



Design Advisory Board

DAB Agenda - Tuesday, September 12, 2023, 3:00 PM, 645 Pine Street, Front Conference Room or Remote on Zoom

645 Pine Street, Front Conference Room or Remote on Zoom:

Please click the link below to join the webinar:

Zoom: <https://us02web.zoom.us/j/87155655137?pwd=ZEdGaGhxeFpRNDJQcFJrNWkvb1Vudz09>

Webinar ID: 871 5565 5137

Passcode: 796731

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1. Agenda

Subject	1.1. Session I: ZP-23-98; 41 Kingsland Terrace Deidre Donovan / Horace Mitchell Conditional use review to demolish an existing garage to construct ADU.
Subject	1.2. Session II: ZPF-23-63; 16 South Winooski Avenue Ronald McDonald House Charities / Kristine Bickford Alternative compliance to replace existing four foot high fence with new 4.8 foot high perimeter fencing.

Subject

**1.3. Session III: ZP-23-398; 300 Flynn Avenue
Howard Center for Human Services, Inc / Joe Weith, White + Burke
Proposed demolition of existing 24,042 sq. ft. building to construct a new
50,100 sq. ft. building for mental health crisis center and related
medical/general office uses.**

2. Adjournment

3. Informational and Non-Discrimination Statements

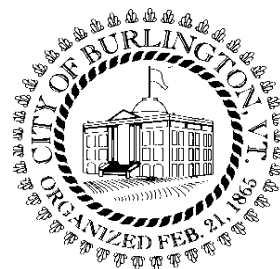
3.1. Non-Discrimination

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. 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 Department of Permitting & Inspections at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188.

Department of Permitting and Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/pz
Phone: (802) 865-7188
Fax: (802) 865-7195

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



MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: ZP-23-98
Location: 41 Kingsland Terrace
Date: September 12, 2023

File: ZP-23-98
Location: 41 Kingsland Terrace
Zone: RL **Ward:** 6S
Parking District: Neighborhood
Date application accepted: March 12, 2023 (review paused while applicant worked to address sewer ROW across property)
Applicant/ Owner: Horace (Binney) Mitchell
Request: Demolish existing single car garage (listed within South Union Street Historic District); construct Accessory Dwelling Unit.

Background:

- **Zoning Permit 11-0318CA;** convert enclosed porch to finished living space. October 2010.
- **Zoning Permit 81-224;** remove existing aluminum windows and replace with wood casements. October, 1980.

Overview: 41 Kingsland Terrace is an existing single family home that sits at the end of a cul-de-sac. The applicant proposes demolition of a single car garage (1923) with construction of a single story Accessory Dwelling Unit (ADU.)

As both the house and the garage are identified as contributing resources within the South Union Street Historic District, Conditional Use review is required for demolition of the garage.



Part 1: Land Division Design Standards

Not applicable.

Part 2: Site Plan Design Standards
Sec. 6.2.2 Review Standards

(a) Protection of Important Natural Features:

The proposed placement of the new ADU is where the existing garage is.



(b) Topographical Alterations:

None are proposed.

(c) Protection of Important Public Views:

There are no protected public views from or through this property.

(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).

See Section 5.4.8, below.

(e) Supporting the Use of Renewable Energy Resources:

No part of this application would preclude the use of wind, water, solar, geothermal, or other renewable energy resources.

(f) Brownfield Sites:

Not applicable.

(g) Provide for nature's events:

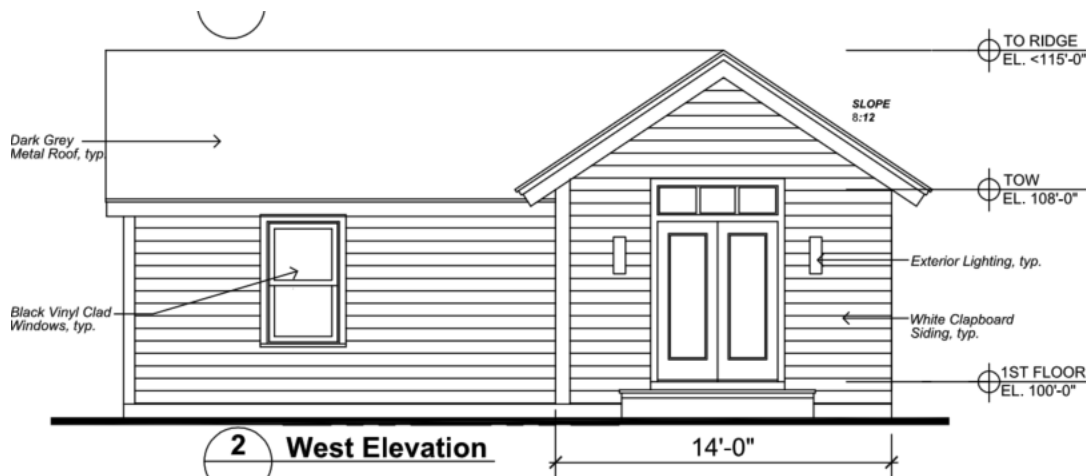
Special attention shall be accorded to stormwater runoff so that neighboring properties and/or the public stormwater drainage system are not adversely affected. All development and site disturbance shall follow applicable city and state erosion and stormwater management guidelines in accordance with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

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.

An Erosion Prevention and Sediment Control plan will be required.

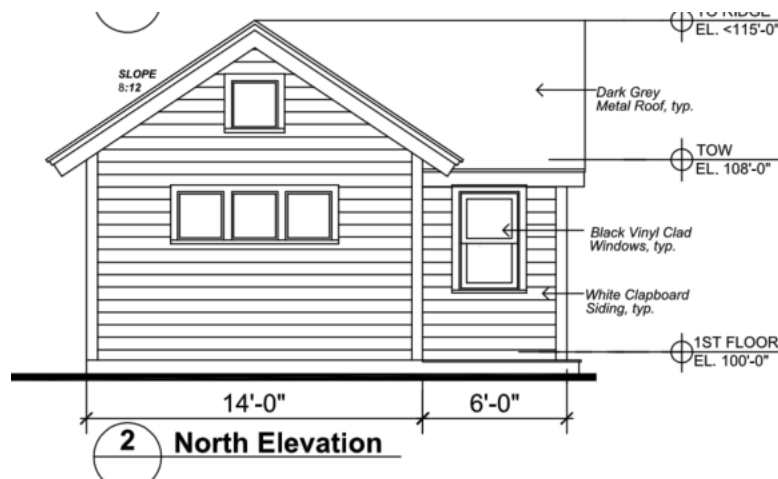
The distance between the driveway and structure will accommodate snow storage.

The entrance to the ADU is on the west elevation (see below), which has no canopy or shelter over the door. Some form of shelter is recommended.



(h) Building Location and Orientation:

The ADU will be located in the approximate location of the existing garage. The streetfront elevation (north) has a pleasant window arrangement, which still affords visual privacy for the bedroom within.



(i) Vehicular Access:

No change to existing.

(j) Pedestrian Access:

There is no identified pedestrian walkway between the house and the ADU, or the public sidewalk and the ADU. Pedestrian access should be identified.

(k) Accessibility for the Handicapped:

ADA access is under the jurisdiction of the building officials. While encouraged, it is not required for single family homes.

(l) Parking and Circulation:

No change is proposed to parking or circulation. The existing driveway immediately connects with the public way on Kingsland Terrace.

(m) Landscaping , Fences and Retaining Walls:

No landscaping plan has been submitted, and one should be prepared prior to review by the DRB.

(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.

Residential style lighting fixtures are proposed at the ADU entrance. See attachments.

(p) Integrate infrastructure into the design:

Exterior storage areas, machinery and equipment installations, service and loading areas, utility meters and structures, mailboxes, and similar accessory structures shall utilize setbacks, plantings, enclosures and other mitigation or screening methods to minimize their auditory and visual impact on the public street and neighboring properties to the extent practicable.

Utility and service enclosures and screening shall be coordinated with the design of the principal building, and should be grouped in a service court away from public view. On-site utilities shall be place underground whenever practicable. Trash and recycling bins and dumpsters shall be located, within preferably, or behind buildings, enclosed on all four (4) sides to prevent blowing trash, and screened from public view.

Any development involving the installation of machinery or equipment which emits heat, vapor, fumes, vibration, or noise shall minimize, insofar as practicable, any adverse impact on neighboring properties and the environment pursuant to the requirements of Article 5, Part 4 Performance Standards.

The plan does not include any information about meters, mailbox, utility connections, trash or recycling storage or any mechanical equipment. All should be identified on the site plan and/or building elevation as appropriate. Condensing units, if included, need to meet required setbacks.

Part 3: Architectural Design Standards
Sec. 6.3.2 Review Standards

(a)Relate development to its environment:

1. Massing, Height and Scale:

The proposed structure is one story / $\leq$ 15' tall, and similar in scale to the garage proposed for demolition.

2. Roofs and Rooflines.

The proposed replacement building is a tri-gable ell, with metal roofing.

3. Building Openings

Black vinyl clad windows are proposed, with a French door style entry.

(b) Protection of Important Architectural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves buildings 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. The introduction of new buildings to a historic district listed on a state or national register of historic places shall make every effort to be compatible with nearby historic buildings.

See Section 5.4.8.

(c) Protection of Important Public Views:

Not applicable.

(d) Provide an active and inviting street edge:

The north (street front) elevation is a gable front, clapboarded small accessory building. As 41 Kingsland Terrace is at the very end of a dead-end street and this is the last building, there will be little opportunity to be observed from the right-of-way.

(e) Quality of materials:

All development shall maximize the use of highly durable building materials that extend the life cycle of the building, and reduce maintenance, waste, and environmental impacts. Such materials are particularly important in certain highly trafficked locations such as along major streets, sidewalks, loading areas, and driveways. Efforts to incorporate the use of recycled content materials and building materials and products that are extracted and/or manufactured within the region are highly encouraged.

Fiber cement clapboard siding, metal roofing, and vinyl clad windows are proposed. All are of acceptable durability for new construction.

(f) Reduce energy utilization:

All new construction 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.

(g) Make advertising features complementary to the site:

Not applicable.

(h) Integrate infrastructure into the building design:

See Section 6.2.2 (p), above.

(i) Make spaces secure and safe:

Redevelopment shall observe all required building and life safety code as defined by the building officials. The entry door shall be adequately lit to assure safety for residents.

Sec. 5.4.8 Historic Buildings and Sites

The City seeks to preserve, maintain, and enhance those aspects of the city having historical, architectural, archaeological, and cultural merit. Specifically, these regulations seek to achieve the following goals:

To preserve, maintain and enhance Burlington's historic character, scale, architectural integrity, and cultural resources;

To foster the preservation of Burlington's historic and cultural resources as part of an attractive, vibrant, and livable community in which to live, work and visit;

To promote a sense of community based on understanding the city's historic growth and development, and maintaining the city's sense of place by protecting its historic and cultural resources; and,

To promote the adaptive re-use of historic buildings and sites.

(a) Applicability:

These regulations shall apply to all buildings and sites in the city that are listed, or eligible for listing, on the State or National Register of Historic Places.

Here is the narrative from the South Union Street Historic District:

30. Harold Slocum House (41 Kingsland Terrace); 1923.

Built in 1923 for Harold Slocum, secretary of the Tuberculois Association of Burlington, this Colonial Revival home is typical of those found on Kingsland Terrace. With a main rectangular block of 3 x 2 bays, this 2 1/2 story, eaves front, gabled house has a one story, glass-enclosed sunporch projecting to the west and an accented central front entrance.

Sheltering the entrance is a pedimented entrance portico supported at its corners by Doric columns; lattice screens enclose the sides. The gable ends of the house have cornice returns. Windows are symmetrically placed and have 6/1 sash on all facades. An exterior brick chimney pierces the roof ridge at the west end of the slate shingle roof and partly projects into the sunporch. Resting on a concrete foundation, this house is sheathed in wide aluminum siding.

30A. Garage (41 Kingsland Terrace); c.1923.

A one bay, clapboarded garage is found to the southeast of house #30. Capping the structure is a gable roof, with raking eaves towards the street. It has an overhead door of tiered panels with the second row from the top being glass. According to Sanborn maps this was built by 1926.

(b) Standards and Guidelines:

The following development standards, following the Secretary of the Interior's Standards for the Treatment of Historic Properties, shall be used in the review of all applications involving historic buildings and sites subject to the provisions of this section and the requirements for Design Review in Art 3, Part 4. The Secretary of the Interior's Standards are basic principles created to help preserve the distinctive character of a historic building and its site. They are a series of concepts about maintaining, repairing and replacing historic features, as well as designing new additions or making alterations. These Standards are intended to be applied in a reasonable manner, taking into consideration economic and technical feasibility.

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

The application proposes removal of the existing garage and replacement with a small building intended to provide housing.

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 that characterize a property will be avoided.*

Through demolition, the building and its historic character will be lost. This garage, typical for its date of construction, is of modest character and intended to be functional protection for the owner's vehicle (a fairly new idea in 1923.)



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.*

While the original garage is proposed to be lost, the replacement building will occupy the same location as the existing garage. No conjectural features are proposed; rather, new construction.

4. *Changes to a property that have acquired historic significance in their*

own right will be retained and preserved.

This small accessory structure is of interest as a representative of the type of automobile shed/garage associated with single family homes in the 1920s.

5. *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*



The existing garage has novelty siding on the north, south (rear) and east with plywood on the west. It features a gabled roof with asphalt shingles. While informative of a style and character associated with residential architecture, these small automotive sheds were typically underbuilt and some, like this one, of slight architectural merit and interest other than intended use and lot placement. 100 years after its original construction, they are challenged to accommodate a modern vehicle but well serve lawn storage items. This example appears to have been extended to the south (see above.)

The original building permit, issued October 20, 1925 gave dimensions as 12' x 20'.

Licenses Applied For.		
DATE	NAME	REMARKS
10-20-25	E. J. Palmer	addition on house
	Permit No 1045	13x24 two string
	R. J. Ludden	garage 12x20
	Permit No 1046	Kingland Terrace

The proposed replacement building will be of a similar size and height, and be equally unobtrusive as the last structure on the east end of Kingsland Terrace, tucked behind the principal structure.

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 request is not for repair but wholesale structural replacement. While the lot placement and building height will be similar to the existing building, the new use will provide a residential unit; presently quite in need.

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 disturbed, mitigation measures will be undertaken.

There are no known archaeological resources at this site; however if any are disturbed during construction, work shall pause until appropriate authorities are notified and resources are identified, evaluated and appropriate disposition determined.

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 materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.

While the structure is proposed for removal, the new structure will retain the spatial relationship to the primary residence. In materials and design the ADU will be differentiated from the old.

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.

While unlikely, the proposed ADU could be removed in the future without tarnishing the character and integrity of the principal structure on the lot. The original garage, however, will be lost.

(d) Demolition of Historic Buildings:

The purpose of this subsection is:

- *To discourage the demolition of a historic building, and allow full consideration of alternatives to demolition, including rehabilitation, adaptive reuse, resale, or relocation;*
- *Provide a procedure and criteria regarding the consideration of a proposal for the demolition of a historic building; and,*
- *To ensure that the community is compensated for the permanent loss of a historic resource by a redevelopment of clear and substantial benefit to the community, region or state.*

1. Application for Demolition.

For demolition applications involving a historic building, the applicant shall submit the following materials in addition to the submission requirements specified in Art. 3:

- A. *A report from a licensed engineer or architect who is experienced in rehabilitation of historic structures regarding the soundness of the structure and its suitability for rehabilitation;*

This has not been provided.

- B. *A statement addressing compliance with each applicable review standard for demolition;*

This has not been provided.

- C. *Where a case for economic hardship is claimed, an economic feasibility report prepared by an architect, developer, or appraiser, or other person experienced in the rehabilitation and adaptive reuse of historic structures that addresses:*

(i) the estimated market value of the property on which the structure lies, both before and after demolition or removal; and,

(ii) the feasibility of rehabilitation or reuse of the structure proposed for demolition or partial demolition;

The applicant has not claimed economical hardship.

- D. *A redevelopment plan for the site, and a statement of the effect of the proposed redevelopment on the architectural and historical qualities of other structures and the character of the neighborhood around the sites;*

The application is accompanied by a redevelopment plan.

and,

- E. *Elevations, drawings, plans, statements, and other materials which satisfy the submission requirements specified in Art. 3, for any replacement structure or structures to be erected or constructed pursuant to a development plan.*

The application includes drawings, plans and specification sheets to outline the intent to construct a new ADU.

2. *Standards for Review of Demolition.*

Demolition of a historic structure shall only be approved by the DRB pursuant to the provisions of Art. 3, Part 5 for Conditional Use Review and in accordance with the following standards:

- A. *The structure proposed for demolition is structurally unsound despite ongoing efforts by the owner to properly maintain the structure;*

There is no claim to structural instability within the application.

or,

- B. *The structure cannot be rehabilitated or reused on site as part of any economically beneficial use of the property in conformance with the intent and requirements of the underlying zoning district; and, the structure cannot be practicably moved to another site within the district;*

While there is no analysis of whether the structure could be moved to another site, it is unlikely that this small accessory structure could be reasonably rehabilitated for a new residential unit due to the inadequacy of its structural system and requirements for new structures intended for habitation.

or,

- C. *The proposed redevelopment of the site will provide a substantial community-wide benefit that outweighs the historic or architectural significance of the building proposed for demolition.*

The proposal to create a new dwelling unit when housing is in scarce supply is a community-wide benefit. In this case, it likely outweighs the historic or architectural significance of this small, extended garage.

And all of the following:

- D. *The demolition and redevelopment proposal mitigates to the greatest extent practical any impact to the historical importance of other structures located on the property and adjacent properties;*

Kingsland Terrace is included with the larger scope of the South Union Street Historic District. While principal structures on lots retain the foundation of the district's character, accessory or minor structures play supporting roles. In this example, the garage at 41 Kingsland Terrace is both in significance and lot placement a lesser character in the cast of important structures within this district and on this street. Its loss is notable, but will not diminish the importance of the remaining primary structures within the district and on the street.

- E. *All historically and architecturally important design, features, construction techniques, examples of craftsmanship and materials have been properly documented using the applicable standards of the Historic American Building*

Survey (HABS) and made available to historians, architectural historians and others interested in Burlington's architectural history;

Photographs of the existing building will suffice for retaining a record within the zoning history file.

and,

F. The applicant has agreed to redevelop the site after demolition pursuant to an approved redevelopment plan which provides for a replacement structure(s).

(i) Such a plan shall be compatible with the historical integrity and enhances the architectural character of the immediate area, neighborhood, and district;

With its small scale and lot placement, the integrity and character of the immediate area will remain intact.

(ii) Such plans must include an acceptable timetable and guarantees which may include performance bonds/letters of credit for demolition and completion of the project;

Per these standards, the time between demolition and commencement of new construction is limited to 6 months.

and,

(iii) The time between demolition and commencement of new construction generally shall not exceed six (6) months.

As conditioned.

This requirement may be waived if the applicant agrees to deed restrict the property to provide for open space or recreational uses where such a restriction constitutes a greater benefit to the community than the property's redevelopment.

Not applicable.

3. Deconstruction: Salvage and Reuse of Historic Building Materials.

The applicant shall be encouraged to sell or reclaim a structure and all historic building materials, or permit others to salvage them and to provide an opportunity for others to purchase or reclaim the building or its materials for future use. An applicant may be required to advertise the availability of the structure and materials for sale or salvage in a local newspaper on at least three (3) occasions prior to demolition.

Items for the Board's consideration:

1. An Erosion Prevention and Sediment Control Plan shall be required.
2. A pedestrian path to the ADU shall be illustrated on the site plan.
3. A landscaping plan is required.

4. The plan does not include any information about meters, mailbox, utility connections, or any mechanical equipment. All should be identified on the site plan and/or building elevation as appropriate. Condensing units, if included, need to meet required setbacks.
5. The applicant shall provide items 5.4.8 d) 1. A-C for DRB review.

Donovan/Mitchell
41 Kingsland Terrace
Burlington, VT
ADU

Exterior lights—spec sheet

Product information

Technical Details

Brand	LEDMO
Color	Black
Material	Aluminum
Style	Modern
Light fixture form	Wall
Room Type	Hallway, Balcony, Villa, Enclosing Wall, Corridor, Homestay, Terrace
Product Dimensions	5"L x 5"W x 10"H
Specific Uses	Garden, Yard, Patio
Indoor/Outdoor Usage	Outdoor, Indoor
Power Source	Corded Electric
Special Feature	Energy Efficient, Waterproof
Control Method	App
Light Source Type	LED
Shade Material	Acrylic

Voltage	110 Volts (AC)
Light Color	Warm White
Included Components	LED Lights
Item Package Quantity	2
Wattage	15 watts
Manufacturer	targetlighting
Part Number	LED1286B
Item Weight	5.46 pounds
Product Dimensions	5 x 5 x 10 inches
Country of Origin	China
Item model number	LED1286B
Assembled Height	10 inches
Assembled Length	5 inches
Assembled Width	5 inches
Special Features	Energy Efficient,Waterproof
Plug Format	A- US style
Switch Installation Type	Wall Mount
Batteries Required?	No

Luminous Flux	1500 Lumen
Bulb Features	Not Dimmable
Color Temperature	3000 Kelvin

Product details

Product Dimensions : 5 x 5 x 10 inches; 5.47 Pounds

Item model number : LED1286B

Date First Available : June 2, 2022

Manufacturer : targetlighting

ASIN : B0B2ZX3C2T

Country of Origin : China

Customer Reviews:

4.3 ★★★★★  [610 ratings](#)

RESIDENTIAL



Trust MBCI to Make Your Home Improvement Dreams Come True

The United States home improvement industry is stronger than it has ever been with our homes being our place of work and safety. Many people are investing into their homes with upgrades, renovations and expansions. Our roofing products are the ideal solution for today's modern, yet traditional look in any neighborhood.

It is estimated that home improvement spending exceeding \$394 billion and is on track for continued growth over the coming years. The business of homeownership represents a significant portion of the nation's economy.

MBCI's metal building products have helped many homeowners improve the aesthetic quality and durability of their homes while also allowing them to save money on maintenance and energy costs. With metal roofing, homeowners can rest assured knowing their roofs are resistant to harsh weather and backed by strong warranties.



MBCI WALL AND ROOF PANELS BENEFITS:

RAPID RENOVATIONS

Count on MBCI exterior metal wall panels and services to complete your home improvement project on-time. With MBCI's metal roofing, homeowners can rest assured their roof will stand for years to come no matter what mother nature brings.

COMPREHENSIVE PRODUCT TESTING

MBCI is committed to an aggressive, independent physical testing program to meet and exceed code requirements on water penetration, uplift ratings, and structural performance. MBCI's metal panels have gone through rigorous testing to ensure enhanced performance.

EYE CATCHING AESTHETICS

Homeowners expect an eye pleasing aesthetic both inside and outside their residence. MBCI metal wall and roof panels feature a vast color palette and premier texture to create an elegant exterior ambiance that will make your home stand-out from other houses in your neighborhood.

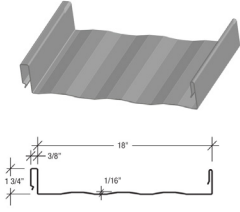
Name: Spencer Residence
Location: Guntersville, AL
Products: LokSeam

Color(s): Slate Gray
General Contractor: Scott Martin Construction

LOKSEAM®

LokSeam is a snap-together standing seam roof system with a 1¾" tall vertical rib, for use on roofs with a minimum slope of 3:12.

LokSeam panels are available in 12", 16" and 18" widths. LokSeam panels can be installed over open framing or a solid substructure and are capable of transitioning from roof to fascia with the use of a rib cover. LokSeam does not require a solid substructure for support



Product Specifications

- **Applications:** Roof
- **Coverage Widths:** 12", 16", 18"
- **Minimum Slope:** 3:12
- **Panel Attachment:** Concealed Fastening System, Standard and UL90 Clips
- **Gauges:** 24 (standard); 22 (12", 16", 18"), 26 (12") (optional)
- **Texture:** Striated (standard); Embossed Striated (optional)
- **Coatings:** Galvalume Plus®, Signature® 200, Signature® 300, Signature® 300 Metallic

Features and Benefits

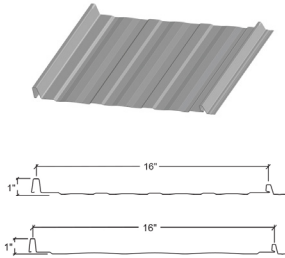
- Narrower widths, heavier gauges, striations and embossing minimize oil canning.
- Panels can be installed on roofs with a transition by using MBCI's die-formed rib covers.
- UL 580 rating is available, as well as UL 790, Class A for external fire, roof assembly for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- LokSeam carries Florida approval rating.

SLIMLINE®

The Slimline roof panel system offers a sleek contemporary profile ideal for residential and light commercial applications.

This system offers a concealed fastener attachment. Slimline panels must be specified as striated or striated with minor ribs.

Slimline cannot be end lapped.



Product Specifications

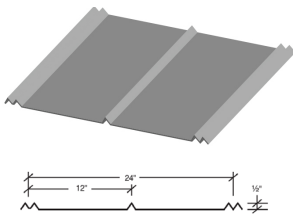
- **Applications:** Roof
- **Coverage Widths:** 16"
- **Rib Height:** 1"
- **Minimum Slope:** 3:12
- **Panel Attachment:** Concealed Fastening System
- **Gauges:** 29 (standard); 26 (optional)
- **Texture:** Striations (standard); Minor Rib Striations (optional)
- **Coatings:** Galvalume Plus®, Signature® 200

Features and Benefits

- UL 580 rating is available, as well as UL 790, Class A for external fire, roof assembly for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- Slimline carries Florida approval rating.

5V CRIMP

The 5V Crimp roof panel offers an ideal old-time, residential appearance. 5V Crimp is also an aesthetically pleasing solution for light commercial applications. The 5V Crimp panels require a solid roof deck with a waterproof membrane.



Product Specifications

- **Applications:** Roof
- **Coverage Widths:** 24"
- **Rib Spacing:** 12" on center
- **Rib Height:** ½"
- **Minimum Slope:** 3:12
- **Panel Attachment:** Exposed Fastening System
- **Gauges:** 29 (standard); 26 (optional)
- **Texture:** Smooth (standard)
- **Coatings:** Galvalume Plus®, Signature® 200

Features and Benefits

- UL 580 rating is available, as well as UL 790, Class A for external fire, roof assembly for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- 5V Crimp carries Florida approval rating.

For more information on how MBCI metal wall and roof systems can impact your next residential project, visit mbci.com/industries.



Since 1976, MBCI has partnered with our customers to deliver high-quality metal building components backed by meaningful relationships and trusted performance. With our comprehensive portfolio and end-to-end expertise in building solutions, MBCI supports our customers throughout the project life cycle.

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James Hardie Statement Collection HZ5 0.312-in x 8.25-in x 144-in Arctic White Fiber Cement Lap Siding

Item #655578 Model #6671171

Shop James Hardie

2

\$22.40

\$21.28 when you choose 5% savings on eligible purchases every day. [Learn how](#)

Hardie® fiber cement siding with ColorPlus Technology® finishes for lasting beauty without sacrificing durability and protection
Hardie® Plank fiber cement siding is Engineered for Climate® resisting damage from harsh weather conditions
30-yr limited non-prorated siding substrate warranty; ColorPlus® Technology finishes are backed by a 15-yr limited warranty

Pickup & Delivery Options

FREE Pickup

Ready Mon, May 22 (Est.)

At Sterling Lowe's

Curbside Available

Delivery 05401

Sat, May 20: From \$79

Scheduled Delivery is available for Orders over \$50

[More Delivery Options](#)

—

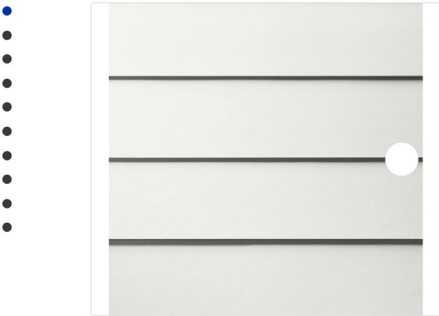
25

+

Add to Cart

Minimum Qty of 25

Easy & Free Returns
Return your new, unused item in-store or ship it back to us free of charge. [Learn More](#)



BETTER TOGETHER

CURRENT ITEM

Selected

Selected

Selected

James Hardie Statement Collection HZ5 0.312-in x 8.25-in x 144-in Arctic White Fiber

\$22.40

DAP Commercial Kitchen 9.8-oz Stainless Steel Silicone Caulk

\$11.29

Lowe's 3-ft x 100-ft TYVEK House Wrap

\$75.98

RELIABILT 1/4-in x 6-in x 2-ft Square Edge Unfinished Red Oak Board

\$7.98

Subtotal for (28) items

\$655.25

Add to cart 28 items

Overview

James Hardie makes your dream home possible. With endless ways to personalize your unique style, Hardie® fiber cement exterior solutions give your home a beautiful design without having to sacrifice durability and protection. Using products from a single, trusted manufacturer that offers exceptional warranties, you'll have complete peace of mind, trusted protection, and long-lasting beauty. Hardie® Plank Statement collection smooth fiber cement siding with ColorPlus® technology finish has no woodgrain texture for a sleek and modern look. The ColorPlus® technology finishes are fully cured onto our boards in a controlled factory environment and arrive at your home ready for install year-round. HZ5® engineering means it is made to withstand temperature fluctuations, snow, ice, freezing temperatures and hail. Board features ColorPlus Technology® in Arctic White for a clean, bright finish.

Feedback

Page 21 of 283

- Hardie® fiber cement siding with ColorPlus Technology® finishes for lasting beauty without sacrificing durability and protection
- Hardie® Plank fiber cement siding is Engineered for Climate® resisting damage from harsh weather conditions
- 30-yr limited non-prorated siding substrate warranty; ColorPlus® Technology finishes are backed by a 15-yr limited warranty
- Smooth, sleek, and modern siding in an Arctic White color has no woodgrain appearance
- Hardie® Plank is a best-selling Hardie® product that delivers lower maintenance exterior solutions
- ASTM E136 noncombustible cladding will not attract pests including termites and woodpeckers
- 5/16-in x 8.25-in x 12-ft smooth lap board installs horizontally and resists pests that can damage wood siding
- Use a 2-1/2 in. siding gun or siding nailer to attach to wood, steel or masonry substrates
- Cut outdoors using a circular saw with a fiber cement saw blade and a vacuum dust collection system or electric fiber cement cutting shear

 **Use and Care Manual**
PDF

 **Prop65 Warning Label**
PDF

 **HowTo Manual**
PDF

 **Installation Manual**
PDF

 **Warranty Guide**
PDF

CA Residents:  [Prop 65 Warning\(s\)](#) 

Specifications

Actual Length (Inches)	144	Finish Warranty	15-year limited
Actual Thickness (Inches)	0.312	Manufacturer Color/Finish	Arctic White
Actual Width (Inches)	8.25	Recommended Exposure (Inches)	7.0
CA Residents: Prop 65 Warning(s)	 Prop 65 WARNING(S) -	Series Name	Statement Collection HZ5
Color/Finish Family	White	Texture	Smooth
Coverage Area (Sq. Feet)	8.25	Type	Lap siding
Edge Profile	Straight	UNSPSC	30151800
Finish	Painted	Warranty	30-year limited

Compare

Reviews 2

Community Q & A

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\$9⁹⁸
~~\$12.48~~ **SAVE 20%**
     235
James Hardie Primed-Hz 5 0.312-in x 8.25-in x 144-in Fiber Cement Lap Siding
[Add to Cart](#)



\$20⁷³
     6
James Hardie Statement Collection Hardie Plank HZ5 0.312-in x 8.25-in x 144-in Arctic White Fiber Cement Lap Siding
[Add to Cart](#)



\$46⁴⁷
     209
James Hardie Primed-Hz 5 0.312-in x 48-in x 96-in Fiber Cement Panel Siding
[Add to Cart](#)



\$1⁰⁰
     8
James Hardie Stater 0.312-in x 6.25-in x 4-Cement Sample
[Add to Cart](#)

Minimum qty of 25

REGULARLY BOUGHT TOGETHER



\$12⁹⁸
     1963



RELIABILT 1-in x 12-in x 2-ft Square Edge
Unfinished Poplar Board

Add to Cart

PREVIOUSLY VIEWED



\$22⁴⁰

★★★★★ 2

James Hardie Statement Collection HZ5
0.312-in x 8.25-in x 144-in Arctic White Fiber
Cement Lap Siding

Add to Cart

Minimum qty of 25

[View Similar](#)

Product Features

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WHITE
PROPERTY

66.95'

PROPOSED
ADU 32' x 20'

20'

38.5'

32'

EXISTING
GARAGE
28.5' x 12.5'

Set
back

14'

99'

10'

HOUSE
40' x 35'

DRIVE
3.4' x 11' x 5.5'

8'
FR

WALKWAY
8' x 10'

64'

Burlington VT

Mitchell-ADU-Essenial

Quote #: N35BWJX

A Proposal for Window and Door Products prepared for:

Job Site:

05401

Shipping Address:

WINDOWS & DOORS BY BROWNELL-WLST

800 MARSHALL AVE STE 50

WILLISTON, VT 05495-8937



JUSTIN HAIGHT
WINDOWS & DOORS BY BROWNELL-
WLST
800 MARSHALL AVE STE 50
WILLISTON, VT 05495-8937
Phone: (802) 861-4914

Email: jhaight@wdbrownell.com

This report was generated on 5/9/2023 9:31:11 AM
using the Marvin Order Management System,
version 0004.02.01 (Current). Price in USD. Unit
availability and price are subject to change. Dealer
terms and conditions may apply.

Featuring products from:



UNIT SUMMARY

The following is a schedule of the windows and doors for this project. For additional unit details, please see Line Item Quotes.

Additional charges, tax or Terms and Conditions may apply. Detail pricing is per unit.

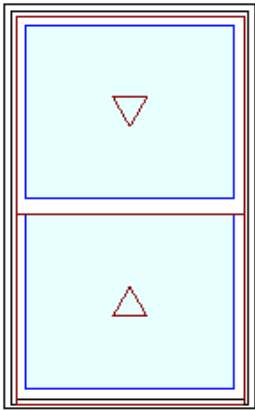
NUMBER OF LINES: 8	TOTAL UNIT QTY: 11	EXT NET PRICE: USD	8,309.65
--------------------	--------------------	--------------------	----------

LINE	MARK UNIT	PRODUCT LINE	ITEM	NET PRICE	QTY	EXTENDED NET PRICE
1	North Double Hung	Essential	Double Hung CN 2640 RO 30" X 48"	489.89	1	489.89
2	North Fixed Single	Essential	Awning CN 2020 RO 24" X 24"	308.47	1	308.47
3	North 3w Assembly	Essential	Essential Assembly RO 72" X 24"	1,322.10	1	1,322.10
4	South Double Hungs	Essential	Double Hung CN 2640 RO 30" X 48"	489.89	3	1,469.67
5	East Awnings	Essential	Awning CN 3030 RO 36" X 36"	606.35	2	1,212.70
6	West Double Hung	Essential	Double Hung CN 3050 RO 36" X 60"	590.82	1	590.82
7	West Awning	Essential	Awning CN 2626 RO 30" X 30"	504.71	1	504.71
8	West Entry	Essential	Essential Assembly RO 60" X 98"	2,411.29	1	2,411.29

LINE ITEM QUOTES

The following is a schedule of the windows and doors for this project. For additional unit details, please see Line Item Quotes. Additional charges, tax or Terms and Conditions may apply. Detail pricing is per unit.

Line #1	Mark Unit: North Double Hung	Net Price:		489.89
Qty: 1		Ext. Net Price:	USD	489.89



As Viewed From The Exterior

CN 2640

FS 29 1/2" X 47 1/2"

RO 30" X 48"

Egress Information

Width: 26 9/16" Height: 19 13/64"

Net Clear Opening: 3.54 SqFt

Performance Information

U-Factor: 0.3

Solar Heat Gain Coefficient: 0.33

Visible Light Transmittance: 0.57

Condensation Resistance: 57

CPD Number: MAR-N-332-00368-00001

ENERGY STAR: NC

Ebony Exterior
Stone White Interior
Essential Double Hung
CN 2640
Rough Opening 30" X 48"
Top Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
Bottom Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
1 White Sash Lock
White Sash Lift
Exterior Aluminum Screen
Ebony Surround
Bright View Mesh

2" Jambs

Nailing Fin

***Note: Unit Availability and Price is Subject to Change

Line #2	Mark Unit: North Fixed Single	Net Price:		308.47
Qty: 1		Ext. Net Price:	USD	308.47

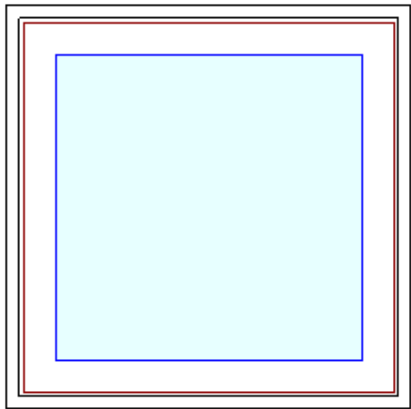


Ebony Exterior
Stone White Interior
Essential Awning - Stationary
CN 2020
Rough Opening 24" X 24"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar

2" Jambs

Nailing Fin

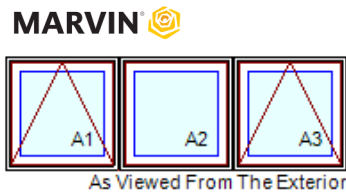
***Note: Unit Availability and Price is Subject to Change



As Viewed From The Exterior

CN 2020
FS 23 1/2" X 23 1/2"
RO 24" X 24"
Egress Information
No Egress Information available.
Performance Information
U-Factor: 0.29
Solar Heat Gain Coefficient: 0.29
Visible Light Transmittance: 0.49
Condensation Resistance: 57
CPD Number: MAR-N-377-00508-00001
ENERGY STAR: NC

Line #3	Mark Unit: North 3w Assembly	Net Price:		1,322.10
Qty: 1		Ext. Net Price:	USD	1,322.10



FS 71 1/2" X 23 1/2"
RO 72" X 24"
Egress Information A1, A2, A3
No Egress Information available.
Performance Information A1, A2, A3
U-Factor: 0.29
Solar Heat Gain Coefficient: 0.29
Visible Light Transmittance: 0.49
Condensation Resistance: 57
CPD Number: MAR-N-377-00508-00001
ENERGY STAR: NC

Ebony Exterior
Stone White Interior
3W1H - Rectangle Assembly
Assembly Rough Opening
72" X 24"

Unit: A1
Essential Awning - Roto Operating
CN 2020
Rough Opening 24" X 24"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
White Folding Handle
Interior Aluminum Screen
Bright View Mesh
Stone White Surround

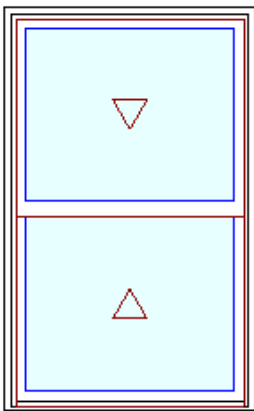
Unit: A2
Essential Awning - Stationary
CN 2020
Rough Opening 24" X 24"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar

Unit: A3
Essential Awning - Roto Operating
CN 2020
Rough Opening 24" X 24"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar

White Folding Handle
Interior Aluminum Screen
Bright View Mesh
Stone White Surround
Vertical 1/2" MRF
2" Jambs
Nailing Fin with 4" Structural Brackets
***Note: This configuration is certified to AAMA 450.
***Note: Unit Availability and Price is Subject to Change

Line #4	Mark Unit: South Double Hungs	Net Price:		489.89
Qty: 3		Ext. Net Price:	USD	1,469.67

MARVIN 



As Viewed From The Exterior

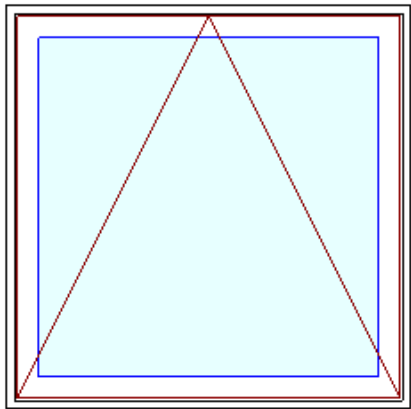
CN 2640
FS 29 1/2" X 47 1/2"
RO 30" X 48"
Egress Information
Width: 26 9/16" Height: 19 13/64"
Net Clear Opening: 3.54 SqFt
Performance Information
U-Factor: 0.3
Solar Heat Gain Coefficient: 0.33
Visible Light Transmittance: 0.57
Condensation Resistance: 57
CPD Number: MAR-N-332-00368-00001
ENERGY STAR: NC

Ebony Exterior
Stone White Interior
Essential Double Hung
CN 2640
Rough Opening 30" X 48"
Top Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
Bottom Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
1 White Sash Lock
White Sash Lift
Exterior Aluminum Screen
Ebony Surround
Bright View Mesh
2" Jambs
Nailing Fin
***Note: Unit Availability and Price is Subject to Change

Line #5	Mark Unit: East Awnings	Net Price:		606.35
Qty: 2		Ext. Net Price:	USD	1,212.70

MARVIN 

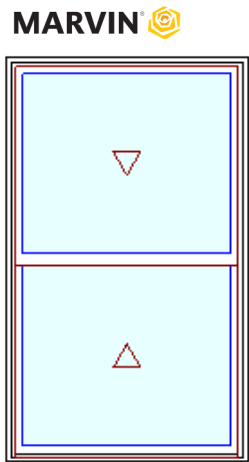
Ebony Exterior
Stone White Interior
Essential Awning - Roto Operating
CN 3030
Rough Opening 36" X 36"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
White Folding Handle
Interior Aluminum Screen
Bright View Mesh
Stone White Surround
2" Jambs
Nailing Fin



CN 3030
FS 35 1/2" X 35 1/2"
RO 36" X 36"
Egress Information
No Egress Information available.
Performance Information
U-Factor: 0.29
Solar Heat Gain Coefficient: 0.29
Visible Light Transmittance: 0.49
Condensation Resistance: 57
CPD Number: MAR-N-377-00508-00001
ENERGY STAR: NC

***Note: Unit Availability and Price is Subject to Change

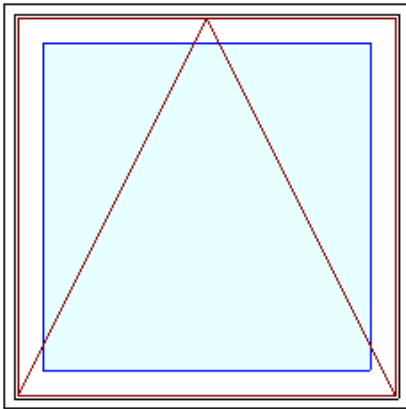
Line #6	Mark Unit: West Double Hung	Net Price:		590.82
Qty: 1		Ext. Net Price:	USD	590.82



CN 3050
FS 35 1/2" X 59 1/2"
RO 36" X 60"
Egress Information
Width: 32 9/16" Height: 25 13/64"
Net Clear Opening: 5.70 SqFt
Performance Information
U-Factor: 0.3
Solar Heat Gain Coefficient: 0.33
Visible Light Transmittance: 0.57
Condensation Resistance: 57
CPD Number: MAR-N-332-00368-00001
ENERGY STAR: NC

Ebony Exterior
Stone White Interior
Essential Double Hung
CN 3050
Rough Opening 36" X 60"
Top Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
Bottom Sash
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
2 White Sash Lock
White Sash Lift
Exterior Aluminum Screen
Ebony Surround
Bright View Mesh
2" Jambs
Nailing Fin
***Note: Unit Availability and Price is Subject to Change

Line #7	Mark Unit: West Awning	Net Price:		504.71
Qty: 1		Ext. Net Price:	USD	504.71



As Viewed From The Exterior

CN 2626

FS 29 1/2" X 29 1/2"

RO 30" X 30"

Egress Information

No Egress Information available.

Performance Information

U-Factor: 0.29

Solar Heat Gain Coefficient: 0.29

Visible Light Transmittance: 0.49

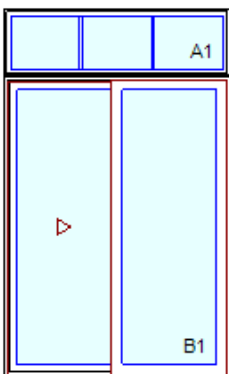
Condensation Resistance: 57

CPD Number: MAR-N-377-00508-00001

ENERGY STAR: NC

Ebony Exterior
Stone White Interior
Essential Awning - Roto Operating
CN 2626
Rough Opening 30" X 30"
IG - 1 Lite
Low E2 w/Argon
Stainless Perimeter Bar
White Folding Handle
Interior Aluminum Screen
Bright View Mesh
Stone White Surround
2" Jambs
Nailing Fin
***Note: Unit Availability and Price is Subject to Change

Line #8	Mark Unit: West Entry	Net Price:		2,411.29
Qty: 1		Ext. Net Price:	USD	2,411.29



Primary Stationary

As Viewed From The Exterior

FS 59 1/2" X 97 1/2"

RO 60" X 98"

Egress Information A1

No Egress Information available.

Egress Information B1

Width: 24 1/16" Height: 75 17/64"

Feature Mismatch: Divided Lite Options

Ebony Exterior
Stone White Interior
1W2H - Rectangle Assembly
Assembly Rough Opening
60" X 98"

Unit: A1
Essential Sliding Patio Door Direct Glaze Transom
CN 5016
Rough Opening 60" X 18"
IG
Low E2 w/Argon
Stainless Perimeter Bar
GBG
Rectangular - Standard Cut 3W1H
Ebony Ext - White Int

Unit: B1
Essential Sliding Patio Door XO
CN 5068
Rough Opening 60" X 80"
Left Panel
IG - 1 Lite
Tempered Low E2 w/Argon

Net Clear Opening: 12.58 SqFt
Performance Information A1, B1
Product Performance Information is currently unavailable in the OMS for this product and glazing option. To request product performance information not in the OMS, contact your Marvin representative or submit an Assistance Request.

Stainless Perimeter Bar
Right Panel
IG - 1 Lite
Tempered Low E2 w/Argon
Stainless Perimeter Bar
Cambridge Handle White Exterior Handle set
Cambridge Handle White Interior Handle set
Ebony Sliding Screen
Bright View Mesh
***Screen/Combo Ship Loose
Bronze Ultrex Sill / Black Weather Strip
Horizontal 1/2" MRF
3 3/8" Jambs
Nailing Fin with 4" Structural Brackets
***Note: Divided lite cut alignment may not be accurately represented in the OMS drawing. Please consult your local representative for exact specifications.
***Note: This configuration is certified to AAMA 450.
***Note: Unit Availability and Price is Subject to Change

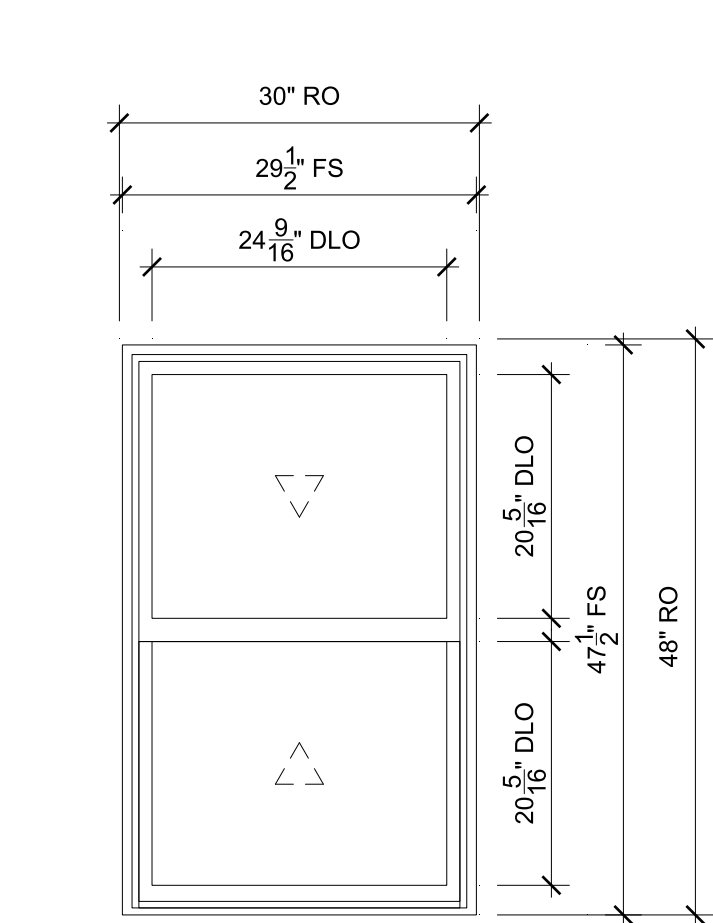
Project Subtotal Net Price: USD	8,309.65
7.000% Sales Tax: USD	581.68
Project Total Net Price: USD	8,891.33

PRODUCT AND PERFORMANCE INFORMATION

NFRC energy ratings and values may vary depending on the exact configuration of glass thickness used on the unit. This data may change over time due to ongoing product changes or updated test results or requirements.

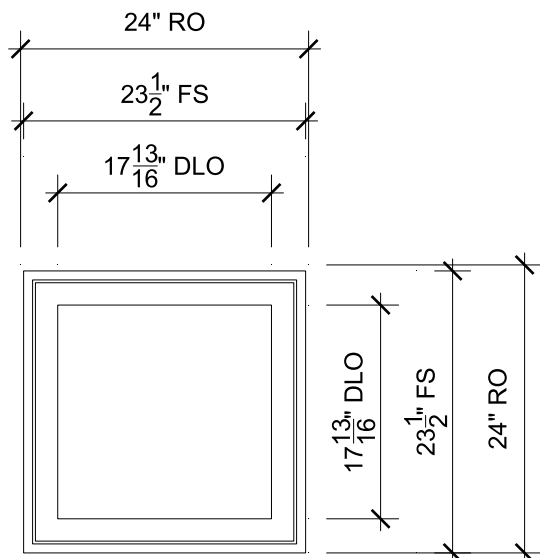
The National Fenestration Rating Council (NFRC) has developed and operates a uniform national rating system for the energy performance of fenestration products, including windows and doors. For additional information regarding this rating system, see www.nfrc.org.

NFRC energy values and ratings may change over time due to ongoing product changes, updated test results or requirements.



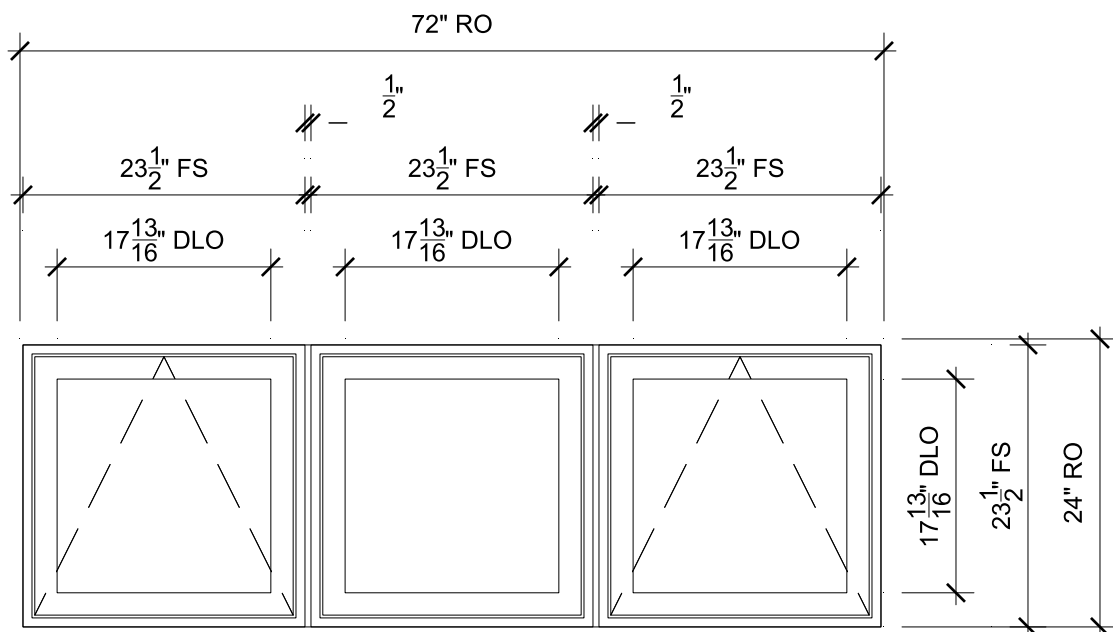
NORTH DOUBLE HUNG
SCALE: 3/4" = 1'-0"

- Head
- Jamb
- Sill
- Check Rail



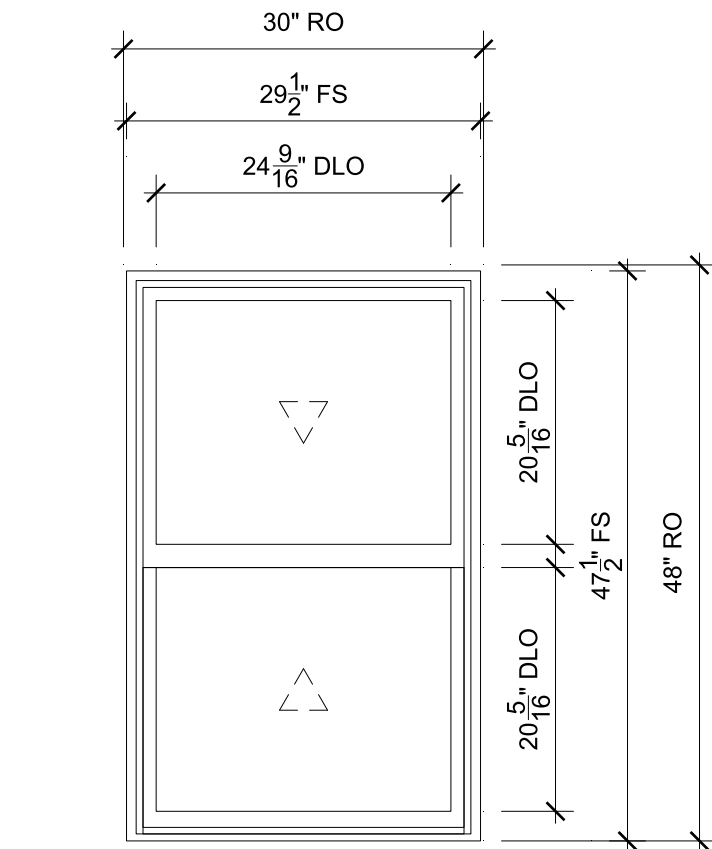
NORTH FIXED SINGLE
SCALE: 3/4" = 1'-0"

- Head
- Jamb
- Sill



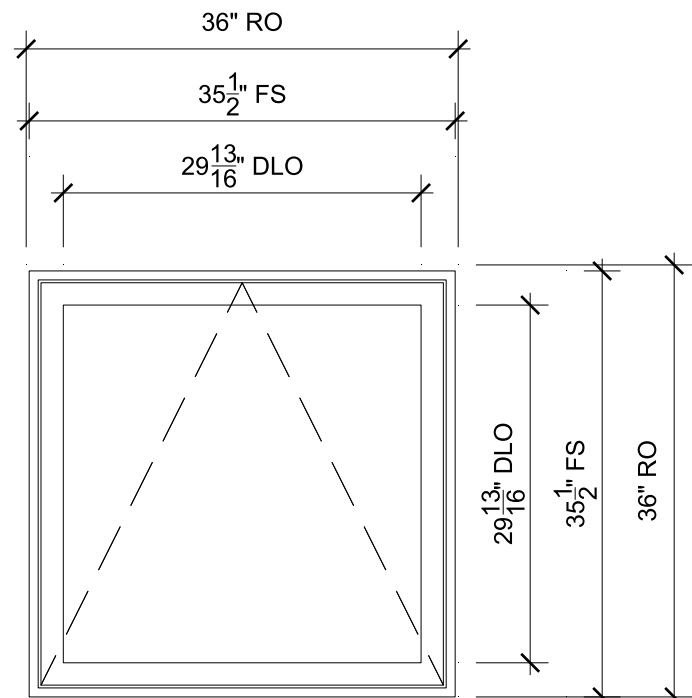
NORTH 3W ASSEMBLY
SCALE: 3/4" = 1'-0"

- Head
- Vertical Mullion
- Head
- Sill
- Jamb
- Sill



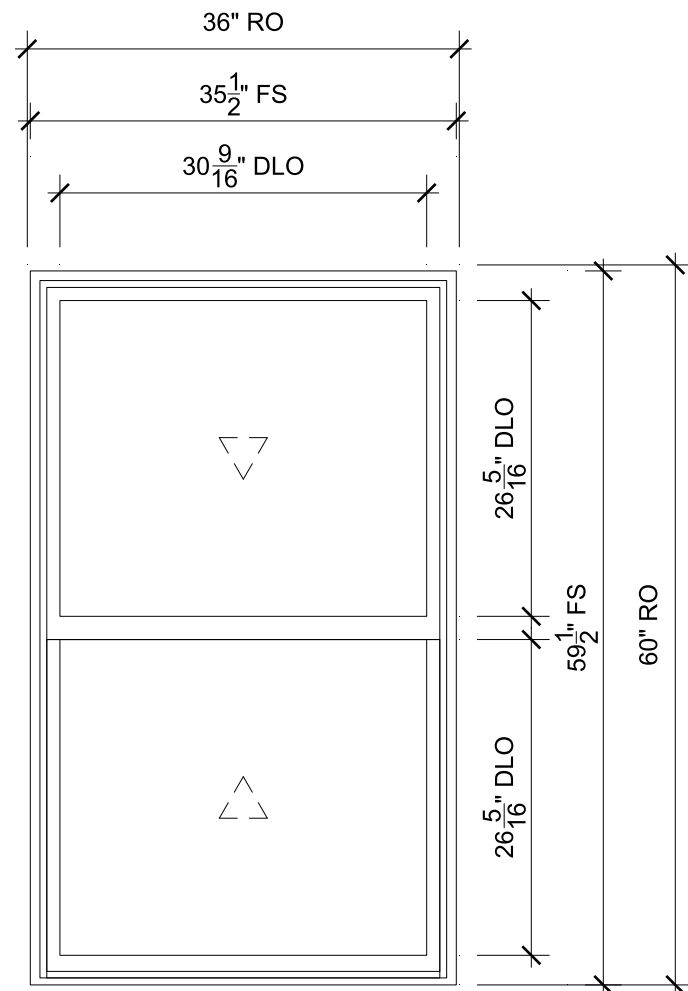
SOUTH DOUBLE HUNGs
SCALE: 3/4" = 1'-0"

- Head
- Sill
- Jamb
- Check Rail



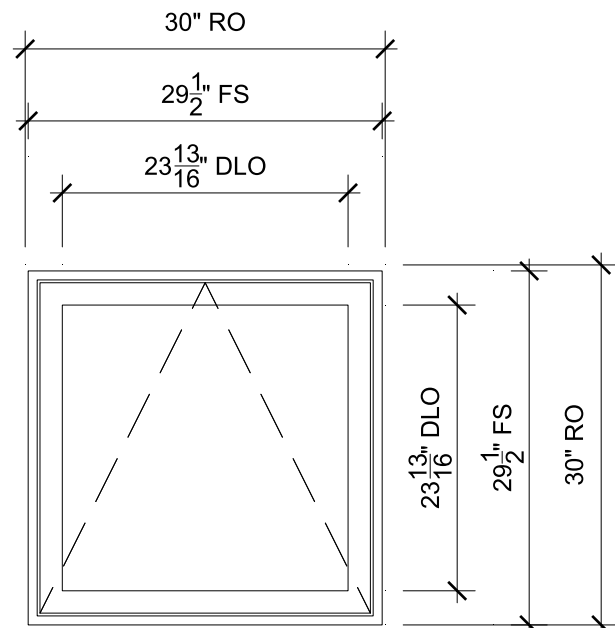
EAST AWNINGS
SCALE: 3/4" = 1'-0"

- Head
- Sill
- Jamb



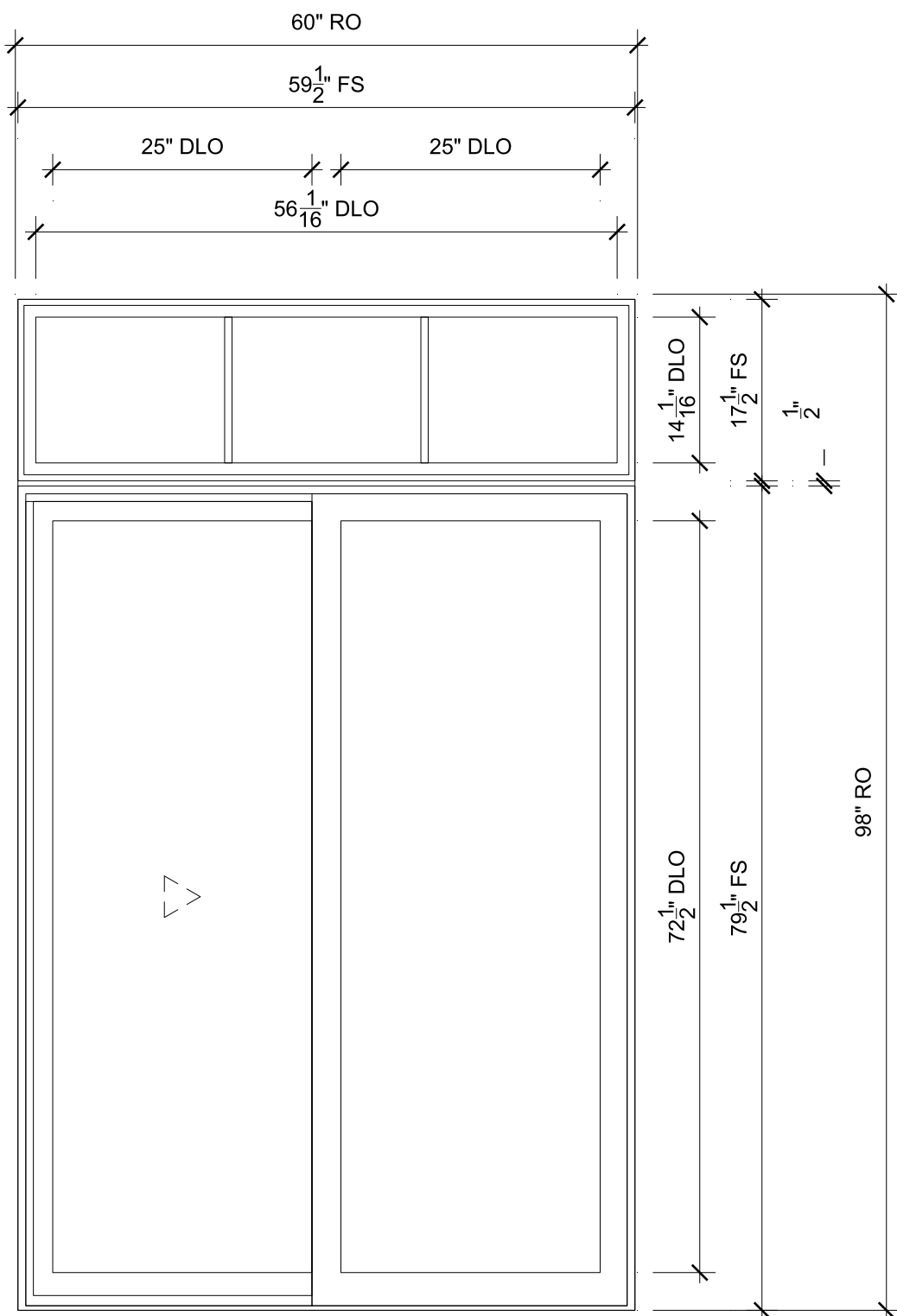
WEST DOUBLE HUNG
SCALE: 3/4" = 1'-0"

- Head
- Sill
- Jamb
- Check Rail



WEST AWNING
SCALE: 3/4" = 1'-0"

- Head
- Sill
- Jamb



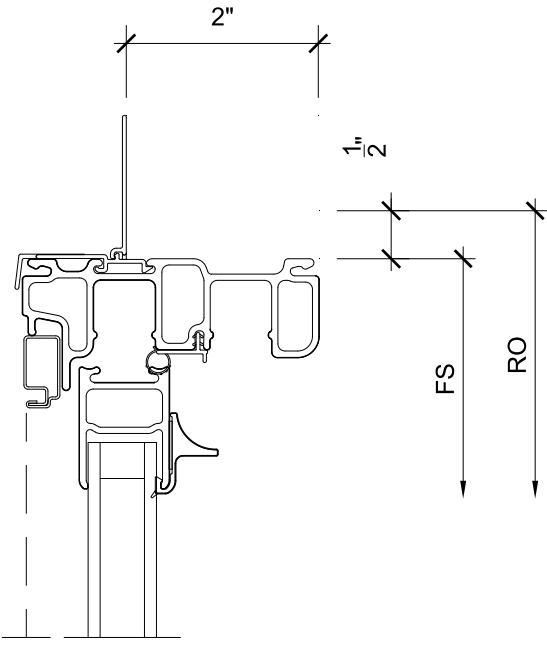
WEST ENTRY
SCALE: 3/4" = 1'-0"

- Head
- Jamb
- Divided Lite
- Horizontal Mullion
- Jamb
- Meeting Stile
- Jamb
- Sill

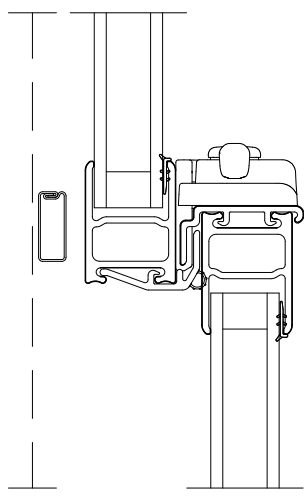
ORDERING PRODUCTS WITH REFERENCE TO SHOP DRAWINGS:
Before ordering the Marvin Window and Door products illustrated within these shop drawings, a copy of these drawings accompanied by an approved signature of the purchaser must be returned to the Architectural Division at Marvin Windows & Doors, P.O. Box 100, Winona, Minnesota 55975. The purchaser must acknowledge that the drawings are subject to the approved shop drawings. Marvin Windows and Doors assumes no responsibility in guaranteeing product coordination with the drawings.

PROJ/JOB: Burlington VT / Mitchell-ADU-Essential
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: JUSTIN HAIGHT
QUOTE#: N36BWJX
PK VERSION: 0004.02.01
CREATED: 05/09/2023
REVISION:

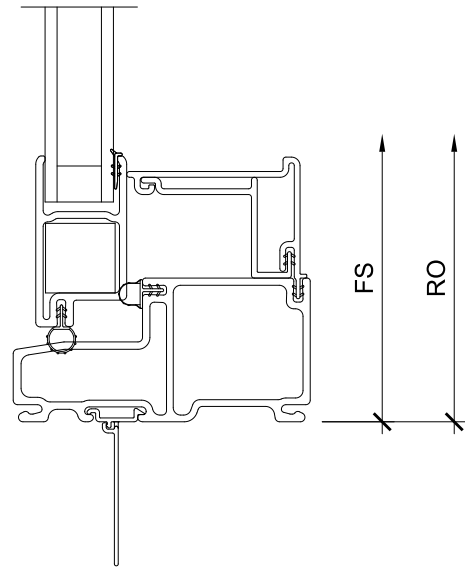
SHEET
1
OF 3



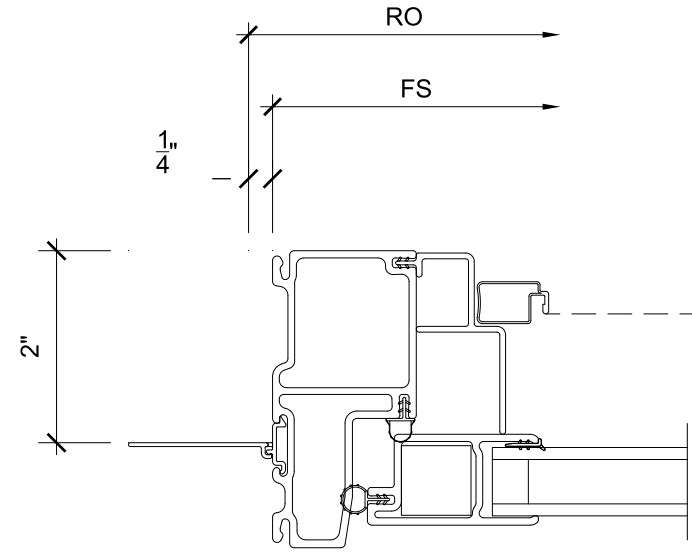
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2 Head SCALE: 6" = 1'-0"



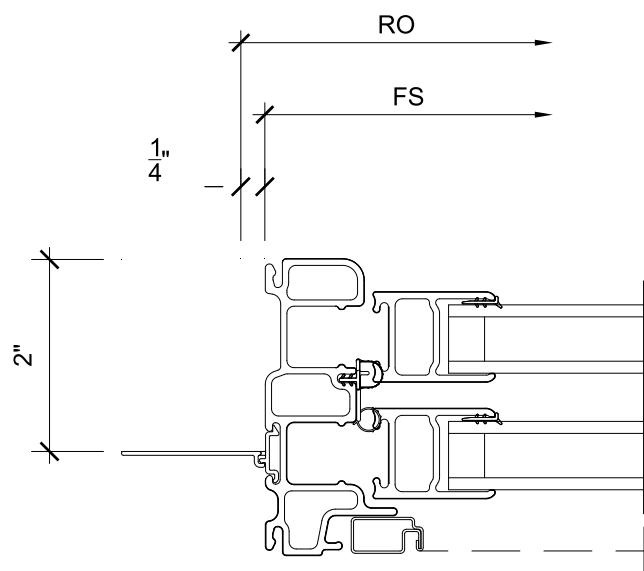
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2 Check Rail SCALE: 6" = 1'-0"



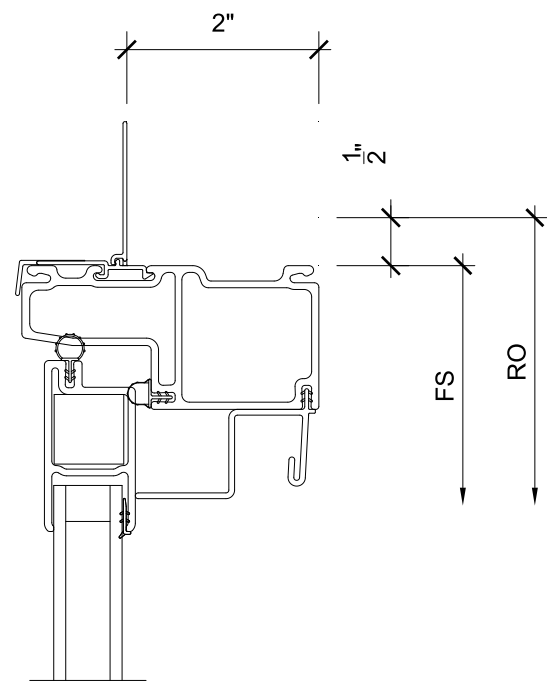
7
2 Sill SCALE: 6" = 1'-0"



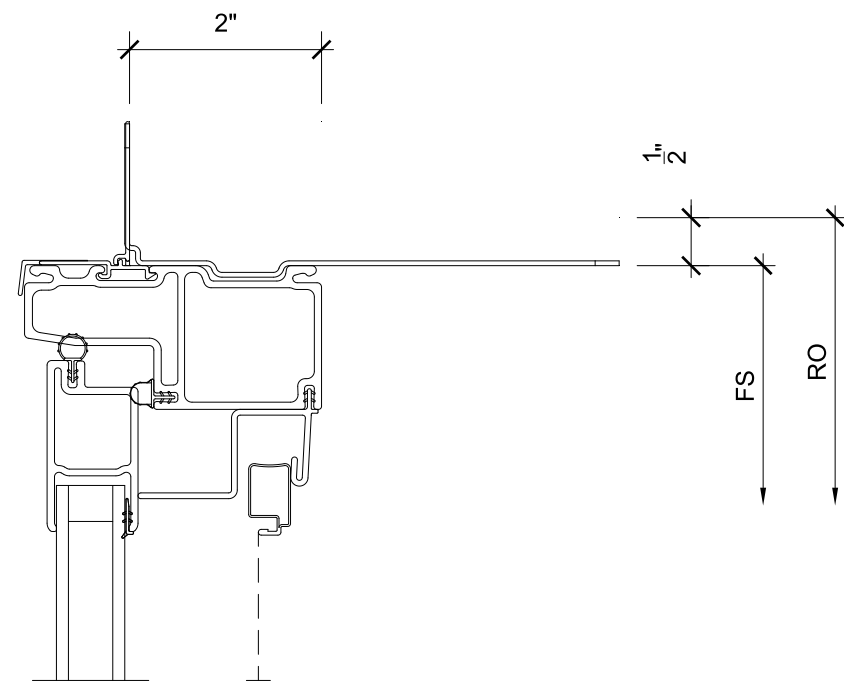
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2 Jamb SCALE: 6" = 1'-0"



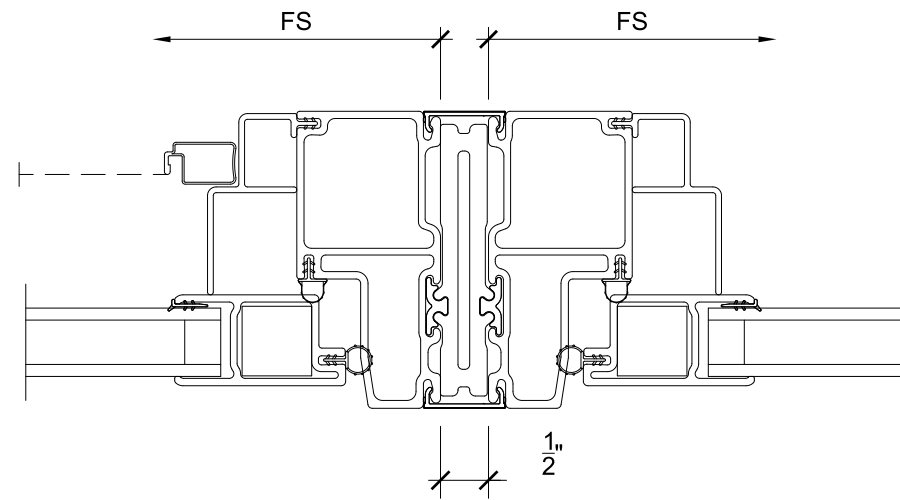
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2 Jamb SCALE: 6" = 1'-0"



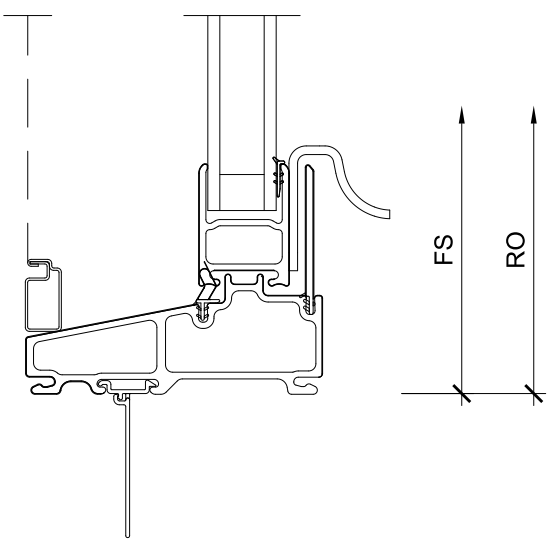
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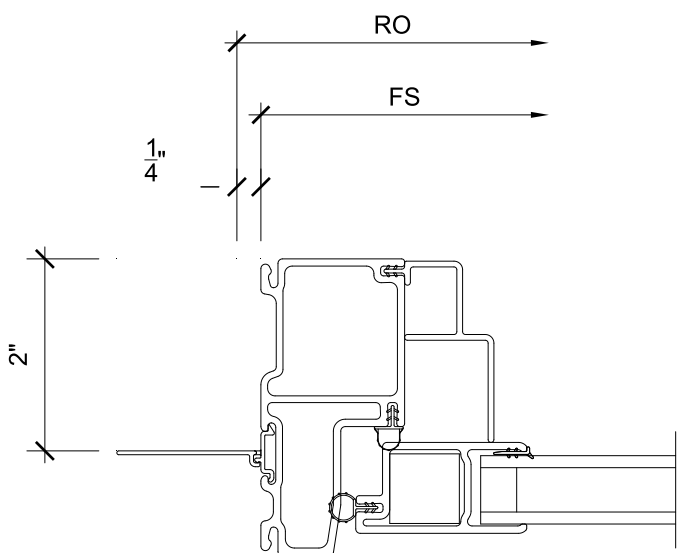
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2 Head SCALE: 6" = 1'-0"



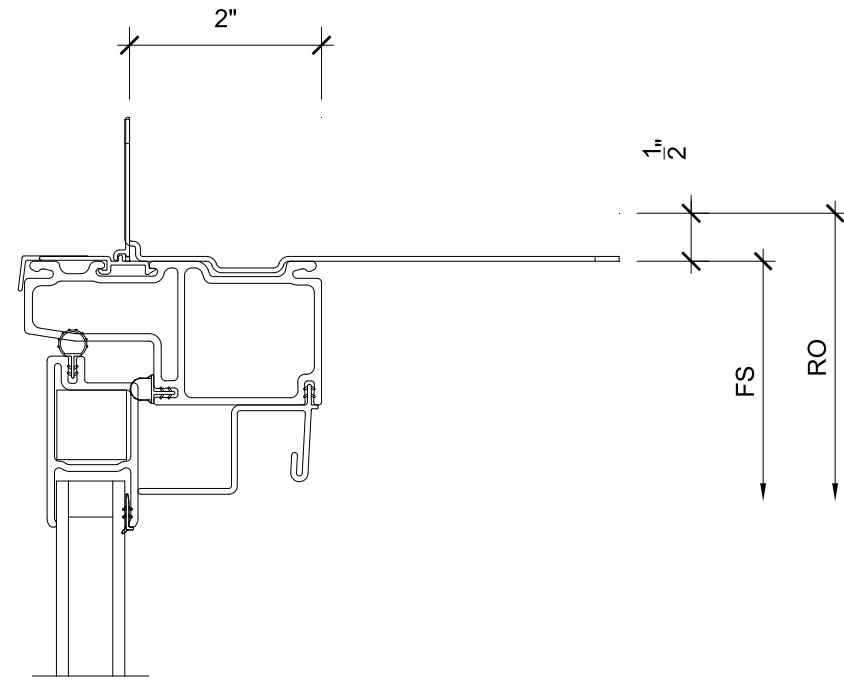
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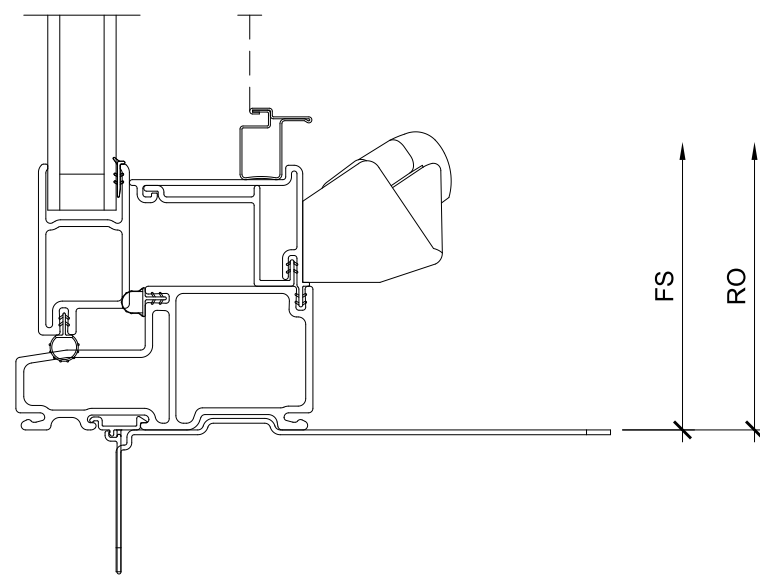
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2 Sill SCALE: 6" = 1'-0"



6
2 Jamb SCALE: 6" = 1'-0"



9
2 Head SCALE: 6" = 1'-0"



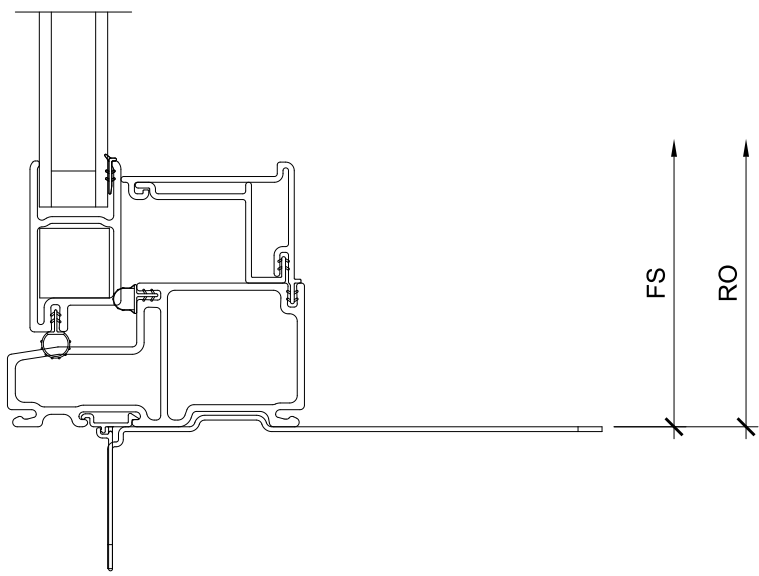
12
2 Sill SCALE: 6" = 1'-0"



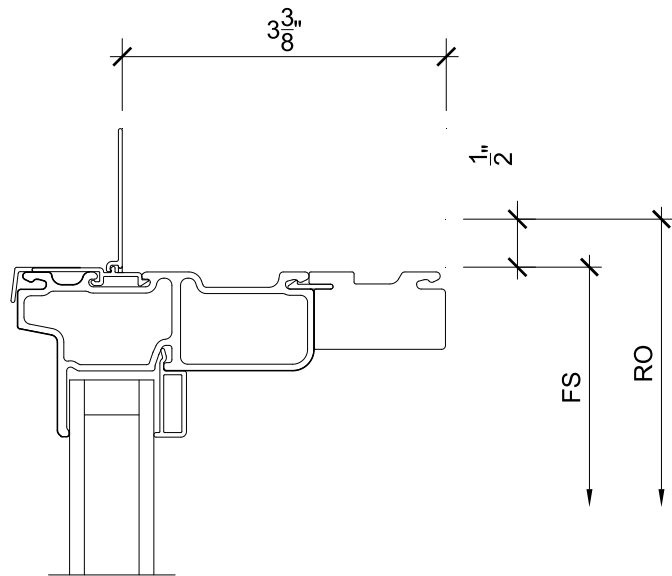
ORDERING PRODUCTS WITH REFERENCE TO SHOP DRAWINGS:
Before ordering the Marvin Window and Door products illustrated within these shop drawings, a copy of these drawings accompanied by an approved signature of the purchaser must be returned to the Architectural Division at Marvin Windows & Doors, P.O. Box 100, Grand Rapids, Michigan 49503. The purchaser must also acknowledge the responsibility to the approved shop drawings. Marvin Windows and Doors assumes no responsibility in guaranteeing product coordination with the drawings.

