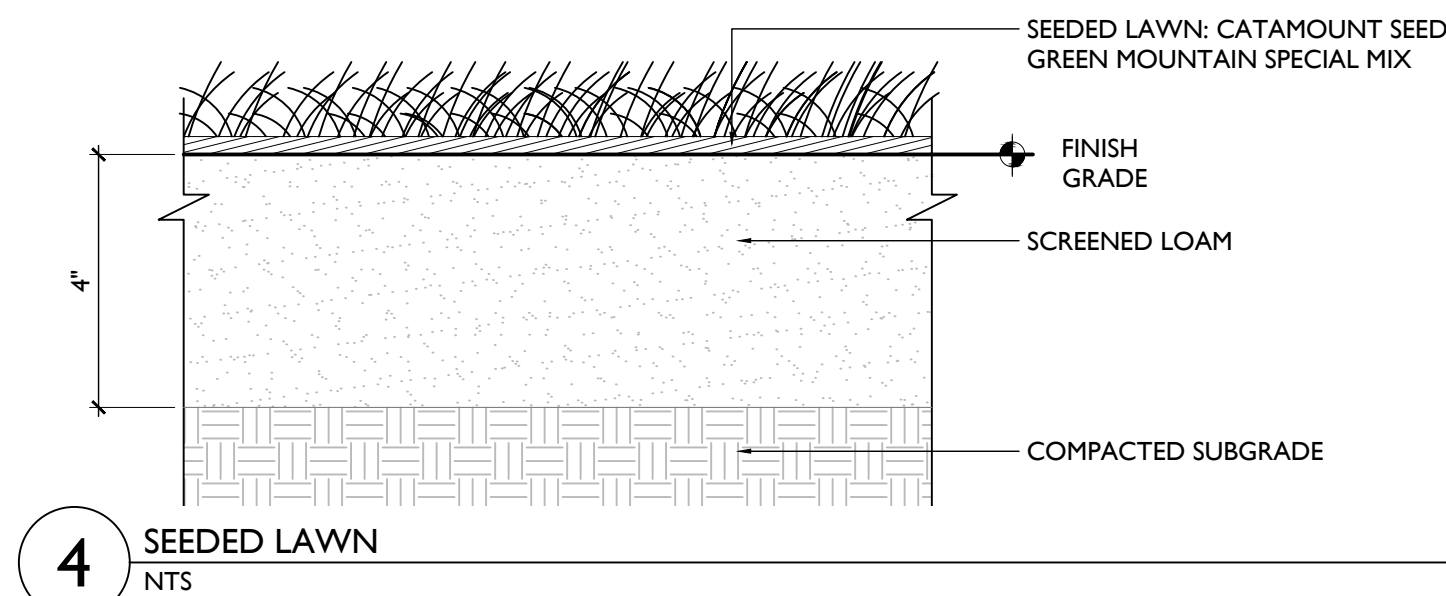
3 DECIDUOUS TREE PLANTED ON SLOPE
NTS

SPACING "D"	ROW "A"	NUMBER OF PLANTS/SQ.FT.
48" O.C.	41.52"	0.07
36" O.C.	31.20"	0.12
24" O.C.	20.76"	0.28
18" O.C.	15.59"	.5
12" O.C.	10.39"	1.15

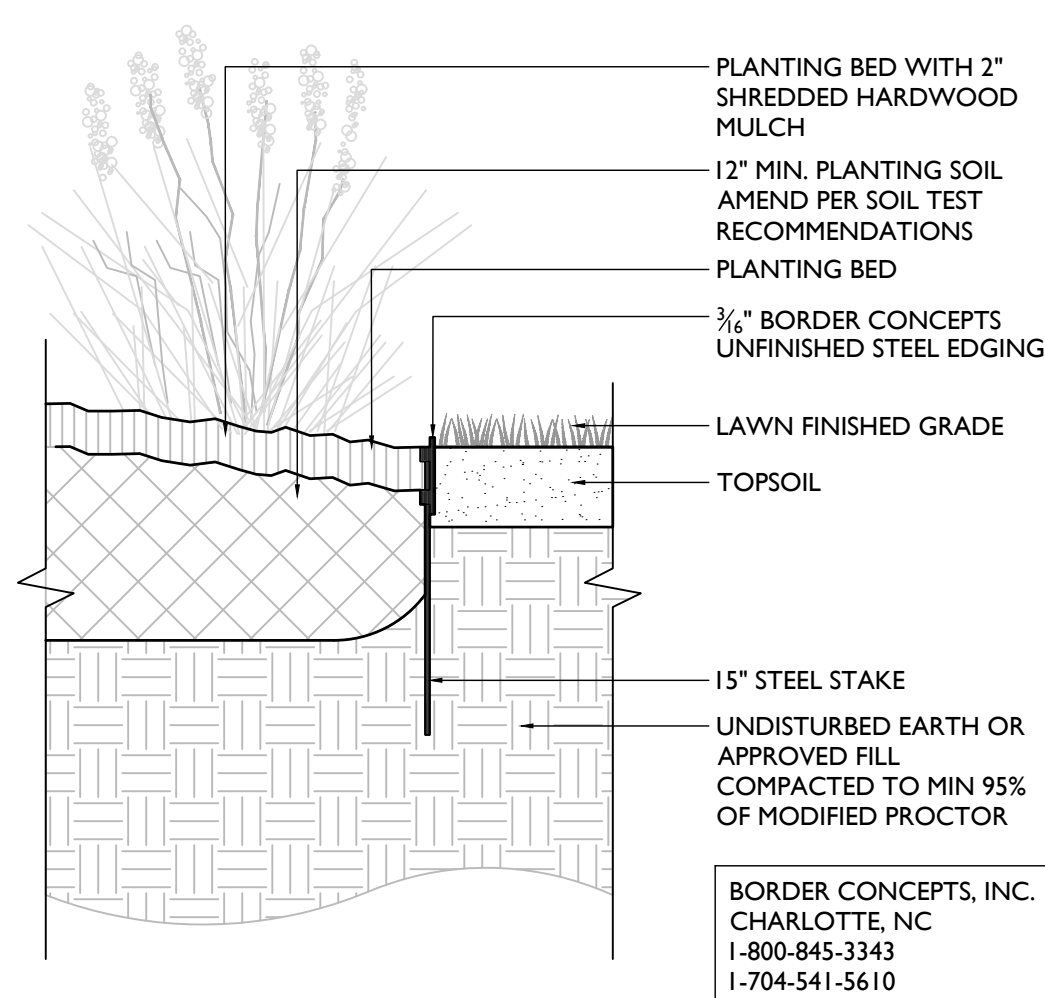
NOTE:
QUANTITY OF SHRUBS AND SPACING AS NOTED IN PLANTING SCHEDULE



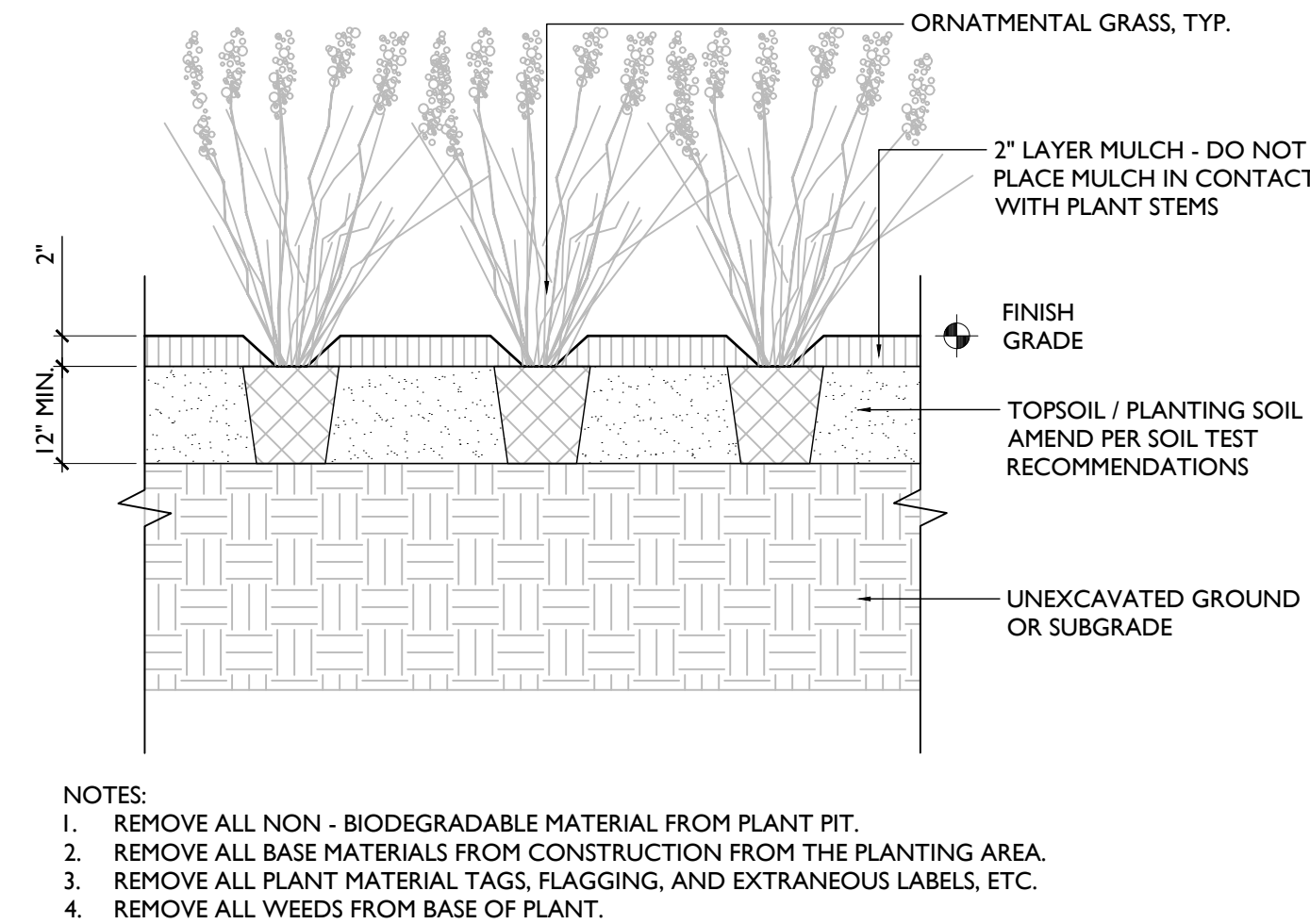
7 PLANT SPACING DIAGRAM
NTS



5 SHRUB PLANTING
NTS



8 STEEL EDGING
1" = 1'-0"



6 PERENNIAL & ORNAMENTAL GRASS PLANTING
NTS



VICTOR STANLEY CYCLE SENTRY BIKE RACK, OR APPROVED EQUAL

9 BIKE RACK
NTS

NO.	DESCRIPTION	DATE
1	City Permit Set	05.23.2023

RHINO FOODS
179 QUEEN CITY PARK ROAD

LANDSCAPE DETAILS

JOB NO. 23-343
SCALE: AS NOTED
DRAWN BY: EB
DATE: 05.09.2023

L400

Project:	
Location:	
Cell No:	
Type:	
Lamps:	Qty:
Notes:	

example: OPE-S-A01-840-T4M-AR1-120-BL50-L3-BZ

[illegible]

- 480V].
 Available for lumen packages P03-P08, HVU [347-480V].
 Packages P06-P09 & A04-A07.
 Available for lumen packages P04-P08.
 Limer, SRDR, FAWs, FS1, FS2, OMSR, DLEA, BL50
 (P1-P08) available only with T2M, T3M, T4M, and T5M
 are not rotatable.
 Recommended for retrofit applications.



GARDCO by @ignify	Site and Area
	OptiForm
	OPF-S Small

Project:	
Location:	
Cat.No:	
Type:	
Lamps:	Qty:
Notes:	

example: QPF-S-A01-B40-T4M-A01-120-BL50-L3-B1

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- **Not available for lumen packages P03-P09. HVU [347-480V], packages P05-P09 & A04-A07.**



Project:	
Location:	
Cat.No:	
Type:	
Lemps:	Qty:
Notes:	

example: OPF-M-A08-840-T4M-AR1-240-BL60-L3-B

100%

- recommended for retrofit applications

Project:	
Location:	
Cat.No:	
Type:	
Lamps:	Qty:
Notes:	

example: 121-32L-700-NW-G4-3-120-BL-IMR12-BZ

--	--	--

- ⁴ Not available with other dimming control options.
- ⁵ Not available with motion sensor.
- ⁶ Not available with photocontrol.
- ⁷ Not available in 347 or 480V.
- ⁸ Must specify input voltage.
- ⁹ Available with two modules (32L) at 530mA.
- ¹⁰ Not available with DD, DCC, and FAWS dimming control options.
- ¹¹ Must specify a motion sensor lens.
- ¹² Not available with DCC, FAWS, and LLC.

The image shows the Gardco LED wall sconce, a modern, curved, and adjustable light fixture. To the left of the product is the Gardco logo, which includes a stylized 'G' icon and the text 'GARDCO by @ignify'. To the right of the product is a small circular icon with the text 'LED' inside, indicating the light source.

Project:	
Location:	
Cat.No:	
Type:	
Lamps:	Qty:
Notes:	

example: 121-32L-700-NW-G4-3-120-BL-IMRI2-B3

[illegible]

- ¹⁰ Not available with DD, DCC, and FAWS dimming control options.

GARDCO by	Wall Mount	
	LED wall sconce	
	121	

Project: _____

Location: _____

Est. No: _____

Type: _____

Lamps:	Qty:
Notes:	

example: 121-321-700-NW-G4-3-120-B1-IMR12-B1

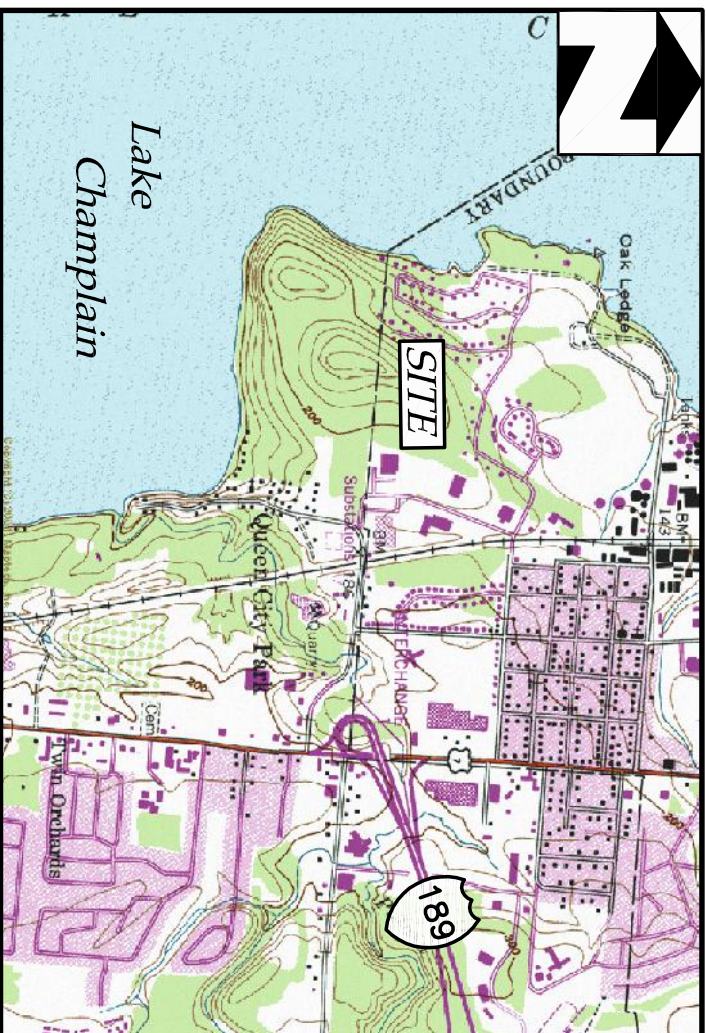
[illegible]

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- ¹¹ Must specify a motion sensor lens.
- ¹² Not available with DCC, FAWS, and LLC.

LANDSCAPE ARCHITECTURE
VT802.864.0010 NY518.567.1791 wagnerhodgson.com

179 QUEEN CITY PARK ROAD

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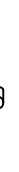
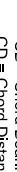


Location Plan

Not to Scale

The purpose of this plan is to adjust the southerly property line of Zoo Holdings, LLC as shown hereon. Certain site features have been digitized from a 2018 orthophoto obtain from VCGI.

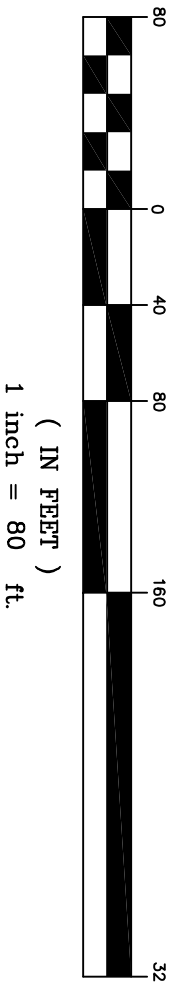
LEGEND

- | | |
|---|--|
|  | Subject Tract Boundary Line |
|  | Existing Boundary Line to be Dissolved |
|  | Apparent Abutting Property Line |
|  | Stone Wall |
|  | Wire Fence |
|  | High Tension Electric Fence |
|  | Well |
|  | Utility Pole |
|  | Guy Wire / Pole |
|  | Iron Pipe or Rebar Found |
|  | Concrete Monument Found |
|  | Calculated Point (Not Set) |
|  | 5/8" Iron Rebar Previously Set in March 2010 |
|  | 5/8" Iron Rebar Set |
|  | Now or Formerly |
|  | Land Records Volume / Page |
|  | Survey Control Point |
- Curve Data:
L = Curve Length
R = Radius
CB = Chord Bearing
CD = Chord Distance
- Horizontal Curve Data

Record Owners:

#179 Queen City Park Road Volume 843, Page 484	#225 Queen City Park Road Volume 1377, Page 330
Zoo Holdings, LLC	Zoo Too, LLC
#179 Queen City Park Road Burlington, VT 05401 Parcel ID: 060-1-062.000 Existing Lot Size: 5.01 Acres ±	#179 Queen City Park Road Burlington, VT 05401 Parcel ID: 060-1-065.000 Existing Lot Size: 3.00 Acres ±

GRAPHIC SCALE



SURVEY NOTES:

- 1.** This Subdivision plot has been compiled from field surveys and record evidence including the following recorded plats:
 - A.** "Survey for Blue Sky Associates, 159 Industrial Parkway, Burlington, Vermont," prepared by Fitzpatrick - Lewellyn, Inc., dated May 1991, provided by Blue Sky Associates
 - B.** "Rhino Foods Inc., Burlington, VT, Master Planning, Existing Site Plan," prepared by Stuhlmann Engineering Corp., dated 9-13--00, provided by Blue Sky Associates
 - C.** "Boundary Lines for G.B.I.C. Parcel 2, Burlington, VT," prepared by Fred C. Keerner, C.E., dated May 1961, and recorded in Volume 163, Page 678 of the City of Burlington Land Records.
 - D.** "Plan of Land to be conveyed by Greater Burlington Industrial Corp. to Gynessco in G.B.I.C. Industrial Park 2, Burlington, Vermont," prepared by Fred C. Keerner, C.E., dated May 1959, and recorded in Volume 126, Page 234 of the City of Burlington Land Records.
- E.** "Greater Burlington Industrial Corporation, Industrial Parkway, Burlington, Vermont. Plan of Land to be conveyed to Gynessco Inc.," prepared by Fred C. Keerner, C.E., recorded on slide #96 of the City of Burlington Land Records.

- F.** "Plot, Condominium Housing, Burlington, Vermont, The Red Rock Corporation", prepared by Robert Burley Associates, recorded on slide #93 of the City of Burlington Land Records.
- G.** "Boundary Survey, property of Martin Morcote Corporation to be conveyed to General Dynamics Armament Systems, Inc., Industrial Parkway, Burlington, Vermont," prepared by Krebs and Lansing Consulting Engineers, Inc., dated January 3, 1997, and recorded on slide #370C of the City of Burlington Land Records.
- H.** "Portion of Land in GBC Industrial Park 2 to be conveyed to Edlund Company Inc., Burlington, Vermont," prepared by Fred C. Keenan, C.E., dated Nov 1957, and recorded in Volume 148, Page 599 of the City of Burlington Land Records.
- I.** "Blue Sky Associates, Industrial Parkway, Burlington, Vermont, Boundary Line Adjustment," prepared by Burton Professional Land Surveyors, P.C., dated 8/06/03, and recorded in Slide #3590 of the City of Burlington Land Records.
- J.** Bearings are based on Vermont State Plane Coordinates (SPC-VT) using NAD83, (1986) control. The north orientation was derived by using Digital Orthophotographs (DOO) 092326 on disk # 101 purchased from the Vermont Mapping Program.
- K.** The measurements and information produced by this survey and shown hereon may contrast from recorded survey information due to differences in orientation, discrepancy or methods of measurement.
- L.** Survey methods employed and the resulting error of closure/precision ratio, meet or exceed minimum precision requirements for urban surveys as outlined in "Standard for the Practice of Land Surveying" adopted by the Vermont Board of Land Surveyors effective 01/07/2013. A random traverse control loop was established using a Nikon DTM-521 Total Station in unison with a Sokkia SDR 35 Data Collector. The field data was adjusted using the Least Square Adjustment Method.
- M.** The diameters of existing monumentation shown on this plan reflect outside diameter dimensions.

- 6.** Boundary markers shown hereon as "SET" or "to be SET" are 5/8 inch diameter iron rebar, 40–inch long, crowned with a plastic cap.
- 7.** The subdivision line pertinent to the parcels shown hereon has been computed, plotted, and laid out to the specifications of the owner and/or their agents.
- 8.** This plot shows the public right of way of Industrial Parkway (now Queen City Park Road) to be 50 feet as documented in Volume 373, Page 757 in the City of Burlington Land Records.
- 9.** The descriptions of these lands and the physical evidence located and existing on the ground were compared and analyzed to provide a final boundary opinion most indicative of the original intent of the deeds and in harmony with existing physical monumentation. Where conflicts between physical evidence and written record evidence are substantial, deeds and/or documents should be executed to eliminate any color of title or conflict. The extent of the effect of adverse possession, if there is or was any, has been identified where known. To that extent, these plots of surveys may be subject to any unidentified claims or rights. Assumptions for correctness and accuracy are indicated on this plot of survey.
- 10.** Only deeds, plats, and plans of public record, which are properly indexed in the City of Burlington Land Records have been reviewed, examined and utilized for the purpose of this survey.

11. The premises shown and described herein may be subject to any existing easements, rights-of-way, restrictive covenants, zoning regulations, and/or setback lines whether or not they may be shown hereon or whether or not recorded in the public records. No investigation was made during the performance of the survey to discover evidence of the existence or any premises. Buried utilities may or may not exist. Interested parties should investigate and verify the existence of utilities, if any. Commercial, jurisdictional areas or negative easements, if any, which might affect the use of the premises, were not located. Only evidence of easements or structures thereto which are readily apparent from a casual above ground view of the premises are shown.

No liability is assumed by the undersigned for any loss that may be associated with the existence of any easements or restrictions on the use of the property.

12. This survey is certified to Zoo Holdings, LLC for the singular purpose of establishing the common property line between Parcel C1 and Parcel 2 as shown hereon. No liability is assumed by the undersigned for any loss that may be associated with the use of this survey other than the purpose stated above.

13. The location of utilities shown hereon in blue should be considered approximate, and are based on a best fit scan of a site plan by Champaign Consulting Engineers, dated 5/20/98. Copy provided by CME Engineering Associates, Inc.

*REFER TO THE FOLLOWING PLATS
PREPARED BY BUTTON PROFESSIONAL
LAND SURVEYORS:

1. BOUNDARY LINE PHOTOGRAPH, SKY ASSOCIATES, INDUSTRIAL PARKWAY, BURLINGTON, VT* DATED 08/06/2003 RECORDED IN SLIDE #399
2. LOT 2 SUBDIVISION PLAT, BLUE SKY ASSOCIATES, VOL.302 PG.344 & VOL.399, PG.662, INDUSTRIAL PARKWAY, BURLINGTON, VT* DATED 07/25/2003.
LAST REVISED 08/10/2011 RECORDED IN SLIDE #471.

Approved by Resolution of the Planning Commission of the City of Burlington, Vermont, on the _____ day of _____, 2023, subject to all requirements and conditions of said approval. Signed this _____ day of _____, 2023.

By _____ *Chair* _____

3

o'clock _____ minutes _____ M

City Clerk _____

DATE	REVISION	BY
-	-	-

Date of Survey	7/25/03	☐ RECORD DRAWING	☒ PRELIMINARY
SURVEYORS	JH/CA/DG	☐ FINAL	☐ SKETCH/CONCEPT
CEA/JMD/JTE			
PLAN			
CHECKED Closure			
LHA			
SCALE			
1" = 80'			

BUTTON

PROFESSIONAL LAND SURVEYORS, PC

bapls.com • info@bapls.com

20 Kimball Avenue Suite 102
South Burlington, VT 05403
802-863-1812 • 800-570-0685

PLAT OF BOUNDARY LINE ADJUSTMENT

BETWEEN

ZOO HOLDINGS, LLC

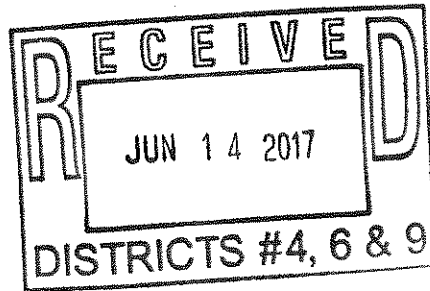
AND

ZOO TOO, LLC

#179th & #25 QUEEN CITY PARK ROAD, BURLINGTON, VT

Date of Job	June 8, 2006
Job #	BURL02
FILE	
RHINO	
PLAN SH	
10	

Natural Resources Board
111 West St
Essex Junction, VT 05452
RE: Minor Application #4C0325-4



June 12, 2017.

Dear Mr. Peter Keibel, District #4 Coordinator

The signatories of this letter are the abutters of 79 Industrial Parkway, Burlington, VT 05401 aka Zoo Holdings (Rhino Foods) and one neighbor within 500 feet. Party status petitions for each household are attached as addendum to this document. Most of us have been neighbors of Rhino Foods for well over 18 years and some as long as 25 years.

Decades ago Burlington zoning ordinances created a difficult situation whereby an industrial zone was placed directly adjacent to a waterfront residential zone with no defined buffer area between the properties. The inherent conflicts of this zoning remain today with neighbors and businesses walking a tightrope between business and operations and the peace, health and safety of residents living in their own homes. We have a long history, starting in 1998, of trying hard to work together, as neighbors, for the good of the households and the good of a neighboring business. When Rhino Foods ran only one or two work shifts there were fewer issues. Once the third shift started there were more and more conflicts. Many noise complaint calls were placed with the local police department, under the City of Burlington's Noise Ordinance (see attached copy), mostly related to the filling of liquid nitrogen tanks, but no action was taken by the police. These concerns lead to a 2001 agreement with Rhino to limit filling of their nitrogen tanks to between the hours of 7am – 8pm (M-F) and 10 am – 6 pm (weekends), unless an emergency situation required a tank fill. Rhino agreed to notify neighbors in advance if this situation was to occur. For the most part this agreement has been adhered to.

For decades, Rhino has said they want to work with us to reduce their noise impacts. For instance, they have moved their dumpster and limited its use to reduce nighttime banging. They have moved their outdoor smoking location so that loud employee talking and car radios are not a problem at night. They have also moved refrigeration trucks and eliminated the truck engine idling (though the reefer engine continues to run as it must for refrigeration). The most obnoxious noise, a high pitched whine, was from deliveries of liquid nitrogen and they have virtually eliminated that during the key sleeping hours (though it is still very loud when the twice-daily deliveries are made).

As Rhino has grown additional equipment has been installed, mostly ventilation and air conditioning equipment, outdoors on the southwest corner of the building. Each piece of equipment adds to the sound profile, incrementally. Taken individually no one piece of machinery may be loud but not rise to the point of offensive, but taken cumulatively the multiple combined machinery and refrigeration trucks do rise to the point of offense and include limits on ability to sleep, spend time outdoors, open windows, and generally enjoy our properties. Saturday morning to 9pm Sunday is our only respite from constant loud noise. During previous Development Review Board hearings and other City sanctioned meetings, abutters and other neighbors have expressed serious concern regarding the noise emitted from Rhino Foods. In about 2002 a hearing concerning new machinery brought attention to the need for noise and visual screening of roof penetrations. The boiler, which makes a loud roar, has been limited in its hours of use. Rhino made an attempt to block the noise from its exhaust at one point with simple fencing but, at this point, even that is gone due to lack of maintenance. Rhino agreed to research a backup hot water system. If successful, there

would be no boiler noise 11Pm to 7AM. Evidently this research was unsuccessful as boiler noise continues day and night as noted in the current application. No follow up correspondence regarding this has been received by homeowners.

The HVAC noise runs whenever Rhino is in operation (all except weekends) and currently sits in an inside corner of the buildings(exterior) which reflect the noise directly at the Nelson/Smith house. When the new plans were first introduced at a public meeting months ago, they showed the HVAC relocated to the west side of the building, even closer to our houses and with a reflective surface aimed at multiple houses. The noise issue was raised at that time and Rhino agreed to take a look at it. As of the second showing of the plans, again in a public meeting, this issue had not been addressed. Finally, as of a recent third meeting May 30th (only neighbors and Rhino), the HVAC equipment has been moved to the roof (though we saw no drawings proving this). What we did see is that a road has appeared going behind the building, right through the location of the originally planned HVAC equipment. When asked what the plans were to mitigate the HVAC noise now on the roof, neither the architect nor the owner knew and there were no rear elevations to show this equipment (our houses are higher than Rhino so roof noise has a pretty direct line of travel.) A call was placed to the construction manager who said it was simple HVAC screening, and as of yet, despite the promise of more formal description the next day, nothing has been sent to us. Now we have a promise to engage a sound engineer to address both the HVAC and boiler noise and agreement to implement the noise reduction features on the roof. This is good and appreciated.

When asked twice what would happen with the LN2 delivery schedule if production continued to rise, necessitating closer delivery spacing, no answer was forthcoming. Since they have said that their goal is to continue growing, we are concerned that eventually, they will need to either increase the size of the LN2 tanks (it already takes an hour or so to fill, twice a day, and larger tanks would increase this) or they will need to refill during the nighttime, a horrible situation.

In January of 2016 Rhino sought permission to remove trees to answer safety and sanitary concerns around food production and animal access from trees to the building. .09 acres of trees were removed between the properties which resulted in the loss of screening for noise and sight lines. The trees removed contained most of the branching below 35ft and thus removed most of the foliage between the properties. In response to neighbor complaints that the tree cutting had more of a visual and noise impact than expected, Rhino planted 12 – 12ft arborvitae as a visual buffer which was more than their permit required.

Rhino Foods has apparently conducted sound level investigations on their property. To our knowledge no sound level readings have been taken "at the residences". Readings at the lot line (points unknown) are as high as 65dbA. Sounds levels during a nitrogen delivery are not reported. Final proposed regulations relating to wind turbines will limit noise to 42db at residences (39 db at night), for comparison. A 3 db increase in readings represents a doubling in sound power levels. 65 db is more than 200 times the 42 db limit about to be put in place for wind turbines. While we believe 42 db is too restrictive, 200 times louder crosses the line into offensive. In addition, noise readings were likely measured at the lot line near ground level possibly blocked from the exhaust source by the edge of the roof (at least partially). Nearby houses are elevated with line of site closer to the roof (exhaust) level and not blocked by the roof. If noise levels were to be measured at residences, they need to be measured in winter when leaves off the trees, and outside the windows of each house. Eight foot fences and young trees are nice for blocking view of lower wall but useless for blocking the view of Rhino's building much less blocking any noise going from a roof 25 feet above ground to residence windows elevated above ground level. We need to have noise stopped at its source - on the roof.

As Rhino Foods seeks an expansion of their building, additional tree cutting, and a new driveway that will exist between Rhino and the abutting neighbors, there are serious concerns regarding the additional noise, hours of operation, and visual screening. Multiple machinery units that were ground based on the south side of the building are being moved to the rooftop. There is concern about additional noise travelling with ease to neighbors, especially those to the north who were effectively blocked by the building when the equipment was on the ground. While we really appreciate the changes they have made to accommodate us, there is quite a ways to go and we have serious concerns. Their latest promises, promises that they have agreed to put into the permit, should be a great help.

Agreement

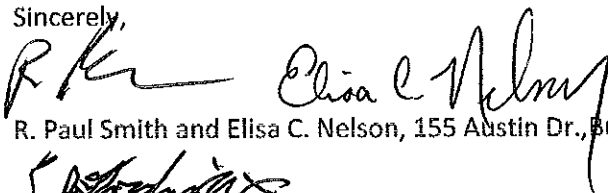
The below signed parties have agreed to the following actions by Rhino Foods to address the unacceptable and offensive noise from their plant activities.

We are asking that the Act 250 Board include these provisions in the Act 250 Permit so that we have official sanction. ***If this is not possible, or if this process is not agreed to, we respectfully request a hearing to bring forward our evidence of offensive noise and detrimental health effects.***

On May 30, 2017, in a meeting with R Paul Smith, Elisa Nelson, and Charles Goodnight, Rhino Foods agreed to the following:

- a. Limit use of back road (west side of building) to liquid nitrogen truck deliveries. Deliveries shall be limited to the hours of 7:00 AM to 8:00 PM, Monday through Friday, and 10:00 AM to 6:00 PM, Saturday and Sunday, unless an emergency delivery is required.
- b. Rhino to engage a sound engineer to provide a plan that recommends the location and specifications of sound barriers that will best minimize the noise (in the westerly direction) of the new units and the existing boiler vent. Based on the recommendation, Rhino will install effective noise reduction equipment and maintain it into the future.
- c. Landscaping:
 - i. Provide for additional evergreen trees in the landscaping plan to provide additional sightline coverage during the winter months.
 - ii. Extend the fence separating the Austin Drive properties and the Rhino Foods property to the north.

Sincerely,

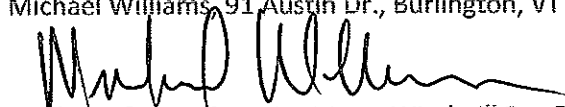


R. Paul Smith and Elisa C. Nelson, 155 Austin Dr., Burlington, VT 05401

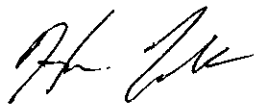


Charles J. Goodnight, 145 Austin Dr., Burlington, VT 05401

Michael Williams, 91 Austin Dr., Burlington, VT 05401



Mark Bonfigli and Marisa Mora, Windmill Bay Rd, Shelburne VT, owners of 121 Austin Dr., Burlington VT, 05401



Hans Manske, 121 Austin Dr., Burlington, VT 05401 – tenant

Attachments:

- Party Status petitions
- Documentation of tree removal impact (photos)
- Noise ordinance
- Wind turbine ordinance (decibel limits)

**Party Status Petition
(And Hearing Request if Minor Application)**

To: Natural Resources Board
District 4 Environmental Commission

Date: June 12, 2017

From: Elisa C. Nelson
155 Austin Drive, Burlington, VT 05401-5412
nelsmith@burlingtontelecom.net 802-557-7202
R. Paul Smith
155 Austin Drive, Burlington, VT 05401-5412
rpauls@burlingtontelecom.net 802-557-7203

This is a petition for party status *and request for hearing if requested conditions (below) are not included in the permit* on Application # 4C0325-4, for the proposed construction of 2 building additions, new parking lot, access drive, and associated stormwater facilities in Burlington, on Criteria 8.

I live at 155 Austin Drive, Burlington, VT. My home property abuts the proposed project site on the western border of the project.

The proposed project could impact me as follows: We will have views of, and auditory impact from, the project and believe we will be adversely affected under Criterion 8, Aesthetics and Scenic Beauty, particularly, offensive noise.

State the reason a hearing on these criteria is required, and the nature of any evidence you intend to present at the hearing: Please see the attached letter for details.

State your position if known on the project. We support the project with the following conditions:

- a. Limit use of back road (west side of building) to liquid nitrogen truck deliveries. Deliveries shall be limited to the hours of 7:00 AM to 8:00 PM, Monday through Friday, and 10:00 AM to 6:00 PM, Saturday and Sunday, unless an emergency delivery is required.
- b. Rhino to engage a sound engineer to provide a plan that recommends the location and specifications of sound barriers that will best minimize the noise (in the westerly direction) of the new units and the existing boiler vent. Based on the recommendation, Rhino will install effective noise reduction equipment and maintain it into the future.
- c. Landscaping:
 - i. Provide for additional evergreen trees in the landscaping plan to provide additional sightline coverage during the winter months.
 - ii. Extend the fence separating the Austin Drive properties and the Rhino Foods property to the north.

Signed Elisa C. Nelson 6/12/17
Elisa C. Nelson

Signed RAC 6/12/17
R. Paul Smith

**Party Status Petition
(And Hearing Request if Minor Application)**

To: Natural Resources Board
District 4 Environmental Commission

Date: June 12, 2017

From: name, address, phone number
Charles J. Goodnight
145 Austin Drive, Burlington, VT 05401-5412
(802) 238-1528

This is a petition for party status *and request for hearing if requested conditions (below) are not included in the permit* on Application # 4C0325-4, for the proposed construction of 2 building additions, new parking lot, access drive, and associated stormwater facilities in Burlington, on Criteria 8.

I live at 145 Austin Drive, Burlington, VT My home property abuts the proposed project site on the western border of the project.

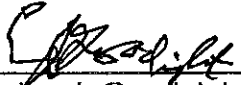
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 - i. Provide for additional evergreen trees in the landscaping plan to provide additional sightline coverage during the winter months.
 - ii. Extend the fence separating the Austin Drive properties and the Rhino Foods property to the north.

Signed _____


Charles J. Goodnight

**Party Status Petition
(And Hearing Request if Minor Application)**

To: Natural Resources Board
District 4 Environmental Commission

Date: June 12, 2017

From: name, address, phone number

MICHAEL WILLIAMS
91 Austin Drive, Burlington, VT 05401-5412
(802) 233-3041

This is a petition for party status *and request for hearing if requested conditions (below) are not included in the permit* on Application # 4C0325-4, for the proposed construction of 2 building additions, new parking lot, access drive, and associated stormwater facilities in Burlington, on Criteria 8.

I live at 91 Austin Drive, Burlington, VT My home property abuts the proposed project site on the western border of the project.

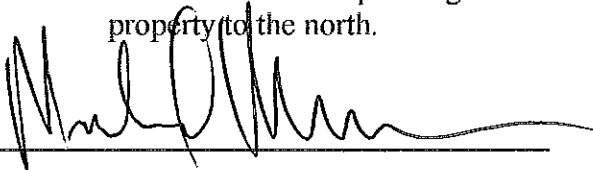
The proposed project could impact me as follows: We will have views of, and auditory impact from, the project and believe we will be adversely affected under Criterion 8, Aesthetics and Scenic Beauty, particularly, offensive noise.

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- c. Landscaping:
 - i. Provide for additional evergreen trees in the landscaping plan to provide additional sightline coverage during the winter months.
 - ii. Extend the fence separating the Austin Drive properties and the Rhino Foods property to the north.

Signed



**Party Status Petition
(And Hearing Request if Minor Application)**

To: Natural Resources Board
District 4 Environmental Commission

Date: June 12, 2017

From: name, address, phone number

HANS MANKE
121 Austin Drive, Burlington, VT 05401-5412
(802) 922-2191

This is a petition for party status *and request for hearing if requested conditions (below) are not included in the permit* on Application # 4C0325-4, for the proposed construction of 2 building additions, new parking lot, access drive, and associated stormwater facilities in Burlington, on Criteria 8.

I live at 121 Austin Drive, Burlington, VT My home property abuts the proposed project site on the western border of the project.

The proposed project could impact me as follows: We will have views of, and auditory impact from, the project and believe we will be adversely affected under Criterion 8, Aesthetics and Scenic Beauty, particularly, offensive noise.

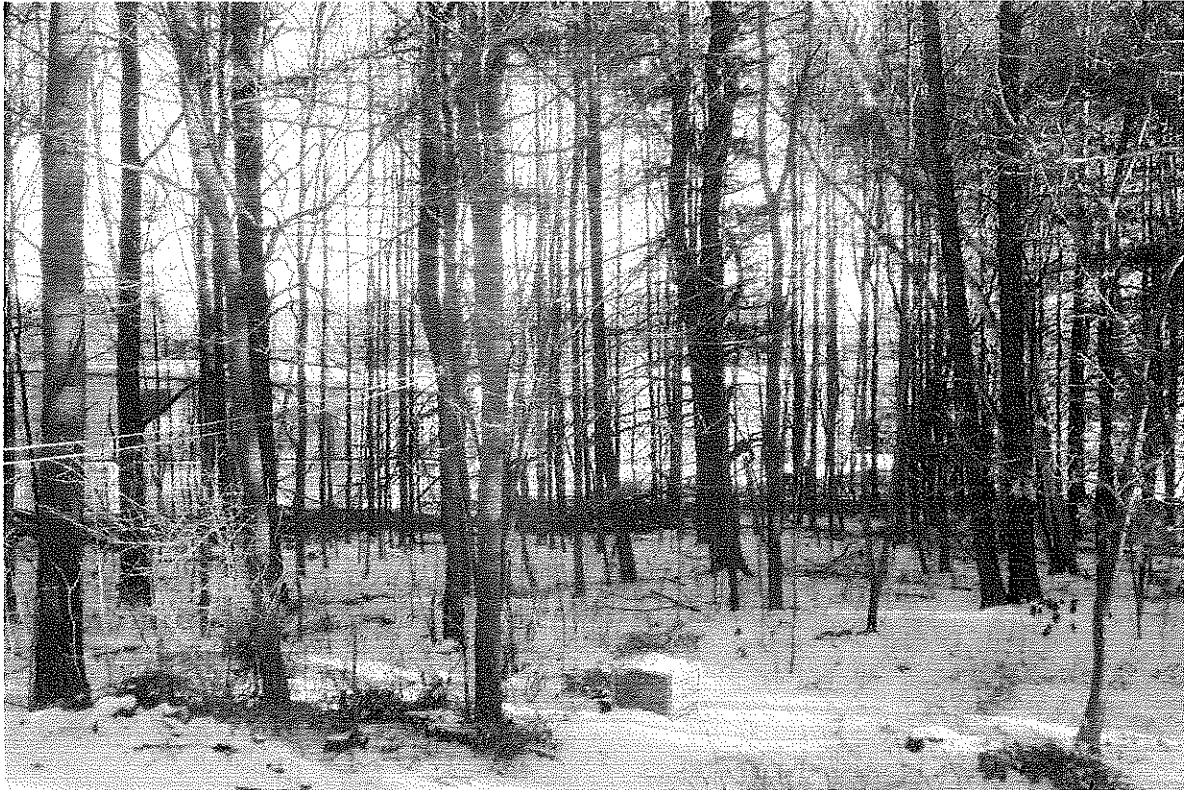
State the reason a hearing on these criteria is required, and the nature of any evidence you intend to present at the hearing: Please see the attached letter for details.

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- a. Limit use of back road (west side of building) to liquid nitrogen truck deliveries. Deliveries shall be limited to the hours of 7:00 AM to 8:00 PM, Monday through Friday, and 10:00 AM to 6:00 PM, Saturday and Sunday, unless an emergency delivery is required.
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 - i. Provide for additional evergreen trees in the landscaping plan to provide additional sightline coverage during the winter months.
 - ii. Extend the fence separating the Austin Drive properties and the Rhino Foods property to the north.

Signed _____





AFTER TREE CUTTING

1/20/2016 2:50pm



BEFORE TREE CUTTING

12/20/2015 8:53am

State law reference—Similar provisions, 13 V.S.A. § 1452.

21-12 Discharging firearms prohibited.

No person shall, except in the performance of a legal duty, or upon or within a firing range approved as to construction and supervision by the chief of police, discharge a gun, pistol or other firearm within the city limits.

(Rev. Ords. 1962, § 3555)

Cross reference—License required for shooting galleries, § 4-6; firearms prohibited in cemetery, § 9-13; firearms prohibited in parks, § 22-12.

State law reference—Weapons generally, 13 V.S.A. § 4001 et seq.; authority of municipality to regulate use or discharge of firearms, 24 V.S.A. § 2291(8).

21-13 Noise control ordinance.

