

Burlington Development Review Board

149 Church Street, City Hall
Burlington, VT 05401

www.burlingtonvt.gov/pz/DRB

Telephone: (802) 865-7188

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Austin Hart
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AJ LaRosa
Geoff Hand
Alexandra Zipparo
Wayne Senville
Jim Drummond, (Alternate)
Robert Purvee, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday February 7, 2017, 5:00 PM AMENDED PUBLIC HEARING NOTICE

The Burlington Development Review Board will hold a meeting on
Tuesday February 7, 2017 at 5:00pm in Contois Auditorium, City Hall.

- 1. 17-0669CA/MA; 29 Starr Farm Beach Road (RL, Ward 4N) David Porteous**
Construction of a stone seawall, slope stabilization, and repair of existing metal stairs. (Project Manager, Ryan Morrison)
- 2. 15-0525CA/MA; 87-95 North Ave and 15-0526CA/MA; 7 Haswell Street (NMU, Ward 3C) COTS**
Application for re-approval of:
ZP 15-0525CA/MA to renovate and add to the existing building at 87-95 North Ave for 14 new residential units as part of a mixed use building, and
ZP 15-0526CA/MA, to demolish an existing house at 7 Haswell St. and merge lot in conjunction with ZP 15-0525CA/MA.
(Project Manager, Ryan Morrison)
- 3. 17-0662CA/MA; 75 CHERRY STREET (D, Ward 3C) BTC Mall Associates, LLC**
Mixed use redevelopment of the existing Burlington Town Center mall site and associated lot line adjustments. (Project Managers, Scott Gustin, Mary O'Neil)

Plans may be viewed in the Planning and Zoning Office, (City Hall, 149 Church Street, Burlington), between the hours of 8:00 a.m. and 4:30 p.m.

Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Planning and Zoning office is considered public and cannot be kept confidential.

This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/pz/dr/ agendas or the office notice board, one week before the hearing for the order in which items will be heard.

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BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday February 7, 2017, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT AGENDA

- I. Agenda
- II. Communications
- III. Minutes
- IV. Consent
 1. **17-0669CA/MA; 29 STARR FARM BEACH (RL-W, Ward 4N) David Porteous**
Construction of a stone seawall, slope stabilization, and repair of existing metal stairs.
(Project Manager, Ryan Morrison)
 2. **15-0525CA/MA; 87-95 NORTH AVE and 15-0526CA/MA; 7 HASWELL STREET (NMU, Ward 7) COTS**
Application for re-approval of:
ZP15-0525CA/MA to renovate and add to the existing building at 8-95 North Ave for 14 new residential units as part of a mixed use building, and
ZP15-0526CA/MA to demolish an existing house at 7 Haswell St and merge lot in conjunction with ZP15-0525CA/MA. (Project Manager, Ryan Morrison)
- V. Public Hearing
 3. **17-0662CA/MA; 75 CHERRY STREET (D, Ward 3C) BTC Mall Associates, LLC**
Mixed use redevelopment of the existing Burlington Town Center mall site and associated lot line adjustments. (Project Managers, Scott Gustin, Mary O'Neil)
- VI. Other Business
- VII. Adjournment

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The programs and services of the City of Burlington are accessible to people with disabilities.

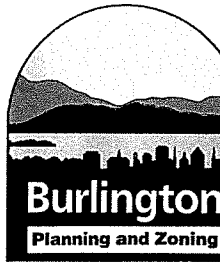
Individuals who require special arrangements to participate are encouraged to contact the Department of Planning & Zoning at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188 (TTY users: 865-7142).

Printed on 100% Recycled Paper

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
<http://www.burlingtonvt.gov/PZ/>
Telephone: (802) 865-7188
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David E. White, AICP, Director
Meagan Tuttle, Comprehensive Planner
Jay Appleton, Senior GIS/IT Programmer/Analyst
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, CFM, Associate Planner
Anita Wade, Zoning Clerk



MEMORANDUM

To: Development Review Board
From: Ryan Morrison, CFM, Associate Planner
Date: February 7, 2017
RE: 17-0669CA/MA; 29 Starr Farm Beach Road

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

File: ZP17-0669CA/MA

Location: 29 Starr Farm Beach Road

Zone: RLW **Ward:** 4N

Date application accepted: December 21, 2016

Applicant/ Owner: David & Vicky Porteous

Parking District: Neighborhood

Request: Construction of a stone seawall, slope stabilization, and repair of existing metal stairs

Applicable Regulations:

Article 3 (Applications, Permits, and Project Reviews), Article 4 (Zoning Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Review Standards)

Overview:

The applicant is seeking approval to construct a seawall for shoreline and slope stabilization and to repair existing metal stairs. The seawall will be constructed of quarry stone and rip rap along the property's southern half of lakeshore. As the seawall is located partially below the 102' elevation, it is subject to review under the special flood hazard area regulations in addition to dimensional and design review standards. As required, the project is subject to review and approval by the State National Floodplain Insurance Program Coordinator, Rebecca Pfeiffer, at VT DEC. A copy of the application was provided to the Coordinator on December 28, 2016, and a response was received on January 4, 2017 (see email dated January 4, 2017 from Rebecca Pfeiffer). The Coordinator stated that only the standards of Sec. 4.5.4 (f) 8.C (ii)-(iii) & (v) of the Burlington Comprehensive Development Ordinance will apply.

- ii. All development shall be designed to minimize flood damage to the proposed development and to public facilities and utilities;*
- iii. All development shall be designed to provide adequate surface drainage to reduce exposure to flood hazards; and*

- v. *All necessary permits shall be obtained from those governmental agencies from which approval is required by federal or state law.*

The Coordinator states that if the project is completed as proposed, it would appear to meet these minimum standards. Ms. Pfeiffer recommends that the City request the following from the applicant consultant:

- Confirm the vertical elevation datum used for the site plans (i.e. NGVD 1929 or NAVD 1988); and
- Delineate the boundary of the FEMA Base Flood Elevation (BFE) on the site plan for reference. The BFE for Lake Champlain is 101.6' (NAVD) or 102' (NGVD).

Conditions of approval will reflect the requirements of Sec. 4.5.4 (f), and Ms. Pfeiffer's recommendations.

Given this project's location along the Lake Champlain shoreline, review by the Conservation Board is required. That review occurred on January 23, 2017, and the Board voted unanimously (8-0-0) to support the project as proposed.

There are no previous zoning actions for this property.

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

I. Findings

Article 3: Applications, Permits and Project Reviews

Part 5: Conditional Use and Major Impact Review

Section 3.5.2 Applicability

(a) Conditional Use Review

Conditional Use Review shall be required for the approval of all development subject to the following provisions of this ordinance:

1. *any use identified under Article 4 and Appendix A – Use Table as a “Conditional Use” Or “CU;”*

Sec. 4.5.4 (c) & (f) each require conditional use review for new construction within their respective overlay zones: the Riparian and Littoral Conservation Zone and the Special Flood Hazard Area. **(Affirmative finding)**

(b) Major Impact Review

In addition, Major Impact Review shall be required for the approval of all development Involving:

6. *Site improvements and land development on parcels that contain designated wetlands as regulated pursuant to Article 4, or natural areas of state or local significance as identified in the municipal development plan.*

The location of the proposed seawall lies within the Lake Champlain shoreline, a natural area of both state and local significance. **(Affirmative finding)**

Section 3.5.6 Review Criteria

(a) Conditional Use Review Standards

Approval shall be granted only if the DRB, after public notice and public hearing, determines that the proposed conditional use and associated development shall not result in an undue adverse effect on each of the following general standards:

1. *Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*
The proposed seawall and repairs to the existing stairs will have no impact on existing or planned public utilities, facilities, or services. **(Affirmative finding)**
2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the Municipal Development Plan;*
The subject property is within the Waterfront Residential Low Density Zone. This zone is typified by single family homes. The existing single family home will remain unchanged. **(Affirmative finding)**
3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*
The proposed seawall is not expected to have any nuisance impacts. **(Affirmative finding)**
4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation, safety for all modes; and adequate transportation demand management strategies;*
The proposed seawall will have no impacts on traffic or other transportation matters. **(Affirmative finding)**
5. *The utilization of renewable energy resources;*
No part of this request prohibits the use of wind, solar, water, geothermal or other renewable energy resources. **(Affirmative finding)**
and;
6. *Any standards or factors set forth in existing City bylaws and city and state ordinances.*
The city now has full delegation down to the 95.5' elevation. No state shoreland permit is needed. **(Affirmative finding)**

(b) Major Impact Review Standards

Before a major impact development may receive approval, the DRB must be satisfied, based on documentation provided by appropriate city agencies, experts, interested parties and/or the applicant that the proposed development shall:

1. *Not result in undue water, air or noise pollution;*

The proposed seawall and stair repairs should not result in undue water, air or noise pollution. **(Affirmative finding)**

2. *Have sufficient water available for its needs;*

The proposed use will not require water availability. **(Affirmative finding)**

3. *Not unreasonably burden the city's present or future water supply or distribution system;*

The proposal will not place any burden on the current or future water supply or distribution system. **(Affirmative finding)**

4. *Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;*

The seawall proposal is to control/prevent erosion of a shoreline slope on a residential property. **(Affirmative finding)**

5. *Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;*

There are no existing or proposed travelways through the subject property. The proposal will not create congestion or unsafe conditions. **(Affirmative finding)**

6. *Not cause an unreasonable burden on the city's ability to provide educational services;*

The proposed seawall will place no burden on educational services. **(Affirmative finding)**

7. *Not place an unreasonable burden on the city's ability to provide municipal services;*

No burden will be placed on municipal services. **(Affirmative finding)**

8. *Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;*

No adverse effects will be placed on the Lake Champlain shoreline. The seawall will protect a shoreline slope from erosion. **(Affirmative finding)**

9. *Not have an undue adverse effect on the city's present or future growth patterns nor on the city's investment in public services and facilities;*

Lake Champlain borders the subject property to the west. No city growth will occur westward of the subject property. **(Affirmative finding)**

10. *Be in substantial conformance with the city's municipal development plan and all incorporated plans;*

The proposed seawall is accessory to the existing single family residence, a permitted use in the underlying zone. **(Affirmative finding)**

11. *Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location;*

The seawall will have no impact whatsoever on the housing needs of the city.

(Affirmative finding)

and

12. *Not have an undue adverse impact on the present or projected park and recreation needs of the city.*

No part of the proposal will impact park and recreation needs of the city. **(Affirmative finding)**

(c) Conditions of Approval

In addition to imposing conditions of approval necessary to satisfy the General Standards specified in (a) or (b) above, the DRB may also impose additional conditions of approval relative to any of the following:

1. *Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area;*
The project will not create a situation where noise and glare will occur. The seawall will be in character with the waterfront development that exists in the surrounding area.
(Affirmative finding)
2. *Time limits for construction.*
The applicant will have one year from the date of final decision to commence with the project, and one year after that to complete the project. If additional time is needed, the applicant may request a one-year extension from the DRB. **(Affirmative finding)**
3. *Hours of operation and/or construction to reduce the impact on surrounding properties.*
The applicant has not proposed construction times. Staff recommends limiting construction times to 7AM – 5PM, Monday – Friday, and Saturdays per DRB allowance. Sunday construction will be prohibited. **(Affirmative finding as conditioned)**
4. *That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions,*
Should the applicant wish to enlarge or alter the seawall and/or staircase, it will be subject to DRB review. **(Affirmative finding as conditioned)**
and
5. *Such additional reasonable performance standards, conditions and safeguards as it may deem necessary to implement the purposes of this chapter and the zoning regulations.*
See Sec. 4.5.4 (c) & (f) below. **(Affirmative finding)**

Article 4: Zoning Maps and Districts

Section 4.4.5 Residential Districts

(a) Purpose

(2) Waterfront Residential Low Density (WRL)

The subject property is located in the WRL zone. This zone is intended primarily for low density residential development in the form of single detached dwellings and duplexes with consideration given to design review. The existing single family residence will remain unchanged. **(Affirmative finding)**

(b) Dimensional Standards & Density

As a result of this proposal, lot coverage will total 20%, well below the maximum allowance of 35% in the WRL zoning district.

The seawall is located within the 75' lakeshore setback; however, walls (i.e. retaining walls and seawalls) are specifically allowed to encroach into setbacks per Sec. 5.2.5, *Setbacks*, (b) *Exceptions to Yard Setback Requirements*.

The seawall is well under the maximum allowable height of 35'. **(Affirmative finding)**

(c) Permitted and Conditional Uses

The seawall is accessory to the single family use. **(Affirmative finding)**

(d) District Specific Regulations

1. *Setbacks*
Not applicable.
2. *Height*
Not applicable.
3. *Lot Coverage*
Not applicable.
4. *Accessory Residential Structures and Uses*
Not applicable.
5. *Residential Density*
Not applicable.
6. *Uses*
Not applicable.
7. *Residential Development Bonuses*
Not applicable.

Section 4.5.4 Natural Resource Protection Overlay District:

(c) District Specific Regulations: Riparian and Littoral Conservation Zone

(4) Requirements

1. *Any land disturbing activities (i.e., vegetation has been removed, or the landscape has*

been graded or filled resulting in bare soil surfaces) shall include a stormwater management, erosion prevention and sediment control plan pursuant to the requirements of Sec. 5.5.3 to be reviewed by the conservation board and approved by the city engineer.

In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater, prevent erosion, and control sedimentation. The city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules;

The project will result in 370 sf of land disturbance. Due to the size and location of the seawall, a stormwater management plan is not necessary. The applicant has, however, submitted an erosion prevention and sediment control (EPSC) plan, which was reviewed and approved by the stormwater program manager on January 20, 2017. The Conservation Board also reviewed the EPSC as part of their overall project review, held January 23, 2017. The Board voted unanimously to support the project. **(Affirmative finding)**

2. *Agricultural and silvicultural activities shall follow Best Management Practices for the Protection of Water Quality;*

Not applicable.

3. *Installation of any seawalls, rip-rap or other shoreland retention structures shall be submitted for review by the conservation board who shall consult with the city engineer prior to issuance of a recommendation to the DRB; and*

As noted above, the Conservation Board reviewed the application on January 23, 2017, and voted unanimously (8-0-0) in support of the project as proposed. The wall will be reviewed by the city engineer or designee prior to construction via the building permit process. **(Affirmative finding)**

4. *No new stormwater outfall shall directly discharge into any surface water without approval and implementation of a stormwater management plan approved by the city engineer.*

No new stormwater outfall is included in this proposal. **(Affirmative finding)**

(f) District Specific Regulations: Special Flood Hazard Area:

(7) Special Review Criteria

- A. *The danger to life and property due to increased flood heights or velocities caused by encroachments;*

The seawall will be placed within the lakeshore flood hazard area. Lakeshore flood dynamics are unlike those of river flood dynamics. The water does not flow at perceptible speeds and is not subject to constriction. Placement of the seawall within the lakeshore flood zone will have no impact on flood heights or velocities. **(Affirmative finding)**

- B. *The danger that material may be swept on to other lands or down stream to the injury of others;*

The new seawall will be constructed of quarry stone, with an 18" deep keyway into the beach. Type I stone rip-rap (18" min.) will locate behind, and above, the quarry stone

wall. There is little danger that the structure will be swept away by flood waters.
(Affirmative finding)

C. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions;
Not applicable.

D. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
The seawall is a protective measure against flood damage to the property. The potential for flood damage to the seawall itself is minimal. **(Affirmative finding)**

E. The importance of the services provided by the proposed facility to the community;
The seawall is of little importance to the Burlington community; however, it will provide substantial protection to the private property that it will be located on. **(Affirmative finding)**

F. The availability of alternative locations not subject to flooding for the proposed use;
The point of the seawall is to protect the property from flood damage. Its placement within the flood zone is key to this function. Its location within the floodplain is acceptable.
(Affirmative finding)

G. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future;
Seawalls are commonplace along Burlington's lakeshore. **(Affirmative finding)**

H. The relationship of the proposed use to the municipal development plan;
The Municipal Development Plan does not address seawalls. It does speak to the development pattern of single family homes and duplexes in the RL and WRL zones. The subject property contains a single family residence. Insofar as homes along the lakeshore commonly have seawalls, the proposal can be found in compliance with the MDP.
(Affirmative finding)

I. The safety of access to the property in times of flood or ordinary and emergency vehicles;
The new seawall will have no effect on the safety of access to the property during times of flood. **(Affirmative finding)**

J. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site; and
The maximum regulatory flood elevation along the lakeshore is 102' above sea level. The seawall will have no impact on flood heights, velocity, duration, rate of rise, or sediment transport. **(Affirmative finding)**

K. Conformance with all other applicable requirements of this ordinance.
See Articles 4, 5, and 6 of these findings.

Article 5: Citywide General Regulations

Section 5.2.3 Lot Coverage Requirements

See Sec. 4.4.5 (b) above.

Section 5.2.4 Buildable Area Calculation

Not applicable.

Section 5.2.5 Setbacks

See Sec. 4.4.5 (b) above.

Section 5.2.6 Building Height Limits

See Sec. 4.4.5 (b) above.

Section 5.2.7 Density and Intensity of Development Calculations

Not applicable.

Section 5.5.1 Nuisance Regulations

Nothing in the proposal appears to result in creating a nuisance under this criterion. **(Affirmative finding)**

Section 5.5.3 Stormwater and Erosion Control

The applicant has submitted an erosion prevention and sedimentation control plan for the project. The applicant has stated that the site contractor will install EPSC measures to keep things onsite. Both the stormwater program manager and the Conservation Board reviewed the EPSC plan and have approved it for the project. Due to the size and location of the project, a stormwater plan is not necessary. **(Affirmative finding)**

Article 6: Development Review Standards

Part 1: Land Division Design Standards

Not applicable.

Part 2: Site Plan Design Standards

Sec. 6.2.2 Review Standards

a) Protection of Important Natural Features

The subject property is located along the Lake Champlain shoreline. The shoreline is identified as a significant natural area. Much of the property is affected by the Natural Resource Protection Overlay District, specifically the riparian and littoral conservation zone, which stretches inland 250' from the 95.5' lakeshore elevation. As required, an erosion control plan was reviewed and approved by the stormwater program manager. The Conservation Board reviewed this project on January 27. The Board voted unanimously to support the project as proposed. **(Affirmative finding)**

b) Topographical Alterations

A fairly steep bank separates the lake from the house site and lawn area. There will be some excavation of the slope, enough to accommodate the new seawall and rip rap. Additionally, a site plan identifies that a large tree trunk will be removed.

- c) *Protection of Important Public Views*
Not applicable.
- d) *Protection of Important Cultural Resources*
Not applicable.
- e) *Supporting the Use of Renewable Energy Resources*
Not applicable.
- f) *Brownfield Sites*
Not applicable.
- g) *Provide for Nature's Events*
See Sec. 5.5.3.
- h) *Building Location and Orientation*
Not applicable
- i) *Vehicular Access*
Not applicable.
- j) *Pedestrian Access*
Not applicable.
- k) *Accessibility for the Handicapped*
Not applicable.
- l) *Parking and Circulation*
Not applicable.
- m) *Landscaping and Fences*
No new landscaping is included in this proposal.
- n) *Public Plazas and Open Space*
Not applicable.
- o) *Outdoor Lighting*
Not applicable.
- p) *Integrate Infrastructure into the Design*
Not applicable.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

Not applicable.

II. Conditions of Approval

1. **Prior to release of the zoning permit**, the applicant shall confirm the vertical elevation datum used for the site plans (i.e. NGVD 1929 or NAVD 1988)
2. **Prior to release of the zoning permit**, the applicant shall delineate the boundary of the FEMA Base Flood Elevation (BFE) on the site plan for reference. The BFE for Lake Champlain is 101.6' (NAVD) or 102' (NGVD).
3. All development shall be designed to minimize flood damage to the proposed development and to public facilities and utilities.
4. All development shall be designed to provide adequate surface drainage to reduce exposure to flood hazards.

5. All necessary permits shall be obtained from those governmental agencies from which approval is required by federal or state law.
6. The project shall be done in accordance with the EPSC plan, approved January 20, 2017.
7. Construction hours shall be limited to Monday – Friday from 7:00 AM – 5:00 PM. Saturday construction may be allowed upon request to the Development Review Board. No work on Sunday
8. Any proposed alteration or enlargement of seawall and/or the staircase will be subject to DRB review and approval.
9. The applicant/property owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required.
10. Standard Permit Conditions 1-15.



Department of Planning and Zoning

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Burlington, VT 05401-8415

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www.burlingtonvt.gov/pz

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DEC 21 2016

DEPARTMENT OF
PLANNING AND ZONING

Zoning Permit Application

Use this form for ALL zoning permit applications. See the relevant checklist for specific requirements.

PROJECT LOCATION ADDRESS: 29 STARR FARM BEACH RD.

PROPERTY OWNER*: STARR FARM BEACH ASSOCIATION
C/O JEFFREY NOWELL, TRUSTEE
(J.J. FLYNN ESTATE)

*If condominium unit, written approval from the Association is also required

APPLICANT: DAVID PORTEOUS & VICKY PORTEOUS

POSTAL ADDRESS: PEOPLES UNITED BANK
PO BOX 820

POSTAL ADDRESS: 136 CRESCENT RD

CITY, ST, ZIP: BURLINGTON, VT 05402

CITY, ST, ZIP: BURLINGTON, VT 05402

DAY PHONE: 802-660-2152

DAY PHONE: 802-343-6066

EMAIL: jeffrey.nowell@peoples.com

EMAIL: dave@homesvermont.com

SIGNATURE: [Signature]

I am the owner. In addition, I duly authorize the applicant (if noted) to act on my behalf for all matters pertaining to this zoning permit application.

SIGNATURE: [Signature]

Description of Proposed Project: CONSTRUCTION OF A PROPOSED STONE
SEAWALL, SLOPE STABILIZATION AND REPAIR OF EXISTING
METAL STAIRS.

Existing Use of Property: ☒ Single Family ☐ Multi Family: # Units ☐ Other:

Proposed Use of Property: ☒ Single Family ☐ Multi Family: # Units ☐ Other:

- Does your project involve new construction, addition, alteration, renovation, or repair to a structure that is heated or cooled? Yes ☐ No ☒
(If yes, the Vermont Residential Building Energy Standards (VRBES) apply. Visit the P&Z Office, Public Service Board or PSB website for details)
- Will 400 sq ft or more of land be disturbed, exposed and/or developed? Yes ☐ No ☒
(If yes, you will need to submit the 'Erosion Prevention and Sediment Control Plan' questionnaire, with a site plan)
- For Single Family & Duplex, will total impervious area be 2500 sq ft or more? Yes ☐ No ☒
(If yes, you will need to submit the 'Stormwater Management Plan' questionnaire, with a site plan)
- Are you proposing any work within or above the public right-of-way? Yes ☐ No ☒
(If yes, you will need to receive prior approval from the Department of Public Works)

Estimated Construction Cost (value)*: \$ 24,667.00

(*Estimated cost a typical contractor would charge for all materials and labor, regardless of who physically completes the work)

Within 30 days of submission, the permit application will be reviewed for completeness, and, if complete, will be processed administratively or referred to a board for review. All permit approvals or denials are subject to an appeal period (15 days for administrative permit; 30 days for board permit). A building (and/or electrical, mechanical, plumbing, curb cut) permit will also be required. Contact the Department of Public Works at 802-863-9094 to inquire. Please ask for assistance if you have any questions about filling out this form. Call the Planning and Zoning at 802-865-7188, or visit the office in the lower level of City Hall, 149 Church Street.

Office Use Only: Zone: RL-W Eligible for Design Review? 4 Age of House 1920 Lot Size 10512

Type: SN AW FC BA COA 1 COA 2 COA 3 CU MA VR HO SP DT MP

Check No. 1443 Amount Paid \$507.46 Zoning Permit # 17-0669CA

April 20



PHOTO #1

Existing Conditions at the proposed seawall location. Note portion of unstable shale ledge, undermined tree stumps and stair supports.

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DEPARTMENT OF
PLANNING & ZONING



PHOTO #2

Existing seawall and slope stabilization at adjoining lot to the north. Proposed seawall and rip-rap will be similar in scale and color.

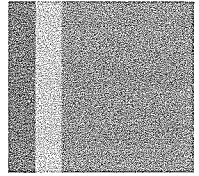
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PLANNING & ZONING

CJ Design Build, LLC

215 Curtis Ave.
Burlington, VT 05408
(802) 752-8461



January 17, 2017

Attn: Ryan Morrison
City of Burlington Zoning
149 Church St, City Hall
Burlington, VT 05401

Re: 29 Starr Farm Beach Road, Dave and Vicky Porteous Camp, Proposed Seawall

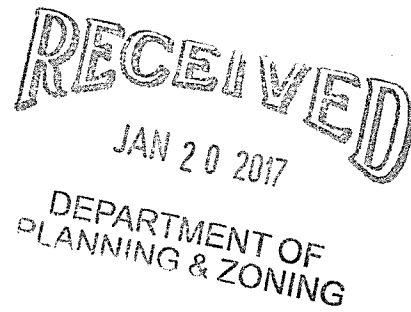
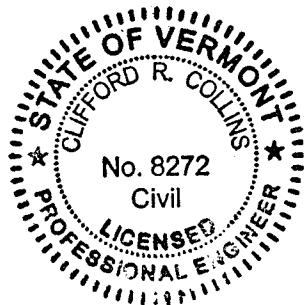
Dear Ryan:

As per your request, am submitting this memorandum regarding the above referenced project. The design depicted on the enclosed plans is consistent with the Shoreline Stabilization Handbook for Lake Champlain and Other Inland Lakes. In fact, the handbook includes a photographic depiction of an almost identical seawall with rip-rap slope stabilization.

Please feel free to call me, or email at cjdesignbuildvt@gmail.com if you have any questions.

Warm regards,

Clifford R. Collins, Jr., P.E.



Ryan Morrison

From: Pfeiffer, Rebecca <Rebecca.Pfeiffer@vermont.gov>
Sent: Wednesday, January 04, 2017 1:03 PM
To: Ryan Morrison
Subject: RE: DEC Notification - City of Burlington - 29 Starr Farm Beach Road seawall project

Hi Ryan,

I hope you had a good New Year and a good holiday season.

I looked through the proposal for the slope stabilization and metal stair repair for 29 Starr Farm Beach Rd. From the site plan and the section profile, it appears that very little of the proposed work will be located within the mapped Special Flood Hazard Area, i.e. any new development that will occur at elevation 102' and below. The work that would occur within the floodplain appears to be the key stone at the base of the wall and the large quarry stone for the seawall face. Some of the type I stone that would be used to backfill behind the seawall, and the repairs to the existing metal stairs like the replacement of two concrete piers supporting the stairs.

As this is not a structure, only the standards of 4.5.4 (f)8.C (ii)-(iii) & (v) in the Burlington Comprehensive Development Ordinance would apply, which is:

- All development shall be designed to minimize flood damage to proposed development and public facilities and utilities;
- All development shall be designed to provide adequate surface drainage to reduce exposure to flood hazards, and
- All necessary permits be obtained from those governmental agencies from which approval is required by federal or state law.

If the project is completed as proposed, it would appear to meet those minimum standards.

We typically encourage designs that minimize the use of any fill in the flood hazard area, and specifically for seawalls, to minimize the chance that the seawall will deflect wave energy to neighboring properties, which could lead to additional erosion on an adjoining property.

Before issuing any permit, I would recommend that the City request the following from the applicant/consultant:

- Confirm the vertical elevation datum used for the site plans (i.e. NGVD 1929 or NAVD 1988); and
- Delineate the boundary of the FEMA Base Flood Elevation (BFE) on the site plan for reference. The BFE for Lake Champlain is 101.6' (NAVD) or 102' (NGVD)

As always, other State, Federal or local permits may be required for this project. The VT DEC Permit Specialist for your region should be able to help identify any other State Environmental Permits that may be necessary. These comments are offered in accordance with 24 VSA §4424.

Please let me know if you have any additional questions or would like to further discuss,

Rebecca



**WATERSHED
MANAGEMENT DIVISION**
RIVERS PROGRAM

Rebecca Pfeiffer, CFM | Floodplain Regulatory Team Lead/Northwest VT Floodplain Manager
River Corridor & Floodplain Protection Program
111 West Street
Essex Junction, VT 05452
C 802-490-6157 | F 802-879-3871

PLEASE NOTE MY NEW EMAIL ADDRESS: Rebecca.Pfeiffer@vermont.gov

Flood Ready Vermont: <http://floodready.vermont.gov/>

VT Floodplain Management Blog: <http://vtffpm.blogspot.com/>

VT ANR Natural Resources Atlas: <http://anrmaps.vermont.gov/websites/anra/>

River Corridor & Floodplain Protection Website: <http://dec.vermont.gov/watershed/rivers/river-corridor-and-floodplain-protection>

From: Ryan Morrison [mailto:rmorrison@burlingtonvt.gov]
Sent: Wednesday, December 28, 2016 12:35 PM
To: Pfeiffer, Rebecca <Rebecca.Pfeiffer@vermont.gov>
Subject: DEC Notification - City of Burlington - 29 Starr Farm Beach Road seawall project

Hi Rebecca.

I am attaching a permit application for a proposed seawall, slope stabilization and stair repairs at 29 Starr Farm Beach Road for your review. This is under conditional use and major impact review and we'll be bringing this to the DRB January 31st or February 7th.

This should satisfy our mandatory 30-day DEC notification requirement... Let me know if you need anything else.

Thanks Rebecca!! Take care

Ryan Morrison, CFM
Associate Planner
City of Burlington
802-865-7190

"Please note that this communication and any response to it will be maintained as a public record and may be subject to disclosure under the Vermont Public Records Act."

Ryan Morrison

From: Do Not Reply <emailautomation@burlingtonvt.gov>
Sent: Wednesday, December 28, 2016 12:38 PM
To: harris@roen.net
Cc: Ryan Morrison
Subject: P+Z Notification for Major Impact Development Application Received

This is an electronically-generated notification from the Burlington Department of Planning and Zoning.

This is to inform you that an application for a Zoning Permit - COA and Major Impact Development was received on Dec 21 2016, and has been deemed complete.

Project Address: 29 Starr Farm Beach

Project Description: *Construction of a stone seawall, slope stabilization, and repair of existing metal stairs.*

ZP#: 17-0669CA/MA

Zoning District: Residential - Low Density - Waterfront

Project Use: Residential

Project Type: Other Project Type

Estimated Construction Cost: \$24,667.00

For more information, please contact the Project Manager, Ryan Morrison (PH: 802-865-7190 EM: rmorrison@burlingtonvt.gov). The project file is available for you to review in the Planning and Zoning office during regular work hours.

Note: This is an electronically generated email. Please do not reply to this email as the From: email address is not for a human.

AN EROSION PREVENTION AND SEDIMENT CONTROL PLAN

FOR THE PROJECT AT:

29 Starr Farm Beach Road

HAS BEEN FILED WITH THE CITY OF BURLINGTON
STORMWATER MANAGEMENT PROGRAM IN ACCORDANCE
WITH CHAPTER 26 OF THE BURLINGTON CODE OF ORDINANCES

THIS REQUIRES THAT MEASURES BE INSTALLED OR TAKEN TO
PREVENT SEDIMENT FROM LEAVING THE SITE AND ENTERING
WATERWAYS AND IMPACTING CITY INFRASTRUCTURE
(RIGHT OF WAY AND STORMDRAINS)

FOR QUESTIONS OR TO REPORT SEDIMENT LEAVING THE SITE
CALL 802-863-4501

This notice to be posted in full view at all times during earth
disturbance. Additional conditions on attached.

Plan Approved by: Jenna Calvi
Burlington Stormwater Program

Digitally signed by Jenna Calvi
DN: cn=Jenna Calvi, c=US, o=City
of Burlington, ou=Department of
Public Works,
email=jcalvi@burlingtonvt.gov
Date: 2017.01.20 10:44:56 -05'00'

Date: 1/20/2017

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PLANNING & ZONING
Nov 2015 (standard form ver.4)



Burlington Department of Public Works
Stormwater Program

234 Penny Lane (Water Plant)

Burlington, VT 05401

PH: 802-863-4501 Email: stormwater@burlingtonvt.gov

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Standard Erosion Prevention & Sediment Control (EPSC) Plan

This questionnaire and associated EPSC plan sheets are required for projects

- on properties other than single family (R1) or duplexes (R2) that require a level II or III Certificate of Appropriateness or Major Impact zoning applications and involve 5000 sq. ft. or more of earth disturbance; or
- any activity where a zoning permit is not required but where the project involves 10,000 sq. ft. or more of earth disturbance; or
- if requested by the Stormwater Program due to project characteristics such as slope, soils or proximity to drainage structures or waterbodies.

Please note that you must submit EPSC plan and detail sheets as outlined in section A below.

All projects involving redevelopment or addition of impervious surface must submit the stormwater management screening project (attached) for evaluation or meet with the Stormwater Program to determine the stormwater management requirements for your project.

1. Project Location 29 STARR FARM BEACH RD
2. Zoning Permit Address (if different from above): _____
3. Brief Project Description (i.e. building construction, subdivision, site work)
CONSTRUCTION OF A STONE SEAWALL WITH RIP-RAP SLOPE
PROTECTION AND REPAIR OF EXISTING METAL STAIRS
4. Owner Name: STARR FARM BEACH ASSOCIATION, C/O JEFFREY NOWELL, TRUST
5. Owner Mailing Address: PEOPLES UNITED BANK, PO BOX 820, BURLINGTON, VT 05402
6. Owner Phone: 802-660-2152 6. Owner email: jeffrey.nowell@peoples.com
7. Contractor Name: ENGINEERS CONSTRUCTION, INC. ☐ Contractor not known at this time
8. Contractor Phone: 802-863-6389 9. Contractor Email: alan@ecivt.com
10. Estimated Project Start Date 2/15/17 Estimated End Date 3/15/17
11. Area of Land Disturbance 370 sq. ft.
12. Total proposed (existing + new) amount of impervious: 2,473 sq. ft.
14. Does your project require a State Construction Stormwater Permit (9020 or INDC)? ☐ Yes ☒ No
(You will be required to submit proof of your authorization to discharge prior to initiation of earth disturbance).

A. REQUIRED PLAN SHEETS:

15. Plan sheet(s) MUST BE ATTACHED showing the following:

- | | |
|--|---|
| ☐ Limits of disturbance | ☐ Direction of stormwater flow on site |
| ☐ Location of stockpiles (if any) | ☐ Location of sediment control BMP's (silt fence etc.) |
| ☐ Location of stabilized construction entrances | ☐ Stabilization measures |
| ☐ Phasing plan (if appropriate) | |

16. Detail sheet MUST BE ATTACHED and include details for all EPSC measures listed on the EPSC Plan Sheet. Additionally, notes must be included related to:

- ☐ Daily inspection of roadways and sweeping as necessary
- ☐ Dewatering measures (if applicable)
- ☐ Temporary site stabilization requirements
- ☐ Final site stabilization requirements
- ☐ Winter site stabilization (for disturbance after November 1)
- ☐ Inspection requirements

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PLANNING & ZONING

B. EPSC QUESTIONNAIRE (See last page for typical solutions to these questions)

A) Do you anticipate the need for any dewatering of excavations during the construction? ☐ Yes ☒ No

- If yes, please indicate which plan sheet has details for how dewatering operations will be managed to prevent the discharge of sediment laden water. Sheet(s): _____

B) Will excavated soil be stockpiled on the site? ☐ Yes ☒ No If yes, show locations and EPSC measures for the stockpile on plan sheet(s)

- If no, where is the ultimate disposal of excess soil? EXCESS SOIL WILL BE TRUCKED TO ECI'S RECYCLING FACILITY.

C) Do you plan to park construction vehicles on or disturb City owned property like the greenbelt area? ☐ Yes ☒ No

- If yes, tell us how you agree to repair all disturbances or damage to City owned property and provide a written approval from the City allowing construction vehicles to park on City owned property.

- If no, then please monitor all construction and visitor vehicles and advise all not to park on City owned property.

D) Will stockpiles or disturbed soils be present and/or exposed after Nov. 1st of any construction year? ☒ Yes ☐ No

- If yes, tell us how you plan to stabilize any stockpile and/or disturbed soils.

THE WORK IS ANTICIPATED TO BE COMPLETED IN WINTER. EXPOSED ERODIBLE SOILS WILL BE REQUIRED TO BE STABILIZED WITH TARPS, EROSION MATTING, OR HEAVY MULCH IF RAIN IS ANTICIPATED WITHIN 24 HOURS OR IF THE SITE WILL BE INACTIVE FOR MORE THAN 24 HOURS.

Do you agree to abide by the following conditions?

☒ ☐ N Applicant will call 863-4501 or email gjohnson@burlingtonvt.gov at least 24 hours prior to initiating earth disturbance and submit the name and contact (cell phone and email) of the erosion control coordinator for the project

☒ ☐ N Applicant will post the attached notice in a visible location

☒ ☐ N I acknowledge that it is the responsibility of the owner and his/her representatives to ensure that:

- ☐ sediment does not enter surface water bodies (streams, ditches, ponds, lakes, wetlands etc.)
- ☐ sediment does not enter City conveyance infrastructure (catch basins, sewers etc.) and
- ☐ All sediment must be removed from the city ROW (sidewalks and roadways) by the end of each work day.

☒ ☐ N Sediment control measures will be installed prior to the initiation of earth disturbance.

- ☒ ☐ N During the non-winter construction season (April 15 – November 1): After an initial **14 day** period of initial disturbance, temporary or permanent stabilization (mulching, erosion control matting or tarps for stockpiles, other approved method) of exposed areas and stockpiles will occur at the end of each work day unless:
- o Earthwork is to continue in the area within the next 24 hours **and** there is NO liquid precipitation forecast for the next 24 hours; or
 - o If work is occurring in a self contained excavation (no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation or utility trenches).
- ☒ ☐ N During the winter construction period from November 1 to April 15, any **new disturbance** must be temporarily or permanently stabilized (mulching, erosion control matting or tarps for stockpiles, or other approved method) will occur at the end of each work day unless:
- o Earthwork is to continue in the area within the next 24 hours **and** there is NO liquid precipitation forecast for the next 24 hours; or
 - o If work is occurring in a self-contained excavation (no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation or utility trenches)
- ☒ ☐ N The perimeter of the site and all BMPs will be inspected at the **end of each workday** to ensure that sediment will not leave the site. If sediment has travelled beyond the site boundary, it shall be swept up or otherwise removed and deposited on-site in an upgradient area at the **end of each work day**.
- ☒ ☐ N The owner and his/her representatives shall abide by the best management practices (BMPs) indicated in this plan and conditions and in the Vermont DEC Low Risk Site Handbook for Erosion Prevention and Sediment Control (2006). Contact 802-863-4501 for a hard copy or go to the web:
http://vtwaterquality.org/stormwater/docs/construction/sw_low_risk_site_handbook.pdf
- ☒ ☐ N If soils will be exposed after November 1st and winter construction has not been permitted the project will notify DPW prior to October 15th and ensure that sediment control is installed PRIOR to soil freezing. If the project is completed during the winter months, an additional inspection will be required to ensure that the site is buttoned up for the winter.
- ☒ ☐ N Within 48 hours of reaching final grading, the exposed soil will be seeded and mulched or covered with erosion control matting (for slopes steeper than 3:1 or high wind prone areas). Erosion control matting is preferred.
- ☒ ☐ N The owner will contact DPW to schedule a stabilization inspection when site work is finished and stabilization measures (seeding and mulching or matting) have been installed.

AGREEMENT

By filling out and signing this plan, I agree to abide by the terms and conditions outlined above. Failure to follow this plan can result in a stop work order by the City of Burlington, fines, or both.

By: ☐ Owner ☒ Contractor

Engineers Construction Inc

Name

Signature

Date

Additional Conditions of Approval:

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TYPICAL SOLUTIONS TO PREVENT OR CONTROL SEDIMENT AND EROSION

STOCKPILES

- Cover small stockpiles with a tarp when not being used.
- Install silt fencing or other appropriate devices around the stockpiles to filter sediment.
- Cover stockpiles with straw or other approved mulching material.
- Plan to remove any unusable material as soon as possible from the site to an approved location.
- Plant grass and mulch stockpiles that will be on site for more than 14 days.
- Cover, vegetate or install erosion matting on stockpiles that will remain disturbed over the winter.

DISTURBED AREAS

- Maintain vegetated buffers around disturbed areas.
- Install silt fencing or other appropriate device to filter sediment washing off from disturbed areas. Remember that the bottom of the silt fence must be "keyed in" (dug into ground) to work correctly.
- To prevent sediment from running off your site via your driveway (or other paved areas where you can't install silt fence) use a row of hay bales or tube sand.
- Cover disturbed areas as soon as possible with straw or other approved mulching material. Use erosion control matting in high wind, traffic or slopes steeper than 3:1 (horizontal to vertical), and follow the manufacturer's guidelines staple the matting down.
- Plant grass and mulch or use erosion control matting all disturbed areas that will remain exposed for more than 14 days.
- Cover, vegetate or install erosion matting on areas that will remain disturbed over the winter.
- Protect ditches, catch basins or water bodies off-site by using silt fencing, gravel check dams or other approved sediment control methods.

CONSTRUCTION VEHICLES

- Do not park construction vehicles on City owned green space. Vehicles disturb vegetation and compact the soil, thereby reducing its ability to infiltrate stormwater. Any green belt disturbance will need to be permanently stabilized with grass seed and erosion control matting.
- Prevent sediment from leaving the project by cleaning the tires of vehicles, or use clean gravel at project access points to clean tires.
- Sweep city streets, sidewalks and bikepaths daily or as needed to remove sediment transported from the project.

RESOURCES

The Vermont Handbook for Erosion Prevention and Sediment Control at:

http://vtwaterquality.org/stormwater/docs/construction/sw_low_risk_site_handbook.pdf

The City of Burlington Stormwater Program Page at

<http://www.burlingtonvt.gov/DPW/Stormwater-Management>

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Stormwater Management Plan Pre-Screening

Please provide the following information to the Stormwater Program (stormwater@burlingtonvt.gov, ph: 863-4501) in order to determine what the requirements will be for your project.

- General Information
 - Project Address:
 - Owner:
 - Engineer:
 - Brief project description:

- Stormwater Management Plan
 - Impervious¹ change summary

Condition	Type	Total Impervious (s.f.)
Existing Conditions	Existing Impervious	
Proposed	Total Proposed (1+2+3)	
	1) New ²	
	2) Existing to Remain	
	3) Redeveloped	
Net New	Total Proposed – Existing	

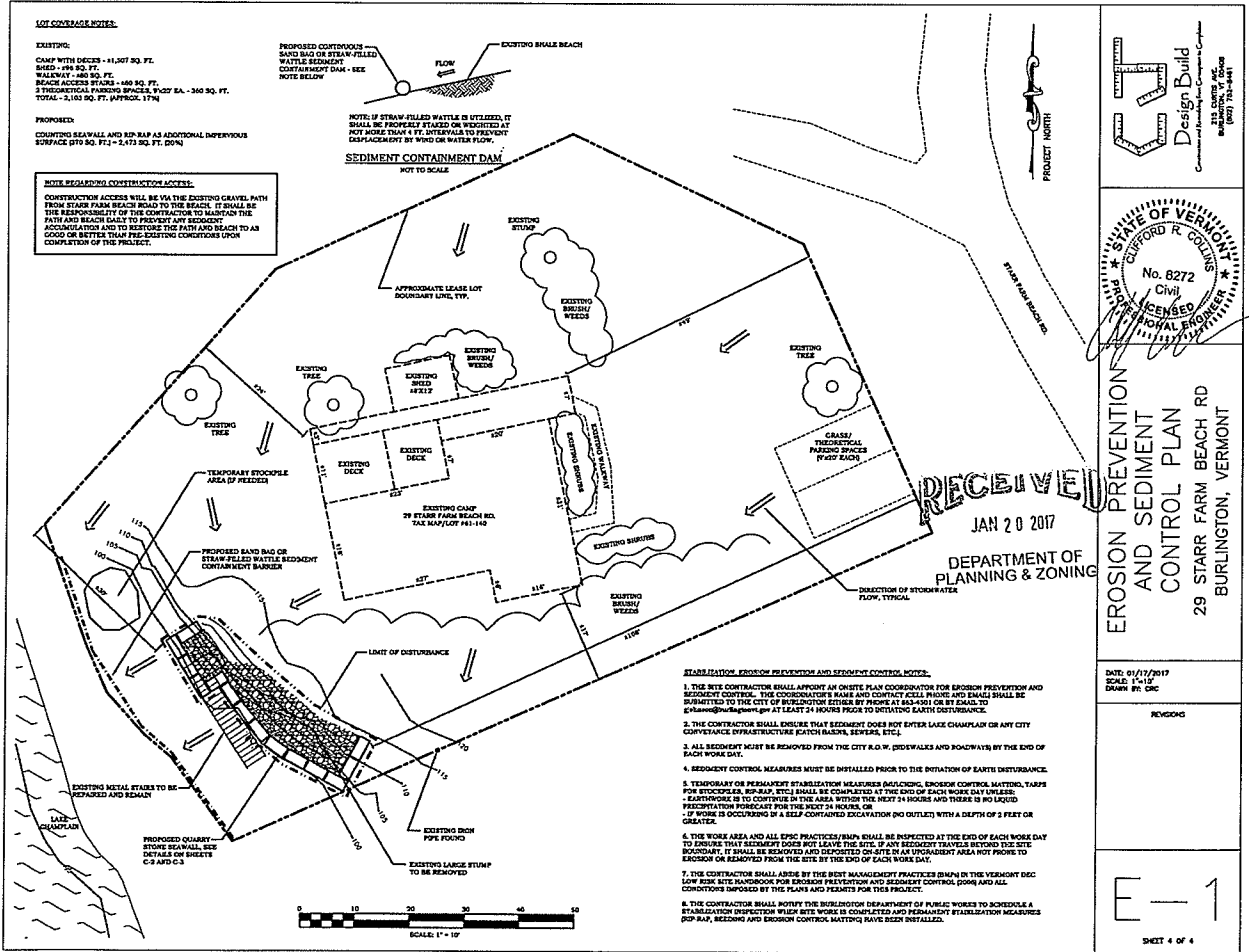
If available at this time:

- Existing conditions: *description of existing conditions, description of existing stormwater system, existing drainage issues, current connectivity to City system*

- Proposed Conditions: *description of proposed conditions, brief description of proposed stormwater system, proposed method of discharge to receiving water or City system (overland flow, direct connection via pipe, existing or new manhole or CB)*

¹ Impervious = any surface off of which water runs off rather than infiltrates, including, but not limited to rooftops and paved/unpaved (gravel/packed dirt) driveways, walkways and patios

² Impervious where there is not currently impervious



Design Build
Civil Engineering
2010 CONSTRUCTION
1000
(802) 733-4441

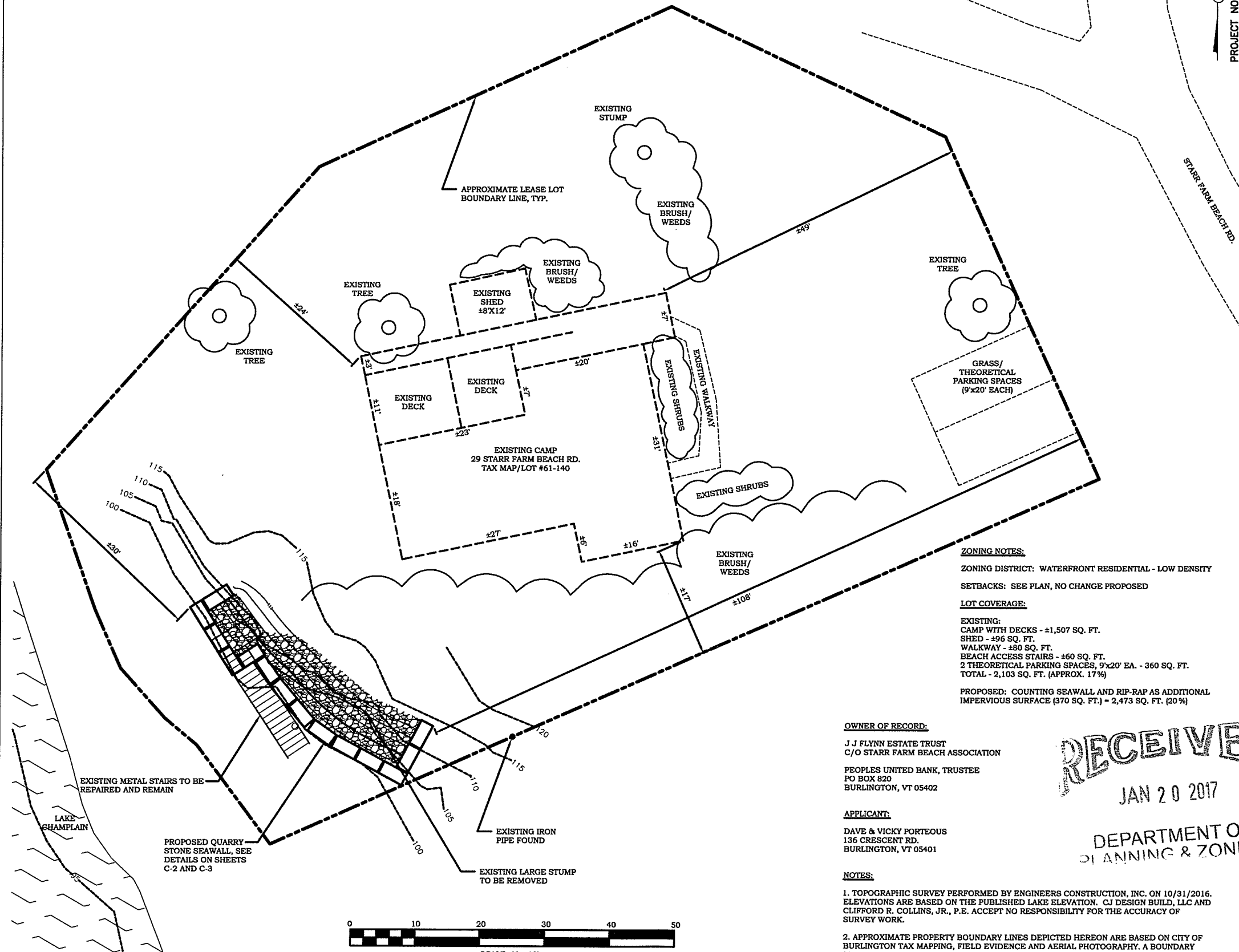
STATE OF VERMONT
No. 8272
Civil
LICENSED PROFESSIONAL ENGINEER

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JAN 20 2017
DEPARTMENT OF
PLANNING & ZONING
EROSION PREVENTION
AND SEDIMENT
CONTROL PLAN
29 STARR FARM BEACH RD
BURLINGTON, VERMONT

DATE: 01/17/2017
SCALE: 1"=10'
DRAWN BY: DEC
REVISIONS
E-1
SHEET 4 OF 4

LIST OF DRAWINGS:

- C-1 OVERALL SITE PLAN
C-2 PARTIAL SITE PLAN
C-3 SECTION/PROFILE
E-1 EROSION PREVENTION AND SEDIMENT CONTROL PLAN



ZONING NOTES:
ZONING DISTRICT: WATERFRONT RESIDENTIAL - LOW DENSITY
SETBACKS: SEE PLAN, NO CHANGE PROPOSED

LOT COVERAGE:
EXISTING:
CAMP WITH DECKS - ±1,507 SQ. FT.
SHED - ±96 SQ. FT.
WALKWAY - ±80 SQ. FT.
BEACH ACCESS STAIRS - ±60 SQ. FT.
2 THEORETICAL PARKING SPACES, 9'x20' EA. - 360 SQ. FT.
TOTAL - 2,103 SQ. FT. (APPROX. 17%)

PROPOSED: COUNTING SEAWALL AND RIP-RAP AS ADDITIONAL IMPERVIOUS SURFACE (370 SQ. FT.) - 2,473 SQ. FT. (20%)

OWNER OF RECORD:
J J FLYNN ESTATE TRUST
C/O STARR FARM BEACH ASSOCIATION
PEOPLES UNITED BANK, TRUSTEE
PO BOX 820
BURLINGTON, VT 05402

APPLICANT:
DAVE & VICKY PORTEOUS
136 CRESCENT RD.
BURLINGTON, VT 05401

NOTES:
1. TOPOGRAPHIC SURVEY PERFORMED BY ENGINEERS CONSTRUCTION, INC. ON 10/31/2016. ELEVATIONS ARE BASED ON THE PUBLISHED LAKE ELEVATION. CJ DESIGN BUILD, LLC AND CLIFFORD R. COLLINS, JR., P.E. ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF SURVEY WORK.
2. APPROXIMATE PROPERTY BOUNDARY LINES DEPICTED HEREON ARE BASED ON CITY OF BURLINGTON TAX MAPPING, FIELD EVIDENCE AND AERIAL PHOTOGRAPHY. A BOUNDARY SURVEY WAS NOT CONDUCTED.

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Design Build
Construction and Renovation from Conception to Completion
215 CURTIS AVE.
BURLINGTON, VT 05408
(802) 752-9451

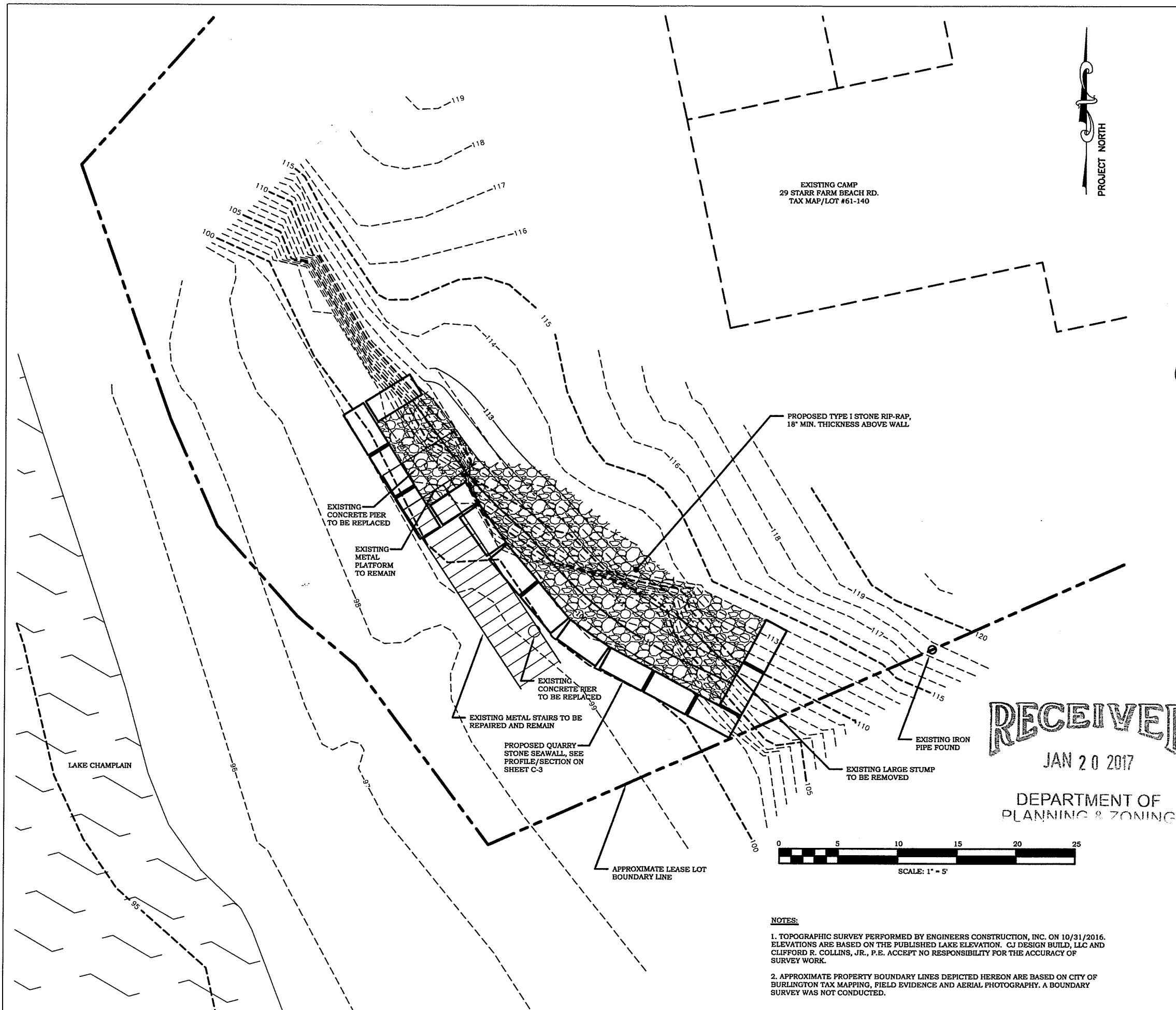
STATE OF VERMONT
CLIFFORD R. COLLINS
No. 8272
Civil
LICENSED
PROFESSIONAL ENGINEER

OVERALL SITE PLAN
PORTEOUS SEAWALL
29 STARR FARM BEACH RD
BURLINGTON, VERMONT

DATE: 12/21/2016
SCALE: 1"=10'
DRAWN BY: CRC/JCE

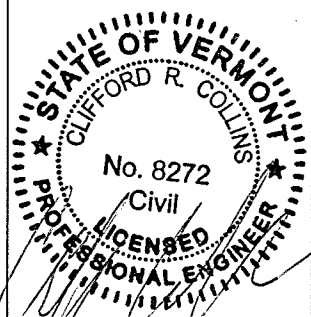
REVISIONS
01/16/2017: UPDATED LOT COVERAGE TO INCLUDE THEORETICAL PARKING AND STAIRS AS EXISTING IMPERVIOUS AND ADD SEAWALL AND RIP-RAP AS PROPOSED IMPERVIOUS

C-1



EXISTING CAMP
29 STARR FARM BEACH RD.
TAX MAP/LOT #61-140

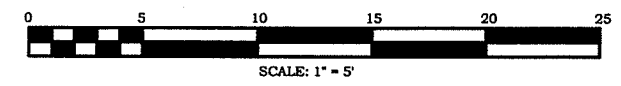
CJ Design Build
Construction and Remedial from Conception to Completion
215 CURTIS AVE.
BURLINGTON, VT 05408
(802) 752-9461



PARTIAL SITE PLAN
PORTEOUS SEAWALL
29 STARR FARM BEACH RD
BURLINGTON, VERMONT

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JAN 20 2017

DEPARTMENT OF
PLANNING & ZONING

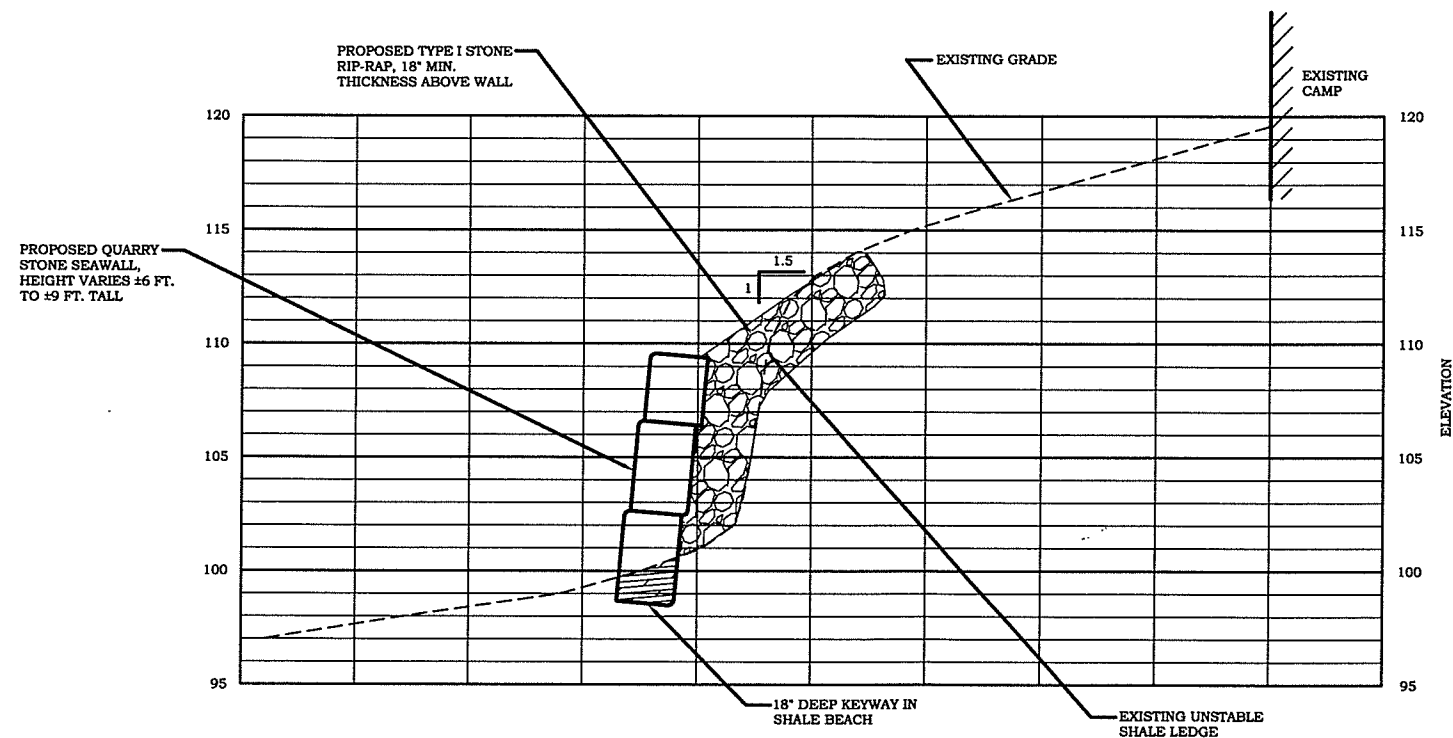


- NOTES:**
1. TOPOGRAPHIC SURVEY PERFORMED BY ENGINEERS CONSTRUCTION, INC. ON 10/31/2016. ELEVATIONS ARE BASED ON THE PUBLISHED LAKE ELEVATION. CJ DESIGN BUILD, LLC AND CLIFFORD R. COLLINS, JR., P.E. ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF SURVEY WORK.
 2. APPROXIMATE PROPERTY BOUNDARY LINES DEPICTED HEREON ARE BASED ON CITY OF BURLINGTON TAX MAPPING, FIELD EVIDENCE AND AERIAL PHOTOGRAPHY. A BOUNDARY SURVEY WAS NOT CONDUCTED.

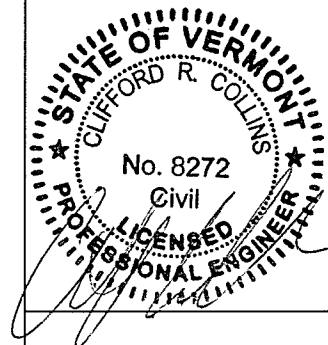
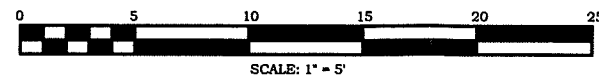
DATE: 12/21/2016
SCALE: 1"=5'
DRAWN BY: CRC/JGE

REVISIONS
01/16/2017: REVISED GRADING OF RIP-RAP AREA TO 1.5H TO 1V PER THE SHORELINE STABILIZATION HANDBOOK GUIDELINES.

C-2



TYPICAL SECTION/PROFILE



SECTION/PROFILE
 PORTEOUS SEAWALL
 29 STARR FARM BEACH RD
 BURLINGTON, VERMONT

DATE: 12/21/2018
 SCALE: 1"=5'
 DRAWN BY: CRC/JGE

REVISIONS
 01/18/2017: REVISED RIP-RAP
 SLOPE TO 1.5H TO 1V PER THE
 SHORELINE STABILIZATION HANDBOOK

RECEIVED
 JAN 20 2017
 DEPARTMENT OF
 PLANNING & ZONING

C-3

LOT COVERAGE NOTES:

EXISTING:

CAMP WITH DECKS - ±1,507 SQ. FT.
SHED - ±96 SQ. FT.
WALKWAY - ±80 SQ. FT.
BEACH ACCESS STAIRS - ±60 SQ. FT.
2 THEORETICAL PARKING SPACES, 9'x20' EA. - 360 SQ. FT.
TOTAL - 2,103 SQ. FT. (APPROX. 17%)

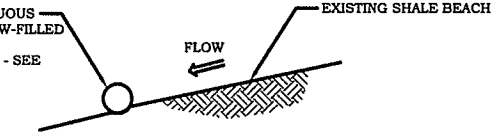
PROPOSED:

COUNTING SEAWALL AND RIP-RAP AS ADDITIONAL IMPERVIOUS
SURFACE (370 SQ. FT.) = 2,473 SQ. FT. (20%)

NOTE REGARDING CONSTRUCTION ACCESS:

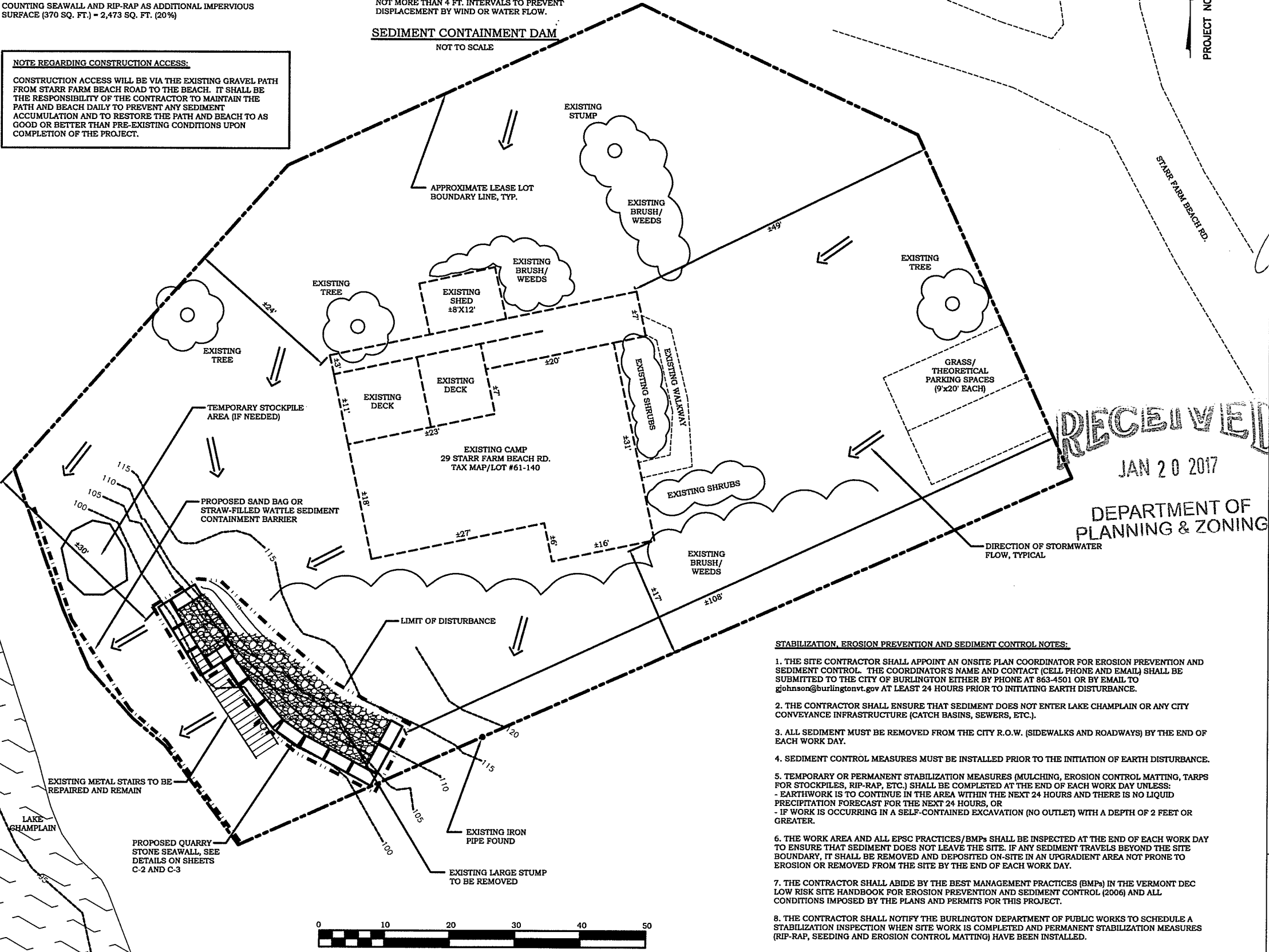
CONSTRUCTION ACCESS WILL BE VIA THE EXISTING GRAVEL PATH
FROM STARR FARM BEACH ROAD TO THE BEACH. IT SHALL BE
THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE
PATH AND BEACH DAILY TO PREVENT ANY SEDIMENT
ACCUMULATION AND TO RESTORE THE PATH AND BEACH TO AS
GOOD OR BETTER THAN PRE-EXISTING CONDITIONS UPON
COMPLETION OF THE PROJECT.

PROPOSED CONTINUOUS
SAND BAG OR STRAW-FILLED
WATTLE SEDIMENT
CONTAINMENT DAM - SEE
NOTE BELOW



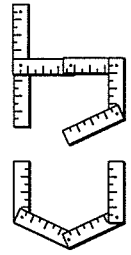
NOTE: IF STRAW-FILLED WATTLE IS UTILIZED, IT
SHALL BE PROPERLY STAKED OR WEIGHTED AT
NOT MORE THAN 4 FT. INTERVALS TO PREVENT
DISPLACEMENT BY WIND OR WATER FLOW.

SEDIMENT CONTAINMENT DAM
NOT TO SCALE



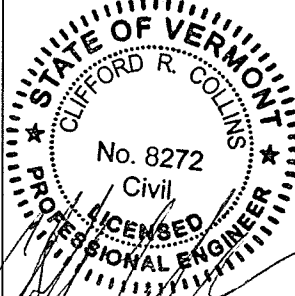
STABILIZATION, EROSION PREVENTION AND SEDIMENT CONTROL NOTES:

1. THE SITE CONTRACTOR SHALL APPOINT AN ONSITE PLAN COORDINATOR FOR EROSION PREVENTION AND SEDIMENT CONTROL. THE COORDINATOR'S NAME AND CONTACT (CELL PHONE AND EMAIL) SHALL BE SUBMITTED TO THE CITY OF BURLINGTON EITHER BY PHONE AT 863-4501 OR BY EMAIL TO gjohnson@burlingtonvt.gov AT LEAST 24 HOURS PRIOR TO INITIATING EARTH DISTURBANCE.
2. THE CONTRACTOR SHALL ENSURE THAT SEDIMENT DOES NOT ENTER LAKE CHAMPLAIN OR ANY CITY CONVEYANCE INFRASTRUCTURE (CATCH BASINS, SEWERS, ETC.).
3. ALL SEDIMENT MUST BE REMOVED FROM THE CITY R.O.W. (SIDEWALKS AND ROADWAYS) BY THE END OF EACH WORK DAY.
4. SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE INITIATION OF EARTH DISTURBANCE.
5. TEMPORARY OR PERMANENT STABILIZATION MEASURES (MULCHING, EROSION CONTROL MATTING, TARPS FOR STOCKPILES, RIP-RAP, ETC.) SHALL BE COMPLETED AT THE END OF EACH WORK DAY UNLESS:
- EARTHWORK IS TO CONTINUE IN THE AREA WITHIN THE NEXT 24 HOURS AND THERE IS NO LIQUID PRECIPITATION FORECAST FOR THE NEXT 24 HOURS, OR
- IF WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION (NO OUTLET) WITH A DEPTH OF 2 FEET OR GREATER.
6. THE WORK AREA AND ALL EPSC PRACTICES/BMPs SHALL BE INSPECTED AT THE END OF EACH WORK DAY TO ENSURE THAT SEDIMENT DOES NOT LEAVE THE SITE. IF ANY SEDIMENT TRAVELS BEYOND THE SITE BOUNDARY, IT SHALL BE REMOVED AND DEPOSITED ON-SITE IN AN UPGRADEMENT AREA NOT PRONE TO EROSION OR REMOVED FROM THE SITE BY THE END OF EACH WORK DAY.
7. THE CONTRACTOR SHALL ABIDE BY THE BEST MANAGEMENT PRACTICES (BMPs) IN THE VERMONT DEC LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL (2006) AND ALL CONDITIONS IMPOSED BY THE PLANS AND PERMITS FOR THIS PROJECT.
8. THE CONTRACTOR SHALL NOTIFY THE BURLINGTON DEPARTMENT OF PUBLIC WORKS TO SCHEDULE A STABILIZATION INSPECTION WHEN SITE WORK IS COMPLETED AND PERMANENT STABILIZATION MEASURES (RIP-RAP, SEEDING AND EROSION CONTROL MATTING) HAVE BEEN INSTALLED.



Design Build

Construction and Remediation from Conception to Completion
215 CURTIS AVE.
BURLINGTON, VT 05408
(802) 752-8481



EROSION PREVENTION
AND SEDIMENT
CONTROL PLAN
29 STARR FARM BEACH RD
BURLINGTON, VERMONT

DATE: 01/17/2017
SCALE: 1"=10'
DRAWN BY: CRC

REVISIONS

E-1



Department of Planning and Zoning

149 Church Street, City Hall

Burlington, VT 05401-8415

Phone: (802) 865-7188

Fax: (802) 865-7195

www.burlingtonvt.gov/pz

RECEIVED
JAN 17 2017

DEPARTMENT OF
PLANNING & ZONING

Zoning Permit Application

Use this form for ALL zoning permit applications. See the relevant checklist for specific requirements.

PROJECT LOCATION ADDRESS: 95 North Avenue and 7 Haswell Street

PROPERTY OWNER*: Committee On Temp Shelter

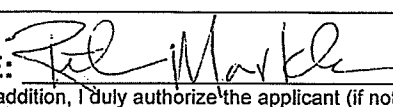
*If condominium unit, written approval from the Association is also required

POSTAL ADDRESS: PO Box 1616

CITY, ST, ZIP: Burlington, VT 05402

DAY PHONE: 802-864-7402

EMAIL: ritam@cotsonline.org

SIGNATURE: 
I am the owner. In addition, I duly authorize the applicant (if noted) to act on my behalf for all matters pertaining to this zoning permit application.

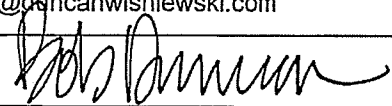
APPLICANT: Duncan Wisniewski Architecture

POSTAL ADDRESS: 255 So. Champlain St.

CITY, ST, ZIP: Burlington, VT 05401

DAY PHONE: 802-864-6693 x 4#

EMAIL: bobd@duncanwisniewski.com

SIGNATURE: 

Description of Proposed Project: Request for an amendment to re-establish permits #15-0525 & 15-0526. Original permit request was for renovation and addition to existing building with lot line adjustment to create one lot from two.

Includes removal of existing house at 7 Haswell Street. See original application for more detailed information.

Existing Use of Property: ☐ Single Family ☐ Multi Family: #___ Units ☒ Other: Office (res at 7 Haswell Street)

Proposed Use of Property: ☐ Single Family ☐ Multi Family: #___ Units ☒ Other: Office/Adult/M-F

- Does your project involve new construction, addition, alteration, renovation, or repair to a structure that is heated or cooled? Yes ☒ No ☐
(If yes, the Vermont Residential Building Energy Standards (VRBES) apply. Visit the P&Z Office, Public Service Board or PSB website for details)
- Will 400 sq ft or more of land be disturbed, exposed and/or developed? Yes ☐ No ☐
(If yes, you will need to submit the 'Erosion Prevention and Sediment Control Plan' questionnaire, with a site plan)
- For Single Family & Duplex, will total impervious area be 2500 sq ft or more? Yes ☐ No ☐
(If yes, you will need to submit the 'Stormwater Management Plan' questionnaire, with a site plan)
- Are you proposing any work within or above the public right of way? Yes ☒ No ☐
(If yes, you will need to receive prior approval from the Department of Public Works)

Estimated Construction Cost (value)*: \$ 3,269,000

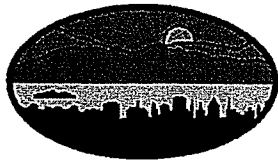
(*Estimated cost a typical contractor would charge for all materials and labor, regardless of who physically completes the work)

Within 30 days of submission, the permit application will be reviewed for completeness, and, if complete, will be processed administratively or referred to a board for review. All permit approvals or denials are subject to an appeal period (15 days for administrative permit; 30 days for board permit). A building (and/or electrical, mechanical, plumbing, curb cut) permit will also be required. Contact the Department of Public Works at 802-863-9094 to inquire. Please ask for assistance if you have any questions about filling out this form. Call the Planning and Zoning at 802-865-7188, or visit the office in the lower level of City Hall, 149 Church Street.

Office Use Only: Zone: _____ Eligible for Design Review? _____ Age of House _____ Lot Size _____

Type: SN _____ AW _____ FC _____ BA _____ COA 1 _____ COA 2 _____ COA 3 _____ CU _____ MA _____ VR _____ HO _____ SP _____ DT _____ MP _____

Check No. _____ Amount Paid _____ Zoning Permit # _____



City of
Burlington, Vermont
149 Church Street

Zoning Permit - COA and Major Impact Development – Findings of Fact

ZP #: 15-0525CA/MA

Tax ID: 043-3-050-000

Issue Date: December 23, 2014

Decision: Approved w/ Pre-Release
Conditions

Property Address: 87-95 NORTH AVENUE

Burlington Development Review Board

**Minutes/Findings of Fact
December 23, 2014**

In RE: 15-0525CA/MA;

87-95 North Avenue; 7 Haswell Street (Ward 7, NMU) (Tax Lot No. 043-3-050-000)

Owner/Representative: Committee on Temporary Shelter (COTS) / Duncan Wisniewski Architects

Request: Renovation and addition to existing building for 14 new residential units as part of mixed use building. Project includes demolition of house and lot merger at 7 Haswell Street. Uses in addition to the residential units will include adult day care (Day Station) and COTS offices.

Members Present:

Jonathan Stevens, Michael Long, Brad Rabinowitz, Israel Smith, AJ LaRosa,
Alexandra Zipparo (by phone)

Evidence Presented:

The Board examined the materials submitted in support of this request.

I. FINDINGS

Applicable Regulations:

Article 3 (Applications and Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Criteria & Guidelines), Article 8 (Parking), Article 9 (Inclusionary and Replacement Housing), & Article 10 (Subdivision)

Background Information:

The applicant is proposing the renovation and addition to the existing 15,400 sq. ft. building resulting in a total of 23,890 sq. ft. The site presently contains, at nearly 100% lot coverage, the former Burlington College, a National Registered historic building, and an adjacent parcel (7 Haswell Street) owned by COTS to the west with a residential structure. This house is proposed to be demolished to provide room for the proposed addition. The expansion to the adjacent lot will necessitate a lot line adjustment to combine that parcel with the main site containing the college.

The proposal will contain 23,890 sq. ft. as follows:

First floor:	9,195 sq. ft. for day-station (adult day care) & offices
Second Floor:	9,770 sq. ft. 14 residential units (12 studios, two 1 bedroom units)
Third Floor:	4,925 sq. ft. offices

A surface parking lot is adjacent to the south that is not owned by COTS. However, according to the applicant, COTS has the legal right to use the parking shown (it controls the land under agreement with Burlington College). Other uses in the vicinity are: to the east, across North Avenue, is a credit union with residences above, a gas station/convenience store; to the north, across Haswell Street, are multi-unit residential buildings; and to the west/northwest, lies the Lakeview Terrace residential neighborhood.

As the project contains 14 residential units it is subject to major impact review and inclusionary housing requirements. The use and intensity of development are acceptable under the dimensional standards of the CDO.

Sketch Plan Review; for the project was presented to the DRB on February 10, 2014. Previous zoning actions for this property include the use for a market, retail, offices, a credit union, a parenting/daycare center (1989), and of course for a college (1983).

The DAB reviewed this application on November 12, 2014 and unanimously voted to recommend approval noting that the HVAC units located on the roof are not readily visible by pedestrians, thus no screening is necessary.

The Conservation Board reviewed the project on November 3, 2014 and unanimously recommended approval.

Article 3: Applications and Reviews

Part 5, Conditional Use & Major Impact Review:

Sec. 3.5.6, Review Criteria

(a) Conditional Use Review Standards

1. The capacity of existing or planned community facilities;

This proposal was reviewed by the Technical Review Committee (TRC) in February 2014. Combined sewer on North Avenue, thus the project will incorporate storm water infiltration chambers to reduce flows during storm events. The proposed development will require significant water and sewer (waste water); however, more than adequate reserve capacity is available. A state wastewater permit will be required as well as confirmation of capacity from Public Works. (Affirmative Finding as Conditioned)

2. The character of the area affected;

The subject property is located within a Neighborhood Mixed Use (NMU) Zoning District. The property is near residential uses, across Haswell St., Lakeview Terr., and North Avenue. It is adjacent to a parking lot and across the street from a variety of commercial use that includes: a credit union office, service station, and convenience store. Redevelopment and renovation of a large historic structure should result in an improved streetscape on this section of North Avenue. (Affirmative Finding)

3. Traffic on roads and highways in the vicinity;

Traffic information provided indicate that, based on the Institute of Transportation Engineer handbook calculations, there will be a minor increase in trip ends associated with this project:

The average daily trip ends increases from 90 to 112.

The 7-9 AM peak will increase from 13 to 16 trip ends.
The 4-6 PM peak increases from 12 to 18.

Generally, however, traffic generation is not expected to be problematic in light of the existing parking and the location being in easy walking proximity to nearby services and employment, and alternative modes of transportation. (Affirmative Finding)

4. Bylaws then in effect;

As conditioned, the proposed development is in full compliance with all applicable bylaws. However, as a portion of the site including the southeast corner of the existing building is within the public ROW, the applicant must contact and work with DPW regarding the work being considered. (Affirmative Finding as Conditioned)

5. Utilization of renewable energy resources;

The building is designed to accommodate roof mounted solar PV and to use these devices as sunshades over the south facing windows and possibly on the west facing ones as well. Utilization of such solar energy devices strongly is encouraged. (Affirmative Finding as Conditioned)

6. Cumulative impacts of the proposed use;

The proposed development is on a site with existing buildings in an older developed area. No significant cumulative impacts are anticipated. (Affirmative Finding)

7. Functional family;

This criterion does not apply to the subject permit request as it is not within a residential district. (Affirmative Finding)

8. Vehicular access points;

No change in parking lot access location is proposed; however, the entrance to the parking area will be re-configured but will remain adequate for the proposed use. A single curb cut access for staff parking is proposed on Haswell Street. (Affirmative Finding as Conditioned)

9. Signs;

No signs are depicted. Future signs are anticipated and will require separate zoning permits. (Affirmative Finding as Conditioned)

10. Mitigation measures;

The proposed development is not expected to generate any noxious effects such as excessive noise, glare, or emissions. While there may be some concern over noise from the adult day care use, the entrance and courtyard are sited so that there are structures and distance from nearby residences. The only concern appears to be service vehicles that would back out onto Haswell Street, although it is a short distance and while lunch is brought in daily, trash pickup only occurs twice/week. (Affirmative Finding)

11. Time limits for construction;

The project completion must occur within the standard 2-year time frame for zoning permits, with project commencement beginning within 12 months. (Affirmative Finding as Conditioned)

12. Hours of operation and construction;

The apartment building will operate 24/7. Construction shall be limited to standard hours of 7:00 am – 6:00 pm Monday-Friday, with Saturday morning hours of construction limited to interior work. The hours for the day station (an adult day care) are from 9am until 5pm every day. The COTS offices are 9am to 5pm on weekdays. (Affirmative Finding as Conditioned)

13. Future enlargement or alterations;

As with any project, future enlargement or alteration to the development will require zoning review under the regulations in effect at that time. (Affirmative Finding as Conditioned)

14. Performance standards;

Performance standards relating to outdoor lighting and erosion control are addressed under Article 5. (Affirmative Finding)

15. Conditions and safeguards;

A concern is the safe removal of existing structures as hazardous materials, such as lead paint and asbestos, are more than likely present. Conditions of approval will address this concern. The proposed building will be 100% sprinklered. (Affirmative Finding as Conditioned)

(b) Major Impact Review Standards

1. Not result in undue water, air, or noise pollution;

A comprehensive stormwater management plan was included with the permit application. Proposed stormwater management measures include the capture and retention of stormwater prior to release into the city system. Volume reduction by way of infiltration is also incorporated with the inclusion of pervious pavers in some areas and overall decreases the amount of lot coverage. See also Sec. 5.5.3.

The project is not expected to generate any significant air or noise pollution, except for the backing up of vehicles as noted. (Affirmative Finding as Conditioned)

2. Have sufficient water available for its needs;

Ample reserve capacity is available, but written confirmation is needed upon permit application. (Affirmative Finding as Conditioned)

3. Not unreasonably burden the city's present or future water supply or distribution system;
See item 2 above.

4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;

Along with a stormwater management plan, a construction site erosion control plan accompanies the permit application for this project. Approval of this plan is required from the stormwater administrator. (Affirmative Finding as Conditioned)

5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;
Traffic information is noted above, and the increase is not expected to be excessive.

The North Avenue corridor currently is being looked at for significant improvements to become a "complete street" and with it to make it safer and to provide convenient and sufficient travel options for the future residents and workers at this property. (Affirmative Finding)

6. Not cause an unreasonable burden on the city's ability to provide educational services;

The proposed residential units are not likely to impact the city's ability to provide educational services as the units are small and not likely to house any children. However, impact fees would offset any potential impacts. (Affirmative Finding as Conditioned)

7. Not place an unreasonable burden on the city's ability to provide municipal services;
The proposed development will generate additional impacts on city services; however, those impacts are expected to be proportionately modest as this is a developed neighborhood with services in place. Impact fees will be paid to help offset impacts generated. (Affirmative Finding as Conditioned)

8. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;
The subject property contains no rare, irreplaceable, or significant natural areas. There is an historic building that will be renovated (the former Burlington College). The adjacent building slated for demolition was built in 1947; it has not been identified on a historical register. The proposed development will be placed in close proximity to historic structures but as proposed should not overwhelm them as it will relate to the existing large structure. There are no known archaeological resources on the property. (Affirmative Finding)

9. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;
This proposal is replacing an existing home with an addition to the large historic former Burlington College building. As mainly a redevelopment project that will help provide needed and affordable housing and services it should not have any adverse impact on the city's present or future growth patterns. (Affirmative Finding)

10. Be in substantial conformance with the city's municipal development plan;
The proposed redevelopment is conceptually consistent with the MDP. The property is also included in the Old North End Enterprise Community which specifically calls for additional public and private investment in housing and other community improvements. (Affirmative Finding)

11. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location;
The proposed development will contribute to the city's housing stock, particularly with regard to the 14 affordable housing units for an underserved population. It would have a beneficial rather than an adverse impact on the present or projected housing needs of the city. (Affirmative Finding)

12. Not have an undue adverse impact on the present or projected park and recreation needs of the city.
Minimal impacts on the city's park and recreation needs are anticipated as a result of the project. Any impacts will, however, be mitigated by impact fees. (Affirmative Finding as Conditioned)

Article 4: Maps & Districts

Sec. 4.4.2, Neighborhood Mixed Use Districts:

The subject property is located in Neighborhood Mixed Use (NMU) district. This zone is intended to preserve and enhance historically commercial areas while reinforcing the compact scale and development patterns within the city's older neighborhoods. Uses are intended to provide neighborhood oriented goods and services and employment opportunities within walking or biking distance of residential neighborhoods. The proposed redevelopment with residential use and employment opportunities with COTS is consistent with the intent of this zone. (Affirmative Finding)

(b) Dimensional Standards & Density

An FAR of 2.5 is allowed for an inclusionary housing project. FAR information has been provided. The property is 14,829 sf (9904sf + 4925 for Haswell property) in size. This allows a total building area of 37,073 sq. ft.; proposed is 23,890 sf. (Affirmative Finding)

Table 4.4.2 -1 Dimensional Standards and Density

Districts

Max. Intensity

(floor area ratio1)

Max. Lot Coverage

Minimum Building Setbacks (feet)

Front4

Side2

Rear2

Height

(feet)

NMU 2.0 FAR 80% 06 0 0 Min: 203

Max: 35

1. Floor area ratio is defined in Art. 13 and described in Art 5. Actual maximum build out potential may be reduced by site plan and architectural design considerations of Art 6.
2. Structures shall be setback a minimum of 15-feet along any property line that abuts a residential zoning district.
3. Minimum building height shall be 20-feet and 2 story's. Measurement of and exceptions to height standards are found in Art 5. Bonuses for additional building height are described in section (d)3 below.
4. All structures shall be setback 12-feet from the curb on a public street.
5. Exceptions to minimum lot coverage are provided in (d)2.
6. Notwithstanding footnote 4, the NMU district at the intersection of Pine St. and Flynn Avenue shall have a minimum front yard setback of 10 feet.

The applicant's plans indicate proposed lot coverage calculation of 81.5%. This is acceptable as the inclusionary requirement allows lot coverage at 92%. Note that this is a reduction in coverage from the current 87.3% with an increase in green space of 2,450 sq. ft. (Affirmative Finding)

No setbacks pertain to the proposed development except for a 12' building setback from the curb. Scaling the submitted site plan indicates that the setback has been met. (Affirmative Finding)

The minimum building height in the NMU zone is 20'; the maximum is 35'. With the inclusionary bonus of an additional 10 ft. the total height allowed is 45 ft. In addition, the existing building appears to be 37.5 ft. high. As such any new structure on this property can be allowed to reach that height. The proposed addition is at this same height and below the 45 ft. limit. (Affirmative Finding)

(c) Permitted & Conditional Uses

The proposed mixed uses: adult daycare (day station), the 14 residential units and offices are all permitted uses in the NMU District - See CDO Appendix A- Use Table. The major impact aspect requires conditional use review. (Affirmative Finding)

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.2 above.

Sec. 5.2.4, Buildable Area Calculation

This criterion does not apply to properties in the NMU zone.

Sec. 5.2.5, Setbacks

See Sec. 4.4.2 above.

Sec. 5.2.6, Building Height Limits

See Sec. 4.4.2 above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See Sec. 4.4.2 above.

Sec. 5.5.1, Nuisance Regulations

Nothing in the proposal appears to constitute a nuisance under this criterion. (Affirmative Finding)

Sec. 5.5.2, Outdoor Lighting

Outdoor lighting information has been provided. Each entrance will have a soffit mounted recessed LED fixture. The parking will also have LED lighting designed to meet the "Dark Sky" standards. Lighting calculations and details are illustrated on site plans and on the rendered lighting plan. (Affirmative Finding)

Sec. 5.5.3, Stormwater and Erosion Control

A comprehensive stormwater management and erosion control plan prepared by a professional civil engineer accompanies the permit application for this project. Approval of this plan is required from the stormwater administrator. It includes underground infiltration structures to mitigate stormwater flow. The overall lot coverage will decrease by over 2,400 sq. ft. thereby reducing impervious surface. The resulting lot coverage is over 11% below the allowed coverage. As noted the Conservation Board recommended approval of the project to the DRB. (Affirmative Finding as Conditioned)

Sec. 5.4.8 Historic Buildings and Sites

87-95 North Avenue is a National Registered historic building. See attached information sheet. The proposal has been reviewed by a historic preservation consultant who has prepared a report favorable to the proposal. The 7 Haswell Street house slated for demolition has not been included on the Vermont Historic Sites and Structures Survey for Haswell Street. It is not listed on the State Register or the National Register.

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

The original building is proposed to be renovated and with an addition constructed over the single story portion extending beyond the current lot boundaries west to the 7 Haswell Street property. The original store front design on the ground floor will be re-established, although not to the extent of the full storefront windows that appear in historic photographs. This is the result of commercial use being deleted due to concerns from neighbors. Except for office use and the adult day care, the historic residential use is re-established. (Affirmative Finding)

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided. The proposed renovations will retain characteristic building details. Specific details indicate that the new addition will be subordinate to the historic building and the new elevator shaft provides a clear break between the old and the new addition. The massing of the new addition will be similar in having a flat

roof with similar window pattern. To the average passerby the new construction will be easily differentiated from the historic building. (Affirmative Finding)

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

The addition is sensitive to the existing building. The changes to that building will improve and re-establish the ground level commercial storefront, albeit not to its original storefront configuration with the full glazing. At least this change provides for a commercial context despite it not being used for such. (Affirmative Finding)

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

The later additions to the historic building are not significant. The original building was renovated C.1979 where the fish-scale shingles, cornice and architectural details were restored. (Affirmative Finding)

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

The existing architectural details and materials that are significant are being retained, including the Italianate brackets and scallop shingles. The incompatible multi-pane glass and aluminum entry on the North Ave. (east) is inconsistent and is being replaced with a storefront that is somewhat appropriate as it recalls the essence of the historic commercial use of the building.

Infill on the second floor is proposed to replace the inappropriate windows that have been installed. (Affirmative Finding)

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

There does not appear to be a significant amount of deteriorated features as none are noted in the consultant's report. Not applicable.

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.

None proposed. Not applicable.

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

Proposed site work will require excavation and if any archaeological resources are identified, the city and state shall be notified for identification and arrangement for appropriate documentation and archiving. (Affirmative Finding as Conditioned)

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 opportunity to add additional affordable residential units is a significant community wide beneficial action and in sync with the CDO and the Municipal Development Plan; however a dual obligation is for

the protection and preservation of Burlington's historic resources. The applicant is proposing to retain and restore the historic building. The proposal will see the removal and infill of inappropriate modifications while retaining the existing window openings on this National Register building. Window openings on the addition appear to respect the scale of the historic elevations although they are differentiated by ganging three windows together and adding sunshades. Fiber cement clapboard siding will be used on the addition. The addition is separated from the old building by an entrance and elevator shaft tower. Such an effort will provide valuable, and tangible evidence of Burlington's past, while adapting to a new use; both value added community efforts. (Affirmative Finding as Conditioned)

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.

The addition is not likely to be removed as it becomes an integral part of the resulting structure. However the materials used, and with the separation created by the elevator tower the addition is clearly distinguishable from the original structure. (Affirmative Finding)

Article 6: Development Review Standards:

Part 1, Land Division Design Standards

While applicable due to the proposed lot line adjustment, none of the sub-criteria from this Part are applicable. The applicant will however, be required to provide the plat that indicated the lot line adjustment and that they are responsible for all deed work associated with the lot changes. (Affirmative Finding as Conditioned)

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

No trees or other significant vegetation will be removed as part of this proposal. There are no significant natural areas on the property. (Affirmative Finding)

(b) Topographical alterations

Minimal earth work is expected. All plans have been prepared by professionals; architects and engineers. (Affirmative Finding)

(c) Protection of important public views

There are no protected public view corridors from or through the subject property. Not applicable.

(d) Protection of important cultural resources

See Sec 3.5.6 (b) 8.

(e) Supporting the use of alternative energy

The building is designed to accommodate roof mounted solar PV and to use these devices as sunshades over the south facing windows and possibly on the west facing ones as well. Utilization of such solar energy devices strongly is encouraged. (Affirmative Finding as Conditioned)

(f) Brownfield sites

The subject property is not an identified brownfield. Not applicable.

(g) Provide for nature's events

Stormwater management is addressed under Sec. 5.5.3.

(h) Building location and orientation

Buildings, including the existing on site and within the immediate area are generally set close to, or on, the front property lines. The new addition will be similarly situated along the front property line. As noted previously, it will observe a 12' setback from the curb to afford wide sidewalk space for pedestrians. The south front entrance is well defined, oriented towards the parking lot. The North Avenue (east) frontage entrance could be enhanced while still retaining the historic character of the building. Both are easily accessible. (Affirmative Finding)

(i) Vehicular access

See Sec. 3.5.6 (a) 8.

(j) Pedestrian access

Sidewalk access exists on North Avenue and Haswell Street. New east-west sidewalk is proposed along the south between the building and parking lot. (Affirmative Finding)

(k) Accessibility for the handicapped

Handicap parking and accessibility is required. The building is fully accessible in accordance with local, state and federal requirements. All of the residential units are designed to meet FHA requirements and one unit (as required with the 2010 ADA) is accessible. (Affirmative Finding)

(l) Parking and circulation

Parking will change on site with the addition of some spaces for staff accessed from Haswell Street. The existing parking lot historically associated with this building will continue to serve the facility. The parking lot itself will be reorganized for better and safer circulation. A sidewalk is being added between the parking and the building. In addition, as noted, the parking entrance will be re-configured and narrowed providing clearer and safer access. This is a Shared Use parking district and parking calculations are addressed under Article 8, below. (Affirmative Finding as Conditioned)

(m) Landscaping and fences

Landscaping details have been provided; Site Plan L1.0. Improvements include street trees, a landscaped buffer along the south of the building and at the parking lot entrance from North Avenue. Additional landscaping is provided on the west of the project site alongside a courtyard for gardening use. Overall there is additional greenspace of 2,450 sq. ft. The proposed street trees must be coordinated with the City Arborist. (Affirmative Finding as Conditioned)

(n) Public plazas and open space

No public plaza or open space is included in this proposal, although an enclosed courtyard is included for users. (Affirmative Finding)

(o) Outdoor lighting

See Sec. 5.5.2 above.

(p) Integrate infrastructure into the design

Mechanical infrastructure includes roof top HVAC. While the standard is to screen these appurtenances the DAB noted in their review that the HVAC units located on the roof are not readily visible by pedestrians, thus no screening is necessary.

All other utilities will be underground. Mail will delivered inside.

Garbage is collected from residents and stored inside at ground level. It will be picked up twice/week from the Haswell Street driveway. (Affirmative Finding)

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

(a) Relate development to its environment

1. Massing, Height, and Scale

This 3-story building given its location on North Avenue is well within the range of scale and height established by existing buildings in this area and thus is reasonable for this location. The building is designed to be subordinate to the existing three story historic structure w. The western addition is designed at two stories to transition from the larger three story North Avenue facing portion to the residential scale west of the site. The new elevator shaft separates the old from the new. (Affirmative Finding)

2. Roofs and Rooflines

The proposed building will have a flat roof. This roof form is common and expected for an Italianate designed historic structure. (Affirmative Finding)

3. Building Openings

The southern elevation facing the parking lot becomes the main entrance and “front” of the facility. The new elevator service becomes the main entrance separating old from new. The entrance on this face has a canopy that is clearly visible from North Avenue. There is an entrance on North Avenue, but it does not appear as a main access point, and it is suggested that this should be strengthened to some extent. (Affirmative Finding as Conditioned)

The variety of windows on the elevations includes upper level ganged double hung windows at a scale appropriate for this building. In response to neighbor comments the commercial component proposed to be re-established on the ground level has been deleted. However, the plans depict a storefront fenestration pattern at the ground level in an attempt to recreate the original retail use. (Affirmative Finding)

(b) Protection of important architectural resources

The subject property contains an historic building that formerly housed Burlington College. The proposed addition is sensitive to this building using fiber cement clapboard style siding.

The existing significant

The neighboring building to the west at 3 Haswell Street is historically significant, dating to c. 1907 and included on the Vermont Historic Sites & Structures Survey. The separation from the proposed development and that structure mitigates any potential impacts on the neighboring building. A detailed discussion of the historic building, its renovation and relation to the new addition is addressed under Sec. 5.4.8. (Affirmative Finding)

(c) Protection of important public views

There are no important public views from or through the subject property. Not applicable.

(d) Provide an active and inviting street edge

As required by this criterion, the façade of the proposed building re-establishes the commercial store front of the original building along the street edge.

It has a well-defined, entry from the south, but the eastern elevation could have a more defined access along North Avenue. There is commercial glazing along the public sidewalk. The rest of the building more uniform in appearance rises above it. (Affirmative Finding as Conditioned)

(e) Quality of materials

Repairs will be undertaken as necessary to the wooden clapboards. Building materials are appropriate given that they are modern – fiber cement wide reveal clapboards, yet retain the character of the original wood clapboard siding. (Affirmative Finding)

(f) Reduce energy utilization

The proposed construction is proposed to meet or exceed all energy related requirements of the all applicable energy efficiency standards. These include the RBES and/or CBES Codes of the state which exceed the requirements of city standards. Sunshades are used on the southern elevation to address that solar exposure. (Affirmative Finding as Conditioned)

(g) Make advertising features complimentary to the site

No advertising is included in this proposal at this time. Future signs will require obtaining approval of sign permits. (Affirmative Finding as Conditioned)

(h) Integrate infrastructure into the building design

As discussed in (p) above mechanical infrastructure includes roof top HVAC. While the standard is to screen these appurtenances the DAB noted in their review that the HVAC units located on the roof are not readily visible by pedestrians, thus no screening is necessary.

All other utilities will be underground. Mail will delivered inside.

Garbage is collected from residents and stored inside at ground level. It will be picked up twice/week from the Haswell Street driveway. (Affirmative Finding)

(i) Make spaces safe and secure

The proposed building must comply with the city's current egress requirements. The entrances are adequately lit, and an intercom system for access to the residential units is included. (Affirmative Finding)

Article 8: Parking

Sec. 8.1.8, Minimum Off-Street Parking Requirements

This property is located within the Shared Use Parking District. Based on the warned and thus applicable Zoning Amendment (ZA14-07) the following parking calculations can be determined as follows:

12 Studio units/ 0.33 parking spaces per unit	=	4 spaces required.
2 one bedrooms units/0.33 spaces/unit	=	1 space required (0.66)
3969 sq. ft. Adult day-care at 1 space/1000 sq. ft.*	=	3.97 spaces
10.096 sq. ft. Offices at 1/500	=	20.2
Total	=	29 spaces required

Provided within the parking area controlled by the applicant = 29.

*The ordinance has two different standards for adult day care; one based on number of employees the other on square footage. Utilizing the sq. ft. standard herein as the employee number is dynamic and thus unreliable indicator of parking needs. (Affirmative Finding)

Sec. 8.2.5, Bicycle Parking Requirements

Bicycle parking is required as follows:

14 residential units require 3.5 long term and 1 short term space (1 per 4 units and 1 per 10 units required, respectively)

3969 sq. ft. day care require 0.19 long term and 0.39 short term spaces (1/20,000 and 1/10,000, respectively)
10.096 sq. ft. offices require 2 long term and 1 short term spaces (1/5,000 and 1/10,000, respectively)
Total = 6 long term and 3 short term bicycle spaces

Bicycle parking provided includes short term racks at the south (main) entrance that would accommodate more than the 3 spaces required. The interior/long-term bike storage as proposed will accommodate 8 wall hung bikes. (Affirmative Finding)

Article 9: Inclusionary and Replacement Housing

Inclusionary Sec. 9.1.5, Applicability As the proposed development includes more than 5 new dwelling units it is subject to the inclusionary housing provisions of this Article. At least fifteen percent of the total unit count must be inclusionary. Final details as to the number of actual affordable location and level of affordability must be worked out with the city's Housing Trust Fund prior to issuance of a certificate of occupancy. (Affirmative Finding as Conditioned)

Housing Replacement Sec. 9.2.2, Applicability This Part is applicable to the demolition of the single family house. Replacement will be met as the project includes 14 residential units. However, as the house is occupied the relocation requirements must be implemented pursuant to Section Sec. 9.2.4 (a) and (b) Relocation Requirements; Notice and Relocation Costs. (Affirmative Finding as Conditioned)

Article 10: Subdivision

There is no subdivision of land included in this proposal. Two parcels will be merged into one lot resulting in a lot line adjustment with the existing COTS building and 7 Haswell Street, the abutting residential property to the west. As required, a boundary survey by a VT licensed land surveyor has been provided with the final plat plans. (Affirmative finding as Conditioned)

II. MINUTES

The meeting minutes will be distributed separately upon review and approval by the Development Review Board.

III. MOTION

Motion: Brad Rabinowitz

I move that the Board grant certificate of appropriateness and conditional use approval for the renovation and addition to existing building for 14 new residential units as part of mixed use building. Project includes demolition of house and lot merger at 7 Haswell Street. Uses in addition to the residential units will include adult day care (Day Station) and COTS offices. Approval is subject to the following conditions of approval:

1. Prior to issuance of a certificate of occupancy, the lot line adjustment mylar, with the applicable endorsement signature, shall be filed with the City Clerk.
2. Prior to issuance of a certificate of occupancy, written confirmation from the City's Housing Trust Manager shall be included in the zoning file concurring with IZ compliance.
3. **Prior to release of the zoning permit**, the applicant shall obtain written approval of the Erosion Prevention and Sediment Control Plan from the Stormwater Administrator.
4. **Prior to the release of the zoning permit**, the applicant shall obtain the written approval of the Stormwater Management Plan from the Stormwater Administrator.
8. As a portion of the site including the southeast corner of the existing building is within the public ROW, the applicant must contact and work with DPW regarding the work being considered.

9. Prior to issuance of a certificate of occupancy, the project engineer must certify in writing that, among other things, the project EPSC plan as approved by the Department of Public Works has been complied with and final site stabilization has occurred. This certification shall be filed with the Department of Planning & Zoning.
10. At least 7 days prior to issuance of a certificate of occupancy, impact fees calculated on the net new square footage of the development shall be paid to the Department of Planning & Zoning. Impact fees may be reduced as determined by the manager of the City's Housing Trust Fund for the provision of inclusionary housing units.
11. Days and hours of construction shall be Monday-Friday 7:00 am – 5:00 pm; Saturdays 8:00 AM – 5:00 PM. No construction on Sunday.
12. A State Wastewater Permit will be required for water and sewer service. It is the obligation of the owner/applicant to seek this and any other required additional permits.
13. If any archaeological resources are identified during excavation, the city and state shall be notified for identification and arrangement for appropriate documentation and archiving.
14. The applicant is strongly encouraged to pursue solar hot water and/or photo voltaic options.
15. The street trees and other landscaping within the ROW must be in consultation with the City Arborist.
16. Future signs are anticipated and shall require separate zoning permits.
17. The applicant shall be aware that due to the age of the building hazardous material such as lead paint and asbestos may be present. All materials removed shall handled and disposed of in a safe and legal manner.
18. It is suggested that while the building entrance on North Avenue is not the main access point it should nonetheless be strengthened to some extent.
19. The proposed construction is proposed to meet or exceed all energy related requirements of the all applicable energy efficiency standards. However it is the applicant's responsibility to file the documents/certifications of both the RBES and/or CBES Codes of the state as required. Evidence of such filing must be provided prior to issuance of a certificate of occupancy.
20. The applicant shall provide a parking management/control plan that assures only COTS related users will park in the parking area and that off-site users will be prohibited from parking in the lot. The plan is subject to review and acceptance by staff.
20. Standard Permit Conditions 1-15
 1. **Other City, State or Federal Permits.** The owner is solely responsible for obtaining all other required City, state and federal approvals. Failure to do so may invalidate this Zoning Permit and result in enforcement actions.
Note: All projects receiving a Zoning Permit also require a Construction Permit or written confirmation that a Construction Permit is not required from Department of Public Works-Inspection Services Division (DPW-ISD). All construction permits must be closed out by way of approved inspections by DPW-ISD before issuance of a Unified Certificate of Occupancy (UCO) by the Code Enforcement Office as per Condition 3, below.
 2. **Time Limits.** This zoning permit shall become invalid unless work or action authorized by the permit is commenced by **December 23, 2015**. The owner shall complete the approved project and obtain a UCO (combined Zoning and Building certificates of occupancy, still applicable even if a zoning or building permit was not required) by **December 23, 2016**, or be subject to enforcement actions.
 These time limits are binding upon the owner unless one of the following apply: a) longer or shorter time limits are specifically imposed by a condition of approval; or b) the time limits are tolled by additional state or federal permitting for the project or by an appeal; or c) an extension of time has been granted. An extension of time must be requested in writing PRIOR to the expiration of the permit. If the owner has enacted the permit and it lapses, the owner may be responsible to

obtain a new zoning permit, if required, which shall be subject to the current Comprehensive Development Ordinance (CDO).

3. **Unified Certificate of Occupancy (UCO):** It shall be unlawful to use or occupy (or allow the use or occupancy of) any land or structure or part thereof which has been created, changed, converted, or wholly or partly altered or enlarged in its use or structure without a UCO.

If the project is partially completed, meets “prior to issuance of a UCO” conditions of approval, meets all health and safety standards, and all municipal fees for the project are paid, a Temporary Zoning CO may be requested and issued. **Upon completion of the project,** applicant shall request and obtain a Final UCO from the Code Enforcement Office (located at 645 Pine Street). Additional information on how to request and obtain this UCO is available at this office. **Failure to obtain a certificate of occupancy** places the property in violation of the CDO and is subject to enforcement.

In addition, **Failure to obtain a UCO within the time limits above is subject to** “after the fact” fees ranging from \$75 - \$1500 (in addition to the UCO fee).

4. **Project Modifications.** The project shall be completed as shown on the plans, which have been stamped “approved” and dated by the administrative officer. The project shall not deviate from the approved plans or conditions of approval without prior written approval from the administrative officer.
5. **Property Inspection.** By acceptance of this permit, the owner authorizes City Officials and/or their authorized representatives, access to the subject property for the purpose of observing work in progress, inspecting and/or measuring the property or improvements until such time the project has been issued a Final UCO.
6. **Completion and Maintenance of Improvements and Landscaping.** Owner or successor in interest is responsible for completing all improvements shown on approved plans. By acceptance of this permit, Owner agrees to maintain all improvements in a satisfactory condition. Any landscaping installed according to the approved plan which becomes diseased or dies shall be replaced by similar species and size no later than the first available planting season.
7. **Off-Site Drainage.** Issuance of this permit does not authorize the discharge of stormwater runoff or other surface drainage from the subject premises onto adjoining property or properties including but not limited to the public Right of Way.
8. **Errors.** The owner is solely responsible for the accuracy of all information contained in the Zoning Permit application. Any errors contained therein may invalidate the Zoning Permit and may result in enforcement action by the City.
9. **Transfer of Ownership. All zoning permits run with the land.** In the event of a transfer of ownership, partial or whole, of the subject premises, the transferee shall become permittee and subject to compliance with the terms and conditions of this permit.
10. **Violations/Penalties.** A violation of any of the conditions of this permit or of any provision of the CDO may result in enforcement actions, including but not limited to a penalty of up to one hundred dollars (\$100) per day, municipal tickets, and/or additional permitting fees.
11. **Incorporation and Reference of All Plans Presented.** This approval incorporates by reference all plans and drawings presented and all verbal representations by the applicant on the subject application to the extent that they are not in conflict with other stated conditions or regulations.

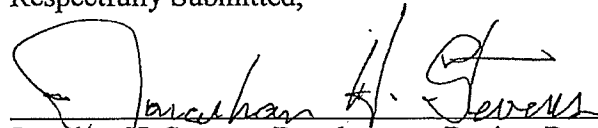
12. **For Properties Involved in Boundary Disputes.** Boundary disputes are not within the jurisdiction of the administrative officer or the Development Review Board. When an application is submitted and the boundary of the subject property is called into question, the boundary will be determined based upon the best evidence available, for instance a survey or other official document. If a permit is issued and contrary evidence is presented to the City after the fact, such as a survey or Superior Court ruling with respect to the boundary lines, the permit may be amended or revoked by the City. If the permit is amended or revoked, owner shall bear all costs to remedy the situation, including removal of the structure(s) if necessary, that is if the structure(s) is/are unable to meet the requirements of the CDO and receive an amended permit in light of the actual boundary line.
13. **Damage to City Property.** The Owner is responsible for any damage to the City of Burlington's property, including but not limited to its right-of-way, sewer/water lines, etcetera, that occurs during the site improvements authorized by this permit. If damage occurs, the Owner shall restore the property to a condition equal to or better than the condition of the property prior to such damage.
14. **City Rights-of-Way and Ownership.** Permit approval does NOT authorize any work to be undertaken within the public ROW. Any work in the ROW can only occur with prior authorization by DPW and City Council, as required. Any work or improvements that are taken within the City's right of way does not diminish the City's ownership or authority regarding said right of way.
15. **Liquor License Required.** An approval of any use that includes the sale of alcoholic beverages is contingent upon the receipt of a liquor license from the City of Burlington or the State of Vermont, whichever is applicable.

Seconded: AJ LaRosa

Vote: 7-0-0, motion carried

Dated at Burlington, Vermont, this 23rd day of December 2014

Respectfully Submitted,



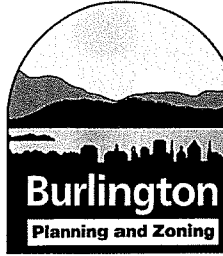
Jonathan H. Stevens, Development Review Board, Vice Chair

Please note that an interested person may appeal a decision of the Development Review Board to the Vermont Superior Court Environmental Division. (Zoning Ordinance Article 17, Section 17.1.7, Appeals of Development Review Board Decisions: An interested person may appeal a decision of the Development Review Board to the Vermont Superior Court Environmental Division. The appeal shall be taken in such a manner as the supreme court may by rule provide for appeals from state agencies governed by Sections 801 through 816 of Title 3). The Court rules may require that such an appeal be commenced within Thirty (30) days of the Board's decision.

Department of Planning and Zoning

149 Church Street
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David White, AICP, Director
Meagan Tuttle, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, CFM, Associate Planner
Anita Wade, Zoning Clerk



MEMORANDUM

TO: Development Review Board
FROM: Ryan Morrison, CFM, Associate Planner
DATE: February 7, 2017
RE: Re-Approval of Zoning Permits ZP15-0525CA/MA (87-95 North Avenue) & ZP15-0526CA/MA (7 Haswell Street)

Files: ZP15-0525CA/MA & ZP15-0526CA/MA

Location: 87-95 North Ave. & 7 Haswell Street

Zone: NMU **Ward:** 3C

Date of Permit Approval: Decision by DRB December 23, 2014

Date of Expiration: December 23, 2016

Applicant/Owner: 95 North Avenue Limited Partnership/Duncan Wisniewski Architecture

Request: Re-Approval of two zoning permits:

1. ZP 15-0525CA/MA for a renovation and addition to the existing building for 14 new residential units as part of a mixed use building.
2. ZP 15-0526CA/MA to demolish an existing house and merge lot in conjunction with ZP 15-0525CA/MA

Zoning Permits ZP15-0525CA/MA and ZP15-0526CA/MA were approved concurrently by the Development Review Board on December 23, 2014. The permit's 2-year life span expired on December 23, 2016. The applicant states that the house at 7 Haswell Street has been removed, and the overall project is 80% complete. The anticipated completion date is March 31, 2017.

There are no deviations from the original proposal, and the request in front of you is to re-approve both zoning permits. Staff recommends re-approval of ZP15-0525CA/MA and ZP15-0526CA/MA, subject to the findings and conditions approved on December 23, 2014 (attached), subject to revised dates.

BURLINGTON TOWN CENTER BURLINGTON, VT



PLANNING & ZONING SUBMISSION

12/15/2016

Revised 01/11/2017

Revised 01/20/2017

BURLINGTON TOWN CENTER PLANNING AND ZONING APPLICATION

12/15/2016

01/11/2017 Revised

01/20/2017 Revised

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1.0 OWNER, APPLICANT, AND DESIGN TEAM

1.1 PLANNINGANDZONINGAPPLICATIONSREQUIRED:

COA LEVEL II REVIEW APPLICATION
MAJOR IMPACT REVIEW APPLICATION

1.2 OWNER:

Devonwood Investors, LLC	Donald Sinex
101 Cherry Street, Suite 440	
Burlington VT 05401	
802-658-2545	

1.3 DESIGNTEAM:

Applicant/ Design Architect	PKSB Architects
Construction Management	PC Construction
Consulting Architect	Freeman French Freeman, Inc.
Structural Engineer	Hardy Structural Engineering
Mech./Elec./Plumbing Engineer	Hallam ICS
Civil Engineer	Engineering Ventures
Landscape Architect	SE Group
Traffic, Noise, and Pollution	VHB

1.4 NEIGHBORHOODMEETING:

Per Zoning Section 3.5.2(b), pre-application neighborhood meetings were held. See FIGURE 1-A for affidavit, list of meeting dates, and meeting minutes.

2.0 NARRATIVE

2.1 PROJECTINTRODUCTION:

Devonwood Investors, LLC proposes to develop a multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District on the project site presently occupied by Burlington Town Center Mall at 49 Church Street. The site is currently spread across six parcels of land, and will be reconfigured into five, two of which will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul Street, between Cherry and Bank Streets (See Drawing C0.1 Adjusted Parcel Boundaries). The lot reconfiguration is a separate application. The proposed uses include retail, residential, office, and parking. The development consists of one building composed of a Base, a South Tower, and a North Tower.

2.2 DECONSTRUCTION(DEMOLITION)OVERVIEW:

Our limits of deconstruction will be framed by the existing street lines and building structures. Cherry Street will provide boundary to the North and Bank Street to the South. The 100 Bank Street building will anchor the southwest deconstruction limits and the Macy's building will provide terminus to the West. The L.L. Bean building and remaining mall structure will provide boundary to the East.

Site and building utilities will be cut and capped where serving the deconstruction areas and the project team will coordinate to maintain utilities for abutting properties. We will coordinate to ensure emergency egress and needs of all abutting properties are met throughout the course of construction.

As part of our LEED goals, we are seeking 75% or more diversion of recycled materials from the waste stream during the deconstruction process.

See Drawing AD-001 for drawing and photos.

2.3 DISTRICTSPECIFICREGULATIONS: Zoning Section 4.5.8(c)1

Uses: Adjusted Parcel 2 is the lot bounded by Cherry, St. Paul, Bank, and Pine Streets exclusive of 100 Bank Street at the corner of Bank and Pine Streets. Square footage of Parcel 2 is 109,779. The total proposed square footage in subject Parcel 2 is 965,352, divided as follows:

Retail:	126,813 sf	13%
Office:	230,328 sf	24%
Residential:	299,602 sf	31%
Residential Parking:	109,391 sf	11%
Non-Residential Parking:	197,868 sf	21%
Public Amenity:	<u>1,350sf</u>	0%
TOTAL:	965,352 sf	

Per zoning section 4.5.8(c)1, the maximum allowed FAR is 9.5

$109,779 \times 9.5 = 1,042,900.5$ sf Maximum allowed area.

The proposed FAR for Adjusted Parcel 2 is: $965,352 / 109,779 = 8.79$ PROPOSED FAR.

Building Height and Setbacks: Maximum building height per zoning section 4.5.8(c)1 is 160'-0". Proposed building heights comply with requirements, see drawing Z-021 Zoning Sections. Setbacks at street level are not required and not provided. Mechanical penthouses encroach beyond height limit no more than 15 feet, as allowed per Zoning Section 5.2.6(b) and are setback 10'-0" from the roof edge.

Pervious Area: Minimum required pervious area per zoning section 4.5.8(c)1 is 10%, or 10,978 square feet. Proposed pervious area to be 11,015 square feet, or 10.03%. These "green" roofs will be in the North Tower on floors 7 and 12.

Floorplate Compliance Checklist

Floors	Max Allowed
1-5	100% of Lot
6-8	80% of Lot
9-12	55% of Lot
13	15,000 sf *
14	15,000 sf *

* Each tower separated by 60'-0"

Floorplate Compliance Checklist - Proposed

Floor	South Tower		Floor	North Tower		Total Coverage	% Lot Coverage	
				East	West			
1	84,795.60		Cellar	23,656.56 (Excluded)		84,795.60	77.24%	< 100%
2	85,488.59		1	22,954.26		108,442.85	98.78%	< 100%
3	94,059.57		2	14,393.59		108,453.16	98.79%	< 100%
4	94,058.57		3	14,392.59		108,451.16	98.79%	< 100%
5	94,058.57		4	14,392.59		108,451.16	98.79%	< 100%
6	18,077.06		5	53,241.62		71,318.68	64.97%	< 80%
7	18,077.06		6	53,241.62		71,318.68	64.97%	< 80%
8	18,077.06		7	33,977.74		52,054.80	47.42%	< 80%
9	18,077.06		8	33,977.74		52,054.80	47.42%	< 55%
10	14,475.33		9	33,977.74		48,453.07	44.14%	< 55%
11	14,475.33		10	32,677.74		47,153.07	42.95%	< 55%
12	11,905.74		11	32,677.74		44,583.48	40.61%	< 55%
Mec.	1,350.00		12	10,140.00	10,140.00	24,766.25	22.56%	< 15,000 ea.
			13	10,140.00	10,140.00	20,280.00	18.47%	< 15,000 ea.
			14	10,140.00	8,710.00	18,850.00	17.17%	< 15,000 ea.

2.4 URBANDESIGNSTANDARDS: Zoning Section 4.5.8(c)2 and Section 6.3.2(a)

Stepbacks are provided within 60'-0" of grade level and by 12th floor at all portions of the development, see Drawing Z-021 Zoning Sections. Upper story floorplates are split into reduced plates to provide tower-like proportions to allow views of the sky between individual building elements.

Projecting bay windows, recessed entryways, recessed balconies, spandrel panels, and brick offsets offer multiple surface relief in articulation of the facades of 4" or more at each facade. Primary material choices include brick, limestone-finished panels, and glass. Material changes are provided at upper story setbacks and other façade elements. Accent materials include metal railings and screens.

Setbacks provided are activated as outdoor amenities for tenants and visitors. The tops of the tower-like elements include columned structure with screened mechanical penthouses including all mechanical equipment (except for plumbing and shaft vents) setback from the façade. The columns also serve as support structure for an extensive photovoltaic array, providing power to the development. A 6" stone projection is provided at the roof level of the North Towers.

The lower stories, consisting of retail, parking, and residential uses, are visually differentiated from upper stories through material changes and setbacks. The upper stories are also differentiated with material changes and setbacks.

Multiple pedestrian access points are provided to buildings on all sides of the development and are typically setback 10'-0" from the main façade. The entry setbacks continue to the upper stories to create vertical expression, and are further expressed through canopies and signage.

Proposed Exterior Finish Materials

	Cherry St.	St. Paul St.	Bank St.	Pine St.
Brick-Faced Panels	13,875 28%	6,884 15%	1,663 5%	7,234 24%
Limestone Finished Panels	4,580 9%	4,934 11%	3,631 10%	4,730 15%
Glazing	23,704 49%	23,135 51%	20,076 55%	15,503 51%
Glazed Spandrel Panel	0 0%	4,761 11%	7,990 22%	0 0%
Stone Base	211 0%	258 1%	152 1%	192 1%
Metal Panels	6,404 13%	5,075 11%	2,834 8%	2,996 10%
Total:	48,774	45,047	36,346	30,655

For additional compliance information, see Zoning Ordinance Appendix.

2.5 RESIDENTIAL: Zoning Section 9.

Proposed residential units at the Cherry Street portion of the development are 242, distributed between floors 2-14. Proposed residential units at the Bank Street portion are 30, distributed between floors 2-4. The total quantity of proposed residential units is 272. Proposed units include 70 Studio apartments, 92 1-Bedroom apartments, and 110 2-Bedroom apartments.

Of the total 272 units, 55 (20.22%) are proposed to be Inclusionary apartments. The Inclusionary units are proportionally distributed amongst unit types and are evenly distributed throughout residential portions of the development. See Drawings A-051 – A-053.

2.6 RETAIL: Zoning Section 4.5.8(c)2C

Retail uses are proposed at street-level areas along all four street frontages, as well as second floors at Bank and St. Paul Streets. Approximately 75% of the retail facades consist of glazing to allow for prescribed display and visual requirements. See Elevations A201-A202 for specific percentages at each facade. Glazing allows transparency in order to provide window displays for tenants. Ground floor heights (floor to floor) are typically 15'-6", but vary per retail tenant space and meet or exceed 14'-0".

2.7 OFFICE:

Proposed office uses are located at floors 6-12 of the Bank Street (South) tower and at floors 5-6 of the Cherry Street (North) tower. See plan drawings.

2.8 PARKING: Zoning Section 4.5.8(c)4, Section 6.2.2(i,l), and Section 8

The development commits to participate in the Downtown Parking and Transportation Management District. Parking for tenants and visitors is provided at and above the second floor of the development on floors 2 through 5 of the South Tower. Vehicular parking access is provided on both Cherry and Bank Streets. Pedestrian access to parking area is provided at Cherry, Pine, and St. Paul Streets. Vehicles and headlights within the parking area are screened from public view with building façade elements consistent with the scale and materials of the overall development.

The total required number of automobile parking spaces is 733 (Zoning Section 8.1.8). See Table below. Total proposed number of automobile parking spaces is 761. Total proposed number of accessible parking spaces is 16, and all are provided at the lowest parking level.

An off-street loading area is proposed on Bank Street sharing the driveway with the off-street parking vehicular access.

Electric Vehicle Charging Stations are a component of the proposed parking use. See LEED checklist for more information.

Car Parking Requirements

Use	Required Base #	Ratio	Required	Proposed
General Retail		0	0	0
Office	230,328 sf	2 per 1000 sf	461	489
Residential	272 Units	1 per unit	272	272
Totals			733	761
Required Accessible Parking (2%)			15	16

Total required and proposed bicycle parking is 171. This is subdivided by 121 long term spaces and 50 (max required per Zoning Section 8.2.5) short term spaces. See table below. The long term spaces are located on floors 2-5 of the parking area, adjacent to the Pine Street parking pedestrian access and

includes shower and changing facilities. Short term spaces are located at streetscape, adjacent to major entry points. See LA-200 Layout Plan.

Bicycle Parking Requirements

Use	Required Base #	Long Term		Short Term	
		Ratio	Spaces	Ratio	Spaces
General Retail	126,813 sf	1 per 20,000 sf	7	1 per 5,000 sf	26
Office	230,328 sf	1 per 5000 sf	46	1 per 10,000 sf	23
Residential	272 Units	1 per 4 units	68	1 per 10 units	27
Sub-Total		121		50 (Max Req'd)	
Required Total		171			

2.9 PUBLICAMENITY:

A public observation deck is located on the 13th floor of the Bank Street (South) tower consisting of an enclosed observation area and an exterior deck. Public access is via the Bank Street Office entry point.

2.10 SIGNS: See Zoning Sections 4.5.8(c)5 and Section 7.

Signs shall be submitted for review under a separate permit application. Any signs shown in the drawings or renderings are generic in nature and do not necessarily represent actual signage to be proposed.

2.11 GREENBUILDING: Zoning Section 4.5.8(c)6

This project is required to meet a LEED Gold Standard as part of the zoning changes for the Downtown Core Mixed Use Overlay district that were approved by Burlington voters. The project will pursue certification under the “LEED v4 for New Construction and Major Renovations” rating system.

See FIGURE 2-A for a Summary LEED Checklist per Zoning Section 5.4.8(c)6A. This checklist illustrates the most straightforward path to the 60 points required for certification at the Gold level. It is of a schematic nature at this time and is subject to change based on design adjustments over the course of the project and may take a significantly different path to certification.

FIGURE 2-B is the receipt offered as proof that the project has been registered with the US Green Building Council. The project ID is 1000097092 and the project should be listed at <http://www.usgbc.org/projects> by the time this application is submitted.

The project team hereby commits to pursuing pre-certification at the earliest appropriate milestone. The ability to pre-certify projects registered for the “New Construction and Major Renovations” version of LEED has not been available in the past, but a precertification option applicable to this project was announced on December 1, 2016. The precertification worksheet requires specific details about the project to be provided to the LEED certification body, such as mechanical equipment schedules, plumbing fixture data, and other details which will not be determined until the design has progressed substantially, although the LEED checklist provided with this application indicates the level of

performance we intend to pursue. <http://www.usgbc.org/articles/new-precertification-options-launched-leed-v4-bdc-and-om-projects>

We note that the LEED process is rigorous and that our team's experience indicates that for a project of this size and complexity, it generally takes a year following final completion of the project to submit the extensive documentation required for formal review by GBCI, the official certifying body for LEED. While precertification will provide written feedback from the reviewing body early in the design process, we anticipate final certification will occur in the summer of 2021, based on the proposed schedule's final completion in May, 2020,

Freeman French Freeman will coordinate the LEED submission and has successfully facilitated the LEED certification of 10 projects, 5 of them at the Gold level. Among them are the Community Health Centers of Burlington (LEED Certified); UVM University Heights (LEED Gold); UVM Jeffords Hall (LEED Gold). FFF has a further 5 projects with LEED certification pending.

2.12 STORMWATERMANAGEMENT: Zoning Section 4.5.8(c)6B

The existing site is composed almost entirely of impervious areas. Runoff from the existing site discharges directly and without treatment or attenuation to the combined sewer system. The runoff from the site is treated at the Burlington Main Municipal Wastewater Treatment plant. Each year, for most storms runoff from the existing site is fully treated at the wastewater treatment plant. However, several times each year during larger storm events, the Main Municipal Wastewater Treatment plant is hydraulically overloaded. Therefore, there are opportunities to implement improved runoff reduction practices for the site in accordance with Section 4.58(c)6B of the Downtown Mixed Use Core Overlay Regulations. The following opportunities are considered:

Separating stormwater flows from sanitary sewer flows to allow onsite attenuation. Onsite, rainwater will be collected through a system that is separate from the sanitary sewer system. Prior to leaving the site, rainwater will be stored and attenuated in 3 large underground water cisterns. These subsurface tanks will reduce the runoff from the site for all storms when compared to current conditions. The rate of runoff will be reduced so that during a 1-year 24-hour storm the peak stormwater rate flows from the site at a rate less than the peak runoff rate from a meadow in good condition. Smart flow meter technology will be integrated for DPW's use to provide effective flow rates optimized to the main wastewater treatment plants needs across a variety of storms hydrographs.

Stormwater Reuse through a greywater toilet or irrigation system is not appropriate to implement for this site. This site is a mixed-use development containing retail and residential bathrooms, medical office uses, and daycare facilities where a greywater reuse system is not feasible due to the future flexibility of uses in the building. Also, Vermont's climate does not require the use of irrigation systems.

Green Roofs will be provided on a minimum of 10% of the proposed building, designed to capture and attenuate the first 1" of rainfall. The location of the green roofs will take into account solar shading of the terraced roof's and structural framing systems.

Bioretention areas need to be located in topographically flat areas with deep well-draining soil, that receive runoff from areas that are protected from sedimentation. A bioretention area is

proposed along a portion of the north side of Bank Street. The bioretention area will be located at the lower end of the street where a parking-bump-out occurs so that the bioretention area has enough width so that the appropriate vegetation can survive winter conditions and a pretreatment device can be provided.

All of the sidewalks surrounding the site will have some pervious paver areas, street trees and landscaping that will reduce the runoff of stormwater through infiltration and evapotranspiration.

The appropriateness of infiltrating stormwater requires the evaluation of subsurface conditions. Prior to implementing stormwater infiltration measures, the following items must be evaluated during construction because a building currently occupies the site: existing soil contamination; structural bearing capacity of saturated soils; water infiltration into basements and subsurface structures including buildings that surround the site; existing and proposed depth to ledge rock; existing and proposed groundwater elevations; and the ability to maintain effective pretreatment facilities where needed.

See Drawings C1.6 and C3.4 for Erosion Prevention Sediment Control Plan, Details and Notes.

2.13 OUTDOORLIGHTING: Zoning Section 5.5.2

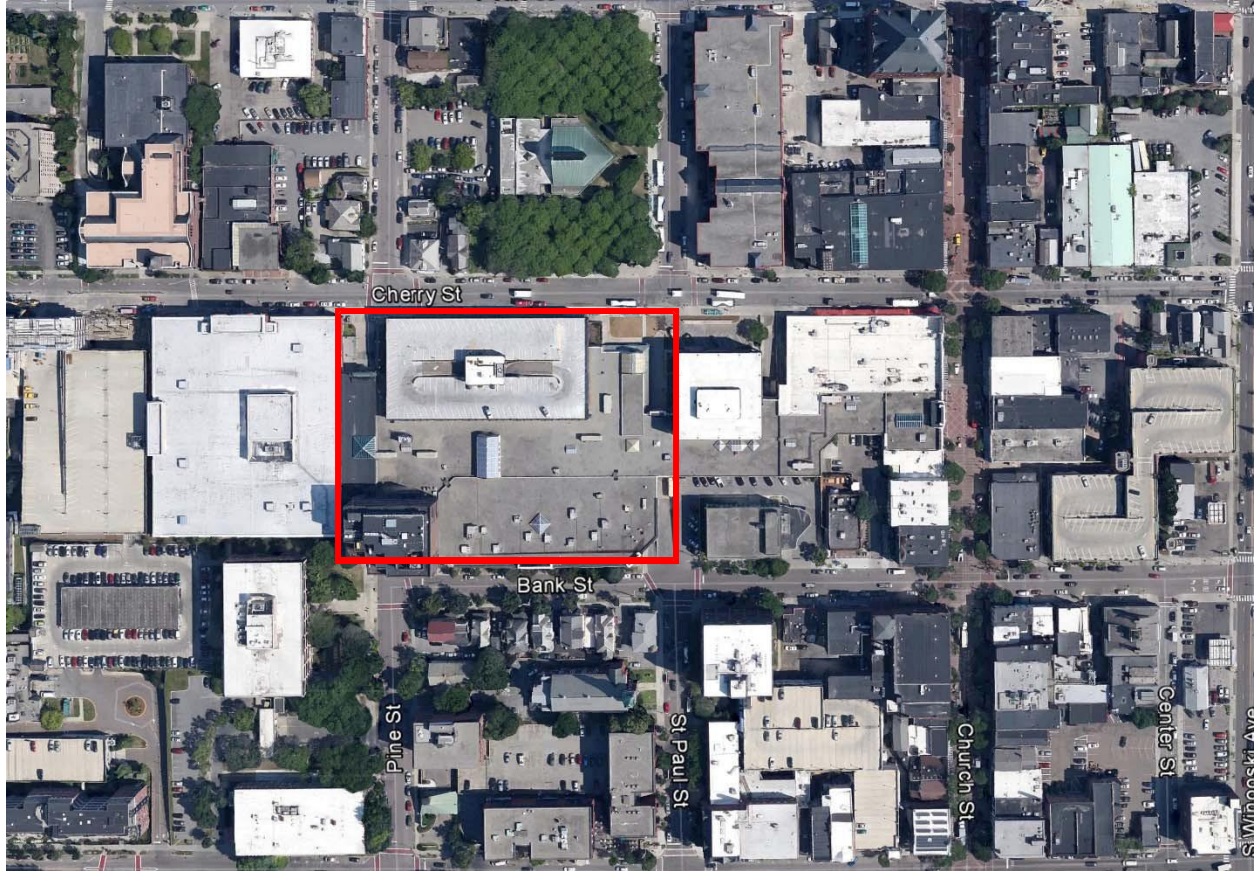
The intent of exterior lighting is to minimize light pollution while providing safe and inviting streetscapes for pedestrians and retail activities. Sidewalk lighting for pedestrians will be wall-mounted downlights mounted at brick piers at either side of the main entries. Additional lighting at main entry points to the development will be by canopy-mounted downlights. See specifications and LA-500 Lighting/Photometric Plan.

2.14 ADJUSTEDPARCEL2COVERAGECALCULATION: (See Proposed Site Plan for more info)

Proposed:

Building (Non-Pervious):	97,122 sf
Pavement:	1,642 sf
Pervious Area (Green Roof):	<u>11,015sf</u>
Total:	109,779 sf
Lot Size:	109,779 sf
Proposed Coverage:	$109,779/109,779 = 100\%$

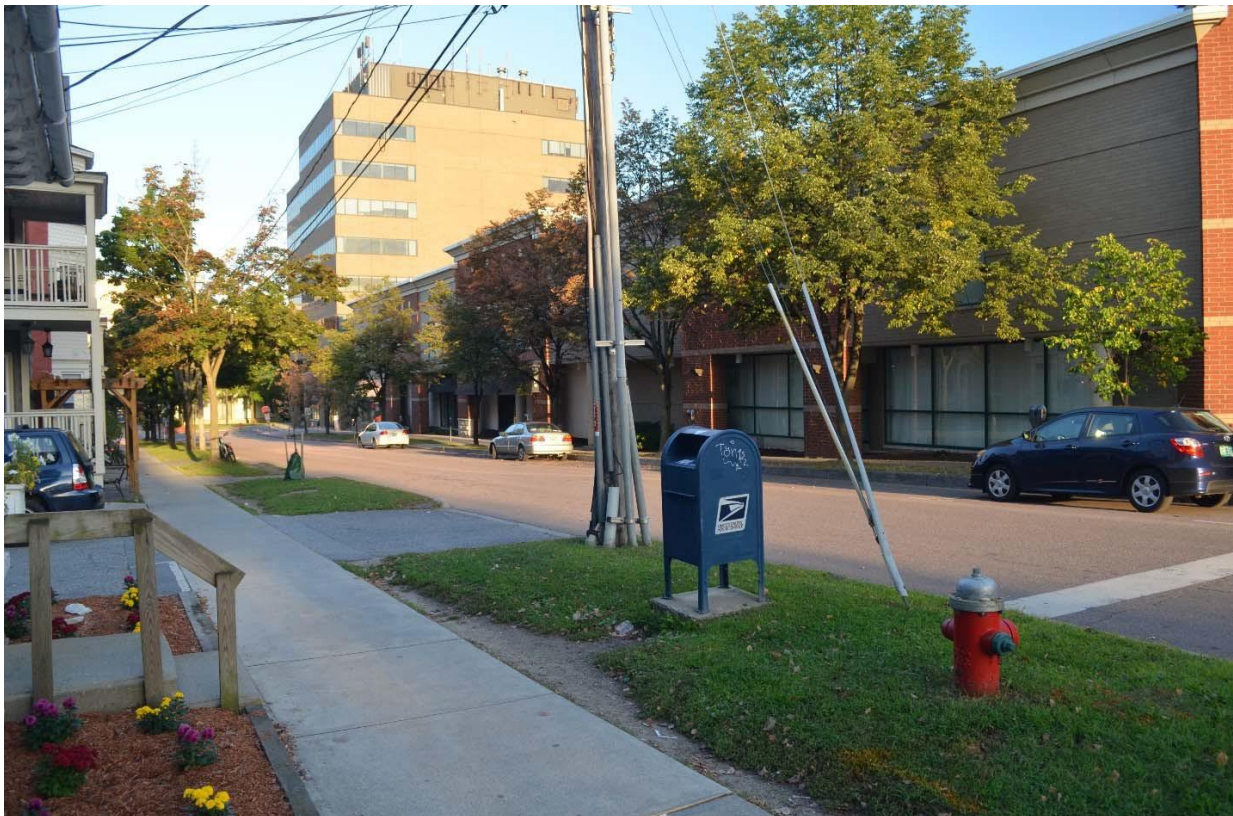
3.0 EXISTING CONDITIONS PHOTOGRAPHS



3.1 AERIAL VIEW OF DEVELOPMENT SITE



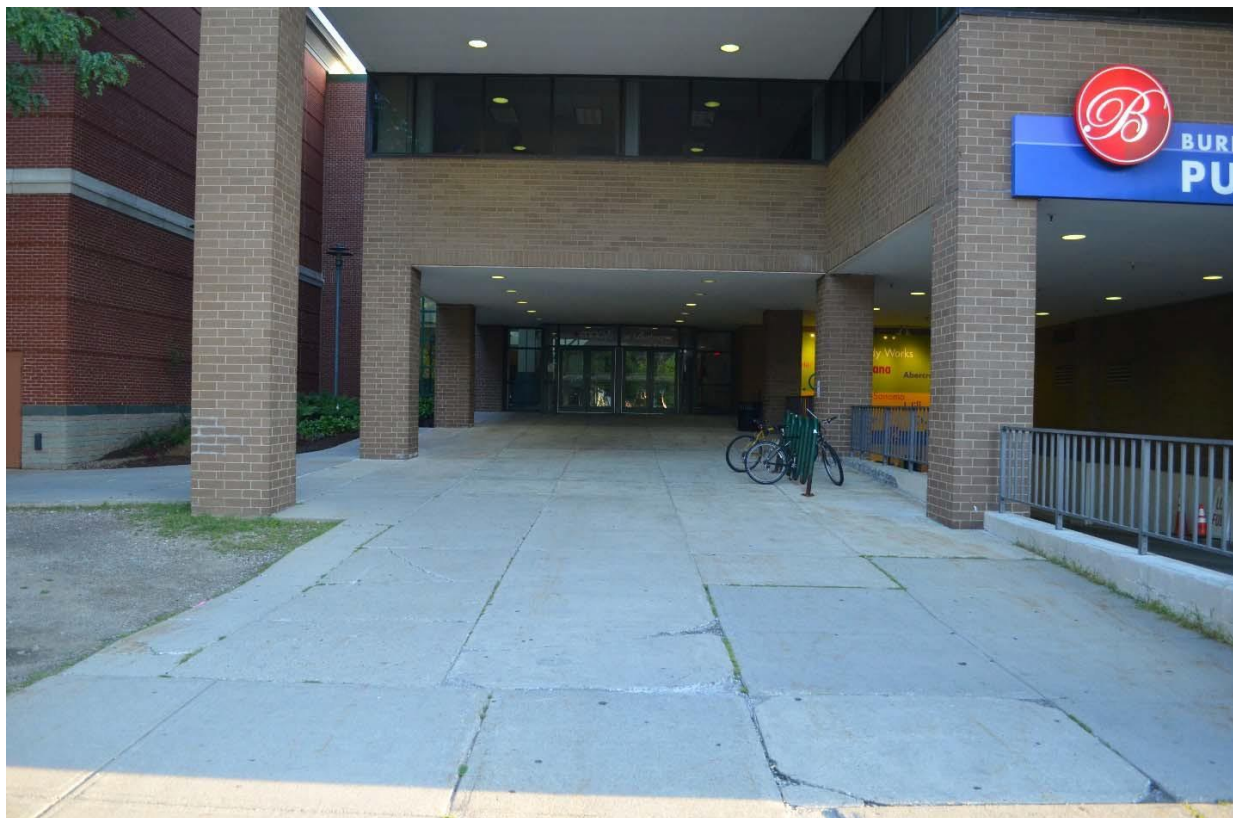
3.2 BANK STREET - LOOKING WEST



3.2 BANK STREET - LOOKING NORTHWEST



3.3 CORNER OF BANK STREET AND PINE STREET – LOOKING NORTHEAST



3.4 PINE STREET AT BANK STREET – LOOKING NORTH



3.5 CHERRY STREET – LOOKING SOUTHWEST



3.6 CHERRY STREET - LOOKING WEST



3.7 CHERRY STREET - LOOKING SOUTHEAST



3.8 PINE STREET AT CHERRY STREET - LOOKING SOUTH



3.9 CHERRY STREET – LOOKING EAST



3.10 CHURCH STREET – LOOKING SOUTHWEST

4.0 SPECIFICATIONS

SITEWORK

Concrete Sidewalk	
Deciduous Street Trees	See LA-400
Storm Drainage Retention System	
Bicycle Rack (Short Term)	See LA-200
Electric Vehicle Charging Station	
Street Light	See FIGURE 4-O

BUILDINGFAÇADE

Brick-Faced Panels	See FIGURE 4-A
Limestone Finished Panels	See FIGURE 4-B
Aluminum Storefront and Entrance Doors	See FIGURE 4-C
Retail Glass	See FIGURE 4-C-2
Aluminum Windows (Upper floors)	See FIGURE 4-D
Aluminum Panels	See FIGURE 4-E
Painted Metal and Stainless Steel Cable Railing	See FIGURE 4-F
Glass Canopies	See FIGURE 4-G
Exterior Wall-mounted Lighting Fixtures	See FIGURE 4-H
Exterior Canopy-Mounted Light Fixtures	See FIGURE 4-I

ROOFAREAS

Pre-cast Concrete Pavers	See FIGURE 4-J
Porous Pavement	See FIGURE 4-K
Fluid-Applied Membrane Roofing	See FIGURE 4-L
Green Roof	See FIGURE 4-M
Photovoltaic Panels	See FIGURE 4-N

5.0 DEVELOPMENT ANALYSIS

5.1 DAYS AND HOURS OF OPERATION:

Days and Hours of Operation

Component	Days	Hours	Notes
Retail	7 days/week	9am-9pm	<i>Extended hours during holiday periods</i>
Office	M-F	7am-6pm	
Residential	7 days/week	24 hours/day	
Parking Structure	7 days/week	24 hours/day	

5.2 NUMBER OF EMPLOYEES:

Number of employees is estimated to be 50.

5.3 TRAFFIC GENERATION AND PARKING ANALYSIS: See FIGURE 5-A.

5.4 PHASING SCHEDULE: See FIGURE 5-B.

5.5 NOISE: See FIGURE 5-C.

The proposed project would not result in adverse noise impact as it relates to the Burlington Noise Code (Section 21-13). The project would not be expected to include specific noise generating activities which are prohibited according to the Noise Code.

The development will include retail and office uses similar in nature and character to existing uses on the site and on abutting parcels typical of the downtown. Parking, loading docks, and trash and recycling facilities are partially enclosed within the building which would improve current conditions. The outdoor fifth floor tenant park will only be accessible to office tenants and the pre-kindergarted program during normal business hours. Standard mechanical equipment will be located on the building roofs and would be enclosed which would substantially reduce noise to the community.

5.6 ARCHEOLOGICAL IMPACTS:

The development is located entirely within a site previously disturbed during the urban renewal projects that resulted in excavation, disturbance and removal of soils to a depth below anticipated features of archeological significance. Based on this and a review with Planning and Zoning Staff and archeological professionals, it has been determined that the site does not require any further study.

6.0 MAJOR IMPACT NARRATIVE pursuant to Zoning Section 3.5.6(b):

- 6.1 The project will not result in undue water, air or noise pollution. Currently, most or all of the stormwater runoff from the site is discharged untreated to the City of Burlington combined sewer and stormwater collection system which is conveyed to the Main Wastewater Treatment Plant for treatment. The proposed project will manage stormwater runoff via filtering through a green roof (for a portion of the project roof), streetscape stormwater treatment features (such as pervious pavers and vegetated filtration planters) and attenuated storage in below grade stormwater cisterns prior to discharge to the municipal system, thus improving the quality and reducing the rate of stormwater discharge from the project site. Sanitary sewage from the project will be discharged to the municipal system and conveyed to the Main Wastewater Treatment Plant for treatment. Coordination with the Burlington Department of Public Works is ongoing to configure discharge locations around the project based on municipal capacity. Proposed mechanical equipment and additional parking within the project will not result in undue additional air pollution.

Refer to Section 5.5 Development Analysis above and FIGURE 5-C for a summary of anticipated noise pollution.

Refer to FIGURE 6-A for Contractor Dust Mitigation Control Measures.

- 6.2 The anticipated increase in domestic water demand for this project (in addition to existing domestic water demand) is roughly 100,000 gallons per day. Coordination with the Burlington Department of Public Works has indicated that there is sufficient reserved water supply available for this project. In addition, adequate flow and pressure for fire suppression is available.
- 6.3 The project site is bounded by municipal waterlines to the north and south and a new municipal waterline is proposed in the new section of Saint Paul Street to the east. This new line will improve the downtown distribution system connectivity. The proposed project does not unreasonably burden the city's present or future water supply or distribution system.
- 6.4 The existing site is essentially 100% covered with impervious surface (building, concrete and asphalt). The proposed site is similarly covered with impervious surface with the addition of a green roof and pervious pavers around the perimeter of the site. Neither existing nor proposed site conditions will cause unreasonable soil erosion or reduce capacity of the land to hold water. During construction, standard urban erosion control measures will be administered including perimeter silt fencing where appropriate, inlet protection, stone construction entrances, temporary sedimentation basins, filtered dewatering and street sweeping as necessary. In general, the majority of the site will be excavated below surrounding grades by several feet during foundation work and, once grades met, stabilized with crushed stone and eventually concrete. Due to the downtown location, there will be minimal soil stockpiling for extended durations.
- 6.5 The Burlington Town Center project is not expected to generate unreasonable congestion or unsafe conditions within Burlington's transportation system. As demonstrated in the project's Traffic Impact Study, the City of Burlington's existing grid street network, transit facilities, sidewalk

network, and bicycle facilities can adequately accommodate the additional trips generated by the proposed Burlington Town Center project. The project is located in the downtown core of Burlington, surrounded by a dense network of sidewalks and bicycle amenities and directly across the street from the recently completed Green Mountain Transit Downtown Transit Center. The proximity and availability of these amenities will result in a significant number of site-generated trips occurring by non-automobile mode (e.g. by foot, by bicycle, and by bus). A number of the likely Town Center tenants are active participants in the Chittenden Area Transportation Management Association (CATMA), an organization that partners with employers and employees to reduce single occupant vehicle trips. The density and mix of uses proposed for the project will likely result in a number of trips occurring entirely within the Town Center (e.g. apartment to daycare or office to restaurant), and thus not impacting the adjacent street network. An important aspect of the project is the proposed construction of Pine Street and St. Paul Street between Bank Street and Cherry Street to restore the City's street grid in this area. In addition to improving overall downtown connectivity, the new blocks of Pine Street and St. Paul Street will enhance bus accessibility from the Downtown Transit Center and create new routes for existing cross-town trips, thereby reducing overall delay on parallel north-south streets including Battery Street and South Winooski Avenue. New traffic signals are proposed at the Pine Street/Cherry Street, Pine Street/Bank Street, and St. Paul Street/Cherry Street (integrated with Downtown Transit signals) which will accommodate both site-generated trips, newly re-routed cross-town trips, and buses departing from the Downtown Transit Center.

- 6.6 The Burlington School District 2015 Annual Report listed total enrollment of 3,975. A letter from the Burlington School Department dated February 5, 2004 regarding proposed housing at the nearby Battery and Cherry Street developments estimated 0.127 school age students per 2-bedroom unit based on a 1990 Cannon Associates report. A 2007 report from VHFA titled Housing and Vermont School Enrollment estimated 0.13 school aged children per "attached" 2-bedroom unit and 0.18 school aged children per 2-bedroom unit in buildings with 2-4 units. Based on these documents, a value of 0.15 school aged children per 2-bedroom unit is assumed for this development. There are 272 units of housing proposed for this development with a mix of 35 studios, 116 1-bedroom and 121 2-bedroom units. Assuming no school age children in the studios and 1-bedroom units, an estimated number of school age children in this development is 18.15. This represents less than ½% of the current enrollment and should not cause an unreasonable burden on the city's ability to provide educational services.
- 6.7 Not place an unreasonable burden on the city's ability to provide municipal services; A technical review meeting was convened with municipal departments on January 14, 2016 to review the project and the city's ability to provide municipal services. Based on input at the meeting there was not indicated that the project would place an unreasonable burden on the city's ability to provide municipal services. Coordination with municipal departments has been ongoing to address technical review comments. Ability to service letters will be requested from municipal departments as necessary.
- 6.8 The project will not have an undue adverse effect on the features noted above. There are no irreplaceable or significant natural areas located on the project site. The existing structures proposed to be demolished for the project were constructed during the period of urban renewal and are all less than 50 years old and not considered historic. As noted in Section 5.6 Archeological

Impacts above, the site was previously disturbed during the urban renewal redevelopment and no significant archeological features are anticipated to have survived. The project will be visible from locations throughout the city, however the size, massing and materials will meet the Downtown Mixed Use Core Overlay regulations and not have an undue adverse effect on the scenic or natural beauty of the area or any part of the city.

- 6.9 The project will not have an undue adverse effect on the city's growth, fiscal capability or public services and facilities. The project meets many of the initiatives identified in planBTV and the city municipal development plan in support of appropriate growth in the city and increased tax base revenue to support public services and facilities.
- 6.10 The project is in substantial conformance with the city's Municipal Development Plan adopted March 31, 2014, planBTV Downtown and Waterfront plan adopted June 10, 2013, the Housing Action Plan, the Great Streets Initiative, the Climate Action Plan and the Legacy Action Plan and the 2013 College Street StormwaterShed Retrofits Green Infrastructure Plan. Specific goals of the of the 2014 Municipal Development Plan supported by this project include; Strengthen the City Center District (CCD) with higher density, mixed-use development as part of the regional core while ensuring that it serves the needs of city residents, particularly those in adjacent neighborhoods. Target new and higher density development into the Downtown, Downtown Waterfront, Enterprise District, Institutional Core Campuses, and the Neighborhood Activity Centers. Enhance the City's gateways and streetscapes. Enhance the pedestrian experience by improving opportunities for pedestrian access and interaction throughout the city. Promote and strengthen a mixed economy, and work actively to retain existing businesses and jobs. Invest in the necessary public improvements, particularly transportation, to strengthen the Downtown, both as a Regional Growth Center, and as city neighborhood. Encourage a healthier regional balance of affordable housing in each community, proximate to jobs and affording mobility and choice to low income residents. Support the development of additional housing opportunities within the city, with concentrations of higher density housing within neighborhood activity centers, the downtown and institutional core campuses.
- 6.11 A major component of the Burlington City Center project is to provide a significant number of new housing units. The project as currently planned contains a total of 272 units. There are 121 2-Bedroom apartments, 116 1-Bedroom apartments, and 35 studio apartments out of which 55 units (24 2BRs, 24 1BRs, & 7 studios) will be permanently affordable. In October 2016, the Allen & Brooks Northwest Vermont Market Report showed a 2.1% rental vacancy rate in Chittenden County, well below the national average of 4.4%. While the project will add both retail and office jobs, that increase will be incremental when compared to jobs at the existing mall use on this site. The 272 units will likely house upwards of 500 people, and mark a significant increase in the population and availability of housing in our downtown core. There is a particularly high demand for housing within the City of Burlington, and PlanBTV notes that downtown housing is in particularly short supply (p60) and has impacted the ability of local business to attract an educated workforce. The PlanBTV report cites the mall site as one of two "ideal locations" for new downtown housing (p62). In focusing on the mall, the report states, "With underdeveloped air space above the mall, and a relatively high and flat area of the City that has little impact on prominent views, this quadrant of downtown is well suited for larger residential structures" (p108). In short, a primary goal of this project is to provide housing in a location that has been

identified by citizens and planners as having a high demand for housing and a high potential for redevelopment.

- 6.12 The project helps to fulfill several goals of Burlington’s Plan BTV Downtown and Waterfront Document that are outlined on By facilitating the re-opening of portions of St. Paul and Pine Streets that were subsumed into the urban renewal “superblock”, the project facilitates movement through downtown, removing barriers to north-south travel, and providing new “complete streets” that include wide sidewalks, street trees, and street furniture, and support for multiple modes of transportation while focusing on a pedestrian experience. The project will help enliven the area just north of City Hall Park and improve the experience of Cherry Street. By enhancing the street life in the area around the mall, the project will enhance the connection between Church Street and Waterfront Park. The project will also include a rooftop observatory, green roof spaces, and street-level outdoor spaces that could provide additional space for popular events such as the Discover Jazz Festival. A day care facility planned for the site will help meet a clear need for childcare. The increased density of the project will bring more residents and office workers to downtown areas that are well served by existing parks facilities- but at the same time, the project will give back street space to the public and enhance the aesthetics and experience of existing streets. Please also refer to FIGURE 6-A letter of support from the Department of Parks and Recreation, and Waterfront.

7.0 MAJOR IMPACT REVIEW INTERDEPARTMENTAL CHECKLIST

Request for impact review letters will be sent to each department below:

- Department of Public Works for written input on municipal water and sewer needs, stormwater management, erosion control, and traffic impacts.
- Department of Parks and Recreation for written input on park and recreation needs.
- School Department for written input on educational impacts.
- Fire Department for written input on anticipated fire and emergency response impacts.
- Police Department for written input on anticipated police service impact.



208 Flynn Avenue, Suite 2A, Burlington, VT 05401 ☎ Tel: 802-863-6225 ☎ Fax: 802-863-6306
85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 7, 2016

Burlington Schools
150 Colchester Avenue
Burlington, VT 05401
Att: Yaw Obeng
Superintendent of Schools
superintendent@bsdvt.org

Dear Mr. Obeng:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2.

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. We are writing to introduce you to the project and review aspects of the project related to educational services. In accordance with section 3.5.6(b)6 of the zoning ordinance, we would like to have you determine that the project, "Not cause an unreasonable burden on the city's ability to provide educational services".

To help you with evaluating this statement we have compiled the following data. The Burlington School District 2015 Annual Report listed total enrollment of 3,975. A letter from the Burlington School Department dated February 5, 2004 regarding proposed housing at the nearby Battery and Cherry Street developments estimated 0.127 school age students per 2-bedroom unit based on a 1990 Cannon Associates report. A 2007 report from VHFA titled Housing and Vermont School Enrollment estimated 0.13 school aged children per "attached" 2-bedroom unit and 0.18 school aged children per 2-bedroom unit in buildings with 2-4 units.

Based on these documents, a value of 0.15 school aged children per 2-bedroom unit is assumed for this development. There are 272 units of housing proposed for this development with a mix of 35 studios, 116 1-bedroom and 121 2-bedroom units. Assuming no school age children in the studios and 1-bedroom units, an estimated number of school age children in this development is 18.15. These 18 children would represent less than one-half of one-percent (0.5%) of the current enrollment and should not cause an unreasonable burden on the city's ability to provide educational services.

If you have any questions or need additional information, please let us know.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a horizontal line.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex Dsinex@devonwoodinvestors.com



208 Flynn Avenue, Suite 2A, Burlington, VT 05401 ☎ Tel: 802-863-6225 ☎ Fax: 802-863-6306
85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 7, 2016

City of Burlington
Department of Public Works
645 Pine Street Suite A
PO Box 849
Burlington, VT 05402-0849
Att: Chapin Spencer
Director of Public Works
cspencer@burlingtonvt.gov

Dear Mr. Spencer:

Thanks for your and your department's previous input on the multi-use project proposed by Devonwood Investors, LLC within the Downtown Mixed Use Core Overlay (DMUC) District. As you know, the purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2

A technical review meeting was convened with municipal departments on January 14, 2016 to review the project and the city's ability to provide municipal services. Based on input at the meeting there was no indication that the project would place an unreasonable burden on the city's ability to provide municipal services. Coordination with municipal departments has been ongoing to address technical review comments.

To summarize the projects estimated demands, there will be an anticipated increase in domestic water demand (in addition to existing domestic water demand) around 100,000 gallons per day. Our previous coordination with the Burlington Department of Public Works has indicated that there is sufficient reserved water supply available for this project.

The project site is bounded by municipal waterlines to the north and south and a new municipal waterline is proposed in the new section of Saint Paul Street to the east. This new line will improve the downtown distribution system connectivity. As the project moves forward, Site Development and Construction Plans will be finalized to provide final construction level details as is necessary.

At this time, to address the initial criteria of a Zoning Permit accordance with section 3.5.6(b) we would like to have you determine that the project:

Has sufficient water available for its needs

Not unreasonably burden the city's present or future water supply or distribution system Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed Not place an unreasonable burden on the city's ability to provide municipal services, as related to the services that the Department of Public Works provides.

