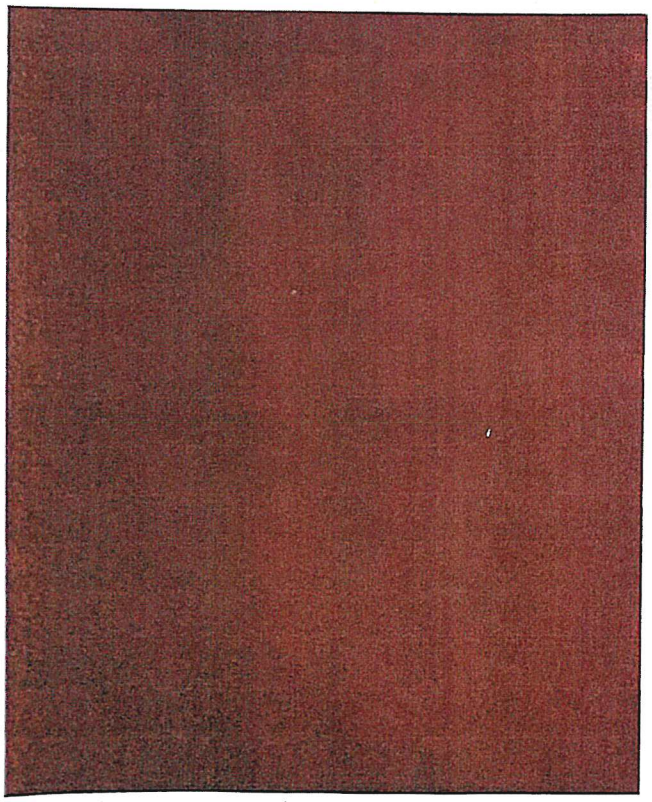
SMOOTH

You can't go wrong with this sleek, modern siding. Find the perfect color in our Statement Collection products or Dream Collection products. Or get it primed for paint.

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

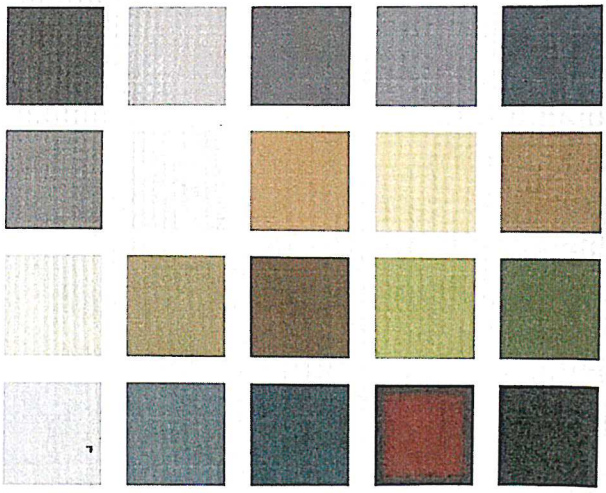
THE STATEMENT COLLECTION™

Classic shades—engineered with long-lasting ColorPlus® Technology—will make a statement that resonates for generations. The tried and true colors of James Hardie's Statement Collection™ products were designed for every home. They're our most popular hues. And they are readily available in your region.



SIDING COLORS

Countrylane Red



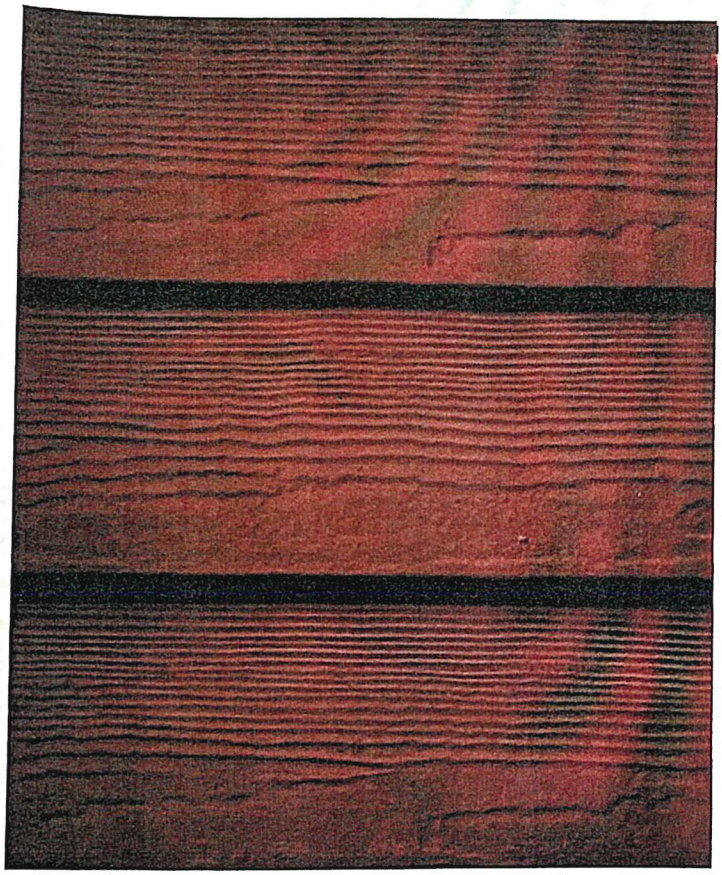
Request a Quote ›

Request a Sample ›

Colors shown may vary due to screen resolution. Please see actual product sample for true color.

AVAILABLE SIZES

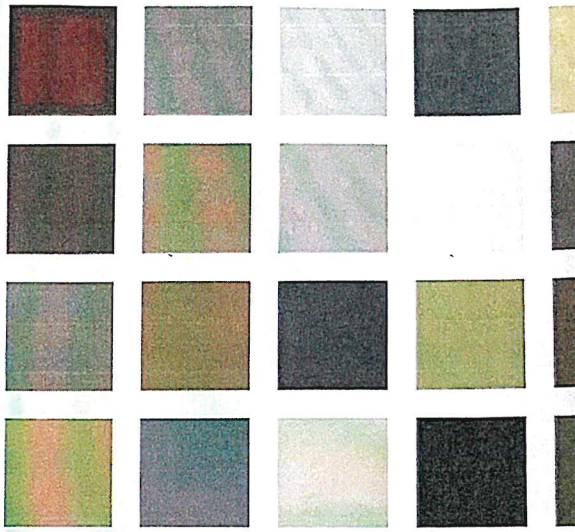
Statement Collection™ products were designed for every home. They're our most popular hues. And they are readily available in your region.



Colors shown may vary due to screen resolution. Please see actual product sample for true color.

SIDING COLORS

Countrylane Red



Request a Quote >

Request a Samp

AVAILABLE SIZES

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

THICKNESS:	0.312"	**WIDTHS:**	5.25"	6.25"
LENGTH:	144" boards	**EXPOSURES:**	4"	5"

Warranty Information >

Not finding the color you're looking for?

FIBERGLASS Double hung/combo windows

MARVIN ESSENTIAL™ COLLECTION

DOUBLE HUNG - Transoms and Multiple Assemblies

Transom Mulled Over Double Hung

MO (mm)	2' - 6" (762)
RO (mm)	2' - 6" (762)
FS (mm)	2' - 5 1/2" (749)

5' - 11 3/4" (1822)
6' - 0" (1829)
5' - 11 1/2" (1816)

ESDHTR2616

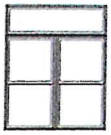
ESDH2646

Transom Mulled Over Double Hung 2 Wide

MO (mm)	5' - 0" (1524)
RO (mm)	5' - 0" (1524)
FS (mm)	4' - 11 1/2" (1511)

5' - 11 3/4" (1822)
6' - 0" (1829)
5' - 11 1/2" (1816)

ESDHTR5016



ESDH2646 / ESDH2646

Double Hung Flankers with Center Picture*

MO (mm)	10' - 0" (3048)
RO (mm)	10' - 0" (3048)
FS (mm)	9' - 11 1/2" (3035)

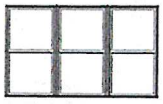
4' - 5 3/4" (1365)
4' - 6" (1372)
4' - 5 1/2" (1359)

ESDH2646 / ESDHP5046 / ESDH2646

Double Hung Flankers with Center Operator

MO (mm)	7' - 6" (2286)
RO (mm)	7' - 6" (2286)
FS (mm)	7' - 5 1/2" (2273)

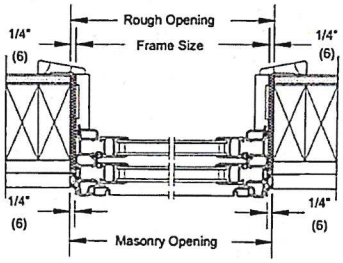
4' - 5 3/4" (1365)
4' - 6" (1372)
4' - 5 1/2" (1359)



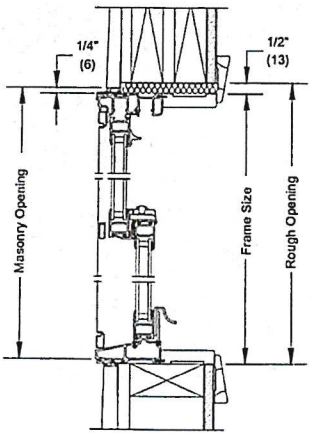
ESDH2646 / ESDH2646 / ESDH2646

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

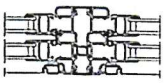
Construction Details



Jambs



Head Jamb
& Sill



Vertical Mullion

Horizontal Mullion
Transom/Operator

- This product is only available field mulled.

Details and Elevations not to scale.

Available in equal, cottage, and reverse cottage sash configurations. Cottage and reverse cottage sash configurations are not available on 20, 60, and 66 call number heights.

Obscure Glass option available on all units.

Special sized units available within product size matrix. See your Marvin retailer.

Units may optionally include a window opening control device tested to ASTM F2090-10, which can be released from the inside without the use of a key, tool, special knowledge, or force greater than that required for normal unit operation.

See page 52 for specific PG Ratings.

For further details and drawings visit the 'Tools and Documents' section at Marvin.com.

MULTIPLE ASSEMBLIES

Multiple assemblies can be factory mulled.

MAXIMUM ROUGH OPENING not to exceed 114" x 78". Maximum up to 6 units wide by 1 unit high.

MAXIMUM ROUGH OPENING not to exceed 96" x 96". Maximum up to 5 units wide by 5 units high.

Field mull kits are available. Structural mullion reinforcement is required for some assemblies.

Please consult your local Marvin representative for more information.

CIRQUE SMALL WALL/CEILING

TECH LIGHTIN

Beautiful for its simplicity, Cirque indoor or outdoor LED light fixture features a thick, round, pressed-glass shade with polished surface suspended from a die-cast base. The fixture has a sleek, modern design and offers installation versatility as a flush mount on the ceiling or as a sconce on the wall.

High quality LM80-tested LEDs
for consistent long-life performance and color

Outstanding protection against the elements:
- Marine-grade powder coat finishes
- Stainless Steel mounting hardware
- Impact-resistant, UV stabilized frosted acrylic lensing

Ceiling or wall mounting option

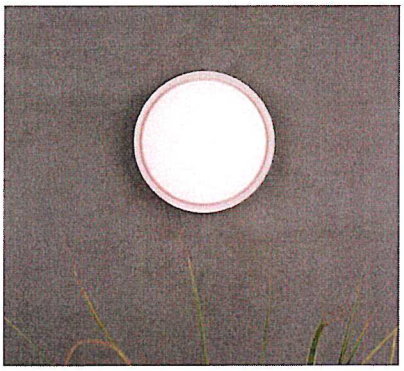
SPECIFICATIONS

DELIVERED LUMENS	472.2 LED
WATTS	12 LED
VOLTAGE	120V, 277V (LED only)
DIMMING	ELV
LIGHT DISTRIBUTION	Symmetric
MOUNTING OPTIONS	Wall or Ceiling
CCT	3000K or 4000K
CRI	90+
COLOR BINNING	3 Step
BUG RATING	B1-U3-G1
DARK SKY	Compliant (Ceiling)
WET LISTED	IP65
GENERAL LISTING	ETL
CALIFORNIA TITLE 24	Can be used to comply with CEC 2016 Title 24 Part 6 for outdoor use. Registration with CEC Appliance Database not required.
START TEMP	-30°C
FIELD SERVICEABLE LED	No
CONSTRUCTION	Aluminum
HARDWARE	Stainless Steel
FINISH	Marine Grade Powder Coat
LED LIFETIME	L70; 70,000 Hours
WARRANTY*	5 Years

* Visit techlighting.com for specific warranty limitations and details.

CIRQUE SMALL
shown in bronze

CIRQUE SMALL
shown in charcoal



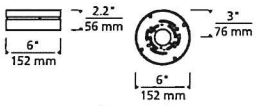
ORDERING INFORMATION

700OWCQ	SHAPE	CRI/CCT	FINISH	VOLTAGE
	S SMALL - 6"	930 90 CRI, 3000K	Z BRONZE	120 120V
		940 90 CRI, 4000K	H CHARCOAL	277 277V
		INC INCANDESCENT*		

*120V ONLY

CIRQUE SMALL WALL/CEILING

TECH LIGHTIN



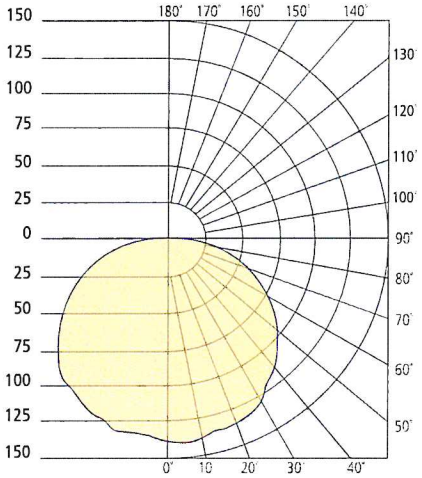
Cirque Small

PHOTOMETRICS*

*For latest photometrics, please visit www.techlighting.com/OUTDO

CIRQUE SMALL

Total Lumen Output:	472.2
Total Power:	12
Luminaire Efficacy:	39.35
Color Temp:	2700K
CRI:	90+
BUG Rating:	B1-U3-G1



PROJECT INFO

FIXTURE TYPE & QUANTITY

JOB NAME & INFO

NOTES

TECH LIGHTIN

GENERATION BRAND

7400 Linder Avenue, Skokie, Illinois 60

T 847.410.4400 F 847.410.4

© 2016 Tech Lighting, L.L.C. All rights reserved. The "Tech Lighting" graphic is a registered trademark of Tech Lighting, L.L.C.
Tech Lighting reserves the right to change specifications for product improvements without notification.

RECEIVED

JUL 14 2020

BURLINGTON
PERMITTING & INSPECTIONS

SITE PLAN

ZONING INFORMATION		
SPACE	EXISTING AREAS	PROPOSED AREAS
PROPERTY: LOTS 260, 264, 272, AND 280	30,851 SQ. FT.	30,851 SQ. FT.
EXISTING STRUCTURES	3484 SQ. FT.	3484 SQ. FT.
NEW UNITS - LOT COVERAGE INCLUDING DECKS AND STAIRS	—	2550 SQ. FT.
WALKWAYS	320 SQ. FT.	321 SQ. FT.
DRIVEWAY	4323 SQ. FT.	6625 SQ. FT.
TOTAL	8127 SQ. FT.	12980 SQ. FT.
TOTAL LOT COVERAGE	26.3%	42%

NOTES:

SITE PLAN BASED ON INFORMATION PROVIDED BY 'CIVIL ENGINEERING ASSOCIATES' DRAWING C1.0 - 'EXISTING CONDITIONS SITE PLAN' C1.0 BISONETTE PROPERTIES. THIS PLAN IS NOT A BOUNDARY SURVEY AND IS NOT INTENDED TO BE USED AS ONE

ZONING PERMIT 2020 06 24

JRMA
DESIGN STUDIO
175 SUMMIT CIRCLE
SHELBURNE, VERMONT 05482
802-985-9363

JOB_NO.	2010-141
DRAWN_BY	WJR
DATE	JUNE-24-2020
SCALE	1"=30'-0"

MANHATTAN DRIVE TOWNHOUSES
BURLINGTON, VERMONT
SITE PLAN

L-1

RECEIVED

JUL 14 2020

BURLINGTON
PERMITTING & INSPECTIONS

VIEW FROM MANHATTAN DRIVE LOOKING NORTHWEST

VIEW FROM MANHATTAN DRIVE LOOKING NORTHEAST

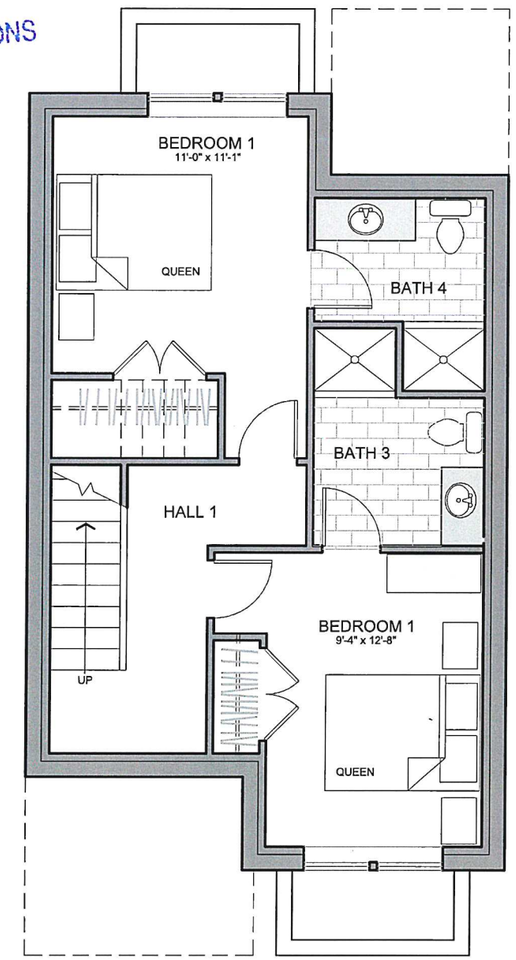
PRELIMINARY - 2020 06 24

JOB_NO.	2010-141
DRAWN_BY	WJR
DATE	JUNE-24-2020
SCALE	N/A

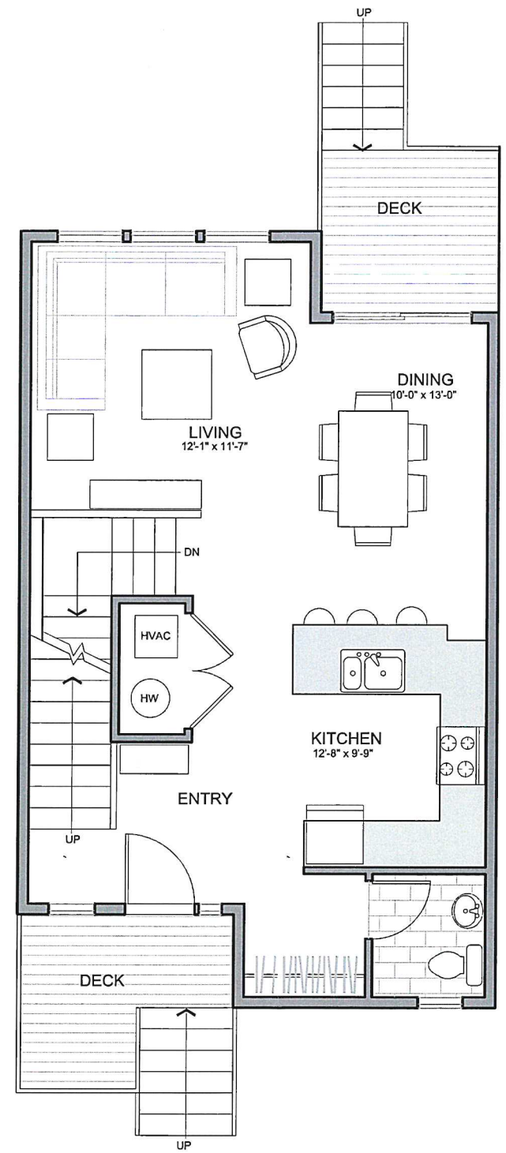
MANHATTAN DRIVE TOWNHOUSES
BURLINGTON, VERMONT
EXISTING SITE PHOTOGRAPHS

EX-1

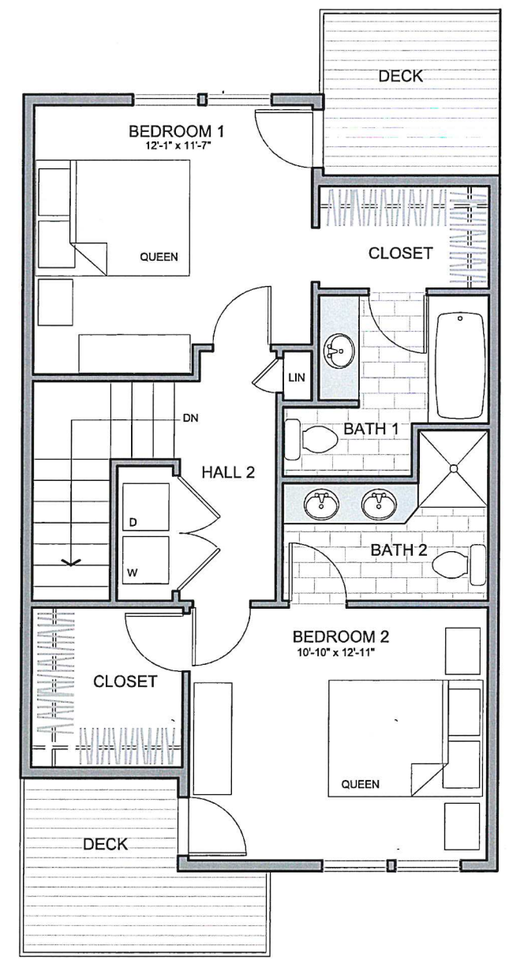
RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS



lower level floor plan
3/16" = 1'-0"



first floor plan
3/16" = 1'-0"



UNIT SIZE: 1884 SQ. FT.
DECKS: 297 SQ. FT.

second floor plan
3/16" = 1'-0"

PRELIMINARY - 2020 06 24

JOB_NO.	2010-141
DRAWN_BY	WJR
DATE	JUNE-24-2020
SCALE	3/16"=1'-0"

MANHATTAN DRIVE TOWNHOUSES
BURLINGTON, VERMONT
FLOOR PLANS

A-1

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

Manhattan Drive Townhouses

BURLINGTON, VERMONT

ZONING PRESENTATION APRIL 14 2020

BILL BISSONETTE PROPERTIES

perspective

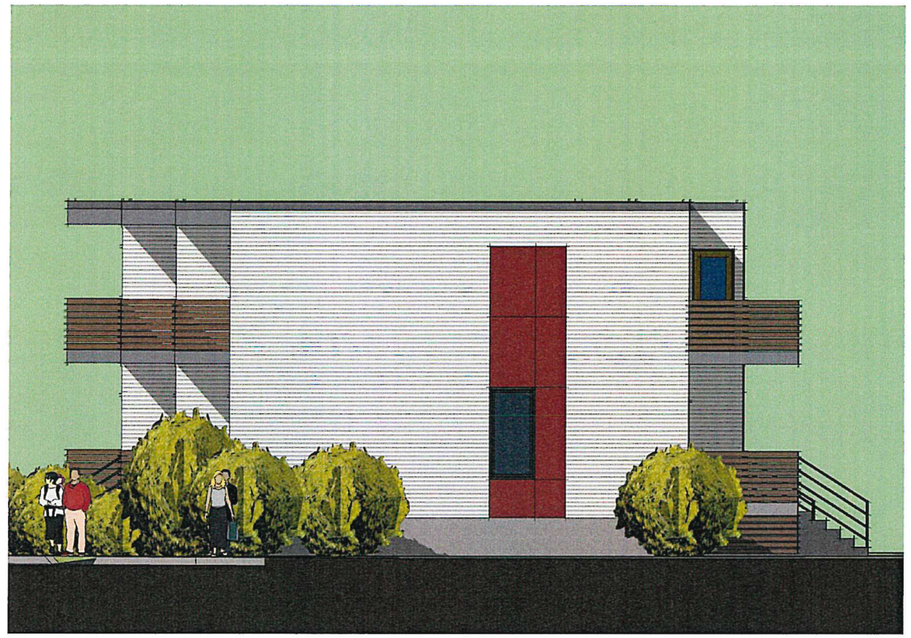
overview from southeast

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

south elevation

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

west elevation



east elevation

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

north elevation

RECEIVED
JUL 14 2020
BURLINGTON
PERMITTING & INSPECTIONS

Burlington Design Advisory Board
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/DPI/DAB
Phone: (802) 865-7188

Matthew Bushey
Ron Wanamaker
Tom Cullins
Eric Morrow
Karyn Norwood
vacant Alt.
vacant, Alt.

DESIGN ADVISORY BOARD
Tuesday August 25, 2020 3:00 PM
REMOTE MEETING

Zoom: https://us02web.zoom.us/j/84139553461?pwd=djdtV01jNHBYVmJIQmFrL3FHUXN6dz09
Webinar ID: 841 3955 3461
Password: 923553
Call in telephone: US: +1 929 205 6099 or +1 301 715 8592 or +1 312 626 6799 or +1 669 900 6833 or +1 253 215 8782 or +1 346 248 7799

Session I – 3:00 PM – 3:30 PM

20-0717CA/MA; 273 Pearl Street (RH, Ward 8E) Triple Tree Group, LLC (Bruce Baker, Greg Doremus)
Planned Unit Development involving 273 Pearl St, 11 Hungerford Terrace, 15 Hungerford Terrace, and 21 Hungerford Terrace. Demolish porch and move garage at 21 Hungerford; demolish garage at 11 Hungerford. Construct 12-unit residential building with related parking and supporting infrastructure.

Session II – 3:30-4:00 PM

21-0050PD; 260-280 Manhattan Drive (RM, Ward 3C) PBGC, LLC (Sam Gardner)
Planned Unit Development involving 260, 264, 272, and 280 Manhattan Drive. Construct new triplex building and a new shared parking area to the rear for the other existing residential homes within the boundary of the PUD.

Session III – 4:00-4:30 PM

20-0194SP; 52 Institute Road (RCO-RG, Ward 4N) Burlington School Dept.
Sketch plan review for redevelopment of Burlington High School and related site work.

Session IV – 4:30-5:00 PM

Other Business; Discussion of Board member attendance, other Chair concerns
Discussion of making motions, Roberts Rules relative to Zoom meetings.

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.

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.

Department of Permiting 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
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Alison Davis, Zoning Clerk
Theodore Miles, Zoning Specialist
Charlene Orton, DPI Administrator

MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: 273 Pearl Street, 11, 15 and 21 Hungerford Terrace
ZP20-0717CA/MA, ZP20-0718CA, ZP20-0719CA, ZP20-0720CA.
First DAB meeting: July 14, 2020
Revised Plans received: August 7, 2020
Date: August 25, 2020

File: ZP20-0717CA/MA, ZP20-0718CA, ZP20-0719CA, ZP20-0720CA.
Location: 273 Pearl Street, 11, 15 and 21 Hungerford Terrace
Zone: RH **Ward**: 8E
Parking District: Neighborhood
Date application accepted: February 20, 2020. Project review delayed by Covid 19, and plan revisions (submitted June 11, 2020 and August 7, 2020.)
Applicant/ Owner: 18138 Parking LLC, Triple Tree Group, LLC, 15 Hungerford Terrace, LLC and 21 Hungerford Terrace LLC. (Bruce Baker, Greg Doremus.)
Request: Planned Unit Development to include demolition of a single family home at 15 Hungerford Terrace and a garage at 11 Hungerford Terrace; demolish south porch and move garage at 21 Hungerford Terrace; construct 12 unit residential building. Net new new units = 11 (if earlier duplex approvals are relinquished.) Site changes, including retaining walls. Parking changes with 17 space parking waiver request (42% of required residential parking.)

Changes to the staff report are in **red.**

Background:

273 Pearl Street (constructed 1952)

- **Zoning Permit 16-0273CA;** replace 3 windows. September 2015.
- **Zoning Permit 15-0427CA; regrade portion of lot and install retaining wall.** Also see 15 and 21 Hungerford Terrace. September 2014.
- **Non-applicability of Zoning Permit Requirements 15-1015NA**; roof replacement. April 2015.
- **Zoning Permit 12-0231FC**; install chain link security fence on top of existing concrete block wall. September 2011.

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).

- **Zoning Permit 00-466**; reside existing medical (dental) office in vinyl siding with new front elevation changes that include new windows, door and unenclosed entry roof canopy. No increase in coverage. Front yard setback encroachment allowed as per 5.3.6 (g). April 2000.
- **Zoning Permit 81-305**; change existing office to dental office. January 1981.
- **Zoning Permit n.n.;** Enlarge existing non-conforming use by addition of 21' x 16'. Approved May 1965.
- **Zoning Permit n.n**; three unilluminated signs. Approved July 1960.
- **Notice to Gates Professional Pharmacy, sign exceeding size permitted in Zone One**. August 1952.
- **Petition to building a one story building approximately 24' x 40' to be used as prescription laboratory, doctor's office or professional use.** Approved December 1951.

11 Hungerford Terrace (constructed 1912)

- **Zoning Permit 18-10990CA;** handicap ramp, stoop, addition, parking changes. Convert a portion of the garage's front wall into a retractable wall to accommodate interior parking. July 2018.
- **Zoning Permit 18-0812CA;** replacement windows. April 2018.
- **Non-applicability of Zoning Permit Requirements 12-0252NA**; replace retaining wall in kind at same location & same height. August 2011.

15 Hungerford Terrace (constructed 1994)

- **Zoning Permit 18-1091CA;** change of use from single family to duplex. Parking changes. July 2018.
- **Zoning Permit 15-0428CA**; regrade portion of lot and install retaining wall. See also 21 Hungerford Terrace and 273 Pearl Street. Issued September 2014; permit relinquished.
- **Zoning Permit 02-377**; Construct 60' retaining wall. Issued March 2002, permit relinquished.
- **Zoning Permit 96-407**; installation of skylight in single family home. April 1996.
- **Zoning Permit 094-059 and 94-059A**; construction of a single-family home on existing vacant lot. February 1994.

21 Hungerford Terrace (constructed 1922)

- **Zoning Permit 18-1092CA;** Change of use from single family to duplex; add habitable space to basement. Shared parking and driveway with 11 and 15 Hungerford. See related permits AP18-1090CA and ZP18-1091CA. July 2018.
- **Zoning Permit 15-0429CA;** regrade portion of lot and install retaining wall. See also 15 Hungerford Terrace and 273 Pearl Street. Permit issued September 2014; permit relinquished.
- **Zoning Permit n.n**.; Use two front rooms for doctor's office. ZBA approved April 1966.

Overview:
The application is for a Planned Unit Development, utilizing 273 Pearl Street, 11, 15 and 21 Hungerford Terrace to create a new 12 unit residential building on the site of 15 Hungerford which will be demolished. One accessory building (garage, 11 Hungerford) and a porch (21 Hungerford) are proposed to be removed and the garage at 21 Hungerford relocated. A retaining wall will be constructed to ameliorate the grade change west of Hungerford Terrace. Parking changes, 17 space (47.22% residential) parking waiver request.

<u>Article 6: Development Review Standards</u>
Part 1: Land Division Design Standards
No land division or boundary line adjustments are proposed. As a Planned Unit Development (PUD), the development area will be reviewed by the DRB under Article 11.

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

(a) Protection of Important Natural Features
The most significant feature of the site is the topographic change from east to west. See "Topographical alterations", below.
There are two mature trees within the ROW in front of 21 Hungerford that are identified on Plan A1 for retention, and a large tree in the front yard of 15 Hungerford Terrace to be removed. At least 17 trees are proposed to be removed from the collective project area. A landscaping plan has been provided (A3) defining new plantings and location.

(b) Topographical alterations

The rear of this development area reflects a tangible remnant of Burlington's physical geography, the Burlington Ravine. Previous permitting illustrates the efforts made to address the significant grade changes in the rear of these four properties.Plan A0 defines the grade low as 220' on the west of the site; increasing to 240' on the east (Hungerford Terrace) side. The plan includes retention of the existing concrete block retaining wall behind 273 Pearl Street, with a connecting retaining wall running around the west and south end of the development area raising the grade from 220 to 232 (see Civil Plan C2.2.) The proposed retaining wall will reach heights of 11' along the westerly wall, requiring approval of the City Engineer.

Hungerford Terrace at the top, Pearl to the left. Grade change to the west (bottom) evident.

(c) Protection of important public views
There are no protected important public views from or through the property.

(d) Protection of important cultural resources
See Section 5.4.8 (b).

(e) Supporting the use of alternative energy
Floor plans illustrate ERV (Energy Recovery Ventilator) closets. Other alternative energy options, including solar for the large flat roof, are encouraged.

(f) Brownfield sites
The properties are not listed on the Vermont DEC Hazardous Waste Site. Not applicable.

(g) Provide for nature's events
A subsurface stormwater treatment vault is present on Civil plans C2.2 and includes a Stormwater Retention component located under the new parking area. The EPSC and Stormwater management plans were forwarded to Stormwater Engineering Division for review. Snow storage is identified on the northerly end of the parking area just north of the three parking spaces.

(h) Building location and orientation
The demolition of 15 Hungerford Terrace affords the location of the new, 3 story 12 unit residential building. The front setback duplicates that of the building to be demolished, with the footprint expanding further west, consistent with the setback average of the three neighboring properties. (Average setback is 47.4' when averaging 11, 21 and 27 Hungerford. Front setback

may be +/- 5' of that average.) Retention of the existing setback, to the same degree, is acceptable.

(i) Vehicular access
The access drive for all units is proposed south of 21 Hungerford Terrace, via an existing driveway. Plans A0 and A1 both define existing driveway encroachment onto a neighboring property. All access must be established within the PUD property boundaries, with no further encroachment into setbacks than existing conditions.

(j) Pedestrian access
Existing front entrance walks connecting to the city public sidewalk will remain at 11 and 21 Hungerford. A new walkway will be introduced to the immediate south of the 3 story residential building, with common ground floor entry at its terminus.

(k) Accessibility for the handicapped
Unit 1 is identified as fully accessible, with Units 2, 3 and 4 as "adaptable". The eight remaining units on the 2nd and third floor will meet Visitability standards for access.
2 ADA parking spaces are provided (one immediately behind 21 Hungerford, and one to the north of the new building at 15 Hungerford; both providing a loading area.) The building inspector has jurisdiction relative to the acceptability of the number of spaces and their specific dimensions.

(l) Parking and circulation
Plan A1 provides 25 parking spaces:
273 Pearl Street will retain its 6 existing permitted parking spaces for the dental office/1 residential unit.
11, 15 and 21 Hungerford (18 units) will share 19 parking spaces.
The requirements within the Neighborhood Parking District are 2 parking spaces for every residential unit.
Zoning Permit 18-1090CA allowed a shared parking arrangement among 11 Hungerford (5 units), 15 and 21 Hungerford Terrace that provided a total of 19 parking spaces. For the total 9 units, that plan met required on-site parking (2 per unit, or 2 x 9 = 18 spaces.)
The current plan proposes **19 spaces** for residential use while the required parking for 18 units (5 units at 11 Hungerford, 12 units at 15 Hungerford, and 1 unit at 21 Hungerford) if earlier permit for duplex is relinquished) is now **36 spaces**. Only one net new additional space is provided greater than the previously approved shared use parking plan for 11, 15 and 21 Hungerford Terrace. With a substantial increase in bedroom count (33 bedrooms in 15 Hungerford), the parking deficiency is marked.
Discounting the dental office/1 apartment use at 273 Pearl which remains constant, the proposal is deficient (36-19) by 17 parking spaces, requiring a 47.22% parking waiver.

Parking spaces north of the new building are standard parking spaces (9 x 20); all of the spaces on the westerly boundary are compact (8 x 18); and the four immediately west of 15 Hungerford are undersized (8 x 16) per Table 8.1.8-11 of the ordinance. All spaces lack the required backup space (24' for 90° standard size angled parking spaces) although the most westerly meet the requirement for compact spaces (20' backup.) The h/c space south of 15 Hungerford, the lone

garage space, and the southerly space immediately west of 15 Hungerford are all deficient in back-up space. The applicant will rely Section 8.1.11 that permits the DRB discretionary review to determine a lesser standard necessary due to site topography, location of existing or proposed structures, lot configuration, and/or the need to preserve existing trees and vegetation.

A Parking management Plan has been submitted, weighing largely on tenants without cars, advantageous location near the downtown, and shared parking by critical use periods. The plan proposes use of 5 residential parking spaces by the dentist office during business hours, when residential tenants would vacate their spaces. The plan further hinges on specific tenant selection practices and required tenant education. Both of these tools rely on the methods and practices of current owners; their continued success largely reliant under practices of unknown future ownership.
Finally, the applicant/owners include up-front monthly charges for parking on-site to discourage vehicular ownership. Parking is permitted on-site by permit and assigned space only, with towing enforced. As proposed, there is just one parking space per residential unit.

Owners will provide information to tenants about ridesharing programs and maintain a group membership with Car Share Vermont, offering to tenants free of charge. CCTA bus passes are provided to tenants on a first-come basis. Bicycle parking and storage is provided on site. Grocery trollies will be made available to tenants.

The applicants have also requested consideration of sharing all parking from their 5 commonly owned lots within 3 blocks; a total of 128 parking spaces. An examination of all those parcels and their parking requirements are outside this project review, but suggest the potential for private TDM (Transportation Demand Management) within the City. While advanced, TDM as practice is not yet incorporated as part of Parking Management opportunites within the Comprehensive Development Ordinance, and at this time prove challenging for future compliance and enforcement of individual properties.

Article 8 defines the requirement to meet the parking demand of new development effectively. A proposed parking management plan must guarantee present and future success, enforceable over the long term. The creation of 33 new bedrooms with only one new parking space is challenging; and hinged in this application with active and enduring control by owners.

Surface parking requires shading to reduce the effect on the local microclimate, air quality, and stormwater runoff. New or substantially improved parking areas must shade at least 30% of the parking lot. 1 shade tree shall be provided for every 5 parking spaces with a minimum caliper size of 2 ½ -3" at planting. A significant number of existing trees will be removed for this redevelopment. Plan A3 details the addition of 2 Honey Locust and 2 Elms; the remainder of the plantings shrubs and ornamentals. Plan A4 illustrates site shading. While a portion of the paved area is shaded in late June (a.m.), the 30% shading requirement is functionally met during the winter months when the sun is at its lowest.

Bicycle parking is provided along a walkway to the newly developed 15 Hungerford Terrace. Long Term bicycle parking is afforded in a separate room in the basement of 15 Hungerford Terrace. (See plan A5.) With 33 new bedrooms, at least 17 long term bicycle parking spaces will

be required for the residential use. (1 bike parking/2 bedrooms requirement). This is more fully addressed under Article 8.

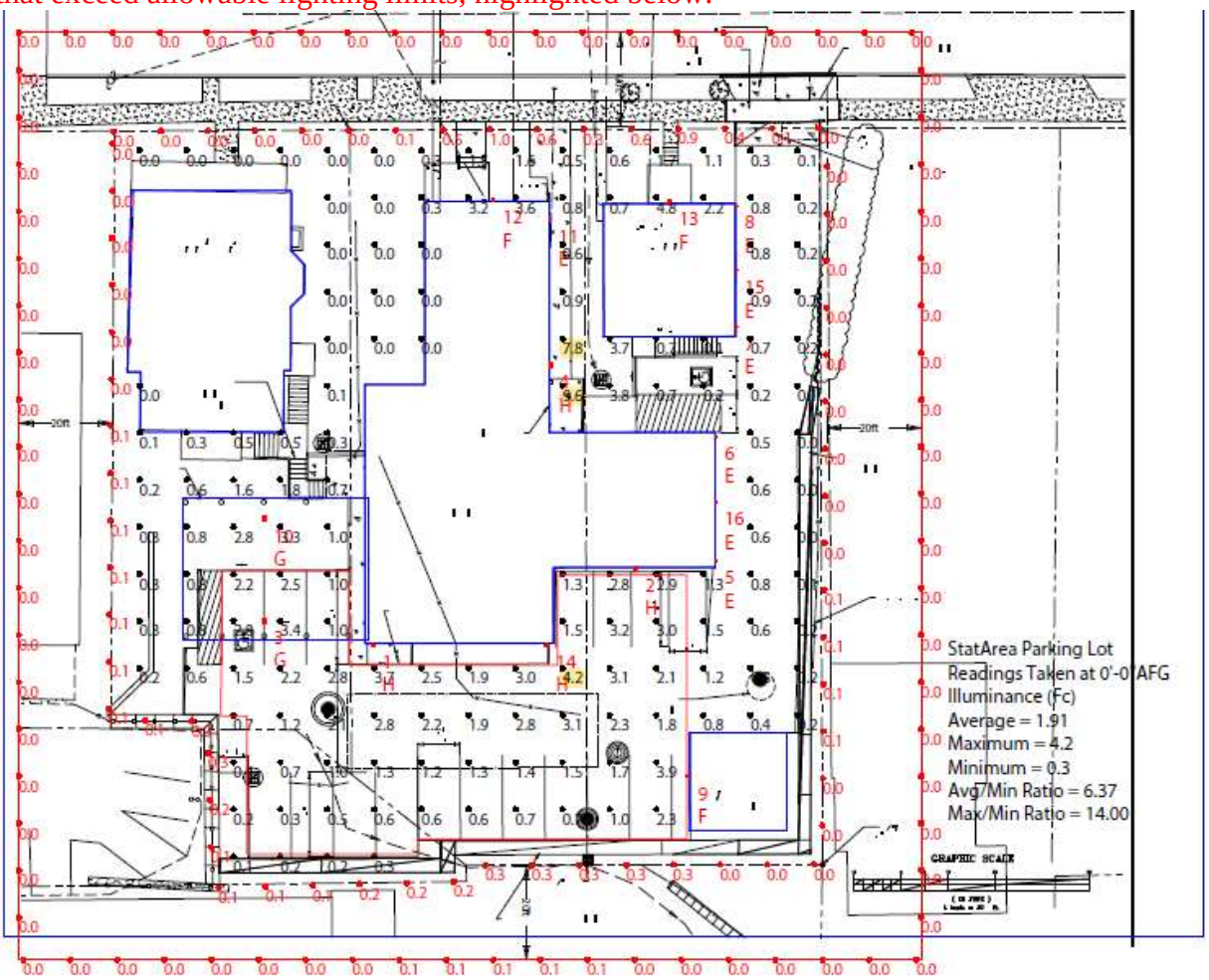
(m) Landscaping, fences and retaining walls
A separate landscaping plan has been provided, and alluded to in plan A0, A7 and A8. Plan A3 provides Boston Ivy (K) as one of the plantings, its location unidentified on the site plan. There is inconsistency between Plans A3 and A9 relative to landscaping and proposed locations. ("Karl Forrester grass, Boston Ivy" on the retaining wall; not illustrated on A3.) Perhaps those are proposed on an abutting property?

This standard requires:
Retaining walls greater than 5 feet tall shall incorporate textured surfaces, terracing, and/or vegetation to avoid long monotonous unarticulated expanses and to minimize adverse visual impacts to neighboring properties. As with fences, retaining wall styles, materials, and dimensions shall be compatible with the context of the neighborhood and use of the property.
Civil plans C2.2 and C4.2 and Plan A8 define the gravity wall as terraced with plantings.
Heights vary from 2-12'. As the involved properties all sit on the cusp of the Burlington Ravine and have consistently struggled with the changing grade inherent to their site, this is the context of the neighborhood. Review of retaining walls greater than 3' in height is the responsibility of the City Engineer.

(n) Public plazas and open space
While there are no formal public plazas included in the plan, "open green space" is annotated on Plan A1. This occurs between 11 Hungerford and the new 12 unit residential building, and north of the parking area. Given the large number of residential units proposed for the combined site, some outdoor amenity space is encouraged to be identified and programmed for the enjoyment of the tenants. Open space / common land is a requirement of PUDs under Article 11.

(o) Outdoor lighting

A photometric has been provided, with a revised plan received 7.30.2020. There are three spots that exceed allowable lighting limits, highlighted below.



- Building entrances, unless designated handicap access, may not exceed 5 fc. The common entry to 15 Hungerford Terrace has measurements as high as 9.6 fc, and should be adjusted downward.
- Parking lots are limited to a maximum illumination of 4 fc. There is a single reading that exceeds 4 fc (west of 15 Hungerford) which will require attention to bring light levels down.

(p) Integrate infrastructure into the design

Civil plan C2.3 shows a continuation of overhead electric service to both 21 Hungerford and the new 15 Hungerford building. New construction demands undergrounding of on-site utilities, Meters, utility connections, HVAC or similar mechanical equipment should be coordinated with the design of the building, and grouped in a service court out of public view. All need to be illustrated on elevations and/or site plans to determine appropriateness of location and necessity of screening.

No rooftop mechanicals are identified. If such units are proposed, they need to be provided with plans to be assessed for compliance with the standards of the ordinance.

The location of trash and recyling facilities is re-defined within the relocated garage at the southwesterly corner of the collective lots.

Residential mailboxes are identified along the public sidewalk, presumably in cluster box unit ("CBU".) This is an undesirable solution for residential use, due to its commercial appearance. An interior or sheltered porch location where unit boxes can be accessed by tenants is preferable and more consistent with residential use. The Common Entry on the south elevation or alternately at the Lounge location are recommended for resident mail delivery.