PROJ/JOB: Burlington VT / Mitchell-ADU-Essential
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: JUSTIN HAIGHT
QUOTE#: N38BWJX
CREATED: 05/09/2023
REVISION:

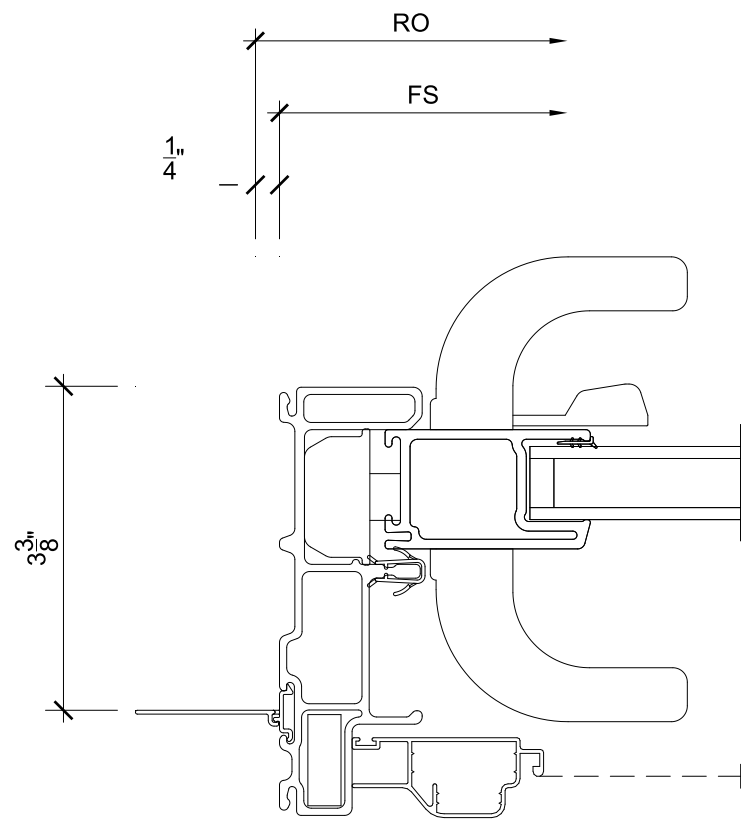
SHEET
2
OF 3



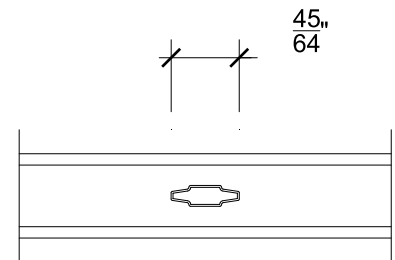
1
3 Sill SCALE: 6" = 1'-0"



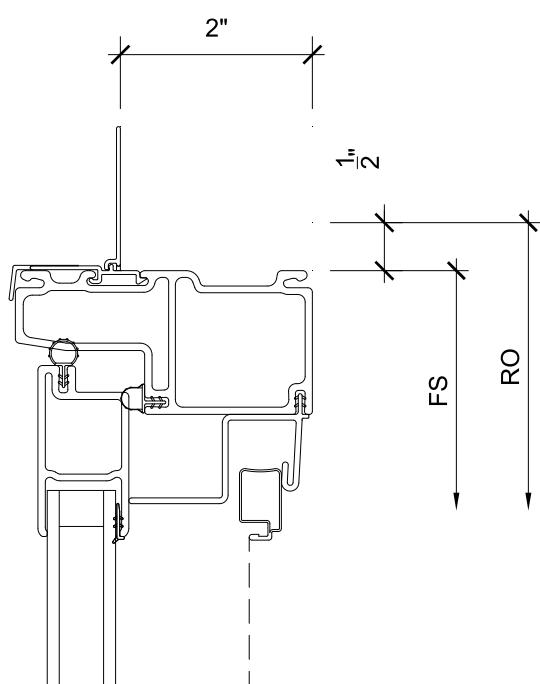
4
3 Head SCALE: 6" = 1'-0"



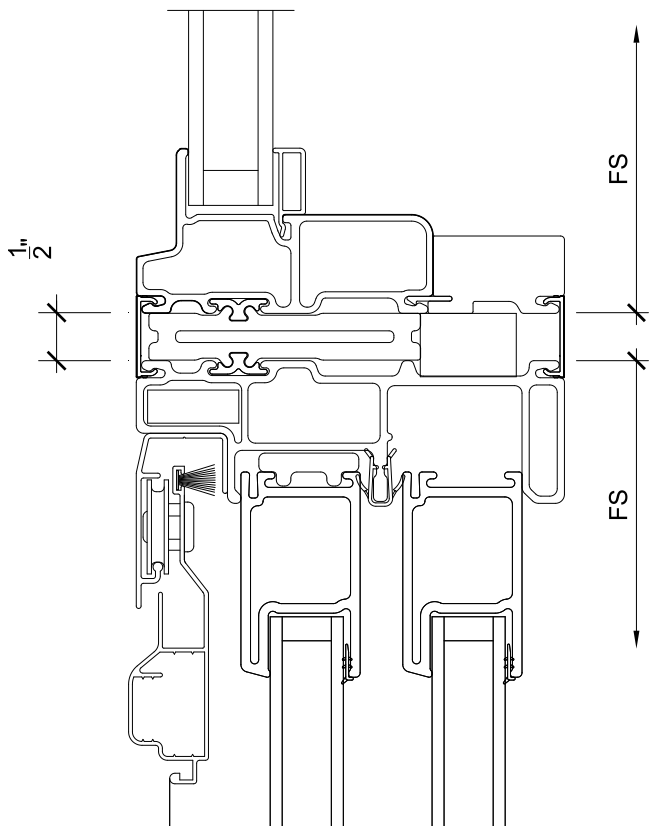
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3 Jamb SCALE: 6" = 1'-0"



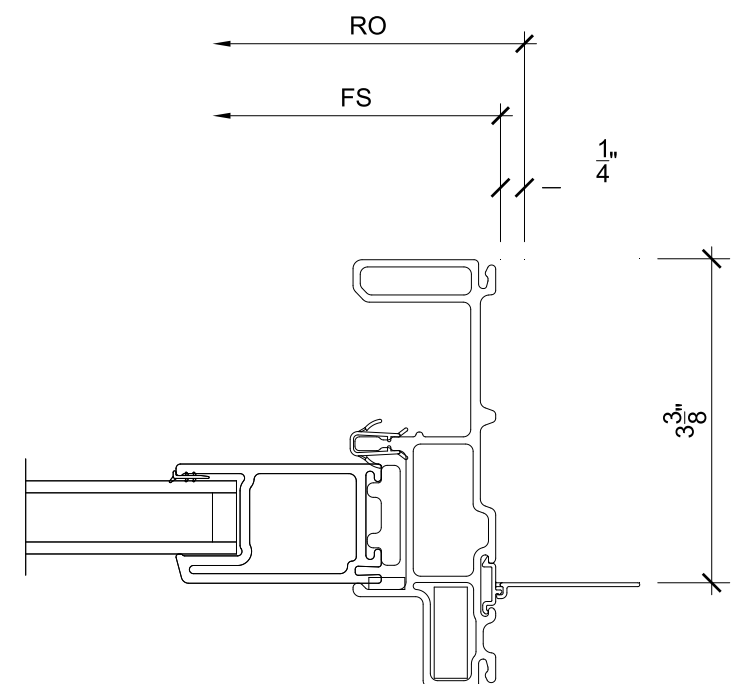
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3 Divided Lite SCALE: 6" = 1'-0"



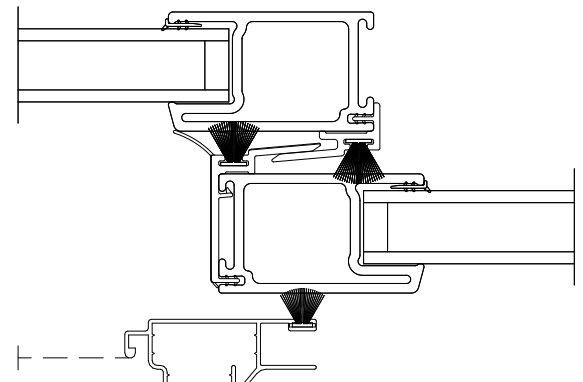
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3 Head SCALE: 6" = 1'-0"



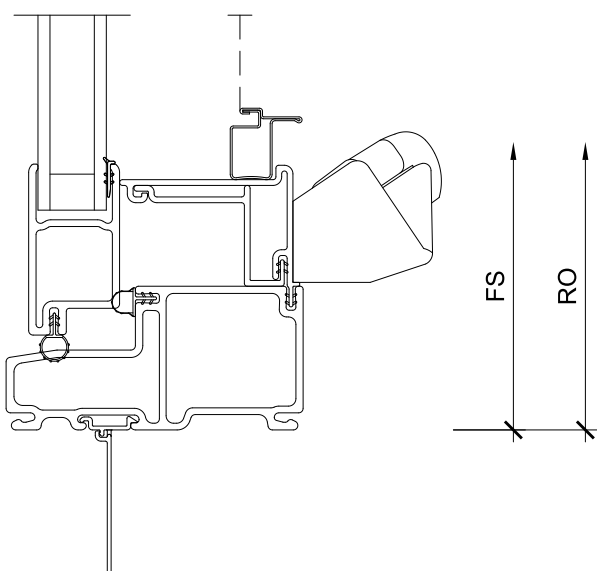
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3 Horizontal Mullion SCALE: 6" = 1'-0"



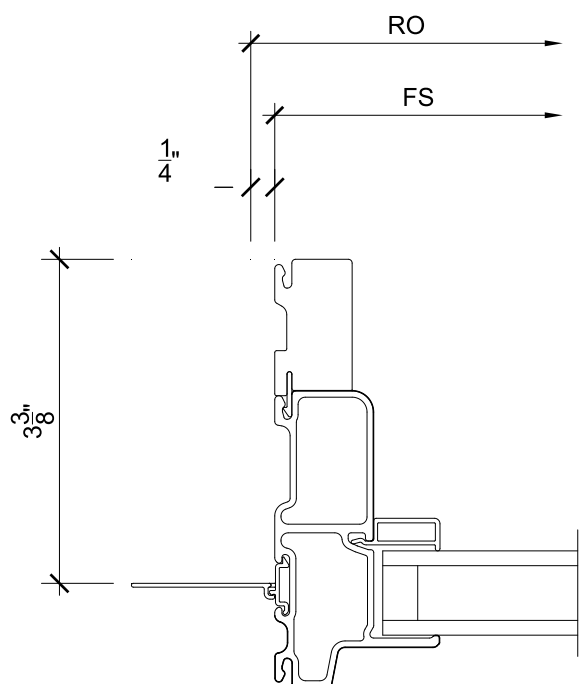
8
3 Jamb SCALE: 6" = 1'-0"



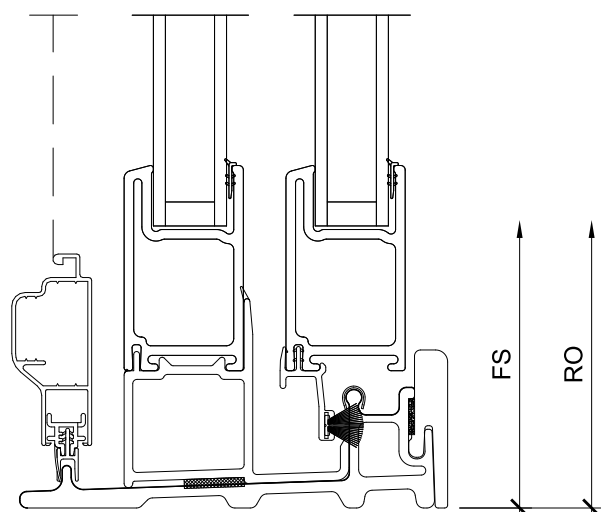
11
3 Meeting Stile SCALE: 6" = 1'-0"



3
3 Sill SCALE: 6" = 1'-0"



6
3 Jamb SCALE: 6" = 1'-0"



9
3 Sill SCALE: 6" = 1'-0"

12
3 NOT USED SCALE: 6" = 1'-0"



ORDERING PRODUCTS WITH REFERENCE TO SHOP DRAWINGS:
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PROJ/JOB: Burlington VT / Mitchell-ADU-Essential
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: JUSTIN HAIGHT
QUOTE#: N38BWJX
CREATED: 05/09/2023
REVISION:

SHEET
3
OF 3



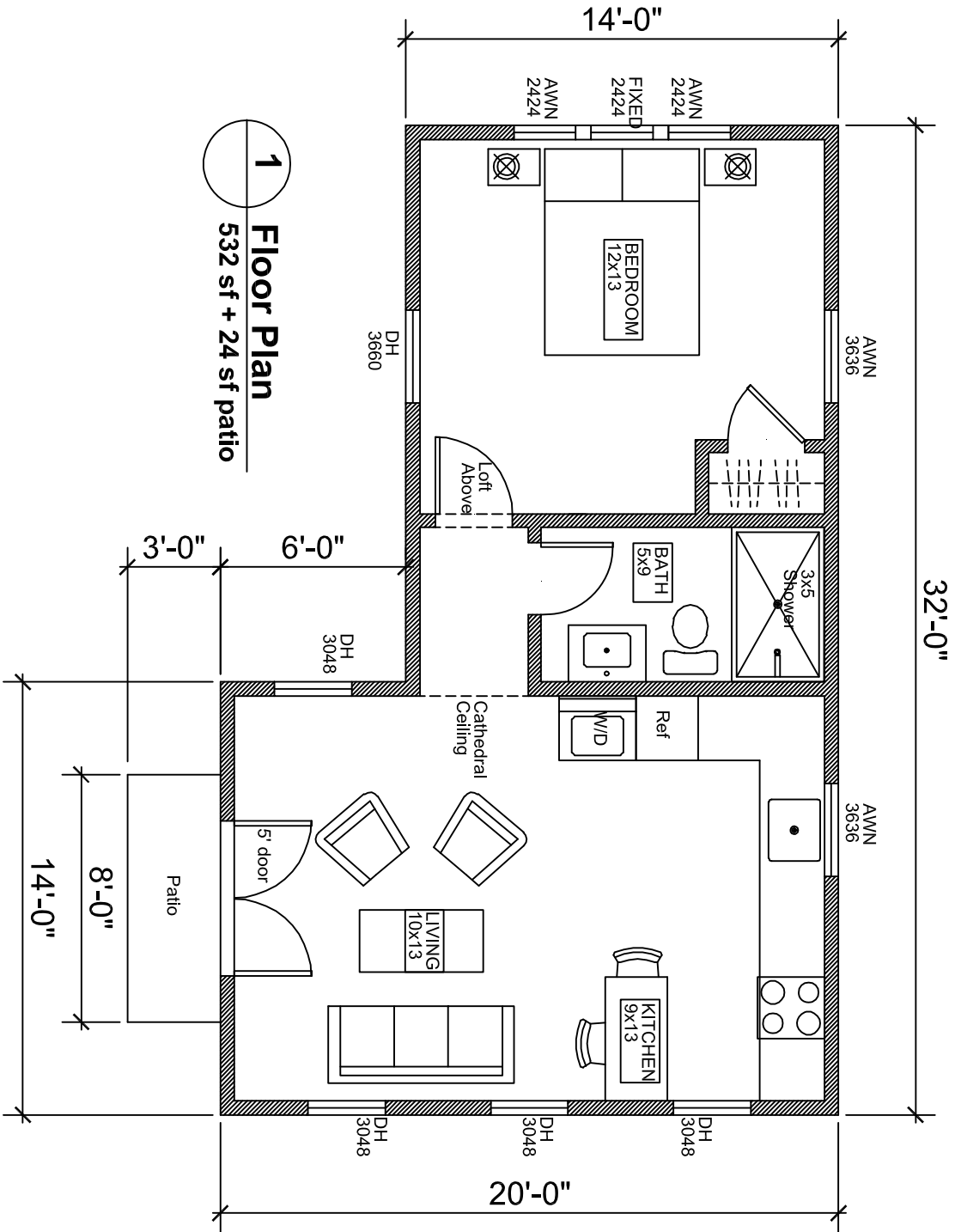
41 KINGSLAND TERRACE
BURLINGTON, VERMONT
SCALE: 3/16" = 1'-0"

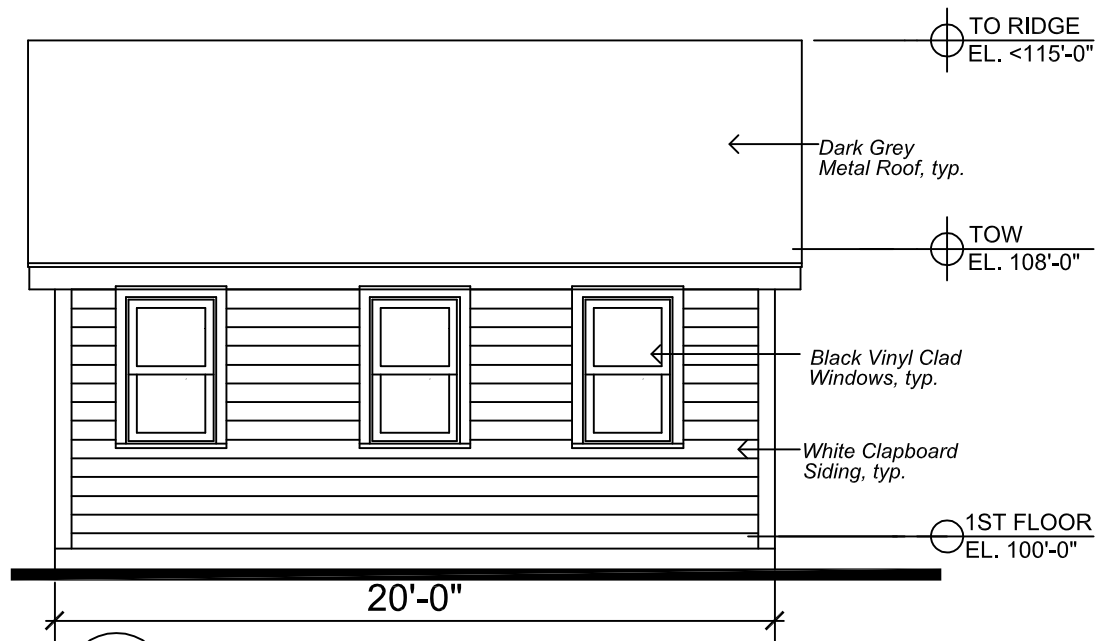
DONOVAN-MITCHELL ADU

PROPOSED FLOOR PLAN

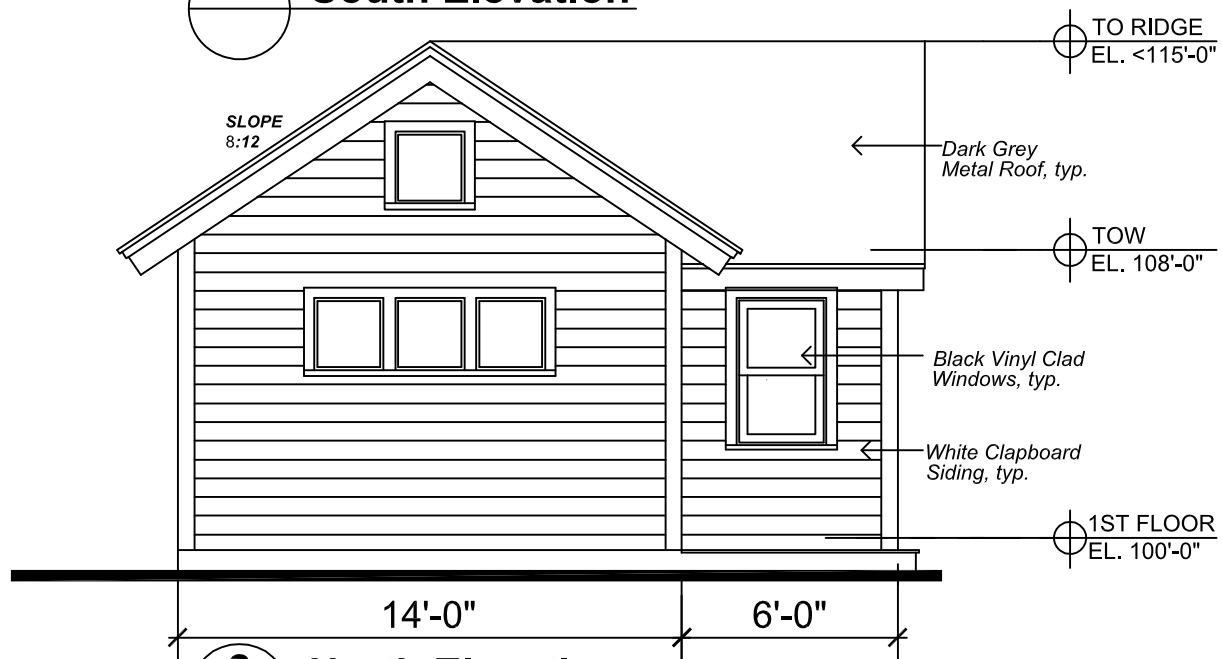
MAY 10, 2023
EBRODY DESIGN

A1





1 South Elevation



2 North Elevation

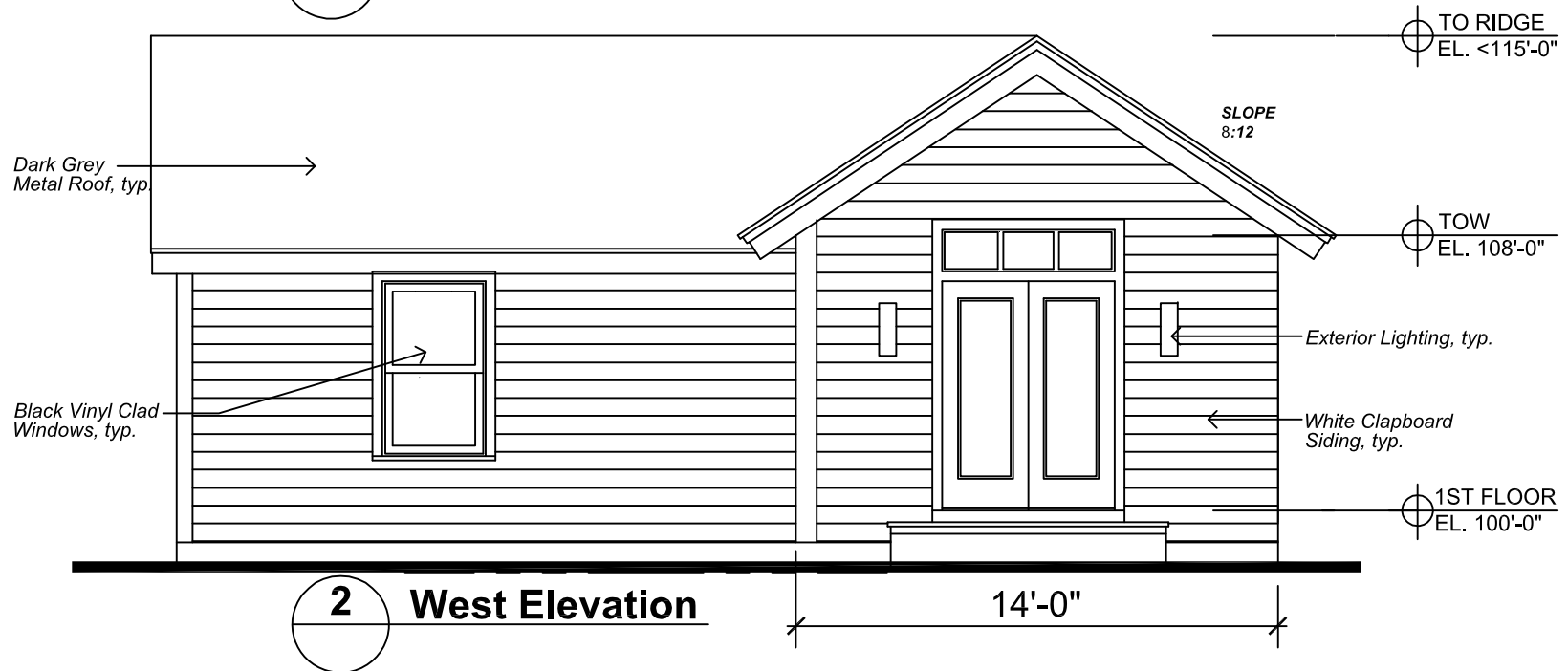
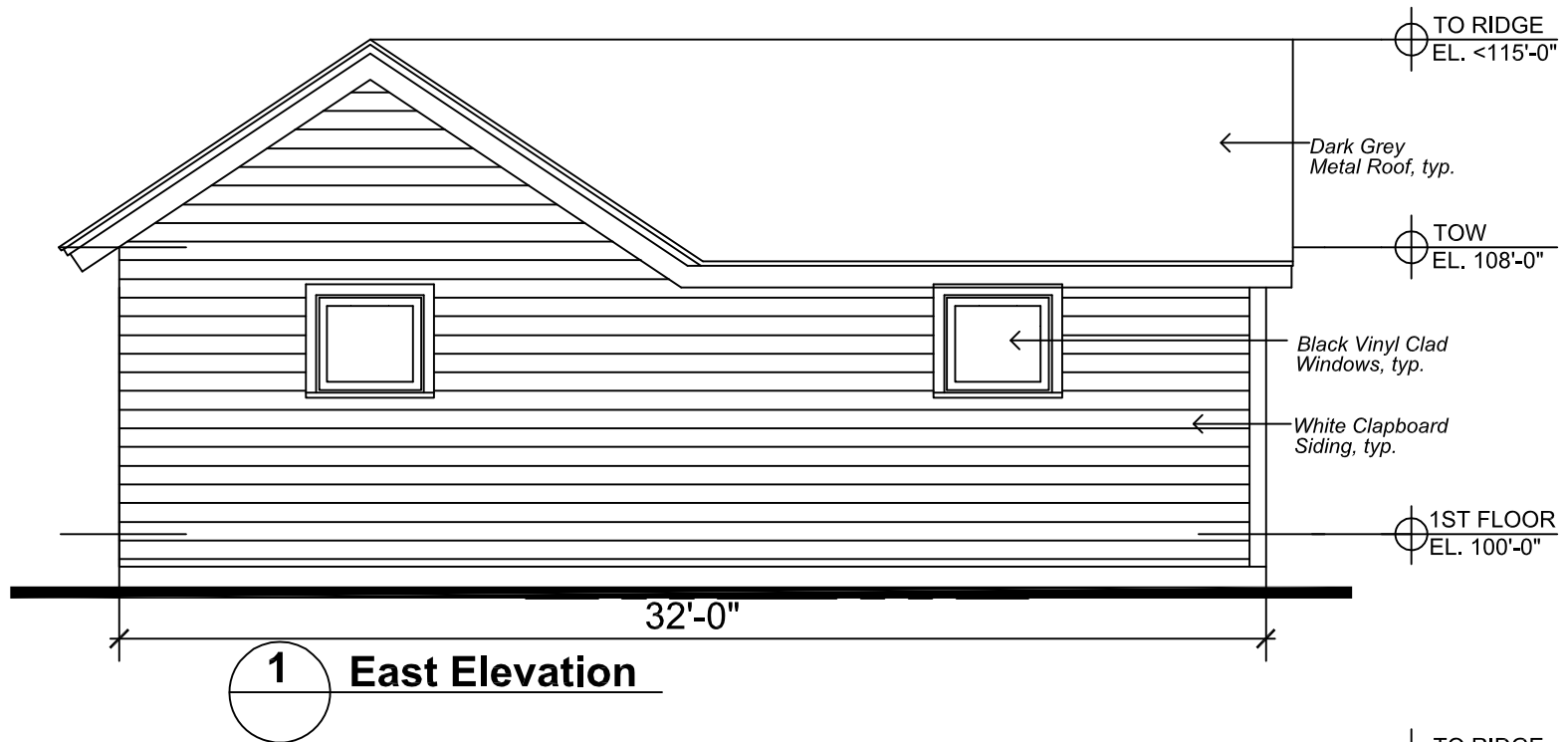


41 KINGSLAND TERRACE
BURLINGTON, VERMONT
SCALE: 3/16" = 1'-0"

DONOVAN- MITCHELL ADU PROPOSED ELEVATIONS

MAY 10, 2023
EBRODY DESIGN

A3



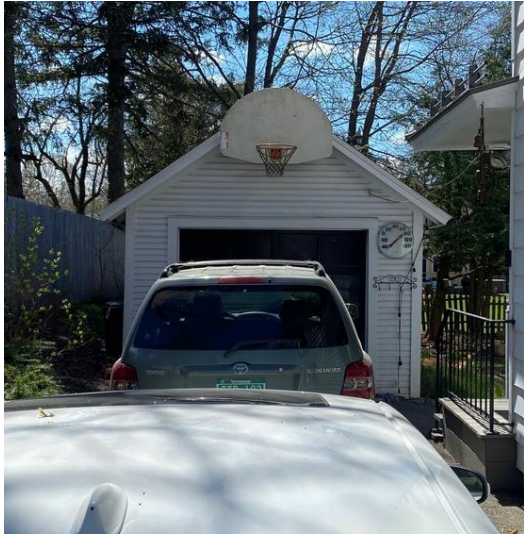
41 KINGSLAND TERRACE
BURLINGTON, VERMONT
SCALE: 3/16" = 1'-0"

DONOVAN- MITCHELL ADU

PROPOSED ELEVATIONS

MAY 10, 2023
EBRODY DESIGN

A2



Department of Permitting and Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/pz
Phone: (802) 865-7188
Fax: (802) 865-7195

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



MEMORANDUM

To: Design Advisory Board
From: Garret King
Re: 16 South Winooski Avenue
Date: September 12th, 2023

File: ZPF-23-63
Location: 16 South Winooski Avenue
Zone: FD5 **Ward:** 8
Parking District: Multimodal Mixed-Use Corridor
Date application accepted: July 24th, 2023
Applicant/ Owner: Kristine Bickford / FIRST CONGREGATIONAL CHURCH
Request: Replace existing four-foot-high aluminum fencing with new 4.8-foot-high steel perimeter fencing.

Overview:

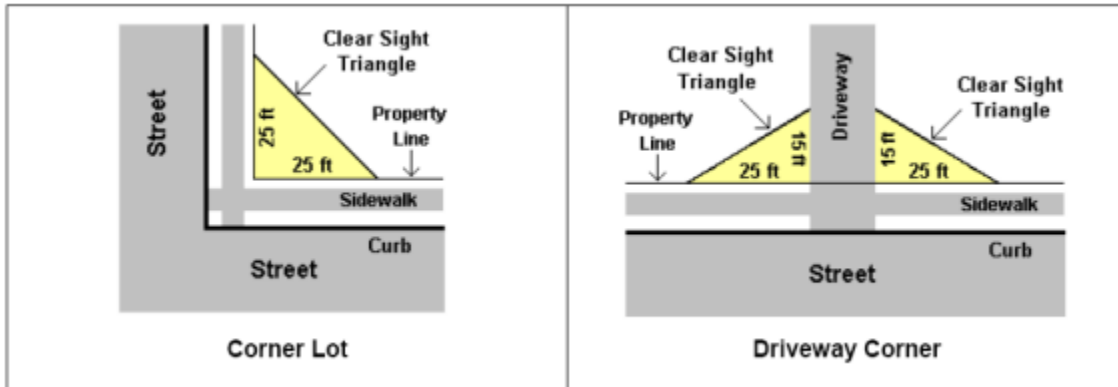
Applicant is looking to replace the existing 4-foot tall fence on the property with a similar 4.8-foot tall fence.

Article 5: Citywide General Standards

Sec 5.2.6 Building Height Limits

(c) Clear Sight Triangle

The fence layout obeys the clear sight triangle requirements for both the corner of South Winooski Avenue and Pearl Street intersection as well as the requirements for a clear sight triangle for the driveway. **(Affirmative Finding)**

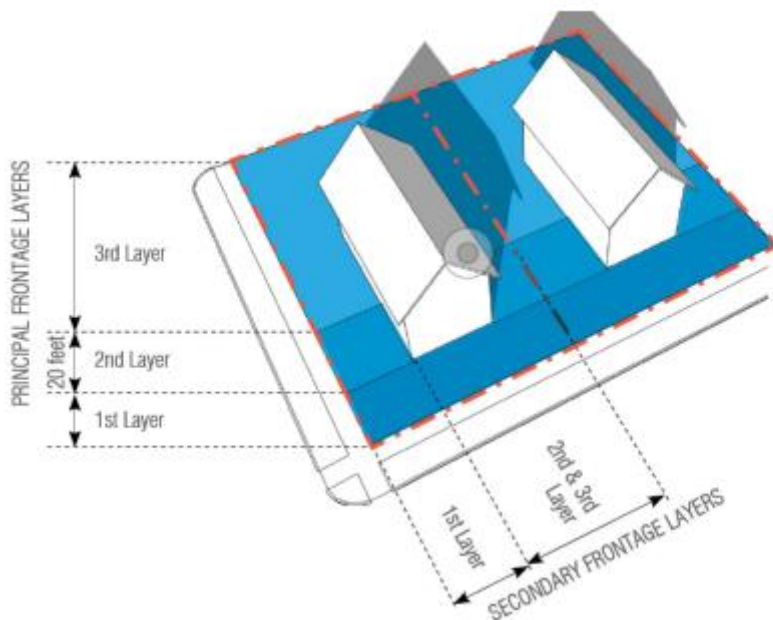


Article 14: Plan BTV Downtown Code

Sec. 14.6.8 Site and Landscape Standards

(b).(v).(A) Fences and free standing walls

Fences and Free-standing Walls placed within the First Lot Layer shall not exceed 4-feet in height unless the applicant is seeking alternative compliance. See Sec. 14.7.3 b. **(Affirmative Finding)**



Sec 14.7.3 Variation from The Form

b) I, DRB Alternative Compliance

Enables up to 20% relief from the applicable numerical standard. In this case, the 4' fence height limit increased to 4.8' tall.

A. The relief sought is necessary in order to accommodate unique site/or building circumstances or opportunities

In order to secure the property and inhibit trespass, a taller fence is required beyond what is allowed in 14.6.8 **(Affirmative Finding)**

- B. *The relief if granted is the minimum necessary to achieve the desired result*
The 20% increase in height requested is modest and results in a 4.8 foot height.
(Affirmative Finding)
- C. *The property will otherwise be developed consistent the purpose of this ordinance, the intent of the Form District, the intent and purpose of the section that the relief is being sought, and all other applicable standards*
The project is to only change out the fence, the installation will not change the character of the property or building. **(Affirmative Finding)**
- D. *The relief if granted will not impose an undue adverse burden on existing or future development of adjacent properties*
The majority of the fence will run along the street edge and will not affect other neighboring properties. The fence if needed could be easily removed in the future.
(Affirmative Finding)
- E. *The relief if granted will yield a result equal to or better than strict compliance with the standard being relieved*
A taller fence will help provide additional protection to the property from trespass, loitering, and vandalism that is currently occurring due to the ease pedestrians have climbing over the 4 foot fence. **(Affirmative Finding)**

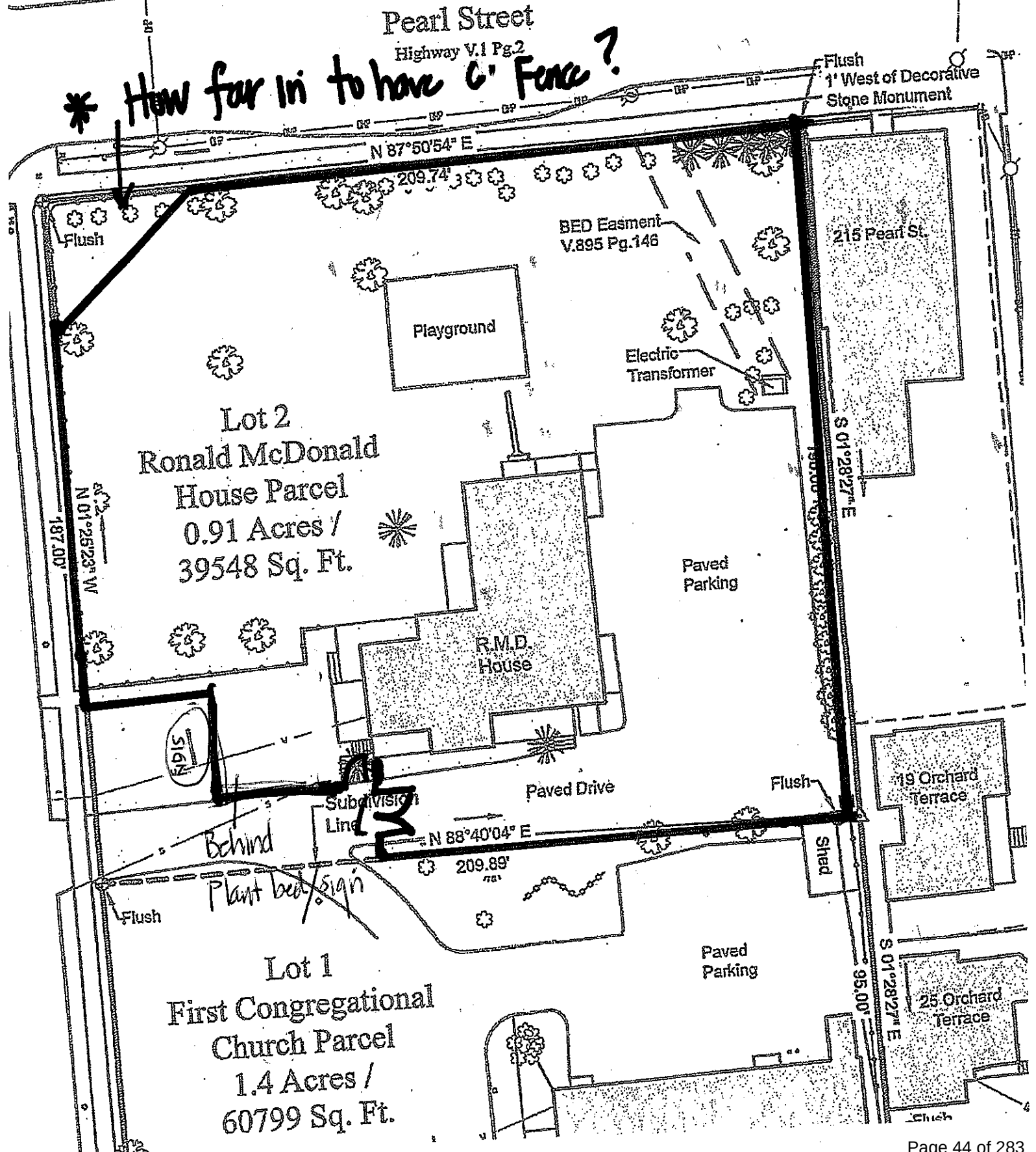
RECOMMENDED MOTION:

Approve the application as presented and forward to the Development Review Board

Install 6' Steel Fence

5/16/23

* How far in to have 6' Fence?



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)

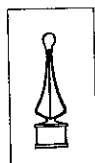


INVINCIBLE™
Style I2 (2-Rail)
Style I3 (3-Rail)



WARRIOR™
Style W2 (2-Rail)
Style W3 (3-Rail)

ADORNMENTS



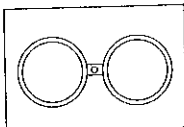
Quad Flare



Triad



Ball Cap



Ring



GATES

Gates are fabricated by welding Montage Plus® panel material to 1-3/4" square gate ends.

DESIGN ADVANTAGES

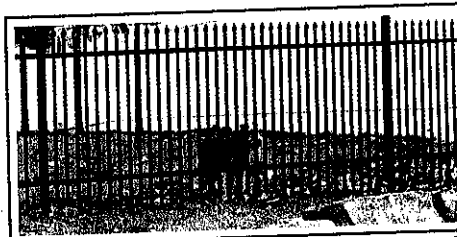
• All Terrain Fence (ATF)™ Panel Design

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.

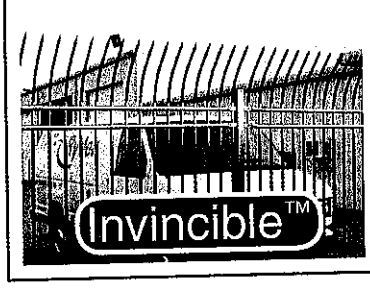
WARRANTY

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).

Department of Permitting and Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/pz
Phone: (802) 865-7188
Fax: (802) 865-7195

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



MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: ZP-23-398
Location: 300 Flynn Avenue
Date: September 12, 2023

File: ZP-23-398
Location: 300 Flynn Avenue
Zone: NMU **Ward:** 5
Parking District: MMMU
Date application accepted: August 19, 2023
Applicant/ Owner: Joe Weith, White + Burke / Howard Center for Human Services Inc.
Request: Proposed demolition of existing 24,042 square foot building to construct a new 50,100 square foot building for mental health crisis center and related medical/general office uses.



Background:

- **Zoning Sketch Plan Review ZSP-23-3;** demolish the existing 24,000 square foot building and construct a new 51,000 square foot building for mental health crisis center use. May 2023.

The programs and services of the City of Burlington are accessible to people with disabilities. For accessibility information call 865-7188 (for TTY users 865-7142).

- **Non-applicability of Zoning Permit Requirements 15-0667NA;** sign panel replacement to accommodate updated logo. December 2014.
- **Non-applicability of Zoning Permit Requirements 16-1198NA;** repave walkway. May 2016.
- **Zoning Permit 16-0214CA;** remove older shed and replace with new, larger shed. September 2015.
- **Non-applicability of Zoning Permit Requirements 14-1036NA;** replace fence. May 2014.
- **Zoning Permit 13-0324CA;** replace eight existing AC condensing units with new units and install one exterior wall vent. September 2012.
- **Zoning Permit 08-317SN;** replacement freestanding sign for Howard Mental Health. October 2007.
- **Non-applicability of Zoning Permit Requirements 10-0147NA;** replace side walk. August 2009.
- **Zoning Permit 11-191;** entry door renovations to the existing mental health facility that include replacing with sliding doors and protective canopy with relocated nonilluminated parallel sign. Proposal includes construction of a wall to protect the existing exterior stair and replacement of the existing brick façade with T1-11 in a section of the north façade. No change in structural capacity. October 1999.
- **Zoning Permit 97-553 / COA 097-082;** installation of three bus shelters, one at Howard Mental Health on Pine Street frontage. June 1997.
- **Zoning Permit 93-514;** replace existing freestanding and parallel sign in same location, size and illumination for community mental health center with new name. June 1993.
- **Zoning Permit 93-442;** replace existing entry step with covered deck measuring 10 x 18' with roof to match existing. Use remains Howard Relief Services. May 1993.
- **Zoning Permit 87-540;** remove approximately 450 sq. ft. of walkway and replace with approximately 460 sf. of walkway in an alternate location. October 1987.
- **Zoning Permit 84-132;** add two windows and a door to the west elevation of the building to accommodate a new entryway into the building. Replace the existing walkway into the building with one of the same dimensions in the new location. April 1984.
- **Zoning Permit 76-208;** install two new exterior doors and exit way and relocate one exterior door on the building. May 1975.
- **Notice of Public Hearing (Burlington Board of Aldermen) November 25, 1974.** Appeal of the Howard Mental Health Services, in anticipation of rezoning this area at 300 Flynn Avenue to permit Howard Mental Health Services to occupy and use the building presently known as St. Anthony's Convent for a semi-public use as soon as possible to carry out its services to the community.

- **Letter by Board of Adjustment;** Notice to Reverend Edmund Marion advising application to the Board of Aldermen to revise the Zoning Ordinance so that the property opposite [your] church be included in Zone 1 rather than Zone 4 so that a use harmful and objectionable to [your] church may not occur. June 2, 1947.

Overview:

Howard Center is proposing to redevelop their property located at 300 Flynn Avenue. The 300 Flynn Redevelopment project will involve demolition of the existing approximately 24,042 square foot building and construction of a new 3 story, approximately 50,100 square foot building. The current and proposed use of the property is a combination of mental health crisis center and related medical and general office uses. Mental health crisis center is a conditional use in the underlying zoning district.



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 Wetland immediately north of the development site is the most important natural feature. See Gilman & Briggs Environmental Memorandum dated 9 March 2022 relative to existing species, alluvial area, and recommendations.

(b) Topographical Alterations:

The plan takes great care to avoid the sensitivity of the natural area on the north of the site. Minimal grade changes (~200 SF) are proposed near the Pine Street parking lot to convey more area to stormwater treatment and away from the municipal system. All disturbed areas will be backfilled or fine graded, seeded, and covered with erosion control matting.

(a) Protection of Important Public Views:

There are no protected important public views from or through this site. Not applicable.

(d) Protection of Important Cultural Resources:

Not applicable.

(e) Supporting the Use of Renewable Energy Resources:

The project will be advanced without the use of any fossil fuels. To achieve this, the building will be insulated above code minimums with a goal of meeting the Passive House air sealing requirements. Heating and cooling will be accomplished using geothermal heat pumps. Ventilation is provided using high efficiency balanced ventilation with heat recovery. The central ventilator will be located on the roof and screened from public view. Domestic hot water will utilize air source heat pump technology. The roof has been designed for future rooftop solar. The design team is working with Burlington Electric Department to maximize opportunities for energy efficiency.

The specific design choices to accommodate the heating/cooling systems require greater building height. Per Article 5.2.6(c)(6) of the CDO, the applicant requests consideration for a 5% variation in the allowable building height to account for grade changes across the site. An additional 1.5 feet in building height will help the design team with managing the grades as they modulate towards Englesby Brook and will enable the building to better support the fully electric air-based building systems needed to provide the clients and staff with good indoor air quality.

(b) Brownfield Sites:

This site is not identified on the State of Vermont Brownfield list. 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.

Both a Stormwater and Erosion Prevention and Sediment Control Plan have been submitted for Water Resource / Stormwater Engineering review.

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.

There are protected entries on both Flynn Avenue and Pine Street. Snow storage is located on the site plan. (Plan C2.0. Snow storage is identified as C14.) **Affirmative finding.**

(h) Building Location and Orientation:

The site is rather unique, as it fronts on both Pine Street and Flynn Avenue; wrapping around an



existing structure on the immediate corner. Both elevations are designed with a welcoming street façade.

(i) Vehicular Access:

Vehicular access is available at both street frontages, with a designed circulation path illustrated on plan C2.0.

(j) Pedestrian Access:

Pedestrian entry is available at both the Pine Street and Flynn Avenue frontages; connected directly to the public sidewalk.

(k) Accessibility for the Handicapped:

The building has been designed to be fully accessible, with available elevators and identified ADA access parking spaces. Burlington's Building Official has the jurisdiction to confirm ADA compliance.

(l) Parking and Circulation:

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 westerly and northerly lots are existing, although expansion and improvements are proposed.

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 prove 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.

The attached landscape planting plan (sheets L2.00 and L2.01 in LA plan set) proposes a mix of trees, shrubs, ornamental grasses and perennials. Eight (8) new shade trees are proposed within and around the Flynn Avenue parking lot. The plan also proposes to save the existing, large,

mature tree along the west property line. The 8 new trees plus the existing mature tree complies with the shading requirements for parking lots.

All parking areas shall provide a physical separation between moving and parked vehicles and pedestrians in a manner that minimizes conflicts and gives pedestrians a safe and unobstructed route to building entrances or a public sidewalk.

There is an identified pedestrian walkway between the westerly parking area and a building entrance.

Parking will be available at the existing westerly lot, under the building on the north side, and north of the building in an open parking area as well. The project proposes 106 total on-site parking spaces including 5 ADA accessible spaces, 2 EV charging spaces, and 8 tandem spaces.

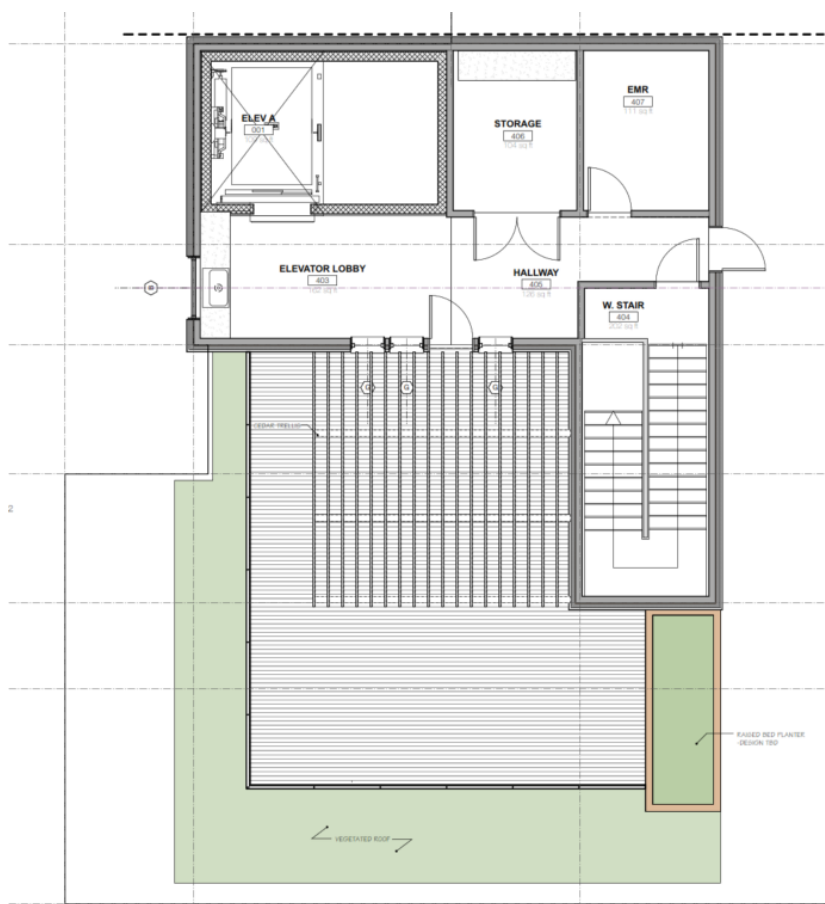
(m) Landscaping and Fences:

The attached landscape planting plan (sheets L2.00 and L2.01 in LA plan set) proposes a mix of trees, shrubs, ornamental grasses and perennials. Eight (8) new shade trees are proposed within and around the Flynn Avenue parking lot. The north/west of the site includes a concrete pad with fencing and a gate to enclose 2 dumpsters and recycling bins. (Plan C 2.0, item C7).

(n) Public Plazas and Open Space:

This is not a requirement for the proposed use. The rooftop, however, features a terraced area. Per Section 5.2.6 (c) 3, *greenhouses, garden sheds, gazebos, rooftop gardens, terraces and similar features, and fully enclosed stair towers, elevator towers and mechanical rooms, where such features are not used for human occupancy or commercial identification, are exempt from specific height limitations. Such features and structures shall be designed and clad in a manner consistent and complementary with the overall architecture of the building.*

A sink is illustrated on Plan A1-4. If considered as a height exemption, **no part of the rooftop feature can be used for occupancy.**



(o) Outdoor Lighting:

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

A lighting plan has been provided. Illumination levels are acceptable, but the max/min ratio for uniformity exceeds the 20:1 ratio defined by the ordinance. An adjustment or correction is necessary.

(p) Integrate infrastructure into the design:

Exterior storage areas, machinery and equipment installations, service and loading areas, utility meters and structures, mailboxes, and similar accessory structures shall utilize setbacks, plantings, enclosures and other mitigation or screening methods to minimize their auditory and visual impact on the public street and neighboring properties to the extent practicable.

Utility and service enclosures and screening shall be coordinated with the design of the principal building, and should be grouped in a service court away from public view. On-site utilities shall be placed underground whenever practicable. Trash and recycling bins and dumpsters shall be located, within preferably, or behind buildings, enclosed on all four (4) sides to prevent blowing trash, and screened from public view.

Any development involving the installation of machinery or equipment which emits heat, vapor, fumes, vibration, or noise shall minimize, insofar as practicable, any adverse impact on neighboring properties and the environment pursuant to the requirements of Article 5, Part 4 Performance Standards.

The dumpster/recycling tote location is at the north of the westerly parking area; fenced and gated to prevent blowing trash. Underground electric will run from the transformer on the south/west corner of the site. “W1” and “W2” reflect two types of water service connections from Flynn Avenue, per the direction of DPW (C2.1 Site Utility Plan.) A ventilator is placed atop the roof, which is proposed for screening.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

The applicant defines the similarity in massing to Flynn Avenue Coop to the west (3 stories), 316 Flynn Avenue to the east (4 stories), and St. Anthony’s Church to the South.

2. Roofs and Rooflines.

The low pitch membrane roof relates to 316 Flynn Avenue, Champlain Elementary School, City Market, and other former industrial buildings on Flynn Avenue.

3. Building Openings

Windows are largely vertically arranged in rhythmic patterns horizontally.

Visual interest is added in the alteration of sizes, as seen on the east and west elevations. Windows are primarily vertical in nature, with some deviation to create visual interest.



(b) Protection of Important Architectural Resources:

Not applicable.

(c) Protection of Important Public Views:

Not applicable.

(d) Provide an active and inviting street edge:

From the application narrative:

Each building elevation employs diverse materials to create depth on the elevation and create an inviting street edge. Plantings along each street edge provide privacy to users as well as performing stormwater function to pre-treat roof water.

(e) Quality of materials:

All development shall maximize the use of highly durable building materials that extend the life cycle of the building, and reduce maintenance, waste, and environmental impacts. Such materials are particularly important in certain highly trafficked locations such as along major streets, sidewalks, loading areas, and driveways. Efforts to incorporate the use of recycled content materials and building materials and products that are extracted and/or manufactured within the region are highly encouraged.

The proposed materials (high density fiber cement, glazed brick, vertical and horizontal metal siding) have a 50+ year expected useful life, and do not require periodic repainting. Both are considered acceptable materials for new construction.

(f) Reduce energy utilization:

From the application narrative:

This project will not use any fossil fuels on site. To achieve this, the building will be insulated above code minimums with a goal of meeting the Passive House air sealing requirements. Heating and cooling will be accomplished using geothermal heat pumps.

Ventilation is provided using high efficiency balanced ventilation with heat recovery. The central ventilator will be located on the roof and screened from public view. Domestic hot water will utilize air source heat pump technology. The roof has been designed for future rooftop solar. The design team is working with Burlington Electric Department to maximize opportunities for energy efficiency.

A vegetated roof has been included; see Plan A1-4.

(g) Make advertising features complementary to the site:

Any signage will require a separate permit.

(h) Integrate infrastructure into the building design:

See Section 6.2.2. (p), above.

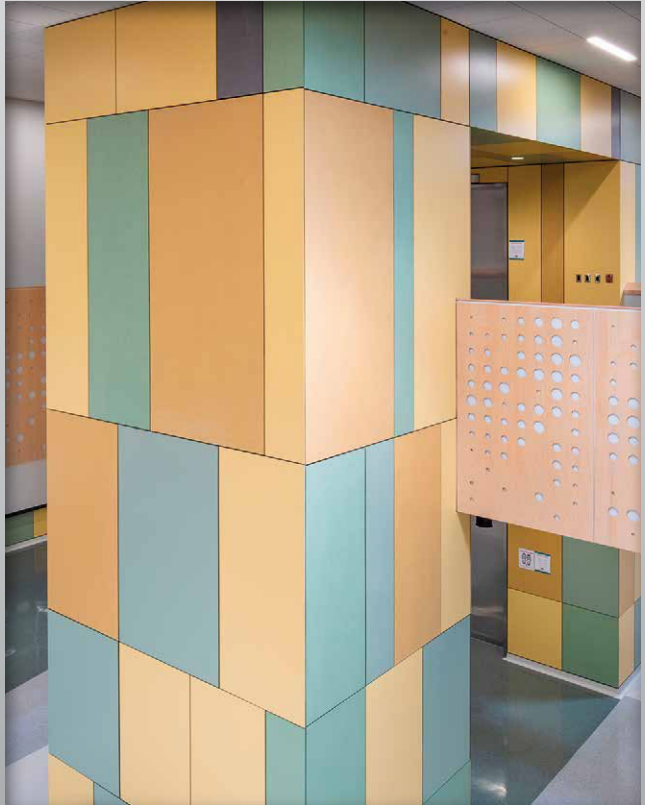
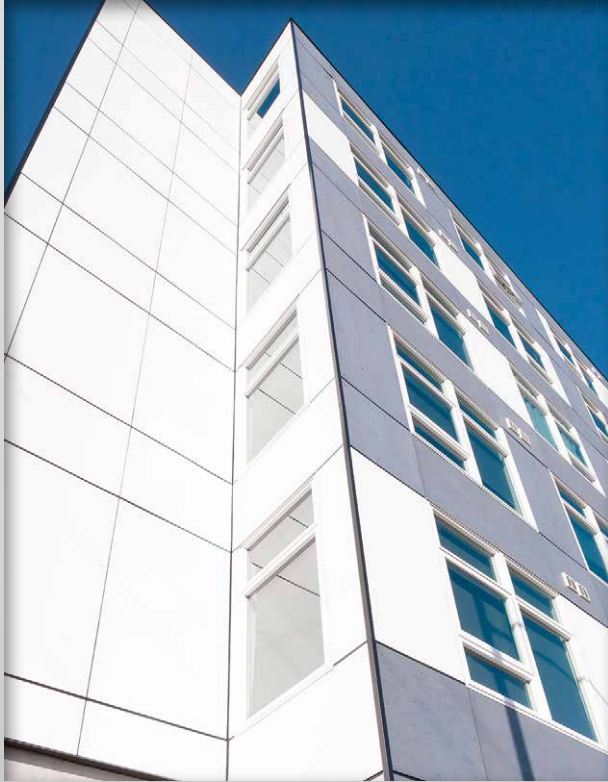
(i) Make spaces secure and safe:

From the submission:

Safety and security for staff and clients is of utmost importance to Howard Center. To those ends, parking lot and parking garage lighting will be as bright as possible (while meeting Burlington's lighting limits) to create a safe environment. Emergency vehicle access, including fire truck radii analysis, has been incorporated into the design. The design team has reviewed the design with the Burlington Fire Marshal.

aFC *cladding*

SUSTAINABLE SOLUTIONS



**American Fiber
Cement Corporation**

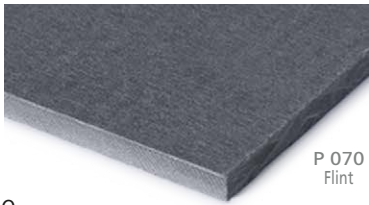
CENIBRIT
Building Better Days

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Cembrit **Patina**

Cembrit Patina has a natural, textured surface. You can see the fiber and natural characteristics of the raw materials, and you can see and feel the sanding lines on the surface. As the seasons change and the years pass, the natural aging of the fiber cement leaves subtle traces on the surface, and the façade will gradually acquire a distinctive patina.



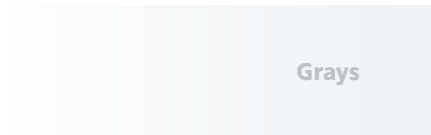
P 020
Granite



P 050
Graphite



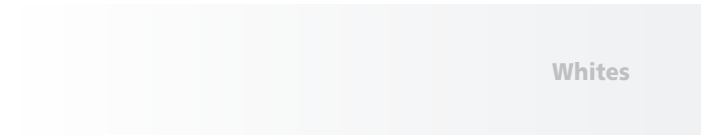
P 070
Flint



Grays



P 222
Pearl



Whites



P 313
Tufa



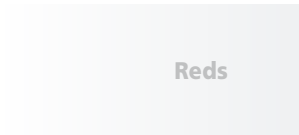
P 323
Magma



P 333
Adobe



P 343
Ruby



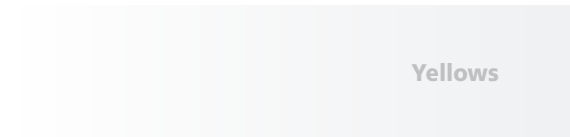
Reds



P 545
Sand



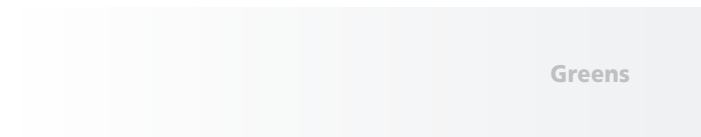
P 565
Amber



Yellows



P 626
Emerald

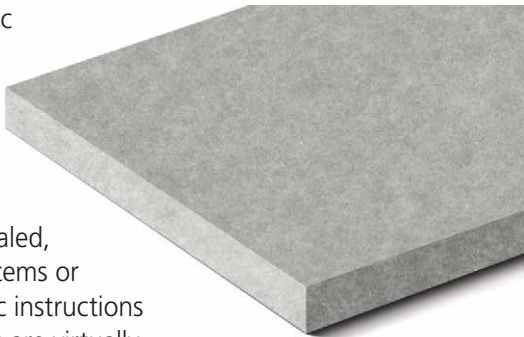


Greens

Minerit HD (Raw)

Minerit HD is an uncoated fiber cement board that allows the authentic appearance of the fiber cement to stand out. In application, Minerit HD is a building board that can be installed for certain cladding purposes when a natural expression is desired. It's an unpigmented material, so variations may occur in the individual boards and from board to board, adding a lively expression to the façade.

When used for cladding in a rainscreen system, the boards must be sealed, typically on all sides. They can be painted on-site with acrylic paint systems or transparent stains that are suitable for cement-based materials (Specific instructions for painting/staining are available). After surface treatment, the boards are virtually maintenance free. In industrial applications where the surface appearance is of less importance, the boards do not need to be sealed but efflorescence will likely occur over time depending on the type of exposure and climate conditions.



The color charts displayed in this brochure give an impression of the available colors. Reproduction of the exact colors is restricted by the printing process. For an exact color match, samples are available upon request.

Cover, Patina, Patina Rough, Transparent and Solid			
U.S. Trimmed sizes in. (mm)		Weight (lbs/ft²)	
Thickness	8 mm	Patina and Patina Rough	Cover, Transparent & Solid
Width	48 (1,220)	2.5	2.9
Length	96 (2,440) 120 (3,050)		

Patina Inline		
U.S. Trimmed sizes in. (mm)		Weight (lbs/ft²)
Thickness	9.5 mm (non-grooved areas), 8 mm (grooved areas)	Patina Inline
Width	48 (1,220)	2.9
Length	96 (2,440) 120 (3,050)	

Minerit HD						
Trimmed sizes — in. nominal (mm)			Weight (lbs/ft²)			
Thickness	4 mm, 6 mm 8 mm or 10 mm		4 mm	6 mm	8 mm	10 mm
Width	48 (1,220)		1.6	2.3	3.1	3.9
Length	96 (2,440)	120 (3,050)	The recommended thickness for Minerit HD in a rainscreen application is 8mm.			

Product Sustainability

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- ◆ BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- ◆ Thermal Comfort

Energy and Atmosphere:

- ◆ Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rainscreen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Warranty information available upon request.

Fiber Cement— Distinct Properties

Sound and Weather Resistant — Cembrit fiber cement boards deliver optimal sound and weather insulation. Noise as well as changing weather conditions such as freeze/thaw, heat and water pose no threat to fiber cement façades. The boards retain their shape at all times.

Low Maintenance — The ability of the boards to resist mold and algae attacks is equally impressive. The result is a long-lived façade that saves you time and effort on inconvenient and costly repairs and repaints.

Non-combustible — The boards are non-combustible, which is your guarantee for a safe building.

Easy Handling — Cembrit fiber cement boards are flexible and easy to handle. They can be delivered cut to size, ready for installation. All this makes for lower construction costs, shorter construction times, and lower installed costs.

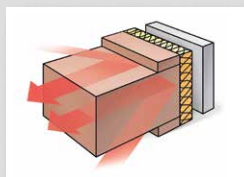
Fiber Cement— A Unique Composition

Natural Ingredients — With the strong composition of cement, mineral fillers, cellulose and non-toxic, organic fibers— and not to forget a dash of water— Cembrit fiber cement boards are made up of purely natural and environmentally friendly raw materials. This makes for sustainable and fully reusable boards.

Strong Recipe — The secret behind the impressive strength and durability of Cembrit fiber cement boards resides in the manufacturing technology. Thin layers of fiber cement are added on top of each other, pressed firmly together under tremendous pressure before completing a slow air curing process. Reinforced by carefully selected fibers, the many thin layers give the fiber cement cladding a strength with few peers in the world of building materials.

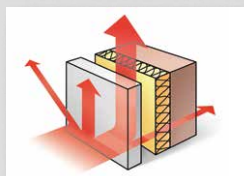
Green Footprints — A comprehensive analysis of the environmental impact of the Cembrit boards can be made from Cembrit's EPDs in accordance with EN 15804 on the Sustainability of Construction Works. The EPDs provide a Life-Cycle Assessment, manufacturing process details, and information on the use of any dangerous materials. These EPDs are available online.

Rainscreen Cladding



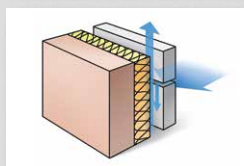
Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.



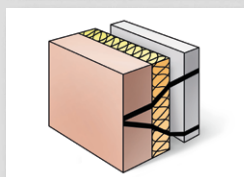
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



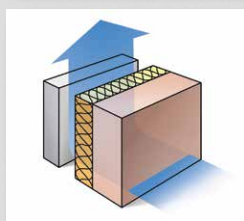
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter in both hot and cold climates.



Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapor pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

Distributed exclusively by



**American Fiber
Cement Corporation**

6901 South Pierce Street, Suite 180
Littleton, CO 80128 U.S.A.

Phone: 303-972-5107
Fax: 303-978-0308

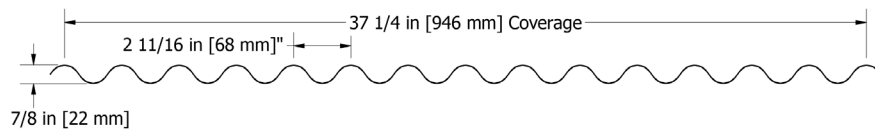
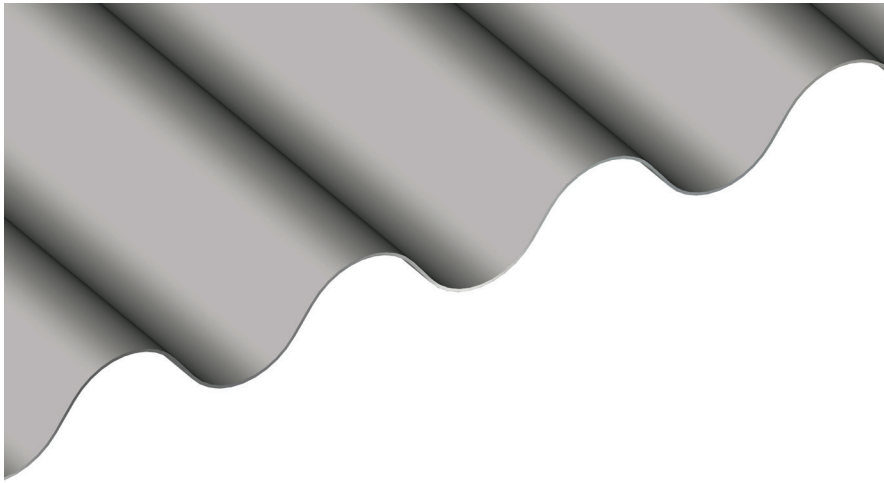
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Continuing
Education
Provider**



CORRUGATED PANEL

SKU: BWC374

MATERIAL

.032, .040, .050 aluminum

24, 22*, 20* ga. metallic coated steel

24, 22*, 20* ga. 55% Al-Zn alloy coated steel with acrylic coating

16, 20 oz. copper**

.8, 1.0, 1.2 mm zinc**

*Inquire for available panel widths

PANEL SPECS

Coverage: 37 1/4"

Minimum Length: 6'-0"

Depth: 7/8"

AVAILABLE

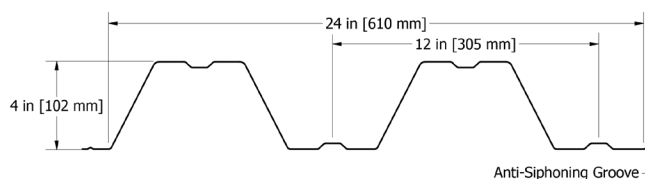
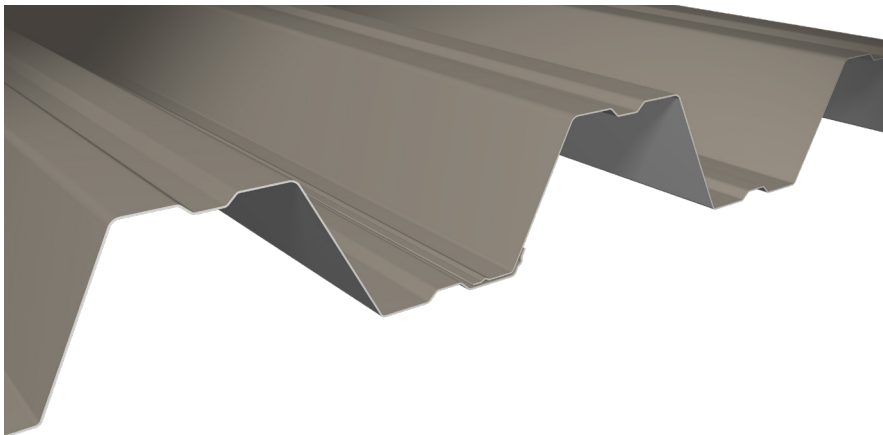
Crimp-Curving (convex and concave)

Stretch Curving

TEXTURE

Smooth or Stucco Embossed

 www.atas.com/corrugated



SPAN WALL™

SKU: BWS240

MATERIAL

.032, .040, .050 aluminum

24, 22*, 20, 18 ga. metallic coated steel

24, 22*, 20*, 18* ga. 55% Al-Zn alloy coated steel with acrylic coating

.8, 1.0 mm zinc*

16, 20 oz. copper*

PANEL SPECS

Coverage: 24"

Minimum Length: 6'-0"

Depth: 4"

AVAILABLE

Crimp-Curving (convex and concave)

TEXTURE

Smooth or Stucco Embossed

 www.atas.com/spanwall



ATAS International, Inc.

Sustainable Building Envelope Technology



STOCK • MATTE • PREMIUM • NATURAL
WOODLAND • OXIDE • LAMINATE

COLOR CHART

A leading manufacturer of sustainable building envelope technology, ATAS utilizes cool pigment paint on many color offerings. Our products reflect infrared radiation, which results in cooler surface temperatures, and maximum fade resistance.

Many of the ATAS products meet the qualifications for potential green building certification credits and industry ratings. See ATAS website for specific SRI values (www.atas.com/sri). Information on ATAS' sustainable products can be found at www.atas.com/sustainability.

70% PVDF finish carries a limited warranty against fading and chalking. ATAS coated materials are non-staining and virtually maintenance free. Any surface residue is easily removed with conventional cleaning solutions or detergents.



STOCK COLORS

70% PVDF resin based coatings provide high-performance durability for exterior and interior applications. These coatings are designed to resist fading, chalking, and abrasion. Meets the requirement of AAMA 2605-13 for aluminum substrates.



Black (02)



Classic Bronze (01)



Medium Bronze (03)



Hartford Green (27)



Forest Green (11)



Teal (19)



Hemlock Green (30)



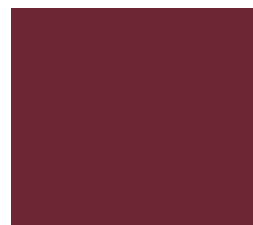
Patina Green (12)



Chocolate Brown (04)



Boysenberry (25)



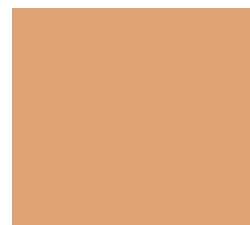
Redwood (07)



Mission Red (08)



Sierra Tan (09)



Rawhide (15)



Concord Cream (05)



Sandstone (06)



Regal Blue (18)



Slate Blue (21)



Siam Blue (14)



Rocky Grey (16)



Charcoal Grey (62)



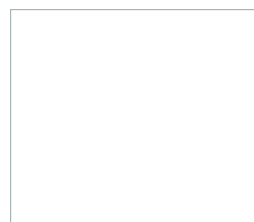
Slate Grey (20)



Dove Grey (13)



Ascot White (10)



Bone White (26)



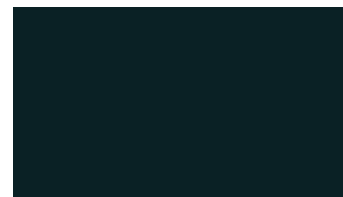
www.atas.com/colors

MATTE FINISH

Designed to simulate natural metal hues in a high-performance 70% PVDF paint system.



Matte Black (32)



Char Brown (29)



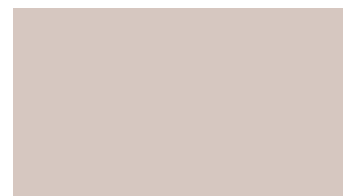
Thunder Grey (34)



Anchor Grey (37)



Ash Grey (33)



Almond (36)

PREMIUM FINISH

70% PVDF resin based coatings, with premium pigmentation to obtain metallic or deep color for desired aesthetics.



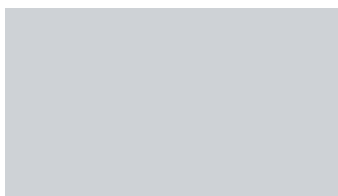
Antique Patina (24)



Champagne (31)



Coppertone (23)



Titanium (35)



Silversmith (28)



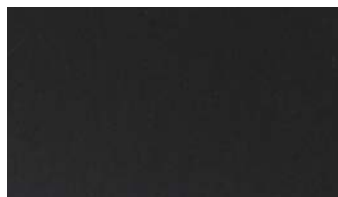
Brite Red (17)

NATURAL METALS

Natural metals will weather and patina naturally over time, adding character and aesthetic appeal to any building design. In addition to natural metals, ATAS offers 55% Al-Zn alloy coated steel with acrylic coating and anodized aluminum as standard available materials.



Grey Zinc (50)*



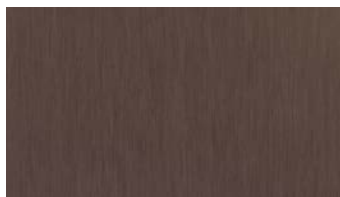
Dark Zinc (51)*



Brown Zinc (89)*



Blue Zinc (94)*



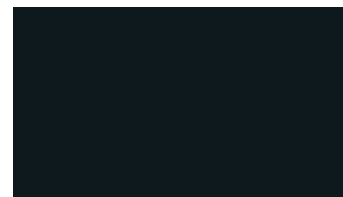
Red Zinc (95)*



Green Zinc (96)*



Clear Satin Anodized (70)



Dark Bronze Anodized (71)



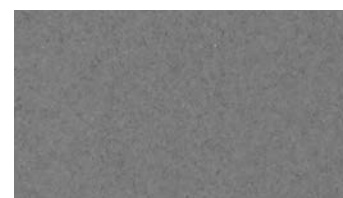
55% Al-Zn Alloy Coated Steel with Acrylic Coating (97)



Copper (49)*



Classic Stainless Steel (40)*



Tin Matte Stainless Steel (41)*

*Special material. Pricing and availability dependent upon project specifics. Color chips available upon request.

WOODLAND SERIES

Add the warmth of wood with the durability of metal to your next project. ATAS offers four classic woodgrain patterns with a 70% PVDF coating. The Woodland Series is available in .032 aluminum.



Birch (57)



Cedar (54)



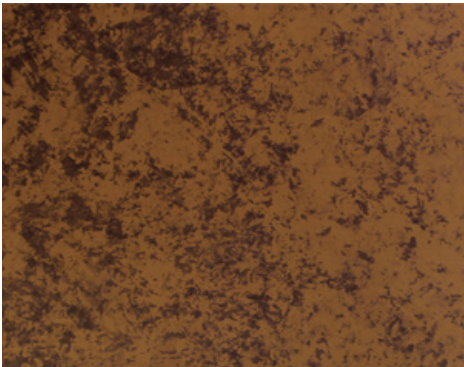
Driftwood (53)



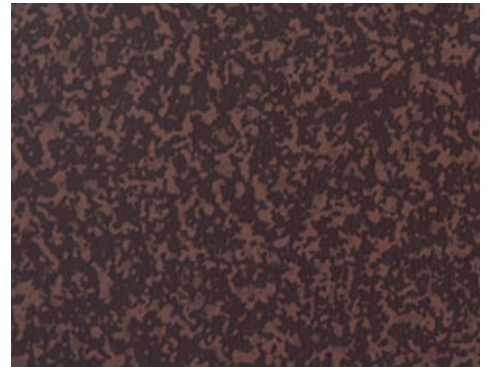
Walnut (55)

OXIDE SERIES

Made to look like weathered steel with a rust-like appearance, these color choices add a timeless appearance with a 70% PVDF finish to your project.