If you have any questions, please call our office.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kevin Worden", with a stylized flourish at the end.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex

Dsinex@devonwoodinvestors.com



208 Flynn Avenue, Suite 2A, Burlington, VT 05401 ☎ Tel: 802-863-6225 ☎ Fax: 802-863-6306
85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 7, 2016

Burlington Fire Department
Office of the City Fire Marshal
132 North Avenue
Burlington, VT 05401

Att: Barry J. Simays Burlington
Fire Marshal
bsimays@burlingtonvt.gov

Dear Barry:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. The project will be designed to meet the requirements of the appropriate Vermont Building Codes, including relevant NFPA Codes, to provide adequate fire protection and emergency medical services to the property. As the Authority Having Jurisdiction, building plans will be submitted to your office for review of all proposed building construction during the Building Permit process.

At this time, to address the initial criteria of a Zoning Permit, we are writing to introduce you to the project, review site and zoning related aspects of the project, and incorporate your input in to the Zoning Permit plans. In accordance with section 3.5.6(b)7 of the zoning ordinance, we would like to have you determine that the project, "Not place an unreasonable burden on the city's ability to provide municipal services" as related to fire and emergency medical services.

Please give me a call at your convenience and we would be happy to meet with you to orient you to the proposed project and receive your feedback.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a horizontal line.

Kevin Worden, P.E.
Vice President
Cc: Donald Sinex

Dsinex@devonwoodinvestors.com



208 Flynn Avenue, Suite 2A, Burlington, VT 05401 ☎ Tel: 802-863-6225 ☎ Fax: 802-863-6306
85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 7, 2016

City of Burlington
Department of Parks and Recreation
645 Pine Street Suite 8
Burlington, VT 05401
Att: Jesse Bridges
Director of Parks and Recreation
jbridges@burlingtonvt.gov

Dear Jesse:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2.

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. We are writing to introduce you to the project and review aspects of the project related to park and recreational facilities. In accordance with section 3.5.6(b)(12) of the zoning ordinance, we would like to have you determine that the project will, "not have an undue adverse impact on the present or projected park and recreation needs of the city." The proposed location of the project is within the proximity of several existing park and recreational facilities.

If you have any questions or would like further information about the project, please let us know.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a light blue horizontal line.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex DSinex@devonwoodinvestors.com



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December 7, 2016

Burlington Police Department
One North Avenue
Burlington, VT 05401
Att: Brandon del Pozo
Chief of Police
bdelpozo@bpdvt.org

Dear Chief del Pozo:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2.

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. We are writing to introduce you to the project and review aspects of the project related to Police services. In accordance with section 3.5.6(7) of the zoning ordinance, we would like to have you determine that the project, "not place an unreasonable burden on the city's ability to provide municipal services" as related to police services.

The intent of exterior lighting is to minimize light pollution while providing safe and inviting streetscapes for pedestrians and retail activities. Sidewalk lighting for pedestrians will be wall-mounted downlights mounted at brick piers. Lighting at main entry points to the development will be by canopy-mounted downlights

Please let us know if you have any questions or need additional information about the site as it relates to police services.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a horizontal line.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex Dsine@devonwoodinvestors.com



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85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 14, 2016

Burlington Electric Department
Attn: Neale Lunderville
585 Pine Street
Burlington, VT 05401

Dear Mr. Lunderville:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. At this time, to address the initial criteria of a Zoning Permit, we are writing to introduce you to the project, review site and zoning related aspects of the project, and incorporate your input in to the Zoning Permit plans.

In accordance with section 3.5.6(b)9 of the zoning ordinance, we would like to have you determine that you have the ability to serve the project and that it does "not have an undue adverse effect on the city's investment in public services and facilities," as related to your electrical facilities.

I have attached the 12/13/2016 Electrical Load Prediction Summary, prepared by William E Neuburger, PE, Director of Engineering, Hallam-ICS indicating the Electrical Load at 2 MVA.

If you have any questions or would like further information about the project, please let us know.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a light blue horizontal line.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex Dsinex@devonwoodinvestors.com
William Neuburger, P.E. bneuburger@hallam-ics.com



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85 Mechanic Street, Suite B2-2, Lebanon, NH 03766 ☎ Tel: 603-442-9333 ☎ Fax: 603-442-9331

December 14, 2016

Burlington Telecom
Attn: William DuShane
200 Church Street
Burlington, VT 05401

Dear William:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. At this time, to address the initial criteria of a Zoning Permit, we are writing to introduce you to the project, review site and zoning related aspects of the project, and incorporate your input in to the Zoning Permit plans.

In accordance with section 3.5.6(b)9 of the zoning ordinance, we would like to have you determine that you have the ability to serve the project and that it does "not have an undue adverse effect on the city's investment in public services and facilities," as related to your telecom facilities.

If you have any questions or would like further information about the project, please let us know.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a light blue horizontal line.

Kevin Worden, P.E.
Vice President
Cc: Donald Sinex

Dsinex@devonwoodinvestors.com



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December 13, 2016

Dale Lavalley
Vermont Gas
P.O. Box 467
Burlington, VT 05402

Dear Dale:

A multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District is proposed by Devonwood Investors, LLC. The purpose of this project is to redevelop the project site presently occupied by Burlington Town Center Mall. The proposed uses include retail, residential, office, and parking with a total proposed square footage of 949,506. In addition, two of the reconfigured parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets. We have included the following Plans for your reference: Existing Conditions C1.0, Demolition Plan C1.1; and Site Plan C1.2

The applicant is in the process of applying to the City of Burlington for a Planning and Zoning Permit. At this time, to address the initial criteria of a Zoning Permit, we are writing to introduce you to the project, review site and zoning related aspects of the project, and incorporate your input in to the Zoning Permit plans.

In accordance with section 3.5.6(b)9 of the zoning ordinance, we would like to have you determine that the project, "Not have an undue adverse effect on the city's investment in public services and facilities."

I have attached the Natural Gas Load Estimated Summary, prepared by William E Neuburger, PE, Director of Engineering, Hallam-ICS indicating the Natural Gas Load at 17 million btu/hour.

If you have any questions or would like further information about the project, please let us know.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Worden', is written over a horizontal line.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex Dsinex@devonwoodinvestors.com
William Neuburger, P.E. bneuburger@hallam-ics.com

December 13, 2016

John Haselbauer
PKSB Architects, PC
330 West 42 Street
New York, NY 10036

Re: Burlington Town Center

Greetings John:

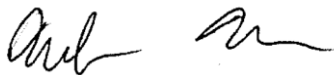
Attached are the electric and gas load projections we have provided for the above captioned project.

The predictions strike a balance between code required values for planning and an expectation the project building will be high performance.

The details are shown in the proceeding pages. In summary, the electric demand prediction is 1,985 kVA and the gas demand prediction is 20.8 million btu/hour.

Feel free to contact me directly with questions.

Yours,



William Neuburger
Director of Engineering

cc: PC Construction, Freeman French Freeman

Burlington Town Center
Electrical Load Estimate - for use with planning and zoning process

Electrical Load Summary	
Residential	154 kVA
Retail	378 kVA
Commercial	381 kVA
Parking garage	74 kVA
House and mech.	1,219 kVA
Sum of demands	2,205 kVA
Non-coincidence	90% Consider non-coincidence by end-use
Factored demand	1,985 kVA

Burlington Town Center
Electrical Load Estimate - for use with planning and zoning process

Residential Electrical Loads

Lighting and Receptacles	0.75 VA/ft^2	Note 1
Residential area	299,213 ft^2	
Lighting and Receptacles	224 kVA	Product of above
Appliance circuit 1	1,500 VA/ft^2	Code, 220.82(B)(2)
Number of apartments	274	
Appliance CKT demand	411 kVA	
Range	5,000 watt	Typical value (one burner, one oven)
Number of apartments	104	Note 3
Range demand	520 kVA	Product of above
Clothes dryer	0	Central laundry rooms, no apartment dryers
Domestic hot water	0	Central DHW, no apartment water heaters
Fan coil unit	200 watt	Estimated value
Number of apartments	274	
Heat pump demand	55 kVA	Product of above
Sum of demands	1,210 kVA	Sum of demands
Demand factor	23%	Code table 220.84
Factored demand	278 kVA	Product of above
Clothing dryer	0.70 kVA	35 pound dryer fan and drum motor
Quantity of dryers	30	Estimate
Dryer demand	21 kVA	Central laundry facilities
Diversity	80%	Match gas estimate sheet
Dryer demand	17 kVA	
Clothes washer	1 kVA	Smaller commercial washer, spin cycle
Quantity of washers	30	Estimate
Washer demand	15 kVA	Match dryer diversity
Diversity	80%	
Washer demand	12 kVA	Product of above
Note 1: Code section 220.82(B)(1) requires 3, we are using 3/4 to respect improved lighting efficiency.		
Note 2: Assume only one appliance circuit per apartment.		
Note 3: Electric ranges are considered only for collegiate apartments.		

Burlington Town Center

Electrical Load Estimate - for use with planning and zoning process

Retail Electrical Loads

Lighting and general	1.5 VA/ft ²	Note 1
Retail net area	127,595.0 ft ²	
Lighting and Receptacles	191 kVA	Product of above
Check value airflow	1.7 cfm/ft ²	ASHRAE pocket guide table 12.1
Total cfm	216,912 ft ³ /minute	Product of unit value and area
Pressure change	3.5 inches w.c.	Air handler and ductwork
Fan horsepower	149.3 HP	Airflow formula, 80% efficiency
Fan demand	186.6 kVA	80% power factor
Total demand	378 kVA	Sum of above
Diversity	100%	No diversity for these values
Factored demand	378 kVA	Product of above
Note 1: Code 220.12 states 3 VA/ft ² for this, use a smaller number to respect high efficiency lighting		

Commercial Electrical Loads

Commercial area	207,742 square feet	Difference of above
Lighting and general	1.0 VA/ft ²	ASHRAE pocket guide table 12.1
Demand	208 kVA	
Check value airflow	1.5 cfm/ft ²	ASHRAE pocket guide table 12.1
Total cfm	311,613 ft ³ /minute	Product of unit value and area
Pressure change	3.5 inches w.c.	Air handler and ductwork
Fan horsepower	214.5 HP	Airflow formula, 80% efficiency
Fan demand	268.1 kVA	80% power factor
Total demand	475.9 kVA	Sum of above
Diversity	80%	Estimate
Factored demand	381 kVA	Product of above

Burlington Town Center
Electrical Load Estimate - for use with planning and zoning process

Parking Garage

Garage area	305,039 square feet	
Lighting and general	0.2 VA/ft ²	Note 1
Demand	61 kVA	Product of above
Lowest level garage	52,915 ft ²	Only ventilate lowest level garage
Airflow unit	1.0 cfm/ft ²	NFPA 88A requirement Product
Total cfm	52,915 ft ³ /minute	of unit value and area Air
Pressure change	1.0 inches w.c.	handler and ductwork Airflow
Fan horsepower	10.4 HP	formula, 80% efficiency
Fan demand	13.0 kVA	80% power factor
Total demand	74.0 kVA	Sum of above
Diversity	100%	No diversity on these loads
Total demand	74.0 kVA	Product of above
Note 1: The code, table 229.12 requires 0.5 VA/ft ² , use a lower value respecting improved lighting		

House Loads and Mechanical Spaces

Total area	52,675 square feet	
Lighting and general	1.0 VA/ft ²	Code, table 220.12, no receptacle allowance
Demand	53 kVA	Product of above
Elevator quantity	10	
Unit elevator motor	25.0 HP	Planning value
Elevator motor load	250.0 HP	Product of above
Elevator diversity	75%	Estimate
Factored elevator load	187.5 HP	Product of above
Domestic water boost	75.0 psid	Planning value
Waterflow rate	300.0 gallon/minute	Planning value, note 2
Boost motor power	18.8 HP	Pumping formula, 70% efficiency
Diversity	100%	Diversity included in flowrate estimate
Factored booster load	18.8 HP	Product of above
Fluid circulating pumps	80.0 HP	Eight 10 HP pump motors, no diversity
Exhaust fans	25.0 HP	Planning value, no diversity
Fire pump	100.0 HP	Planning value, no diversity
Stair press. Fans	50.0 HP	Planning value, no diversity
Cooling tower fans	50.0 HP	Planning value, no diversity
Condenser water pump	2,100.0 gallon/minute	
Condenser water pump	39.9 HP	19 watts/gpm
Chilled water pump	1,680.0	
Chilled water pump	36.96 HP	19 watts/gpm
Total motor demand	588.1 HP	
Total motor demand	735.1 kVA	80% power factor

Burlington Town Center
Electrical Load Estimate - for use with planning and zoning process

House Loads and Mechanical Spaces Continued

Cooling demands		
Residential	1,000.0 ft ² /ton	Planning value
Commercial	900.0 ft ² /ton	Planning value
Retail	800.0 ft ² /ton	Planning value
Residential space	299,213.0 ft ²	
Commercial space	207,742.0 ft ²	
Retail space	127,595.0 ft ²	
Residential demand	299.2 tons	
Commercial demand	230.8 tons	
Retail demand	159.5 tons	
Total cooling demand	689.5 tons	
Chiller efficiency	0.50 kW/ton	Very efficient chiller
Chiller demand	431 kVA	Product of above, 80% power factor
Total demand	1,218.8 kVA	Sum of above
Note 1: the code table 220.12 requires 2.0 VA/ft ² , use smaller number to respect improved lighting		
Note 2: This value is much lower than the plumbing code requires		

Burlington Town Center

Natural Gas Load Estimate - for use with planning and zoning process

Perimeter wall heating	3,872,186 btu/hour
Roof/floor heating	310,022 btu/hour
Ventilation heating	7,379,982 btu/hour
Central laundry facilities	1,536,000 btu/hour
Residential culinary equipment	2,541,500 btu/hour
Central domestic hot water	5,200,000 btu/hour
Total	20,839,690 btu/hour

Burlington Town Center
Natural Gas Load Estimate - for use with planning and zoning process

Perimeter Area by floor

Floor	Perimeter (feet)	Height (feet)	Area (ft^2)	Wall (R-21) %	Wall (R-21) (ft^2)	Glaze/Door (R-3) %	Glaze/Door (R-3) (ft^2)
Concourse	1,390	15.4	21,406	50%	10,703	50%	10,703
Plaza	1,915.0	15.5	29,683	50%	14,841	50%	14,841
2	1,371	10	13,710	80%	10,968	20%	2,742
3	1,371	10	13,710	80%	10,968	20%	2,742
4	1,371	10	13,710	80%	10,968	20%	2,742
5	1,538	13.5	20,763	50%	10,382	50%	10,382
6	1,538	13.5	20,763	50%	10,382	50%	10,382
7 N	1,160	10	11,600	40%	4,640	60%	6,960
7 S	571	13.5	7,709	30%	2,313	70%	5,396
8 N	1,160	10	11,600	40%	4,640	60%	6,960
8 S	571	13.5	7,709	30%	2,313	70%	5,396
9 N	1,160	10	11,600	40%	4,640	60%	6,960
9 S	529	13.5	7,142	30%	2,142	70%	4,999
10 N	1,160	10	11,600	40%	4,640	60%	6,960
10 S	529	13.5	7,142	30%	2,142	70%	4,999
11	1,160	10	11,600	40%	4,640	60%	6,960
12	906	10	9,060	40%	3,624	60%	5,436
13	883	10	8,830	40%	3,532	60%	5,298
14	857	10	8,570	40%	3,428	60%	5,142
Total					121,905		125,999

Exterior wall heating demand

Indoor air temperature	70
Outdoor air temperature	-11
Wall thermal demand	470,206 btu/hour
Glazing thermal demand	3,401,980 btu/hour
Total envelope demand	3,872,186 btu/hour

Exterior floor/roof heating demand

Residential tower net roof area	9,605 ft^2
North tower area over garage	70,771 ft^2
Floor/roof R-value	40
Thermal demand	310,022 btu/hour

Burlington Town Center

Natural Gas Load Estimate - for use with planning and zoning process

Ventilation

Space	Size (ft^2)	ft^2/person	People	cfm/pers	Vent
Residential	299,213	175	1,710	20	34,196
Retail	127,595	75	1,701	20	34,025
Commercial	207,742	125	1,662	20	33,239
Parking garage	305,039	N/A			
House and mech.	52,675	N/A			
Total outdoor airflow					101,460
Reduce demand for residential ventilation, likely there will be heat recovery. Plan for 50% of the residential load.					-17,098
Heating demand		7,379,982			

Residential laundry equipment

35 pound dryer	64,000 btu/hour	Typical value for 35 pound dryer
Quantity of dryers	30	Estimate
Dryer gas demand	1,920,000 btu/hour	Product of above
Diversity	80%	Estimate
Dryer demand	1,536,000 btu/hour	Product of above

Residential culinary equipment

Range	65,000 btu/hour	NFPA 54, table 5.4.2.1
Quantity ranges	170	Non-collegiate housing
Range demand	11,050,000 btu/hour	Product of above
Diversity	23%	Mimic diversity allowed by electric code for ranges
Range demand	2,541,500 btu/hour	Product of above

Burlington Town Center

Natural Gas Load Estimate - for use with planning and zoning process

Central domestic hot water

Commercial clothes washer	3	Fixture unit	Plumbing code, table 709.1
Quantity of washers	30	Estimate	
Fixture units of washers	90	Fixture unit	Product of above
Residential bathroom group	5	Fixture unit	Plumbing code, table 709.1
Quantity of bathroom groups	274		
Fixture units of washers	1,370	Fixture unit	Product of above
Residential kitchen sink w/DW	2	Fixture unit	Plumbing code, table 709.1
Quantity of kitchen sinks w/DW	274		
Fixture units of sinks w/DW	548	Fixture unit	Product of above
Public lavatory	1	Fixture unit	Plumbing code, table 709.1
Quantity of lavatories, retail	14	Estimate	
Quantity of lavatories, office	44	Estimate	
Fixture units of lavatories	58	Fixture unit	Product of above
Service sink	2	Fixture unit	Plumbing code, table 709.1, note 1
Quantity of service sinks, retail	4	Estimate	
Quantity of service sinks, office	11	Estimate	
Fixture units of service sinks	30	Fixture unit	Product of above
Total fixture units	2,096		
Flowrate	130	gall/min	Hunters curve for residential
Entering water temperature	40	deg F	Lowest likely water temperature
Leaving water temperature	120	deg F	Likely supply water temperature
Water heat efficiency	95%	Estimate	
Natural gas demand	5,200,000	btu/hour	Heatflow ~ flowrate x 500 x flow x temp.
Note 1: Some sources indicated 2.5 fixture units for service sink.			
DW = dishwasher			

Burlington Town Center

Spaces and floor areas - for use with planning and zoning process

Floor	Residential			Commer. Area	Retail Area	Utility Area	Parking Area	Total Area
	Total	Collegiat	Area					
Conc.	0	0	0	0	80,703	14,317	2,562	97,582
Plaza	0	0	0	0	46,892	0	52,915	99,807
2	19	0	19,957	0	0	8,358	79,512	107,827
3	21	0	22,523	0	0	0	85,025	107,548
4	21	0	24,323	0	0	0	85,025	109,348
5	0	0	0	70,840	0	0	0	70,840
6	0	0	0	70,840	0	0	0	70,840
7	34	14	34,884	17,755	0	0	0	52,639
8	34	14	34,884	17,755	0	0	0	52,639
9	34	14	34,884	15,276	0	0	0	50,160
10	34	14	34,884	15,276	0	0	0	50,160
11	34	14	33,484	0	0	0	0	33,484
12	16	12	20,570	0	0	0	0	20,570
13	14	11	19,794	0	0	0	0	19,794
14	13	11	19,026	0	0	0	0	19,026
Mech	0		0	0	0	30,000	0	30,000
Total	274	104	299,213	207,742	127,595	52,675	305,039	992,264

Based on October 19, 2016 PKSB drawing package

Area in square feet

8.0 LIST OF DRAWINGS:

T-000 COVER SHEET

CIVIL

C1.0 EXISTING & ADJUSTED PARCEL BOUNDARIES
C1.1 EXISTING CONDITIONS PLAN
C1.2 DEMOLITION PLAN
C1.3 SITE PLAN
C1.4 GRADING PLAN
C1.5 UTILITY PLAN
C1.6 EROSION PREVENTION AND SEDIMENT CONTROL PLAN
C2.1 ST PAUL STREET PROFILE
C2.2 CHERRY STREET PROFILE
C2.3 PINE STREET PROFILE
C2.4 BANK STREET PROFILE
C2.5 ROAD SECTIONS
C2.6 ROAD SECTIONS
C3.0 SITE DETAILS AND NOTES
C3.1 WATER DETAILS AND NOTES
C3.2 SEWER DETAILS AND NOTES
C3.3 STORMWATER DETAILS
C3.4 EROSION PREVENTION AND SEDIMENTATION CONTROL DETAILS

LANDSCAPE

LA-200 LAYOUT PLAN
LA-400 PLANTING PLAN
LA-500 LIGHTING/ PHOTOMETRIC PLAN

ARCHITECTURAL

AD-001 OVERALL DECONSTRUCTION PLAN
Z-001 LOT COVERAGE DIAGRAMS I
Z-002 LOT COVERAGE DIAGRAMS II
Z-003 ZONING SITE PLAN
Z-021 ZONING SECTIONS
A-051 FLOOR PLANS 1ST-4TH FLOORS
A-052 FLOOR PLANS 4TH-11TH FLOORS
A-053 FLOOR PLANS 12TH FLOOR - ROOF
A-201 ELEVATIONS – CHERRY STREET & ST. PAUL STREET
A-202 ELEVATIONS – BANK STREET & PINE STREET
A-211 BUILDING SECTION I
A-221 WALL SECTIONS I – CHERRY STREET
A-222 WALL SECTIONS II – CHERRY STREET
A-223 WALL SECTIONS III – CHERRY STREET
A-224 WALL SECTIONS IV – BANK STREET

A-225 WALL SECTIONS V – BANK STREET
A-226 WALL SECTIONS VI – BANK STREET
A-227 WALL SECTIONS VII – ST. PAUL STREET
A-228 WALL SECTIONS VIII – ST. PAUL STREET
A-229 WALL SECTIONS IX – ST. PAUL STREET
A-230 WALL SECTIONS X – PINE STREET
A-231 WALL SECTIONS XI – PINE STREET
A-232 WALL SECTIONS XII – PINE STREET
A-233 ENTRY CANOPY SECTION
A-234 BALCONY AND BAY WINDOW SECTION
A-401 RENDERED PERSPECTIVES – AERIAL
A-402 RENDERED PERSPECTIVES – CORNER VIEWS

9.0 FIGURES

Pre-Application Public Neighborhood Meeting Certification

I, Jesse Beck, certify that the Pre-Application Public Neighborhood Meeting requirement pursuant to Sec. 3.2.1(d) of the *Burlington Comprehensive Development Ordinance* has been satisfied in accordance with the procedures and requirements set forth by the Department of Planning and Zoning for a public neighborhood meeting held on (see attached spreadsheet)

A copy of the meeting date, time and location; list of attendees with contact information; NPA meeting minutes or meeting notes summarizing the discussion; and method and copy of public notice is attached and made a part of this Certification.

Signature: W "F2lr-p...-../"---' "&---=-----

STATE OF VERMONT

COUNTY OF t'f.:J<Jen.

The above and foregoing Affidavit as subscribed before me this {p day of JJcM k, A.D., 20c_b personally by ::6-e' &c;,k._



Notary Public

My Commission expires: &6./t:?) dOl h

Seal





freeman | french | freeman

MEMORANDUM

Freeman French Freeman Inc. | Architecture • Planning • Interiors
81 Maple Street • Burlington Vermont 05401
802-864-6844 • www.fffinc.com

Project Name: BTC: P&Z, 30% Docs.

Project Number: A1636

Date: 12/12/2016

Ward	Date	Coordinator	Who attended	Minutes: Y/N
4/7	6/22/16	Liam Griffin liamgriffin@me.com	Don	Y
1/8	8/10/16	Richard Hillyard pompeyhccc@hotmail.com	Don	Y
6	9/1/16	Clare Wool clarewool@me.com	Don & Jesse	Y
2/3	9/8/16	Ryan McLaren ryan.d.mclaren@gmail.com	Don, Jesse & Liz	Y
5	9/20/16	Nate Orshan natosongs@gmail.com	Don & Jesse	Y
1/8	10/12/16	Richard Hillyard pompeyhccc@hotmail.com	Jesse & Liz	Y
2/3	10/13/16	Ryan McLaren ryan.d.mclaren@gmail.com	Don	Y

CC:

File A1636.00	Don Sinex		
Liz Miller			



Wards 4 & 7 NPA
June 22, 2016
7:00-9:00 pm
The Miller Center, 130 Gosse Court, Burlington
Agenda
Draft

- 6:45-7:00 - Social Time and Snacks
- 7:00-7:15 - Ground-rules, introductions, announcements, nominations and requests.
- 7:15-7:30 - Open Forum
- 7:30-8:00 - Don Sinex - Burlington Town Center Redevelopment (10 minute presentation
- 20 minute Q&A) - Plus either CEDO and/or Planning & Zoning
- 8:00-8:15 - Burlington Police Department - Lt. Michael D. Warren
- 8:15-8:30 - CCTA Discussion - David Armstrong
- 8:30-9:00 - Elected and Appointed Officials
 - City Councilors
 - School Board Members
 - Legislative Representatives
 - Department of Public Works

Ward 4 Steering Committee

Matt Cropp, Green Acres Dr., 338-1002
Dan Weber, Muirfield Road, 999-8043

Ward 7 Steering Committee

Liam Griffin, Billings Ct, (347) 647-0371
Martha Molpus, Heineberg Rd., 652-0323
Michael McGarghan, Birch Ct., 233-1238
Linda Deliduka, Village Green, 864-5114
David Kirk

GROUND RULES

Listen to others speaking
Respect the agenda and process
Share your opinion politely
Treat people respectfully



Neighborhood Planning Assembly Attendees

NU
(choose one)

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6

Date of Assembly : 6-22-16 Location: Miller Ctr

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Please return to your convenor,

NU

ICAC '16-VI

or email to cedofd@burlingtonvt.gov

Click + Sherrill

W3 Miller

1 Don Sinex + 1

2 Roger Persimmon

3 Martie Majoros

4 Margaret Tenner

6 Jude Hill

Kelly Cross

7 Pat Hattaway

8 Marie Moisis

10 Diane H. Morris

11 DEAN WEAVER

Wayne Datchman

13 Pat Datchman

14 Martin Waldron

15 Arnie Krieger

16 Maisha Melpus 7

17 Caryn + Michael Long Ward 1

18 G. Simpson Ward C

19 Jon G. Ward 2

20 Chas Trombly 7

Sandi Conner 7

Kurt Wright Ward 4

21 Click + Sherrill

22 Patsy Lawrence

23 Michael Palmer

24 Shirley Washburn

25 Lois H. H.

26 Sheryl Chamberlain

27 Patricia Branch

28 Chuck Branch

29 Paul Cruz

30 Joanne Hunt

31 Susan Chopel

32 Leering Chodun

33 Ngodup Dharma

34 Ken McGarvey

35 Jay McGarvey

36 Pat Payne

37 Rob Whitman

38 Ken Relati Ward 4

39 Robert Herndon 4

40 ANN TAYLOR

Janet Patterson

Dea Ga

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Wards 4 and 7 NPA Meeting
Wednesday, June 22, 2016
Draft

Robert E. Miller Community Center
130 Gosse Court, Burlington, VT

Meeting Start: 7:00pm

Steering Committee members: Michael McGarghan, Matt Cropp, Linda Deliduka,
Martha Molpus

Welcome & Introductions

Facilitator: Michael McGarghan

Chris Trombly, Ward 7 resident, was nominated for the Steering Committee. Out of 26 Ward 7 residents, 25 voted Yes, with Mr. Trombly abstaining.

Sandi Omanovic, Ward 7 resident, was nominated for the Steering Committee. Out of 26 Ward 7 residents, 25 voted Yes, with Mr. Omanovic abstaining.

Open Forum

The Rivers Edge' gate is currently kept locked; there is a proposal to open the gate to create an emergency exit. The resident voiced support for keeping the gate closed, due to safety, cost of maintenance, and concern about excess traffic.

Coalition for a Livable City advocates that the proposed mall redevelopment height goes against community benefit and PlanBTV vision.

Resident voiced a concern about the Burlington College development compromising one of the most prominent natural open spaces in City limits.

The bike lane pilot project is slated to begin Thursday, June 23, and is on schedule to be completed by Monday, June 27, pending weather.

Presentation by Don Sinex, Mall Developer

Mr. Sinex's first thought upon reviewing the site was how it could be improved to better serve the purposes of living and working downtown in a present-day economy. He met with Mayor Weinberger and was informed of PlanBTV. His design integrated the plan, and his team is committed to environmentally sound development to increase vibrancy and investment. This will increase the walkability of downtown, and the ability to live and work in Burlington. The current design is not relevant; essentially an outdated suburban mall concept in the core of a downtown. The project will bring 900 construction jobs during development, and 1,200 permanent jobs in diversified sectors. The project is still in the design and public input process, and is receptive to feedback; the project has already been changed in design many times in response to constructive public input.

Burlington Police Department – Lt. Michael D. Warren

Lt. Warren has been in law enforcement for 18 years. His primary area of responsibility is the New North End. Some of the concerns heard from residents include vandalism using BB guns and bricks to break windows. Although these are low-level offenses from a criminality perspective, they are important to the department, and resources are being allocated. Neighborhood coordination is encouraged to deter and respond to vandalism and related offenses; email list serves and Front Porch Forum are avenues for this.

CCTA – David Armstrong

GMTA merge will be rural and add more routes, including 15 minute service from Cherry at no additional cost to the city. Transit station will open in August or September, and will have public bathroom.

Automatic vehicle location, so patrons can know when a bus is coming, will be available in a mobile app. Additionally, mobile app will be used for ticketing, to provide an alternative to cash or a paper ticket. In response to a public question, adding debit card functionality to the fare boxes would be a retrofit upgrade costing approximately one million dollars; the mobile app option will be more cost-effective.

Currently in the process of a redesign to look at systems changes across the area to be more efficient and effective, including the Bridge Program which uses data to inform the department about how patrons are using the system.

Elected and Appointed Officials

Councilor Kurt Wright – Charter change in March. We are the only City that uses Party designation in local municipal races. This will be put on the ballot.

Looking at residency requirement update, requiring department heads to live in Burlington. If a hardship exemption exists, they would have one year to move into city.

Councilor Tom Ayers-Pilot project to be implemented beginning Thursday the 23rd and finishing by Monday the 27th. A City Council meeting on October 17th will address whether to keep the change or move back to the current configuration. Public input is accepted in all forms, and a survey will come in August or September.

Anne Judson, School Board Commissioner – We're focused on the needs of safety and education, not wants. Champlain school is overcrowded. Bond may come in the fall, but working with City on where to save money and share cost. Looking to cut 1.2 million.

Meeting adjourned at 9:03pm.

Note Taker: Phet Keomanyvanh, CEDO



Location: UVM Medical Center, McClure Lobby Conference Room

Date: August 10, 2016

Time: 7.00 p.m.

Draft

Agenda:

7.00 p.m.: Welcome and Introductions

7.05: City Council Update: Adam Roof, Sharon Bushor, Selene Colburn: This will certainly include updates on Burlington Town Center, with a City Council Meeting due August 15th to discuss proposed Zoning Changes.

7.30: Speak Out

7.40: Burlington Schools update from Board Chairman Mark Porter

7.50: New UVM Rescue Building on East Avenue: Lisa Kingsbury of UVM to discuss.

8.00: Fletcher Place development project: Frank Von Turkovich has been bringing plans to the NPA and immediate neighborhood for four years or more now. He joins us again with modified proposals.

8.45: Close

Parking: In the McClure Garage, free, courtesy of UVM MC.



Neighborhood Planning Assembly Attendees

NPA (choose one)	☒	Wards 1 & 8	☐	Wards 2 & 3	☐	Wards 4 & 7	☐	Ward 5	☐	Ward 6
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Date of Assembly: 8 / 10 / 16 Location: Uv fj'..Jl cX.l.C J

Please return to your convenor, Phet Keomanyum
or email to cedofd@burlingtonvt.gov

1 Dana Hamencik
2 William O. Switzer
3 William P. Hinkle
4 Jason Williams
5 Nancy Kirby
6 Bob Butner
7 Richard Hillyard
8 = - - M:t-c. c. n
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11 Jonathan Czapka-Sokol
12 Sharon Bushor
13 Lisa Kingsbury
14 Jim Barr
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21 Mary Heid.
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UVM Medical Center, McClure Lobby Conference Room
August 10, 2016
7.00 p.m.
Draft Minutes

Start: 7:05

Steering Committee member present: Emily Lee, Richard Hillyard

Agenda:

7pm Welcome and Introductions:

See attendance list

City Council Updates: Adam Roof, Sharon Bushor, Selene Colburn

Adam Roof-Burlington Town Center dates moving forward to the full City Council. Meeting dates are 15th at 6pm Special Work Session, 18th, 22th, 24th. Meeting times can be found on the City's Government Calendar <https://www.burlingtonvt.gov/Calendar> . 3-D model of the Town Center project will be displayed at Fletcher Free model.

Selene Colburn-Community Development and Revitalization committee; have been meeting to discuss housing policy and troubleshooting about homelessness. This has brought up conversation about encampment and solutions such as tiny houses. Still exploring solutions. The Committee will be sponsoring a forum to look at micro-housing and broadly how it will play in housing action plan. Will be inviting CODE in September or October to look at new practices in inspection to know what is expected in compliance. Also will expect report on inclusionary zoning and looking at neighborhood revitalization in housing stock of historical housing that have been used in student and turning over to original usage.

Sharon Bushor- Ordinance Committee; looking at Town Center there are two parts which is the overlay ordinance and the project itself. The 3-D model only shows foot print of project but not the ordinance overlay. The model is to scale. When you go it will be labelled and will address the height of 160feet.

Schedule 6 meetings for the Ordinance committee. The Committee was given an ordinance that had edits that would defined agreements from the Planning Commission. The committee went through the ordinance line by line looking at controversy and non-controversy matters. Changes proposed are that the size is too big and should be scaled back. Eliminating Macy's and 2 parking structures won't impact project but change the ordinance overlay zone.

Speak out:

-Planning Commission recommend that the energy guidelines of the building reach gold and that the developer be bonded to reach a LEED Standard of Gold. The developer agrees to have equivalent but not reach gold. The Planning Commission is asking for high quality energy efficient building and the developer meets this. This tool is in the language in the ordinance. Planning Commission finished, sent to ordinance and now it's on to full council. Next big project for the commission is former Burlington College and working to have this parcel developed.

-Feel that this project was pushed through too fast and meetings are jammed together and model is too small which doesn't show the whole overlay. Troubling that storm water is lined up and not in the promise.

-Need to get additional affordable housing. Don't set a standard but give developer incentives to do things for the community. Concerned about terrible landlords that are horrible to their tenants. This may be cause for some state statue.

-SD Ireland leasing apartment on Sept. 1. Posting weekly developments of their projects.

Burlington School District: Mark Porter, Chair

BSD has a Capital Plan. Last improvement work done was on Edmunds Elementary. The district had a study done on capital needs. Goals are to take care of ADA and Space which will help improve quality of education and tax payer investment. At BHS connecting doors to auditorium freezes in the winter and the phone system is really old and outdated. If you call 911 then they wouldn't know where you are. Other issues of aspects are elevator repair, windows. With space looking at projections of repair over 10yr to be \$65,320,854. Really, total improvement work would be 100million. In moving forward, the District will bring in public participating include New American communities and provide translators. Tax % change in income 5.53. Voting cycle is November and will move fast on this. Mark will come back in September for Wards 1 and NPA 8 to give an update.

For further details about capital improvement look on BSD website.

<http://district.bsd.schoolfusion.us/modules/cms/pages.phtml?pageid=334221>

New UVM Rescue Building- Lisa Kingbury, Lani Raven

The UVM Rescue project was approved by Development Review Board (DRB) on Monday. There is requirement to bring any major impact project to the NPAs but this is not a major project. This development is located on 284 East Ave at the South End of East Ave. UVM Rescue is primary for UVM. It's been pretty cramp quarters and one ambulance needs to stay outside and ambulances have equipment that need to stay warm to function timely and effectively. The development will have room to house both ambulances. The area will be improved and not increase scope of activity or parking.

Another development project on UVM campus is to the Bailey Howe Library. This development has already going to DRB and will connect first year housing project to the library. The bridge is creating new entrance to the library which needs space for lobby and foyer. Also will have indoor bicycle structure. Bridge will have weather protection and be conditioned. The campus master planning is to build connections between building so students can get around and stay out of the elements.

Fletcher Place development-Frank Von Turkovich

Project on Colchester Ave. Fletcher project would supply affordable and needed housing for Medical workforce community. Two buildings connected by a small connector and will have medical offices and practice. Underground parking, surface parking, bike parking. Lower entrance goes to sidewalk will allow residents to have convenience to medical practice. In the lobby there will be elevator that go to studios. Will not demolish existing structures that are already there. This new development will be set behind the existing building. Current plan tonight shows 73 but may reduce in units. Still need to develop technical issues and not sure when going to be ready to go in front of DRB. Excavated soil may be use on the site which City and State encourage but a lot of it will be taken away. Geo test of soil will be available to first City and State then can be available to private entities. Building design is contemporary. Not looking for this to be student housing but to house work-force development for medical staff. The plan will be one bedroom and studio units. Studios will be \$1400-1500 month. There will be a number of affordable housing units which is required under exclusionary zoning. One bed room units will be 500square feet. Not settled on the floor plan and looking at a few designs.

Close: 9:20pm

Minutes taken by Phet Keomanyvanh

CEDO-Community Engagement Specialist-Public Engagement

FIGURE 1-A



September 1, 2016 at **7:00 Morgan Room, Aiken Hall**, Champlain College

Facilitator: Clare Wool; Minutes: Charles Simpson; Treats: Charles Simpson;

Videographers: TBD

- 6:45 Social time food and refreshments
- 7:00 Agenda overview and approval of June 2, 2016 Minutes
- 7:05 School Board Update - Stephanie Seguino and Miriam Stoll
- 7:20 Champlain College Update – John Caulo and Sandy Yusen
- 7:30 UVM Update – Lisa Kingsbury
- 7:40 Burlington Town Center – Ann Taylor and Don Sinex along with representatives from the Coalition for a Livable City
- 8:40 City Council Update – Karen Paul and Joan Shannon
- 8:55 Members Items/Open forum
- 9:00 Adjourn

Ward 6 Steering Committee:

Peter Keating, 922-7846,

keating@burlingtontelecom.net

Charles Simpson, 865-5110,

Charles.simpson@plattsburg.edu

Julie Richards, julie@juliecrichards.com

Clare Wool, (clarewool@me.com)

Caroline Saba caroline.saba@gmail.com

City Councilors:

Karen Paul, 863-3817, paulfin@sover.net

Joan Shannon, jshannon@burlingtonvt.gov

Board of School Commissioners:

Stephanie Seguino, sseguino@bsdvt.org

Miriam Stoll mstoll@bsdvt.org

State Representatives Chittenden District 6-3

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Chittenden District 6-6:

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State Senators:

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Philip Baruth (D) 656-3298 pbaruth@leg.state.vt.us

Virginia “Ginny” Lyons (D) 863-6129

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Michael Sirotkin (D) 999-4360 msirotkin@leg.state.vt.us

Diane Snelling (R) 482-4382 dbsnelling@aol.com

David Zuckerman (P/D) 598-1986 davidz@together.net

For information on accessibility, alternate forms of the agenda, including something on the agenda, etc., of the Ward 6 Neighborhood Planning Assembly, contact any of the Steering Committee members listed above. The Ward 6 NPA strives for flexibility in planning before and during the meeting. Accordingly, the specifics of the agenda and the allocated times may change.



Neighborhood Planning Assembly Attendees

NPA (choose one)	Wards 1 & 8	Wards 2 & 3	Wards 4 & 7	Ward 5	Ward 6
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Date of Assembly: 9-1-16, Location: 1111 QrjM iCDJYIN .A Ik..er

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or email to cedofd@burlingtonvt.gov Cot

1 Heather Scott

2 Mark Heinzer

3 Karen Freudenberge

4 Diane Gayer

5 Margaret Murray

6 Tom and Adrienne Dono

7 Anita Reppin

8 Jared Knepper

9 Sandy Yensen

10 Michael Rooney & Susan Dorn

11 ANN TAYLOR

12 Mr D. Asch

13 Gary Chassman

14 Deborah Boothby

15 STEVE GOODKIND

16 Mary Gade

17 jtry-\Bard

18 Caryn Long

19 Greg Eperwood

20 Joe Speidel

21 Tobias A. Stratigis

22 [Signature]

2 MARI TWITCHEN

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Meeting of NPA 6, Aiken Hall, Champlain College, Sept. 1, 2016

Approximately 26 people in attendance plus speakers and NPA steering committee.
Steering Committee member present: Clare Wool and Charles Simpson.

Minutes:

1. Meeting began at 7:04; Clare Wool presented the agenda for approval.
2. Stephanie Seguino and Miriam Stoll from the School Board gave an up-date.
Summer construction on various buildings, including Edmunds School, is complete. Burlington High School is poised for positive change. Partnership for Change members have had their program, Architecture for Equity, funded for the coming year. The district audit of facilities last year and determined that \$65 million is needed to correct problems, including deferred maintenance. The Board will be considering two options. 1) Address and correct all deferred maintenance problems but not build a new high school. 2) Do K-12 repairs and analyze the need for a new high school over this school year. Moving ahead with repairs will require asking voters to approve a \$19 million bond issue. This translates into an additional tax burden for the average home owner of \$91 per month. The bonding vote could come in November or March. After fact-finding, contract negotiations with the teachers' union will resume on 9/12. Question (Q): Does the state participate in such expenses? Answer (A) No. School repair issues are a national problem estimated at \$4 billion; this isn't due to our neglect here. Q. For how long is the bond? A. 10 years. Q. Will it result in improvements such as energy efficiency or just a return us to the status quo? A. We don't want just a patch-up. \$10 million goes to put our schools in compliance with ADA. Q. Will you give equal weight to rehab as well as a new high school building? A. The size of the HS is adequate, so yes, though ADA compliance is an issue. Keeping the present building is not off the table.
3. Sandy Yusen and a Champlain College Student Government rep., Gerard --?, spoke. CC Student Government will have a rep. at NPA 6 this year as part of their community outreach effort. A new Women and Gender Studies Center has opened on campus. A faculty art exhibition has opened in the college gallery. Yusen thanked the community for bearing with the college during "move-in weekend". This year they welcomed the largest college class yet and CC will be housing some upper class students in three off-campus facilities, 287 College St.; Bayberry Place, and Spinner Place, Winooski. There will be staff in each location. Eagles Landing is scheduled to be open to students in the fall of 2018. The last campus building project in the master plan, Information Technology Science, is in the planning stage. ITS programs will include cyber security. Some landscape construction is being completed. As a safety and diversity move, the college is painting the crosswalk at So. Willard near Maple in a rainbow pattern. Enhanced crosswalk visibility is being studied for So. Willard crossings. Q. Students are hard to see until they are in the street. A. We are looking into a blinker system. We know we need additional lighting there. Q. We need lighting that covers the middle of the street, not so much a blinker. A. We are looking into this. There will be a raised portion of the crosswalk. Q. Who pays for it? A. The city, we

expect. This is an open conversation. Q. Why the delay at Eagles Landing? A. We are still negotiating with the City for the Brown's Court property. Q. What are your student numbers? A. 2100 now, which is generally even with figures for the past five years. Others students are abroad. Of the 2100, 632 are first-year students. Check for our welcoming event information on the table.

4. Gail Shampnois and Joe Speidel represented UVM. New construction underway will add 300 beds to the previous number on campus. These dorms will open in Fall 2017. The STEM building will open later. The new class has higher than previous GPA and SAT scores. More Vermont high school grads are attending with free tuition than perviously. We are working with our city counselors, the police dept., and code enforcement to address problem incidents off campus. We are funding police officers to be in the neighborhoods on weekends, including on So. Prospect. We will be mapping incidents so as to take pro-active initiatives. The trends in this area are positive. Thanks for bearing with us during move-in. We are informing all students about the behavior that is expected of them in the community, and will be distributing 500 information and treat bags Sept. 10. We've worked with Councilor Karen Paul on this effort to raise awareness. Call Gail's office with any problems you experience in this regard. We also are running late night student shuttles. (Karen Paul): noise complaints have fallen sharply, sometimes being resolved in 24 hours with the help of the code enforcement officer. Q. Don't you have space to build dorms on the Trinity Campus? A. Yes. We are looking at that. That might need a zoning change "down the line". Q. I want to report that the Wellness Campus is effective. A. Yes, it now is oversubscribed.
5. Ann Taylor, Don Sinex, and Jesse Beck, President of Freeman French Freeman, Inc., presented information on the proposed Burlington Town Center. Taylor said Burlington is a great place to live and the project won't injure it. Business supports it. Sinex said he purchased the property 3 years ago and for the past 2 years has worked with the mayor, Council, Planning and Zoning, and the Planning Commission to refine the plan. BTC is 40 year old and sits on 5 acres or 215,000 sq. feet of land. Physical retail is in a state of flux currently and each year appears to be declining, hence the problems cited by Macy's Corp closing some stores. If they close here, you'll know as soon as I will. I hope not. The site is perfect for mixed use, stacked vertically. This cuts down on auto trips. Our two years of work has gotten us a good design. (At this point he showed slides of the site and the proposed buildings.) These will be true public streets with access to all vehicles, including fire trucks, and pedestrians and bikes. Slopes won't be over 4.5 degrees and so ADA compliant. They aren't perfect. There is a 20 foot drop between Cherry and Bank Streets and 20 feet between Church and Pine. The project will revitalize the downtown, according to an economic impact study done for us by a UVM professor, generating 900 temporary and 1200 permanent jobs. There will be \$200 million of additional economic activity surrounding the mall, including rebuilding on Bank Street. Now there is no storm water management at all. We will improve this, catching, storing, and slowly releasing water to reduce impact on the city's systems. We are working with DPW on this, and storage will be on the 5th floor. Both the streets and the observation deck will be public amenities. There is a problem. We can get clearance of 13'6" for each street with the exception of the ramp under the Free Press Building,

which is 12'. Our largest fire truck is 12'. If we were to increase the slope to lower the ramp, we'd increase the incline and create problems as the road meets the Macy's entrance. They'd need steps. So Macy's isn't pleased. But the roads will be 60' wide. Yes, they won't be perfect in that they won't align with the streets they connect with. We can't move the Free Press building. And the NBT Bank building is also in the way. We still aren't done with our planning process and need to meet with DRB and the Conservation Board. They wanted us to make the garage disappear. It is self-ventilating and 50% open, using screens with holes. From the sidewalk, you can't see through the screens but you could face-on. From the street you won't see car lights or cars. The buildings are well-designed with setbacks so the pedestrian experience from the street is such that you won't feel the height. A bird will see it, but not a pedestrian. Our goal is for the pedestrian to feel the street vitality, not the height. We think we have the right balance. 50,000 feet of the plot are streets, deeded to the city. Yes, we can ask to close them for events, just as any city street could be closed through the proper procedure for a proper purpose. This is a large space for community functions, an outdoor plaza. Parking: We wanted underground but the cost is \$75 million not the \$25 million we'll pay for above-ground parking. We can't pay for it. It requires a 45 foot hole over 125,000 sq. ft., and excavation would take 9 months and many trucks coming and going. Downtown soil is often contaminated so disposal could add \$100 a cubic yard for 200,000 yards. It's impossible. Height? You won't feel it. Inclusionary Zoning? We have full IZ compliance that will never go away, set at 60% of median income. Shops, "most of the shops" will be entered from the street. We may need a clinic, a pet shop, a pre-school; it is hard to say at this point. TIF's? I'm giving up property. I can't build the roads. If the public wants them, they should pay. I've been told that Farrell's project has the developer building the streets. But he's getting \$2 million from the city (for the park) and money is fungible. He'll use that to build the streets. So it's the same. TIF's don't impact your tax bill. We use 75% of the increased tax generated to pay the bond, but 25% goes to the city. "This is my money, not the city's." It doesn't impact your tax bill. Without the project there's no increase so you can't say you could use the money for some other expense. You'll get to vote on the TIF. The public gets the streets. (Jesse Beck): We are also doing the new City Market and we did the garages at the airport and the hospital. The 160ft. height is only on half of the plot. Downtown is ready for this. We have setbacks after the 5th story. Q. Don't you have a wall on Cherry Street unlike the setbacks on Church Street? A. Setbacks vary with the city requirements. They are 60ft. on Church Street after 45 ft. The 45ft height gives Church St. a potential uniform wall on the west side. Planning and Zoning wanted this increase to 45 foot height to make it even. Q. Won't there be shading on the Cherry Street park? Can't you space out the towers more to minimize that? A. We are looking at that. New streets will also add street level sun. Check the CEDO website for particulars on setbacks. Q. Can you lower the height? The square feet on the top of the towers is only 8000 ft each or a total of 24,000 sq. ft. With 325,000 sq. ft. for the garage, putting it underground would let you lower the towers. It is hard to see that all 200,000 cubic yards of soil would be contaminated. Say half was. That would make removal and disposal cost \$60 million more for a project with underground parking. A. (Beck) At BTV the cost for above ground parking was 10,000-15,000 a space; at the hospital it was 42,000 a space.

(Sinex): \$21,000 above ground and \$55,000 below at present. We initially wanted it underground but the project can't sustain it financially. We wouldn't get the financing. Each garage floor is 10 ft. Q. Can't you reduce the number of parking spaces, put parking where the concourse presently is, sell some spaces, use shared space as per the downtown parking plan, and then you'd have 325,000 more square feet of space to rent. A. We looked at all those options. We can't get it to work. Our garage is as small as possible given the demand of our mix. Retail wants spaces We can't reduce the number of spaces without reducing the size of the project. Our UVM Medical tenants have 500 employees and want 500 spaces. We are trying to shift some of this to adjacent lots. Apartments want one space each. Then there's additional office space, then retail. Yes, we need smart parking management. Champlain College students won't be allowed to park downtown so that saves 80 spaces. We've studied this. You have peak demand at 1200 spaces and you have 925 slots. Valet parking can gain you 225 spaces. You build to 85% of the peak demand so you don't have unused spaces most of the year. We are stuck. Q. If you presume the soil is contaminated, won't rebuilding the streets involve removal of contaminated soil, and thus the TIF won't be sufficient? A. We will be adding soil to the streets, not removing it, We'll add 10,000 cu. yds.

6. Because of the late hour, Councilor Paul ceded her time and will report in October and we lacked time for "member items/open forum."
7. Meeting adjourned at 9 pm.

Respectfully submitted, Charles Simpson



Neighborhood Planning Assembly Agenda for the Wards 2 and 3

Thursday, September 8, 2016

McClure Multi-Generational Center/Champlain Senior Center, 241 N. Winooski Ave.

FREE Community Dinner at 5:30 pm

Facilitator: Ryan McLaren, Steering Committee

6:30PM - Welcome & Introductions

6:35PM - Don Sinex, Burlington Town Center Project (40 mins)

7:15PM - Burlington Schools Update - Ward 2/3 School Commissioners (30 Mins)

7:30PM - North Avenue Pilot Project - Elizabeth Gohringer, Department of Public Works

7:45PM - George/Pearl Street Lofts Project Update - John Alden

8:00PM - Public Comment - Opportunity for residents to share comments on any topic and for suggestions for future NPA agendas (please limit any commentary to one minute)

Current Steering Committee:

Infinite Culcleasure Ward 3, infinite.culcleasure@gmail.com

Fauna Hurley Ward 3, faunashaw@gmail.com

Ryan McLaren Ward 3, ryan.d.mclaren@gmail.com

Barbara McGrew Ward, 3 bmcgrew@aol.com

Andrew Champagne Ward 2

Tony Redington Ward 2, TonyRVT99@gmail.com

Patrick Johnson Ward 2, superdogirie@gmail.com



Neighborhood Planning Assembly Attendees

NPA (choose one)	☐	Wards 1 & 8	☒	Wards 2 & 3	☐	Wards 4 & 7	☐	Ward 5	☐	Ward 6
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Date of Assembly : 9/8/16 Location: McClure Multi-Generat
Ctr.

Please return to your convenor, _____
 or email to cedofd@burlingtonvt.gov

1 <u>Zyann McLauren</u>	21 _____
2 <u>[Signature]</u>	22 _____
3 <u>R. St. Hilaire</u>	23 _____
4 <u>Chester Sanford</u>	24 _____
5 <u>Janet Wilson</u>	25 _____
6 <u>Sharon Webster</u>	26 _____
7 <u>Sara Giannoni</u>	27 _____
8 <u>Synn Martin</u>	28 _____
9 <u>Michael McCormick</u>	29 _____
10 <u>Tom Benoit</u>	30 _____
11 <u>Barbara Wynn</u>	31 _____
12 <u>Carolyn Bates</u>	32 _____
13 <u>Willi Peery</u>	33 _____
14 <u>Ann Peery</u>	34 _____
15 <u>Erica Spiegel</u>	35 _____
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Neighborhood Planning Assembly Agenda for the Wards 2 and 3

Thursday, September 8, 2016

McClure Multi-Generational Center/Champlain Senior Center, 241 N. Winooski Ave.

Draft

Meeting start time: 6:40pm

Steering Committee member present: Infinite Culcleasure Ward 3; Fauna Hurley Ward 3; Barbara McGrew Ward 3; Ryan McLaren Ward 3; Tony Redington Ward 2; Patrick Johnson Ward 2

Don Sinex, Burlington Town Center Project- Liz Miller and Jesse Beck

BTC presentation

Liz helps with Communication and Jesse is Project Architect. Presentation also on CEDO website.

<https://www.burlingtonvt.gov/CEDO/BTV-Mall-Redevelopment-Process>

Project doesn't own Macy People's and Free Press building.

The New St. Paul Street divides the project in two phases. St Paul, has mall retail, housing and office tower. The website has primary goals for housing, economic development in jobs, and wrap around services in the downtown. Housing has not been designated on what floor it will be on yet. Still looking at the inclusionary units and market housing location. There is a two floor tenant of UVM Medical Center. In phase one, the mall will be removed and has two levels of retail.

Phase two is under the ground. There's a 3rd party that developing a 3D walk through of the streets. The project will LEED Gold. DPW expectation that the property takes care of storm water and connect to City storm water. Have roof top water retention and solar power on the tower. 274 units 20% inclusionary 55, which is permanent affordable 80 units of Champlain College that yet to be negotiated; the rest is market rate. 160ft is the height. Overlay district allowed for this height and allows for another 15 for mechanical. The observation tower is part of the height and not part of the TIF. Right now at conceptual phase and if project gets voted in will go through Major Project review. Feasibility study is being developed but the office space would be what the market will bear.

Burlington District School Update-Brian Cina and Liz Curry

Negotiation process but is at the end. Hope to reach an agreement to secure the tax payer's ability to pay and also continue to attract quality teachers. 2013-2016 is the current contract term.

Fact finding and negotiation details can be found on District website. Sept 12 will go into mediation.

<http://district.bsd.schoolfusion.us/modules/cms/pages.phtml?pageid=332596>

Living contract which pegs the teachers with the surrounding salary. Problem with this is if other district are paying higher it locks the district to pay similarly even if not fiscally able in the SBD budget. This set

The areas that set the union and district apart are; the District where salaries are set by other districts. Cannot longer sustain this. Looking to still have BSD teacher salary to still be at the midpoint range. Healthcare is a problem. Co-pay is 15% and asking to have teachers' pay more of the co-pay. Also teacher can take classes. This is 300k of budget. Looking to be more strategic with the class taken to be changed to meet the needs of students. The Superintendent hired a strong administration team and the beginning of the year has gone smooth. There is a committee that tracks student outcome and there's a diversity and equity committee. One thing implemented is a trauma training due to the needs of students. The school is moving forward to do Restorative Justice Practices in schools to not push students out.

North Avenue Pilot Project-Senior Planner-Nicole Losche and Cindy Cook Public Outreach

Consultant

North Ave Pilot implemented in July and taking in all the adjustments based on feedback. Changes made were: reduced Bollards, created pull out for south bound bus next to Hannaford's, added additional sign bikers to ride alongside with cars. Still doing data collection and public engagement. Looking at bike count, collision reports, and City wide survey. There will public forum on Sept 20th 7pm in Miller Center. At City Council meeting on Oct. 17 DPW will give a report which as a 4month check in. This will give time if any changes need to be made can be done before winter. Biker education will continue. Ballers will be removed for the winter due to plowing and possibly sooner. As school resumes, DPW and CCRPC will continue to observe the corridor and collect data to assess additional morning traffic. Need to see how the pilot handles during school.

George/Pearl Street Lofts Project Update-John Aldon and Julio

Plan BTV is still calling for more housing. This projects fits into the targeted areas in the City for more infill areas and creating more density. Residential structures will be on George and Pearl. Former Bove's restaurant will be removed. Bove's is not a historical site but will memorialize through the story and history of Little Italy on an informational plaque infused with a video documentary. Will also preserve some items inside the restaurant such as the jukebox, pictures, and fixtures to bring to shop in Milton to have a little museum. One parking underground and one on ground. Project holds 62 apartment units which 20% is inclusionary housing. 3 story in front and 4 in back on George Street. There is outdoor bike parking and each housing unit has storage unit next to the garage. There will be some green strips that will be incorporated into the project but don't have much to work with because there is no room it's a pedestrian sidewalk. The construction timeline would be ahead of Burlington Town Center and hoping to start in late spring. Don't have to go through ACT 250 because this project is in a designated downtown and providing housing. The state passed this ruling for all downtown development projects. Will still need to go through the development review processes. This project is aiming at workforce housing and working with CEDO to see how to do this. The aim is to keep in middle to low income.

Meeting Adjourn: 8:52pm

Meeting Notes submitted by Phet Keomanyvanh-CEDO Community Development Specialist-Public Engagement

FIGURE 1-A



Ward 5 NPA
DPW Conference Room, 645 Pine Street
Tuesday 20, 2016 7:00 – 9:00 pm

7:00 - Opening Statements and Welcome Address.

7:05 - Safety in the Neighborhood. Lt. John Young, BPD.

7:20 - Burlington Town Center Presentation and Q+A. Don Sinex, Devonwood.

8:00 - City Market South End Update. Allison Weinhausen, Community Engagement, City Market.

8:30 - Open Forum and Closing.



Neighborhood Planning Assembly Attendees

NPA (choose one)	Wards 1 & 8	Wards 2 & 3	Wards 4 & 7	Ward 5	Ward 6
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Date of Assembly : 9/20/16 Location: DPW

Please return to your convenor, Phet Keomanyvanh
or email to cedofd@burlingtonv.gov

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|---------------------|----|
| 1 Sue Plisinski | 21 |
| 2 Tony Rowin | 22 |
| 3 BARBARA GAIDA | 23 |
| 4 Joseph Gaida | 24 |
| 5 Mark & Joseph | 25 |
| 6 Russell Aminzade | 26 |
| 7 Jack Ward | 27 |
| 8 Phet Keomanyvanh | 28 |
| 9 Rebecca Galvin | 29 |
| 10 Marcia Gustafson | 30 |
| 11 Kristin Winrock | 31 |
| 12 Tom Winrock | 32 |
| 13 ANN TAYLOR | 33 |
| 14 Allison Wapnagen | 34 |
| 15 ANDREW SIMON | 35 |
| 16 ELISA NELSON | 36 |
| 17 PAUL SMITH | 37 |
| 18 | 38 |
| 19 | 39 |
| 20 | 40 |



Neighborhood Planning Assembly Minutes

NPA:
(choose one)

Wards	Wards	Wards	Ward	Ward
1 & 8	2 & 3	4 & 7	5	6

Date of Assembly : 9 / 20 / 2016

Start Time: (Commence): 7:05 PM

Location: DPW Building, Pine St.

Finish Time: (Adjourn): 9:05 PM

Notetaker: Nate Orshan

Steering Committee Members in Attendance:

Alec Bauer
Elisa Nelson
Nate Orshan

Discussion Topics and Action Items:

(1) Safety in the Neighborhood - Lt. John Young, Burlington Police Department

Answered questions such as top South End calls to the BPD (#1: Issues with population of transient people; #2: Issues with motor vehicle use), the Department's approach to traffic violations, the outcome of recent de-escalation training, and more.

(2) Presentation and Q & A: Burlington Town Center - Don Sinex, Managing Director, Devonwood Investors LLC, and Jesse Beck, President, Freeman French Freeman

Sinex delivered a presentation with a status report for and details about the proposed Burlington Town Center redevelopment project and answered attendee questions. The zoning amendment is in its final stages, with a City Council public hearing on September 29. When asked if a critical dependency such as the zoning amendment were not passed what Devonwood Investors would do, Sinex stated that they would still try to propose some development project, though the scope and nature of such a project would depend on timing.

(3) Update: City Market South End - John Tashiro, General Manager, and Allison Weinhagen, Director of Community Engagement

Tashiro stated that the new store is on schedule for a Summer 2017 opening. Weinhagen shared details about recent Design Review Board meetings and developments that had occurred since their last presentation for the NPA. Among details shared were the fact that the City will not act to temporarily dead-end the streets along Briggs Street and the fact that City Market moved the entire footprint for the building two feet to the east (to accommodate vehicle entrances and exits from a single driveway) and three feet to the south (to accommodate a potential right-turn lane for the Champlain Parkway when it is finally built).

(4) NPA Related Open Forum and Closing

Tony Redington announced that, at the next month's Ward 5 NPA meeting (Thursday, October 20) in addition to a presentation about the Burlington Town Center redevelopment project, the Coalition for a Livable City would be announcing a proposal to modify the plans for the Champlain Parkway.

No action items.

Motion to adjourn adopted at 9:05 PM.



Location: UVM Medical Center, McClure Lobby Conference Room

Date: October 12, 2016

Time: 7.00 p.m.

Draft

7.00 p.m.: Welcome and Introductions

7.05: City Council Update

7.25: Speak Out: Including any election candidates who wish to be recognized - (no draft ballot yet so regrettably no customary "candidates' forum".)

7.45: A chance to meet newly appointed CEDO Director, Noelle MacKay, with a brief introduction and Q&A.

8.00: Devonwood Investors' presentation. Not clear if Don Sinex will be with us, but either Elizabeth Murray, Jesse Beck or Don Sinex, or a combination of all three, will join us to discuss the Town Center redevelopment, and entertain Q&A.

8.30: Coalition for a Liveable City: Genese Grill will offer a different perspective, with Q&A.

9.00: Close

Emily Lee, Ward 8 NPA Steering Committee Dana

Kamencik, Ward 1 NPA Steering Committee

Richard Hillyard, Ward 1 NPA Steering Committee

Parking: In the McClure Garage, free, courtesy of UVM MC.



Neighborhood Planning Assembly Attendees

NPA (choose one)	Wards 1 & 8	Wards 2 & 3	Wards 4 & 7	Ward 5	Ward 6
K1					

Date of Assembly : 12 Oct. 2016 Location: McClure Lobby Conference Room

Please return to your convenor, Phet Keomanyvanh
or email to cedofd@burlingtonvt.gov

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3	GENESE GRILL	23
4	Charles Simpson	24
5	Brian Cinal	25
6	Maria McClellan	26
7	Sandywynne	27
8	Scott Kilpatrick	28
9	Tyler Mitchell BFD	29
10	Lauren Beriozbeoria	30
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Ward 1 and 8 NPA list serve

Name	Street	Phone Number	Email Address
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Dana Hamenick

Lisa Kingsbury

Nkelele Gumbo

Brian Cina

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Ward 1 and 8 NPA list serve

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FIGURE 1-A



Ward 1 and 8 NPA
UVM Medical Center, McClure Lobby Conference
October 12, 2016
Draft

Steering Committee Members Present
Richard Hillyard-Ward 1, Dana Kamencik-Ward 1.

Start time 7:04pm

City Council Updates

Sharon Bushor-Ballots have Capital Plan and Tax Increment Financing(TIF) for overlay zoning to open up streets. Not supportive for some of traffic charter change due to the funds going into parking and feel that this should not be done through bonds. Went through lengthy process to change a zone from institutional to residential in order to protect the character, hoping that residential medium will go forward. A development is being built across the street of Fletcher Place. The development going through Development Review Board and Conservation Board. There are some concerns that the development is on a slope and might not hold due to the capacity of the project.

Selene Colburn – Did not support zoning changes and is glad to hear from the public about this zoning proposal change. There was support and favor for the project but not for the size of the project. Wish there was more of a conversation to reach a middle ground on compromising instead of a black or white yes or no. Sharon did a tremendous work with zoning review. Chair Development and Revitalization Committee is meeting on the 18th to review consultants from inclusionary zoning, the report has not been released by the administration. Originally was going to vote on TIF but a group petitioned to put zoning on the ballot too. If zoning doesn't pass, then we'll need to go back to the developer to work with existing zoning, although the developer has stated that this is the way the project will be. If TIF passes, the money will still be there to open up the streets. The current zoning does not allow to open up the streets.

Brian Cine - lives in Ward 2, but under Chittenden 6-4 due to redistricting. Cine wants to work on legislative level to apply background in social work to make public change, also currently on the School District Board.

Selene Colburn running for 6-4 Legislative District. Currently serving 2nd term in City Council, Librarian at UVM. Colburn wants to run on state level because hits some barriers of advocating for opiates recovery and limited access to mental health services on a municipal level. She also works on environmental and Housing issues.

Fire Department Bonds

Chief Steven Locke- Item #1 is Capital bond and includes replacing 4 firetrucks. Trucks have over 100k and sometimes trucks are out of service and need to borrow trucks from South Burlington. Also waterline is unable to deliver water flow due to the rotting infrastructure. This inhibits the quality of services that can be delivered.

Community and Economic Development Office-CEDO

Noelle MacKay- New CEDO Director. Her previous employer was with Smart Growth Vermont and also Commissioner of Housing and Community Development. In CEDO there is Community Justice Center which works with re-entry and Restorative Justice in schools. CEDO also supports projects such as Moran Plant and other development projects. MacKay has been doing CEDO chats to understand what's working and what's not with staff, past staff, Dept., and community partners. This will help understand what CEDO can do and should do. In CEDO there has been a history of creativity of community and economic development. CEDO has Burlington Lead Program (BLP) to make homes safer and more livable. This year hit 100 homes in BLP and looking at diversifying funding streams beyond grants. New Housing staff will start Nov. 1st and also recently filled in new finance staff too. Looking to ramp up communication, re-branding, and marketing. CEDO has three teams and each has Assistant Directors. The teams are Sustainable Housing and Economic Development (SHED), Community Housing and Economic Opportunity Programs (CHOP) and Community Justice Center (CJC). Housing is in all three Teams. TIF history has a long history of modification and change. The most recent is on the Town Center and Waterfront. Currently reviewing Consultant report on how inclusionary zoning has worked in other cities to making small changes and tweaks before releasing it to the public. Had a 3rd party to study a feasibility study and there is not a full ROI report to produce. Some of the information is confidential and developers need this information to produce intent letters. In terms of getting money worth there are several terms in the predevelopment agreement that need to be done first. On the CEDO website, there is information about what we are getting back.

There was a question for Noelle regarding the unallocated Community Development Block Grant (CDBG) money from last year and using it for the opioid crisis. After the NPA meeting Mary Esbjerg provided this answer to the question. "There are unallocated funds from our CDBG Program Years 2015 and 2016 which will be advertised along with CDBG funds for 2017 beginning in December 2016, with new grants being available July 2017. We will include, as an eligible activity, health-related projects with a focus on opiate addiction related services. The application process is an open and competitive one; all decisions are made by a citizen advisory group, presented to the Mayor and confirmed by City Council."

Devonwood-The zoning overlay shape and design

Jesse Beck and Elizabeth Murray. Liz- Started last January when pre-agreement started. Jesse one of the Architect-Freeman French Freeman. Specialty has been doing complex projects such as the airport and statehouse so Beck is used to this size of development. Devonwood properties are Macy's to LL Bean, Old Parking Garage. Does not include Free Press and Bank building. The overlay district that was passed starts past lakeside garage and larger than Devon Wood Properties. Phase 1 will deconstruct the entire mall. Phase 2 will be small to medium retailers. In the upper level there will be a 3 level garage, housing, 2 floors for UVM Medical Center offices and a public terrace. New streets restored will be on St. Paul and Bank street. There will be 60ft wide street between phase 1 and 2. Height is 160ft. Free Press is 105

to offer some perspective of 160ft tower next to it. Project signed on to 2030 challenge to reduce energy consumption. Any TIF district has to have economic development that is produced from a project. Three million dollars will be generated from property taxes and 75% will go to paying it back in 15 years. Taxes will not go towards schools until TIF district is paid for. The developer has a Facebook and Twitter Feed. Search Burlington Downtown Redevelopment. Opinions differ but from the developer's point the City requested to reconnect city streets. To minimize risk and disruption the first phase will be away from Church Street. The permitting process will take 4 or 5 months which will go into 2017. Developer will have to get the project financing done and development agreement finalized with the City and Council. The development agreement will also show community benefit. Pieces will have job fair and housing. TIF is reimbursement to the developer for the public streets only. What you see now is conceptual design that will evolve when going through Development Review Board.

Coalition for a Livable City (CLC)

Genese Grill, Charles Simpson, Steve Goodwin. The 160ft and 105ft are not 4 stories than what Devonwood has claimed and is much higher. There are two items on ballot and if item 3 of the zoning gets voted down then CLC would like to offer consultant services to help develop a new project. If Mayor would work with community's vision of Plan BTV then it would be better project. The Mayor and Council promise developer TIF and Zoning change in the interest of developer. CLC is not against development but wants a more affordable and sustainable project. Glad to see that some of the parking can be wrapped but there are still three open floors. If we want more parking there is the suggestion to dig underground to reduce height. A sustainable idea is to look at less parking downtown and more on the need for an electric trolley system. Also the 80 student units should be eliminated from the project and these units should be on campus. The developer needs streets for the plan not for public connectivity. The developer should pay for the streets not the taxpayers. What happens to TIF is taxes are frozen and 100% goes to pay bond holder and will continue for the life of the TIF. There has never been a developer in history that has the tax payer pay public streets. They are asking voters to make a decision but numbers are not available. The Business Associate hired a lobbying to advocate for ballot items. CLC filed a Freedom of information Act for the feasibility report but was denied.

9:20 pm End

Notes submitted by Phet Keomanyvanh

Community Development Specialist-CEDO

Neighborhood Planning Assembly Agenda for the Wards 2 and 3
Thursday, October 13, 2016
McClure Multi-Generational Center/Champlain Senior Center, 241 N. Winooski
Ave.

FREE Community Dinner at 5:30 pm
Facilitator: Ryan McLaren, Steering Committee

6:30PM - Public Comment Period- Opportunity for residents to share comments on any topic and for suggestions for future NPA agendas (please limit any commentary to one minute)
6:35PM - BTV Great Streets Initiative, Kirsten Merriman Shapiro, CEDO (10mins)
6:45PM - Burlington Town Center Project, Don Sinex (15mins)
7:00PM - Crosswalk Improvements on North Avenue, Martin Lee, DPW (10 mins)
7:10PM - Mayor Miro Weinberger, November Ballot Initiatives (20mins)
7:30PM - Fire Department Bond Initiatives - Chief Steven Locke, BFD, Michael Curtin BFFA President (15mins)
7:45PM - Dan Albrecht, CCRPC Brownfields Program: Site planning Assessment and Cleanup Planning Assistance. (15mins)

Current Steering Committee:
Infinite Culcleasure Ward 3 infinite.culcleasure@gmail.com
Fauna Hurley Ward 3 faunashaw@gmail.com
Ryan McLaren Ward 3 ryan.d.mclaren@gmail.com
Barbara McGrew Ward 3 bmcgrew@aol.com
Andrew Champagne Ward 2
Tony Redington Ward 2 TonyRVT99@gmail.com
Patrick Johnson - superdogirie@gmail.com



Neighborhood Planning Assembly Attendees

NPA (choose one) | Wards 1 & 8 | Wards 2 & 3 | Wards 4 & 7 | Ward 5 | Ward 6
 Date of Assembly: /0../ /" /6 Location: McClure Multi-Generations ctr.
 Please return to your convenor, fit!-ek Keomanyvanh,
 or email to cedofd@burlingtonvt.gov

1 Catherine LaPenta

2 Nate Benner

3 Emily LaPenta

4 Sam Julia

5 Sharon Webster

6 Harry Appelgate

7 Rosie Blick

8 Rosemary Ringer

9 Aloysie Rowsley

10 Carole Langlois

11 David Kelm

12 =t r.p. L

13 Melissa Cain

14 Max Tracy

15 Gideon Turner

16 Gerald Gower

17 ~~Out~~

18 Patrick Johnson

19 Roger Letovitz

20 Barbara McGrew

21 Jack Daggitt

22 Jean Suelwan

23 Robert Herendeen Ward 4

24 Barbara Wyonette

25 Charlie Moring

26 Michael McDonnell

27 Rico DeFranco

28 Lynn Martin

29 Genese Grill

30 Amy Prevorse

31 Jane Knodell

32 Tony Bonin et al

33 Carol Spina

34 Benjamin L.

35 Chelsea Sanford

36 Robert Strube

37 Andrew Champagne

38

39

40



Neighborhood Planning Assembly Agenda for the Wards 2 and 3
Thursday, October 13, 2016
McClure Multi-Generational Center/Champlain Senior Center, 241 N. Winooski Ave
Draft

Steering Committee Present: Ryan McLaren Ward 3, Barbara McGrew Ward 3, Andrew Champagne Ward 2, Tony Redington Ward 2, Patrick Johnson Ward 2

Start time 6:30pm

Public Comment

Tony Redington-redesign for Champlain Parkway meeting will be held in early Nov. The meeting will work on bringing a proposal to bring to Mayor. The proposal will reduce parkway cost by 25% and will include 2 acres of land for business innovation and 2 acres for preservation.

Bill Diaz-Chaplin of VFW of Winooski. Consider supporting veterans, help improve their lives and get to know the people who served this country.

BTV Great Streets Initiative, Kirsten Merriman Shapiro, CEDO

Project will improve corridor in main street and city hall park. Public meeting will be held on November 16th, 6:30pm, City Hill in Contois Hall. Great Street has a website where the public can leave comments <http://greatstreetsbtv.com/> This project started out of 18+ different plans and taking all the planning processes over the 5+ years and making it into one great plan. Parts of the plan is to standardize storm water and curb extension depending on locations. The plans need to add to vibrancy, walkability, durability, functional and keep in state and federal standards. These are the standards that will be developed over months and be done by January 2017. This is 6 block project.

Burlington Town Center Project, Don Sinex

City Council passed the zoning law amendment creating a new an overlay district. Mayor decided to place this zoning law on the ballot as question for the voters to decide. Overall felt that this is a good decision because this brings a conclusion and this will be a firm decision. The zoning is a good thing for unique projects. When developer buy a piece of real estate they start from a framework and working with the City there will be other factors that come up such as the two public streets. This becomes a process to redesign. There is no plan B for this project. This project has been worked on for two years. If the Tax Increment Finance does not pass, then the public streets won't happen. The cost of an underground garage and removal of soil will be 3x times more in cost to develop the project. Looking at using some of the existing garage to offset the height. This project has multiple uses and will generate

revenue. Timing of financing is good and this is a low interest rate. In the project there is 55 Affordable units. This is only rental housing. Efficiencies are studios one bed room and two bed-room. This project will be Gold LEED, sustainable and the design will still need to go through DRB.

Crosswalk Improvements on North Avenue, Martin Lee and Roger Dickerson

This project is funded 80% by VTrans and 20% by the City 20%. New crosswalks are on Wards St., North Ave and Village Green, Gosse Court and Green Acres Drive. Project is developing a conceptual plan and there will be a public process. At the top of Ward St. on North Ave. crosswalk will have a safer crossing. Will install flashing beacons on both sides of N. Ave. Will also have a curb extension which will provide a better line of sight (20ft) and minimize parking next to the crosswalk. On the other streets further down North Ave. will also install yield markings to yield to pedestrians. There are two locations that are going to have more intense pedestrian crosswalk. This is not new technology. Federal Highway has been established for these types of devices.

Mayor Miro Weinberger, November Ballot Initiatives

There are 6 items on the local ballot but going to talk about 4 ballot items. 1st is general bond, 2nd is water infrastructure bond, 3rd is new zoning for downtown core, and 4th is 21 million in Tax Increment Financing (TIF). Ballot 1 and 2 are focused on infrastructure. The water infrastructure is 75 years old. 6 firetrucks are old and also need to finish bike path. This is a 50-million-dollar plan. 1 needs a 67% yes vote to pass. The City will not be coming back for more bonding for at least 5 years. Although there is some uncertainty around storm water because there are regulatory changes and this does not include the schools because they are separate from the City's budget. Memorial Auditorium is not part of this capital bond. Before doing bonds for Memorial we will need to have public process on how we will want to know what we want to do with this space. Items 3 and 4 is about the downtown core. #4 is TIF investment. Feel this is a rare and outstanding opportunity for the City. Property there now is a 70's declining mall that is not keeping up with the commerce side. From the project there will be an increase of retail, keeping well-paying jobs here, and create a massive revenue to city and state. Project will have environmental benefits will need to be green LEED Gold, heating and cooling is more efficient, also there will be less vehicle trips for those living down town will lower carbon foot print. This is a huge win for affordability and this keeps inclusionary zoning in place forever. Burlington has used TIF to change for the better such as in the Waterfront district. If it gets to the final development agreement with the developer, what will come out is a new operation run out of the City for people from all backgrounds to get job training. If voted yes, we will have to flesh out final agreements and the project still needs go through DRB. This year the City double the Housing Trust Fund to have families stay in the homes. The City was instrumental in the creation of Bright Street Housing and will continue to support affordable housing. 2 years ago the project did not have storm water management, public streets, livable wage jobs. TIF will cover 8 blocks all will be broadly public infrastructure.

Fire Department Bond Initiatives - Chief Steven Locke, BFD

Chief Steven Locke- Item #1 is Capital bond and includes replacing 4 firetrucks. Trucks have over 100k and sometimes trucks are out service and need to borrow trucks from South Burlington. Also Item 2 of the waterline is unable to deliver water flow due to the rotting infrastructure. This inhibits the quality of services that can be deliver.

Dan Albrecht, CCRPC Brownfields Program

Chittenden County Regional Planning Commission (CCRPC) administers the Brownfield Program that offer site planning assessment and cleanup planning assistance for properties that are vacant or underutilized because of potential petroleum or hazardous substance contamination. CCRPC can assist property owners and potential developers by conducting environmental studies and/or draft site clean-up plans and cost estimates. Help identify sources of potential funding to clean up and redevelop the property to provide assurance to redevelop in urban environment. For more information, contact Dan Albrecht 802-861-0133 or dalbrecht@ccrpcvt.org
<http://www.ccrpcvt.org/>

Coalition for a Livable City

Video-Google Earth perspective of development not the overlay.

The people that are saying yes on 3 and 4 are saying they can't get LEED, storm water management, affordable housing without this project. In the past Bernie Sanders wanted to build on the waterfront and this got voted down and out of this the public got what we have today, a better waterfront project. This is a bad deal for affordable housing and misuse of TIF funding. Traditionally the developer pays for their own streets. Once this is voted down the CLC will offer its contracting services to the developer. CLC is made up of professional; engineers, graphic designers, lawyers, and teachers. Having TIF go towards building the streets is a misuse where it should be going to helping to improve other infrastructure in the city. There are two types of Affordable housing; one is section 8 and then one is inclusionary housing. With existing projects there is 2500 units and only affordable 500 units of subsidies units. Most of what the Mayor is talking about is inclusionary. We want to see more affordable housing for families and seniors. TIF is not bad but in this way it's going to be for the developer to pay for his road. There was a feasibility study done and all the numbers are adapted. It might be feasible but the public doesn't have the numbers. Without the numbers the public can't be informed to vote on the TIF. Filed for Freedom of information Act but was denied. Middle class and poor people are being driven out of the City. This is a small City and there will also be gentrification of local business too. CLC will be canvassing and has a Facebook page. www.clcburlington.org

End time 9:10pm

Notes submitted by Phet Keomanyvanh

Community Development Specialist-CEDO



LEED v4 - Building Design and Construction - New Construction (Not Schools or Health Care)

Updated: December 1, 2016
 Project Name: Burlington Town Center
 Phase:

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
Y	Design	Minimum Program Requirements	Architect
			Project is permanent on existing land and complies with size requirements. Design team to establish LEED boundary. [No Form Required?]
Y	Design	Project Information	Architect
			Establish systems narrative and occupancy counts. Design documentation upload at design completion.
1	0	0	Integrative Process (IP) 1 Point Possible
1	Design	IPc1 Integrative Process [1]	Full Team
		Perform and document discovery and implementation on Energy-Related Systems and Water-Related Systems	Recommend charrette and exploration of impacts of various building orientations. Having CM on board already will help us achieve this credit.
9	5	2	Location and Transportation 16 Points Possible
Option 1: LEED for Neighborhood Development Location			
Not Applicable, Use Opt. 2	Design	LTC1 LEED for Neighborhood Development Location [16]	None in Vermont- Not Applicable
		Locate the project within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the LEED v4 rating system).	Using Option 2- Individual Credits
Option 2: Individual Credits			
1	Design	LTC2 Sensitive Land Protection [1]	Architect
		Option 1: Locate the footprint on land that has been previously developed. Option 2: Locate footprint on land that meets these criteria: * Not prime farmland of statewide or local importance * Not within a 100 year floodplain * Not a threatened, imperiled or endangered species habitat * Not within 100 feet of a water body * Not within 50 feet of a wetland except for minor improvements	Previously developed site, this point is a given, easy documentation
1	Design	LTC3 High-Priority Site [1-2]	Architect
		Option 1: Locate on an infill location in a historic district. [1] Option 2: Locate in a nationally recognized priority zone. [1] Option 3: Located on a brownfield site where soil or groundwater contamination has been identified and where the AHJ requires its remediation. Perform remediation. [2]	Determine if we meet the requirements of options 1 or 2.
3	Design	LTC4 Surrounding Density and Diverse Uses [1-5]	Architect
		Category 1: Locate on a site with a surrounding existing density of at least 22,000 SF/acre [2pts] or 35,000 SF/acre [3] within a 1/4 mile radius of the project boundary. AND/OR Category 2: Construct or renovate a building or a space within a building such that the building's main entrance is within a 1/2-mile walking distance of the main entrance of four to seven [2] or eight or more [3] existing and publicly available diverse uses.	We will get points for redeveloping a previously developed site and for access to transportation resources. The "maybe" points depend on whether we can count this as a redevelopment of more than one site or

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
3 2	Design	LTc5 Access to Quality Transit [1-5]	Architect
		Locate any functional entry of the project within a ¼-mile walking distance of existing or planned bus, streetcar, or rideshare stops with minimum 72 daily weekday trips (see reference guide).	One of the few sites in Vermont where this credit is achievable.
1	Design	LTc6 Bicycle Facilities [1]	Architect
		Design or locate the project such that a functional entry or bicycle storage is within a 200-yard walking distance or bicycling distance from a bicycle network that connects to at least one of the following: * at least 10 diverse uses (see reference guide Appendix 1) * a school or employment center, if project floor area 50% or more residential * a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary	We will need to provide covered bicycle parking for residential units and shower facilities accessible to retail and office employees working in the building. The entrance to the bike parking needs to be within 200yds of the new transit center at Cherry and St. Paul.
	1 Design	LTc7 Reduced Parking Footprint [1]	Architect, Civil, Landscape
		Do not exceed the minimum local code requirements for parking capacity. Provide parking capacity that is a percentage reduction below the base ratios recommended by the Parking Consultants Council, as shown in the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4	We are providing more parking than the zoning requirement and are therefore ineligible for this point.
1	Design	LTc8 Green Vehicles [1]	Architect, Civil, Landscape
		Designate 5% of all parking spaces used by the project as preferred parking for green vehicles. AND Option 1. Electric Vehicle Charging: Install Level 2 electrical vehicle supply equipment (EVSE) in 2% of all parking spaces used by the project. Option 2. Liquid, gas, or battery facilities: Install liquid or gas alternative fuel fueling facilities or a battery switching station capable of refueling a number of vehicles per day equal to at least 2% of all parking spaces	This version of LEED does require Level 2 Charging stations (220/240v charging). Potentially partner with BED to offer street parking with chargers. LEED site boundary will need to include these spaces and they will need to be quantified as "spaces used by the project". 2% of 815 spaces results in 9 charging stations serving 2 spaces each. It may be possible to provide a mix of 240v rapid charging stations and standard 110v outlets.
4 4 2	Sustainable Sites (SS)		10 Points Possible
Y	Const.	SSp1 Construction Activity Pollution Prevention	Civil
		Create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.	Assume General Construction Permit from requirements State will be most stringent. Civil engineer to verify.
1	Design	SSc1 Site Assessment [1]	Landscape Architect, Civil, Architect
		Complete and document a site survey or assessment that includes the following information: topography, hydrology, climate, vegetation, soils, human use, human health effects.	Create site diagram as part of concept design. By EV and SE Group
	2 Design	SSc2 Site Development - Protect or Restore Habitat [1-2]	Landscape Architect, Civil
		Preserve and protect from all development and construction activity 40% of the greenfield area on the site (if such areas exist). AND Option 1. On-Site Restoration (Previously Disturbed): Using native or adapted vegetation, restore 30% (including the building footprint) of all portions of the site identified as previously disturbed [2] Option 2. Option 2. Financial Support: Provide financial support equivalent to at least \$0.40 per square foot for the total site area (including the building footprint). Financial support must be provided to a nationally or locally recognized land trust or conservation organization within the same EPA Level III ecoregion or the project's state. The land trust must be accredited by the Land Trust Alliance. [1]	

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
1	Design	SSc3 Open Space [1] Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space must be vegetated (turf grass does not count as vegetation) or have overhead vegetated canopy.	Landscape Architect, Civil, Owner Note 25% vegetated requirement; this would require an extensive amount of green roof. We consider this unlikely.
3	Design	SSc4 Rainwater Management [2-3] Option 1. Percentile of Rainfall Events * Path 1. 95th Percentile: In a manner best replicating natural site hydrology processes, manage on site the runoff from the developed site for the 95th percentile of regional or local rainfall events using low-impact development (LID) and green infrastructure. [2] * Path 2. 98th Percentile: Same as Path 1 but for the 98th percentile of rainfall events. * Path 3. Zero Lot Line projects only - using green infrastructure and low-impact development, manage 100% of runoff from 85th percentile rainfall event on site through infiltration, evapotranspiration, or capture and reuse. [3] Option 2. Natural Land Cover Conditions: Not applicable to project	Civil Path 3 may be achievable with infiltration in combination with green roofs, porous paving, and planter boxes. Explore infiltration potential.
2	Design	SSc5 Heat Island Reduction [1-2] Option 1. Nonroof and Roof: Provide a total amount of non-roof measures and high-reflectance roof as per formula in reference guide [2] Option 2. Parking under Cover: Place a minimum of 75% of parking spaces under cover [1]	Landscape Architect, Civil, Architect Between PV systems, light colored membranes, and green roofs, this credit should be achievable. The SRI and color of pervious play surface for the Daycare must take this credit into account but there should be a compliant play surface solution.
1	Design	SSc6 Light Pollution Reduction [1] Meet uplight and light trespass requirements, using either the backlight-uplight-glare (BUG) method or the calculation method. Projects may use different options for uplight and light trespass. See reference guide for detailed requirements.	Landscape Architect, Civil, Electrical During concept design, establish the methods that will be used to address uplight and trespass. Establish the lighting zone of the project property. SE Group will need to provide additional photometrics beyond requirements for zoning compliance in order to document compliance with this credit.
4	4	3	Water Efficiency (WE) 11 Points Possible
Y	Design	WEp1 Outdoor Water Use Reduction Option 1. (Always use) Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.	Landscape Architect Have always achieved this credit on Vermont projects. Install no permanent irrigation systems. Hose bibs are OK.
Y	Design	WEp2 Indoor Water Use Reduction For the fixtures and fittings listed in Table 1, as applicable to the project scope, reduce aggregate water consumption by 20% from the baseline. Base calculations on the volumes and flow rates shown in Table 1. All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling must be WaterSense labeled. Install appliances, equipment, and processes within the project scope that meet the requirements listed in the requirement tables.	Plumbing This has not been difficult to achieve on past projects. Baseline is minimally code compliant fixtures (e.g. baseline assumes such things as 1.6gpf toilets) Possibly more complicated with private residential use, but we must achieve this water use reduction.
Y	Design	WEp3 Building-Level Water Metering Install permanent water meters that measure the total potable water use for the building and associated grounds. Meter data must be compiled into monthly and annual summaries; meter readings can be manual or automated. Commit to sharing with USGBC the resulting whole-project water usage data for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first. This commitment must carry forward for five years or until the building changes ownership or lessee.	Plumbing Building level metering required by city, no issue here.
2	Design	WEc1 Outdoor Water Use Reduction [1-2] Option 1. (Always use) Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period. [2]	Landscape Architect Have always achieved this credit on Vermont projects. Install no permanent irrigation systems. Hose bibs are OK.

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
1 2 3	Design	WEc2 Indoor Water Use Reduction [1-6] Further reduce fixture and fitting water use from the calculated baseline in WE Prerequisite Indoor Water Use Reduction AND Appliance and Process Water. Install equipment within the project scope that meets the minimum requirements in Table 2, 3, 4, or 5. One point is awarded for meeting all applicable requirements in any one table. All applicable equipment listed in each table must meet the standard.	Plumbing Make further improvements over baseline described in WEp3. 25% improvement = 1 point, 30%=2points, each 5% increase is one more point up to 50% reduction/ 6 points
1 1	Design	WEc3 Cooling Tower Water Use [1-2] Conserve water used for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system. See reference guide.	Mechanical Review requirements for any methods that may add significant project cost. Note methods of reducing cooling tower water use generally have associated operating cost savings.
1	Design	WEc4 Water Metering [1] Install permanent water meters for two or more of the following water subsystems, as applicable to the project: Irrigation, Indoor plumbing fixtures and fittings, Domestic hot water, Boiler over certain size (see reference guide), reclaimed water, other process water.	Plumbing Incorporate metering into BOD

20	11	2	Energy & Atmosphere (EA)		33 Points Possible
Y		Const.	EAp1 Fundamental Commissioning of Building Energy Systems Commission mechanical, electrical, plumbing, and renewable energy systems and assemblies. Prerequisite requirements for exterior enclosures are limited to inclusion in the owner's project requirements (OPR) and basis of design (BOD), as well as internal 3rd party review of the OPR, BOD and project design. Develop the OPR. Develop a BOD. CxA must review OPR, BOD and design; develop and implement a Cx plan and confirm requirements incorporated into construction documents; develop construction checklists; develop system test procedures; verify tests execution; maintain an issues log; prepare a final report. Cx to report directly to the owner throughout the process. Prepare and maintain a current facilities requirements and operations and maintenance plan that contains the information necessary to operate the building efficiently.	Owner Provide project OPR inclusive of enclosure requirements. Contract systems commissioning agents prior to 30% design completion	
Y		Design	EAp2 Minimum Energy Performance Option 1. Demonstrate an improvement of 5% for new construction, 3% for major renovations, or 2% for core and shell projects in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.), using a simulation model. [For Retail projects see exception.] Option 2. Prescriptive Compliance: ASHRAE 50% Advanced Energy Design Guide Option 3. Prescriptive Compliance: Advanced Buildings™ Core Performance™ Guide	Mechanical Establish energy model (Option 1)	
Y		Design	EAp3 Building Level Energy Metering Install new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption. Commit to sharing with USGBC the resulting energy consumption data and electrical demand data (if metered) for a five-year period beginning on the date the project accepts LEED certification. At a minimum, energy consumption must be tracked at one-month intervals. This commitment must carry forward for five years or until the building changes ownership or lessee.	Mechanical, Owner	
Y		Design	EAp4 Fundamental Refrigerant Management Do not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems. Existing small HVAC&R units (containing less than 0.5 pound) and other equipment, such as standard refrigerators and small water coolers are exempt.	Mechanical Design and select equipment without CFC refrigerants	

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
6	Const.	EAc1 Enhanced Commissioning [2-6] Option 1. Enhanced Systems Commissioning Path 1. In addition to the Fundamental Building Commissioning prerequisite, the CxA must do the following: Review contractor submittals; Verify inclusion of systems manual requirements in construction documents; Verify inclusion of operator and occupant training requirements in construction documents; Verify systems manual updates and delivery; Verify operator and occupant training delivery and effectiveness; Verify seasonal testing; Review building operations 10 months after substantial completion; Develop an on-going commissioning plan. Include all enhanced commissioning tasks in the OPR and BOD. [3] Path 2. Achieve Path 1 AND Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy- and water-consuming systems. [4] AND/OR Option 2. Envelope Commissioning. 3rd party external CxA must perform the required design reviews and complete the following commissioning process (CxP) activities for the building's thermal envelope in accordance with ASHRAE Guideline 0-2005 and the National Institute of Building Sciences (NIBS) Guideline 3-2012, Exterior Enclosure Technical Requirements for the Commissioning Process, as they relate to energy, water, indoor environmental quality, and durability. Review contractor submittals; Verify inclusion of systems manual requirements in construction documents; Verify inclusion of operator and occupant training requirements in construction documents; Verify systems manual updates and delivery; Verify operator and occupant training delivery and effectiveness; Verify seasonal testing; Review building operations 10 months after substantial completion; Develop an on-going commissioning plan. [2]	Owner Confirm intent and contract CxA (Systems Commissioning Authority) and BeCxA (Building Envelope Commissioning Authority) prior to 30% design documentation. Note that BECx is one path for energy code compliance.
10	Design	EAc2 Optimize Energy Performance [1-18] Establish an energy performance target no later than the schematic design phase. The target must be established as kBtu per square foot-year (kW per square meter-year) of source energy use. Option 1. Project teams pursuing the Integrative Process credit must complete the basic energy analysis for that credit before conducting the energy simulation. Points for percentage improvement in energy performance compared with baseline model meeting ASHRAE/ASHRAE/IESNA Standard 90.1-2010 requirements. [1-18] OR Option 2. Prescriptive Compliance. See reference guide. [1-4]	Mechanical, Electrical [Note that percentage here is inclusive of assumed 10% building energy solar system as part of project and that the baseline is ASHRAE 90.1-2010 Zone 6. This represents a significant energy use reduction for the baseline comparison compared to LEED v3.] Establish energy performance target. Complete Integrative Process credit energy analysis. Create first draft energy model based on 30% Design Documents [to discuss]. An energy model will be required to demonstrate energy code compliance based on current % fenestration. Burlington Electric will provide targeted incentives based on the model. The PV produced energy counts as "energy saved" for this credit. Simply meeting VT energy code will earn us some additional points. Design to a low lighting power density and select mechanical equipment that has favorable cost/efficiency ratios (quick paybacks).
		1 6% New Buildings or 4% Existing Building Renovations 1 8% New Buildings or 6% Existing Building Renovations 1 10% New Buildings or 8% Existing Building Renovations 1 12% New Buildings or 10% Existing Building Renovations 1 14% New Buildings or 12% Existing Building Renovations 1 16% New Buildings or 14% Existing Building Renovations 1 18% New Buildings or 16% Existing Building Renovations 1 20% New Buildings or 18% Existing Building Renovations 1 22% New Buildings or 20% Existing Building Renovations 1 24% New Buildings or 22% Existing Building Renovations ? 26% New Buildings or 24% Existing Building Renovations ? 29% New Buildings or 27% Existing Building Renovations ? 32% New Buildings or 30% Existing Building Renovations ? 35% New Buildings or 33% Existing Building Renovations ? 38% New Buildings or 36% Existing Building Renovations ? 42% New Buildings or 40% Existing Building Renovations X 46% New Buildings or 44% Existing Building Renovations X 50% New Buildings or 48% Existing Building Renovations	

FIGURE 2-A

Qualify			Phase	Title, [Available Points]	Team / Comments
Yes ? No					
1			Design	EAc3 Advanced Energy Metering [1] Install advanced energy metering for all whole-building energy sources used by the building and any individual energy end uses that represent 10% or more of the total annual consumption of the building. The advanced energy metering must have the following characteristics: Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location; Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate; The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure; The system must be capable of storing all meter data for at least 36 months; The data must be remotely accessible; All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.	Mechanical, Electrical This dovetails with municipal/ Burlington Electric Department goals for green infrastructure. Discuss incentives and cost-sharing with BED. Individually meter residential units and consider individually metering each tenant rather than including electrical use in leases- this strategy may help earn additional LEED points elsewhere.
	2		Const.	EAc4 Demand Response [1-2] Case 1. Demand Response Program Available: Participate in an existing demand response (DR) program. Design a system with the capability for real-time, fully-automated DR based on external initiation by a DR Program Provider. Semi-automated DR may be utilized in practice. Enroll in a minimum one-year DR participation amount contractual commitment with a qualified DR program provider, with the intention of multiyear renewal, for at least 10% of the estimated peak electricity demand as determined under EA Prerequisite Minimum Energy Performance. Develop a comprehensive plan for meeting the contractual commitment during a Demand Response event. Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan. [2] Case 2. Demand Response Program Not Available: Provide infrastructure to take advantage of future demand response programs or dynamic, real-time pricing programs. Install interval recording meters with communications and ability for the building automation system to accept an external price or control signal. Develop a comprehensive plan for shedding at least 10% of building estimated peak electricity demand as determined under EA Prerequisite Minimum Energy Performance. Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan. Contact local utility representatives to	Electrical, Owner, Utility A demand response program is available from both BED and Vermont Gas; discuss incentives and implementation with these utilities.
2	1		Design	EAc5 Renewable Energy Production [1-3] Use renewable energy systems to offset building energy costs. The use of solar gardens or community renewable energy systems is allowed if both: The project owns the system or has signed a lease agreement for a period of at least 10 years; The system is located with the same utility service area as the facility claiming the use. Credit is based on the percentage of ownership or percentage of use assigned in the lease agreement. 1 1% of total building energy cost offset 1 5% of total building energy cost offset 1 10% of total building energy cost offset	Owner, Electrical We will need an energy model to predict building energy use in order to understand the % we will generate with the PV array. Note that PV generated power gets double counted as energy use reduction in EAc1.
1			Design	EAc6 Enhanced Refrigerant Management [1] Option 1. No Refrigerants or Low-Impact Refrigerants: Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50. Option 2. Calculation of Refrigerant Impact: Select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. See reference guide for calculation. [See additional requirements for Retail uses.]	Mechanical For base building systems and residential units, obtain refrigerant info for all

FIGURE 2-A

Qualify			Phase	Title, [Available Points]	Team / Comments
Yes	?	No			
	2		Const.	EAc7 Green Power and Carbon Offsets [1-2]	Owner
				Engage in a contract for qualified resources that have come online since January 1, 2005, for a minimum of five years, to be delivered at least annually. The contract must specify the provision of at least 50% or 100% of the project's energy from green power, carbon offsets, or renewable energy certificates (RECs).	This credit represents the possibility to purchase RECs on the market. We advise using this credit as a backup in case the review of our submission does not return the minimum of 60 points needed for LEED Gold.
4	7	2	Materials & Resources (MR) 13 Points Possible		
Y			Design	MRp1 Storage & Collection of Recyclables	Owner, Architect, Civil
				Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. Take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.	Provide standard waste handling procedures that will be used at this facility.
Y			Const.	MRp2 Construction and Demolition Waste Management Planning	Specifications, Contractor
				Develop and implement a construction and demolition waste management plan to establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent. Specify whether materials will be separated or comingled and describe the diversion strategies planned for the project. Describe where the material will be taken and how the recycling facility will process the material. Provide a final report detailing all major waste streams generated, including disposal and diversion rates. Alternative daily cover (ADC) does not qualify as material diverted from disposal. Land-clearing debris is not considered construction, demolition, or renovation waste that can contribute to waste diversion.	Specify CDWM requirements. Contractor to develop, submit, implement and track CDWM plan. Note this was previously a credit but is now a pre-requisite
	3	2	Const.	MRC1 Building Life-Cycle Impact Reduction [2-5]	Full Team
				Option 1. Historic Building Reuse. See reference guide. [5] Option 2. Renovation of Abandoned or Blighted Building. See reference guide. [5] Option 3. Building and Material Reuse. Reuse or salvage building materials from off site or on site as a percentage of the surface area, as listed in Table 1. Include structural elements (e.g., floors, roof decking), enclosure materials (e.g., skin, framing), and permanently installed interior elements (e.g., walls, doors, floor coverings, ceiling systems). Exclude from the calculation window assemblies and any hazardous materials that are remediated as a part of the project. Points by percentage of completed project surface area reused. 25% [2], 50% [3], 75% [4] Option 4. Whole-Building Life-Cycle Assessment. Conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be global warming potential. No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building. Global warming potential; depletion of the stratospheric ozone; acidification of land and water sources; eutrophication (nitrogen or phosphate); formation of tropospheric ozone; and depletion of nonrenewable energy resources. [3]	Would require a whole bulding life-cycle assesment. Potentially costly.

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
1 1	Const.	MRc2 Environmental Product Declarations [1-2] Achieve one or more of the options below, for a maximum of 2 points. One point per Option. Option 1. Environmental Product Declaration (EPD). Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of three disclosure criteria. (1) Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit calculation. (2) Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope: Industry-wide (generic) EPD -- Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator are valued as one half (1/2) of a product for purposes of credit calculation. Product-specific Type III EPD -- Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation. (3) USGBC approved program -- Products that comply with other USGBC approved environmental product declaration frameworks. Option 2. Multi-Attribute Optimization. Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project. (1) Third party certified products that demonstrate impact reduction below industry average in at least three of the following categories are valued at 100% of their cost for credit achievement calculations: global warming potential; depletion of the stratospheric ozone layer; acidification of land and water sources; eutrophication (nitrogen or phosphate); formation of tropospheric ozone; and depletion of nonrenewable energy resources. (2) USGBC approved program -- Products that comply with other USGBC approved environmental product declaration frameworks. Products sourced (extracted, manufactured, purchased) within 100 miles of the project site are valued at 200% of their base contributing cost. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.	Specifications, Contractor Include requirements for the submission of EPDs in specifications.
2	Const.	MRc3 Sourcing of Raw Materials [1-2] Achieve one or more of the options below, for a maximum of 2 points. One point per Option. Option 1. Raw Material Source and Extraction Reporting. Use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers which include raw material supplier extraction locations, a commitment to long-term ecologically responsible land use, a commitment to reducing environmental harms from extraction and/or manufacturing processes, and a commitment to meeting applicable standards or programs voluntarily that address responsible sourcing criteria. Products sourced from manufacturers with self-declared reports are valued as one half (1/2) of a product for credit achievement. Third-party verified corporate sustainability reports (CSR) which include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain, are valued as one whole product for credit achievement calculation. Option 2. Leadership Extraction Practices. Use products that meet at least one of the responsible extraction criteria for at least 25%, by cost, of the total value of permanently installed building products in the project: Extended producer responsibility; Bio-based materials; Certified Wood products; Materials reuse; Recycled content; USGBC approved program. For credit achievement calculation, products sourced (extracted, manufactured and purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.	Specifications, Contractor Documentation is time intensive and costly. Was previously worth more points. While this may not add much to construction costs, it will require documentation by subcontractors, contractors, and LEED consultant/ architect, as well as specifications language.

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
1 1	Const.	MRc4 Material Ingredients [1-2] Achieve one or more of the options below, for a maximum of 2 points. One point per Option. Option 1: Material Ingredient Reporting. Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm). Manufacturer Inventory. The manufacturer has published complete content inventory for the product; Health Product Declaration. The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard; Cradle to Cradle. The end use product has been certified at the Cradle to Cradle v2 Basic level or Cradle to Cradle v3 Bronze level; USGBC approved program. Option 2: Material Ingredient Optimization. Use products that document their material ingredient optimization for at least 25%, by cost, of the total value of permanently installed products in the project using one of these paths: GreenScreen v1.2 with no Benchmark 1 hazards; Cradle to Cradle Certified; USGBC approved program. Option 3: Product Manufacturer Supply Chain Optimization Use building products for at least 25%, by cost, of the total value of permanently installed products in the project that are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material, and are sourced from product manufacturers with independent third party verification of their supply chain that verifies processes are in place to identify, document and communicate information about safety, health, and hazards of chemicals within the products throughout the supply chain. For credit achievement calculation of options 2 and 3, products sourced (extracted, manufactured, purchased) within 100 miles of the project site are valued at 200% of their base contributing cost. For credit achievement calculation, the value of individual products compliant with either option 2 or 3 can be combined to reach the 25% threshold but products compliant with both option 2 and 3 may only be counted once. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.	Specifications, Contractor Option 1 should be attainable. This is a new approach to LEED materials optimization, and the contractor will need to play an active role in sourcing the "20 products from 5 manufacturers" to obtain this point. Specs should identify material categories where documentation is available and require documentation of compliance as part of product submittals.
2	Const.	MRc5 Construction and Demolition Waste Management [1-2] Option 1. Diversion Path 1. Divert at least 50% of the total construction and demolition material; diverted materials must include at least three material streams. [1] Path 2. Divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams. [2] Option 2. Reduction of Total Waste Material Do not generate more than 2.5 pounds of construction waste per square foot of the building's floor area. [2]	Specifications, Contractor Specify CDWM requirements. Require strategies for reduction and tracking of total waste material while leaving option for credit compliance open to contractor discretion. Contractor to develop, submit, implement and track CDWM plan.
10 6 0	Indoor Environmental Quality (EQ)		16 Points Possible
Y	Prereq 1	EQp1 Minimum IAQ Performance For mechanically ventilated spaces (and for mixed-mode systems when the mechanical ventilation is activated), meet the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata), or a local equivalent, whichever is more stringent. For naturally ventilated spaces (and for mixed-mode systems when the mechanical ventilation is inactivated), determine the minimum outdoor air opening and space configuration requirements using the natural ventilation procedure from ASHRAE Standard 62.1–2010 or a local equivalent, whichever is more stringent. Confirm that natural ventilation is an effective strategy for the project by following the flow diagram in the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Nondomestic Buildings, Figure 2.8, and meet the requirements of ASHRAE Standard 62.1–2010, Section 4, or a local equivalent, whichever is more stringent.	Mechanical Verify and document compliance.

FIGURE 2-A

Qualify			Phase	Title, [Available Points]	Team / Comments
Yes ? No					
Y			Prereq 2	EQp2 Environmental Tobacco Smoke Control	Owner
				Prohibit smoking inside the building. Prohibit smoking outside the building except in designated smoking areas located at least 25 feet from all entries, outdoor air intakes, and operable windows. Also prohibit smoking outside the property line in spaces used for business purposes. Signage must be posted within 10 feet of all building entrances indicating the no-smoking policy.	Provide compliant property smoking policy.
1	1		Design	EQc1 Enhanced Indoor Air Quality Strategies [1-2]	Mechanical, Architect
				Achieve one or more of the options below, for a maximum of 2 points. One point per Option. Option 1. Enhanced IAQ Strategies Mechanically ventilated spaces to have entryway systems, interior cross-contamination prevention, and filtration. Naturally ventilated spaces to have entryway systems and natural ventilation design calculations. Mixed-mode systems to have entryway systems, interior cross-contamination prevention, filtration, natural ventilation design calculations, and mixed-mode design calculations Option 2. Additional Enhanced IAQ Strategies Mechanically ventilated spaces (select one): exterior contamination prevention; increased ventilation; carbon dioxide monitoring; or additional source control and monitoring. Naturally ventilated spaces (select one): exterior contamination prevention; additional source control and monitoring; or natural ventilation room by room calculations. Mixed-mode systems (select one): exterior contamination prevention; increased ventilation; additional source control and monitoring; or natural ventilation room-by-room calculations.	Assess options and strategies to confirm number of points to target.
2	1		Const.	EQc2 Low-Emitting Materials [1-3]	Architect, Interiors, Contractor
				Option 1. Product Category Calculations. Achieve the threshold level of compliance with emissions and content standards for the number of product categories listed in credit Table 2. Option 2. Budget Calculation Method. If some products in a category do not meet the criteria, project teams may use the budget calculation method (Table 3).	Select and specify products during design development to meet credit criteria. There are 6 categories: Interior Paints & Coatings, Interior Adhesives and Sealants, Flooring, Composite Wood, Ceilings, walls and acoustic & thermal insulation, and Furniture. Compliance in 2 categories= 1 point; 4 categories= 2 points; 5 categories=3points
1			Const.	EQc3 Construction Indoor Air Quality Management Plan [1]	Specifications, Contractor
				Develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building.	Specify requirement for creation and implementation of compliant construction indoor air quality management plan.
	2		Const.	EQc4 Indoor Air Quality Assessment [1-2]	Owner, Contractor
				Option 1. Flush-Out [1] Path 1. Before Occupancy. Install new filtration media and supply a total air volume of 14,000 cubic feet of outdoor air per gross square foot while maintaining temperature and humidity prior to occupancy. Path 2. During Occupancy. Install new filtration media and supply a total air volume of 3,500 cubic feet of outdoor air per gross square foot while maintaining temperature and humidity prior to occupancy. Continue flushout at 0.3 CFM until total of 14,000 cubic feet per square foot have been delivered. Option 2. Air Testing [2] After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing for all occupied spaces.	Determine whether air testing between construction and occupancy is desirable for confirmation of air quality and attainment of second LEED point.
1			Design	EQc5 Thermal Comfort [1]	Mechanical
				Option 1. ASHRAE Standard 55-2010. Design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2010, Thermal Comfort Conditions for Human Occupancy with errata or a local equivalent. Option 2. ISO and CEN Standards. Design HVAC systems and the building envelope to meet the requirements of the applicable standard.	Confirm design will be able to meet ASHRAE 55-2010.

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
1 1	Design	EQc6 Interior Lighting [1-2] Select one or both of the following two options. Option 1. Lighting Control. For at least 90% of individual occupant spaces, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes (on, off, midlevel). For all shared multioccupant spaces have in place multizone control systems with at least three lighting levels, lighting for any presentation or projection wall must be separately controlled, Switches or manual controls must be located in the same space as the controlled luminaires. Option 2. Lighting Quality. Choose four of the following strategies: low glare fixtures; high CRI; long life light sources; less than 25% direct-only lighting; light/high reflectance interior finishes; light/high reflectance furnishings; proportionate wall/work plane illuminance; proportionate ceiling/work plane illuminance. [Other requirements for Retail.]	Electrical, Owner Pursue Option 2 and select the four or more strategies that will be employed on the project. Review whether Option 1 will be achievable on the project.
3	Design	EQc7 Daylight [1-3] Option 1. Simulation: Spatial Daylight Autonomy and Annual Sunlight Exposure. Demonstrate through annual computer simulations that spatial daylight autonomy 300/50% is achieved for 55% [2] or 75% [3] of regularly occupied floor area is achieved. And, demonstrate through annual computer simulations that annual sunlight exposure 1000,250 of no more than 10% is achieved. Option 2. Simulation: Illuminance Calculations. Demonstrate through computer modeling that illuminance levels will be between 300 lux and 3,000 lux for 9 a.m. and 3 p.m., both on a clear-sky day at the equinox, for 75% [1] or 90% [2] of regularly occupied floor area. Option 3. Measurement. Achieve illuminance levels between 300 lux and 3,000 lux for 75% [2] or 90% [3] of regularly occupied floor area as measured on two dates in year following completion.	Architect, Interiors Indicate whether daylight simulation will be able to show credit achievement and/or whether team should plan on field measurement following completion.
1	Design	EQc8 Quality Views [1] Achieve a direct line of sight to the outdoors via vision glazing, not obstructed by patterns or tints that distort color balance, for 75% of all regularly occupied floor area. Additionally, provide at least two of the following four kinds of views: multiple lines of sight to vision glazing in different directions at least 90 degrees apart; views that include at least two of the following: (1) flora, fauna, or sky; (2) movement; and (3) objects at least 25 feet from the exterior of the glazing; unobstructed views located within the distance of three times the head height of the vision glazing; and views with a view factor of 3 or greater, as defined in "Windows and Offices: A Study of Office Worker Performance and the Indoor Environment."	Architect, Interiors Provide design concept indicating all regularly occupied spaces, concepts for locations of permanent interior obstructions. Provide building sections through all exterior glazing and skylight conditions.
1	Design	EQc9 Acoustic Performance [1] For all occupied spaces, meet the requirements for HVAC background noise, sound isolation, reverberation time, and sound reinforcement and masking. Achieve maximum background noise levels from heating, ventilating, and air conditioning (HVAC) systems per 2011 ASHRAE Handbook, HVAC Applications, Chapter 48, Table 1; AHRI Standard 885-2008, Table 15; or a local equivalent. Calculate or measure sound levels. Meet the composite sound transmission class (STCC) ratings listed in credit Table, or local building code, whichever is more stringent. Meet the reverberation time requirements in credit Table. For all large conference rooms and auditoriums seating more than 50 persons, evaluate whether sound reinforcement and AV playback capabilities are needed. For projects that use masking systems, the design levels must not exceed 48 dBA. Ensure that loudspeaker coverage provides uniformity of +/-2 dBA and that speech spectra are effectively masked.	Architect, Interiors, Mechanical Review credit requirements and confirm readiness to meet credit going forward.

FIGURE 2-A

Qualify	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
5	0	0	Innovation 6 Points Possible
1			Innovation in Design or Pilot Credit or Exemplary Performance Full Team
		Possible Exemplary Performance Credits: Protect or Restore Habitat; Rainwater Management; Optimize Energy Performance; Renewable Energy Production; Building Life-Cycle Impact Reduction; Environmental Product Declarations; Sourcing of Raw Materials; BPDO-Material Ingredients; Construction and Demolition Waste Management; Enhanced Air Quality Strategies; Low-Emitting Materials; Quality Views	Plan a team meeting during concept or schematic design to discuss the options available for Exemplary Performance, Innovation and Pilot Credits. Select no more than ten for further analysis and consideration to be narrowed to 6 by the end of construction documents and 5 for submission.
1			Innovation in Design or Exemplary Performance
		Possible Innovation Credits: Sustainable Purchasing Policy; Green Building Education; Solid Waste Management Policy; Building Exterior and Hardscape Management Plan; Green Cleaning (3 options); IPM, Erosion Control, and Landscape Management Plan	Achieve 95% diversion of construction waste.
1			Innovation in Design or Pilot Credit
		Possible Pilot Credits: Ergonomics Strategy; Bird Collision Deterrence; Clean Construction; Exterior Noise Control; Design for Active Occupants; Environmentally Preferable Interior Finishes and Furnishings; Local Food Production; Verified Construction & Demolition Recycling Rates; LEED O+M Starter: Green Cleaning Policy and IPM Plan, Purchasing Waste and Renovation Policies, Site Management Policy, and/or Systems O+M Plan; Social Equity Within the Supply Chain; Social Equity Within the Project Team	
1			Innovation in Design or Pilot Credit Potentially provide tenant fitup design guidelines (a core and shell credit)
		See above	
		Pilot Credit	
		See above	
1			LEED® Accredited Professional Architect
			Achieved, complete form.
3	2	1	Regional Priority 4 Points Possible
Earn up to 4 points out of six possible priority points based on achieved credits above.			Regional credits list is at http://www.usgbc.org/rpc ; this list is for our downtown Burlington site.
1			Renewable Energy Production (EAc5)
1			Surrounding Density and Diverse Uses (LTc4)
1			Bicycle Facilities (LTc6)
	1		Sourcing of Raw Materials (MRc3)
		1	Protect or Restore Habitat (SSc2)
	1		Rainwater Management (SSc4)
Yes ? No			
60	39	12	Project Totals (pre-certification estimates) 100 of 110 Points Possible*

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points

* Innovation and Regional Priority are excluded from the base of 100 possible points.

FIGURE 2-A

Jesse Robbins

From: LEED Info <leedinfo@usgbc.org>
 Sent: Thursday, December 08, 2016 4:17 PM
 To: Jesse Robbins
 Subject: Thank you for your LEED Project Registration

U.S. GREEN BUILDING COUNCIL



Dear Jesse Robbins,

Your LEED project has been successfully registered in LEED Online.

Project ID	: 1000097092
Project Title	: Burlington City Center
Project Rating System	: LEED v4 BD+C: NC
Registration Type	: Individual Project
Registration Date	: 12/08/2016
Project Location	: Burlington, VT, US, 05401

You may now log into LEED Online to manage your project and begin the application process. The first time you log in, you will be presented with a set of 'Getting Started' information that will help you kick off the certification process. Further technical LEED assistance is available through the following resources:

- The help section of LEED Online
- LEED Resources & Tools : <https://new.usgbc.org/leed/certification>
- LEED Reference Guides : <https://new.usgbc.org/store/reference-guides>
- Subscribe to LEED Update, a quarterly e-newsletter from USGBC and GBCI : <https://new.usgbc.org/legacy/account/subscriptions>
- LEEDuser, a third-party resource that offers a variety of supplemental LEED advice: <http://www.leeduser.com>

If you find an error within the LEED Online system, including any of the forms, please report it using of the feedback button, located in the menu bar. If you have questions

We have received
your payment
& are processing
it as quickly as
possible, please

LEED ONLINE



Jesse Robbins



Project Registration

Details

Agreement

Payment

Receipt

Thank you!

Your payment has been received and your receipt has been sent to jrobbins@ffinc.com.

Order summary

ORDER #	0012045856	
AMOUNT	\$ 1,200.00	
TITLE	Burlington City Center	
ID	1000097092	

Notes

Upon receipt, please allow 2-3 business days for processing.

A copy of the invoice must be included with payment.

To avoid delays in processing, please write the invoice number on the check.

Projects may NOT submit for review until the check processing for the registration payment is complete.

PRINT ORDER

DONE

FIGURE 2-B

FIGURE 4-A

BRICK-FACED PANEL

Manufacturer: Saramac

Website: <http://www.saramac.com/en/documents/newfor2009/index.html>

Image:

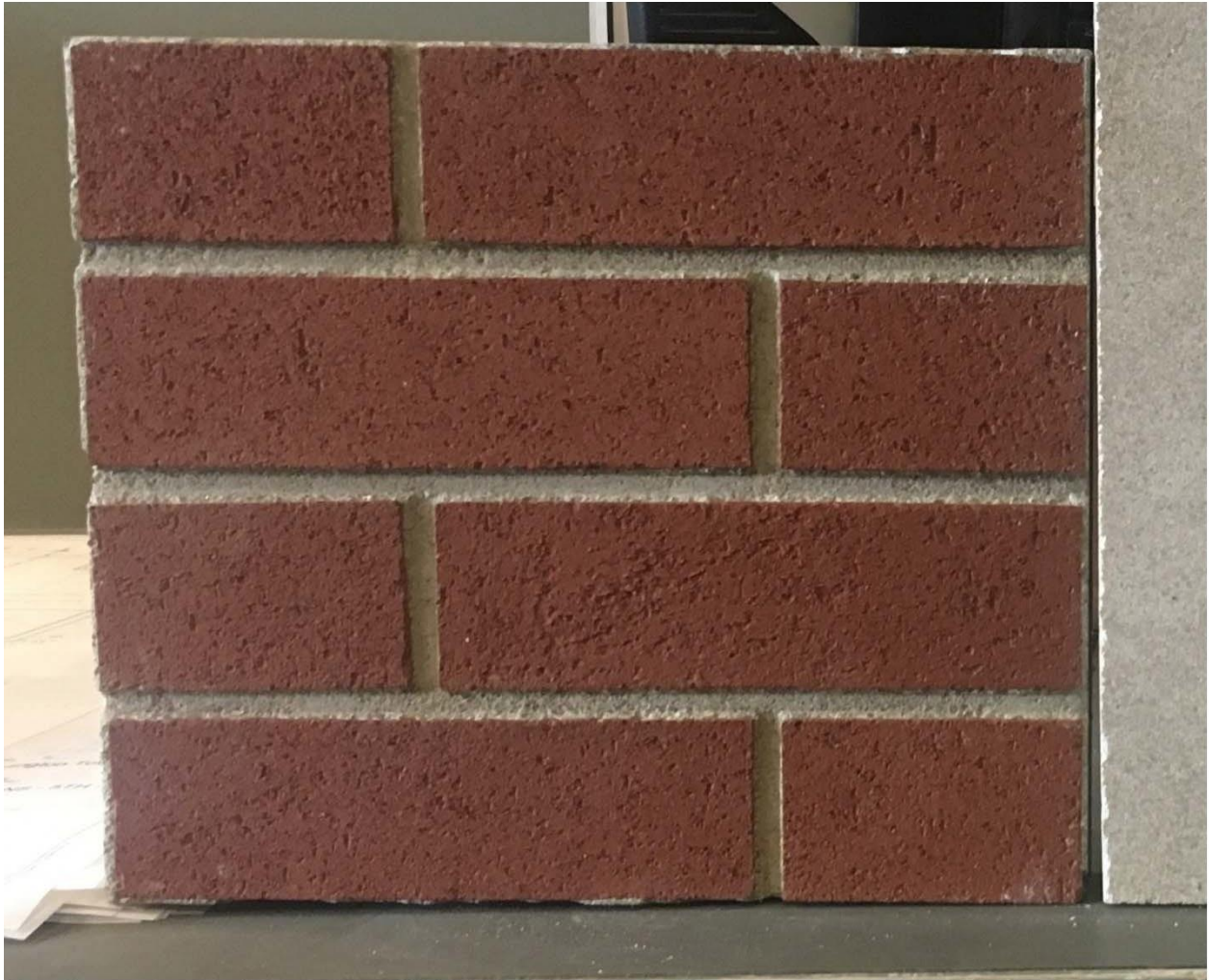


FIGURE 4-B

LIMESTONE FINISHED PANEL

Manufacturer: Saramac

Website: <http://www.saramac.com/en/documents/newfor2009/index.html>

Image:



FIGURE 4-C

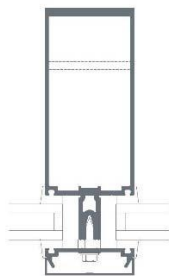
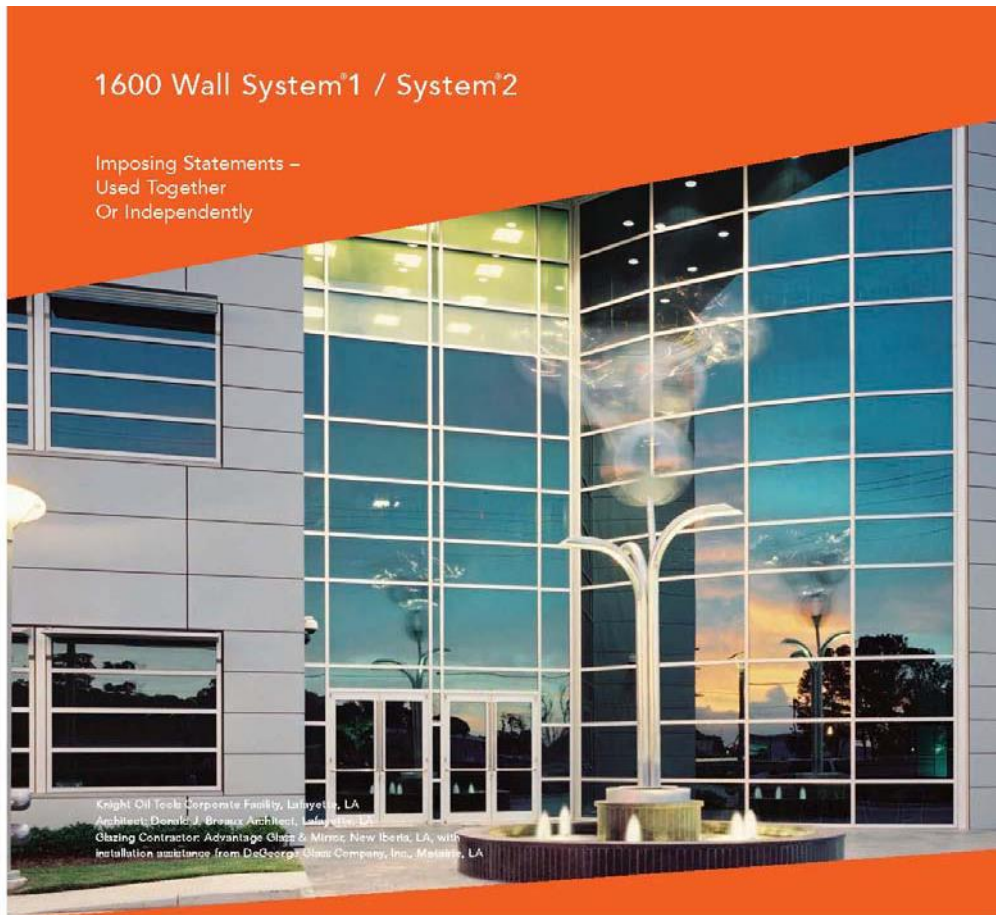
ALUMINUM STOREFRONT AND ENTRANCE DOORS

Manufacturer: Kawneer 1600

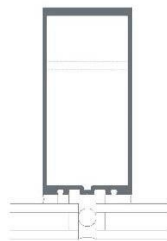
Website:

http://www.kawneer.com/kawneer/north_america/en/product.asp?cat_id=1992&prod_id=1801&desc=hurricane-resistant-curved-curtain-wall-systems

Image:



1600 Wall System®1



1600 Wall System®2

FIGURE 4-C-2

RETAIL GLASS

Manufacturer: PPG Starphire Ultra-Clear Glass ½" thickness

Website: [http://www.ppgideascape.com/getmedia/798287cc-3f49-46b8-b328-9fac88a41a7c/17054_PGAG-Starphire-Vision-\(7073\).pdf.aspx](http://www.ppgideascape.com/getmedia/798287cc-3f49-46b8-b328-9fac88a41a7c/17054_PGAG-Starphire-Vision-(7073).pdf.aspx)

This product at ½" thickness will provide 90% VLT and 8% VLR, exceeding zoning ordinance requirements.

Image:



PPG Monolithic Glass Comparisons

Table of Performance Values ¹													
Glass Thickness		Transmittance ²			Reflectance ²		(BTU/hr•ft ² •F) NFRC U-Value ⁴		U-Value ³ EN 673 (W/m ² •K)	Shading Coefficient ⁶	Solar Heat Gain Coefficient ⁷	Light to Solar Gain (LSG) ⁸	
Inches	mm	Ultra- violet %	Visible %	Total Solar Energy %	Visible Light %	Total Solar Energy %	Winter Night time	Summer Day time					
Uncoated													
STARPHIRE® Glass													
	1/8	3	89	91	90	8	8	1.04	0.94	5.8	1.04	0.91	1.00
	5/32	4	88	91	90	8	8	1.04	0.94	5.8	1.04	0.91	1.00
	3/16	5	88	91	90	8	8	1.03	0.93	5.8	1.04	0.90	1.01
	1/4	6	87	91	89	8	8	1.02	0.93	5.8	1.03	0.90	1.01
	5/16	8	86	91	88	8	8	1.01	0.92	5.7	1.02	0.89	1.02
	3/8	10	85	91	87	8	8	1.00	0.91	5.6	1.02	0.89	1.02
	1/2	12	83	90	86	8	8	0.98	0.89	5.5	1.01	0.88	1.02
	5/8	16	81	90	84	8	7	0.97	0.88	5.4	1.00	0.87	1.03
	3/4	19	80	90	83	8	7	0.95	0.86	5.3	0.99	0.86	1.05
	1	25	77	89	80	8	7	0.92	0.84	5.2	0.97	0.84	1.06



Ordinary glass is green with envy.

Vision Glazings

Starphire® Ultra-Clear Glass by PPG provides commercial designers with a new and unprecedented option for all their vision glass applications. For entire building facades or retail showroom windows, to maximize light transmission and bring an uncommon brightness and clarity to the interior, no commercially available glazing product comes close to the pristine personality of **Starphire** glass.

Starphire vision glass is clearly remarkable:

- Maximum transparency – 5% higher Visible Light Transmittance than ordinary clear glass (in a 1-inch IG unit)
- High fidelity color transmission – undistorted view of exterior
- New level of visual brightness and clarity
- Jewel-like brilliance and character
- Easily fabricated to required specifications

For vision glazings in which enhanced energy performance is required, **Starphire** glass can be combined with solar control, low-e coatings to satisfy energy requirements while maintaining the unique ultra-clear visual character of **Starphire** glass.

Starphire glass is available in thicknesses from 2.5 mm to 19 mm and is stocked regionally to assure consistent supply reliability. For **Starphire** glass samples or a list of distributors, contact our Solutions Hotline at 1-888-PPG-IDEA, or visit www.ppgstarphire.com.

All PPG architectural glass is **Cradle to Cradle Certified**.^{CM}

PPG IdeaScapes® Integrated products, people and services to inspire your design and color vision.

Ultra-Clear Glass



Tokyo Kasai Rinkai Park View Visitors Center

Chiba Prefecture, Japan
(Complete project details on our web site)

The ultra-clear character of **Starphire** glass is exemplified in this Tokyo visitor center project. The difference between the unglazed lower-level breezeway and the **Starphire**-glazed areas is nearly imperceptible. Contrast that to the green appearance of the glass hand rails which are glazed with conventional clear glass.



Alcoa Corporate Center

Pittsburgh, PA
(Complete project details on our web site)

Starphire glass was the choice of both owner and architect to bring the brightness and color fidelity of the outdoors into this magnificent new structure. For energy efficiency, **Starphire** glass is combined with a solar control, low-e coating to clad the entire exterior facade.

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7073 07/13 5M



IdeaScapes®
Glass • Coatings • Paint

FIGURE 4-C-2

PPG Monolithic Glass Comparisons

Glass Thickness			Table of Performance Values ¹										Solar Heat Gain Coefficient ⁷	Light to Solar Gain (LSG) ⁸
		Transmittance ²			Reflectance ²		(BTU/hr·ft²·F) NFRC U-Value ⁴		U-Value ⁵ EN 673 (W/m²·K)	Shading Coefficient ⁶				
Inches	mm	Ultra-violet %	Visible %	Total Solar Energy %	Visible Light %	Total Solar Energy %	Winter Night time	Summer Day time						
Uncoated														
	1/8	3	89	91	90	8	8	1.04	0.94	5.8	1.04	0.91	1.00	
	5/32	4	88	91	90	8	8	1.04	0.94	5.8	1.04	0.91	1.00	
	3/16	5	88	91	90	8	8	1.03	0.93	5.8	1.04	0.90	1.01	
	1/4	6	87	91	89	8	8	1.02	0.93	5.8	1.03	0.90	1.01	
	5/16	8	86	91	88	8	8	1.01	0.92	5.7	1.02	0.89	1.02	
	3/8	10	85	91	87	8	8	1.00	0.91	5.6	1.02	0.89	1.02	
	1/2	12	83	90	86	8	8	0.98	0.89	5.5	1.01	0.88	1.02	
	5/8	16	81	90	84	8	7	0.97	0.88	5.4	1.00	0.87	1.03	
	3/4	19	80	90	83	8	7	0.95	0.86	5.3	0.99	0.86	1.05	
	1	25	77	89	80	8	7	0.92	0.84	5.2	0.97	0.84	1.06	
	1/8	3	73	90	83	9	8	1.04	0.94	5.8	0.98	0.86	1.05	
	5/32	4	71	90	81	9	7	1.04	0.94	5.8	0.97	0.84	1.07	
	3/16	5	69	89	79	9	7	1.03	0.93	5.8	0.96	0.83	1.07	
	1/4	6	66	89	77	8	7	1.02	0.93	5.8	0.94	0.82	1.09	
	5/16	8	61	87	72	8	7	1.01	0.92	5.7	0.90	0.79	1.10	
	3/8	10	58	87	69	8	7	1.00	0.91	5.6	0.88	0.77	1.13	
	1/2	12	53	85	63	8	6	0.98	0.89	5.5	0.84	0.73	1.16	
	5/8	16	49	84	59	8	6	0.97	0.88	5.4	0.80	0.70	1.20	
	3/4	19	45	83	55	8	6	0.95	0.86	5.3	0.77	0.67	1.24	
	1	25	40	80	48	8	6	0.92	0.84	5.2	0.72	0.63	1.27	
	1/4	6	44	64	64	6	6	1.02	0.93	5.8	0.84	0.73	0.88	
	1/8	3	43	83	60	8	6	1.04	0.94	5.8	0.81	0.70	1.19	
	5/32	4	39	81	56	8	6	1.04	0.94	5.8	0.78	0.68	1.19	
	3/16	5	35	79	52	8	6	1.03	0.93	5.8	0.75	0.65	1.22	
	1/4	6	31	77	47	8	6	1.02	0.93	5.8	0.71	0.62	1.24	
	1/4	6	16	67	34	7	5	1.02	0.93	5.8	0.61	0.53	1.26	
	5/32	4	50	75	40	7	5	1.04	0.94	5.8	0.66	0.57	1.32	
	3/16	5	46	72	36	7	5	1.03	0.93	5.8	0.62	0.54	1.33	
	1/4	6	42	68	32	7	5	1.02	0.93	5.8	0.59	0.52	1.31	
	5/16	8	35	61	26	6	5	1.01	0.92	5.7	0.55	0.48	1.27	
	3/8	10	31	57	23	6	5	1.00	0.91	5.6	0.53	0.46	1.24	
	1/4	6	15	42	27	5	5	1.02	0.93	5.8	0.56	0.49	0.86	
	1/4	6	31	56	47	6	5	1.02	0.93	5.8	0.71	0.61	0.92	
	1/8	3	39	67	64	7	6	1.04	0.94	5.8	0.84	0.73	0.92	
	5/32	4	35	63	60	7	6	1.04	0.94	5.8	0.81	0.70	0.90	
	3/16	5	30	58	55	6	6	1.03	0.93	5.8	0.77	0.67	0.87	
	1/4	6	25	53	50	6	6	1.02	0.93	5.8	0.73	0.63	0.84	
	5/16	8	18	43	39	6	5	1.01	0.92	5.7	0.65	0.57	0.75	
	3/8	10	14	37	34	5	5	1.00	0.91	5.6	0.61	0.53	0.70	
	1/2	12	9	27	24	5	5	0.98	0.89	5.5	0.54	0.47	0.57	
	1/4	6	33	63	51	6	6	1.02	0.93	5.2	0.74	0.64	0.98	
	1/8	3	37	60	58	6	6	1.04	0.94	5.8	0.79	0.69	0.87	
	5/32	4	33	56	53	6	6	1.04	0.94	5.8	0.75	0.66	0.85	
	3/16	5	29	50	48	6	5	1.03	0.93	5.8	0.71	0.62	0.81	
	1/4	6	24	44	42	6	5	1.02	0.93	5.8	0.67	0.58	0.76	
	5/16	8	17	33	31	5	5	1.01	0.92	5.7	0.59	0.51	0.65	
	3/8	10	13	28	26	5	5	1.00	0.91	5.6	0.55	0.48	0.58	
	1/2	12	8	18	17	5	5	0.98	0.89	5.5	0.49	0.42	0.43	
	1/8	3	8	24	22	5	4	1.04	0.94	5.8	0.51	0.45	0.53	
	5/32	4	5	18	17	4	4	1.04	0.94	5.8	0.48	0.41	0.44	
	3/16	5	3	13	12	4	4	1.03	0.93	5.8	0.44	0.39	0.33	
	1/4	6	2	9	8	4	4	1.02	0.93	5.8	0.41	0.36	0.25	

One-inch insulating glass data and comparisons can be found at www.ppgideascape.com or by calling PPG at 1-888-774-4332.

For data on:
 Solargreen® Glass — see Atlantica® Glass
 Solex® Glass — see Solexia® Glass
 Azurlite® Glass — see Azuria® Glass

FIGURE 4-C-2

Table of Performance Values ¹													
Glass Thickness		Transmittance ²			Reflectance ²		(BTU/hr·ft ² ·F) NFRC U-Value ⁴		U-Value ⁵ EN 673 (W/m ² ·K)	Shading Coefficient ⁶	Solar Heat Gain Coefficient ⁷	Light to Solar Gain (LSG) ⁸	
Inches	mm	Ultra- violet %	Visible %	Total Solar Energy %	Visible Light %	Total Solar Energy %	Winter Night time	Summer Day time					
Fenestration Systems													
	1/4	6	35	52	25	19	10	1.02	0.92	5.8	0.52	0.46	1.13
	5/16	8	29	46	20	16	9	1.01	0.91	5.7	0.49	0.43	1.07
	Fenestration Systems												
	1/4	6	12	32	22	10	7	1.02	0.93	5.8	0.51	0.44	0.73
	Fenestration Systems												
	1/4	6	9	30	23	37	30	1.02	0.93	5.8	0.43	0.37	0.81
	Fenestration Systems												
	1/4	6	9	30	23	23	12	1.03	0.93	5.8	0.50	0.43	0.70
	Fenestration Systems												
	3/16	5	13	27	16	36	30	1.03	0.93	5.8	0.37	0.32	0.84
	1/4	6	12	26	13	36	30	1.02	0.93	5.8	0.36	0.31	0.84
	Fenestration Systems												
	3/16	5	13	27	16	20	10	1.04	0.94	5.8	0.45	0.39	0.69
	1/4	6	12	26	13	19	9	1.03	0.93	5.8	0.44	0.38	0.68
	Fenestration Systems												
	1/4	6	4	16	13	36	30	1.02	0.93	5.8	0.35	0.31	0.52
	Fenestration Systems												
	1/4	6	4	16	13	10	7	1.02	0.93	5.8	0.44	0.38	0.42
	Fenestration Systems												
	1/4	6	9	21	24	36	30	1.02	0.93	5.8	0.44	0.38	0.55
	Fenestration Systems												
	1/4	6	9	21	24	14	10	1.02	0.93	5.8	0.51	0.45	0.47
	Fenestration Systems												
	1/4	6	7	21	27	36	30	1.02	0.93	5.8	0.46	0.40	0.53
	Fenestration Systems												
	1/4	6	7	21	27	13	11	1.03	0.93	5.8	0.53	0.47	0.45
	Fenestration Systems												
	1/4	6	7	17	23	36	30	1.02	0.93	5.8	0.43	0.37	0.46
	Fenestration Systems												
	1/4	6	7	17	23	11	9	1.03	0.93	5.8	0.51	0.44	0.39

1. Data is based on center of glass performance of representative factory production samples. Actual values may vary due to the production process and manufacturing tolerances. All tabulated data is based on NFRC methodology using the LBNL Window 6.3 software. Variations from previously published data are due to minor changes in the LBNL Window 6.3 software versus Version 5.2.
2. Transmittance and Reflectance values based on spectrophotometric measurements and energy distribution of solar radiation.
3. U-value is the overall coefficient of heat transmittance or heat flow measured in BTU/hr. • ft² • °F. Lower U-values indicate better insulating performance.
4. European U-Value is the overall coefficient of heat transmittance or heat flow measured in Watts/m² • °C, and is calculated using WinDat WIS version 3.0.1 software.

5. Shading Coefficient is the ratio of the total amount of solar energy that passes through a glass relative to 1/8-inch (3.0mm) thick clear glass under the same design conditions. It includes both solar energy transmitted directly plus any absorbed solar energy re-radiated and convected. Lower shading coefficient values indicate better performance in reducing solar heat gain.
6. Solar Heat Gain Coefficient (SHGC) represents the solar heat gain through the glass relative to the incident solar radiation. It is equal to 86% of the shading coefficient.
7. Light to Solar Gain (LSG) ratio is the ratio of visible light transmittance to solar heat gain coefficient.

Important glass design considerations and comprehensive technical information, including performance, thermal stress and wind load tools for all PPG glasses are available at www.ppgideascape.com/glasstechnical. Monolithic Glass Data can also be found at www.ppgideascape.com/glasstechnical or by calling 1-888-PPG-IDEA (1-888-774-4332).

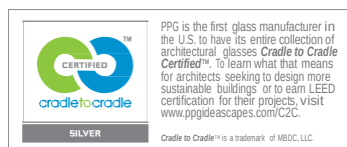


FIGURE 4-0

ALUMINUM WINDOWS UPPER FLOORS

Manufacturer: Kawneer FG 501T

Website: http://www.kawneer.com/kawneer/north_america/en/product.asp?prod_id-4495

Image:



FIGURE 4-E

ALUMINUM PANELS

Manufacturer: Kawneer to Match Window System

Website: http://www.kawneer.com/kawneer/north america/en/product.asp?prod_id=4495

Image:

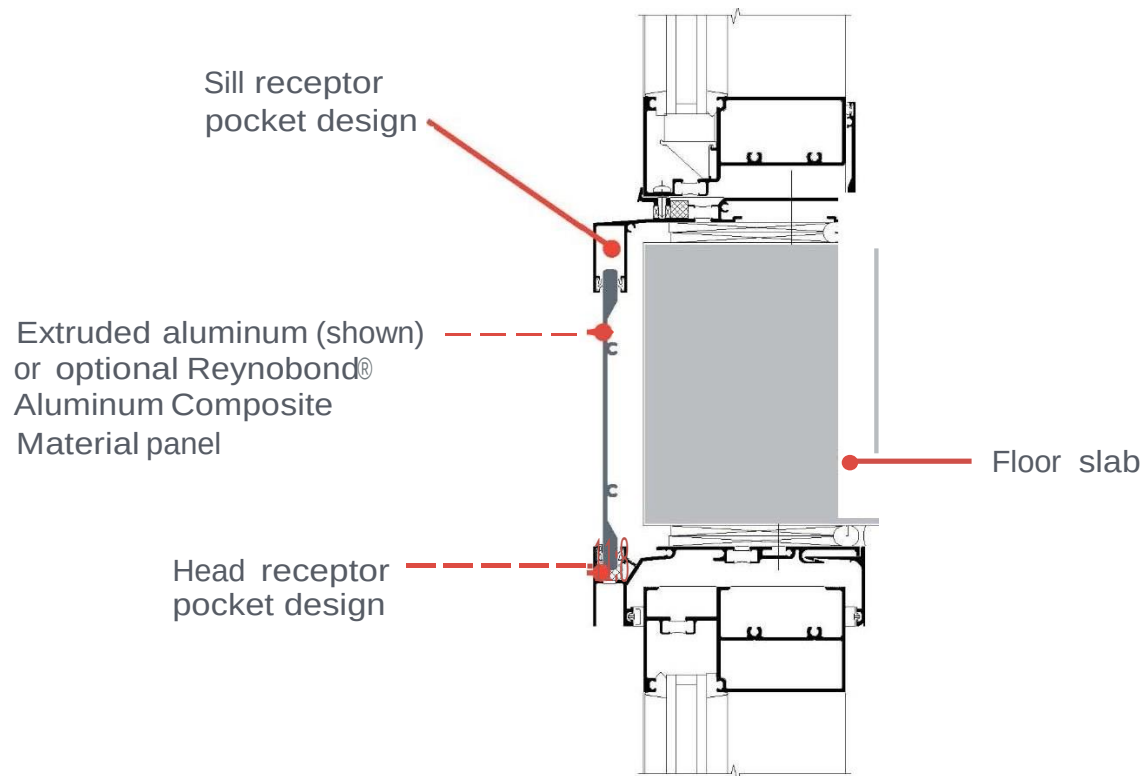


FIGURE 4-F

PAINTED METAL AND STAINLESS STEEL CABLE RAILING

Manufacturer: Wagner

Website: <http://www.wagnercompanies.com/products-services/railing-systems-and-components/cable-railing/>

Image:



FIGURE 4-G

GLASS AND STEEL CANOPY

Manufacturer: Custom

Image:



Glass and steel canopies and awnings are to be custom. Photo is for reference of similar canopy only. For canopy and awning details, see drawing sheets A-221, A-224, A-227, A-230, and A-233.

FIGURE 4-H

EXTERIOR WALL-MOUNTED LIGHT FIXTURE

Manufacturer: Bega 66 698

Website: <http://www.bega-us.com/productdetail.aspx?groupid=126655&itemid=6785&familyid=16>

Image:



© BEGA-US

FIGURE 4-H

Wall luminaires with single-sided light output

Housing: Extruded and die cast aluminum. Mounts directly to a BEGA 19537 box (provided). Die castings are marine grade, copper free ($\leq 0.3\%$ copper content) A360.0 aluminum alloy.

Enclosure: Tempered, clear glass, flush to the die casting to prevent water accumulation. Fully gasketed for weather tight operation using a 'U' channel molded silicone rubber gasket.

Electrical: 18W LED luminaire, 20.5 total system watts, -40°C start temperature. Integral 120V through 277V electronic LED driver, 0-10V dimming. LED module(s) are available from factory for easy replacement. Standard LED color temperature is 3000K with an 85 CRI. Available in 4000K (85 CRI); add suffix K4 to order.

Notes: LEDs supplied with luminaire. Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

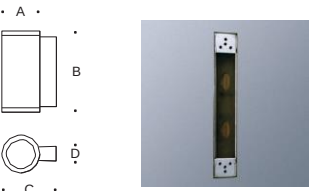
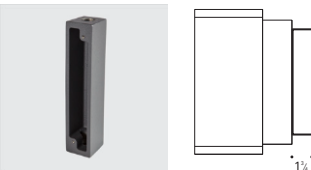
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

CSA certified to U.S. and Canadian standards for wet locations.
Protection class IP65

Weight: 7.3 lbs

Luminaire Lumens: 803
Tested in accordance with LM-79-08

Mounting options:
79 547 Surface-mount wiring box



These luminaires mount over a custom BEGA recessed box. This box can be shipped ahead of the luminaire.

Narrow beam upwards or downwards							
		Lamp	b	A	B	C	D
66 698*		18W LED	19.5°	5 7/8	11 3/4	7 7/8	1 5/8
							Wiring box* 19537

b = Beam angle *Small opening wiring box included.

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:



FIGURE 4-1

EXTERIOR CANOPY-MOUNTED LIGHT FIXTURE

Manufacturer: Bega 77 529

Website: <http://www.bega-us.com/productdetail.aspx?groupid=179a&itemid=5156&familyid=20>

Image:

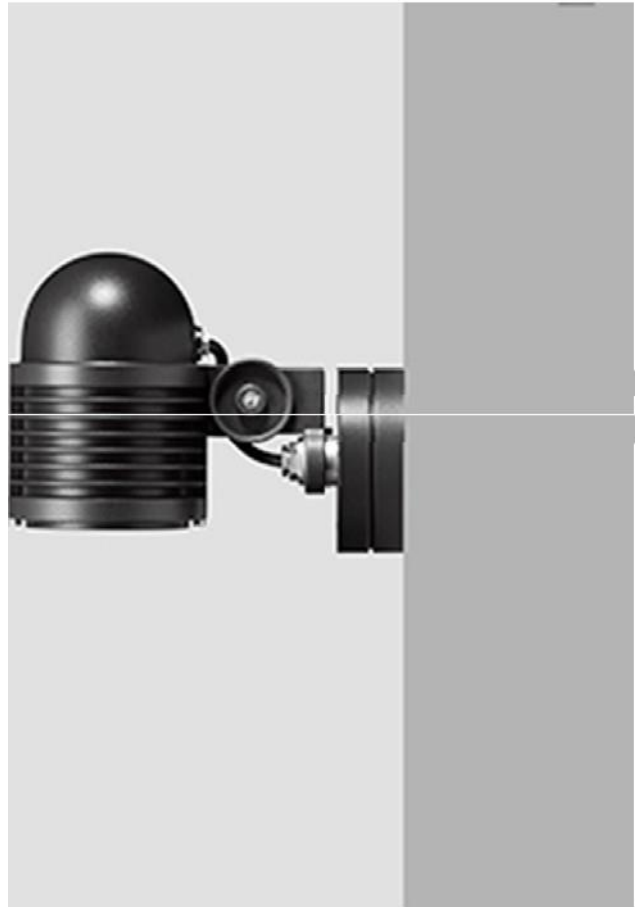


FIGURE 4-J

PRE-CAST CONCRETE ROOF PAVERS AND PEDESTAL SYSTEM

Manufacturer: Hanover

Website: <http://www.hanoverpavers.com/index.php/pedestal-pavers>

Image:



FIGURE 4-K

POROUS PAVEMENT

Manufacturer: Flexi-Pave

Website: <http://kbius.com/kbi-products/kbi-flexi-pave/>

Image:



FIGURE 4-L

FLUID-APPLIED MEMBRANE ROOFING

Manufacturer: Kemper 2K-PUR

Website: <http://www.kemper-system.com/CA/eng/products/kemperol-2k-pur/>

Image:

FIGURE 4-M

GREEN ROOFING SYSTEM

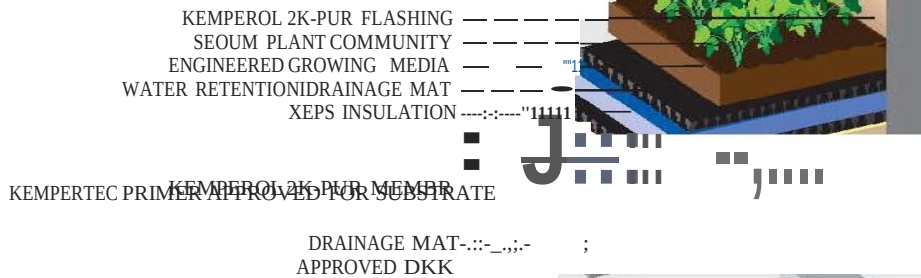
Manufacturer: Kemper 2K-PUR Green Roof

Website: <http://www.kemper-system.com/US/eng/applications/green-roofs/>

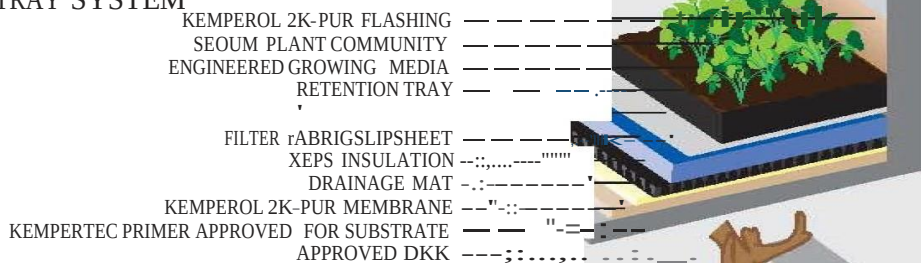
Image:

TYPICAL ASSEMBLIES

EXTENSIVE LANDSCAPED ASSEMBLY-BUILT UP SYSTEM



EXTENSIVE LANDSCAPED ASSEMBLY-TRAY SYSTEM



INTENSIVE LANDSCAPED ASSEMBLY

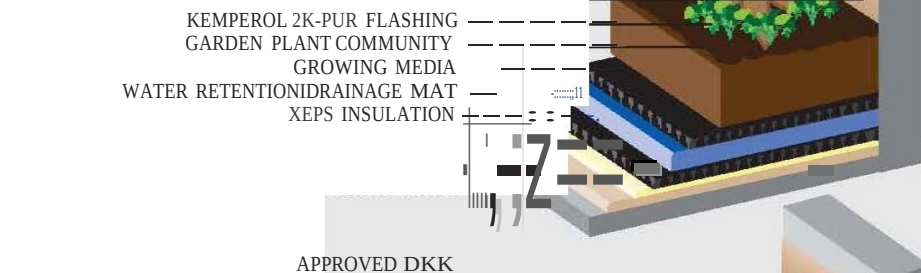


FIGURE 4-N

SOLAR PANELS

Manufacturer: Solar City

Website: <http://www.solarcity.com/>

Image:



FIGURE 4-O

EXTERIOR POLE-MOUNTED LIGHT FIXTURE A

Manufacturer: Lumec – Domus DMS50

Website: http://www.lumec.com/products/luminaires/serie_domus.html?A

Image:



FIGURE 4.0



Project: _____

Location: _____

Cat.No: _____

Type: _____

Lamps: _____ Qty: _____

Notes: _____

The Domus 50 is one of the most versatile luminaires offered by Philips Lumec. This classic shape was one of the first in a line of pioneering Philips Lumec designs. Domus offers a subtly refined design that balances shape, dimension and proportion.

Ordering guide: Luminaire

Example: DMS50-90W80LED4K-T-ACDR-LE3F-120-DMG-SMB-RCD-PH8-BKTX

Series	LED module		Lamp type	Globe material	Optical system	Voltage	Driver options
DMS50			T				
DMS50 Domus	4000K	3000K	T	ACDR Acrylic globe	Globe	120 120V 208 208V 240 240V 277 277V 347 347V 480 480V	AST ³ Pre-set, progressive start-up CLO ³ Pre-set, manage lumen depreciation DALI ³ Pre-set, compatible with the DALI control system OTL ³ Pre-set to signal end of life of the lamp DMG 0-10V CDMGP ³ Dimming level set by user CDMGE25 ³ 8 hrs. 25% reduction CDMGE50 ³ 8 hrs. 50% reduction CDMGE75 ³ 8 hrs. 75% reduction CDMGM25 ³ 6 hrs. 25% reduction CDMGM50 ³ 6 hrs. 50% reduction CDMGM75 ³ 6 hrs. 75% reduction CDMGS25 ³ 4 hrs. 25% reduction CDMGS50 ³ 4 hrs. 50% reduction CDMGS75 ³ 4 hrs. 75% reduction
	35W32LED4K	35W32LED3K			LE2A ⁶ Type II (ASYM) with globe		
	55W32LED4K	55W32LED3K			LE3A ⁶ Type III (ASYM) with globe		
	55W48LED4K	55W48LED3K			LE4A ⁶ Type IV (ASYM) with globe		
	70W64LED4K	70W64LED3K			Sag lens		
	72W32LED4K	72W32LED3K			LE2S Type II (ASYM) Sag glass lens		
	80W48LED4K	80W48LED3K			LE3S Type III (ASYM) Sag glass lens		
	90W80LED4K	90W80LED3K			LE4S Type IV (ASYM) Sag glass lens		
	108W48LED4K	108W48LED3K			LE5S ¹ Type V (SYMM) Sag glass lens		
	110W64LED4K	110W64LED3K			Flat lens		
	135W80LED4K	135W80LED3K			LE2F Type II (ASYM) Flat glass lens		
	145W64LED4K	145W64LED3K			LE3F Type III (ASYM) Flat glass lens		
	180W80LED4K	180W80LED3K			LE4F Type IV (ASYM) Flat glass lens		
					LE5F ¹ Type V (SYMM) Flat glass lens		

Ordering guide (continued)

Adaptors	Luminaire options		Poles & Brackets	Finish
MA1 1 1/4" NPT threaded hole adaptor	BO Bridge and Overpass		Consult Philips.com/ luminaires for details and the complete line of Philips poles and brackets.	BE2TX Textured midnight blue
MA2 1 1/2" NPT threaded hole adaptor	DE1 Decorative deflector			BE6TX Textured ocean blue
SMA ⁷ Decorative retro side-mounted cast-aluminum, accepts tubes from 1 5/8" to 2 3/8"	HS House side shield			BE8TX Textured royal blue
	PH7 Photoelectric cell, bottom type			BG2TX Textured Sandstone
	PH8 ^{2,4} Photoelectric cell			BKTX Textured black
	PH9 ^{2,4} Shorting cap			BRTX Textured bronze
	PHXL ^{2,4} Photoelectric cell, extended life			GN4TX Textured blue green
	RC ^{2,5} Receptacle 3 pins			GN6TX Textured forest green
	RCD ^{2,5} Receptacle 5 pins			GN8TX Textured Dk forest green
	RCD7 ^{2,5} Receptacle 7 pins			GNTX Textured green
SMB Decorative contemporary side-mounted cast-aluminum, accepts tubes from 1 5/8" to 2 3/8"	SP2 Surge protector			GR Gray sandtex
				GY3TX Textured medium grey
				NP Natural aluminum
				RD2TX Textured burgundy
				RD4TX Textured scarlet
				TG Hammertone gold
				WHTX Textured white

Footnotes

- Not available with **HS** option.
- SMA** or **SMB** adaptors is required for this option.
- Not available 347-480 volt.
- Luminaire option **RC**, **RCD** or **RCD7** is required with this options.
- Use of photoelectric cell or shorting cap is required to ensure proper illumination.
- Globe Material **ACDR** is required with this optical system.
- Only 3 pin receptacle **RC** is available with **SMA** adaptor.



FIGURE 4-O

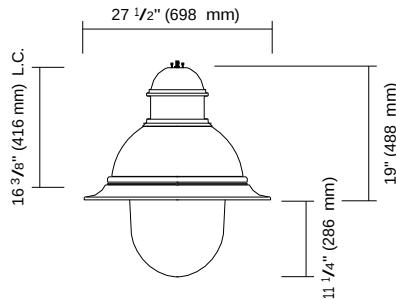
DMS50 Domus LED pendant

Urban luminaire

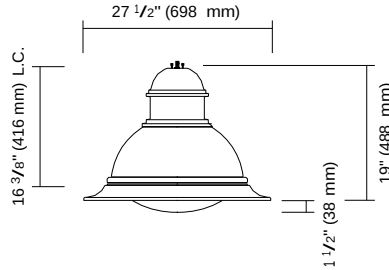
Dimensions

EPA: 1.35 ft² max.

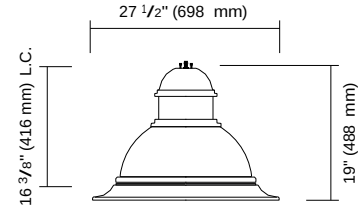
Weight: 42 lbs (19.1kg) max.



DMS50 - A optics
Long drop globe



DMS50 - S optics
Sag lens



DMS50 - F optics
Flat lens

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours.