Part 3, Architectural Design Standards
Section 6.3.2 Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

Plan A9, A10 and A11 provide a modeled street view, illustrating the new building approximately the same height as the hipped roof of 11 Hungerford Terrace, to its north and 295 Pearl Street; on the corner of Pearl and Hungerford. The flat roof, however, allows for a building mass (and occupied third floor) that exceeds any of the existing buildings surrounding it. As viewed from the south and west (see rendered elevations A6, A7) the new building dominates the viewshed. The automotive service station on Pearl Street somewhat ameliorates the view from the north.

2. Roofs and Rooflines.

The new building has connected flat roofs; differing from either the north or south detached building that will abut it.

3. Building Openings

Building openings are symmetrically arranged on the primary façade, with rhythmic structural punctures on other elevations. Openings are grouped to provide the same floorplan plate-to-plate.

(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:

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

(d) Provide an active and inviting street edge:

The removal and replacement of 15 Hungerford Terrace has introduced a substantially larger and more imposing structure to the streetscape. While there is no relationship in style or massing to the context of the older street, it does offer an identifiable front portal, the welcome of porches,

and larger windows to warm the streetface. Easterly porches have been extended to strengthen the horizontal element of the design, tying it in with neighboring properties.

(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 applicants have revised their exterior sheathing plans at the recommendation of the DAB, now favoring fiber cement clapboards with a smaller area in fiber cement panels. Changes are intended to provide greater horizontality, as guided by the Board. Boral trim (with more interest provided to break up the visual massing) and MDO accent bands will complete the finish. Brick veneer has been extended vertically on the east, north and south as suggested by the DAB. Windows and doors are detailed on Plan A7. All are acceptable 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:

No signage is proposed. Any signs will require a separate sign permit, consistent with the regulations of Article 7 and compliant to the residential zoning district standards.

(h) Integrate infrastructure into the building design:

See Section 6.2.2. (p.)

(i) Make spaces secure and safe:

All applicable building and life safety code as defined by the building inspector and fire marshal will be required. Building entrances need to be adequately illuminated (but not to exceed 5 fc.) Adequate lighting at building entrances will support resident safety. See lighting standards of Section 5.5.2 and 6.2.2. (o), above.
An intercom system is recommended to maximize personal safety of the residents in the new 12-unit structure.

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.

11 and 21 Hungerford Terrace (and their garages) are listed on the Vermont State Register of Historic Places and the National Register of Historic Places within the **Buell-Bradley Street Historic District**.

15 Hungerford Terrace is of construction that is more modern and identified as non-contributing due to age.

273 Pearl Street falls within the **Pearl Street Historic District** (#50, Lavoie Offices**)**, but was identified as non-contributing to the district.

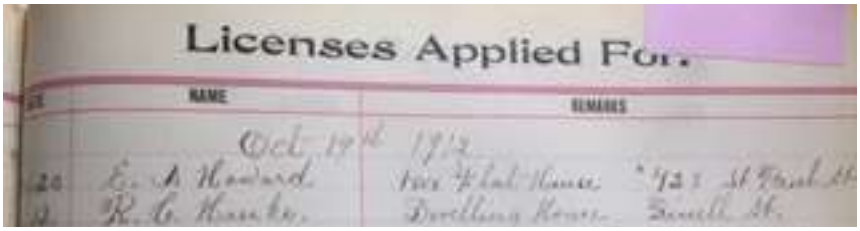
The following standards apply to 11 and 21 Hungerford Terrace:

(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.*

   11 and 21 Hungerford Terrace will remain residential, although 11 Hungerford is now multi-unit. The existing garage at 11 Hungerford is proposed to be demolished in support of new development, as well as the southerly side porch at 21 Hungerford Terrace. The garage at 21 Hungerford will be moved to the rear of the lot to be utilized for one parking space and a trash location.



Issuance of a building permit for the construction of 11 Hungerford Terrace October 24, 1912.

The elimination of the 11 Hungerford garage (1912) and porch at 21 Hungerford (between 1936-1942) alters the essential characteristics of the resources, and diminishes the integrity of the overall context of the site as documented in the National Register nomination. The DAB previously offered their support of the proposal.

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.*

   See response above.

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.*

   No conjectural features are proposed.

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

The southerly sunporch on 21 Hungerford Terrace is a typical feature that characteristically was added after the original construction of the single family home, adding to the significance of the overall structure. The porch is a feature that has acquired significance, consistent with 20th century evolutionary changes to residential architecture as promoted by Sears, Aladdin, Montgomery Wards and other national building plan providers. 21 Hungerford Terrace appears to be based on the Sears "Rembrandt" or "Van Jean"design, both of which were offered an option of a side porch. The DAB offered their support of the proposal within the overall application, however, at their July 14, 2020 meeting.

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

   The location of the garages behind residential buildings is characteristic of residential construction during the period of origin. The removal of the garage at 11 Hungerford and replacement with a paved surface parking lot advances development intensification rather than the original character of a residential neighborhood. Similarly, the addition of a side porch (popularized particularly in house plan catalogs) strongly supports the residential nature of this neighborhood as it was listed on the National Register of Historic Resources. Its proposed removal will diminish those essential and concomitant characteristics that collectively contribute to the overall feeling, association, and arrangement of the neighborhood. The DAB has, however, provided their support for the loss of the garage and porch within the overall redevelopment proposal.

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 object of the application is to remove a 1994 home and replace it with a 12 unit three story building with associated parking. The retaining walls will be new construction. A garage at 11 Hungerford that is in disrepair is proposed for demolition rather than repair and reuse. The applicant has provided a narrative (Exhibit G-11H) as to the condition of the

garage at 11 Hungerford and Exhibit SP-21H for the proposed porch removal at 21 Hungerford.

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.*

   Building demolition of a garage and a porch is a permanent physical treatment. See Section 5.4.8 (d) below.

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

   No archaeological resources have been identified on these parcels.

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.*

   The proposed new multi unit residential building is much larger is massing than the abutting buildings, and will introduce a building of greater proportion. It is, however, minimized at the street front and designed with a modern vocabulary that is differentiated from the older building stock that surrounds it.

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.*

    Although unlikely, if the replacement building at 15 Hungerford Terrace were removed, 11 and 21 Hungerford Terrace would remain and retain enough integrity to merit retention on the National Register of Historic Places. The large parking area proposed for the 15 Hungerford site would, on its own, be out of character for the existing neighborhood.

Items for the Board's consideration:

- Permits 18-1091CA (15 Hungerford) and 18-1092CA (21 Hungerford) must be successfully relinquished for the unit count to agree with the application materials.
- The Erosion Prevention and Sediment Control Plan as well as a Stormwater Plan are subject to review and written approval of the Stormwater Engineering Division.
- The retaining wall will require approval of the City Engineer.
- The applicant shall provide one new shade tree for every 5 parking spaces of the newly improved parking area, providing shade for at least 30% of the parking area.
- As submitted, light levels exceed allowable levels at three locations across the site. The applicant is advised to consult Section 5.5.2 of the ordinance, and address light levels as identified within 6.2.2. (o), above. A revised photometric will be required to demonstrate compliance.

- The proposed parking count, parking dimensions, and parking backup space are deficient to Table 8.1.8-1 and 8.1.11-1. The DRB has authority to provide relief in situations where a lesser standard is deemed necessary due to site topography, location of existing or proposed structures, lot configuration, and/or the need to preserve existing trees and mature vegetation.

- The parking requirement may be reduced through calculation of Inclusionary Housing. (8.1.8 (c))

2 EXISTING SITE PLAN IN CONTEXT
1" = 50'-0"

7 EXISTING UNITS
5 UNITS - 11 HUNGERFORD
1 UNITS - 15 HUNGERFORD
1 UNITS - 21 HUNGERFORD

1 DEMO SITE PLAN
1" = 10'-0"

HUNGERFORD TERRACE

A1

EXISTING SITE PLAN

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

② SITE PLAN IN CONTEXT
1" = 50'-0"

① SCHEMATIC SITE PLAN
1" = 10'-0"

18 UNITS TOTAL
5 UNITS - 11 HUNGERFORD
12 UNITS - NEW BUILDING
1 UNITS - 21 HUNGERFORD

25 PARKING SPACES
(19) RESIDENTIAL
(6) EXISTING
(2) ADA

TOTAL LOT AREA (4 PARCELS) = 27,226.97 SF
MAX LOT COVERAGE ALLOWED = 80%
INCLUSIONARY BONUS = **92% MAX LOT COVERAGE ALLOWED**

BUILDING FOOTPRINT = 8,000 SF
PARKING/WALKWAYS/PORCHES = 13,000 SF
TOTAL **PROPOSED LOT COVERAGE = 21,000 SF (78%)**

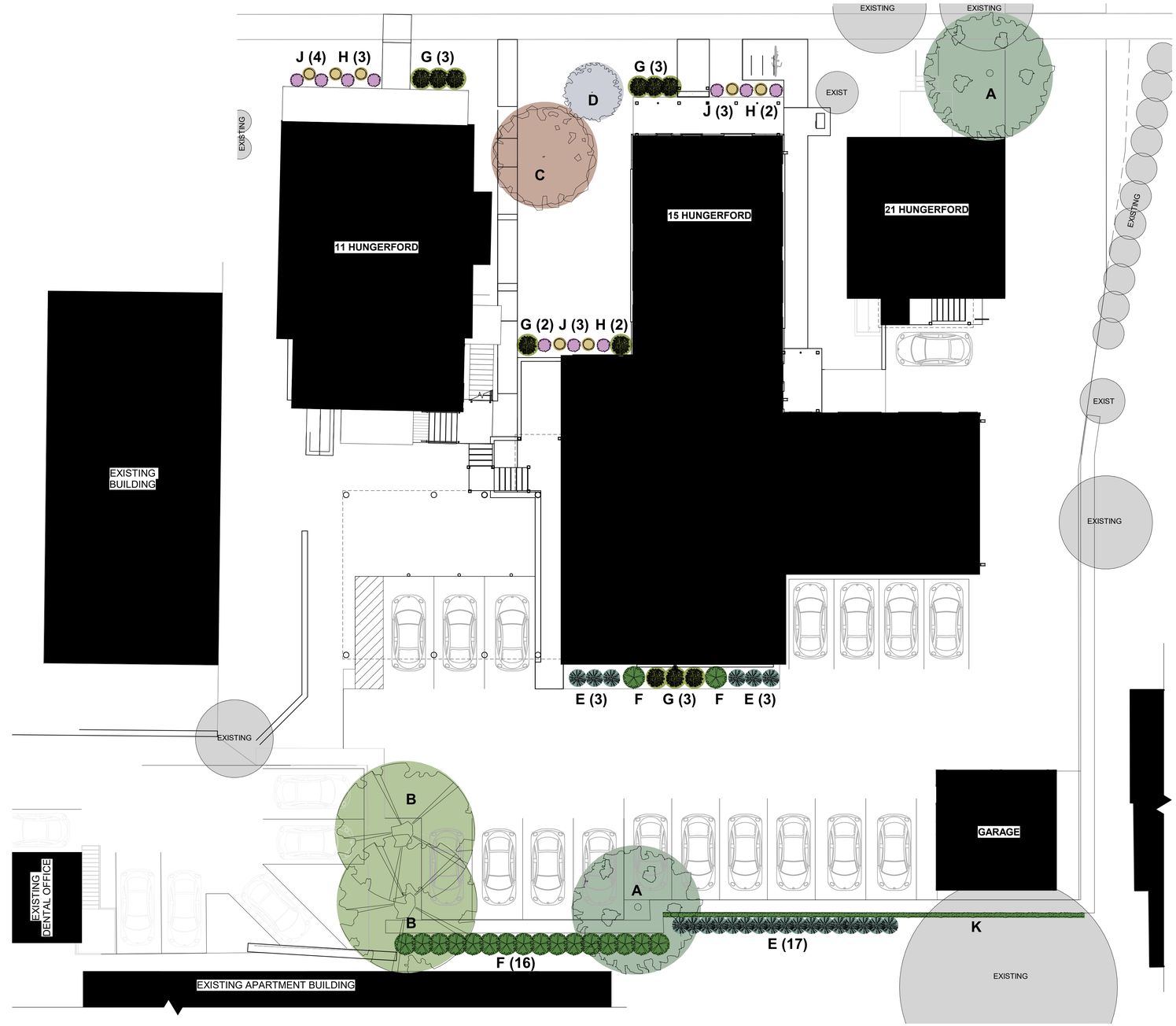
HUNGERFORD TERRACE

A2

SCHEMATIC PROPOSED SITE PLAN

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM



1 SCHEMATIC LANDSCAPE PLAN
1" = 10'-0"

PROPOSED TREES AND PLANTINGS HARDINESS ZONE 5a

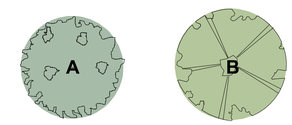
MINIMUM SHADE TREES REQ'D = 1 TREE PER 5 PARKING SPACES: 25 SPACES/5 = **5 TREES REQUIRED**
8 SHADE TREES PROVIDED: 4 EXISTING, 4 PROPOSED

		PROPOSED QUANTITY	MIN. SIZE (CALIPER)	MATURE HEIGHT	MATURE CANOPY Ø	PLANTING AREA REQ'D*
	SHADE TREES					
A	'FRONTIER' ELM *(ULMUS X FRONTIER)*	2	MIN. 2.5"	35 FT	25 FT	SMALL
B	'IMPERIAL' HONEY LOCUST *(GLEDITSIA TRIACANTHOS VAR INERMIS)*	2	MIN. 2.5"	30 FT	35 FT	MEDIUM
	ORNAMENTAL TREES / SHRUBS					
C	APPLE SERVICEBERRY 'AUTUMN BRILLIANCE' *(AMELANCHIER A GRANDIFLORA)*	1	N/A	25 FT	25 FT	SMALL
D	SHADBLOW SERVICEBERRY 'SPRING GLORY' *(AMELANCHIER CANADENSIS SPRIZAM)*	1	N/A	12 FT	10 FT	SMALL
E	LITTLE BLUESTEM *(SCHIZACHYRIUM SCOPARIUM)*	23	N/A	24" - 48"	24" - 36"	N/A
F	'EMERALD' WHITE CEDAR *(THUJA OCCIDENTALUS SMARAGD)*	18	N/A	15 FT	4 FT	SMALL
G	BUSH-HONEYSUCKLE *(DIERVILLA LONICERA)*	11	N/A	24" - 36"	24" - 48"	N/A
H	BLUE-STEM GOLDENROD *(SOLIDAGO CAESIA)*	7	N/A	24"	24"	N/A
J	EASTERN PURPLE CONEFLOWER *(ECHINACEA PURPUREA)*	10	N/A	36"	24"	N/A
K	BOSTON IVY *(PARTHENOCISSUS TRICUSPIDATA)*	WALL COVER	N/A	N/A	N/A	N/A

*REQUIRED PLANTING AREA
SMALL = MIN. 4'x4'
MEDIUM = WIDER THAN 6'

Native species were chosen wherever possible. Deviations were due to size restrictions, or other desireable characteristics. Trees were selected using the *Vermont Tree Selection Guide* published by the Vermont Department of Forests, Parks & Recreation. Shrubs and perennials were selected from a list of native species published by Audubon Vermont, as well as an article published by UVM Extension Department of Plant and Soil Science, *Low Native Shrubs and Groundcovers*.

SHADE TREES



'FRONTIER' ELM — 'IMPERIAL' HONEY LOCUST

ORNAMENTAL TREES / SHRUBS

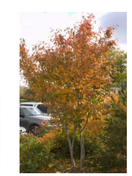
APPLE SERVICEBERRY 'AUTUMN BRILLIANCE' — SHADBLOW SERVICEBERRY 'SPRING GLORY' — LITTLE BLUESTEM — 'EMERALD' WHITE CEDAR

BUSH-HONEYSUCKLE — 'BLUE-STEM' GOLDENROD — PURPLE CONEFLOWER — BOSTON IVY

LITTLE BLUESTEM *(SCHIZACHYRIUM SCOPARIUM)*

'IMPERIAL' HONEY LOCUST *(GLEDITSIA TRIACANTHOS VAR INERMIS)*

'FRONTIER' ELM *(ULMUS X FRONTIER)*



APPLE SERVICEBERRY 'AUTUMN BRILLIANCE' *(AMELANCHIER A GRANDIFLORA)*

SHADBLOW SERVICEBERRY 'SPRING GLORY' *(AMELANCHIER CANADENSIS SPRIZAM)*

'EMERALD' WHITE CEDAR *(THUJA OCCIDENTALUS SMARAGD)*

BOSTON IVY *(PARTHENOCISSUS TRICUSPIDATA)*

BUSH-HONEYSUCKLE *(DIERVILLA LONICERA)*

BLUE-STEM GOLDENROD *(SOLIDAGO CAESIA)*

EASTERN PURPLE CONEFLOWER *(ECHINACEA PURPUREA)*

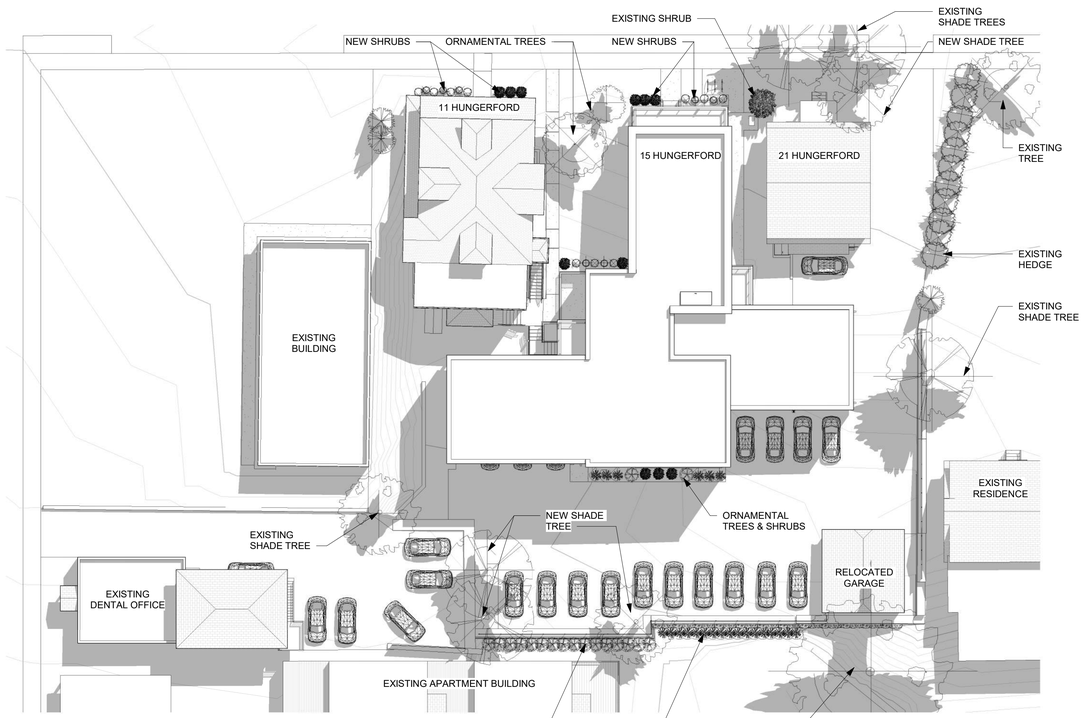
HUNGERFORD TERRACE

A3

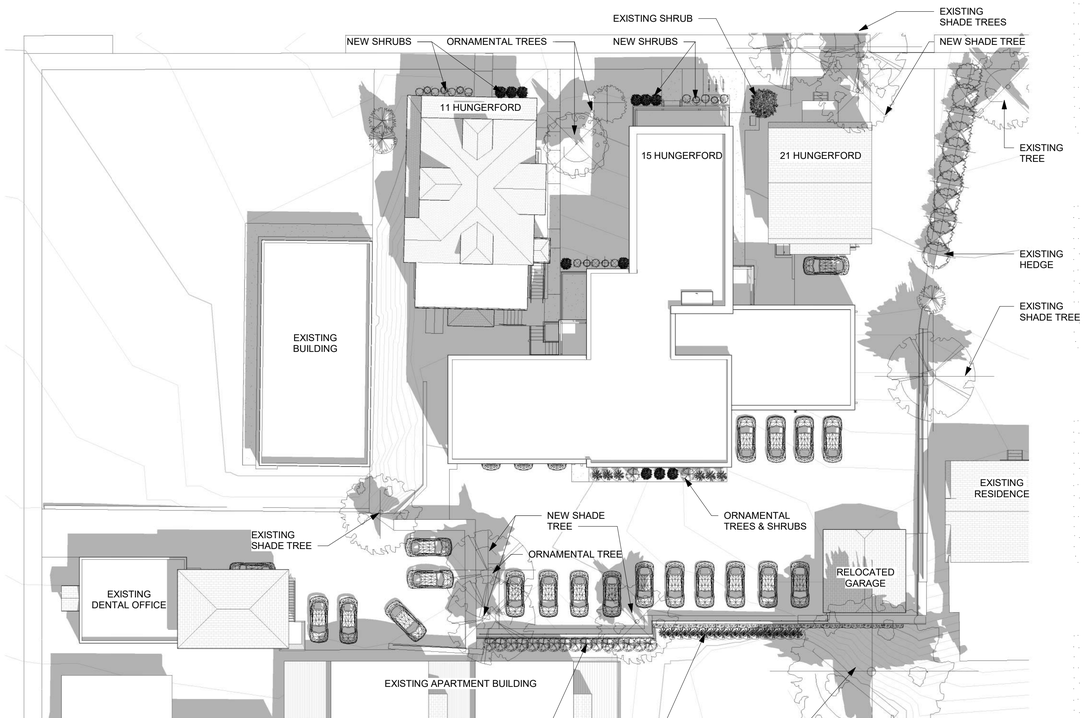
SCHEMATIC LANDSCAPE PLAN

08/06/20

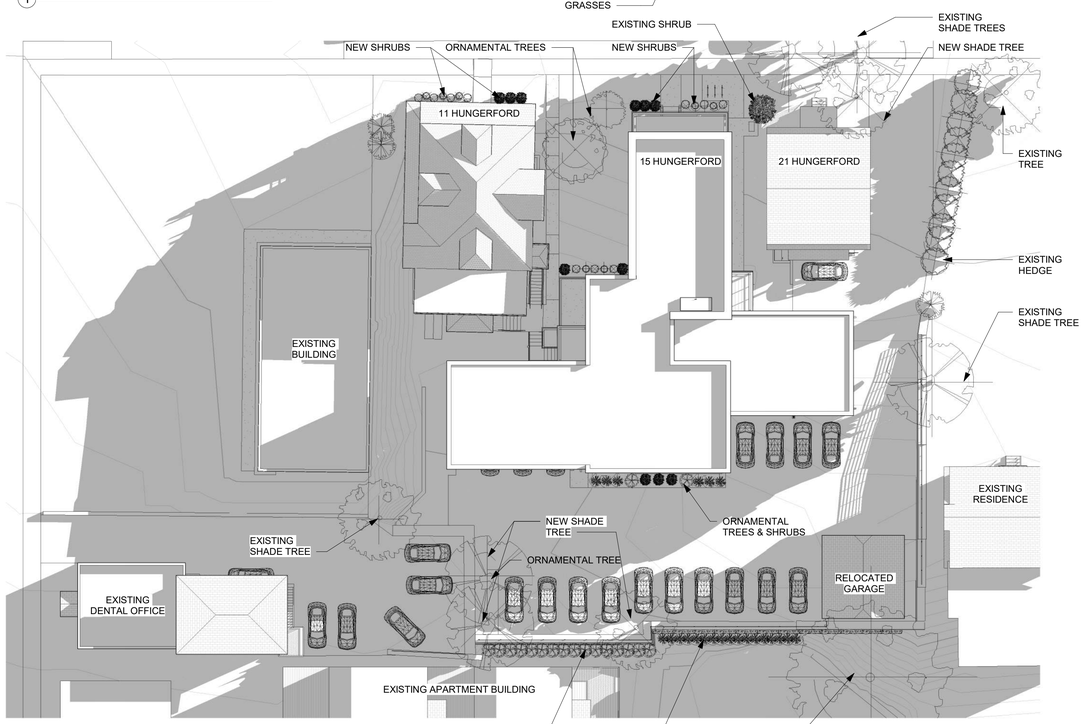
SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM



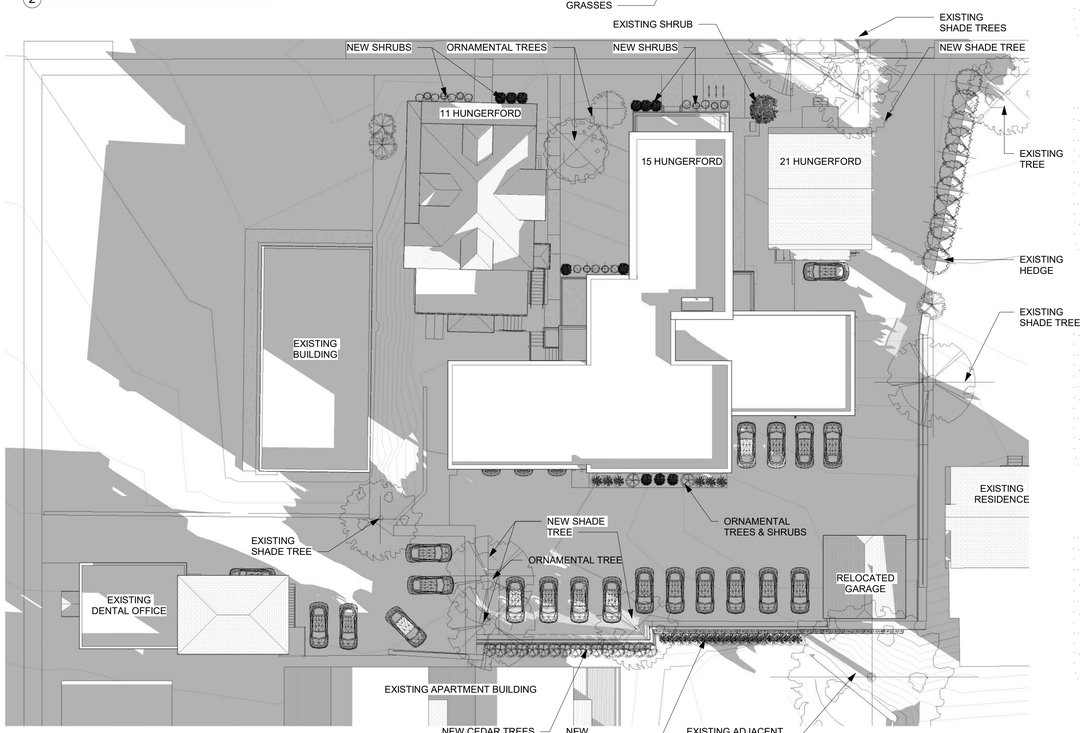
1 SHADING - JUNE 21 AT 10 AM



2 SHADING - JUNE 21 AT 2 PM



3 SHADING - DECEMBER 21 AT 10 AM



4 SHADING - DECEMBER 21 AT 2 PM

HUNGERFORD TERRACE

A4

SITE SHADING

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

2 BASEMENT PLAN - ENTRY FROM REAR PARKING LEVEL
1/8" = 1'-0"

1 FIRST FLOOR PLAN - ENTRY FROM SIDEWALK LEVEL
1/8" = 1'-0"

HUNGERFORD TERRACE

A5

NEW BUILDING PLANS

08/06/20

SCOTT + PARTNERS
ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

1 SECOND FLOOR PLAN
1/8" = 1'-0"

2 THIRD FLOOR PLAN
1/8" = 1'-0"

HUNGERFORD TERRACE

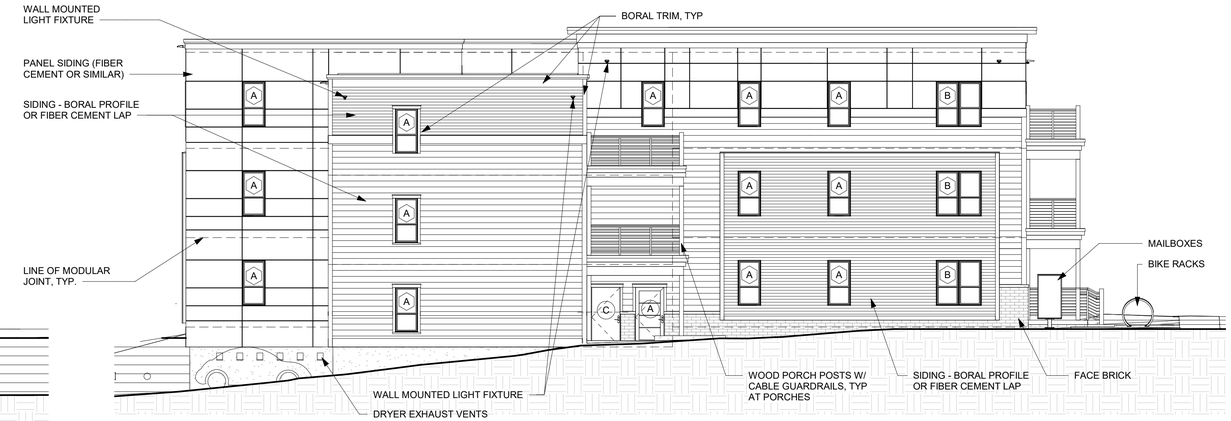
A6

NEW BUILDING PLANS

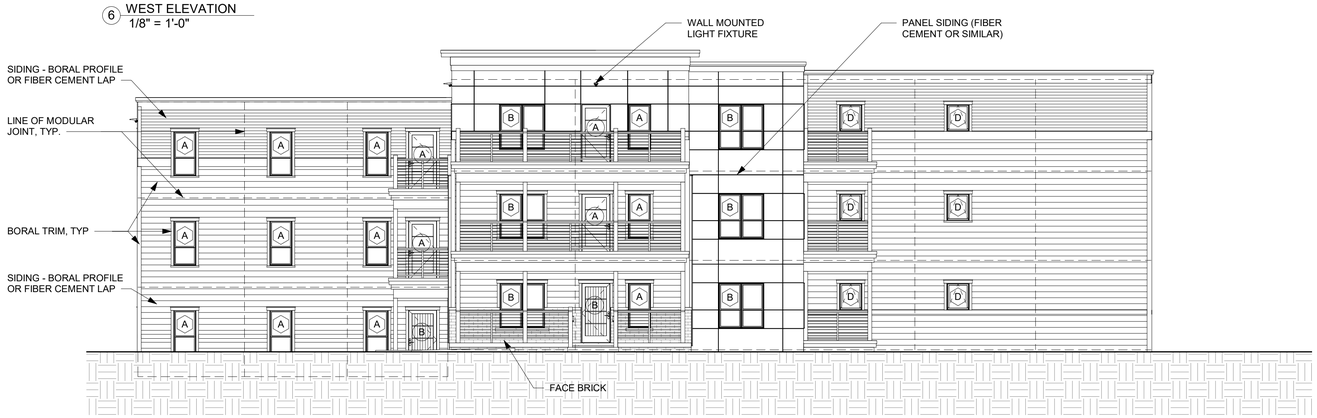
08/06/20

SCOTT + PARTNERS
ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

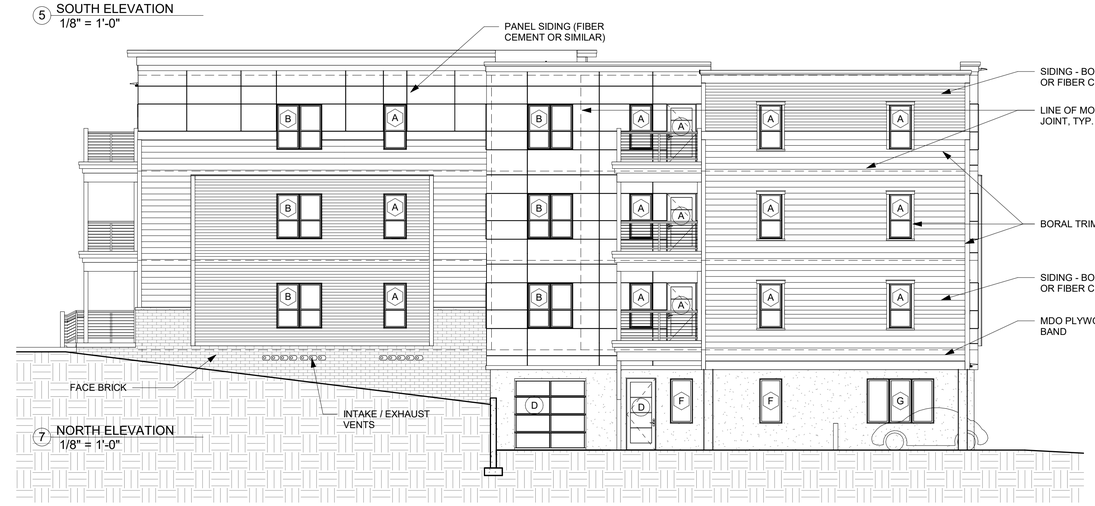
6 WEST ELEVATION
1/8" = 1'-0"



5 SOUTH ELEVATION
1/8" = 1'-0"

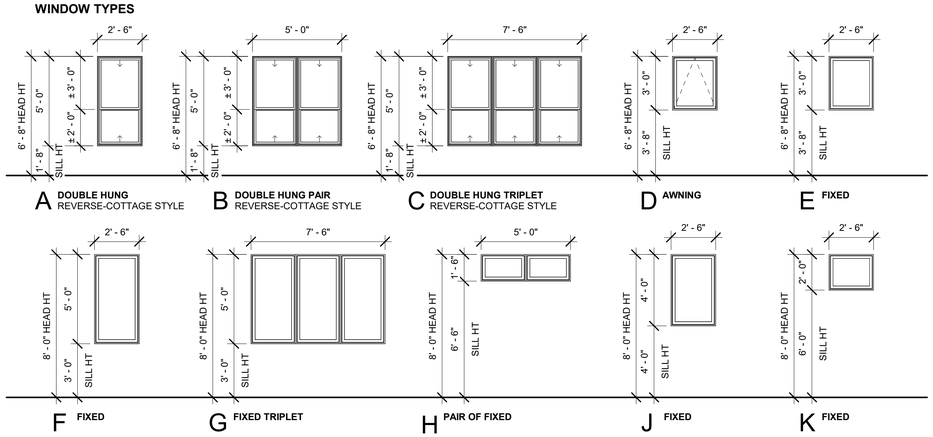


4 EAST ELEVATION
1/8" = 1'-0"

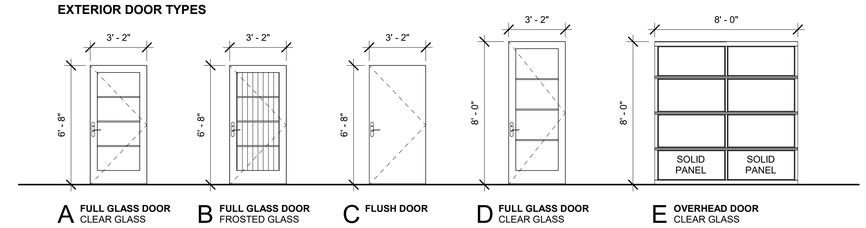


7 NORTH ELEVATION
1/8" = 1'-0"

WINDOW TYPES



EXTERIOR DOOR TYPES



HUNGERFORD TERRACE

A7

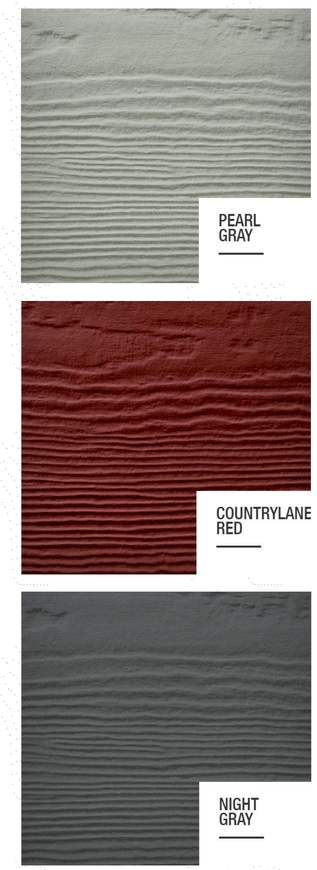
EXTERIOR ELEVATIONS

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

1 EAST ELEVATION RENDERED
3/16" = 1'-0"

4 SOUTH ELEVATION RENDERED
3/16" = 1'-0"



HUNGERFORD TERRACE

A8

RENDERED ELEVATIONS

08/06/20

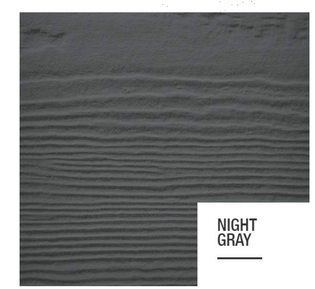
SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

1 WEST ELEVATION RENDERED
3/16" = 1'-0"

2 NORTH ELEVATION RENDERED
3/16" = 1'-0"

PEARL GRAY

COUNTRYLANE RED



NIGHT GRAY

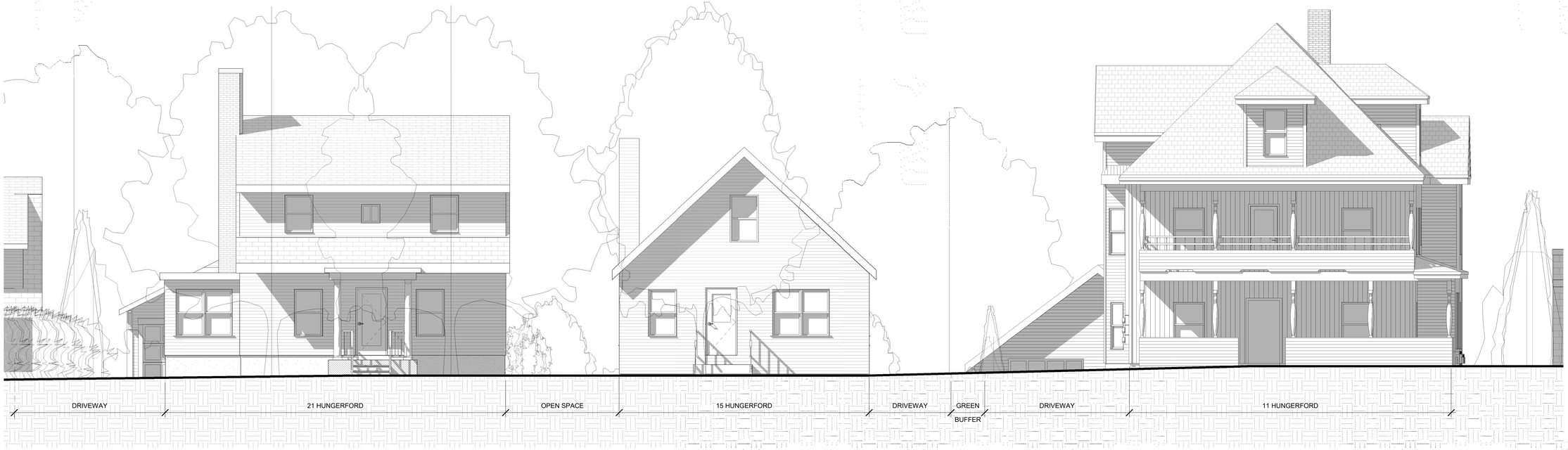
HUNGERFORD TERRACE

A9

RENDERED ELEVATIONS

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM



1 EAST ELEVATION - EXISTING
3/16" = 1'-0"

2 EAST ELEVATION - PROPOSED
3/16" = 1'-0"

HUNGERFORD TERRACE

A10

EAST ELEVATION

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

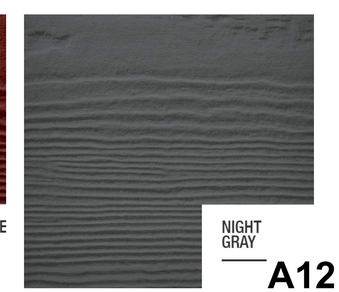
HUNGERFORD TERRACE

A11

PERSPECTIVE VIEW NORTH

08/06/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM



HUNGERFORD TERRACE

A12

PERSPECTIVE VIEW SOUTH

08/06/20

SCOTT + PARTNERS
ARCHITECTURE

7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

NOTE: STREET TREES AND LARGER SITE TREES ARE NOT SHOWN, TO BETTER ILLUSTRATE THE BUILDING.

HUNGERFORD TERRACE

A17

PROPOSED VIEW ALONG HUNGERFORD

08/07/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

NOTE: SOME STREET TREES ARE NOT SHOWN, TO BETTER ILLUSTRATE THE BUILDING.

HUNGERFORD TERRACE

A18

PROPOSED VIEW ALONG HUNGERFORD

08/07/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

NOTE: STREET TREES ARE SHOWN TO ILLUSTRATE A REALISTIC VIEW. THE BUILDING IS MOSTLY OBSCURED.

HUNGERFORD TERRACE

PROPOSED VIEW ALONG HUNGERFORD

08/07/20

SCOTT + PARTNERS
ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

EXISTING VIEW NORTH ALONG HUNGERFORD TERRACE - MID SUMMER

HUNGERFORD TERRACE

A20

EXISTING PHOTOS ALONG HUNGERFORD

08/07/20

SCOTT + PARTNERS
ARCHITECTURE

7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM

EXISTING VIEW NORTH ALONG HUNGERFORD TERRACE - LATE FALL

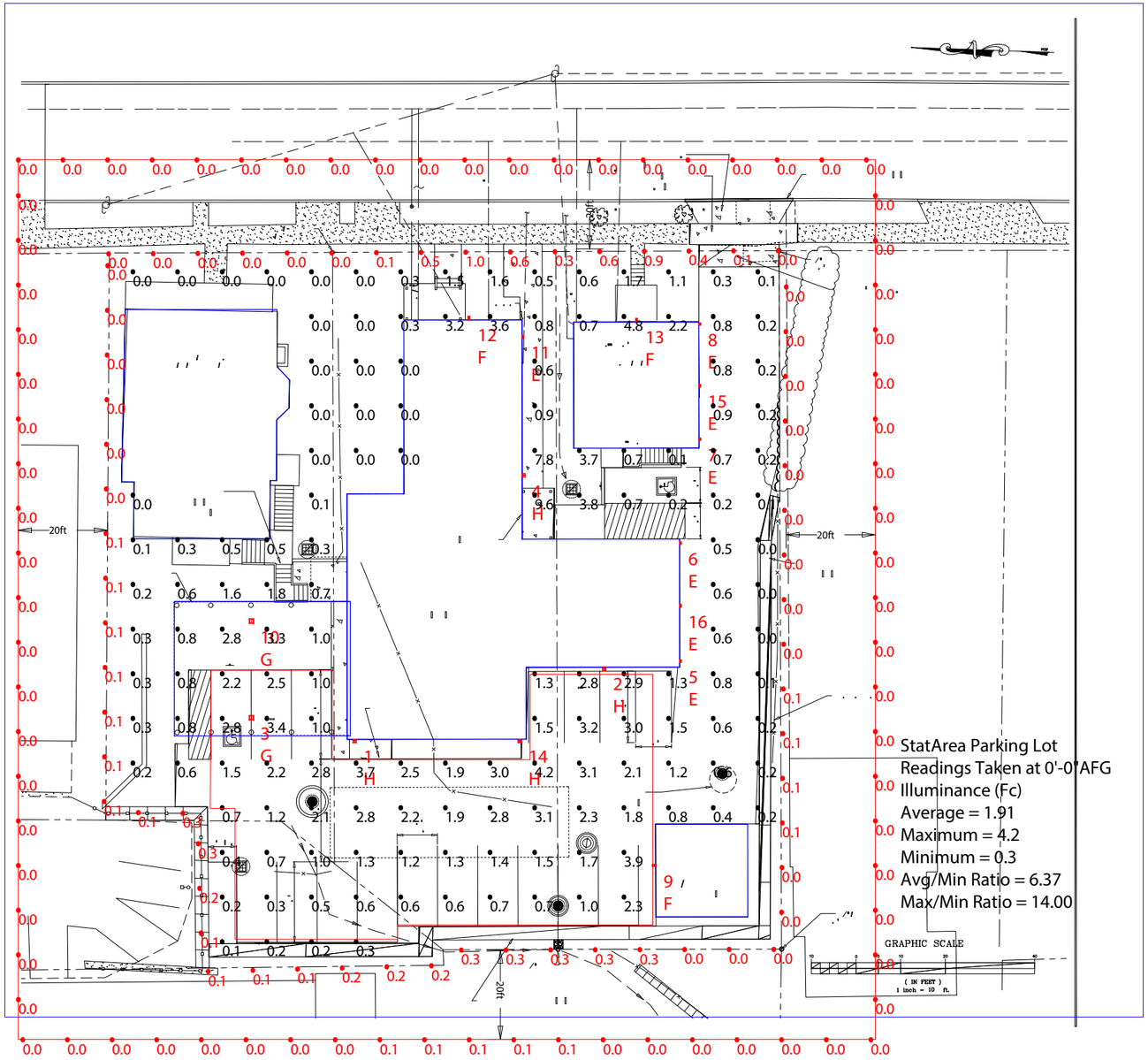
HUNGERFORD TERRACE

A21

EXISTING PHOTOS ALONG HUNGERFORD

08/07/20

SCOTT + PARTNERS ARCHITECTURE
7 CARMICHAEL ST. ESSEX JUNCTION, VT 05452
P: 802.879.5153
F: 802.872.2764
SCOTTPARTNERS.COM



Scale: 1 inch= 30 Ft.