Copper Brown (42)



Tarnished Red (47)

LAMINATE

ATAS offers a stacked stone pattern stocked in .032 aluminum in 50" width. It is UV stable for exterior application.



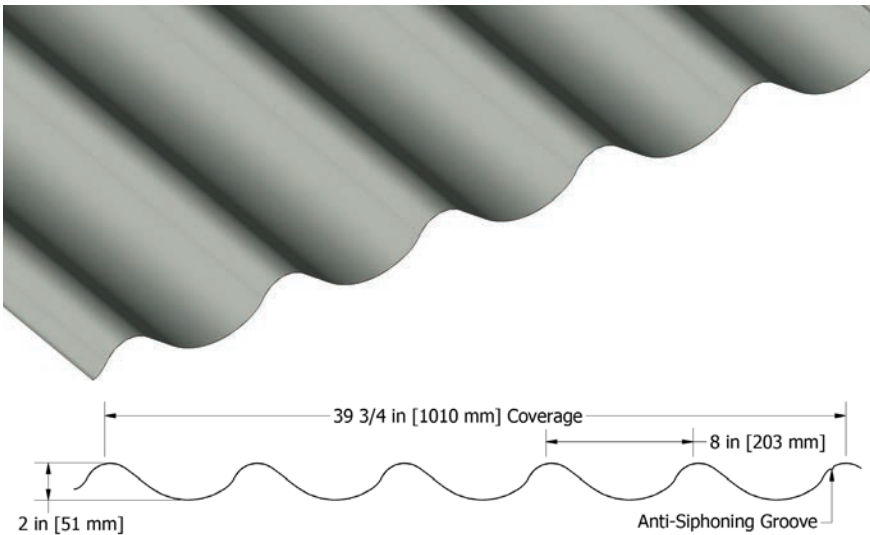
Stacked Stone (85)

www.atas.com
800.468.1441

ATAS International, Inc.
Allentown, PA | Mesa, AZ



Stainless steel products provided by ROOFINOX®. Colors are as close to the actual colors as modern printing allows. Exact metal color chips available upon request (this is a requirement for all premium colors), and should be used for final color selection. If you have requirements or preference for colors or finishes other than shown, contact ATAS. Color availability varies by material, gauge and profile. ATAS is not responsible for colors selected from color chart. ATAS reserves the right to modify, eliminate and/or change its products without prior notification. All colors are produced under stringent guidelines and tolerances that are identified within the coated metal industry. Batch to batch variations may occur within these established industry tolerances. Care should be exercised by customer when mixing lots. Contact ATAS for more information. Please visit www.atas.com for the most up-to-date information. © 2020 ATAS International, Inc. LRD0121 LAT400



WAVE PANEL

SKU: BWW400

MATERIAL

.032, .040, .050 aluminum,
22* ga. metallic coated steel

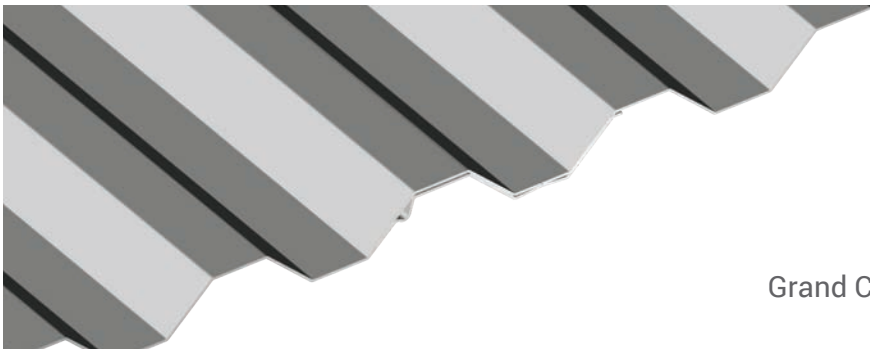
PANEL SPECS

Coverage: 39³/₄"
Minimum Length: 1'-6¹/₂"
Depth: 2"

TEXTURE

Smooth or Stucco Embossed

www.atas.com/wavepanel



Grand C



Grand V

GRAND C & GRAND V

SKU: BWF324 (Grand C),
BWW320 (Grand V)

MATERIAL

.032 aluminum

PANEL SPECS

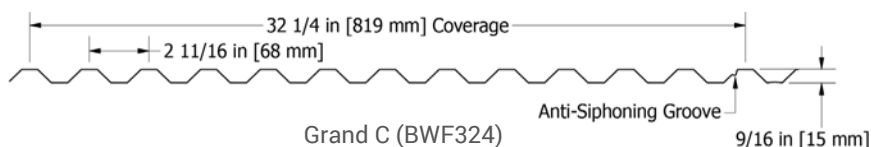
Coverage:
32¹/₄" (Grand C),
32" (Grand V)
Minimum Length: 6'-0"
Depth:
9/16" (Grand C),
1/2" (Grand V)

TEXTURE

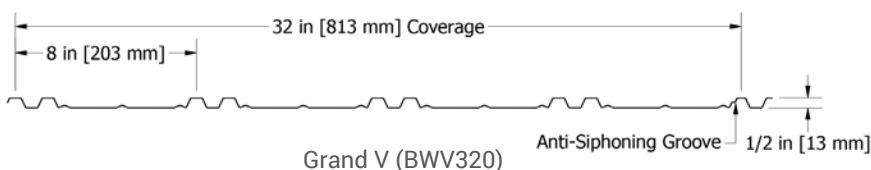
Smooth

www.atas.com/grandc

www.atas.com/grandv



Grand C (BWF324)



Grand V (BWW320)



ATAS International, Inc.

Sustainable Building Envelope Technology



STOCK • MATTE • PREMIUM • NATURAL
WOODLAND • OXIDE • LAMINATE

COLOR CHART

A leading manufacturer of sustainable building envelope technology, ATAS utilizes cool pigment paint on many color offerings. Our products reflect infrared radiation, which results in cooler surface temperatures, and maximum fade resistance.

Many of the ATAS products meet the qualifications for potential green building certification credits and industry ratings. See ATAS website for specific SRI values (www.atas.com/sri). Information on ATAS' sustainable products can be found at www.atas.com/sustainability.

70% PVDF finish carries a limited warranty against fading and chalking. ATAS coated materials are non-staining and virtually maintenance free. Any surface residue is easily removed with conventional cleaning solutions or detergents.



STOCK COLORS

70% PVDF resin based coatings provide high-performance durability for exterior and interior applications. These coatings are designed to resist fading, chalking, and abrasion. Meets the requirement of AAMA 2605-13 for aluminum substrates.



Black (02)



Classic Bronze (01)



Medium Bronze (03)



Hartford Green (27)



Forest Green (11)



Teal (19)



Hemlock Green (30)



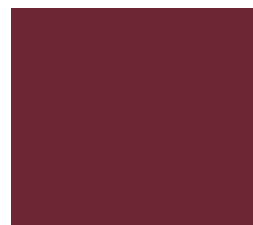
Patina Green (12)



Chocolate Brown (04)



Boysenberry (25)



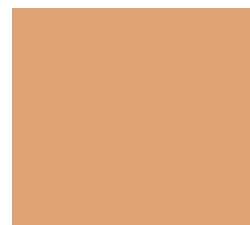
Redwood (07)



Mission Red (08)



Sierra Tan (09)



Rawhide (15)



Concord Cream (05)



Sandstone (06)



Regal Blue (18)



Slate Blue (21)



Siam Blue (14)



Rocky Grey (16)



Charcoal Grey (62)



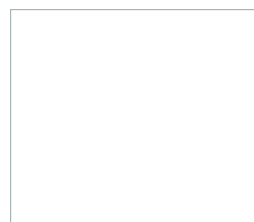
Slate Grey (20)



Dove Grey (13)



Ascot White (10)



Bone White (26)



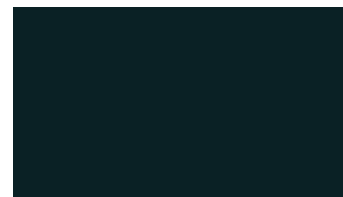
www.atas.com/colors

MATTE FINISH

Designed to simulate natural metal hues in a high-performance 70% PVDF paint system.



Matte Black (32)



Char Brown (29)



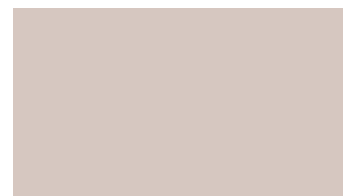
Thunder Grey (34)



Anchor Grey (37)



Ash Grey (33)



Almond (36)

PREMIUM FINISH

70% PVDF resin based coatings, with premium pigmentation to obtain metallic or deep color for desired aesthetics.



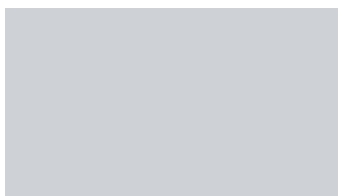
Antique Patina (24)



Champagne (31)



Coppertone (23)



Titanium (35)



Silversmith (28)



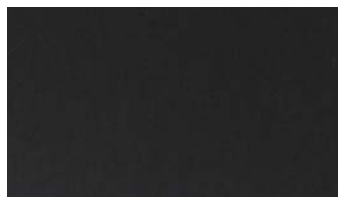
Brite Red (17)

NATURAL METALS

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Grey Zinc (50)*



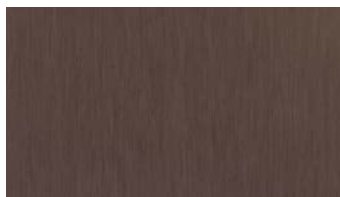
Dark Zinc (51)*



Brown Zinc (89)*



Blue Zinc (94)*



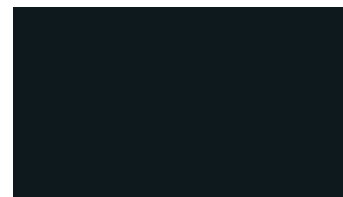
Red Zinc (95)*



Green Zinc (96)*



Clear Satin Anodized (70)



Dark Bronze Anodized (71)



55% Al-Zn Alloy Coated Steel with Acrylic Coating (97)



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Cedar (54)



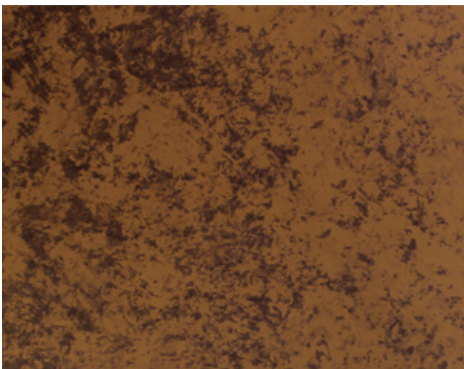
Driftwood (53)



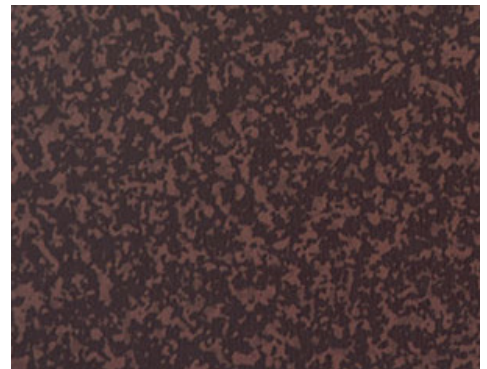
Walnut (55)

OXIDE SERIES

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Copper Brown (42)



Tarnished Red (47)

LAMINATE

ATAS offers a stacked stone pattern stocked in .032 aluminum in 50" width. It is UV stable for exterior application.



Stacked Stone (85)

TruExterior®

Siding & Trim





So Authentic. So Reliable. Nothing Compares.

TruExterior® Siding & Trim is a true innovation, invented to address issues common with other exterior products in the industry. It's a siding material that offers a high level of dimensional stability to help reduce expansion and contraction. Plus, TruExterior resists water, making it ideal for applications with ground or masonry contact. TruExterior gives builders the freedom to build beautiful homes with confidence.

Pictured: Shiplap, Channel Bevel
On the Cover: Nickel Gap, Channel







Phenomenal Performance. Remarkable Workability.

TruExterior® Siding & Trim offers both and a lasting look while eliminating the need for gluing, gapping and other cumbersome and costly installation techniques.

APPLICATION

- Designed for use in non-structural applications
- Suitable for ground and masonry contact
- Can be used in moisture-prone areas
- Installation is the same regardless of the season

TOOLS

- Installed using proven woodworking tools and methods
- Carbide-tipped blades and bits are recommended for a longer tool life

FASTENING

- Accepts common high-quality, exterior-grade fasteners that are suitable for the local environment
- Can be fastened close to the edge
- No need for pre-drilling
- No mushrooming

DURABILITY

- WUI listed
- No need to prime ends or field cuts
- Resists rot and termite attacks*
- No excessive swelling*

PAINTING

- TruExterior® products come pre-primed and do require paint
- No need to prime end cuts
- Can be painted with any high-grade exterior paint when following the paint manufacturer's instructions
- Dimensionally stable, promoting long-lasting paint adhesions, even with dark colors*
- Virtually no moisture cycling, paint lasts longer than on wood*
- Traditional exterior-grade caulks or exterior-grade wood fillers are all acceptable for filling nail holes

BEAUTY

- Tighter gaps, minimal movement—it will move less than PVC and vinyl
- Truly historically accurate profiles—get the look of traditional, authentic wood profiles
- True look of cedar siding profiles, real architectural detail

WARRANTY

- 20 year limited warranty

*Please see TruExterior® Siding & Trim Limited Warranties and Product Data Sheets for proprietary test results, located at TruExterior.com. Always follow local building codes and construction best practices. See the complete Installation Guidelines for TruExterior® Siding & Trim at TruExterior.com.

Pictured: Channel Bevel



Pictured: Nickel Gap



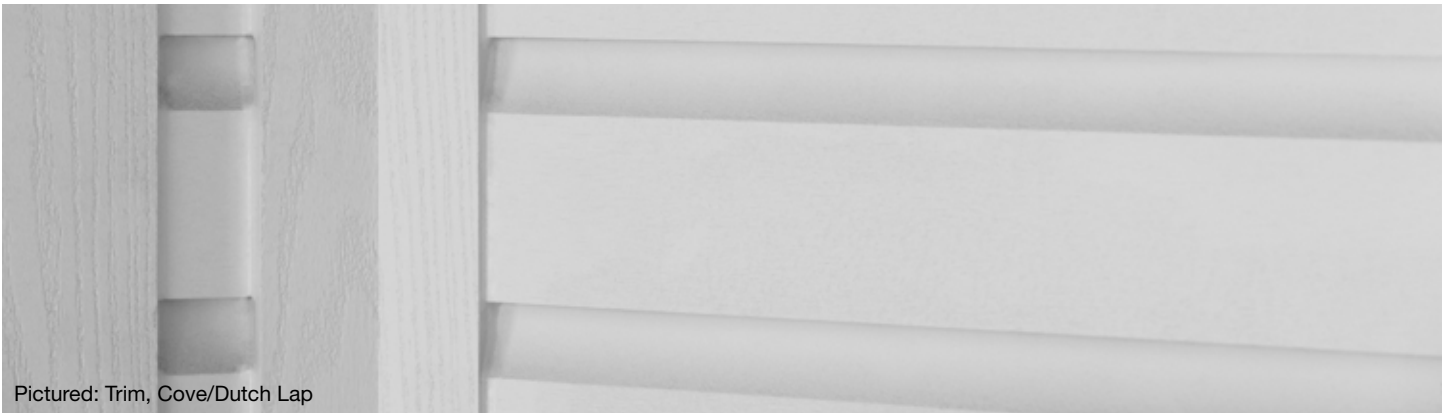
Pictured: Nickel Gap, Trim



Pictured: Channel, Board-and-Batten



Pictured: Nickel Gap, Board-and-Batten



Pictured: Trim, Cove/Dutch Lap



Pictured: Nickel Gap



Pictured: Trim



Pictured: Cove/Dutch Lap



Pictured: Cove/Dutch Lap

Craftsman Collection™

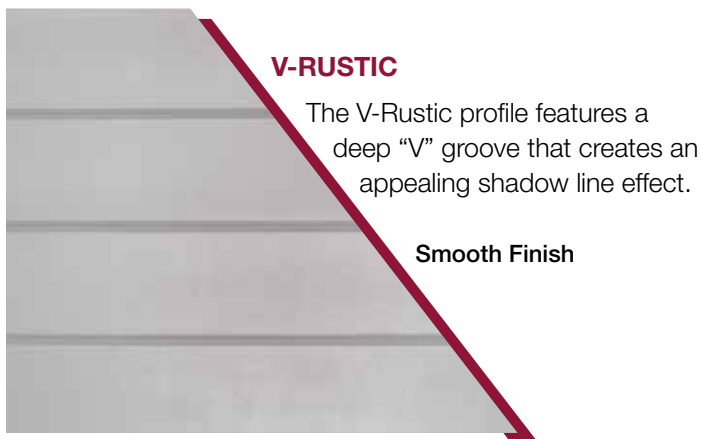
The TruExterior® Siding Craftsman Collection™ offers a variety of authentic, full-thickness profiles with bold, defined shapes and the natural aesthetic of traditional wood siding, all without the maintenance and upkeep associated with exterior wood products.

Historically and architecturally accurate profiles—Channel, Channel Bevel, Cove/Dutch Lap, Nickel Gap, Shiplap and V-Rustic—are the ideal solution for homeowners who desire the look, feel and character of authentic wood siding while avoiding rotting, excessive swelling and termite attacks.

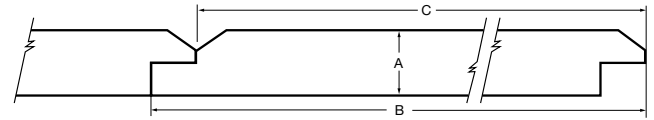


Pictured Top Left to Right: Channel Bevel, Nickel Gap

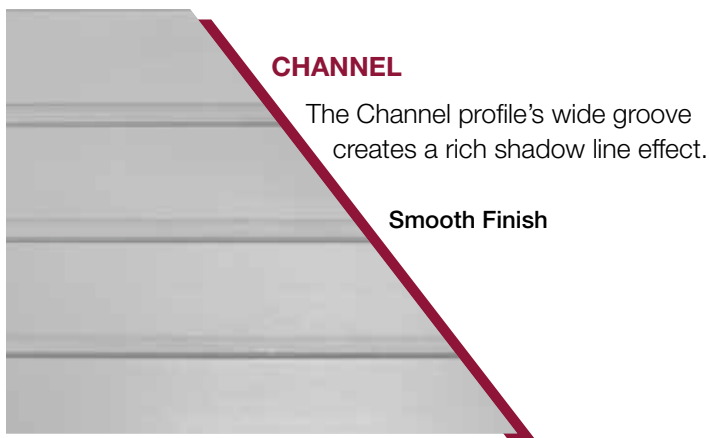
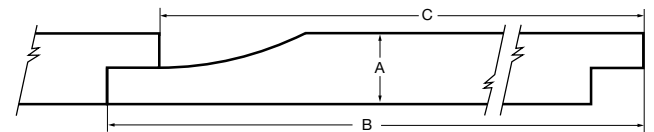
Pictured Bottom Left to Right: Nickel Gap, Channel Bevel



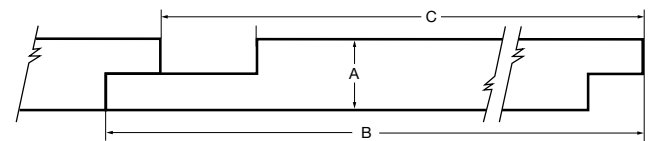
Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
1 x 6	11/16"	5-1/2"	5"
1 x 8	11/16"	7-1/2"	7"
1 x 10	11/16"	9-1/2"	9"



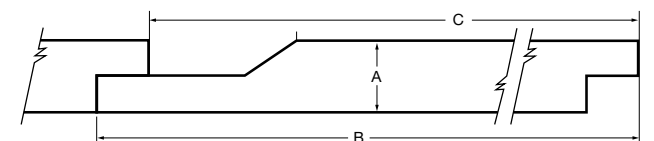
Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
1 x 6	11/16"	5-1/2"	4-31/32"
1 x 8	11/16"	7-1/4"	6-23/32"
1 x 10	11/16"	9-1/4"	8-23/32"



Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
1 x 6	11/16"	5-1/2"	4-31/32"
1 x 8	11/16"	7-1/4"	6-23/32"
1 x 10	11/16"	9-1/4"	8-23/32"



Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
1 x 6	11/16"	5-1/2"	4-31/32"
1 x 8	11/16"	7-1/2"	6-31/32"
1 x 10	11/16"	9-1/2"	8-31/32"



TruExterior Siding comes pre-primed and does require paint.

REVERSIBLE SHIPLAP-NICKEL GAP

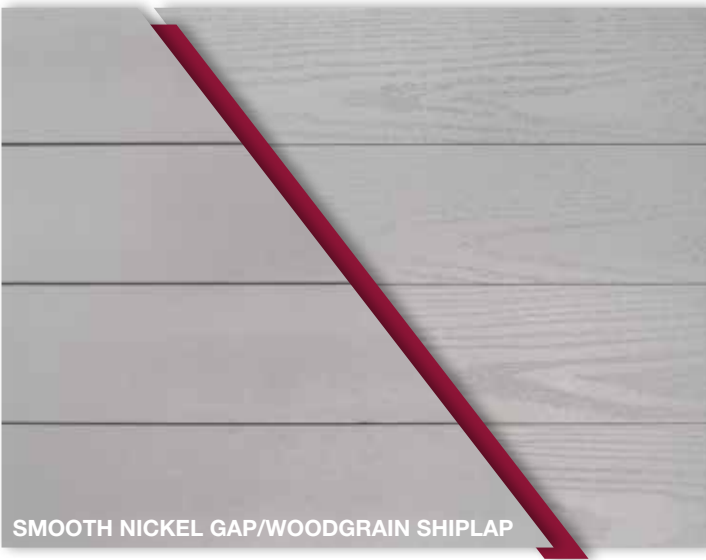
TruExterior Siding & Trim’s Reversible Shiplap/Nickel Gap siding panels offer two authentic, on-trend looks in one for increased versatility and convenience. The profile comes in two formats: one features smooth Nickel Gap on one side and woodgrain Shiplap on the other; the second combines woodgrain Nickel Gap with smooth Shiplap on the flip side. A rabbeted edge ensures panels install with authentic spacing depending on which side is installed—the tight joint appearance of Shiplap or the nickel-sized space of Nickel Gap. Four widths are available for 16 total profile combinations.

Finish Options:

- Smooth Nickel Gap with Woodgrain Shiplap
- Woodgrain Nickel Gap with Smooth Shiplap



Pictured: Smooth Nickel Gap

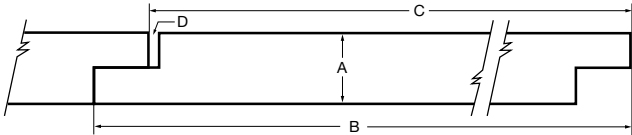
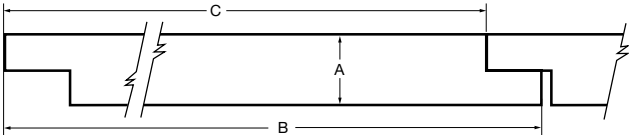


SHIPLAP GAP SIDE

Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
1 x 4	11/16"	3-1/2"	3-3/32"
1 x 6	11/16"	5-1/2"	5-3/32"
1 x 8	11/16"	7-1/4"	6-13/16"
1 x 10	11/16"	9-1/4"	8-13/16"

NICKEL GAP SIDE

Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)	Gap (D)
1 x 4	11/16"	3-1/2"	3-3/32"	5/64"
1 x 6	11/16"	5-1/2"	5-3/32"	5/64"
1 x 8	11/16"	7-1/4"	6-13/16"	5/64"
1 x 10	11/16"	9-1/4"	8-13/16"	5/64"



TruExterior Siding comes pre-primed and does require paint.



Beadboard

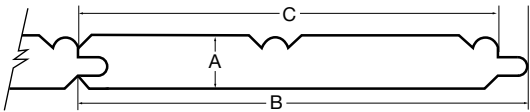
Including single and double profiles, TruExterior® Beadboard is ideal for porch ceilings, soffits and decorative wall applications, and allows for a variety of installations, as it can be attached in either parallel or perpendicular directions.

Its “tongue-and-groove” design results in a clean look that can be reversed to offer a contemporary “V-groove” appearance.



Pictured: Beaded Pattern

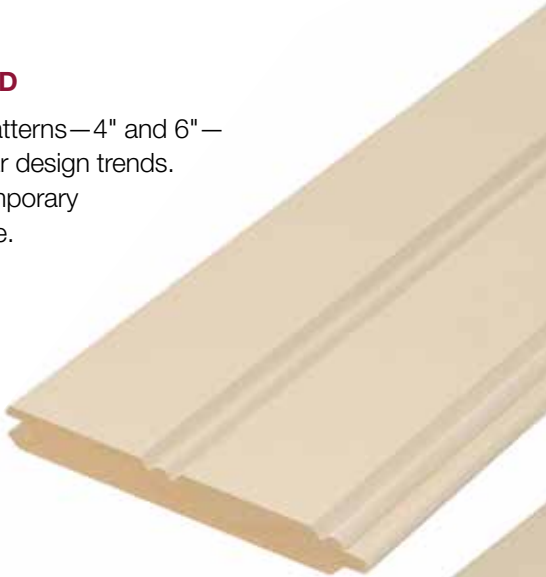
Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
5/8 x 4	5/8"	3-15/32"	3-5/32"
5/8 x 6	5/8"	5-5/16"	4-15/16"



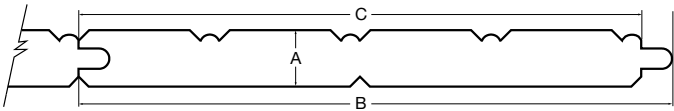
SINGLE BEADBOARD

Two distinct beaded patterns—4" and 6"—to suit the most popular design trends. Reversible for a contemporary “V-Groove” appearance.

Smooth Finish



Nominal Size	Actual Thickness (A)	Actual Width (B)	Reveal (C)
5/8 x 8	5/8"	6-9/16"	6-7/32"
5/8 x 12	5/8"	10-1/4"	9-29/32"



DOUBLE BEADBOARD

The same appearance as the single-profile products, but with twice the coverage. Reversible for a contemporary “V-Groove” appearance.

Smooth Finish



TruExterior Beadboard comes pre-primed and does require paint.



Trim

Designed to be used in non-load-bearing applications, TruExterior® Trim is suitable for ground and masonry contact and moisture-prone areas, which makes it ideal for exterior trim applications such as fascia, door trim, soffits, rake boards and a variety of other applications. There is no need to prime ends or field cuts. Plus, it can be painted any color. TruExterior® Trim accepts common high-quality, exterior-grade fasteners and can be installed using standard woodworking tools and methods.



5/8 Trim Sizes		1X Trim Sizes		5/4 Trim Sizes		2X Trim Sizes	
Nominal	Actual	Nominal	Actual	Nominal	Actual	Nominal	Actual
—	—	—	—	—	—	2 x 2	1-1/2" x 1-1/2"
—	—	1 x 3	3/4" x 2-1/2"	5/4 x 3	1" x 2-1/2"	—	—
5/8 x 4	5/8" x 3-1/2"	1 x 4	3/4" x 3-1/2"	5/4 x 4	1" x 3-1/2"	2 x 4	1-1/2" x 3-1/2"
—	—	1 x 5	3/4" x 4-1/2"	5/4 x 5	1" x 4-1/2"	—	—
5/8 x 6	5/8" x 5-1/2"	1 x 6	3/4" x 5-1/2"	5/4 x 6	1" x 5-1/2"	2 x 6	1-1/2" x 5-1/2"
5/8 x 8	5/8" x 7-1/4"	1 x 8	3/4" x 7-1/4"	5/4 x 8	1" x 7-1/4"	2 x 8	1-1/2" x 7-1/4"
5/8 x 10	5/8" x 9-1/4"	1 x 10	3/4" x 9-1/4"	5/4 x 10	1" x 9-1/4"	2 x 10	1-1/2" x 9-1/4"
5/8 x 12	5/8" x 11-1/4"	1 x 12	3/4" x 11-1/4"	5/4 x 12	1" x 11-1/4"	2 x 12	1-1/2" x 11-1/4"

TruExterior® Trim is reversible with woodgrain on one side and a smooth finish on the reverse. Available in a 16' length.

Reversible Smooth/Woodgrain Finish

BOARD-AND-BATTEN SIDING

Whether a Modern Farmhouse design or creating accents on a gable, board-and-batten is one of the hottest trends in home exterior design. And it's easy to create the board-and-batten look using just TruExterior Trim.



TruExterior Trim comes pre-primed and does require paint.

Accessories

TruExterior® Siding & Trim Accessories make it easy to create polished, professional-looking siding and trim installations. Decorative yet functional, the poly-ash accessories are designed to go where other materials can't, making them the perfect complement to cedar, fiber cement and other traditional siding products, as they are suitable for ground and masonry contact.



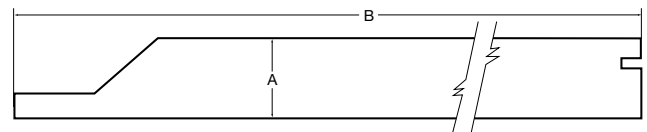
SKIRT BOARD

Provides a decorative yet functional way to create the required clearance between siding and grade.

Available Finishes:

- Smooth
- Woodgrain

Nominal Size	Actual Thickness (A)	Actual Width (B)
1 x 6	3/4"	5-1/2"
1 x 8	3/4"	7-1/4"
5/4 x 6	1"	5-1/2"
5/4 x 8	1"	7-1/4"



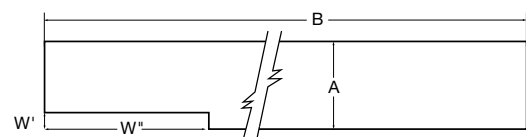
WINDOW POCKET RABBETED TRIM

The rabbeted groove helps trim to sit flush over the window's nailing flange, eliminating the need for cuts or shims.

Available Finishes:

- Smooth
- Woodgrain

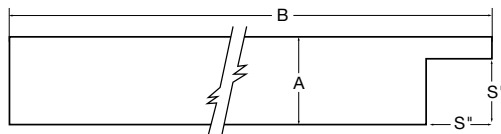
Nominal Size	Actual Thickness (A)	Actual Width (B)	Window Pocket (W' x W'')
5/4 x 4	1"	3-1/2"	3/16" x 1-7/8"
5/4 x 6	1"	5-1/2"	3/16" x 1-7/8"
5/4 x 8	1"	7-1/4"	3/16" x 1-7/8"



TruExterior Accessories come pre-primed and do require paint.



Nominal Size	Actual Thickness (A)	Actual Width (B)	Siding Pocket (S' x S'')
5/4 x 3	1"	2-1/2"	3/4" x 3/4"
5/4 x 4	1"	3-1/2"	3/4" x 3/4"
5/4 x 5	1"	4-1/2"	3/4" x 3/4"
5/4 x 6	1"	5-1/2"	3/4" x 3/4"
5/4 x 8	1"	7-1/4"	3/4" x 3/4"



SIDING POCKET RABBETED TRIM

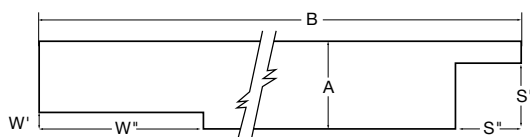
Perfect for end wall terminations, this trim with a 3/4" siding pocket accepts all TruExterior® Siding profiles.

Available Finishes:

- Smooth
- Woodgrain



Nominal Size	Actual Thickness (A)	Actual Width (B)	Window Pocket (W' x W'')	Siding Pocket (S' x S'')
5/4 x 4	1"	3-1/2"	3/16" x 1-7/8"	3/4" x 3/4"
5/4 x 6	1"	5-1/2"	3/16" x 1-7/8"	3/4" x 3/4"
5/4 x 8	1"	7-1/4"	3/16" x 1-7/8"	3/4" x 3/4"

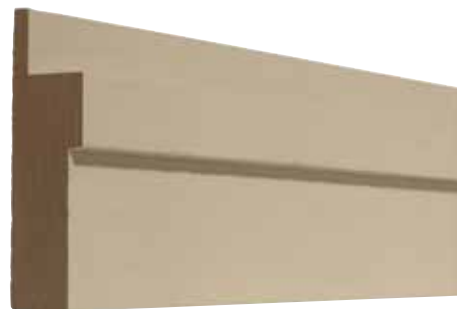


WINDOW AND SIDING POCKET RABBETED TRIM

The ultimate accessory to build a neat, professional-looking window surround.

Available Finishes:

- Smooth
- Woodgrain



TruExterior Accessories come pre-primed and do require paint.

TruExterior® Siding & Trim Reference Guide

SUSTAINABILITY

The sustainable properties of TruExterior® Siding & Trim are a result of a combination of proprietary polymer chemistry and highly refined, recovered coal combustion products (fly ash), which are endorsed by the U.S. Green Building Council (USGBC) for use in construction materials.

- Contains a minimum of 70% recycled content—verified by SCS Global Services



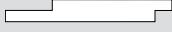
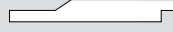
CODE LISTINGS

TruExterior® Siding & Trim have undergone rigorous internal and third-party testing to provide building officials, architects, contractors, specifiers, designers and others with reliable, high-performing products.

- California's Wildland-Urban Interface (WUI) listed—Beadboard, Siding, and Trim
- Texas Department of Insurance (TDI) EC-92—Siding
- Florida Building Code FL17285—Siding
- Intertek CCRR-0300

PROJECT ESTIMATOR

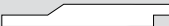
V-Rustic		Cove/Dutch Lap	
			
Nominal	Boards per square	Nominal	Boards per square
1 x 6	15	1 x 6	15
1 x 8	11	1 x 8	12
1 x 10	9	1 x 10	9

Channel		Channel Bevel	
			
Nominal	Boards per square	Nominal	Boards per square
1 x 6	15	1 x 6	15
1 x 8	12	1 x 8	11
1 x 10	9	1 x 10	9

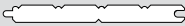
Reversible Shiplap-Nickel Gap	
	
Nominal	Boards per square
1 x 4	24
1 x 6	15
1 x 8	11
1 x 10	9

Craftsman Collection™ Siding

V-Rustic		Cove/Dutch Lap		Channel	
					
Nominal	Actual	Nominal	Actual	Nominal	Actual
1 x 6	11/16" x 5-1/2"	1 x 6	11/16" x 5-1/2"	1 x 6	11/16" x 5-1/2"
1 x 8	11/16" x 7-1/2"	1 x 8	11/16" x 7-1/4"	1 x 8	11/16" x 7-1/4"
1 x 10	11/16" x 9-1/2"	1 x 10	11/16" x 9-1/4"	1 x 10	11/16" x 9-1/4"

Channel Bevel		Reversible Shiplap-Nickel Gap	
			
Nominal	Actual	Nominal	Actual
1 x 6	11/16" x 5-1/2"	1 x 4	11/16" x 3-1/2"
1 x 8	11/16" x 7-1/2"	1 x 6	11/16" x 5-1/2"
1 x 10	11/16" x 9-1/2"	1 x 8	11/16" x 7-1/4"
		1 x 10	11/16" x 9-1/4"

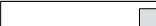
Beadboard

Single		Double	
			
Nominal Size	Actual	Nominal	Actual
5/8 x 4	5/8" x 3-15/32"	5/8 x 8	5/8" x 6-9/16"
5/8 x 6	5/8" x 5-5/16"	5/8 x 12	5/8" x 10-1/4"

Trim

5/8 Trim Sizes		1X Trim Sizes		5/4 Trim Sizes		2X Trim Sizes	
Nominal	Actual	Nominal	Actual	Nominal	Actual	Nominal	Actual
—	—	—	—	—	—	2 x 2	1-1/2" x 1-1/2"
—	—	1 x 3	3/4" x 2-1/2"	5/4 x 3	1" x 2-1/2"	—	—
5/8 x 4	5/8" x 3-1/2"	1 x 4	3/4" x 3-1/2"	5/4 x 4	1" x 3-1/2"	2 x 4	1-1/2" x 3-1/2"
—	—	1 x 5	3/4" x 4-1/2"	5/4 x 5	1" x 4-1/2"	—	—
5/8 x 6	5/8" x 5-1/2"	1 x 6	3/4" x 5-1/2"	5/4 x 6	1" x 5-1/2"	2 x 6	1-1/2" x 5-1/2"
5/8 x 8	5/8" x 7-1/4"	1 x 8	3/4" x 7-1/4"	5/4 x 8	1" x 7-1/4"	2 x 8	1-1/2" x 7-1/4"
5/8 x 10	5/8" x 9-1/4"	1 x 10	3/4" x 9-1/4"	5/4 x 10	1" x 9-1/4"	2 x 10	1-1/2" x 9-1/4"
5/8 x 12	5/8" x 11-1/4"	1 x 12	3/4" x 11-1/4"	5/4 x 12	1" x 11-1/4"	2 x 12	1-1/2" x 11-1/4"

Accessories

Skirt Board		Window Pocket Rabbeted Trim		Siding Pocket Rabbeted Trim		Window and Siding Pocket Rabbeted Trim	
							
Nominal	Actual	Nominal	Actual	Nominal	Actual	Nominal	Actual
1 x 6	3/4" x 5-1/2"	5/4 x 4	1" x 3-1/2"	5/4 x 3	1" x 2-1/2"	5/4 x 4	1" x 3-1/2"
1 x 8	3/4" x 7-1/4"	5/4 x 6	1" x 5-1/2"	5/4 x 4	1" x 3-1/2"	5/4 x 6	1" x 5-1/2"
5/4 x 6	1" x 5-1/2"	5/4 x 8	1" x 7-1/4"	5/4 x 5	1" x 4-1/2"	5/4 x 8	1" x 7-1/4"
5/4 x 8	1" x 7-1/4"			5/4 x 6	1" x 5-1/2"		
				5/4 x 8	1" x 7-1/4"		

Note: All TruExterior® Siding, Trim, Beadboard and Accessory products are available in standard 16' length.



TruExterior®

Siding & Trim

TruExterior.com | 800-521-8486

Made in the USA

Westlake
Royal Building Products™
WestlakeRoyalBuildingProducts.com

SIDING & ACCESSORIES
TRIM & MOULDINGS
ROOFING
STONE
WINDOWS
OUTDOOR LIVING

THE ELEMENTS ARE SIMPLE

greenscreen 



Rigid, lightweight panels are 48 inches wide and 6 ft, 8 ft, 10 ft, 12 ft, 14 ft long and can be installed either vertically, horizontally, wall mounted or freestanding.

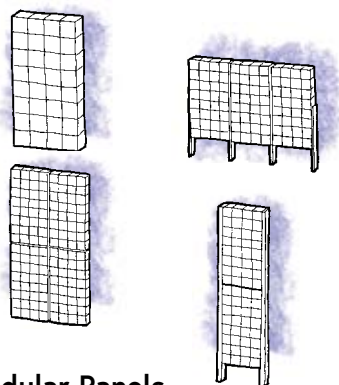
In addition to the standard panel, the **greenscreen®** system of green facade wall products includes the Column Trellis, customized Crimp-to-Curve shapes, panel trims and a complete selection of engineered attachment solutions. Customization and adaptation to unique project specifications can easily become a part of your **greenscreen®** project. The panels are made from recycled content, galvanized steel wire and finished with a baked on powder coat for durability.



basic elements

greenscreen® is a three-dimensional, welded wire green facade wall system.

The distinctive modular trellis panel is the building block of **greenscreen®**.



Modular Panels

Use for covering walls, freestanding fences, screens and enclosures.

Standard Sizes:

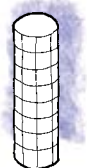
width: 48" wide

length: 6', 8', 10', 12', 14'

thickness: 3" standard

Custom dimensions available in 2" increments, length and width.

See our Accessory Items, Mounting Options and Detail Examples that work together to provide efficient solutions.



Column Trellis

Use as a vertical freestanding element or as a cover for existing posts. Coiled or flat for easy field installation in standard or custom diameters.

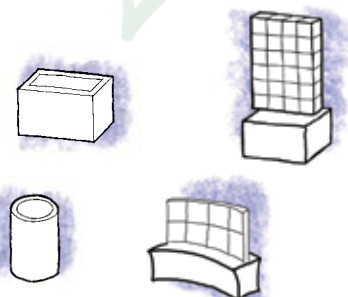
Standard Sizes:

dia: 15½"

height: 6', 8', 10', 12', 14'

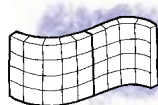
Custom heights in 2" increments

thickness: 3" standard



Planter Options

Planter options are available for a variety of applications and panel heights. Standard 4 ft. wide fiberglass planter units support up to 6' tall screens, and Column planters work with our standard diameter Column Trellis. Our Hedge-A-Matic family of planters use rectangle, curved and square shapes with shorter screens, for venues like patios, restaurants, entries and decks.



Crimp-to-Curve

Use for curved surfaces, covering walls, freestanding fences, screens, and enclosures.

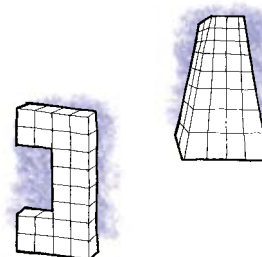
Standard Sizes:

radius: standard radius 4 ft to 12 ft at 12" increments

length: Available in 4" increments.

thickness: 3"

Custom radius and lengths available. Width variable in 2" increments.



Custom

Using our basic panel as the building block, we are always available to discuss creative options. Panels can be notched, cut to create a taper, mitered and are available in crimped-to-curve combinations.

Colors

Our standard powder coated colors are; green, black, silver, bronze, and white. Custom colors are available.



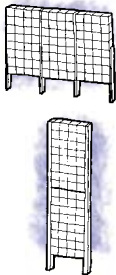
Accessories

greenscreen® is a complete trellis system that includes a versatile array of engineered mounting clips for almost every application of panels and columns. Our trims are factory installed before finishing. All clips, posts and caps are finished to match your project colors. Our Accessory Items list, Mounting Options, Detail Examples and Specifications all work together to provide efficient solutions.

FREESTANDING

Freestanding Green Facade Wall or Trellis Fence

When used freestanding, **greenscreen**®'s unique wire truss configuration can span between structural members for use as a security fence, privacy screen, shade element or three-dimensional enclosure. Light in weight, but incredibly strong, **greenscreen**®'s three inch screen depth "captures" plant material and provides the benefits of a living fence or tapestry that can be enjoyed from both sides. Our engineered mounting accessories match the panel finish and easily adapt to posts for simple fence installations or to more complex frameworks for larger multi-story projects. Working with the 2" modular grid simplifies the design process and ensures accurate field installation.





FREESTANDING

Standard sizes

- width: 4 ft
- length: 6 ft
- 8 ft
- 10 ft
- 12 ft
- 14 ft

thickness: 3" standard

Custom Sizes

width and length available in 2" increments up to 4 ft x 14 ft

Finish

- baked on powder coat finish over galvanized steel wire
 - ~ green
 - ~ black
 - ~ silver
 - ~ bronze
 - ~ white
 - ~ custom

Accessory Options

- trim: #5104
- #5105

Mounting Hardware

full range available

PLANTER

Size

Rectangular:

4 ft wide x 24" x 30" tall

Cylindrical:

18" dia x 28" tall

Curved:

20" tall x various shapes

Custom Sizes

custom sizes available

Finish

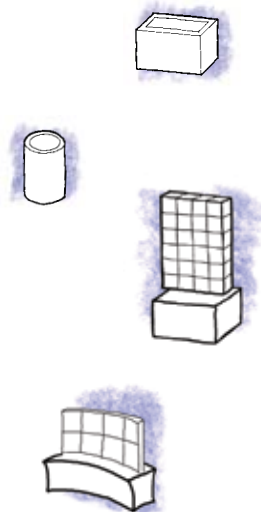
- fiberglass with multiple textures available
- custom color to match client color chip

Accessory Options:

order with 4 ft wide and 6 ft tall trellis panels for large standard planters. For taller panels additional structure required.

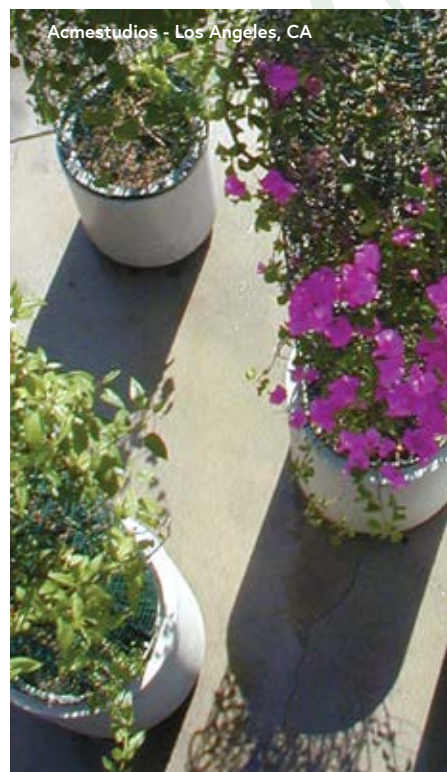
Mounting Hardware

Planter Straps



Above Ground Planter

For projects that require containers, **greenscreen®** trellis panels can be mounted to our stationary planters in multiple configurations. Planters may feature special liners and drainage for irrigation control and are available in a variety of colors and finishes. Standard cylindrical planters coordinate with the Column Trellis and flat, modular panels work with rectangular planters. Custom sizes, shapes, and colors can be made to order depending on your project requirements. Curved, straight and square shapes used in combinations are featured in our *Hedge-A-Matic* family of planters, and are available with shorter privacy screens for venues like patios, restaurants, entries and decks.



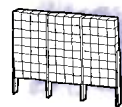
project examples

The following pages illustrate some of the many combinations offered with the **greenscreen®** green facade wall system.



The "captive growing space" created by the unique **greenscreen®** panel design promotes vertical plant growth and is an excellent support for maintaining healthy plants. Edge trim can be added at pedestrian areas as a closure strip or at the panel perimeter to provide a reinforced edge for plant maintenance. A variety of colors, finish-matched clips and mounting hardware make it easy to adapt to round or square post systems. **greenscreen®** panels can be mounted vertically or horizontally between posts and are easily integrated into custom gate openings.

FENCING



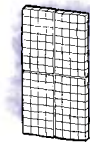


Staten Island Courthouse Parking - NJ



Stanford University Parking Structure #5 - Stanford, CA

PARKING STRUCTURES



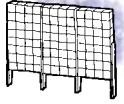
greenscreen® trellis panels are a proven solution for providing vertical plant greenery on large multi-story buildings such as parking structures. In a tight building-setback situation, **greenscreen®** requires only a few inches of space to create an effective vertical landscape element. Multi-floor heights can be vegetated from a narrow planting bed that eliminates walkway encroachment or by integrating above grade planters to reach higher elevations. The panels are easily adaptable for new projects or to retro-fit onto existing buildings. The unique panel construction spans between floors and attaches directly to the building face or to a secondary steel frame. In all cases, the three-dimensional depth of the panel promotes rapid, early growth and long term plant support.



California State University at Fullerton Parking Structure - Fullerton, CA



Renaissance 500 Parking, Ridgeland, MS



greenscreen® installations provide security benefits by controlling access without bars or conventional fencing while simultaneously covering the openings with a lacy leaf texture. The three-dimensional panel construction of the **greenscreen®** green facade wall system allows spanning between structural members and can be stacked vertically or horizontally to cover larger areas. The 2" x 2" grid, adaptable clips and brackets make installation simple and efficient.

SECURITY

Pacific View Mall Parking Structure - Ventura, CA

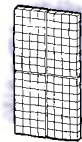


Rolex - Beverly Hills, CA



Vine Street School - Los Angeles CA

GRAFFITI CONTROL



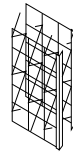
greenscreen® modular wall mounted trellis panels inhibit graffiti action on this 12 foot high parking area wall in a dense urban environment and on a neighborhood school building. A narrow planting bed helps maximize the usable traffic area and the neighborhood enjoys the benefit of a flowering, vine covered solution instead of a monotonous concrete wall. Neighborhood groups and Planning Department officials responded favorably to this alternative.

accessories

Our Accessory Items list will provide your project with the necessary edge trims, mounting clips, straps, posts, and caps to match your specified finishes with maximum flexibility.

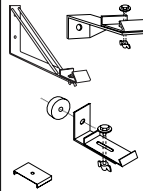
To assist with design and product specification we provide additional details, material specifications, engineering data, complete accessory specifications, BIM and CAD details for inserting into working drawings. Also included is a helpful **Mounting Options** section for use as a guide on typical installations. This additional information is available online at www.greenscreen.com and in our Complete Catalog Binder. Contact us for additional materials or with specific questions.

EDGE TRIMS



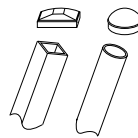
Use as a closure strip at edges of **greenscreen®** panels. Recommended on panel edges adjacent to pedestrian traffic or where edge reinforcement is required for special mounting conditions or long term plant maintenance. #5104 Steel Channel Trim or #5105 Steel Edge Trim can be added to panels in multiple configurations.

MOUNTING CLIPS



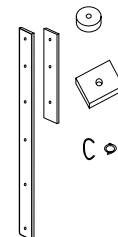
A selection of engineered clips and brackets can be used for a variety of project requirements. Examples are on our website. Please contact a **greenscreen®** Project Manager for more information.

POSTS AND CAPS



Available in matching finishes and custom lengths.

STRAPS, SPACERS AND RINGS



Use for attachment to planters, adapting to uneven surfaces, isolating different building materials, aligning screens and joining screens together in a stacking configuration.





Color Chart

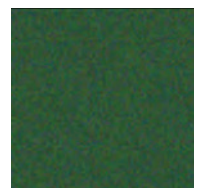
greenscreen® offers six standard colors as well as custom colors. All attachments, posts and custom accessories can be colored to match. Note that color rendering can shift depending on your monitor calibration and viewing conditions. For an exact representation of these colors, sample color chips are available upon request. Visit greenscreen.com/contact/catalog-samples/.



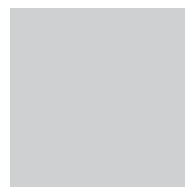
Matte Texture
Black



White



Matte Texture
Green



Silver



Bronze



Terra



Studios 5C - Tempe, AZ

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At **greenscreen®** we are a team of architects and designers with a broad and deep range of experience in urban planning, landscape design and the construction industry. We consult on both small and large scale projects across the continent and around the world, and we're committed to providing team-oriented design and technical support for your project.

Contact us to discuss **greenscreen®**'s possibilities and its application to your job. We will answer your questions, review drawings, recommend mounting details, prepare shop drawings, provide price quotes and help you place an order.



Spring 2021

Front - Whole Foods, Lincoln Park, IL

DICHROIC GLASS

PRODUCT DATA

Dichroic Glass is a mesmerizing reflective surface which selectively filters and reflects different wavelengths of light, depending on the angle of observation. Available in monolithic or laminated form, Dichroic Glass can be combined with complimentary products to create a striking and unique feature piece that will elevate any space with dramatic effects.



PRODUCT STANDARD OPTIONS*

COLOR SHIFTS	IMAGE
Gold to Magenta to Green	
Copper to Cyan to Orange	



GOLDRAY
GLASS

*Colors may vary when viewed or printed on different devices. For most accurate color representation, please refer to our website or request a product sample.

GLASS TOLERANCE

SI Designation	Traditional Designation	Glass Makeup Thickness Range				Glass Weight	
		min (mm)	max (mm)	min (in)	max (in)	kg/sqm	lb/sqft
6mm	1/4in	5.56	6.20	0.219	0.244	15.52	3.18

- Strength – Available annealed, heat-strengthened, or tempered
- Edgework – Standard seamed-edge. Flat polished or flat ground edge available
- Fabrication – Available for specific installation and hardware requirements

PRODUCT FEATURES

- Suitable for interior and exterior applications
- Standard and custom options available
- Can be used to achieve a variety of design goals
- Cost effective and easy to maintain
- Highly durable and abrasion resistant

APPLICABLE STANDARDS

- ANSI 97.1: Pass
 - » Safety Glazing Materials Used in Buildings
 - » Safety Performance Specifications and Methods Test
- 16 CFR 1201: Pass
- CAN/CGSB 12.1-2017: Pass

APPLICABLE SPECIFICATIONS

Goldray's Dichroic Glass complies with all major building codes and meets the following industry standards:

- ASTM C1036 - Specification for Flat Glass
- ASTM C1048 - Specification for Heat Strengthened and Fully Tempered Flat Glass
- ASTM C1172 - Specification for Laminated Architectural Flat Glass (When Laminated)

COMPATIBLE SYSTEMS

☒ MOSAIC ☒ NOVA

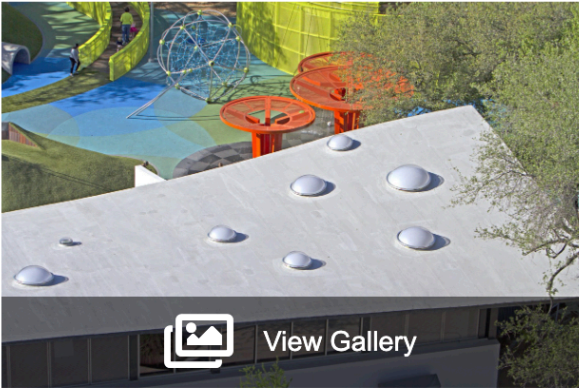


GOLDRAY
GLASS

Circular Domes

Brings Skylights Full Circle

These circular, curb-mounted domes have been updated to meet today's expectations and specifications. With structural improvements like incorporating a vinyl curb and rolled aluminum retainers, Circular Units have reduced condensation and increased thermal performance compared to their earlier counterparts.



Most common applications:

- Public education, healthcare, and office buildings
- Hotel and conference centers
- Retail and shopping malls

Key benefits:

- ✓ Standard sizes for double or triple dome
- ✓ Vinyl curb and rolled aluminum retainer
- ✓ No weep holes
- ✓ Available in multiple glazing and finish options

[Find Commercial Rep >](#)

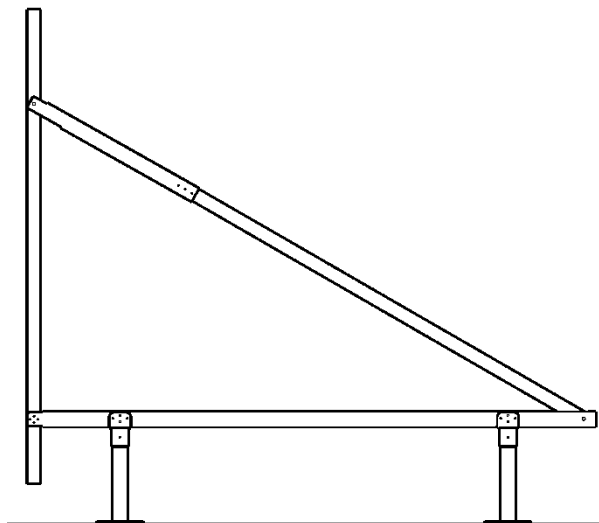
Tools and Guides



Product Details

Sizes	Glazing Options	Finish Options
Double or Triple Dome Curb Mount Units		Outside Dimension of Curb
CC2/CC3-36		34"
CC2/CC3-48		46"
CC2/CC3-60		57"
CC2/CC3-72		70"
CC2/CC3-84		82"
CC2/CC3-96		94"

RoofScreen LT™ Frame



Example of RoofScreen LT™ Frame Configuration

Description:

The RoofScreen LT™ frame is a light-duty frame system that consists of 3 square galvanized tube members and our Square Post Support system, which allows adjustment for roof slope and a watertight connection. This system is adjustable during installation and does not require perfect alignment of the front Post Supports from frame to frame.

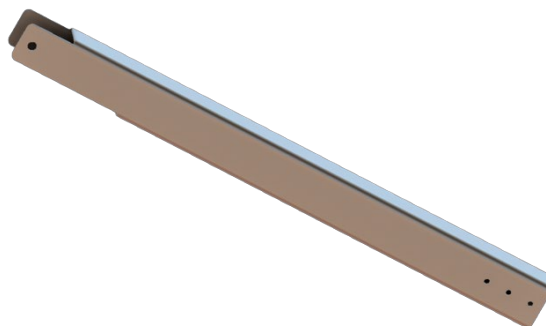
Application:

RoofScreen LT™ frames are designed to be used as the primary structural supports for equipment screens on flat and low sloped commercial rooftops. The frames can accommodate virtually any type of face panel to achieve the desired aesthetics for the building. The Square Post Support system can attach in a watertight manner to any type of roof construction, occasionally needing additional structural blocking or reinforcement.

Materials/Components:

Frame Tubes:

- 2"x 2" and 1.75" x 1.75" 14ga. Galvanized steel (ASTM A653).
- Fy = 50ksi (min).
- G90 galvanized.



RoofScreen LT Frame
Updated 05.09.23

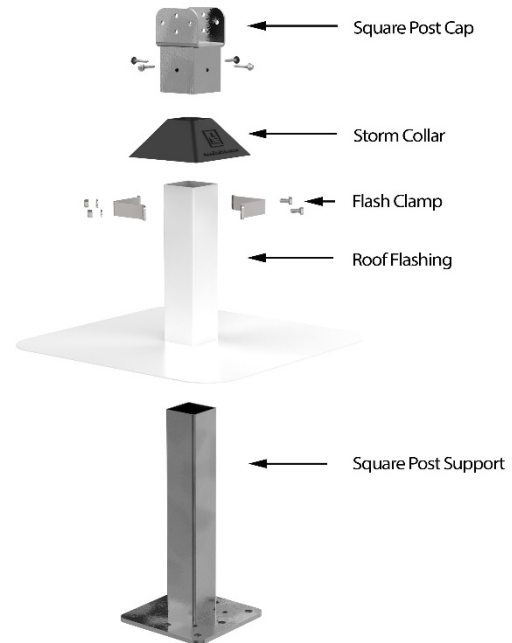
www.roofscreen.com

Hardware:

- Nuts and bolts used for connectors are corrosion resistant 18-8 stainless steel.
- Tek Screws are carbon steel with premium coating.

Roof Connections:

- Galvanized steel Square Post Support.
- Galvanized steel Square Post Cap.
- Flashing boot matching roof type.
- Flash Clamp and EPDM storm collar for added protection.



Structural Notes:

The modular design allows the frame configuration and spacing to be adapted to a range of wind loads. Frames can be installed closer together to accommodate varying conditions. Square Post Supports have a fixed connection at the base to the roof structure.

All projects require analysis and calculations by a licensed professional engineer to ensure the design is appropriate for the specific conditions that apply.

Installation:

For typical RoofScreen projects, the frame tubes are delivered pre-cut based on the dimensions of the tallest frame on the project. Depending on the amount of roof slope, some tubes may require field trimming during installation. The installation consists of connecting the tubes together, adjusting for levelness, then locking them together with self-drilling tek screws and through bolts. Slotted and tabbed tube connections allow for frame adjustability and ease of installation. A full installation manual is available, and most projects include full shop drawings showing project specific details.

Warranty:

When the system is designed and engineered by RoofScreen Mfg., we include a 20-year limited warranty.

Apex™

The Apex™ rectangular post railing system is constructed with mechanical threaded connections to ensure an exact, precise and secure fitting.

Apex railing Materials

High quality Aluminum for interior or exterior use. Finishes are powder coated standard colors with custom options available to RAL standards. Post and Top Rail dimensions are 1/2" (12mm) x 2" (51mm). Mounting plates, attachments, and toe boards in powder coated aluminum to match guardrail.

Infill materials are:

- Aluminum powder coated pickets

Standard attachment methods are surface and side mounts.

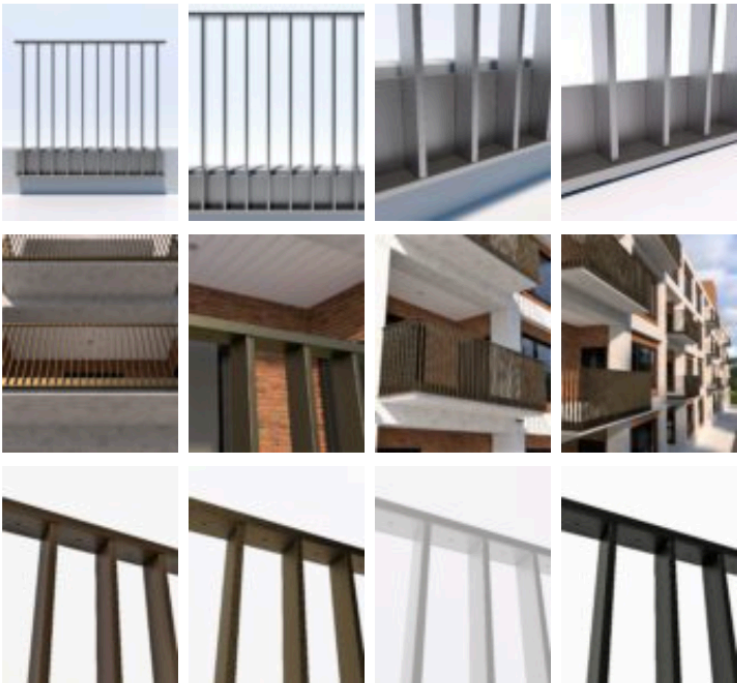
Installation is available as required.

Catalog*	↓
CSI Specs	↓
AutoCAD Drawings*	↓
Revit Files*	↓

**Log-in required for download - call 717.285.4088*



Apex™ guardrail Stainless Steel finish. Other colors available on request.



HDI Railing Systems

3905 Continental Drive
Columbia, PA 17512

Phone: 717.285.4088

Fax: 717.285.5083

HDI International Customers:

Sales Manager:
Shawn Maguire

Phone: (011) 717.381.0830

email:

smaguire@hdirailings.com

Contact a Regional Sales
Manager by state. 

Design + Performance

Versatility with Unmatched Fabrication Flexibility



Geisinger Professional Building
Jenkins Township, Pennsylvania
ARCHITECT
Mericle Commercial Real Estate Services
Wilkes-Barre, Pennsylvania
GLAZING CONTRACTOR
Sterling Glass, Inc., Scranton, Pennsylvania
PHOTOGRAPHER
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Trifab® VersaGlaze® is built on the proven and successful Trifab® platform – with all the versatility its name implies. There are enough framing system choices, fabrication methods, design options and performance levels to please the most discerning building owner, architect and installer. The 4.5" depth Trifab® VersaGlaze® Framing System family is available with non-thermal, thermal and ultra-thermal performance levels. The ultra-thermal Trifab® 451UT Framing System, is designed for the most demanding thermal performance and employs a dual Isolock® thermal break.

AESTHETICS

Trifab® VersaGlaze® Framing Systems offer designers a choice of front-, center-, back- or multi-plane glass applications. Structural silicone

glazing (SSG) and weatherseal glazing options further expand designers' choices, allowing for a greater range of possibilities for specific project requirements and architectural styles. All systems have a 4-1/2" frame depth; Trifab® VersaGlaze® 450 has 1-3/4" sightlines, while Trifab® VersaGlaze® 451/451T and Trifab® 451UT have 2" sightlines.

With seamless incorporation of Kawneer entrances or windows, including GLASSvent® visually frameless ventilators, Trifab® framing can be used on almost any project. These framing systems can also be packaged with Kawneer curtain walls and overhead glazing, thereby providing a full range of proven, and tested, quality products for the owner, architect and installer from a single-source supplier.

ECONOMY

Trifab® VersaGlaze® 450/451/451T/451UT Framing Systems offer a variety of fabrication choices to suit your project:

- **Screw Spline** – for economical continuous runs utilizing two-piece vertical members that provide the option to pre-assemble units with controlled shop labor costs and smaller field crews for handling and installation. (available for all systems)
- **Shear Block** – for punched openings or continuous runs using tubular moldings with shear block clips that provide tight joints for transporting large pre-assembled multi-lite units. (available for 450/451/451T systems)
- **Stick** – for fast, easy field fabrication. Field measurements and material cuts can be done when metal is on the jobsite. (available for 450/451/451T systems)
- **Pre-glazed** – The combination of screw spline construction with pre-glazing in the shop accelerates installation and reduces field labor time while minimizing disruption to the surrounding area or existing tenants. Making it an exceptional choice for new or retrofit applications, particularly in urban areas or where space is limited. (available for 451/451T/451UT framing)



Brighton Landing
Cambridge, Massachusetts
ARCHITECT
ADD Inc., Cambridge, Massachusetts
GLAZING CONTRACTOR
Ipswich Bay Glass Company, Inc., Rowley, Massachusetts
PHOTOGRAPHER
© Gordon Schenck, Jr.

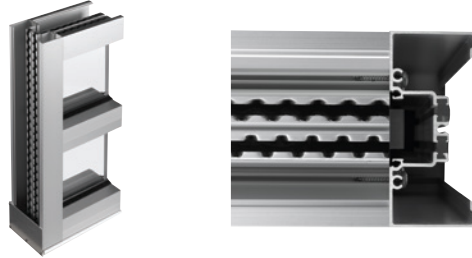
All systems can be flush glazed from either the inside or outside. The weatherseal option provides an alternative to SSG vertical mullions for Trifab® VersaGlaze® 450/451/451T. This ABS/ASA rigid polymer extrusion allows complete inside glazing and creates a flush glass appearance on the building exterior without the added labor of scaffolding or swing stages. Additionally, high-performance flashing options are engineered to eliminate perimeter sill fasteners and associated blind seals.

FOR THE FINISHING TOUCH

Architectural Class I anodized aluminum and painted finishes in fluoropolymer (AAMA 2605) and solvent-free powder coatings (AAMA 2604) offer a variety of color choices.

PERFORMANCE

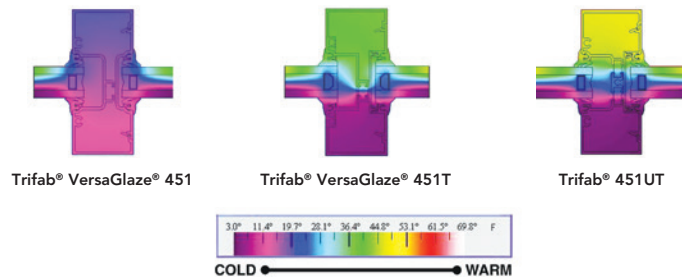
Kawneer's Isolock® thermal break technology creates a composite section, prevents dry shrinkage and is available on Trifab® VersaGlaze® 451T. For even greater thermal performance, a dual Isolock® thermal break is used on Trifab® 451UT.



Trifab® 451UT uses a dual Isolock® thermal break (right) and features a new high-performance sill design, which incorporates a screw-applied end dam (left), ensuring positive engagement and tight joints between the sill flashing and end dam.

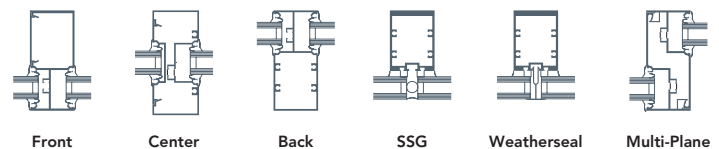
U-factor, CRF values and STC ratings for Trifab® framing systems vary depending upon the glass plane application. Project-specific U-factors can be determined for each individual project. (See the Kawneer Architectural Manual or Kawneer.com for additional information.)

Thermal simulations showing temperature variations from exterior/cold side to interior/warm side.



PERFORMANCE TEST STANDARDS

Air Infiltration	ASTM E283
Water	AAMA 501, ASTM E331
Structural	ASTM E330
Thermal	AAMA 1503
Thermal Break	AAMA 505, AAMA TIR-A8
Acoustical	AAMA 1801, ASTM E1425



Redefining Thermal Entrances with IsoPour™ Technology



Ask more from your door, and get it all with Kawneer's new Insulpour® Thermal Entrances, featuring IsoPour™ technology. This innovative product offering gives architects, developers, owners, and glazing contractors the ability to create a true thermally broken entrance system. It's an ideal solution for high-end commercial and multifamily facilities looking to improve thermal control in common areas with moderate to high traffic.

By merging industry-proven pour and debridge and polymer isolator technologies, Kawneer's IsoPour™ Thermal Break technology creates thermally broken assemblies for enhanced building energy efficiencies with higher structural performance. Insulpour® Thermal Entrances simultaneously provide additional design flexibility through multiple door cross-rail and bottom rail choices along with dual finish capabilities for the door and door frame.

PERFORMANCE, STRENGTH & SECURITY

The door and frame both leverage IsoPour™ Thermal Break technology, enabling high thermal performance. Specifically aimed at quelling concerns about cold spots and thermal bridging from architects and specifiers, Insulpour® Thermal Entrances feature a true thermally broken door header, which significantly mitigates the formation of condensation when used with a concealed overhead closer. Insulating glass unit options of double pane 1" (25.4 mm) or triple pane 1-1/2" (38.1 mm) improve thermal and sound reduction performance.

For added strength, the 2-1/4" (57.2 mm) deep door has a stout 1/8" (3.2 mm) wall thickness, and the dual-welded corner construction of Insulpour® Thermal Entrances adds long-term performance. Each door corner comes with a limited lifetime warranty, good for the life of the door under normal use operation. It is transferable from building owner to owner and is provided in addition to the standard two-year warranty covering material and workmanship of each Kawneer door.

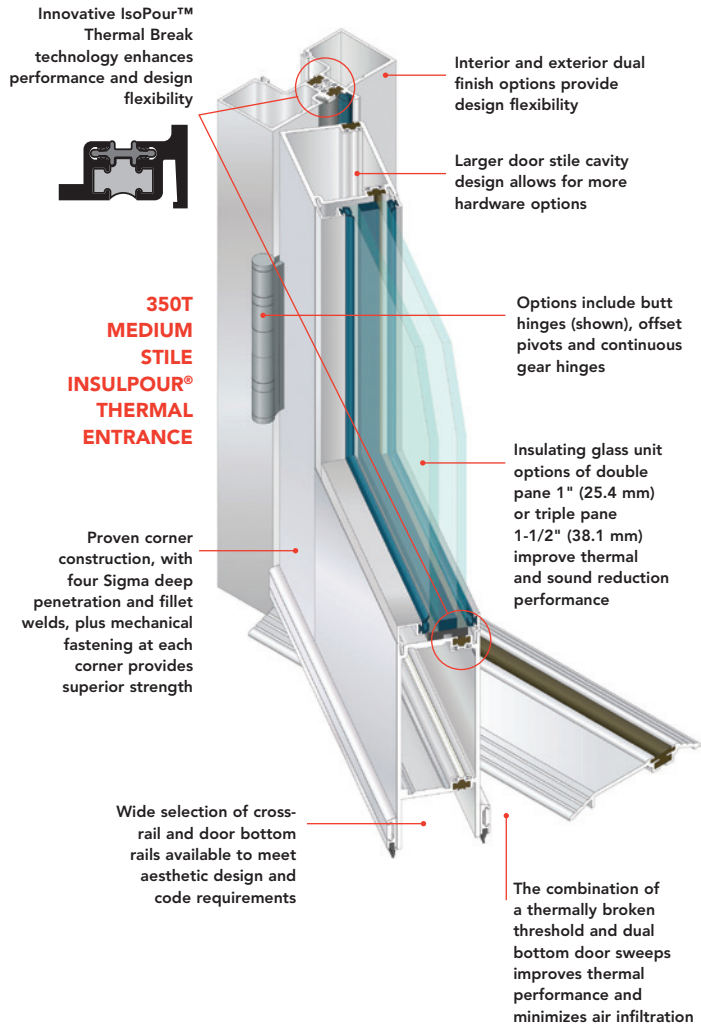
Insulpour® Thermal Entrances meet ASTM E1996 hurricane impact resistant requirements up to Zone 4 and Level D, and have undergone shock tube testing for blast mitigation. Contact your local Kawneer sales representative for limitations and specific application requirements.

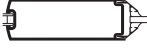
AESTHETICS & DESIGN FLEXIBILITY

With sightlines that match standard, non-thermally broken entrances, Insulpour® Thermal Entrances offer 250T narrow, 350T medium and 500T wide stile options.

	VERTICAL STILE	TOP	BOTTOM RAIL
250T Narrow Stile	2-1/2" (63.5 mm)	2-15/16" (74.6 mm)	3-7/8" (98.4 mm)
350T Medium Stile	3-1/2" (88.9 mm)	3-1/2" (88.9 mm)	6-1/2" (165.1 mm)
500T Wide Stile	5" (127 mm)	5" (127 mm)	6-1/2" (165.1 mm)

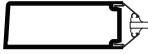
The unique thermal break design allows for a wider choice of locking option hardware than previous thermal entrance designs. Coupled with various cross-rail sizes and multiple bottom rail heights of 7-1/2" (190.5 mm), 10" (254 mm) and 12" (304.8 mm), Insulpour® Thermal Entrances give architects, designers and building owners more opportunities to bring their vision to life.