Ambient Temperature °C	Driver mA	Calculated L ₇₀ Hours	L ₇₀ per TM-21	Lumen Maintenance % at 60,000 hrs
35°C	700 mA	>100,000 hours	>60,000 hours	>86%

LED Wattage and Lumen Values: 4000K Domus luminaire

Flat lens

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2F			Type LE3F			Type LE4F			Type LE5F		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED4K-T	32	350	37	4000K	4,039	109	B1-U0-G1	3,934	106	B1-U0-G1	3,895	105	B1-U0-G1	3,925	106	B3-U0-G1
DMS50-55W32LED4K-T	32	530	55	4000K	5,808	106	B1-U0-G1	5,657	103	B1-U0-G1	5,602	102	B1-U0-G2	5,644	103	B3-U0-G1
DMS50-72W32LED4K-T	32	700	73	4000K	7,312	101	B2-U0-G1	7,122	98	B1-U0-G2	7,052	97	B1-U0-G2	7,105	98	B3-U0-G2
DMS50-55W48LED4K-T	48	350	54	4000K	6,041	113	B1-U0-G1	5,883	110	B1-U0-G1	5,826	109	B1-U0-G2	5,870	110	B3-U0-G1
DMS50-80W48LED4K-T	48	530	80	4000K	8,641	108	B2-U0-G2	8,417	105	B2-U0-G2	8,335	104	B2-U0-G2	8,398	105	B3-U0-G2
DMS50-108W48LED4K-T	48	700	106	4000K	10,852	103	B2-U0-G2	10,570	100	B2-U0-G2	10,467	99	B2-U0-G2	10,546	100	B4-U0-G2
DMS50-70W64LED4K-T	64	350	69	4000K	7,856	113	B2-U0-G1	7,709	111	B1-U0-G2	7,697	111	B1-U0-G2	7,643	110	B3-U0-G2
DMS50-110W64LED4K-T	64	530	105	4000K	11,261	107	B2-U0-G2	11,050	105	B2-U0-G2	11,034	105	B2-U0-G2	10,955	104	B4-U0-G2
DMS50-145W64LED4K-T	64	700	141	4000K	14,148	101	B3-U0-G2	13,883	99	B2-U0-G2	13,862	99	B2-U0-G2	13,763	98	B4-U0-G2
DMS50-90W80LED4K-T	80	350	86	4000K	9,806	114	B2-U0-G2	9,623	112	B2-U0-G2	9,608	112	B2-U0-G2	9,540	111	B4-U0-G2
DMS50-135W80LED4K-T	80	530	131	4000K	14,008	107	B3-U0-G2	13,745	105	B2-U0-G2	13,724	105	B2-U0-G2	13,626	104	B4-U0-G2
DMS50-180W80LED4K-T	80	700	174	4000K	17,483	100	B3-U0-G2	17,144	98	B3-U0-G2	17,269	99	B3-U0-G3	17,115	98	B4-U0-G2

1. System input wattage may vary based on input voltage, by up to +/- 10%, and based on manufacturer forward voltage, by up to +/- 8%.

2. Lumen values based on photometric tests performed in compliance with IESNA LM-79.

Note: Some data may be scaled based on tests of similar, but not identical, luminaires.

FIGURE 4-O

DMS50 Domus LED pendant

Urban luminaire

LED Wattage and Lumen Values: 4000K Domus luminaire (continued)

Sag lens

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2S			Type LE3S			Type LE4S			Type LE5S		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED4K-T	32	350	37	4000K	4,064	110	B1-U0-G1	4,005	108	B1-U0-G1	4,005	107	B1-U0-G1	4,005	110	B1-U0-G1
DMS50-55W32LED4K-T	32	530	55	4000K	5,846	106	B1-U0-G1	5,759	105	B1-U0-G1	5,759	104	B1-U0-G1	5,759	106	B1-U0-G1
DMS50-72W32LED4K-T	32	700	73	4000K	7,359	101	B2-U0-G1	7,250	100	B2-U0-G1	7,250	99	B2-U0-G1	7,250	101	B2-U0-G1
DMS50-55W48LED4K-T	48	350	54	4000K	6,079	113	B1-U0-G1	5,990	112	B1-U0-G1	5,990	111	B1-U0-G1	5,990	114	B1-U0-G1
DMS50-80W48LED4K-T	48	530	80	4000K	8,697	109	B2-U0-G2	8,569	107	B2-U0-G2	8,569	106	B2-U0-G2	8,569	109	B2-U0-G2
DMS50-108W48LED4K-T	48	700	106	4000K	10,922	103	B2-U0-G2	10,761	102	B2-U0-G2	10,761	101	B2-U0-G2	10,761	103	B2-U0-G2
DMS50-70W64LED4K-T	64	350	69	4000K	7,910	114	B2-U0-G2	7,849	113	B2-U0-G2	7,849	113	B2-U0-G2	7,849	114	B2-U0-G2
DMS50-110W64LED4K-T	64	530	105	4000K	11,338	108	B2-U0-G2	11,250	107	B2-U0-G2	11,250	107	B2-U0-G2	11,250	108	B2-U0-G2
DMS50-145W64LED4K-T	64	700	141	4000K	14,244	101	B3-U0-G2	14,134	101	B3-U0-G2	14,134	100	B3-U0-G2	14,134	102	B3-U0-G2
DMS50-90W80LED4K-T	80	350	86	4000K	9,873	115	B2-U0-G2	9,797	114	B2-U0-G2	9,797	114	B2-U0-G2	9,797	115	B2-U0-G2
DMS50-135W80LED4K-T	80	530	131	4000K	14,102	108	B3-U0-G2	13,993	107	B3-U0-G2	13,993	107	B3-U0-G2	13,993	108	B3-U0-G2
DMS50-180W80LED4K-T	80	700	174	4000K	17,668	101	B3-U0-G2	17,526	101	B3-U0-G2	17,526	100	B3-U0-G2	17,526	102	B3-U0-G2

Globe (ACDR)

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2A			Type LE3A			Type LE4A		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED4K-T	32	350	37	4000K	4,138	112	B1-U3-G1	4,138	110	B1-U2-G1	4,063	110	B1-U2-G2
DMS50-55W32LED4K-T	32	530	55	4000K	5,952	108	B1-U3-G1	5,952	107	B1-U3-G2	5,844	106	B1-U3-G2
DMS50-72W32LED4K-T	32	700	73	4000K	7,493	103	B2-U3-G2	7,493	102	B1-U3-G2	7,357	101	B1-U3-G2
DMS50-55W48LED4K-T	48	350	54	4000K	6,190	115	B1-U3-G1	6,190	114	B1-U3-G2	6,078	113	B1-U3-G2
DMS50-80W48LED4K-T	48	530	80	4000K	8,855	111	B2-U3-G2	8,855	109	B2-U3-G2	8,695	109	B1-U3-G3
DMS50-108W48LED4K-T	48	700	106	4000K	11,120	105	B2-U3-G2	11,120	104	B2-U3-G2	10,919	103	B2-U3-G3
DMS50-70W64LED4K-T	64	350	69	4000K	7,933	114	B2-U3-G2	7,933	112	B2-U3-G2	7,844	113	B2-U3-G2
DMS50-110W64LED4K-T	64	530	105	4000K	11,371	108	B2-U3-G2	11,371	106	B2-U3-G2	11,243	107	B2-U3-G3
DMS50-145W64LED4K-T	64	700	141	4000K	14,286	102	B3-U3-G3	14,286	100	B3-U3-G3	14,125	101	B2-U3-G3
DMS50-90W80LED4K-T	80	350	86	4000K	9,902	115	B2-U3-G2	9,902	113	B2-U3-G2	9,791	114	B2-U3-G3
DMS50-135W80LED4K-T	80	530	131	4000K	14,144	108	B3-U3-G3	14,144	106	B3-U3-G3	13,985	107	B2-U3-G3
DMS50-180W80LED4K-T	80	700	174	4000K	17,715	102	B3-U3-G3	17,715	100	B3-U3-G3	17,515	101	B3-U3-G3

1. System input wattage may vary based on input voltage, by up to +/- 10%, and based on manufacturer forward voltage, by up to +/- 8%.

2. Lumen values based on photometric tests performed in compliance with IESNA LM-79.

Note: Some data may be scaled based on tests of similar, but not identical, luminaires.

FIGURE 4-O

DMS50 Domus LED pendant

Urban luminaire

LED Wattage and Lumen Values: 3000K Domus luminaire

Flat lens

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2F			Type LE3F			Type LE4F			Type LE5F		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED3K-T	32	350	37	3000K	3,641	98	B1-U0-G1	3,547	96	B1-U0-G1	3,512	95	B1-U0-G1	3,538	95	B2-U0-G1
DMS50-55W32LED3K-T	32	530	55	3000K	5,237	95	B1-U0-G1	5,101	93	B1-U0-G1	5,051	92	B1-U0-G1	5,089	93	B3-U0-G1
DMS50-72W32LED3K-T	32	700	73	3000K	6,592	91	B2-U0-G1	6,421	88	B1-U0-G1	6,358	87	B1-U0-G2	6,406	88	B3-U0-G1
DMS50-55W48LED3K-T	48	350	54	3000K	5,446	102	B1-U0-G1	5,305	99	B1-U0-G1	5,253	98	B1-U0-G2	5,292	99	B3-U0-G1
DMS50-80W48LED3K-T	48	530	80	3000K	7,791	97	B2-U0-G1	7,589	95	B1-U0-G2	7,515	94	B1-U0-G2	7,571	95	B3-U0-G2
DMS50-108W48LED3K-T	48	700	106	3000K	9,784	93	B2-U0-G2	9,530	90	B2-U0-G2	9,437	89	B2-U0-G2	9,508	90	B4-U0-G2
DMS50-70W64LED3K-T	64	350	69	3000K	7,083	102	B2-U0-G1	6,951	100	B1-U0-G2	6,940	100	B1-U0-G2	6,891	99	B3-U0-G2
DMS50-110W64LED3K-T	64	530	105	3000K	10,153	96	B2-U0-G2	9,963	95	B2-U0-G2	9,948	94	B2-U0-G2	9,877	94	B4-U0-G2
DMS50-145W64LED3K-T	64	700	141	3000K	12,756	91	B3-U0-G2	12,517	89	B2-U0-G2	12,498	89	B2-U0-G2	12,409	88	B4-U0-G2
DMS50-90W80LED3K-T	80	350	86	3000K	8,842	103	B2-U0-G2	8,676	101	B2-U0-G2	8,663	101	B2-U0-G2	8,601	100	B3-U0-G2
DMS50-135W80LED3K-T	80	530	131	3000K	12,629	97	B3-U0-G2	12,392	95	B2-U0-G2	12,374	95	B2-U0-G2	12,286	94	B4-U0-G2
DMS50-180W80LED3K-T	80	700	174	3000K	15,817	91	B3-U0-G2	15,521	89	B2-U0-G2	15,497	89	B2-U0-G3	15,387	88	B4-U0-G2

Sag lens

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2S			Type LE3S			Type LE4S			Type LE5S		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED3K-T	32	350	37	3000K	3,665	99	B1-U0-G1	3,611	97	B1-U0-G1	3,576	96	B1-U0-G1	3,668	99	B3-U0-G1
DMS50-55W32LED3K-T	32	530	55	3000K	5,270	96	B1-U0-G1	5,193	94	B1-U0-G1	5,144	94	B1-U0-G2	5,276	96	B3-U0-G1
DMS50-72W32LED3K-T	32	700	73	3000K	6,635	91	B2-U0-G1	6,537	90	B1-U0-G2	6,475	89	B1-U0-G2	6,641	91	B3-U0-G2
DMS50-55W48LED3K-T	48	350	54	3000K	5,481	102	B1-U0-G1	5,401	101	B1-U0-G1	5,349	100	B1-U0-G2	5,487	102	B3-U0-G1
DMS50-80W48LED3K-T	48	530	80	3000K	7,842	98	B2-U0-G2	7,726	97	B1-U0-G2	7,653	96	B1-U0-G2	7,849	98	B3-U0-G2
DMS50-108W48LED3K-T	48	700	106	3000K	9,847	93	B2-U0-G2	9,702	92	B2-U0-G2	9,610	91	B2-U0-G2	9,857	93	B4-U0-G2
DMS50-70W64LED3K-T	64	350	69	3000K	7,131	103	B2-U0-G1	7,076	102	B1-U0-G2	7,067	102	B1-U0-G2	7,144	103	B3-U0-G2
DMS50-110W64LED3K-T	64	530	105	3000K	10,222	97	B2-U0-G2	10,143	96	B2-U0-G2	10,130	96	B2-U0-G2	10,239	97	B4-U0-G2
DMS50-145W64LED3K-T	64	700	141	3000K	12,842	91	B2-U0-G2	12,743	91	B2-U0-G2	12,727	91	B2-U0-G2	12,864	92	B4-U0-G2
DMS50-90W80LED3K-T	80	350	86	3000K	8,901	104	B2-U0-G2	8,833	103	B2-U0-G2	8,822	103	B2-U0-G2	8,917	104	B4-U0-G2
DMS50-135W80LED3K-T	80	530	131	3000K	12,715	97	B2-U0-G2	12,616	97	B2-U0-G2	12,601	96	B2-U0-G2	12,736	98	B4-U0-G2
DMS50-180W80LED3K-T	80	700	174	3000K	15,924	91	B3-U0-G2	15,801	91	B2-U0-G2	15,782	91	B2-U0-G3	15,951	92	B4-U0-G2

1. System input wattage may vary based on input voltage, by up to +/- 10%, and based on manufacturer forward voltage, by up to +/- 8%.

2. Lumen values based on photometric tests performed in compliance with IESNA LM-79.

Note: Some data may be scaled based on tests of similar, but not identical, luminaires.

DMS50 Domus LED pendant

Urban luminaire

LED Wattage and Lumen Values: 3000K Domus luminaire (continued)

Globe (ACDR)

Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	Type LE2A			Type LE3A			Type LE4A		
					Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating	Delivered Lumens ²	Efficacy (LPW)	BUG Rating
DMS50-35W32LED3K-T	32	350	37	3000K	3,731	101	B1-U2-G1	3,686	99	B1-U2-G1	3,664	99	B1-U2-G2
DMS50-55W32LED3K-T	32	530	55	3000K	5,366	98	B1-U3-G1	5,302	96	B1-U3-G2	5,269	96	B1-U3-G2
DMS50-72W32LED3K-T	32	700	73	3000K	6,755	93	B1-U3-G2	6,674	92	B1-U3-G2	6,633	91	B1-U3-G2
DMS50-55W48LED3K-T	48	350	54	3000K	5,581	104	B1-U3-G1	5,514	103	B1-U3-G2	5,480	102	B1-U3-G2
DMS50-80W48LED3K-T	48	530	80	3000K	7,984	100	B2-U3-G2	7,888	99	B1-U3-G2	7,839	98	B1-U3-G2
DMS50-108W48LED3K-T	48	700	106	3000K	10,026	95	B2-U3-G2	9,906	94	B2-U3-G2	9,845	93	B2-U3-G3
DMS50-70W64LED3K-T	64	350	69	3000K	7,153	103	B2-U3-G2	7,025	101	B2-U3-G2	7,072	102	B1-U3-G2
DMS50-110W64LED3K-T	64	530	105	3000K	10,253	97	B2-U3-G2	10,069	96	B2-U3-G2	10,137	96	B2-U3-G3
DMS50-145W64LED3K-T	64	700	141	3000K	12,881	92	B3-U3-G3	12,651	90	B2-U3-G2	12,736	91	B2-U3-G3
DMS50-90W80LED3K-T	80	350	86	3000K	8,928	104	B2-U3-G2	8,768	102	B2-U3-G2	8,827	103	B2-U3-G2
DMS50-135W80LED3K-T	80	530	131	3000K	12,753	98	B3-U3-G3	12,525	96	B2-U3-G2	12,609	97	B2-U3-G3
DMS50-180W80LED3K-T	80	700	174	3000K	15,972	92	B3-U3-G3	15,687	90	B3-U3-G3	15,792	91	B3-U3-G3

1. System input wattage may vary based on input voltage, by up to +/- 10% , and based on manufacturer forward voltage, by up to +/- 8%.

2. Lumen values based on photometric tests performed in compliance with IESNA LM-79.

Note: Some data may be scaled based on tests of similar, but not identical, luminaires.

Specifications:

Housing

In a round shape, this housing is made of die cast A380 aluminum, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 5/16 18 UNC. This suspension system permits for a full rotation of the luminaire in 90° increments.

Access-mechanism

A die cast A360 aluminum technical ring with latch, hinge and a cast in decorative skirt. The mechanism shall offer tool free access to the inside of the luminaire. An embedded memory retentive gasket shall ensure weatherproofing.

Light engine

LEDgine composed of 5 main components:

Heat Sink / Lens / LED lamp / Driver / Optical System

Electrical components are RoHS compliant.

LED engine

LED type: Philips Lumileds LUXEON T.
Composed of high-performance white LEDs.
Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K) or Warm white, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), CRI 70 Min. 75 Typical.

Lens

LExF / LexS: Made of soda lime tempered glass lens, mechanically assembled and sealed onto the lower part of the heat sink.

LExA (Globe): Made of one-piece seamless injection-molded impact-resistant (DR) acrylic having an inner prismatic surface. The globe is mechanically assembled and sealed onto the lower part of the heat sink.

Heat sink

Made of cast aluminum optimizing the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Driver

Driver comes standard with dimming compatible 0-10V. High power factor of 95%.
Electronic driver, operating range 50/60 Hz.
Auto adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max.
Maximum ambient operating temperature from 40F(40C) to 130F(55C) degrees. Certified in compliance to UL1310 cULus requirement. Dry and damp location. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221F(105C) degrees. The current supplying the LEDs will be reduced

by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

Optical system

Composed of high performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM 63, LM 79 and TM 15 (IESNA) certifying its photometric performance. Street side indicated. Flat lens (F optics) is Dark Sky compliant with 0% upright and U0 per IESNA TM 15.

FIGURE 4-O

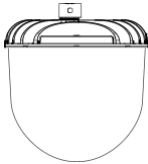
DMS50 Domus LED pendant

Urban luminaire

Specifications (continued):

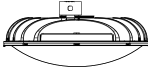
Optical system (continued):

Prismatic globe: IP66 rated optical system, composed of individual pre-oriented lens to achieve desired distribution, assembled with globe having an inner prismatic surface permanently sealed onto the lower part of the heat sink.



LE2A - Type II (ASYM) with globe (ACDR)
LE3A - Type III (ASYM) with globe (ACDR)
LE4A - Type IV (ASYM) with globe (ACDR)

Sag lens: IP66 rated optical system, composed of individual pre-oriented lens to achieve desired distribution, assembled with a tempered-glass sag lens permanently sealed onto the lower part of the heat sink.



LE2S - Type II (ASYM) Sag glass lens
LE3S - Type III (ASYM) Sag glass lens
LE4S - Type IV (ASYM) Sag glass lens
LE5S - Type V (SYMM) Sag glass lens

Flat lens: IP66 rated optical system, composed of individual pre-oriented lens to achieve desired distribution, assembled with a tempered-glass flat lens permanently sealed onto the lower part of the heat sink.



LE2F - Type II (ASYM) Flat glass lens
LE3F - Type III (ASYM) Flat glass lens
LE4F - Type IV (ASYM) Flat glass lens
LE5F - Type V (SYMM) Flat glass lens

Driver options

AST: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

DALI: Pre-set driver compatible with the DALI control system.

OTL: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

DMG: Dimmable driver 0-10V.

CDMG: Dynadimmer standard dimming functionalities including pre-programmed scenarios to suit many applications and needs from safety to maximum energy savings.

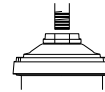
Ordering Code	Scenario	Dimming Time	Dimming Level
CDMGS25	Safety	4 hours	25% power dimming
CDMGS50	Safety	4 hours	50% power dimming
CDMGS75	Safety	4 hours	75% power dimming
CDMG25	Median	6 hours	25% power dimming
CDMG50	Median	6 hours	50% power dimming
CDMG75	Median	6 hours	75% power dimming
CDMGE25	Economy	8 hours	25% power dimming
CDMGE50	Economy	8 hours	50% power dimming
CDMGE75	Economy	8 hours	75% power dimming

Surge protector

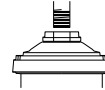
Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA. **SP2** 20kV/20kA optional.

Luminaire adaptor

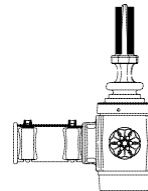
MA1: The luminaire is suspended by means of a mounting adaptor with a 1½" (32mm) NPT threaded hole accepting a threaded tube from the mounting. Retrofit adaptor for existing mounting.



MA2: 1½" (38mm) NPT threaded hole accepting threaded tube from the mounting. Retrofit adaptor for existing mounting.



SMA: The luminaire is suspended by means of a decorative side-mounted cast aluminum adaptor. This adaptor accepts tubes from 1½" to 2½" (41 to 60 mm) and is adjustable to more or less 5°. The adaptor features a cast



SMB: The luminaire is suspended by means of a decorative side-mounted cast aluminum adaptor. This adaptor accepts tubes from 1½" to 2½" (41 to 60 mm) and is adjustable to more or less 5°.

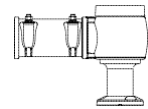


FIGURE 4-O

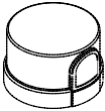
DMS50 Domus LED pendant

Urban luminaire

Specifications (continued):

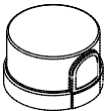
Luminaire options

BO:	Bridge and Overpass
HS:	House side shield
PH7:	Photoelectric cell, bottom type
PH8:	Photoelectric Cell, Twist-lock Type. Allows a 90 degree rotation.



PH8 ————— **HS**

PHXL: Extended life photoelectric cell, twist-lock type. Allows a 90 degree rotation.



PH8 ————— **HS**

PH9: Shorting cap, Twist-lock Type



RC: Receptacle 3 pins



RCD: Receptacle 5 pins



RCD7: Receptacle 7 pins



SP2: Integral surge protector

Finish

In accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with +/- 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard. The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed per ASTM B117 standard.

Finish Options Include:

BE2TX: Textured Midnight Blue
BE6TX: Textured Ocean Blue
BE8TX: Textured Royal Blue
BG2TX: Textured Sandstone
BKTX: Textured Black
BRTX: Textured Bronze
GN4TX: Textured Blue Green
GN6TX: Textured Forest Green
GN8TX: Textured Dark Forest Green
GNTX: Textured Green
GR: Gray Sandtex
GY3TX: Textured Medium Grey
NP: Natural Aluminum
RD2TX: Textured Burgundy
RD4TX: Textured Scarlet
TG: Hammer-tone Gold
WHTX: Textured White

Wiring

Gauge (#14) TEW/AWM 1015 or 1230 wires, 6" (152mm) minimum exceeding from luminaire.

Hardware

All exposed screws shall be complete with Ceramic primer-seal base coat to reduce seizing of the parts and offers a high resistance to corrosion. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

Luminaire useful life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, Philips System Reliability Tool, Philips Advance data and Philips Lumileds LM-80/TM-21 data, expected to reach 100,000+ hours with >L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion. Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +35°C / +95°F.

DC1 LED products **DE1** **GRD**
(manufacturing standard)

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340 5 1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

DC1 Quality control **DE1** **GRD**

Manufactured to ISO 9001 2008 standards and ISO 14001-2004 International Quality Standards Certification.

Vibration resistance

Meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100 000 cycles)

Certifications and Compliance

CSA, cULus Listed for Canada and USA. Domus LED luminaires are DesignLights Consortium qualified.

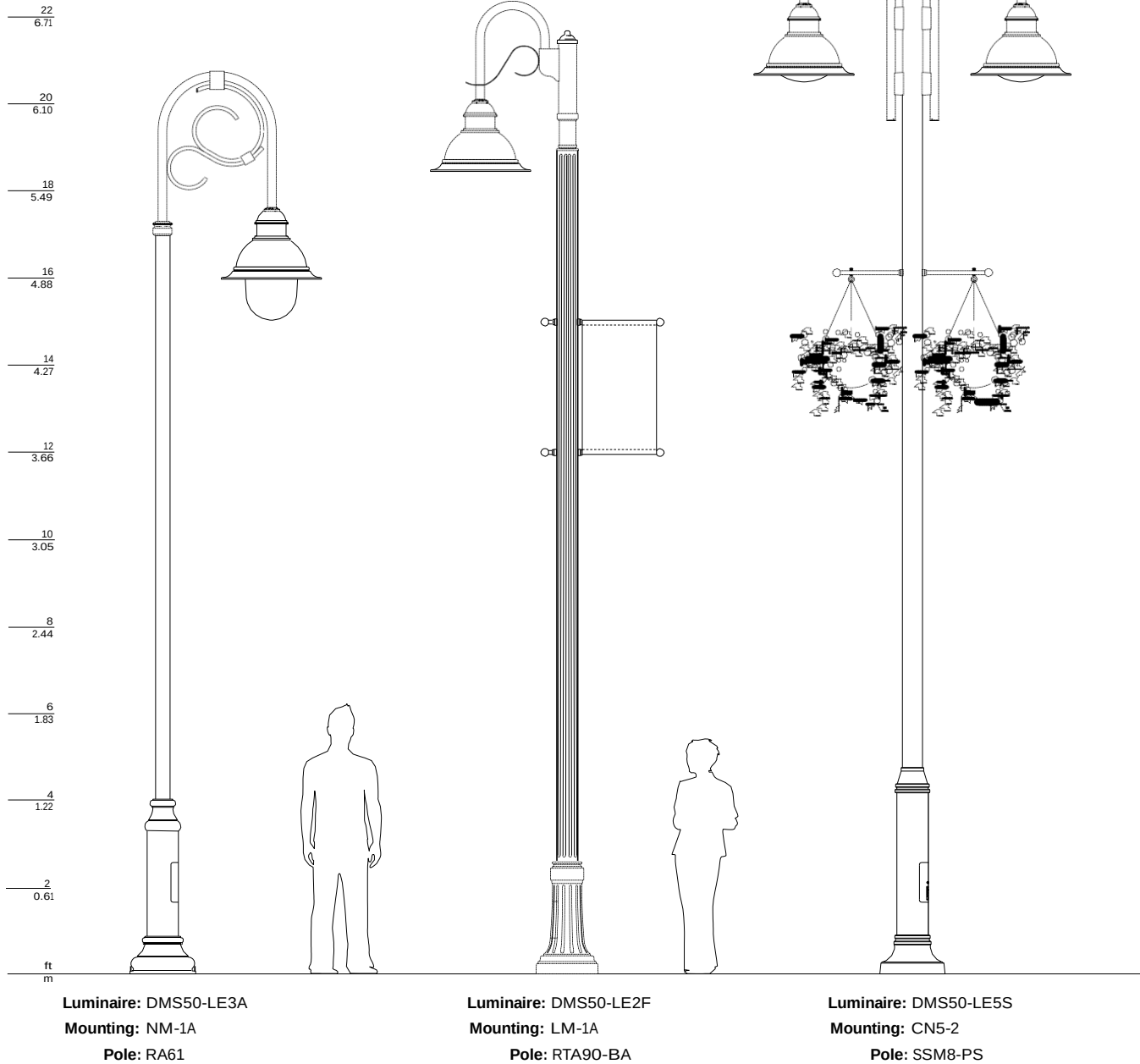
FIGURE 4-O

DMS50 Domus LED pendant

Urban luminaire

Specifications (continued):

Poles & Brackets Sample configurations.



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For FIGURE 5-A See Supplement

FIGURE 5-B

BURLINGTON CITY CENTER PHASE I OCCUPANCY SCHEDULE

The occupancy of Burlington City Center will occur in a logical manner based on current and future anticipated market conditions and the extension of infrastructure. This occupancy is anticipated to occur in multiple phases between March 2019 through June 2020.

The project is organized into three main parts – 1) a five-story mixed-use podium, 2) a six-story office tower and 3) an eight-story residential tower with the lower two floors containing office occupancy. Occupancy will follow the general construction sequence for the project.

The first phase of occupancy will include the retail space along Cherry and Bank streets, two levels of office space (UVMCC) in the residential tower, and the lower two levels of the parking garage. To support this phase of occupancy, the Cherry St. and Bank St. public improvements will be completed including the access to the parking garage and loading dock. It is anticipated that occupancy will occur on March 1, 2019.

The second phase of occupancy will include the collegiate housing located in the east wing of the residential tower, 103 units, the “wrap” housing that encloses the parking garage on two sides, 61 units, the office tower and the remaining two levels of the parking garage. It is anticipated that occupancy will occur on December 31, 2019.

The final phase of occupancy will include the retail space along St. Paul and Pine streets and the remaining residential tower units, 109 units. This will be supported by the opening of the new St. Paul St. and Pine St. It is anticipated that occupancy will occur on May 1, 2020.

A summary of the anticipated occupancy schedule is below:

1st Phase of Occupancy

UVMCC Office Space	3/1/2019
Parking Garage Levels P + L2	3/1/2019
Cherry St. + Bank St. Improvements	3/1/2019
Retail Space Bank + Cherry Facades	3/1/2019

2nd Phase of Occupancy

Residential Tower – East Wing (Collegiate)	12/31/2019	103 Units
Residential Housing (Parking Garage Wrap)	12/31/2019	61 Units
Office Tower	12/31/2019	
Parking Garage Levels L3 + L4	12/31/2019	

3rd Phase of Occupancy

Residential Tower – Center + West Wings	5/1/2020	109 Units
Retail Space St. Paul + Pine St. Facades	5/1/2020	
St. Paul St. + Pine St. Improvements	5/1/2020	



Memorandum

To: Devonwood Investors, LLC

Date: December 13, 2016

Project #: 57881.00

From: Jason Ross, Director of Noise and
Vibration

Re: Noise Impact Assessment for Burlington Town Center

Introduction

VHB has conducted a noise assessment of the proposed Burlington Town Center multi-use development project in Burlington, VT. The development has the potential to introduce new stationary and mobile sources of noise that could potentially affect the existing community. The development would introduce new stationary sources including rooftop mechanical equipment and outdoor use of a rooftop park. Increased retail, office, residential and preschool space would generate vehicle trips that have the potential to increase traffic noise. This noise impact memo provides background on the proposed development, describes applicable noise impact criteria and qualitatively assesses the potential for impact.

Background

The proposed project would include demolishing the existing Town Center Mall and construction of a mixed-use development including office, residential, preschool, retail and parking. The building would be fourteen stories tall (approximately 158 feet) with mechanical equipment enclosed on the rooftop level. The development will include uses similar to the existing uses on site. Retail spaces would generally be on the concourse, first and second floors, parking would be on the third, fourth and fifth floors, an outdoor tenant park would be on the fifth floor (fourth floor roof), office space would be on the third to tenth floors and residential space would be on the seventh to 14th floors.

Noise Ordinance

There are no federal or state-level noise regulations in Vermont that apply to evaluate potential noise effects due to the proposed development. Additionally, the project is not subject to environmental review pursuant to the Act 250 program administered by the Natural Resources Board.

The Burlington Noise Code (Section 21-13) "Noise Ordinance" is intended to preserve the public health, safety and welfare by prohibiting excessive and disturbing noise. Specific noise-generating activities are prohibited including the following that may be applicable to the proposed development:

- making "loud or unreasonable" noise which disturbs, injures or endangers the peace or health of another;
- operating radios, television, musical instruments or similar devices that is plainly audible from another property or from the street between the hours of 10:00 PM and 7:00 AM;
- parties and social events that generate unreasonably loud noise or is plainly audible between the hours of 10:00 PM and 7:00 AM at another property or at the street;
- construction activities between 9:00 PM and 7:00 AM; and
- use of loudspeakers for the purpose of attracting the attention of the public to a building.

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Building 100, Suite 200
South Burlington, VT 05403-7771
P 802.497.6100

Ref: 57881.00
December 13, 2016
Page 2

Noise Impact Assessment

The development will include retail and office uses similar in nature and character to existing uses on the site and on abutting parcels typical of the downtown. Noise-sensitive receptors near the proposed development include retail and residential buildings on Bank Street to the south, retail properties to the east and west and residences and the Cathedral of the Immaculate Conception to the north.

The project would not be expected to include specific noise-generating activities which are prohibited according to the Noise Code such as making loud or unreasonable noise, operating radios, televisions, musical instruments or similar devices that could be audible from other properties or the street, and parties or social events that generate plainly audible noise between 10:00 PM and 7:00 AM.

Parking, loading docks and trash and recycling facilities will be located within the building which would improve current conditions. The outdoor fifth floor tenant park will only be accessible to office tenants and the pre-kindergarten program during normal business hours which would be outside the hours of 10:00PM and 7:00 AM when loud and unreasonable events are prohibited.

Specific details including location, types and sizes of stationary mechanical equipment such as condenser units and generators are not known at this time. Standard mechanical equipment will be located on the building roofs and would likely be enclosed which would substantially reduce noise to the community.

As described in the Traffic Impact Study, the proposed development would increase traffic volumes in the area up to 4% on major gateways such as North Avenue, Route 127, Colchester Avenue, Pine Street, Shelburne Road (US 7) and Main Street (US 2) during the peak afternoon hour. Vehicle trips generated by the development would be primarily automobiles based on the retail, office and residential uses of the property. This increase in traffic volumes would result in a negligible (less than 0.2 dB) increase in noise due to additional mobile sources.

Construction of the proposed development would involve equipment and methods typical of mixed-use development projects in the region. As feasible, construction of the proposed facility would not occur during the hours of 9:00 PM and 7:00 AM which is prohibited according to the town ordinance.

Conclusions

The proposed development would not result in adverse noise impact according to the Burlington Noise Ordinance as it relates to the introduction of new stationary sources including rooftop mechanical equipment, increases in traffic volumes due to the additional retail, office and residential uses or construction-period activities.

DUST MITIGATION & CONTROL MEASURES

PC Construction takes dust control seriously on all its project sites and recognizes the City of Burlington's concern about controlling dust during the entirety of the project. As such, the following dust control measures are proposed:

- During dry conditions, soil disturbance areas will be visually monitored by onsite PC Construction supervision / personnel that are experienced in proactively identifying areas needing dust control before visible dust is generated. When such areas are identified, the contractor will preemptively employ appropriate dust mitigation measures/practices. It will be the responsibility of the contractor and applicable subcontractors to perform the dust mitigation measures.
- Dust mitigation will be addressed via the use of calcium chloride amended water that will be applied to roadways, access corridors, soil excavation areas, demolition areas, soil stockpiles, and/or other areas where dust may be generated; however, care will be taken not to produce a condition where runoff results. Water will be applied to potential areas of concern via industrial fan misters, sprinklers, water trucks, and/or other similar methods.
- Should visible dust be observed, work will temporarily cease until adequate water application is achieved and no visible dust is being generated. In addition to water application, other dust mitigation practices may be employed during windy, dry conditions when dust is most likely to be generated. These additional practices will include reduction of truck traffic speeds and a general increased level of care during excavation and soil loading activities (e.g. place bucket of soil as opposed to dumping it from some height). As part of the design plan, an Erosion Prevention and Sediment Control Plan will be prepared which will further address dust mitigation measures.

Heavy equipment will be utilized for demolition of structures, processing of debris and haulage of said material, as well as movement of vehicles at the work site, and movement of demolition materials.

- Dust control will be provided by routine spraying and dependent upon weather conditions at the time, i.e., wind, temperature, use of haul roads, type of debris being processed) with water trucks or fire hoses.

The following locations are the main areas of work for the project and may or may not generate dust:

- Lay-down area
- Foot print of the work area
- Processing of debris
- Equipment travel path
- Mobilization and De-mobilization of equipment
- Demolition of structures and foundations

10.0 APPENDIX – DOWNTOWN MIXED USE CORE OVERLAY COMPLIANCE CHECKLIST

Instructions:
The Downtown Mixed Use Core Overlay Compliance Checklist is a tool to be use for documentation and confirmation of compliance with the requirements of Sec. 4.5.8 Downtown Mixed Use Core Overlay (DMUC) District. This checklist documents compliance only with the requirements of Sec. 4.5.8. Other sections of the CDO as applicable (e.g. Art 8 Parking, Art 9 Inclusionary and Replacement Housing) also require documentation of compliance.

The ordinance requirements listed in the first column are in some cases onlyasummary of the requirements found in the CDO. Any questions or conflicts should refer back to the CDO itself for clarification. The Applicant Compliance Documentation should be as brief as necessary to convey how compliance with the requirements have been achieved, and should reference related plans and illustrations as appropriate.

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
<u>Sec. 4.5.8 Downtown Mixed Use Core Overlay (DMUC) District</u>		
(a) Purpose:		
The Downtown Mixed Use Core Overlay (DMUC) district is intended to facilitate the redevelopment of a portion of the former Urban Renewal Area in order to provide for a more walkable, connected, dense, compact, mixed use and diverse urban center. The area should support a diversity of residential, commercial, recreational, educational, civic, hospitality, and entertainment activities, and create opportunities to better connect the street grid for enhanced mobility for automobiles, pedestrians, and bicyclists in order to sustain and advance the economic vitality Burlington’s downtown urban core. This overlay allows larger scale development than is typically found in the underlying district, and development with larger and taller buildings. Development should be designed to support the diverse mixed- uses, activate and enrich the street and sidewalk for pedestrian activity, and encourage mobility throughout the district and adjacent districts for pedestrians and bicyclists with reduced reliance on automobiles.	The proposed development is a multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District on the project site presently occupied by Burlington Town Center Mall at 49 Church Street. The proposed uses include retail, residential, office, and parking. Two of the project parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul’s Street, between Cherry and Bank Streets.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
(b) Areas Covered:		
The Downtown Mixed Use Core Overlay (DMUC) district includes those portions of the Mixed Use Downtown (D) District as delineated on Map 4.5.8-1.	See Project Narrative section 2.1.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
(c) District Specific Regulations: Downtown Mixed Use Core Overlay (DMUC) district;		
<u>1. Dimensional Standards:</u>		
The maximum Building height and mass shall be as prescribed in Table 4.5.8-1 below. Building height and mass in excess of 65-feet and 5.5 FAR shall be allowed by-right and without the necessity of the DRB granting of Development Bonuses/Additional Allowances pursuant to Sec 4.4.1 (d)7.		
Any application requiring Major Impact Review pursuant to Sec. 3.5.2 (b) shall not also be subject to Conditional Use Review (Sec. 3.5.2 (a)) unless a use specifically identified in Appendix A – Use Table as a “Conditional Use” or identified as “CU” is also proposed.	Documentation of compliance with the requirements of Art. 3 Part 5 Conditional Use and Major Impact Review as applicable should be made separate from this checklist.	

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
The Dimensional Standards within the DMUC Overlay District shall be as follows:		
Building Height: 3 stories min, 14 stories not to exceed 160-ft max	See drawing Z-021 Zoning Sections. South Tower = 12 Stories (+ Excluded Mechanical Level): 152’-8” above average grade at Bank Street. 148’-11” above average grade at St. Paul Street. North Towers = 14 Stories (+ Excluded Mechanical Level): 159’-7” above average grade at Cherry Street. 157’-10” above average grade at St. Paul Street. 162’-2”* above average grade at Pine Street. * 2’-2” Height Variation is within 5% of 160’-0” height allowed.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
FAR: 9.5 FAR total max per lot	See Project Narrative section 2.3. 965,352 GSF / 109,779 Site Area = 8.79 PROPOSED FAR <9.5	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
Floorplate: Floors 1-5 100% of lot max. Floors 6-8 80% of lot max. Floors 9-12 55% of lot max. Floors 13+ 15, 000 sf max per individual floorplate, with individual towers separated by a minimum of 60-ft measured orthogonally. The floorplate of any floor may not be larger than the floor below.	See Project Narrative section 2.3 (Floorplate Compliance Checklist – Proposed), drawing Z-001, and Z-002 Lot Coverage Diagrams.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
Pervious Area: 10% min	See Project Narrative section 2.3, 2.12, 2.14, and drawings A-052 and A-053 Floor Plans. Required Pervious Area = 109,779 sf x 10% = 10,978 sf Proposed Pervious Area = 11,015 sf = 10.03%	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
Setbacks: - Front: 0-ft min, 10-ft max. In no event shall a Building be closer than 12’ from the curb. - Side/Rear: 0-ft min, 12-ft max.	See Project Narrative sections 2.3, 2.4, and drawing Z-021 Zoning Sections. South Tower: 0-ft Setback from Property Lines; 18-ft. from curb at Bank St., 15-ft. from curb at St. Paul St.; North Tower: 0-ft. Setback from Property Lines; 18-ft. from curb at Cherry St., 15-ft. from curb at Pine and St Paul Streets.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
Occupied Build-to Zone: 100%	See Project Narrative sections 2.3, 2.14, and drawing A-051 Floor Plans. 109,779 sf Lot Size – 1,557 sf Pavement within property lines = 108,222 = 98.6%	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
Ground Floor Height (floor to floor): 14-ft min	See Project Narrative section 2.6, drawing A-211, and A-212 Building Sections. Ground floor heights (floor to floor) are typically 15’-6”, but vary per retail tenant space and meet or exceed 14’-0”.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
Arcades: 10-ft min clear depth, 14-ft min clear height	Not Applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
<u>2. Urban Design Standards:</u>		
The following urban design standards shall apply to all Buildings in the DMUC Overlay, and the DRB shall make a final determination regarding strict compliance with these standards except as provided for in E below. These standards and requirements shall take precedence without limitation over any duplicative or conflicting provisions of Article 6, and compliance with Article 6 shall be presumed where a Building is in compliance with these design standards as determined by the DRB.		
A. Overall Design: Proposed Buildings shall present an architecturally significant design as follows:		
i. Step backs, horizontal and vertical variation, selection of materials and other architectural design techniques are used to reinforce the street wall, create transitions from adjacent buildings of a smaller mass and height, and reduce the perceived height and mass of the upper stories from the street level;	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. Proposed Buildings provide visual interest and human scale at the pedestrian level through the use of a variety of scales, materials, fenestration, massing or other architectural design techniques;	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iii. Upper story proportions of Buildings emphasize vertically-oriented proportions to assure a rich visually interesting experience as viewed within the context of the downtown skyline, reinforce opportunities for establishing points of reference for visual orientation, and retain opportunities for a view of the sky between individual Building elements.	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
B. Façade Articulation: All street-facing Building facades shall be articulated as follows:		
i. Building facades shall incorporate at least three (3) methods of surface relief which must either recess or project from the average plane of the facade by at least four (4) inches.	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations. 1.) Top of Building 6” cornice. 2.) 18” offset at corner of brick façade. 3.) 4” setback at glazing. 4.) Spandrel Panel projects 4” from face of glazing. 5.) Bay window 18” projection. 6.) 42” Recessed Balcony. 7.) Vertical articulation 9” projection. 8.) 10’-0” Recessed building entry. 9.) Storefront awning and entrance canopy.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. Buildings with facades between 75-150 feet in width shall include vertical changes through the horizontal plane of the Façade by dividing the facade into a series of architectural and/or structural bays between 6-65 feet in width involving up to a minimum of 50% of the height of the façade.	See drawings A-201 and A-202 Building Elevations. Structural bays are provided running the entire height of building facades. Widths of bays varies, typically from 18’-0” min to 28’-0” max.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iii. Buildings with facades greater than 150 feet in width must include a more substantial change in the horizontal plane of the façade where for every 150 feet in facade width, 1 or more architectural bay as required above must either recess or project by at least 4 feet involving the full height of the façade from the average plane of the street wall portion of the facade. Such bays shall occur no closer than 50 feet from the Building’s corner.	See drawings A-201 and A-202 Building Elevations. Facades exceed 150’-0” in length and include differentials massing and setbacks above street wall façade. Recessed entryways are set in 10’-0” from the main façade and continue to the upper stories to create vertical expression.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iv. Required Building Height Setbacks pursuant to Sec 4.4.1 (d) 4 shall not be applicable. Instead, upper stories of any street-facing Building facade exceeding 6 stories in height shall be setback as follows:		
a. An upper story setback at least 10 feet from the primary plane of the façade below shall occur within the first 60-ft of Building height at either the 3rd, 4th, or 5th story. Such a change shall involve the full width of the Building façade, but does not have to occur in the same story.	See drawing Z-021 Zoning Sections. A 10’-0” setback is provided at the 5 th floor of the North Tower and the 6 th floor of the South Tower, both within 60’-0” from average grade.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
b. For Buildings exceeding 10 stories in height a second upper story setback at least ten (10) feet from the primary plane of the façade below shall occur at either the 10th, 11th, or 12th story. Such a change shall involve the full width of the Building façade, but does not have to occur in the same story.	See drawing Z-021 Zoning Sections. A 10’-0” setback is provided at the 10th floor of the South Tower. The North Tower has multiple setbacks of at least 10’-0” at either the 7 th floor, 11 th floor, or 12 th floor.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
c. Setbacks must be visually set off from the stories below by a balustrade, parapet, cornice and/or similar architectural feature, and are encouraged to be activated as an outdoor amenity space for Building occupants.	See drawing Z-021 Zoning Sections; A-051, A-052, & A-053 Floor Plans; and A-201 and A-202 Building Elevations. Setbacks are visually offset from stories below by material changes and in some places railings. The setbacks provided are activated as outdoor amenities for tenants and visitors.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
d. The upper stories beyond a setback may be visually differentiated from the stories below by a change in color, materials and/or pattern of fenestration in order to reduce the actual or perceived massing of the Building overall.	See drawings A-201 and A-202 Building Elevations. Setbacks are visually offset from stories below by material changes and fenestration patterns.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
v. Where visible, the raised foundation or basement of a Building shall not exceed 4-ft as measured from the exterior finished grade to the finished floor of the Story above, and must be visually differentiated from the stories above by a horizontal expression line and change in color, material, and/or pattern of fenestration;	Not Applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
vi. The lower 1-5 stories of a Building must be visually differentiated from the stories above by a horizontal expression across a majority of the facade; and,	See drawings A-201 and A-202 Building Elevations. The streetwall façade extends from grade to the 5th floor North Tower/6th floor South Tower, which provides a horizontal expression across the majority of the façade.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
vii. The top 1-5 stories of a Building must be visually differentiated from the stories below by a horizontal expression across a majority of the façade	See drawings A-201 and A-202 Building Elevations. The massing of the upper stories is broken up, and higher setbacks are provided, articulating horizontal expression at each massing.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
viii. The top of a Building must have an expression of the Buildings top involving a projection from the average plane of the facade by at least 6 inches.	See drawings A-201 and A-202 Building Elevations. The North Tower provides a 6” stone projection at the roof level.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
2.) Street Activation: All Buildings shall activate the street as follows:		
i. Buildings shall have one or more principal entrances for pedestrians at street level that are clearly identified as such along the street frontage or at a corner where a corner lot.	See Project Narrative section 2.4 and drawing A-051 Floor Plans. Multiple principal pedestrian entrances are provided and further expressed through canopies and signage.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. The linear distance along the street frontage between ground floor entries shall not exceed 60-feet, and such doors must be open and operable by residential occupants at all times and non-residential occupants and customers during business hours.	See drawing A-051 Floor Plans and A201 and A-202 Building Elevations. The distances between multiple ground floor entries varies and does not exceed 60'-0". Doors are operable by residential occupants at all times and non-residential occupants and customers during business hours.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
iii. Building entrances shall be defined and articulated by architectural elements appropriate to the architectural style and details of the Building as a whole. Bays including a principal entrance should be expressed vertically and continue onto the upper stories. Such bays are not required to include additional horizontal expression beyond what is required for any upper story setbacks	See drawings A-201 and A-202 Building Elevations. Multiple principal pedestrian entrances are provided and continue to the upper stories to create vertical expression. Steel and glass canopies extend over the sidewalks.	☐ In compliance ☐ Not in compliance Explanation:
iv. Requirements regarding openings and the transparency of glazing in a street-facing Building facade shall be as follows:		
Rough openings for windows and doors (per floor) - Ground Floor: 70% min, 80% of which shall be concentrated between 3-10 feet above the adjacent sidewalk - Upper Floors: 20% min May be reduced to 50 and 30% respectively to meet the requirements of a High Performance Building Energy Code or equivalent program as determined by the DRB	See drawings A-201 and A-202 Building Elevations. Ground floor rough openings: Cherry Street: 70% St. Paul Street: 75% Bank Street: 70% Pine Street: 74% Upper Floor rough openings exceed 20% at all floors.	☐ In compliance ☐ Not in compliance Explanation:
Horizontal and vertical distance between rough openings: 20' max.	See drawings A-201 and A-202 Building Elevations. Rough opening separations vary due to complexity but in no case exceed 20'-0" horizontally or vertically. Typical dimension is +/-4'-0".	☐ In compliance ☐ Not in compliance Explanation:
Transparency: (applicable to 80% of the glazing on each floor) - VLT: 60% min ground floor, 40% min upper floors - VLR: 15% max all floors	See Project Narrative section 2.6. and FIGURE 4-C-2. VLT at Ground floors is typically 90%. VLT at upper floors is 40% or higher. VLR at Retail is 8%. VLR is 15% or less for glazing at all floors.	☐ In compliance ☐ Not in compliance Explanation:
v. Street-facing, street-level windows must allow views into a ground story non-residential use for a depth of at least 3 feet for the first 4 feet above the level of the finished sidewalk in order to provide for a window display, and for a depth of at least 8 feet for the next 4 feet above the level of the finished sidewalk in order to provide a view into the interior of the space. Windows cannot be made opaque by window treatments (except operable sunscreen devices within the conditioned space). External security shutters are not permitted.	See Project Narrative section 2.6 and drawings A-201 and A-202 Building Elevations. All Street level windows allow views into the ground story as per regulations.	☐ In compliance ☐ Not in compliance Explanation:
vi. In addition to the restriction regarding ground floor residential uses pursuant to Sec. 4.4.1, (d) 1 A, General Office uses shall also not be permitted on the ground floor of any building in the DMUC Overlay.	See Project Narrative section 2.6 and drawing A-051 Floor Plans. General office use is not provided at ground floor.	☐ In compliance ☐ Not in compliance Explanation:
3.) Materials: The following requirements regarding the selection and use of Building materials is intended to improve the physical quality and durability of buildings, enhance the pedestrian experience, and protect the character of the downtown area.		

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
i. Primary Materials: Not less than 80 percent of each street-facing Facade shall be constructed of primary materials comprised of high quality, durable, and natural materials. For Facades over 100 square feet, more than one primary material shall be used. Changes between primary materials must occur only at inside corners. The following are considered acceptable primary materials: a. Brick and tile masonry; b. Native stone; c. Wood – panels, clapboard or shingles; d. Glass curtain wall; and, e. Cementitious siding;	See Project Narrative section 2.4 Proposed Exterior Finish Materials Table and drawings A-201 and A-202 Building Elevations. Also see FIGURES 4-A through 4-D. Primary materials consist of Brick-Faced Panels, Limestone Finished Panels, Glazing, and Stone Base.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. Accent Materials: The following accent materials may make up no more than 20% of the surface area on each street-facing façade. Accent materials are limited to: a. Pre-cast masonry (for trim and cornice elements only); b. External Insulation Finishing System - EIFS (for upper story trim and cornice elements only); c. Gypsum Reinforced Fiber Concrete (GFRC—for trim elements only); d. Metal (for beams, lintels, trim elements and ornamentation, and exterior architectural metal panels and cladding only); e. Split-faced block (for piers, foundation walls and chimneys only); and, f. Glass block.	See Project Narrative section 2.4 and drawings A-201 and A-202 Building Elevations. See FIGURE 4-E. Accent materials consist of Metal Panels.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iii. Alternate Materials: Alternate materials, including high quality synthetic materials, may be approved by the administrative officer after seeking input from the Design Advisory Board. New materials must be considered equivalent or better than the materials listed above and must demonstrate successful, high quality local installations. Regionally-available materials are preferred.	Not applicable.	☐ Not applicable ☐ In compliance as approved ☐ Not in compliance as approved <u>Explanation:</u>
iv. Other:		
a. The use of recycled and/or regionally-sourced materials is strongly encouraged.		
b. With the exception of natural wood siding or shingles such as cedar or redwood intended to gradually weather with time, all exposed wood and wood-like products (e.g. fiber-cement) shall be painted or stained. Exterior trim shall be indistinguishable from wood when painted.	Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
c. Any synthetic siding and finish products shall be smooth-faced with no artificial grain texturing.	Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance Explanation:
4.) Alternative Compliance: Relief from any non-numerical standard above, and relief from any numerical standard with the exception of building height and FAR by no more than 20% of such requirement, may be granted by the Development Review Board after review and comment by the Design Advisory Board and the administrative officer. In granting such relief, the DRB shall find that: i. the relief sought is necessary in order to accommodate unique site and/or Building circumstances or opportunities; ii. the relief if granted is the minimum necessary to achieve the desired result; iii. the property will otherwise be developed consistent the purpose of this ordinance, the purpose of the underlying Zoning District and this Overlay District, the purpose of the section that the relief is being sought, and all other applicable standards; iv. the relief if granted will not impose an undue adverse burden on existing or future development of adjacent properties; and, v. the relief if granted will yield a result equal to or better than strict compliance with the standard being relieved.		☐ Not applicable ☐ In compliance as approved ☐ Not in compliance as approved Explanation:
3. Use		☐ Not applicable ☐ Applicable
Mixed Use Buildings: Any new or substantially rehabilitated building over 105’ in total height shall include a mix of uses including no less than 25% of the gross leasable floor area dedicated to non-residential uses and another 25% or more dedicated to residential use.	See Project Narrative section 2.3, drawings A-051, A-052, and A-053 Floor Plans. Non-Residential mixed uses are provided. Retail: 13% Office: 24% Non-Residential Parking: 21% Total: 57% Non-Residential. Residential uses provided: Residential: 31% Residential Parking: 11% Total: 42% Residential.	☐ In compliance ☐ Not in compliance Explanation:

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
4. <u>Parking</u> (provided onsite)		☐ Not applicable ☐ Applicable
i. All onsite parking shall be provided in one or more of the following: a. an underground parking structure (strongly preferred); b. an above ground parking structure separated from the public street by a liner building a minimum of 40-ft in depth; or, c. a mixed-use building where with parking located underground, setback a minimum of 40-ft behind the façade of building at the ground level, and/or above the ground floor.	See Project Narrative sections 2.8, 5.3, drawings A-051, and A-052 Floor Plans. Parking for tenants and visitors is provided at and above the second floor of the development on floors 2 through 5 of the South Tower. Parking is separated from Cherry and Bank Streets by Residential Uses. Parking is screened from view at St. Paul and Pine Streets by façade elements.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. All onsite parking shall participate in any Downtown Parking and Transportation Management District in order to minimize the amount of parking provided and maximize the efficiency of its utilization.	See Project Narrative section 5.3.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iii. Vehicular entrances to parking structures shall not exceed 24-ft clear width and 16-ft clear height at the street frontage.	See drawings A-201 and A-202 Building Elevations. Vehicular parking access is provided on both Cherry and Bank Streets and does not exceed 24'-0" width and 16'-0" height.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
iv. At least one pedestrian route from all parking structures shall lead directly to a street frontage (i.e., not directly into a Building). When portions of a building containing parking front on more than one street, multiple pedestrian routes to street frontage is strongly encouraged.	See Project Narrative section 2.8 and drawing A-051 Floor Plans. Pedestrian access to parking area is provided at Cherry, Pine, and St. Paul Streets.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
v. All structured parking with frontage on any portion of a public street shall be treated as follows:		☐ Not applicable ☐ Applicable
a. The required setback between the parking and the public street at the ground level must be occupied by an active use (such as, but not limited to, residential lobby, retail, office, recreational or services). This requirement shall not apply to parking located either entirely below-grade or above the second floor where parking may extend out to the building's perimeter.	Parking is located above the second floor.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
b. All floors of a parking structure fronting a public street must be level (not inclined), and any sloped ramps between parking levels must be setback a minimum of 20-ft from the street-facing building façade and shall not be discernible along the perimeter of the parking structure.	See drawings A-051 and A-052 Floor Plans. Parking floors are level and sloped ramps will not be discernible along the perimeter of the structure.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
c. Where upper stories of structured parking are located at the perimeter of a building, parked vehicles, vehicle headlights and interior lighting shall be screened from view from the street and adjacent properties.	See Project Narrative 2.8, drawings A-201, and A-202 Building Elevations. At St. Paul and Pine Streets vehicle headlights are visually screened from view with glazed panels. Interior lighting shall be screened from view by interior valances set back from the façade.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>

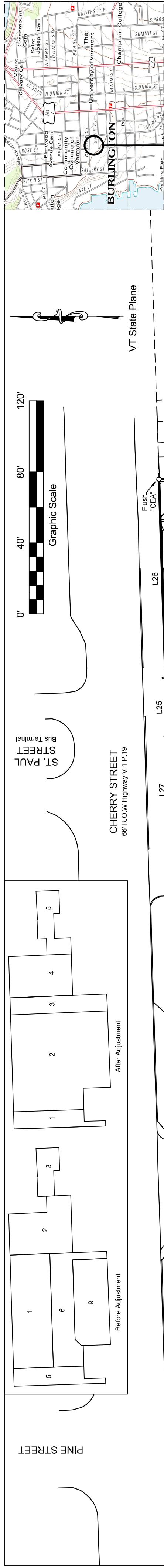
Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
d. In addition to the Urban Design Standards required above, facade treatments (materials, fenestration patterns, and architectural detailing) must be continued on stories containing parking in a manner consistent with the overall architectural design of the Building and such that levels of parking are not clearly distinguishable from other uses in a building.	See Project Narrative 2.8, drawings A-201, and A-202 Building Elevations. Parking areas are screened from public view with building façade elements consistent with the scale and materials of the overall development.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
vi. Each parking space provided in an underground parking structure may be counted as 1.75 of the parking spaces as required in Art 8.	Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
5. <u>Signs</u>		☐ Not applicable ☐ Applicable
A master sign plan pursuant to Article 7 Part 3 is required for all sites occupied by more than three tenants where all signs must meet the requirements of the master sign plan. The master sign plan must establish standards of consistency as applicable of all signs to be provided on the subject property with regard to: Colors; Letter/graphics style; Location and Sign Type; Materials; Methods of illumination; and/or Maximum dimensions and proportion.	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
In addition to the flexibility from the requirements of Article 7 provided under Sec. 7.3.4, the following shall also be permitted when incorporated as part of a master sign plan in the DMUC Overlay:		☐ Not applicable ☐ Applicable
i. The area of projecting signs, marques, canopies and awnings shall not be deducted from the maximum allowed signage area permitted for signage under Sec 7.2.3.	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
ii. Projecting Signs: One projecting sign may be permitted for each ground floor use provided each sign:	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
a. does not exceed 8 square feet in area;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
b. does not project more than 4 feet from the building façade on which it is attached;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
c. has its lowest edge at least eight (8) feet above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
d. has its highest edge no more than eighteen (18) feet above any pedestrian way; and,	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
e. Any encroachment into the public right-of-way must also be approved by the City Council.		☐ Not applicable ☐ Applicable ☐ Required permit condition included
iii. Marquee Signs: One marquee sign per street frontage may be permitted provided such sign:		☐ Not applicable ☐ Applicable
a. is associated with the following uses only: Cinema, Conference Center, Convention Center, Performing Arts Center and Recreation Facility- Indoor;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
b. is located above the principal Building entrance;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
c. projects a minimum of 6 feet from the building façade on which it is attached but in no event more than 10 feet and 3 feet from the curb;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
d. has its lowest edge at least 9’6” above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
e. has its highest edge no more the lesser of the floor level of the third story or 35 feet above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
f. is no more than 40 feet in width;	See Project Narrative section 2.10. Not applicable.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
g. may contain an area for manual changeable copy that does not exceed 30 percent of the area of the sign face on which it is located or 32 square feet, whichever is less; and,	See Project Narrative section 2.10. Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
h. Any encroachment into the public right-of-way must also be approved by the City Council.		☐ Not applicable ☐ Applicable ☐ Required permit condition included
iv. Canopies and Awnings: Where provided, awnings and canopies placed on a building facade shall meet the following specifications:		☐ Not applicable ☐ Applicable
a. Awnings and canopies shall provide 8’ minimum clear height above the finished grade, and shall project a minimum of 6’ from the building façade to a maximum of 2’ from the curb. 14’ minimum clear height above the finished grade shall be provided above any area used for parking or circulation. Any encroachment into the public right-of-way must also be approved by the City Council.	See drawings A-201 and A-202 Building Elevations. Awnings are located at Retail Use areas along all four streets. Due to sidewalk pitch, the height varies from 12’-0” to 28’-0”, and in no case is less than 8’-0” above sidewalk. Awnings project from façade 5’-0”. Canopies at Main Pedestrian Entrances are typically at +/-30’-0” above sidewalk (depending on grade) and extend +/- 12’-0” from façade, not to within 2’ of the curb. Vehicular entrance clear heights are typically 16’-0”.	☐ In compliance ☐ Required permit condition included ☐ Not in compliance <u>Explanation:</u>
b. Awnings and canopies shall be placed, sized, shaped and proportioned to match the associated openings.	See drawings A-201 and A-202 Building Elevations. Awnings are placed, sized, shaped, and proportioned to the associated openings.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>
c. Except as provided below, awnings and canopies shall not be internally illuminated or backlit, however they may contain lighting fixtures intended to illuminate the ground beneath.	See Project Narrative section 2.13 and L-500 Lighting/Photometric Plan. Canopies contain lighting fixtures illuminating the ground, See FIGURE 4-I.	☐ Not applicable ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
d. Awnings shall have a metal structure covered with non-translucent canvas, synthetic canvas or painted metal, and shall have no soffit or sides. Retractable awnings are encouraged.	See drawings A-201 and A-202 Building Elevations, as well as A-221, A-224, A-227, and A-230. Awnings are painted steel to match panels used throughout development and glass.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
e. Awnings shall be rectangular in elevation and triangular in cross-section with straight edges. The valance of the awning shall be no more than 12” in height.	See drawings A-201 and A-202 Building Elevations, as well as A-221, A-224, A-227, and A-230.	☐ In compliance ☐ Not in compliance Explanation:
f. Canopies shall be constructed of wood and/or metal, and shall be cantilevered or supported from above. The face of the canopy shall be no more than 24” in height.	See drawings A-201 and A-202 Building Elevations. Canopies are constructed of steel structure with glass panels. They are cantilevered from the building structure and are no more than 24” in height. See A-233.	☐ In compliance ☐ Not in compliance Explanation:
g. Signage placed on an awning or canopy shall be limited to the windows and doors on the first (ground) floor, and shall not extend outside the overall length or width.	See Project Narrative section 2.10. Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance Explanation:
h. Signage placed on a canopy shall be limited to the face or may project above and may be backlit.	See Project Narrative section 2.10. Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance Explanation:
i. Signage placed on an awning or canopy shall be limited to: i. 75% of the valance or canopy face and/or 25% of the sloping plane max. ii. The height of lettering shall be limited to: 5” min - 10” max on the valance; 18” max on the sloping plane; or 24” max on or above the canopy.	See Project Narrative section 2.10. Not applicable.	☐ Not applicable ☐ In compliance ☐ Not in compliance Explanation:
6. <u>Green Buildings and Stormwater Management</u>		
A. Green Buildings: New development and substantial redevelopment in the DMUC Overlay shall be built to the standard of LEED Gold Certification, or a nationally recognized equivalent as determined by the administrative officer.		
i. At the time of application the following shall be required: a. the submission of documentation of the planned performance criteria and elements of the project necessary to obtain the required green building certification (e.g. LEED checklist); b. documentation that the project has been registered with the applicable green building certification program (e.g. LEED project registration); and, c. a written commitment to apply for formal, written review of the project at the earliest milestone where the green building certifying body offers "precertification" or similar (e.g. LEED Design Review).	See Project Narrative section 2.11 and FIGURES 2-A LEED Checklist and 2-B USGBC Registration Receipt.	☐ In compliance ☐ Not in compliance Explanation:

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
ii. Prior to the release of any Final Certificate of Occupancy the following shall be required: a. the submission of revised as-built performance criteria and project elements necessary to obtain the required green building certification (e.g. LEED checklist): b. the results of 3rd party commissioning of the building envelope and mechanical systems documenting compliance of as-built performance; and, c. a written certification from the project design professional of record that the project has been constructed to comply with the green building requirements of this section.		☐ Required permit condition included
B. Stormwater Management: Stormwater runoff from 100% of all net new and substantially redeveloped impervious area (or an equivalent area of impervious)) must be captured and managed in such a way as to mimic pre-development (meadow in good condition, Hydrologic Soil Group B) runoff (or discharge) ratio for the 1 year, 24 hour design storm subject to review and approval by the DPW Water Resources Div. The feasibility of implementing runoff volume reduction practices must be evaluated in consultation with the DPW Water Resources Division and shall include an evaluation of the engineering feasibility of techniques including, but not limited to runoff reduction through stormwater reuse, green stormwater infrastructure such as green roofs, bioretention, tree planting and sewer separation of roof water for sites currently discharging to the combined sewer system. Storage and detention methods may be used to meet pre-development flow targets. When and where detention systems are the primary mode of stormwater management, “smart” precipitation integrated detention systems must be evaluated and are strongly preferred. On-site stormwater management must be maximized; however, off-site stormwater management may also be used in consultation with DPW Water Resources.	See Project Narrative section 2.12.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>



LINE TABLE					
LINE	BEARING	DISTANCE	L26	S 88°08'46" W	111.89'
L1	S 01°49'03" E	333.23'	L27	S 88°10'48" W	60.00'
L2	N 87°49'17" E	18.51"	L28	S 88°10'48" W	339.29'
L3	N 01°52'00" E	75.09'	L29	S 88°10'59" W	1.65'
L4	N 88°10'57" E	41.55'	L30	S 88°10'59" W	60.00'
L5	N 88°10'57" E	3.53'	L31	S 01°49'03" E	248.02'
L6	N 88°10'51" E	71.93'	L32	S 02°14'59" E	140.50'
L7	N 88°10'54" E	96.00'	L33	S 88°10'46" E	399.55'
L8	N 87°42'53" E	288.65'	L34	S 02°14'59" E	107.53'
L9	N 87°30'49" E	25.19'	L35	N 01°50'49" E	6.41'
L10	N 02°18'18" W	120.30'	L36	N 43°42'43" E	30.37'
L12	N 88°11'12" E	145.50'	L37	N 88°10'08" E	280.78'
L13	N 88°11'12" E	57.01'	L38	S 02°19'08" E	121.26'
L15	N 88°10'52" E	65.62'	L39	S 02°21'14" W	341.86'
L16	N 01°50'48" E	21.23'	L40	N 02°21'14" W	80.49'
L17	N 88°07'53" E	80.49'	L41	N 02°21'14" W	140.50'
L18	N 02°10'06" W	80.93'	L42	S 02°32'55" E	57.55'
L19	S 87°14'46" W	100.00'	L45	N 86°37'28" W	0.11'
L21	S 87°49'46" W	68.92'	L46	N 02°10'14" W	1.00'
L22	S 02°32'29" E	30.59'	L47	S 88°10'52" W	22.54'
L23	S 88°08'46" W	30.59'	L48	S 02°32'29" E	57.54'
L24	N 02°32'29" W	135.42'	L49	S 87°33'01" W	7.82'
L25	N 88°10'57" W	33.00'	L50	S 87°42'53" W	27.00'

LINE TABLE

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- Easements / Encroachments**
- Ⓐ Rectiprocal Easements V.283 P.500 V.597 P.368 V.665 P.344 V.853 P.639
 - Ⓑ Electrical line easement V.491 P.400
 - Ⓒ Rectiprocal Easement V.643 P.96
 - Ⓓ Along this portion of the boundary line the Mall wall crosses into the "Ponfearle lot" by 0.5' ±.
- Notes**
1. The purpose of this survey plat is to depict a boundary adjustment. The boundary lines of "former parcels" 1,2,3,5,6 and 9 are adjusted / reconfigured creating parcels 1,2,3,4 and 5. This plat is not a claim of legal title or compliance with state and local regulations.
 2. This plat is based on records researched in the city of Burlington, VT, land records and a closed loop traverse using a total station completed on 12/23/2016. Accuracy of measurements meet the standards for a urban survey.
 3. Distances are shown to the hundredth of a foot and bearings are shown to the nearest second for mathematical closure purposes only.
 4. Bearings shown are in reference to Vermont State Plane North established using dual frequency survey grade GPS observations on site.
 5. An attempt has been made to identify or delineate easements, rights of way, lease lands, encroachment, etc. observed in the field or found in the land records. Additional encumbrances may exist that are not shown on this plat.
 6. R.O.W shown for Cherry, Church and Bank streets are public and were determined from plats of record, physical location and existing monumentation.
 7. Plat references slides 336A, 147, 328D, 134, 140, 99, V.163 P.424, V.163 P.423 V.183 P.743 Burlington land records.

Approval of this lot line adjustment plat does not constitute the creation of a separate parcel or lot. It adjusts the physical location of the common boundary of the adjoining parcels or lots. This lot line adjustment has been approved by:

City of Burlington Administrative Officer / Assistant Administrative Officer

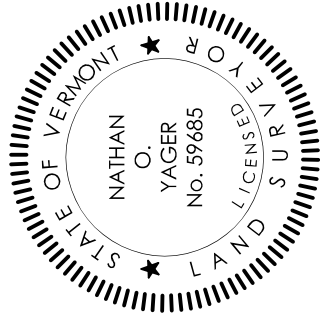
Zoning Permit #

This plat is my faithful representation of record evidence, parol evidence, physical site conditions at the time of survey and all other specific evidence referred to in the notes section and on the plat herein. This plat meets the requirements of VT statute title 27, chapter 17, section 1403.

Nathan O. Yager VT LLS # 59685

[Signature]

Date 1/9/2017
Scale 1"=40'
Project #161230



Lot Line Adjustment
for
BTC Mall Associates LLC
101 Cherry Street,
Burlington, Vermont

LATITUDES Land Surveying
41 Murray Street Burlington, VT
latitudeslandsurveying.com



P + S **K + B** PKSB ARCHITECTS, PC
330 WEST 42 STREET
NEW YORK, NY 10036
212 594 2010
www.pksb.com

PC Construction
153 Tilly Drive
South Burlington, VT 05403

Freeman French Freeman, Inc.
81 Maple Street
Burlington, VT 05401

Hardy Structural Engineering
975 Roosevelt Hwy, Suite 130
Colchester, VT 05446

Hallam ICS
88 Eastwood Drive, Suite 200
South Burlington, VT 05403

Engineering Ventures P.C.
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

GeoDesign
1233 Shelburne Rd, Suite 360
South Burlington, VT 05403

SE Group
131 Church Street, 3rd Floor
Burlington, VT 05401

Construction Manager
www.pconstruction.com

Consulting Architect
www.fhinc.com

Structural Engineer
www.hardyse.com

Mechanical Engineer
www.hallam-ics.com

Civil Engineer
www.engineeringventures.com

Geotechnical Engineer
www.geodesign.net

Landscape Architect
www.segroup.com

NOT FOR CONSTRUCTION

Approval:

Date	No.	Description
1/20/2017	03	P & Z RESUBMISSION 2
1/11/2017	02	P & Z RESUBMISSION 1
12/15/2016	01	P & Z SUBMISSION

Project:

**Burlington Town Center,
Devonwood Investors, LLC**

101 Cherry Street
Burlington, VT 05401

**ELEVATIONS -
CHERRY STREET &
ST. PAULS STREET**

Project Number: 1317-01

Owner: CH

Architect: JH/WF

Scale: AS NOTED

Drawing Number:

A-201

BANK STREET FACADE:			
PRIMARY		AREA (SQ.FT.)	% OF WHOLE
	TOTAL ELEVATION	36,346	
	BRICK FACED PANEL	1,663	5
	LIMESTONE FINISHED PANEL	3,631	10
	GLAZING	20,076	55
	GLAZED SPANDREL PANEL	7,990	22
ACCENT	STONE BASE	152	< 1
	METAL PANEL	2,834	8

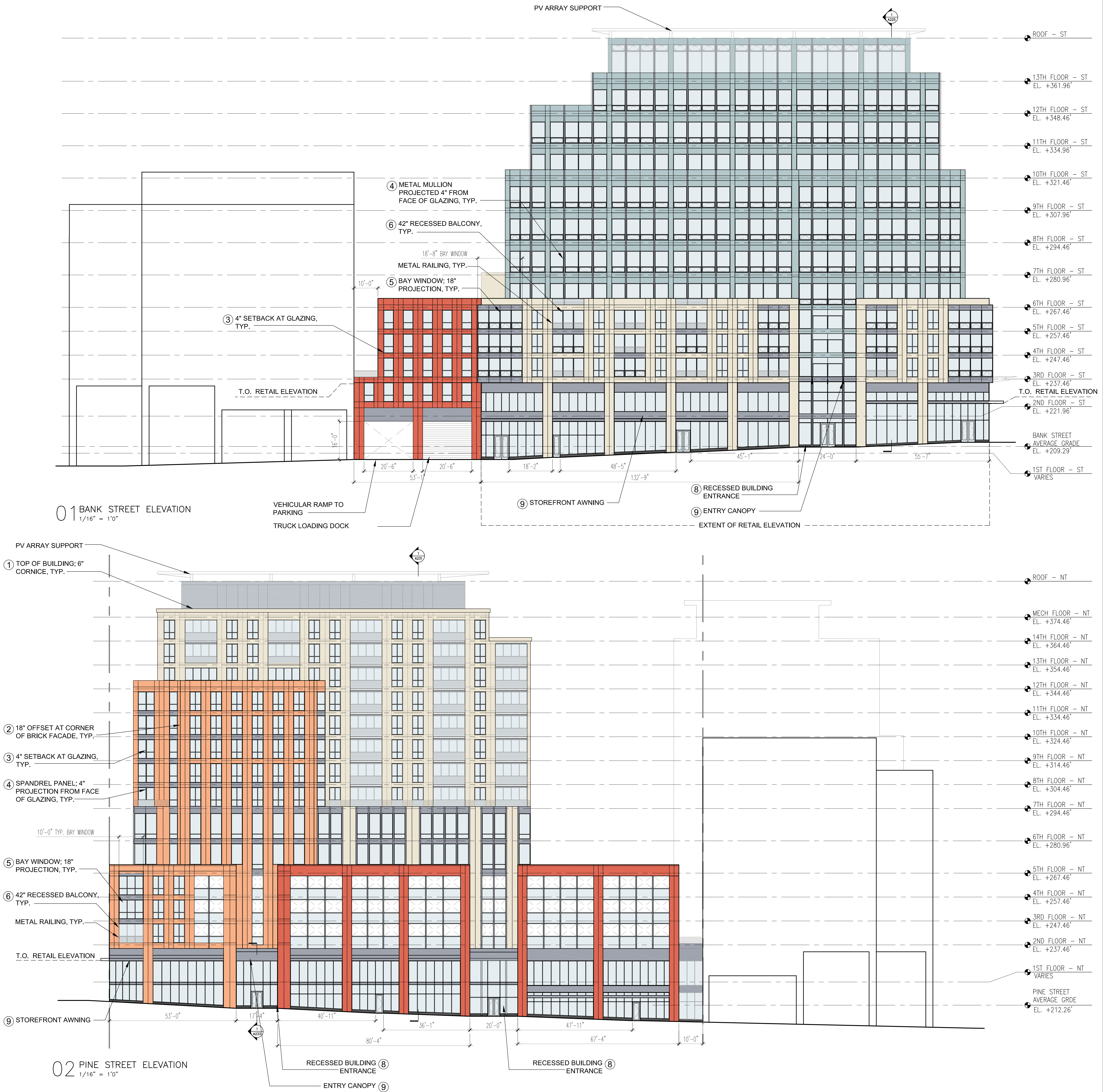
RETAIL ELEVATION ONLY		
GLAZING	3,715	70
NON-GLAZING	1,574	30

MATERIAL LEGEND

- PRIMARY MATERIAL 1A:
BRICK FACED PANEL
- PRIMARY MATERIAL 1B:
BRICK FACED PANEL
- PRIMARY MATERIAL 2:
LIMESTONE FINISHED PANEL
- PRIMARY MATERIAL 3A:
GLAZING
- PRIMARY MATERIAL 3B:
GLAZED SPANDREL PANEL
- PRIMARY MATERIAL 4:
STONE BASE
- ACCENT MATERIAL 1:
METAL PANEL

PINE STREET FACADE:			
PRIMARY		AREA (SQ.FT.)	% OF WHOLE
	TOTAL ELEVATION	30,655	
	BRICK FACED PANEL	7,234	24
	LIMESTONE FINISHED PANEL	4,730	15
	GLAZING	15,503	51
	GLAZED SPANDREL PANEL	0	0
ACCENT	STONE BASE	192	< 1
	METAL PANEL	2,996	10

RETAIL ELEVATION ONLY		
GLAZING	4,008	74
NON-GLAZING	1,412	26



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www.fffrc.com

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www.geodesign.net

SE Group
131 Church Street, 3rd Floor
Burlington, VT 05401

Landscape Architect
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www.segroup.com

NOT FOR CONSTRUCTION

Project			
Date	No.	Description	
1/20/2017	03	P & Z RESUBMISSION 2	
1/11/2017	02	P & Z RESUBMISSION 1	
12/15/2016	01	P & Z SUBMISSION	

Burlington Town Center,
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

ELEVATIONS -
BANK STREET &
PINE STREET

Project Number		Revision & Date
1317-01		
Drawn By		CH
Checked By		JH/WF
Scale		AS NOTED
Drawing Number		

A-202

Instructions:

The Downtown Mixed Use Core Overlay Compliance Checklist is a tool to be use for documentation and confirmation of compliance with the requirements of Sec. 4.5.8 Downtown Mixed Use Core Overlay (DMUC) District. This checklist documents compliance **only** with the requirements of Sec. 4.5.8. Other sections of the CDO as applicable (e.g. Art 8 Parking, Art 9 Inclusionary and Replacement Housing) also require documentation of compliance.

The ordinance requirements listed in the first column are in some cases only a summary of the requirements found in the CDO. Any questions or conflicts should refer back to the CDO itself for clarification. The Applicant Compliance Documentation should be as brief as necessary to convey how compliance with the requirements have been achieved, and should reference related plans and illustrations as appropriate.

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
<u>Sec. 4.5.8 Downtown Mixed Use Core Overlay (DMUC) District</u>		
(a) Purpose:		
The Downtown Mixed Use Core Overlay (DMUC) district is intended to facilitate the redevelopment of a portion of the former Urban Renewal Area in order to provide for a more walkable, connected, dense, compact, mixed use and diverse urban center. The area should support a diversity of residential, commercial, recreational, educational, civic, hospitality, and entertainment activities, and create opportunities to better connect the street grid for enhanced mobility for automobiles, pedestrians, and bicyclists in order to sustain and advance the economic vitality Burlington’s downtown urban core. This overlay allows larger scale development than is typically found in the underlying district, and development with larger and taller buildings. Development should be designed to support the diverse mixed-uses, activate and enrich the street and sidewalk for pedestrian activity, and encourage mobility throughout the district and adjacent districts for pedestrians and bicyclists with reduced reliance on automobiles.	The proposed development is a multi-use project within the Downtown Mixed Use Core Overlay (DMUC) District on the project site presently occupied by Burlington Town Center Mall at 49 Church Street. The proposed uses include retail, residential, office, and parking. Two of the project parcels will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul’s Street, between Cherry and Bank Streets.	☒ In compliance <u>Explanation:</u>
(b) Areas Covered:		
The Downtown Mixed Use Core Overlay (DMUC) district includes those portions of the Mixed Use Downtown (D) District as delineated on Map 4.5.8-1.	See Project Narrative section 2.1.	☒ In compliance <u>Explanation:</u>
(c) District Specific Regulations: Downtown Mixed Use Core Overlay (DMUC) district;		
<u>1. Dimensional Standards:</u>		
The maximum Building height and mass shall be as prescribed in Table 4.5.8-1 below. Building height and mass in excess of 65-feet and 5.5 FAR shall be allowed by-right and without the necessity of the DRB granting of Development Bonuses/Additional Allowances pursuant to Sec 4.4.1 (d)7.		
Any application requiring Major Impact Review pursuant to Sec. 3.5.2 (b) shall not also be subject to Conditional Use Review (Sec. 3.5.2 (a)) unless a use specifically identified in Appendix A – Use Table as a “Conditional Use” or identified as “CU” is also proposed.	Documentation of compliance with the requirements of Art. 3 Part 5 Conditional Use and Major Impact Review as applicable should be made separate from this checklist.	

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
The Dimensional Standards within the DMUC Overlay District shall be as follows:		
Building Height: 3 stories min, 14 stories not to exceed 160-ft max	See drawing Z-021 Zoning Sections. South Tower = 12 Stories (+ Excluded Mechanical Level): 152’-8” above average grade at Bank Street. 148’-11” above average grade at St. Paul Street. North Towers = 14 Stories (+ Excluded Mechanical Level): 159’-7” above average grade at Cherry Street. 157’-10” above average grade at St. Paul Street. 162’-2”* above average grade at Pine Street. * 2’-2” Height Variation is within 5% of 160’-0” height allowed.	☒ In compliance <u>Explanation/Notes:</u> Figure 05 on Sheet Z-021 illustrates additional height beyond 160 being sought for NW tower - proposed roof height shown is 162’-2” from average grade of Pine Street. NW tower is setback 92’-8” from Pine Street therefore measurement from Pine St is not necessary. Measurement from St. Paul St is controlling and in compliance at 159’-7” above average grade.
Exceptions to Building Height: (per Sec. 5.2.6)		☒ In compliance <u>Explanation:</u> DAB noted that mechanical penthouse roof appears to encroach into the 10’ setback requirement from the edge of the roof deck required under Sec. 5.2.6 (b) 4. However, this is actually a support that sits on top of the mechanical penthouse for the PV solar array for which there is no zoning jurisdiction under state statute 24 VSA 4413 (b) and (g)(1).
FAR: 9.5 FAR total max per lot	See Project Narrative section 2.3. 965,352 GSF / 109,779 Site Area = 8.79 PROPOSED FAR <9.5	☒ In compliance <u>Explanation:</u>
Floorplate: Floors 1-5 100% of lot max. Floors 6-8 80% of lot max. Floors 9-12 55% of lot max. Floors 13+ 15, 000 sf max per individual floorplate, with individual towers separated by a minimum of 60-ft measured orthogonally. The floorplate of any floor may not be larger than the floor below.	See Project Narrative section 2.3 (Floorplate Compliance Checklist – Proposed), drawing Z-001, and Z-002 Lot Coverage Diagrams.	☒ In compliance <u>Explanation:</u>
Pervious Area: 10% min	See Project Narrative section 2.3, 2.12, 2.14, and drawings A-052 and A-053 Floor Plans. Required Pervious Area = 109,779 sf x 10% = 10,978 sf Proposed Pervious Area = 11,015 sf = 10.03%	☒ In compliance <u>Explanation/Notes:</u> 2 green roof sections situated west of the NW and between the NW and NE towers. DPW Stormwater has evaluated their effectiveness and performance as part of their review.

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
Setbacks: - Front: 0-ft min, 10-ft max. In no event shall a Building be closer than 12’ from the curb. - Side/Rear: 0-ft min, 12-ft max.	See Project Narrative sections 2.3, 2.4, and drawing Z-021 Zoning Sections. South Tower: 0-ft Setback from Property Lines; 18-ft. from curb at Bank St., 15-ft. from curb at St. Paul St.; North Tower: 0-ft. Setback from Property Lines; 18-ft. from curb at Cherry St., 15-ft. from curb at Pine and St Paul Streets.	☒ In compliance <u>Explanation/notes:</u>
Occupied Build-to Zone: 100%	See Project Narrative sections 2.3, 2.14, and drawing A-051 Floor Plans. 109,779 sf Lot Size – 1,557 sf Pavement within property lines = 108,222 = 98.6%	☒ In compliance <u>Explanation/notes:</u>
Ground Floor Height (floor to floor): 14-ft min	See Project Narrative section 2.6, drawing A-211, and A-212 Building Sections. Ground floor heights (floor to floor) are typically 15’-6”, but vary per retail tenant space and meet or exceed 14’-0”.	☒ In compliance <u>Explanation:</u>
Arcades: 10-ft min clear depth, 14-ft min clear height	Not Applicable.	☒ Not applicable
<u>2. Urban Design Standards:</u>		
The following urban design standards shall apply to all Buildings in the DMUC Overlay, and the DRB shall make a final determination regarding strict compliance with these standards except as provided for in E below. These standards and requirements shall take precedence without limitation over any duplicative or conflicting provisions of Article 6, and compliance with Article 6 shall be presumed where a Building is in compliance with these design standards as determined by the DRB.		
A. Overall Design: Proposed Buildings shall present an architecturally significant design as follows:		
i. Step backs, horizontal and vertical variation, selection of materials and other architectural design techniques are used to reinforce the street wall, create transitions from adjacent buildings of a smaller mass and height, and reduce the perceived height and mass of the upper stories from the street level;	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☒ In compliance <u>Explanation:</u>
ii. Proposed Buildings provide visual interest and human scale at the pedestrian level through the use of a variety of scales, materials, fenestration, massing or other architectural design techniques;	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☒ In compliance <u>Explanation:</u>
iii. Upper story proportions of Buildings emphasize vertically-oriented proportions to assure a rich visually interesting experience as viewed within the context of the downtown skyline, reinforce opportunities for establishing points of reference for visual orientation, and retain opportunities for a view of the sky between individual Building elements.	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations.	☒ In compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
B. Façade Articulation: All street-facing Building facades shall be articulated as follows:		
i. Building facades shall incorporate at least three (3) methods of surface relief which must either recess or project from the average plane of the facade by at least four (4) inches.	See Project Narrative section 2.4, drawing A-201, and A-202 Building Elevations. 1.) Top of Building 6” cornice. 2.) 18” offset at corner of brick façade. 3.) 4” setback at glazing. 4.) Spandrel Panel projects 4” from face of glazing. 5.) Bay window 18” projection. 6.) 42” Recessed Balcony. 7.) Vertical articulation 9” projection. 8.) 10’-0” Recessed building entry. 9.) Storefront awning and entrance canopy.	☒ In compliance ☐ Required permit condition included <u>Explanation/Notes:</u> Bay Windows, awnings and canopies project out over the public ROW, and will require Council approval
ii. Buildings with facades between 75-150 feet in width shall include vertical changes through the horizontal plane of the Façade by dividing the facade into a series of architectural and/or structural bays between 6-65 feet in width involving up to a minimum of 50% of the height of the façade.	See drawings A-201 and A-202 Building Elevations. Structural bays are provided running the entire height of building facades. Widths of bays varies, typically from 18’-0” min to 28’-0” max.	☒ In compliance <u>Explanation/Notes:</u>
iii. Buildings with facades greater than 150 feet in width must include a more substantial change in the horizontal plane of the façade where for every 150 feet in facade width, 1 or more architectural bay as required above must either recess or project by at least 4 feet involving the full height of the façade from the average plane of the street wall portion of the facade. Such bays shall occur no closer than 50 feet from the Building’s corner.	See drawings A-201 and A-202 Building Elevations. Facades exceed 150’-0” in length and include differentials massing and setbacks above street wall façade. Recessed entryways are set in 10’-0” from the main façade and continue to the upper stories to create vertical expression.	☒ In compliance <u>Explanation/Notes:</u>
iv. Required Building Height Setbacks pursuant to Sec 4.4.1 (d) 4 shall not be applicable. Instead, upper stories of any street-facing Building facade exceeding 6 stories in height shall be setback as follows:		
a. An upper story setback at least 10 feet from the primary plane of the façade below shall occur within the first 60-ft of Building height at either the 3rd, 4th, or 5th story. Such a change shall involve the full width of the Building façade, but does not have to occur in the same story.	See drawing Z-021 Zoning Sections. A 10’-0” setback is provided at the 5 th floor of the North Tower and the 6 th floor of the South Tower, both within 60’-0” from average grade.	☒ In compliance <u>Explanation:</u>
b. For Buildings exceeding 10 stories in height a second upper story setback at least ten (10) feet from the primary plane of the façade below shall occur at either the 10th, 11th, or 12th story. Such a change shall involve the full width of the Building façade, but does not have to occur in the same story.	See drawing Z-021 Zoning Sections. A 10’-0” setback is provided at the 10th floor of the South Tower. The North Tower has multiple setbacks of at least 10’-0” at either the 7 th floor, 11 th floor, or 12 th floor.	☒ In compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
c. Setbacks must be visually set off from the stories below by a balustrade, parapet, cornice and/or similar architectural feature, and are encouraged to be activated as an outdoor amenity space for Building occupants.	See drawing Z-021 Zoning Sections; A-051, A-052, & A-053 Floor Plans; and A-201 and A-202 Building Elevations. Setbacks are visually offset from stories below by material changes and in some places railings. The setbacks provided are activated as outdoor amenities for tenants and visitors.	☒ In compliance <u>Explanation:</u>
d. The upper stories beyond a setback may be visually differentiated from the stories below by a change in color, materials and/or pattern of fenestration in order to reduce the actual or perceived massing of the Building overall.	See drawings A-201 and A-202 Building Elevations. Setbacks are visually offset from stories below by material changes and fenestration patterns.	☒ In compliance <u>Explanation:</u>
v. Where visible, the raised foundation or basement of a Building shall not exceed 4-ft as measured from the exterior finished grade to the finished floor of the Story above, and must be visually differentiated from the stories above by a horizontal expression line and change in color, material, and/or pattern of fenestration;	Not Applicable.	☒ In compliance <u>Explanation:</u>
vi. The lower 1-5 stories of a Building must be visually differentiated from the stories above by a horizontal expression across a majority of the facade; and,	See drawings A-201 and A-202 Building Elevations. The streetwall façade extends from grade to the 5 th floor North Tower/6 th floor South Tower, which provides a horizontal expression across the majority of the façade.	☒ In compliance <u>Explanation/Notes:</u>
vii. The top 1-5 stories of a Building must be visually differentiated from the stories below by a horizontal expression across a majority of the façade	See drawings A-201 and A-202 Building Elevations. The massing of the upper stories is broken up, and higher setbacks are provided, articulating horizontal expression at each massing.	☒ In compliance <u>Explanation:</u>
viii. The top of a Building must have an expression of the Buildings top involving a projection from the average plane of the facade by at least 6 inches.	See drawings A-201 and A-202 Building Elevations. The North Tower provides a 6” stone projection at the roof level.	☒ In compliance <u>Explanation:</u> While exempt from zoning jurisdiction under state statute, the roof supports for the PV solar array, with its prominent overhang, also serves as a projecting expression of the building tops.
2.) Street Activation: All Buildings shall activate the street as follows:		
i. Buildings shall have one or more principal entrances for pedestrians at street level that are clearly identified as such along the street frontage or at a corner where a corner lot.	See Project Narrative section 2.4 and drawing A-051 Floor Plans. Multiple principal pedestrian entrances are provided and further expressed through canopies and signage.	☒ In compliance <u>Explanation:</u>
ii. The linear distance along the street frontage between ground floor entries shall not exceed 60-feet, and such doors must be open and operable by residential occupants at all times and non-residential occupants and customers during business hours.	See drawing A-051 Floor Plans and A201 and A-202 Building Elevations. The distances between multiple ground floor entries varies and does not exceed 60’-0” . Doors are operable by residential occupants at all times and non-residential occupants and customers during business hours.	☒ In compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
iii. Building entrances shall be defined and articulated by architectural elements appropriate to the architectural style and details of the Building as a whole. Bays including a principal entrance should be expressed vertically and continue onto the upper stories. Such bays are not required to include additional horizontal expression beyond what is required for any upper story setbacks	See drawings A-201 and A-202 Building Elevations. Multiple principal pedestrian entrances are provided and continue to the upper stories to create vertical expression. Steel and glass canopies extend over the sidewalks.	☒ In compliance <u>Explanation:</u>
iv. Requirements regarding openings and the transparency of glazing in a street-facing Building facade shall be as follows:		
Rough openings for windows and doors (per floor) - Ground Floor: 70% min, 80% of which shall be concentrated between 3-10 feet above the adjacent sidewalk - Upper Floors: 20% min <i>May be reduced to 50 and 30% respectively to meet the requirements of a High Performance Building Energy Code or equivalent program as determined by the DRB</i>	See drawings A-201 and A-202 Building Elevations. Ground floor rough openings: • Cherry Street: 70% • St. Paul Street: 75% • Bank Street: 70% • Pine Street: 74% Upper Floor rough openings exceed 20% at all floors.	☒ In compliance <u>Explanation:</u>
Horizontal and vertical distance between rough openings: 20’ max.	See drawings A-201 and A-202 Building Elevations. Rough opening separations vary due to complexity but in no case exceed 20’-0” horizontally or vertically. Typical dimension is +/-4’-0”.	☒ In compliance <u>Explanation:</u>
Transparency: (applicable to 80% of the glazing on each floor) - VLT: 60% min ground floor, 40% min upper floors - VLR: 15% max all floors	See Project Narrative section 2.6. and FIGURE 4-C-2. VLT at Ground floors is typically 90%. VLT at upper floors is 40% or higher. VLR at Retail is 8%. VLR is 15% or less for glazing at all floors.	☒ In compliance <u>Explanation:</u>
v. Street-facing, street-level windows must allow views into a ground story non-residential use for a depth of at least 3 feet for the first 4 feet above the level of the finished sidewalk in order to provide for a window display, and for a depth of at least 8 feet for the next 4 feet above the level of the finished sidewalk in order to provide a view into the interior of the space. Windows cannot be made opaque by window treatments (except operable sunscreen devices within the conditioned space). External security shutters are not permitted.	See Project Narrative section 2.6 and drawings A-201 and A-202 Building Elevations. All Street level windows allow views into the ground story as per regulations.	☒ In compliance ☐ Required permit condition included <u>Explanation:</u>
vi. In addition to the restriction regarding ground floor residential uses pursuant to Sec. 4.4.1, (d) 1 A, General Office uses shall also not be permitted on the ground floor of any building in the DMUC Overlay.	See Project Narrative section 2.6 and drawing A-051 Floor Plans. General office use is not provided at ground floor.	☒ In compliance <u>Explanation:</u>
3.) Materials: The following requirements regarding the selection and use of Building materials is intended to improve the physical quality and durability of buildings, enhance the pedestrian experience, and protect the character of the downtown area.		

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
i. Primary Materials: Not less than 80 percent of each street-facing Facade shall be constructed of primary materials comprised of high quality, durable, and natural materials. For Facades over 100 square feet, more than one primary material shall be used. Changes between primary materials must occur only at inside corners. The following are considered acceptable primary materials: a. Brick and tile masonry; b. Native stone; c. Wood – panels, clapboard or shingles; d. Glass curtain wall; and, e. Cementitious siding;	See Project Narrative section 2.4 Proposed Exterior Finish Materials Table and drawings A-201 and A-202 Building Elevations. Also see FIGURES 4-A through 4-D. Primary materials consist of Brick-Faced Panels, Limestone Finished Panels, Glazing, and Stone Base.	☒ In compliance <u>Explanation/Notes:</u>
ii. Accent Materials: The following accent materials may make up no more than 20% of the surface area on each street-facing façade. Accent materials are limited to: a. Pre-cast masonry (for trim and cornice elements only); b. External Insulation Finishing System - EIFS (for upper story trim and cornice elements only); c. Gypsum Reinforced Fiber Concrete (GFRC—for trim elements only); d. Metal (for beams, lintels, trim elements and ornamentation, and exterior architectural metal panels and cladding only); e. Split-faced block (for piers, foundation walls and chimneys only); and. f. Glass block.	See Project Narrative section 2.4 and drawings A-201 and A-202 Building Elevations. See FIGURE 4-E. Accent materials consist of Metal Panels.	☒ In compliance <u>Explanation:</u>
iii. Alternate Materials: Alternate materials, including high quality synthetic materials, may be approved by the administrative officer after seeking input from the Design Advisory Board. New materials must be considered equivalent or better than the materials listed above and must demonstrate successful, high quality local installations. Regionally-available materials are preferred.	Not applicable.	☒ Not applicable <u>Explanation:</u> No request for alternate materials has been submitted.
iv. Other:		
a. The use of recycled and/or regionally-sourced materials is strongly encouraged.		
b. With the exception of natural wood siding or shingles such as cedar or redwood intended to gradually weather with time, all exposed wood and wood-like products (e.g. fiber-cement) shall be painted or stained. Exterior trim shall be indistinguishable from wood when painted.	Not applicable.	☒ Not applicable
c. Any synthetic siding and finish products shall be smooth-faced with no artificial grain texturing.	Not applicable.	☒ Not applicable

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
4.) Alternative Compliance: Relief from any non-numerical standard above, and relief from any numerical standard with the exception of building height and FAR by no more than 20% of such requirement, may be granted by the Development Review Board after review and comment by the Design Advisory Board and the administrative officer. In granting such relief, the DRB shall find that: i. the relief sought is necessary in order to accommodate unique site and/or Building circumstances or opportunities; ii. the relief if granted is the minimum necessary to achieve the desired result; iii. the property will otherwise be developed consistent the purpose of this ordinance, the purpose of the underlying Zoning District and this Overlay District, the purpose of the section that the relief is being sought, and all other applicable standards; iv. the relief if granted will not impose an undue adverse burden on existing or future development of adjacent properties; and, v. the relief if granted will yield a result equal to or better than strict compliance with the standard being relieved.		☒ Not applicable <u>Explanation:</u> No request for alternative compliance has been submitted.
<u>3. Use</u>		☒ Applicable
Mixed Use Buildings: Any new or substantially rehabilitated building over 105’ in total height shall include a mix of uses including no less than 25% of the gross leasable floor area dedicated to non-residential uses and another 25% or more dedicated to residential use.	See Project Narrative section 2.3, drawings A-051, A-052, and A-053 Floor Plans. Non-Residential mixed uses are provided. • Retail: 13% • Office: 24% • Non-Residential Parking: 21% Total: 57% Non-Residential. Residential uses provided: • Residential: 31% • Residential Parking: 11% Total: 42% Residential.	☒ In compliance <u>Explanation:</u>
<u>4. Parking</u> <i>(provided onsite)</i>		☒ Applicable
i. All onsite parking shall be provided in one or more of the following: a. an underground parking structure (strongly preferred); b. an above ground parking structure separated from the public street by a liner building a minimum of 40-ft in depth; or, c. a mixed-use building where with parking located underground, setback a minimum of 40-ft behind the façade of building at the ground level, and/or above the ground floor.	See Project Narrative sections 2.8, 5.3, drawings A-051, and A-052 Floor Plans. Parking for tenants and visitors is provided at and above the second floor of the development on floors 2 through 5 of the South Tower. Parking is separated from Cherry and Bank Streets by Residential Uses. Parking is screened from view at St. Paul and Pine Streets by façade elements.	☒ In compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
ii. All onsite parking shall participate in any Downtown Parking and Transportation Management District in order to minimize the amount of parking provided and maximize the efficiency of its utilization.	See Project Narrative section 5.3.	☒ In compliance <u>Explanation:</u>
iii. Vehicular entrances to parking structures shall not exceed 24-ft clear width and 16-ft clear height at the street frontage.	See drawings A-201 and A-202 Building Elevations. Vehicular parking access is provided on both Cherry and Bank Streets and does not exceed 24’-0” width and 16’-0” height.	☒ In compliance <u>Explanation:</u>
iv. At least one pedestrian route from all parking structures shall lead directly to a street frontage (i.e., not directly into a Building). When portions of a building containing parking front on more than one street, multiple pedestrian routes to street frontage is strongly encouraged.	See Project Narrative section 2.8 and drawing A-051 Floor Plans. Pedestrian access to parking area is provided at Cherry, Pine, and St. Paul Streets.	☒ In compliance <u>Explanation:</u>
v. All structured parking with frontage on any portion of a public street shall be treated as follows:		☒ Applicable St. Paul and Pine Street facades only
a. The required setback between the parking and the public street at the ground level must be occupied by an active use (such as, but not limited to, residential lobby, retail, office, recreational or services). This requirement shall not apply to parking located either entirely below-grade or above the second floor where parking may extend out to the building’s perimeter.	Parking is located above the second floor.	☒ In compliance <u>Explanation:</u>
b. All floors of a parking structure fronting a public street must be level (not inclined), and any sloped ramps between parking levels must be setback a minimum of 20-ft from the street-facing building façade and shall not be discernible along the perimeter of the parking structure.	See drawings A-051 and A-052 Floor Plans. Parking floors are level and sloped ramps will not be discernible along the perimeter of the structure.	☒ In compliance <u>Explanation:</u>
c. Where upper stories of structured parking are located at the perimeter of a building, parked vehicles, vehicle headlights and interior lighting shall be screened from view from the street and adjacent properties.	See Project Narrative 2.8, drawings A-201, and A-202 Building Elevations. At St. Paul and Pine Streets vehicle headlights are visually screened from view with glazed panels. Interior lighting shall be screened from view by interior valances set back from the façade.	☒ In compliance <u>Explanation:</u>
d. In addition to the Urban Design Standards required above, facade treatments (materials, fenestration patterns, and architectural detailing) must be continued on stories containing parking in a manner consistent with the overall architectural design of the Building and such that levels of parking are not clearly distinguishable from other uses in a building.	See Project Narrative 2.8, drawings A-201, and A-202 Building Elevations. Parking areas are screened from public view with building façade elements consistent with the scale and materials of the overall development.	☒ In compliance <u>Explanation:</u>
vi. Each parking space provided in an underground parking structure may be counted as 1.75 of the parking spaces as required in Art 8.	Not applicable.	☒ Not applicable

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
5. <u>Signs</u>		☒ Applicable <u>Explanation:</u> No signage has been proposed under this application. This section is applicably only for awning and canopy design and dimensional requirements
A master sign plan pursuant to Article 7 Part 3 is required for all sites occupied by more than three tenants where all signs must meet the requirements of the master sign plan. The master sign plan must establish standards of consistency as applicable of all signs to be provided on the subject property with regard to: • Colors; • Letter/graphics style; • Location and Sign Type; • Materials; • Methods of illumination; and/or • Maximum dimensions and proportion.	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
In addition to the flexibility from the requirements of Article 7 provided under Sec. 7.3.4, the following shall also be permitted when incorporated as part of a master sign plan in the DMUC Overlay:		☒ Not applicable
i. The area of projecting signs, marques, canopies and awnings shall not be deducted from the maximum allowed signage area permitted for signage under Sec 7.2.3.	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
ii. Projecting Signs: One projecting sign may be permitted for each ground floor use provided each sign:	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
a. does not exceed 8 square feet in area;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
b. does not project more than 4 feet from the building façade on which it is attached;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
c. has its lowest edge at least eight (8) feet above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
d. has its highest edge no more than eighteen (18) feet above any pedestrian way; and,	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
e. Any encroachment into the public right-of-way must also be approved by the City Council.		☒ Not applicable
iii. Marquee Signs: One marquee sign per street frontage may be permitted provided such sign:		☒ Not applicable

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
a. is associated with the following uses only: Cinema, Conference Center, Convention Center, Performing Arts Center and Recreation Facility-Indoor;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
b. is located above the principal Building entrance;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
c. projects a minimum of 6 feet from the building façade on which it is attached but in no event more than 10 feet and 3 feet from the curb;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
d. has its lowest edge at least 9’6” above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
e. has its highest edge no more the lesser of the floor level of the third story or 35 feet above any pedestrian way;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
f. is no more than 40 feet in width;	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
g. may contain an area for manual changeable copy that does not exceed 30 percent of the area of the sign face on which it is located or 32 square feet, whichever is less; and,	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
h. Any encroachment into the public right-of-way must also be approved by the City Council.		☒ Not applicable
iv. Canopies and Awnings: Where provided, awnings and canopies placed on a building facade shall meet the following specifications:		☒ Applicable
a. Awnings and canopies shall provide 8’ minimum clear height above the finished grade, and shall project a minimum of 6’ from the building façade to a maximum of 2’ from the curb. 14’ minimum clear height above the finished grade shall be provided above any area used for parking or circulation. Any encroachment into the public right-of-way must also be approved by the City Council.	See drawings A-201 and A-202 Building Elevations. Awnings are located at Retail Use areas along all four streets. Due to sidewalk pitch, the height varies from 12’-0” to 28’-0”, and in no case is less than 8’-0” above sidewalk. Awnings project from façade 5’-0” . Canopies at Main Pedestrian Entrances are typically at +/- 30’-0” above sidewalk (depending on grade) and extend +/- 12’-0” from façade, not to within 2’ of the curb. Vehicular entrance clear heights are typically 16’-0”.	☒ In compliance <u>Explanation:</u>
b. Awnings and canopies shall be placed, sized, shaped and proportioned to match the associated openings.	See drawings A-201 and A-202 Building Elevations. Awnings are placed, sized, shaped, and proportioned to the associated openings.	☒ In compliance <u>Explanation:</u>
c. Except as provided below, awnings and canopies shall not be internally illuminated or backlit, however they may contain lighting fixtures intended to illuminate the ground beneath.	See Project Narrative section 2.13 and L-500 Lighting/Photometric Plan. Canopies contain lighting fixtures illuminating the ground, See FIGURE 4-I.	☒ In compliance <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
d. Awnings shall have a metal structure covered with non-translucent canvas, synthetic canvas or painted metal, and shall have no soffit or sides. Retractable awnings are encouraged.	See drawings A-201 and A-202 Building Elevations, as well as A-221, A-224, A-227, and A-230. Awnings are painted steel to match panels used throughout development and glass.	☒ In compliance <u>Explanation:</u>
e. Awnings shall be rectangular in elevation and triangular in cross-section with straight edges. The valance of the awning shall be no more than 12” in height.	See drawings A-201 and A-202 Building Elevations, as well as A-221, A-224, A-227, and A-230.	☒ In compliance <u>Explanation:</u>
f. Canopies shall be constructed of wood and/or metal, and shall be cantilevered or supported from above. The face of the canopy shall be no more than 24” in height.	See drawings A-201 and A-202 Building Elevations. Canopies are constructed of steel structure with glass panels. They are cantilevered from the building structure and are no more than 24” in height. See A-233.	☒ In compliance <u>Explanation:</u>
g. Signage placed on an awning or canopy shall be limited to the windows and doors on the first (ground) floor, and shall not extend outside the overall length or width.	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
h. Signage placed on a canopy shall be limited to the face or may project above and may be backlit.	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
i. Signage placed on an awning or canopy shall be limited to: i. 75% of the valance or canopy face and/or 25% of the sloping plane max. ii. The height of lettering shall be limited to: 5” min - 10” max on the valance; 18” max on the sloping plane; or 24” max on or above the canopy.	See Project Narrative section 2.10. Not applicable.	☒ Not applicable
<u>6. Green Buildings and Stormwater Management</u>		
A. Green Buildings: New development and substantial redevelopment in the DMUC Overlay shall be built to the standard of LEED Gold Certification, or a nationally recognized equivalent as determined by the administrative officer.		

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
i. At the time of application the following shall be required: a. the submission of documentation of the planned performance criteria and elements of the project necessary to obtain the required green building certification (e.g. LEED checklist); b. documentation that the project has been registered with the applicable green building certification program (e.g. LEED project registration); and, c. a written commitment to apply for formal, written review of the project at the earliest milestone where the green building certifying body offers "precertification" or similar (e.g. LEED Design Review).	See Project Narrative section 2.11 and FIGURES 2-A LEED Checklist and 2-B USGBC Registration Receipt.	☒ In compliance Explanation:
ii. Prior to the release of any Final Certificate of Occupancy the following shall be required: a. the submission of revised as-built performance criteria and project elements necessary to obtain the required green building certification (e.g. LEED checklist): b. the results of 3rd party commissioning of the building envelope and mechanical systems documenting compliance of as-built performance; and, c. a written certification from the project design professional of record that the project has been constructed to comply with the green building requirements of this section.		☐ Required permit condition included
B. Stormwater Management: Stormwater runoff from 100% of all net new and substantially redeveloped impervious area (or an equivalent area of impervious)) must be captured and managed in such a way as to mimic pre-development (meadow in good condition, Hydrologic Soil Group B) runoff (or discharge) ratio for the 1 year, 24 hour design storm subject to review and approval by the DPW Water Resources Div. The feasibility of implementing runoff volume reduction practices must be evaluated in consultation with the DPW Water Resources Division and shall include an evaluation of the engineering feasibility of techniques including, but not limited to runoff reduction through stormwater reuse, green stormwater infrastructure such as green roofs, bioretention, tree planting and sewer separation of roof water for sites currently discharging to the combined sewer system. Storage and detention methods may be used to meet pre-development flow targets. When and where detention systems are the primary mode of stormwater management, “smart” precipitation integrated detention systems must be evaluated and are strongly preferred. On-site stormwater management must be maximized; however, off-site stormwater management may also be used in consultation with DPW Water Resources.	See Project Narrative section 2.12.	☒ In compliance Explanation: To be confirmed by the DPW Water Resources Div. Conservation Board has recommended approval



Thickness (Inches)	Transmittance Visible %	Exterior Visible Reflectance %	Interior Visible Reflectance %	U-Value (Winter Nighttime) (Btu/hr-ft ² -°F)	Solar Heat Gain Coefficient (SHGC)	Light To Solar Gain (LSG)	Thermal Stress Risk
Starphire® 6mm Air (10%) / Argon (90%) Mix 1/2" (12.7mm) Starphire® 6mm							
1"	84	15	15	0.45	0.82	1.02	Low

① Specifications

Insulating Unit Construction

Starphire® 6mm | Air (10%) / Argon (90%) Mix 1/2" (12.7mm) | Starphire® 6mm

Indoor Lite: Starphire® 6mm

Outdoor Lite: Starphire® 6mm

PPG Approved Manufacturers/Where to Buy PPG Products: PPG Glass Fabricator

Certification: PPG lite(s) are Cradle to Cradle certified by McDonough Braungart Design Chemistry, LLC (MBDC www.mbdc.com)

Starphire®: Starphire® Ultra-Clear glass is a unique low-iron glass, the clearest float glass available, delivering high light transmittance and true-color fidelity.

The results represent Center-of-Glass performance data based on NFRC 100 Environmental Design Conditions utilizing the LBNL Window 7.3 software program. Performance data is based on representative samples of factory production. Actual values may vary slightly due to variations in the production process. This data is to be used for comparison purposes and should not be considered a contract. It is the recipient's responsibility to ensure the manufacturability of the above glazing configurations as well as evaluating appropriate design considerations such as wind and snow load analysis, thermal stress analysis, and local building code compliance. Vitro recommends that a full size mock-up be reviewed under the specific job-site conditions and retain the mock-up as a basis of acceptable product.

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Solarban® 60 on Clear 6mm (2) Air (10%) / Argon (90%) Mix 1/2" (12.7mm) Clear 6mm							
1"	70	11	12	0.24	0.39	1.79	Med

Specifications

Insulating Unit Construction

Solarban® 60 on Clear 6mm (2) | Air (10%) / Argon (90%) Mix 1/2" (12.7mm) | Clear 6mm

Indoor Lite: Clear 6mm

Outdoor Lite: Clear with a second surface Solarban® 60

PPG Approved Manufacturers/Where to Buy PPG Products: PPG Certified Network (CFP, CLP, CCWF) OR PPG Qualified Supplier (QSP)

Certification: PPG lite(s) are Cradle to Cradle certified by McDonough Braungart Design Chemistry, LLC (MBDC www.mbdc.com)

Solarban® 60: Solarban® 60 glass is a mid-range MSVD solar control low-e glass. Though the coating is transparent (on clear or Starphire® Ultra-Clear glass), it can also be paired with, or applied directly on most PPG tinted glasses in an insulating glass unit.

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Solarban® 60 on Starphire® 6mm (2) Air (10%) / Argon (90%) Mix 1/2" (12.7mm) Starphire® 6mm							
1"	74	11	12	0.24	0.41	1.80	Low

Specifications

Insulating Unit Construction

Solarban® 60 on Starphire® 6mm (2) | Air (10%) / Argon (90%) Mix 1/2" (12.7mm) | Starphire® 6mm

Indoor Lite: Starphire® 6mm

Outdoor Lite: Starphire® with a second surface Solarban® 60

PPG Approved Manufacturers/Where to Buy PPG Products: PPG Certified Network (CFP, CLP, CCWF)

Certification: PPG lite(s) are Cradle to Cradle certified by McDonough Braungart Design Chemistry, LLC (MBDC www.mbdc.com)

Solarban® 60: Solarban® 60 glass is a mid-range MSVD solar control low-e glass. Though the coating is transparent (on clear or Starphire® Ultra-Clear glass), it can also be paired with, or applied directly on most PPG tinted glasses in an insulating glass unit.

Starphire®: Starphire® Ultra-Clear glass is a unique low-iron glass, the clearest float glass available, delivering high light transmittance and true-color fidelity.

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Solarban® 70XL * 6mm (2) Air (10%) / Argon (90%) Mix 1/2" (12.7mm) Clear 6mm							
1 "	64	12	13	0.24	0.27	2.37	Low

Specifications

Insulating Unit Construction

Solarban® 70XL * 6mm (2) | Air (10%) / Argon (90%) Mix 1/2" (12.7mm) | Clear 6mm

Indoor Lite: Clear 6mm

Outdoor Lite: with a second surface Solarban® 70XL

PPG Approved Manufacturers/Where to Buy PPG Products: PPG Certified Network (CFP, CLP, CCWF)

Certification: PPG lite(s) are Cradle to Cradle certified by McDonough Braungart Design Chemistry, LLC (MBDC www.mbdc.com)

Note(*): Solarban 70XL for annealed applications is applied to Starphire® glass; heat treated applications will require either clear or Starphire glass depending on the manufacturing process. For international markets, Solarban 70XL is only available on clear glass and must always be heat treated.

Solarban® 70XL: Solarban® 70XL glass is a high performing MSVD solar control low-e glass. Though the coating is transparent (on clear or Starphire® Ultra-Clear glass), it can also be paired with, or applied directly on most PPG tinted glasses in an insulating glass unit.

Starphire®: Starphire® Ultra-Clear glass is a unique low-iron glass, the clearest float glass available, delivering high light transmittance and true-color fidelity.

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Solarban® 70XL * 6mm (2) Air (10%) / Argon (90%) Mix 1/2" (12.7mm) Starphire® 6mm							
1 "	66	12	13	0.24	0.27	2.44	Low

Specifications

Insulating Unit Construction

Solarban® 70XL * 6mm (2) | Air (10%) / Argon (90%) Mix 1/2" (12.7mm) | Starphire® 6mm

Indoor Lite: Starphire® 6mm

Outdoor Lite: with a second surface Solarban® 70XL

PPG Approved Manufacturers/Where to Buy PPG Products: PPG Certified Network (CFP, CLP, CCWF)

Certification: PPG lite(s) are Cradle to Cradle certified by McDonough Braungart Design Chemistry, LLC (MBDC www.mbdcc.com)

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(Glass Type: N, FT)

ARCHITECTURAL GUIDE SPECIFICATION SECTION 08 81 00 GLASS GLAZING

Note to Specifiers:

The specifications below are suggested as desirable inclusions in glass and glazing specifications (section 08 81 00), but are not intended to be complete. An appropriate and qualified Architect or Engineer must verify suitability of a particular product for use in a particular application as well as review final specifications. Oldcastle BuildingEnvelope® assumes no responsibility or liability for the information included or not included in these specifications.

PRODUCTS

Approved Glass Fabricator	Oldcastle BuildingEnvelope®
Glass Description	FLOAT GLASS
	1. USA - Annealed float glass shall comply with ASTM C1036, Type I, Class 1 (clear), Class 2 (tinted), Quality-Q3. Canada - Annealed float glass shall comply with CAN/CGSB-12.3-M, Quality-Glazing.
	2. USA- Heat-strengthened float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind HS. Canada - Heat-strengthened float glass shall comply with CAN/CGSB-12.9-M, Type 2-Heat-Strengthened Glass, Class A-Float Glass.
	3. USA - Tempered float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind FT. Canada - Tempered float glass shall comply with CAN/CGSB-12.1-M, Type 2-Tempered Glass, Class B-Float Glass.
	4. USA - Laminated glass to comply with ASTM C1172. Canada - Laminated glass to comply with CAN/CGSB-12.1-M, Type 1-Laminated Glass, Class B-Float Glass.
	5. Glass shall be annealed, heat-strengthened or tempered as required by codes, or as required to meet thermal stress and wind loads.

Sealed Insulating Glass (IG) Vision Glass (Vertical)	GENERAL
	1. IG units consist of glass lites separated by a dehydrated airspace that is hermetically dual sealed with a primary seal of polyisobutylene (PIB) and a secondary seal of silicone or an organic sealant depending on the application.
	2. USA - Insulating glass units are certified through the Insulating Glass Certification Council (IGCC) to ASTM E2190. Canada - Insulating Glass units are certified through the Insulating Glass Manufacturers Alliance (IGMA) to either the IGMAC certification program to CAN/CGSB-12.8, or through the IGMA program to ASTM E2190.

IG VISION UNIT PERFORMANCE CHARACTERISTICS

1. Exterior Lite			
1/4" Guardian SunGuard® SuperNeutral® 68 on Clear Low-E #2			
2. Interior Lite			
1/4" Clear			
3. 1/2" Cavity			
1/2 inch (90% Argon Fill)			
4. Performance Characteristics			
Thermal		Optical	
Winter U-factor/U-value:	0.25	Visible Light Transmittance:	67%
Summer U-factor/U-value:	0.22	Visible Light Reflectance (outside):	11%
Solar Heat Gain Coefficient:	0.37	Visible Light Reflectance (inside):	12%
Shading Coefficient:	0.43	Total Solar Transmittance:	32%
Relative Heat Gain (Btu/hr-ft²):	88	Total Solar Reflectance (outside):	32%
Light to Solar Gain:	1.81	Ultraviolet Transmittance:	30%

Contact Oldcastle BuildingEnvelope® at 866-Oldcastle (653-2278) for samples or additional information concerning performance, strength, deflection, thermal stress or application guidelines. GlasSelect® calculates center of glass performance data using the Lawrence Berkeley National Laboratory (LBNL) Window 6.3 program (version 6.3.74.0) with Environmental Conditions set at NFRC 100-2001. Gas Library ID#1 (Air) is used for Insulating Glass units with air. Gas Library ID#9 (10% Air/90% Argon) is used for Insulating Glass units with argon. Monolithic glass data is from the following sources: 1. LBNL International Glazing Database (IGDB) version 38.0; 2. Vendor supplied spectral data files. Laminated glass data is from the following sources: 1. LBNL International Glazing Database (IGDB) version 38.0; 2. LBNL Optics 6 (version 6.0 Maintenance Pack 1); 3. Vendor supplied spectral data files; 4. Vendor supplied data. 5. Based on vendor testing, clear acid-etched glass performance data is estimated using regular clear glass of equivalent thickness. Thermal values are in Imperial units.

BURLINGTON TOWN CENTER

BURLINGTON, VERMONT

PLANNING & ZONING SUBMISSION



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12/15/16		P&Z Submission	
1/11/16		P&Z Resubmission I	
Date	No.	Description	

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

Drawing Title

COVER SHEET

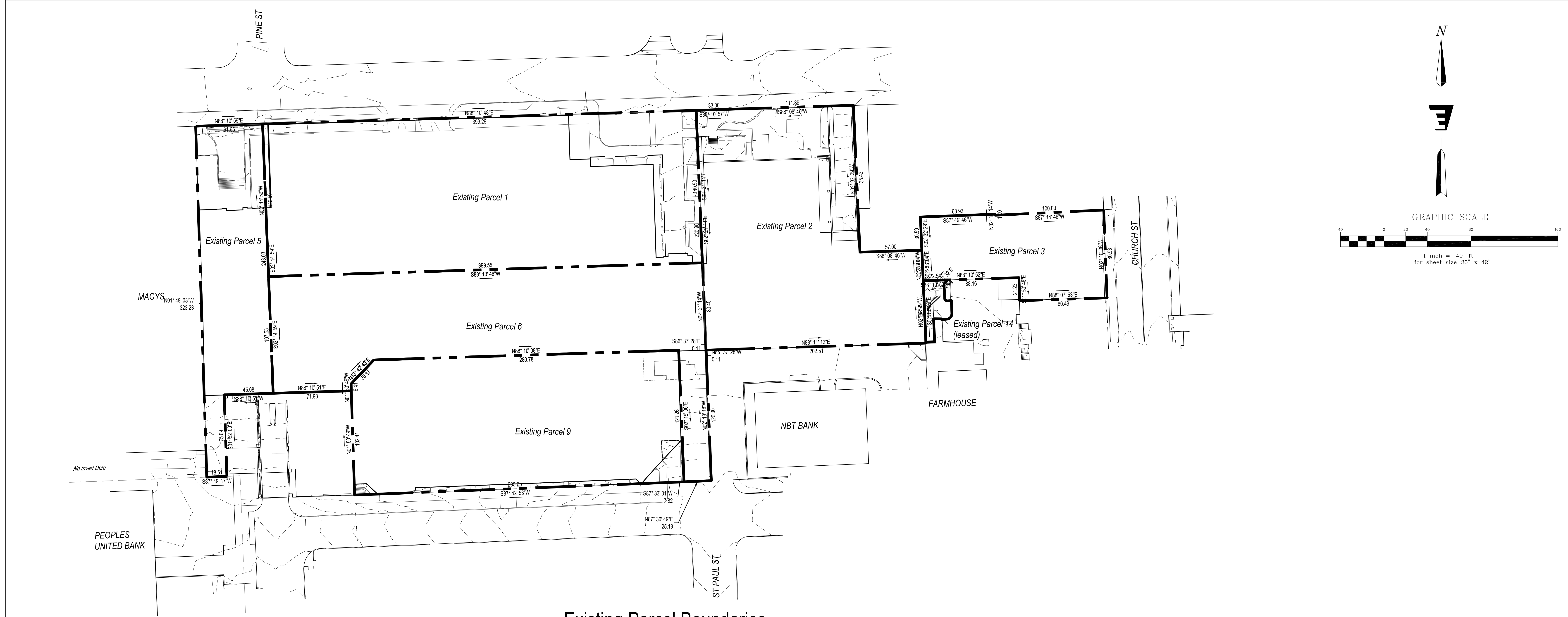
Project Number	Signature & Date
1317-01	
Drawn By	
Designer	
Checked By	
Checker	
Scale	

Drawing Number

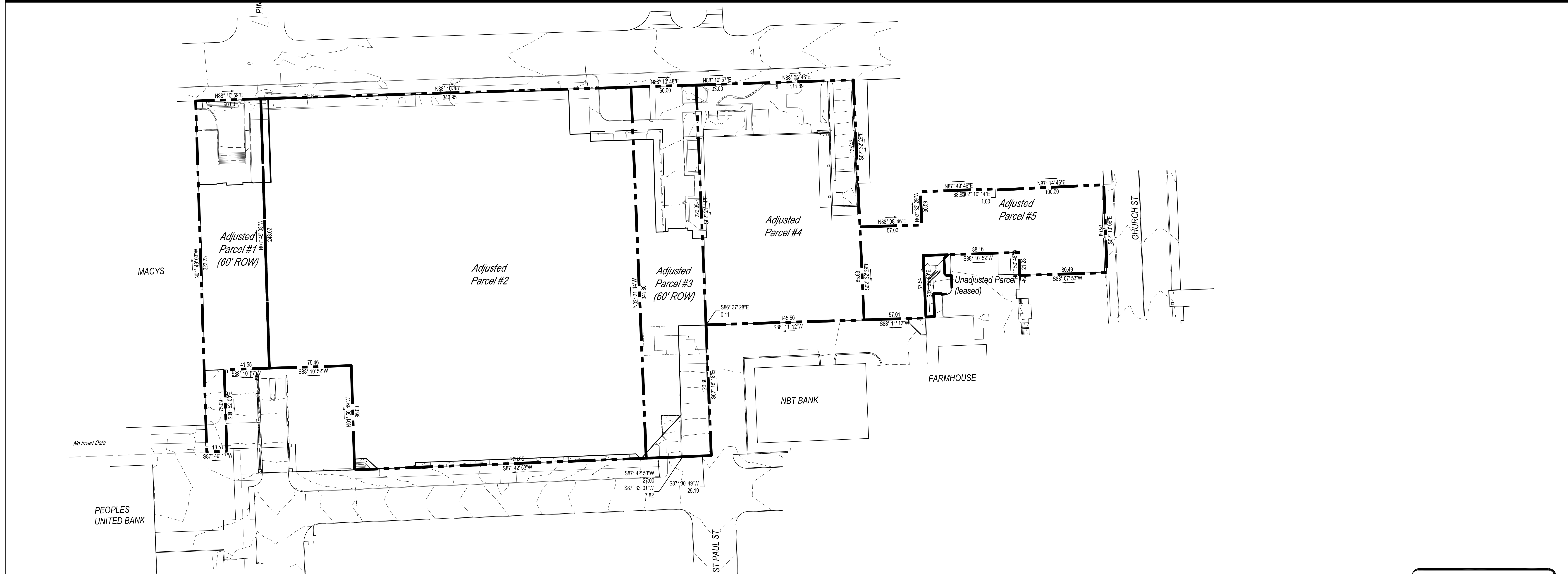
T-000

New Building Application Number

Drawing



Existing Parcel Boundaries



Proposed Adjusted Parcel Boundaries

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Date	No.	Description
12/15/2016	1	P & Z Submission

Burlington Town Center
Devonwood Investors

75 Cherry Street
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Drawing Title

Existing & Adjusted
Parcel Boundaries

Project Number	Revision & Date
1317-01	
Drawn By	
WCJZ	
Checked By	
JZ/KW	
Scale	
As Noted	
Drawing Number	

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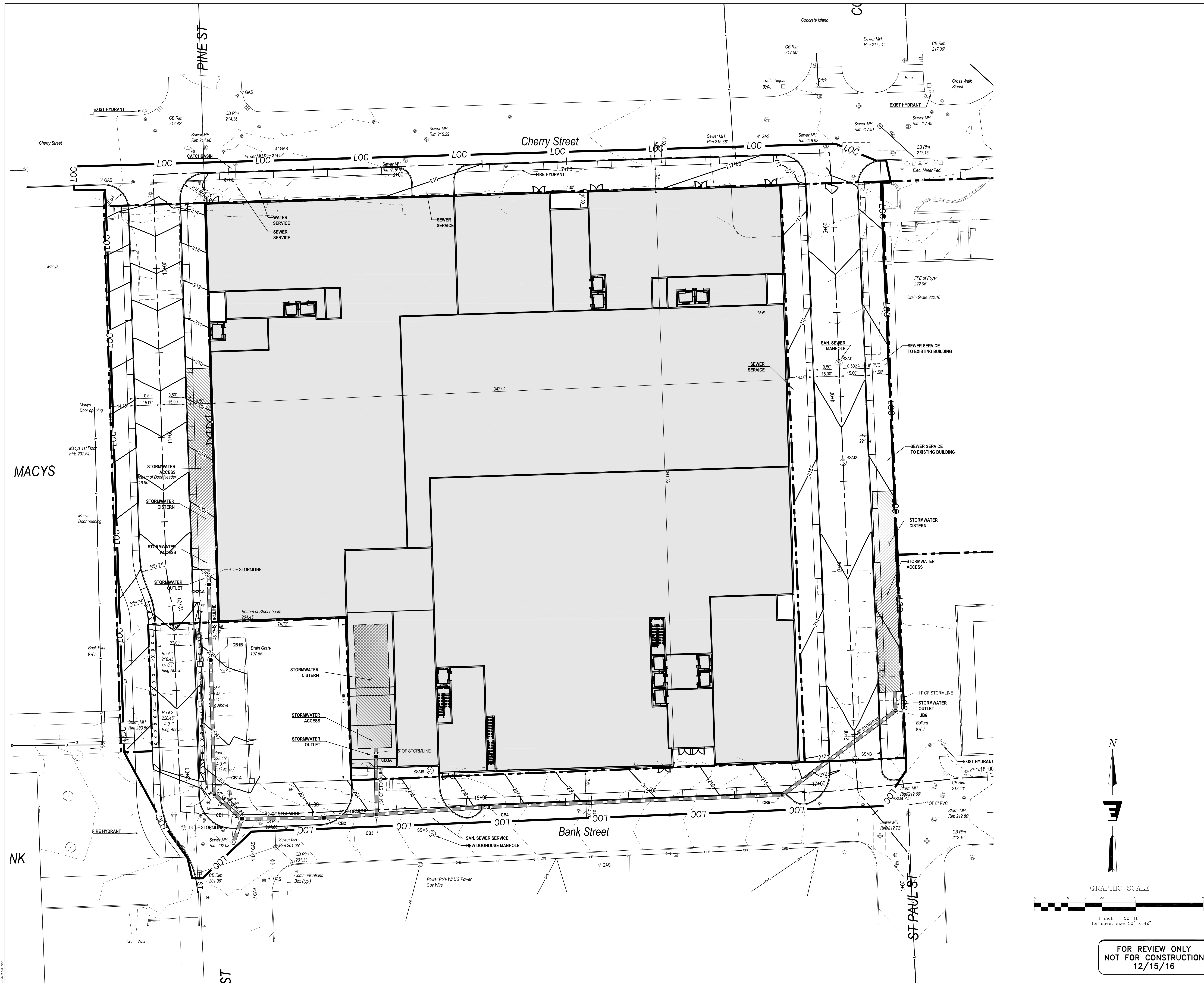
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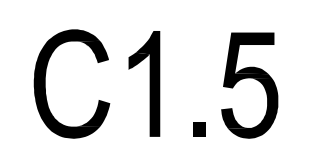
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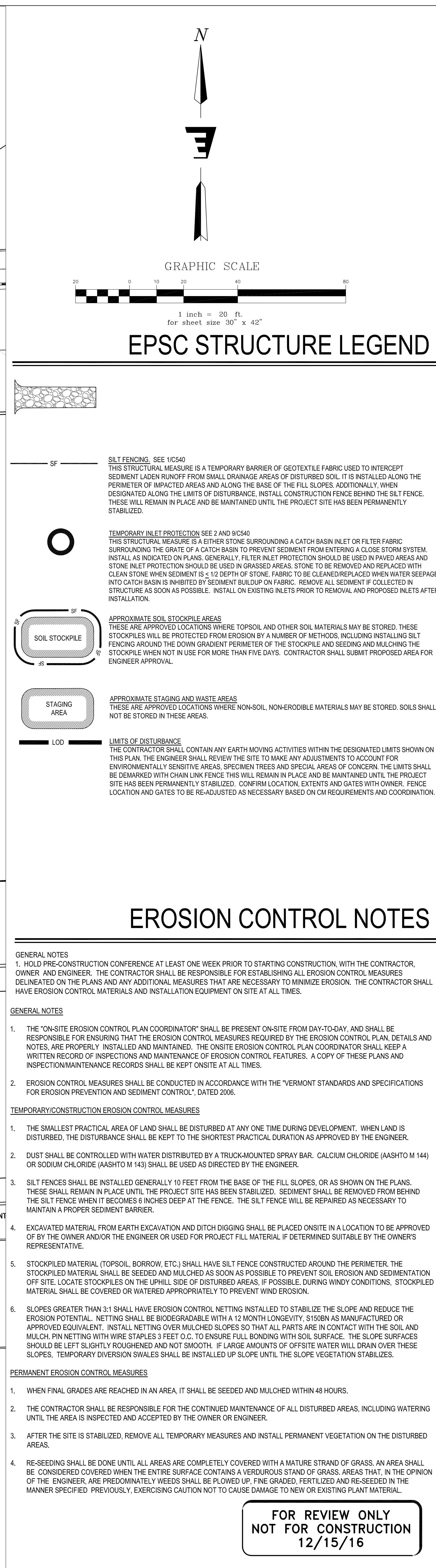
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C1.4







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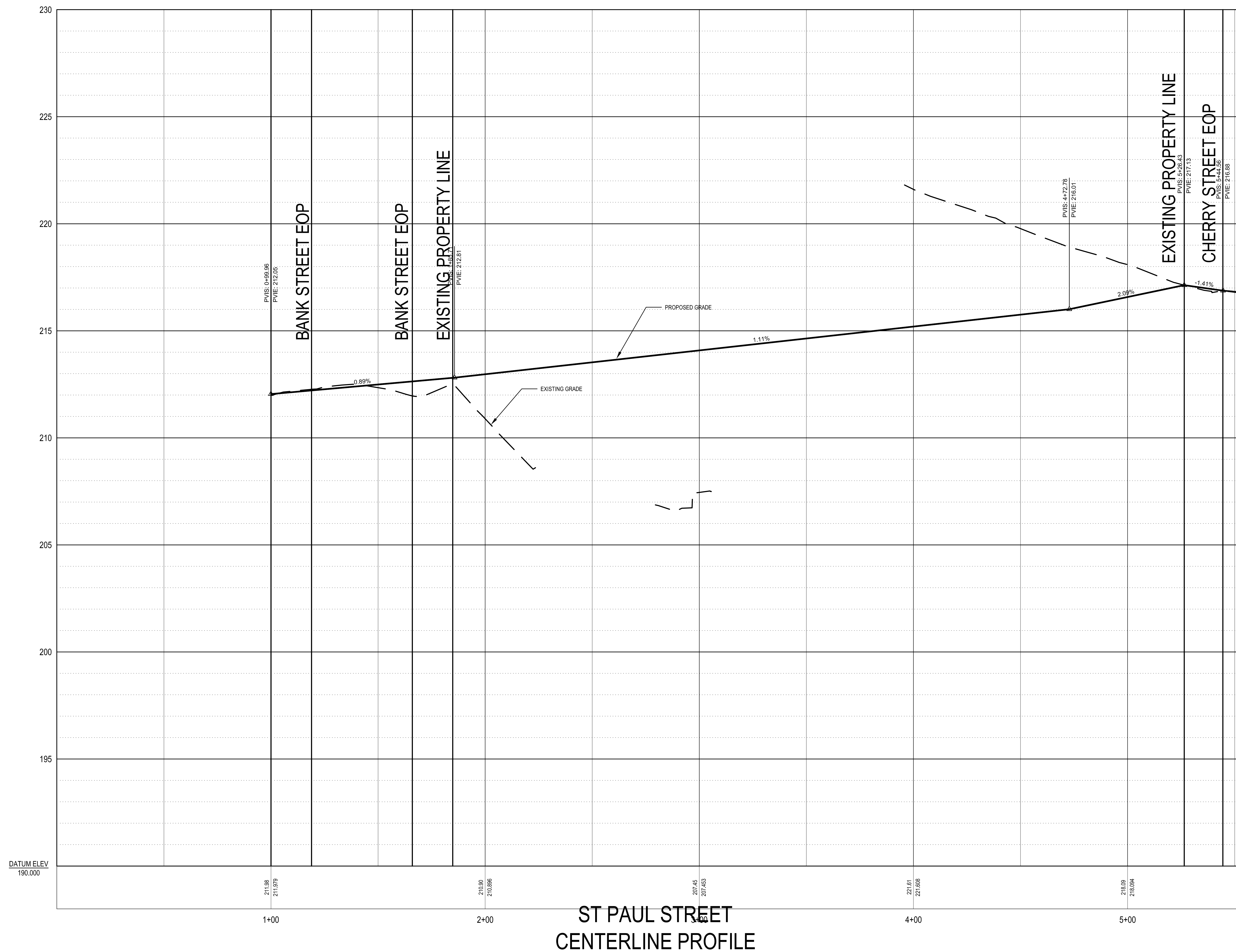
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ST PAUL STREET CENTERLINE PROFILE

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Date	No.	Description

Burlington Town Center
Devonwood Investors

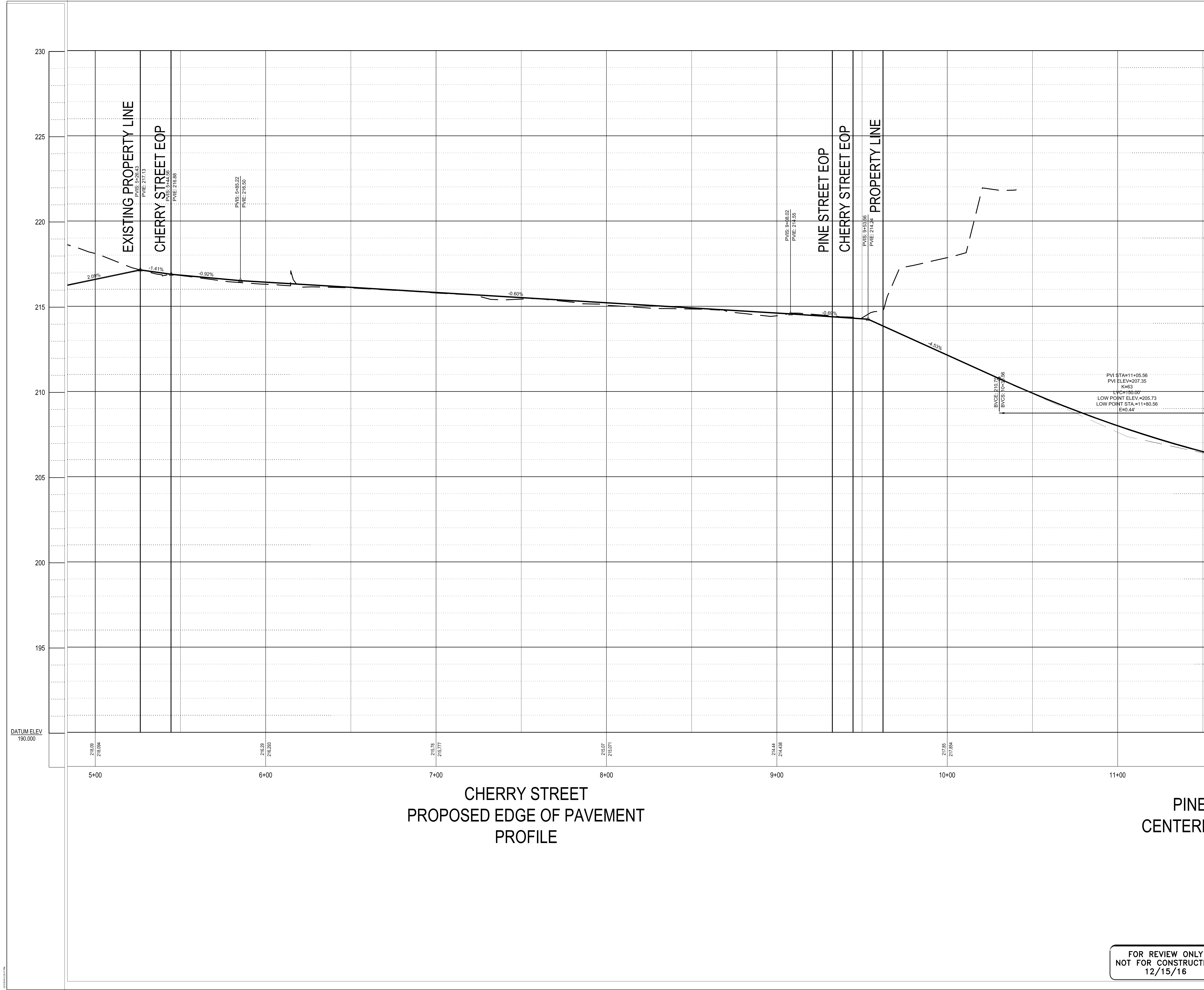
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ST PAUL STREET PROFILE

Project Number:	Signature & Date:
1317-01	
Drawn By:	
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**CHERRY STREET
PROFILE**

Project Number	Signature & Date
1317-01	
Drawn By	
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Checked By	
JZ/KW	
Scale	
As Noted	
Drawing Number	

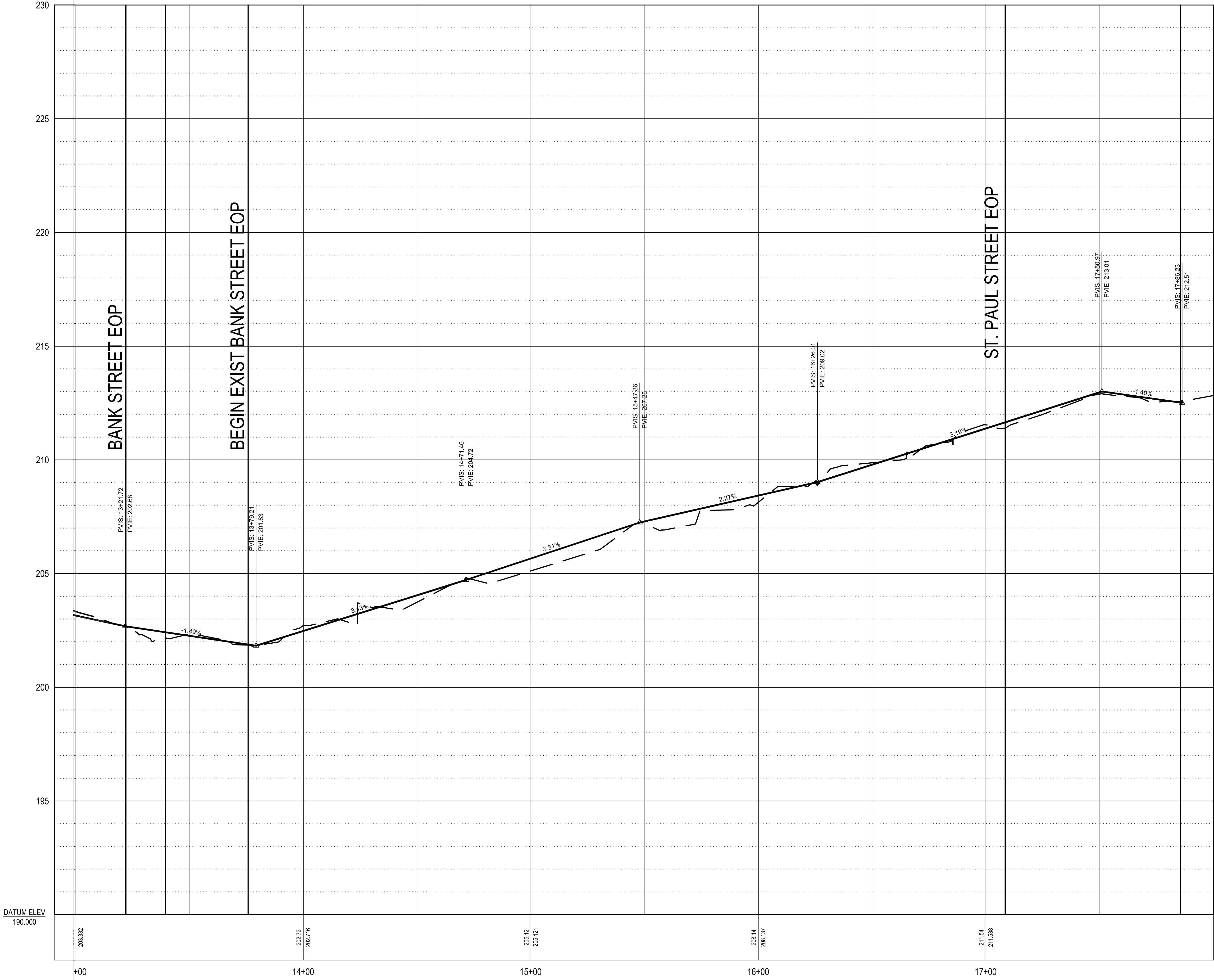
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C2.2



C2.3

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BANK STREET
PROPOSED EDGE OF PAVEMENT
PROFILE

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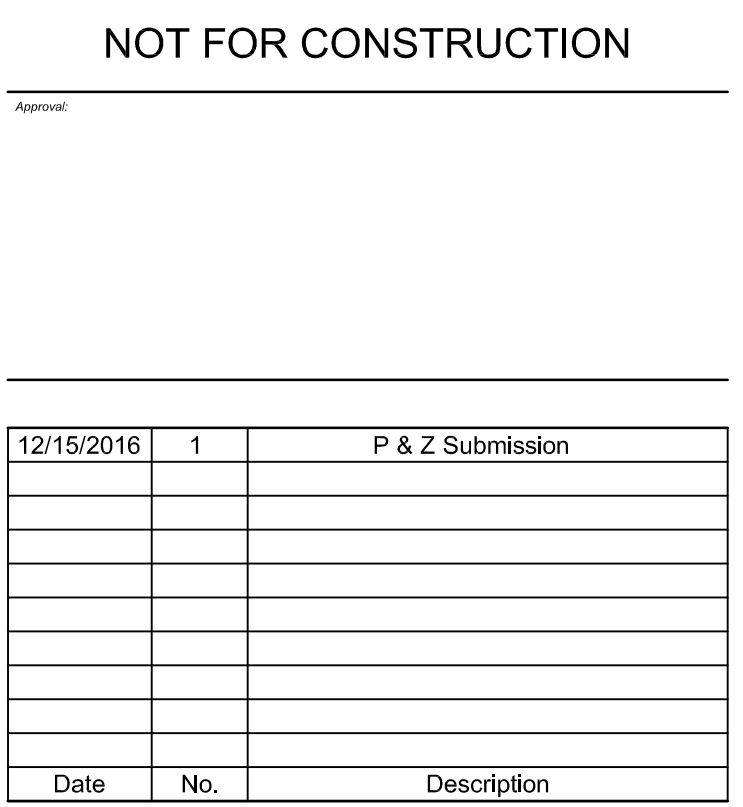
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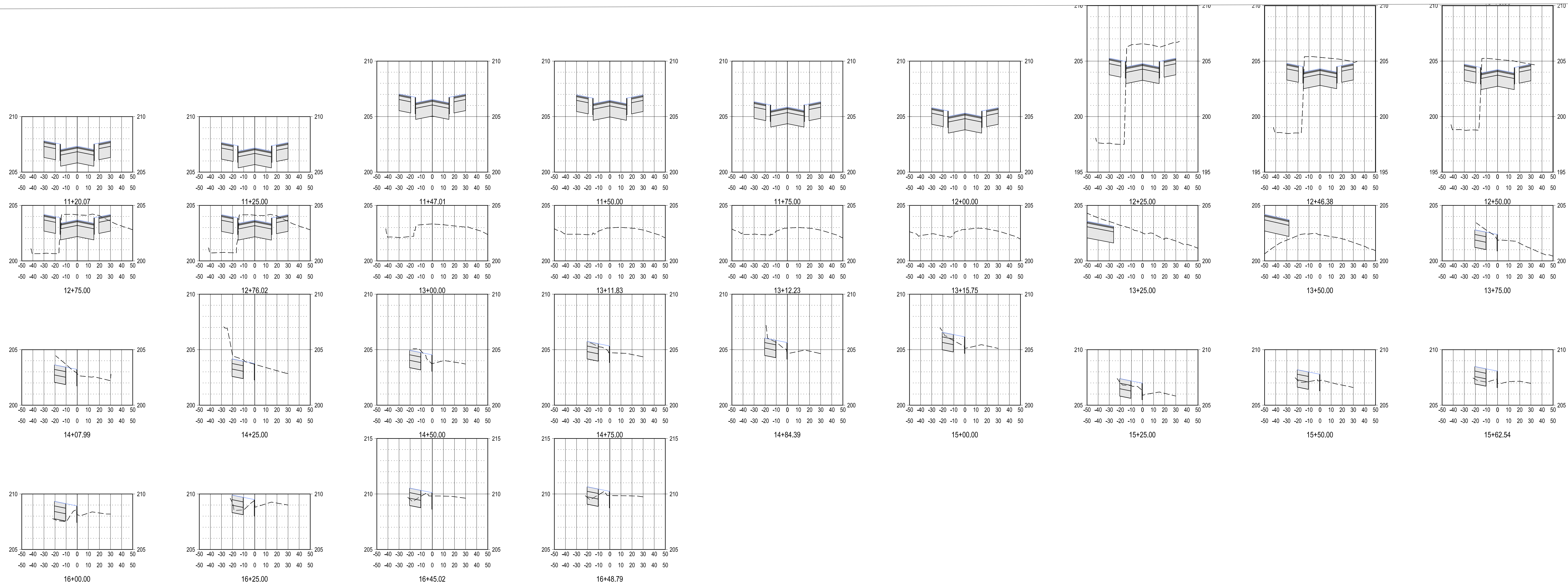
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C2.5



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STREET SECTIONS

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C2.6

DEPENDING ON WASTEWATER FLOW, IT MAY BE NECESSARY PLUG AN UPSTREAM MANHOLE AND PUMP WASTEWATER TO THE NEXT DOWNSLOPE STRUCTURE DURING MANHOLE INSTALLATION.

CONTRACTOR SHALL CONFORM TO GUIDELINES DETAILED IN THE VERNON STATE SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR READING AND FOLLOWING THE FULL COMPLETE EDITION PROVIDED BY THE STATE.

BUILDING SEWERS MUST BE CONSTRUCTED IN A MANNER WHICH WILL PREVENT LEAKING, BREAKING OR CLOGGING.

SIZE AND SLOPE: MINIMUM BUILDING SEWER SIZE IS 4 INCHES (UNLESS SHOWN ON THE PLAN) AND A MINIMUM SLOPE IS 1/4" PER FOOT.

CLEANOUTS: CLEANOUTS SHALL BE PROVIDED AT EACH HORIZONTAL CHANGE IN DIRECTION OF THE BUILDING SEWER GREATER THAN 45 DEGREES AND WHERE INDICATED ON THE DESIGN DRAWINGS. BUILDING SEWER CHANGES IN DIRECTION WHICH EXCEED 45 DEGREES SHOULD BE MADE WITH TWO 45 DEGREE ELBS OR LONG SWEEP FITTINGS. MANHOLES ARE ACCEPTABLE IN LIEU OF CLEANOUTS. WHERE BUILDING SEWERS ARE TO BE INSTALLED AT A DEPTH OF LESS THAN 5 FEET UNDER DRIVEWAYS ARE ANTICIPATED, EXTRA HEAVY CAST IRON PIPE SHALL BE USED.

LEAKAGE: BUILDING SEWERS SHALL MEET THE LEAKAGE STANDARDS PRESCRIBED IN THE STATE OF VERMONT SPECIFICATIONS (EPR- CHAPTER 1). SEE BELOW FOR MORE DETAIL.

SLOPE, VELOCITY: ALL GRAVITY SEWER LINES SHALL BE INSTALLED WITH NOT LESS THAN THE SLOPES SHOWN BELOW:	
PIPE SIZE (INCHES)	SLOPE (FEET/100 FEET)
4"	2%
6"	1%
8"	0.4%

CHANGES IN PIPE SIZE: WHEN A SMALLER SEWER JOINS A LARGER ONE, THE INVERT OF THE LARGER SEWER SHALL BE LOWERED SUFFICIENTLY TO MAINTAIN THE SAME ENERGY GRADIENT.

MATERIAL: PVC SDR 35, ASTM D3034, WITH PUSH-ON GASKETED JOINTS. GASKETS SHALL CONFORM TO ASTM D2122. SEWER JOINTS SHALL BE CONSTRUCTED TO MINIMIZE INFILTRATION AND TO PREVENT THE ENTRANCE OF ROOTS INTO THE SYSTEM.

TRENCHING: LEDGE, ROCK, BouldERS AND LARGE STONES SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF FOUR INCHES BELOW AND ON EACH SIDE OF ALL PIPES.

BEDDING: SEE TRENCH DETAIL DRAWING FOR MATERIALS. TRENCH BACKFILL SHALL BE OF A SUITABLE NATIVE MATERIAL FREE FROM DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER, OR OTHER UNSTABLE MATERIALS.

LEAKAGE TESTS: UPON COMPLETION OF SEWER LINE CONSTRUCTION, THE SEWER LINE SHALL BE TESTED IN ACCORDANCE WITH THE STATE OF VERMONT SPECIFICATIONS (EPR - CHAPTER 1, APPENDIX "A").

LEAKAGE TESTS FOR GRAVITY SEWERS

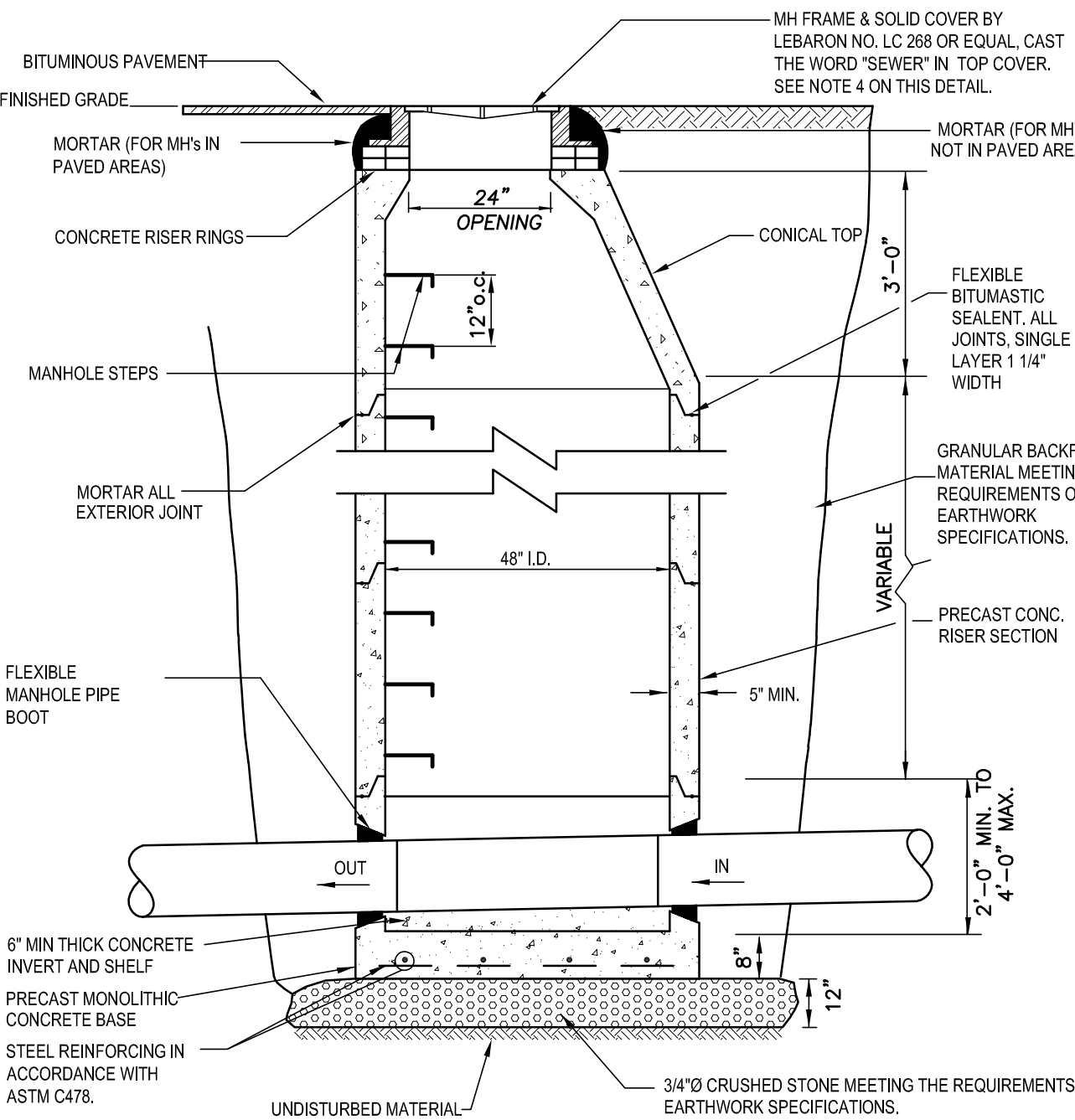
PLUG ALL OPENINGS IN THE TEST SECTION. ADD AIR UNTIL THE INTERNAL PRESSURE OF THE LINE IS RAISED TO APPROXIMATELY 4.0 POUNDS/SQUARE INCH (PSI) GREATER THAN THE AVERAGE PRESSURE OF ANY GROUND WATER. AFTER THIS PRESSURE IS REACHED, ALLOW THE PRESSURE TO STABILIZE. THE PRESSURE WILL NORMALLY DROP AS THE AIR TEMPERATURE STABILIZES. THIS USUALLY TAKES 2 TO 5 MINUTES DEPENDING ON THE PIPE SIZE. THE PRESSURE MAY BE REDUCED TO 3.5 PSI BEFORE STARTING THE TEST.

PIPE SIZE (IN)	T (TIME) (MIN./100FT)
3	0.2
4	0.3
6	0.7
8	1.2

- INSTALLATION:** PIPE SHALL BE LAID WITH BELL ENDS FACING UPGRADE AND LAYING SHALL START AT THE DOWNGRADE END.
- 4. WATER LINE SEPARATION**
- a. **HORIZONTAL SEPARATION:** SEWERS SHALL BE LAID FLAT AT LEAST TEN FEET HORIZONTAL FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
- WHERE IMPOSSIBLE OR IMPRACTICABLE TO MAINTAIN THE TEN FOOT SEWER/WATER PIPE HORIZONTAL SEPARATION, DUE TO LEDGE, BOUNDERS OR OTHER UNUSUAL CONDITIONS) THE WATER LINE MAY BE IN A SEPARATE TRENCH OR ON AN EARTH SHELf IF THE SEWER TRENCH PROVIDED THAT THE BOTTOM OF THE WATER LINE IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, WHEREVER IMPOSSIBLE OR IMPRACTICAL TO MAINTAIN THE 18 INCH VERTICAL SEPARATION, THE SEWER LINE SHALL BE CONSTRUCTED USING PRESSURE PIPE TO NORMAL WATER LINE STANDARDS AND PRESSURE TESTED TO 50 PSI FOR 15 MINUTE PRIOR TO BACKFILLING.
- b. **CROSSINGS:** SEWERS CROSSING WATER MAINS SHALL BE LAID BENEATH THE WATER MAIN WITH AT LEAST 18 INCHES VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF THE SEWER AND THE OUTSIDE OF THE WATER MAIN, WHEN IT IS IMPOSSIBLE TO MAINTAIN THE 18 INCH VERTICAL SEPARATION, THE CROSSING SHALL BE ARRANGED SUCH THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AWAY AS POSSIBLE FROM WATER JOINTS.
- c. THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR AT LEAST THREE FULL LENGTHS, WHICHEVER IS GREATER.
- d. THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS.
- e. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.
- 5. MANHOLES**
- a. **DIAMETERS:** THE MINIMUM DIAMETER OF MANHOLES SHALL BE 48 INCHES. LARGE DIAMETERS ARE PREFERRED FOR CONNECTION TO LARGE DIAMETER SEWERS. A MINIMUM ACCESS DIAMETER OF 24 INCHES SHALL BE PROVIDED.
- b. **FLOW CHANNEL:** FLOW CHANNELS SHALL BE PROVIDED IN THE BASE OF ALL MANHOLES AND THE FLOW CHANNEL, THROUGH MANHOLES SHOULD BE MADE TO CONFORM IN SHAPE AND SLOPE TO THAT OF THE SEWERS.
- c. **MANHOLE SLABS** SHALL BE OF THE PRE-CAST CONCRETE OR POUR-IN-PLACE CONCRETE TYPE. MANHOLES SHALL BE WATERPROOFED ON THE EXTERIOR.
- d. INLET AND OUTLET PIPES SHALL BE JOINED TO THE MANHOLE WITH A RUBBER-GASKETED FLEXIBLE WATERTIGHT CONNECTION THAT ALLOWS DIFFERENTIAL SETTLEMENT OF THE PIPE AND MANHOLE WALL TO TAKE PLACE.
- e. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE. LEAKAGE TESTING OF GRAVITY SEWERS UTILIZING THE WATER TESTING PROCEDURES TAKES INTO ACCOUNT THE LEAKAGE FROM ONE MANHOLE IN THE TEST SECTION. OTHERWISE, MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH THE FOLLOWING PROCEDURE:
1. PRIOR TO THE MANHOLE HAS BEEN ASSEMBLED IN PLACE. ALL LIFTING HOLES AND EXTERIOR JOINTS SHALL BE FILLED WITH AND POINTED WITH AN APPROPRIATE CURING MORTAR. ALL PIPES AND OTHER OPENINGS IN THE MANHOLE SHALL BE SUITABLY PLUGGED AND THE PLUGS PLACED TO PREVENT BLOWOUT.
- EACH MANHOLE SHALL BE CHECKED FOR INFILTRATION BY FILLING WITH WATER TO THE TOP OF THE CONE SECTION. A STABILIZATION PERIOD OF ONE HOUR ALLOW FOR ABSORPTION. AT THE END OF THIS PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE. IF NECESSARY, AND THE MEASURING TIME OF AT LEAST SIX HOURS BEGUN. AT THE END OF THE TEST PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE MEASURING THE VOLUME OF WATER ADDED. THIS AMOUNT SHALL BE CONVERTED TO A 24 HOUR RATE AND THE LEAKAGE DETERMINED ON THE BASIS OF DEPTH. THE LEAKAGE FOR EACH MANHOLE SHALL NOT EXCEED ONE GALLON PER VERTICAL FOOT FOR A 24 HOUR PERIOD FOR EXFILTRATION. THERE SHALL BE NO VISIBLE INFILTRATION. IF AN AIR TEST IS PERFORMED ON THE MANHOLE, INSTEAD OF THE WATER TEST, THE MANHOLE SHALL REMAIN UN-BACKFILLED DOWN TO THE SEWER LINE INVERTS DURING THE AIR TEST.

