

Burlington Development Review Board

149 Church Street, City Hall

Burlington, VT 05401

www.burlingtonvt.gov/pz/DRB

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Alexandra Zipparo
Wayne Senville
Jim Drummond, (Alternate)
Robert Purvee, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday February 21, 2017, 5:00 PM PUBLIC HEARING NOTICE

The Burlington Development Review Board will hold a meeting on
Tuesday February 21, 2017 at 5:00pm in Contois Auditorium, City Hall.

- 1. 17-0253CA; 201 South Prospect (RL, Ward 6S) Bing Enterprises, Ltd**
Appeal of an administrative denial to replace 2 windows with
2 egress windows. (Project Manager, Ryan Morrison)
- 2. 17-0617CA; 62-64 Buell St (RH, Ward 8E) Earnest Palasits**
Appeal of administrative denial to replace railings and decking on porch.
(Project Manager, Ryan Morrison)

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/drbb/agendas or the office notice board, one week before the hearing for the order in which items will be heard.

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).

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BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday February 21, 2017, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT AGENDA

- I. **Agenda**
- II. **Communications**
- III. **Minutes**
- IV. **Public Hearing**
 - 1. **17-0253CA; 201 South Prospect Street (RL, Ward 6S) Bing Enterprises, Ltd**
Appeal of an administrative denial to replace 2 windows with 2 egress windows.
(Project Manager, Ryan Morrison)
 - 2. **17-0617CA; 62-64 Buell Street (RH, Ward 8E) Earnest Palasits**
Appeal of administrative denial to replace railings and decking on porch.
(Project Manager, Ryan Morrison)
 - 3. **17-0662CA/MA; 75 Cherry Street (D, Ward 3C) BTC Mall Associates, LLC**
Continued review of mixed use redevelopment of the existing Burlington Town Center Mall site and associated lot line adjustments.
(Project Managers, Scott Gustin, Mary O'Neil)
- V. **Other Business**
- VI. **Adjournment**

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*Submitted at DRB
2/14/17*

February 14, 2017

By Hand Delivery

Austin Hart, Chair
City of Burlington Development Review Board
City Hall
Burlington, VT 05401

Re: DRB Proceedings, Permit Application #17-0662CA/MA

Dear Mr. Hart,

I write on behalf of BTC Mall Associates, LLC ("BTC") in reply to the letters filed on behalf of Barbara McGrew and the petition to participate concerning permit application #17-0062CA/MA sent through counsel and dated February 7, 2017 and February 8, 2017.

BTC reserves the right to challenge Ms. McGrew and petitioners' status as interested persons in this matter. The arguments regarding the completeness of the permit application are out of time, and are not properly raised. An appeal from a decision of the Zoning Administrator must be taken within fifteen days after the date of decision by filing a notice of appeal. CDO § 12.2.2; 24 V.S.A. § 4465(a). The letters were submitted more than fifteen days after the Zoning Administrator deemed the zoning permit application complete. No notice of appeal has been filed. Thus, none of her arguments concerning the completeness of the zoning permit application can be considered.

In any case, BTC disputes all of the allegations raised, many of which are deficient on their face or have no basis in the CDO. To the extent they are related to the DRB's review of this project, the allegations and BTC's responses are as follows.

- 1) *The Predevelopment Agreement provides that the property owner BTC Mall Associates, LLC will be the developer, but it not the zoning permit applicant. The permit applicant is Devonwood Investors, LLC. Devonwood is neither an owner of the subject properties nor a signatory to the Predevelopment Agreement, and is not legally bound by the requirements of the Predevelopment Agreement.*

Mr. Don Sinex, who owns and controls both BTC and Devonwood Investors, LLC ("Devonwood"), signed the application. Devonwood is in the upstream ownership of BTC. Moreover, the applicant intends to add BTC to the application materials.

2) *The permit application is incomplete because:*

The allegations concerning the completeness of the zoning permit application fail at the outset. Under BZO 3.2.5, the administrative officer has authority to determine if an application is complete. The administrative officer deemed it complete and referred the application to the DRB.

2.1 *It does not address what is to happen with the facade of the remaining portion of the existing BTC Mall to be exposed by the proposed demolition of a portion of the existing mall and the re-establishment of St. Paul Street.*

BTC is preparing an elevation of the façade on the east side of St. Paul Street, which will be submitted when it is available.

2.2 *It similarly does not address what is to happen with the exposed facade of the remaining portion of the Macy's building by the re-establishment of Pine Street.*

The façade of this property is not the applicant's property. A zoning application for an adjacent property would not be timely until a decision on this application is final.

2.3 *It does not include all of the Public Improvements identified in the property owner's Predevelopment Agreement with the City and the 2016 TIF referendum language. This contradicts the Predevelopment Agreement § 4d, which provides that "the Owner shall construct all the Public Improvements at its own cost and expense, and the City shall reimburse the Owner for the agreed upon cost of constructing the Public Improvements . . . upon Owner's receipt of a Unified Certificate of Occupancy for Phase I of the Project:" Moreover, the Public Improvements which are included the permit application are not scheduled to be completed until mid-2020. This contradicts the Predevelopment Agreement which provides they are to be completed and the Unified Certificate of Occupancy is to be received no later than December 31, 2019.*

The Predevelopment Agreement is not germane to the application to the DRB, and it is inappropriate to ask the DRB to adjudicate it. In any event, the application complies with BTC's commitments under the Predevelopment Agreement for this project.

2.4 *The permit application has consequently shorted the amount it owes to the City in the permit application fee. Because the Owner is to be constructing the improvements at his own cost and expense with later reimbursement by the City only if a Unified Certificate is obtained, they all must be included in the permit application and the cost of the permit application fee if they are to be built, but are not.*

The application is deemed complete by the administrative officer, and all required fees have been paid by applicant.

2.5 *The permit application is incomplete because it does not address how or where the parking demand to be created by Phase II of the redevelopment project is to be satisfied.*

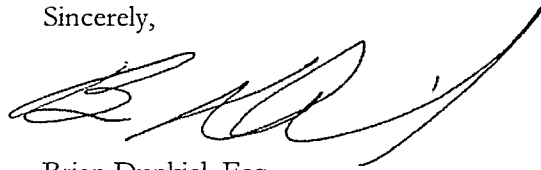
Phase II of the Mall redevelopment is not currently before the DRB. Future development on property owned by the applicant not subject to this application is speculative and beyond the scope of the matter before the DRB through this application.

2.6 *The permit application is incomplete because it does not address how the existing demand for public parking being satisfied by the public parking spaces in the parking facility which is to be demolished will be accommodated during the period of demolition and construction.*

There is no zoning requirement to provide public parking.

Thank you for your consideration of this matter. Please contact me with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. Dunkiel', with a long, sweeping horizontal stroke extending to the right.

Brian Dunkiel, Esq.

DUNKIEL SAUNDERS ELLIOTT RAUBVOGEL & HAND, PLLC

Cc: Noelle MacKay, Director, Burlington Community & Economic Development Office
Richard W. Haesler, Esq., Assistant City Attorney, City of Burlington



**CITY OF BURLINGTON
DEPARTMENT OF PUBLIC WORKS**

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Chapin Spencer
DIRECTOR OF PUBLIC WORKS

MEMORANDUM

To: Development Review Board
Fr: Chapin Spencer, Director *Chapin*
Re: Status Update on our Burlington Town Center Review
Date: February 14, 2017

I am writing to provide the Development Review Board an update on our department's review of the Burlington Town Center redevelopment.

Members of our staff have met with the property owner and their team more than ten times over the last year to review various components of the Burlington Town Center project. We have been pleased with the collaborative process and the project design has evolved significantly since we began meeting. Below is an update of our review to date.

Water and Wastewater Capacity: Based on the proposed project's calculated design flows from the State Environmental Protection Rules, we provided a letter on 2-7-17 agreeing to reserve a total of 100,000 gallons per day for water and sewer. We are continuing to work with the applicant to determine the best locations to tie in the water services and sewer laterals and whether any main upgrades will be required.

Stormwater – The City's Stormwater staff have met with the applicant's consultants several times now, and we are comfortable with the conceptual design that the applicant has proposed for Stormwater treatment. Based on our most recent conversation with the BTC design team, they are in the process of finalizing the State Stormwater Permit application and will have the final Stormwater design details to our staff as soon as that application is complete. The current conceptual stormwater design, as proposed, would meet the standards for Chapter 26 review and our staff would be willing to grant the project conditional approval, contingent on review of the final design details and application materials. For projects of this sale, there are almost always details that need to be adjusted in the final review. It is important to note that the applicant has revised the project plans to connect entire site's stormwater to the College St separated stormwater collection system, taking wet weather flows off the combined sewer system.

Non-Discrimination

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at 865-7145.

Street Design: The applicant has taken the draft Great Streets design standards and applied them to the new blocks of Pine Street and St. Paul Street. Initial staff review has found the design to be generally consistent with the draft Great Street standards. The design has minimized travel lane widths and the amount of vehicular parking on the new streets to maximize the width of sidewalks and permeable treebelts. Mid-block crossings are proposed for both Pine Street and St Paul Street. The applicant will be meeting with GMT to review their operational needs in the project area.

Traffic: Our staff has reviewed the original Traffic Impact Study (TIS) dated 12-14-17 and requested a number of modifications including the addition of vehicular trips from the 80 units of what may become student housing. The TIS has been updated twice since the original and there has been significant progress reducing the number of outstanding issues. We will complete our review by next week's DRB meeting.

Parking (Construction Phase): The Council-approved Pre Development Agreement called for the parties to negotiate a construction-phase parking agreement to accommodate existing monthly customers from the BTC garage after its closure and demolition. The City is expeditiously advancing a large capital repair project for the College Street Garage this spring and summer so that the College St and Lakeview garages can be fully operational and can accommodate hundreds of additional parkers during the BTC redevelopment. The City and the applicant will need to finalize the parking agreement over the next few months. If the applicant seeks to use any portions of the City's ROW for construction related parking, they will need to propose that as part of their Encumbrance Permit.

Parking (Post-Construction): As we requested, the applicant has adjusted the plans to move the new Cherry Street garage entrance further away from the Pine St intersection. We will be providing comments on the bicycle parking design and location at the next DRB meeting. The applicant has indicated a willingness participate in the proposed Downtown Parking Management District and the City will work to include this in the Development Agreement.

DPW will have our full written comments provided at the next DRB meeting on Feb 21. Thank you.

Submitted at DRB 2/14



29 Church St., Suite 3-5
Burlington, Vermont 05401
802-863-1175

The Burlington Business Association, founded in 1978, is a non-profit, non-political membership organization with 200 business and non-profit members.

Our mission is to enhance and promote the economic vitality of Burlington, Vermont, and to assure that the City of Burlington continues as the cultural, social, political, educational and economic center of northwestern Vermont.

Board of Directors:

Richard Deane, Chair
Russ Scully, Vice Chair
Tom Brassard, Secretary
Zandy Wheeler, Treasurer
Afi Ahmadi
Kara Alnasrawi
John Caulo
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Shireen Hart
Leslee MacKenzie
Maria McClellan
Stephanie Miller Taylor
Kevin Owens
Mike Schirling
Jeff Schulman
Stephanie Wernhoff

Kelly Devine
Executive Director

Sarah O Donnell
Membership Services &
Events Manager

Jack Commo
Administrative Coordinator

February 14, 2017

Development Review Board Members,

The Burlington Business Association (BBA) and its more than 230 local business members supports the Burlington Town Center Redevelopment, a project which is crucial to the future economic vitality of downtown Burlington.

We encourage the Development Review Board to support this project and make every effort to move it forward. The project has benefited from a comprehensive public input process, which has resulted in a plan that benefits our downtown, our local businesses and the Burlington community.

The planned 274 units of housing will be an important step in addressing our housing supply crisis. In addition, with 20% of the units (total of 54) designated as perpetually affordable, the project will offer much-needed workforce housing. Time and time again, the BBA has heard from member businesses that struggle to attract new employees because of the high cost of living, one which rivals that of a major metropolitan area, not a small college town like ours.

It's time we address the fact that businesses are leaving for more modern, energy efficient office space in other parts of Chittenden County. This project creates "Class A" office space in the commercial center of Vermont.

We understand that concerns have been raised about parking management during project construction. A recent agreement between the BBA and the city of Burlington requires the BBA to help support the parking needs of this project during construction. We will be working with DPW and private parking owners and operators to identify available parking spaces downtown and ensure parking needs are met during the construction phase. We know from our work on the Parking and Transportation Management Plan that parking spaces are available to meet this



29 Church St., Suite 3-5
Burlington, Vermont 05401
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need. On an average weekday, about 50% of our more than 8,000 downtown parking spaces sit vacant.

The proposed project replaces a failing suburban-style mall in the core of our city, with a vibrant mixed-use urban neighborhood, one that enhances our downtown. It will allow residents and community members the opportunity to live, work and play in the heart of this community.

For their part, Devonwood has consistently shown a commitment to working with community members, hearing out their concerns and making adjustments accordingly. There has been an honest effort to make this project one that the entire community can support.

The transformative nature of this project will project will shape our downtown for decades to come. We urge you to support it, because we believe that it represents much needed progress for Burlington. It will support our local downtown retail and hospitality industry, add office spaces for companies that want to be in Burlington and provide workforce housing for people who want to be part of this community.

Sincerely,

A handwritten signature in black ink that reads "Kelly Devine". The signature is written in a cursive, flowing style.

Kelly Devine

Executive Director

Local Motion Comments at February 14, 2017 DRB Hearing Regarding Burlington Town Center

Thank you for the opportunity to speak regarding the BTC redevelopment project. We'd like to start by reiterating Local Motion's support for this project. We believe that, as currently envisioned, the redevelopment of the BTC property has the potential to make Burlington a significantly more walk- and bike-friendly place.

Our reasons for supporting the project remain the same as last fall, when we spoke in favor of the project before City Council. As we see it, the project confers the following benefits:

1. Reactivating the streetscape with storefronts and walk-bike friendly infrastructure
2. Re-opening public rights-of-way at Pine Street and at St. Paul Street, with an emphasis on walking and biking
3. Adding a substantial amount of housing and office space, which Burlington very much needs and which will help build a vibrant downtown

Based on tonight's presentation by the project team, we would like to draw the DRB's attention to four specific aspects of the proposal that need further attention in order to fully realize its potential.

1. AMOUNT OF BIKE PARKING

It is great to see that the project proposes to provide more bike parking than Burlington's standards currently require. The problem is, Burlington's bike parking standards are woefully out of date, particularly in comparison with other communities with similar levels of biking. For example, Portland, Oregon -- whose bike commute mode share is roughly the same as Burlington's -- requires upwards of 1 long-term bike parking space per residential unit.

The contrast between the project team's approach to bike parking versus stormwater management was striking. The project team has made a commitment to a world-class stormwater management system that far exceeds what is required and puts this project at the vanguard nationally for stormwater management in redevelopment projects. We would like to see a similar level of ambition with regard to bike parking. The current proposal for bike parking is solid and respectable, but it is not visionary.

We request that the DRB take three actions with regard to bike parking:

1. Request an analysis from the project team comparing its bike parking facilities to those of similar-size developments in communities with levels of biking in the same range as Burlington's (6% to 7% bike commute mode share), and review the proposed amount of bike parking in that light
2. Grant explicit pre-approval to the developer to substitute additional bike parking for car parking at a prescribed ratio (in the range of 5:1) without any further review if utilization rates indicate that more bike parking is needed

3. Ensure that the design of the car parking areas easily allows for conversion of car parking to bike parking (in particular, that areas of car parking that are adjacent to planned bike parking can easily be made accessible for bikes)

2. DESIGN OF STRUCTURED PARKING GENERALLY

Our understanding is that the parking in this development is designed to allow it to be repurposed for non-parking uses over time, if and when transportation needs change and the space is better dedicated to other uses. We have no reason to believe that this has changed, as the developer indicated a strong commitment to this design feature. However, we request that the DRB take two actions with regard to parking generally:

1. Ensure that this commitment to flexible design of parking decks is retained in the final approved design, such that the building itself presents no structural impediments to repurposing of parking decks for other uses
2. Ensure that no procedural requirements are enacted that would make it impractical to act on this structural flexibility -- that is, do not bind the developer to maintain a certain number of spaces as a condition of the permit, but rather allow for flexible management of the space currently occupied by parking based on actual utilization rates

3. SCHEDULE FOR OPENING STREETS

We noted in the project team's presentation that they plan to open St. Paul and Pine streets to traffic at the end of the construction period. **We would like to register our strong objection to a delayed opening of these two streets.** Burlington desperately needs more and better north-south connections for driving and transit as well as for walking and biking.

A two year delay in re-establishing these streets is significant, particularly with regard to two key elements of the planned bike network: a continuous bike route on Pine Street from the South End to the Old North End, and conversion of Winooski Avenue through downtown to a three-lane street with bike lanes. The latter depends on the opening of Pine & St. Paul because a reconnected street grid will reduce the traffic demand on Winooski, allowing more flexibility in design for that street.

To this end, we request that the DRB take the following action with regard to opening of these streets:

1. Require that St. Paul and Pine be fully constructed and opened to traffic immediately following demolition of the existing structures, and that construction be managed from within the footprint of the block bounded by those two streets

4. BIKE FACILITIES ON PINE STREET

It was unclear from the presentation what bike facilities are planned for the reconstructed section of Pine Street. Given the importance of this street in a city-wide bike network, the street should be designed with dedicated bike lanes, not simply with shared-lane markings. These lanes should not run next to on-street car parking or a drop-off zone, but rather should be against the curb. To this end, we request that the DRB take the following action with regard to bike lanes on Pine Street:

1. Require that Pine be designed and built with curbside bike lanes on both sides of the street for the length of the block that are a minimum of 5' wide

Thank you for your consideration.

Sincerely,
Jason Van Driesche
Deputy Director, Local Motion

1 Steele St., Burlington, VT 05401
o: 802-861-2700 ext. 109
m: 802-735-7271



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.



MEMORANDUM

Project: **Burlington Town Center**

FFF Project Number: **A1636**

Date: **Feb. 16, 2017**

Freeman French Freeman Inc. | Architecture • Planning • Interiors

81 Maple Street • Burlington Vermont 05401

802-864-6844 • www.fffinc.com

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To: City of Burlington, Department of Planning and Zoning

From: Jesse Robbins, FFF

Subject: **Burlington Town Center- Valet Parking Plan**

The proposed Burlington Town Center parking structure will use stacked parking to maximize parking capacity. The following zoning language addresses requirements for compliant stacked parking:

Sec. 8.1.14 Stacked and Tandem Parking Restrictions

Except as otherwise provided below, all parking facilities shall be designed so that each motor vehicle may proceed to and from the parking space provided for it without the moving of any other motor vehicle.

- (a) Stacked or valet parking may be allowed if an attendant is present to move vehicles. If stacked parking is used for required parking spaces, a written guarantee must be filed with the City ensuring that an attendant will always be present when the lot is in operation. The requirements for minimum or maximum spaces continue to apply for stacked parking.

The following procedures will be put in place to comply with these requirements and ensure the parking structure meets the needs of tenants and visitors:

- 1) The applicant will provide a written commitment that a parking attendant will be present when the garage is in operation.
- 2) Hours of operation – Garage will be open 24 hours a day, 7 days a week.
- 3) Stacked and Valet stalls will be signed and striped to distinguish from open stalls.
- 4) Valet operations for stacked parking will not impede the operational flow of the open stalls.
- 5) There will be an attendant on each floor where stacked parking is being utilized.
- 6) The attendant will park the tenant/visitor's car and provide the vehicle owner a valet slip for retrieving the car.
- 7) Tenants using valet services will be directed to a spot on each floor to drop the car off for the attendant. Signs at the each entrance to each parking level will direct the customer to the valet stand.

CC:

File A1636	Art Klugo, PC	Jesse Beck, FFF	Brian Dunkiel, DSERH
John Haselbauer, PKSB			

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
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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
vacant, Department Secretary
Anita Wade, Zoning Clerk



MEMORANDUM

To: Development Review Board
From: Ryan Morrison, CFM, Associate Planner
Date: February 21, 2017
RE: ZP17-0617CA/AP; 62-64 Buell Street

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

File: ZP17-0617CA/AP

Location: 62-64 Buell Street

Zone: RH **Ward:** 8E

Date application accepted: January 11, 2017

Applicant/ Owner: Ernest Palasits

Request: Appeal of administrative denial for the replacement of decking and railings on a front porch.

Overview:

The appellant, Ernest Palasits, is appealing the administrative denial of his zoning permit request for alterations to the front porch at 62-64 Buell Street.

The subject property, 62-64 Buell Street, built circa 1892, is listed as a contributing historic resource in the Buell St. / Bradley St. Historic District of the National Register of Historic Places. It is also listed on the Vermont State Historic Register. Given the building's age and historic significance, it is subject to the regulations set forth in Articles 5 & 6 that pertain to historic preservation.

The property listing in the Buell St. / Bradley St. Historic District speaks specifically to the front porch, stating "*Fronting the main block is a 2-story porch with turned spindle posts and pilasters, stick balustrade, scroll-sawn brackets, and lattice skirt.*" Based on the regulations of Articles 5 & 6, preservation of distinctive materials, features, finishes, and construction techniques or craftsmanship that characterize a property is required. The appellant obtained a Non-Applicability of Zoning Permit Requirements (13-1287NA) to "*Repair front porch, replace rear soffit.*" The approval specified that the repair/replacement work was exempt from the requirements of a zoning permit because the work proposed constituted a 'replacement in-kind'. However, as the appellant states, he was unaware that the porch had to be rebuilt in a specific manner, and as a result, the work did not preserve distinctive materials, features, finishes, and construction techniques of the original porch. Rather, the porch was replaced with pressure-treated wood that lacks the characteristics of the original materials and design. In response to a

zoning violation warning for “construction changes to railings on the front porch without zoning approval”, the applicant submitted zoning permit application 17-0617CA to permit the porch as it had been rebuilt. On December 27, 2016, staff denied ZP17-0617 for reasons found below in the Findings.

This appeal was filed in a timely manner, in accordance with Sec. 12.2.2.

Recommendation: **Uphold zoning permit denial** based on the following findings.

I. Findings

Timeline:

- **June 19, 2013** – Non-Applicability of Zoning Permit issued for in-kind front porch repairs.
- **November 9, 2016** – Zoning warning letter issued for change to railing style on the front porch of a structure currently on the Federal Historic List, without Zoning Approval.
- **November 28, 2016** – Application ZP17-0617CA submitted.
- **December 5, 2016** – Application ZP17-0617CA deemed complete.
- **December 5, 2016** – Additional information requested.
- **December 27, 2016** – Restarted review.
- **December 27, 2016** – Decision of denial for ZP17-0617CA. See attached Reasons for Denial document.
- **January 11, 2017** – Appeal of administrative decision of ZP17-0617CA submitted.

Applicant’s Basis for Appeal:

- Appellant states that he was not aware that the porch had to be replaced in a specific manner.
- Appellant would like to request a variance on the materials if the property can be restored to the look that it had previously.

ARTICLE 5: CITYWIDE GENERAL STANDARDS

Sec. 5.4.8, Historic Buildings and Sites

(a) Applicability

1. The building is 50 years old or older.

The building at 62-64 Buell Street was constructed in 1892 and is more than 50 years old.

(Affirmative finding)

2. The building or site is deemed to possess significance in illustrating or interpreting the heritage of the city, state, or nation in history, architecture, archeology, technology, and culture because one or more of the following conditions is present:

- A. *Association with events that have made a significant contribution to the broad patterns of history; or,*
- B. *Association with the lives of persons significant in the past; or,*
- C. *Embodiment of distinctive characteristics of a type, period, or method of construction, or representation of the work of a master, or possession of high artistic values, or representation of a significant or distinguishable entity whose components may lack individual distinction; or,*
- D. *Maintenance of an exceptionally high degree of integrity, original site orientation and virtually all character defining elements intact; or,*
- E. *Yielding, or may be likely to yield, information important to prehistory.*

As described in the property listing in the Buell St. / Bradley St. Historic District, the front porch had specific materials and craftsmanship that represented the architectural stylings of a historic period.

The National Registry notes that some alterations have occurred to the structure. The alterations include a 2-story (plus basement) addition to the building's rear, vinyl sheathing, covering the original foundation with concrete, and changes to the original fenestration. However, the registry entry goes on to say *"although somewhat altered during its conversion into student housing in recent decades, this duplex maintains the rhythm and massing of the streetscape, and through its remaining details contributes to the historic character of the district."* **(Affirmative finding)**

3. *The building or site possess a high degree of integrity of location, design, setting, materials, workmanship, feeling, and association.*

See item 2 above. There have been a few alterations to the building. However, the National Registry listing maintains that the structure still maintains the rhythm and massing of the streetscape, and its remaining details contribute to the historic character of the district. Review under the standards of Sec. 5.4.8 is intended to ensure continued integrity, whereas without it, incremental changes may continue until such integrity is lost. **(Affirmative finding)**

(b) Standards and Guidelines

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 building at 62-64 Buell Street was constructed for residential use, and continues to be used for residential use as a duplex. **(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 front porch was one character defining feature of the structure. As with any building, certain elements need to be repaired/replaced over time, and Planning and Zoning staff approved an 'in-kind' repair/replacement of the front porch, via Non-Applicability of Zoning Permit 13-1276NA. However, the work done did not preserve the distinctive materials and appearance of the front porch. The porch railings, decking and lattice have all been removed and replaced with pressure-treated wood lacking the details of the original. This is a

significant alteration to the front façade of a National Register building. To approve the new porch would be a substantial step towards the loss of the building's historic character. Such action would be inconsistent with this standard. **(Adverse 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 before and after photos of the front porch show noticeable differences in the historical elements. Replacement of the porch with plain, pressure-treated wood and no preservation of previous architectural details introduce features inconsistent with the home's style. **(Adverse finding)**
4. *Changes to a property that have acquired historic significance in their own right will be retained and preserved.*
No such changes are included in this proposal. **(Affirmative finding)**
5. *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*
The new porch's styling and materials are inconsistent with this standard, and replacement as such was not approved by the City, nor should it be approved now. Replacement with pressure-treated wood that lacks the historic architectural elements of the original porch is inconsistent with this standard and with long-standing precedent for structural repairs/replacements on historic buildings. **(Adverse finding)**
6. *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials recognizing that new technologies may provide an appropriate alternative in order to adapt to ever changing conditions and provide for an efficient contemporary use. Replacement of missing features will be substantiated by documentary and physical evidence.*
The porch, as it is today, is not the result of repair work, it is a complete replacement, and represents a change in design, color, and texture. The DRB has, in the past, allowed use of alternative materials as an option for structural repairs/replacements on historic buildings (i.e. fiber cement boards). However, previous determinations have precluded the use of pressure-treated wood in similar situations. As a result, the proposed use of pressure-treated dimensional lumber inconsistent with this standard and with precedent. **(Adverse finding)**
7. *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*
No such treatment is included in this proposal. Not applicable.
8. *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*
There are no known archeological resources on the property. Not applicable.

9. *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.*
Approval of the porch replacement would validate the loss of the historic porch's materials and design. As such, the proposed work would significantly erode the historic integrity of the building at 62-64 Buell Street. **(Adverse finding)**
10. *New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*
See #9 above. **(Adverse finding)**

ARTICLE 6: DEVELOPMENT REVIEW STANDARDS

Sec. 6.3.2, Review Standards

(a) Relate Development to its Environment

1. Massing, Height and Scale

Not applicable.

2. Roofs and Rooflines

Not applicable.

3. Building Openings

Not applicable.

(b) Protection of Important Architectural Resources

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves buildings listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8.
See Sec. 5.4.8 above. To allow a new porch that lacks the materials and historic architectural details would be in direct conflict with the intent of this section; which is to protect Burlington's architectural and cultural heritage. **(Adverse finding)**

(c) Protection of Important Public Views

Not applicable.

(d) Provide an Active and Inviting Street Edge

Not applicable.

(e) Quality of Materials

Not applicable.

(f) Reduce Energy Utilization

Not applicable.

(g) Make Advertising Features Complementary to the Site
Not applicable.

(h) Integrate Infrastructure into the Building Design
Not applicable.

(i) Make Spaces Secure and Safe
Not applicable.

Summary:

In summary, the alterations to the front porch of this national register historic building conflicts with the applicable standards of Sec. 5.4.8 and Sec. 6.3.2. The Non-Applicability determination was issued specifically for in-kind repairs. What was done amounts to wholesale replacement and alteration. The replacement front porch cannot be approved in light of the applicable standards.

II. Recommended Motion

Uphold denial of zoning application 17-0617CA per the foregoing findings.



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

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JAN 11 2017

DEPARTMENT OF
PLANNING & ZONING

Appeal of an Administrative Decision Request

Use this form to appeal any Administrative Decision or Notice of Violation - See Sec. 12.2.2 of the Zoning Ordinance.

SUBJECT LOCATION ADDRESS: 62-64 BUELL ST

Subject Property Owner: ERNIE PALASTIS

Appellant: _____

Agent/Representative: _____

Mailing Address: 20 KIMBALL AVE STE 203

City, St, Zip: 50 BURLINGTON VT 05403

Day Phone: 863-1040 Email: EPALASTIS@YAHOO.COM

Appellant Signature: [Signature] Date: 1/9/17

In order for your request to be considered complete, ALL of the following information must be provided, as applicable:

- ☒ The Appeal fee of \$250;
- ☒ Description of the decision under appeal;
- ☒ Description of the property subject to the appeal;
- ☒ Reference to the regulatory provisions applicable to the appeal;
- ☒ Relief requested by the appellant;
- ☒ Alleged grounds why such requested relief is believed proper under the circumstances.

Office Use Only:

Check No. 2440 Amount Paid \$250. Zoning Permit # 17-0617CA

JB PROPERTIES/Ernie Palasits
20 Kimball Ave Ste #203
S.Burlington, Vt. 05403
(802) 863-1040
(802) 864-2541 (Fax)

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JAN 11 2017

DEPARTMENT OF
PLANNING & ZONING

1/9/17

To: Dept. of Planning and Zoning
149 Church St.
Burlington VT 05401-8415

Re: Porch 62-64 Buell St.

To Whom it may concern,,

I would like to appeal the decision by Ryan Morrison. concerning the front porch at 62-64 Buell St. I would like ask if it there can be a variance on the materials if the property can be restored to the look that it had previously. I have enclosed some pictures showing the property as it was before any work was done and as it is now as well as how it will look after decorative corners are installed and the entire porch is painted. Lattice will be replaced as it was in the past. I understand the bare wood lacks historical appeal and I am hoping if the look can be nearly identical to what it was previously it can be accomplished without discarding perfectly good material. I appreciate the attempt to keep things historical and have seen other properties on Buell St that have used pressure treated wood that was painted and one would not know that unless the scraped off the paint. If I had known that this type of wood wasn't allowed I wouldn't be asking for this type of compromise. I hope that there can be some consideration in following the spirit of the ordinance if not the exact language.

Thank you for considering my appeal of this matter.

Sincerely;



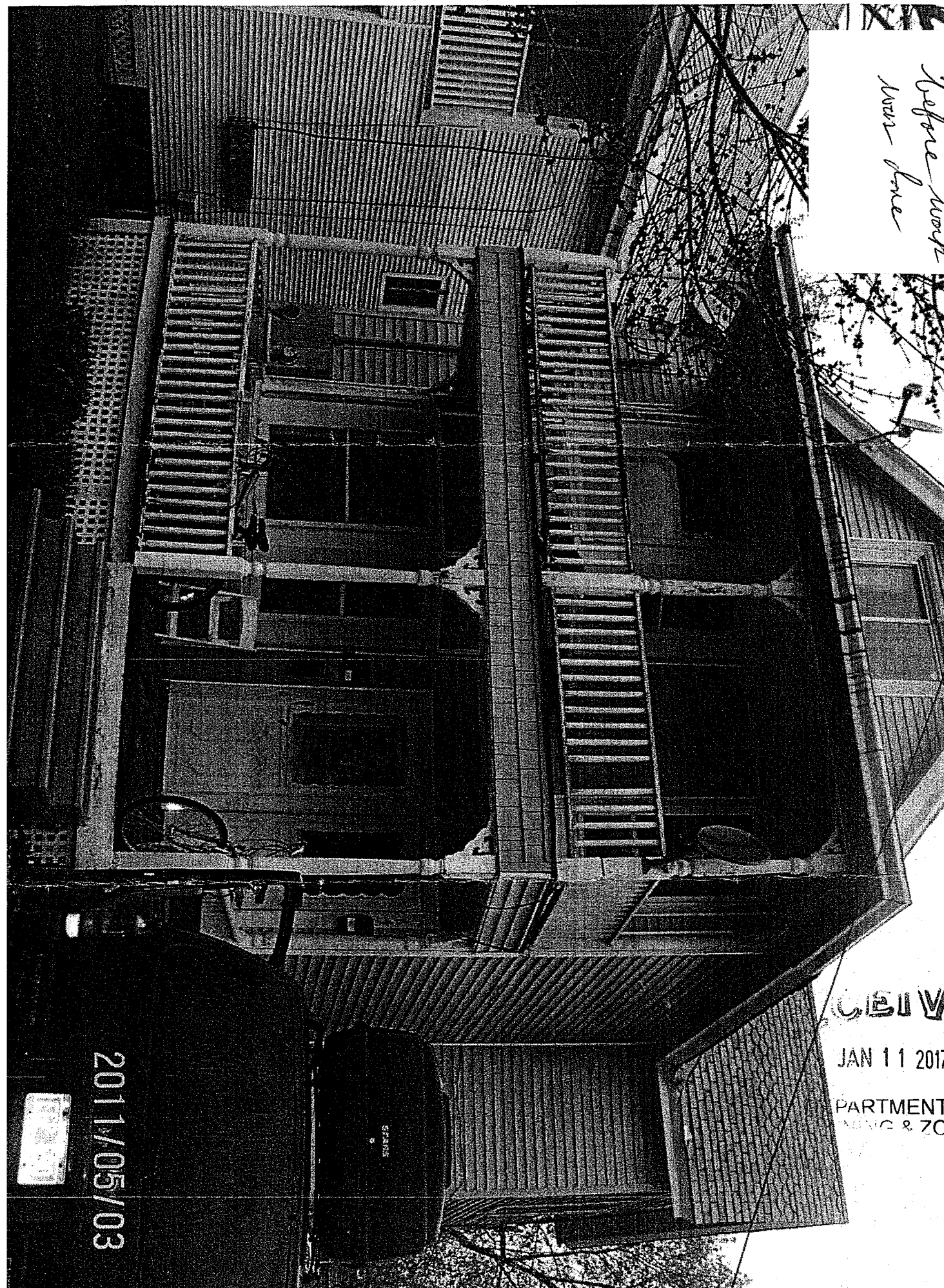
Ernie Palasits

Planning & Zoning
City of Burlington
149 Church Street
Burlington, VT 05401
(802) 865-7000

Date: 01/11/2017
Receipt: 2017-00015986
Cashier: Anita Wade
Received From: Ernie Palasits
62-64 Buell St

CONDITIONAL USE	
APPEALS/VARI	250.00
Receipt Total	250.00
Total Check	250.00
Total Remitted	250.00
Total Received	250.00

Before work
was done



CEIV

JAN 11 2017

PARTMENT
NING & ZO

2011/05/03



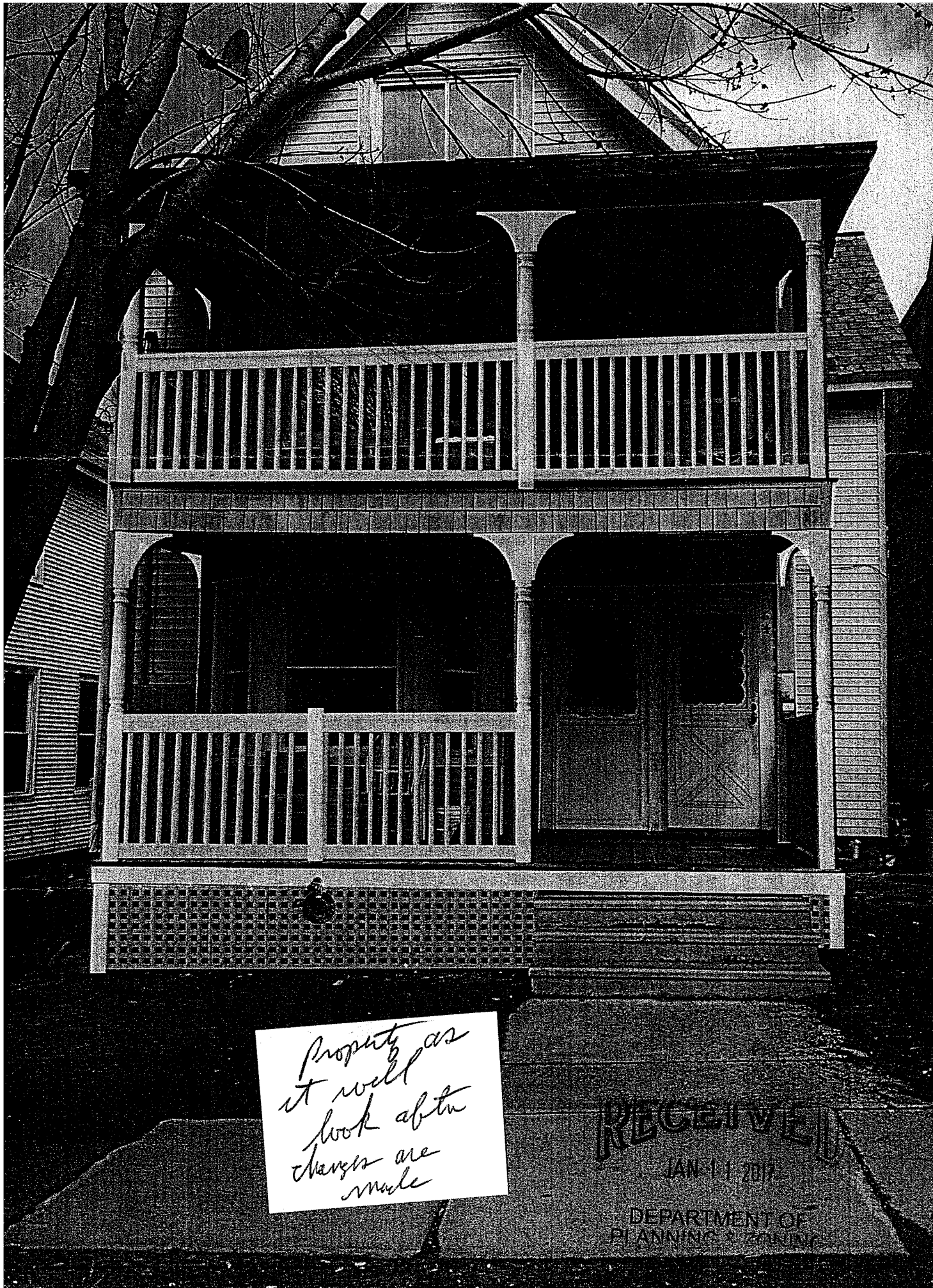
Property
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RECEIVED

JAN 11 2017

DEPARTMENT
OF PLANNING & ZONING

01/05/2017



Property as
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RECEIVED

JAN 11 2017

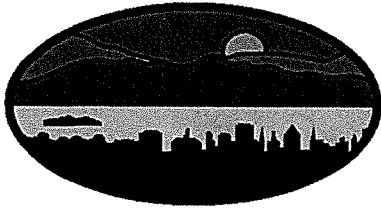
DEPARTMENT OF
PLANNING & ZONING

Decorative
corners that
were on the
porch



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DEPARTMENT OF
HOMELAND SECURITY



ZONING REQUEST DENIAL
CERTIFICATE OF APPROPRIATENESS

City of Burlington, Vermont
Department of Planning and Zoning

Application Date: 11/28/2016

Appeal Expiration Date: 01/11/2017

Project Location: 62-64 BUELL STREET

District: RH

Owner: Ernest Palasits

Ward: 8E

Address: 20 Kimball Ave Suite 203
South Burlington VT 05403

Tax ID: 044-4-208-000

Project Type: Residential - Renovation/Facade

Project Description: Replace railings and decking on porch.

Construction Cost:	\$5,000.00	Lot Size (Sq Ft):	4,500
Net New Habitable Sq Ft:	0.00	Net New # of Housing Units:	0
Existing % Lot Coverage:	0.00	Existing # of Parking Spaces:	0
Proposed % Lot Coverage:	0.00	Proposed # of Parking Spaces:	0
Net New % Lot Coverage:	0.00	Required # of Parking Spaces:	0

Zoning Permit #: 17-0617CA

Decision By: Administrative

Level of Review: 1

Decision: Denied

See Reasons for Denial

Decision Date: December 27, 2016

Project File: NA

Zoning Administrative Officer

Sent to applicant 12/27

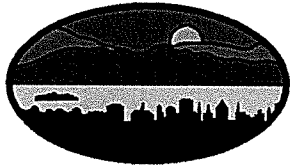
An interested person may appeal a decision of the Zoning Administrator to the Development Review Board until 4 pm on January 11, 2017.

Fee Type	Amount	Paid in Full	Balance Due: \$0.00
Application Fee:	\$80.00	Yes	Date Paid: _____
Development Review Fee:	\$0.00	NA	Check # _____
Impact Fee:	Not Applicable		

Building Permit Required: **Not Applicable**

Received by: _____

Date: _____



City of
Burlington, Vermont
149 Church Street

Zoning Permit - COA Level I – Reasons for Denial

ZP #: 17-0617CA

Tax ID: 044-4-208-000

Issue Date: December 27, 2016

Decision: Denied

Property Address: 62-64 BUELL STREET

Description: Replace railings and decking on porch.

Reasons for Denial:

1. Section 5.4.8 Historic Buildings and Sites

Section 5.4.8 (a) Applicability

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

The subject building, built in 1892, is included in both the National Register of Historic Places (Buell Street/Bradley Street Historic District) and the Vermont State Register of Historic Places.

Section 5.4.8 (b) (2) states *“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.”*

Section 5.4.8 (b) (5) states *“Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.”*

As detailed in the National Register of Historic Places’ property description, the historic, 2-story porch had turned spindle posts and pilasters, stick balustrade, scroll-sawn brackets, and lattice skirt. The porch railings, decking and lattice have all been replaced with pressure-treated wood lacking the details of the original. Approval of replacement railings, decking and lattice with pressure-treated wood will alter the historic character of the building.

2. Article 6, Part 2: Site Plan Design Standards

Section 6.2.2 (d) – Protection of Important Cultural Resources

Burlington’s architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill... Where the proposed development involves sites listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8 (b).

See Sec. 5.4.8 above.

3. Article 6, Part 3: Architectural Design Standards

Section 6.3.2 (b) – Protection of Important Architectural Resources

Burlington’s architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves

buildings listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8. See Sec. 5.4.8 above.



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

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NOV 28 2016

Zoning Permit Application

DEPARTMENT OF
PLANNING & ZONING

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

PROJECT LOCATION ADDRESS: 62-64 BUELL ST

PROPERTY OWNER*:

ERNIE PALASITS

APPLICANT: ERNIE PALASITS

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

POSTAL ADDRESS: _____

POSTAL ADDRESS: SAME

CITY, ST, ZIP: _____



Mr. Ernest C. Palasits
20 Kimball Ave Ste 203
S Burlington VT 05403-6805

CITY, ST, ZIP: _____

DAY PHONE: _____

863-1040

DAY PHONE: _____

EMAIL: EPALASITS@YAHOO.COM

EMAIL: _____

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.

Description of Proposed Project: REPLACE RAILINGS + DECKING ON PORCH

Existing Use of Property: ☐ Single Family ☒ Multi Family: # 3 Units ☐ Other: _____

Proposed Use of Property: ☐ Single Family ☒ Multi Family: # 3 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)*: \$ 5000

(*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: RH Eligible for Design Review? Yes Age of House 1892 Lot Size 4500

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

Check No. 242M Amount Paid \$80.- Zoning Permit # 17-0617CA

JB PROPERTIES/Ernie Palasits

20 Kimball Ave Ste #203

S.Burlington, Vt. 05403

(802) 863-1040

(802) 864-2541 (Fax)

11/14/16

To: Code Enforcement Office
65A Pine St.
PO Box 849
Burlington VT 05402
Att: Jeanne Francis

Re: Railing 62-64 Buell St.

Dear Jeanne,

I was notified of this situation a couple of months ago by Bill Ward. I called the Zoning office, spoke to a woman there, and heard nothing further. When I got the permit a couple of years ago no one said anything about my building being historic and the porch needing to be replaced in such a specific manner. My intention was to fix a substandard porch to make it safe for my tenants. I knew the railings needed to be 42 inches high to be within code. When I was asked what I was doing and I said I was replacing the porch the same as it had been, I was referring to the footprint, and I thought except for not having painted it yet the general look was very similar. In the time I have owned the property (34 years) I have seen properties being upgraded with modern materials, and have seen pressure treated wood being used, and properties where turned spindle posts have been replaced with square cut posts. I have enclosed some photos of properties on Buell St that have clearly not retained the look of years ago, more so than my property. I can replace the corner trim pieces that were there in the past. 3 of the 12 were unusable but I can surely find 9 replacement pieces if that would help the situation. I can also paint the porch white as soon as weather permits in the spring. My main reason for sending this letter is to stress that I fully believed that I was doing exactly as I should have at a substantial expense to provide my tenants with a new safe porch. I hope this can be resolved in an equitable manner.

Sincerely;



Ernie Palasits



11-22-16
Ernest Palasits
Called today - will
go to P/Z on Monday
11/28 to apply for
permit. J.



CODE ENFORCEMENT OFFICE

645A Pine St, PO Box 849
Burlington, VT 05402-0849

VOICE (802) 863-0442

FAX: (802) 652-4221

November 7, 2016

ERNEST PALASITS
20 KIMBALL AVE SUITE 203
SOUTH BURLINGTON VT 05403

RE: 62-64 Buell Street Burlington, Vermont

Dear Owner(s),

According to our records, you are the owner of record of the above-referenced property. This letter is to inform you the Code Enforcement Office has received the following complaint(s) regarding this property:

- **Construction changes to railings on the front porch without Zoning Approval.**

Our office has initiated an investigation regarding the complaint(s), however, as of this date; a final determination not been made. Should you have any information that you believe will be useful to us during our investigation, please submit it to the Code Enforcement Office, **in written form, within the next ten (10) business days**.

This is your opportunity to provide information to refute the allegation(s) prior to our issuance of a formal determination and possibly a Notice of Violation. Information that may be helpful includes, but is not limited to, the following:

- Permits which document that the condition that is alleged to be in violation has been approved by the City.
- Other relevant documents that you would like us to consider.

Please note, while any information from you as the property owner is useful, the investigation will occur with or without the information. This letter is intended to give you notice of the alleged complaint(s) against your property and provide you an opportunity to refute the allegation prior to a formal determination being issued.

Should you have questions, please don't hesitate to call me at 863-0442.

Sincerely,

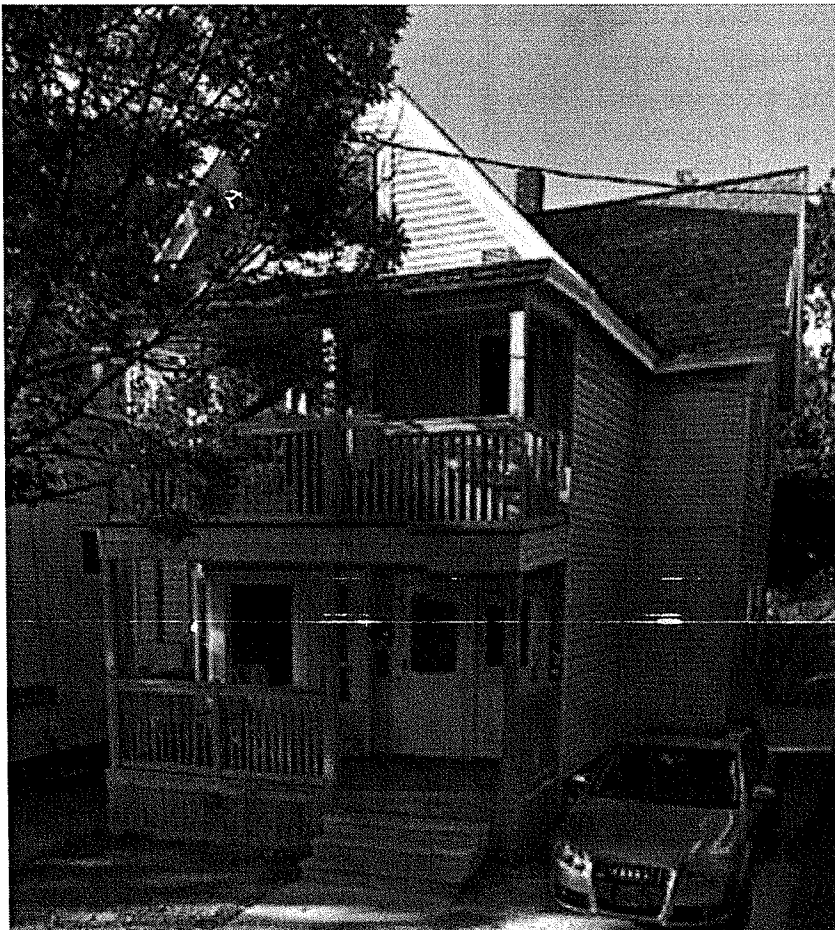
Jeanne Francis, Zoning Specialist



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NOV 28 2001

DEPARTMENT
PLANNING & ZONING



Information available in alternative media forms for people with disabilities.
For disability access information call (802) 865-7121 or (802) 863-0450 TTY.
An Equal Opportunity Employer



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

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JUN 19 2013

DEPARTMENT OF
PLANNING & ZONING

Non-Applicability of Zoning Permit Requirements

This form is a written verification from the Department of Planning and Zoning that based upon the description and statement given by the owner/applicant, a zoning permit is not applicable or required for the proposed project.