Product	190 Standard Entrances Narrow Stile	350 Standard Entrances Medium Stile	500 Standard Entrances Wide Stile	
Catalog Section	Entrances	Entrances	Entrances	
Typical Detail				
Sightline	2-1/8"	3-1/2"	5"	
Depth	1-3/4"	1-3/4"	1-3/4"	
Applications	Moderate Traffic	Moderate to High Traffic	High Traffic	
Infill Options	Up to 1"	Up to 1"	Up to 1"	
Cross Rails/Muntins	Yes	Yes	Yes	
Thermal	No	No	No	
2 Color Option	No	No	No	
Product Description	190 narrow stile entrance door offers a slim appearance, features dual-moment corner construction and is designed for applications such as offices, stores and apartment buildings.	350 medium stile entrance door offers a rugged appearance features dual-moment corner construction and is designed for schools, institutions, and other high traffic conditions.	500 wide stile entrance door features dual-moment corner construction, and it creates a monumental visual appearance for banks, libraries or buildings experiencing the heaviest traffic conditions.	
Testing for Protective Glazing	—	—	—	
Performance Class/Rating	—	—	—	
Performance Test Standards	ASTM E283 Dual Moment Corner	ASTM E283 Dual Moment Corner	ASTM E283 Dual Moment Corner	

Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
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Product	350 Heavy Wall® Entrances	500 Heavy Wall® Entrances	350 Tuffline® Entrances	500 Tuffline® Entrances
Catalog Section	Entrances	Entrances	Entrances	Entrances
Typical Detail				
Sightline	3-1/2"	5"	3-1/2"	5"
Depth	2"	2"	2"	2"
Applications	High Traffic	High Traffic	High Traffic High Abuse	High Traffic High Abuse
Infill Options	Up to 1"	Up to 1"	Up to 1"	Up to 1"
Cross Rails/Muntins	Yes	Yes	Yes	Yes
Thermal	No	No	No	No
2 Color Option	No	No	No	No
Product Description	A medium stile heavy duty door and door frame with increased wall thickness to provide greater durability in heavy traffic areas.	500 Heavy Wall® offers the same performance features as the 350 except in a wide stile design.	A medium stile heavy duty door and door frame with hardware package for high abuse applications. Ideal for schools, universities, sports stadiums and other high traffic, high abuse areas.	500 Tuffline® offers the same performance features as the 350 Tuffline® except in a wide stile design.
Testing for Protective Glazing	—	—	—	—
Performance Class/Rating	—	—	—	—
Performance Test Standards	ASTM E283 Dual Moment Corner	ASTM E283 Dual Moment Corner	ASTM E283 Dual Moment Corner	Dual Moment Corner

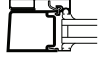
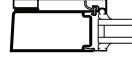
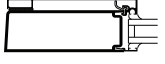
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Product	250T Insulpour® Thermal Entrances	350T Insulpour® Thermal Entrances	500T Insulpour® Thermal Entrances	AA®250 Thermal Entrances
Catalog Section	Entrances	Entrances	Entrances	Entrances
Typical Detail				
Sightline	2-1/2"	3-1/2"	5"	2-1/2"
Depth	2-1/4"	2-1/4"	2-1/4"	2-1/4"
Applications	Moderate Traffic	Moderate to High Traffic	High Traffic	Moderate Traffic
Infill Options	1"	1"	1"	1"
Cross Rails/Muntins	Cross Rails	Cross Rails	Cross Rails	Yes
Thermal	Yes	Yes	Yes	Yes
2 Color Option	Yes	Yes	Yes	Yes
Product Description	250T is a thermally broken entrance system, both door and door frame are thermally broken. The door features the dual-moment corner construction and is engineered for use with Kawneer's Trifab® VersaGlaze® 451T, 451UT, 601T, and 601UT framing system.	350T offers the same performance features as the 250T except in a medium stile design.	500T offers the same performance features as the 250T except in a wide stile design.	AA®250 is a thermally broken entrance system, both door and door frame are thermally broken. The door features the dual-moment corner construction and is engineered for use with Kawneer's Trifab® VersaGlaze® 451T framing system.
Testing for Protective Glazing	—	Small Missile Large Missile Blast Mitigation	Small Missile Large Missile Blast Mitigation	Large Missile
Performance Class/Rating	—	+/- 70 PSF Max.	+/- 70 PSF Max.	+/- 45 PSF
Performance Test Standards	AAMA 507 AAMA 925 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500	AAMA 507 AAMA 925 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01	AAMA 507 AAMA 925 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01	AAMA 925 AAMA 1304 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996

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Product	AA®425 Thermal Entrances	260 Insulclad® Thermal Entrances	360 Insulclad® Thermal Entrances	560 Insulclad® Thermal Entrances
Catalog Section	Entrances	Entrances	Entrances	Entrances
Typical Detail				
Sightline	4-1/4"	2-11/16"	4-1/16"	5-9/16"
Depth	2-1/4"	2-1/4"	2-1/4"	2-1/4"
Applications	Moderate Traffic	Moderate Traffic Thermal	Moderate Traffic	Moderate Traffic
Infill Options	1"	1"	1"	1"
Cross Rails/Muntins	Yes	Yes	Yes	Yes
Thermal	Yes	Extruded PVC / VHB Acrylic Foam Tape	Extruded PVC / VHB Acrylic Foam Tape	Extruded PVC / VHB Acrylic Foam Tape
2 Color Option	Yes	Yes	Yes	Yes
Product Description	AA®425 offers the same performance features as the AA®250 except in a wide stile design.	260 Insulclad® is a complete package of thermally broken door and door frame. Features dual-moment corner construction and is engineered for use with Kawneer's Trifab® VersaGlaze® 451T Framing System and 1600 Wall Systems.	360 Insulclad® offers the same performance features as the 260 Insulclad® except in a medium stile design.	560 Insulclad® offers the same performance features as the 260 Insulclad® except in a wide stile design.
Testing for Protective Glazing	Large Missile Blast Mitigation	—	—	—
Performance Class/Rating	+/- 50 PSF	—	—	—
Performance Test Standards	AAMA 925 AAMA 1304 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996	AAMA 507 ASTM E283 Dual Moment Corner NFRC 100/200/500	AAMA 507 ASTM E283 Dual Moment Corner NFRC 100/200/500	AAMA 507 ASTM E283 Dual Moment Corner NFRC 100/200/500

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Product	Flushline® Entrances			
Catalog Section	Entrances			
Typical Detail				
Sightline	N/A			
Depth	1-3/4"			
Applications	Moderate to High Traffic, Impact Areas			
Infill Options	1/4" or 1"			
Cross Rails/Muntins	No			
Thermal	No			
2 Color Option	Yes			
Product Description	A urethane foam-filled door with aluminum or FRP face sheet designs in various interior and exterior applications such as schools and manufacturing facilities.			
Testing for Protective Glazing	Small Missile Large Missile Blast Mitigation			
Performance Class/Rating	+/- 75 PSF Max.			
Performance Test Standards	AAMA 507 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01			

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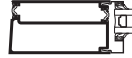
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Product	350 IR Entrances	500 IR Entrances	350 Heavy Wall® IR Entrances	500 Heavy Wall® IR Entrances
Catalog Section	Entrances	Entrances	Entrances	Entrances
Typical Detail				
Sightline	3-1/2"	5"	3-1/2"	5"
Depth	1-3/4"	1-3/4"	2"	2"
Applications	Moderate to High Traffic	Moderate to High Traffic	Moderate to High Traffic	Moderate to High Traffic
Infill Options	9/16"	9/16"	9/16", 1"	9/16", 1"
Cross Rails/Muntins	Cross Rails	Cross Rails	Cross Rails	Cross Rails
Thermal	No	No	No	No
2 Color Option	No	No	No	No
Product Description	350 IR medium stile entrance offers a rugged appearance, features dual-moment corner construction, silicone sealed interior glass stop, and hardware designed to meet the code requirements of wind-borne debris protection.	500 IR wide stile entrance offers a rugged appearance, features dual-moment corner construction, silicone sealed interior glass stop, and hardware designed to meet the code requirements of wind-borne debris protection.	350 Heavy Wall® IR offers the same features as the 350IR, increased wall thickness provides for greater durability and strength.	500 Heavy Wall® IR offers the same performance features as the 350 except in a wide stile.
Testing for Protective Glazing	Small Missile Large Missile	Small Missile Large Missile	Small Missile Large Missile	Small Missile Large Missile
Performance Class/Rating	+/- 65 PSF +/- 85 PSF	+/- 65 PSF +/- 85 PSF	+/- 110 PSF	+/- 110 PSF
Performance Test Standards	ASTM E330 ASTM E1886 ASTM E1996 Dual - Moment Corner TAS 201, 202, 203	ASTM E330 ASTM E1886 ASTM E1996 Dual - Moment Corner TAS 201, 202, 203	ASTM E330 ASTM E1886 ASTM E1996 Dual - Moment Corner TAS 201, 202, 203	ASTM E330 ASTM E1886 ASTM E1996 Dual - Moment Corner TAS 201, 202, 203

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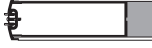
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Product	350T Insulpour® Thermal Entrances	500T Insulpour® Thermal Entrances	AA®425 Thermal Entrances	
Catalog Section	Entrances	Entrances	Entrances	
Typical Detail				
Sightline	3-1/2"	5"	4-1/4"	
Depth	2-1/4"	2-1/4"	2-1/4"	
Applications	Moderate to High Traffic	High Traffic	Moderate Traffic	
Infill Options	1"	1"	1"	
Cross Rails/Muntins	Cross Rails	Cross Rails	No	
Thermal	Yes	Yes	Yes	
2 Color Option	Yes	Yes	Yes	
Product Description	350T offers the same performance features as the 250T except in a medium stile design.	500T offers the same performance features as the 250T except in a wide stile design.	AA®425 offers the same performance features as the AA®250 except in a wide stile design.	
Testing for Protective Glazing	Small Missile Large Missile Blast Mitigation	Small Missile Large Missile Blast Mitigation	Large Missile Blast Mitigation	
Performance Class/Rating	+/- 70 PSF Max.	+/- 70 PSF Max.	+/- 50 PSF	
Performance Test Standards	AAMA 507 AAMA 925 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01	AAMA 507 AAMA 925 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01	AAMA 925 AAMA 1304 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996	

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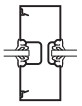
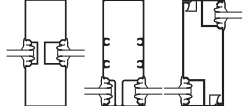
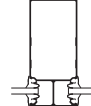
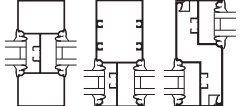
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Product	Flushline® Entrances			
Catalog Section	Entrances			
Typical Detail				
Sightline	N/A			
Depth	1-3/4"			
Applications	Moderate to High Traffic, Impact Areas			
Infill Options	1/4" or 1"			
Cross Rails/Muntins	No			
Thermal	No			
2 Color Option	Yes			
Product Description	A urethane foam-filled door with aluminum or FRP face sheet designs in various interior and exterior applications such as schools and manufacturing facilities.			
Testing for Protective Glazing	Small Missile Large Missile Blast Mitigation			
Performance Class/Rating	+/- 75 PSF Max.			
Performance Test Standards	AAMA 507 AAMA 1503 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F2927 GSA T501-2003 NFRC 100/200/500 UFC 4-010-01			

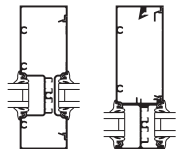
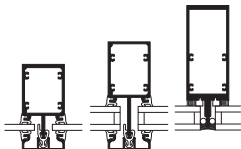
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Product	Trifab® 400 Framing (1-3/4" x 4")	Trifab® VersaGlaze® 450 Framing System 1-3/4" sightline (1-3/4" x 4-1/2")	Trifab® VersaGlaze® 450 Framing System 2" sightline (2" x 4-1/2") (2" x 2-1/4" Veneer)	Trifab® VersaGlaze® 451 Framing System (2" x 4-1/2")
Catalog Section	Framing	Framing	Framing	Framing
Typical Detail				
Applications	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings
Glass Plane Options	Center	Center Front Back Multi-Plane	Front	Center Front Back Multi-Plane
Infill Options	1/8", 1/4" & 3/8"	1/8", 1/4" & 3/8"	1/8", 1/4" & 3/8"	Up to 1-1/8"
Glazing Options	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed
Thermal	No	No	No	No
SSG	No	Optional	Optional	Optional
Weatherseal	No	Optional	Optional	Optional
2 Color Option	No	No	No	Yes with Front Stick
Integrated Entrance Framing	Yes	Yes	Yes	Yes
Windows Integration	Yes	Yes	Yes	Yes
GLASSvent® Integration	Yes	Yes	Yes	Yes
Fabrication Method	Screw Spline, Shear Block, Stick	Screw Spline, Shear Block, Stick, Continuous Head and Sill	Stick	Screw Spline, Shear Block, Stick, Continuous Head and Sill
Product Description	A 1-3/4" x 4" flush glazed system for 1/4" glass. Designed for quick installation on low rise buildings. It offers design economy with flexibility.	A 1-3/4" x 4-1/2" flush glazed system for 1/4" glass. VersaGlaze® is engineered for design and fabrication versatility with variable glass plane choices, SSG or Weatherseal options and four types of fabrication.	A 2" x 2-1/4" Veneer and a 2" x 4-1/2" Captured, flush glazed system for 1/4" glass with SSG and Weatherseal options. Designed for quick installation on low to mid-rise buildings.	A 2" x 4-1/2" flush glazed system for 1" glass. VersaGlaze® is engineered for design and fabrication versatility with variable glass plane choices, SSG or Weatherseal options, and four types of fabrication.
Testing for Protective Glazing	—	—	—	—
Performance Test Standards	AAMA 501 ASTM E283 ASTM E330 ASTM E331	AAMA 501 ASTM E283 ASTM E330 ASTM E331	AAMA 501 ASTM E283 ASTM E330 ASTM E331	AAMA 501, AAMA 507, AAMA1801, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, NFRC 100/200/500

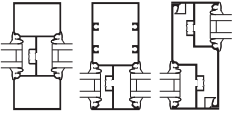
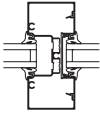
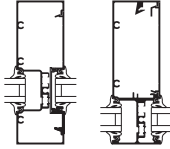
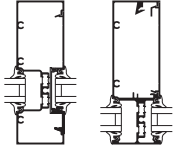
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Product	Trifab® VersaGlaze® 601 Framing System (2" x 6")	EnCORE® Framing System (1-3/4" x Variable)		
Catalog Section	Framing	Framing		
Typical Detail				
Applications	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings		
Glass Plane Options	Center Front	Center Front		
Infill Options	Up to 1-1/8"	Up to 1-1/8"		
Glazing Options	Inside Glazed Outside Glazed	Outside Glazed		
Thermal	Dual IsoLock® Pour and Debridge	Polymer Glazing Clip		
SSG	Yes (Front)	Optional		
Weatherseal	No	No		
2 Color Option	No	Yes		
Integrated Entrance Framing	Yes	Yes		
Windows Integration	Yes	Yes		
GLASSvent® Integration	Yes	Yes		
Versoleil® Sunshade Integration	Yes (Center Only)	No		
Fabrication Method	Screw Spline, Shear Block, Stick	Screw Spline Shear Block Continuous Head and Sill		
Product Description	A versatile 2" x 6" flush glazed system for 1" glass available in Center Set and Front Set options. Engineered to perform to current energy code requirements using a dual IsoLock® thermal break.	A versatile two-piece face and gutter system that incorporates an engineered polymer glazing clip for thermal performance. It offers a variety of depth combinations to meet various design possibilities including SSG and curved applications.		
Testing for Protective Glazing	—	—		
Performance Test Standards	AAMA 501, AAMA 505, AAMA 507, AAMA 1503, AAMA 1801, AAMA TIR-A8, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500	AAMA 150 AAMA 501 AAMA 507 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500		

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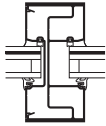
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Product	Trifab® VersaGlaze® 451T Framing System (2" x 4-1/2")	Trifab® 451UT Framing (2" x 4-1/2")	Trifab® VersaGlaze® 601T Framing System (2" x 6")	Trifab® VersaGlaze® 601UT Framing System (2" x 6")
Catalog Section	Framing	Framing	Framing	Framing
Typical Detail				
Applications	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings
Glass Plane Options	Center, Front, Back, Multi-Plane	Center	Center Front	Center Front
Infill Options	Up to 1-1/8"	Up to 1-1/8"	Up to 1-1/8"	Up to 1-1/8"
Glazing Options	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed
Thermal	IsoLock® Pour and Debridge	Dual IsoLock® Pour and Debridge	Dual IsoLock® Pour and Debridge	Dual IsoLock® Pour and Debridge
SSG	Optional	No	Yes (Front)	Yes (Front)
Weatherseal	Optional	No	No	No
2 Color Option	Yes with Front Stick	No	No	No
Integrated Entrance Framing	Yes	Yes	Yes	Yes
Windows Integration	Yes	Yes	Yes	Yes
GLASSvent® Integration	Yes	Yes	Yes	Yes
Versoleil® Sunshade Integration	Yes	Yes	Yes (Center Only)	Yes (Center Only)
Fabrication Method	Screw Spline, Shear Block, Stick, Continuous Head and Sill	Screw Spline	Screw Spline, Shear Block, Stick	Screw Spline, Shear Block, Stick
Product Description	A 2" x 4-1/2" flush glazed system for 1" glass. VersaGlaze® is engineered for design and fabrication versatility with variable glass planes choices, SSG or Weatherseal options, IsoLock® thermal break option and four types of fabrication.	A 2" x 4-1/2" flush glazed system for 1" glass. Engineered to perform to current energy code requirements using a dual IsoLock® thermal break.	A 2" x 6" flush glazed system for 1" glass. Engineered to perform to current energy code requirements using a dual IsoLock® thermal break.	A 2" x 6" flush glazed system for 1" glass. Engineered to perform to current energy code requirements using a dual IsoLock® thermal break.
Testing for Protective Glazing	—	—	—	—
Performance Test Standards	AAMA 501.1, AAMA 507, AAMA 501, AAMA 505, AAMA 1503, AAMA 1801, AAMA TIR-A8, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, NFRC 100/200/500	AAMA 501, AAMA 505, AAMA 1503, AAMA 507, AAMA 1801, AAMA TIR-A8, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500	AAMA 501, AAMA 505, AAMA 507, AAMA 1503, AAMA 1801, AAMA TIR-A8, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500	AAMA 501, AAMA 505, AAMA 507, AAMA 1503, AAMA 1801, AAMA TIR-A8, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500

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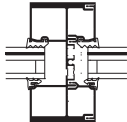
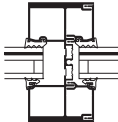
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Product	IR 500 Framing 2-1/2" x 5" (Wind-borne Debris)	IR 501 Framing 2-1/2" x 5" (Wind-borne Debris)		
Catalog Section	Framing	Framing		
Typical Detail				
Applications	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings		
Glass Plane Options	Center	Center		
Infill Options	9/16", 5/8" (Impact) 1/4" (Non-Impact)	1-5/16" (Impact) 1" (Non-Impact)		
Glazing Options	Outside Glazed	Outside Glazed		
Thermal	No	No		
SSG	No	No		
Weatherseal	No	No		
2 Color Option	No	No		
Integrated Entrance Framing	Yes	Yes		
Windows Integration	No	No		
GLASSvent® Integration	No	No		
Versoleil® Sunshade Integration	No	No		
Fabrication Method	Screw Spline	Screw Spline		
Product Description	A 2-1/2" x 5" framing system for wind-borne debris applications. It offers a center flush glazed look with either a interior structural silicone seal (wet glazed) or EPDM gasket (dry glazed) for large missile applications.	A 2-1/2" x 5" framing system for wind-borne debris applications. It offers a center flush glazed look with either a interior structural silicone seal (wet glazed) or EPDM gasket (dry glazed) for large missile applications.		
Testing for Protective Glazing	Large Missile	Small Missile Large Missile		
Performance Test Standards	AAMA 501 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 TAS 201, 202, 203	AAMA 501 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 TAS 201, 202, 203		

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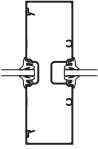
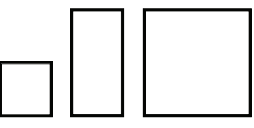
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Product	IR 501T Framing 2-3/4" x 5" (Wind-borne Debris)	IR 501UT Framing 2-3/4" x 5" (Wind-borne Debris)		
Catalog Section	Framing	Framing		
Typical Detail				
Applications	Storefront Ribbon Windows Punched Openings	Storefront Ribbon Windows Punched Openings		
Glass Plane Options	Center	Center		
Infill Options	1-5/16" (Impact)	1-5/16" (Impact)		
Glazing Options	Outside Glazed	Outside Glazed		
Thermal	Yes	Yes		
SSG	No	No		
Weatherseal	No	No		
2 Color Option	No	No		
Integrated Entrance Framing	Yes	Yes		
Windows Integration	No	No		
GLASSvent® Integration	No	No		
Versoleil® Sunshade Integration	Yes	Yes		
Fabrication Method	Screw Spline	Screw Spline		
Product Description	A 2-3/4" x 5" thermal framing system for wind-borne debris applications. It offers a center flush glazed look with either a interior structural silicone seal (wet glazed) or EPDM gasket (dry glazed) for large missile applications.	A 2-3/4" x 5" thermal framing system for wind-borne debris applications. It offers a center flush glazed look with either a interior structural silicone seal (wet glazed) or EPDM gasket (dry glazed) for large missile applications.		
Testing for Protective Glazing	Small Missile Large Missile	Small Missile Large Missile		
Performance Test Standards	AAMA 501, ASTM E283, ASTM E330, ASTM E331, ASTM E1886, ASTM E1996, TAS 201, 202, 203	AAMA 501, AAMA 1503, AAMA 1801, ASTM E283, ASTM E330, ASTM E331, ASTM E1886, ASTM E1996, CAN/CSAA440, TAS 201, 202, 203		

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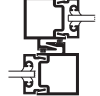
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Product	InFrame® Interior Framing System (2" x 6")	Miscellaneous Framing		
Catalog Section	Framing	Framing		
Typical Detail				
Applications	Interior Framing for Partitions	Safety Rails Glazing Moldings Tubes		
Glass Plane Options	Center	—		
Infill Options	1/8", 1/4" & 3/8"	—		
Glazing Options	Inside Glazed	—		
Thermal	No	—		
SSG	No	—		
Weatherseal	No	—		
2 Color Option	No	—		
Integrated Entrance Framing	Yes	—		
Windows Integration	No	—		
GLASSvent® Integration	No	—		
Versoleil® Sunshade Integration	No	—		
Fabrication Method	Screw Spline	—		
Product Description	A 2" x 6" flush glazed system for 1/4" glass. Two-piece perimeter profiles for interior framing partitions that capture drywall to simplify and speed the installation process.	Safety Rails, Glazing Moldings and Tubes.		
Testing for Protective Glazing	—	—		
Performance Test Standards				

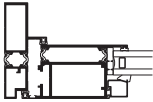
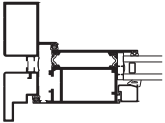
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Product	1010 Sliding Mall Front	1010C Sliding Mall Front	1040 Sliding Mall Front	
Catalog Section	Sliding Doors	Sliding Doors	Sliding Doors	
Typical Detail				
Sightline	1", 1-3/4", 3-7/16", 5-1/8"	1-3/4", 2-5/16", 2-15/16"	2-1/8", 4"	
Depth	Varies by # of panels	Varies by # of panels	1-3/4"	
Applications	Interior	Interior	Interior or Exterior	
Infill Options	Up to 1"	3/16" & 1/4"	1/4" & 1"	
Cross Rails/Muntins	Yes	Yes	Yes	
Product Description	The 1010 sliding mall front is a floor supported, multi-track (surface or recessed), sliding door offering parallel in-line stacking. The 1010 sliding mall front is intended to be used primarily as an interior unit. It may be used as an exterior unit when optimum weathering performance is not required.	The 1010C sliding mall front is a floor supported, multi-track (surface or recessed), sliding door offering parallel in-line stacking. The 1010C sliding mall front is intended to be used primarily as an interior unit. It may be used as an exterior unit when optimum weathering performance is not required. It accepts a swinging entrance door within the sliding panels.	The 1040 sliding mall front is a floor supported, single track (surface or recessed), sliding door offering three separate stacking options (parallel staggered, parallel even and 90° stacking). The 1040 sliding mall front is intended to be used primarily as an interior unit. It may be used as an exterior unit when optimum weathering performance is not required.	
Testing for Protective Glazing	—	—	—	
Performance Class/Rating	—	—	—	
Performance Test Standards	—	—	—	

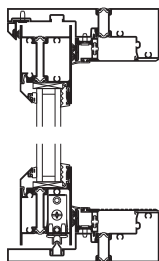
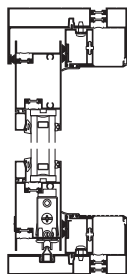
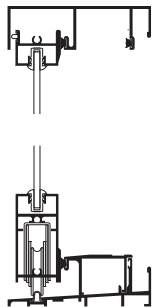
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Product	2000T Terrace Doors 4" Frame	2000T Terrace Doors 5" Frame		
Catalog Section	Entrances	Entrances		
Typical Detail				
Sightline	3-3/4"	3-3/4"		
Depth	2-1/4"	2-1/4"		
Applications	Exterior Balconies	Exterior Balconies		
Infill Options	Up to 1-1/16"	Up to 1-1/16"		
Cross Rails/Muntins	No	No		
Thermal	IsoWeb®	IsoWeb® Door Panel IsoLock® Pour & Debridge Frame		
2 Color Option	Yes	No		
Product Description	A thermally broken high performance French door for use in condominiums, lofts, hotels, and apartments. Mitered corner construction with heavy duty corner clips, stainless steel locking hardware, designed to meet the code requirements of wind-borne debris protection.	A thermally broken high performance French door for use in condominiums, lofts, hotels, and apartments. Mitered corner construction with heavy duty corner clips, stainless steel locking hardware, designed to meet the code requirements of wind-borne debris protection. Integrates with MetroView® FG 501T and MetroView® FG 601T PG Window Walls.		
Testing for Protective Glazing	Small Missile Large Missile	—		
Performance Class/Rating	Single: AW-PG90-ATD Pairs: AW-PG45/65-ATD	Single: AW-PG90-ATD Pairs: AW-PG45/65-ATD		
Performance Test Standards	AAMA 507 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E547 ASTM E1886 ASTM E1996 NAFS-08 NFRC 100/200/500 TAS 201, 202, 203	AAMA 507 ASTM E90 ASTM E283 ASTM E330 ASTM E331 ASTM E547 ASTM E1886 ASTM E1996 NAFS-11 NFRC 100/200/500 TAS 201, 202, 203		

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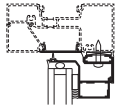
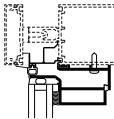
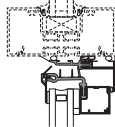
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Product	AA® 3200 Thermal Sliding Doors	AA®3200M Thermal Sliding Doors	990 Sliding Doors
Catalog Section	Sliding Doors	Sliding Doors	Sliding Doors
Typical Detail			
Sightline	4-1/4"	Sliding Panel – 3.75" Interlock – 3.75" Frame – 2.375"	1-1/8", 1-3/4", 3-1/8", 5-1/8"
Depth	6-3/4"	5"	4-1/2"
Applications	Exterior	Exterior	Exterior
Infill Options	1" and 1-5/16"	1"	Up to 1"
Cross Rails/Muntins	No	No	Yes
Product Description	A monumental, high performance, sliding door for use in low, medium and high rise applications, where improved thermal performance is required. Tested to the most current North American industry standards, the AA®3200 meets performance designation of AW-135 (deflection limited to L/175) at the required gateway test unit sizes. Water penetration resistance is tested up to 15 PSF (720 Pa).	Mid-range thermal sliding door that will provide a performance / price point option compared to the AA3200. A low profile threshold option. The new thermally broken slider and frame uses our innovative IsoPour® thermal break technology. The IsoPour® thermal break technology will provide top of line thermal performance and accommodates ability for dual color finishes.	A superior operating sliding door for low, medium or high rise applications offering performance class and grades of C30, HC40 and HC60. Standard configurations are OX, XO, OXO and OXXO.
Thermal	Yes	Yes	No
Two Color Option	Yes	Yes	No
Testing for Protective Glazing	Small Missile Large Missile	No	No
Performance	AW-PG135-SD	AW-PG45-SD (Standard Interlocks) AW-PG65-SD (Heavy Interlocks)	SGD-C30, SGD-HC40, SGD-HC60
Performance Test Standards	AAMA 507, AAMA/WDMA/CSA 101/I.S.2/A440-08, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E547, ASTM F842, ASTM E987, ASTM E1886, ASTM E1996, NFRC 100/200/500, TAS 201, 203	AAMA / WDMA / CSA 101 / I.S.2 / A440 (NAFS) AAMA 910 AAMA 1503 ASTM E 90 ASTM E 283 ASTM E 330 ASTM E 331 ASTM E 547 ASTM E 987 ASTM E 1332 ASTM E 1425 ASTM E 2068 ASTM F 842	AAMA 1303.5 AAMA/WDMA/CSA 101/I.S.2/AA440 ASTM E283 ASTM E330 ASTM E331 ASTM E547 ASTM E987

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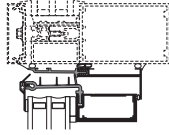
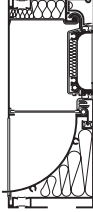
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Product	GLASSvent® Windows for Storefront Framing	GLASSvent® Windows for Curtain Wall	GLASSvent® UT Windows (Commercial Window)
Catalog Section	Windows - Casement / Projected	Windows - Casement / Projected	Windows - Casement / Projected
Typical Detail			
Grade	Heavy Commercial (HC)	Architectural Window (AW)	Commercial Window (CW)
Frame Depth	2-3/16" (55.6 mm) 1/4" Infill 2-13/16" (71.4 mm) 1" Infill	2-11/16" (68.3 mm) 1/4" Infill 3-7/16" (87.3 mm) 1" Infill	3-1/8" (79.4 mm) 3-7/8" (98.4 mm)
Functions	Outswing Casement Project-Out	Outswing Casement Project-Out	Outswing Casement Project-Out
Product Description	A visually frameless operable vent designed to be used in conjunction with a variety of Kawneer storefront systems. The operable vent virtually disappears into the adjacent framing system eliminating the typical sightline buildup. Suitable for a wide variety of building applications particularly where there is need to add operable vents to existing installations.	A visually frameless operable vent designed to be used in conjunction with a variety of Kawneer curtain wall systems. Similar to the Storefront GLASSvent® with added depth to resist higher wind loads associated with multi-story buildings.	A ultra thermal, visually frameless operable vent designed to be used in conjunction with Kawneer curtain wall and storefront systems.
Infill Options	1/4" and 1"	1/4" and 1"	1" and 1-3/4"
Factory Glazing	Silicone Glazed	Silicone Glazed	Silicone Glazed
Access Panels with Venetian Blinds	No	No	No
Muntins	No	No	No
Testing for Protective Glazing	---	---	---
Performance Test Standards	ANSI/AAMA/NWWDA 101/I.S.2/NAFS	ANSI/AAMA/NWWDA 101/I.S.2/NAFS	ANSI/AAMA/NWWDA 101/I.S.2/NAFS ASTM E283 ASTM E330 ASTM E331

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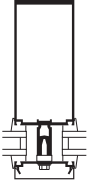
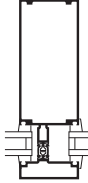
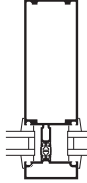
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Product	GLASSvent® UT Windows (Architectural Window)	512 Ventrow Thermal Ventilator	
Catalog Section	Windows - Casement / Projected	Windows - Window Accessories	
Typical Detail			
Grade	Architectural Window (AW)	N/A	
Frame Depth	4-3/8" (111.1 mm) 5-1/8" (130.2 mm)	3-19/32" (91.2 mm)	
Functions	Outswing Casement Project-Out	Horizontal Ventilator	
Product Description	A ultra thermal, visually frameless operable vent designed to be used in conjunction with Kawneer curtain wall and storefront systems.	A thermally broken horizontal ventilator used in conjunction with both storefront and curtain wall systems to provide natural air circulation when a fully functional operable window is not desired.	
Infill Options	1" and 1-3/4"	N/A	
Factory Glazing	Silicone Glazed	Tape Glazed	
Access Panels with Venetian Blinds	No	No	
Muntins	No	No	
Testing for Protective Glazing	Small Missile Large Missile Blast Mitigation	No	
Performance Test Standards	ANSI/AAMA/NWWDA 101/I.S.2/NAFS ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 ASTM F1642 ASTM F2912 GSA TS01-2003 TAS 201, 202, 203 UFC 4-010-01	CAN/CSA-A440	

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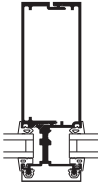
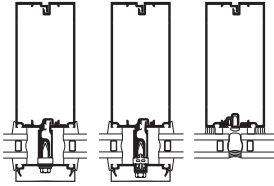
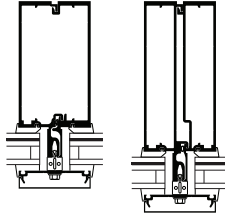
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Product	1600 Wall System®1 Curtain Wall	1600 Wall System®2 Curtain Wall	1600 Wall System®3 Curtain Wall	1600 Wall System®4 Curtain Wall
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional
Typical Detail				
Sightline	2-1/2"	2-1/2"	2-1/2"	2-1/4"
Depths	6", 7-1/2"	6", 7-1/2"	6", 7-1/2"	6", 7-1/2"
Applications	Low to Mid-Rise	Low to Mid-Rise	Low to High-Rise	Low to High-Rise
Infill Options	Up to 1-1/8"	Up to 1"	Up to 1"	Up to 1"
Glazing Options	Outside Glazed	Outside Glazed	Inside Glazed Outside Glazed	Inside Glazed Outside Glazed
Thermal	Silicone Compatible Elastomer, Fiberglass Pressure Plate Available	Silicone Compatible Elastomer, Fiberglass Pressure Plate Available	IsoStrut®	IsoStrut® or Optional IsoLock® Pour and Debridge
SSG	No	Yes	Optional	No
2 Color Option	Yes	Yes	Yes	Yes
Integrated Entrance Framing	Yes	Yes	No	No
Windows Integration	Yes	Yes	Yes	Yes
GLASSvent® Integration	Yes	Yes	Yes	Yes
Versoleil® Sunshade Integration	Yes	Yes	No	No
Fabrication Method	Shear Block	Shear Block	Shear Block	Shear Block Screw Spline
Product Description	An outside glazed pressure wall that is designed to easily integrate with 1600 Wall System®2. It is ideal for low to mid-rise curtain wall applications where high performance is desired. It is also the right choice for high-span applications.	A silicone glazed ribbon window system that eliminates exterior vertical covers and offers fast "stick" erection and inside glazing.	An inside/outside glazed pressure wall that utilizes the IsoStrut® thermal break on the vertical mullion. This provides superior structural and thermal performance. Spandrel glazing and/or re-glazing is easily handled from the exterior.	A lower profile pressure wall that utilizes the IsoStrut® thermal break for superior structural and thermal performance. A 6" ribbon window version is available with the IsoLock® Pour and Debridge Thermal Break.
Testing for Protective Glazing	Small Missile, Large Missile, Blast Mitigation	Small Missile Large Missile	—	—
Performance Test Standards	AAMA 501.1, AAMA 501.4, AAMA 501.6, AAMA 507, AAMA 1503, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM F1642, ASTM E1886, ASTM E1996, CSA-A440-00, NFRC 100/200/500, TAS 201, 202, 203, UFC 4-010-01	AAMA 501.1, AAMA 501.4, AAMA 501.6, AAMA 507, AAMA 1503, ASTM E90, ASTM E283, ASTM E330, ASTM E331, CSA-A440, NFRC 100/200/500	AAMA 501.1, AAMA 507, AAMA 1503, ASTM E283, ASTM E330, ASTM E331, NFRC 100/200/500	AAMA 501.1, AAMA 507, AAMA 1503, ASTM E283, ASTM E330, ASTM E331, NFRC 100/200/500

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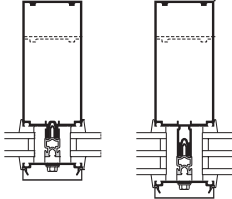
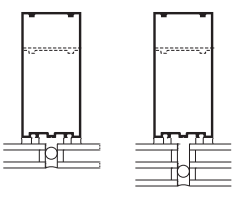
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Product	1600 Wall System®5 Curtain Wall	1600 SS Curtain Wall System	1630 SS IR Curtain Wall System	
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional	
Typical Detail				
Sightline	2-1/2"	2-1/2"	3"	
Depths	6", 7-1/2"	6", 7-1/2"	7-13/16", 8-13/16"	
Applications	Low to High-Rise	Low to Mid-Rise	Low to Mid-Rise	
Infill Options	Up to 1"	Up to 1-1/8"	1-5/16"	
Glazing Options	Inside Glazed	Outside Glazed	Outside Glazed	
Thermal	Isolator Clip	Silicone Compatible Elastomer	Silicone Compatible Elastomer	
SSG	Optional	Optional	No	
2 Color Option	Yes	Yes	Yes	
Integrated Entrance Framing	Yes	Yes	Yes	
Windows Integration	Yes	Yes	Yes	
GLASSvent® Integration	Yes	Yes	No	
Versoleil® Sunshade Integration	Yes	Yes	Yes	
Fabrication Method	Screw Spline - Type A Screw Spline - Type B Shear Block	Screw Spline	Screw Spline	
Product Description	A high performance ribbon window or curtain wall system. Male/Female split vertical mullion option available for easier assembly and installation.	An outside glazed pressure wall that is designed to be fabricated and assembled in the shop. It is ideal for low to mid-rise curtain wall applications where high performance is desired. Also available in a pre-glazed version - 1600 SS Unitwall®.	A high performance outside glazed curtain wall that has been tested at high structural load pressures and meets high velocity impact zone product approval requirements. With screw-spline architecture and both dry and wet glazing options available, 1630 SS IR is easy and fast to install.	
Testing for Protective Glazing	—	Blast Mitigation	Small Missile, Large Missile, Blast Mitigation	
Performance Test Standards	AAMA 501.1 AAMA 501.4 AAMA 507 AAMA 1503 ASTM E283 ASTM E330 ASTM E331 ASTM E1425 NFRC 100/200/500	AAMA 501.1, AAMA 501.4, AAMA 507, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM F1642, CSA-A440, NFRC 100/200/500, UFC 4-010-01	AAMA 501.1, AAMA 507, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM E1886, ASTM E1996, ASTM F1642, CSA-A440, UFC 4-010-01, NFRC 100/200/500, TAS 201, 202, 203	

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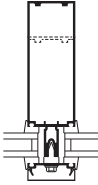
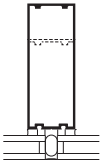
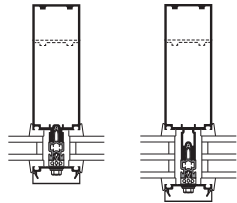
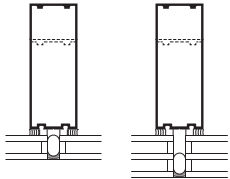
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Product	1600UT System®1 Curtain Wall	1600UT System®2 Curtain Wall		
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional		
Typical Detail				
Sightline	2-1/2"	2-1/2"		
Depths	6" and 7-1/2" (Double Glazed) 6-3/4" and 8-1/4" (Triple Glazed)	6" and 7-1/2" (Double Glazed) 6-3/4" and 8-1/4" (Triple Glazed)		
Applications	Low to Mid-Rise	Low to Mid-Rise		
Infill Options	1", 1-1/4", 1-5/16", and 1-3/4"	1", 1-1/4", 1-5/16", and 1-3/4"		
Glazing Options	Outside Glazed	Outside Glazed		
Thermal	Engineered Polymer Separator	Engineered Polymer Separator		
SSG	No	Yes		
2 Color Option	Yes	Yes		
Integrated Entrance Framing	Yes	Yes		
Windows Integration	Yes	Yes		
GLASSvent® UT Integration	Yes	Yes		
Versoleil® Sunshade Integration	Yes	No		
Fabrication Method	Shear Block	Shear Block		
Product Description	High thermal performance curtain wall system with excellent condensation resistance. Accommodates 1", 1-1/4" and 1-5/16" double and 1-3/4" triple glazing. Full integration with Kawneer's high performing entrance and window products. Ideal for low rise, mid rise and high-span applications.	Vertical two-sided structural silicone glazed (SSG) curtain wall system with high thermal performance and excellent condensation resistance. Accommodates 1", 1-1/4" and 1-5/16" double and 1-3/4" triple glazing. Full integration with Kawneer's high thermal performing entrance and window products. Ideal for low rise, mid rise and high-span applications.		
Testing for Protective Glazing	Storm Shelter, Blast Mitigation, Human Impact	—		
Performance Test Standards	AAMA 501, AAMA 501.1, AAMA 501.4, AAMA 501.5, AAMA 501.6, AAMA 501.8, AAMA 507, AAMA 520, AAMA 1801, AAMA 1503, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM F1642, ASTM F2912, CSA-A440, ICC 500, NFRC 100/200/500, TAS 202, GSA-TS01-2003	AAMA 501, AAMA 501.1, AAMA 501.4, AAMA 501.5, AAMA 501.6, AAMA 507, AAMA 520, AAMA 1801, ASTM E90, ASTM E330, ASTM E283, ASTM E331, ASTM E1425, TAS 202, NFRC 100/200/500		

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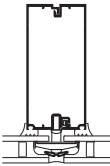
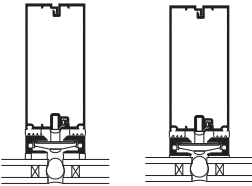
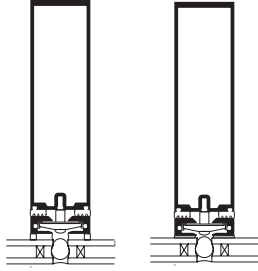
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Product	1620 Curtain Wall System	1620 SSG Curtain Wall System	1620UT Curtain Wall System	1620UT SSG Curtain Wall System
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional
Typical Detail				
Sightline	2"	2"	2"	2"
Depths	6", 7-1/2"	6", 7-1/2"	6" and 7-1/2" (Double Glazed) 6-3/4" and 8-1/4" (Triple Glazed)	6" and 7-1/2" (Double Glazed) 6-3/4" and 8-1/4" (Triple Glazed)
Applications	Low to Mid-Rise	Low to Mid-Rise	Low to Mid-Rise	Low to Mid-Rise
Infill Options	1/4" and 1"	1/4" and 1"	1/4", 1" and 1-3/4"	1/4", 1" and 1-3/4"
Glazing Options	Outside Glazed	Outside Glazed	Outside Glazed	Outside Glazed
Thermal	Silicone Compatible Elastomer, Fiberglass Pressure Plate	Silicone Compatible Elastomer, Fiberglass Pressure Plate	Engineered Polymer Separator Fiberglass Pressure Plate	Engineered Polymer Separator Fiberglass Pressure Plate
SSG	No	Yes	No	Yes
2 Color Option	Yes	Yes	Yes	Yes
Integrated Entrance Framing	Yes	Yes	Yes	Yes
Windows Integration	Yes	Yes	Yes	Yes
GLASSvent® / GLASSvent® UT Integration	Yes (1" Double Glazing Only)	Yes (1" Double Glazing Only)	Yes	Yes
Versoleil® Sunshade Integration	No	No	No	No
Fabrication Method	Shear Block	Shear Block	Shear Block	Shear Block
Product Description	An outside glazed Curtain wall system that is designed to easily integrate with 1620 SSG. It has 2" narrow sightline, accommodate 1/4" and 1" glazing. Ideal for low to mid-rise curtain wall applications. Full integration with Kawneer's entrance and window products.	Structural silicone glazed (SSG) curtain wall system with 2" narrow sightline and accommodates 1/4" and 1" glazing. Ideal for low to mid-rise curtain-wall applications. Full integration with Kawneer's high performing entrance and window products.	A High-Thermal Performance outside glazed curtain wall system with excellent condensation resistance. It has 2" narrow sightline and accommodates 1/4", 1" and 1-3/4" glazing. Ideal for low to mid-rise curtain-wall applications. Full integration with Kawneer's high performing entrance and window products and 1620UT SSG.	Vertical two-sided structural silicone glazed (SSG) curtain wall system with high thermal performance and excellent condensation resistance. It has 2" narrow sightline and accommodates 1/4", 1" and 1-3/4" glazing. Ideal for low to mid-rise curtain-wall applications. Full integration with Kawneer's high performing entrance and window products.
Testing for Protective Glazing	—	—	—	—
Performance Test Standards	AAMA 501, AAMA 501.5, AAMA 507, AAMA 520, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, TAS 202, NFRC 100/200/500	AAMA 501, AAMA 501.5, AAMA 507, AAMA 520, AAMA 1801, ASTM E90, ASTM E330, ASTM E283, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500, TAS 202	AAMA 501, AAMA 501.4, AAMA 501.5, AAMA 501.6, AAMA 507, AAMA 520, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, TAS 202, NFRC 100/200/500	AAMA 501, AAMA 501.4, AAMA 501.5, AAMA 501.6, AAMA 507, AAMA 520, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, TAS 202, NFRC 100/200/500

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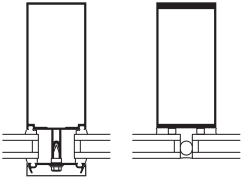
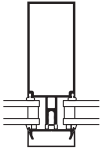
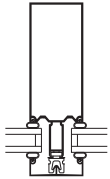
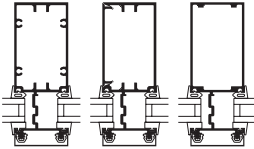
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Product	Clearwall® SS Curtain Wall System	Clearwall® SSI Clearwall® SSIT Curtain Wall Systems	Clearwall® SB Curtain Wall System	Clearwall® SBI Clearwall® SBIT Curtain Wall Systems
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional		
Typical Detail				
Sightline	(2-1/2") Flush Glass Exterior	(2-1/2") Flush Glass Exterior	(2-1/2") Flush Glass Exterior	(2-1/2") Flush Glass Exterior
Depths	5-1/8", 6-5/8"	SSI - 6", 7-1/2" SSIT - 5-7/8", 7-3/8"	SB - 10-1/8"	SBI - 11" SBIT - 10-27/32"
Applications	Low Rise	Low Rise	Low Rise	Low Rise
Infill Options	1-1/8"	1"	1-1/8"	1"
Glazing Options	Outside Glazed	Outside Glazed	Outside Glazed	Outside Glazed
Thermal	ABS Base on Toggles	ABS Base on Toggles	ABS Base on Toggles	ABS Base on Toggles
Structural Silicone Glazed (SSG) or Toggle Glazed (TG)	Toggle Glazed (TG) with recessed spacer, insulating glass unit.	Toggle Glazed with metal interface attached to insulating glass unit, using Structural Silicone or 3M® VHB® Structural Glazing Tape.	Toggle Glazed (TG) with recessed spacer, insulating glass unit.	Toggle Glazed with metal interface attached to insulating glass unit, using Structural Silicone or 3M® VHB® Structural Glazing Tape.
2 Color Option	Yes	Yes	Yes	Yes
Integrated Entrance Framing	Yes	Yes	Yes	Yes
Windows Integration	No	No	No	No
GLASSvent® Integration	No	No	No	No
Versoleil® Sunshade Integration	No	No	No	No
Fabrication Method	Screw Spline	Screw Spline	Shear Block	Shear Block
Product Description	An outside glazed 4-sided curtain wall system, which uses an innovative toggle assembly to mechanically capture glass with recessed spacer, eliminating the need for any structural silicone. Ideal for low rise curtain wall applications where an uninterrupted all-glass aesthetic is desired.	An outside glazed 4-sided curtain wall system, which uses an innovative toggle assembly to mechanically capture metal interface attached to glass. Ideal for low rise curtain wall applications where an uninterrupted all-glass aesthetic is desired.	An outside glazed 4-sided curtain wall system, which uses an innovative toggle assembly to mechanically capture glass with recessed spacer, eliminating the need for any structural silicone. Ideal for low rise curtain wall applications where an uninterrupted all-glass aesthetic when high free spans are desired.	An outside glazed 4-sided curtain wall system, which uses an innovative toggle assembly to mechanically capture metal interface attached to glass. Ideal for low rise curtain wall applications where an uninterrupted all-glass aesthetic when high free spans are desired.
Testing for Protective Glazing	—	Small Missile Large Missile	—	—
Performance Test Standards	AAMA 501, AAMA 501.1, AAMA 501.4, AAMA 501.5, AAMA 507, AAMA 520, AAMA 1503, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, CSA-A440, NFRC 100/200/500, TAS 202	AAMA 501, AAMA 501.1, AAMA 501.4, AAMA 501.5, AAMA 507, AAMA 520, AAMA 1503, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM E1886, ASTM E1996, CSA-A440, NFRC 100/200/500, TAS 201, 202, 203	Refer to Clearwall® SS performance standards	Refer to Clearwall® SSI and SSIT performance standards

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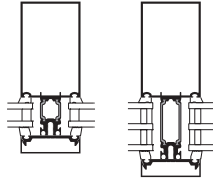
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Product	1600 LR Wall® Curtain Wall System	1602 Wall System	2250 L-R Wall System	2250 IG Curtain Wall System
Catalog Section	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional	Curtain Wall - Traditional
Typical Detail				
Sightline	2-1/2"	2"	2-1/4"	2-1/4"
Depths	5-3/4", 7-1/4"	5", 6"	4-1/4", 5", 6-1/2", 7-1/4"	4-1/2", 6", 7-1/2"
Applications	Low Rise	Low to Mid-Rise	Low Rise	Low to High-Rise
Infill Options	1/4" and 1"	Up to 1"	Up to 1"	Up to 1"
Glazing Options	Outside Glazed	Outside Glazed	Outside Glazed	Inside Glazed
Thermal	Silicone Compatible Elastomer	PVC Isolator	Polymer Glazing Clip	PVC Isolator Clip
SSG	Optional	No	Optional	Optional
2 Color Option	Yes	Yes	Yes	Yes
Integrated Entrance Framing	Yes	Yes	Yes	No
Windows Integration	Yes	Yes	Yes	Yes
GLASSvent® Integration	Yes	Yes	Yes	Yes
Versoleil® Sunshade Integration	No	No	No	No
Fabrication Method	Shear Block	Shear Block	Shear Block	Screw Spline - Type A Screw Spline - Type B Shear Block
Product Description	An economical stock length, outside glaze pressure wall system. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.	An outside glazed pressure wall that is designed to be fabricated and assembled in the shop. It is ideal for low to mid-rise curtain wall applications where high performance is desired.	An economical, outside glazed, low-rise curtain wall system with versatility to be used in punched openings/ribbon windows. Accommodates 1/4" and 1" glazing. Less labor intensive stick built system. Shear block construction using concealed fasteners. Vertical SSG option. Two color capability. Integrates with GLASSvent® Windows for Curtain Wall.	An economical, internal glazed, 2-1/4" sightline curtain wall, ideal for low-to-midrise applications. Option for punched opening/ribbon window. Accommodates 1/4" and 1" glazing. Screw spline or shear block fabrication. SSG option. Integrates with GLASSvent® Windows for Curtain Wall.
Testing for Protective Glazing	—	—	—	—
Performance Test Standards	AAMA 501.1, AAMA 501.4, AAMA 507, AAMA 1503, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, NFRC 100/200/500	ASTM E283 ASTM E331 CAN3-S157 CAN/CSA-A440	AAMA 501.1 AAMA 507 AAMA 1503 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500	AAMA 501.1 AAMA 507 AAMA 1503 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500

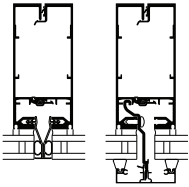
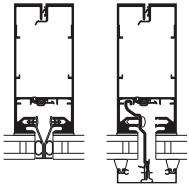
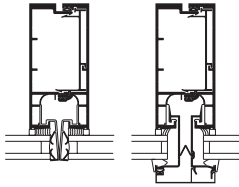
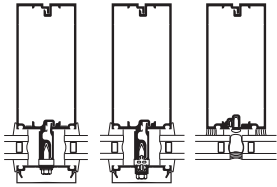
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Product	7500 Wall® Curtain Wall System			
Catalog Section	Curtain Wall - Traditional			
Typical Detail				
Sightline	2-1/2"			
Depths	6-5/16, 7-5/16"			
Applications	Low to High-Rise			
Infill Options	1/8", 1/4", 1" and 2"			
Glazing Options	Outside Glazed			
Thermal	IsoWeb®			
SSG	No			
2 Color Option	Yes			
Integrated Entrance Framing	Yes			
Windows Integration	Yes			
GLASSvent® Integration	No			
Versoleil® Sunshade Integration	No			
Fabrication Method	Shear Block			
Product Description	A high performance pressure wall system that has exceptional thermal performance and resistance to water condensation. It will accommodate 1" double or 2" triple glazing. 7500 Wall is ideal for low to high-rise applications.			
Testing for Protective Glazing	—			
Performance Test Standards	AAMA 507 ASTM E283 ASTM E330 ASTM E331 ASTM E547 CSA-A440 NFRC 100/200/500			

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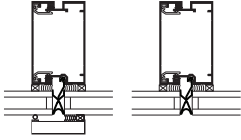
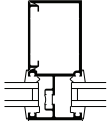
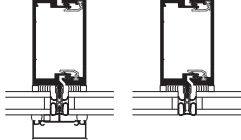
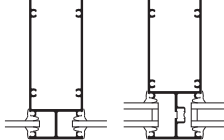
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Product	2500 UT Unitwall® System	2500 UT Unitwall® System - SGT	2500 PG Wall® Curtain Wall System	1600 SS Curtain Wall System
Catalog Section	Curtain Wall - Unitized	Curtain Wall - Unitized	Curtain Wall - Unitized	Curtain Wall - Unitized
Typical Detail				
Sightline	2-1/2"	2-1/2"	2-1/2"	2-1/2"
Depths	6-1/2" (4-sided SSG) 7-1/2" (Captured)	6-1/2" (4-sided SGT) 7-1/2" (Captured)	7-1/2"	6", 7-1/2"
Applications	Mid-High Rise	Mid-High Rise	Low to High-Rise	Low to Mid-Rise
Infill Options	1" and 1-3/4"	1" and 1-3/4"	1/4" and 1"	Up to 1-1/8"
Glazing Options	Pre-Glazed	Pre-Glazed	Pre-Glazed	Pre-Glazed
Thermal	Polyamide	Polyamide	Silicone Compatible Elastomer	Silicone Compatible Elastomer
SSG	Yes, 4-Sided Structural Silicone Glazing (SSG); 2-Sided Vertical SSG (Captured-Horizontal)	Yes, 4-Sided Structural Glazing Tape (SGT); 2-Sided Vertical SGT (Captured-Horizontal)	Optional	Optional
2 Color Option	Yes	Yes	Yes	Yes
Integrated Entrance Framing	No	No	No	Yes
Windows Integration	No	No	Yes	Yes
GLASSvent® Integration	Captured Only	Captured Only	Yes (with 4 Side Captured)	Yes
Versoleil® Sunshade Integration	No	No	No	Yes
Fabrication Method	Screw Spline	Screw Spline	Screw Spline	Screw Spline
Product Description	A high performance pre-glazed unitized curtain wall system with Structural Silicone Glazing (SSG). Shipped in stock length or fabricated or fully glazed and assembled unit. Options: Captured or 2-sided Vertical SSG (captured-horizontal) or 4-sided SSG (all glass exterior look)	A high performance pre-glazed unitized curtain wall system with Structural Glazing Tape (SGT), with no curing-wait-time. Shipped in stock length or fabricated to customers for unit assembly and installation. Options: Captured or 2-sided Vertical SGT (captured-horizontal) or 4-sided SGT (all glass exterior look)	A high performance unitized curtain wall system. Shipped fabricated for customer unit assembly and installation. The product has (4) types: - 4 Side Captured - 4 Side SSG - Vertical SSG - Horizontal SSG	An outside glazed pressure wall that is designed to be fabricated and assembled in the shop. It is ideal for low to mid-rise curtain wall applications where high performance is desired. Also available in a pre-glazed version - 1600 SS Unitwall®.
Testing for Protective Glazing	—	—	Large Missile	Blast Mitigation
Performance Test Standards	AAMA 501, AAMA 501.1, AAMA 501.4, AAMA 501.5, AAMA 501.6, AAMA 501.7, AAMA 507, AAMA 1503, AAMA 1801, ASTM E90, E283, E330, E331, ASTM E1425, CSA-A440, NFRC 100/200/500, TAS 202	AAMA 501, 501.1, 501.4, 501.5, AAMA 501.6, 501.7, 507, AAMA 1503, 1801, ASTM E90, E283, E330, E331, ASTM E1425, CSA-A440, NFRC 100/200/500, TAS 202	AAMA 501.1, AAMA 507, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM E1886, ASTM E1996, CSA-A440, NFRC 100/200/500	AAMA 501.1, AAMA 501.4, AAMA 507, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E1425, ASTM F1642, CSA-A440, NFRC 100/200/500, UFC 4-010-01

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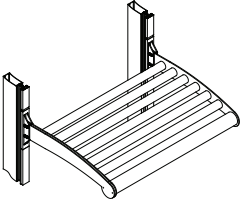
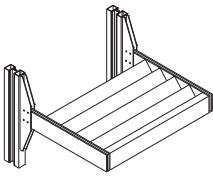
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Product	PG 123® Framing	MetroView® FG 501T Window Wall	MetroView® FG 601T PG Window Wall	FG 623 Window Wall
Catalog Section	Curtain Wall - Window Wall	Curtain Wall - Window Wall	Curtain Wall - Window Wall	Curtain Wall - Window Wall
Typical Detail				
Sightline	2-1/4"	2-1/4"	2-1/4"	2-1/4"
Depths	6"	5"	6"	6"
Applications	Pre-Glazed Exterior Ribbon Windows & Multi-Lite Punched Openings	Single or Multi-Lite Punched Openings	Single or Multi-Lite Punched Openings	Single or Multi-Lite Punched Openings
Infill Options	1/4" and 1"	1"	1" and 1-3/16"	1/4" and 1"
Glazing Options	Pre-Glazed or Inside Glazed Units	Inside Glazed or Outside Glazed	Pre-Glazed	Inside Glazed
Thermal	IsoWeb® Thermal Barrier and silicone compatible elastomer	IsoLock® Lance and Debridge	IsoLock® Lance and Debridge	IsoLock® Lance and Debridge
SSG	Yes	No	Yes	No
2 Color Option	Yes	No	Yes	No
Integrated Entrance Framing	No	Yes	Yes	No
Windows Integration	No	Yes	Yes	Yes
GLASSvent® Integration	No	Yes	Yes	No
Versoleil® Sunshade Integration	No	No	No	No
Fabrication Method	Screw Spline	Screw Spline	Screw Spline	Shear Block and Screw Spline
Product Description	A pre-assembled and pre-glazed ribbon window and multi-lite punched opening system. An Alcryn rain screen gasket provides the "silicone glazed" appearance without running the exterior silicone weather seal. Optional vertical covers provide a four-side captured appearance.	A 2-1/4" x 5" punched opening window for single or multi-lite openings. It offers a flush metal to exterior appearance, to complement the "glass to the front" look.	A 2-1/4" x 6" punched opening window for single or multi-lite openings. It offers a flush metal to exterior appearance, to complement the "glass to the front" look.	A 2-1/4" x 6" punched opening window for single or multi-lite openings. It offers a flush metal to exterior appearance, to complement the "glass to the front" look.
Testing for Protective Glazing	—	—	—	Small Missile Large Missile
Performance Test Standards	AAMA 501 AAMA 507 AAMA 1503 AAMA 1801 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500	AAMA 507, AAMA 520, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E547, ASTM E1425, ASTM E1886, ASTM E1996, NFRC 100/200/400/500, TAS 202	AAMA 507, AAMA 520, AAMA 1503, AAMA 1801, ASTM E90, ASTM E283, ASTM E330, ASTM E331, ASTM E547, ASTM E1425, ASTM E1886, ASTM E1996, NFRC 100/200/400/500, TAS 202	AAMA 507 AAMA 1503 ASTM E283 ASTM E330 ASTM E331 ASTM E1886 ASTM E1996 NFRC 100/200/500

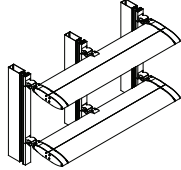
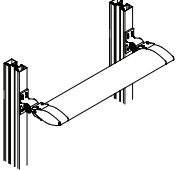
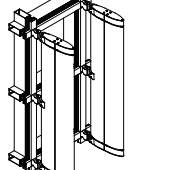
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Product	Versoleil® SunShade Outrigger System (Curtain Wall)	Versoleil® SunShade Outrigger System (Storefront)		
Catalog Section	Sun Control	Sun Control		
Typical Detail				
Sightline	Variable	Variable		
Depths	30" and 36" Outrigger Depths	30" Outrigger Depth		
Applications	Low to High-Rise	Storefronts		
Infill Options	—	—		
Compatible Systems	1600 Wall System®1 1600 Wall System®2 1600UT System®1 1600 Wall System®5 1600 SS 1600 SS SSG 1630 SS IR	Trifab® 451 Trifab® 451T Trifab® 451UT Trifab® 601 Trifab® 601T Trifab® 601UT IR 501T IR 501UT		
Thermally Broken/ Thermally Improved	Yes (Excluding 1600 Wall System®2 and 1600 Wall System®5)	Yes (Excluding Trifab® 451 and Trifab® 601)		
Shallow Cover Available	Yes	N/A		
Corners Available	90° Inside/Outside 135° Inside/Outside	No		
Selector® Sunshading Estimator (Available on kawneer.com)	Yes	Yes		
Fabrication Method	Screw Spline	Screw Spline		
Load Charts Available	Yes	Yes		
Blade Options	Infinity, Flare, Arch, Airfoil, Planar, Wave, Circular, Diamond, Square	Infinity, Flare, Arch, Airfoil, Planar, Wave, Circular, Diamond, Square		
Product Description	Outrigger SunShade system, which seamlessly integrates with multiple Kawneer curtain wall systems. Highly versatile design offers inside and outside corners, sleek blade options with standard 30" and 36" outriggers for enhanced performance.	Outrigger SunShade system, which seamlessly integrates with multiple Kawneer storefront systems. Highly versatile design offers sleek blade options with standard 30" outrigger for enhanced performance.		
Performance Test Standards	Concentrated load test reports available on request	Concentrated load test reports available on request		

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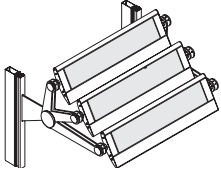
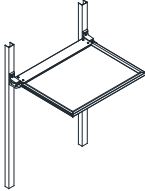
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Product	Versoleil® SunShade Single Blade System for Curtain Wall (Horizontal Blade)	Versoleil® SunShade Single Blade System for Storefront (Horizontal Blade)	Versoleil® SunShade Single Blade System for Curtain Wall (Vertical Blade)	
Catalog Section	Sun Control	Sun Control	Sun Control	
Typical Detail				
Sightline	Variable	Variable	Variable	
Depths	Blade Depths of 6", 8", 10", 12" and 14"	Blade Depths of 6", 8", 10", 12" and 14"	Blade Depths of 6", 8", 10", 12" and 14"	
Applications	Low to High-Rise	Storefronts	Low to High-Rise	
Infill Options	—	—	—	
Compatible Systems	1600 Wall System®1 1600UT System®1 1600 Wall System®2 1600 Wall System®5 1600 SS 1600 SS (SSG)	Trifab® 451 Trifab® 451T Trifab® 451UT Trifab® 601 Trifab® 601T Trifab® 601UT IR501UT	1600 Wall System®1 1600UT System®1 1600 Wall System®5 1600 SS	
Thermally Broken	Yes (Excluding 1600 Wall System®5)	Yes (Excluding Trifab® 451 and Trifab® 601)	Yes (Excluding 1600 Wall System®5)	
Shallow Cover Available	No	N/A	No	
Corners Available	90° Inside/Outside 135° Inside/Outside	No	N/A	
Solector® Sunshading Estimator (Available on kawneer.com)	Yes	Yes	Yes	
Fabrication Method	Screw Spline	Screw Spline	Screw Spline	
Load Charts Available	Yes	Yes	Yes	
Blade Options	Airfoil Blade 6", 8", 10", 12" and 14" Deep	Airfoil Blade 6", 8", 10", 12" and 14" Deep	Airfoil Blade 6", 8", 10", 12" and 14" Deep	
Product Description	Single blade horizontal sunshade system, which seamlessly integrates with multiple Kawneer curtain wall systems. Highly versatile design allows for blade orientation at multiple angles, and multiple blade widths for maximising shading potential and creating a distinctive appearance.	Single blade horizontal sunshade system, which seamlessly integrates with multiple Kawneer curtain wall systems. Highly versatile design allows for blade orientation at multiple angles, and multiple blade widths for maximising shading potential and creating a distinctive appearance.	Single blade vertical sunshade system, which seamlessly integrates with multiple Kawneer curtain wall systems. Highly versatile design allows for blade orientation at multiple angles and multiple blade widths, for maximising shading potential and creating a distinctive appearance.	
Performance Test Standards	Concentrated load test reports available on request	Concentrated load test reports available on request	Concentrated load test reports available on request	

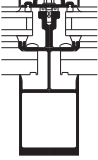
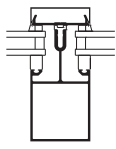
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Product	1600 PowerShade® Sun shade System	InLighten® Light Shelf		
Catalog Section	Sun Control	Sun Control		
Typical Detail				
Sightline	Variable	1"		
Depths	Variable depending on configuration	Variable (30" Maximum)		
Applications	Low to High-Rise	Interior		
Infill Options	—	Reynobond® Aluminum Composite Panel/Translucent Polycarbonate Panel		
Compatible Systems	1600 Wall System®1	Any Kawneer Curtain Wall or Storefront Product* with interior face dimension of 2" and greater		
Thermally Broken	—	—		
Shallow Cover Available	—	—		
Corners Available	No	Yes		
Selector® Sunshading Estimator (Available on kawneer.com)	No	N/A		
Fabrication Method	Screw Spline	Screw Spline		
Structural Charts Available	—	N/A		
Blade Options	—	N/A		
Product Description	A sunshade designed to combine photovoltaic technology with shading to reduce energy usage. 1600 PowerShade® is designed to be used with 1600 Wall System®1.	An interior light shelf designed to passively channel daylight into an occupied space. InLighten® can be applied to multiple Kawneer Curtain Wall or Storefront* products. Unique design allows for easy installation. Tilt feature allows for easy cleaning and care of the top reflective surface.		
Performance Test Standards				

* Exclusions apply: Center and Front set only, tubular single piece mullion only.

Product	1600 Sloped Glazing	2000 Skylight		
Catalog Section	Overhead Glazing	Overhead Glazing		
Typical Detail				
Sightline	2-1/2"	2-1/2"		
Depths	4-3/4", 6"	5-1/2", 7", 8-1/4"		
Applications	Low to High-Rise	Low to High-Rise		
Infill Options	Up to 1-5/16"	1/4" and 1"		
Glazing Options	Outside Glazed	Outside Glazed		
Thermal	PVC Isolator	PVC Isolator		
SSG	Yes	Yes		
2 Color Option	Yes	Yes		
Integrated Entrance Framing	—	—		
Windows Integration	—	—		
GLASSvent® Integration	—	—		
Fabrication Method	Coped/Overlapped/ Mechanically Fastened	Coped/Overlapped/ Mechanically Fastened		
Product Description	A monumental slope glazing system that easily integrates into the 1600 Wall systems. Has a standard silicone glazed purlin. Fully factory fabricated for quality.	A high performance, low cost slope glazing system engineered to be self-supporting. Available in slope, gables, pyramid, and canopy configurations. The system has optional silicone glazed purlins. It is supplied as a fully-engineered and fabricated package for easier on-site installation.		
Performance Test Standards	AAMA 501.1 AAMA 507 AAMA 1503 ASTM E283 ASTM E330 ASTM E331 NFRC 100/200/500	AAMA 507 AAMA 1503 ASTM E283 ASTM E331 NFRC 100/200/500		

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To: Joe Weith, White + Burke
Sandy McGuire, Howard Center

Date: August 9, 2023

Memorandum

Project #: 59011.00

From: Karen Sentoff
Evan Haugh
Joe Vanacore

Re: Howard Center Traffic Analysis

VHB has completed a traffic analysis for the proposed expansion of the Howard Center's office and program space at 300 Flynn Avenue in Burlington. This analysis reviews the proposed development program, associated trip generation, and potential impacts at Flynn Avenue and Pine Street. A map of the project area is shown in **Figure 1**. Red arrows indicate driveway locations on Pine Street and Flynn Avenue, which will not be changed as part of this project.

Figure 1 **Howard Center**



Traffic Counts and Adjustments

Base traffic volumes were collected at the Flynn Avenue / Pine Street intersection on Thursday, March 30th, 2023. The morning peak hour occurred from 8:00 – 9:00 AM, with 1,392 vehicles total entering the intersection. In the evening, the peak hour was 4:30 – 5:30 PM with 1,683 vehicles total entering the intersection. The count data are shown in **Figure 2**.

Figure 2 March 2023 Traffic Volumes

				Pine Street						
				11 peds						
				101	320	88				
				↙	↓	↘				
Flynn Avenue	5 peds	58	↗	AM pk hour			↖	234	32 peds	Flynn Avenue
		53	→	1,392			←	102		
		8	↘				↙	6		
				↖	↑	↗				
				21	394	7				
				5 peds						
				Pine Street						

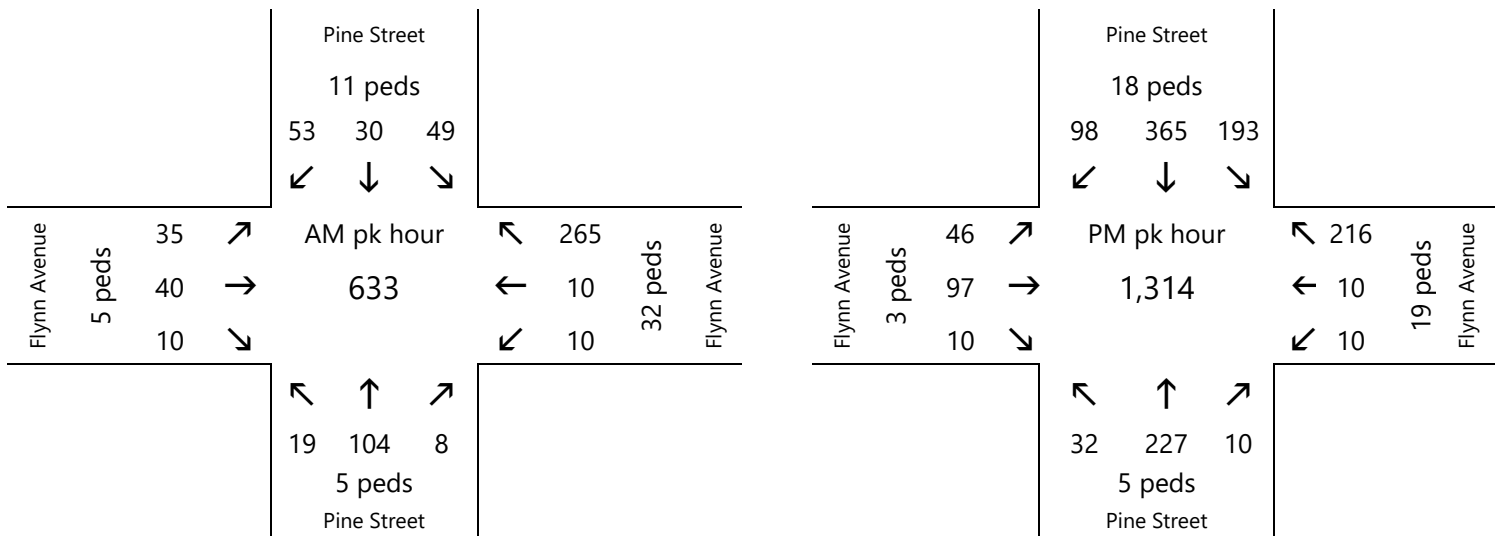
				Pine Street						
				18 peds						
				104	472	243				
				↙	↓	↘				
Flynn Avenue	3 peds	99	↗	PM pk hour			↖	168	19 peds	Flynn Avenue
		140	→	1,683			←	99		
		8	↘				↙	10		
				↖	↑	↗				
				28	295	3				
				5 peds						
				Pine Street						

For the purposes of the traffic analysis, the volumes were scaled up to the 2028 Design Hour Volume (DHV). DHV is defined as the 30th highest traffic hour of the year. Factors were applied for seasonality and future growth to 2028. For seasonality, 2022 DHV at a nearby continuous counter (D099 on I-189) was compared to the peak hour for the last Thursday of March 2022. Based on this comparison, a ratio of 1.11 was used as the DHV factor for the March 2023 counts. For future growth, the VTrans Red Book lists a 2023 to 2028 growth factor of 1.021¹.

In addition to the seasonality and growth factors, volumes were also adjusted to account for the opening of the Champlain Parkway. Volumes from the Champlain Parkway plans were used to deduct diverted trips the Parkway captures from Flynn and Pine Street. After scaling to 2028 DHV and subtracting diverted trips, the 2028 No Build Volumes are shown in **Figure 3**.

¹ Vermont Agency of Transportation, June 2023. *Continuous Traffic Counter Report (The Redbook) Based on 2022 Traffic Data*. <https://vtrans.vermont.gov/sites/aot/files/documents/Redbook%202022.pdf>

Figure 3 2028 No Build Volume



Trip Generation

Trip generation estimates for the proposed site were calculated based on rates published in the *ITE Trip Generation Manual, 11th Edition*. Land use codes 630 (Medical Clinic) and 710 (General Office Building) were used. Floor space assigned to each Howard Center program was divided between clinical and office uses based on the type of services provided. For the existing use, the building is split approximately 60% clinic and 40% office, or 14,427 ft² clinic and 9,618 ft² office. The proposed use and programming is expected to be approximately 48% clinic and 52% office, totaling 24,282 ft² of clinic space and 25,818 ft² of office.

Table 1 summarizes the trip generation estimate. The net trip generation above current use is anticipated to be 52 AM peak hour trips and 60 PM peak hour trips. Although this area is well-served by transit, pedestrian, and bike facilities, no reduction was made for alternative modes in order to remain conservative.

Table 1 Trip Generation Summary

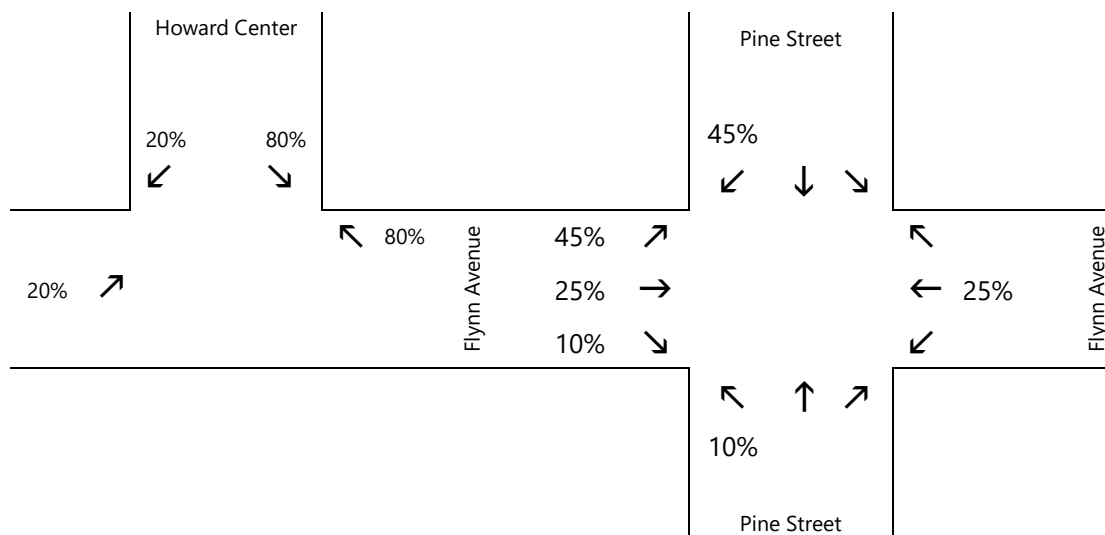
Site Generated Trips – Howard Center			
Peak Period	Existing	Proposed	Net New
AM Peak Hour			
Enter	45	89	44
Exit	9	17	8
Total	54	106	52
PM Peak Hour			
Enter	18	33	15
Exit	49	94	45
Total	67	127	60

Trip Distribution

Trips were distributed based on existing turning movement counts and projected deviation to the Champlain Parkway. To be conservative, all trips were routed through the main driveway on Flynn Avenue so they would navigate the intersection at Flynn Avenue and Pine Street. Trips were distributed according to the following zones, as shown below in **Figure 4**:

- Points South (45%)
 - Via Champlain Parkway – 20%
 - Via Pine Street – 10%
 - Via Flynn to Shelburne Road – 15%
- Points North (55%)
 - Via Pine Street – 45%
 - Via Flynn to Shelburne Road – 10%

Figure 4 Trip Distribution



Traffic Capacity Analysis

An intersection capacity analysis was performed for Flynn Avenue and Pine Street. Levels of service (LOS) were calculated based on the criteria published in the *Highway Capacity Manual (HCM 2000)*². Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing generally congested conditions.

Flynn Avenue and Pine Street

Table 2 summarizes traffic operations at the signalized intersection of Flynn Avenue and Pine Street during the 2028 weekday AM and PM peak hours under No Build and Build conditions. This intersection consistently operates at an overall LOS B across each scenario.

Table 2 Signalized Intersection Capacity Analysis

Approach	2028 AM No Build				2028 AM Build			
	v/c	Delay*	LOS**	Q95***	v/c	Delay*	LOS**	Q95***
Flynn Avenue at Pine Street								
Pine Street, SB	0.11	7.7	A	26	0.11	7.8	A	32
Pine Street, NB	0.29	13.8	B	81	0.32	14.2	B	89
Flynn Avenue, EB	0.25	14.1	B	57	0.28	14.1	B	61
Flynn Avenue, WB	0.23	13.9	B	61	0.25	13.9	B	65
Overall Intersection		12.5	B			12.5	B	

Approach	2028 PM No Build				2028 PM Build			
	v/c	Delay*	LOS**	Q95***	v/c	Delay*	LOS**	Q95***
Flynn Avenue at Pine Street								
Pine Street, SB	0.47	8.7	A	202	0.49	9.5	A	229
Pine Street, NB	0.61	20.7	C	174	0.63	22.0	C	189
Flynn Avenue, EB	0.50	20.7	C	113	0.58	22.4	C	137
Flynn Avenue, WB	0.20	18.4	B	61	0.21	18.2	B	62
Overall Intersection		14.2	B			15.3	B	

* Delay expressed in seconds per vehicle

** Level of Service

*** 95th percentile queue length expressed in feet. Value shown is maximum of all lanes.

Delay increases of less than 2 seconds on any given approach and overall would be expected with the Build condition compared to the No Build. The additional trips would be expected to have modest effects on queuing. The AM peak

² Although HCM 6th Edition is the preferred manual, HCM 2000 must be used for intersections with exclusive or leading pedestrian phases.

hour queues would be expected to increase by less than 10 feet. In the PM peak hour, queues would be expected to increase by less than 30 feet, with Pine Street southbound and Flynn Avenue eastbound increasing modestly by 20-30 feet.

Conclusions

This development is projected to produce 52 net new trips in the AM peak hour and 60 net new trips in the PM peak hour. With conservative assumptions regarding mode split and trip distribution, the new trips are expected to have minimal effect on the intersection of Flynn Avenue and Pine Street. Delay increases by less than two seconds for any given approach or overall may be expected. The additional trips may also have modest effects on queuing, with AM peak queues expected to increase by less than 10 feet and PM peak hour queues expected to increase by less than 30 feet, or one and a half car lengths. An overall Level of Service B is expected to remain in the Build condition for the AM and PM peak hour.

In conclusion, based on the results of this Traffic Impact Study, the proposed Howard Center expansion is not anticipated to generate unreasonable congestion conditions on the adjacent roadway network.



Appendix

A: Intersection Capacity Analysis

Queues
3: Pine St & Flynn Ave

2028 - AM No Build

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	85	285	131	49	83
v/c Ratio	0.24	0.50	0.27	0.10	0.12
Control Delay	16.1	7.2	16.0	8.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	7.2	16.0	8.1	4.6
Queue Length 50th (ft)	8	2	13	5	3
Queue Length 95th (ft)	57	61	81	26	26
Internal Link Dist (ft)	718	933	707		1026
Turn Bay Length (ft)				150	
Base Capacity (vph)	836	1007	1128	582	1541
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.10	0.28	0.12	0.08	0.05
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

2028 - AM No Build

3: Pine St & Flynn Ave

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	40	10	10	10	265	19	104	8	49	30	53
Future Volume (vph)	35	40	10	10	10	265	19	104	8	49	30	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	11	11	14	11	11	14	11	11	14	11
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.92			0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.97	1.00	
Frt		0.98			0.87			0.99		1.00	0.90	
Flt Protected		0.98			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1793			1591			1964		1598	1729	
Flt Permitted		0.75			0.99			0.94		0.57	1.00	
Satd. Flow (perm)		1369			1571			1859		953	1729	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	40	10	10	10	265	19	104	8	49	30	53
RTOR Reduction (vph)	0	7	0	0	206	0	0	3	0	0	30	0
Lane Group Flow (vph)	0	78	0	0	79	0	0	128	0	49	53	0
Confl. Peds. (#/hr)				5		36			54	54		
Heavy Vehicles (%)	9%	9%	9%	2%	2%	2%	1%	1%	1%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.6			9.6			10.1		18.5	18.5	
Effective Green, g (s)		9.6			9.6			10.1		18.5	18.5	
Actuated g/C Ratio		0.22			0.22			0.24		0.43	0.43	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		307			352			438		448	747	
v/s Ratio Prot										c0.01	0.03	
v/s Ratio Perm		c0.06			0.05			c0.07		0.04		
v/c Ratio		0.25			0.23			0.29		0.11	0.07	
Uniform Delay, d1		13.7			13.6			13.4		7.6	7.1	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.3			0.4		0.1	0.0	
Delay (s)		14.1			13.9			13.8		7.7	7.2	
Level of Service		B			B			B		A	A	
Approach Delay (s)		14.1			13.9			13.8			7.3	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			42.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			44.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Queues
3: Pine St & Flynn Ave

2028 - AM Build

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	92	295	141	49	110
v/c Ratio	0.26	0.50	0.29	0.10	0.16
Control Delay	16.2	7.5	16.7	8.5	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	7.5	16.7	8.5	4.6
Queue Length 50th (ft)	9	3	14	5	4
Queue Length 95th (ft)	61	65	89	27	32
Internal Link Dist (ft)	718	933	707		1026
Turn Bay Length (ft)				150	
Base Capacity (vph)	814	1016	1109	581	1526
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.29	0.13	0.08	0.07
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

3: Pine St & Flynn Ave

2028 - AM Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	42	11	10	21	264	23	110	8	49	37	73
Future Volume (vph)	39	42	11	10	21	264	23	110	8	49	37	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	11	11	14	11	11	14	11	11	14	11
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.92			0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.97	1.00	
Frt		0.98			0.88			0.99		1.00	0.90	
Flt Protected		0.98			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1791			1604			1964		1598	1722	
Flt Permitted		0.73			0.99			0.93		0.57	1.00	
Satd. Flow (perm)		1336			1585			1832		951	1722	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	42	11	10	21	264	23	110	8	49	37	73
RTOR Reduction (vph)	0	7	0	0	203	0	0	3	0	0	42	0
Lane Group Flow (vph)	0	85	0	0	92	0	0	138	0	49	68	0
Confl. Peds. (#/hr)				5		36			54	54		
Heavy Vehicles (%)	9%	9%	9%	2%	2%	2%	1%	1%	1%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.0			10.0			10.1		18.5	18.5	
Effective Green, g (s)		10.0			10.0			10.1		18.5	18.5	
Actuated g/C Ratio		0.23			0.23			0.23		0.43	0.43	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		309			366			428		443	737	
v/s Ratio Prot										0.01	c0.04	
v/s Ratio Perm		c0.06			0.06			c0.08		0.04		
v/c Ratio		0.28			0.25			0.32		0.11	0.09	
Uniform Delay, d1		13.6			13.5			13.7		7.7	7.4	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.5			0.4			0.4		0.1	0.1	
Delay (s)		14.1			13.9			14.2		7.8	7.4	
Level of Service		B			B			B		A	A	
Approach Delay (s)		14.1			13.9			14.2			7.5	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			43.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			48.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

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Queues
3: Pine St & Flynn Ave

2028 - PM No Build

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	153	236	269	193	463
v/c Ratio	0.50	0.49	0.61	0.37	0.46
Control Delay	26.2	8.7	25.0	9.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	8.7	25.0	9.8	9.9
Queue Length 50th (ft)	38	5	67	25	65
Queue Length 95th (ft)	113	61	174	85	202
Internal Link Dist (ft)	718	933	707		1026
Turn Bay Length (ft)				150	
Base Capacity (vph)	599	734	725	545	1343
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.32	0.37	0.35	0.34
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

2028 - PM No Build

3: Pine St & Flynn Ave

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	97	10	10	10	216	32	227	10	193	365	98
Future Volume (vph)	46	97	10	10	10	216	32	227	10	193	365	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	11	11	14	11	11	14	11	11	14	11
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.90			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.98	1.00	
Frt		0.99			0.88			0.99		1.00	0.97	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1816			1566			1976		1619	1851	
Flt Permitted		0.79			0.98			0.89		0.40	1.00	
Satd. Flow (perm)		1458			1539			1770		684	1851	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	97	10	10	10	216	32	227	10	193	365	98
RTOR Reduction (vph)	0	4	0	0	172	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	149	0	0	64	0	0	267	0	193	451	0
Confl. Peds. (#/hr)				5		36			54	54		
Heavy Vehicles (%)	9%	9%	9%	2%	2%	2%	1%	1%	1%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.1			11.1			13.5		28.6	28.6	
Effective Green, g (s)		11.1			11.1			13.5		28.6	28.6	
Actuated g/C Ratio		0.20			0.20			0.25		0.52	0.52	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		296			312			437		514	969	
v/s Ratio Prot										0.06	c0.24	
v/s Ratio Perm		c0.10			0.04			c0.15		0.13		
v/c Ratio		0.50			0.20			0.61		0.38	0.47	
Uniform Delay, d1		19.3			18.1			18.2		8.2	8.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.3			0.3			2.5		0.5	0.4	
Delay (s)		20.7			18.4			20.7		8.7	8.5	
Level of Service		C			B			C		A	A	
Approach Delay (s)		20.7			18.4			20.7			8.6	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay		14.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		54.6			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		81.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

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Queues
3: Pine St & Flynn Ave

2028 - PM Build

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	189	239	272	195	473
v/c Ratio	0.57	0.47	0.63	0.39	0.48
Control Delay	27.5	8.1	27.2	11.1	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	8.1	27.2	11.1	11.2
Queue Length 50th (ft)	50	6	74	28	75
Queue Length 95th (ft)	137	62	189	95	229
Internal Link Dist (ft)	718	933	707		1026
Turn Bay Length (ft)				150	
Base Capacity (vph)	556	718	690	526	1290
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.34	0.33	0.39	0.37	0.37
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

3: Pine St & Flynn Ave

2028 - PM Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	108	15	10	14	215	34	228	10	195	368	105
Future Volume (vph)	66	108	15	10	14	215	34	228	10	195	368	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	11	11	14	11	11	14	11	11	14	11
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.90			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.98	1.00	
Frt		0.99			0.88			1.00		1.00	0.97	
Flt Protected		0.98			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1808			1567			1975		1619	1848	
Flt Permitted		0.76			0.98			0.88		0.39	1.00	
Satd. Flow (perm)		1405			1540			1755		673	1848	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	108	15	10	14	215	34	228	10	195	368	105
RTOR Reduction (vph)	0	5	0	0	166	0	0	2	0	0	13	0
Lane Group Flow (vph)	0	184	0	0	73	0	0	270	0	195	460	0
Confl. Peds. (#/hr)				5		36			54	54		
Heavy Vehicles (%)	9%	9%	9%	2%	2%	2%	1%	1%	1%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.9			12.9			14.0		29.2	29.2	
Effective Green, g (s)		12.9			12.9			14.0		29.2	29.2	
Actuated g/C Ratio		0.23			0.23			0.25		0.51	0.51	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		317			348			431		497	946	
v/s Ratio Prot										0.06	c0.25	
v/s Ratio Perm		c0.13			0.05			c0.15		0.14		
v/c Ratio		0.58			0.21			0.63		0.39	0.49	
Uniform Delay, d1		19.6			17.9			19.2		9.0	9.0	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		2.7			0.3			2.9		0.5	0.4	
Delay (s)		22.4			18.2			22.0		9.5	9.4	
Level of Service		C			B			C		A	A	
Approach Delay (s)		22.4			18.2			22.0			9.4	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay		15.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		57.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		88.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

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Modern Aluminum COLLECTION



Crisp lines and sleek design formed from durable corrosion-resistant aluminum and light-filtering glass.