(a) *Purpose.* The purpose of this section is to preserve the public health, safety, and welfare by prohibiting excessive and disturbing noise and to prevent noise which is prolonged or unsuitable for the time and place and which is detrimental to the peace and good order of the community. It is the goal of this section to allow all residents of our city to peacefully coexist in a manner which is mutually respectful of the interests and rights of others.

(b) *Prohibited noise offenses:*

(1) *General prohibition.* It shall be unlawful for any person to make or cause to be made any loud or unreasonable noise. Noise shall be deemed to be unreasonable when it disturbs, injures or endangers the peace or health of another or when it endangers the health, safety or welfare of the community. Any such noise shall be considered to be a noise disturbance and a public nuisance.

(2) *Express prohibitions.* The following acts, which enumeration shall not be deemed to be exclusive, are declared to be noise disturbances:

a. *Radios, television sets, musical instruments, phonographs and similar devices.* The operation or permitting the use or operation of any musical instrument, radio, television, phonograph, or other device for the production or reproduction of sound in such a manner as to be plainly audible through walls between units within the same building, from another property or from the street between the hours of 10:00 p.m. and 7:00 a.m. or in such a manner as to unreasonably disturb the peace, quiet or comfort of the public.

b. *Motor vehicle sound equipment.* The operation or permitting the operation of any radio, stereo or other sound amplification equipment from a motor vehicle that is audible at twenty-five (25) feet from such vehicle. The term "motor vehicle" shall mean any car, truck or motorcycle.

c. *Parties and other social events.* Notwithstanding section (b)(1), it shall be unlawful for any person who is participating in a party or other social event to actively make unreasonably loud noise. A party or other social event is defined as a gathering upon the

premises of one or more persons not residing at the premises. Unreasonably loud noise is noise that unreasonably interferes with the peace or health of members of the public or is plainly audible between the hours of 10:00 p.m. and 7:00 a.m. through the walls between units within the same building, from another property or from the street. It shall also be unlawful for any resident of a premises to allow a party or other social event occurring in or about the premises to produce unreasonably loud noise. There is a rebuttable presumption that all residents of the premises have allowed such party or other social event to occur in or about the premises. All residents of the premises are responsible for such unreasonable noise made, each having joint and several liability.

d. *Machinery.* The operation or permitting or directing the operation of any power equipment or machinery outdoors between the hours of 9:00 p.m. and 7:00 a.m. except in emergency situations.

e. *Construction noise.* The excavation, demolition, erection, construction, alteration or repair of any premises or structure between the hours of 9:00 p.m. and 7:00 a.m. except in emergency situations.

f. *Loudspeakers.* The use of loudspeakers or other sound amplification equipment upon the public streets for the purpose of commercial advertising or attracting the attention of the public to any building or site.

(c) *Exemptions.* Noise from the following sources shall be exempt from the prohibitions specified herein:

(1) All safety signals and warning devices or any other device used to alert persons to any emergency or used during the conduct of emergency work, including, but not limited to, police, fire and rescue vehicle sirens.

(2) The repair and maintenance of municipal facilities, services or public utilities when such work must be accomplished outside daytime hours.

(3) Snow removal equipment operated within the manufacturer's specifications and in proper operating condition.

(4) Musical, recreational and athletic events conducted by and on the site of a school or educational institution.

(5) Events and activities conducted by or permitted by the city. Persons operating an event or activity under authority of an entertainment permit, parade/street event permit, solid waste license, or parks special use permit shall comply with all conditions of such permits or licenses with respect to noise control issues.

(6) Construction or repair work which must be done to address an emergency health or safety concern and that cannot be accomplished during daytime hours and which is not work which includes normal maintenance and repair.

5.703 General Rule

No wind generation facility shall emit sound levels in excess of the following during operation:

- (A) Facilities with a plant capacity up to and including 50 kilowatts. Operation of facilities with a plant capacity up to and including 50 kilowatts shall not result in: (1) sound pressure levels that exceed 42 dBA more than 5% of the time at a distance of 100 feet from the residence of a non-participating landowner; or (2) audible prominent discrete frequency tones pursuant to the latest revision of ANSI S1.13 Annex A at a distance of 100 feet from the residence of a non-participating landowner.
- (B) Facilities with a plant capacity greater than 50 and up to and including 150 kilowatts. Operation of facilities with a plant capacity greater than 50 kilowatts and up to and including 150 kilowatts shall not result in sound pressure levels in excess of 42 dBA, including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner.
- (C) Facilities with a plant capacity greater than 150 kilowatts. Operation of facilities with a plant capacity greater than 150 kW shall not result in sound pressure levels in excess of 42 dBA between the hours of 7 A.M. and 9 P.M. or 39 dBA between the hours of 9 P.M. and 7 A.M., including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner. Each turbine and any sound-producing equipment located within the footprint of the turbine array shall be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner. This minimum setback requirement may be waived on a case-by-case basis for good cause shown.

5.704 Pre-Construction Sound Modeling

- (A) Facilities with a plant capacity up to and including 50 kilowatts. In lieu of submitting sound modeling pursuant to Section 5.704(B), below, petitions to construct and operate a wind generation facility with a plant capacity up to and including 50 kilowatts may instead file the following information with its petition:
1. All certification documents from the Small Wind Certification Council showing the results of acoustic sound testing;
 2. The distance to the nearest residence(s) in each cardinal direction, as well as an analysis of the expected sound pressure level at those residences calculated using spherical spreading.
- (B) Facilities with a plant capacity of more than 50 kilowatts. All petitions to construct and operate a wind generation facility with a plant capacity of more than 50 kW shall include a sound model developed for the proposed facility that reports the expected maximum project sound pressure levels, without using NRO mode, modeled out to a

From: susan <susan@herstudio.com>
Sent: Monday, April 10, 2023 9:04 AM
To: Scott Gustin <SGustin@burlingtonvt.gov>
Cc: lisa.e.gibbons <lisa.e.gibbons@gmail.com>; jmpphd <jmpphd@gmail.com>; pete.furtado <pete.furtado@gmail.com>; Beth.Mintz <Beth.Mintz@uvm.edu>; redrockphase1 <redrockphase1@gmail.com>
Subject: RR: Rhino expansion

You don't often get email from susan@herstudio.com. [Learn why this is important](#)

[WARNING]: This email was sent from someone outside of the City of Burlington.

Scott,

We spoke last week about the Rhino project. I've copied the Redrock Phase 1 board on this just to minimize emails getting circulated and to keep them in the loop on this. Susy -----

Scott Gustin, AICP, CFM

City of Burlington, Principal Planner for Development Review

Rhino expansion project Manager

Re: Rhino Foods 2023 addition plans

Scott,

This is a follow-up to our phone call following the public review of the Rhino addition plans that were presented at the DPW meeting on Tuesday, 4/4/23.

I live in Redrock Phase 1 condominiums just to the west of Rhino on the other side of the barrier woods between the commercially zoned Rhino area and the residentially zoned "Cove" neighborhood.

I appreciate Rhino's B-Corp status and the mindful improvements they have already done to improve the quality of the work environment for their employees. I also appreciate Rhino's effort to be a good neighbor, and engaging the neighborhood in a discussion when thinking about expansion that will impact the neighborhood.

With the close proximity of the site for the 65,000 sf expansion, I am concerned about the environmental impact the expansion will have on the quality of life in the neighborhood. I think plans to mitigate the impact of the addition on the neighborhood in terms of noise, lights, traffic, air, groundwater management, etc are needed to be proposed with the project plans.

Lights

More so in winter when the trees are thin, the lights are very bright. I am concerned about the extra facility lights as well as truck lights as the trucks round the back north of the building and turn south to go to the loading bays. The truck lights will flash into our neighborhood as they turn the corner.

Noise

With my limited experiential knowledge, I think the primary sources of noise are the refrigerant refill (the high pitch noise we regularly hear) and the compressors on the trucks. I lived in the flower district in Manhattan for many years and, like many of Rhino's products, the flowers needed to be kept refrigerated. During loading and unloading, the trucks would be kept running for hours, making the neighborhood unlivable.

Future expansion options and their impact

From the meeting, it's my understanding that the addition will include expansion options for 2 additional production lines that could be tapped as business needs evolve. How will 2 additional production lines impact the facility and the environment? Increase truck activity? Increase the number of employees? Increase in frequency or quantity of refrigerant storage? More noise?

Traffic

The access to industrial Avenue isn't great. Traffic is squeezed through a single-lane bridge on the Queen City side and a small 2-way passage on home avenue at the railroad tracks. Shifting plans regarding Burton's Higher Ground music venue and the City's I-189 highway extension will come into play regarding traffic and noise. All of these need to be holistically considered when thinking about the impact on the neighborhood.

Consideration

Perhaps Rhino would agree to a sound attenuation barrier wall on their side of the barrier woods like what is commonly built along highways? The intention being that this partition would shelter the neighborhood from both light and sound. Just one idea.

We don't want to stop Rhino from expanding. They are a good neighbor and a good business. We just want to protect the quality of our life while their business expands.

Thank you Scott.

Kind regards,

Susy

Susan Mason Lazarev

Susan Mason Lazarev
125 Redrock Dr., Unit 302
Burlington, VT 05401

T: 802-825-5280

-----Original Message-----

From: Sandra Short <sandy_short@comcast.net>

Sent: Sunday, June 25, 2023 1:15 PM

To: Scott Gustin <SGustin@burlingtonvt.gov>

Subject: Re: Rhino expansion

[You don't often get email from sandy_short@comcast.net. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

[WARNING]: This email was sent from someone outside of the City of Burlington.

Oops I meant to say please approve Rhinos plans to have electric "shore" power at the loading bays.
Sandy

Sent from my iPhone

> On Jun 25, 2023, at 1:09 PM, Sandra Short <sandy_short@comcast.net> wrote:

>

> Please do not approve Rhinos revision of plans to have electric "shore" power at the loading bays for the trucks so they won't have to run diesel to keep their refrigeration cold.

> The noise will be worse than it is now. I live at Ledgewood Condos and can hear a very annoying loud high-pitched hum as it is. Please don't let them make it louder and worse.

> Please consider all the surrounding neighbors and let's try to keep the South End relatively quiet and peaceful.

> Thank you for your consideration.

> Sandra Short

> Ledgewood Circle

>

> Sent from my iPhone

From: Derek Zipprich <derekmzipprich@gmail.com>
Sent: Tuesday, April 11, 2023 2:09 PM
To: Scott Gustin <SGustin@burlingtonvt.gov>
Subject: Rhino Foods Expansion

You don't often get email from derekmzipprich@gmail.com. [Learn why this is important](#)

[WARNING]: This email was sent from someone outside of the City of Burlington.

Hi Scott,

My name is Derek Zipprich, I live at 145 Austin Dr, Burlington, VT. I was traveling for work and was not able to attend the zoning board meeting on April 4 regarding the Rhino foods expansion.

I am generally concerned about the expansion and the impact on my property value. The ambient noise (ventilation equipment, nitrogen truck unloading, misc. operation activities) and odors from both Rhino foods and the GMT bus garage are a persistent nuisance. With a further expansion of the Rhino foods facility and associated construction I am further concerned about additional negative impact on my property.

I feel the setback requirements between a low density residential parcel and an industrial zone parcel is not sufficient and should be enlarged significantly further to mitigate the incompatibilities of an industrial zoned parcel and low density residential property.

Please let me know what the next steps are in the zoning process.

Regards,

-Derek Zipprich

From: Derek Zipprich <derekmzipprich@gmail.com>

Sent: Friday, May 26, 2023 10:19 AM

To: Scott Gustin <SGustin@burlingtonvt.gov>; Benjamin Traverse <btraverse@burlingtonvt.gov>

Subject: Conflict concerns regard 79 Queen City Parkway Expansion

[WARNING]: This email was sent from someone outside of the City of Burlington.

Scott,

Below are my preliminary thoughts and concerns regarding the proposed expansion of 79 Industrial Parkway, currently owned and operated by Rhino Foods. My property, 145 Austin Drive directly abuts the 79 Queen City Parkway along its western border. Noise pollution currently emitted from 79 Queen City Parkway is a persistent nuisance and negatively impacts my property and overall quality of life at 145 Austin Drive. I am concerned the proposed expansion will further negatively impact my property.

79 Queen City Parkway is zoned for "light manufacturing". The 2017 expansion on the property expanded the building footprint, added a ring road around the building and additional ventilation / noise sources. As I understand it, the 2017 expansion created conflict with interspersed residential properties due to noise pollution, mainly nitrogen truck unloading, as it was not properly mitigated by the time of completion. To date it seems the nitrogen truck issue has mostly been resolved however, noise pollution from ventilation equipment remains today.

The 2017 expansion brought the development of 79 Queen City Parkway to what I feel is the limit of "light manufacturing". The current proposed upgrades at the 79 Queen City Parkway present several key issues that create significant conflict with adjacent residential areas as I have summarized below:

- **Curb cut and increased traffic on the ring road around the property perimeter.**
 - The proposed new curb cut, and anticipated traffic pattern will increase truck traffic around the perimeter of the property.
 - Light pollution from vehicular traffic as vehicles travel around the property border is likely to create conflict with residential neighbors.
 - New building and or pole mounted lighting to support heavier traffic around ring road will increase light pollution for adjacent residential neighbors.
 - Additional noise pollution from tractor trailers and 24x7 operation traveling along western property border.
 - Air brakes, idling, backing up noises, general logistics.
 - Effectiveness of any proposed mitigation for noise and light pollution will not be understood until the project is built. Once built, modifications to mitigation strategy will be more difficult for Rhino and likely less effective for Homeowners.
 - Enforcement of operational restrictions (hours of operation, idling restrictions, volume of traffic, etc..) will be a burden on adjacent residential properties to report.
- **Building expansion including cold storage & 10 new truck bays:**
 - Cold storage is distinctively different than warehousing:
 - Trucks require auxiliary refrigeration (noise emitting)
 - Building requires special ventilation

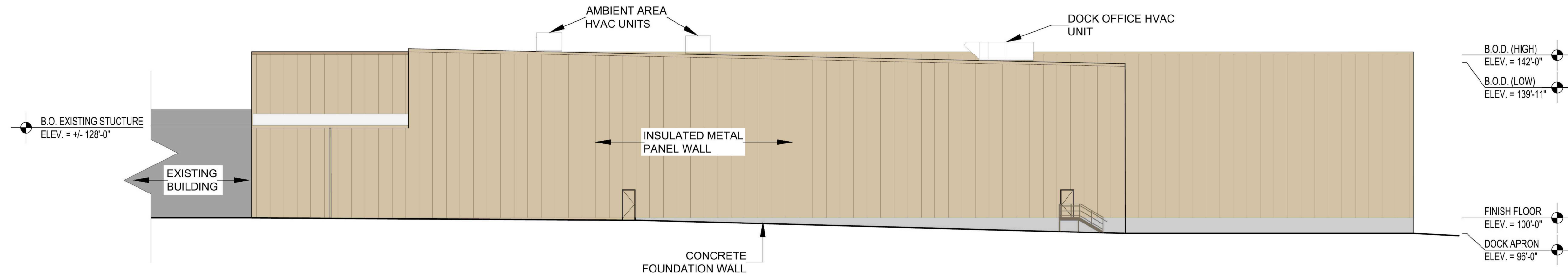
- Cold storage requires an engine room to house compressors. Incredible source of noise pollution (often requires double hearing protection inside engine room) Ambient noise outside of the building is often excessive.
- 10 new truck bays:
 - Significant noise and light pollution from refrigerated trucks.
 - Increased capacity for truck traffic on site. (Noise, air, light pollution)
 - Truck bay area will require additional lighting to support 24x7 operation.
 - Embankment on the southern property boundary may mitigate some light pollution (when the ground is not covered in snow), but light pollution overall will be a net positive emitting from the site and proposed expansion.
- Building Expansion
 - Building footprint is approx. double or more, ventilation load and noise pollution is assumed to double.
- **Proposed expansion depresses the value of adjacent residential properties which will not be recognized by the City of Burlington Tax Assessment.**
 - Current noise pollution from 79 Queen City Parkway negatively impacts property value of 145 Austin Drive.
 - Further expansion of 79 Queen City Parkway will increase noise and light pollution for 145 Austin Drive resulting in a decrease of market value.
 - City of Burlington tax assessor office does not account for impact of noise pollution in tax assessment, even though it impacts market value.

In summary, the proposed expansions and changes for 79 Queen City Parkway are going to create further conflict with interspersed residential areas. This is in direct conflict with the Burlington zoning definition for “light manufacturing”. The potential changes to traffic pattern and building expansion is going to greatly increase light and noise pollution. The noise and light pollution alone will reduce market value of adjacent homes. These market factors are not currently recognized by the City of Burlington tax assessment (as reviewed with tax Burlington Tax assessor Spring 2022). The tax burden for adjacent residents will remain as if they are abutting Lake Champlain and not a large manufacturing complex. From all accounts, Rhino foods sounds like a great company with lots of potential. However, they may not always be the owner and operator of the proposed facility. Once the project is built, it is built. The precedent for “light manufacturing” will be further expanded. The burden of enforcing noise / light or other future potential sources will be put on adjacent residents to report and hold accountable. I am not in favor of the project as proposed and feel significant changes must be made to address the significant conflict the proposed plans will have with interposed residential users in the area.

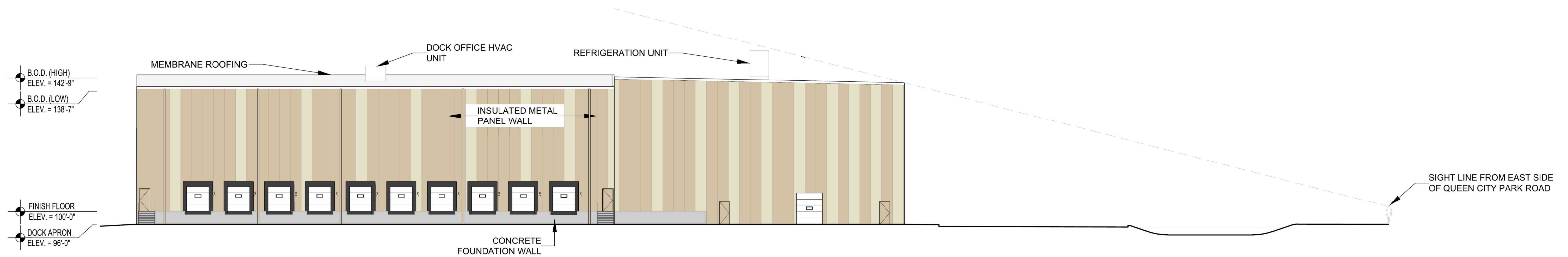
Please keep me posted with the next steps.

Regards,

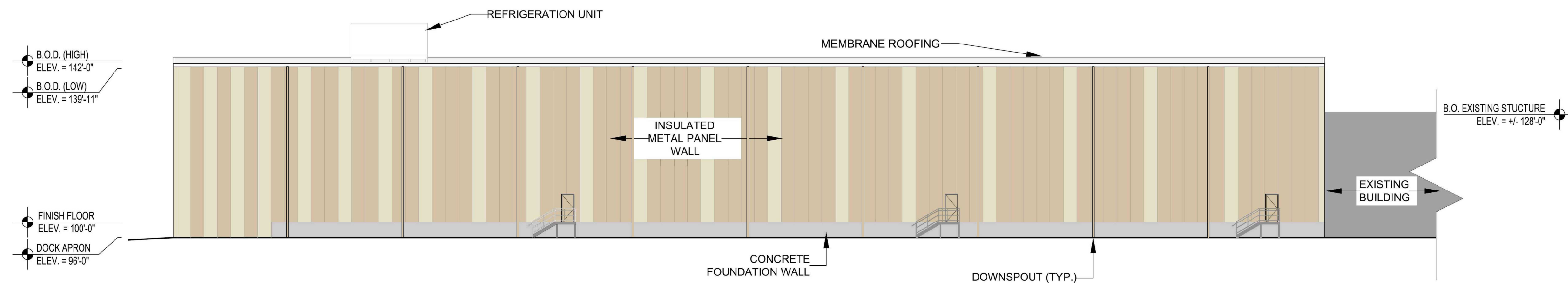
-Derek Zipprich



A WEST ELEVATION
SCALE: 1/16" = 1'-0"



B SOUTH ELEVATION
SCALE: 1/16" = 1'-0"



C EAST ELEVATION
SCALE: 1/16" = 1'-0"

Disclaimer
This drawing as prepared by Food Tech, INC. is schematic and conceptual in nature. It is intended to illustrate the Owner's operational requirements and is NOT FOR CONSTRUCTION, permitting or approvals from local authorities. The scale of this drawing may be distorted due to electronic transmission and reproduction. Confirmation of field dimensions and existing conditions is advised. This drawing is the property of Food Tech, INC. and shall not be reproduced or reused without our written approval.

PLANNING STUDY FOR:
RHINO FOODS
179 QUEEN CITY RD
BURLINGTON, VT 05401

PROPOSED
BUILDING ELEVATIONS

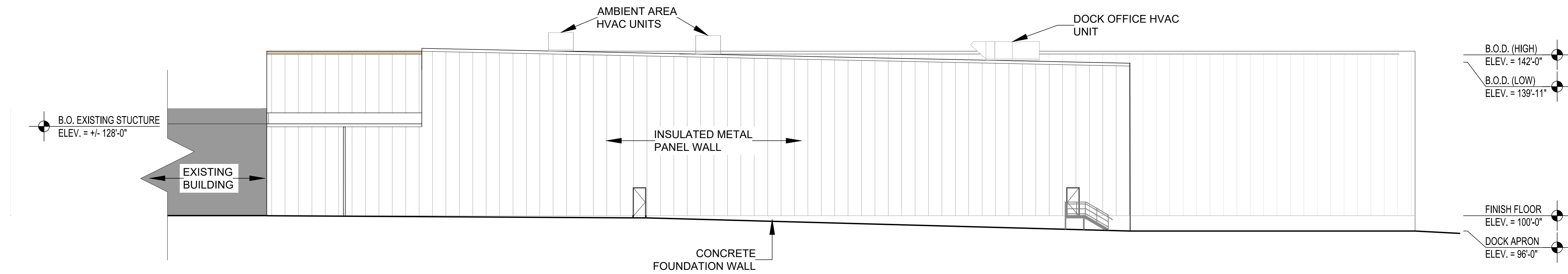
Food Tech
An EMCOR Company
200 LEDGEWOOD PL., STE 200, ROCKLAND, MA 02370
Tel: (781) 281-9700
foodtech.com

DATE: 06-28-23
DESIGNED BY: FTI
DRAWN BY: NS
CHECKED BY: NS

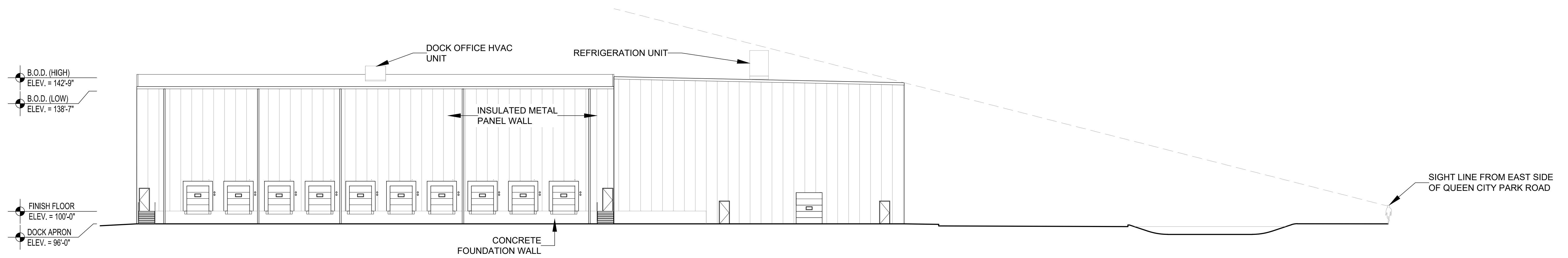
DRAWING NO.

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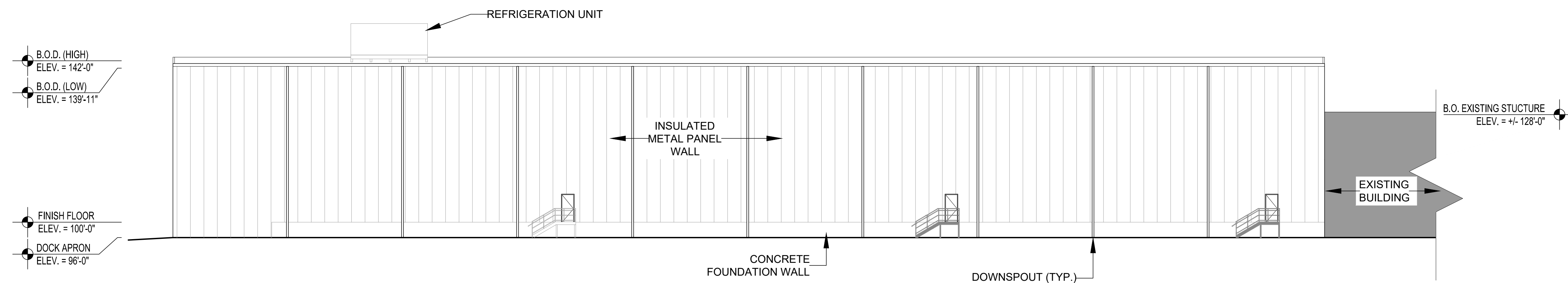
102209



A WEST ELEVATION
SCALE: 1/16" = 1'-0"



B SOUTH ELEVATION
SCALE: 1/16" = 1'-0"



C EAST ELEVATION
SCALE: 1/16" = 1'-0"

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PLANNING STUDY FOR:
RHINO FOODS
179 QUEEN CITY RD
BURLINGTON, VT 05401

PROPOSED
BUILDING ELEVATIONS

Food Tech
An EMCOR Company
200 LEDGEWOOD PL., STE 200, ROCKLAND, MA 02370
Tel: (781) 281-9700
foodtech.com

DATE: 6-12-23
DESIGNED BY: FTI
DRAWN BY: NS
CHECKED BY: NS

DRAWING NO.

A4.1

102209





Department of Permitting & Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone: (802) 865-7188

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Ted Miles, Code Compliance Officer
Ted Boylan, DPI Administrator



TO: Development Review Board
FROM: Scott Gustin
DATE: July 5, 2023
RE: ZP-23-247; 179 Queen City Park Road

=====

Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: E-LM Ward: 5S

Owner/Applicant: Zoo Holdings, LLC / Martin Courcelle

Request: Approximately 65,000 square foot addition to the existing Rhino Foods facility including associated access, parking, utility and stormwater modifications.

Applicable Regulations:

Article 3 (Applications, Permits, and Project Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Criteria & Guidelines), Article 8 (Parking)

Background Information:

The applicant is proposing to construct a ~65,000 sf addition to the existing food processing facility. Related site work including grading, stormwater infrastructure, and new parking and circulation are also included.

The applicants met with the city's Technical Review Committee in December, 2022. Sketch plan review with the Design Advisory Board and the Development Review Board took place March 28, 2023 and April 4, 2023, respectively. The Design Advisory Board reviewed this application June 13, 2023 and unanimously recommended approval of the project. The DAB recommended only that alternative siding patterns for the addition be considered.

Prior zoning permit actions for this property.

- Zoning Permit 21-463; Addition of boiler room. May 2021.
- Zoning Permit 20-0463CA; Post-construction site changes. November 2019.
- Zoning Permit 19-0560CA; Amend permit 17-1097CA/MA. February 2019.
- Zoning Permit 19-0538CA; Install new tanks and extend sound barrier. January 2019.
- Zoning Permit 19-0175CA; Window installation. August 2018.
- Zoning Permit 18-0150CA; Temporary construction trailer. August 2017.
- Zoning Permit 18-0066CA; Temporary concrete pad. July 2017.
- Zoning Permit 17-1097CA/MA; 14,200 sf building addition. June 2017.
- Zoning Permit 16-1434CA; Exterior lighting package. July 2016.

- Zoning Permit 16-1433CA; three new pole lights in front of building. July 2016.
- Zoning Permit 16-1126CA; place office trailer onsite for approximately one year. May 2016.
- Zoning Permit 16-1000CA; remove one existing light, replace with motion sensitive light, add two new lights. April 2016.
- Zoning Permit 16-0613CA; 5-year tree maintenance plan. January 2016.
- Zoning Permit 16-0673FC, installation of approximately 80 feet of vinyl fencing. December 2015.
- Zoning Permit 16-0400CA; install temporary loading dock and door. September 2015.
- Zoning Permit 15-0842CA; construct new addition for trash and recycling enclosure. Amendment to zoning permit 15-0252CA. March 2015.
- Zoning Permit 15-0252CA; construction new addition for trash and recycling enclosure. September 2014.
- Zoning Permit 15-0411SN; install lettering on existing freestanding concrete sign platform for “Rhino Foods” and “79”. September 2014.
- Zoning Permit 14-0354SN; replace existing sign with new metal, non illuminated sign for Rhino Foods. September 2013.
- Zoning Permit 09-087CA; two temporary trailers/containers for storage. August 2008.
- Zoning Permit 09-088CA; erect a 7 x 10 shed. August 2008.
- Zoning Permit 07-293CA; add 8 x 20 outdoor storage shed on existing gravel surface. No increase in lot coverage. October 2006.
- Zoning Permit 07-025CA; temporary trailer/shipping container 8’ x 40’ to be kept on an existing concrete pad to provide additional storage space. No change in lot coverage. To be removed by July 1, 2007. July, 2006.
- Zoning Permit 06-759CA; extension of permit 06-210CA for temporary field office. Field office to be removed six months from end of appeal period for this permit (December 1, 2006.) May, 2006.
- Zoning Permit 06-446CA; install an air cooled chiller inside existing fenced equipment area on south side of building. January 2006.
- Zoning Permit 06-210CA; temporary 36’ x 10’ field office for additional meeting space. Shall be removed within eight months from end of appeal period. September 2005.
- Zoning Permit 04-576; fence around chiller and HVAC and noise barrier on south side. Apply for additional parking on existing gravel. Storing shed on south side and rocks on south side as parking barrier. June 2004.
- Zoning Permit 04-145, boundary line adjustment to increase 70 Industrial Parkway by 1.41 acres to become 5.01 acres and reduce 159 Industrial Parkway by 1.41 acres to become 11.0 acres. September 2003.
- Zoning Permit 02-584; installation of 8’ chain link fence around existing chiller and HVAC on south side of building and installation of a 16’ x 30’ concrete slab on north side of building for compost bin. June 2002.
- Zoning Permit 01-535; installation of HVAC unit on south side of building. June 2001.
- Zoning Permit 01-261; increase parking lot for 22 spaces, install 500-gallon fuel tank, demolish shed, enclosed roof vent with 7’ high 8’ x 8’ fence. November 2000.
- Zoning Permit 00-090 / COA 000-005; installation of five trailers (3 dry storage and 2 refrigeration) as storage units for the existing frozen food manufacturer. August 1999.
- Zoning Permit 99-591; replace one horizontal tank with two vertical nitrogen tanks 36’ high on the north side of the existing Rhino Foods manufacturing plant. June 1999.

- Zoning Permit 97-249 / COA 092-086B; revised site and landscaping plan for the existing manufacturing facility. Proposal represents as-built conditions for COA 92-086. January 1997.
- Zoning Permit 97-227 / COA 092-086A; renewal of COA 92-086, dated 4/23/1992, to utilize the originally approved maximum of 4300 sf. within the existing manufacturing space for associated office space. November 1996.
- Zoning Permit 92-313 / COA 092-086; fenestration and façade renovations to existing industrial complex. Relocated front entryway, with installation of horizontal above ground 48' long tank on side of building. April 1992.
- Zoning Permit 79-210A / COA 79-27; construction of 18,000 sf pre-engineered frame addition (metal clad) at rear of existing building. To be accomplished in 2 phases. Phase I refers to excavation and foundation; Phase II refers to frame addition. May 1979.

Recommendation: **Certificate of appropriateness approval** as per, and subject to, the following findings and conditions:

I. Findings

Article 3: Applications, Permits, and Project Reviews

Part 3: Impact Fees

Applicant will be required to pay impact fees set forth and calculated by the Impact Fee Administrative Regulations based on the net new square footage of the proposed addition.
(Affirmative finding as conditioned)

Part 5: Conditional Use & Major Impact Review

Sec. 3.5.2, Applicability

(a) Conditional Use

The food and beverage processing use is permitted (not conditional).

(b) Major Impact Review

Although the proposed expansion is large enough to trigger major impact review, it qualifies for exemption from major impact review as there is no change in use.

Article 4: Maps & Districts

Sec. 4.4.3, Enterprise Districts:

(a) Purpose

*The **Light Manufacturing (E-LM)** district is the primary commercial/industrial center of Burlington, and is intended primarily to accommodate enterprises engaged in the manufacturing, processing, distribution, creating, repairing, renovating, painting, cleaning, or assembling of goods, merchandise, or equipment without potential conflicts from interspersed residential uses. Other accessory commercial uses are allowed to support a wide range of services and employment opportunities. This district is intended to ensure that sufficient land area is appropriately designated within the city to provide an adequate and diversified economic base that will facilitate high-density job creation and retention. This district is primarily intended to provide for industrial uses suitable for location in areas of proximity to residential development. Development is intended to respect interspersed historic industrial buildings, and reflect the industrial aesthetic of the district's past. Parking is intended to be hidden within, behind, or to the side of structures.*

Rhino Foods is an existing food processing facility; the use and proposed expansion is consistent with the intent of the E-LM zoning district. **(Affirmative finding)**

(b) Dimensional Standards & Density

Proposed building FAR is 0.3. A maximum FAR of 2.0 is permissible.

Lot coverage will change to 66.4%. Within the E-LM zone, maximum permissible lot coverage is 80%. Recent permit history for the property indicates 52% existing coverage.

The proposed addition is set back beyond the minimum 5' required front yard setback. There are no minimum side yard setback requirements. As the rear of the property is also a zoning district boundary with a residential zone, a 25' rear yard setback applies. As proposed, the rear of the building addition looks to be close to 100' from the rear property line, and the circulation pavement is about 50.'

Building height is calculated based on the average finished grade around the addition. Elevation info shows a height of 45' – 46' tall. The maximum permissible height is 45'; however, Sec. 5.2.6 (c), *Exceptions to Height Limits*, enables 5% variation in building height limit. The additional 1' is acceptable. **(Affirmative finding)**

(c) Permitted & Conditional Uses

The food and beverage processing use is permitted in the E-LM zone. **(Affirmative finding)**

(d) District Specific Regulations

Not applicable.

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

The applicant is not seeking lot coverage exceptions.

Sec. 5.2.4, Buildable Area Calculation

Not applicable.

Sec. 5.2.5, Setbacks

See above.

Sec. 5.2.6, Building Height Limits

See above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See above.

Sec. 5.5.1, Nuisance Regulations

The application asserts that no nuisance impacts are anticipated with the proposed expansion. The food processing facility is a permitted use in the E-LM district. Therefore, criteria as to noise, odor, fumes, and the like addressed under the conditional use standards do not apply. This more general standard as to nuisances does apply.

There is no indication in the application materials that the rooftop equipment will produce any perceptible heat, vapor, fumes, vibration, or noise. Information provided for the RTU's notes less than 60 dB at 285 feet, within the property. This sound level approximates normal conversation. Existing truck traffic generates noise. The application notes that the project may result in a decrease in overnight truck traffic. There are existing sound mitigation measures in place, including a sound barrier constructed with a prior addition, intact vegetation along the westerly property line, and a 300-plus foot distance 8 - 12 feet downslope from the closest residences. **(Affirmative finding)**

Sec. 5.5.2, Outdoor Lighting

New outdoor lighting is included. Primarily, it will illuminate the new parking area and related circulation areas. The new walkway alongside the new parking lot will be illuminated as well. The proposed lighting fixtures include pole-mounted and wall-mounted lights. All utilize LED luminaires and all are mounted at compliant heights. The photometric plan depicts lighting levels consistent with the standards of Sec. 5.5.2, f, 1, *Parking Lot Lighting*. **(Affirmative finding)**

Sec. 5.5.3, Stormwater and Erosion Control

The project plans include details for construction site erosion prevention and sediment control. They also contain details for post-construction stormwater management. New stormwater "wetlands" are proposed to the south and east of the proposed construction. These measures are subject to review and approval by the city's stormwater program. **(Affirmative finding as conditioned)**

Article 6: Development Review Standards

Part 1, Land Division Design Standards

Two neighboring parcels will be merged as part of this development. The required boundary survey has been submitted. **(Affirmative finding)**

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

The property is not affected by any important natural features as identified in the Natural Resource Overlay map. The tree line along the westerly boundary line remains intact. **(Affirmative finding)**

(b) Topographical alterations

The property gradually slopes upward from the northeast to the southwest. The proposed addition and related circulation will require cutting into the slope towards the southwest corner of the site. Relatively little grading work is need to the north and east. As required, a grading plan is included with the application. **(Affirmative finding)**

(c) Protection of important public views

There are no important public views on or through the subject property. **(Affirmative finding)**

(d) Protection of important cultural resources

The site has no historical significance, nor are there any known archaeological resources. **(Affirmative finding)**

(e) Supporting the use of alternative energy

The project plans depict extensive rooftop solar on the addition; however, the accompanying narrative states the rooftop solar is under evaluation and not part of the current proposal. Inclusion of the solar array is encouraged but is exempt from zoning approval in any event. The application narrative refers to CO2 refrigeration, water re-use, and above-code insulation throughout.

(Affirmative finding)

(f) Brownfield sites

The subject property is not an identified brownfield. **(Not applicable)**

(g) Provide for nature's events

See Sec. 5.5.3 for stormwater management.

Peripheral green space remains for wintertime snow storage from plowing. Existing sheltered building entries will remain. Several new entries are depicted on the elevation plans and lack any shelter. They are presumed to be emergency exits, but clarification is warranted. **(Affirmative finding)**

(h) Building location and orientation

The existing building faces Queen City Park Road. The proposed addition will be constructed to the south of the existing building and utilizes approximately the same front yard setback. The existing front entry remains intact and will continue to serve as the primary entrance into the building. **(Affirmative finding)**

(i) Vehicular access

The existing driveway will be retained and will provide ingress and egress to and from the property for passenger vehicles. It will also serve as the entry for truck deliveries; however, trucks will circulate around the building and exit from a new southerly curb cut. The Department of Public Works has reviewed this second curb cut and found it acceptable. Sight lines at the existing driveway's intersection with the road remain essentially unchanged. Sight lines at the new driveway intersection with the road appear to be clear. Preliminary traffic information has been provided. Between 11 and 31 additional peak hour trip ends are anticipated, depending on the ITE versus Rhino Foods' supplied data. Both are below the 75 peak hour trip end threshold for requiring a comprehensive traffic analysis. **(Affirmative finding)**

(j) Pedestrian access

There is no public sidewalk along this side of Queen City Park Road. Therefore, there is no requirement to provide a front walkway connecting to it. Pedestrian walkways provide access from the existing parking lot to building entries. As required, a new concrete walkway will provide access from the new parking lot into the building entries. **(Affirmative finding)**

(k) Accessibility for the handicapped

ADA parking spaces are depicted within the existing parking lot. No additional ADA spaces are noted in the proposed parking. ADA standards are administered through the building code. **(Affirmative finding)**

(l) Parking and circulation

Under present conditions, parking is situated in front of the building and to the south side. Circulation wraps around the entire building to facilitate truck access. The proposed building

addition is located to the south. Parking to the south will be removed and relocated/expanded in front of the proposed building addition. Truck circulation will wrap around the entire building and exit via a new curb cut to the south.

This criterion calls for parking to be located to the side or rear of the building where possible. The proposed parking arrangement was included in sketch plan review and justified by the applicants as necessary for interior production line flow and employee access to a central entrance. Although no Board action was taken as part of sketch plan review, neither the DAB nor DRB expressed concern with the proposed parking layout, in light of the reasons driving it.

As required, the new parking area is broken up into subsections of less than 20 spaces each, interspersed with landscape islands. At least 30% shading of the new parking area is required. At least one shade tree for every 5 parking spaces is needed. The landscaping plan set includes a shading analysis that indicates 34.2% shading and 12 new shade trees for 57 parking spaces in the new lot. Proposed shade trees include Hackberry, Honey locust, Black Tupelo, and River Birch.

Per this criterion, curbing will run between the new parking area and the concrete walkway linking it to the building entries. A bike rack detail is provided in the landscape plan set; however, location within the site is not evident. Bike parking is required. Short term bike parking, typically in the form of racks, must be proximate to the primary building entrance. **(Affirmative finding)**

(m) Landscaping, fences, and retaining walls

A row of existing trees to the south of the building will be removed, as will several others in front of the existing building. New landscaping includes a variety of trees, shrubs, and perennials. The new stormwater features will be planted with wetland species. The new landscaping will screen the new parking area from the street and will also provide shade for it. The cut area to the northwest will be graded and seeded with a conservation mix. New trees and shrubs will be interspersed throughout. Note that the project plans depict foundation plantings. The applicant stated during DAB review that these cannot be installed due to rodent deterrent measures for food processing facilities. Project plans need to be updated to reflect this deletion. No new retaining walls or fences are evident. **(Affirmative finding as conditioned)**

(n) Public plazas and open space

No public plaza or open space is included or required in this proposal. **(Not applicable)**

(o) Outdoor lighting

See Sec. 5.5.2.

(p) Integrate infrastructure into the design

No new infrastructure, such as mechanical equipment and solid waste and recycling facilities, is depicted in the project plans, nor does the application narrative indicate any. Given the existing business, such site infrastructure is already in place. **(Affirmative finding)**

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

With the addition, the facility will more than double in size. It is located within the Enterprise – Light Manufacturing district and is neighbored by other commercial facilities of similar scale along Queen City Park Road. Massing is simply one large metal box appended to the existing building. Height of the addition is somewhat taller than the existing building but is unremarkable and not out of character with other industrial buildings in the area. **(Affirmative finding)**

2. Roofs and Rooflines.

As with the existing building, the proposed addition will have a flat roof. Such roof form is common among the neighboring commercial buildings in this area. As noted above, solar panels are contemplated for this new roof. **(Affirmative finding)**

3. Building Openings

Building openings in the addition are limited to truck loading docks and several emergency exits. There are no windows. As previously noted, the existing primary entrance remains and will continue to serve as such. **(Affirmative finding)**

(b) Protection of Important Architectural Resources:

The existing building is not historically significant, nor are any of the neighboring buildings. **(Affirmative finding)**

(c) Protection of Important Public Views:

As noted in Sec. 6.2.2, there are no important public views on or through the subject property. **(Affirmative finding)**

(d) Provide an active and inviting street edge:

Building facades shall be varied along the street edge by integration of architectural features, building materials, or physical step-backs of the façade along its length. Large expanses of undifferentiated building wall shall be avoided.

The proposed addition presents a monolithic metal wall to the public street. There is no variation of building materials or plane of the building. There are no architectural features. Except for some external downspouts, the addition presents a large expanse of undifferentiated building wall to the public street. The Design Advisory Board recognized that this is a commercial manufacturing facility, and some sort of high-style design is not necessary. The DAB considered leaving the blank metal wall as-is but ultimately recommended a minor change to incorporate alternative siding patterns for the addition as reflected in revised elevation drawings. Variation is in coloration only. **(Affirmative finding)**

(e) Quality of materials:

The proposed addition will be clad in metal panel siding and (presumably) membrane roofing. Such material is common for industrial facilities. **(Affirmative finding)**

(f) Reduce energy utilization:

The proposed addition is required to meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of

Burlington Code of Ordinances. The application narrative asserts that the thermal insulation will be above code. **(Affirmative finding)**

(g) Make advertising features complementary to the site:

No new outdoor signs are included in the application. **(Affirmative finding)**

(h) Integrate infrastructure into the building design:

Several roof-mounted mechanical units are proposed. All appear to exceed 1' in height, and all are arranged and set back from the front edge of the roof to minimize their visibility from the street. The street-level perspective shows no rooftop equipment visible. Additional street perspective renderings submitted for DAB review confirm lack of visibility from the street. **(Affirmative finding)**

(i) Make spaces secure and safe:

The entire building, upon completion, will be accessible by emergency vehicles. Building entries are visible and illuminated. **(Affirmative finding)**

Article 8: Parking

Sec. 8.1.9, Maximum On-Site Parking Spaces

Within the Shared Use Parking District, the maximum number of onsite parking spaces is limited to 1 per 1,000 sf GFA, plus 2 per 1,000 sf GFA devoted to patron use. Existing GFA of the building is 43,666 sf. The proposed 65,000 sf addition would bring GFA to 108,666 sf. No patron use areas are noted. As proposed, 96 parking spaces will be provided onsite. This total is below the maximum permissible of 109 spaces. **(Affirmative finding)**

Sec. 8.1.10, Off-Street Loading Requirements

Off-street loading docks to the south side of the proposed addition are depicted on the project plans. As required, circulation affords truck access to them from the public street. The loading docks are appropriately located away from parking and pedestrian circulation. **(Affirmative finding)**

Sec. 8.1.11, Parking Dimensional Requirements

The proposed parking spaces and circulation aisles are compliant with the standards of Table 8.1.11-1. They are 18' deep by 9' wide and have 24' aisle width for 2-way circulation. **(Affirmative finding)**

Sec. 8.1.12, Limitations, Location, Use of Facilities

(a) Shared Parking for Off-Site Use

None of the parking will be provided for off-site users. The parking will serve onsite employees and visitors. **(Affirmative finding)**

(b) Front Yard Parking Restricted & Residential Driveways
(Not applicable)

(c) Availability of Facilities

As noted above, parking will be provided for onsite users. The parking areas will not be used for storage or display of vehicles or materials. **(Affirmative finding)**

Sec. 8.1.13, Parking for Disabled Persons

The site plans depict four handicap parking spaces in close proximity to pathways and building entries. The application notes that this is the required number of ADA spaces relative to the total number of spaces. ADA compliance is administered via the city's building permit process.