RAB®
170 Ludlow Avenue, Northvale, NJ 07647
888 722-1000 • rablighting.com

Prepared For:
Holbrook Associated
P.O. Box 401
Rockland, MA 02370

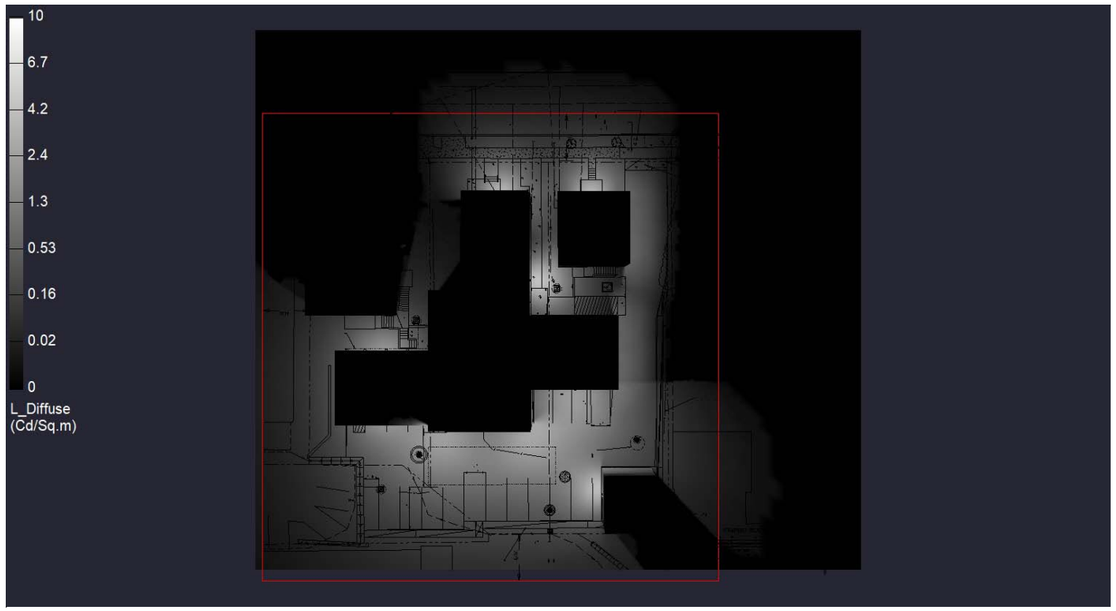
Job Name:
Hungerford Terrace
Lighting Layout
Version B

Scale: as noted	PROJECT # : 152640
Date:7/23/2020	CASE # : 00465632
Filename: Hungerford Terrace Lighting Layout 00465632B.AGI	
Drawn By: S Elliott	

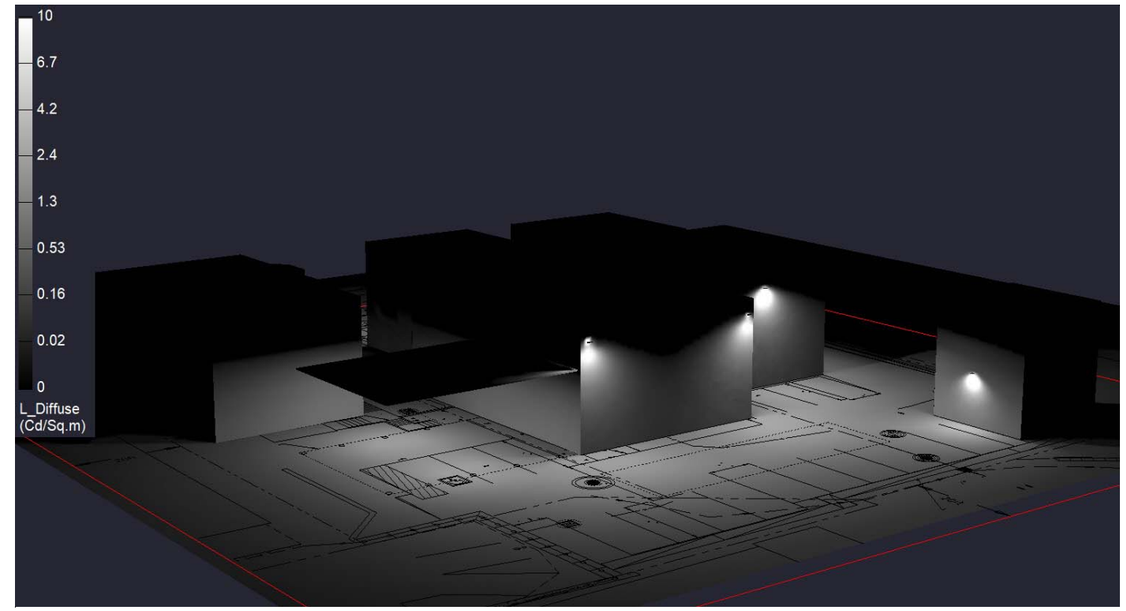
Filename: Z:\Job Files\Holbrook Associated\NE North East\Williston 108345\Hungerford Terrace\Working Files\AGI\Hungerford Terrace Lighting Layout 00465632B.AGI

The Lighting Analysis, ezLayout, Energy Analysis and/or Visual Simulation ("Lighting Design") provided by the RAB Lighting Inc. ("RAB") represent an anticipated prediction of lighting system performance based upon design parameters and information supplied by others. These design parameters and information provided by others have not been field verified by RAB and therefore actual measured r esults may vary from the actual field conditions. RAB recommends that design parameters and other information be field verified to reduce variation.

RAB neither warranties, either implied or stated with regard to actual measured light levels or energy consumption levels as compared to those illustrated by the Lighting Design. RAB neither warranties, either implied or stated, nor represents the appropriateness, completeness or suitability of the Lighting Design intent as compliant with any applicable regulatory code requirements with the exception of those specifically stated on drawings created and submitted by RAB. The Lighting design is issued, in whole or in part, as advisory documents for informational purposes and is not intended for construction nor as being part of a project's construction documentation package.



Plan View



Iso View

RAB®
170 Ludlow Avenue, Northvale, NJ 07647
888 722-1000 • rablighting.com

Prepared For:
Holbrook Associated
P.O. Box 401
Rockland, MA 02370

Job Name:
Hungerford Terrace
Lighting Layout
Version B

Scale: as noted	PROJECT # : 152640
Date:7/23/2020	CASE # : 00465632
Filename: Hungerford Terrace Lighting Layout 00465632B.AGI	
Drawn By: S Elliott	

Filename: Z:\Job Files\Holbrook Associated\NE North East\Williston 108345\Hungerford Terrace\Working Files\AGI\Hungerford Terrace Lighting Layout 00465632B.AGI

The Lighting Analysis, ezLayout, Energy Analysis and/or Visual Simulation ("Lighting Design") provided by the RAB Lighting Inc. ("RAB") represent an anticipated prediction of lighting system performance based upon design parameters and information supplied by others. These design parameters and information provided by others have not been field verified by RAB and therefore actual measured r esults may vary from the actual field conditions. RAB recommends that design parameters and other information be field verified to reduce variation.

RAB neither warranties, either implied or stated with regard to actual measured light levels or energy consumption levels as compared to those illustrated by the Lighting Design. RAB neither warranties, either implied or stated, nor represents the appropriateness, completeness or suitability of the Lighting Design intent as compliant with any applicable regulatory code requirements with the exception of those specifically stated on drawings created and submitted by RAB. The Lighting design is issued, in whole or in part, as advisory documents for informational purposes and is not intended for construction nor as being part of a project's construction documentation package.

Calculation Summary											
Label	**CalcType**	**Units**	**Avg**	**Max**	**Min**	**Avg/Min**	**Max/Min**	**Description**	**PtSpcLr**	**PtSpcTb**	**Meter Type**
CalcPts Ground	Illuminance	Fc	1.21	9.6	0.0	N.A.	N.A.	Readings Taken at 0'-0"AFG	10	10	Horizontal
CalcPts Perimeter	Illuminance	Fc	0.14	1.0	0.0	N.A.	N.A.	Readings Taken at 0'-0"AFG	10	N.A.	Horizontal
CalcPts Perimeter	Illuminance	Fc	0.01	0.1	0.0	N.A.	N.A.	Readings Taken at 0'-0"AFG	10	N.A.	Horizontal
StatArea Parking L	Illuminance	Fc	1.91	4.2	0.3	6.37	14.00	Readings Taken at 0'-0"AFG			

Luminaire Schedule **All quotes/orders generated from this layout must be forwarded to the Local Rep Agency**

Symbol	Qty	Tag	Label	Arrangement	LLF	Description	BUG Rating
	7	E	WPLED5Y	SINGLE	1.000	Wall Mount	B0-U1-G0
	3	F	WPLED10Y	SINGLE	1.000	Wall Mount	B1-U0-G0
	2	G	VANLED10YF	SINGLE	1.000	Ceiling	B1-U0-G1
	4	H	WPLED26Y	SINGLE	1.000	Wall Mount	B1-U0-G0

Luminaire Tag Summary	
Tag	**Qty**
E	7
F	3
G	2
H	4

Expanded Luminaire Location Summary						
LumNo	**Tag**	**X**	**Y**	**MTG HT**	**Orient**	**Tilt**
1	H	78.351	61.739	20	270	0
2	H	134.262	77.952	20	270	0
3	G	55.238	67.066	15	0	0
4	H	116.279	121.325	10	0	0
5	E	151.422	79.735	10	0	0
6	E	151.411	106.174	10	0	0
7	E	155.758	129.434	10	0	0
8	E	155.758	155.228	10	0	0
9	F	145.298	33.962	10	180	0
10	G	55.238	88.676	15	0	0
11	E	116.165	152.346	10	0	0
12	F	103.94	156.635	10	90	0
13	F	141.5	156.167	10	90	0
14	H	115.351	61.739	20	270	0
15	E	155.758	141.434	10	0	0
16	E	151.411	92.174	10	0	0
Total Quantity: 16						

NOTES:

* The light loss factor (LLF) is a product of many variables, only lamp lumen depreciation (LLD) has been applied to the calculated results unless otherwise noted. The LLD is the result (quotient) of mean lumens / initial lumens per lamp manufacturers' specifications.

* Illumination values shown (in footcandles) are the predicted results for planes of calculation either horizontal, vertical or inclined as designated in the calculation summary. Meter orientation is normal to the plane of calculation.

* The calculated results of this lighting simulation represent an anticipated prediction of system performance. Actual measured results may vary from the anticipated performance and are subject to means and methods which are beyond the control of RAB Lighting Inc.

* Mounting height determination is job site specific, our lighting simulations assume a mounting height (insertion point of the luminaire symbol) to be taken at the top of the symbol for ceiling mounted luminaires and at the bottom of the symbol for all other luminaire mounting configurations.

* It is the Owner's responsibility to confirm the suitability of the existing or proposed poles and bases to support the proposed fixtures, based on the weight and EPA of the proposed fixtures and the owner's site soil conditions and wind zone. It is recommended that a professional engineer licensed to practice in the state the site is located be engaged to assist in this determination.

* The landscape material shown hereon is conceptual, and is not intended to be an accurate representation of any particular plant, shrub, bush, or tree, as these materials are living objects, and subject to constant change. The conceptual objects shown are for illustrative purposes only. The actual illumination values measured in the field will vary.

* Photometric model elements such as buildings, rooms, plants, furnishings or any architectural details which impact the dispersion of light must be detailed by the customer documents for inclusion in the RAB lighting design model. RAB is not responsible for any inaccuracies caused by incomplete information on the part of the customer, and reserves the right to use best judgement when translating customer requests into photometric studies.

* RAB Lighting Inc. luminaire and product designs are protected under U.S. and International intellectual property laws. Patents issued or pending apply.

RAB®
170 Ludlow Avenue, Northvale, NJ 07647
888 722-1000 • rablighting.com

Prepared For:
Holbrook Associated
P.O. Box 401
Rockland, MA 02370

Job Name:
Hungerford Terrace
Lighting Layout
Version B

Scale: as noted	PROJECT # : 152640
Date:7/23/2020	CASE # : 00465632
Filename: Hungerford Terrace Lighting Layout 00465632B.AGI	
Drawn By: S Elliott	

Filename: Z:\Job Files\Holbrook Associated\NE North East\Williston 108345\Hungerford Terrace\Working Files\AGI\Hungerford Terrace Lighting Layout 00465632B.AGI

The Lighting Analysis, ezLayout, Energy Analysis and/or Visual Simulation ("Lighting Design") provided by the RAB Lighting Inc. ("RAB") represent an anticipated prediction of lighting system performance based upon design parameters and information supplied by others. These design parameters and information provided by others have not been field verified by RAB and therefore actual measured r esults may vary from the actual field conditions. RAB recommends that design parameters and other information be field verified to reduce variation.

RAB neither warranties, either implied or stated with regard to actual measured light levels or energy consumption levels as compared to those illustrated by the Lighting Design. RAB neither warranties, either implied or stated, nor represents the appropriateness, completeness or suitability of the Lighting Design intent as compliant with any applicable regulatory code requirements with the exception of those specifically stated on drawings created and submitted by RAB. The Lighting design is issued, in whole or in part, as advisory documents for informational purposes and is not intended for construction nor as being part of a project's construction documentation package.

WPLED5Y

LED 5W Wall packs. patent-pending thermal management system. 100,000 hour L70 lifespan. 5-year, no-compromise warranty.

Color: Bronze

Weight: 2.0 lbs

Project:	Type:
Prepared By:	Date:

Driver Info

Type	Constant Current
120V	0.18A
208V	0.18A
240V	0.18A
277V	N/A
Input Watts	5.30W

LED Info

Watts	5W
Color Temp	3000K (Warm)
Color Accuracy	88 CRI
L70 Lifespan	100,000
Lumens	128
Efficacy	24.2 lm/W

Technical Specifications

Listings

UL Listed:

Suitable for wet locations in downlight position only. Suitable for mounting within 1.2m (4ft) of the ground.

IESNA LM-79 & IESNA LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

LED Characteristics

Lifespan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations

LEDs:

5W, high-output, long-life LED

Color Temperature:

3000K

Color Consistency:

3-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Construction

IP Rating:

Ingress Protection rating of IP66 for dust and water

Ambient Temperature:

Suitable For use in 40°C (104°F)

Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

Housing:

Precision die-cast aluminum housing and mounting plate. 1 1/2" backbox with three 1/2" conduit entry points.

Gaskets:

High-temperature silicone gaskets

Finish:

Formulated for high durability and long-lasting color

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Technical Specifications (continued)

Construction

Green Technology:

Mercury and UV free. RoHS-compliant components.

Other

Patents:

The WPLED design is protected by patents pending in the U.S., Canada, China, Taiwan and Mexico.

Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Equivalency:

Equivalent to 13W CFL or 60W Incandescent

Buy American Act Compliance:

RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Electrical

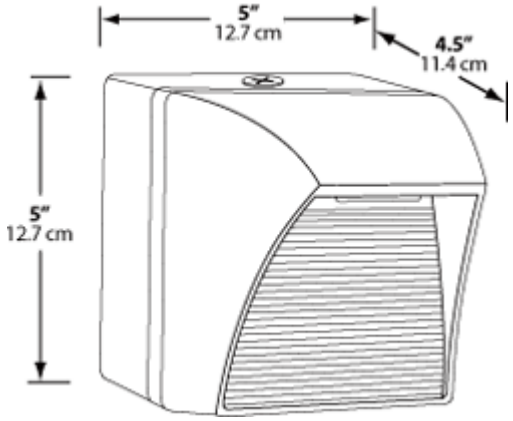
Drivers:

Constant current, Class 2, 100 - 240VAC, 50 - 60 Hz, 0.18 Amps.

Surge Protection:

1 KV

Dimensions



Features

- High performance LED light engine
- Maintains 70% of initial lumens at 100,000-hours
- Weatherproof high temperature silicone gaskets
- Superior heat sinking with die cast aluminum housing and external fins
- Replaces 13W CFL or 60W Incandescent
- 100 up to 240 Volts
- 5-Year, No-Compromise Warranty

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

WPLED10Y

LED 10W & 13 Wall packs. patent-pending thermal management system. 100,000 hour L70 lifespan. 5-year, no-compromise warranty.

Color: Bronze

Weight: 3.3 lbs

Project:	Type:
Prepared By:	Date:

Driver Info

Type	Constant Current
120V	0.1A
208V	0.07A
240V	0.06A
277V	0.05A
Input Watts	12.40W

LED Info

Watts	10W
Color Temp	3000K (Warm)
Color Accuracy	74 CRI
L70 Lifespan	100,000
Lumens	1,198
Efficacy	96.6 lm/W

Technical Specifications

Listings

UL Listed:

Suitable for Wet Locations as a Downlight. Suitable for Damp Locations as an Uplight. Wall Mount only. Suitable for Mounting within 4ft. of ground.

IESNA LM-79 & IESNA LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

DLC Listed:

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities. DLC Product Code: P5NSZ02C

LED Characteristics

Lifespan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations

Color Consistency:

3-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Lumen Maintenance:

The LED will deliver 70% of its initial lumens at 100,000 hours of operation

Construction

Finish:

Formulated for high durability and long-lasting color

Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

Maximum Ambient Temperature:

Suitable for use in 40°C (104°F)

Housing:

Precision die-cast aluminum housing, lens frame

Mounting:

Surface plate and Junction box

Green Technology:

Mercury and UV free. RoHS-compliant components.

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Technical Specifications (continued)

Construction

Gaskets:

High-temperature Silicone

Electrical

Driver:

Multi-chip 10W high output long life LED Driver Constant Current, Class II, 120V-240V, 50/60/Hz, 350mA

THD:

10.8% at 120V, 13.8% at 277V

Power Factor:

98.5% at 120V, 92.1% at 277V

Other

Patents:

The design of the LPACK is protected by U.S. Pat. D604,004 and patents pending in Canada, China and Taiwan.

Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Equivalency:

Equivalent to 70W Metal Halide

Buy American Act Compliance:

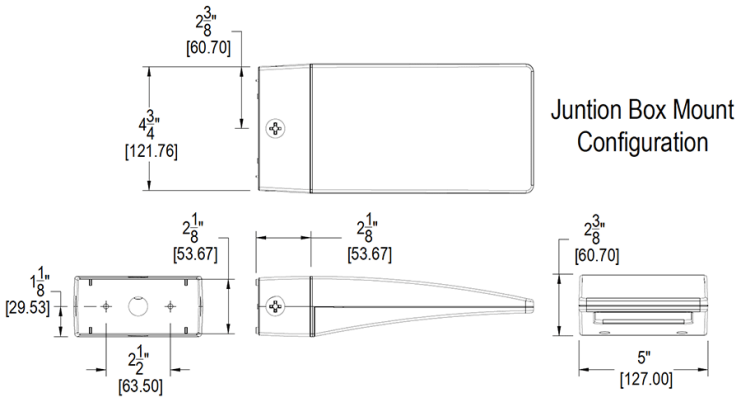
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

- High performance LED light engine
- Maintains 70% of initial lumens at 100,000-hours
- Weatherproof high temperature silicone gaskets
- Superior heat sinking with die cast aluminum housing and external fins
- 5-Year, No-Compromise Warranty

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

VANLED10YF

RAB

Low-profile vandal-resistant fixture covers the footprint of most traditional canopy lights. Available in flat or drop lens with frosted and unfrosted options.

Color: Bronze

Weight: 10.0 lbs

Project:	Type:
Prepared By:	Date:

Driver Info

Type	Constant Current
120V	0.11A
208V	0.07A
240V	0.06A
277V	0.05A
Input Watts	13.4W

LED Info

Watts	10W
Color Temp	3000K (Warm)
Color Accuracy	84 CRI
L70 Lifespan	100,000
Lumens	1,921
Efficacy	143.4 lm/W

Technical Specifications

Listings

UL Listed:

Suitable for Wet Locations. Covered Ceiling Mount Only.

IESNA LM-79 & LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. DLC Product Code: PGTX21QW

LED Characteristics

LEDs:

Long-life, high-efficacy, surface-mount LEDs

Color Stability:

RAB LEDs exceed industry standards for chromatic stability

Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Construction

Maximum Ambient Temperature:

Suitable for use in 40°C (104°F)

Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

Lens:

Vandal-resistant polycarbonate textured opaque for low glare flat lens

Housing:

Die-cast aluminum housing and lens frame with (4) 1/2" NPS side conduit entries and weatherproof rear wire plug and access plate

Mounting:

Ceiling mount to recessed junction with knockout template or directy to ceiling surface, utilizing side conduit entry points

IP Rating:

Ingress Protection rating of IP66 for dust and water

Air Tight:

Housing certified Air Tight as per ASTM E283

Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and long-lasting color

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Technical Specifications (continued)

Other

Equivalency:

Equivalent to 70W Metal Halide

Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:

RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Electrical

Driver:

Class 2, Constant Current, 120-277V, 50-60Hz, 120V: 0.11A, 208V: 0.07A, 240V: 0.06A, 277V: 0.05A

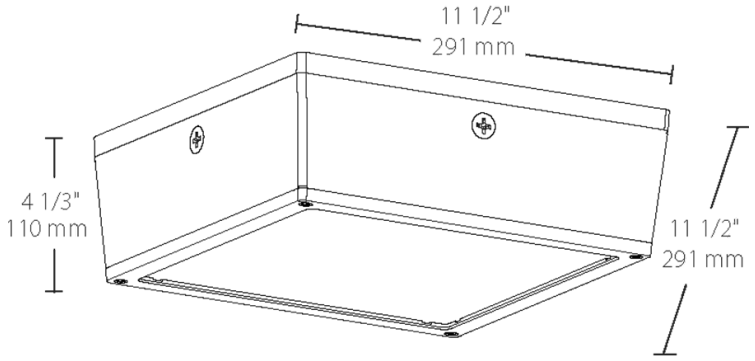
THD:

9.61% at 120V, 16.5% at 277V

Power Factor:

98.2% at 120V, 89.3% at 277V

Dimensions



Features

- Fits the footprint of older canopy lights
- Vandal resistant and UV resistant lens
- Ultra-high efficiency
- Clean, contemporary, low-profile design
- Available with drop lens or flat lens
- IP66 rated, keeps dust, bugs and water out
- Photo and motion sensor options available

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Ordering Matrix

Family	Wattage	Color Temp	Lens-Optics	Finish	Voltage	Options	Suffix
VANLED	10	Y	F				
	10 = 10W **20 =** 20W **28 =** 28W **40 =** 40W **52 =** 52W **65 =** 65W **75 =** 75W	**Blank =** 5000K (Cool) **N =** 4000K (Neutral) **Y =** 3000K (Warm)	**Blank =** Drop lens **F =** Flat lens [1] **FR =** Frosted Drop Lens **FFR =** Frosted Flat Lens [1]	**Blank =** Bronze **W =** White	**Blank =** 120-277V, 0-10V Dim Standard **/480 =** 480V, 0-10V Dim Standard	**Blank =** No Options **/MVS =** Microwave Sensor [1] **/WS =** Wattstopper, 8ft **/WS2 =** Wattstopper, 20ft **/PCS =** 120V Swivel Photocell **/PCS2 =** 277V Swivel Photocell **/PCS4 =** 480V Swivel Photocell **/LC =** Lightcloud® Control factory Installed **/E2 =** Battery, 120-277V only	**Blank =** Standard **USA =** Complies with the BAA

[1] /MVS option not available with F and FFR lens

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

WPLED26Y

Color: Bronze

Weight: 7.1 lbs

Project:	Type:
Prepared By:	Date:

Driver Info

Type	Constant Current
120V	0.26A
208V	0.16A
240V	0.14A
277V	0.12A
Input Watts	29.5W

LED Info

Watts	26W
Color Temp	3000K (Warm)
Color Accuracy	70 CRI
L70 Lifespan	100,000
Lumens	3,267
Efficacy	110.7 lm/W

Technical Specifications

Listings

UL Listed:

Suitable for wet locations. Suitable for mounting within 1.2m (4ft) of the ground.

DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. DLC Product Code: P0000175O

LED Characteristics

Lifespan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations

Color Consistency:

3-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Construction

IP Rating:

Ingress Protection rating of IP66 for dust and water

Finish:

Formulated for high durability and long-lasting color

Ambient Temperature:

Suitable For use in 40°C (104°F)

Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

Green Technology:

Mercury and UV free. RoHS-compliant components.

Other

Patents:

The WPLED design is protected by U.S. Pat. D634878, Canada Pat 134878, China Pat. CN301649064S.

Equivalency:

Equivalent to 150W Metal Halide

Buy American Act Compliance:

RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Technical Specifications (continued)

Optical

BUG Rating:

B1 U0 G0

Electrical

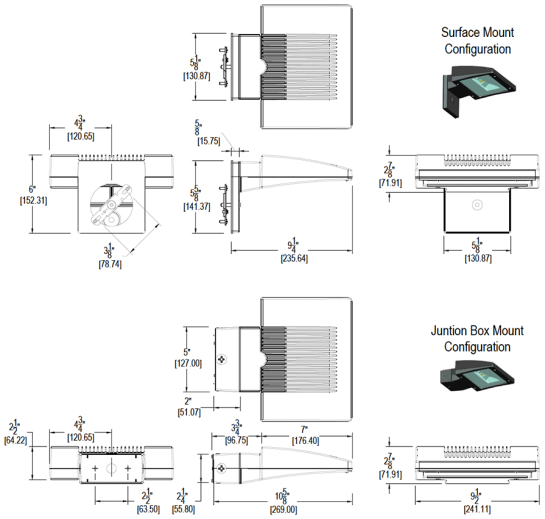
Driver:

Multi-chip 26W high output long life LED Driver Constant Current, 720mA, Class 2, 6kV Surge Protection, 100V-277V, 50-60 Hz, 100-240V.4 Amps.

THD:

9.16% at 120V, 10.34% at 277V

Dimensions



Features

- Maintains 70% of initial lumens at 100,000-hours
- Weatherproof high temperature silicone gaskets
- Superior heat sinking with die cast aluminum housing and external fins
- 100 up to 277 Volts
- 5-Year, No-Compromise Warranty

Copyright © 2020 RAB Lighting All Rights Reserved Note: Specifications are subject to change at any time without notice

Department of Permiting 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
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Alison Davis, Zoning Clerk
Theodore Miles, Zoning Specialist
Charlene Orton, DPI Administrator

MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: ZP20-0914SP, 52 Institute Road (Sketch Plan)
Date: August 25, 2020

File: ZP20-0914SP
Location: 52 Institute Road
Zone: RCO-RG **Ward**: 4N
Parking District: Neighborhood
Date application accepted: August 14, 2019 (Delayed review per applicant request)
Applicant/ Owner: Black River Design / Burlington School District
Request: Renovations and new additions to Burlington High School. Demolition of Building C. Parking, site and landscaping revisions.

Background:

- **Zoning Permit 15-0982CA;** addition of storage shed. April 2015.
- **Zoning Permit 13-0291CA;** installation of rooftop condensing units on Buildings A and B. June 2013.
- **Zoning Permit 13-1037CA**; Replace existing HVAC system with new heat pump system and condenser on roof of Building A. May 2013.
- **Zoning Permit 13-0053CA;** install new shed in north east portion of property. July 2012.
- **Non-Applicability of Zoning Permit Requirements 12-0558NA;** installation of photovoltaic system, Certificate of Public Good. November 2011.

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).

- **Zoning Permit 11-1123CA**; install condensing unit on the side of F building at BHS. July 2011.
- **Zoning Permit 10-0850CA**; two new Energy Recovery Units on roof of A Building at Burlington High School. June 2010.
- **Zoning Permit 09-616CA**; Renovations to existing press box including new membrane roof covering, roof access hatch, ladder, and safety rail. March 2009.
- **Zoning Permit 09-321SN**; Electronic sign to be added to previously approved sign. October 2008.
- **Zoning Permit 09-241CA**; Relocate solar array from building side to flat roof of building with new rack mounting structure. September 2008.
- **Zoning Permit 09-137SN**; freestanding sign for Burlington High School. August 2008.
- **Zoning Permit 08-549SN**; one freestanding, internally lit, metal sign for Burlington High School. Application **denied**, February 2008.
- **Zoning Permit 06-457CA**; construction of 3,200 square foot building to house wood chip boiler system for existing high school. March 2006.
- **Zoning Permit 06-452CA**; redevelopment of high school athletic fields, parking, new service and entrance buildings and new sewage pump station. February 2006.
- **Zoning Permit 05-305CCA**; amended plan for building-mounted solar panels at BHS. Reduction from six panels to four. Child of permit 05-058CA. November 2004.
- **Zoning Permit 05-058CA;** Install 6 solar panels attaching to a pole located approximately 35 ft. off the SE corner of building A. July 2004.
- **Zoning Permit 04-723CA**; Remove old green house. Enclose with walls, new roof and windows. July 2004.
- **Zoning Permit 00-028**; Installation of two metal halide flood lights on existing poles to illuminate the existing press box for the high school athletic field. July 1999.
- **Zoning Permit 99-186**; Amend previously approved bleacher system at the Burlington High School track to include a press box. October 1998.
- **Zoning Permit 98-305**; Replace existing steel and wood bleachers with new on the east and west sides of the Burlington High School track. Proposal includes installation of a slab on the east side (Portable units on the west). January 1998.
- **Zoning Permit 98-074**; Installation of a handicapped access ramp on the front of the existing Burlington high school. Materials to be painted metal (Dark green and concrete). August 1997.
- **Zoning Permit 97-033**; Add nonilluminated message board section under the existing freestanding sign for Burlington High School. Location on North Avenue and height and overall size to remain the same. July 1996.
- **Zoning Permit 87-678 / COA 87-215**; building three bay one-story garage for storage of aircraft parts for school program. January 1988.

- **Zoning Permit 87-320**; change an existing window on west side to exterior door to provide gress to new classroom. June 1987.
- **Zoning Permit 82-435**; construct bus shelter on the site of a removed bus shelter. September 1982.

Overview:

Burlington School District proposes to reconfigure and modernize Burlington High School. Three additions are proposed to consolidate programs, improve accessibility, and enhance security.

In November 2018, voters approved a bond to complete the project, entitled "Revisioning BHS/BTC". Sketch Plan Review was delayed while design modification occurred post preliminary bids. More information and updates can be viewed here.

Part 1: Land Division Design Standards
No land division is proposed.

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

(a)Protection of Important Natural Features:

Submission documents include an enhanced landscaping and tree removal plan (See L100) that includes identification of species, caliper, and disposition within the development plan.

(b) Topographical Alterations:

The North Parking Lot is proposed to be regraded to improve accessibility and traffic flow. The area of Building C will be modified to allow for an outdoor seating area, with grading to affirm positive drainage. See detail in Plan L100. Overall, the introduction of stormwater features (gravel wetlands) will result in some site modifications.

(c)Protection of Important Public Views:

There are no protected views from or through this site.

(d) Protection of Important Cultural Resources:

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

Not applicable.

(e) Supporting the Use of Renewable Energy Resources:

The redevelopment plan includes entirely new infrastructure, including:

- New LED lighting with low voltage controls;

- Addition of cooling throughout the complex;
- New heating and ventilation systems
- Electric Vehicle charging stations

There is existing solar on the multiple rooftops. No part of the application will preclude future utilization of wind, geothermal, water, or other renewable energy.

(f) Brownfield Sites:

This site is not listed on the Vermont DEC list of identified Brownfields. The work will, however, address the presence of urban soils, on-site asbestos, and PCBs.

(g) Provide for nature's events:

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

The narrative defines the intent to introduce Stormwater Treatment to meet all City and State regulations. The project will be required to satisfy all Chapter 26 requirements, with written approval of the City Stormwater program.

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.

Improvements to building entrances will assure enhanced shelter for students and staff. Burlington School District maintains an active snow removal program for all their facilities.

(h) Building Location and Orientation:

The building will continue to front Institute Road, with additions to the east, north and at a southerly entrance. Redevelopment will continue to emphasize and enhance the existing orientation to the street.

(i) Vehicular Access:

The existing bus-loop will remain as existing. All other vehicles will enter from Institute Road, although both the entrance and exit pathes will be shifted to the east. See RSG Traffic memo update of July 2, 2020.

(j) Pedestrian Access:

Sidewalks will remain as circulation paths from North Avenue and the remainder of the campus to the west and north. Walkways within the courtyard will remain or be replaced. Enhanced pedestrian access will be introduced at the easterly (main) building entrance, in immediate proximity to accessible and bicycle parking. Emergency responder access will be achieved at both the easterly and southwesterly entrances. The pedestrian path at the vehicular exit from the north parking lot will feature a handrail to both address the grade change, and to prevent students from cutting across the grass to cross Institute Road.

(k) Accessibility for the Handicapped:

The minor addition at the southwesterly corner will provide broad access and an internal elevator to access four floors. Accessible parking spaces will be scattered across the entire campus, with increases in the north lot from 4 to 6 spaces.

(l) Parking and Circulation:

Reference is made to the Civil plans and the RSG memo of July 2.
The Existing North Parking Lot (ENL) will be completely reconfigured to improve accessibility and traffic flow. This existing North Lot has 122 parking spaces and a curb side aisle used as approximately 30 temporary pickup and dropoff spaces.
The proposed lot (PNL) will include 105 parking spaces and a curbside aisle for 16 temporary pick up and drop off spaces. See Table 1 of the RSG memo. The layout of the PNL will operate much as the existing lot. Buses will remain on a separate loop directly off North Avenue. The one-way pattern of circulation through the lot will remain.
Both the entrance and exit drives off Institute Road will be shifted to the east.
With no change in traffic volumes, only the queue development is anticipated to change. See figure 4 of the RSG memo. Of course these models are based on the 10-15 minute congestion period at the close of school; otherwise, traffic volumes are lower and congestion is not a problem.
The overall decrease in parking spaces must be addressed in a parking management plan. (-17 parking spaces in ENL, -14 pick up and drop off spaces at ENL.)

(m) Landscaping and Fences:

Wagner Hodgson has submitted an illustrative site plan (L000) that colors in the redevelopment build-out of the site. With an improved parking lot and introduction of new Stormwater features the campus will enjoy renewed green space and functional circulation throughut the site.

(n) Public Plazas and Open Space:

There are several areas of existing and proposed gathering space; the enhanced entry courtyard on the east, the improved central access entry on the south, the courtyard (including an area within the partial foundation of Building C), as well as the bicycle corrals and wide paths. Enhanced landscaping surrounding the walkways and at the site of Building C will provide comfortable and attractive areas to gather.

(o) Outdoor Lighting:

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

Extensive energy modeling is included within this design package, including entirely new LED lighting and low voltage controls. A photometric and fixture information for exterior lighting should be included in a final application for staff review.

(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 very ambitious and comprehensive application intends to increase energy efficiency, improve accessibility, enhance security, and consolidate programming. New underground utility (sewer, water, power and stormwater) infrastructure is included. On final application, review of any additional changes will be considered under this standard.

Part 3: Architectural Design Standards
Sec. 6.3.2 Review Standards

State Statute **§**4413 Limits Municipal Review per the following:

§ 4413. Limitations on municipal bylaws

(a) The following uses may be regulated only with respect to ***location, size, height, building bulk, yards, courts, setbacks, density of buildings, off-street parking, loading facilities, traffic, noise, lighting, landscaping, and screening requirements,*** *and only to the extent that regulations do not have the effect of interfering with the intended functional use:*

(1) State- or community-owned and operated institutions and facilities.

(2) Public and private schools and other educational institutions certified by the state department of education.

(3) Churches and other places of worship, convents, and parish houses.

(4) Public and private hospitals.

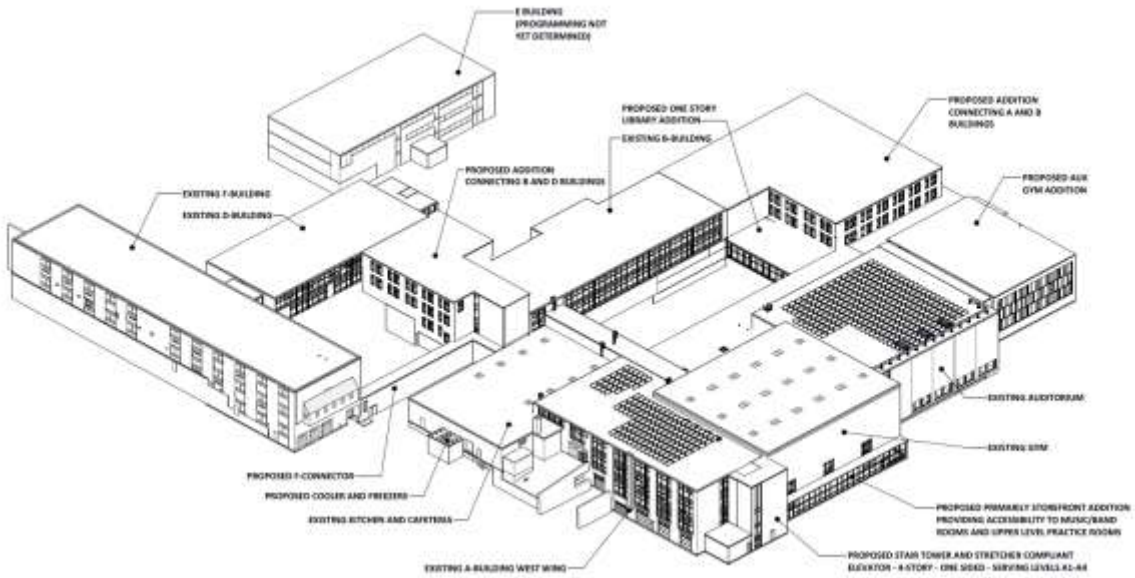
(5) Regional solid waste management facilities certified under 10 V.S.A. chapter 159.

(6) Hazardous waste management facilities for which a notice of intent to construct has been received under 10 V.S.A. § 6606a.

(a)Relate development to its environment:

1. Massing, Height and Scale:

The proposed additions are similar in scale, massing and height to the existing building(s) on site.



2. Roofs and Rooflines.

Not applicable per § 4413. *Limitations on municipal bylaws*.

3. Building Openings

Not applicable per § 4413. *Limitations on municipal bylaws*.

(b) Protection of Important Architectural Resources:

Not applicable.

(c)Protection of Important Public Views:

Not applicable.

(d) Provide an active and inviting street edge:

Not applicable per § 4413. *Limitations on municipal bylaws*.

(e)Quality of materials:

Not applicable per § 4413. *Limitations on municipal bylaws*.

(f) Reduce energy utilization:

A large part of this redevelopment is to improve energy efficiency. Reference is made to the energy modeling information beginning on page 10 of the *buhs/TRC/document*.

(g)Make advertising features complementary to the site:

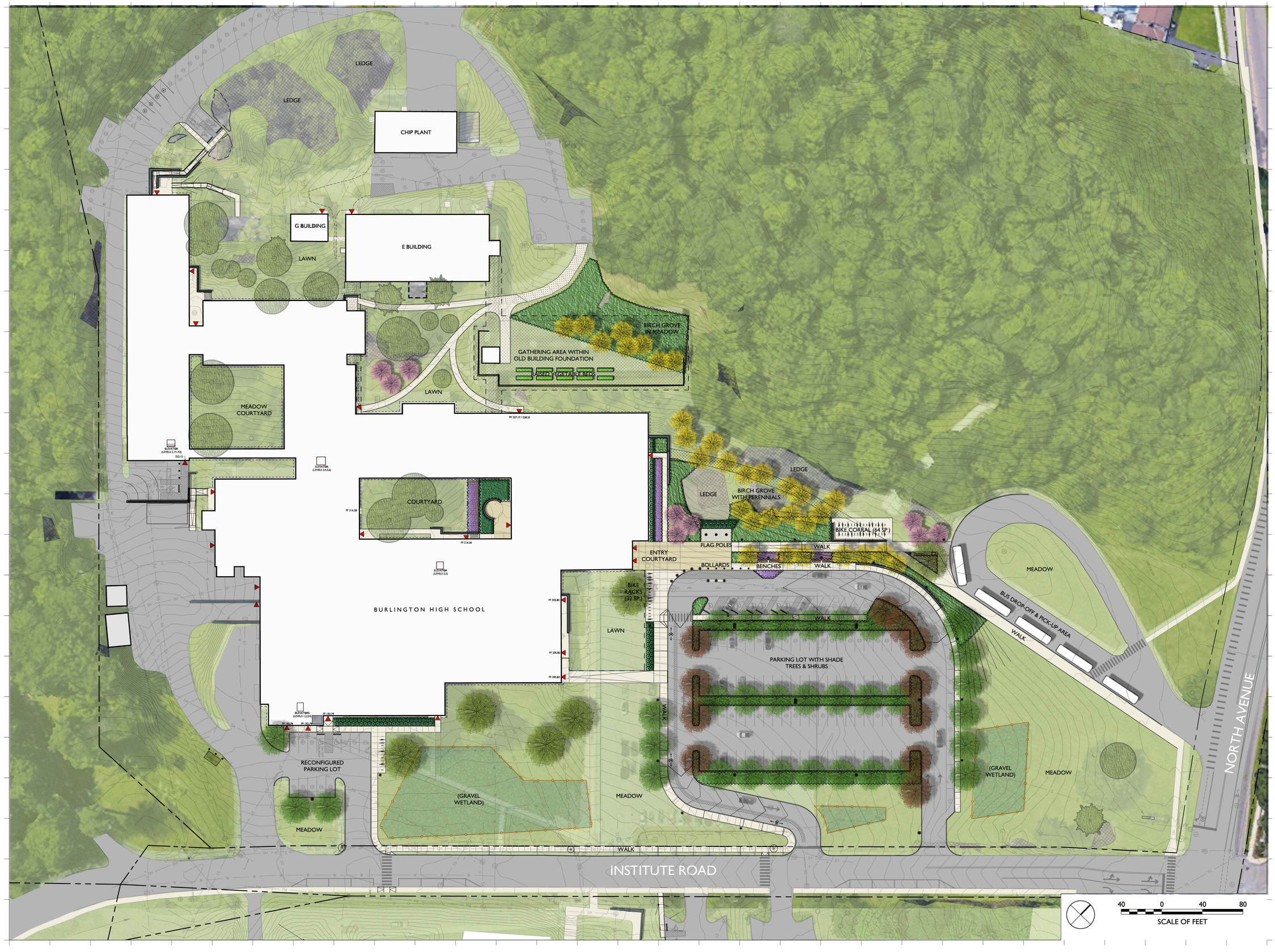
Not applicable.

(h) Integrate infrastructure into the building design:

Not applicable per § 4413. *Limitations on municipal bylaws*.

(i)Make spaces secure and safe:

Improved staff and student safety is core to the project. The addition of automatic sprinkler system throughout the complex, a new addressable fire alarm system, new lighting, ventilation, and improved traffic circulation and parking are all identified as safety improvements. Additionally, circulation to allow emergency vehicle access as well as first responder entrances with a stretcher-sized elevator will significantly advance site safety.