The Genuine. The Original.





The Modern Aluminum Collection doors present contemporary elegance with sleek lines while delivering maximum light infiltration into the garage space.

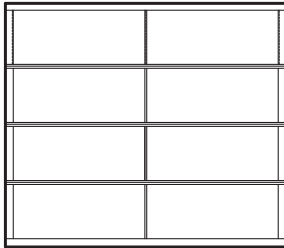


Modern Aluminum COLLECTION

Door Designs

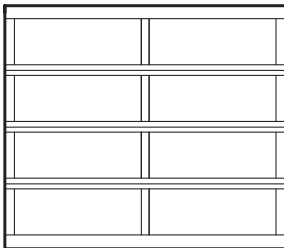
Select your Door Panel Style and Glass

1 Choose a Frame Option



Model 9910 (511)* Standard Frame

- Narrow rails and stiles
- An array of frame finishes and special custom options
- Door sizes **up to 16' 2" wide by 16' 1" high**



Model 9920 (521)* Heavy-duty Frame

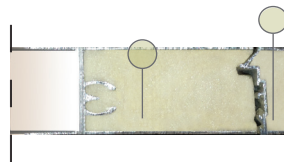
- Wide, heavy-duty rails and stiles
- An array of frame finishes and special custom options
- Door sizes **up to 26' 2" wide by 20' 1" high**
- Joint seal between sections for additional weather-resistance
- **Wind load and impact rated door** Door can be built to withstand a variety of wind conditions
- Optional **polyurethane** insulation for rails and stiles up to 18' 2" wide

* Section height varies dependent on door height.

† R-Value: Overhead Door Corporation uses a calculated door section R-Value for our insulated doors.

R-values† of complete Model 9920 with insulated rails and stiles

1/2" Insulated Glazing Unit	Door R-Value)
DSB- Clear, Tempered, Obscure	2.87
Clear Polycarbonate	2.93
DSB - Solar Bronze	3.17
DSB - Low E coating	3.43
SolarBan 70XL Argon Filled	4.09
Multi-wall Polycarbonate	Door R-Value
1/4" Thick Unit	2.75
3/8" Thick Unit	3.21
5/8" Thick Unit	3.48
Insulated Panels	Door R-Value
3/8" EPS solid panels	2.60



Polyurethane filled rails and stiles

Note: Previous model numbers and panel styles are noted in parentheses in gray.

2 Choose a Glass Type

Specialty Glass

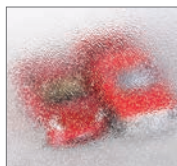
- Laminated White – privacy
- Low E Glass** – thermal efficiency
- Tempered Glass – enhanced safety
- Tinted Glass** – color options: Green, Gray, Bronze

Glass Alternatives

- Clear Lexan® Polycarbonate** – shatter resistant
- Multi Wall Polycarbonate – superior strength with UV protection; color options: Clear, White, Bronze
- Plexiglas® Acrylic** – shatter resistant
- Impact Clear and Frosted Polycarbonate - 0.250" minimum



Double Strength DSB** (Standard)



Obscure



Satin Etched



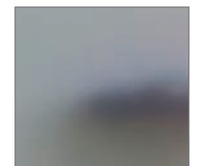
Gray Tint



Green Tint

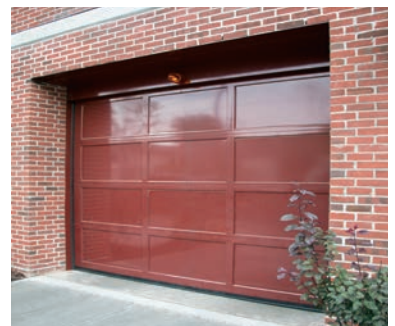


Bronze Tint



Impact Frosted Polycarbonate

Solid aluminum panels also available.



Actual glass may vary from brochure photos due to fluctuations in the printing process. Check with your Overhead Door™ Distributor to view a glass sample.

** Insulated options available.

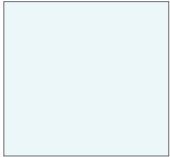
Modern Aluminum COLLECTION

Decorative Accents

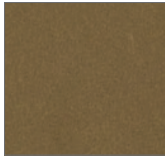
Customize your Door with Color

3 Choose a Color

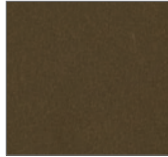
Anodized Finishes



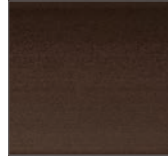
Clear (standard)



Light Bronze



Medium Bronze

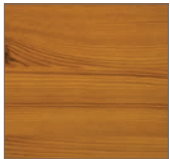


Dark Bronze



Black

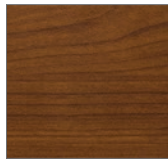
Wood Grain Powder Coat Finishes (Model 9920 only)



Knotty Pine



Cherry



Cherry with Flame



Dark Walnut

Actual color may vary slightly from brochure due to fluctuations in printing process. Color samples are available by request through your local Overhead Door™ Distributor.

RAL Powder Coat Finishes

Select from approximately 200 RAL powder coat color options to best match your home.



4 Choose Your Opener



Be sure to ask about our complete line of Overhead Door® garage door openers. Powerful, quiet and durable, these garage door openers are designed for performance, safety and convenience. Your Overhead Door™ Distributor will help you choose the opener that best suits your door and preferences.



Model 9920 (521), Clear anodized finish, Double Strength glass

Built Better from the Inside Out

Door Construction

The Modern Aluminum Collection Models 9910 and 9920 combine glass and aluminum for unparalleled visual appeal, strength and light infiltration. A unique solution for your extraordinary home.



Between Section Seals

Offer additional weather-resistance.



Commercial-grade Aluminum Frame

Low-maintenance and corrosion resistant.

Design Flexibility

Available in a variety of vertical rail and horizontal stile widths to complement the style of your home.

Finished Hardware

Hinges and fixtures are galvanized to maintain a contemporary look.

Integrated Stiffening Struts*

Strong, light-weight struts are included in the design of the rail assembly to enhance durability.

* Offered on non-wind loaded doors only. Size restrictions may apply. See your Overhead Door™ Distributor for details.

Wind Load-rated Doors

Model 9920 can be built to meet local building codes and provide your home with protection from a variety of wind conditions, such as hurricane force winds. We have Florida Building Code Static and Impact approvals on our best-selling Modern Aluminum Model 9920. These doors feature unobstructed views with no reinforcement struts running across the sections. Tough polycarbonate glazing is also available in clear for commercial needs or frosted for residential applications.

Energy Efficiency

Thermal performance test ratings are available for Model 9920, including air infiltration, U-Factor, solar heat gain coefficient (SHGC), visible transmittance (VT), condensation resistance and sound transmission class (STC).

Model 9920 meets IECC® requirements for air infiltration.



Transform Your Home with the DoorView® Visualization Tool.

Go to overheaddoor.com to try our online interactive software tool that lets you visualize what your home would look like with a new Overhead Door™ garage door. Contact your local Overhead Door™ Distributor for more information and to receive a quote.



Model 9920, (521), Black powder coat finish, Satin Etched glass glass

The Genuine. The Original.

Since 1921, Overhead Door Corporation has not only raised the standards of excellence for the industry – we’ve created them. We created the first sectional garage door in 1921 and the first electric garage door opener in 1926.

Today, our network of over 400 Overhead Door™ Distributors are still leading the way with innovative solutions and unmatched installation, service and support. So look for the Red Ribbon. It’s your guarantee that you’re getting the genuine, the original Overhead Door™ products and services.

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85 Mechanic Street, Suite E3-4, Lebanon, NH 03766 • Tel: 603-442-9333
414 Union Street, Schenectady, NY 12305 • Tel: 518-205-914

Howard Center Redevelopment Project, 300 Flynn Ave. & 855 Pine St. **Stormwater General Permit 3-9050 Narrative**

1. Introduction

Engineering Ventures, PC are writing on behalf of Howard Center to apply for a State Stormwater Discharge Permit pursuant to General Permit 3-9050. This project requires a permit as it includes the redevelopment of impervious surfaces greater than one-half acre.

2. Project Description

The proposed project consists of the demolition of an existing office building and the construction of a new, larger one on some of the same footprint. Two existing parking lots will be reconstructed and a covered parking garage added. The purpose of this project is to create a centralized location for Howard Center's social services. Site balancing is proposed so that some of the redeveloped area will be treated as new to meet the requisite standards.

3. Existing Condition

This project is located in the south end of Burlington, Vermont at the junction of Pine Street and Flynn Avenue. The southern portion of the existing site is developed with the above-mentioned building and parking lots. The northern portion of the site slopes steeply down to a class II wetland which surrounds Engelsby Brook. This undeveloped area is mapped as Munson and Belgrade silt loams, 12 to 25 percent slopes, and described as hydrologic soil group C/D. The developed part of the site has no available digital data on the USDA soil survey. Test pits, borings, and infiltration tests were conducted by John Turner Consulting (see attached report). The testing concluded that the soils in the developed area consist of silty sand with some gravel to approximately ten feet below grade and are underlain by lean clay or bedrock. Infiltration tests concluded no capacity in the majority of the project area, with the exception of IT-1 which provided a rate of ~10 in/hr.

The southern half of the Flynn Avenue parking lot flows towards the street and enters the city of Burlington conveyance system which discharges to Engelsby Brook just west of the project parcel (SN03). The eastern half of the Pine Street parking area flows towards the street and enters the city's conveyance system. This area discharges to a detention pond south of Electric Avenue which overflows to Lake Champlain (SN02). The remainder of the site, including the building's roof, via overland flow or closed pipe, discharges directly into the wetland (SN01). The contributing area to Engelsby Brook is considered a stormwater impaired watershed and is subject to a flow restoration plan which was published in 2017. The project area was noted as a potential location for a proposed dry detention basin as part of the plan.

Existing Land Use (Acres)					
	A	B	C	D	Total
Grass	0.000	0.000	0.000	0.000	0.000
Meadow	0.000	0.000	0.000	0.000	0.000
Woods	0.000	0.000	0.000	0.620	0.620
Existing Impervious	0.000	0.000	0.000	0.719	0.719
Impervious previously authorized under 2002 VSMM					0.000
Total Pre Site Area					1.339

4. Proposed Stormwater System:

This project proposes dense development on the exiting disturbed area with as little impact to the natural area (i.e. wetland buffer) as practicable. The runoff from the parking lots and building roof are proposed to be treated in high-rate filters (Focal Point system) before discharging into below-grade detention/infiltration tanks. The tanks are sized to detain the channel protection volume and have a controlled outlet to mitigate the ten-year storm. A conservative infiltration rate of 0.2 inches/hour was used in the design as the bedrock profile under the proposed system is not fully known.

The water quality treatment standard is calculated based on the entire site, however, not all areas of the site are routed to treatment. Smaller portions of the parking lots will continue to discharge to SN02 (0.04 acres post versus 0.05 acres pre) and SN03 (0.06 acres post versus 0.25 acres pre). Downgrade areas of lawn and wetland buffer (0.23 acres) will also bypass the treatment system but discharge to the same receiving body (SN01).

Proposed Land Use (Acres)					
	A	B	C	D	Total
Grass	0.000	0.000	0.000	0.132	0.132
Meadow	0.000	0.000	0.000	0.000	0.000
Woods	0.000	0.000	0.000	0.196	0.196
New Impervious	0.000	0.000	0.000	0.371	0.371
Existing to Treat	0.000	0.000	0.000	0.000	0.000
Existing Impervious Not for Permit Coverage					0.000
Redeveloped Impervious					0.640
Impervious previously authorized under 2002 VSMM					0.000
Total Site Area					1.339

$$WQ_{VT} = \frac{P * R_V * A}{12 \frac{in}{ft}} \rightarrow WQ_{VT} = 0.0602 \text{ acre} - \text{feet} \quad \text{Equation 2 - 2}$$

where:

WQ_{VT} = total water quality treatment volume required (acre – feet)

P = 1 inch across Vermont

R_V = volumetric runoff coefficient $\rightarrow R_V = 0.05 + 0.009I \rightarrow R_V = 0.730$

I = site imperviousness $\rightarrow I_N = \frac{0.371 \text{ ac}}{1.339 \text{ ac}} * 100\% \rightarrow I = 27.7\%$ $I_R = \frac{0.641 \text{ ac}}{1.339 \text{ ac}} * 100\% \rightarrow I = 47.9\%$

A = site area (acres) $\rightarrow A = 1.339 \text{ acres}$

- a) Description of Impervious Area: 0.952 acres including rooftop, asphalt and concrete pavement

Proposed Treated Land Use (Acres)					
	A	B	C	D	Total
Grass	0.000	0.000	0.000	0.029	0.029
Meadow	0.000	0.000	0.000	0.000	0.000
Woods	0.000	0.000	0.000	0.000	0.000
New Impervious	0.000	0.000	0.000	0.331	0.331
Existing to Treat	0.000	0.000	0.000	0.000	0.000
Redeveloped Impervious					0.621
Total Site Area					0.981

- b) Receiving Body: SN01 - Unnamed wetland tributary to Engelsby Brook
- c) Fish Habitat Designation for Receiving Water: Warm
- d) Description of compliance with each of the treatment standards in the 2017 VSMM including the treatment practices or waivers used to meet each of the following standards:
- i) The Post-Construction Soil Depth and Quality Standard: Met by any of the four methods cited in the 2017 VSMM (all four are listed on the plans with final decision left to the contractor)
 - ii) The Groundwater Recharge Standard: Waived due to HSG D soils
 - iii) The Water Quality Treatment Standard: SN01 - Met via high-rate filters (Focal Point system, tier 2)
 - iv) Channel Protection Standard: SN01 - Met via detention/infiltration chambers
 - v) Overbank Flood Protection Standard: SN01 - Met via detention/infiltration chambers
 - vi) Extreme Flood Protection Standard (Q_{P100}): A waiver is sought as proposed impervious is less than 10-acres

The following items are included for review:

- Location Map
- Soil Map
- Geotechnical Report by J. Turner Consulting, Inc.
- Select Pages from Engelsby Brook Flow Restoration Plan



LEGEND

NOTES

Map created using ANR's
Natural Resources Atlas

1: 10,000

July 11, 2023



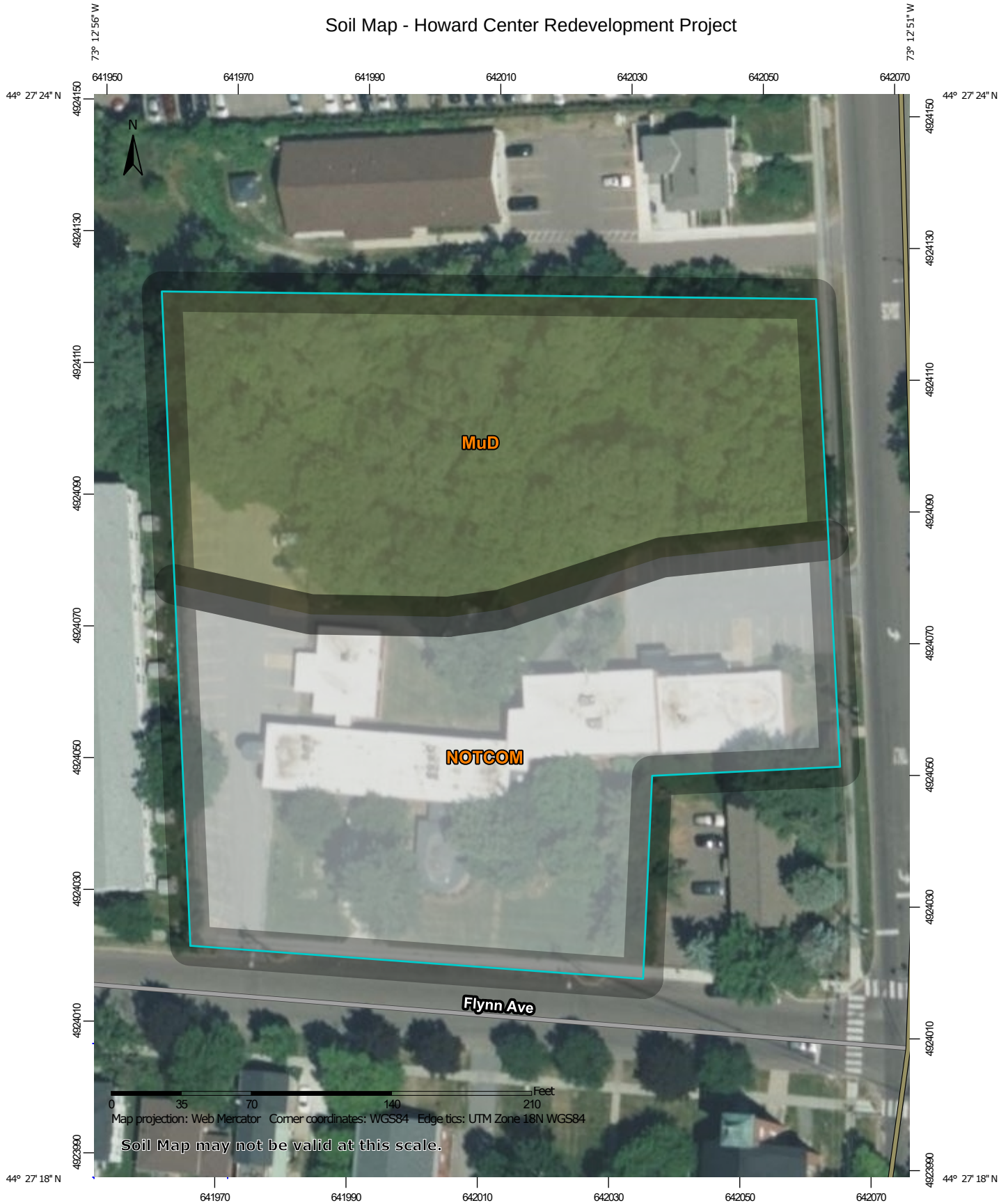
1,667.0 0 834.00 1,667.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Agency of Natural Resources

1" = 833 Ft. 1cm = 100 Meters
THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Soil Map - Howard Center Redevelopment Project



Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MuD	Munson and Belgrade silt loams, 12 to 25 percent slopes	C/D	1.1	47.8%
NOTCOM	No Digital Data Available		1.2	52.2%
Totals for Area of Interest			2.3	100.0%



GEOTECHNICAL INVESTIGATION REPORT

HOWARD CENTER REDEVELOPMENT PROJECT

300 Flynn Avenue
Burlington, VT 05401

Prepared for:

Howard Center
Burlington, VT 05401

Prepared by:

John Turner Consulting, Inc.
12 Gregory Drive, Unit 7
South Burlington, VT 05403

JTC Project No. 22-04-138

February 7, 2023



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February 7, 2023

Sandy McGuire - CFO
Howard Center
208 Flynn Avenue, Suite 3J
Burlington, VT 05401
P: 802-488-6900
E: sandym@howardcenter.org

**RE: Geotechnical Investigation Report
Howard Center Redevelopment Project
300 Flynn Avenue
Burlington, VT 05401**

Dear Ms. McGuire:

In accordance with our proposal and authorization to proceed, John Turner Consulting, Inc. (JTC) has performed a geotechnical investigation for the above captioned project. Presented herein and attached are the results of the site subsurface investigation, and our recommendations regarding the design and construction of the foundation, and other geotechnical related concerns or issues.

This submission completes our services under the approved contract. We appreciate the opportunity to assist you on this venture and we look forward to working with you on this project through its completion. Please do not hesitate to contact us if you have any questions or require additional information.

Sincerely,
JOHN TURNER CONSULTING, INC.



Stephen C. Lanne, PE
Vice President of Engineering
19 Dover Street
Dover, NH 03820
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Ph: (413) 222-1675

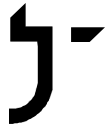
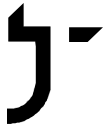


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1.0 INTRODUCTION

John Turner Consulting, Inc. (JTC) is pleased to present this *Geotechnical Investigation Report* for the proposed redevelopment of the medical building located at 300 Flynn Road in Burlington, Vermont. JTC conducted geotechnical explorations, laboratory testing, and engineering evaluations in general accordance with our proposed scope of services submitted on November 11, 2022.

The purpose of the geotechnical investigation was to obtain information on the subsurface conditions at the site and to provide geotechnical engineering recommendations to support the planning, design, and construction of the proposed development. Geotechnical explorations and laboratory testing services were performed in December of 2022, and January of 2023. The contents of this report are subject to the attached *Limitations*.

2.0 PROJECT INFORMATION

The following subsections provide general descriptions of the site, the regional geologic setting, and the proposed development.

2.1 Site Description

The property is currently developed with an approximately 21,000 square foot (s.f.) building, with associated parking lots, driveways, and landscaped areas. The site is bounded by Pine Street to the east, Flynn Avenue to the south, and other commercial properties to the north and west. The north side of the site slopes downward towards a creek.

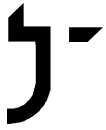
2.2 Regional Geologic Setting

JTC's review of the surficial geologic maps of the area, as well the previous geotechnical investigations of the area, indicate soils at the site most likely consist of fill over glaciolacustrine deposits mainly consisting of silts and clays, all underlain by glacial till and bedrock.

2.3 Proposed Development

JTC understands that the proposed development involves the demolition of the current structure and the construction of a new, 51,000 square feet (s.f.), three story building, with associated driveways and parking lots. Ground level, under building parking is proposed below portions of the proposed building, and part of the south end of the building will have a basement. Proposed site plans show grading will include moderate cuts and fills, i.e, up to about 6 feet or so, to achieve design grades

Preliminary site-specific structural loading was provided by the structural engineer. As such, JTC has used the following structural loading conditions:



- Column loads will be on the order of 220 kips or less; and
- Live loads applied to the floor slab-on-grade will be on the order of 150 pounds per square foot (psf) or less.

3.0 GEOTECHNICAL EXPLORATIONS

3.1 Soil Borings

JTC subcontracted Soil Exploration Corp to perform five (5) geotechnical test borings, designated as B-1 through B-5 (including B-2A), one (1) ledge probe designated as P-1, and six (6) infiltration tests, designated as IT-1 through IT-6, via a truck-mounted drill rig. JTC directed the drilling, testing, and sampling activities and logged the subsurface conditions encountered at each boring location.

The exploration locations were selected in relation to the existing site features and proposed development, and under the constraints of drill rig access and utility conflicts. Subsequently, the relative location of each boring was established via measurements from existing site features and scaling the dimensions onto the provided plan(s). The attached *Exploration Location Plan* depicts the approximate exploration locations.

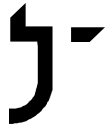
The explorations were advanced to depths ranging from 5.0 feet to 38.0 feet below the ground surface (bgs) utilizing 4¼-inch inner-diameter hollow stem augers (HSAs). As the explorations were advanced, standard penetration tests (SPTs) were conducted at regular intervals and soil samples were obtained via 2-inch outside-diameter split-spoon samplers driven by a 140-pound automatic hammer. SPTs were performed in general accordance with ASTM D1586, Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils. Soil samples were sealed in moisture-tight containers and returned to JTC's office for further review, classification, and/or geotechnical laboratory testing. The explorations were backfilled with soil cuttings upon completion of drilling.

Detailed records of the drilling, testing, and sampling performed, and the soil, bedrock, and groundwater conditions observed at each test boring location are provided on the attached *Exploration Logs*.

3.2 Infiltration Tests

Infiltration testing was performed in general accordance with local standards. The testing procedure at each location was performed as follows:

- A borehole was advanced to the infiltration depth using hollow stem augers and a 3.5-inch diameter Schedule 40 polyvinyl chloride (PVC) casing was placed inside the hollow stem auger and seated into the soils at the bottom of the hole. The auger was then removed and the annulus between the pipe and the borehole was backfilled with



bentonite chips for approximately 2 feet, and then soil cuttings for the remaining depth of the hole;

- An approximately 2-inch thick layer of drainage gravel was placed at the bottom of the casing to protect the soil from scouring and sedimentation;
- The casing was filled with water to about 2 feet above the bottom of the boring to pre-soak for approximately 24 hours; After the 24-hour soaking period, JTC performed infiltration testing at the prepared locations.

The testing procedure consisted of:

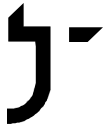
- Filling the pipe with water to a depth of 2 feet above the bottom of the casing;
- Taking regular water level measurements over the following hour;
- Refilling the water after each hour and repeating the process for a total of four cycles, if necessary.

3.2.1 Infiltration Testing Results

The infiltration testing results are summarized in the following table:

Table 1 – Summary of Infiltration Testing Results							
Infiltration Test #	Location	Soil Type	Measured Infiltration Rate (in/hr)				Average Measured Rate (in/hr)
			Round 1	Round 2	Round 3	Round 4	
IT-1	IT-1	SM	12	8	11	10	10.3
IT-2	IT-2	CL	0	0	0	0	0
IT-3	IT-3	SM	0	0	0	0	0
IT-4	IT-4	CL	0	0	-	-	0
IT-5	IT-5	CL	0	0	-	-	0
IT-6	IT-6	CL	0	0	-	-	0

No factors of safety have been applied to the measured rates presented in the table. JTC recommends applying a minimum safety factor of 2 to the measured rates for design purposes. The infiltration test logs are provided in the attached *Exploration Logs*.



4.0 GEOTECHNICAL LABORATORY TESTING

JTC selected representative soil samples for geotechnical laboratory testing. The following tests were performed:

- 3 Moisture content determinations
- 3 Particle-size analyses
- 2 Hydrometer analyses
- 2 Atterberg Limits determinations
- 2 Shelby Tube Logs and Testing
- 1 One-dimensional Consolidation test

Geotechnical laboratory testing was performed in general accordance with ASTM procedures. Test results are provided on the attached *Geotechnical Laboratory Testing Reports*.

5.0 SUBSURFACE CONDITIONS

The following subsections describe the site soil, bedrock, and groundwater conditions encountered, based on results of the geotechnical explorations and laboratory testing. Detailed descriptions of the conditions observed at each test boring are provided on the attached *Test Boring Logs*.

5.1 Soils

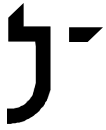
The overburden soils encountered at the test boring locations appear to be consistent with those described by the published geologic data. The primary soil strata are briefly described in the paragraphs below.

5.1.1 Surface Materials

Surface materials encountered at B-1 consisted primarily of man-placed organic mulch, approximately 0.4 feet thick, while the materials encountered at the surface of the remaining borings was interpreted as Topsoil and was about 0.25 feet to 1 foot thick. The Topsoil at B-2 was composed primarily of brown Silty Sand (SM) with organics, while the Topsoil at B-3 through B-5 consisted primarily of Sandy Lean Clay (CL) with organics. These soils exhibited varying relative density ranging from loose to stiff based on SPT N-Values.

5.1.2 Existing Fill

Soils interpreted as Fill were encountered underlying the Surface Materials at B-1, to depths of about 10 feet bgs. The existing Fill materials consisted primarily of brown, Silty Sand (SM) with trace gravel. These soils exhibited varying relative density ranging from loose to medium dense based on SPT N-Values.



5.1.3 Glaciolacustrine Deposits

Native soils interpreted to be Glaciolacustrine Deposits were encountered underlying the surficial materials at B-2 through B-5, and below the Fill materials at B-1. The Glaciolacustrine Deposits consisted primarily of brown to grey, Lean Clay (CL) with varying amounts of silt and sand. Based on SPT N-Values, these soils were typically considered to be medium stiff to stiff in the upper portion of the layer, then soft to very soft in the lower portion of the layer.

5.2 Bedrock

Practical refusal to further penetration of the augers was encountered at all exploration locations except B-5. The approximate depth to practical refusal and the estimated refusal material are tabulated below.

Exploration #	Refusal Type and Depth (feet bgs)	Estimated Refusal Material
B-1	Auger Refusal – 35.0	Bedrock
B-2	Auger Refusal – 5.0	Bedrock
B-2A	Auger Refusal – 5.0	Bedrock
B-3	Auger Refusal – 38.0	Bedrock
B-4	Auger Refusal – 30.0	Bedrock
B-5	Auger Refusal – (N/A)	(N/A)
P-1	Auger Refusal – 4.5	Bedrock

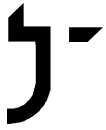
5.3 Groundwater

Groundwater was encountered at B-1 at a depth of approximately 25 feet bgs, and at B-3 through B-5 at a depth of approximately 15 feet bgs at the time of drilling. However, short-term (i.e., during drilling, upon completion of drilling, and/or a few hours after drilling) water levels observed in test borings performed in silty soils should be considered approximate.

JTC estimates that this investigation occurred during a period of seasonally low ground water. Site groundwater levels should be expected to fluctuate seasonally and in response to precipitation events, tides, construction activity, site use, and adjacent site use. In addition, water can become temporarily perched above relatively low permeability soils and/or the bedrock surface.

6.0 GEOTECHNICAL ANALYSIS & RECOMMENDATIONS

The evaluation of the site and the proposed development was based on the subsurface conditions encountered at the exploration locations, results of geotechnical laboratory testing, provided site plans/grading, and provided structural loading conditions, as described herein.

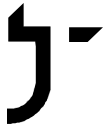


The Existing Fill and Glaciolacustrine Deposits are considered unsuitable for direct support of shallow foundations and slabs-on-grade. The Existing Fill is generally loose, indicating the materials were not placed under controlled, engineered conditions. The lower, soft Glaciolacustrine Deposits would consolidate under the proposed loading, making them unsuitable for the direct support of shallow foundations. Settlement analysis of these soils indicate estimated settlement exceeding 2.0 inches. In addition, the likely presence of Bedrock at foundation level within portions of the proposed buildings will lead to dramatically differing bearing conditions that would likely result in undesirable differential settlement if foundations were bearing on both Bedrock and Glaciolacustrine Deposits.

In order to provide a more uniform bearing condition, JTC recommends that ground improvements, e.g., installation of Aggregate Piers/Rigid Inclusions, be implemented to provide suitable bearing and stiffness to minimize post-construction settlement of shallow foundations.

The Aggregate Pier/Rigid Inclusion method is a common ground improvement method. In general, Aggregate Pier/Rigid Inclusion foundation elements would be constructed by drilling (or displacing) 18-inch to 30-inch diameter cavities through the Existing Fill and Glaciolacustrine Deposits, terminating in the underlying Bedrock. The cavities are then backfilled with crushed stone that is densified with impact and/or vibratory compaction. The densification process pushes the crushed stone radially outward into the sidewalls of the cavities, thereby increasing the lateral stresses in the matrix soil surrounding the Aggregate Pier elements. The end product is the formation of very stiff aggregate elements that are extremely efficient in providing foundation support and reducing foundation settlement. Aggregate Piers are sometimes grouted (via Portland cement) where soft and/or organic soils are present. In some cases, the cavities are backfilled with concrete instead of crushed stone. The grouted and/or concrete elements are even stiffer than the traditional Aggregate Pier and are commonly referred to as Rigid Inclusions. Aggregate Piers and/or Rigid Inclusions are typically designed and constructed by a specialty design-build firm and/or Geo-Contractor. Some products include patented/licensed technology. The design of Aggregate Piers/Rigid Inclusions and/or equivalent should be completed by a Professional Engineer licensed in Vermont. The design should be provided as a Technical Submittal.

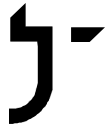
Subsequent to ground improvement, JTC believes that the proposed building can be supported upon shallow foundations bearing on Bedrock, *Structural Fill* or Crushed Stone, or the design-build Ground Improvement surface, provided that the geotechnical design and construction recommendations presented herein are satisfied. Additionally, due to the limitations to access caused by the existing building, the extent of the shallow bedrock and thickness of the clay could not be adequately mapped. JTC recommends further boring explorations of the site be conducted once the building is demolished, to accurately map the subsurface conditions. This will allow for a more accurate and efficient ground improvement and traditional foundation design.



6.1 Site Preparation and Grading

Site preparation and grading should be performed in accordance with the following procedures:

- A geotechnical engineer should directly observe site preparation and grading activities;
- The site soils contain substantial proportions of fine sand, silt and clay, and may degrade and/or become unworkable when subjected to construction traffic or other disturbance during wet conditions. As such, site preparations, grading, and earthworks should be performed during a dry season if possible. The Contractor shall be aware of these conditions and must take precautions to minimize subgrade disturbance. Such precautions may include diverting storm run-off away from construction areas, reducing traffic in sensitive areas, minimizing the extent of exposed subgrade if inclement weather is forecast, backfilling excavations and footings as soon as practicable, grading (and compacting) exposed subgrades to promote surface water run-off, and maintaining an effective dewatering program, as necessary. Over-excavation to remove degraded or unworkable subgrade soils should be anticipated and budgeted (cost and schedule);
- Any existing buildings, structures, and/or associated foundations (including footings, foundation walls, slabs-on-grade, and/or basements) should be completely removed from within proposed building areas and replaced/backfilled with properly placed and compacted *Structural Fill*. Any existing structures within paved areas should be removed to a depth of at least 3 feet below the pavement section. Slabs or other large portions of concrete left in place should be periodically broken to prevent ponding water;
- Any existing subsurface utilities and underground utility structures should be completely removed from the footprint of the proposed buildings and replaced/backfilled with properly placed and compacted *Structural Fill*. Any existing subsurface utilities in proposed pavement areas should be removed and/or appropriately abandoned in place to prevent transmitting water, as approved by the on-site geotechnical engineer;
- The site should be cleared and stripped of any existing trees/vegetation and asphalt-concrete pavement not designated to remain; Topsoil, rootmat, forest mat; loamy/organic-laden Subsoil; and any otherwise unsuitable materials;
- Bedrock may impact excavation/construction of shallow foundations and site utilities, depending on the final design grading. Based on the depth to refusal on presumed bedrock, the planned partial basements, and our expectation of some cutting to achieve finished grade, we expect bedrock removal may be required for foundation construction in some areas. A variety of removal methods should be anticipated and budgeted for, including mechanical excavation, ripping, hoe-ram, and pneumatic jackhammering (in the case of small or confined areas);
- Following clearing, stripping, removal of any unsuitable soil, and/or cutting, the exposed subgrade soils should be proof-rolled with successive passes aligned perpendicularly. Within the building pad, the exposed subgrade should be proof-rolled and subject to vibratory densification via at least 8 passes using a large (10-ton) smooth-drum roller and a crisscross pattern. Proof-rolling/densification should not be performed if/when the



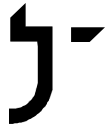
exposed subgrade soils are wet (i.e., due to presence of groundwater, stormwater, perched water, etc.) because this may result in soil pumping and instability. Therefore, the proof-rolling efforts, including the number of passes and whether to employ static or vibratory methods, should be directed by the on-site geotechnical engineer;

- Any loose, soft, wet, and/or otherwise unsuitable soils (typically evidenced by rutting, pumping, and/or deflection of the subgrade) should be over-excavated to expose suitable soils, or other remedial measures should be taken, as approved by the on-site geotechnical engineer; and
- The resulting excavation should then be backfilled with properly placed and compacted *Structural Fill*.
- Where Bedrock is encountered at or above design foundation level, Bedrock should be removed to a depth of at least 24 inches below the bottom of foundation. Loose rock material and high spots should be removed to provide a fairly uniform bearing surface;
- *Structural Fill* should be used for subgrade fill within the building pad. The placement of *Structural Fill* materials to achieve design subgrades in the building pad should not begin until the exposed soil or bedrock surface has been directly observed and approved by the on-site geotechnical engineer;
- *Common Fill* is acceptable for subgrade fill in parking and driveway areas. The placement of *Common Fill* materials to achieve design subgrades in pavement areas should not begin until the exposed subgrade soils have been directly observed and approved by the on-site geotechnical engineer; and
- *Structural Fill* and *Common Fill* materials and placement and compaction requirements are provided in the attached Specifications.

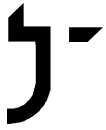
6.2 Shallow Foundations and Foundation Walls

Based on the subsurface conditions encountered at the exploration locations and our current understanding and assumptions relative to the proposed development, the following foundation design recommendations are provided. The recommendations for shallow foundations assume that the recommended ground improvements, i.e., Aggregate Piers/Rigid Inclusions, will be completed:

- The Existing Fill and Glaciolacustrine Deposits are not suitable for direct support of shallow foundations in their current condition;
- The buildings may be supported on a system of continuous and/or isolated shallow spread footings bearing on improved existing soils and/or *Structural Fill* built-up from Bedrock subgrades. We expect Bedrock will exist at foundation level in some areas. In order to provide a more uniform and elastic response to foundation loading, foundations should not bear directly on Bedrock. A minimum 24-inch thick cushion layer of *Structural Fill* should be placed below foundations bearing on Bedrock to help reduce effects of differential settlement;



- Following ground improvements, shallow foundations may be designed using an allowable bearing pressure as determined by the design-build submittal. Since we expect foundations to bear on both bedrock and ground improvement subgrades, the extents of which may not be completely clear until the time of construction, we recommend the foundation design proceed using an allowable bearing pressure of 4,000 psf. Design bearing pressures may be increased by one-third ($\frac{1}{3}$) when considering seismic and or transient wind loading conditions;
- Continuous wall footings should have a minimum width of 3 feet. Isolated column footings should have a minimum width of 5 feet;
- Exterior footings should be founded at least 5 feet below the lowest adjacent grade to provide adequate frost protection. Interior footings in heated portions of the building should be founded at least 2 feet below FFE to develop adequate bearing capacity; and
 - If shallow competent Bedrock is encountered during excavations for exterior footings, the footings can be founded at a minimum depth of 2 feet below the adjacent grade, atop at least 24 inches of *Structural Fill* (cushion layer) placed on clean competent Bedrock, provided that the condition of the Bedrock is inspected by the on-site geotechnical engineer;
 - If weathered Bedrock is encountered during excavations for exterior footings, the footings should be founded at least 5 feet below final grade, as described herein.
- For footings founded on clean competent Bedrock (and the recommended *Structural Fill* cushion layer), total post-construction settlements should be minimal. We recommend the design-build ground improvement submittal consider stiffness of the system, in addition to strength, in order to limit the potential for differential settlement;
- A foundation drain system should be installed around the perimeter of the proposed building at the exterior toe of the exterior footings. Foundation drains should consist of 4-inch diameter PVC-SDR35 perforated pipe encased in at least 10 inches of $\frac{3}{4}$ -inch stone protected with a filter fabric such as Mirafi 140N or equal. The drains should be graded to positively drain to a suitable discharge point away from the proposed structure. Drains should not be connected to surface or roof drain discharge points. Clean-outs should be located at bends and no greater than 150 feet on-center. It is recommended that a backflow preventer be installed at the outlet of the drains to reduce the impact of potential surcharges;
- A waterproofing specialist should design a comprehensive waterproofing system for the basement area of the proposed building. JTC recommends that the waterproofing design consider the potential for perched water conditions, above and within the low permeability Glaciolacustrine Deposits. Typical, waterproofing systems include any or all of the following:
 - Utilization of waterstops at construction joints in below grade walls, footings, slabs, and other intersections/cold joints where a waterproof system is required.



The waterstops prevent the passage of water across these construction joints.

- Application of multiple perpendicular coats of asphalt-modified polyurethane (or equivalent) to the exterior of the entire foundation;
 - Installation of rubberized asphaltic membrane sheets/rolls to the exterior of the entire foundation; and
 - Installation of bentonite waterproofing panels (bentonite clay sandwiched between cardboard panels). The highly expansive clay forms an impenetrable barrier once water contacts the panels.
- Recommended lateral earth pressures and friction factors for unbalanced/basement walls are provided in *Appendix C*.

Recommendations for shallow foundation subgrade preparation and construction are provided as follows:

- A geotechnical engineer or his/her representative should directly observe foundation subgrade preparation activities;
- If shallow and/or perched groundwater is encountered, it must be continuously maintained at least 2 feet below the bottom of excavation and subsequent construction grade until the backfilling is complete;
- The subgrade soils will be sensitive to moisture and will readily disturb or soften if exposed to wet conditions during construction activities. Therefore, the final foot, at a minimum, of excavation for foundations should be performed using a smooth-edged cutting bucket (no teeth) to minimize subgrade disturbance. Furthermore, if wet conditions are present or anticipated due to groundwater seepage, perched groundwater, and/or precipitation/stormwater, the foundation subgrade should be protected with a 6-inch (minimum) thick layer of $\frac{3}{4}$ -inch minus crushed stone encased in a geotextile fabric (e.g., Mirafi 140N or equal). The fabric and crushed stone shall be placed immediately upon exposure of the foundation subgrade soils and densified with a plate compactor until exhibiting stable conditions. The purpose of the crushed stone is to protect the subgrade soils from disturbance, facilitate construction dewatering (if necessary), and provide a dry/stable subgrade upon which to progress construction.
- Foundation subgrades should be proof-rolled using a large smooth-drum roller with successive perpendicular passes.
- Where Bedrock subgrade is encountered in some areas of the proposed building;
 - The exposed Bedrock must be scraped clean of soil and any loose/weathered rock or severely fractured rock should be removed;
 - The footing subgrade should be approximately level. Bedrock surfaces that exceed 6H:1V in slope should be step-serrated or suitably benched;
 - Smooth surfaces should be roughened or serrated; and
 - A minimum 24-inch thick lift of *Structural Fill* should be placed between the footing

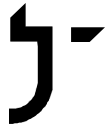
and the bedrock surface to provide a more uniform and elastic bearing subgrade. The purpose of the crushed stone (i.e., cushion base) is to minimize differential settlements.

- Prior to setting forms and placing reinforcing steel, a geotechnical engineer should directly observe footing subgrades;
 - Footing subgrades should be level or suitably benched and free of standing water and/or debris;
 - Loose, soft, wet, frozen, or otherwise unsuitable soils should either be re-compacted or over-excavated to a suitable subgrade, as approved by the on-site geotechnical engineer; and
 - Over-excavations should be backfilled with properly placed and compacted *Structural Fill* as approved by the on-site geotechnical engineer.
- Foundation subgrade soils should be protected against physical disturbance, precipitation, and/or frost throughout construction. Surface water run-on/run-off should be diverted away from open foundation excavations. The Contractor shall ultimately be responsible for the means and methods to protect the foundation subgrade during construction;
- Interior footings, piers, and/or walls and the interior side of balanced perimeter foundation walls should be backfilled with *Clean Granular Fill* and/or 3-inch minus material meeting the requirements of *Structural Fill*, as described in the attached *Tables*;
- Exterior footings and exterior side of balanced perimeter foundation walls should be backfilled with non-frost-susceptible fill in order to mitigate potential adverse effects of frost. Exterior footing and foundation wall backfill should consist of well-graded, free-draining, granular soil conforming to the requirements of *Clean Granular Fill*, as described in the attached *Tables*;
- Backfill for footings and foundation walls should be placed in uniform horizontal lifts having a maximum loose lift thickness of 8 inches and compacted to 95 percent of its modified proctor maximum dry density (MPMDD; per ASTM D1557). Thinner lifts may be required in order to achieve the required compaction criteria; and
- To minimize the potential for foundation wall damage during the backfill and compaction activities, it is recommended that foundation wall backfill be placed in a manner that maintains a balanced fill height on both sides of the wall (except for unbalanced walls).

6.3 Floor Slab-On-Grade

Design recommendations for the floor slab-on-grade are provided as follows:

- The slab area should be improved with a design-build aggregate pier or rigid inclusion solution. The floor slab-on-grade should be underlain by a base course layer consisting of a minimum 12-inch thick layer of *Clean Granular Fill* placed over improved soils or *Structural Fill*, to provide a capillary break and a stable working surface;



- A modulus of vertical subgrade reaction, k_{vi} , of 200 pounds per cubic inch (pci) should be available for structural design of floor slabs-on-grade, provided that the subgrade is prepared as recommended;
- The floor slab should be isolated structurally from foundation walls and columns/piers to allow for differential movement; and
- The requirement for under slab drainage and a moisture/vapor barrier beneath floor slabs-on-grade should be evaluated by the architect and/or the structural engineer, based on the building's specific interior usage requirements.

Additional recommendations for slab-on-grade subgrade preparation and construction are provided as follows:

- A geotechnical engineer should directly observe the subgrade soils prior to the placement of fill within the slab area;
- The subgrade should be level and free of standing water and/or debris;
- Loose, soft, wet, frozen, or otherwise unsuitable soils should either be re-compacted or over-excavated to a suitable subgrade, as approved by the on-site geotechnical engineer; and
- Over-excavations should be backfilled with properly placed and compacted *Structural Fill*.

6.4 Seismic Considerations

Based on site class definitions of the American Society of Civil Engineers (ASCE) Standard 7-10, Minimum Design Loads for Buildings and Other Structures and the conditions encountered at the test boring locations, the site is classified as:

Site Class D: Stiff Soil.

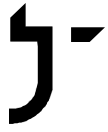
Liquefaction refers to the loss of strength in saturated cohesionless soils due to the buildup of pore water pressures during cyclic or seismic loading. Based on the conditions encountered at the test boring locations, the site is not considered to be susceptible to liquefaction.

6.5 Re-Use of Site Soils

The excavated materials encountered at the site are not expected to be suitable for re-use as *Structural Fill*, *Clean Granular Fill*, or *Common Fill* due to high fines content. These soils may be re-used in areas to be landscaped, subject to conformance with the project specifications.

6.6 Construction Monitoring and Quality Control Testing

A qualified geotechnical engineer or representative should be retained to review the site preparation and grading activities and foundation subgrade preparations, at a minimum. Similarly, quality control testing, including in-place field density and moisture tests, should be performed to confirm that the specified compaction is achieved. It is recommended that JTC be



retained to provide earthwork construction monitoring and quality control testing services.

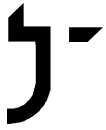
Quality control testing recommendations are provided as follows:

- The Geotechnical Engineer should be on-site full time to monitor the installation of the Ground Improvement system;
- During site grading and foundation subgrade preparation, 3 field density tests should be performed for every 5,000 square feet (per lift) of *Structural Fill* placement, at a minimum. At least 3 tests should be performed on each lift of material even if the lift is less than 5,000 square feet;
- During foundation wall backfilling, 3 field density tests should be performed for every 100 linear feet (per lift) of fill placement, at a minimum. At least 3 tests should be performed on each lift of material even if the lift is less than 100 linear feet;
- During placement and compaction of *Clean Granular Fill* as the base course below the floor slab-on-grade and sidewalks, 3 field density tests should be performed for every 5,000 square feet of placement. At least 3 tests should be performed on each lift of material even if the lift is less than 5,000 square feet;
- During backfilling of utility trenches, at least 1 test should be conducted on *Structural Fill* per 50 linear feet (per lift) of trench; and
- During site grading and pavement subgrade preparation, 3 field density tests should be performed for every 5,000 square feet (per lift) of *Common Fill*, at a minimum. At least 3 tests should be performed on each lift even if the lift is less than 5,000 square feet.

6.7 Additional Considerations

Additional design recommendations are provided as follows:

- Exterior concrete sidewalks should be underlain by at least 12 inches of *Clean Granular Fill*. The thickness of the *Clean Granular Fill* should be increased to no less than 18 inches for exterior concrete slabs located adjacent to exterior doorways and ramps to provide additional frost protection at building entry/exit points;
- Roof drains or similar features should be provided to collect roof run-off and prevent ponding near the building. Roof drains and other stormwater controls should not discharge to foundation drains;
- The exterior ground surface adjacent to the building should be sloped away from the building to provide for positive drainage. Similarly, the final surface materials adjacent to the building should be relatively impermeable to reduce the volume of precipitation infiltrating into the subsurface proximate to building foundations. Such impermeable materials include cement concrete, bituminous concrete, and/or vegetated silty/clayey topsoil; and
- Permanent fill or cut slopes should have a maximum slope of 2.5H:1V (horizontal to vertical) or flatter for dry conditions. Permanent fill or cut slopes should be no steeper



than 3H:1V for wet/submerged conditions (e.g., stormwater basin) unless a properly designed surface slope stabilization system (e.g. rip rap, geosynthetics) is provided.

Additional construction considerations/recommendations are provided as follows:

- Safe temporary excavation and/or fill slopes are the responsibility of the Contractor. Excavations should be conducted in accordance with local, state, and federal (OSHA) requirements, at a minimum. If an excavation cannot be properly sloped or benched due to space limitations, adjacent structures, and/or seepage, the Contractor should install an engineered shoring system to support the temporary excavation;
- Subgrade conditions will be influenced by excavation methods, precipitation, stormwater management, groundwater control(s), and/or construction activities. Most of the site soils are poorly-drained, moisture-sensitive, and considered susceptible to disturbance when exposed to wet conditions and construction activities. As such, the Contractor should be aware of these conditions and must take precautions to minimize subgrade disturbance. Such precautions may include diverting storm run-off away from construction areas, reducing traffic in sensitive areas, minimizing the extent of exposed subgrade if inclement weather is forecast, backfilling excavations and footings as soon as practicable, and maintaining an effective dewatering program, as necessary;
- Proper groundwater control and stormwater management are necessary to maintain site stability. Groundwater should be removed in advance and continuously maintained at least 2 feet below the working construction grade until earthworks and/or backfilling are complete;
- If groundwater seepage and/or wet soils due to shallow groundwater are observed, a $\frac{3}{4}$ -inch minus crushed stone base should be placed atop the exposed subgrade soils. The stone should be immediately placed atop the undisturbed subgrade and then tamped with a plate compactor until exhibiting stable conditions. The stone should be protected, as required, with a geotextile filter fabric such as Mirafi 140N or equal. The purpose of the stone base is to protect the wet subgrade, facilitate dewatering, and provide a dry/stable base upon which to progress construction; and
- All slopes should be protected from erosion during (and after) construction.

7.0 CLOSING

We trust the contents of this report are responsive to your needs at this time. Should you have any questions or require additional assistance, please do not hesitate to contact our office.

APPENDIX A: LIMITATIONS

Explorations

1. The analyses and recommendations presented in this report are based in part upon the data obtained from widely-spaced subsurface explorations. Subsurface conditions between exploration locations may vary from those encountered at the exploration locations. The nature and extent of variations between explorations may not become evident until construction. If variations appear, it will be necessary to re-evaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely-spaced explorations and samples; actual strata transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.
3. Water level readings have been made in the test pits and/or test borings under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time the measurements were made.

Review

4. It is recommended that John Turner Consulting, Inc. be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the geotechnical engineering recommendations provided herein.
5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and conclusions of the report modified or verified in writing by John Turner Consulting, Inc.

Construction

6. It is recommended that John Turner Consulting, Inc. be retained to provide geotechnical engineering services during the installation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

7. This report has been prepared for the exclusive use of the addressee for the noted project. All considerations are based on the available information and is in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
8. This report has been prepared for this project by John Turner Consulting, Inc. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to preliminary geotechnical design considerations.

APPENDIX B: RECOMMENDED SOIL GRADATION & COMPACTION SPECIFICATIONS

TABLE 1: Structural Fill

SIEVE SIZE	PERCENT PASSING BY WEIGHT
5-inch	100
¾-inch	60 - 100
No. 4	20 - 80
No. 200	0 - 10

NOTES:

1. For use as structural load support below foundations and within the building pad. Structural Fill placed beneath building foundations should include the Footing Zone of Influence which is defined as that area extending laterally one foot from the edge of the footing then outward and downward at a 1:1.5 (H:V) splay.
2. ¾-inch crushed stone may be used in wet conditions.
3. Structural Fill should be free of construction and demolition debris, frozen soil, organic soil, peat, stumps, brush, trash, and refuse;
4. Structural Fill should not be placed on soft, saturated, or frozen subgrade soils;
5. Structural Fill should be placed in lifts not exceeding 12 inches for heavy vibratory rollers and 8 inches for vibratory plate compactors.
6. Place and compact within $\pm 3\%$ of optimum moisture content.
7. Compact to at least 95% relative compaction per ASTM D1557.
8. The adequacy of the compaction efforts should be verified by field density testing.

TABLE 2: Clean Granular Fill

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3-inch	100
¾-inch	60 – 90
No. 4	20 – 70
No. 200	2 – 8

NOTES:

1. Should consist of crushed stone beneath the concrete pad, as approved by on-site geotechnical engineer.
2. For minimum 9-inch base below the floor slab-on-grade.
3. For minimum 12-inch base for exterior concrete slabs exposed to frost.
4. For minimum 18-inch base at exterior ramps, aprons, and loading bays adjacent to entrances/exit ways.
5. For use as footing and foundation wall backfill.
6. For use as backfill behind unbalanced foundation/retaining walls.
7. Place in lifts not exceeding 12 inches for heavy vibratory rollers and 8 inches for vibratory plate compactors.
8. Place and compact within $\pm 3\%$ of optimum moisture content.
9. Compact to at least 95% relative compaction per ASTM D1557.
10. Compact to at least 95% relative compaction per ASTM D1557 when placed as foundation wall backfill in conjunction with a bond break.
11. The adequacy of the compaction efforts should be verified by field density testing.

TABLE 3: Common Fill

SIEVE SIZE	PERCENT PASSING BY WEIGHT
6-inch	100
¾-inch	60 – 100
No. 4	20 – 85
No. 200	0 – 25

NOTES:

1. For use as common/subgrade fill in parking areas and roadway embankments.
2. For use as foundation wall backfill if used in conjunction with a bond break and sized/screened to 3-inch minus.
3. Place in lifts not exceeding 12 inches.
4. Maximum stone size should not exceed ½ the actual lift thickness.
5. Compact to at least 92% relative compaction per ASTM D1557 when placed as subgrade fill in parking areas or roadway embankments.
6. Compact to at least 95% relative compaction per ASTM D1557 when placed as foundation wall backfill in conjunction with a bond break.
7. The adequacy of the compaction efforts should be verified by field density testing.

APPENDIX C: RECOMMENDED DESIGN PARAMETERS FOR UNBALANCED WALLS

Lateral earth pressures for the structural design and stability analysis of unbalanced foundation walls (basement walls, retaining walls, etc.) are provided herein. The following table outlines the recommended lateral earth pressure coefficients and equivalent fluid weights:

WALL CONDITION	LATERAL TRANSLATION (Δ/H)	EARTH PRESSURE COEFFICIENT (K)
restrained	0	$K_o = 0.50$
no restraint	0.002	$K_a = 0.31$
no restraint	0.02	$K_p = 3.25$
seismic	n/a	K_{eq}

where: Δ = movement at top of wall by rotation or lateral translation

H = height of wall

The recommended lateral earth parameters are based upon and/or assume:

1. Rankine earth pressure theory;
2. Retaining wall backfilled with *Clean Granular Fill* (Table 1);
3. Unit weight of backfill less than 135 pcf;
4. No hydrostatic pressures;
5. Surcharge loading; The proposed basement wall should be designed to support the surcharge loading from the proposed building. Parking areas and roadway will be proximally located to the proposed foundation walls, and where applicable, the walls should be designed with a minimum surcharge load of 250 psf in accordance with the *AASHTO Standard Specification for Highway Bridges*;
6. A level backfill in front and behind of wall;
7. Dynamic/compaction stresses limited to 200 psf/foot;
8. The top 2 feet of soils in front of exterior retaining walls should not be considered for passive resistance;
9. Seismic loading shall be applied as required by the *IBC*;
10. Use of only small plate compactors within 3 feet of the top of wall.

The lateral resistance of retaining walls should also accommodate any surcharge loads. Uniformly distributed loads should be superimposed along the face of the wall at a magnitude equal to the surcharge pressure multiplied by the appropriate earth pressure coefficient. Surcharge loads should be considered where they are located within a horizontal distance equivalent to 1 times the height of the wall. Any anticipated point or line loads situated behind the wall should be evaluated in accordance with linear elastic theory.

For frost protection and proper drainage, it is recommended that *Clean Granular Fill* be placed

directly behind unbalanced walls. The ground surface immediately adjacent to the unbalanced wall should be sloped away from the building to allow for positive drainage. It is also recommended that the final surface materials adjacent to the wall be relatively impermeable to reduce the volume of precipitation infiltrating into the subgrade. Such impermeable materials include cement concrete, bituminous concrete, and/or vegetated silty/clayey topsoil.

Retaining walls (including basement walls) should be provided with adequate footing drains per the International Building Code. The perimeter foundation drain should be located at least 4 inches above the bottom of footing elevation and six inches outward from the edge of footing. The drains should not encroach within the Footing Zone of Influence, which is defined as that area extending laterally one foot from the edge of footing then outward and downward at a 1H:1.5V splay. Furthermore, the invert elevation of the drain should be at least 12 inches below the underside of the adjacent floor slab. The drains should consist of minimum 4-inch diameter perforated PVC-SDR 35 drain pipe encased within 12 inches of $\frac{3}{4}$ -inch stone and wrapped with a filter fabric such as Mirafi 140N or equal. If unbalanced walls cannot be drained to alleviate hydrostatic forces, then the lateral earth pressure should be increased to include full hydrostatic pressures.

Any footing and under-slab drains may discharge via gravity to a storm drain line not subject to surcharge. The Civil Engineer should review the discharge of the drains. The drains should be provided with permanent clean-outs at convenient locations to facilitate access to all sections of the system. Roof gutters and other storm collection should not be discharged to the footing/under-slab drains. Any recharge systems, infiltrators, and/or dry wells shall be kept away from the unbalanced/retaining walls to prevent hydrostatic surcharge.

The following interface friction angle(s), ϕ , and associated friction factors ($=\tan \phi$) are recommended for sliding resistance/overturning:

<u>Condition</u>	<u>Interface Friction Angle</u>	<u>Friction Factor</u>
Mass concrete (base of wall) on crushed gravel/stone	30	0.57
Mass concrete (base of wall) on Glacial Deposits	22	0.40
Formed concrete (wall) against Clean Granular Fill	22	0.40

APPENDIX D: CONCEPT PLAN & EXPLORATION LOCATION PLAN



SITE SCHEDULE

- C1** AREAS TO BE RE-GRADED AND PAVED, APPLY MARKINGS AS SHOWN, TYP., INCLUSIVE OF MIRAFI 500X GEOTEXTILE, 18" COARSE CRUSHED GRAVEL & 6" FINE CRUSHED GRAVEL
- C2** 4" THICK CONCRETE SIDEWALK, TYP., INCLUSIVE OF MIRAFI 500X GEOTEXTILE, 24" COARSE CRUSHED GRAVEL & 6" FINE CRUSHED GRAVEL
- C3** CONNECT 2" TYPE "K" COPPER WATER SERVICE LINE FROM EX. PIPE TO PROP. BLDG, INCLUSIVE OF GATE VALVE PER BURLINGTON DPW STANDARD
- C3A** ADD ALT. - WET TAP AT MAIN IN FLYNN AVE., 6" D.I. SERVICE LINE TO PROP. BLDG. & GATE VALVE PER BURLINGTON DPW STANDARD
- C4** CONNECT 6" PVC SANITARY SEWER SERVICE LINE FROM PROP. BLDG. TO EX. MAIN IN FLYNN AVE., INCLUSIVE OF CLEANOUT WITH BACKFLOW PREVENTER AS SHOWN
- C5** WOOD GUIDERAIL, TYP.
- C6** PRECAST CONCRETE BLOCK RETAINING WALL, MAX. HEIGHT 5'
- C7** BOULDER OR PRECAST CONCRETE BLOCK RETAINING WALL, MAX. HEIGHT 3'
- C8** FOCAL POINT STORMWATER TREATMENT SYSTEM INCLUDING RAIN GUARDIAN TURRET & NYLOPLAST OUTLET DRAIN, TYP.
 - A. 25 SF TREATMENT AREA AT EL. 143.0
 - B. 75 SF TREATMENT AREA AT EL. 142.0
 - C. 75 SF TREATMENT AREA AT EL. 142.0
 - D. 275 SF TREATMENT AREA AT EL. 144.0
- C9** (143) ADS SC-310 STORMTECH CHAMBERS BELOW PARKING
- C10** 18" HDPE OUTLET PIPE FROM C9 INCLUDING FLARED END SECTION
- C11** 4' I.D. MANHOLE PROVIDING CONNECTION FROM C8A TO C9
- C12** CONCRETE PAD SURROUNDED BY PRIVACY FENCE WITH LOCKING GATE SIZED FOR (2) REFUSE DUMPSTERS
- C13** TRANSFORMER ON CONCRETE PAD SURROUNDED BY BOLLARDS, COORDINATE WITH MEP
- C14** 6" PERF. PVC FOOTING DRAIN AROUND BASEMENT LEVEL, DISCHARGE TO DAYLIGHT
- C14A** ADD ALT. - 6" PERF. FOOTING DRAIN AROUND FIRST FLOOR LEVEL, DISCHARGE TO DAYLIGHT
- C15** ELECTRIC VEHICLE CHARGING STATION WITH (2) CHARGE PORTS

Stamp	
Date	Description
No.	

ENGINEERING VENTURES PC

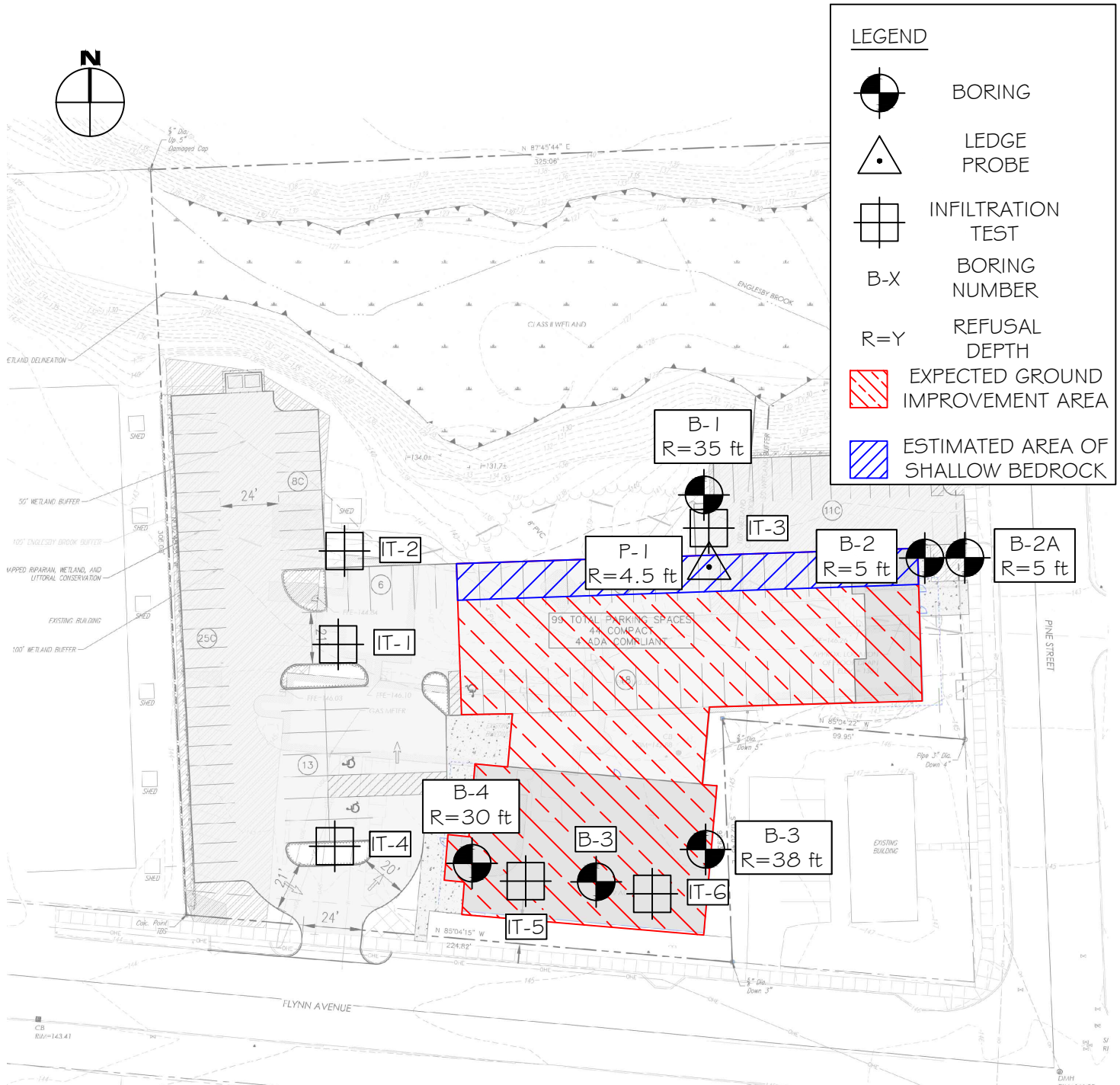
DUNCAN WISNIEWSKI
ARCHITECTURE
255 SOUTH CHAMPLAIN STREET
BURLINGTON, VT 05401
(802) 864-6693

SITE UTILITY AND LAYOUT PLAN

HOWARD CENTER REDEVELOPMENT
855 PINE STREET/300 FLYNN AVENUE
CITY OF BURLINGTON, CHITTENDEN COUNTY, VERMONT

EV Project #	22488
Drawn By:	JG
Checked By:	KW
Scale:	1" = 20'
Date:	12/09/2022

C2.0



DATE: 02/06/23	DRAWING NAME:
JOB # 22-04-138	EXPLORATION LOCATION PLAN
DRAFT: TM	PROJECT: HOWARD HEALTH CENTER RENOVATIONS
DESIGN: QG	BURLINGTON, VERMONT
REVIEW: SL	CLIENT: HOWARD HEALTH CENTER
REVISIONS:	BURLINGTON, VERMONT



DRAWING #:
1

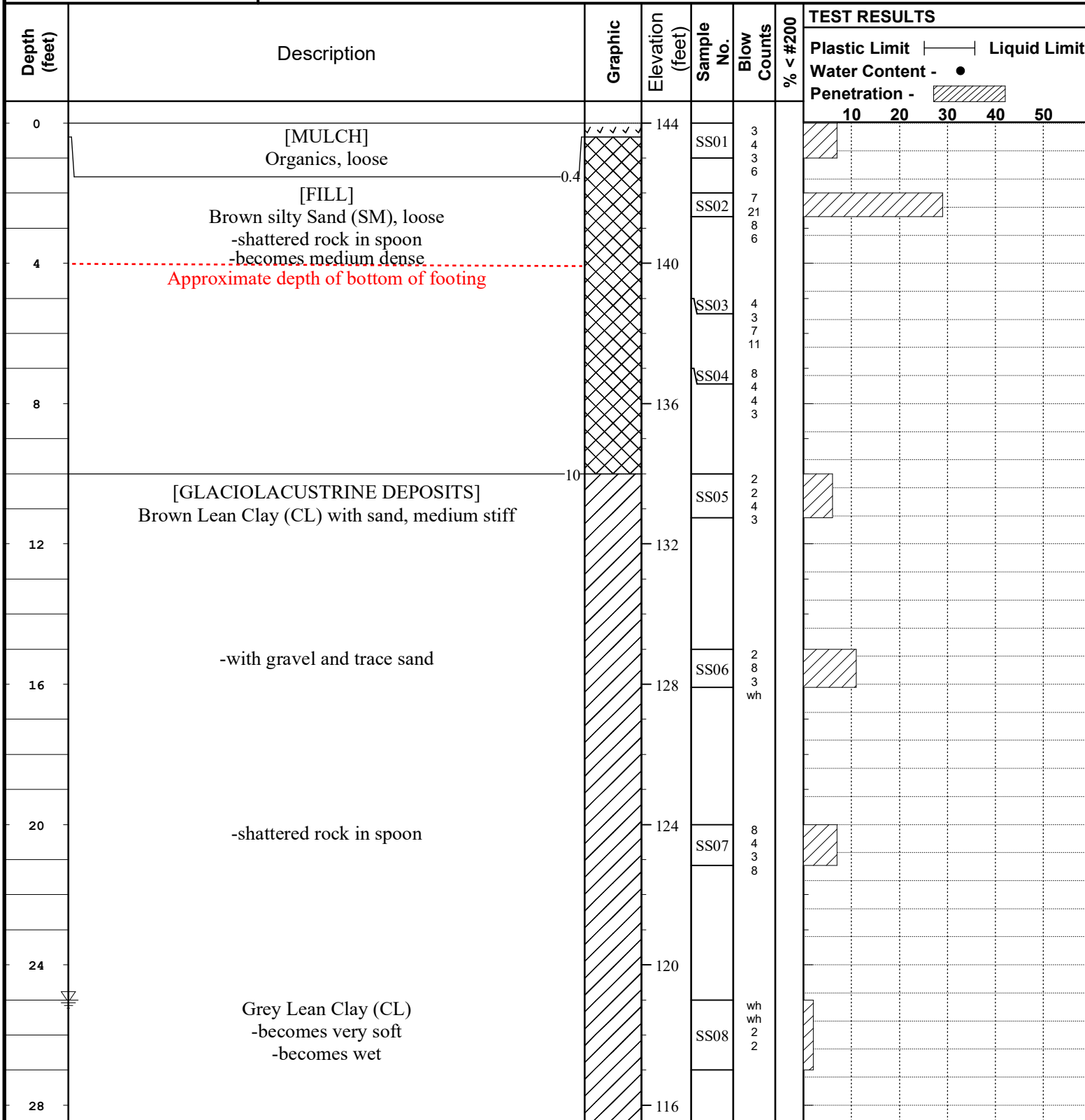
APPENDIX E: EXPLORATION LOGS & KEY TO SYMBOLS AND DESCRIPTIONS



LOG OF BORING No. B-1

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 25 AFTER 24 HOURS: 25

This information pertains only to this boring and should not be interpreted as being indicative of the site.





LOG OF BORING No. B-1

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 25 AFTER 24 HOURS: 25

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS				
							Plastic Limit	—	Liquid Limit	Water Content	Penetration
32			112	SS09	wh wh wh 18						
36	Auger Refusal Boring terminated at 35 ft.		108	SS10	25/0 - -						
40			104								
44			100								
48			96								
52			92								
56			88								



LOG OF BORING No. B-2

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: ≅ AFTER 24 HOURS: ≅

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS				
							Plastic Limit	—	Liquid Limit	Water Content	Penetration
0	[TOPSOIL] Dark brown silty Sand (SM) with organics, loose		144	SS01	2 2 3 4						
	[GLACIOLACUSTRINE DEPOSITS] Brown Lean Clay (CL), medium stiff -becomes stiff				2 7 6 8						
4	Approximate depth of bottom of footing		140								
	Auger Refusal Boring terminated at 5 ft.			SS03	25/0						
8			136								
12			132								
16			128								
20			124								
24			120								
28			116								



LOG OF BORING
No. B-2A

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: ≡ AFTER 24 HOURS: ≡

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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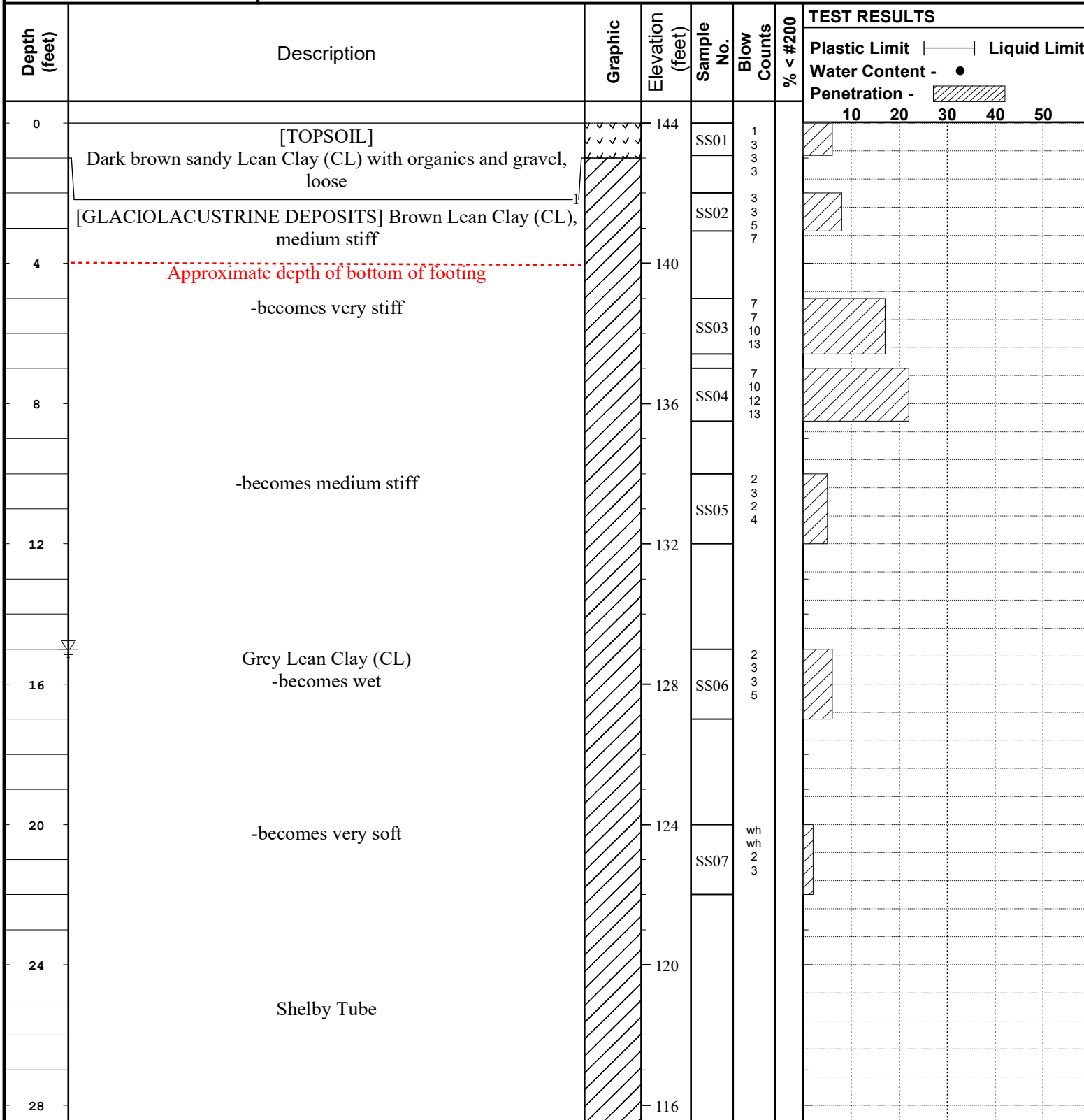
7 feet east of B-2



LOG OF BORING No. B-3

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 15 AFTER 24 HOURS: 15

This information pertains only to this boring and should not be interpreted as being indicative of the site.





LOG OF BORING No. B-3

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 15 AFTER 24 HOURS: 15

This information pertains only to this boring and should not be interpreted as being indicative of the site.

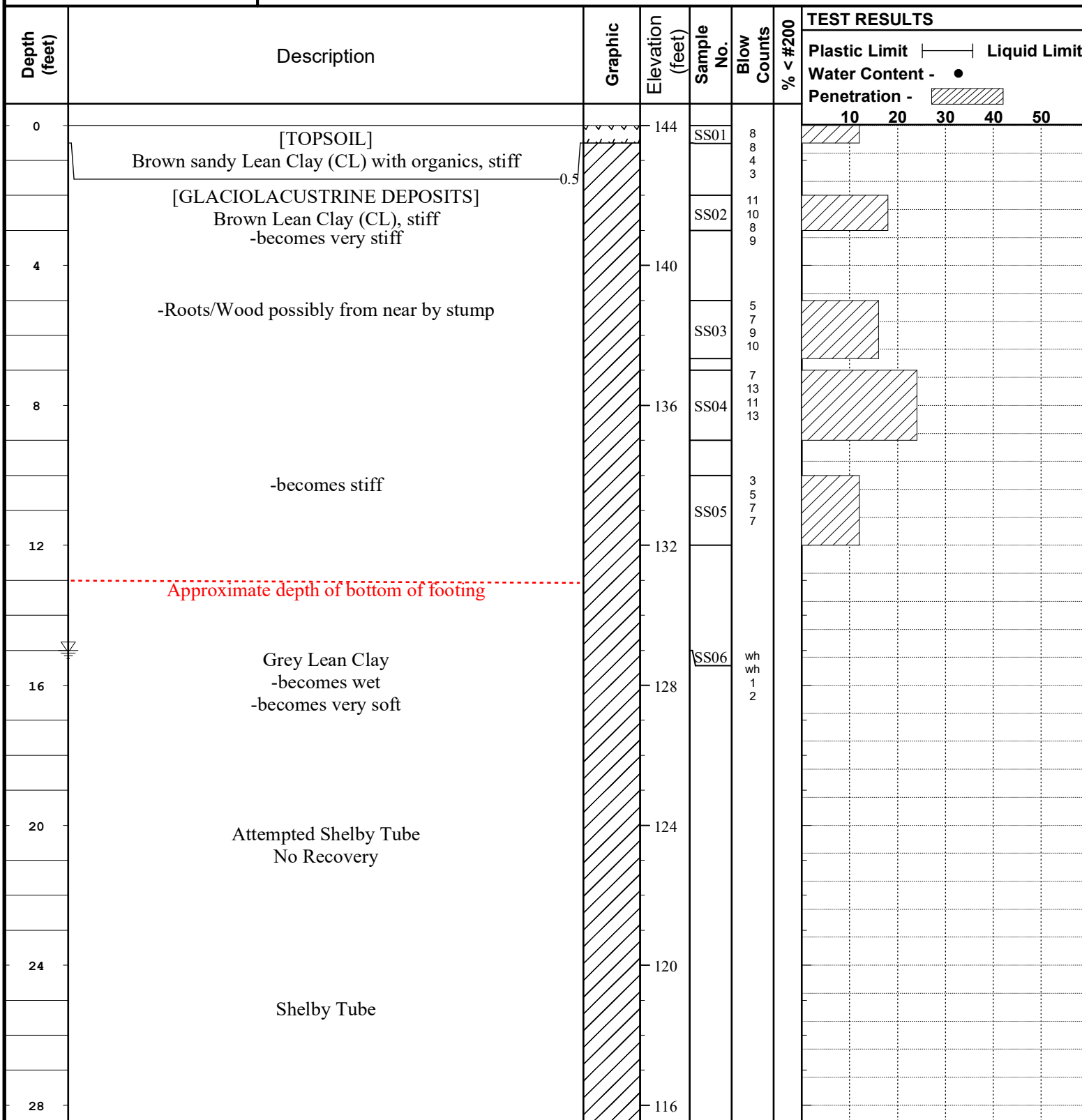
Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS				
							Plastic Limit	—	Liquid Limit	Water Content	Penetration
32			112	SS08	wh wh 3						
36			108								
	Auger Refusal Boring terminated at 38 ft.			SS09	25/0						
40			104								
44			100								
48			96								
52			92								
56			88								



LOG OF BORING No. B-4

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 15 AFTER 24 HOURS: 15

This information pertains only to this boring and should not be interpreted as being indicative of the site.