(Affirmative finding)

Sec. 8.1.14, Stacked and Tandem Parking Restrictions

(Not applicable)

Sec. 8.1.15, Reserved

Sec. 8.1.16, Transportation Demand Management

(b) Applicability

As the project results in more than 15,000 sf commercial GFA, it is subject to the standards of this section.

(c) Transportation Demand Management Program

As required, a Transportation Demand Management (TDM) Plan has been provided with the application.

a. Outreach and Education:

The TDM plan designates the company president as the Transportation Coordinator. The plan acknowledges the responsibilities of the coordinator to survey employees as to transportation modes used, to keep records, and to make available information as to available TDM measures. **(Affirmative finding)**

b. TDM Strategies:

Onsite bike parking is provided. See Sec. 8.2.5.

The TDM plan notes three strategies: 1) Join CATMA; 2) Implement a guaranteed ride home plan through CATMA; and 3) Provide access to discounted transit passes through CATMA.

This criterion requires at least two TDM strategies. The three noted above are actually just one strategy – membership in CATMA. The guaranteed ride home strategy is available as an option if not otherwise provided by the TMA. That is not the case here. The other option noted – discounted transit passes – must be at least 50% discount. The percentage discount offered through CATMA is less than 50%. In order to comply with this criterion, the GMT pass discount for employees must be at least 50%. It is understood that rides on GMT have been fare free for several years. The 50% discount would become applicable upon reinstitution of fares. Revision of the TDM strategy is needed. **(Affirmative finding as conditioned)**

c. Parking Management:

The TDM plan acknowledges the need for annual parking utilization studies for a period of 7 years following issuance of a certificate of occupancy for the development. The plan does not address the required carpool and/or vanpool parking spaces. Of the 56 spaces in the new parking lot, 5% (3 spaces) must be dedicated for carpool and/or

vanpool prior to 9:00 AM on weekdays. This designation must be noted on the project site plan. **(Affirmative finding as conditioned)**

d. TDM Agreement:

The TDM agreement form will be provided to the applicant for signature and recoding with the permit. **(Affirmative finding)**

Sec. 8.2.5, Bicycle Parking Requirements

The site and landscaping plans depict the bike rack location for short term bike parking to be located at the northeast corner of the existing building. A bike rack detail is also included. Only 3 short term spaces are required (1 per 25,000 sf for the 65,000 sf addition). Long term bike parking will be provided and is required at a ratio of 1 per 20,000 sf (3 for the addition). Details are lacking and must be provided. **(Affirmative finding as conditioned)**

II. Conditions of Approval

1. **Prior to release of the zoning permit**, the following shall be addressed, subject to staff review and approval:
 - a. Corrected project plans deleting the foundation plantings;
 - b. Revised TDM plan including provision for at least 50% discount GMT passes for employees and designation of 3 parking spaces for carpool and/or vanpool use; and,
 - c. Long term bike parking details.
2. **Prior to release of the zoning permit**, the erosion prevention and sediment control plan and the post-construction stormwater management plan shall be reviewed and approved by city stormwater program staff.
3. At least **7 days prior to the issuance of a certificate of occupancy**, the applicant shall pay to the Department of Permitting & Inspections the impact fee as calculated by staff based on the new square footage of the proposed development.
4. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state.
5. Standard permit conditions 1-15.

S2000 Ultra Dock Shelter

Product Specifications



DESIGN HIGHLIGHTS

- Impactable foam-filled side members
- Roll-formed galvanized steel framing
- Fiberglass stays in side/head curtains
- Translucent head member transmits light
- Raked header for moisture run-off
- Foam filled draft pads
- Full range of colors and fabrics

APPLICATION DATA

Door width: _____ ft. _____ in.

Door height: _____ ft. _____ in.

Dock height: _____ ft. _____ in.

Bumper protection*: _____ in.

(*Includes bumper projection and any building wall/foundation offset or cantilever)

TRUCKS AND TRAILERS SERVICED

Width: _____ Max. _____ Min.

Height: _____ Max. _____ Min.

Length: _____ Max. _____ Min.

Hydraulic tailgate: ☐ Yes ☐ No

Tailgate/step section size: _____ in

Rear step section: ☐ Yes ☐ No

Yard jockeys: ☐ Yes ☐ No

PROJECT INFORMATION

JOB NAME _____

ADDRESS _____

GENERAL CONTRACTOR _____

DISTRIBUTOR _____

MODEL _____ QUANTITY _____

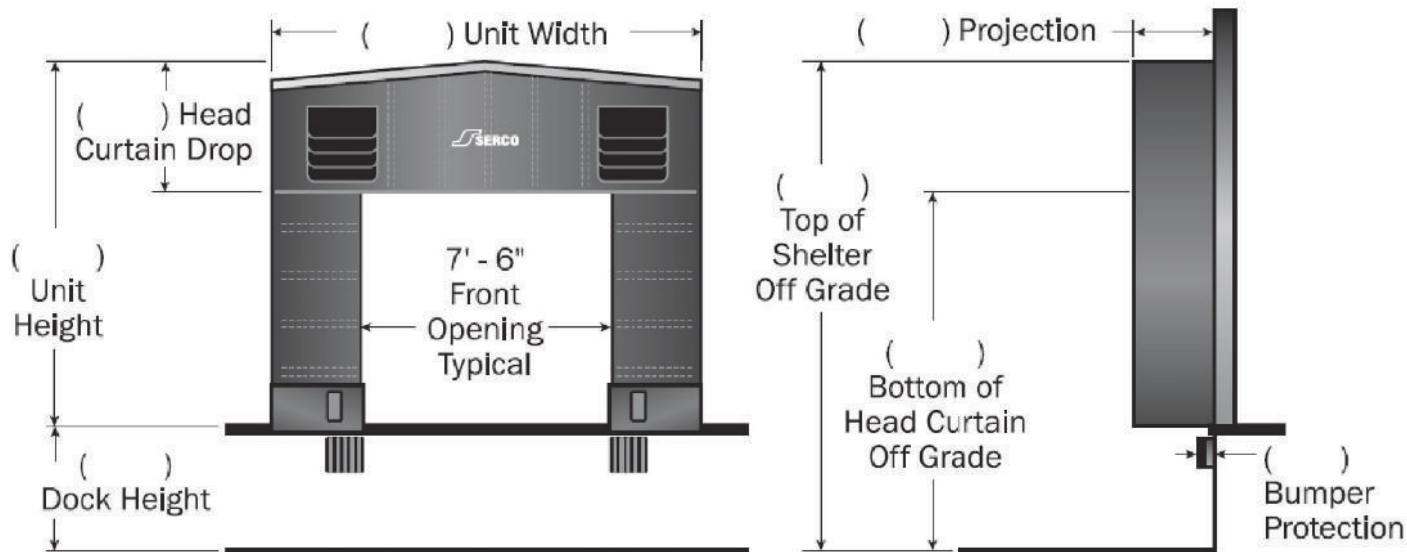
CERTIFIED FOR CONSTRUCTION

BY _____

COMPANY _____

ADDRESS _____

DATE _____



Quantity _____ Drive Approach: ☐ Level ☐ Incline ☐ Decline ☐ _____ % of grade

Building Wall Structure: ☐ Metal ☐ Other

Unit Width: ☐ 11'6" ☐ 12' ☐ 12'6"

Unit Height: ☐ 11' ☐ 11'6" ☐ 12' ☐ 12'6"

Head Member Style: ☐ Raked ☐ Flat

Curtain Material: ☐ 22 oz. vinyl ☐ 40 oz. vinyl ☐ XL-100

Color: ☐ Black ☐ Tan ☐ Brown ☐ Blue ☐ Green

Head Curtain Drop: ☐ 30" ☐ 36" ☐ 42" ☐ 48" ☐ 54" ☐ _____"

Tapered: ☐ Yes ☐ No

Top Projection: ☐ 18" ☐ 20" ☐ 22" ☐ 24" ☐ 26" ☐ 28" ☐ 30" ☐ 36" ☐ 42" ☐ _____"

Bottom Projection: ☐ 18" ☐ 20" ☐ 22" ☐ 24" ☐ 26" ☐ 28" ☐ 30" ☐ 36" ☐ 42"

Options: ☐ Door numbers ☐ Full length guide stripes ☐ Pull rope Assy

*Note: Consult factory for blackout application assistance.

*Conversions: To convert measurements to metric, see formulas below:

Inches x 25.4 = millimeters (Example: 4" x 25.4 = 101.6 mm)

Feet x .3048 = meters (Example: 12' x .3048 = 3.66 m)



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Features & Benefits

- Highly efficient and flexible insulated metal panel design is ideal for commercial, industrial and controlled environment applications
- Provides long-term thermal, moisture and vapor transmission performance
- Panel joinery is designed to permit installation of the panel vertically or horizontally
- Composite panel simplifies design, reduces complexity, improves efficiency and reduces installation costs
- Single component wall design includes exterior aesthetic, weather barrier, insulation and vapor barrier



Product Specifications

Profile	Exterior	Embossed, Lightly Planked, Mesa Rib					
	Interior	Embossed, Lightly Planked, Mesa Rib					
Exterior Face Skin	26 Gauge G90/AZ50, Optional Gauges: 24 and 22 G90/AZ50, 26 304 2B Stainless Steel*						
Interior Face Skin	26 Gauge G90/AZ50, Optional Gauges: 24 and 22 G90/AZ50, 26 304 2B Stainless Steel						
Panel Module**	40"[1016mm]						
Lengths**	Minimum: 8'[2.44m], Maximum: 50'[15.24m]						
Side Lap	Double Tongue and Groove						
Thermal Performance†							
Thickness	2"[51mm]	2.5"[64mm]	3"[76mm]	4"[102mm]	5"[127mm]	6"[152mm]	8"[203mm]
R-Value @ 75°F mean (°F·ft2·h/BTU)	14	18	21	28	36	43	57
U-Value @ 75°F mean (BTU/°F·ft2·h)	0.069	0.056	0.046	0.035	0.028	0.023	0.017
R-Value @ 35°F mean (°F·ft2·h/BTU)	16	20	24	32	41	49	65
U-Value @ 35°F mean (BTU/°F·ft2·h)	0.061	0.049	0.041	0.031	0.024	0.020	0.015

* For interior applications only

** Contact AWIP for Custom Sizes

† Thermal values as tested per ASTM C518

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All Weather
Insulated Panels

Testing & Approvals

Category	Test	Test Title	Results
Fire	FM 4880	Class 1 Fire Rating of Insulated Wall, Ceiling and Roof Panels	Passed: Class 1 Fire Rating of Building Panels or Interior Finish Material
	ASTM E84	Surface Burning Characteristics of Building Materials	Flame Spread Index: 25 or less Smoke Developed Index: 450 or less
	NFPA 285	Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies	Passed
	NFPA 286	Room Fire Growth for Wall and Ceiling Interior	Passed Maximum 6"[152mm] thickness
	NFPA 268	Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source	Assembly tested meets the requirements of the standard
Water Penetration	ASTM E331	Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference	No uncontrolled water penetration at 20 PSF differential pressure for a duration of 2-hours
Air Infiltration	ASTM E283	Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors	<0.01 CFM/ft ² of Panel Area at 20 PSF
Structural	FM 4881	Class 1 Exterior Wall Systems	See FM Approval Guide or contact Technical Services Minimum 2.5"[64mm] thickness
	ASTM E72	Standard Test Methods of Conducting Strength Tests of Panels for Building Construction	See Span Tables
	ASTM E1592	Structural Performance for Sheet Metal and Sidings Systems by Uniform Static Air Pressure Difference	See Span Tables
Thermal	ASTM C518	Steady-State Thermal Transmission	Nominal R-value of 7.2 [hr·ft ² ·°F/Btu] per inch at 75°F mean temperature and 8.2 [hr·ft ² ·°F/Btu] per inch at 35°F mean temperature
Code Approvals	FBC	Florida Building Code	FL15060
	Miami-Dade NOA	Florida Building Code	NOA No. 19-0124.03
	LARR	Los Angeles Building Code	LARR No. 25697 / IAPMO ER-301
	IAPMO	Various Building Codes	ER-301



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THERMOSPAN® 200

INSULATED SECTIONAL STEEL DOORS



PREMIUM THERMAL EFFICIENCY AND LOW MAINTENANCE

Wayne Dalton's Thermospan® 200 provides premium thermal efficiency and low maintenance costs, resulting in a door that costs less to own.

Thermospan® 200 are the only doors in the industry with patented, roll-formed integral struts on each section, making them the most rigid doors available.

- » PREMIUM THERMAL QUALITIES
R-VALUE: 17.50, U-VALUE: 0.057
THERMAL BREAK
- » 2 INTEGRAL STEEL STRUTS PER
SECTION FOR SUPERIOR
STRENGTH AND RIGIDITY
- » STANDARD SIZES UP TO 32'1"
HIGH AND 40'2" WIDE
- » CFC AND HCFC FREE - FULLY
ENCAPSULATED INSULATION

THERMOSPAN® 200

STANDARD FEATURES OVERVIEW

THERMAL EFFICIENCY

R-VALUE*	17.50 (3.09 W/Msq)
U-VALUE*	0.057 (.324 W/Msq)
THERMAL BREAK	Thermoplastic adhesive with rubber seal
AIR INFILTRATION	0.17 cfm/ft2

CONSTRUCTION

SECTION THICKNESS	2" (51 mm)
INTEGRAL STRUTS	Two 1-3/4" struts per section for strength and rigidity
MAX HEIGHT	32'1" (9,779 mm)
MAX WIDTH	40'2" (12,243 mm)
EXTERIOR STEEL	.015" (.35 mm)
INTERIOR PER SECTION	Roll formed with two 1-3/4" integral struts sealed with polypropylene rib caps
STANDARD SPRINGS	10,000 cycle
INTERIOR COLOR	White
EXTERIOR COLOR	White, Tan, Brown

CODES AND ASTM STANDARD CLASS

STC (ASTM E 413)	Class 22
OITC (ASTM E 1332)	Class 19
ASTM E 84	Class A
UBC 17-5	Meets
ASTM D 1929	Flash ignition = 734° F, Self ignition = 950° F

WARRANTY

TERMS	Ten (10) years against cracking, splitting, rust deterioration and delamination. One (1) year against defects in material and workmanship
-------	--

OPTIONS

- Pass door
- Vision lites
- Aluminum full-view sections
- Chain hoist operation
- Motor operation
- Sensing edges
- Photo eyes
- High cycle spring (25k, 50k, 100k)
- 3" Track option
- Solid shafts
- Perimeter weatherseal
- Special track designs
- Mullions

*Wayne Dalton uses a calculated door section R-value and U-value for our insulated doors.

For those who make thermal efficiency, durability and strength a high priority, the Thermospan® 200 is the ideal choice in sectional doors.

Wayne Dalton's Thermospan® 200 features an innovative thermal break that keeps the interior skin at room temperature, preventing condensation and frost to help resist corrosion. Flexible vinyl bulb seal and non-corrosive polymer retainer prevent water and air infiltration at the bottom of the door.

MATERIALS AND CONSTRUCTION

Continuous foamed-in-place polyurethane insulation and a non-conductive thermal break between the inner and outer skins combine to provide an R-value of 17.50 and a U-value of .057.

Features two patented 1-3/4" integral roll-formed struts per section providing the highest strength-to-weight ratio.

Virtually maintenance free due to the hot-dipped galvanized steel that is factory finished with pre-painted primer and baked on finish.

Reinforcement plates are located at all hardware attachment locations. Industry standard commercial-grade, heavy-duty, hardware also contribute to the long service life of Thermospan® 200.

FINISH OPTIONS



White embossed stucco



Tan embossed stucco



Brown embossed stucco



Thermospan® 200 is available with the TruChoice® Color System, Wayne Dalton's custom painting process that offers more than 6,000 colors. See dealer for details.

INSULATED SECTIONAL STEEL DOOR



LITE OPTIONS



Vision lites



Full-view lites

DOOR CONSTRUCTION

Joint seal — prevents air infiltration and saves energy.

Thermal break — separates inner and outer skins so virtually no heat or cold is conducted through section. Prepainted inner and outer skins for added corrosion-resistance.

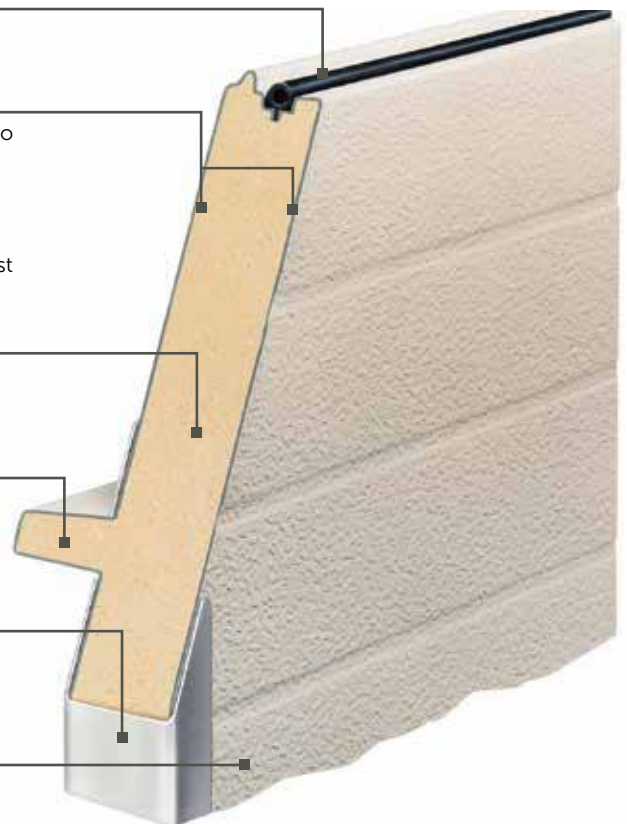
NOTE: Both skins are also hot-dipped galvanized steel for further protection against corrosion.

Solid polyurethane core — provides maximum thermal efficiency and adds to quiet operation and strength.

Integral struts — Two 1-³/₄" patented, integral roll-formed struts per section increases rigidity and strength.

Two-inch nominal thickness —

Embossed pinstripping — (grooves) on Thermospan® 200's embossed stucco outer skin adds strength and enhances appearance.



Wind load options available



GENERAL OPERATING CLEARANCES

TYPE	HEADROOM		SIDEROOM		DEPTH INTO ROOM	CENTER LINE OF SPRINGS	
	2" TRACK	3" TRACK	2" TRACK	3" TRACK	2" AND 3" TRACK	2" TRACK	3" TRACK
Standard Lift Manual 12" R	13"-17"	NA	4.5"	5.5"	Opening Height +18"	Opening Height +12"	N/A
Standard Lift Manual 15" R	15"-20"	16"-21"				Opening Height +13"	Opening Height +14"
Standard Lift Motor Oper. 12" R	15"-20"	NA			Opening Height +66"	Opening Height +12"	N/A
Standard Lift Motor Oper. 15" R	15"-20"	18"-24"				Opening Height +13"	Opening Height +14"
High Lift Manual	High Lift +12"		24" One Side		Opening Height - Lift +30"	Opening Height +Lift +6.5"	Opening Height +Lift +7.5"
High Lift Motor Oper.							
Vertical Lift Manual	Door Height +20"		4.5"	5.5"	18"	Double Door Height +13"	
Vertical Lift Motor Oper.			24" One Side				
Low Headroom Manual	6"-15"	6"-15"	6"	9"	Opening Height +20" to-26"	N/A	
Low Headroom Motor Oper.	9"-17"	9"-17"			Opening Height +66"		

PANEL/SECTION SELECTION GUIDE

DOOR WIDTH	NUMBER OF PANELS	NUMBER OF LITES
Up to 9'2"	2	2
9'3" to 12'2"	3	3
12'3" to 16'2"	4	4
16'3" to 19'2"	5	5
19'3" to 24'2"	6	6
24'3" to 28'2"	7	7
28'3" to 32'2"	8	8
32'3" to 33'11"	9	9
34'0" to 36'11"	10	10
37'0" to 38'11"	11	11
39'0" to 40'2"	12	12

DOOR HEIGHT	NUMBER OF SECTIONS
Up to 8'1"	4
8'-8" to 10'1"	5
10'5" to 12'1"	6
12'2" to 14'1"	7
14'2" to 16'1"	8
22'-2" and Up	Call Factory

NOTES:

- 1) Springs must be rear mount to achieve minimum headroom listed. Front mount torsion headroom depends on drum size, and varies over the range listed.
- 2) 8" side-room required, one side, for doors with chain hoist.
- 3) Headroom for standard lift depends on drum size, and varies over the range listed.

TRACK SELECTION GUIDE



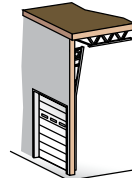
STANDARD LIFT



HIGH LIFT
break-away is standard, straight incline is available



ROOF PITCH
standard or high lift



VERTICAL LIFT
break-away is standard, straight incline is available



LOW HEADROOM
rear mount torsion



LOW HEADROOM
front mount torsion



Architect Resource Center

Visit wayne-dalton.com/architect-resource-center to find our Architect Resource Center. In this tool, you will quickly find all of the specifications, drawings and documents you need to complete your project.

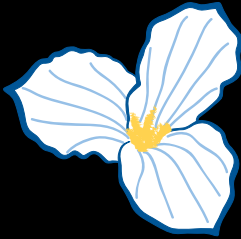
Wayne Dalton
COMMERCIAL DOORS

DISTRIBUTED BY:

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Lewisville, TX 75067

wayne-dalton.com





TrilliumSeries™

Adiabatic Products

Combining the best of wet and dry cooling, TrilliumSeries™ Adiabatic Products optimize energy and water savings for commercial and industrial refrigeration applications.



**LOWEST
WATER USE**



**LOWEST
SYSTEM ENERGY**



**EASIEST
MAINTENANCE**



**LOWEST
SYSTEM CHARGE**

EC Fans

Highest efficiency, maintenance-free, whisper-quiet, and factory-wired.

EcoFlex™ Controls

Plug and play, self-contained capability, optimized energy and water savings, communication protocol flexibility, and automatic unit self-cleaning.

Coils

Corrosion-resistant coated fins as standard. Flexibility in materials of construction to best suit CO₂, HFC, Ammonia, and fluid cooler applications.

Discrete Make-up

Emergency backup water supply connection.

Pre-Cooler Pads

Highest efficiency pads for the coldest air possible minimizes fluid temperatures and compressor energy usage year-round.

Over 10 years of proven performance with thousands of installations worldwide.

CO₂, Ammonia, and Fluid Cooler Models Now Available

TrilliumSeries™ Adiabatic Products

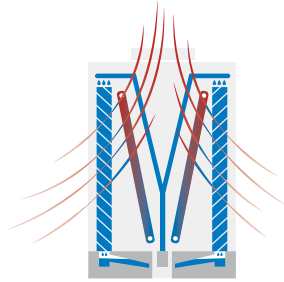
MODES OF OPERATION



WARM AMBIENT TEMPERATURE

PRE-COOLER MODE

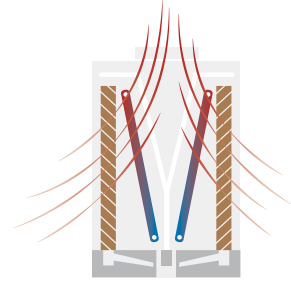
When the unit is in Pre-Cooler mode, water is evenly distributed over the highly-efficient Pre-Cooler Pads. The air is cooled to 1-3°F above the wet-bulb temperature. Such substantial depression of the air temperature results in a significant increase in dry cooling capacity and energy efficiency.



COOL AMBIENT TEMPERATURE

DRY MODE

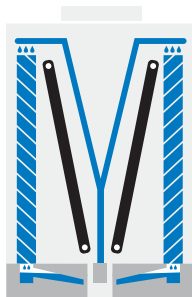
When the ambient air is below the custom setpoint based on location, the unit is automatically drained and runs in dry mode to optimize water savings. No winterization needed.



AUTOMATICALLY MINIMIZE MAINTENANCE WITH TRILLIUMSERIES™ ADIABATIC PRODUCTS

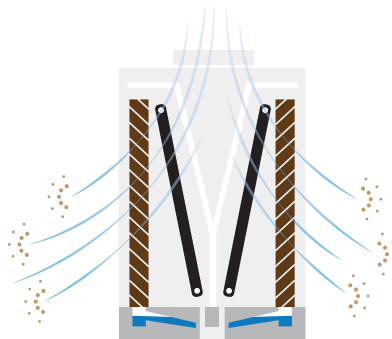
CLEANSING CYCLES

Periodic cleansing cycles during wet mode prevents scaling and maintains water quality.



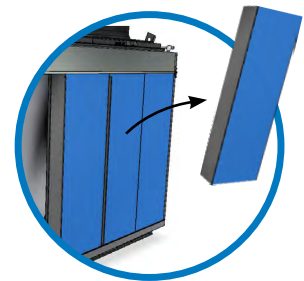
SELF-CLEAN PROTOCOLS

In addition to the cleansing cycles, fans run in reverse once daily to prevent clogging and maintain performance.



UNIQUE, EASY-TO-REMOVE COATED PADS

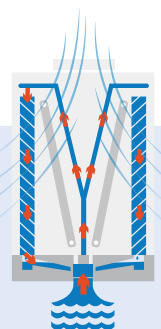
UV & algae resistant pads, thickest in the industry, provide unrivaled system efficiency. Toolless and no-struggle frame enables easy removal for coil inspections.



EXCLUSIVE FEATURE

Cleansing Circulation: Water enters the unit and remains in circulation until it is drained and replaced every two hours, not remaining still. The TrilliumSeries™ is developed to achieve maximum adiabatic cooling while reducing the potential for uncontrolled bacterial growth.*

*TrilliumSeries™ Adiabatic Products are not subject to NY State Subpart 4-1 Regulations.

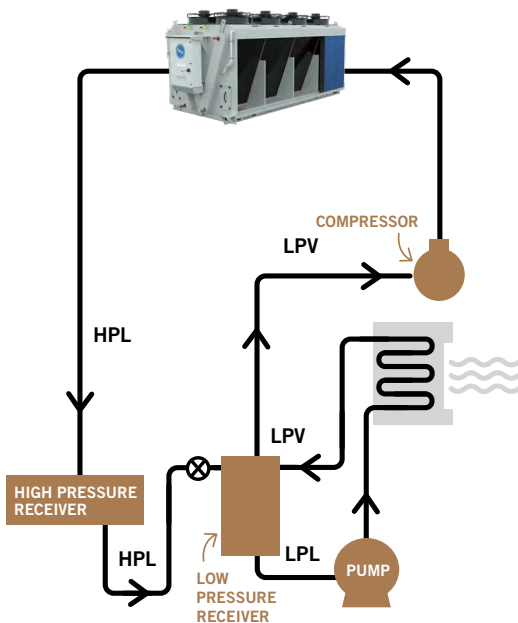


TrilliumSeries™ Adiabatic Products

THE BEST CHOICE

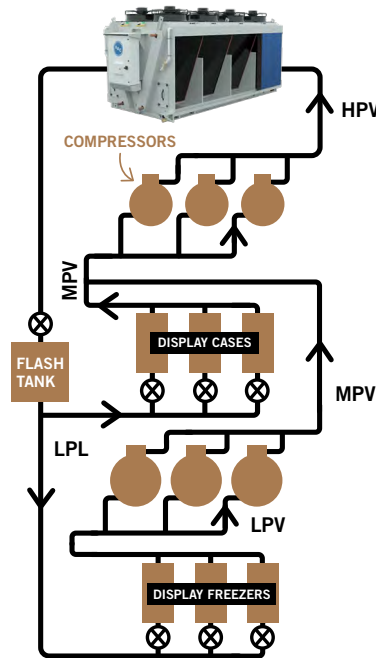
AMMONIA

Save up to 90% of water and reduce charge when compared to traditional evaporative products.



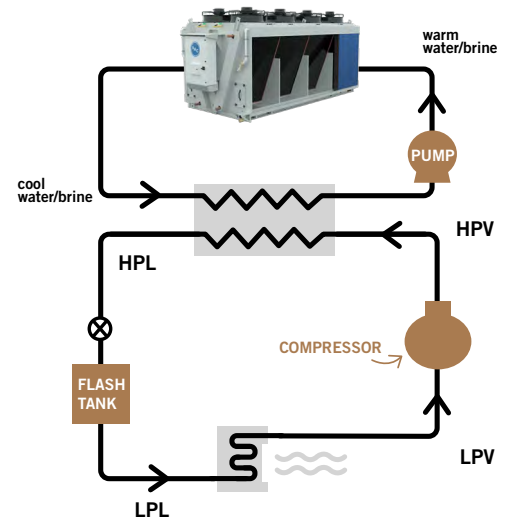
HFC/CO₂

Save up to 44% energy compared to air cooled products. For CO₂ systems, stay subcritical in most climates.



NEW! FLUID COOLER

Reduce charge and footprint when compared to typical condenser system design. Supports use of hydrocarbon applications.



MAXIMIZE ENERGY SAVINGS FOR COMMERCIAL REFRIGERATION APPLICATIONS

TrilliumSeries™ Adiabatic Products are always the best heat rejection solutions compared to traditional air-cooled condensers. They automatically optimize water and energy savings while delivering the lowest total cost of ownership with easy maintenance.



MAXIMIZE WATER SAVINGS FOR INDUSTRIAL REFRIGERATION APPLICATIONS

Evaporative condensers are the industry standard energy-efficient option for your refrigeration system. For those looking to maximize water savings while still saving energy, TrilliumSeries™ Adiabatic Products are the solution for you.



REDUCE SYSTEM CHARGE WITH FLUID COOLER MODELS

All TrilliumSeries™ models allow you to reduce system refrigerant charge vs. traditional air-cooled equipment. To further reduce system refrigerant charge, a TrilliumSeries™ Fluid Cooler can be combined with a fluid loop to reject heat, while still taking advantage of the TrilliumSeries™ benefits including water and energy savings, low condensing temperatures, and easy maintenance.

THE BAC DIFFERENCE



BEST-IN-CLASS
SUPPORT



CUSTOMIZED
SELECTION



ON-SITE
STARTUP

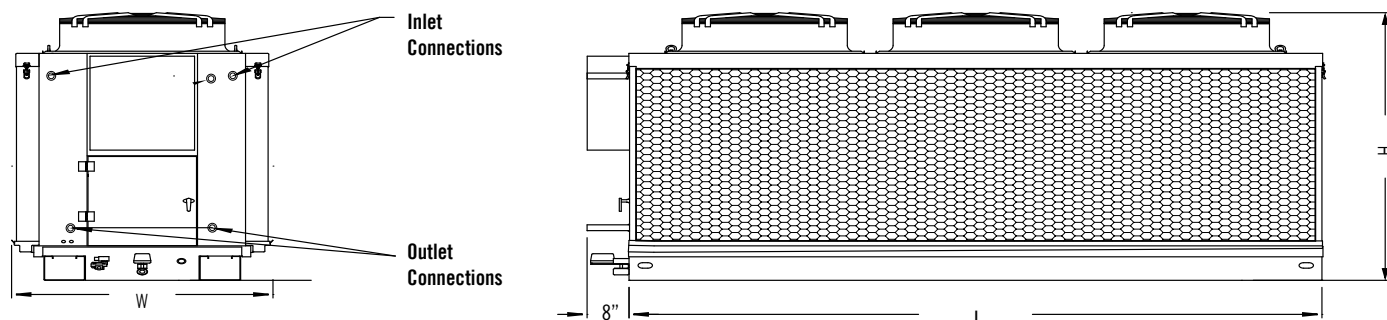


WARRANTY

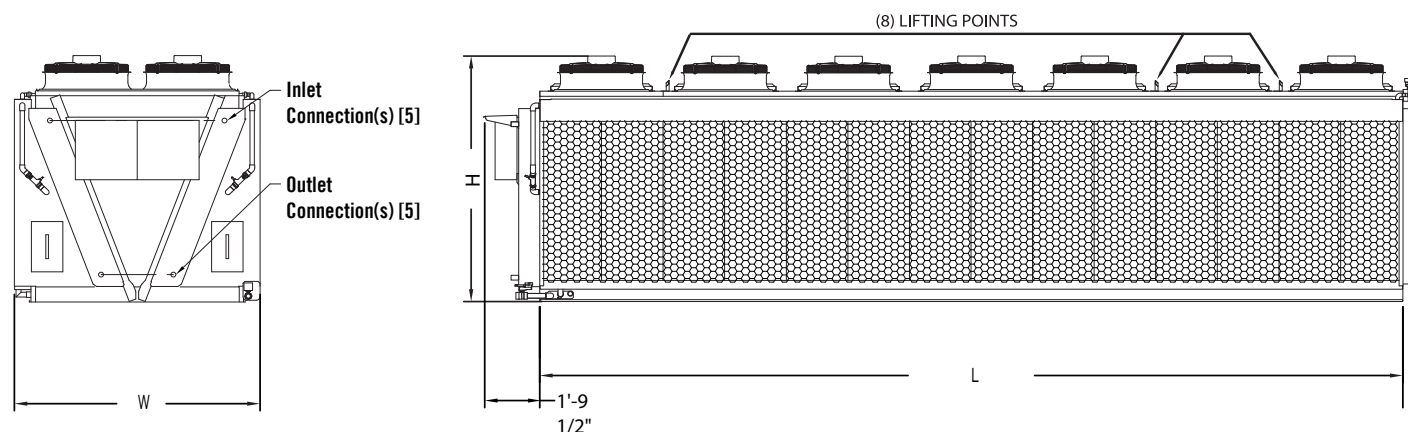


TrilliumSeries™ Adiabatic Products

ENGINEERING DATA



Model	Fan Qty	Tons ^[1]	Motor HP ^[2]	Unit Length (L)	Unit Width (W)	Unit Height (H)	Operating Weight (lbs) ^[4]
TSDC-xxx-3	1	15-27	3.0	5'-3"	4'-2"-5'7"	7'-0"	1,500-1,990
TSDC-xxx-6.2	2	26-45	6.2	7'-11"	4'-2"-5'7"	7'-0"	2,000-2,690
TSDC-xxx-9.6	3	37-65	9.6	11'-1"	4'-2"-5'7"	7'-0"	2,600-3,500
TSDC-xxx-12.4	4	51-90	12.4	15'-7"	4'-2"-5'7"	7'-1/2"	3,570-4,560



Model	Fan Qty	Tons ^[1]	Motor HP ^[2]	Unit Length (L)	Unit Width (W)	Unit Height (H)	Operating Weight ^[4] (lbs)
TSDX2-xxx-12.4	4	54-108	12.4	10'-2"	7'-10"	8'-2"	4,430 - 4,980
TSDX2-XXX-18.6	6	82-164	18.6	14'-1"	7'-10"	8'-2"	6,085 - 6,810
TSDX2-XXX-24.8	8	107-214	24.8	18'-1"	7'-10"	8'-2"	7,715 - 9,085
TSDX2-xxx-31.0	10	134-268	31.0	22'-0"	7'-10"	8'-2"	9,130 - 10,670
TSDX2-xxx-37.2	12	160-320	37.2	25'-11"	7'-10"	8'-2"	11,000 - 13,185
TSDX2-xxx-43.4	14	188-376	43.4	29'-10"	7'-10"	8'-2"	12,460 - 14,880

NOTES:



1. Ton range covers NH₃, HFC, CO₂, and H₂O at a variety of conditions. For specific selections, please contact your local BAC Representative.
2. TSDC2 and TSDF2 models have two (2) 0.33 HP pumps.
3. The water make-up connection is 3/4", drain connection is 1 1/4" or 1 1/2", and overflow connection is 1 1/2".
4. Operating weights are estimated and will vary depending on coil and fluid selected.
5. TSDF2 models have 1 or 2 sets of inlets/outlets depending on the selection.

Do not use for construction. Refer to factory certified dimensions. This catalog includes data current at the time of publication, which should be reconfirmed at the time of purchase. Up-to-date engineering data, free product selection software, and more can be found at www.BaltimoreAircoil.com.



Baltimore Aircoil Company TrilliumSeries™ Condenser Selection Report

Version: 1.11.18 NA
Product data: November 15, 2022

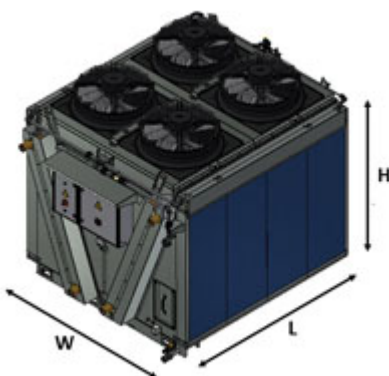
Project Name: New Freezer
Selection Name: Burlington Roof
Project City: BURLINGTON INTL, VT, USA
Project Country: United States
Date: June 28, 2023

Model Information

Product Line: TrilliumSeries™ Adiabatic Condenser
Model: (1) TSDC2-CO2-509-31.0
Fluid Pressure Drop: 32.11 psi
Fan Motor: 31.00 HP
Total Standard Fan Power: 90% of Full Speed, 22.60 BHP
Total Pump Motor Power: 0.66 HP

Design Conditions

Refrigerant/Fluid: R-744
Total Heat Rejection: 8,741.10 MBH
Wet Bulb Temperature: 14.00 °F
Dry Bulb Temperature: 14.00 °F
Elevation: 40 ft.
ESP: 0.00 "WC
Gas Cooler Outlet Temperature: 85.00 °F
Superheat: 12.40 °F
Gas Temperature In: 187.32 °F
Design Pressure: 1,088 psi
Reserve Capability: -0 %



Engineering Data, per Unit

Standard Total Fan Motor Power: (10) 3.10 HP
Total Pump Motor Power: (2) 0.33 HP
Airflow: 100,665 CFM
Unit Length: 22' 9.75"
Unit Width: 7' 10.00"
Unit Height: 8' 2.25"
Approximate Shipping Weight: 9,392 pounds
Approximate Operating Weight: 10,516 pounds
Refrigerant Charge: 300 pounds

Electrical Data @ 460V

FLA	MCA	MOP
40.3	50.4	60.0

Note: These unit dimensions do not account for any accessories. Please contact your local BAC sales representative for dimensions of units with accessories.

Note: The values presented in this document are estimates only and are subject to change by BAC.

Note: Data for other supply voltages is available from your local BAC sales representative.



Baltimore Aircoil Company TrilliumSeries™ Condenser Selection Report

Version: 1.11.18 NA
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Project Name: New Freezer
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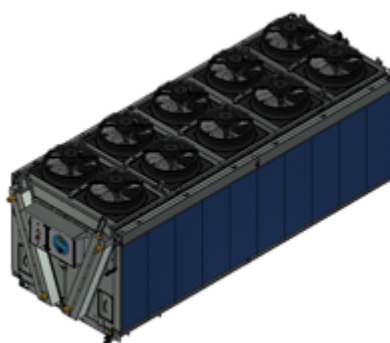
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Model: (1) TSDC2-CO2-509-31.0

Fan Motor: 31.00 HP
Total Standard Fan Power: 90% of Full Speed, 22.60 BHP
Total Pump Motor Power: 0.66 HP

Octave band and A-weighted sound pressure levels (Lp) are expressed in decibels (dB) reference 0.0002 microbar. Sound power levels (Lw) are expressed in decibels (dB) reference one picowatt. Octave band 1 has a center frequency of 63 Hertz.

Top Sound Pressure (dB)		
Octave Band	Distance	
	5 ft.	285 ft.
1	75	51
2	87	59
3	83	54
4	81	54
5	80	53
6	75	49
7	70	44
8	64	37
A-wgtd	84	57

Air Inlet Sound Pressure (dB)		
Octave Band	Distance	
	5 ft.	285 ft.
1	74	51
2	83	59
3	83	55
4	81	52
5	79	50
6	72	45
7	64	38
8	54	30
A-wgtd	83	55



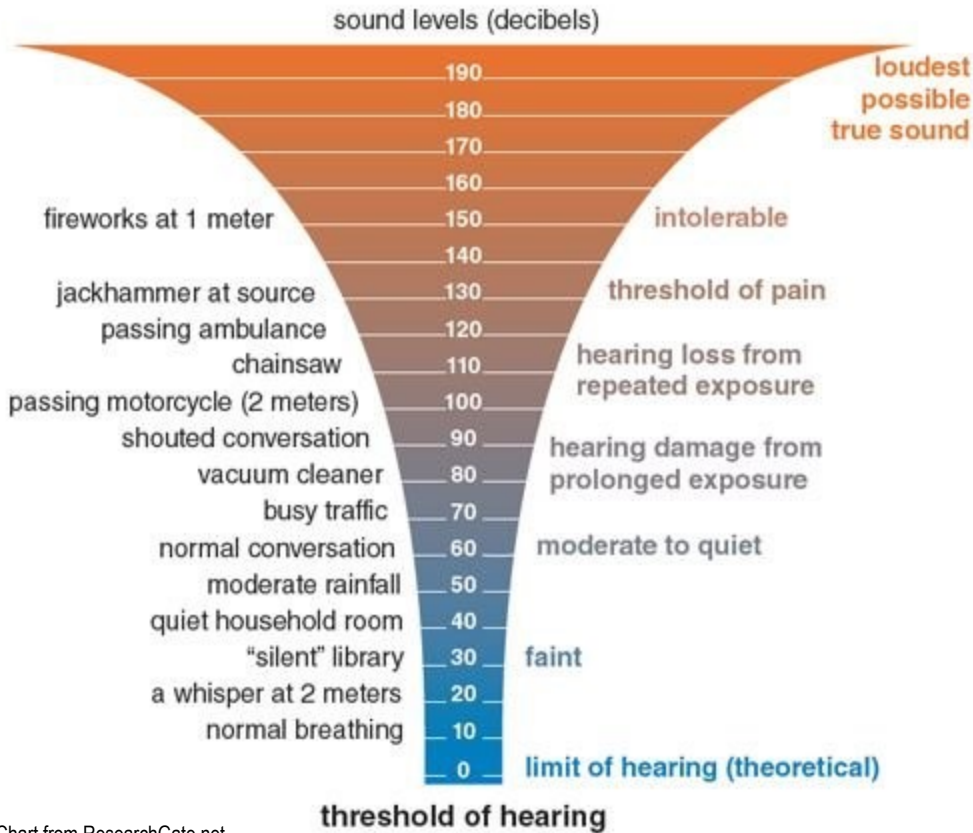
End Sound Pressure (dB)		
Octave Band	Distance	
	5 ft.	285 ft.
1	76	51
2	79	57
3	75	50
4	73	48
5	70	46
6	63	41
7	55	33
8	49	27
A-wgtd	75	51

End Sound Pressure (dB)		
Octave Band	Distance	
	5 ft.	285 ft.
1	76	51
2	79	57
3	75	50
4	73	48
5	70	46
6	63	41
7	55	33
8	49	27
A-wgtd	75	51

Sound Power (dB)		
Octave Band	Center Frequency (Hertz)	Lw
1	63	98
2	125	106
3	250	101
4	500	100
5	1000	99
6	2000	95
7	4000	90
8	8000	83
A-wgtd		103

Air Inlet Sound Pressure (dB)		
Octave Band	Distance	
	5 ft.	285 ft.
1	74	51
2	83	59
3	83	55
4	81	52
5	79	50
6	72	45
7	64	38
8	54	30
A-wgtd	83	55

Note: Sound data provided by CTI ATC-128 sound test code revision 2019





June 28, 2023

Scott,

I would like to address and clarify some concerns that have been brought up by neighbors in relative proximity to Rhino.