WAGNERHODGSON
LANDSCAPE ARCHITECTURE

VT802.864.0010 NY518.567.1791 wagnerhodgson.com

NO.	DESCRIPTION	DATE

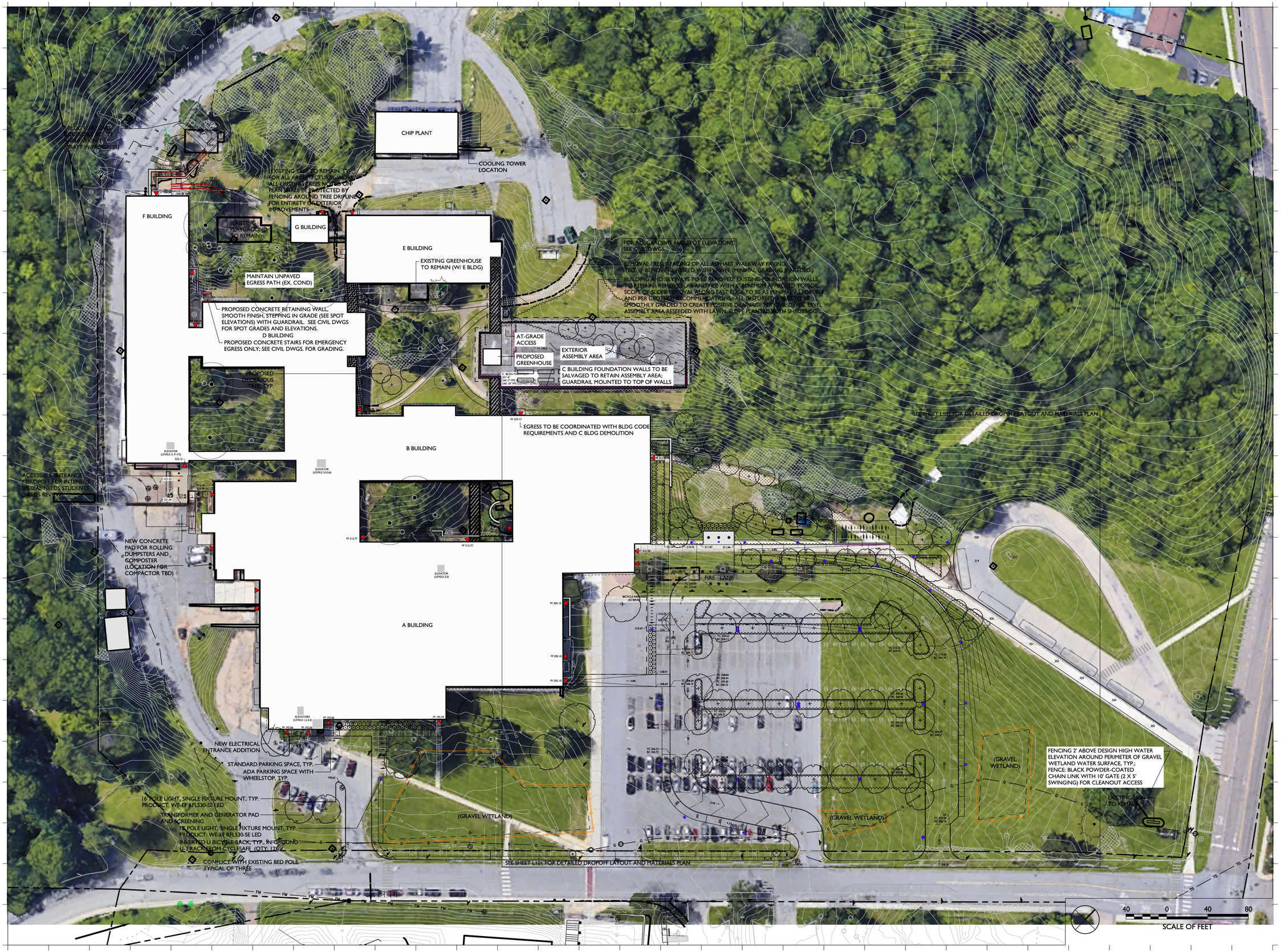
BURLINGTON HIGH SCHOOL

ILLUSTRATIVE SITE PLAN

JOB NO. 887
SCALE: 1"=40'
DRAWN BY: HL
DATE: 08/11/2020

L000

© WHLA ALL RIGHTS RESERVED 2017



WAGNERHODGSON
LANDSCAPE ARCHITECTURE
VT802.864.0010 NY518.567.1791 wagnerhodgson.com

NO.	DESCRIPTION	DATE

BURLINGTON HIGH SCHOOL

FOR REVIEW ONLY

8/10/2020 (PROGRESS)

OVERALL LANDSCAPE PLAN

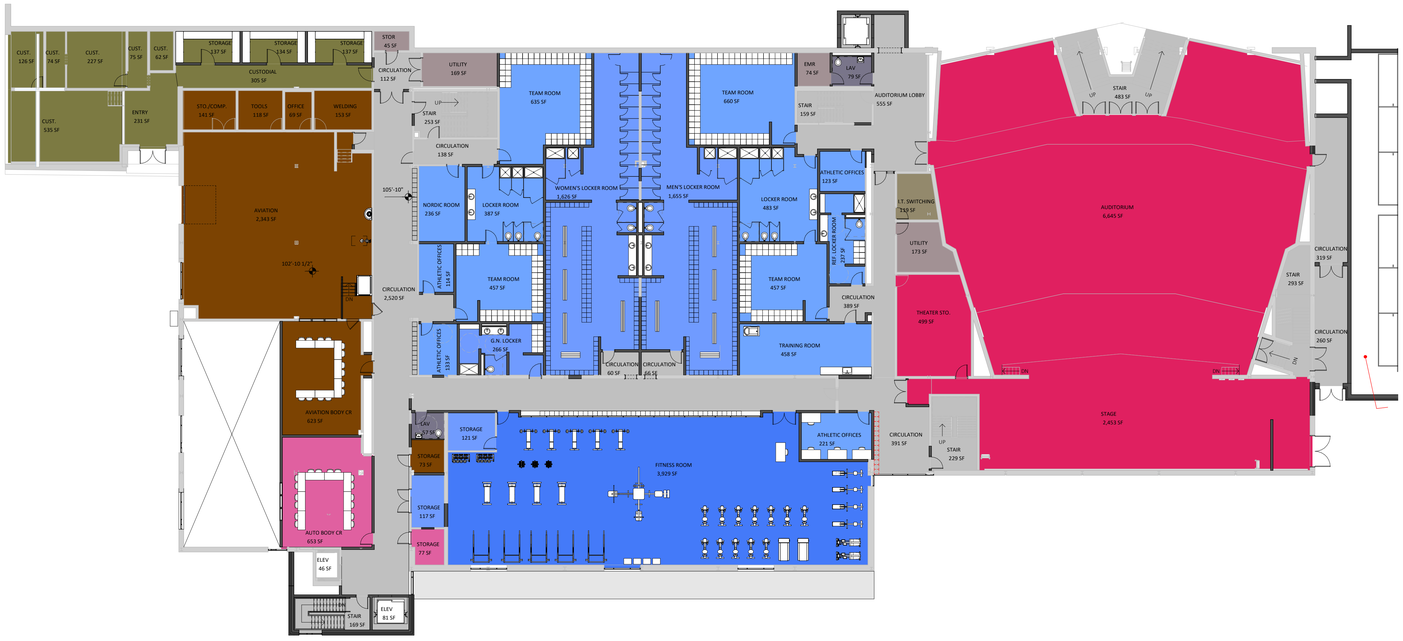
JOB NO. 887
SCALE: 1"=40'
DRAWN BY: HL
DATE: 6/8/2020

L100

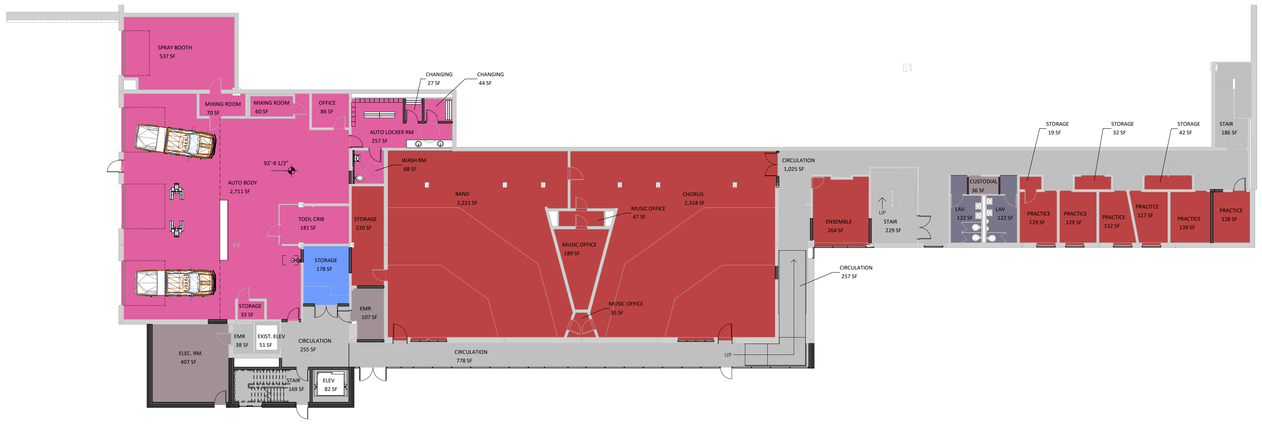
© WHLA ALL RIGHTS RESERVED 2017

© 2020, Black River Design, Architects. All rights reserved.

north



2 PROPOSED BUILDING A/B - LEVEL 2
SCALE: 1/16" = 1'-0"



1 PROPOSED BUILDING A/B - LEVEL 1
SCALE: 1/16" = 1'-0"

DEPARTMENT LEGEND

- ADMIN. - MLL
- ADMIN. - PROF. DEVEL
- ADMIN. GUIDANCE
- ADMIN. HEALTH
- ADMIN. STUDENT SERVICES
- ADMINISTRATION
- ATHLETICS
- ATHLETICS - PE
- ATHLETICS - SPORTS
- BTC
- BTC - ADMINISTRATION
- BTC - AUTO BODY REPAIR
- BTC - AUTO REPAIR
- BTC - AVIATION TECH
- BTC - COMPUTER PROGRAMMING & SCIENCES
- BTC - CRIMINAL JUSTICE
- BTC - CULINARY / PROFESSIONAL FOOD
- BTC - DESIGN & ILLUSTRATION
- BTC - DIGITAL MEDIA ARTS
- BTC - ENGLISH LANGUAGE
- BTC - HEALTH SCIENCES
- BTC - HUMAN DEVELOPMENT
- BTC - LEARNING LAB
- BTC - PRE TECH ENG., ARCH., & CONSTRUCTION
- BTC - WELDING & METAL FABRICATION
- CAFETERIA / KITCHEN - DINING
- CAFETERIA / KITCHEN - PREP
- CLASSROOM
- CLASSROOM - SHARED/CORE
- DESIGN & TECHNOLOGY
- DISTRICT ON TOP
- DRIVER'S ED
- FACULTY & SHARED RESOURCE SPACE
- FINE ARTS
- FOOD LAB
- I.T.
- INFRASTRUCTURE - CIRCULATION
- INFRASTRUCTURE - CUSTODIAL
- INFRASTRUCTURE - LAVATORY
- INFRASTRUCTURE - UTILITY
- LIBRARY
- MUSIC
- SCIENCE
- SP.ED.
- SP.ED. - INTENSIVE SPECIAL NEEDS
- THEATER - AUDITORIUM
- UNKNOWN

PROPOSED BUILDING A/B LEVEL 1 & 2 PLANS

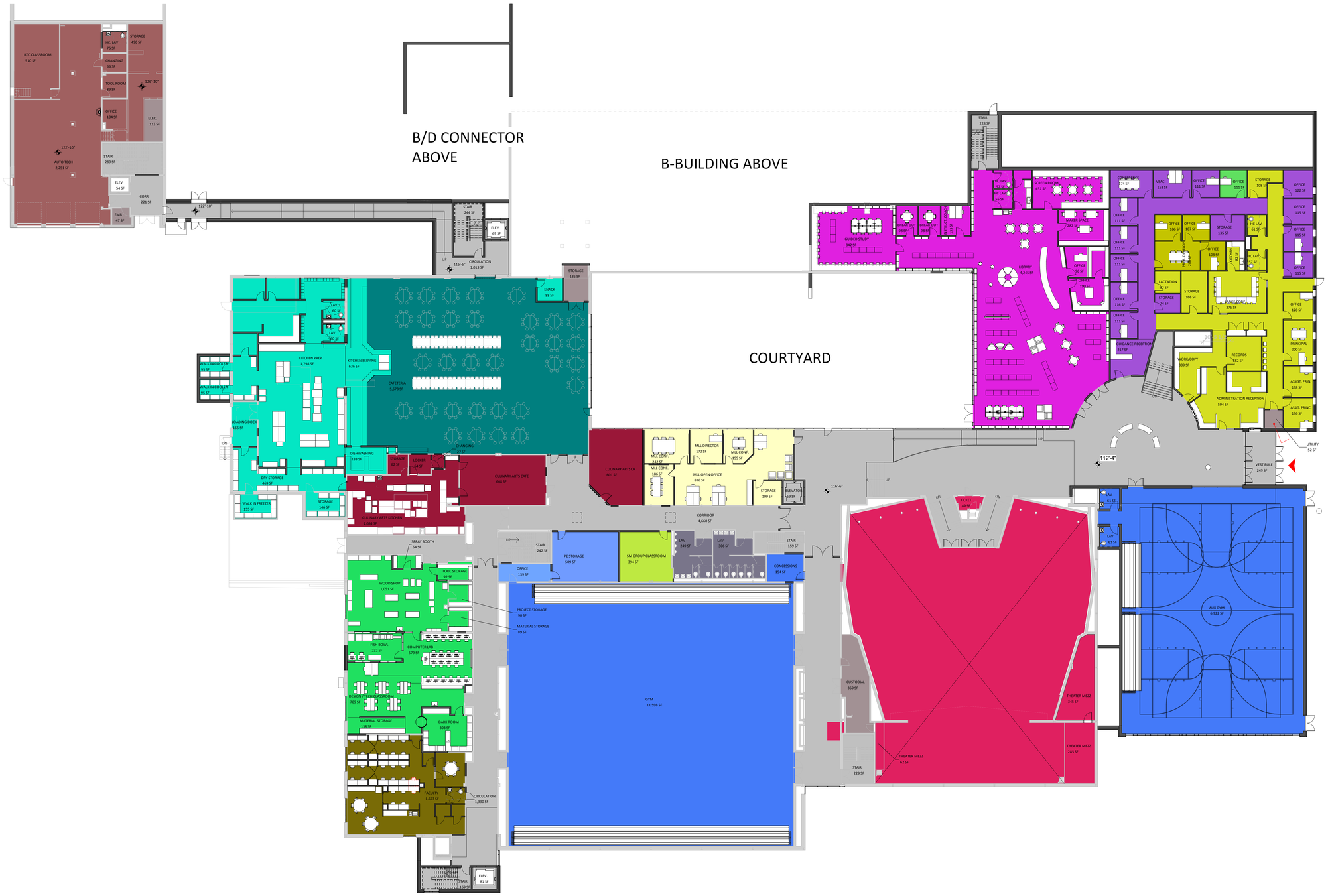
2020-08-11 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



PROPOSED BUILDING A/B LEVEL 3 PLAN

2020-08-11 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north

PROPOSED BUILDING A/B LEVEL 4 PLAN

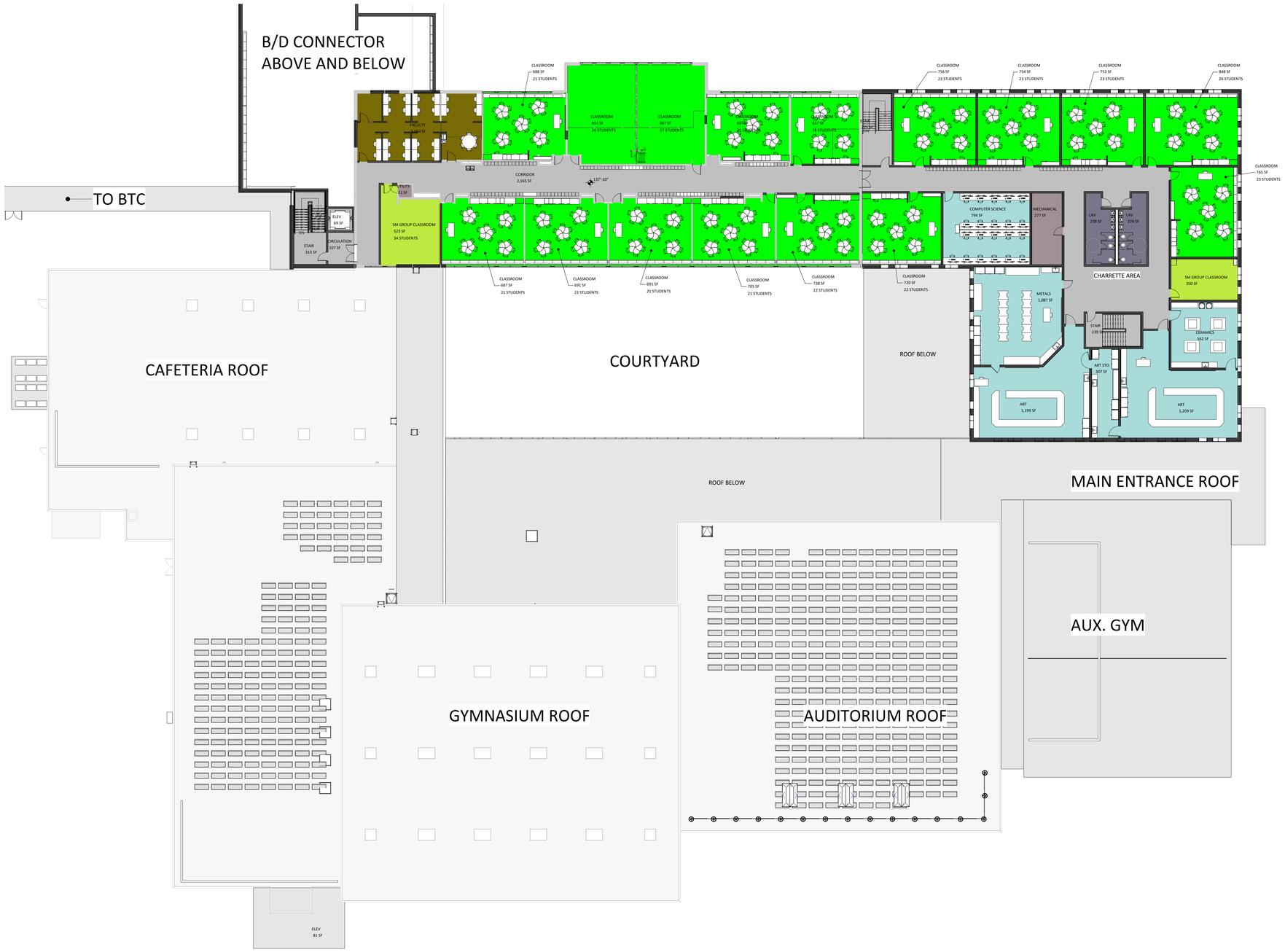
2020-08-11 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



PROPOSED BUILDING A/B LEVEL 5 PLAN

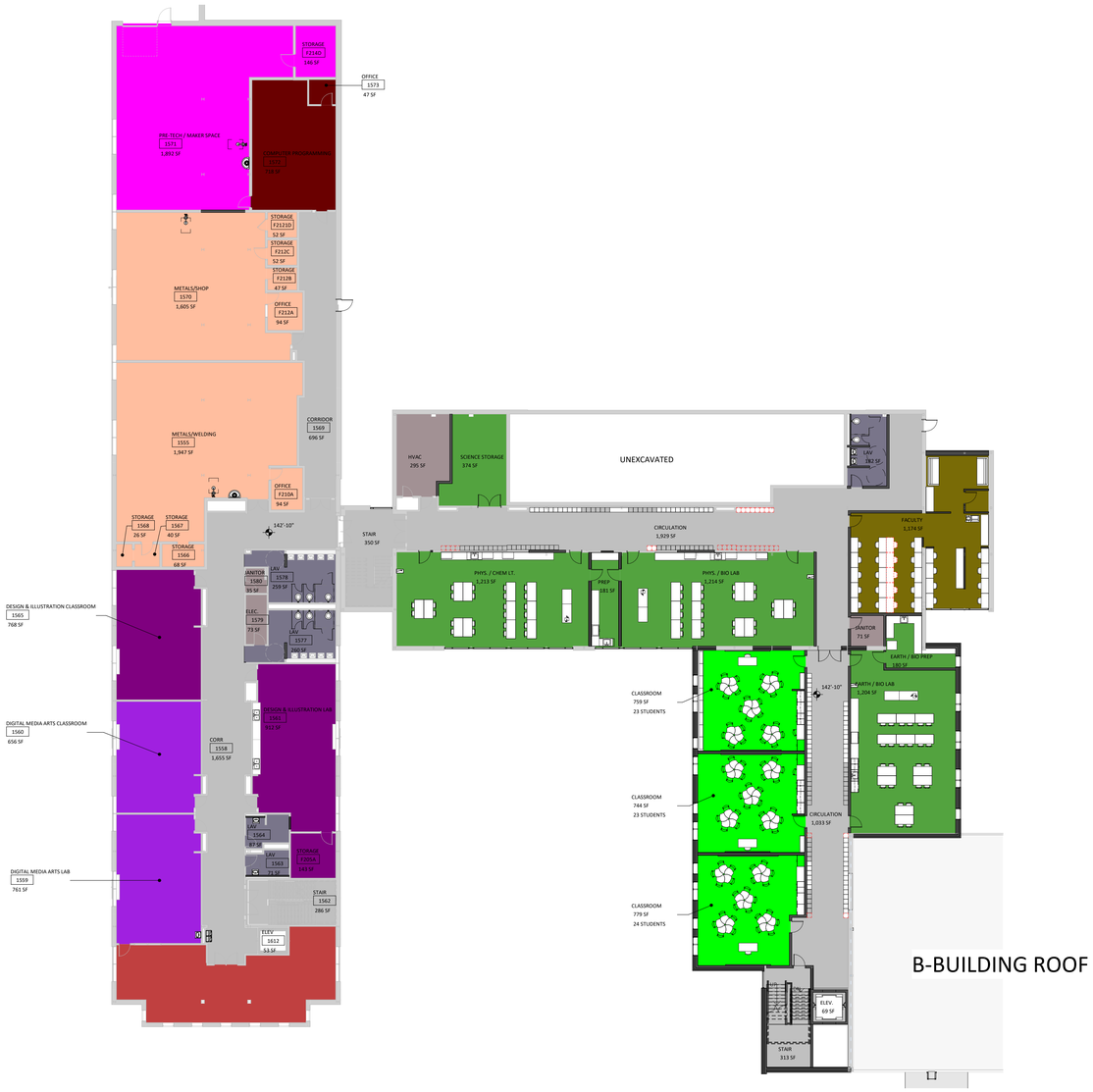
2020-08-11 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

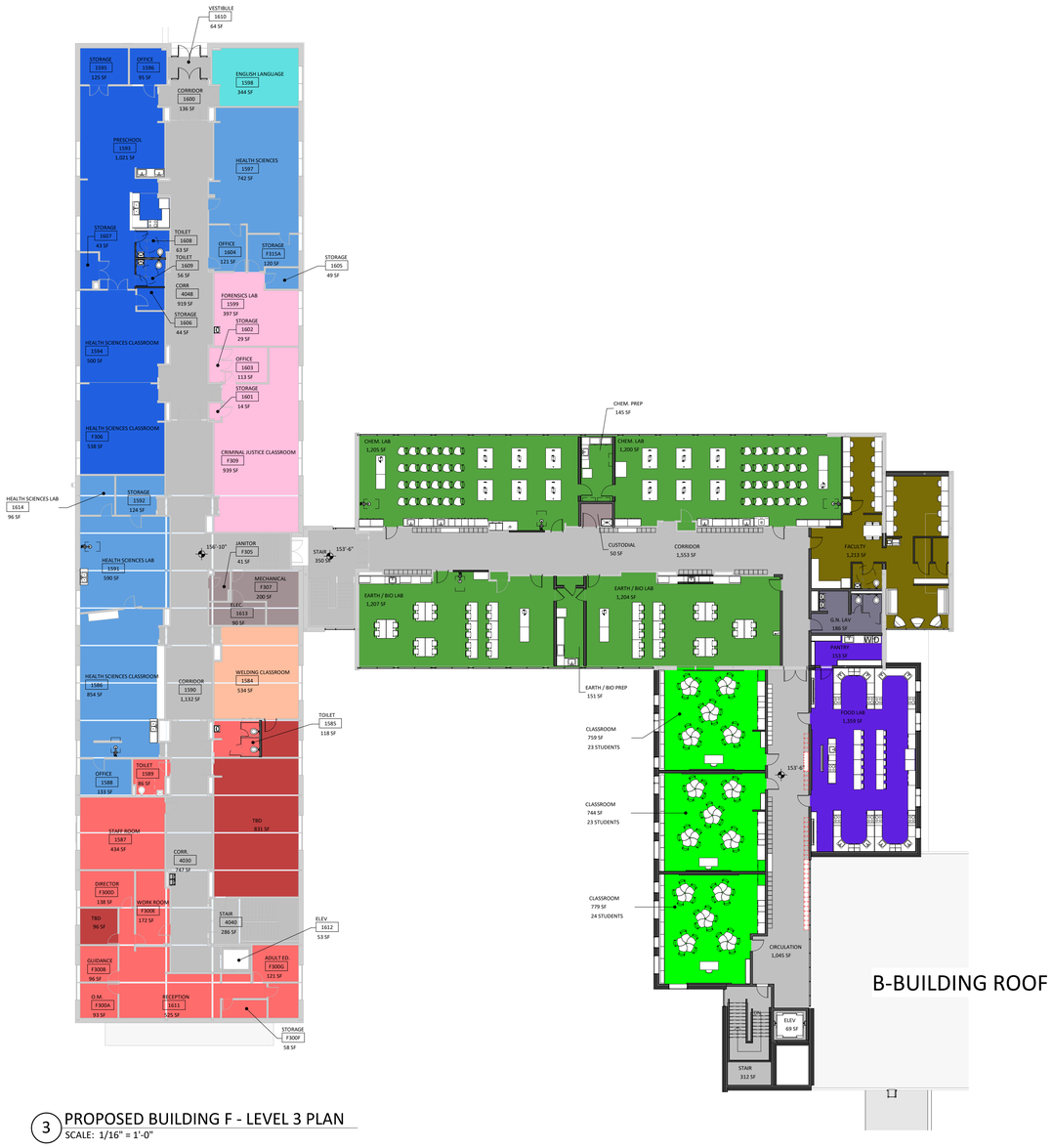
BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



2 PROPOSED BUILDING F - LEVEL 2 PLAN
SCALE: 1/16" = 1'-0"



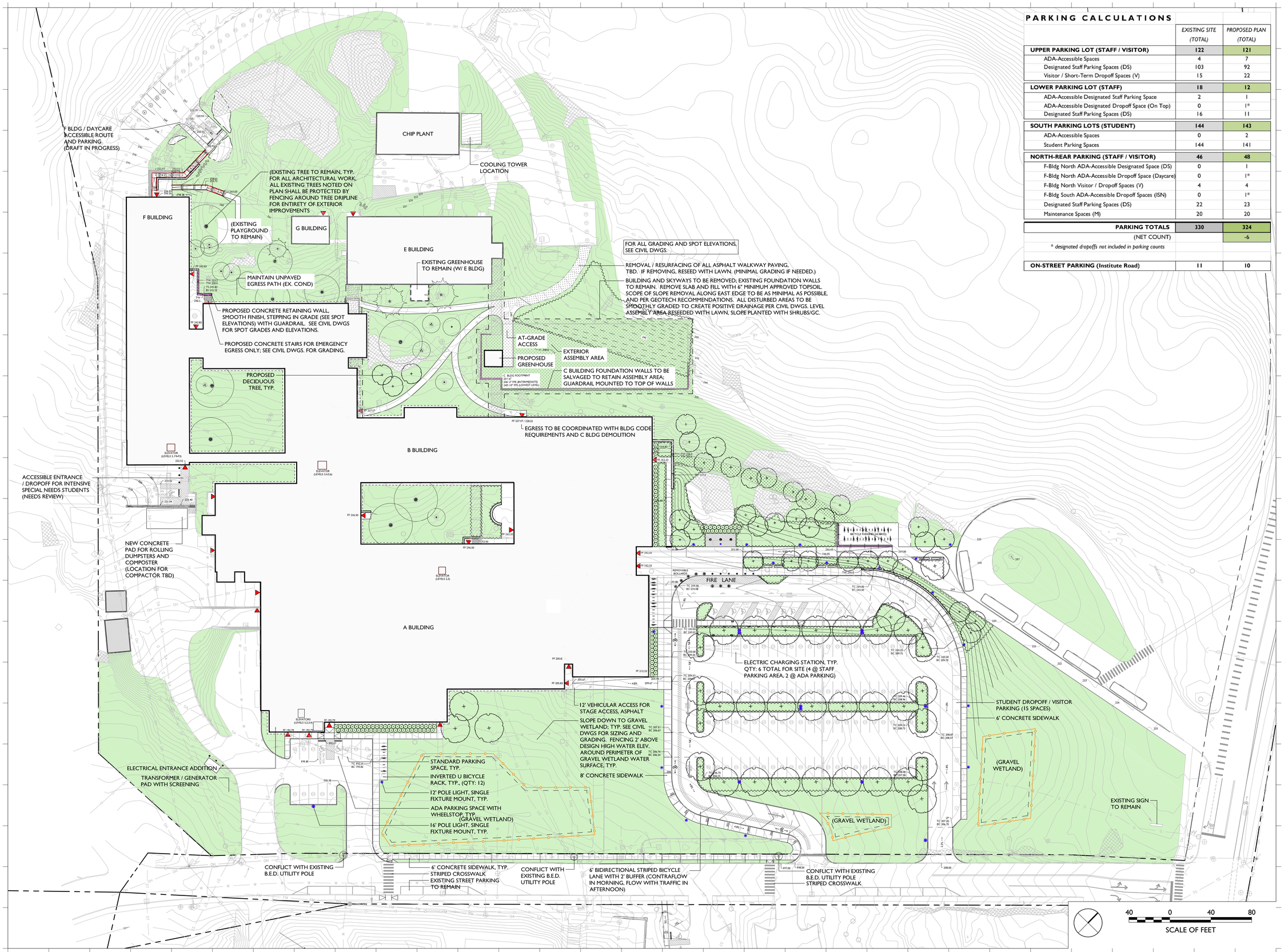
3 PROPOSED BUILDING F - LEVEL 3 PLAN
SCALE: 1/16" = 1'-0"

PROPOSED - BUILDING F/D LEVEL 2 & 3 PLANS

2020-08-11 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS



PARKING CALCULATIONS

	EXISTING SITE (TOTAL)	PROPOSED PLAN (TOTAL)
UPPER PARKING LOT (STAFF / VISITOR)	**122**	**121**
ADA-Accessible Spaces	4	7
Designated Staff Parking Spaces (DS)	103	92
Visitor / Short-Term Dropoff Spaces (V)	15	22
LOWER PARKING LOT (STAFF)	**18**	**12**
ADA-Accessible Designated Staff Parking Space	2	1
ADA-Accessible Designated Dropoff Space (On Top)	0	1*
Designated Staff Parking Spaces (DS)	16	11
SOUTH PARKING LOTS (STUDENT)	**144**	**143**
ADA-Accessible Spaces	0	2
Student Parking Spaces	144	141
NORTH-REAR PARKING (STAFF / VISITOR)	**46**	**48**
F-Bldg North ADA-Accessible Designated Space (DS)	0	1
F-Bldg North ADA-Accessible Dropoff Space (Daycare)	0	1*
F-Bldg North Visitor / Dropoff Spaces (V)	4	4
F-Bldg South ADA-Accessible Dropoff Spaces (ISN)	0	1*
Designated Staff Parking Spaces (DS)	22	23
Maintenance Spaces (M)	20	20
PARKING TOTALS	**330**	**324**
(NET COUNT)		-6

** designated dropoffs not included in parking counts*

ON-STREET PARKING (Institute Road)	11	10

Proposed Bicycle Parking:
TOTAL: 120 Bikes

MAIN ENTRY (North Ave): 32 Racks (64 bik

MAIN ENTRY (Bike Path): 16 Racks (32 bik

ATHLETICS AREA: 12 Racks (24 bikes)

KEY

- Pole Light, 16' Mounting Height. Single Fixt (Vehicular)
- Pole Light, 16' Mounting Height. Double Fixture (Vehicular)
- Pole Light, 12' Mounting Height. Single Fixt (Pedestrian)
- Ground-Mounted Uplight, Single Fixture (Flagpole Illumination)
- Recessed Wall Light, Integrated in Concret Seating Elements
- Removable Bollard
- Fixed Bollard
- Electric Car-Charging Station
- Guardrail, 42" height from walking surface
- Handrail, 36" height from walking surface
- Fencing, 42" height along perimeter of gravel wetlands

NO.	DESCRIPTION	DATE

BURLINGTON HIGH SCHOOL

OVERALL LANDSCAPE PLAN

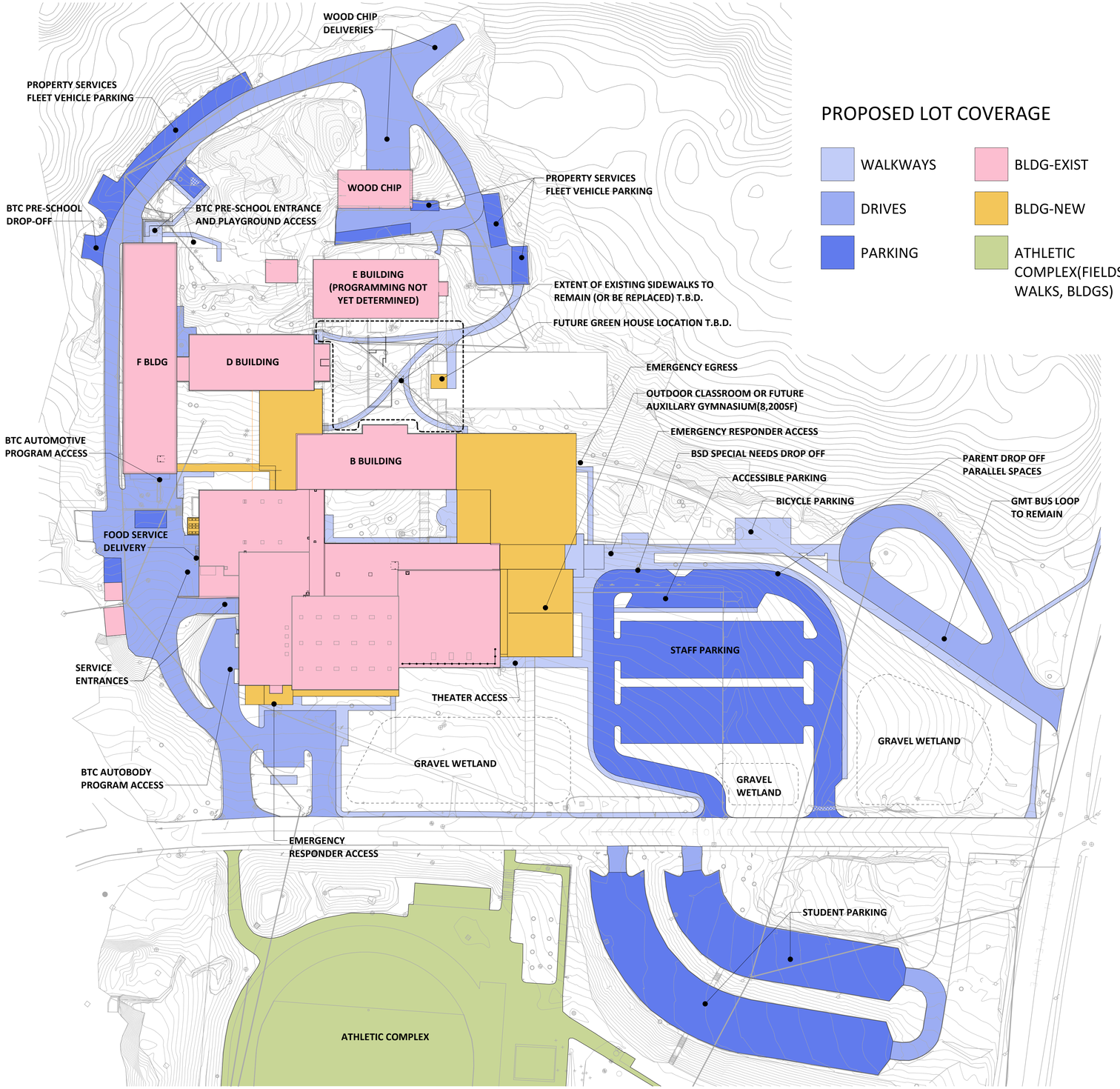
JOB NO. 887
SCALE: 1"=40'
DRAWN BY: HL
DATE: 6/8/2020

L100

© WHLA ALL RIGHTS RESERVED 2017

© 2020, Black River Design, Architects. All rights reserved.

north



PROPOSED LOT COVERAGE

- WALKWAYS
- DRIVES
- PARKING
- BLDG-EXIST
- BLDG-NEW
- ATHLETIC COMPLEX(FIELDS, WALKS, BLDGS)

PROPOSED LOT COVERAGE AREA

DESCRIPTION	PROPOSED LOT COVERAGE
WALKWAYS	35,292 SF
DRIVES	87,887 SF
PARKING	106,130 SF
EXISTING BUILDINGS AND STRUCTURES TO REMAIN	111,179 SF
BUILDINGS NEW	36,419 SF
ATHLETIC FIELDS, ASPHALT WALKS, BUILDINGS	211,367 SF
	588,273 SF

TOTAL SITE AREA = 2,116,012 SF

PROPOSED LOT COVERAGE = 588,274 SF

LOT COVERAGE AREA(EXISTING) = (567,812 SF)

% OF PROPOSED LOT COVERAGE = 27.80%

% OF LOT COVERAGE(EXISTING) = (26.83%)

PROPOSED LOT COVERAGE SUMMARY(w/o E-Bldg)

	Existing Area	Proposed Area	Existing Lot Coverage %	Proposed Lot Coverage %	% Change
Total Site	2,116,012 SF	2,116,012 SF			
Athletic Complex	211,365 SF	211,367 SF	9.99%	9.99%	0.00%
Bldg footprint	128,348 SF	137,982 SF	6.07%	6.52%	0.46%
Paving					
Walkways	31,753 SF	35,292 SF	1.50%	1.67%	0.17%
Drives	88,837 SF	87,887 SF	4.20%	4.15%	-0.04%
Parking	107,509 SF	106,130 SF	5.08%	5.02%	-0.07%
	567,812 SF	**578,658 SF**	**26.83%**	**27.35%**	**0.51%**
Parking Spaces (448 required by Zoning)	343	322*			

**REDUCTION OF +/- 70 SPACES FROM PROPOSED SD PLAN*

PROPOSED LOT COVERAGE SUMMARY(with E-Bldg)

	Existing Area	Proposed Area	Existing Lot Coverage %	Proposed Lot Coverage %	% Change
Total Site	2,116,012 SF	2,116,012 SF			
Athletic Complex	211,365 SF	211,367 SF	9.99%	9.99%	0.00%
Bldg footprint	128,348 SF	147,598 SF	6.07%	6.98%	0.91%
Paving					
Walkways	31,753 SF	35,292 SF	1.50%	1.67%	0.17%
Drives	88,837 SF	87,887 SF	4.20%	4.15%	-0.04%
Parking	107,509 SF	106,130 SF	5.08%	5.02%	-0.07%
	567,812 SF	**588,274 SF**	**26.83%**	**27.80%**	**0.97%**
Parking Spaces (448 required by Zoning)	343	322*			

**REDUCTION OF +/- 70 SPACES FROM PROPOSED SD PLAN*

LOT COVERAGE PLAN

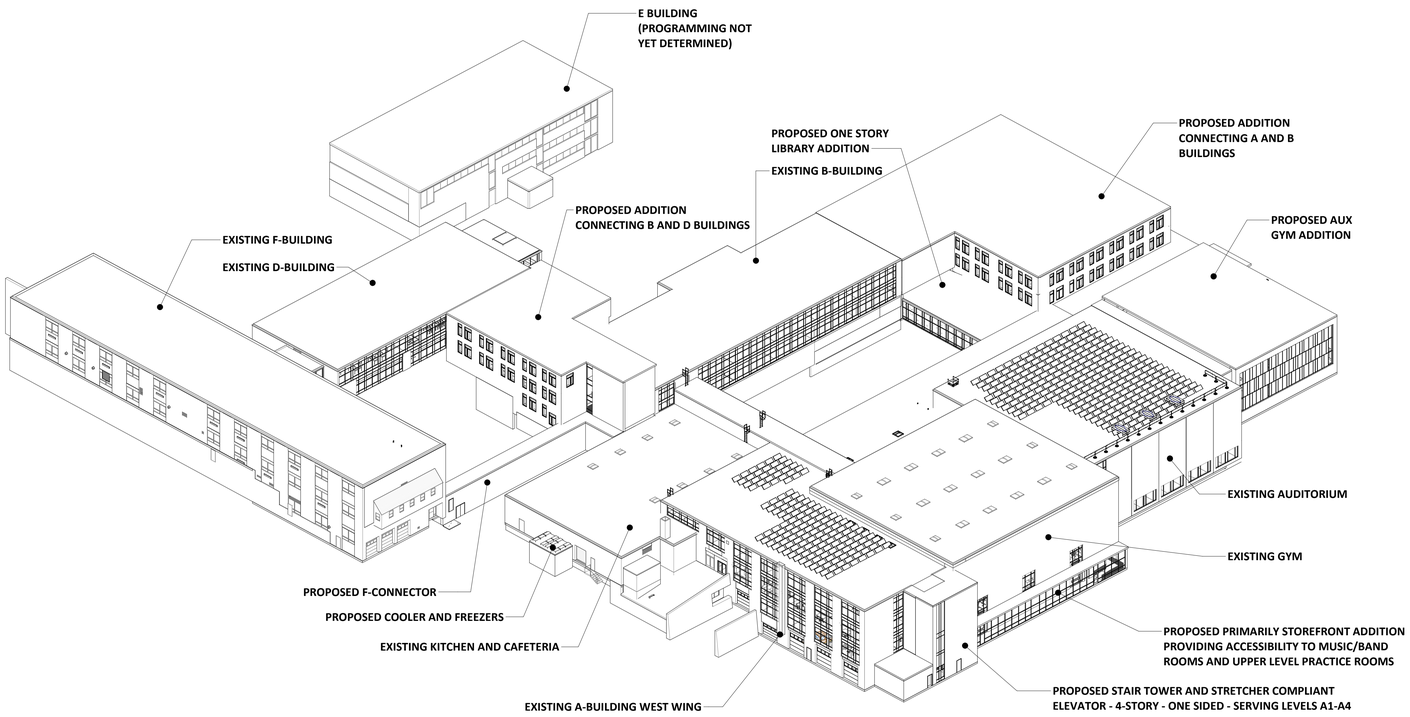
2020-06-29 scale: 1" = 60'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

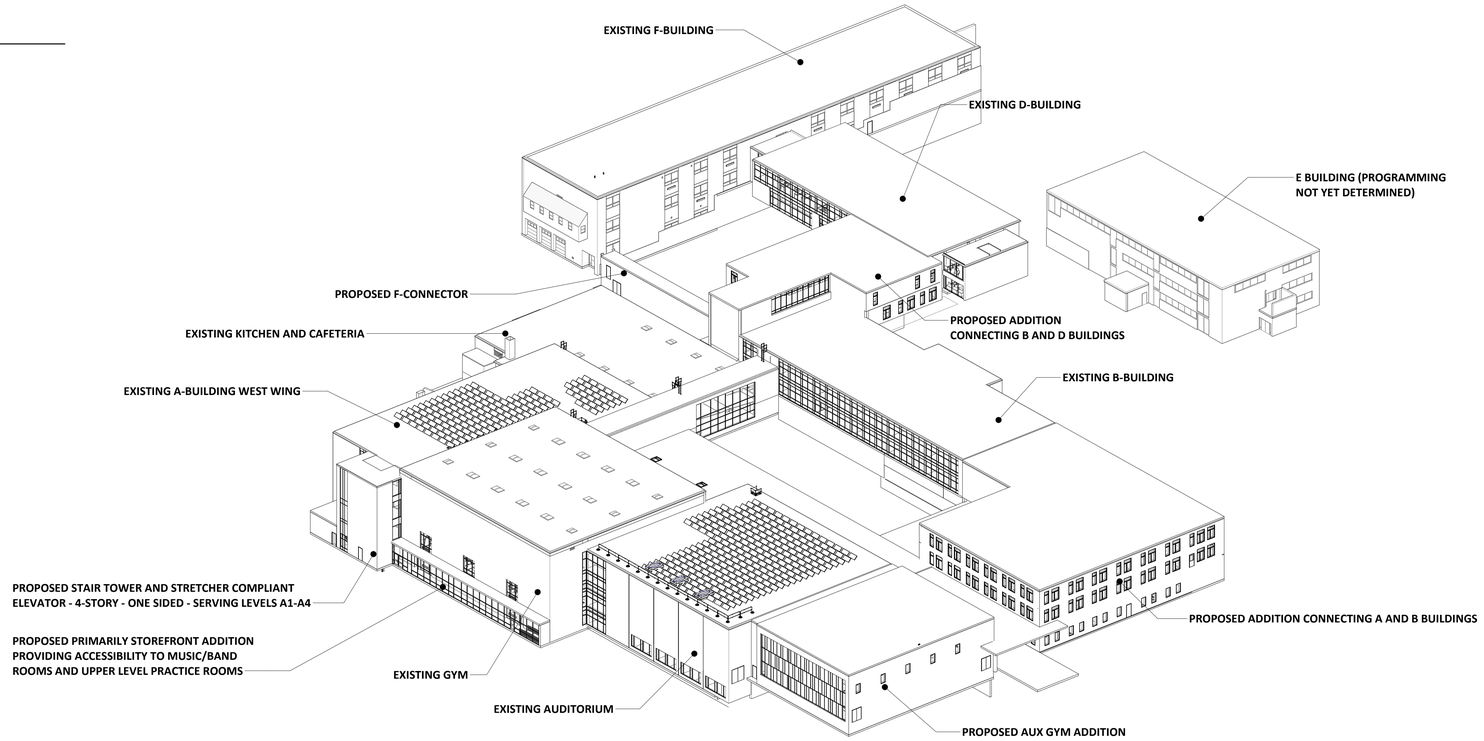
BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