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ICS 1000 Main Street Durham, UT 05403	Mechanical Engineer (802) 655-4891 www.hallam-ics.com
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Design 1000 Main Street Durham, UT 05403	Geotechnical Engineer (802) 652-5140 www.geodesign.net
Design 1000 Main Street Durham, UT 05403	Landscape Architect (802) 962-0908 www.esrpa.com

1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
2. BUILDING TO REMOVE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR FULL LENGTH OF PIPE.
3. IF EXISTING CONCRETE OR MASONRY FOUNDATION IS FOUND, IT SHALL BE REMOVED TO A MINIMUM DEPTH TO BE INSTALLED AT A DEPTH LESS THAN 3'-0" UNDER DRIVEWAYS, EXTRA HEAVY CAST IRON OR OTHER HIGH STRENGTH PIPE SHALL BE USED TO SUPPORT THE PIPE UNDER DRIVEWAYS.
4. FOR SEWER COLLECTION SYSTEMS THE MINIMUM DEPTH TO TOP OF THE PIPE SHALL BE 5'-0". THIS DEPTH SHALL BE INCREASED TO 6'-0" IN AREAS TO BE FLOODED DURING THE WINTER MONTHS. OTHERWISE, REFER TO INSULATION OVER SHOWN ON THE LINE DETAIL.
5. BACKFILL SHALL BE OF A SUITABLE MATERIAL REMOVED FROM EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. ALL LARGE ROCKS, BRICKS, CEMENT BLOCKS, OR OTHER UNDESIRABLE MATERIAL SHALL BE REMOVED FROM BACKFILL WITHIN TWO FEET OF THE TOP OF THE PIPE.
6. IF LARGE ROCKS OR OTHER UNDESIRABLE MATERIAL IS FOUND, IT SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF SIX INCHES BELOW AND ON EACH SIDE OF ALL PIPES.



1. PROVIDE SMOOTH SWEEPING TRANSITIONS BETWEEN INVERTS OF INTERSECTING PIPE.
2. IF DEPTH OF MANHOLE IS 7' OR LESS FROM RIM TO CENTERLINE INVERT, THEN A FLAT TOP WILL BE INSTALLED. IF DEPTH OF MANHOLE FROM RIM TO CENTERLINE INVERT IS MORE THAN 7', THEN A CONICAL TOP WILL BE INSTALLED.
3. MANHOLE AND COVER SHALL BE DESIGNED FOR H2O LOADING.
4. INVERT TO BE FORMED AND POURED BY MANHOLE SUPPLIER UNLESS OTHERWISE APPROVED BY THE ENGINEER.

1. WATER MAIN RELATIONS TO SEWER SHALL BE IN ACCORDANCE WITH THE "RECOMMENDED STANDARDS FOR WATER WORKS" SO-CALLED TEN STATE STANDARDS.
2. WATER MAINS SHALL BE LAID AT LEAST 1 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IF THIS DISTANCE CANNOT BE OBTAINED, THEN THE PIPES SHALL BE INSTALLED IN A SEPARATE TRENCH AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
3. WHEN IT IS IMPOSSIBLE TO MAINTAIN 18" VERTICAL SEPARATION OR WHERE THE SEWER IS LAID ABOVE THE WATER MAIN, 1) THE CROSSING SHALL BE ARRANGED SO THAT ONE PIPE IS NOT IN CONTACT WITH THE OTHER PIPE. 2) THE SEWER MAIN SHALL BE AS FAR AS POSSIBLE FROM WATER JOINTS. 2) THE SEWER PIPE MUST BE CONSTRUCTED TO MEET STANDARDS FOR A MINIMUM DURATION OF 20 FEET EITHER SIDE OF THE CROSSING TOTAL OF THREE PIPE LENGTHS, WHICH EVER IS GREATER. 3) THE SECTION CONSTRUCT WATER MAIN STANDARDS TO BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTE. 4) NO DAMAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO JOINT TIGHTNESS.

The diagram illustrates a trench cross-section with a central drain and a lower drain. The trench is divided into two main sections: PAVED (left) and UNPAVED (right). The trench width is indicated as 4'-0" at the top. The trench depth is indicated as 4'-0" on the right side. The diagram shows the placement of insulation in the paved and unpaved areas, with a lower drain and a main drain. The insulation requirements are detailed in the tables below.

INSULATION IN PAVED AREAS:		
COVER	INSUL WIDTH	INSUL THICKNESS
0'-3"	LOWER DRAIN	
3'-4"	6'-0"	3"
4'-5"	4'-0"	2"
> 5'	NO INSUL. REQUIRED	

INSULATION IN UNPAVED AREAS:		
COVER	INSUL WIDTH	INSUL THICKNESS
0'-2"	LOWER DRAIN	
2'-3"	6'-0"	3"
3'-4"	4'-0"	2"
> 4'	NO INSUL. REQUIRED	

2. RIGID EXTRUDED POLYSTYRENE INSULATION SHALL CONFORM WITH ASTM C57 STANDARD SPECIFICATION FOR RIGID CELLULAR POLYSTYRENE THERMAL INSULATION AND SHALL BE DOW STYROFOAM HIGH LOAD 40 OR EQUIVALENT.

OUTLET PIPE

WATER TIGHT CEMENT

KOR-N-SEAL RUBBER BOOT

STAINLESS STEEL CLAMP

SEWER PIPE

EXISTING MANHOLE

1. CORE HOLE SHALL BE SMOOTH, SYMMETRICAL, AND APPROPRIATELY SIZED FOR SEWER PIPE INSTALLATION.
2. RECONSTRUCT FLOW CHANNELS FOR NEW SEWER INLET PIPING.

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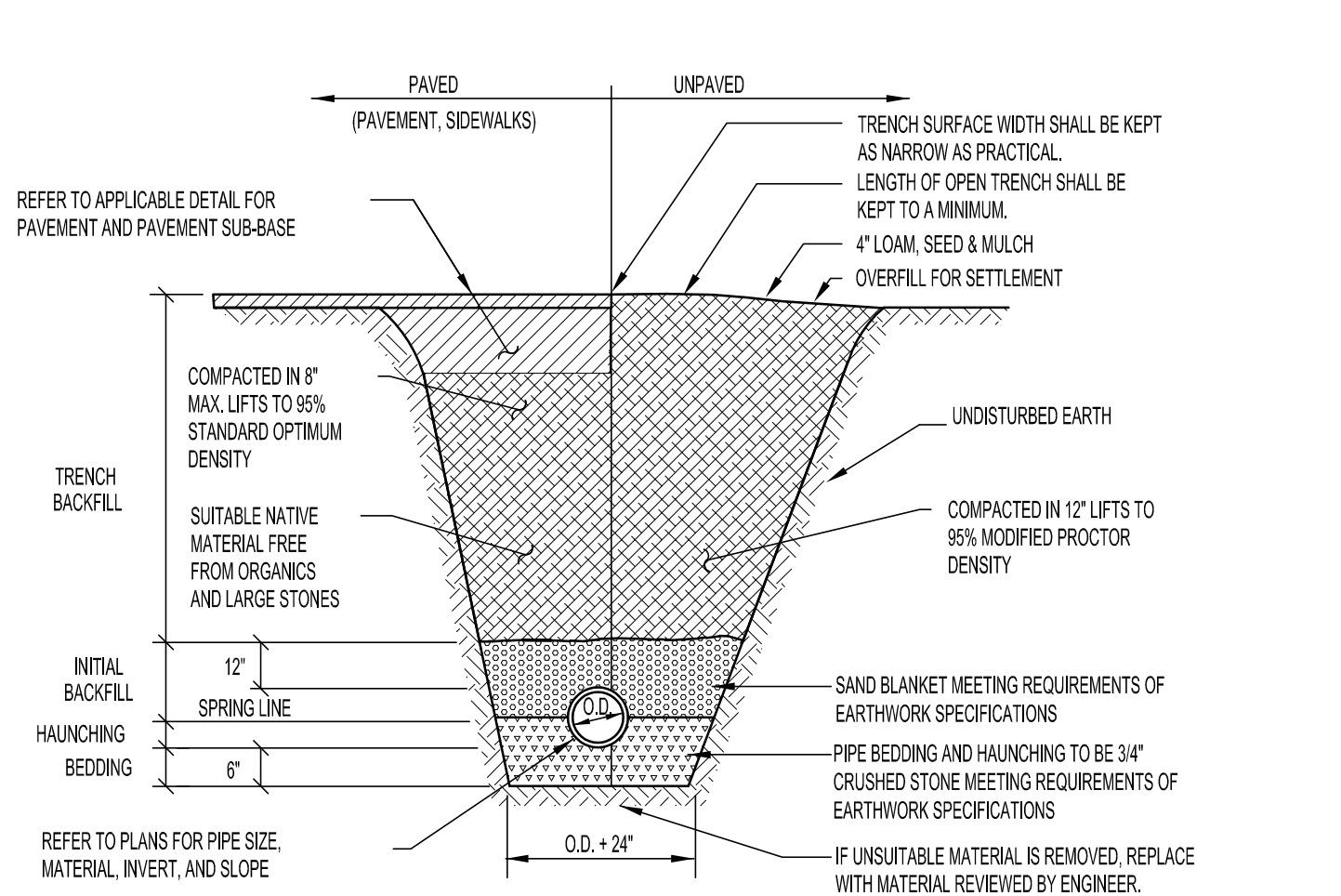
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JZ/KW	
Scale:	
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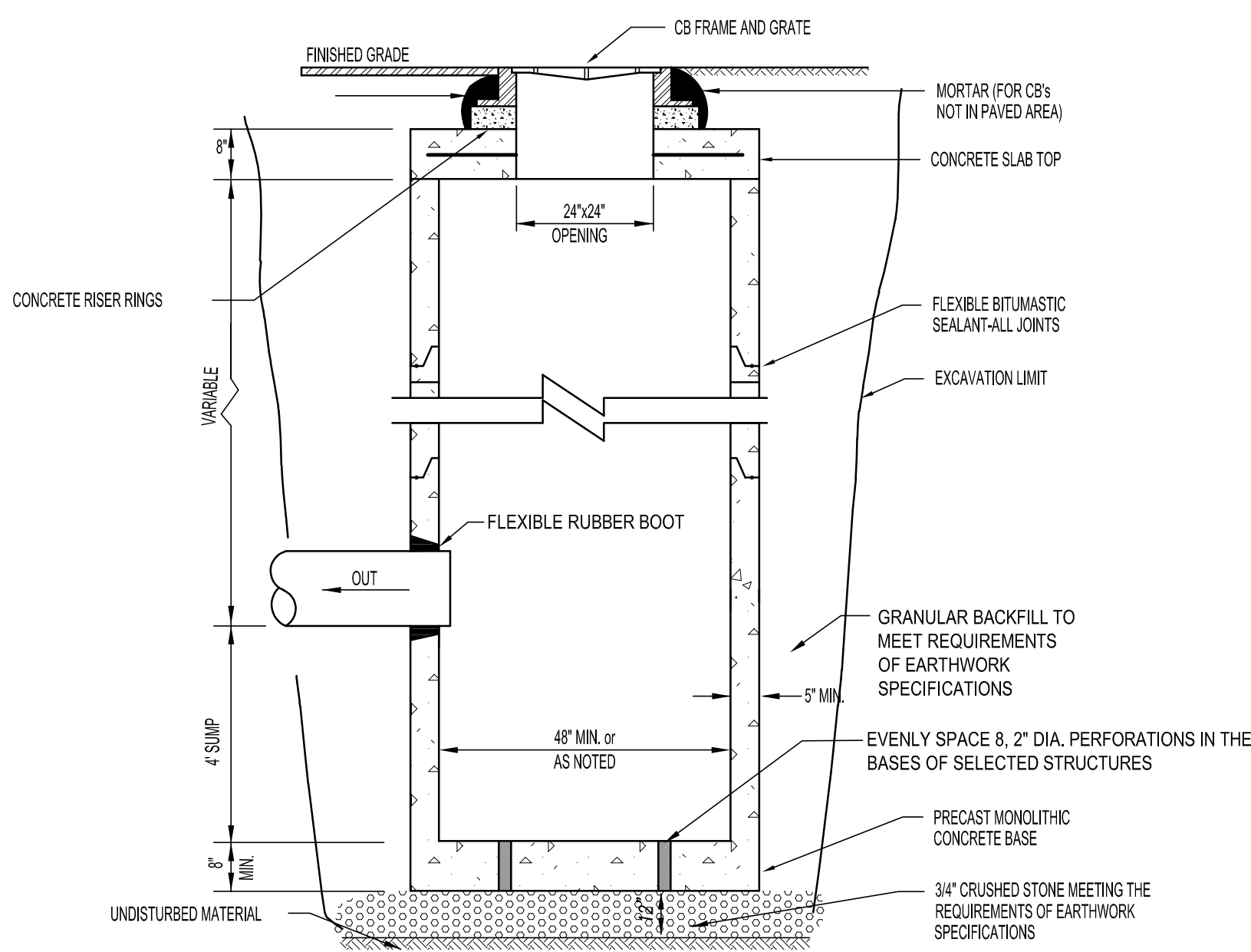


- STORM DRAIN TRENCH NOTES**
1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
 2. BEDDING TO PROVIDE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR THE FULL LENGTH OF PIPE.
 3. WHEN APPLICABLE, INSTALL PIPE WITH BELL ENDS DOWN SLOPE. PREVENT SEDIMENT FROM ENTERING NEW STORM DRAIN SYSTEM DURING CONSTRUCTION.
 4. NO MECHANICAL TAMPERS SHALL BE USED DIRECTLY OVER PIPE TO INSURE PIPE IS NOT DAMAGED.
 5. PROVIDE 6" OF COVER OVER PIPE IN PAVED AREAS AND 5" OF COVER OVER PIPE IN UNPAVED AREAS. REFER TO INSULATION DETAIL FOR AREAS WHERE PROPER COVER CAN NOT BE ACHIEVED.

TYPICAL STORM DRAIN TRENCH DETAIL

SCALE: NONE

1

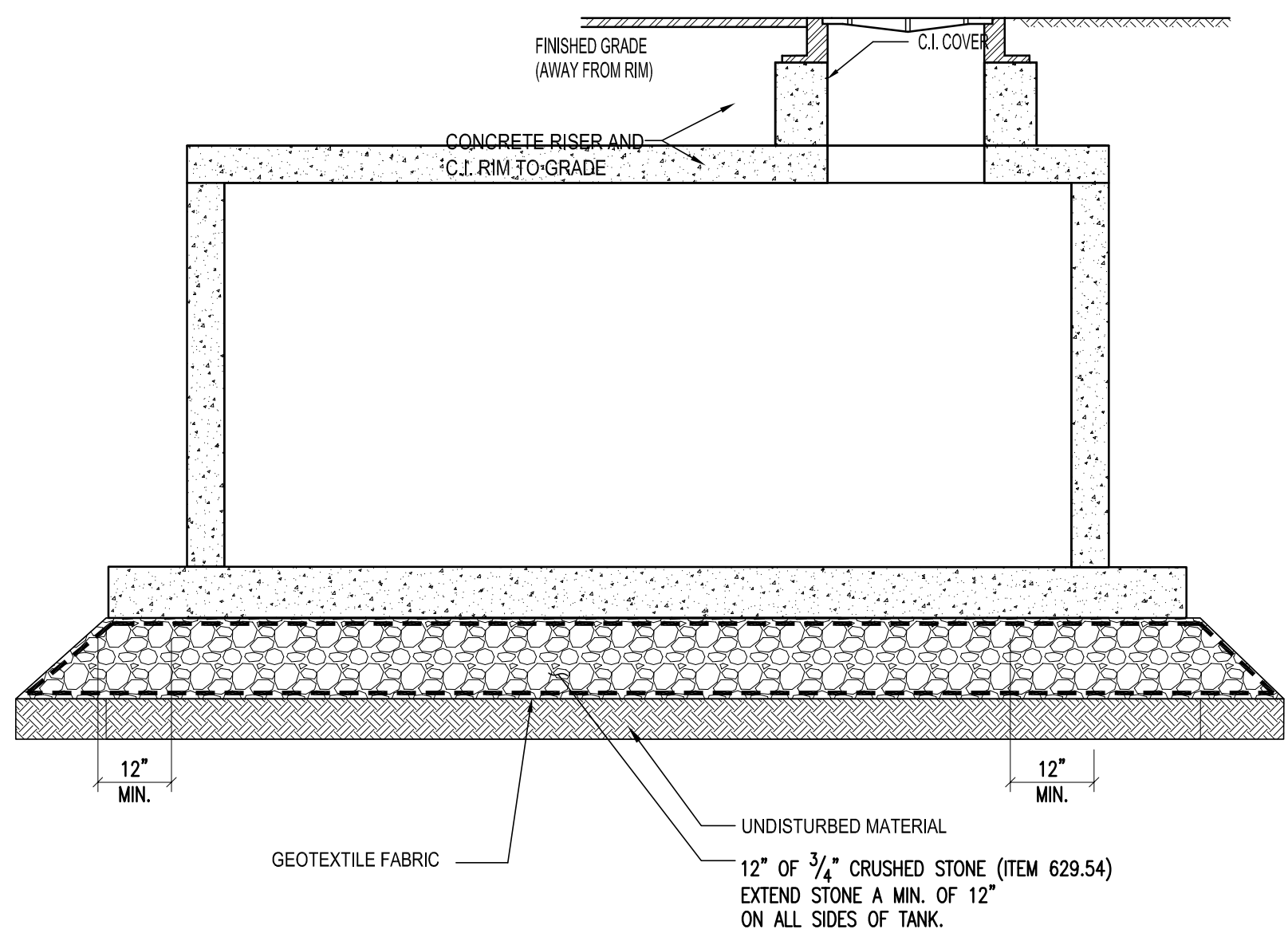


- CATCH BASIN NOTES**
1. PROVIDE A LEBARON 24"x24" TYPE E OR EQUAL, 3 FLANGE GRATE AND FRAME NEXT TO CURBS AND 4 FLANGE GRATE AND FRAME AT ALL OTHER LOCATIONS.
 2. CATCH BASIN AND GRATE SHALL BE DESIGNED FOR H20 LOADING.

CATCH BASIN DETAIL

SCALE: NONE

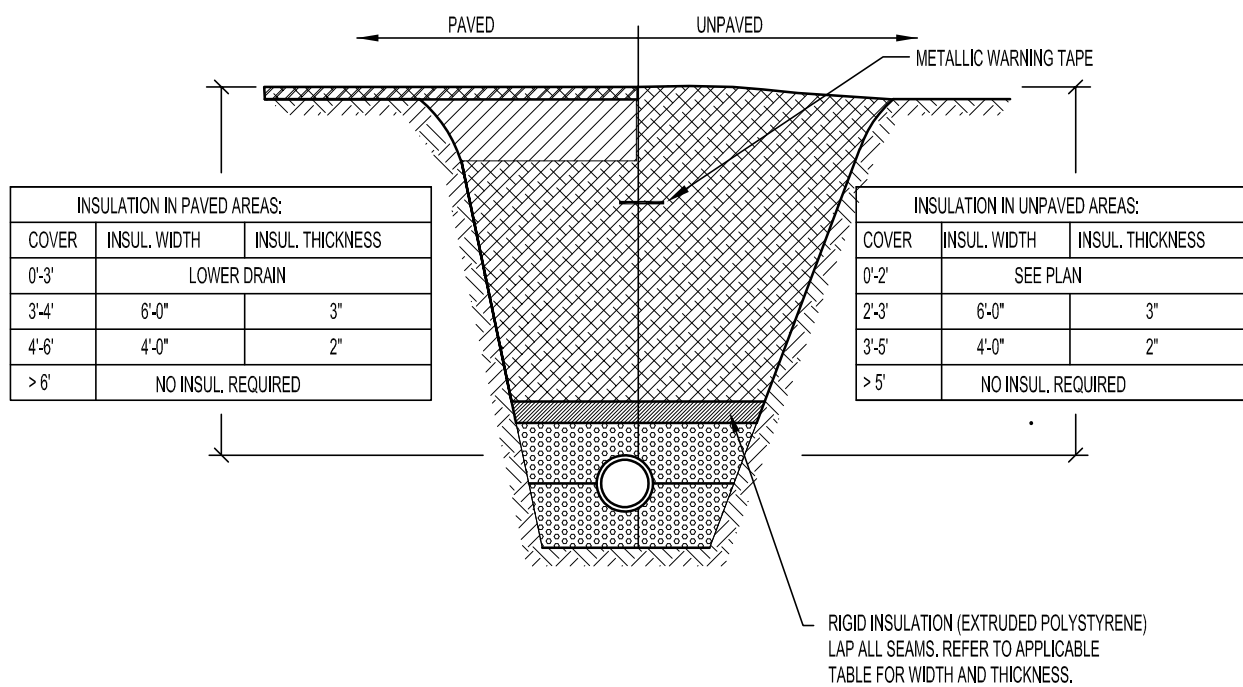
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SECTION

- EMERGENCY STORAGE TANK NOTES:**
1. CAST IN PLACE TANK SHALL BE RATED FOR H20 LOADING.

STORM WATER STORAGE TANK DETAIL

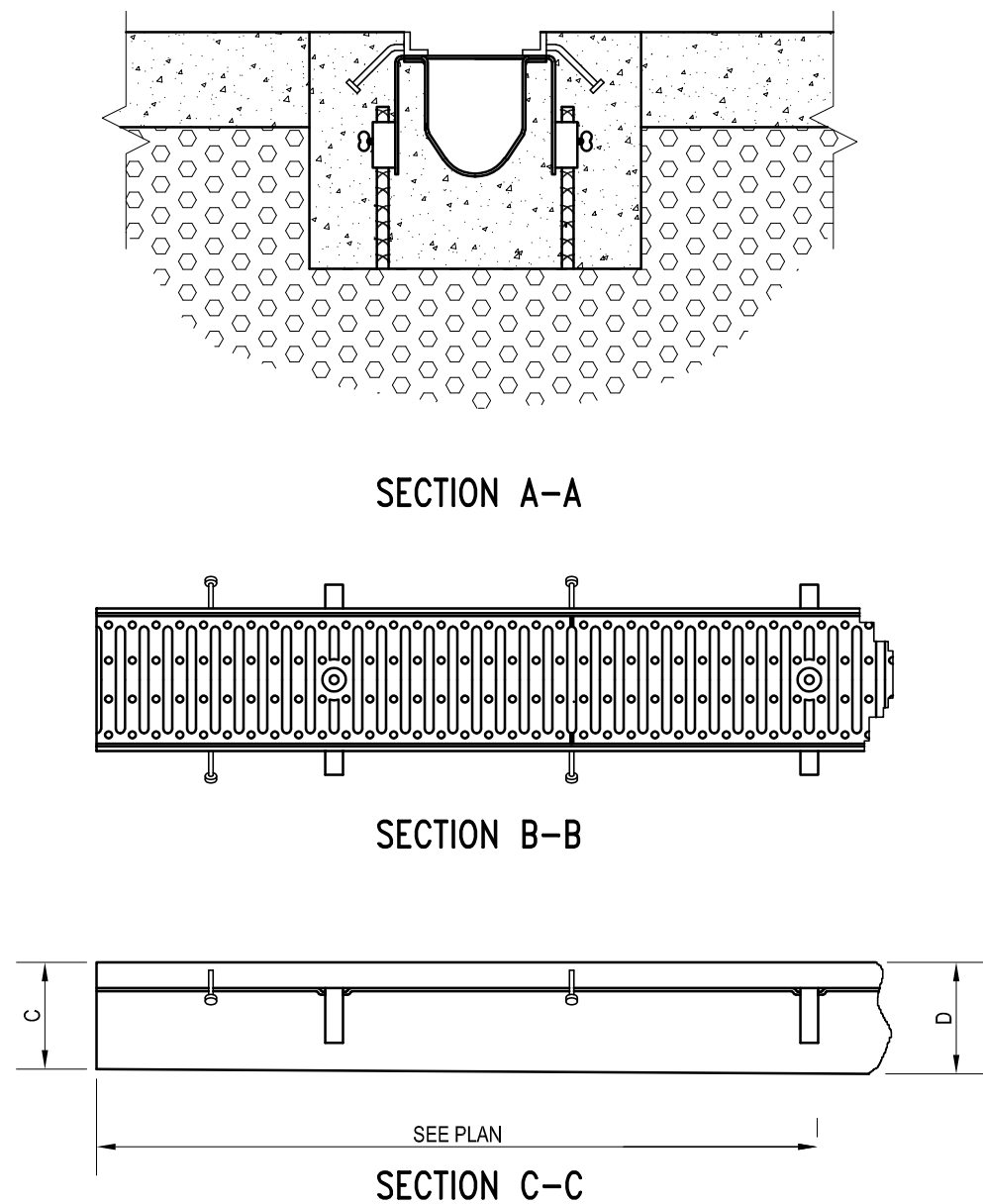


- TRENCH NOTES**
1. REFER TO APPLICABLE TRENCH DETAIL FOR SPECIFIC BACKFILL INFORMATION.

INSULATION OVER SHALLOW DRAIN DETAIL

SCALE: NONE

2

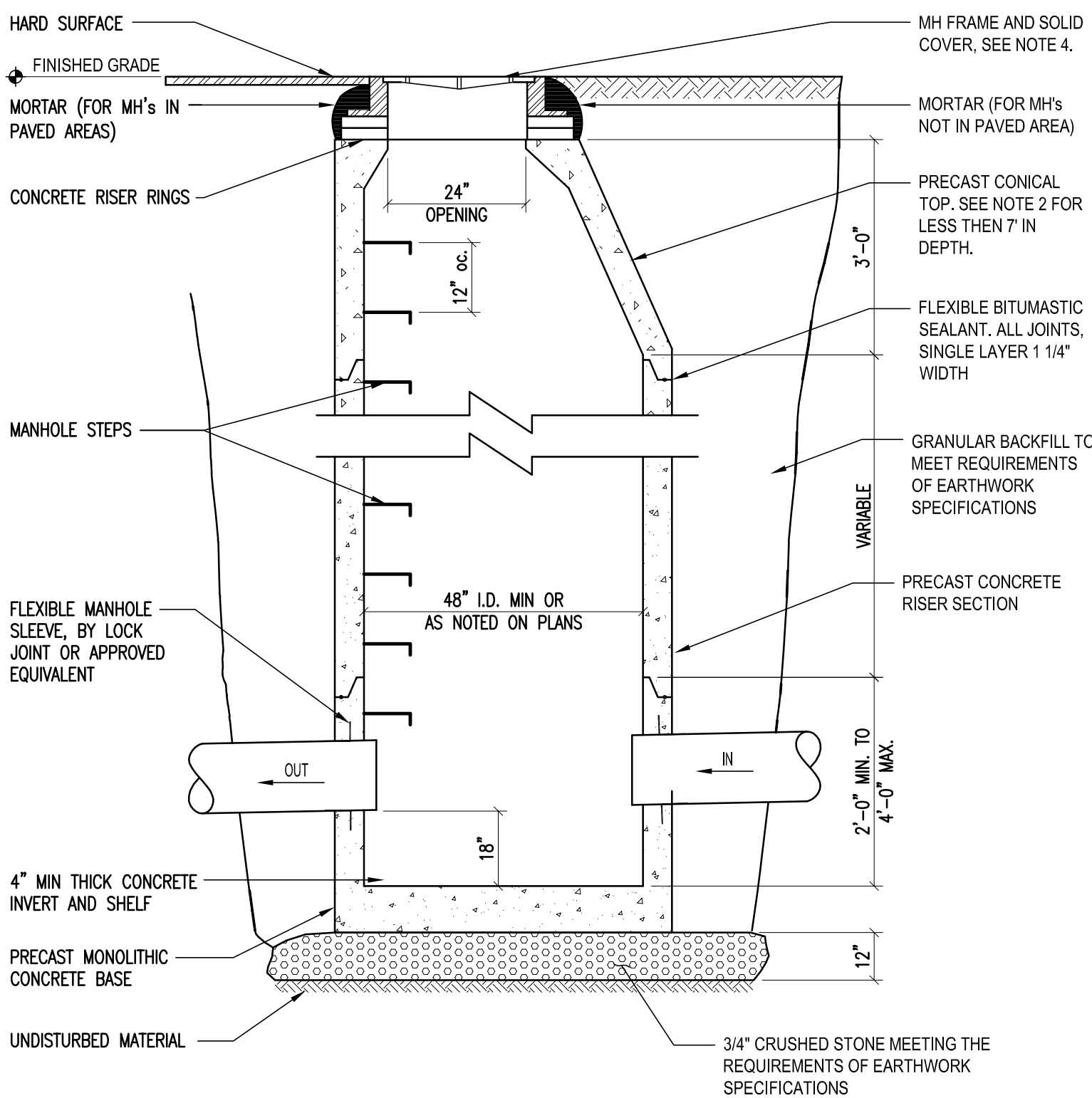


- NOTES:**
1. TRENCH DRAIN SHALL BE ACO MODEL #S100K, 9 SECTIONS, 6" WIDE TRENCH DRAIN SYSTEM OR APPROVED EQUIVALENT. PART NUMBERS SK22 THROUGH SK30.
 2. TRENCH FRAME AND GRATE SHALL BE HEAVY DUTY.
 3. TRENCH DRAIN SHALL BE CAST-IN-PLACE CONCRETE, INSTALLED PER MANUFACTURERS INSTRUCTIONS.
 4. CONCRETE TO BE 4000 PSI.
 5. TRENCH DRAIN SHALL BE CONNECTED THROUGH THE BOTTOM OF THE DRAIN AT THE INVERT SHOWN ON THE PLANS.

TRENCH DRAIN DETAIL

SCALE: NONE

5



- STORM MANHOLE NOTES**
1. PROVIDE SMOOTH SWEEPING TRANSITIONS BETWEEN INVERTS OF INTERSECTING PIPE.
 2. IF DEPTH OF MANHOLE IS 7 ft. OR LESS FROM RIM TO CENTERLINE INVERT, THEN A FLAT TOP WILL BE INSTALLED. IF DEPTH OF MANHOLE FROM RIM TO CENTERLINE INVERT IS MORE THAN 7 ft., THEN A CONICAL TOP WILL BE INSTALLED.
 3. MANHOLE AND COVER SHALL BE DESIGNED FOR H20 LOADING.
 4. PROVIDE A LEBARON NO. LC 288 OR APPROVED EQUIVALENT. CAST THE WORD "STORM" IN TOP COVER.
 5. MANHOLE SHALL BE PRECAST CONCRETE AS MANUFACTURED BY S.T. GRISWOLD & CO., INC. OR APPROVED EQUIVALENT.

STORM MANHOLE DETAIL

SCALE: NONE

3

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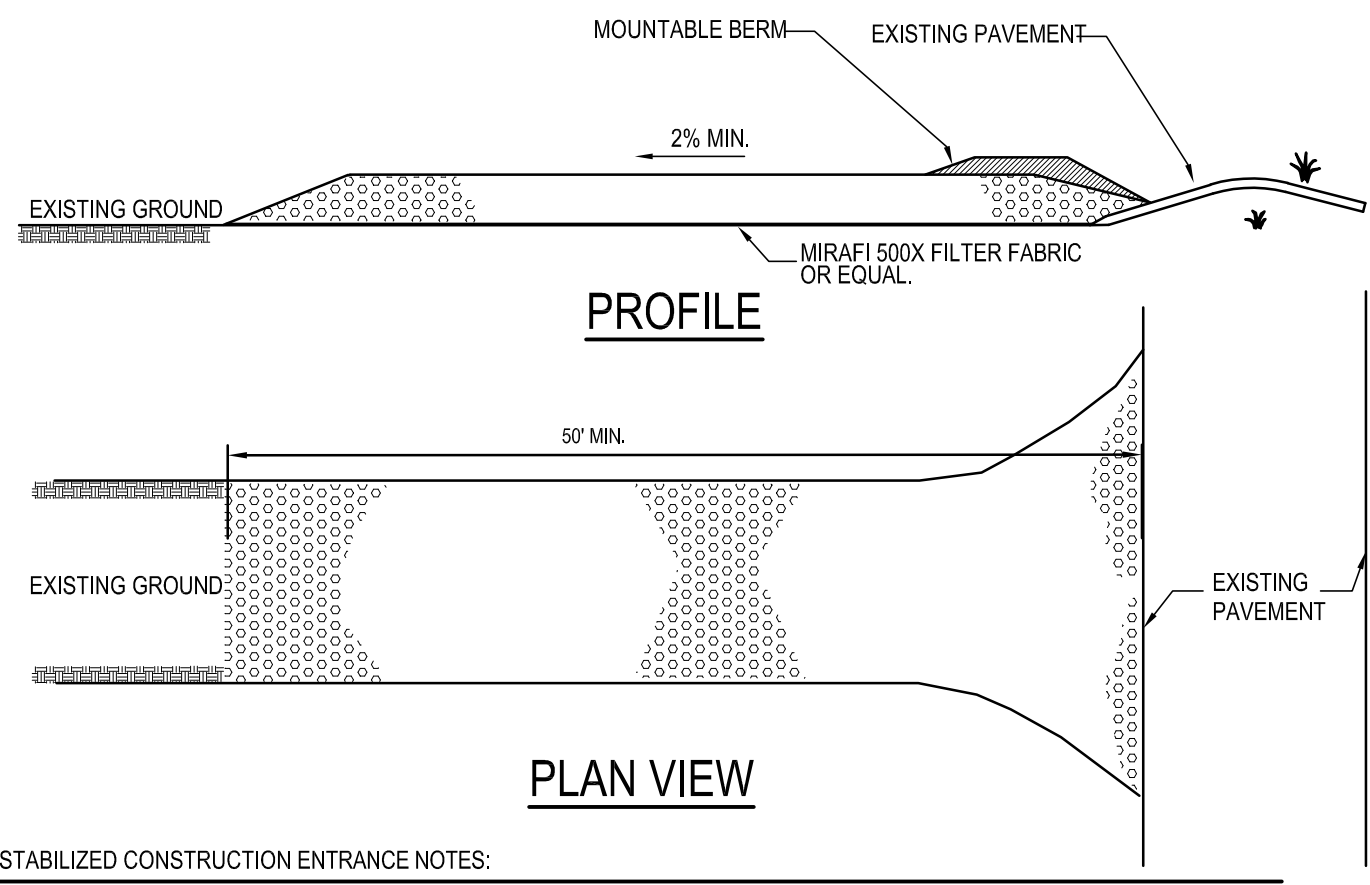
Approval		
Project		
12/15/2016	1	P & Z Submission
Date	No.	Description

Burlington Town Center
Devonwood Investors
75 Cherry Street
Burlington, VT 05401

Project Number	Signature & Date
1317-01	
Drawn By	
WCJZ	
Checked By	
JZ/KW	
Scale	
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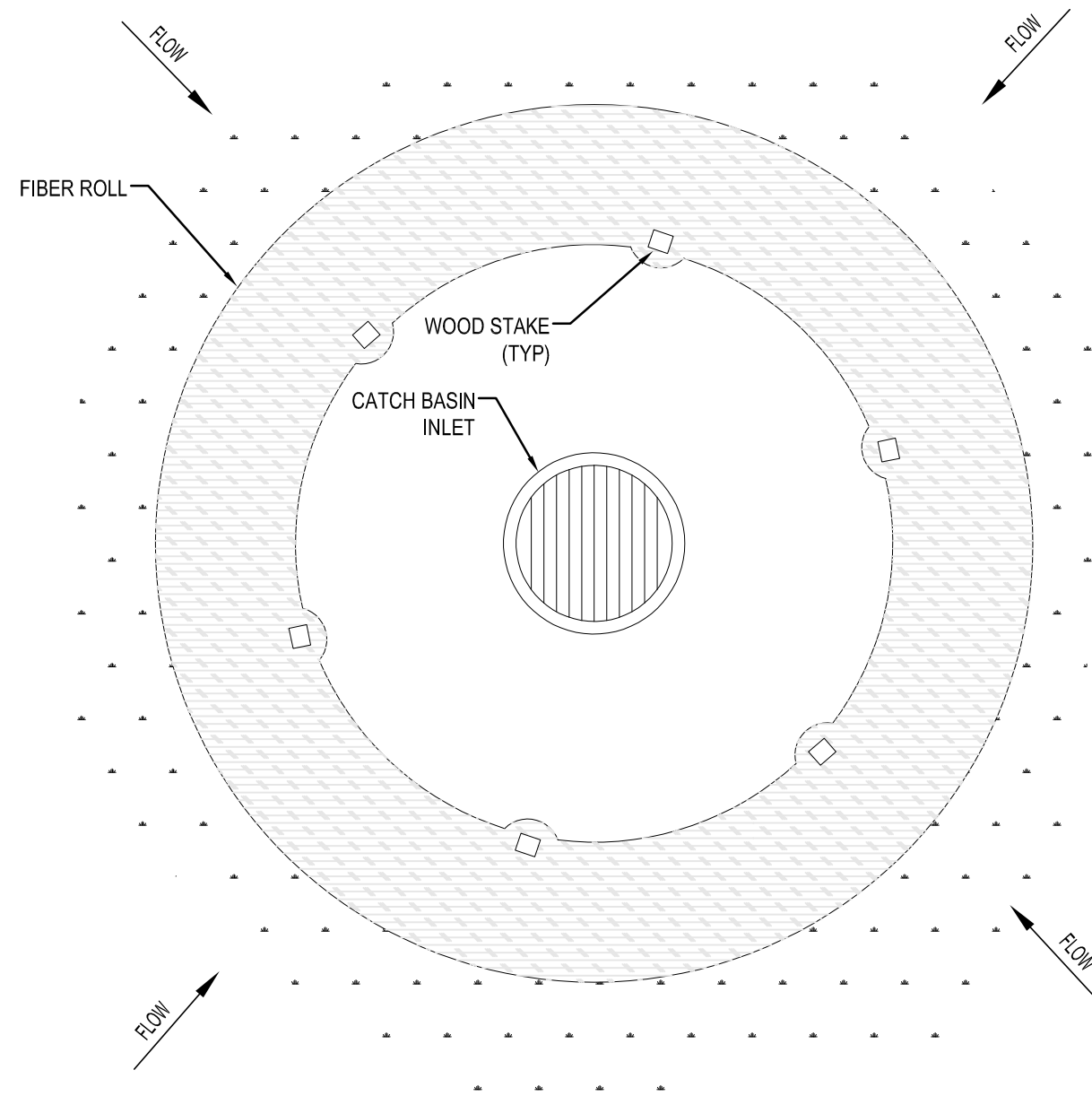


- STABILIZED CONSTRUCTION ENTRANCE NOTES:**
1. STONE SIZE: USE 1-1/2" CRUSHED STONE.
 2. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCE SHALL BE PIPED ACROSS THE ENTRANCE.
 3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. REPAIR AND/OR CLEANOUT ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
 4. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
 5. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

CONSTRUCTION ENTRANCE DETAIL

SCALE: NONE

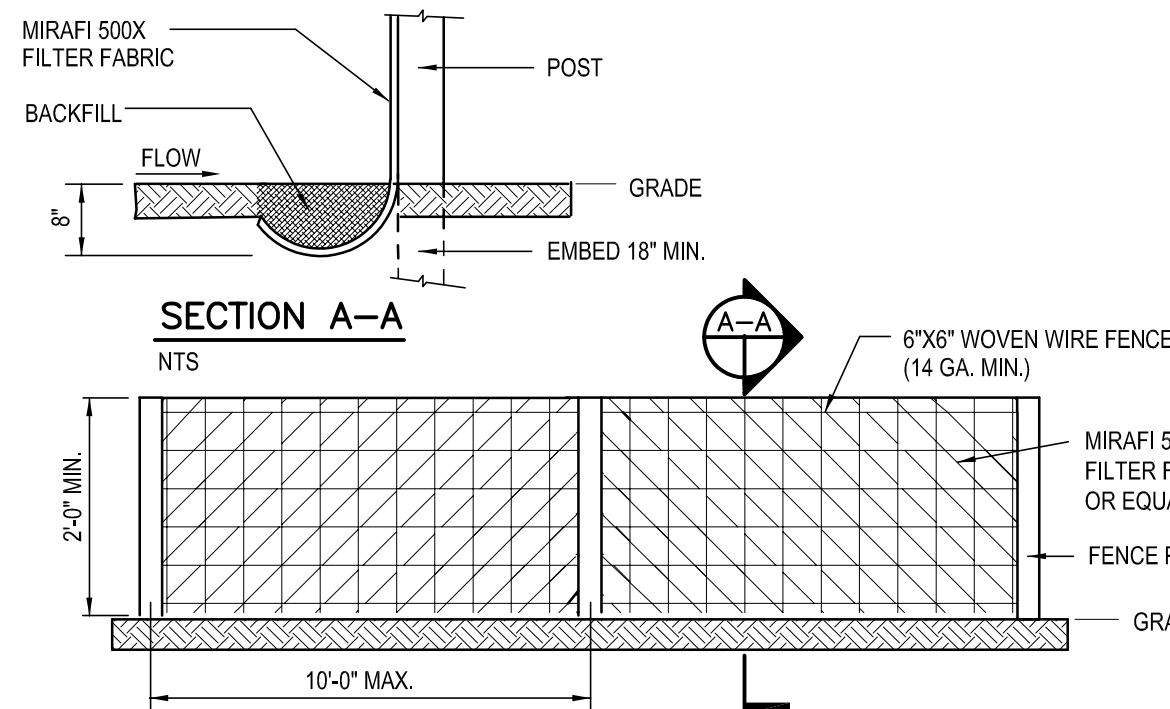
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FIBER ROLL INLET PROTECTION DETAIL

SCALE: NONE

4

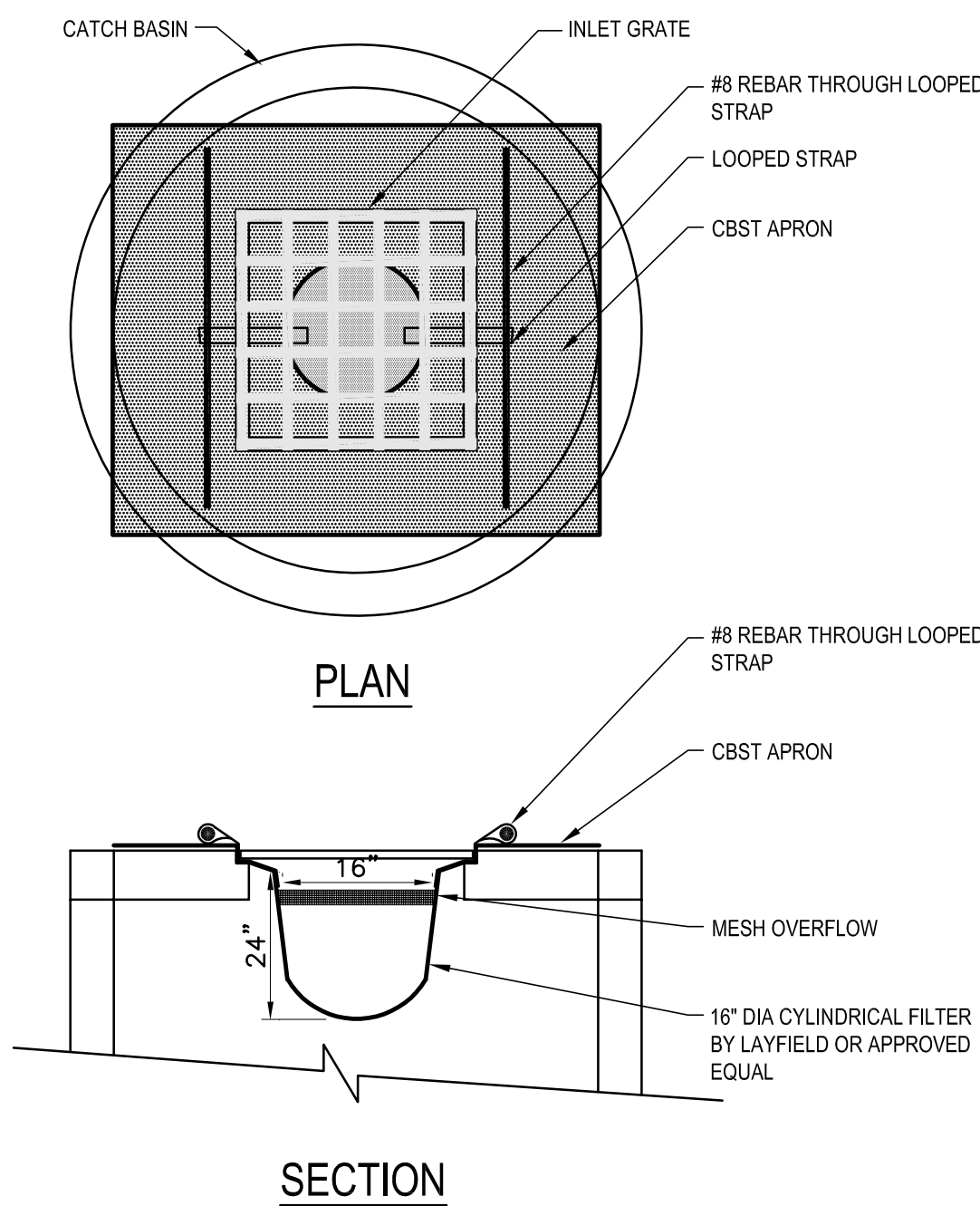


- SILT FENCE NOTES:**
1. SILT FENCE SHALL BE PRE-FABRICATED EROSION CONTROL FENCE BY MIRAFI OR EQUAL, OR CONSTRUCTED IN PLACE AS SPECIFIED HEREIN.
 2. CONSTRUCTED IN PLACE SILT FENCE:
 - A. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
 - B. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE TIES SPACED EVERY 24" AT TOP OF MID SECTION.
 - C. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6", FOLDED AND STAPLED.
 3. INSPECTION SHALL BE FREQUENT (MINIMUM ONCE A WEEK AND AFTER EVERY RAINFALL). MAINTENANCE SHALL BE PERFORMED AS NEEDED, AND SEDIMENT REMOVED WHEN BULKES DEVELOP IN SILT FENCE.
 4. WOVEN WIRE FENCE REINFORCEMENT IS REQUIRED BY THE VT CONSTRUCTION GENERAL PERMIT WHEN SILT FENCE IS PLACED WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

SILT FENCE DETAIL

SCALE: NONE

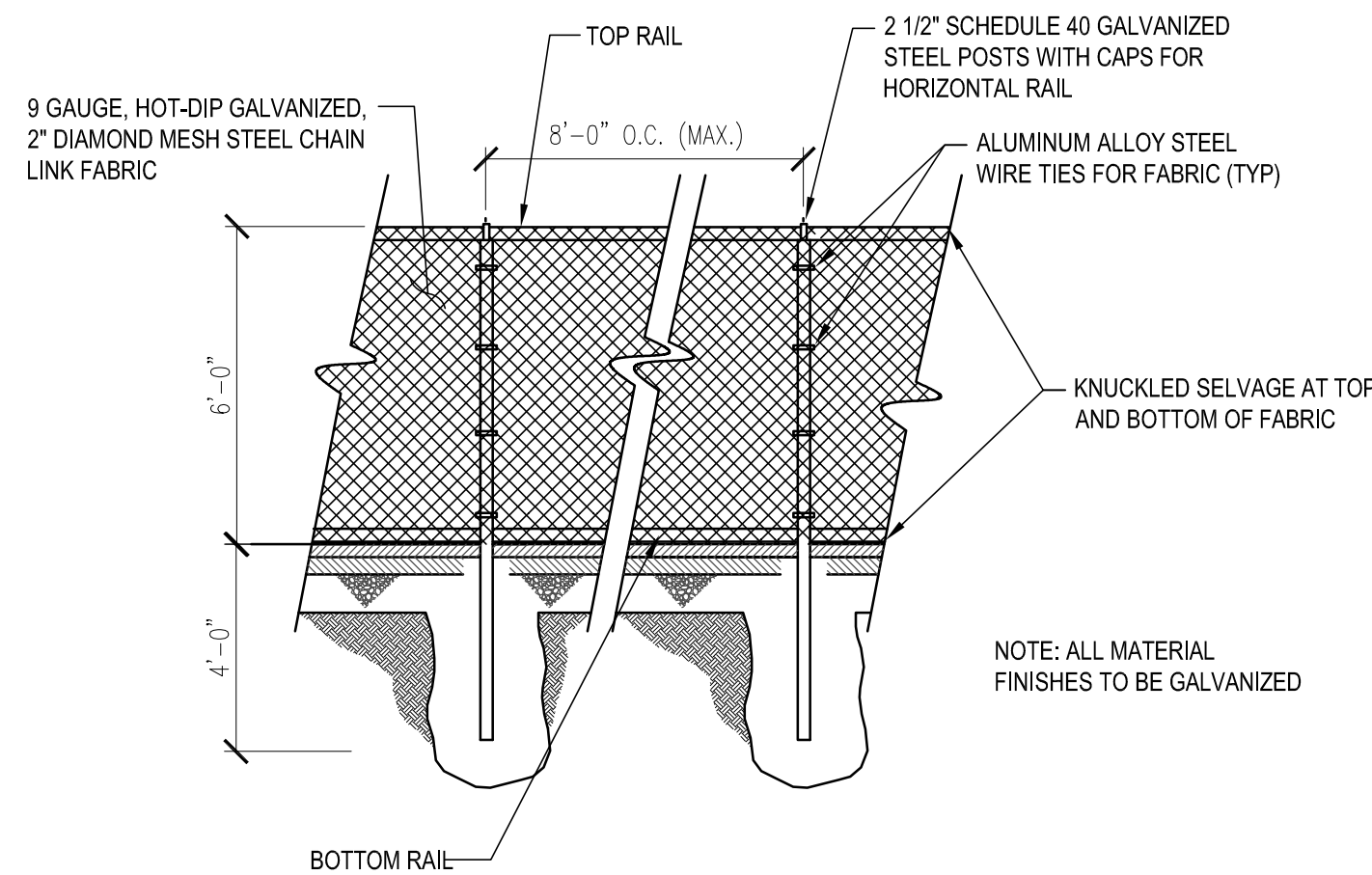
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FABRIC INLET PROTECTION

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5



FENCE DETAIL

SCALE: NONE

3

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12/15/2016	1	P & Z Submission

Burlington Town Center
Devonwood Investors

75 Cherry Street
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Drawing Title

**Erosion Prevention and
Sediment Control Details**

Project Number	1317-01	Signature & Date
Drawn By	WCJ/JZ	
Checked By	JZ/KW	
Scale	As Noted	
Drawing Number		

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Drawing



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Approval:

12/15/2016 01 P & Z SUBMISSION

Date No. Description

Project

Burlington Town Center

Devonwood Investors

75 Cherry Street

Burlington, VT 05401

Layout Plan

Project Number: 1317-01

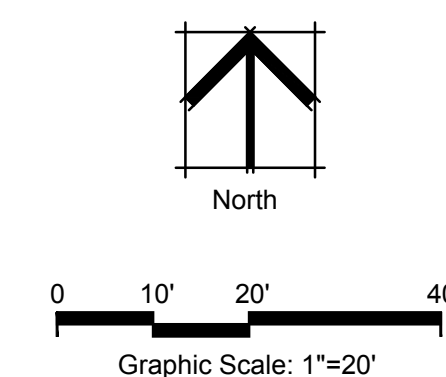
Drawn By: mkw

Checked By: mkw

Date: 12/15/2016

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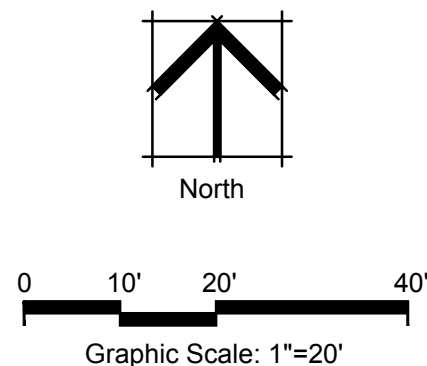
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PLANT LIST						
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	REMARKS	MATURE CANOPY DIMS.
DECIDUOUS TREES:						
AF	Acer rubrum 'Autumn flame'	Autumn Flame Red Maple	10	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 30' Diameter
AR	Acer freemanii 'Sienna'	Sienna Glen Red Maple	19	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 30' Diameter
GB	Ginkgo biloba 'Autumn gold'	Autumn Gold Ginkgo	22	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 30' Diameter
UA	Ulmus americana 'Princeton'	Princeton American Elm	7	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	60' Tall x 40' Diameter
SHRUBS:						
CS	Cornus sericea 'Isanti'	Red-osier Dogwood	7	24-30" Wide	C.G., Plant 30" o.c.	
IJ	Ilex verticillata 'Jim Dandy'	Winterberry Holly	2	24-30" Wide	C.G., Plant 30" o.c.	
IV	Ilex verticillata 'Red Sprite'	Winterberry Holly	10	24-30" Wide	C.G., Plant 30" o.c.	
PERENNIALS:						
Mixed variety of perennials and ornamental grasses used in the rain garden treatment areas.						

- NOTES:
1. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL PLANT QUANTITIES FOUND IN THE PLANTING PLANS. IF ANY DISCREPANCIES ARE FOUND, LANDSCAPE ARCHITECT SHOULD BE NOTIFIED IMMEDIATELY.
 2. FINAL LAYOUT AND PLACEMENT OF ALL PLANT MATERIAL TO BE APPROVED BY THE LANDSCAPE ARCHITECT.
 3. REFER TO PLANTING DETAILS FOR PROPER PLANT MATERIAL INSTALLATION REQUIREMENTS.
 5. ALL TREE, SHRUB AND PERENNIAL PLANTING BEDS ARE TO BE CONTINUOUS, COMPLETELY DUG OUT AND BACKFILLED WITH THE PROPER PLANTING BED BACKFILL MATERIAL TO DEPTH SPECIFIED IN DETAILS AND SOIL PREPARATION SPECIFICATION.
 6. IF THE LANDSCAPE CONTRACTOR PROPOSES A SUBSTITUTE PLANT SPECIES, ALL SUBSTITUTES NEED TO BE APPROVED BY THE CITY ARBORIST AND LANDSCAPE ARCHITECT IN WRITING PRIOR TO ORDERING.
 7. FOR SOIL BACKFILL IN THE RAIN GARDEN BASINS, REFER TO CIVIL DRAWINGS, SPECIFICATIONS AND DETAILS.



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Date No. Description
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Burlington Town Center
Devonwood Investors
75 Cherry Street
Burlington, VT 05401

Planting Plan

Project Number: 1317-01
Drawn By: mkw
Checked By: mkw
Scale: 1"=20'
Drawing Number

LA-400



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Mechanical Engineer
(802) 658-4848
www.hallam-ics.com

Civil Engineer
(802) 863-6242
www.engineeringventures.co

Geotechnical Engineer
(802) 652-5111
www.geodesign.com

Landscape Architect
(802) 862-0000
www.segroup.com

NOT FOR CONSTRUCTION

Approved:

Project:

Date:

No.:

Description:

12/15/2016 01 P & Z SUBMISSION

Burlington Town Center

Devonwood Investors

75 Cherry Street

Burlington, VT 05401

Lighting / Photometric Plan

Project Number:

1317-01

Drawn By:

mikw

Checked By:

mikw

Date:

12/15/2016

Drawing Number:

LA-500

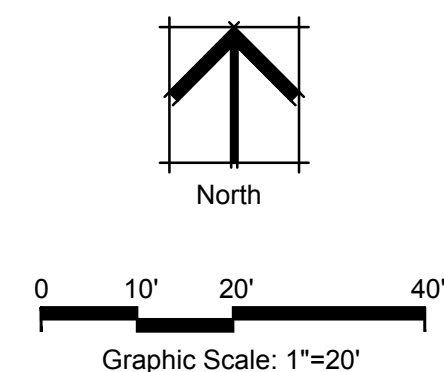
FIXTURE AND POLE SPECIFICATIONS

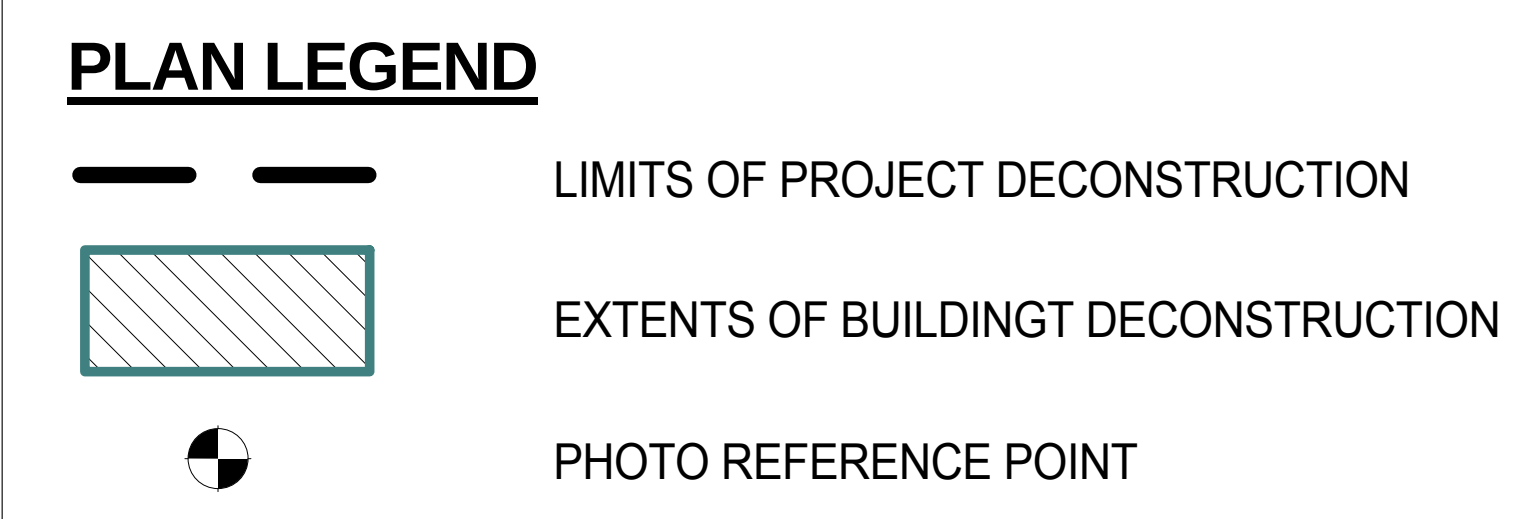
Fixture A
Fixture Manufacturer: Lumec
Fixture: Domus - DMS50
Configuration: 1A
Lamp: 90Watt LED4K
Lens Type: Flat Glass
Distribution: LE3F
Color: Black
Pole Manufacturer: Lumec
Pole: SPR5V-25.5'
Pole Options: B105 & GFI
Mounting Arm: SM-1A, LMS*
Color: Black

Fixture B
Fixture Manufacturer: Bega
Fixture: 66698
Lamp: 18w LED
Color: Black
Mounting Height: 7 feet

Notes:
1. Proposed street lights to match BED lighting standards for street lights within the Central Business District.

* - LMS radius must measure 5' distance from center of pole to center of fixture. City of Burlington standard.





12/15/2016	01	P & Z SUBMISSION
Date	Nr	Description

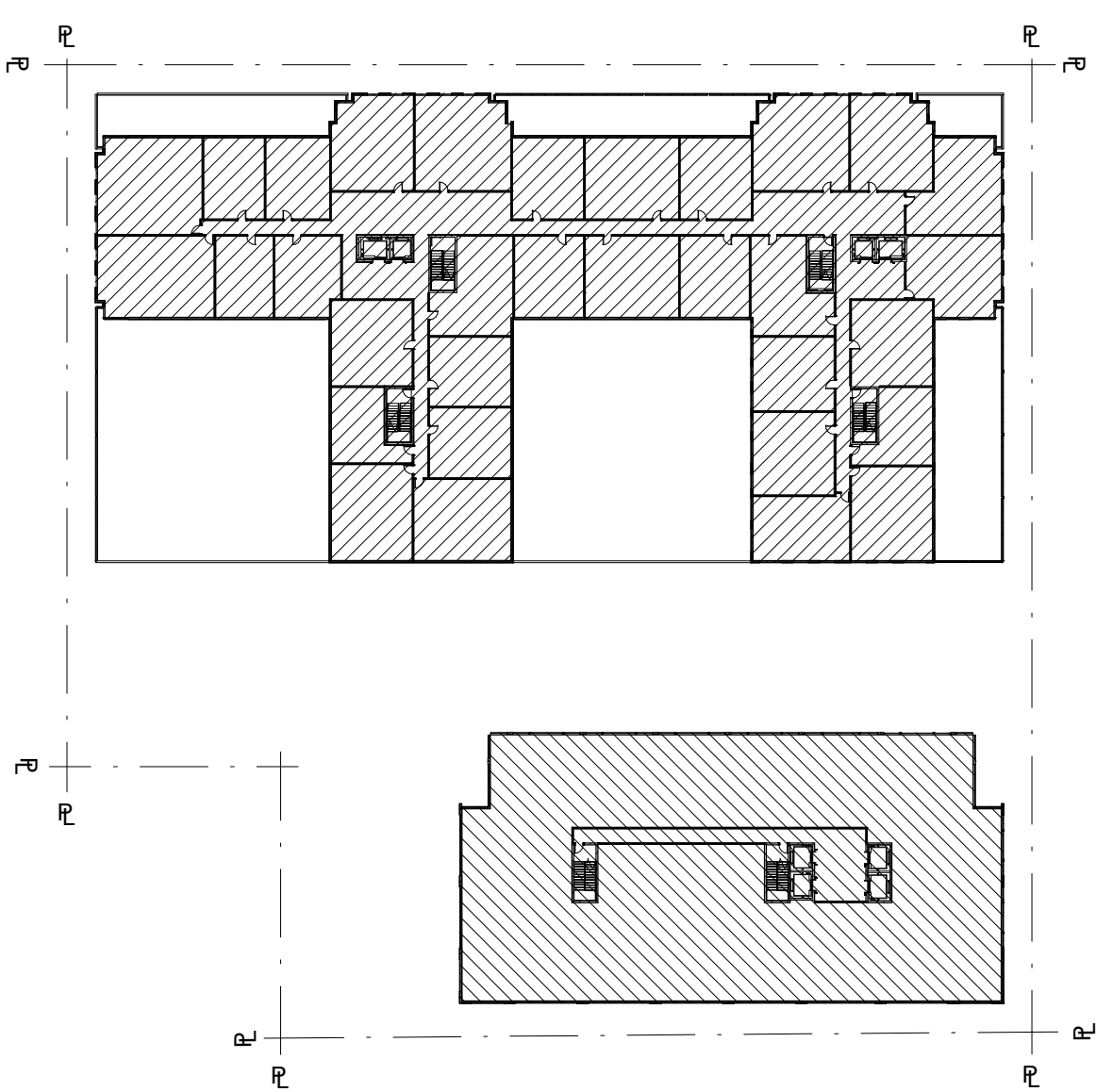
101 Cherry Street
Burlington, VT 0541

Project Number	Signature & Seal
A1636	
Drawn By: JM	
Checked By: WW	
Scale: 1" = 30'-0"	

Drawing Number:

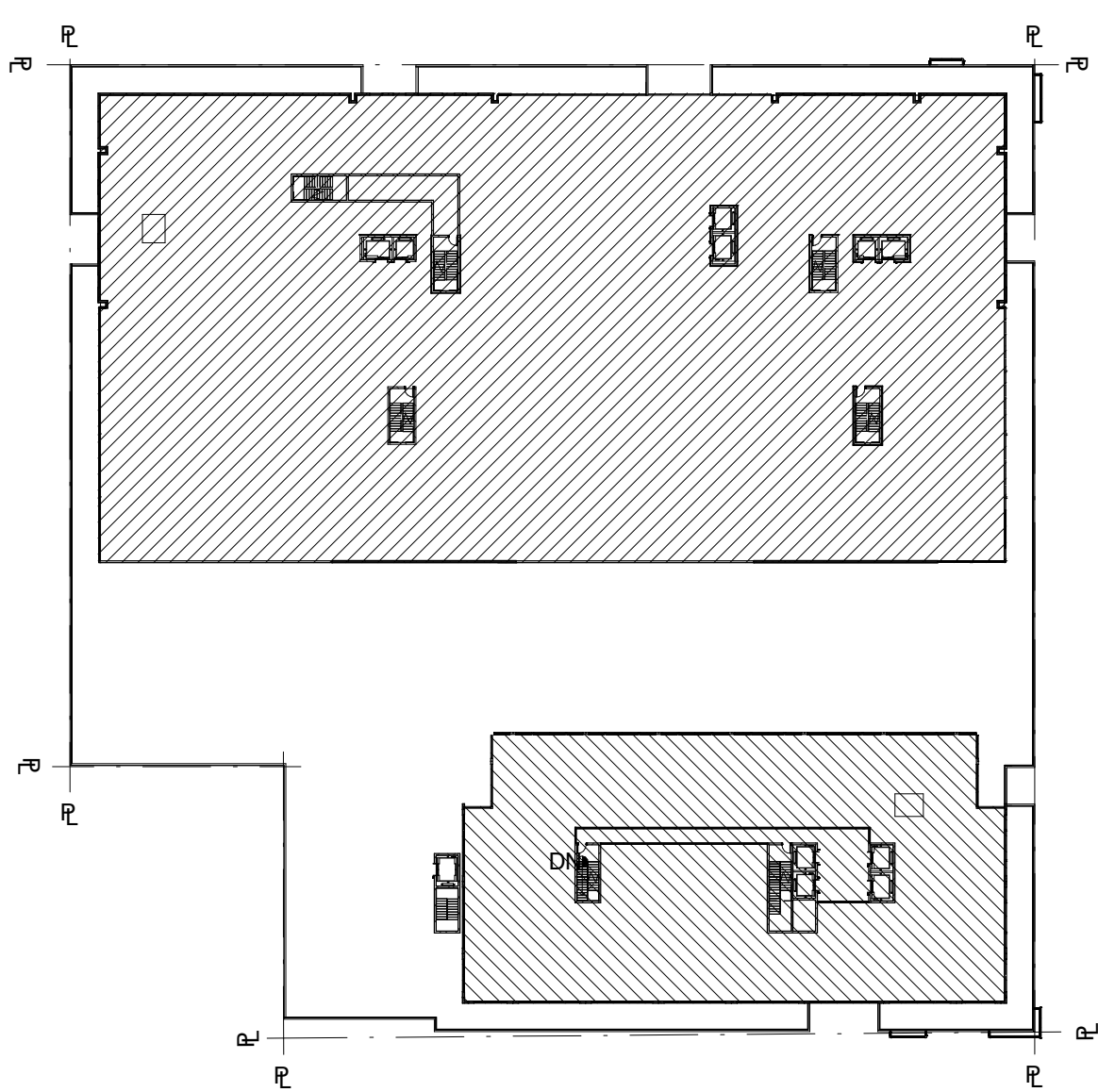
AD-001

8TH FLOOR NORTH & 9TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	8TH	33,788.72 SF	30.78 %
SOUTH	9TH	17,868.58 SF	16.28 %
TOTAL		51,657.30 SF	47.06 %



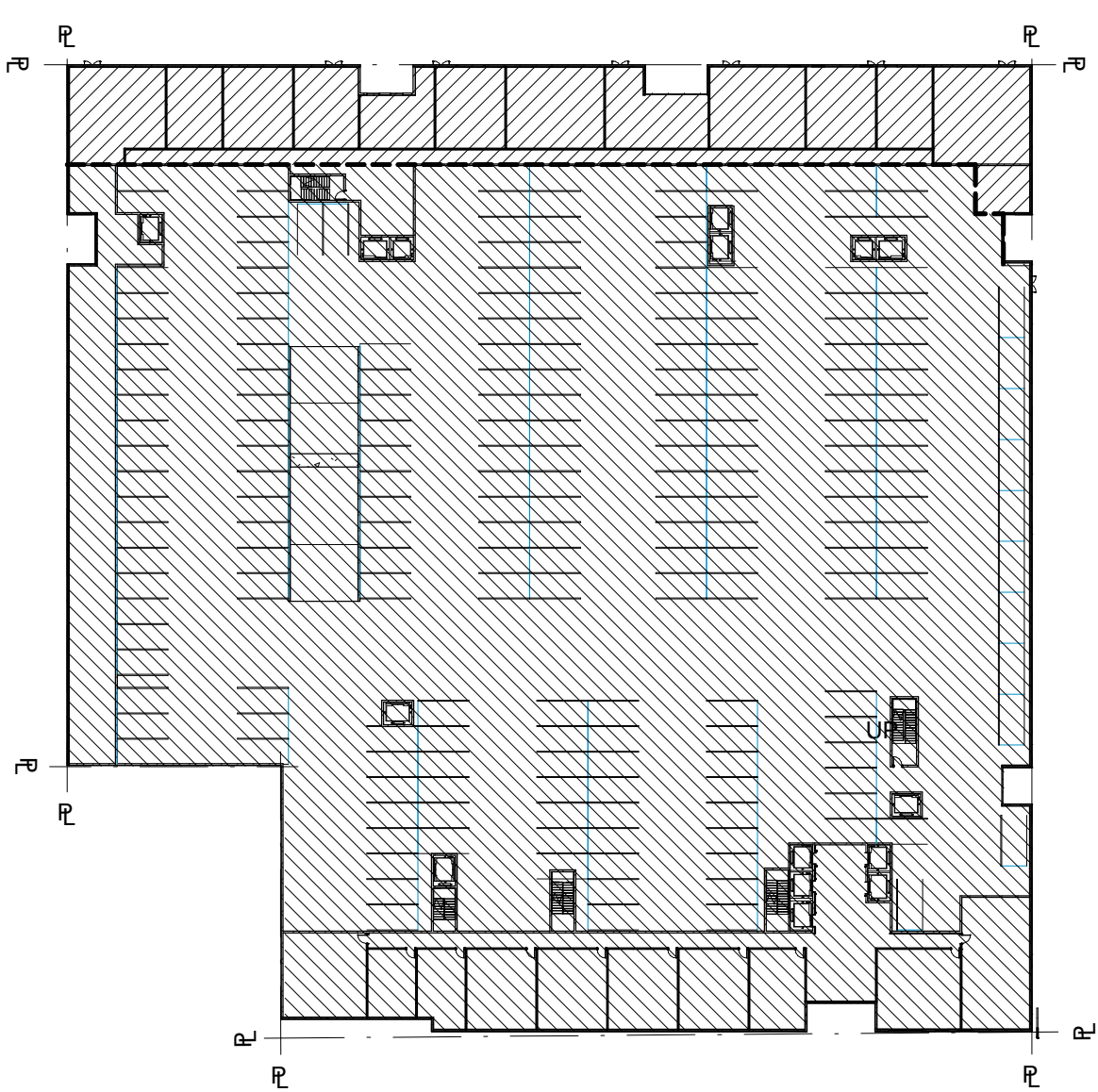
9 LOT COVERAGE - 8TH FLOOR NT
& 9TH FLOOR ST
1/64" = 1'-0"

5TH FLOOR NORTH & 6TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	5TH	53,281.74 SF	48.54 %
SOUTH	6TH	17,868.58 SF	16.28 %
TOTAL		71,150.32 SF	64.82 %



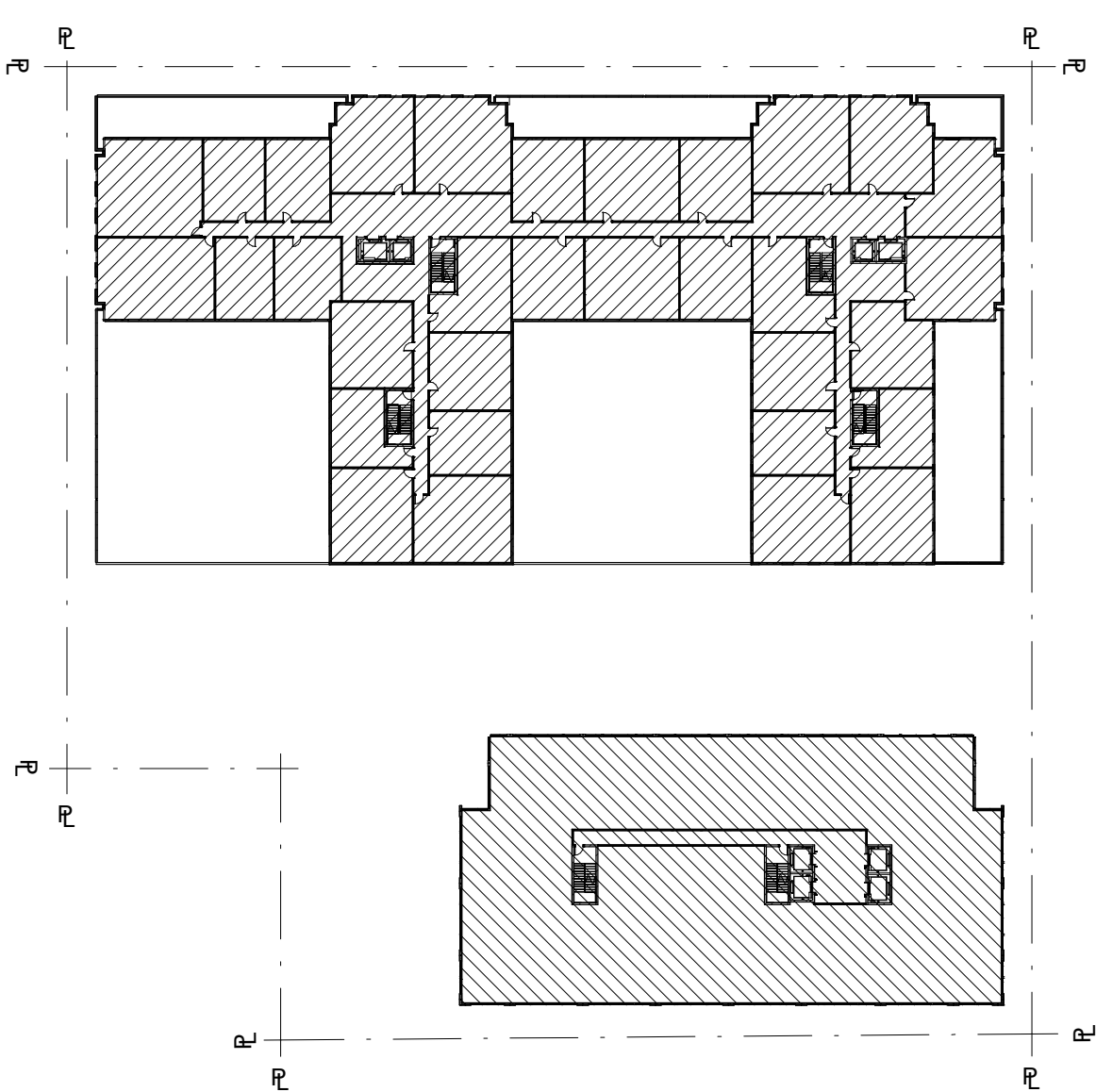
6 LOT COVERAGE - 5TH FLOOR NT
& 6TH FLOOR ST
1/64" = 1'-0"

2ND FLOOR NORTH & 3RD FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	2ND	11,987.02 SF	10.92 %
SOUTH	3RD	95,942.43 SF	87.40 %
TOTAL		107,929.45 SF	98.32 %



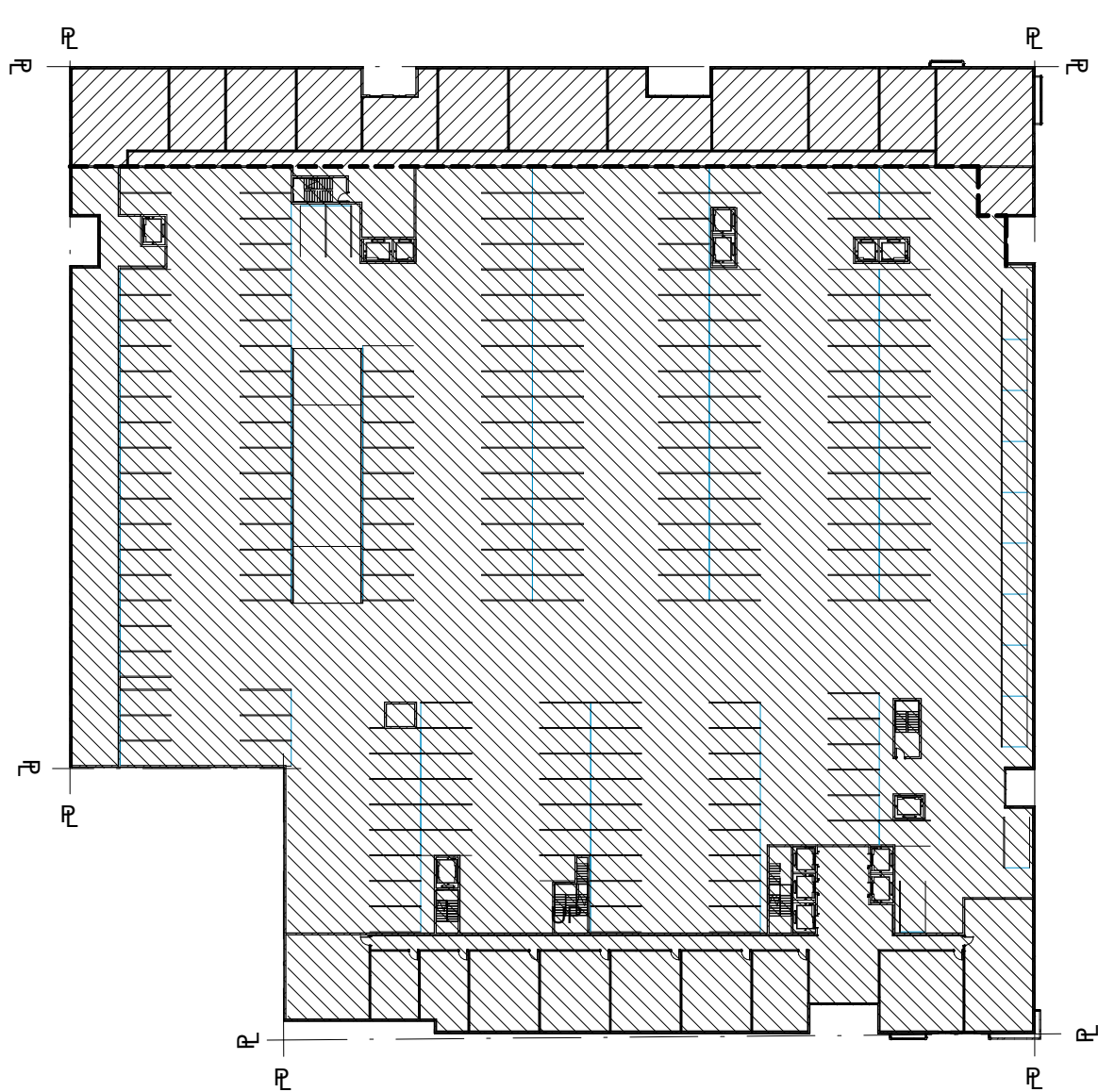
3 LOT COVERAGE - 2ND FLOOR NT
& 3RD FLOOR ST
1/64" = 1'-0"

7TH FLOOR NORTH & 8TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	7TH	33,788.72 SF	30.78 %
SOUTH	8TH	17,868.58 SF	16.28 %
TOTAL		51,657.30 SF	47.06 %



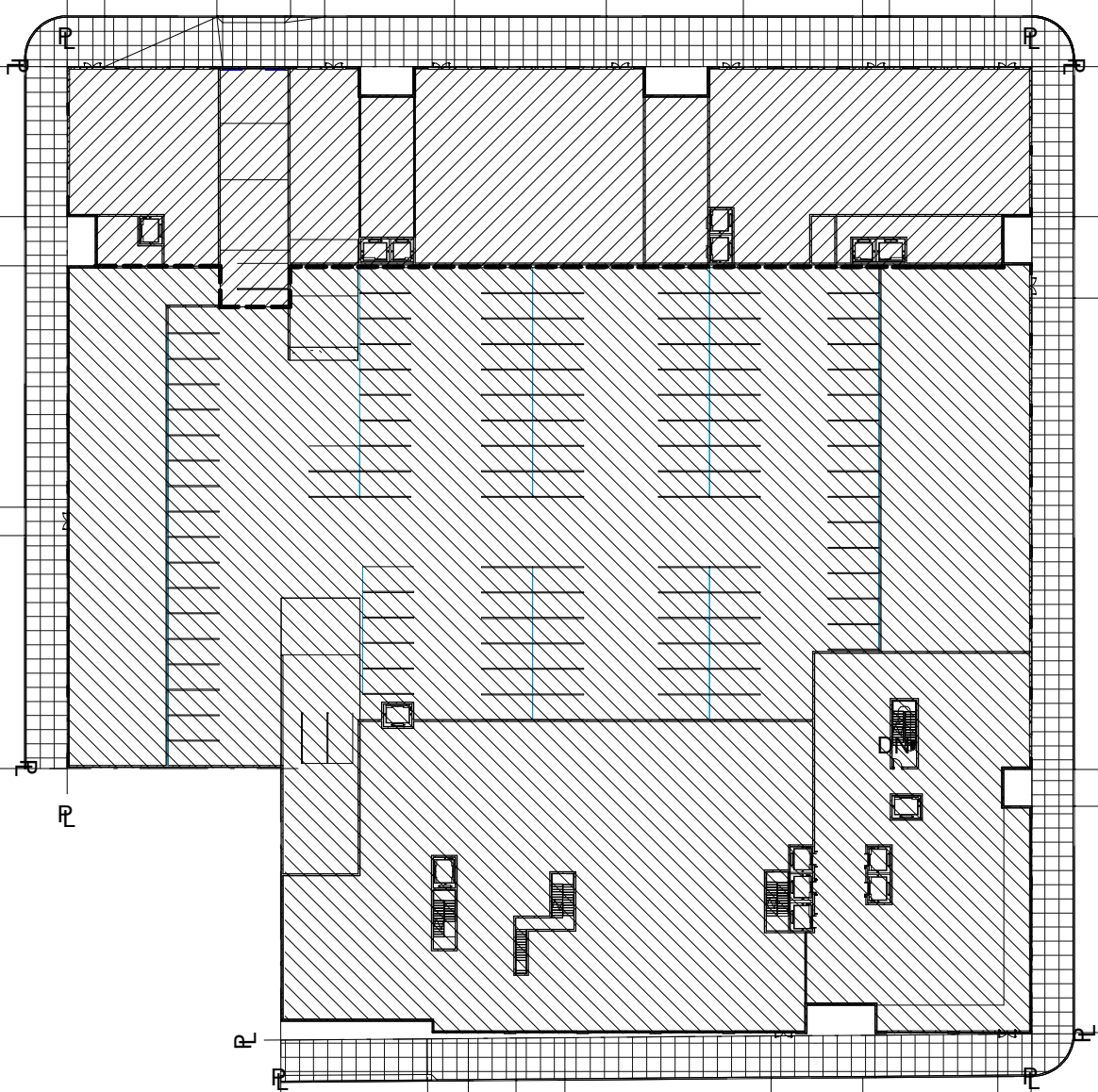
8 LOT COVERAGE - 7TH FLOOR NT
& 8TH FLOOR ST
1/64" = 1'-0"

4TH FLOOR NORTH & 5TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	4TH	11,987.02 SF	10.92 %
SOUTH	5TH	95,942.43 SF	87.40 %
TOTAL		108,116.12 SF	98.32 %



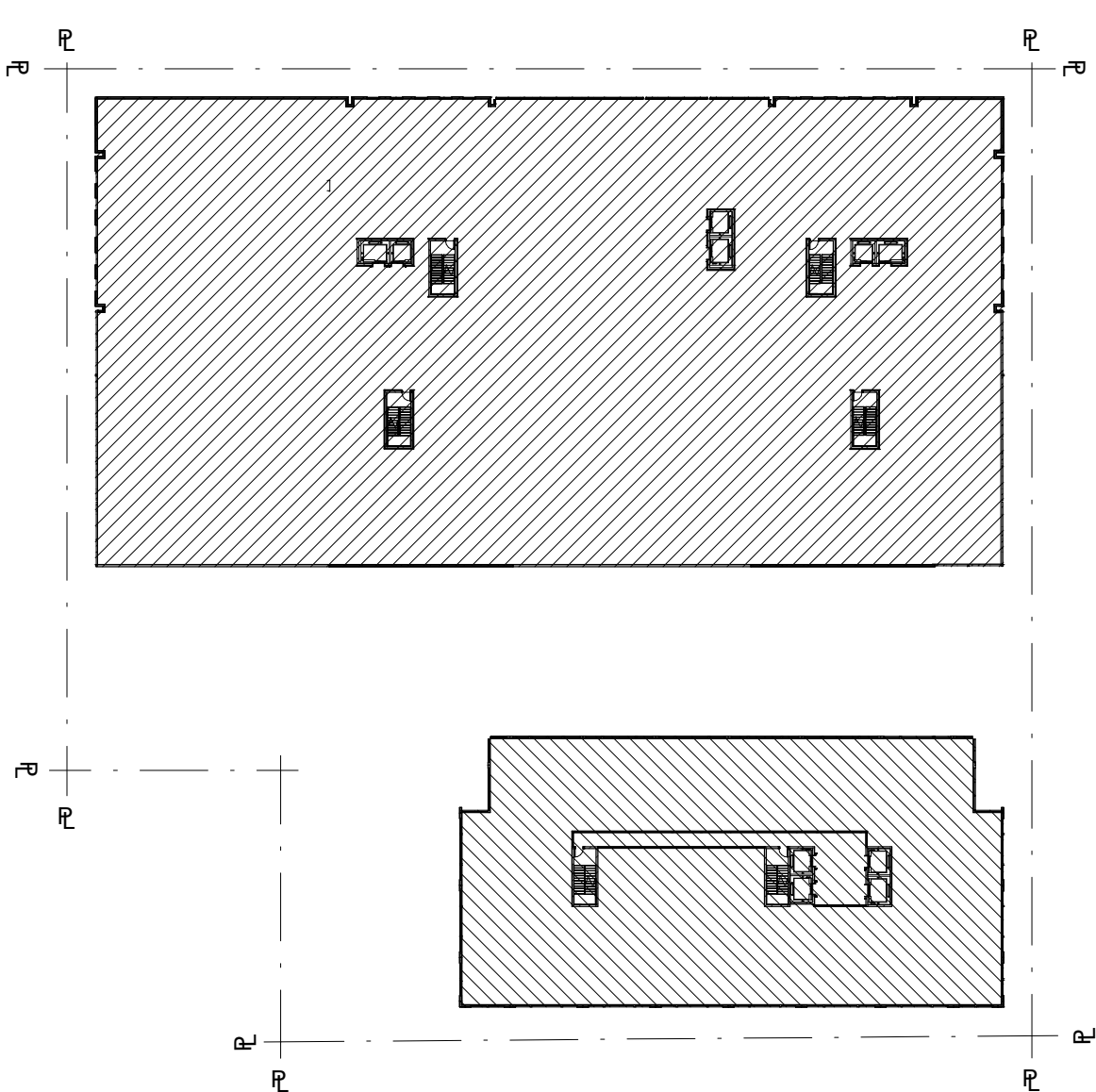
5 LOT COVERAGE - 4TH FLOOR NT
& 5TH FLOOR ST
1/64" = 1'-0"

1ST FLOOR NORTH & 2ND FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	1ST	23,682.33 SF	21.57 %
SOUTH	2ND	84,233.53 SF	76.73 %
TOTAL		107,915.86 SF	98.30 %



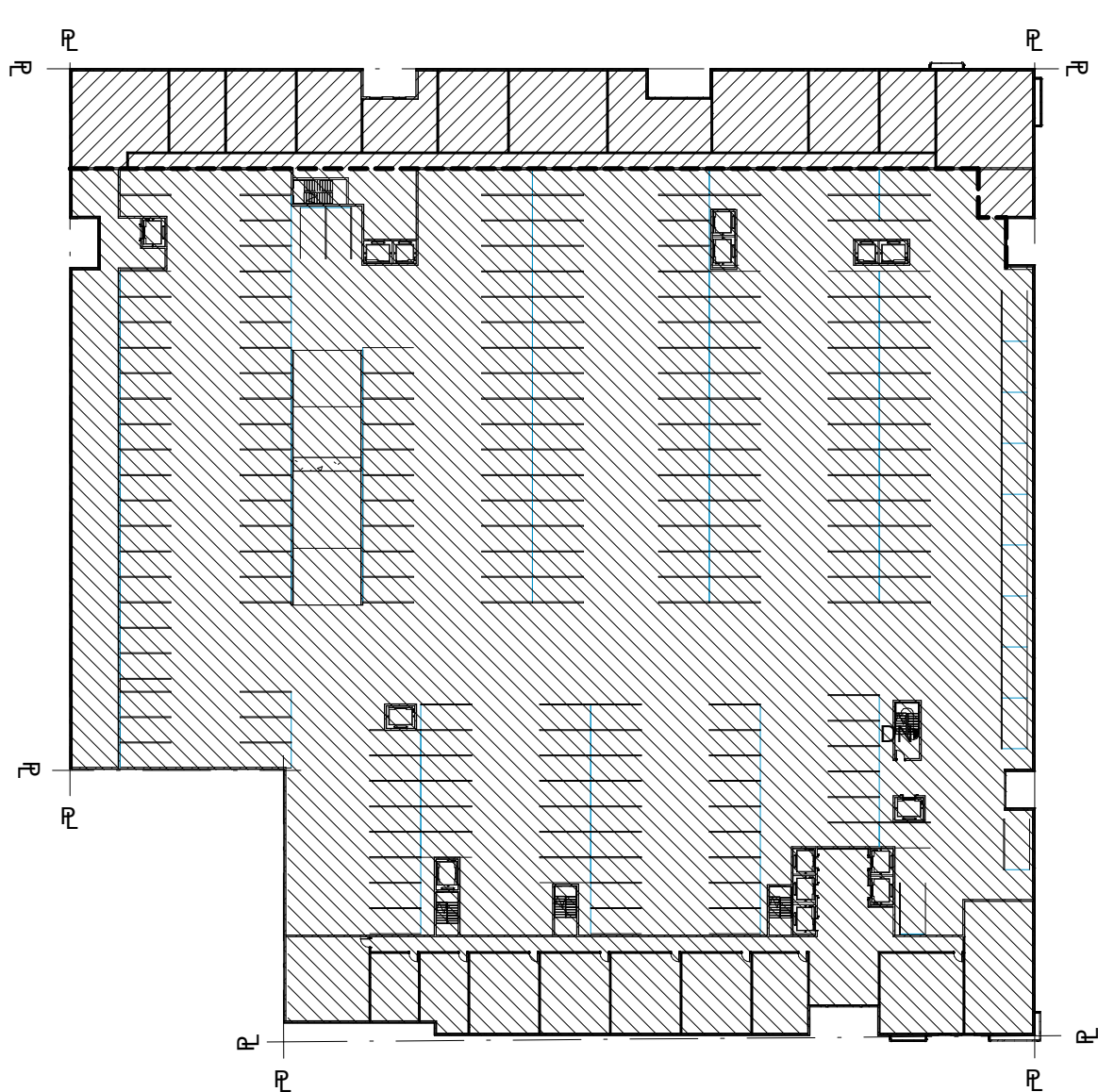
2 LOT COVERAGE - 1ST FLOOR NT
& 2ND FLOOR ST
1/64" = 1'-0"

6TH FLOOR NORTH & 7TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	6TH	53,281.74 SF	48.54 %
SOUTH	7TH	17,868.58 SF	16.28 %
TOTAL		71,150.32 SF	64.82 %



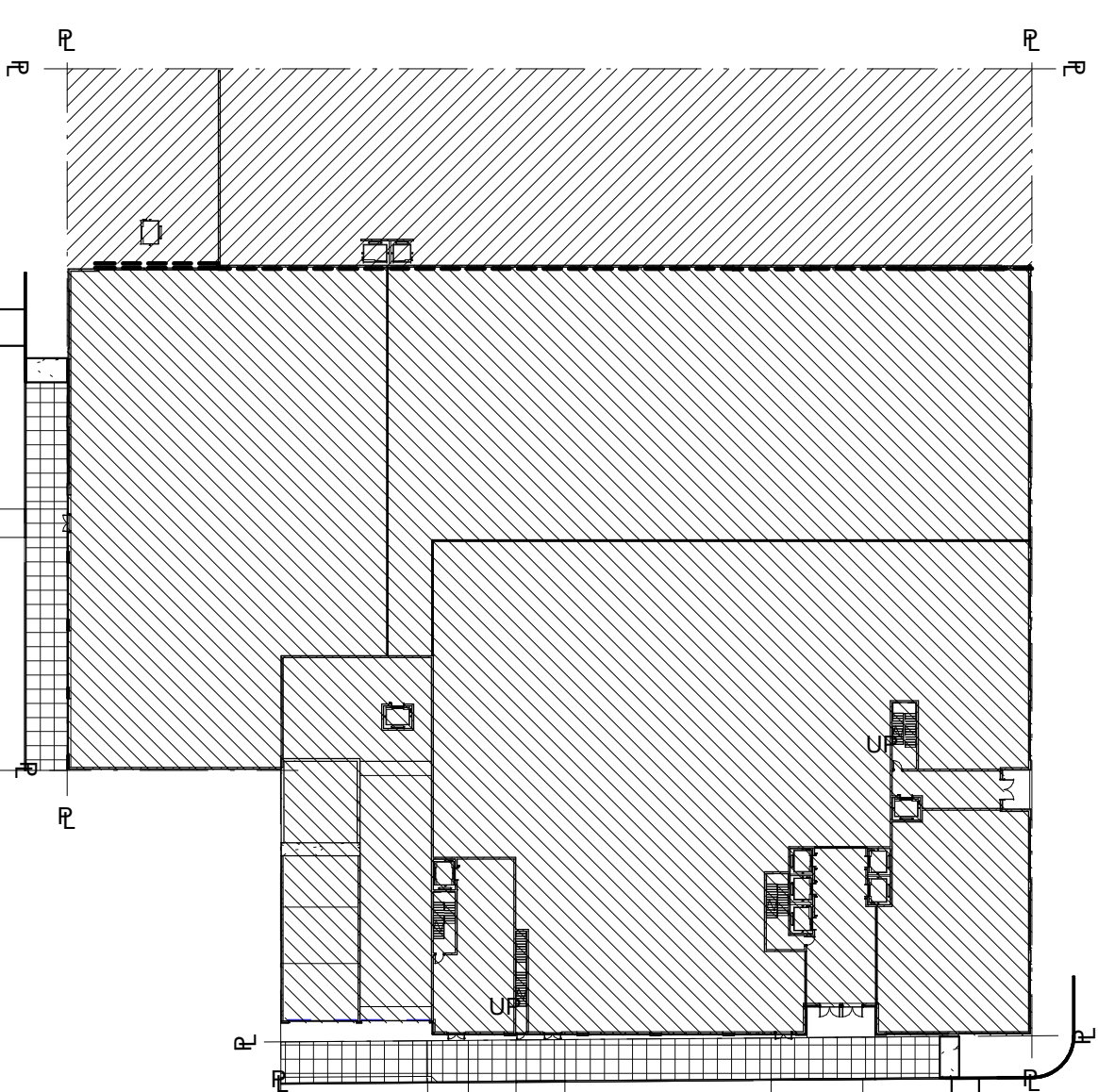
7 LOT COVERAGE - 6TH FLOOR NT
& 7TH FLOOR ST
1/64" = 1'-0"

3RD FLOOR NORTH & 4TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	3RD	11,987.02 SF	10.92 %
SOUTH	4TH	95,942.43 SF	87.40 %
TOTAL		107,929.45 SF	98.32 %



4 LOT COVERAGE - 3RD FLOOR NT
& 4TH FLOOR ST
1/64" = 1'-0"

1ST FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	CELLAR	24,026.29 SF	00.00 %
SOUTH	1ST	84,582.32 SF	77.05 %
TOTAL		84,582.32 SF	77.05 %



1 LOT COVERAGE - 1ST FLOOR ST
1/64" = 1'-0"

NOT FOR CONSTRUCTION

Approval

Project

12/15/16 P&Z Submission

1/11/16 P&Z Resubmission I

Date No. Description

Project

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

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101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

LOT COVERAGE
DIAGRAMS I

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

Scale

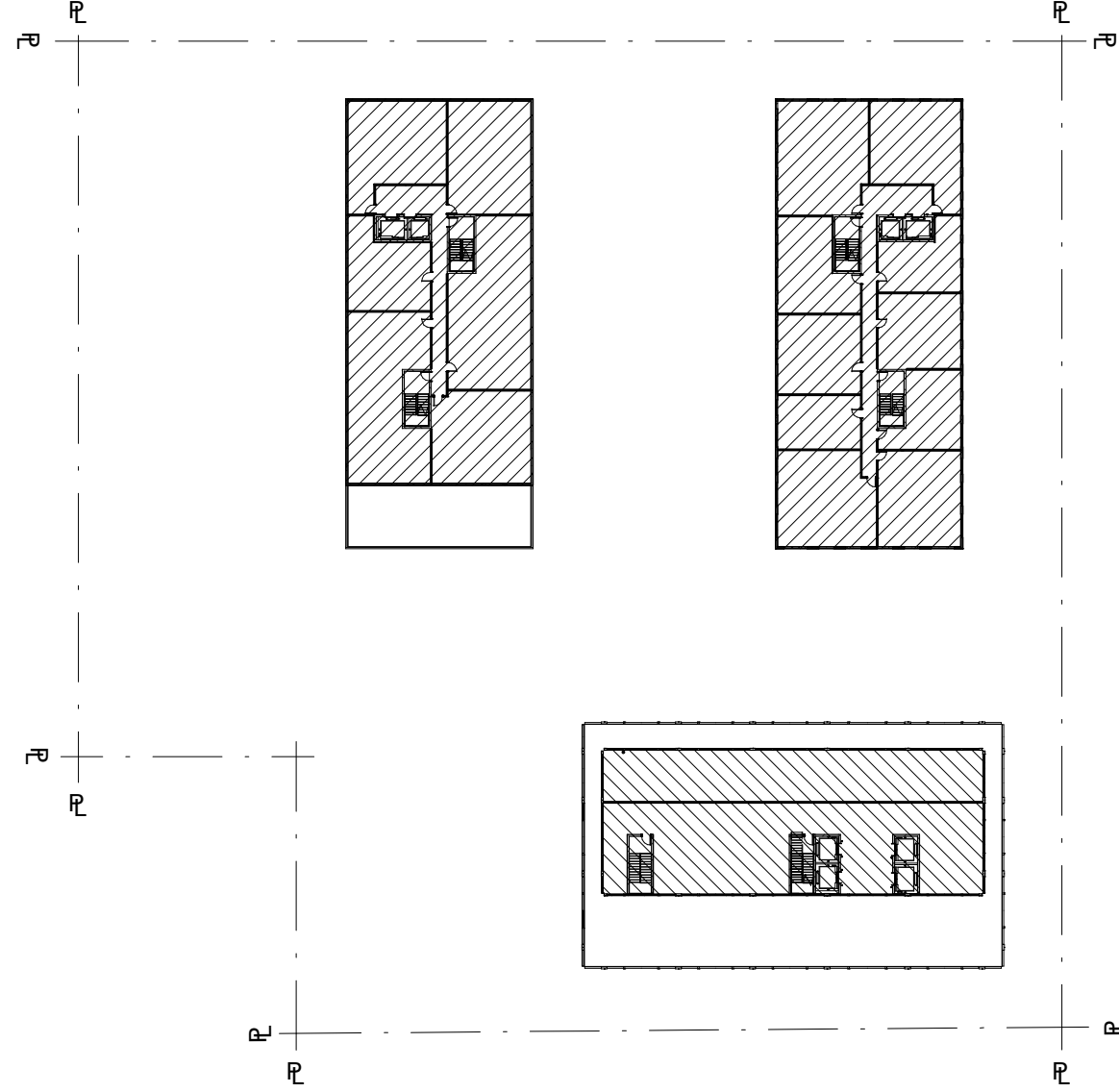
1/64" = 1'-0"

Drawing Number

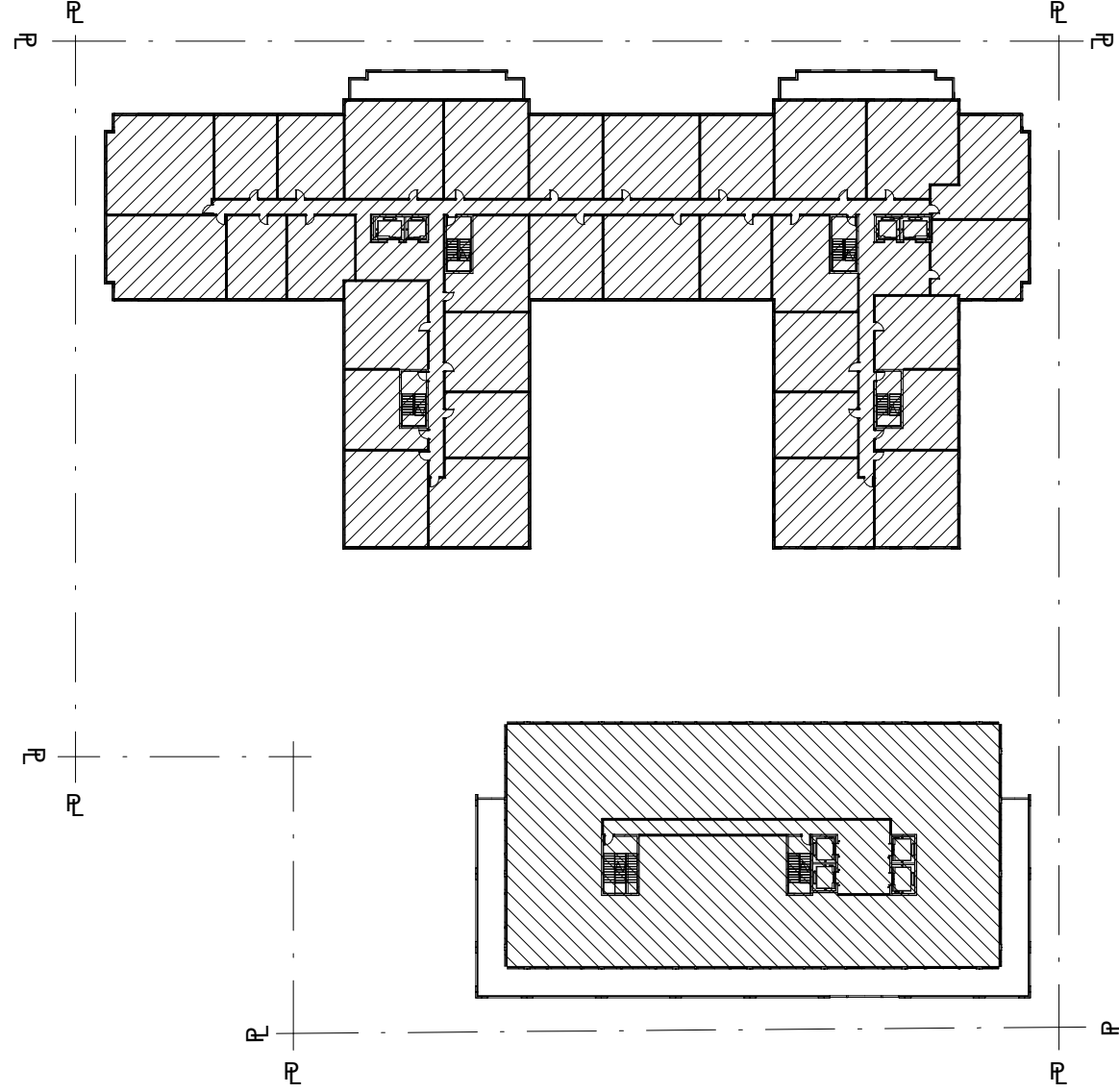
1317-01

24 of 35

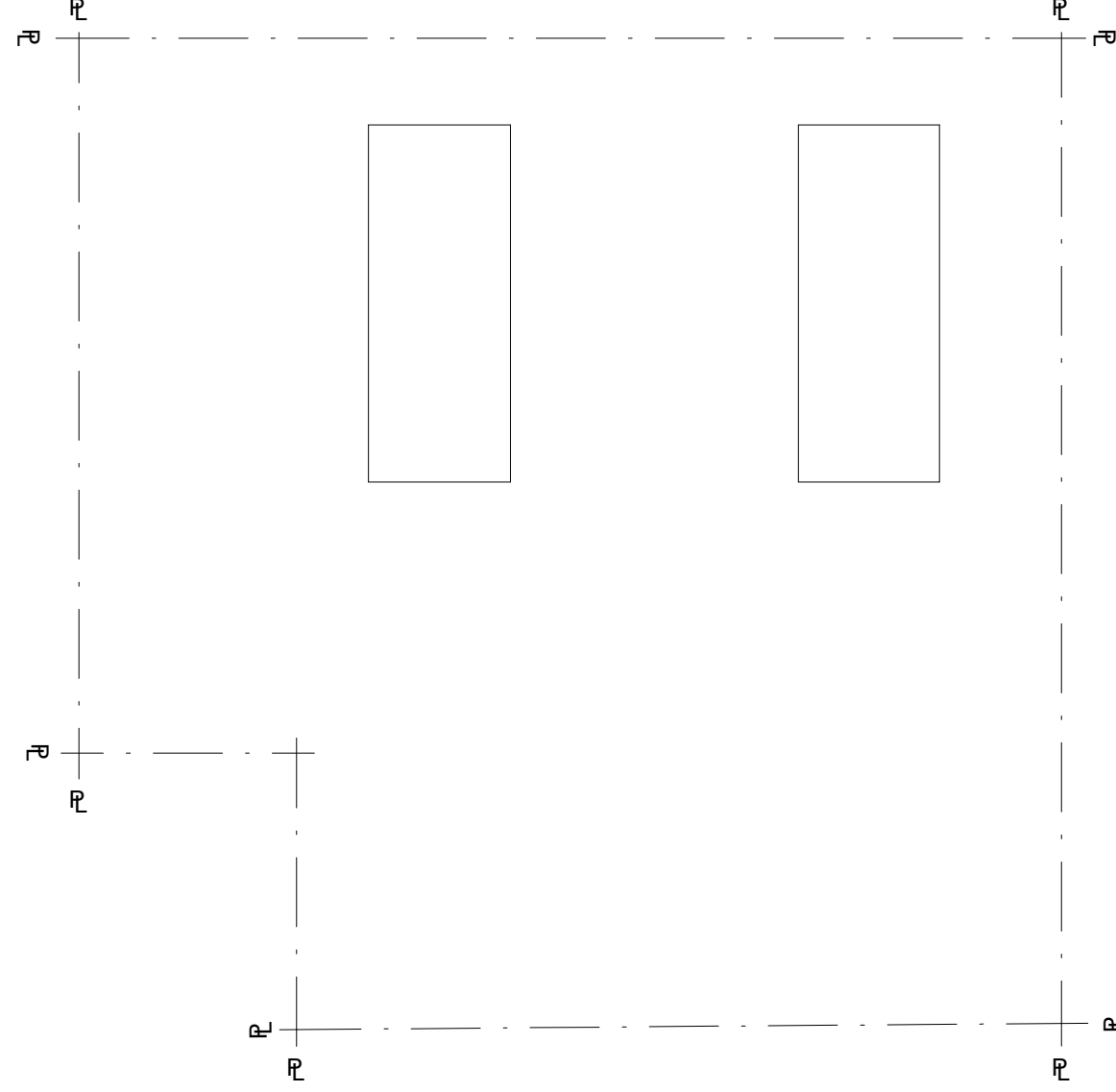
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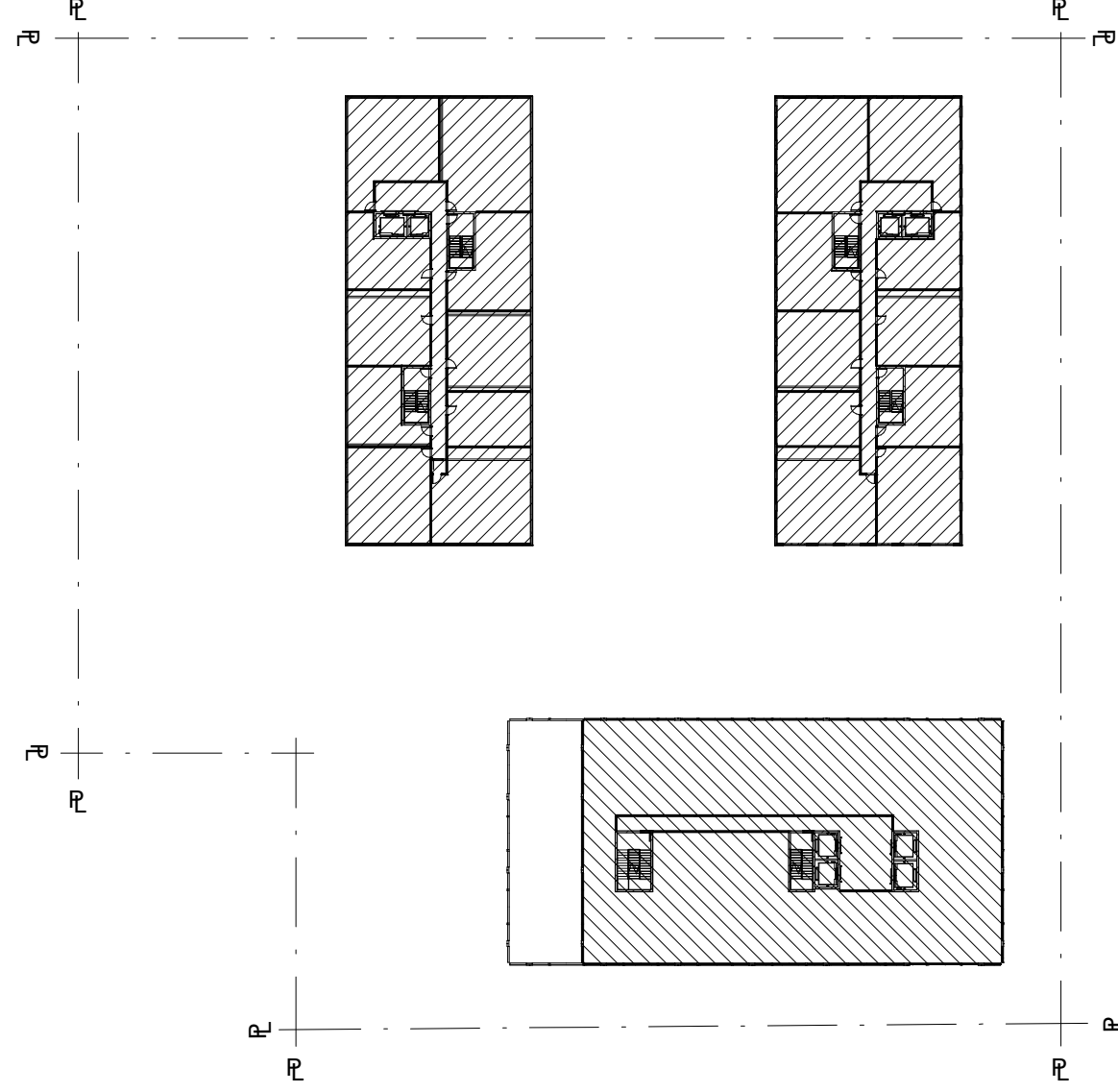
6 NT & 13 FLU
1/64" = 1'-0"



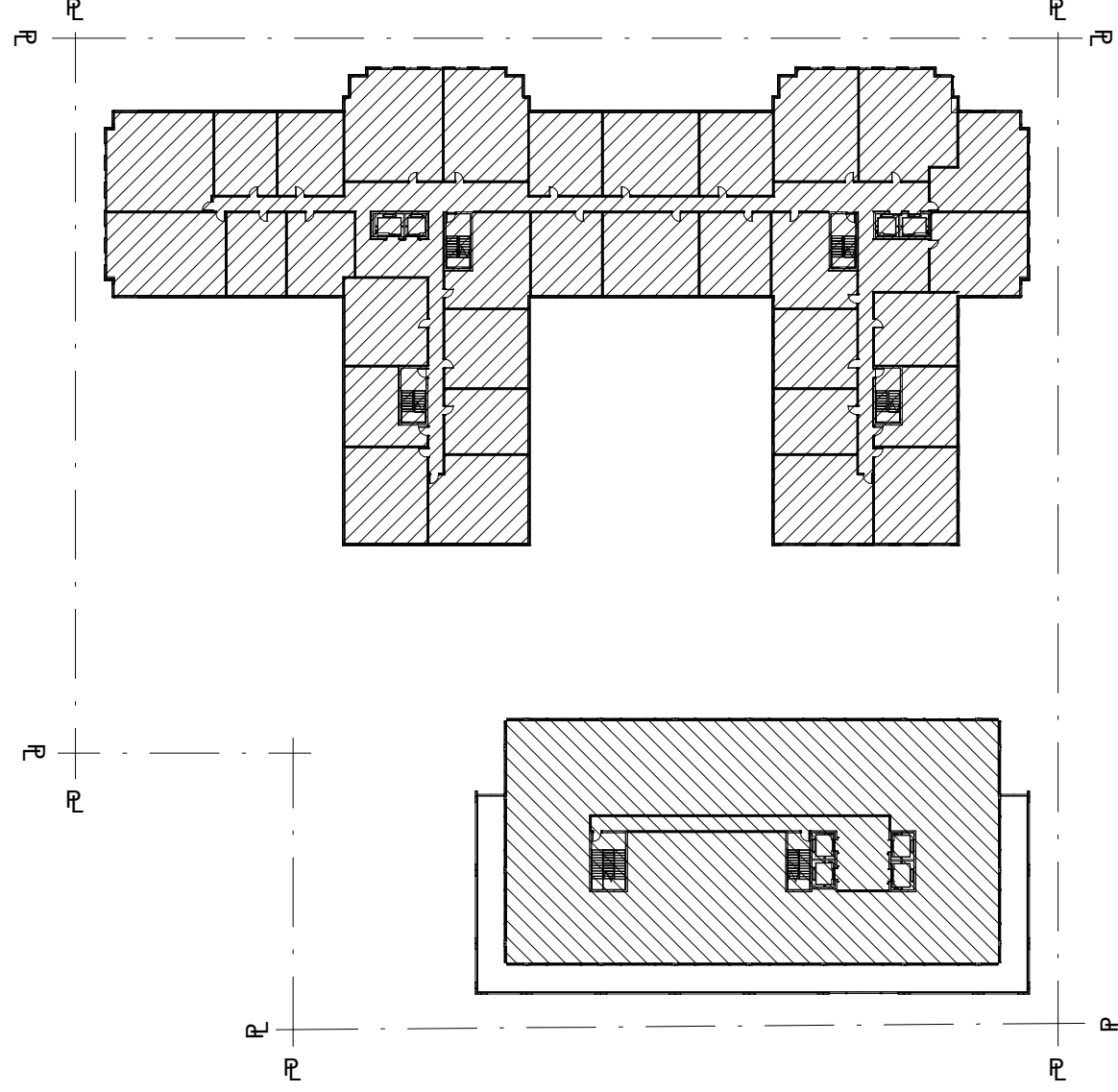
③ $\frac{1}{64}'' = 1'-0''$



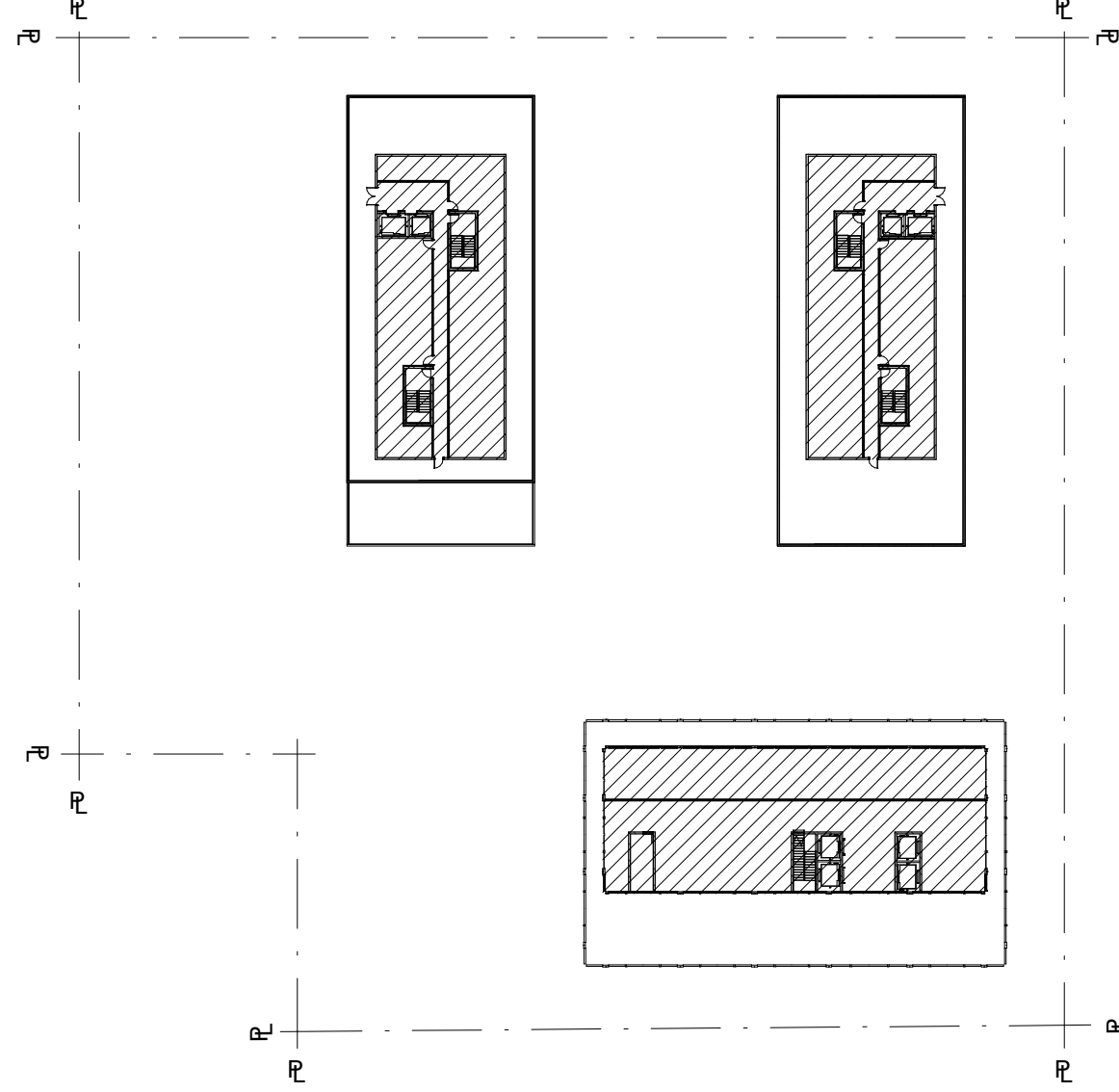
8 LOT COVER
1/64" = 1'-0"



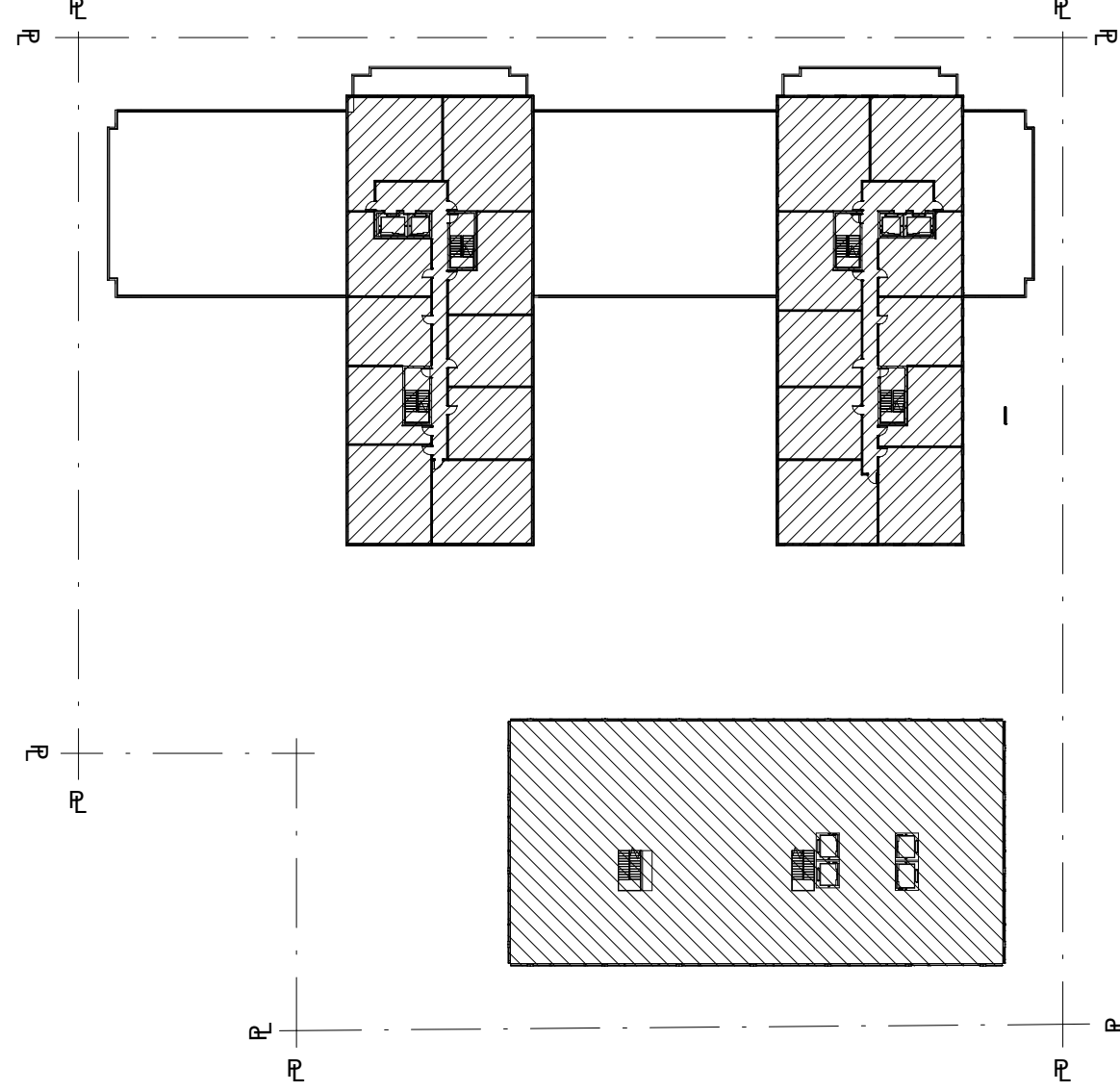
5 $\frac{1}{64}'' = 1'-0''$



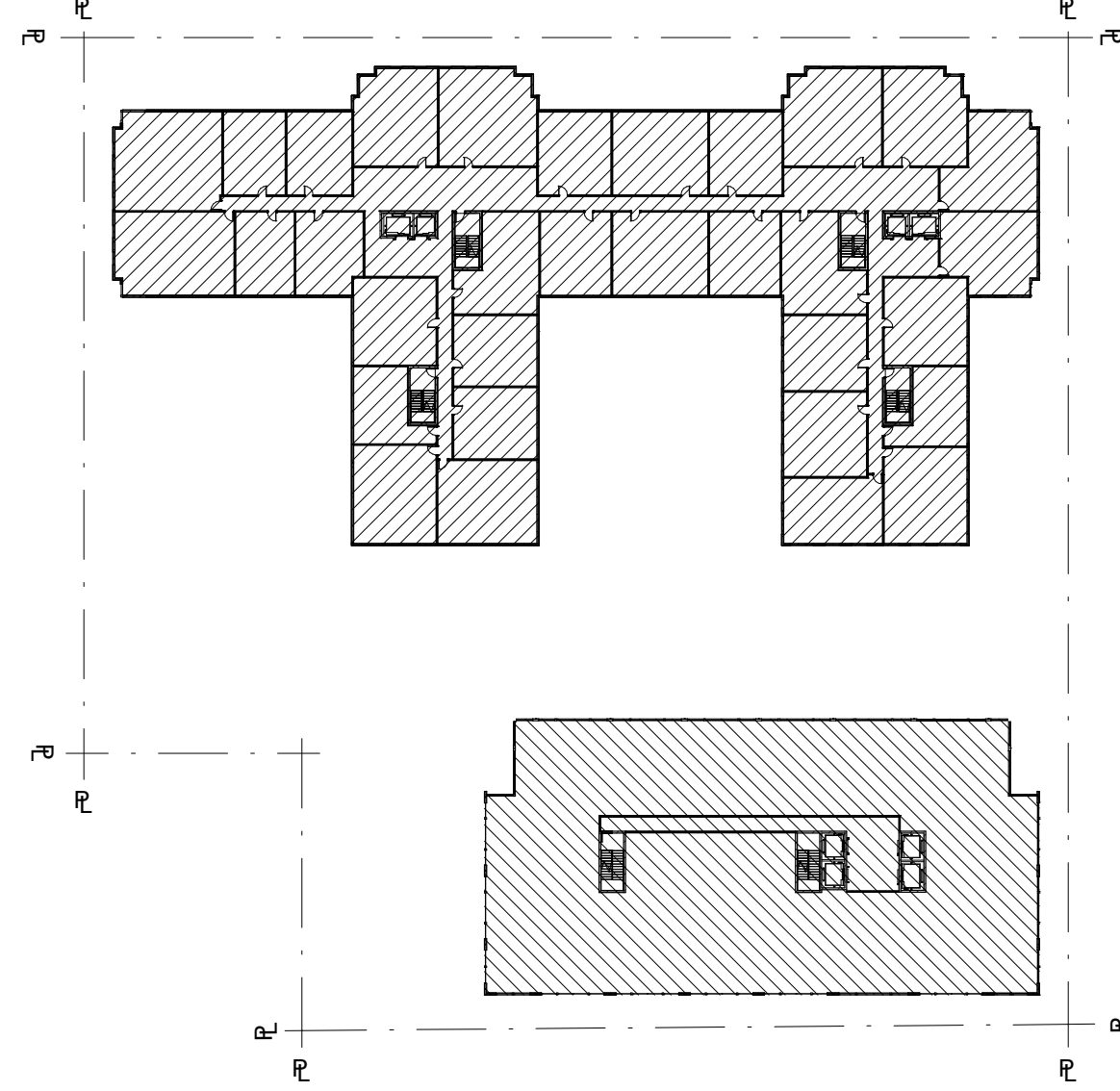
② $\frac{NI \& 101HF}{1/64" = 1'-0"}$



7 FLOOR NT 8
1/64" = 1'-0"



④ NT & 11 FLO
1/64" = 1'-0"



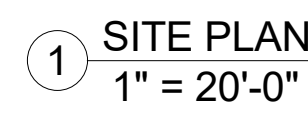
① & 9TH FLOOR
1/64" = 1'-0"

Appendix		
12/15/16		P&Z Submission
1/11/16		P&Z Resubmission I
Date	No.	Description

101 Cherry Street
Burlington, VT 05401

Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Scale: 1/64" = 1'-0"	

New Building Application Number:	Crewing:
----------------------------------	----------



AVERAGE GRADE CALCULATIONS:

PINE STREET:

$$\frac{211.71' + 212.80'}{2} = 214.26'$$

CHERRY STREET:

$$\frac{214.71' + 215.03'}{2} = 214.87'$$

ST. PAUL STREET NORTH:

$$\frac{216.36' + 216.90'}{2} = 216.63'$$

ST. PAUL STREET SOUTH:

$$\frac{212.69' + 213.32'}{2} = 213.01'$$

BANK STREET SOUTH:

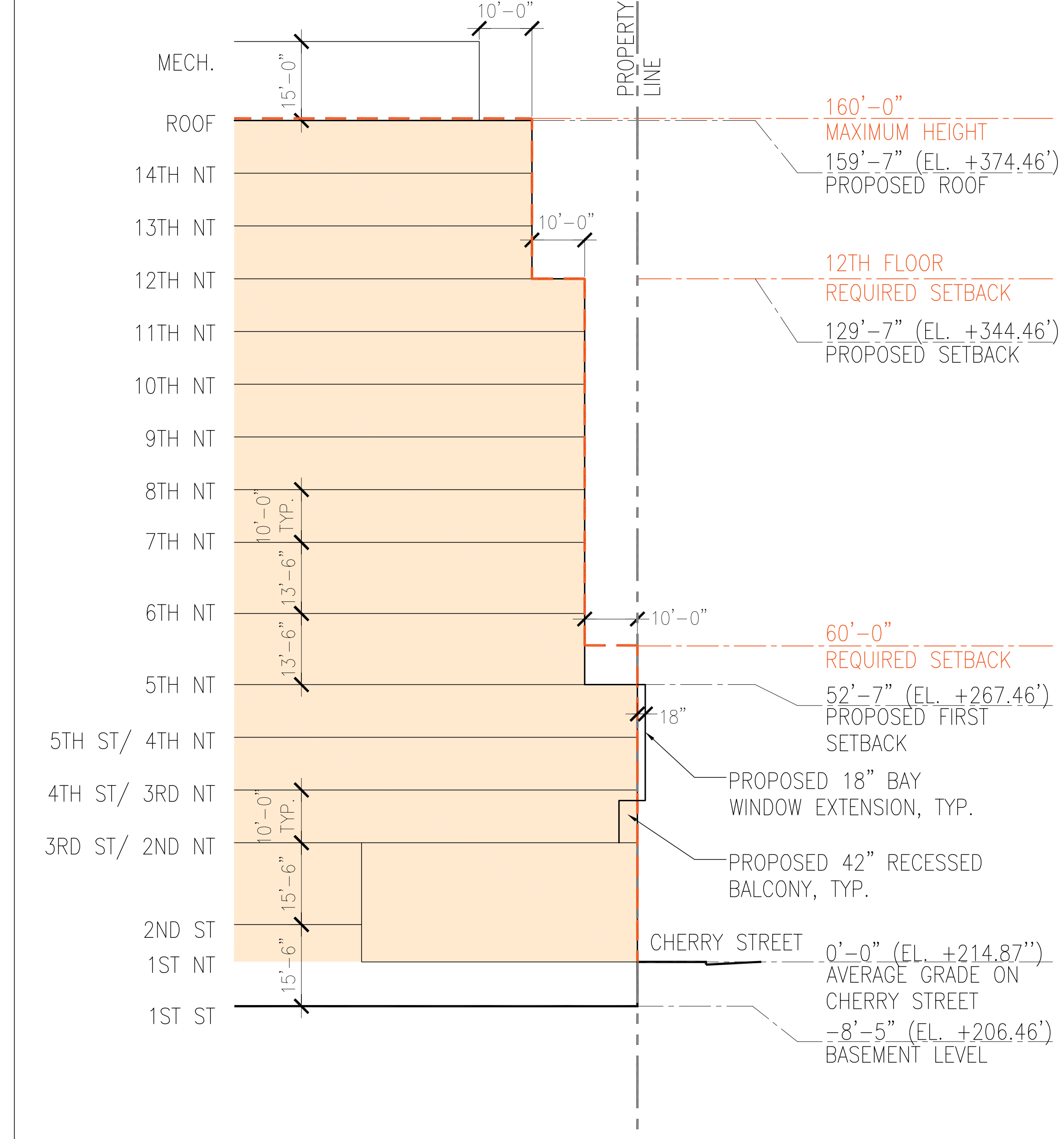
$$\frac{207.86' + 209.29' + 210.69'}{3} = 209.29'$$

	GREEN ROOF (11,015 SF)
	PV ARRAY
	PEDESTAL PAVER SYSTEM
	FLEXI-PAVE PLAY SURFACE

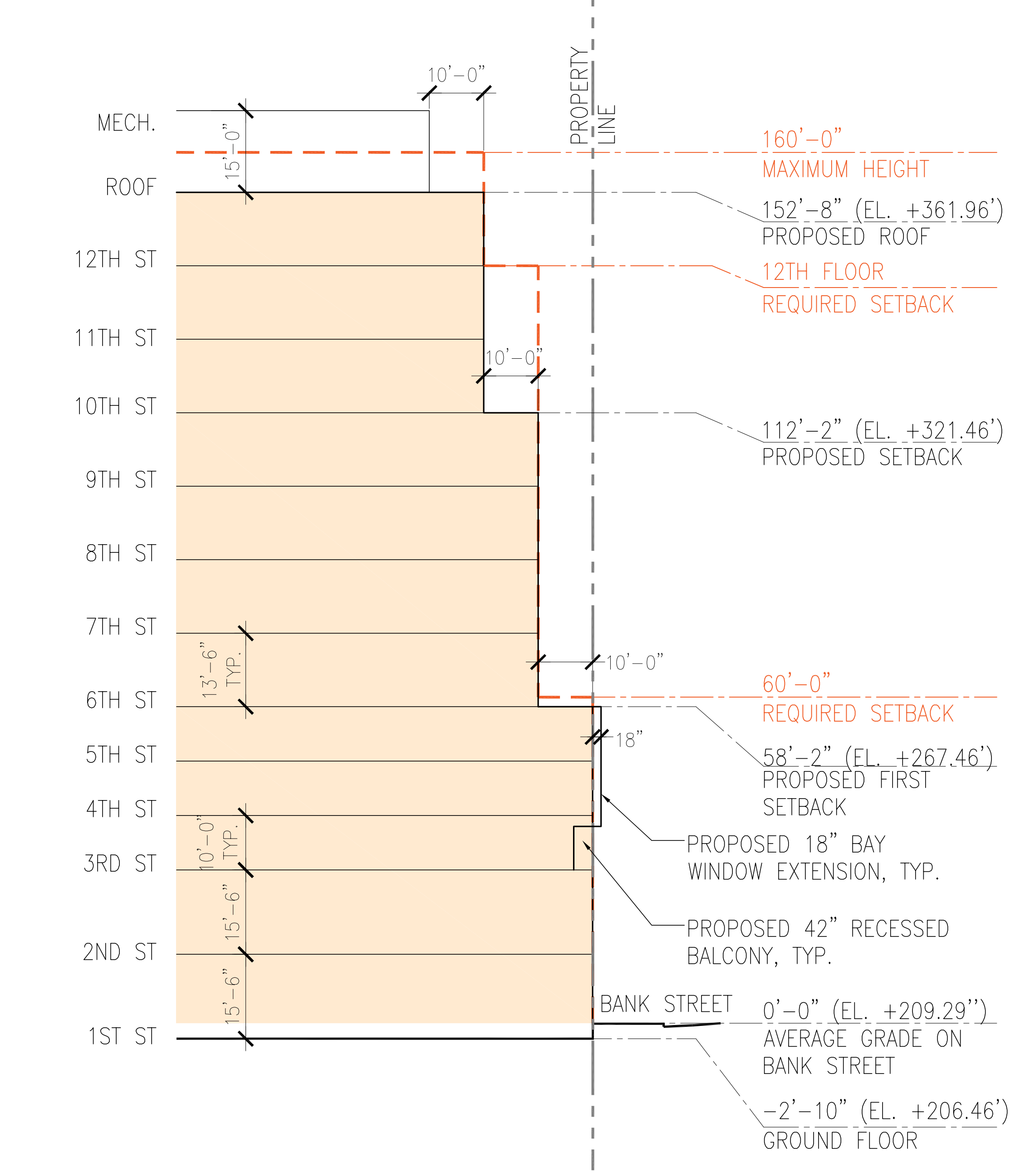
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Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Scale: As indicated	

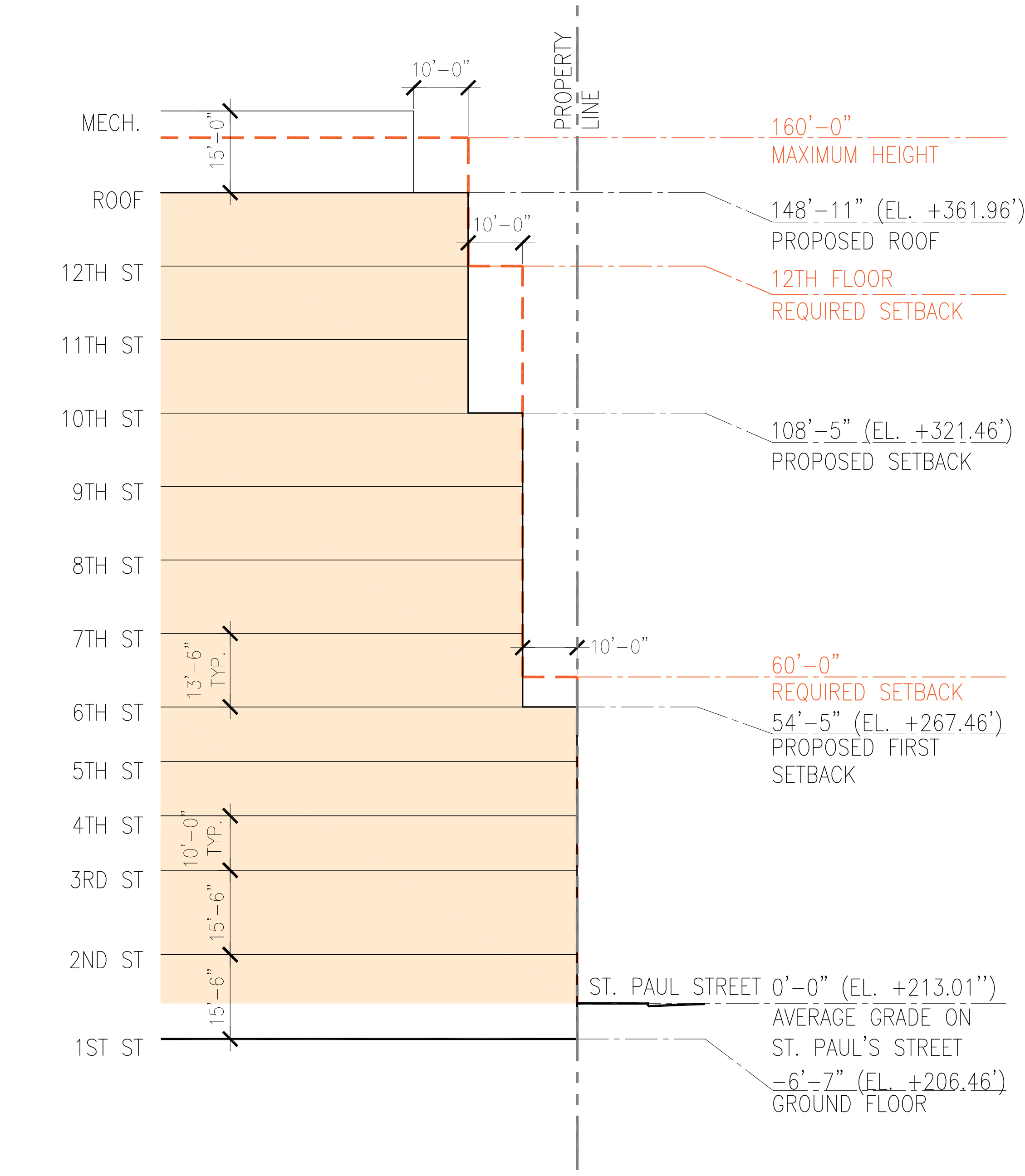
Z-003



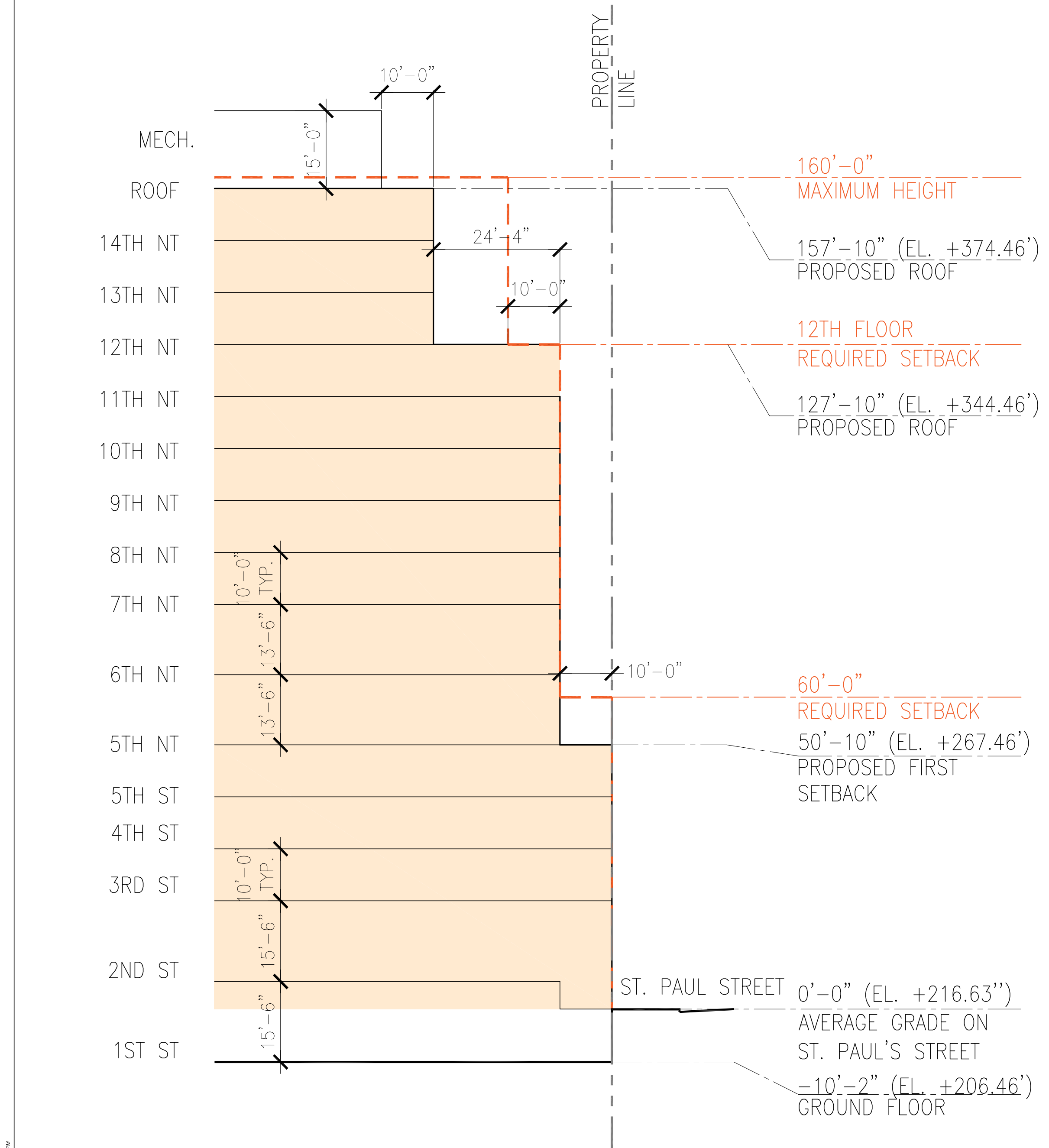
01 PROPOSED NORTH TOWER BUILDING SETBACK - CHERRY STREET
1/16" = 1'-0"



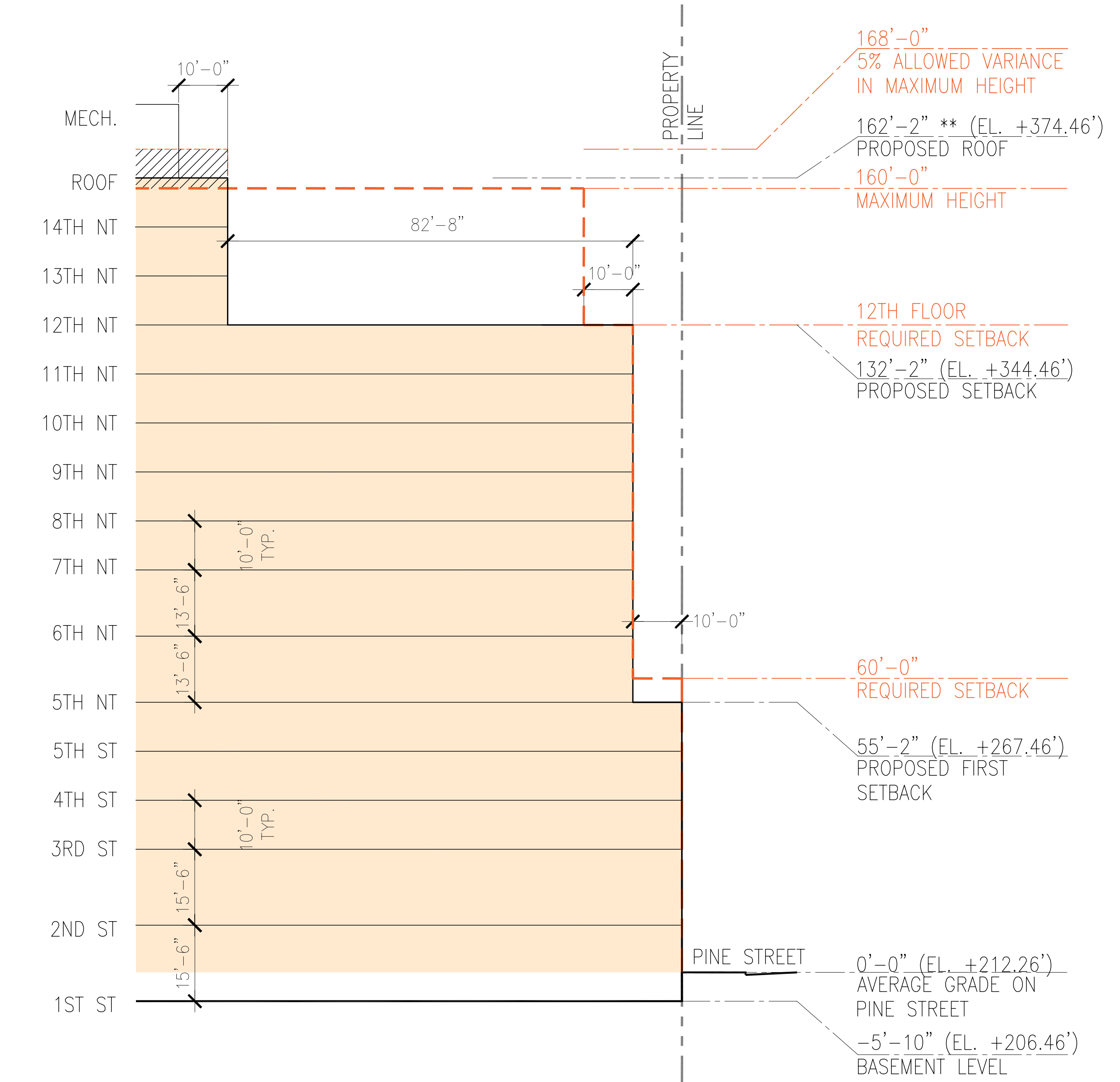
02 PROPOSED SOUTH TOWER BUILDING SETBACK - BANK STREET
1/16" = 1'-0"



03 PROPOSED SOUTH TOWER BUILDING SETBACK - ST PAUL ST SOUTH
1/16" = 1'-0"



04 PROPOSED NORTH TOWER BUILDING SETBACK - ST PAUL ST NORTH
1/16" = 1'-0"



05 PROPOSED NORTH TOWER BUILDING SETBACK - PINE STREET
1/16" = 1'-0"

- MAXIMUM ZONING ENVELOPE
- PROPOSED BUILDING ENVELOPE
- PROPOSED BUILDING BEYOND ZONING ENVELOPE, WITHIN 5% VARIATION **

** 5% HEIGHT VARIATION IN THE MAXIMUM BUILDING HEIGHT IS ALLOWED FOR GRADE CHANGES ACROSS THE SITE. THE ADDITIONAL HEIGHT DOES NOT ENABLE THE CREATION OF AN ADDITIONAL STORY BEYOND THE MAXIMUM PERMITTED. 5'-7" HEIGHT INCREASE @ PINE STREET NORTH TOWER = 3.48% OF 160'-0"

P K PKSB ARCHITECTS, PC
+ S B 330 WEST 42 STREET
NEW YORK, NY 10036
212 594 2010
www.pksb.com

PC Construction
193 Tilley Drive
South Burlington, VT 05403

Freeman French Freeman, Inc.
81 Maple Street
Burlington, VT 05401

Hardy Structural Engineering
875 Roosevelt Hwy, Suite 130
Colchester, VT 05446

Hallam ICS
38 Eastwood Drive, Suite 200
South Burlington, VT 05403

Engineering Ventures P.C.
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

GeoDesign
1233 Shelburne Rd, Suite 360
South Burlington, VT 05403

SE Group
131 Church Street, 3rd Floor
Burlington, VT 05401

Construction Manager
(802)-651-1283
www.pconstruction.com

Consulting Architect
(802)-864-6844
www.fffinc.com

Structural Engineer
(802)-655-0755
www.hardyse.com

Mechanical Engineer
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www.hallam-ics.com

Civil Engineer
(802)-863-6225
www.engineeringventures.com

Geotechnical Engineer
(802)-652-5140
www.geodesign.net

Landscape Architect
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www.segroup.com

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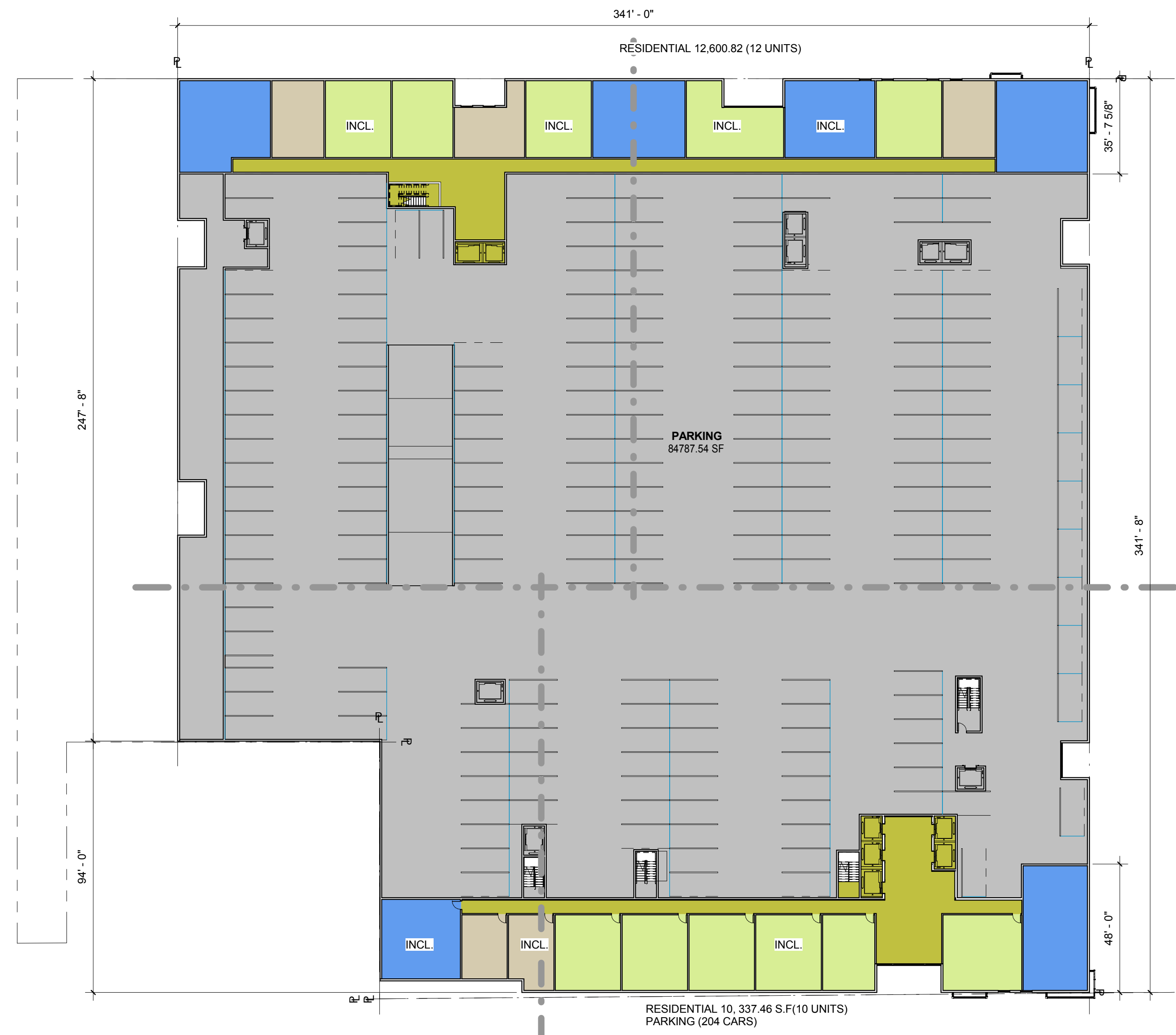
1/11/2017	02	P & Z RESUBMISSION 1
12/15/2016	01	P & Z SUBMISSION
Date	No.	Description

Burlington Town Center,
Devonwood Investors, LLC
101 Cherry Street
Burlington, VT 05401

BUILDING SECTIONS

Project Number: 1317-01	Signature & Seal
Drawn By:	
Checked By:	
Date: AS NOTED	

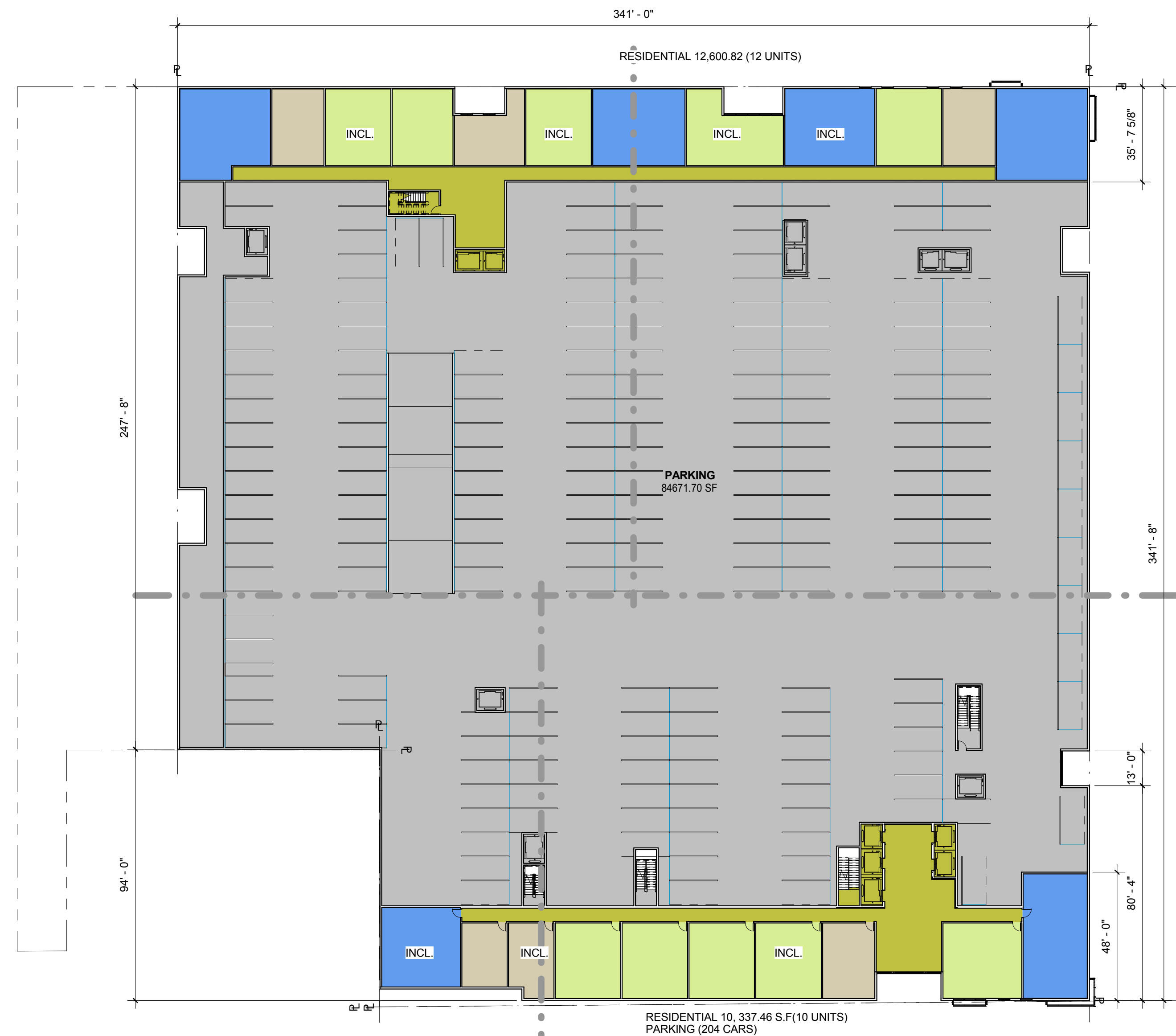
Z-021



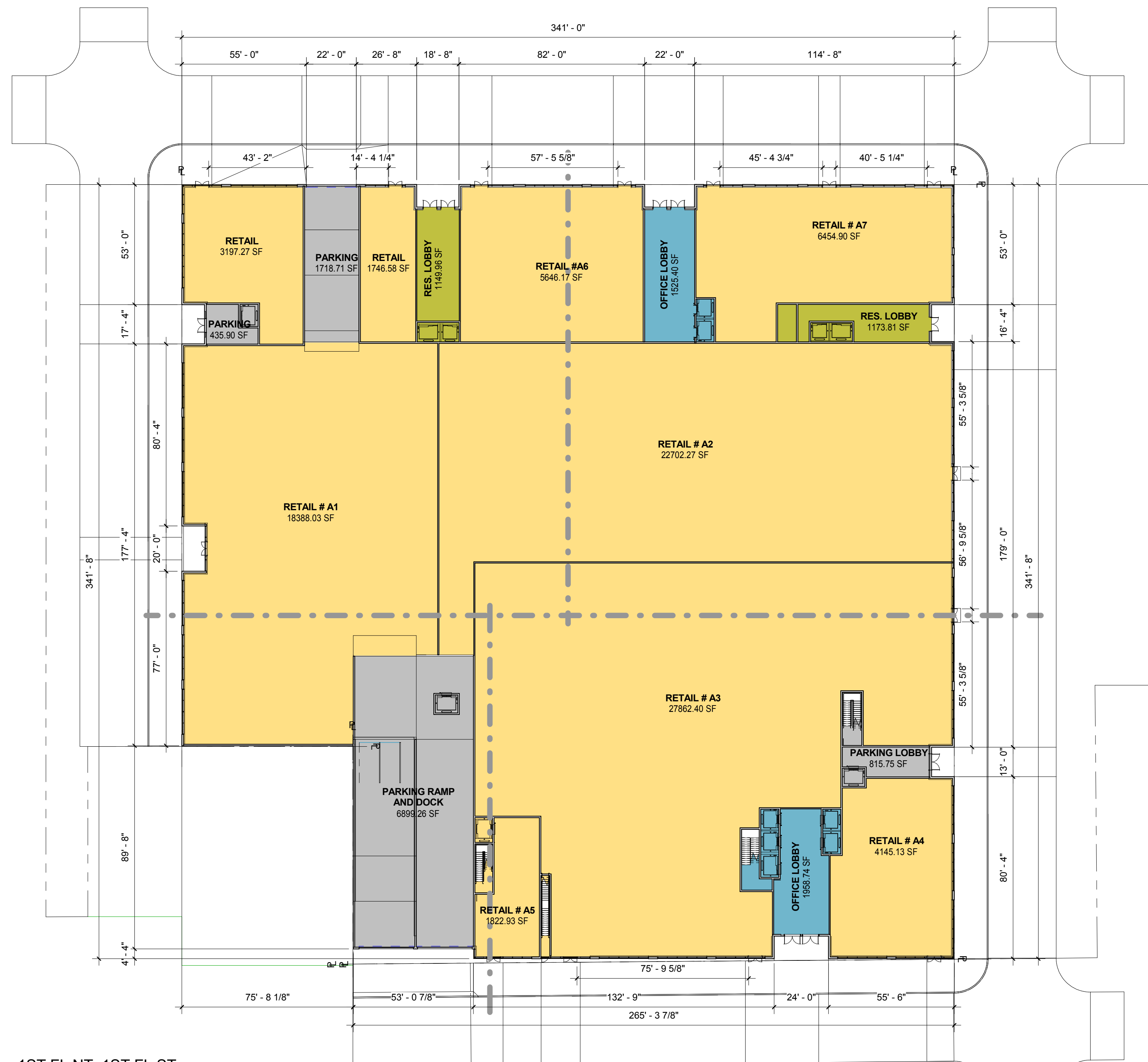
④ 3RD FL NT, 4TH FL ST
1/32" = 1'-0"