- Rhino Foods has been and wants to continue to be a good member of this neighborhood and work to reduce our environmental footprint. It's just part of our B Corp certification and values.
- Rhino Foods has an established track record of making investments to reduce noise and its environmental footprint. A few recent examples include:
 - ⊖ Sound Barriers - All sound barriers were completed and have been maintained since our previous facility expansion.
 - Hot Water Boiler - Rhino replaced the original hot water boiler system in 2022, which was one of the neighbor's major concerns regarding noise. The new system is in an enclosed addition with a much larger hot water capacity, thus greatly reducing its operating frequency and noise level.
 - Recycling program – Before 2018 all food waste, corrugated, and trash containers were located on the north side of the building. Now only the recycling container is located on the north side, which has limited noise levels associated with opening and closing containers especially on the 3rd shift.
- There are not qualitatively new sources of noise based on this expansion. There are already refrigerated trucks coming and going from the site today and idling at docks. Also, our hours of operation would not change, and there is potentially less truck traffic overnight with the expansion.
- Rhino Foods has already designed this project to reduce noise. For example, we will be housing the refrigeration compressors in a mechanical room instead of in a lighter duty enclosure on the roof or in the rear of the facility, which would have been substantially less expensive.
- Rhino Foods is working with Burlington Electric and Vermont Gas on a variety of initiatives to reduce the carbon footprint of this expansion. Some of these efforts (more efficient refrigeration technology, heat reclaim systems) will also translate into less noise generated from mechanical equipment.
- Rhino Foods will continue to try to identify and invest in additional means to reduce noise associated with this project.

Delicious things, done right.



- Finally, although it is not directly related to noise, this expansion would reduce the overall amount of truck mileage in Chittenden County, further reducing Rhino Foods' overall carbon footprint.

Additionally, I met with Derek Zipprich last Friday 6/23 and provided a tour inside and outside our facility and shared the details of our plans. We discussed our current and future use and how this may or may not affect his concerns. Rhino has always and will continue to meet with neighbors to discuss concerns.

Feel free to reach out to me for further information.

Ted



Ted Castle
Founder

Rhino Foods, Inc.

www.rhinofoods.com

📞 802.598.6730

179 Queen City Park Road | Burlington VT 05401

Delicious things, done right.

Burlington Development Review Board

Department of Permitting & Inspections
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/DPI/DRB
Telephone: (802) 865-7188
Fax (802) 863-0466

AJ LaRosa
Caitlin Halpert
Geoff Hand
Sean McKenzie
Brad Rabinowitz
Leo Sprinzen
Chase Taylor
Evan Gould, (Alternate)
Vacant, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD

Wednesday, July 5, 2023, 5:00 PM

AMENDED AGENDA

Remote Meeting

Zoom: <https://us02web.zoom.us/j/83225696227?pwd=SGQ0bTdnS000Wkc3c2J4WWw1dzMxUT09>

Webinar ID: 832 2569 6227

Passcode: 969186

Telephone: US +1 929 205 6099 or +1 301 715 8592 or +1 312 626 6799 or +1 669 900 6833 or
+1 253 215 8782 or +1 346 248 7799

- I. Agenda**
- II. Communications**
- III. Minutes**
- IV. Public Hearing**

- 1. ZP-23-100; 50 Howard Street (RM, Ward 5S) Rogers Nest, LLC / Luke Clavelle**
Renovate historic cottage and convert to a dwelling unit. (Project Manager, Garret King)
- 2. ZAP-23-7; 16 South Winooski Avenue (FD5, Ward 8E) Ronald McDonald House Charities / Kristine Bickford**
Appeal of zoning administrative denial (ZPF-23-27) to replace existing fence with six-foot-high fence. (Project Manager, Garret King)

V. Certificate of Appropriateness

- 1. ZP-23-205; 655 Spear Street (I, Ward 6S) University of Vermont / State Agricultural College / Claire Forbes**
Continued review of proposed construction of a parking lot (162 spaces) following the demolition and removal of the BioResearch Laboratory building. (Project Manager, Mary O'Neil)
- 2. ZP-23-247; 179 Queen City Park Road (E-LM, Ward 5S) Zoo Holdings, LLC / Martin Courcelle**
Construct 65,000 square foot addition to existing Rhino Foods facility including associated access, parking, utility and stormwater modifications. (Project Manager, Scott Gustin)

VI. Other Business

- 1. ZP-23-9; 98 Sunset Cliff Road (RL-W, Ward 4N) Keye & Lucy Wong / Elizabeth Herrmann**
Address permit condition number one, submission of noise mitigation plan prior to the approval of the pickle ball court. (Project Manager, Scott Gustin)

VII. Adjournment

The programs and services of the City of Burlington are accessible to people with disabilities. Individuals who require special arrangements to participate are encouraged to contact the Zoning Division at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188 (TTY users: 865-7142).
Printed on 100% Recycled Paper

Plans may be viewed upon request by contacting the Department of Permitting & Inspections between the hours of 8:00 a.m. and 4:30 p.m. Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Zoning office is considered public and cannot be kept confidential. This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/dpi/drb/agendas or the office notice board, one week before the hearing for the order in which items will be heard.

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status, crime victim status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at (802) 540-2505.

From: marciawhemley@comcast.net <marciawhemley@comcast.net>

Sent: Friday, June 30, 2023 11:27 AM

To: Scott Gustin <SGustin@burlingtonvt.gov>

Subject: Re: Pickleball Problem on Sunset Cliff

[WARNING]: This email was sent from someone outside of the City of Burlington.



Shattered Nerves, Sleepless Nights: Pickleball Noise Is Driving Everyone Nuts
[nytimes.com](https://www.nytimes.com)

Sent from my iPhone

Dear Scott,

This timely NYT article speaks to a nationwide recognition of the negative impact on residential neighborhoods of pickleball noise pollution. Studies of noise abatement clearly indicate that the only effective solution to protect homes located within 150 feet of a pickleball court is a totally enclosed and roofed structure. In contrast, the Wongs proposed noise abatement plan consists of a row of trees and some low lying greenery which does not even surround their proposed court.

At the May DRB meeting which addressed proposed plans for 98 Sunset Cliff, Lucy Wong demonstrated her resentment of and disregard for neighbors' concerns about pickleball noise by sarcastically stating, not once but twice, something like , "And I want to thank everyone for welcoming us to the neighborhood".

In addition to the Wong's proposed noise mitigation plan being totally inadequate, their current behavior presents further concern about their vindictive disregard for the impact of their property on neighbors. Since May, after maintaining the grounds of their property for all of last year, the Wongs ceased having their lawn mowed. Consequently, their yard is now overgrown with two months of high grass, which, as you know, attracts mosquitoes and ticks. This decision on their part predicts that they will express their anger at neighbors' voicing legitimate concerns by engaging in inconsiderate, vindictive, and retaliative behaviors.

I ask that you share this email with DRB members for the purpose of conveying my concerns in the event that I am not able to attend the July 5th DRB meeting.

Thank you,

Marcia Hemley
62 and 68 Sunset Cliff Road

From: marciawhemley@comcast.net <marciawhemley@comcast.net>

Sent: Friday, June 30, 2023 11:27 AM

To: Scott Gustin <SGustin@burlingtonvt.gov>

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Thank you,

Marcia Hemley
62 and 68 Sunset Cliff Road

Susan Mason Lazarev

125 Redrock Drive, Unit 302
Burlington, VT 05401

T: 802-825-5280
E: susy.mason@me.com

7/3/23

Scott Gustin, AICP, CFM

City of Burlington, Principal Planner for Development Review
Rhino expansion project Manager

Re: Rhino Foods expansion plans
Act 250 permit will be required if local approval granted

Scott,

We've spoken before about the expansion plans for Rhino Foods that are currently under review. As you know, I am concerned about the noise and pollution that are going to be generated by trucks while in the loading bays.

I spoke with Kaitlyn Hayes, the Act 250 coordinator for Chittenden County, and on Thursday, June 15th via text message, she informed me that an Act 250 review will be required for the Rhino project if and after it passes local approval.

We didn't have clarity on that during our last phone call so I wanted to provide this update.

Thank you Scott.

Kind regards,

Susy

Susan Mason Lazarev

802-825-5280
susy.mason@me.com

Susan Mason Lazarev

7/3/23

—
125 Redrock Drive, Unit 302
Burlington, VT 05401

T: 802-825-5280
E: susy.mason@me.com

Scott Gustin, AICP, CFM

City of Burlington, Principal Planner for Development Review
Rhino expansion project Manager

Re: Rhino Foods expansion plans
Concerns about noise and air pollution
Options for hybrid freezer units for trucks in loading bays

Scott,

We've spoken before about the expansion plans for Rhino Foods that are currently under review. I am concerned about the noise and pollution that are going to be generated by trucks while in the loading bays.

As a B-Corp, Rhino Foods has a responsibility to consider the environmental impact associated with the proposed expansion. While acknowledging that consolidating the Williston and Burlington locations will reduce Rhino's overall carbon footprint, it is important to also address the environmental impact of the 10 truck bays planned for the expansion.

I have launched a petition on change.org to find out how neighbors feel about the issue and encourage a discussion to explore alternatives to diesel for powering the freezer compressors while at the loading docks. To date, 74 people have signed the petition.

There are existing technologies that Rhino can consider that can address these concerns. ThermoKing, for example, manufactures hybrid [diesel-powered freezers for trucks](#). These units have the capability to run on electric power when stationary at the loading docks and switch to diesel power when en route. This solution not only reduces noise and disruption for residential neighbors but also would further reduce Rhino's impact on the environment.

Implementing such alternative technologies can also lead to substantial cost savings. ThermoKing estimates potential fuel cost savings of up to 75% and with the solar panels that are planned for the roof, they will realize further savings after their initial capital expense is met.

I know that changing the freezer compressors on the trucks or converting them to hybrid will cost money, but there are grants, rebates and funding assistance programs available at the Federal and State level.

For example, [The Vermont Diesel Emissions Reduction Financial Assistance Program](#), provides technical assistance and incentive funding for projects aimed at reducing diesel emissions from engines.

I wish to encourage Rhino Foods to explore alternatives to diesel for powering the freezer units while at the loading dock and do not recommend approving the plans as they are. Please note that I am not asking for a fleet of electric trucks- I am asking for cleaner, quieter powering of the freezer units while they are the loading dock.

I *conditionally* support the Rhino Foods expansion plans. They are a good neighbor and a good business. I just feel that in the balance between profit and purpose, they have an attainable option to be more responsible to their community and the environment while expanding their business.

Thank you Scott.

Kind regards,

Susy

Susan Mason Lazarev

802-825-5280

susy.mason@me.com

Resources

ThermoKing hybrid freezer units

<https://www.thermoking.com/na/en/road/trucks-and-vans/diesel-powered-truck-units.html>

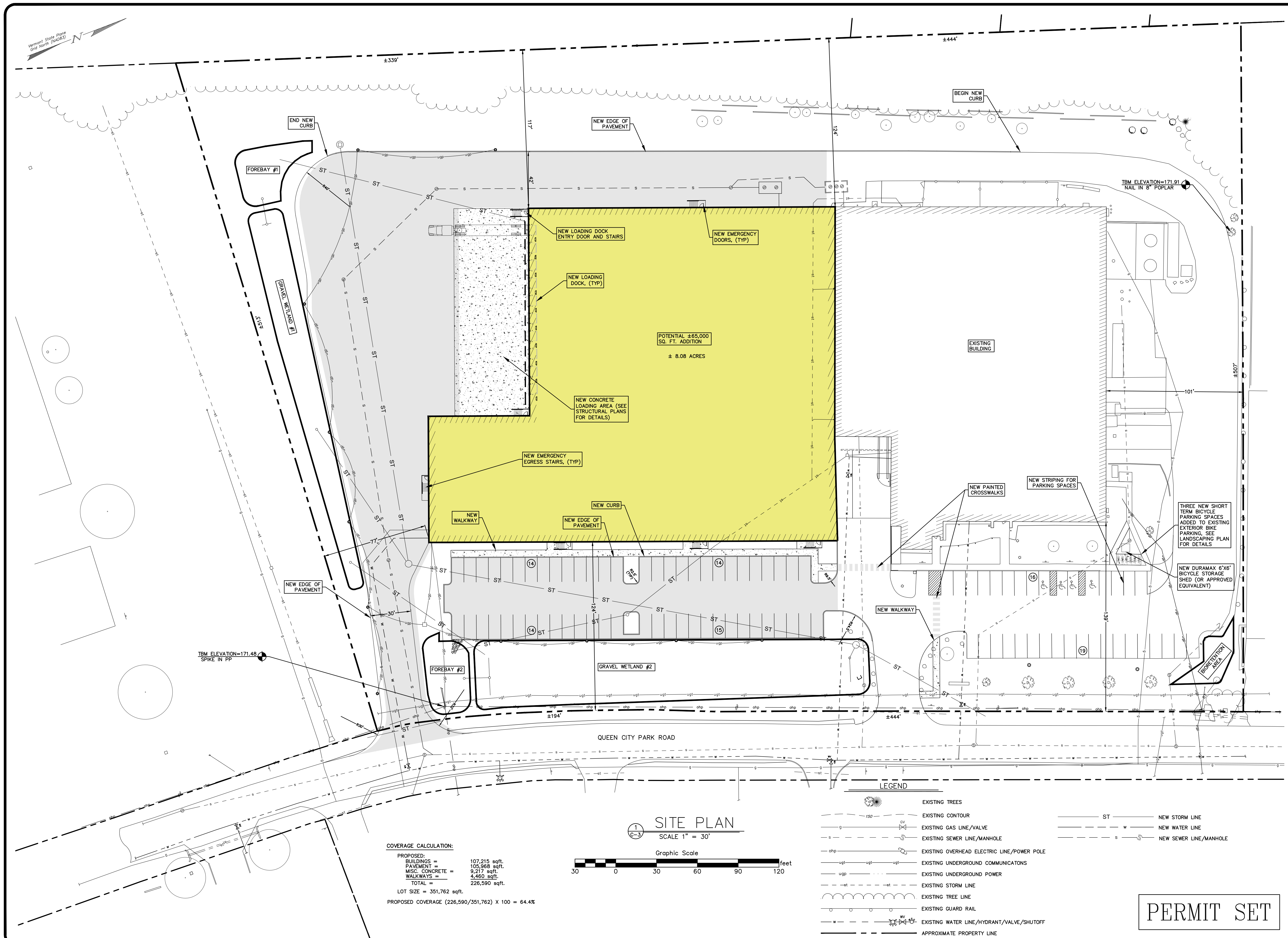
The Vermont Diesel Emissions Reduction Financial Assistance Program

<https://dec.vermont.gov/air-quality/mobile-sources/diesel-emissions/vt-diesel-grant>

California Air Resources Board

California has more information that Vermont does about Truck Refrigeration Units and ways to reduce carbon emissions

<https://ww2.arb.ca.gov/our-work/programs/transport-refrigeration-unit/about>



Install 6' Steel Fence

5/16/23

Place

* How far in to have 6' Fence?

Pearl Street
Highway V.1 Pg.2

N 87°50'54" E

209.74'

BED Easment
V.895 Pg.146

Flush
1' West of Decorative
Stone Monument

215 Pearl St.

Electric
Transformer

Playground

Lot 2
Ronald McDonald
House Parcel
0.91 Acres /
39548 Sq. Ft.

Paved
Parking

R.M.D.
House

Paved Drive

Flush

19 Orchard
Terrace

Subdivision
Line

N 88°40'04" E

209.89'

Behind
Plant bed/sign

Flush

Lot 1
First Congregational
Church Parcel
1.4 Acres /
60799 Sq. Ft.

Paved
Parking

25 Orchard
Terrace

S 01°28'27" E

95.00'

Church

Kristene Montage Plus®

Buyline 5862

Fusion Welded Steel Construction

Montage Plus® is crafted with an inherent beauty that adds a decorative touch to any landscape. The fusion welded steel construction makes it applicable for all types of commercial installations such as retail businesses, storage facilities, schools, health care facilities and golf courses and recreational parks. The curved pickets of the Invincible® style provide a superior look to chain link and barbed wire. The maintenance-free electro-deposition coating (E-Coat) makes Montage Plus® suitable for any climate, hot or cold, wet or dry; Ameristar® uses the same cyclic testing technology used in the automotive industry to ensure that the coating will withstand repeated shifts in temperature and humidity.

COMPONENT SIZES

System	Pickets	Rails	Posts
Montage Plus® Commercial	3/4" x 16 Ga. for fences up to & including 6' tall; 3/4" x 14 Ga. for 7' & 8' tall fences	1-7/16" x 0.072 Top 1-1/2" x 0.072" Sides	2-1/2" Sq. x 16 Ga. min. for fences up to & including 6' tall; 2-1/2" Sq. x 14 Ga. min. for 7' & 8' tall fences

STYLES



CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)



GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)

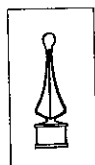


INVINCIBLE™
Style I2 (2-Rail)
Style I3 (3-Rail)



WARRIOR™
Style W2 (2-Rail)
Style W3 (3-Rail)

ADORNMENTS



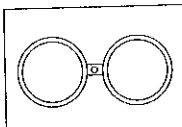
Quad Flare



Triad



Ball Cap



Ring



GATES

Gates are fabricated by welding Montage Plus® panel material to 1-3/4" square gate ends.

DESIGN ADVANTAGES

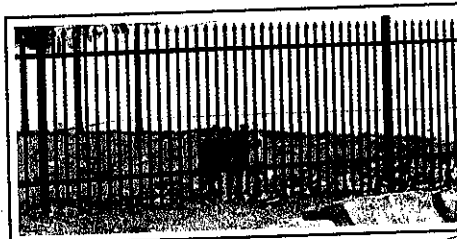
• All Terrain Fence (ATF)™ Panel Design

Unlike conventional welded panels that require stair-stepping along grades (leaving gaps and open areas below the fence), the all-terrain flexibility (ATF) of eight-foot long Montage Plus® panels allows them to rack up to 48" on Classic, Majestic, and Genesis styles; up to 18" on Invincible® curved picket style.



• Pool, Pet & Play (PPP)™ Picket Space Option

In many cases related to child care, public swimming pools, and containment, a narrower space may be desired or required for added safety or security. Montage Plus® offers the optional 3" space.



• Flush Bottom Rail Option

For some applications, a flush bottom rail may be necessary to meet local building codes or simply to meet an aesthetic preference.

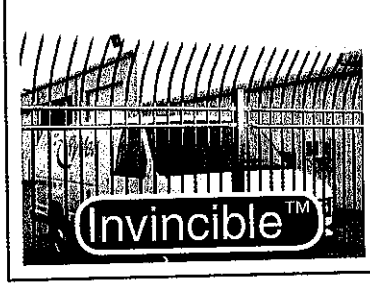
WARRANTY

The E-Coat combination of galvanized steel, zinc phosphate pre-treatment, and epoxy and acrylic double coating provide the protection necessary to withstand adverse weathering effects and justify the 'best-in-the-business' 20 Year Warranty.

COLORS, AVAILABILITY & MAINTENANCE

Montage Plus® color chip samples can be requested for actual color. Availability and maintenance information are the same as for the Aegis II® and Aegis Plus® steel fence systems.

Montage Plus® offers elegant style at an afford-able price. Montage Plus® is the best choice for commercial projects that require perimeter fences.



CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL WELDED FENCING SYSTEM

Montage Plus® - Commercial Weight

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the welded ornamental steel fence system defined herein at (specify project site).

1.02 RELATED WORK

Section _____ - Earthwork
Section _____ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total fence system of (specify Montage Plus ATF® standard picket space or Montage Plus® Pool, Pet & Play® 3" air space) Welded Ornamental Steel (for standard picket space, specify Invincible®, Classic™, Majestic™, or Genesis™, for 3" air space, specify Classic™, Majestic™, or Genesis™) design. The system shall include all components (i.e., panels, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The fence system shall conform to (specify Montage Plus ATF® standard picket space or Montage Plus® Pool, Pet & Play® 3" air space) Welded Ornamental Steel, (for standard picket space, specify Invincible®, Classic™, Majestic™, or Genesis™, for 3" air space, specify Classic™, Majestic™, or Genesis™) design, (specify extended picket or flush) bottom rail treatment, (specify 2-Rail, 3-Rail or 4-Rail or 3-Rail or 4-Rail with Coronas) style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

Table 1 - Minimum Sizes for Montage Plus Gate Posts

Gate Opening	Gate Height		
	Up To & Including 4'	Over 4', Up To & Including 6'	Over 6', Up To & Including 8'
Up to & Including 4'	2-1/2" x 14 Ga.	3" x 12 Ga.	3" x 12 Ga.
Over 4', Up To & Including 6'	3" x 12 Ga.	3" x 12 Ga.	4" x 12 Ga.
Over 6', Up To & Including 8'	3" x 12 Ga.	4" x 12 Ga.	6" x 12 Ga.

2.02 MATERIAL

- Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (344 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft² (184 g/m²), Coating Designation G-60.
- For fence systems up to and including 6' tall, material for pickets shall be 3/4" square x 16 Ga. tubing. For fence systems 7' and 8' tall, material for pickets shall be 3/4" square x 14 Ga. tubing. The rails shall be steel channel, 1.5" x 1.4375" x 14 Ga. Picket holes in the rail shall be spaced (specify 4.675" o.c. for standard picket space or 3.500" o.c. for 3" air space). For fence systems up to and including 6' tall, posts shall be a minimum of 2-1/2" square x 16 Ga. For fence systems 7' and 8' tall, posts shall be a minimum of 2-1/2" square x 14 Ga. Gate posts shall meet the minimum requirements of Table 1.

2.03 FABRICATION

- Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.
- Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel.).
- The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be (specify Black or Bronze). The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.
- Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-3/4" square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts shall be set according to Table 3, plus or minus 1/2". Fence panels shall be attached to posts with brackets supplied by the manufacturer. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 2 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

ORDER FOR PRELIMINARY INJUNCTION (Mass. R. Civ. P. 65)	DOCKET NUMBER 2272CV00001	Trial Court of Massachusetts The Superior Court 
CASE NAME: Robert Mastroianni et al vs. Falmouth Zoning Board of Appeals		Scott W. Nickerson, Clerk of Court Barnstable County
PARTY(S) WHO IS SUBJECT TO THIS ORDER FOR PRELIMINARY INJUNCTION : Falmouth Zoning Board of Appeals		COURT NAME & ADDRESS Barnstable County Superior Court 3195 Main Street Barnstable, MA 02630
Upon the application of Plaintiffs: Mastroianni, Robert this action came before Hon. Gregg J Pasquale, J., presiding, and upon actual notice to the parties as required by Mass. R. Civ. P. 65, and after a hearing and consideration thereof; It is ORDERED and ADJUDGED: That the party(s) named above and their officers, agents, servants, employees, attorneys and counselors, and upon those persons in active concert or participation with them, and each and every one of them are: hereby enjoined and restrained from allowing the use of the courts located at the Lawrence Middle School for playing pickle ball until further order of this Court.		
DATE ISSUED 10/06/2022	ASSOCIATE JUSTICE Hon. Gregg J Pasquale	CLERK MAGISTRATE/ ASSISTANT CLERK 

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, ss.

SUPERIOR COURT DEPT.

CIVIL ACTION # 2272CV00001

ROBERT MASTROIANNI ET ALS.,	)
	)
	)
Plaintiffs,	)
	)
v.	)
	)
TOWN OF FALMOUTH ZONING BOARD	)
OF APPEALS ET ALS.,	)
	)
Defendants.	)

**MEMORANDUM IN SUPPORT OF PLAINTIFFS
MOTION FOR PRELIMINARY INJUNCTION**

Plaintiffs Robert Mastroianni, Stephanie Mastroianni, Jon Churchill, Michael B. Galasso, Dustin Fauth and Carol Parmenter (“Plaintiffs”) seek to prohibit the use of the courts on the “subject property” (*i.e.*, the Lawrence Middle School) for pickleball play during the pendency of this action. Since the courts were reconstructed in 2020, the Plaintiffs have been vocal in their opposition to the use of the courts for pickleball and in seeking relief. This has included appearing before various Town of Falmouth (“Town”) departments and governing bodies, and ultimately filing of this action. Plaintiffs have sought to find a temporary solution with the Defendant Town Zoning Board of Appeals (“Board”), but to date have been unsuccessful in abating the immediate and ongoing harm to the private enjoyment of their respective properties.

Factual Background

In 2019, the Town approved Warrant Article 40 to introduce five new pickleball courts on rehabilitated tennis courts at the Lawrence Middle School. Without any advance notice to abutters

or acoustical study, this project was approved. In effect, the reconstruction moved the existing courts and positioned a permanent pickleball court closest to the property line bordering a dense residential neighborhood. Construction was completed in late 2020, and was immediately followed by noise complaints from abutting residences. Compl., at 13-16, 25.

In July, 2021, the Town's Recreation Committee initiated the first of many public hearings to address sounds impacts from the pickleball courts. However, the only action taken at the hearing was to "seek funds...for sound mitigation", which meant the installation of sound curtains such as had been used in Mashpee. Id., at 26-28.

At a hearing on August 11, 2021, it was reported that members of the public using the courts for pickleball were not complying with the hours of play, and were "inappropriate and aggressive...when they were advised of the rules." And on September 8, 2021, two members of the Recreation Committee reported that noise from pickleball play was significantly worse than other community noise, was horrendous, and that installation of the courts for pickleball was a mistake. Id., at 32-33.

In spite of this, no meaningful action has been taken to date. On November 15, 2021, Town Meeting voted down a proposal that would have reduced pickleball noise at the courts by no more than 50%, and at a cost of \$50,000. Id., at 62.

Prior to that Town Meeting, the Plaintiffs had requested enforcement of the Town's zoning bylaw prohibiting injurious noise by submitting a request to the Town's Zoning Enforcement Officer ("ZEO") for a cease-and-desist order prohibiting any use of the courts for pickleball play. Id., at 36. Plaintiffs submitted various affidavits documenting the effects of pickleball on their lives, and in August 2021, at the ZEO's request, shared with the ZEO the results of an acoustical study Plaintiffs had independently commissioned. Id., at 56. The acoustical study demonstrated that noise levels at abutting residences were regularly at 10-20 dB(A) over ambient levels as a

direct result of pickleball play. However, the ZEO declined enforcement of the zoning bylaw because of the request for sound mitigation that was going before Town Meeting. Plaintiffs then appealed ZEO's denial to the Board.

On December 2, 2021, the Board voted against overturning the ZEO's decision based primarily on an interpretation that the Dover Amendment provided the Town with immunity from this type of lawsuit. Plaintiffs' appeal is the subject of the present action.

Continuing Delay

Since filing their complaint in this matter, Plaintiffs have sought some form of relief. Plaintiffs' daily lives are continuously interrupted by the loud and frequent popping sounds produced by pickleball play. This sound comes from the hard paddles and hard balls used in pickleball.

Plaintiffs have been unable to escape this noise, notwithstanding their ongoing efforts, which include keeping their windows closed all day, running the air conditioning or playing loud music, and wearing noise-cancelling headphones while at home. Churchill Aff., ¶ 4, 6, 7; Fauth Aff., ¶ 6; Galasso Aff., ¶ 12, 13, 16 (copies of all Plaintiffs affidavits are included herewith in Exhibit 1). Plaintiffs eventually leave their homes to find some relief. Plaintiffs suffer from many symptoms, such as inability to concentrate, stress and anxiety. They also feel driven from their homes in order to escape the constant sounds of pickleball playing.

Through conversations with the Town, Plaintiffs have sought to reduce hours of play and identify some meaningful ability to enforce the rules around start and end times, and what courts should be in use. Unfortunately, these efforts have not been successful. As a result, Plaintiffs are forced to seek a court order enjoining the activities at the courts as the only way to achieve any kind of interim relief.

Argument

In order to succeed on their motion for a preliminary injunction, Plaintiffs must show 1) a likelihood of success on the merits, 2) that they will be irreparably harmed if the injunction is not granted, and 3) that the risk of harm to the plaintiffs outweighs the potential harm to the defendant. *Tri-Nel Management, Inc. v. Board of Health of Barnstable*, 433 Mass. 217, 219 (2001). Here, Plaintiffs amply demonstrate that they are substantially likely to succeed on the merits of their claim where the Dover Amendment has no application in the context of public use of publicly available recreational facilities with no evident (and certainly no primary) educational purpose, and can also show that pickleball play materially interferes with their daily lives. Plaintiffs are already suffering harm due to the obnoxious noise produced from playing pickleball, and will continue to suffer as long as such play continues. Finally, the risk of harm to the Defendants is minimal where the action only seeks to enjoin pickleball play (and not tennis or basketball) and there are other public courts available elsewhere for playing the sport.

1. Plaintiffs Have A Substantial Likelihood Of Success On The Merits

a. Dover Amendment has no application to the present case

The Town relies primarily on an overly broad interpretation of the Dover Amendment, G.L. c. 40A, § 3, to claim that any regulation of the courts is improper. This is faulty for several reasons, and sufficiently demonstrates the Plaintiffs' likelihood of success in overturning the Board's decision.¹

¹ Another related defense, mentioned in the ZBA's decision, is that recreation is an allowed use in this zoning district. However, a "zoning ordinance is not in its legal effect like a license or legislative sanction to carry on in a district every kind of business that may not be expressly excluded therefrom, and if there are reasons apart from the zoning law why the business may not legally be carried on in the district, the zoning law...furnishes no protection to it." *Marshall v. Holbrook*, 276 Mass. 341, 348 (1931). The fact that recreational uses are allowed on the Subject Property does not allow the Town to maintain a nuisance.

First, the Town bases its conclusion on the simple fact that the courts are located at a public school. The fact that the courts may be located on school property ignores the language of the Dover Amendment that is specific to the “use” of a particular structure. “The court must look beyond individual activities, some of which undoubtedly may in isolation constitute educational use, to see whether, in the aggregate, the overall use of the structures in question amount to educational use. The educational use must be the ‘primary or dominant purpose’ of the facility to qualify under the Dover Amendment.” *Metrowest YMCA, Inc. v. Town of Hopkinton*, 14 LCR 378, 381 (Mass. Land Ct. 2006) (citing *Whitinsville Retirement Society, Inc.*, 394 Mass. 757, 760 (1985). “It is well settled that ... purely recreational projects are not referred to in normal usage as ‘educational’”. *Regis College v. Town of Weston*, 462 Mass. 280, 287 (2012).

Despite their location, there is no evidence that the courts are actually used by students. To the contrary, the courts are used for pickleball primarily by older adults. This is further supported by the language of Article 40, where the Town appropriated funds for this project. Nowhere in Article 40 is there any language of educational purpose. The school was not the project proponent. Rather, Town Community Preservation Committee funds were used to rehabilitate old and worn tennis courts on school property. The clear purpose was to create a space for recreational activity, and to include a new use, namely, an increasingly popular sport called pickleball.

Moreover, there is no evidence that the Lawrence Middle School courts, in and of themselves, fulfill any educational purpose. Their primary use is recreation and sport. Even where individuals may be learning a new sport, the lack of formal instruction, *i.e.*, curriculum, suggests it is insufficient to qualify for Dover protection. *Whitinsville Retirement Society, Inc. v. Town of Northbridge*, 394 Mass. 757, 760, 477 N.E.2d 407 (1985). In this sense, the courts more closely resemble a “purely recreational project” and not an educational one, and the predominant use is for recreational and exercise purposes.

Finally, even if the introduction of pickleball at the Lawrence Middle School courts were a protected use, the Town is estopped from claiming it cannot regulate the courts *at all*. The Dover Amendment “authorizes a municipality to adopt and apply ‘reasonable regulations’ concerning bulk, dimensions, open space and parking, to land and structures for which an educational use is proposed.” *Trustees of Tufts College v. City of Medford*, 415 Mass. 753, 757 (1993). This provision acknowledges the legitimate municipal purposes of local zoning laws, “such as promoting public health or safety, preserving the character of an adjacent neighborhood, or one of the other purposes sought to be achieved by local zoning as enunciated in St. 1975, c. 808, § 2A”. *Id.*, at 758. The Town’s expansion and relocation of the courts closer to neighboring residences shows the lack of any attempt to reasonably regulate these courts.

Because the Dover Amendment does not apply to protect the use of the courts for pickleball play on the subject property and from application of the Town’s Zoning Bylaw, the Board improperly relied on it and, as such, its decision is legally untenable.

b. Pickleball noise materially interferes with Plaintiffs enjoyment of their property

Moreover, Plaintiffs have a substantial likelihood of success on their nuisance claim in light of the harmful noise they are currently and continually exposed to. “Nuisances at common law frequently arise from offensive sights, sounds or smells.” *General Outdoor Advertising Co. v. Department of Pub. Works*, 289 Mass. 149, 183 (1935). “It is not open to doubt that noise alone may constitute a nuisance.” *Stevens v. Rockport Granite Co.*, 216 Mass. 486, 488 (1914). Privacy and freedom in one’s own home is a legitimate protected interest. *Brookline v. Goldstein*, 388 Mass. 443, 449-450 (1983). “[W]here, as here, plaintiff seeks to restrain an alleged nuisance by noise, [they are] required to show that, ‘the noise materially interferes with the physical comforts of existence, not according to exceptionally refined, uncommon or luxurious habits of living, but according to the simple tastes and unaffected notions generally prevailing among plain

people.”” *Pearcey v. Coachmen's Lodge*, 96-1674A, 1996 Mass. Super. LEXIS 233, at *7 (Nov. 5, 1996), citing *Malm v. Dubrey*, 325 Mass. 63, 65 (1949), quoting *Stevens v. Rockport Granite Co.*, *supra* at 489. Obnoxious sounds are a nuisance. *Rattigan*, *supra* at 859.

In *Malm v. Dubrey*, the defendant was engaged in a trucking business that involved rolling freight over a steel plate and causing a sharp, vibrant clang. It was found that this noise was of a type that was “discordant and likely to disturb seriously the rest of neighbors.” 325 Mass. at 65. Defendant also engaged in vehicle repairs, involving racing the vehicle motor and hammering with heavy hammers. *Id.* This interference was found to be a nuisance, and suitably enjoined.

A similar noise was enjoined in *Stevens v. Rockport Granite Co.*, involving an increasing number of surfacing machines used in processing granite. The court, in finding an actionable nuisance, relied on the findings of the master, which found the machines which operated on compressed air produced a “loud, penetrating, confused and disagreeable noise” and that “[t]he amount of intensity and penetration of this noise varies about in ratio with the number of machines running at a given time, and increased in its effect with the length of time of continuous runs.” *Stevens*, *supra* at 487. This noise was found to interfere with the “reasonable comfort and enjoyment of life” of the plaintiffs during the day and particularly when windows and doors would be open.

Plaintiffs have sufficient evidence to meet their burden, as demonstrated in their respective affidavits, as well as two acoustical studies (Noise Control Engineering LLC (“NCE”) acoustical study, included as Exhibit 2, and Spendiarian & Willis Acoustics & Noise Control LLC (“Spendiarian & Willis”) acoustical study, included as Exhibit 3). The evidence shows (qualitatively and quantitatively) that the noise from pickleball play in such close proximity invades the physical comforts of all of their homes, and is beyond what would be acceptable to normal sensibilities.

It is entirely reasonable to conclude that an ordinary person would be bothered by a repetitive and loud popping sound that goes on all day long. The courts are positioned extremely close to residences in the neighboring residential district, coming within 40 feet of one Plaintiff's residence at its closest proximity, within 100 feet of two Plaintiffs' respective residences, and within 350 feet of all of the Plaintiffs' respective residences. Compl., ¶ 24. Like the sharp clang in *Malm*, and the constant pneumatic noise in *Stevens*, Plaintiffs are subject to loud popping sounds from hard materials. The paddles and balls used in pickleball are significantly different than those utilized in tennis, as is their acoustical impact on human receptors; in tennis, the balls are soft with acoustically absorptive interior materials, and their area of impact (on the racket's hardware) is comprised of strings of varying tension and made of natural gut, nylon, polyester or other synthetic material. In contrast, Pickleball's hard surfaced equipment coupled with the greater frequency of impacts (during a typical game) generates an intense degree of loud and piercing noise levels in excess of MADEP standards when weighted. Spenderian & Willis, at 22; NCE, at 5-7. Like *Malm*, it is discordant and disrupts the neighborhood, and like *Stevens*, it is penetrating and disagreeable. Plaintiffs are forced to keep their windows and doors closed. In order to block out the incessant popping sound, the Plaintiffs have all at some point adopted noise canceling headphones and left their homes. Churchill Aff., ¶ 4; Fauth Aff., ¶ 6. Several of the Plaintiffs complain that the noise interferes with sleep. Parmenter Aff., ¶ 6; Churchill Aff., ¶ 5.

Activities at their respective residences are also significantly curtailed when pickleball is being played. In *Brookline v. Goldstein*, 388 Mass. 443, 449-450 (1983), town officials who received numerous, constant and repeated phone calls at their homes and place of work sued to enjoin the conduct. The interference with their legitimate right to privacy in their own homes was found to be a great harm. Similarly, the constant popping sound coming from the pickleball courts interferes with Plaintiffs ordinary lives in their own homes. Plaintiffs report being unable to be

outside when pickleball is being played, unable to perform ordinary activities such as landscaping and gardening, and difficulty concentrating or being able to work indoors during such times. Galasso Aff., ¶ 10-13; Churchill Aff., ¶ 3-9; Parmenter Aff., ¶ 3-6. Many normal household activities such as napping or reading are disrupted and made impossible in the context of even *one* given pickleball game by the continual barrage of noxious noise from pickleball hard surfaced rackets coming into frequent contact with the game's hard surfaced balls. And, as noted, this is in circumstances where the Lawrence Middle School courts consist of one dedicated pickleball court (available seven days weekly for pickleball play from morning hours to dusk) and an additional four courts (available three days weekly, also from morning hours to dusk).

The fact that the Plaintiffs have taken such extreme measures as leaving their homes for extended periods in order to find some relief from the pickleball noise, conveys how significant the acoustical impacts are for them. The fact that the Town may point to some other individual homeowners that may not be bothered by pickleball playing does not change the analysis. *Davis v. Sawyer*, 133 Mass. 289, 291 (1882) (noting the fact that although noise did not bother, and therefore was not a nuisance, to some persons did not mean it was not a nuisance to plaintiffs). The appropriate inquiry is whether a person of ordinary sensibilities would be bothered by the repetitive popping sound made by pickleball players all day, sometimes from 7am to late at night. Unlike *Pearcey*, where the homeowners failed to overcome evidence that the obnoxious noise had actually lessened and was barely audible from their property, Plaintiffs have properly supported their nuisance claim with testimony that the noise is problematically audible, persistent and can occur seven days a week. This is particularly problematic during the time of year (spring-fall) where Plaintiffs wish to rightfully enjoy their respective residential outdoor spaces (*e.g.*, decks, patios, gardens, etc.) and also open their windows and doors to experience fresh air in their respective homes.

The interference from pickleball noise is also unreasonable given that the harm is substantial to the Plaintiffs and there are available practical alternatives – siting pickleball in more appropriate locations and utilizing existing courts situated elsewhere - that do not involve undue hardship to the Town. See *Rattigan, supra* at 857, citing *Restatement (Second) of Torts*, § 830 (1979). Notably, the Town has other available courts that are located further away from residences and do not implicate the harms associated with what the Plaintiffs are exposed to on a frequent basis. Moreover, because tennis and basketball can still be played at the Subject Property, and there is no undue hardship in relocating pickleball play to other available courts, the Town’s conduct in permitting pickleball in close proximity to Plaintiffs homes is *per se* unreasonable.

Based on the substantial harm to Plaintiffs ordinary use of their homes, and where the Town’s conduct is unreasonable, the Plaintiffs have demonstrated a substantial likelihood of success on their nuisance claim as well.

2. A Preliminary Injunction Is Necessary To Prevent Irreparable Harm During The Course Of This Action

Plaintiffs are harmed by the noise from pickleball playing that is both continuous and in close proximity to their respective residences. “Noise which constitutes an annoyance to a person of ordinary sensibility to sound, such as materially to interfere with the ordinary comfort of life, and impair the reasonable enjoyment of his habitation, is a nuisance to him.” *Davis v. Sawyer*, 133 Mass. 289, 290 (1882); see also *Malm, supra*, and *Stevens, supra*.

This invasion of the Plaintiffs homes constitutes an irreparable harm because it affects the use of their real property. Where real property is implicated, money damages are often inadequate to remedy the deprivation of rights. See *Greenfield Country Estates Tenants Ass’n v. Deep*, 423 Mass. 81, 88 (1996); *Brookline, supra*; see also *Stevens v. Rockport Granite Co., supra* at 491 (finding money damages are not adequate relief for an invasion of the right to comfortable living);

Hambley v. Dalzell, 24 Mass. L. Rep. 43 (2008) citing *Boston Athletic Assoc.*, 392 Mass. 356, 362 (1984) (difficulty in establishing damages is a basis for finding irreparable harm). Because the noise from pickleball play is interfering with Plaintiffs' ability to use and enjoy their respective homes, there is no adequate remedy at law and therefore the harm is irreparable.

3. The Balance Of Harms Weighs In Favor Of The Plaintiffs

For the reasons stated above, the Court should also find the balance of harms favors the Plaintiffs. In *Brookline*, the defendant's harm in being prevented from exercising his right to contact public figures did not outweigh the harm to their right to privacy and freedom from harassment. As in *Brookline*, the risk of harm to the Town in relocating pickleball use does not outweigh the harm to the plaintiffs from this unnecessary interference. In *Stodder v. Rosen Talking Mach. Co.*, 241 Mass. 245, 250 (1922), a blaring phonograph used for advertising unreasonably harmed the business across the street when it could be used as effectively at considerably lower volume. The presence of an alternative use that does not create a hardship makes the continuance of the harm unreasonable. While the Town has other avenues in which to pursue the ostensibly good goal of outdoor public recreation intended with playing pickleball, the Plaintiffs have no other recourse but to sell their homes and move. The Town's investment in rehabilitating the courts in 2020 is not wasted, as they are still available and can be used for other more appropriate recreational uses such as tennis and basketball. "This is not a case where there is nothing that the defendant can do as a reasonable and practical matter to abate the nuisance." *Godard v. Babson-Dow Mfg. Co.*, 313 Mass. 280, 286 (1943). With other pickleball courts available, the Town can ensure there is adequate distance between pickleball play and residential neighborhoods without sacrificing the ability of residents or others to play the game.

Conclusion

For the reasons stated above, this Honorable Court should grant Plaintiff's motion and enjoin the Defendant from allowing the Subject Property to be used for the playing of pickleball until such time as this matter is resolved after a trial on the merits.

Respectfully submitted,

The Plaintiffs by their Attorneys:



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vdalmas@senie-law.com
jpolloni@senie-law.com

Dated: August 22, 2022

EXHIBIT 1

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, ss.

SUPERIOR COURT DEPT.

CIVIL ACTION # 2272CV00001

ROBERT MASTROIANNI, STEPHANIE)
MASTROIANNI, JON CHURCHILL, MICHAEL)
B. GALASSO, DUSTIN FAUTH and CAROL)
PARMENTER,)

Defendants,)

v.)

TOWN OF FALMOUTH ZONING BOARD)
OF APPEALS; and)

Its Members:)

Terrence J. Hurrie, Chair;)

Edwin P. Zylinski, II Vice Chair;)

Robert B Dugan, Clerk;)

Edward Van Keuren, Member;)

James T. Morse, Member;)

D. Scott Peterson, Associate Member;)

Gerald Potamis; Associate Member,)

Defendants.)

AFFIDAVIT OF CAROL PARMENTER

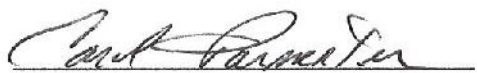
I, Carol Parmenter, with personal knowledge of the statements made in this affidavit, hereby
depone and say, under pains and penalties of perjury, the following.

1. I am over the age 18 years and am of sound mind.
2. Of all the neighborhood homes in our area, my property at 71 Lakeview Avenue, is the
closest to the Pickleball courts. The Pickleball courts abut the full length of my east
property line, and my house is approximately 40 feet from the courts. Of all of the games
played on these courts, the noise from Pickleball is by far the WORST. Pickleball goes on

7 days a week from, sometimes as early as 7:00am, until dusk, in spite of the posted start time of 9:00am.