VIEW LOOKING NORTH/EAST FROM WEST END OF INSTITUTE ROAD



VIEW LOOKING NORTH WEST FROM NORTH AVE

PROPOSED - 3D ORIENTATION PLAN

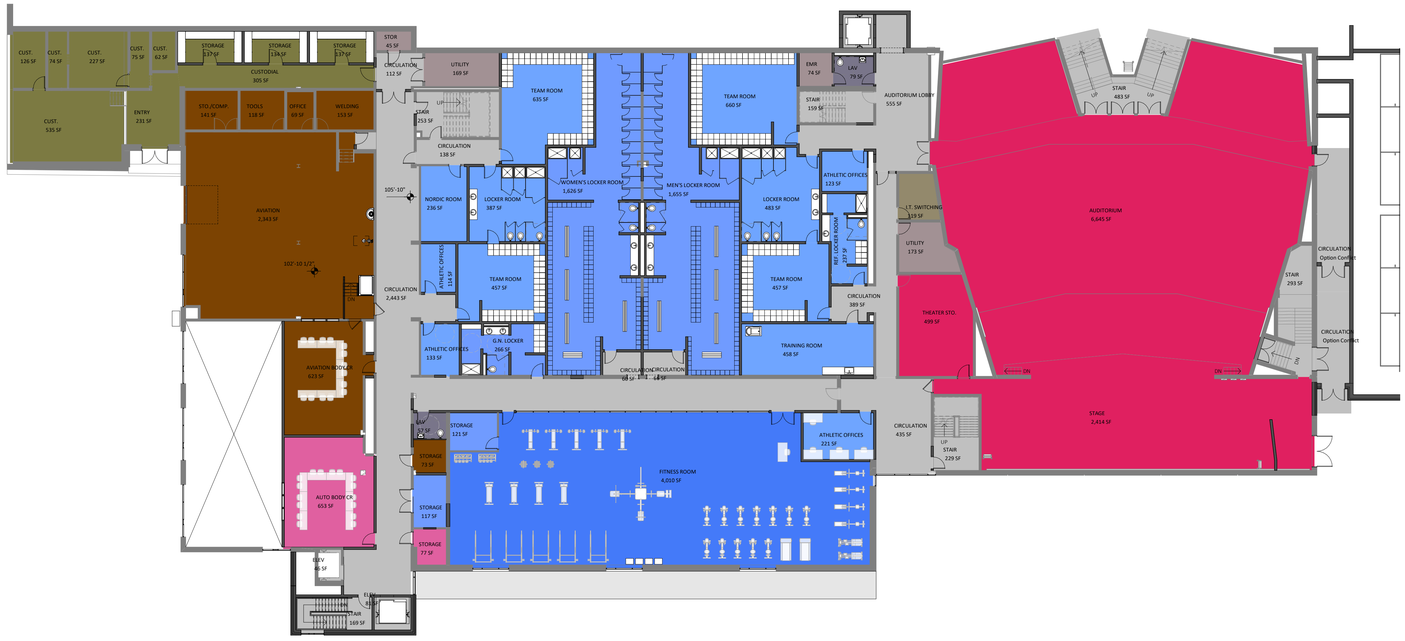
06/29/20 scale:

BURLINGTON HIGH SCHOOL RE-ENVISIONING

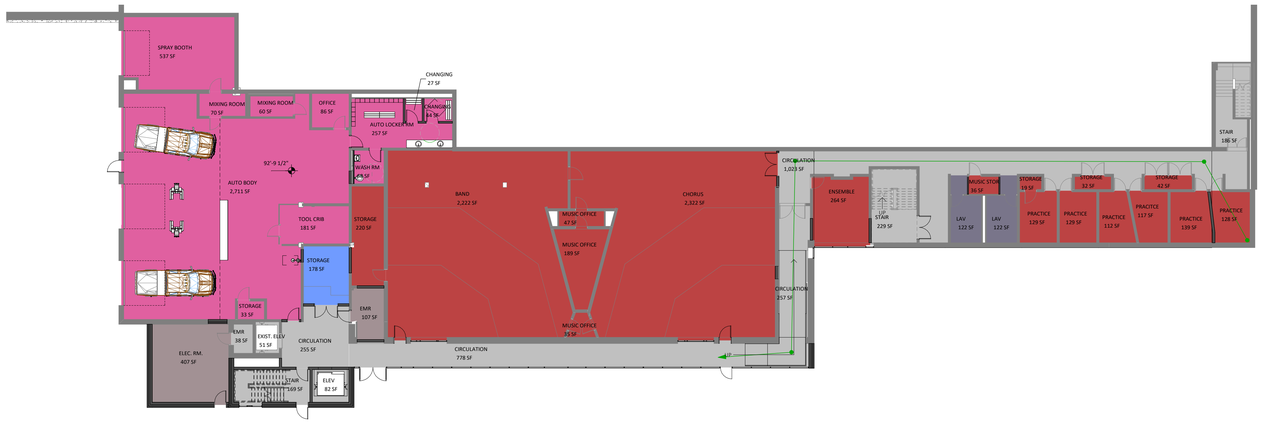
BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



2 PROPOSED BUILDING A/B - LEVEL 2
SCALE: 1/16" = 1'-0"



1 PROPOSED BUILDING A/B - LEVEL 1
SCALE: 1/16" = 1'-0"

DEPARTMENT LEGEND

- ADMIN. - MLL
- ADMIN. - PROF. DEVEL
- ADMIN. GUIDANCE
- ADMIN. HEALTH
- ADMIN. STUDENT SERVICES
- ADMINISTRATION
- ATHLETICS
- ATHLETICS - PE
- ATHLETICS - SPORTS
- BTC
- BTC - ADMINISTRATION
- BTC - AUTO BODY REPAIR
- BTC - AUTO REPAIR
- BTC - AVIATION TECH
- BTC - COMPUTER PROGRAMMING & SCIENCES
- BTC - CRIMINAL JUSTICE
- BTC - CULINARY / PROFESSIONAL FOOD
- BTC - DESIGN & ILLUSTRATION
- BTC - DIGITAL MEDIA ARTS
- BTC - ENGLISH LANGUAGE
- BTC - HEALTH SCIENCES
- BTC - HUMAN DEVELOPMENT
- BTC - LEARNING LAB
- BTC - PRE TECH ENG., ARCH., & CONSTRUCTION
- BTC - WELDING & METAL FABRICATION
- CAFETERIA / KITCHEN - DINING
- CAFETERIA / KITCHEN - PREP
- CLASSROOM
- CLASSROOM - SHARED/CORE
- DESIGN & TECHNOLOGY
- DISTRICT ON TOP
- DRIVER'S ED
- FACULTY & SHARED RESOURCE SPACE
- FINE ARTS
- FOOD LAB
- I.T.
- INFRASTRUCTURE - CIRCULATION
- INFRASTRUCTURE - CUSTODIAL
- INFRASTRUCTURE - LAVATORY
- INFRASTRUCTURE - UTILITY
- LIBRARY
- MUSIC
- SCIENCE
- SP.ED.
- SP.ED. - INTENSIVE SPECIAL NEEDS
- THEATER - AUDITORIUM
- UNKNOWN

PROPOSED BUILDING A/B LEVEL 1 & 2 PLANS

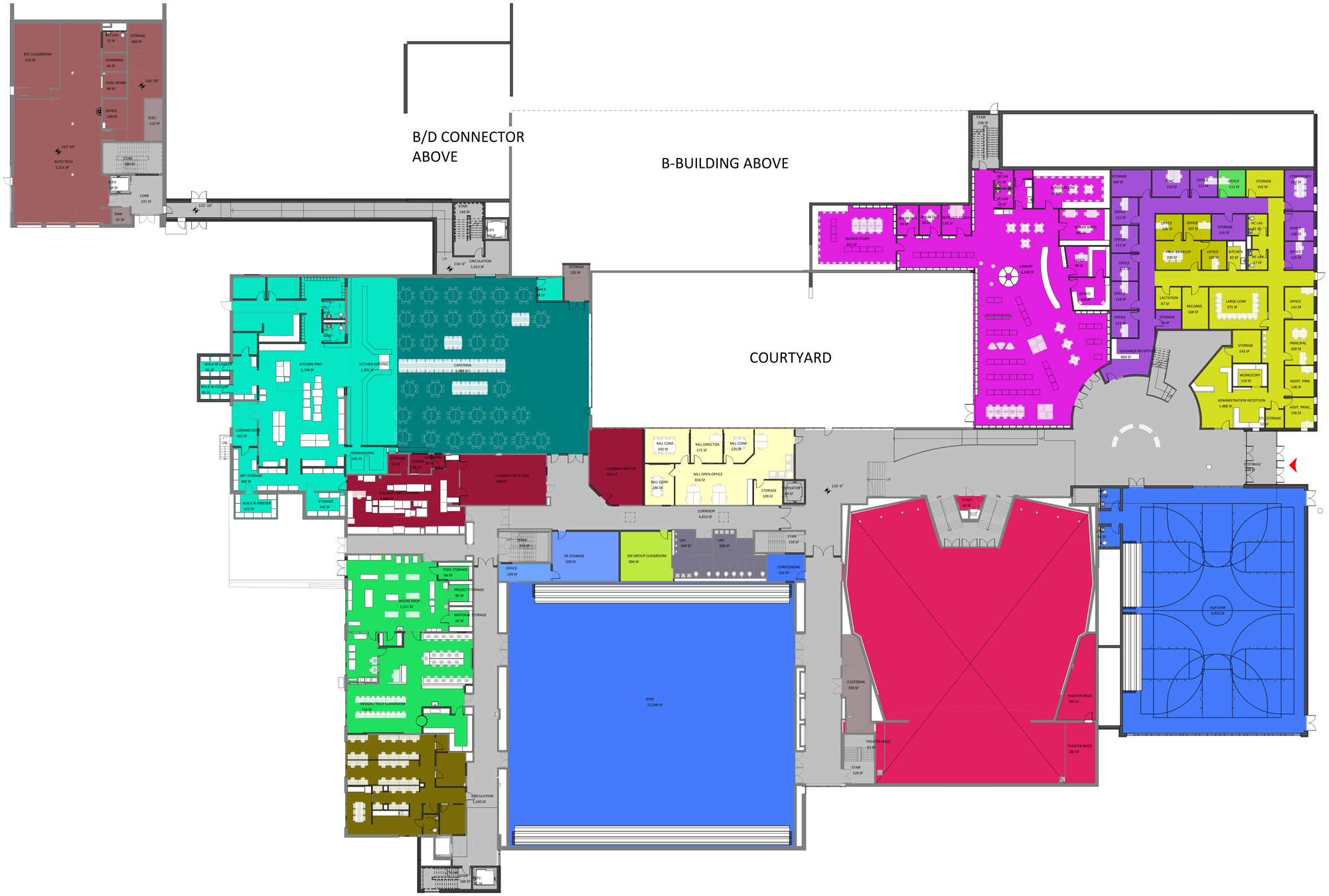
2020-06-29 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



PROPOSED BUILDING A/B LEVEL 3 PLAN

2020-06-29 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north

PROPOSED BUILDING A/B LEVEL 4 PLAN

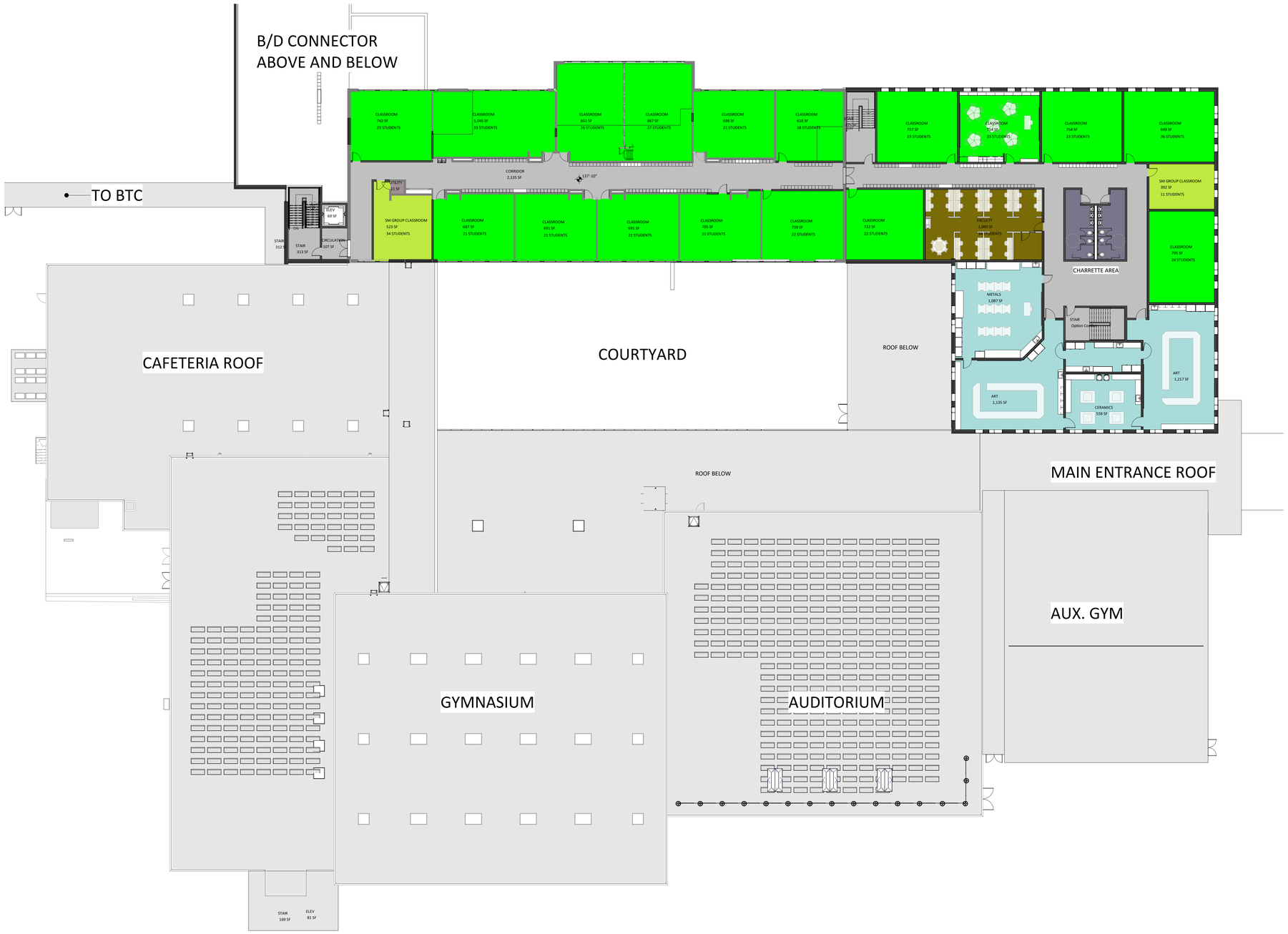
2020-06-29 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



PROPOSED BUILDING A/B LEVEL 5 PLAN

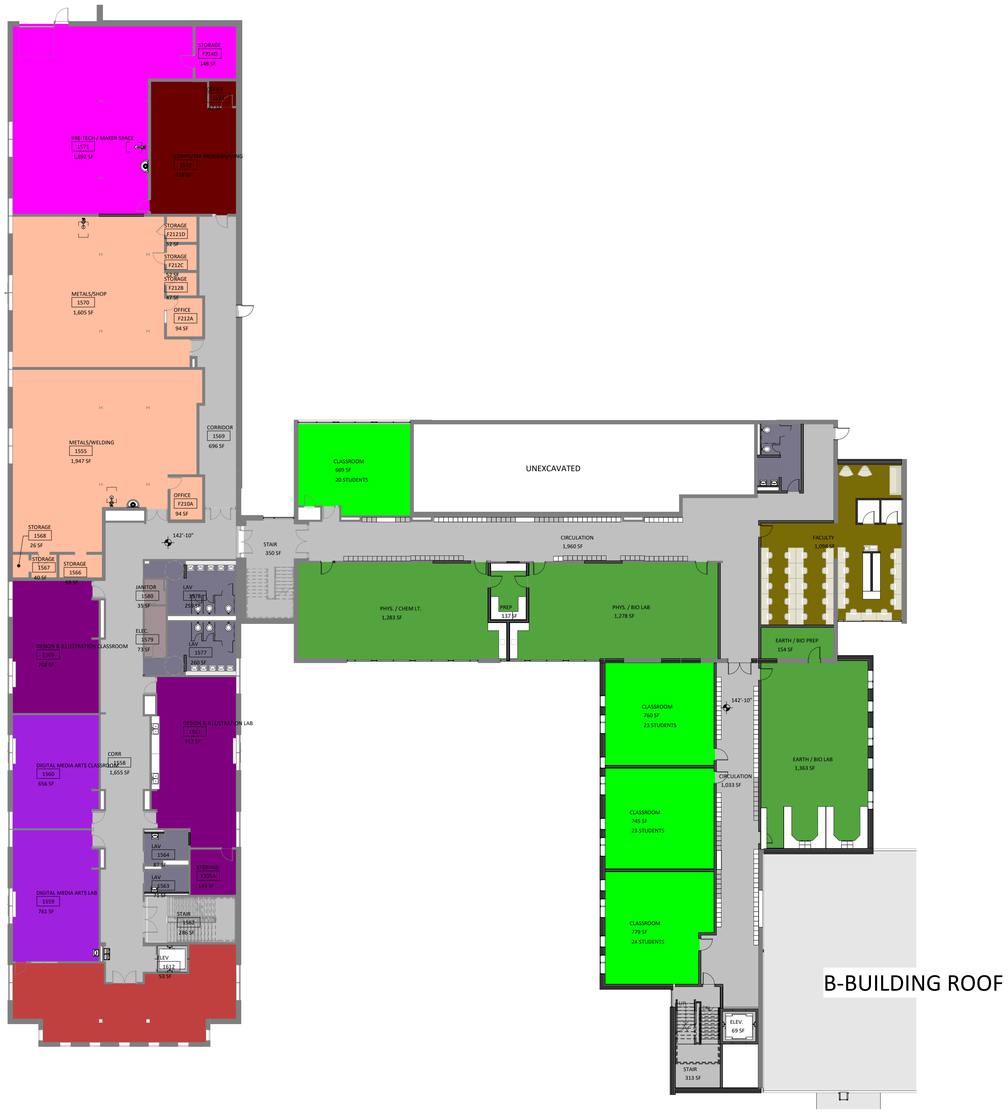
2020-06-29 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

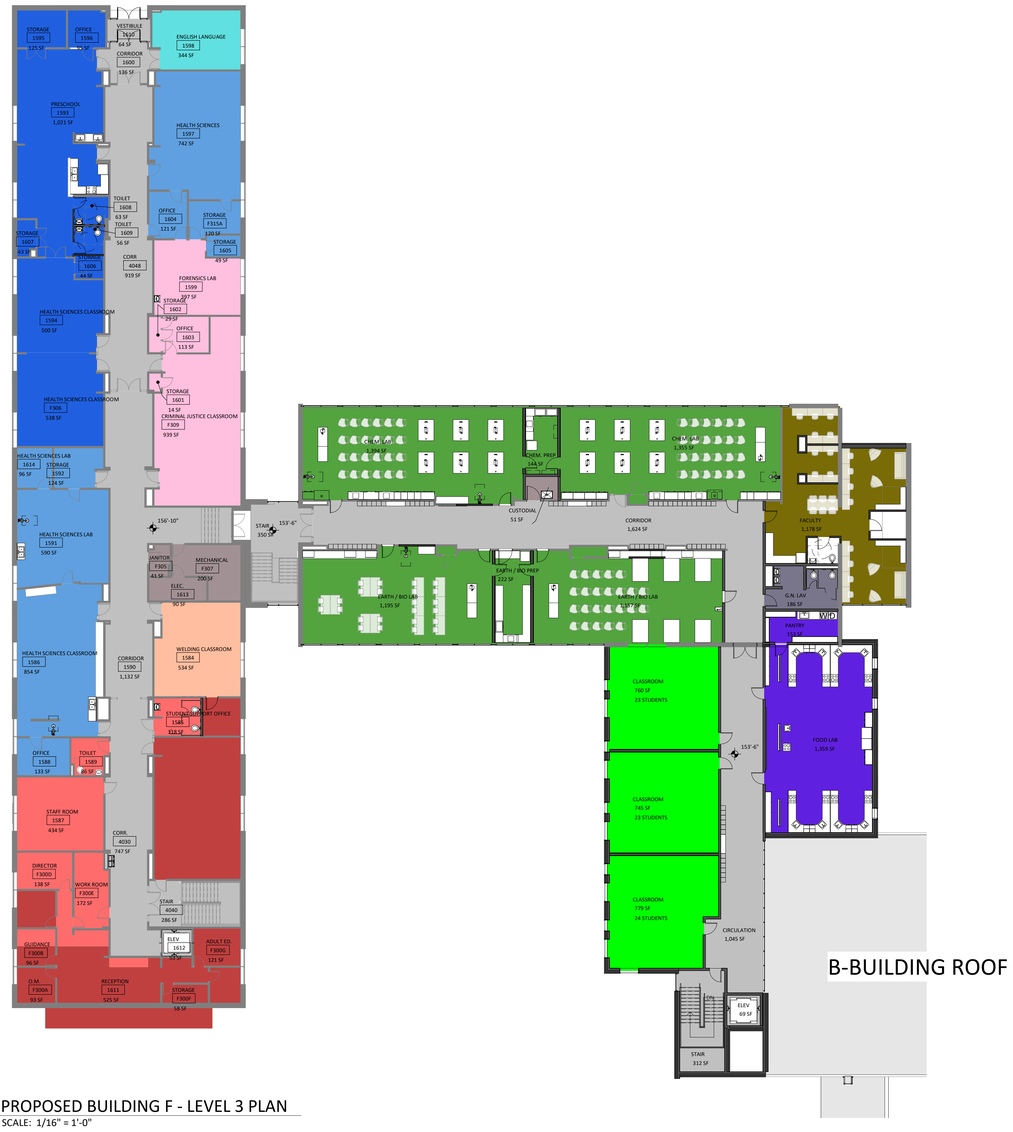
BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

north



2 PROPOSED BUILDING F - LEVEL 2 PLAN
SCALE: 1/16" = 1'-0"



3 PROPOSED BUILDING F - LEVEL 3 PLAN
SCALE: 1/16" = 1'-0"

PROPOSED - BUILDING F/D LEVEL 2 & 3 PLANS

2020-06-29 scale: 1/16" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

BLACK RIVER DESIGN ARCHITECTS

© 2020, Black River Design, Architects. All rights reserved.

AERIAL VIEW - NO GALLERIA NO GYM

AERIAL VIEW FROM SOUTH EAST

PROPOSED ENTRY VIEWS WITH/OUT AUXILIARY GYM

06/29/20 scale: 3" = 1'-0"

BURLINGTON HIGH SCHOOL RE-ENVISIONING

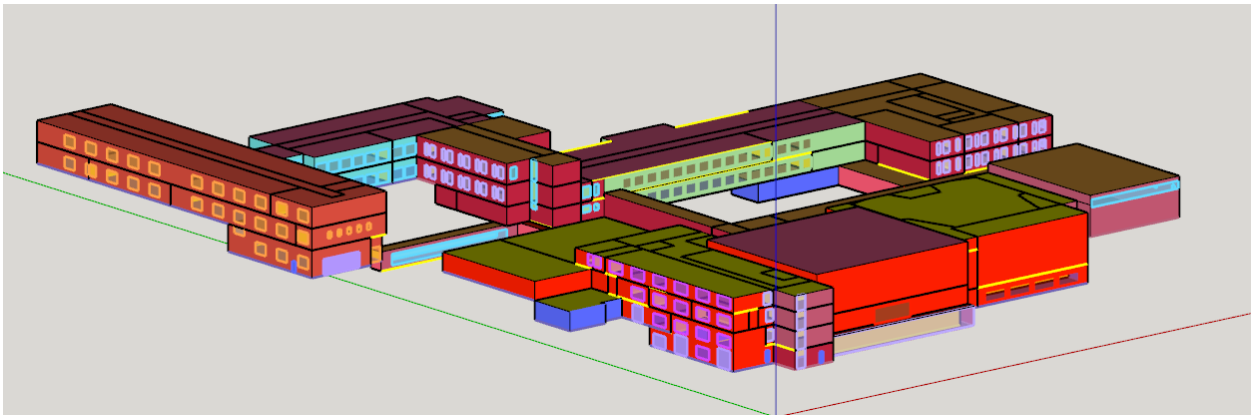
BLACK RIVER DESIGN ARCHITECTS

SECOND LAW
KAREN WALKERMAN
802-238-0980
karen@secondlaw.biz
energy modeling and consulting services

May 25, 2020
George Martin
LN Consulting

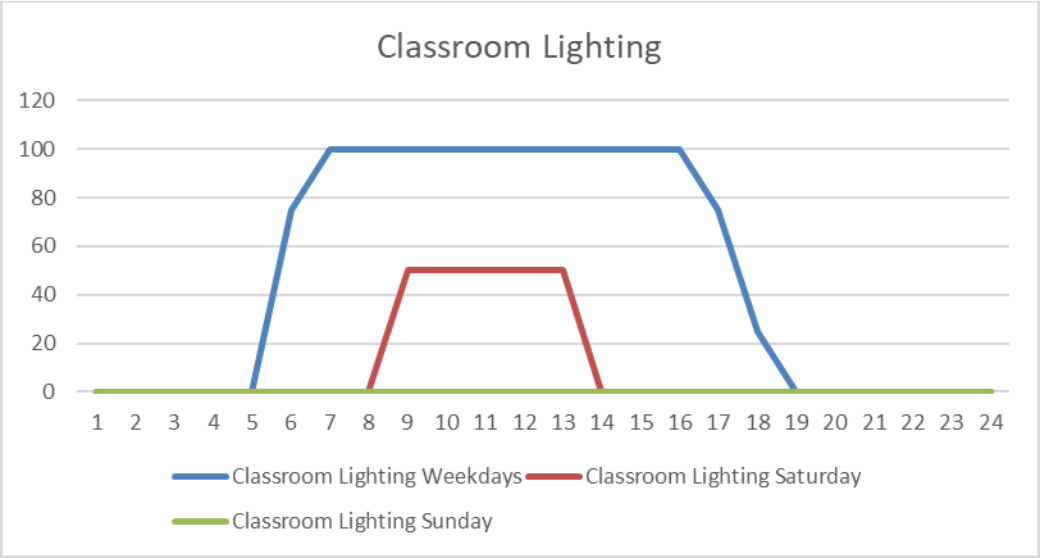
Burlington High School Energy Model Report

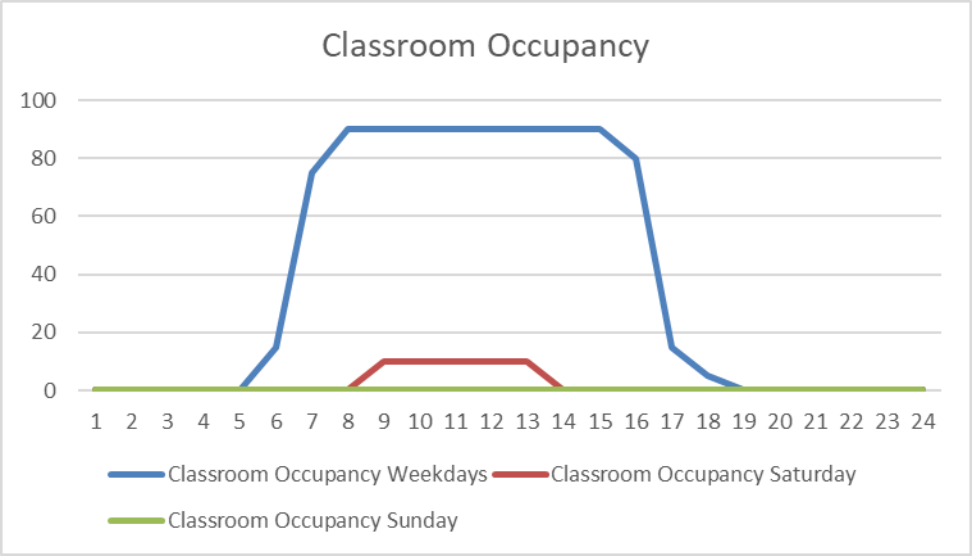
Second Law has completed an energy model of the Burlington High School proposed renovation and addition including updates to the building design. The building is about 280,000 square feet and includes classroom spaces, auditorium, gymnasium, library, kitchen, cafeteria and tech spaces. The energy model was created using EnergyPlus Version 9.1 software and is based on drawings and information provided to Second Law by Black River Design Architects and LN Consulting.

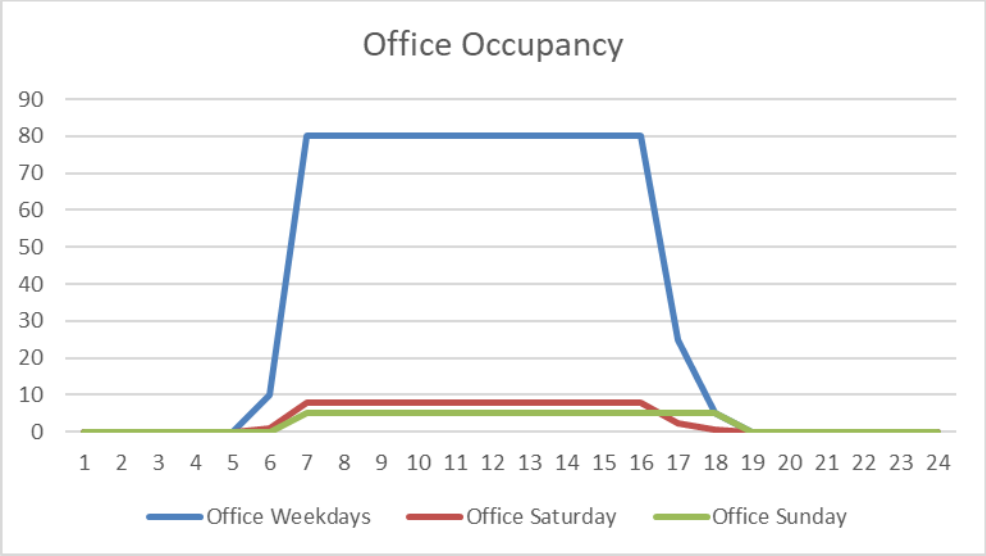


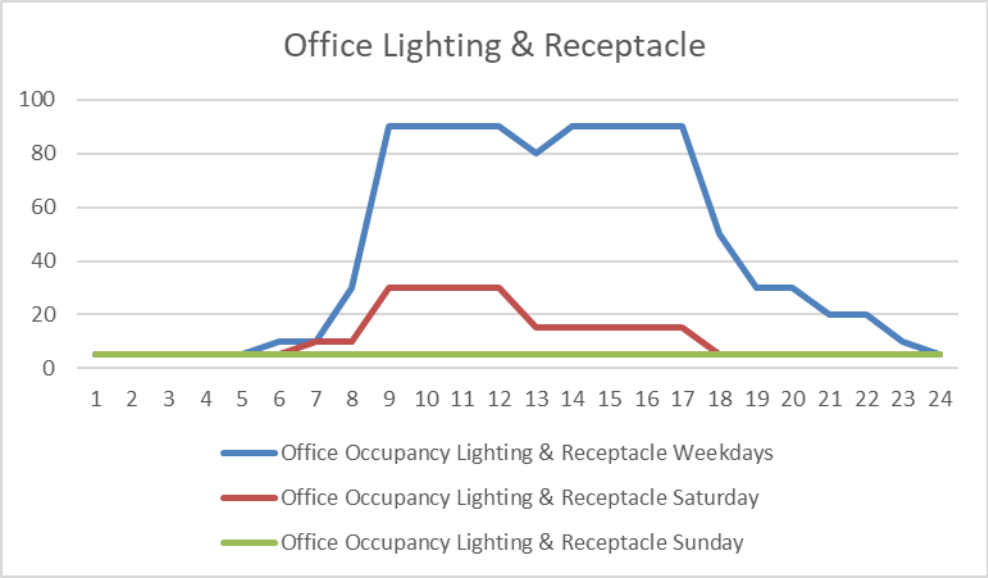
The following pages are a summary of inputs used in the creation of the energy model.

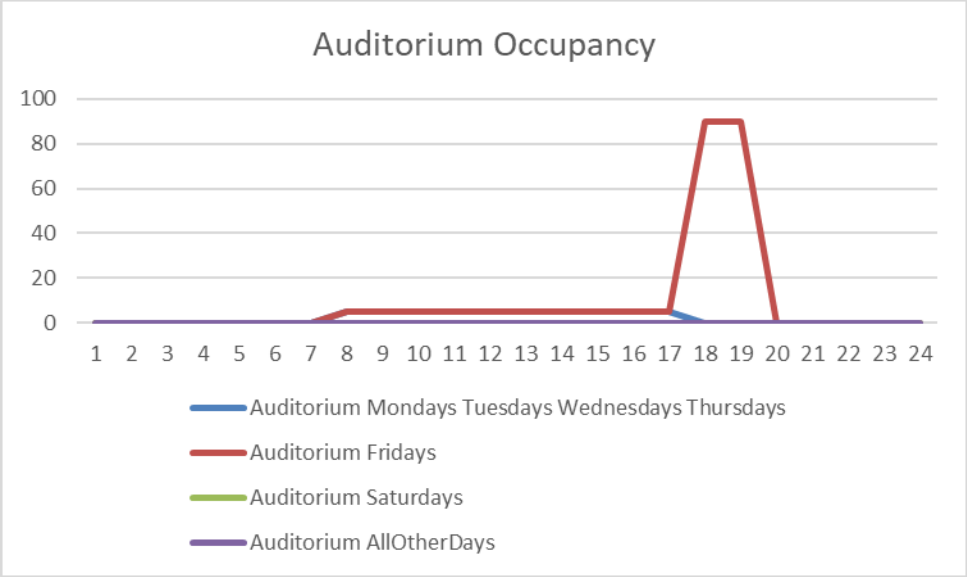
Schedules:

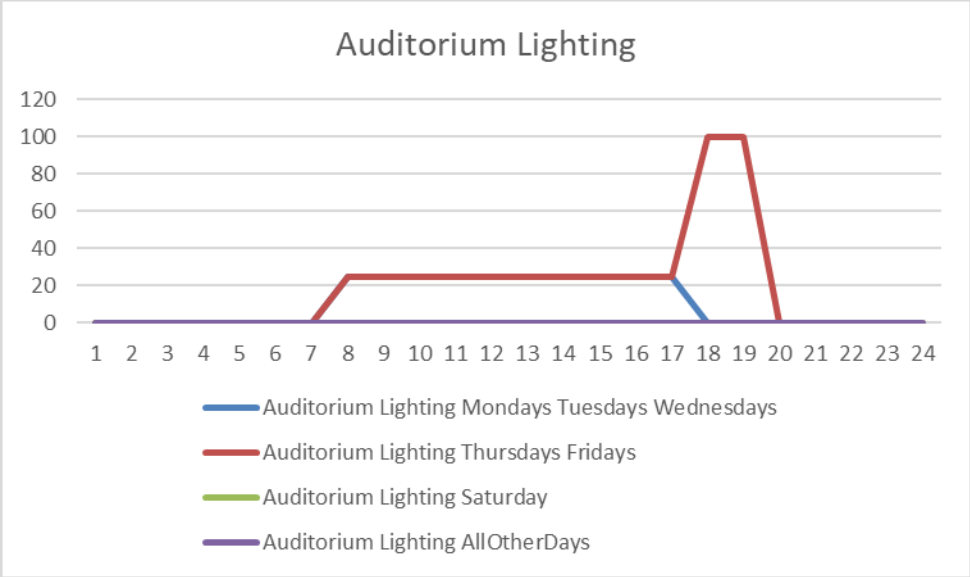

Classroom Lighting
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Classroom Lighting Weekdays
Classroom Lighting Saturday
Classroom Lighting Sunday

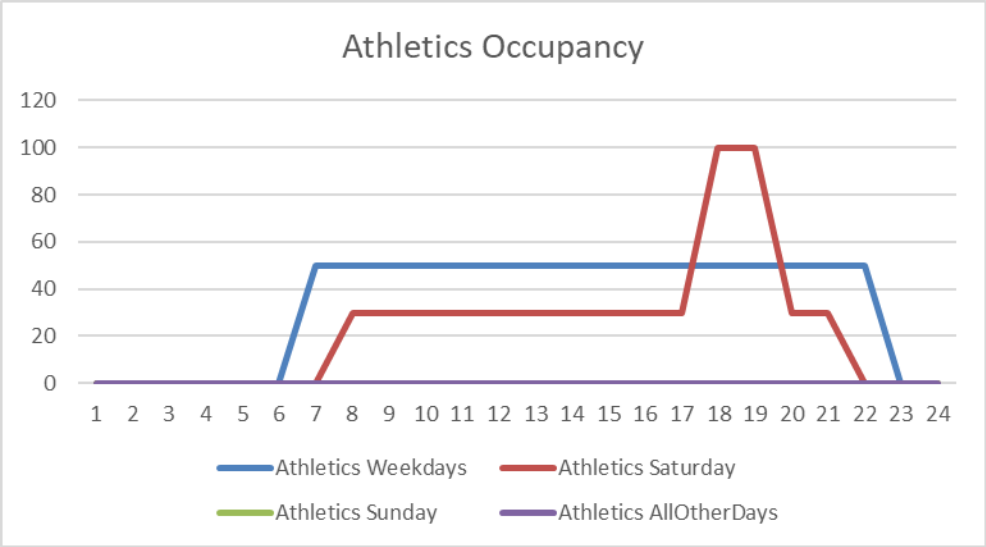

Classroom Occupancy
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Classroom Occupancy Weekdays
Classroom Occupancy Saturday
Classroom Occupancy Sunday

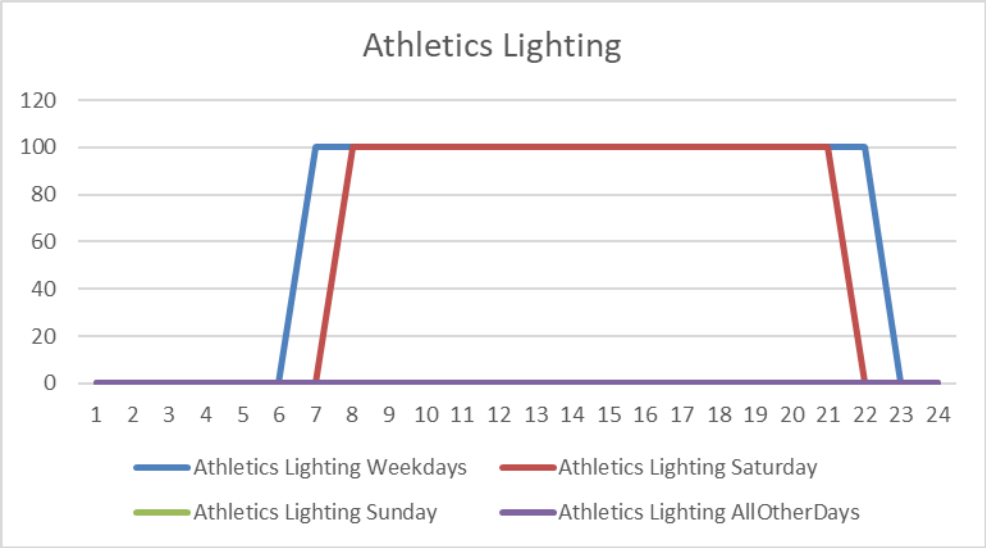

Office Occupancy
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Office Weekdays
Office Saturday
Office Sunday

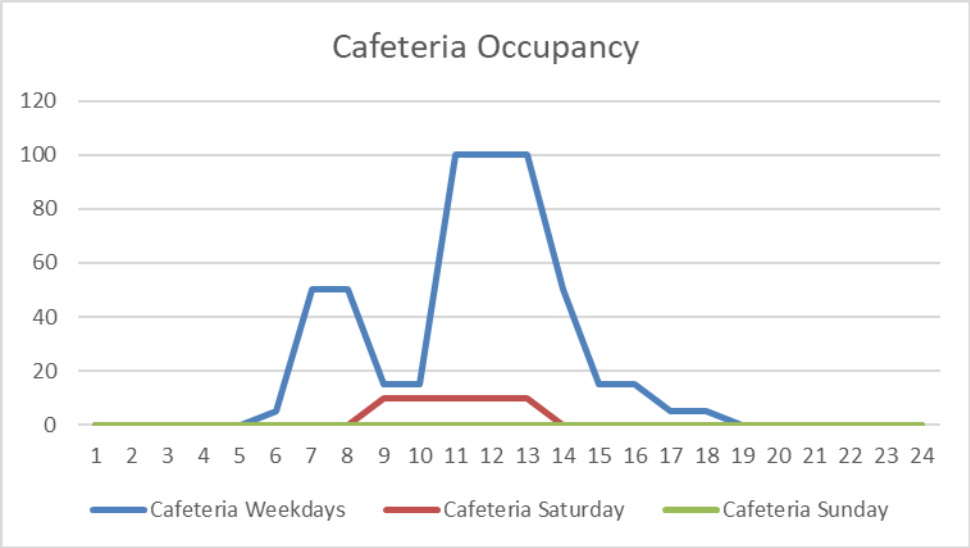

Office Lighting & Receptacle
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Office Occupancy Lighting & Receptacle Weekdays
Office Occupancy Lighting & Receptacle Saturday
Office Occupancy Lighting & Receptacle Sunday

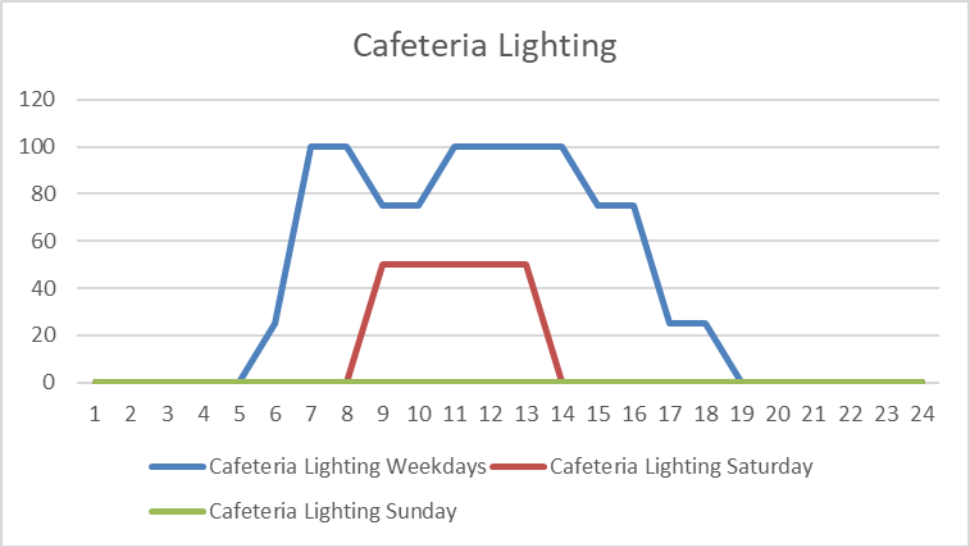

Auditorium Occupancy
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Auditorium Mondays Tuesdays Wednesdays Thursdays
Auditorium Fridays
Auditorium Saturdays
Auditorium AllOtherDays


Auditorium Lighting
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Auditorium Lighting Mondays Tuesdays Wednesdays
Auditorium Lighting Thursdays Fridays
Auditorium Lighting Saturday
Auditorium Lighting AllOtherDays


Athletics Occupancy
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Athletics Weekdays
Athletics Saturday
Athletics Sunday
Athletics AllOtherDays


Athletics Lighting
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Athletics Lighting Weekdays
Athletics Lighting Saturday
Athletics Lighting Sunday
Athletics Lighting AllOtherDays


Cafeteria Occupancy
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Cafeteria Weekdays
Cafeteria Saturday
Cafeteria Sunday


Cafeteria Lighting
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Cafeteria Lighting Weekdays
Cafeteria Lighting Saturday
Cafeteria Lighting Sunday

Envelope Components:

	existing construction	proposed upgrade	alternatives to model
A Building			
walls	masonry walls overall insulation value R-12.5	none	Review the existing exterior wall upgrades Option C and include as an alternate.
windows	Existing drawings show 1" insulated glass(double glazed) in a metal frame(not thermally broken)	Punched windows will be thermally broken aluminum , double glazed windows(glazing to match previously provided specifications)	
slab	shown uninsulated	none	
underground walls	3" rigid insul to 3' below grade	none	
B Building			
walls	masonry walls overall insulation value R-12.5	Scope currently includes NO improvements	Review the existing exterior wall upgrades Option C and include as an alternate.
windows	Existing drawings show 1" insulated glass(double glazed) in a metal frame(not thermally broken)	Punched windows will be thermally broken aluminum , double glazed windows(glazing to match previously provided specifications)	
slab	uninsulated	none	
underground walls	3" rigid insul to 3' below grade		
D Building			
walls	Existing drawings show 3" rigid insulation	Scope currently includes NO improvements	Review the existing exterior wall upgrades Option C and include as an alternate.
windows	Existing drawings show 1" insulated glass(double glazed) in a metal frame(not thermally broken)	Punched windows will be thermally broken aluminum , double glazed windows(glazing to match previously provided specifications)	
slab	shown uninsulated		
underground walls	3" rigid insul to 3' below grade		
F Building			
wall A & B	masonry walls overall insulation value R-12.5	F-Bldg improvements are not included in the project scope	
windows	Existing drawings show 1" insulated glass(double glazed) in a metal frame(not thermally broken)	F-Bldg improvements are not included in the project scope	
slab	shown uninsulated	F-Bldg improvements are not included in the project scope	
underground walls	3" rigid insul to 3' below grade	F-Bldg improvements are not included in the project scope	
Roofs			
R-1(A-bldg)	6" foam board (R-30)	R-40	
R-2(A-bldg)	4" styrofoam (R-15)	R-40	
R-3(A-bldg)	4" styrofoam (R-15)	R-40	
R-4(A-bldg)	4" styrofoam (R-15)	R-40	
R-5(A-bldg)	4" styrofoam (R-15)	R-40	
R-7(B-bldg)	6" foam board (R-30)	R-40	
R-10(D-bldg)	6" foam board (R-30)	R-40	

Infiltration – 0.04166999992755 cfm/ ft2 exterior area

Proposed Constructions:

Exterior Walls:

R-25

Roofs:

R-40

Fixed Glazing:

U – 0.29

SHGC – 0.4

Operable Glazing:

U – 0.37

SHGC – 0.4

Infiltration – 0.019685 cfm/ ft2 exterior area

Internal Loads:

People:

	Area / Person
Athletics People	103.5
Auditorium People	21.96
Auto & Aviation People	89.04
Cafeteria People	9.98
Classroom1 People	89.34
Classroom2 People	89.34
Conference People	49.91
Corridor People	998.24
Culinary People	111.3
District On Top People	156.72
Kitchen People	49.91
Library People	156.72
Office People	179.68

Lighting:

	Proposed W/sf	Baseline w/sf
Auditorium_LPD	0.5	0.63
Classroom_LPD	0.8	1.24
Corridor_LPD	0.53	0.66
GYM_LPD	0.65	1.11
Office_LPD	0.5	0.81

Electric Equipment:

	W/sf
Athletic Equip	0.25
Auditorium Equip	0.1
Auto & Aviation Equip	1
Cafeteria Equip	0.25
Classroom Equip	0.5
Classroom2 Equip	0.5
Conference Equip	0.75
Culinary Equip	2
District on Top Equip	0.5
Kitchen Equip	3.01
Library Equip	0.5
Mech Equip	1
Office Equip	0.75

HVAC Alternatives:

1. Fossil Fuel Baseline – this model includes the baseline system as specified by ASHRAE 90.1. It includes a central air handling unit for each floor with cooling provided by central chilled water coils and heating provided by hot water coils located in the air handling unit and reheat coils in each zone. The system includes energy recovery ventilation, demand control ventilation and economizers where required by code. The heating plant is supported by a fossil fuel boiler.