② 2ND FL NT
1/32" = 1'-0"



③ 2ND FL NT, 3RD FL ST
1/32" = 1'-0"



① 1ST FL NT, 1ST FL ST
1/32" = 1'-0"

NOT FOR CONSTRUCTION

Approval

12/15/16 P&Z Submission

1/11/16 P&Z Resubmission I

Date No. Description

Project

Burlington Town Center

Devonwood Investors, LLC

101 Cherry Street

Burlington, VT 05401

Drawing Title

FLOOR PLANS 1-4TH

FLOOR

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

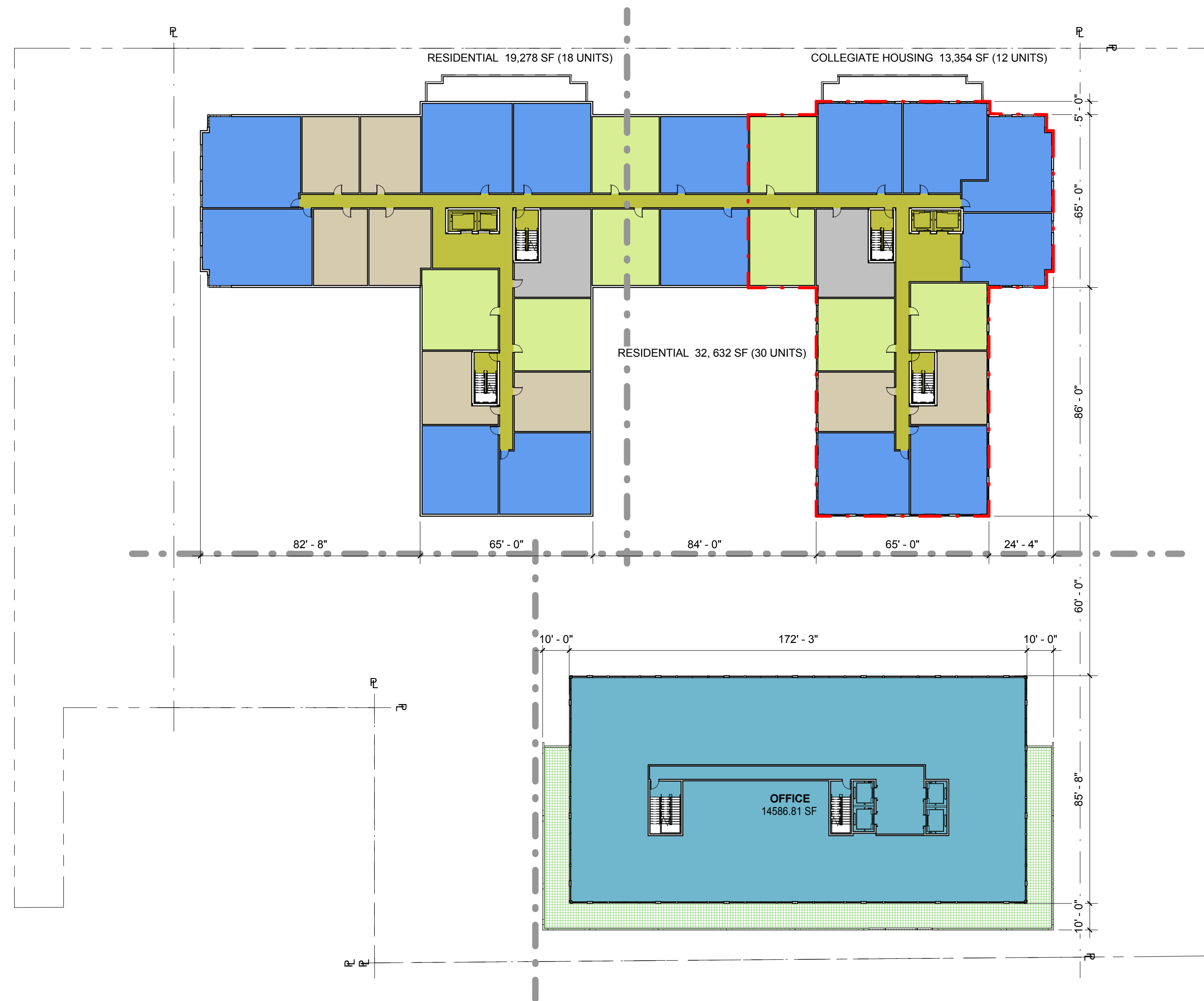
Scale

As Indicated

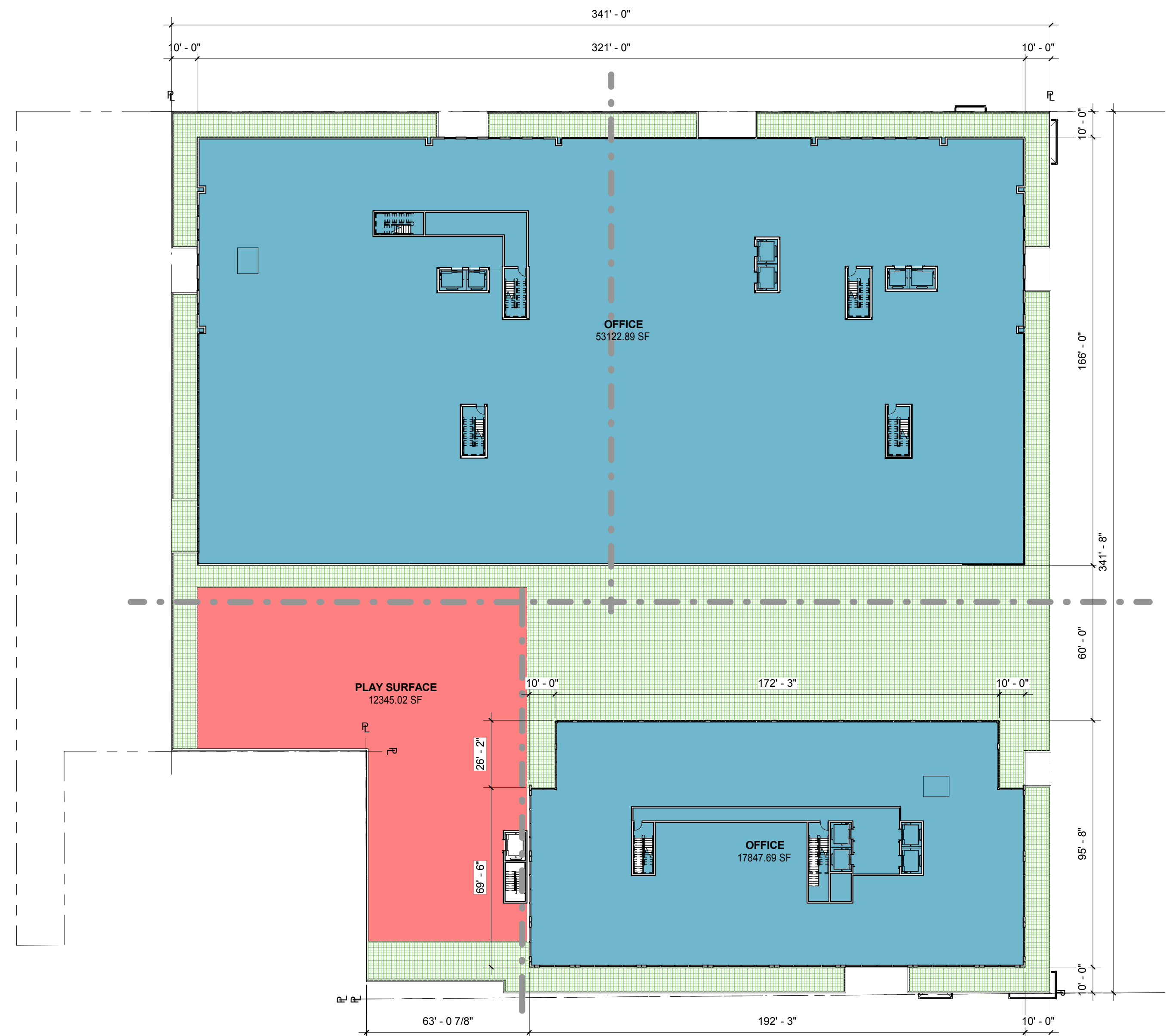
Drawing Number

A-051

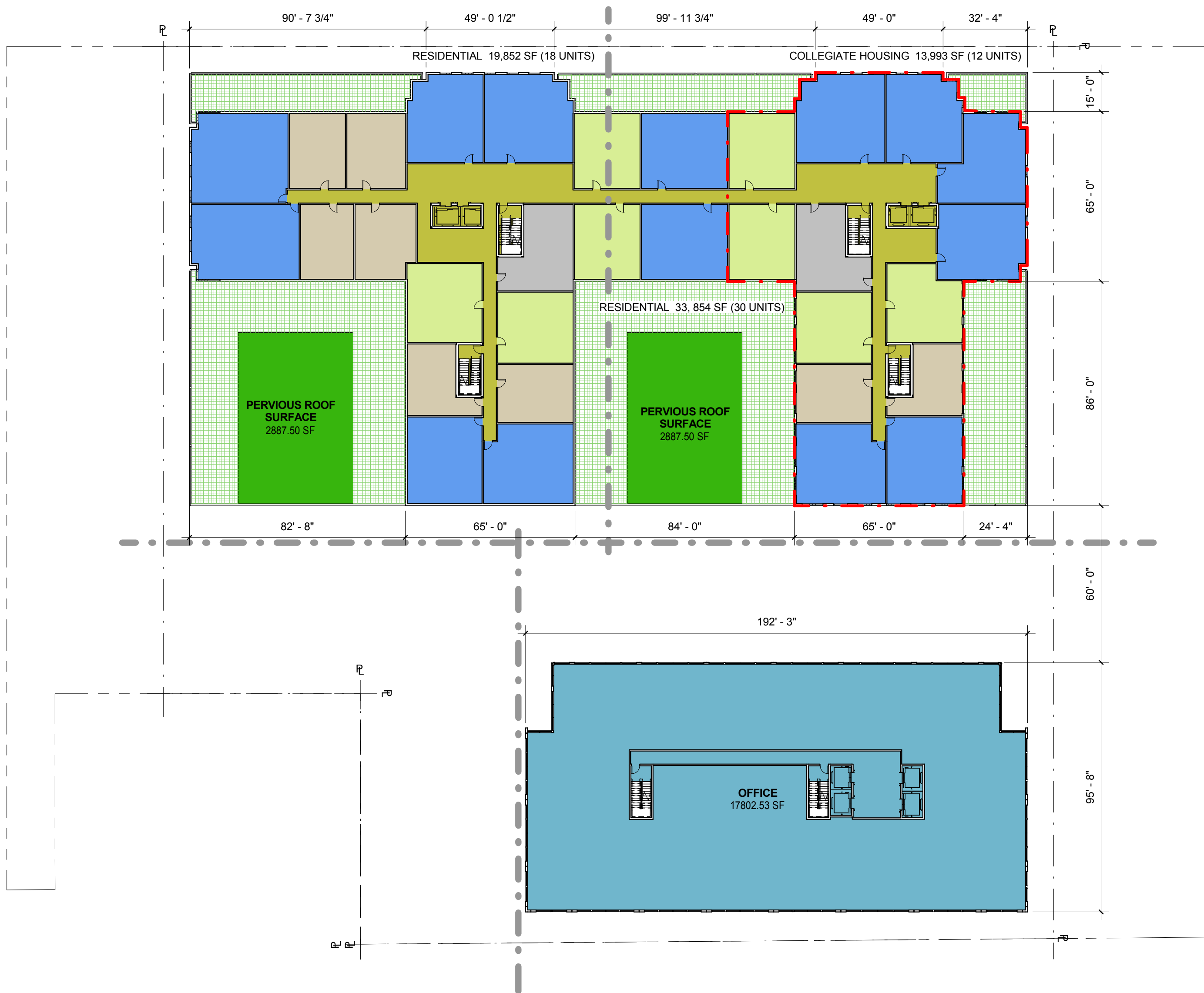
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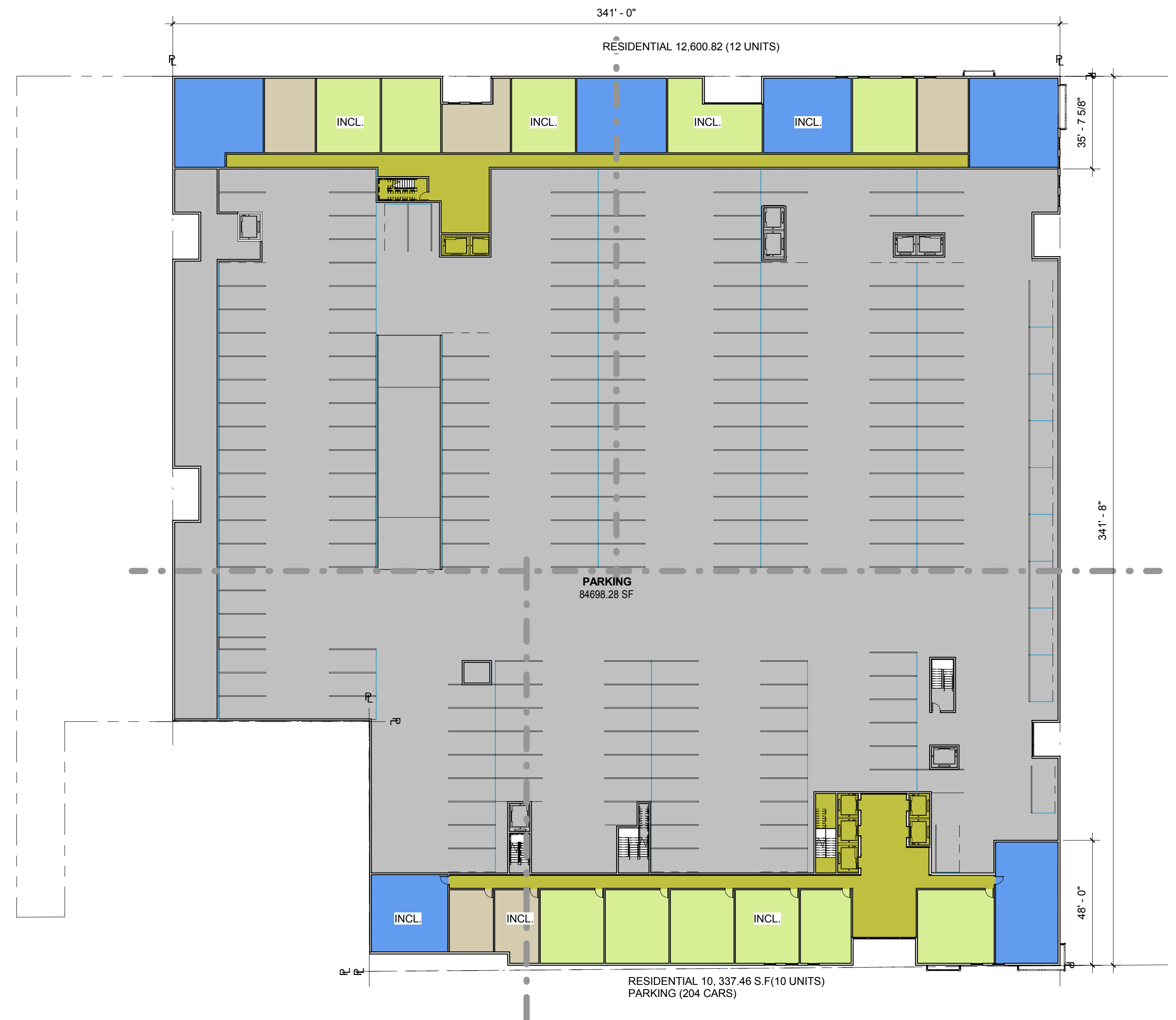
4 11TH FL NT, 10-11TH FLS ST
1/32" = 1'-0"



2 5-6TH FL NT, 6-7TH FL ST
1/32" = 1'-0"



3 7-10TH FLS NT, 8-9TH FLS ST
1/32" = 1'-0"



1 4TH FL NT, 5TH FL ST
1/32" = 1'-0"

NOT FOR CONSTRUCTION

Approval

Project

12/15/16 P&Z Submission

1/11/16 P&Z Resubmission I

Date No. Description

Project

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

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Burlington, VT 05401

101 Cherry Street

Burlington, VT 05401

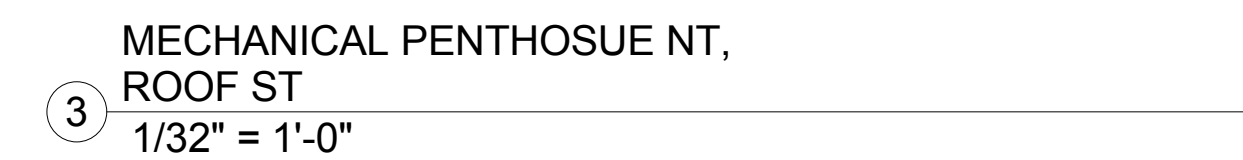
101 Cherry Street

Burlington, VT 05401

101 Cherry Street

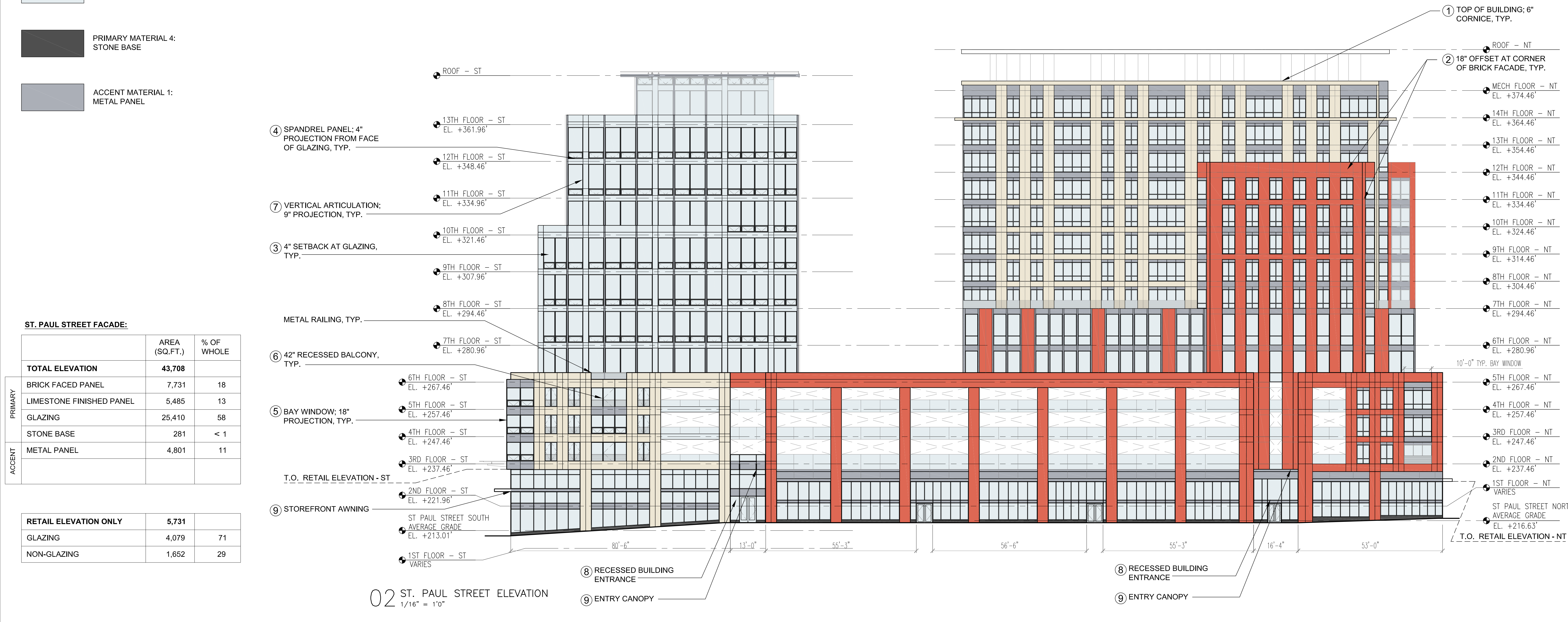
Burlington, VT 05401

A-052

[illegible]

Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Scale: As indicated	

A-053



P + S **K + B** PKSB ARCHITECTS, PC
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NEW YORK, NY 10036
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www.pksb.com

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81 Maple Street
Burlington, VT 05401

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GeoDesign
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South Burlington, VT 05403

SE Group
131 Church Street, 3rd Floor
Burlington, VT 05401

Construction Manager
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Consulting Architect
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www.fllinc.com

Structural Engineer
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www.hardyse.com

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www.hallam-ics.com

Civil Engineer
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www.engineeringventures.com

Geotechnical Engineer
(802)-652-5140
www.geodesign.net

Landscape Architect
(802)-862-0098
www.segroup.com

NOT FOR CONSTRUCTION

Approval:

Date	No.	Description
1/11/2017	02	P & Z RESUBMISSION 1
12/15/2016	01	P & Z SUBMISSION

Project:

Burlington Town Center,
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

Drawn by:

ELEVATIONS -
CHERRY STREET &
ST. PAULS STREET

Project Number: 1317-01

Owner: CH

Designer: JH/WF

Scale:

AS NOTED

Drawn by:

A-201

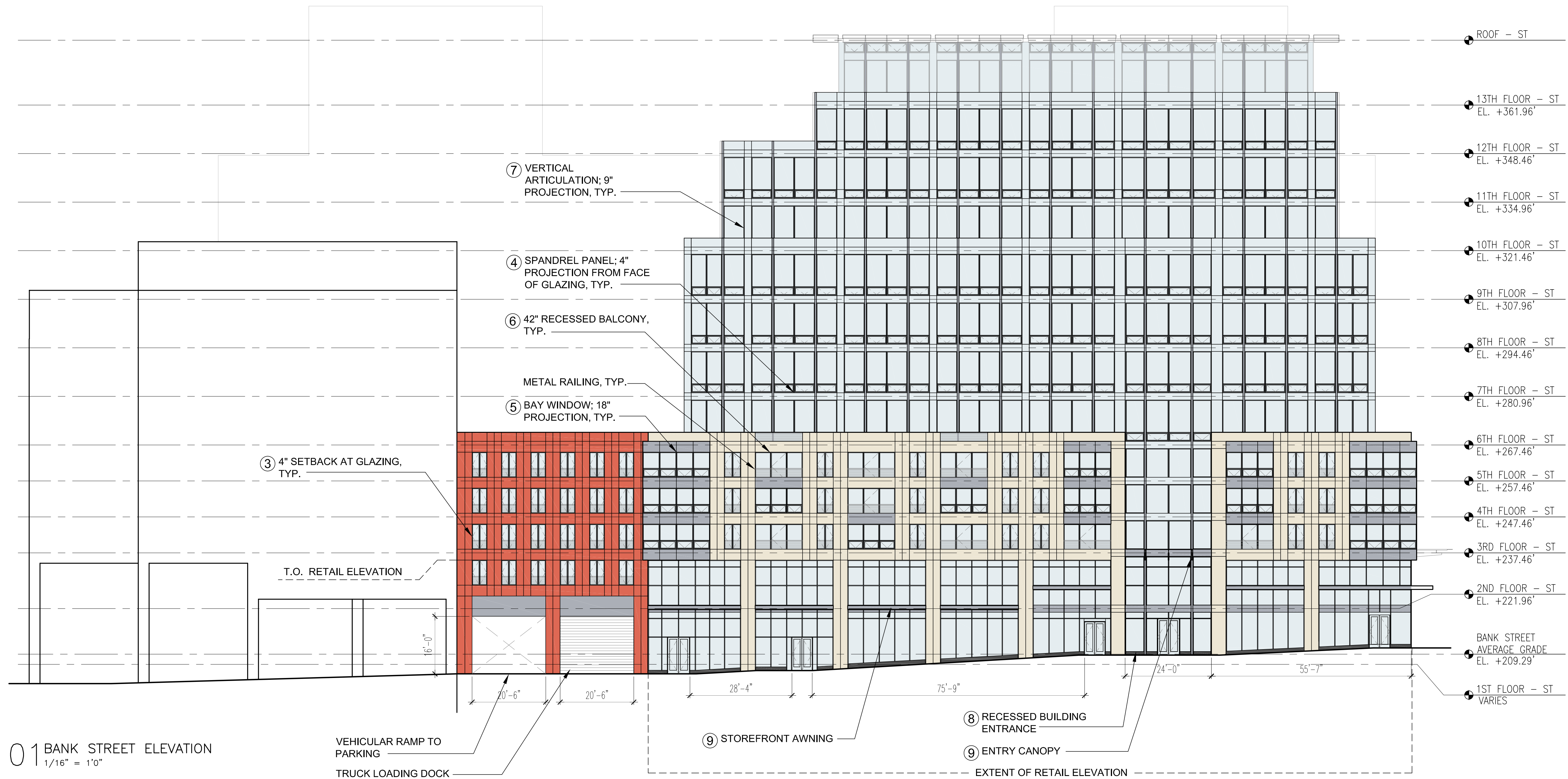
	AREA (SQ.FT.)	% OF WHOLE
TOTAL ELEVATION	35,493	
BRICK FACED PANEL	1,978	6
LIMESTONE FINISHED PANEL	3,853	11
GLAZING	27,418	77
STONE BASE	161	< 1
METAL PANEL	2,083	6

RETAIL ELEVATION ONLY	5,905	
GLAZING	4,523	77
NON-GLAZING	1,382	23

	PRIMARY MATERIAL 1A: BRICK FACED PANEL
	PRIMARY MATERIAL 1B: BRICK FACED PANEL
	PRIMARY MATERIAL 2: LIMESTONE FINISHED PANEL
	PRIMARY MATERIAL 3: GLAZING
	PRIMARY MATERIAL 4: STONE BASE
	ACCENT MATERIAL 1: METAL PANEL

	AREA (SQ.FT.)	% OF WHOLE
TOTAL ELEVATION	30,956	
BRICK FACED PANEL	7,749	25
LIMESTONE FINISHED PANEL	4,796	15
GLAZING	14,819	48
STONE BASE	194	1
METAL PANEL	3,398	11

RETAIL ELEVATION ONLY	5,772	
GLAZING	4,329	75
NON-GLAZING	1,443	25



NOT FOR CONSTRUCTION

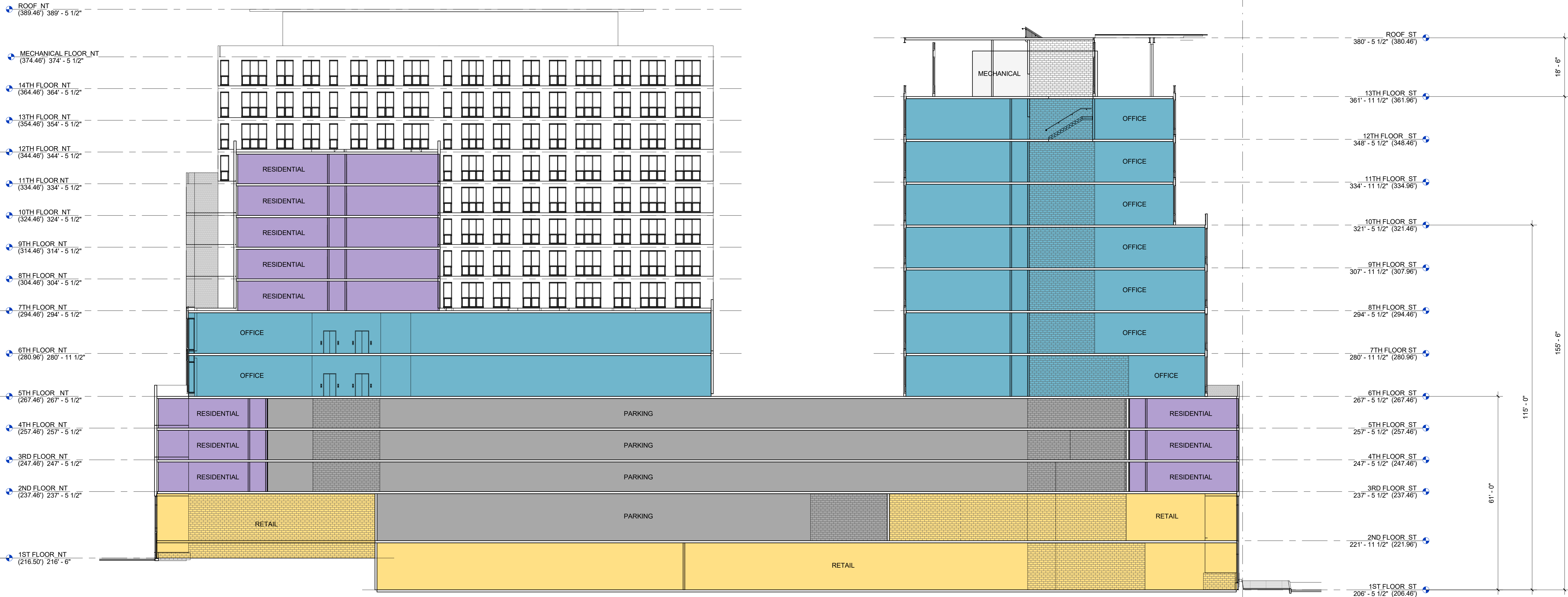
Appendix		
1/11/2017	02	P & Z RESUBMISSION 1
12/15/2016	01	P & Z SUBMISSION
Date	No.	Description

Burlington Town Center,
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

ELEVATIONS -
BANK STREET &
PINE STREET

Project Number:	Signature & Seal:
1317-01	
Drawn By:	
CH	
Checked By:	
JH/WF	
Scale:	
AS NOTED	



SECTION - NORTH/SOUTH
THROUGH BOTH TOWERS

1
A-101B

1/16" = 1'-0"

NOT FOR CONSTRUCTION

[illegible]

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

BUILDING SECTION

Project Number:	Signature & Seal
1317-01	
Drawn By:	
Designer	
Checked By:	
Checker	
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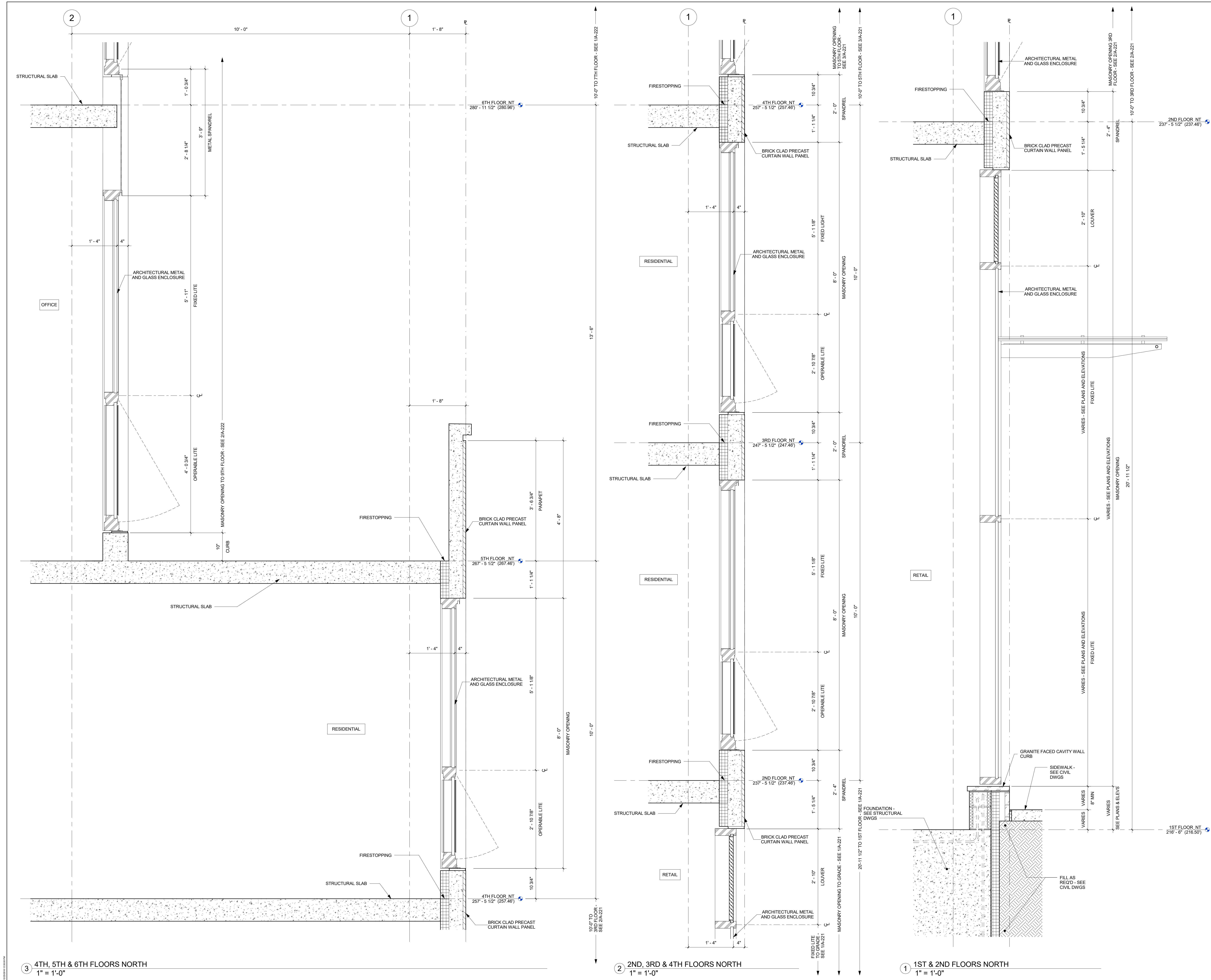
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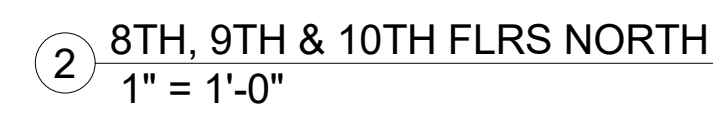
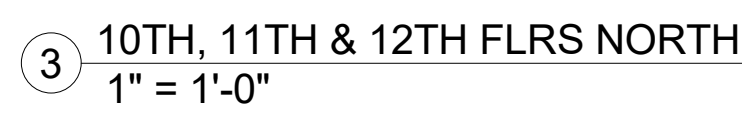
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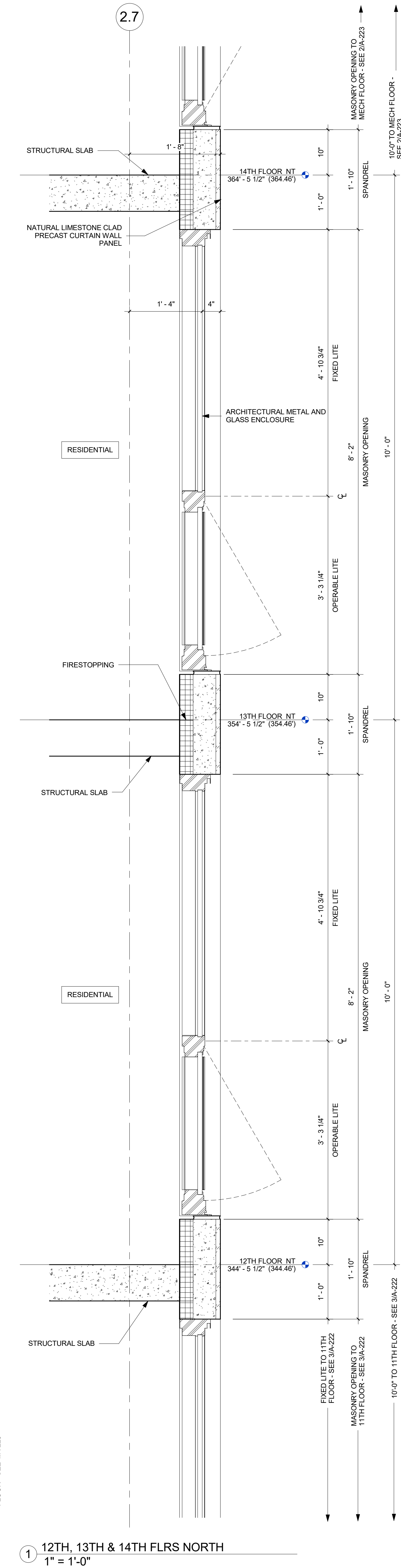


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Burlington, VT 05401

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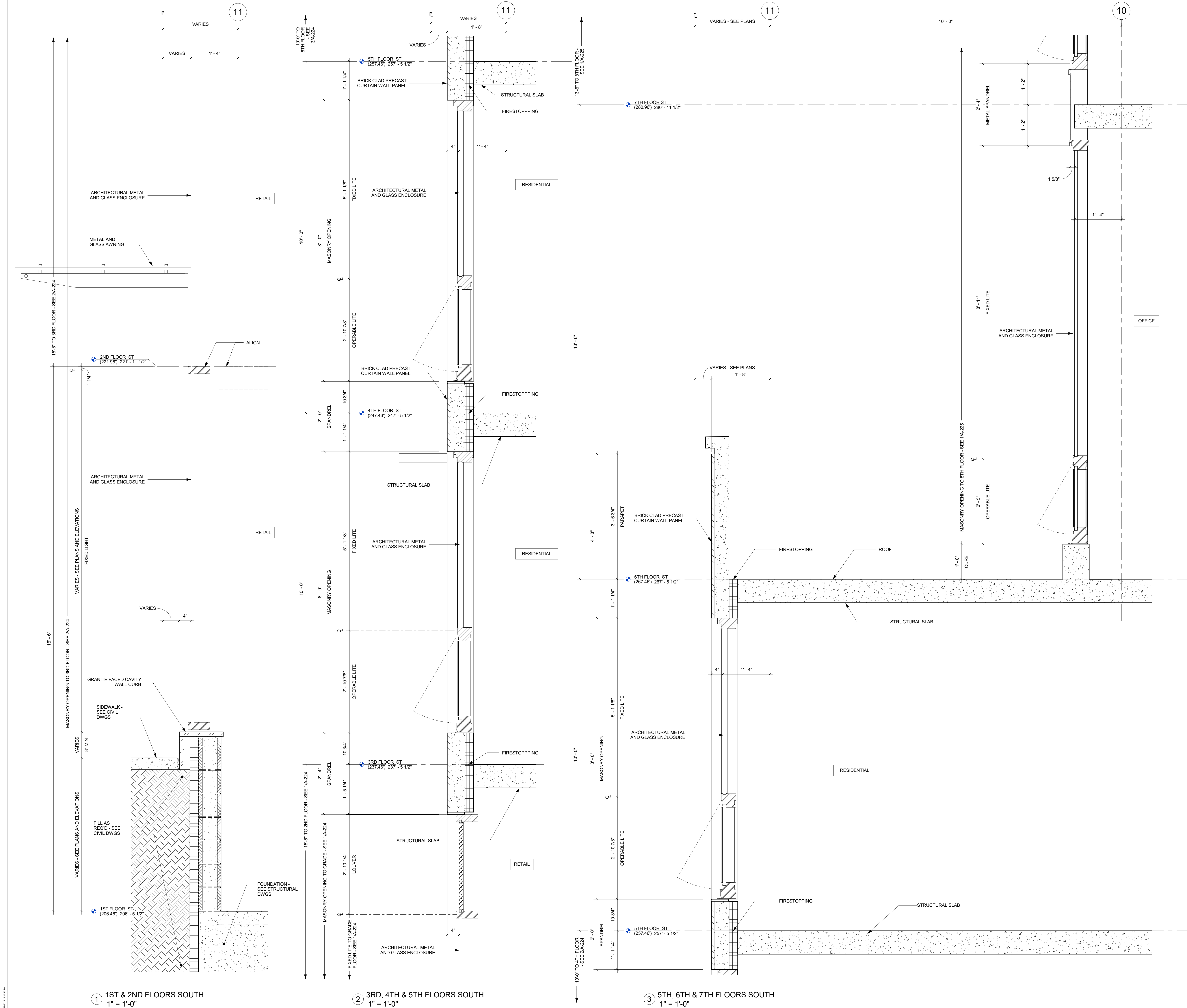
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101 Cherry Street
Burlington, VT 05401

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101 Cherry Street
Burlington, VT 05401

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Burlington, VT 05401

NOT FOR CONSTRUCTION

Approval: _____

1/11/2017	02	P & Z RESUBMISSION 1
12/15/2016	01	P & Z SUBMISSION
Date	No	Description

**Burlington Town Center,
Devonwood Investors, LLC**

101 Cherry Street
Burlington, VT 05401

Drawing Title:

PERSPECTIVE VIEWS
AERIAL VIEWS

Project Number: 1317-01 Drawn By: Checked By: State: AS NOTED	Signature & Date:
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Drawing Number: **A-401**



01 PERSPECTIVE VIEW — CORNER OF CHERRY AND ST PAUL
NA



02 PERSPECTIVE VIEW — CORNER OF CHERRY AND PINE
NA



03 PERSPECTIVE VIEW — CORNER OF BANK AND ST PAUL
NA

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www.geodesign.com

Landscape Architecture
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www.segroup.com

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Approval

Project

1/11/2017 02 P & Z RESUBMISSION 1

12/15/2016 01 P & Z SUBMISSION

Date No. Description

Project

Burlington Town Center,

Devonwood Investors, LL

101 Cherry Street

Burlington, VT 05401

Drawing Title

PERSPECTIVE VIEWS -

STREET VIEWS

Project Number

1317-01

Drawn By

Checked By

Date

AS NOTED

Drawing Number

A-402

TRAFFIC IMPACT STUDY

Burlington Town Center Traffic Impact Study

Burlington, Vermont

PREPARED FOR

Devonwood Investors, LLC
101 Cherry Street, Suite 440
Burlington, VT 05401

PREPARED BY



40 IDX Drive
Building 100, Suite 200
South Burlington, VT
05403-7771

DECEMBER 14, 2016

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Appendices

APPENDIX A: Traffic Volume Data

APPENDIX B: Crash Data

APPENDIX C: Adjustment Factors (Seasonal / DHV and Growth)

APPENDIX D: Trip Generation Calculations

APPENDIX E: Supporting Traffic Volume Networks

APPENDIX F: Signalized Intersection Capacity Analyses

APPENDIX G: Unsignalized Intersection Capacity Analyses



1. Introduction

Devonwood Investors, LLC proposes to develop a multi-use project (Burlington Town Center) within the Downtown Mixed Use Core Overlay (DMUC) District on the project site presently occupied by Burlington Town Center Mall at 49 Church Street. The site is currently spread across six parcels of land, and will be reconfigured into five, two of which will be turned over to the City of Burlington for use as new public through-street extensions of Pine Street and St. Paul's Street, between Cherry and Bank Streets.

VHB has completed a Traffic Impact Study (TIS) for the proposed Burlington Town Center redevelopment which includes demolishing the existing Town Center Mall between St. Paul Street and Pine Street and constructing a mixed-use town center that includes approximately 965,352 square feet of parking, office, residential, and retail uses.

This Traffic Impact Study includes the following elements:

- A description of the existing transportation network in the vicinity of the site;
- A summary of the crash data within the study area;
- A description of the proposed development program;
- A trip generation estimate for the proposed development program;
- An evaluation of traffic operations at eighteen intersections within the study area; and
- Conclusions and recommendations to support the project.

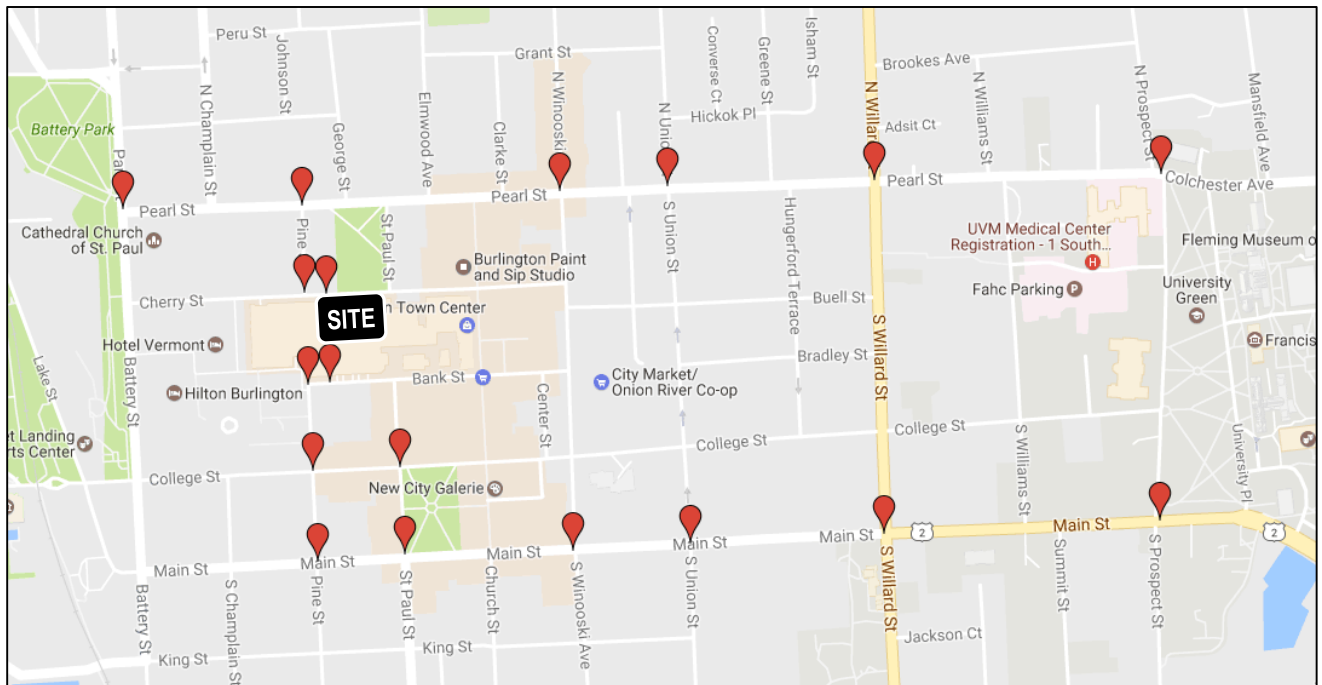
This report was developed to address the following Major Impact Review Standard, as outlined in the City of Burlington's *Comprehensive Development Ordinance* (Section 3.5.6(b)):

- *Criteria #5: The proposed development shall not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed.*

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As part of this study, a total of 18 intersections were evaluated and summarized in regards to level of service (LOS) and delay in order to estimate how the proposed project impacts the local street network. Additional reviews and evaluations are contained within this report which summarize the existing and proposed project area as it relates to traffic and safety impacts. The general project area and traffic study intersections are shown below in **Figure 1**.

Figure 1: Project Location and Study Intersections



2. Existing Conditions

The project site is bounded by Cherry Street to the north, St. Paul Street to the east, Bank Street to the south, and Pine Street to the west. The existing Burlington Town Center Mall consists of approximately 170,000 square feet of commercial space on two floors, comprised of national, regional, and local retailers. The proposed project will involve a redevelopment of a portion of the existing mall between St. Paul Street and Pine Street, with the existing mall stores between St. Paul Street and Church Street remaining largely unchanged.

The downtown intersections being evaluated for this project were identified based on input from City staff and generally include the major intersections in the vicinity of the project which are anticipated to receive at least 75 trips during the peak hour (per VTrans *Traffic Impact Study Guidelines*). Table 1 provides a summary of the intersection control type and lane configurations at the eighteen intersections being evaluated as part of this project.

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Table 1: Study Intersection Summary

Intersection	Control Type	Stop Control Approach	Approach Lane Configuration
1. Cherry Street / Parking Garage		Northbound	Single lane approaches
2. Bank Street / Parking Garage		Southbound	Single lane approaches
3. Pine Street / Bank Street / Parking Garage		West & Southbound	Single lane approaches
4. Pine Street / Cherry Street		Southbound	Single lane approaches
5. Pearl Street / Battery Street / Park Street			EB: 1 left, 1 right NB: 1 through, 2 right
6. Pearl Street / Pine Street			Single lane approaches
7. Pearl Street / Winooski Avenue			EB: 1 through, 1 right WB: 1 through, 1 left NB: 1 left, 1 right SB: 1 through, 1 through/right, 1 left
8. Pearl Street / Union Street			EB: 1 through, 1 left NB: 1 through/right, 1 left
9. Pearl Street / Willard Street			Single lane approaches
10. Pearl St / Prospect St / Colchester Ave			WB: 1 through, 1 left NB: 1 through, 1 left, 1 right
11. College Street / Pine Street		All-way stop	Single lane approaches
12. College Street / St. Paul Street		All-way stop	Single lane approaches
13. Main Street / Pine Street			Single lane approaches
14. Main Street / St. Paul Street			Single lane approaches
15. Main Street / S. Winooski Avenue			EB: 1 through/right, 1 left WB: 1 through, 1 left, 1 right SB: 1 through, 1 right, 1 left
16. Main Street / S. Union Street			EB: 1 through, 1 left NB: 1 through/left, 1 right
17. Main Street / S. Willard Street			EB: 1 through/right, 1 left WB 1 through/right, 1 left
18. Main Street / S. Prospect Street			EB: 1 through, 1 through/right WB: 1 through, 1 left, 1 right NB: 1 through, 1 right SB: 1 through/right, 2 left

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3. Crash Summary

VTrans evaluates reported crash data and identifies High Crash Location (HCL) intersections and sections that have a minimum of five reported crashes in five years, and have an actual-to-critical ratio greater than 1.0. The actual-to-critical ratio compares the actual crash rate at a given location to a critical crash rate calculated for similar facilities statewide. A review of VTrans' most recent HCL Report (2010 – 2014)¹ revealed that eight intersections and two sections within the study area are HCLs. These HCLs are summarized in Table 2 below.

Table 2: High Crash Location Intersections within Project Area

HCL #	Location	Mile Marker	Total Crashes	Fatalities	Injuries	Actual/ Critical Ratio
Intersections						
2	Main / S Winooski	0.990 - 1.010	101	0	11	2.73
11	Main / S Willard	2.110 - 2.130	74	0	13	1.89
15	Main / St. Paul	0.250 - 0.270	34	1	9	1.80
17	Main / Prospect	0.22 - 0.24	73	0	18	1.78
41	Pearl / Prospect / Colchester	0.930 - 0.940	44	0	14	1.39
59	Winooski / Pearl	1.310 - 1.330	58	0	15	1.29
67	Pearl / Willard	2.420 - 2.440	58	0	15	1.81
90	Pearl / Union ¹	0.000 - 0.010	14	0	3	1.10
Sections						
4	Pearl Street ²	0.000 - 0.300	104	0	5	4.111
130	South Union ³	0.500 - 0.800	32	0	8	1.818

¹ Listed in HCL Report as N. Union / S. Union

² This section includes the Pearl / Battery / Park intersection as well as the Pine Street intersection.

³ This section includes the intersection with Main Street.

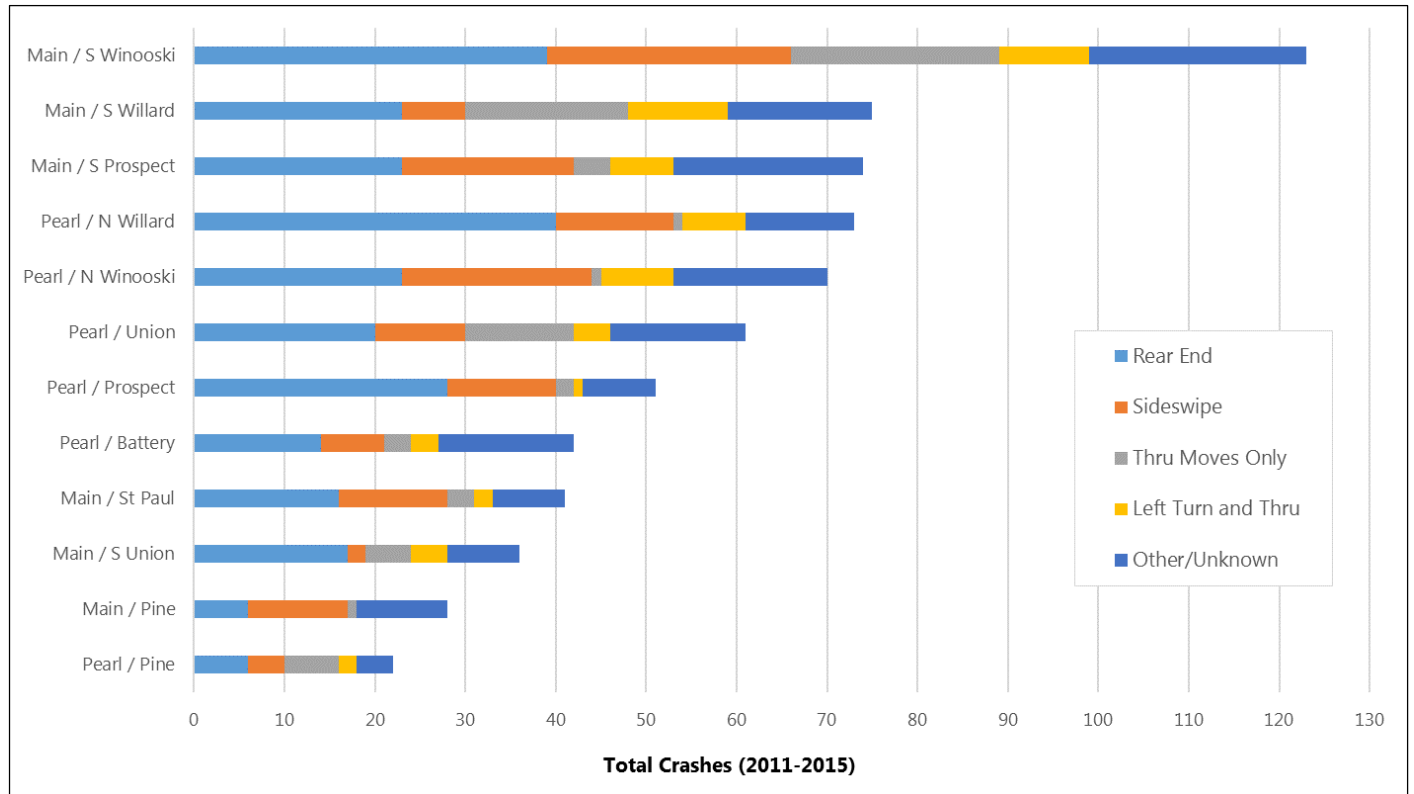
In addition to reviewing the 2010-2014 VTrans HCL report, the latest reported crash data (2011 – 2015) for the study area was reviewed via the online VTrans Public Crash Data Query Tool.² Figure 2 below summarizes reported crashes by type within 150 feet of study intersections.

¹ High Crash Locations Report: Intersections and Sections (2010 – 2014), Vermont Agency of Transportation, 2015.

² VTrans Public Crash Data Query Tool. <http://apps.vtrans.vermont.gov/CrashPublicQueryTool/home/index>

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Figure 2: Study Intersection Crashes by Type



The following are observations based on a review of reported crash data in the vicinity of the project.

- There was one fatality within the project area which occurred on December 26, 2010 at the Main Street and St. Paul Street intersection. This crash involved through movements only, during freezing precipitation, and had at least one individual under the influence of a controlled substance.
- The Main Street / Winooski Street intersection has the second highest actual/critical ratio of intersections in Vermont. Based on 2011-2015 crash data, this intersection's top crash types include rear ends (32%), sideswipes (24%), and left turn and through movements (10%).
- Across all of the study intersections, the most common crash types at these intersections are rear ends (37%) and sideswipe crashes (21%).
- Across the City, the number of reported crashes is generally consistent from month to month, with a slight increase generally in reported crashes in January and February, likely due to adverse weather conditions. Between 2011 and 2015, the number of crashes reported across Burlington has generally decreased from 1,524 reported crashes in 2011 to 1,345 crashes in 2015.

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4. Trip Generation

The proposed redevelopment program consists of demolishing a portion of the existing Burlington Town Center Mall between St. Paul Street and Pine Street and constructing a mixed-use town center that includes approximately 965,352 square feet of parking, office, residential, and retail uses. Primary vehicular access and egress is provided to the internal parking garage via mid-block access points on Cherry and Bank Streets. The project is located in the downtown core, surrounded by a dense network of sidewalks and bicycle facilities and directly across the street from the recently completed Green Mountain Transit Downtown Transit Center. The proposed layout of the project is shown in **Figure 3³** on the following page.

The proposed redevelopment of the Burlington Town Center includes the following general components:

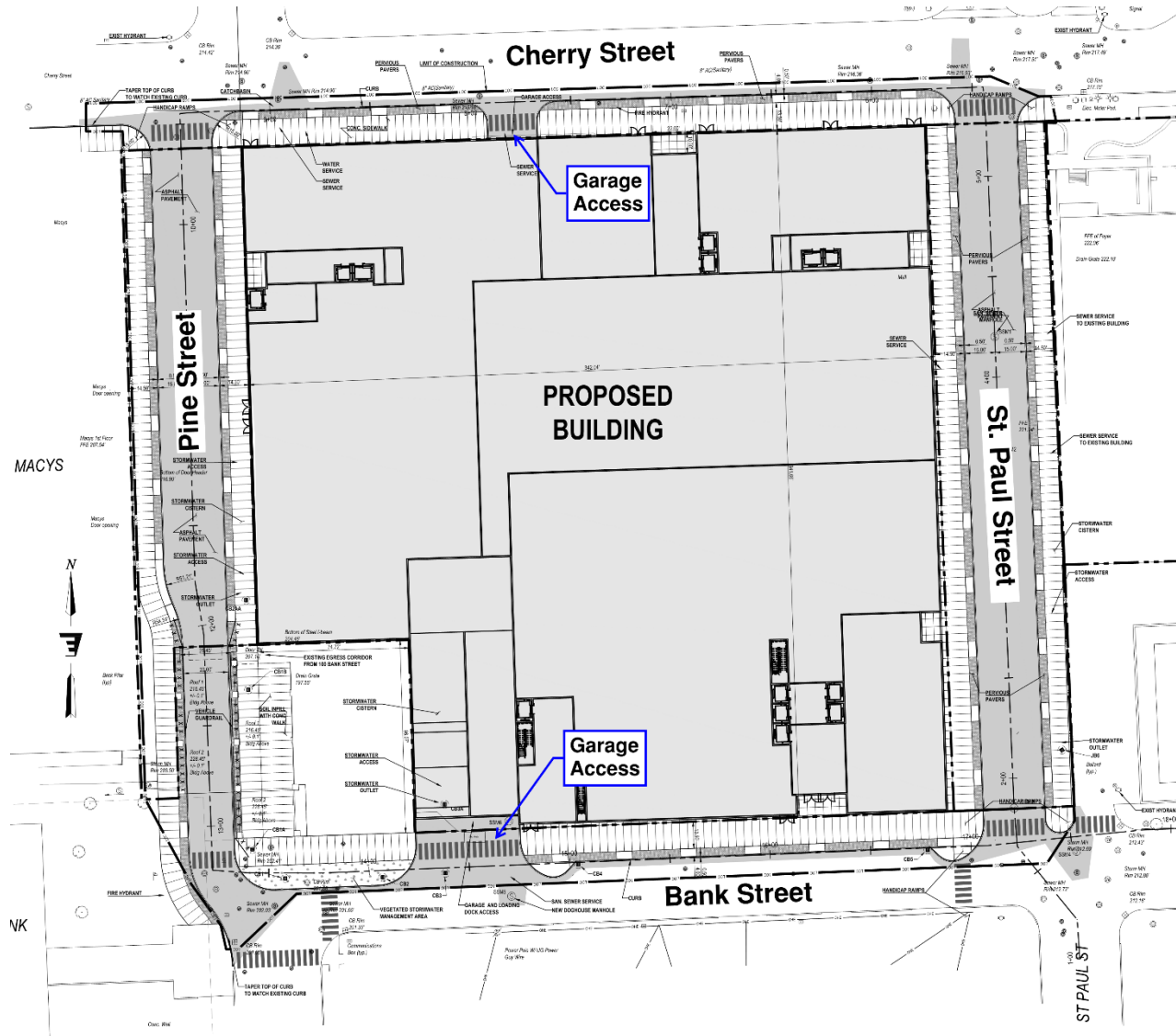
- Demolition of approximately 130,000 square feet of existing retail space
- Retail – 107,304 square feet (including a market, walk-in medical clinic, restaurants and general retail)
- Preschool – 19,509 square feet
- Office space – 230,328 square feet
- Apartments – 272 units (299,602 square feet)
- Construction of Pine Street and St. Paul Street between Bank Street and Cherry Street to restore the City's street grid in this area and enhance overall connectivity downtown.

In addition, redevelopment will include replacing the existing parking garage (capacity approximately 570 spaces) with a new parking garage which is estimated to have a capacity of approximately 761 vehicles. The project will also incorporate approximately 170 bicycle parking spaces (120 long-term and 50 short-term spaces).

³ Site Plan developed for Devonwood Investors by Engineering Ventures, P.C., dated 12/2/2016 (Sheet C1.3).

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Figure 3: Proposed Site Layout



Trip generation estimates for the proposed development program were calculated using rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation*.⁴ The land use codes assumed for this project include Mid-Rise Apartments (*Land Use Code 274*), Day Care (*Land Use Code 565*), Office (*Land Use Code 710*), and Shopping Center (*Land Use Code 820*). **Figure 4** below summarizes the trip generation estimates for the proposed development during the

⁴ *Trip Generation Manual, 9th Edition*, Institute of Transportation Engineers, 2012.

weekday morning and weekday evening peak hours. Calculations supporting the proposed trip generation estimates are provided in the Appendix.

Figure 4: Peak Hour Site Trip Generation Estimate

	<u>Total New Trips</u> <i>All Modes</i> (a)	Transit (b)	Bike & Pedestrian (c)	Internal Capture (d)	External Trips (e) = (a) - (b) - (c) - (d)	Existing Mall Trip Generation (f)	<u>Net New Trips</u> <i>Vehicles</i> (g) = (e) - (f/2)
Weekday Morning							
Enter	440	20	110	35	275	138	206
Exit	<u>155</u>	<u>10</u>	<u>40</u>	<u>10</u>	<u>95</u>	<u>2</u>	94
Total	595	30	150	45	370	140	300
Weekday Evening							
Enter	430	20	110	50	250	41	229
Exit	<u>675</u>	<u>35</u>	<u>170</u>	<u>80</u>	<u>390</u>	<u>159</u>	310
Total	1,105	55	280	130	640	200	539

Given the Burlington Town Center's location in downtown Burlington, with its interconnected network of sidewalks and bicycle facilities, and the site's proximity to the new GMT Downtown Transit Center, it is reasonable to assume that a portion of the person-trips generated by the proposed project will occur by foot, by bicycle, or by bus. Further, a number of the likely Town Center tenants are active participants in the Chittenden Area Transportation Management Association (CATMA), an organization that partners with employers to reduce single occupant vehicle trips. Although no specific reduction was taken in the analysis (to remain conservative), the VTrans guidance for Transportation Demand Management (TDM) states that there is an allowable 15% reduction in single occupant vehicle trips when an office is a member of a TMA, has more than 100 employees, and operates out of a mixed-use, moderate transit development⁵.

The modal splits utilized in this trip generation estimate were based on US Census Journey to Work and American Community Survey Data for Burlington and incorporate a 25% bike/walk mode share and a 5% transit mode share.

Mixed use developments such as the Burlington Town Center project generate *internal capture* trips which are defined as trips having multiple destinations within a given project site (for example, a resident of the Burlington Town Center who drops off his or her child at the day care center, then picks up a coffee before departing for work would represent three individual trips, two of which were internally captured within the project site). The level of shared trips/internal capture for this project (8% of AM trips and 12% of PM trips) was determined based on information published by the Transportation Research Board (TRB) in *NCHRP Report 684*.⁶

Figure 4 above calculates the number of net new vehicle trips by accounting for the replacement of a portion of the trips currently generated by the Town Center Mall. The proposed project includes the demolition of approximately 75% of the existing Mall footprint (approximately

⁵ VTrans Transportation Demand Management (TDM) Guidance – Draft 2. Vermont Agency of Transportation, Vermont, 2015.

⁶ "Enhancing Internal Trip Capture Estimation for Mixed-Use Developments", Transportation Research Board, Washington D.C., 2011.

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130,000 square feet). Within the retained portion of the mall east of St. Paul Street are a number of fairly active retail uses (e.g. L.L. Bean, Starbucks). We conservatively assumed that these stores in the retained mall section will generate 50% of the trips currently occurring at the mall.

5. Trip Distribution

The directional distribution of site-generated traffic (after accounting for existing trips currently being generated by the Burlington Town Center) was developed based on a review of the existing travel patterns within Burlington and the surrounding area, a review of previous traffic studies, a review of US Census Journey to Work and American Community Survey Data, and trip distribution data developed through the use of the Chittenden County Regional Planning Commission's regional travel demand model as summarized within the *PlanBTV Transportation Study Final Report*⁷ (see **Figure 5** below).

Figure 5: Source of External Trips Destined for Downtown Burlington (source: Plan BTV Transportation Study, RSG, 2011)

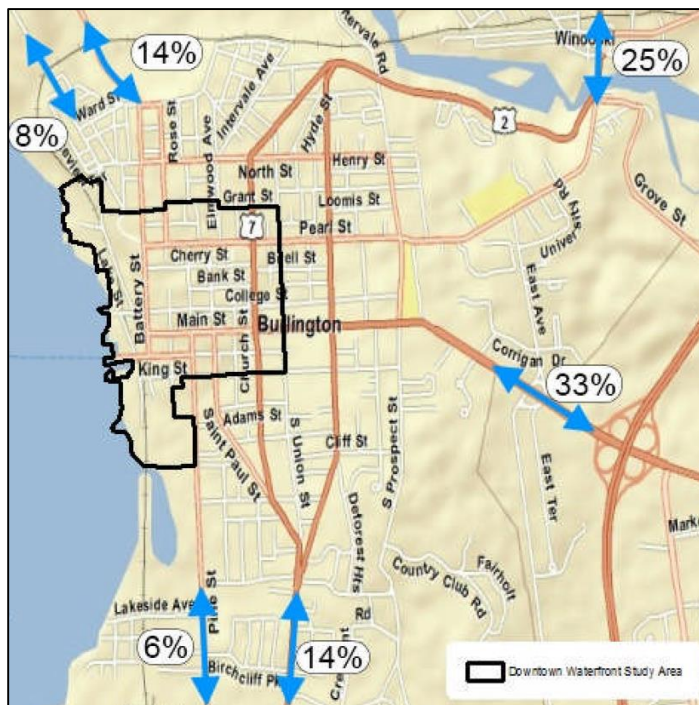


Figure 6 shows the general distribution of net new trips generated by the Burlington Town Center across the City and at each of the major access points to downtown Burlington. At each entry point into the City, the figure shows the percentage and number of site-generated trips estimated to travel through that gateway, and the corresponding percentage increase in peak hour traffic at

⁷ *PlanBTV Transportation Study: Final Report*, RSG, Inc., October 2011.

FIGURE 5-A

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that location. The graphic also breaks down the trips that remain internal to downtown Burlington between the North End, Downtown and Campus Districts, and South End.

Figure 6: City-wide Trip Distribution Map

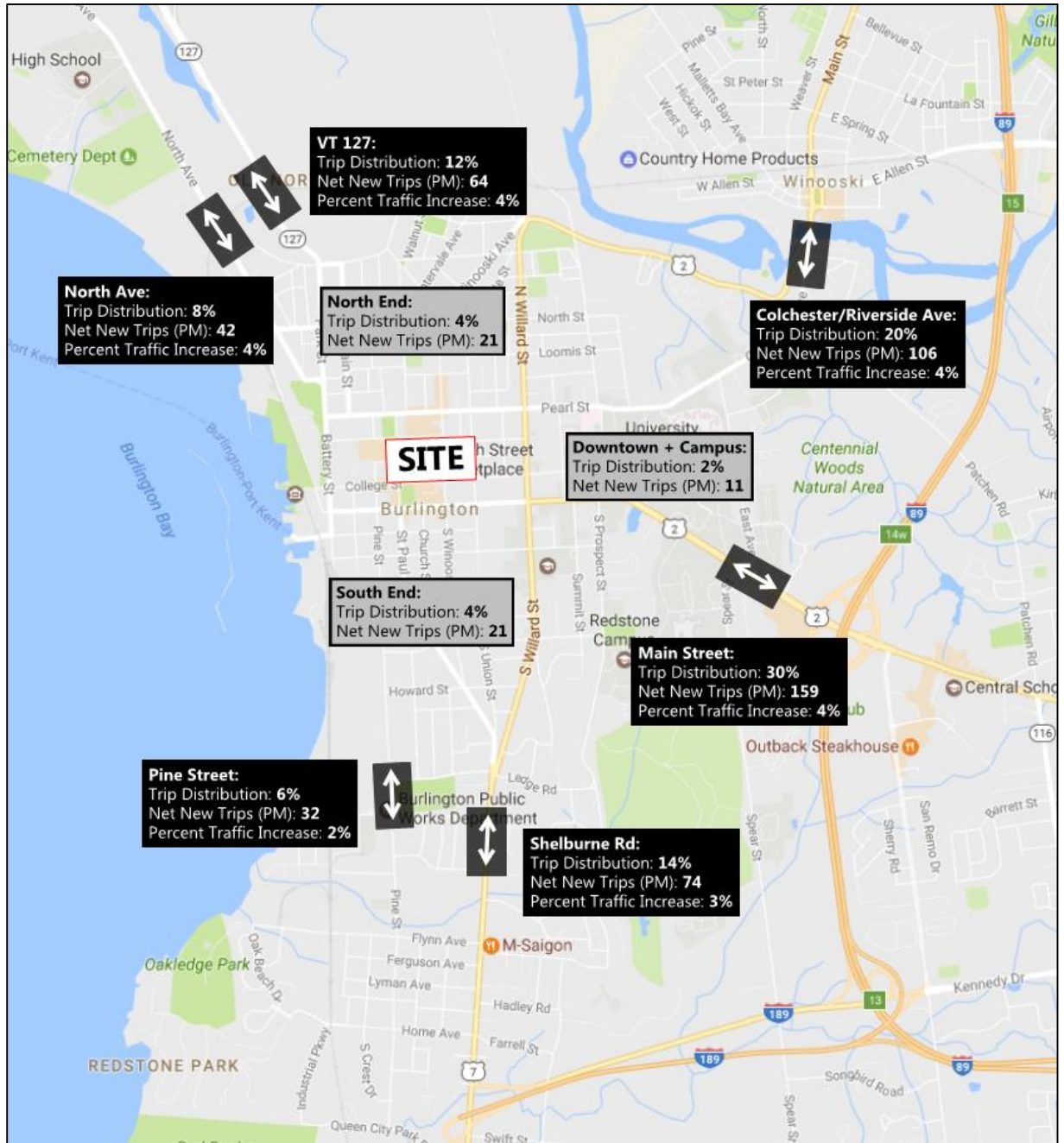


Figure 7 below shows the existing weekday evening peak hour trips at the six major gateways into downtown Burlington along with the percentage increase in trips at that gateway resulting from the project. As the figure shows, the proposed Burlington Town Center is not anticipated to increase traffic along any of the City's main gateways by more than 4% during the weekday evening peak hour.

Figure 7: Projected Increase in PM Peak Hour Trips on Major Gateways

Gateway	PM Peak Hour		% Increase
	Existing Trips	Town Center Trips	
North Ave	1,127	43	4%
Route 127	1,589	65	4%
Colchester Ave	2,461	108	4%
Pine St	1,483	32	2%
Shelburne Road (US 7)	2,563	76	3%
Main St (US 2)	3,505	162	4%

A more detailed figure showing weekday AM and PM peak hour trip generation on the adjacent street network can be found in the Appendix.

6. Traffic Networks

The weekday morning and weekday evening peak periods were selected for analysis purposes as they represent the peak conditions for the both the site-generated traffic and the adjacent street system. Turning movement count data at the 18 study intersections was obtained from recent counts conducted by VHB and the Chittenden County Regional Planning Commission. To evaluate the impact of the proposed development within the study area, AM and PM peak hour traffic volumes were projected to the opening year (2019) and a 5-year forecast horizon (2024). Copies of the traffic volume count data are provided in the Appendix.

6.1 Seasonal Variation

Since it is impractical to design for the highest volume encountered during the year, VTrans guidelines recommend using the Design Hourly Volume (DHV), which generally represents the 30th highest hourly volume of the year, traffic analysis and design. Historical data from the closest, most comparable VTrans Automatic Traffic Recorder (ATR) stations in Burlington were reviewed to establish appropriate DHV adjustment factors.⁸ Detailed calculations for the DHV adjustments are provided in the Appendix.

⁸ ATR stations D162, D161, D096, and D155 are located on Main Street, between S Willard Street and S Prospect Street, Main Street between S Willard Street and S Union Street, Battery Street south of Pearl Street, and Pearl Street west of Prospect Street, respectively.

6.2 Background Growth

Traffic growth is a function of expected land development in the region. To predict a rate at which traffic can be expected to grow during the forecast period, historical traffic growth was examined. The regression analysis chart in the 2015 VTrans Redbook⁹ for the urban street group suggests that traffic is anticipated to grow by approximately 0.5% annually. Any background growth factors were taken directly from the tables in the 2015 Redbook.

Conversations with the City of Burlington Planning Department staff revealed that there were two projects currently under consideration in the vicinity of the Town Center that should be considered in this analysis. The two developments are the Cambrian Rise project on North Avenue and a housing development on Fletcher Place, off of Colchester Avenue. Trip generation figures for the Cambrian Rise project were based on preliminary estimates prepared by RSG¹⁰ and were incorporated into the background traffic volumes. The Fletcher Place housing development's trip generation was calculated using ITE trip generation rates for 75 units of single-family housing and incorporated into the background traffic volumes.

6.3 No Build and Build Traffic Networks

The 2019 and 2024 No Build traffic volumes were developed by applying growth factors from the VTrans regression analysis chart for urban roadways to DHV-adjusted peak hour traffic volumes. The 2019 and 2024 No Build weekday morning and weekday evening peak hour volumes are shown in **Figure 8** and **Figure 9**.

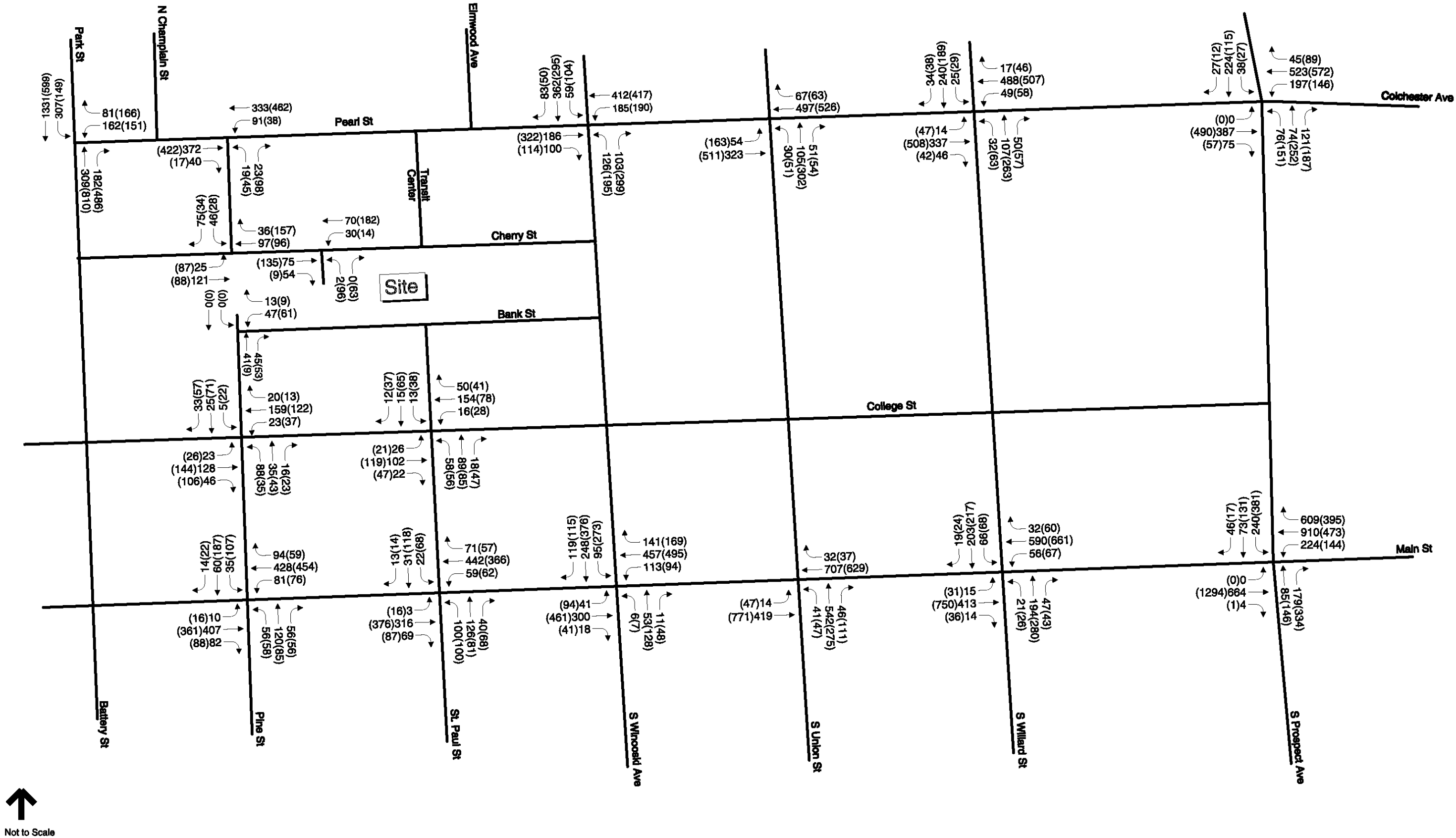
Based on the expected trip distribution methodology summarized previously, the site-generated trips were added to the 2019 and 2024 No Build peak hour traffic volumes to establish the 2019 and 2024 Build networks. The Build networks are shown in **Figure 10** and **Figure 11**.

As requested by the City's Department of Public Works, the 2024 forecast year traffic volumes were adjusted to account for the effects of the Champlain Parkway. Traffic volume projections from the *Southern Connector/Champlain Parkway MEGC-M5000(1)* study prepared by CHA were used to establish the necessary traffic volume adjustments along Main Street in the 2024 No Build and Build scenarios.¹¹

⁹ Continuous Traffic Counter Report (The Redbook), Vermont Agency of Transportation, 2016.

¹⁰ *Cambrian Rise – 351 North Ave Preliminary Traffic Assessment: Meeting with Burlington DPW Technical Review Committee*, RSG, November 2016.

¹¹ Volumes from the 2009 Champlain Parkway Final Supplemental Environmental Impact Statement scenario, "2028 PM Peak Hour Traffic Volumes C-1 Section & C-2 Section Only" were used under the Champlain Parkway No Build and Build conditions.



Legend
AM Peak Hour Volume
(PM Peak Hour Volume)



Figure 8
2019 No Build Weekday
Peak Hour Traffic Volumes

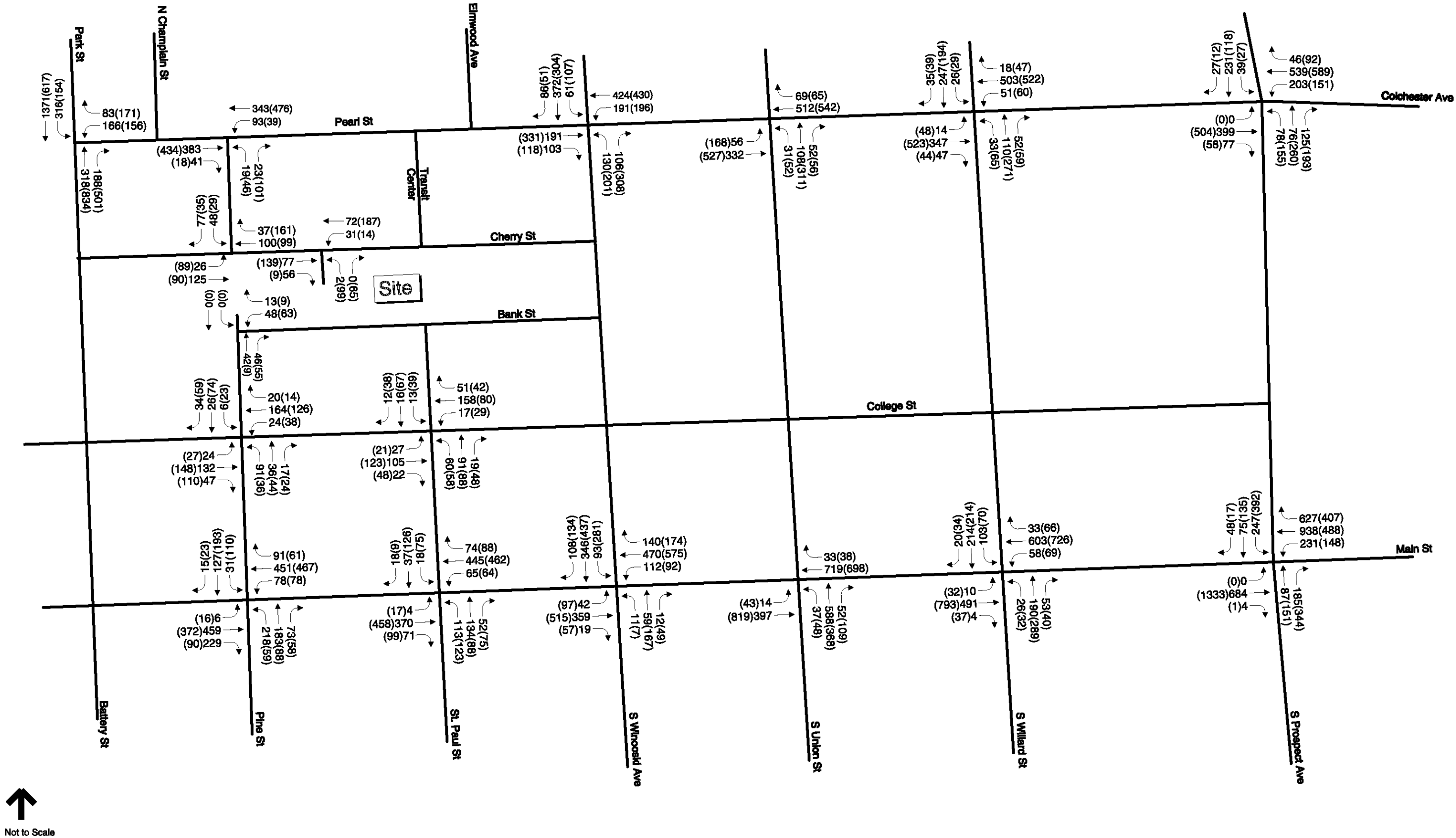
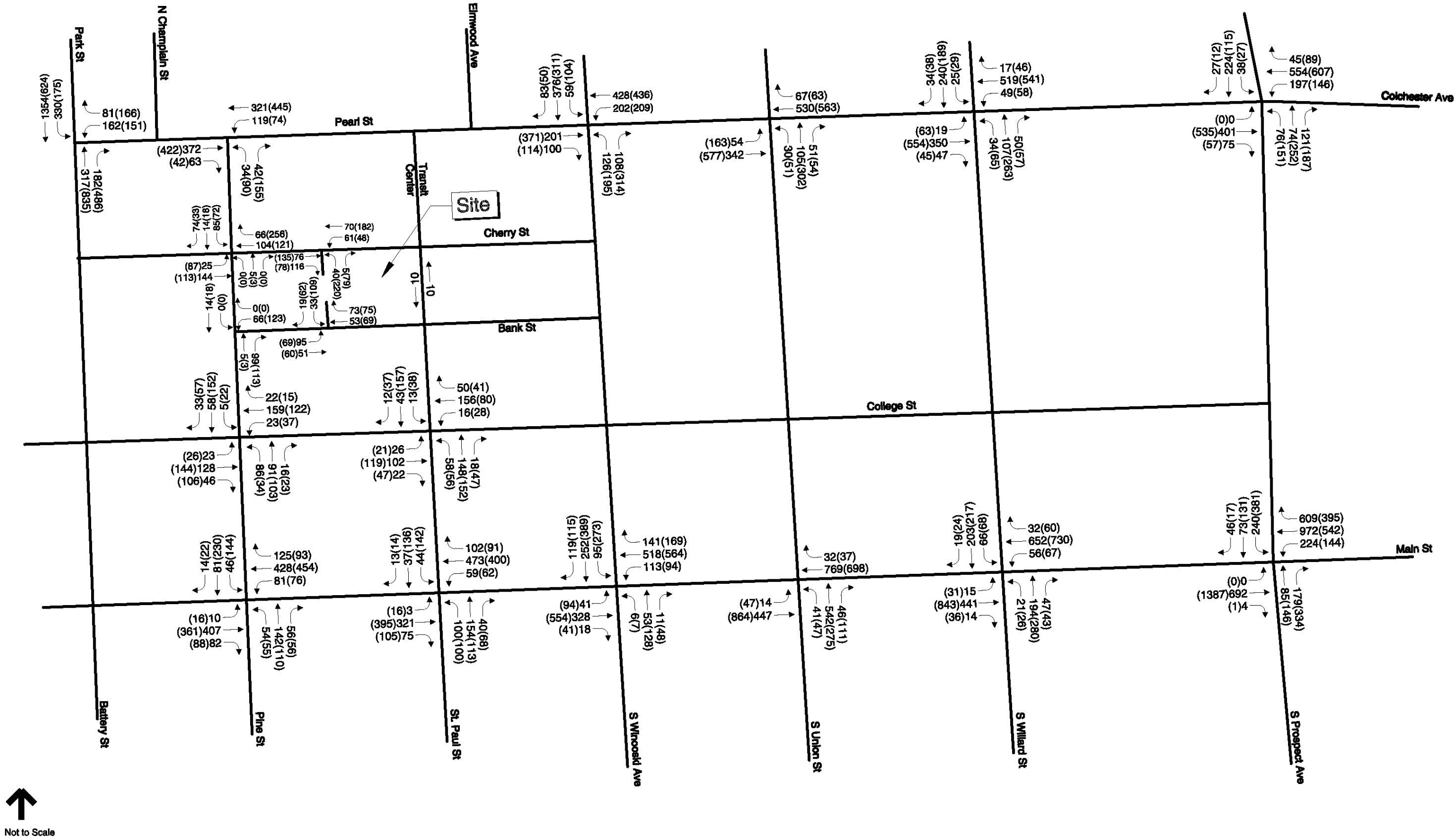


Figure 9
2024 No Build Weekday
Peak Hour Traffic Volumes
Including Champlain Parkway



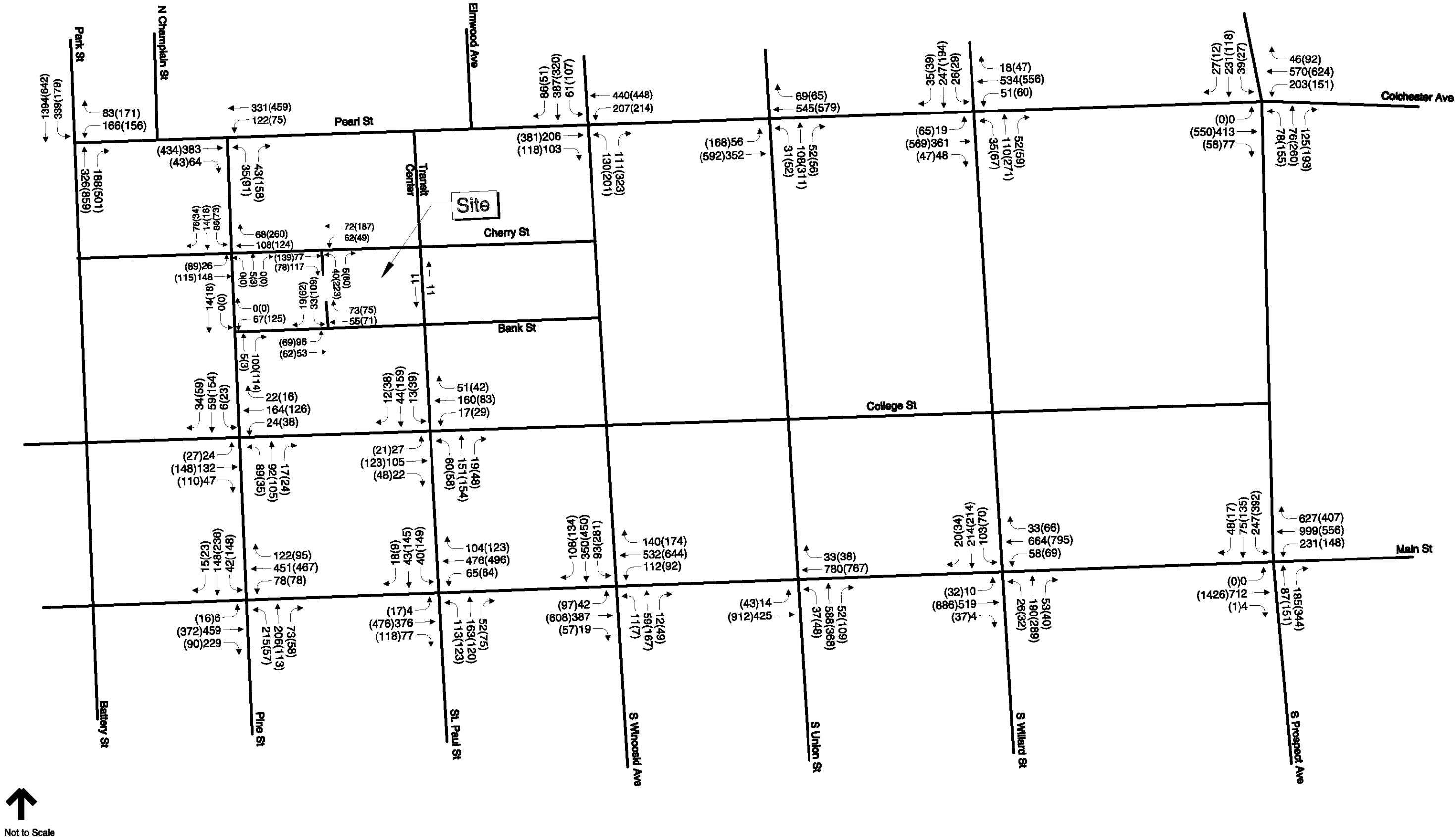


Figure 11
2024 Build Weekday
Peak Hour Traffic Volumes
Including Champlain Parkway

7. Traffic Analyses

Intersection capacity analyses were performed for all of the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the *2000 Highway Capacity Manual*.¹² Level of service is the term that defines the conditions that may occur on a given roadway or at an intersection when accommodating various traffic volume loads. Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing generally congested conditions. Copies of the LOS calculations are provided in the Appendix.

7.1 Signalized Intersections

Table 3 and **Table 4** summarize the operational analysis at the *signalized* study area intersections during the 2019 and 2024 weekday morning and evening peak hours under No Build and Build conditions. The 2019 and 2024 Build scenarios include the new Pine Street and St. Paul Street blocks between Cherry and Bank Streets as well as new traffic control signals at the Pine Street/Bank Street and Pine Street/Cherry Street intersections.

As shown in the two tables, all of the signalized intersections were found to operate at LOS D or better in each of the No Build and Build scenarios. Volume-to-capacity ratios also remain less than 1.0 at the signalized intersections under all scenarios. On average, the trips generated by the project increase signalized intersection delay by 4-5 seconds during the peak hours.

¹² *Highway Capacity Manual*, Federal Highway Administration, Transportation Research Board, 2000.

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Table 3: Signalized Intersection Capacity Analysis Summary – 2019

Intersection	Peak Hour	2019 No Build			2019 Build		
		v/c*	Delay**	LOS***	v/c	Delay	LOS
Pine St at Bank St	Weekday AM	UNSIGNALIZED IN NO BUILD			0.11	11.9	B
	Weekday PM				0.16	12.3	B
Pine St at Cherry St	Weekday AM	UNSIGNALIZED IN NO BUILD			0.27	13.1	B
	Weekday PM				0.38	14.8	B
Battery St/Park St at Pearl St	Weekday AM	0.78	12.7	B	0.83	15.2	B
	Weekday PM	0.69	11.3	B	0.71	12.2	B
Pine St at Pearl St	Weekday AM	0.40	15.4	B	0.53	22.6	C
	Weekday PM	0.46	17.3	B	0.59	20.4	C
N/S Winooski Ave at Pearl St	Weekday AM	0.47	10.2	B	0.62	25.2	C
	Weekday PM	0.58	13.3	B	0.77	31.1	C
N/S Union St at Pearl St	Weekday AM	0.46	12.4	B	0.53	15.9	B
	Weekday PM	0.70	19.2	B	0.75	21.4	C
N/S Willard St at Pearl St	Weekday AM	0.55	10.6	B	0.61	16.4	B
	Weekday PM	0.75	18.0	B	0.85	23.2	C
Prospect St at Pearl St/Colchester Ave	Weekday AM	0.71	27.7	C	0.83	36.0	D
	Weekday PM	0.82	36.4	D	0.86	41.1	D
Pine St at Main St	Weekday AM	0.57	13.9	B	0.66	18.2	B
	Weekday PM	0.74	18.3	B	0.83	22.0	C
Saint Paul St at Main St	Weekday AM	0.52	11.9	B	0.64	15.1	B
	Weekday PM	0.50	13.8	B	0.57	14.6	B
S Winooski Ave at Main St	Weekday AM	0.47	10.7	B	0.57	14.0	B
	Weekday PM	0.67	15.9	B	0.73	18.1	B
S Union St at Main St	Weekday AM	0.83	23.7	C	0.89	33.3	C
	Weekday PM	0.77	20.6	C	0.82	22.3	C
S Willard St at Main St	Weekday AM	0.62	13.5	B	0.71	18.7	B
	Weekday PM	0.81	23.2	C	0.86	26.3	C
S Prospect St at Main St	Weekday AM	0.78	23.0	C	0.93	29.8	C
	Weekday PM	0.93	44.9	D	0.97	50.5	D

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

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Table 4: Signalized Intersection Capacity Analyses Summary - 2024

Intersection	Peak Hour	2024 No Build			2024 Build		
		v/c	Delay	LOS	v/c	Delay	LOS
Pine St at Bank St	Weekday AM	UNSIGNALIZED IN NO BUILD			0.12	12.0	B
	Weekday PM				0.16	11.2	B
Pine St at Cherry St	Weekday AM	UNSIGNALIZED IN NO BUILD			0.28	13.2	B
	Weekday PM				0.39	15.2	B
Battery St/Park St at Pearl St	Weekday AM	0.83	15.3	B	0.85	16.9	B
	Weekday PM	0.71	12.0	B	0.73	13.0	B
Pine St at Pearl St	Weekday AM	0.47	20.9	C	0.54	22.4	C
	Weekday PM	0.47	16.1	B	0.61	19.5	B
N/S Winooski Ave at Pearl St	Weekday AM	0.52	12.3	B	0.64	26.8	C
	Weekday PM	0.60	13.2	B	0.79	32.0	C
N/S Union St at Pearl St	Weekday AM	0.52	15.7	B	0.54	15.3	B
	Weekday PM	0.75	20.8	C	0.79	22.9	C
N/S Willard St at Pearl St	Weekday AM	0.64	13.3	B	0.63	17.0	B
	Weekday PM	0.77	19.1	B	0.89	26.5	C
Prospect St at Pearl St/Colchester Ave	Weekday AM	0.82	39.6	D	0.84	42.8	D
	Weekday PM	0.85	38.4	D	0.89	44.4	D
Pine St at Main St	Weekday AM	0.87	29.8	C	0.92	30.7	C
	Weekday PM	0.76	19.0	B	0.86	23.3	C
Saint Paul St at Main St	Weekday AM	0.61	15.0	B	0.65	15.2	B
	Weekday PM	0.62	15.4	B	0.67	16.5	B
S Winooski Ave at Main St	Weekday AM	0.61	13.5	B	0.65	14.9	B
	Weekday PM	0.71	18.4	B	0.82	21.1	C
S Union St at Main St	Weekday AM	0.89	33.3	C	0.92	37.0	D
	Weekday PM	0.86	25.0	C	0.88	26.5	C
S Willard St at Main St	Weekday AM	0.74	19.1	B	0.78	20.2	C
	Weekday PM	0.86	27.7	C	0.88	30.6	C
S Prospect St at Main St	Weekday AM	0.91	29.0	C	0.96	31.7	C
	Weekday PM	0.93	46.3	D	0.97	51.1	D

7.2 Unsignalized Intersections

Table 5 and **Table 6** summarize the operational analysis at the *unsignalized* study area intersections during the 2019 and 2024 weekday morning and evening peak hours under No Build and Build conditions.

As shown in the two tables, all unsignalized intersection approaches are anticipated to operate at LOS of C or better and none of the unsignalized approaches exceed a v/c ratio of 0.51.

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Table 5: Unsignalized Intersection Capacity Analyses Summary - Weekday AM Peak Hour

Intersection / Movement	2019 AM No Build			2019 AM Build			2024 AM No Build			2024 AM Build		
	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Cherry Street at Parking Garage												
EB movements from Cherry St	0.08	0	-	0.11	0	-	0.08	0	-	0.11	0	-
WB movements from Cherry St	0.02	2.4	A	0.04	3.7	A	0.02	2.4	A	0.04	3.7	A
NB movements from Garage	0	10	B	0.07	10.7	B	0	9.9	A	0.07	10.7	B
Bank St at Pine St/(Parking Garage)												
WB movements from Bank St	0.07	9.1	A	SIGNALIZED IN BUILD CONDITIONS			0.06	9	A	SIGNALIZED IN BUILD CONDITIONS		
NB movements from Pine St	0.06	0	-				0.05	0	-			
SB movements from Garage	0	0	-				0	0	-			
Bank St at Parking Garage												
EB movements from Bank St	DOES NOT EXIST IN NO BUILD CONDITIONS			0.06	5.1	A	DOES NOT EXIST IN NO BUILD CONDITIONS			0.06	5.1	A
WB movements from Bank St				0.07	0	-				0.07	0	-
SB movements from Garage				0.08	10.4	B				0.08	10.5	B
Cherry St at Pine St												
EB movements from Cherry St	0.02	1.4	A	SIGNALIZED IN BUILD CONDITIONS			0.02	1.4	A	SIGNALIZED IN BUILD CONDITIONS		
WB movements from Cherry St	0.08	0	-				0.08	0	-			
NB movements from Pine St	--	--	--				--	--	--			
SB movements from Pine St	0.15	10.2	B				0.15	10.2	B			
College St at Pine St												
EB movements from College St	0.28	9.3	A	0.29	9.6	A	0.28	9.3	A	0.30	9.8	A
WB movements from College St	0.29	9.4	A	0.30	9.8	A	0.29	9.4	A	0.31	10	A
NB movements from Pine St	0.22	9.3	A	0.30	10	B	0.22	9.3	A	0.31	10.2	B
SB movements from Pine St	0.10	8.3	A	0.15	8.8	A	0.10	8.3	A	0.16	8.9	A
College St at St. Paul St												
EB movements from College St	0.22	8.9	A	0.22	9.2	A	0.22	8.9	A	0.23	9.3	A
WB movements from College St	0.30	9.4	A	0.32	9.8	A	0.30	9.4	A	0.33	9.9	A
NB movements from St. Paul St	0.25	9.4	A	0.33	10.2	B	0.25	9.4	A	0.34	10.3	B
SB movements from St. Paul St	0.06	8.3	A	0.11	8.7	A	0.06	8.3	A	0.12	8.8	A

Table 6: Unsignalized Intersection Capacity Analyses Summary - PM Weekday Peak Hour

Intersection / Movement	2019 PM No Build			2019 PM Build			2024 PM No Build			2024 PM Build		
	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Cherry Street at Parking Garage												
EB movements from Cherry St	0.08	0	-	0.13	0	-	0.09	0	-	0.13	0	-
WB movements from Cherry St	0.01	0.6	A	0.04	1.9	A	0.01	0.6	A	0.04	1.9	A
NB movements from Garage	0.22	11.3	B	0.5	16.8	C	0.23	11.5	B	0.51	17.2	C
Bank St at Pine St/(Parking Garage)												
WB movements from Bank St	0.07	8.9	A	SIGNALIZED IN BUILD CONDITIONS			0.07	9	A	SIGNALIZED IN BUILD CONDITIONS		
NB movements from Pine St	0.04	0	-				0.04	0	-			
SB movements from Garage	0	0	-				0	0	-			
Bank St at Parking Garage												
EB movements from Bank St	DOES NOT EXIST IN NO BUILD CONDITIONS			0.05	4.3	A	DOES NOT EXIST IN NO BUILD CONDITIONS			0.05	4.3	A
WB movements from Bank St				0.09	0	-				0.09	0	-
SB movements from Garage				0.23	11.4	B				0.23	11.4	B
Cherry St at Pine St												
EB movements from Cherry St	0.07	4.2	A	SIGNALIZED IN BUILD CONDITIONS			0.07	4.2	A	SIGNALIZED IN BUILD CONDITIONS		
WB movements from Cherry St	0.15	0	-				0.15	0	-			
NB movements from Pine St	--	--	--				--	--	--			
SB movements from Pine St	0.09	10.6	B				0.09	10.7	B			
College St at Pine St												
EB movements from College St	0.38	10.1	B	0.42	11.3	B	0.39	10.3	B	0.44	11.7	B
WB movements from College St	0.25	9.5	A	0.29	10.4	B	0.27	9.6	A	0.30	10.6	B
NB movements from Pine St	0.16	9.1	A	0.28	10.3	B	0.17	9.2	A	0.29	10.5	B
SB movements from Pine St	0.23	9.3	A	0.37	11	B	0.24	9.4	A	0.38	11.2	B
College St at St. Paul St												
EB movements from College St	0.27	9.5	A	0.31	10.4	B	0.28	9.6	A	0.32	10.6	B
WB movements from College St	0.22	9.1	A	0.25	10	B	0.23	9.2	A	0.26	10.2	B
NB movements from St. Paul St	0.27	9.5	A	0.40	11.2	B	0.29	9.7	A	0.41	11.4	B
SB movements from St. Paul St	0.21	9.1	A	0.36	10.8	B	0.22	9.2	A	0.37	11	B

8. Conclusions

The proposed redevelopment of the Burlington Town Center includes the following general components:

- Demolition of approximately 130,000 square feet of existing retail space
- Retail – 107,304 square feet (including a market, walk-in medical clinic, restaurants and general retail)
- Preschool – 19,509 square feet
- Office space – 230,328 square feet
- Apartments – 272 units (299,602 square feet)
- Construction of Pine Street and St. Paul Street between Bank Street and Cherry Street to restore the City's street grid in this area and enhance overall connectivity downtown.

The trip generation estimates conducted for this study indicate that the proposed redevelopment program will generate approximately 300 net new vehicle trips (206 entering and 94 exiting) during the weekday morning peak hour and 539 net new vehicle trips (229 entering and 310 exiting) during the weekday evening peak hour. The site-generated trips were distributed onto the downtown street network based on a review of the existing travel patterns, a review of previous traffic studies, a review of US Census Journey to Work and American Community Survey Data, and trip distribution data developed through the use of the CCRPC regional travel demand model.

From a traffic operations perspective, all of the signalized intersections were found to operate at LOS D or better in each of the No Build and Build. Volume-to-capacity ratios at the signalized intersections also remain less than 1.0 under all scenarios. On average, the trips generated by the project increase signalized intersection delay by 4-5 seconds during the peak hours. Further, it was determined that the site generated trips did not increase traffic volumes on any of the main arterials into Burlington by more than 4% over current peak hour volumes.

As demonstrated in this report, the City of Burlington's existing grid street network, transit facilities, sidewalk network, and bicycle facilities adequately accommodate the additional trips generated by the Town Center. Several important aspects of the project contribute to this overall accommodation of site-generated trips including:

- The project is located in the downtown core of Burlington, surrounded by a dense network of sidewalks and bicycle amenities and directly across the street from the recently completed Green Mountain Transit Downtown Transit Center. The proximity and availability of these amenities will result in a significant number of site-generated trips occurring by non-automobile mode (e.g. by foot, by bicycle, and by bus).
- A number of the likely Town Center tenants are active participants in the Chittenden Area Transportation Management Association (CATMA), an organization that partners with employers and employees to reduce single occupant vehicle trips.

- The density and mix of uses proposed for the project will likely result in a number of trips occurring entirely *within* the Town Center (e.g. apartment to daycare or office to restaurant), and thus not impacting the adjacent street network.
- An important aspect of the project is the proposed construction of Pine Street and St. Paul Street between Bank Street and Cherry Street to restore the City's street grid in this area. In addition to improving overall downtown connectivity, the new blocks of Pine Street and St. Paul Street will enhance bus accessibility from the Downtown Transit Center and create new routes for existing cross-town trips, thereby reducing overall delay on parallel north-south streets including Battery Street and South Winooski Avenue.
- New traffic signals are proposed at the Pine Street/Cherry Street, Pine Street/Bank Street, and St. Paul Street/Cherry Street (integrated with Downtown Transit signals) which will accommodate both site-generated trips, newly re-routed cross-town trips, and buses departing from the Downtown Transit Center.
- The City's traffic impact fees generated by the project can be used to further optimize traffic signals and enhance corridor signal coordination plans.

In conclusion, based on the results of this Traffic Impact Study, the Burlington Town Center project is not expected to generate unreasonable congestion or unsafe conditions within Burlington's transportation system.

Technical Appendix Traffic



-
- Traffic Volume Data
 - Crash Data
 - Adjustment Factors (Seasonal / DHV and Growth)
 - Trip Generation Calculations
 - Supporting Traffic Volume Networks
 - Signalized Intersection Capacity Analyses
 - Unsignalized Intersection Capacity Analyses



Traffic Volume Data

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington, VT **Sheet:** _____
Calculated by: E. Quallen **Date:** 11/28/16
Checked by: _____ **Date:** _____
Title: _____
Intersection: _____

Intersection: Cherry St / Parking Garage
 Count Date(s): 6/14/2016

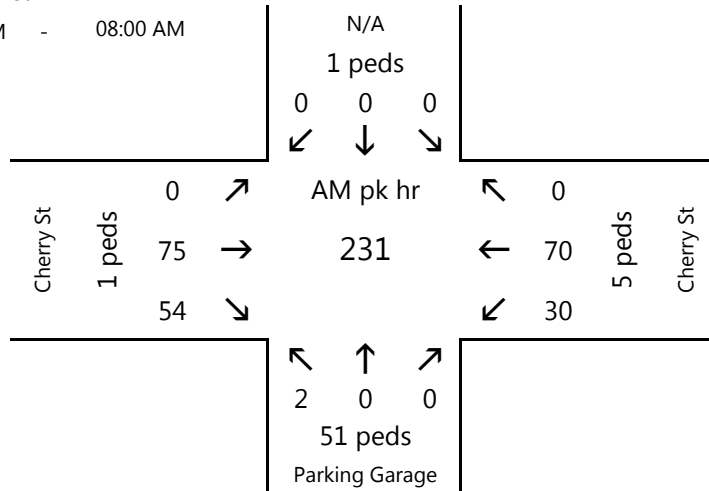
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	N/A				Cherry St				Parking Garage				Cherry St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	0	0	0	1	0	70	30	5	0	0	2	51	54	75	0	1	231
PM pk hr	0	0	0	0	0	182	14	1	63	0	96	73	9	135	0	4	499

AM Peak Hour

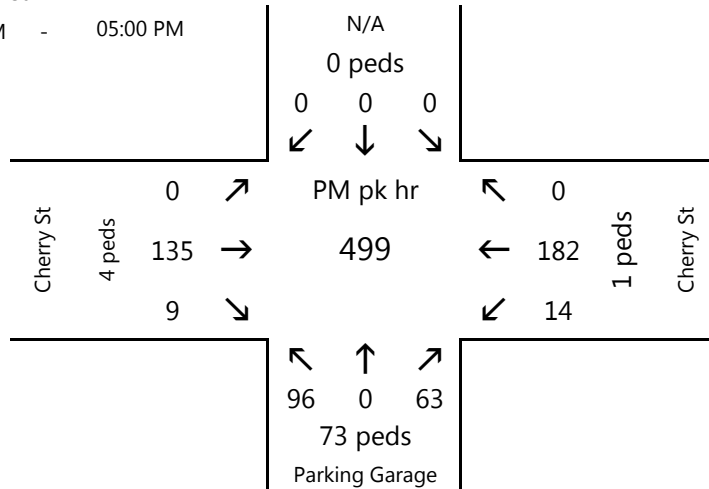
07:00 AM - 08:00 AM



% Auto: 79.9%
 % Med: 0.0%
 % Heavy: 0.0%
 total % Trucks: 0.0%

PM Peak Hour

04:00 PM - 05:00 PM



% Auto: 86.5%
 % Med: 0.0%
 % Heavy: 0.0%
 total % Trucks: 0.0%

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington, VT **Sheet:** _____
Calculated by: E. Quallen **Date:** 11/28/16
Checked by: _____ **Date:** _____
Title: _____
Intersection: _____

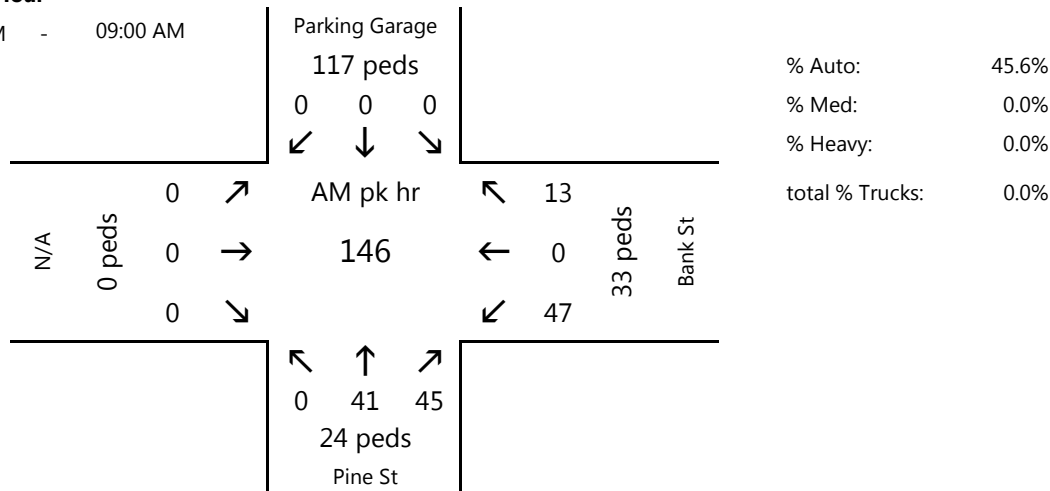
Intersection: Bank St / Pine St/Parking Garage Town: Burlington
 Count Date(s): 6/14/2016 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Parking Garage				Bank St				Pine St				N/A				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	0	0	0	117	13	0	47	33	45	41	0	24	0	0	0	0	146
PM pk hr	0	0	0	102	9	1	61	61	53	9	0	35	0	0	0	0	133

AM Peak Hour

08:00 AM - 09:00 AM



PM Peak Hour

05:00 PM - 06:00 PM

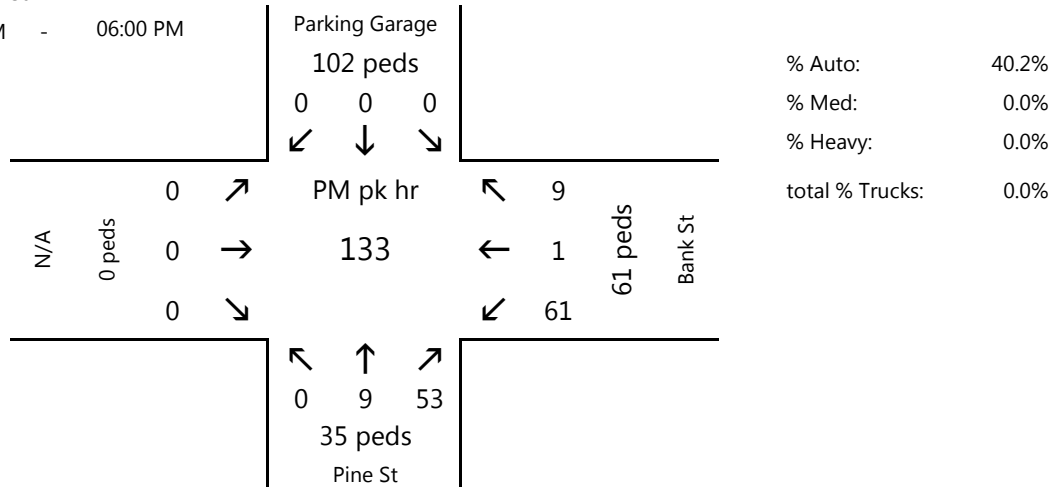


FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center Project #: 57881.00
 Location: Burlington, VT Sheet: _____
 Calculated by: E. Quallen Date: 12/2/16
 Checked by: _____ Date: _____
 Title: BTV Town Center Traffic Counts
 Intersection: Pine St / Cherry St

Intersection: Pine St / Cherry St
 Count Date(s): 12/2/2016 (AM) 11/30/2016 (PM)

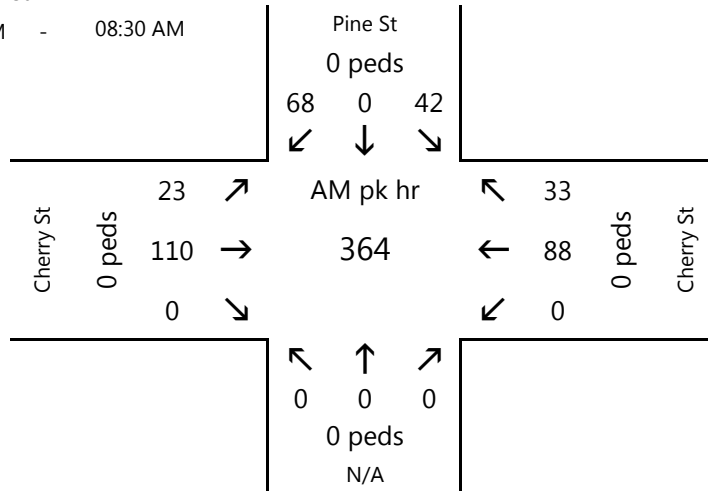
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St				Cherry St				N/A				Cherry St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	68	0	42	0	33	88	0	0	0	0	0	0	0	110	23	0	364
PM pk hr	31	0	26	29	143	88	0	9	0	0	0	0	0	80	79	33	447

AM Peak Hour

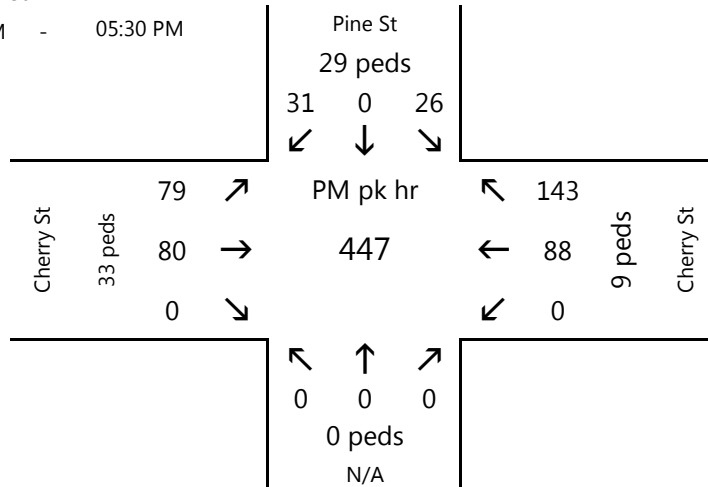
07:30 AM - 08:30 AM



% Auto: 95.9%
 % Med: 4.1%
 % Heavy: 0.0%
 total % Trucks: 4.1%

PM Peak Hour

04:30 PM - 05:30 PM



% Auto: 82.4%
 % Med: 3.9%
 % Heavy: 0.0%
 total % Trucks: 3.9%

FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403224
 Community: BURLINGTON
 Road 1: BATTERY ST
 Road 2: PEARL ST

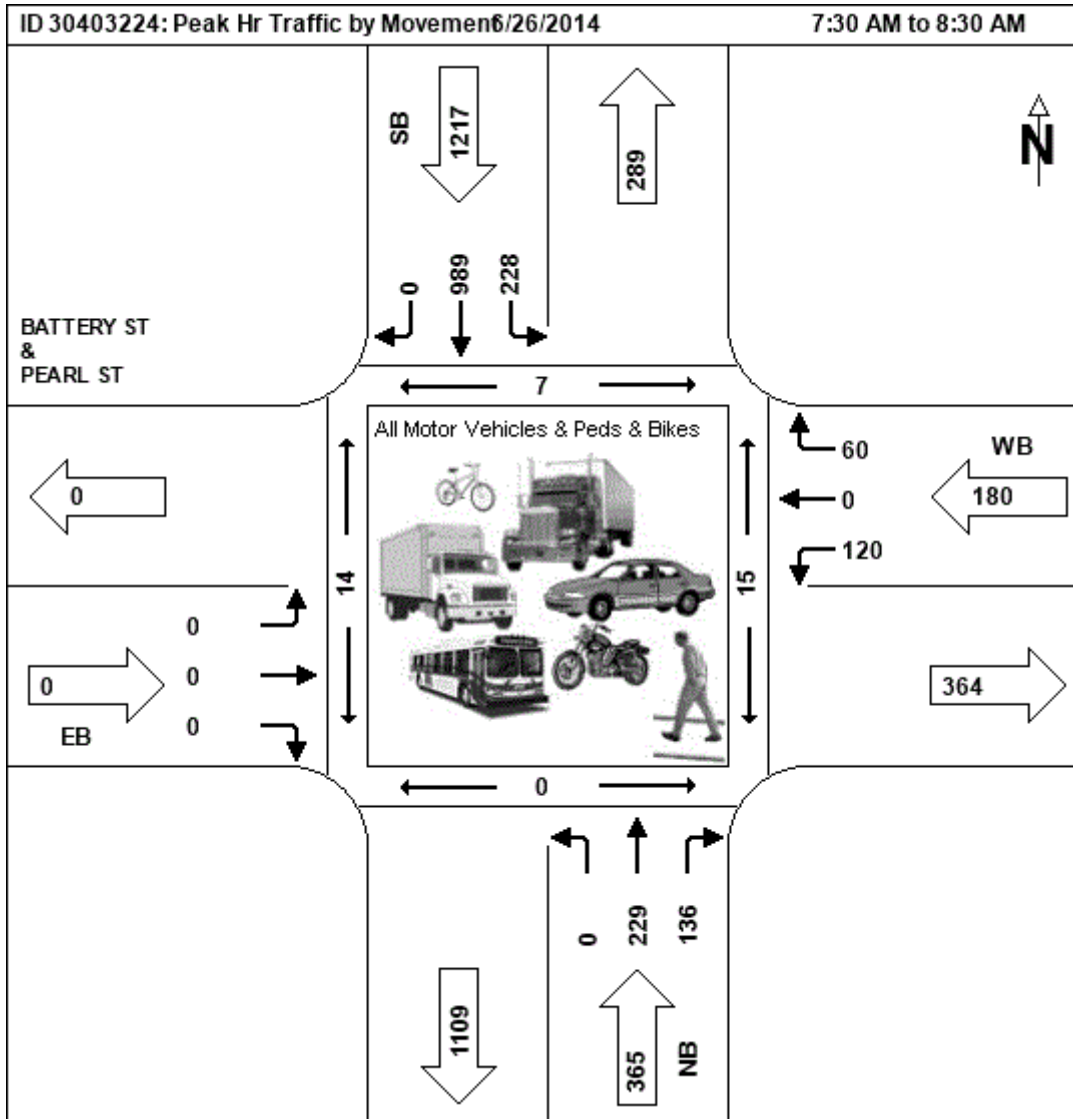
Corridor:
 Road 3: BATTERY ST
 Road 4:

|<<|<|>|>>| 1-1 of 1

AM Peak Hour
06/26/2014

NB					SB					WB					App	Int
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:30 AM	0	61	38	2	99	48	249	0	3	297	23	0	10	2	33	429
7:45 AM	0	75	39	3	114	65	252	0	1	317	32	0	28	0	60	491
8:00 AM	0	42	34	6	76	54	237	0	5	291	32	0	6	3	38	405
8:15 AM	0	51	25	4	76	61	251	0	5	312	33	0	16	2	49	437
Total	0	229	136	15	365	228	989	0	14	1217	120	0	60	7	180	1762
PHF	0.76	0.87			0.80	0.88	0.98			0.96	0.91				0.54	0.75
HV %	11	10			2	3				10	13					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

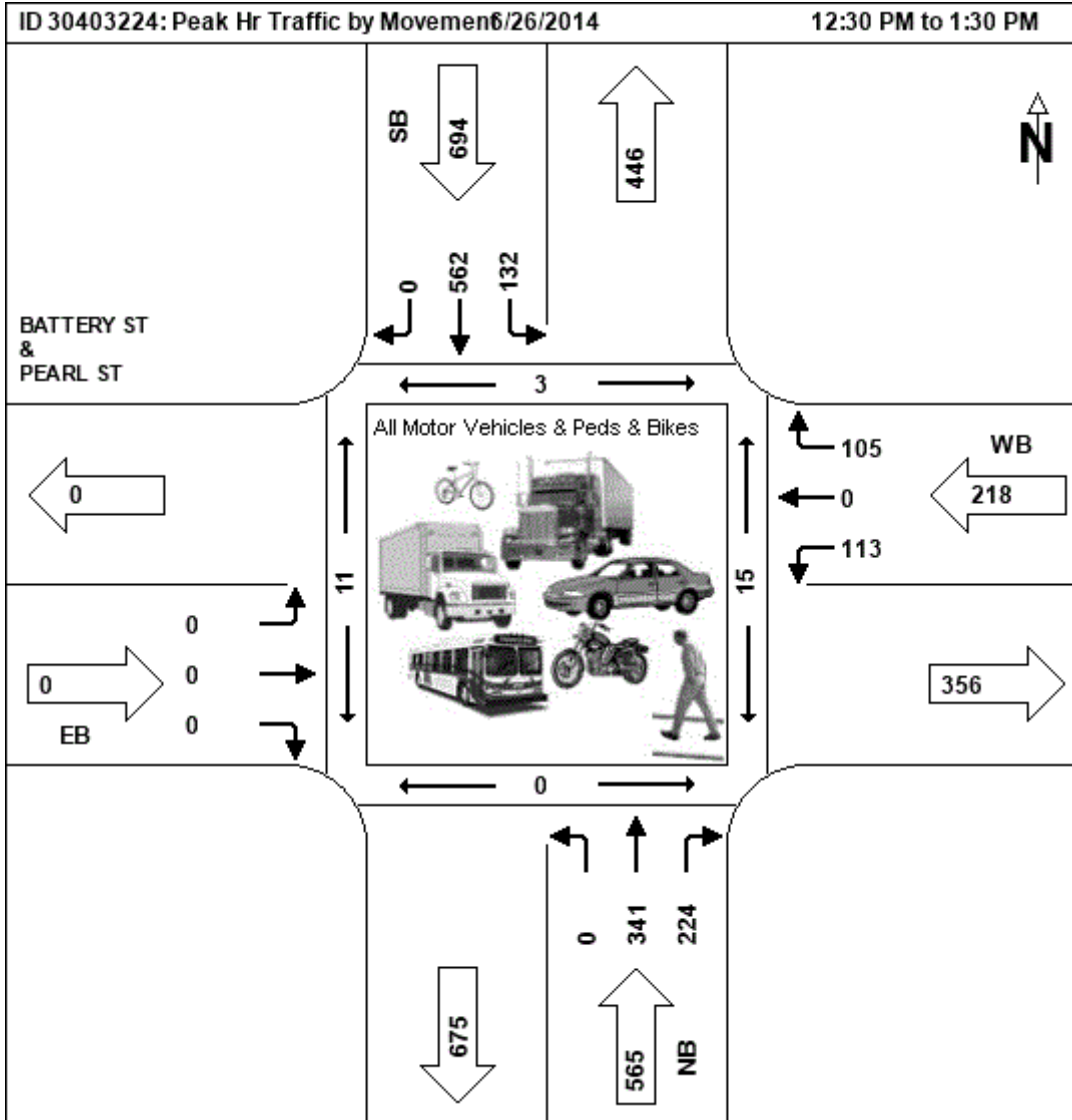


Midday Peak Hour
06/26/2014

NB					SB					WB					App	Int
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
12:30 PM	0	81	46	6	127	39	143	0	4	182	22	0	26	0	48	357

12:45 PM	0	78	58	2	136	35	155	0	0	190	33	0	3	395
1:00 PM	0	98	53	5	151	26	135	0	1	161	24	0	16	352
1:15 PM	0	84	67	2	151	32	129	0	6	161	34	0	27	373
Total	0	341	224	15	565	132	562	0	11	694	113	0	105	218
PHF		0.87	0.84		0.94	0.85	0.91			0.91	0.83		0.73	0.79
HV %		3	3		2	4				6	5			

FIGURE 5A

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes


PM Peak Hour
06/26/2014

NB					SB					WB				
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped
4:30 PM	0	131	94	1	225	27	100	0	3	127	33	0	25	1
4:45 PM	0	158	79	1	237	23	119	0	0	142	27	0	28	0
5:00 PM	0	150	120	2	270	31	107	0	0	138	25	0	30	1
5:15 PM	0	139	80	0	219	33	109	0	3	142	26	0	39	1
Total	0	578	373	4	951	114	435	0	6	549	111	0	122	3
PHF		0.91	0.78		0.88	0.86	0.91			0.97	0.84		0.78	
HV %		2	3		4	1				1	2			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

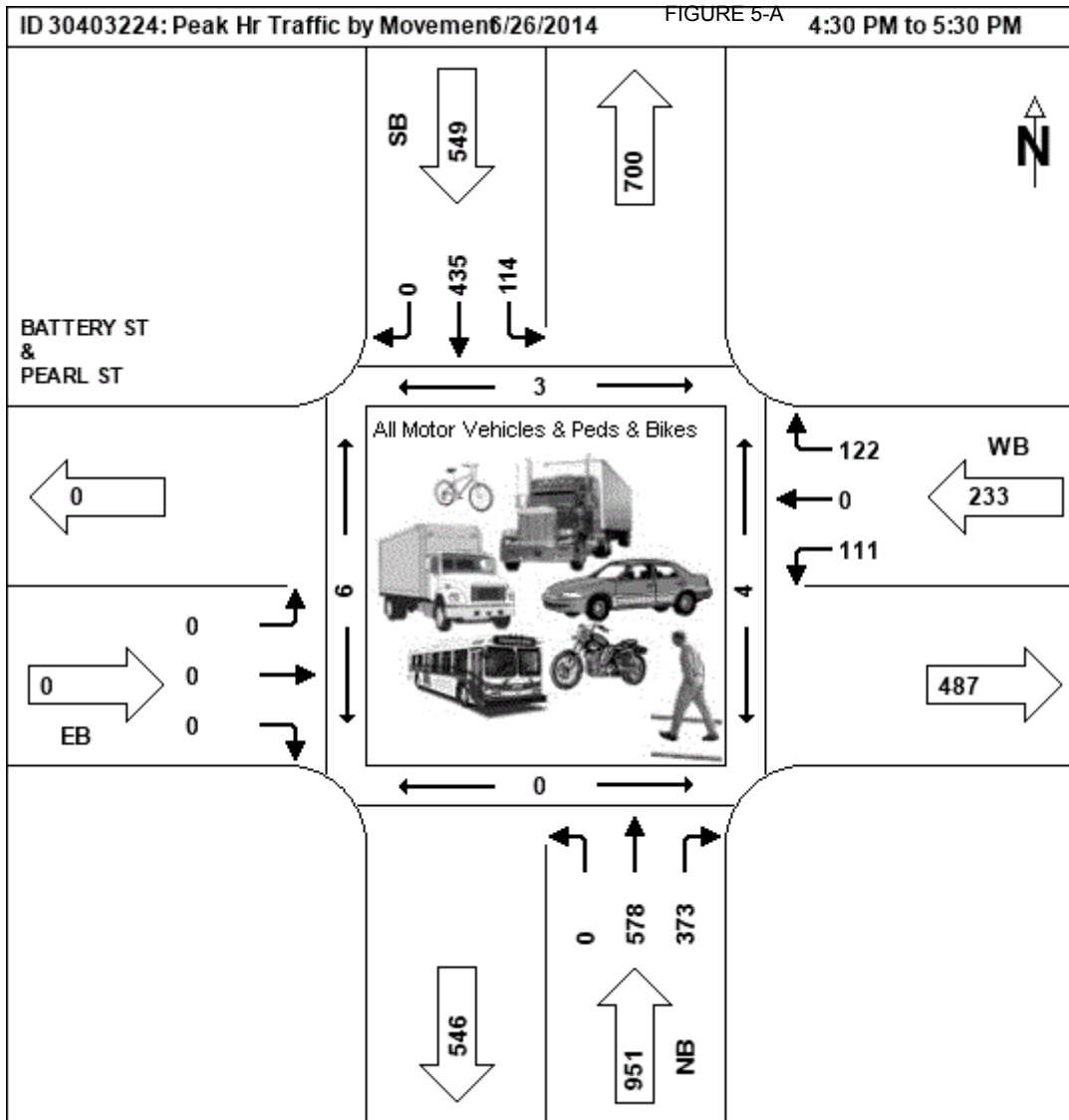


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403221
 Community: BURLINGTON
 Road 1: PEARL ST
 Road 2: PINE ST

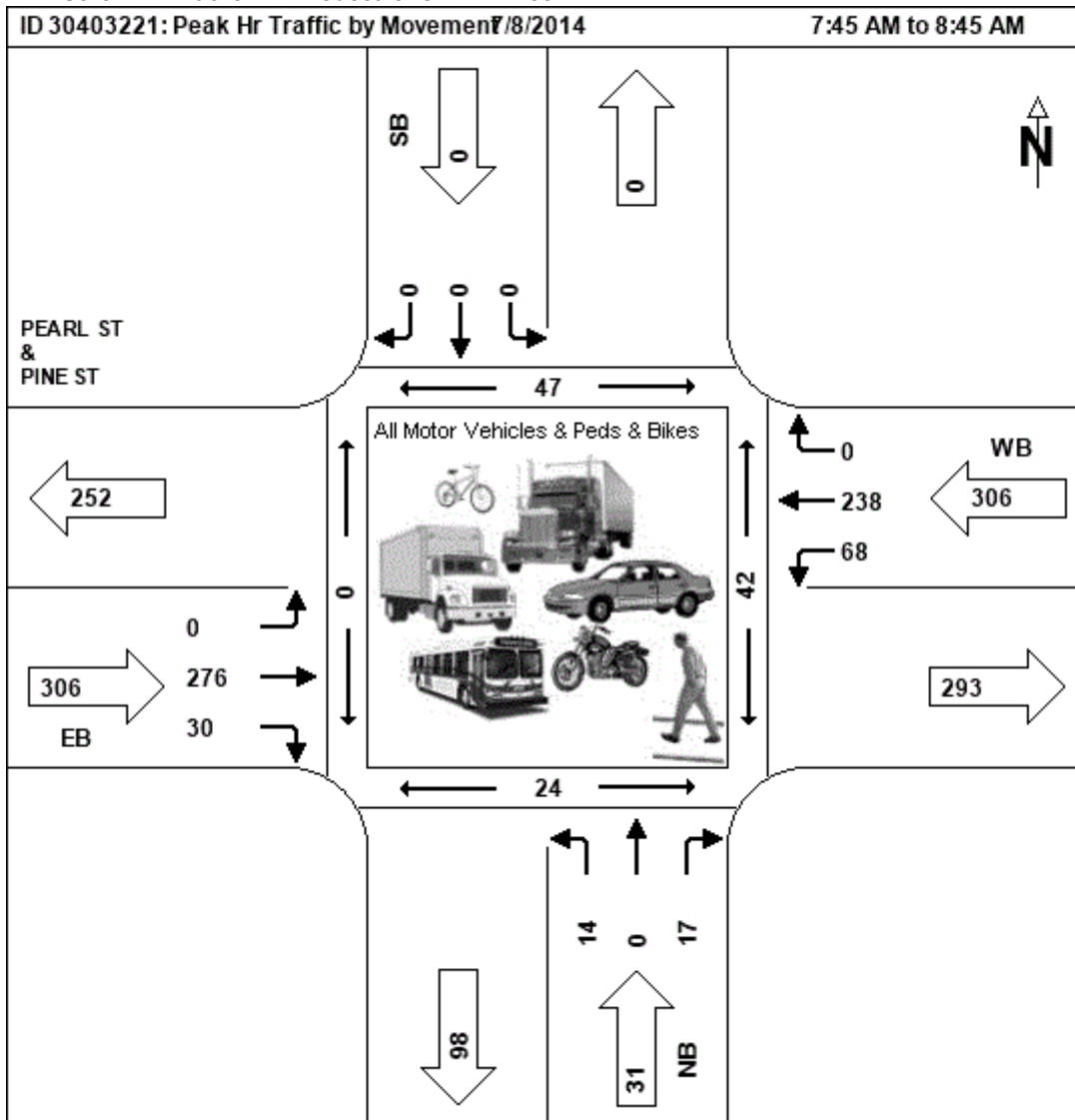
Corridor:
 Road 3: PEARL ST
 Road 4:

|<<|<|>|>>| 1-1 of 1

AM Peak Hour
07/08/2014

NB					EB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total	Total
7:45 AM	4	0	4	10	8	0	79	10	5	89	16	50	0	14	66	163
8:00 AM	3	0	6	14	9	0	57	4	10	61	20	62	0	9	82	152
8:15 AM	4	0	4	9	8	0	67	9	4	76	14	67	0	13	81	165
8:30 AM	3	0	3	9	6	0	73	7	5	80	18	59	0	11	77	163
Total	14	0	17	42	31	0	276	30	24	306	68	238	0	47	306	643
PHF	0.88		0.71		0.86		0.87	0.75		0.86	0.85	0.89			0.93	
HV %	14		6				4	10			7	7				

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

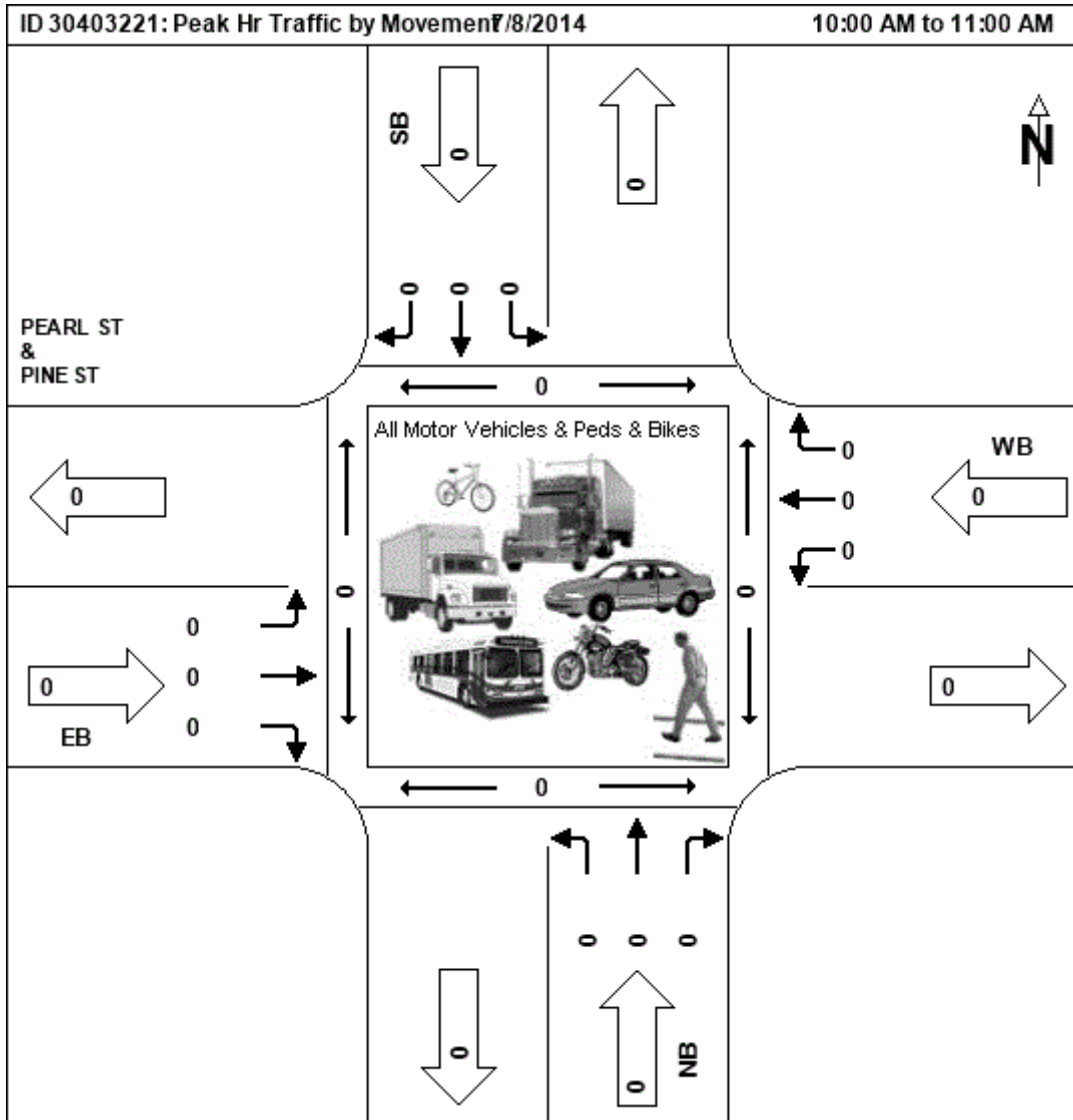


Midday Peak Hour
07/08/2014

NB					EB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total	Total
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[illegible]

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
07/08/2014

Start Time	NB				App Total	EB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
4:15 PM	6	0	18	16	24	0	69	0	14	69	9	80	0	5	89	182
4:30 PM	13	0	15	26	28	0	89	5	11	94	6	76	0	10	82	204
4:45 PM	9	0	15	20	24	0	68	5	4	73	4	92	0	6	96	193
5:00 PM	6	0	26	8	32	0	82	3	5	85	10	96	0	8	106	223
Total	34	0	74	70	108	0	308	13	34	321	29	344	0	29	373	802
PHF	0.65		0.71		0.84	0.87	0.65			0.85	0.73	0.90			0.88	
HV %	3		9			4	0				7	3				

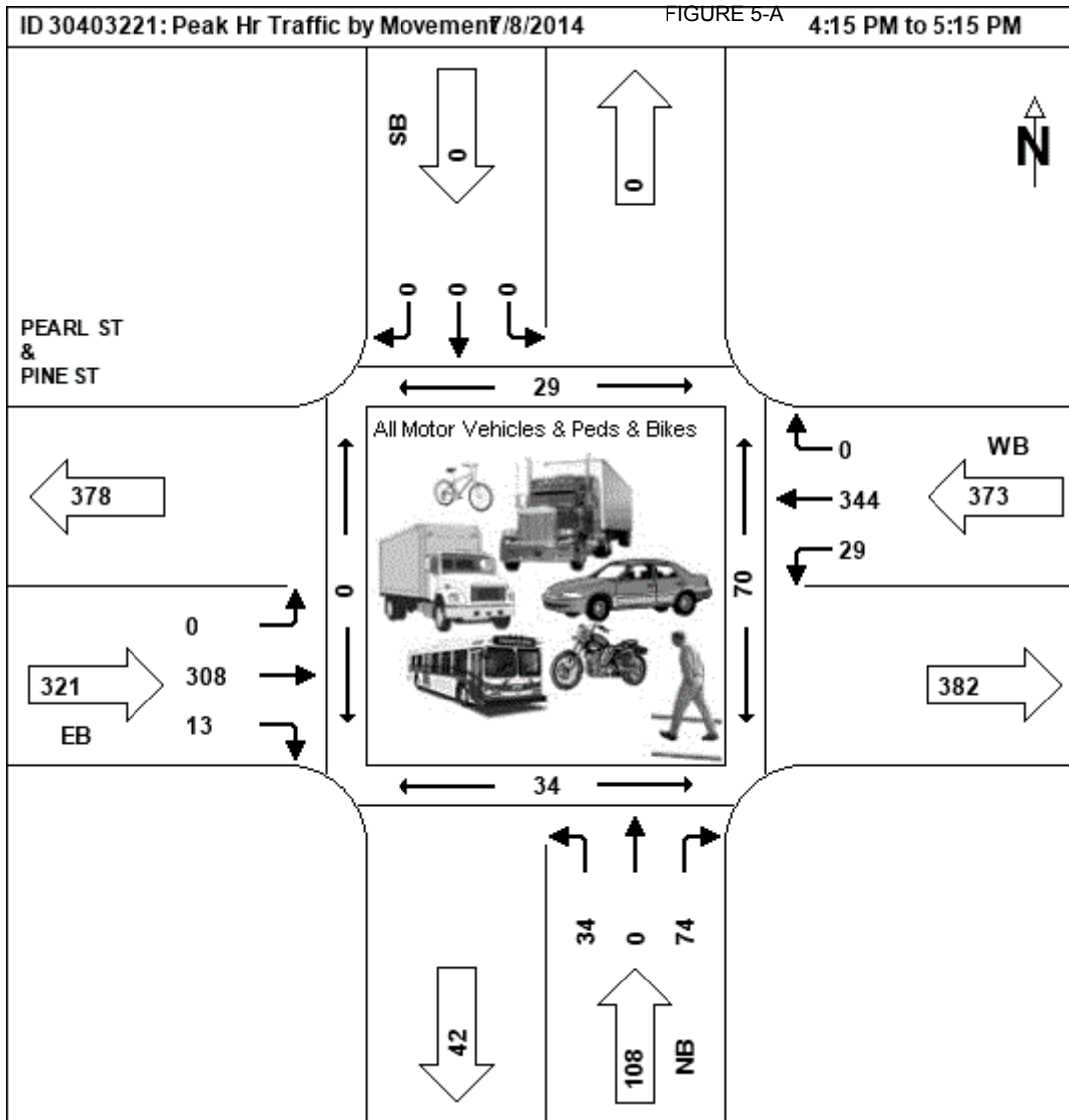


FIGURE 5-A

Peak Hour Data for Intersection

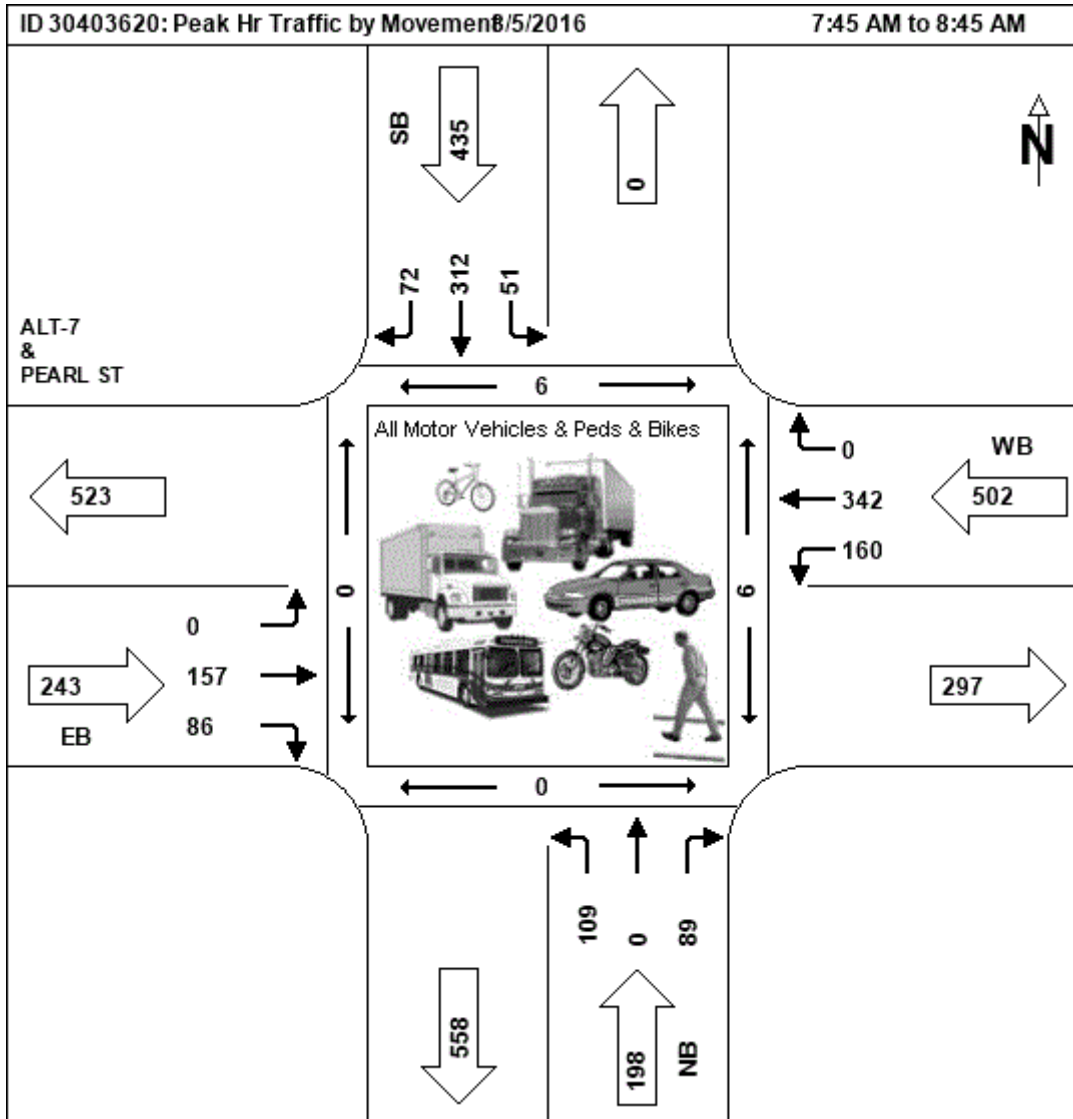
Int ID: 30403620
 Community: BURLINGTON
 Road 1: ALT-7
 Road 2: PEARL ST

Corridor: NA
 Road 3: ALT-7
 Road 4: PEARL ST

|<<|<|>|>>| 1-5 of 5

AM Peak Hour
08/05/2016

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int. Total		
7:45 AM	25	0	19	0	44	0	50	23	0	73	9	74	23	0	106	34	94	0	0	128	351		
8:00 AM	28	0	23	0	51	0	33	21	0	54	11	76	18	0	105	34	87	0	0	121	331		
8:15 AM	30	0	22	0	52	0	42	21	0	63	18	64	14	0	96	41	80	0	1	121	332		
8:30 AM	26	0	25	6	51	0	32	21	0	53	13	98	17	0	128	51	81	0	5	132	364		
Total	109	0	89	6	198	0	157	86	0	243	51	312	72	0	435	160	342	0	6	502	1378		
PHF	0.91		0.89		0.95		0.79	0.93		0.83	0.71	0.80	0.78		0.85	0.78	0.91			0.95			
HV %	8		15				3	1			4	1	7			3	6						
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes																							

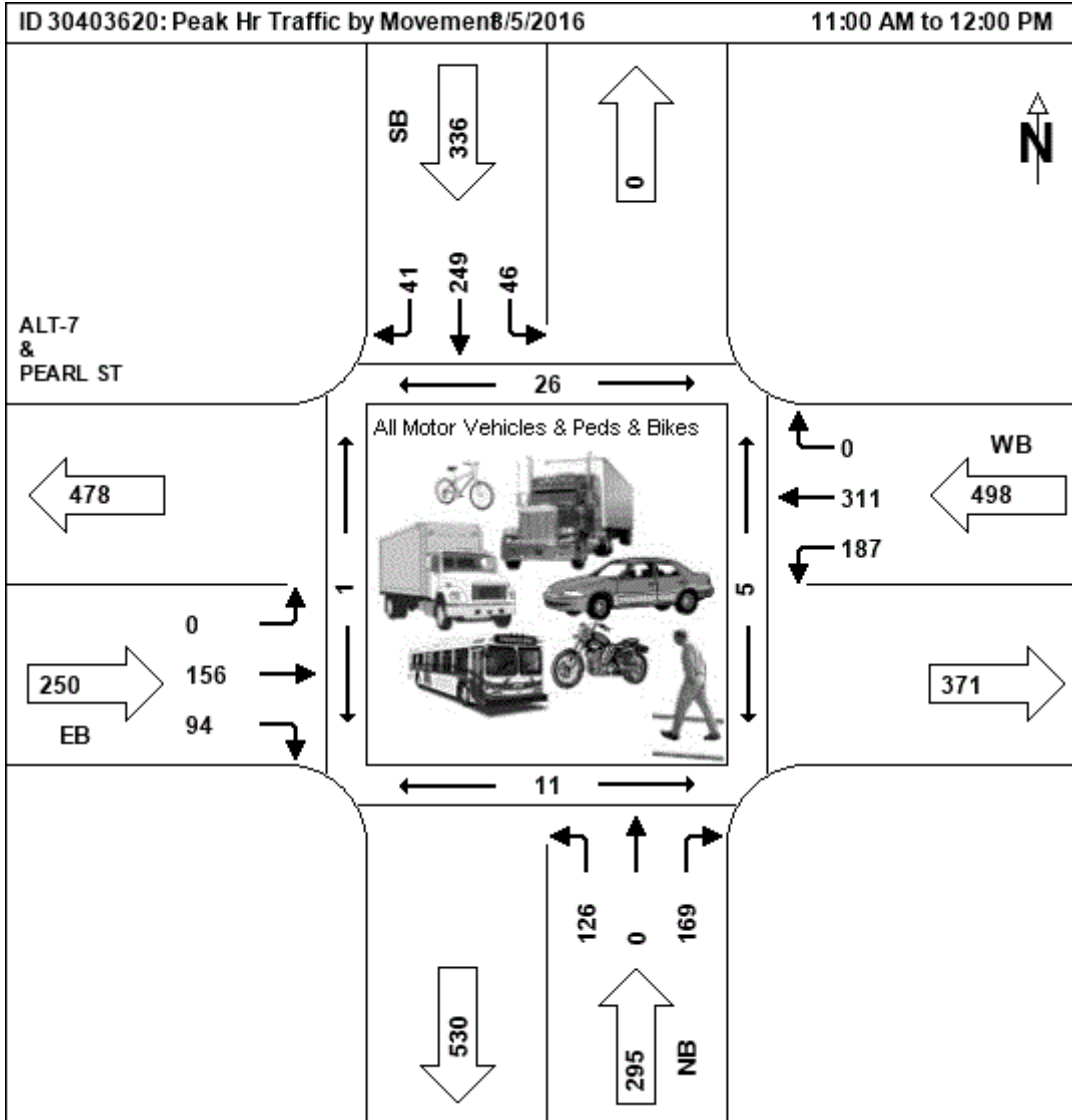


Midday Peak Hour
08/05/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
11:00 AM	24	0	51	0	75	0	49	24	0	73	13	65	14	0	92	49	66	0	7	115	355

11:15 AM	34	0	40	0	74	0	32	18	0	50	15	57	40	94	0	0	134	341			
11:30 AM	26	0	38	5	64	0	37	19	5	56	7	52	4	0	63	46	64	0	6	110	293
11:45 AM	42	0	40	0	82	0	38	33	6	71	11	75	12	1	98	52	87	0	13	139	390
Total	126	0	169	5	295	0	156	94	11	250	46	249	41	1	336	187	311	0	26	498	1379
PHF	0.75		0.83		0.90		0.80	0.71		0.86	0.77	0.83	0.73		0.86	0.90	0.83			0.90	
HV %	9		5				4	5			2	3	2		2	5					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
08/04/2016

NB						EB					SB					WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:30 PM	43	0	64	14	107	0	64	25	17	89	20	49	14	10	83	44	86	0	6	130	409
4:45 PM	43	0	62	7	105	0	73	26	4	99	21	71	8	7	100	37	90	0	5	127	431
5:00 PM	31	0	63	7	94	0	64	27	14	91	18	64	11	0	93	54	99	0	11	153	431
5:15 PM	52	0	70	11	122	0	65	21	7	86	31	72	10	0	113	30	80	0	0	110	431
Total	169	0	259	39	428	0	266	99	42	365	90	256	43	17	389	165	355	0	22	520	1702
PHF	0.81		0.93		0.88		0.91	0.92		0.92	0.73	0.89	0.77		0.86	0.76	0.90			0.85	
HV %	4		2				3	0			0	1	9		1	2					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

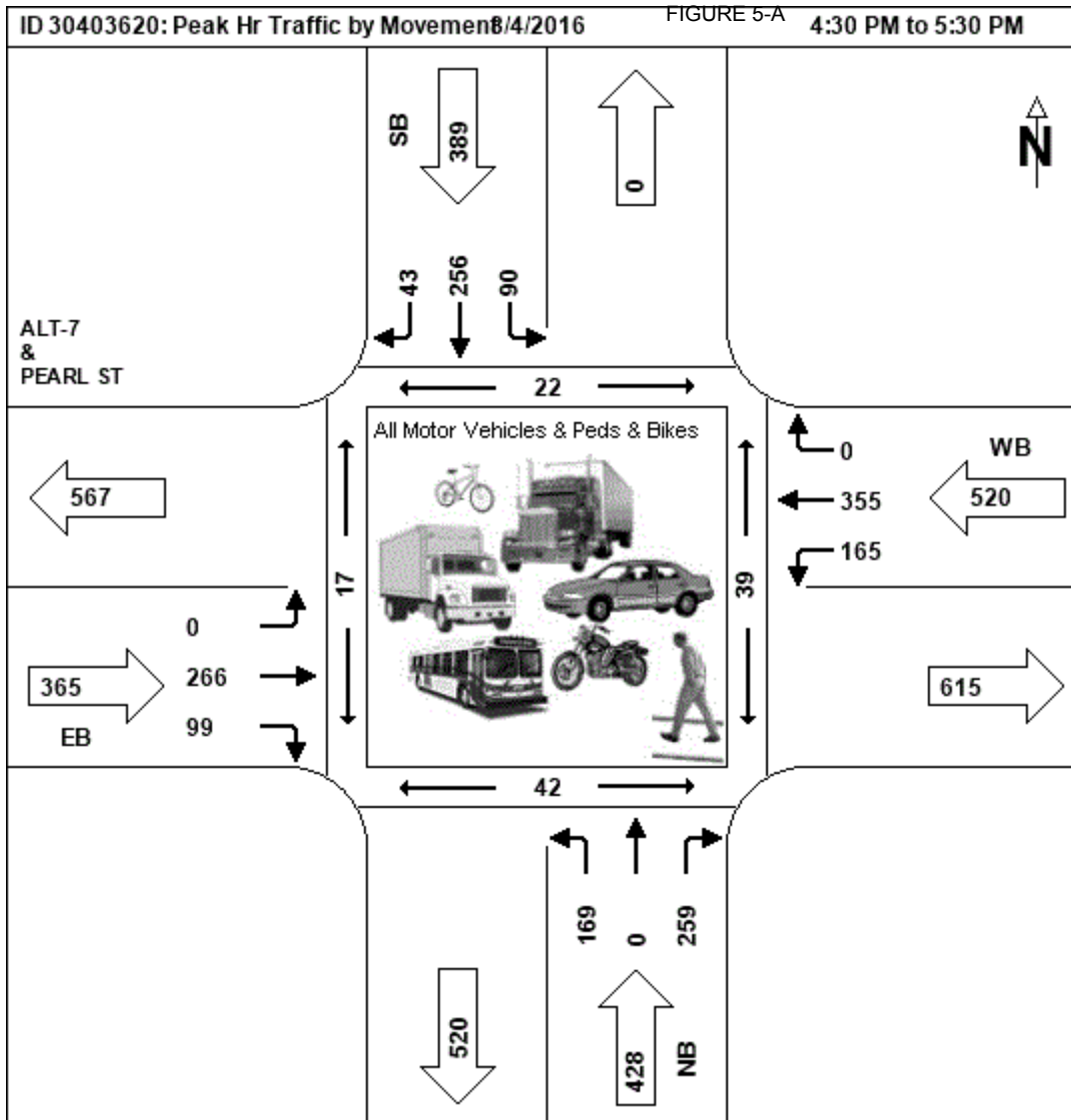


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403325
 Community: BURLINGTON
 Road 1: N UNION ST
 Road 2: PEARL ST