3. The noise from the pickle ball hitting the racket is incessant and creates a bang bang bang sound that is extremely loud and repetitive. My house is quite small. I can hear the injurious popping noise in every single room of my house, even when the windows are shut. There is no escaping it. On my property, inside and out, there is not a single space to go where I do not hear it. I can see and hear the players in view through the bushes because they are that close to my house.
4. I have been living here a long time. This Pickleball noise is by far the worst that I have ever experienced living here, living so close to the courts. The noise from the Pickleball play has completely ruined any chance of relaxation both inside and outside of my home. I am unable to enjoy my home and property because of the Pickleball noise.
5. I have a lot of work to do in my backyard, but I can't stand to be outside on my property anymore because of the Pickleball noise. The vegetation is overgrown and has been neglected because I simply cannot be outside with the constant banging noise from the ball hitting the paddle. Inside, I can't read or concentrate without that same noise in the background. My focus is constantly interrupted because of it. In fact, I actually leave my house when they are playing so that I can have relief, because I cannot stand the noise.
6. I am in my 70s and often try to go to bed early. Pickleball, which is allowed until dusk, very often affects my ability to sleep in the early evening. I not only hear them all day, but into the early hours of evening. Napping is simply not an option during the day because the noise interrupts any hope of relaxation.

Signed this 22 day of August, 2022 under pains and penalties of perjury

A handwritten signature in cursive script, appearing to read "Carol Parmenter", written over a horizontal line.

Carol Parmenter

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, ss.

SUPERIOR COURT DEPT.

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James T. Morse, Member;
D. Scott Peterson, Associate Member;
Gerald Potamis, Associate Member,

Defendants.

AFFIDAVIT OF DUSTIN FAUTH

I, Dustin Fauth, with personal knowledge of the statements made in this affidavit, hereby depose and say, under pains and penalties of perjury, the following.

1. I am over the age of 18 years and of sound mind.
2. I currently live at 53 Lakeview Avenue, Falmouth, MA with my wife and two children.
3. Ever since the Pickleball courts at Lawrence Middle School have been opened our daily life has been incredibly impacted by the non-stop noise of the "Pop, Pop-Pop" of the pickleball ball.

4. As I write this, in my living room, the sound is all around, it comes through the windows and walls and does not stop. In the last thirty seconds of writing, I have counted more than fifty "Pops" of the ball followed by wild cheers from the players. This will continue all day until 7:00 pm when the courts close, and sometimes after.
5. The single court is open seven days a week. This means, that every day, our private lives, in our house our backyard, and our patio are constantly impacted by pickleball noise. For three days a week, there are five courts available which makes the constant "Pop" even more repetitive and disruptive.
6. For our family, this is a huge nuisance that makes it very difficult to enjoy the peace of our own home. To stop the incessant sound, I often play loud music, much louder than I would otherwise want to play just to enjoy it. I sometimes wear noise-canceling headphones when I really need to concentrate. I often keep the windows closed in order to minimize the sound as much as possible. My family and I sometimes leave our home to go elsewhere when we just can't take it anymore.
7. There is no other situation, that I am aware of, that a town allowing this level of public noise in a residential area. This is where we live. This is where we hope to live for many years to come. The thought of living with this constant noise all day every day for the rest of our time on Lakeview Avenue is unimaginable.
8. We were given no heads up from the town that this level of auditory disturbance would be brought to our backyards. Those of us within earshot of the pickleball courts are struggling daily with this and desperately need the courts immediately closed and relocated to a non-residential area.
9. I feel it is hypocritical of the Town to have streets with "Noise Ordinances". The Town

recently put up signs to stop people with loud stereos in their cars from disturbing the people that live on those streets. The ordinance allows the Town to issue citations for loud vehicles. This situation that I endure daily is even worse, because it isn't just a car driving by but a constant sound that goes on what seems like all day, every day. The only relief I get is by completely changing my life and how I live, and frequently leaving my home to get away.

Signed this 18 day of August, 2022 under the pains and penalties of perjury:

A handwritten signature in blue ink, appearing to read "Dustin Fauth", is written over a horizontal line.

Dustin Fauth

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, ss.

SUPERIOR COURT DEPT.

CIVIL ACTION # 2272CV00001

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James T. Morse, Member;
D. Scott Peterson, Associate Member;
Gerald Potamis, Associate Member,

Defendants.

AFFIDAVIT OF MICHAEL B. GALASSO

I, Michael B. Galasso, with personal knowledge of the statements made in this affidavit, hereby depose and say, under pains and penalties of perjury, the following.

1. I am over the age of 18 years and of sound mind.
2. My family has owned the home at 107 Lakeview Avenue, Falmouth, MA, located in front of the Lawrence School, since 1963.
3. 107 Lakeview is approximately 175 feet from the rehabilitated courts at the Lawrence School.

4. When we bought the house in 1963 there were no athletic fields at the Lawrence School. That area was still native woods from the school parking lot to the back of the Congregational Church on Main Street (Katharine Lee Bates Road was not constricted back then),
5. Francisco Tavares constructed the ball fields in 1964-5 and the tennis courts then were located about fifty feet south (away from Lakeview and closer to the school) back then.
6. During the school year, play on the field was limited to students of Lawrence High and during the summer, Little League and Babe Ruth Baseball used the ball fields. Tennis was played on the tennis courts. That was about the extent of the use of the fields and tennis courts.
7. Recently, the fields have become "Recreation Center West", with numerous activities added including Pee Wee football and soccer, YMCA Day Camp, Collegiate Frisbee Golf tournament, Lacrosse Summer Camp, and as a staging area for the Falmouth Road Race and Cape Cod Marathons.
8. In addition, persons often park their cars in the Lawrence School parking lot and walk to the Steamship Authority Parking lot to catch the bus to Woods Hole to save the cost of parking at the Steamship Authority lot (on Palmer Avenue), only to loudly return late at night to retrieve their respective cars.
9. Recently, with the elimination of truck traffic on Main Street from Gifford Street to Palmer Avenue, Lakeview Avenue has become the main by-pass route for those going to Woods Hole and north, increasing the amount of truck traffic on Lakeview Avenue and notably often traveling over the posted speed limits.
10. I and my family have tolerated most of these changes and the increased activity, noise and traffic around my house over the past 59 years, but the addition of the only dedicated pick

ball court in town, located so close to our house, our bedroom and living room, and our backyard, the increased traffic caused by players travelling to-and-from the courts, the (at times) up to 20 players playing pickle ball with the constant high pitch “pop, pop, pop” sound of play, has become unbearable and detrimental to my health.

11. In my home, our bedrooms, living room and kitchen windows face the direction of the courts and the porch is located on the side of the house facing the courts. It has become very difficult to enjoy those rooms, the porch and our back yard with the constant “pop, pop, pop” of pickle ball play seven days a week.
12. Rather than be in my bedroom, living room or den, I now retreat to an office space I recently leased when I need to concentrate or want peace and quiet.
13. In the kitchen, if I am preparing food I have to put up with the popping noise which makes it very difficult to concentrate.
14. I have asked the Town of Falmouth Recreation Committee to consider closing or seriously restricting the use of the Lawrence School courts for pickle ball play until a solution can be reached that eliminates this injurious sound, but they have refused to make any meaningful changes.
15. I have no issues with those who enjoy playing the game (except those who violate the hours of operating, for example, like those who were playing on the courts at 7 am last Sunday in violation of the posted hours), but would like to see pickleball moved to another location so I and my family can enjoy our home again.
16. Posting the hours and other limitations at the courts are not being enforced by the Town and add to my frustration, and causes stress to me and my family from not being able to plan or count on being free from the noise.

17. Over the years the Town has added numerous outdoor activities, not for the Lawrence School students' but for the general public at the school fields adding to the noise and traffic.
18. Although we have lived at 107 Lakeview Ave for almost 60 years, right next to the school and tennis courts, we were never notified by the town of their intent to change the use of the tennis courts by adding pickle ball, an activity that creates more noise and traffic from users than tennis and is having a major impact on our health, quality of life and enjoyment of our home.

Signed this 18 day of August, 2022 under the pains and penalties of perjury:



Michael B. Galasso

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, ss.

SUPERIOR COURT DEPT.

CIVIL ACTION # 2272CV00001

ROBERT MASTROIANNI, STEPHANIE)
MASTROIANNI, JON CHURCHILL, MICHAEL)
B. GALASSO, DUSTIN FAUTH and CAROL)
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James T. Morse, Member;)
D. Scott Peterson, Associate Member;)
Gerald Potamis; Associate Member,)

Defendants.)

AFFIDAVIT OF JON CHURCHILL

I, Jon Churchill, with personal knowledge of the statements made in this affidavit, hereby depose and say, under pains and penalties of perjury, the following.

1. I am over the age of 18 years and of sound mind.
2. I live at 75 Lakeview Avenue, Falmouth, MA, with my wife. Our house is approximately 80 feet from the Lawrence Middle School court complex, the court is 40 feet from the property line.

8. When I'm cooking on the grille at supper time, I can't remain outside because I'm hearing both the noise from pickleball playing as well as the loud bantering of the players talking over that noise.
7. It is frustrating and stressful to deal with and is limiting our ability to enjoy our home.

Signed this 12 day of August, 2022 under pains and penalties of perjury.

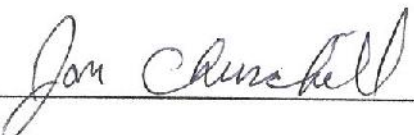
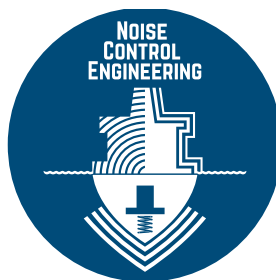

Jon Churchill

EXHIBIT 2



NCE JOB MEMO

TO: Rob Mastroianni
FROM: Zachary Weiss, Jeff Komrower
DATE: 8/27/2021
SUBJECT: Pickleball Noise Measurements, Lawrence Middle School,
Falmouth, MA, 7/24/2021

1.0 OVERVIEW

Five pickleball courts have recently been constructed at Lawrence Middle School in Falmouth, MA. The game of pickleball uses a hard, solid racquet and hard plastic balls, generating frequent noise impulses while in play. Nearby neighbors have reported high levels of annoyance from these impulsive noises, affecting their ability to enjoy the quiet and peaceful use of their property.

Noise Control Engineering, LLC (NCE) was retained by Rob Mastroianni in order to investigate this noise issue and assess compliance to state and local noise regulations. This memo summarizes noise measurements taken on residential properties neighboring the pickleball courts on Saturday, July 24, 2021, over multiple hours of pickleball activity.

2.0 NOISE REGULATIONS

The Massachusetts Department of Environmental Protection (MADEP) Noise Policy ("MADEP Noise Policy"), codified in DAQC Policy 90-001 with reference to 310 CMR 7.10, provides a quantitative criteria for environmental noise across the State of Massachusetts. A sound source is considered to be in violation of the MADEP Noise Policy if the source:

1. Increases the broadband sound level by more than 10 dB(A) above ambient, or
2. Produces a "pure tone" condition – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are relevant both at and within the property lines of neighboring residences. It should be noted that the dB(A) metric refers to noise levels filtered with the A-weighting frequency network, which has a shape approximating the frequency sensitivity of the human ear. Most quantitative noise criteria are given in A-weighted decibels.

Additionally, while the Town of Falmouth, MA does not appear to have a specific noise ordinance, it does have a few regulations that address noise qualitatively. Section 240-13.1A of the Zoning By-Law (Nuisance) states that:

“No use shall be permitted which would be offensive because of injurious or obnoxious noise, vibration, smoke, gas, fumes, odors, dust or other objectionable features, or be hazardous to the community on account of fire or explosion or any other cause.”

Chapter 150-1 of the Town of Falmouth Code also describes a prohibition on “Excessive, Loud and Unusual Noises”. Although it specifically calls out operations from “any radio, phonograph or other mechanical soundmaking device or instrument...”, it also mentions the “fact that the noise is plainly audible at a distance of one hundred and fifty (150) feet from the vehicle or premises from which it originates shall constitute prima facie evidence of a violation of this chapter.” For pertinent sources, this gives a “plainly audible” level criteria applicable at 150 feet or more from the source.

3.0 INSTRUMENTATION AND SETUP

NCE performed noise measurements at residential properties neighboring the pickleball courts on July 24, 2021, between the hours of 8 AM and 9 PM. Long duration semi-attended measurements were taken on the property of 71 Lakeview Ave, the closest residence to the pickleball courts. These captured extended periods of pickleball activity, as well as periods of quiet and other miscellaneous activities such as tennis and basketball. Additionally, shorter duration measurements of 15 to 60 seconds were taken across multiple properties, both during periods of pickleball activity and quiet. These measurement locations are presented in Figure 1 and are detailed in Table 1.

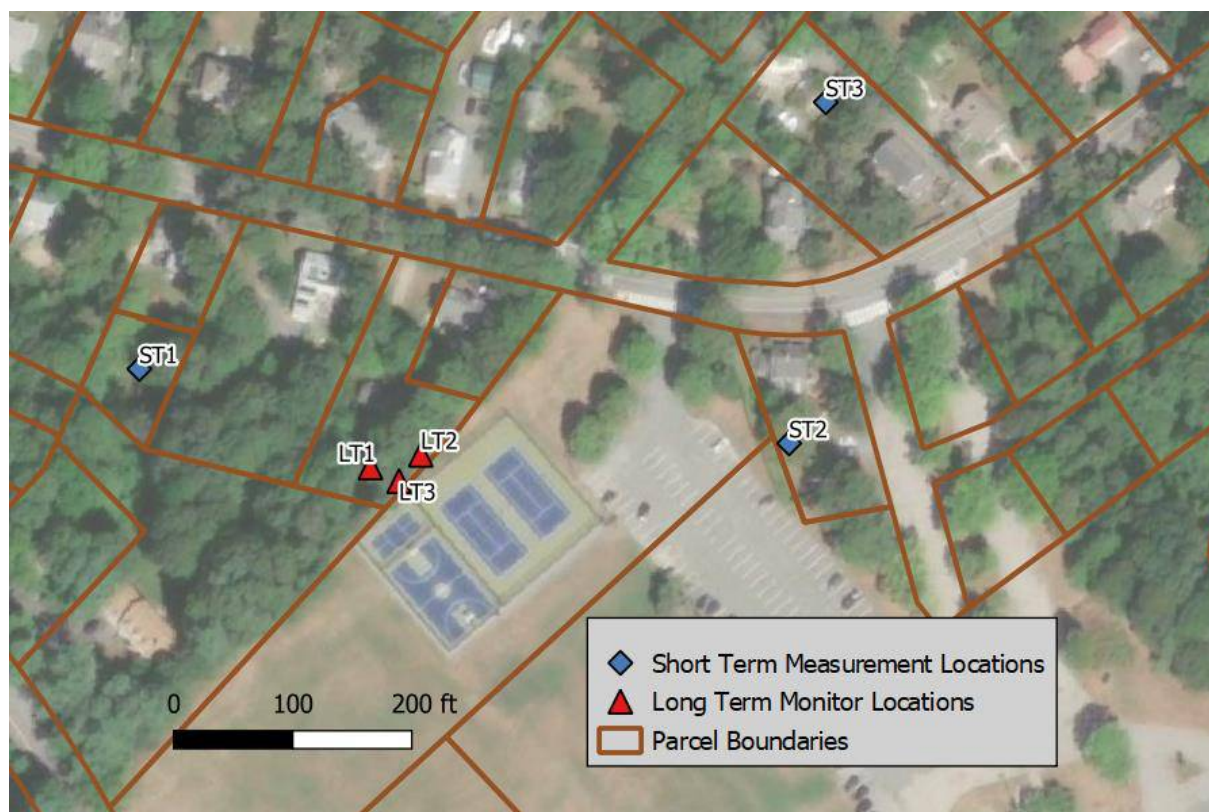


Figure 1: Measurement Locations, Lakeview Ave, Falmouth, MA

Table 1: Measurement Locations

Location Name	Address	Apprx. Distance From Courts, ft
LT1	71 Lakeview Ave, Backyard	50
LT2	71 Lakeview Ave, Property Line North of Shed	25
LT3	71 Lakeview Ave, Property Line South of Shed	16
ST1	53 Lakeview Ave, Backyard	250
ST2	107 Lakeview Ave, Backyard	175
ST3	120 Lakeview Ave, Backyard	350

At location LT1 (shown in Figure 2), a monitor was installed for the duration of the measurement period, capturing data from 8:30 AM to 8:30 PM representative of noise in the backyard of 71 Lakeview Ave. This monitor consisted of a Larson Davis Type 831 sound level meter with a PCB model 377B20 ½” microphone and a PCB model PRM831 preamplifier. This equipment was affixed to a tripod installed at ground level, with the microphone positioned at approximately 5 feet and covered with a windscreen to minimize noise from wind gusts. The meter was configured to average sound pressure levels continuously in both 0.1-second and 5-minute intervals for the duration of the monitoring period. Data was collected at these intervals in overall dB(A), A-weighted L₉₀, and 1/3 octave-band formats.



Figure 2: LT1 Monitor, 71 Lakeview Ave, Backyard

Additionally, supplemental long duration monitoring was performed at location LT2 between 10:10 and 11:40 AM, and at location LT3 between 11:50 AM and 8:50 PM, capturing noise levels representative of the property line dividing the Lawrence Middle School Pickleball courts and 71 Lakeview Ave. These monitors consisted of National Instruments 9234 four-channel data acquisition cards with custom LabView software written for collection of noise data, along with a PCB Model 377B20 or 377C20 ½" microphones covered in windscreens and PCB model 426D01 or 426E01 preamps. At LT2, the monitor was installed with a microphone positioned at approximately 5 feet in a clearing near the property line, while at LT3 it was affixed to tree right at the property line approximately 5 feet above the ground (though it should be noted that the ground elevation is a few feet higher at LT3 than LT1 & LT2). These monitors were configured to capture time waveforms, which were later post-processed to derive similar metrics to those capture by the Larson Davis Meter

Shorter duration measurements were taken with a mobile version of the National Instruments system used for the supplemental long duration measurements, configured to capture overall dB(A), 1/3 octave-band, 1-Hz narrowband, and time waveform formats. All meters were field calibrated using a Larson Davis CAL200 prior to data capture.

A Kestrel DROP D3 environmental data logger was also attached to the tripod at LT1. It was configured to log temperature and relative humidity in 5-minute intervals from 10:10 AM to 8:30 PM.

4.0 RESULTS

4.1 Pickleball Court Area Activity

Using a combination of field observations, neighbor reports, and audio analysis, the following 15-minute periods were determined to have notable pickleball activity: 9:00 to 11:00 AM, 11:15 AM to 1:00 PM, and 5:45 to 6:00 PM (activity up to 1 PM was largely continuous, while activity in the final period was intermittent). Additionally, mixed tennis and basketball activity occurred between 2:00 and 3:30 PM, tennis alone between 6:15 and 6:45 PM, and miscellaneous playing (i.e. noise from running, talking, and balls bouncing) between 7:00 and 7:30 PM.

Neighboring residents reported that high pickleball activity often occurs for much longer periods, extending from 9 AM to late in the afternoon, and that activity was likely reduced on the day of measurement due to higher temperatures.¹

4.2 Long Duration Results

The MADEP noise regulation requires the quantification of both the source noise level present and an ambient noise level representative of a location without the source or any other noises that are not typically present most of the time. The source level is often acquired by measuring the

¹ Logged temperatures at LT1 ranged from a low of 74° F in the morning (10:35 AM) up to a peak of 83° F in the early afternoon (1:05 PM) down to an evening low of 67° F (8:30 PM).

LA_{eq} with the source present, which is the equivalent A-weighted level for the duration of the period measured. The ambient is then often determined by calculating the LA_{90} , which is defined as the A-weighted level that is exceeded 90% of the time in a given time period. However, if more appropriate, the ambient can also be defined by separate LA_{eq} measurements without the source present.

Figure 3 presents both the LA_{eq} and LA_{90} at LT1 for the duration of the measurement period in 5-minute intervals, along with annotations on the LA_{eq} showing periods of pickleball activity and relative quiet. From 8:30 AM to 1:15 PM, the LA_{90} increases up to 5 dB from periods of relative quiet to when pickleball activity is present. This reflects the constant presence of pickleball-related noise during these activity periods and illustrates that the pickleball noise is not sufficiently intermittent to determine the ambient level using the LA_{90} metric.

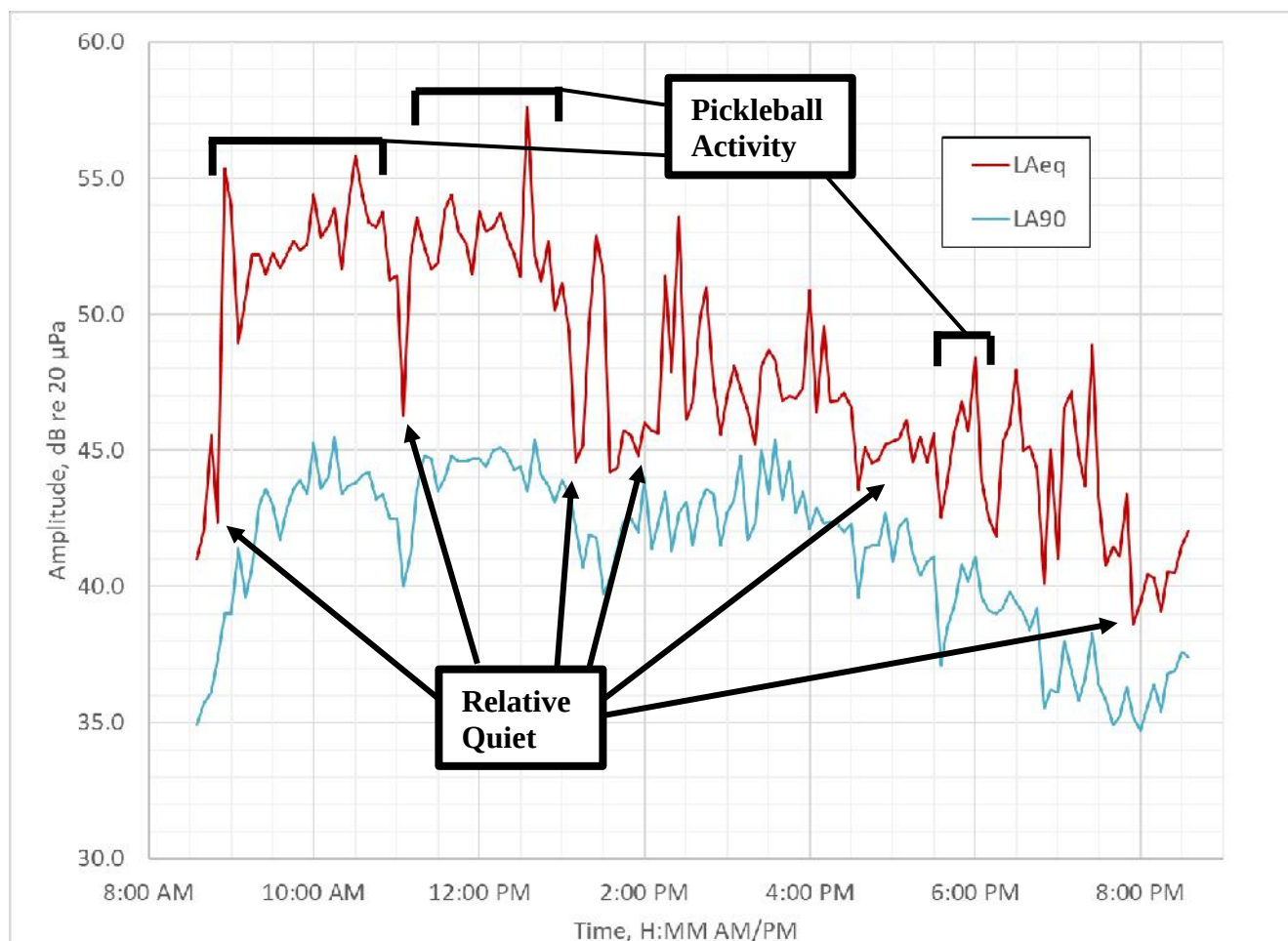


Figure 3: 5-minute LA_{eq} and LA_{90} at Location LT1 (71 Lakeview Ave, Backyard)

Consequently, a preliminary assessment of the MADEP Noise Policy quantitative criteria can be done by comparing the 5-minute LA_{eq} during relative quiet periods to those with pickleball activity. From 8:50, before the courts opened, to 9:00 AM, when pickleball activity began, the 5-minute LA_{eq} increased 13 dB from 42 to 55 dB(A). Additionally, during the periods of pickleball activity, levels largely ranged from 51 to 56 dB(A). These levels exceed many of the levels during periods of relative quiet, such as the period before 9 AM, by more than 10 dB.

This illustrates that the equivalent noise level integrated over a reasonably long time interval is already noncompliant with the MADEP Noise Policy quantitative criteria. However, due to the impulsive nature of the noise from paddle-ball impacts¹, the problem is in actuality much more severe than occasional periods of excess. Figure 4 presents two 30-second time histories measured at LT1 in 0.1 second intervals, which is a small enough time resolution to show individual paddle-ball impacts. The selection from 11:45 AM is during a period of high pickleball activity, in which at least 20 impact peaks can be seen within the period. These peaks largely range from 55 to 65 dB(A), which is typical of pickleball activity at this location measured up until 1 PM. In contrast, the selection from 8:45 AM, before activity began, has no sharp peaks (note that the 6-8 dB of gradual variation is likely attributable to passing cars on Lakeview Ave). Many of the 11:45 peaks are clearly more than 10 dB above the levels directly before and after them, which can be considered to be the ambient level at the time of the peak. Some peaks even exceed 15 and 20 dB. Although occasional excesses of this sort may be acceptable, such as a dog barking, this data shows that during periods of high pickleball activity, excesses can potentially occur every few seconds.

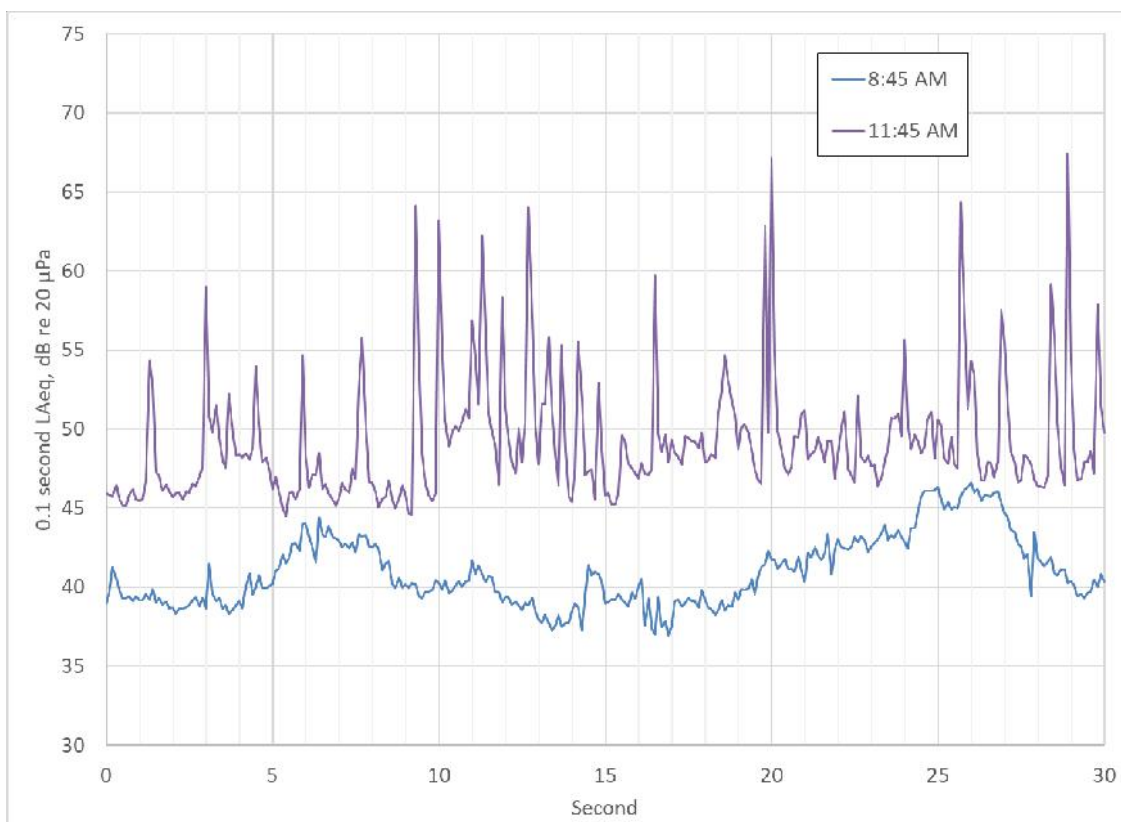


Figure 4: 30-second LAeq Time History in 0.1-second intervals at 8:45 AM (Relative Quiet) and 11:45 AM (Pickleball Activity), LT1

¹ “Paddle-ball impacts” is used throughout this report to specifically refer to the impact between a pickleball paddle and ball. This was noted to be the most prominent noise created during pickleball activity.

To assess this issue over a longer time scale, the number of 10 dB and 15 dB peaks above ambient were processed for the entire 0.1-second LA_{eq} time history collected at LT1. A peak was defined as a moment where the intervals immediately preceding and following have lower LA_{eq} levels, and the dB level of the peak was determined by the minimum LA_{eq} value that occurs both 0.5 seconds before and after the moment of the peak (i.e. 1-second ambient). Figure 5 presents this data in 15-minute intervals, along with annotations indicating the time of activities.

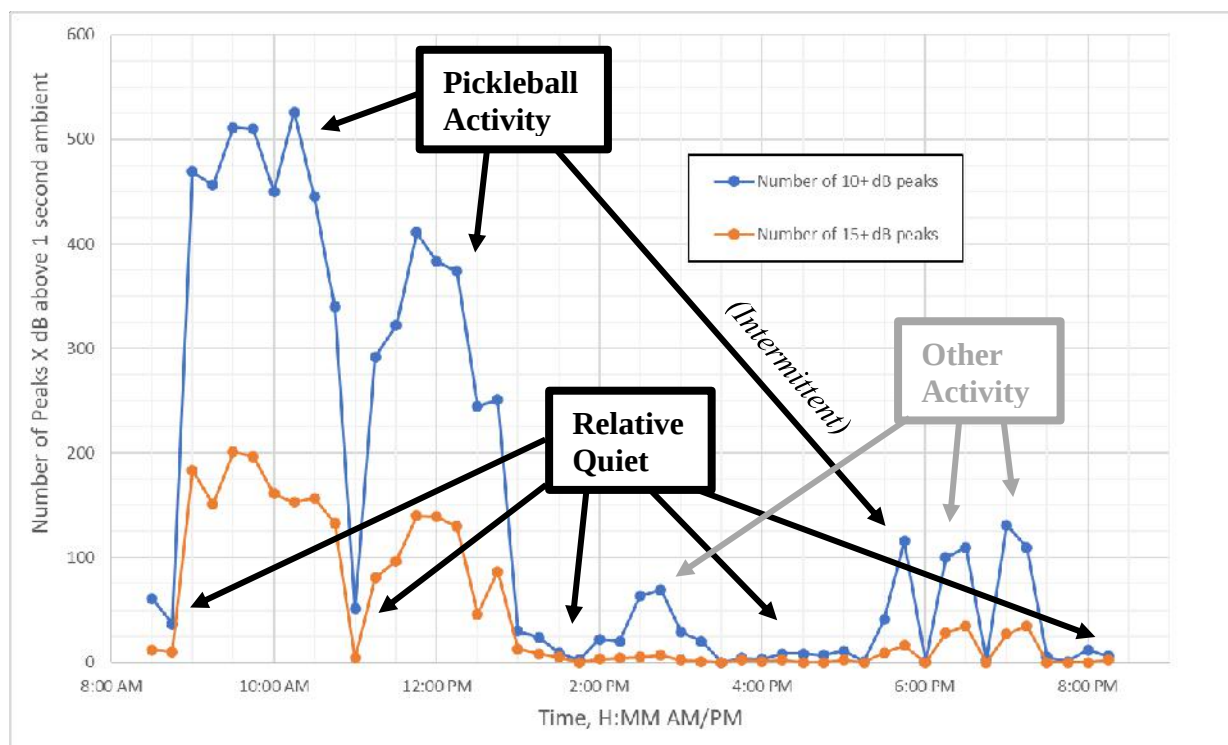


Figure 5: Number of Peaks 10 & 15 dB above 1 second Ambient at LT1 in 15-minute Intervals

Although the trends in Figure 5 are similar to the 5-minute LA_{eq} intervals shown in Figure 3, with the highest values during pickleball activity and the lowest values during relative quiet, the correlation between value and activity is much stronger, and the implications are much more severe. From 9:00 to 11:00 AM, the average amount of 10 dB peaks above ambient per 5-minute interval is over 460, which is roughly equivalent to a peak every two seconds. From 11:15 AM to 1:00 PM, the value average is a bit lower around 325 per interval, which is about one peak every three seconds.

Figure 6 shows a similar plot for the two supplemental long duration measurement locations. The trends are very similar, although there are more peaks during all activities, as both locations were near the property line and closer to the pickleball courts LT1.

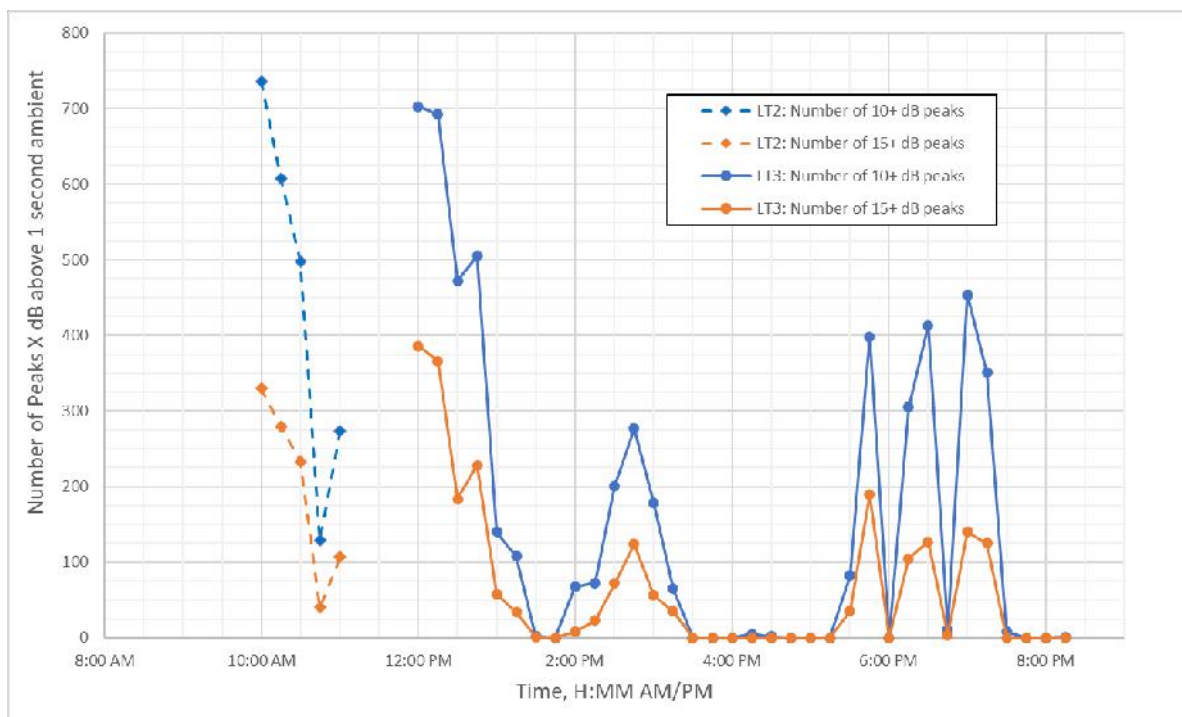


Figure 6: Number of Peaks 10 & 15 dB above 1 second Ambient at LT2 & LT3 in 15-minute Intervals

The point of this analysis is not to state that any number of peaks is bad. Periods of non-pickleball activity show peak counts ranging from 60 to 130 peaks per interval at LT1, or one peak per 9 to 15 seconds. These noise sources (tennis, basketball, etc.) are plainly audible at LT1, but quantitatively do not cause nearly as much annoyance to the residence as the noise from pickleball. Rather, in a relative sense, high pickleball activity exhibits 4-10 times as many 10+ dB peak events above ambient (i.e. exceeds MADEP Noise Policy quantitative criteria) as other measured activities, and 6-40 times as many 15+ dB events at the LT1 location.

It should be noted that some of the peaks included in this analysis were inevitably not from pickleball or other court-related activity. Events such as dog barks and car door slams were noted to happen on occasion and were not excluded from the data set.¹ However, the larger point is that the number of peaks increase significantly during times of high pickleball activity.

4.3 Short Duration Results

A limited number of short duration measurements were also taken at residences further away from the pickleball courts for comparison with the long duration measurements detailed above. Figures 7, 8, and 9 present 0.1-second LA_{eq} time histories over different 1-minute durations for

¹ No events were excluded in the analysis. NCE was onsite for multiple hours throughout the measurement period and observed very few impulsive sounds that were not directly due to activity on the courts. These occasional events are considered insignificant in the overall analysis.

ST1, ST2, and ST3 respectively. High pickleball activity was present during each of these time periods.

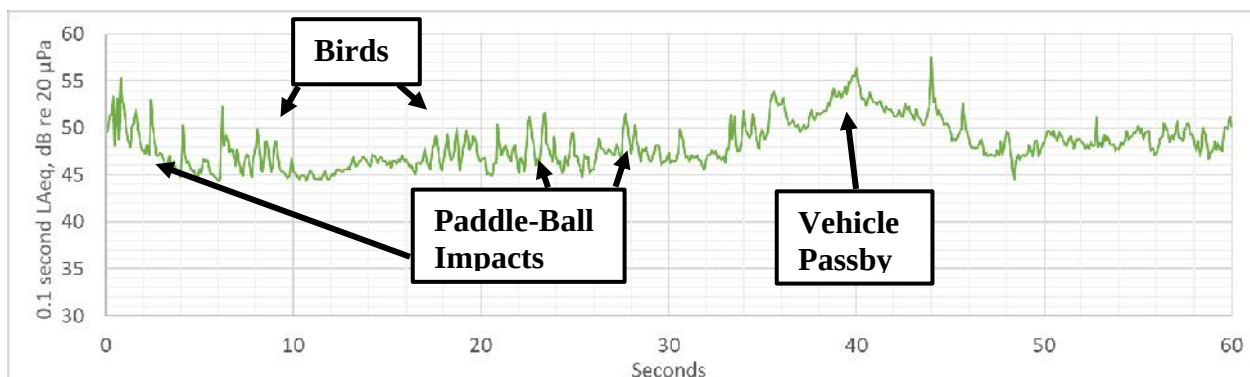


Figure 7: 60-second LA_{eq} Time History in 0.1-second intervals at 9:59 AM, ST1 (250 ft)

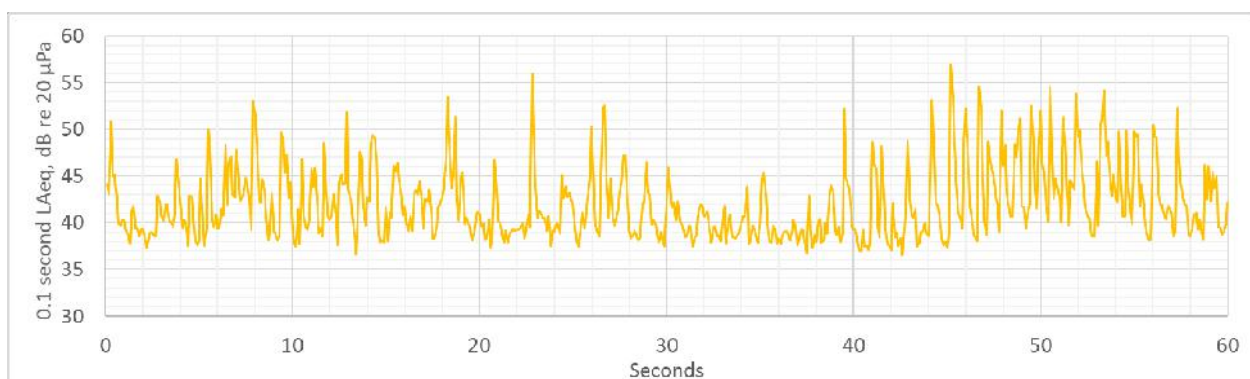


Figure 8: 60-second LA_{eq} Time History in 0.1-second intervals at 9:43 AM, ST2 (175 ft)

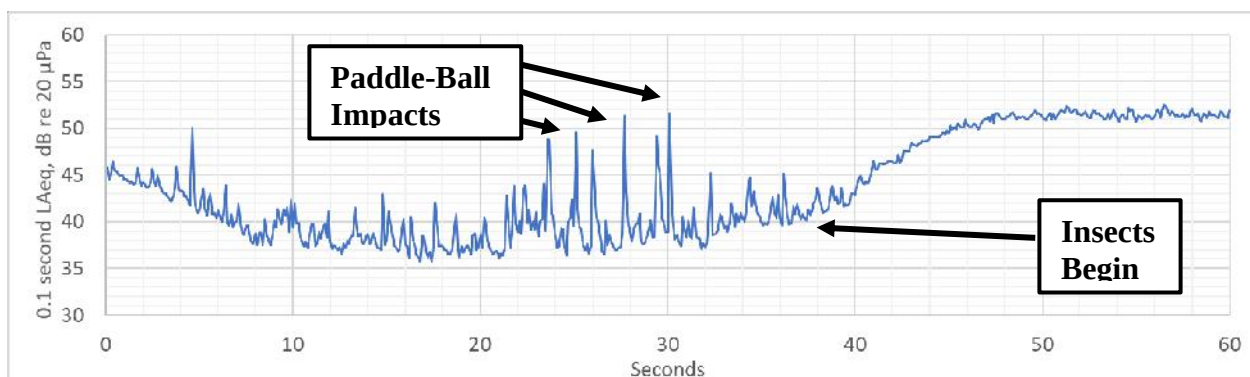


Figure 9: 60-second LA_{eq} Time History in 0.1-second intervals at 9:32 AM, ST3 (350 ft)

The LA_{eq} time history amplitude in Figure 7 mostly stays between 45 and 50 dB(A), with the exception of a passing vehicle between 30 and 50 seconds which raises the ambient an additional 5 dB. Paddle-ball impacts are detectable in the figure as 3-5 dB peaks before the vehicle pass-by, along with similar peaks from nearby birds. These are both masked during the vehicle pass-by.

Additionally, nearby electrical machinery¹ in temporary operation appears to be controlling the lower end of the levels, keeping them at 45 dB(A) and above. With this machinery off, these same paddle ball peaks would likely be of similar prominence to the peaks in Figure 9, which reach similar absolute levels at 51 dB(A).

In contrast, the background level for the measurement at ST2 is 5-8 dB lower than the ST1 measurement. Additionally, nearly all of the peaks visible in Figure 8 are from paddle-ball impacts, and they often have maxima over 10-15 dB above the 1-second ambient. ST2 is also closer to the courts than the other short duration measurement locations, which, along with the relatively direct propagation path to ST2, explain why the maximum are regularly 5 dB or more higher than the other two short duration measurements.

Lastly, the measurement at ST3 (Figure 9) illustrates how background levels can ebb and flow, alternately masking and revealing noise propagating from the pickleball courts. Between 10 and 30 seconds, the background level is relatively low at 36 to 39 dB(A). From 20 to 30 seconds, a number of large paddle-ball impact peaks are plainly audible and show up clearly in the figure. Some of these peaks are over 10 dB above the 1-second ambient, reaching maxima as high as 52 dB(A). However, shortly after this, insect noise starts to crescendo, reaching 51-52 dB(A) by 50 seconds. Although paddle-ball impacts could still be heard faintly during this period, they were temporarily masked by the intermittent insect noise.²

As detailed in Table 1, all three short duration locations were greater than 150 feet away from the pickleball courts. Paddle-ball impacts show up at each of the sites, and although they reach different peak levels and levels above ambient, impacts were subjectively assessed to be plainly audible during all three measurements. Additionally, both ST2 and ST3 had multiple impacts within the 1-minute measurement period with peaks more than 10 dB above the 1-second ambient, and ST1 would likely record similar peaks at times with lower ambient levels (i.e. without nearby running machinery). Therefore, the short duration measurements show that noise from the pickleball court is out of compliance with the MADEP Noise Policy quantitative criteria at locations as far as 300 feet away.