2. Rooftop Unit BED Baseline – this system is the baseline required for BED incentives if the AHU system is chosen for design. It includes air handlers as in #4, but with minimal efficiencies and operation.

3. WSHP BED Baseline – this system is the baseline required by BED for electrical incentives if a WSHP system is chosen for the design. It includes a water source heat pump system as in #5, but with minimal efficiencies and operation.

4. Rooftop Unit Proposed – this system consists of a rooftop units equipped with DX cooling coils and hot water heating coils. Supply air is varied between 55 and 60F to meet the cooling setpoint of the warmest zone. Air handlers have economizer capabilities, demand control ventilation and energy recovery.

5. Water Source Heat Pump System Proposed– this system models a central ventilation unit for each floor. The ventilation units include energy recovery ventilators. Ventilation uses CO2 sensors located in each space to vary the amount of ventilation air based on occupant density. Space heating and cooling is provided by water source heat pumps.

   The water source heat pump loop is maintained between 70 and 90F by a cooling tower and hot water is provided by the central heating plant.

   The central plant includes a natural gas boiler which operates from May 15 through October 10 and a wood chip boiler which operates from October 10 – May 15.

6. Two speed water source heat pump system – The model is similar to #5 but with the higher efficiency two speed/modulating heat pumps and higher efficiency Energy Recovery Units.

HVAC Alternatives Results:

Electricity: $0.14/kWh
Natural Gas: $0.95/ccf
Wood Chips: $60.00/Ton

1. Fossil Fuel Baseline –
   Electrical: 1,105,877 kWh - $154,822.78
   Natural Gas (Heating): 186,429 CCF - $177,278.73
   Wood Chips (Heating): N/A
   Total Utility Cost per year: **$332,101.51**
   Carbon Emissions (Metric Tons per year): 952*

2. Rooftop Unit BED Baseline –
   Electrical: 661,259 kWh - $136,336.76
   Natural Gas (Heating): 134,181 CCF - $127,594.66
   Wood Chips (Heating): N/A
   Total Utility Cost per year: **$220,170.92**
   Carbon Emissions (Metric Tons per year): 685*

3. WSHP BED Baseline –
   Electrical: 741,842 kWh - $103,857.88
   Natural Gas (Heating): 67,568.96 CCF - $64,252.47
   Wood Chips (Heating): N/A
   Total Utility Cost per year: **$168,110.35**
   Carbon Emissions (Metric Tons per year): 345*

4. Rooftop Unit Proposed –
   Electrical: 254,412 kWh - $35,617.68
   Natural Gas (Heating): 3,322 CCF - $3,046.65
   Wood Chips (Heating): 48,964 Tons - $34,562.82
   Total Utility Cost per year: **$73,227.15**
   Carbon Emissions (Metric Tons per year): 17 *

5. WSHP Proposed –
   Electrical: 374,199 kWh - $52,387.86
   Natural Gas (Heating): 171 CCF - $156.75
   Wood Chips (Heating): 31,835 Tons - $22,471.76
   Total Utility Cost per year: **$75,016.37**
   Carbon Emissions (Metric Tons per year): 0.87*

6. Two Speed WSHP Proposed
   Electrical: 225,442 kWh - $31,561.88
   Natural Gas (Heating): 212 CCF - $194.75
   Wood Chips (Heating): 34,791 Tons - $24,558.35
   Total Utility Cost per year: **$56,314.98**
   Carbon Emissions (Metric Tons per year): 1.1*

*Carbon emissions assume all wood chips are sustainably sourced to allow for net carbon neutral operation

BHS Energy Model Results

Electricity	0.14	kwh	
Natural Gas	0.95	ccf	
Wood Chips	$60	ton	85 Therm/Ton

	Fossil Fuel Baseline			**Rooftop Unit BED Baseline**			**WSHP BED Baseline**			**Rooftop Unit Proposed**			**WSHP Proposed**			**WSHP (High Efficiency)**		
	Eletricity (kwh)	Natural Gas	Wood Chips	Eletricity (kwh)	Natural Gas	Wood Chips	Eletricity (kwh)	Natural Gas	Wood Chips	Eletricity (kwh)	Natural Gas	Wood Chips	Eletricity (kwh)	Natural Gas	Wood Chips	Eletricity (kwh)	Natural Gas	Wood Chips
Heating		179,951		0	129,518	0	331,792	65,221	0	0	3,207	48,964	169,148	165	31,835	98,737	205	34,791
Cooling	331,445			411,759			140,120			125,054			90,709			72,292		
Interior Lighting	722,120			722,120			722,120			472,347			472,347			472,347		
Interior Equipment	312,575	208		312,575	208		312,575	208		312,575	208		312,575	208		312,575	208	
Fans	535,831			240,560			233,978			124,682			94,019			50,326		
Pumps	236,391			8,940			35,626			4,676			19,925			3,686		
Heat Rejection	2,210						326						398			401		
Water Systems		7,033			7,033			7,033			5,923			5,923			5,923	
TOTAL	2,140,572	187,192	0	1,695,954	136,759	0	1,776,537	72,462	0	1,039,334	9,338	48,964	1,159,121	6,296	31,835	1,010,364	6,336	34,791
	$299,680.08	$184,412.20	$0.00	$237,433.56	$134,728.13	$0.00	$248,715.18	$71,385.94	$0.00	$145,506.76	$8,871.10	$34,562.82	$162,276.94	$5,981.20	$22,471.76	$141,450.96	$6,019.20	$24,558.35
Total	**$484,092.28**			**$372,161.69**			**$320,101.12**			**$188,940.68**			**$190,729.90**			**$172,028.51**		
Total HVAC System Cost Estimate										**$12,871,591.00**			**$13,371,591.00**			**$14,471,591.00**		

Note the RTU option may requior additional roof structual improvements that have yet to be identified.

Rooftop Unit System Total	$188,940.68
WSHP Total	$190,729.90
Difference	-$1,789.22

208 Flynn Avenue #2J, Burlington, VT 05401 ■ (802) 655-1753 ■ Fax (802) 655-7628 ■ lnconsulting.com

February 05, 2020

Mark Montminy
Black River Design Architects
73 Main Street, Room 9
Montpelier, VT 05602

Burlington High School Renovation/Addition Project–Mechanical, Plumbing, Electrical & Fire Protection February 2020 SD Cost Estimate Heating Only Cost Reduction

L.N. Consulting, Inc. has been retained to provide a Schematic Design narrative for the proposed renovations to the Burlington High School. The existing campus consists of (6) buildings; A-building, B-building, C-building, D-building, E-building and the F-building which is the Burlington Technical Center (BTC). The C building will be demolished as part of the current design plan. The proposed project consists of a complete renovation of the existing D-building; a renovation and addition to the main A-building and the existing B-building; and a partial renovation of the BTC F-building. The A-building is (4) levels; the lower (2) levels of the building are partial floors. The B-building is currently (2) levels and will have a lower level added as part of the project. The lower level of the B-building will be at the same level as Level 3 of the A-building. The BTC F-building is (3) levels; the lowest level is a partial floor which is at the same level as the lower level of the B-building and Level 3 of the A-building. A new connector will be installed between the B-building and D-building connecting the lower level of D-building with the upper level of B-building. The current architectural drawings indicate the proposed program will include the following:

A-Building:

Level 1:	Spray Booth, Auto Body Shop, Mixing Rooms, Auto Locker & Changing Rooms, Tool Cribs, Band Room, Chorus Room, Ensemble Room, Practice Rooms
Level 2:	Property Services offices/breakroom and storage areas, Aviation Room and Welding and Tool Room, Electrical Service Entrance, Aviation Body, multiple Team Rooms, Men's & Women's Locker Rooms, Team Locker Rooms, Training Room, Fitness Room, Athletic Offices, Auditorium Stage (and lower level of Auditorium)
Level 3:	Main building entrance with Atrium and lobby area, entrance to the Auditorium, main kitchen and auxiliary offices/storage, Cafeteria and supporting spaces, loading dock, Culinary Arts spaces, Culinary Arts Classroom, Culinary Arts Café, Main/Large Gymnasium, PE Storage, Guidance offices, Health offices, Wood Shop and supporting spaces, Design/Tech and supporting spaces, BTC Faculty rooms, Multi-Lavatory Spaces, New Auxiliary Gymnasium with (2) supporting Lavatories

Level 4:	Art Rooms, ISN Program space, Main IT Offices and IT Servers, Upper level atrium space (walkway to Level 1 of B-building), MLL Offices, Existing Mechanical Room

B-building:

Level 0:	Library, Maker Space, Screen Room, Library Offices, Guided Study, Administration Offices
Level 1:	Professional Development Offices, Classrooms, ISS Offices, SLP Offices and Sped Testing rooms
Level 2:	Classrooms, Faculty Lounge, DOT Classrooms, DOT Reception, DOT Kitchen
L2 Connector to D:	Classrooms, Corridor/Ramp
L3 Connector to D:	Classrooms, Corridor/Ramp

D-building:

Level 1:	(3) Science Classrooms, (2) Science Prep rooms
Level 2:	(4) Science Classrooms, (2) Science Prep rooms, Food Lab

F-Building (Tech Center):

Level 1:	BTC Classroom, Auto Tech, Auto Tech supporting storage spaces, Toilet/Shower area
Level 2:	Sound/Recording, Audio Rooms, Digital Media Classrooms, Design and ILL Lab, Metals/Welding and support spaces, Metals/Shop and support spaces, Maker Space and support space, Welding Classroom
Level 3:	Health Sciences Offices, BTC Staff Room, BTC Conference Room, Health Sciences Classrooms, Computer Lab, Work Based Learning Lab, BTC Classrooms, Forensics Lab, English Language Classrooms, Preschool space

1. Outdoor Design Conditions

Elevation	200	ft.
Winter		
Dry bulb	-11	F

Summer		
Dry bulb	84	F
Wet bulb	69	F
Relative Humidity	47	RH
Dew Point	62	F
Moisture	82	grains/lbs.

2. Indoor Conditions

Thermostat/Sensor set points. Space humidity levels will be continuously monitored via thermostats and sensors located throughout the facility. During the cooling season, the humidity levels will be controlled by the ventilation units which will be sequenced to sub-cool and then reheat (via modulating hot gas reheat) the air to reduce the space humidity levels. Additional moisture will also be removed from each space via the air-source heat pumps where those systems are located (see Space Conditioning section below). The space humidity levels will be monitored, but not controlled during heating mode.

General Classroom/Office Space Temperature/RH Control Schedules

	Winter Occupied	Winter Unoccupied	Summer Occupied	Summer Unoccupied
Temperature	72 F	66 F	75 F	82 F
RH %	Uncontrolled	Uncontrolled	<50%	<50%

General Shop Space Temperature/RH Control Schedules

	Winter Occupied	Winter Unoccupied	Summer Occupied	Summer Unoccupied
Temperature	70 F	60 F	75 F	84 F
RH %	Uncontrolled	Uncontrolled	<50%	<50%

General Back of House Spaces Temperature/RH Control Schedules

	Winter Occupied	Winter Unoccupied	Summer Occupied	Summer Unoccupied
Temperature	70 F	60 F	76 F	84 F
RH %	Uncontrolled	Uncontrolled	<50%	<50%

3. Ventilation Design – The ventilation rates supplied to each space within the renovated building will be calculated based on the procedures outlined in ASHRAE 62.1-2016. Ventilation air will generally be provided by dedicated rooftop heat recovery and energy recovery ventilators for all spaces except for the Science Labs (D-building), Gymnasium and Auditorium spaces

(these spaces will have integral energy and heat recovery sections). The kitchen make-up air will be mostly supplied by rooftop Make-up Air Units (MAUs) and supplemented by the Cafeteria ERV.

Existing

4. Mechanical-Building Conditioning

Currently the Burlington High School campus including the Burlington Tech Center (BTC) F-building are condition by a hot water hydronic system that supplies hot water to terminal units throughout the campus. The water is heated either by the main biomass boiler plant during the winter, or by the gas fired backup boiler(s) during the shoulder seasons. Water is distributed to heat exchangers located in each building via rooftop mounted hot water piping. This piping is insulated and jacketed, but we understand that there are numerous locations where the insulation is in poor condition or missing. We also understand that the piping has routinely leaked and has required regular repairs.

Each building has dedicated heating hot water circulators that distribute the water to the terminal heating units. The majority of the buildings are conditioned by exterior wall mounted unit ventilators. The unit ventilators provide ventilation air to the space by pulling in outdoor air through an exterior louver. Air is relieved through the roof from gravity relief hoods or exhausted through the roof by exhaust fans. Heating for the unit ventilators is provided by the central heating hot water system.

The gymnasium is conditioned by (4) large air handling units installed in the vertical located high up on the walls of the gym. The air handling units bring in outdoor air through intake hoods located on the roof. We understand that the gravity reliefs have been plugged and are no longer functional. This causes the air handling units to pressurize the space which is evidenced by noticeably strong air movement at the entrance doors into the gymnasium. The lack of relief for the space is likely limiting the amount of ventilation air being brought into the gymnasium. The gymnasium air handling units are also original to the building and have reached the end of their useful service life.

The shop spaces in the A-building were conditioned by direct gas-fired make-up air units. Direct combustion air handling units discharge the products of combustion into the space. This is not recommended for environmental air quality reasons.

The kitchen exhaust fan is a down blast type unit which discharges the kitchen exhaust down towards the roof. The existing make-up air unit is currently located too closed to this exhaust fan and the kitchen exhaust is often recirculated back into the cafeteria/kitchen. This condition needs to be rectified. We recommend replacement of both units as part of this project. See recommendation in the proposed section below.

The Auditorium has a relatively new air handling unit which is located in the Level 4 mechanical room adjacent to the Auditorium. This unit provides cooling for the Auditorium by utilizing a remote Direct Expansion (DX) compressor/condensing unit located on the roof with refrigerant lines piped to the cooling coil in the unit. A hot gas reheat coil in the unit enables the unit to dehumidify the discharge air to allow the unit to reduce the humidity in the space without overcooling the space. A hot water heating coil in the unit provides the necessary heating capabilities for the space. The unit has an energy recovery wheel to pre-condition the incoming

outdoor ventilation air to save energy. This unit is controlled by the building Direct Digital Controls (DDC) system.

A new energy recovery unit with an energy recovery wheel is located in the Level 4 mechanical room adjacent to the Auditorium. The unit provides ventilation air to the locker rooms on the lower level along with some surrounding spaces. The unit has heating and cooling capabilities to post condition the ventilation air (after the air is pre-conditioned by the energy recovery wheel) to a neutral air temperature for distribution to the spaces. The cooling for this unit is provided by a remote Direct Expansion (DX) compressor/condensing unit located on the roof with refrigerant lines piped to the cooling coil in the unit. A hot gas reheat coil in the unit enables the unit to dehumidify the discharge air to allow the unit to reduce the humidity in the space without the need to overcool the air. A hot water heating coil in the unit provides the necessary heating capabilities for the ventilation air. This unit is controlled by the building Direct Digital Controls (DDC) system.

The BTC F-building shops are conditioned similar to the shops in the A-building. They have space mounted gas fired make-up air units with exhaust fans located in a small mechanical room located on the upper level of the building. It is our understanding that the positively pressurized exhaust ductwork downstream of the exhaust fans is not well sealed. This causes dust, dirt, and odors from the welding and auto shops to leak into the room. We do not recommend having pressurized ductwork (ductwork downstream of the fan) inside the building for exhaust systems that handle noxious air.

The classrooms in the BTC F-building are generally conditioned by hot water unit ventilators. However, some of the unit ventilators in the F-building have cooling capabilities. A refrigerant cooling coil is installed in the unit ventilators with cooling capabilities. The refrigerant piping is connected to a compressor/condensing unit located on the roof. Many of the unit ventilators are not equipped with cooling and some of those spaces have had large window mounted air conditioners installed for cooling. A few locations, including the Criminal Justice classroom were observed to have window air conditioners cut into the glass windows to provide cooling for the spaces. These units are left in place year round which causes an increase in infiltration of unconditioned outdoor air.

Proposed

5. Mechanical-Building Conditioning

General

The existing HVAC infrastructure for the facility is old and is not configured for the proposed facility expansion, nor is it configured to provide cooling to the entire facility. Because of the age of the facility and the extensive renovations planned, we recommend removing the existing HVAC system, with the exception of the newer A-building Auditorium AHU and the newer ERV unit currently serving the locker rooms in the A-building.

The existing Biomass heating plant will remain to serve as the primary heating source during the winter. The existing natural gas fired heating plant building which currently serves as a shoulder season heating source and backup heating source will be reused. The existing equipment (including pumps, boilers, expansion tanks, piping etc.) will be demolished and all new pumps, boilers specialties etc. will be installed within the gas fired heating plant building. The existing

pump(s) for the central plant will be replaced and the existing piping will be reconfigured as necessary to accommodate the new primary-secondary pumping system outlined below along with the heat-add loops for the natural gas fired boilers and the biomass heating plant in their respective buildings. For phasing, the existing natural gas-fired backup boilers will be utilized to heat the E-building which we understand will be utilized as swing space during construction. This equipment will be demolished with the E-building at a future date To Be Determined by Burlington School District.

Space Conditioning

The primary means of building conditioning shall be via a hydronic hot water system. Generally, heating shall be provided by hydronic fintube radiation and/or hot air using hydronic unit heaters, hot water fan coil units, or duct mounted reheat coils.

Typical Classroom

The individual classroom spaces and non-administrative office spaces will be conditioned by fintube. Preliminary equipment selection is for the fintube to be equivalent to Runtal R2F-4 which will be installed along the exterior envelope walls in each space. Each typical classroom or office (non-administrative space) will be a dedicated heating zone with the heating controlled by a modulating 2-way control valve that modulates to maintain space temperature.

Typical Shops

Shop spaces will be conditioned by hydronic unit heaters equivalent to Modine HC's. The shop unit heaters will be sized for 50 Btu/hr./sq.ft. and will be oversized approximately 30% above nominal ratings to account for the derating factor of the lower water temperatures. Each shop will have dedicated temperature control.

Typical Science Classroom

The D-building science classrooms will be conditioned using a rooftop air handling unit (with heat recovery) and a Variable Air Volume (VAV) system with modulating duct mounted reheat coils. See AHU-1D in the Air Handling unit section below.

Typical Office/Administrative Area and Meeting Space

Offices and administrative areas will be conditioned by an Air-to-Air heat pump Variable Refrigerant Flow (VRF) system using ducted fan coil units with backup heating hot water duct mounted reheat coils. A modulating 2-way valve (controlled by the DDC system) shall control the water through the reheat coils to maintain space temperature when the outdoor air temperature is below set point. The VRF systems will be equivalent to Daikin VRV IV Heat Recovery that is to be capable of simultaneous heating and cooling capabilities and operation down to -13°F. The indoor ducted fan coil units (located above the ceiling) will be equivalent to Daikin FXSQxxTAVJU. The VRF system is to have full BACnet integration for set point control, fan speed control, and unit monitoring from the building BMS. Each heating/cooling zone is to contain a local space mounted temperature sensor to control unit operation. See below for preliminary VRF systems and sizing:

- A-Building:
  - System #1 to be an 18-ton VRF Located on the Roof: Serving Fitness Room 4105, Faculty 1141 and 1142
  - System #2 to be a 6-ton VRF Located on the Roof: Serving Facilities Suite 2027, 2028, 2029, 2030, Kitchen Staff Offices.

- System #3 to be a 16-ton VRF Located on the Roof: Serving I.T. Suite, I.S.N. Suite, Small Group CR 4049, Health Suite, BTC Offices, Culinary Arts Café, Culinary Arts Classroom 1316
- System #4 to be 3-ton Cooling only VRF equivalent to Daikin FTXS36LVJU/RKS36LVJU for the I.T. Server Room. The outdoor unit is to be located within the Level 4 Mechanical Room.

- B-Building:
  - System #1 to be a 16-ton VRF Located on the Roof: Serving Faculty 1091, Eastern Lower Level Administrative Office Suite
  - System #2 to be a 14-ton VRF Located on the Roof: Offices 1324-1326, Conference 1327, SLP & SPED Rooms 1172, 1336, 1337, 1150, Lower Level Library and Western Administrative Office Suite
  - System #3 to be a 6-ton VRF Located on the Roof: ISS Office Suite, Professional Development Office Suite
- F-Building:
  - System #1 to be a 6-ton VRF Located on the Roof: Health Sciences and BTC Staff, Design/ILL Lab, Computer Lab F343, F344, F345
  - System #2 to be a 6-ton VRF Located on the Roof: Serving Preschool Suite

Typical Gymnasium
Gymnasiums shall be conditioned and ventilated by roof mounted Air Handling Units (AHU's) with an integral ERV section and economizer cooling capabilities. See specific unit sizing information in the AHU section below.

Auditorium
The Auditorium unit shall remain as currently operating with a remote condensing unit and heating hot water coil for space conditioning.

Cafeteria
The Cafeteria shall be conditioned by a rooftop fully recirculating AHU (see additional information below) with 100% economizer capabilities.

Paint Spray Booth
The paint Spray Booth located on the lower level of the A-building will be heated by a natural gas fired unit heater equivalent to the Sterling Nexus condensing style unit heater rated for 50,000 Btu/hr.

Rooftop Air Handling Units

The rooftop units will be installed on 18" insulated roof curbs. The air handling units will be utilized for the (2) gymnasiums and the cafeteria. These units will be equivalent to Aaon RN series with integral air-source heat pump to provide both cooling and heating. The gymnasium units will be provided with an integral Semco energy recovery wheel; the cafeteria unit will be fully recirculating with 100% economizer capability. The gymnasium energy recovery units will have will total energy recovery wheels which have the ability to transmit both sensible and latent (moisture) energy between the incoming outdoor ventilation air and the outgoing exhaust air. This significantly reduces the energy necessary to condition the ventilation air. The air handling

units shall utilize an air-source heat pump to condition the supply air distributed to the space. A hot water heating coil with modulating 2-way valve and balance valve will be installed for backup heating capabilities. The units will have fully ducted supply and return systems. In the gymnasiums, a return fan (equivalent to Greenheck QEID) is to be located high in the space (suspended from the structure with vibration isolators) ducted to the return connection to the unit. The air should be returned through an expanded metal opening on the top of the return ductwork (upstream of the fan). CO2 sensors shall be located throughout the space to modulate the ventilation air as necessary to maintain space CO2 levels below set point. The units will have EC fan motors where applicable or premium efficiency motors with VFDs where EC motors are not available. The refrigeration equipment will have modulating compressors, modulating hot gas reheat for dehumidification, variable speed condenser fans with EC motors and head pressure controls, dedicated return fan and modulating recirculation dampers. The hot water piping through the roof will be fully insulated and jacketed and will have heat trace in the piping to prevent the water from freezing. All (3) units are to have the ability of providing 1.5" of external static pressure on the supply and return fans. The return air and outdoor air streams will have 2" MERV 8 pre-filters to protect the coils and the energy recovery wheel. The units will have 4" MERV 13 final filters. The units will have 100% economizer capabilities including bypass dampers around the energy wheel. Ebtron Gold airflow stations will be installed on the supply air and return air duct mains, in the outdoor air intake plenum, and in the exhaust air plenum. The units will also have outdoor air and exhaust air isolation dampers at the exterior of the units.

The refrigeration systems for the units will have modulating compressors. The unit will also be provided with modulating hot gas reheat capabilities. The refrigeration system is to have factory controls to modulate the compressors and the hot gas reheat as necessary to maintain the discharge air temperature set point as determined by the DDC system. The (3) air handling units are indicated below with preliminary sizing:

AHU-1A Serving the Large Gymnasium (11,600 sq.ft): This unit will be rated to deliver 17,500 Cubic Feet per Minute (CFM) of supply and return air to the gymnasium. The ventilation section will be rated for 11,750 CFM. This unit will have supply and return duct smoke detectors as well as smoke dampers, equal to Ruskin SD-60 with flanged frame and linkage as required with 24VAC actuators and UL listed for smoke control. The unit will be controlled to maintain space temperature and humidity and the ventilation rate will be controlled to maintain space Carbon Dioxide (CO2) levels below set point values. Main duct size out of the unit to be 60/28.

AHU-2A Serving the Auxiliary Gymnasium (6,935 sq. ft): This unit will be rated to deliver 10,500 Cubic Feet per Minute (CFM) of supply and return air to the gymnasium. The ventilation section will be rated for 4,400 CFM. This unit will have a supply duct smoke detector. The unit will be controlled to maintain space temperature and humidity and the ventilation rate will be controlled to maintain space Carbon Dioxide (CO2) levels below set point values. Main duct size out of the unit to be 50/22.

AHU-3A Serving the Cafeteria (6,030 sq. ft): This unit will be rated to deliver 9,250 Cubic Feet per Minute (CFM) of supply and return air to the cafeteria/kitchen space. The ventilation air delivered from the Cafeteria ERV (see ventilation section) section will be rated for 5,350 CFM. This unit will have a supply duct smoke detector. The unit will be controlled to maintain space temperature and humidity at set point values. Main duct size out of the unit to be 46/20.

AHU-4A Existing Auditorium Unit (8,700 sq.ft.): This existing unit will remain serving the auditorium space. The current unit has a hot water coil and split system Direct Expansion (DX) cooling system with a rooftop condensing unit which is to remain. The existing Auditorium ductwork will need to be modified as necessary to accommodate the new Roof Smoke Vents that will be installed above the stage.

AHU-1D D-Building Unit (16,500 sq.ft): This unit will be rated for 23,000 CFM and will have both supply and return duct detectors and Ruskin SD-60 smoke dampers with flanged frame and linkage as required with 24VAC actuators and UL listed for smoke control. This unit will be 100% outdoor/exhaust air (like the HRV's indicated below). The unit will be a Mainstrem with a heating hot water coil and refrigeration coils, both DX and hot gas reheat. The refrigeration coils are to be connected to a rooftop mount Aaon heat pump condensing unit. The Aaon remote condensing unit heat pump will have modulating compressors, modulating EC condenser coil fan motors with head pressure control, sound reduction package including compressor blankets and cabinet insulation, and factory refrigeration controls. The refrigeration piping will be field installed between the (2) units. The Aaon will be mounted on structural steel with housed spring isolators. The exhaust section of the unit including the plate heat exchanger and exhaust fan will be epoxy coated to prevent corrosion and unit deterioration. The unit exhaust will be discharged straight up rather than out the side for dispersion. Exhaust ductwork serving the science labs and preparation areas will be fully welded stainless steel. It is currently assumed that there will be **(3)** fume hoods total. The fume hoods will be modulating flow hoods with integral modulating controls and air velocity sensors to adjust a duct mounted control valve equivalent to TSI model EL-316-FLA-S/S. Bubble tight dampers, equivalent to Ruskin BTO92 will be installed in the ductwork to ensure that the room exhaust air ductwork is isolated from the fume hood exhaust if the exhaust fan(s) in the AHU fail. Supply and exhaust air duct mains will be located on the roof of the D-building due to lack of ceiling space with vertical shafts down to the levels below. Roof mounted ductwork to be installed within a "dog house" under the roof envelope. Main duct size out of the unit to be 60/30. The airflow will be controlled via Variable Air Volume (VAV) boxes and the unit supply and exhaust fans will operate as a variable volume unit to maintain a duct static pressure set point. Discharge supply air will be conditioned by a air-source heat pump sized to provide space conditioning air during the summer, and the hot water heating coil. The unit will be controlled to maintain the lowest required discharge temperature to satisfy all zones served by the unit as well as reduce humidity using the modulating hot gas reheat control. Individual zones space temperatures will be controlled by VAV boxes with reheat coils.

The kitchen hoods will be new and sized to meet the requirements of the cooking equipment located underneath them. The hoods will be rated for Type 1 or Type 2 exhaust based on the equipment they are exhausting. The exhaust hoods will have variable volume controls with temperature and smoke sensors, and will have an Ansul fire suppression system. Hoods will have UL listed isolation control dampers. Roof mounted exhaust fans connected to each hood will be installed on 18" insulated roof curbs with hinges to provide for duct access and cleaning. The fans will have either EC motors or high efficiency motors with Variable Frequency Drives (VFDs) and the fan speed will be modulated by the variable volume hood controls. Preliminary estimates are for main kitchen total exhaust flow to be 5,100 CFM. The Culinary Arts Kitchen preliminary estimate is for the total flow to be 4,000 CFM. The hoods will have supply plenums at the front for the make-up air duct connections so that make-up air is delivered directly at the hoods.

MAU-1 Serving the Main Kitchen: This space will be normally conditioned by the heating hot water fan coil units equivalent to Envirotec HPP. Type 1 and/or Type 2 kitchen hoods equivalent to the hoods mentioned above for the main kitchen will be installed over the cooking equipment in this space that requires exhaust. Roof mounted upblast exhaust fan(s) will be installed on roof curbs and controlled by the variable volume hood controls systems. A roof mounted air-source heat pump with natural gas fired backup make-up air unit MAU-1 will be installed to provide the make-up air needed directly to the front of the hoods to match the exhaust from the kitchen hoods minus 1,000 CFM. The make-up air unit will be equal to a Captiveaire CASRTU3 with a modulating EC supply fan, modulating air-source heat pump with modulating hot gas reheat, modulating EC condenser fans, an 18" insulated roof curb, supply duct smoke detector installed in the supply ductwork, factory installed controls and a modulating gas fired burner. The operation of this unit will be by the factory hood controls to maintain discharge air temperature using either the air-source heat pump or the gas fired heater. Preliminary sizing is for the unit to flow 4,100 CFM. Main duct size out of the unit to be 24/20.

MAU-2 Serving the Culinary Arts: This space will be normally conditioned by the heating hot water fan coil units equivalent to Envirotec HPP. Type 1 and/or Type 2 kitchen hoods equivalent to the hoods mentioned above for the main kitchen will be installed over the cooking equipment in this space that requires exhaust. Roof mounted upblast exhaust fan(s) will be installed on roof curbs and controlled by the variable volume hood controls systems. A roof mounted air-source heat pump with natural gas fired backup make-up air unit MAU-2 will be installed to provide the make-up air needed directly to the front of the hoods to match the exhaust from the kitchen hoods. The make-up air unit will be equal to a Captiveaire CASRTU3 with a modulating EC supply fan, modulating air-source heat pump with modulating hot gas reheat, modulating EC condenser fans, an 18" insulated roof curb, supply duct smoke detector installed in the supply ductwork, factory installed controls and a modulating gas fired burner. The operation of this unit will be by the factory hood controls to maintain discharge air temperature using either the air-source heat pump or the gas fired heater. Preliminary sizing is for the unit to flow 3,000 CFM. Main duct size out of the unit to be 22/18.

Building Ventilation

All of the spaces that are not conditioned by rooftop air handling units will have their ventilation air supplied by either Energy Recover Ventilators (ERVs) or Heat Recovery Ventilators (HRVs). The ERV's and HRV's will be dedicated ventilation units that are 100% outdoor air and 100% exhaust air (no air is recirculated). All ERVs except ERV-2A will be equivalent to Aaon RN units. The HRVs will be equivalent to Mainstream (see AHU-1D above) with a plate heat exchanger core and an Aaon remote condensing unit for cooling/dehumidification. The ERVs will utilize a total energy recovery Semco wheel to recover both sensible and latent (moisture) energy from the outgoing exhaust air stream to the incoming outdoor air. All ERV's will have an integral air-to-air heat pump with modulating compressors, modulating hot gas reheat, heating hot water coil, exhaust air and outdoor air isolation dampers, VFD wheel speed control and energy recovery wheel bypass dampers. The HRVs will have refrigeration coils (see AHU-1D) for both DX heating/cooling, hot gas reheat coil, heating hot water coil, heat recovery core bypass dampers, and exhaust air and outdoor air isolation dampers. The Aaon remote condensing unit heat pump will have modulating compressors, modulating EC condenser coil fan motors with head pressure control, sound reduction package including compressor blankets and cabinet insulation, and factory refrigeration controls. The refrigeration piping will be field installed between the (2) units. The Aaon will be mounted on structural steel with housed spring isolators. ERV-2A serving will be equivalent to Petra APPH with a heating hot water coil. The ERV will utilize a high efficiency Sorption Coated dual heat exchanger core (AccuBloc). The

unit will have an integral air cooled compressor/condenser with variable speed compressors and condensers and modulating hot gas reheat control. All units will have MERV 8 pre-filters and MERV 13 final filters. All units will have EC fans with modulating speed capabilities where applicable. The fan speed will be modulated to maintain a static pressure set point in the ductwork which will vary based on the ventilation requirements in each individual zone. The units will be provided with supply duct smoke detectors. The units that flow greater than 15,000 CFM are to also have return air duct smoke detectors and smoke dampers equivalent to Ruskin SD-60 with flanged frame and linkage as required with 24VAC actuators and UL listed for smoke control. The outdoor air supply ductwork will be insulated with 1" of 1.5 PCF duct wrap (for ductwork smaller than 24" wide) or 1" of 3 PCF duct board insulation (for ductwork 24" or larger wide).

The ventilation air will be distributed throughout the facility with ductwork. Each ventilation zone will have an outdoor air supply and exhaust air Variable Air Volume (VAV) boxes. These boxes independently measure the air going through each box and can modulate a damper to maintain a desired airflow set point. There will be (2) types of ventilation zones. There will be constant volume ventilation zones such as zones that serve restrooms and janitor's closets, and there will be variable volume zones for the balance of the building. The variable volume ventilation zones will modulate the ventilation air delivered to and exhausted from each space to ensure that no space exceeds CO2 set point levels. By reducing ventilation air to the spaces that do not need design flow, significant energy is saved by both not conditioning and not moving the excess air. Each classroom, conference room, lab, and large work area will have dedicated zones (1 supply and 1 exhaust VAV each). Multiple office spaces will be combined into a single ventilation zone with ventilation air distributed to each office with a fully ducted supply and exhaust system. CO2 will be monitored in every office space and the VAV boxes will modulate as necessary to ensure no office exceeds CO2 set points. Preliminary estimates are that (1) ventilation zone will encompass approximately (5) adjacent office spaces. The supply VAV's will generally discharge the supply air into the return plenums of the ducted heat pump fan coil units.

ERV-2A (see below) is to provide ventilation air to the Main Kitchen and the Culinary Arts Kitchen. The VAV boxes are to provide the additional 1,000 CFM make-up air (exhaust air minus the MAU make-up air) via transfer from the Cafeteria and Culinary Arts Café spaces respectively. Ventilation air to the Cafeteria to be provided by Ruskin CD-60 dampers with Ebtron ELF airflow stations (combination units to operate as a variable volume box).

There are multiple rooms within the facility that will contain equipment requiring localized exhaust. The Library Maker's Space, Autobody, Welding, Pre-Tech, Design Tech Spray Booth, Art Pottery Studio, Art Metals, Aviation Welding, Custodial Closets, Printer Areas (Work Areas) all will have local exhaust inlets to capture fumes. Where applicable Monkey Arm flexible exhaust arms or capture hoods will be utilized to provide exhaust at specific fume producing equipment. The exhaust will be tied into the ventilation exhaust systems. Depending on the toxicity of the exhaust fumes, Bubble Tight dampers equivalent to the units listed above for the science lab exhaust system will be utilized to isolate the toxic fumes from the rest of the exhaust system during a unit shutdown. The exhaust system will be designed to satisfy the CHPS 2.0 requirements.

New dust collection systems including dust collectors and ductwork with manual isolation dampers will be installed in the Design/Tech room, the Woodshop and the Autobody shop. The dust collectors will be equivalent to Dust Gorilla Pro system with HEPA filtration, cyclone separator, integral collection bin, unit stand, filter gauge and bin fill level indicator.

There will be multiple ERV/HRV units and duct systems that will be utilized to condition the (4) main educational buildings on campus. The ventilation units will be located as close to the center of the zone that they serve as possible to minimize ductwork. See SD rooftop equipment drawing for approximate preliminary unit locations. The preliminary ventilation systems, sizes, and the locations they serve are indicated below:

A-building:

ERV-1A (existing to remain unit located in Level 4 mechanical room): This ERV is an existing unit rated for a nominal 10,000 CFM. The ERV will be repurposed to serve different spaces as part of the renovation project. This ERV will serve the Level 1 rooms from the Band Room and Chorus Room east including the Ensemble and practice rooms, the Level 2 Team Rooms, Locker Rooms, Fitness Room. The current unit has a hot water coil and split system Direct Expansion (DX) cooling system with a rooftop condensing unit. The existing hot water coil, DX coil and rooftop condensing unit will remain. The existing roof mounted louvered penthouse for the ERV exhaust will need to be relocated. The ductwork will need to be revised to accommodate the revised unit exhaust location.

ERV-2A (Petra Unit): This ERV will be rated for a nominal 17,000 CFM and will serve the Cafeteria, Kitchen and back-of-house cooking spaces, the Culinary Arts Kitchen, Culinary Arts Café, The Level 3 Councilor Offices, the Health Services offices, the Level 3 Main Entry area, the Level 4 I.S.N Offices, the I.T. Offices, and the Level 4 Mezzanine area. This unit will require smoke dampers along with a return duct smoke detector. The unit is to be located on the roof of the Cafeteria with roof mounted ductwork (insulated with 3” of 6 PCF fiberglass insulation wrapped in an EPDM membrane) suspended above the roof on rooftop duct supports equivalent to Miro Industries Model# 10-DS. Outdoor Air and Exhaust Air ductwork shall run across the Cafeteria roof and rise up in the southeast corner of that roof up the vertical wall of the A-building to the roof of the A-building and shall drop back down into Level 4 ceiling space. Insulated isolation dampers (equivalent to Ruskin TED50) are to be located at the duct penetration of the roof deck. This unit is to operate with a 2,000 CFM offset (more supply than exhaust) when the kitchen hoods are in operation.

HRV-1A: This HRV will be rated for a nominal 20,000 CFM. This unit will have supply and return air duct smoke detector(s) and supply and exhaust smoke dampers equal to the dampers indicated for the rooftop air handling units. The unit will serve Spray Booth 1042 on Level 1. A large exhaust air filter rack is to be installed at the back (east) end of the space and supply air is to be discharge at the front (west) end of the space. The unit is to be suspended in the ceiling of the Aviation space along the southern wall. The unit is to be equivalent to an Xetex XHS with a heat exchanger core, MERV 8 filters on the supply and exhaust before the heat exchanger core, and 4” MERV 13 final filters. The unit will have a gas-fired indirect heat exchanger with a modulating burner. This unit is to have explosion proof fans and shall be spark resistant.

HRV-2A: This HRV will be rated for a nominal 18,000 CFM. The unit will serve the BTC spaces at the western end of the A-building. The unit will be located on the roof above the Level 4 Art Rooms and will serve the Level 1 Auto Body shop and surrounding support spaces, the Leve 2 Aviation shop and surrounding support spaces, the Aviation classrooms, and the Property Services (facilities) offices and support spaces, the Level 3 Wood Shop and surrounding support spaces, the Design/Tech room, the BTC Faculty rooms, and the Level 4 Art Rooms The airflow will be controlled via Variable Air Volume (VAV) boxes and the unit supply and

exhaust fans will operate as a variable volume unit to maintain a duct static pressure set point. This unit will have the epoxy coating indicated above. This unit will have supply and return duct smoke detectors as well as smoke dampers, equal to Ruskin SD-60 with flanged frame and linkage as required with 24VAC actuators and UL listed for smoke control. Discharge supply air will be conditioned by the air-source heat pump remote condensing unit and heating hot water coil sized to provide neutral air temperatures.

B-building:

ERV-1B: This ERV will be rated for a nominal 13,500 CFM and will serve the classrooms and spaces west of the building's central stairwell. The unit will be installed on the roof approximately in the middle of the area served. This unit will also ventilate the connector to the D-building including the (4) classrooms in the connector addition.

ERV-2B: This ERV will be rated for a nominal 16,000 CFM and will serve the classrooms and spaces east of the building's central stairwell including the lower level library and administrative spaces. The unit will be installed on the roof approximately in the middle of the B-building addition.

F-building (Tech Center):

ERV-1F (Tech Center F-building): This ERV will be rated for a nominal 9,000 CFM and will serve all spaces in the F-building that are not served by the HRV's. See HRV scheduling below for spaces served by the HRV's. This unit will be located on the roof near the middle of the building.

HRV-1F: This HRV will be rated for a nominal 5,500 CFM and will be located on the roof near the southern end of the Building. This unit will serve the Level 1 Auto Tech shop and surrounding support spaces, the Level 1 BTC classroom Aviation shop, and the Level 1 Toilet/Shower area.

HRV-2F: This unit will be rated for a nominal 7,000 CFM and will be located on the roof near the northern end of the building. This unit will serve the Level 2 Metal/Welding shop and surround support spaces, the Metals Shop and the surround support spaces, the Welding Classroom, and the Pre-Tech/Makers Space and the surrounding support spaces.

Mechanical-Central Plant Design

The campus will be heated by both the existing to remain biomass heating plant and new natural gas fired boilers that will be located in the existing G-building. Operation of the natural gas fired boilers and the biomass plant will be by the Direct Digital Controls (DDC) system. All circulator pumps will be either base mounted (aligned from the factory) or inline type with high efficiency variable speed EC motors. Larger inline circulator pumps will be vertical type.

The central heating hot water system will operate as a primary-secondary pumping system with the existing biomass boiler tying into the new primary campus heating loop for heat add, as will the new gas fired boilers located within the G-building when the loop drops below set point. The heating hot water plant consists of the existing biomass plant and a proposed high efficiency natural gas boiler plant which will be located at the existing biomass plant facility. The proposed natural gas heating plant will be based on (3) Riello Array 4000 (AR 4000) boilers which each have a net output capacity of 3,844,000 BTU/Hr and a 40:1 turn down ratio. The new boilers will

be sealed combustion type with fully ducted intake combustion air (ducted from the outside) and fully ducted exhaust flues. Each boiler will be a multi/modular burner type with each burner containing an individual (dedicated) circulator. Two (2) of the boilers will be utilized to heat the central primary heating hot water loop during the shoulder seasons and as backup heating for the biomass plant. The third boiler will initially be the primary heating source for the existing to remain E-building and will also provide heating hot water to the D-building and F-building through a 500 gallon buffer tank equivalent to A.O. Smith TJV-500 ASME. The boiler will also have the ability to heat the primary heating hot water loop. A secondary heating hot water system will be piped to the D-building, F-building, and tie into the existing E-building heating loop (see secondary heating hot water system below). This secondary system will be glycoled until the E-building is demolished; a heat exchanger with circulator pumps will use the primary heating system to condition the buffer tank. The secondary system serving the D, F, and E-buildings will pump water through the buffer tank. There will be (3) redundant heating hot water circulators will be rated for 200 GPM at 80 feet of head to distribute hot water to the D, F, and E-building.

Heating Hot Water Primary System

The primary heating hot water piping will distribute water from the (2) central plants to each of the buildings by the primary heating hot water circulator pumps. The primary heating hot water loop will be circulated by (2) pumps operating simultaneously with a third pump for redundancy. The proposed pumps are to be rated for 700 GPM at 50 feet of head each. Each building shall have a mechanical room to serve the secondary pumps and piping systems. The primary piping system will run underground from the main boiler plant to the D-building and will rise up inside the northern exterior wall to the roof. The underground piping will be pre-insulated PEX (cross-linked polyethylene with oxygen barrier). A branch will run to the D-building mechanical room. The primary loop piping will rise up to the roof of D-building and will run in a “doghouse” (the doghouse will continue the roof insulation over the heating hot water piping) on the roof of D-building (preliminary estimates are for approximately 180 feet of rooftop doghouse on D-building). A branch will run along the roof of D-building in a “doghouse” to the F-building and will penetrate the F-building exterior wall (above the D-building to F-building connector) and will run to the F-building mechanical room. The primary heating hot water will then run across the roof from the D-building and the D to B-building connector (preliminary estimates are for approximately 105 feet of rooftop doghouse on D to B-building connector) and will drop down at the southern end of the connector. A branch will run across the roof of B-building in a “doghouse” (preliminary estimates are for approximately 20 feet of rooftop doghouse on B-building) and drop down into the B-building mechanical room. The primary piping will drop down from the B-building and into the ceiling space of the cafeteria in A-building. The primary loop piping will rise up in A-building to get into the Level 4 A-building ceiling space and will run to the A-building mechanical room.