**NOTE: THIS IS NOT AN APPROVAL TO START WORK.
CONSTRUCTION PERMITS WILL ALSO BE REQUIRED: CALL 802-863-9094**

PROJECT LOCATION ADDRESS: 62-64 BUELL ST

PROPERTY OWNER*: ERNIE PALASITS

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

OWNER'S REPRESENTATIVE: _____

POSTAL ADDRESS: 20 KIMBALL AVE #203

POSTAL ADDRESS: _____

CITY, ST, ZIP: S. BURLINGTON

CITY, ST, ZIP: _____

DAY PHONE: 863-1040

DAY PHONE: _____

EMAIL: EPALASITS@YAHOO.COM

EMAIL: _____

SIGNATURE: [Signature]

SIGNATURE: _____

I duly authorize the owner's representative to act on my behalf for all matters pertaining to this application.

Description of Proposed Project:

REPLACE REPAIR FRONT PORCH, REAR SUFFIT

Existing Use of Property: ☐ Single Family ☒ Multi Family: 3 Units ☐ Other: _____

Proposed Use of Property: ☐ Single Family ☒ Multi Family: 3 Units ☐ Other: _____

OFFICE USE ONLY Zone: _____ Eligible for Design Review? _____ Year Constructed? _____ Property Size? _____

Based upon the above description, the proposed work does not require a zoning permit for the following reason(s):

☒ Project constitutes repair/maintenance or replacement in-kind.

☐ Project is exempt from Zoning Permit requirements per Section 3.1.2(c)1 of the Zoning Ordinance.

☐ Other: _____

Reviewed and approved by: [Signature]

Date: 6/19/13

☐ Additional Notes: _____

Non Applicability Reference #: 13-1276 NA



13x1276NA

United States Department of the Interior
National Park Service

**National Register of Historic Places
Continuation Sheet**

Buell St./Bradley St. Historic District
Burlington, Chittenden Co., Vermont

Section number 7 Page 34

1/1 windows light each story of the projection. This projection extends to include the right bay of the first story also.

A 2 story, shed roofed, box post porch covers the entire front facade of the house. An aluminum sided apron sits above the lattice skirt of the first floor porch. Two fascia boards separate the boxed posts of the lower story from the upper story's apron. A low wall separates the approach to the two doors located in the right bay. A door on the right side of the projection provides access to the second story of the porch.

A bay window capped by a closed gable and lit by a small 1/1 window occupies the third bay of the left side. Cornerboards define the edges of the bay window. Two entrance porches separated by a small enclosed vestibule sit behind the bay window. The front one has box posts and a balustrade and provides access to the side while an identical porch faces to the rear.

All windows on the building have 1/1 sash except for a pair of modern casement windows that light the main front gable and a square fixed sash window surrounded by colored panes that lights the stairway between the first and second floor.

The building rests on a redstone foundation and has been covered in aluminum siding. A brick chimney sits at the midpoint of the ridge of the roof, and a second chimney appears on the right slope toward the rear of the building.

Harrison A. Brigham, who ran a breeding, feed, and sale stable on Winooski Avenue was the first occupant of this house.

45. Wronn-Leonard Residence (62-64 Buell Street), c.1892

Similar in plan and detail to buildings #44 and #46, this gable-roofed, 2 1/2 story duplex with Queen Anne detailing was originally the residence of Gottlieb Wronn, who was listed in the Burlington Directory as a tailor, and Henry Leonard, a tinsmith. The house is rectilinear in plan, with a gable front orientation, and has a 2 1/2 story, gable roofed projecting bay on the east side. Fronting the main block is a 2-story porch with turned spindle posts and pilasters, stick balustrade, scroll-sawn brackets, and lattice skirt. On the rear of the building is a shed roofed, 2-story (plus basement), addition with sunporches on the first and second floor levels. Little of the historic sheathing remains on the house, except for the imbricated slate roof, as the building has been recently covered with vinyl siding and the original foundation has been covered with concrete.

Fenestration is irregular. On the left gable front is a 2-story, trapezoidal bay window that has undergone alterations in recent years. Original gable windows have been replaced with large casement windows on both front and rear. Other windows have 2/2 sash. The double entrance, gable right, has wood doors with recessed panels and aluminum storm doors. There is an interior brick chimney, no longer in use, on the west slope of the roof.

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetBuell St./Bradley St. Historic District
Burlington, Chittenden Co., VermontSection number 7 Page 35

Although somewhat altered during its conversion into student housing in recent decades, this duplex maintains the rhythm and massing of the streetscape, and through its remaining details contributes to the historic character of the district.

46. Harran-Foster House (66-68 Buell Street), 1911

The 2 1/2 story, Queen Anne duplex rises from a redstone foundation up to a slate-shingled gable roof with shed dormers running the length of both sides. The gable end facing the street has a bay window on its left (west) half with a 2 story porch on its right. The 2 story bay window's central section contains large, fixed pane windows with transoms containing a honeycomb pattern overlayed with a colored glass, foliated design. The porch to the right of this has a latticework skirt and turned posts with cut-out brackets at the top and a balustrade with square balusters connecting them at the bottom. One second floor and 2 first floor entrances are screened by the shed roof porch, above which sits a small, 1 x 1 bay gable roof projection located just beneath the peak of the main gable and glazed with two 1/1 windows on each side.

The clapboard sided walls below the lateral eaves are irregularly fenestrated with 1/1 windows of varying size and divided in half by a horizontal band of imbricated wood shingles that wraps around the house. The rear (north) facade of the house is covered by a 2 story, flat roof addition with an enclosed first floor porch supporting an open second story porch on its northwest corner.

The house's first occupants were Dennis E. Harran, a foreman plumber for William H. Buckley and Company located on Main Street, and B. O. Foster, a manager for the Standard Oil Company on College Street.

47. 70-72 Buell Street, c.1892

A cut redstone foundation supports the 2 1/2 story, Queen Anne, residential, vinyl-sided, gable-roofed structure, which is basically a rectangular mass with two porches and a bay window. A band of imbricated shingles adorns the slate roof and a chimney is located along the center of its peak. On the south facade there is a 1 story, 3 bay porch that penetrates the left corner of the structure as a two-bay deep recessed extension of the porch. Roofed with asphalt shingles, the porch has a twisted metal balustrade on the right side of the house, and a simple wood balustrade on the left side. The wooden doors, which are glazed on the top half with 3 horizontal panels beneath, are located on the right corner and within the recess of the left hand corner.

The windows of the house are very unusual; they have 1/2 sash with each upper sash having small, rectangular panes of glass on its sides and small squares in each of the top

STATE OF VERMONT
Division of Historic Sites
Montpelier, VT 05602

HISTORIC SITES & STRUCTURES SURVEY
Individual Structure Survey Form

COUNTY:	Chittenden
TOWN:	Burlington
LOCATION:	62-64 Buell St.
FUNCTIONAL TYPE:	dwelling
COMMON NAME:	
OWNER:	Franklin R. & John N. Dunskee
ADDRESS:	62 Buell St. Burlington, VT 05401
ACCESSIBILITY TO PUBLIC:	Yes ☐ No ☒ Restricted ☐
LEVEL OF SIGNIFICANCE:	Local ☒ State ☒ National ☐
DATE BUILT:	ca. 1892

GENERAL DESCRIPTION:

Structural System

1. Foundation: Brick ☐ Stone ☐ Concrete ☒ Concrete Block ☐
2. Wall Structure
 - a. Wood Frame: Balloon ☐ Western Platform ☐ Post & Beam
 - b. Load Bearing Masonry: Brick ☐ Stone ☐ Concrete ☐ Concrete Block ☐
 - c. Iron ☐
 - d. Steel ☐
 - e. Other:
3. Wall Covering: Clapboard ☒ Wood Shingle ☐ Board & Batten ☐ Shiplap ☐ Novelty ☐ Stucco ☐ Tile ☐ Brick ☐ Stone ☐ Slate ☐ Sheet Metal ☐ Asphalt Shingle ☐ Aluminum ☐
4. Roof Structure
 - a. Truss: Wood ☐ Iron ☐ Steel ☐ Concrete ☐
 - b. Vault: Brick ☐ Stone ☐ Concrete ☐
 - c. Other: rafter
5. Roof Covering: Wood Shingle ☐ Asphalt Shingle ☐ Tile ☐ Slate ☐ Sheet Metal ☐ Paper ☐ Built Up ☐ Rolled ☐
6. Engineering Structure:
7. Other:

Appendages: Porches ☒ Towers ☐ Dormers ☐ Bay Windows ☐ Ells ☐ Chimneys ☒ Cupolas ☐ Wings ☐ Sheds ☐ Other:

Number of Stories: 2 1/2 Number of Bays: 2 x 3 Entrance Location: 2 entrances in 2nd

Approximate Dimensions:

Roof Style: Gable ☒ Gambrel ☐ Flat ☐ Shed ☐ Hip ☐ Mansard ☐ Jerkinhead ☐ Monitor ☐ Saw Tooth ☐ Other:
With Belcast ☐ With Parapet ☐ With False Front ☐

THREAT TO STRUCTURE:

No Threat ☐ Zoning ☐ Roads ☐ Development ☐ Deterioration ☐ Other:

SURVEY NUMBER: 62-64 Buell St.

NEGATIVE FILE NUMBER: 77-A-61

LATITUDE LONGITUDE

U.S.G.S. QUAD. MAP:

PRESENT FORMAL NAME:

ORIGINAL FORMAL NAME: Wronn 2-family

PRESENT USE: apartments

ORIGINAL USE: 2-family

ARCHITECT/ENGINEER:

BUILDER/CONTRACTOR:

PHYSICAL CONDITION OF STRUCTURE:

Excellent ☐ Good ☒
Fair ☐ Deteriorated ☐

THEME:

STYLE: Queen Anne

LOCAL ATTITUDES:

Positive ☐ Negative ☐ Mixed ☐ Other:

ADDITIONAL ARCHITECTURAL OR STRUCTURAL DESCRIPTION:

Massing - T-plan with a front gable and side gable at right angles. 2 story porch supported on bracketed, turned posts spans the front elevation.

Fenestration - a 2-story bay window lights the front elevation.

Doors - are set in one architrave with a molded head.

Cornice - embellished with incised vergeboards.

Wall Enrichment - some stickwork above the window in the front gable and in the bay windows. Imbricated shingles in the gables. The horizontal strip forming the pediment of the side gable is modillioned and bracketed on the ends.

RELATED STRUCTURES:

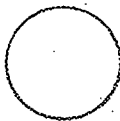
STATEMENT OF SIGNIFICANCE:

One of the few houses on the street with incised vergeboards combined with stickwork and brackets. This was built to be a 2-family home. Some early occupants were Gottlieb Wronn, a tailor and Henry Leonard, a tinsmith.

REFERENCES:

Sanborns, Directories

MAP: (Indicate North in Circle)



SURROUNDING ENVIRONMENT:

Open Land ☐ Woodland ☐
Scattered Buildings ☐
Moderately Built Up ☐
Densely Built Up ☒
Residential ☒ Commercial ☐
Agricultural ☐ Industrial ☐
Other:

RECORDED BY:

Adele Cramer

ORGANIZATION:

VT Division for Historic Preservation

DATE RECORDED:

6/27/77

JB PROPERTIES/Ernie Palasits

20 Kimball Ave Ste #203

S.Burlington, Vt. 05403

(802) 863-1040

(802) 864-2541 (Fax)

11/14/16

To: Code Enforcement Office
65A Pine St.
PO Box 849
Burlington VT 05402
Att: Jeanne Francis

Re: Railing 62-64 Buell St.

Dear Jeanne,

I was notified of this situation a couple of months ago by Bill Ward. I called the Zoning office, spoke to a woman there, and heard nothing further. When I got the permit a couple of years ago no one said anything about my building being historic and the porch needing to be replaced in such a specific manner. My intention was to fix a substandard porch to make it safe for my tenants. I knew the railings needed to be 42 inches high to be within code. When I was asked what I was doing and I said I was replacing the porch the same as it had been, I was referring to the footprint, and I thought except for not having painted it yet the general look was very similar. In the time I have owned the property (34 years) I have seen properties being upgraded with modern materials, and have seen pressure treated wood being used, and properties where turned spindle posts have been replaced with square cut posts. I have enclosed some photos of properties on Buell St that have clearly not retained the look of years ago, more so than my property. I can replace the corner trim pieces that were there in the past. 3 of the 12 were unusable but I can surely find 9 replacement pieces if that would help the situation. I can also paint the porch white as soon as weather permits in the spring. My main reason for sending this letter is to stress that I fully believed that I was doing exactly as I should have at a substantial expense to provide my tenants with a new safe porch. I hope this can be resolved in an equitable manner.

Sincerely;



Ernie Palasits



11-22-16
Ernest Palasits
Called today - will
go to P/Z on Monday
11/28 to apply for
permit. J.



CODE ENFORCEMENT OFFICE

645A Pine St, PO Box 849
Burlington, VT 05402-0849

VOICE (802) 863-0442

FAX: (802) 652-4221

November 7, 2016

ERNEST PALASITS
20 KIMBALL AVE SUITE 203
SOUTH BURLINGTON VT 05403

RE: 62-64 Buell Street Burlington, Vermont

Dear Owner(s),

According to our records, you are the owner of record of the above-referenced property. This letter is to inform you the Code Enforcement Office has received the following complaint(s) regarding this property:

- **Construction changes to railings on the front porch without Zoning Approval.**

Our office has initiated an investigation regarding the complaint(s), however, as of this date; a final determination not been made. Should you have any information that you believe will be useful to us during our investigation, please submit it to the Code Enforcement Office, **in written form, within the next ten (10) business days**.

This is your opportunity to provide information to refute the allegation(s) prior to our issuance of a formal determination and possibly a Notice of Violation. Information that may be helpful includes, but is not limited to, the following:

- Permits which document that the condition that is alleged to be in violation has been approved by the City.
- Other relevant documents that you would like us to consider.

Please note, while any information from you as the property owner is useful, the investigation will occur with or without the information. This letter is intended to give you notice of the alleged complaint(s) against your property and provide you an opportunity to refute the allegation prior to a formal determination being issued.

Should you have questions, please don't hesitate to call me at 863-0442.

Sincerely,

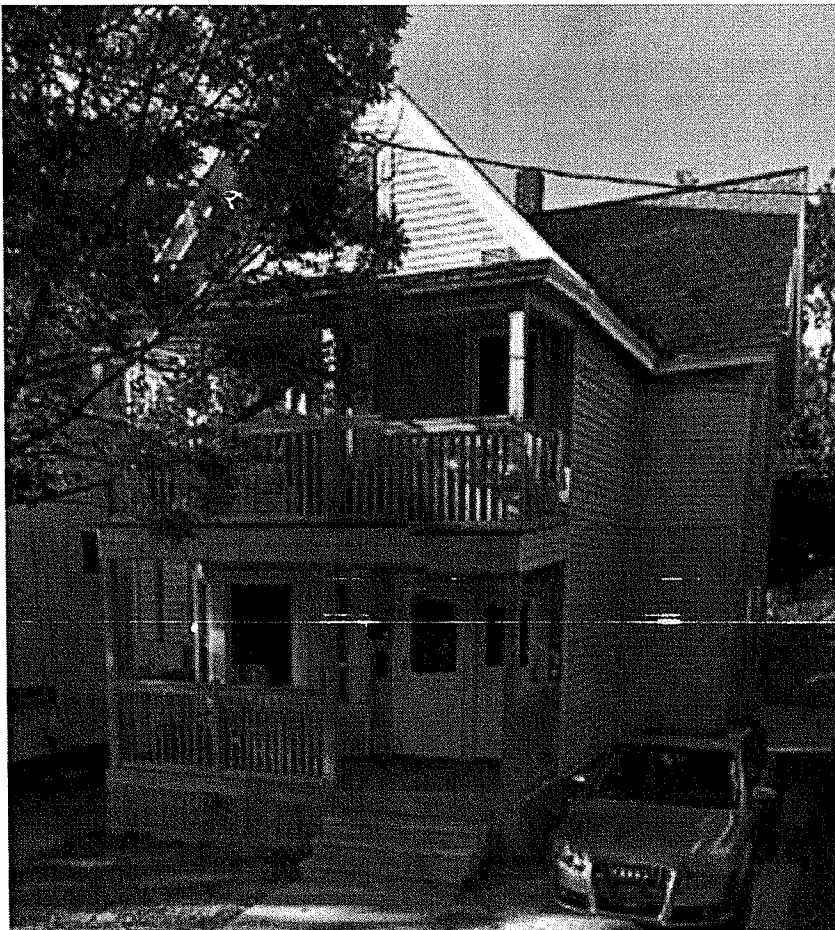
Jeanne Francis, Zoning Specialist



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NOV 28 2011

DEPARTMENT
PLANNING & ZONING



Information available in alternative media forms for people with disabilities.
For disability access information call (802) 865-7121 or (802) 863-0450 TTY.
An Equal Opportunity Employer



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

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JUN 19 2013

DEPARTMENT OF
PLANNING & ZONING

Non-Applicability of Zoning Permit Requirements

This form is a written verification from the Department of Planning and Zoning that based upon the description and statement given by the owner/applicant, a zoning permit is not applicable or required for the proposed project.

**NOTE: THIS IS NOT AN APPROVAL TO START WORK.
CONSTRUCTION PERMITS WILL ALSO BE REQUIRED: CALL 802-863-9094**

PROJECT LOCATION ADDRESS: 62-64 BUELL ST

PROPERTY OWNER*: ERNE PALASITS

OWNER'S REPRESENTATIVE: _____

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

POSTAL ADDRESS: 20 KIMBALL AVE #203

POSTAL ADDRESS: _____

CITY, ST, ZIP: S. BURLINGTON

CITY, ST, ZIP: _____

DAY PHONE: 863-1040

DAY PHONE: _____

EMAIL: EPALASITS@YAHOO.COM

EMAIL: _____

SIGNATURE: [Signature]

SIGNATURE: _____

I duly authorize the owner's representative to act on my behalf for all matters pertaining to this application.

Description of Proposed Project:

REPLACE
REPAIR FRONT PORCH, REAR SUFFIT

Existing Use of Property: ☐ Single Family ☒ Multi Family: 3 Units ☐ Other: _____

Proposed Use of Property: ☐ Single Family ☒ Multi Family: 3 Units ☐ Other: _____

OFFICE USE ONLY Zone: _____ Eligible for Design Review? _____ Year Constructed? _____ Property Size? _____

Based upon the above description, the proposed work does not require a zoning permit for the following reason(s):

☒ Project constitutes repair/maintenance or replacement in-kind.

☐ Project is exempt from Zoning Permit requirements per Section 3.1.2(c)1 of the Zoning Ordinance.

☐ Other: _____

Reviewed and approved by: [Signature]

Date: 6/19/13

☐ Additional Notes: _____

Non Applicability Reference #: 13-1276 NA



13x1276NA

Department of Planning and Zoning

149 Church Street

Burlington, VT 05401

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

Telephone: (802) 865-7188

(802) 865-7195 (FAX)

*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 21, 2017

RE: 17-0253CA; 201 South Prospect Street

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

File: ZP17-0253CA

Location: 201 South Prospect Street

Zone: RL **Ward:** 6S

Date application accepted: January 11, 2017

Applicant/ Owner: Bing Enterprises LTD

Parking District: Neighborhood

Request: Appeal of an administrative denial to replace 2 windows with 2 egress windows.

Overview:

Under Zoning Permit 17-0253CA, the owner of 201 South Prospect Street requested to replace two windows in the building's attic with egress windows to meet life safety codes. The permit request was administratively denied because there had never been a permit to convert the attic into habitable space, and because there is insufficient parking in the shared parking area to meet the requirements for these two units, and the ten units of 205 South Prospect Street.

Note that the zoning permit application specifically states "egress" windows, whereas the appeal document refers to both ventilation and egress requirements. Note also that under the appeal, the appellant requests a 1-space parking waiver for 201 South Prospect Street. This request is outside the scope of this appeal and cannot be entertained. A request for a parking waiver must be submitted under separate zoning application to the Development Review Board.

Recommendation: Uphold zoning permit denial based on the following findings.

I. Findings:

Timeline:

- **August 29, 2016** – Application ZP17-0253CA submitted.
- **September 6, 2016** – Application ZP17-0253CA deemed complete.

- **September 13, 2016** – Additional information requested. Correspondence continued for over three months to address zoning requests.
- **December 28, 2016** – Restarted review after a final site plan was submitted.
- **December 28, 2016** – Decision of Denial for ZP17-0253CA. Below are the reasons for denial issued with ZP17-0253CA.

Reasons for Denial:

1. Section 8.1.7 Non-Conforming Residential Structure

Where additions or conversions to existing residential structures within a Neighborhood or Shared Use Parking District add living space but do not add dwelling units, and such sites do not currently meet the parking standards of Sec. 8.1.8, one (1) parking space shall be provided for each additional room. Single detached dwellings shall be exempt from this requirement.

There are no zoning permits on file to create habitable space in the attic of the 201 South Prospect Street duplex. The requested windows are intended to provide egress from this unpermitted finished space.

Table 8.1.8-1 Minimum Off-Street Parking Requirements

	Neighborhood Districts
RESIDENTIAL USES	Per Dwelling Unit except as noted
Multi-unit attached dwelling units, studio units or 1-bedroom dwelling unit.	2
Single Family detached and Duplex	2

The property is located in the Neighborhood Parking District and shares a parking lot with 205 S. Prospect Street, which contains 10 units. In accordance with the table above, the shared parking area for 201 and 205 S. Prospect Street requires a minimum of 24 spaces. The site plan shows a total of 23 spaces. The shared parking area does not meet the minimum parking requirement. The application cannot be approved.

- **January 11, 2017** – Appeal of administrative decision of ZP17-0253CA submitted. Filed within the 15 day appeal period.

Appellant's Arguments & City Responses:

Appellant's arguments are in *italics*, the city responses are not.

1. *When Bing Enterprises purchased the property at 201 South Prospect Street in 1991, the realtor listing, property inspector and the appraiser all noted that the building includes two units and contains 6 bedrooms, and that there is no attic for the building due to the fact that the third floor is finished into bedrooms. The property inspector specifically noted that “there is no attic for the building due to the fact that the third floor is finished into bedrooms.”*

As noted on the earliest Assessor’s property record from at least 1981, the structure was originally built as an 8 room single family residence in 1968. That record also noted that there was no finished attic. The table below lists each Assessor’s record on file, the dwelling unit count, and whether the attic was finished or not.

Assessor’s Record Date	# of Dwelling Units	Finished Attic	# of Bedrooms
February, 1981	1	No	not noted
June, 1985	1	No	4
April, 1986	2	Yes	4
February, 1994	2	Yes	4
May, 1994	2	Yes	4
May, 2005	2	No	6
July, 2005	2	Yes	6
September, 2005	2	Yes	6

As the table shows, sometime between 1985 and 1986, a second dwelling unit was created, and the attic was seemingly finished. Sometime between 1994 and 2005, two bedrooms were apparently added to bring the total bedroom count to 6. There are no zoning permits on file for these changes.

It is important to note that even if the Assessor’s office notes a certain number of bedrooms, or even dwelling units in this matter, it does not mean that these numbers were approved by Planning and Zoning. The same applies to realtor listings, property inspectors, and appraisers, who all tend to report on what they observe, and not necessarily what zoning permit history there is.

2. *For the last 25 years, Bing Enterprises has continued to use the third floor as bedrooms, and has paid its property taxes based on the property containing 6 bedrooms.*

See response to #1 above. The fact that the property owners have paid taxes based on the property containing 6 bedrooms holds no merit in the fact that the additional finished space (2 bedrooms) in the attic that seemingly appeared sometime between 1994 and 2006 never obtained Zoning Permit approval. More importantly, this assertion is seemingly a request for a 15-year statute of limitations determination of an unenforceable violation relative to the finished attic space. Such request is outside the scope of this appeal and cannot be entertained. It is understood that the Zoning Administrator issued a 15-year determination for the duplex use in

2007. That determination made no reference whatsoever to the finished attic space. If the appellants wish to seek a 15-year determination relative to the attic space, they may do so separately.

3. *The property owners responded to a City request by eliminating one of two parking spaces in the front of the property in order to create additional green space.*

The subject property shares a parking lot with neighboring 205 South Prospect Street, which is also owned by Bing Enterprises LTD. Both properties are located in the Neighborhood Parking District where a minimum of 2 parking spaces per dwelling unit is required. With 205 South Prospect Street containing 10 units and the subject duplex, the total number of required parking spaces is 24. The current site plan identifies 23 parking spaces – one short of compliance. The appellant asserts that in 2003 the City asked Bing Enterprises to eliminate one of two tandem parking spaces in the front of the property to create additional green space. However, the removal of one of these spaces was a result of a zoning violation notice sent to the property owner on March 27, 2003 for the unpermitted parking area expansion (attached). The subsequent appeal was withdrawn after the appellant agreed to remove the front yard parking – except for the 1 remaining space found to be in existence at least since the 1978 orthophotos.

4. *In 2007, the City denied a zoning permit application (ZP06-370CA) to remove a derelict carport on the basis of insufficient parking for 12 apartment units. However, Ken Lerner, then Interim Director of Planning & Zoning, wrote the applicant to recognize and acknowledge that there are two units at the property and ten units at 205 South Prospect Street, despite knowing that these units were served by 23 parking spaces, rather than 24.*

In a letter dated April 6, 2007, Zoning Administrator Ken Lerner responded to a request that the “City recognize the 2 units at 201 South Prospect Street and the 10 units at 205 South Prospect Street, even though they do not have zoning approval for that number of units.” Mr. Lerner responded that “Based upon the representations of the former Code Director and Planning Director and based upon the current evidence in city department files, the City does not intend to pursue zoning enforcement against the unpermitted units at 201 and 205 South Prospect Street. However, be advised that all units must be found to comply with minimum housing requirements, and this correspondence makes no determination or implication whatsoever regarding these important safety standards. Please note that if some evidence or circumstance changed that would make it our ministerial duty to enforce, then we would have to reevaluate this decision.”

As noted above, this determination cites the duplex use at 201 South Prospect Street. It makes no reference at all to finished attic space. There is no zoning permit allowing the attic (or third floor) to be converted to habitable area.

Sec. 8.1.7 – Non-Conforming Residential Structure states “Where additions or conversions to existing residential structures within a Neighborhood or Shared Use Parking District add living space but do not add dwelling units, and such sites do not currently meet the parking standards of Sec. 8.1.8, one (1) parking space shall be provided for each additional room.” The shared parking area between 201 and 205 South Prospect Street does not contain the minimum required

parking. The requested windows are sought only because they are seemingly required for egress and/or ventilation for the unpermitted finished space.

5. *Bing Enterprises seeks to comply with minimum housing requirements by replacing the third floor bedroom windows.*

See above. The applicant is seeking to install windows for finished space (two bedrooms) that never obtained Planning and Zoning approval.

6. *The City's stated reason for denying Zoning Permit #17-0253CA is due to the lack of a 24th parking space in the shared parking area, however, this minor deviation from the parking requirements was created in part by the City.*

The removal of all but 1 front yard parking space was in response to a zoning violation notice issued on March 27, 2003 for "increasing parking area without an approved zoning permit." The property owner agreed to remove front yard parking except for 1 remaining space in order to close the zoning violation.

7. *Replacement of two existing windows with egress windows will not increase the number of units at the property and will not increase the demand for the parking at the property.*

Staff agrees with this statement. However, the request is being driven solely by unpermitted finished space. Approval of windows for egress and/or ventilation for unpermitted finished space is premature and plainly sidesteps the obvious problem of unpermitted finished space.

8. *The City granted Zoning Permit #17-0255CA on September 7, 2016 to replace a window at 205 South Prospect Street.*

Zoning Permit #17-0255CA was approved for a ground-floor window at 205 South Prospect Street. Unlike the finished attic space, there is no reason to believe the ground floor living space may be unpermitted.

9. *The appellant is requesting a parking waiver for one space to ensure parking conformance for all 12 dwelling units at the property and at 205 South Prospect Street.*

As noted above, in accordance with Sec. 8.1.15 – Waivers from Parking Requirements / Parking Management Plans, the applicant may certainly submit a new zoning permit application requesting not only a parking waiver for one space, but also to convert the attic to habitable space. Such a request would require DRB approval. Sec. 8.1.15 contains a list of items necessary for a parking management plan.

Summary:

The subject property has a history of expanded and changing use without zoning approval – the duplex use, front yard parking, and finished attic space. Until or unless the finished attic space receives zoning approval, the requested egress windows should not be approved. The City would be remiss to approve the windows without addressing the driving factor: the unpermitted

finished space. Approval of the windows and the finished attic space is attainable under the zoning code and would move the property towards greater compliance rather than continued violation.

II. Recommended Motion:

Uphold the denial of zoning application 17-0253CA.



Department of Planning and Zoning

149 Church Street, City Hall
Burlington, VT 05401-8415

Phone: (802) 865-7188

Fax: (802) 865-7195

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JAN 11 2017

DEPARTMENT OF
PLANNING & ZONING

Appeal of an Administrative Decision Request

Use this form to appeal any Administrative Decision or Notice of Violation - See Sec. 12.2.2 of the Zoning Ordinance.

SUBJECT LOCATION ADDRESS: 201 South Prospect Street

Subject Property Owner: Bing Enterprises, Ltd.

Appellant: Bing Enterprises, Ltd.

Agent/Representative: Jeremy Farkas, Murphy Sullivan Kronk

Mailing Address: 275 College Street

City, St, Zip: Burlington, VT 05401

Day Phone: 802-861-7000

Email: jfarkas@mskvt.com

Appellant Signature: [Signature]

Date: 1/9/17

In order for your request to be considered complete, **ALL** of the following information provided, as applicable:

- ☐ The Appeal fee of \$250;
- ☐ Description of the decision under appeal;
- ☐ Description of the property subject to the appeal;
- ☐ Reference to the regulatory provisions applicable to the appeal;
- ☐ Relief requested by the appellant;
- ☐ Alleged grounds why such requested relief is believed proper under the

250.00
250.00
250.00

Office Use Only:

Check No. 14014

Amount Paid \$250.

Zoning Permit # 17-0253CA

CITY OF BURLINGTON
DEVELOPMENT REVIEW BOARD

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JAN 11 2017

In Re: Bing Enterprises, Ltd. Zoning Permit # 17-0253CA Denial

DEPARTMENT OF
PLANNING & ZONING

NOTICE OF APPEAL and REQUEST FOR PARKING WAIVER

Now comes Applicant Bing Enterprises, Ltd., a Vermont corporation (“Bing Enterprises”), by and through counsel, Murphy Sullivan Kronk, and pursuant to 24 V.S.A. § 4465 and Burlington Comprehensive Development Ordinance (“CDO”) § 12.2.2, hereby appeals the Zoning Permit #17-0253CA Denial issued by the Zoning Administrative Officer on December 28, 2016, denying Bing Enterprises’ request to replace two third-floor windows with egress windows (attached).

Pursuant to 24 V.S.A. § 4466, Bing Enterprises states as follows:

1. The address of Bing Enterprises is 6 Lime Rock Road, South Burlington, VT 05403. Bing Enterprises can be reached through Jeremy Farkas, Esq. of Murphy Sullivan Kronk, 275 College Street, Burlington, VT 05406, (802) 861-7000.
2. The property with respect to which the appeal is taken is located at 201 South Prospect Street, Burlington, VT 05401 (parcel Tax ID # 050-3-009-000) (the “Property”). The Property contains a two-unit dwelling with six total bedrooms located in the Residential Low Density (RL) District. Bing Enterprises’ adjacent parcel, 205 South Prospect Street, contains ten dwelling units. The Property and 205 South Prospect Street share a parking area.
3. The regulatory provision applicable to this appeal is CDO § 8.1.7.

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JAN 11 2017

4. Bing Enterprises requests that the City of Burlington Development Review Board ("DRB") reverse the denial of the Zoning Permit for the replacement of two windows with two egress windows on the grounds described below. Bing Enterprises also requests that the DRB grant the Property and 205 South Prospect a parking waiver for one (1) parking space.

5. Grounds for Relief.

The Property is located in the RL Zoning District and Neighborhood Parking District. Multi-unit attached dwelling units and duplexes within a Neighborhood Parking District require two parking spaces per dwelling unit. CDO § 8.1.8. The Property (two units) and 205 South Prospect Street (ten units) share a parking area that contains 23 parking spaces as shown on the attached parking plan prepared by Civil Engineering Associates, Inc. dated December 19, 2016.

When Bing Enterprises purchased the Property in 1991, the realtor listing, the property inspector and the appraiser all noted that the building on the Property includes two units and contains six bedrooms. *Exhibits 1, 2 and 3.* The property inspector specifically noted that "there is no attic for the building due to the fact that the third floor is finished into bedrooms." *Exhibit 1.* For the last 25 years, Bing Enterprises has continued to use the third floor as bedrooms. Moreover, the City, through its Assessor's Office, has recognized that the Property contains six bedrooms, and Bing Enterprises has therefore paid its property taxes based on the Property containing six bedrooms. *Exhibit 4* (2005 and 2016 Assessor's Cards). Although the Property has been regularly and periodically inspected by Code Enforcement for compliance with Burlington's Minimum Housing Ordinance, only recently did Code Enforcement indicate that Bing Enterprises needed to replace the existing third floor windows in order to comply with applicable codes (specifically, on August 18, 2016 Code Enforcement required Bing Enterprises to "Increase window size to meet minimum ventilation requirement to code (opened window

area must equal 8 percent of floor area).” Immediately upon receipt of the Code Enforcement inspection report indicating the need to replace the windows, Bing Enterprises engaged Able Glass to fabricate two new windows and applied for a zoning permit to perform the window replacement in order to bring the Property into compliance with applicable codes.

Until May 2003, the shared parking area for the Property and 205 South Prospect contained 24 parking spaces (see Affidavit of Phillip Aaron, *Exhibit 5*). However, in May 2003, the City asked Bing Enterprises to eliminate one of two parking spaces in the front of the Property in order to create additional green space, and Bing Enterprises agreed to relinquish the space because the Property and 205 South Prospect have always had sufficient parking for the needs even without the use of the additional space in the front of the Property. *Exhibit 5*. The City and Bing Enterprises agreed to a 23-space parking plan that eliminated one parking space in the front of the Property and which delineated the remaining parking space in the front of the Property with a parking barrier. *Exhibit 5*. Specifically, by email dated May 9, 2003 to Stuart Bennett, then counsel to Bing Enterprises, Jeanne Francis wrote “If you are doing a site plan to reorganize the current parking area, are not adding additional parking or coverage on the property, our office would review and approve such a plan based on the fact the existing parking has occurred in the same location with the exact dimensions for a consecutive period of 15+ consecutive years.” *Exhibit 6*.

In 2007, when Bing Enterprises sought to remove a derelict carport at the Property, the City initially denied a zoning permit on the basis of insufficient parking for 12 apartment units. However, Ken Lerner, then Interim Director of Planning & Zoning, wrote to Phil and Keith Aaron of Bing Enterprises to recognize and acknowledge that there are two units at the Property and ten units at 205 South Prospect, despite knowing that these units are served by 23 parking spaces rather than 24. *Exhibit 7*. Mr. Lerner’s letter stated, in part that “the City does not inter-

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JAN 11 2017

to pursue zoning enforcement against the unpermitted units at 201 and 205 South Prospect Street. However, be advised that all units must be found to comply with minimum housing requirements, and this correspondence makes no determination or implication whatsoever regarding these important safety standards.” *Exhibit 7.*

By its application to replace the third floor bedroom windows at the Property, Bing Enterprises seeks to comply with minimum housing requirements per Mr. Lerner’s 2007 directive. The City’s stated reason for denying Zoning Permit #17-0253CA to replace two windows at the Property is the lack of a 24th parking space in the shared parking area, however this minor deviation from the parking requirements was created in part by the City. In addition we note that the replacement of two existing windows with egress windows will not increase number of units at the Property and will not increase the demand for the parking at the Property but it will bring the Property into compliance with applicable codes. We also note that the City granted Zoning Permit #17-0255CA on September 7, 2016 to replace a window at 205 South Prospect. *Exhibit 8.*

Bing Enterprises has submitted an updated parking plan, prepared by Civil Engineering Associates, Inc., depicting 23 non-tandem parking spaces that satisfy the CDO dimensional requirements. *Exhibit 9.* Concurrent with its appeal of the denial of the zoning permit application to replace the two windows, Bing Enterprises hereby requests a parking waiver of one parking space to ensure parking conformance for all 12 dwelling units at the Property and 205 South Prospect.

For the reasons stated above, Bing Enterprises asks the DRB to reverse the zoning permit denial and direct the Zoning Administrator to issue a zoning permit for the window replacements.

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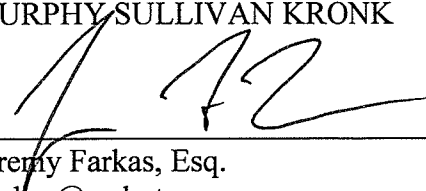
DEPARTMENT OF
PLANNING & ZONING

6. Bing Enterprises reserves the right to present additional evidence and argument at the hearing convened by the DRB pursuant to 24 V.S.A. § 4468.

Dated at Burlington, Vermont this 9th day of January 2017.

MURPHY SULLIVAN KRONK

By:



Jeremy Farkas, Esq.
jfarkas@mskvt.com
275 College Street
Burlington, VT 05401
(802) 861-7000

Attorneys for Appellant

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JAN 11 2017

DEPARTMENT OF
PLANNING & ZONING



NORTHWESTERN VERMONT BOARD OF REALTORS — MULTI-FAMILY

# of Apts. 2	Address 201 So. Prospect Burl.		Price \$ 250,000.00	MLS# 9102092
Direction: West side of So. Prospect. At FF in both apts.				
Remarks 201 & 205 can be purchased together for \$675,000.00*Area: 1 Sign Yes				
Lot Size F 84x156±	Deed y.p. ---		Home Site Inveg. SA --- PK Yes	
	Apt. 1	Apt. 2	Apt. 3	Apt. 4
Floor/Approx. Sq. Ft.				
Total Rms./Bdrms.	4+1/2	6/4		
Est./Actual Rent	\$300	1500		
Type Heat & Util. Inci.	Oil/No	Elec/No		
Appliances	Stove/Ref	Stove/Ref		
Lease Expiration	5/91	5/91		
Damage Deposit	900	1500		
Tenants	Tong	Peck		
Phone	--	--		
How Show	CLA	CLA	*Brick	
Found Wells CB/		Roof AS	Siding CLPB/*	St. Win. Yes
OWNER James & Andrea Crook				
LoFoley Real Estate Inc.			Ph. ---	Type Mortgage --- Bank ---
L/ARobert Foley			Ph. 967-2711	Owner Assist w/Financing? No
S-A-O 2.5%EA	Code 151	Exp. Date: 6/8/91		
Information herein is believed to be accurate, but is not warranted.				

LISTED DATE 4/8/91

EXPIRATION DATE 6/8/91

BROKER NO. 151

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ESSEX REAL ESTATE INSPECTION
SERVICE, INC.
67 JERICHO ROAD
ESSEX JUNCTION, VT. 05452

DEPARTMENT OF
PLANNING & ZONING

#91277A&B
July 30, 1991

Phillip Arron
115 Elieen Way
Syosset, NY. 11791

RE: Summary of Inspection
Location: 201-205 South Prospect Street, Burlington

Unit # 201 So. Prospect St.

After completing my inspection of the building it is my opinion that it is in relatively sound condition structurally and mechanically, however, there are definite needs for some repair and changes which I will explain.

On the exterior of the building I did not find and signs or needs for major structural repairs, but there is a need for repairs such as the repair and/or replacement of the hand rails on the entrance ways.

There is a need for the replacement of the basement windows due to the rot of the frames.

There is also a need for the repair of the trim around the entrance door to the second floor.

There is a tree on the left side of the building which will need to be trimmed up and away from the building.

The roof of the building is an asphalt shingle type and after inspecting the condition it is my opinion that it is approximately 15-16 years old and has approximately 2 possibly 3 years of life expectancy. There are also several shingle which will need replacement.

In the basement the structure (foundation walls, columns and girder and floor joists) is sound, however, there is a crack in the foundation which is not uncommon to this type of foundation which is block and does not appear to be causing any structural damage.

There is water seepage into the basement which is apparently from seepage through the windows and also from lack of proper water diversion on the exterior.

There is insulation in the ceiling of the basement which is improperly installed and should be reversed.

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The electric service for the building is two 100 Amps service panel and the wiring does appear to be in good condition. I did find a definite need for upgrading or change in the service due to the usage of electric heating in the units. It is my recommendation that the service be increased to 150 Amps to accept the electric heat or that there be a change in the type of heating in the building. There is also a need for the normal change or upgrading in the building which is common due to the changes in codes or regulations and this is not unexpected.

I did find some signs of carpenter ant infestation in the basement and would recommend having an extermination in the immediate future.

The plumbing in the building is copper water and waste lines and there were no leaks in the lines or fixtures at this time, however, there is some deterioration of the flooring around the tub and toilet areas on the first floor. There may be a need for the repair or replacement of some flooring. There is also some stains under the same area for the second floor.

The heating for the building is an oil fired forced air furnace for the first floor with a back up of electric baseboard units and electric baseboard units on the second floor. The furnace was operational during the inspection, however, there is excessive rust on the interior of the chamber and also odors, fumes and soot during the operation. I do recommend that the furnace be serviced and inspected further to insure that there is not a need for major repairs or replacement of the furnace.

There is no attic for the building due to the fact that the third floor is finished into bedrooms but there does not appear to be any signs of leaks or mold or moisture in the ceiling areas. I would recommend some additional ventilation in the small area as I explained to Keith.

#205 So. Prospect Street

Based on the conditions found it is my opinion that the building is relatively sound structurally and mechanically however, I definitely feel that there is a need for further investigation in specific areas such as the electric service due to the extensive amount of wiring which has been changed and added to in many areas.

There are also two natural gas fired space heaters, one in unit 9 and unit 5 which do show some discrepancies in the installation in unit 9 and I did not get to see the one in unit 5.

In unit 9 in the bedroom area I did find a wood sleeper floor with a small crawl space opening in it. After opening it and investigating it I did find some deteriorations, moisture mold and mildew. There also appears to be several layers of plywood to strengthen the floor.

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I do recommend that there is a definite need to open this floor up and determine the amount of deterioration and extend of repairs needed in the immediate future.

Also in unit 9 there is deterioration of the floor in the shower unit around the tub area.

I did find some settlement cracks or movement in the foundation areas but this does not appear to be causing any structural damage to the building at this time.

On the exterior I found that the entrance stairs and platform to units 7 & 8 which is a combination of wood and steel does have excessive deterioration in many areas. They do not appear to be completely unsound at this time, but it is unsafe and will need to be rebuilt or replaced in the immediate future.

There is also some deterioration of the roof structure over the rear porch of unit 1 due to the ice and snow falling off on to it. I did walk on this area and found it to be very soft and settling which would indicate to me that there is a need for the repairs in this area.

The roof over unit 8 is a tin type and has had a coating on it but is in need of additional coating due to the rusting I found.

There is also some signs of leaking on the roof of unit 6 which is at this time used by the tenant for a sun bathing platform. There is no safety rails on this areas and should not be used except for fire.

The slate roof on the building does not show any signs or needs for repair, but the normal visual inspection and possible replacement of slate as needed each year which is common on this type of roof.

The front entrance porch on the building does appear to have had some continued restructuring or supporting over the years, but it does not appear that these repairs were proper or permanent and will need some immediate restructuring and repair to maintain it.

The plumbing for the building has been upgraded in most areas and does not show any signs of continued leaking in the areas where there were stains. All the plumbing fixtures are also in good to average operational condition.

The heating for the building is a natural gas fired radiator circulating water for most of the units except for the ones with the space units. There did appear to be some leaking in a few areas of fittings on the radiators which is normal maintenance or repair.

There is also some asbestos wrapping on the pipes in the basement area and it does not appear to be deteriorating or in need of removal or encapsulation at this time. It is my opinion or recommendation the this not be disturbed until deterioration is noted and only then encapsulation would be recommended.

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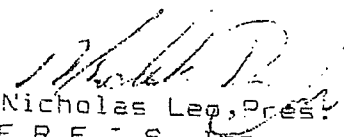
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The cracks in the plaster through out the building appear to be from years of movement in the building and not being repaired or patched. Even if they are repaired there is still a continued movement in the building which will bring most of them back.

The windows throughout the building do appear to be in basic operational condition needing definite painting and glazing of most of the sash.

This entire inspection has been recorded on a cassette tape, of which a copy has been made, and sent along with this report. On the tape I have given a description and explanation of each area of my inspection as well as any suggestions or recommendations on the care and/or repair of the home in the future.

If you have any further questions, please contact me.


Nicholas Lep, Pres.
E.R.E.I.S., Inc.
(802) 897-7751

(NOTE) EREIS does not warranty or guarantee that the premises are as stated in this report or on the cassette tape, but merely expresses an opinion, based on a visual inspection. Under no circumstances will EREIS be responsible for any repair of the premises at any time.