4.4 Tonal Analysis

The second part of the MADEP Noise Policy defines a tonal criteria where an excess is considered to be present if the level in one octave band exceeds its two neighboring octave bands by 3 dB or more (Section 2.0). Although paddle-ball impacts during pickleball do not generate whistle-like tones at a single frequency, they do generate band-limited noise, typically within the 500 or 1000 Hz octave bands.³ During many impacts, the level in one of these bands exceeds the two neighboring octave bands, thus violating the MADEP quantitative tonal criteria. Figure 10

¹ The exact source of this noise was not able to be identified. However, the noise was noted not to be present at other times during measurement period on 7/24/2021

² Insect noise is dependent on seasonal factors as well as time of day and was noted to intermittently come and go during the measurement period.

³ This criteria essentially applies to sounds that are distinctive due to their frequency content and are not masked by other sounds at similar overall levels.

illustrates an example impact where this violation occurs in the 1000 Hz octave band. Immediately before the impact, there is no peak in the 1000 Hz band, whereas during the impact, the amplitude of this band exceeds the two neighboring octave bands by over 5 dB.

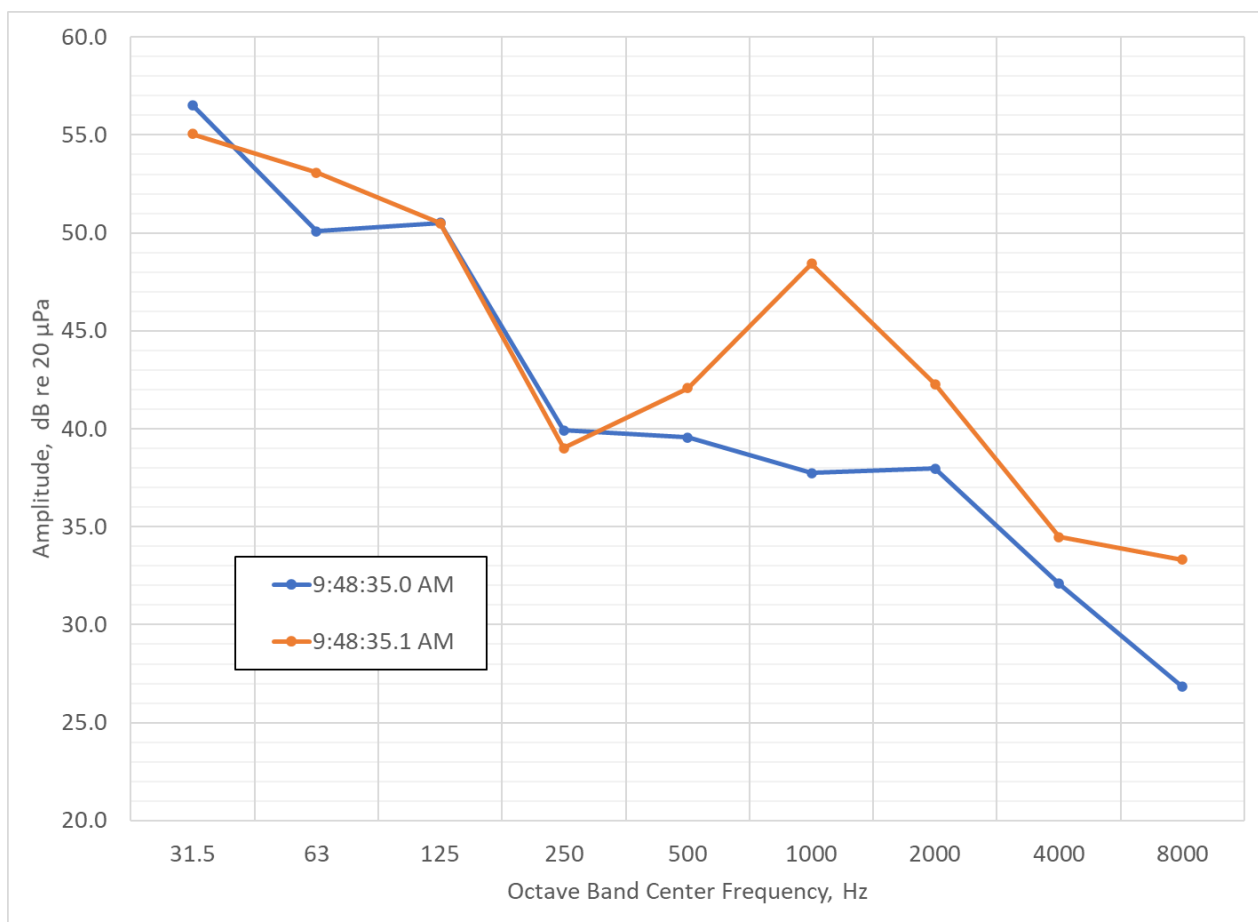


Figure 10: Octave Band Spectra Immediately Before and During Paddle-Ball Impact, Illustrating Failure to meet the Tonal Requirement

5.0 POTENTIAL MITIGATION

As understood within this study, noise from the pickleball courts at Lawrence Middle School does not comply with the MADEP Noise Policy quantitative criteria and is possibly also in violation of Section 150-1 of the Town of Falmouth Code. If feasible, the simplest solution to these noise excesses would be to move or close the pickleball courts. However, if this cannot be done as a permanent solution, it is likely prudent to temporarily close the courts until an alternative solution can be implemented.

If the courts cannot be closed or relocated, the next best option would be to implement noise controls around the perimeter of courts. The most robust option would be to construct noise barriers at these locations. These can be purchased prefabricated from vendors or built, and should typically have a surface density of at least 4 pounds per square foot and be constructed without any opening or gaps in the barrier material or between the barrier and its foundation. The height should at least break the line of sight between players on the court and residential outdoor

land use areas on neighboring parcels. A further study could also be performed to optimize the barrier height in order to minimize material cost.

Barriers will not cause the pickleball noise to disappear. However, if 6 or more dB of reduction could be achieved, then the large amount of 10+ dB peaks above ambient could be notably reduced.

It will likely not be feasible to build barriers tall enough to shield the second-story windows at 75 Lakeview Street from court noise. If this is the case, it may be pertinent to evaluate the current performance of the windows within line-of-sight of the courts. If they are deemed insufficient to block out the noise from pickleball, then it may be necessary to replace them with higher STC windows.

6.0 CONCLUSION

The most significant cause of noise from pickleball is the impact of the ball on the paddle. This noise is impulsive, lasting only for a fraction of a second. As a result, the relationship of these impulses to an existing ambient level cannot be properly quantified by measuring over an extended interval of time, since the level of the impulse gets reduced through averaging over time scale significantly longer than the impulse itself.

Therefore, to compare representative levels of these impacts with an appropriate ambient level, 0.1 second LA_{eq} time histories were captured as part of every measurement taken. This revealed that at least 4-8 times more peaks in violation of the MADEP Noise Policy quantitative criteria occur during high pickleball activity than any other measured activity. This is on the order of one occurring every 2 to 3 seconds during high pickleball activity. By contrast, periods of relative quiet had almost none of these peaks.

Additionally, example impacts have been found that fail the MADEP quantitative tonal criteria.

Measurements and subjective observation at more distant locations also show that the pickleball noise could potentially be in violation of Section 150-1 of the Town of Falmouth Code as well.

The simplest solution to solve these excesses would be to close or relocate these pickleball courts. Barring that, noise barriers could be installed around the perimeter, along with improvements to any windows that are too high for the barrier to shield.

EXHIBIT 3



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The Form and Function of Sound

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Pickleball Noise Assessment

Lawrence Middle School

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R. 0, May 6, 2022

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1. Summary

This is a supplemental report documenting additional data analysis performed on acoustical measurements made by Noise Control Engineering on July 24, 2021 of pickleball courts at the Lawrence Middle School in Falmouth, Massachusetts [Weiss]. This analysis uses the methodology of ANSI S12.9 Part 4 to assess the noise impact in terms of annoyance from the impacts between the pickleballs and paddles as measured on an adjacent residential property. This type of analysis provides a more accurate assessment of the community response to impulsive sound.

Noise impacts from the pickleball courts are found to be significant and the buffer distance between the courts and adjacent residential properties insufficient for mitigation using a sound wall system or fence cover.

2. Characteristics of Pickleball Sound

Spendiarian & Willis has prepared many noise abatement plans for pickleball courts. This chapter summarizes some of the knowledge gained over the years of working with this sound source.

The main concern in regard to noise from the pickleball courts is the sound produced by the impact of the hard plastic ball on the paddles. This sound is characterized by a sudden onset and brief duration, thus classifying it as impulsive sound. The spectral content of the paddle impact is narrowband with a center frequency typically between 1,000 and 2,000 Hertz. This is near the most sensitive frequency range of human hearing.

2.1 Comparison of Pickleball to Other Activities

There is a common misconception that pickleball is acoustically equivalent to tennis, volleyball, or many of the other activities typically found at outdoor recreation centers and parks. Numerous news articles covering disputes over pickleball noise, many of which originate when existing tennis courts are converted to pickleball, demonstrate that this is not the case:

- Sheets, Connor, "Pickleball noise is fueling neighborhood drama from coast to coast." Los Angeles Times, Los Angeles, California. March 3, 2022. <<https://www.latimes.com/california/story/2022-03-03/pickleball-noise-fueling-neighborhood-drama>>
- Adler, Erin, "Apple Valley neighbors in a pickle over pickleball noise." Star Tribune, Minneapolis, Minnesota. March 27, 2019. <<http://www.startribune.com/apple-valley-neighbors-in-a-pickle-over-pickleball-noise/507726242/>>
- Bartel, Mario, "Pickleball banished from Port Moody court after neighbours complain of rising stress, anxiety." The Tri-City News, Coquitlam, British Columbia, Canada. April 24, 2021. <<https://www.tricitynews.com/local-sports/these-games-are-loud-port-moody-pickleball-neighbours-revolt-against-rising-stress-anxiety-3662369>>
- City of Lakewood, "Green Mountain Courts Closure." <https://www.lakewoodtogether.org/pickleball/news_feed/green-mountain-courts-update>
- Higgins, Sean, "No vote on residential pickleball until city adopts new land management code." KPCW News, Park City, Utah. January 27, 2022. <<https://www.kpcw.org/park-city/2022-01-27/no-vote-on-residential-pickleball-until-city-adopts-new-land-management-code>>

- Maryniak, Paul, "Pickleball lights plan puts two HOAs at loggerheads." Ahwatukee Foothills News, Tempe, Arizona. November 29, 2017. <https://www.ahwatukee.com/news/article_9056a946-d48e-11e7-9838-8b69fb2d50b2.html>
- Bottemiller, Kitty, "Too loud! Pickleball noise upsets neighbors." Green Valley News, Green Valley, Arizona. August 28, 2013. <https://www.gvnews.com/news/local/too-loud-pickleball-noise-upsets-neighbors/article_542c2aac-0f91-11e3-acdc-0019bb2963f4.html>
- Clay, Joanna, "Woman sues Newport Beach over pickleball noise at park near her home." Orange County Register, California. April 7, 2016. <<https://www.ocregister.com/2016/04/07/woman-sues-newport-beach-over-pickleball-noise-at-park-near-her-home/>>
- Wheatley, Mike, "Noisy pickleball courts cause upset with homeowners." Realty Biz News. March 15, 2022. <<https://realtybiznews.com/noisy-pickleball-courts-cause-upset-with-homeowners/98768719/#:~:text=In one lawsuit in Newport Beach%2C Calif.%2C a,are causing them less enjoyment of their home.>>
- Lazaruk, Susan, "Pickleballers face off with residents over noise in Metro Vancouver." Vancouver Sun, Toronto, Ontario, Canada. February 2, 2022. <<https://vancouversun.com/news/local-news/pickleballers-face-off-with-residents-over-noise-in-metro-vancouver>>
- Shanes, Alexis, "Village in a pickle: How Ridgewood plans to tone down the pickleball court noise." northjersey.com, California. January 16, 2020. <<https://www.northjersey.com/story/news/bergen/ridgewood/2020/01/16/ridgewood-nj-pickleball-noise-reduction-measures/4480463002/>>
- Monterey Herald Staff, "Pickleball noise controversy goes before city leaders Pacific Grove neighbors object to game at nearby tennis courts." The Mercury News, California. September 19, 2019. <<https://www.mercurynews.com/2019/09/19/pickleball-noise-controversy-goes-before-city-leaders/>>
- Fraser, Patrick and Rodriguez, Ambar, "What to do about constant pickleball noise?" WSVN 7 News Miami, Miami, Florida. March 27, 2019. <<https://wsvn.com/news/help-me-howard/what-to-do-about-constant-pickleball-noise/>>
- Sutphin, Daniel, "Nixing the noise: Sound fence construction underway at Gilchrist pickleball courts." Port Charlotte Sun, Charlotte Harbor, Florida. May 20, 2019. <https://www.yoursun.com/charlotte/news/nixing-the-noise-sound-fence-construction-underway-at-gilchrist-pickleball/article_79a764de-7b1c-11e9-b4d4-6bcaa919f3f3.html>
- Corrigan, James, "York residents complain noise from pickleball club is hurting quality of life." WMTW News 8, Portland, Maine. November 16, 2021. <<https://www.wmtw.com/article/york-residents-complain-noise-from-pickleball-club-is-hurting-quality-of-life/38271921>>

It should be clear from the above list of references that pickleball constitutes a significant change in the acoustic environment of the area surrounding the courts in comparison to tennis and must be planned for accordingly. In particular, the impulsive sound produced by the impact of the hard plastic ball on the paddle can cause significant noise impact for those living near the courts.

2.2 Effects of Impulsive Sound

Persistent impulsive sounds create annoyance because they are similar to sounds that contain important information about our environment such as footsteps, a door opening, a tap at the window, or speech. We are sensitive to these types of sounds because they alert us to events occurring nearby that we may need to respond to. Continuous false alarms such as the popping sound created by pickleball paddle impacts make it difficult to relax, concentrate, or sleep soundly without disturbance as each time a pop is heard it draws the attention, creating distraction.

While it is well known that high amplitude acoustical pressures can cause hearing impairment as well as other types injury to the body, lower amplitude sound can also have adverse long term physiological effects. The World Health Organization recognizes that low level noise exposure has measurable health effects.

Sound/noise is a psychosocial stressor that activates the sympathetic and endocrine system. Acute noise effects do not only occur at high sound levels in occupational settings, but also at relatively low environmental sound levels when, more importantly, intended activities such as concentration, relaxation or sleep are disturbed. [WHO p. 61]

The sympathetic nervous system is part of the autonomic nervous system and is involved in the body's fight or flight arousal response. Chronic activation of the sympathetic system leads to stress, fatigue, and anxiety.

In addition to nervous system activation, sleep disturbance from noise can involve difficulty in falling asleep as well as awakenings that occur during sleep. Frequent awakenings lead to sleep fragmentation. This disrupts the normal stages of sleep and may lead to further neurocognitive manifestations not limited to daytime tiredness, loss of concentration, morning confusion, irritability, anxiety, and depression. [WHO p. 48, 26]

Environmental noise also has implications for the cardiovascular system, metabolism, and homeostasis, the ability of the body to regulate itself.

The auditory system is continuously analyzing acoustic information, which is filtered and interpreted by different cortical and subcortical brain structures. The limbic system, including the hippocampus and the amygdala, plays an important role in the emotional processing pathways. It has a close connection to the hypothalamus that controls the autonomic nervous system and the hormonal balance of the body. Laboratory studies found changes in blood flow, [blood pressure] and heart rate in reaction to noise stimuli as well as increases in the release of stress hormones... Acoustic stimulation may act as an unspecific stressor that arouses the autonomic nervous system and the endocrine system... The arousal of the sympathetic and

endocrine system is associated with changes in the physiological functions and the metabolism of the organism, including [blood pressure], cardiac output, blood lipids (cholesterol, triglycerides, free fatty acids, phosphatides), carbohydrates (glucose), electrolytes (magnesium, calcium), blood clotting factors (thrombocyte, aggregation, blood viscosity, leukocyte count) and others. In the long term, functional changes and dysregulation may occur, thus increasing the risk of manifest diseases. [WHO p. 62-63]

The effects of stress can take many forms as seen above. Low level noise exposure that disturbs sleep and concentration are known to produce a range of diagnosable illnesses and disorders.

2.3 Acoustical Characteristics

The sound produced by the impact between a pickleball and paddle is characterized by a rapid onset and brief duration, typically on the order of two milliseconds (0.002 seconds) for the direct path sound. This classifies it as impulsive sound. Figure 2.1 shows a time trace of a pickleball paddle impact measured near Phoenix, Arizona. The main part of the direct sound impulse can be seen to be less than two milliseconds followed by a rapid decay and some later reverberant arrivals.

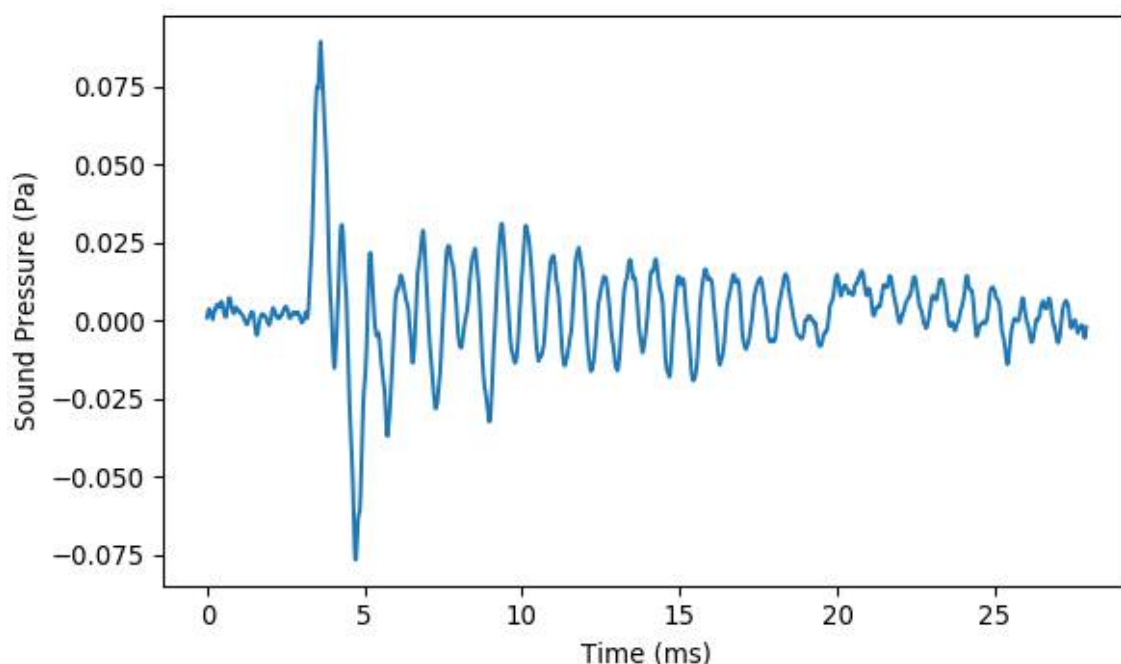


Figure 2.1. Pickleball Paddle and Ball Impact Sound Pressure Trace
1 millisecond (ms) = 0.001 seconds.

The spectral content of the paddle impact is narrowband with a center frequency typically between 1,000 and 2,000 Hertz (see Figure 2.2). Although it does not meet most guidelines for tonal prominence such as Annex C of ANSI S12.9 Part 4 or ANSI S1.13, it does impart a vague sensation of pitch similar to a wood block percussion musical instrument. The radiation pattern of the paddle is more or less a dipole, i.e. the sound from the front and back of the paddle is of opposite polarity and cancels itself in the plane of the paddle. Therefore, orienting the courts so that the direction of play faces away from noise sensitive areas can provide some attenuation.

The sound power spectrum of the pickleball and paddle impact has two basic shapes depending on how the ball is hit. Figure 2.2 and Figure 2.3 show the power spectra of a 'sharp' hit and a 'dull' hit. The curves are not calibrated for absolute level, but can be compared relatively.

The sharp hit spectrum shows a narrowband signature. The frequency of the peak typically varies between 1,000 and 2,000 Hz. The energy in the dull hit is more spread out, but still peaks between 1,000 and 2,000 Hz.

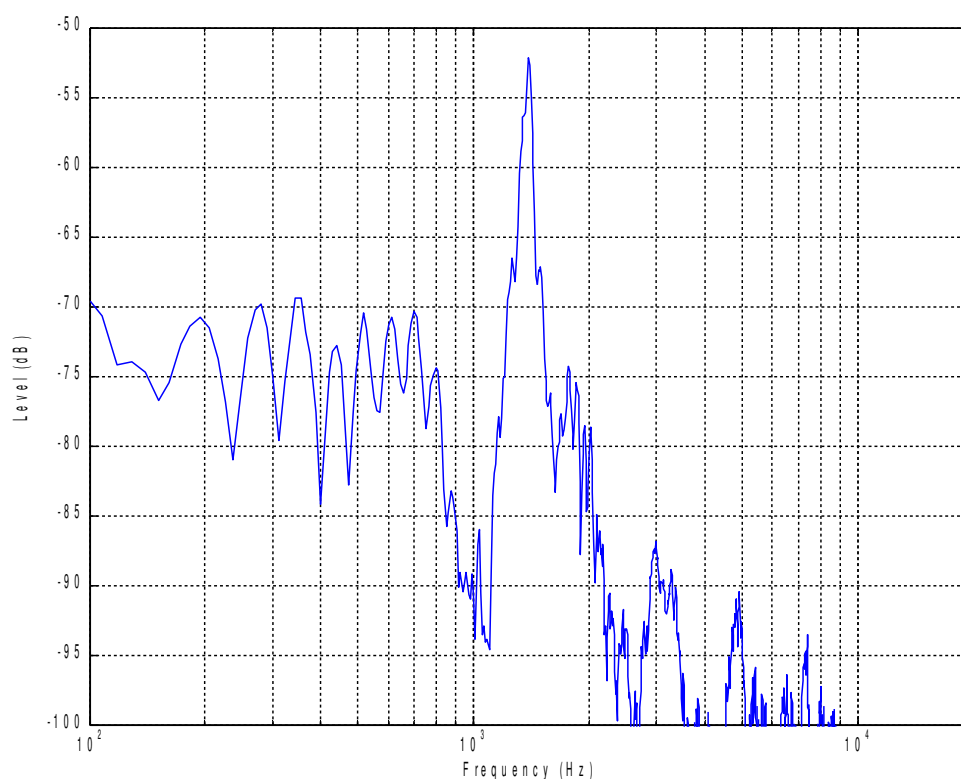


Figure 2.2. Spectral Response of a Sharp Hit

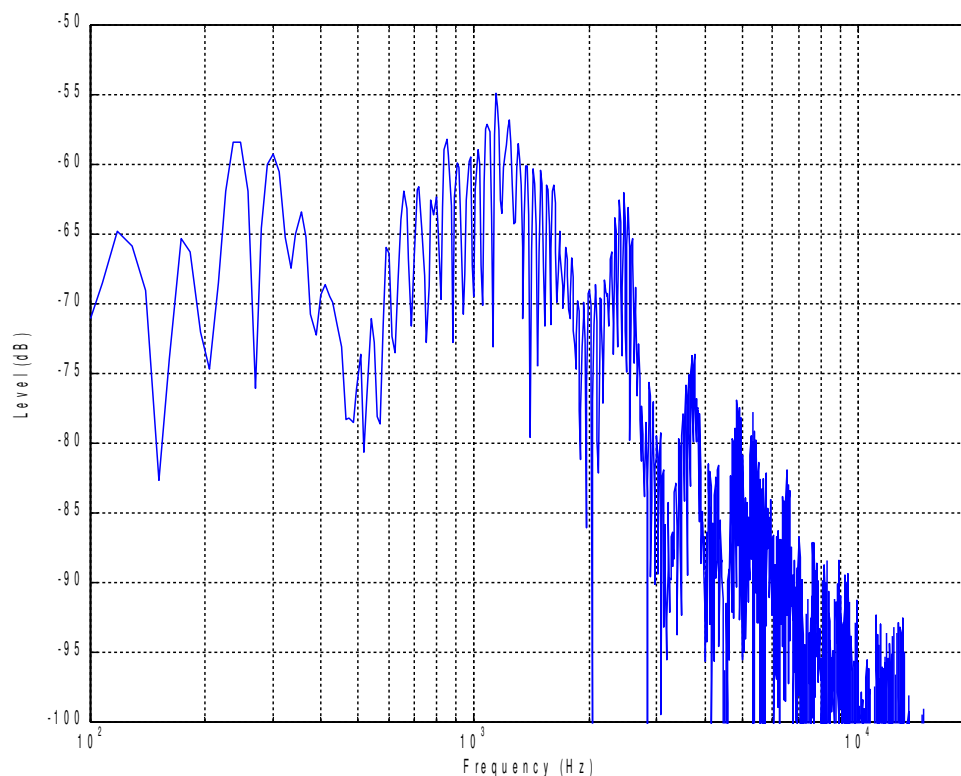


Figure 2.3. Spectral Response of a Dull Hit

A sound wall design will require effective attenuation in the 1,000 Hz octave band and above. In most applications, any material having a sound transmission class meeting STC 20 can be used to construct a sound wall or fence for pickleball provided best practices for sound barrier construction are followed.

2.4 Measuring Pickleball Sound

Due to the short duration of the impact, averaging sound pressure level metrics such as equivalent-continuous level (Leq), maximum fast exponential time weighted level (Lmax), and impulse time weighting (LAI) fail to accurately represent the perceived loudness and annoyance of the paddle impact and impact processes in general. The fast exponential time weighting filter is a first order lowpass filter with a 125 millisecond time constant applied to the square of the acoustic pressure waveform. If a tone burst is applied to the squaring circuit and filter, after two milliseconds the filter output will only rise to a level that is 18 dB lower than the equivalent-continuous sound pressure level of the input signal. Because the short impulse is being significantly attenuated by the averaging in the sound level meter, in practice it is generally not possible to distinguish pickleball paddle impacts from the background noise when measuring

Leq or Lmax even though the paddle impacts may be identified by a listener as the primary sound source. To get a better correlation with the actual response of the surrounding community to this type of sound, metrics with a shorter time scale are needed.

The paddle impact sound pressure level is better represented by a combination of peak sound pressure level and sound exposure level (SEL). Using the sound exposure level involves windowing the measured sound pressure in time to include only the paddle impact and reflections from nearby surfaces as seen in Figure 2.1. The equivalent-continuous sound pressure level of the windowed impact is then normalized to the length of the window giving a representation of the energy in the impact alone. Appropriate adjustments for impulsive sounds can then be applied to the impacts as described next.

Most acoustical standards for sound pressure levels with regard to compatible land use provide adjustment factors for different types of sound, e.g. impulsive, tonal, time of day, etc. Each of these categories of sound produces different levels of community impact and annoyance due to their temporal or spectral characteristics in comparison to a broadband sound that does not vary in level or frequency content with time. The purpose of the adjustment factors is to normalize these types of sound to a neutral broadband sound pressure level so that they can be reasonably compared to a defined sound pressure level limit or the background noise level.

ANSI S12.9 Part 4 and ISO 1996 Part 1 give criteria for assigning adjustment factors to a variety of impulsive sounds. Sounds produced by impact processes are typically classified as ‘highly impulsive’ due to their high onset rates and assigned a 12 dB adjustment. Experience has shown that pickleball paddle impacts should be adjusted as highly impulsive sounds in order to set appropriate performance goals for abatement treatments. Inadequate abatement treatment may lead to ongoing complaints, strained relations with neighbors, legal action, the need for continued involvement on the part of authorities, retrofitting, and possibly demolition costs to improve the abatement later.

2.5 Problems with Exponential Time Weighting

Fast exponential time weighting is often recommended for assessing impulsive sound. For highly impulsive sounds having short durations this metric does not work well. When the averaging time of the time weighting is longer than the duration of the impulse, the impulse is in the stopband of the filter. In other words, the time weighting is filtering out the impulsive sound source being measured.

Figure 2.4 demonstrates the filter response to a burst of sound just long enough to achieve a reasonably accurate reading within 0.5 dB of the true sound pressure level. The red curve represents the envelop of a burst of sound 0.277 seconds in duration. This is the time required for the output of the fast exponential time averaging filter (blue curve) to rise to within 0.5 dB of the actual sound pressure level of the sound burst. When the sound burst ends, the output of the exponential time averaging filter begins to decay. The peak value in the output of the fast exponential time averaging filter, after being converted to sound pressure level, is known as the Lmax level.

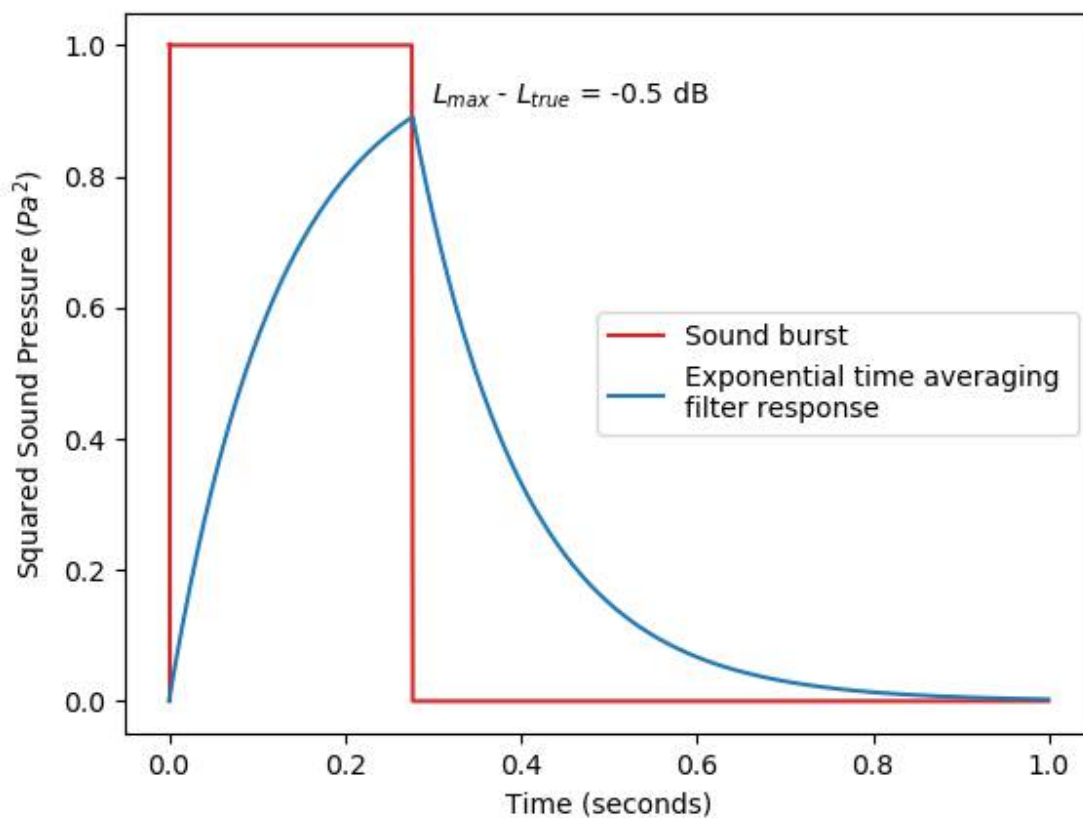


Figure 2.4. Fast Time Averaging Filter Response to a 0.277 Second Sound Burst

Figure 2.4 shows the behavior of the fast exponential time averaging filter and L_{max} when used properly. Figure 2.5 illustrates how the fast exponential time averaging filter responds to a typical pickleball paddle impact. Note that the time scale has been reduced for clarity. At the end of the 0.002 second impulse, the fast exponential time averaging filter has only had time to rise to a level that is 18 dB below the true sound pressure level of the impulse. The pickleball paddle impulse is so much shorter than the time constant of the averaging filter that the exponential curvature of the filter response is not even visible. It is clear that fast exponential time weighting, much less slow exponential time weighting, cannot be used to assess the noise impact of pickleball paddle impacts.

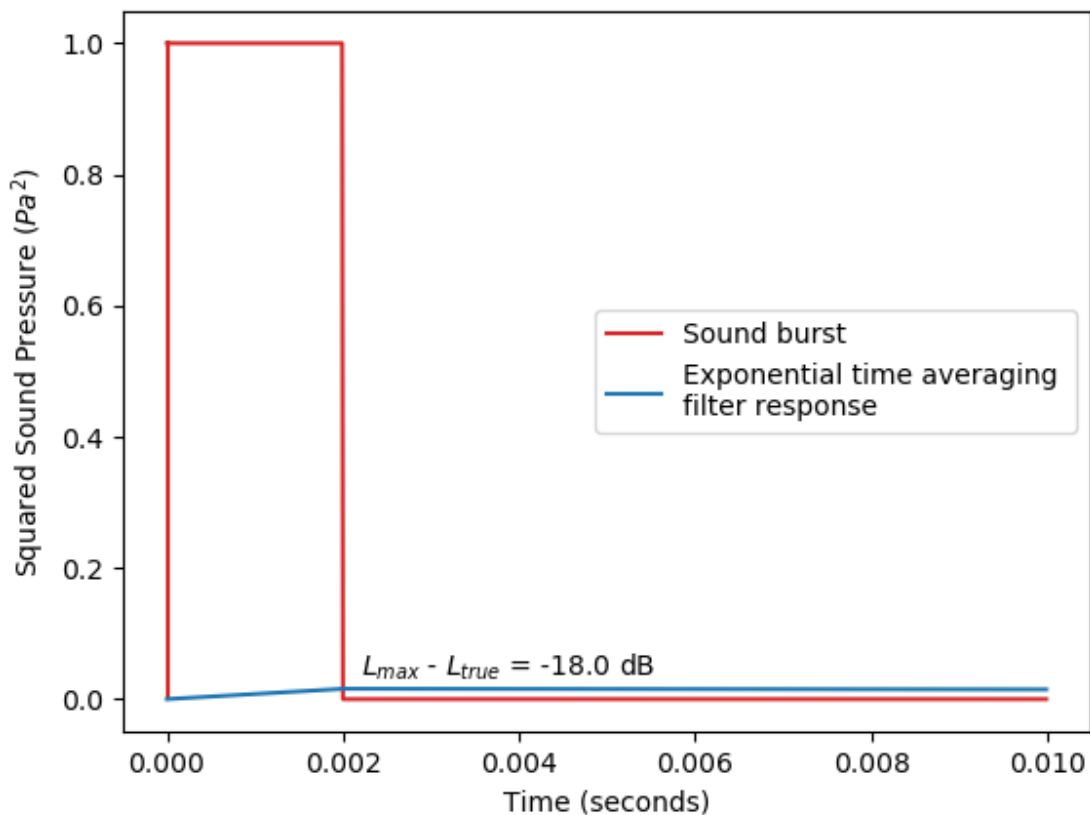


Figure 2.5. Fast Time Averaging Filter Response to a Typical Pickleball Paddle Impact

2.6 Directivity of Pickleball Courts

The impulsive sound of the paddle impacts is radiated mainly by the large, flat paddle surface. Since both faces of the paddle are connected internally by a honeycomb structure and move together in vibration, one side of the paddle will produce a positive sound pressure while the other produces a negative sound pressure similar to a loudspeaker diaphragm that is not mounted in a cabinet. The result is that these two pressure waves having opposite polarity will cancel in the plane of the paddle where the path length from each face is the same to all receiver locations. This is known as a dipole or figure eight radiation pattern.

The positions of the paddles relative to the court change with each hit; however, the object of the game is to hit the ball to the opposite half of the court. Therefore, the dipole axis of each paddle impact will be in the general direction of play and not completely random. Measurements of several pickleball facilities have shown that this results in a null depth of four to five dB. Figure 2.6 compares a typical pickleball court directivity pattern to a mathematical dipole where 0° and 180° are in the direction of play and the null is on the 90° and 270° bearings. Several decibels of attenuation can often be obtained simply by optimizing the orientation of the courts with respect to noise sensitive areas.

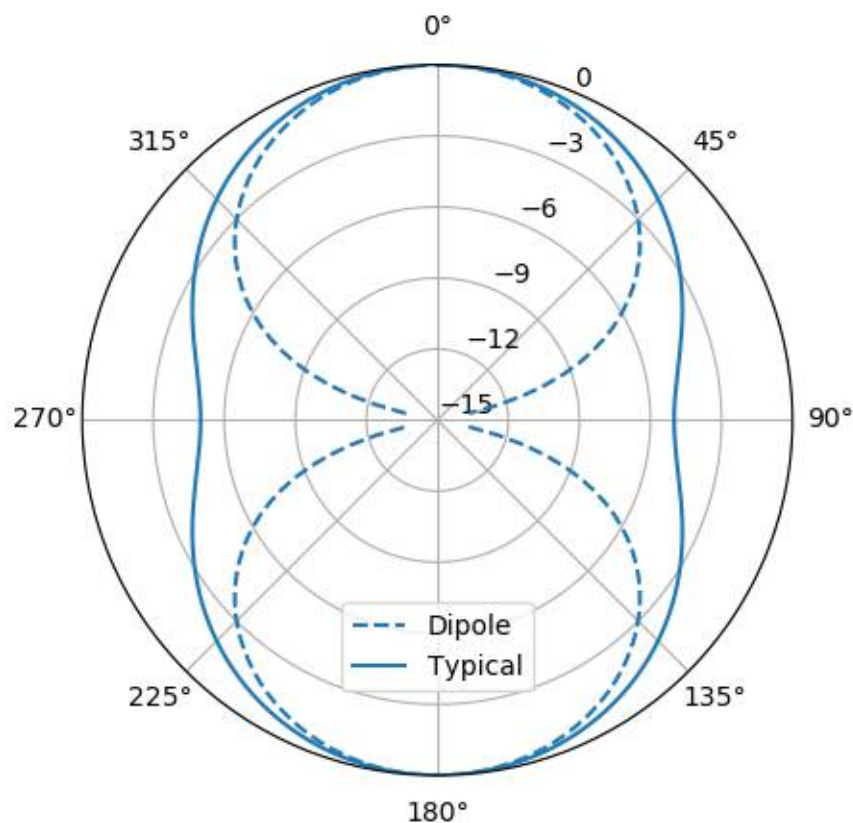


Figure 2.6. Typical Pickleball Court Directivity in Decibels

3. Data Analysis

3.1 Noise Assessment Criteria

The Falmouth Zoning Bylaw 240-110 states,

No use shall be permitted which would be offensive because of injurious or obnoxious noise... or be hazardous to the community on account of fire or explosion or any other cause. No permit shall be granted for any use which would prove injurious to the safety or welfare of the neighborhood into which it proposes to go, and destructive of property values, because of any excessive nuisance qualities.

The Bylaw does not give maximum residential sound pressure level limits, but the stated criteria are applicable at all points on the receiving properties. In order to assess the noise impact of a given sound source, a quantitative methodology is needed. The Bylaw does not specify how sound pressure levels are to be measured or which acoustical metric is to be used.

ANSI S12.9 is a national standard for quantifying annoyance caused by sound and is an appropriate method for assessing highly impulsive sound according to the criteria of offensive and obnoxious. Part 5 of the standard recommends a maximum day-night level of 55 dBA for residential areas. This translates into a 55 dBA adjusted equivalent-continuous sound pressure level limit for daytime activities.

The 55 dBA day-night level recommended in ANSI S12.9 Part 5 is based on attitudinal survey studies funded by various federal agencies. Day-night level is a 24 hour equivalent-continuous sound pressure level with a 10 dBA adjustment for nighttime hours. It works well for most transportation noise sources (community response to aircraft flyovers has been found to correlate better with maximum fast exponential time weighted level). It does not work for impulsive or tonal sound sources. Additional research was therefore funded in the 1980s and 1990s to determine adjustments for sounds with special characteristics so that they could be compared to established day-night level limits for more neutral sound sources. In 1996, this noise assessment methodology was standardized in ANSI S12.9.

3.2 Pickleball Data

Acoustical measurements were performed on the neighboring residential properties by Noise Control Engineering on July 24, 2021 [Weiss]. This analysis will focus on the data set at point LT1, 50 feet from the pickleball courts on the adjacent property to the west. This was a 12 hour measurement with a logging interval of 0.1 seconds.

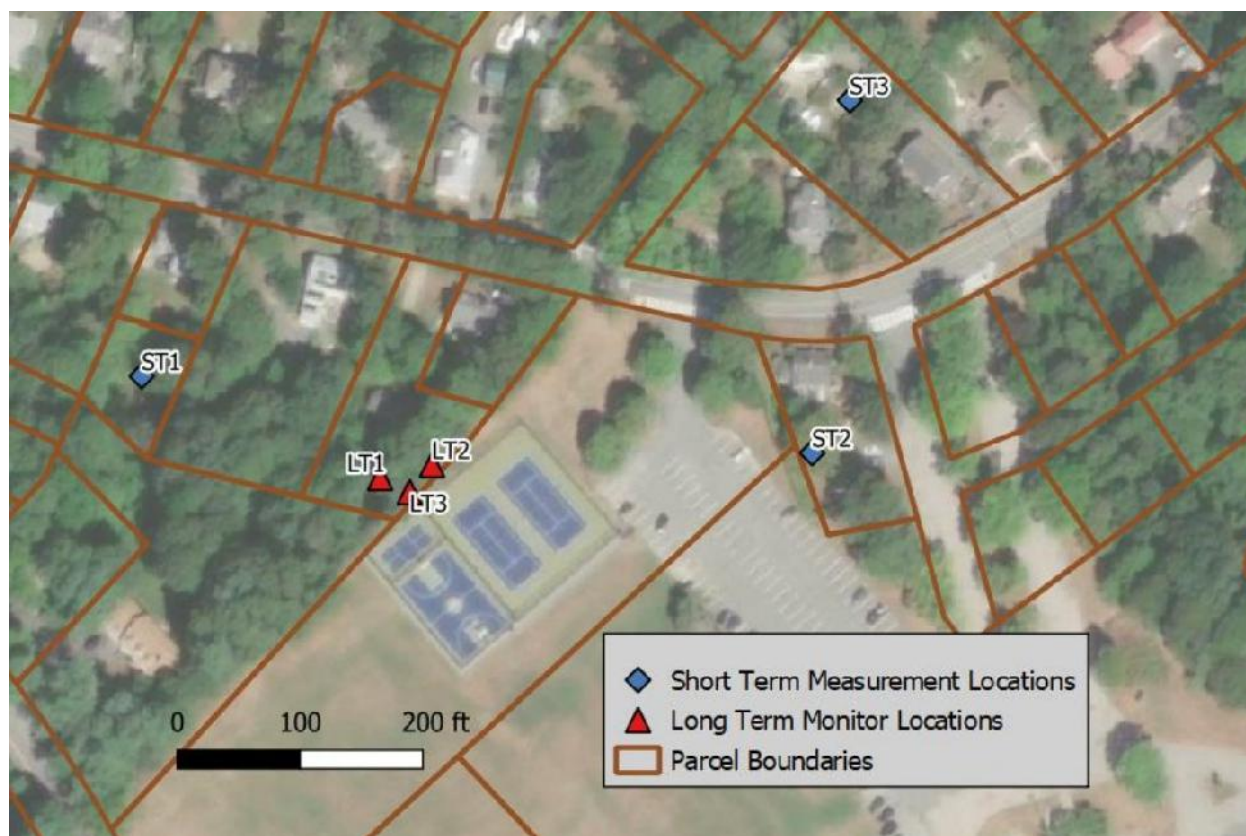


Figure 3.1. Measurement Locations [Weiss]

For the reasons described in the previous chapter, neither the equivalent-continuous nor the fast exponential time weighted sound pressure level is sufficient to provide an assessment of the short duration paddle and ball impact sounds that correlates well with the community response to this type of sound. Therefore, the methodology of ANSI S12.9 Part 4 has been selected to assess the annoyance of the sound of the pickleball paddle impacts.

Although the 0.1 second logging period is in general too long to adequately capture short duration impulsive events such as pickleball paddle impacts, it can be used to calculate sound exposure levels for the higher energy paddle impacts. Many of the lower energy events cannot be detected because of the energy spreading involved in averaging over a much longer period than the paddle impact events themselves. Based on measurements performed by Spendiarian & Willis at numerous other pickleball facilities in the southwestern United States, we expect about 12 paddle impacts per minute per pickleball court.

The measured 0.1 second data has been imported into an analysis script. This script uses a peak detector that compares each logged 0.1 second equivalent-continuous sound pressure level, $Leq100ms$, to an average over the previous five seconds, $Leq5"$. This allows paddle impact

events to be separated from the background noise. Detected peaks are those log intervals that exceed Leq_5 by 12 dBA.

ANSI S12.9 Part 4 is a noise dosage method based on adjustments for different classifications of sound such as impulsive and tonal to normalize these sources for comparison with neutral sound sources like traffic noise. Paddle impacts have been adjusted according to ANSI S12.9 Part 4 for highly impulsive characteristic (12 dB) and time of day (weekend, 5 dB).