PROJECT: <u>Howard Center Redevelopment Project</u>		PROJECT NO.: <u>22-04-138</u>	
CLIENT: <u>Howard Center</u>			
PROJECT LOCATION: <u>300 Flynn Avenue, Burlington, Vermont</u>			
LOCATION: <u>Howard Center</u>		ELEVATION: <u>144</u>	
DRILLER: <u>Soil-X</u>		LOGGED BY: <u>Q. Guglielmo</u>	
DRILLING METHOD: <u>B-57 Truck Mounted Drilling Rig</u>		DATE: <u>12/12/22 & 12/13/22</u>	
DEPTH TO - WATER> INITIAL: <u>15</u>		AFTER 24 HOURS: <u>15</u>	

Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS				
							Plastic Limit	Water Content -	Liquid Limit	Penetration -	
					</						

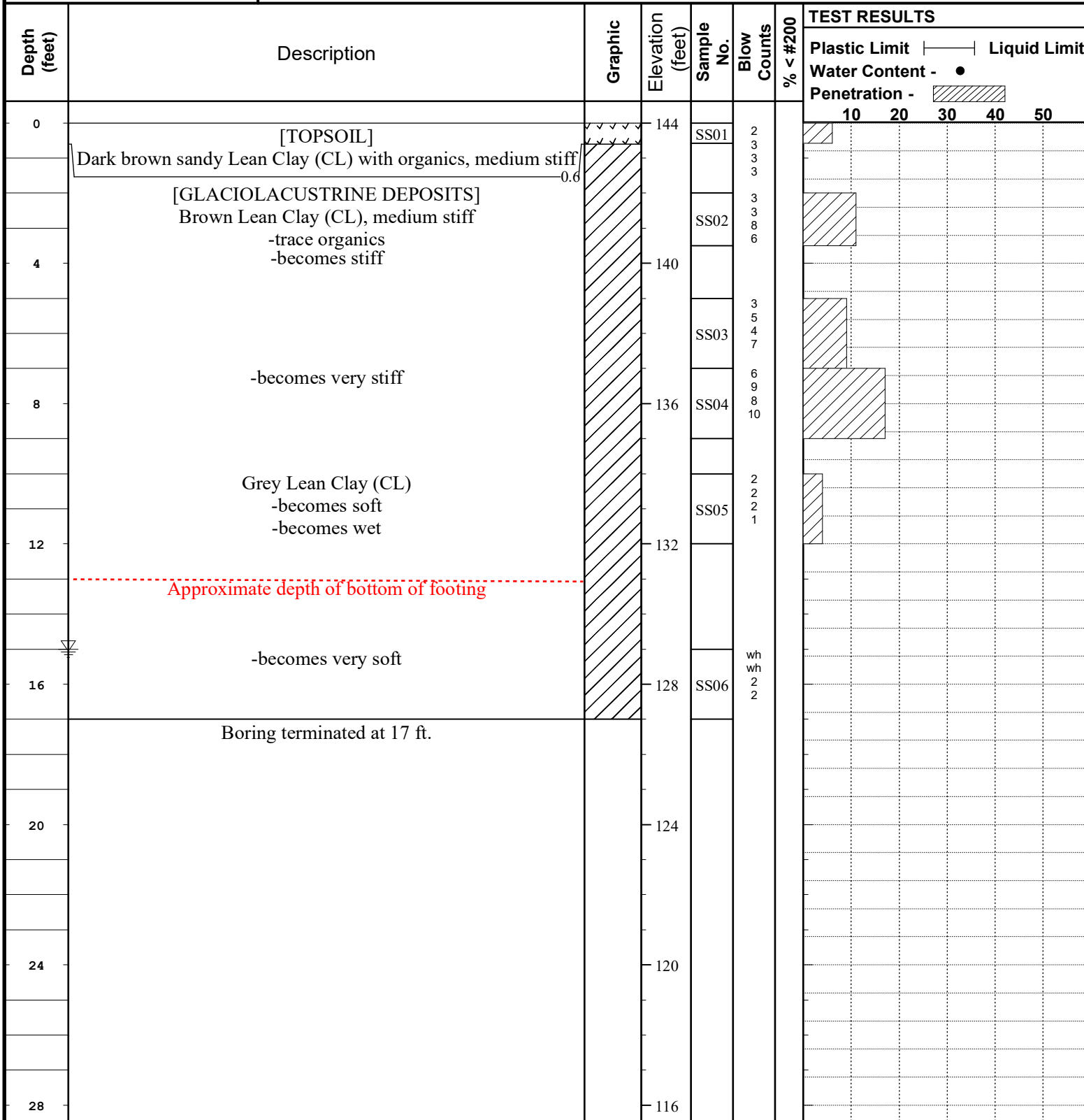
This information pertains only to this boring and should not be interpreted as being indicative of the site.



LOG OF BORING No. B-5

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: 15 AFTER 24 HOURS: 15

This information pertains only to this boring and should not be interpreted as being indicative of the site.





LOG OF BORING No. P-1

PROJECT: Howard Center Redevelopment Project PROJECT NO.: 22-04-138
CLIENT: Howard Center
PROJECT LOCATION: 300 Flynn Avenue, Burlington, Vermont
LOCATION: Howard Center ELEVATION: 144
DRILLER: Soil-X LOGGED BY: Q. Guglielmo
DRILLING METHOD: B-57 Truck Mounted Drilling Rig DATE: 12/12/22 & 12/13/22
DEPTH TO - WATER> INITIAL: ≡ AFTER 24 HOURS: ≡

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Elevation (feet)	Sample No.	Blow Counts	% < #200	TEST RESULTS				
							Plastic Limit	—	Liquid Limit	Water Content	•
							Penetration	-			
0	Augered directly to 4.5 feet		144				10	20	30	40	50
4	Approximate depth of bottom of footing Auger Refusal Boring terminated at 4.5 ft.		140								
8			136								
12			132								
16			128								
20			124								
24			120								
28			116								

MAJOR DIVISIONS			SYMBOLS		TYPICAL NAMES	
COARSE-GRAINED SOILS OVER 50% > No.200 SIEVE SIZE	GRAVELS	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW		Well-graded gravels or gravel-sand mixtures, little or no fines	
			GP		Poorly graded gravels or gravel-sand mixtures, little or no fines	
		GRAVELS WITH OVER 15% FINES	GM		Silty gravels, gravel-sand mixtures	
			GC		Clayey gravels, gravel-sand-clay mixtures	
	SANDS	CLEAN SANDS WITH LESS THAN 5% FINES	SW		Well-graded sand or gravelly sands, little or no fines	
			SP		Poorly graded sands or gravelly sands, little or no fines	
		SANDS WITH OVER 15% FINES	SM		Silty sand, sand-silt mixtures	
			SC		Clayey sands, sand-clay mixtures	
FINE-GRAINED SOILS OVER 50% < No.200 SIEVE SIZE	SILTS & CLAYS LIQUID LIMIT 50% OR LESS		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL		Organic silts and organic silty clays of low plasticity	
	SILTS & CLAYS LIQUID LIMIT GREATER THAN 50%		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH		Inorganic clays of high plasticity, fat clays	
			OH		Organic clays of medium to high plasticity, organic silty clays, organic silts	
			PT		Peat and other highly organic soils	
	HIGHLY ORGANIC SOILS					

KEY TO SYMBOLS AND DESCRIPTIONS

Shelby Tube

Standard Split Spoon Sample

Rock Core

Vane Shear

Geoprobe Sample

Water Table
(at time of drilling)

Auger Cuttings

3" Split Spoon Sample

Dynamic Cone Penetrometer

Bulk/Grab Sample

Sonic or Vibro-Core Sample

Water Table
(after 24 hours)

TYPICAL SYMBOLS

Term	Description
Dry	Absence of moisture; dusty, dry to touch
Moist	Damp but no visible water
Wet	Visible free water

The descriptor "damp" should not be used (use "moist").
The descriptor "saturated" should not be used (use "wet").

Recessed Cover Set in Concrete

Top of Well, Recessed Pipe

Covered Riser

Capped Riser w/ Locking Cover

Pipe Riser

Concrete Seal

Gravel Backfill

Assorted Cuttings

Bentonite Slurry

Bentonite Pellets

Silica Sand, blank PVC

Slotted Pipe w/ Sand

Endcap on Pipe Packed in Sand

Silica Sand, No Pipe (End Plug)

WELL SYMBOLS

CLASSIFICATION	RANGE OF GRAIN SIZES		RELATIVE DENSITY/CONSISTENCY					PERCENT OR PORTIONS OF SOIL	
	U.S. Standard Sieve Size	Grain Size in Millimeters	Gravel, Sand, and Silt (nonplastic)		Silt (plastic) and Clay			Term	Description
BOULDERS	Above 12"	Above 305	N-Value	Relative Density	N-Value	Su	Consistency	Parting:	> 1/16 in.
COBBLES	12" to 3"	305 to 76.2	0 - 4	Very Loose	0 - 2	0 - 250	Very Soft	Seam:	0.5 in. to 1/16 in.
GRAVEL coarse fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.75 76.2 to 19.1 19.1 to 4.75	5 - 10	Loose	3 - 4	251 - 500	Soft	Layer:	12 in. to 0.5 in.
			11-30	Medium Dense	5 - 8	501 - 1000	Medium Stiff	Stratum:	> 12 in.
			31 - 50	Dense	9 - 15	1001 - 2000	Stiff	Pocket:	Small erratic deposit
SAND coarse medium fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.75 to 0.075 4.75 to 2.00 2.00 to 0.425 0.425 to 0.075	51 +	Very Dense	16 - 30	2001 - 4000	Very Stiff	Lens:	Lenticular deposit
					31 +	4001+	Hard	Occasional:	One or less per foot of thickness
			Standard Penetration Testing (SPT) N ₆₀ based on blows per 12 inches. WR = Weight of Rods; WH = Weight of Hammer					Frequent	More than one per foot of thickness
SILT & CLAY	Below No. 200	Below 0.075						Varved	Alternating seams or layers of silt and/or clay and sometimes f. sand

REFERENCE: UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488-93

INFILTRATION TEST LOGS

John Turner Consulting, Inc.	Site Location: 300 Flynn Avenue, Burlington, VT
-------------------------------------	--

IT-1	Depth to Water (in)				Depth to Gravel (in): 57	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	45	50	55	57	12	12
Trial 2	45	48	50	53	8	8
Trial 3	40	44	49	51	11	11
Trial 4	40	44	48	50	10	10

IT-2	Depth to Water (in)				Depth to Gravel (in): 49	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	28	28	28	28	0	0
Trial 2	28	28	28	28	0	0
Trial 3	28	28	28	28	0	0
Trial 4	28	28	28	28	0	0

IT-3	Depth to Water (in)				Depth to Gravel (in): 56	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	36	36	36	36	0	0
Trial 2	36	36	36	36	0	0
Trial 3	36	36	36	36	0	0
Trial 4	36	36	36	36	0	0

IT-4	Depth to Water (in)				Depth to Gravel (in): 55	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	31	31	31	31	0	0
Trial 2	31	31	31	31	0	0
Trial 3	-	-	-	-	-	-
Trial 4	-	-	-	-	-	-

IT-5	Depth to Water (in)				Depth to Gravel (in): 55	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	35	35	35	35	0	0
Trial 2	35	35	35	35	0	0
Trial 3	-	-	-	-	-	-
Trial 4	-	-	-	-	-	-

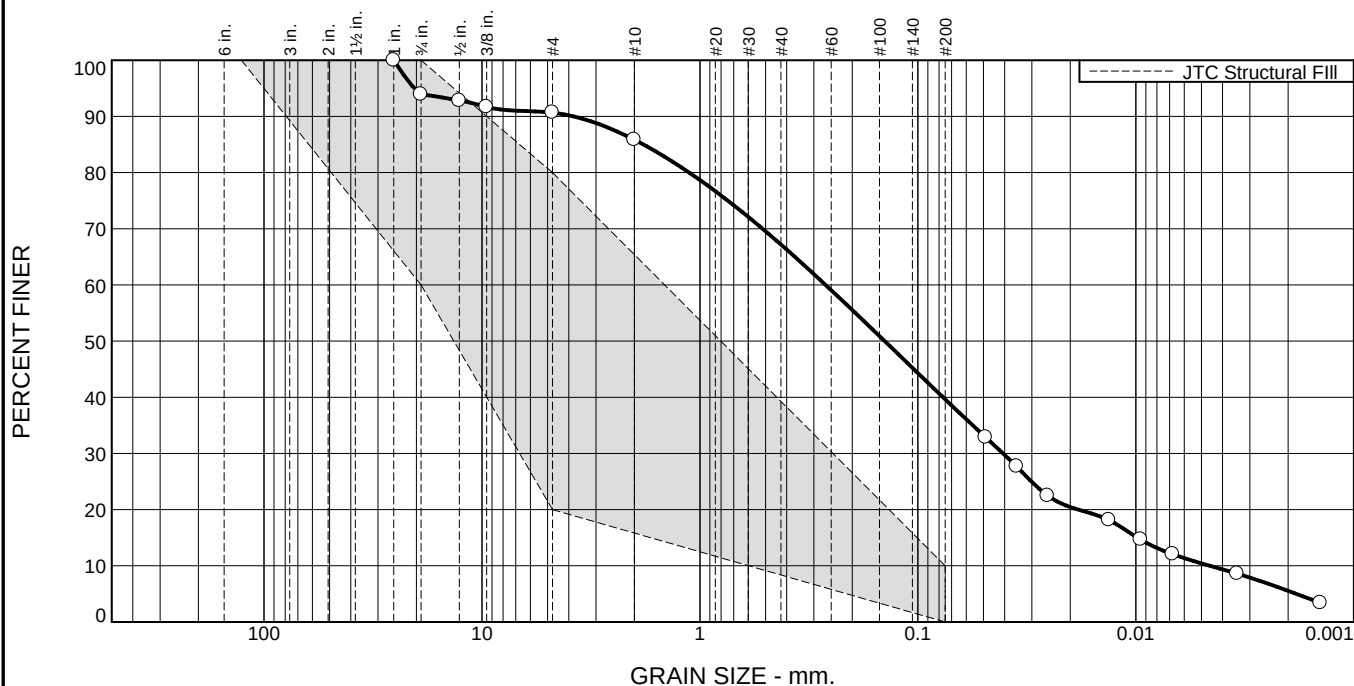
INFILTRATION TEST LOGS

John Turner Consulting, Inc.	Site Location: 300 Flynn Avenue, Burlington, VT
-------------------------------------	--

IT-6	Depth to Water (in)				Depth to Gravel (in): 52	
	15 min	30 min	45 min	60 min	Total Drop (in)	Drop/Hour (in/hr)
Trial 1	32	32	32	32	0	0
Trial 2	32	32	32	32	0	0
Trial 3	-	-	-	-	-	-
Trial 4	-	-	-	-	-	-

APPENDIX F: GEOTECHNICAL LABORATORY TESTING REPORTS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.1	3.2	4.9	18.6	27.6	29.2	10.4

Test Results (ASTM C 136 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0	60.0 - 100.0	X
3/4"	93.9		
1/2"	92.8		
3/8"	91.7		
#4	90.7	20.0 - 80.0	
#10	85.8		
0.0489 mm.	32.9		
0.0352 mm.	27.7		
0.0254 mm.	22.5		
0.0133 mm.	18.1		
0.0095 mm.	14.7		
0.0068 mm.	12.1		
0.0034 mm.	8.6		
0.0014 mm.	3.4		

* JTC Structural Fill

Material Description

Silty Sand

Atterberg Limits (ASTM D 4318)

PL= N/A LL= N/A PI= N/A

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D₉₀= 3.7911 D₈₅= 1.8186 D₆₀= 0.2651
D₅₀= 0.1420 D₃₀= 0.0407 D₁₅= 0.0098
D₁₀= 0.0046 C_u= 57.91 C_c= 1.36

Remarks

Moisture: 20.5%
non-plastic, non-liquid

Date Received: 12/13/22 Date Tested: 12/23/22

Tested By: AA

Checked By: Adam Allen

Title: Lab manager

Location: B-1 SS02
Sample Number: VT22-244

Date Sampled: 12/13/22

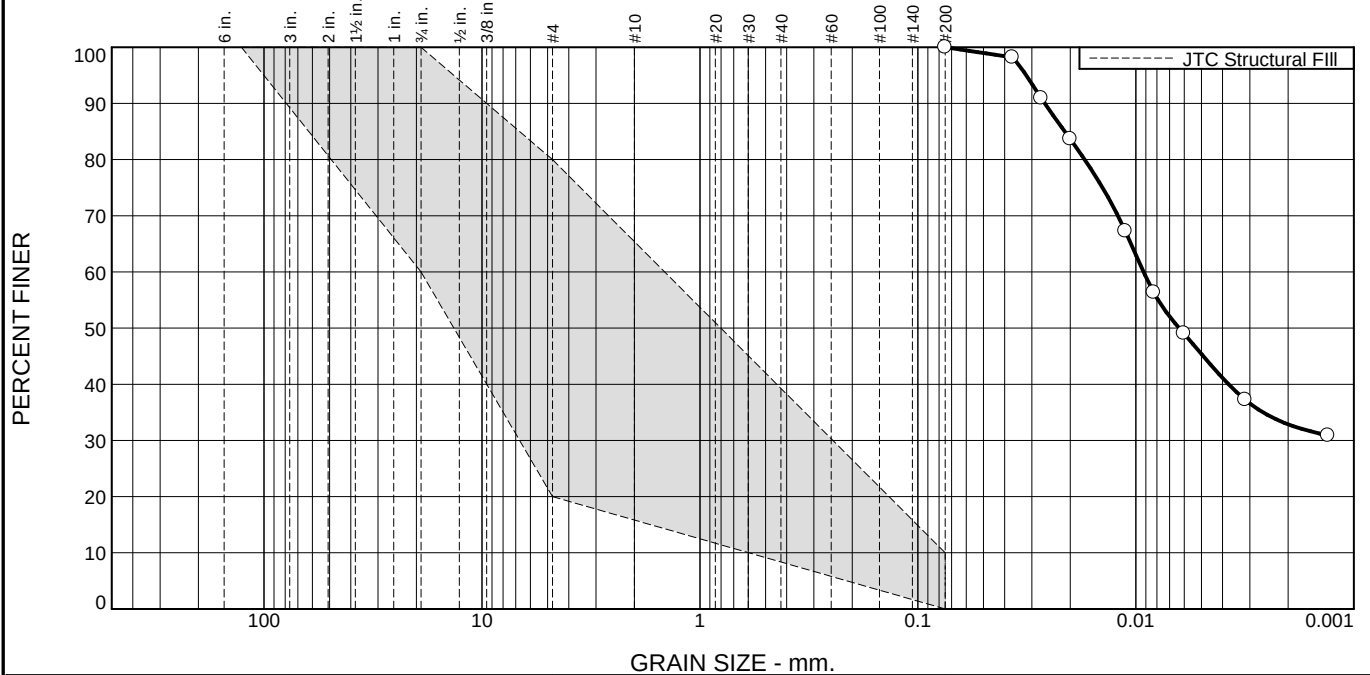


Client: Howard Center
Project: Howard Center Redevelopment Project

Project No: 22-04-138

Figure 003

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.0	54.6	45.4

Test Results (ASTM C 136 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#200	100.0	0.0 - 10.0	X
0.0368 mm.	98.2		
0.0272 mm.	90.9		
0.0200 mm.	83.6		
0.0112 mm.	67.3		
0.0083 mm.	56.3		
0.0060 mm.	49.1		
0.0031 mm.	37.2		
0.0013 mm.	30.9		

* JTC Structural Fill

Material Description

Lean Clay

Atterberg Limits (ASTM D 4318)

PL= 17 LL= 28 PI= 11

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-6(10)

Coefficients

D₉₀= 0.0262 D₈₅= 0.0212 D₆₀= 0.0092
D₅₀= 0.0063 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Moisture: 27.4%

Date Received: 12/13/22 Date Tested: 12/21

Tested By: AA

Checked By: Adam Allen

Title: Lab Manager

Location: B-3 SS06
Sample Number: VT22-242

Date Sampled: 12/13/22

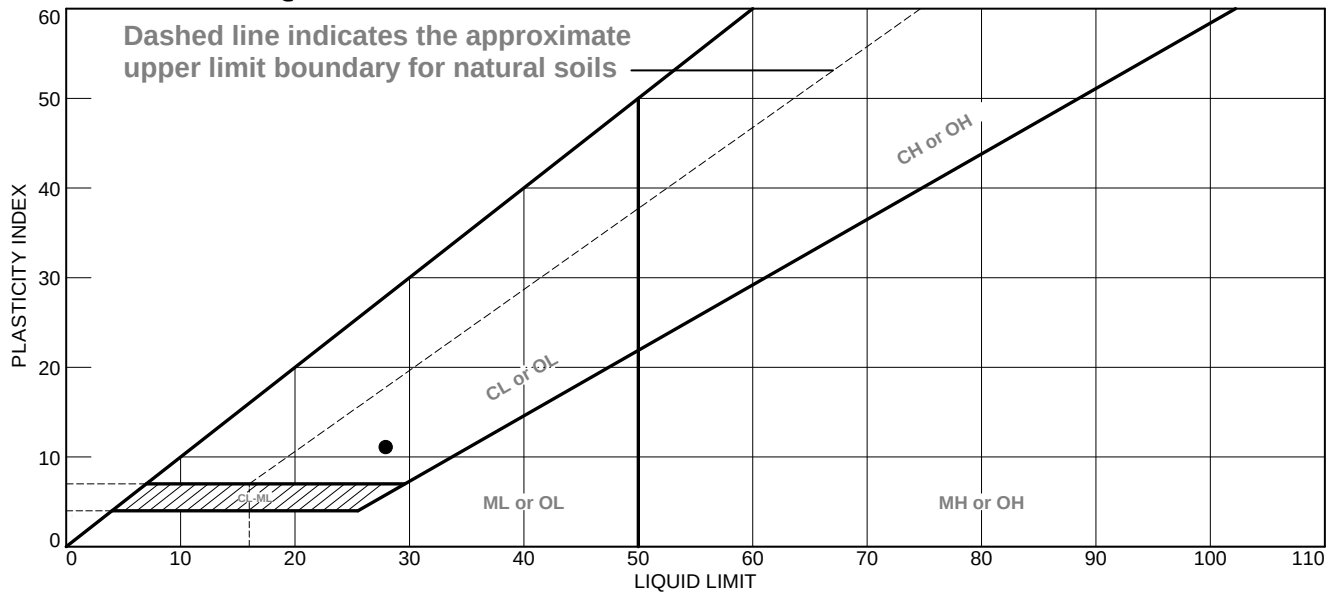


Client: Howard Center
Project: Howard Center Redevelopment Project

Project No: 22-04-138

Figure 001

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean Clay	28	17	11	100	100	CL

Project No. 22-04-138 **Client:** Howard Center

Project: Howard Center Redevelopment Project

Location: B-3 SS06

Sample Number: VT22-242

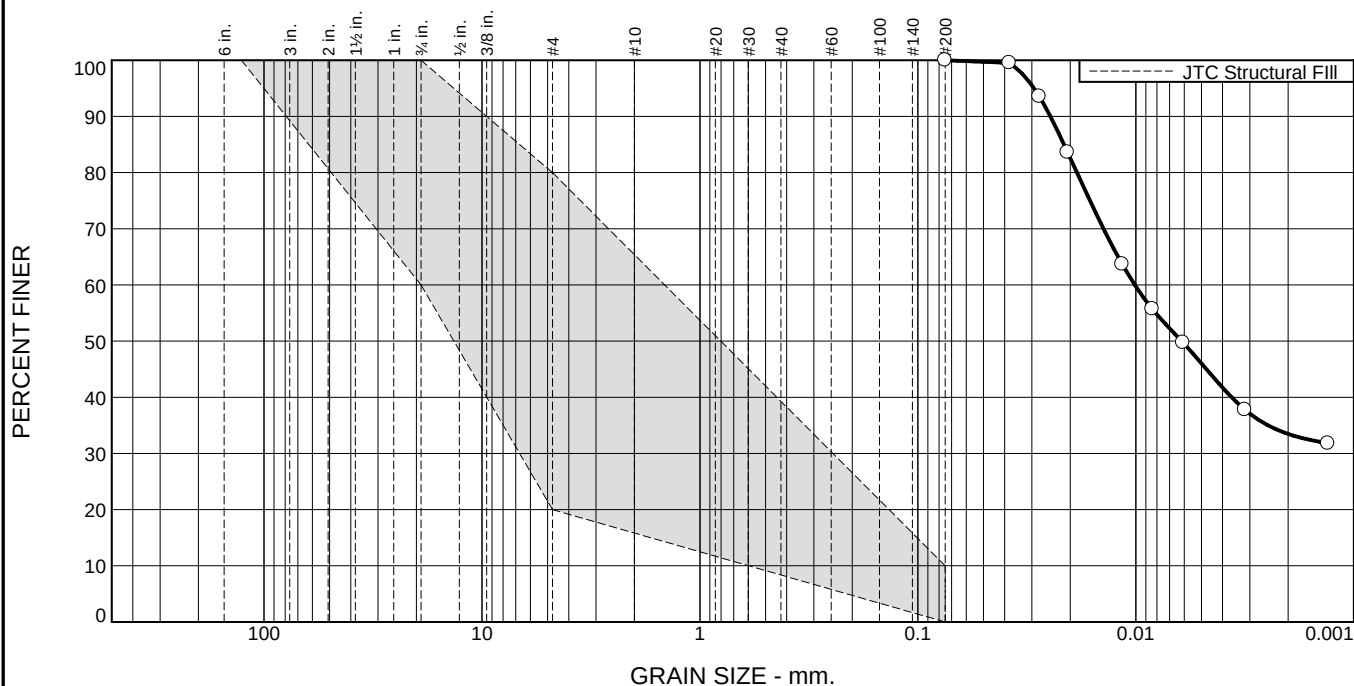
Remarks:



Figure 001B

Tested By: AA **Checked By:** Adam Allen

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.0	54.0	46.0

Test Results (ASTM C 136 & ASTM C 117)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#200	100.0	0.0 - 10.0	X
0.0380 mm.	99.5		
0.0277 mm.	93.6		
0.0206 mm.	83.6		
0.0115 mm.	63.7		
0.0084 mm.	55.7		
0.0061 mm.	49.7		
0.0032 mm.	37.8		
0.0013 mm.	31.8		

* JTC Structural Fill

Material Description		
Silt		
Atterberg Limits (ASTM D 4318)		
PL= 24	LL= 31	PI= 7
Classification		
USCS (D 2487)= ML	AASHTO (M 145)= A-4(8)	
Coefficients		
D ₉₀ = 0.0247	D ₈₅ = 0.0214	D ₆₀ = 0.0101
D ₅₀ = 0.0062	D ₃₀ =	D ₁₅ =
D ₁₀ =	C _u =	C _c =
Remarks		
Moisture: 26.5%		
Date Received: 12/13/22		Date Tested: 12/21/22
Tested By: AA		
Checked By: Adam Allen		
Title: Lab manager		

Location: B-5 SS04
Sample Number: VT22-243

Date Sampled: 12/13/22

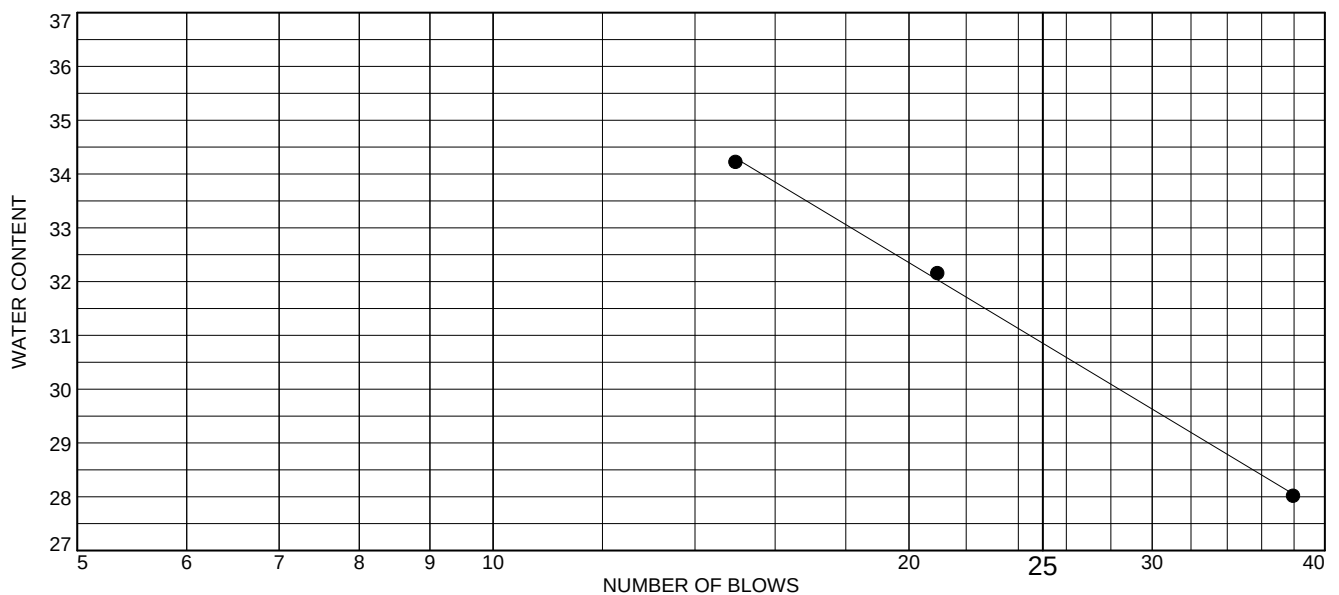
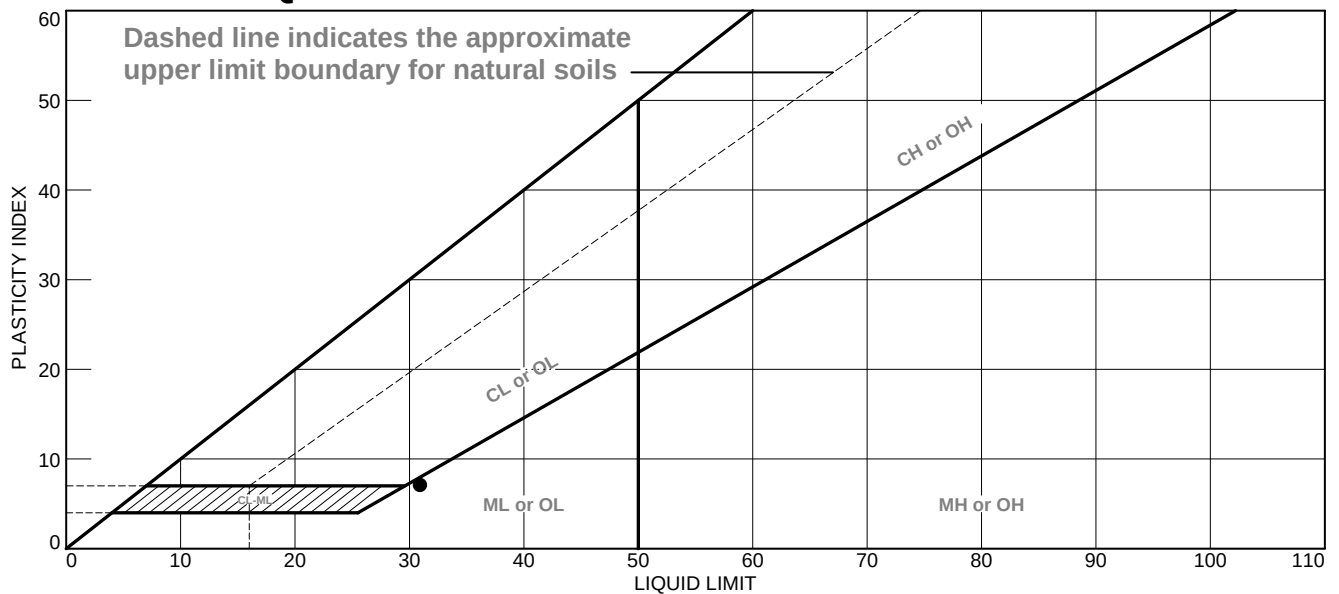


Client: Howard Center
Project: Howard Center Redevelopment Project

Project No: 22-04-138

Figure 002

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silt	31	24	7	100.0	100.0	ML

Project No. 22-04-138 **Client:** Howard Center

Project: Howard Center Redevelopment Project

Location: B-5 SS04

Sample Number: VT22-243

Remarks:



Figure 002B

Tested By: AA



Client: John Turner Consulting, Inc
 Project Name: Howard Center
 Project Location: Burlington, VA

GTX #: 316555
 Test Date: 12/13/22

Tested By: MD
 Checked By: ank

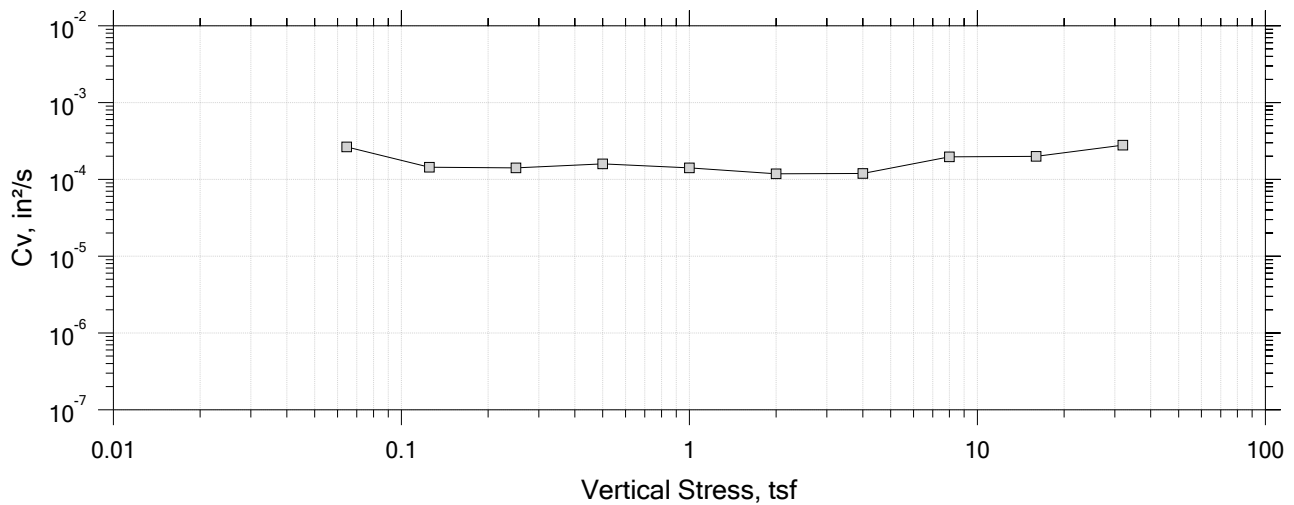
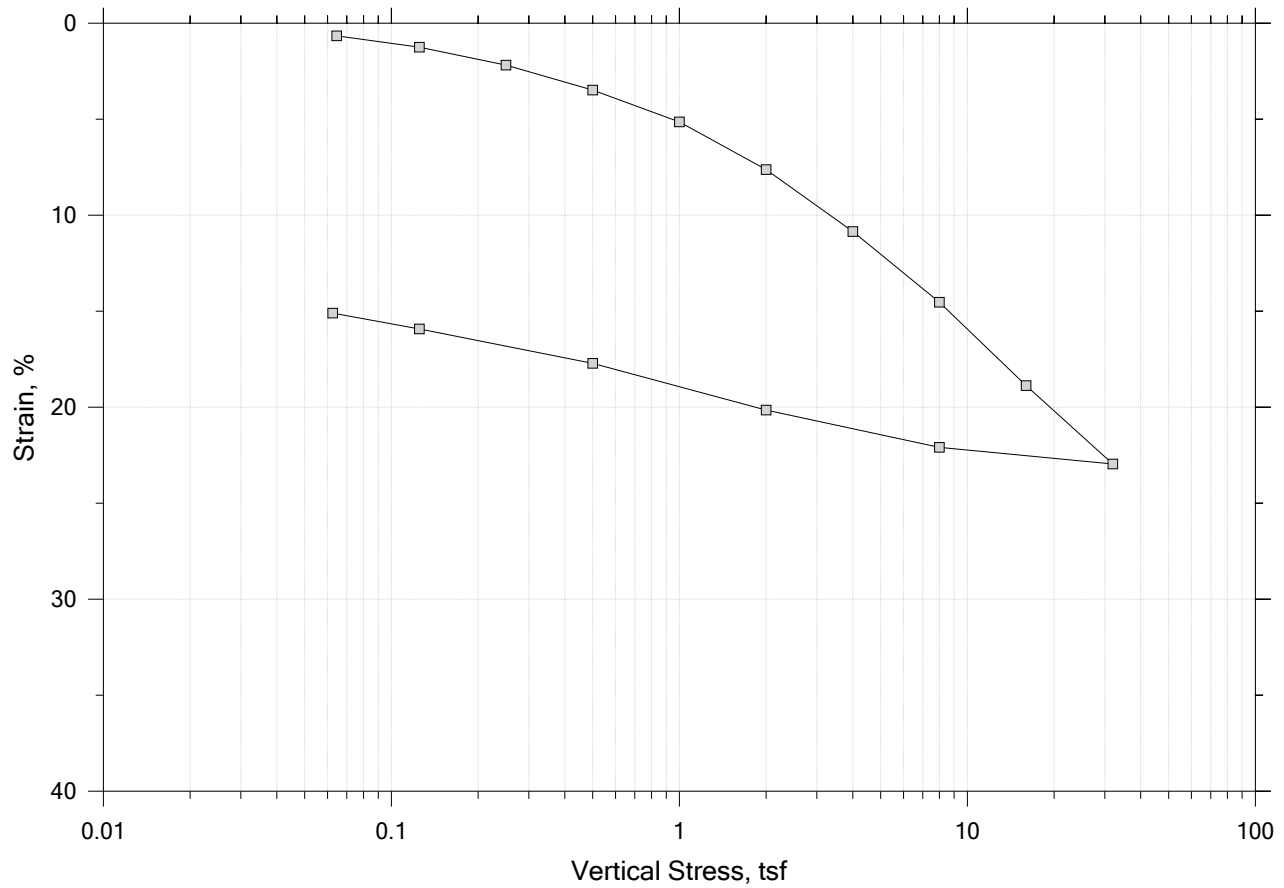
**Tube Handling with
 Moisture Content (ASTM D2216), Density of Soil (ASTM D7263),
 Hand-Held Torvane, & Visual Description**

Boring ID	Sample ID	Depth, ft	Section	Visual Description	Bulk Density, lb/ft ³	Moisture Content, %	Dry Density, lb/ft ³	Hand Held Torvane Readings, tsf			
								1	2	3	Average
B-3	---	25-27	Top	Moist,brown clay with sand	110.7	41.6	78.2	0.40	0.35	0.30	0.35
			Middle	Moist,brown clay with sand	120.3	29.6	92.8	0.32	0.35	0.35	0.34
			Bottom	Moist,brown clay with sand	120.6	26.9	95.0	0.90	1.13	0.60	0.88
B-4	---	25-27	Top	Moist, brown clay	104.0	46.7	70.9	0.40	0.30	0.38	0.36
			Middle	Moist, brown clay	106.5	45.6	73.1	0.31	0.37	0.35	0.34
			Bottom	Moist, brown clay	108.4	41.8	76	0.30	0.30	0.30	0.30

Notes: Density determined on undisturbed tube samples provided to GeoTesting Express in Shelby tubes
 Moisture content determined by ASTM D2216 at 110° C

One-Dimensional Consolidation by ASTM D2435 - Method B

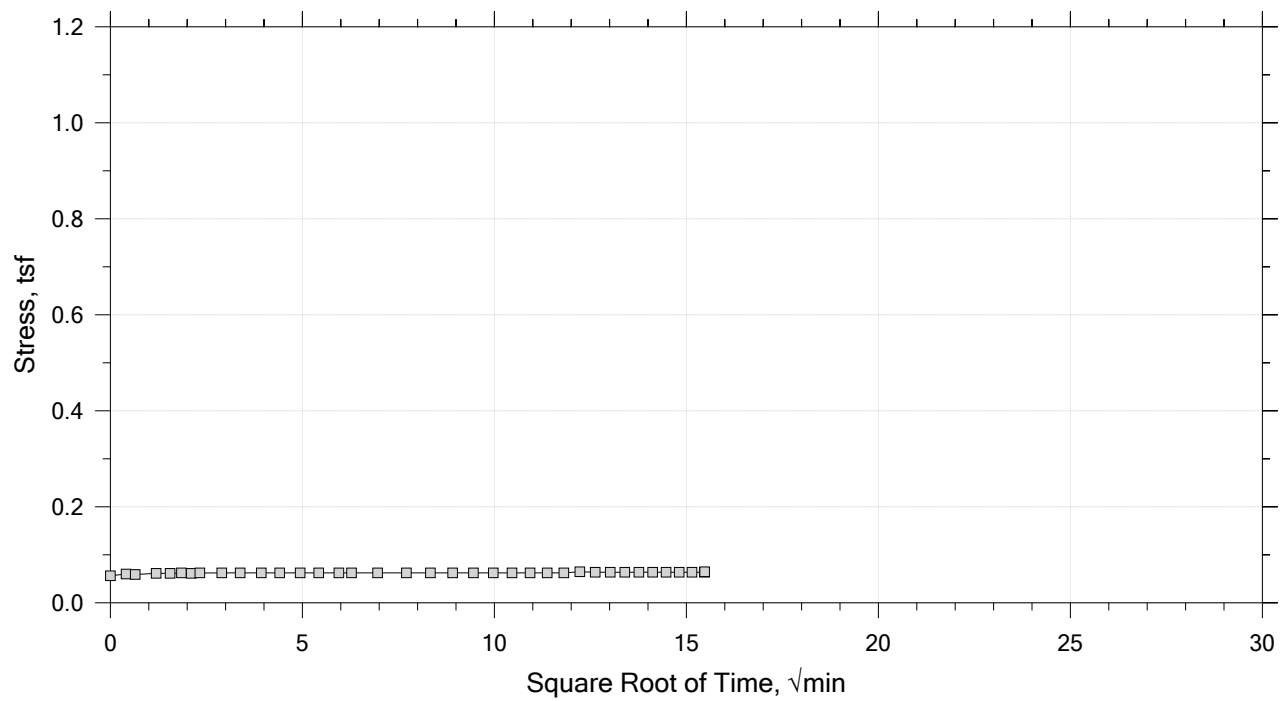
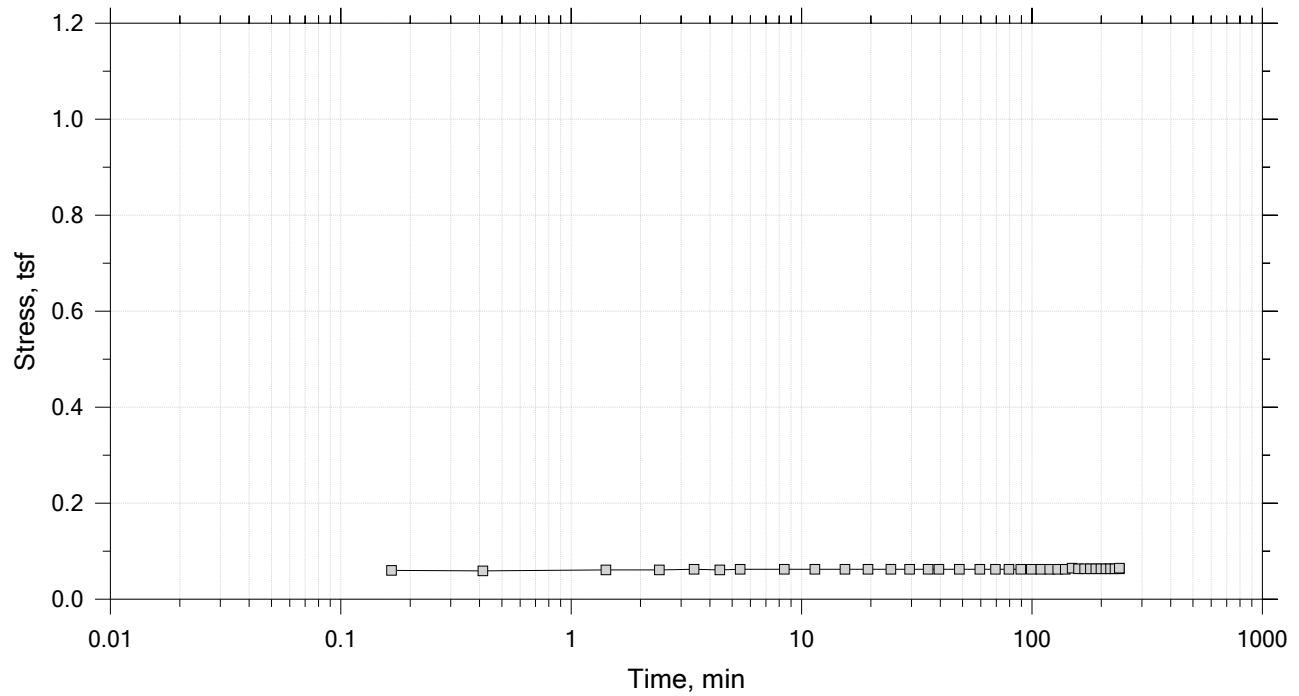
Summary Report



	Project: Howard Center	Location: Burlington, VT	Project No.: GTX-316555
	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0646 tsf



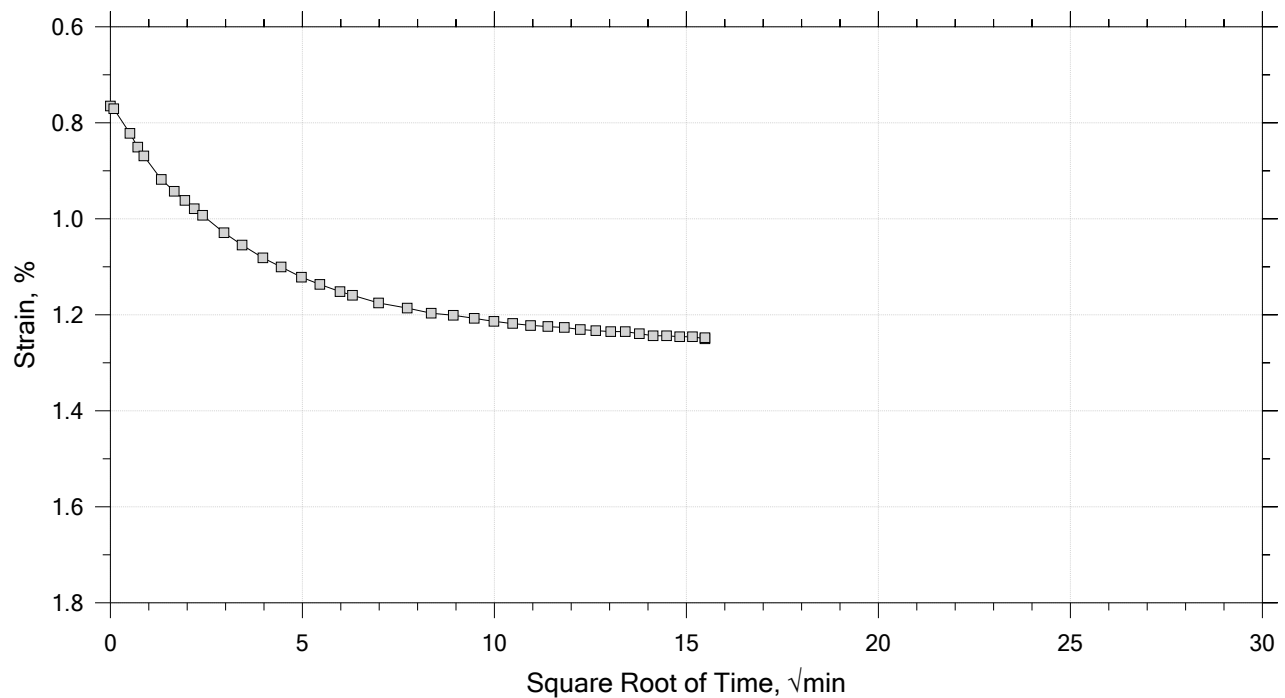
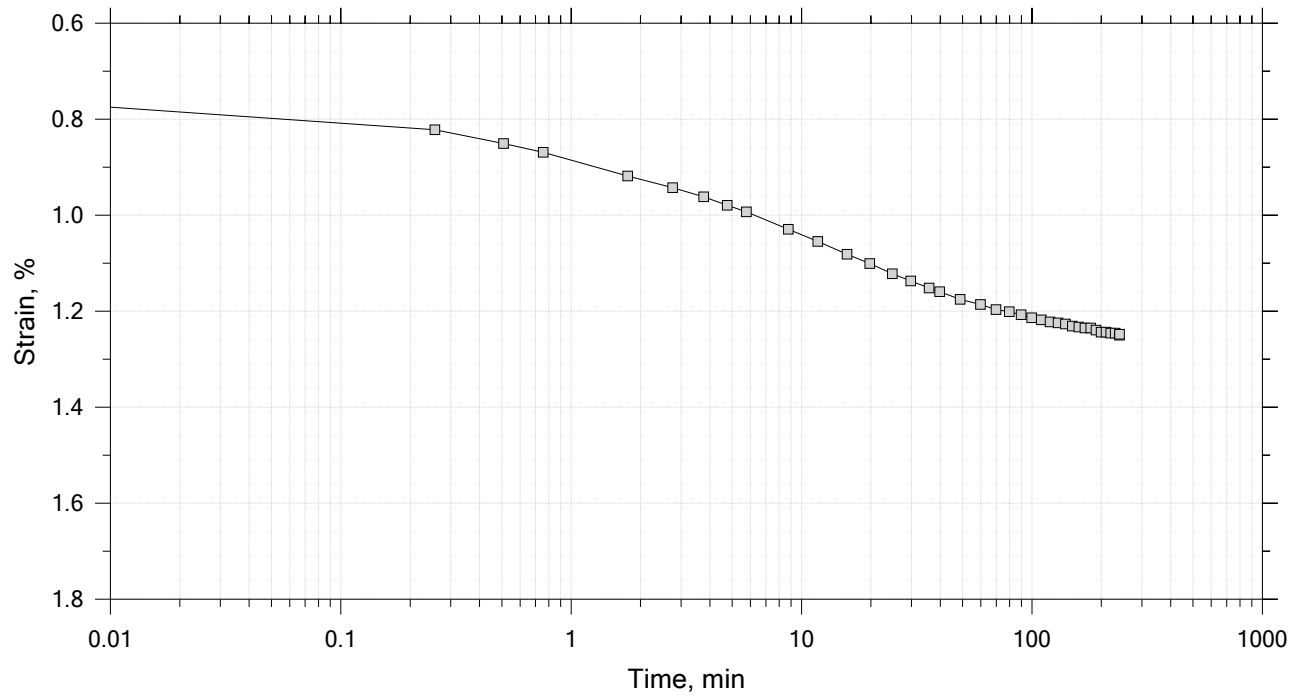
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



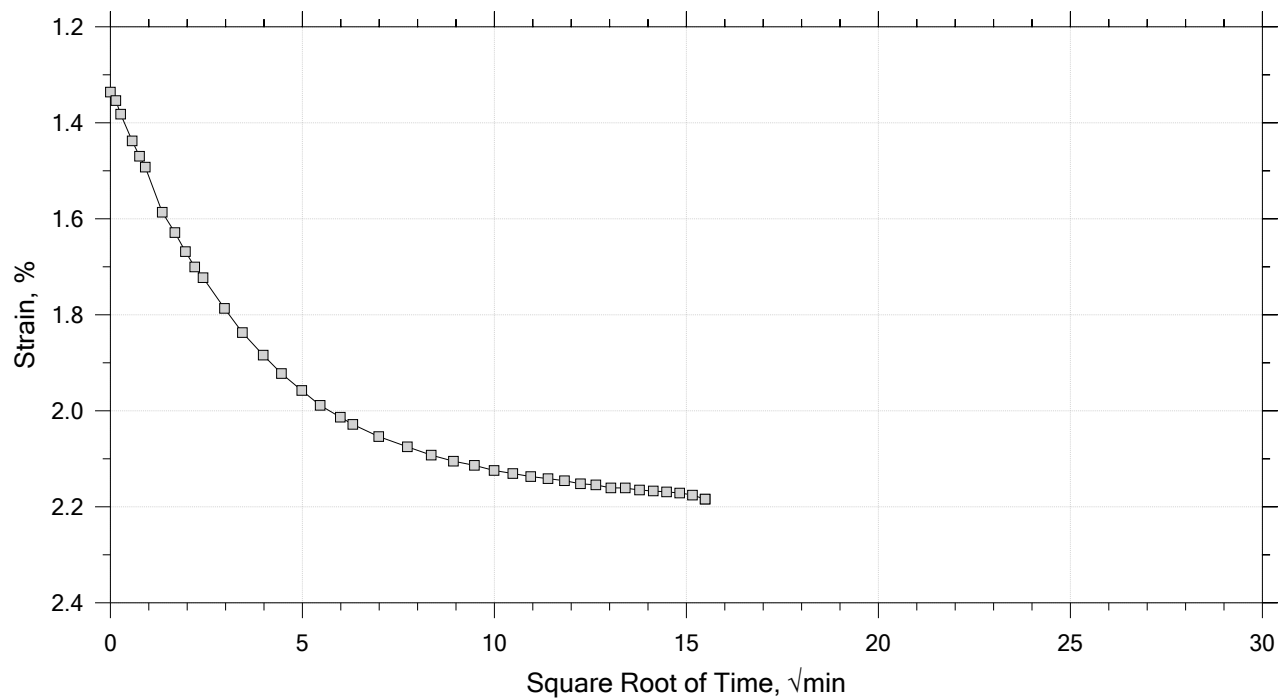
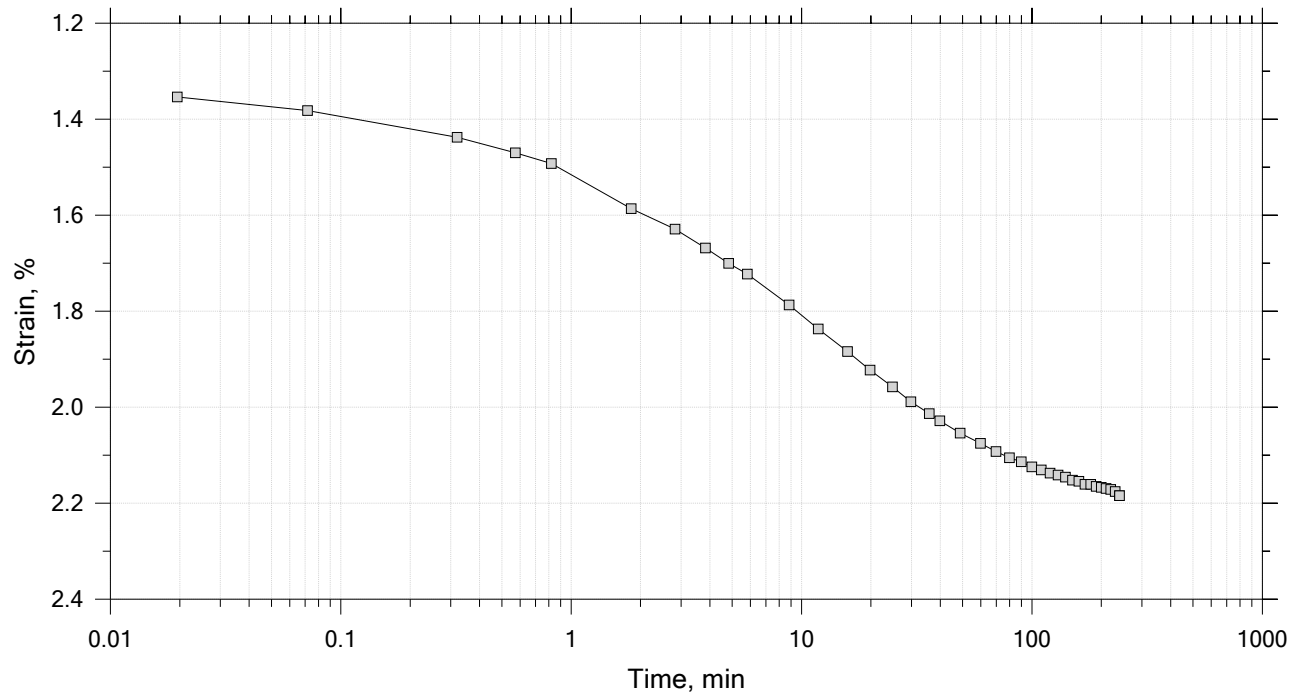
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



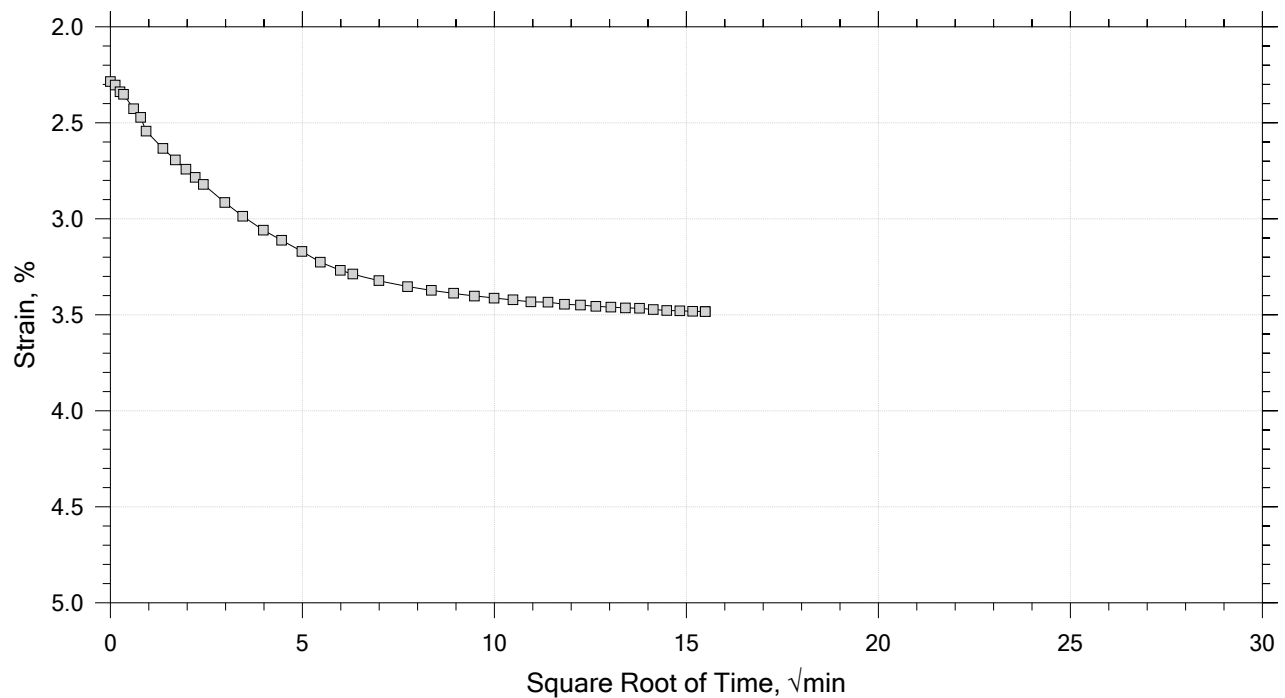
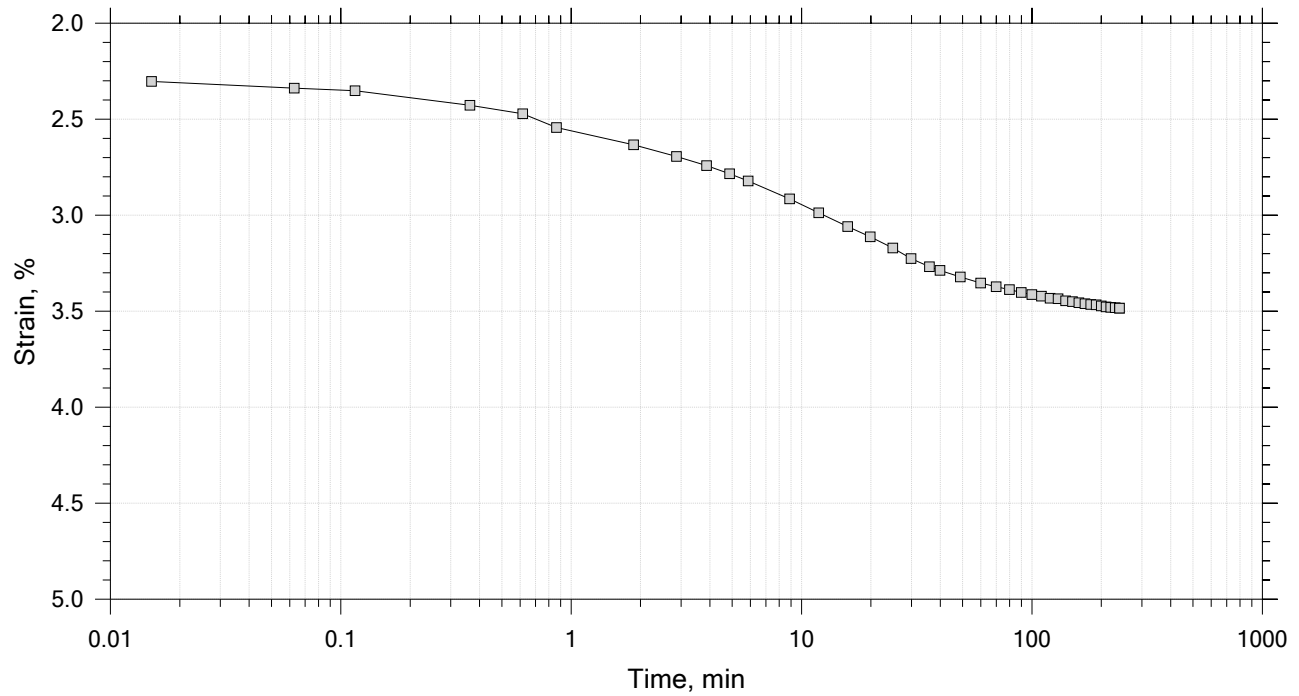
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



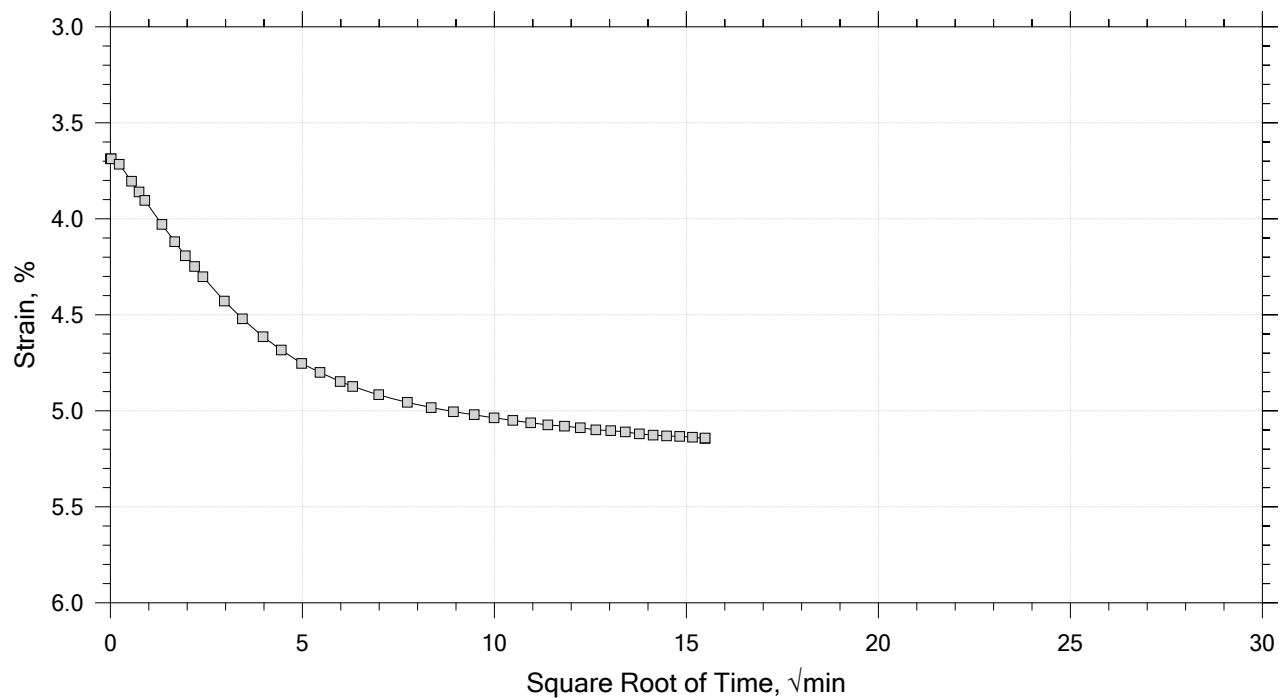
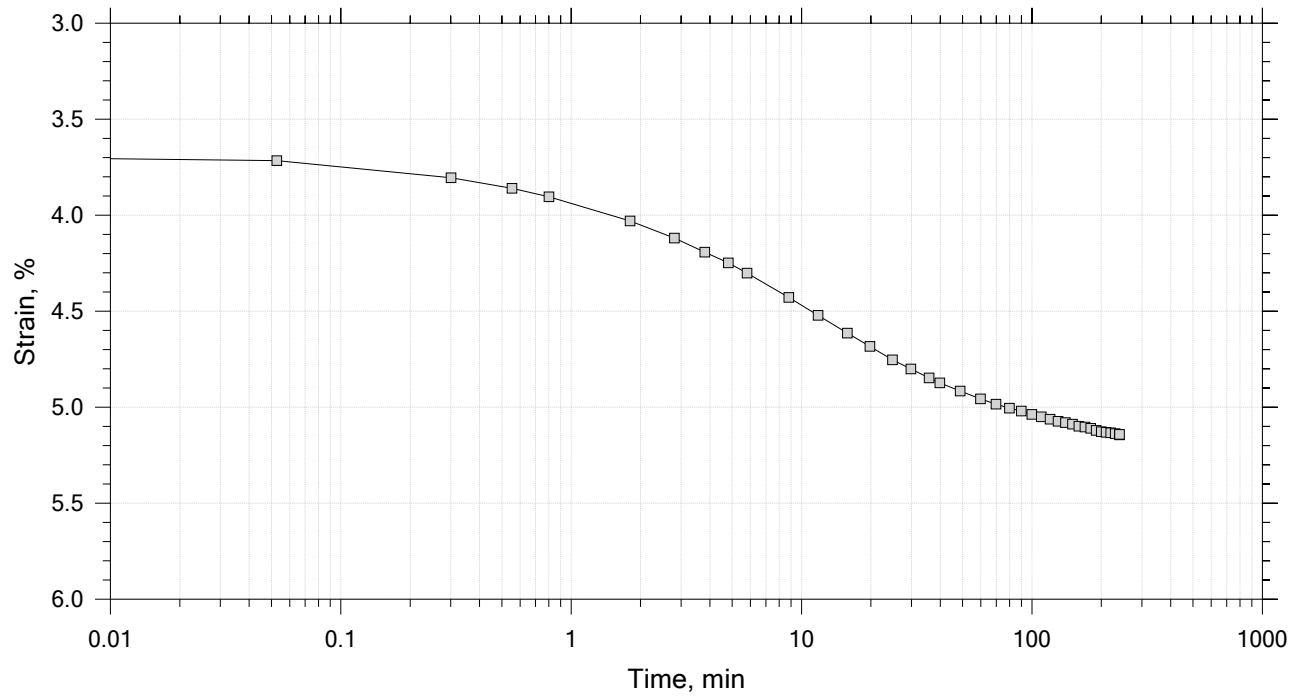
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



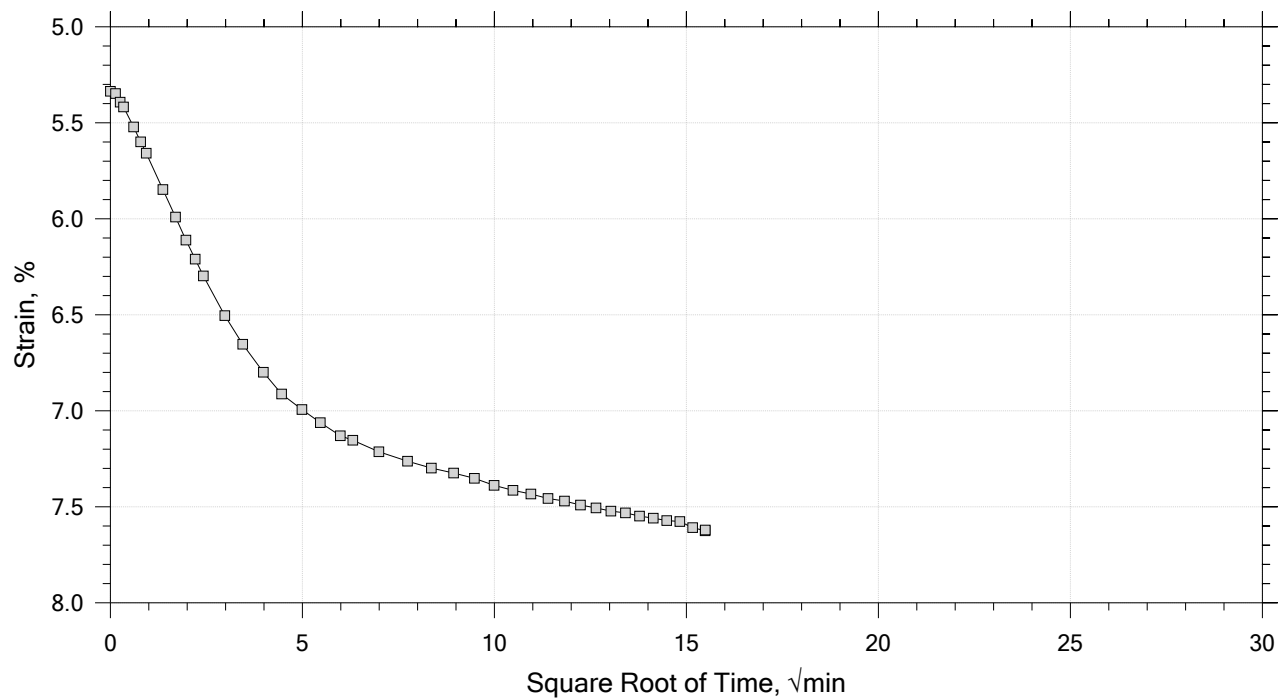
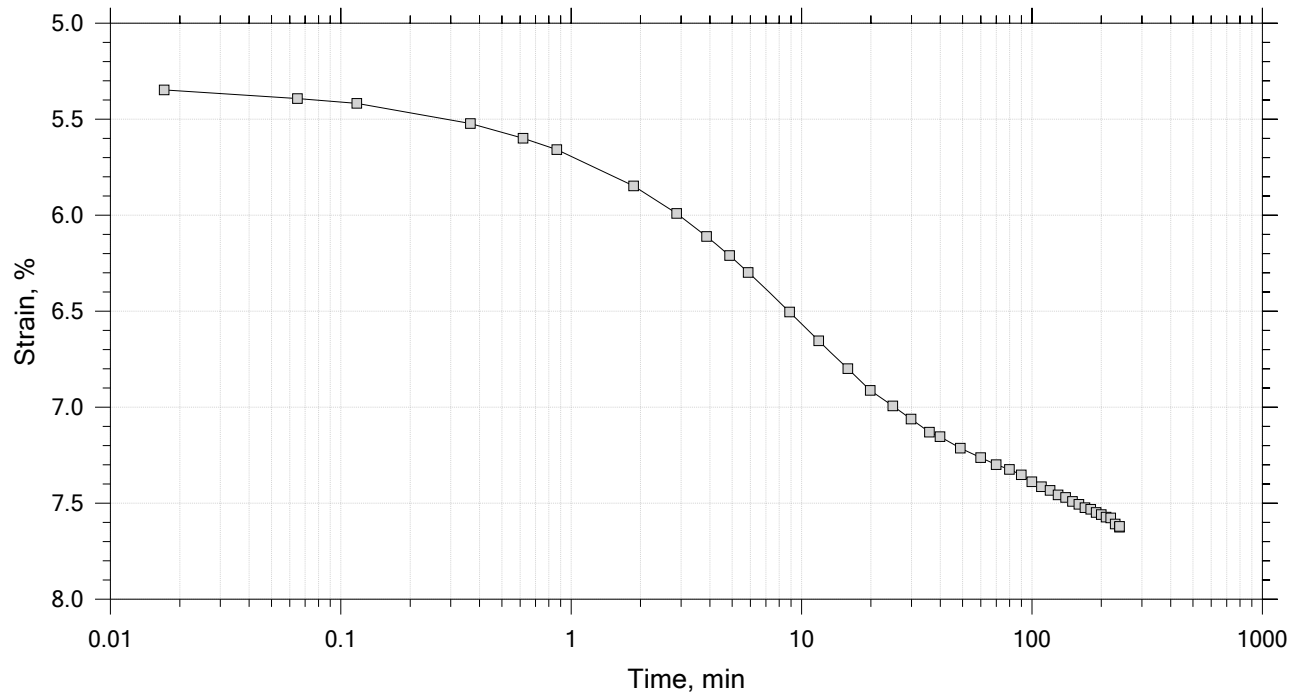
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



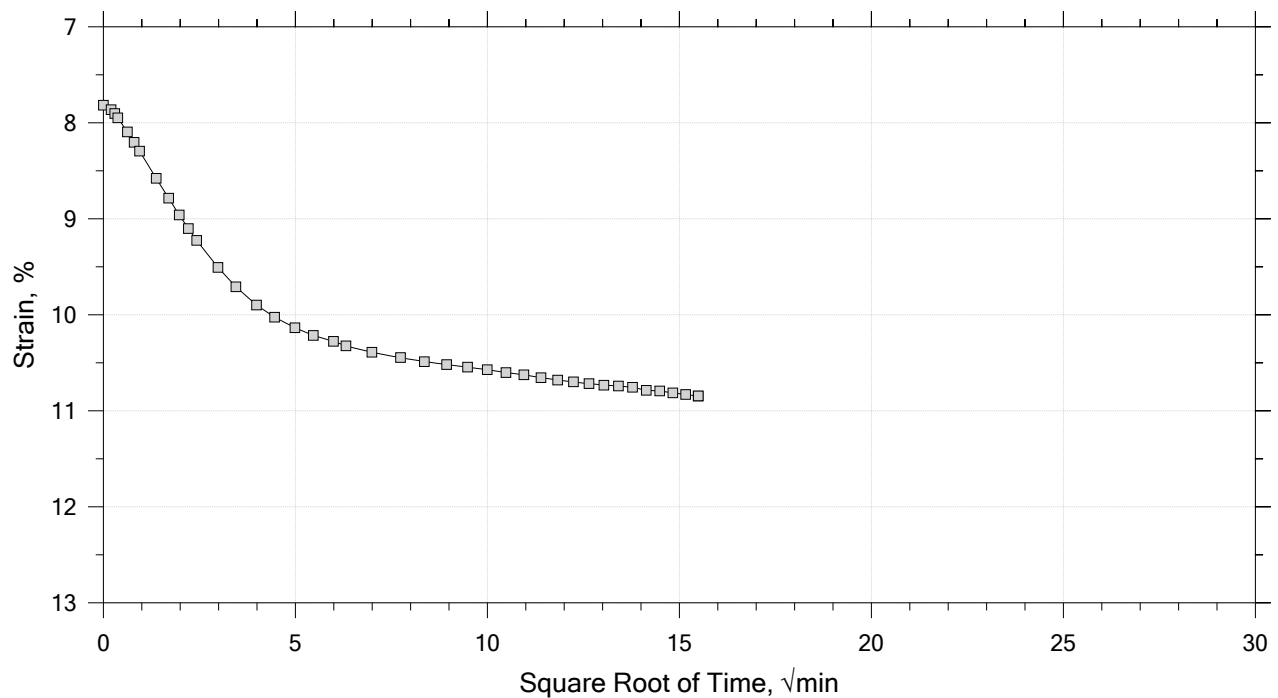
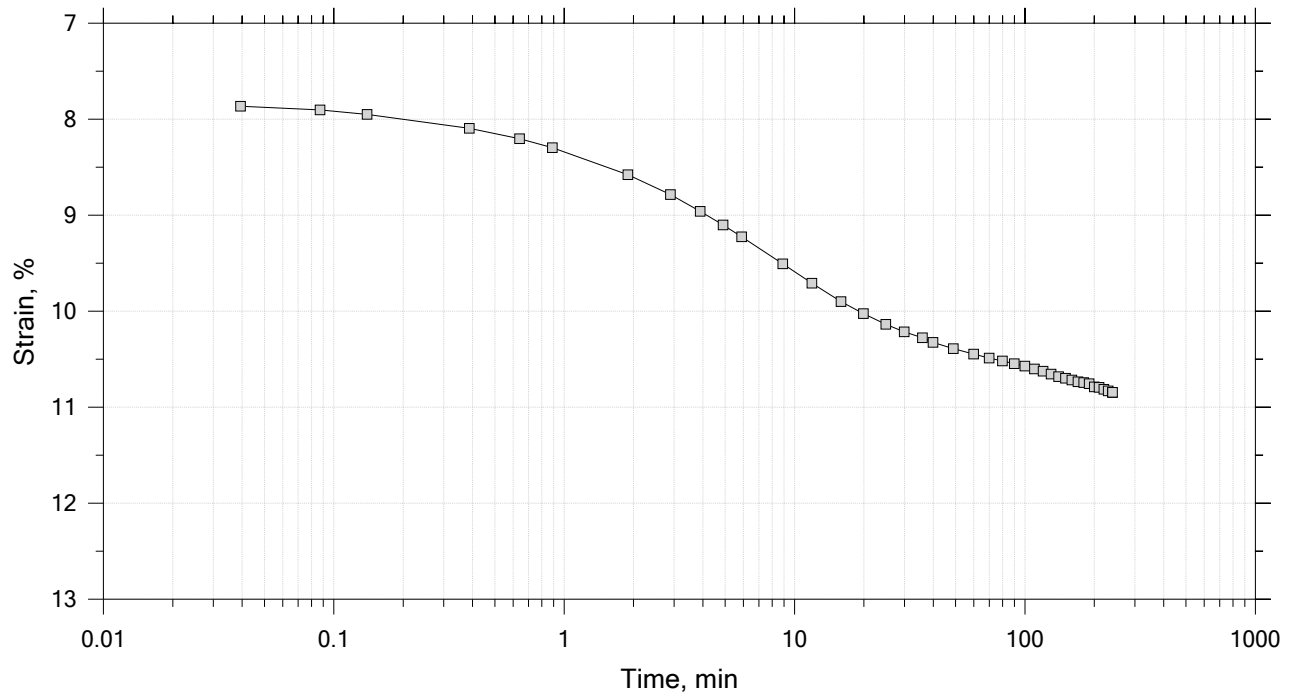
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