SMALL RESIDENTIAL INCOME PROPERTY APPRAISAL REPORT

PROPERTY "A"

The undersigned has recited three recent sales of properties most similar and proximate to the subject property and has described and analyzed these in this analysis. If there is a significant variation between the subject and comparable properties, the analysis includes a dollar adjustment reflecting the market reaction to those items or an explanation supported by the market data. If a significant difference between the subject and comparable properties is superior to, or more favorable than, the subject property, a minus (-) adjustment is made, thus reducing the indicated value of subject. If a significant difference between the subject and comparable properties is inferior to, or less favorable than, the subject property, a plus (+) adjustment is made, thus increasing the indicated value of the subject. (1) Sales Price ÷ Gross Monthly Rent

ITEM	SUBJECT	COMPARABLE SALE NO. 1			COMPARABLE SALE NO. 2			COMPARABLE SALE NO. 3		
201 So. Prospect Address Burlington		122-23 Mansfield Ave. Burlington 2 blocks			114-16 No. Prospect Burlington 3 blocks			376 Winslow Ave. Burlington 5 blocks		
Proximity to subject										
Sales price	\$ ---	☒ Unl. ☐ Furn. \$203,000			☒ Unl. ☐ Furn. \$228,000			☒ Unl. ☐ Furn. \$163,000		
Sales price per GBA	\$ ---	\$ 60.71			\$ 80.00			\$ 83.16		
Gross monthly rent	\$ 2,412	\$ 1,843			\$ 2,130			\$ 1,325		
Gross mo. rent mult. (1)	---	110			107			123		
Sales price per unit	\$ ---	\$ 101,500			\$ 76,000			\$ 81,500		
Sales price per room	\$ --	\$ 16,916			\$ 20,727			\$ 20,375		
Data source	Inspection	Insp/MLS/City records			Insp/MLS/City records			Insp/MLS/City records		
ADJUSTMENTS	DESCRIPTION	DESCRIPTION + (-) \$ Adjustment			DESCRIPTION + (-) \$ Adjustment			DESCRIPTION + (-) \$ Adjustment		
Sales or financing concessions		None Noted			None Noted			None Noted		
Date of sale/time	9/16/91	3/23/90			3/28/90			3/20/91		
Location	Good	Inferior +20,000			Inferior +10,000			Inferior +15,000		
Site/view	.30A/None	.14A/None			.15A/None			.26A/None		
Design and appeal	Duplex	Duplex			Duplex/Super. -5,000			Duplex		
Quality of construction	Average	Average			Average			Average		
Year built	1940+	1930+			1930+			1910		
Condition	Average	Inferior +10,000			Average			Inferior +10,000		
Gross building area	3400 Sq. ft.	3344 Sq. ft.			2850 Sq. ft. +12,000			1960 Sq. ft. +35,000		
Unit breakdown	No. of units	No. of units			No. of units			No. of units		
	Rm. count	Rm. count			Rm. count			Rm. count		
	Tot. Br. Ba. No. Vac.	Tot. Br. Ba. No. Vac.			Tot. Br. Ba. No. Vac.			Tot. Br. Ba. No. Vac.		
	1 4 2 2 0	1 5 3 1 0			1 4 2 1 0			1 4 1 1 0		
		-2,000								
					-2,000			+6,000		
Basement description	Full/0 fin.	Full/0 fin.			Full/0 fin.			Full/0 fin.		
Functional utility	Average	Average			Average			Average		
Heating/cooling	OHA/Flue	GHW			O/G HA			GHA		
Parking on/off site	18 shared	6 lot			4 lot			2 gar/2 lot		
Project amenities and fee (if applicable)	Near Univer. & Hosp.	Near Univer. & Hosp.			Near Univ. & Hosp.			Near Center City		
Other										
Net Adj. (total)		☒ + ☐ - \$28,000			☒ + ☐ - \$15,000			☒ + ☐ - \$66,000		
Adj. sales price of comparables		\$ 231,000			\$ 243,000			\$ 229,000		

Comments on sales comparison (including reconciliation of all indicators of value as to consistency and relative strength and evaluation of the typical investors'/purchasers' motives):
Living area adjusted at \$25/sq. ft. living area. Comp 2 dominant supported by
1, Comp 3 supportive but inferior due to excessive adjustments. GRM of 110
indicates \$265,000 market value

INDICATED VALUE BY SALES COMPARISON APPROACH \$240,000

Analysis of any current agreement of sale, option, or listing of the subject property and analysis of any prior sales of subject and comparables within one year of the date of appraisal

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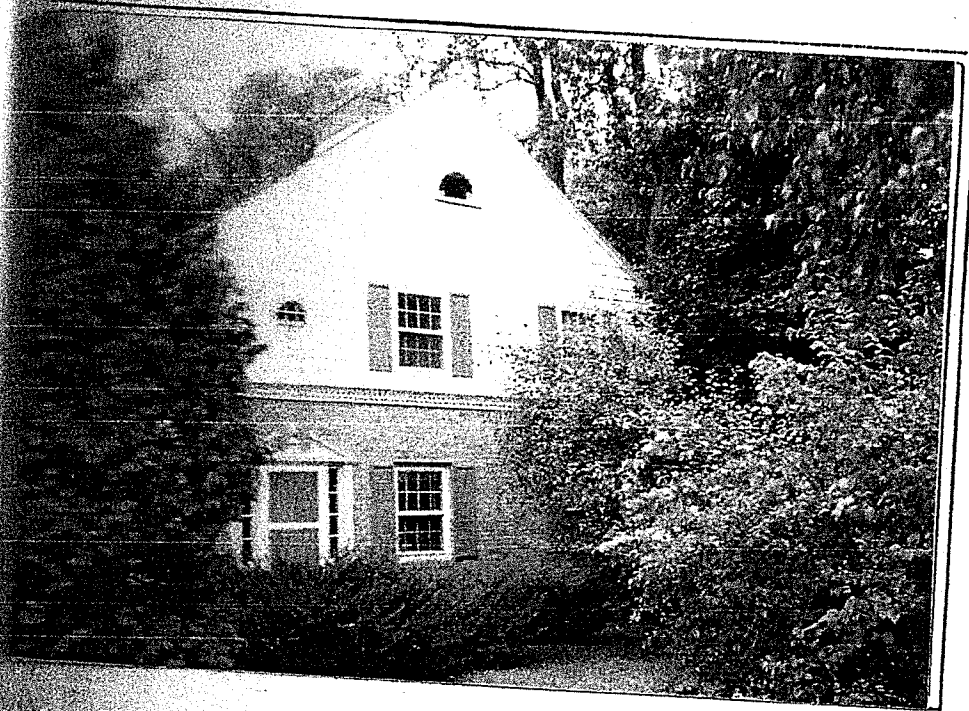
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PHOTOGRAPH ADDENDUM

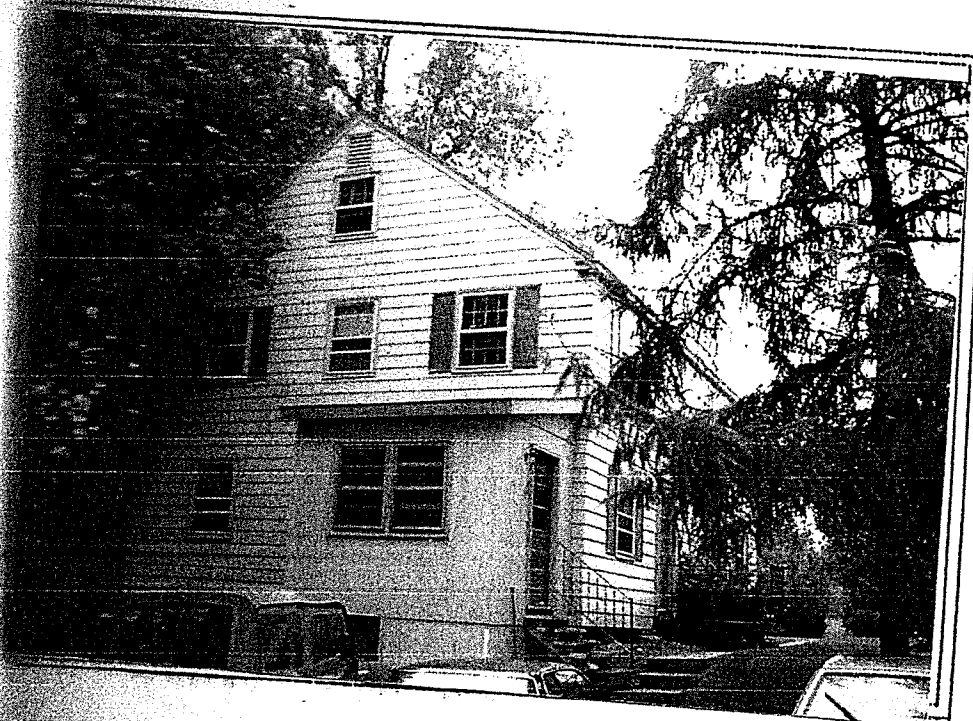
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Front View
201 So. Prospect St.
Burlington, VT



Rear View
201 So. Prospect St.
Burlington, VT



The City of Burlington, Vermont

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Property Summary				
Parcel ID	050-3-009-000	Location	201 SOUTH PROSPECT ST	Owner(s)
SPAN Number	114-035-18064	Land Use	2 Family	

2005/2006 Assessed Values				
Total Value	\$392,600	Building Value	\$202,700	Land Value \$189,900
2004/2005 Assessed Values				
Total Value	\$193,600	Building Value	\$112,200	Land Value \$81,400

Sales Information	
Sales Information Not Available	

Building Information				
Property Image	Image Not Available	Grade	AVERAGE	Heat Type HOT WA
		Acres	0.211433	Gross Area 4,864
		Building Type	COLONIAL	Year Built 1978

Sketched Areas	
Area	Description
EFB	ENCL PORCH
FFL	1ST FLOOR
BMT	BASEMENT
SFL	2ND FLOOR
STG	STORAGE
ATC	ATTIC W FIN

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12/9



Don't
Property

PROPERTY LOCATION

201	SOUTH PROSPECT ST, BURLINGTO
OWNERSHIP	
Owner 1	BING ENTERPRISES LTD
Owner 2	
Owner 3	
Street 1	6 LIME ROCK ROAD
Street 2	
City/County	SOUTH BURLINGTON
State/Zip	CT/05403
Postal	05403
	County/State
	Type

IN PROCESS APPRAISAL SUMMARY

Order Code	Building	Valuation	Acres	Land Size	Land Value	Total Value	Legal Description	User/Agent
R2		202,700		9210.000	189,900	392,600		
								GIS Ref
								316897720552
								GIS Ref
		202,700		0.211	189,900	392,600		
		202,700		0.211	189,900	392,600		
							9210	Insp Date
	OverRide				128.40	128.40	SF	

PREVIOUS ASSESSMENT

Year	Issue	Case	Birth date	Age	Height	Weight	Land Size	Land Value	Obj Value	Assess Value	Notes	Date
2005	R2	ABST	232,800	0	9,210	189,900	422,700		422,700	422,700	INFORMAL NOTICES	8/5/05
2005	R2	FV	202,700	0	9,210	189,900	392,600		392,600	392,600	GRAND LIST TO PV&R	8/17/05
2005	R2	PENT	202,700	0	9,210	189,900	392,600		392,600	392,600	BOA COMPLETE 6.30.05	6/30/05
2005	R2	PREL	202,700	0	9,210	189,900	392,600		392,600	392,600	pre BOA hearing COMM	n6/7/05
2004	R2	ABST	112,200	0	9,210	81,400	193,600		193,600	193,600	Year End Roll	5/6/04
2004	R2	FV	112,200	0	9,210	81,400	193,600		193,600	193,600	Year End Roll	8/23/04
2004	R2	PREL	112,200	0	9,210	81,400	193,600		193,600	193,600	Year End Roll	7/16/04
2003	R2	CKFY	112,200	0	9,210	81,400	193,600		193,600	193,600	Year End Roll	7/11/03

INVESTIGATIVE DESCRIPTION	INVESTIGATIVE DESCRIPTION
1. [REDACTED]	2. [REDACTED]
3. [REDACTED]	4. [REDACTED]
5. [REDACTED]	6. [REDACTED]
7. [REDACTED]	8. [REDACTED]
9. [REDACTED]	10. [REDACTED]
11. [REDACTED]	12. [REDACTED]
13. [REDACTED]	14. [REDACTED]
15. [REDACTED]	16. [REDACTED]
17. [REDACTED]	18. [REDACTED]
19. [REDACTED]	20. [REDACTED]
21. [REDACTED]	22. [REDACTED]
23. [REDACTED]	24. [REDACTED]
25. [REDACTED]	26. [REDACTED]
27. [REDACTED]	28. [REDACTED]
29. [REDACTED]	30. [REDACTED]
31. [REDACTED]	32. [REDACTED]
33. [REDACTED]	34. [REDACTED]
35. [REDACTED]	36. [REDACTED]
37. [REDACTED]	38. [REDACTED]
39. [REDACTED]	40. [REDACTED]
41. [REDACTED]	42. [REDACTED]
43. [REDACTED]	44. [REDACTED]
45. [REDACTED]	46. [REDACTED]
47. [REDACTED]	48. [REDACTED]
49. [REDACTED]	50. [REDACTED]
51. [REDACTED]	52. [REDACTED]
53. [REDACTED]	54. [REDACTED]
55. [REDACTED]	56. [REDACTED]
57. [REDACTED]	58. [REDACTED]
59. [REDACTED]	60. [REDACTED]
61. [REDACTED]	62. [REDACTED]
63. [REDACTED]	64. [REDACTED]
65. [REDACTED]	66. [REDACTED]
67. [REDACTED]	68. [REDACTED]
69. [REDACTED]	70. [REDACTED]
71. [REDACTED]	72. [REDACTED]
73. [REDACTED]	74. [REDACTED]
75. [REDACTED]	76. [REDACTED]
77. [REDACTED]	78. [REDACTED]
79. [REDACTED]	80. [REDACTED]
81. [REDACTED]	82. [REDACTED]
83. [REDACTED]	84. [REDACTED]
85. [REDACTED]	86. [REDACTED]
87. [REDACTED]	88. [REDACTED]
89. [REDACTED]	90. [REDACTED]
91. [REDACTED]	92. [REDACTED]
93. [REDACTED]	94. [REDACTED]
95. [REDACTED]	96. [REDACTED]
97. [REDACTED]	98. [REDACTED]
99. [REDACTED]	100. [REDACTED]

This Parcel contains 9210. SF of land mainly classified as 2 family and one COLONIAL Building Built about 1978, Having a METAL ROOF, METAL EXTERIOR and METAL ROOF COVER, with 2 Bedrooms, 1 Bath, 0 Hall Baths, 0 3/4 Baths, 12 Rooms Total, and 6 Units. 4 Baths, 0 Hall Baths, 0 3/4 Baths, 12 Rooms Total, and 6 Units.

OTHER ASSESSMENTS

DATE	DESCRIPTION	AMOUNT	BALANCE
11/1/2017	DEPOSIT	100.00	100.00
11/1/2017	DEPOSIT	100.00	200.00
11/1/2017	DEPOSIT	100.00	300.00
11/1/2017	DEPOSIT	100.00	400.00
11/1/2017	DEPOSIT	100.00	500.00
11/1/2017	DEPOSIT	100.00	600.00
11/1/2017	DEPOSIT	100.00	700.00
11/1/2017	DEPOSIT	100.00	800.00
11/1/2017	DEPOSIT	100.00	900.00
11/1/2017	DEPOSIT	100.00	1000.00
11/1/2017	DEPOSIT	100.00	1100.00
11/1/2017	DEPOSIT	100.00	1200.00
11/1/2017	DEPOSIT	100.00	1300.00
11/1/2017	DEPOSIT	100.00	1400.00
11/1/2017	DEPOSIT	100.00	1500.00
11/1/2017	DEPOSIT	100.00	1600.00
11/1/2017	DEPOSIT	100.00	1700.00
11/1/2017	DEPOSIT	100.00	1800.00
11/1/2017	DEPOSIT	100.00	1900.00
11/1/2017	DEPOSIT	100.00	2000.00
11/1/2017	DEPOSIT	100.00	2100.00
11/1/2017	DEPOSIT	100.00	2200.00
11/1/2017	DEPOSIT	100.00	2300.00
11/1/2017	DEPOSIT	100.00	2400.00
11/1/2017	DEPOSIT	100.00	2500.00
11/1/2017	DEPOSIT	100.00	2600.00
11/1/2017	DEPOSIT	100.00	2700.00
11/1/2017	DEPOSIT	100.00	2800.00
11/1/2017	DEPOSIT	100.00	2900.00
11/1/2017	DEPOSIT	100.00	3000.00
11/1/2017	DEPOSIT	100.00	3100.00
11/1/2017	DEPOSIT	100.00	3200.00
11/1/2017	DEPOSIT	100.00	3300.00
11/1/2017	DEPOSIT	100.00	3400.00
11/1/2017	DEPOSIT	100.00	3500.00
11/1/2017	DEPOSIT	100.00	3600.00
11/1/2017	DEPOSIT	100.00	3700.00
11/1/2017	DEPOSIT	100.00	3800.00
11/1/2017	DEPOSIT	100.00	3900.00
11/1/2017	DEPOSIT	100.00	4000.00
11/1/2017	DEPOSIT	100.00	4100.00
11/1/2017	DEPOSIT	100.00	4200.00
11/1/2017	DEPOSIT	100.00	4300.00
11/1/2017	DEPOSIT	100.00	4400.00
11/1/2017	DEPOSIT	100.00	4500.00
11/1/2017	DEPOSIT	100.00	4600.00
11/1/2017	DEPOSIT	100.00	4700.00
11/1/2017	DEPOSIT	100.00	4800.00
11/1/2017	DEPOSIT	100.00	4900.00
11/1/2017	DEPOSIT	100.00	5000.00
11/1/2017	DEPOSIT	100.00	5100.00
11/1/2017	DEPOSIT	100.00	5200.00
11/1/2017	DEPOSIT	100.00	5300.00
11/1/2017	DEPOSIT	100.00	5400.00
11/1/2017	DEPOSIT	100.00	5500.00
11/1/2017	DEPOSIT	100.00	5600.00
11/1/2017	DEPOSIT	100.00	5700.00
11/1/2017	DEPOSIT	100.00	5800.00
11/1/2017	DEPOSIT	100.00	5900.00
11/1/2017	DEPOSIT	100.00	6000.00
11/1/2017	DEPOSIT	100.00	6100.00
11/1/2017	DEPOSIT	100.00	6200.00
11/1/2017	DEPOSIT	100.00	6300.00
11/1/2017	DEPOSIT	100.00	6400.00
11/1/2017	DEPOSIT	100.00	6500.00
11/1/2017	DEPOSIT	100.00	6600.00
11/1/2017	DEPOSIT	100.00	6700.00
11/1/2017	DEPOSIT	100.00	6800.00
11/1/2017	DEPOSIT	100.00	6900.00
11/1/2017	DEPOSIT	100.00	7000.00
11/1/2017	DEPOSIT	100.00	7100.00
11/1/2017	DEPOSIT	100.00	7200.00
11/1/2017	DEPOSIT	100.00	7300.00
11/1/2017	DEPOSIT	100.00	7400.00
11/1/2017	DEPOSIT	100.00	7500.00
11/1/2017	DEPOSIT	100.00	7600.00
11/1/2017	DEPOSIT	100.00	7700.00
11/1/2017	DEPOSIT	100.00	7800.00
11/1/2017	DEPOSIT	100.00	7900.00
11/1/2017	DEPOSIT	100.00	8000.00
11/1/2017	DEPOSIT	100.00	8100.00
11/1/2017	DEPOSIT	100.00	8200.00
11/1/2017	DEPOSIT	100.00	8300.00
11/1/2017	DEPOSIT	100.00	8400.00
11/1/2017	DEPOSIT	100.00	8500.00
11/1/2017	DEPOSIT	100.00	8600.00
11/1/2017	DEPOSIT	100.00	8700.00
11/1/2017	DEPOSIT	100.00	8800.00
11/1/2017	DEPOSIT	100.00	8900.00
11/1/2017	DEPOSIT	100.00	9000.00
11/1/2017	DEPOSIT	100.00	9100.00
11/1/2017	DEPOSIT	100.00	9200.00
11/1/2017	DEPOSIT	100.00	9300.00
11/1/2017	DEPOSIT	100.00	9400.00
11/1/2017	DEPOSIT	100.00	9500.00
11/1/2017	DEPOSIT	100.00	9600.00
11/1/2017	DEPOSIT	100.00	9700.00
11/1/2017	DEPOSIT	100.00	9800.00
11/1/2017	DEPOSIT	100.00	9900.00
11/1/2017	DEPOSIT	100.00	10000.00

PROPERTY FACTORS

[illegible]

BUILDING PERMITS

[illegible]

ACTIVITY INFORMATION

Date	Result	By	Name
6/22/05	INFO HEARING	JV	J VICKERY
6/2/05	INFOMAL REV	TH	T HUSEBY
1/13/05	DATA ENTRY	KN	K KNOSE
1/13/04	ENTRY & SIG	BKS	B SCHIRMER
1/11/04	NOT HOME-EX	BKS	B SCHIRMER

SALES INFORMATION

Company	Credit Ref.	Type	Date	Sale Code	Sale Price	Est. Year	Asset Pct. Value	From MS ACCESS Database Sales Data	Notes
WING ENTERPRISE	443-75	WWD	1/2/92		628000	No			

PAT ACCT.

[illegible]

Sign Verification of Yield Data

Use	Loc	UUC	No of Units	Depth	Unit Type	Land Type	UUC Factor	Base Factor	Unit Price	Ad. Value	Neigh. Value	Neigh. Units	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20	Unit 21	Unit 22	Unit 23	Unit 24	Unit 25	Unit 26	Unit 27	Unit 28	Unit 29	Unit 30	Unit 31	Unit 32	Unit 33	Unit 34	Unit 35	Unit 36	Unit 37	Unit 38	Unit 39	Unit 40	Unit 41	Unit 42	Unit 43	Unit 44	Unit 45	Unit 46	Unit 47	Unit 48	Unit 49	Unit 50	Unit 51	Unit 52	Unit 53	Unit 54	Unit 55	Unit 56	Unit 57	Unit 58	Unit 59	Unit 60	Unit 61	Unit 62	Unit 63	Unit 64	Unit 65	Unit 66	Unit 67	Unit 68	Unit 69	Unit 70	Unit 71	Unit 72	Unit 73	Unit 74	Unit 75	Unit 76	Unit 77	Unit 78	Unit 79	Unit 80	Unit 81	Unit 82	Unit 83	Unit 84	Unit 85	Unit 86	Unit 87	Unit 88	Unit 89	Unit 90	Unit 91	Unit 92	Unit 93	Unit 94	Unit 95	Unit 96	Unit 97	Unit 98	Unit 99	Unit 100	Unit 101	Unit 102	Unit 103	Unit 104	Unit 105	Unit 106	Unit 107	Unit 108	Unit 109	Unit 110	Unit 111	Unit 112	Unit 113	Unit 114	Unit 115	Unit 116	Unit 117	Unit 118	Unit 119	Unit 120	Unit 121	Unit 122	Unit 123	Unit 124	Unit 125	Unit 126	Unit 127	Unit 128	Unit 129	Unit 130	Unit 131	Unit 132	Unit 133	Unit 134	Unit 135	Unit 136	Unit 137	Unit 138	Unit 139	Unit 140	Unit 141	Unit 142	Unit 143	Unit 144	Unit 145	Unit 146	Unit 147	Unit 148	Unit 149	Unit 150	Unit 151	Unit 152	Unit 153	Unit 154	Unit 155	Unit 156	Unit 157	Unit 158	Unit 159	Unit 160	Unit 161	Unit 162	Unit 163	Unit 164	Unit 165	Unit 166	Unit 167	Unit 168	Unit 169	Unit 170	Unit 171	Unit 172	Unit 173	Unit 174	Unit 175	Unit 176	Unit 177	Unit 178	Unit 179	Unit 180	Unit 181	Unit 182	Unit 183	Unit 184	Unit 185	Unit 186	Unit 187	Unit 188	Unit 189	Unit 190	Unit 191	Unit 192	Unit 193	Unit 194	Unit 195	Unit 196	Unit 197	Unit 198	Unit 199	Unit 200	Unit 201	Unit 202	Unit 203	Unit 204	Unit 205	Unit 206	Unit 207	Unit 208	Unit 209	Unit 210	Unit 211	Unit 212	Unit 213	Unit 214	Unit 215	Unit 216	Unit 217	Unit 218	Unit 219	Unit 220	Unit 221	Unit 222	Unit 223	Unit 224	Unit 225	Unit 226	Unit 227	Unit 228	Unit 229	Unit 230	Unit 231	Unit 232	Unit 233	Unit 234	Unit 235	Unit 236	Unit 237	Unit 238	Unit 239	Unit 240	Unit 241	Unit 242	Unit 243	Unit 244	Unit 245	Unit 246	Unit 247	Unit 248	Unit 249	Unit 250	Unit 251	Unit 252	Unit 253	Unit 254	Unit 255	Unit 256	Unit 257	Unit 258	Unit 259	Unit 260	Unit 261	Unit 262	Unit 263	Unit 264	Unit 265	Unit 266	Unit 267	Unit 268	Unit 269	Unit 270	Unit 271	Unit 272	Unit 273	Unit 274	Unit 275	Unit 276	Unit 277	Unit 278	Unit 279	Unit 280	Unit 281	Unit 282	Unit 283	Unit 284	Unit 285	Unit 286	Unit 287	Unit 288	Unit 289	Unit 290	Unit 291	Unit 292	Unit 293	Unit 294	Unit 295	Unit 296	Unit 297	Unit 298	Unit 299	Unit 300	Unit 301	Unit 302	Unit 303	Unit 304	Unit 305	Unit 306	Unit 307	Unit 308	Unit 309	Unit 310	Unit 311	Unit 312	Unit 313	Unit 314	Unit 315	Unit 316	Unit 317	Unit 318	Unit 319	Unit 320	Unit 321	Unit 322	Unit 323	Unit 324	Unit 325	Unit 326	Unit 327	Unit 328	Unit 329	Unit 330	Unit 331	Unit 332	Unit 333	Unit 334	Unit 335	Unit 336	Unit 337	Unit 338	Unit 339	Unit 340	Unit 341	Unit 342	Unit 343	Unit 344	Unit 345	Unit 346	Unit 347	Unit 348	Unit 349	Unit 350	Unit 351	Unit 352	Unit 353	Unit 354	Unit 355	Unit 356	Unit 357	Unit 358	Unit 359	Unit 360	Unit 361	Unit 362	Unit 363	Unit 364	Unit 365	Unit 366	Unit 367	Unit 368	Unit 369	Unit 370	Unit 371	Unit 372	Unit 373	Unit 374	Unit 375	Unit 376	Unit 377	Unit 378	Unit 379	Unit 380	Unit 381	Unit 382	Unit 383	Unit 384	Unit 385	Unit 386	Unit 387	Unit 388	Unit 389	Unit 390	Unit 391	Unit 392	Unit 393	Unit 394	Unit 395	Unit 396	Unit 397	Unit 398	Unit 399	Unit 400	Unit 401	Unit 402	Unit 403	Unit 404	Unit 405	Unit 406	Unit 407	Unit 408	Unit 409	Unit 410	Unit 411	Unit 412	Unit 413	Unit 414	Unit 415	Unit 416	Unit 417	Unit 418	Unit 419	Unit 420	Unit 421	Unit 422	Unit 423	Unit 424	Unit 425	Unit 426	Unit 427	Unit 428	Unit 429	Unit 430	Unit 431	Unit 432	Unit 433	Unit 434	Unit 435	Unit 436	Unit 437	Unit 438	Unit 439	Unit 440	Unit 441	Unit 442	Unit 443	Unit 444	Unit 445	Unit 446	Unit 447	Unit 448	Unit 449	Unit 450	Unit 451	Unit 452	Unit 453	Unit 454	Unit 455	Unit 456	Unit 457	Unit 458	Unit 459	Unit 460	Unit 461	Unit 462	Unit 463	Unit 464	Unit 465	Unit 466	Unit 467	Unit 468	Unit 469	Unit 470	Unit 471	Unit 472	Unit 473	Unit 474	Unit 475	Unit 476	Unit 477	Unit 478	Unit 479	Unit 480	Unit 481	Unit 482	Unit 483	Unit 484	Unit 485	Unit 486	Unit 487	Unit 488	Unit 489	Unit 490	Unit 491	Unit 492	Unit 493	Unit 494	Unit 495	Unit 496	Unit 497	Unit 498	Unit 499	Unit 500	Unit 501	Unit 502	Unit 503	Unit 504	Unit 505	Unit 506	Unit 507	Unit 508	Unit 509	Unit 510	Unit 511	Unit 512	Unit 513	Unit 514	Unit 515	Unit 516	Unit 517	Unit 518	Unit 519	Unit 520	Unit 521	Unit 522	Unit 523	Unit 524	Unit 525	Unit 526	Unit 527	Unit 528	Unit 529	Unit 530	Unit 531	Unit 532	Unit 533	Unit 534	Unit 535	Unit 536	Unit 537	Unit 538	Unit 539	Unit 540	Unit 541	Unit 542	Unit 543	Unit 544	Unit 545	Unit 546	Unit 547	Unit 548	Unit 549	Unit 550	Unit 551	Unit 552	Unit 553	Unit 554	Unit 555	Unit 556	Unit 557	Unit 558	Unit 559	Unit 560	Unit 561	Unit 562	Unit 563	Unit 564	Unit 565	Unit 566	Unit 567	Unit 568	Unit 569	Unit 570	Unit 571	Unit 572	Unit 573	Unit 574	Unit 575	Unit 576	Unit 577	Unit 578	Unit 579	Unit 580	Unit 581	Unit 582	Unit 583	Unit 584	Unit 585	Unit 586	Unit 587	Unit 588	Unit 589	Unit 590	Unit 591	Unit 592	Unit 593	Unit 594	Unit 595	Unit 596	Unit 597	Unit 598	Unit 599	Unit 600	Unit 601	Unit 602	Unit 603	Unit 604	Unit 605	Unit 606	Unit 607	Unit 608	Unit 609	Unit 610	Unit 611	Unit 612	Unit 613	Unit 614	Unit 615	Unit 616	Unit 617	Unit 618	Unit 619	Unit 620	Unit 621	Unit 622	Unit 623	Unit 624	Unit 625	Unit 626	Unit 627	Unit 628	Unit 629	Unit 630	Unit 631	Unit 632	Unit 633	Unit 634	Unit 635	Unit 636	Unit 637	Unit 638	Unit 639	Unit 640	Unit 641	Unit 642	Unit 643	Unit 644	Unit 645	Unit 646	Unit 647	Unit 648	Unit 649	Unit 650	Unit 651	Unit 652	Unit 653	Unit 654	Unit 655	Unit 656	Unit 657	Unit 658	Unit 659	Unit 660	Unit 661	Unit 662	Unit 663	Unit 664	Unit 665	Unit 666	Unit 667	Unit 668	Unit 669	Unit 670	Unit 671	Unit 672	Unit 673	Unit 674	Unit 675	Unit 676	Unit 677	Unit 678	Unit 679	Unit 680	Unit 681	Unit 682	Unit 683	Unit 684	Unit 685	Unit 686	Unit 687	Unit 688	Unit 689	Unit 690	Unit 691	Unit 692	Unit 693	Unit 694	Unit 695	Unit 696	Unit 697	Unit 698	Unit 699	Unit 700	Unit 701	Unit 702	Unit 703	Unit 704	Unit 705	Unit 706	Unit 707	Unit 708	Unit 709	Unit 710	Unit 711	Unit 712	Unit 713	Unit 714	Unit 715	Unit 716	Unit 717	Unit 718	Unit 719	Unit 720	Unit 721	Unit 722	Unit 723	Unit 724	Unit 725	Unit 726	Unit 727	Unit 728	Unit 729	Unit 730	Unit 731	Unit 732	Unit 733	Unit 734	Unit 735	Unit 736	Unit 737	Unit 738	Unit 739	Unit 740	Unit 741	Unit 742	Unit 743	Unit 744	Unit 745	Unit 746	Unit 747	Unit 748	Unit 749	Unit 750	Unit 751	Unit 752	Unit 753	Unit 754	Unit 755	Unit 756	Unit 757	Unit 758	Unit 759	Unit 760	Unit 761	Unit 762	Unit 763	Unit 764	Unit 765	Unit 766	Unit 767	Unit 768	Unit 769	Unit 770	Unit 771	Unit 772	Unit 773	Unit 774	Unit 775	Unit 776	Unit 777	Unit 778	Unit 779	Unit 780	Unit 781	Unit 782	Unit 783	Unit 784	Unit 785	Unit 786	Unit 787	Unit 788	Unit 789	Unit 790	Unit 791	Unit 792	Unit 793	Unit 794	Unit 795	Unit 796	Unit 797	Unit 798	Unit 799	Unit 800	Unit 801	Unit 802	Unit 803	Unit 804	Unit 805	Unit 806	Unit 807	Unit 808	Unit 809	Unit 810	Unit 811	Unit 812	Unit 813	Unit 814	Unit 815	Unit 816	Unit 817	Unit 818	Unit 819	Unit 820	Unit 821	Unit 822	Unit 823	Unit 824	Unit 825	Unit 826	Unit 827	Unit 828	Unit 829	Unit 830	Unit 831	Unit 832	Unit 833	Unit 834	Unit 835	Unit 836	Unit 837	Unit 838	Unit 839	Unit 840	Unit 841	Unit 842	Unit 843	Unit 844	Unit 845	Unit 846	Unit 847	Unit 848	Unit 849	Unit 850	Unit 851	Unit 852	Unit 853	Unit 854	Unit 855	Unit 856	Unit 857	Unit 858	Unit 859	Unit 860	Unit 861	Unit 862	Unit 863	Unit 864	Unit 865	Unit 866	Unit 867	Unit 868	Unit 869	Unit 870	Unit 871	Unit 872	Unit 873	Unit 874	Unit 875	Unit 876	Unit 877	Unit 878	Unit 879	Unit 880	Unit 881	Unit 882	Unit 883	Unit 884	Unit 885	Unit 886	Unit 887	Unit 888	Unit 889	Unit 890	Unit 891	Unit 892	Unit 893	Unit 894	Unit 895	Unit 896	Unit 897	Unit 898	Unit 899	Unit 900	Unit 901	Unit 902	Unit 903	Unit 904	Unit 905	Unit 906	Unit 907	Unit 908	Unit 909	Unit 910	Unit 911	Unit 912	Unit 913	Unit 914	Unit 915	Unit 916	Unit 917	Unit 918	Unit 919	Unit 920	Unit 921	Unit 922	Unit 923	Unit 924	Unit 925	Unit 926	Unit 927	Unit 928	Unit 929	Unit 930	Unit 931	Unit 932	Unit 933	Unit 934	Unit 935	Unit 936	Unit 937	Unit 938	Unit 939	Unit 940	Unit 941	Unit 942	Unit 943	Unit 944	Unit 945	Unit 946	Unit 947	Unit 948	Unit 949	Unit 950	Unit 951	Unit 952	Unit 953	Unit 954	Unit 955	Unit 956	Unit 957	Unit 958	Unit 959	Unit 960	Unit 961	Unit 962	Unit 963	Unit 964	Unit 965	Unit 966	Unit 967	Unit 968	Unit 969	Unit 970	Unit 971	Unit 972	Unit 973	Unit 974	Unit 975	Unit 976	Unit 977	Unit 978	Unit 979	Unit 980	Unit 981	Unit 982	Unit 983	Unit 984	Unit 985	Unit 986	Unit 987	Unit 988	Unit 989	Unit 990	Unit 991	Unit 992	Unit 993	Unit 994	Unit 995	Unit 996	Unit 997	Unit 998	Unit 999	Unit 1000	Unit 1001	Unit 1002	Unit 1003	Unit 1004	Unit 1005	Unit 1006	Unit 1007	Unit 1008	Unit 1009	Unit 1010	Unit 1011	Unit 1012	Unit 1013	Unit 1014	Unit 1015	Unit 1016	Unit 1017	Unit 1018	Unit 1019	Unit 1020	Unit 1021	Unit 1022	Unit 1023	Unit 1024	Unit 1025	Unit 1026	Unit 1027	Unit 1028	Unit 1029	Unit 1030	Unit 1031	Unit 1032	Unit 1033	Unit 1034	Unit 1035	Unit 1036	Unit 1037	Unit 1038	Unit 1039	Unit 1040	Unit 1041	Unit 1042	Unit 1043	Unit 1044	Unit 1045	Unit 1046	Unit 1047	Unit 1048	Unit 1049	Unit 1050	Unit 1051	Unit 1052	Unit 1053	Unit 1054	Unit 1055	Unit 1056	Unit 1057	Unit 1058	Unit 1059	Unit 1060	Unit 1061	Unit 1062	Unit 1063	Unit 1064	Unit 1065	Unit 1066	Unit 1067	Unit 1068	Unit 1069	Unit 1070	Unit 1071	Unit 1072	Unit 1073	Unit 1074	Unit 1075	Unit 1076	Unit 1077	Unit 1078	Unit 1079	Unit 1080	Unit 1081	Unit 1082	Unit 1083	Unit 1084	Unit 1085	Unit 1086	Unit 1087	Unit 1088	Unit 1089	Unit 1090	Unit 1091	Unit 1092	Unit 1093	Unit 1094	Unit 1095	Unit 1096	Unit 1097	Unit 1098	Unit 1099	Unit 1100	Unit 1101	Unit 1102	Unit 1103	Unit 1104	Unit 1105	Unit 1106	Unit 1107	Unit 1108	Unit 1109	Unit 1110	Unit 1111	Unit 1112	Unit 1113	Unit 1114	Unit 1115	Unit 1116	Unit 1117	Unit 1118	Unit 1119	Unit 1120	Unit 1121	Unit 1122	Unit 1123	Unit 1124	Unit 1125	Unit 1126	Unit 1127	Unit 1128	Unit 1129	Unit 1130	Unit 1131	Unit 1132	Unit 1133	Unit 1134	Unit 1135	Unit 1136	Unit 1137	Unit 1138	Unit 1139	Unit 1140	Unit 1141	Unit 1142	Unit 1143	Unit 1144	Unit 1145	Unit 1146	Unit 1147	Unit 1148	Unit 1149	Unit 1150	Unit 1151	Unit 1152	Unit 1153	Unit 1154	Unit 1155	Unit 1156	Unit 1157	Unit 1158	Unit 1159	Unit 1160	Unit 1161	Unit 1162	Unit 1163	Unit 1164	Unit 1165	Unit 1166	Unit 1167	Unit 1168	Unit 1169	Unit 1170	Unit 1171	Unit 1172	Unit 1173	Unit 1174	Unit 1175	Unit 1176	Unit 1177	Unit 1178	Unit 1179	Unit 1180	Unit 1181	Unit 1182	Unit 1183	Unit 1184	Unit 1185	Unit 1186	Unit 1187	Unit 1188	Unit 1189	Unit 1190	Unit 1191	Unit 1192	Unit 1193	Unit 1194	Unit 1195	Unit 1196	Unit 1197	Unit 1198	Unit 1199	Unit 1200	Unit 1201	Unit 1202	Unit 1203	Unit 1204	Unit 1205	Unit 1206	Unit 1207	Unit 1208	Unit 1209	Unit 1210	Unit 1211	Unit 1212	Unit 1213	Unit 1214	Unit 1215	Unit 1216	Unit 1217	Unit 12
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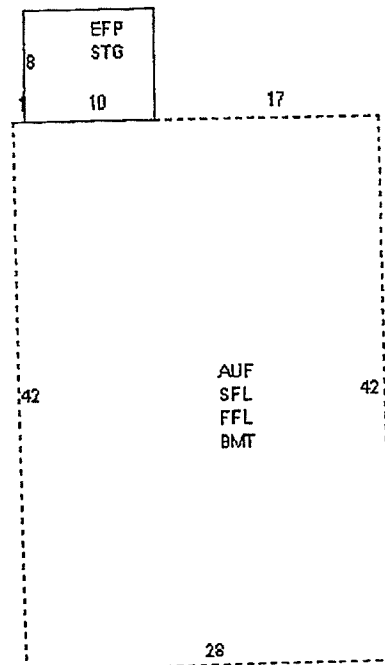
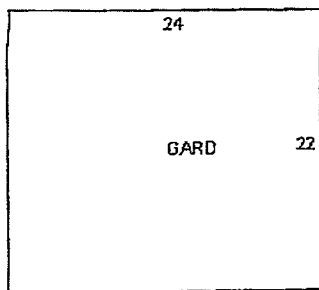
Code	Description	Area	SG	Rate	AV	Under Value	Sub % Area	% Usbl	Descrip Type	% Qu Ten
BMT	BASMENT	1,176		12,080		14,202				
BFT	1ST FLOOR	1,176		60,380		71,008				
SFL	2ND FLOOR	1,176		54,340		63,907				
ATC	ATTIC W FINI	706		36,230		25,563				
EPP	ENCL PORCH	80		37,240		2,979				
STG	STORAGE	80		12,080		966				
BSCG		4,394				178,625				
3057 B				4864		3058				

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Property Summary					
Parcel ID	050-3-009-000	Address	201 SOUTH PROSPECT ST	Owner(s)	BING ENTERPRISES LTD
SPAN Number	114-035-18064	Land Use	2 Family		
Mailing Address	6 LIME ROCK ROAD, SOUTH BURLINGTON, VT 05403				

Current Assessed Values							
Total Value	\$392,600	Building Value	\$202,700	Land Value	\$189,900	Yard Items	\$0

Current Property Taxes							
Total Property Taxes	\$10,010.88	HS-131 (https://secure.vermont.gov/hd/index#maincontent)	Pct Business		Pct Rental		
(Tax years are based on the fiscal year calendar which run from July-June)							

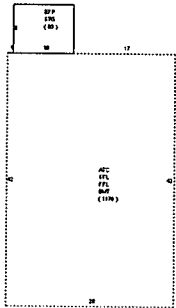
Most Recent Sales Information			
Grantor	Sale Date	Sale Price	Book & Page
BING ENTERPRISES LTD	1/2/1992	\$628,000	443-75

Property Details					
Grade	AVERAGE	Heat Type	HOT WATER	Heat Fuel	OIL
Acres	0.2114	Gross Area	4,864	Finished Area	3,058
Building Type	COLONIAL	Year Built	1978	Units	2
Rooms	12	Bedrooms	6	Baths (Full/Half)	2 / 0
Zoning	RL	Foundation	CB	Depreciation	13.30 %

Sketched Areas

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(/Sketch/8000/64001.png)

Card #	Area	Description	Gross Area	Finish Area
1	ATC	ATTIC W FINI	1,176	706
1	BMT	BASEMENT	1,176	0
1	EFP	ENCL PORCH	80	0
1	FFL	1ST FLOOR	1,176	1,176
1	SFL	2ND FLOOR	1,176	1,176
1	STG	STORAGE	80	0

Additional unsketched basement finished area

Card #	Area	Finish Type	Alt. Pct.
No unsketched areas listed			

Image(s)



(/Image/8000/64001%231.JPG)

(/Image/8000/64001.JPG)

Location Map



Google
(https://maps.google.com/maps/@44.47322,73.20142,15z/data=!3m1!1e3!3m1!1s0x444732201420142014:0x444732201420142014)

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**CITY OF BURLINGTON
Development Review Board**

In Re: Bing Enterprises, Ltd. Zoning Permit # 17-0253CA Denial

**AFFIDAVIT OF PHILLIP AARON
ON BEHALF OF BING ENTERPRISES, LTD.**

State of Florida)
) ss:
County of Palm Beach)

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JAN 11 2017

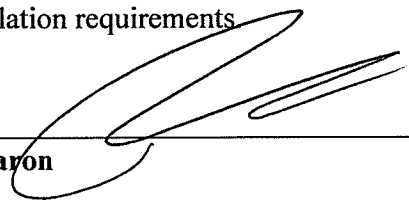
DEPARTMENT OF
PLANNING & ZONING

Phillip Aaron, being duly sworn, hereby states as follows:

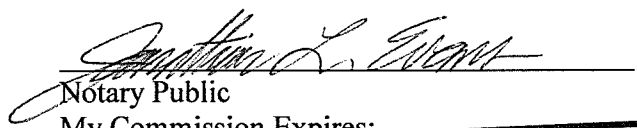
1. I am and have been a director of Bing Enterprises, Ltd., a Vermont corporation ("Bing Enterprises"), since Bing Enterprises acquired the real properties known as and numbered 201 South Prospect Street and 205 South Prospect Street, both in Burlington, Vermont, from James & Andrea Crook on September 27, 1991.
2. At the time that Bing Enterprises acquired both properties, 201 South Prospect Street contained two units (six bedrooms total) and 205 South Prospect Street contained ten units (ten bedrooms total), and the combined properties were served by 24 parking spaces. 22 parking spaces were located in the rear parking lot that serves the combined property, and 2 parking spaces were located in the front of the combined property. Bing Enterprises continued the use of 24 parking spaces at the combined property from 1991 to 2003. I recall that Peter Torono, who sold the combined property to James & Andrea Crook in 1988 and then managed it for them until they sold it to Bing Enterprises, confirmed that there were 24 parking spaces at the combined property in that configuration since at least 1988.
3. In May 2003, the City of Burlington asked Bing Enterprises to eliminate one of two parking spaces in the front of the property in order to create additional green space, and after a

meeting attended by Stuart Bennett (our attorney at the time), Keith Aaron, Jeanne Francis, Ray O'Connor and me, Bing Enterprises agreed to relinquish the space because 201 South Prospect Street and 205 South Prospect Street have always had sufficient parking for their needs even without the use of the additional space in the front of the property. Bing Enterprises also agreed to seed the relinquished parking space and cordon it off from the remaining parking space so that it would become and remain "green".

4. Accordingly, since May 2003, 201 South Prospect Street and 205 South Prospect Street have been served by a total of 23 parking spaces; 22 parking spaces are located in the rear parking lot that serves the combined property, and 1 parking space is located in the front of the combined property.
5. At the City's request, in 2003 Bing Enterprises prepared a parking layout plan showing the 23 spaces at the combined property. In 2016, Bing Enterprises prepared an updated parking layout plan showing 23 spaces at the combined property in a different configuration in order to ensure compliance with dimensional and circulation requirements


Phillip Aaron

Sworn to before me, in the state and county stated above, this 5th day of January, 2017.


Notary Public

My Commission Expires:



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MSN Home | My MSN | Hotmail | Shopping | Money | People & Chat

Sign Out

Web Search:

Go



Hotmail

Today

Mail

Calendar

Contacts

pia425@hotmail.com

Reply | Reply All | Forward | Delete | Junk | Put in Folder | Print View | Save Address

From: Stuart M. Bennett <stuart.bennett@verizon.net>

Inbox

Sent: Tuesday, June 20, 2006 5:05 PM

To: "Phil Aaron" <pia425@hotmail.com>

Subject: Fw: Bing Enterprises

Phil;

Do you have this?

I am doing a global search .

This seems very helpful.

Stuart

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

From: "Jeanne Francis" <Jeanne.Francis@cl.Burlington.vt.us>

To: <stuart.bennett@verizon.net>

Sent: Friday, May 09, 2003 1:32 PM

Subject: Re: Bing Enterprises

> I just left you a telephone voice mail message. For now, I would like
> to address 201 So. Prospect Street as your client is scheduled to appear
> before the DRB on May 20th and the Planning/Zoning staff is trying to
> put together staff comments for projects on that agenda - today is their
> deadline. So with that said, We are in agreement with your analysis
> outlined in your memo dated 5/5/03 in regards to 201 So. Prospect
> Street, with one addition. In addition to the barrier, all areas
> damaged by the parking shall be seeded and the barrier and seeding shall
> be maintained. If you are planning on removing the garage currently
> located on the 201 So. Prospect Street property, a zoning permit is
> required. If you are doing a site plan to organize the current
> parking area, are not adding additional parking or coverage on the
> property, our office would review and approve such a plan based on the
> fact the existing parking has occurred in the same location with the
> exact dimensions for a consecutive period of 15+ consecutive years - we
> would need to review and approve documentation to support the 15+ years
> claim.

> The appeal before the DRB relates to the parking directly in front of
> the house. So, if you agree to install the fence to delineate one
> parking space and re-seed lawn area damaged by all the parking that has
> been occurring outside the one parking space that has been identified,
> we would be happy to release the notice of violation from the land
> records. I will put a photo in the mail that explicitly identifies the
> one parking space, where the barrier shall be placed, and where the
> grass shall be re-seeded.

> If you intend to withdraw your appeal, it needs to be in writing. If
> you could make that decision today, Planning staff would not have to
> prepare staff comments to this project (if you desire, Planning's fax
> number is 865-7195.

> Thank you and if you have questions, don't hesitate to call me at

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> 865-7544. I will try to address the memo relating to the other 3
> properties this weekend and get you something in writing the beginning
> of next week.
>
> Have a nice weekend.
>
> >>> "Stuart Bennett" <stuart.bennett@verizon.net> 05/09/03 11:51AM >>>
> Hello Jean and Ray;
>
> Do you have a sense of the timing on putting together an agreement that
> covers the issues that we reviewed? I think we have agreed on what has
> to be done on all the properties that we discussed.
>
> Jean mentioned that the So Prospect appeal was scheduled for 5/20 (I
> have no notice of that date yet). I would hope that we can get an
> agreement signed before then. I am visiting So Prospect with a draftsman
> on the 16th to do a accurate diagram of the parking in the rear of 201
> and 205 So Prospect.
>
> Just to be sure, I am attaching the letter that I hand delivered to Ray
> at the Health Department meeting on Wednesday.
>
> Thanks
>
> Stuart Bennett
> Confidentiality Note: This transmission contains information from the
> law firm of Stuart M. Bennett, P.C. which is confidential and/or legally
> privileged. The information is intended only for the use of the
> individual or entity named herein. If you are not the intended
> recipient, you are hereby notified that any disclosure, copying,
> distribution or the taking of any action in reliance on the contents of
> this information is strictly prohibited and that the transmission should
> be returned to this firm immediately. In this regard, if you have
> received this transmission in error, please notify us by telephone
> immediately. (802) 985-2533
>



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DEPARTMENT OF
PLANNING & ZONING

Department of Planning and Zoning

149 Church Street

Burlington, VT 05401

Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

Ken Lerner, Interim Director
David White, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, Senior Planner
Mary O'Neil, Associate Planner
Kathy Parrott, Zoning Clerk
Elsie Tillotson, Department Secretary



April 6, 2007

Phil and Keith Aaron
Bing Enterprises, LTD
c/o Randy Amis, Esq.
110 Main Street, Suite 3A
PO Box 238
Burlington, VT 05402-0238

Re: 201-205 South Prospect Street, Burlington, Vermont

Dear Messrs. Aaron:

This letter is in regard to the above-referenced properties, specifically your request that the City of Burlington recognize the 2 units at 201 South Prospect Street and the 10 units at 205 South Prospect Street even though they do not have zoning approval for that number of units. Based upon the representations of the former Code Director and Planning Director and based upon the current evidence in city department files, the City does not intend to pursue zoning enforcement against the unpermitted units at 201 and 205 South Prospect Street. However, be advised that all units must be found to comply with minimum housing requirements, and this correspondence makes no determination or implication whatsoever regarding these important safety standards.

Please note that if some evidence or circumstance changed that would make it our ministerial duty to enforce, then we would have to reevaluate this decision.

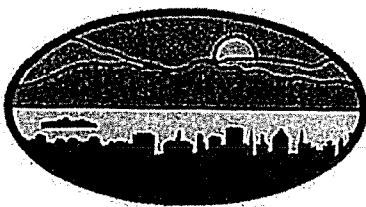
Sincerely,

A handwritten signature in black ink, appearing to read "Ken Lerner".

Ken Lerner
Interim Director of Planning & Zoning

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ZONING PERMIT
CERTIFICATE OF APPROPRIATENESS

City of Burlington, Vermont
Department of Planning and Zoning

Application Date: 08/29/2016

Appeal Expiration Date: 09/22/2016

Project Location: 205 SOUTH PROSPECT STREET

District: RL

Owner: Bing Enterprises Ltd

Ward: 6S

Address: 6 Lime Rock Road
Burlington, VT 05403

Tax ID: 050-3-008-000

Project Type: Residential - Renovation/Facade

Project Description: Replace 1 window on side of house.

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Construction Cost:	\$1,522	Lot Size (Sq Ft):	10,225
Net New Habitable Sq Ft:	0.00	Net New # of Housing Units:	0
Existing % Lot Coverage:	0.00	Existing # of Parking Spaces:	0
Proposed % Lot Coverage:	0.00	Proposed # of Parking Spaces:	0
Net New % Lot Coverage:	0.00	Required # of Parking Spaces:	0

Zoning Permit #: 17-0255CA

Decision By: Administrative

Level of Review: 1

Decision: Approved

See Conditions of Approval

Decision Date: September 7, 2016

Project File: NA

Zoning Administrative Officer

An interested person may appeal a decision of the Zoning Administrator to the Development Review Board until 4 pm on September 22, 2016.

Fee Type	Amount	Paid in Full	Balance Due: \$0.00
Application Fee:	\$80.00	Yes	Date Paid: _____
Development Review Fee:	\$0.00	NA	Check # _____
Impact Fee:	Not Applicable		

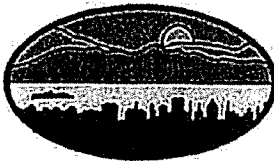
Building Permit Required: Yes

Permit Received by:

Date: 9-23-16

RSN: 319797

149 Church Street Burlington, Vermont 05401-8415



City of
Burlington, Vermont
149 Church Street

Zoning Permit - COA Level I – Conditions of Approval

ZP #: 17-0255CA

Tax ID: 050-3-008-000

Issue Date: September 7, 2016

Decision: Approved

Property Address: 205 SOUTH PROSPECT STREET

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Description: Replace 1 window on side of house.

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Project Permit Conditions:

1. The size, appearance, configuration and profile of the window shall remain as existing.
2. The muntins (i.e. grilles) within the replacement window shall be factory adhered to the exterior of the window unit.
3. The replacement double hung unit shall match the window pattern of the existing double hung window (2/2).
4. Vermont Residential Building Energy Standards apply to this project. Compliance with the standards is the Owner's responsibility. Prior to requesting a Certificate of Occupancy, a copy of a completed Vermont Residential Building Energy Standards Certificate shall be submitted with a Certificate of Occupancy (final or temporary) request, and filed in the Land Records located at the Clerk/Treasurers office in City Hall (149 Church Street). For more information, see http://publicservice.vermont.gov/topics/energy_efficiency.