3.3 Noise Impact Analysis

The noise impact analysis has been segmented into shorter time periods identified by NCE as having pickleball activity or relative quiet. The total time span of the measurement at point LT1 was 8:30 am to 8:30 pm.

In the figures below, the equivalent-continuous sound pressure (Leq) over 0.1 second periods is shown in blue. The five second average level is in magenta. Detected events are marked with a red asterisk above the corresponding log interval.

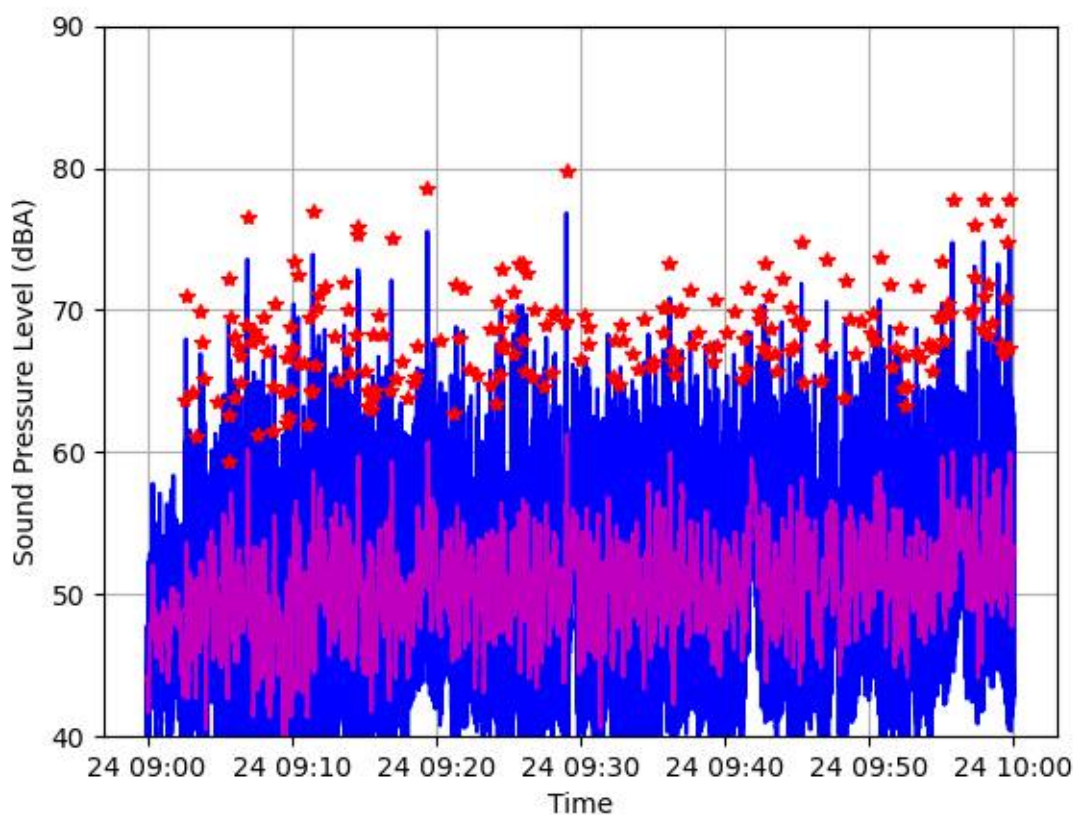


Figure 3.2. Sound Pressure Level and Paddle Impacts Events, 0900 to 1000

Pickleball activity began shortly after 9:00 am. During the hour from 9:00 am to 10:00 am (Figure 3.2) there were about three paddle impacts per minute. This is much less than the expected 12 impacts per minute for one court indicating that there is a considerable number of undetected paddle impact events.

The half hour period from 10:00 am to 10:30 am (Figure 3.3) had the highest adjusted sound pressure level at 64.8 dBA. It also had a higher paddle impact rate at 4.2 impacts per minute during the most active portion. This is still far less than expected for one court.

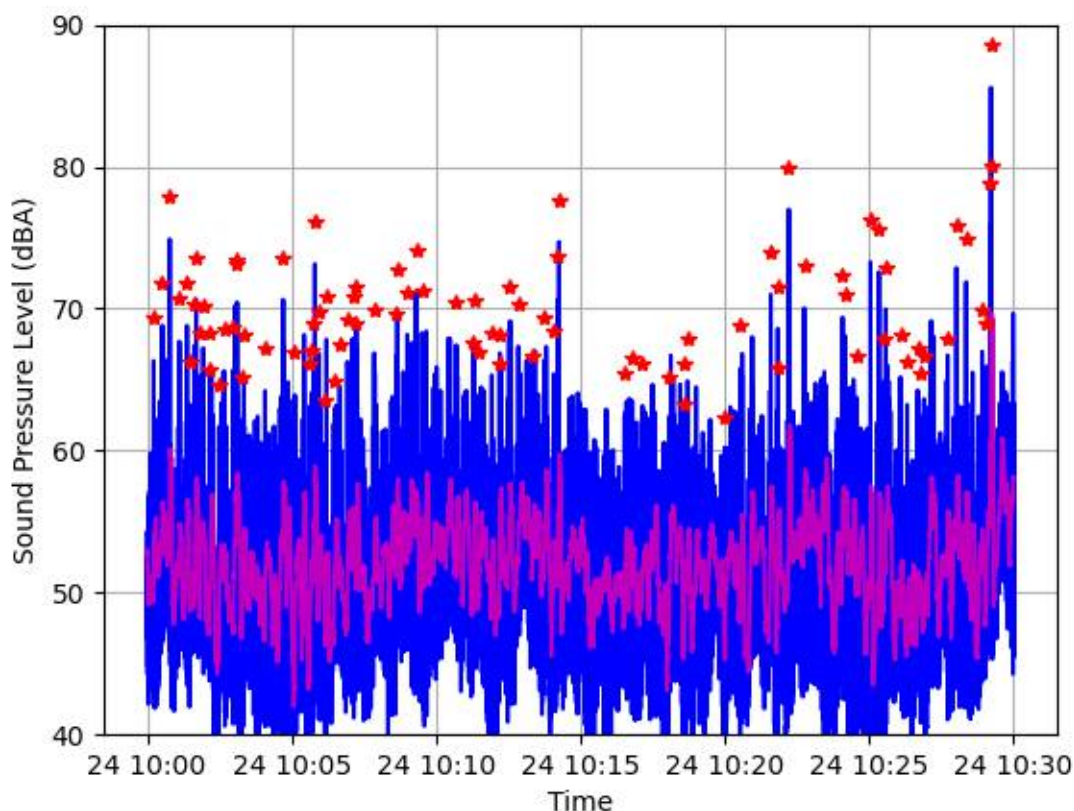


Figure 3.3. Sound Pressure Level and Paddle Impacts Events, 1000 to 1030

From 1:00 pm to 2:00 pm (Figure 3.4) there was sporadic activity. The period from 2:00 pm to 4:00 pm was similar. The adjusted sound pressure level from impulsive events was 50.2 dBA over this one hour period.

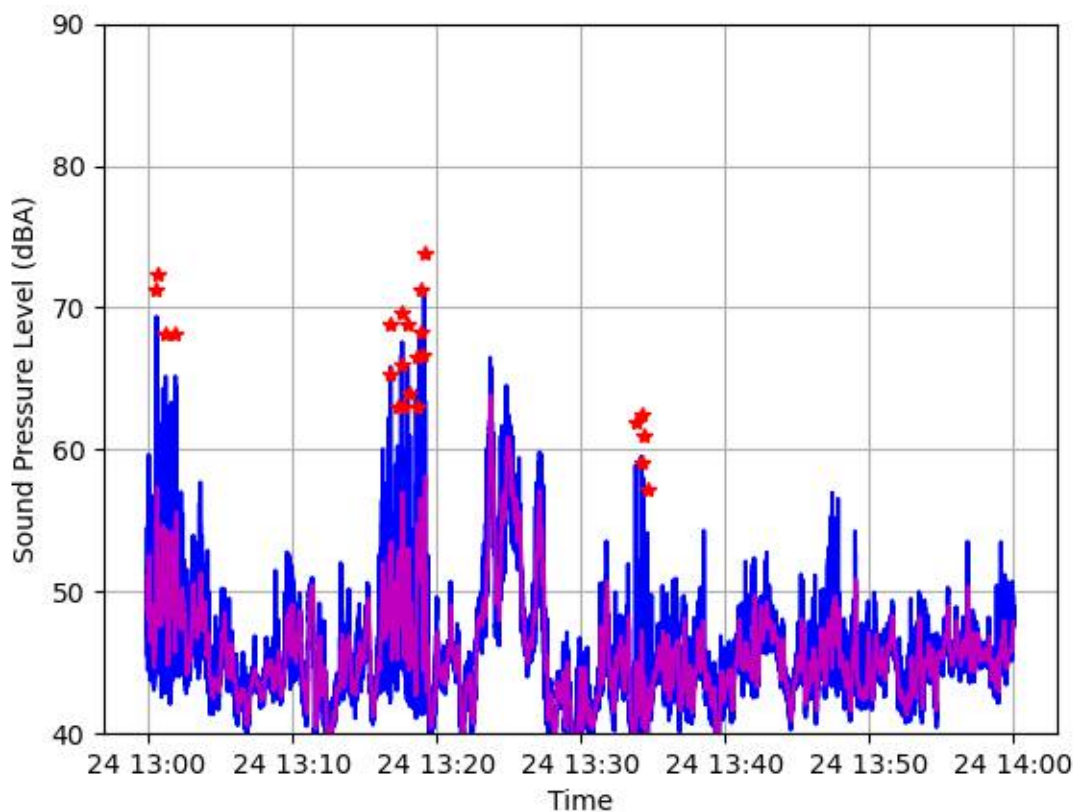


Figure 3.4. Sound Pressure Level and Paddle Impacts Events, 1300 to 1400

During the period from 7:30 pm to 8:00 pm (Figure 3.5) when there was no pickleball activity there was one impulsive event from an unknown source showing that impulsive events are not common in this area. This event was also considerably lower in amplitude than the pickleball paddle impacts.

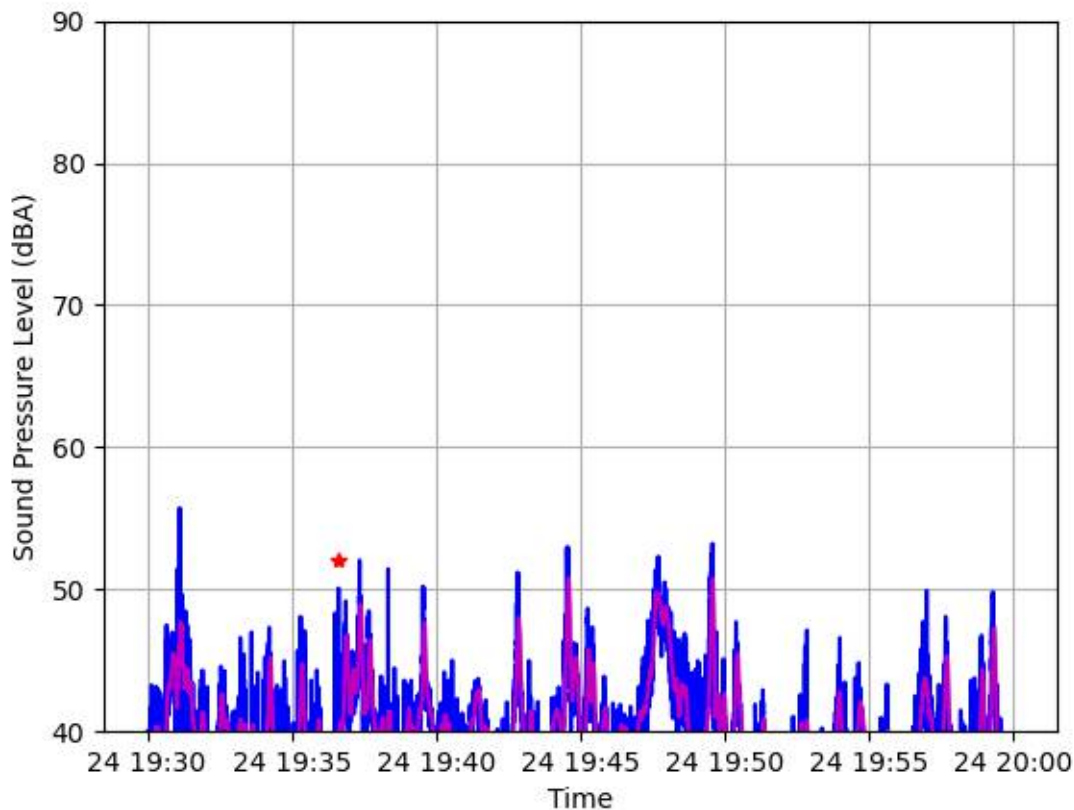


Figure 3.5. Sound Pressure Level and Paddle Impacts Events, 1930 to 2000

Table 3.1 summarizes the adjusted sound pressure levels due to impulsive events during the time periods examined.

Start	End	Adjusted Paddle Leq (dBA)	Pickleball Activity
09:00 AM	10:00 AM	61.8	yes
10:00 AM	10:30 AM	64.5	yes
11:30 AM	12:30 PM	60.4	yes
12:30 PM	01:00 PM	58.5	yes
01:00 PM	02:00 PM	50.0	sporadic
02:00 PM	04:00 PM	50.2	sporadic
07:30 PM	08:00 PM	23.5	no

**Table 3.1. Adjusted Equivalent-continuous Sound
Pressure Levels from Impulsive Events**

4. Conclusions and Recommendations

4.1 Summary of Results

The noise impact of impulsive sounds produced by pickleball courts located at the Lawrence Middle School have been analyzed using the methodology of ANSI S12.9 Part 4. Adjusted sound pressure levels near the adjacent home were found to be in the 60 to 65 dBA range during the most active periods of play.

The rate of pickleball paddle impacts was found to be in the range of 3 to 4 impacts per minute. This is much lower than the expected rate of 12 impacts per minute per court based on testing at other locations. The reason for this discrepancy is most likely the type of data available. A 0.1 second logging interval is much longer than the duration of a typical paddle impact. This will cause many of the paddle impact events to be missed by the peak detector algorithm. A more accurate assessment will require higher resolution log data or calibrated recordings of the tests.

Five active pickleball courts can be expected to produce 50 to 60 paddle impacts each minute. This means that the ANSI S12.9 adjusted sound pressure levels obtained here could underestimate the actual impact of the pickleball courts by as much as 9 to 12 dBA.

4.2 Noise Assessment

The ANSI S12.9 Part 4 assessment of the sound pressure levels at the adjacent home (point LT1 located 50 feet from the pickleball courts) found that the adjusted level reached 64.8 dBA. In order to avoid impacting the quality of life of neighbors and incurring complaints, Spendiarian & Willis has found that it is necessary to limit adjusted sound pressure levels at residential land uses to 55 dBA as recommended in ANSI S12.9 Part 5. This is not only to reduce impacts inside the home, but to preserve the ability to utilize outdoor spaces as well. The pickleball courts as tested on July 24, 2021 are having a significant noise impact on the adjacent homes.

4.3 Code Compliance

4.3.1 Falmouth Zoning Bylaw 240-110

The Falmouth Zoning Bylaws prohibit offensive and obnoxious sound. For this reason, ANSI S12.9 has been selected to quantify the annoyance caused by the impulsive sound produced by the pickleball courts. Part 5 of the standard recommends an adjusted sound pressure level limit of 55 dBA for residential land uses receiving sound. The adjusted sound pressure levels in the data from the adjacent residential site exceeds this level and will have a significant noise impact on the nearby homes.

4.3.2 DEP DAQC Policy 90-001

The Division of Air Quality Control policy states,

A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

1. Increases the broadband sound level by more than 10 dB(A) above ambient, or
2. Produces a "pure tone" condition - when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours.

The acoustical data provided by NCE [Weiss] indicates that the L90 level during pickleball activity was close to 45 dBA and, while the courts were inactive but during operating hours, between 40 and 42 dBA. This again indicates that the adjusted sound pressure level from the pickleball courts should not exceed 50 to 55 dBA.

NCE also found that the paddle impacts meet the octave band criterion for tonal sound as defined by the policy above, thus violating both criteria in the policy. The ANSI S12.9 Part 4 adjustments include only the greatest of the tonal and impulsive adjustments that apply. The 12 dB highly impulsive adjustment takes precedence over the 5 dB tonal adjustment. Therefore, only the highly impulsive adjustment has been applied.

4.4 Recommendations

4.4.1 Land Use Compatibility

Based on over 10 years of experience with pickleball noise abatement, Spendiarian & Willis does not recommend this location for open air pickleball courts as being compatible with adjacent residential land uses. Given the insufficient buffer distance and our experience at similar pickleball sites, development of an effective noise abatement plan will be difficult for this site. A 150 foot buffer distance is recommended from the pickleball courts to the adjacent residential properties so that a sound wall can provide sufficient attenuation and achieve enough height to block the line of sight to windows and decks on adjacent properties.

4.4.2 Installation of Nonporous Fence Coverings

The use of a mass-loaded vinyl or other fence covering does not meet the acoustical design goals for this application with a 10 foot fence. At this close distance a practical sound wall system cannot provide the amount of insertion loss needed to meet the target sound pressure level.

In addition, acoustical barriers must have a sound transmission class (STC) rating of at least 20 to be effective for pickleball. This is to ensure that sound goes over the barrier rather than through it. Sound attenuation blankets are made for sound absorption, but not necessarily for

sound insulation, i.e. blocking sound transmission through the blanket. Selection of the wrong blanket type (one without a core mass layer to reduce sound transmission) will not result in a meaningful reduction in noise impact on the adjacent residences.

References

ANSI S12.9-2005, *Quantities and Procedures for Description and Measurement of Environmental Sound – Part 4: Noise Assessment and Prediction of Long Term Community Response*, American National Standards Institute, 2005.

ISO 1996-1, *Acoustics - Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures*, International Organization for Standardization (ISO), 2016.

ISO 9613-2, *Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation*, International Organization for Standardization (ISO), 1996.

Schultz, T. J., “Synthesis of Social Surveys on Noise Annoyance,” *Journal of the Acoustical Society of America* v. 64, pp. 377-405, 1978.

Weiss, Zachary and Komrower, Jeff, “Pickleball Noise Measurements, Lawrence Middle School, Falmouth, MA, 7/24/2021,” *Noise Control Engineering*, August 27, 2021.

World Health Organization, *Night Noise Guidelines for Europe*, <http://www.euro.who.int>, 2009.

Appendix

A1. Glossary of Acoustical Terms and Abbreviations

A1.1 Abbreviations

AI: articulation index

ASEL: A-weighted sound exposure level

ASTC: apparent sound transmission class

dB: decibel

DNL: day - night level

FSTC: field sound transmission class

Hz: Hertz

IIC: impact insulation class

kHz: kilohertz

L_{eq}, LA_{eq}, LC_{eq}: equivalent sound pressure level

L_{max}, LA_{max}: maximum fast sound pressure level

NC: noise criteria

NIC: noise isolation class

NIPTS: noise induced permanent threshold shift

NR: noise reduction

Pa: Pascal

POE: probable occupant evaluation (see room criteria)

PTS: permanent threshold shift

PWL: sound power level

QAI: quality assessment index (see room criteria)

RC: room criteria

RT₆₀: reverberation time

SEL: sound exposure level

SII: speech interference index

SIL: speech interference level

SLM: sound level meter

SPI: speech privacy index

SPL: sound pressure level

STI: speech transmission index

TTS: temporary threshold shift

A1.2 Terms

A-weighting: see frequency weighting

absorption coefficient: see sound absorption coefficient

acoustical coupler: a cavity of predetermined shape and volume used for the calibration of earphones or microphones in conjunction with a calibrated microphone adapted to measure the sound pressure developed within the cavity

anechoic room: a room whose boundaries absorb practically all of the sound incident thereon, thereby providing essentially freefield conditions

articulation index (AI): a number (ranging from 0 to 1) which is a measure of the intelligibility of speech- the higher the number the greater the intelligibility. This metric has been replaced by the Speech Intelligibility Index (SII) defined in ANSI S3.5.

average sound level: see equivalent-continuous sound level

background noise: the total noise from all sound sources excluding a particular sound source that is of interest

band: a subsection of the frequency spectrum

C-weighting: see frequency weighting

coupler: see acoustical coupler

day-night level (DNL): the 24 hour equivalent (average) A-weighted sound pressure level. A 10 dBA penalty is incurred between the hours of 10:00 PM and 7:00 AM. The DNL system has been adopted by the U.S. Department of Housing and Urban Development, the Department of Defense, and the Federal Aviation Administration.

decibel (dB): a unit of level which denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the common logarithm (base 10) of this ratio.

diffuse field: a sound field which has statistically uniform energy density and in which the

directions of propagation of the sound waves are randomly distributed. In a practical sense, the sound pressure levels at all points in the room are nearly the same except near the room boundaries and a sound wave reaching a given point in the room is equally likely to arrive from all directions.

direct sound: sound which reaches a given location in a direct line from the source without any reflections.

equivalent-continuous sound level (L_{eq}): the level of steady sound which, in a stated time period and at a stated location, has the same sound energy as the time varying sound. If frequency weighting is applied, the equivalent continuous sound level may be designated LA_{eq} to indicate A-weighting or LC_{eq} to indicate C-weighting, etc. See also frequency weighting.

fast exponential time weighting: a lowpass filter for the purpose of averaging a signal having a time constant of 0.125 seconds applied to the square of the sound pressure as specified in ANSI S1.4.

field sound transmission class (FSTC): a single number rating similar to sound transmission class (STC), except that the transmission loss values used to derive this class are measured in the field. FSTC ratings are typically lower than STC ratings which are measured under laboratory conditions.

flanking path: A wall or floor/ceiling construction that permits sound to be transmitted along its surface; or any opening, which permits the direct transmission of sound through the air.

freefield: a sound field in which the boundaries have negligible effect over the frequency range of interest.

frequency: the number of times that a waveform repeats itself in a given period of time, usually one second, i.e. the number of cycles per second). Unit: Hz.

frequency weighting: a prescribed frequency dependent attenuation or amplification applied to measured sound data usually intended to better approximate the sensation of loudness in a human listener. For example, A, B, and C weighting approximate the frequency dependent shape of the equal loudness contours for soft, moderate, and loud sounds.

Hertz (Hz): unit of frequency, cycles per second.

impact insulation class (IIC): a single number metric used to compare the effectiveness of floor-ceiling assemblies in providing reduction of impact-generated sounds such as footsteps. This rating is derived from values of normalized impact sound pressure levels in accordance with ASTM E492.

impulsive sound: sound that is characterized by brief excursions of sound pressure, typically less than one second, whose peak pressure significantly exceeds the background sound pressure.

insertion loss: the reduction in sound level at the location of the receiver when a noise reduction measure such as a barrier, attenuator, muffler, etc. is inserted into the transmission path between the source and receiver. Unit: dB.

level: the logarithm of the ratio of a given quantity to the reference quantity of the same kind. Levels represent physical quantities such as sound pressure on a logarithmic scale and are

therefore expressed in decibels. Unit: dB.

loudness: that attribute of auditory sensation in terms of which sounds may be ordered on a scale extending from soft to loud. Unit: sone.

masking: the process by which the threshold of hearing for one sound is raised by the presence of another sound.

maximum fast sound pressure level: the maximum sound pressure level recorded using fast exponential time weighting.

noise criteria (NC): a single number criteria for the HVAC or mechanical noise level in a room derived from measured octave band data. The octave bands are weighted to de-emphasize low frequencies because the human ear is least sensitive to these frequencies. This metric is not valid for outdoor measurements.

noise induced permanent threshold shift (NIPTS): the permanent hearing loss resulting from noise exposure.

noise isolation class (NIC): a single number rating derived from measured values of noise reduction between two enclosed spaces that are connected by one or more paths. This rating is not adjusted or normalized to a standard reverberation time.

noise reduction (NR): the difference in sound pressure level between any two points along the path of sound propagation, e.g. the difference in level between the interior and exterior of a building where the sound level inside is due only to exterior noise.

octave: the frequency interval between two tones whose frequency ratio is 2.

omnidirectional microphone: a microphone whose response is independent of the direction of the incident sound wave.

Pascal (Pa): a unit of pressure. 1 Pascal = 1 Newton per square meter (1 N / m²).

permanent threshold shift (PTS): a permanent increase in the threshold of hearing at a given frequency.

point source: a source that radiates sound as if from a single point.

receiver: a person (or persons) or equipment which is affected by sound.

refraction: (1) the phenomenon by which the direction of propagation of a sound wave is changed as a result of a spatial variation in the speed of sound. (2) The angular change in direction of a sound wave as it passes obliquely from one medium to another having different sound speed.

reverberation time (RT₆₀): of an enclosure, for a sound of a given frequency or frequency band, the time that is required for the sound pressure level in the enclosure to decrease by 60 dB after the source has stopped. Unit: second.

room criteria (RC, RC Mark II): an octave band metric for evaluating HVAC noise inside a room. RC is a two dimensional metric consisting of a curve number that is the arithmetic average

of the 500, 1000, and 2000 Hz octave band sound pressure levels and a qualitative descriptor identifying the character of the sound spectrum. The descriptor can be (N) for neutral, (LF) for low frequency dominance (rumble), (MF) for midfrequency dominance (roar), and (HF) for high frequency dominance (hiss). In addition, acoustically induced vibration can be designated by (LFV_B) for moderate, but perceptible vibration and (LFV_A) for clearly perceptible vibration. As an example, the maximum RC prerequisite for LEED is designated as RC 37(N) indicating curve number 37 with a neutral spectrum.

Further, two intermediary metrics are used in calculating the room criteria. The quality assessment index (QAI) is a measure of the deviation from the given RC curve. The probable occupant evaluation (POE) is based on the magnitude of the QAI and can be 'Acceptable,' 'Marginal,' or 'Objectionable.'

Sabin: a unit of measure of sound absorption; a measure of sound absorption of a surface. It is the equivalent of 1 square foot of a perfectly absorbing surface; a metric Sabin is the equivalent of 1 square meter of a perfectly absorbing surface.

sone: the unit of loudness. One sone is the loudness of a pure tone presented frontally at a frequency of 1000 Hz and a sound pressure level of 40 dB referenced to 20 micropascals.

sound absorption coefficient (α): ideally, the fraction of diffusely incident sound power that is absorbed (or otherwise not reflected) by a material or surface.

sound exposure level (SEL): over a stated time period or event, 10 times the logarithm base 10 of the ratio of the time integral of the sound pressure squared to the product of the reference sound pressure, 20 μ Pa, squared and the reference time, one second.

sound level meter (SLM): an instrument that is used to measure sound level, with a standard frequency weighting and standard exponentially weighted time averaging.

sound power level (PWL): the total acoustical power emitted from a sound source expressed in decibels relative to 10^{-12} Watts.

sound pressure level (SPL): the acoustical pressure amplitude expressed in decibels relative to 20 micropascals.

sound transmission class (STC): a single number rating used to compare sound insulation properties of walls, floors, ceilings, windows, or doors. See also field sound transmission class.

speech intelligibility index (SII): metric defined under ANSI S3.5 to quantify the intelligibility of speech under adverse listening conditions such as noise masking, spectral filtering, and reverberation. The SII is defined for a scale of 0 to 1 where values greater than 0.75 indicate good communication and values below 0.45 indicate generally poor communication conditions.

speech intelligibility test: a procedure that measures the portion of test items (such as syllables, monosyllabic words, or sentences) that are heard correctly.

speech interference level (SIL): an index for assessing the interference effects of noise on the intelligibility of speech, derived from measurements of the background noise level of contiguous octave bands; i.e. the arithmetic average of the octave band sound levels for the bands centered at 500, 1000, 2000, and 4000 Hz (four band method) or the corresponding average for the octave

bands centered at 500, 1000, and 2000 Hz (three band method). If other octave bands are used they must be specified. Unit: dB.

speech privacy index (SPI): The SPI is essentially the opposite of the speech intelligibility index and is defined as $1 - \text{SII}$ and usually represented as a percentage. An SPI above 80% is considered normal privacy while an SPI above 95% would meet the requirements of confidential privacy.

speech transmission index (STI): an index for rating the intelligibility of speech that takes both noise and reverberation into account.

temporary threshold shift (TTS): a temporary increase in the threshold of hearing at a given frequency.

threshold of hearing: for a given listener, the minimum sound pressure level of a specified sound that is capable of evoking an auditory sensation. The sound reaching the ears from other sources is assumed negligible.

transducer: a device designed to receive an input signal of a given kind and to furnish an output signal of a different kind in such a manner that the desired characteristics of the input signal appear in the output signal. For example, a microphone takes an acoustic pressure as an input and produces an electrical voltage as an output that is direct proportion to the instantaneous acoustic pressure amplitude. Other common examples in noise measurement would be a loudspeaker, accelerometer, or laser Doppler vibrometer (LDV).

transmission loss: the reduction in sound level from one side of a partition to the other.

wavelength: the distance a sound wave travels in the time it takes to complete one cycle.

weighting: see frequency weighting

A2. General Acoustics

Sound Pressure Level (SPL)

Sound is small, rapidly varying perturbations of atmospheric pressure with respect to the slowly changing ambient pressure. The ambient pressure is measured with a barometer while the small acoustic perturbations are measured with a microphone.

The unit of sound pressure is the Pascal (Pa). However, due to the wide range of acoustic amplitudes that can be heard by the human ear, sound pressure is normally expressed on a logarithmic scale having units of decibels (dB). Sound pressure expressed this way is known as the sound pressure level (SPL) and has the following relation to sound pressure.

$$SPL = 20 \log_{10} \left(\frac{p}{p_{ref}} \right) \quad (A2.1)$$

Here p is the sound pressure in Pascals. p_{ref} is a reference pressure, the threshold of hearing at 1000 Hertz (Hz), 20×10^{-6} Pa.

A-Weighting

The above formulation of SPL is a purely physical quantity. Due to the nonlinear and frequency dependent characteristics of the human ear it does not always correlate well with the perception of loudness. To improve the correlation for noise assessment purposes, a frequency weighting is often applied called A-weighting. The A-weighting function is based on listening tests in which human subjects adjusted tones throughout a range of frequencies to have equal loudness compared to a tone having an SPL of 40 dB at 1000 Hz. Figure A2.1 shows equal loudness contours according to ISO 226.

Thus applying A-weighting to measured sound pressures more closely represents the frequency response of the human ear for low to moderate amplitude sound. Sound pressure levels that have been A-weighted are denoted by the symbol, dBA. Figure A2.2 shows the A frequency weighting and several other common weightings.

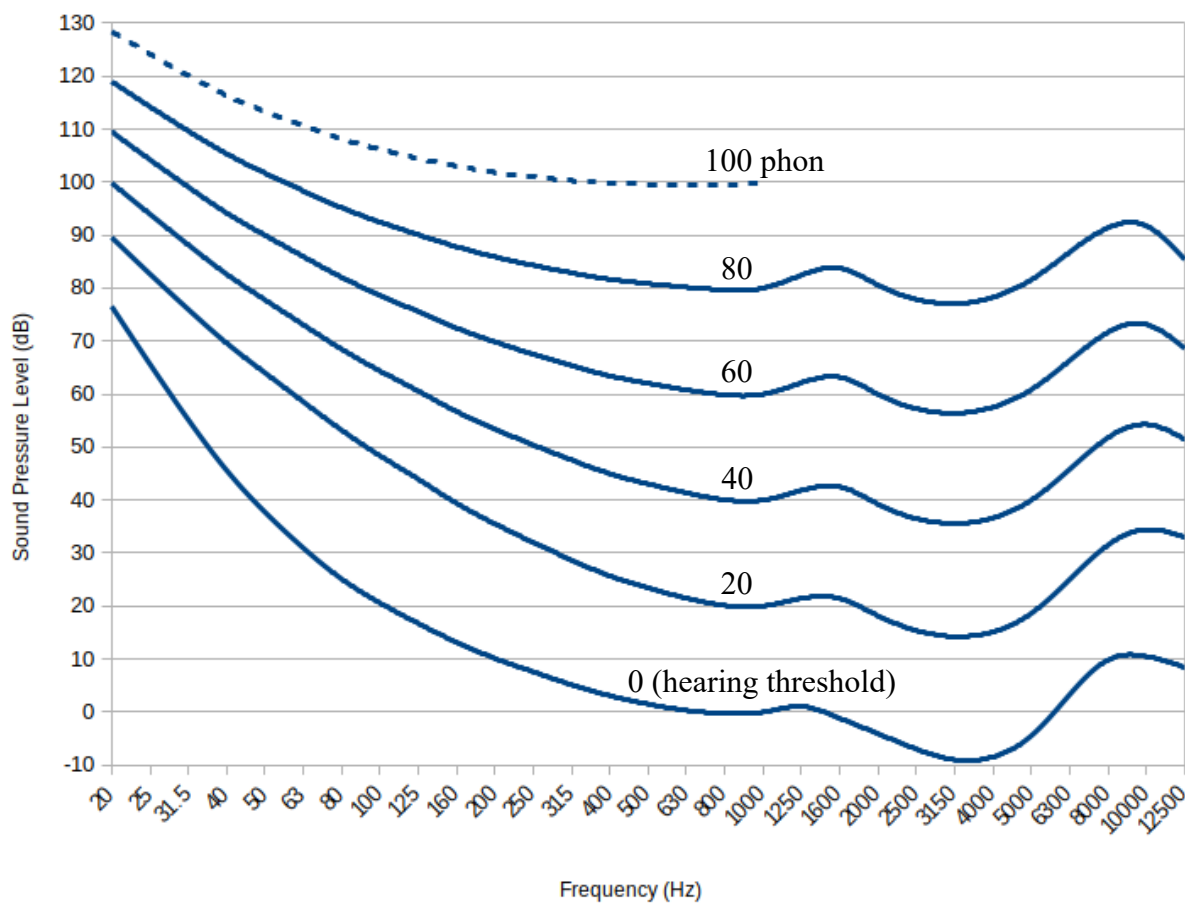


Figure A2.1. ISO 226 Equal Loudness Contours

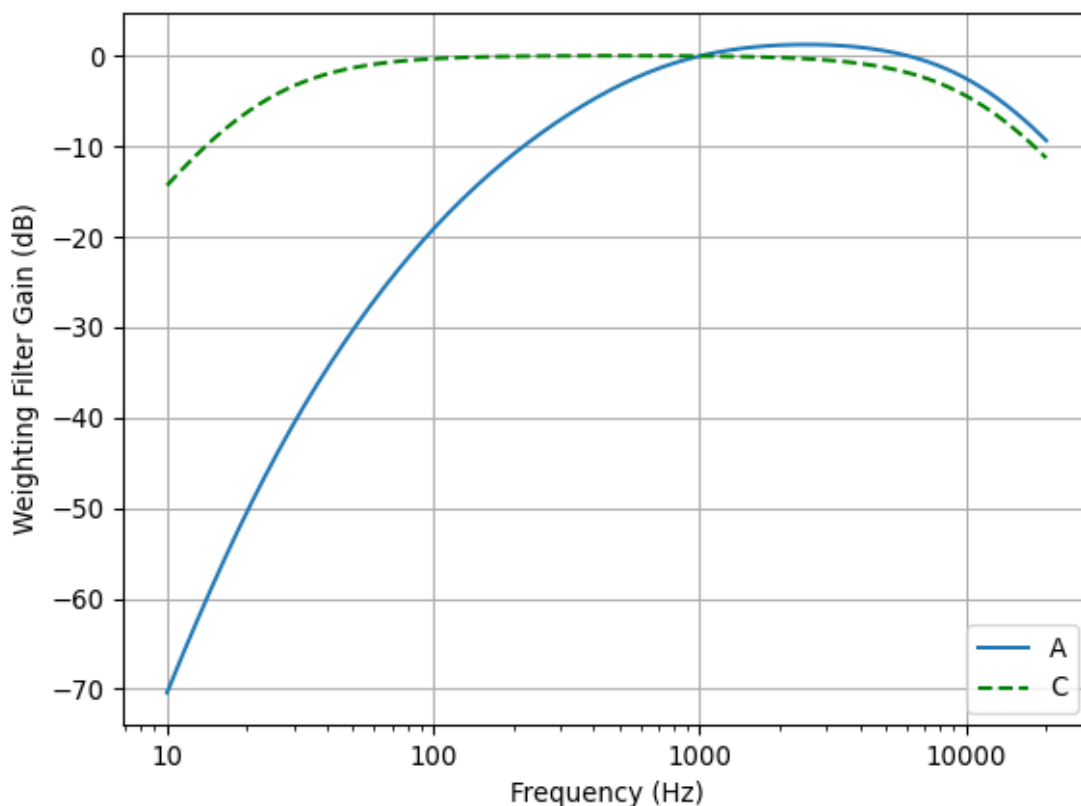


Figure A2.2. Frequency Weighting Filter Curves

The Perception of Sound

The most basic descriptions of sound are loudness (amplitude) and pitch (frequency). The frequency range of human hearing is roughly 20 to 20,000 Hz, although most people can not hear this full range because high frequencies are lost as a natural part of aging and other factors such as illness and exposure to high levels of noise that may cause permanent hearing loss.

Amplitude Attenuation with Distance

Sound originating from a small point source will spread spherically in all directions, absent any nearby surfaces. The conservation of energy requires the sound pressure spreading out from such a source to decrease by half with each doubling of distance. This is known as the inverse square law and is demonstrated in Table A2.1 and Figure A2.3.

Distance from Source (ft)	SPL (dBA)	SPL Loss Relative to 10 ft
10	90	
20	84	6
40	78	12
80	72	18
160	66	24
320	60	30

Table A2.1. Decrease of SPL with Distance Due to Spherical Spreading

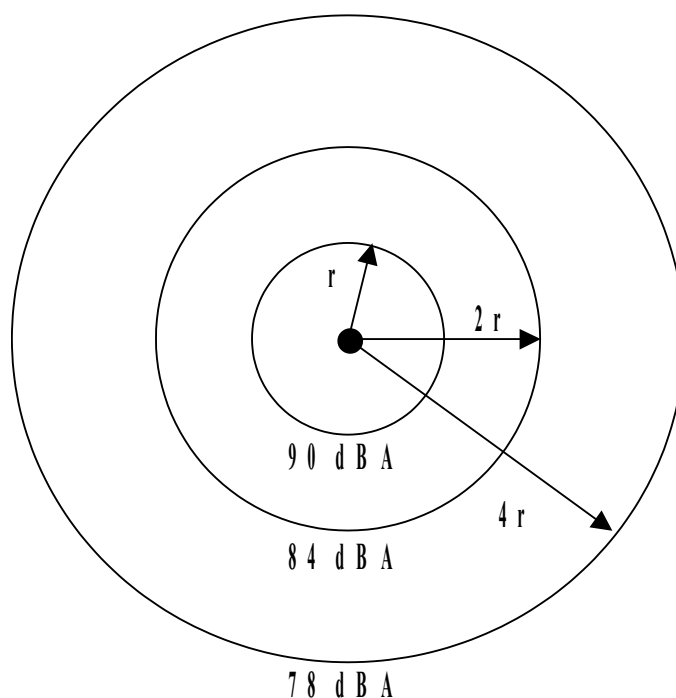


Figure A2.3. Decrease of SPL with Distance Due to Spherical Spreading

Adding Decibels

Summing the contributions from multiple sound sources to obtain the total SPL is *not* done simply by adding the decibel levels because SPL is a logarithmic quantity.

Imagine a fan produces a moderate SPL of 65 dBA at 6 feet. If a second identical fan were turned on the resulting SPL would not be 130 dBA. This would be equivalent to a commercial jetliner taking off at close range.

The correct method of adding the SPL from each source is to sum the acoustic power produced by each source. This implies that each time the number of sources having equal SPL is doubled, the SPL will increase by 3 dBA. Therefore, in the example with two fans, the correct total SPL would be 68 dBA. More examples with multiple sources producing equal SPL are shown in Figure A2.4.

$$65 \text{ dBA} + 65 \text{ dBA} \neq 130 \text{ dBA} \quad \text{WRONG} \quad (\text{A2.2})$$

$$65 \text{ dBA} + 65 \text{ dBA} = 68 \text{ dBA} \quad \text{RIGHT} \quad (\text{A2.3})$$

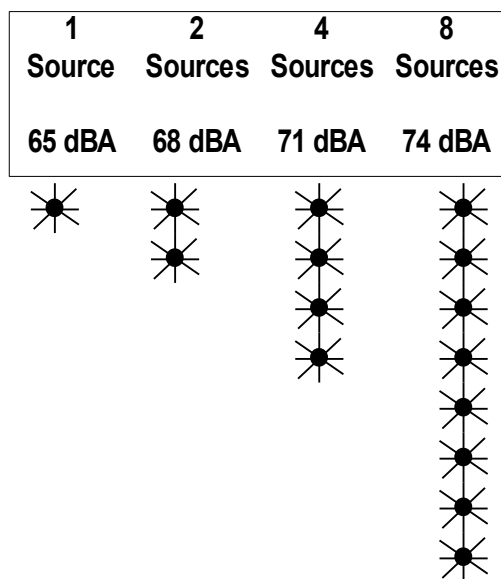


Figure A2.4. Total SPL from Multiple Sources with Equal SPL Output

Further Reading

Bruel and Kjaer, “Measuring Sound.” Covers topics in this appendix in more detail. Available on the Bruel and Kjaer website, www.bkhome.com. Find this and other primers under the library section of the site.

Cyril M. Harris, Ed. Handbook of Acoustical Measurements and Noise Control, 3rd Edition. Acoustical Society of America, Melville, NY, 1998.

Shattered Nerves, Sleepless Nights: Pickleball Noise Is Driving Everyone Nuts

The incessant pop-pop-pop of the fast-growing sport has brought on a nationwide scourge of unneighborly clashes, petitions, calls to police and lawsuits, with no solution in sight.

By Andrew Keh Audio produced by Alyssa Schukar

Reporting from Arlington, Va.

June 30, 2023 Updated 10:43 a.m. ET

It sounded like popcorn warming in a microwave: sporadic bursts that quickened, gradually, to an arrhythmic clatter.

“There it is,” Mary McKee said, staring out the front door of her home in Arlington, Va., on a recent afternoon.

McKee, 43, a conference planner, moved to the neighborhood in 2005 and for the next decade and a half enjoyed a mostly tranquil existence. Then came the pickleball players.

She gestured across the street to the Walter Reed Community Center, less than 100 feet from her yard, where a group of players, the day, had started rallying on a repurposed tennis court. More arrived in short order, spreading out until there were six games going on once. Together they produced an hourslong ticktock cacophony that has become the unwanted soundtrack of the lives of McKee and her neighbors.

“I thought maybe I could live with it, maybe it would fade into the background,” she said of the clamor, which began around the height of the coronavirus pandemic and now reverberates through her home, even when her windows are closed. “But it never did.”