The primary loop piping will utilize a modulating control valve to inject the primary loop water into the secondary heating hot water systems to maintain the secondary loop temperatures at set point.

Heating Hot Water Secondary System

All heating hot water secondary circulator pumps will modulate their speed to maintain a differential pressure set point between the heating hot water supply and heating hot water return piping.

The D-building will have a single secondary piping system served by (2) redundant variable volume circulators. The circulators will be rated for 190 GPM at 50 feet of head.

The F-building will have a single secondary piping system served by (2) redundant variable volume circulators. The proposed pumps will be rated for 300 GPM at 60 feet of head.

The B-building will have a single secondary piping system served by (2) redundant variable volume circulators. The proposed pumps will be rated for 280 GPM at 60 feet of head.

The A-building will have (4) secondary piping systems, each served by (2) redundant variable volume circulators. The circulator pumps will modulate their speed to maintain a differential pressure set point between the heating hot water supply and return piping in each system. The circulator pump systems are to be served by (2) redundant variable volume circulators with ratings of 250 GPM, 390 GPM, 225 GPM, and 350 GPM.

Temporary Heating Hot Water Tie-in
During the temporary operation of the E-building, a new heating hot water line will run from the G-building to the existing E-building. The piping will be run exposed (outdoors) with 2" of elastomeric foam insulation (equivalent to Armacell or Aerocel) with UV coating and aluminum jacketing. The heating hot water system is to be filled with a 40% propylene glycol solution while the system is serving the temporary E-building. Provide a new Axiom Industries DMF300 glycol feeder for the hydronic system. Once E-building has been demolished, the system will be drained and filled with treated water.

Domestic Hot Water
The domestic hot water for the D-building will be supplied by a new Rheem PROPH80 T2 RH350 DCB 80 gallon hybrid heat pump water heater. A stainless steel lead free circulator pump will be installed to recirculate domestic hot water through a dedicated Domestic Hot Water Recirculation (DHWR) system.

The domestic hot water for the F-building will be supplied by a new Rheem PROPH80 T2 RH350 DCB 80 gallon hybrid heat pump water heater. A stainless steel lead free circulator pump will be installed to recirculate domestic hot water through a dedicated Domestic Hot Water Recirculation (DHWR) system.

The domestic hot water for the A-building and B-building will be supplied by (2) 119 gallon A.O. Smith MXi water heaters. The water heaters are to be models BTH-400A rated for 400,000 Btu./hr. each. Multiple stainless steel lead free circulator pumps will be installed to recirculate domestic hot water through dedicated Domestic Hot Water Recirculation (DHWR) systems. A separate system will be installed for the B-building, the A-building cooking facilities, and the remainder of the A-building for a total of (3) separate DHWR systems.

Athletic Field Concessions Stand Conditioning (To be included as an Add-Alternate)
The existing athletic field concessions stand is currently conditioned using a propane fired heater. We recommend replacing this heater with an air-to-air heat pump system. The air-source heat pump is to be equivalent to Samsung DVM S Eco AM060MXMDCH/AA rated for a nominal 60,000 btu/hr. cooling and a nominal 66,000 btu/hr. heating. The conditioned air will be distributed to the space via wall mounted or suspended heat pump indoor units, models AM0xxMNVDCHAA and AM0xxMNHDCHAA respectively.

Controls

A Direct Digital Controls (DDC) system will be utilized to provide proper control and monitoring of all the new HVAC equipment. The DDC system will be web based enabling remote access and will utilize the BACnet protocol. This system will be capable of managing energy savings functions of the mechanical systems and also provide alarms to building manager/service team. The building automation system shall include the following functionality:

- Each independent HVAC zone shall be configured with (1) combination temperature, relative humidity, and CO2 sensor with digital display and the ability to control zone temperature set point.
- Each independent space in the building shall be configured with a wall mounted temperature sensor.
- Each space will be configured with occupancy sensors (from the lighting controls system) which will utilize connect to the lighting controls system to monitor the occupancy sensors in each space
- The natural gas and biomass heating plant controls shall operate in conjunction to maintain space temperature set points in all spaces. Controls to ensure that systems are not operate in conflict with each other
- Ventilation system shall be configured as a variable volume system based on space occupancy and CO2 levels.
- Ventilation systems serving localized exhaust (which ties into the HRV exhaust system with VAV's)
- Air-Source VRF heat pump systems will have BACnet interconnectivity such that the DDC system can monitor the operation of the heat pumps and adjust space set points, lockout the compressor system at a specified outdoor air temperature, and operate the hot water reheat control valves.
- Heat pump systems (both VRF and rooftop units) shall tie into the Automatic Transfer Switch (ATS) so that when a power outage is detected, the system shall load shed by disabling approximately 2/3 of the campus heat pumps and the non-essential ventilation units before then sending a signal that the ATS may switch over to generator power.

Typical Energy Recovery/Air Handling Unit Controls Points

DI	Supply Fan Status	DO	Supply Fan Enable
DI	Supply Fan Status	DO	Supply Fan Enable
DI	Exhaust Fan Status	DO	Exhaust Fan Enable
DI	Exhaust Fan Status	DO	Exhaust Fan Enable
DI	Energy Wheel Status	DO	Energy Wheel Enable
DI	Freeze Stat Trip Status	DO	Refrigeration System Enable
DI	Refrigeration System Alarm Status	DO	Dehumidification Enable
DI	Refrigeration	DO	Supply Isolation

	System Status		Damper Open/Close
DI	Supply Air Duct Detector	DO	Exhaust Isolation Damper Open/Close
DI	Exhaust Air Duct Detector	DO	Unit Outdoor Air Isolation Damper Open/Close
DI	Supply Smoke Damper Status	DO	Unit Exhaust Air Isolation Damper Open/Close
DI	Exhaust Smoke Damper Status	DO	Heat Trace Relay Enable
DI	Supply Air Isolation Damper Status		
DI	Exhaust Air Isolation Damper Status	AO	Supply Fan Speed Control
DI	Unit Outdoor Air Damper Status	AO	Supply Fan Speed Control
DI	Unit Relief Air Damper Status	AO	Exhaust Fan Speed Control
		AO	Refrigeration System Discharge Temp. Set Point
AI	Supply Air Temperature	AO	Energy Wheel Speed Control
AI	Supply Air Relative Humidity	AO	Wheel Bypass Damper Modulation
AI	Post Wheel Outdoor Air Temperature	AO	Hot Water Heating Valve Modulation
AI	Post Wheel Outdoor Relative Humidity		
AI	Post DX Coil Temperature	AI	Exhaust Air Static Pressure
AI	Exhaust Air Temperature	AI	Supply Fan Speed Feedback
AI	Exhaust Air Relative Humidity	AI	Supply Fan Speed Feedback
AI	Spare	AI	Exhaust Fan Speed Feedback
AI	Spare	AI	Exhaust Fan Speed Feedback

AI	Outdoor Air Pre-Filter DP	AI	Energy Wheel Speed Feedback
AI	Exhaust Air Pre-Filter DP	AI	Bypass Damper Position
AI	Final Filter DP	AI	Internal Cabinet Temperature
AI	Supply Air Static Pressure		

HVAC Ductwork and Piping Materials
Refrigerant piping shall be Type L (ACR) copper with brazed joints and fittings. All piping shall be insulated per the 2020 Vermont Commercial Energy Code.

Heating hot water piping shall be Type L copper with soldered joints and fittings for 2" and smaller. Piping shall be Schedule 40 welded steel for piping 2 ½" and larger. An alternate price shall be provided to use Aquatherm blue (Polypropylene-R) piping and electro-fusion welded joints and fittings. Heating water piping shall be insulated per the 2020 Vermont Commercial Energy Code.

Building Conditioning, Kitchen Make-up Air System and Building Ventilation Systems ductwork materials shall be G-90 galvanized steel. All ductwork shall be insulated per the 2020 Vermont Commercial Energy Code.

The HVAC air distribution systems (fan coil units, kitchen make-up air unit, and ventilation system) shall be fully ducted, including all supply and return/exhaust air ductwork. The air distribution systems shall be designed in accordance with the recommended practices of ASHRAE, Chapter 21, "Duct Design", 2013 "Fundamentals" Handbook and SMACNA "HVAC Duct System Design". Supply and return ductwork shall be designed to maintain an air velocity below 800 FPM near duct transitions and take-offs and below 500 FPM near terminal units to minimize noise levels.

All discharge, and return air ducts supporting diffusers and registers shall be fitted with adjustable locking quadrant type volume dampers to allow balancing and adjustment of air flows into each room. Dampers shall be located at takeoffs from main air ducts to minimize noise at registers.

Flexible air ducting shall be limited to 6 feet total length per take-off. All distribution ductwork shall be sealed to a Class B seal.

All penetrations through fire rated shaft partitions shall be fitted with fire dampers, access doors, and breakaway connections as required.

All concealed ductwork shall be insulated per the 2020 Vermont Commercial Energy Code.

The HVAC systems sound levels shall meet the following sound criteria: Less than 35 dB (A) at any location 2'-0" from noise source, air outlet or equipment.

Grease Laden Vapor Exhaust ductwork materials shall be fully welded type 304 Stainless Steel with cleanouts as required per NFPA 96. The ductwork shall be insulated with 3" fire wrap.

The Grease Laden Vapor Exhaust system, including but not limited to duct material, duct velocities, duct construction, installation of owner furnished canopy hood, clearances, and equipment listings, shall be designed and installed per the requirements of all local, state and federal codes and standards including but not limited to the International Building Code and NFPA 96.

6. Plumbing

Existing Fixture Reuse
Provide a deduct alternate price to remove (and safely store) and reinstall the existing plumbing fixtures in the main/central public restrooms in A-building Level 3. L.N. Consulting does not recommend retaining these fixtures since the ceilings will be removed to work on the HVAC systems and all of the plumbing piping will be replaced which will likely require the fixtures to be removed and stored during the demolition phase.

The recently renovated restrooms in A-building Level 4 (north end) are to be reused. These fixtures may require removal during construction (pricing should include removal and safe storage during construction) since the HVAC systems will be replaced in this area.

Sanitary Waste and Vent System
Waste and venting piping shall be installed per the latest adopted edition of the International Plumbing Code. We recommend replacing the entire waste and vent piping system for the A, B, and D-buildings. Waste exit locations from each building are to be coordinated with the Civil Engineer. We recommend replacing the entire waste and vent piping system within the F-building as the main restrooms are being relocated and all of the fixtures are being replaced.

Roof Drains
The building roofs shall be supported by new roof drains as required to meet the guidelines of the 2018 International Plumbing Code. The storm drainage system shall exit separately from the sanitary drainage system. Roof drains shall be insulated per the 2018 Vermont Commercial Energy Code.

Grease Waste and Vent System
The building grease waste system will be supported from a new 4" grease waste main and an exterior grease trap located on site (location to be coordinated with Civil Engineer). Final grease trap sizing to be determined once the kitchen design is completed. Fixtures in the cooking kitchen that contain grease waste shall discharge to the grease waste system through indirect drains (floor sinks) where required per code.

Fixtures
All fixtures shall comply with Vermont's Anti-Lead law VT ACT 193 (0.25% weighted average lead content for fixtures). We recommend using low flow or dual flush water closets and low flow urinals for water conservation purposes with automatic sensor controlled flush valves. The lavatories will be based upon low flow, automatically controlled faucets for water conservation and infection control purposes. The janitors closets should be fitted with floor mounted 24"x24" basins with utility faucet, mop holder, wall guards, and bucket hose. Water fountains (where

applicable) should be based upon a standard ADA wall mounted unit that is fitted with a carbon filter system and water bottle filler.

All plumbing fixtures in the A, B, D and F-buildings are to be replaced with new.

Water Supply Systems and Domestic Water System
A new domestic water entrance (and fire protection service) shall be installed in the A-building to support both the A and B-buildings. A new domestic water service entrance (and fire protection service) shall be installed in the F-building to support both the F and D-buildings. A 3" domestic cold water entrance shall tap off of the main fire protection entrance in the A-building to support the A and B-buildings. A new 2 ½" domestic cold water entrance shall tap off of the main fire protection entrance in the F-building to support the F and D-buildings. The water entrances shall each have a backflow preventer, water meter, pressure reducing valve, pressure gauges, and isolation valves.

Domestic Hot Water System
As noted above, the domestic hot water for the A and B buildings will be via (2) 120 gallon natural gas fired water heaters. Final sizing will be determined once a fixture count has been finalized.

D-Building domestic hot water heater and backflow preventer to be replaced with a new 80 Gallon Hybrid Heat Pump water heater equivalent to Rheem PROPH80 T2 RH350 DCB as indicated above. The D-building domestic hot and cold water distribution systems are to be completely replaced to service the new plumbing fixtures. Final sizing will be determined once a fixture count has been finalized.

F-Building domestic hot water heater and backflow preventer to be replaced with a new 80 Gallon Hybrid Heat Pump water heater equivalent to Rheem PROPH80 T2 RH350 DCB as indicated above. The F-building domestic hot and cold water distribution systems are to be completely replaced to service the new plumbing fixtures. Final sizing will be determined once a fixture count has been finalized.

The domestic hot water systems shall be configured with main mixing valves located at the domestic hot water heaters to maintain the hot water supply temperature below 120°F. There shall also be mixing valves located at the public lavatory faucets to provide tempered hot water to those fixtures. A domestic hot water recirculation (DHWR) system will be installed as indicated above. There will be multiple recirculation systems serving the A and B-buildings as indicated above. The D-building will have a dedicated DHWR system and the F-building will have a dedicated DHWR system. Balance valves (Lead Free) will be installed on each branch of the system to ensure each branch is receiving adequate flow. The DHWR systems shall be configured to provide a recirculating connection within 2'-0" of each commercial lavatory. The DHWR systems will be controlled by temperature sensor(s) and building occupancy sensor(s) along with timeclock control.

Natural Gas System
Natural gas piping for the A-building will be provided for the cooking appliances, natural gas fired unit heater in the spray booth, the heat recovery ventilation unit (HRV-1A) that serves the spray booth, and make-up air units MAU-1 and MAU-2. A main service entrance with a low pressure regulator will be installed for the new natural gas piping system for the kitchen. A separate natural gas entrance and meter will be installed for the unit heater and HRV-1A

serving the paint spray booth. The natural gas service entrance location will be coordinated with the Civil Engineer. Piping shall be sized and installed per NFPA 54 for low pressure drop.

Natural gas piping for the D-building will be provided for the science labs. A new natural gas service entrance location will be coordinated with the Civil Engineer. Piping shall be sized and installed per NFPA 54 for low pressure drop.

Each science lab will be provided with an Emergency Power Off (EPO) button to shut down both the power and close an emergency natural gas valve to stop the gas supply to the lab.

Plumbing Piping Materials
DCW piping shall be Type L copper with soldered joints and fittings or Aquatherm green (Polypropylene-R) piping and electro-fusion welded joints and fittings. DCW piping shall be insulated per the 2020 Vermont Commercial Energy Code.

DHW and DHWR piping shall be Type L copper with soldered joints and fittings or Aquatherm green (Polypropylene-R) piping and electro-fusion welded joints and fittings. DHW and DHWR piping shall be insulated per the 2020 Vermont Commercial Energy Code.

Sanitary waste and vent piping shall be schedule 40 PVC piping for both above and below ground piping.

Storm drainage piping shall be schedule 40 PVC piping for both above and below ground piping.

All grease waste and vent piping shall be schedule 40 PVC piping from the fixture to the exterior grease trap.

Above ground natural gas piping shall be Schedule 40 ASTM A 53 Steel Pipe, Type E or S, Grade B, Black.

7. Electrical

Distribution

The existing electrical distribution system within the school is made up of a combination of some newer panelboards and circuits that have been added since the school was built and a significant amount of equipment that is original equipment. The school was originally designed to accommodate electric heat, however due to the removal of essentially all the electric heat the service entrance was reduced. Due to the proposed addition to the school, and the implementation of air conditioning, the service will need to be significantly expanded. See drawings E3 through E5 for the existing electrical distribution system with proposed demolition, and drawings E6 and E7 for the proposed new electrical service and infrastructure.

The entire electrical infrastructure of the Building A, B, D and F will be replaced with a new code compliant electrical system that meets the program requirements for each space. The proposed main service entrance will be relocated to the new location, tentatively shown on the western side of Level 1 in the A-building. This service will serve buildings A, B, D and F, as well as the Pump House (Bldg. G). Refer to drawing E2 for proposed main electric room layout.

To accommodate the additions to the facility, our preliminary estimate is that a service size of 3000 amps, 277/480 volts, three phase, four wire would be required. This service will require ground fault protection at the main breaker within the main distribution switchboard. It will be fed from a new Burlington Electric Department (BED) pad mount transformer located externally and to west of Aviation room. The final location of the main electric room is being determined. All 277/480 volt and below electrical work to be by Owner's contractors at Owner's expense. All high voltage underground or overhead circuit work shall be done by BED at Owner's expense, other than the transformer vault and conduits to a BED pole which will be provided by the Owner's contractor at the Owner's expense. The vault shall be per BED standards for large transformer vaults.

To accommodate distances, it is proposed to provide a new electric room for four (4) quadrants of the new Building A; Southwest (SW), Southeast (SE), Northeast (NE) and Northwest (NW). A new fifth electric room will be provided in Building F to serve that building. The SW electric room is actually the Main Electric Room which will include the 3500 amp service entrance switchgear. The other three electric rooms will be approximately 8'x8'. From each of these electric rooms, all panelboards, elevators, HVAC equipment, etc., within that quadrant will be fed. Additional panelboards, typically 100 amp or 225 amp main lug only type, will be located throughout the "quadrant" in small "closets". These panelboards will typically serve most 20 amp circuits for classroom, office and corridor receptacles and lighting, as well as specific panelboards provided for locations such as kitchens, shops, mechanical spaces, etc.

The fault current rating of all 480 volt panelboards and switchboards in the main electric room shall be 35,000 amps or more. The fault current rating of all 208 volt panelboards in the main electric room shall be 42,000 amps or more. The fault current ratings for the other electric rooms shall be minimum 25,000 amps for 480 volt and 22,000 amps for 208 volt panelboards. For the most part all remaining 480 volt panelboards will be rated for 14,000 amps and 208 volt panelboards for 10,000 amps.

The existing electrical service to Building E will remain as is and the Woodchip Plant would remain fed from Building E. The existing Building G (Pump House) will be removed from the Building E electrical system and tied into the new electrical distribution system for Building A.

The main switchboards or panelboards on both the 480 volt and 208 volt systems, within each of the "main" quadrant electric rooms, will be provided with surge protection. Additionally, the main 480 switchboard for the entire campus will be provided with an integral power meter to monitor energy usage and power quality.

Within each electric room, a 480 volt to 120/208 volt, three-phase, four-wire step-down transformer will be provided for 120 and 208 volt loads. The intent is to keep the number of transformers to a minimum. Where feasible, transformers will only be located within the four quadrant electric rooms.

It is expected all large HVAC equipment will be fed from one of the main distribution panels. The kitchen to be provided with dedicated 225 amp panelboards to accommodate the significant amount of equipment, and depending on the number of hoods a separate panelboard for shunt-trip loads may also be provided. These panels will also serve smaller HVAC and refrigeration loads. Depending on space, locations for these panelboards will need to be verified to conform to ADA standards.

Each science lab, Aviation shop, Auto Body shop, Metal shop, Design/Tech space, and Library Maker Space will each be provided with an Emergency Power Off (EPO) switch to enable power to be cut to the space in case of an emergency. Each lab or similar space where dangerous tools are not used will be provided with a dedicated relay panel that will shut off power to receptacles or other devices and close any gas valves. EPO's will be located in multiple locations within each space for added safety. For shops and other locations where dangerous equipment is used, each room will be provided with a dedicated panelboard with a main shunt trip breaker or contactor. See attached drawing E1 for typical installation in labs.

Depending on whether the elevators are hydraulic or machine room-less will dictate the size of these circuits and where they are fed from. Per Vermont codes the elevators shall not be provided with shunt trip operation. Assume each elevator 40 horsepower at 480 volts three phase, fed via 110 amp circuit breaker and circuit.

The proposed design does not include a standby power emergency generator. If a generator was to be added as part of an alternate to the base design, it would be tied into the main electric service entrance room at southwest corner of Building A via a 3000 amp automatic transfer switch (ATS). To keep the size of the generator to a minimum, the Building Management System (BMS) would be used to shut-down all non-necessary equipment during a power outage. The ATS would be inhibited from transferring to the generator until a signal is sent by the BMS that all non-essential equipment has been shut-down. The final selection of equipment to be shut-down would be determined. The proposed size of the generator would be 500kW/625kVA.

The electrical distribution will be designed to accommodate alternative energy solutions. The building currently has photovoltaics installed on the roof, and the new electrical system will be designed for this system and for the installation of additional photovoltaics or other alternative energy systems. This will include providing spare breakers in the main electrical gear and running spare conduits from the BED transformer to the main electric room or where the alternative energy source is located. Additional conduits will also be run, via chases or shafts, up to the roof from the main electric room.

Included with this report are proposed electrical distribution one-lines for the project (drawings E6 and E7). These are very preliminary and do not show all devices such as shunt-trip panels, connections to large HVAC equipment, final panelboard sizes, etc. The final number of panelboards may change, however the drawings do provide a fundamental idea of the proposed basis of design.

Branch Circuiting

The majority of the branch circuiting will be concealed in spaces such as ceilings and walls. In concealed areas, armored MC or AC cable may be used.

For exposed circuiting, EMT conduit is to be used where approved by electrical codes. For corrosive areas Schedule 40 PVC conduit to be used. Rigid steel conduit only used in areas subject to physical damage where required by electrical codes. Schedule 40 PVC conduit to be used for underground circuits.

In some locations, the use of Wiremold will be used, particularly where flexibility of device locations is desired. Where only receptacles or only data required, Wiremold 2000 Series steel raceway to be used. Where both receptacles and data required, Wiremold 4000 Series steel raceway to be used.

Where running circuits to exterior locations, smaller surge protective devices will be provided at the panelboard or breaker serving these circuits.

For feeders over 100 amps, aluminum conductors will be used. For elevators or larger HVAC equipment, aluminum may be used up to the contractor-furnished disconnect switch however copper conductors shall be used between disconnect and unit.

Lighting

New LED light fixtures would be used throughout the facility. All existing lighting within Building A, B, D and F will be removed. Other than in rooms such as closets, mechanical rooms, or other minimally occupied spaces, dimming will be provided. Dimming can significantly reduce electrical consumption as fixtures can be dimmed to provide only the amount of lighting the specific occupant requires. The dimming function is also useful in locations with exterior exposure; daylight harvesting control can dim rows of fixtures as daylight enters through exterior glazing. LNC recommends installing pendant mounted direct/indirect lighting for all classrooms, including labs, in the facility. Where pendant mounted fixtures are not feasible, recessed 2x2 fixtures with a direct/indirect style of illumination is proposed. Refer to attached drawing E1 for typical lighting layouts and fixture information.

For corridors and similar spaces with grid tile ceilings, 2x2 lighting would typically be used, except in special circumstances, and spaced approximately 10’ on center for ceilings below 9’ and 12’ on center for ceilings 9’ and above. These 2x2 fixtures will be similar to those shown on drawing E1.

For small bathrooms a 24” vanity wall mount direct/indirect LED fixture above mirror will be provided. For larger multi-person bathrooms, a row of direct/indirect wall mount light fixtures will be provided above mirrors at sinks and above the toilets along the opposite wall. Fixtures proposed to be Litecontrol MOD 3 3L-W-IAD-SPA-2’ or 4’-SOF-C1-40K-I100/D050-D01-1C-UNV or equal. Large restrooms controlled via occupancy sensor for auto on/auto off, with local keyed switch for maintenance. Small, single person restrooms provided with manual on/auto off control and occupancy sensor.

For gymnasiums the design foot candle level will be approximately 75. It is estimated lighting will be located approximately 22’ AFF, spaced 15’ on center, Fixtures proposed to be 2’x4’ high-bay LED type with wireguards (Columbia Pelaton P4-40-MXHE-FA-ED-WG type or equal). Some fixtures to be fed via a lighting inverter for emergency power. Provide with dimming capability. Control of lighting to be via wall-mount occupancy sensors, keyed switches and programmed operation (manual or via “scenes”) via networked lighting control system.

Stairwells will be provided with wall mount direct/indirect on wall along stair risers. These fixtures to be provided with integral battery backup. Control of these fixtures, including occupancy sensors to allow lights to dim when stairwell not occupied, will be tied to the network. Fixtures proposed to be Columbia ESL-4-40-ML-FA-W-ED-U-ELL14-NXOS or equal.

A new lighting technology that is becoming more prevalent is the ability to “tune” or alter the color temperature of the fixtures. Although studies are still being done, this may have an effect on circadian and behavioral responses by students by varying the lighting color temperature with the time of the day or for a specific class. The lighting color temperature can be reduced to a warmer light in areas to provide aid in providing a calmer atmosphere, while cooler color temperature lighting can be used to provide for better illumination for more visual tasks. Where deemed appropriate, the use of color tuning lighting would be implemented. It is expected there will be very minimal use of color tuning on this project.

All lighting shall be DLC or EnergyStar rated, where applicable. Emergency interior lighting will be typically via exit signs with integral “eyeball” emergency lighting. Where additional emergency lighting required, wall mounted “eyeball” type fixtures will be provided. In large spaces with high ceilings such as gymnasiums or auditoriums, the use of a lighting inverter that powers select ceiling mounted lighting in the space will be used. All emergency lighting will be battery backup type with self-diagnostics.

All exterior exit locations shall be provided with egress lighting. This will be a combination of building mounted lighting, as well as pole mounted lighting. Emergency power would be provided via several lighting inverters located indoors to provide power to the exterior building mounted fixtures within the entire campus. Exterior building mounted lighting to be Hubbell LNC2-12LU-4K-3-1 for mounting heights below 12’ AFG and LNC2-18LU-4K-3-1 for heights above 12’, or equal, and will be controlled via network lighting control system based on local outdoor-rated occupancy sensors and ambient light levels.

Site lighting design is part of the landscape scope, however it is assumed pole lighting will be 20’ or less in height. All pole lighting to be provided with wireless lighting control that is compatible with the networked lighting control system.

Unless directed by others, all lighting foot candle levels will be based on latest edition of the IESNA (Illuminating Engineering Society of North American) design handbook.

With all lighting being replaced, the lighting system will be fed via the 277/480 volt system to reduce infrastructure costs, transformer sizes and electric losses.

Lighting Controls

The new lighting control system will be a digital type system, similar to Acuity nLight Digital Network control system. Lighting shall be controlled in zones. The system shall be provided with a network backbone for web-based remote access from any authorized computer. The system will be able to provide both control and monitoring of the entire lighting system within the building. It also provides the Owner with an easier method to program, as well as providing the Commissioning agent a better way of performing final programming. Although the technology and costs are changing, it is expected a wired system may be more practical due to the scope of renovation work. Due to the scale of this project, there may be a desire to “network” the other school lighting control systems within the school district to allow access from a single connection.

For lighting furnished with freezers, coolers, etc., the intent is to provide power to the lighting via the control system to allow for control and monitoring of light fixtures.

The exterior lighting will also be tied into the control system to enable remote timeclock and occupancy control. The pole or other remote lighting will be controlled via wireless “mesh” networks to the main lighting control system. The exterior lighting including site lighting will also be dimmable.

The lighting control system will have the means to estimate lighting load via algorithms within the software based on fixture type, level of dimming, etc.

Lighting for individual rooms will be provided with local control. All spaces shall be provided with occupancy sensors. Where required by energy code, daylight harvesting control will be provided. Egress paths, large restrooms, electrical and mechanical spaces will be auto on/auto off. Non-egress paths will generally be manual on/auto off, with exceptions as required for safety. See attached drawing E1 for typical control layouts for rooms with multiple zones.

The lighting control system will tie into the BMS via BACnet or other similar means. Status, alarm and control ability from the BMS will be feasible, including means to turn lights on via fire alarm or security alarm activation.

See drawing E10 for proposed lighting control detail drawings.

General Power

Provide commercial specification grade 120 volt NEMA 5-20R receptacles as follows:

- See attached drawing E1 for some typical room receptacle layouts.
- All 20 amp non-locking receptacles in gymnasiums and auditoriums shall be tamper-resistant.
- (1) Receptacle every 25’ along walls in corridors.
- Coordination will be required for locations such as shop and science classrooms to ensure adequate power and receptacles. Provide “non-standard” receptacles as needed.
- General-use GFCI receptacles in kitchen, prep areas, service areas, in addition to receptacles indicated on kitchen vendor plans. Locate every 20’ along walls.
- Assume (4) power circuits for each server room(s). Assume at least (1) 30 amp circuit.
- Several receptacles for small data closet(s), mechanical and electrical rooms, and exterior locations. Each data closet, mechanical and electric room will be on a dedicated circuit.
- Four (4) new construction classrooms each to be provided with floor boxes with (2) duplex receptacles each (also (2) data jacks each). (1) Classroom on Level 4, (1) classroom on Level 5, (1) classroom on Level 1 of B-D connector and (1) classroom on Level 2 of B-D connector.

The intent will be to keep the number of 20 amp receptacles per circuit to less than 6. Some locations may be less depending on requirements.

Where required by energy code or other ordinances, some receptacles will be tied into the lighting control system for load shedding when areas are not occupied. This is expected to be minimal.

Kitchen, prep areas, etc., designed by others shall be provided with receptacles and power as indicated on kitchen equipment vendor supplied drawings.

All single phase receptacles less than 150 volts to ground up to 50 amps and 208/240 volt three phase receptacles up to 100 amps in kitchens, bathrooms, within 6' of sinks, wet locations indoors or outdoors, locker rooms, garages and service bays, or other similar rooms, shall be provided with GFCI protection. Where GFCI protection is not "readily accessible" (i.e., behind dishwasher, etc.), the GFCI protection shall be provided with the circuit breakers in panelboards or the use of "blank face" devices with GFCI test buttons located adjacent to receptacle and in an accessible location.

In some locations such as common/waiting areas, classrooms and Labs, receptacles with USB ports will be provided.

Coordinate with mechanical contractor and mechanical controls contractor for all power for HVAC and plumbing equipment. Intent is to locate as much equipment on the 480 volt system as possible. All controls including 120 volt power for control systems to be provided under mechanical work. All VFDs or other motor control equipment to be provided under mechanical work.

Fire Alarm

As part of any reconstruction the entire fire alarm system and infrastructure would be replaced and a new addressable fire alarm system with full voice evacuation that complies with local, state and NFPA requirements be installed. System shall be Mircom FX2000 or equal as approved by Owner. The fire alarm would tie into the security and lighting control systems for enhanced safety. Manual pull stations at each exit and at stairwells will be provided. At locations open to the public, protective covers (such as STI Stopper II) to be provided on pull stations.

This upgrade may impact Building E where no work is planned. This includes some possible replacement or retrofit of existing devices. It is assumed Building E would be tied into the new fire alarm system via modules to tie the older system into the new.

Smoke detectors to be provided only in a few areas, such as storage rooms or other rooms where normally not occupied, and corridors. Duct smoke detectors to be provided in supply ductwork for all HVAC equipment with a supply CFM of 2,000 or higher and in the return ductwork where return CFM is 15,000 or greater. Locate detectors per manufacturer's standards and prior to branching of ductwork.

Magnetic door hold-opens will be provided at all classroom, office, etc., doors with closers. Additional smoke detectors are not required at each of these doors.

The fire alarm system will have connections to fire protection systems such as, but not limited to, the sprinkler and kitchen suppression systems.

It is understood a fire pump is not required.

Provide smoke detectors at each elevator lobby and each elevator machine room.

At no location within the building will the decibel level for the fire alarm system be less than 75 dBA.

“Panic buttons” will be provided where required to send alarm to fire or police department as well as release door hold-opens.

The fire alarm will communicate with the local fire department via radio call box per City of Burlington, Vermont standards.

See attached drawing E9 for additional information.

Telecommunications

Reuse of the existing data/phone infrastructure is impractical and replacement of all data circuits is recommended. The older phone lines would be removed entirely and the use of VOIP phones recommended. The existing IT equipment would be reviewed as to whether it could be reused. It is recommended the school district’s IT department start to develop a plan for how a new telecommunication infrastructure should be designed.

Due to the size of the campus and limits to telecom cable lengths, it is proposed to provide data closets throughout Building A similarly to how the electric rooms are being laid out. The telecom conduit(s) would enter the building the same way the electrical does; via the spray booth room within concrete encased conduit. Due to phasing, the new main IT server room and area will not be completed as part of the initial phase work. It is proposed that the room where the telecom service enters building, shown on drawing E2 adjacent to the main electric room, to act as a temporary “main server” space until the final IT and Server room area is completed. The temporary main server room will then become one of the data closets. An additional data closet would be provided for Building B, D and F. Each of these data closets would tie back into a main telecom room via fiber cable. See attached drawing E8.

For Building E, a new conduit would be run from the new building to the Building E existing main telecom room to tie to the school’s main infrastructure.

Contractor shall run CAT6 data cable and terminate at patch panels and CAT6 jacks. Each office or workstation to be provided with (2) RJ-45 jacks in single outlet box. Each jack shall be provided with a dedicated CAT6 cable. All cables and terminations shall be tested per telecom standards.

Provide ceiling mounted data jacks for wireless access ports. Estimate (1) jack every 50’ square (2,500 sf) per floor.

At a minimum provide (1) data jacks for fire alarm panel, (2) data jacks for BMS system, (2) data jacks for each elevator, (2) data jacks for networked lighting control, (2) data jacks for security system, (1) data jack for electronic meter in main 480 volt switchboard.

Kitchen, prep areas, etc., designed by others shall be provided with data and voice jacks as indicated on kitchen equipment vendor supplied drawings. At a minimum, (2) data jacks shall be provided in each location.

In the (4) new classrooms described in the General Power section above, floor boxes with (2) duplex receptacles and (2) data jacks will be provided. Also in classrooms a data jack for a ceiling mounted projector and a data jack on wall for monitor will be provided.

Miscellaneous

The existing security system vendor should also be contacted to determine what, if any, existing equipment can be utilized as part of a building reconstruction. It is expected the existing cabling infrastructure and all devices would be replaced due to it being impractical to attempt to reuse them. The security system would tie into the BMS system. Means to perform functions such as automatic lockdown, lighting control, monitoring by remote means (police department, etc.) would be provided. Security cameras will be located throughout the campus, both indoors and outdoors

The school will be provided with a new public address system throughout.

The existing auditorium lighting systems are to remain as is. The electrical infrastructure (wiring, panelboards, devices, etc.) will be replaced. Any new sound systems or stage lighting to be part of add alternate package.

Within classrooms, meeting rooms or other like locations where TV monitors or similar may be used, a recessed wall mounted 3-gang box with 1.25" conduit with pull string up to ceiling space will be provided to provide for future A/V cable access to monitor. A duplex receptacle and data jack will also be provided.

8. Fire Protection

A new fire protection entrance located in A-building shall be 8" (hydrant flow test is required to verify entrance size and system pipe sizing) and sized to provide a complete NFPA 13 compliant fire protection system for the A and B-buildings. A new 4" fire protection entrance shall be located in F-building (hydrant flow test required to verify entrance size and system pipe size) and sized to provide a complete NFPA 13 compliant fire protection system for the F and D-buildings. The fire protection system shall be designed by a NICET Level III Technician experienced in design of this type of work and licensed in Vermont. The majority of the building shall be covered as Light Hazard density with 0.1 GPM/sq.ft over 1500 sq.ft with some locations such as storage rooms, mechanical rooms, shops and kitchens shall be covered under Ordinary Hazard Group 1 density with 0.15 GPM/sq.ft over 1500 sq.ft. An Ansul fire suppression system shall be installed under the hoods in both kitchens to provide fire protection against grease and cooking fires. Provide dry-type sidewall sprinkler heads to protect exterior canopies.

Fire protection piping shall be threaded-end schedule 40 steel for 1-½" and below. Fire protection piping 2" shall be schedule 40 or schedule 10 steel with grooved fittings.

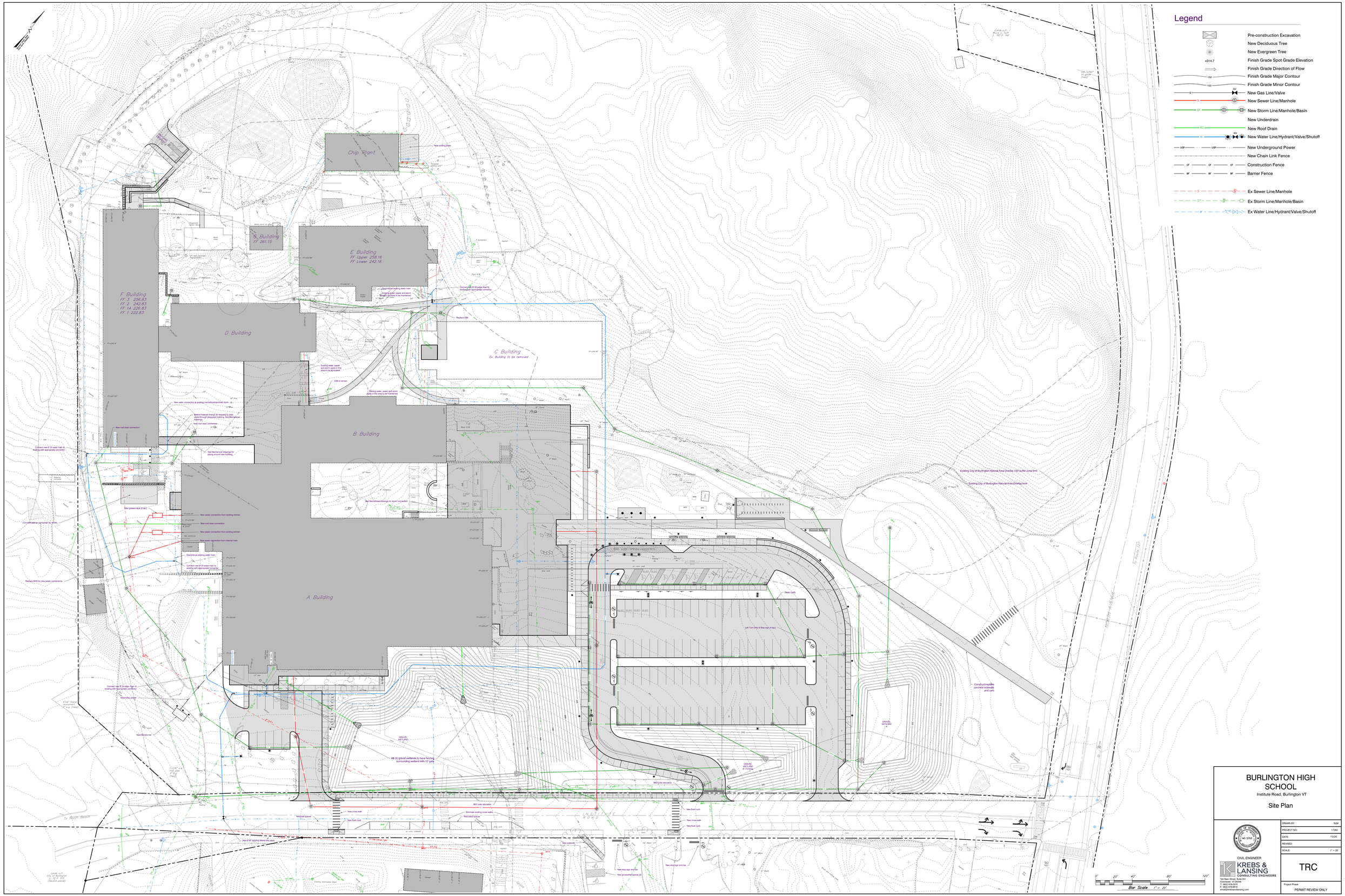
Please feel free to ask us any questions regarding this scope of work.

Sincerely,

Ian Donahue
John Askew

George Martin
Aaron Welch

L.N. Consulting, Inc.


Legend
Pre-construction Excavation
New Deciduous Tree
New Evergreen Tree
x314.7
Finish Grade Spot Grade Elevation
Finish Grade Direction of Flow
150
Finish Grade Major Contour
153
Finish Grade Minor Contour
S
GV
New Gas Line/Valve
S
New Sewer Line/Manhole
ST
New Storm Line/Manhole/Basin
New Underdrain
RD
New Roof Drain
W
WV
New Water Line/Hydrant/Valve/Shutoff
UGP
New Underground Power
New Chain Link Fence
CF
Construction Fence
BF
Barrier Fence
Ex Sewer Line/Manhole
Ex Storm Line/Manhole/Basin
Ex Water Line/Hydrant/Valve/Shutoff
Chip Plant
S Building
FF 261.15
E Building
FF Upper 258.16
FF Lower 242.16
F Building
FF 3 256.83
FF 2 242.83
FF 14 226.83
FF 1 222.83
D Building
C Building
Ex. Building to be removed
B Building
A Building
Existing City of Burlington Natural Area Overlay 100' buffer zone limit
Existing City of Burlington Natural Area Overlay limit
New Curb
Left Turn Only & Stop sign (typ.)
Construct new concrete sidewalk and curb
GRAVEL WETLAND
All (3) gravel wetlands to have fencing surrounding wetland with 10' gate
BED pole relocation
Eliminate existing cross walks
Relocated spaces
New cross walk
New flush curb
New sidewalk
New stop sign and bar
New accessible spaces (2)
Bar Scale 1" = 20'
BURLINGTON HIGH SCHOOL
Institute Road, Burlington VT
Site Plan
DRAWN BY: SLM
PROJECT NO: 17283
DATE: 7/2/20
REVISED:
SCALE: 1" = 20'
TRC
CIVIL ENGINEER
KREBS & LANSING CONSULTING ENGINEERS
164 Main Street, Suite 201
Colchester, VT 05446
P: (802) 878-0375
F: (802) 878-6618
email@krebsandlansing.com
Project Phase
PERMIT REVIEW ONLY

MEMO

TO:	Tom Peterson, CSI LEED AP, Peterson Consulting, Inc.
FROM:	Corey Mack, PE
DATE:	July 2, 2020
SUBJECT:	BHS Campus Plan – Revised Traffic Assessment and Review

The Burlington School District requested RSG to update their analysis of estimated traffic associated with the proposed Burlington High School (BHS) Campus Redesign. This memorandum documents the proposed changes to vehicle access patterns, estimates the associated traffic congestion with the revised vehicle traffic patterns, and recommends potential site and traffic engineering improvements to reduce vehicle conflict, increase safety, and minimize congestion during the dismissal period.

The traffic assessment is based on the overall site plan provided by Wagner Hodgson Landscape Architecture dated June 8, 2020.

1.0 REVISED SITE PLAN

The existing BHS campus is shown in Figure 1, and the revised overall site plan is shown in Figure 2. The primary change to vehicle access is associated with the existing north lot (ENL). The ENL consists of 122 parking spaces, and a curb-side aisle used as approximately 30 temporary pick-up and drop-off spaces. The proposed north lot (PNL), illustrated in the revised site plan, formalizes circulation aisles, creates a centralized school entrance, and levels the parking surface for accessibility. The PNL will include 105 parking spaces and a curb-side aisle for 16 temporary pick-up and drop-off spaces. The number parking spaces, and their specific assigned use, is documented in Table 1.

Compared to the previous campus design presented in earlier traffic assessment, the layout of the revised PNL will operate much more similarly to the existing conditions. Buses will remain on a separate loop directly off North Avenue. Personal vehicles will access the campus from Institute Road. The existing one-way circulation pattern is recommended to remain.

Both the entrance and exit drives to the north lot will shift east along Institute Road. The proposed eastern entrance drive is approximately 240-feet west of North Avenue (the existing drive is approximately 370-feet west of North Avenue, and the previous design drive was approximately 260-feet west of North Avenue), and the proposed western exit drive is approximately across from the south lot east drive.