Standard Permit Conditions:

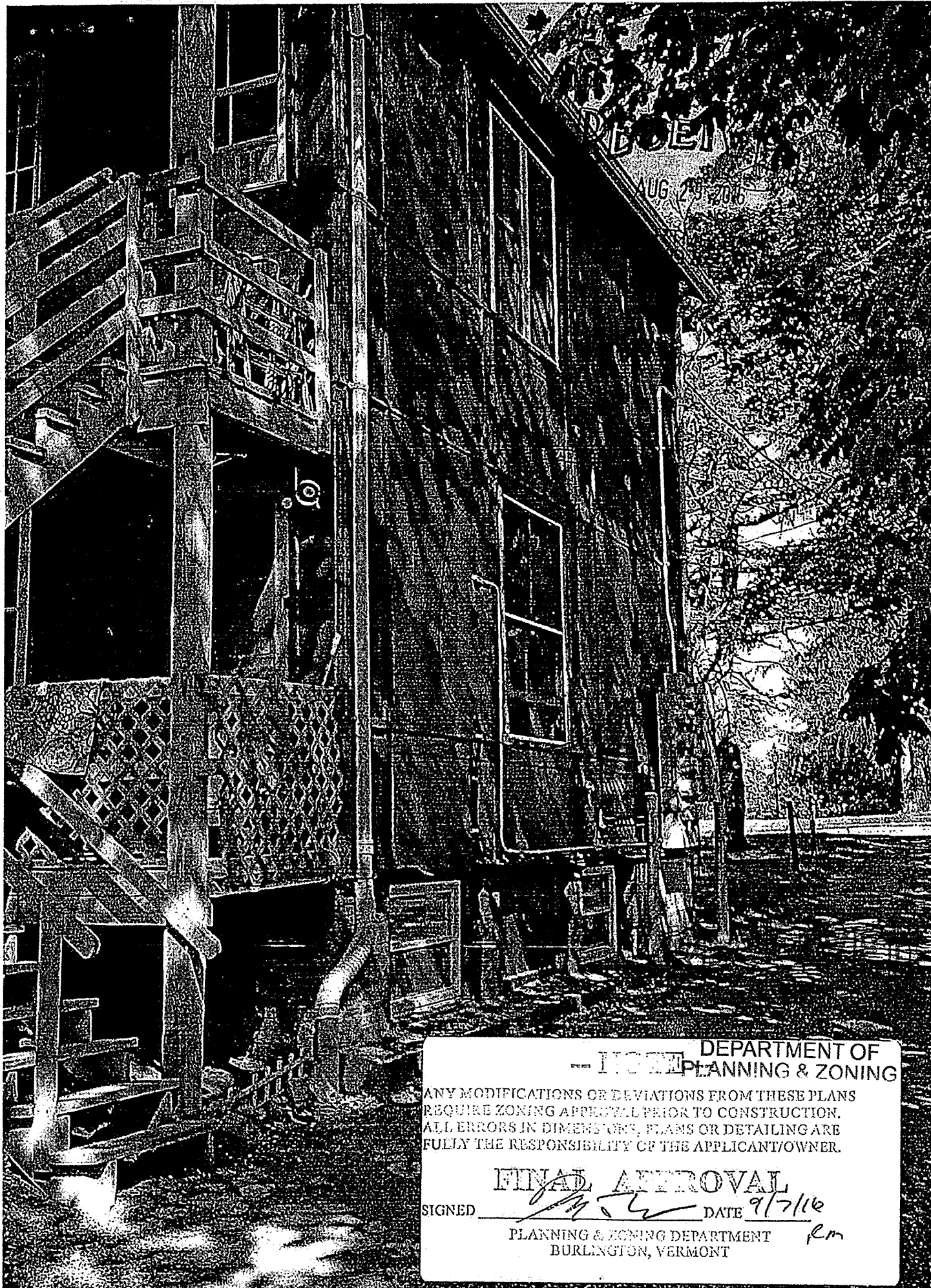
1. **Other City, State or Federal Permits.** The owner is solely responsible for obtaining all other required City, state and federal approvals. Failure to do so may invalidate this Zoning Permit and result in enforcement actions.
Note: All projects receiving a Zoning Permit also require a Construction 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 **September 7, 2017**. 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 **September 7, 2018**, or be subject to enforcement actions.

These time limits are binding upon the owner unless one of the following apply: a) longer or

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.

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SECRET

AUG 29 2016

DEPARTMENT OF
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ANY MODIFICATIONS OR DEVIATIONS FROM THESE PLANS
REQUIRE ZONING APPROVAL PRIOR TO CONSTRUCTION.
ALL ERRORS IN DIMENSIONS, PLANS OR DETAILING ARE
FULLY THE RESPONSIBILITY OF THE APPLICANT/OWNER.

FINAL APPROVAL

SIGNED

[Signature]

DATE

9/7/16

PLANNING & ZONING DEPARTMENT
BURLINGTON, VERMONT

pm


HARVEY
BUILDING PRODUCTS

Harvey Industries, Inc.
 1400 Main Street, Waltham, MA 02451-1689
 (781) 899-3500 harveybp.com

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 AUG 29 2016

Manufacturing
ACKNOWLEDGEMENT

Williston
 71 Leroy Road
 WILLISTON, VT 05495-5891
 Phone: (802) 660-8111 Fax: (802) 660-4782

DEPARTMENT OF
PLANNING & ZONING
BILL TO:

ABLE PAINT GLASS & FLOORING/MAIN
 683 PINE ST
 BURLINGTON, VT 05401-0000

SHIP TO:

ABLE PAINT GLASS & FLOORING/MAIN
 683 PINE ST

Phone: 802-655-6500 Fax: 802-655-6908

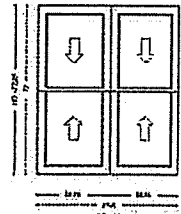
BURLINGTON VT 05401-0000
 Phone: 802-655-6500 Fax: (802) 655-6908



QUOTENBR	CUSTNBR	CUSTOMERTO	DATECREATED	DATEORDERED	ORDERTYPE
4055588	1051530		8/26/2016	Quote Not Ordered	Charge
ORDEREDBY	STATUS	SHIP-VIA	DELIVERY AREA		
BING	None	Whse Pickup	WILLISTON VT		
CLERK		JOB NAME	COUPON		
dgh - Drew Halko		JOSH			

10000-1 Majesty DH, Unit Size 57.5 x 72, RO 58 x 72.25
 Unit 1, 2: U-Factor = 0.47, SHGC = 0.57, VT = 0.59, NFRC CPD Number =
 HII-M-26-00364-00001, Custom / Call Size Option = Custom Size, Replacement,
 Double Hung
 Unit 1 Lower Glass, 1 Upper Glass, 2 Lower Glass, 2 Upper Glass: NFRC CPD
 Number = HII-M-26-00364-00001
 Unit 1, 2: Preserve Film Required = No
 Unit 1 Lower, 1 Upper, 2 Lower, 2 Upper: Overall Glass Thickness = 1 1/16",
 Double Glazed, Clear, Custom Annealed IG = Yes, IG MFG = CL
 Natural Pine, Base Color = White, Jamb Liner Color = Standard-Almond
 Window Label = Harvey, Single, Coppertone, Routed
 Half Screen, Fiberglass Mesh, Screen Shipping Separate = No
 Vertical Factory 0" thick, 72" length
 Overall Rough Opening Width = 58, Overall Rough Opening Height = 72.25

Room Location: None Assigned



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

This quotation is based on our interpretation of the information provided. All quantities, sizes, extensions, grand totals, and specifications should be verified by the contractor prior to his/her bidding or ordering of materials. Harvey Industries, Inc., is responsible only for the items as quoted above. Any changes or addendums will be subject to a request. We propose to supply the materials as described above, subject to the terms and conditions as required by our credit department. The prices are guaranteed for 90 days from the date of quotation unless otherwise noted. Delivery charges may apply and are not reflected on this quote. We appreciate the opportunity to quote this job. If you have any questions, please call your local warehouse.

CUSTOMER SIGNATURE _____

DATE _____

ANY MODIFICATIONS OR DEVIATIONS FROM THESE PLANS
 REQUIRE ZONING APPROVAL PRIOR TO CONSTRUCTION.
 ALL ERRORS IN DIMENSIONS, PLANS OR DETAILING ARE
 FULLY THE RESPONSIBILITY OF THE APPLICANT/OWNER.

FINAL APPROVAL
 SIGNED _____ DATE 9/7/16 RM

Last Update: 8/26/2016 11:45 AM

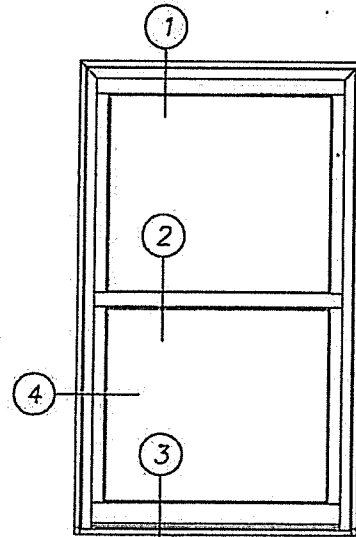
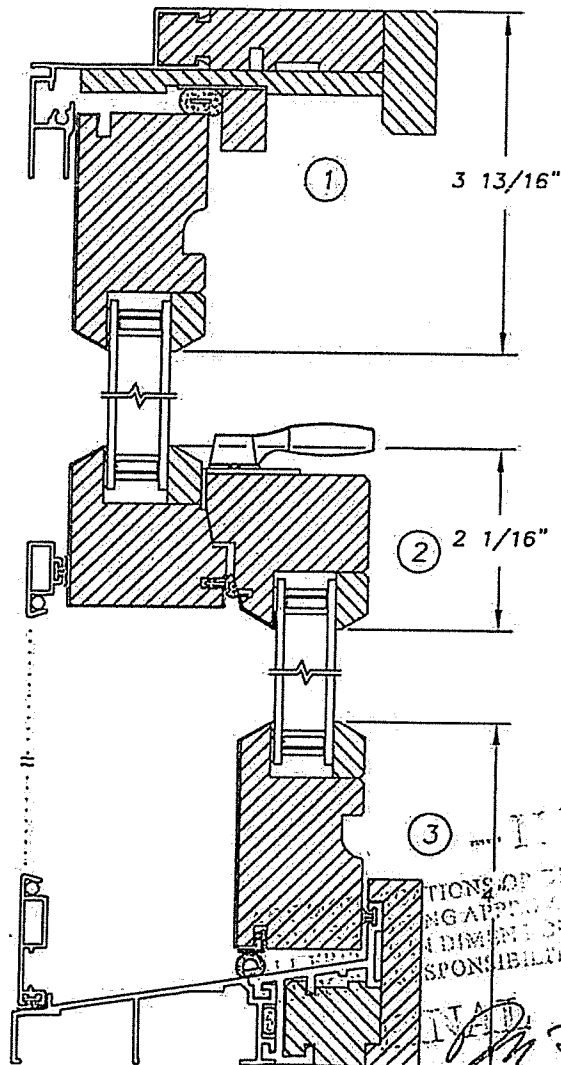
PLANNING & ZONING DEPARTMENT
 BURLINGTON, VERMONT 1 OF 1

Printed: 8/26/2016 11:46 AM

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



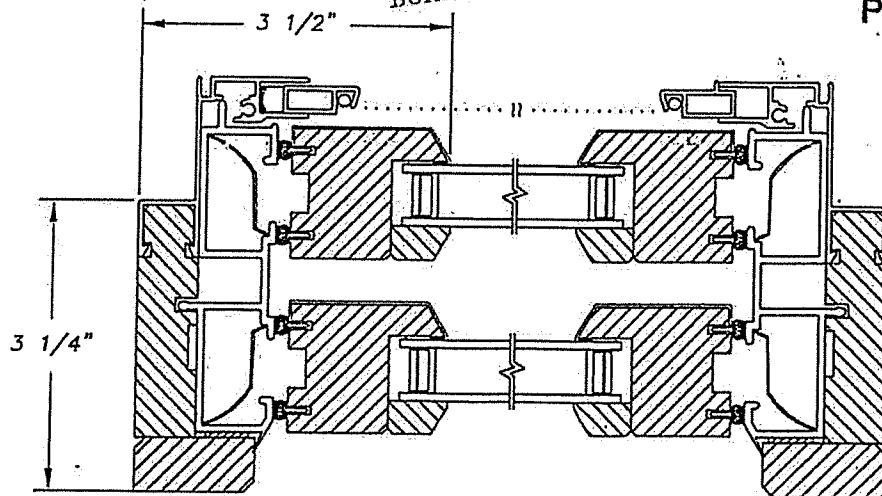
NOTES:
1. NO DEVIATIONS FROM THESE PLANS
2. NO APPROVAL PRIOR TO CONSTRUCTION.
3. NO DEVIATIONS FROM THESE PLANS OR DETAILING A(8/20)
4. RESPONSIBILITY OF THE APPLICANT/OWNER.

SIGNED *[Signature]* APPROVAL
DATE 9/7/16
PLANNING & ZONING DEPARTMENT
BURLINGTON, VERMONT

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DEPARTMENT OF
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REV. 09/11

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PLANNING & ZONING



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

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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: 205 S. Prospect

PROPERTY OWNER*: Bing Enterprise

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

APPLICANT: Abbe Paint & Glass

POSTAL ADDRESS: 6 Elm Rock Rd

POSTAL ADDRESS: 683 Pine St

CITY, ST, ZIP: S. Burlington VT, 05403

CITY, ST, ZIP: Burl, Vt 05401

DAY PHONE: 802-235-6421

DAY PHONE: 655 6500

EMAIL: bee fus 02@gmail.com

EMAIL: Sean@AbbeVt.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.

Description of Proposed Project: Replacing 1 window

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)*: \$ 1522.00

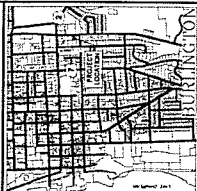
(*Estimated cost a typical contractor would charge for all materials and labor, regardless of who physically completes the work)

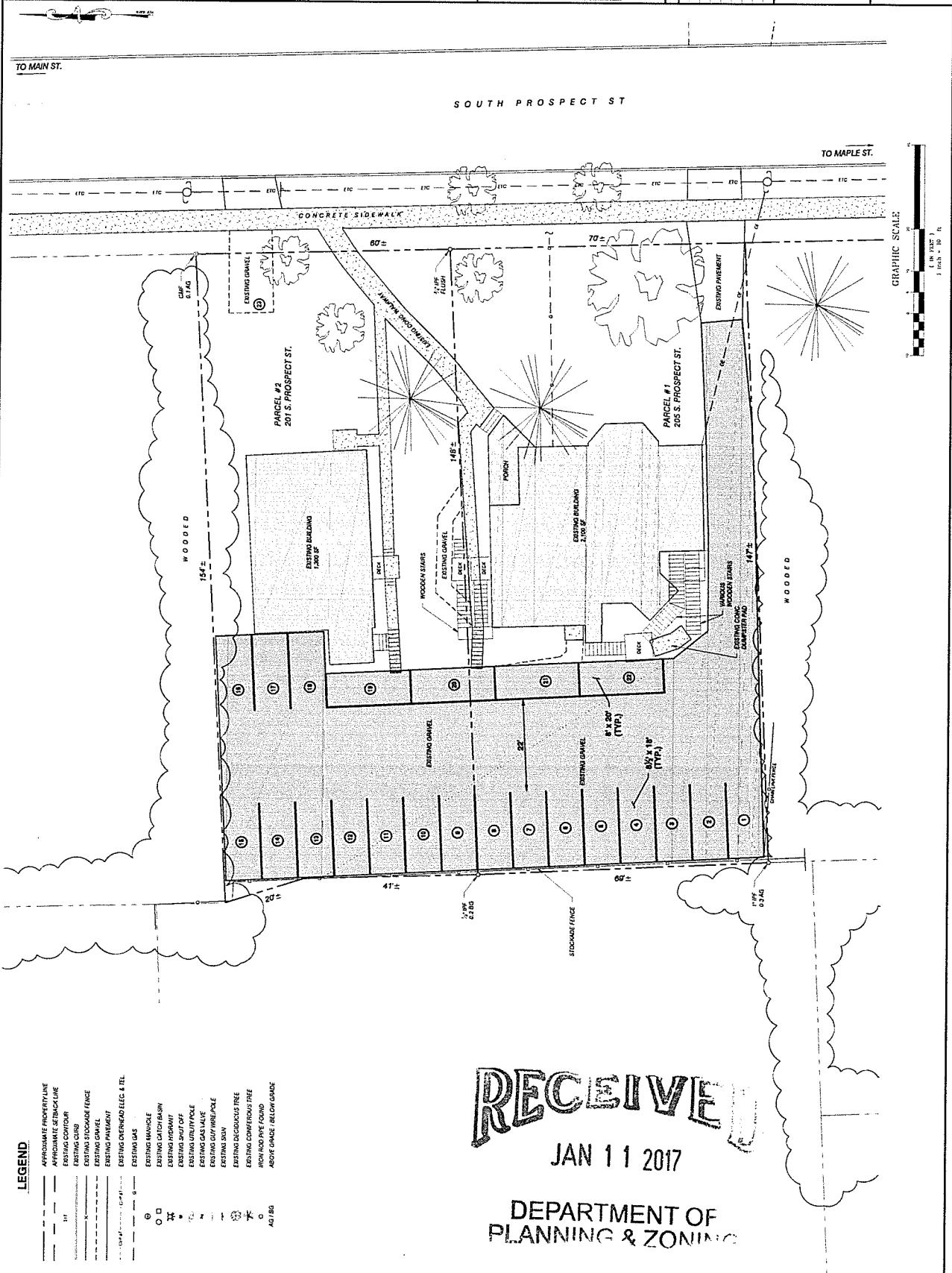
Within 30 days of submission, the permit application will be reviewed for completeness, and, if complete, will be processed administratively or referred to a board for review. All permit approvals or denials are subject to an appeal period (15 days for administrative permit; 30 days for board permit). 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: FC-1 Eligible for Design Review? Yes Age of House: 187 Lot Size: 1623
Type: SN AW FC-1 BA COA-1 COA-2 COA-3 CU MA VR HO SP DT MP
Check No: 910 Amount Paid: 1522.00 Zoning Permit: 1623

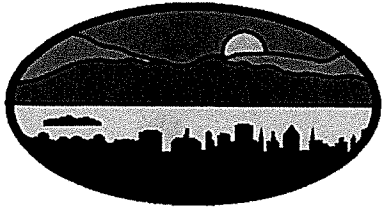
April 2014

DEPARTMENT OF PLANNING & ZONING

		CIVIL ENGINEERING ASSOCIATES, INC. 100 WASHINGTON ST., SUITE 200, BURLINGTON, VT 05401 TEL: 802.255.1234 FAX: 802.255.1235 WWW.CEA-INC.COM	
DRAWN GAC	CHECKED JLM	APPROVED JLM	DATE 12/19/16
CLIENT: BING ENTERPRISE, LTD		PROJECT: 201-205 S. PROSPECT ST.	
6 LIME ROCK RD SOUTH BURLINGTON VERMONT 05403		BURLINGTON, VT	
			
DATE 12/19/16		SCALE 1" = 10'	
DRAWING NUMBER C1.0		SHEET NUMBER 10220	



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 DEPARTMENT OF
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**ZONING REQUEST DENIAL
CERTIFICATE OF APPROPRIATENESS**

City of Burlington, Vermont
Department of Planning and Zoning

Application Date: 08/29/2016

Appeal Expiration Date: 01/12/2017

Project Location: 201 SOUTH PROSPECT STREET

District: RL

Owner: Bing Enterprises Ltd

Ward: 6S

Address: 6 Lime Rock Road
Burlington, VT 05403

Tax ID: 050-3-009-000

Project Type: Residential - Renovation/Facade

Project Description: Replace 2 windows with 2 egress windows.

Construction Cost:	\$0.00	Lot Size (Sq Ft):	9,210
Net New Habitable Sq Ft:	0.00	Net New # of Housing Units:	0
Existing % Lot Coverage:	0.00	Existing # of Parking Spaces:	0
Proposed % Lot Coverage:	0.00	Proposed # of Parking Spaces:	0
Net New % Lot Coverage:	0.00	Required # of Parking Spaces:	0

Zoning Permit #: 17-0253CA

Decision By: Administrative

Level of Review: 1

Decision: Denied

See Reasons for Denial

Decision Date: December 28, 2016

Project File: NA

Zoning Administrative Officer

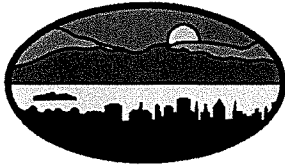
An interested person may appeal a decision of the Zoning Administrator to the Development Review Board until 4 pm on January 12, 2017.

Fee Type	Amount	Paid in Full	Balance Due: \$0.00
Application Fee:	\$80.00	Yes	Date Paid: _____
Development Review Fee:	\$0.00	NA	Check # _____
Impact Fee:	Not Applicable		

Building Permit Required: **Not Applicable**

Received by: _____

Date: _____



City of
Burlington, Vermont
149 Church Street

Zoning Permit - COA Level I – Reasons for Denial

ZP #: 17-0253CA

Tax ID: 050-3-009-000

Issue Date: December 28, 2016

Decision: Denied

Property Address: 201 SOUTH PROSPECT STREET

Description: Replace 2 windows with 2 egress windows.

Reasons for Denial:

1. Section 8.1.7 Non-Conforming Residential Structure

Where additions or conversions to existing residential structures within a Neighborhood or Shared Use Parking District add living space but do not add dwelling units, and such sites do not currently meet the parking standards of Sec. 8.1.8, one (1) parking space shall be provided for each additional room. Single detached dwellings shall be exempt from this requirement.

There are no zoning permits on file to create habitable space in the attic of the 201 South Prospect Street duplex. The requested windows are intended to provide egress from this unpermitted finished space.

Table 8.1.8-1 Minimum Off-Street Parking Requirements

	Neighborhood Districts
RESIDENTIAL USES	Per Dwelling Unit except as noted
Multi-unit attached dwelling units, studio units or 1-bedroom dwelling unit.	2
Single Family detached and Duplex	2

The property is located in the Neighborhood Parking District and shares a parking lot with 205 S. Prospect Street, which contains 10 units. In accordance with the table above, the shared parking area for 201 and 205 S. Prospect Street requires a minimum of 24 spaces. The site plan shows a total of 23 spaces. The shared parking area does not meet the minimum parking requirement. The application cannot be approved.



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

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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: 201 S. Prospect Apt 2

PROPERTY OWNER*: Bing Enterprises

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

APPLICANT: Able paint & glass

POSTAL ADDRESS: 6 Line Rock Rd.

POSTAL ADDRESS: 683 Pine St

CITY, ST, ZIP: S. Burlington VT.

CITY, ST, ZIP: Burl, VT 05401

DAY PHONE: 802-238-6821

DAY PHONE: 655 5500

EMAIL: beeus02@gmail.com

EMAIL: Sean@Able.com

SIGNATURE: [Signature]

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.

Description of Proposed Project: Replacing 2 windows with egress

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

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

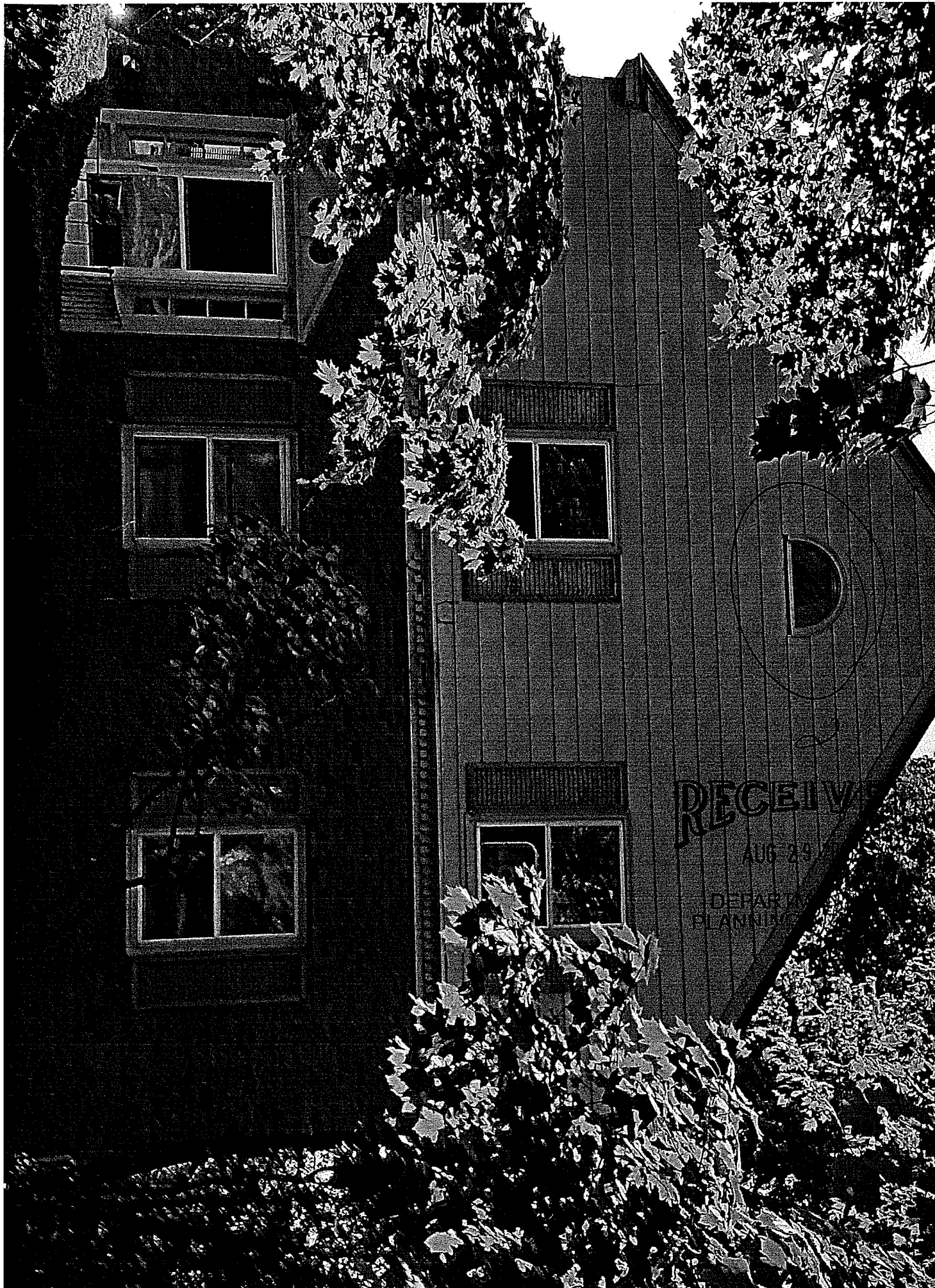
- Does your project involve new construction, addition, alteration, renovation, or repair to a structure that is heated or cooled? Yes ☒ No ☐
(If yes, the Vermont Residential Building Energy Standards (VRBES) apply. Visit the P&Z Office, Public Service Board or PSB website for details)
- Will 400 sq 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)*: \$2591.⁰⁰

(*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.

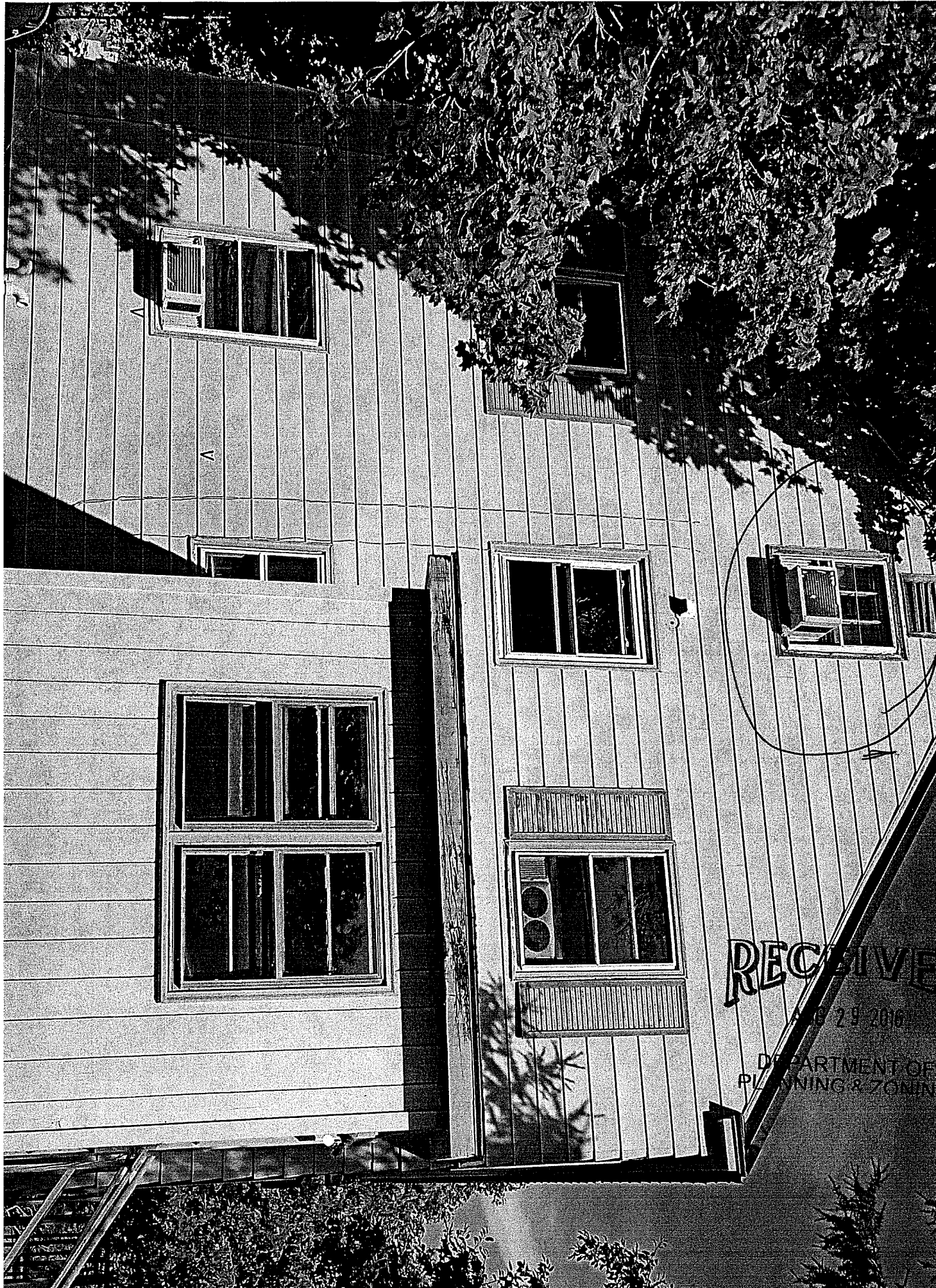
Office Use Only: Zone: RL Eligible for Design Review? Y Age of House: 1968 Lot Size: 9210
Type: SN AW FC BA COA 1 COA 2 COA 3 CU MA VR HO SP DT MP
Check No. 9048 Amount Paid \$80. Zoning Permit # 17-0253CA



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PLANNING



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DEPARTMENT OF
PLANNING & ZONING



Harvey Industries, Inc.
1400 Main Street, Waltham, MA 02451-1689
(781) 899-3500 harveybp.com

Manufacturing ACKNOWLEDGEMENT

Williston
71 Leroy Road
WILLISTON, VT 05495-5891
Phone: (802) 660-8111 Fax: (802) 660-4782

BILL TO:

ABLE PAINT GLASS & FLOORING/MAIN
683 PINE ST
DURLINGTON, VT 05101 0000

Phone: 802-655-6500 Fax: 8026556908

SHIP TO:

ABLE PAINT GLASS & FLOORING/MAIN
683 PINE ST

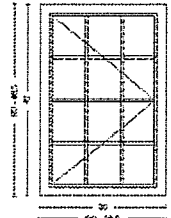
BURLINGTON VT 05401-0000
Phone: 802-655-6500 Fax: (802)655-6908



QUOTE NBR	CUST NBR	CUSTOMER PO	DATE CREATED	DATE ORDERED	ORDER TYPE
4055830	1051530		8/26/2016	Quote Not Ordered	Charge
ORDERED BY	STATUS	SHIP VIA	DELIVERY AREA		
JOSH	None	Whse Pickup	WILLISTON VT		
CLERK		JOB NAME		COUPON	
dgh - Drew Halko		BING			

LINE #	DESCRIPTION	QTY
--------	-------------	-----

2
10000-1 Majesty Casement, Unit Size 30 x 48, RO 30.5 x 48.5
Unit 1: U-Factor = 0.26, SHGC = 0.21, VT = 0.35, NFRC CPD Number =
HII-M-23-00768-00001, Custom / Call Size Option = Custom Size, New
Construction, Hinge Right
Unit 1 Glass: NFRC CPD Number = HII-M-23-00768-00001
North=Yes, North-Central=Yes
Performance Packages = E Star 6.0 2015
Unit 1: Preserve Film Required = No
Unit 1: Overall Glass Thickness = 7/8" Insulated, Triple Glazed, Double Low E,
Krypton Filled, Custom Annealed IG = Yes, IG MFG = CL
Natural Pine, Base Color = White
Window Label = Harvey, Tandem Lock, Coppertone, Sash Limit Devices = None,
Operator Arm = Double
Screen Color = Coppertone, Fiberglass Mesh, Screen Shipping Separate = No
Sim Div Lite, Colonial, A-White, Interior Finish = None, 3W4H
Overall Rough Opening Width = 30.5, Overall Rough Opening Height = 48.5
Applied Nail Fin

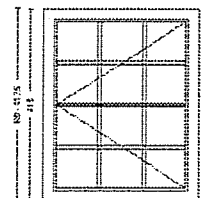


Room Location: W/ 1" CENTER GRID

LINE #	DESCRIPTION	QTY
--------	-------------	-----

1
11000-1 Majesty Casement, Unit Size 32 x 41.5, RO 32.25 x 41.75
Unit 1: U-Factor = 0.26, SHGC = 0.21, VT = 0.35, NFRC CPD Number =
HII-M-23-00768-00001, Custom / Call Size Option = Custom Size, Replacement,
Hinge Left
Unit 1 Glass: NFRC CPD Number = HII-M-23-00768-00001
North=Yes, North-Central=Yes
Performance Packages = E Star 6.0 2015
Unit 1: Preserve Film Required = No
Unit 1: Overall Glass Thickness = 7/8" Insulated, Triple Glazed, Double Low E,
Krypton Filled, Custom Annealed IG = Yes, IG MFG = CL
Natural Pine, Base Color = White
Window Label = Harvey, Tandem Lock, Coppertone, Sash Limit Devices = None,
Operator Arm = Double
Screen Color = Coppertone, Fiberglass Mesh, Screen Shipping Separate = No
Sim Div Lite, Colonial, A-White, Interior Finish = None, 3W4H
Overall Rough Opening Width = 32.25, Overall Rough Opening Height = 41.75

Room Location: W/ 1" CENTER GRID

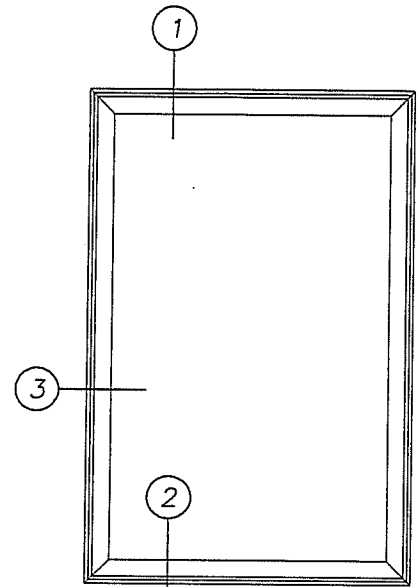
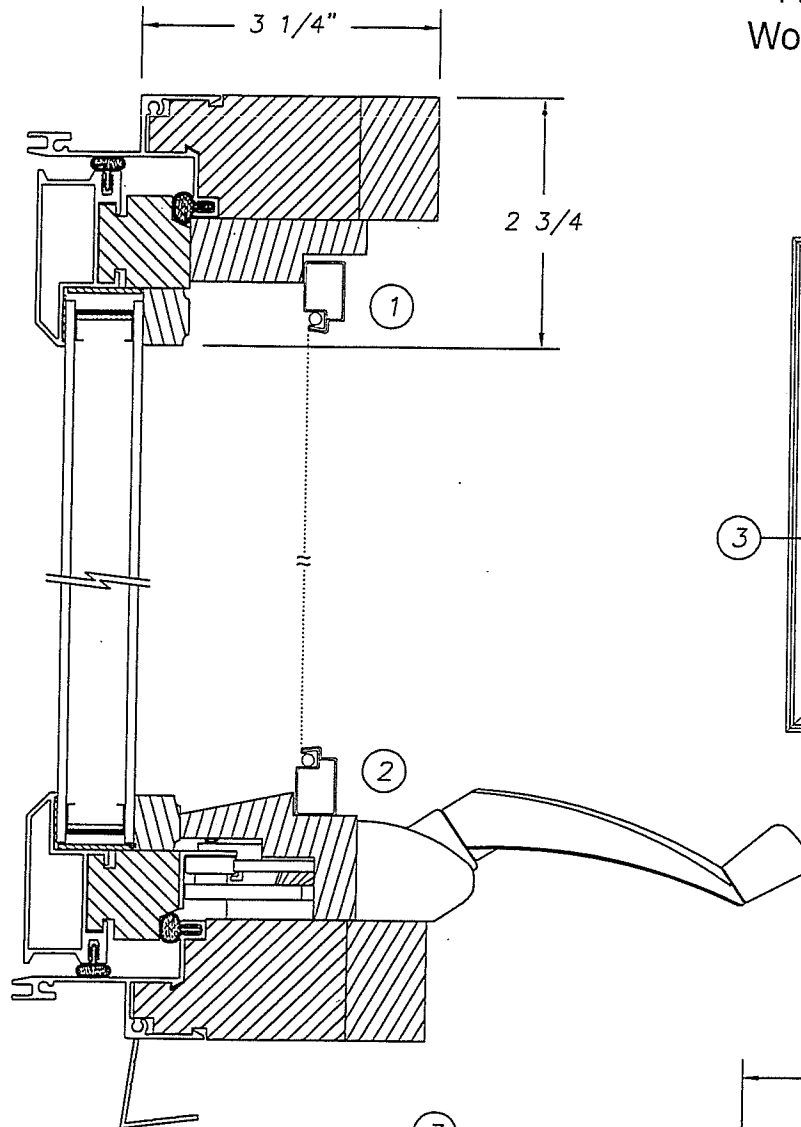


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DEPARTMENT OF
PLANNING & ZONING

Harvey Industries, Inc.
Majesty Replacement
Wood Casement Window
(1/2 Scale)

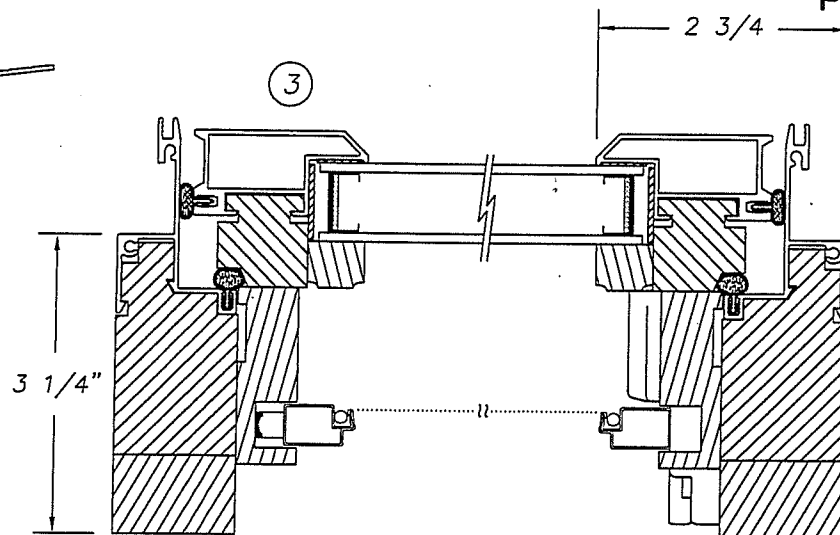


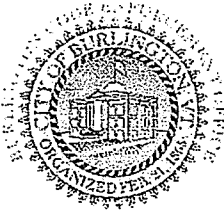
(1/20)

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DEPARTMENT OF
PLANNING & ZONING





CODE ENFORCEMENT OFFICE

645A Pine St, PO Box 8
Burlington, VT 05402-08
VOICE (802) 863-0444
FAX: (802) 652-4222

SHOW CAUSE LETTER

December 2, 2005

Bing Enterprises, Ltd.
c/o Keith S. Aaron
6 Lime Rock Road
S. Burlington, VT 05403-5836

RE: 201 South Prospect Street (hereinafter referred to as "Premises")

Dear Mr. Aaron:

It has come to the attention of this office that a potential zoning violation exists at the above referenced Premises.

Nature of Alleged Violation: Change of use from single family house to a duplex without an approved zoning permit and increasing the parking (rear) without an approved zoning permit.
Burlington Zoning Ordinance Articles: 4, 5, 6, 7, 10 and 19.

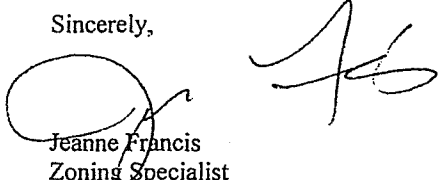
You, as the Owner of the Premises (hereinafter "Owner") have **TEN (10) CALENDAR DAYS** from the date of this memo (ie. December 12, 2005) to show cause that the alleged violation does not exist or, **within the same time frame**, remedy the alleged violation by either:

1. removing the violation, restoring the Premises to its prior state and informing this office that the violation has been removed so our office can verify compliance, or
2. submit a complete application to the Department of Planning and Zoning (located in City Hall) to cure the alleged violation. If the application or the portion of the application that deals with the alleged violation is denied, you have **TEN (10) CALENDAR DAYS** from the application denial date to remove the alleged violation and restore the Premises to its prior state.

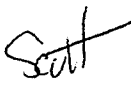
There will be no further warnings forthcoming. Pursuant to Burlington Zoning Ordinance Article 19 and 24 V.S.A. §§1974a, 4451 and 4452, if the alleged violation has not been cured or Owner has not shown a violation does not exist within ten (10) calendar days from the date of this letter, either a Municipal Complaint Ticket or a Notice of Violation will be issued to you as Owner. Please note the first Municipal Complaint Ticket carries a waiver fee of \$100, the second ticket carries a waiver fee of \$150, and the third ticket carries a waiver fee of \$250; there is a five (5) calendar day cure period between each ticket. The Notice of Violation has a fee of up to \$100.00 for each offense. Each day that a violation is continued shall be a separate offense.

Thank you for your anticipated cooperation and prompt attention to this matter.

Sincerely,


Jeanne Francis
Zoning Specialist

Enclosures: see above

Cc: ☒ Department Planning/Zoning 

☐ Code File

Information available in alternative media forms for people with disabilities.
For disability access information call (802) 865-7121 or (802) 863-0450 TTY.
An Equal Opportunity Employer

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DEPT. OF
PLANNING & ZONING



Patricia
Properties Inc.

USER DEFINED

OWNERSHIP	
Owner 1:	BING ENTERPRISES LTD
Owner 2:	
Owner 3:	
Street 1:	6 LIME ROCK ROAD
Street 2:	
Town/City:	SOUTH BURLINGTON
State/Prov:	VT
Postal:	05403
PREVIOUS OWNER	
Owner 1:	
Owner 2:	
Street 1:	
Town/City:	
State/Prov:	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 9210. SF of land mainly classified as 2 Family with an COLONIAL Building Built about 1978, Having Primarily ALUMINUM Exterior and METAL Roof Cover, with 2 Units, 4 Baths, 0 HalfBaths, 0 3/4 Baths, 12 Rooms Total, and 6 Bdrms.

OTHER ASSESSMENTS

Code	Description	No	Amount	Comm. Int.

PROPERTY FACTORS

Item	Code	Description	%	Item	Code	Description
Z	RL	RES LOW D	100	U	A	ALL UTILITIES
0						
n						
Census:				Exempt		
Flood Haz:						
D	B	City	100	Topo	3	SUITABLE
s	SN	NonHomestead	100	Street		
t				Traffic		

LAND SECTION (first 7 lines only)

Use	Description	LU	No of Units	Depth	Unit Type	Land Type
R2	2 Family	9210			SQ FT	SITE

Total AC/Ha:	0.211433	Total SF/SM:	9210.00	Parcel LU:	R2	2 Family	Prime NB Desc:	UVM CAMPUS	Total:	189,882	Spl Credit:	Total:	189,900
--------------	----------	--------------	---------	------------	----	----------	----------------	------------	--------	---------	-------------	--------	---------

Disclaimer: This information is believed to be correct but is subject to change and is not warranted. Database: AssessPro

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description	User Acct
R2	202,700		9210.000	189,900	392,600		
Total Card	202,700		0.211	189,900	392,600	Entered Lot Size	316897720552
Total Parcel	202,700		0.211	189,900	392,600	Total Land: 9210	GIS Ref
Source: OverRide						Parcel: 128.40	Insp Date
						Land Unit Type: SF	

PREVIOUS ASSESSMENT

Tax Yr	Use	Cal	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Assess Value	Notes	Date
2005	R2	ABST	232,800	0	9,210.	189,900	422,700	422,700	INFORMAL NOTICES AR15/2005	
2005	R2	FV	202,700	0	9,210.	189,900	392,600	392,600	GRAND LIST TO PVAR 8/17/2005	
2005	R2	PENT	202,700	0	9,210.	189,900	392,600	392,600	BOA COMPLETE 6.30.05 6/30/2005	
2005	R2	PREL	202,700	0	9,210.	189,900	392,600	392,600	BOA hearing COMM n6/7/2005	
2004	R2	ABST	112,200	0	9,210.	81,400	193,600	193,600	Year End Roll	5/5/2004
2004	R2	FV	112,200	0	9,210.	81,400	193,600	193,600	Year End Roll	8/23/2004
2004	R2	PREL	112,200	0	9,210.	81,400	193,600	193,600	Year End Roll	7/16/2004
2003	R2	CKFV	112,200	0	9,210.	81,400	193,600	193,600	Year End Roll	7/11/2003

SALES INFORMATION

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
BING ENTERPRISE	443-75	WD	1/2/1992		628000	No				From MS ACCESS DB table SalesDate

BUILDING PERMITS

Date	Number	Desc	Amount	C/O	Last Visit	Fed Code	F Desc	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
6/22/2005	INFO HEARING	JV	JWICKERY
6/2/2005	INFORMAL REV	TH	JT HULSEBY
1/13/2005	DATA ENTRY	KN	K NOSEK
1/13/2004	ENTRY & SIG	BKS	B SCHERMERHO
1/11/2004	NOT HOME-EX	BKS	B SCHERMERHO

Sign:	VERIFICATION OF VENT HOT DATA	All	%	Spec	J	Fed	Use Value	Notes
							189,882	
							189,900	

Total:	189,882	Spl Credit:	Total:	189,900
--------	---------	-------------	--------	---------

RMGREEN

No	Alt No	Direction/Street/City
201		SOUTH PROSPECT ST, BURLINGTO

OWNERSHIP

Owner 1:	BING ENTERPRISES LTD
Owner 2:	
Owner 3:	
Street 1:	6 LIME ROCK ROAD
Street 2:	
Town/City:	SOUTH BURLINGTON
State/Prov:	VT
Postal:	05403

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Town/City:	
State/Prov:	Chitry
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 9210. SF of land mainly classified as 2 Family with a(n) COLONIAL Building built about 1978, Having Primarily BRICK Exterior and ASPHALT SH Roof Cover, with 2 Units, 4 Baths, 0 HalfBaths, 0 3/4 Baths, 10 Rooms Total, and 6 Bdrms.

OTHER ASSESSMENTS

Code	Description	Amount	Com. Int

PROPERTY FACTORS

Item	Code	Desc	%	Item	Code	Desc
Z	RL	RES LOW D	100	U	A	ALL UTILITIES
0				1		
n						
Census:				Exempt		
Flood Haz:						
D	B	City	100	Topo	3	SUITABLE
s	SN	Nonhomestead	100	Street		
1				Traffic		

LAND SECTION (First 7 lines only)

Use	Description	LUC	No of Units	Depth / Price/Units	Unit Type	Land Type
R2	2 Family		9210	21. SQ FT	SITE	

Total A/C/H/A:	0.21433	Total S/F/S/M:	9210.00	Parcel LUC:	R2	2 Family	Prime NB Desc	UVM CAMPUS
----------------	---------	----------------	---------	-------------	----	----------	---------------	------------

Disclaimer: This Information is believed to be correct but is subject to change and is not warranted. Database: AssessPro

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description	User Acct
R2	232,800		9210.000	189,900	422,700		
Total Card	232,800		0.214	189,900	422,700	Entered Lot Size	31689720562
Total Parcel	232,800		0.214	189,900	422,700	Total Land: 9210	GIS Ref
Source: Over/ride						Parcel: 179.72	Insp Date
						Land Unit Type: SF	

PREVIOUS ASSESSMENT

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2005	R2	ABST	232,800	0	9,210	189,900	422,700	422,700	INFORMAL NOTICES AR5/5/2005	5/5/2004
2004	R2	ABST	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	8/23/2004
2004	R2	FV	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	7/16/2004
2004	R2	PREL	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	7/11/2003
2003	R2	CKFV	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	7/11/2003
2003	R2	CKFX	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	7/3/2003
2003	R2	FV	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	05/19/05
2003	R2	FX	112,200	0	9,210	81,400	193,600	193,600	Year End Roll	9/26/2003

SALES INFORMATION

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
BING ENTERPRISE	443-75	WD	1/2/1992		628000	No				From MS ACCESS DB table SalesData

PAT ACCT.