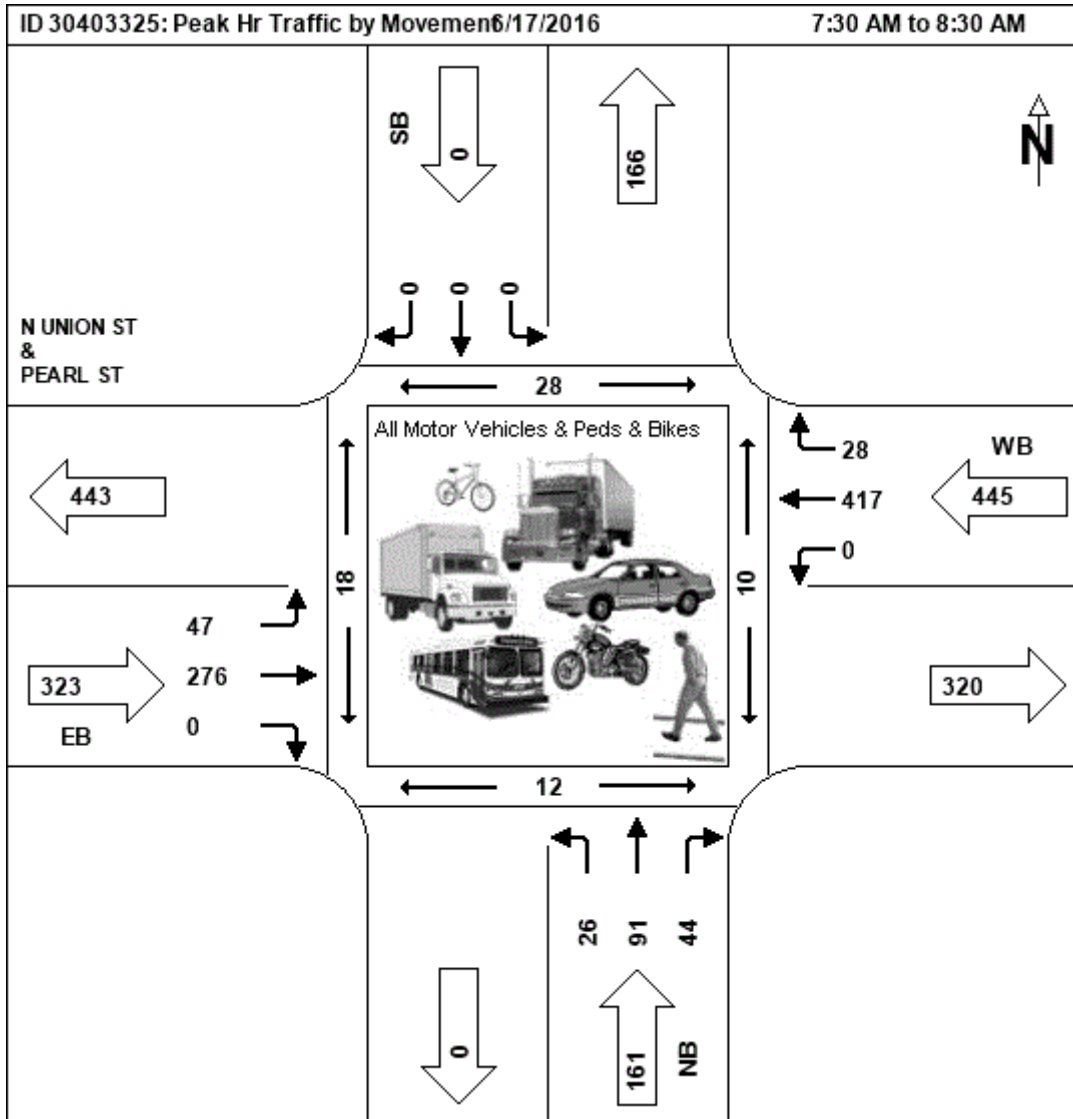
Corridor: NA
 Road 3: S UNION ST
 Road 4: PEARL ST

|<<|<|>|>>| 1-5 of 5

AM Peak Hour
06/17/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:30 AM	9	26	7	2	42	7	63	0	2	70	0	0	0	3	0	0	111	10	8	121	233
7:45 AM	6	19	11	2	36	17	66	0	3	83	0	0	0	4	0	0	117	3	7	120	239
8:00 AM	4	21	11	2	36	12	77	0	3	89	0	0	0	6	0	0	83	9	5	92	217
8:15 AM	7	25	15	4	47	11	70	0	4	81	0	0	0	5	0	0	106	6	8	112	240
Total	26	91	44	10	161	47	276	0	12	323	0	0	0	18	0	0	417	28	28	445	929
PHF	0.72	0.88	0.73		0.86	0.69	0.90			0.91							0.89	0.70		0.92	
HV %	0	1	2			13	5										5	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



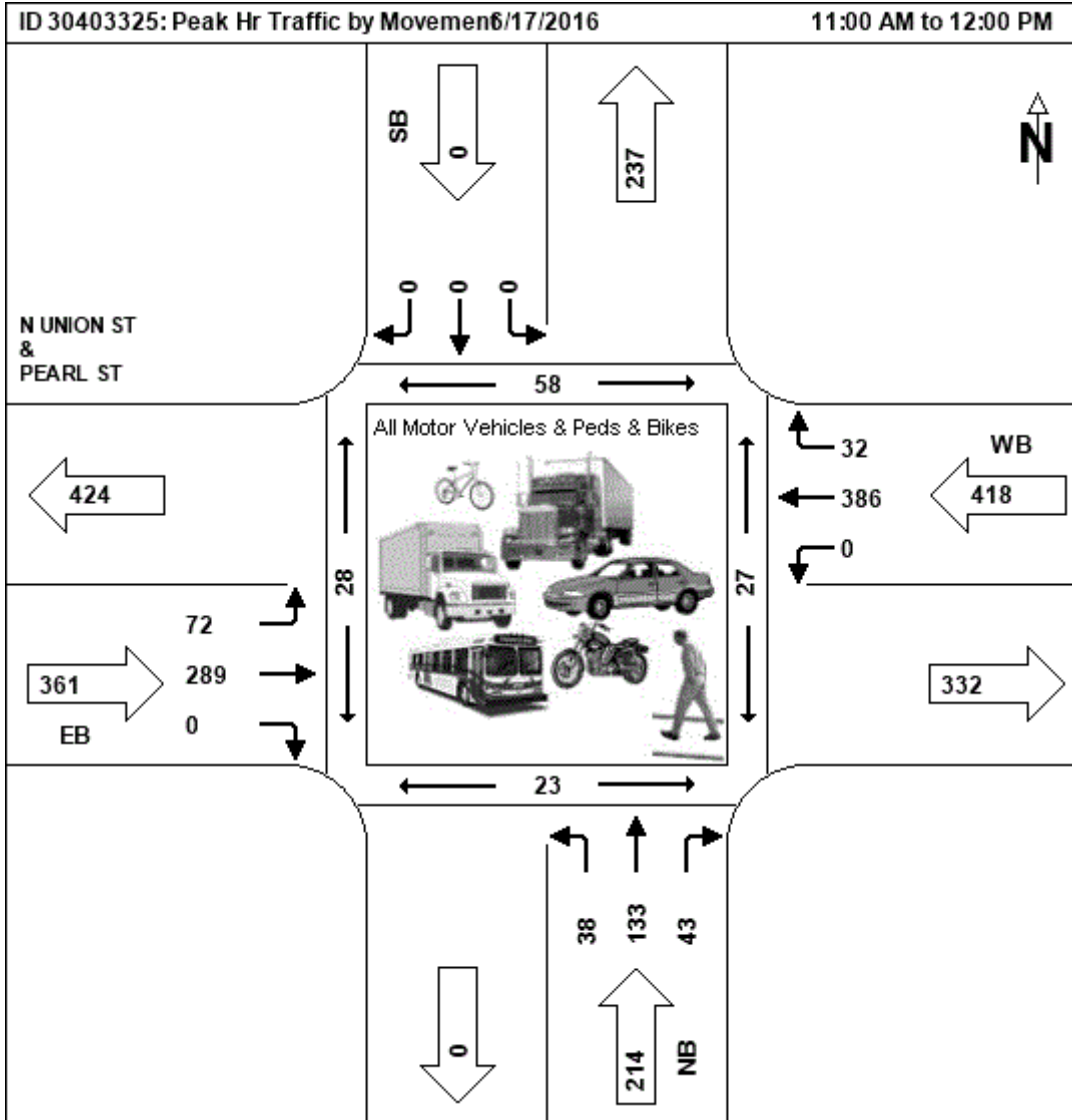
Midday Peak Hour
06/17/2016

06/11/2019

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
11:00 AM	10	32	6	4	48	13	69	0	9	82	0	0	0	13	0	0	102	7	25	109	239

11:15 AM	6	35	6	7	47	19	64	0	5	83	0	0	FIGURE 5-A				0	89	9	8	98	228
11:30 AM	12	36	15	7	63	19	71	0	3	90	0	0	0	10	0	0	98	5	4	103	256	
11:45 AM	10	30	16	9	56	21	85	0	6	106	0	0	0	1	0	0	97	11	21	108	270	
Total	38	133	43	27	214	72	289	0	23	361	0	0	0	28	0	0	386	32	58	418	993	
PHF					0.85	0.79	0.92	0.67		0.85							0.95	0.73		0.96		
HV %	0	1	0			7	2										2	13				

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/16/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:45 PM	16	63	13	4	92	31	125	0	10	156	0	0	0	6	0	0	117	15	10	132	380
5:00 PM	8	78	12	9	98	41	115	0	9	156	0	0	0	2	0	0	103	9	12	112	366
5:15 PM	11	68	11	16	90	32	90	0	4	122	0	0	0	11	0	0	114	18	13	132	344
5:30 PM	9	54	11	9	74	38	102	0	14	140	0	0	0	8	0	0	117	13	18	130	344
Total	44	263	47	38	354	142	432	0	37	574	0	0	0	27	0	0	451	55	53	506	1434
PHF	0.690	0.84	0.90		0.90	0.870	0.86			0.92							0.96	0.76		0.96	
HV %	0	0	0			1	3										2	2			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

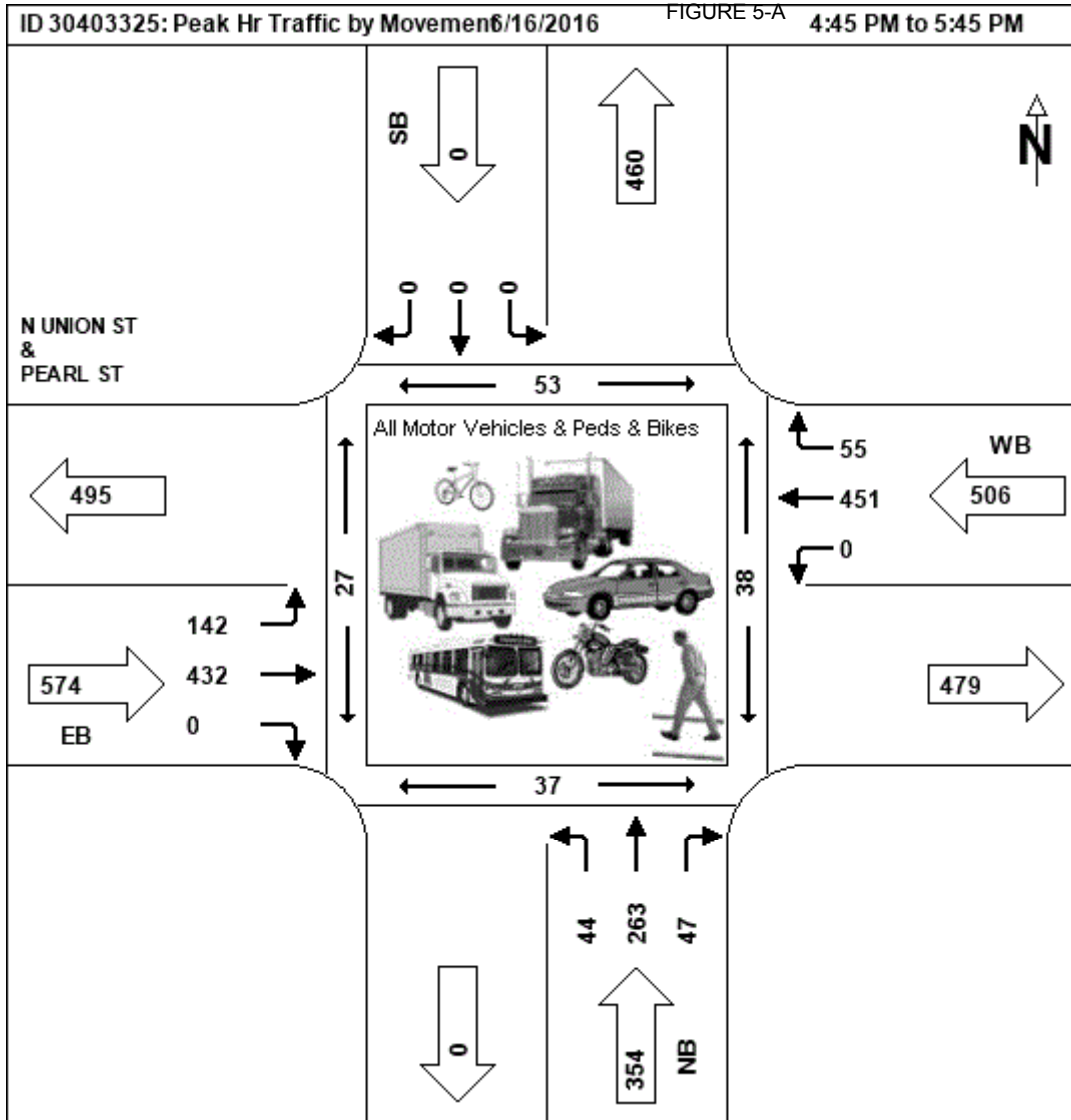


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403745
 Community: BURLINGTON
 Road 1: US-7
 Road 2: PEARL ST

Corridor: NA
 Road 3: US-7
 Road 4: PEARL ST

|<<|<|>|>>| 1-4 of 4

AM Peak Hour 06/17/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:45 AM	9	25	6	2	40	0	71	13	4	84	8	62	8	3	78	17	99	4	2	120	322
8:00 AM	4	23	9	2	36	3	71	15	4	89	5	47	6	3	58	6	90	3	2	99	282
8:15 AM	10	21	14	3	45	4	77	5	2	86	6	52	7	0	65	9	103	5	9	117	313
8:30 AM	5	24	15	0	44	5	71	7	2	83	3	48	9	2	60	11	120	3	8	134	321
Total	28	93	44	7	165	12	290	40	12	342	22	209	30	8	261	43	412	15	21	470	1238
PHF	0.70	0.93	0.73		0.92	0.60	0.94	0.67		0.96	0.69	0.84	0.83		0.84	0.63	0.86	0.75		0.88	
HV %	4	6	2			0	5	3			0	3	3			0	4	0			

☒

 Cars

☒

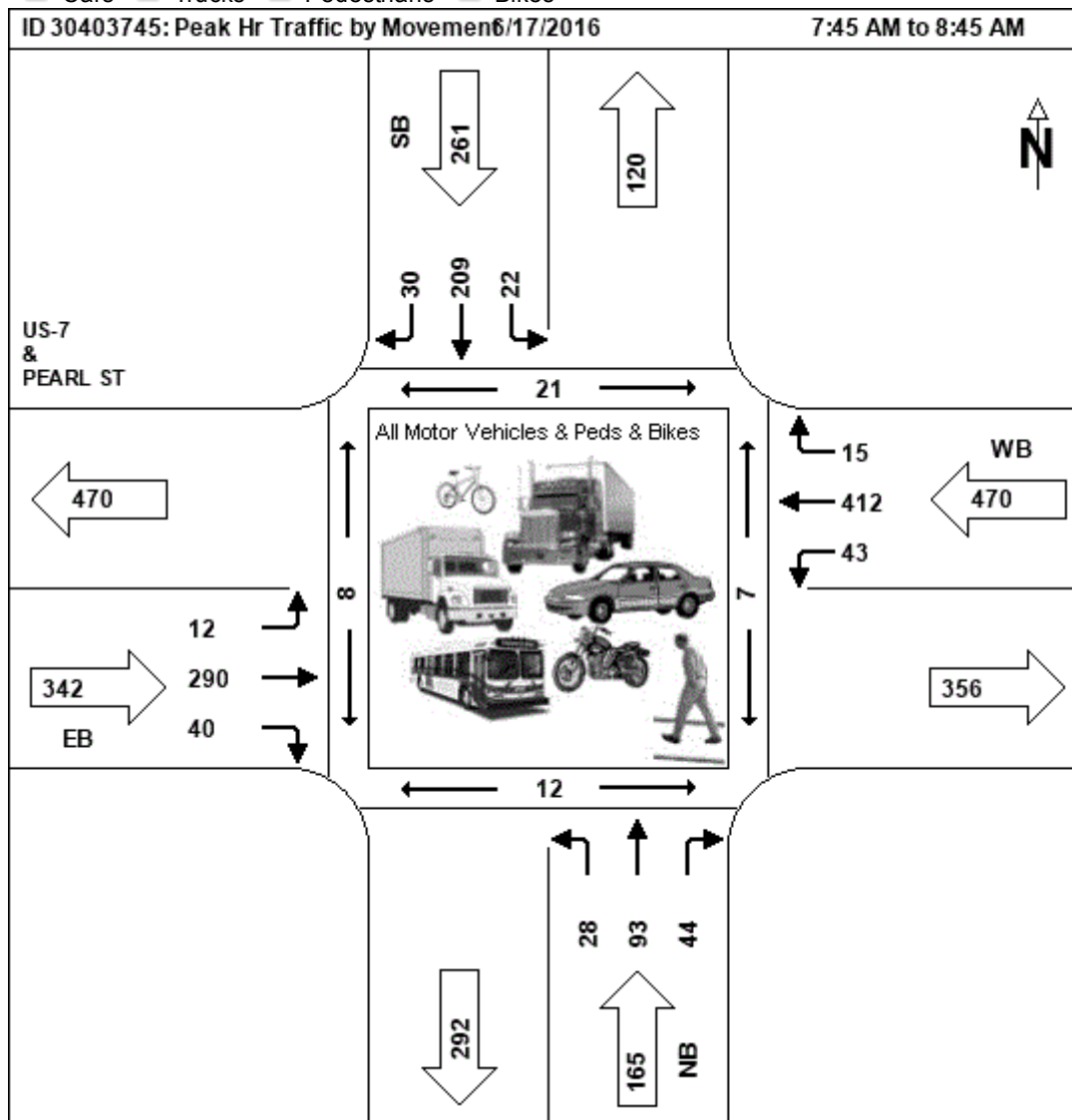
 Trucks

☒

 Pedestrians

☒

 Bikes



Midday Peak Hour 06/17/2016

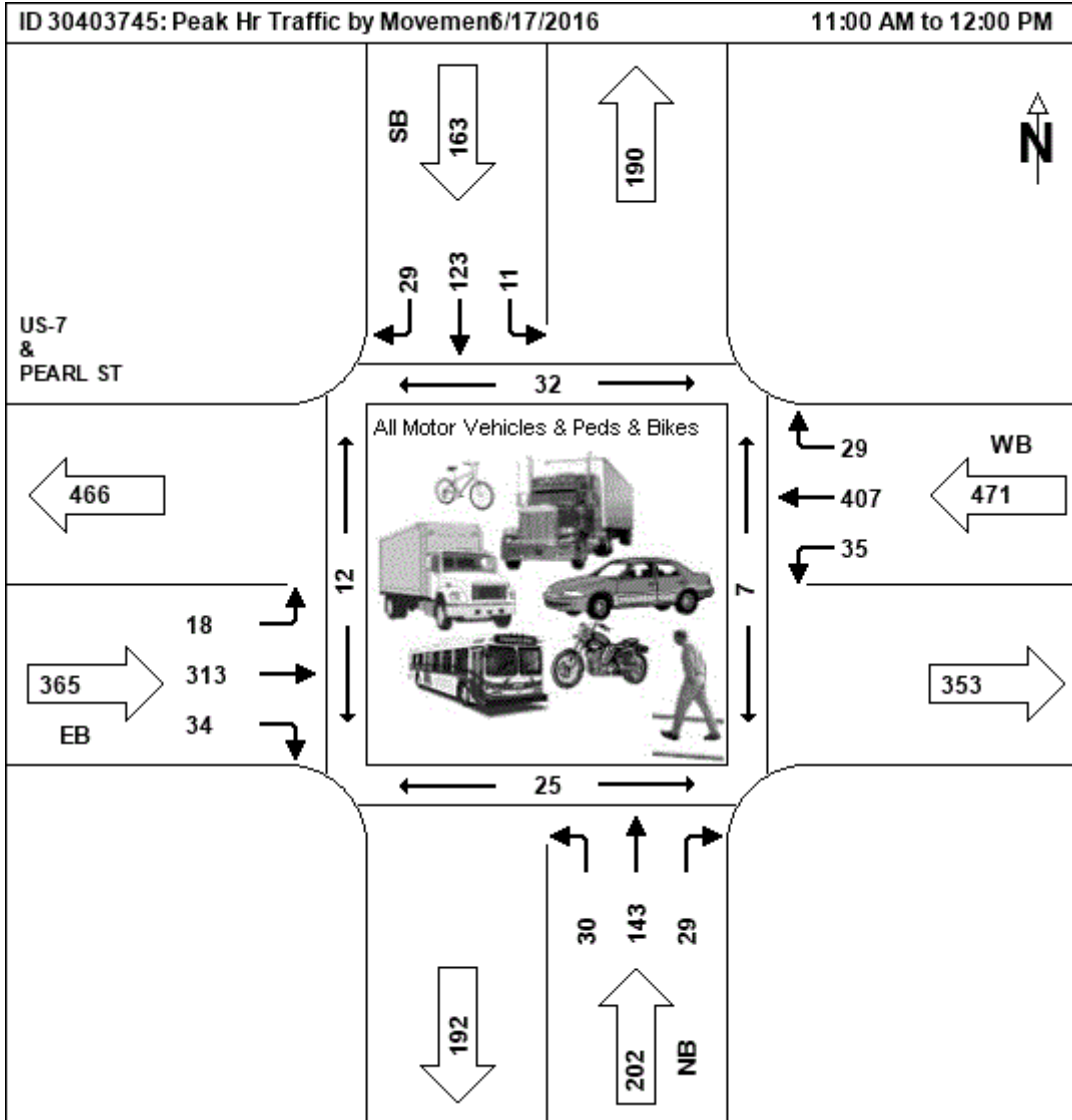
06/11/2019

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
11:00 AM	8	34	5	3	47	2	76	9	7	87	4	26	6	0	36	10	112	7	13	129	299

FIGURE 5-A

11:15 AM	8	36	7	2	51	3	74	8	7	85	3	31	5	4	8	102	7	7	117	293	
11:30 AM	8	36	8	0	52	4	72	6	6	82	2	36	6	6	44	5	91	6	1	102	280
11:45 AM	6	37	9	2	52	9	91	11	5	111	2	30	11	3	43	12	102	9	11	123	329
Total	30	143	29	7	202	18	313	34	25	365	11	123	29	12	163	35	407	29	32	471	1201
PHF	0.94	0.97	0.81		0.97	0.50	0.86	0.77		0.82	0.69	0.85	0.66		0.93	0.73	0.91	0.81		0.91	
HV %	10	4	3			11	4	3			0	3	7			0	3	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/16/2016

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
4:15 PM	10	55	10	0	75	4	114	6	0	124	4	54	7	0	65	7	106	5	0	118	382		
4:30 PM	17	56	14	1	87	10	98	12	0	120	6	36	11	0	53	18	105	13	4	136	396		
4:45 PM	19	48	10	0	77	13	112	6	5	131	10	44	9	0	63	16	125	12	1	153	424		
5:00 PM	9	71	16	0	96	14	107	13	0	134	5	31	6	4	42	10	100	10	0	120	392		
Total	55	230	50	1	335	41	431	37	5	509	25	165	33	4	223	51	436	40	5	527	1594		
PHF	0.720.810.78				0.87	0.730.950.71				0.95	0.630.760.75				0.86	0.710.870.77				0.86			
HV %	0	1	2			2	3	0			0	1	0			2	3	0					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

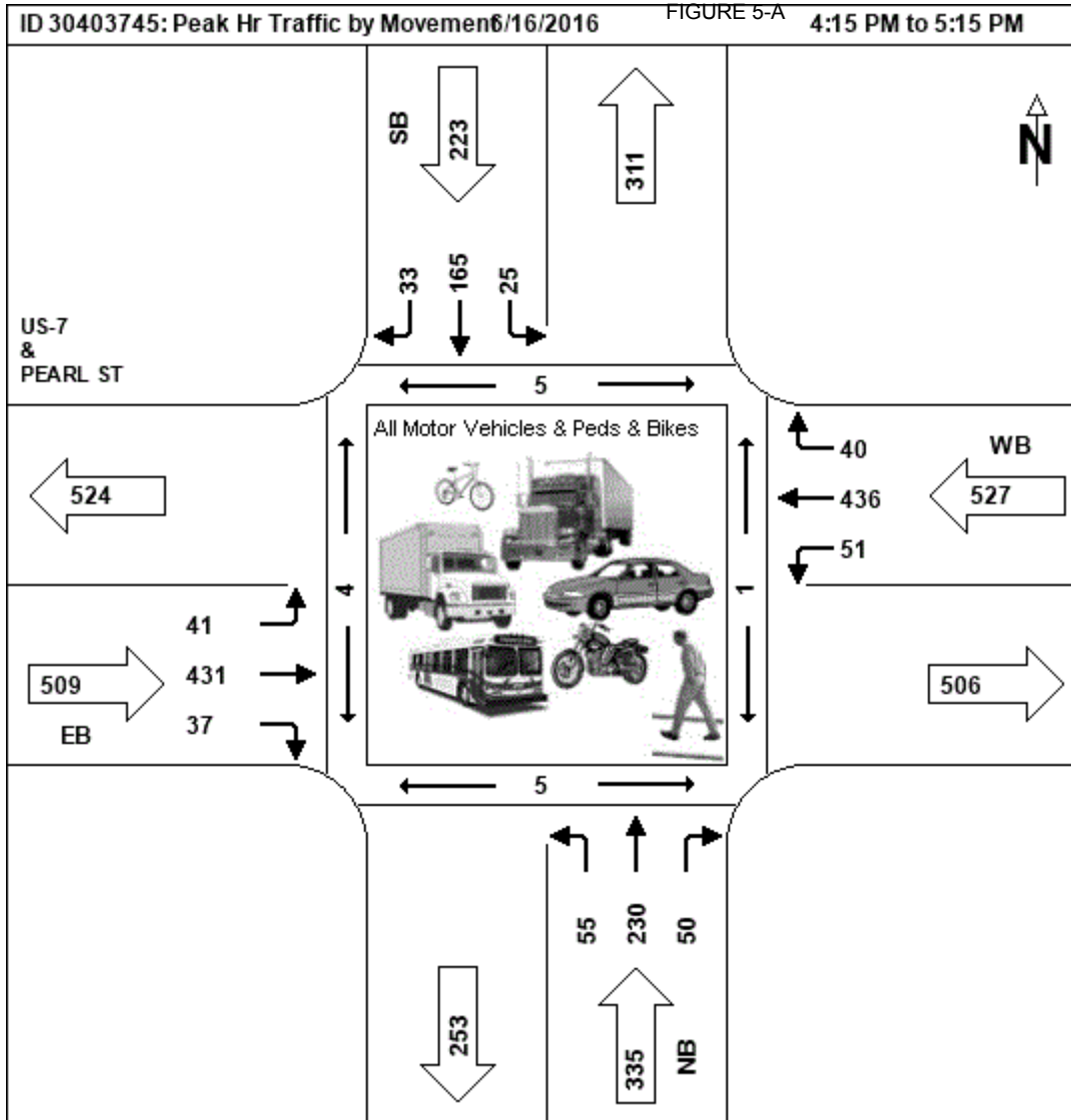


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403330
 Community: BURLINGTON
 Road 1: N PROSPECT ST
 Road 2: COLCHESTER AV

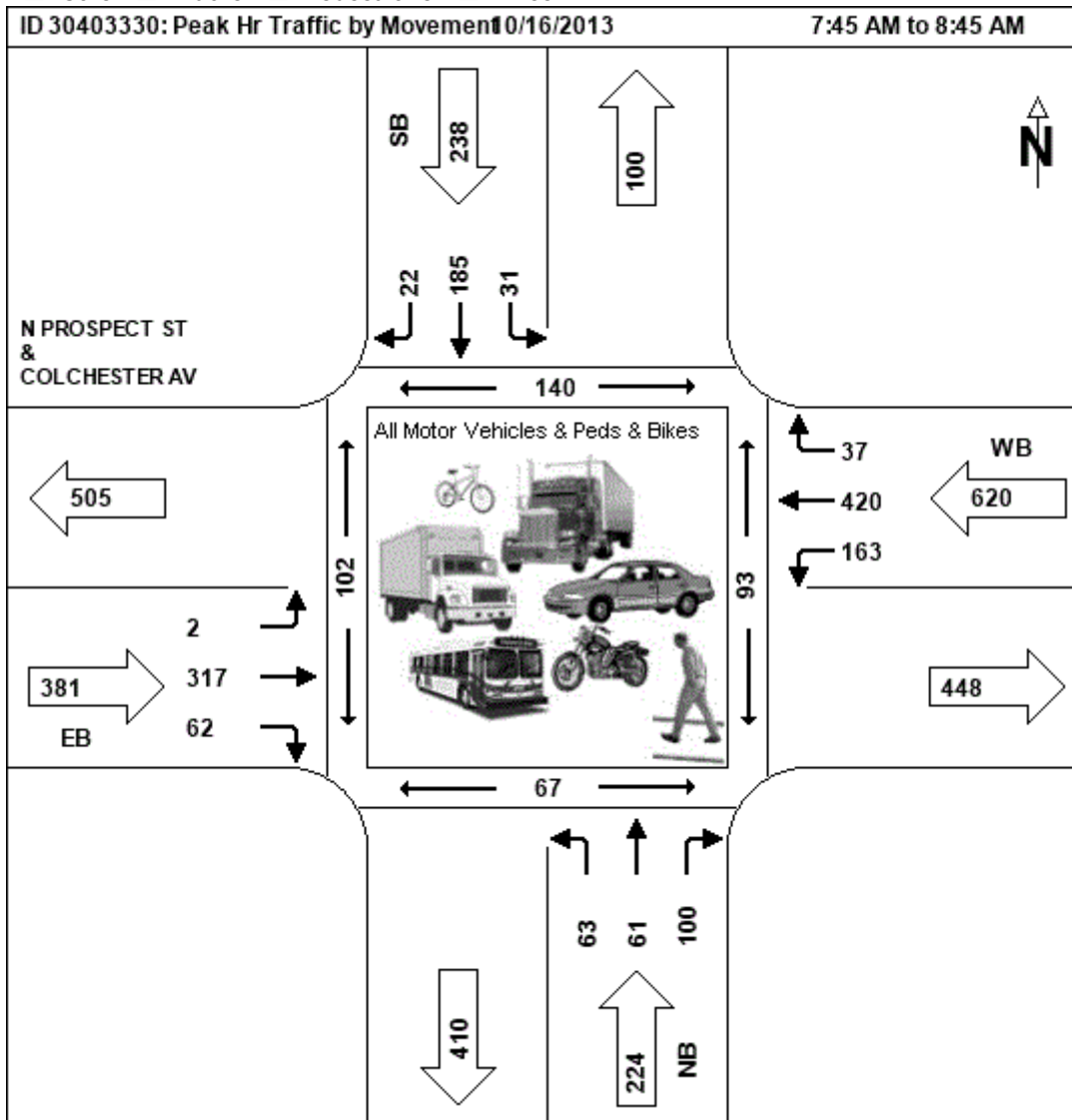
Corridor: NA
 Road 3: S PROSPECT ST
 Road 4: PEARL ST

|<<|<|>|>>| 1-5 of 5

AM Peak Hour 10/16/2013

NB					EB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total					Total	Total
7:45 AM	13	15	28	37	56	0	76	28	25	104	9	33	6	35	48	43	109	12	39	164	372
8:00 AM	20	20	30	19	70	0	89	7	5	96	9	55	4	18	68	38	112	12	26	162	396
8:15 AM	18	12	22	30	52	1	81	20	28	102	7	46	5	30	58	42	96	7	53	145	357
8:30 AM	12	14	20	7	46	1	71	7	9	79	6	51	7	19	64	40	103	6	22	149	338
Total	63	61	100	93	224	2	317	62	67	381	31	185	22	102	238	163	420	37	140	620	1463
PHF	0.79	0.76	0.83		0.80	0.50	0.89	0.55		0.92	0.86	0.84	0.79		0.88	0.95	0.94	0.77		0.95	
HV %	6	0	13			0	5	0			0	2	0			11	5	3			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



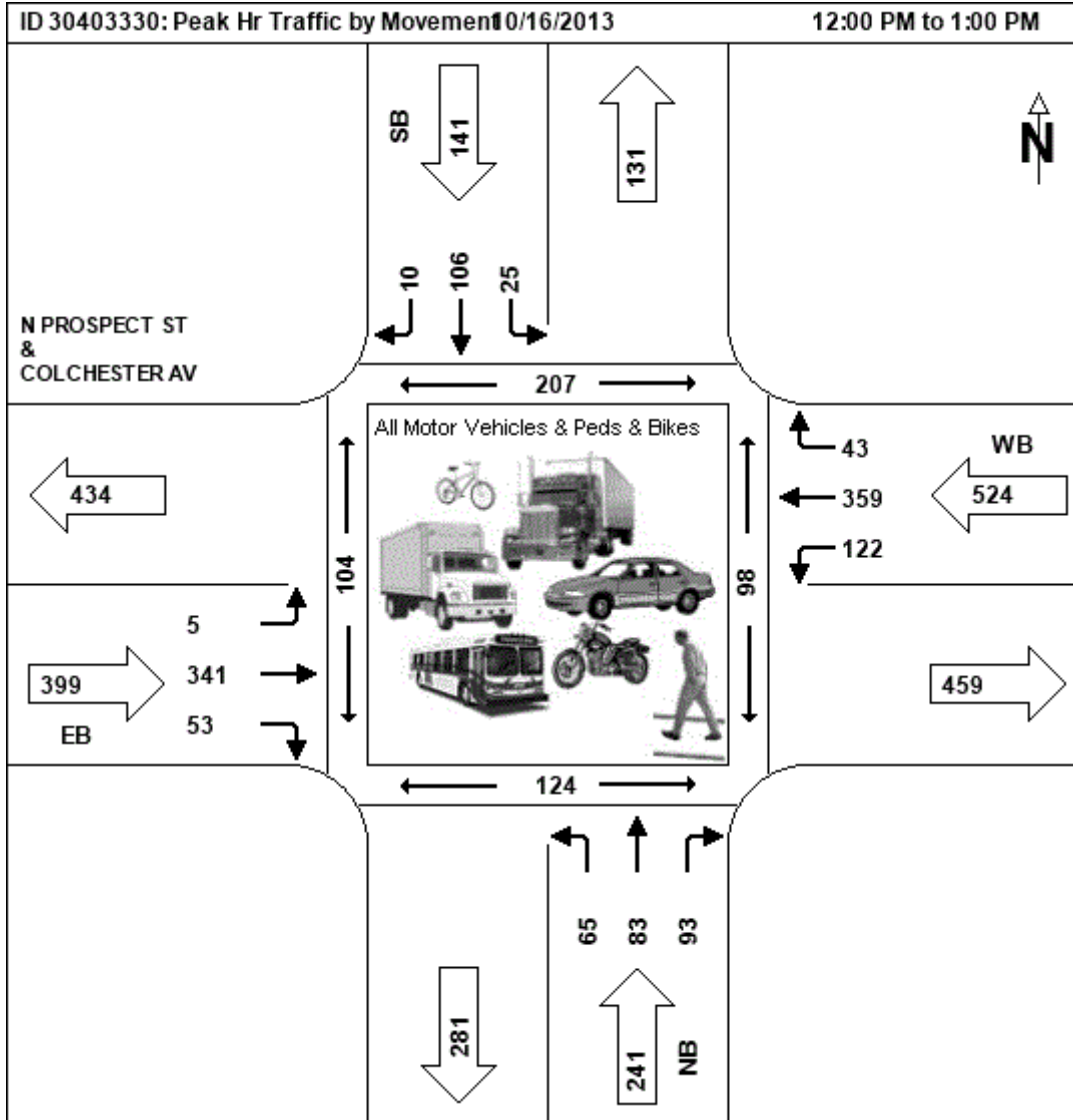
Midday Peak Hour 10/16/2013

NB					EB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total					Total	Total
12:00 PM	16	24	32	20	72	0	71	21	22	92	10	21	2	17	33	28	81	10	15	119	316

FIGURE 5-A

12:15 PM	13	15	21	9	49	1	87	11	17	99	2	27	33	90	9	16	132	310			
12:30 PM	20	22	17	39	59	3	78	11	54	92	6	19	6	42	31	34	76	10	140	120	302
12:45 PM	16	22	23	30	61	1	105	10	31	116	7	39	1	29	47	27	112	14	36	153	377
Total	65	83	93	98	241	5	341	53	124	399	25	106	10	104	141	122	359	43	207	524	1305
PHF	0.81	0.86	0.73		0.84	0.42	0.81	0.63		0.86	0.63	0.68	0.42		0.75	0.90	0.80	0.77		0.86	
HV %	8	2	9			0	5	4			8	6	10			12	4	2			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
10/16/2013

NB						EB					SB					WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
5:00 PM	31	49	46	39	126	0	104	7	57	111	3	26	3	31	32	42	117	11	48	170	439
5:15 PM	33	62	29	22	124	1	89	7	33	97	7	23	3	41	33	29	115	24	56	168	422
5:30 PM	36	53	43	33	132	2	97	19	27	118	7	24	2	28	33	32	115	15	30	162	445
5:45 PM	25	45	37	26	107	1	103	14	19	118	5	22	2	25	29	18	120	24	30	162	416
Total	125	209	155	120	489	4	393	47	136	444	22	95	10	125	127	121	467	74	164	662	1722
PHF	0.870	0.84	0.84		0.93	0.500	0.94	0.62		0.94	0.790	0.91	0.83		0.96	0.720	0.97	0.77		0.97	
HV %	0	0	0	5		0	3	0			0	3	0			7	1	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

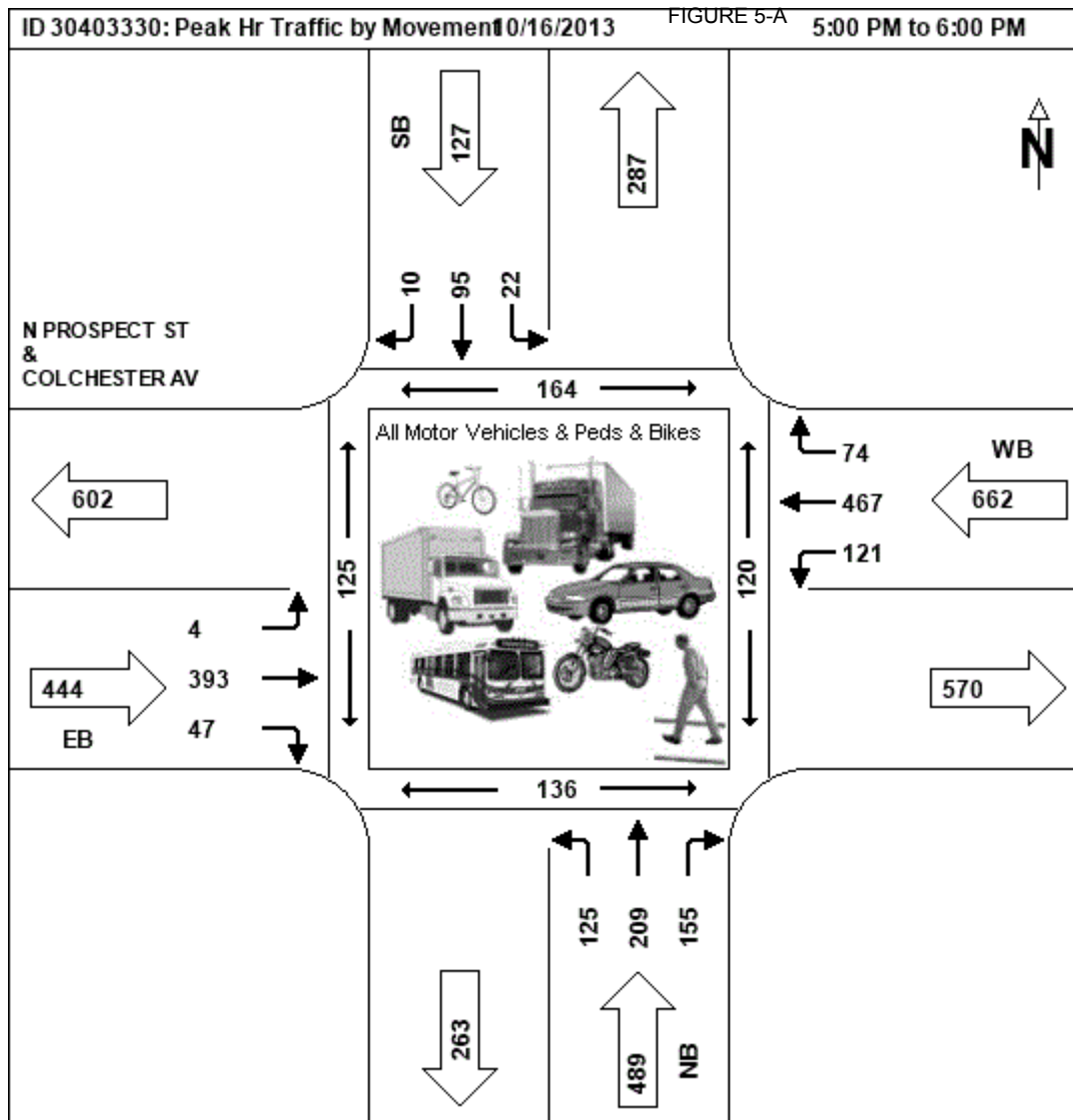


FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington, VT **Sheet:**
Calculated by: E. Quallen **Date:** 12/2/16
Checked by: **Date:**
Title: BTV Town Center Traffic Counts
Intersection: College St / Pine St

Intersection: College St / Pine St
 Count Date(s): 11/30/2016

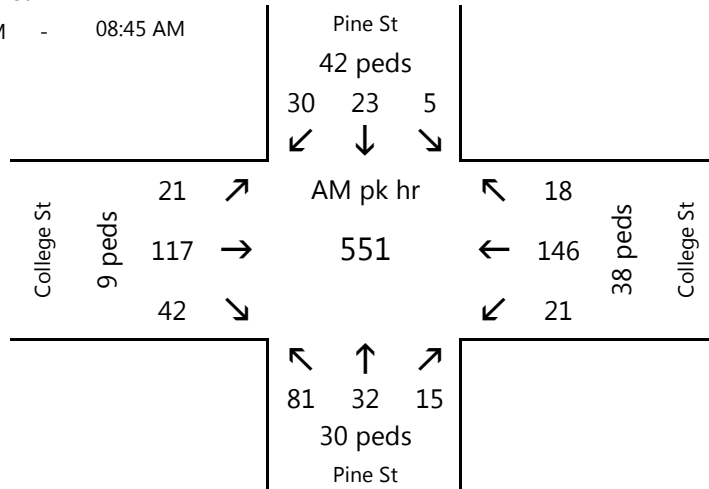
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St				College St				Pine St				College St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	30	23	5	42	18	146	21	38	15	32	81	30	42	117	21	9	551
PM pk hr	52	65	20	51	12	111	34	45	21	39	32	43	97	131	24	28	638

AM Peak Hour

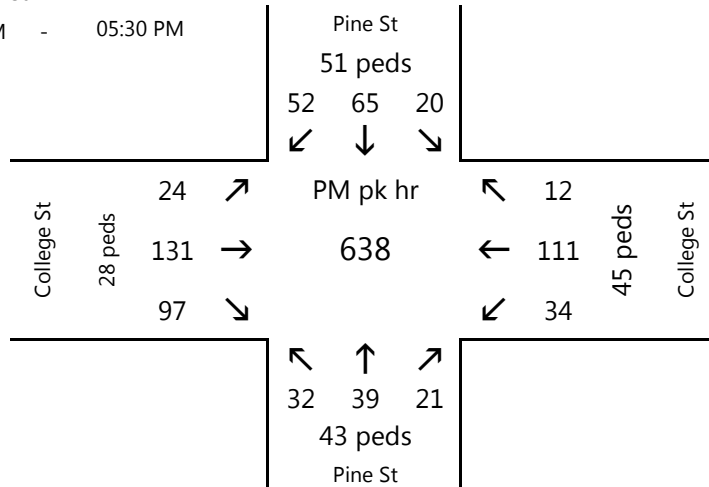
07:45 AM - 08:45 AM



% Auto: 80.1%
 % Med: 0.0%
 % Heavy: 2.1%
 total % Trucks: 2.1%

PM Peak Hour

04:30 PM - 05:30 PM



% Auto: 79.3%
 % Med: 0.0%
 % Heavy: 0.0%
 total % Trucks: 0.0%

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington, VT **Sheet:**
Calculated by: E. Quallen **Date:** 12/2/16
Checked by: **Date:**
Title: BTV Town Center Traffic Counts
Intersection: College St / St Paul St

Intersection: College St / St Paul St
 Count Date(s): 12/1/2016

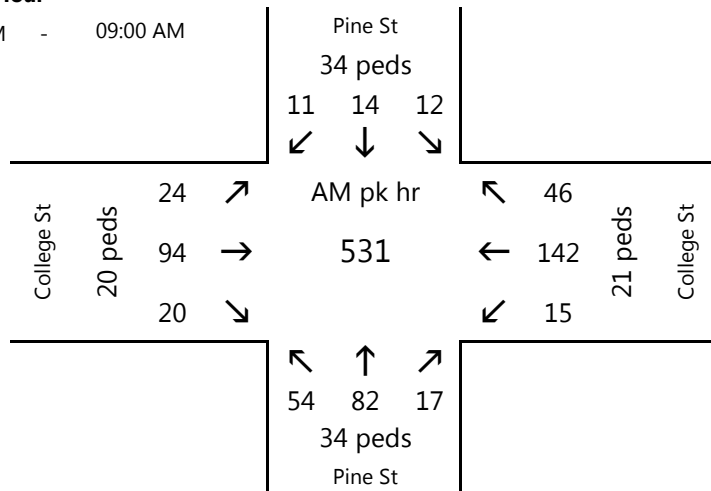
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St				College St				Pine St				College St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	11	14	12	34	46	142	15	21	17	82	54	34	20	94	24	20	531
PM pk hr	34	60	35	133	38	72	26	80	43	79	52	111	43	110	19	102	611

AM Peak Hour

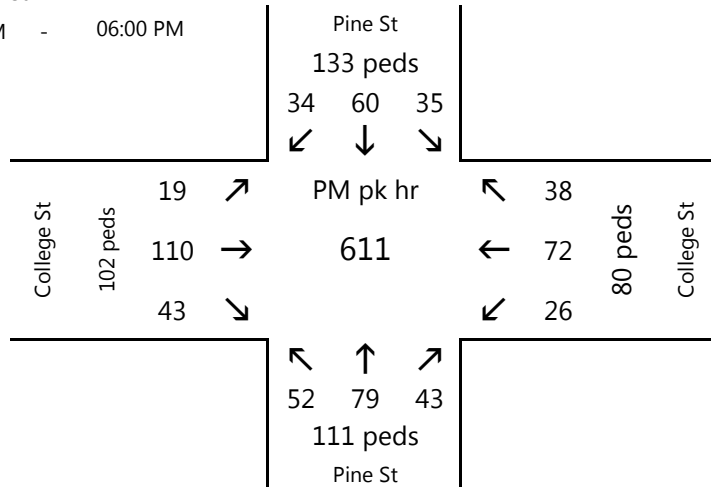
08:00 AM - 09:00 AM



% Auto: 83.0%
 % Med: 0.0%
 % Heavy: 0.0%
 total % Trucks: 0.0%

PM Peak Hour

05:00 PM - 06:00 PM



% Auto: 58.1%
 % Med: 0.8%
 % Heavy: 0.0%
 total % Trucks: 0.8%

FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403275
 Community: BURLINGTON
 Road 1: PINE ST
 Road 2: MAIN ST

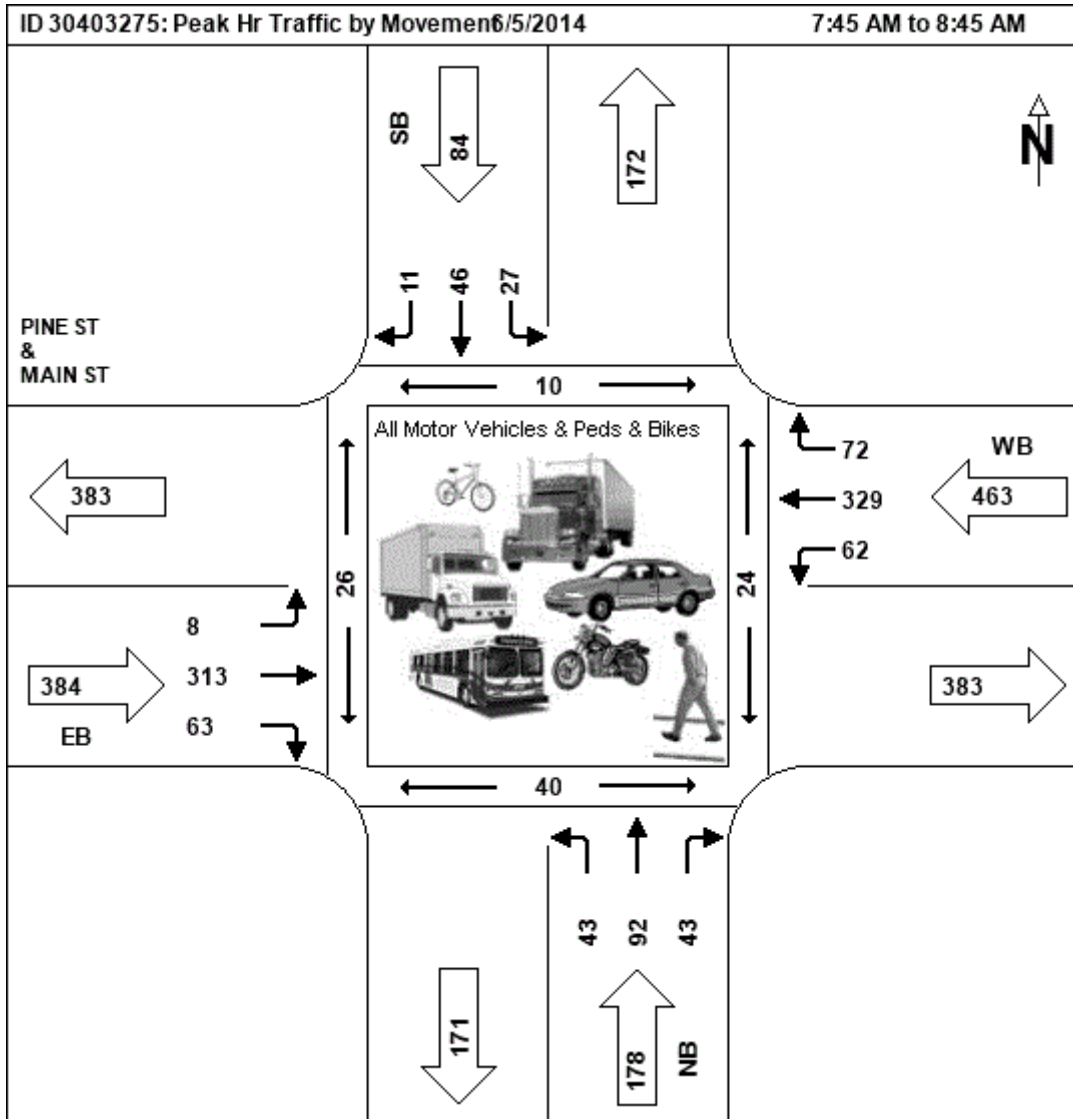
Corridor: NA
 Road 3: PINE ST
 Road 4: MAIN ST

<< < > >> 1-5 of 5

AM Peak Hour
06/05/2014

NB					EB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total					Total	Total
7:45 AM	11	26	10	7	47	1	73	17	4	91	6	11	2	3	19	18	73	21	3	112	269
8:00 AM	11	19	9	4	39	3	91	19	5	113	3	14	1	3	18	12	89	18	1	119	289
8:15 AM	13	26	13	5	52	2	70	14	13	86	10	10	4	11	24	20	81	19	6	120	282
8:30 AM	8	21	11	8	40	2	79	13	18	94	8	11	4	9	23	12	86	14	0	112	269
Total	43	92	43	24	178	8	313	63	40	384	27	46	11	26	84	62	329	72	10	463	1109
PHF	0.83	0.88	0.83		0.86	0.67	0.86	0.83		0.85	0.68	0.82	0.69		0.88	0.78	0.92	0.86		0.96	
HV %	12	7	21			0	6	10			4	20	9			5	6	4			

☒ Cars
 ☒ Trucks
 ☒ Pedestrians
 ☒ Bikes

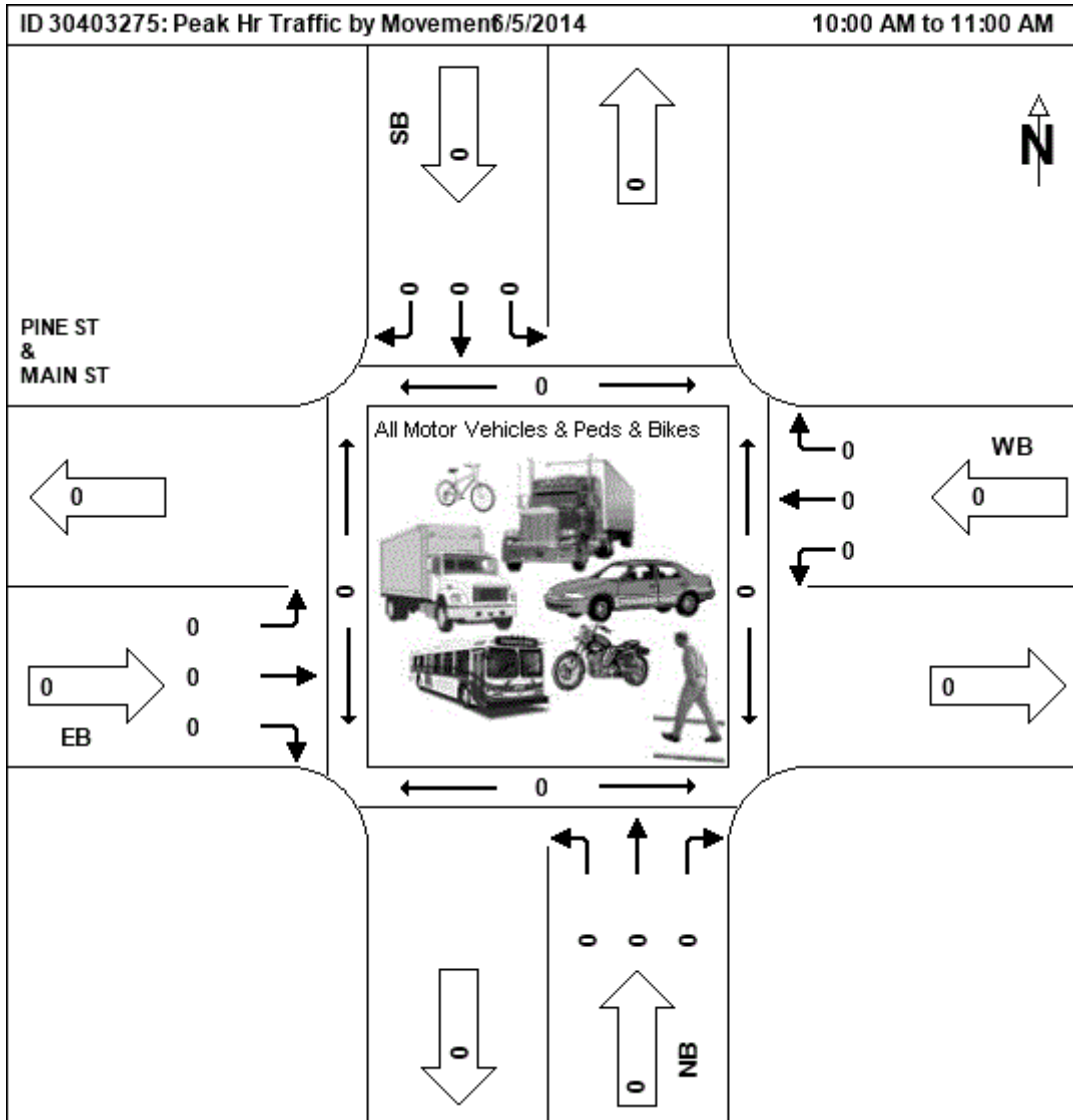


Midday Peak Hour
06/05/2014

NB					EB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total					Total	Total
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIGURE 5-A1

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/05/2014

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
4:30 PM	13	13	12	14	38	0	78	19	12	97	25	44	4	19	73	8	68	11	4	87	295		
4:45 PM	10	18	9	24	37	1	62	15	15	98	12	23	7	39	42	16	84	12	5	112	269		
5:00 PM	11	24	11	25	46	8	67	13	20	88	28	40	1	44	69	18	92	11	10	121	324		
5:15 PM	10	10	11	14	31	3	69	20	17	92	17	36	5	38	58	16	103	11	2	130	311		
Total	44	65	43	77	152	12	276	67	64	355	82	143	17	140	242	58	347	45	21	450	1199		
PHF	0.850	0.68	0.90		0.83	0.380	0.88	0.84		0.910	0.730	0.81	0.61		0.830	0.810	0.84	0.94		0.87			
HV %	20	3	0			0	4	0			1	1	6			7	4	2					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

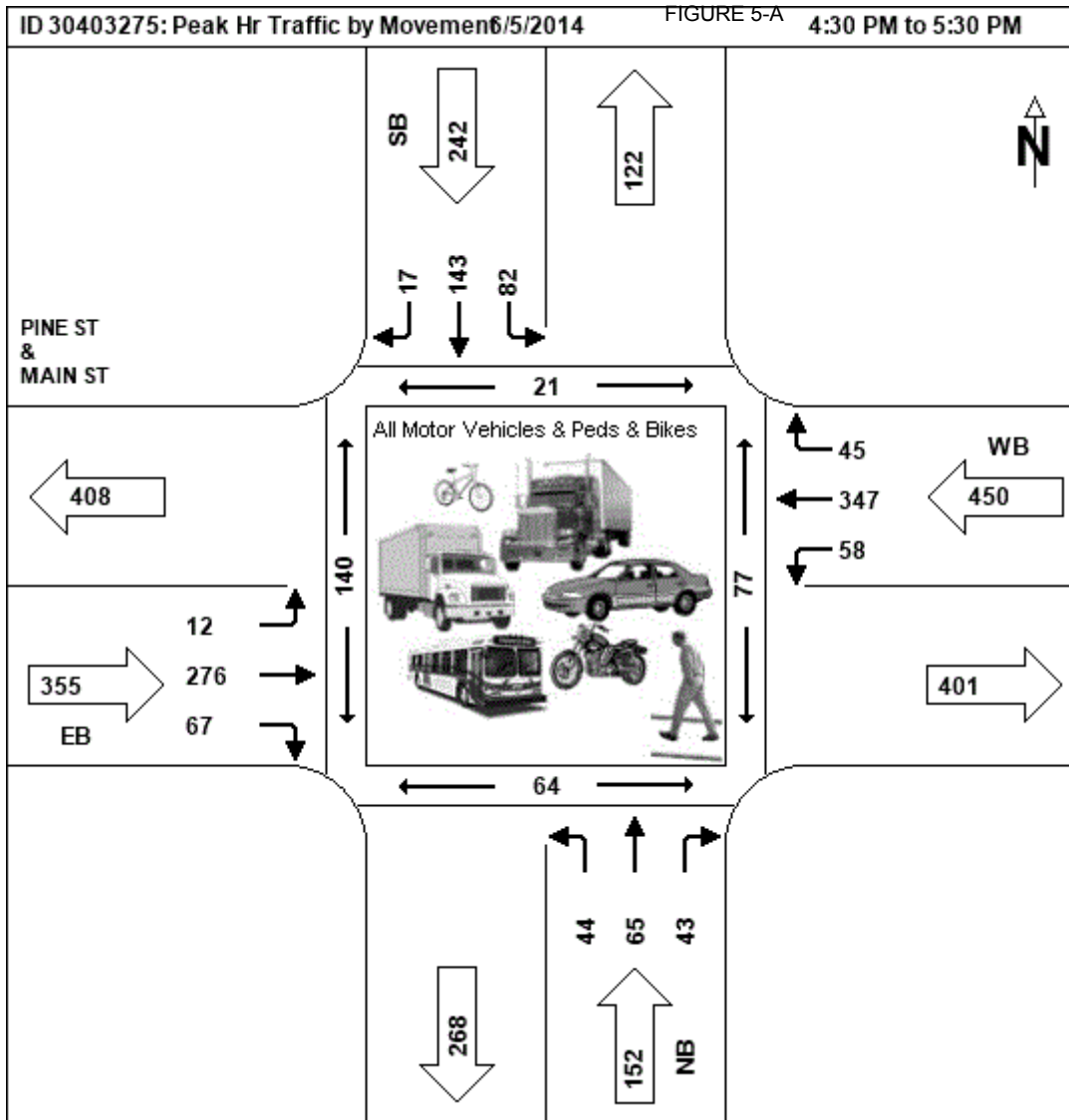


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403270
 Community: BURLINGTON
 Road 1: ST PAUL ST
 Road 2: MAIN ST

Corridor: NA
 Road 3: ST PAUL ST
 Road 4: MAIN ST

|<<|<|>|>>| 1-4 of 4

AM Peak Hour 06/14/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:45 AM	25	21	5	3	51	1	80	19	4	100	7	4	1	5	12	13	101	16	1	130	293
8:00 AM	20	39	11	10	70	0	70	21	7	91	6	6	0	4	12	15	90	11	7	116	289
8:15 AM	18	26	9	6	53	2	62	13	9	77	2	10	4	2	16	9	98	17	11	124	270
8:30 AM	24	23	10	3	57	0	62	7	16	69	4	7	6	6	17	14	95	18	3	127	270
Total	87	109	35	22	231	3	274	60	36	337	19	27	11	17	57	51	384	62	22	497	1122
PHF	0.87	0.70	0.80		0.83	0.38	0.86	0.71		0.84	0.68	0.68	0.46		0.84	0.85	0.95	0.86		0.96	
HV %	7	2	6			33	7	0			5	4	0			10	5	0			

☒

 Cars

☒

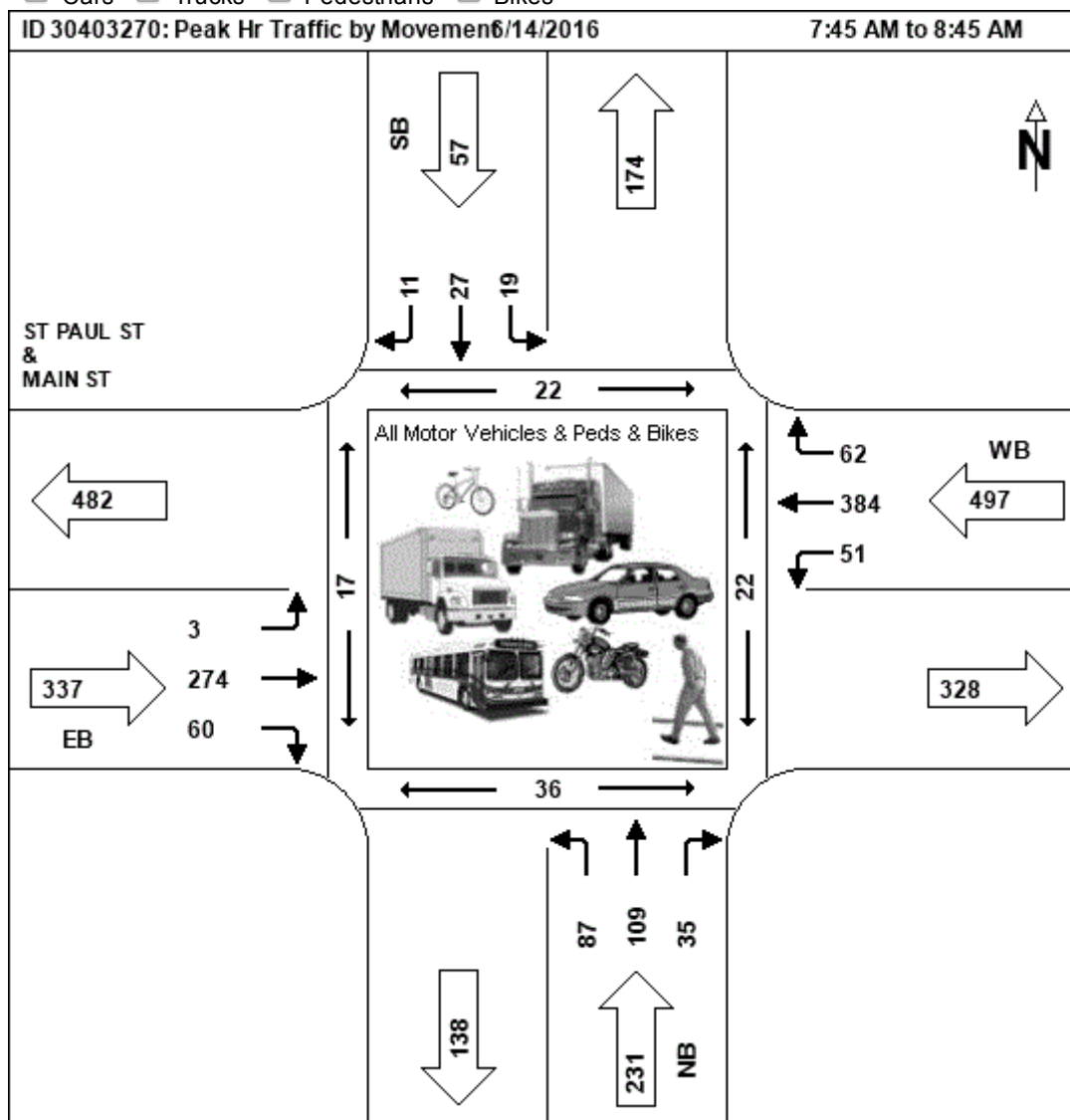
 Trucks

☒

 Pedestrians

☒

 Bikes



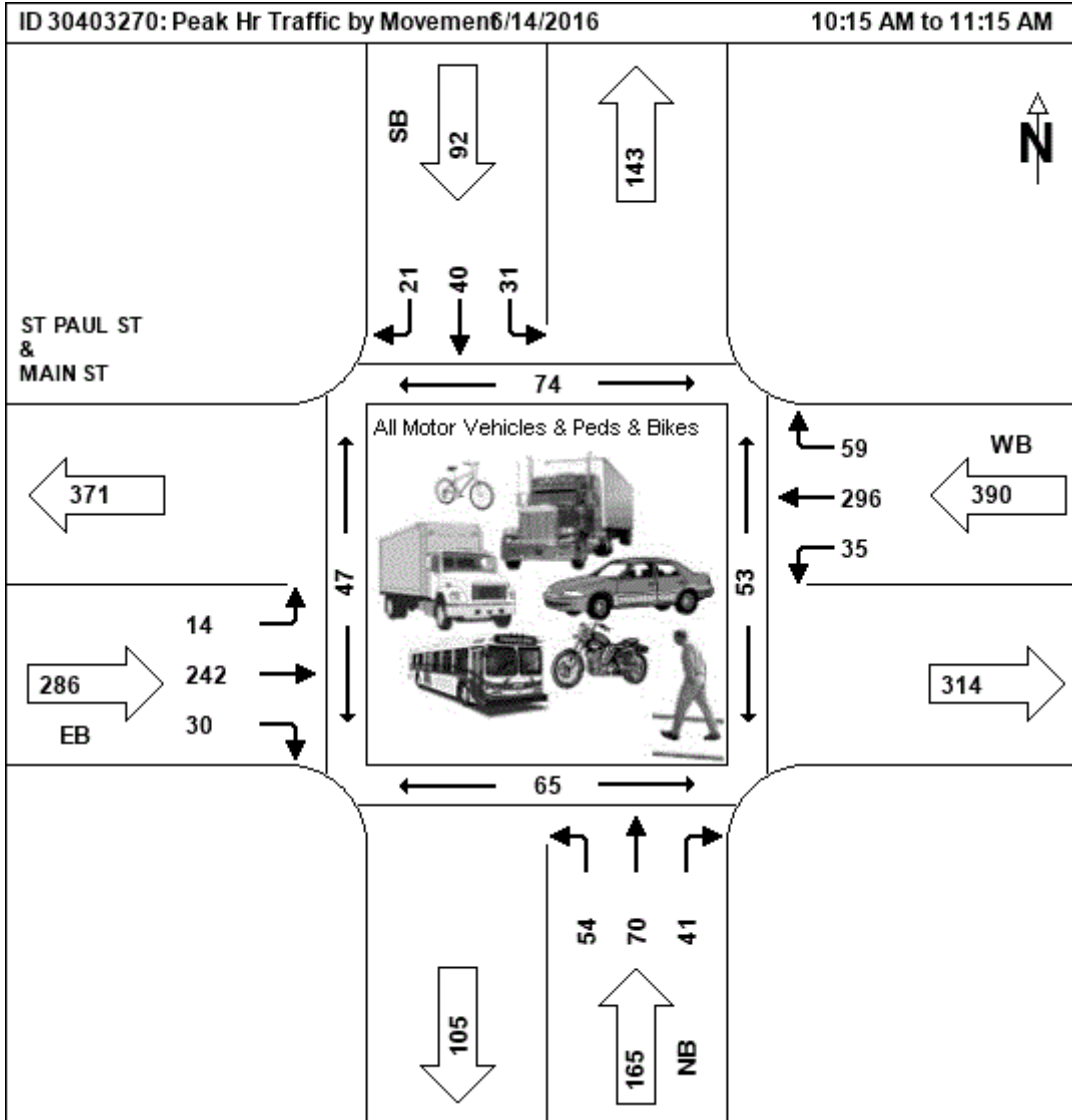
Midday Peak Hour 06/14/2016

06/11/2019

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
10:15 AM	18	16	9	10	43	0	72	8	15	80	8	9	8	15	25	16	68	18	14	102	250		

10:30 AM	14	9	12	10	35	4	57	7	19	68	8	9	FIGURE 5A				5	82	14	20	101	224
10:45 AM	8	24	9	15	41	3	51	4	14	58	7	13	4	8	24	8	73	15	23	96	219	
11:00 AM	14	21	11	18	46	7	62	11	17	80	8	9	6	13	23	6	73	12	17	91	240	
Total	54	70	41	53	165	14	242	30	65	286	31	40	21	47	92	35	296	59	74	390	933	
PHF	0.75	0.73	0.85		0.90	0.50	0.84	0.68		0.89	0.97	0.77	0.66		0.92	0.55	0.90	0.82		0.96		
HV %	7	4	7			0	3	3			10	5	5		6	6	8					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/13/2016

NB						EB					SB					WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:30 PM	21	28	12	11	61	7	70	17	16	94	14	31	6	14	51	12	81	11	10	104	310
4:45 PM	22	13	21	11	56	3	78	23	25	104	16	22	1	20	39	11	67	10	12	88	287
5:00 PM	21	12	19	25	52	2	107	21	39	130	14	30	2	16	46	19	83	11	36	113	341
5:15 PM	23	17	7	11	47	2	71	14	35	87	15	19	3	14	37	12	86	17	20	115	286
Total	87	70	59	58	216	14	326	75	115	415	59	102	12	64	173	54	317	49	78	420	1224
PHF	0.95	0.63	0.70		0.89	0.50	0.76	0.82		0.80	0.92	0.82	0.50		0.85	0.71	0.92	0.72		0.91	
HV %	8	0	0			0	2	5			2	2	0			0	2	2			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

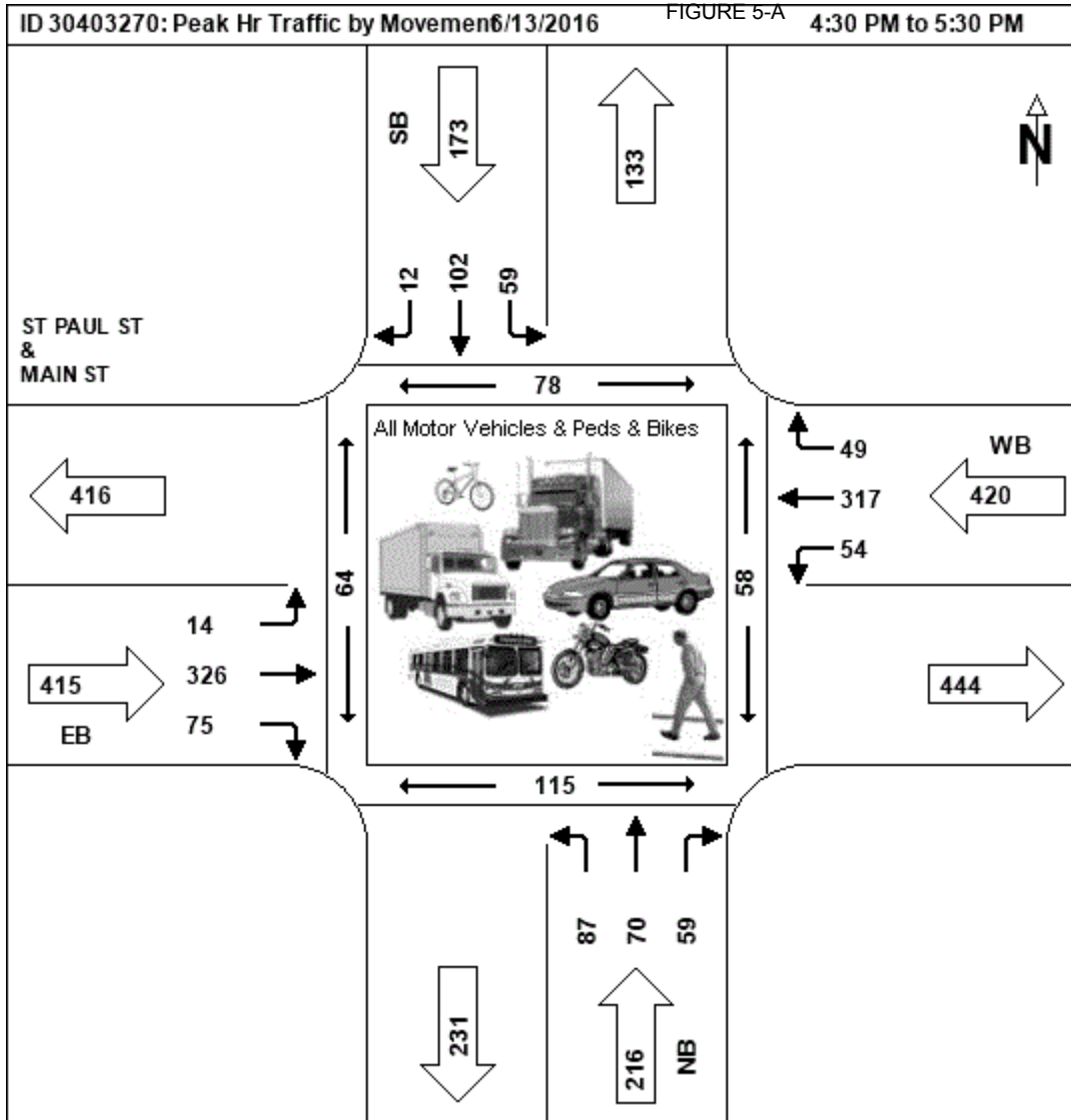


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403615
 Community: BURLINGTON
 Road 1: ALT-7
 Road 2: MAIN ST

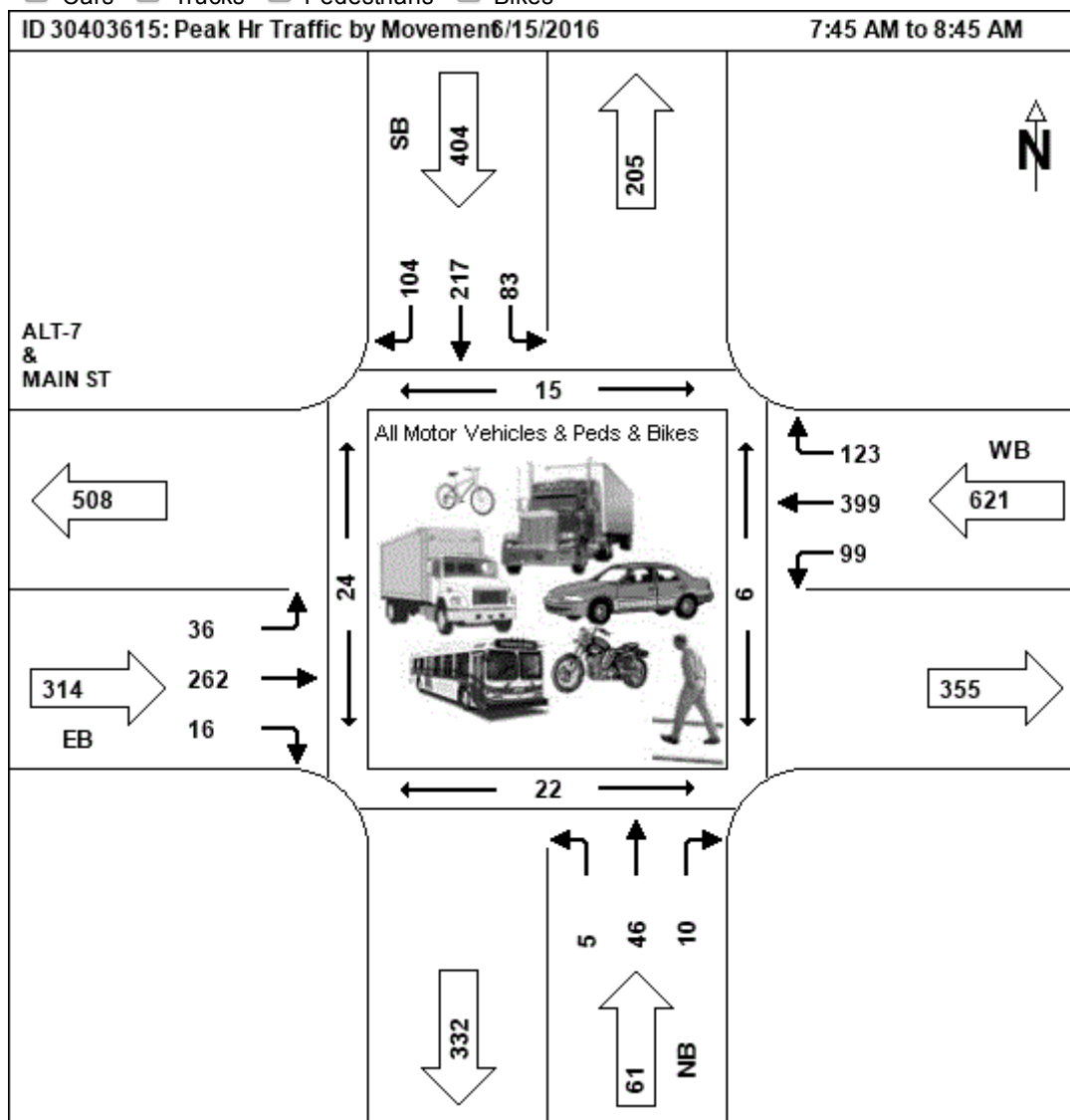
Corridor: NA
 Road 3: ALT-7
 Road 4: MAIN ST

|<<|<|>|>>| 1-5 of 5

AM Peak Hour 06/15/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:45 AM	1	7	4	0	12	9	80	3	3	92	20	58	18	4	96	28	97	29	3	154	354
8:00 AM	0	13	3	4	16	2	59	4	11	65	18	43	19	7	80	32	98	25	5	155	316
8:15 AM	3	10	1	1	14	11	58	5	5	74	21	55	28	4	104	25	110	37	1	172	364
8:30 AM	1	16	2	1	19	14	65	4	3	83	24	61	39	9	124	14	94	32	6	140	366
Total	5	46	10	6	61	36	262	16	22	314	83	217	104	24	404	99	399	123	15	621	1400
PHF	0.42	0.72	0.63		0.80	0.64	0.82	0.80		0.85	0.86	0.89	0.67		0.81	0.77	0.91	0.83		0.90	
HV %	0	0	0			6	5	0			13	7	3			1	4	4			
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes																					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



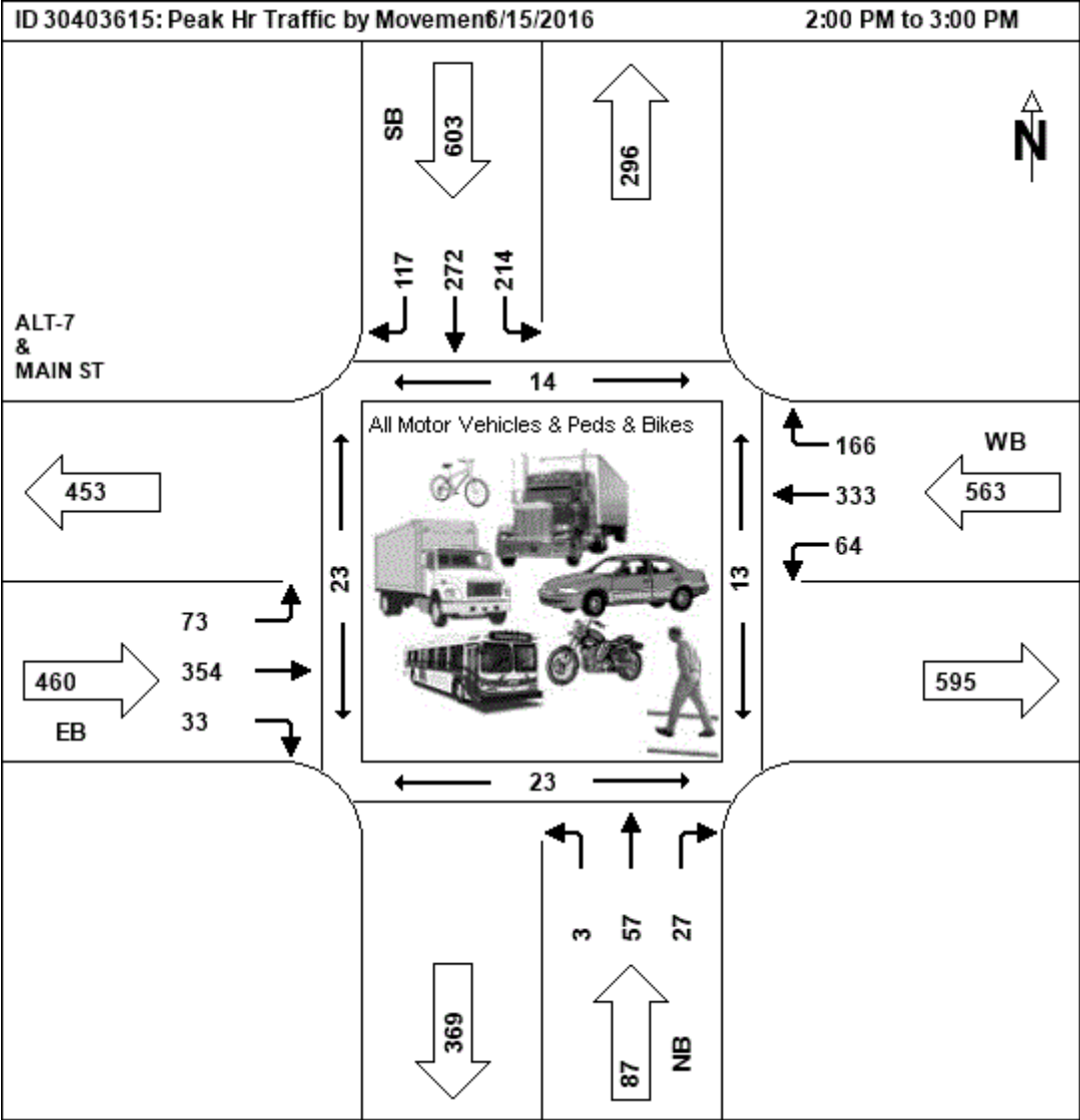
Midday Peak Hour 06/15/2016

06/16/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
2:00 PM	0	19	7	4	26	11	96	9	7	116	59	72	31	0	162	21	78	32	1	131	435

2:15 PM	1	14	8	3	23	19	84	12	9	115	42	59	26	7	81	50	5	138	403		
2:30 PM	2	11	9	2	22	23	89	6	5	118	56	69	21	8	146	9	90	42	5	141	427
2:45 PM	0	13	3	4	16	20	85	6	2	111	57	72	39	5	168	27	84	42	3	153	448
Total	3	57	27	13	87	73	354	33	23	460	214	272	117	23	603	64	333	166	14	563	1713
PHF	0.38	0.75	0.75		0.84	0.79	0.92	0.69		0.97	0.91	0.94	0.75		0.90	0.59	0.93	0.83		0.92	
HV %	0	2	0			3	4	0			3	6	9			0	3	2			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/15/2016

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
4:45 PM	1	30	12	2	43	19	101	11	0	131	59	85	38	0	182	11	92	44	10	147	503
5:00 PM	1	31	15	6	47	21	111	8	8	140	70	79	20	0	169	23	118	48	4	189	545
5:15 PM	2	31	4	6	37	21	98	7	5	126	64	84	25	3	173	26	109	21	6	156	492
5:30 PM	2	20	11	5	33	21	93	10	7	124	46	81	18	0	145	22	114	35	11	171	473
Total	6	112	42	19	160	82	403	36	20	521	239	329	101	3	669	82	433	148	31	663	2013
PHF	0.75	0.90	0.70		0.85	0.98	0.91	0.82		0.93	0.85	0.97	0.66		0.92	0.79	0.92	0.77		0.88	
HV %	0	0	5			2	0	0			3	2	2			0	2	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

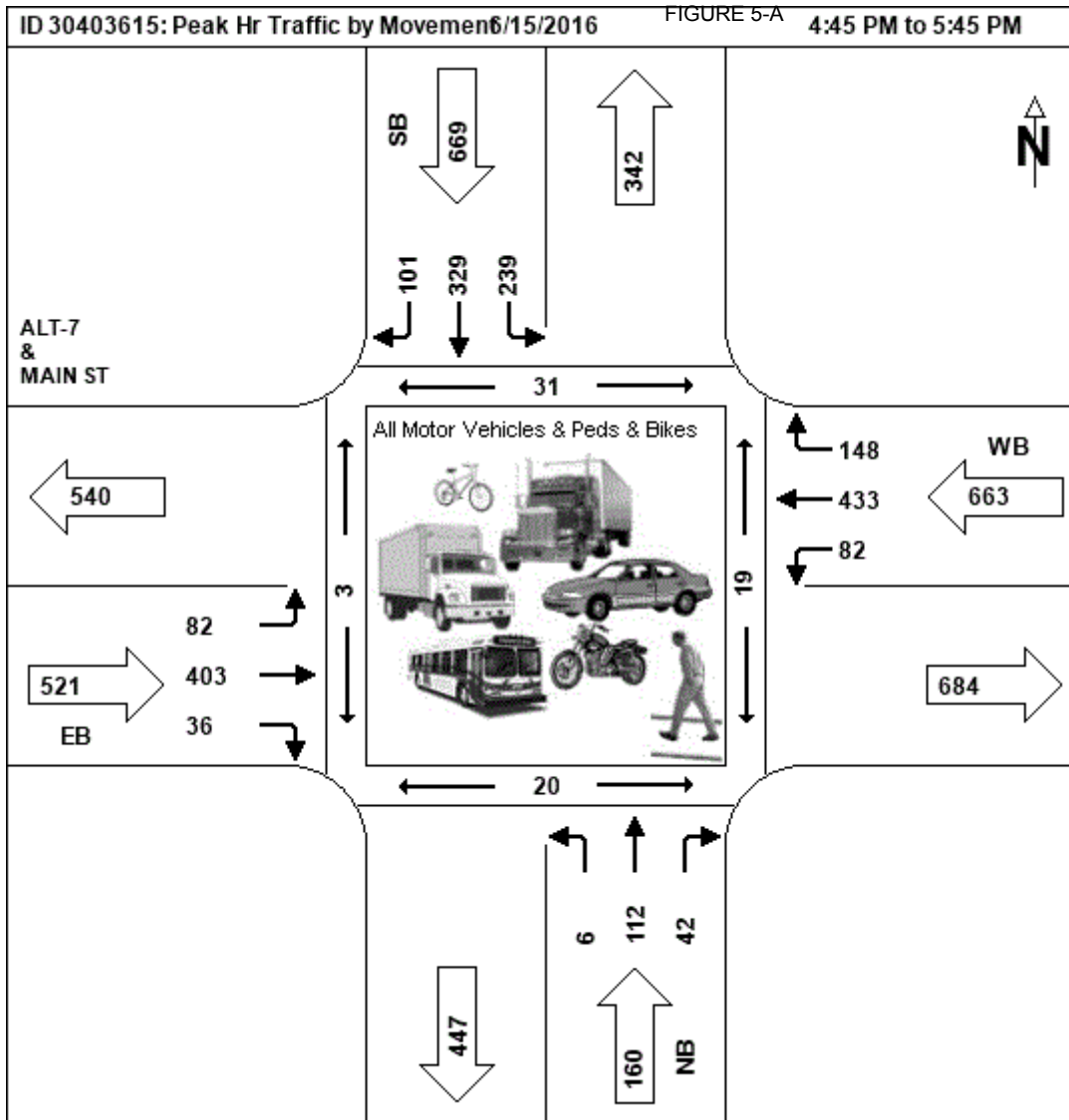


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403265
 Community: BURLINGTON
 Road 1: S UNION ST
 Road 2: MAIN ST

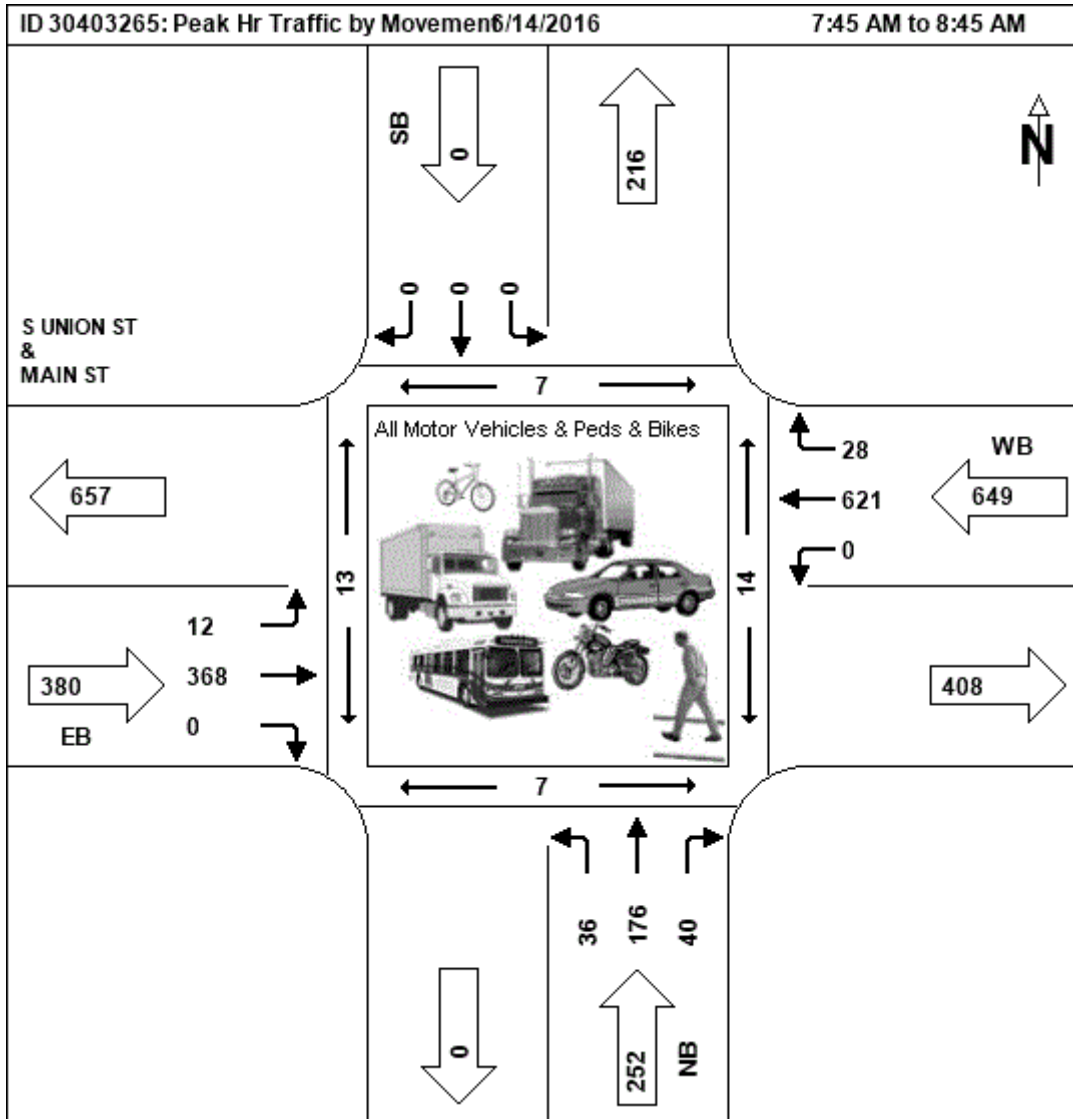
Corridor: NA
 Road 3: S UNION ST
 Road 4: MAIN ST

|<<|<|>|>>| 1-6 of 6

AM Peak Hour
06/14/2016

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
7:45 AM	3	46	5	7	54	6	112	0	2	118	0	0	0	7	0	0	166	4	0	170	342
8:00 AM	6	41	14	4	61	1	87	0	1	88	0	0	0	1	0	0	158	4	3	162	311
8:15 AM	19	50	11	2	80	2	88	0	1	90	0	0	0	1	0	0	141	12	2	153	323
8:30 AM	8	39	10	1	57	3	81	0	3	84	0	0	0	4	0	0	156	8	2	164	305
Total	36	176	40	14	252	12	368	0	7	380	0	0	0	13	0	0	621	28	7	649	1281
PHF	0.470	0.88	0.71		0.79	0.500	0.82			0.81							0.94	0.58		0.95	
HV %	11	2	3			17	7										4	4			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

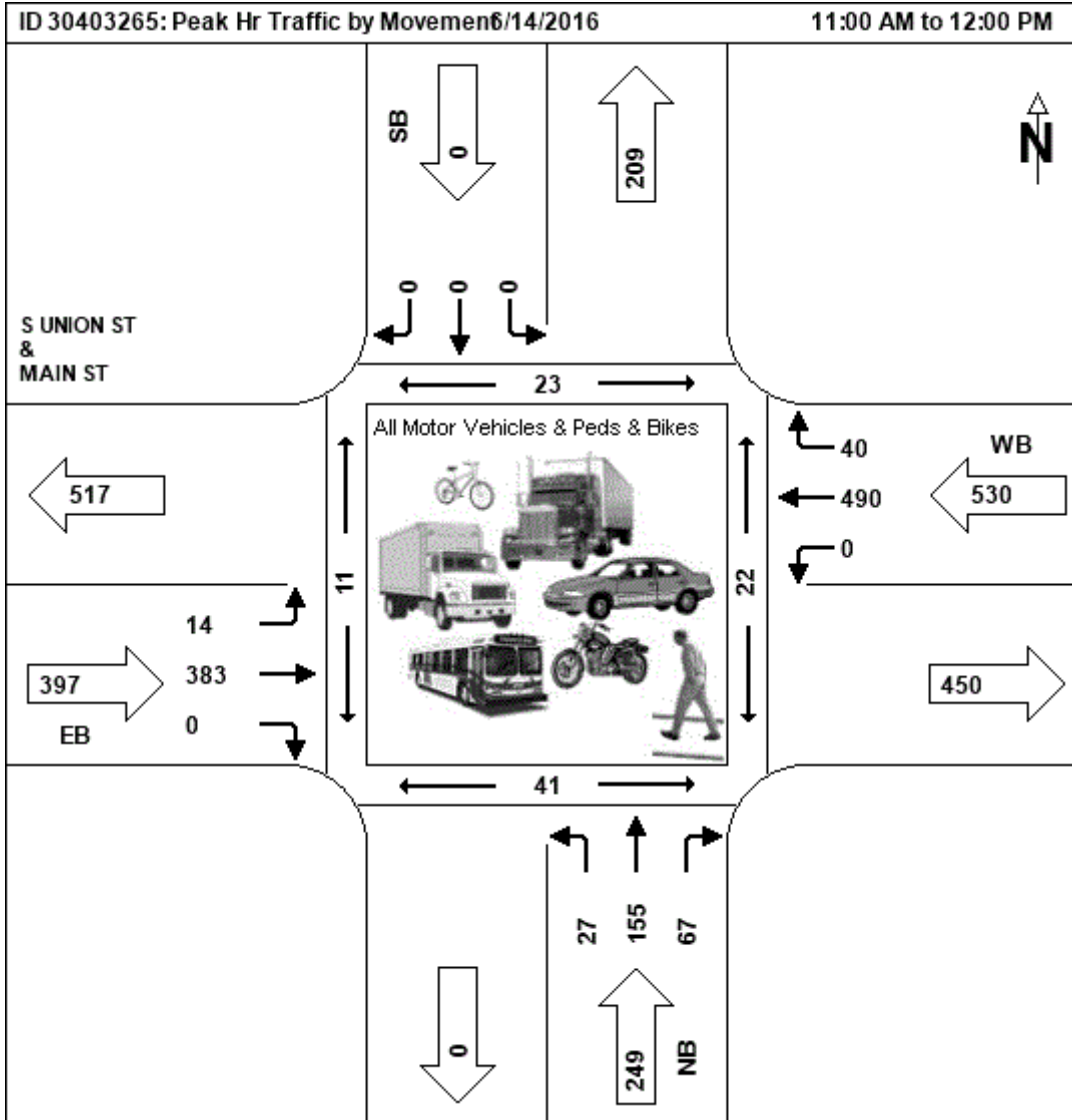


Midday Peak Hour
06/14/2016

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
11:00 AM	5	28	13	3	46	4	80	0	9	84	0	0	0	2	0	0	119	10	5	129	259		

11:15 AM	4	53	18	4	75	4	102	0	0	106	0	0	FIGURE 5-A				0	119	4	0	123	304
11:30 AM	9	23	23	1	55	1	97	0	28	98	0	0	0	4	0	0	107	10	7	117	270	
11:45 AM	9	51	13	14	73	5	104	0	4	109	0	0	0	3	0	0	145	16	11	161	343	
Total	27	155	67	22	249	14	383	0	41	397	0	0	0	11	0	0	490	40	23	530	1176	
PHF		0.750	0.73	0.73		0.83	0.70	0.92		0.91							0.84	0.63		0.82		
HV %	11	2	3			0	7										5	3				

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/13/2016

NB						EB					SB					WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:30 PM	6	66	23	3	95	12	163	0	3	175	0	0	0	3	0	0	122	5	7	127	397
4:45 PM	13	61	25	2	99	7	175	0	1	182	0	0	0	2	0	0	123	11	4	134	415
5:00 PM	7	57	33	2	97	9	179	0	5	188	0	0	0	3	0	0	148	11	9	159	444
5:15 PM	15	57	16	5	88	13	158	0	5	171	0	0	0	10	0	0	158	5	9	163	422
Total	41	241	97	12	379	41	675	0	14	716	0	0	0	18	0	0	551	32	29	583	1678
PHF	0.68	0.91	0.73		0.96	0.79	0.94			0.95							0.87	0.73		0.89	
HV %	5	2	0			0	2										1	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

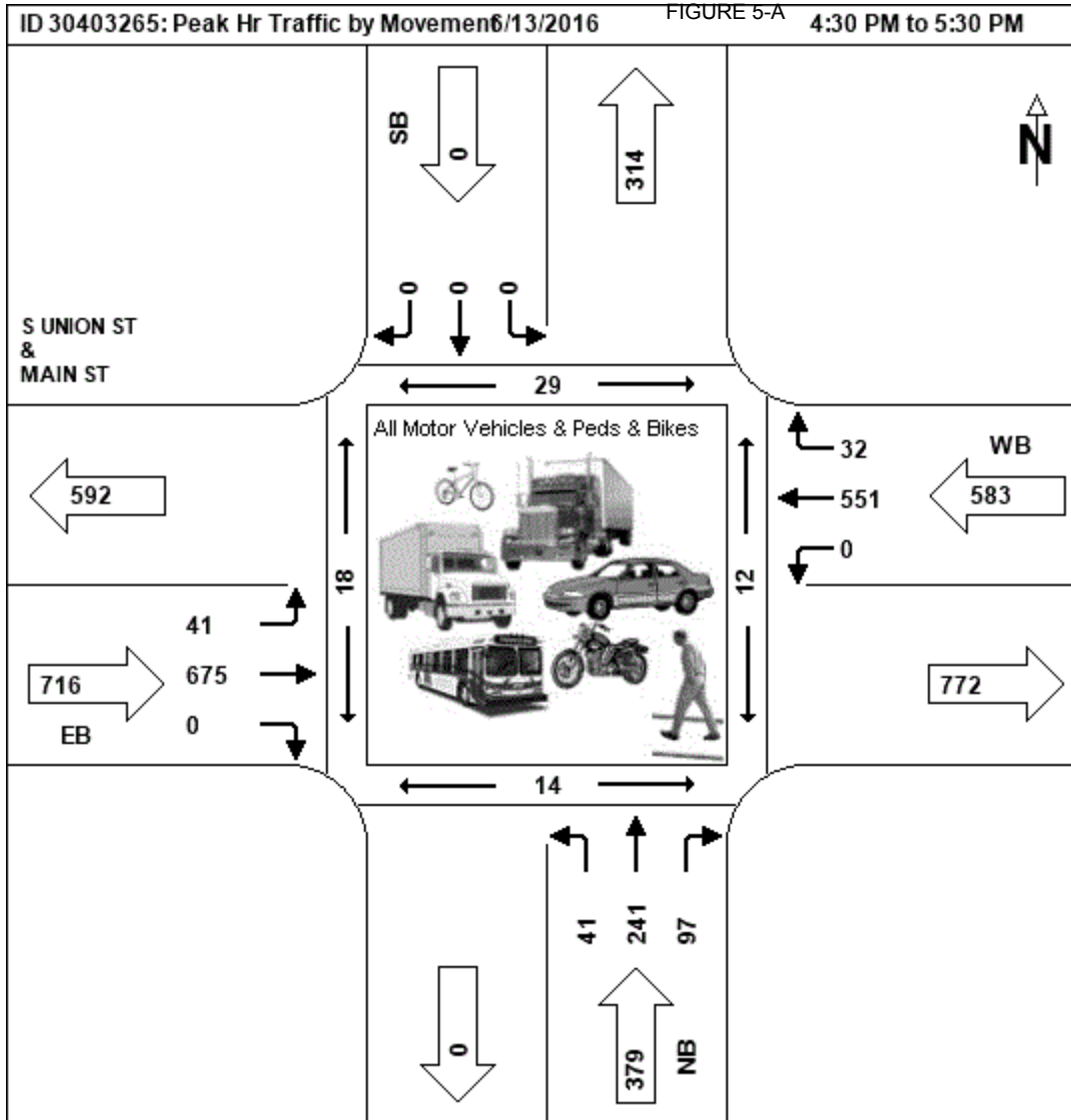


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403705
 Community: BURLINGTON
 Road 1: US-7
 Road 2: US-2

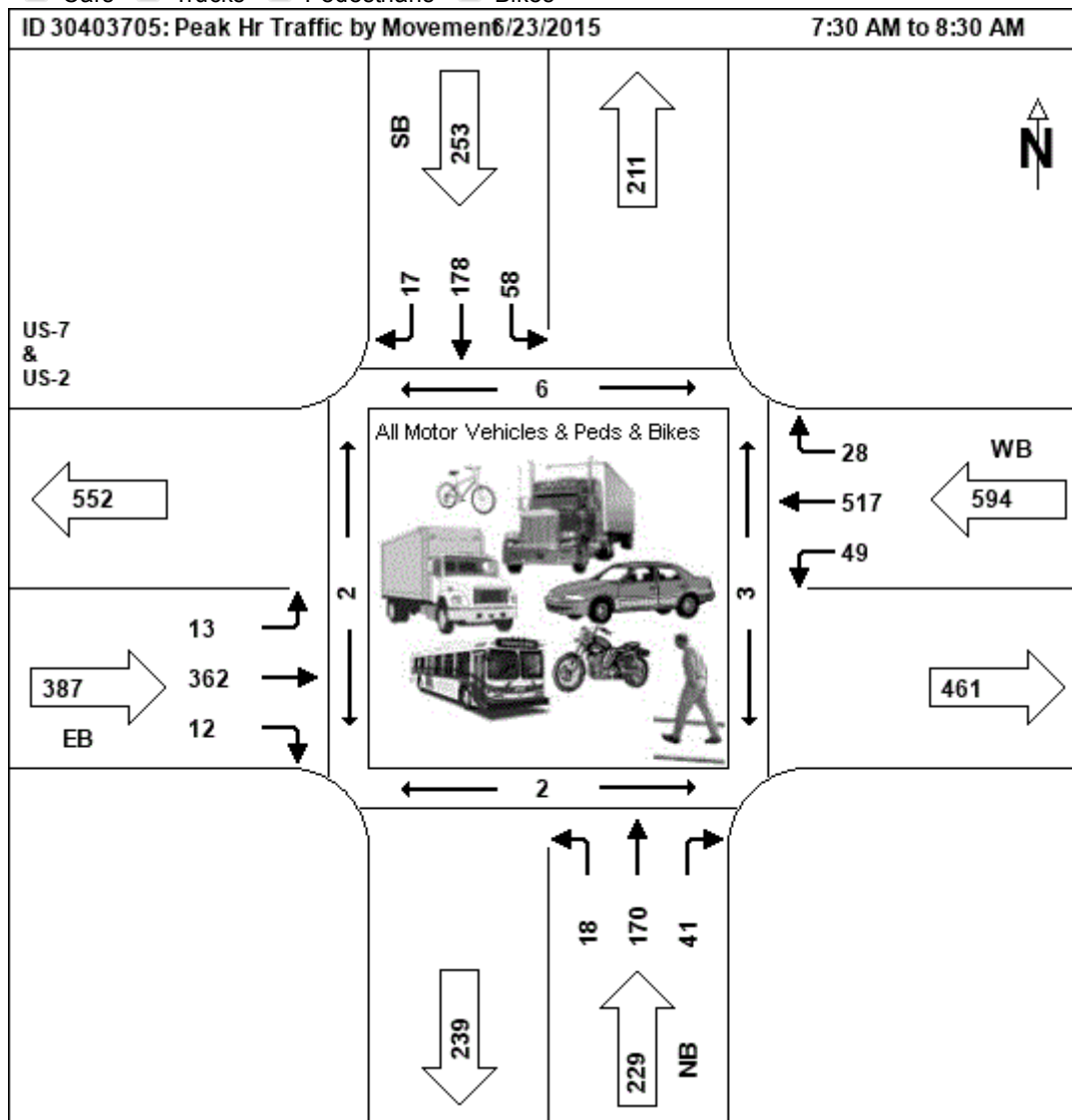
Corridor: NA
 Road 3: US-7
 Road 4: MAIN ST

|<<|<|>|>>| 1-8 of 8

AM Peak Hour 06/23/2015

NB					EB					SB					WB								
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
7:30 AM	7	43	10	1	60	3	74	3	2	80	13	34	3	0	50	11	99	7	2	117	307		
7:45 AM	3	44	11	1	58	3	109	3	0	115	18	67	7	2	92	17	155	7	3	179	444		
8:00 AM	5	46	11	1	62	6	99	3	0	108	13	43	4	0	60	13	144	10	1	167	397		
8:15 AM	3	37	9	0	49	1	80	3	0	84	14	34	3	0	51	8	119	4	0	131	315		
Total	18	170	41	3	229	13	362	12	2	387	58	178	17	2	253	49	517	28	6	594	1463		
PHF	0.64	0.92	0.93		0.92	0.54	0.83	1.00		0.84	0.81	0.66	0.61		0.69	0.72	0.83	0.70		0.83			
HV %	11	2	0			38	5	17			2	0	0			2	3	0					
☒ Cars						☒ Trucks						☒ Pedestrians						☒ Bikes					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



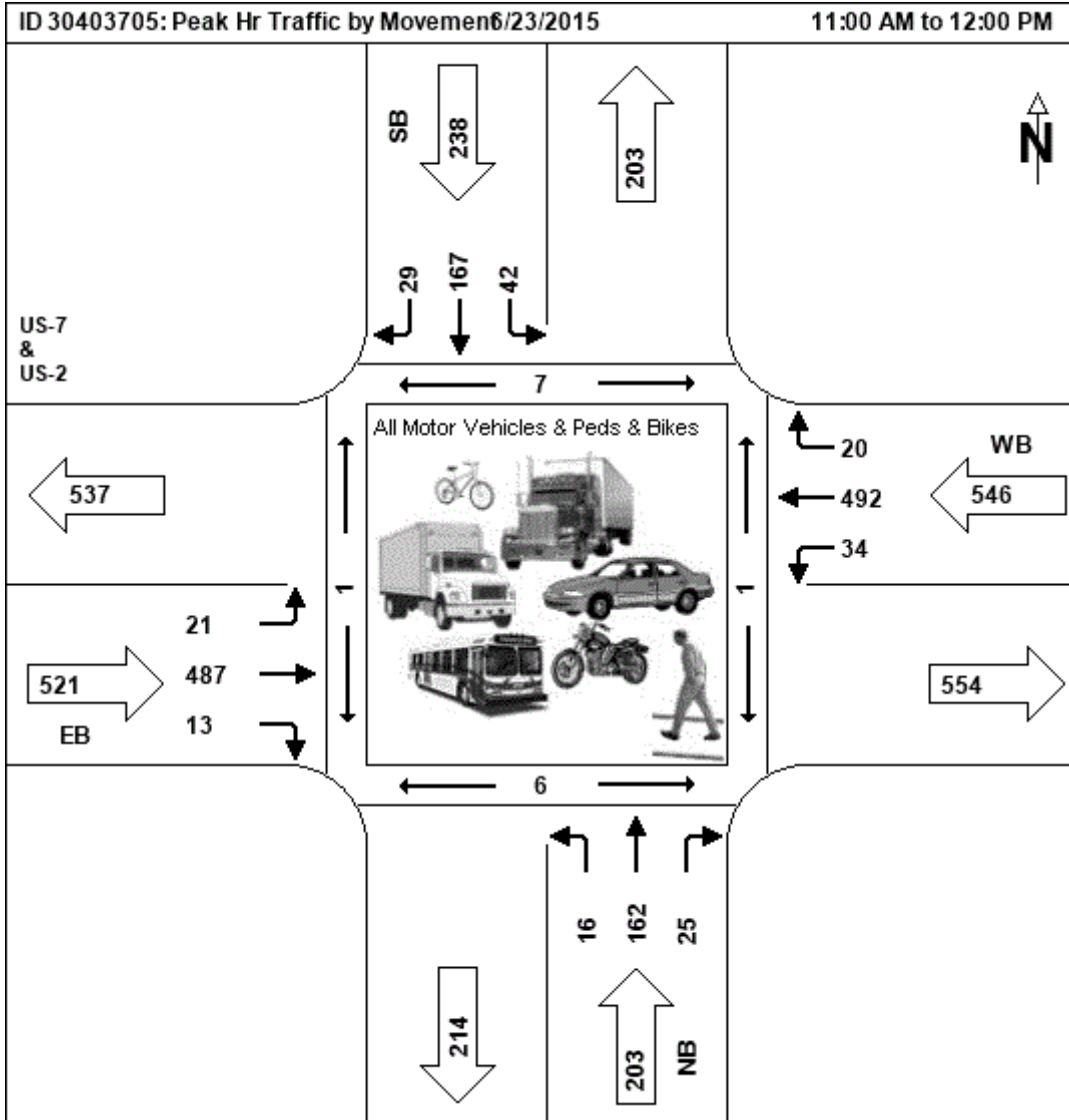
Midday Peak Hour 06/23/2015

06/26/2019

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total		
11:00 AM	4	39	4	0	47	6	114	2	1	122	8	33	10	0	51	6	106	1	1	113	333		

11:15 AM	3	33	10	0	46	4	126	2	0	132	12	41	5	2	163	399	
11:30 AM	5	40	3	0	48	8	130	4	3	142	12	38	8	0	131	379	
11:45 AM	4	50	8	1	62	3	117	5	2	125	10	55	6	1	139	397	
Total	16	162	25	1	203	21	487	13	6	521	42	167	29	1	546	1508	
PHF	0.80	0.81	0.63		0.82	0.66	0.94	0.65		0.92	0.88	0.76	0.73		0.84	0.84	
HV %	0	2	0		5	4	8			5	2	3			0	4	5

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/22/2015

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:30 PM	2	40	7	3	49	9	155	7	2	171	12	40	7	3	59	18	128	7	0	153	432
4:45 PM	2	58	7	1	67	5	158	8	0	171	13	57	6	1	76	10	150	14	2	174	488
5:00 PM	8	72	12	1	92	7	149	2	0	158	8	37	3	0	48	13	142	16	0	171	469
5:15 PM	9	56	9	0	74	4	143	12	8	159	22	41	3	3	66	13	113	11	0	137	436
Total	21	226	35	5	282	25	605	29	10	659	55	175	19	7	249	54	533	48	2	635	1825
PHF	0.58	0.78	0.73		0.77	0.69	0.96	0.60		0.96	0.63	0.77	0.68		0.82	0.75	0.89	0.75		0.91	
HV %	5	1	6			0	2	3			0	1	0			0	2	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

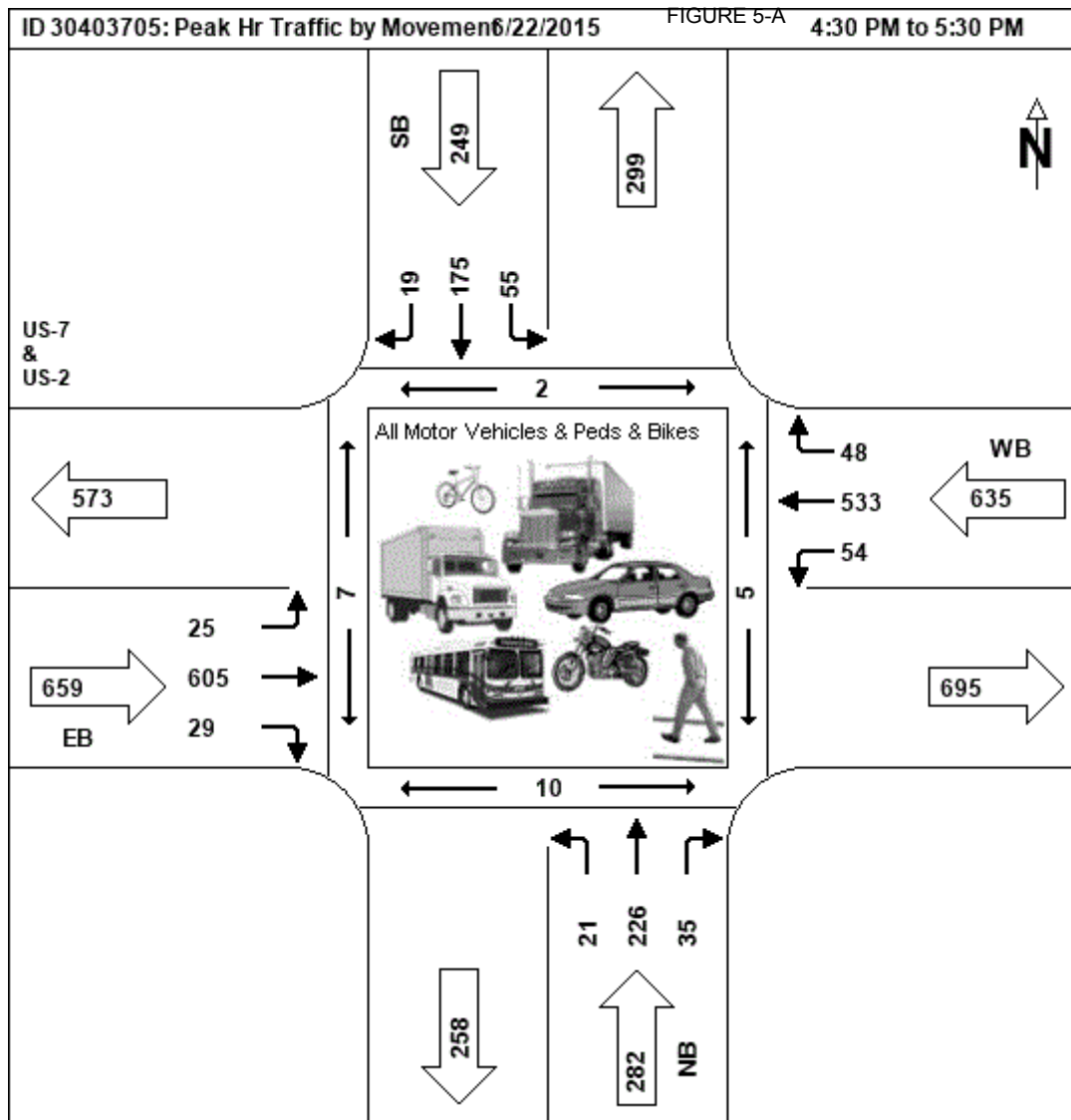


FIGURE 5-A

Peak Hour Data for Intersection

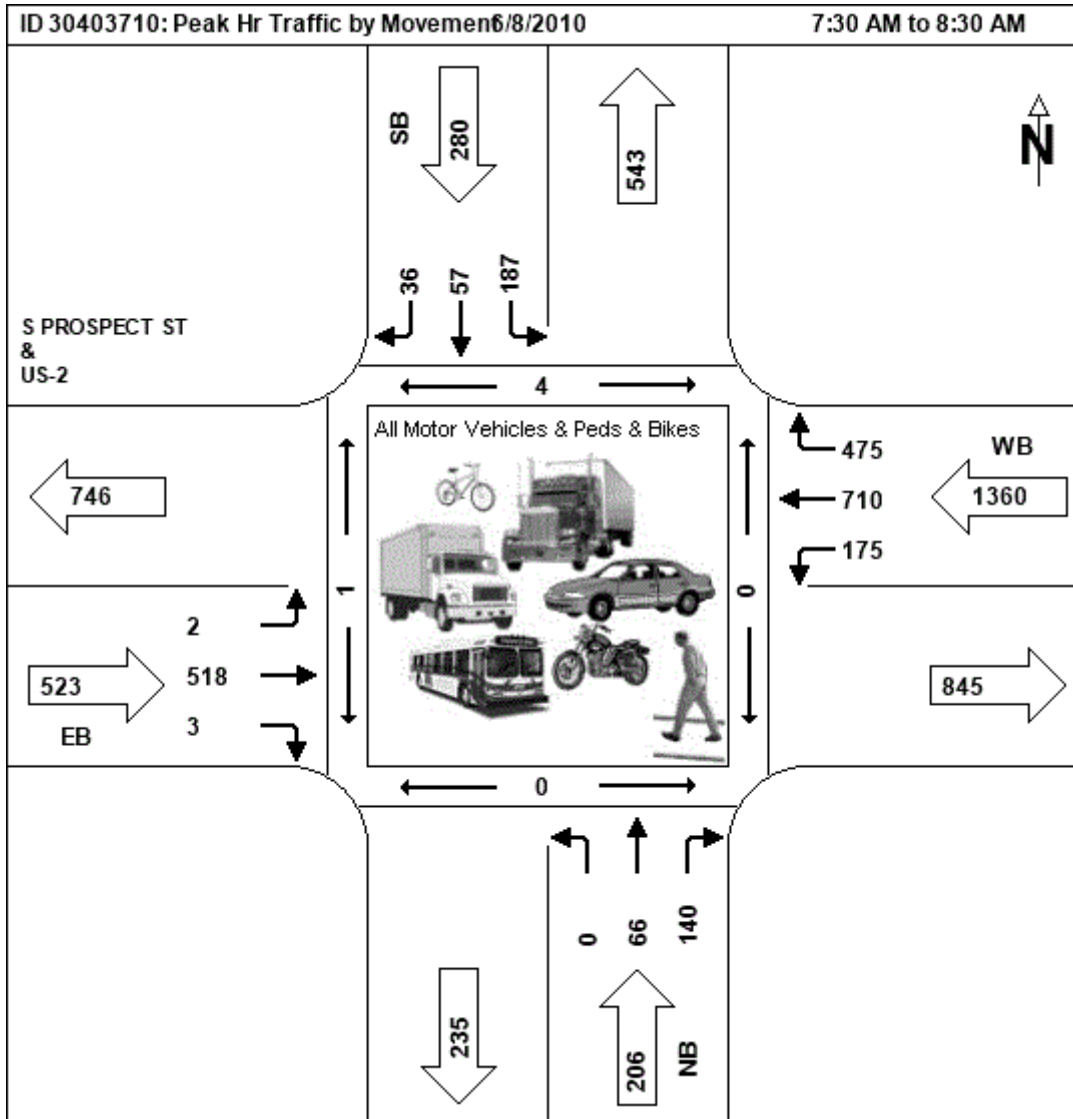
Int ID: 30403710
 Community: BURLINGTON
 Road 1: S PROSPECT ST
 Road 2: US-2

Corridor: NA
 Road 3: S PROSPECT ST
 Road 4: US-2

|<<|<|>|>>| 1-3 of 3

AM Peak Hour
06/08/2010

NB						EB						SB						WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int. Total		
7:30 AM	0	13	23	0	36	2	148	1	0	151	55	14	2	0	71	40	166	104	1	310	568		
7:45 AM	0	27	42	0	69	0	124	0	0	124	57	24	9	0	90	54	205	130	2	389	672		
8:00 AM	0	14	32	0	46	0	111	1	0	112	31	8	16	0	55	34	158	114	0	306	519		
8:15 AM	0	12	43	0	55	0	135	1	0	136	44	11	9	1	64	47	181	127	1	355	610		
Total	0	66	140	0	206	2	518	3	0	523	187	57	36	1	280	175	710	475	4	1360	2369		
PHF		0.61	0.81		0.75		0.25	0.88	0.75	0.87	0.82	0.59	0.56		0.78	0.81	0.87	0.91		0.87			
HV %		2	1				0	4	0			2	9	3			3	4	2				
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes																							

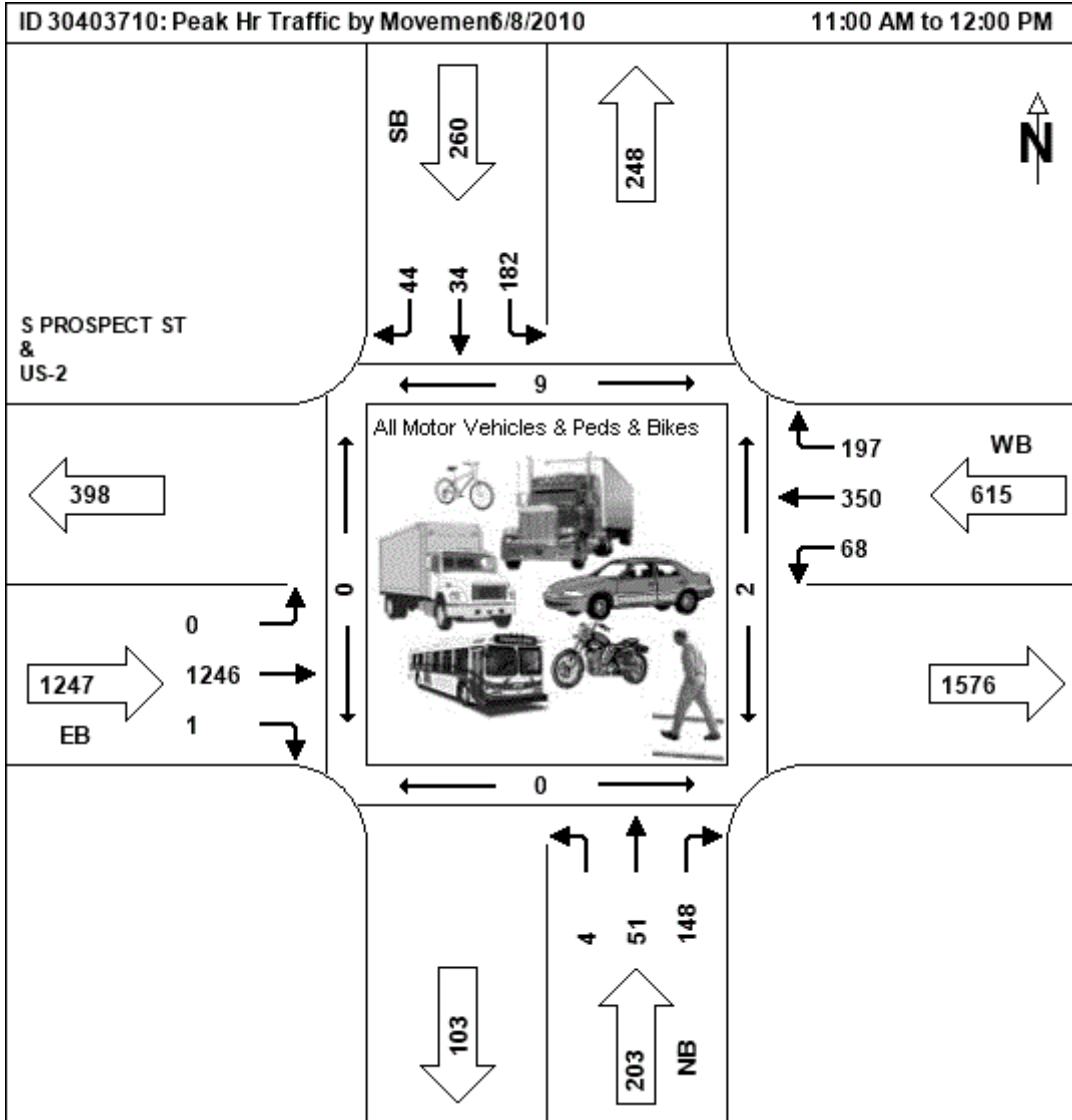


Midday Peak Hour
06/08/2010

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
11:00 AM	0	7	27	0	34	0	178	0	0	178	40	6	8	0	54	13	77	38	0	128	394

11:15 AM	1	10	47	2	58	0	304	1	0	305	47	9	FIGURE 5A	12	87	55	0	154	583		
11:30 AM	3	15	46	0	64	0	426	0	0	426	50	4	15	0	69	23	97	61	7	181	740
11:45 AM	0	19	28	0	47	0	338	0	0	338	45	15	11	0	71	20	89	43	2	152	608
Total	4	51	148	2	203	0	1246	1	0	1247	182	34	44	0	260	68	350	197	9	615	2325
PHF	0.33	0.67	0.79		0.79		0.73	0.25		0.73	0.91	0.57	0.73		0.92	0.74	0.90	0.81		0.85	
HV %	0	2	3				2	0			5	15	0			0	5	3			

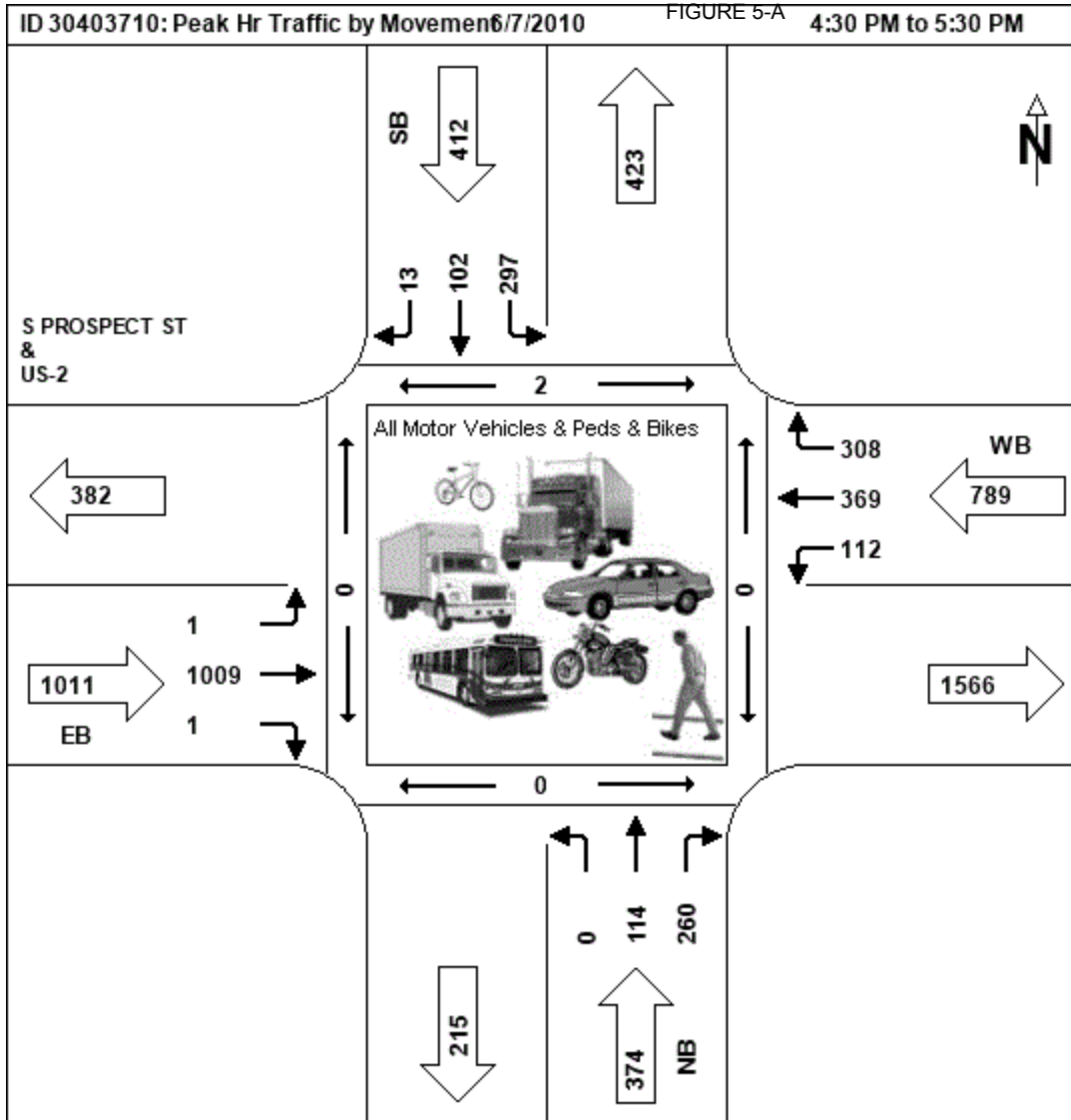
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
06/07/2010

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
4:30 PM	0	27	67	0	94	1	265	0	0	266	78	19	3	0	100	31	75	67	0	173	633
4:45 PM	0	22	52	0	74	0	252	0	0	252	63	25	6	0	94	24	88	75	1	187	607
5:00 PM	0	36	71	0	107	0	262	1	0	263	71	29	3	0	103	26	101	77	0	204	677
5:15 PM	0	29	70	0	99	0	230	0	0	230	85	29	1	0	115	31	105	89	1	225	669
Total	0	114	260	0	374	1	1009	1	0	1011	297	102	13	0	412	112	369	308	2	789	2586
PHF	0.79 0.92				0.87	0.25	0.95	0.25		0.95	0.87	0.88	0.54		0.90	0.90	0.88	0.87		0.88	
HV %	1 1					0	1	0			1	2	0			4	2	1			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes





Crash Data

FIGURE 5-A

Vermont Agency of Transportation

Statewide Intersections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1)
#	35 US-2, VT-78, TOWN ROAD 0004	Principal Arterial (r)	Alburgh	6.180 - 6.280	6205	5	12	0	5	8	0.718	1.059	1.475	\$38,808
	8 US-2, I-89	Minor Arterial (u)	Colchester	1.830 - 2.030	11805	5	38	0	21	26	0.867	1.763	2.033	\$49,692
	65 US-2, I-89	Principal Arterial (u)	Colchester	2.040 - 2.150	5360	5	16	0	6	11	1.282	1.635	1.276	\$35,706
#	17 US-2, S PROSPECT ST., BURLINGTON, <T0000>	Principal Arterial (u)/Urban Collector (u)	Burlington	0.220 - 0.240	27040	5	73	0	18	62	0.83	1.479	1.781	\$27,014
#	14 US-2, DORSET ST., SOUTH BURLINGTON	Principal Arterial (u)/Urban Collector (u)	South Burlington	0.490 - 0.500	40960	5	106	0	10	99	0.782	1.418	1.813	\$15,756
#	56 US-2, WHITE ST., SOUTH BURLINGTON	Principal Arterial (u)/Urban Collector (u)	South Burlington	0.860 - 0.880	28990	5	57	0	9	49	0.821	1.077	1.311	\$20,109
#	43 US-2, PATCHEN ROAD, SOUTH BURLINGTON, VT-116	Principal Arterial (u)/Urban Collector (u)	South Burlington	0.990 - 1.010	29890	5	61	0	5	58	0.817	1.118	1.367	\$14,930
#	97 US-2, AIRPORT DRIVE, SOUTH BURLINGTON, SO. BURLINGTON (FAP 121-1 KENNEDY DRIVE)	Principal Arterial (u)/Minor Arterial (u)	South Burlington	1.880 - 1.910	27435	5	74	0	12	64	1.354	1.477	1.091	\$20,492
*	78 US-2, INDUSTRIAL AVE., WILLISTON	Principal Arterial (u)/Urban Collector (u)	Williston	0.250 - 0.270	14910	5	29	0	3	27	0.917	1.065	1.161	\$16,448
	72 US-2, VT-2A	Principal Arterial (u)/Minor Arterial (u)	Williston	1.420 - 1.440	26890	5	79	0	11	72	1.357	1.609	1.186	\$19,097
	10 US-2, FAS 0209	Major Collector (r)	Richmond	2.690 - 2.770	9389	5	26	0	1	25	0.758	1.517	2	\$11,592
	48 VT-2A, MARSHALL AVE., WILLISTON	Principal Arterial (u)/Urban Collector (u)	Williston	3.320 - 3.340	30820	5	61	0	6	56	0.814	1.084	1.332	\$15,931
	42 VT-2A, INDUSTRIAL AVE., WILLISTON, MT. VIEW ROAD, WILLISTON	Minor Arterial (u)/Urban Collector (u)	Williston	4.780 - 4.800	21270	5	46	0	8	40	0.857	1.185	1.381	\$21,461
	89 VT-2A, EAST ROAD, COLCHESTER, MILL POND ROAD, COLCHESTER	Minor Arterial (u)/Urban Collector (u)	Colchester	1.430 - 1.510	14475	5	27	0	7	20	0.917	1.022	1.114	\$27,048
	102 US-4, FAS 0168	Principal Arterial (r)/Major Collector (r)	Hartford	3.310 - 3.390	10609	5	15	0	3	12	0.716	0.774	1.081	\$22,900
	114 US-4, QUEECHE STATE HIGHWAY	Principal Arterial (r)	Hartford	5.780 - 5.940	12000	5	14	0	6	10	0.617	0.639	1.036	\$40,171
	40 US-4, I-89	Principal Arterial (r)/Minor Arterial (r)	Hartford	6.430 - 6.590	6280	5	15	0	8	9	0.943	1.308	1.387	\$47,420
	75 VT-4A, VT-30	Minor Arterial (r)/Major Collector (r)	Castleton	1.760 - 1.860	9970	5	21	0	6	15	0.983	1.154	1.173	\$28,900
#	36 US-5, FAIRGROUND ROAD, BRATTLEBORO	Minor Arterial (u)/Urban Collector (u)	Brattleboro	1.130 - 1.150	10925	5	28	0	2	26	0.968	1.404	1.45	\$13,900
#	106 US-5, FAIRVIEW AVE., BRATTLEBORO	Minor Arterial (u)/Urban Collector (u)	Brattleboro	1.210 - 1.230	10465	5	20	0	6	14	0.976	1.047	1.072	\$29,900
#	80 US-5, BIRGE ST., BRATTLEBORO, <T0000>	Minor Arterial (u)/Urban Collector (u)	Brattleboro	1.650 - 1.680	11950	5	24	0	7	19	0.951	1.1	1.157	\$30,058

FIGURE 5-A

Vermont Agency of Transportation

Statewide Intersections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1)
#	71 US-7, <0189>, SWIFT ST., SOUTH BURLINGTON	Principal Arterial (u)/Urban Collector (u)	South Burlington/Burlington	1.720 - 0.010	39650	5	66	0	4	62	0.788	0.935	1.187	\$13,142
#	11 US-7, MAIN ST., BURLINGTON, US-2	Principal Arterial (u)	Burlington	2.110 - 2.130	21900	5	74	0	13	64	0.981	1.851	1.886	\$21,558
#	67 US-7, PEARL ST., BURLINGTON	Principal Arterial (u)/Minor Arterial (u)	Burlington	2.420 - 2.440	17520	5	58	0	15	47	1.44	1.813	1.259	\$27,617
#	49 US-7, BURLINGTON (ALTERNATE US-7)	Principal Arterial (u)	Burlington	3.050 - 3.070	12135	5	32	0	6	27	1.085	1.444	1.331	\$22,303
#	6 US-7, W. ALLEN ST., WINOOSKI CITY, VT-15, E. CANAL ST., WINOOS, W. CENTER ST., WINOO, <T0000>	Principal Arterial (u)/Minor Arterial (u)	Winooski City	0.040 - 0.230	28231	5	152	0	22	134	1.349	2.95	2.186	\$19,266
#	46 US-7, E SPRING ST., WINOOSKI CITY, W SPRING ST., WINOOSKI CITY	Principal Arterial (u)/Urban Collector (u)	Winooski City	0.430 - 0.450	17340	5	38	0	14	30	0.893	1.2	1.344	\$36,095
*	129 US-7, I-89	Principal Arterial (u)	Colchester	0.170 - 0.230	19612	5	36	0	6	31	0.999	1.005	1.007	\$20,814
	127 US-7, VT. 127 TH, COLCHESTER, SEVERANCE ROAD, COLCHESTER	Principal Arterial (u)/Minor Arterial (u)	Colchester	1.940 - 2.040	19140	5	50	0	16	39	1.421	1.431	1.007	\$32,190
	26 US-7, VT-2A	Principal Arterial (u)/Minor Arterial (u)	Colchester	3.580 - 3.650	11830	5	54	0	11	47	1.531	2.501	1.633	\$23,819
	63 US-7, VT-207	Major Collector (r)	St. Albans Town	2.290 - 2.310	8950	5	16	0	11	8	0.766	0.979	1.277	\$58,694
	66 VT-7A	Minor Arterial (u)	Bennington	0.100 - 0.120	13327	5	26	0	5	23	0.846	1.069	1.262	\$23,046
	45 VT-7A, RICE LN., BENNINGTON, <T0000>	Minor Arterial (u)/Urban Collector (u)	Bennington	1.700 - 1.720	5900	5	16	0	18	5	1.102	1.485	1.347	\$91,544
#	124 VT-9, DEPOT ST., BENNINGTON, WASHINGTON ST., BENNINGTON	Principal Arterial (u)/Urban Collector (u)	Bennington	4.260 - 4.280	10500	5	19	0	2	17	0.981	0.991	1.01	\$16,268
#	120 VT-9, UNION ST., BENNINGTON, PLEASANT ST., BENNINGTON	Principal Arterial (u)/Urban Collector (u)	Bennington	4.810 - 4.830	10300	5	19	0	6	14	0.985	1.01	1.026	\$31,474
	51 VT-9, VT-100, TOWN ROAD 0033	Principal Arterial (r)/Minor Arterial (r)	Wilmington	2.990 - 3.050	9027	5	19	0	0	19	0.87	1.153	1.324	\$8,900
	58 VT-11, VT-30	Minor Arterial (r)	Winhall	3.030 - 3.230	7037	5	11	0	2	9	0.656	0.856	1.306	\$21,627
	24 VT-11, VT-100, TOWN ROAD 0059	Minor Arterial (r)	Londonderry	1.880 - 1.960	5810	5	12	0	3	9	0.687	1.131	1.646	\$26,400
#	37 VT-11, VT-106	Minor Arterial (r)/Major Collector (r)	Springfield	3.950 - 4.030	14600	5	35	0	2	33	0.913	1.313	1.438	\$12,900
#	62 VT-11, FAS 0136 (VT-143 TH)	Minor Arterial (r)/Major Collector (r)	Springfield	4.590 - 4.660	12227	5	27	0	1	26	0.944	1.209	1.281	\$11,493
	125 VT-12, VT-64	Major Collector (r)	Northfield	1.980 - 2.080	4934	5	8	0	7	3	0.881	0.888	1.008	\$72,375
	101 VT-14, VT-63, TOWN ROAD 0004	Minor Arterial (r)/Major Collector (r)	Barre Town	1.650 - 1.730	11025	5	21	0	5	17	0.964	1.043	1.083	\$25,990

FIGURE 5-A

Vermont Agency of Transportation

Statewide Intersections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1.)
	103 VT-105, VT-100	Minor Arterial (r)	Newport Town	4.190 - 4.350	4041	5	6	0	1	5	0.753	0.813	1.08	\$20,567
	76 VT-112, FAS 0111 (VT 8A TH)	Minor Arterial (r)/Major Collector (r)	Halifax/Whitingham	5.810 - 0.140	1523	5	5	0	3	3	1.535	1.798	1.171	\$52,680
*	29 VT-116, FAS 0210	Minor Arterial (r)/Major Collector (r)	Hinesburg	5.410 - 5.510	10951	5	31	0	5	26	0.965	1.551	1.607	\$20,190
	131 VT-116, VT-2A	Minor Arterial (r)/Major Collector (r)	St. George	0.270 - 0.370	10042	5	18	0	6	13	0.982	0.982	1	\$32,728
	118 VT-116, CHEESEFACTORY RD., SOUTH BURLINGTON	Principal Arterial (u)/Urban Collector (u)	South Burlington	0.160 - 0.320	6975	5	14	0	6	11	1.068	1.099	1.029	\$40,807
	115 VT-117, FAS 0213	Minor Arterial (r)/Major Collector (r)	Richmond	0.650 - 0.750	6350	5	13	0	1	12	1.082	1.121	1.036	\$14,285
#	83 VT-125, WEYBRIDGE ST., MIDDLEBURY	Minor Arterial (u)	Middlebury	0.890 - 1.030	6937	5	14	0	1	13	0.97	1.105	1.139	\$13,900
#	110 VT-142, BRIDGE ST., VT 119, BRATTLEBORO	Minor Arterial (u)	Brattleboro	2.150 - 2.170	10470	5	18	0	1	17	0.888	0.942	1.06	\$12,789
*	93 US-302, VT-110, TOWN ROAD 0030	Minor Arterial (r)/Major Collector (r)	Barre Town	2.470 - 2.630	7090	5	15	0	2	13	1.056	1.159	1.097	\$18,233
	99 US-302, VT-25	Minor Arterial (r)	Orange	6.010 - 6.110	3130	5	5	0	3	3	0.804	0.875	1.088	\$52,680
	73 VT-313, FAS 0171, TOWN ROAD 0004	Minor Arterial (r)/Major Collector (r)	Arlington	7.110 - 7.240	2845	5	8	0	7	1	1.309	1.54	1.177	\$70,150
#	77 WEST RUTLAND-RUTLAND (BR US-4), GROVE ST., RUTLAND CITY	Minor Arterial (u)	Rutland City	1.400 - 1.420	8650	5	17	0	3	14	0.924	1.076	1.164	\$21,253
#	2 BURLINGTON (ALTERNATE US-7), MAIN ST., BURLINGTON	Principal Arterial (u)	Burlington	0.990 - 1.010	20430	5	101	0	11	93	0.992	2.708	2.729	\$16,788
#	59 BURLINGTON (ALTERNATE US-7), PEARL ST., BURLINGTON	Principal Arterial (u)/Minor Arterial (u)	Burlington	1.310 - 1.330	17040	5	58	0	15	46	1.446	1.865	1.29	\$27,464
#	31 BURLINGTON (ALTERNATE US-7), NORTH ST., BURLINGTON	Principal Arterial (u)/Urban Collector (u)	Burlington	1.620 - 1.640	7380	5	22	0	5	17	1.055	1.633	1.547	\$24,809
	54 SO. BURLINGTON (FAP 121-1 KENNEDY DRIVE), DORSET ST., SOUTH BURLINGTON. I-89	Minor Arterial (u)/Urban Collector (u)	South Burlington	0.000 - 0.010	19000	5	40	0	2	38	0.874	1.153	1.319	\$12,400
	104 COUNTY RD., BENNINGTON, PARK ST., BENNINGTON, <T0000>	Minor Arterial (u)/Urban Collector (u)	Bennington	0.460 - 0.480	7250	5	15	0	1	14	1.053	1.133	1.076	\$13,567
	52 DEPOT ST., BENNINGTON, COUNTY RD., BENNINGTON	Urban Collector (u)	Bennington	0.350 - 0.370	6600	5	15	0	6	10	0.942	1.245	1.321	\$37,493
	91 ELM ST., BENNINGTON, DEWEY ST., BENNINGTON	Urban Collector (u)	Bennington	0.360 - 0.380	7640	5	14	0	5	11	0.912	1.004	1.101	\$35,171
	53 PLEASANT ST., BENNINGTON, SCHOOL ST., BENNINGTON	Urban Collector (u)	Bennington	0.100 - 0.120	3380	5	9	0	5	6	1.106	1.459	1.319	\$49,767
	94 UNION ST., BENNINGTON, SILVER ST., BENNINGTON	Urban Collector (u)	Bennington	0.160 - 0.180	3095	5	7	0	0	7	1.13	1.239	1.096	\$8,900

FIGURE 5-A

Vermont Agency of Transportation

Statewide Intersections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1.)
	22 COLCHESTER AVE., BURLINGTON, BARRETT ST., BURLINGTON	Minor Arterial (u)/Urban Collector (u)	Burlington	0.990 - 1.010	7595	5	24	1	5	19	1.043	1.731	1.659	\$82,233
	55 STRONGS AVE., RUTLAND CITY, WASHINGTON ST., RUTLAND CITY	Principal Arterial (u)/Urban Collector (u)	Rutland City	0.600 - 0.620	10610	5	25	0	11	17	0.979	1.291	1.318	\$40,768
	16 BATTERY ST., BURLINGTON, MAIN ST., BURLINGTON	Principal Arterial (u)	Burlington	0.220 - 0.240	15300	5	52	0	11	42	1.041	1.862	1.788	\$23,879
	4 VT. 127 BELTLINE, BURLINGTON, <5009>	Freeway/Expressway (u)	Burlington	1.340 - 1.500	5205	5	7	0	6	4	0.316	0.736	2.328	\$72,714
	1 VT. 127 BELTLINE, BURLINGTON, <5042>	Freeway/Expressway (u)	Burlington	3.360 - 3.470	6573	5	10	0	11	5	0.298	0.833	2.797	\$91,240
	28 COLCHESTER AVE., BURLINGTON, EAST AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.430 - 0.450	17120	5	41	0	8	33	0.808	1.312	1.624	\$22,559
	15 MAIN ST., BURLINGTON, ST. PAUL ST., BURLINGTON	Principal Arterial (u)/Urban Collector (u)	Burlington	0.250 - 0.270	10565	5	34	1	9	25	0.98	1.763	1.799	\$68,900
	96 NORTH AVE., BURLINGTON, PLATTSBURG AVE., BURLINGTON	Minor Arterial (u)	Burlington	3.090 - 3.100	8700	5	16	0	3	13	0.923	1.007	1.091	\$22,025
	7 NORTH ST., BURLINGTON, N CHAMPLAIN ST., BURLINGTON	Principal Arterial (u)/Urban Collector (u)	Burlington	0.220 - 0.240	6400	5	26	0	5	21	1.089	2.226	2.044	\$22,362
	90 N UNION ST., BURLINGTON, S UNION ST., BURLINGTON, <T0000>	Principal Arterial (u)	Burlington	0.000 - 0.010	5435	5	14	0	3	11	1.278	1.411	1.104	\$23,900
	27 PARK ST., BURLINGTON, NORTH ST., BURLINGTON	Principal Arterial (u)/Urban Collector (u)	Burlington	0.280 - 0.300	6135	5	20	0	4	16	1.099	1.786	1.625	\$22,900
	100 PARK ST., BURLINGTON, MANHATTAN DRIVE, BURLINGTON, VT. 127 BELTLINE, BURLINGTON	Freeway/Expressway (u)/Principal Arterial (u)	Burlington	0.480 - 0.490	14235	5	39	0	7	33	1.385	1.501	1.084	\$21,692
	41 PEARL ST., BURLINGTON, <T0000>, S PROSPECT ST., BURLINGTON, COLCHESTER AVE., BURLINGTON	Minor Arterial (u)/Urban Collector (u)	Burlington	0.930 - 0.940	20100	5	44	0	14	34	0.866	1.199	1.385	\$31,982
	130 W. ALLEN ST., WINOOSKI CITY, MALLETT'S BAY AVE., WINOOSKI CITY, <T0000>, W. CENTER ST., WINOOSKI	Minor Arterial (u)/Urban Collector (u)	Winooski City	0.000 - 0.010	2925	5	7	0	0	7	1.303	1.311	1.006	\$8,900
	32 PATCHEN ROAD, SOUTH BURLINGTON, WHITE ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	0.080 - 0.100	12515	5	29	0	6	25	0.822	1.269	1.544	\$23,997
	13 SUSIE WILSON RD., ESSEX, KELLOGG ROAD, ESSEX	Urban Collector (u)	Essex	0.480 - 0.500	19720	5	51	0	2	49	0.754	1.417	1.877	\$11,645
	81 VT. 127 TH, COLCHESTER, PORTER POINT RD., COLCHESTER	Minor Arterial (u)/Urban Collector (u)	Colchester	0.860 - 0.940	12650	5	25	0	6	20	0.941	1.082	1.151	\$26,056
	44 VT. 127 TH, COLCHESTER, W. LAKESHORE DR., COLCHESTER	Minor Arterial (u)	Colchester	2.170 - 2.230	9850	5	22	0	13	15	0.899	1.223	1.36	\$52,691
	105 VT. 127 TH, COLCHESTER, E. LAKESHORE DR., COLCHESTER	Minor Arterial (u)/Urban Collector (u)	Colchester	3.170 - 3.250	13080	5	24	0	3	21	0.935	1.005	1.075	\$17,650

FIGURE 5-A

Vermont Agency of Transportation

Statewide Sections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L. No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1.)
	472 GAGE ST., BENNINGTON	Urban Collector (u)	Bennington	0.800 - 1.100	1663	5	8	0	1	7	7.586	8.786	1.158	\$17,650
	333 TOWN HWY. NO. 28 (KOCHER DR.), BENNINGTON	Urban Collector (u)	Bennington	0.000 - 0.300	9220	5	35	0	8	29	5.229	6.933	1.326	\$25,409
	235 UNION ST., BENNINGTON	Urban Collector (u)	Bennington	0.200 - 0.500	2000	5	12	0	3	11	7.249	10.958	1.512	\$27,883
	558 FAIRGROUND ROAD, BRATTLEBORO	Urban Collector (u)	Brattleboro	0.100 - 0.400	3500	5	13	0	3	10	6.358	6.784	1.067	\$25,054
	245 OAK GROVE AVE., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.000 - 0.300	800	5	6	0	0	6	9.149	13.698	1.497	\$8,900
	278 SOUTH MAIN ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.600 - 0.900	2900	5	15	0	2	14	6.636	9.447	1.424	\$18,827
	632 ALLEN ST., RUTLAND CITY	Minor Arterial (u)	Rutland City	0.100 - 0.400	8600	5	27	0	8	22	5.674	5.734	1.011	\$30,630
	52 CHURCH ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.100 - 0.400	1330	5	13	0	5	10	8.025	17.852	2.224	\$37,192
	619 CRESCENT ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.400 - 0.700	4460	5	15	0	4	12	6.031	6.142	1.019	\$28,160
	630 FOREST ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.500 - 0.800	2667	5	10	0	6	8	6.767	6.848	1.012	\$54,460
	206 LINCOLN AVE., RUTLAND CITY	Urban Collector (u)	Rutland City	0.100 - 0.400	1090	5	8	1	3	5	8.445	13.405	1.587	\$211,400
	443 LINCOLN AVE., RUTLAND CITY	Urban Collector (u)	Rutland City	0.400 - 0.700	1090	5	6	0	1	5	8.445	10.054	1.19	\$20,567
	221 STRONGS AVE., RUTLAND CITY	Principal Arterial (u)	Rutland City	0.200 - 0.500	8823	5	53	1	15	40	7.159	10.971	1.532	\$55,651
	562 WEST ST., RUTLAND CITY	Principal Arterial (u)	Rutland City	0.400 - 0.700	10615	5	43	0	14	33	6.951	7.398	1.064	\$32,519
	91 COLCHESTER AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.100 - 0.400	16012	5	89	0	20	72	5.126	10.152	1.981	\$24,930
	63 EAST AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	8328	5	56	0	10	47	5.707	12.281	2.152	\$21,559
	519 NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	10553	5	35	0	6	30	5.476	6.057	1.106	\$21,154
	126 NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	1.900 - 2.200	13258	5	70	0	13	59	5.276	9.643	1.828	\$22,154
	369 NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	2.200 - 2.500	13313	5	49	0	9	41	5.273	6.722	1.275	\$21,939
	398 NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	2.600 - 2.900	10800	5	40	0	6	34	5.455	6.764	1.24	\$19,400
	4 PEARL ST., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	8045	5	104	0	5	100	5.743	23.611	4.111	\$12,351
	319 PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.200 - 0.500	11800	5	47	0	13	35	5.376	7.274	1.353	\$28,451

FIGURE 5-A

Vermont Agency of Transportation

Statewide Sections - Route Log Order /2 - Statewide

Years: 2010 - 2014

H.C.L. No.	/3. Route	System	Town	Mileage	ADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Accident/1.)
	440 PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.800 - 1.100	10580	5	38	0	6	32	5.474	6.56	1.198	\$19,953
	40 PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	1.100 - 1.400	7175	5	53	0	9	45	5.865	13.491	2.3	\$20,955
	32 ST. PAUL ST., BURLINGTON	Urban Collector (u)	Burlington	0.000 - 0.300	9400	5	65	0	14	52	5.211	12.629	2.423	\$24,114
	629 S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.000 - 0.300	3100	5	15	0	2	13	8.719	8.837	1.014	\$18,233
	130 S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.500 - 0.800	3858	5	32	0	8	26	8.331	15.149	1.818	\$26,956
	638 E SPRING ST., WINOOSKI CITY	Urban Collector (u)	Winooski City	0.100 - 0.400	5700	5	18	0	2	16	5.731	5.767	1.006	\$16,678
	80 MALLETT'S BAY AVE., WINOOSKI CITY	Minor Arterial (u)	Winooski City	0.100 - 0.400	3738	5	28	0	4	24	6.693	13.681	2.044	\$18,900
	115 W SPRING ST., WINOOSKI CITY	Urban Collector (u)	Winooski City	0.000 - 0.300	3302	5	22	1	5	18	6.442	12.169	1.889	\$89,305
	384 DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.100 - 3.400	12582	5	43	0	9	36	4.957	6.242	1.259	\$23,965
	11 DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.700 - 4.000	14475	5	120	0	11	111	4.847	15.141	3.124	\$15,465
	524 SPEAR ST., SOUTH BURLINGTON	Minor Arterial (u)	South Burlington	1.800 - 2.100	5047	5	19	0	2	17	6.283	6.876	1.094	\$16,268
	437 SWIFT ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	0.900 - 1.200	6213	5	23	0	1	22	5.633	6.761	1.2	\$11,943
	144 SUSIE WILSON RD., ESSEX	Urban Collector (u)	Essex	0.000 - 0.300	17453	5	80	0	15	67	4.71	8.372	1.777	\$22,248
	282 BEAR TRAP ROAD, MILTON	Urban Collector (u)	Milton	0.000 - 0.300	860	5	6	0	2	4	8.979	12.742	1.419	\$32,233
	46 JACKSON ROAD, MILTON	Urban Collector (u)	Milton	1.000 - 1.300	460	5	6	0	1	5	10.548	23.823	2.258	\$20,567
	305 MAIN ST.(WESTFORD RD)., MILTON	Urban Collector (u)	Milton	0.600 - 0.900	2287	5	12	0	8	6	7.017	9.583	1.366	\$57,050
	604 MIDDLE ROAD, MILTON	Urban Collector (u)	Milton	2.600 - 2.900	2961	5	11	0	3	9	6.604	6.785	1.027	\$28,800
	634 SEYMOUR ST., MIDDLEBURY	Urban Collector (u)	Middlebury	0.300 - 0.600	1670	5	7	0	0	7	7.578	7.655	1.01	\$8,900
	421 WASHINGTON ST., MIDDLEBURY	Urban Collector (u)	Middlebury	0.000 - 0.300	4158	5	17	0	0	17	6.122	7.467	1.22	\$8,900
	487 BROOK ST., BARRE CITY	Urban Collector (u)	Barre City	0.000 - 0.300	1160	5	6	0	0	6	8.311	9.447	1.137	\$8,900
	213 HILL ST., BARRE CITY	Urban Collector (u)	Barre City	0.000 - 0.300	3500	5	19	0	6	15	6.358	9.915	1.559	\$31,942
	322 MERCHANT ST., BARRE CITY	Urban Collector (u)	Barre City	0.000 - 0.300	2339	5	12	0	2	10	6.98	9.37	1.342	\$20,567