Pickleball at the Walter Reed Community Center is played on repurposed tennis courts. Jason Andrew for The New York Times

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Shattered Nerves, Sleepless Nights: Pickleball Noise Is Driving Everyone Nuts - The New York Times

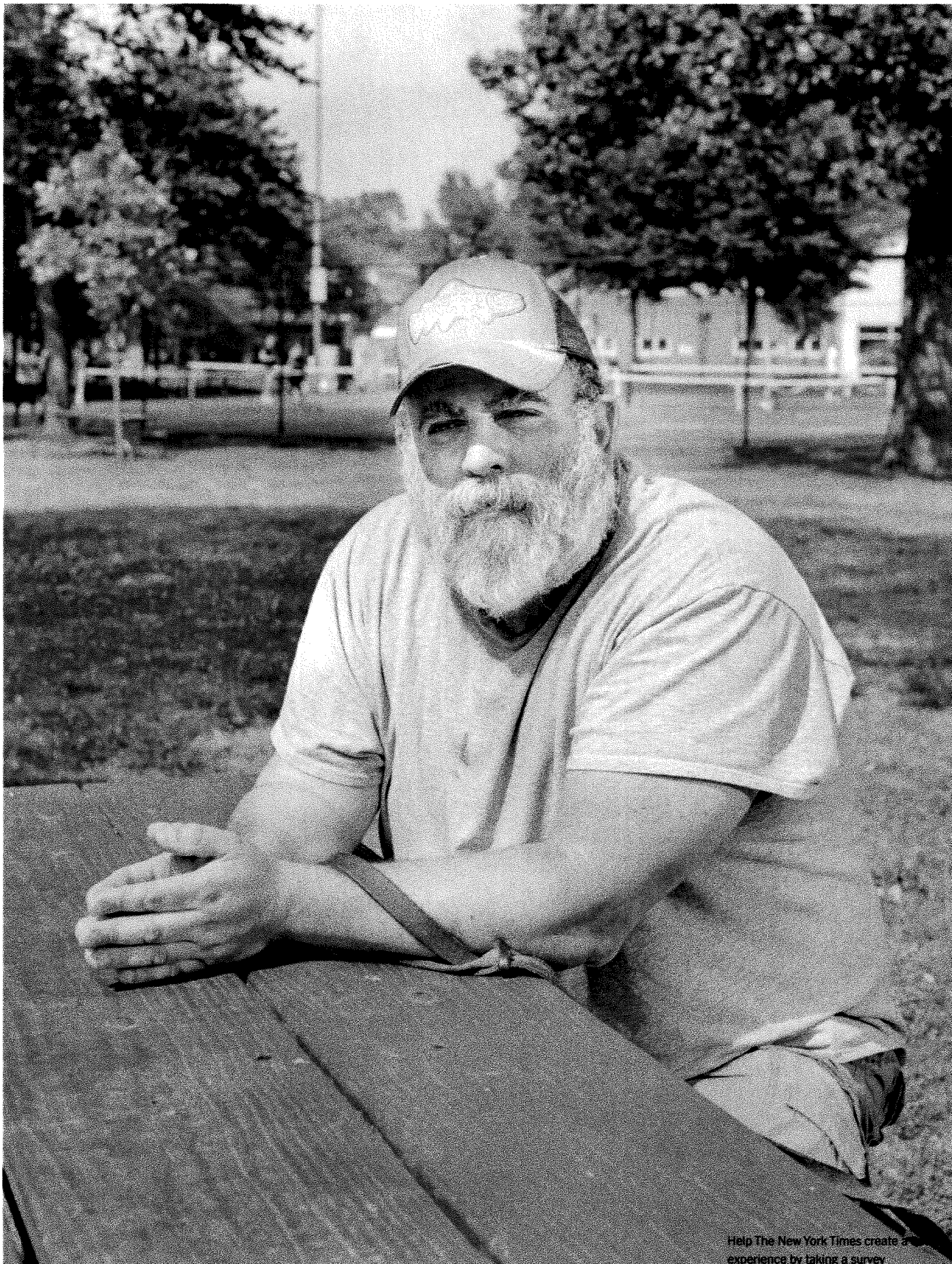


Mary McKee, who lives across the street from the Walter Reed Community Center, has been fighting the noise pollution. Jason Andrew for The New York Times

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Shattered Nerves, Sleepless Nights: Pickleball Noise Is Driving Everyone Nuts - The New York Times



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Armand Ciccarelli, 51, another resident who has complained about the noise. Jason Andrew for The New York Times

Sports can produce all kinds of unpleasant noises: referees' whistles, rancorous boos, vuvuzelas. But the most grating and disruptive sound in the entire athletic ecosystem right now may be the staccato *pop-pop-pop* emanating from America's rapidly multiplying pickleball courts.

The sound has brought on a nationwide scourge of frayed nerves and unneighborly clashes — and those, in turn, have elicited petitions to the police and last-ditch lawsuits aimed at the local parks, private clubs and homeowners associations that rushed to open courts during the sport's recent boom.

The hubbub has given new meaning to the phrase racket sport, testing the sanity of anyone within earshot of a game.

"It's like having a pistol range in your backyard," said John Mancini, 82, whose Wellesley, Mass., home abuts a cluster of public courts.

"It's a torture technique," said Clint Ellis, 37, who lives across the street from a private club in York, Maine.

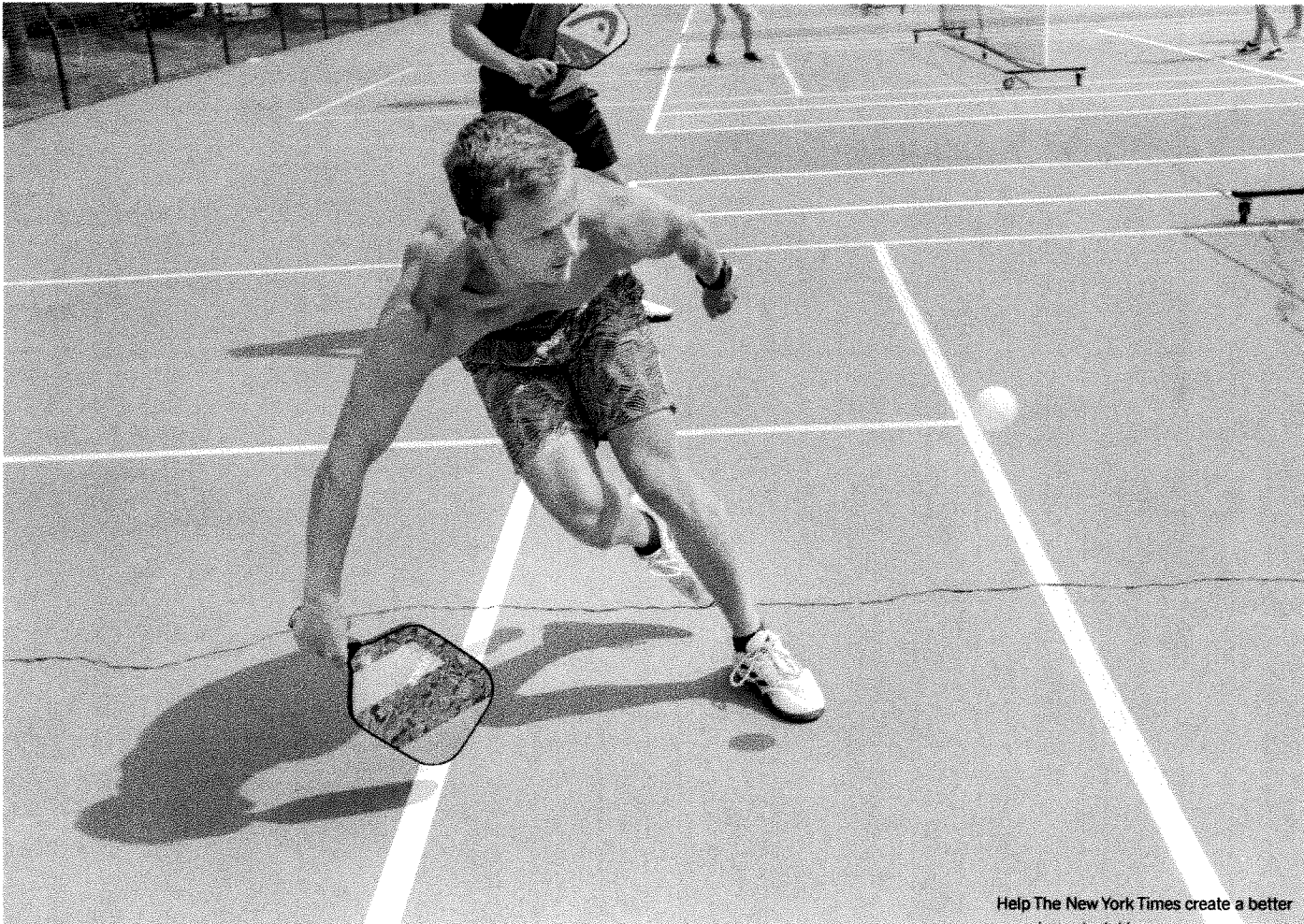
"Living here is hell," said Debbie Nagle, 67, whose gated community in Scottsdale, Ariz., installed courts a few years ago.

Modern society is inherently inharmonious — think of children shouting, dogs barking, lawn mowers roaring. So what makes the sound of pickleball, specifically, so hard to tolerate?

For answers, many have turned to Bob Unetich, 77, a retired engineer and avid pickleball player, who became one of the foremost authorities on muffling the game after starting a consulting firm called Pickleball Sound Mitigation. Unetich said that pickleball whistles from 100 feet away could reach 70 dBA (a measure of decibels), similar to some vacuum cleaners, while everyday background noise outside typically tops off at a "somewhat annoying 55."

But decibel readings alone are insufficient for conveying the true magnitude of any annoyance. Two factors — the high pitch of a paddle slamming a plastic ball and the erratic, often frantic rhythm of the smacks — also contribute to its uncanny ability to drive bystanders crazy.

"It creates vibrations in a range that can be extremely annoying to humans," Unetich said.



Hayden Sealander, 26, reaches for a ball while playing. Jason Andrew for The New York Times

These bad vibrations have created an unforeseen growing pain for pickleball, which emerged from relative obscurity in recent years to become the fastest-growing sport in the country.

The sounds were even dissected last month at Noise-Con 2023, the annual conference of North American noise control professionals, which featured an opening-night session called “Pickleball Noise.”

“Pickleball is the topic of the year,” said Jeanette Hesedahl, vice chair for the conference.

The same story, the same jarring sound, has echoed across American communities like rolling thunder.

Sue-Ellen Welfonder, 66, a best-selling romance novelist from Longboat Key, Fla., once enjoyed listening to the singing birds and the swish of trees during her daily walks — her “soul balm time” — through a local park. The *thump-thump* of a tennis match never bothered her, either. But the arrival of pickleball this spring, she said, shattered her idyll.

“Pickleball has replaced leaf blowers as my No. 1 noise nuisance,” said Welfonder, who has been sketching the outlines of a new novel in the present day, with a couple of pickleball-loving characters: “I’m making them really nasty people.”

The complaints were equally dramatic at a Feb. 6 city council meeting in West Linn, Ore., where residents have been vexed by the click-clacking from Tanner Creek Park.

“One of our neighbors who lived directly across from the courts and was dying from cancer noted the pickleball noise was worse than cancer,” Dan Lavery, a West Linn resident, said at the meeting. “Sadly, he recently passed.”

Scores of similarly suffering Americans are finding their way to a rapidly growing Facebook group, also started by Unetich, where more than 1,000 frazzled users exchange technical advice, let off steam and engage in a sort of group therapy.

“We try to keep it civil,” Unetich said, “because it gets pretty emotional.”

A few lessons have crystallized within the group. Soundproof barriers — a go-to solution for many at first — can be expensive and are often improperly deployed. New paddles and balls designed to dampen noise have had marginal uptake among players. Moving pickleball courts away from human life may be the only surefire solution — but many are slow to reach that conclusion, which presents its own hurdles.



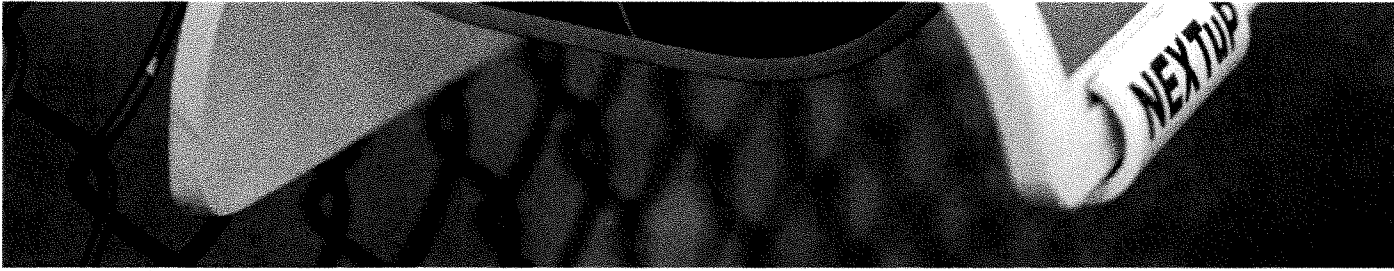
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Alyssa Schukar for The New York Times





Jason Andrew for The New York Times

Irritated homeowners, as a result, often resort to fighting pickleball courts in the courts of law.

Last year, Rob Mastroianni, 58, and his neighbors in Falmouth, Mass., filed a lawsuit against their town claiming that the courts near their homes violated local sound ordinances. They won a temporary injunction, which has closed the facility for now. By then Mastroianni had already sold his house and moved to a different part of town to escape the noise.

“I was Google Mapping the new house, making sure there were no courts nearby,” Mastroianni said.

In Arlington, McKee and her neighbors around the community center are waiting to see what happens next. They shared their pain with the county, which for now appears to be moving forward with plans to spend close to \$2 million to make the pickleball courts permanent.

The players there sympathized with the residents’ plight — but only to an extent.

“If I had that home, I’d be mad, because it is annoying — it’s obnoxious,” Jordan Sawyer, 25, a dietitian from Arlington and an avid player, said between games this month. “But I don’t feel bad because I want to play, and this is the best place to play. Honestly, I just feel like I’m a bit unfortunate. It’s unlucky for these people.”

Sawyer described herself as a “rule follower.” But McKee and the others recounted being woken up at 3 a.m. by middle-of-the-night pickleball matches. Another time they listened to a player banging a tambourine on the court, apparently to taunt those who had complained.

Armand Ciccarelli, 51, who often walks his dog, Winona, around the community center, said that anybody downplaying pickleball noise should try hearing it for 12 hours a day.

“I know this seems like a small thing in the grand scheme of the world, where we’re dealing with big things, like climate change,” Ciccarelli said. “But, as you can see, it’s a nationwide problem.”

Kitty Bennett contributed research.

Andrew Keh is a sports reporter in New York. He was previously an international correspondent based in Berlin and has reported from more than 25 countries. @andrewkeh

51 Nottingham Lane
Burlington, VT 05408
July 5, 2023

Mr. Scott Gustin
Burlington Development Review Board
645 Pine Street
Burlington, VT 05401

Re: Proposed Pickleball Court at 98 Sunset Cliff Road, Burlington, VT

Dear Mr Gustin,

We built our home 26 years ago at 51 Nottingham Lane on a lot specifically chosen for its proximity away from Appletree Park, on the far end of the Strathmore at Appletree Point residential development, without any through streets and which backs up the peaceful enclave of homes along the cliff overlooking Lake Champlain – Sunset Cliff Road. After raising two children and working in stressful and demanding professions for over 40 and 36 years, respectively, we have now retired to enjoy the beauty and tranquility of our home.

We heard through the grapevine that a public DRB meeting had been scheduled for this evening, July 5, 2023, concerning the installation of a pickleball court virtually in my backyard, at 98 Sunset Cliff Road. We also learned today that the meeting, which we had planned to attend in-person, will now only be held virtually.

Therefore, we submit the following points for your consideration and respectfully request that the DRB deny the applicants' proposal to construct a pickleball court at 98 Sunset Cliff Road for the following reasons:

1. Pursuant to Burlington's Noise Control Ordinance, a pickleball court creates a noise disturbance and is a public nuisance, *per se*, in a residential neighborhood of the kind and character of Sunset Cliff Road, and the adjacent properties on Nottingham Lane.
 - a. "It is unlawful for any person to make any loud or unreasonable noise. Noise is deemed unreasonable when it disturbs. . . the peace. . . of another. Any such noise shall be considered to be a noise disturbance and a public nuisance." (Burlington Code 21-13(b)(1)).
 - b. A plastic pickleball being hit with velocity by a plastic pickleball paddle creates a sound that is high pitched and loud – 70 decibels. Sound engineer and pickleball noise mitigation expert, Bob Unetich, has opined that "pickleball sound exists right in that most sensitive range" that makes it most annoying. The sound is similar in pitch had volume the backup beepers of a garbage truck, which is both high pitched and loud, and chosen because "it's the most annoying frequency." "You can't take pop, pop, pop for 12 hours a day, every day, and remain sane." NPR, All Things Considered, June 8, 2023.
 - c. This annoying sound will be much worse if the applicants choose to practice their pickleball skills by hitting the pickleball with a paddle off a cement wall or other wall-like structure, such as a pitch-back. This practice will create a constant and repeated pop, pop, pop, pop, pop, pop sound, which will be significantly worse than the playing of a pickleball game. A game is often marked by pauses and silence between shots and after points are scored before the next serve. With a practice activity, and repeated hitting the ball against a hard surface, there will be no pauses or intervening silence. Rather, the constant and repeated

popping will be akin to a type of water torture. POP, POP, POP, POP, POP, POP, POP, POP, POP, POP, POP, POP, POP!

2. Notice and the opportunity to be heard concerning the proposed installation of a pickleball court was not properly provided to the neighbors on Nottingham Lane who will be directly impacted by the noise disturbance and public nuisance created by the proposed pickleball court.
 - a. "Written notification to owners of all properties adjoining the property subject to development" is required for all development review applications before a municipal panel. *See* 24 V.S.A 4464.
 - b. To our knowledge, only a single Nottingham Lane resident, whose home backs up to the east side of Sunset Cliff Road and approximately 500 feet from the proposed construction, was provided written notice of the proposed construction and zoning application.
 - c. Our home likewise backs up to the east side of Sunset Cliff Road and is located approximately 533 feet from the proposed construction of a noise disturbance and public nuisance and we should also have received written notice and an opportunity to be heard before the DRB made any decision regarding the construction of the proposed pickleball court.
 - d. All the residents of Nottingham Lane whose backyards abut the east side of Sunset Cliff Road should have received notice and an opportunity to be heard before the DRB considered and decided the application to build a pickleball court in their backyards.
 - e. Even if written notice of the construction of a single-family residence at 98 Sunset Cliff Road may have been technically proper, the construction of a pickleball court, with its attendant noise disturbance and public nuisance, is not in the same category as the construction of a single-family residence and therefore a heightened degree of notice and opportunity to be heard is required before a public nuisance is considered and approved by the DRB.
 - f. The single resident of Nottingham Lane who received written notice of the proposed installation of the pickleball court provided a letter of opposition to the construction, dated March 29, 2023, based on the unreasonable and loud noise it would cause.
 - g. Notwithstanding the clear opposition and impact of the noise disturbance and public nuisance on the residents of Nottingham Lane, the DRB chose to approve the installation of a pickleball court, with conditions, and
 - (i) ignored those concerns expressed by the sole Nottingham Lane resident who was notified of the application,
 - (ii) failed to properly notice all the neighbors who would be impacted by the noise,
 - (iii) failed to provide such neighbors with an opportunity to be heard,
 - (iv) failed to investigate or consider the impact of the noise disturbance and public nuisance that would be caused by a pickleball court in this neighborhood,
 - (v) failed to require the applicant to conduct a sound study and demonstrate that the pickleball court would not cause a public nuisance.
3. The City's website fails to include all the information and documents necessary for the public to determine the history and status of the zoning process and assess the necessity to take action in favor of or in opposition to the proposed construction of a public nuisance.
 - a. From the documents and minutes haphazardly and randomly available on the City's DRB website, it appears that the DRB has apparently approved the installation of the pickleball court, on conditions. The first condition is the requirement that the applicant undertake "noise mitigation" measures.
 - b. We are unable to locate on the City's website the DRB's decision to approve the installation of the pickleball court and the conditions the DRB imposed for granting such approval.

- c. What other conditions have been imposed and when will those conditions be addressed?
- 4. The applicants' proposed sound mitigation efforts, per the supplemental project plans, illustrative site plan and perspectives submitted for tonight's meeting, consisting of the installation of shrubbery on the east side of the pickleball court -- along the west side of Sunset Cliff Road -- are wholly inadequate to mitigate any noise disturbance and public nuisance impacting the residents on Nottingham Lane.
 - a. The applicants have not produced a sound study or any expert opinion establishing that their mitigation efforts will be effective in reducing the high pitched and loud sound, identical in pitch and volume of the backup beeping of a garbage truck, that will be created by the paddle hitting the ball.
 - b. Bob Unetich, of Pickleball Sound Mitigation LLC, is a sound engineer specializing in sound mitigation specifically for pickleball courts, states that "wind screens and bushes are not very effective sound barriers." See www.pickleballsound.com. He identifies two sound barriers that are commonly used and considered effective in mitigating the constant pop, pop, pop of pickleball hitting a paddle.
 - (i) A reflective mass loaded vinyl sheet, which blocks sound primarily by reflecting it, or
 - (ii) A vinyl sheet with a quilted layer of fiberglass and thin fabric, which blocks the sound by absorbing most of the sound striking it.
 - c. In addition to physical sound barriers, Unetich opines that it is possible to reduce the sound level by selecting paddles and balls that are quieter, made out of softer and padded paddles and softer balls
 - d. In combination, the physical barrier around all four sides of the Pickleball court and using paddles and balls made of softer materials, are necessary to sufficiently mitigate the noise disturbance that will be created by this public nuisance. The applicants make no mention of using either of the two recognized sound barriers or using softer, quieter paddles and balls to assist with noise mitigation of the public nuisance. The applicants' efforts are therefore
- 5. **"THE BEST WAY TO MITIGATE [PICKLEBALL] NOISE IS TO FIX IT BEFORE THE PROBLEM STARTS AND BUILD COURTS THAT ARE FAR ENOUGH AWAY FROM PEOPLE."** NPR, All Things Considered, June 8, 2023.
 - a. The construction of a known noise disturbance that will create a public nuisance is inappropriate in a densely populated, residential neighborhood, where lots are the size of postage-stamps and where a sound known to be loud, high-pitched and annoying, will carry well beyond the confines of the construction and will disturb the peace and tranquility of a neighborhood known and expected to value and honor the right of every neighbor to enjoy the solitude afforded our choice to live on the edge of a cliff.
 - b. We did not choose to live with a pickleball court, basketball court, tennis court or playground in my backyard, although such lots were available in this development when we built our home 26 years ago. Instead, we paid a premium to purchase a building lot and construct our home with only Sunset Cliff Road in our backyard.

In conclusion, we respectfully request that you take full consideration of our concerns and deny the application to install a pickleball court at 98 Sunset Cliff Road. Thank you for your attention to this matter.

Sincerely yours,

Melissa & Richard Ranaldo

Burlington Development Review Board

Department of Permitting & Inspections
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/DPI/DRB
Telephone: (802) 865-7188
Fax (802) 863-0466

AJ LaRosa
Caitlin Halpert
Geoff Hand
Sean McKenzie
Brad Rabinowitz
Leo Sprinzen
Chase Taylor
Evan Gould, (Alternate)
Vacant, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD

Wednesday, July 5, 2023, 5:00 PM

AMENDED AGENDA

Remote Meeting

- I. **Agenda**
- II. **Communications**
- III. **Minutes**
- IV. **Public Hearing**

- 1. **ZP-23-100; 50 Howard Street (RM, Ward 5S) Rogers Nest, LLC / Luke Clavelle**
Renovate historic cottage and convert to a dwelling unit. (Project Manager, Garret King)

Approved

- 2. **ZAP-23-7; 16 South Winooski Avenue (FD5, Ward 8E) Ronald McDonald House Charities / Kristine Bickford**
Appeal of zoning administrative denial (ZPF-23-27) to replace existing fence with six-foot-high fence. (Project Manager, Garret King)

Administrative denial upheld

- V. **Certificate of Appropriateness**

- 1. **ZP-23-205; 655 Spear Street (I, Ward 6S) University of Vermont / State Agricultural College / Claire Forbes**
Continued review of proposed construction of a parking lot (162 spaces) following the demolition and removal of the BioResearch Laboratory building. (Project Manager, Mary O'Neil)

Approved

- 2. **ZP-23-247; 179 Queen City Park Road (E-LM, Ward 5S) Zoo Holdings, LLC / Martin Courcelle**
Construct 65,000 square foot addition to existing Rhino Foods facility including associated access, parking, utility and stormwater modifications. (Project Manager, Scott Gustin)

Approved

- VI. **Other Business**

- 1. **ZP-23-9; 98 Sunset Cliff Road (RL-W, Ward 4N) Keye & Lucy Wong / Elizabeth Herrmann**
Address permit condition number one, submission of noise mitigation plan prior to the approval of the pickle ball court. (Project Manager, Scott Gustin)

Approved

The programs and services of the City of Burlington are accessible to people with disabilities. Individuals who require special arrangements to participate are encouraged to contact the Zoning Division at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188 (TTY users: 865-7142).

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VII. Adjournment

Plans may be viewed upon request by contacting the Department of Permitting & Inspections between the hours of 8:00 a.m. and 4:30 p.m. Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Zoning office is considered public and cannot be kept confidential. This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/dpi/drb/agendas or the office notice board, one week before the hearing for the order in which items will be heard.

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Burlington Development Review Board

Department of Permitting & Inspections

645 Pine Street

Burlington, VT 05401

www.burlingtonvt.gov/DPI/DRB

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BURLINGTON DEVELOPMENT REVIEW BOARD

Wednesday, July 5, 2023, 5:00 PM

MINUTES

Remote Meeting

Board Members Present: All members were remote. AJ LaRosa, Caitlin Halpert, Geoff Hand, Brad Rabinowitz, Leo Sprinzen (5:15 PM), Chase Taylor, and Evan Gould

Board Members Absent: Sean McKenzie

Staff Members Present: All members were remote. Scott Gustin, Mary O'Neil, Garret King, and Joseph Cava

- I. Agenda**
- II. Communications**
- III. Minutes**
- IV. Consent**

- 1. ZP-23-100; 50 Howard Street (RM, Ward 5S) Rogers Nest, LLC / Luke Clavelle**
Renovate historic cottage and convert to a dwelling unit. (Project Manager, Garret King)
Luke Clavelle, Amy Magyar: Sworn in.

AJ LaRosa: This item is recommended for consent approval. Have you seen the staff report?

Luke Clavelle: Yes.

AJ LaRosa: Do you have any questions?

Luke Clavelle: No, none.

AJ LaRosa: Do any board members have objection to treating this as consent? Hearing none, is there anyone from the public that would like to speak? Seeing hands, we will open the public hearing on this item.

Amy Magyar: I am an abutting property owner, and I have a permitted ADU on my property. I do not have an issue with the project, but I do have concerns related to overextending the density of this property. The existing duplex has eight tenants at any given time, and this ADU will add at least two additional adults for ten people. Parking is tight as it is in this area.

AJ LaRosa: Do we count the ADU in density calculations?

Scott Gustin: No, ADU's do not count toward density, but this is not an ADU. It is a PUD. A small one. The third unit proposed is over density. The only way it can be approved is by way of the historic building rehabilitation bonus.

AJ LaRosa: Any questions from the board?

Brad Rabinowitz: Yes, how much parking can you accommodate?

Luke Clavelle: Up to four parking spaces.

Brad Rabinowitz: How many bedrooms in the PUD?

Luke Clavelle: We have not decided yet.

AJ LaRosa: Any additional questions?

Amy Magyar: The parking area mentioned by Luke Clavelle, allows for four smaller vehicles in the parking spaces provided, but the standard vehicle is significantly larger which will create a parking issue in this area of Howard Street.

AJ LaRosa: With that, we will close the public hearing on this item.

V. Public Hearing

1. ZAP-23-7; 16 South Winooski Avenue (FD5, Ward 8E) Ronald McDonald House Charities / Kristine Bickford

Appeal of zoning administrative denial (ZPF-23-27) to replace existing fence with six-foot-high fence. (Project Manager, Garret King)

Kristine Bickford and Chris Beaulieu: Sworn in.

AJ LaRosa: Is the applicant here?

Kristine Bickford: Yes.

AJ LaRosa: This is an appeal. Traditionally, we hear the facts of the case from the City, and then we allow the appellant to speak.

Garret King: There are two parts to this application. Part one is the clear sight triangle. Part two is the ordinance, which imposes a four-foot-high maximum fence height in the first and second lot layers.

Geoff Hand: Could the applicant have a taller fence along the sides of the property where sidewalks currently exist?

Garret King: No. Reviewing the site plan, this is a corner lot within the form-based district.

AJ LaRosa: Where does the four-foot-height get measured from?

Scott Gustin: It gets measured from the grade underneath the fence.

Geoff Hand: So under the code, they can have a six-foot-high fence around their parking lot out back, but not in the front of the property.

Scott Gustin: Correct, the applicant could apply for a variance, but I do not recommend it in this case.

Brad Rabinowitz: Under alternative compliance, the fence height could be about five feet.

AJ LaRosa: Okay, let us hear from the applicant.

Kristine Bickford: I believe you have all the supporting information we submitted. We are the Ronald McDonald House, which is a twelve-bedroom respite space for families of children receiving intensive care at UVM Medical. During the last six months, we have been experiencing increased amounts of trespassing, which creates an unsafe environment for our guests.

Chris Beaulieu: We are here for our guests, and we check on them periodically. I only average four hours of sleep a night because someone needs to monitor the security cameras for combative individuals. The police have instructed me to stay inside and lock the doors. We cannot tell our guests that they need to stay inside to protect themselves against fence jumpers.

Kristine Bickford: We need to ensure the safety of our guests, but the existing fence is creating a precarious situation that is no longer making this a safe location for Ronald McDonald House Charities to occupy. We just want a taller fence so we can stay in this area and feel safe. These families do not just include parents; they include siblings and younger children that are at risk due to this behavior. How would you deal with this if this were your property? We have run out of options at this point.

AJ LaRosa: Beyond a fence, have you considered landscaping?

Scott Gustin: Landscaping does not require a zoning permit.

AJ LaRosa: I would like to hear more about the height limitations about landscaping.

Kristine Bickford: We have spoken to the City Arborist, VJ Comai, about landscaping, but we would still be finding needles and other paraphernalia that pose a danger to our guests.

Brad Rabinowitz: What about a berm?

Scott Gustin: The height of the fence is measured from the ground at the base of the fence.

Brad Rabinowitz: This is a unique situation, but the form-based code, does not address situations like this.

Mary O'Neil: Noted the standards for grading under Article 14.

AJ LaRosa: The form-based code is not written to address unique situations such as this.

Chris Beaulieu: Are there unique situations concerning fencing for playgrounds?

Mary O'Neil: Playgrounds are a civic feature. This is not a civic site.

Caitlin Halpert: If we approved this under the 20% rule, would this require an additional permit?

Mary O'Neil: The application could be revised to reflect the berm.

Scott Gustin: That would require application for alternative compliance.

AJ LaRosa: The code does not give us a lot of wiggle room.

Geoff Hand: Could we approve a 4.8 foot tall fence with a later addition of a retaining wall below the fence?

AJ LaRosa: We could overturn the denial, but we should take more time to deliberate. We will close the hearing on this item, and deliberate later on.

VI. Certificate of Appropriateness

1. ZP-23-205; 655 Spear Street (I, Ward 6S) University of Vermont / State Agricultural College / Claire Forbes

Continued review of proposed construction of a parking lot (162 spaces) following the demolition and removal of the BioResearch Laboratory building. (Project Manager, Mary O'Neil)
Claire Forbes and Jamie Smith: Sworn in.

Mary O'Neil: There is a request for a tree-planting waiver, not a parking waiver.

AJ LaRosa: Is the applicant here?

Claire Forbes: Yes.

AJ LaRosa: Can you give us a summary of the project?

Claire Forbes: This is an expansion of parking in response to the demolition of the Bio-Research Laboratory building. The new parking lot will shift parking away from the campus core and consolidate it so it is not sprawling out from the campus core into surrounding neighborhoods. There will be increased traffic along Spear Street, but has convenient access to the campus core. Future data includes establishing a bus stop in this location.

AJ LaRosa: I see that you have included the additional data that we requested.

Claire Forbes: Yes, we have been working with the State of Vermont on guidelines for parking. Employees will not be accessing this Spear Street parking lot during rush hour commute times.

AJ LaRosa: Additional questions? It should be mentioned that consolidating the fleet vehicles would not create increase the traffic flux on this road because there is no new use beyond consolidating existing fleet vehicles.

Leo Sprinzen: One of our concerns was the additional trips at any given hour during the day.

Claire Forbes: I will defer to Jamie Smith to answer this.

Jamie Smith: We will be consolidating over 100 fleet vehicles to this area.

Geoff Hand: This in the past has been a dangerous intersection for pedestrian and vehicular access. Can you elaborate?

Jamie Smith: I am on the planning side which does not calculate risk.

Claire Forbes: We have heard from members of UVM working this area, and they have confirmed dangerous conditions.

Leo Sprinzen: Is there a section of the ordinance that regulates stop signs on the bike path?

Mary O'Neil: I would need to defer to Parks & Recreation.

Claire Forbes: This area is also near South Burlington and may be out of our jurisdiction.

AJ LaRosa: Would any members of the audience wish to speak? Hearing none, we will close the hearing on this item.

2. ZP-23-247; 179 Queen City Park Road (E-LM, Ward 5S) Zoo Holdings, LLC / Martin Courcelle

Construct 65,000 square foot addition to existing Rhino Foods facility including associated access, parking, utility and stormwater modifications. (Project Manager, Scott Gustin)
Martin Courcelle, Blaine Paxton, Brian Pine, Susan Mason, Edward Castle, Janice Ellis, Derek Zipprich, and Alex Demoly: Sworn in.

Geoff Hand: I am recused on this item.

AJ LaRosa: We recently saw this project during sketch plan review; can you walk us through the changes that were made to the project plans?

Martin Courcelle: Since sketch plan review, we finalized the stormwater design including the bio-retention area.

Blaine Paxton: Following our meeting with the Design Advisory Board (DAB), we started on the elevation designs, sidewalks, and bicycle parking. Short-term and long-term bike parking is proposed near the primary entrance.

AJ LaRosa: When we talked about stormwater previously, the design was not complete.

Blaine Paxton: We are comfortable with the design of the stormwater ponds.

AJ LaRosa: There were concerns from neighbors regarding noise created from compressed air tanks. Have you mitigated this?

Blaine Paxton: The existing tanks are staying where they are. There is no new equipment expansion proposed on the exterior of the building.

AJ LaRosa: Why is the loading dock on the south side of the property?

Blaine Paxton: Raw materials and employees come in and the design is aligned with the flow of traffic and parking.

Martin Courcelle: Under the existing ordinance, the site configuration will screen the trucks from view.

Blaine Paxton: Most of the trucks using the loading docks will not be idling.

AJ LaRosa: Will the trucks idle to provide refrigeration?

Blaine Paxton: The trailers have their own refrigeration units which idle to keep product fresh.

AJ LaRosa: Is employee population increasing?

Blaine Paxton: We would bring employees in from our Williston location. We're also retaining workers and aiming to automate these lines.

AJ LaRosa: The proposed building is substantial. You have specified net neutrality for truck traffic.

Blaine Paxton: Jobs will be transferring from the Williston location and we are estimating up to thirty new jobs over the next five to six years at this location.

AJ LaRosa: Any questions from the board?

Leo Sprinzen: Night deliveries may be lessened, but it is our understanding that night deliveries will occur.

Blaine Paxton: We have worked well with the neighbors over the years, and the expectation is not to increase deliveries during non-traditional operating hours. Shipping and receiving hours will not be changing from what is existing.

Leo Sprinzen: Will fencing on the west of the property be changed?

Blaine Paxton: There is an eleven-foot grade over a steep slope with wooded areas between. There is no intention at this time to erect a new fence.

AJ LaRosa: We will open this to public comment. We would like to hear what people have to say, but there is no need to repeat what has already been submitted in written feedback.

Brian Pine: We are excited for this project to contribute to the workforce and increase the financial and social bottom line. This area is designated as an industrial park to facilitate manufacturing businesses where many other businesses have been lost. This company relies on a workforce of immigrants, which do not rely on traditional private vehicular transportation. They will take the bus and Rhino returns this by providing innovative loans that match the weekly paycheck. This is good corporate citizenship.

Susan Mason: Would the liquid nitrogen tanks be expanded by increasing production?

Martin Courcelle: We would be using new equipment on the interior of the building with no exterior expansions beyond what is proposed for the building footprint.

Susan Mason: Are there alternatives to diesel fuel for hybrid refrigeration units that reduce pollution caused by the fuel?

AJ LaRosa: Is there a green building standard for this?

Scott Gustin: No, this is different from the green building standards that are outlined in the form-based code.

Edward Castle: We are committed to the practical uses of electrical hookups versus refrigeration units that rely entirely upon diesel fuel.

Susan Mason: What about the auxiliary units?

Edward Castle: Yes, these run on diesel fuel.

Susan Mason: Could the brand provide coloring to improve the building's appearance?

Blaine Paxton: Yes, there are limited colors to choose from for the panels. The color scheme matches the existing building. Our goal is to make the building less stark and more engaging.

Martin Courcelle: The rendering company submitted a perspective today. The striping is further apart on the north side of the building as it transitions to the south side of the building. At our last DAB meeting, they favored the proposed coloring.

Janice Ellis: I live nearby and I am frequently hearing noise associated with the construction of the Champlain Parkway. Rhino seems committed to mitigate noise pollution, but we would like to be heard concerning our noise concerns.

AJ LaRosa: When do you hear noise?

Janice Ellis: I usually hear noise around 7:00 AM and I recognize that during the day there is business occurring.

Blaine Paxton: I can understand, and the liquid nitrogen tanks do cause their own noise, but we work hard to ensure that noise is kept at a minimum output level.

Martin Courcelle: Compressors will be on the interior of the building. No additional nitrogen tanks are proposed.

Derek Zipprich: I am concerned about the noise and struggling with this district providing noise mitigation measures that alleviate concerns and consideration of acceptable noise emissions. It is not fair to neighbors or the zoning board for not being able to quantify noise emissions.

AJ LaRosa: Are there any other questions?

Alex Demloy: Burlington and more specifically Rhino is at the heart of what we do. We appreciate the time of the DRB and appreciate their support for promoting good business in Burlington. Rhino is a good neighbor in this district.

AJ LaRosa: Would the applicant wish to respond?

Edward Castle: It is important to get this permit process figured out so we can move forward. This is a huge investment for the future.

AJ LaRosa: With that, we will close the public hearing on this item and deliberate later on.

VII. Other Business

- 1. ZP-23-9; 98 Sunset Cliff Road (RL-W, Ward 4N) Keye & Lucy Wong / Elizabeth Herrmann**
Address permit condition number one, submission of noise mitigation plan prior to the approval of the pickle ball court. (Project Manager, Scott Gustin)
Keye Wong, Lucy Wong, owners, present, Elizabeth Herrmann, Keith Wagner, Marcia Hemley, Melissa Ranaldo, Claudine Safar, Dr. Lance Willis, Gail Anderson, John Clark, and Christopher Roy: Sworn in.

AJ LaRosa: I am recused on this item.

Caitlin Halpert: We were looking for additional noise mitigation, but we will swear in those who wish to speak on this item.

Elizabeth Herrmann: I am Keye and Lucy's architect and these are our sound mitigation measures. The noise mitigation is concerning decibel output caused by pickle ball. This project only proposes one pickle ball court with one ball at play at any given time. The average output of a pickle ball is 70

decibels, where lawn and other mechanical yard maintenance equipment have outputs far exceeding that of pickle ball.

Keith Wagner: We went back and revised the landscape plan using a mixture of deciduous and evergreen plantings to provide dense foliage, which will mitigate noise based on the DRB's recommendations.

Caitlin Halpert: Are there any questions you have for the board?

Brad Rabinowitz: Did you consider solid fencing?

Keith Wagner: We did consider fencing, but dense plant material provides more appropriate mitigation measures in this case.

Elizabeth Herrmann: The proposed house also provide noise mitigation.

Geoff Hand: Is there data to accompany the vegetative sound buffer, we are missing context?

Elizabeth Herrmann: It is hard to calculate noise coefficients with plantings. The height of the grass and soil also mitigates the decibel output. It is hard to quantify sound against organic plantings which are always changing.

Caitlin Halpert: Is there anyone from the applicant team that can speak on the foliage during off season times when foliage isn't available.

Keye Wong: If there were time restrictions created between 10:00 AM and 2:00 PM, we would accept that. It is hard to implement any specific measure without direction from the board. We have received mixed reviews between a constructed wall and plantings. I am not a sound engineer, and we want to be respectful, but there are forests growing between neighboring residences. On a personal level, I find neighbors with small barking dogs more annoying than pickle ball. The requirements for this noise mitigation condition keeps changing and we are not receiving clear instruction. I feel people are being discriminatory towards me because I am Asian.

Lucy Wong: I know neighbors have suggested several alternatives and I would like to clarify that I am not playing this game for more than two hours a day during five consecutive days. I do not like people commenting on my habits when they do not even know me.

Caitlin Halpert: Any questions from the board before opening it to public comment?

Brad Rabinowitz: We have receive many written comments.

Caitlin Halpert: Please reserve your comments to things that have not been said or submitted through written feedback.

Marcia Hemley: My interpretation of noise mitigation is that hydrangeas and lilacs are static. The proposed pickle ball court is not sufficiently setback from neighboring residences. I am concerned about the level of respect from our future neighbors since their lawn hasn't been mowed in six months.

Melissa Ranaldo: I live approximately 500 feet from the proposed pickle ball court. I can hear the sound that is carried from garbage and recycling trucks, and I have not seen any written plans that will effectively mitigate the sound generated by this proposal. I have no objection to this project, but I suspect that sound will carry. Fiberglass and fabric sheathing according to experts can block sound.

I sit out on my screened porch to read and the constant popping noise will upset me. We have no demonstration or expert testimony to resolve this.

Claudine Safar: I would like to reintroduce our expert, Dr. Lance Willis to speak on this. Elizabeth Hermann is unqualified to make sound recommendations and is lacking in her professional ability to do so.

Brad Rabinowitz: Can we move forward?

Caitlin Halpert: The expert witness is not applicable to the proceedings of this board.

Claudine Safar: I disagree and think the expertise would be important to these proceedings.

Caitlin Halpert: Commentary and questions should be directed to the DRB, not the applicant. There was not clear policing in previous hearings on this topic.

Claudine Safar: I would like to proceed. Dr. Willis, have you had time to review the drawings and will it be sufficient to abate sound.

Dr. Lance Willis: It is a good visual landscape plan, but the design lacks meaningful noise abatement treatments. The vegetation will provide privacy buffers, but not noise buffers.

Claudine Safar: Can you expand?

Dr. Lance Willis: The lot is too small to implement a noise mitigation plan.

Claudine Safar: Will the bushes provide a meaningful abatement? Is this a reasonable plan to mitigate noise?

Dr. Lance Willis: No.

Caitlin Halpert: Is there any other public questions or comments.

Geoff Hand: I appreciate the testimony, but I am trying to understand how we assess this from a standard or nuisance perspective. In your experience, how does the level of usage affect this project?

Dr. Lance Willis: I have reviewed cases of private residences implementing pickle ball courts and it creates friction with the surrounding neighbors.

Geoff Hand: How do we evaluate this on a nuisance perspective to prevent the permitting for this project?

Dr. Lance Willis: There have been a numbers of cases where the size of the lot is a detriment to the project.

Brad Rabinowitz: Can you expand on the noise barriers? The City of Burlington has used trees at the Burlington International Airport to mitigate noise.

Dr. Lance Willis: The hedgerow presented is immeasurable.

Melissa Ranaldo: The issue here is there are pickle ball courts located at Appletree Park four blocks away from this residential neighborhood. Why do these neighbors need a pickle ball court in their yard where it will disturb the peace of this neighborhood?

Gail Anderson: We are about 80-feet from this property and our primary concern is the decibel output cause by playing pickle ball. Our children are also Chinese so our complaints are not racially motivated.

John Clark: My family has lived in this neighborhood for eighty years and many residents are retired. I have hedgerows surrounding my property and dense woods, and my neighbors could still hear the sound of a pickle ball bouncing off my driveway as a test I conducted. I feel that the camps in this neighborhood that are not year round residences have no protection against the noise concerns presented.

Claudine Safar: In April, we submitted documents outlining this as a nuisance, and the testimony has proved it is just that.

Gail Anderson: I feel this project should not be permitted because I could hear the sound of the pickle ball popping off John Clark's driveway.

Keye Wong: People have made comments about not being notified, and I do not understand the complaints about what we are doing wrong.

Lucy Wong: It is hard when lawyers and expert witnesses are attacking us when we have not broken any laws. We are being attacked personally and it has not been a great experience because we are being judged on things that they do not even know about. I do not know where Appletree Park is, but we are on the losing end of what we are trying to accomplish with our private property. The lawsuit examples brought up by professional testimony are based upon large-scale courts, not singular residential examples.

Christopher Roy: What is not supposed to be guiding this discussion is neighbors using a nuisance to prevent recreational noise that is not clearly articulated in the zoning ordinance. People citing basketball, hockey, or tennis as acceptable neighborhood use is a dubious standard against pickle ball. The DRB should not be micromanaging accessory recreational uses in a residential district.

Caitlin Halpert: With that, we will close the hearing on this item and enter into deliberative session.

VIII. Adjournment

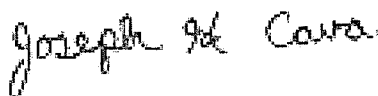
Hearing closed at 8:15 PM.



Alexander J. LaRosa, Chair of Development Review Board

8/1/23

Date



Joseph H. Cava, Permitting & Inspections Permit Technician

7-13-23

Date

which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/dpi/drb/agendas or the office notice board, one week before the hearing for the order in which items will be heard.

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