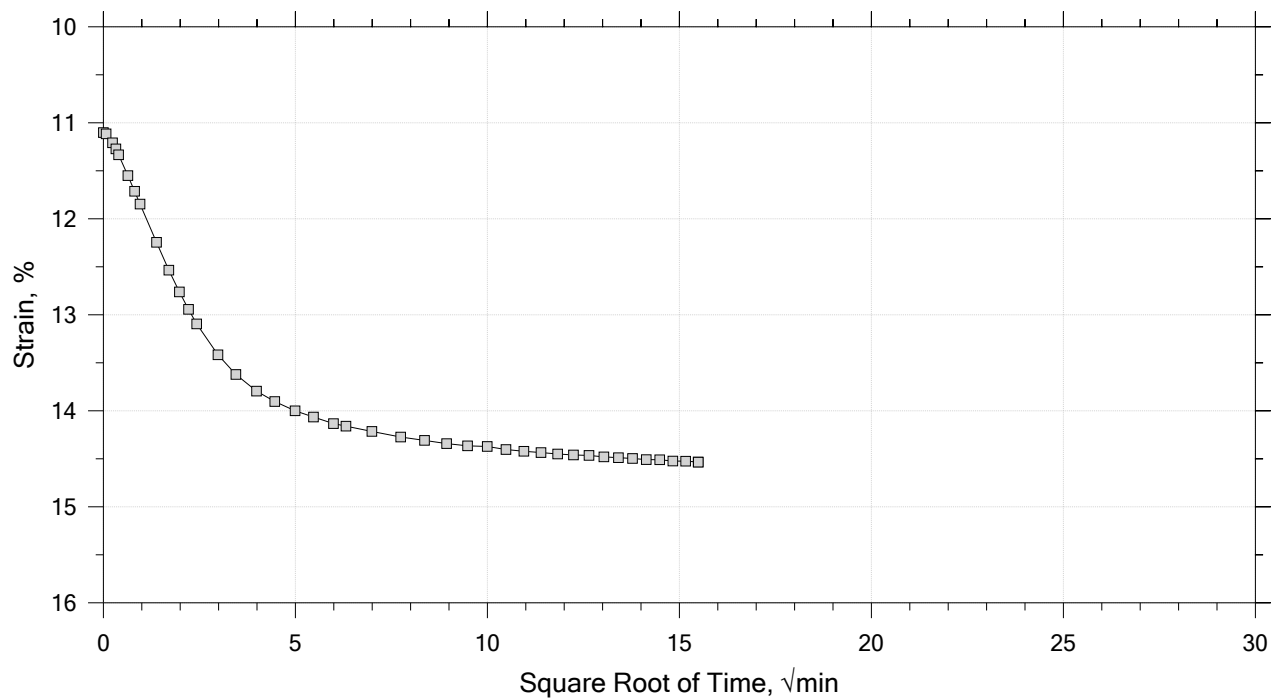
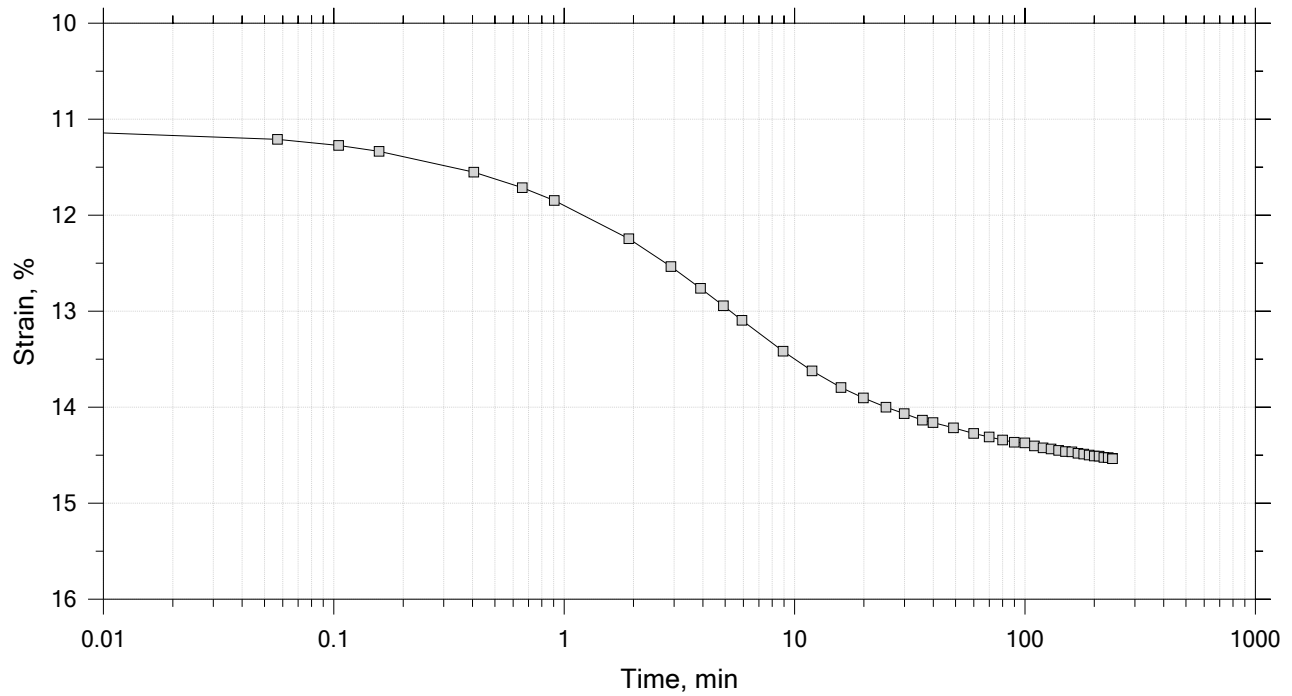
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



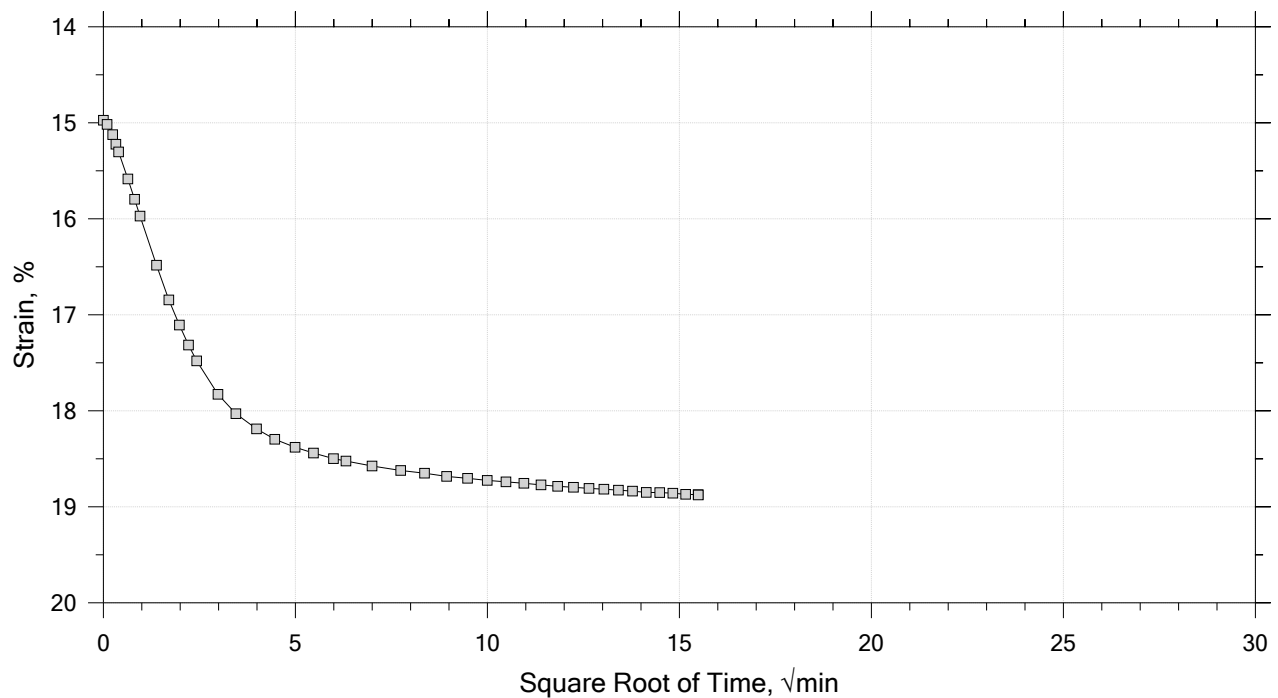
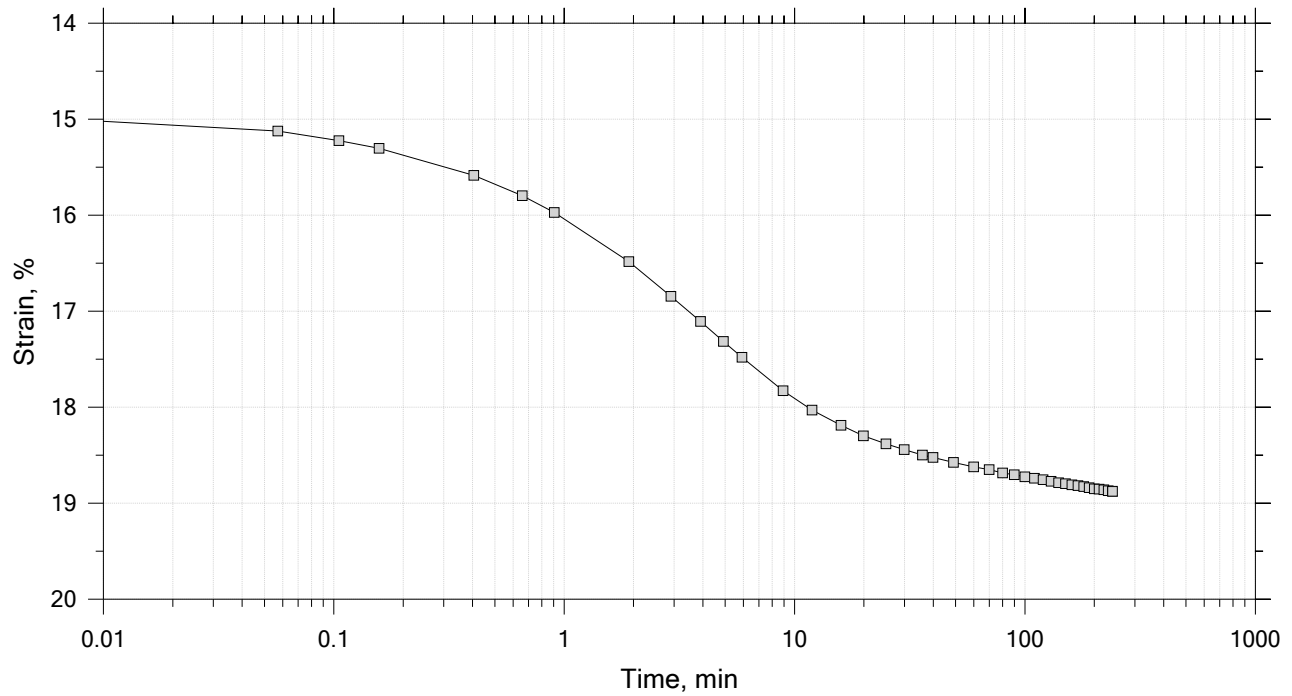
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	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



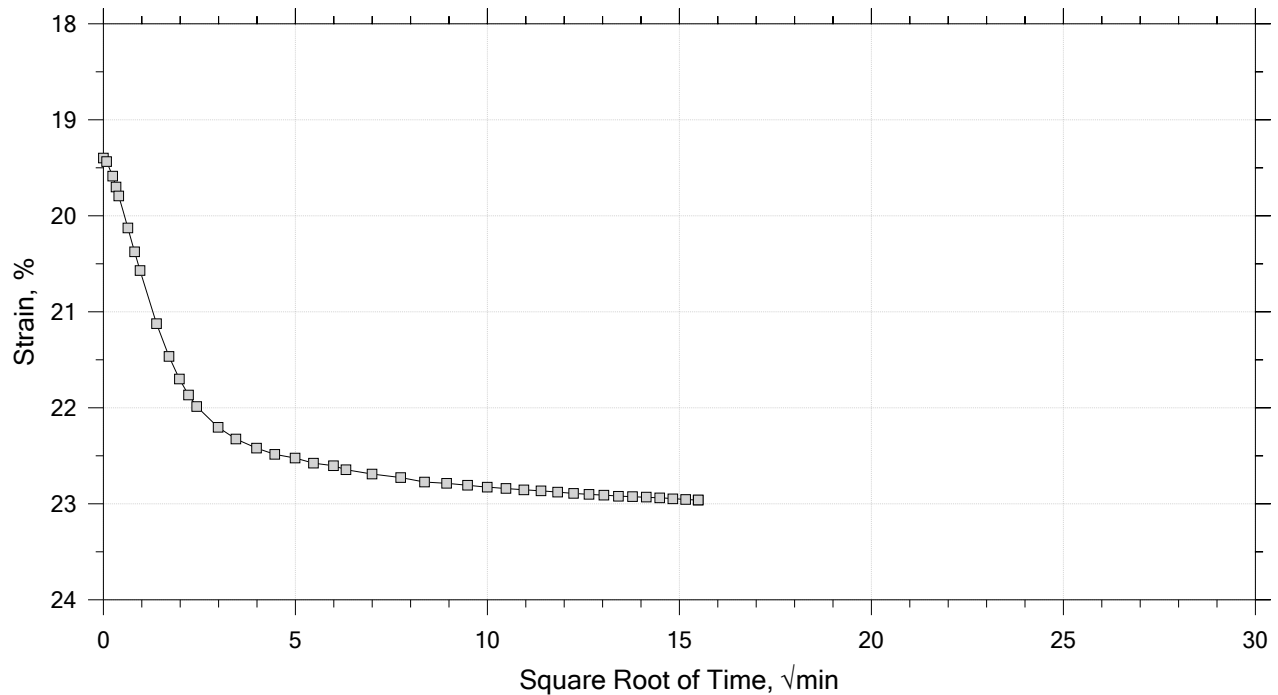
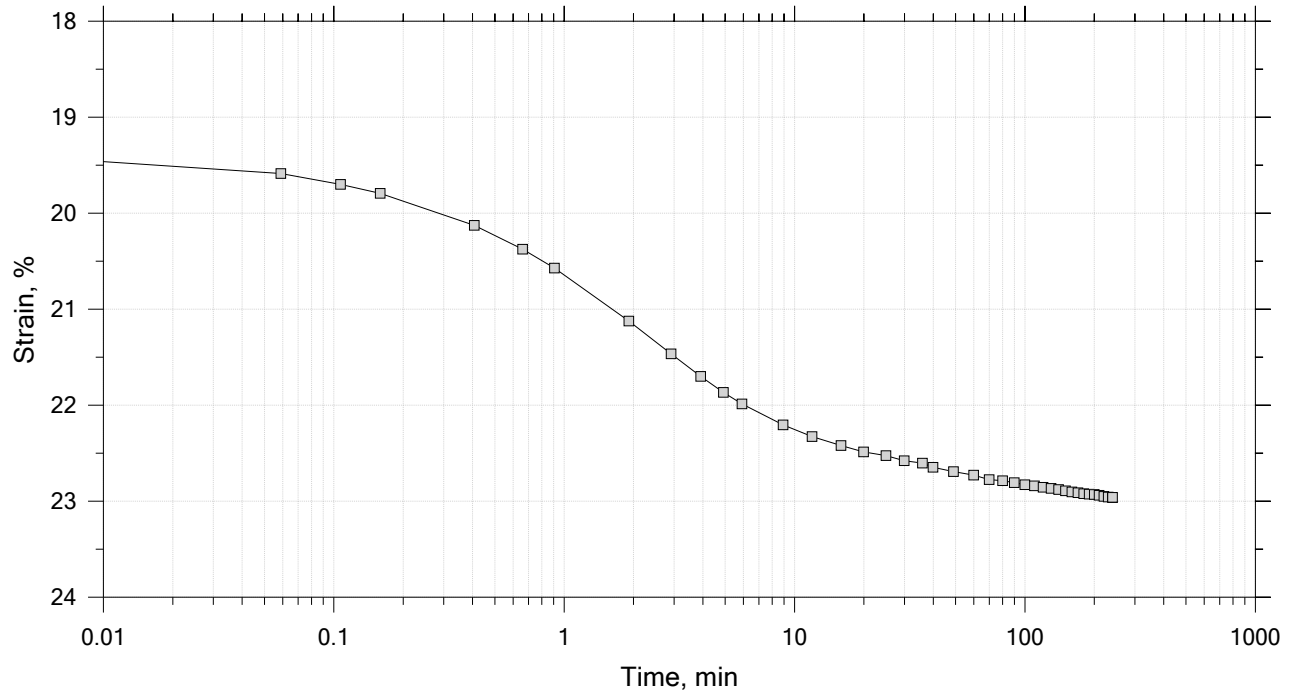
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



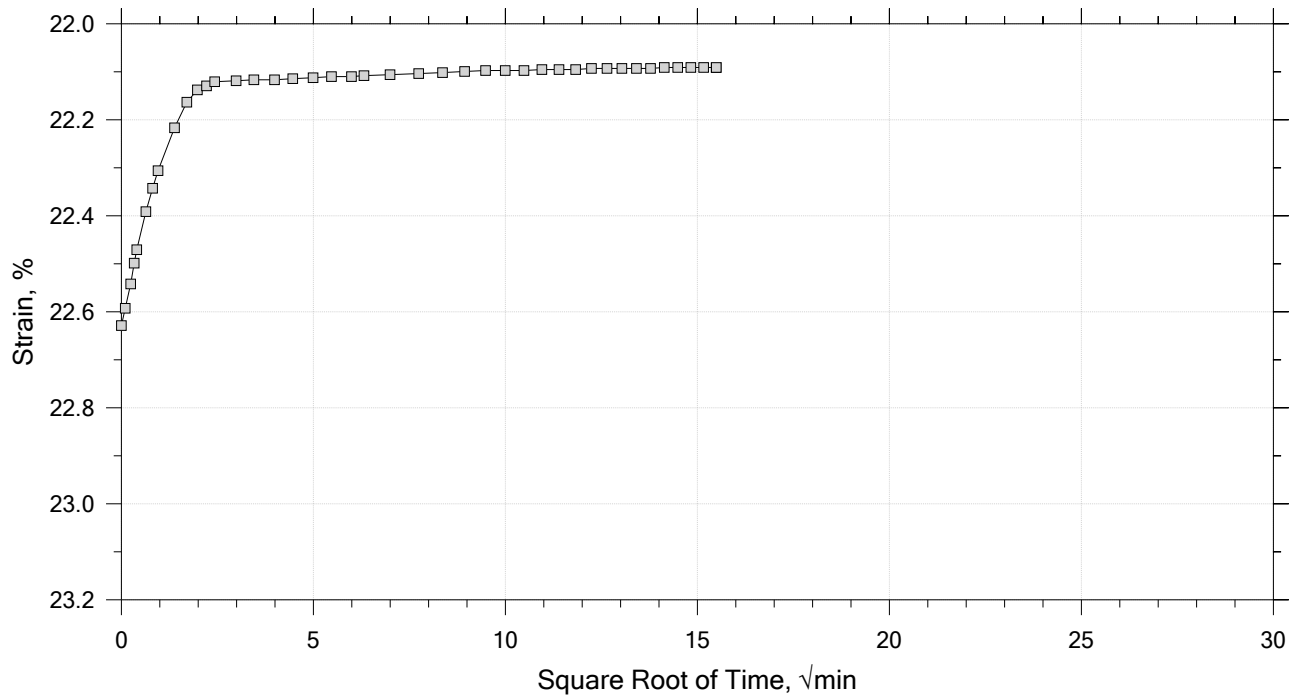
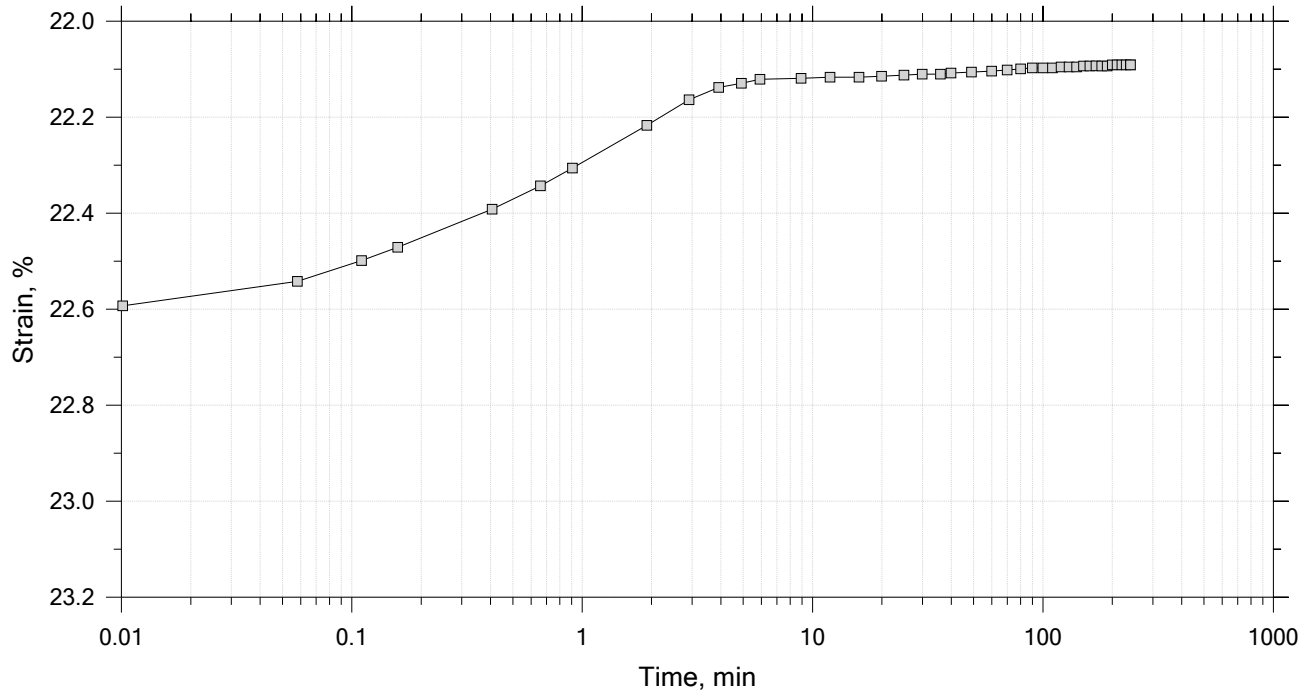
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	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



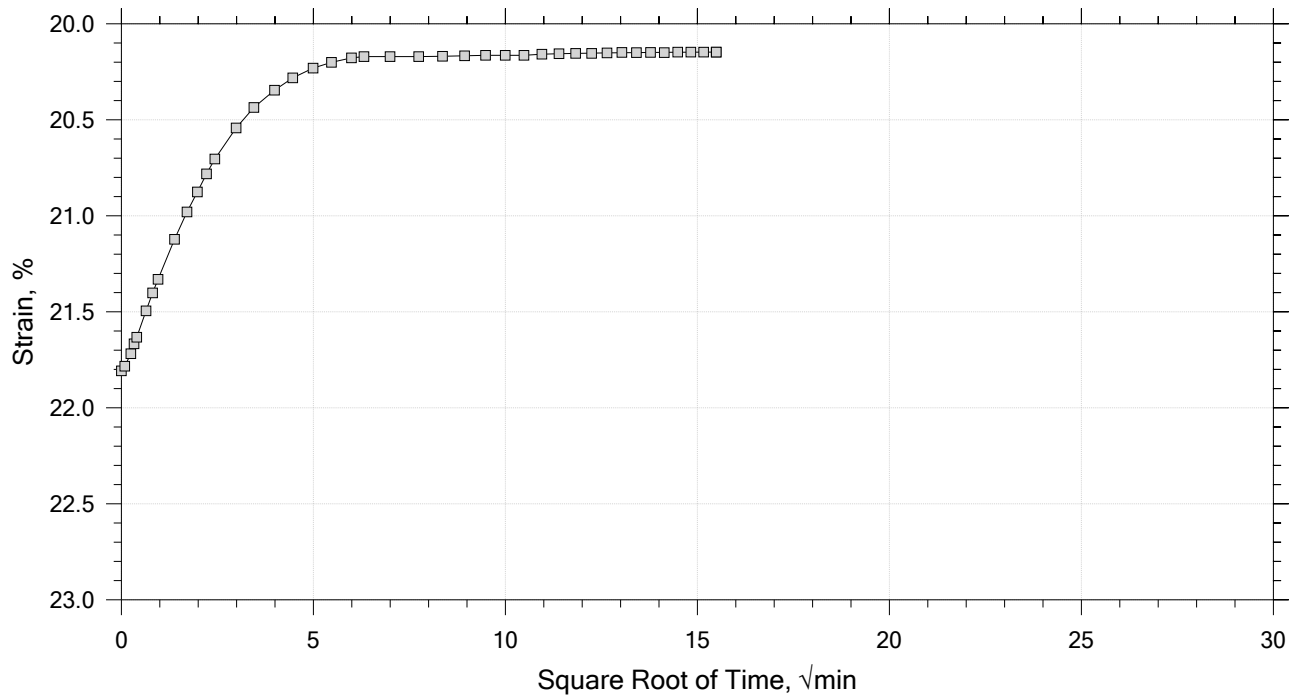
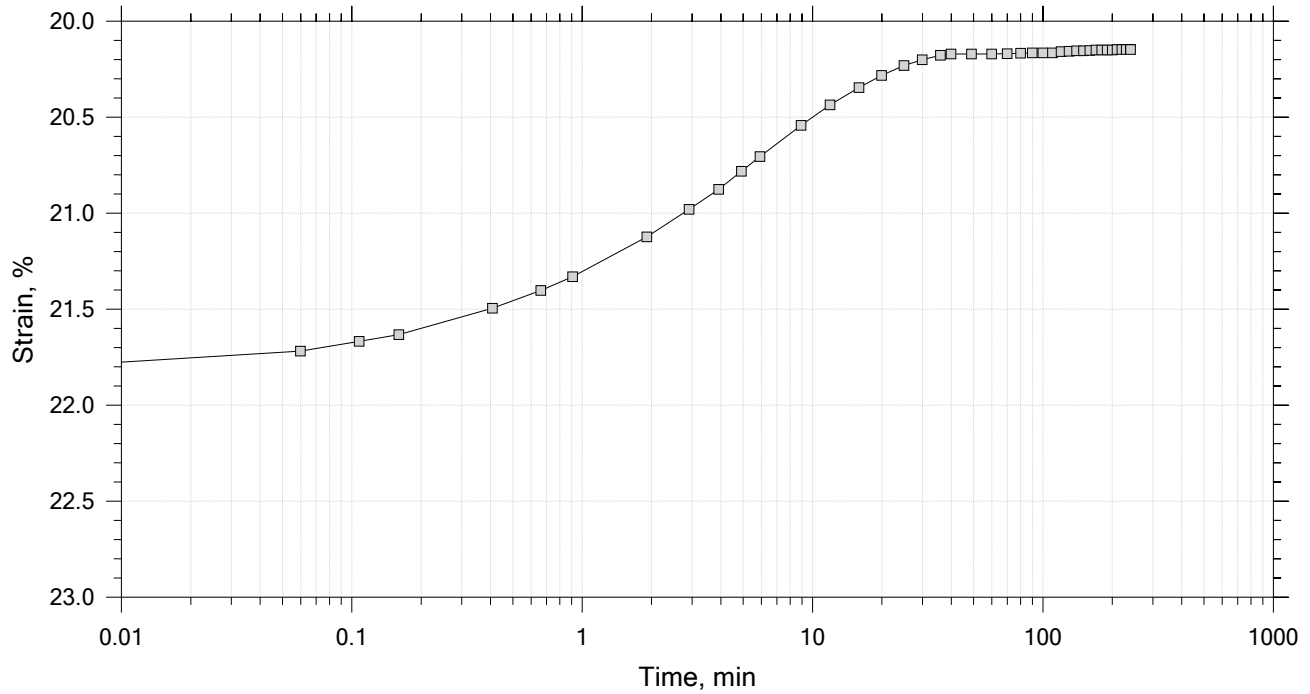
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	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



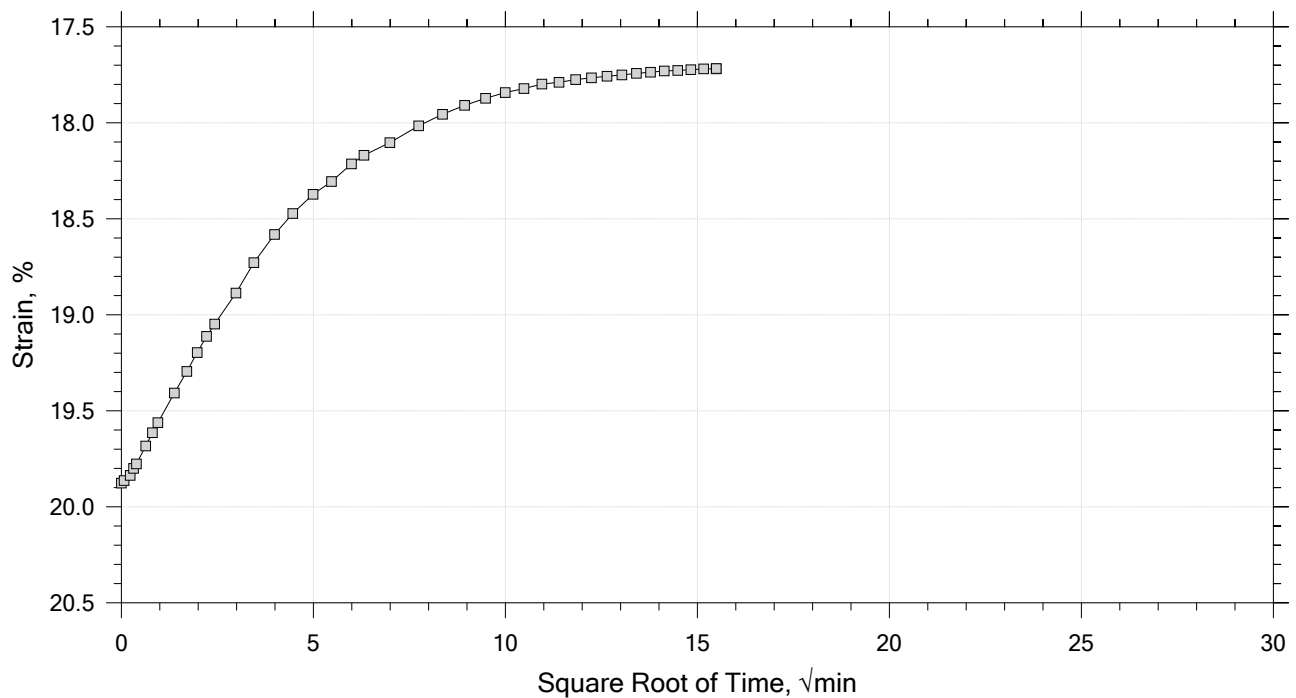
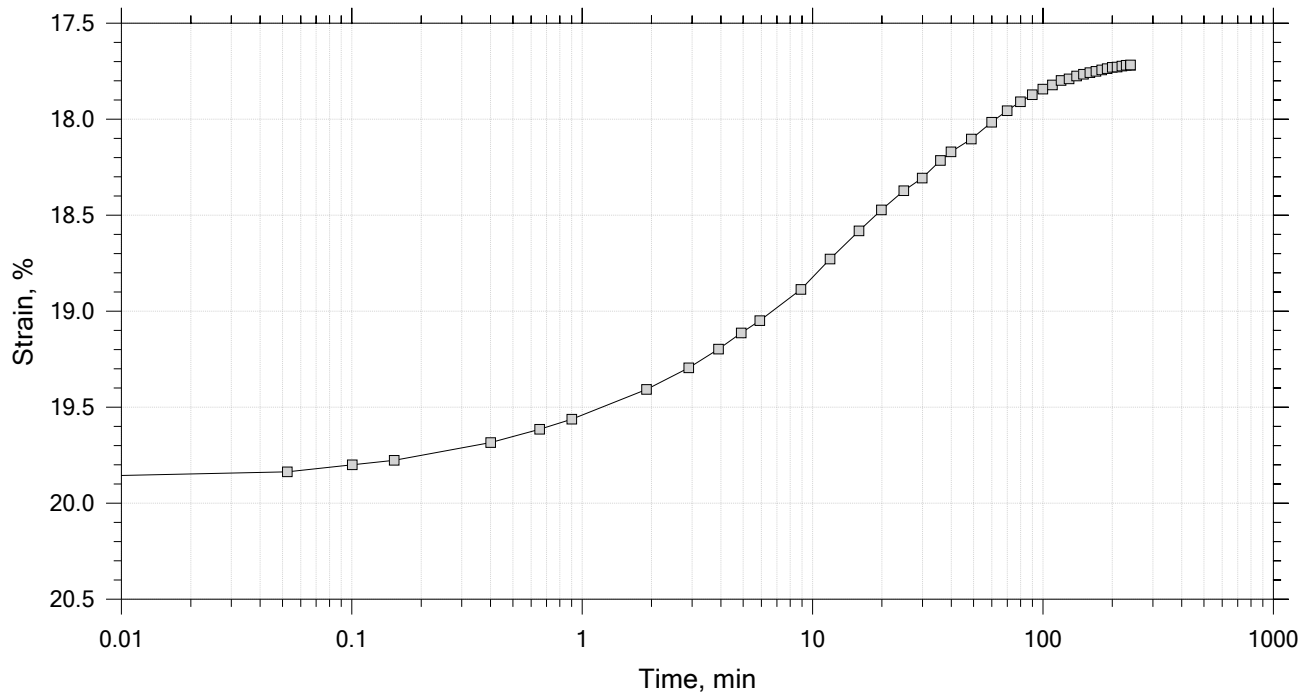
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



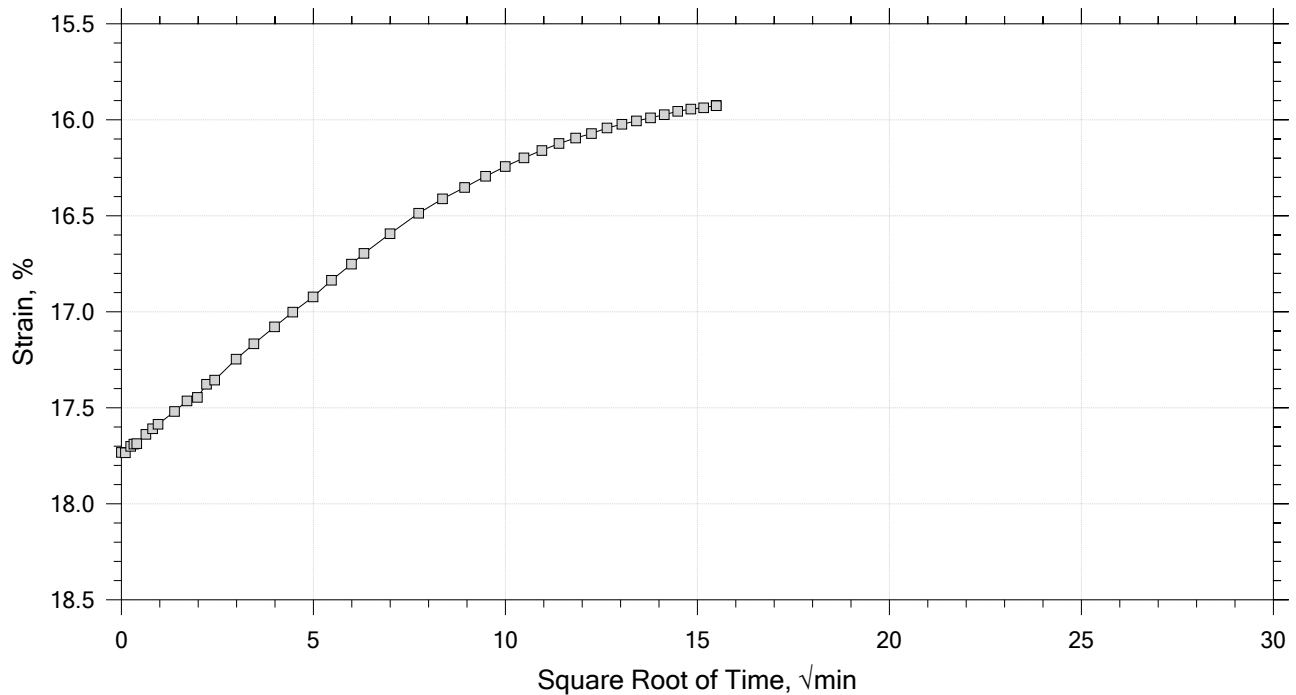
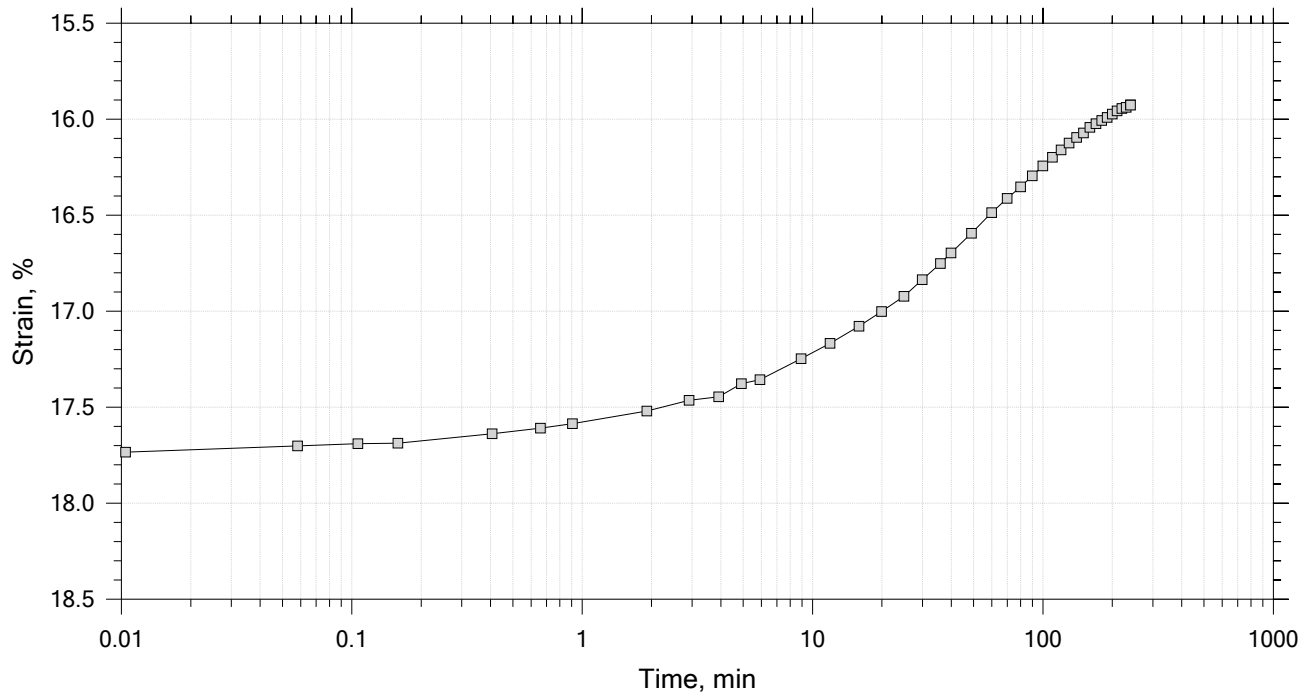
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	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



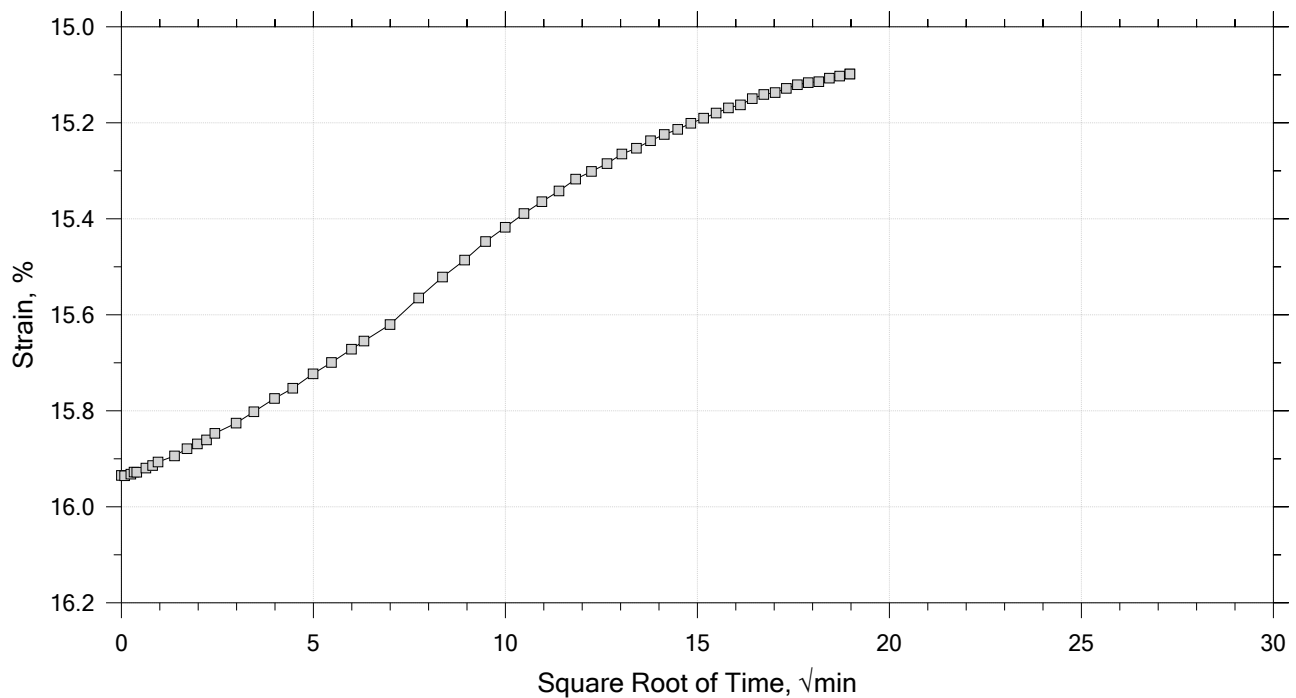
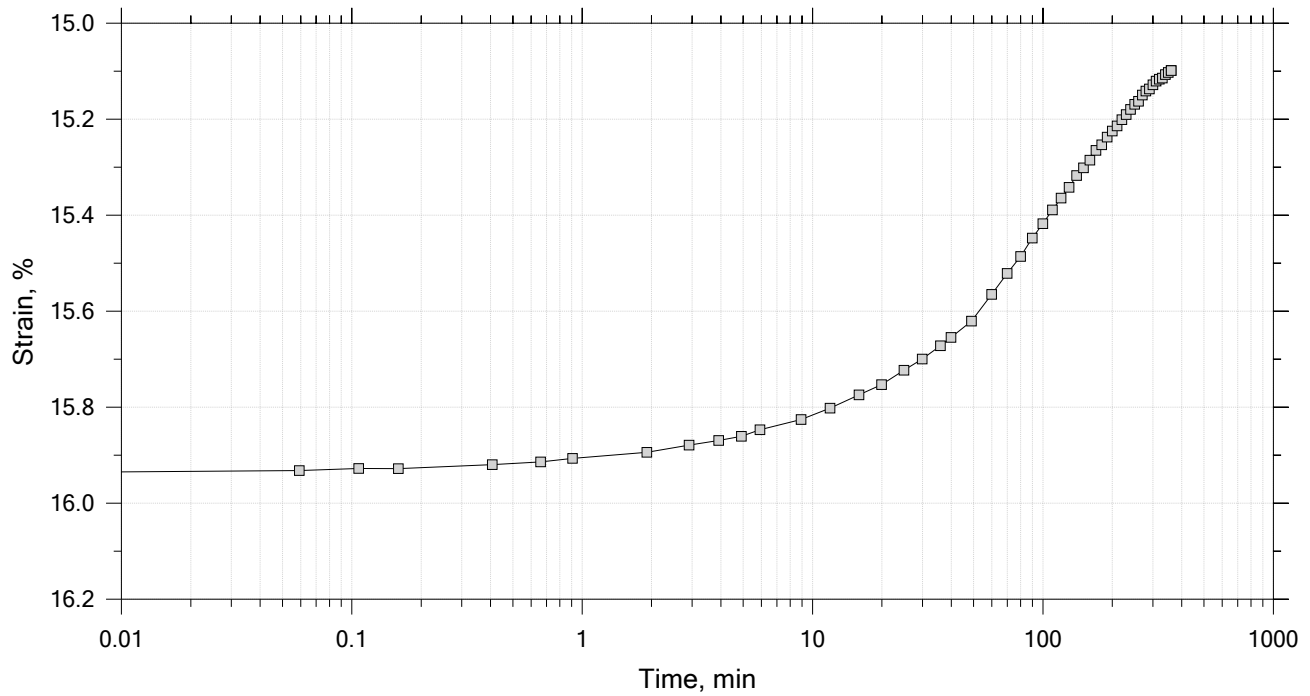
	Project: Howard Center	Location: Burlington, VT	Project No.: GTX-316555
	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf



	Project: Howard Center	Location: Burlington, VT	Project No.: GTX-316555
	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.73	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.783	Plastic Limit: ---
Final Height: 0.84 in	Final Void Ratio: 0.498	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-5371	RING		E3727
Mass Container, gm	8.63	111.23	111.23	8.33
Mass Container + Wet Soil, gm	190.71	269.6	257	155.45
Mass Container + Dry Soil, gm	152.15	234.55	234.55	132.79
Mass Dry Soil, gm	143.52	123.32	123.32	124.46
Water Content, %	26.87	28.42	18.21	18.21
Void Ratio	---	0.78	0.50	---
Degree of Saturation, %	---	99.23	100.00	---
Dry Unit Weight, pcf	---	95.705	113.93	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

	Project: Howard Center	Location: Burlington, VT	Project No.: GTX-316555
	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

[illegible]

	Project: Howard Center	Location: Burlington, VT	Project No.: GTX-316555
	Boring No.: ---	Tested By: md	Checked By: anm
	Sample No.: B-3	Test Date: 12/28/22	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, brown clay with sand		
	Remarks: System LTIII-H, Swell Pressure = 0.0646 tsf		
	Displacement at End of Increment		

APPENDIX G: SITE PHOTOGRAPHS

PHOTO LOG

John Turner Consulting, Inc.	Site Location: 300 Flynn Avenue, Burlington, VT
------------------------------	---

Photo No. 1	Date: 12/12/2022
	
Description: B-57 Truck Mounted Drilling Rig	

Photo No. 2	Date: 12/12/2022
	
Description: B-1 (10-12 Feet)	

Photo No. 3	Date: 12/12/2022
	
Description: B-3 (20-22 Feet)	

Photo No. 4	Date: 12/12/2022
	
Description: B-4 (10-12 Feet)	

Figure 2. Locations and Drainage Areas of BMPs Considered in Developing Englesby Brook FRP

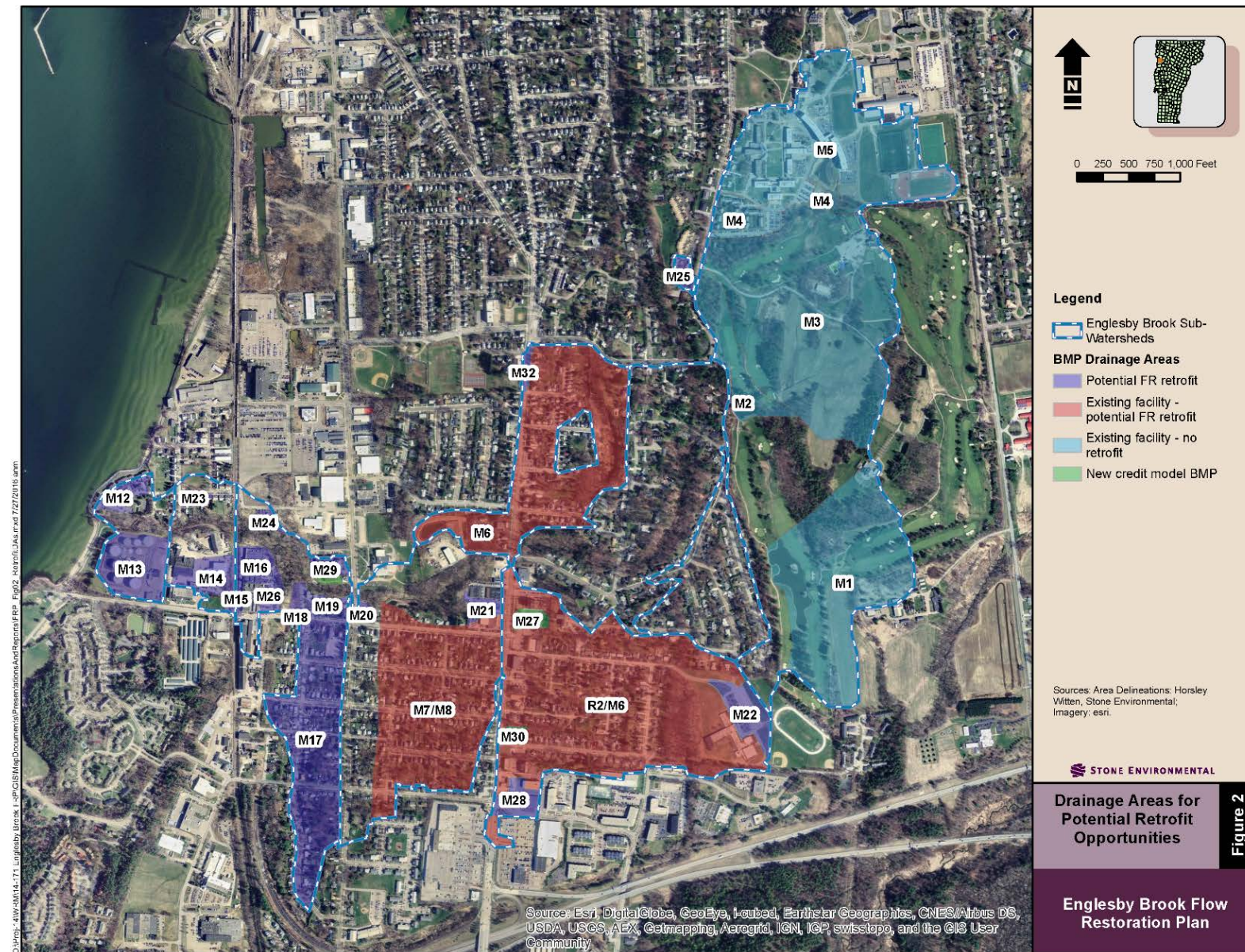


Table 7: Summary of BMPs Included in Englesby Brook Flow Restoration Scenario.

Site ID	Site Name	BMP Type	Model Scenario	DA (ac)	IA (ac)	% Difference in Q03 ¹		Detention Time ⁴ (min)
						BMP ²	Water-shed ³	
M1	BCC Lower Pond	Wet Basin	Base/ Credit	43.40	1.28	-6.7	-3.0	997
M2	BCC Upper Pond 2	Wet Basin	Base/ Credit	9.34	0.54	-0.2	0.7	33
M3	BCC Upper Pond 1	Wet Basin	Base/ Credit	67.94	5.60	-0.1	0.0	17
M4	Catamount Lower Pond	Wet Basin	Base/ Credit	7.46	3.36	-37.5	-1.6	517
M5	Catamount Upper Pond	Wet Basin	Base/ Credit	45.23	20.61	-46.3	-8.5	843
M6B (M10)	Englesby 08 Pond Retrofit	Wet Basin	Credit/FRP	129.76	48.55	-63.4	-36.9	721
M7/M8/M9	Englesby SM6 Ponds	Forebay/ 2 Wet Basins	Credit	44.09	19.52	3.5	0.05	47
M17	288 Flynn Ave/ Champlain Pkwy	Dry Basin	FRP	30.77	13.07	-49.4	-5.1	763
M18	208 Flynn Ave Coop	Dry Basin	FRP	0.42	0.30	-66.7	0.0	758
M19	Pine St. Counseling Ctr.	Dry Basin	FRP	0.80	0.48	-50.0	-0.1	704
M25	Overlake Condos	Dry Basin	FRP	1.19	0.73	-62.5	-0.8	647
V27/M27A/ M27B	Hickok & Boardman	Swale/Wet Pond/Infil. Chamber	Credit	1.29	0.92	-100.0	-0.9	55
M29	Champlain Co-op	Dry Basin	FRP	1.59	1.09	-57.1	-0.6	847
M30	Pizzagalli Properties	Permeable Pavement	Credit	0.64	0.58	-100.0	-0.3	360
M31	847 Pine St.	Dry Basin	Credit	0.45	0.23	-100.0	-0.1	101

¹ Percent difference in high flows is negative when showing a reduction. The model was run with all BMPs turned on and then with individual BMPs turned off, one at a time, to quantify differences in flow and relative performance.

² Differences at each BMP were determined by comparing the inflows and outflows in the BMP. 100% represents no surface discharge; BMPs with less than 50% at the BMP outlet could be opportunities to enhance performance.

³ Differences in flow at the watershed outlet are intended as a relative comparison of BMP effectiveness, but are not absolute or additive. Individual BMP values do not add up to corresponding total watershed reductions due to other losses in the system.

⁴ Detention times are restricted to ~12 hrs (720 mins) per cold water fisheries requirements.

Figure 3: Englesby Brook Watershed Areas Receiving Treatment in the Flow Restoration Scenario

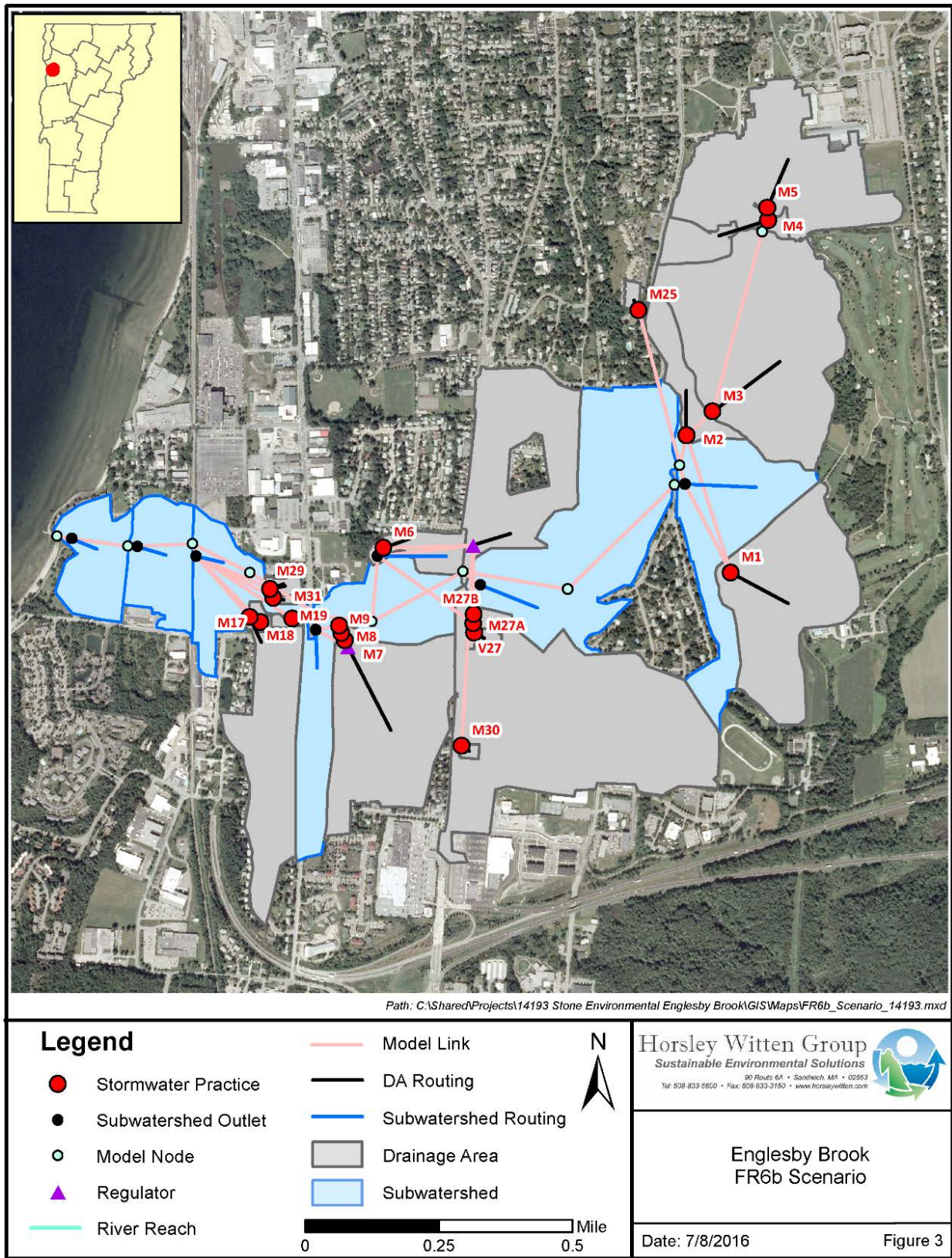


Table 8: Proposed Priority BMP Cost Estimates.

BMP ID	Site Name	Storage Volume (cf)	Total Cost (\$)	Impervious Area (ac)	Cost per Impervious Acre
M10	O8 Pond retrofit ¹	136,061	\$360,850	48.55	\$7,433
M17	288 Flynn Ave/ Champlain Pkwy	74,201	\$385,500	13.07	\$29,495
TOTAL			\$746,350	61.62	

¹ This is an expansion of an existing practice which increases available storage and optimizes detention; costs reflect only the incremental cost of the retrofit.

5.2. Spreadsheet Cost Estimates

Estimating costs for implementing BMP retrofits for sites with expired permits utilized a somewhat less robust approach. Cost estimates were calculated as a base construction cost plus a 30% contingency factor for final design and permitting. The base cost was estimated on a unit cost basis, using a specified design volume (cu. ft.) multiplied by a unit cost (\$/cu. ft.). Unit costs were calculated based on the memorandum from Tetra Tech, Inc. dated October 30, 2007. These rates use a 2000 base year and have been updated to account for inflation to the year 2016, using a 2.5% inflation rate. The costs are calculated based on the following equation:

$$\text{total cost} = \text{installation cost (I)} + \text{land cost (L)} + \text{fixed cost (F)}$$

Where:

I = \$6/cf of infiltration, inflated at 2.5% to year 2016 = \$8.70/cf

L = \$0 as it is not anticipated that property will be required to be purchased

F = design/permitting costs (30% of I)

The anticipated costs associated with implementing the expired permit BMP retrofits, as identified in Table 7 as part of the Flow Restoration Scenario, are presented below in Table 9. Although all of these projects would be located on private land, no cost has been assigned for land acquisition.

Table 9: Proposed Expired Permit BMP Retrofit Cost Estimates.

BMP ID	Site Name	Treatment Volume (cf)	I (\$)	F (\$)	Total Cost (\$)	Impervious Area (ac)	Cost per Impervious Acre
M18	208 Flynn Ave Coop	1,370	\$11,919	\$3,576	\$15,495	0.30	\$51,649
M19	Pine St Counseling Ctr	2,349	\$20,436	\$6,131	\$26,567	0.48	\$55,348
M25	Overlake Condos	3,537	\$30,772	\$9,232	\$40,004	0.73	\$54,799
M29	Champlain Co-op ¹	5,089	\$55,343	\$16,603	\$71,946	1.09	\$66,005
TOTAL					\$154,011	2.60	

¹ Any BMP at this location will likely need to be subsurface, and therefore the assumed unit cost per cf treated was increased by 25%.

ID#: M19

Name: Pine Street Counseling Center**Concept Description:**

Install dry basin or possibly bioretention area in north central area of lot to capture flows from roof and parking areas.

Notes/Feasibility:

Expired permit 1-0337

**GENERAL SITE INFORMATION****RETROFIT DETAILS****Site Contact Info:****Project Candidate:** 1st tier**Ownership:****Retrofit of new or existing BMP:** New**Land Use Type:****Proposed Retrofit Practice 1:** Dry basin**Land Use Detail:****Proposed Retrofit Practice 2:** Bioretention**Existing BMP on Site?****Non-Structural Controls:****Is site a hotspot?****Non-Structural Other:****Sources/pollutants:****Maintenance Burden:** moderate**Soils:****Benefits:****Conflicts:**

Storage: Y

Soils:

Water Quality: Y

Access:

Recharge: M

Land Use:

Demonstration: N

Utilities:

Repair: N

Polluted:

Reuse: N

High WT:

Wetlands:

Other:**Other:****SIZING INFORMATION****Drainage Area (ac):** 0.80**Impervious Area (ac):** 0.48**Practice Area Available (ft²):** 1750**Existing Head Available?** Y**Date:** 04/10/15**Assessed by:** JSM

March 29, 2016

To: Megan Moir, CPESC, CPSWQ

From: Julie Moore, PE

Stone Project No. 16-030

Subject: Englesby Watershed Expired Stormwater Permit Review

MEMO

Stone completed a field assessment of each of the five systems in the Englesby Brook watershed with expired stormwater permits. These systems are identified in Table 1, below.

Table 1: Expired Stormwater Permits in the Englesby Brook Watershed

Permit Number	Project Name	Permit Issued
1-0337	Howard Mental Health Services	3/4/1982
1-1087	Flynn Ave Coop Housing	9/15/1992
2-0789	Overlake Condominiums	11/24/1988
2-0999	Champlain Apartments	4/20/1982
2-1052	Crescent Terrace	12/20/1985

In general, the permits are written rather broadly with few enforceable items and typically focus on curb-and-gutter system elements, including catch basins. Further, the site plans available in the permit files tend to lack the specificity and level of detail provided for systems constructed post-2002. A brief summary of our observations is provided below, including recommendations for completing any actions that would be required to bring the facilities into compliance.

1-0337, Howard Mental Health Services, 300 Flynn Ave.

Permit covers the discharge of roof drainage via “stone lined ditch in natural drainage swale” to Englesby Brook; parking lot runoff does not appear to be regulated under the permit. During the site visit we found that the stone lined ditch is not well defined. The majority of flow leaving the site and discharging to Englesby Brook appears to occur via subsurface drain pipes not included in the permit; four outfalls were identified during the site visit that are not included in the City’s stormwater GIS layer, including one of which appears to divert water directly from Pine Street. In order to bring this facility into compliance with its existing permit, the stone lined ditch would need to be improved. In addition, the source of the water draining to each of the subsurface drains should be confirmed. As part of the Englesby Brook Flow

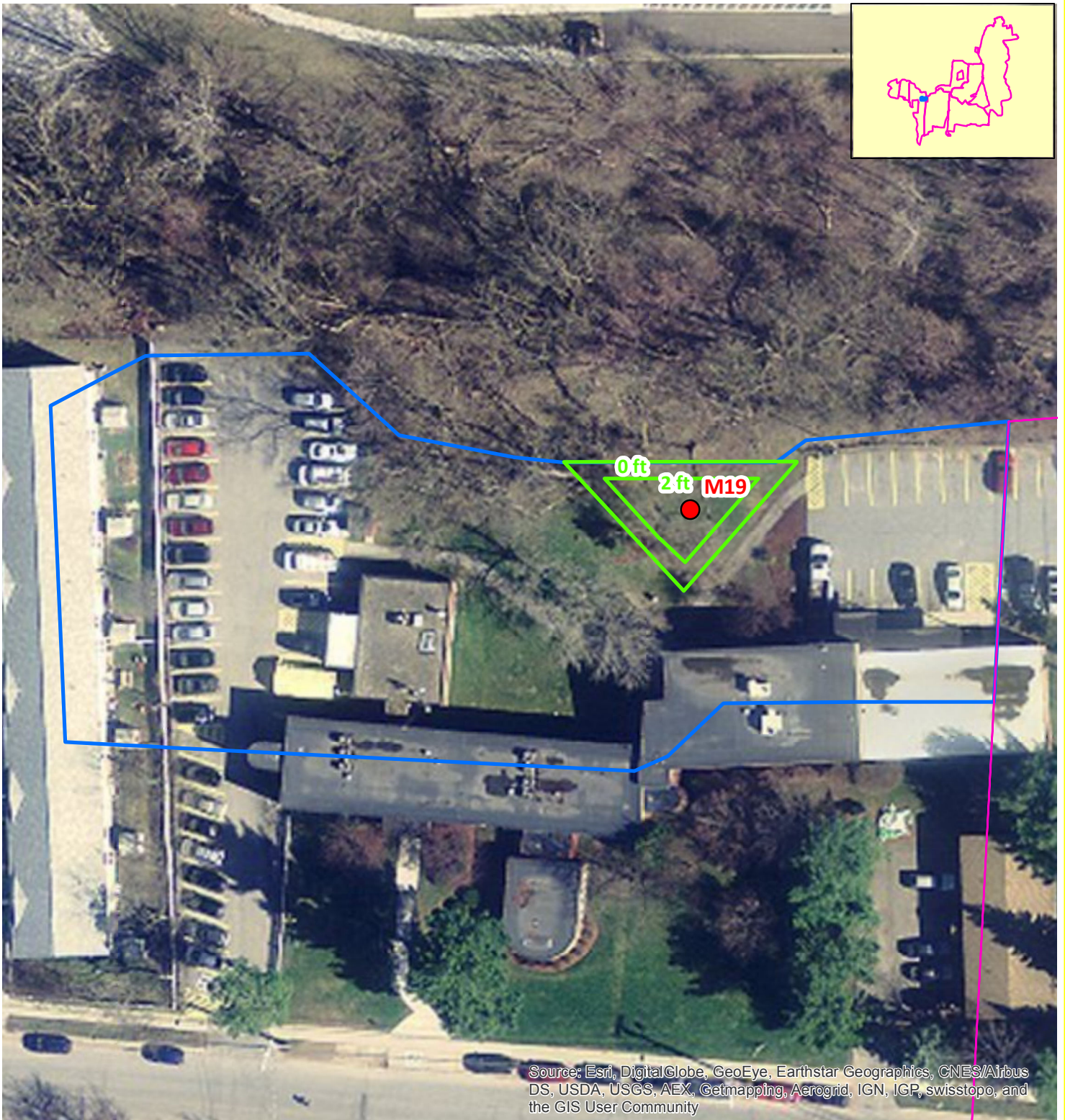
Restoration Plan (FRP), a potential retrofit was identified for managing runoff from parking lots draining to the existing green space behind 300 Flynn Ave.

Photo 1: Presumed Location of Natural Drainage Swale and Unknown Subsurface Drainage Outlet



1-1087, Flynn Ave Coop Housing, 288 Flynn Ave

Permit covers the discharge of stormwater runoff from roofs and paved parking lots following treatment “via grass-lined swales, through rip-rapped areas at the top of bank of Englesby Ravine, and via overland flow across vegetated terrain...” During the site visit we found that there are grass-lined to the north of the apartment complex which appear to convey stormwater runoff to rip-rapped areas that lead down to the ravine. We also noted during our site visit that the parking lot catch basin indicated in the City’s stormwater GIS layer does not exist. This site was generally found to be in compliance with its permit. As part of the Englesby Brook FRP, a significant potential retrofit was identified for in the green space immediately to the west of 288 Flynn Ave. and to the east of the proposed Champlain Parkway alignment.



Path: \\CIFS1\netdrv-o\Proj-14\WRM\14-171 Englesby Brook FRP\GIS\MapDocuments\PpresentationsAndReports\VR_concepts\Englesby_Concept_14193_M19.mxd

Legend

- Proposed M19 BMP
- Proposed M19 Depth Contours
- Proposed M19 Drainage Area
- Sub-watersheds



0 25 50 Feet

Horsley Witten Group
Sustainable Environmental Solutions

90 Route 6A • Sandwich, MA • 02563
Tel: 508-833-6600 • Fax: 508-833-3150 • www.horsleywitten.com

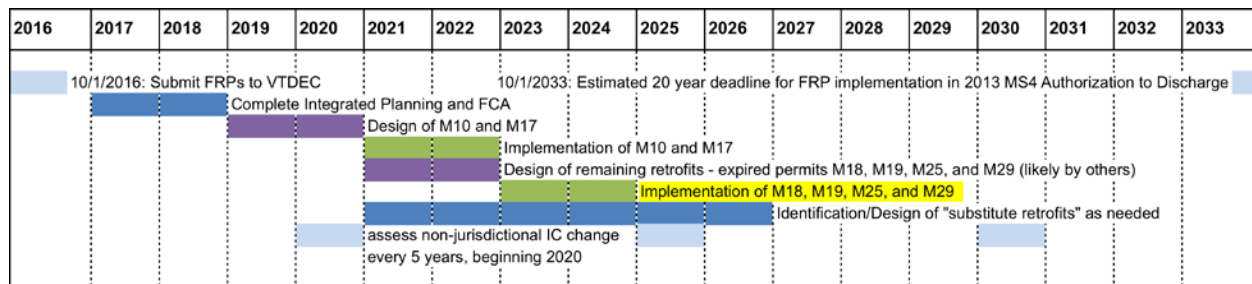


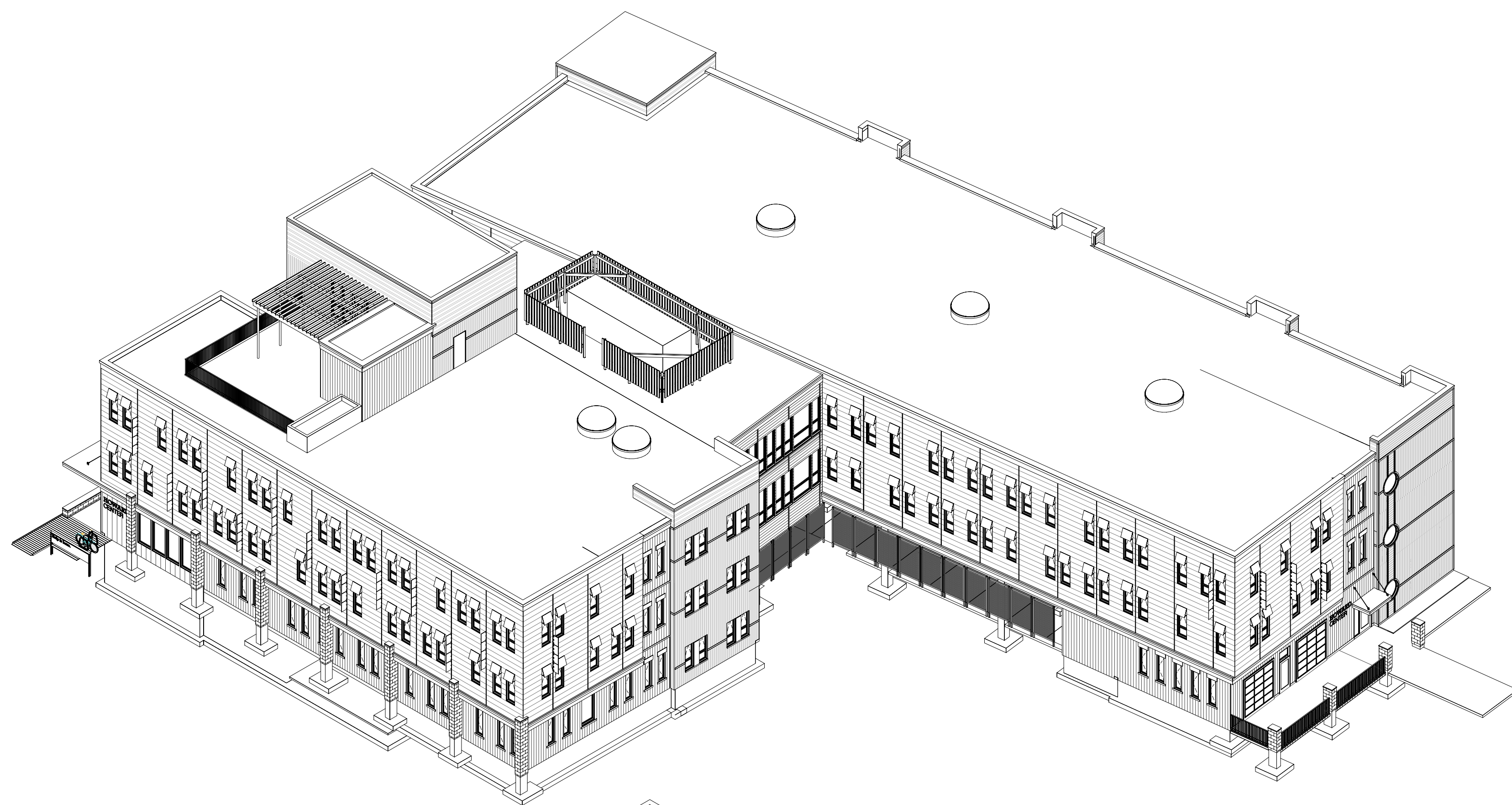
M19 Concept Design

Date: 7/29/2016

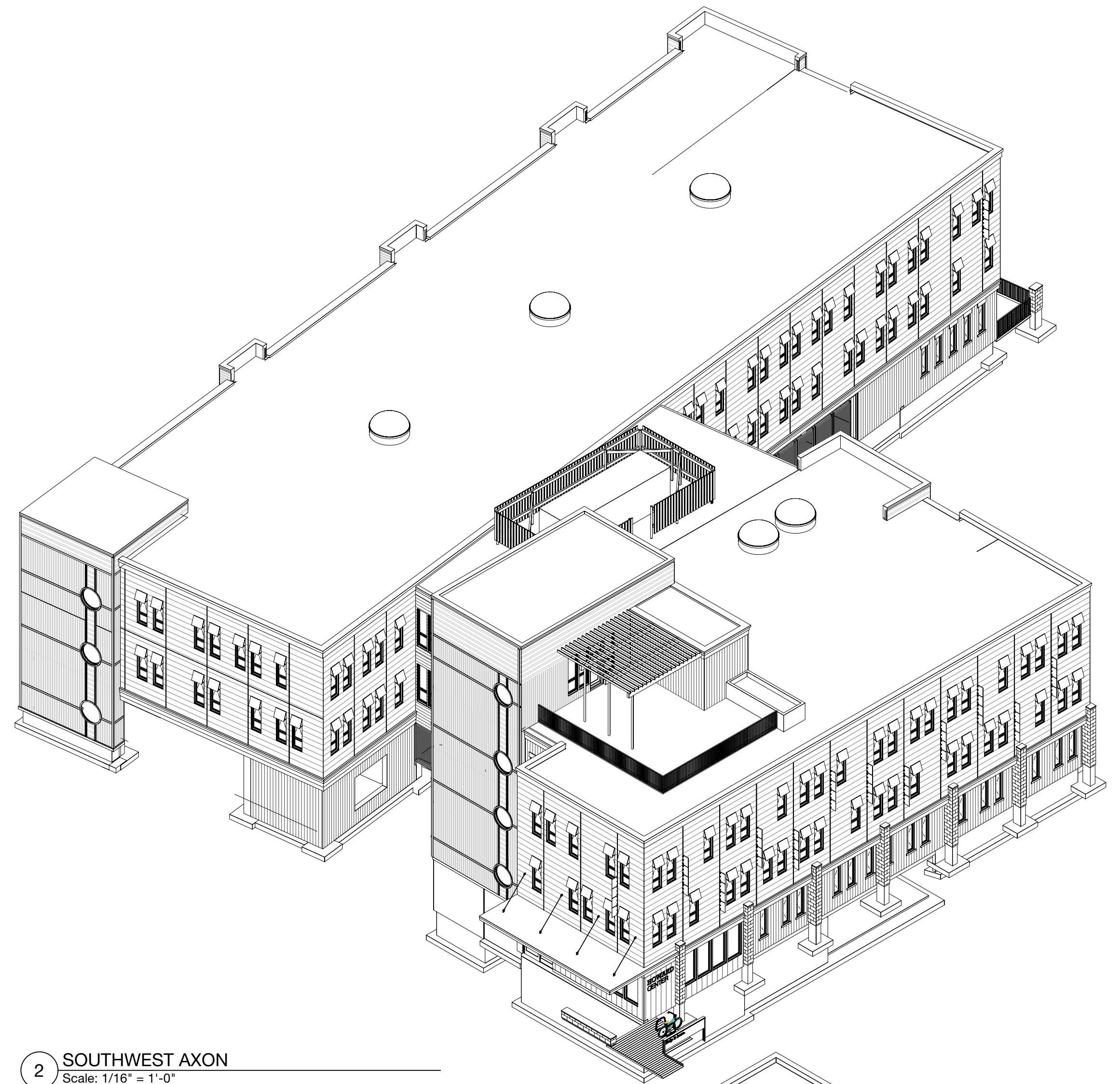
Figure C.3

APPENDIX E: DESIGN AND CONSTRUCTION SCHEDULE

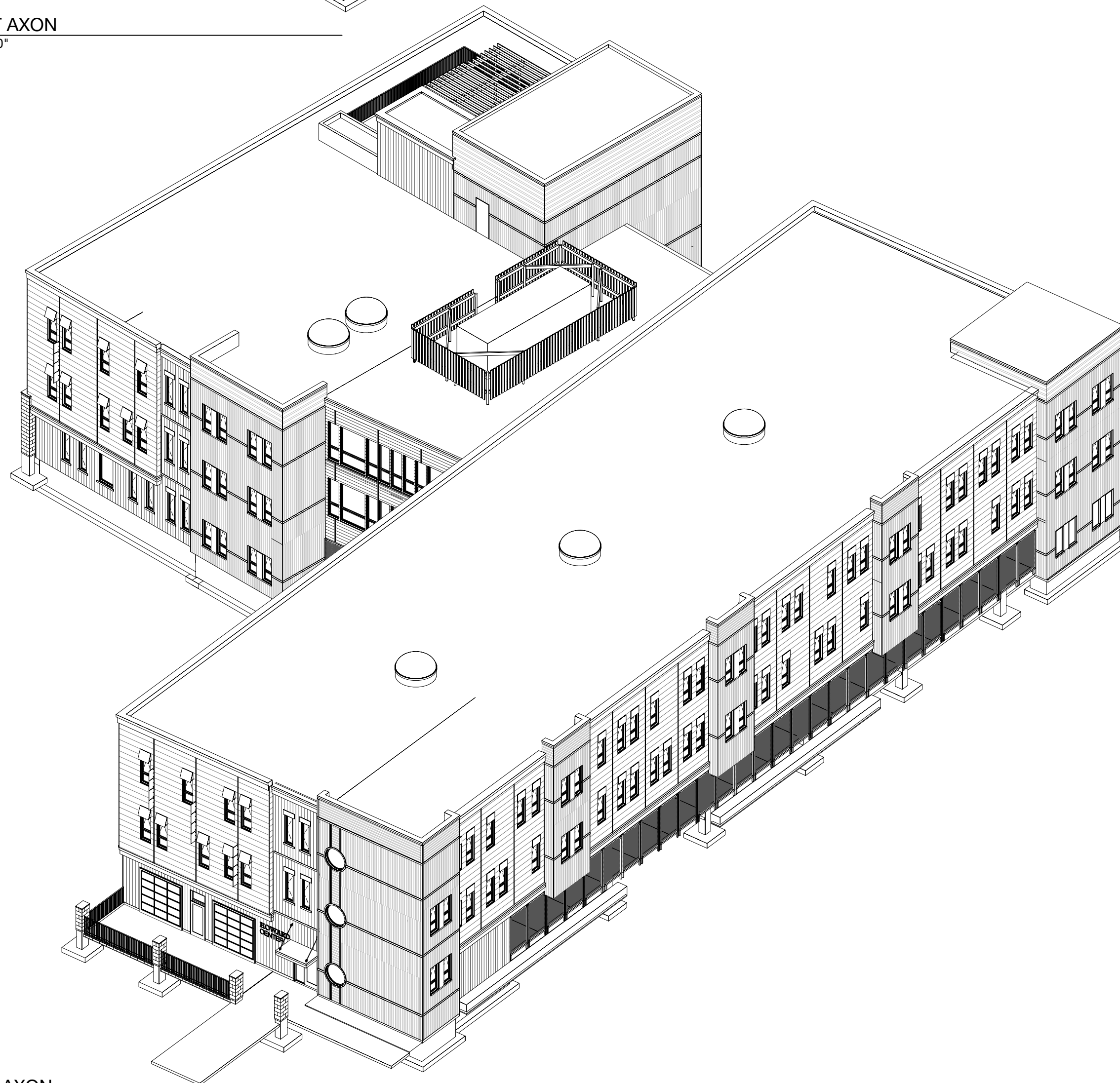




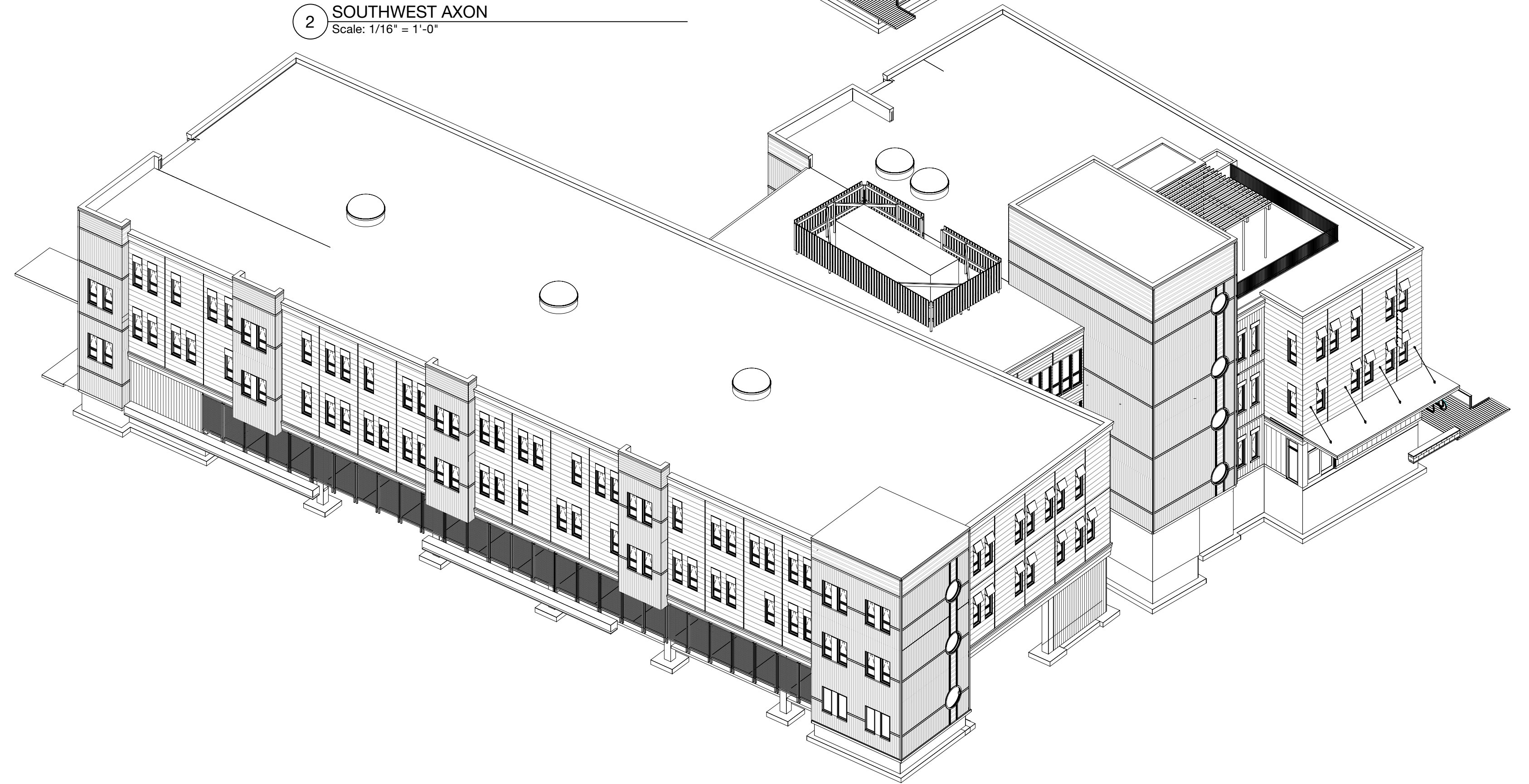
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2 SOUTHWEST AXON
Scale: 1/16" = 1'-0"