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
5	5/20/2011	0	FAU-5036 Park Street	Dry	Property Damage Only	No Control	Pearl Street	Rear End
5	10/4/2012	0	FAU-5036 Park Street	Wet	Injury	Traffic Signal (Flashing)	Pearl Street	Rear End
5	12/4/2014	0	FAU-5036 Park St	Dry	Property Damage Only	No Control	Pearl St	Rear End
5	9/17/2011	0	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	Battery St	Same Direction Sideswipe
5	5/18/2012	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Same Direction Sideswipe
5	7/30/2012	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Same Direction Sideswipe
5	8/1/2012	0	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Battery St	Same Direction Sideswipe
5	10/8/2012	0	FAU-5038 Pearl Street	Dry	Property Damage Only	Traffic Signal	Battery Street	Same Direction Sideswipe
5	1/22/2013	0	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal	Battery St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
5	4/6/2013	0	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Battery St	Rear-to-rear
5	4/22/2013	0	FAU-5038 Pearl St/Battery St	Dry	Property Damage Only	No Control	Battery St	Rear End
5	5/8/2013	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
5	4/18/2014	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Same Direction Sideswipe
5	6/8/2014	0	FAU-5038 Pearl St		Property Damage Only	No Control	Park St	Same Direction Sideswipe
5	1/13/2015	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
5	4/9/2015	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
5	4/29/2015	0	Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Right Turn, Same Direction, Rear End ^~^--
5	9/6/2015	0	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Battery St	Same Direction Sideswipe
5	11/23/2015	0	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	Battery St	Same Direction Sideswipe
5	8/16/2012	0.01	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Battery St	Same Direction Sideswipe
5	7/27/2013	0.01	FAU-5038 (240 Pearl St)	Dry	Unknown	No Control	North Union Street	Rear-to-rear
5	4/18/2012	0.02	FAU-5038 (12 Pearl St)	Dry	Property Damage Only	No Control	Battery St	Unknown
5	4/25/2014	0.54	FAU-5008 Battery St	Dry	Property Damage Only	No Control	Pearl St	Unknown
5	1/11/2011	0.55	FAU 5008 (Battery Street)	Wet	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
5	4/14/2011	0.55	FAU-5008 Battery St.	Dry	Property Damage Only	No Control	Pearl St.	Unknown
5	7/16/2011	0.55	FAU 5008 (Battery St)	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
5	9/7/2011	0.55	FAU 5008 (Battery St/Pearl St)	Wet	Property Damage Only	Traffic Signal	Park St	No Turns, Thru moves only, Broadside ^<
5	12/5/2011	0.55	FAU 5008 Battery St	Wet	Property Damage Only	Traffic Signal	Pearl St	Rear End
5	5/19/2012	0.55	FAU-5008 Battery St	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	Pearl St	Single Vehicle Crash
5	8/12/2012	0.55	FAU-5008 Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Left Turn and Thru, Angle Broadside -->v--
5	11/6/2012	0.55	FAU-5008 Battery Street	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
5	6/6/2013	0.55	FAU 5008 Battery St	Wet	Property Damage Only	Traffic Signal	Pearl St	Rear End
5	6/17/2013	0.55	FAU-5008 Battery St	Dry	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
5	8/28/2014	0.55	Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
5	10/28/2014	0.55	FAU-5008 Battery St	Dry	Property Damage Only	No Control	Pearl St	Rear End
5	1/8/2015	0.55	FAU-5008 Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
5	5/28/2015	0.55	Battery St	Dry	Property Damage Only	unknown	Pearl St	No Turns, Thru moves only, Broadside ^<
5	7/25/2015	0.55	FAU-5008 Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
5	8/21/2015	0.55	FAU-5008 Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
5	8/21/2015	0.55	Battery st	Dry	Property Damage Only	Traffic Signal	Park St	Rear End
5	9/22/2015	0.55	Battery St	Dry	Property Damage Only	No Control	Pearl St	Rear End
5	10/20/2015	0.55	Battery St	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
6	12/15/2011	0.13	FAU-5038 (58 Pearl St)	Dry	Property Damage Only	No Control	N Champlain St	Unknown
6	8/18/2012	0.13	FAU-5038 (58 Pearl St)	Dry	Property Damage Only	No Control	N Champlain St	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--
6	8/22/2012	0.13	FAU-5038 (58 Pearl St)	Dry	Property Damage Only	No Control	North Champlain	Unknown
6	10/21/2012	0.13	FAU-5038 (58 Pearl St)	Dry	Property Damage Only	No Control	Boves	Same Direction Sideswipe
6	12/23/2013	0.13	FAU-5038 (58 Pearl St)	Snow	Property Damage Only	No Control	Pine St	Same Direction Sideswipe

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
6	6/30/2014	0.15	72 Pearl St	Dry	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
6	1/19/2011	0.16	FAU 5038 (90 Pearl Street)	Slush	Property Damage Only	Traffic Signal		Rear End
6	6/20/2011	0.16	FAU-5038 (90 Pearl St)	Dry	Property Damage Only	Traffic Signal	Pine St	Same Direction Sideswipe
6	8/27/2012	0.16	FAU-5038 (84 Pearl St)	Dry	Property Damage Only	No Control	Pine St/Pearl St	Same Direction Sideswipe
6	1/11/2013	0.16	FAU-5038 Pearl Street	Wet	Property Damage Only	Traffic Signal	Pine Street	Rear-to-rear
6	12/13/2013	0.16	FAU-5038 Pearl St./Pine St	Unknown	Property Damage Only	unknown	Pearl St	Unknown
6	6/3/2014	0.16	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Pine St	Rear End
6	10/22/2014	0.16	Pearl St	Wet	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
6	12/29/2014	0.16	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Pine St	No Turns, Thru moves only, Broadside ^<
6	12/30/2014	0.16	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
6	3/9/2015	0.16	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Pine St	No Turns, Thru moves only, Broadside ^<
6	7/18/2015	0.16	Pearl St	Dry	Injury	Traffic Signal	PineSt	Rear End
6	10/31/2015	0.16	Pearl St	Dry	Property Damage Only	Traffic Signal (Flashing)	Pine St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
6	6/11/2011	0.17	FAU-5038 (83 Pearl Street)	Dry	Property Damage Only	Traffic Signal	Pine Street	Rear End
6	6/29/2011	0.17	FAU 5038 (77 Pearl St)	Dry	Property Damage Only	No Control	77 Pearl St	Rear End
6	5/24/2014	0.18	FAU-5038 (85 Pearl St)	Dry	Property Damage Only	No Control	George	Rear End
6	8/12/2015	0.18	90 Pearl St	Dry	Property Damage Only	Traffic Signal	Pine Street	Rear End
7	4/26/2012	0.37	FAU-5038 (185 Pearl St)	Wet	Property Damage Only	No Control	Clarke St	Same Direction Sideswipe
7	3/4/2011	0.38	FAU 5038 (187 Pearl Street)	Dry	Property Damage Only	No Control		Rear End
7	10/8/2014	0.38	Pearl St	Unknown	Property Damage Only	No Control	S Winooski Ave	Unknown
7	12/21/2015	0.38	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Winooski	Rear End
7	9/14/2011	0.39	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
7	12/19/2012	0.39	FAU-5038 Pearl Street	Wet	Property Damage Only	No Control	Winooski Avenue	Rear End
7	10/10/2014	0.39	Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Unknown
7	3/17/2015	0.39	FAU-5038 Pearl St	Dry	Injury	No Control	S Winooski Ave	Rear End
7	3/31/2015	0.39	Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
7	5/19/2015	0.39	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
7	2/19/2011	0.4	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
7	7/24/2011	0.4	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
7	3/17/2012	0.4	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Same Direction Sideswipe
7	4/14/2012	0.4	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	8/21/2012	0.4	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	9/22/2012	0.4	FAU-5038 Pearl St	Wet	Injury	Traffic Signal	S Winooski Ave	Unknown
7	7/11/2013	0.4	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	8/30/2013	0.4	FAU-5038 Pearl St		Injury	unknown	N Winooski	Unknown
7	1/22/2014	0.4	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	7/29/2014	0.4	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
7	8/13/2014	0.4	Pearl St	Wet	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	11/20/2014	0.4	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	S Winooski	Same Direction Sideswipe
7	12/16/2014	0.4	FAU-5038 Pearl St	Dry	Injury	All-way Flasher (Red on All)	N Winooski Ave	Left Turn and Thru, Broadside v<--
7	12/31/2014	0.4	Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	10/31/2015	0.4	FAU-5038 Pearl St	Dry	Injury	Traffic Signal	n Winooski Ave	Head On
7	4/8/2013	0.41	FAU-5038 Pearl Street	Dry	Property Damage Only	Traffic Signal	North Winooski Avenue	Rear End
7	4/23/2013	0.42	FAU-5038 (198 Pearl Street)	Dry	Property Damage Only	Traffic Signal	South Winooski Avenue	Rear End
7	8/31/2011	1.31	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
7	10/28/2011	1.319	ALTUS-7 (S Winooski Ave)	Dry	Injury	No Control	Pearl St	Same Direction Sideswipe
7	1/11/2011	1.32	ALTUS-7 (N Winooski)	Dry	Property Damage Only	Traffic Signal	Pearl Street	Left Turn and Thru, Angle Broadside -->v--

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
7	1/23/2011	1.32	ALTUS-7 (S Winooski Ave)	Explain in Narrative	Injury	Traffic Signal	Pearl Street	Head On
7	2/4/2011	1.32	ALTUS-7 (S Winooski Ave)	Snow	Property Damage Only	Traffic Signal	Pearl Street	Head On
7	7/3/2011	1.32	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Pearl St	Unknown
7	9/13/2011	1.32	Alt. US-7 N. Winooski Ave./Pearl St	Dry	Injury	Traffic Signal	N Winooski Ave	Opp Direction Sideswipe
7	4/1/2012	1.32	Alt. US-7 N Winooski Ave/Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Opp Direction Sideswipe
7	4/15/2012	1.32	Alt. US-7 N Winooski Ave	Dry	Property Damage Only	No Control	Pearl St	Opp Direction Sideswipe
7	5/4/2012	1.32	Alt. US-7 S Winooski Ave	Wet	Injury	Traffic Signal	Pearl St	Rear End
7	7/29/2012	1.32	Alt. US-7 N Winooski Ave/Pearl St	Dry	Injury	Traffic Signal	N Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
7	7/29/2012	1.32	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	1/24/2013	1.32	Alt. US-7N. Winooski Avenue/Pearl Street	Dry	Property Damage Only	No Control	North Winooski Avenue	Same Direction Sideswipe
7	3/3/2013	1.32	Alt. US-7 S. Winooski Ave./Pearl St.	Dry	Property Damage Only	Traffic Signal	South Winooski Avenue	Head On
7	4/15/2013	1.32	Alt. US-7 South Winooski Avenue		Property Damage Only	unknown	Pearl Street	Rear End
7	7/19/2013	1.32	Alt. US-7 N Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Left Turn and Thru, Angle Broadside -->v--
7	9/20/2013	1.32	Alt. US-7 N. Winooski Av./Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Unknown
7	9/27/2013	1.32	Alt. US-7 N Winooski Ave	Unknown	Property Damage Only	unknown	Pearl St	Same Direction Sideswipe
7	10/29/2013	1.32	Alt. US-7 No Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	11/1/2013	1.32	Alt. US-7 N Winooski Ave/Pearl St		Injury	unknown	N Winooski Ave	Unknown
7	11/10/2013	1.32	N Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
7	1/13/2014	1.32	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
7	3/7/2014	1.32	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	3/16/2014	1.32	Alt. US-7 S. Winooski Ave./Pearl St	Dry	Injury	Traffic Signal	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
7	4/26/2014	1.32	St Paul St	Wet	Property Damage Only	No Control	Pearl St	Rear End
7	5/14/2014	1.32	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	5/26/2014	1.32	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Head On
7	7/2/2014	1.32	Alt. US-7 S. Winooski Av./Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
7	9/20/2014	1.32	S Winooski	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	12/27/2014	1.32	Alt. US-7 S Winooski/Pearl St	Dry	Property Damage Only	Traffic Signal	Pearl St/S Winooski	Left and Right Turns, Simultaneous Turn Crash --v--
7	4/6/2015	1.32	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
7	5/4/2015	1.32	Alt. US-7 S. Winooski Av./Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
7	5/14/2015	1.32	Alt. US-7 N. Winoosk Av./Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	7/15/2015	1.32	Alt. US-7 N Winooski Av./Pearl St	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
7	9/6/2015	1.32	N Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Same Direction Sideswipe
7	10/7/2015	1.32	Alt. US-7 S. Winooski Av./Pearl St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
7	10/18/2015	1.32	N Winooski Ave	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
7	11/20/2015	1.32	Alt. US 7 N Winooski Ave	Dry	Property Damage Only	No Control	Pearl St	Unknown
7	11/8/2012	1.33	Alt. US-7 N Winooski Ave	Dry	Injury	No Control	Pearl St	Single Vehicle Crash
7	8/9/2013	1.34	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
7	7/2/2013	1.35	Alt. US-7 (15 N Winooski Ave)		Property Damage Only	unknown	Pearl St.	Unknown
7	9/22/2014	1.35	Alt. US-7 N Winooski Ave	Dry	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
7	10/21/2014	1.35	Alt. US-7 (14 N Winooski Ave)	Dry	Property Damage Only	No Control	N Winooski Ave	Same Direction Sideswipe
8	6/24/2012	0.46	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	South Union St	Same Direction Sideswipe
8	6/15/2013	0.46	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Orchard Terr	Unknown
8	9/3/2014	0.46	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	Orchard Ter	Rear-to-rear
8	9/30/2012	0.47	FAU-5038 (223 Pearl St)	Unknown	Property Damage Only	No Control	#1	Unknown
8	2/13/2012	0.48	FAU 5038 (Pearl Street)	Wet	Property Damage Only	All-way Flasher (Red on Cross Street)	So Union St	No Turns, Thru moves only, Broadside ^<
8	2/5/2014	0.48	FAU-5038 Pearl St	Snow	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
8	9/21/2011	0.489	FAU 5038 (Pearl Street)	Dry	Property Damage Only	No Control	N Union St	Rear End

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
8	9/25/2011	0.489	FAU 5038 (Pearl Street)	Dry	Injury	Traffic Signal (Normal Operation)	S Union St	No Turns, Thru moves only, Broadside ^<
8	2/25/2011	0.49	FAU 5038 (Pearl Street)	Snow	Property Damage Only	No Control	N Union Street	No Turns, Thru moves only, Broadside ^<
8	6/2/2011	0.49	FAU 5038 (Pearl Street)	Dry	Property Damage Only	No Control	N. Union St.	Rear End
8	6/5/2011	0.49	FAU 5038 (Pearl Street)	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	North Union Street	Left Turn and Thru, Angle Broadside -->v--
8	6/20/2011	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Same Direction Sideswipe
8	12/10/2011	0.49	FAU-5038 Pearl Street	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	N Union St	Same Direction Sideswipe
8	12/15/2011	0.49	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	No Turns, Thru moves only, Broadside ^<
8	12/30/2011	0.49	FAU-5038 Pearl St	Unknown	Property Damage Only	Traffic Signal (Flashing)	N Union St	No Turns, Thru moves only, Broadside ^<
8	4/11/2012	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	unknown	N Union St	Same Direction Sideswipe
8	8/30/2012	0.49	FAU-5038 Pearl St	Dry	Injury	No Control	No Union St	Unknown
8	10/3/2012	0.49	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	No Turns, Thru moves only, Broadside ^<
8	10/20/2012	0.49	FAU-5038 Pearl Street	Wet	Injury	All-way Flasher (Red on Cross Street)	North Union Street	No Turns, Thru moves only, Broadside ^<
8	10/24/2012	0.49	FAU-5038 (240 Pearl St)	Dry	Property Damage Only	No Control	N Union St	Opp Direction Sideswipe
8	1/4/2013	0.49	FAU-5038 Pearl Street	Wet	Property Damage Only	Traffic Signal (Normal Operation)	South Union Street	No Turns, Thru moves only, Broadside ^<
8	1/26/2013	0.49	FAU-5038 Pearl Street	Wet	Property Damage Only	Traffic Signal (Normal Operation)	North Union Street	No Turns, Thru moves only, Broadside ^<
8	2/5/2013	0.49	FAU-5038 Pearl Street	Dry	Injury	Traffic Signal (Normal Operation)	South Union Street	No Turns, Thru moves only, Broadside ^<
8	2/7/2013	0.49	FAU-5038 Pearl Street	Dry	Property Damage Only	Traffic Signal (Normal Operation)	North Union Street	No Turns, Thru moves only, Broadside ^<
8	3/1/2013	0.49	FAU-5038 Pearl Street	Dry	Injury	Traffic Signal (Normal Operation)	North Union Street	Left Turn and Thru, Broadside v<--
8	3/6/2013	0.49	FAU-5038 Pearl Street	Dry	Injury	Traffic Signal (Normal Operation)	North Union Street	No Turns, Thru moves only, Broadside ^<
8	3/17/2013	0.49	FAU-5038 Pearl St	Dry	Injury	unknown	S Union St	Unknown
8	3/20/2013	0.49	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Rear End
8	3/30/2013	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	No Turns, Thru moves only, Broadside ^<
8	5/15/2013	0.49	FAU-5038 Pearl St	Dry	Injury	Traffic Signal (Normal Operation)	South Willard St	Rear End
8	5/16/2013	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	North Union St	No Turns, Thru moves only, Broadside ^<
8	5/23/2013	0.49	FAU-5038 Pearl St	Dry	Injury	Traffic Signal (Normal Operation)	S Union St	Left Turn and Thru, Angle Broadside -->v--
8	9/1/2013	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	Rear End
8	9/8/2013	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	Same Direction Sideswipe
8	10/3/2013	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Union St	Unknown
8	5/19/2014	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Union St	Rear-to-rear
8	6/2/2014	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Union St	Unknown
8	10/14/2014	0.49	fau-5038 Pearl St	Dry	Property Damage Only	No Control	N Union	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--
8	10/20/2014	0.49	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Rear End
8	12/4/2014	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	unknown	N Union St	No Turns, Thru moves only, Broadside ^<
8	1/16/2015	0.49	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	Opp Direction Sideswipe
8	2/19/2015	0.49	Pearl St	Snow	Property Damage Only	All-way Flasher (Red on Cross Street)	N Union St	No Turns, Thru moves only, Broadside ^<
8	3/26/2015	0.49	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union	No Turns, Thru moves only, Broadside ^<
8	4/9/2015	0.49	Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	Rear End
8	4/10/2015	0.49	Pearl St	Dry	Property Damage Only	No Control	S Union St	No Turns, Thru moves only, Broadside ^<
8	4/27/2015	0.49	Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	Rear End
8	4/27/2015	0.49	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Flashing)	N Union St	Rear End
8	5/16/2015	0.49	Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Rear End
8	8/10/2015	0.49	Pearl St	Dry	Property Damage Only	No Control	South Union St	Unknown
8	9/1/2015	0.49	Pearl St	Dry	Property Damage Only	No Control	N Union St	Same Direction Sideswipe
8	9/3/2015	0.49	Pearl St	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	S Union St	No Turns, Thru moves only, Broadside ^<
8	9/15/2015	0.49	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Union St	Same Direction Sideswipe
8	10/5/2013	0.5	FAU-5038 (240 Pearl St)	Dry	Injury	No Control	So Union St	Left Turn and Thru, Angle Broadside -->v--
8	10/21/2013	0.5	FAU-5038 Pearl st	Dry	Property Damage Only	No Control	N Union St	Same Direction Sideswipe

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
8	10/31/2013	0.5	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Rear End
8	11/5/2013	0.5	FAU-5038 (240 Pearl St)	Dry	Property Damage Only	Traffic Signal (Normal Operation)	So Union St	Rear End
8	11/9/2013	0.5	FAU-5038 (240 Pearl St)	Dry	Property Damage Only	Traffic Signal (Flashing)	S Union St	No Turns, Thru moves only, Broadside ^<
8	11/29/2013	0.5	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	No Turns, Thru moves only, Broadside ^<
8	12/27/2013	0.5	FAU-5038 Pearl St	Slush	Property Damage Only	Traffic Signal (Normal Operation)	S Union St	No Turns, Thru moves only, Broadside ^<
8	2/13/2014	0.5	FAU-5038 Pearl St	Snow	Property Damage Only	Traffic Signal (Normal Operation)	N Union St	Left Turn and Thru, Same Direction Sideswipe/Angle Crash v--
8	3/9/2014	0.5	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Union	No Turns, Thru moves only, Broadside ^<
8	3/22/2014	0.5	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	S Union St	Head On
8	12/29/2013	0.51	FAU-5038 (239 Pearl St)	Wet	Property Damage Only	No Control	South Union St	Rear End
8	1/10/2014	0.51	FAU-5038 Pearl St	Wet	Property Damage Only	No Control	N Union St	Same Direction Sideswipe
8	5/20/2014	0.51	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Union St	No Turns, Thru moves only, Broadside ^<
9	9/9/2011	0.67	FAU 5038 (322 Pearl Street)	Dry	Injury	Traffic Signal	South Willard Street	Single Vehicle Crash
9	3/23/2012	0.67	FAU-5038 Pearl St	Dry	Injury	No Control	N Willard St	Rear End
9	2/11/2013	0.67	FAU-5038 Pearl Street	Slush	Injury	Traffic Signal (Flashing)	North Willard Street	Rear End
9	9/6/2013	0.67	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	S Willard	Rear End
9	10/21/2013	0.67	FAU-5038 Pearl St	Dry	Injury	No Control	N Willard St	Unknown
9	2/21/2014	0.67	FAU-5038 Pearl St	Wet	Property Damage Only	No Control	N Willard St	Unknown
9	8/10/2015	0.67	Pearl St	Dry	Injury	Traffic Signal	N Willard St	Unknown
9	10/6/2015	0.67	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	11/26/2012	0.68	FAU-5038 Pearl St	Snow	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	11/23/2013	0.68	FAU-5038 Pearl St	Ice	Property Damage Only	Traffic Signal	N Willard St	Rear End
9	11/23/2013	0.68	FAU-5038 Pearl St	Ice	Property Damage Only	No Control	N Willard St	Rear End
9	1/24/2014	0.68	FAU-5038 Pearl St	Snow	Property Damage Only	No Control	S Willard St	Same Direction Sideswipe
9	4/2/2015	0.68	FAU-5038 Pearl St	Dry	Injury	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
9	7/1/2011	0.69	FAU 5038 (Pearl St)	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	7/17/2011	0.69	FAU 5038 (Pearl St)	Dry	Injury	Traffic Signal	N Willard St	No Turns, Thru moves only, Broadside ^<
9	8/29/2011	0.69	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	10/31/2011	0.69	FAU 5038 (Pearl Street)	Dry	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
9	12/16/2011	0.69	FAU-5038 Pearl St	Dry	Injury	Traffic Signal	N Willard St	Head On
9	2/24/2012	0.69	FAU 5038 (Pearl Street)	Snow	Property Damage Only	No Control	N Willard St	Unknown
9	3/22/2012	0.69	FAU-5038 Pearl St	Dry	Injury	Traffic Signal	S Willard St	Rear End
9	6/20/2012	0.69	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	N Willard St	Rear End
9	9/4/2012	0.69	FAU-5038 Pearl St	water (standing / moving)	Property Damage Only	Traffic Signal	Willard St	Left Turn and Thru, Broadside v<--
9	3/19/2013	0.69	FAU-5038 Pearl Street	Slush	Property Damage Only	Traffic Signal	North Willard Street	Rear End
9	5/7/2013	0.69	FAU-5038 Pearl St/S Willard St	Dry	Property Damage Only	No Control	S Willard St	Rear End
9	6/13/2013	0.69	FAU-5038 Pearl St	Dry	Injury	Traffic Signal	N Willard St	Right Turn and Thru, Broadside ^<--
9	7/23/2013	0.69	FAU-5038 Pearl St	Wet	Property Damage Only	No Control	S Willard St	Rear End
9	4/8/2014	0.69	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	7/11/2014	0.69	Pearl St	Dry	Property Damage Only	Traffic Signal	N Willard St	Rear End
9	1/13/2015	0.69	FAU-5038(328 Pearl St)	Wet	Property Damage Only	Traffic Signal (Flashing)	S Willard St	No Turns, Thru moves only, Broadside ^<
9	12/19/2015	0.69	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal	So Willard St	No Turns, Thru moves only, Broadside ^<
9	12/7/2011	0.7	FAU 5038 (338 Pearl St)	Wet	Property Damage Only	No Control	Willard St	Same Direction Sideswipe
9	8/14/2012	0.7	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	N Willard St	Rear End
9	8/16/2012	0.71	FAU-5038 (337 Pearl St)	Dry	Property Damage Only	No Control	N Willard St	No Turns, Thru moves only, Broadside ^<
9	12/26/2014	2.4	US-7(17 S Willard St)	Snow	Property Damage Only	No Control	Pearl St	Unknown
9	10/3/2014	2.41	3 S Willard St	Dry	Property Damage Only	No Control	Pearl St	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
9	1/4/2011	2.43	US-7 (Pearl Street)	Wet	Injury	Traffic Signal	S Willard Street	No Turns, Thru moves only, Broadside ^<

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
9	2/6/2011	2.43	US-7 (Willard Street)	Snow	Property Damage Only	Traffic Signal	Pearl Street	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^-
9	4/26/2011	2.43	US-7 South Willard Street	Wet	Property Damage Only	Traffic Signal	Pearl Street	Rear End
9	6/21/2011	2.43	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	No Turns, Thru moves only, Broadside ^<
9	9/9/2011	2.43	US-7 (S Willard Street)	Dry	Injury	Traffic Signal	Pearl St	Right Turn and Thru, Broadside ^<--
9	9/18/2011	2.43	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	No Turns, Thru moves only, Broadside ^<
9	11/12/2011	2.43	US-7 (S Willard Street)	Dry	Property Damage Only	No Control	Pearl St	Unknown
9	7/18/2012	2.43	US-7 N Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
9	7/27/2012	2.43	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
9	10/16/2012	2.43	US-7 Willard Street	Dry	Property Damage Only	Traffic Signal	Pearl Street	Left Turn and Thru, Angle Broadside -->v--
9	10/23/2012	2.43	US-7 North Willard Street/Pearl Street	Dry	Property Damage Only	Traffic Signal (Flashing)	North Willard Street	No Turns, Thru moves only, Broadside ^<
9	11/26/2012	2.43	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
9	11/28/2012	2.43	US-7 Willard Street/Pearl Street	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	Willard Street	No Turns, Thru moves only, Broadside ^<
9	12/20/2012	2.43	US-7 North Willard Street	Wet	Property Damage Only	Traffic Signal	Pearl Street	Left Turn and Thru, Angle Broadside -->v--
9	3/15/2013	2.43	US-7 South Willard Street	Dry	Property Damage Only	No Control	Pearl Street	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^-
9	4/6/2013	2.43	US-7 North Willard Street	Dry	Property Damage Only	Traffic Signal (Flashing)	Pearl Street	Unknown
9	5/29/2013	2.43	US-7 N. Willard St./Pearl St	Wet	Property Damage Only	Traffic Signal	N Willard St	Rear End
9	9/15/2013	2.43	US-7 S. Willard St./Pearl St	Dry	Injury	Traffic Signal	S Willard St	No Turns, Thru moves only, Broadside ^<
9	9/19/2013	2.43	US-7 N. Willard St./Pearl St	Dry	Property Damage Only	No Control	N Willard St	Left Turn and Thru, Angle Broadside -->v--
9	10/27/2013	2.43	US-7 N. Willard St./Pearl St	Dry	Property Damage Only	Traffic Signal	N Willard St	No Turns, Thru moves only, Broadside ^<
9	11/6/2013	2.43	US-7 N Willard St/Pearl St		Property Damage Only	unknown	N Willard St	unknown
9	3/1/2014	2.43	US-7 S. Willard St./Pearl St	Dry	Injury	Traffic Signal	S Willard St	No Turns, Thru moves only, Broadside ^<
9	5/27/2014	2.43	US-7 N Willard St	Dry	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
9	7/31/2014	2.43	US-7 N. Willard St./Pearl St	Wet	Property Damage Only	Traffic Signal	N Willard St	No Turns, Thru moves only, Broadside ^<
9	11/20/2014	2.43	US-7 S. Willard St./Pearl St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
9	12/7/2014	2.43	US-7 S. Willard St./Pearl St	Dry	Injury	Traffic Signal (Flashing)	S Willard St	No Turns, Thru moves only, Broadside ^<
9	12/23/2014	2.43	US-7 S. Willard St./Pearl St	Snow	Injury	All-way Flasher (Red on Cross Street)	S Willard St	No Turns, Thru moves only, Broadside ^<
9	2/21/2015	2.43	Pearl St	Snow	Property Damage Only	No Control	N Willard St	No Turns, Thru moves only, Broadside ^<
9	2/27/2015	2.43	US-7 S. Willard St./Pearl St	Dry	Property Damage Only	Traffic Signal (Flashing)	S Willard St	No Turns, Thru moves only, Broadside ^<
9	3/26/2015	2.43	US-7 S. Willard St./Pearl St	Wet	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
9	4/22/2015	2.43	N Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	Rear End
9	4/22/2015	2.43	Pearl St	Wet	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
9	9/1/2015	2.43	US-7 N Willard St./Pearl St	Dry	Injury	Traffic Signal	N Willard St	Unknown
9	9/17/2015	2.43	US-7 S Willard ST	Dry	Property Damage Only	Traffic Signal	Pearl ST	Rear End
9	11/23/2015	2.43	N Willard St	Dry	Property Damage Only	Traffic Signal	Pearl St	Left Turn and Thru, Angle Broadside -->v--
9	12/19/2015	2.43	US-7 N. Willard St./Pearl St	Dry	Property Damage Only	Traffic Signal	N Willard St	Head On
9	10/9/2012	2.44	US-7 N Willard St	Wet	Property Damage Only	No Control	Pearl St	No Turns, Thru moves only, Broadside ^<
9	6/30/2011	2.46	US-7 (17 No Willard St)	Dry	Property Damage Only	No Control	17 No Willard St	Opp Direction Sideswipe
10	2/1/2011	0	FAU 5014 (Colchester Ave)	Snow	Property Damage Only	No Control	Prospect Ave	Rear End
10	3/18/2011	0	FAU-5014 Colchester Ave.	Wet	Property Damage Only	No Control	South Prospect St.	No Turns, Thru moves only, Broadside ^<
10	11/14/2011	0	FAU-5014 Colchester Ave	Dry	Injury	No Control	East Ave	Rear End
10	9/7/2012	0	FAU-5014 Colchester Ave	Dry	Property Damage Only	Traffic Signal (Normal Operation)	No Prospect St	Unknown
10	10/17/2012	0	FAU-5014 Colchester Ave	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Right Turn and Thru, Broadside ^<--
10	10/25/2012	0	FAU-5014 Colchester Avenue	Dry	Property Damage Only	Traffic Signal (Normal Operation)	South Prospect Street	Left Turn and Thru, Angle Broadside -->v--
10	3/12/2013	0	FAU-5014 Colchester Ave	Wet	Injury	Traffic Signal (Normal Operation)	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
10	10/2/2013	0	FAU-5014 Colchester Ave	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Prospect St	Right Turn and Thru, Angle Broadside -->^--
10	11/12/2013	0	FAU-5014 Colchester Av./ Pearl St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
10	11/21/2013	0	FAU-5014 Colchester Ave	Dry	Injury	Traffic Signal (Normal Operation)	S Prospect St	Rear End

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
10	12/2/2013	0	FAU-5014 Colchester Ave	Wet	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Rear End
10	5/27/2014	0	Colchester Ave	Dry	Property Damage Only	No Control	N Prospect St	Rear End
10	9/2/2014	0	FAU-5014 Colchester Ave	Wet	Injury	Traffic Signal (Normal Operation)	S Prospect St	Head On
10	10/26/2015	0	Colchester Ave	Dry	Property Damage Only	unknown	S Prospect St	Rear End
10	10/27/2015	0	Colchester Ave	Unknown	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	No Turns, Thru moves only, Broadside ^<
10	11/17/2015	0	Colchester Ave	Dry	Property Damage Only	No Control	N Prospect St	Same Direction Sideswipe
10	12/8/2015	0	FAU-5014 Colchester Ave	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Rear End
10	5/14/2013	0.01	FAU-5014 (2 Colchester Ave)	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
10	2/25/2011	0.27	FAU 5050 (1 Prospect Street)	Snow	Property Damage Only	Traffic Signal (Normal Operation)	Colchester Ave	Rear End
10	2/1/2011	0.3	FAU 5050 (1 S Prospect Street)	Snow	Property Damage Only	No Control		Rear End
10	9/9/2011	0.3	FAU 5050 (S Prospect Street)	Dry	Property Damage Only	Traffic Signal (Normal Operation)	Pearl St	Unknown
10	11/11/2011	0.3	FAU 5050 (So Prospect St)	Dry	Property Damage Only	Traffic Signal (Normal Operation)	Colchester Ave	Left Turn and Thru, Angle Broadside -->v--
10	11/18/2011	0.3	FAU 5050 (S Prospect St)	Dry	Property Damage Only	No Control	Pearl St	Rear End
10	11/23/2011	0.3	FAU 5050 (S Prospect Street)	Snow	Property Damage Only	Traffic Signal (Normal Operation)	Colchester Ave	Same Direction Sideswipe
10	12/1/2011	0.3	1 South Prospect St	Dry	Property Damage Only	No Control	Pearl St	Same Direction Sideswipe
10	1/7/2012	0.3	FAU 5050 (S Prospect Street)	Slush	Injury	Traffic Signal (Normal Operation)	Pearl St	Rear End
10	2/1/2012	0.3	FAU 5050 (S Prospect Street)	Wet	Injury	Traffic Signal (Normal Operation)	Pearl St	Single Vehicle Crash
10	12/30/2012	0.3	FAU-5050 South Prospect Street	Slush	Property Damage Only	Traffic Signal (Normal Operation)	Pearl Street	Left Turn and Thru, Angle Broadside -->v--
10	5/1/2013	0.3	FAU-5050 South Prospect Street	Dry	Injury	Traffic Signal (Normal Operation)	Colchester Avenue	Rear End
10	7/17/2013	0.3	FAU-5050 S Prospect St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	Colchester Ave	Opp Direction Sideswipe
10	1/24/2012	0.91	FAU 5038 (Pearl Street)	Dry	Injury	unknown	N Prospect St	Rear End
10	7/11/2011	0.929	FAU 5038 (Pearl Street)	Dry	Property Damage Only	No Control	N Prospect St	Same Direction Sideswipe
10	1/20/2012	0.93	FAU 5038 (Pearl Street)	Unknown	Property Damage Only	No Control	No Prospect St	Rear End
10	6/29/2012	0.93	FAU-5038 Pearl Street	Dry	Property Damage Only	Traffic Signal (Normal Operation)	North Prospect Street	Rear End
10	6/4/2013	0.93	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Union	Rear End
10	11/23/2013	0.93	FAU-5038 Pearl St	Ice	Property Damage Only	unknown	N Prospect St	Right Turn and Thru, Head On v^--
10	10/16/2014	0.93	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Same Direction Sideswipe
10	1/23/2015	0.93	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Single Vehicle Crash
10	5/7/2015	0.93	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Opp Direction Sideswipe
10	10/16/2015	0.93	Colchester Ave	Wet	Property Damage Only	Traffic Signal (Normal Operation)	N Prospect St	Same Direction Sideswipe
10	11/7/2015	0.93	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	N Prospect St	Rear End
10	11/20/2015	0.93	FAU-5038 Pearl St	Dry	Injury	No Control	N Prospect St	Rear End
10	1/12/2011	0.94	FAU 5038 (Pearl Street)	Unknown	Property Damage Only	No Control	North Prospect	Same Direction Sideswipe
10	1/17/2011	0.94	FAU 5038 (Pearl Street)	Wet	Property Damage Only	Traffic Signal (Normal Operation)	Prospect Street	Left and Right Turns, Simultaneous Turn Crash --v--
10	4/17/2012	0.94	FAU-5038 Pearl St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
10	9/4/2012	0.94	FAU-5038 Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
10	10/26/2012	0.94	FAU-5038 Pearl St	Dry	Injury	No Control	N Willard St	Rear End
10	12/18/2012	0.94	FAU-5038 Pearl Street	Wet	Property Damage Only	Traffic Signal (Normal Operation)	South Prospect Street	Left Turn and Thru, Angle Broadside -->v--
10	5/24/2013	0.94	FAU-5038 Pearl St	Wet	Property Damage Only	Traffic Signal (Normal Operation)	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
10	6/9/2015	0.94	Pearl St	Wet	Injury	Traffic Signal (Normal Operation)	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
10	11/1/2015	0.94	Pearl St	Dry	Property Damage Only	Traffic Signal (Normal Operation)	s Prospect St	Head On
13	7/15/2014	0.15	FAU-5022 Main St	Dry	Property Damage Only	No Control	85 Pine St	Rear End
13	3/3/2015	0.15	FAU-5022(85 Main St)	Wet	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
13	1/2/2011	0.17	FAU Main Street	Slush	Property Damage Only	Traffic Signal	Pine St	Left Turn and Thru, Angle Broadside -->v--
13	3/9/2011	0.17	FAU 5022 (Main Street)	Wet	Property Damage Only	Traffic Signal	Pine St	Opp Direction Sideswipe
13	10/20/2011	0.17	FAU 5022 (Main Street)	Dry	Property Damage Only	Traffic Signal	Pine St	Opp Direction Sideswipe
13	2/3/2012	0.17	FAU 5022 (Main Street)	Dry	Injury	Traffic Signal	Pine St	Rear End

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FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
13	3/19/2012	0.17	FAU 5022 (Main Street)	Dry	Property Damage Only	Traffic Signal	Pine St	Rear End
13	7/14/2012	0.17	FAU-5022 Main St	Dry	Property Damage Only	unknown	Pine St	Left Turn and Thru, Angle Broadside -->v--
13	8/9/2012	0.17	FAU-5022 Main St	Wet	Injury	Traffic Signal	Pine St	Same Direction Sideswipe
13	1/3/2013	0.17	Main Street	Wet	Injury	Traffic Signal	Pine St	No Turns, Thru moves only, Broadside ^<
13	4/3/2013	0.17	FAU-5022 Main Street	Dry	Property Damage Only	Traffic Signal	Pine St	No Turns, Thru moves only, Broadside ^<
13	11/3/2013	0.17	FAU-5022 Main St		Property Damage Only	unknown	Pine St	Unknown
13	7/9/2014	0.17	Main St	Dry	Property Damage Only	Traffic Signal	Pine St	Unknown
13	10/11/2014	0.17	Main St	Dry	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
13	12/3/2014	0.17	Main St	Dry	Property Damage Only	Traffic Signal	Pine St	Rear End
13	12/13/2014	0.17	Main St	water (standing / moving)	Property Damage Only	No Control	Pine St	Same Direction Sideswipe
13	12/23/2014	0.17	FAU-5022 Main St	Wet	Injury	Traffic Signal	St Paul St	Single Vehicle Crash
13	2/21/2015	0.17	FAU-5022 Main St	Snow	Property Damage Only	Traffic Signal	Pine St	Rear End
13	2/27/2015	0.17	Main St	Dry	Property Damage Only	Traffic Signal	Pine St	Rear End
13	8/14/2015	0.17	Main St	Dry	Property Damage Only	No Control	Pine St	Unknown
13	12/9/2015	0.17	FAU-5022 Main St	Dry	Property Damage Only	unknown	Pine St	Rear End
13	11/18/2015	0.18	FAU-5022 Main St	Dry	Property Damage Only	No Control	Pine St	Head On
13	5/2/2012	1.41	FAU-5040 Pine St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
13	5/2/2013	1.41	FAU-5040 Pine St	Dry	Property Damage Only	No Control	Main St	Rear End
13	6/22/2014	1.41	FAU-5040 Pine St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
13	8/27/2014	1.41	Pine St	Dry	Property Damage Only	Traffic Signal	Main St	Unknown
13	10/14/2014	1.41	FAU-5040 Pine St./Main St	Dry	Property Damage Only	No Control	Pine St	No Turns, Thru moves only, Broadside ^<
13	12/3/2014	1.41	FAU-5040 Pine St	Dry	Property Damage Only	No Control	Main St	Unknown
14	1/31/2011	0.22	FAU 5022 (111 Main Street)	Dry	Property Damage Only	No Control	St Paul St	Same Direction Sideswipe
14	5/25/2013	0.22	FAU-5022 (111 Main St)	Wet	Property Damage Only	Traffic Signal	Main St	Unknown
14	6/12/2015	0.24	Main St	Dry	Property Damage Only	No Control	St Paul St	No Turns, Thru moves only, Broadside ^<
14	9/4/2011	0.25	FAU 5022 (Main St)	Dry	Property Damage Only	Traffic Signal	St Paul St	Left Turn and Thru, Broadside v<--
14	12/3/2011	0.25	FAU 5022 (Main Street)	Dry	Injury	Traffic Signal	St Paul St	Unknown
14	6/13/2012	0.25	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Unknown
14	7/9/2013	0.25	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Rear End
14	9/4/2013	0.25	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	St Paul St	Same Direction Sideswipe
14	10/1/2013	0.25	FAU-5022 Main St		Injury	unknown	St Paul St	Unknown
14	3/5/2014	0.25	FAU-5022 Main St	Dry	Injury	Traffic Signal	St Paul St	Unknown
14	6/30/2014	0.25	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	St Paul St	Rear End
14	10/1/2014	0.25	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	St Paul St	Rear End
14	10/17/2014	0.25	Main St	Dry	Property Damage Only	Traffic Signal	St Paul St	Same Direction Sideswipe
14	12/26/2014	0.25	Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
14	1/10/2015	0.25	FAU 5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Rear End
14	4/27/2015	0.25	Main St	Wet	Property Damage Only	No Control	St Paul St	Rear End
14	6/12/2015	0.25	FAU-5022 Main St	Wet	Property Damage Only	Traffic Signal	St Paul St	Unknown
14	9/10/2015	0.25	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Same Direction Sideswipe
14	11/3/2015	0.25	Main St	Dry	Property Damage Only	No Control	St Paul St	Unknown
14	3/3/2012	0.26	FAU 5022 (Main Street)	Dry	Property Damage Only	No Control	St Paul St	Rear End
14	6/8/2012	0.26	FAU-5022 Main Street	Dry	Property Damage Only	Traffic Signal	St. Paul Street	Left and Right Turns, Simultaneous Turn Crash --v--
14	11/7/2012	0.26	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	St Paul St	Same Direction Sideswipe
14	12/13/2012	0.26	FAU-5022 Main Street	Dry	Property Damage Only	Traffic Signal	Pine Street	Same Direction Sideswipe
14	12/2/2013	0.26	FAU-5022 Main St		Property Damage Only	unknown	St Paul St	Unknown
14	3/18/2014	0.26	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Rear End

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FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
14	5/10/2014	0.26	FAU-5022 Main St	Wet	Property Damage Only	unknown	St Paul St	Unknown
14	6/7/2014	0.26	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Left Turn and Thru, Broadside v<--
14	2/16/2013	0.27	FAU-5022 Main St	Dry	Property Damage Only	No Control	St Paul St	Same Direction Sideswipe
14	8/8/2014	0.28	FAU-5022 Main St	Dry	Property Damage Only	No Control	Church St	Rear End
14	7/27/2011	0.57	FAU-5048 (152 St Paul St)	Dry	Property Damage Only	Traffic Signal	King St	Unknown
14	3/11/2011	0.58	FAU 5046 (150 ST. PAUL STREET)		Property Damage Only	unknown		Unknown
14	12/3/2012	0.58	FAU-5046 (150 St Paul Street)	Unknown	Property Damage Only	No Control	N/A	No Turns, Thru moves only, Broadside ^<
14	4/9/2011	0.59	FAU-5046 St. Paul/Main St.	Dry	Property Damage Only	Traffic Signal	St. Paul/Main St.	Rear End
14	8/25/2011	0.6	FAU 5046 (St Paul Street)	Wet	Property Damage Only	Traffic Signal	Pearl St	Rear End
14	9/15/2011	0.6	FAU 5046 (St Paul Street)	Wet	Injury	Traffic Signal	Main St	Rear End
14	1/16/2012	0.6	FAU 5046 (St Paul Street)	Dry	Injury	Traffic Signal	Main St	Unknown
14	6/18/2012	0.6	FAU-5046 St Paul Street	Dry	Property Damage Only	No Control	Main Street	Unknown
14	6/23/2012	0.6	FAU-5046 St Paul St	Dry	Injury	Traffic Signal	Main St	Unknown
14	10/14/2012	0.6	FAU-5046 St Paul St	Wet	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
14	12/7/2012	0.6	FAU-5046 (125 St Paul Street)	Dry	Property Damage Only	No Control	N/A	Rear-to-rear
14	8/7/2015	0.6	FAU-5046 St Paul St	Unknown	Property Damage Only	All-way Flasher (Red on Cross Street)	Main St	Same Direction Sideswipe
15	2/12/2011	0.38	FAU 5022 (#188 Main Street)	Wet	Property Damage Only	No Control		Unknown
15	4/22/2011	0.38	FAU-5022 (188 Main St)	Dry	Property Damage Only	No Control	Church St	Same Direction Sideswipe
15	7/12/2011	0.38	FAU 5022 (188 Main St)	Dry	Property Damage Only	No Control	Nectars	Left Turn and Thru, Angle Broadside -->v--
15	3/21/2012	0.38	FAU 5022 (188 Main Street)	Dry	Injury	No Control	So Winooski Ave	Rear End
15	12/30/2012	0.38	FAU-5022 (188 Main Street)	Wet	Property Damage Only	No Control	South Winooski Avenue	Rear End
15	2/18/2014	0.38	FAU-5022 (188 Main St)	Wet	Property Damage Only	No Control	Nectar's Bar	Same Direction Sideswipe
15	2/18/2014	0.38	188 Main St	Wet	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	12/19/2014	0.38	FAU-5022 (190 Main St)	Dry	Property Damage Only	No Control	S Winooski Ave	Same Direction Sideswipe
15	1/24/2015	0.38	FAU-5022 (188 Main St)	Dry	Property Damage Only	No Control	Church St	Unknown
15	10/14/2015	0.38	FAU-5022 (194 Main St)	Dry	Injury	No Control	Esox	Right Turn and Thru, Broadside ^<--
15	1/18/2011	0.39	FAU 5022 (Main Street)	Snow	Property Damage Only	No Control	IFO E Sox Bar	Left and Right Turns, Simultaneous Turn Crash --wv--
15	6/7/2011	0.39	US-2 (200 Main Street)	Dry	Property Damage Only	No Control	South Winooski Avenue	Rear End
15	6/7/2011	0.39	FAU-5022 (200 Main Street)	Dry	Property Damage Only	No Control	South Winooski Avenue	No Turns, Thru moves only, Broadside ^<
15	8/4/2011	0.39	FAU-5022 (194 Main St)	Dry	Property Damage Only	No Control	194 Main St	Same Direction Sideswipe
15	8/12/2011	0.39	FAU 5022 (Main Street)	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	6/15/2012	0.39	FAU-5022 (194 Main Street)	Dry	Property Damage Only	No Control	N/A	Rear End
15	9/19/2014	0.39	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
15	6/7/2011	0.4	FAU-5022 (200 Main Street)	Dry	Property Damage Only	No Control	South Winooski Avenue	Rear End
15	7/25/2013	0.4	FAU-5022 (202 Main St)	Dry	Injury	No Control	Main St	Rear End
15	9/25/2013	0.4	FAU-5022 (199 Main St)	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	10/26/2013	0.4	FAU-5022 (202 Main St)		Property Damage Only	unknown	Main Street	Unknown
15	12/29/2013	0.4	FAU-5022 Main St	Wet	Property Damage Only	No Control	S Winooski Ave	Rear-to-rear
15	3/14/2014	0.4	FAU-5022 (199 Main St)	Snow	Property Damage Only	No Control	199 Main St	Left Turn and Thru, Angle Broadside -->v--
15	1/31/2015	0.4	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Unknown
15	4/12/2015	0.4	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	9/3/2015	0.4	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Unknown
15	11/18/2015	0.4	Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Head On
15	1/16/2011	0.41	FAU 5022 (Main Street)	Snow	Property Damage Only	unknown	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
15	4/1/2011	0.41	FAU-5022 Main St	Wet	Injury	unknown	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
15	4/25/2011	0.41	FAU-5022 (Main Street)	Dry	Injury	Traffic Signal	South Winooski Avenue	No Turns, Thru moves only, Broadside ^<
15	6/17/2011	0.41	FAU-5022 Main St	Dry	Property Damage Only	unknown	S Winooski Ave	Unknown

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FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
15	7/23/2011	0.41	FAU 5022 (Main Street)	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	9/2/2011	0.41	FAU 5022 (Main Street)	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	10/9/2011	0.41	FAU-5022 Main St	Dry	Property Damage Only	No Control	So Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	10/16/2011	0.41	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	11/3/2011	0.41	FAU 5022 (Main Street)	Wet	Property Damage Only	Traffic Signal	S Winooski Ave	Head On
15	1/27/2012	0.41	FAU 5022 (Main Street)	Wet	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	2/17/2012	0.41	FAU 5022 (Main Street)	Dry	Property Damage Only	unknown	S Winooski Ave	Unknown
15	2/26/2012	0.41	FAU 5022 (Main Street)	Dry	Property Damage Only	No Control	S Winooski Ave	No Turns, Thru moves only, Broadside ^<
15	5/10/2012	0.41	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	7/20/2012	0.41	FAU-5022 Main St		Property Damage Only	Traffic Signal	S Winooski Ave	Unknown
15	8/20/2012	0.41	FAU-5022 MAIN ST	Dry	Injury	Traffic Signal	S WINOOSKI AVE	Rear End
15	8/20/2012	0.41	FAU-5022 Main St	Dry	Property Damage Only	No Control	Church St	No Turns, Thru moves only, Broadside ^<
15	8/27/2012	0.41	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	3/15/2013	0.41	FAU-5022 Main Street	Dry	Property Damage Only	Traffic Signal	South Winooski Avenue	Rear End
15	5/24/2013	0.41	FAU-5022 Main St	Wet	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	6/20/2013	0.41	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	6/28/2013	0.41	FAU-5022(199 Main Street)	Wet	Property Damage Only	No Control	South Winooski Ave	No Turns, Thru moves only, Broadside ^<
15	8/29/2013	0.41	FAU-5022 (199 Main St)	Dry	Property Damage Only	No Control	Church St	Rear End
15	12/20/2013	0.41	FAU-5022 Main St	Snow	Property Damage Only	No Control	S Winooski Ave	Rear End
15	4/9/2014	0.41	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Single Vehicle Crash
15	5/10/2014	0.41	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	5/30/2014	0.41	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	8/1/2014	0.41	Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	11/30/2014	0.41	FAU-5022 Main St	Wet	Property Damage Only	No Control	S Winooski Ave	Same Direction Sideswipe
15	2/16/2015	0.41	FAU-5022 Main St	Slush	Property Damage Only	No Control	S Winooski Ave	Rear-to-rear
15	7/16/2015	0.41	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	8/21/2015	0.41	Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	9/5/2015	0.41	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	3/10/2011	0.42	FAU 5022 (199 Main Street)	Dry	Property Damage Only	unknown		Unknown
15	5/3/2012	0.42	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	7/2/2012	0.42	FAU-5022 (219 Main St)	Dry	Property Damage Only	No Control	Main St	Opp Direction Sideswipe
15	10/12/2012	0.42	Main Street	Dry	Property Damage Only	No Control	South Winooski Avenue	Left Turn and Thru, Angle Broadside -->v--
15	2/9/2013	0.42	FAU-5022 Main St	Snow	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	3/10/2013	0.42	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	6/7/2013	0.42	FAU- 5022 Main St	Wet	Property Damage Only	No Control	S Winooski Ave	Same Direction Sideswipe
15	8/9/2013	0.42	FAU-5022 Main St		Property Damage Only	unknown	S Winooski Ave	Unknown
15	10/19/2013	0.42	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Unknown
15	11/4/2013	0.42	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	7/8/2014	0.42	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	7/21/2014	0.42	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Left Turns, Same Direction, Rear End v--v--
15	12/6/2014	0.42	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Right Turn and Thru, Broadside ^<--
15	4/25/2015	0.42	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear-to-rear
15	5/15/2015	0.42	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Same Direction Sideswipe
15	6/6/2015	0.42	Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Same Direction Sideswipe
15	10/3/2015	0.42	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	6/30/2015	0.43	Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	9/27/2014	0.44	Main St	Dry	Injury	No Control	S Winooski Ave	No Turns, Thru moves only, Broadside ^<

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
15	5/23/2011	0.99	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
15	6/29/2011	0.99	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	No Control	Main St	Rear End
15	9/1/2011	0.99	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	2/15/2012	0.99	ALTUS-7 (So Winooski Ave)	Wet	Property Damage Only	No Control	Main St	Same Direction Sideswipe
15	2/28/2012	0.99	ALTUS-7 (S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
15	9/23/2011	0.997	ALTUS-7 (So Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	1/28/2011	1	ALTUS-7 (S Winooski Ave)	Wet	Property Damage Only	No Control	Main Street	Same Direction Sideswipe
15	2/8/2011	1	ALTUS-7 (S Winooski Ave)	Snow	Property Damage Only	Traffic Signal	Main Street	Left Turn and Thru, Angle Broadside -->v--
15	5/23/2011	1	ALTUS-7 (S. Winooski Ave)	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
15	7/30/2011	1	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	Traffic Signal	Main St	Rear End
15	12/27/2011	1	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	Traffic Signal	Main St	Head On
15	4/7/2012	1	Alt. US-7 S Winooski Ave/Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	5/4/2012	1	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	Traffic Signal	Main St	Rear End
15	6/22/2012	1	Alt. US-7 S Winooski Avenue	Dry	Property Damage Only	No Control	Main Street	Same Direction Sideswipe
15	7/29/2012	1	Alt. US-7 S Winooski Ave/Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	12/8/2012	1	Alt. US-7 S Winooski Avenue	Dry	Property Damage Only	Traffic Signal	Main Street	Rear End
15	12/13/2012	1	Alt. US-7 South Winooski Avenue	Wet	Property Damage Only	No Control	Main Street	Single Vehicle Crash
15	2/4/2013	1	South Winooski Avenue	Dry	Property Damage Only	No Control	Main Street	Opp Direction Sideswipe
15	5/3/2013	1	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	No Control	Main St	Same Direction Sideswipe
15	9/20/2013	1	Alt US-7 S Winooski Ave	Dry	Injury	Traffic Signal	Main St	Unknown
15	11/1/2013	1	Alt. US-7 S Winooski Ave/Main St		Property Damage Only	unknown	S Winooski Ave	Unknown
15	11/9/2013	1	Alt. US-7 S Winooski Ave/Main St	Dry	Property Damage Only	No Control	S Winooski Ave	Rear End
15	11/11/2013	1	Alt. US-7 S Winooski Ave		Property Damage Only	unknown	Main St	Unknown
15	11/18/2013	1	Alt. US-7 S Winooski Ave	Wet	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	12/31/2013	1	Alt. US-7 S Winooski Ave	Unknown	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	12/31/2013	1	Alt. US-7 S Winooski Ave	Snow	Property Damage Only	No Control	Main St	Unknown
15	1/3/2014	1	Alt. US-7 S Winooski Ave/Main St	Snow	Property Damage Only	Traffic Signal	S Winooski Ave	Rear End
15	2/8/2014	1	S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	5/3/2014	1	Alt. US-7 S Winooski Ave	Dry	Injury	No Control	Main St	Rear End
15	5/31/2014	1	Alt. US-7 Winooski Ave./188 Main St	Dry	Property Damage Only	No Control	Main St	Same Direction Sideswipe
15	9/16/2014	1	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	9/20/2014	1	Alt. US-7 S Winooski Ave/Main St	Dry	Injury	Traffic Signal	S Winooski Ave	Single Vehicle Crash
15	11/9/2014	1	S Winooski	Dry	Property Damage Only	Traffic Signal	Main St	Left Turn and Thru, Angle Broadside -->v--
15	12/8/2014	1	Alt. US 7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
15	12/9/2014	1	Alt. US 7 S. Winooski Av./Main St	Slush	Property Damage Only	Traffic Signal	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	1/23/2015	1	Alt. US 7 S. Winooski Av./Main St	Dry	Injury	Traffic Signal	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	1/31/2015	1	Alt. US 7 S Winooski Ave	Wet	Property Damage Only	No Control	Main St	Unknown
15	5/28/2015	1	Alt. US-7 S. Winooski Av./Main St	Dry	Property Damage Only	Traffic Signal	S Winooski Ave	Left Turn and Thru, Angle Broadside -->v--
15	6/17/2015	1	S Winooski Ave	Dry	Property Damage Only	No Control	Intersection With Main St	Unknown
15	6/29/2015	1	S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Main St	Left Turn and Thru, Angle Broadside -->v--
15	7/2/2015	1	Alt. US-7 S Winooski Ave	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
15	8/11/2015	1	Alt US-7 South Winooski Ave	Wet	Property Damage Only	Traffic Signal	Main St	Head On
15	12/15/2015	1	Alt. US-7 S. Winooski Av./Main St	Wet	Property Damage Only	Traffic Signal	S Winooski Ave	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
15	10/4/2013	1.02	Alt. US-7 S Winooski Av	Dry	Injury	No Control	Main St	Unknown
15	9/6/2013	1.03	Alt. US-7 (136 S Winooski Ave)	Dry	Property Damage Only	Traffic Signal	MAin St	Same Direction Sideswipe
16	2/8/2015	0.5	FAU-5022 (250 Main St)	Snow	Property Damage Only	No Control	Side Driveway	No Turns, Thru moves only, Broadside ^<
16	4/10/2012	0.52	FAU 5022 (Main Stret)	Dry	Injury	Traffic Signal	S Union St	Rear End

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
16	4/24/2012	0.52	FAU 5022 (Main St)	Wet	Property Damage Only	Traffic Signal	S Union St	Same Direction Sideswipe
16	8/22/2013	0.52	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	6/22/2011	0.53	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	South Union St	Rear End
16	12/8/2011	0.53	FAU 5022 (Main Street)	Snow	Property Damage Only	Traffic Signal	S Union St	Same Direction Sideswipe
16	4/15/2012	0.53	FAU-5022 Main St	Dry	Injury	Traffic Signal	S Union St	Single Vehicle Crash
16	5/22/2012	0.53	FAU-5022 Main St	Dry	Property Damage Only	All-way Flasher (Red on Cross Street)	S Union St	Unknown
16	7/12/2012	0.53	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Union St	Rear-to-rear
16	8/4/2012	0.53	FAU-5022 (250 Main St)	Dry	Property Damage Only	No Control	So Union St/ College St	Unknown
16	10/25/2012	0.53	FAU-5022 Main Street	Dry	Property Damage Only	Traffic Signal	South Union Street	No Turns, Thru moves only, Broadside ^<
16	1/2/2013	0.53	FAU-5022 Main Street	Wet	Property Damage Only	No Control	South Union Street	Rear End
16	1/20/2013	0.53	FAU-5022 Main Street	Unknown	Property Damage Only	Traffic Signal	South Union Street	Unknown
16	1/28/2013	0.53	FAU-5022 Main Street	Snow	Property Damage Only	No Control	South Union Street	Rear End
16	3/26/2013	0.53	FAU-5022 Main St	Dry	Injury	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	1/20/2014	0.53	FAU-5022 Main St	Ice	Property Damage Only	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	1/29/2014	0.53	FAU-5022 Main St	Slush	Property Damage Only	unknown	S Union St	Single Vehicle Crash
16	2/5/2014	0.53	FAU-5022 Main St	Snow	Property Damage Only	No Control	S Union St	Unknown
16	2/17/2014	0.53	Main St	Dry	Injury	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	3/11/2014	0.53	FAU-5022 Main St	Wet	Property Damage Only	No Control	S Union St	Rear End
16	4/19/2014	0.53	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	7/5/2014	0.53	FAU-5022 Main St	Dry	Injury	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	11/17/2014	0.53	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Union St	Unknown
16	2/20/2015	0.53	Main St	Wet	Property Damage Only	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	4/29/2015	0.53	Main St	Dry	Property Damage Only	Traffic Signal	S Union St	Rear End
16	5/1/2015	0.53	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Union St	Same Direction Sideswipe
16	7/28/2015	0.53	Main St	Dry	Property Damage Only	Traffic Signal	S Union St	No Turns, Thru moves only, Broadside ^<
16	12/5/2015	0.53	Main St	Dry	Property Damage Only	No Control	S Union St	Same Direction Sideswipe
16	9/9/2014	0.54	FAU-5022 (266 Main St)	Dry	Property Damage Only	No Control	S Union St	Rear End
16	1/20/2011	0.55	FAU (266 Main Street)	Dry	Property Damage Only	No Control	S Union Street	Same Direction Sideswipe
16	6/10/2011	0.56	FAU-5022 (275 Main St)		Injury	No Control	Edmunds School	Right Turn and Thru, Broadside ^<--
16	10/8/2012	0.56	FAU-5022 (275 Main Street)	Dry	Property Damage Only	No Control	N/A	Same Direction Sideswipe
17	1/8/2011	0	US-2 Main St.	Snow	Property Damage Only	Traffic Signal	S. Willard St.	Rear End
17	2/5/2011	0	US-2 (Main Street)	Wet	Property Damage Only	Traffic Signal	S Willard Street	Left Turn and Thru, Angle Broadside -->v--
17	2/15/2011	0	US-2 (Main Street)	Dry	Property Damage Only	Traffic Signal	Willard Street	Same Direction Sideswipe
17	3/20/2011	0	US-2 (253 Main Street)	Dry	Property Damage Only	Traffic Signal	S Willard Street	Rear End
17	5/21/2011	0	US-2 Main Street		Property Damage Only	unknown	South Willard Street	Unknown
17	9/9/2011	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	10/6/2011	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Same Direction Sideswipe
17	10/30/2011	0	US-2 (Main Street)	Dry	Property Damage Only	Traffic Signal	Willard St	Rear End
17	1/15/2012	0	US-2 (Main Street)	Wet	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	4/16/2012	0	US-2 Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	9/3/2012	0	Main St	Dry	Property Damage Only	No Control	S Willard St	No Turns, Thru moves only, Broadside ^<
17	9/22/2012	0	US-2 Main St	Wet	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	11/2/2012	0	US-2 Main Street	Dry	Property Damage Only	Traffic Signal	South Willard Street	Same Direction Sideswipe
17	4/2/2013	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Broadside v<--
17	4/3/2013	0	US-2 Main Street	Dry	Property Damage Only	Traffic Signal	South Willard Street	Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--
17	4/17/2013	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Unknown
17	8/13/2013	0	US-2 Main St	Wet	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
17	11/18/2013	0	US-2 Main St	Dry	Property Damage Only	unknown	S Willard St	Rear End
17	12/28/2013	0	US-2 Main St	Wet	Property Damage Only	Traffic Signal	S Willard St	No Turns, Thru moves only, Broadside ^<
17	2/21/2014	0	US-2 Main St	Wet	Property Damage Only	Traffic Signal	s Willard St	Rear End
17	4/3/2014	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	4/8/2014	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	5/1/2014	0	Main St	Wet	Injury	Traffic Signal	S Willard St	Rear End
17	5/25/2014	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	6/2/2014	0	US-2 Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	7/23/2014	0	US-2 Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	8/5/2014	0	US-2 Main St	Dry	Injury	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	8/13/2014	0	US-2 Main St	Wet	Property Damage Only	No Control	S Willard St	Rear End
17	8/23/2014	0	Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	8/30/2014	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Same Direction Sideswipe
17	9/5/2014	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Same Direction Sideswipe
17	10/2/2014	0	US-2 Main St	Dry	Property Damage Only	Stop Signs on Cross Street Only	S Willard St	Rear End
17	11/7/2014	0	US-2 Main St	Other - Explain in Narrative	Property Damage Only	Traffic Signal	S Willard St	Unknown
17	12/11/2014	0	Main St	Snow	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	1/1/2015	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Same Direction Sideswipe
17	1/3/2015	0	Main St @ Willard St	Snow	Property Damage Only	Traffic Signal	Main St @ Willard St	Left Turn and Thru, Angle Broadside -->v--
17	2/2/2015	0	US-2 Main St	Snow	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	2/28/2015	0	US-2 Main St	Dry	Property Damage Only	No Control	S Willard St	Unknown
17	4/23/2015	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Same Direction Sideswipe
17	7/3/2015	0	Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	8/29/2015	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Unknown
17	9/5/2015	0	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	3/20/2011	0.01	US-2 (350 Main St)	Dry	Property Damage Only	Traffic Signal	So Willard St	Rear End
17	2/24/2011	0.02	US-2 (360 Main St)	Dry	Property Damage Only	No Control	S Williams St	Same Direction Sideswipe
17	7/30/2015	0.02	Main St	Wet	Property Damage Only	No Control	S Willard St	Rear End
17	7/29/2015	0.03	Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	10/16/2013	0.7	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Willard St	Unknown
17	4/13/2012	0.71	FAU-5022Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	4/14/2012	0.71	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	4/16/2012	0.71	FAU-5022 Main St	Dry	Property Damage Only	Traffic Signal	Prospect St	Rear End
17	8/1/2012	0.71	FAU-5022 Main St	Dry	Property Damage Only	No Control	S Willard St	Rear End
17	11/10/2012	0.71	FAU-5022 Main Street	Dry	Injury	No Control	South Prospect Street	Rear End
17	7/9/2013	2.09	US-7 Riverside Ave		Property Damage Only	unknown	N Winooski Ave	Unknown
17	8/7/2015	2.09	US-7 Riverside Ave	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Same Direction Sideswipe
17	10/10/2011	2.1	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
17	7/4/2013	2.1	US-7 Riverside Ave		Property Damage Only	unknown	N Winooski Ave	Unknown
17	10/5/2013	2.1	US-7 Riverside Ave	Dry	Property Damage Only	Traffic Signal	N Winooski Ave	Rear End
17	8/27/2011	2.12	US-7 S Willard St/Main St	Dry	Injury	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	10/31/2011	2.12	US-7 (S Willard Street)	Dry	Property Damage Only	Traffic Signal	Main St	Right Turn and Thru, Broadside ^<--
17	3/26/2012	2.12	US-7 (S Willard Street)	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
17	5/29/2012	2.12	US-7 South Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
17	6/29/2012	2.12	US-7 S. Willard St./Main St	Dry	Property Damage Only	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	7/7/2012	2.12	US-7 S Willard St	Dry	Injury	Traffic Signal	Main St	Rear End
17	9/8/2012	2.12	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Rear End

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FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
17	9/20/2012	2.12	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Rear End
17	1/22/2013	2.12	US-7 South Willard Street	Wet	Property Damage Only	Traffic Signal	Main Street	Rear End
17	9/4/2013	2.12	US-7 S Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
17	11/2/2013	2.12	US-7 S Willard St/Main St	Wet	Injury	Traffic Signal	S Willard St	Left Turn and Thru, Angle Broadside -->v--
17	3/14/2014	2.12	US-7 S. Willard St./Main St	Sand, mud, dirt, oil, gravel	Property Damage Only	Traffic Signal	S Willard St	Rear End
17	8/7/2014	2.12	US-7 S Willard St	Wet	Property Damage Only	Traffic Signal	Main St	Rear End
17	8/11/2014	2.12	S Willard St	Dry	Property Damage Only	Traffic Signal	Main St	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--
17	9/15/2014	2.12	S Willard St	Dry	Property Damage Only	unknown	Main St	Rear End
17	11/5/2014	2.12	S Willard St	Unknown	Injury	Traffic Signal (Flashing)	Main St	Right Turn and Thru, Broadside ^<--
17	2/10/2015	2.12	S Willard St	Slush	Property Damage Only	Traffic Signal	Main St	Rear End
17	4/6/2015	2.12	US-7 S Willard St	Unknown	Property Damage Only	No Control	Main St	Unknown
18	1/23/2011	0	FAU 5050 (S Prospect Street)	Dry	Property Damage Only	No Control	Main Street	Same Direction Sideswipe
18	5/11/2012	0	FAU-5050 S Prospect St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
18	7/17/2012	0	FAU-5050 S Prospect St	Wet	Property Damage Only	unknown	Main St	Rear End
18	9/12/2012	0	FAU-5050 S Prospect St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
18	7/9/2013	0	FAU-5050 (2 South Prospect Street)	Dry	Property Damage Only	No Control	Main Street	Head On
18	12/13/2015	0	FAU-5050 S Prospect St	Dry	Property Damage Only	Traffic Signal	Main St	Same Direction Sideswipe
18	11/14/2012	0.01	FAU-5050 South Prospect Street	Dry	Property Damage Only	No Control	Main Street	No Turns, Thru moves only, Broadside ^<
18	8/13/2013	0.21	US-2 Main St		Property Damage Only	unknown	S Prospect St	Unknown
18	5/11/2015	0.21	Main St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
18	1/13/2011	0.23	US-2 Main St.	Slush	Property Damage Only	Traffic Signal	S. Prospect St.	Rear End
18	1/23/2011	0.23	US-2 (Main Street)	Not Reported	Injury	Traffic Signal	S Prospect	Rear End
18	1/27/2011	0.23	US-2 (Main Street)	Wet	Property Damage Only	No Control	S Prospect Street	Rear End
18	2/5/2011	0.23	US-2 (Main Street)	Snow	Property Damage Only	No Control	S Prospect Street	Rear End
18	2/26/2011	0.23	US-2 (Main Street)	Dry	Property Damage Only	Traffic Signal	Prospect Street	Same Direction Sideswipe
18	4/19/2011	0.23	US-2 Main St / S. Prospect Street	Dry	Injury	Traffic Signal	Main Street / South Prospect Street	Rear End
18	5/11/2011	0.23	US-2 (590 Main St)	Dry	Property Damage Only	Traffic Signal	Prospect St	Rear End
18	7/16/2011	0.23	US-2 (Main St)	Dry	Injury	Traffic Signal	S Prospect St	Rear End
18	8/10/2011	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	So Prospect St	Same Direction Sideswipe
18	9/15/2011	0.23	US-2 Main St	Unknown	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	4/18/2012	0.23	US-2 (Main Street)	Dry	Property Damage Only	No Control	South Prospect	Left and Right Turns, Simultaneous Turn Crash --v--
18	5/14/2012	0.23	US-2 Main St	Dry	Property Damage Only	All-way Stop Signs	So Prospect St	Rear End
18	6/2/2012	0.23	US-2 Main Street	Wet	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	7/5/2012	0.23	US-2 Main Street	Dry	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	7/11/2012	0.23	US-2 Main St		Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	7/16/2012	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	9/13/2012	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	9/27/2012	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	10/2/2012	0.23	US-2 Main Street	Dry	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	10/10/2012	0.23	US-2 Main St/So Prospect St	Dry	Injury	Traffic Signal	Main St	Unknown
18	11/10/2012	0.23	US-2 Main St	Dry	Injury	No Control	S Prospect St	Same Direction Sideswipe
18	1/3/2013	0.23	US-2 Main Street	Slush	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	1/6/2013	0.23	US-2 Main Street	Slush	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	2/6/2013	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	2/22/2013	0.23	US-2 Main Street	Wet	Property Damage Only	Traffic Signal	South Prospect Street	Rear End
18	3/7/2013	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	6/6/2013	0.23	US-2 Main St	Wet	Property Damage Only	No Control	S Prospect St	Same Direction Sideswipe

Report results from the online Public Query Tool may not match exactly with those obtained directly from VTrans Crash staff due to the nuances of reporting mechanisms.

FIGURE 5-A

Int. ID #	Date	AOT MM	Street Address	Surface Condition	Crash Type	Traffic Signals	Intersection With	Dir. of Collision
18	6/6/2013	0.23	US-2 Main St	Wet	Property Damage Only	No Control	Prospect St	Rear End
18	6/18/2013	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	8/15/2013	0.23	US-2 Main St	Unknown	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	10/4/2013	0.23	US-2 Main St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
18	10/23/2013	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect	Same Direction Sideswipe
18	11/21/2013	0.23	US-2 Main St	Dry	Injury	Traffic Signal	S Prospect St	Rear End
18	1/20/2014	0.23	US-2 Main St		Property Damage Only	unknown	South Prospect St	Unknown
18	1/28/2014	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	3/13/2014	0.23	Main St	Snow	Property Damage Only	Traffic Signal	S Prospect St	Left Turn and Thru, Angle Broadside -->v--
18	4/2/2014	0.23	Main St	Wet	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	5/7/2014	0.23	Main St		Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	5/14/2014	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	No Turns, Thru moves only, Broadside ^<
18	6/6/2014	0.23	US-2 Main St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
18	6/18/2014	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	8/29/2014	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Right Turn and Thru, Angle Broadside -->^--
18	11/1/2014	0.23	Main St	Wet	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	12/7/2014	0.23	Main St	Dry	Injury	Traffic Signal	S Prospect St	Unknown
18	12/23/2014	0.23	US-2 Main St	Wet	Property Damage Only	No Control	S Prospect St	Rear End
18	12/30/2014	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	1/5/2015	0.23	Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	2/5/2015	0.23	Main St	Snow	Property Damage Only	unknown	S Prospect St	Single Vehicle Crash
18	3/11/2015	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Left and Right Turns, Simultaneous Turn Crash --vv--
18	3/29/2015	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	5/6/2015	0.23	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	5/8/2015	0.23	Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	6/10/2015	0.23	Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Same Direction Sideswipe
18	8/27/2015	0.23	US-2 Main St	Dry	Property Damage Only	No Control	Summit St	Rear End
18	10/16/2015	0.23	Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Head On
18	11/10/2015	0.23	US-2 Main St	Dry	Property Damage Only	No Control	S Prospect St	Same Direction Sideswipe
18	12/16/2015	0.23	Main St	Dry	Injury	Traffic Signal	S Prospect St	No Turns, Thru moves only, Broadside ^<
18	12/16/2015	0.23	Main St	Dry	Property Damage Only	unknown	S Prospect St	Rear End
18	3/20/2011	0.24	US-2 (Main St)	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	8/11/2011	0.24	US-2 (Main Street)	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	8/29/2013	0.24	US-2 (461 Main Street)		Property Damage Only	unknown	South Prospect St	Unknown
18	9/1/2013	0.24	Main St	Dry	Property Damage Only	No Control	Prosepect St	Same Direction Sideswipe
18	8/5/2015	0.24	US-2 Main St	Dry	Property Damage Only	Traffic Signal	S Prospect St	Rear End
18	10/17/2015	0.25	Main St	Dry	Property Damage Only	No Control	S Prospect St	Rear End
18	7/29/2014	0.26	Main St	Dry	Property Damage Only	No Control	S Prospect St	Same Direction Sideswipe



Adjustment Factors (Seasonal / DHV and Growth)

FIGURE 5-A

 Computations			
		Project: Burlington Town Center TIS	Project #: 57881.00
		Location: Burlington, VT	Sheet: _____
		Calculated by: ELQ	Date: 12/6/16
		Checked by: _____	Date: _____
		Title: DHV Adjustment Factors	
Year: 2010			
		TM Count: 18 *AADT from ATR	
ATR ID	D162	ATR/CTC Year	2016
		ATR/CTC AADT*	16,517
		2016-2010 Growth	0.97
		Corr. AADT	16,021
K Factor	0.106 Poll Group 3	DHV (Equation)	use k factor
Monthly Adjust	1	DHV (K-Factor)	1,698
DHV Adjustment	1.22	Corr. Count	1,393
2010 - 2019 Growth	1.050	TM Count Year	2010
Total Adjustment	1.28 (min. of 1.00)	Analysis Year 1	2019
Year: 2013			
		TM Count: 10 *AADT from ATR	
ATR ID	D155	ATR/CTC Year	2013
		ATR/CTC AADT*	11,300
		2013-2010 Growth	0.98
		Corr. AADT	11,300
K Factor	0.106 Poll Group 3	DHV (Equation)	use k factor
Monthly Adjust	1	DHV (K-Factor)	1,198
DHV Adjustment	1.15	Corr. Count	1,046
2010 - 2019 Growth	1.050	TM Count Year	2010
Total Adjustment	1.20 (min. of 1.00)	Analysis Year 1	2019
Year: 2014			
		TM Count: 5 *AADT from ATR	
ATR ID	D096	ATR/CTC Year	2016
		ATR/CTC AADT*	17,705
		2016-2014 Growth	0.99
		Corr. AADT	17,528
K Factor	0.106 Poll Group 3	DHV (Equation)	use k factor
Monthly Adjust	1	DHV (K-Factor)	1,858
DHV Adjustment	1.24	Corr. Count	1,497
2014 - 2019 Growth	1.030	TM Count Year	2014
Total Adjustment	1.28 (min. of 1.00)	Analysis Year 1	2019
Year: 2015			
		TM Count: 17 *AADT from ATR	
ATR ID	D161	ATR/CTC Year	2016
		ATR/CTC AADT*	14,218
		2016-2015 Growth	0.99
		Corr. AADT	14,076
K Factor	0.106 Poll Group 3	DHV (Equation)	use k factor
Monthly Adjust	1	DHV (K-Factor)	1,492
DHV Adjustment	1.21	Corr. Count	1,232
2015 - 2019 Growth	1.020	TM Count Year	2015
Total Adjustment	1.24 (min. of 1.00)	Analysis Year 1	2019
Year: 2016			
		TM Count: 16 *AADT from ATR	
ATR ID	D161	ATR/CTC Year	2016
		ATR/CTC AADT*	14,218
		2016-2016 Growth	1.00
		Corr. AADT	14,218
K Factor	0.106 Poll Group 3	DHV (Equation)	use k factor
Monthly Adjust	1	DHV (K-Factor)	1,507
DHV Adjustment	1.11	Corr. Count	1,355
2016 - 0 Growth	1.020	TM Count Year	2016
Total Adjustment	1.13 (min. of 1.00)	Analysis Year 1	0

2010 TO 2015 GROWTH FACTORS

The 5-year growth factors shown in the tables below are based on AADTs from VTrans Continuous Traffic Counters (CTC). Each CTC is assigned to a Growth Factor Group and the factors for each group are calculated based on the average ratio of the 2015 AADT to the prior year AADT for each CTC in the group.

Growth Factor Group 1: Rural - This is the default group if a location does not fit another group -						
To \ From	2010	2011	2012	2013	2014	
2010	1.00					
2011	1.01	1.00				
2012	1.01	1.01	1.00			
2013	1.02	1.02	1.01	1.00		
2014	1.02	1.03	1.02	1.01	1.00	
2015	1.03	1.05	1.03	1.03	1.05	

Growth Factor Group 2: Urban - For locations within a designated federal aid urban (FAU) area -						
To \ From	2010	2011	2012	2013	2014	
2010	1.00					
2011	1.00	1.00				
2012	1.00	1.01	1.00			
2013	1.00	1.02	1.00	1.00		
2014	0.99	1.04	1.00	1.00	1.00	
2015	0.99	1.05	1.00	1.00	1.01	

Growth Factor Group 3: Interstate - For locations on I-89, I-91 or I-93 -						
To \ From	2010	2011	2012	2013	2014	
2010	1.00					
2011	1.01	1.00				
2012	1.02	1.01	1.00			
2013	1.02	1.02	1.01	1.00		
2014	1.03	1.03	1.03	1.02	1.00	
2015	1.04	1.04	1.04	1.05	1.04	

Growth Factor Group 4: Ski - For locations on ski access roads -						
To \ From	2010	2011	2012	2013	2014	
2010	1.00					
2011	1.02	1.00				
2012	1.03	1.04	1.00			
2013	1.05	1.07	1.05	1.00		
2014	1.07	1.11	1.10	1.03	1.00	
2015	1.08	1.14	1.15	1.05	1.04	

Example: Project the 2012 AADT at D053 on I-89 to Year 2015

2012 AADT = 29,300

$GF_3(2012 \rightarrow 2015) = 1.04$

2015 AADT = $29,300 \times 1.04 = 30,472$

Round to the nearest hundred = 30,500

2015 AADT GROWTH FACTORS

The factors in the table below may be used to project current year AADTs to a future year. They are applicable on all routes statewide.

The factors are based on a 2015 to 2035 20-year AADT growth factor of 1.12 which was developed from Vermont economic and labor statistics.

TO FUTURE YEAR	FROM CURRENT YEAR		
	2015	2016	2017
2015	1.00		
2016	1.01	1.00	
2017	1.01	1.01	1.00
2018	1.02	1.01	1.01
2019	1.02	1.02	1.01
2020	1.03	1.02	1.02
2021	1.04	1.03	1.02
2022	1.04	1.04	1.03
2023	1.05	1.04	1.04
2024	1.05	1.05	1.04
2025	1.06	1.05	1.05
2026	1.07	1.06	1.05
2027	1.07	1.07	1.06
2028	1.08	1.07	1.07
2029	1.08	1.08	1.07
2030	1.09	1.08	1.08
2031	1.10	1.09	1.08
2032	1.10	1.10	1.09
2033	1.11	1.10	1.10
2034	1.11	1.11	1.10
2035	1.12	1.11	1.11
2036	1.13	1.12	1.11
2037	1.13	1.13	1.12
2038	1.14	1.13	1.13
2039	1.14	1.14	1.13
2040	1.15	1.14	1.14
2041	1.16	1.15	1.14
2042	1.16	1.16	1.15
2043	1.17	1.16	1.16
2044	1.17	1.17	1.16
2045	1.18	1.17	1.17



Trip Generation Calculations

Trip Generation - Burlington Town Center TIS

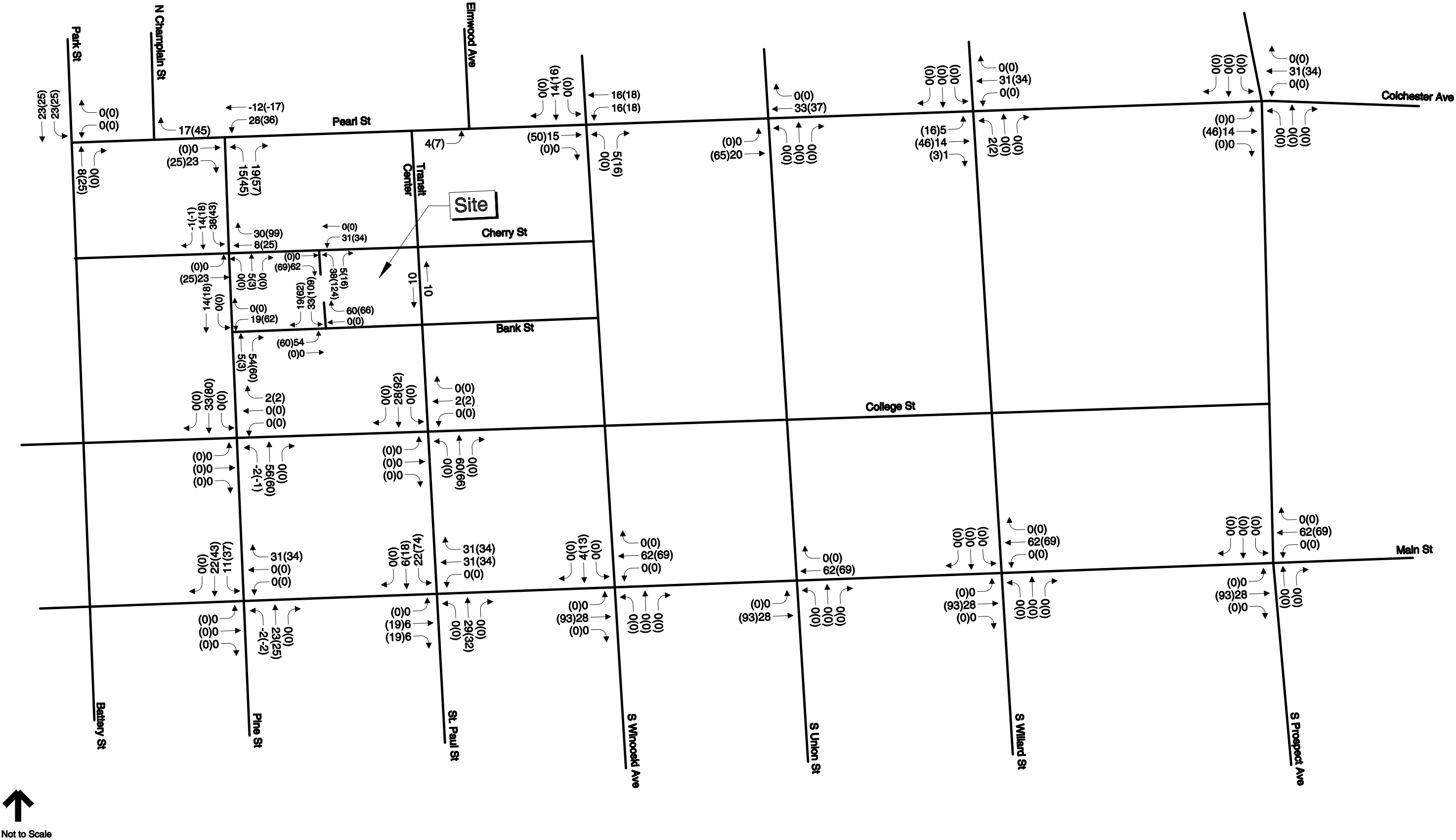
Total Site generated trips (not accounting for internal, pass-by, or diverted trips)

Site Land Uses and Descriptions				AM PK HR OF ADJACENT STREET TRAFFIC												PM PK HR OF ADJACENT STREET TRAFFIC											
Code	Land Use	Size	Unit	directional dist.		average				regression		# trips				directional dist.		average				regression		# trips			
				% enter	% exit	# studies	Avg Rate	Std Dev.	Total by Avg	r ²	total by Eq'n	Method Chosen	Total Trips	Entering	Exiting	% enter	% exit	# studies	Avg Rate	Std Dev.	Total by Avg	r ²	total by Eq'n	Method Chosen	Total Trips	Entering	Exiting
1	2	3	4	16	17	18	19	20	21	22	23	24	25			26	27	28	29	30	31	32	33	34	35		
223	Mid-Rise Apartment	192	ea	31%	69%	7	0.30	0.56	58	0.83	65.66	average	58	18	40	58%	42%	7	0.39	0.63	75	0.89	81	average	75	43	31
565	Day Care Center	19.5	1k sf	53%	47%	67	12.18	6.40	238	n/a	n/a	average	238	126	112	47%	53%	68	12.38	6.93	241	n/a	n/a	average	241	113	128
710	General Office Building	230	1k sf	88%	12%	218	1.56	1.40	359	0.83	373	regression	373	328	45	17%	83%	236	1.49	1.37	343	0.82	336	regression	336	57	279
820	Shopping Center	108	1k sf	62%	38%	104	0.96	1.31	104	0.56	163	average	104	64	39	48%	52%	426	3.71	2.74	401	0.81	631	regression	631	303	328



Supporting Traffic Volume Networks

FIGURE 5-A





Signalized Intersection Capacity Analysis

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	81	309	182	307	1331
Future Volume (vph)	162	81	309	182	307	1331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3389
Flt Permitted	0.95	1.00	1.00	1.00		0.80
Satd. Flow (perm)	1711	1531	1801	2694		2722
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	162	81	309	182	307	1331
RTOR Reduction (vph)	0	66	0	53	0	0
Lane Group Flow (vph)	162	15	309	129	0	1638
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.5	12.5	53.2	53.2		53.2
Effective Green, g (s)	14.5	14.5	55.2	55.2		55.2
Actuated g/C Ratio	0.19	0.19	0.71	0.71		0.71
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	319	285	1279	1913		1933
v/s Ratio Prot	c0.09		0.17			
v/s Ratio Perm		0.01		0.05		c0.60
v/c Ratio	0.51	0.05	0.24	0.07		0.85
Uniform Delay, d1	28.4	26.0	3.9	3.4		8.2
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.3	0.1	0.4	0.1		4.8
Delay (s)	29.7	26.0	4.4	3.5		13.0
Level of Service	C	C	A	A		B
Approach Delay (s)	28.5		4.1			13.0
Approach LOS	C		A			B
Intersection Summary						
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			77.7		Sum of lost time (s)	8.0
Intersection Capacity Utilization			80.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	372	40	91	333	19	23
Future Volume (vph)	372	40	91	333	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1777			1782	1631	
Flt Permitted	1.00			0.75	0.98	
Satd. Flow (perm)	1777			1354	1631	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	372	40	91	333	19	23
RTOR Reduction (vph)	8	0	0	0	13	0
Lane Group Flow (vph)	404	0	0	424	29	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	16.8			16.8	18.1	
Effective Green, g (s)	18.8			18.8	20.1	
Actuated g/C Ratio	0.40			0.40	0.43	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	712			542	699	
v/s Ratio Prot	0.23				c0.02	
v/s Ratio Perm				c0.31		
v/c Ratio	0.57			0.78	0.04	
Uniform Delay, d1	10.9			12.3	7.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			7.2	0.1	
Delay (s)	11.9			19.5	7.9	
Level of Service	B			B	A	
Approach Delay (s)	11.9			19.5	7.9	
Approach LOS	B			B	A	
Intersection Summary						
HCM 2000 Control Delay			15.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			46.9		Sum of lost time (s)	8.0
Intersection Capacity Utilization			58.7%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	186	100	185	412	0	126	0	103	59	362	83
Future Volume (vph)	0	186	100	185	412	0	126	0	103	59	362	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3326	
Flt Permitted		1.00	1.00	0.64	1.00		0.49		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1153	1801		890		1531	1711	3326	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	186	100	185	412	0	126	0	103	59	362	83
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	58	0	0	0
Lane Group Flow (vph)	0	186	100	185	412	0	126	0	45	59	445	0
Turn Type		NA	Perm	Perm	NA		Perm		Perm	Perm	NA	
Protected Phases		4			8						6	
Permitted Phases			4	8			2		2	6		
Actuated Green, G (s)		15.7	15.7	15.7	15.7		18.2		18.2	18.2	18.2	
Effective Green, g (s)		17.7	17.7	17.7	17.7		20.2		20.2	20.2	20.2	
Actuated g/C Ratio		0.39	0.39	0.39	0.39		0.44		0.44	0.44	0.44	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		694	590	444	694		391		673	752	1463	
v/s Ratio Prot		0.10			c0.23						0.13	
v/s Ratio Perm			0.07	0.16			c0.14		0.03	0.03		
v/c Ratio		0.27	0.17	0.42	0.59		0.32		0.07	0.08	0.30	
Uniform Delay, d1		9.7	9.3	10.3	11.2		8.4		7.4	7.5	8.3	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.2	0.1	0.6	1.4		2.2		0.2	0.2	0.5	
Delay (s)		9.9	9.4	11.0	12.6		10.6		7.6	7.7	8.8	
Level of Service		A	A	B	B		B		A	A	A	
Approach Delay (s)		9.7			12.1			9.2			8.7	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.2			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			45.9			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			53.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	323	0	0	497	67	30	105	51	0	0	0
Future Volume (vph)	54	323	0	0	497	67	30	105	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1772		1711	1712				
Flt Permitted	0.27	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	485	1801			1772		1711	1712				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	323	0	0	497	67	30	105	51	0	0	0
RTOR Reduction (vph)	0	0	0	0	10	0	0	30	0	0	0	0
Lane Group Flow (vph)	54	323	0	0	554	0	30	126	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	19.9	19.9			19.9		18.2	18.2				
Effective Green, g (s)	21.9	21.9			21.9		20.2	20.2				
Actuated g/C Ratio	0.44	0.44			0.44		0.40	0.40				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	212	787			774		689	690				
v/s Ratio Prot		0.18			c0.31			c0.07				
v/s Ratio Perm	0.11						0.02					
v/c Ratio	0.25	0.41			0.72		0.04	0.18				
Uniform Delay, d1	8.9	9.7			11.6		9.1	9.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.6	0.3			3.2		0.1	0.6				
Delay (s)	9.6	10.0			14.7		9.2	10.2				
Level of Service	A	B			B		A	B				
Approach Delay (s)		10.0			14.7			10.1			0.0	
Approach LOS		A			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		12.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.46										
Actuated Cycle Length (s)		50.1			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		53.0%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	337	46	49	488	17	32	107	50	25	240	34
Future Volume (vph)	14	337	46	49	488	17	32	107	50	25	240	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.96			0.98	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1769		1711	1792			1722			1766	
Flt Permitted		0.98		0.52	1.00			0.92			0.96	
Satd. Flow (perm)		1734		944	1792			1598			1706	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	337	46	49	488	17	32	107	50	25	240	34
RTOR Reduction (vph)	0	9	0	0	2	0	0	29	0	0	10	0
Lane Group Flow (vph)	0	388	0	49	503	0	0	160	0	0	289	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.3		20.3	20.3			12.4			12.4	
Effective Green, g (s)		22.3		22.3	22.3			14.4			14.4	
Actuated g/C Ratio		0.50		0.50	0.50			0.32			0.32	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		865		470	893			514			549	
v/s Ratio Prot					c0.28							
v/s Ratio Perm		0.22		0.05				0.10			c0.17	
v/c Ratio		0.45		0.10	0.56			0.31			0.53	
Uniform Delay, d1		7.2		5.9	7.8			11.4			12.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.7		0.4	2.6			0.3			0.9	
Delay (s)		8.9		6.4	10.4			11.8			13.3	
Level of Service		A		A	B			B			B	
Approach Delay (s)		8.9			10.0			11.8			13.3	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			10.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			44.7			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			57.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	387	75	197	523	45	76	74	121	38	224	27
Future Volume (vph)	0	387	75	197	523	45	76	74	121	38	224	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1761		1711	1779		1711	1801	1531		1766	
Flt Permitted		1.00		0.25	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1761		451	1779		1711	1801	1531		1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	387	75	197	523	45	76	74	121	38	224	27
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	105	0	5	0
Lane Group Flow (vph)	0	454	0	197	568	0	76	74	16	0	284	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		20.5		31.7	31.7		7.3	7.3	7.3		15.2	
Effective Green, g (s)		22.5		33.7	33.7		9.3	9.3	9.3		17.2	
Actuated g/C Ratio		0.31		0.47	0.47		0.13	0.13	0.13		0.24	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		548		336	830		220	231	197		420	
v/s Ratio Prot		c0.26		0.06	c0.32		c0.04	0.04			c0.16	
v/s Ratio Perm				0.22					0.01			
v/c Ratio		0.83		0.59	0.68		0.35	0.32	0.08		0.68	
Uniform Delay, d1		23.1		23.4	15.1		28.7	28.6	27.7		25.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		13.6		2.6	4.6		0.9	0.8	0.2		4.3	
Delay (s)		36.6		26.0	19.6		29.6	29.4	27.9		29.3	
Level of Service		D		C	B		C	C	C		C	
Approach Delay (s)		36.6			21.3			28.8			29.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			72.2			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			87.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	407	82	81	428	94	56	120	56	35	60	14
Future Volume (vph)	10	407	82	81	428	94	56	120	56	35	60	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.98			0.98			1.00	0.85		0.98	
Flt Protected		1.00			0.99			0.98	1.00		0.98	
Satd. Flow (prot)		1759			1751			1772	1531		1741	
Flt Permitted		0.99			0.89			0.88	1.00		0.88	
Satd. Flow (perm)		1737			1572			1593	1531		1556	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	407	82	81	428	94	56	120	56	35	60	14
RTOR Reduction (vph)	0	13	0	0	12	0	0	0	35	0	8	0
Lane Group Flow (vph)	0	486	0	0	591	0	0	176	21	0	101	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		24.2			24.2			18.2	18.2		18.2	
Effective Green, g (s)		26.2			26.2			20.2	20.2		20.2	
Actuated g/C Ratio		0.48			0.48			0.37	0.37		0.37	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		836			757			591	568		577	
v/s Ratio Prot												
v/s Ratio Perm		0.28			0.38			0.11	0.01		0.06	
v/c Ratio		0.58			0.78			0.30	0.04		0.17	
Uniform Delay, d1		10.2			11.7			12.1	10.9		11.5	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.0			5.2			1.3	0.1		0.7	
Delay (s)		11.2			16.9			13.4	11.0		12.2	
Level of Service		B			B			B	B		B	
Approach Delay (s)		11.2			16.9			12.8			12.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		54.4			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		82.3%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	316	69	59	442	71	100	126	40	22	31	13
Future Volume (vph)	3	316	69	59	442	71	100	126	40	22	31	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)		1800	1531	1711	1763			1762	1531		1764	1531
Flt Permitted		0.99	1.00	0.51	1.00			0.85	1.00		0.86	1.00
Satd. Flow (perm)		1792	1531	911	1763			1537	1531		1549	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	316	69	59	442	71	100	126	40	22	31	13
RTOR Reduction (vph)	0	0	41	0	13	0	0	0	23	0	0	7
Lane Group Flow (vph)	0	319	28	59	500	0	0	226	17	0	53	6
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		17.0	17.0	17.0	17.0			18.1	18.1		18.1	18.1
Effective Green, g (s)		19.0	19.0	19.0	19.0			20.1	20.1		20.1	20.1
Actuated g/C Ratio		0.40	0.40	0.40	0.40			0.43	0.43		0.43	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		722	617	367	711			655	653		661	653
v/s Ratio Prot				c0.28								
v/s Ratio Perm		0.18	0.02	0.06				c0.15	0.01		0.03	0.00
v/c Ratio		0.44	0.05	0.16	0.70			0.35	0.03		0.08	0.01
Uniform Delay, d1		10.2	8.5	9.0	11.7			9.1	7.8		8.0	7.8
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4	0.0	0.2	3.2			1.4	0.1		0.2	0.0
Delay (s)		10.6	8.6	9.2	14.9			10.5	7.9		8.3	7.8
Level of Service		B	A	A	B			B	A		A	A
Approach Delay (s)		10.3			14.3			10.1			8.2	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		11.9				HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		47.1				Sum of lost time (s)		8.0				
Intersection Capacity Utilization		74.0%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	300	18	113	457	141	6	53	11	95	248	119
Future Volume (vph)	41	300	18	113	457	141	6	53	11	95	248	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1785		1711	1801	1531		1755		1711	1801	1531
Flt Permitted	0.35	1.00		0.50	1.00	1.00		0.97		0.71	1.00	1.00
Satd. Flow (perm)	628	1785		909	1801	1531		1714		1281	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	300	18	113	457	141	6	53	11	95	248	119
RTOR Reduction (vph)	0	5	0	0	0	85	0	6	0	0	0	68
Lane Group Flow (vph)	41	313	0	113	457	56	0	64	0	95	248	51
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	16.4	16.4		16.4	16.4	16.4		18.1		18.1	18.1	18.1
Effective Green, g (s)	18.4	18.4		18.4	18.4	18.4		20.1		20.1	20.1	20.1
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.43		0.43	0.43	0.43
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	248	706		359	712	605		740		553	778	661
v/s Ratio Prot		0.18			c0.25						c0.14	
v/s Ratio Perm	0.07			0.12		0.04		0.04		0.07		0.03
v/c Ratio	0.17	0.44		0.31	0.64	0.09		0.09		0.17	0.32	0.08
Uniform Delay, d1	9.1	10.3		9.7	11.4	8.8		7.8		8.1	8.7	7.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.4		0.5	2.0	0.1		0.2		0.7	1.1	0.2
Delay (s)	9.4	10.7		10.2	13.4	8.9		8.0		8.8	9.8	8.0
Level of Service	A	B		B	B	A		A		A	A	A
Approach Delay (s)		10.6			12.0			8.0			9.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		10.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		46.5			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		51.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	419	0	0	707	32	41	542	46	0	0	0
Future Volume (vph)	14	419	0	0	707	32	41	542	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1711	1801			1790			1794	1531			
Flt Permitted	0.12	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	219	1801			1790			1794	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	419	0	0	707	32	41	542	46	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	25	0	0	0
Lane Group Flow (vph)	14	419	0	0	737	0	0	583	21	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	32.0	32.0			32.0			29.1	29.1			
Effective Green, g (s)	34.0	34.0			34.0			31.1	31.1			
Actuated g/C Ratio	0.47	0.47			0.47			0.43	0.43			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	101	837			832			763	651			
v/s Ratio Prot		0.23			c0.41							
v/s Ratio Perm	0.06							0.32	0.01			
v/c Ratio	0.14	0.50			0.89			0.76	0.03			
Uniform Delay, d1	11.2	13.6			17.8			17.9	12.2			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.6	0.5			11.1			7.2	0.1			
Delay (s)	11.8	14.1			28.9			25.0	12.3			
Level of Service	B	B			C			C	B			
Approach Delay (s)		14.0			28.9			24.1			0.0	
Approach LOS		B			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			23.7									
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			73.1									
Intersection Capacity Utilization			76.6%									
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	413	14	56	590	32	21	194	47	66	203	19
Future Volume (vph)	15	413	14	56	590	32	21	194	47	66	203	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1792		1711	1787			1750			1764	
Flt Permitted	0.23	1.00		0.41	1.00			0.96			0.88	
Satd. Flow (perm)	413	1792		737	1787			1689			1562	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	413	14	56	590	32	21	194	47	66	203	19
RTOR Reduction (vph)	0	2	0	0	4	0	0	13	0	0	4	0
Lane Group Flow (vph)	15	425	0	56	618	0	0	249	0	0	284	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.3	21.3		21.3	21.3			18.1			18.1	
Effective Green, g (s)	23.3	23.3		23.3	23.3			20.1			20.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.39			0.39	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	187	812		334	810			660			610	
v/s Ratio Prot		0.24			c0.35							
v/s Ratio Perm	0.04			0.08				0.15			c0.18	
v/c Ratio	0.08	0.52		0.17	0.76			0.38			0.47	
Uniform Delay, d1	8.0	10.1		8.3	11.7			11.2			11.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.6		0.2	4.3			1.6			2.5	
Delay (s)	8.2	10.7		8.6	16.0			12.8			14.2	
Level of Service	A	B		A	B			B			B	
Approach Delay (s)		10.6			15.4			12.8			14.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			51.4			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			78.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	664	4	224	910	609	0	85	179	240	73	46
Future Volume (vph)	0	664	4	224	910	609	0	85	179	240	73	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3418		1711	1801	1531		1801	1531	3319	1696	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3418		1711	1801	1531		1801	1531	3319	1696	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	664	4	224	910	609	0	85	179	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	154	0	0	0
Lane Group Flow (vph)	0	667	0	224	910	609	0	85	25	240	119	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		27.3		14.8	48.1	48.1		9.3	9.3	5.0	20.3	
Effective Green, g (s)		29.3		16.8	50.1	50.1		11.3	11.3	7.0	22.3	
Actuated g/C Ratio		0.36		0.21	0.62	0.62		0.14	0.14	0.09	0.28	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1245		357	1122	954		253	215	288	470	
v/s Ratio Prot		0.20		0.13	c0.51	0.40		c0.05		c0.07	0.07	
v/s Ratio Perm									0.02			
v/c Ratio		0.54		0.63	0.81	0.64		0.34	0.12	0.83	0.25	
Uniform Delay, d1		20.2		29.0	11.5	9.5		31.2	30.2	36.1	22.6	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.7		3.4	6.4	3.3		0.8	0.2	18.3	0.3	
Delay (s)		21.8		32.4	17.9	12.7		32.0	30.4	54.4	22.9	
Level of Service		C		C	B	B		C	C	D	C	
Approach Delay (s)		21.8			18.0			30.9			44.0	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			23.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			80.4				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			68.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	151	166	810	486	149	599
Future Volume (vph)	151	166	810	486	149	599
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3388
Flt Permitted	0.95	1.00	1.00	1.00		0.59
Satd. Flow (perm)	1711	1531	1801	2694		2007
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	151	166	810	486	149	599
RTOR Reduction (vph)	0	104	0	196	0	0
Lane Group Flow (vph)	151	62	810	290	0	748
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.1	10.1	32.8	32.8		32.8
Effective Green, g (s)	10.1	10.1	32.8	32.8		32.8
Actuated g/C Ratio	0.18	0.18	0.60	0.60		0.60
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	314	281	1076	1609		1199
v/s Ratio Prot	c0.09		c0.45			
v/s Ratio Perm		0.04		0.11		0.37
v/c Ratio	0.48	0.22	0.75	0.18		0.62
Uniform Delay, d1	20.1	19.0	8.1	5.0		7.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.4	4.9	0.2		2.5
Delay (s)	21.2	19.4	13.0	5.2		9.5
Level of Service	C	B	B	A		A
Approach Delay (s)	20.3		10.1			9.5
Approach LOS	C		B			A
Intersection Summary						
HCM 2000 Control Delay			11.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			54.9		Sum of lost time (s)	12.0
Intersection Capacity Utilization			86.9%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	17	38	462	45	98
Future Volume (vph)	422	17	38	462	45	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1791			1794	1609	
Flt Permitted	1.00			0.94	0.98	
Satd. Flow (perm)	1791			1688	1609	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	422	17	38	462	45	98
RTOR Reduction (vph)	3	0	0	0	61	0
Lane Group Flow (vph)	436	0	0	500	82	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	17.4			17.4	18.1	
Effective Green, g (s)	17.4			17.4	18.1	
Actuated g/C Ratio	0.37			0.37	0.38	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	656			618	613	
v/s Ratio Prot	0.24				c0.05	
v/s Ratio Perm				c0.30		
v/c Ratio	0.66			0.81	0.13	
Uniform Delay, d1	12.6			13.6	9.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.5			7.7	0.5	
Delay (s)	15.1			21.3	10.0	
Level of Service	B			C	B	
Approach Delay (s)	15.1			21.3	10.0	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			17.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			47.5		Sum of lost time (s)	12.0
Intersection Capacity Utilization			73.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	322	114	190	417	0	195	0	299	104	295	50
Future Volume (vph)	0	322	114	190	417	0	195	0	299	104	295	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3347	
Flt Permitted		1.00	1.00	0.53	1.00		0.54		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	952	1801		981		1531	1711	3347	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	322	114	190	417	0	195	0	299	104	295	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	172	0	0	0
Lane Group Flow (vph)	0	322	114	190	417	0	195	0	127	104	345	0
Turn Type		NA	Perm	Perm	NA		Perm		Perm	Perm	NA	
Protected Phases		4			8						6	
Permitted Phases			4	8			2		2	6		
Actuated Green, G (s)		15.3	15.3	15.3	15.3		20.1		20.1	20.1	20.1	
Effective Green, g (s)		15.3	15.3	15.3	15.3		20.1		20.1	20.1	20.1	
Actuated g/C Ratio		0.32	0.32	0.32	0.32		0.42		0.42	0.42	0.42	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		581	494	307	581		415		649	725	1419	
v/s Ratio Prot		0.18			c0.23						0.10	
v/s Ratio Perm			0.07	0.20			c0.20		0.08	0.06		
v/c Ratio		0.55	0.23	0.62	0.72		0.47		0.20	0.14	0.24	
Uniform Delay, d1		13.2	11.7	13.6	14.1		9.8		8.6	8.4	8.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.1	0.2	3.7	4.2		3.8		0.7	0.4	0.4	
Delay (s)		14.4	12.0	17.3	18.4		13.6		9.2	8.8	9.2	
Level of Service		B	B	B	B		B		A	A	A	
Approach Delay (s)		13.8			18.0			11.0			9.1	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			66.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	511	0	0	526	63	51	302	54	0	0	0
Future Volume (vph)	163	511	0	0	526	63	51	302	54	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1775		1711	1760				
Flt Permitted	0.26	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	468	1801			1775		1711	1760				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	163	511	0	0	526	63	51	302	54	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	10	0	0	0	0
Lane Group Flow (vph)	163	511	0	0	581	0	51	346	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	22.4	22.4			22.4		19.3	19.3				
Effective Green, g (s)	22.4	22.4			22.4		19.3	19.3				
Actuated g/C Ratio	0.42	0.42			0.42		0.36	0.36				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	195	751			740		614	632				
v/s Ratio Prot		0.28			0.33			c0.20				
v/s Ratio Perm	c0.35						0.03					
v/c Ratio	0.84	0.68			0.78		0.08	0.55				
Uniform Delay, d1	14.0	12.7			13.6		11.4	13.7				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	25.5	2.5			5.5		0.3	3.4				
Delay (s)	39.5	15.3			19.0		11.6	17.1				
Level of Service	D	B			B		B	B				
Approach Delay (s)		21.1			19.0			16.4			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		19.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		53.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	508	42	58	507	46	63	263	57	29	189	38
Future Volume (vph)	47	508	42	58	507	46	63	263	57	29	189	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	0.99			0.98			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		1777		1711	1778			1750			1755	
Flt Permitted		0.93		0.40	1.00			0.90			0.93	
Satd. Flow (perm)		1654		728	1778			1591			1635	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	508	42	58	507	46	63	263	57	29	189	38
RTOR Reduction (vph)	0	5	0	0	5	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	592	0	58	548	0	0	372	0	0	245	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.1		28.1	28.1			16.8			16.8	
Effective Green, g (s)		28.1		28.1	28.1			16.8			16.8	
Actuated g/C Ratio		0.49		0.49	0.49			0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		816		359	878			469			482	
v/s Ratio Prot					0.31							
v/s Ratio Perm		c0.36		0.08				c0.23			0.15	
v/c Ratio		0.73		0.16	0.62			0.79			0.51	
Uniform Delay, d1		11.4		7.9	10.5			18.4			16.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		5.6		1.0	3.3			8.9			0.8	
Delay (s)		17.0		8.9	13.9			27.4			17.5	
Level of Service		B		A	B			C			B	
Approach Delay (s)		17.0			13.4			27.4			17.5	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.0									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			56.9									
Intersection Capacity Utilization			107.7%									
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	490	57	146	572	89	151	252	187	27	115	12
Future Volume (vph)	0	490	57	146	572	89	151	252	187	27	115	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1775		1711	1764		1711	1801	1531		1766	
Flt Permitted		0.99		0.21	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1758		385	1764		1711	1801	1531		1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	490	57	146	572	89	151	252	187	27	115	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	153	0	3	0
Lane Group Flow (vph)	0	543	0	146	661	0	151	252	34	0	151	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		30.1		41.2	41.2		16.2	16.2	16.2		12.7	
Effective Green, g (s)		30.1		41.2	41.2		16.2	16.2	16.2		12.7	
Actuated g/C Ratio		0.34		0.47	0.47		0.18	0.18	0.18		0.14	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		606		256	824		314	331	281		254	
v/s Ratio Prot		c0.31		0.03	c0.37		0.09	c0.14			c0.09	
v/s Ratio Perm				0.23					0.02			
v/c Ratio		0.90		0.57	0.80		0.48	0.76	0.12		0.59	
Uniform Delay, d1		27.5		30.2	20.0		32.2	34.1	30.0		35.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		18.4		3.1	8.1		1.2	9.9	0.2		3.7	
Delay (s)		45.9		33.3	28.1		33.3	44.0	30.2		39.0	
Level of Service		D		C	C		C	D	C		D	
Approach Delay (s)		45.9			29.0			36.9			39.0	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			36.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			88.1			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			106.3%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	361	88	76	454	59	58	85	56	107	187	22
Future Volume (vph)	16	361	88	76	454	59	58	85	56	107	187	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			0.99			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.98	1.00		0.98	
Satd. Flow (prot)		1752			1765			1765	1531		1754	
Flt Permitted		0.97			0.89			0.80	1.00		0.83	
Satd. Flow (perm)		1707			1587			1432	1531		1482	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	361	88	76	454	59	58	85	56	107	187	22
RTOR Reduction (vph)	0	15	0	0	7	0	0	0	37	0	5	0
Lane Group Flow (vph)	0	450	0	0	582	0	0	143	19	0	311	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		24.2			24.2			19.2	19.2		19.2	
Effective Green, g (s)		24.2			24.2			19.2	19.2		19.2	
Actuated g/C Ratio		0.44			0.44			0.35	0.35		0.35	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		745			693			496	530		513	
v/s Ratio Prot												
v/s Ratio Perm		0.26			c0.37			0.10	0.01		c0.21	
v/c Ratio		0.60			0.84			0.29	0.04		0.61	
Uniform Delay, d1		11.9			13.9			13.1	12.0		15.0	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4			8.8			1.5	0.1		5.3	
Delay (s)		13.3			22.7			14.6	12.1		20.2	
Level of Service		B			C			B	B		C	
Approach Delay (s)		13.3			22.7			13.9			20.2	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			18.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			55.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			95.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	376	87	62	366	57	100	81	68	68	118	14
Future Volume (vph)	16	376	87	62	366	57	100	81	68	68	118	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)		1797	1531	1711	1764			1752	1531		1768	1531
Flt Permitted		0.97	1.00	0.45	1.00			0.74	1.00		0.83	1.00
Satd. Flow (perm)		1748	1531	805	1764			1331	1531		1493	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	376	87	62	366	57	100	81	68	68	118	14
RTOR Reduction (vph)	0	0	58	0	13	0	0	0	41	0	0	8
Lane Group Flow (vph)	0	392	29	62	410	0	0	181	27	0	186	6
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		15.3	15.3	15.3	15.3			18.2	18.2		18.2	18.2
Effective Green, g (s)		15.3	15.3	15.3	15.3			18.2	18.2		18.2	18.2
Actuated g/C Ratio		0.34	0.34	0.34	0.34			0.40	0.40		0.40	0.40
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		587	514	270	593			532	612		597	612
v/s Ratio Prot				c0.23								
v/s Ratio Perm		0.22	0.02	0.08				c0.14	0.02		0.12	0.00
v/c Ratio		0.67	0.06	0.23	0.69			0.34	0.04		0.31	0.01
Uniform Delay, d1		12.9	10.2	10.9	13.1			9.5	8.3		9.4	8.2
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		2.9	0.0	0.4	3.5			1.7	0.1		1.4	0.0
Delay (s)		15.8	10.3	11.3	16.5			11.2	8.5		10.7	8.2
Level of Service		B	B	B	B			B	A		B	A
Approach Delay (s)		14.8			15.9			10.5			10.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.8			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			45.5			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			75.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	461	41	94	495	169	7	128	48	273	376	115
Future Volume (vph)	94	461	41	94	495	169	7	128	48	273	376	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1779		1711	1801	1531		1734		1711	1801	1531
Flt Permitted	0.32	1.00		0.31	1.00	1.00		0.98		0.64	1.00	1.00
Satd. Flow (perm)	582	1779		567	1801	1531		1705		1156	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	94	461	41	94	495	169	7	128	48	273	376	115
RTOR Reduction (vph)	0	6	0	0	0	107	0	22	0	0	0	69
Lane Group Flow (vph)	94	496	0	94	495	62	0	161	0	273	376	46
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	18.8	18.8		18.8	18.8	18.8		20.2		20.2	20.2	20.2
Effective Green, g (s)	18.8	18.8		18.8	18.8	18.8		20.2		20.2	20.2	20.2
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37		0.40		0.40	0.40	0.40
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	655		209	663	564		675		457	713	606
v/s Ratio Prot		c0.28			0.27						0.21	
v/s Ratio Perm	0.16			0.17		0.04		0.09		c0.24		0.03
v/c Ratio	0.44	0.76		0.45	0.75	0.11		0.24		0.60	0.53	0.08
Uniform Delay, d1	12.1	14.1		12.2	14.0	10.6		10.3		12.2	11.8	9.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	5.0		1.5	4.6	0.1		0.8		5.7	2.8	0.2
Delay (s)	13.6	19.1		13.7	18.6	10.7		11.1		17.8	14.5	9.8
Level of Service	B	B		B	B	B		B		B	B	A
Approach Delay (s)		18.2			16.2			11.1			15.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		15.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		51.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		81.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	771	0	0	629	37	47	275	111	0	0	0
Future Volume (vph)	47	771	0	0	629	37	47	275	111	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.99	1.00			
Satd. Flow (prot)	1711	1801			1787			1788	1531			
Flt Permitted	0.24	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	429	1801			1787			1788	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	771	0	0	629	37	47	275	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	76	0	0	0
Lane Group Flow (vph)	47	771	0	0	662	0	0	322	35	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	27.7	27.7			27.7			18.1	18.1			
Effective Green, g (s)	27.7	27.7			27.7			18.1	18.1			
Actuated g/C Ratio	0.48	0.48			0.48			0.31	0.31			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	205	863			856			559	479			
v/s Ratio Prot		c0.43			0.37							
v/s Ratio Perm	0.11							0.18	0.02			
v/c Ratio	0.23	0.89			0.77			0.58	0.07			
Uniform Delay, d1	8.8	13.7			12.5			16.6	14.0			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.6	11.6			4.4			4.3	0.3			
Delay (s)	9.4	25.3			16.9			20.9	14.2			
Level of Service	A	C			B			C	B			
Approach Delay (s)		24.4			16.9			19.2			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			20.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			57.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	750	36	67	661	60	26	280	43	68	217	24
Future Volume (vph)	31	750	36	67	661	60	26	280	43	68	217	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1788		1711	1778			1764			1762	
Flt Permitted	0.20	1.00		0.14	1.00			0.96			0.82	
Satd. Flow (perm)	353	1788		257	1778			1695			1454	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	31	750	36	67	661	60	26	280	43	68	217	24
RTOR Reduction (vph)	0	3	0	0	6	0	0	8	0	0	5	0
Lane Group Flow (vph)	31	783	0	67	715	0	0	341	0	0	304	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.3	28.3		28.3	28.3			18.1			18.1	
Effective Green, g (s)	28.3	28.3		28.3	28.3			18.1			18.1	
Actuated g/C Ratio	0.48	0.48		0.48	0.48			0.31			0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	171	866		124	861			525			450	
v/s Ratio Prot		c0.44			0.40							
v/s Ratio Perm	0.09			0.26				0.20			c0.21	
v/c Ratio	0.18	0.90		0.54	0.83			0.65			0.68	
Uniform Delay, d1	8.5	13.8		10.5	13.0			17.4			17.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	12.7		4.7	6.9			6.1			7.9	
Delay (s)	9.0	26.5		15.2	19.8			23.5			25.5	
Level of Service	A	C		B	B			C			C	
Approach Delay (s)		25.9			19.5			23.5			25.5	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			23.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			58.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			94.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	1294	1	144	473	395	0	146	334	381	131	17
Future Volume (vph)	0	1294	1	144	473	395	0	146	334	381	131	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3421		1711	1801	1531		1801	1531	3319	1770	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3421		1711	1801	1531		1801	1531	3319	1770	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1294	1	144	473	395	0	146	334	381	131	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	151	0	0	0
Lane Group Flow (vph)	0	1295	0	144	473	395	0	146	183	381	148	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		38.1		9.0	53.1	53.1		14.9	14.9	11.0	31.9	
Effective Green, g (s)		38.1		9.0	53.1	53.1		14.9	14.9	11.0	31.9	
Actuated g/C Ratio		0.39		0.09	0.55	0.55		0.15	0.15	0.11	0.33	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1343		158	985	838		276	235	376	582	
v/s Ratio Prot		c0.38		c0.08	0.26	0.26		0.08		c0.11	0.08	
v/s Ratio Perm									c0.12			
v/c Ratio		0.96		0.91	0.48	0.47		0.53	0.78	1.01	0.25	
Uniform Delay, d1		28.8		43.6	13.5	13.4		37.8	39.5	43.0	23.8	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		17.4		46.4	1.7	1.9		1.8	15.3	49.8	0.2	
Delay (s)		46.2		90.0	15.2	15.3		39.6	54.8	92.8	24.1	
Level of Service		D		F	B	B		D	D	F	C	
Approach Delay (s)		46.2			25.9			50.2			73.6	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			44.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			97.0				Sum of lost time (s)		24.0			
Intersection Capacity Utilization			82.4%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations				 		 
Traffic Volume (vph)	166	83	318	188	316	1371
Future Volume (vph)	166	83	318	188	316	1371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3389
Flt Permitted	0.95	1.00	1.00	1.00		0.80
Satd. Flow (perm)	1711	1531	1801	2694		2726
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	166	83	318	188	316	1371
RTOR Reduction (vph)	0	70	0	54	0	0
Lane Group Flow (vph)	166	13	318	134	0	1687
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.5	13.5	63.0	63.0		63.0
Effective Green, g (s)	13.5	13.5	63.0	63.0		63.0
Actuated g/C Ratio	0.15	0.15	0.71	0.71		0.71
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	261	233	1282	1917		1940
v/s Ratio Prot	c0.10		0.18			
v/s Ratio Perm		0.01		0.05		c0.62
v/c Ratio	0.64	0.05	0.25	0.07		0.87
Uniform Delay, d1	35.2	32.0	4.5	3.9		9.6
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.0	0.1	0.5	0.1		5.6
Delay (s)	40.2	32.1	4.9	3.9		15.3
Level of Service	D	C	A	A		B
Approach Delay (s)	37.5		4.6			15.3
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			15.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			88.5		Sum of lost time (s)	12.0
Intersection Capacity Utilization			88.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	383	41	93	343	19	23
Future Volume (vph)	383	41	93	343	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1777			1782	1631	
Flt Permitted	1.00			0.72	0.98	
Satd. Flow (perm)	1777			1295	1631	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	383	41	93	343	19	23
RTOR Reduction (vph)	8	0	0	0	15	0
Lane Group Flow (vph)	416	0	0	436	27	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	19.1			19.1	18.2	
Effective Green, g (s)	19.1			19.1	18.2	
Actuated g/C Ratio	0.39			0.39	0.37	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	688			501	602	
v/s Ratio Prot	0.23				c0.02	
v/s Ratio Perm				c0.34		
v/c Ratio	0.60			0.87	0.05	
Uniform Delay, d1	12.1			14.0	10.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.5			15.2	0.1	
Delay (s)	13.6			29.1	10.1	
Level of Service	B			C	B	
Approach Delay (s)	13.6			29.1	10.1	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.9		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			49.3		Sum of lost time (s)	12.0
Intersection Capacity Utilization			65.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	191	103	191	424	0	130	0	106	61	372	86
Future Volume (vph)	0	191	103	191	424	0	130	0	106	61	372	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3325	
Flt Permitted		1.00	1.00	0.64	1.00		0.49		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1148	1801		879		1531	1711	3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	191	103	191	424	0	130	0	106	61	372	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	64	0	0	0
Lane Group Flow (vph)	0	191	103	191	424	0	130	0	42	61	458	0
Turn Type		NA	Perm	Perm	NA		Perm		Perm	Perm	NA	
Protected Phases		4			8						6	
Permitted Phases			4	8			2		2	6		
Actuated Green, G (s)		15.9	15.9	15.9	15.9		18.1		18.1	18.1	18.1	
Effective Green, g (s)		15.9	15.9	15.9	15.9		18.1		18.1	18.1	18.1	
Actuated g/C Ratio		0.35	0.35	0.35	0.35		0.39		0.39	0.39	0.39	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		622	529	396	622		345		602	673	1308	
v/s Ratio Prot		0.11			c0.24						0.14	
v/s Ratio Perm			0.07	0.17			c0.15		0.03	0.04		
v/c Ratio		0.31	0.19	0.48	0.68		0.38		0.07	0.09	0.35	
Uniform Delay, d1		11.0	10.6	11.8	12.9		9.9		8.7	8.8	9.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.2	0.9	3.1		3.1		0.2	0.3	0.7	
Delay (s)		11.3	10.7	12.7	16.0		13.1		8.9	9.0	10.6	
Level of Service		B	B	B	B		B		A	A	B	
Approach Delay (s)		11.1			15.0			11.2			10.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			46.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			59.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	332	0	0	512	69	31	108	52	0	0	0
Future Volume (vph)	56	332	0	0	512	69	31	108	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1772		1711	1713				
Flt Permitted	0.26	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	471	1801			1772		1711	1713				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	332	0	0	512	69	31	108	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	10	0	0	30	0	0	0	0
Lane Group Flow (vph)	56	332	0	0	571	0	31	130	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	20.3	20.3			20.3		18.2	18.2				
Effective Green, g (s)	20.3	20.3			20.3		18.2	18.2				
Actuated g/C Ratio	0.40	0.40			0.40		0.36	0.36				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	189	723			712		616	617				
v/s Ratio Prot		0.18			c0.32			c0.08				
v/s Ratio Perm	0.12						0.02					
v/c Ratio	0.30	0.46			0.80		0.05	0.21				
Uniform Delay, d1	10.3	11.1			13.3		10.5	11.2				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.9	0.5			6.5		0.2	0.8				
Delay (s)	11.1	11.5			19.8		10.7	12.0				
Level of Service	B	B			B		B	B				
Approach Delay (s)		11.5			19.8			11.7			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			50.5				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			59.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	347	47	51	503	18	33	110	52	26	247	35
Future Volume (vph)	14	347	47	51	503	18	33	110	52	26	247	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.96			0.98	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1770		1711	1791			1721			1766	
Flt Permitted		0.98		0.54	1.00			0.91			0.95	
Satd. Flow (perm)		1730		980	1791			1575			1693	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	347	47	51	503	18	33	110	52	26	247	35
RTOR Reduction (vph)	0	9	0	0	2	0	0	29	0	0	10	0
Lane Group Flow (vph)	0	399	0	51	519	0	0	166	0	0	298	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.1		20.1	20.1			12.6			12.6	
Effective Green, g (s)		20.1		20.1	20.1			12.6			12.6	
Actuated g/C Ratio		0.45		0.45	0.45			0.28			0.28	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		777		440	805			443			477	
v/s Ratio Prot					c0.29							
v/s Ratio Perm		0.23		0.05				0.11			c0.18	
v/c Ratio		0.51		0.12	0.64			0.37			0.62	
Uniform Delay, d1		8.8		7.1	9.5			12.9			14.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.4		0.5	4.0			0.5			2.5	
Delay (s)		11.2		7.7	13.5			13.4			16.5	
Level of Service		B		A	B			B			B	
Approach Delay (s)		11.2			13.0			13.4			16.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			44.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			61.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	399	77	203	539	46	78	76	125	39	231	27
Future Volume (vph)	0	399	77	203	539	46	78	76	125	39	231	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1761		1711	1779		1711	1801	1531		1767	
Flt Permitted		1.00		0.24	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1761		430	1779		1711	1801	1531		1767	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	399	77	203	539	46	78	76	125	39	231	27
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	110	0	4	0
Lane Group Flow (vph)	0	468	0	203	585	0	78	76	15	0	293	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		20.1		31.1	31.1		8.9	8.9	8.9		16.1	
Effective Green, g (s)		20.1		31.1	31.1		8.9	8.9	8.9		16.1	
Actuated g/C Ratio		0.27		0.42	0.42		0.12	0.12	0.12		0.22	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		477		266	746		205	216	183		383	
v/s Ratio Prot		c0.27		0.05	c0.33		c0.05	0.04			c0.17	
v/s Ratio Perm				0.27					0.01			
v/c Ratio		0.98		0.76	0.78		0.38	0.35	0.08		0.77	
Uniform Delay, d1		26.8		26.6	18.6		30.1	30.0	29.0		27.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		36.8		12.2	8.1		1.2	1.0	0.2		8.8	
Delay (s)		63.6		38.8	26.7		31.2	30.9	29.2		36.0	
Level of Service		E		D	C		C	C	C		D	
Approach Delay (s)		63.6			29.8			30.2			36.0	
Approach LOS		E			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			39.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			74.1			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			94.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	459	229	78	451	91	218	183	73	31	127	15
Future Volume (vph)	6	459	229	78	451	91	218	183	73	31	127	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.96			0.98			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.97	1.00		0.99	
Satd. Flow (prot)		1720			1754			1753	1531		1764	
Flt Permitted		0.99			0.82			0.76	1.00		0.89	
Satd. Flow (perm)		1711			1442			1374	1531		1578	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	459	229	78	451	91	218	183	73	31	127	15
RTOR Reduction (vph)	0	26	0	0	9	0	0	0	46	0	5	0
Lane Group Flow (vph)	0	668	0	0	611	0	0	401	27	0	168	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		30.7			30.7			25.1	25.1		25.1	
Effective Green, g (s)		30.7			30.7			25.1	25.1		25.1	
Actuated g/C Ratio		0.45			0.45			0.37	0.37		0.37	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		774			652			508	566		584	
v/s Ratio Prot												
v/s Ratio Perm		0.39			c0.42			c0.29	0.02		0.11	
v/c Ratio		0.86			0.94			0.79	0.05		0.29	
Uniform Delay, d1		16.7			17.6			19.0	13.7		15.0	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		9.8			20.9			11.8	0.2		1.2	
Delay (s)		26.4			38.5			30.8	13.8		16.3	
Level of Service		C			D			C	B		B	
Approach Delay (s)		26.4			38.5			28.2			16.3	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			67.8				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			123.0%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	370	71	65	445	74	113	134	52	18	37	18
Future Volume (vph)	4	370	71	65	445	74	113	134	52	18	37	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)		1800	1531	1711	1762			1760	1531		1772	1531
Flt Permitted		0.99	1.00	0.48	1.00			0.83	1.00		0.87	1.00
Satd. Flow (perm)		1789	1531	865	1762			1488	1531		1571	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	370	71	65	445	74	113	134	52	18	37	18
RTOR Reduction (vph)	0	0	45	0	13	0	0	0	32	0	0	11
Lane Group Flow (vph)	0	374	26	65	506	0	0	247	20	0	55	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		17.4	17.4	17.4	17.4			18.1	18.1		18.1	18.1
Effective Green, g (s)		17.4	17.4	17.4	17.4			18.1	18.1		18.1	18.1
Actuated g/C Ratio		0.37	0.37	0.37	0.37			0.38	0.38		0.38	0.38
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		655	560	316	645			567	583		598	583
v/s Ratio Prot				c0.29								
v/s Ratio Perm		0.21	0.02	0.08				c0.17	0.01		0.04	0.00
v/c Ratio		0.57	0.05	0.21	0.79			0.44	0.03		0.09	0.01
Uniform Delay, d1		12.1	9.7	10.3	13.4			10.9	9.2		9.4	9.1
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.0	0.3	6.2			2.4	0.1		0.3	0.0
Delay (s)		13.3	9.7	10.6	19.6			13.3	9.3		9.7	9.2
Level of Service		B	A	B	B			B	A		A	A
Approach Delay (s)		12.7			18.6			12.6			9.6	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			47.5			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			82.6%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	359	19	112	470	140	11	59	12	93	346	108
Future Volume (vph)	42	359	19	112	470	140	11	59	12	93	346	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1711	1787		1711	1801	1531		1753		1711	1801	1531
Flt Permitted	0.36	1.00		0.47	1.00	1.00		0.94		0.70	1.00	1.00
Satd. Flow (perm)	644	1787		852	1801	1531		1652		1267	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	359	19	112	470	140	11	59	12	93	346	108
RTOR Reduction (vph)	0	4	0	0	0	90	0	7	0	0	0	66
Lane Group Flow (vph)	42	374	0	112	470	50	0	75	0	93	346	42
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	16.8	16.8		16.8	16.8	16.8		18.1		18.1	18.1	18.1
Effective Green, g (s)	16.8	16.8		16.8	16.8	16.8		18.1		18.1	18.1	18.1
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36		0.39		0.39	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	230	640		305	645	548		637		488	695	590
v/s Ratio Prot		0.21			c0.26						c0.19	
v/s Ratio Perm	0.07			0.13		0.03		0.05		0.07		0.03
v/c Ratio	0.18	0.58		0.37	0.73	0.09		0.12		0.19	0.50	0.07
Uniform Delay, d1	10.3	12.2		11.1	13.1	10.0		9.3		9.5	10.9	9.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.4		0.8	4.1	0.1		0.4		0.9	2.5	0.2
Delay (s)	10.7	13.6		11.9	17.2	10.1		9.6		10.4	13.5	9.3
Level of Service	B	B		B	B	B		A		B	B	A
Approach Delay (s)		13.3			15.0			9.6			12.1	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			46.9				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			62.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	397	0	0	719	33	37	588	52	0	0	0
Future Volume (vph)	14	397	0	0	719	33	37	588	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1711	1801			1790			1795	1531			
Flt Permitted	0.10	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	184	1801			1790			1795	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	397	0	0	719	33	37	588	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	21	0	0	0
Lane Group Flow (vph)	14	397	0	0	750	0	0	625	31	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	39.2	39.2			39.2			37.1	37.1			
Effective Green, g (s)	39.2	39.2			39.2			37.1	37.1			
Actuated g/C Ratio	0.44	0.44			0.44			0.42	0.42			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	81	799			794			754	643			
v/s Ratio Prot		0.22			c0.42							
v/s Ratio Perm	0.08							0.35	0.02			
v/c Ratio	0.17	0.50			0.95			0.83	0.05			
Uniform Delay, d1	14.8	17.5			23.5			22.8	15.2			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	1.0	0.5			19.6			10.2	0.1			
Delay (s)	15.8	18.0			43.2			33.0	15.3			
Level of Service	B	B			D			C	B			
Approach Delay (s)		17.9			43.2			31.6			0.0	
Approach LOS		B			D			C			A	
Intersection Summary												
HCM 2000 Control Delay			33.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			88.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			82.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	491	4	58	603	33	26	190	53	103	214	20
Future Volume (vph)	10	491	4	58	603	33	26	190	53	103	214	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.97			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1711	1798		1711	1787			1744			1759	
Flt Permitted	0.21	1.00		0.35	1.00			0.94			0.82	
Satd. Flow (perm)	372	1798		627	1787			1653			1466	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	491	4	58	603	33	26	190	53	103	214	20
RTOR Reduction (vph)	0	1	0	0	4	0	0	14	0	0	4	0
Lane Group Flow (vph)	10	494	0	58	632	0	0	255	0	0	333	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.6	23.6		23.6	23.6			21.1			21.1	
Effective Green, g (s)	23.6	23.6		23.6	23.6			21.1			21.1	
Actuated g/C Ratio	0.42	0.42		0.42	0.42			0.37			0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	154	748		260	743			615			545	
v/s Ratio Prot		0.27			c0.35							
v/s Ratio Perm	0.03			0.09				0.15			c0.23	
v/c Ratio	0.06	0.66		0.22	0.85			0.41			0.61	
Uniform Delay, d1	9.9	13.3		10.7	15.0			13.2			14.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	2.2		0.4	9.3			2.1			5.1	
Delay (s)	10.1	15.5		11.1	24.2			15.3			19.5	
Level of Service	B	B		B	C			B			B	
Approach Delay (s)		15.4			23.1			15.3			19.5	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			56.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			90.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	684	4	231	938	627	0	87	185	247	75	48
Future Volume (vph)	0	684	4	231	938	627	0	87	185	247	75	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3418		1711	1801	1531		1801	1531	3319	1695	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3418		1711	1801	1531		1801	1531	3319	1695	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	684	4	231	938	627	0	87	185	247	75	48
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	164	0	0	0
Lane Group Flow (vph)	0	687	0	231	938	627	0	87	21	247	123	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		26.6		14.5	47.1	47.1		9.4	9.4	7.0	22.4	
Effective Green, g (s)		26.6		14.5	47.1	47.1		9.4	9.4	7.0	22.4	
Actuated g/C Ratio		0.33		0.18	0.58	0.58		0.12	0.12	0.09	0.27	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1115		304	1040	884		207	176	285	465	
v/s Ratio Prot		0.20		0.14	c0.52	0.41		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.62		0.76	0.90	0.71		0.42	0.12	0.87	0.26	
Uniform Delay, d1		23.1		31.8	15.2	12.3		33.5	32.3	36.8	23.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.6		10.4	12.4	4.8		1.4	0.3	23.0	0.3	
Delay (s)		25.7		42.3	27.6	17.1		34.9	32.7	59.8	23.4	
Level of Service		C		D	C	B		C	C	E	C	
Approach Delay (s)		25.7			25.8			33.4			47.7	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			29.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			81.5				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			73.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	171	834	501	154	617
Future Volume (vph)	156	171	834	501	154	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3387
Flt Permitted	0.95	1.00	1.00	1.00		0.57
Satd. Flow (perm)	1711	1531	1801	2694		1948
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	156	171	834	501	154	617
RTOR Reduction (vph)	0	98	0	203	0	0
Lane Group Flow (vph)	156	73	834	298	0	771
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.3	10.3	32.8	32.8		32.8
Effective Green, g (s)	10.3	10.3	32.8	32.8		32.8
Actuated g/C Ratio	0.19	0.19	0.60	0.60		0.60
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	319	286	1072	1603		1159
v/s Ratio Prot	c0.09		c0.46			
v/s Ratio Perm		0.05		0.11		0.40
v/c Ratio	0.49	0.26	0.78	0.19		0.67
Uniform Delay, d1	20.0	19.1	8.4	5.1		7.5
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.5	5.6	0.3		3.0
Delay (s)	21.2	19.6	14.0	5.3		10.5
Level of Service	C	B	B	A		B
Approach Delay (s)	20.4		10.7			10.5
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			55.1		Sum of lost time (s)	12.0
Intersection Capacity Utilization			89.1%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (vph)	434	18	39	476	46	101
Future Volume (vph)	434	18	39	476	46	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1791			1794	1608	
Flt Permitted	1.00			0.93	0.98	
Satd. Flow (perm)	1791			1679	1608	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	434	18	39	476	46	101
RTOR Reduction (vph)	3	0	0	0	63	0
Lane Group Flow (vph)	449	0	0	515	84	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	17.7			17.7	18.1	
Effective Green, g (s)	17.7			17.7	18.1	
Actuated g/C Ratio	0.37			0.37	0.38	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	663			621	608	
v/s Ratio Prot	0.25				c0.05	
v/s Ratio Perm				c0.31		
v/c Ratio	0.68			0.83	0.14	
Uniform Delay, d1	12.6			13.7	9.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.7			9.0	0.5	
Delay (s)	15.4			22.7	10.2	
Level of Service	B			C	B	
Approach Delay (s)	15.4			22.7	10.2	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			18.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			47.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			74.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	331	118	196	430	0	201	0	308	107	304	51
Future Volume (vph)	0	331	118	196	430	0	201	0	308	107	304	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3348	
Flt Permitted		1.00	1.00	0.52	1.00		0.54		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	930	1801		971		1531	1711	3348	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	331	118	196	430	0	201	0	308	107	304	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	178	0	0	0
Lane Group Flow (vph)	0	331	118	196	430	0	201	0	130	107	355	0
Turn Type		NA	Perm	Perm	NA		Perm		Perm	Perm	NA	
Protected Phases		4			8						6	
Permitted Phases			4	8			2		2	6		
Actuated Green, G (s)		15.5	15.5	15.5	15.5		20.1		20.1	20.1	20.1	
Effective Green, g (s)		15.5	15.5	15.5	15.5		20.1		20.1	20.1	20.1	
Actuated g/C Ratio		0.33	0.33	0.33	0.33		0.42		0.42	0.42	0.42	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		586	498	302	586		410		646	722	1413	
v/s Ratio Prot		0.18			c0.24						0.11	
v/s Ratio Perm			0.08	0.21			c0.21		0.08	0.06		
v/c Ratio		0.56	0.24	0.65	0.73		0.49		0.20	0.15	0.25	
Uniform Delay, d1		13.3	11.7	13.7	14.2		10.0		8.7	8.5	8.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.3	0.2	4.8	4.7		4.1		0.7	0.4	0.4	
Delay (s)		14.5	12.0	18.5	19.0		14.2		9.4	8.9	9.3	
Level of Service		B	B	B	B		B		A	A	A	
Approach Delay (s)		13.8			18.8			11.3			9.2	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			47.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	527	0	0	542	65	52	311	56	0	0	0
Future Volume (vph)	168	527	0	0	542	65	52	311	56	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1775		1711	1759				
Flt Permitted	0.25	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	445	1801			1775		1711	1759				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	168	527	0	0	542	65	52	311	56	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	10	0	0	0	0
Lane Group Flow (vph)	168	527	0	0	599	0	52	357	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	22.9	22.9			22.9		19.2	19.2				
Effective Green, g (s)	22.9	22.9			22.9		19.2	19.2				
Actuated g/C Ratio	0.42	0.42			0.42		0.35	0.35				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	188	762			751		607	624				
v/s Ratio Prot		0.29			0.34			c0.20				
v/s Ratio Perm	c0.38						0.03					
v/c Ratio	0.89	0.69			0.80		0.09	0.57				
Uniform Delay, d1	14.5	12.7			13.6		11.6	14.1				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	37.3	2.7			5.9		0.3	3.8				
Delay (s)	51.7	15.4			19.5		11.9	17.9				
Level of Service	D	B			B		B	B				
Approach Delay (s)		24.2			19.5			17.2			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			20.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			54.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			76.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	523	44	60	522	47	65	271	59	29	194	39
Future Volume (vph)	48	523	44	60	522	47	65	271	59	29	194	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	0.99			0.98			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		1776		1711	1778			1750			1755	
Flt Permitted		0.93		0.39	1.00			0.90			0.93	
Satd. Flow (perm)		1650		706	1778			1587			1636	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	523	44	60	522	47	65	271	59	29	194	39
RTOR Reduction (vph)	0	5	0	0	5	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	610	0	60	564	0	0	384	0	0	251	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.1		28.1	28.1			17.2			17.2	
Effective Green, g (s)		28.1		28.1	28.1			17.2			17.2	
Actuated g/C Ratio		0.49		0.49	0.49			0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		809		346	871			476			491	
v/s Ratio Prot					0.32							
v/s Ratio Perm		c0.37		0.08				c0.24			0.15	
v/c Ratio		0.75		0.17	0.65			0.81			0.51	
Uniform Delay, d1		11.8		8.1	10.9			18.5			16.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		6.5		1.1	3.7			9.6			0.9	
Delay (s)		18.3		9.2	14.6			28.2			17.5	
Level of Service		B		A	B			C			B	
Approach Delay (s)		18.3			14.1			28.2			17.5	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			57.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			110.8%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	504	58	151	589	92	155	260	193	27	118	12
Future Volume (vph)	0	504	58	151	589	92	155	260	193	27	118	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1776		1711	1764		1711	1801	1531		1767	
Flt Permitted		0.99		0.20	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1758		354	1764		1711	1801	1531		1767	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	504	58	151	589	92	155	260	193	27	118	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	157	0	3	0
Lane Group Flow (vph)	0	558	0	151	681	0	155	260	36	0	154	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		30.1		41.2	41.2		16.4	16.4	16.4		12.8	
Effective Green, g (s)		30.1		41.2	41.2		16.4	16.4	16.4		12.8	
Actuated g/C Ratio		0.34		0.47	0.47		0.19	0.19	0.19		0.14	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		604		243	822		317	334	284		255	
v/s Ratio Prot		0.31		0.04	c0.39		0.09	c0.14			c0.09	
v/s Ratio Perm				0.25					0.02			
v/c Ratio		0.92		0.62	0.83		0.49	0.78	0.13		0.60	
Uniform Delay, d1		28.0		31.8	20.5		32.2	34.3	30.0		35.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		22.0		4.9	9.4		1.2	10.9	0.2		4.0	
Delay (s)		50.1		36.6	30.0		33.4	45.2	30.2		39.4	
Level of Service		D		D	C		C	D	C		D	
Approach Delay (s)		50.1			31.2			37.4			39.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			38.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			108.7%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	372	90	78	467	61	59	88	58	110	193	23
Future Volume (vph)	16	372	90	78	467	61	59	88	58	110	193	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			0.99			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.98	1.00		0.98	
Satd. Flow (prot)		1752			1765			1765	1531		1754	
Flt Permitted		0.97			0.89			0.79	1.00		0.83	
Satd. Flow (perm)		1708			1582			1422	1531		1480	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	372	90	78	467	61	59	88	58	110	193	23
RTOR Reduction (vph)	0	15	0	0	7	0	0	0	38	0	5	0
Lane Group Flow (vph)	0	463	0	0	599	0	0	147	20	0	321	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		24.9			24.9			19.2	19.2		19.2	
Effective Green, g (s)		24.9			24.9			19.2	19.2		19.2	
Actuated g/C Ratio		0.44			0.44			0.34	0.34		0.34	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		758			702			486	523		506	
v/s Ratio Prot												
v/s Ratio Perm		0.27			0.38			0.10	0.01		0.22	
v/c Ratio		0.61			0.85			0.30	0.04		0.64	
Uniform Delay, d1		11.9			14.0			13.5	12.3		15.5	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.5			9.8			1.6	0.1		6.0	
Delay (s)		13.4			23.8			15.1	12.4		21.5	
Level of Service		B			C			B	B		C	
Approach Delay (s)		13.4			23.8			14.4			21.5	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			56.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			97.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	458	99	64	462	88	123	88	75	75	126	9
Future Volume (vph)	17	458	99	64	462	88	123	88	75	75	126	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)		1797	1531	1711	1757			1750	1531		1768	1531
Flt Permitted		0.94	1.00	0.36	1.00			0.71	1.00		0.81	1.00
Satd. Flow (perm)		1701	1531	648	1757			1279	1531		1455	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	458	99	64	462	88	123	88	75	75	126	9
RTOR Reduction (vph)	0	0	62	0	14	0	0	0	47	0	0	6
Lane Group Flow (vph)	0	475	37	64	536	0	0	211	28	0	201	3
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		17.9	17.9	17.9	17.9			18.1	18.1		18.1	18.1
Effective Green, g (s)		17.9	17.9	17.9	17.9			18.1	18.1		18.1	18.1
Actuated g/C Ratio		0.37	0.37	0.37	0.37			0.38	0.38		0.38	0.38
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		634	570	241	655			482	577		548	577
v/s Ratio Prot				c0.30								
v/s Ratio Perm		0.28	0.02	0.10				c0.16	0.02		0.14	0.00
v/c Ratio		0.75	0.06	0.27	0.82			0.44	0.05		0.37	0.01
Uniform Delay, d1		13.1	9.7	10.5	13.6			11.2	9.5		10.8	9.3
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		4.8	0.0	0.6	7.8			2.9	0.2		1.9	0.0
Delay (s)		17.9	9.7	11.1	21.4			14.0	9.6		12.7	9.4
Level of Service		B	A	B	C			B	A		B	A
Approach Delay (s)		16.5			20.3			12.9			12.6	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.8				HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		48.0				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		90.4%				ICU Level of Service		E				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	515	57	92	575	174	7	167	49	281	437	134
Future Volume (vph)	97	515	57	92	575	174	7	167	49	281	437	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1774		1711	1801	1531		1745		1711	1801	1531
Flt Permitted	0.25	1.00		0.25	1.00	1.00		0.98		0.68	1.00	1.00
Satd. Flow (perm)	450	1774		456	1801	1531		1718		1221	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	515	57	92	575	174	7	167	49	281	437	134
RTOR Reduction (vph)	0	7	0	0	0	104	0	18	0	0	0	83
Lane Group Flow (vph)	97	565	0	92	575	70	0	205	0	281	437	51
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	20.5	20.5		20.5	20.5	20.5		20.1		20.1	20.1	20.1
Effective Green, g (s)	20.5	20.5		20.5	20.5	20.5		20.1		20.1	20.1	20.1
Actuated g/C Ratio	0.39	0.39		0.39	0.39	0.39		0.38		0.38	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	175	691		177	701	596		656		466	688	585
v/s Ratio Prot		0.32			c0.32						c0.24	
v/s Ratio Perm	0.22			0.20		0.05		0.12		0.23		0.03
v/c Ratio	0.55	0.82		0.52	0.82	0.12		0.31		0.60	0.64	0.09
Uniform Delay, d1	12.5	14.4		12.3	14.4	10.3		11.4		13.0	13.3	10.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	7.4		2.6	7.6	0.1		1.2		5.7	4.4	0.3
Delay (s)	16.3	21.8		14.9	22.0	10.4		12.6		18.7	17.7	10.7
Level of Service	B	C		B	C	B		B		B	B	B
Approach Delay (s)		21.0			18.8			12.6			16.9	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			52.6				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			90.8%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	819	0	0	698	38	48	368	109	0	0	0
Future Volume (vph)	43	819	0	0	698	38	48	368	109	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.99	1.00			
Satd. Flow (prot)	1711	1801			1788			1790	1531			
Flt Permitted	0.19	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	338	1801			1788			1790	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	819	0	0	698	38	48	368	109	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	76	0	0	0
Lane Group Flow (vph)	43	819	0	0	732	0	0	416	33	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	28.7	28.7			28.7			18.0	18.0			
Effective Green, g (s)	28.7	28.7			28.7			18.0	18.0			
Actuated g/C Ratio	0.49	0.49			0.49			0.31	0.31			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	165	880			874			548	469			
v/s Ratio Prot		c0.45			0.41							
v/s Ratio Perm	0.13							0.23	0.02			
v/c Ratio	0.26	0.93			0.84			0.76	0.07			
Uniform Delay, d1	8.8	14.1			13.0			18.4	14.4			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.8	16.1			7.1			9.5	0.3			
Delay (s)	9.6	30.2			20.1			27.9	14.7			
Level of Service	A	C			C			C	B			
Approach Delay (s)		29.1			20.1			25.2			0.0	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			25.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			58.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			75.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	793	37	69	726	66	32	289	40	70	214	34
Future Volume (vph)	32	793	37	69	726	66	32	289	40	70	214	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1789		1711	1778			1766			1755	
Flt Permitted	0.14	1.00		0.14	1.00			0.95			0.80	
Satd. Flow (perm)	260	1789		248	1778			1686			1417	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	793	37	69	726	66	32	289	40	70	214	34
RTOR Reduction (vph)	0	3	0	0	6	0	0	8	0	0	7	0
Lane Group Flow (vph)	32	827	0	69	786	0	0	353	0	0	311	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	29.0	29.0		29.0	29.0			18.0			18.0	
Effective Green, g (s)	29.0	29.0		29.0	29.0			18.0			18.0	
Actuated g/C Ratio	0.49	0.49		0.49	0.49			0.31			0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	127	879		121	873			514			432	
v/s Ratio Prot		c0.46			0.44							
v/s Ratio Perm	0.12			0.28				0.21			c0.22	
v/c Ratio	0.25	0.94		0.57	0.90			0.69			0.72	
Uniform Delay, d1	8.7	14.2		10.6	13.7			18.0			18.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.0	17.7		6.3	12.3			7.3			9.9	
Delay (s)	9.8	31.9		16.9	26.0			25.3			28.2	
Level of Service	A	C		B	C			C			C	
Approach Delay (s)		31.0			25.3			25.3			28.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			59.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			95.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1333	1	148	488	407	0	151	344	392	135	17
Future Volume (vph)	0	1333	1	148	488	407	0	151	344	392	135	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3421		1711	1801	1531		1801	1531	3319	1770	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3421		1711	1801	1531		1801	1531	3319	1770	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1333	1	148	488	407	0	151	344	392	135	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	146	0	0	0
Lane Group Flow (vph)	0	1334	0	148	488	407	0	151	198	392	152	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		43.1		10.0	59.1	59.1		16.5	16.5	14.0	36.5	
Effective Green, g (s)		43.1		10.0	59.1	59.1		16.5	16.5	14.0	36.5	
Actuated g/C Ratio		0.40		0.09	0.55	0.55		0.15	0.15	0.13	0.34	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1370		159	989	840		276	234	431	600	
v/s Ratio Prot		c0.39		c0.09	0.27	0.27		0.08		c0.12	0.09	
v/s Ratio Perm									c0.13			
v/c Ratio		0.97		0.93	0.49	0.48		0.55	0.84	0.91	0.25	
Uniform Delay, d1		31.7		48.5	15.0	14.9		42.1	44.3	46.2	25.7	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		18.8		51.2	1.8	2.0		2.2	23.3	22.7	0.2	
Delay (s)		50.5		99.6	16.8	16.9		44.3	67.6	68.8	25.9	
Level of Service		D		F	B	B		D	E	E	C	
Approach Delay (s)		50.5			28.6			60.5			56.8	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			46.3		HCM 2000 Level of Service						D	
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			107.6		Sum of lost time (s)						24.0	
Intersection Capacity Utilization			84.4%		ICU Level of Service						E	
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

3: Pine St & Bank St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	68	0	5	97	0	14
Future Volume (vph)	68	0	5	97	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	1.00		0.87			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1711		1569			1801
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1711		1569			1801
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	0	5	97	0	14
RTOR Reduction (vph)	0	0	32	0	0	0
Lane Group Flow (vph)	68	0	70	0	0	14
Turn Type	Prot		NA			NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	3.3		31.8			31.8
Effective Green, g (s)	3.3		31.8			31.8
Actuated g/C Ratio	0.07		0.68			0.68
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	119		1059			1215
v/s Ratio Prot	c0.04		c0.04			0.01
v/s Ratio Perm						
v/c Ratio	0.57		0.07			0.01
Uniform Delay, d1	21.2		2.6			2.5
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	6.5		0.1			0.0
Delay (s)	27.7		2.7			2.5
Level of Service	C		A			A
Approach Delay (s)	27.7		2.7			2.5
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			11.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.11			
Actuated Cycle Length (s)			47.1		Sum of lost time (s)	12.0
Intersection Capacity Utilization			20.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