Date	Time	Date	Time
05/19/05	12:18:15	05/19/05	12:01:26

BUILDING PERMITS

Date	Number	Desc	Amount	C/O	Last Visit	Fed Code	F. Desc	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
1/13/2005	DATA ENTRY	KN	K NOSEK
11/13/2004	ENTRY & SIG	BKS	B SCHERMERH
11/11/2004	NOT HOME-EX	BKS	B SCHERMERH

Sign: VERIFICATION OF VISIT NOT DATA

Use	Description	LUC	No of Units	Depth / Price/Units	Unit Type	Land Type	LT	Base Value	Unit Price	Adj	Neigh Infl	Neigh Infl	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt	%	Spec Land	J	Fact	Use Value	Not
R2	2 Family		9210	21. SQ FT	SITE			0	21.	0.982350									189,882						189,900	

Total:	189,882	Spl Credit	Total:	189,900
--------	---------	------------	--------	---------

Disclaimer: This Information is believed to be correct but is subject to change and is not warranted. Database: AssessPro

[illegible]

GENERAL INFORMATION	WSFue:	Rating:
Grade: A - AVERAGE	CONDO INFORMATION	

Year Bilt:	1978	Est Yr Bilt:		Location:
Alt. UUC:		Alt. %:		Unit #:
Jurisdct:		Fact.:		Floor:
Const Mod:				% Own:
Lump Sum Adj:				Name:

INTERIOR INFORMATION		DEPRECIATION	
Avg Ht/Ft:		Phys Cond: GD - Good	13.3%
Prim Int Wall/DW - DRYWALL		Functional:	%
Sec Int Wall:	%	Economic:	%
Partition:		Special:	%
Prim Floors: CA - CARPET		Override:	%
Sec Floors: CA - CARPET	50%	Total:	13.3%

CC SUMMARY	
CALC SUMMARY	
Bsmnt Ftr: C - CONCRETE BMT	Basic \$ / Sq.ft:67.00
Bsmnt Gar:	Size Adj.:0.940136
Electric: T - TYPICAL	Const Adj.:1.00385
Insulation: T - TYPICAL	Adj \$ / Sq.ft:63.231
Int vs Ext:	Grade Factor:1.00
Heat Fuel: O - OIL	Other Features:22000
Heat Type: HW - HOT WATER	
Fate:	

# Heat Sys/2		Neighborhood Int: 1.2	
% Heated: 100	% AC:	LUC Factor: 1.00	W
Solar HW: NO	Central Vac: NO	Adj Total: 241522	
% Com Wai	% Sprinkled	Depreciation: 32122	Spec
		Depreciated Total: 203399	

[illegible][illegible][illegible][illegible][illegible][illegible]

More in: objects and items: objects:

RESIDENTIAL GRID											# Units: 1
1st Res Grid Desc: 2BR											
Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L O
Other											
Upper											
Lvl 2											
Lvl 1											
Lower											
Totals	Rms: 10	Brs: 6	Baths: 4	HB							

REMODELING					
Exterior:					
Interior:					
Additions:					
Kitchen:					
Baths:					
Plumbing:					
Electric:					
Heating:					
General:					
	No Unit	RMS	BRS	FL	
	1	6	4		
	1	4	2		
	Totals				
	2	10	6		

[illegible][illegible][illegible]

The drawing shows a rectangular area with a dashed border. The width is labeled '17' and the height is labeled '28'. The area is divided into four quadrants by a horizontal and vertical line. The quadrants are labeled as follows:

- Top Left: AUF
- Top Right: SFL
- Bottom Left: FFL
- Bottom Right: BMT

In the top right corner, there is a small box containing the text:

EFP
STO
10

Loc	Description	Area	Use	Type	
BMT	BASEMENT	1,176	12,650	14,872	
FFL	1ST FLOOR	1,176	63,230	74,360	
SFL	2ND FLOOR	1,176	56,910	66,924	
AUF	ATTIC UNFIN	588	12,650	7,436	
GARD	GARAGE DET	528	22,130	11,685	
EFP	ENCL. PORCH	80	37,240	2,979	
STG	STORAGE	80	12,650	1,012	
	Net Sketched Area:	4,804	Total:	179,268	
Size Adj	2940	Gross Area	5392	FinArea	2352

AssessPro Patriot Properties

IMAGE

050, 3,000, 000

[illegible]

IMAGE
AssessPro Patriot Properties

5 SOUTH PROSPECT STREET
BRINGTON VT 05401

LAND: 81,400 STCD:R2 RTG:000.000
BLDG: 112,200 CLASS:R RESIDENTIAL
TOTAL: 193,600

CARD 01 OF 01 APPRAISAL WORK SHEET (AWS) 05/18/94 10:07:00
TAX YEAR: 1994 REVIEW DATE:

RAD: 350 SUB: 000 BLK: 0000 CAD: 550 SUB: 000 BLK: 000

```

LOC: 201 SOUTH PROSPECT ST
      :SALE DATE PRICE ADJUSTED BOOK-PAGE V Q S
      :01/02/92 628000 628000 0443-0075 1 A

```

✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂
 ✂ ✂ ✂ ✂ ✂ ✂ ✂

[illegible]

PROPERTY CHARACTERISTICS		SIDEWALK	
09 F	FEEDER	:08 S	SIDEWALK
09 A	ALL UTIL	:11 T	TYPICAL
15 C8	CEMENTBL	:16 V	VINYL
17 GB	GABLE	:21 S	SLAB
21 U	WOOD JO	:24 WW	WWCARPET
25 DU	DRYWALL	:29 CL	COLORIAL
30 OP	OPENINGS	1:32 FX	ACTCOUNT
33 D		4:33 RM	
40 BF			

4 AFIN										4 BSIZ										1120										0 CSIZ																													
PR WALL										FR										FLR AREA										LIV AREA																													
COMPARABLE SALES										PHY DEPR										.08 X NBHD										1.00 = DEPRECTN										.08																			
SALE DATE										TASP DATE										VALUE										LIV AREA										ADJ TO SUBJ										SQF									
PRICE										DATE										DATE										DATE										DATE										DATE									
RCEL	0-4	-081	-000	05/08/93	0	00/00/00	0	0	0	249478	.00	2.431	1-3	-016	-000	05/28/92	0	00/00/00	0	0	246465	.00	4.907	0-4	-044	-005	05/04/92	0	00/00/00	0	0	246559	.00	7.457	0-4	-044	-004	06/10/93	0	00/00/00	0	0	243677	.00	2.455	0-4	-085	-000	11/04/92	0	00/00/00	0	0	264923	.00	2.762			

DESCRIPTION	AREA	CODE	DESCRIPTION	SIZ	GRADE	CD	YEAR	RCN	VALUE	%	R6	ECON	RCNLD	VA
			DWELLING	1,200	C	-01	G 1978	116,252	.92	1.00			106.95	
		FDG	FR DE-GARAGE	528	D		1978	7,878	.67	1.00			5.27	

YES:

TOTAL	124,130	112,23
-------	---------	--------

T	OCC	RTG	SITE DATA AND VALUATION				MRKT	DPTH	VT	VALUE	INDICATION	VALUE	HGH
			SIZE	SADJ	RATE	ADJUSTMENTS							
			9,210.00	1.00	9.00	.00 .00	.00	.00	M	81.378	COST	193,830	1.0
											COMPS	240,500	.0
											MRA	0	.0
											TASP	0	.0

```

TOTAL      81.400  : TOTAL      193.600
BLD PRMT # ISSUE DT %CP ----TYPE--

```

ASSOCIATED PARCELS AND OCCUPANCY

2323 CITY OF BURLINGTON
PROPERTY ID: R 050-3-009-000
NG ENTERPRISES, LTD

5 SOUTH PROSPECT STREET
BRINGTON VT 05401

CARD 01 OF 01 APPRAISAL WORK SHEET (AWS) 05/18/94 07:0
TAX YEAR: 1994 REVIEW DATE:

STCD:R2 RTG:000.000
CLASS:R RESIDENTIAL

RAD: 350 SUB: 000 BLK: 0000 CAD: 550 SUB: 000 BLK: 000
LOC: 201 SOUTH PROSPECT ST

FLOOR SPACES										EXTERIOR FEATURES							
DOR	TP	CHST.	INC	BASE	AREA	LIV.	AREA	UNHEAT	AR	A/C	AREA	BASE	VALUE	FEATURE	SIZE	BASE	VALUE
RST	FR		0		1,200		1,200		0		0	58,000					
PER	FR		0		1,120		1,120		0		0	31,150					
LF			0				0		0		0	0					
TIC					1,120	*	672	*	0		0	12,920					
YNT					1,120		0		0		0	8,910					
AVL					0		0		0		0	0					

2323 CITY OF BURLINGTON
PROPERTY ID: R 050-3-009-000
NG ENTERPRISES, LTD
5 SOUTH PROSPECT STREET
BURLINGTON VT 05401

LAND: 81,400
BLDG: 112,200
TOTAL: 193,600
CARD 01 OF 01
STCD: R2
CLASS: R
RTG: 000.000
RESIDENTIAL

APPRaisal WORK SHEET (AWS) 02/21/94 12:5
TAX YEAR: 1994 REVIEW DATE:

RAD: 350 SUB: 000 BLK: 0000 CAD: 550 SUB: 000 BLK: 000
LOC: 201 SOUTH PROSPECT ST
SALE DATE: 01/02/92 PRICE ADJUSTED: 628000 BOOK-PAGE V Q S
01/02/92 628000 0443-0075 1 A

++++++
+ FDG +
+ C --- +
+ 528 +
+ + +
++++++

++++
+ B +

28 #

4 A 4 #
0 0 #

28 #
#####

07 F FEEDER
09 A ALL UTIL
15 CB CEMENTEL
17 GB GABLE
21 W WOOD JO
25 DW DRYWALL
31 OP OPENINGS
33 BD BEDROOMS
40 MF MULTIFAM

PROPERTY CHARACTERISTICS

08 I IMPROVED
10 3 SUITABLE
16 BR BRICK
18 AS ASPHALT
24 IN INLAID
26 EL ELECTRIC
27 ST STACKS
43 FB FULLBATH
08 S SIDEWALK
11 T TYPICAL
16 V VINYL
21 S SLAB
24 WW WWCARPET
29 CL COLONIAL
32 FX ACTCOUNT
43 RM ROOMS

COMPARABLE SALES
CEL SALE DATE PRICE TASP DATE VALUE PHY DEPR WALL FR X NBHD ADJ 1.00 = DEPRECTN .03 SQF FACTOR VISIT HISTORY
-4-081-000 06/08/93 0 00/00/00 0 0 0 0 249478 -00 2.431
-3-016-000 05/28/92 0 00/00/00 0 0 0 0 246465 -00 4.987 3/12/94 101
-4-044-005 06/04/92 0 00/00/00 0 0 0 0 225659 -00 7.457
-4-044-004 06/10/93 0 00/00/00 0 0 0 0 233677 -00 8.245
-4-085-000 11/04/92 0 00/00/00 0 0 0 0 264923 -00 2.762
SUMMARY OF IMPROVEMENTS
DESCRIPTION AREA CODE DESCRIPTION SIZE GRADE CD YEAR RCN VALUE % RG ECON RCNLD VAL
A/2FR/B 1120: DWELLING 1,200 C -01 G 1978 116,252 -92.1 .00 106,95
1FR 80: FDG FR DE-GARAGE 528 D 1978 7,878 -.67 .00 5,27
FDG 528:
ES: TOTAL 124,130 112,231

T OCC RTG SIZE SADJ SITE DATA AND VALUATION RATE ADJUSTMENTS MRKT DPTH VT VALUE INDICATIONS
9,210.00 1.00 9.00 .00 .00 .00 .00 M 81,378 INDICATION VALUE
COST 193,630
COMPS 240,500
MRA 0
TASP 628,000

TOTAL 81,400 TOTAL 193,600
BLD PRMT # ISSUE DT XCP ----TYPE----

ASSOCIATED PARCELS AND OCCUPANCY

2323 CITY OF BURLINGTON
PROPERTY ID: R 050-3-009-000
NG ENTERPRISES, LTD
5 SOUTH PROSPECT STREET
BURLINGTON VT 05401

CARD 01 OF 01 APPRAISAL WORK SHEET (AWS) 02/21/94 12:5
STCD: R2 TAX YEAR: 1994 REVIEW DATE:
CLASS: R RESIDENTIAL
RAD: 350 SUB: 000 BLK: 0000 CAD: 550 SUB: 000 BLK: 000
LOC: 201 SOUTH PROSPECT ST

FLOOR SPACES
RST FR INC BASE AREA LIV. AREA UNHEAT AR A/C AREA BASE VALUE EXTERIOR FEATURES
PER FR 0 1,200 1,200 0 0 58,000
LF 0 1,120 1,120 0 0 31,150
TIC 0 1,120 672 0 0 12,920
MNT 1,120 0 0 0 8,910
ANL 0 0 0 0 0

52

[illegible]

7

BASE AREA		STORIES		WYTP	SPECIAL FEATURES • COST REFINEMENTS • AUXILIARY IMPROVEMENTS	
BLOG.	FEATURE				UNIT OF MEASURE	RATE
50			1	0	54 ASIZ	1120
51			1		55 BSIZ	4
52			1		56 CSIZ	0
53			1		57 AFIN	
					58 BFIN	
					59 BREC	
60	02	007	6.65	30	72	24
61						
62						
63						
64						

VISIT HISTORY				
DATE	R	I	C	I.D.
65	7-24-91			
66	4-9-86			
67				
68				

THIS SIGNATURE ONLY ACKNOWLEDGES A VISIT BY A DATA COLLECTOR. IT DOES NOT AGREE WITH THE ITEMS DESCRIBED HEREON.

James W. Smith

86 144002

ATTN: DISEMMENT - CIA/WL

2000

SECRET

SECRET

[illegible][illegible]

PMAL	ER	ADJA	2875	LVAR	2875
CE	8.00 /	NADJ	0.80 =	DEPR	0.02 /
RENTAL	DATA			ECGN	
				VISIT	HISTORY
				07/04/04	2

[illegible]

OUTSIDE	INFLATIONS	LOAN
COST	135400.00	54.05 50 144000.00

COMPSTAT	" 00	" 00	0
74SP	" 00	" 00	0

144000.0
E11

28'

2⁵ - KRAMLE

11

BRICK

1176

42'

28'

2 1/2' - CRANE

BRICK

42'

1176

28'

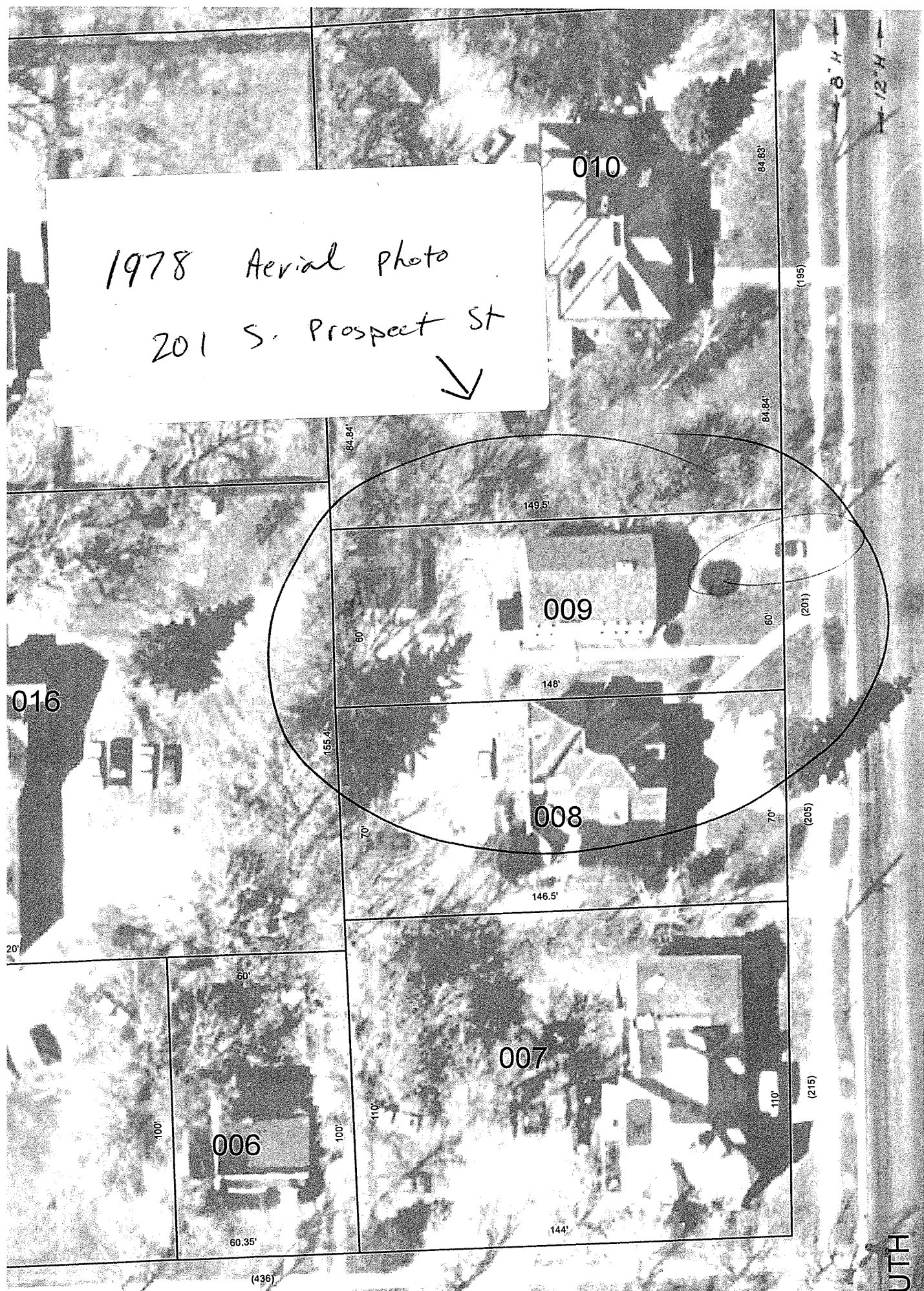
2 1/2' - CRANE

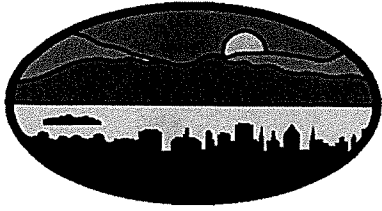
BRICK

42'

1176

1978 Aerial photo
201 S. Prospect St
↓





**ZONING REQUEST DENIAL
CERTIFICATE OF APPROPRIATENESS**

City of Burlington, Vermont
Department of Planning and Zoning

Application Date: 08/29/2016

Appeal Expiration Date: 01/12/2017

Project Location: 201 SOUTH PROSPECT STREET

District: RL

Owner: Bing Enterprises Ltd

Ward: 6S

Address: 6 Lime Rock Road
Burlington, VT 05403

Tax ID: 050-3-009-000

Project Type: Residential - Renovation/Facade

Project Description: Replace 2 windows with 2 egress windows.

Construction Cost:	\$0.00	Lot Size (Sq Ft):	9,210
Net New Habitable Sq Ft:	0.00	Net New # of Housing Units:	0
Existing % Lot Coverage:	0.00	Existing # of Parking Spaces:	0
Proposed % Lot Coverage:	0.00	Proposed # of Parking Spaces:	0
Net New % Lot Coverage:	0.00	Required # of Parking Spaces:	0

Zoning Permit #: 17-0253CA

Decision By: Administrative

Level of Review: 1

Decision: Denied

See Reasons for Denial

Decision Date: December 28, 2016

Project File: NA


Zoning Administrative Officer

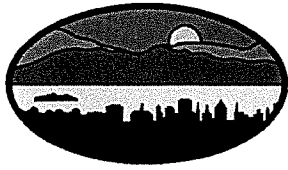
An interested person may appeal a decision of the Zoning Administrator to the Development Review Board until 4 pm on January 12, 2017.

Fee Type	Amount	Paid in Full	Balance Due: \$0.00
Application Fee:	\$80.00	Yes	Date Paid: _____
Development Review Fee:	\$0.00	NA	Check # _____
Impact Fee:	Not Applicable		

Building Permit Required: **Not Applicable**

Received by: _____

Date: _____



City of
Burlington, Vermont
149 Church Street

Zoning Permit - COA Level I – Reasons for Denial

ZP #: 17-0253CA

Tax ID: 050-3-009-000

Issue Date: December 28, 2016

Decision: Denied

Property Address: 201 SOUTH PROSPECT STREET

Description: Replace 2 windows with 2 egress windows.

Reasons for Denial:

1. Section 8.1.7 Non-Conforming Residential Structure

Where additions or conversions to existing residential structures within a Neighborhood or Shared Use Parking District add living space but do not add dwelling units, and such sites do not currently meet the parking standards of Sec. 8.1.8, one (1) parking space shall be provided for each additional room. Single detached dwellings shall be exempt from this requirement.

There are no zoning permits on file to create habitable space in the attic of the 201 South Prospect Street duplex. The requested windows are intended to provide egress from this unpermitted finished space.

Table 8.1.8-1 Minimum Off-Street Parking Requirements

	Neighborhood Districts
RESIDENTIAL USES	Per Dwelling Unit except as noted
Multi-unit attached dwelling units, studio units or 1-bedroom dwelling unit.	2
Single Family detached and Duplex	2

The property is located in the Neighborhood Parking District and shares a parking lot with 205 S. Prospect Street, which contains 10 units. In accordance with the table above, the shared parking area for 201 and 205 S. Prospect Street requires a minimum of 24 spaces. The site plan shows a total of 23 spaces. The shared parking area does not meet the minimum parking requirement. The application cannot be approved.



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

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AUG 29 2016

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: 201 S. Prospect Apt 2

PROPERTY OWNER*: Bing Enterprises

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

APPLICANT: Able paint + glass

POSTAL ADDRESS: 6 Lime Rock Rd.

POSTAL ADDRESS: 683 Pine St

CITY, ST, ZIP: S. Burlington VT.

CITY, ST, ZIP: Burl. VT 05401

DAY PHONE: 802-238-6821

DAY PHONE: 655 5500

EMAIL: beeus02@gmail.com

EMAIL: Sean@Able.com

SIGNATURE: [Signature]

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.

Description of Proposed Project: Replacing 2 windows with egress

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

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

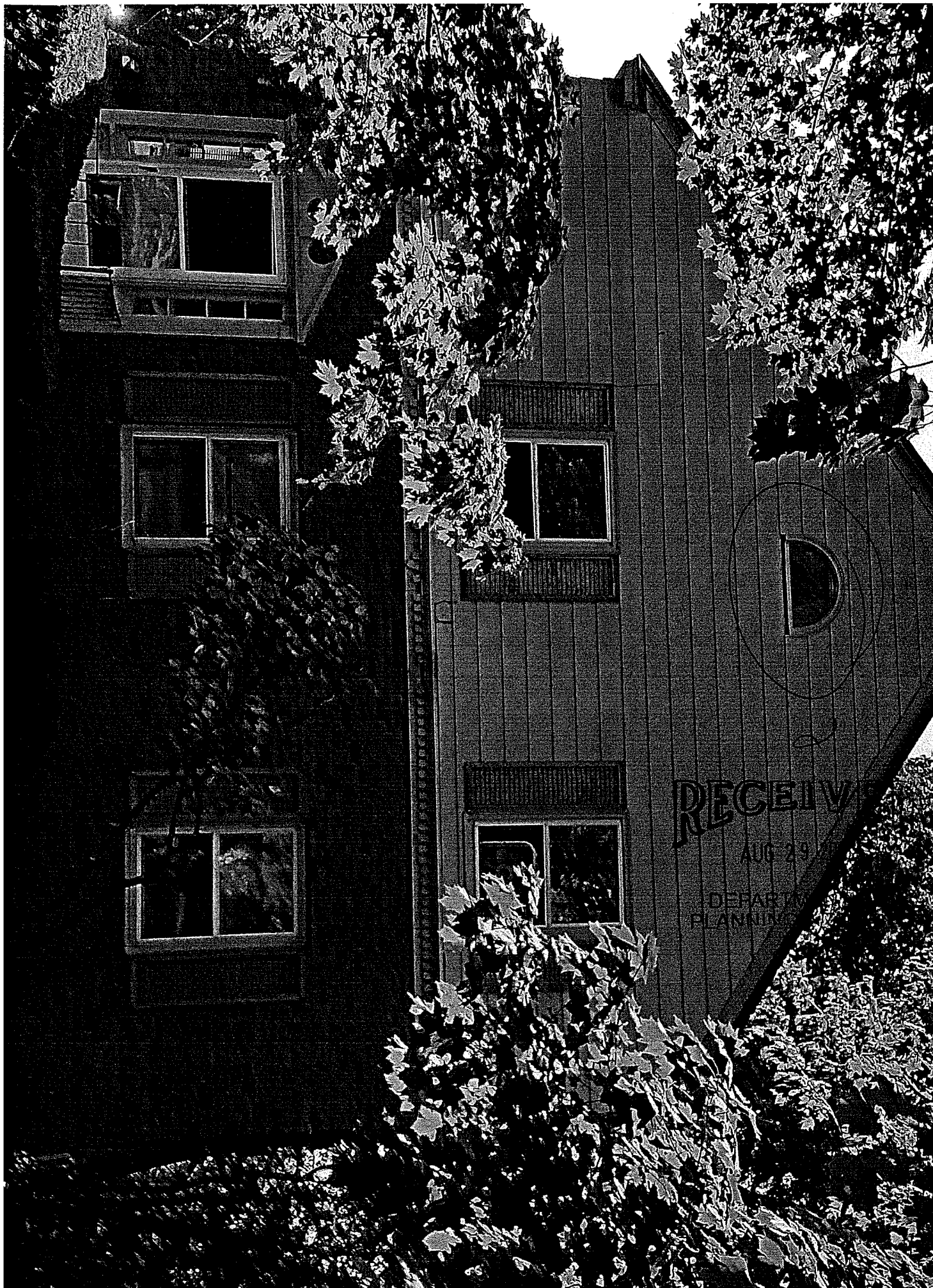
- Does your project involve new construction, addition, alteration, renovation, or repair to a structure that is heated or cooled? Yes ☒ No ☐
(If yes, the Vermont Residential Building Energy Standards (VRBES) apply. Visit the P&Z Office, Public Service Board or PSB website for details)
- Will 400 sq 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)*: \$2591.00

(*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 Eligible for Design Review? Y Age of House: 1968 Lot Size: 9210
Type: SN AW FC BA COA1 COA2 COA3 CU MA VR HO SP DT MP
Check No: 9048 Amount Paid: \$80. Zoning Permit #: 17-0253CA



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AUG 29 1971

DEPARTMENT OF
PLANNING



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MAY 29 2016
DEPARTMENT OF
PLANNING & ZONING



Harvey Industries, Inc.
1400 Main Street, Waltham, MA 02451-1689
(781) 899-3500 harveybp.com

Manufacturing ACKNOWLEDGEMENT

Williston
71 Leroy Road
WILLISTON, VT 05495-5891
Phone: (802) 660-8111 Fax: (802) 660-4782

BILL TO:

ABLE PAINT GLASS & FLOORING/MAIN
683 PINE ST
DURLINGTON, VT 05401 0000

Phone: 802-655-6500 Fax: 8026556908

SHIP TO:

ABLE PAINT GLASS & FLOORING/MAIN
683 PINE ST

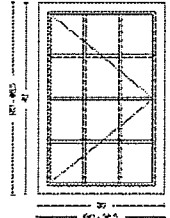
BURLINGTON VT 05401-0000
Phone: 802-655-6500 Fax: (802)655-6908



QUOTE NBR	CUST NBR	CUSTOMER PO	DATE CREATED	DATE ORDERED	ORDER TYPE
4055830	1051530		8/26/2016	Quote Not Ordered	Charge
ORDERED BY	STATUS	SHIP VIA	DELIVERY AREA		
JOSH	None	Whse Pickup	WILLISTON VT		
CLERK		JOB NAME		COUPON	
dgh - Drew Halko		BING			

LINE #	DESCRIPTION	QTY
--------	-------------	-----

2
10000-1 Majesty Casement, Unit Size 30 x 48, RO 30.5 x 48.5
Unit 1: U-Factor = 0.26, SHGC = 0.21, VT = 0.35, NFRC CPD Number =
HII-M-23-00768-00001, Custom / Call Size Option = Custom Size, New
Construction, Hinge Right
Unit 1 Glass: NFRC CPD Number = HII-M-23-00768-00001
North=Yes, North-Central=Yes
Performance Packages = E Star 6.0 2015
Unit 1: Preserve Film Required = No
Unit 1: Overall Glass Thickness = 7/8" Insulated, Triple Glazed, Double Low E,
Krypton Filled, Custom Annealed IG = Yes, IG MFG = CL
Natural Pine, Base Color = White
Window Label = Harvey, Tandem Lock, Coppertone, Sash Limit Devices = None,
Operator Arm = Double
Screen Color = Coppertone, Fiberglass Mesh, Screen Shipping Separate = No
Sim Div Lite, Colonial, A-White, Interior Finish = None, 3W4H
Overall Rough Opening Width = 30.5, Overall Rough Opening Height = 48.5
Applied Nail Fin

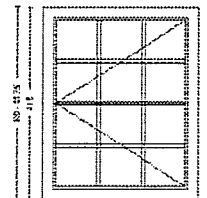


Room Location: W/ 1" CENTER GRID

LINE #	DESCRIPTION	QTY
--------	-------------	-----

1
11000-1 Majesty Casement, Unit Size 32 x 41.5, RO 32.25 x 41.75
Unit 1: U-Factor = 0.26, SHGC = 0.21, VT = 0.35, NFRC CPD Number =
HII-M-23-00768-00001, Custom / Call Size Option = Custom Size, Replacement,
Hinge Left
Unit 1 Glass: NFRC CPD Number = HII-M-23-00768-00001
North=Yes, North-Central=Yes
Performance Packages = E Star 6.0 2015
Unit 1: Preserve Film Required = No
Unit 1: Overall Glass Thickness = 7/8" Insulated, Triple Glazed, Double Low E,
Krypton Filled, Custom Annealed IG = Yes, IG MFG = CL
Natural Pine, Base Color = White
Window Label = Harvey, Tandem Lock, Coppertone, Sash Limit Devices = None,
Operator Arm = Double
Screen Color = Coppertone, Fiberglass Mesh, Screen Shipping Separate = No
Sim Div Lite, Colonial, A-White, Interior Finish = None, 3W4H
Overall Rough Opening Width = 32.25, Overall Rough Opening Height = 41.75

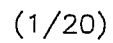
Room Location: W/ 1" CENTER GRID



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AUG 29 2016

DEPARTMENT OF
PLANNING & ZONING



AUG 29 2016

AS 109



CODE ENFORCEMENT OFFICE

645A Pine St, PO Box 84
Burlington, VT 05402-084
VOICE (802) 863-0444
FAX: (802) 652-4222

SHOW CAUSE LETTER

December 2, 2005

Bing Enterprises, Ltd.
c/o Keith S. Aaron
6 Lime Rock Road
S. Burlington, VT 05403-5836

RE: 201 South Prospect Street (hereinafter referred to as "Premises")

Dear Mr. Aaron:

It has come to the attention of this office that a potential zoning violation exists at the above referenced Premises.

Nature of Alleged Violation: Change of use from single family house to a duplex without an approved zoning permit and increasing the parking (rear) without an approved zoning permit.

Burlington Zoning Ordinance Articles: 4, 5, 6, 7, 10 and 19.

You, as the Owner of the Premises (hereinafter "Owner") have **TEN (10) CALENDAR DAYS** from the date of this memo (ie. December 12, 2005) to show cause that the alleged violation does not exist or, **within the same time frame**, remedy the alleged violation by either:

1. removing the violation, restoring the Premises to its prior state and informing this office that the violation has been removed so our office can verify compliance, or
2. submit a complete application to the Department of Planning and Zoning (located in City Hall) to cure the alleged violation. If the application or the portion of the application that deals with the alleged violation is denied, you have **TEN (10) CALENDAR DAYS** from the application denial date to remove the alleged violation and restore the Premises to its prior state.

There will be no further warnings forthcoming. Pursuant to Burlington Zoning Ordinance Article 19 and 24 V.S.A. §§1974a, 4451 and 4452, if the alleged violation has not been cured or Owner has not shown a violation does not exist within ten (10) calendar days from the date of this letter, either a Municipal Complaint Ticket or a Notice of Violation will be issued to you as Owner. Please note the first Municipal Complaint Ticket carries a waiver fee of \$100, the second ticket carries a waiver fee of \$150, and the third ticket carries a waiver fee of \$250; there is a five (5) calendar day cure period between each ticket. The Notice of Violation has a fee of up to \$100.00 for each offense. Each day that a violation is continued shall be a separate offense.

Thank you for your anticipated cooperation and prompt attention to this matter.

Sincerely,


Jeanne Francis
Zoning Specialist

Enclosures: see above

Cc: ☒ Department Planning/Zoning 

☐ Code File

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DEC 5 2005
DEPT. OF
PLANNING & ZONING

PLANNING & ZONING SUBMISSION



P K + S 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	Construction Manager (802) 651-1283 www.pcconstr.com
Freeman Francis Freeman, Architects 81 Maple Street Burlington, VT 05401	Consulting Architect (802) 664-6844 www.fffmc.com
Hardy Structural Engineering 875 Roosevelt Hwy, Suite 130 Colchester, VT 05446	Structural Engineer (802) 655-0755 www.hardysc.com
Hallam ICS 38 Eastford Drive, Suite 200 South Burlington, VT 05403	MEP / PF Consultant (802) 650-4891 www.Hallam-ICS.com
Engineering Ventures P.C. 208 Flynn Avenue, Suite 2A Burlington, VT 05401	Civil Engineer (802) 863-6225 www.engineeringventures.com
GeoDesign 1233 Shelburne Rd, Suite 360 South Burlington, VT 05403	Geotechnical Engineer (802) 652-5140 www.geodesign.net
SE Group 131 Church Street, 3rd Floor Burlington, VT 05401	Landscape Architect (802) 862-0098 www.segroup.com

NOT FOR CONSTRUCTION

Date	No.	Description
12/15/16		P&Z Submission
1/11/17		P&Z Resubmission I
1/20/17		P&Z Resubmission II
2/16/17		P&Z Resubmission III

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

COVER SHEET

Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Date:	

T-000

 CS Rim
 Elec. Meter Ped.
 Bollard
 Sign
 Tree
 Parking Meter
 Gas Valve
 Storm Manhole
 Hydrant
 Electric or T/Com Manhole
 Water Valve
 Traffic Signal
Minor Contour
Major Contour

 LOC

 Proposed Limits of Construction/Limits of Disturbance
 Adjusted Boundary Line

HE ——— OHE ——— OHE ——— Overhead Electrical/TCom Line

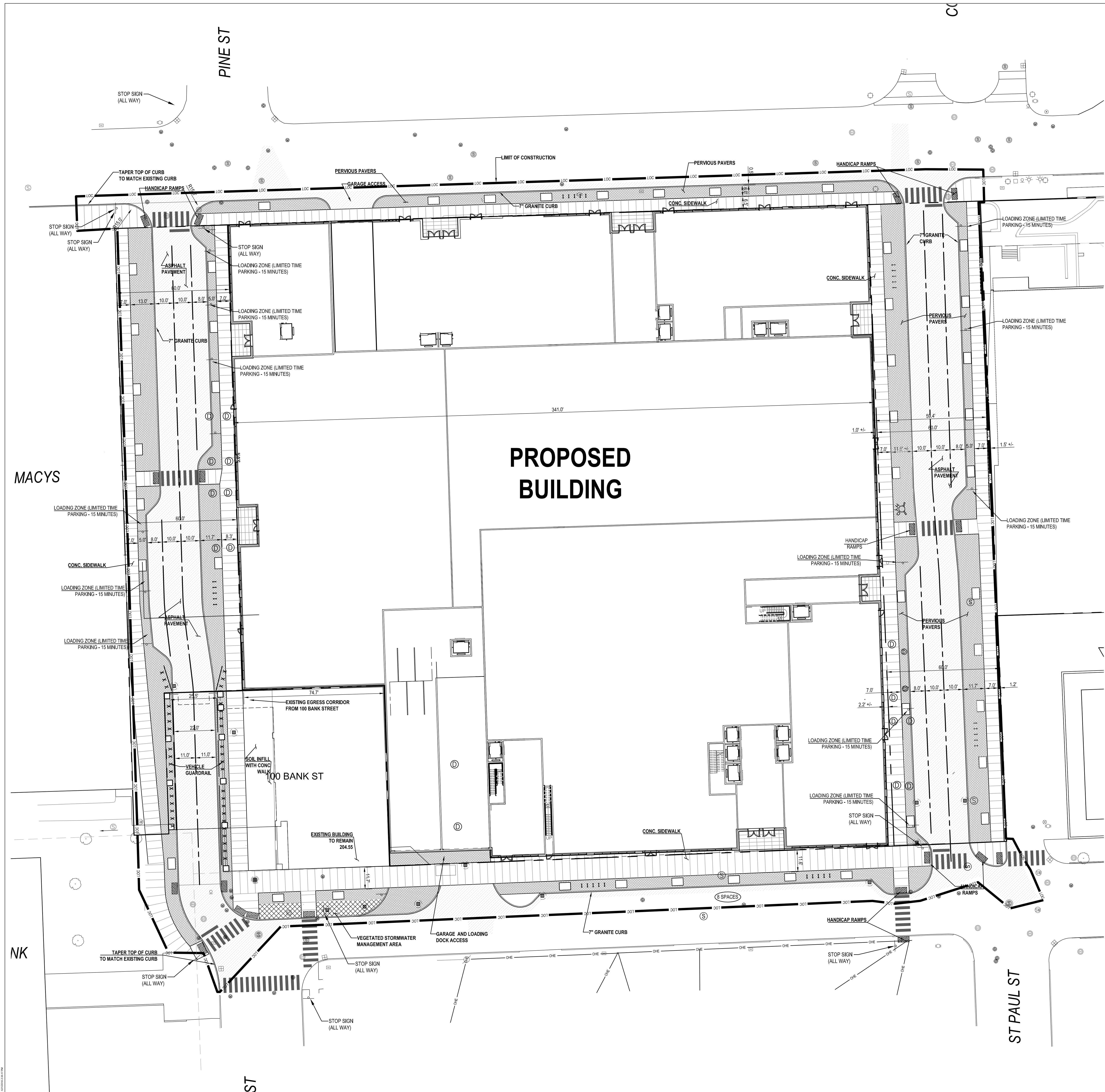
[] Sub-surface Vaults (approx. di

Appendix		
12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
02/14/2017	3	DPW Comments
Date	No.	Description

75 Cherry Street
Burlington, VT 05401

Project Number: 1317-01	Signature & Seal
Drawn By: WC/JZ	
Checked By: JZ/KW	
Scale: As Noted	

C-103

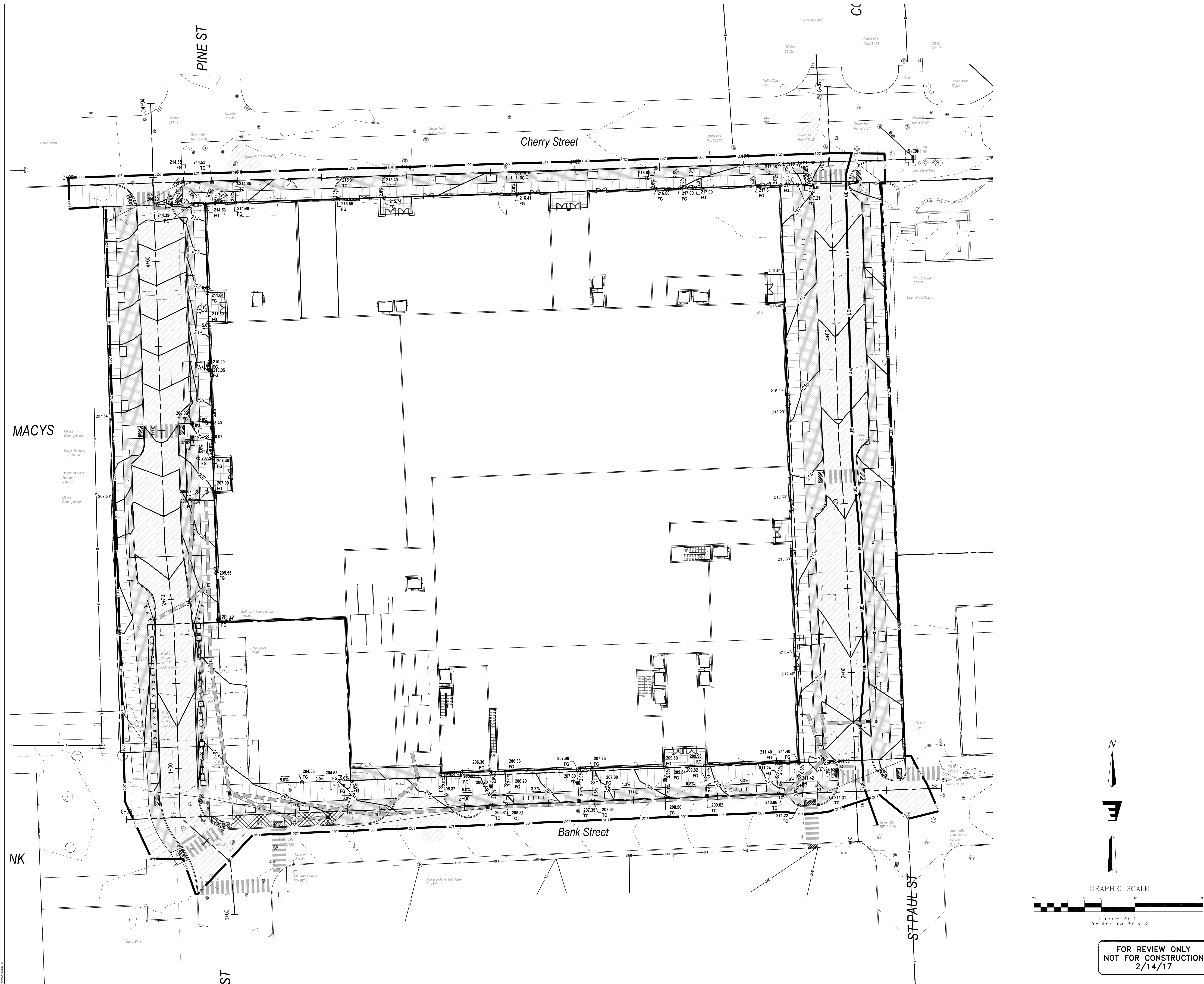


Appendix		
12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
Date	No.	Description

75 Cherry Street
Burlington, VT 05401

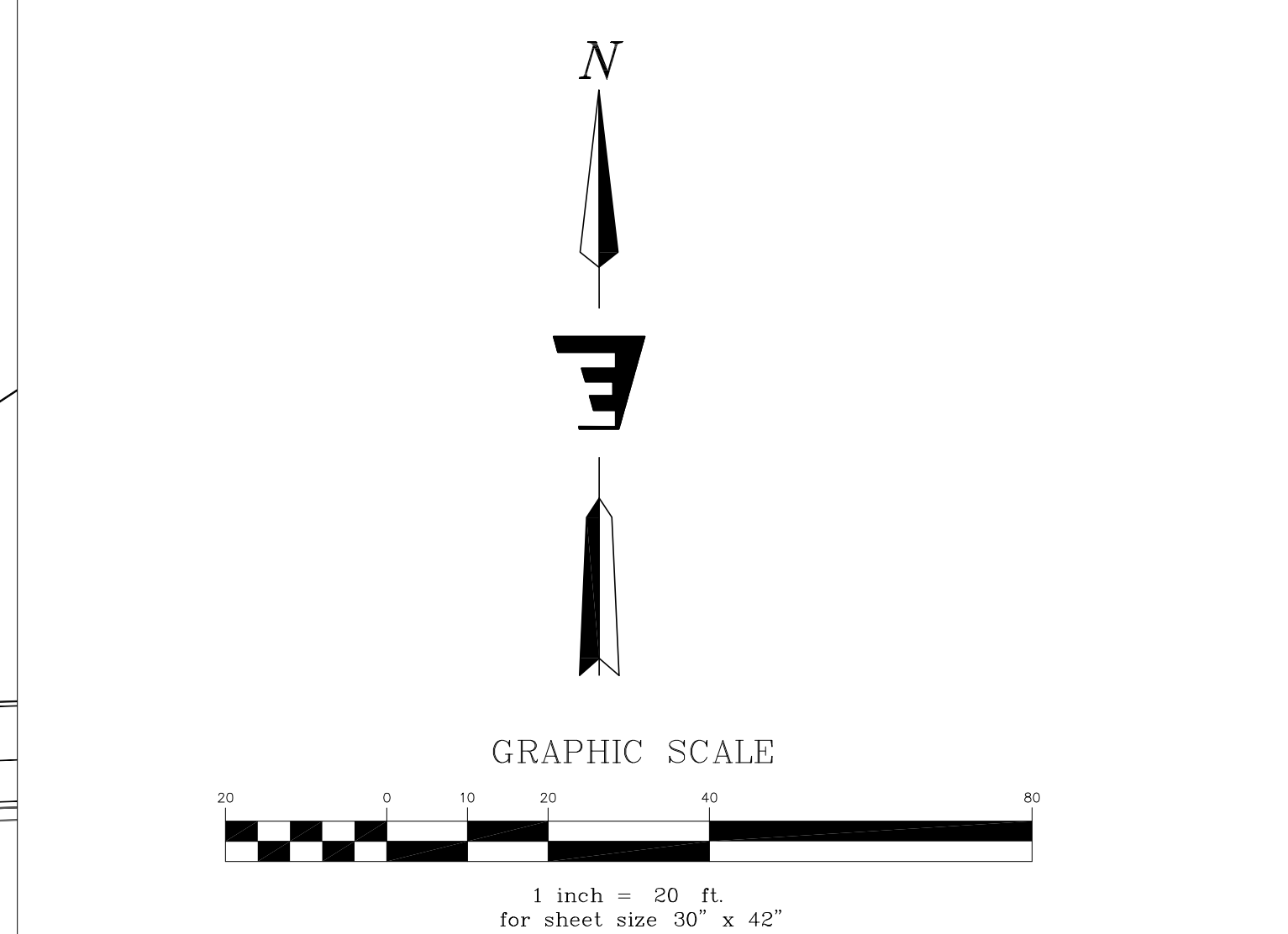
Project Number:	Signature & Seal:
1317-01	
Drawn By:	
WC/JZ	
Checked By:	
JZ/KW	
Scale:	
As Noted	

C-104





Project Number	Signature & Seal
1317-01	
Drawn By:	
WC/JZ	
Checked By:	
JZ/KW	
Scale:	
As Noted	



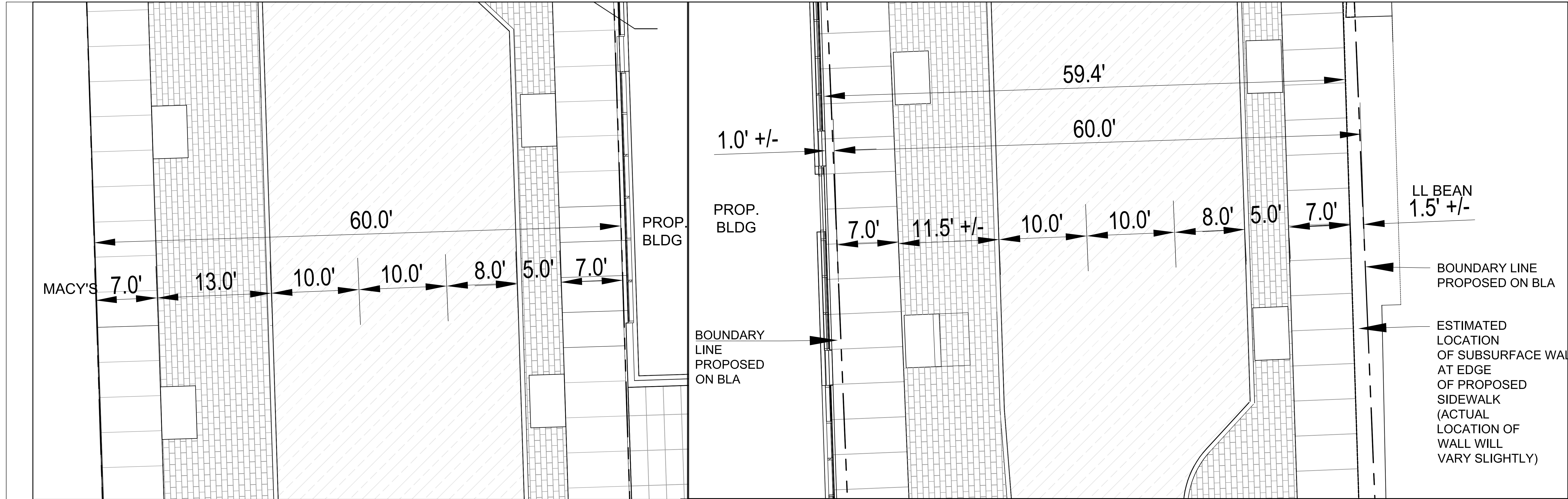
EPSC STRUCTURE LEGEND

-
- SILT FENCING** SEE 10C540
SILT STRUCTURAL MEASURE IS A TEMPORARY BARRIER OF GEOTEXTILE FABRIC USED TO INTERCEPT SEDIMENT LADEN RUNOFF FROM SMALL DRAINAGE AREAS OF DISTURBED SOIL. IT IS INSTALLED ALONG THE PERIMETER OF IMPACTED AREAS AND ALONG THE BASE OF THE FILL SLOPES. ADDITIONALLY, WHEN DESIGNATED ALONG THE LIMITS OF DISTURBANCE, INSTALL CONSTRUCTION FENCE BEHIND THE SILT FENCE. THESE WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED.
- TEMPORARY INLET PROTECTION** SEE 2 AND 9/C540
THIS STRUCTURAL MEASURE IS A EITHER STONE SURROUNDING A CATCH BASIN INLET OR FILTER FABRIC SURROUNDING THE GRATE OF A CATCH BASIN TO PREVENT SEDIMENT FROM ENTERING A CLOSE-TO-STORM SYSTEM. INSTALL AS INDICATED ON PLANS. GENERALLY, FILTER INLET PROTECTION SHOULD BE USED IN PAVED AREAS AND STONE INLET PROTECTION SHOULD BE USED IN GRASSSED AREAS. STONE TO BE REMOVED AND REPLACED WITH CLEAN STONE WHEN SEDIMENT IS ≤ 12 DEPTH OF STONE. FABRIC TO BE CLEANED/REPLACED WHEN WATER SEEPAGE INTO CATCH BASIN IS INHIBITED BY SEDIMENT BUILDUP ON FABRIC. REMOVE ALL SEDIMENT IF COLLECTED IN STRUCTURE AS SOON AS POSSIBLE. INSTALL ON EXISTING INLETS PRIOR TO REMOVAL AND PROPOSED INLETS AFTER INSTALLATION.
- APPROXIMATE SOIL STOCKPILE AREAS**
THESE ARE APPROVED LOCATIONS WHERE TOPSOIL AND OTHER SOIL MATERIALS MAY BE STORED. THESE STOCKPILES WILL BE PROTECTED FROM EROSION BY A NUMBER OF METHODS, INCLUDING INSTALLING SILT FENCING AROUND THE DOWN GRADIENT PERIMETER OF THE STOCKPILE AND SEEDING AND MULCHING THE STOCKPILE WHEN NOT IN USE FOR MORE THAN FIVE DAYS. CONTRACTOR SHALL SUBMIT PROPOSED AREA FOR ENGINEER APPROVAL.
- APPROXIMATE STAGING AND WASTE AREAS**
THESE ARE APPROVED LOCATIONS WHERE NON-SOIL, NON-ERODEABLE MATERIALS MAY BE STORED. SOILS SHALL NOT BE STORED IN THESE AREAS.
- LIMITS OF DISTURBANCE**
THE CONTRACTOR SHALL CONTAIN ANY EARTH MOVING ACTIVITIES WITHIN THE DESIGNATED LIMITS SHOWN ON THIS PLAN. THE ENGINEER SHALL REVIEW THE SITE TO MAKE ANY ADJUSTMENTS TO ACCOUNT FOR ENVIRONMENTALLY SENSITIVE AREAS, SPECIMEN TREES AND SPECIAL AREAS OF CONCERN. THE LIMITS SHALL BE DEMARKED WITH CHAIN LINK FENCE THIS WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED WITH CONFIRMAL LOCATION, EXTENTS AND GATES WITH OWNER, FENCE LOCATION AND GATES TO BE RE-ADJUSTED AS NECESSARY BASED ON CM REQUIREMENTS AND COORDINATION