FIGURE 1: EXISTING BHS CAMPUS

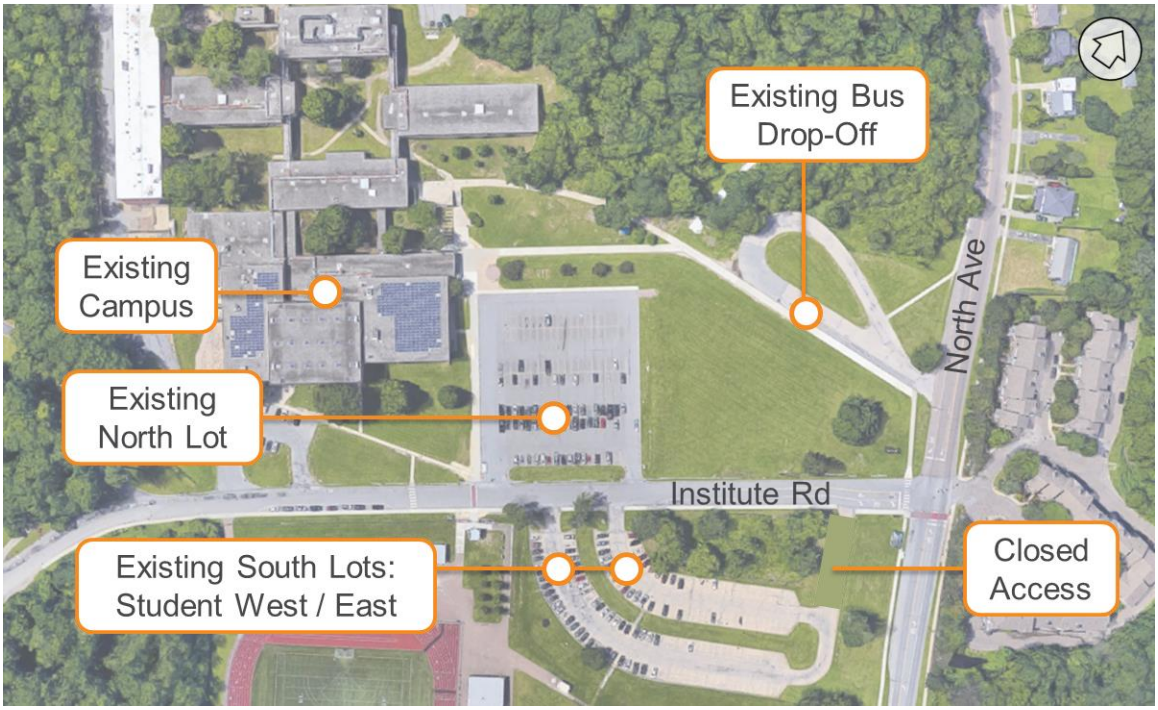


FIGURE 2: PROPOSED BHS CAMPUS (REVISION DATE 6/8/20)

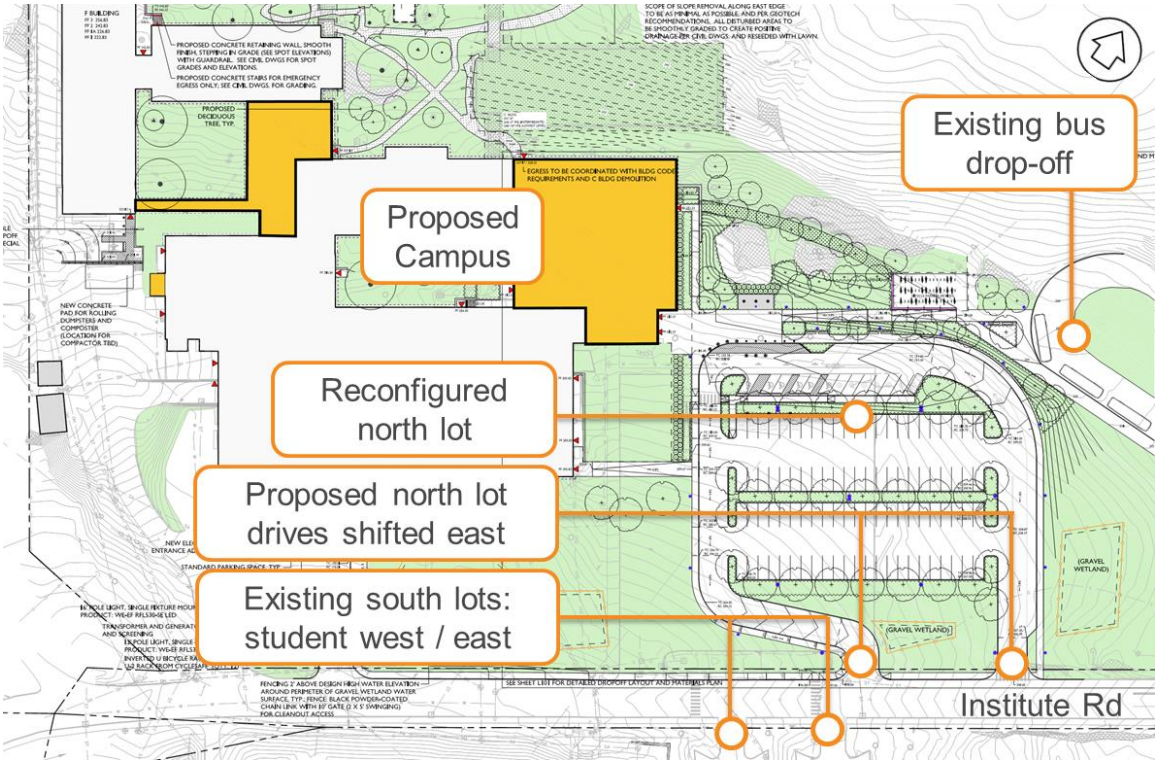


TABLE 1: EXISTING AND PROPOSED NORTH LOT PARKING SPACES

PARKING SPACE TYPE	EXISTING NORTH LOT	PROPOSED NORTH LOT
General Purpose	103	92
Accessible	4	6
Visitor / Short Term	15	7
Parallel Short Term	30	16
Total Parking Spaces	152	121

The school district is not anticipating any changes to overall total student enrollment or employment as a result of the school campus renovation project. The school district is intending to assign 16 existing parking spaces in the rear, wrap around parking area nearest the Burlington Technical Center (BTC) to facility management fleet vehicles. The displaced employees who currently park in these locations are expected to instead park in the overflow south lots as needed.

General school operating hours are not expected to change. These hours are:

Staff Arrival	7:45
Student Arrival	8:00 – BHS; 9:35 – BTC
Student Dismissal	3:05 – BHS; 2:21 – BTC
Staff Departure	3:30

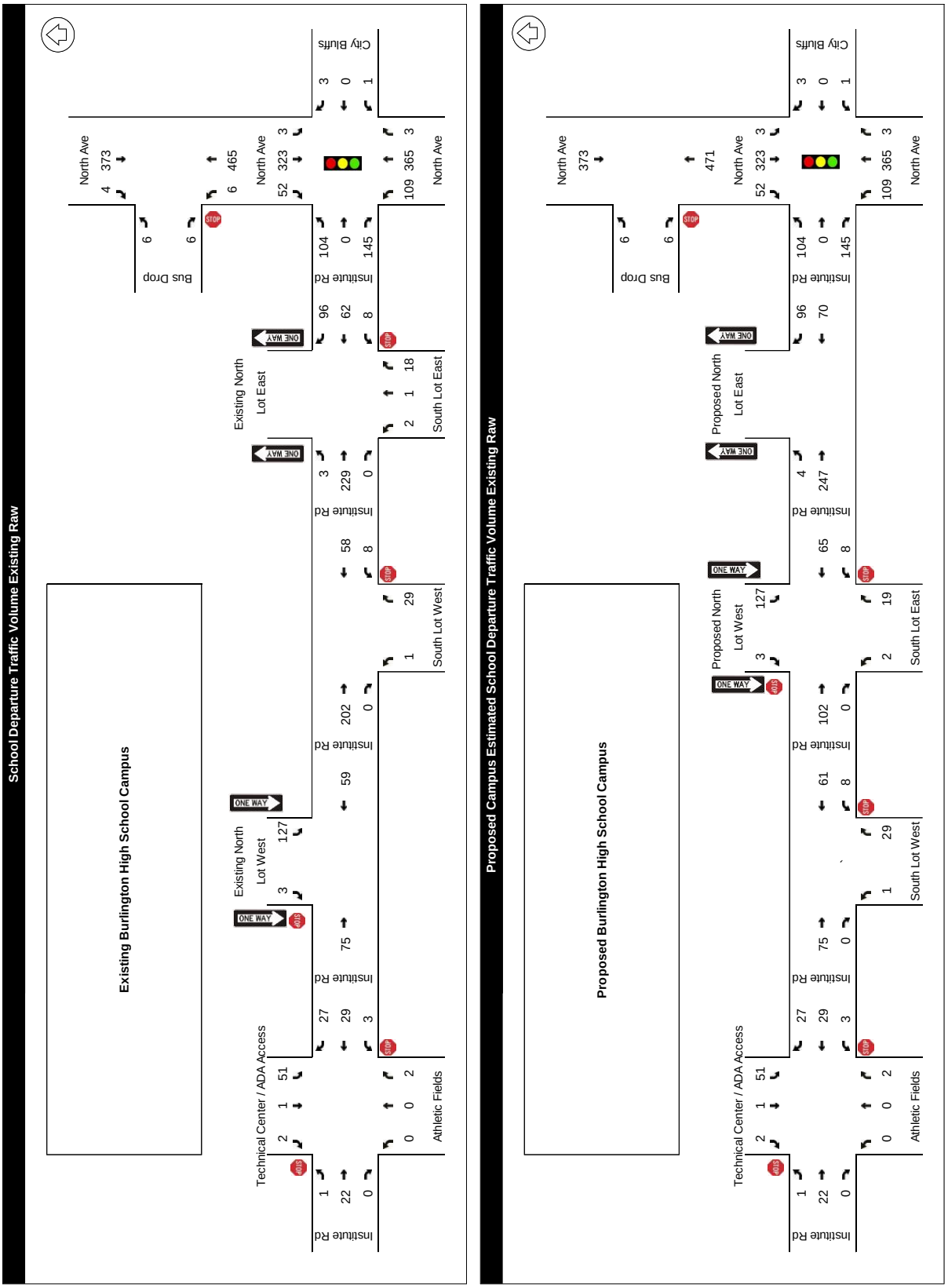
2.0 UPDATED TRAFFIC ANALYSIS

The traffic analysis relies upon trip generation estimates and procedures outlined in the previous memorandum, dated 7/18/19. Please refer to the previous memorandum for details documenting traffic volumes, estimated traffic demand, development of 5-minute peak hour factor (PHF-5) adjusted analysis volumes, and queueing observations.

2.1 DISMISSAL PERIOD

In the previous traffic analysis, RSG estimated traffic demand during the dismissal period to be proportional to the increase in visitor / short term spaces. This updated design results in a decrease in visitor / short term spaces. Rather than apply a proportional reduction in traffic demand associated with the change in visitor / short term spaces, this revised traffic analysis assumes the traffic demand will remain unchanged from the existing observations. The existing PHF-5 analysis volumes are presented in the following figures.

FIGURE 3: SCHEMATIC DRAWINGS OF PHF-5 ADJUSTED TRAFFIC VOLUMES; EXISTING CAMPUS ON LEFT, REVISED CAMPUS ON RIGHT (NOT TO SCALE)



With little change in traffic volumes between existing conditions and proposed conditions, we do not expect to see any significant change in conventional traffic analysis metrics such as delay, level of service, or volume-to-capacity ratio between the No-Build (existing condition) and Build (proposed condition) scenarios.

The layout and spacing of driveways do impact queue development. Queue interaction and spillback can be modeled with SimTraffic microsimulation software. The existing conditions modeling remains unchanged from the previous analysis and is reproduced in the following figure.

FIGURE 4: MAXIMUM QUEUES FROM SIMTRAFFIC MODEL ALONG EB INSTITUTE ROAD AND SB EXISTING NORTH LOT EXIT

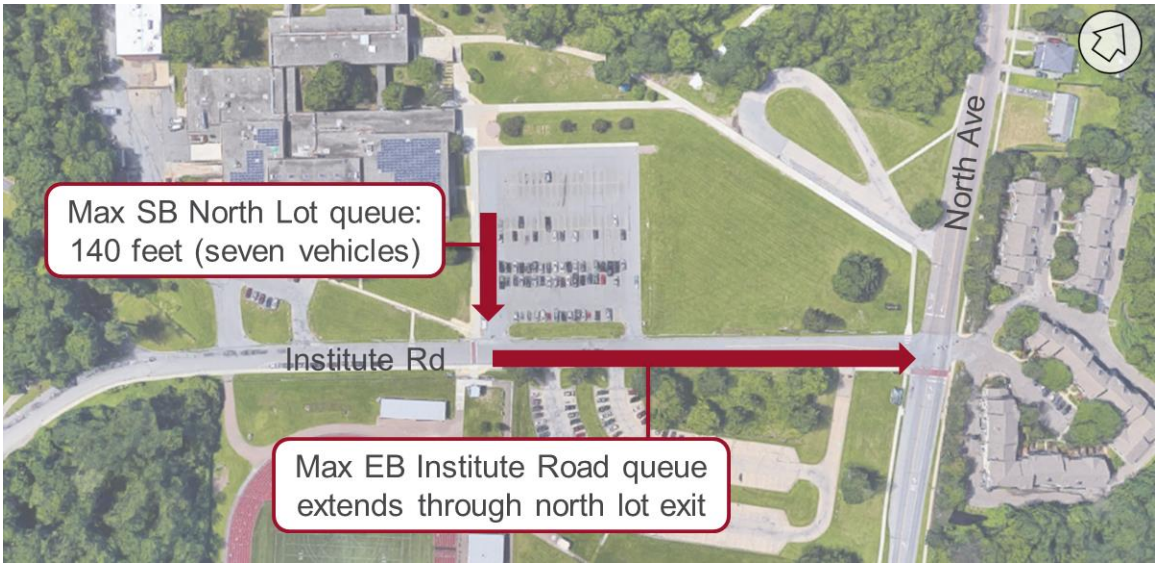
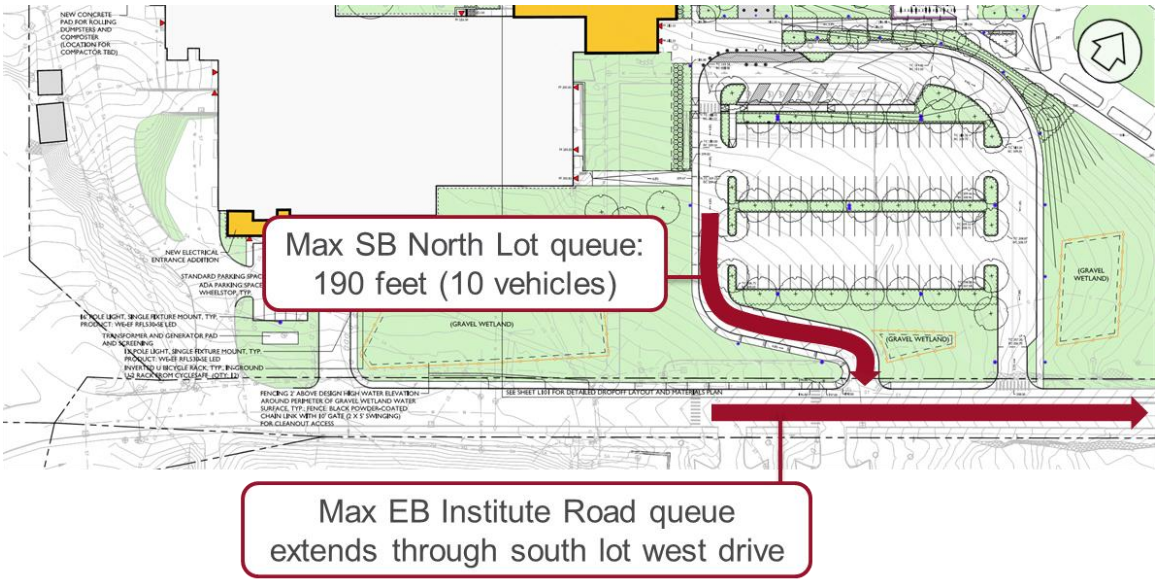


FIGURE 5: MAXIMUM QUEUES FROM SIMTRAFFIC MODEL ALONG EB INSTITUTE ROAD AND SB PROPOSED NORTH LOT EXIT



As discussed in the previous analysis, the queues modeled are unlikely, and would only approach that length for one or two cycles during the peak 10-minute dismissal period from 3:05 to 3:15. Outside of this period, traffic volumes are lower and congestion is not an issue.

2.2 ARRIVAL PERIOD

RSG did not observe the arrival period or capture or process data during the morning peak period at the existing BHS campus. However, it is our experience that student arrival patterns typically exhibit a wider time distribution due to morning activities at the school. A recent analysis of the Winooski School District (WSD) campus travel patterns indicated that drop-offs significantly increased approximately 20 minutes prior to the start of school, with peak drop-offs in final five minutes prior to the start of school. The peak 5-minute arrival period drop-off demand, measured by departures from the school campus in the morning peak, was approximately 56% of the peak 5-minute dismissal period departure demand.

The peak 5-minute dismissal period departure demand at the BHS campus is 62 vehicles, from 3:10 to 3:15. Assuming the same ratio of arrival period drop-off demand to dismissal period departure volume as seen at the WSD campus, the peak BHS drop-off demand is 35 vehicles in 5 minutes, or seven vehicles per minute. Assuming a dwell period of 2 minute for a vehicle to pull over, unload students, and re-enter traffic, the campus would require a drop off capacity of 14 spaces; the PNL proposes an aisle of 16 short-term pick-up and drop-off parallel spaces. The revised layout of the proposed north lot is expected to accommodate peak arrival period drop-off demand.

In the event that peak arrival period drop-off demand exceeds the proposed capacity, queuing is not expected to spill back onto Institute Road or North Avenue. The width of the outer PNL circulation aisle is between 24-feet and 18-feet. While not advised or encouraged, this width should allow circulating traffic to pass double parked or improperly parked vehicles.

3.0 SITE PLAN REVIEW AND RECOMMENDATIONS

Recommendations and observations resulting from our review of the revised site plan are illustrated in Figure 6.

3.1 RECOMMEND ONE WAY CIRCULATION FLOW IN PNL

The eastern entrance drive to the proposed north lot is illustrated in the site plan with a double yellow line. We recommend instituting a one-way circulation pattern to simplify access patterns and reduce the number of vehicle conflict points.

3.2 EXPECT DRIVERS TO USE THE ENTIRE LENGTH OF OUTER CURB DURING THE PICK-UP AND DROP-OFF PERIODS

There is a dedicated parallel pick-up and drop off aisle on the eastern and northern curb lines of the PNL. However, many drivers will ignore open spaces early in the access aisle in order to drop off closer to the entrance or will prefer to queue in the dismissal period at a location to be “first in line” to depart. We would expect many drivers to use the hatched area in the front of the school for morning drop-off, and the western curb line for both morning overflow drop-off and afternoon pick-up standing and queuing.

The PNL circulating aisle width is at least 18-feet; most vehicles would still be able to pass an improperly parked and standing vehicle.

3.3 RECOMMEND ALIGNING THE PNL EXIT AND EAST SOUTH LOT DRIVES

We recommend aligning the PNL exit drive to be directly across from the south lot east drive. Removing the offset to the intersection and allow for clearer vehicle interactions between northbound and southbound approaching vehicles. This may increase the grade of the southbound approach drive above 5%, which would require a handrail. A handrail, while an additional expense, may be advantageous to help keep pedestrians on the walkway rather than walking on the planted slope to reach the south parking lots in the shortest line.

3.4 RECOMMEND MODIFICATIONS ON INSTITUTE ROAD

A short, 90-foot parallel parking aisle is present on the south side of Institute Road, between North Avenue and the existing north lot entrance drive. This parallel parking aisle has capacity for four to five vehicles. During review of the videos of the dismissal period on May 16, 2019, we did not observe any vehicles parked in this parallel parking aisle. We did observe vehicles bypassing the left turn lane queue by driving through the parallel parking aisle. School staff anecdotally noted that these spaces are rarely used except during athletic events or the summer for North Beach parking

The revised site plan did not illustrate any striping at this location. We recommend the striping, parking aisle, and lane designation is clarified through this area. Potential improvements along this location may include:

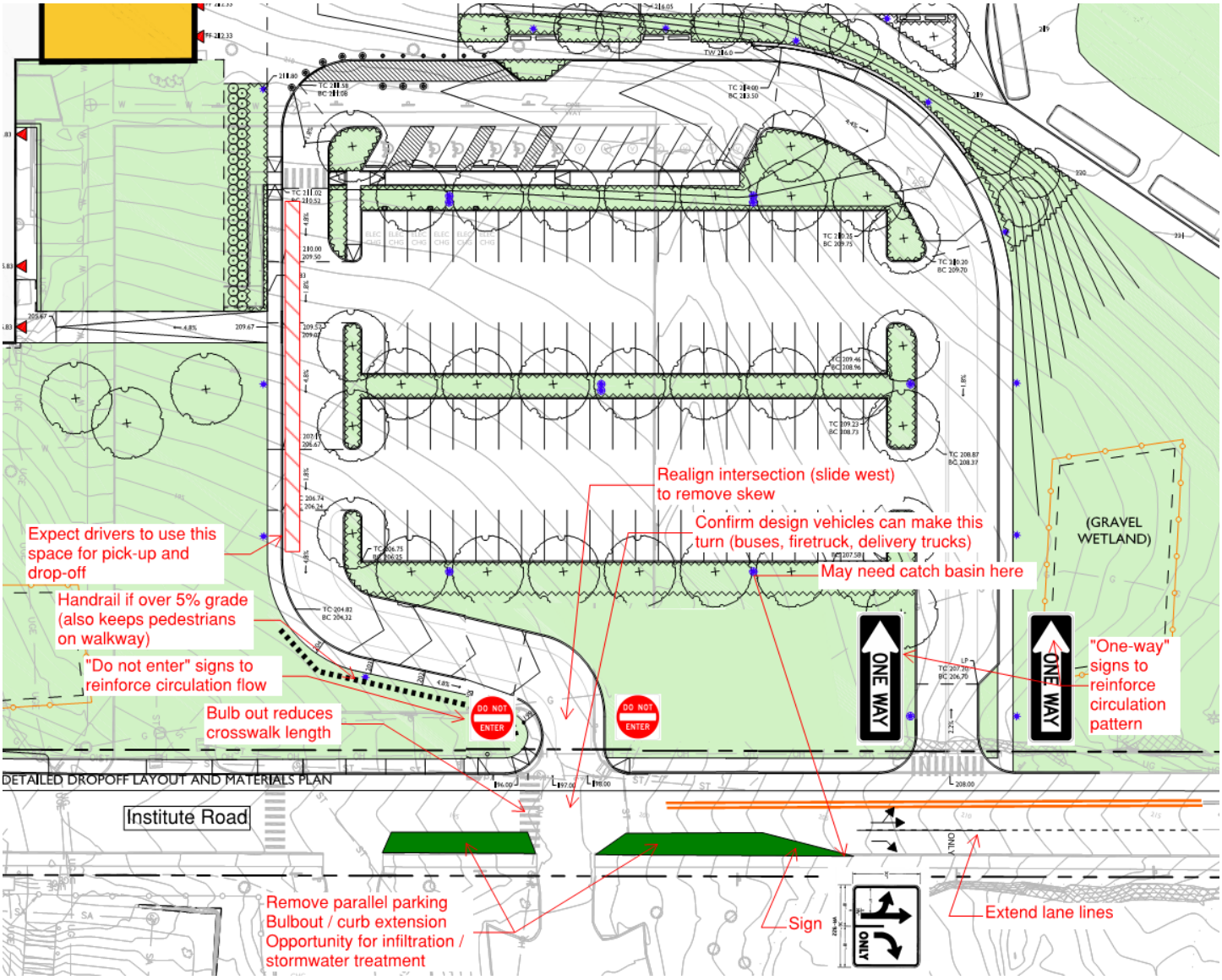
- Removal of the parking aisle to reduce potential conflicts at the Institute Road / PNL entrance drive intersection.
- Clarification of the EB Institute Road approach lanes, which may include:
    - Extension of the turn lane lines
    - Installation of a lane designation sign
    - Installation of bulb outs on the south side of Institute Road to reinforce the one-lane drive aisle and reduce the pedestrian crossing distance.

Additionally, the bulb out areas may provide opportunities for stormwater infiltration and / or treatment.

3.5 RECOMMEND MODIFIED SIGNAL TIMING ON NORTH AVENUE

We recommend working with the City of Burlington's Department of Public Works to implement a dismissal period signal timing plan to be in effect from 3:05 to 3:20. This timing plan could assign a greater percentage of green to Institute Road and / or shorter overall cycle lengths to reduce the queue development along Institute Road. This targeted signal retiming would result in minor increased delay to North Avenue for a short period of time in a non-peak period and only when school is in session.

FIGURE 6: CONCEPT SKETCH OF RECOMMENDATIONS RESULTING FROM REVIEW OF 6/8/20 BHS SITE PLAN



BLACK
RIVER
DESIGN
ARCHITECTS

June 29, 2020

Mary O'Neil, Principal Planner
Permitting and Inspections
645A Pine Street
Burlington, VT 05402-0849
Re: TRC Submission

Dear M. O'Neill,

Burlington School District (BSD) proposes to reconfigure and modernize Burlington High School (BHS). Three additions will be constructed to consolidate programs, improve accessibility, and enhance security.

The main addition is a three story addition at the main entrance to house administrative and support functions with a new secure entrance vestibule as well as replace the C Building classrooms and provide for a modernized library more conveniently located for both student and public access. An auxiliary gym to be located near the main building entrance remains an option, but is budget dependent. A second three story addition will connect A, B, D, and F buildings near the BHS cafeteria and house an elevator, the Intensive Special Needs (ISN) suite and multiple Science Labs. It will provide a new direct connection between BHS and BTC. The third addition is located south of the existing gymnasium and provides for a new four-story elevator and egress stair and accessibility for the music rooms located at the ground level. The On Top program will continue to be located on the fourth floor of A Building. Aging infrastructure will be replaced to decrease maintenance costs and improve energy efficiency. The scope of work for Burlington Technical Center (BTC) programs housed in F Building will be limited to ADA and Building Code required improvements. C Building will be demolished and E Building will remain on site to be used for future BSD programming with no renovations planned at this time.

Primary BHS (A, B, and D Buildings) infrastructure upgrades include:
* Addition of automatic sprinkler system throughout
* New addressable fire alarm system throughout
* New interior plumbing piping and fixtures
* New LED lighting and low voltage controls
* Addition of cooling throughout
* New heating and ventilation throughout
* New flooring and ceiling finishes
* New windows
* New roofs

73 Main Street, Rm. 9 Montpelier, VT 05602 (802) 223-2044
BLACKRIVERDESIGN.COM

Major sitework features of the proposal include:
* Regraded parking lot to improve accessibility and traffic flow
* Stormwater treatment to meet State and City regulations
* Relocated electrical service with provisions to connect a portable generator for emergency power
* Improved traffic circulation routes able to support fire department vehicle access
* New underground utility (sewer, water, power, and stormwater) infrastructure
* Additional ADA parking distributed across the site
* Additional and conveniently located bicycle parking
* Electric Vehicle charging stations

The existing woodchip plant (Building H) will remain in use and unchanged. No improvements to the existing bus loop or any facilities south of Institute Road are included in this project. The project will address the presence of pre-existing asbestos, urban soils and PCB contamination.

Respectfully Submitted,

John Hemmelgarn, Partner

Submission materials:
* Overall Site plan (with parking counts)
* Lot Coverage Plan
* 3D Orientation Plan (bird's-eye views)
* Floor Plans
* Proposed Entry Views with and without Auxiliary Gym
* Energy Model
* HVAC Narrative

Department of Permiting 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
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Alison Davis, Zoning Clerk
Theodore Miles, Zoning Specialist
Charlene Orton, DPI Administrator

MEMORANDUM

To: The Design Advisory Board
From: Ryan Morrison, Associate Planner
RE: ZP21-0050PD; 260-280 Manhattan Drive
Date: August 25, 2020

File: 21-0050PD
Location: 260-280 Manhattan Drive
Zone: RM **Ward**: 3N
Parking District: Neighborhood
Date application accepted: July 16, 2020
Applicant / Owner: Sam Gardner / PBGC, LLC & 280 Manhattan, LLC
Request: Planned Unit Development involving, 260, 264-266, 272, and 280 Manhattan Drive. Development includes construction of a triplex, and associated parking and infrastructure.

Background:

260 Manhattan Drive

- **Zoning Permit 18-0891CA**; change of dwelling unit to group home, shared parking with 272 Manhattan Drive. May 2018.

264-266 Manhattan Drive

- **Zoning Permit 99-538**; demolish duplex returning area to green space, install chain link fence. May 1999.

272 Manhattan Drive

- **Zoning Permit 18-0890CA**; change of use to group home, shared parking with 260 Manhattan Drive. May 2018.

280 Manhattan Drive

No previous zoning permits.

Overview: The applicant proposes a Planned Unit Development with four properties (260, 264-266, 272, and 280 Manhattan Drive). New development will include a new triplex fronting Manhattan Drive, with a shared parking lot to the rear which will provide parking for the various uses within the PUD. Existing uses within the proposed PUD include a group home on 260 Manhattan Drive, a group home and detached garage on 272 Manhattan Drive, and duplex on 280 Manhattan Drive.

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).

Part 1: Land Division Design Standards
No land division or boundary line adjustments are proposed. As a Planned Unit Development (PUD), the development area will be reviewed by the DRB under Article 11.

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

(a) Protection of Important Natural Features:

With the exception of an elevation drop at the rear of the PUD, there are no significant natural features located on the site. As development is proposed in the front half of the PUD boundary, there will be no impact to the steep slope to the rear.

(b) Topographical Alterations:

While there is a drop in elevation at the rear of the involved properties, the proposed triplex and shared parking area will locate on generally flat ground. No significant topographical alterations are defined within the project application.

(c) Protection of Important Public Views:

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

(d) Protection of Important Cultural Resources:

There are no known archaeological resources on the site, nor are there any listed structures of historic significance involved in the PUD. There are no plans to alter the existing structures.

(e) Supporting the Use of Renewable Energy Resources:

No part of this application precludes the use of wind, solar, water, geothermal or other renewable energy resource.

(f) Brownfield Sites:

This address is not listed on the Vermont DEC website for identified Brownfields.

(g) Provide for nature's events

An Erosion Prevention and Sediment Control Plan has not been submitted and will need to be for review and approval by the Stormwater Program Manager. Their review and written approval will be a condition of this permit.

The elevation drawings show recessed and covered building entries. The site plan indicates plenty of room for onsite snow storage.

(h) Building Location and Orientation:

The proposed triplex will be aligned with the front façade of neighboring buildings and will reinforce the existing street edge. Each unit will have a front entrance and walkway to the public sidewalk, thus creating clearly identifiable front entrances. A new parking lot to serve the overall PUD will locate behind the proposed triplex and the group home at 260 Manhattan Drive. The other existing structures within the PUD will remain unchanged.

(i) Vehicular Access:

A paved driveway off of Manhattan Drive, between the proposed triplex and the existing duplex at 280 Manhattan Drive, will be constructed for the various uses within the PUD. This driveway will lead to a new 12-space parking area in the rear as well as connect with the existing gravel driveway/parking area for the duplex at 280 Manhattan Drive. Also, there is a shared driveway off of Manhattan Drive, immediately adjacent to 280 Manhattan Drive, that will also provide vehicular access to the PUD.

(j) Pedestrian Access:

Pedestrian access is proposed between each triplex unit and the sidewalk along Manhattan Drive. The group home at 260 Manhattan Drive and the duplex at 280 Manhattan Drive will continue to have pedestrian access from the Manhattan Drive sidewalk. Additionally, there will be walkways between the access driveway and parking area to the group home at 260 Manhattan Drive, the proposed triplex, and the group home at 272 Manhattan Drive.

(k) Accessibility for the Handicapped:

The building inspector has jurisdiction over ADA requirements. By his direction and per Chapter 8 of the Burlington Code of Ordinances, 4 to 14 units must provide 1 accessible unit.

(l) Parking and Circulation:

The PUD is located within the Neighborhood Parking District. Parking requirements are based on each individual use. Dwelling units require two spaces per unit and group homes require one space per two beds. In accordance with ZPs 18-0890CA and 18-0891CA, the group home on 260 Manhattan Drive requires 2 spaces, and the group home at 272 Manhattan Drive requires 5 spaces. With the group homes combined with the proposed triplex and existing duplex on 280 Manhattan Drive, the minimum parking space requirement for the overall PUD totals 17 spaces. The proposed plans show a 12 space parking lot behind the future triplex – 5 spaces short of the 17 space minimum. The 'existing gravel driveway' located behind 280 Manhattan Drive appears to have the ability to provide a few more spaces. It will be the applicant's responsibility to show on a revised site plan at least 17 onsite parking spaces.

(m) Landscaping and Fences:

The site plan and elevation drawings show new landscaping around the proposed triplex. Specific plantings are unknown and will need to be identified, along with each type of plant's sizes at the time of planting. The plans do not indicate any fencing.

(n) Public Plazas and Open Space:

While there are no formal public plazas included in the plans, there appears to be potential for shared open spaces within the PUD. There is some yard space around the proposed triplex and behind the group home at 260 Manhattan Drive. Additionally, there appears to be some yard space to the sides and rear of the proposed parking area. Given the number of residential units included within this PUD, some outdoor amenity space is encouraged to be identified and programmed for the enjoyment of the tenants. Open space / common land is a requirement of PUDs under Article 11.

(o) Outdoor Lighting:

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

No lighting information has been provided, and is required. The elevation drawings do not include exterior light fixtures. Fixture information and illumination levels are required, and the elevation drawings need to be revised to include exterior light fixture locations.

(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 location of mailboxes, utility connections, meters, trash/recycling bins and mechanical equipment must be identified on the site plan and building elevations as appropriate. All electrical service to the new building shall be underground.

Part 3: Architectural Design Standards
Sec. 6.3.2 Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

The proposed triplex will be two stories tall and will be similar in massing, height and scale to other nearby residential buildings. It will maintain similar front yard setbacks, for a consistent streetscape along this stretch of Manhattan Drive. Further, this new structure, combined with the group home at 260 Manhattan Drive, will also act as a screen to the rear parking area.

2. Roofs and Rooflines.

The new building will have a flat roof, which is unique in the immediate area. However, 280 Manhattan Drive (which is included within the PUD) also has a flat roof.

3. Building Openings

The front (south) and rear (north) facades contain symmetrical building openings across the three units. The side facades (west & east) each contain one ground level window.

(b) Protection of Important Architectural Resources:

There are no listed historic structures included as part of this PUD, nor are there any proposed changes to the existing structures within.

(c) Protection of Important Public Views:

There are no protected important views from this property. Not applicable.

(d) Provide an active and inviting street edge:

The front façade of the new building offers relief from a monotonous front wall. Each unit will be similar in style, with a more forward front wall for living space, and an inset entrance with a front deck. Each unit will have its own concrete walkway to the public sidewalk as well. Siding on the front façade will be of two types: 1) wood or cement board clapboard siding and 2) cement panels.

(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.*

Sheathing on all sides will be a mix of wood or cement board clapboards and cement panels. Windows will be fiberglass double hung/combo windows. The building will also have metal fascia around. For the decking, the applicant proposes PVC decking. The roof material will be rubber membrane.

(f) Reduce energy utilization:

All new construction shall 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:

Any signage will require a separate zoning permit.

(h) Integrate infrastructure into the building design:

The applicant has indicated that he will update the plans to include any mechanical units. Those updated plans have yet to be submitted.

(i) Make spaces secure and safe:

This development is subject to all applicable building and life safety codes as defined by the Burlington's Building Inspector and the Fire Marshal.

Items for the Board's consideration:

- Because the PUD involves 4 separate parcels, a zoning permit application for each property must be filed. Only one application has been filed under 260 Manhattan Drive. Three more applications are needed – one for 264-266, 272, and 280 Manhattan Drive.
- The site plan shall be revised to show a minimum of 17 onsite parking spaces within the boundary of the PUD.
- The plans shall be updated to include the following:
    - More specific lot coverage calculations breaking down each existing property including all buildings, walkways, decks, patios, driveway/parking space to ensure compliance with Article 4 of the CDO.
    - Exterior lighting
    - Long/short term bicycle parking
    - Trash/recycling area(s)
    - Mechanical units
    - All parking spaces to comply with the
    - Specific landscaping details
- Spec sheets for the following shall be submitted:
    - Exterior light fixtures
    - Doors
    - Roofing material
- The Erosion Prevention and Sediment Control Plan as well as a Stormwater Plan are subject to review and approval by the Stormwater Engineering Division.
- Electrical service shall be underground unless otherwise permitted by the DRB.
- Screening must be provided between parking areas and boundary lines to prevent headlight trespass onto neighboring properties.

Department of Permiting 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
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Alison Davis, Zoning Clerk
Theodore Miles, Zoning Specialist
Charlene Orton, DPI Administrator

MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: Items brought up for discussion by Chair Eric Morrow
Date: August 25, 2020

The following issues were raised by Chair Eric Morrow at the DAB meeting July 28, 2020:

1. DAB membership

From the Comprehensive Development Ordinance (CDO):

PART 5: ADVISORY COMMITTEES
Sec. 2.5.1 Design Advisory Board

(a)Composition and Terms

There shall be a Design Advisory Board (or DAB) consisting of ***five (5) members and two (2) alternates*** *appointed to staggered three (3) year terms by the city council with mayor presiding. A majority of the members shall be professionals from any of the following fields: architecture, landscape architecture, engineering, planning, contracting, archaeology, or real estate development. To the extent possible, at least two (2) of the members shall be professionals from the disciplines of history, architectural history, architecture or historical architecture. Any appointment to fill a vacancy shall be for the unexpired term. Any member may be removed at any time for just cause by vote of the city council with mayor presiding, for reasons given to the member in writing, and after a public hearing on the issue if the member so requests.*

(b)Powers and Duties

In addition to other responsibilities which may by assigned by the city council, the design advisory board shall, upon request of the board or the administrative officer, review requests for certificates of appropriateness in accordance with the design review standards specified in Article 6, and prepare written advice and recommendations to the board. Such projects may include but not be limited to:

1. *Applications involving site plan and design review subject to review and approval by the Board; and,*
2. *Applications involving historic buildings or sites; and,*

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).

3. *Applications reviewed under the Major Impact (Sec. 3.5.2(b)), Planned Development (Art. 11), and Subdivision (Art. 10) provisions of these regulations.*

A change to the number of Board members would require a change to the ordinance; to be advanced through a vote by a majority of the Design Advisory Board; advancing to the Planning Commission and ultimately City Council.

2. Minutes of the Design Advisory Board

Section IV of the DAB Bylaws addresses meeting minutes:

C. It shall be the duty of all members to review the minutes and other official records of DAB meetings and actions, and correct and ratify these when appropriate and necessary.

D. Planning & Zoning Department staff shall record decisions of all meetings.

Eric Morrow has requested a revision to the DAB Bylaws to revise the method and format of minutes. He expressed the desire to review and vote on acceptance of minutes.
The Bylaws outline the duty of member to review the minutes, and to correct and ratify "when appropriate and necessary."
Currently, minutes are written by staff and meet the requirements outlined by the City Attorneys' office to be consistent with Vermont Public Meeting law. DAB minutes include the date, location of meeting, agenda items, who is present (staff, board members, applicants and guests) and detail actions (motion, second, vote.)
On the rare occasion when a member has a question about previous decisions, staff has provided the document for review. As an advisory board, there has been no evidence that detailed transcripts of meetings have been necessary or required by statute.
To require more comprehensive minutes would require the attendance of another staff member to record, complete and post.

3. Allowing all attendees to be granted entrance to a (remote) meeting
New challenges have resulted in new technology to conduct public meetings. DAB, like Conservation Board and Development Review Board are conducted on a Zoom platform as a webinar. When the meeting manager begins the hearing, the option to "Broadcast" is activated, allowing all panelists and attendees to "observe" the hearing. The meeting manager does retain control of audio for all attendees, and can mute/unmute at appropriate times.
Staff believes the public hearing element of the Chair's concern is met.

4. Member absences
The following excerpt from the DAB Bylaws addresses absences:

Absence of any member from more than three (3) consecutive or eight (8) total meetings over a period of one fiscal year will be cause for consideration for removal from the board. At the discretion of the chair and voted by a majority of the board, such affirmative vote for removal shall be advanced to the City Council immediately, requesting the appropriate measures be taken.

Board members may be removed for cause by the City Council upon written charges and after public hearing. 24 V.S.A. § 4460(c).

Members will be advised by staff when two (2) consecutive or a total of four (4) absences have accumulated. This measure shall not be applicable to alternates, where their attendance is required only by absence or recusal of a regular member.

Please see attached membership attendance records.
Tom Cullins was notified July 30 of four consecutive absences, and 4 out of 6 in this calendar year.

5. Technical review of projects with 5+ residential units
The Chair, as a registered architect, believes the board should undertake technical review of projects that propose more than 5 residential units for code compliance and adequacy of professional plans.
Staff (Mary O'Neil) outlined the requirments for application submission under the ordinance, which do not require plans prepared by an architect or engineer (with the exception of survey plats and documents relative to demolition of historic structures.) Such technical review is under the jurisdiction of the building inspector who may require more technical plan sets.
The CDO does not support the suggested requirement of the Chair.

Burlington Design Advisory Board
Department of Permitting and Inspections
645 Pine Street
Burlington, VT 05401
http://www.burlingtonvt.gov/DPI/Boards/Design-Advisory-Board/
Telephone: (802) 865-7188

Eric Morrow, Chair
Matt Bushey, Vice Chair
Tom Cullins
Ron Wanamaker
Karyn Norwood
Vacant, Alternate
Vacant, Alternate

DESIGN ADVISORY BOARD
Tuesday, August 25 2020
Remote Meeting via Zoom

Present: Eric Morrow, Matt Bushey, Ron Wanamaker, Karyn Norwood, Tom Cullins

Absent: None.

Staff present: Mary O'Neil

Applicants and guests present:

Greg Doremus, Bruce baker, John Hemmelgarn, Marty Spaulding, Jennifer Green, Tom Peterson, Mark Montminy, Jesse Remick, Jeff Hodgson, Hannah Loope.

Session I – 3:00 PM – 3:30 PM

20-0717CA/MA; 273 Pearl Street (RH, Ward 8E) Triple Tree Group, LLC (Bruce Baker, Greg Doremus)
Planned Unit Development involving 273 Pearl St, 11 Hungerford Terrace, 15 Hungerford Terrace, and 21 Hungerford Terrace. Demolish porch and move garage at 21 Hungerford; demolish garage at 11 Hungerford. Construct 12-unit residential building with related parking and supporting infrastructure.

Motion by Matthew Bushey:
I move we forward this project to the DRB with a recommendation for approval, with the following comments:
1. The demolition of the garage at 11 Hungerford and the porch at 21 Hungerford will not notably diminish the historic character of those houses, and is approved.
2. In response to recommendations from the DAB, the applicant has revised the design of the streetfront façade, with changes to cladding materials and the front porch that bring the building into an acceptable level of compatibility with the surrounding buildings.
3. Based on the Parking Management Plan submitted by the applicant and the site topography, the DAB recommends that the requested parking waiver be granted, to allow for 19 parking spaces in lieu of the required 36.
4. Mailboxes should be relocated from the public sidewalk to an interior or sheltered location, such as the Common Entry on the South Elevation or the Common Entry / Lounge.
5. Solar PV is recommended for the large, flat roof.

2nd KN

Vote 5-0
Motion carries

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 Planning & Zoning at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188 (TTY users: 865-7142).

Session II – 3:30-4:00 PM

21-0050PD; 260-280 Manhattan Drive (RM, Ward 3C) PBGC, LLC (Sam Gardner)
Planned Unit Development involving 260, 264, 272, and 280 Manhattan Drive. Construct new triplex building and a new shared parking area to the rear for the other existing residential homes within the boundary of the PUD.

Application is deferred to the September 22, 2020 meeting,

Session III – 4:00-4:30 PM

20-0194SP; 52 Institute Road (RCO-RG, Ward 4N) Burlington School Dept.
Sketch plan review for redevelopment of Burlington High School and related site work.

As this is only Sketch Plan review, no action is taken.

Karyn Norwood leaves meeting @4:15 pm.
Tom Cullins leaves meeting @ 5:00 pm.

Session IV – 4:30-5:00 PM

Other Business; Discussion of Board member attendance, other Chair concerns
Discussion of making motions, Roberts Rules relative to Zoom meetings.

1. Staff outlined the composition of the DAB as adopted and within the Comprehensive Development Ordinance. It was agreed that until there is a full complement of Board members (including alternates); it does not make sense to consider expanding the size of the DAB.
2. To assuage the concerns of the Chair, staff assured the Board that Zoom allows for "Broadcasting" the meeting, which allows all attendees to observe and participate in Board hearings.
3. Eric Morrow (Chair) continues his concern about a lack of compliance with state statute relative to review of a 5+ residential building without a licensed professional as an agent of the project. Matt Bushey suggests posting a Vt. AIA flyer in the zoning office to educate. Ron Wanamaker suggests this is a building office review issue, and outside the purview of this Board. Mary O'Neil (staff) asks Chair to formulate a narrative of what the statute requires and what Burlington's Code of Ordinances directs: To provide a side-by-side comparison illustrating where Burlington's requirements may differ from that of the state. It is agreed that this document will then be forwarded to the City Attorneys' office for review and further guidance.
4. There is a broad discussion of the challenges of remote meetings, including today's where panelists and applicants were not able to "get in" and required another link to be

sent to gain access. Mary O'Neil (staff) agrees that this is a new hurdle, but will seek the advice of other colleagues in assuring a more timely entrance and smooth commencement of meetings.

5. Eric Morrow asks Mary to consult with the City Attorney on the requirement to vote on meeting minutes. There was a broad discussion of what is required by Public Meeting Law and the directives provided by the Attorneys' office in 2014. Staff currently posts minutes immediately after each hearing, including information of what matters were discussed, Board and staff members present, guests and applicants present, and any action (motion, second, vote, decisions) taken by the Board.
6. The Board discussed the DAB Bylaw relative to Board attendance, and decided not to consider the absences of a Board member.

Meeting adjourned 5:15 pm.