4: Pine St & Cherry St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	143	0	0	105	70	0	5	0	84	14	74
Future Volume (vph)	25	143	0	0	105	70	0	5	0	84	14	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.95			1.00			0.94	
Flt Protected		0.99			1.00			1.00			0.98	
Satd. Flow (prot)		1787			1703			1801			1656	
Flt Permitted		0.91			1.00			1.00			0.87	
Satd. Flow (perm)		1641			1703			1801			1472	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	143	0	0	105	70	0	5	0	84	14	74
RTOR Reduction (vph)	0	0	0	0	57	0	0	0	0	0	34	0
Lane Group Flow (vph)	0	168	0	0	118	0	0	5	0	0	138	0
Turn Type	Perm	NA			NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.1			8.1			23.1			23.1	
Effective Green, g (s)		8.1			8.1			23.1			23.1	
Actuated g/C Ratio		0.19			0.19			0.53			0.53	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		307			319			963			787	
v/s Ratio Prot					0.07			0.00				
v/s Ratio Perm		c0.10									c0.09	
v/c Ratio		0.55			0.37			0.01			0.17	
Uniform Delay, d1		15.9			15.3			4.7			5.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.0			0.7			0.0			0.5	
Delay (s)		17.9			16.1			4.7			5.6	
Level of Service		B			B			A			A	
Approach Delay (s)		17.9			16.1			4.7			5.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		13.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.27										
Actuated Cycle Length (s)		43.2			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		50.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	81	318	182	329	1353
Future Volume (vph)	162	81	318	182	329	1353
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3388
Flt Permitted	0.95	1.00	1.00	1.00		0.79
Satd. Flow (perm)	1711	1531	1801	2694		2710
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	162	81	318	182	329	1353
RTOR Reduction (vph)	0	69	0	52	0	0
Lane Group Flow (vph)	162	12	318	130	0	1682
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.3	13.3	63.1	63.1		63.1
Effective Green, g (s)	13.3	13.3	63.1	63.1		63.1
Actuated g/C Ratio	0.15	0.15	0.71	0.71		0.71
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	257	230	1285	1922		1934
v/s Ratio Prot	c0.09		0.18			
v/s Ratio Perm		0.01		0.05		c0.62
v/c Ratio	0.63	0.05	0.25	0.07		0.87
Uniform Delay, d1	35.2	32.2	4.4	3.8		9.5
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.0	0.1	0.5	0.1		5.7
Delay (s)	40.2	32.3	4.9	3.9		15.2
Level of Service	D	C	A	A		B
Approach Delay (s)	37.6		4.5			15.2
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			88.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			87.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	372	62	119	321	36	44
Future Volume (vph)	372	62	119	321	36	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1766			1777	1630	
Flt Permitted	1.00			0.65	0.98	
Satd. Flow (perm)	1766			1175	1630	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	372	62	119	321	36	44
RTOR Reduction (vph)	12	0	0	0	28	0
Lane Group Flow (vph)	422	0	0	440	52	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	21.4			21.4	18.3	
Effective Green, g (s)	21.4			21.4	18.3	
Actuated g/C Ratio	0.41			0.41	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	730			486	576	
v/s Ratio Prot	0.24				c0.03	
v/s Ratio Perm				c0.37		
v/c Ratio	0.58			0.91	0.09	
Uniform Delay, d1	11.7			14.2	11.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.1			20.2	0.3	
Delay (s)	12.8			34.4	11.4	
Level of Service	B			C	B	
Approach Delay (s)	12.8			34.4	11.4	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			22.6		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			51.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			66.5%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	202	100	201	428	0	126	0	108	59	376	83
Future Volume (vph)	0	202	100	201	428	0	126	0	108	59	376	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3328	
Flt Permitted		1.00	1.00	0.95	1.00		0.49		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1711	1801		878		1531	1711	3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	202	100	201	428	0	126	0	108	59	376	83
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	0	202	100	201	428	0	126	0	37	59	459	0
Turn Type		NA	Perm	Prot	NA		Perm		Perm	Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		11.3	11.3	6.0	23.3		18.1		18.1	18.1	18.1	
Effective Green, g (s)		11.3	11.3	6.0	23.3		18.1		18.1	18.1	18.1	
Actuated g/C Ratio		0.21	0.21	0.11	0.44		0.34		0.34	0.34	0.34	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		381	323	192	785		297		518	579	1128	
v/s Ratio Prot		0.11		c0.12	c0.24						0.14	
v/s Ratio Perm			0.07				c0.14		0.02	0.03		
v/c Ratio		0.53	0.31	1.05	0.55		0.42		0.07	0.10	0.41	
Uniform Delay, d1		18.7	17.8	23.7	11.1		13.6		12.0	12.1	13.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.4	0.5	77.8	0.8		4.4		0.3	0.4	1.1	
Delay (s)		20.1	18.3	101.5	11.9		18.0		12.2	12.4	14.6	
Level of Service		C	B	F	B		B		B	B	B	
Approach Delay (s)		19.5			40.5			15.3			14.4	
Approach LOS		B			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			25.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			53.4			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			60.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	344	0	0	529	67	30	105	51	0	0	0
Future Volume (vph)	54	344	0	0	529	67	30	105	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1773		1711	1712				
Flt Permitted	0.25	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	452	1801			1773		1711	1712				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	344	0	0	529	67	30	105	51	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	30	0	0	0	0
Lane Group Flow (vph)	54	344	0	0	587	0	30	126	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	20.9	20.9			20.9		18.2	18.2				
Effective Green, g (s)	20.9	20.9			20.9		18.2	18.2				
Actuated g/C Ratio	0.41	0.41			0.41		0.36	0.36				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	184	736			725		609	609				
v/s Ratio Prot		0.19			c0.33			c0.07				
v/s Ratio Perm	0.12						0.02					
v/c Ratio	0.29	0.47			0.81		0.05	0.21				
Uniform Delay, d1	10.1	11.0			13.3		10.8	11.4				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.9	0.5			6.7		0.2	0.8				
Delay (s)	11.0	11.5			20.0		10.9	12.2				
Level of Service	B	B			C		B	B				
Approach Delay (s)		11.4			20.0			12.0			0.0	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			51.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			59.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	352	47	49	518	17	34	107	50	25	240	34
Future Volume (vph)	19	352	47	49	518	17	34	107	50	25	240	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	1.00			0.96			0.98	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1769		1711	1792			1722			1766	
Flt Permitted		0.96		0.49	1.00			0.90			0.96	
Satd. Flow (perm)		1709		887	1792			1561			1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	19	352	47	49	518	17	34	107	50	25	240	34
RTOR Reduction (vph)	0	9	0	0	2	0	0	26	0	0	9	0
Lane Group Flow (vph)	0	409	0	49	533	0	0	165	0	0	290	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0		20.0	20.0			18.0			18.0	
Effective Green, g (s)		20.0		20.0	20.0			18.0			18.0	
Actuated g/C Ratio		0.40		0.40	0.40			0.36			0.36	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		683		354	716			561			614	
v/s Ratio Prot					c0.30							
v/s Ratio Perm		0.24		0.06				0.11			c0.17	
v/c Ratio		0.60		0.14	0.74			0.29			0.47	
Uniform Delay, d1		11.8		9.5	12.8			11.5			12.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.9		0.8	6.9			1.3			2.6	
Delay (s)		15.7		10.3	19.7			12.8			14.9	
Level of Service		B		B	B			B			B	
Approach Delay (s)		15.7			18.9			12.8			14.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑	↔		↔	
Traffic Volume (vph)	0	403	75	197	554	45	76	74	121	38	224	27
Future Volume (vph)	0	403	75	197	554	45	76	74	121	38	224	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1763		1711	1780		1711	1801	1531		1766	
Flt Permitted		1.00		0.25	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1763		452	1780		1711	1801	1531		1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	403	75	197	554	45	76	74	121	38	224	27
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	109	0	5	0
Lane Group Flow (vph)	0	471	0	197	599	0	76	74	12	0	284	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		20.4		31.7	31.7		7.3	7.3	7.3		15.6	
Effective Green, g (s)		20.4		31.7	31.7		7.3	7.3	7.3		15.6	
Actuated g/C Ratio		0.28		0.44	0.44		0.10	0.10	0.10		0.21	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		495		289	777		172	181	153		379	
v/s Ratio Prot		c0.27		0.05	c0.34		c0.04	0.04			c0.16	
v/s Ratio Perm				0.25					0.01			
v/c Ratio		0.95		0.68	0.77		0.44	0.41	0.08		0.75	
Uniform Delay, d1		25.6		25.1	17.4		30.7	30.6	29.6		26.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		30.0		6.5	7.3		1.8	1.5	0.2		8.1	
Delay (s)		55.6		31.5	24.6		32.5	32.1	29.8		34.8	
Level of Service		E		C	C		C	C	C		C	
Approach Delay (s)		55.6			26.4			31.2			34.8	
Approach LOS		E			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.0			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			72.6			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			94.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	407	82	81	428	124	54	142	56	48	82	14
Future Volume (vph)	10	407	82	81	428	124	54	142	56	48	82	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.98			0.97			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.99	1.00		0.98	
Satd. Flow (prot)		1759			1742			1776	1531		1748	
Flt Permitted		0.99			0.89			0.88	1.00		0.84	
Satd. Flow (perm)		1735			1556			1579	1531		1497	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	407	82	81	428	124	54	142	56	48	82	14
RTOR Reduction (vph)	0	13	0	0	16	0	0	0	38	0	6	0
Lane Group Flow (vph)	0	486	0	0	617	0	0	196	18	0	138	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		25.7			25.7			18.2	18.2		18.2	
Effective Green, g (s)		25.7			25.7			18.2	18.2		18.2	
Actuated g/C Ratio		0.46			0.46			0.33	0.33		0.33	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		797			715			514	498		487	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.40			c0.12	0.01		0.09	
v/c Ratio		0.61			0.86			0.38	0.04		0.28	
Uniform Delay, d1		11.3			13.5			14.5	12.9		14.0	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.3			10.5			2.1	0.1		1.5	
Delay (s)		12.7			24.1			16.7	13.0		15.5	
Level of Service		B			C			B	B		B	
Approach Delay (s)		12.7			24.1			15.8			15.5	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		18.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		55.9			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		99.8%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	322	75	59	472	102	100	154	40	47	37	13
Future Volume (vph)	3	322	75	59	472	102	100	154	40	47	37	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1800	1531	1711	1753			1766	1531	1711	1730	
Flt Permitted		0.99	1.00	0.55	1.00			0.85	1.00	0.60	1.00	
Satd. Flow (perm)		1791	1531	983	1753			1533	1531	1084	1730	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	322	75	59	472	102	100	154	40	47	37	13
RTOR Reduction (vph)	0	0	45	0	16	0	0	0	26	0	8	0
Lane Group Flow (vph)	0	325	30	59	558	0	0	254	14	47	42	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		20.3	20.3	20.3	20.3			18.2	18.2	18.2	18.2	
Effective Green, g (s)		20.3	20.3	20.3	20.3			18.2	18.2	18.2	18.2	
Actuated g/C Ratio		0.40	0.40	0.40	0.40			0.36	0.36	0.36	0.36	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		719	615	395	704			552	551	390	623	
v/s Ratio Prot					c0.32							0.02
v/s Ratio Perm		0.18	0.02	0.06				c0.17	0.01	0.04		
v/c Ratio		0.45	0.05	0.15	0.79			0.46	0.03	0.12	0.07	
Uniform Delay, d1		11.0	9.2	9.6	13.3			12.4	10.4	10.8	10.6	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.0	0.2	6.1			2.7	0.1	0.6	0.2	
Delay (s)		11.5	9.2	9.8	19.4			15.1	10.5	11.4	10.8	
Level of Service		B	A	A	B			B	B	B	B	
Approach Delay (s)		11.1			18.5			14.5			11.1	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			50.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			81.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	331	18	113	517	141	6	53	11	95	253	119
Future Volume (vph)	41	331	18	113	517	141	6	53	11	95	253	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	0.95	0.95		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1625	1697		1711	1801	1531		1755		1711	1801	1531
Flt Permitted	0.31	0.99		0.48	1.00	1.00		0.97		0.71	1.00	1.00
Satd. Flow (perm)	525	1686		871	1801	1531		1707		1281	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	331	18	113	517	141	6	53	11	95	253	119
RTOR Reduction (vph)	0	4	0	0	0	89	0	7	0	0	0	74
Lane Group Flow (vph)	37	349	0	113	517	52	0	63	0	95	253	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	17.5	17.5		17.5	17.5	17.5		18.1		18.1	18.1	18.1
Effective Green, g (s)	17.5	17.5		17.5	17.5	17.5		18.1		18.1	18.1	18.1
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37		0.38		0.38	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	193	619		320	662	562		649		487	684	582
v/s Ratio Prot				c0.29						c0.14		
v/s Ratio Perm	0.07	0.21		0.13		0.03		0.04		0.07		0.03
v/c Ratio	0.19	0.56		0.35	0.78	0.09		0.10		0.20	0.37	0.08
Uniform Delay, d1	10.2	12.0		10.9	13.3	9.9		9.5		9.9	10.6	9.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.2		0.7	6.0	0.1		0.3		0.9	1.5	0.3
Delay (s)	10.7	13.2		11.6	19.3	9.9		9.8		10.8	12.2	9.7
Level of Service	B	B		B	B	A		A		B	B	A
Approach Delay (s)		13.0			16.5			9.8			11.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			47.6				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			73.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	450	0	0	768	32	41	542	46	0	0	0
Future Volume (vph)	14	450	0	0	768	32	41	542	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1711	1801			1791			1794	1531			
Flt Permitted	0.10	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	174	1801			1791			1794	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	450	0	0	768	32	41	542	46	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	22	0	0	0
Lane Group Flow (vph)	14	450	0	0	798	0	0	583	24	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	41.4	41.4			41.4			35.0	35.0			
Effective Green, g (s)	41.4	41.4			41.4			35.0	35.0			
Actuated g/C Ratio	0.47	0.47			0.47			0.40	0.40			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	81	843			838			710	606			
v/s Ratio Prot		0.25			c0.45							
v/s Ratio Perm	0.08							0.32	0.02			
v/c Ratio	0.17	0.53			0.95			0.82	0.04			
Uniform Delay, d1	13.6	16.7			22.6			23.9	16.4			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	1.0	0.7			20.4			10.3	0.1			
Delay (s)	14.6	17.3			42.9			34.2	16.5			
Level of Service	B	B			D			C	B			
Approach Delay (s)		17.2			42.9			32.9			0.0	
Approach LOS		B			D			C			A	
Intersection Summary												
HCM 2000 Control Delay			33.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			83.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	444	14	56	650	32	21	194	47	66	203	19
Future Volume (vph)	15	444	14	56	650	32	21	194	47	66	203	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1792		1711	1788			1750			1764	
Flt Permitted	0.19	1.00		0.40	1.00			0.96			0.87	
Satd. Flow (perm)	334	1792		721	1788			1684			1561	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	444	14	56	650	32	21	194	47	66	203	19
RTOR Reduction (vph)	0	2	0	0	3	0	0	13	0	0	4	0
Lane Group Flow (vph)	15	456	0	56	679	0	0	249	0	0	284	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.0	25.0		25.0	25.0			20.1			20.1	
Effective Green, g (s)	25.0	25.0		25.0	25.0			20.1			20.1	
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.35			0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	146	784		315	782			592			549	
v/s Ratio Prot		0.25			c0.38							
v/s Ratio Perm	0.04			0.08				0.15			c0.18	
v/c Ratio	0.10	0.58		0.18	0.87			0.42			0.52	
Uniform Delay, d1	9.4	12.1		9.8	14.6			14.1			14.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.1		0.3	10.0			2.2			3.5	
Delay (s)	9.8	13.2		10.1	24.6			16.3			18.1	
Level of Service	A	B		B	C			B			B	
Approach Delay (s)		13.1			23.5			16.3			18.1	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			57.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			86.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	695	4	224	971	609	0	85	179	240	73	46
Future Volume (vph)	0	695	4	224	971	609	0	85	179	240	73	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3418		1711	1801	1531		1801	1531	3319	1696	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3418		1711	1801	1531		1801	1531	3319	1696	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	695	4	224	971	609	0	85	179	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	159	0	0	0
Lane Group Flow (vph)	0	698	0	224	971	609	0	85	20	240	119	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		27.1		13.9	47.0	47.0		9.3	9.3	7.1	22.4	
Effective Green, g (s)		27.1		13.9	47.0	47.0		9.3	9.3	7.1	22.4	
Actuated g/C Ratio		0.33		0.17	0.58	0.58		0.11	0.11	0.09	0.28	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1137		292	1039	883		205	174	289	466	
v/s Ratio Prot		0.20		0.13	c0.54	0.40		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.61		0.77	0.93	0.69		0.41	0.12	0.83	0.26	
Uniform Delay, d1		22.8		32.2	15.8	12.1		33.5	32.4	36.6	23.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.5		11.4	16.0	4.4		1.4	0.3	18.0	0.3	
Delay (s)		25.3		43.6	31.8	16.5		34.9	32.7	54.5	23.3	
Level of Service		C		D	C	B		C	C	D	C	
Approach Delay (s)		25.3			28.1			33.4			44.2	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			81.4				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			74.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

3: Pine St & Bank St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	0	3	115	0	18
Future Volume (vph)	123	0	3	115	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	1.00		0.87			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1711		1564			1801
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1711		1564			1801
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	0	3	115	0	18
RTOR Reduction (vph)	0	0	46	0	0	0
Lane Group Flow (vph)	123	0	72	0	0	18
Turn Type	Prot		NA			NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	5.6		26.7			26.7
Effective Green, g (s)	5.6		26.7			26.7
Actuated g/C Ratio	0.13		0.60			0.60
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	216		942			1085
v/s Ratio Prot	c0.07		c0.05			0.01
v/s Ratio Perm						
v/c Ratio	0.57		0.08			0.02
Uniform Delay, d1	18.2		3.7			3.5
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	3.4		0.2			0.0
Delay (s)	21.6		3.8			3.6
Level of Service	C		A			A
Approach Delay (s)	21.6		3.8			3.6
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			12.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.16			
Actuated Cycle Length (s)			44.3		Sum of lost time (s)	12.0
Intersection Capacity Utilization			24.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

4: Pine St & Cherry St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	114	0	0	121	256	0	3	0	74	18	33
Future Volume (vph)	87	114	0	0	121	256	0	3	0	74	18	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.91			1.00			0.96	
Flt Protected		0.98			1.00			1.00			0.97	
Satd. Flow (prot)		1763			1636			1801			1687	
Flt Permitted		0.56			1.00			1.00			0.84	
Satd. Flow (perm)		1013			1636			1801			1461	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	114	0	0	121	256	0	3	0	74	18	33
RTOR Reduction (vph)	0	0	0	0	177	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	201	0	0	200	0	0	3	0	0	107	0
Turn Type	Perm	NA			NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.2			12.2			19.2			19.2	
Effective Green, g (s)		12.2			12.2			19.2			19.2	
Actuated g/C Ratio		0.28			0.28			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		284			459			796			646	
v/s Ratio Prot					0.12			0.00				
v/s Ratio Perm		c0.20									c0.07	
v/c Ratio		0.71			0.44			0.00			0.17	
Uniform Delay, d1		14.0			12.8			6.8			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.8			0.7			0.0			0.5	
Delay (s)		21.8			13.4			6.8			7.8	
Level of Service		C			B			A			A	
Approach Delay (s)		21.8			13.4			6.8			7.8	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		14.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		43.4			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		61.6%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	151	166	835	486	176	625
Future Volume (vph)	151	166	835	486	176	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3384
Flt Permitted	0.95	1.00	1.00	1.00		0.56
Satd. Flow (perm)	1711	1531	1801	2694		1899
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	151	166	835	486	176	625
RTOR Reduction (vph)	0	98	0	196	0	0
Lane Group Flow (vph)	151	68	835	290	0	801
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.1	10.1	32.8	32.8		32.8
Effective Green, g (s)	10.1	10.1	32.8	32.8		32.8
Actuated g/C Ratio	0.18	0.18	0.60	0.60		0.60
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	314	281	1076	1609		1134
v/s Ratio Prot	c0.09		c0.46			
v/s Ratio Perm		0.04		0.11		0.42
v/c Ratio	0.48	0.24	0.78	0.18		0.71
Uniform Delay, d1	20.1	19.1	8.3	5.0		7.7
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.4	5.5	0.2		3.7
Delay (s)	21.2	19.6	13.8	5.2		11.4
Level of Service	C	B	B	A		B
Approach Delay (s)	20.4		10.6			11.4
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			12.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			54.9		Sum of lost time (s)	12.0
Intersection Capacity Utilization			89.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	43	75	445	90	155
Future Volume (vph)	422	43	75	445	90	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.91	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1778			1788	1617	
Flt Permitted	1.00			0.79	0.98	
Satd. Flow (perm)	1778			1422	1617	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	422	43	75	445	90	155
RTOR Reduction (vph)	7	0	0	0	100	0
Lane Group Flow (vph)	458	0	0	520	145	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	21.0			21.0	18.2	
Effective Green, g (s)	21.0			21.0	18.2	
Actuated g/C Ratio	0.41			0.41	0.36	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	729			583	574	
v/s Ratio Prot	0.26				c0.09	
v/s Ratio Perm				c0.37		
v/c Ratio	0.63			0.89	0.25	
Uniform Delay, d1	12.0			14.0	11.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.7			15.8	1.1	
Delay (s)	13.7			29.9	12.7	
Level of Service	B			C	B	
Approach Delay (s)	13.7			29.9	12.7	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			51.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			81.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑		↑		↑	↑	↑↓	↑
Traffic Volume (vph)	0	371	114	209	436	0	195	0	314	104	312	50
Future Volume (vph)	0	371	114	209	436	0	195	0	314	104	312	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3350	
Flt Permitted		1.00	1.00	0.95	1.00		0.54		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1711	1801		965		1531	1711	3350	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	371	114	209	436	0	195	0	314	104	312	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	216	0	0	0
Lane Group Flow (vph)	0	371	114	209	436	0	195	0	98	104	362	0
Turn Type		NA	Perm	Prot	NA		Perm		Perm	Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		15.7	15.7	6.0	27.7		18.0		18.0	18.0	18.0	
Effective Green, g (s)		15.7	15.7	6.0	27.7		18.0		18.0	18.0	18.0	
Actuated g/C Ratio		0.27	0.27	0.10	0.48		0.31		0.31	0.31	0.31	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		490	416	177	864		301		477	533	1045	
v/s Ratio Prot		c0.21		c0.12	0.24						0.11	
v/s Ratio Perm			0.07				c0.20		0.06	0.06		
v/c Ratio		0.76	0.27	1.18	0.50		0.65		0.21	0.20	0.35	
Uniform Delay, d1		19.3	16.5	25.9	10.3		17.1		14.6	14.5	15.3	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		6.6	0.4	124.7	0.5		10.3		1.0	0.8	0.9	
Delay (s)		25.8	16.9	150.5	10.8		27.4		15.6	15.4	16.2	
Level of Service		C	B	F	B		C		B	B	B	
Approach Delay (s)		23.7			56.1			20.1			16.0	
Approach LOS		C			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			31.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			57.7			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			70.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	577	0	0	565	63	51	302	54	0	0	0
Future Volume (vph)	163	577	0	0	565	63	51	302	54	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1776		1711	1760				
Flt Permitted	0.23	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	422	1801			1776		1711	1760				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	163	577	0	0	565	63	51	302	54	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	10	0	0	0	0
Lane Group Flow (vph)	163	577	0	0	621	0	51	346	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	23.8	23.8			23.8		19.2	19.2				
Effective Green, g (s)	23.8	23.8			23.8		19.2	19.2				
Actuated g/C Ratio	0.43	0.43			0.43		0.35	0.35				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	182	779			768		597	614				
v/s Ratio Prot		0.32			0.35			c0.20				
v/s Ratio Perm	c0.39						0.03					
v/c Ratio	0.90	0.74			0.81		0.09	0.56				
Uniform Delay, d1	14.4	13.0			13.6		12.0	14.5				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	38.4	3.8			6.3		0.3	3.7				
Delay (s)	52.9	16.8			19.9		12.3	18.2				
Level of Service	D	B			B		B	B				
Approach Delay (s)		24.8			19.9			17.5			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		21.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	554	45	58	543	46	65	263	57	29	189	38
Future Volume (vph)	63	554	45	58	543	46	65	263	57	29	189	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	0.99			0.98			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		1776		1711	1780			1750			1755	
Flt Permitted		0.84		0.37	1.00			0.90			0.93	
Satd. Flow (perm)		1491		668	1780			1585			1637	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	63	554	45	58	543	46	65	263	57	29	189	38
RTOR Reduction (vph)	0	5	0	0	5	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	658	0	58	584	0	0	375	0	0	246	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0		30.0	30.0			18.0			18.0	
Effective Green, g (s)		30.0		30.0	30.0			18.0			18.0	
Actuated g/C Ratio		0.50		0.50	0.50			0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		745		334	890			475			491	
v/s Ratio Prot					0.33							
v/s Ratio Perm		c0.44		0.09				c0.24			0.15	
v/c Ratio		0.88		0.17	0.66			0.79			0.50	
Uniform Delay, d1		13.4		8.2	11.2			19.3			17.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		14.3		1.1	3.8			12.5			3.6	
Delay (s)		27.7		9.3	14.9			31.7			20.9	
Level of Service		C		A	B			C			C	
Approach Delay (s)		27.7			14.4			31.7			20.9	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			23.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			113.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑	↔		↔	
Traffic Volume (vph)	0	535	57	146	608	89	151	252	187	27	115	12
Future Volume (vph)	0	535	57	146	608	89	151	252	187	27	115	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1777		1711	1766		1711	1801	1531		1766	
Flt Permitted		1.00		0.17	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1777		301	1766		1711	1801	1531		1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	535	57	146	608	89	151	252	187	27	115	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	153	0	3	0
Lane Group Flow (vph)	0	588	0	146	697	0	151	252	34	0	151	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		30.1		41.2	41.2		16.2	16.2	16.2		12.7	
Effective Green, g (s)		30.1		41.2	41.2		16.2	16.2	16.2		12.7	
Actuated g/C Ratio		0.34		0.47	0.47		0.18	0.18	0.18		0.14	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		607		222	825		314	331	281		254	
v/s Ratio Prot		c0.33		0.04	c0.39		0.09	c0.14			c0.09	
v/s Ratio Perm				0.27					0.02			
v/c Ratio		0.97		0.66	0.84		0.48	0.76	0.12		0.59	
Uniform Delay, d1		28.5		32.8	20.6		32.2	34.1	30.0		35.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		29.6		6.9	10.3		1.2	9.9	0.2		3.7	
Delay (s)		58.1		39.6	31.0		33.3	44.0	30.2		39.0	
Level of Service		E		D	C		C	D	C		D	
Approach Delay (s)		58.1			32.5			36.9			39.0	
Approach LOS		E			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.1			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			88.1			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			110.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	361	88	76	454	95	55	111	56	144	230	22
Future Volume (vph)	16	361	88	76	454	95	55	111	56	144	230	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			0.98			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.98	1.00		0.98	
Satd. Flow (prot)		1752			1753			1771	1531		1755	
Flt Permitted		0.97			0.90			0.80	1.00		0.81	
Satd. Flow (perm)		1705			1584			1439	1531		1450	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	361	88	76	454	95	55	111	56	144	230	22
RTOR Reduction (vph)	0	15	0	0	11	0	0	0	36	0	3	0
Lane Group Flow (vph)	0	450	0	0	614	0	0	166	20	0	393	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		25.0			25.0			20.1	20.1		20.1	
Effective Green, g (s)		25.0			25.0			20.1	20.1		20.1	
Actuated g/C Ratio		0.44			0.44			0.35	0.35		0.35	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		746			693			506	538		510	
v/s Ratio Prot												
v/s Ratio Perm		0.26			c0.39			0.12	0.01		c0.27	
v/c Ratio		0.60			0.89			0.33	0.04		0.77	
Uniform Delay, d1		12.3			14.7			13.6	12.1		16.4	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4			13.0			1.7	0.1		10.7	
Delay (s)		13.7			27.7			15.3	12.3		27.2	
Level of Service		B			C			B	B		C	
Approach Delay (s)		13.7			27.7			14.5			27.2	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			57.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			101.8%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	395	105	62	402	92	100	114	68	142	136	14
Future Volume (vph)	16	395	105	62	402	92	100	114	68	142	136	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1797	1531	1711	1750			1760	1531	1711	1775	
Flt Permitted		0.97	1.00	0.43	1.00			0.78	1.00	0.62	1.00	
Satd. Flow (perm)		1746	1531	773	1750			1413	1531	1124	1775	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	395	105	62	402	92	100	114	68	142	136	14
RTOR Reduction (vph)	0	0	68	0	17	0	0	0	42	0	7	0
Lane Group Flow (vph)	0	411	37	62	477	0	0	214	26	142	143	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		16.5	16.5	16.5	16.5			18.1	18.1	18.1	18.1	
Effective Green, g (s)		16.5	16.5	16.5	16.5			18.1	18.1	18.1	18.1	
Actuated g/C Ratio		0.35	0.35	0.35	0.35			0.39	0.39	0.39	0.39	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		618	542	273	619			548	594	436	689	
v/s Ratio Prot				c0.27								0.08
v/s Ratio Perm		0.24	0.02	0.08				c0.15	0.02	0.13		
v/c Ratio		0.67	0.07	0.23	0.77			0.39	0.04	0.33	0.21	
Uniform Delay, d1		12.7	10.0	10.6	13.4			10.3	8.9	10.0	9.5	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.7	0.1	0.4	5.8			2.1	0.1	2.0	0.7	
Delay (s)		15.4	10.0	11.0	19.1			12.4	9.0	12.0	10.2	
Level of Service		B	B	B	B			B	A	B	B	
Approach Delay (s)		14.3			18.2			11.6			11.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.6				HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		46.6				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		86.1%				ICU Level of Service		E				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	554	41	94	567	169	7	128	48	273	389	115
Future Volume (vph)	94	554	41	94	567	169	7	128	48	273	389	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	0.95	0.95		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1625	1692		1711	1801	1531		1734		1711	1801	1531
Flt Permitted	0.28	0.99		0.22	1.00	1.00		0.98		0.71	1.00	1.00
Satd. Flow (perm)	486	1676		391	1801	1531		1704		1285	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	94	554	41	94	567	169	7	128	48	273	389	115
RTOR Reduction (vph)	0	5	0	0	0	97	0	20	0	0	0	74
Lane Group Flow (vph)	85	599	0	94	567	72	0	163	0	273	389	41
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	23.8	23.8		23.8	23.8	23.8		20.2		20.2	20.2	20.2
Effective Green, g (s)	23.8	23.8		23.8	23.8	23.8		20.2		20.2	20.2	20.2
Actuated g/C Ratio	0.43	0.43		0.43	0.43	0.43		0.36		0.36	0.36	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	206	712		166	765	650		614		463	649	552
v/s Ratio Prot					0.31						c0.22	
v/s Ratio Perm	0.17	c0.36		0.24		0.05		0.10		0.21		0.03
v/c Ratio	0.41	0.84		0.57	0.74	0.11		0.26		0.59	0.60	0.08
Uniform Delay, d1	11.2	14.4		12.2	13.5	9.7		12.7		14.5	14.6	11.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	8.9		4.4	3.9	0.1		1.1		5.4	4.1	0.3
Delay (s)	12.6	23.3		16.6	17.4	9.8		13.7		20.0	18.7	12.0
Level of Service	B	C		B	B	A		B		B	B	B
Approach Delay (s)		22.0			15.8			13.7			18.1	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			56.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			109.8%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	864	0	0	701	37	47	275	111	0	0	0
Future Volume (vph)	47	864	0	0	701	37	47	275	111	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.99	1.00			
Satd. Flow (prot)	1711	1801			1788			1788	1531			
Flt Permitted	0.21	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	379	1801			1788			1788	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	864	0	0	701	37	47	275	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	79	0	0	0
Lane Group Flow (vph)	47	864	0	0	735	0	0	322	32	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	32.9	32.9			32.9			18.1	18.1			
Effective Green, g (s)	32.9	32.9			32.9			18.1	18.1			
Actuated g/C Ratio	0.52	0.52			0.52			0.29	0.29			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	197	940			933			513	439			
v/s Ratio Prot		c0.48			0.41							
v/s Ratio Perm	0.12							0.18	0.02			
v/c Ratio	0.24	0.92			0.79			0.63	0.07			
Uniform Delay, d1	8.2	13.8			12.2			19.5	16.3			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.6	13.6			4.5			5.7	0.3			
Delay (s)	8.8	27.4			16.7			25.2	16.7			
Level of Service	A	C			B			C	B			
Approach Delay (s)		26.4			16.7			23.0			0.0	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			22.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			63.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			72.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	843	36	67	733	60	26	280	43	68	217	24
Future Volume (vph)	31	843	36	67	733	60	26	280	43	68	217	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1790		1711	1780			1764			1762	
Flt Permitted	0.17	1.00		0.11	1.00			0.96			0.78	
Satd. Flow (perm)	307	1790		200	1780			1701			1393	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	31	843	36	67	733	60	26	280	43	68	217	24
RTOR Reduction (vph)	0	2	0	0	4	0	0	7	0	0	4	0
Lane Group Flow (vph)	31	877	0	67	789	0	0	342	0	0	305	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.1	36.1		36.1	36.1			20.1			20.1	
Effective Green, g (s)	36.1	36.1		36.1	36.1			20.1			20.1	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.29			0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	162	947		105	942			501			410	
v/s Ratio Prot		c0.49			0.44							
v/s Ratio Perm	0.10			0.34				0.20			c0.22	
v/c Ratio	0.19	0.93		0.64	0.84			0.68			0.74	
Uniform Delay, d1	8.4	14.8		11.4	13.6			21.2			21.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.6	14.4		12.0	6.6			7.3			11.6	
Delay (s)	9.0	29.2		23.5	20.1			28.6			33.3	
Level of Service	A	C		C	C			C			C	
Approach Delay (s)		28.5			20.4			28.6			33.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			68.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			99.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	1387	1	144	545	395	0	146	334	381	131	17
Future Volume (vph)	0	1387	1	144	545	395	0	146	334	381	131	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3421		1711	1801	1531		1801	1531	3319	1770	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3421		1711	1801	1531		1801	1531	3319	1770	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1387	1	144	545	395	0	146	334	381	131	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	138	0	0	0
Lane Group Flow (vph)	0	1388	0	144	545	395	0	146	196	381	148	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		39.1		8.0	53.1	53.1		15.2	15.2	11.1	32.3	
Effective Green, g (s)		39.1		8.0	53.1	53.1		15.2	15.2	11.1	32.3	
Actuated g/C Ratio		0.40		0.08	0.55	0.55		0.16	0.16	0.11	0.33	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1373		140	981	834		281	238	378	586	
v/s Ratio Prot		c0.41		c0.08	0.30	0.26		0.08		c0.11	0.08	
v/s Ratio Perm									c0.13			
v/c Ratio		1.01		1.03	0.56	0.47		0.52	0.82	1.01	0.25	
Uniform Delay, d1		29.2		44.7	14.5	13.6		37.7	39.8	43.2	23.7	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		27.0		83.8	2.3	1.9		1.6	19.9	48.3	0.2	
Delay (s)		56.2		128.5	16.7	15.5		39.4	59.7	91.4	24.0	
Level of Service		E		F	B	B		D	E	F	C	
Approach Delay (s)		56.2			31.1			53.5			72.6	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			50.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			97.4				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			84.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

3: Pine St & Bank St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	69	0	5	99	0	14
Future Volume (vph)	69	0	5	99	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	1.00		0.87			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1711		1569			1801
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1711		1569			1801
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	0	5	99	0	14
RTOR Reduction (vph)	0	0	32	0	0	0
Lane Group Flow (vph)	69	0	72	0	0	14
Turn Type	Prot		NA			NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	3.3		31.8			31.8
Effective Green, g (s)	3.3		31.8			31.8
Actuated g/C Ratio	0.07		0.68			0.68
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	119		1059			1215
v/s Ratio Prot	c0.04		c0.05			0.01
v/s Ratio Perm						
v/c Ratio	0.58		0.07			0.01
Uniform Delay, d1	21.2		2.6			2.5
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	6.7		0.1			0.0
Delay (s)	27.9		2.7			2.5
Level of Service	C		A			A
Approach Delay (s)	27.9		2.7			2.5
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.12			
Actuated Cycle Length (s)			47.1		Sum of lost time (s)	12.0
Intersection Capacity Utilization			20.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

4: Pine St & Cherry St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	147	0	0	108	71	0	5	0	85	14	76
Future Volume (vph)	26	147	0	0	108	71	0	5	0	85	14	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.95			1.00			0.94	
Flt Protected		0.99			1.00			1.00			0.98	
Satd. Flow (prot)		1787			1704			1801			1655	
Flt Permitted		0.91			1.00			1.00			0.87	
Satd. Flow (perm)		1638			1704			1801			1472	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	147	0	0	108	71	0	5	0	85	14	76
RTOR Reduction (vph)	0	0	0	0	58	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	173	0	0	121	0	0	5	0	0	140	0
Turn Type	Perm	NA			NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.2			8.2			23.1			23.1	
Effective Green, g (s)		8.2			8.2			23.1			23.1	
Actuated g/C Ratio		0.19			0.19			0.53			0.53	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		310			322			960			785	
v/s Ratio Prot					0.07			0.00				
v/s Ratio Perm		c0.11									c0.09	
v/c Ratio		0.56			0.38			0.01			0.18	
Uniform Delay, d1		15.9			15.3			4.7			5.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			0.7			0.0			0.5	
Delay (s)		18.1			16.1			4.7			5.7	
Level of Service		B			B			A			A	
Approach Delay (s)		18.1			16.1			4.7			5.7	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			43.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			51.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	166	83	327	188	338	1393
Future Volume (vph)	166	83	327	188	338	1393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3388
Flt Permitted	0.95	1.00	1.00	1.00		0.79
Satd. Flow (perm)	1711	1531	1801	2694		2701
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	166	83	327	188	338	1393
RTOR Reduction (vph)	0	70	0	54	0	0
Lane Group Flow (vph)	166	13	327	134	0	1731
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.5	13.5	63.0	63.0		63.0
Effective Green, g (s)	13.5	13.5	63.0	63.0		63.0
Actuated g/C Ratio	0.15	0.15	0.71	0.71		0.71
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	261	233	1282	1917		1922
v/s Ratio Prot	c0.10		0.18			
v/s Ratio Perm		0.01		0.05		c0.64
v/c Ratio	0.64	0.05	0.26	0.07		0.90
Uniform Delay, d1	35.2	32.0	4.5	3.9		10.2
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.0	0.1	0.5	0.1		7.3
Delay (s)	40.2	32.1	5.0	3.9		17.5
Level of Service	D	C	A	A		B
Approach Delay (s)	37.5		4.6			17.5
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			16.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.85			
Actuated Cycle Length (s)			88.5		Sum of lost time (s)	12.0
Intersection Capacity Utilization			89.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	383	63	121	331	36	44
Future Volume (vph)	383	63	121	331	36	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1766			1777	1630	
Flt Permitted	1.00			0.65	0.98	
Satd. Flow (perm)	1766			1171	1630	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	383	63	121	331	36	44
RTOR Reduction (vph)	11	0	0	0	29	0
Lane Group Flow (vph)	435	0	0	452	51	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.5			22.5	18.3	
Effective Green, g (s)	22.5			22.5	18.3	
Actuated g/C Ratio	0.43			0.43	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	752			499	564	
v/s Ratio Prot	0.25				0.03	
v/s Ratio Perm				0.39		
v/c Ratio	0.58			0.91	0.09	
Uniform Delay, d1	11.5			14.2	11.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.1			19.8	0.3	
Delay (s)	12.6			34.0	12.0	
Level of Service	B			C	B	
Approach Delay (s)	12.6			34.0	12.0	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			22.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			52.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			67.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	208	103	207	440	0	130	0	111	61	386	86
Future Volume (vph)	0	208	103	207	440	0	130	0	111	61	386	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3328	
Flt Permitted		1.00	1.00	0.95	1.00		0.48		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1711	1801		867		1531	1711	3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	208	103	207	440	0	130	0	111	61	386	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	208	103	207	440	0	130	0	37	61	472	0
Turn Type		NA	Perm	Prot	NA		Perm		Perm	Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		11.5	11.5	6.0	23.5		18.1		18.1	18.1	18.1	
Effective Green, g (s)		11.5	11.5	6.0	23.5		18.1		18.1	18.1	18.1	
Actuated g/C Ratio		0.21	0.21	0.11	0.44		0.34		0.34	0.34	0.34	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		386	328	191	789		292		516	577	1123	
v/s Ratio Prot		0.12		c0.12	c0.24						0.14	
v/s Ratio Perm			0.07				c0.15		0.02	0.04		
v/c Ratio		0.54	0.31	1.08	0.56		0.45		0.07	0.11	0.42	
Uniform Delay, d1		18.7	17.7	23.8	11.2		13.8		12.1	12.2	13.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.6	89.2	0.9		4.9		0.3	0.4	1.2	
Delay (s)		20.1	18.3	113.0	12.0		18.7		12.3	12.6	14.9	
Level of Service		C	B	F	B		B		B	B	B	
Approach Delay (s)		19.5			44.3			15.8			14.6	
Approach LOS		B			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			26.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			53.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			61.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	354	0	0	544	69	31	108	52	0	0	0
Future Volume (vph)	56	354	0	0	544	69	31	108	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1773		1711	1713				
Flt Permitted	0.25	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	449	1801			1773		1711	1713				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	354	0	0	544	69	31	108	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	27	0	0	0	0
Lane Group Flow (vph)	56	354	0	0	604	0	31	133	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	22.8	22.8			22.8		18.3	18.3				
Effective Green, g (s)	22.8	22.8			22.8		18.3	18.3				
Actuated g/C Ratio	0.43	0.43			0.43		0.34	0.34				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	192	773			761		589	590				
v/s Ratio Prot		0.20			c0.34			c0.08				
v/s Ratio Perm	0.12						0.02					
v/c Ratio	0.29	0.46			0.79		0.05	0.23				
Uniform Delay, d1	9.9	10.8			13.1		11.6	12.4				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.8	0.4			5.7		0.2	0.9				
Delay (s)	10.7	11.2			18.8		11.8	13.3				
Level of Service	B	B			B		B	B				
Approach Delay (s)		11.1			18.8			13.0			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			53.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			60.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	362	48	51	533	18	35	110	52	26	247	35
Future Volume (vph)	20	362	48	51	533	18	35	110	52	26	247	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	1.00			0.96			0.98	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1769		1711	1792			1721			1766	
Flt Permitted		0.96		0.48	1.00			0.90			0.96	
Satd. Flow (perm)		1706		868	1792			1556			1705	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	362	48	51	533	18	35	110	52	26	247	35
RTOR Reduction (vph)	0	9	0	0	2	0	0	26	0	0	9	0
Lane Group Flow (vph)	0	421	0	51	549	0	0	171	0	0	299	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0		20.0	20.0			18.0			18.0	
Effective Green, g (s)		20.0		20.0	20.0			18.0			18.0	
Actuated g/C Ratio		0.40		0.40	0.40			0.36			0.36	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		682		347	716			560			613	
v/s Ratio Prot					c0.31							
v/s Ratio Perm		0.25		0.06				0.11			c0.18	
v/c Ratio		0.62		0.15	0.77			0.31			0.49	
Uniform Delay, d1		12.0		9.6	13.0			11.5			12.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		4.2		0.9	7.7			1.4			2.8	
Delay (s)		16.1		10.5	20.7			12.9			15.2	
Level of Service		B		B	C			B			B	
Approach Delay (s)		16.1			19.8			12.9			15.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	414	77	203	569	46	78	76	125	39	231	27
Future Volume (vph)	0	414	77	203	569	46	78	76	125	39	231	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1763		1711	1780		1711	1801	1531		1767	
Flt Permitted		1.00		0.22	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1763		396	1780		1711	1801	1531		1767	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	414	77	203	569	46	78	76	125	39	231	27
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	110	0	4	0
Lane Group Flow (vph)	0	484	0	203	615	0	78	76	15	0	293	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		20.1		31.1	31.1		8.9	8.9	8.9		16.1	
Effective Green, g (s)		20.1		31.1	31.1		8.9	8.9	8.9		16.1	
Actuated g/C Ratio		0.27		0.42	0.42		0.12	0.12	0.12		0.22	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		478		254	747		205	216	183		383	
v/s Ratio Prot		c0.27		0.05	c0.35		c0.05	0.04			c0.17	
v/s Ratio Perm				0.28					0.01			
v/c Ratio		1.01		0.80	0.82		0.38	0.35	0.08		0.77	
Uniform Delay, d1		27.0		27.1	19.1		30.1	30.0	29.0		27.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		44.2		16.0	10.0		1.2	1.0	0.2		8.8	
Delay (s)		71.2		43.0	29.0		31.2	30.9	29.2		36.0	
Level of Service		E		D	C		C	C	C		D	
Approach Delay (s)		71.2			32.5			30.2			36.0	
Approach LOS		E			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			74.1			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			96.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	459	229	78	451	122	215	206	73	44	149	15
Future Volume (vph)	6	459	229	78	451	122	215	206	73	44	149	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.96			0.97			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.98	1.00		0.99	
Satd. Flow (prot)		1720			1745			1756	1531		1764	
Flt Permitted		0.99			0.84			0.75	1.00		0.78	
Satd. Flow (perm)		1711			1469			1356	1531		1385	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	459	229	78	451	122	215	206	73	44	149	15
RTOR Reduction (vph)	0	28	0	0	13	0	0	0	48	0	5	0
Lane Group Flow (vph)	0	666	0	0	638	0	0	421	25	0	203	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		29.2			29.2			22.1	22.1		22.1	
Effective Green, g (s)		29.2			29.2			22.1	22.1		22.1	
Actuated g/C Ratio		0.46			0.46			0.35	0.35		0.35	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		789			677			473	534		483	
v/s Ratio Prot												
v/s Ratio Perm		0.39			c0.43			c0.31	0.02		0.15	
v/c Ratio		0.84			0.94			0.89	0.05		0.42	
Uniform Delay, d1		15.0			16.2			19.5	13.6		15.7	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		8.2			21.5			21.5	0.2		2.7	
Delay (s)		23.3			37.8			40.9	13.8		18.4	
Level of Service		C			D			D	B		B	
Approach Delay (s)		23.3			37.8			36.9			18.4	
Approach LOS		C			D			D			B	
Intersection Summary												
HCM 2000 Control Delay			30.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			63.3				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			127.8%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	376	77	65	476	104	113	162	52	42	43	18
Future Volume (vph)	4	376	77	65	476	104	113	162	52	42	43	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1800	1531	1711	1752			1764	1531	1711	1721	
Flt Permitted		0.99	1.00	0.48	1.00			0.84	1.00	0.59	1.00	
Satd. Flow (perm)		1789	1531	862	1752			1510	1531	1055	1721	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	376	77	65	476	104	113	162	52	42	43	18
RTOR Reduction (vph)	0	0	45	0	15	0	0	0	33	0	11	0
Lane Group Flow (vph)	0	380	32	65	565	0	0	275	19	42	50	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		22.1	22.1	22.1	22.1			19.3	19.3	19.3	19.3	
Effective Green, g (s)		22.1	22.1	22.1	22.1			19.3	19.3	19.3	19.3	
Actuated g/C Ratio		0.41	0.41	0.41	0.41			0.36	0.36	0.36	0.36	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		740	633	356	725			545	553	381	622	
v/s Ratio Prot					c0.32							0.03
v/s Ratio Perm		0.21	0.02	0.08				c0.18	0.01	0.04		
v/c Ratio		0.51	0.05	0.18	0.78			0.50	0.03	0.11	0.08	
Uniform Delay, d1		11.6	9.4	9.9	13.5			13.3	11.0	11.3	11.2	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6	0.0	0.2	5.3			3.3	0.1	0.6	0.3	
Delay (s)		12.3	9.4	10.2	18.9			16.6	11.1	11.9	11.5	
Level of Service		B	A	B	B			B	B	B	B	
Approach Delay (s)		11.8			18.0			15.8			11.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			53.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			88.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	390	19	112	531	140	11	59	12	93	350	108
Future Volume (vph)	42	390	19	112	531	140	11	59	12	93	350	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	0.95	0.95		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1625	1698		1711	1801	1531		1753		1711	1801	1531
Flt Permitted	0.29	0.99		0.41	1.00	1.00		0.94		0.70	1.00	1.00
Satd. Flow (perm)	501	1688		732	1801	1531		1651		1267	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	390	19	112	531	140	11	59	12	93	350	108
RTOR Reduction (vph)	0	4	0	0	0	88	0	7	0	0	0	67
Lane Group Flow (vph)	38	409	0	112	531	52	0	75	0	93	350	41
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	17.7	17.7		17.7	17.7	17.7		18.1		18.1	18.1	18.1
Effective Green, g (s)	17.7	17.7		17.7	17.7	17.7		18.1		18.1	18.1	18.1
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37		0.38		0.38	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	185	625		271	666	566		625		479	681	579
v/s Ratio Prot				c0.29						c0.19		
v/s Ratio Perm	0.08	0.24		0.15		0.03		0.05		0.07		0.03
v/c Ratio	0.21	0.65		0.41	0.80	0.09		0.12		0.19	0.51	0.07
Uniform Delay, d1	10.3	12.5		11.2	13.4	9.8		9.7		10.0	11.5	9.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	2.5		1.0	6.6	0.1		0.4		0.9	2.8	0.2
Delay (s)	10.8	15.0		12.2	20.0	9.9		10.1		10.9	14.2	9.7
Level of Service	B	B		B	C	A		B		B	B	A
Approach Delay (s)		14.6			17.1			10.1			12.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			47.8				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			82.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	428	0	0	779	33	37	588	52	0	0	0
Future Volume (vph)	14	428	0	0	779	33	37	588	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1711	1801			1791			1795	1531			
Flt Permitted	0.10	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	173	1801			1791			1795	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	428	0	0	779	33	37	588	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	22	0	0	0
Lane Group Flow (vph)	14	428	0	0	810	0	0	625	30	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	41.7	41.7			41.7			36.0	36.0			
Effective Green, g (s)	41.7	41.7			41.7			36.0	36.0			
Actuated g/C Ratio	0.46	0.46			0.46			0.40	0.40			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	80	837			832			720	614			
v/s Ratio Prot		0.24			c0.45							
v/s Ratio Perm	0.08							0.35	0.02			
v/c Ratio	0.17	0.51			0.97			0.87	0.05			
Uniform Delay, d1	14.0	16.8			23.5			24.7	16.4			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	1.0	0.5			24.8			13.4	0.2			
Delay (s)	15.0	17.4			48.2			38.1	16.6			
Level of Service	B	B			D			D	B			
Approach Delay (s)		17.3			48.2			36.4			0.0	
Approach LOS		B			D			D			A	
Intersection Summary												
HCM 2000 Control Delay			37.0			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			89.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			86.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	522	4	58	663	33	26	190	53	103	214	20
Future Volume (vph)	10	522	4	58	663	33	26	190	53	103	214	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.97			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1711	1799		1711	1788			1744			1759	
Flt Permitted	0.18	1.00		0.33	1.00			0.94			0.81	
Satd. Flow (perm)	315	1799		602	1788			1651			1445	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	522	4	58	663	33	26	190	53	103	214	20
RTOR Reduction (vph)	0	1	0	0	3	0	0	14	0	0	4	0
Lane Group Flow (vph)	10	525	0	58	693	0	0	255	0	0	333	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.3	25.3		25.3	25.3			20.1			20.1	
Effective Green, g (s)	25.3	25.3		25.3	25.3			20.1			20.1	
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.35			0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	138	792		265	788			578			506	
v/s Ratio Prot		0.29			c0.39							
v/s Ratio Perm	0.03			0.10				0.15			c0.23	
v/c Ratio	0.07	0.66		0.22	0.88			0.44			0.66	
Uniform Delay, d1	9.3	12.7		9.9	14.7			14.3			15.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	2.1		0.4	10.9			2.4			6.6	
Delay (s)	9.5	14.8		10.4	25.6			16.8			22.3	
Level of Service	A	B		B	C			B			C	
Approach Delay (s)		14.7			24.4			16.8			22.3	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			57.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			93.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	715	4	231	998	627	0	87	185	247	75	48
Future Volume (vph)	0	715	4	231	998	627	0	87	185	247	75	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3418		1711	1801	1531		1801	1531	3319	1695	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3418		1711	1801	1531		1801	1531	3319	1695	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	715	4	231	998	627	0	87	185	247	75	48
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	164	0	0	0
Lane Group Flow (vph)	0	718	0	231	998	627	0	87	21	247	123	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		26.6		14.5	47.1	47.1		9.4	9.4	7.0	22.4	
Effective Green, g (s)		26.6		14.5	47.1	47.1		9.4	9.4	7.0	22.4	
Actuated g/C Ratio		0.33		0.18	0.58	0.58		0.12	0.12	0.09	0.27	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1115		304	1040	884		207	176	285	465	
v/s Ratio Prot		0.21		0.14	c0.55	0.41		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.64		0.76	0.96	0.71		0.42	0.12	0.87	0.26	
Uniform Delay, d1		23.4		31.8	16.3	12.3		33.5	32.3	36.8	23.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.9		10.4	19.7	4.8		1.4	0.3	23.0	0.3	
Delay (s)		26.3		42.3	36.0	17.1		34.9	32.7	59.8	23.4	
Level of Service		C		D	D	B		C	C	E	C	
Approach Delay (s)		26.3			30.4			33.4			47.7	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			31.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			81.5				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			76.2%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

3: Pine St & Bank St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	125	0	3	117	0	18
Future Volume (vph)	125	0	3	117	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	1.00		0.87			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1711		1564			1801
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1711		1564			1801
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	0	3	117	0	18
RTOR Reduction (vph)	0	0	49	0	0	0
Lane Group Flow (vph)	125	0	71	0	0	18
Turn Type	Prot		NA			NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	7.2		26.4			26.4
Effective Green, g (s)	7.2		26.4			26.4
Actuated g/C Ratio	0.16		0.58			0.58
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	270		905			1042
v/s Ratio Prot	c0.07		c0.05			0.01
v/s Ratio Perm						
v/c Ratio	0.46		0.08			0.02
Uniform Delay, d1	17.4		4.2			4.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.3		0.2			0.0
Delay (s)	18.7		4.4			4.1
Level of Service	B		A			A
Approach Delay (s)	18.7		4.4			4.1
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			11.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.16			
Actuated Cycle Length (s)			45.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			24.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

4: Pine St & Cherry St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	117	0	0	124	260	0	3	0	74	18	34
Future Volume (vph)	89	117	0	0	124	260	0	3	0	74	18	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.91			1.00			0.96	
Flt Protected		0.98			1.00			1.00			0.97	
Satd. Flow (prot)		1763			1636			1801			1686	
Flt Permitted		0.55			1.00			1.00			0.84	
Satd. Flow (perm)		995			1636			1801			1462	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	117	0	0	124	260	0	3	0	74	18	34
RTOR Reduction (vph)	0	0	0	0	173	0	0	0	0	0	19	0
Lane Group Flow (vph)	0	206	0	0	211	0	0	3	0	0	107	0
Turn Type	Perm	NA			NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.5			12.5			19.2			19.2	
Effective Green, g (s)		12.5			12.5			19.2			19.2	
Actuated g/C Ratio		0.29			0.29			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		284			467			791			642	
v/s Ratio Prot					0.13			0.00				
v/s Ratio Perm		c0.21									c0.07	
v/c Ratio		0.73			0.45			0.00			0.17	
Uniform Delay, d1		14.1			12.8			6.9			7.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.9			0.7			0.0			0.6	
Delay (s)		22.9			13.5			6.9			8.0	
Level of Service		C			B			A			A	
Approach Delay (s)		22.9			13.5			6.9			8.0	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		43.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		62.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

12/12/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	171	859	501	180	643
Future Volume (vph)	156	171	859	501	180	643
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	0.88		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		0.99
Satd. Flow (prot)	1711	1531	1801	2694		3384
Flt Permitted	0.95	1.00	1.00	1.00		0.54
Satd. Flow (perm)	1711	1531	1801	2694		1864
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	156	171	859	501	180	643
RTOR Reduction (vph)	0	91	0	203	0	0
Lane Group Flow (vph)	156	80	859	298	0	823
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.3	10.3	32.8	32.8		32.8
Effective Green, g (s)	10.3	10.3	32.8	32.8		32.8
Actuated g/C Ratio	0.19	0.19	0.60	0.60		0.60
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	319	286	1072	1603		1109
v/s Ratio Prot	c0.09		c0.48			
v/s Ratio Perm		0.05		0.11		0.44
v/c Ratio	0.49	0.28	0.80	0.19		0.87dl
Uniform Delay, d1	20.0	19.2	8.6	5.1		8.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.5	6.3	0.3		4.5
Delay (s)	21.2	19.8	15.0	5.3		12.6
Level of Service	C	B	B	A		B
Approach Delay (s)	20.5		11.4			12.6
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			13.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			55.1		Sum of lost time (s)	12.0
Intersection Capacity Utilization			91.9%		ICU Level of Service	F
Analysis Period (min)			15			
dl Defacto Left Lane. Recode with 1 though lane as a left lane.						
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

6: Pine St & Pearl St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	434	44	76	459	91	158
Future Volume (vph)	434	44	76	459	91	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.99			1.00	0.91	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1778			1788	1617	
Flt Permitted	1.00			0.79	0.98	
Satd. Flow (perm)	1778			1429	1617	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	434	44	76	459	91	158
RTOR Reduction (vph)	7	0	0	0	97	0
Lane Group Flow (vph)	471	0	0	535	152	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.5			22.5	18.3	
Effective Green, g (s)	22.5			22.5	18.3	
Actuated g/C Ratio	0.43			0.43	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	757			608	560	
v/s Ratio Prot	0.26				c0.09	
v/s Ratio Perm				c0.37		
v/c Ratio	0.62			0.88	0.27	
Uniform Delay, d1	11.8			13.9	12.4	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.6			13.7	1.2	
Delay (s)	13.4			27.6	13.6	
Level of Service	B			C	B	
Approach Delay (s)	13.4			27.6	13.6	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			19.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			52.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			83.6%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑		↑		↑	↑	↑↓	↑
Traffic Volume (vph)	0	381	118	215	449	0	201	0	323	107	321	51
Future Volume (vph)	0	381	118	215	449	0	201	0	323	107	321	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frt		1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		1801	1531	1711	1801		1711		1531	1711	3351	
Flt Permitted		1.00	1.00	0.95	1.00		0.53		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1711	1801		955		1531	1711	3351	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	381	118	215	449	0	201	0	323	107	321	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	223	0	0	0
Lane Group Flow (vph)	0	381	118	215	449	0	201	0	100	107	372	0
Turn Type		NA	Perm	Prot	NA		Perm		Perm	Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		15.8	15.8	6.1	27.9		18.0		18.0	18.0	18.0	
Effective Green, g (s)		15.8	15.8	6.1	27.9		18.0		18.0	18.0	18.0	
Actuated g/C Ratio		0.27	0.27	0.11	0.48		0.31		0.31	0.31	0.31	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		491	417	180	867		296		475	531	1041	
v/s Ratio Prot		c0.21		c0.13	0.25						0.11	
v/s Ratio Perm			0.08				c0.21		0.07	0.06		
v/c Ratio		0.78	0.28	1.19	0.52		0.68		0.21	0.20	0.36	
Uniform Delay, d1		19.4	16.6	25.9	10.4		17.4		14.7	14.7	15.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		7.5	0.4	129.1	0.5		11.9		1.0	0.9	1.0	
Delay (s)		27.0	17.0	155.0	10.9		29.3		15.7	15.5	16.4	
Level of Service		C	B	F	B		C		B	B	B	
Approach Delay (s)		24.6			57.6			20.9			16.2	
Approach LOS		C			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			32.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			57.9			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			71.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

8: S Union St/N Union St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	592	0	0	580	65	52	311	56	0	0	0
Future Volume (vph)	168	592	0	0	580	65	52	311	56	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1776		1711	1759				
Flt Permitted	0.22	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	405	1801			1776		1711	1759				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	168	592	0	0	580	65	52	311	56	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	10	0	0	0	0
Lane Group Flow (vph)	168	592	0	0	638	0	52	357	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	24.6	24.6			24.6		19.2	19.2				
Effective Green, g (s)	24.6	24.6			24.6		19.2	19.2				
Actuated g/C Ratio	0.44	0.44			0.44		0.34	0.34				
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	178	793			782		588	605				
v/s Ratio Prot		0.33			0.36			c0.20				
v/s Ratio Perm	c0.41						0.03					
v/c Ratio	0.94	0.75			0.82		0.09	0.59				
Uniform Delay, d1	14.9	13.0			13.6		12.4	15.1				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	50.9	3.9			6.6		0.3	4.2				
Delay (s)	65.9	16.9			20.2		12.7	19.2				
Level of Service	E	B			C		B	B				
Approach Delay (s)		27.7			20.2			18.4			0.0	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			22.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			55.8				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			78.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

9: S Willard St/N Willard St & Pearl St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	569	47	60	558	47	67	271	59	29	194	39
Future Volume (vph)	65	569	47	60	558	47	67	271	59	29	194	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	0.99			0.98			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		1775		1711	1780			1750			1755	
Flt Permitted		0.81		0.36	1.00			0.89			0.93	
Satd. Flow (perm)		1443		652	1780			1576			1634	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	569	47	60	558	47	67	271	59	29	194	39
RTOR Reduction (vph)	0	5	0	0	5	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	677	0	60	600	0	0	387	0	0	252	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0		30.0	30.0			18.0			18.0	
Effective Green, g (s)		30.0		30.0	30.0			18.0			18.0	
Actuated g/C Ratio		0.50		0.50	0.50			0.30			0.30	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		721		326	890			472			490	
v/s Ratio Prot					0.34							
v/s Ratio Perm		c0.47		0.09				c0.25			0.15	
v/c Ratio		0.94		0.18	0.67			0.82			0.51	
Uniform Delay, d1		14.1		8.3	11.3			19.5			17.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		21.4		1.2	4.1			14.6			3.8	
Delay (s)		35.6		9.5	15.4			34.1			21.2	
Level of Service		D		A	B			C			C	
Approach Delay (s)		35.6			14.9			34.1			21.2	
Approach LOS		D			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			116.8%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

12/12/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑	↔		↔	
Traffic Volume (vph)	0	550	58	151	625	92	155	260	193	27	118	12
Future Volume (vph)	0	550	58	151	625	92	155	260	193	27	118	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)		1777		1711	1766		1711	1801	1531		1767	
Flt Permitted		1.00		0.15	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1777		268	1766		1711	1801	1531		1767	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	550	58	151	625	92	155	260	193	27	118	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	157	0	3	0
Lane Group Flow (vph)	0	604	0	151	717	0	155	260	36	0	154	0
Turn Type		NA		pm+pt	NA		Split	NA	Perm		Split	NA
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4			8					2			
Actuated Green, G (s)		30.1		41.2	41.2		16.4	16.4	16.4		12.8	
Effective Green, g (s)		30.1		41.2	41.2		16.4	16.4	16.4		12.8	
Actuated g/C Ratio		0.34		0.47	0.47		0.19	0.19	0.19		0.14	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		605		208	823		317	334	284		255	
v/s Ratio Prot		c0.34		0.04	c0.41		0.09	c0.14			c0.09	
v/s Ratio Perm				0.30					0.02			
v/c Ratio		1.00		0.73	0.87		0.49	0.78	0.13		0.60	
Uniform Delay, d1		29.1		33.7	21.2		32.2	34.3	30.0		35.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		36.2		11.9	12.2		1.2	10.9	0.2		4.0	
Delay (s)		65.3		45.6	33.4		33.4	45.2	30.2		39.4	
Level of Service		E		D	C		C	D	C		D	
Approach Delay (s)		65.3			35.5			37.4			39.4	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			44.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			113.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	372	90	78	467	96	57	114	58	148	236	23
Future Volume (vph)	16	372	90	78	467	96	57	114	58	148	236	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			0.98			1.00	0.85		0.99	
Flt Protected		1.00			0.99			0.98	1.00		0.98	
Satd. Flow (prot)		1752			1754			1771	1531		1755	
Flt Permitted		0.97			0.90			0.79	1.00		0.81	
Satd. Flow (perm)		1706			1579			1420	1531		1446	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	16	372	90	78	467	96	57	114	58	148	236	23
RTOR Reduction (vph)	0	14	0	0	11	0	0	0	38	0	3	0
Lane Group Flow (vph)	0	464	0	0	630	0	0	171	20	0	404	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		25.6			25.6			20.1	20.1		20.1	
Effective Green, g (s)		25.6			25.6			20.1	20.1		20.1	
Actuated g/C Ratio		0.44			0.44			0.35	0.35		0.35	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		756			700			494	533		503	
v/s Ratio Prot												
v/s Ratio Perm		0.27			c0.40			0.12	0.01		c0.28	
v/c Ratio		0.61			0.90			0.35	0.04		0.80	
Uniform Delay, d1		12.3			14.9			13.9	12.4		17.0	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.5			14.4			1.9	0.1		12.7	
Delay (s)		13.7			29.3			15.8	12.5		29.7	
Level of Service		B			C			B	B		C	
Approach Delay (s)		13.7			29.3			15.0			29.7	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay		23.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		57.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		104.3%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St. Paul St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	476	118	64	498	124	123	122	75	149	145	9
Future Volume (vph)	17	476	118	64	498	124	123	122	75	149	145	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1798	1531	1711	1747			1757	1531	1711	1785	
Flt Permitted		0.95	1.00	0.36	1.00			0.76	1.00	0.61	1.00	
Satd. Flow (perm)		1715	1531	653	1747			1374	1531	1093	1785	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	476	118	64	498	124	123	122	75	149	145	9
RTOR Reduction (vph)	0	0	64	0	17	0	0	0	48	0	3	0
Lane Group Flow (vph)	0	493	54	64	605	0	0	245	27	149	151	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		23.1	23.1	23.1	23.1			19.2	19.2	19.2	19.2	
Effective Green, g (s)		23.1	23.1	23.1	23.1			19.2	19.2	19.2	19.2	
Actuated g/C Ratio		0.43	0.43	0.43	0.43			0.35	0.35	0.35	0.35	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		729	651	277	743			485	541	386	631	
v/s Ratio Prot				c0.35							0.08	
v/s Ratio Perm		0.29	0.04	0.10				c0.18	0.02	0.14		
v/c Ratio		0.68	0.08	0.23	0.81			0.51	0.05	0.39	0.24	
Uniform Delay, d1		12.6	9.3	9.9	13.7			13.8	11.5	13.1	12.4	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.5	0.1	0.4	6.9			3.7	0.2	2.9	0.9	
Delay (s)		15.1	9.3	10.4	20.6			17.5	11.7	16.0	13.3	
Level of Service		B	A	B	C			B	B	B	B	
Approach Delay (s)		14.0			19.6			16.2			14.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			54.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			89.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: Main St & S Winooski Ave

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	608	57	92	647	174	7	167	49	281	450	134
Future Volume (vph)	97	608	57	92	647	174	7	167	49	281	450	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	0.95	0.95		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1625	1688		1711	1801	1531		1745		1711	1801	1531
Flt Permitted	0.23	0.99		0.18	1.00	1.00		0.98		0.65	1.00	1.00
Satd. Flow (perm)	401	1670		321	1801	1531		1715		1164	1801	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	608	57	92	647	174	7	167	49	281	450	134
RTOR Reduction (vph)	0	6	0	0	0	85	0	17	0	0	0	89
Lane Group Flow (vph)	87	669	0	92	647	89	0	206	0	281	450	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	26.0	26.0		26.0	26.0	26.0		19.1		19.1	19.1	19.1
Effective Green, g (s)	26.0	26.0		26.0	26.0	26.0		19.1		19.1	19.1	19.1
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46		0.33		0.33	0.33	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	182	760		146	820	697		573		389	602	512
v/s Ratio Prot					0.36						c0.25	
v/s Ratio Perm	0.22	c0.40		0.29		0.06		0.12		0.24		0.03
v/c Ratio	0.48	0.88		0.63	0.79	0.13		0.36		0.72	0.75	0.09
Uniform Delay, d1	10.8	14.1		11.9	13.2	9.0		14.4		16.7	16.9	13.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	11.6		8.6	5.1	0.1		1.8		11.1	8.3	0.3
Delay (s)	12.8	25.7		20.4	18.3	9.1		16.1		27.7	25.1	13.4
Level of Service	B	C		C	B	A		B		C	C	B
Approach Delay (s)		24.2			16.8			16.1			24.1	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			21.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			57.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			122.3%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	912	0	0	770	38	48	368	109	0	0	0
Future Volume (vph)	43	912	0	0	770	38	48	368	109	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.99	1.00			
Satd. Flow (prot)	1711	1801			1789			1790	1531			
Flt Permitted	0.17	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	306	1801			1789			1790	1531			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	912	0	0	770	38	48	368	109	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	62	0	0	0
Lane Group Flow (vph)	43	912	0	0	806	0	0	416	47	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	39.6	39.6			39.6			21.1	21.1			
Effective Green, g (s)	39.6	39.6			39.6			21.1	21.1			
Actuated g/C Ratio	0.54	0.54			0.54			0.29	0.29			
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	166	981			974			519	444			
v/s Ratio Prot		c0.51			0.45							
v/s Ratio Perm	0.14							0.23	0.03			
v/c Ratio	0.26	0.93			0.83			0.80	0.11			
Uniform Delay, d1	8.8	15.3			13.7			23.9	18.9			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.8	14.5			5.9			12.3	0.5			
Delay (s)	9.6	29.8			19.6			36.2	19.4			
Level of Service	A	C			B			D	B			
Approach Delay (s)		28.9			19.6			32.7			0.0	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			72.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			80.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	886	37	69	798	66	32	289	40	70	214	34
Future Volume (vph)	32	886	37	69	798	66	32	289	40	70	214	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	1790		1711	1780			1766			1755	
Flt Permitted	0.13	1.00		0.09	1.00			0.95			0.76	
Satd. Flow (perm)	235	1790		169	1780			1682			1345	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	886	37	69	798	66	32	289	40	70	214	34
RTOR Reduction (vph)	0	2	0	0	4	0	0	6	0	0	6	0
Lane Group Flow (vph)	32	921	0	69	860	0	0	355	0	0	312	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.7	42.7		42.7	42.7			23.1			23.1	
Effective Green, g (s)	42.7	42.7		42.7	42.7			23.1			23.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.30			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	128	982		92	976			499			399	
v/s Ratio Prot		c0.51			0.48							
v/s Ratio Perm	0.14			0.41				0.21			c0.23	
v/c Ratio	0.25	0.94		0.75	0.88			0.71			0.78	
Uniform Delay, d1	9.2	16.3		13.5	15.3			24.4			25.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.0	15.8		28.6	9.4			8.4			14.2	
Delay (s)	10.2	32.1		42.0	24.7			32.8			39.3	
Level of Service	B	C		D	C			C			D	
Approach Delay (s)		31.3			26.0			32.8			39.3	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			30.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			77.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			100.1%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1426	1	148	559	407	0	151	344	392	135	17
Future Volume (vph)	0	1426	1	148	559	407	0	151	344	392	135	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00	1.00	0.97	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3421		1711	1801	1531		1801	1531	3319	1770	
Flt Permitted		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3421		1711	1801	1531		1801	1531	3319	1770	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1426	1	148	559	407	0	151	344	392	135	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	143	0	0	0
Lane Group Flow (vph)	0	1427	0	148	559	407	0	151	201	392	152	0
Turn Type		NA		Prot	NA	Prot		NA	Perm	Prot	NA	
Protected Phases		4		3	8	8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		45.0		10.0	61.0	61.0		16.4	16.4	13.0	35.4	
Effective Green, g (s)		45.0		10.0	61.0	61.0		16.4	16.4	13.0	35.4	
Actuated g/C Ratio		0.42		0.09	0.56	0.56		0.15	0.15	0.12	0.33	
Clearance Time (s)		6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1420		157	1013	861		272	231	398	578	
v/s Ratio Prot		c0.42		c0.09	0.31	0.27		0.08		c0.12	0.09	
v/s Ratio Perm									c0.13			
v/c Ratio		1.00		0.94	0.55	0.47		0.56	0.87	0.98	0.26	
Uniform Delay, d1		31.7		48.9	15.0	14.1		42.6	44.9	47.6	26.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		25.1		54.7	2.2	1.9		2.4	27.3	40.8	0.2	
Delay (s)		56.8		103.6	17.2	16.0		45.1	72.2	88.4	27.1	
Level of Service		E		F	B	B		D	E	F	C	
Approach Delay (s)		56.8			28.2			63.9			71.3	
Approach LOS		E			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			51.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			108.4				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			86.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												



Unsignalized Intersection Capacity Analysis

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	75	54	30	70	2	0
Future Volume (Veh/h)	75	54	30	70	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	54	30	70	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			129		232	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		232	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1457		741	953
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	129	100	2			
Volume Left	0	30	2			
Volume Right	54	0	0			
cSH	1700	1457	741			
Volume to Capacity	0.08	0.02	0.00			
Queue Length 95th (ft)	0	2	0			
Control Delay (s)	0.0	2.4	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.4	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			25.9%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

12/12/2016

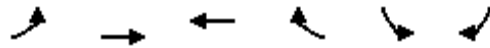
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	13	41	45	0	0
Future Volume (Veh/h)	47	13	41	45	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	47	13	41	45	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	64	64			86	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64	64			86	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	942	1001			1510	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	86	0			
Volume Left	47	0	0			
Volume Right	13	45	0			
cSH	954	1700	1700			
Volume to Capacity	0.06	0.05	0.00			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		15.0%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	121	97	36	46	75
Future Volume (Veh/h)	25	121	97	36	46	75
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	121	97	36	46	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	133				286	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	133				286	115
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				93	92
cM capacity (veh/h)	1452				692	937
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	146	133	121			
Volume Left	25	0	46			
Volume Right	0	36	75			
cSH	1452	1700	826			
Volume to Capacity	0.02	0.08	0.15			
Queue Length 95th (ft)	1	0	13			
Control Delay (s)	1.4	0.0	10.1			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			32.2%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	128	46	23	159	20	88	35	16	5	25	33
Future Volume (vph)	23	128	46	23	159	20	88	35	16	5	25	33
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	128	46	23	159	20	88	35	16	5	25	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	202	139	63								
Volume Left (vph)	23	23	88	5								
Volume Right (vph)	46	20	16	33								
Hadj (s)	-0.08	0.00	0.09	-0.26								
Departure Headway (s)	4.6	4.7	5.0	4.8								
Degree Utilization, x	0.25	0.26	0.19	0.08								
Capacity (veh/h)	736	730	662	674								
Control Delay (s)	9.1	9.3	9.2	8.2								
Approach Delay (s)	9.1	9.3	9.2	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.1									
Level of Service			A									
Intersection Capacity Utilization			35.5%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	102	22	16	154	50	58	89	18	13	15	12
Future Volume (vph)	26	102	22	16	154	50	58	89	18	13	15	12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	102	22	16	154	50	58	89	18	13	15	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	220	165	40								
Volume Left (vph)	26	16	58	13								
Volume Right (vph)	22	50	18	12								
Hadj (s)	-0.02	-0.09	0.04	-0.08								
Departure Headway (s)	4.7	4.5	4.9	4.9								
Degree Utilization, x	0.19	0.28	0.22	0.05								
Capacity (veh/h)	721	753	690	657								
Control Delay (s)	8.8	9.2	9.3	8.2								
Approach Delay (s)	8.8	9.2	9.3	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.1									
Level of Service			A									
Intersection Capacity Utilization			33.5%	ICU Level of Service					A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	9	14	182	96	63
Future Volume (Veh/h)	135	9	14	182	96	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	135	9	14	182	96	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			144		350	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		350	140
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		85	93
cM capacity (veh/h)			1438		641	909
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	144	196	159			
Volume Left	0	14	96			
Volume Right	9	0	63			
cSH	1700	1438	726			
Volume to Capacity	0.08	0.01	0.22			
Queue Length 95th (ft)	0	1	21			
Control Delay (s)	0.0	0.6	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			37.0%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

12/12/2016

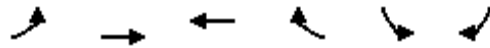
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	61	9	9	53	0	0
Future Volume (Veh/h)	61	9	9	53	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	61	9	9	53	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	36	36			62	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36	36			62	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			100	
cM capacity (veh/h)	977	1037			1541	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	70	62	0			
Volume Left	61	0	0			
Volume Right	9	53	0			
cSH	985	1700	1700			
Volume to Capacity	0.07	0.04	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	8.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.9	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.7				
Intersection Capacity Utilization		14.3%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	88	96	157	28	34
Future Volume (Veh/h)	87	88	96	157	28	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	87	88	96	157	28	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253				436	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253				436	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				95	96
cM capacity (veh/h)	1312				539	869
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	175	253	62			
Volume Left	87	0	28			
Volume Right	0	157	34			
cSH	1312	1700	681			
Volume to Capacity	0.07	0.15	0.09			
Queue Length 95th (ft)	5	0	7			
Control Delay (s)	4.2	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	4.2	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			37.8%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	144	106	37	122	13	35	43	23	22	71	57
Future Volume (vph)	26	144	106	37	122	13	35	43	23	22	71	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	144	106	37	122	13	35	43	23	22	71	57
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	276	172	101	150								
Volume Left (vph)	26	37	35	22								
Volume Right (vph)	106	13	23	57								
Hadj (s)	-0.18	0.03	-0.03	-0.16								
Departure Headway (s)	4.6	4.9	5.2	5.0								
Degree Utilization, x	0.35	0.24	0.15	0.21								
Capacity (veh/h)	734	680	626	656								
Control Delay (s)	10.1	9.5	9.1	9.3								
Approach Delay (s)	10.1	9.5	9.1	9.3								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			9.6									
Level of Service			A									
Intersection Capacity Utilization			35.2%	ICU Level of Service					A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	119	47	28	78	41	56	85	47	38	65	37
Future Volume (vph)	21	119	47	28	78	41	56	85	47	38	65	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	119	47	28	78	41	56	85	47	38	65	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	187	147	188	140								
Volume Left (vph)	21	28	56	38								
Volume Right (vph)	47	41	47	37								
Hadj (s)	-0.09	-0.10	-0.06	-0.07								
Departure Headway (s)	4.8	4.9	4.9	4.9								
Degree Utilization, x	0.25	0.20	0.25	0.19								
Capacity (veh/h)	688	675	688	669								
Control Delay (s)	9.5	9.1	9.5	9.1								
Approach Delay (s)	9.5	9.1	9.5	9.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization				34.2%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	77	56	31	72	2	0
Future Volume (Veh/h)	77	56	31	72	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	77	56	31	72	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			133		239	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			133		239	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1452		733	949
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	133	103	2			
Volume Left	0	31	2			
Volume Right	56	0	0			
cSH	1700	1452	733			
Volume to Capacity	0.08	0.02	0.00			
Queue Length 95th (ft)	0	2	0			
Control Delay (s)	0.0	2.4	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.4	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			26.3%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

12/12/2016

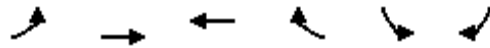
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	48	13	42	46	0	0
Future Volume (Veh/h)	48	13	42	46	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	48	13	42	46	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	65	65			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65	65			88	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	941	999			1508	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	61	88	0			
Volume Left	48	0	0			
Volume Right	13	46	0			
cSH	952	1700	1700			
Volume to Capacity	0.06	0.05	0.00			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		15.1%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	125	100	37	48	77
Future Volume (Veh/h)	26	125	100	37	48	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	125	100	37	48	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				296	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				296	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				93	92
cM capacity (veh/h)	1447				683	933
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	151	137	125			
Volume Left	26	0	48			
Volume Right	0	37	77			
cSH	1447	1700	818			
Volume to Capacity	0.02	0.08	0.15			
Queue Length 95th (ft)	1	0	13			
Control Delay (s)	1.4	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		32.9%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	132	47	24	164	20	91	36	17	6	26	34
Future Volume (vph)	24	132	47	24	164	20	91	36	17	6	26	34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	132	47	24	164	20	91	36	17	6	26	34
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	203	208	144	66								
Volume Left (vph)	24	24	91	6								
Volume Right (vph)	47	20	17	34								
Hadj (s)	-0.08	0.00	0.09	-0.26								
Departure Headway (s)	4.6	4.7	5.1	4.8								
Degree Utilization, x	0.26	0.27	0.20	0.09								
Capacity (veh/h)	730	724	656	665								
Control Delay (s)	9.3	9.4	9.3	8.3								
Approach Delay (s)	9.3	9.4	9.3	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.2								
Level of Service				A								
Intersection Capacity Utilization				36.2%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	105	22	17	158	51	60	91	19	13	16	12
Future Volume (vph)	27	105	22	17	158	51	60	91	19	13	16	12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	105	22	17	158	51	60	91	19	13	16	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	154	226	170	41								
Volume Left (vph)	27	17	60	13								
Volume Right (vph)	22	51	19	12								
Hadj (s)	-0.02	-0.09	0.04	-0.08								
Departure Headway (s)	4.7	4.5	4.9	5.0								
Degree Utilization, x	0.20	0.29	0.23	0.06								
Capacity (veh/h)	715	749	686	650								
Control Delay (s)	8.9	9.4	9.4	8.3								
Approach Delay (s)	8.9	9.4	9.4	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
Level of Service			A									
Intersection Capacity Utilization			34.4%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/09/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	139	9	14	187	99	65
Future Volume (Veh/h)	139	9	14	187	99	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	10	15	203	108	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			161		389	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			161		389	156
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		82	92
cM capacity (veh/h)			1418		608	890
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	161	218	179			
Volume Left	0	15	108			
Volume Right	10	0	71			
cSH	1700	1418	695			
Volume to Capacity	0.09	0.01	0.26			
Queue Length 95th (ft)	0	1	26			
Control Delay (s)	0.0	0.6	12.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization			37.5%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

12/09/2016

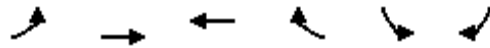
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	9	9	55	0	0
Future Volume (Veh/h)	63	9	9	55	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	10	10	60	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	40	40			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	40			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	972	1031			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	78	70	0			
Volume Left	68	0	0			
Volume Right	10	60	0			
cSH	979	1700	1700			
Volume to Capacity	0.08	0.04	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.7				
Intersection Capacity Utilization		14.6%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

12/09/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	90	99	161	29	35
Future Volume (Veh/h)	89	90	99	161	29	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	98	108	175	32	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				488	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				488	196
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				94	96
cM capacity (veh/h)	1279				498	846
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	195	283	70			
Volume Left	97	0	32			
Volume Right	0	175	38			
cSH	1279	1700	641			
Volume to Capacity	0.08	0.17	0.11			
Queue Length 95th (ft)	6	0	9			
Control Delay (s)	4.3	0.0	11.3			
Lane LOS	A		B			
Approach Delay (s)	4.3	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		38.5%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/09/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	148	110	38	126	14	36	44	24	23	74	59
Future Volume (vph)	27	148	110	38	126	14	36	44	24	23	74	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	161	120	41	137	15	39	48	26	25	80	64
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	310	193	113	169								
Volume Left (vph)	29	41	39	25								
Volume Right (vph)	120	15	26	64								
Hadj (s)	-0.18	0.03	-0.04	-0.16								
Departure Headway (s)	4.8	5.1	5.4	5.2								
Degree Utilization, x	0.41	0.28	0.17	0.24								
Capacity (veh/h)	711	652	586	627								
Control Delay (s)	11.1	10.1	9.5	9.9								
Approach Delay (s)	11.1	10.1	9.5	9.9								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				10.3								
Level of Service				B								
Intersection Capacity Utilization				36.1%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/09/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	123	48	29	80	42	58	88	48	39	67	38
Future Volume (vph)	21	123	48	29	80	42	58	88	48	39	67	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	134	52	32	87	46	63	96	52	42	73	41
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	209	165	211	156								
Volume Left (vph)	23	32	63	42								
Volume Right (vph)	52	46	52	41								
Hadj (s)	-0.09	-0.09	-0.05	-0.07								
Departure Headway (s)	5.0	5.1	5.0	5.1								
Degree Utilization, x	0.29	0.23	0.30	0.22								
Capacity (veh/h)	661	648	660	641								
Control Delay (s)	10.0	9.6	10.1	9.6								
Approach Delay (s)	10.0	9.6	10.1	9.6								
Approach LOS	B	A	B	A								
Intersection Summary												
Delay			9.9									
Level of Service			A									
Intersection Capacity Utilization			35.2%	ICU Level of Service					A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

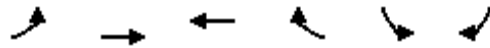
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	75	114	60	70	44	5
Future Volume (Veh/h)	75	114	60	70	44	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	114	60	70	44	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	151					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			189		322	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			147		284	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		93	99
cM capacity (veh/h)			1390		655	940
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	189	130	49			
Volume Left	0	60	44			
Volume Right	114	0	5			
cSH	1700	1390	675			
Volume to Capacity	0.11	0.04	0.07			
Queue Length 95th (ft)	0	3	6			
Control Delay (s)	0.0	3.7	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	3.7	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			31.3%		ICU Level of Service	A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	51	53	71	36	21
Future Volume (Veh/h)	93	51	53	71	36	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	93	51	53	71	36	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		157				
pX, platoon unblocked						
vC, conflicting volume	124				326	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				326	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				94	98
cM capacity (veh/h)	1463				626	970
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	144	124	57			
Volume Left	93	0	36			
Volume Right	0	71	21			
cSH	1463	1700	720			
Volume to Capacity	0.06	0.07	0.08			
Queue Length 95th (ft)	5	0	6			
Control Delay (s)	5.1	0.0	10.4			
Lane LOS	A		B			
Approach Delay (s)	5.1	0.0	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		28.3%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	128	46	23	159	22	86	90	16	5	60	33
Future Volume (vph)	23	128	46	23	159	22	86	90	16	5	60	33
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	128	46	23	159	22	86	90	16	5	60	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	204	192	98								
Volume Left (vph)	23	23	86	5								
Volume Right (vph)	46	22	16	33								
Hadj (s)	-0.08	-0.01	0.07	-0.16								
Departure Headway (s)	4.9	4.9	5.1	5.0								
Degree Utilization, x	0.27	0.28	0.27	0.14								
Capacity (veh/h)	687	682	642	641								
Control Delay (s)	9.6	9.8	10.0	8.8								
Approach Delay (s)	9.6	9.8	10.0	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay				9.7								
Level of Service				A								
Intersection Capacity Utilization				38.3%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	102	22	16	156	50	58	147	18	13	46	12
Future Volume (vph)	26	102	22	16	156	50	58	147	18	13	46	12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	102	22	16	156	50	58	147	18	13	46	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	222	223	71								
Volume Left (vph)	26	16	58	13								
Volume Right (vph)	22	50	18	12								
Hadj (s)	-0.02	-0.09	0.04	-0.03								
Departure Headway (s)	4.9	4.8	5.0	5.1								
Degree Utilization, x	0.21	0.30	0.31	0.10								
Capacity (veh/h)	670	704	680	631								
Control Delay (s)	9.2	9.8	10.2	8.7								
Approach Delay (s)	9.2	9.8	10.2	8.7								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			9.7									
Level of Service			A									
Intersection Capacity Utilization			39.9%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

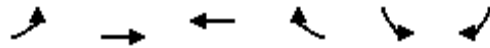
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	81	50	182	220	79
Future Volume (Veh/h)	135	81	50	182	220	79
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	135	81	50	182	220	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	151					
pX, platoon unblocked						
vC, conflicting volume			216	458		176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216	458		176
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			96	59		91
cM capacity (veh/h)			1354	541		868
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	216	232	299			
Volume Left	0	50	220			
Volume Right	81	0	79			
cSH	1700	1354	600			
Volume to Capacity	0.13	0.04	0.50			
Queue Length 95th (ft)	0	3	69			
Control Delay (s)	0.0	1.9	16.8			
Lane LOS			A C			
Approach Delay (s)	0.0	1.9	16.8			
Approach LOS			C			
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization			51.4%		ICU Level of Service A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	71	60	69	78	109	62
Future Volume (Veh/h)	71	60	69	78	109	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	71	60	69	78	109	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		157				
pX, platoon unblocked						
vC, conflicting volume	147				310	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	147				310	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				83	93
cM capacity (veh/h)	1435				649	946
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	131	147	171			
Volume Left	71	0	109			
Volume Right	0	78	62			
cSH	1435	1700	732			
Volume to Capacity	0.05	0.09	0.23			
Queue Length 95th (ft)	4	0	23			
Control Delay (s)	4.3	0.0	11.4			
Lane LOS	A		B			
Approach Delay (s)	4.3	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		35.3%	ICU Level of Service	A		
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	144	106	37	122	16	34	106	23	22	152	57
Future Volume (vph)	26	144	106	37	122	16	34	106	23	22	152	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	144	106	37	122	16	34	106	23	22	152	57
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	276	175	163	231								
Volume Left (vph)	26	37	34	22								
Volume Right (vph)	106	16	23	57								
Hadj (s)	-0.18	0.02	-0.01	-0.10								
Departure Headway (s)	5.1	5.5	5.5	5.3								
Degree Utilization, x	0.39	0.27	0.25	0.34								
Capacity (veh/h)	655	601	585	623								
Control Delay (s)	11.4	10.4	10.3	11.0								
Approach Delay (s)	11.4	10.4	10.3	11.0								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				10.9								
Level of Service				B								
Intersection Capacity Utilization				40.0%	ICU Level of Service		A					
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	119	47	28	80	41	56	155	47	38	157	37
Future Volume (vph)	21	119	47	28	80	41	56	155	47	38	157	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	119	47	28	80	41	56	155	47	38	157	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	187	149	258	232								
Volume Left (vph)	21	28	56	38								
Volume Right (vph)	47	41	47	37								
Hadj (s)	-0.09	-0.09	-0.03	-0.03								
Departure Headway (s)	5.4	5.4	5.2	5.2								
Degree Utilization, x	0.28	0.22	0.37	0.34								
Capacity (veh/h)	609	594	643	642								
Control Delay (s)	10.4	10.0	11.2	10.8								
Approach Delay (s)	10.4	10.0	11.2	10.8								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				10.7								
Level of Service				B								
Intersection Capacity Utilization				40.8%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

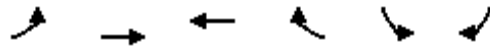
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	77	116	61	72	44	5
Future Volume (Veh/h)	77	116	61	72	44	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	77	116	61	72	44	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	151					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			193		329	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			147		288	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		93	99
cM capacity (veh/h)			1386		649	938
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	193	133	49			
Volume Left	0	61	44			
Volume Right	116	0	5			
cSH	1700	1386	670			
Volume to Capacity	0.11	0.04	0.07			
Queue Length 95th (ft)	0	3	6			
Control Delay (s)	0.0	3.7	10.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	3.7	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			31.7%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	94	53	55	72	36	21
Future Volume (Veh/h)	94	53	55	72	36	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	94	53	55	72	36	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		157				
pX, platoon unblocked						
vC, conflicting volume	127				332	91
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	127				332	91
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				94	98
cM capacity (veh/h)	1459				620	967
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	147	127	57			
Volume Left	94	0	36			
Volume Right	0	72	21			
cSH	1459	1700	714			
Volume to Capacity	0.06	0.07	0.08			
Queue Length 95th (ft)	5	0	6			
Control Delay (s)	5.1	0.0	10.5			
Lane LOS	A		B			
Approach Delay (s)	5.1	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		28.6%	ICU Level of Service	A		
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	132	47	24	164	22	89	91	17	6	61	34
Future Volume (vph)	24	132	47	24	164	22	89	91	17	6	61	34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	132	47	24	164	22	89	91	17	6	61	34
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	203	210	197	101								
Volume Left (vph)	24	24	89	6								
Volume Right (vph)	47	22	17	34								
Hadj (s)	-0.08	-0.01	0.07	-0.16								
Departure Headway (s)	4.9	5.0	5.2	5.1								
Degree Utilization, x	0.28	0.29	0.28	0.14								
Capacity (veh/h)	679	674	645	633								
Control Delay (s)	9.8	10.0	10.2	8.9								
Approach Delay (s)	9.8	10.0	10.2	8.9								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				39.0%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	105	22	17	160	51	60	150	19	13	47	12
Future Volume (vph)	27	105	22	17	160	51	60	150	19	13	47	12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	105	22	17	160	51	60	150	19	13	47	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	154	228	229	72								
Volume Left (vph)	27	17	60	13								
Volume Right (vph)	22	51	19	12								
Hadj (s)	-0.02	-0.09	0.04	-0.03								
Departure Headway (s)	5.0	4.8	5.0	5.2								
Degree Utilization, x	0.21	0.31	0.32	0.10								
Capacity (veh/h)	664	699	675	624								
Control Delay (s)	9.3	9.9	10.3	8.8								
Approach Delay (s)	9.3	9.9	10.3	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				40.7%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

12/12/2016

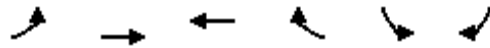
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Volume (veh/h)	139	81	50	187	223	80
Future Volume (Veh/h)	139	81	50	187	223	80
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	139	81	50	187	223	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	151					
pX, platoon unblocked						
vC, conflicting volume			220		466	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			220		466	180
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		58	91
cM capacity (veh/h)			1349		534	863
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	220	237	303			
Volume Left	0	50	223			
Volume Right	81	0	80			
cSH	1700	1349	594			
Volume to Capacity	0.13	0.04	0.51			
Queue Length 95th (ft)	0	3	72			
Control Delay (s)	0.0	1.9	17.2			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.9	17.2			
Approach LOS			C			
Intersection Summary						
Average Delay			7.5			
Intersection Capacity Utilization			52.1%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

12/12/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	71	62	71	78	109	62
Future Volume (Veh/h)	71	62	71	78	109	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	71	62	71	78	109	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		157				
pX, platoon unblocked						
vC, conflicting volume	149				314	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				314	110
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				83	93
cM capacity (veh/h)	1432				645	943
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	133	149	171			
Volume Left	71	0	109			
Volume Right	0	78	62			
cSH	1432	1700	729			
Volume to Capacity	0.05	0.09	0.23			
Queue Length 95th (ft)	4	0	23			
Control Delay (s)	4.3	0.0	11.4			
Lane LOS	A		B			
Approach Delay (s)	4.3	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		35.5%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	148	110	38	126	16	35	107	24	23	154	59
Future Volume (vph)	27	148	110	38	126	16	35	107	24	23	154	59
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	148	110	38	126	16	35	107	24	23	154	59
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	285	180	166	236								
Volume Left (vph)	27	38	35	23								
Volume Right (vph)	110	16	24	59								
Hadj (s)	-0.18	0.02	-0.01	-0.10								
Departure Headway (s)	5.2	5.5	5.6	5.4								
Degree Utilization, x	0.41	0.28	0.26	0.35								
Capacity (veh/h)	649	594	578	616								
Control Delay (s)	11.7	10.6	10.5	11.2								
Approach Delay (s)	11.7	10.6	10.5	11.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay	11.1											
Level of Service	B											
Intersection Capacity Utilization	40.8%			ICU Level of Service					A			
Analysis Period (min)	15											

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: College St & St. Paul St

12/12/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	123	48	29	83	42	58	157	48	39	159	38
Future Volume (vph)	21	123	48	29	83	42	58	157	48	39	159	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	123	48	29	83	42	58	157	48	39	159	38
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	192	154	263	236								
Volume Left (vph)	21	29	58	39								
Volume Right (vph)	48	42	48	38								
Hadj (s)	-0.09	-0.09	-0.03	-0.03								
Departure Headway (s)	5.4	5.5	5.2	5.3								
Degree Utilization, x	0.29	0.23	0.38	0.34								
Capacity (veh/h)	603	586	636	634								
Control Delay (s)	10.6	10.2	11.4	11.0								
Approach Delay (s)	10.6	10.2	11.4	11.0								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				10.9								
Level of Service				B								
Intersection Capacity Utilization				41.9%	ICU Level of Service	A						
Analysis Period (min)				15								

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
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David White, AICP, Director
Meagan Tuttle, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, CFM, Associate Planner
Anita Wade, Zoning Clerk



TO: Development Review Board
FROM: David White, Director; Scott Gustin and Mary O'Neil, Principal Planners
DATE: February 7, 2017
RE: ZP17-0662CA/MA; 75 Cherry Street (Burlington Town Center)

=====

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

Zone: D **Overlay:** Downtown Mixed Use Core Overlay (DMUC) Ward: 3C

Owner/Applicant: Devonwood Investors, LLC (Donald Sinex) / PKSB Architects, PC



CORNER OF CHERRY AND PINE STREETS

Request: 950,000 sf mixed use redevelopment of the existing Burlington Town Center mall site, bounded by Bank Street, Cherry Street, and extensions of Pine and St. Paul Streets with associated lot line adjustment.

Applicable Regulations:

Article 3 (Applications and Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 8 (Parking), Article 9 (Inclusionary and Replacement Housing), Article 10 (Subdivision).

Background Information:

This project underwent Sketch Plan review under the address of 49 Church Street (ZP16-1258SP) as follows:

Technical Review	January 14, 2016
Conservation Board	June 6, 2016
Design Advisory Board	June 14, 2016
Development Review Board	June 28, 2016

The formal application was received December 15, 2016, and reflects a revised plan, eliminating development on the Church Street (easterly) side of the collective parcels. The associated project folder reflects the more accurate identification as 75 Cherry Street, on which parcel the proposed redevelopment will occur. Note that project plans do not address necessary alterations to the exteriors of the adjacent remaining buildings and must.

The application will reconfigure parcels; address identification is anticipated to change with the opening of Pine Street and St. Paul Streets. Addresses are anticipated to be re- assigned in consultation with the E-911 Coordinator at construction start.

Previous zoning actions for involved properties are noted below.

75 Cherry Street

- **Zoning Permit 12-0391CA**; convert asphalt turnaround area to grass and landscaping on Cherry Street side of property. September 2011.
- **Zoning Permit 79-120**; pathways within the urban renewal area and drive into parking area on parcel 10 as marked to be paved. (Cherry Street circular drive.) April 1979.

49 Church Street (interior of assembled parcels, excluding Church St. frontage)

- **Non-applicability of Zoning Permit Requirements 10-0992NA**; interior fit up for salon. May 2010.
- **Zoning Permit 10-0495CA**; install new rooftop HVAC system for Baby Gap store. November 2009.
- **Zoning Permit 10-0191CA**; install 34 x 34 in wide and 32 high 5 ton AC system on roof of Mall and connect to existing duct work. September 2009.
- **Zoning Permit 07-126SN**; Four replacement parallel signs for Burlington Town Center (Bank St. and Church St. facades and 3 new freestanding signs (Church St.) Parallel Church St. signs to be lit with new reverse channel illumination; freestanding signs to be externally illuminated. No illumination proposed for Bank St. parallel signs. August 2006.
- **Zoning Permit 04-087**; install metal panels to match Old Navy storefront, patch and paint to match. August 2003.

- **Zoning Permit 03-268**; install non-illuminated canvas shed awning on Bank St. façade of Pottery Barn. December 31, 2002.
- **Zoning Permit 03-108**; installation of concrete landing and stairs with handrails at service entry for Burlington Town Center (Pottery Barn) on Bank Street. September 2002.
- **Zoning Permit 02-360**; installation of two black canvas awnings on Bank Street for J. Crew Store. March 2002.
- **Zoning Permit 02-361**; installation of projecting sign on Bank Street for J. Crew Store. March 2002.
- **Zoning Permit 02-328**; installation of two rooftop fan units for Empire Express restaurant. February 2002.
- **Zoning Permit 02-232**; installation of 2 parallel signs on Cherry Street at Gap elevation. Installation of 2 parallel signs on Cherry Street at Filenes elevation. November 2001.
- **Zoning Permit 01-488**; parallel sign for J. Crew store, frontage on Bank Street. June 2001.
- **Zoning Permit 01-483**; amend previously approved façade improvements for the Bank Street storefront portion of the existing Burlington Town Center retail mall. Tenant to be J. Crew. June 2001.
- **Zoning Permit 01-445**; renovations to the Bank Street façade of the mall. May 2001.
- **Zoning Permit 01-404**; amend previously approved façade changes for the Cherry Street and Church Street facades of the existing retail mall. April 2001.
- **Zoning Permit 00-494**; renovations to the Cherry, Bank and Church Street frontages of the existing mall. April 2000.
- **Non-applicability of Zoning Permit Requirements**; interior change of use of 600 sq. ft. to nail salon. September 1996.
- **Non-applicability of Zoning Permit Requirements**; interior continued use of 30,000 sq. ft. for offices. June 1995.
- **Zoning Permit 93-226**; fenestration renovations to Cherry Street façade of mall for the Gap. Includes combining two windows into one and the installation of a service door. November 1992.
- **Zoning Permit 92-160**; change of use within Burlington Square Mall from bank offices to fitness center, 16,110 sq. ft. October 1991.
- **Zoning Permit 87-119**; place 8 signs for Burlington Square on various facades of structures. December 1987.
- **Zoning Permit 84-331 / COA 84-067**; construction addition to Radisson Hotel (64 new rooms, net 57 rooms) with 467 space parking garage, new 68,000 sq. ft. department store on Bank Street (Porteous), 48,000 sq. ft. addition to Burlington Square Mall. July 1984.
- **Zoning Permit 81-821**; open access between Burlington Square Mall and Woolworths at lower level of mall. December 1981.
- **Zoning Permit 81-814**; remove staircase off atrium to plaza level. December 1981.

- **Determination of Non-Applicability**; new retail store – The Limited. September 1981.
- **Determination of Non-Applicability**; wall finishes, suspended ceilings, lighting, finish flooring & store fixtures. August 1981.
- **Zoning Permit 81-578**; erect five flagpoles and one kiosk at the entrance to the mall as per 4443 (c) approval of the Board of Aldermen on 6.15.1981. June 1981.
- **Zoning Permit 81-20**; (current use; vacant land); pave pathway currently used by (illegible) between Cherry and Pearl Street to ?; erect fence with gates along the northerly and southerly boundaries. October 1980.
- **Zoning Permit 81-190**; removal of existing stairs southeast corner of mall atrium. September 1980.
- **Zoning Permit 81-171**; construct a fountain in previously approved project (scope of services). September 1980.
- **Zoning Permit 80-900**; bring plaza beneath VFSL out flush with building for offices, west elevation.
- **Zoning Permit 80-755**; construct stairway connection between McDonalds and Proposed Burlington Square Expansion. March 1980.
- **Zoning Permit 595**; Church Street entrance of Burlington Square and add approx. 30,000 sq. ft. of retail and common area space extending from Church Street to easterly boundary parcel 3. May 1979.
- **Zoning Permit 80-710**; remove stairs northwest corner of atrium from atrium floor to balcony. January 1980.
- **Zoning Permit 79-92**; entrance to Burlington Square shopping mall and open plaza. April 1979.
- **Zoning Permit 79-17**; Church Street entrance of Burlington Square and add approx. 30,000 sq. ft. of retail and common area extending from Church Street to westerly boundary of parcel 3. May 1979.
- **Zoning Permit 79-150**; install a separate entrance to the restaurant with awning at the westerly end of Burlington Square to permit evening hours independently of hours of Burlington Square Mall. May 1979.
- **Zoning Permit 78-243**; retail fruits/vegetables/juices sold from movable cart in mall atrium. December 1978.
- **Zoning Permit 78-810**; Top of the Square Inc. to erect a 60' x 60' tent and a dressing tent on the Plaza level of the Burlington Square Mall, to be used for an assembly occupancy. May 1978.
- **Amended Certificate of Appropriateness, application #75-16**; change in design of car drive-in drop off point between Vermont Federal Savings and Loan Office building and parking garage. Specifically, double curb cut, larger turnaround to accommodate 12 cars instead of 5, landscaped island with stairwell leading to concourse level incorporated within island. March 1975.

- **Certificate of Appropriateness;** construction of a below grade retail mall with open plaza above as shown on the plans dated November 20, 1972 and revised on October 26, 1973 and prepared by the office of Mies Van der Rohe and Freeman, French, Freeman. March 1974.

The current application has been reviewed and received recommendations of approval from:

The Conservation Board January 9, 2017
 Design Advisory Board January 17 and 24, 2017

At its January 9, 2017 meeting the Conservation Board voted 7-1-1 to recommend approval of the application with a single condition strongly encouraging the applicant and the DRB to significantly increase the number of proposed bike parking spaces. No revisions to bike parking are evident in the most recent revised project plans, although, as presented the minimum bike parking requirements are met

Design Advisory Board voted 3-0-0 on January 24, 2017 to support the project. Their motion:

Based on a sketch plan review with the Applicant on June 14, 2016, and project reviews on January 17 and January 24, 2017, and as a result of design revisions that the Applicant has made to the project in response to previously expressed concerns by the DAB,

The Design Advisory Board strongly supports and recommends for approval the proposed mixed use redevelopment of the existing Burlington Town Center mall site, bounded by Cherry Street to the north, Bank Street to the south, the Pine Street extension to the west, and the St. Paul Street extension to the east,

With the following conditions and suggestions (with staff response and recommendation added):

DAB Comment	Staff Response and Recommendation
1. Provide a narrative to explain the methodology used to establish the average grade for purposes of demonstrating compliance with building height limits. The Average Grade may be calculated separately for each tower on Cherry Street and St. Paul Street.	While getting accurate numbers is important, regardless how the street grade is calculated it will make no difference in the compliance of the building height – all buildings are within the specified prescriptive limit. As a result, we cannot compel the applicant to specifically address this comment - it is purely advisory in nature.
2. In spite of Vermont State Statute 24 VSA 4413 (g)(1), the support structure for the rooftop PV array should be set back from the street-facing elevations to minimize the perceived height of	Pursuant to 24 VSA 4413 (b), there is no municipal zoning jurisdiction for solar collection devices that are

the building, as it exceeds over the maximum allowed building height of 160' . We encourage the Applicant to revise the layout of the PV support structure in this manner in such a way that maintains an optimum amount of PV array.	also subject to review by the Public Service Board under Sec. 248. As a result, we cannot compel the applicant to specifically address this comment - it is purely advisory in nature.
3. While the inclusion of an enclosed Observation deck may not be permissible as an occupied space above the maximum building height under section 5.2.6. (b), we approve of it at this location due to its public benefit.	Sec. 5.2.6 (b) Exceptions to Height Limits specifically provides exceptions for a number of rooftop structures, that while required by the Building Code to be safe for human occupancy, are not intended for continuous occupancy and use as leasable space. Additionally, a vestibule enclosing the elevator entrance is a requirement of the Building Code. The proposed observation deck and associated enclosure clearly fits within this category of exceptions, and any continuous occupancy and use as leasable space could be specifically prohibited as a Condition of Approval with some allowance for temporary (30-days or less) special events.
4. The 10-foot setback required in section 4.5.8 (c)(2)(B)(iv)(a) is currently set at approximately Elevation 271.5', continuously around all four streetfront elevations. The elevation of this setback should include more "vertical changes" as required in 4.5.8 (c)(2)(B)(ii), or "vertical variation" as described in 4.5.8 (c)(2)(A)(i). The vertical variation in this setback should be of at least a full story, and should be expressed in locations to relate to the massing of the three distinct towers above, and/or introduced at the south elevation of the south tower facing Bank Street, which would also bring the requirement for a 3rd 4th or 5th story setback in 4.5.8 (c)(2)(B)(iv)(a), into closer compliance.	The requirement to include a 10' minimum setback within the first 60' of building height from the street is in compliance. The additional requirement for this setback to be located at either the 3rd, 4th or 5th story would appear to conflict with the minimum building height requirement of 3 stories in Table 4.5.8-1 as a setback of the 3rd story would create a building wall of only 2 stories. As a result, the 10' minimum setback within the first 60' of building height from the street should be the controlling standard in this section.

	While varying the location and treatment of the required setback is an option and is encouraged within the ordinance, we cannot compel the applicant to specifically address this comment - it is purely advisory in nature.
5. The top of the South Tower shall have an expression of the building's top involving a projection from the plane of the façade of at least 6 inches, as required in section 4.5.8 (c)(2)(B)(viii), and this expression shall occur at the top of the uppermost occupied floor, not at the top of the mechanical penthouse.	The standard requires an expression of the building's top involving a projection from the plane of the façade of at least 6 inches, but does not specify where on the top of this building such an expression should occur. As a result, we cannot compel the applicant to specifically address this comment - it is purely advisory in nature.
6. The interior parking layout shall be arranged to avoid dead-end driveways; to avoid parallel parking spots; and to allow for safe pedestrian passage from parking spaces to stairs and elevators, to fully comply with Article 8.	Requirements regarding the layout, design and circulation of parking remains subject to any associated requirements as may be specified in Article 6 or Article 8 provided they do not conflict with the new Sec. 4.5.8 (c) 4. As a result, the applicant is expected to take the steps necessary to address these comments.

Recommendation: Open public hearing for initial review and continue review at the February 14, 2017 hearing.

I. Findings

Article 3: Applications and Reviews

Part 3: Impact Fees

Section 3.3.2 Applicability

Any new development or additions to existing buildings which result in new dwelling units or in new nonresidential buildings square footage are subject to impact fees as is any change of use which results in an added impact.

Impact Fees will be calculated for the gross new area, with credit given for existing area. The applicant shall confirm existing area (for a credit) and proposed area/uses for staff calculation of required Impact Fees. Projects containing newly constructed units that are affordable for households as described within this section are eligible for a waiver of impact fees for that portion of the project. The applicant is encouraged to consult with the Housing Trust Fund Manager to identify area and potential waiver allowance. **(Affirmative finding if conditioned)**

Section 3.3.8 Time and Place of Payment

Impact fees must be paid to the city's chief administrative officer/city treasurer according to the following schedule:

- (a) New Buildings: Impact fees must be paid at least seven (7) days prior to occupancy of a new building or any portion thereof.*

(Affirmative finding if conditioned)

Part 5 Major Impact Review

(b) Major Impact Review Standards

- 1. Not result in undue water, air, or noise pollution;*

See Section 6.0 of application materials. The project will manage stormwater runoff via filtering through a green roof, streetscape stormwater treatment features (pervious pavers and vegetated filtration planters) and attenuated storage in below grade holding tanks. See Sec. 6.1 of the project submission documents and CDO Section 5.5.3 for further discussion of stormwater management. See analysis of noise/dust, Section 5.5 and Figure 5-C, 5-D, and 6-A. **(Affirmative finding)**

- 2. Have sufficient water available for its needs;*

The anticipated increase in domestic water demand for this project is roughly 100,000 gallons per day. Burlington Department of Public Works has indicated that there is sufficient reserved water supply available for this project. **(Affirmative finding)**

- 3. Not unreasonably burden the city's present or future water supply or distribution system;*

The project site has existing waterline to the north and south with a new municipal waterline proposed in the new section of Saint Paul Street to the east. The new line will improve the downtown distribution system connectivity. **(Affirmative finding)**

- 4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;*

See Sec. 5.5.3.

- 5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;*

The reconnection of St. Paul Street and Pine Street between Cherry and Bank will restore the original grid network in the downtown; providing an increase in circulation paths around the project site. This is within the downtown, where exists a dense network of sidewalks, paths, bicycle corridors and a street web that accommodate many opportunities for passage. Additionally, the recently completed Downtown Transit Center is immediately adjacent to the project site, completing the link to mass transit. Reference is made to the submitted Traffic Impact Study, and Section 6.5 of the submission. The Department of Public Works, however, withholds

approval of the submitted traffic report. The applicant is encouraged to consult with that office to identify deficiencies in the submission and analysis. **(No finding possible)**

6. Not cause an unreasonable burden on the city's ability to provide educational services;

See Section 6.6 in submission materials for enhanced discussion. An estimated number of school age children in this development is 18.15. This represents less than ½ % of the current enrollment and should not cause an unreasonable burden on the City's ability to provide educational services. If this project receives final approval, impact fees would be paid to help offset impacts on the school system. **(Affirmative finding if conditioned)**

7. Not place an unreasonable burden on the city's ability to provide municipal services;

All affected City Departments (Parks & Recreation, Fire, Police, Electric, CEDO, Planning & Zoning, School, and Public Works) have been involved in the review of this project and have participated in interdepartmental Technical Review (January 14, 2016). Ability to serve letters are required to assure departmental satisfaction of the plan. Assurance of services has been received from Burlington Electric Department, Burlington Telecom, and Parks & Recreation. The others remain outstanding. The proposed development will likely generate additional impacts on city services; however, impact fees will be paid to help offset those impacts. **(No finding possible)**

8. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;

The project site is a city block that was razed and reconfigured during Burlington's 1960's Urban Development plan. It was at that time that the segments of St. Paul and Pine Streets were eliminated in favor of a larger redevelopment site. The site is significantly disturbed and all original buildings removed earlier. The existing retail mall has no historic significance. There exist no irreplaceable or significant natural areas, historic or archaeological sites. There is no identified area within the project plan that is scenic or contains natural beauty. **(Affirmative finding)**

9. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;

The proposed redevelopment is located within the city's downtown core; an area targeted for high intensity mixed use development. The project is consistent with many of the goals identified in *PlanBTV* and the Municipal Development Plan relative to concentrated growth in the urban core. City infrastructure improvements to support the project are linked to Tax Increment Financing (TIF), approved by the voters November 8, 2016. Impact Fees will be assessed to address additional related impacts of the redevelopment. **(Affirmative finding if conditioned)**

10. Be in substantial conformance with the city's municipal development plan;

An entire section of *PlanBTV* is dedicated to the redevelopment of the downtown mall and potential improvements. The plan calls for creation of additional downtown housing, reconnecting the street grid (cut off during urban renewal), new strategic infill, and improved street life particularly along Cherry Street and Bank Street. The proposed redevelopment addresses each of these targeted items. The application proposes 272 dwelling units in a variety of studio, 1-, and 2-, -bedroom units. Pine Street and St. Paul Street are to be reconnected. The proposed project is a

comprehensive redevelopment of an entire city block; re-framed by Pine and St. Paul Streets. The redevelopment introduces a mix of uses and streetscape improvements on all four street frontages. Additionally, the proposal complements the Municipal Development Plan in other specific areas:

- *This area (Urban Renewal District) should be the site of intensive mixed-use development including housing, hotels, a small to medium sized conference center, and public space...mid-block pathways and public greenspace must be included to facilitate pedestrian and bicycle circulation north-south and east-west....the City may consider re-introducing one or more through streets within portions of the urban renewal area in order to ease the flow of traffic through downtown by improving north-south circulation.* [MDP, Land Use Plan, Page I-14-15.]
- *Strengthen the City Center District with higher density, mixed use development.* [MDP, Land Use Plan, Page I-2.]
- *Target new and higher density development into the Downtown, Downtown Waterfront, Enterprise District, Institutional Core Campuses, and Neighborhood Activity Centers* [MDP, Land Use Plan, Page I-2.]
- *Guide a higher proportion of future development into the city center and neighborhood activity centers* [MDP, Natural Environment, page II-2.]
- *Enhance the City's gateways and streetscapes* {MDP, Built Environment, Page III-1.]
- *Enhance the pedestrian experience by improving opportunities for pedestrian access and interaction throughout the city* [MDP, Built Environment, Page III-2.]
- *Ensure people with disabilities have equal access to the built environment* [MDP, Built Environment, Page III -2.]
- *Ensure building design and public amenities take into account Burlington's northern climate* [MDP, Built Environment, Page III-2.]
- *Promote and strengthen a mixed economy and work actively to retain existing businesses and jobs* [MDP, Economic Development Plan, Page VI-2.]
- *Invest in the necessary public improvements, particularly transportation, to strengthen the Downtown, both as a Regional Growth Center and as city neighborhood.* [MDP, Economic Development Plan, Page VI-2.]
- *Encourage a healthier regional balance of affordable housing in each community, proximate to jobs and affording mobility and choice to low income residents.* [MDP, Housing Plan, Page IX-1.]
- *Support the development of additional housing opportunities within the city, with concentrations of higher-density housing within neighborhood activity centers, the downtown and institutional core campuses.* [MDP, Housing Plan, Page IX-1.]

(Affirmative finding)

11. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location;

PlanBTV: Downtown & Waterfront calls for more housing downtown generally and specifically within the mall property. The submitted redevelopment application identifies a total of 272 housing units broken down as follows:

121 2 bedroom apartments
116 One bedroom apartments
35 studio apartments

Of the total, 55 units (24 2- bedroom, 24 1- bedroom, and 7 studios) will be permanently affordable. This constitutes more than 20% IZ. Satisfaction of the requirements of Article 9 will be required via a letter of Compliance from the city's Housing Trust Fund Manager. **(Affirmative finding if conditioned)**

12. Not have an undue adverse impact on the present or projected park and recreation needs of the city.

Residents of the new dwelling units and even employees within the new commercial spaces will likely utilize the city's park and recreation facilities. If final approval is granted, park impact fees will be paid to help offset any related impact on park needs. An ability to serve letter has been obtained from the Department of Parks & Recreation. **(Affirmative finding)**

(c) Conditions of Approval:

In addition to imposing conditions of approval necessary to satisfy the General Standards specified in (a) or (b) above, the DRB may also impose additional conditions of approval relative to any of the following:

1. Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.

A dust mitigation plan for construction work is included within the application. (Figure 6-A, submission materials.) Construction would involve equipment typical of mixed-use development in the area, and would not occur during the hours of 9:00 pm and 7:00 am which is prohibited by the Burlington Noise Code (Section 21-13.)

Trash, recycling and loading area are proposed within an interior bay accessed from Bank Street; a design feature that should minimize any potential noise impacts from those activities.

Mechanical equipment is proposed to be enclosed within a rooftop penthouse, significantly reducing the potential for noise impacts.

While the development is anticipated to increase traffic volumes (see Traffic Impact Study), the increase in noise is anticipated to be negligible (less than .2 dB) for traffic sources.

Noise monitoring will be on-going on site. (Figure 5-D.)

VHB's noise assessment concluded that the proposed development would not result in adverse noise impact according to Burlington's Noise Code as it relates to stationary sources. See Figure 5-c and 5-d of submission materials. **(Affirmative finding)**

2. Time limits for construction.

Construction and occupancy are anticipated to occur in multiple phases, with occupancy between March 2019 through June 2020. The applicant may wish a different phasing schedule than is broken down by Figure 5-B, **Occupancy Schedule**. Breaking the project into distinct phases will allow occupancy of buildings, or even sections within buildings, as they are completed while construction of others is ongoing. As outlined in that document:

- 1st Phase: A five-story mixed use podium including the UVMMC Office space, parking garage levels P + L2, Cherry St. and Bank Street improvements, and retail space on Bank and Cherry Facades Anticipated March 1, 2019.
- 2nd Phase: collegiate housing located in the east wing of the residential tower (103 units); residential housing (61 units; parking garage wrap); office tower and parking garage Levels L3 + L4. Anticipated December 31, 2019.

- 3rd Phase: Residential Tower – Center and west wings (109 units); retail space St. Paul and Pine Street facades; St. Paul St. and Pine Street improvements. Anticipated May, 2020.

Any phasing schedule is at the discretion of the DRB. **(Affirmative finding if conditioned)**

3. Hours of operation and/or construction to reduce the impacts on surrounding properties.

Unless specifically requested and altered by the DRB, construction hours will be limited Monday-Friday 7:00 am – 5:30 pm, and Saturday work hours for indoor work only. No construction shall occur on Sundays.

None of the proposed uses (retail, restaurant, office, daycare and residential) are conditional.

Therefore, limitations of days and hours of operation are not warranted. **(Affirmative finding if conditioned)**

4. That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions;

Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time. **(Affirmative finding if conditioned)**
and,

5. Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.

This is at the discretion of the DRB.

Article 4: Zoning Maps and Districts

The mall property is located within the Downtown Zoning District and within the Downtown Mixed Use Core Overlay, adopted by City Council September 29, 2016 and the voters on November 8, 2016.

Section 4.3.2 Overlay Districts Established

(h) A Downtown Mixed Use Core (DMUC) district.

Please see attached compliance checklist.

Sec. 4.4.1, Downtown Mixed Use Districts:

(a) Purpose

(1) Downtown District (D)

The subject property is located in the Downtown (D) District. This zone is the primary urban center of Burlington. As noted previously, high intensity development with large, tall buildings and a diversity of uses is anticipated. Emphasis has been placed on creating pedestrian friendly streetscapes with human scale components. **(Affirmative finding)**

(b) Dimensional Standards & Density

See Compliance Checklist for DMUC Overlay, Section 4.5.8, below.

(c) Permitted & Conditional Uses

The proposed residential, retail (including restaurant), daycare and office uses are permitted in the Downtown zone. The size of the project triggers “major impact” review. **(Affirmative finding)**

(d) District Specific Regulations

1. Use Restrictions

A. Ground Floor Residential Uses Restricted

No residential units are proposed along the ground floors of the proposed development. **(Affirmative finding)**

2. Public Trust Restrictions

The subject property is not located within the Public Trust. **(Not applicable)**

3. Facades and Setbacks on Side and Rear Property Lines

This criterion requires that new buildings placed on a side or rear property have no doors or windows along such façade. It also requires a 10' setback for new construction where the façade of an existing adjacent principal building is within 5' of a common property line and has existing doors or windows. The new development meets the required 10' setback from 100 Bank Street. See Plan A-202. **(Affirmative finding)**

4. Building Height Setbacks

A. Principal View Corridors

The proposed development parallels Cherry Street – an identified view corridor. The overlay district specifies building setbacks. See Section 4.5.8, below.

B. Church Street Buildings (Not applicable)

C. Side Street Building Height

See Compliance Checklist, Section 4.5.8.

5. Lake Champlain Waterfront Setbacks

The subject property is not located along the Lake Champlain waterfront. **(Not applicable)**

6. Development Bonuses/Additional Allowances

See Compliance Checklist, Section 4.5.8. Building height is allowed by right.

Section 4.5.8 Downtown Mixed Use Core Overlay (DMUC) District

(a) Purpose

The Downtown Mixed Use Core Overlay (DMUC) district is intended to facilitate the redevelopment of a portion of the former Urban Renewal Area in order to provide for a more walkable, connected, dense, compact, mixed use and diverse urban center. The area should support a diversity of residential, commercial, recreation, educational, civic, hospitality, and entertainment activities, and create opportunities to better connect the street grid for enhanced mobility for automobiles, pedestrians, and bicyclists in order to sustain and advance the economic vitality Burlington's downtown urban core.

The overlay allows larger scale development than is typically found in the underlying district, and development with larger and taller buildings. Development should be designed to support the diverse mixed-uses, activate and enrich the street and sidewalk for pedestrian activity, and encourage mobility throughout the district and adjacent districts for pedestrians and bicyclists with reduced reliance on automobiles.

(b) **Areas covered**

75 Cherry Street is within the overlay district. **(Affirmative finding)**

(c) **District Specific Regulations: Downtown Mixed Use Core Overlay (DMUC) District**

The following are the adopted standards.

Reference is made to the associated Compliance Checklist for findings.

1. Dimensional Standards:

The maximum Building height and mass shall be as prescribed in Table 4.5.8-1 below. Building height and mass in excess of 65-feet and 5.5 FAR shall be allowed by-right and without the necessity of the DRB granting of Development Bonuses/Additional Allowances pursuant to Sec 4.4.1 (d)7.

Any application requiring Major Impact Review pursuant to Sec. 3.5.2 (b) shall not also be subject to Conditional Use Review unless a use specifically identified in Appendix A – Use Table as a “Conditional Use” or identified as “CU” is also proposed.

The Dimensional Standards within the DMUC Overlay District shall be as follows:

<u>Table 4.5.8-1 Downtown Mixed Use Core Overlay (DMUC) District Dimensional Standards</u>	
Building Height⁴	3 stories min. 14 stories not to exceed 160-ft max.
FAR⁴	9.5 FAR total max. per lot
Floorplate:	
Floors 1-5	100% of lot max.
Floors 6-8	80% of lot max.
Floors 9-12	55% of lot max.
Floors 13+	15, 000 sf max. per individual floorplate, with individual towers separated by a minimum of 60-ft measured orthogonally.
The floorplate of any floor may not be larger than the floor below.	
Pervious Area¹	10% min.
Setbacks:	

- Front	0-ft min, 10-ft max. In no event shall a Building be closer than 12' from the curb.
- Side/Rear	0-ft min., 12-ft max.
Occupied Build-to Zone²	100%
Ground Floor Height (floor to floor)	14-ft min.
Arcades³	10-ft clear depth min. 14-ft clear height min.

¹ Pervious Area is the area of a lot covered by surfaces or materials that allow for the movement or passage of water into soils below. Pervious areas include, but are not limited to, areas of a lot covered by soil/ mulch, vegetative matter, permeable pavers/pavement, bio-retention areas, or other materials that allow for the infiltration of at least the first inch (1") of rainfall. For these purposes, green roofs that capture and attenuate at least the first inch (1") of rainfall are also considered pervious area.

² Occupied Build-to Zone is the proportion of the linear distance between the maximum and minimum front setback along a front property line that must be occupied by a Building façade. In lieu of a Building façade, a streetscreen between 3.5 and 8 feet in height or active public use or activity (such as outdoor cafes) occupying no more than the lesser of 20 feet or 20% of the Build-to Zone may be included.

³ An Arcade is where only the ground floor level of the building facade is set back from the front property line. The building facade for the upper floors is at or near the front property line within the Build-to Zone, and is supported by a colonnade with habitable space above.

⁴ Additional development allowances for inclusionary housing projects as provided in Sec. 9.1.12 shall not be applicable in the Downtown Mixed Use Core Overlay District.

2. Urban Design Standards:

The following urban design standards shall apply to all Buildings in the DMUC Overlay, and the DRB shall make a final determination regarding strict compliance with these standards except as provided for in E below. These standards and requirements shall take precedence without limitation over any duplicative or conflicting provisions of Article 6, and compliance with Article 6 shall be presumed where a building is in compliance with these design standards as determined by the DRB.

A. Overall Design: *Proposed buildings shall present an architecturally significant design as follows:*

- i. Step backs, horizontal and vertical variation, selection of materials and other architectural design techniques are used to reinforce the street wall, create*

transitions from adjacent buildings of a smaller mass and height, and reduce the perceived height and mass of the upper stories from the street level;

- ii. Proposed Buildings provide visual interest and human scale at the pedestrian level through the use of a variety of scales, materials, fenestration, massing or other architectural design techniques;*
- iii. Upper story proportions of buildings emphasize vertically-oriented proportions to assure a rich visually interesting experience as viewed within the context of the downtown skyline, reinforce opportunities for establishing points of reference for visual orientation, and retain opportunities for a view of the sky between individual building elements.*

B. Façade Articulation: *All street-facing building facades shall be articulated as follows:*

- i. Building facades shall incorporate surface relief through the use of elements such as bay windows, cladding materials, columns, corner boards, cornices, door surrounds, moldings, piers, pilasters, sills, belt courses, sign bands, windows, balconies and/or other equivalent architectural features at least three (3) of which must either recess or project from the average plane of the facade by at least four (4) inches.*
- ii. Buildings with facades between seventy-five (75) feet and one hundred and fifty (150) feet in width shall include vertical changes through the horizontal plane of the façade by dividing the facade into a series of architectural and/or structural bays between six (6) feet and sixty-five (65) feet in width involving up to a minimum of 50% of the height of the façade.*
- iii. Buildings with facades greater than one hundred and fifty (150) feet in width must include a more substantial change in the horizontal plane of the façade where for every one hundred and fifty (150) feet in facade width, one (1) or more architectural bay as required above must either recess or project by at least four (4) feet involving the full height of the façade from the average plane of the street wall portion of the facade. Such bays shall occur no closer than fifty (50) feet from the building's corner.*
- iv. Required Building Height Setbacks pursuant to Sec 4.4.1 (d) 4 shall not be applicable. Instead, upper stories of any street-facing building facade exceeding six (6) stories in height shall be setback as follows:*
 - a. An upper story setback at least ten (10) feet from the primary plane of the façade below shall occur within the first 60-ft of building height at either the 3rd, 4th, or 5th story in order to provide a change in the vertical plane of the façade. Such a change shall involve the full width of the building façade, but does not have to occur in the same story. Additional upper story setbacks may occur in order to provide additional terraces, taper and visual interest to taller buildings.*
 - b. For buildings exceeding ten (10) stories in height a second upper story setback at least ten (10) feet from the primary plane of the façade below shall occur at either the 10th, 11th, or 12th story in order to provide another change in the vertical plane of the façade. Such a change shall involve the*

full width of the building façade, but does not have to occur in the same story. Additional upper story setbacks may occur in order to provide additional terraces, taper and visual interest to taller buildings.

- c. Setbacks must be visually set off from the stories below by a balustrade, parapet, cornice and/or similar architectural feature, and are encouraged to be activated as an outdoor amenity space for building occupants.*
- d. The upper stories beyond a setback may be visually differentiated from the stories below by a change in color, materials and/or pattern of fenestration in order to reduce the actual or perceived massing of the building overall.*
- v. Where visible, the raised foundation or basement of a building shall not exceed 4-ft as measured from the exterior finished grade to the finished floor of the Story above, and must be visually differentiated from the stories above by a horizontal expression line and change in color, material, and/or pattern of fenestration;*
- vi. The lower one to five stories of a building must be visually differentiated from the stories above by a horizontal expression line, belt courses, banding, sign band, cornice and/or equivalent architectural feature, and include a change in color, material, and/or pattern of fenestration across a majority of the façade;*
- vii. The top one to five stories of a building must be visually differentiated from the stories below by a horizontal expression line, belt courses, banding, sign band, cornice and/or equivalent architectural feature, and include a change in color, material, and/or pattern of fenestration across a majority of the façade; and,*
- viii. The top of a building must have a cornice, parapet, pitched or shaped roof form and/or other equivalent architectural feature involving a projection from the average plane of the façade by at least six (6) inches to serve as an expression of the building's top.*

C. *Street Activation:* *All Buildings shall activate the street as follows:*

- i. Buildings shall have one or more principal entrances for pedestrians at street level that are clearly identified as such along the street frontage or at a corner where a corner lot.*
- ii. The linear distance along the street frontage between ground floor entries shall not exceed 60-feet, and such doors must be open and operable by residential occupants at all times and non-residential occupants and customers during business hours.*
- iii. Building entrances shall be defined and articulated by architectural elements such as lintels, pediments, pilasters, columns, canopies, awnings, transoms, sidelights and/or other design elements appropriate to the architectural style and details of the building as a whole. Bays including a principal entrance should be expressed vertically and continue onto the upper stories. Such bays are not required to include additional horizontal expression beyond what is required for any upper story setbacks*
- iv. Requirements regarding openings and the transparency of glazing in a street-facing Building facade shall be as follows:*

	Ground Floor	Upper Floors
Rough openings for windows and doors (per floor)	70% min., 80% of which shall be concentrated between 3-10 feet above the adjacent sidewalk	20% min.
- Horizontal and vertical distance between rough openings	20' max.	
Transparency: - applicable to 80% of the glazing on each floor.		
- VLT - Visible Light Transmittance ¹	60% min.	40% min.
- VLR - Visible Light Reflectance	15% max.	15% max.

¹May be reduced to 50 and 30% respectively to meet the requirements of a High Performance Building Energy Code or equivalent program as determined by the DRB.

- v. *Street-facing, street-level windows must allow views into a ground story non-residential use for a depth of at least 3 feet for the first 4 feet above the level of the finished sidewalk in order to provide for a window display, and for a depth of at least 8 feet for the next 4 feet above the level of the finished sidewalk in order to provide a view into the interior of the space. Windows cannot be made opaque by window treatments (except operable sunscreen devices within the conditioned space). External security shutters are not permitted.*
- vi. *In addition to the restriction regarding ground floor residential uses pursuant to Sec. 4.4.1, (d) 1 A, General Office uses shall also not be permitted on the ground floor of any building in the DMUC Overlay.*

D. Materials:

The following requirements regarding the selection and use of Building materials is intended to improve the physical quality and durability of buildings, enhance the pedestrian experience, and protect the character of the downtown area.

- i. *Primary Materials: Not less than 80 percent of each street-facing facade shall be constructed of primary materials comprised of high quality, durable, and natural materials. For facades over 100 square feet, more than one primary material shall be used. Changes between primary materials must occur only at inside corners. The following are considered acceptable primary materials:*
 - a. *Brick and tile masonry;*
 - b. *Native stone;*
 - c. *Wood – panels, clapboard or shingles;*
 - d. *Glass curtain wall; and,*

- e. *Cementitious siding;*
 - ii. *Accent Materials: The following accent materials may make up no more than 20% of the surface area on each street-facing façade. Accent materials are limited to:*
 - a. *Pre-cast masonry (for trim and cornice elements only);*
 - b. *External Insulation Finishing System - EIFS (for upper story trim and cornice elements only);*
 - c. *Gypsum Reinforced Fiber Concrete (GFRC—for trim elements only);*
 - d. *Metal (for beams, lintels, trim elements and ornamentation, and exterior architectural metal panels and cladding only);*
 - e. *Split-faced block (for piers, foundation walls and chimneys only); and.*
 - f. *Glass block.*
 - iii. *Alternate Materials: Alternate materials, including high quality synthetic materials, may be approved by the administrative officer after seeking input from the Design Advisory Board. New materials must be considered equivalent or better than the materials listed above and must demonstrate successful, high quality local installations. Regionally-available materials are preferred.*
 - iv. *Other:*
 - a. *The use of recycled and/or regionally-sourced materials is strongly encouraged.*
 - b. *With the exception of natural wood siding or shingles such as cedar or redwood intended to gradually weather with time, all exposed wood and wood-like products (e.g. fiber-cement) shall be painted or stained. Exterior trim shall be indistinguishable from wood when painted.*
 - c. *Any synthetic siding and finish products shall be smooth-faced with no artificial grain texturing.*
- E. *Alternative Compliance:*** *Relief from any non-numerical standard above, and relief from any numerical standard with the exception of building height and FAR by no more than 20% of such requirement, may be granted by the Development Review Board after review and comment by the Design Advisory Board and the administrative officer. In granting such relief, the DRB shall find that:*
- i. *the relief sought is necessary in order to accommodate unique site and/or Building circumstances or opportunities;*
 - ii. *the relief if granted is the minimum necessary to achieve the desired result;*
 - iii. *the property will otherwise be developed consistent the purpose of this ordinance, the purpose of the underlying Zoning District and this Overlay District, the purpose of the section that the relief is being sought, and all other applicable standards;*
 - iv. *the relief if granted will not impose an undue adverse burden on existing or future development of adjacent properties; and,*
 - v. *the relief if granted will yield a result equal to or better than strict compliance with the standard being relieved.*

3. Use

Mixed Use Buildings: Any new or substantially rehabilitated building over 105' in total height shall include a mix of uses including no less than 25% of the gross leasable floor area dedicated to non-residential uses and another 25% or more dedicated to residential use.

4. Parking

- i. *All onsite parking shall be provided in one or more of the following:*
 - a. *an underground parking structure (strongly preferred);*
 - b. *an above ground parking structure separated from the public street by a liner building a minimum of 40-ft in depth; or,*
 - c. *a mixed-use building where with parking located underground, setback a minimum of 40-ft behind the façade of building at the ground level, and/or above the ground floor.*
- ii. *All onsite parking shall participate in any Downtown Parking and Transportation Management District in order to minimize the amount of parking provided and maximize the efficiency of its utilization.*
- iii. *Vehicular entrances to parking structures shall not exceed 24-ft clear width and 16-ft clear height at the street frontage.*
- iv. *At least one pedestrian route from all parking structures shall lead directly to a street frontage (i.e., not directly into a Building). When portions of a building containing parking front on more than one street, multiple pedestrian routes to street frontage is strongly encouraged.*
- v. *All structured parking with frontage on any portion of a public street shall be treated as follows:*
 - a. *The required setback between the parking and the public street at the ground level must be occupied by an active use (such as, but not limited to, residential lobby, retail, office, recreational or services). This requirement shall not apply to parking located either entirely below-grade or above the second floor where parking may extend out to the building's perimeter.*
 - b. *All floors of a parking structure fronting a public street must be level (not inclined), and any sloped ramps between parking levels must be setback a minimum of 20-ft from the street-facing building façade and shall not be discernible along the perimeter of the parking structure.*
 - c. *Where upper stories of structured parking are located at the perimeter of a building, parked vehicles, vehicle headlights and interior lighting shall be screened from view from the street and adjacent properties.*
 - d. *In addition to the Urban Design Standards required above, facade treatments (materials, fenestration patterns, and architectural detailing) must be continued on stories containing parking in a manner consistent with the overall architectural design of the building and such that levels of parking are not clearly distinguishable from other uses in a building.*

- vi. *Each parking space provided in an underground parking structure may be counted as 1.75 of the parking spaces as required in Art 8.*

5. Signs

A master sign plan pursuant to Article 7 Part 3 is required for all sites occupied by more than three tenants where all signs must meet the requirements of the master sign plan. The master sign plan must establish standards of consistency as applicable of all signs to be provided on the subject property with regard to:

- *Colors;*
- *Letter/graphics style;*
- *Location and Sign Type;*
- *Materials;*
- *Methods of illumination; and/or*
- *Maximum dimensions and proportion.*

In addition to the flexibility from the requirements of Article 7 provided under Sec. 7.3.4, the following shall also be permitted when incorporated as part of a master sign plan in the DMUC Overlay:

- i. *The area of projecting signs, marques, canopies and awnings shall not be deducted from the maximum allowed signage area permitted for signage under Sec 7.2.3.*
- ii. *Projecting Signs: One projecting sign may be permitted for each ground floor use provided each sign:*
 - a. *does not exceed 8 square feet in area;*
 - b. *does not project more than 4 feet from the building façade on which it is attached;*
 - c. *has its lowest edge at least eight (8) feet above any pedestrian way;*
 - d. *has its highest edge no more than eighteen (18) feet above any pedestrian way; and,*
 - e. *any encroachment into the public right-of-way must also be approved by the City Council.*
- iii. *Marquee Signs: One marquee sign per street frontage may be permitted provided such sign:*
 - a. *is associated with the following uses only: Cinema, Conference Center, Convention Center, Performing Arts Center and Recreation Facility-Indoor;*
 - b. *is located above the principal building entrance;*
 - c. *projects a minimum of 6 feet from the building façade on which it is attached but in no event more than 10 feet and 3 feet from the curb;*

- d. *has its lowest edge at least 9'6" above any pedestrian way;*
 - e. *has its highest edge no more the lesser of the floor level of the third story or 35 feet above any pedestrian way;*
 - f. *is no more than 40 feet in width;*
 - g. *may contain an area for manual changeable copy that does not exceed 30 percent of the area of the sign face on which it is located or 32 square feet, whichever is less; and,*
 - h. *Any encroachment into the public right-of-way must also be approved by the City Council.*
- iv. *Canopies and Awnings: Where provided, awnings and canopies placed on a building facade shall meet the following specifications:*
- a. *Awnings and canopies shall provide 8' minimum clear height above the finished grade, and shall project a minimum of 6' from the building façade to a maximum of 2' from the curb. 14' minimum clear height above the finished grade shall be provided above any area used for parking or circulation. Any encroachment into the public right-of-way must also be approved by the City Council.*
 - b. *Awnings and canopies shall be placed, sized, shaped and proportioned to match the associated openings.*
 - c. *Except as provided below, awnings and canopies shall not be internally illuminated or backlit, however they may contain lighting fixtures intended to illuminate the ground beneath.*
 - d. *Awnings shall have a metal structure covered with non-translucent canvas, synthetic canvas or painted metal, and shall have no soffit or sides. Retractable awnings are encouraged.*
 - e. *Awnings shall be rectangular in elevation and triangular in cross-section with straight edges. The valance of the awning shall be no more than 12" in height.*
 - f. *Canopies shall be constructed of wood and/or metal, and shall be cantilevered or supported from above. The face of the canopy shall be no more than 24" in height.*
 - g. *Signage placed on an awning or canopy shall be limited to the windows and doors on the first (ground) floor, and shall not extend outside the overall length or width.*
 - h. *Signage placed on a canopy shall be limited to the face or may project above and may be backlit.*
 - i. *Signage placed on an awning or canopy shall be limited to:*
 - i. *75% of the valance or canopy face and/or 25% of the sloping plane max.*

- ii. *The height of lettering shall be limited to: 5" min. - 10" max. on the valance; 18" max. on the sloping plane; or 24" max. on or above the canopy.*

6. Green Buildings and Stormwater Management

A. **Green Buildings:** *New development and substantial redevelopment in the DMUC Overlay shall be built to the standard of LEED Gold Certification, or a nationally recognized equivalent as determined by the administrative officer.*

i. *At the time of application the following shall be required:*

- a. *the submission of documentation of the planned performance criteria and elements of the project necessary to obtain the required green building certification (e.g. LEED checklist);*
- b. *documentation that the project has been registered with the applicable green building certification program (e.g. LEED project registration); and,*
- c. *a written commitment to apply for formal, written review of the project at the earliest milestone where the green building certifying body offers "precertification" or similar (e.g. LEED Design Review).*

ii. *Prior to the release of any Final Certificate of Occupancy the following shall be required:*

- a. *the submission of revised as-built performance criteria and project elements necessary to obtain the required green building certification (e.g. LEED checklist);*
- b. *the results of 3rd party commissioning of the building envelope and mechanical systems documenting compliance of as-built performance; and,*
- c. *a written certification from the project design professional of record that the project has been constructed to comply with the green building requirements of this section.*

B. **Stormwater Management:** *Stormwater runoff from 100% of all net new and substantially redeveloped impervious area (or an equivalent area of impervious) must be captured and managed in such a way as to mimic pre-development (meadow in good condition, Hydrologic Soil Group B) runoff (or discharge) ratio for the 1 year, 24 hour design storm subject to review and approval by the DPW Water Resources Division.*

The feasibility of implementing runoff volume reduction practices must be evaluated in consultation with the DPW Water Resources Division and shall include an evaluation of the engineering feasibility of techniques including, but not limited to runoff reduction through stormwater reuse, green stormwater infrastructure such as green roofs, bio retention, tree planting and sewer separation of roof water for sites currently discharging to the combined sewer system. Storage and detention methods may be used to meet pre-development flow targets. When and where detention systems are the primary mode of stormwater management, "smart" precipitation integrated detention

systems must be evaluated and are strongly preferred. On-site stormwater management must be maximized; however, off-site stormwater management may also be used in consultation with DPW Water Resources.

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Article 4 above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable in the D zone.

Sec. 5.2.5, Setbacks

(a) Setbacks Required

See Article 4 above.

(b) Exceptions to Yard Setback Requirements

1. Abutting Building with Doors or Windows

This criterion requires a setback of 10' for new construction abutting an existing building within 5' of the property line that has windows or doors facing the new construction. Project plans revised as of 01/20/2017 comply with this criterion. Previously, construction abutting the existing building at 100 Bank Street had encroached into this setback.

(Affirmative finding)

Sec. 5.2.6, Building Height Limits

See Article 4 above.

(b) Exceptions to Height Limits

- 1. Additions and new construction on parcels created prior to January 1, 2008 that contain a non-conforming principal building exceeding the maximum permitted building height may exceed the maximum permitted building height of the zoning district subject to the design review provisions of Art. 3 and 6, but in no event shall exceed the height of the existing non-conforming principal building.*

(Not applicable)

- 2. In no case shall the height of any structure exceed the limit permitted by federal and state regulations regarding flight paths of airplanes.*

As the proposed construction is not located at an airport, the threshold for FAA review appears to be 200' tall per 14 CFR Part 77.9. The proposed construction is less than 200' tall. **(Affirmative finding)**

- 3. Ornamental and symbolic architectural features, including towers, spires, cupolas, belfries and domes; greenhouses, garden sheds, gazebos, rooftop gardens, terraces, and similar features; and fully enclosed stair towers, elevator towers and mechanical rooms, where such features are not used for human occupancy or commercial identification, are exempt from specific height limitations but shall be subject to the design review provisions of Art. 3 and 6. Such features and structures shall be*

designed and clad in a manner consistent and complementary with the overall architecture of the building.

The enclosed rooftop mechanical penthouse atop the south tower also includes an enclosed observation deck. This penthouse exceeds the standard 160' height limit. As noted in their recommendation to the DRB, the Design Advisory Board supported inclusion of this feature in the building design. The space is open to the public – as an observation deck – it is not occupied space in the typical sense (office, residence, etc.). In light of the benefit of this public amenity, allowing it to share space within the mechanical penthouse is reasonable. **(Affirmative finding)**

4. *Exposed mechanical equipment shall be allowed to encroach beyond the maximum building height by no more than 15-feet provided that portion exceeding the height limit does not exceed 20% of the roof area.*

Exposed mechanical equipment shall be fully screened on all sides to the full height of the equipment, and positioned on the roof to be unseen from view at the street level. Screening may consist of parapets, screens, latticework, louvered panels, and/or other similar methods. Such features and structures shall be designed and clad in a manner consistent and complementary with the overall architecture of the building

Where mechanical equipment is incorporated into and hidden within the roof structure, or a mechanical penthouse setback a minimum of 10-ft from the roof edge, no such area limit shall apply and the structure shall be considered pursuant with 4 above.

Rooftop equipment is fully enclosed within a mechanical penthouse. As required, the penthouse observes a 10' setback from the roof edge. **(Affirmative finding)**

5. *All forms of communications equipment including satellite dish antennae shall not be exempt from height limitations except as provided in Sec 5.4.7 of this Article.*

(Not applicable)

6. *The administrative officer may allow for up to a 5% variation in the maximum building height to account for grade changes across the site. In no event however, shall such additional height enable the creation of an additional story beyond the maximum permitted.*

The maximum building height of the proposed construction varies between 158' and 162' 2". The 2' 2" over 160' is within 5% and is allowable. **(Affirmative finding)**

Sec. 5.2.7, Density and Intensity of Development Calculations

See Article 4 above.

Sec. 5.5.1, Nuisance Regulations

No part of the application indicates that nuisance impacts may result. No industrial or other commercial uses typically associated with heat, glare, emissions, or noise are included in the application. The application materials include an evaluation of potential noise impacts relative to Burlington's noise ordinance. Parking areas, trash/recycling facilities, and loading docks will be internal to the proposed building, thereby limiting outdoor noise. Mechanical equipment will be located on the rooftops within fully enclosed penthouses. Noise from mechanical units will,

therefore, be substantially less than ground mounted and/or unenclosed mechanical units.
(Affirmative finding)

Sec. 5.5.2, Outdoor Lighting

New outdoor lighting is included in this proposal. New pole-mounted lights are proposed within the public street rights-of-way. A fixture cutsheet has been provided, and illumination levels are depicted in a photometric plan for the site. The application asserts that the new streetlights comply with Burlington Electric Department's central business district lighting standards. Confirmation from BED is needed. Other lighting includes building entryway lighting and under-canopy lighting. Cutsheets are provided for both fixtures. Both are acceptable cutoff LED fixtures; however, only one fixture (BEGA 66 698 for entries) is included in the photometric plan. Footcandle levels for both fixtures are needed. As presently depicted on the photometric plan, entryway illumination is acceptable in most cases, but there are some hot spots that reach well above 5.0 footcandles. A table noting average footcandle levels for the entries is needed. Some revision is likely needed to comply with the 5.0 average for building entries. Finally, no lighting information for the parking garage is evident in the project plans. Sec. 5.5.2, (f) 5 outlines lighting standards for parking garages. Demonstration of compliance is needed. **(No finding possible)**

Sec. 5.5.3, Stormwater and Erosion Control

A comprehensive stormwater management plan is included in this proposal. Presently, there is virtually no onsite stormwater management. Runoff flows without attenuation into the city's receiving sewers. As proposed, the ~3.5 acre project site will be overhauled to capture and attenuate stormwater flows to green meadow conditions prior to discharge into the city system. Doing so will be of significant benefit to the city's receiving system. The proposal includes large underground cisterns to capture most of the flows and sand filters to treat stormwater prior to discharge at a controlled rate into the city system. Green roofs are also included. They, too, will capture and control release of stormwater with the added benefit of evapotranspiration. On the ground, areas of pervious pavement, in combination with oversized soil chambers for new street trees, will also capture and attenuate stormwater. The Conservation Board reviewed this proposed stormwater management plan and recommended approval. Final approval by the city's stormwater program is required.

A detailed construction site erosion prevention and sediment control (EPSC) plan is included in the project plans. It, too, has been reviewed and approved by the Conservation Board. It includes a variety of standard EPSC practices. The application also contains a comprehensive dust control plan to limit offsite impacts associated with construction and earth disturbance. As with stormwater management, the EPSC plan is subject to final approval by the city's stormwater program. **(Affirmative finding if conditioned)**

Article 8: Parking

Section 8.1.3 Parking Districts

c) Downtown Parking District

This parking district further reduces the requirements from the baseline standards recognizing that extensive sharing of parking demand between nearby land uses occurs; that a majority of travel to and between land uses is independent from an automobile; and that an array of public parking facilities and frequent transit service greatly reduces the need for independent parking for individual land uses.

Sec. 8.1.8, Minimum Off-Street Parking Requirements

Calculated for Downtown District

Use	Area	Requirement	Total required	Proposed
Retail	107,304 sf	0	0	0
Office	230,328 sf	2 per 1000 sf	461	489
Residential	272 units	1 per unit	272	272
Preschool/Daycare	19,509	2 drop off	2	As required
Total			735	761
Required accessible parking 2%			15	16

The applicant is required to identify the 2 preschool drop-off parking spaces on a parking deck plan as appropriate. **(Affirmative finding if conditioned)**

Section 8.1.9 Maximum Parking Spaces

The total number of parking spaces provided in all parking districts shall not be more than 125% of the minimum number of spaces required for the Neighborhood Parking District for any given use as required in Table 8.1.8-1.

The number of spaces provided does not exceed 125% of the required parking as calculated for the Neighborhood Parking District. Total number provided: 761. As calculated for the Neighborhood Parking District: (and depending upon size of daycare), approximately 1337 parking spaces could be provided under the maximum. **(Affirmative finding)**

(c) Exemptions

1. *Structured parking: Spaces provided within the footprint of a structure containing one or more other uses, including rooftop, at-grade, or below grade spaces shall not be counted towards the maximum, provided the floor area dedicated to parking is less than 50% of the total gross floor area of the structure.*

Although the provided parking minimally exceeds the parking requirement for the Downtown parking district, the additional spaces are not counted toward the parking maximum limitation as they are within a parking structure. **(Affirmative finding)**

Section 8.2.5, Bicycle Parking Requirements

Use	Area	Long Term		Short Term	
Retail	126,813	1 per 20,000 sf	6	1 per 5,000	25
Office	230,328	1 per 5,000	46	1 per 10,000	23
Residential	272 units	1 per 4	68	1 per 10	27
Subtotal			120		50 maximum requirement*
Required total	170				

*Section 8.2.5 (c) *Where bicycle parking is required, the minimum number of bicycling parking spaces provided at each site shall be 2 (2) and the maximum shall be fifty (50, not including long term parking.*

Long term bicycle parking is located on floors 2-5 of the parking area, adjacent to the Pine Street parking pedestrian access. Facilities include showers and changing accommodation. Short term spaces are located on the streetscape, adjacent to major entry points. Please refer to Plan LA200. Placement within the public right-of-way will require approval of the Department of Public Works and a license agreement with the city, with ultimate approval by City Council. **(Affirmative finding if conditioned)**

Article 9: Inclusionary and Replacement Housing

Sec. 9.1.5, Applicability

As the proposed development includes more than 5 new dwelling units, it is subject to the inclusionary housing provisions of this Article. In this case, a total of 272 residential units is proposed. Typically, 15% of housing units must be inclusionary, but this number may vary depending on price points of the market-rate units. This application proposes 55 inclusionary units (20% of the total) to be integrated throughout the residential portion of the development. Final written approval of the inclusionary housing approval from the manager of the city's Housing Trust Fund is required. **(Affirmative finding if conditioned)**

Sec. 9.1.17, Review of Proposal for Phasing

The application contains a phasing schedule (figure 5-B) that articulates 3 distinct phases. Phases 2 and 3 include all of the residential units. The phasing proposal does not specifically address construction of the inclusionary units. Presumably, as all of the inclusionary units will be integrated throughout the residential component, they will be made available for occupancy at a rate consistent with that of the market rate units. This criterion, however, requires that phasing of the inclusionary units be expressly addressed. A revised phasing schedule is needed. **(No finding yet possible)**

Sec. 9.1.18, Timeline for Availability/Phasing of Inclusionary Units for Issuance of Certificate of Occupancy

See Sec. 9.1.17 above.

Article 10: Subdivision

Sec. 10.1.15, Lot Line Adjustments

No subdivision is included in this proposal. Lot lines; however, will be adjusted. Six existing parcels will be reconfigured into five parcels. As required, a boundary survey by a VT licensed land surveyor has been provided. No nonconforming parcels result from the proposed lot line adjustments. All reconfigured parcels have street frontage. There is no minimum lot size requirement in the Downtown zone or within the Downtown Mixed Use Core Overlay. **(Affirmative finding)**

Sec. 10.1.10 Performance Bond and Guarantee of Completion

As new public improvements (city streets and related infrastructure) are included in this project, this criterion call for a performance guarantee. **(Affirmative finding if conditioned)**

Sec. 10.1.12 Dedication of Public Streets

As new public streets are included in this project, procedures for acceptance outlined in this section must be followed. **(Affirmative finding if conditioned)**

II. Items for Consideration

1. Impact Fees will be calculated for the gross new area, with credit given for existing area. the applicant shall confirm those uses/areas for staff to calculate appropriate fees. Impact fees must be paid at least seven (7) days prior to occupancy of a new building or any portion thereof.
2. Elevation drawings for the affected facades of the adjacent remaining buildings following demolition.
3. Unless specifically requested and altered by the DRB, construction hours will be limited Monday-Friday 7:00 am – 5:30 pm, and Saturday work hours for indoor work only No construction shall occur on Sundays.
4. The applicant is required to identify the 2 preschool drop-off parking spaces on a parking deck plan as appropriate.
5. Revised traffic analysis per Department of Public Works comments.
6. Final stormwater plan and erosion prevention and sediment control plan review and approval by the city's stormwater program.
7. Final review and approval of the inclusionary housing proposal by the manager of the city's Housing Trust Fund.
8. Revised outdoor lighting plan consistent with Sec. 5.5.2.
9. Revised phasing plan that specifically references the inclusionary housing units.

Burlington Development Review Board

149 Church Street, City Hall

Burlington, VT 05401

www.burlingtonvt.gov/pz/DRB

Telephone: (802) 865-7188

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Austin Hart

Brad Rabinowitz

Israel Smith

AJ LaRosa

Geoff Hand

Alexandra Zipparo

Wayne Senville

Jim Drummond, (Alternate)

Robert Purvee, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday February 7, 2017, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT Minutes

Board Members Present: Austin Hart, Brad Rabinowitz, A.J.LaRosa, Geoff Hand, Wayne Senville, Alexandra Zipparo, Jim Drummond (Alt), Robert Purvee (Alt)

Board Members Absent: Israel Smith

Staff Members Present: Scott Gustin, Mary O'Neil, Ryan Morrison, Anita Wade

I. Agenda

II. Communications

Supplemental: Letter from attorney John Franco is accepted by the Board.

III. Minutes

IV. Consent

1. **17-0669CA/MA; 29 STARR FARM BEACH (RL-W, Ward 4N) David Porteous**
Construction of a stone seawall, slope stabilization, and repair of existing metal stairs.
(Project Manager, Ryan Morrison)

C.Cullins: engineer for project is representing the applicant.

Board members accept this project as a consent item.

B.Rabinowitz: motion to approve and adopt staff findings.

W.Senville: Seconds the motion

Board Vote: 7-0-0

2. **15-0525CA/MA; 87-95 NORTH AVE and 15-0526CA/MA; 7 HASWELL STREET (NMU, Ward 7) COTS**

Application for re-approval of:

ZP15-0525CA/MA to renovate and add to the existing building at 8-95 North Ave for 14 new residential units as part of a mixed use building, and

ZP15-0526CA/MA to demolish an existing house at 7 Haswell St and merge lot in conjunction with ZP15-0525CA/MA. (Project Manager, Ryan Morrison)

A.Hart: recused from this item.

B.Rabinowitz: Board accepts as a consent item.

G.Hand: motions to accept and adopt staff findings.

R.Purvee: seconds the motion.

Board Vote: 7-0-0

V. Public Hearing

3. 17-0662CA/MA; 75 CHERRY STREET (D, Ward 3C) BTC Mall Associates, LLC

Mixed use redevelopment of the existing Burlington Town Center mall site and associated lot line adjustments. (Project Managers, Scott Gustin, Mary O'Neil)

G.Hand and AJ.LaRosa are recused.

AHart: swears in applicant and interested parties. Introduces David White, Director of Planning & Zoning. Slide presentation of the new ordinance presents overview, design, massing and parking aspects.

D.White: Director of Planning & Zoning. Spoke of the new overlay district approved on November 8, 2016 and the connection of former urban renewal area and downtown waterfront. The connections are about people and how people interact with development around them. Slide presentation presented described the new overlay district. Showed map of downtown mixed use core overlay district of 8.7 acres. Principal objectives meant to reestablish the street grid lost in 60's and 70's and for two new 60 foot pedestrian walkways. There are components of the overlay of which applicant must meet. Staff role is to make a determination that applicant has met the performance standards. Building height exceptions are applicable citywide. Spoke of the massing potential and building envelope. Building zone is where building occupies an area with 100% of frontage, ground floor height minimum of 14ft. Pervious area provides open space, green space and stormwater. The façade of building needs to be bays and recesses with changes of the horizontal in the vertical plane and where every 60ft height the building needs a setback. Street activation looks at principal entrance height of every 60 feet at minimum. Parking setback is 40 feet at ground level, floor plates are level, for screening of cars. Master sign plans are required for mixed use projects and greater range and prescriptive signage which are separate from this application. Green buildings required are Leed Gold or better. CO received if applicant demonstrates requirement of Leed standard. Stormwater management where runoff is 100% of all net new and redeveloped areas. The packet has a checklist for requirements, how they are satisfied and staff verification. W.Senville: asks if historic development standards applicable.

M.ONeil: potentially could apply.

W.Fellows: complies with all overlays standards and parking requirements. Slide presentation shows continuous retail at sixty feet height and residential above. Lot line adjustment realigns the streets and square footage provided for retail, office, residential and parking equaling 980,000 square feet.

M.Willard: landscape architect shows slides on the landscape design on St.Paul and Pine Street with wider sidewalks on Bank St and Cherry St. Materials to be used are brick permeable pavers at street levels. Working with Warren Spinner on new street standards for street standards incorporating green street elements, 60 uncovered bike stands around buildings, and various types of trees. Working with BED with lighting and illumination levels.

W.Fellows: mentioned cellar plans integrating mechanical and structural within building, massing on north and south sides, principal entrances, and a truck dock on Bank Street. All retail is from streetscape removing the interior arcade. Slide presentation shown for floor level activities and the open air parking. Fifty-five inclusionary units are mixed with market rate units. A total number of parking spaces for retail and residential is 761spaces. Using stacked parking with valet service. Allocating 16 handicap parking and 3 van stalls everything on rooftop will be enclosed.

Issues of streetscape and public amenities have worked to make a presence that is a presence on the streets that is brand new and enliven the street and bring more activity to street.

W.Senville: questions about massing of buildings and impact on the facing for all four sides. Asks for more information about the mall in relation to new buildings. Would like more perspective for buildings. What is the nature of Bank St in relationship to other buildings.

B.Rabinowitz: the building has improved with presence and façade. Asks for the elevation for the east side of St Paul St.

A.Hart: asks about the demolition project and how process work and how it will be done in the middle of the downtown will circulation issues and affects everyone.

W.Fellows: will provide the schedule for this.

A.Hart: uses sign in sheet to call forward interested persons for comments.

S.Bushor: City Councilor from Ward 1. Looked at staff comments and feels things remain incomplete for traffic and congestion.

A.Hart: subject of future hearing.

S.Bushor: asks for impact on different departments such as Police and Fire. Questioned caliber of the trees, parking wraparound concept versus curtain concept. Asks how parking conceals car headlights. Had hoped the residential component would look different than the commercial component and that bays would be rounded and softened.

J.Franco: represents B.McGrew and other interested parties.petitioners. Concerned incongruity with applicant Devonwood Investment, LLC and property owner as BTC Mall Associates. Concern about façades of St Paul and Macy's building. Phasing is not consistent with predevelopment agreement. Questions major demolition and what happens to public parking facility on Cherry St. which meets parking requirements parking for surrounding retail and residential uses. May be in violation to take away this parking spaces and may create a major parking crisis for City.

S.Goodkind: has a signed petition from those who want to address the project as active participants.

G.Nanton: Assistant Director of Community and Economic Development Office; reads a statement on how this is an important project to the housing action plan. The project is located near transportation and will have positive impact. Project fits into design for community services and conforms with other plans, the DowntownBTV, Climate Action Plan, Great Street plan, Legacy plan, and Municipal plan as a major milestone for city.

AHart: swears in interested person.

G.Brunelle; resident of Burlington is happy with inclusionary housing dispersed but on the same floor, but finds none on upper floor. Interested in moving to upper floor of new building. Would like to know how inclusionary housing is dispersed on all levels.

D.Sinex; intends to respond to resident and to Board within a week and will have designers respond to S.Bushor. Mentioned this has been a three year process and the principal object is to provide benefits and continue to work to make it a better project.

J.Beck: addressed S.Bushor's comments. Will be getting letters of support from all departments and hope to have this before Board soon.

A.Hart: stacking and valet parking is a new provision in ordinance and Board needs to understand this in relation to valet parking and its function

J.Beck: mentions article 8 provisions for stacked and tandem for car parking and when it can be used. Parking is both public and private access.

W.Fellows: working to comply with overlay district requirements and have met all requirements of overlay successfully.

D.Senix: would like to see more spaces, but with valet service will do better with providing parking spaces. Will be providing a parking management plan.

W.Fellows: fifty-five inclusionary units are on multiple floors.

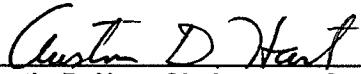
A.Zipparo; asks how many leased parking spaces to public.

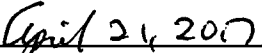
D.Sinex: public spaces are monthly for either residents or office employees and integrating carsharing to make up for spaces. Meets the requirements of phase one.

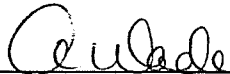
A.Hart: asks for the parking management plan for the Board's review.
A.Zipparo: said the city ordinance requires a certain number of parking. Needs to know what the plan is and what is going on with the spaces.
D.Sinex: said a required parking 735 spaces and we have 761 spaces.
J.Beck: not looking for a parking waiver.
W.Fellows: said there is no requirement for public parking.
A.Zipparo: the concern is that parking is being used for other uses than residential uses.
A.Hart: asked as parking is demolished and 18 months to build are you providing sufficient parking.
W.Fellows: we will go over the ordinance and parking requirements.
J.Drummond: asks about grill space for the area of UVM area, retail space, and size of the floor plate.
W.Fellows: said the grill space includes two floors and retail encompasses 100,000 square feet.
B.Rabinowitz: questions vertical changes.
W.Senville: asks how the retail space will be allocated.
W.Fellows: explains how users of spaces are determined.
W.Senville: asks if there is a difference between sketch plan and the current plan and assessment for Bank Street.
M.ONeil: did not include sec 5.4.8 in report because there is nothing historic in area. Said this could be addressed at the next hearing.
A.Hart: requested information on traffic, stormwater, possibly from DPW at next hearing.
W.Senville: asks to know what is being done to reduce parking.
A.Zipparo: asks about outdoor, indoor, and retail parking.
A.Hart: tentative hearing date for 2/14 and 2/21.
W.Fellows: would like to proceed on for 2/14.
Board discusses when to schedule deliberation.
B.Dunkeil: wants to keep the 2/14, and not sure 2/21 is necessary.
A.Hart: asks for a motion to keep special meeting for 2/14 and continuance.
W.Senville: motion to proceed with meeting on 2/14 with continuance.
B.Rabinowitz: seconds the motion.
Board vote: 6-0-0

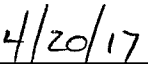
VI. Other Business

VII. Adjournment


Austin D. Hart, Chairperson Development Review Board


Date


A.Wade, Planning & Zoning Clerk


Date

Plans may be viewed in the Planning and Zoning Office, (City Hall, 149 Church Street, Burlington), between the hours of 8:00 a.m. and 4:30 p.m.

Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Planning and Zoning office is considered public and cannot be kept confidential.

This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/pz/drba/agendas or the office notice board, one week before the hearing for the order in which items will be heard.