EROSION CONTROL NOTES

- GENERAL NOTES**
1. HOLD PRE-CONSTRUCTION CONFERENCE AT LEAST ONE WEEK PRIOR TO STARTING CONSTRUCTION, WITH THE CONTRACTOR, OWNER AND ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING ALL EROSION CONTROL MEASURES DELINEATED ON THE PLANS AND ANY ADDITIONAL MEASURES THAT ARE NECESSARY TO MINIMIZE EROSION. THE CONTRACTOR SHALL HAVE EROSION CONTROL MATERIALS AND INSTALLATION EQUIPMENT ON SITE AT ALL TIMES.
- GENERAL NOTES**
1. THE "ON-SITE EROSION CONTROL PLAN COORDINATOR" SHALL BE PRESENT ON-SITE FROM DAY-TO-DAY, AND SHALL BE RESPONSIBLE FOR ENSURING THAT THE EROSION CONTROL MEASURES REQUIRED BY THE EROSION CONTROL PLAN (DETAILS AND NOTES), ARE PROPERLY INSTALLED AND MAINTAINED. THE ON-SITE EROSION CONTROL PLAN COORDINATOR SHALL KEEP A WRITTEN RECORD OF INSPECTIONS AND MAINTENANCE OF EROSION CONTROL FEATURES. A COPY OF THESE PLANS AND INSPECTION/MAINTENANCE RECORDS SHALL BE KEPT ON-SITE AT ALL TIMES.
2. EROSION CONTROL MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH THE "VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL", DATED 2006.
- TEMPORARY/CONSTRUCTION EROSION CONTROL MEASURES**
1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE DISTURBED AT ANY ONE TIME DURING DEVELOPMENT. WHEN LAND IS DISTURBED, THE DISTURBANCE SHALL BE KEPT TO THE SHORTEST PRACTICAL DURATION AS APPROVED BY THE ENGINEER.
2. DUST SHALL BE CONTROLLED WITH WATER DISTRIBUTED BY A TRUCK-MOUNTED SPRAY BAR, CALCIUM CHLORIDE (ASPHALT M 144) OR SODIUM CHLORIDE (INSTALLED M 143) SHALL BE USED AS DIRECTED BY THE ENGINEER.
3. SILT FENCES SHALL BE INSTALLED GENERALLY 10 FEET FROM THE BASE OF THE FILL SLOPES, OR AS SHOWN ON THE PLANS. THESE SHALL REMAIN IN PLACE UNTIL THE PROJECT SITE HAS BEEN STABILIZED. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES 6 INCHES DEEP AT THE FENCE. THE SILT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A PROPER SEDIMENT BARRIER.
4. EXCAVATED MATERIAL FROM EARTH EXCAVATION AND DITCH DIGGING SHALL BE PLACED ON-SITE IN A LOCATION TO BE APPROVED OF BY THE OWNER AND/OR THE ENGINEER OR USED FOR PROJECT FILL MATERIAL, IF DETERMINED SUITABLE BY THE OWNER'S REPRESENTATIVE.
5. STOCKPILED MATERIAL (TOPSOIL, BORROW, ETC.) SHALL BE SILT FENCE CONSTRUCTED AROUND THE PERIMETER. THE STOCKPILED MATERIAL SHALL BE SEEDED AND MULCHED AS SOON AS POSSIBLE TO PREVENT SOIL EROSION AND SEDIMENTATION OFF SITE. LOCATE STOCKPILES ON THE UPHILL SIDE OF DISTURBED AREAS, IF POSSIBLE. DURING WINDY CONDITIONS, STOCKPILED MATERIAL SHALL BE COVERED OR WATERED APPROPRIATELY TO PREVENT WIND EROSION.
6. SLOPES GREATER THAN 3:1 SHALL HAVE EROSION CONTROL NETTING INSTALLED TO STABILIZE THE SLOPE AND REDUCE THE EROSION POTENTIAL. NETTING SHALL BE BIODEGRADABLE WITH A 12 MONTH LONGEVITY. S15088 AS MANUFACTURED OR APPROVED EQUIVALENT. INSTALL NETTING OVER UNMULCHED SLOPES SO THAT ALL PARTS ARE IN CONTACT WITH THE SOIL AND NOT PINNING WITH THE STAPLES. 3 FEET OR 4' TO ENSURE FULL BONDING WITH SOIL SURFACE. THE SLOPE SURFACING SHOULD BE LEFT SLIGHTLY ROUGHENED AND NOT SMOOTH. IF LARGE AMOUNTS OF OFFSITE WATER WILL DRAIN OVER THESE SLOPES, TEMPORARY DIVERSION SWALES SHALL BE INSTALLED UP SLOPE UNTIL THE SLOPE VEGETATION STABILIZES.
- PERMANENT EROSION CONTROL MEASURES**
1. WHEN FINAL GRADES ARE REACHED IN AN AREA, IT SHALL BE SEEDED AND MULCHED WITHIN 48 HOURS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUED MAINTENANCE OF ALL DISTURBED AREAS, INCLUDING WATERING UNTIL THE AREA IS INSPECTED AND ACCEPTED BY THE OWNER OR ENGINEER.
3. AFTER THE SITE IS STABILIZED, REMOVE ALL TEMPORARY MEASURES AND INSTALL PERMANENT VEGETATION ON THE DISTURBED AREAS.
4. RE-SEEDING SHALL BE DONE UNTIL ALL AREAS ARE COMPLETELY COVERED WITH A MATURE STRAND OF GRASS. AN AREA SHALL BE CONSIDERED COVERED WHEN THE ENTIRE SURFACE CONTAINS A VERDANT STRAND OF GRASS. AREAS THAT, IN THE OPINION OF THE ENGINEER, ARE PREDOMINATELY WEEDS SHALL BE PLOWED UP, FINE GRADED, FERTILIZED AND RE-SEED IN THE MANNER SPECIFIED PREVIOUSLY. EXERCISING CAUTION NOT TO CAUSE DAMAGE TO NEW OR EXISTING PLANT MATERIAL.

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PINE STREET – DIMENSIONS AT NORTH END

ST PAUL STREET – DIMENSIONS AT NORTH END

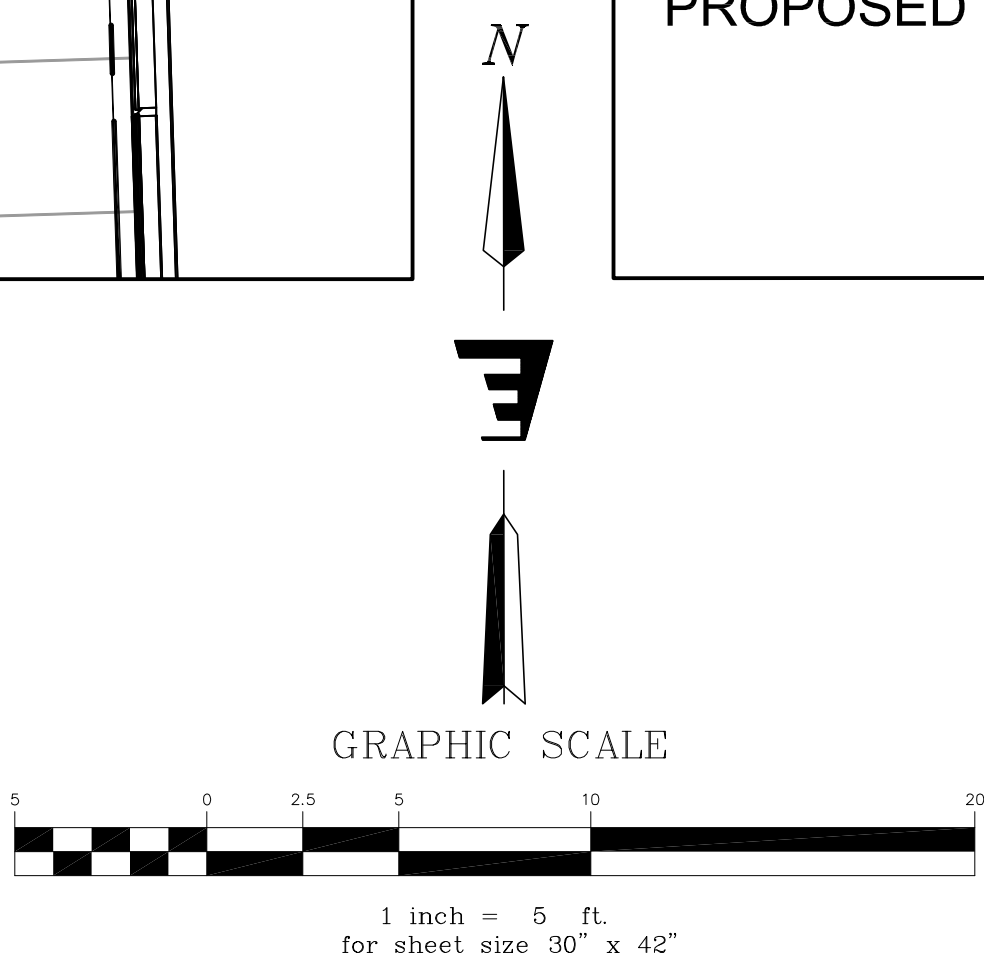


PINE STREET – DIMENSIONS AT MID-LOWER BLOCK



ST PAUL STREET – DIMENSIONS AT SOUTH END

02/14/2017 10:17 AM



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02/14/2017	1	DPW Comments

Date	No.	Description

Burlington Town Center
Devonwood Investors
75 Cherry Street
Burlington, VT 05401

St Paul and Pine Street
Dimensions

Project Number 1317-01	Signature & Seal
Owner Ref WC/JZ	
Checker Ref JZ/KW	
Scale As Noted	
Drawing Number	

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Assessment

12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
02/14/2017	3	DPW Comments
Date	No.	Description

75 Cherry Street
Burlington, VT 05401

Drawing Title:

CHERRY STREET PROFILE

Project Number	Signature & Seal
1317-01	
Drawn By	
WC/JZ	
Checked By	
JZ/KW	
Scale	
As Noted	

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C-202

Drawing



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C-203

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12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
02/14/2017	3	DPW Comments
Date	No.	Description

Burlington Town Center
Devonwood Investors

75 Cherry Street
Burlington, VT 05401

PINE STREET PROFILE

Project Number	Signature & Seal
1317-01	
Drawn By: WC/JZ	
Checked By: JZ/KW	
Scale:	
As Noted	



C-204

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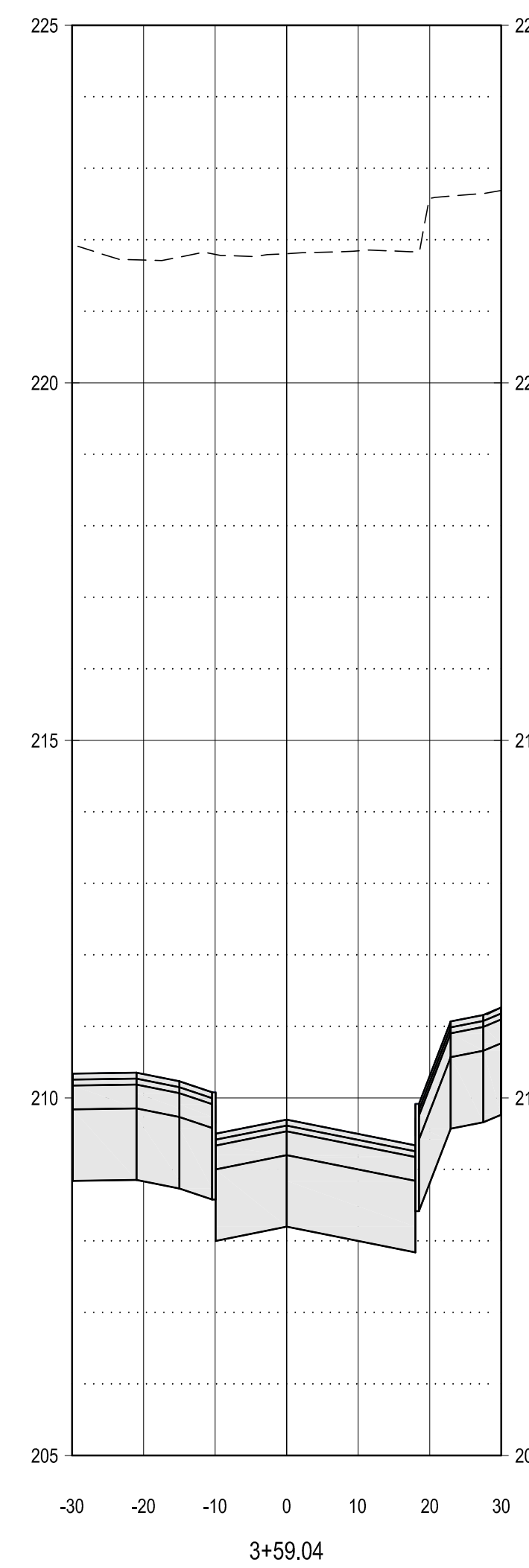
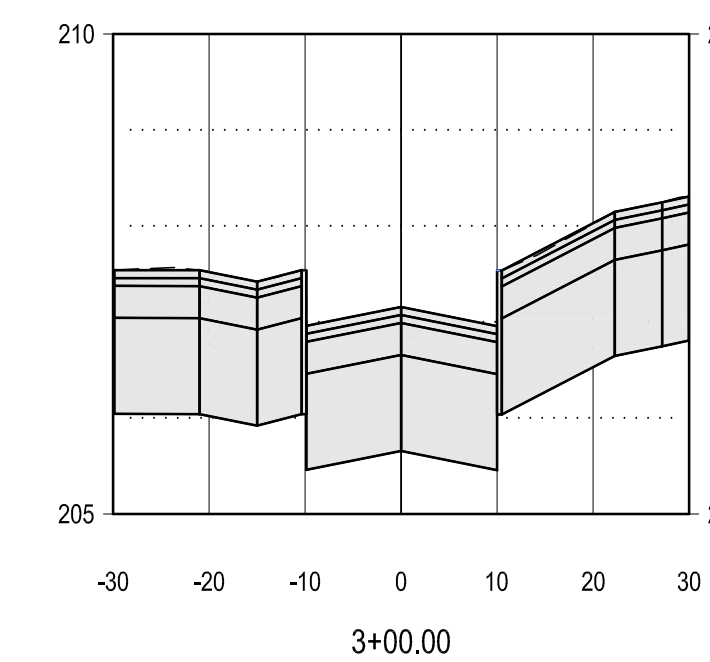
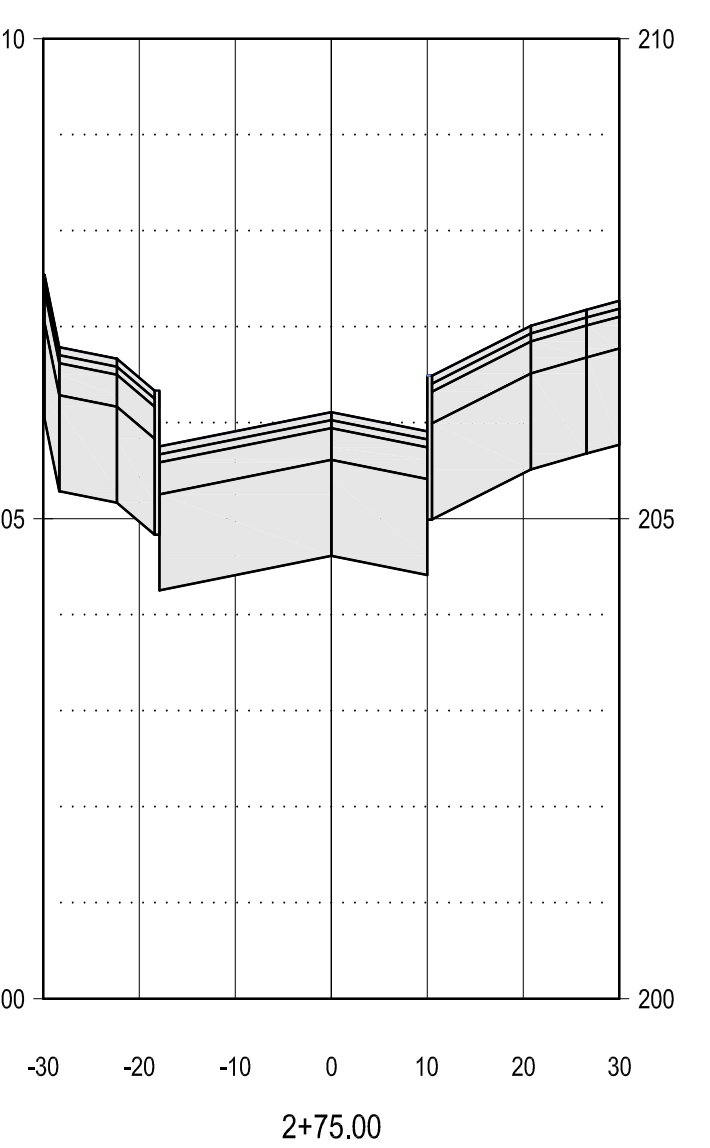
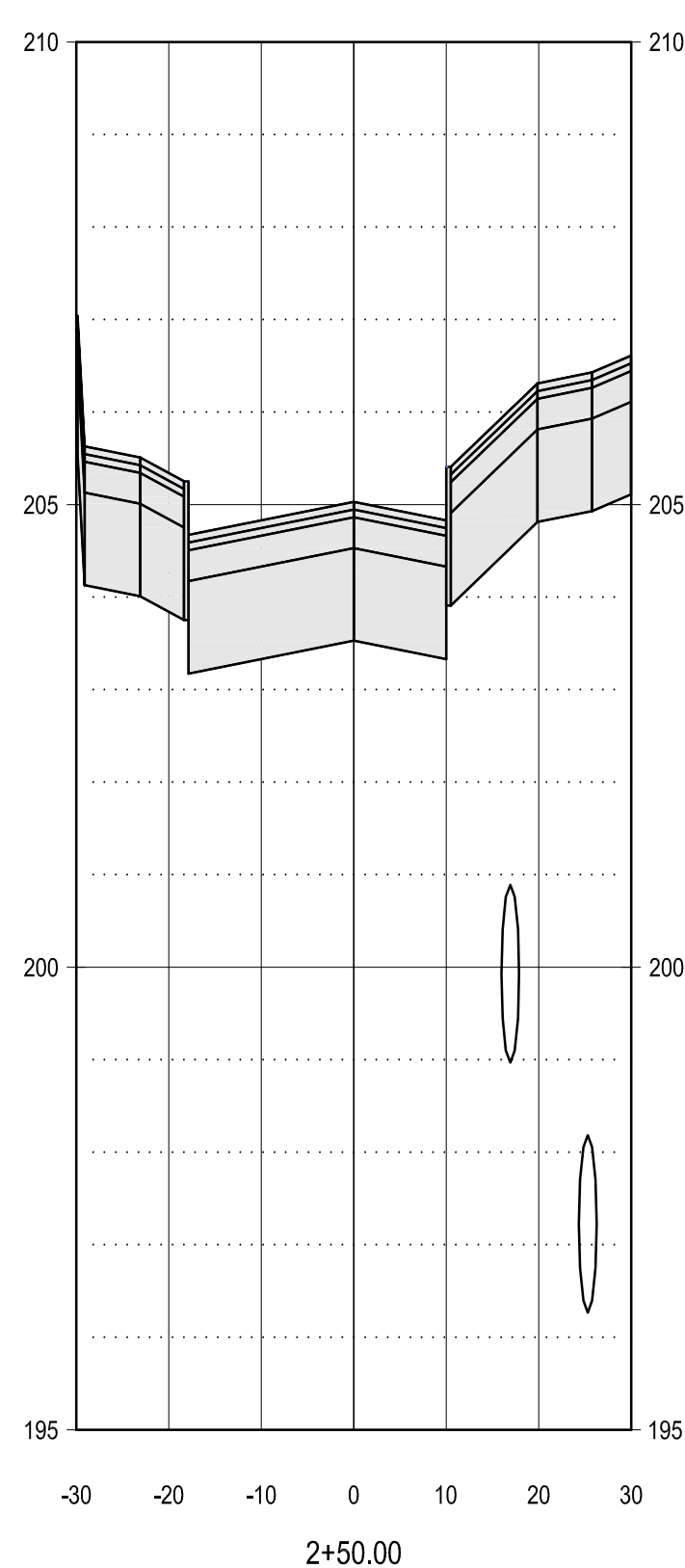
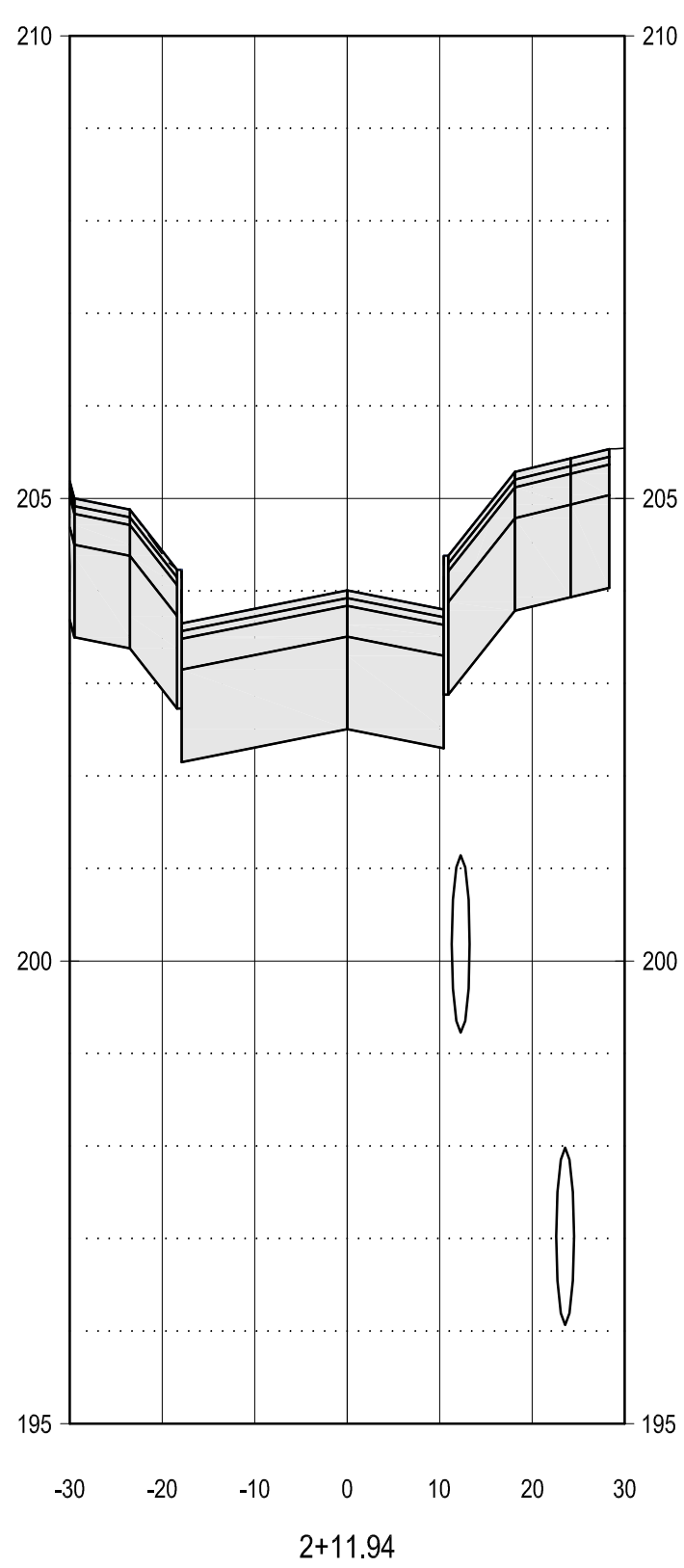
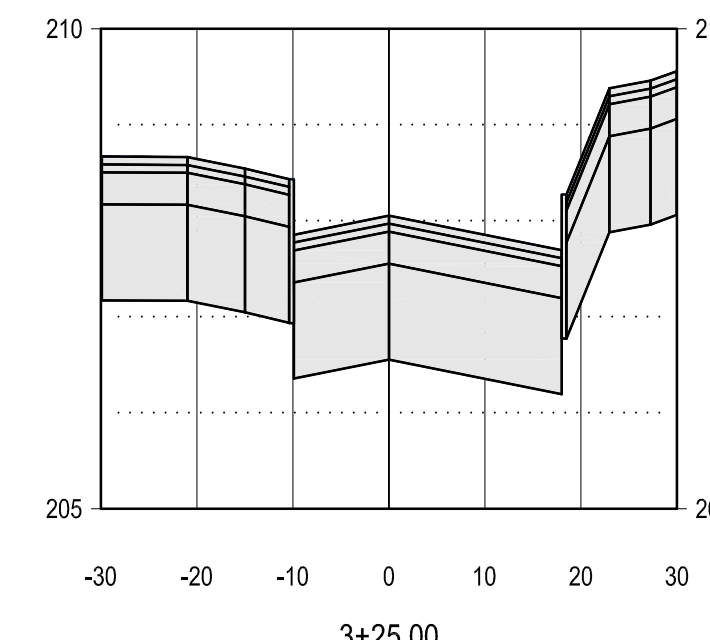
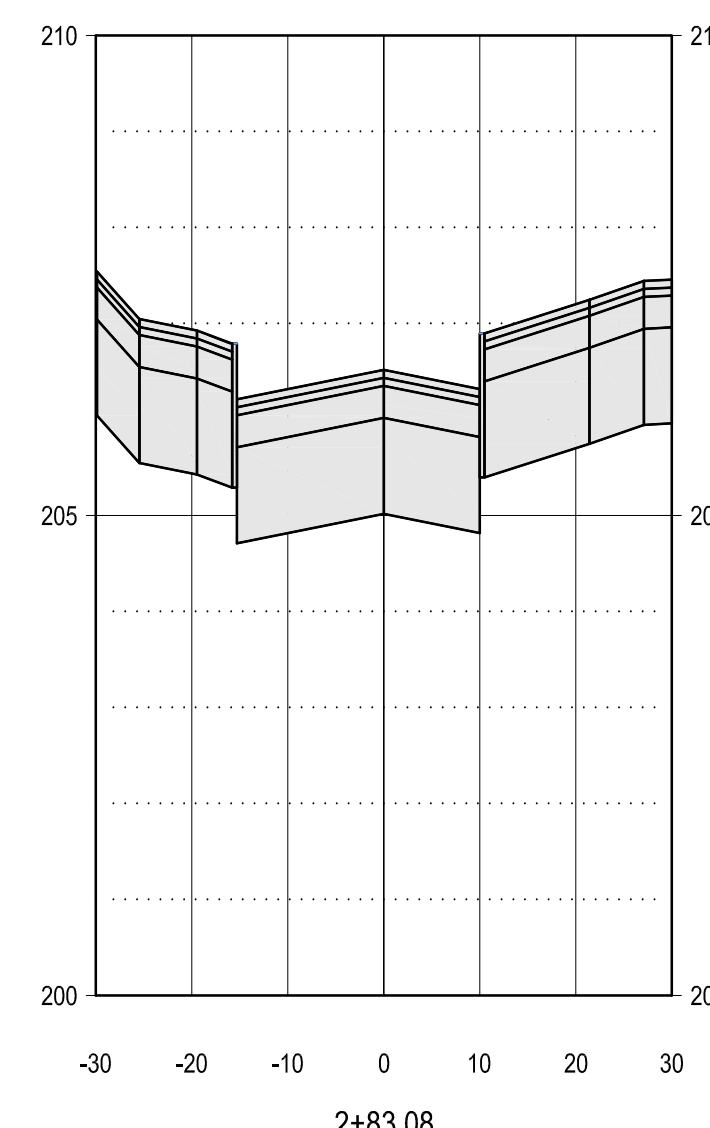
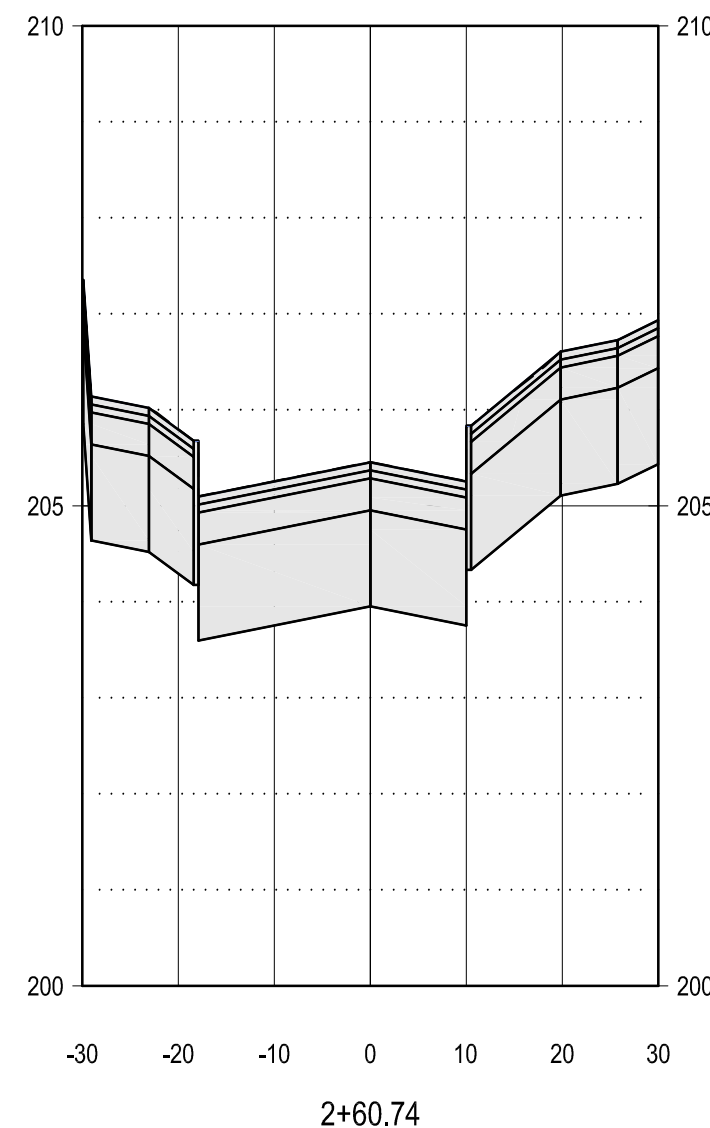
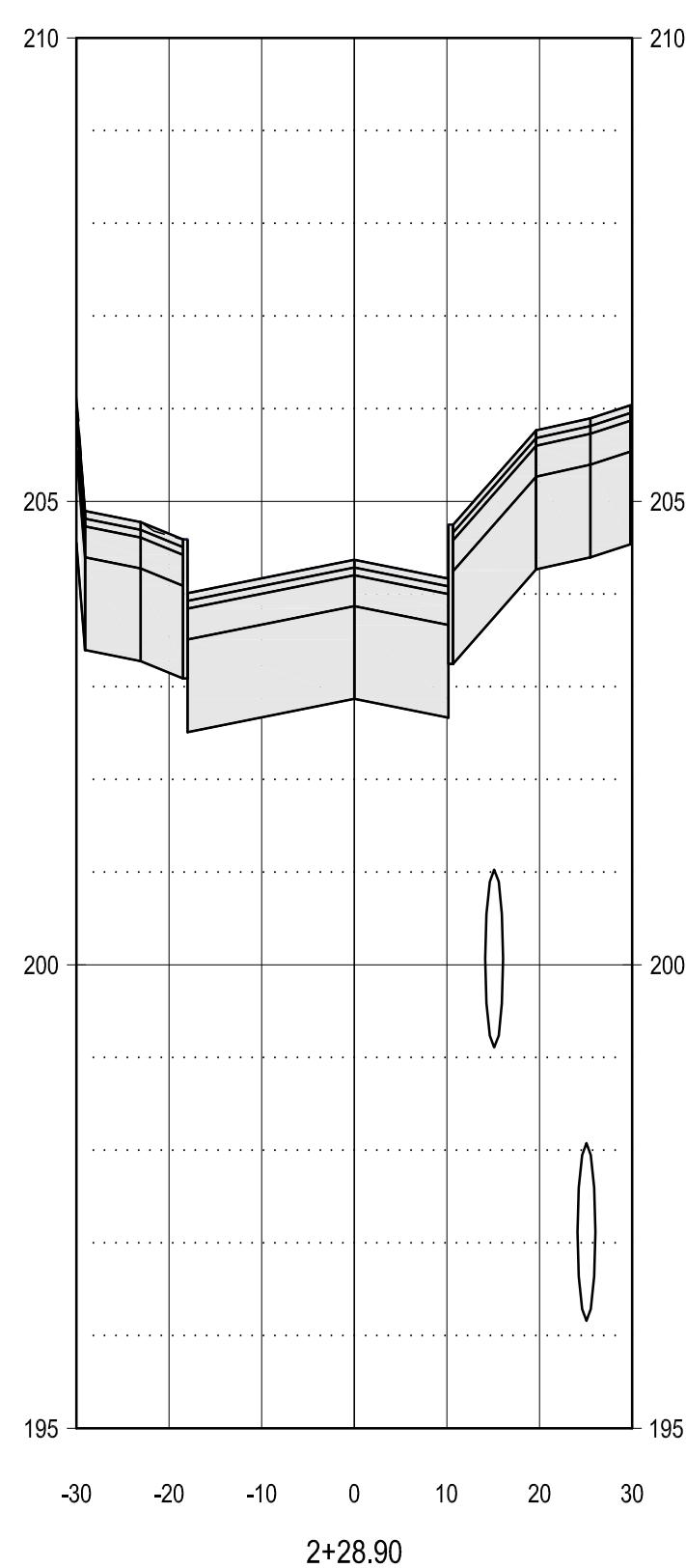
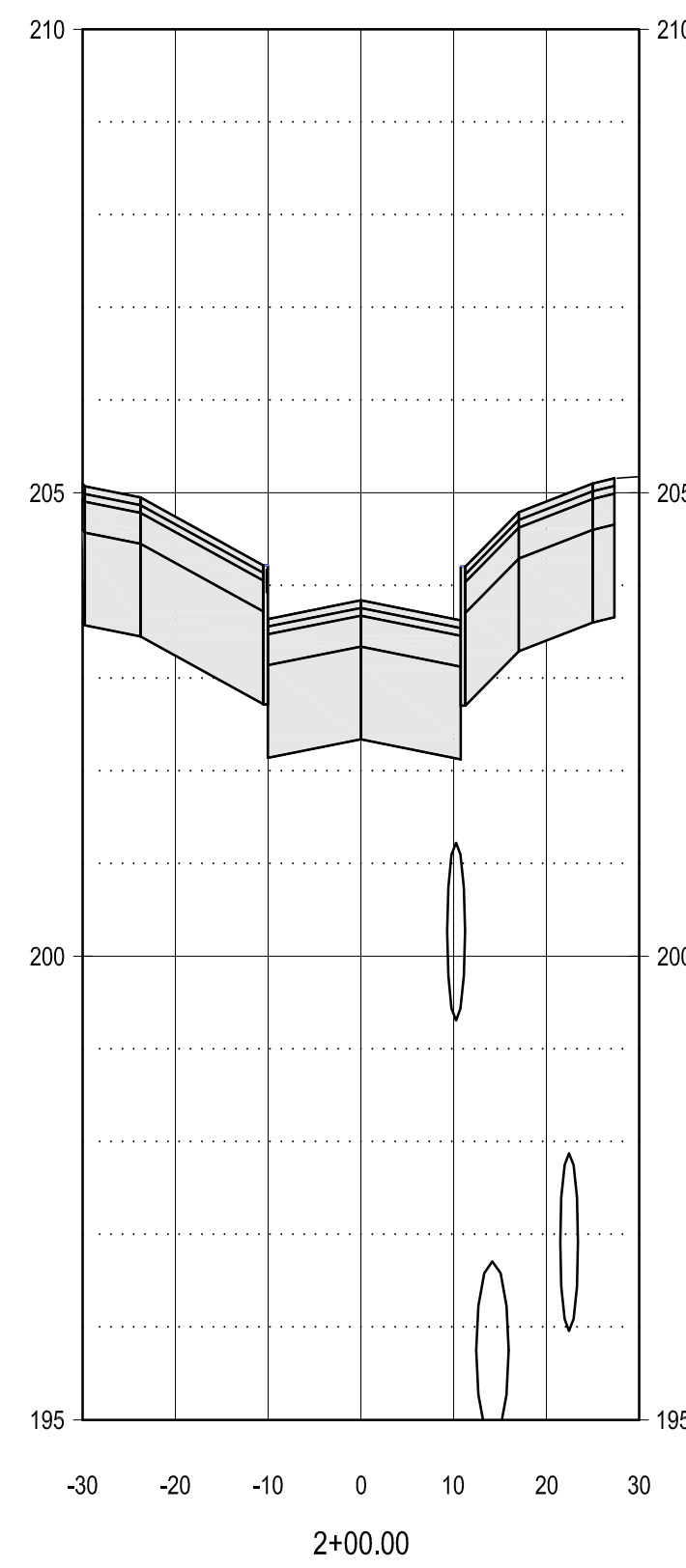
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PINE STREET CROSS-SECTIONS

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2/14/17

C-205

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12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
02/14/2017	3	DPW Comments
Date	No.	Description

Burlington Town Center
Devonwood Investors

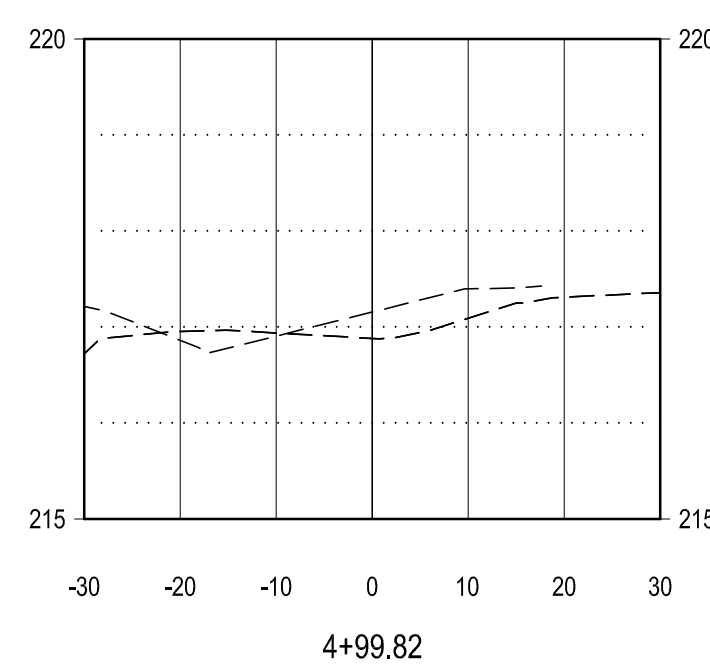
75 Cherry Street
Burlington, VT 05401

PINE STREET SECTIONS

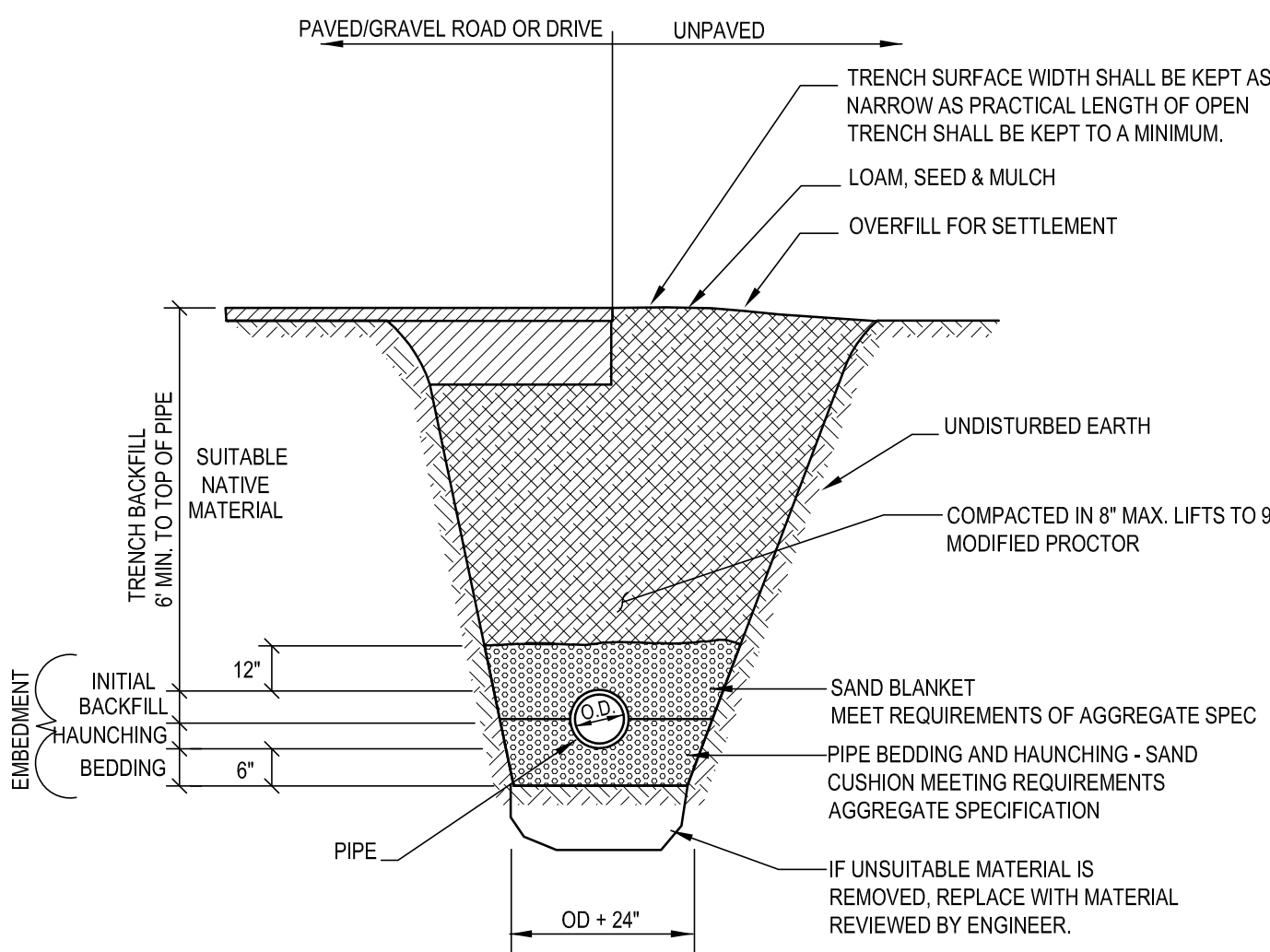
Project Number: 1317-01	Signature & Seal
Drawn By: WC/JZ	
Checked By: JZ/KW	
Notes: As Noted	

Drawing Number:

Drawing:



C-206



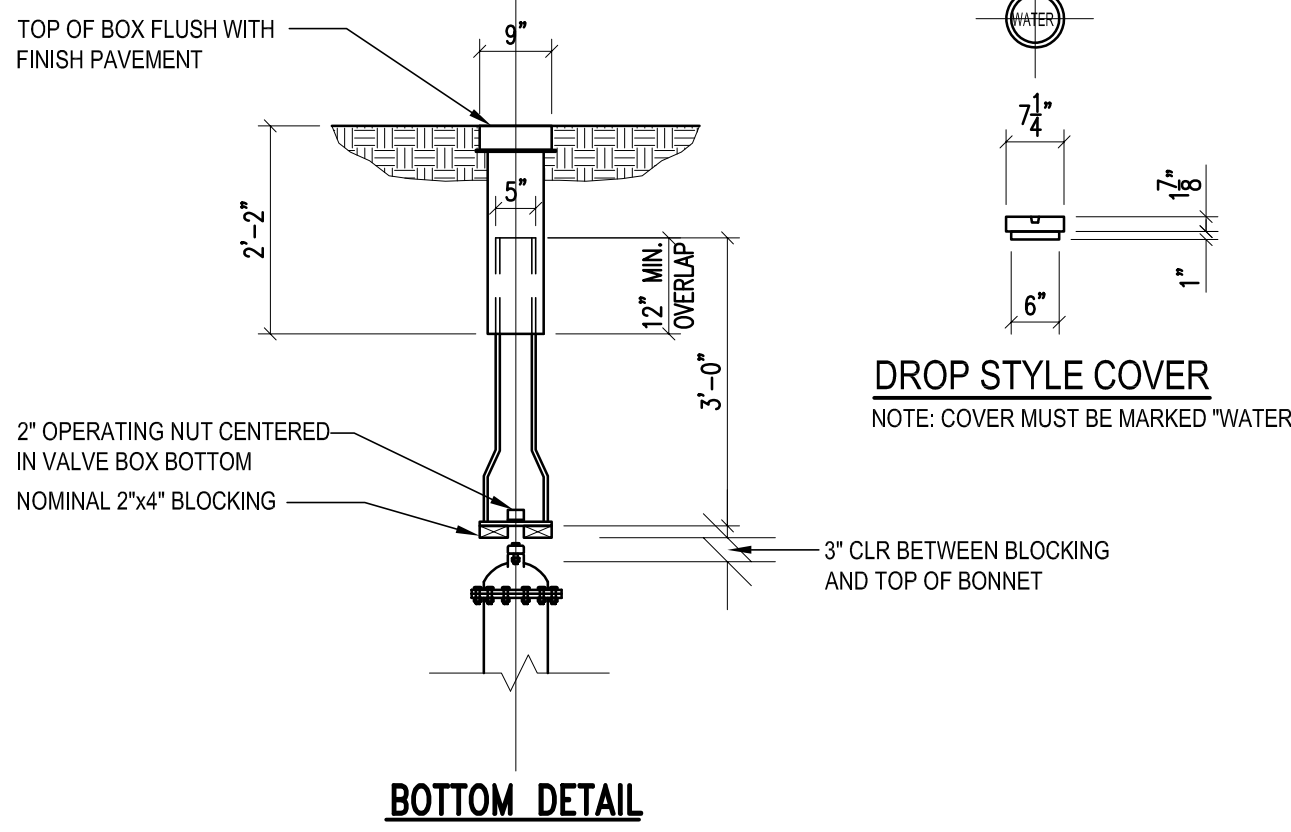
WATER TRENCH NOTES:

1. BEDDING TO PROVIDE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR THE FULL LENGTH OF PIPE.
2. PROVIDE 6" MINIMUM COVER OVER WATER PIPE.
3. INSTALL WATER PIPE IN ACCORDANCE WITH AWWA STANDARD C600.