3 NORTHEAST AXON
Scale: 1/16" = 1'-0"



4 NORTHWEST AXON
Scale: 1/16" = 1'-0"

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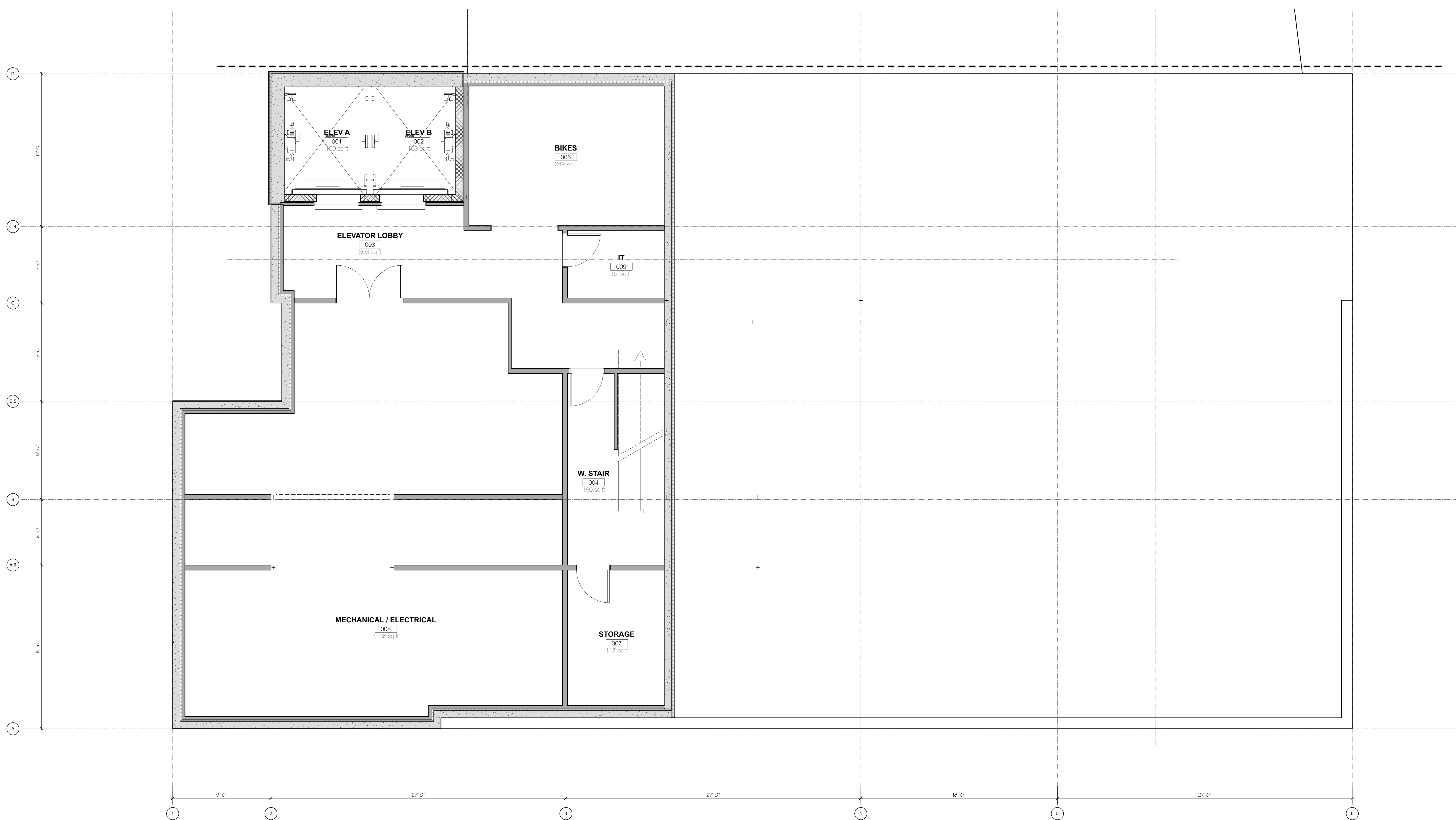
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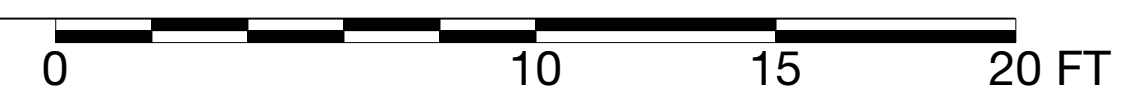
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A0-0.0



ENLARGED BASEMENT PLAN
Scale: 1/4" = 1'-0"



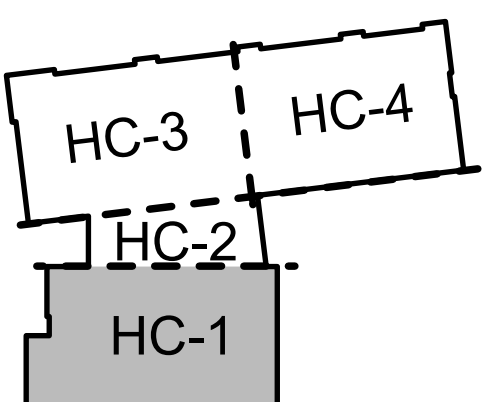
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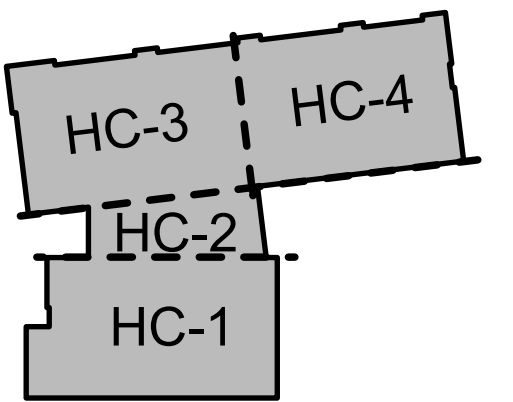
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FIRST FLOOR PLAN
Scale: 3/32" = 1'-0"

0 10 15 20 FT



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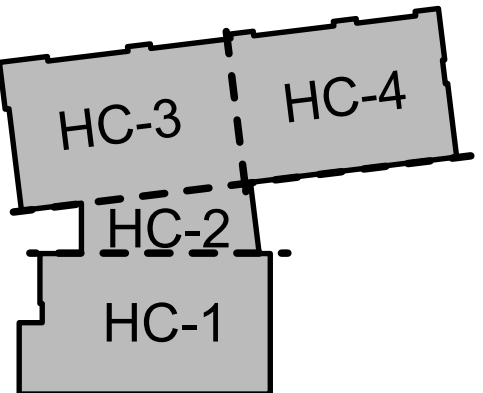
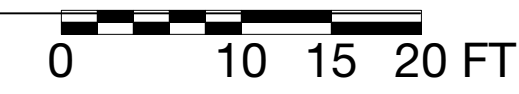
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A1-1



1 SECOND FLOOR PLAN
Scale: 3/32" = 1'-0"



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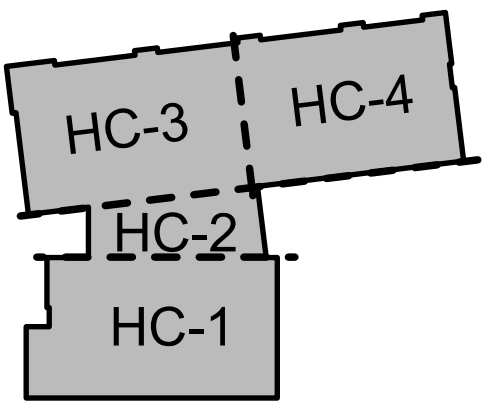
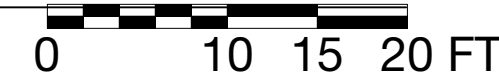
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A1-2



THIRD FLOOR PLAN
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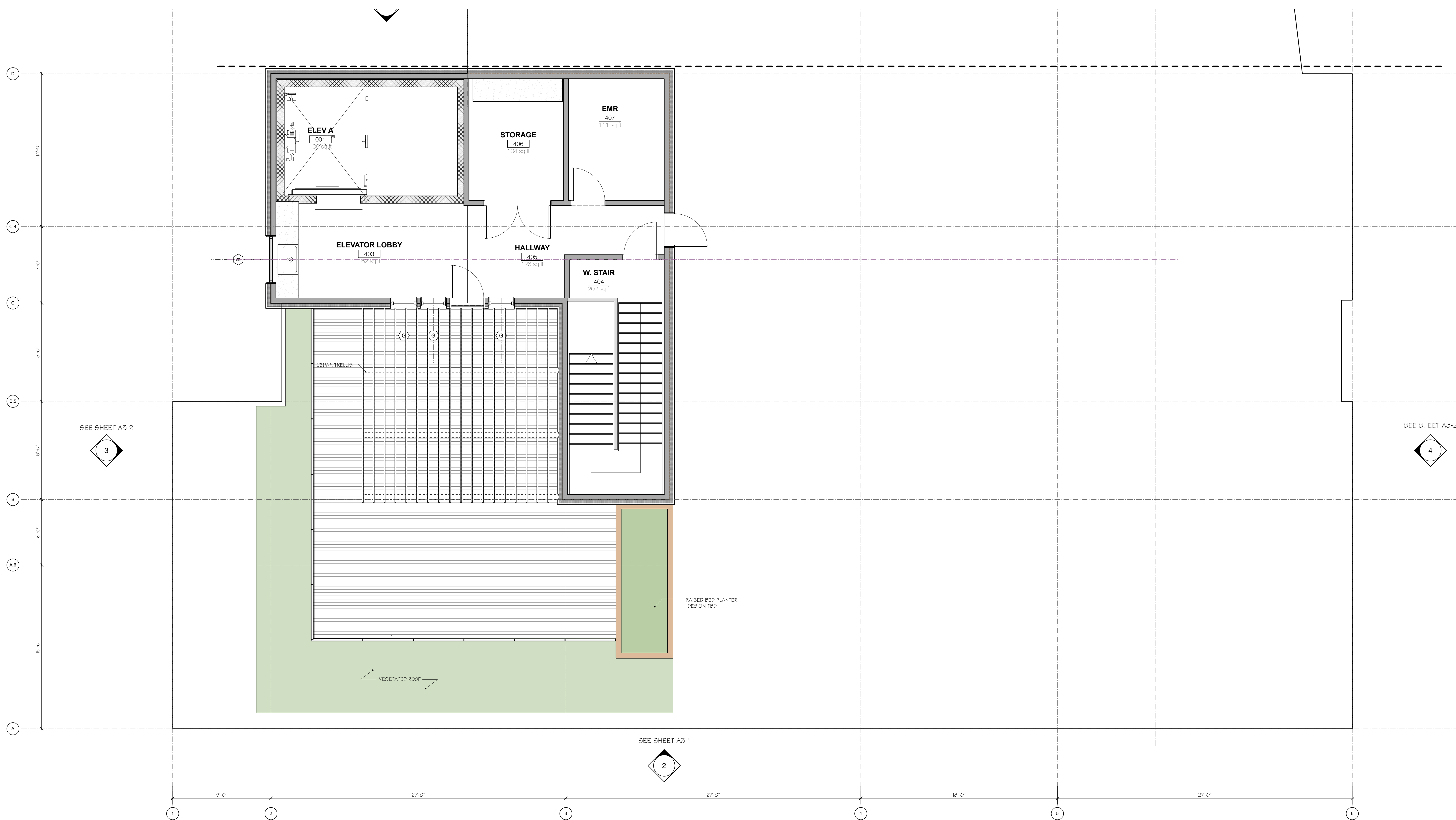
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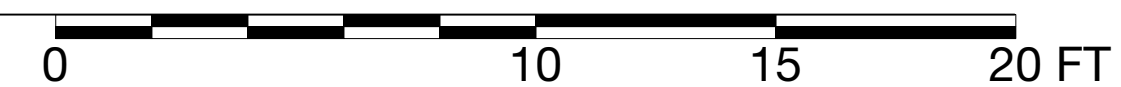
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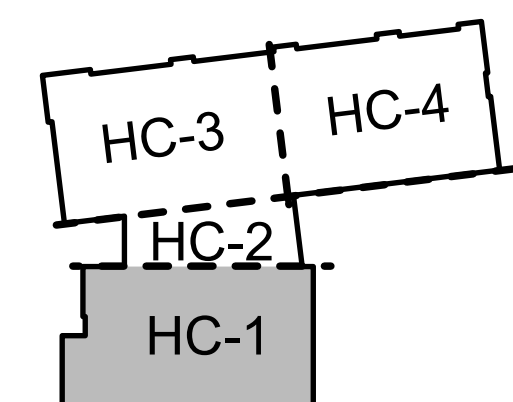
ENLARGED TERRACE PLAN
Scale: 1/4" = 1'-0"



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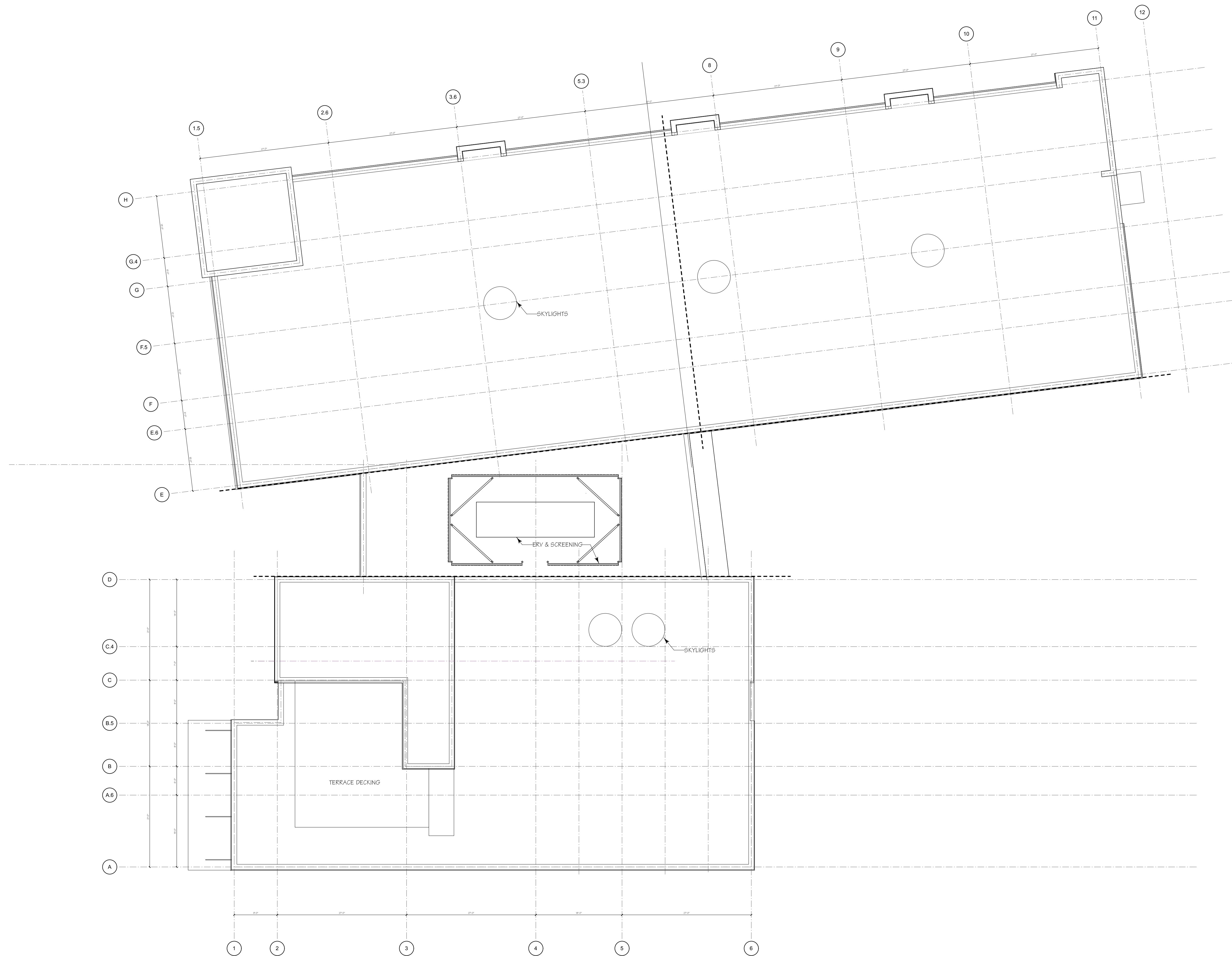


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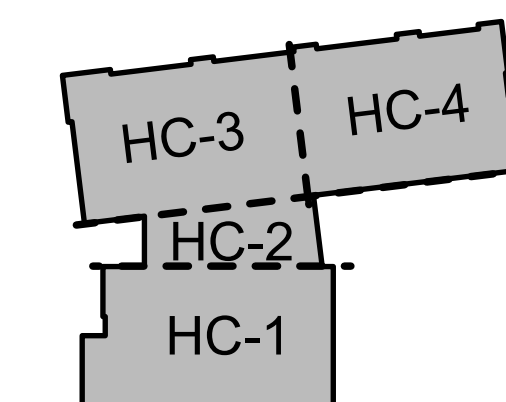
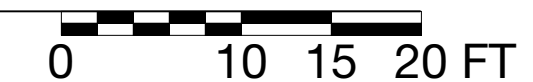
A1-4

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ROOF PLAN
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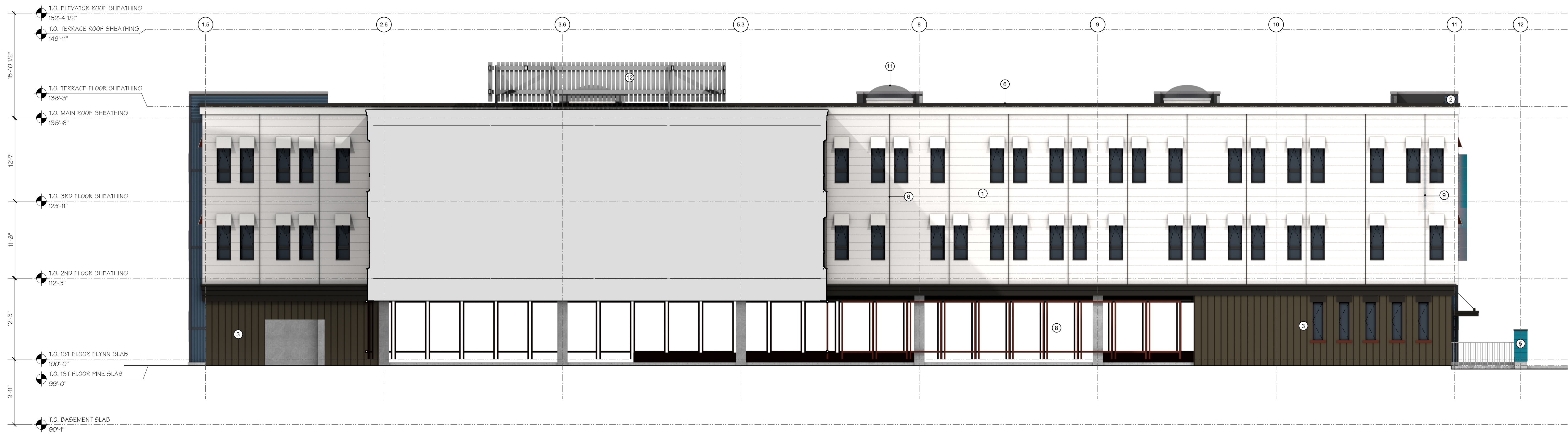
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A1-5



SOUTH SECTION/ELEVATION
Scale: 1/8" = 1'-0"



SOUTH ELEVATION
Scale: 1/8" = 1'-0"

MATERIAL LEGEND			
①	FIBER CEMENT SIDING	⑧	WIRE SCREENING
②	HORIZONTAL METAL SIDING B	⑨	DICHROIC GLASS PANELS
③	VERTICAL METAL SIDING A	⑩	HORIZONTAL METAL SIDING A
④	VERTICAL METAL SIDING B	⑪	SKYLIGHTS
⑤	GLAZED CMU	⑫	MECHANICAL SCREENING
⑥	METAL TRIM	⑬	METAL RAILING
⑦	SYNTHETIC TRIM	COLORS (T.B.D.)	
		Ⓐ	COLOR - A
		Ⓑ	COLOR - B
		Ⓒ	COLOR - C

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A3-0.0



WEST ELEVATION
Scale: 1/8" = 1'-0"



EAST ELEVATION
Scale: 1/8" = 1'-0"

MATERIAL LEGEND			
①	FIBER CEMENT SIDING	⑧	WIRE SCREENING
②	HORIZONTAL METAL SIDING B	⑨	DICHROIC GLASS PANELS
③	VERTICAL METAL SIDING A	⑩	HORIZONTAL METAL SIDING A
④	VERTICAL METAL SIDING B	⑪	SKYLIGHTS
⑤	GLAZED CMU	⑫	MECHANICAL SCREENING
⑥	METAL TRIM	⑬	METAL RAILING
⑦	SYNTHETIC TRIM	COLORS (T.B.D.)	
		Ⓐ	COLOR - A
		Ⓑ	COLOR - B
		Ⓒ	COLOR - C

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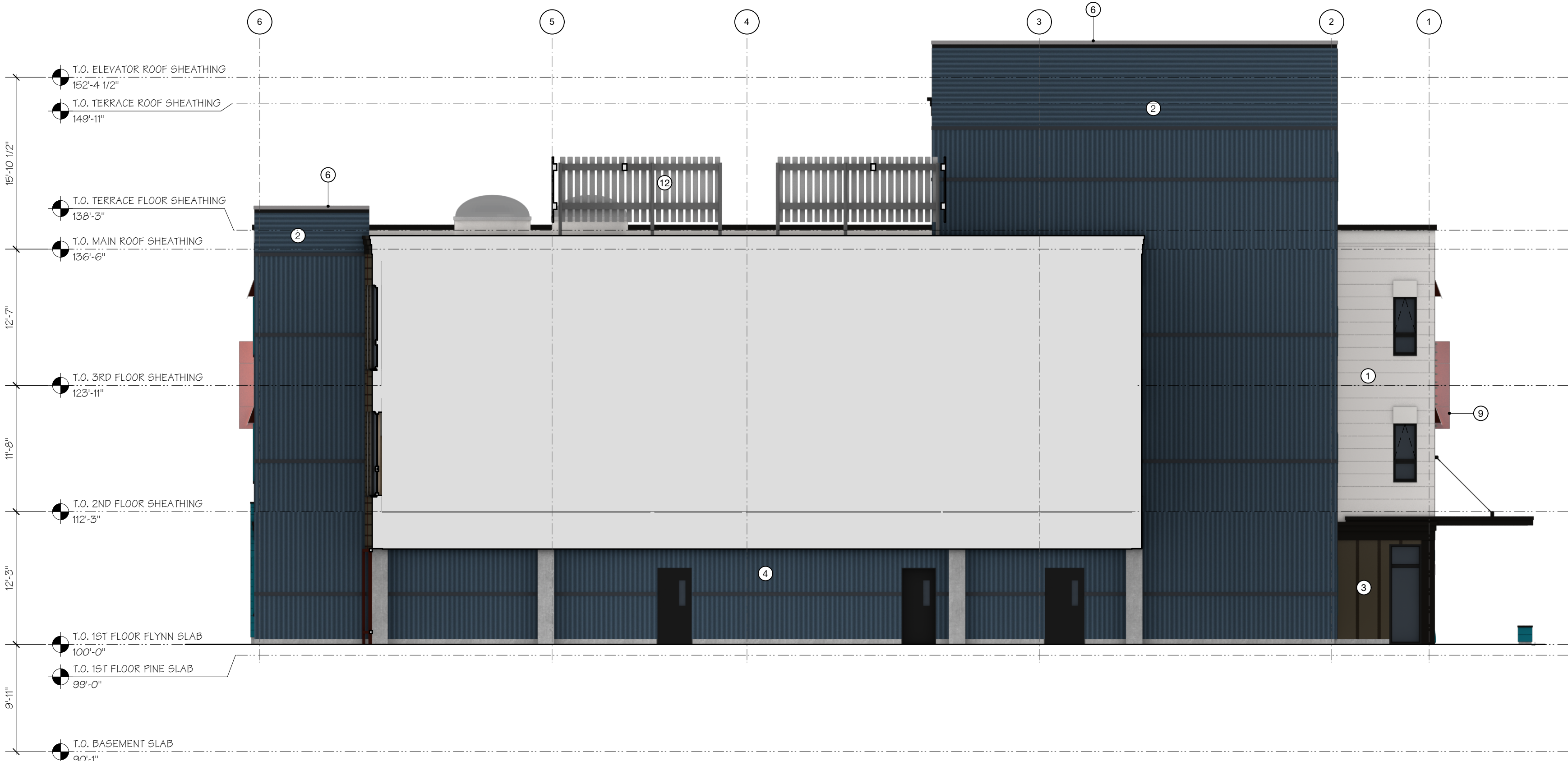
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A3-1.0



NORTH ELEVATION
Scale: 1/8" = 1'-0"



NORTH SECTION/ELEVATION
Scale: 1/8" = 1'-0"

MATERIAL LEGEND

- | | |
|-----------------------------|------------------------------|
| ① FIBER CEMENT SIDING | ⑧ WIRE SCREENING |
| ② HORIZONTAL METAL SIDING B | ⑨ DICHROIC GLASS PANELS |
| ③ VERTICAL METAL SIDING A | ⑩ HORIZONTAL METAL SIDING A |
| ④ VERTICAL METAL SIDING B | ⑪ SKYLIGHTS |
| ⑤ GLAZED CMU | ⑫ MECHANICAL SCREENING |
| ⑥ METAL TRIM | ⑬ METAL RAILING |
| ⑦ SYNTHETIC TRIM | COLORS (T.B.D.) |
| | ① COLOR - A ② COLOR - B |
| | ③ COLOR - C |

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A3-2.0

Architectural Design Standards

The redevelopment of 300 Flynn Avenue / 855 Pine Street meets the Architectural Design Standards as written in article 6.

6.3.2 (a) Relate Development to its environment:

The proposed massing, height, and scale relate harmoniously with adjacent structures: Flynn Avenue Coop to the west (3 stories), 316 Flynn Avenue to the east (4 stories), and St. Anthony's Church to the north. The proposed low pitch membrane roof is appropriate for the commercial function of the building, and relates to existing low pitch roofs nearby: Champlain School, 316 Flynn, and industrial buildings further west on Flynn (208 Flynn, City Market). Cornices and different parapet heights are employed in the design to provide architectural detail and avoid large expanses of undifferentiated roof forms.

Two fully accessible primary entrances invite the user to the building. The main entrance on Flynn Avenue welcomes most visitors and staff, while the Pine Street entrance serves users coming to the community room space on Pine Street.

Windows are primarily vertical in nature, with some deviations to create visual interest.

6.3.2 (b) Protection of Important Architectural Resources:

N/A

6.3.2 (c) Protection of Important Public Views:

The proposed development does not adversely impact any important public views.

6.3.2 (d) Provide an active and inviting street edge:

Each building elevation employs diverse materials (see e) to create depth on the elevation and create an inviting street edge. Plantings along each street edge provide privacy to users as well as performing stormwater function to pre-treat roof water.

6.3.2 (e) Quality of Materials:

The proposed materials (high density fiber cement and metal siding) have a 50+ year expected useful life, and do not require periodic repainting. Cut sheets of all proposed materials are included in the application.

6.3.2 (f) Reduce energy utilization:

This project will not use any fossil fuels on site. To achieve this, the building will be insulated above code minimums with a goal of meeting the Passive House air sealing requirements. Heating and cooling will be accomplished using geothermal heat pumps. Ventilation is provided using high efficiency balanced ventilation with heat recovery. The central ventilator will be located on the roof and screened from public view. Domestic hot water will utilize air source heat pump technology. The roof has been designed for future rooftop solar. The design team is working with Burlington Electric Department to maximize opportunities for energy efficiency.

6.3.2 (g) Make advertising features complementary to the site:

Signage is illustrated in elevations and renderings. However, the applicant will apply for signage permits separately. Proposed signs will be complementary to the architecture and coordinated with other materials in a harmonious fashion.

6.3.2 (h) Integrate infrastructure into the building design:

Aforementioned rooftop mechanicals will be screened from view with rooftop screening that is complementary to the architectural design. Stormwater infrastructure will be planted and celebrated as part of the Flynn Avenue street edge landscaping.

6.3.2 (i) Make spaces secure and safe:

HOWARD CENTER

Site Plan Application Narratives

DATE: August 23, 2023

Safety and security for staff and clients is of utmost importance to Howard Center. To those ends, parking lot and parking garage lighting will be as bright as possible (while meeting Burlington's lighting limits) to create a safe environment. Emergency vehicle access, including fire truck radii analysis, has been incorporated into the design. The design team has reviewed the design with the Burlington Fire Marshal.

Building Height Variation

Per Article 5.2.6 (c) 6 - the applicant requests consideration for a 5% variation in the allowable building height to account for grade changes across the site. The building's main finish floor elevation (FFE) is measured at 146', at the primary facade facing Flynn Avenue. The zoning ordinance allows 35' in this district, and we are requesting the additional 1'-6" to assist the team with managing the grades as they modulate towards Englesby Brook. The additional height will enable the building to better support the fully electric air based building systems we need to provide the clients and staff with good indoor air quality.

Sam











FLYNN AVENUE PARKING LOT



VIEW FROM FLYNN AVENUE PARKING LOT



FLYNN AVENUE ENTRANCE



NEIGHBORING BUILDING



VIEW FROM FLYNN AVENUE



VIEW FROM PINE STREET



PINE STREET PARKING LOT AND ENTRANCE



WALKWAY BEHIND BUILDING



VIEW TO FLYNN AVENUE PARKING LOT



NORTH SIDE OF BUILDING



EXISTING FLYNN AVENUE PARKING LOT

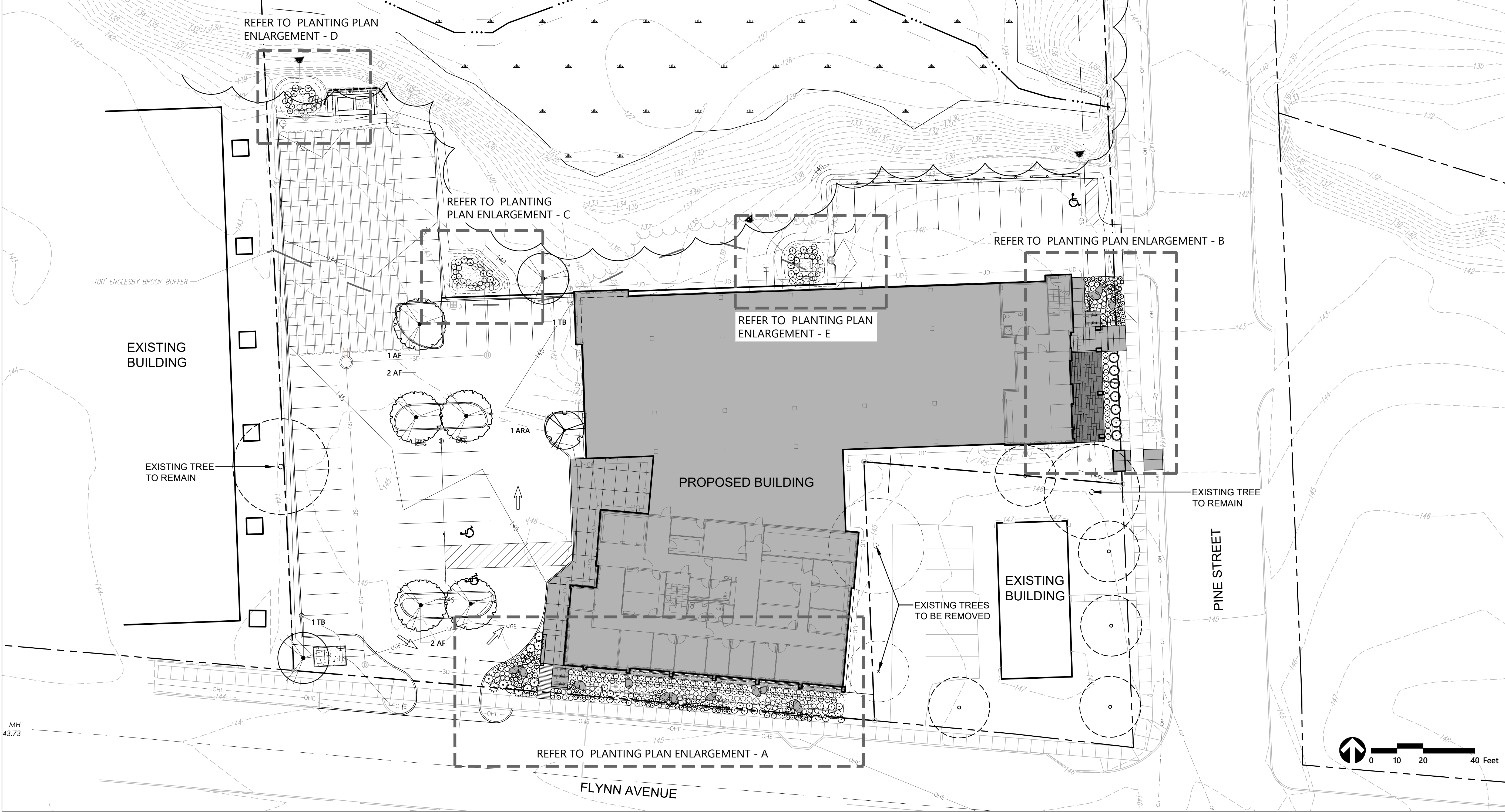


Designed by mkw	Checked by mkw
Issued for	Date
Permit Application	8/3/2023

Not For Construction

Drawing Title

Landscape Layout Plan



**Howard Center
Redevelopment Project**
855 Pine Street/300 Flynn Avenue
Burlington, Vermont

No.	Revision	Date	Appr'd.
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Designed by	Checked by
mkw	mkw

Issued for	Date
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Permit Application 8/3/2023

Not For Construction

Drawing Title
Planting Plan

Drawing Number

L2.00

PLANT SCHEDULE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
ARA	1	Acer rubrum 'Armstrong'	Armstrong Red Maple	2 1/2 - 3" CAL.
AF	5	Acer x freemanii 'Sienna'	Sienna Glen Maple	2 1/2 - 3" CAL.
TB	2	Tilia americana 'Baillyard'	Frontyard® American Linden	2 1/2 - 3" CAL/ B&B
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CSK	51	Cornus sericea 'Kelsey'	Kelsey Dogwood	18 - 24" SPD
JP2	10	Juniperus horizontalis 'Plumosa Compacta'	Creeping Juniper	18 - 24" SPD
MD	7	Microbiota decussata	Russian Cypress	18 - 24" SPD
ORNAMENTAL GRASSES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CA	123	Calamagrostis x acutiflora 'Karl Foerster'	Karl Foerster Feather Reed Grass	2 GAL.
PV5	61	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 GAL.
SS3	33	Schizachyrium scoparium 'Standing Ovation'	Standing Ovation Little Bluestem	2 GAL.
SH	32	Sporobolus heterolepis	Prairie Dropseed	2 GAL.
PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CC3	12	Chrysanthemum coccineum 'Robinson's Pink'	Robinson's Pink Painted Daisy	1 GAL., 18" o.c.
NF	17	Nepeta x faassenii	Catmint	1 GAL., 24" o.c.
RM	41	Rudbeckia hirta 'Marmalade'	Marmalade Black-eyed Susan	1 GAL., 24" o.c.
SV	19	Salvia nemorosa 'Pink Profusion'	Pink Profusion Meadow Sage	1 GAL.
SA	61	Sedum x 'Autumn Joy'	Autumn Joy Sedum	1 GAL.

- Notes:
- CONTRACTOR IS RESPONSIBLE TO VERIFY ALL PLANT QUANTITIES FOUND IN THE PLANTING PLANS. IF ANY DISCREPANCIES ARE FOUND, LANDSCAPE ARCHITECT SHOULD BE NOTIFIED IMMEDIATELY.
 - FINAL LAYOUT AND PLACEMENT OF ALL PLANT MATERIAL TO BE APPROVED BY THE LANDSCAPE ARCHITECT.
 - CONTRACTOR IS RESPONSIBLE TO SEED ALL DISTURBED AREAS ACCORDING TO THE SPECIFICATIONS AND LAWN DETAIL.
 - REFER TO PLANT MATERIAL INSTALLATION DETAILS AND SPECIFICATIONS.
 - IF THE LANDSCAPE CONTRACTOR PROPOSES A SUBSTITUTE PLANT SPECIES, ALL SUBSTITUTES NEED TO BE APPROVED BY THE LANDSCAPE ARCHITECT IN WRITING PRIOR TO ORDERING.



<u>DECIDUOUS TREES</u>		<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>SIZE</u>
ARA	1	Acer rubrum 'Armstrong'	Armstrong Red Maple	2 1/2 - 3' CAL.
AF	5	Acer x freemanii 'Sienna'	Sienna Glen Maple	2 1/2 - 3' CAL.
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<u>SHRUBS</u>		<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>SIZE</u>
JSK	51	Cornus sericea 'Kelsey'	Kelsey Dogwood	18 - 24" SPD
JPL	10	Juniperus horizontalis 'Plumosa Compacta'	Creeping Juniper	18 - 24" SPD
MD	7	Microbiota decussata	Russian Cypress	18 - 24" SPD
<u>ORNAMENTAL GRASSES</u>		<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>SIZE</u>
CA	123	Calamagrostis x acutiflora 'Karl Foerster'	Karl Foerster Feather Reed Grass	2 GAL.
PVS	61	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 GAL.
SS3	33	Schizachyrium scoparium 'Standing Ovation'	Standing Ovation Little Bluestem	2 GAL.
SH	32	Sporobolus heterolepis	Prairie Dropseed	2 GAL.
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RF	41	Rudbeckia hirta 'Marmalade'	Marmalade Black-eyed Susan	1 GAL., 24" o.c.
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No.	Revision	Date	Apprd.

Designed by	Checked by
mkw	mkw

Permit Application 8/3/2023

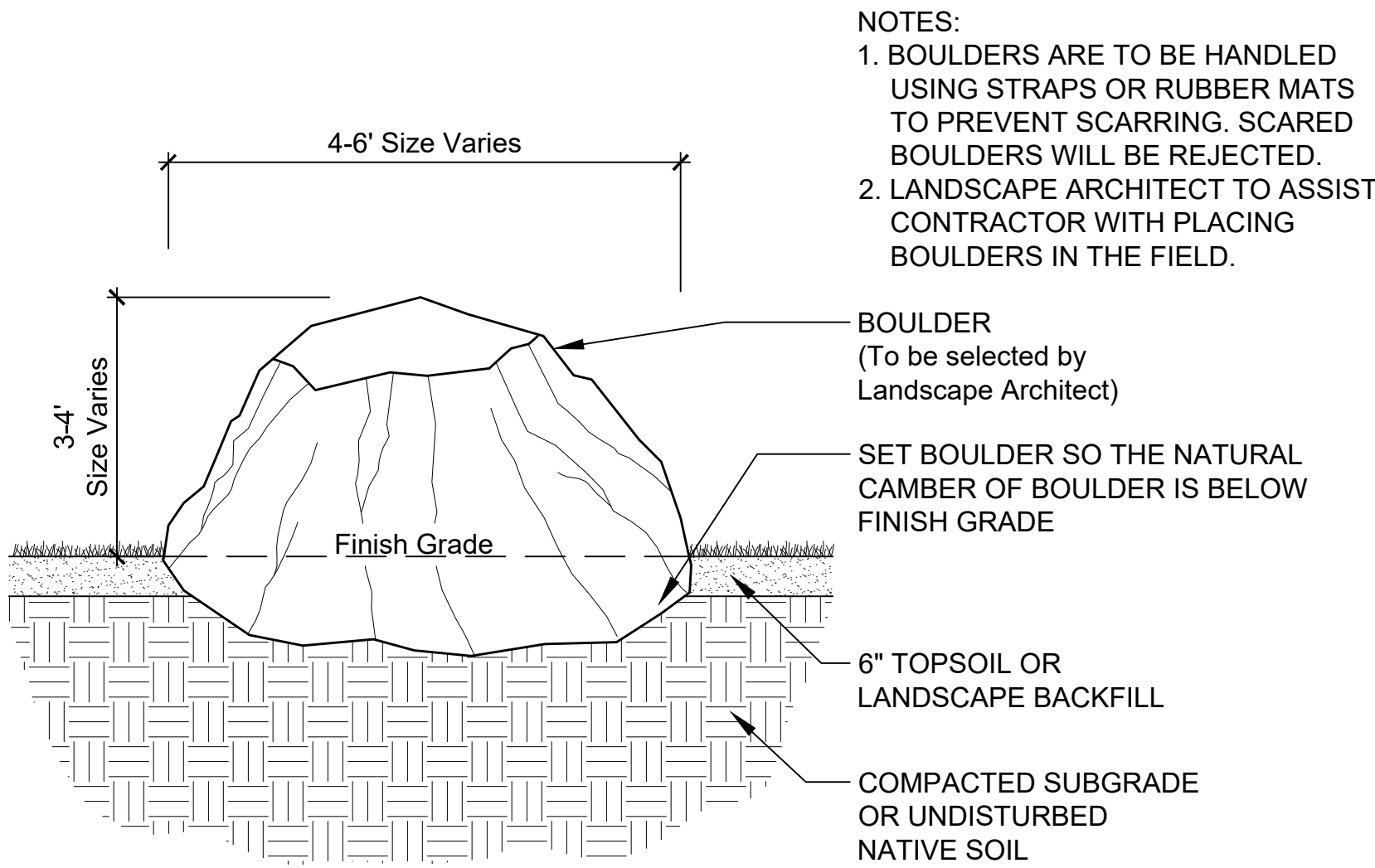
Not For Construction

Drawing Title

Planting Plan Enlargements

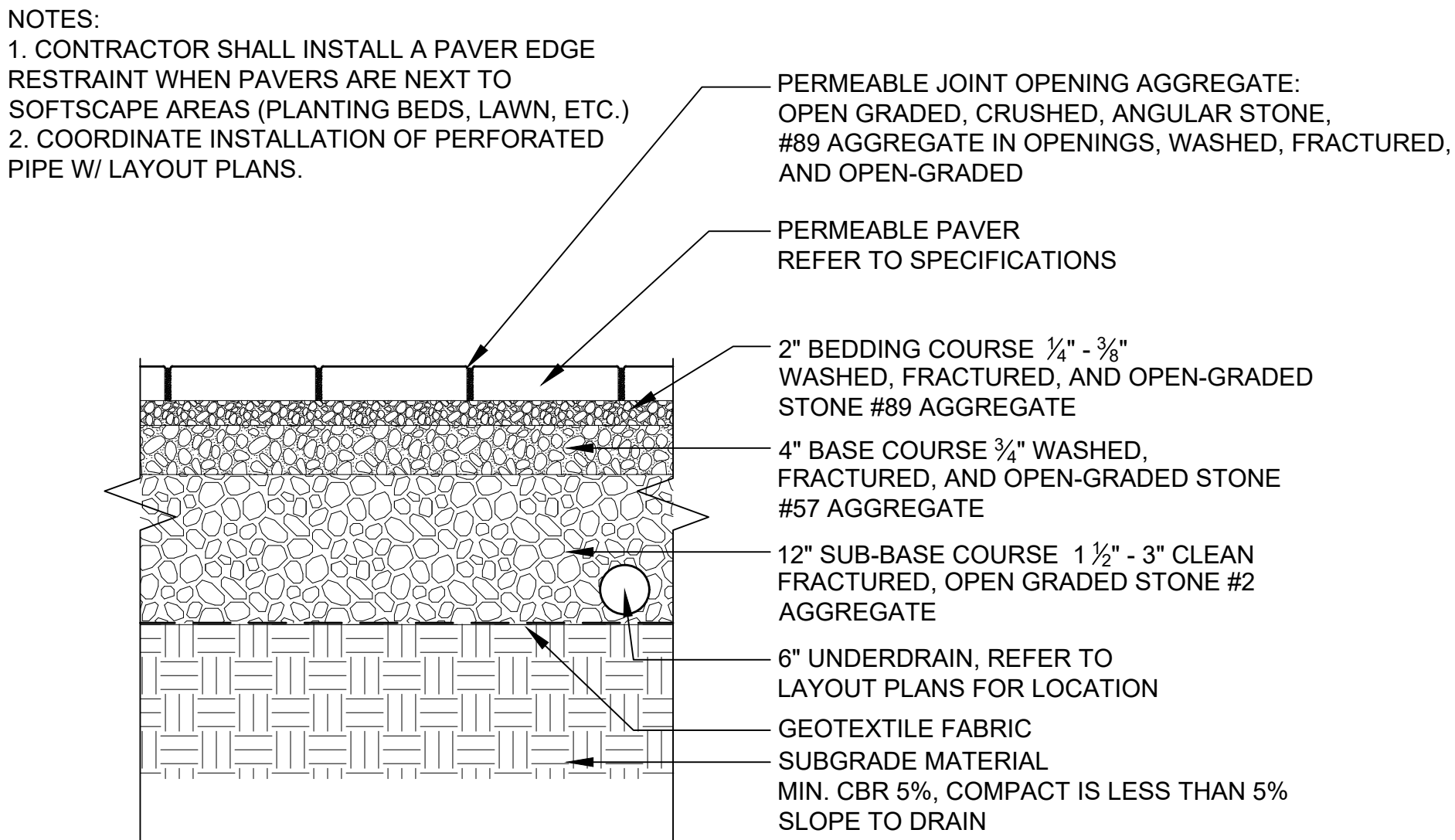
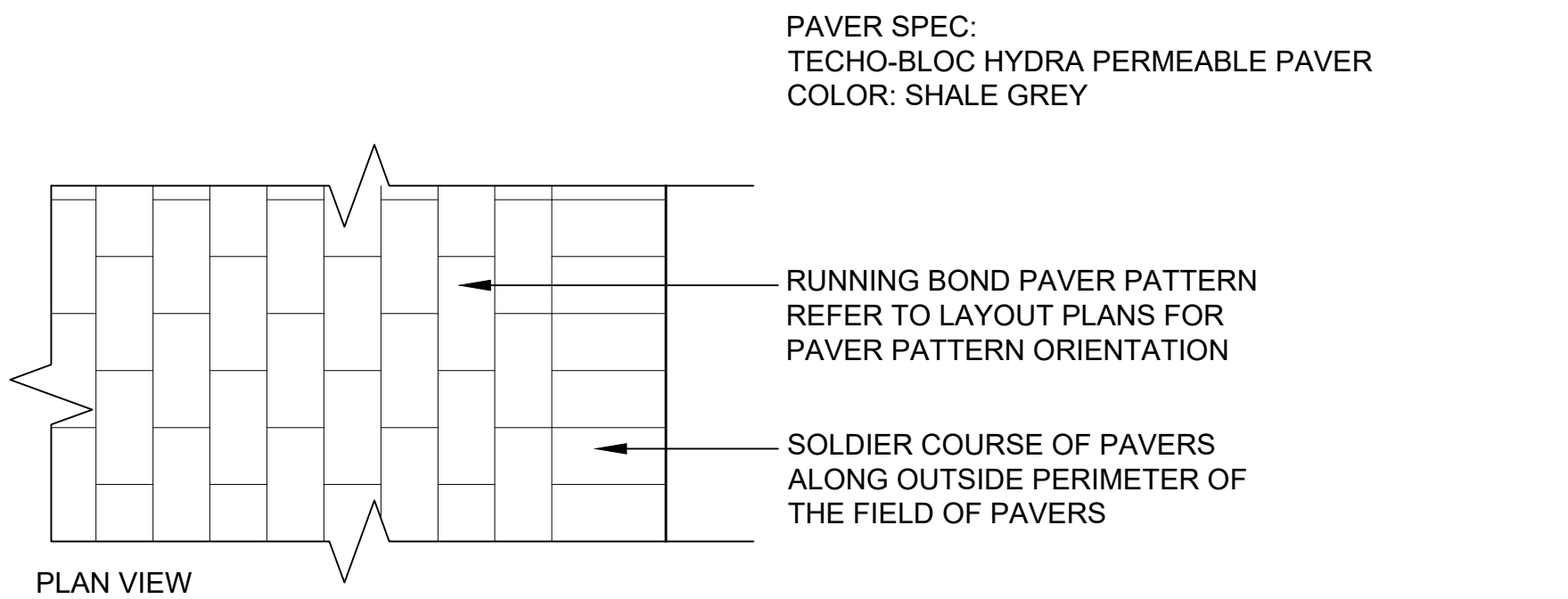
Drawing Number

L2.01



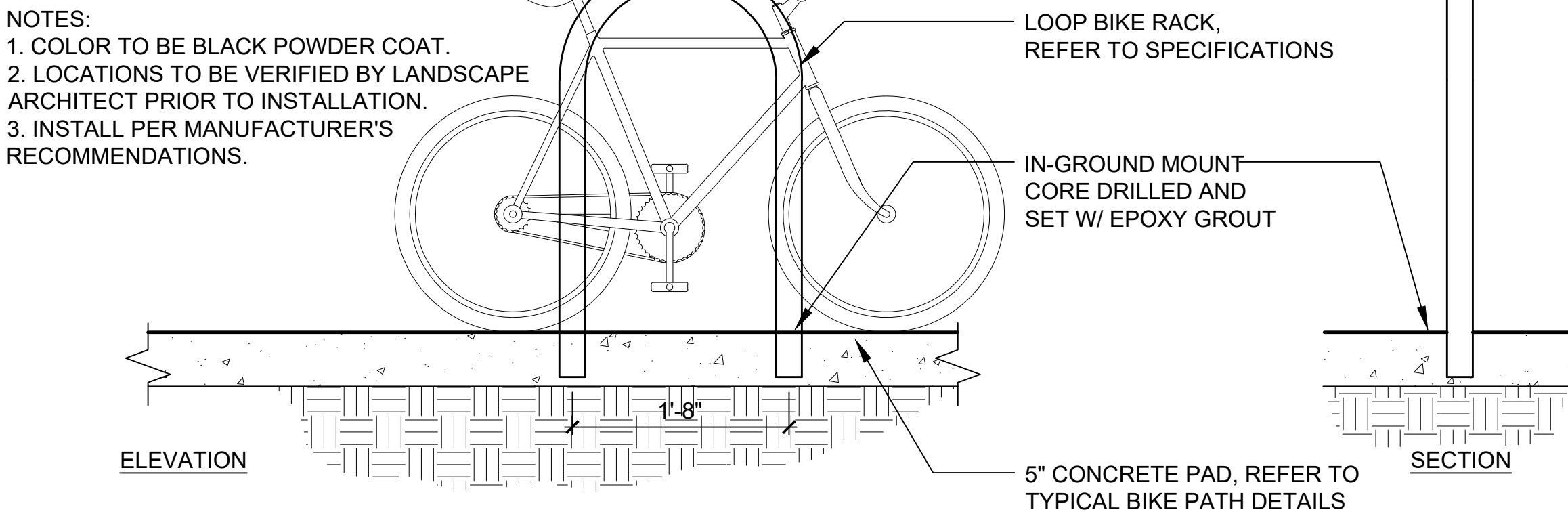
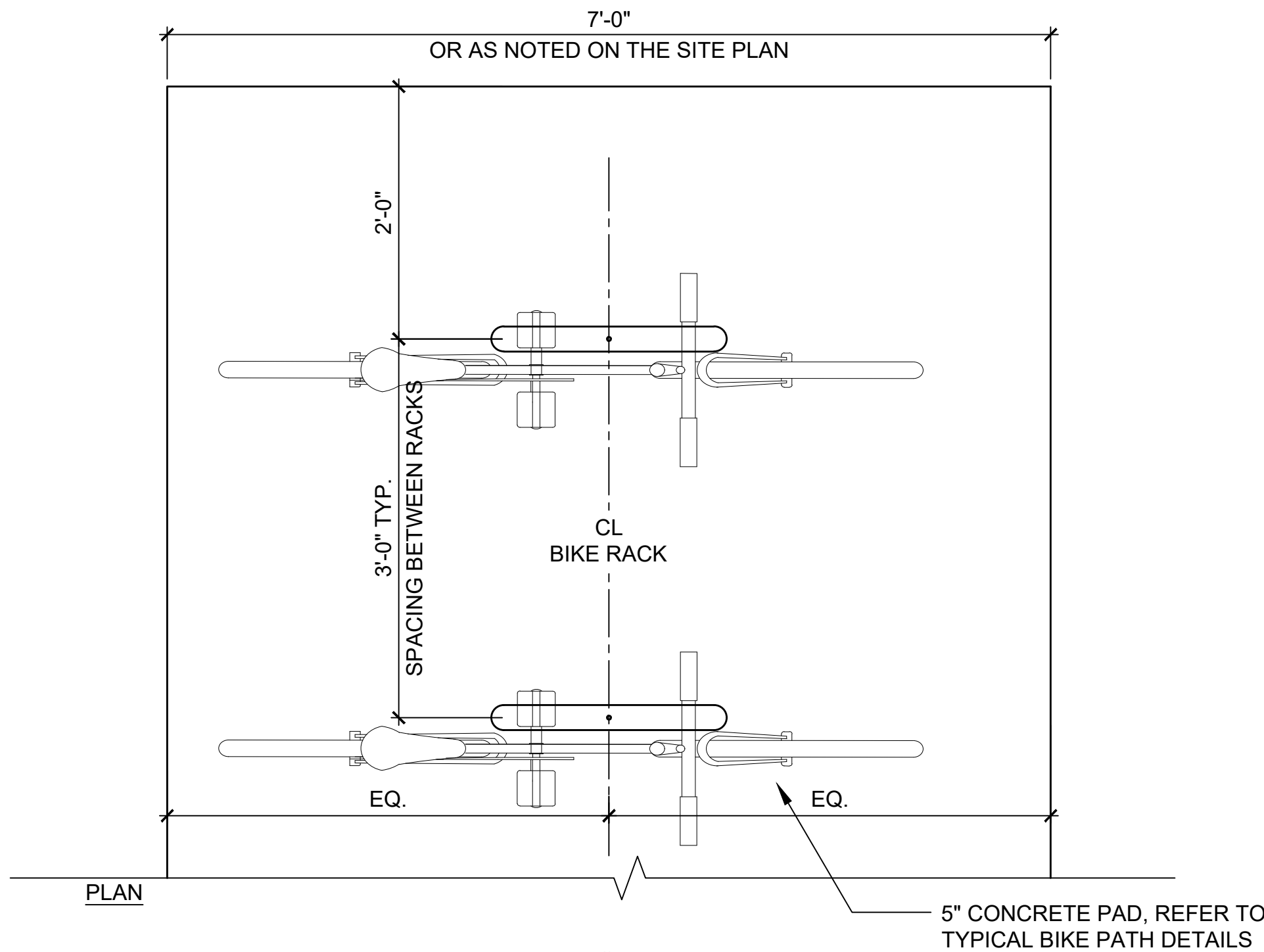
A LANDSCAPE BOULDER

SCALE 1/2" = 1'-0"



C PERMEABLE PAVERS

SCALE 1" = 1'-0"



B BIKE RACK

SCALE 1" = 1'

Howard Center Redevelopment Project

855 Pine Street/300 Flynn Avenue
Burlington, Vermont

No.	Revision	Date	Appr'd.

Designed by	mkw	Checked by	mkw
Issued for		Date	8/3/2023

Permit Application

Not For Construction

Drawing Title
Landscape Details

Drawing Number

L3.00



No.	Revision	Date	Appvd.
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Designed by	Checked by
mkw	mkw
Issued for	Date

Permit Application 8/3/2023

Not For Construction

Drawing Title

Landscape Lighting Plan

Drawing Number

L4.00

LIGHT FIXTURE AND POLE SPECIFICATIONS

Fixture A Manufacturer: Brownlee Fixture: Penny-OD LED Engine: 16w L Series LED Color Temperature: 3,000k Mounting: Ceiling Mounted	Fixture D Manufacturer: Eureka Fixture: Luz 10094 LED Engine: 1w LED Color Temperature: 3,000k Color: Black Texture Mounting: Wall - 1.5ft
Fixture B Manufacturer: Eureka Fixture: Cliff - 3419 LED Engine: HO Color Temperature: 3,000k Color: Black Texture Mounting: Wall - 8-10ft	Fixture E Manufacturer: Beacon Lighting Fixture: VPL LED Engine: 160L-100 Color Temperature: 3,000k Distribution: Type 3 Configuration: Single Finish: Black Matte Textured Pole Height: 22'
Fixture C Manufacturer: Equinox 3411 Fixture: Eureka LED Engine: 2xLED2 - Narrow Color Temperature: 3,000k Color: Black Texture Mounting: Wall - 8-10ft	Fixture F Manufacturer: Beacon Lighting Fixture: VPL LED Engine: 160L-100 Color Temperature: 3,000k Distribution: Type 3 Configuration: Twin Finish: Black Matte Textured Pole Height: 22'



STATISTICAL AREA SUMMARY

Grid Type: Horizontal Illuminance at finish grade.
Grid Units: Footcandles

Statistical Area		Avg	Max	Min	Avg/Min	Max/Min
1	Parking Lot - A	1.55	3.50	0.10	15.50	35.00
2	Parking Lot - B	1.93	3.10	0.90	2.14	3.44

Statistical Boundary

Disclaimer:

This analysis was calculated in accordance with published IES calculation methods and procedures with the data as entered by the user. This analysis is based on tested IES photometric data, light loss factors as defined in the LLF value. This analysis is a mathematical model of real life situations, and it can be only as accurate as the model itself. Calculated values may vary from actual measurements in certain situations. VHB is not responsible for light output deviations due to light source, or other variables.



MEMORANDUM

To: Burlington Development Review Board
Mary O’Neil, Principal Planner
Scott Gustin, Principal Planner & Asst. Administrative Officer

From: Joe Weith, Senior Project Manager

Date: August 10, 2023

Re: Howard Center 300 Flynn Redevelopment – Project Narrative

Howard Center is proposing to redevelop their property located at 300 Flynn Avenue. This narrative provides a brief description of the project and addresses several key design aspects and regulatory requirements as outlined in the Burlington Comprehensive Development Ordinance (“CDO”).

Project Description

The 300 Flynn Redevelopment project will involve demolition of the existing approximately 24,042 square foot building and construction of a new 3 story, approximately 50,100 square foot building. The current and proposed use of the property is a combination of mental health crisis center and related medical and general office uses. Mental health crisis center is a conditional use in the underlying zoning district.

Howard Center and the project team met with the Ward 5 NPA on December 15, 2022, the City’s Technical Review Committee on February 9, 2023, and the Development Review Board (“DRB”) on May 16, 2023 for sketch plan review.

Dimensional Standards and Density

Zoning District: The underlying zoning district is Neighborhood Mixed-Use (NMU).

Overlay Districts: Design Review Overlay District; Natural Resource Protection including the Riparian and Littoral Conservation Zone along Englesby Brook and the Wetland Conservation Zone for the wetland along Englesby Brook.

Building Setbacks: Proposed building setbacks: 11feet from Flynn Avenue (10 foot minimum required), 18 feet from Pine Street (10 foot minimum required), 104 feet from the west property line (zero feet minimum required), 164 feet from north property line (zero feet minimum required), and 3.4 feet from southeast property line (zero feet minimum required).

Lot Coverage: The proposed lot coverage is 58% (80% maximum lot coverage allowed).

Building Height: The proposed building height is 36.5 feet as measured from the building's main finish floor elevation (FFE) of the primary facade facing Flynn Avenue (see South Elevation on A3-0.0 for the measurement of building height). Maximum allowable building height in the NMU District is 35 feet. Per Article 5.2.6(c)(6) of the CDO, the applicant requests consideration for a 5% variation in the allowable building height to account for grade changes across the site. An additional 1.5 feet in building height will help the design team with managing the grades as they modulate towards Englesby Brook and will enable the building to better support the fully electric air-based building systems needed to provide the clients and staff with good indoor air quality.

Parking

Vehicle Parking: The property is located within the Multi-Modal Mixed Use Parking District. Table 8.1.9-1 of the CDO does not list a maximum off-street parking requirement for mental health crisis centers. The land use category most similar to mental health crisis center for parking purposes is "crisis counseling center", which allows maximum parking of 3 spaces per 1,000 gfa. The programmed use of the building will be a blend of scheduled outpatient services and unscheduled, drop in, as needed services. The latter relates primarily to our crisis services and intake services which will be located at this site with a visitor flow that more closely aligns with the "crisis counseling center" use.

The maximum allowable number of on-site parking spaces is 150 (50,100 sf / 1,000 sf x 3 spaces = 150). The project proposes 106 total on-site parking spaces including 5 ADA accessible spaces, 2 EV charging spaces, and 8 tandem spaces. The total number of proposed parking spaces that count toward the maximum allowed is 99.

Bicycle Parking: Section 8.2.4 of the CDO requires 6 short term (50,100 sf / 8,000 sf = 6) and 10 long term (50,100 / 5,000 sf = 10) bike parking spaces for this project. For short-term bike

parking, 3 U-racks (6 bike parking spaces) are proposed near the main entrance on Flynn Avenue and 2 U-racks (4 bike parking spaces) are proposed near the entrance on Pine Street for a total of 10 short-term parking spaces. A minimum of 10 long term bike parking spaces will be accommodated in the basement (see basement floor plan Sheet A1-0 in architectural plan set).

Traffic/Transportation

As indicated in the attached Howard Center Traffic Analysis memo prepared by VHB and dated 8/9/23, the project is projected to produce 52 net new trips in the AM peak hour and 60 net new trips in the PM peak hour compared to existing conditions. While VTrans and Burlington Public Works (“BPW”) policy does not require a traffic study if the net increase in peak hour trip ends is less than 75, Howard Center went ahead and analyzed the project’s potential impact on the Pine Street/Flynn Avenue intersection. With conservative assumptions regarding mode split and trip distribution, the new trips are expected to have minimal effect on the intersection. An overall Level of Service B is expected to remain in the Build condition for the AM and PM peak hours. The Traffic Analysis memo concludes that the project is not anticipated to generate unreasonable congestion conditions on the adjacent roadway network.

As shown on Sheet C2.0 of the civil plan set, the existing bus stop on Pine Street will be relocated several feet to the south. GMT has approved relocation of the bus stop as proposed.

Transportation Demand Management Plan

Attached is a Transportation Demand Management (TDM) plan for the project.

Stormwater

The proposed stormwater management plan will significantly improve the detention and treatment of stormwater on the site compared to existing conditions. The stormwater management plan involves the installation of practices to both treat and detain runoff from the site to reduce pollutant load and peak flows to Englesby Brook and the surrounding wetland. Stormwater from the building roof and parking areas will be directed to high-flow vegetated filters which will provide water quality treatment. The water will then flow into a system of buried chambers which have a controlled outlet. This system allows for the slow release of stormwater back towards the wetland without increasing peak flows. This proposed system surpasses the plan outlined in the Englesby Brook Flow Restoration Plan.

The stormwater management and EPSC plans, detail sheets and the attached Stormwater General Permit Narrative have been submitted to and have been preliminarily reviewed by James Sherard at the City’s Stormwater Division.

Natural Resource Protection

As shown on the attached civil plans, the northern portion of the site is comprised of Englesby Brook and an associated Class II wetland. The limits of the wetland were delineated by Gilman & Briggs Environmental and are depicted on the plan. The plan also shows the limits of the state's regulated 50-foot wetland buffer and the City's 100-foot wetland and riparian and littoral conservation zones.

The project reduces the area of impact to the 50' wetland buffer zone, 100' wetland buffer zone, and 100' riparian buffer zone compared to the existing site (see zoning table on Sheet C0.0 in the civil plan set). The tree line will not be significantly altered, and best management practices will be used to prevent erosion and control sedimentation during construction. In addition, the stormwater management system will effectively treat runoff before it enters the wetland/riparian buffer zones and control the release of runoff to protect the existing stream channel.

Attached is a wetland and natural resources evaluation memorandum prepared by Gilman & Briggs. Gilman & Briggs concluded that the project is well designed with better water quality infrastructure than currently exists and there will be no negative impact to the wetland, wetland buffer or natural resource areas.

Steep Slopes

Areas of steep slopes exist on the site beginning just beyond the existing development and sloping down to and ending at the wetland surrounding Englesby Brook (see sheets C1.0 and C2.0 in the civil plan set). The intent of the site design is to minimize disturbance and avoid encroachment into this area to the extent practicable. Work within areas of steep slopes will be extremely minimal and will involve removal of three existing drainage pipes which discharge midway down the slope. Minimal grade changes (~200 SF) are proposed near the Pine Street parking lot to convey more area to stormwater treatment and away from the municipal system. All disturbed areas will be backfilled or fine graded, seeded, and covered with erosion control matting. No difference to the overall area of steep slopes is proposed in the pre and post site condition.

Architectural Design

See attached architectural design narrative prepared by Duncan Wisniewski Architects.

Energy Efficiency/Sustainability

The project will not use any fossil fuels on site. To achieve this, the building will be insulated above code minimums with a goal of meeting the Passive House air sealing requirements. Heating and cooling will be accomplished using geothermal heat pumps. Ventilation is provided using high efficiency balanced ventilation with heat recovery. The central ventilator will be located on the roof and screened from public view. Domestic hot water will utilize air source heat pump technology. The roof has been designed for future rooftop solar. The design team is working with Burlington Electric Department to maximize opportunities for energy efficiency.

Landscaping and Lighting

The attached landscape planting plan (sheets L2.00 and L2.01 in LA plan set) proposes a mix of trees, shrubs, ornamental grasses and perennials. Eight (8) new shade trees are proposed within and around the Flynn Avenue parking lot. The plan also proposes to save the existing, large, mature tree along the west property line. The 8 new trees plus the existing mature tree complies with the shading requirements for parking lots and the intent of the regulations as it relates to the number of trees for parking lots.

A photometric lighting plan, light fixture and pole specifications, and lighting statistical area summary are provided on sheets L4.00 – L4.02 in the LA plan set.

Conditional Use Criteria

Existing or planned public utilities, facilities or services: The project will not introduce any identified adverse impacts on public utilities, facilities or services in the area. The project team has met with DPW, BED and GMT to review the project and get their input regarding utilities and services for the project. The stormwater management system will significantly improve management and treatment of stormwater compared to existing conditions.

Character of the area as defined in the zoning ordinance and the municipal development plan:

The project is compatible with the purpose of the Neighborhood Mixed Use District as it will preserve and enhance a historically mixed commercial/residential area while reinforcing the compact scale and development pattern within the neighborhood. The proposed use will provide employment opportunities within walking or biking distance of the nearby residential neighborhoods. The project will further several goals/objectives contained in the plan including coordination of land use and development with availability and capacity of public services, facilities and utilities, and enable the provision of treatment facilities in accessible locations for residents who need them.

Nuisance impacts from noise, odor, dust, heat, and vibrations: The project will continue and expand the existing use of the property to accommodate the range of caregivers and providers on staff. No additional impacts to the zoning district are anticipated.

Transportation system capable of supporting the proposed use in addition to the existing uses in the area: As indicated in the Howard Center Traffic Analysis memo prepared by VHB dated 8/9/12, the project is not anticipated to generate unreasonable congestion conditions on the adjacent roadway network. Howard Center will also implement the TDM plan which will reduce the need for parking and vehicular travel to and from the site.

Utilization of renewable energy resources: The project will not result in an undue adverse effect on the utilization of renewable energy resources. As stated in the Energy Efficiency/Sustainability section above, the project will not use any fossil fuels on site. The building will be insulated above code minimums with a goal of meeting the Passive House air sealing requirements and heating/cooling will be accomplished using geothermal heat pumps.

Domestic hot water will utilize electric air source heat pump technology. The roof has been designed for future rooftop solar.

Standards or factors set forth in City bylaws and city and state ordinances: The project will comply with all City bylaws and city and state ordinances.

Gilman & Briggs Environmental

1 Conti Circle #5, Barre, VT 05641

Ph: 802-479-7480; team@gbevt.com

MEMORANDUM

To: Kevin Worden, PE
From: Art Gilman
Date: 9 March 2022
Re: The Howard Center, Englesby Ravine

The Howard Center proposes redevelopment of its facility at 300 Flynn Avenue in Burlington. Englesby Brook, a stream that drains ca. 1 sq. mile of generally urban land, flows through the northern portion of the property in a deep ravine, entering via a culvert under Pine Street, and exiting at the northwest corner of the property. A Class Two, significant wetland occupies the floor of the ravine, extending only very slightly upslope in a couple of areas.

This reach of Englesby Brook is shown on the City of Burlington “Potential Natural Community Types” map (2021) and, indeed, most of the length of Englesby Brook is shown on that map, with various natural community types along its length. For this reason, when I delineated the wetland on 9 September 2022, I also took note of the natural community within Englesby Ravine, and offer the following insight.

First, the Ravine is flat-bottomed as is evident by inspecting the topographic layer on the Existing Conditions plan (Sheet C1-01), and the side-slopes are relatively steep. Thus, the wetland area occupies the full extent of the floor of the Ravine but extends only minimally upslope. The stream itself occupies a very shallow channel through the alluvial soil and, on the date of my visit, had some dry channels in addition to the wetted main channel. That is, the stream course evidently meanders across the whole area over time, and there is evidence of seasonal flooding.

Of note is that the entire wetland is shaded by full-canopy trees, both within the wetland and especially, at its edge. The tree community includes two maples: box elder (*Acer negundo*) and silver maple (*A. saccharinum*), as well as green ash (*Fraxinus pennsylvanica*) and at least one large crack willow (*Salix fragilis*). The shade limits the growth of potential invasive shrubs such as Asian honeysuckles (*Lonicera morrowii* and *L. tatarica*), glossy buckthorn (*Frangula alnus*), etc, which often form streamside thickets in Chittenden County; neither of these are present in the area. Within the wetland there are common native herbs including white grass (*Leersia virginica*), fowl manna grass (*Glyceria striata*), jewelweed (*Impatiens capensis*), fringed loosestrife (*Lysimachia ciliata*), marsh blue violet (*Viola cucullata*), and jumpseed (*Persicaria virginiana*).

The slopes are occupied by box elder and white ash (*Fraxinus americana*), striped maple (*Acer pensylvanicum*) and others, with a limited shrub layer and not many ground-layer plants (again, due to shade and likely to dryness on the well-drained slope).

Most of the plants observed were native to Vermont. Although there are other non-native species present, e.g., multiflora rose (*Rosa multiflora*) and ivy-leaved maple (*Acer campestre*) the only plants listed on the

Vermont's list of non-native invasive plants are one thicket of Japanese knotweed (now known as *Reynoutria cuspidata*), on the slope near the northwest end of the parking lot, and the annual weedy garlic mustard (*Alliaria petiolaris*) on the slope in the same section. Therefore, although in generally good condition given its location, history of impacts, and known water quality problems, this area is hardly pristine. As part of a wetland system connecting the southern part of the City of Burlington between the Lake, Crescent Woods, and the open land of the Burlington Country Club, it assumes some importance. <https://enjoyburlington.com/crescent-woods/>

I did not observe any evidence of animal activity during my work, but I note that a local website with waypoints along Englesby Brook, noted tracks of raccoon, which is a common urban animal. It may provide a feeding source and shelter for that and other such species. <https://www.uvm.edu/place/burlingtongeographic/focalplaces/englesbybrook.php>

The proposed Project is well designed, with better water quality infrastructure than currently exists and very minor intrusion into the wetland's statutory buffer zone—and that only in a mowed lawn area. Notably, there will be no tree removal. The relatively good condition of the wetland in the ravine is maintained, in my estimation by the shade from the tree canopy, which suppresses growth of invasive shrubs, this feature of the project is important. I recommend that, not just during the redevelopment project, but going forward long-term, the Howard Center should prioritize tree growth where it now exists, e.g., retaining the trees now there, replanting any that might die, and adding others as appropriate.

I suggest also controlling the spread of Japanese knotweed from its existing location. This species is notoriously difficult to eradicate but, given that it is already somewhat suppressed by the shade, it can probably be prevented from spreading. The garlic mustard, an annual species, has less impact in this location—it does not appear to be suppressing growth of native plants.



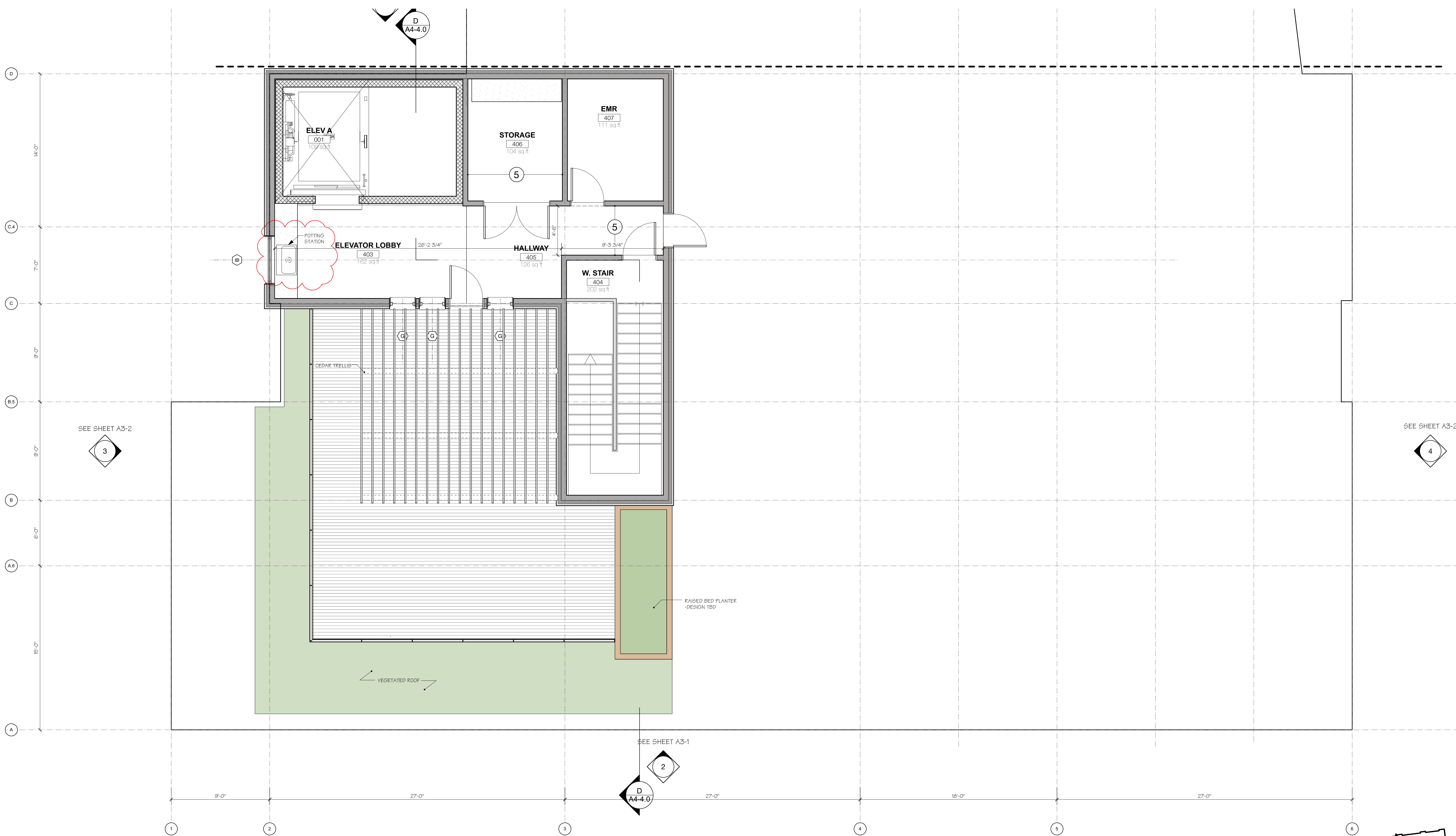
Photo 1: A broad, seasonal flow channel along the bottom of the ravine; the main flow at present is in a different channel.



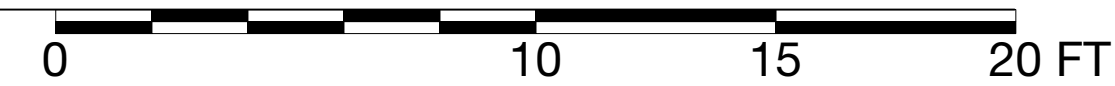
Photo 2. Looking west. On the left is the slope up toward the Howard Center, at upper right is a large crack willow tree. In the foreground is evidence of seasonal flow and seasonal ponding from Englesby Brook.



Photo 3. Englesby Brook, slightly downstream of the Pine Street culvert. The channel is well-defined, through alluvium. The plant with 5-parted leaves in the foreground is Virginia creeper, a native vine that often climbs trees but sometimes makes a ground-cover.



ENLARGED TERRACE PLAN
Scale: 1/4" = 1'-0"



HOWARD CENTER
BURLINGTON, VT

Duncan
Wisniewski
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