TYPICAL WATER TRENCH DETAIL

SCALE: NONE

1



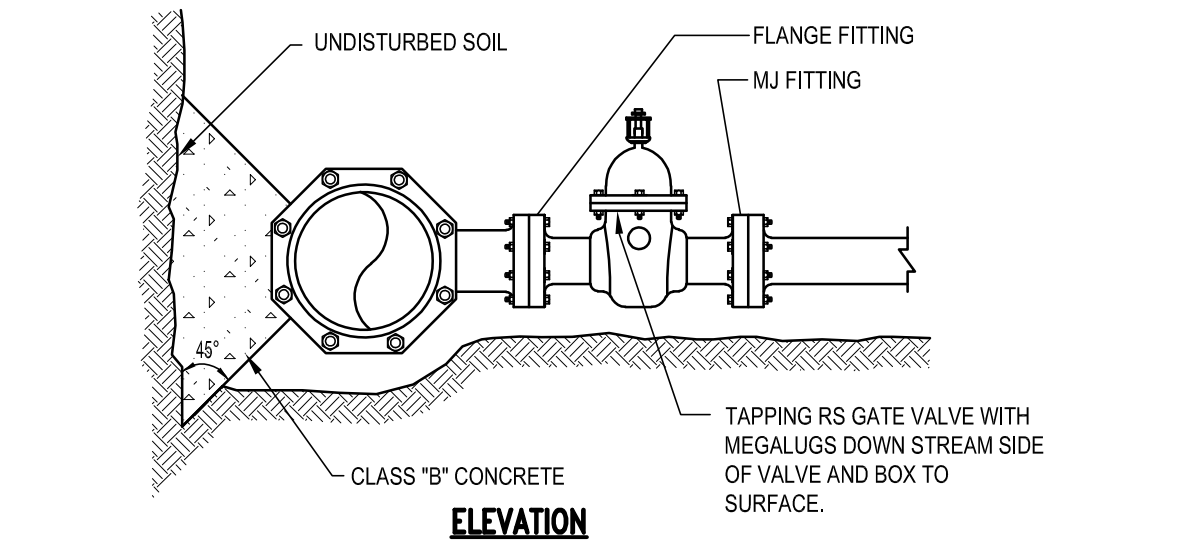
VALVE BOX NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FORM TOP OF PIPE TO FINISH GRADE.
3. VALVE ROTATION PER DPV STANDARDS.

TYPICAL VALVE BOX DETAIL

SCALE: NONE

4



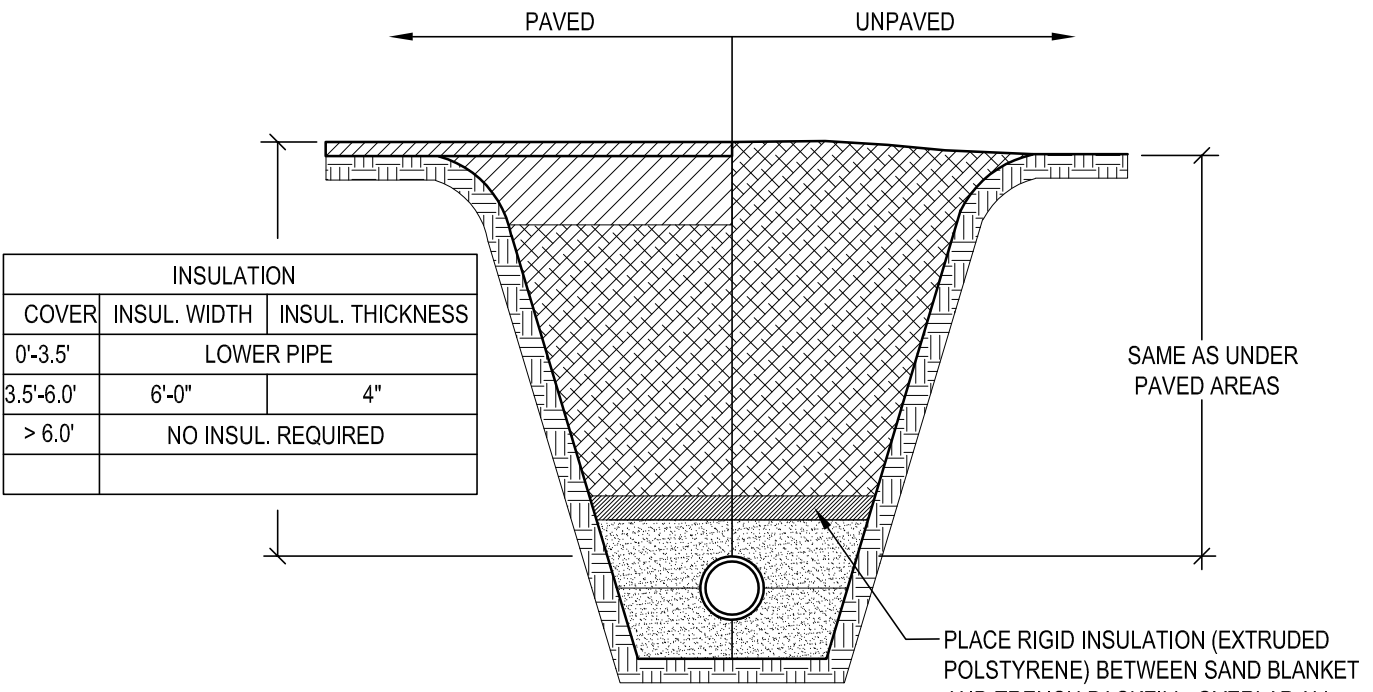
NOTE:

1. SEE GATE VALVE DETAIL FOR ADDITIONAL REQUIREMENTS
2. AREA OF BEARING AGAINST UNDISTURBED SOIL SHALL BE THE SAME AS FOR 14" BEND (90°) THRUST BLOCK

TAPPING SLEEVE AND VALVE

SCALE: NONE

5



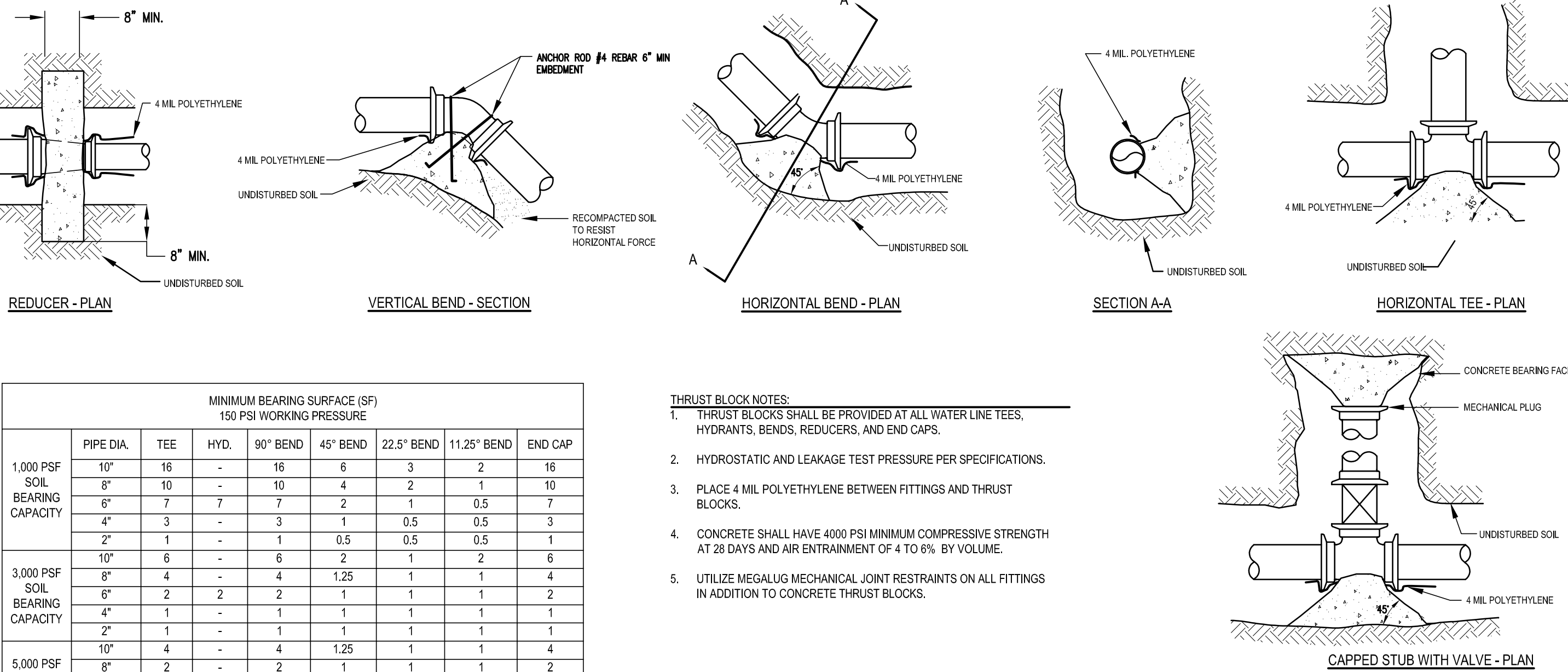
TRENCH NOTES:

1. REFER TO APPLICABLE TRENCH DETAIL FOR SPECIFIC BACKFILL INFORMATION.

INSULATION OVER SHALLOW WATER LINE DETAIL

SCALE: NONE

2



THRUST BLOCK NOTES:

1. THRUST BLOCKS SHALL BE PROVIDED AT ALL WATER LINE TEES, HYDRANTS, BENDS, REDUCERS, AND END CAPS.
2. HYDROSTATIC AND LEAKAGE TEST PRESSURE PER SPECIFICATIONS.
3. PLACE 4 MIL POLYETHYLENE BETWEEN FITTINGS AND THRUST BLOCKS.
4. CONCRETE SHALL HAVE 4000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AND AIR ENTRAINMENT OF 4 TO 6% BY VOLUME.
5. UTILIZE MEGALUG MECHANICAL JOINT RESTRAINTS ON ALL FITTINGS IN ADDITION TO CONCRETE THRUST BLOCKS.

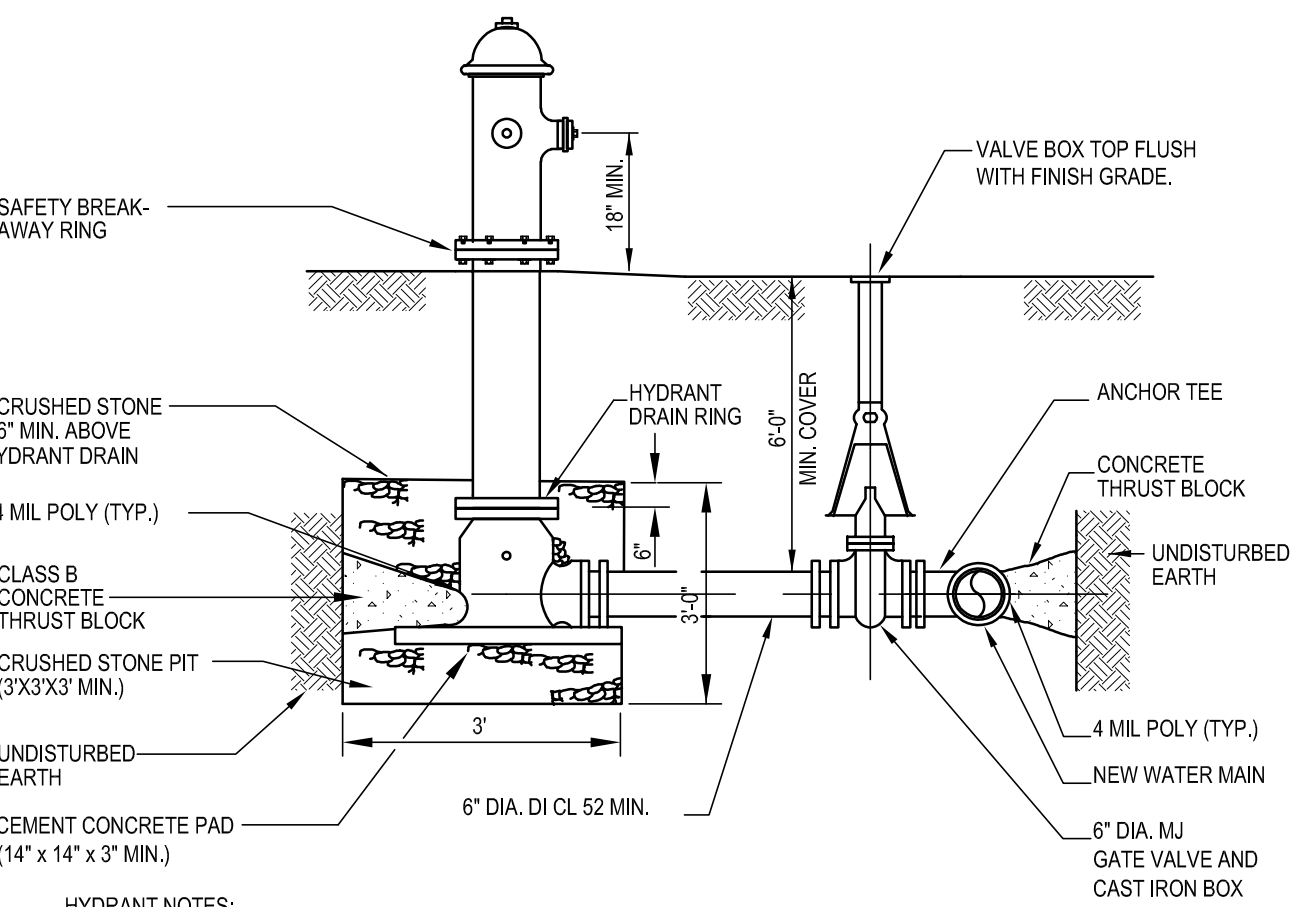
TYPICAL BEARING THRUST BLOCK

SCALE: NONE

6

NOTE:

THE CITY OF BURLINGTON HOLDS THE RIGHT OF FIRST REFUSAL FOR ALL WATER SYSTEM WORK. COORDINATE WITH PUBLIC WORKS DEPARTMENT.



HYDRANT NOTES:

1. HYDRANTS WHICH ARE INSTALLED WHERE THE NATURAL GROUND WATER TABLE IS ABOVE THE HYDRANT WASTE ORIFICE AND WHERE HYDRANTS ARE LOCATED WITHIN 10' OF SEWER LINES SHALL HAVE THE ORIFICE PLUGGED. HYDRANTS WITH PLUGGED ORIFICES SHALL BE LABELED "ND" FOR NON-DRAINING IN 3" HIGH ORANGE PAINTED LETTERS ON THE BONNET FACING THE ROAD.

FIRE HYDRANT DETAIL

SCALE: NONE

3

WATER NOTES

GENERAL

1. METERS FOR SERVICE CONNECTIONS 3/4" OR SMALLER WILL BE PROVIDED BY THE WATER UTILITY, BUT INSTALLED BY THE CONTRACTOR.
2. WATER SYSTEM COMPONENTS ARE TO BE LEAD FREE, AND APPROVED BY THE WATER DEPARTMENT.
3. A REPRESENTATIVE FOR THE WATER UTILITY MUST BE PRESENT, UNLESS OTHERWISE NOTIFIED IN WRITING, FOR ALL WATER MAIN TAPS.
4. WATER INFRASTRUCTURE IS TO INCLUDE SWING TIES - AS BUILT DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR WHICH REFLECT ACTUAL UTILITY LOCATIONS AND RESULTING EASEMENTS AT THE TIME OF COMPLETION OF THE SYSTEM.
5. THE WATER UTILITY SHALL INSPECT ALL ITEMS TO BE TAKEN OVER BY THE TOWN PRIOR TO ACCEPTANCE.
6. THE CONTRACTOR SHALL PROVIDE A 2 YEAR WARRANTY ON ALL WATER RELATED ITEMS FROM THE TIME OF COMPLETION OF THE PROJECT.

EXISTING UTILITIES

1. LOCATION OF UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN AS APPROXIMATE ON THE CONTRACT DOCUMENTS.
2. ALL UTILITIES SHALL BE LOCATED BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.
3. EXISTING UTILITIES SHALL BE PROTECTED AND SUPPORTED DURING CONSTRUCTION.
4. ALL WATER, GAS, CABLE, TELEPHONE, ELECTRIC, SEWER, AND OTHER UTILITIES FOUND TO INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED IN A MANNER ACCEPTABLE TO THE ENGINEER.

PIPE BEDDING

1. SAND BEDDING MEETING REQUIREMENTS OF EARTHWORK SPECIFICATIONS
2. SAND BLANKET MEETING REQUIREMENTS OF EARTHWORK SPECIFICATIONS
3. TRENCH FINAL BACKFILL MATERIAL - MATERIAL WILL EXCLUDE PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, CLAY, LARGE ROCKS (12" DIMENSION), OR ANY MATERIAL DETERMINED BY THE ENGINEER THAT WILL NOT BE SUITABLE.

WATER MAINS

1. ONCE INSTALLED PERFORM A HYDROSTATIC AND LEAKAGE TEST ACCORDING TO AWWA C600(LATEST REVISION) ON EACH PIPE LINE.
2. THE ENGINEER AND THE WATER UTILITY SHALL BE GIVEN AT LEAST 72 HOURS NOTICE BEFORE THE TEST IS CONDUCTED. TEST MUST BE WITNESSED BY THE ENGINEER.
3. SPECIFIED TEST PRESSURE IS 200 PSI, AND PRESSURE DURING TEST SHALL NOT VARY BY MORE THAN 5 PSI.

DUCTILE IRON PIPE: AWWA C151

1. FITTINGS: DUCTILE IRON, STANDARD THICKNESS, 350 PSI PRESSURE RATING. (AWWA C110, C153, C105, ANSI A21.10).
2. FITTINGS: CAST IRON, 250 PSI PRESSURE RATING (ANSI A21.10).
3. JOINTS: MECHANICAL, PUSH-ON AND FLANGED (AWWA C111, C115).
4. GASKETS:
 - A. MECHANICAL AND PUSH-ON JOINTS, ANSI A21.11.
 - F. FLANGED JOINTS: -2" THICK RING OR FULL FACED RUBBER, ANSI A21.15.
5. BOLTS/NUTS:
 - A. MECHANICAL JOINT: ANSI A21.11.
 - F. FLANGED JOINT: ANSI A21.15.
6. MECHANICAL JOINT GLANDS SHALL BE "MEGA-LUG" RETAINER GLANDS.
7. LININGS AND LINING REPAIR TO AWWA/C104:
 - A. INTERIOR - CEMENT LINED, DOUBLE THICKNESS BITUMINOUS SEAL.
 - F. EXTERIOR - BITUMINOUS COATING APPROXIMATELY 2 MILS THICK, ANSI A21.15, ANSI A21.15, AND ANSI A21.10.
 - C. FLANGE MACHINED FACE COATING: ANSI A21.15.

COPPER TUBING

1. TYPE-K, ANNEALED, ASTM B88
2. FITTINGS: ASME B16.18, CAST COPPER, OR ASME B16.22, WROUGHT COPPER.
3. JOINTS: COMPRESSION CONNECTION OR AWS A5.8, BCP SILVER BRAZE.
4. ORIENTATION OF DOMESTIC WATER LINES
 - A. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE WATER UTILITY AT LEAST 72 HOURS IN ADVANCE OF BEGINNING ANY DISINFECTION OF WATER MAINS.
 2. CONTRACTOR SHALL BE RESPONSIBLE FOR BACTERIOLOGICAL TESTING AS REQUIRED BY THIS SPECIFICATION AND REFERENCE STANDARDS MENTIONED.
 3. DISINFECT ALL NEW PIPELINE SYSTEMS IN ACCORDANCE WITH AWWA C651, INCLUDING:
 - A. METHOD OF CHLORINE APPLICATION. USE CONTINUOUS FEED METHOD OR SLUG METHOD. (TABLET METHOD IS NOT ACCEPTABLE).
 - B. FORM OF CHLORINE UTILIZED.
 - C. FINAL FLUSHING.
 - D. BACTERIOLOGICAL TESTING.
 - E. REPETITION OF PROCEDURE.
5. GATE VALVES
 - A. RESILIENT SEAT GATE VALVES BY KENNEDY "KEN-SEAL" OR EQUAL.
 2. IRON BODY GATE VALVES TO MEET AWWA C-509-47.
 3. STEM CONSTRUCTION: NON-RISING.
 4. STEM SEALS: DOUBLE O-RING.
 5. GATE: CAST IRON RESILIENT WEDGE WITH SYNTHETIC ELASTOMER COATING, AND SHALL BE EPOXY COATED (FUSION BONDED) INSIDE AND OUT.
 6. BONNET HARDWARE SHALL MEET ASTM A307, CADMIUM PLATED.
 7. OUTLET CONNECTION: STANDARD MECHANICAL JOINT.
 8. OPERATION: OPEN TO THE RIGHT.
6. TAPPING VALVES
 - A. TAPPING VALVES TO MEET ANSI/AWWA C509-47, STANDARD FOR RESILIENT SEATED GATE VALVES.
 2. VALVES SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI.
 3. VALVES SHALL OPEN RIGHT (CONFIRM WITH DPW).
 4. INLET FLANGES SHALL BE CLASS 125, ANSI B16.1, OR ANSI/AWWA C110/A21.11-90.
 5. OUTLET CONNECTION: STANDARD MECHANICAL JOINT.
 6. STEM SEALS: O RING.
 7. STEM CONSTRUCTION: NON-RISING.
 8. SEATING: PARALLEL SEAT.
 9. END CONNECTIONS: MECHANICAL ON RUN, FLANGED ON BRANCH.
 10. BURIED TAPPING VALVES SHALL BE PROVIDED WITH A 2 INCH SQUARE WRENCH NUT AND CAST IRON VALVE BOX. IF DEPTH FROM GRADE TO TOP OF VALVE OPERATING NUT IS GREATER THAN 6'-0" A VALVE STEM RISER MADE OF HIGH STRENGTH STEEL SHALL BE PROVIDED. DEPTH FROM VALVE STEM RISER NUT TO GRADE WILL BE 4 TO 6 FEET.
7. TAPPING SLEEVES
 - A. AWWA C509, LATEST REVISION.
 2. AWWA C207, CLASS D, MAX. WORKING PRESSURE OF 150 PSI.
 3. SLEEVES: SPLIT SLEEVES OF CAST IRON OR DUCTILE IRON.
 4. MECHANICAL JOINT ENDS WITH END AND GASKET SEALS.
 5. PROVIDE A 3/4" NPT TEST PLUG OR OTHER PROVISION FOR AIR TESTING THE VALVE AND SLEEVE AT MAXIMUM WORKING PRESSURE.
 6. BOLTS AND NUTS, MECHANICAL JOINTS: HIGH STRENGTH CAST IRON OR HIGH STRENGTH LOW ALLOY STEEL, ANSI/AWWA C111/A21.11-90.
 7. BOLTS AND NUTS, FLANGED JOINTS: HIGH STRENGTH LOW CARBON STEEL, CONFORMING TO ANSI/AWWA C110/A21.10-47, APPENDIX A.
 8. COAT ALL NUTS AND BOLTS WITH A RUST RESISTANT LUBRICANT.
 9. ALL BOLTS AND NUTS USED WITH PIPE SLEEVES SHALL BE BRUSH COATED HEAVILY AFTER FINAL TIGHTENING WITH BITUMASTIC COLD-APPLIED MATERIAL TO THOROUGHLY COVER ALL EXPOSED SURFACES OF BOLTS AND NUTS.
8. VALVE BOXES
 - A. ACCEPTABLE MANUFACTURER'S: MUELLER, CLOW, OR EQUAL.
 2. CLOW F-2452 SLIDING TYPE, TWO PIECE, OR EQUAL.
 3. 5 1/4 INCH SHAFT.
 4. SIZE 66A-A (40-60 INCH OVERALL LENGTH).
 5. CAST IRON.
 6. CLOW F-2490 LIDS OR EQUAL.
 7. THE WORD "WATER" TO BE CAST INTO TOP OF COVERS, AND ARROW SHOWING DIRECTION OF OPENING.

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Approved:

12/15/2016	1	P & Z Submission
01/31/2017	2	P & Z Submission
02/14/2017	3	DPW Comments

Date	No.	Description
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Burlington Town Center
Devonwood Investors
75 Cherry Street
Burlington, VT 05401

Water Details
and Notes

Project Number	Department & Staff
1317-01	
Owner Rep	WC/JZ
Contractor Rep	JZ/KW
Scale	As Noted
Drawing Number	

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C-301

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 CLOSOS 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").

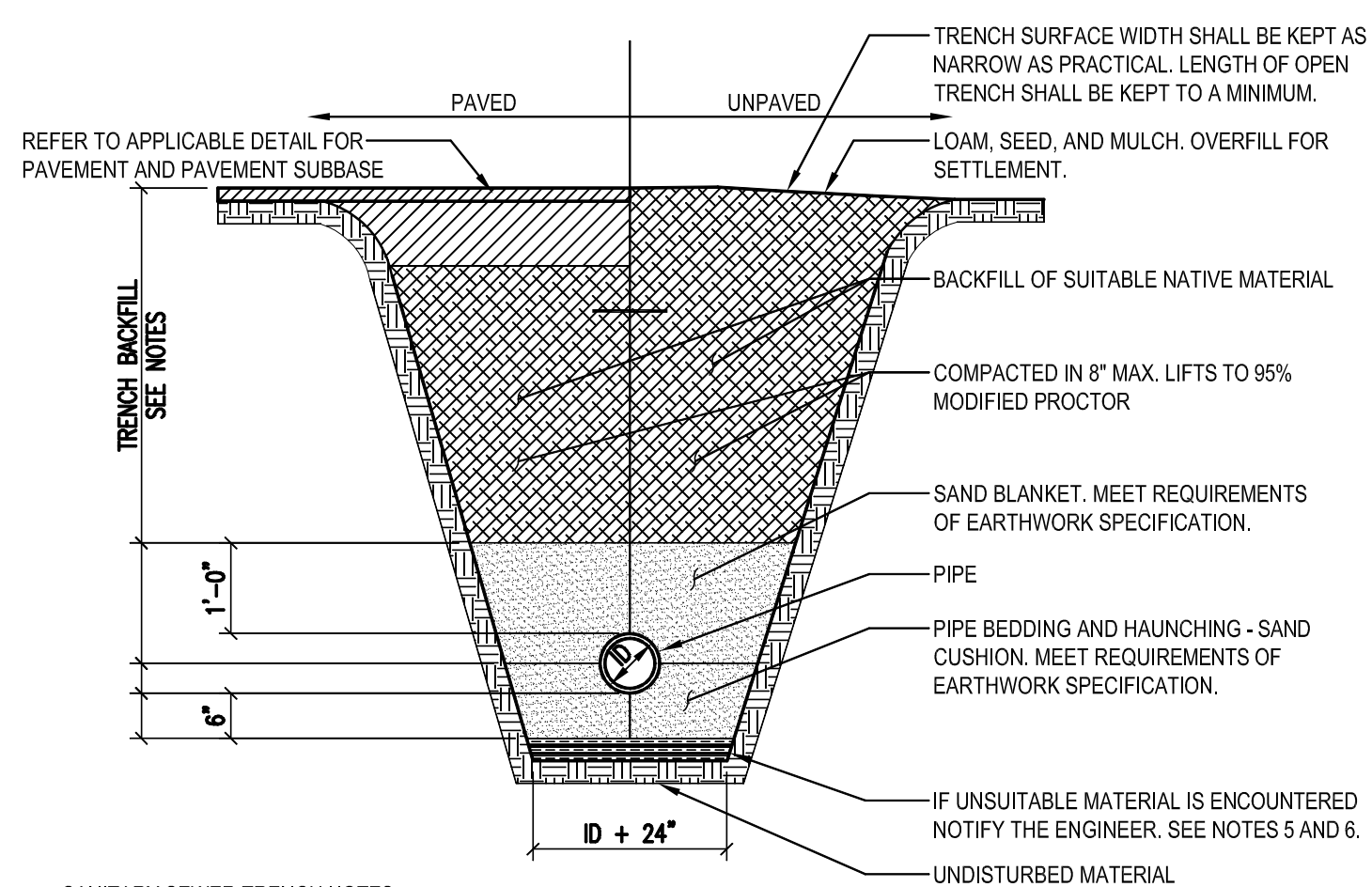
LEAKAGE TESTS FOR GRAVITY SEWERS

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 UNDERGROWN WITH ONE FULL LENGTH OF SEWER 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 THE END OF THREE PIPE 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. **DIAMETER:** 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 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:**
- BEFORE THE MANHOLE HAS BEEN ASSEMBLED IN PLACE, ALL LIFTING HOLES AND EXTERIOR JOINTS SHALL BE FILLED WITH AND POINTED WITH AN APPROPRIATE CURING MORTAR. 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.

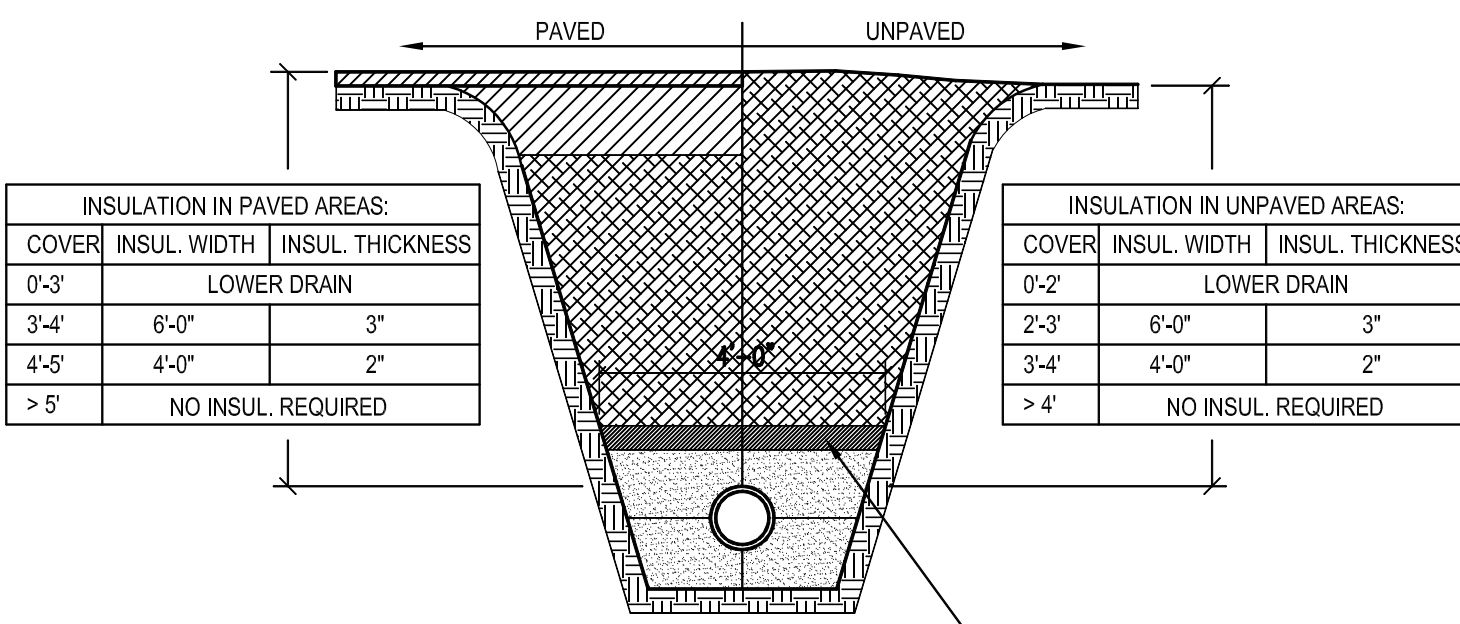
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SCALE: NONE



SANITARY SEWER TRENCH NOTES

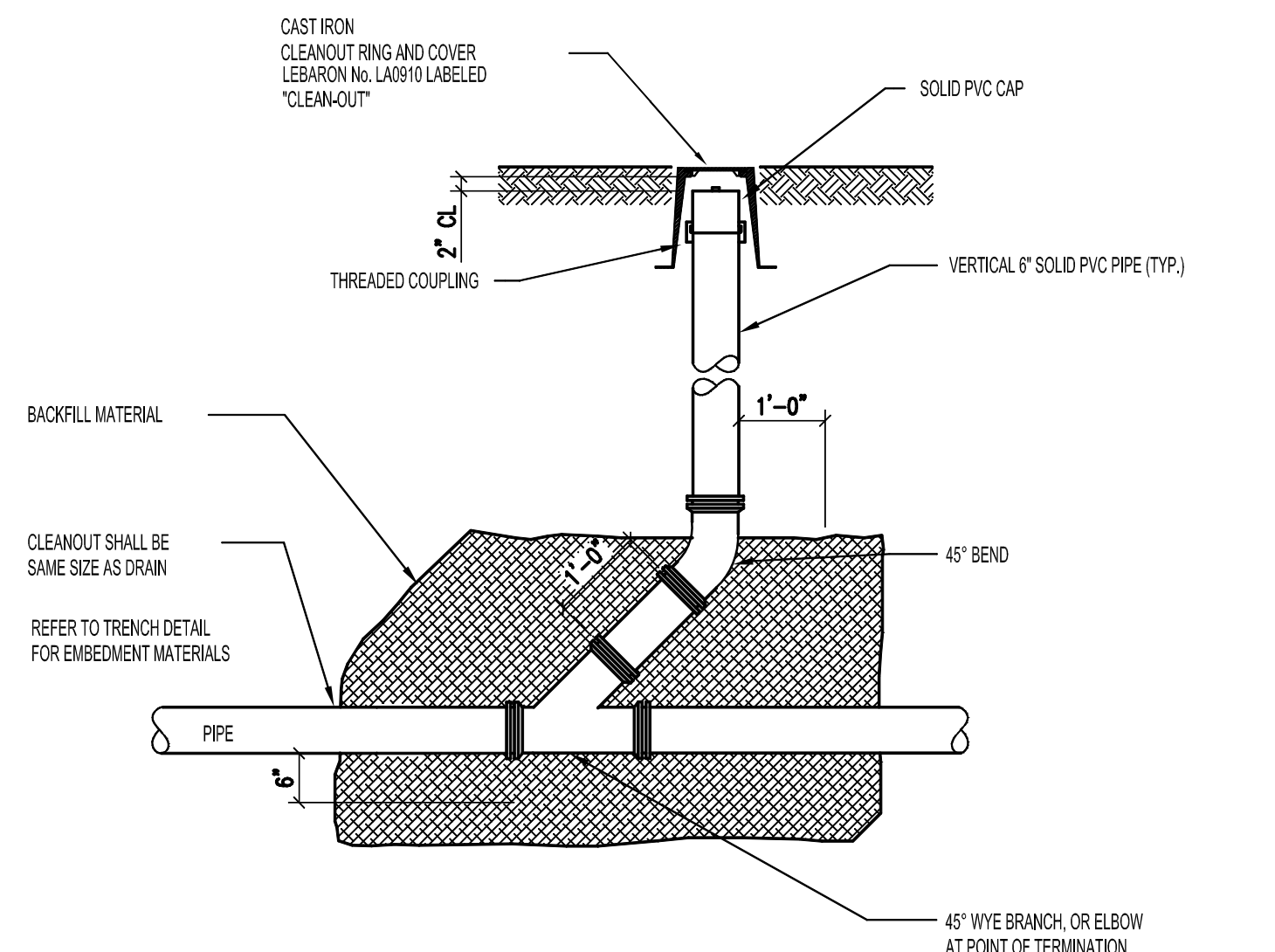
1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
2. BUILDING TO REMOVE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR FULL LENGTH OF PIPE.
3. IF THE EXISTING PIPE IS TO BE REMOVED, THE EXCAVATION SHALL BE DEEP ENOUGH TO ALLOW THE NEW PIPES TO BE INSTALLED AT A DEPTH LESS THAN 3'-0" UNDER DRIVEWAYS, EXTRA HEAVY CANT IRON OR IRON OR OTHER HIGH STRENGTH PIPE SHALL BE USED TO SUPPORT THE EXISTING DRIVEWAY.
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 THE PIPE FOR INSULATION DETAIL.
5. BACKFILL SHALL BE OF A SUITABLE MATERIAL REMOVED FROM EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. ALL LARGE ROCKS SHALL BE REMOVED FROM THE BACKFILL. ALL OTHER UNDESIRABLE MATERIALS SHALL NOT BE USED FOR BACKFILL WITHIN TWO FEET OF THE TOP OF THE PIPE.
6. ALL EXISTING AND NEW STORMS SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF FOUR INCHES BELOW AND ON EACH SIDE OF ALL PIPES.



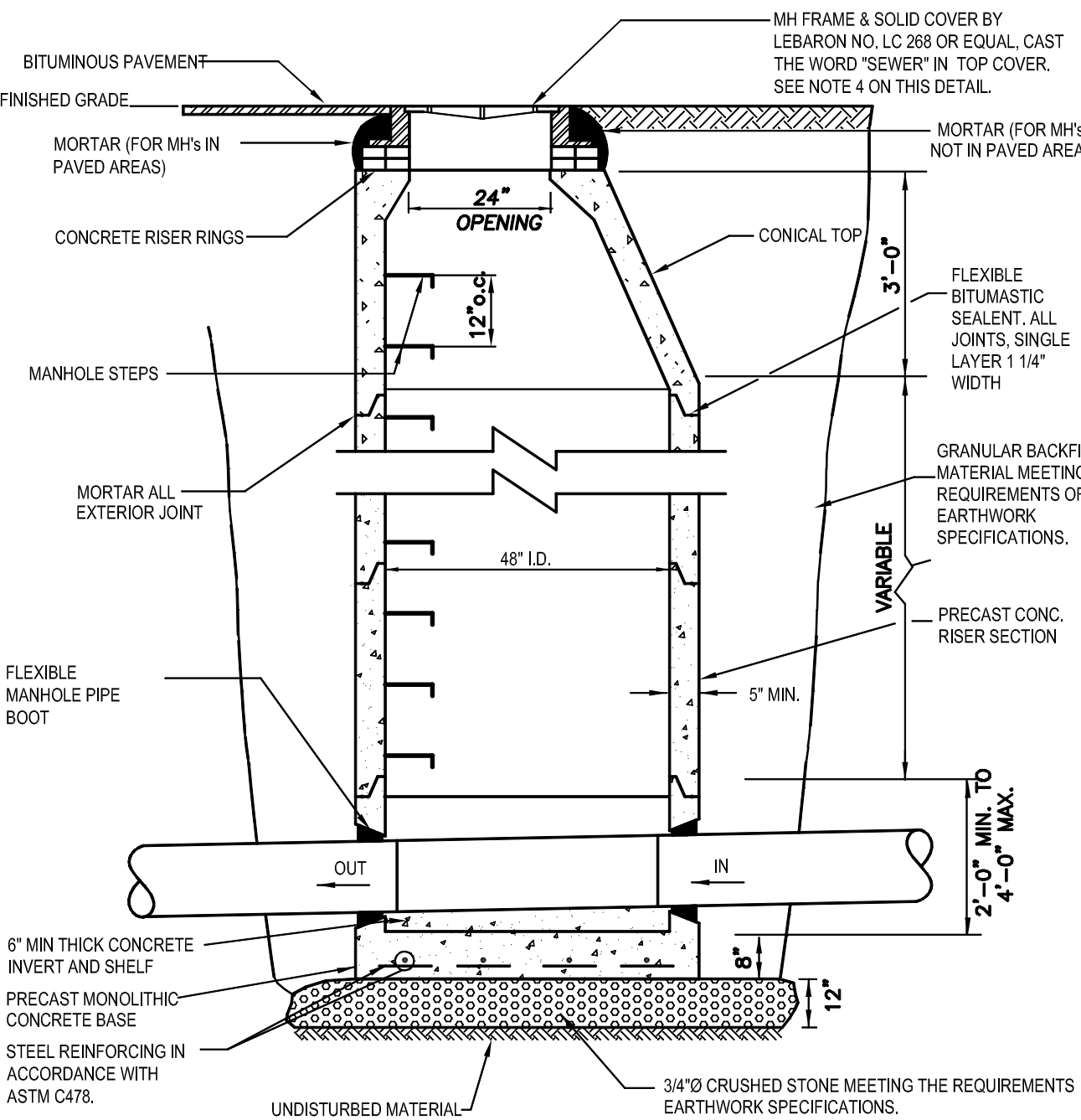
TRENCH NOTES:

2. RIGID EXTRUDED POLYSTYRENE INSULATION SHALL CONFORM WITH ASTM C578 STANDARD SPECIFICATION FOR RIGID CELLULAR POLYSTYRENE THERMAL INSULATION AND SHALL BE DOW STYROFOAM HIGH LOAD 40 OR EQUIVALENT.

SCALE: NONE



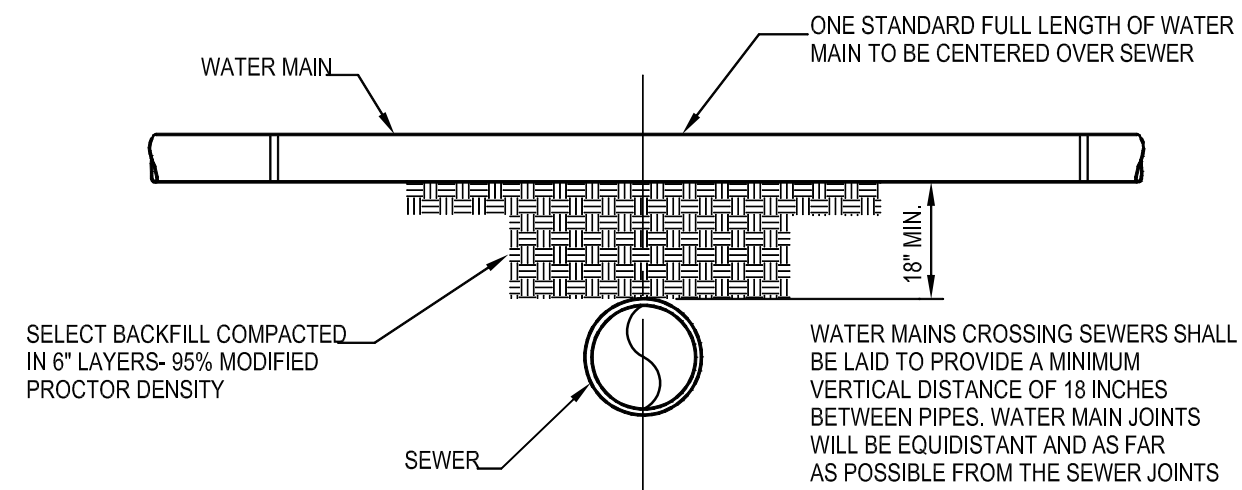
SCALE: NONE



MANHOLE NOTES

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 ft., 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.

SCALE: NONE

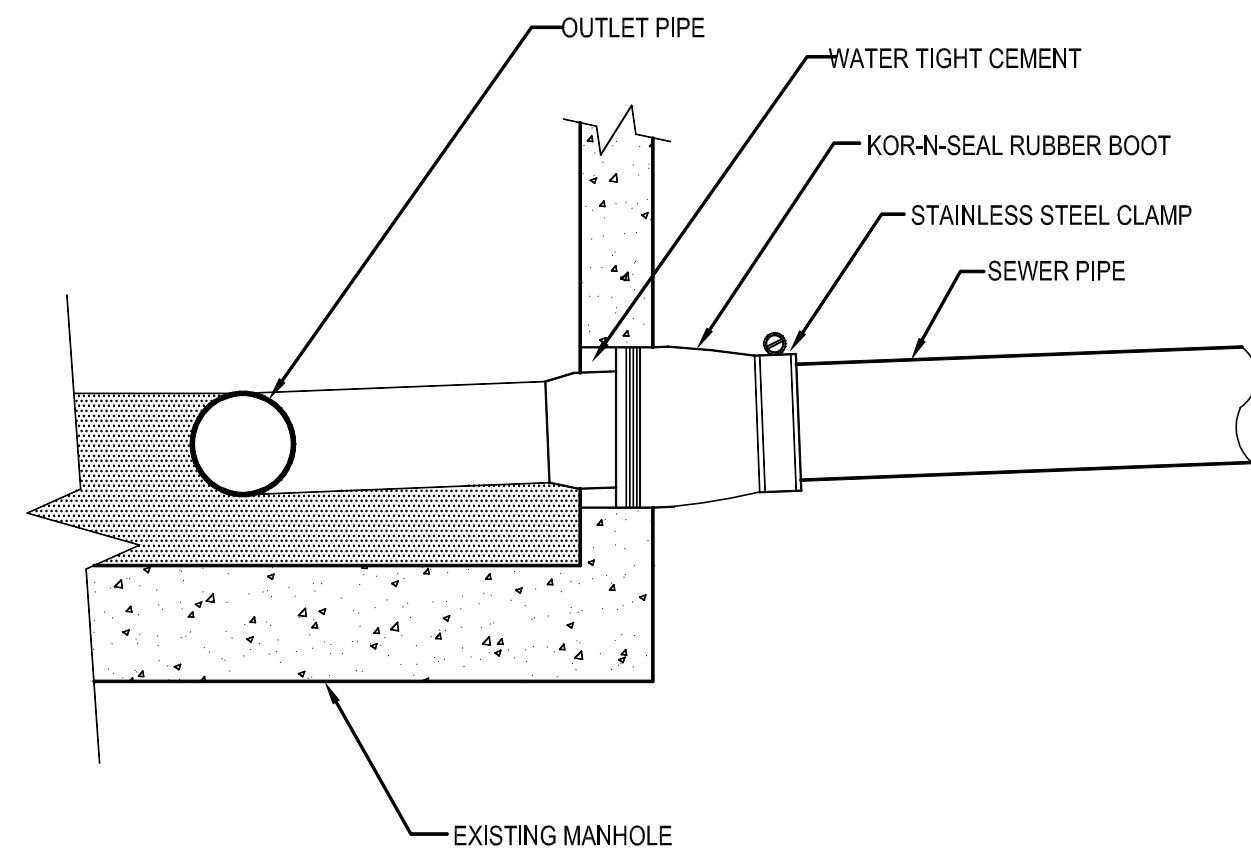


WATER MAIN ABOVE SEWER

SEPARATION NOTES

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 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWER MAINS. IF THE SEWER MAIN IS TO BE DEGRADED 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 MAIN IS 48" OR LESS IN DIAMETER, THE WATER MAIN SHALL BE Laid SO THAT ONE FEET LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AS POSSIBLE FROM WATER JOINTS; THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN DEPTH. IF THE SEWER MAIN IS 48" OR MORE IN DIAMETER, THE SEWER MAIN SHALL BE CONSTRUCTED TO THE DEPTH OF THREE PIPE LENGTHS, WHICH EVER IS GREATER; 3' THE SECTION CONSTRUCTED TO WATER MAIN DEPTH MUST BE PRESURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES TO PROVE THE SEWER MAIN IS NOT LEAKING. THE WATER MAIN SHALL BE Laid TO ASSURE THE WATER MAIN IS NOT EXPOSED TO BACKFLOWS BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE THE WEIGHT.

SCALE: NONE 5



KOR -N- SEAL NOTES

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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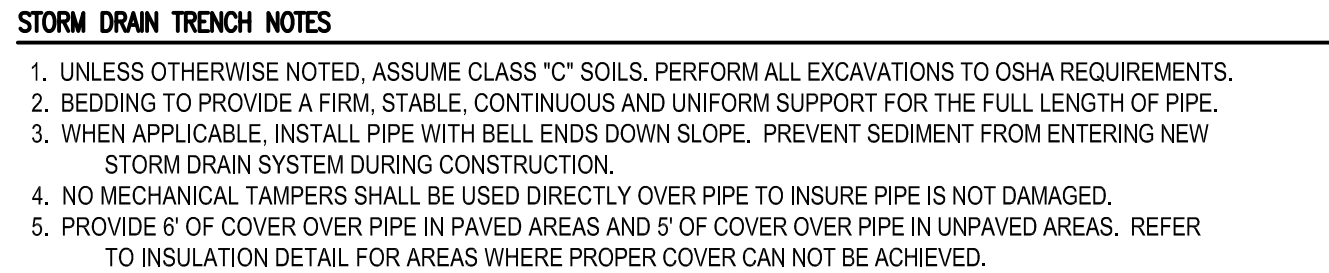
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Sewer Details and Notes

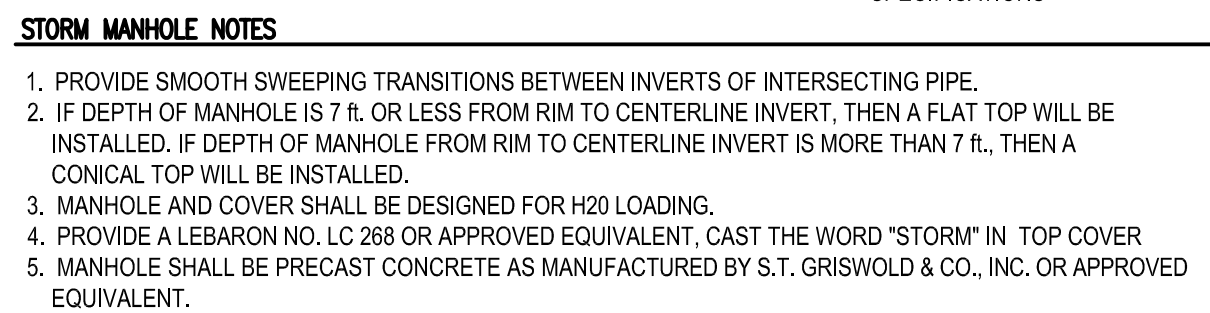
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Scale:	
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C-302

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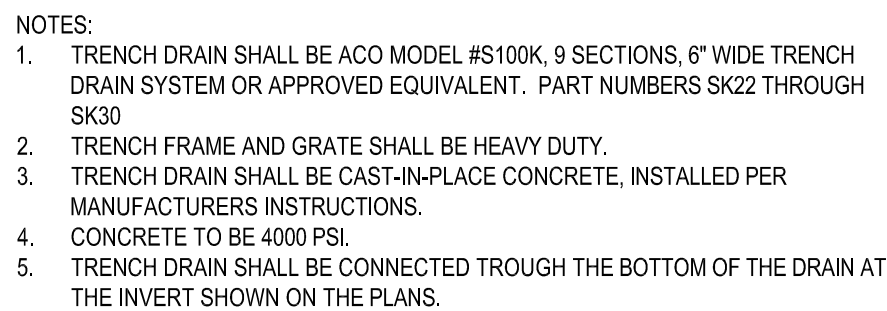
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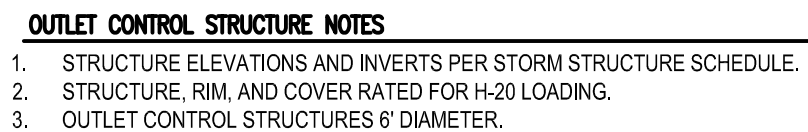


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TANK NOTES:

SCALE: NONE

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1317-01

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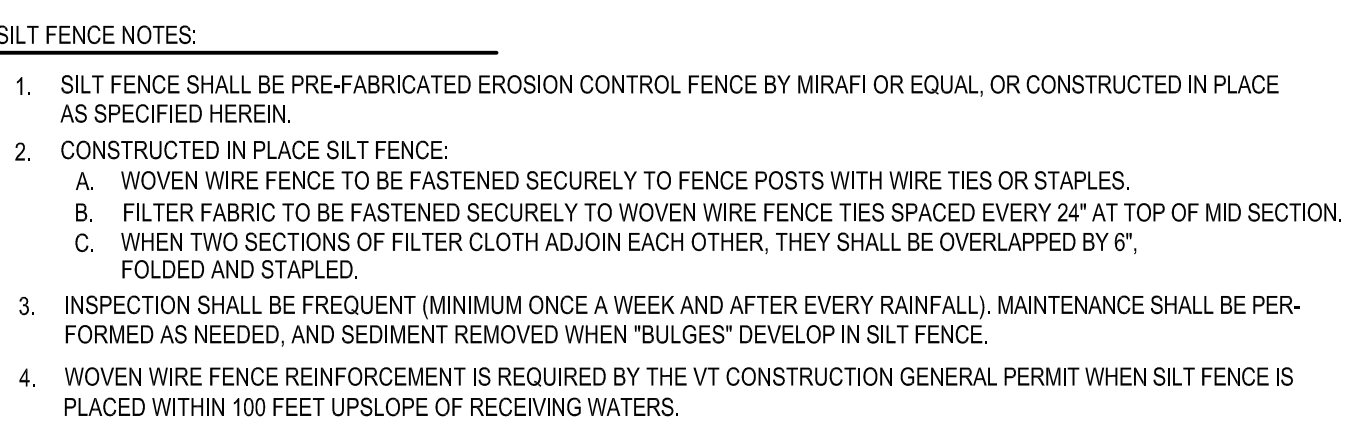
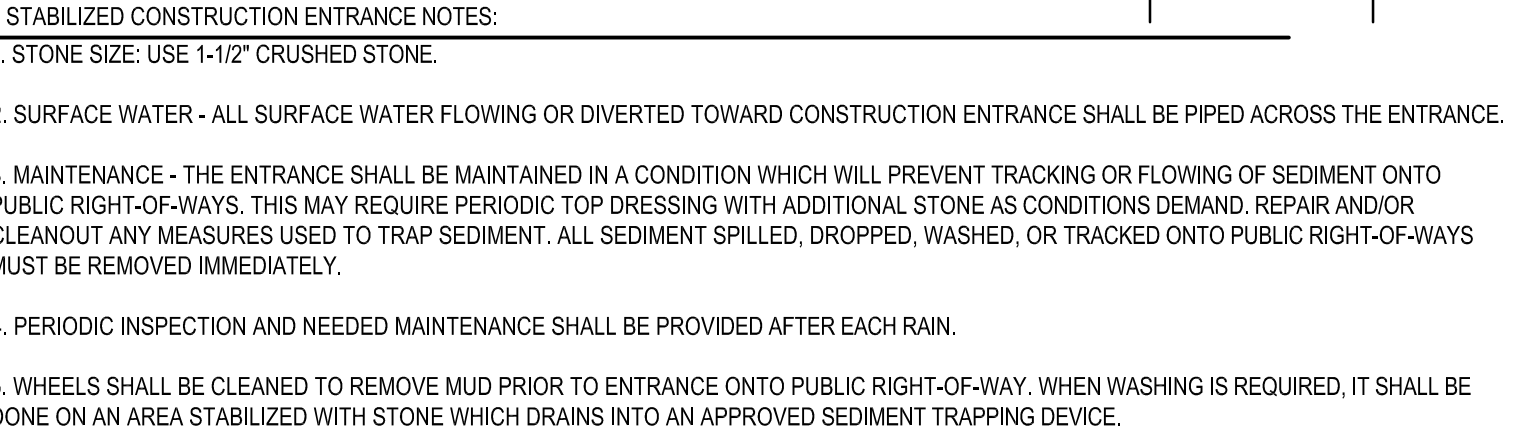
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Burlington Town Center
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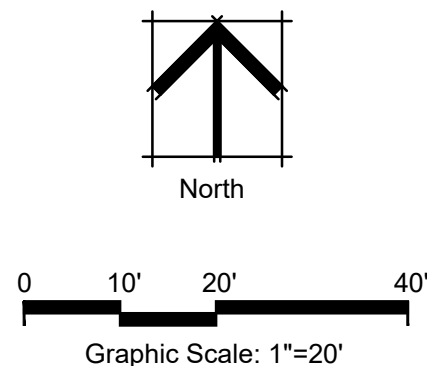
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C-305



PLANT LIST						
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	REMARKS	MATURE CANOPY DIMS.
DECIDUOUS TREES:						
AR	Acer x freemanii 'Firefall'	Firefall Red Maple	11	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 30' Diameter
AF	Acer x freemanii 'Armstrong'	Armstrong Red Maple	11	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 15/20' Diameter
AC	Acer x freemanii 'Celebration'	Celebration Red Maple	12	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 30' Diameter
QR	Quercus x warei 'Long' Regal Prince	Regal Prince Red Oak	6	2.5-3" Cal.	B&B, 6' Branching Ht. (Min.)	50' Tall x 15/20' Diameter
UA	Ulmus americana 'Princeton'	Princeton American Elm	6	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.
 4. 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.
 5. 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.
 6. FOR SOIL BACKFILL IN THE RAIN GARDEN BASINS, REFER TO CIVIL DRAWINGS, SPECIFICATIONS AND DETAILS.



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01/31/2017 02 PROGRESS PRINT
12/15/2016 01 P & Z SUBMISSION
Date No. Description

Burlington Town Center
Devonwood Investors

75 Cherry Street
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Planting Plan

Project Number: 1317-01
Drawn By: mkw
Checked By: mkw
Scale: 1"=20'
Drawing Number:

LA-400



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Date No Description

Project

Burlington Town Center

Devonwood Investors

75 Cherry Street
Burlington, VT 05401

Lighting / Photometric Plan

Project Number: 1317-01

Drawn By: mkw

Checked By: mkw

Date: 1/15/2017

Scale: 1"=20'

Drawing Number: LA-500

Signature & Seal

1317-01

Drawn By: mkw

Checked By: mkw

Date: 1/15/2017

Scale: 1"=20'

Drawing Number: LA-500

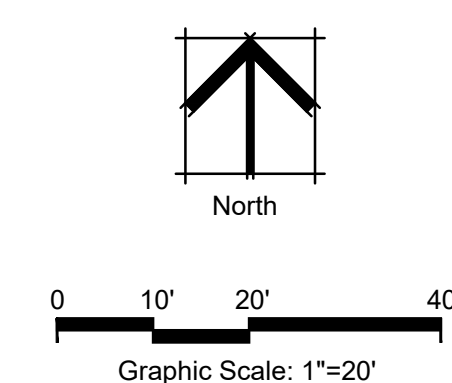
FIXTURE AND POLE SPECIFICATIONS

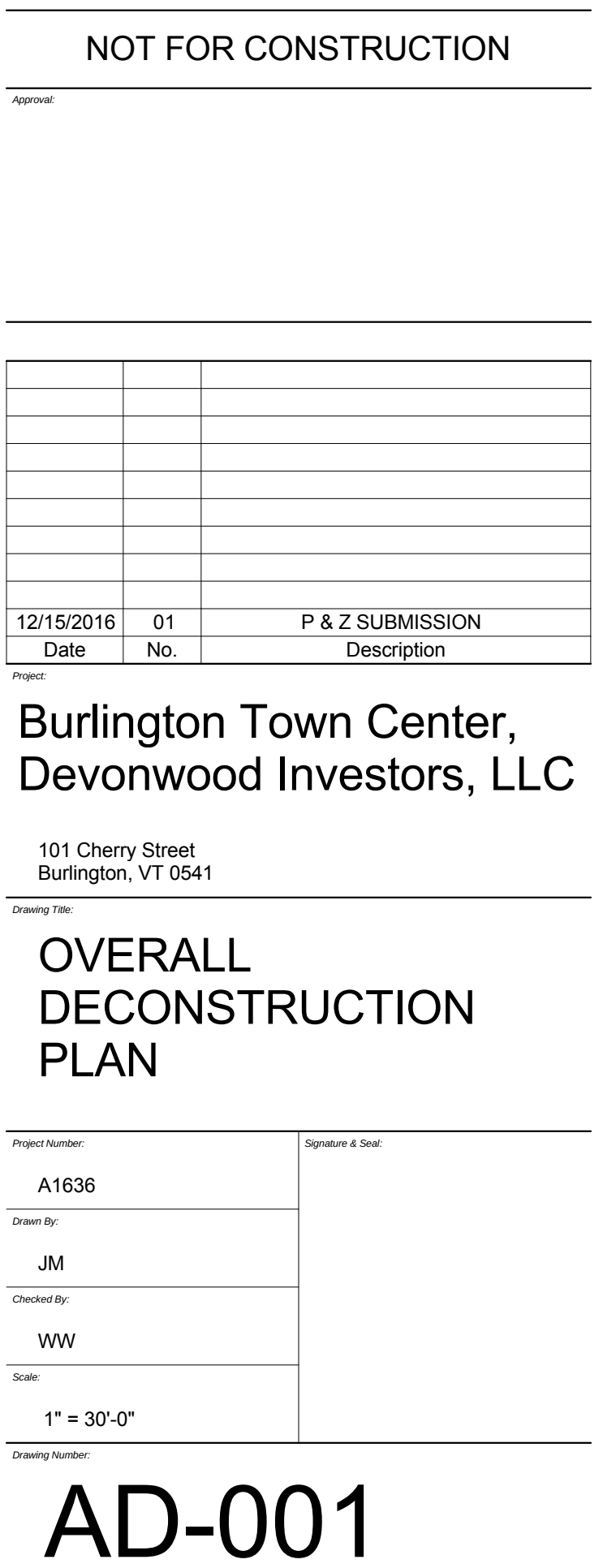
Fixture A
Fixture Manufacturer: Lumec
Fixture: Domus - DMS50
Configuration: 1A
Lamp: 90Watt LED4K
Lens Type: Flat Glass
Distribution: LE3F
Color: Black
Pole Manufacturer: Lumec
Pole: SPR5V-25.5'
Pole Options: B105 & GFI
Mounting Arm: SM-1A, LMS*
Color: Black

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.





PC Construction
1935 Tilly Drive
South Burlington, VT 05403

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Hallam ICS
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Geosign
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(802) 530-5140
www.geodesign.net

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www.segroup.com

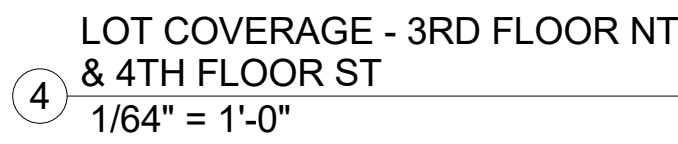
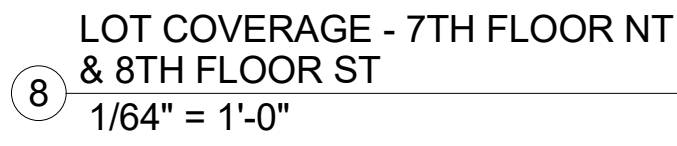
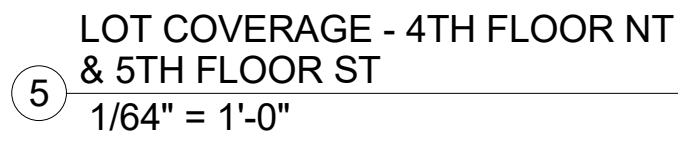
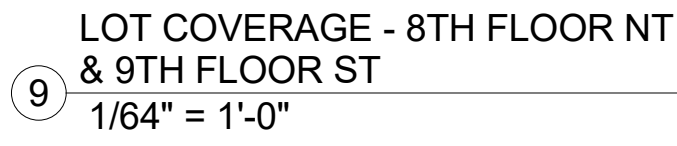
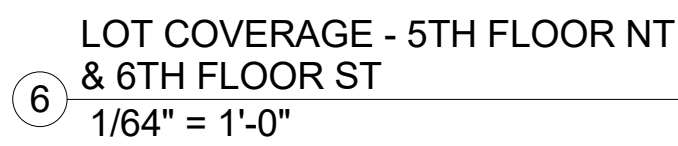
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101 Cherry Street
Burlington, VT 05401

Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Scale: 1/8" = 1'-0"	

New Building Application Number

24 of 35



<u>1ST FLOOR NORTH & 2ND FLOOR SOUTH COVERAGE</u>			
<u>PORTION</u>	<u>FLOOR</u>	<u>AREA</u>	<u>COVERAGE</u>
NORTH	1ST	23,682.33 SF	21.57 %
SOUTH	2ND	84,233.53 SF	76.73 %
TOTAL		107,915.86 SF	98.30 %

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 %

<u>7TH FLOOR NORTH & 8TH FLOOR SOUTH COVERAGE</u>			
<u>PORTION</u>	<u>FLOOR</u>	<u>AREA</u>	<u>COVERAGE</u>
NORTH	7TH	33,788.72 SF	30.78 %
SOUTH	8TH	17,868.58 SF	16.28 %
TOTAL		51,657.30 SF	47.06 %

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 %

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 %

<u>6TH FLOOR NORTH & 7TH FLOOR SOUTH COVERAGE</u>			
<u>PORTION</u>	<u>FLOOR</u>	<u>AREA</u>	<u>COVERAGE</u>
<u>NORTH</u>	<u>6TH</u>	53,281.74 SF	48.54 %
<u>SOUTH</u>	<u>7TH</u>	17,868.58 SF	16.28 %
<u>TOTAL</u>		71,150.32 SF	64.82 %

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153 Tilly Drive
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Burlington, VT 05401

Civil Engineer
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www.engineeringventures.com

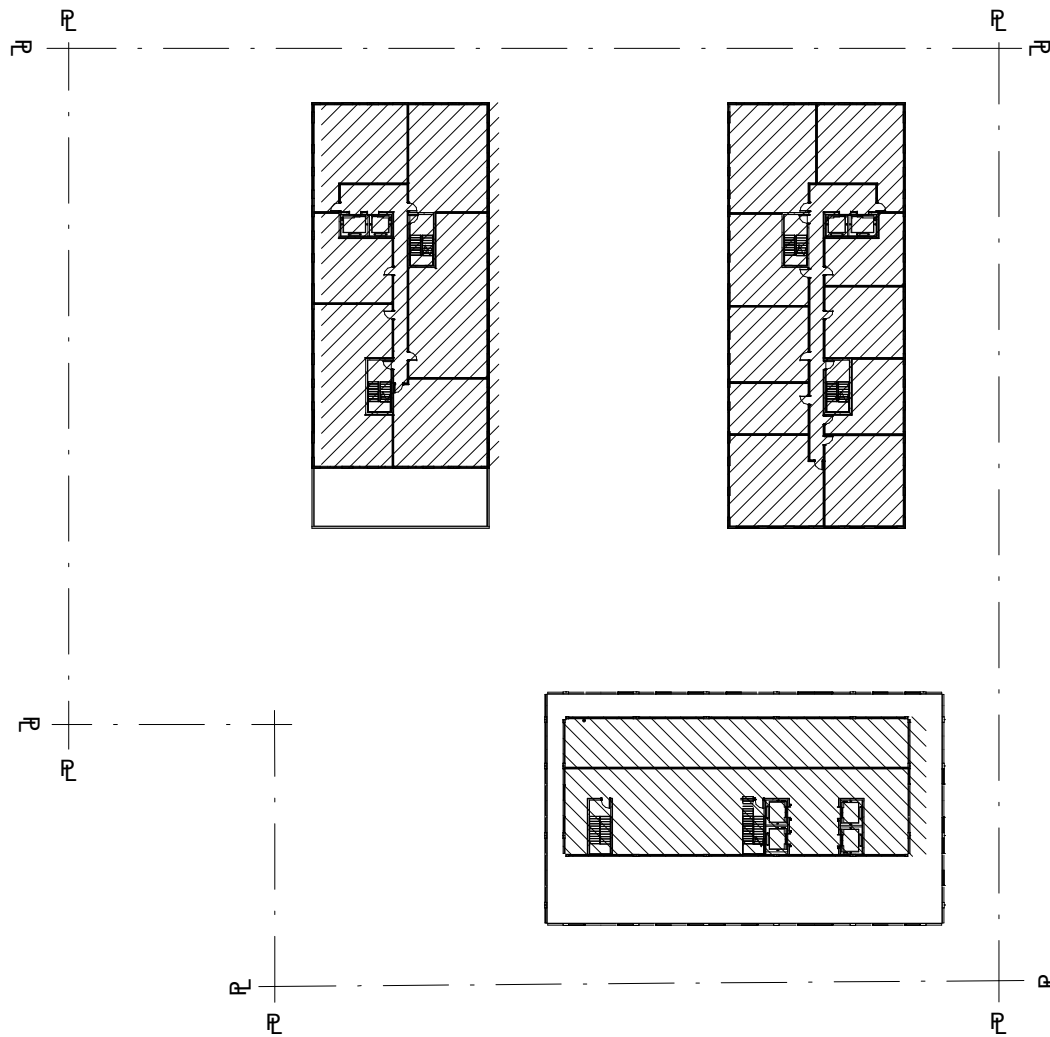
GeoDesign
2223 Shelburne Rd, Suite 360
South Burlington, VT 05403

Geotechnical Engineer
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www.geodesign.net

SE Group
131 Church Street, 3rd Floor
Burlington, VT 05401

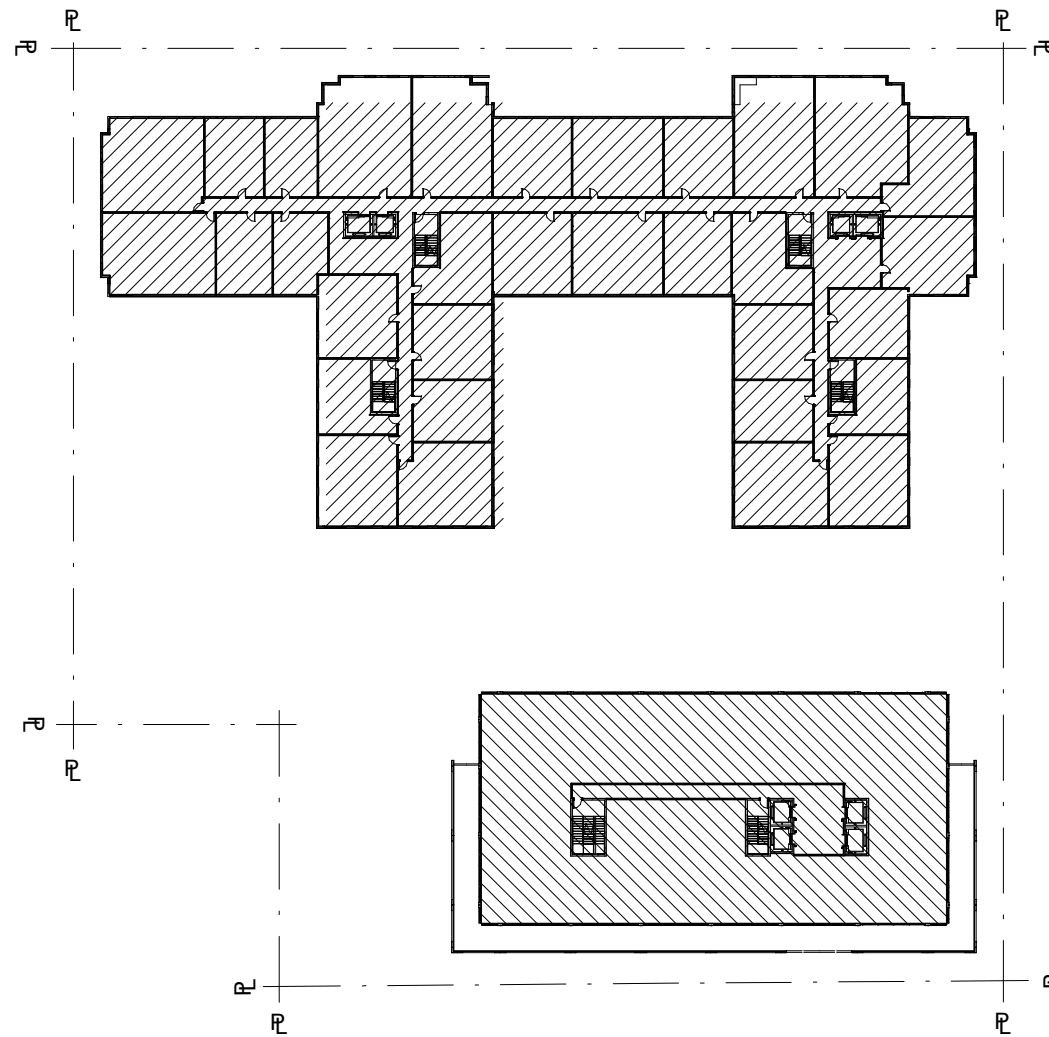
Landscape Architect
(802) 552-2098
www.segroup.com

14TH FLOOR NORTH & 13TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTHEAST	14TH	10,140.00 SF	9.24 %
NORTHWEST	14TH	8,710.00 SF	7.93 %
SOUTH	13TH	6,799.63 SF	6.19 %
TOTAL		25,649.63 SF	23.36 %



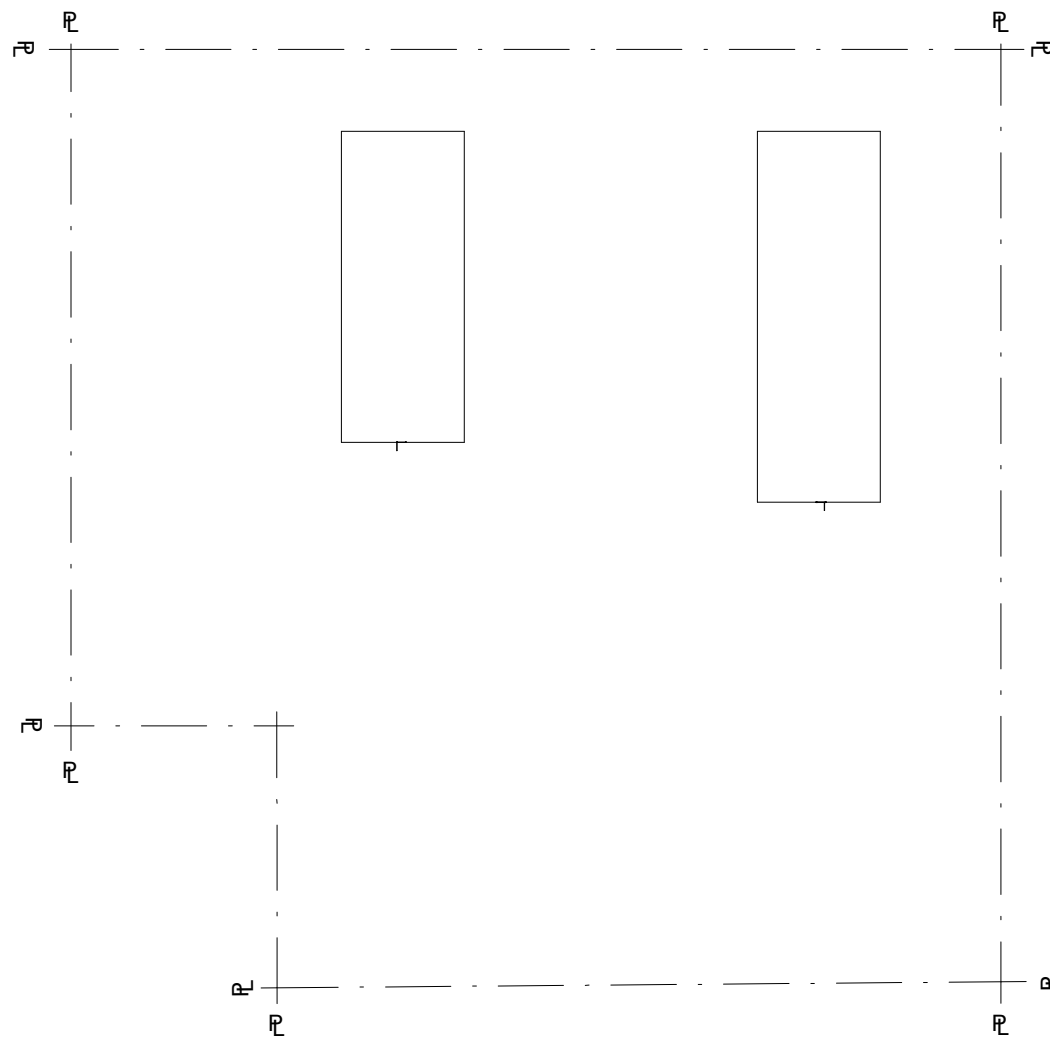
LOT COVERAGE - 14TH FLOOR
NT & 13 FLOOR ST
1/64" = 1'-0"

11TH FLOOR NORTH & 11TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	11TH	32,630.40 SF	29.72 %
SOUTH	11TH	14,763.70 SF	13.44 %
TOTAL		47,394.10 SF	43.16 %



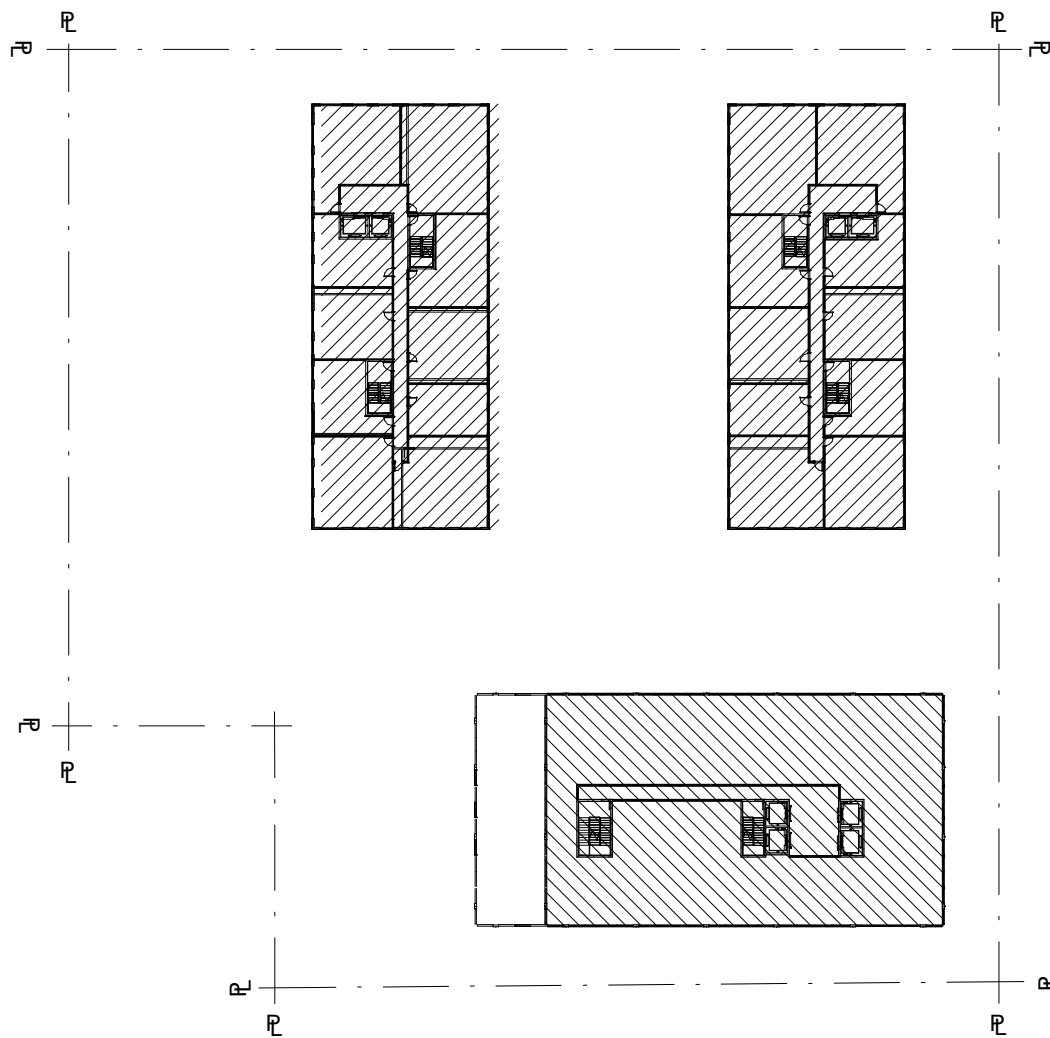
LOT COVERAGE - 11TH FLOOR
NT & 11TH FLOOR ST
1/64" = 1'-0"

ROOF NORTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	ROOF	00.00 SF	00.00 %
TOTAL		00.00 SF	00.00 %



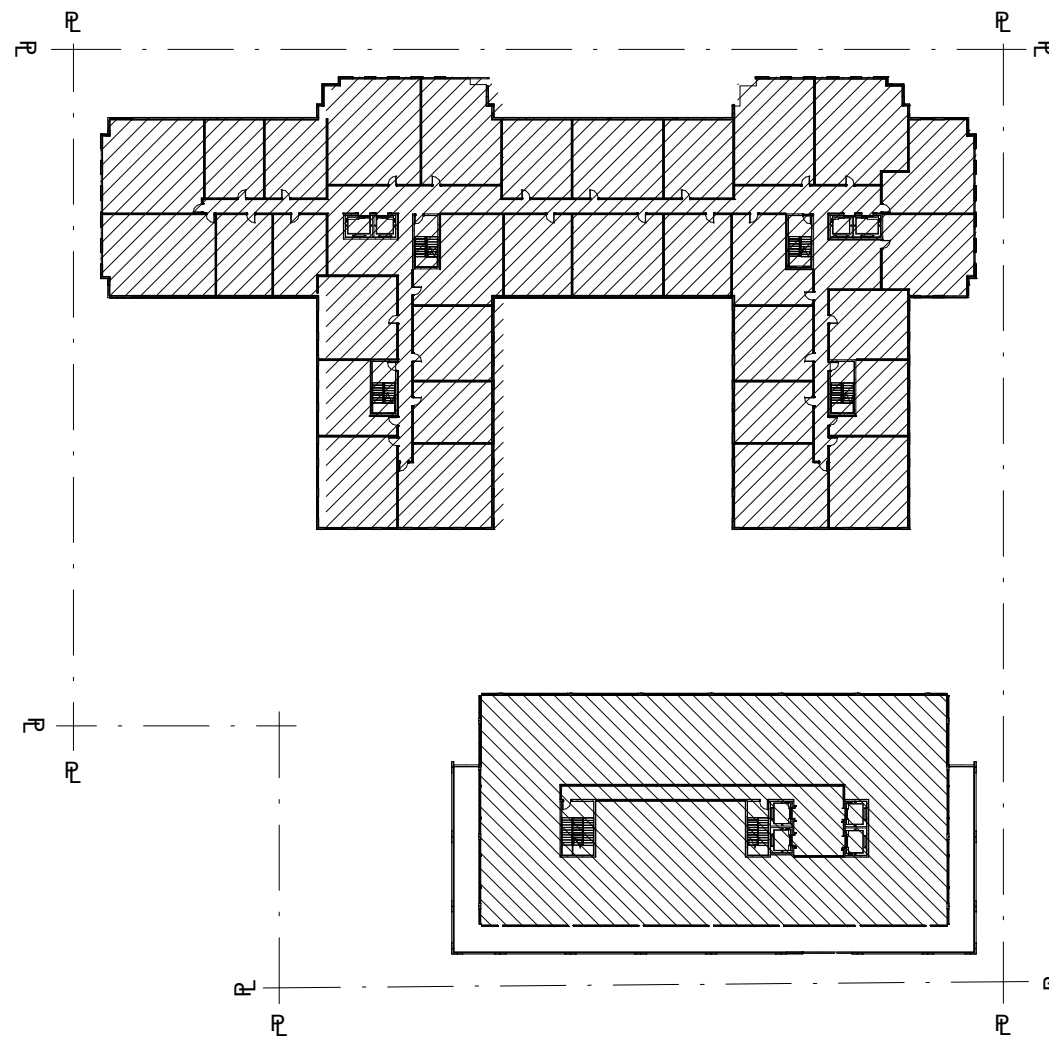
LOT COVERAGE - ROOF NT
1/64" = 1'-0"

13TH FLOOR NORTH & 12TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTHEAST	13TH	10,140.00 SF	9.24 %
NORTHWEST	13TH	10,140.00 SF	9.24 %
SOUTH	12TH	12,542.78 SF	11.43 %
TOTAL		32,822.78 SF	29.91 %



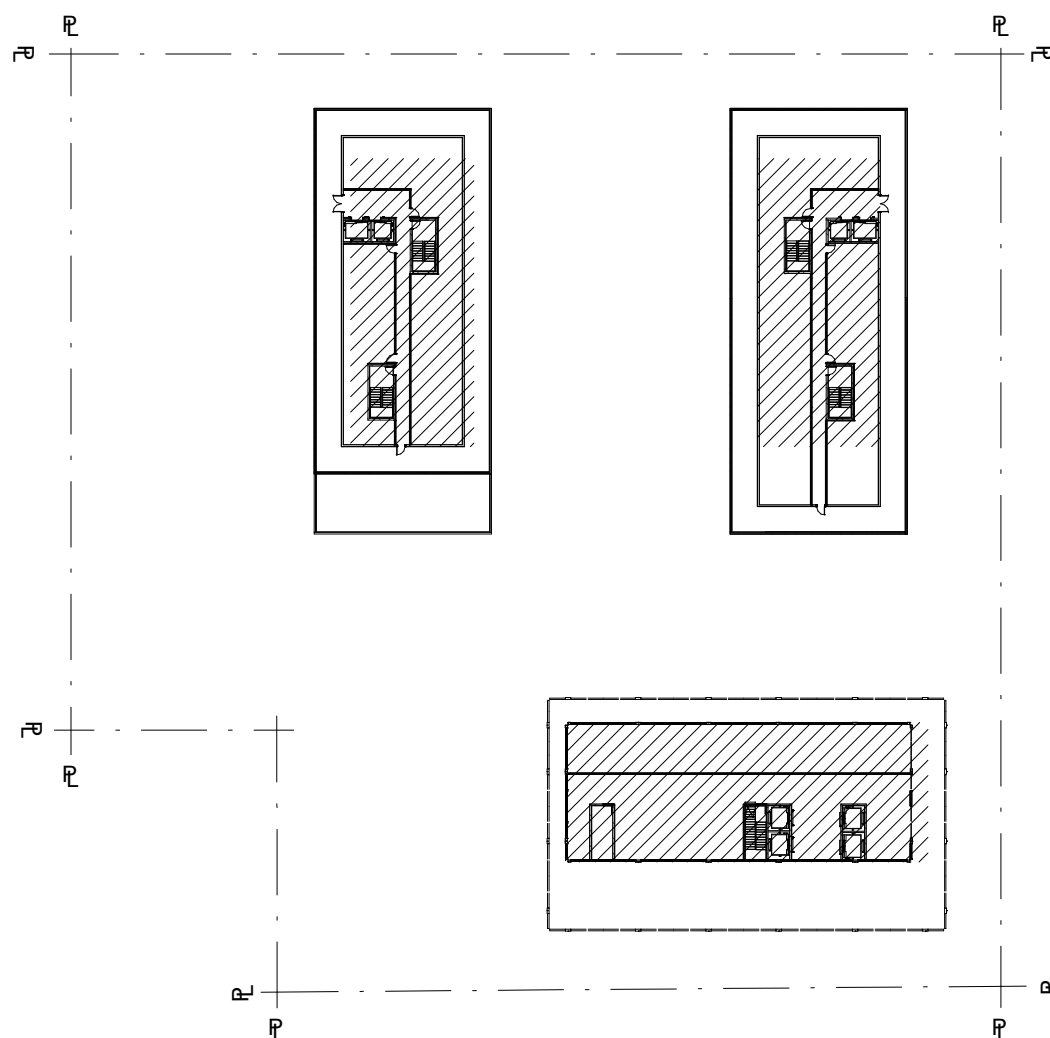
LOT COVERAGE - 13TH FLOOR
NT & 12 FLOOR ST
1/64" = 1'-0"

10TH FLOOR NORTH & 10TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	10TH	33,788.72 SF	30.78 %
SOUTH	10TH	15,733.70 SF	14.44 %
TOTAL		49,522.42 SF	45.22 %



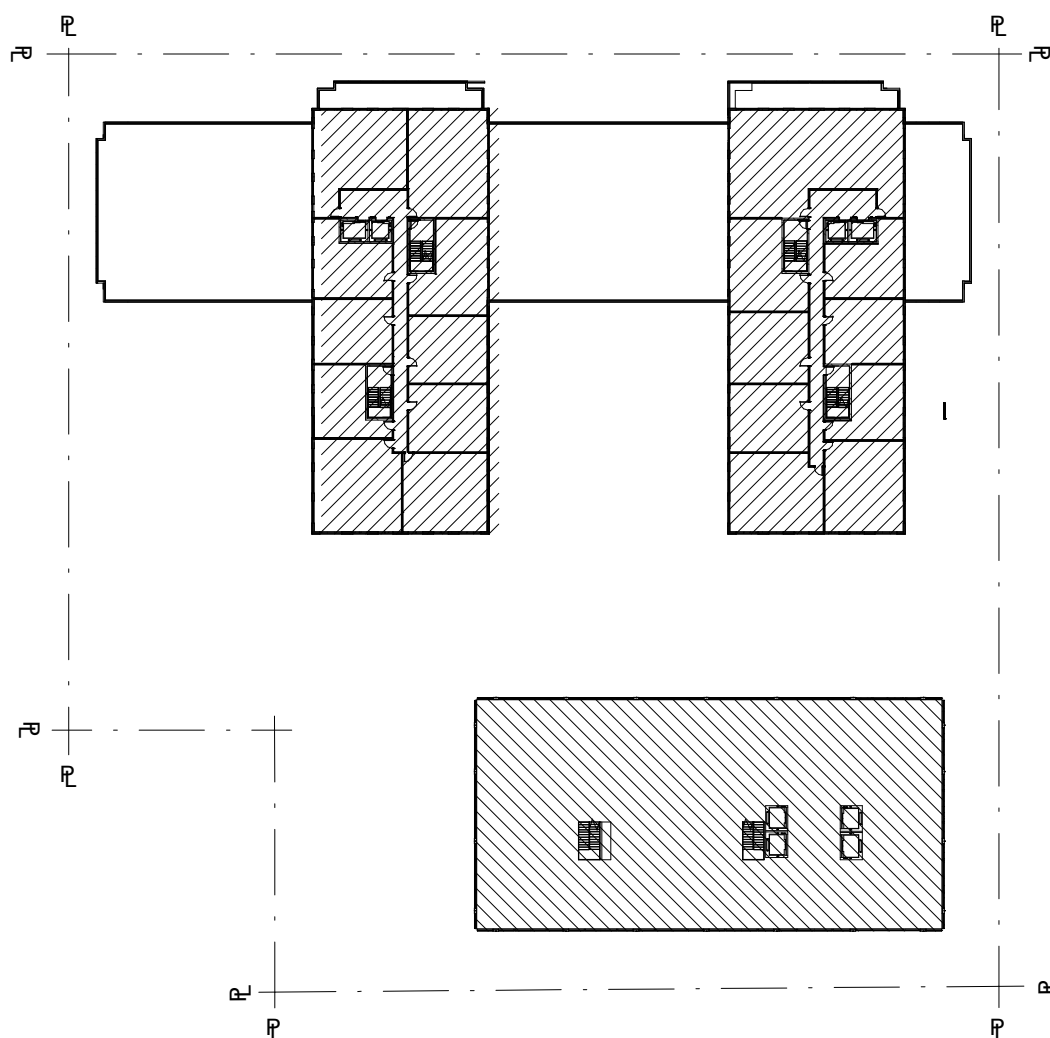
LOT COVERAGE - 10TH FLOOR
NT & 10TH FLOOR ST
1/64" = 1'-0"

MECHANICAL FLOOR NORTH & ROOF SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTHEAST	MECH	4,751.25 SF	00.00 %
NORTHWEST	MECH	4,751.25 SF	00.00 %
SOUTH	ROOF	6,799.63 SF	00.00 %
TOTAL		00.00 SF	00.00 %



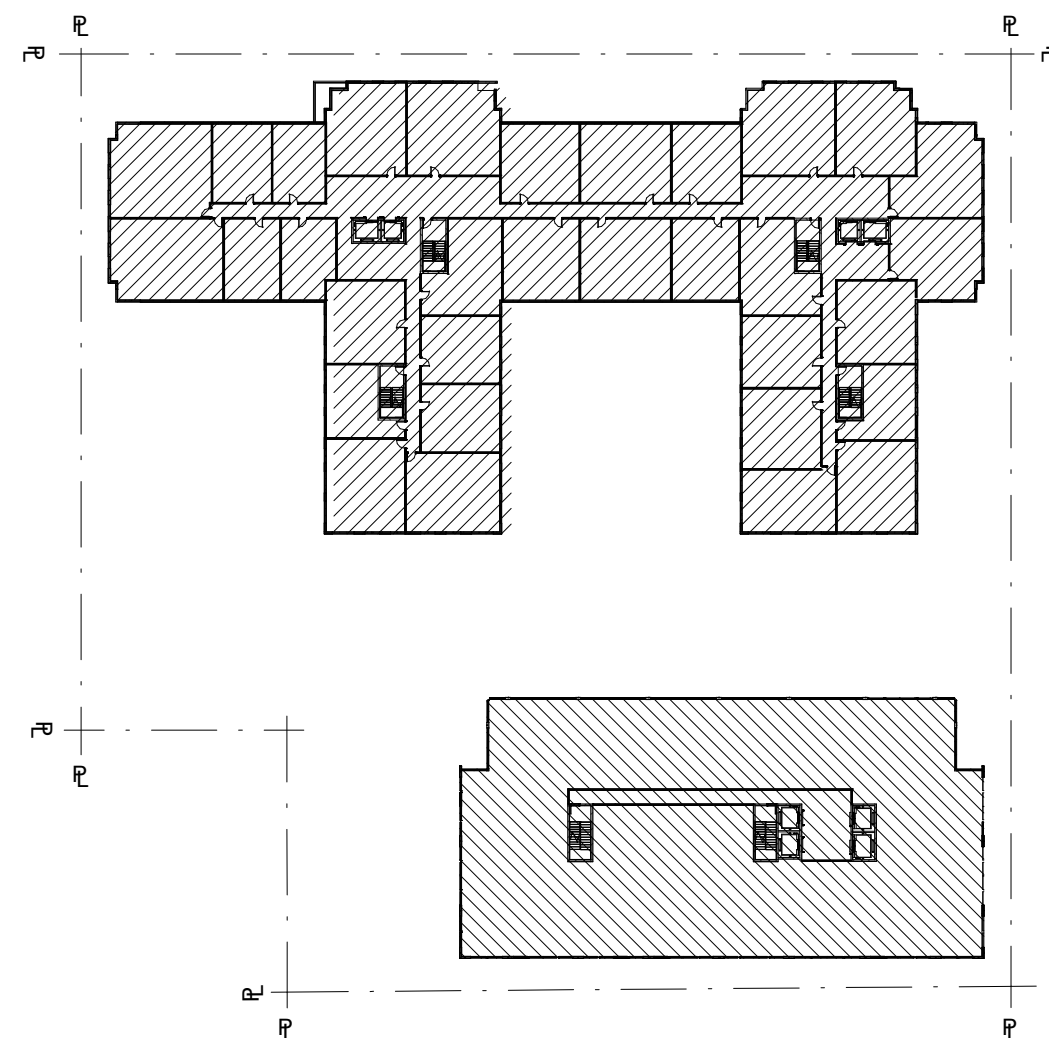
LOT COVERAGE - MECH.
FLOOR NT & MECH. FLOOR ST
1/64" = 1'-0"

12TH FLOOR NORTH & 11TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTHEAST	12TH	10,140.00 SF	9.24 %
NORTHWEST	12TH	10,140.00 SF	9.24 %
SOUTH	11TH	14,763.70 SF	13.44 %
TOTAL		35,033.70 SF	31.92 %



LOT COVERAGE - 12TH FLOOR
NT & 11 FLOOR ST
1/64" = 1'-0"

9TH FLOOR NORTH & 9TH FLOOR SOUTH COVERAGE			
PORTION	FLOOR	AREA	COVERAGE
NORTH	9TH	33,788.72 SF	30.78 %
SOUTH	9TH	17,863.58 SF	16.28 %
TOTAL		51,652.30 SF	47.06 %



LOT COVERAGE 9TH FLOOR NT
& 9TH FLOOR ST
1/64" = 1'-0"

NOT FOR CONSTRUCTION

Approved

Date	No.	Description
12/15/16		P&Z Submission
1/11/17		P&Z Resubmission I
1/20/17		P&Z Resubmission II

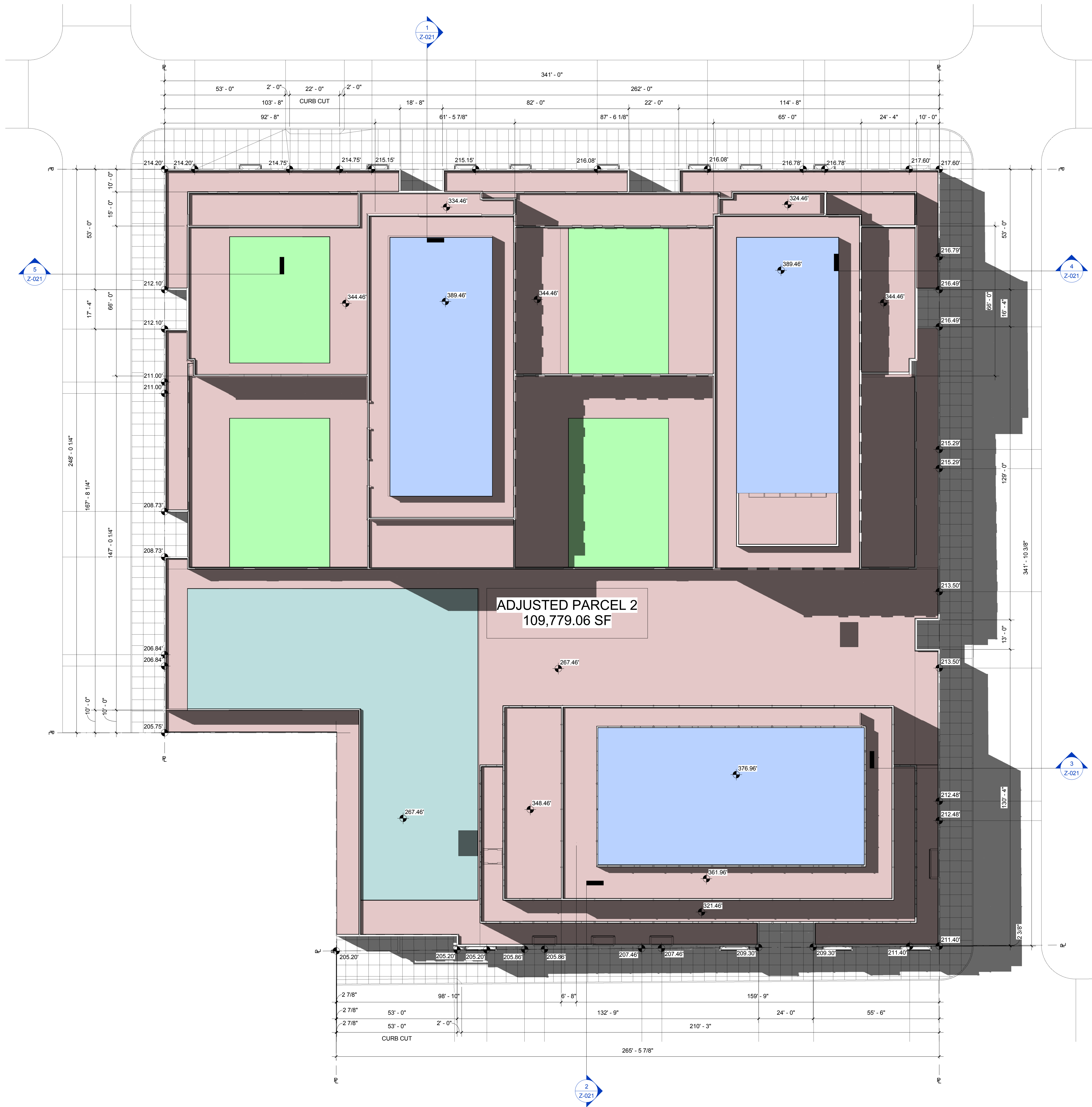
Burlington Town Center
Devonwood Investors, LLC
101 Cherry Street
Burlington, VT 05401

LOT COVERAGE
DIAGRAMS II

Project Number 1317-01	Signature & Seal
Drawn By Designer	
Checked By Checker	
Date 1/64" = 1'-0"	

Drawing Number
Z-002

New Building Application Number
Drawing
25 of 35



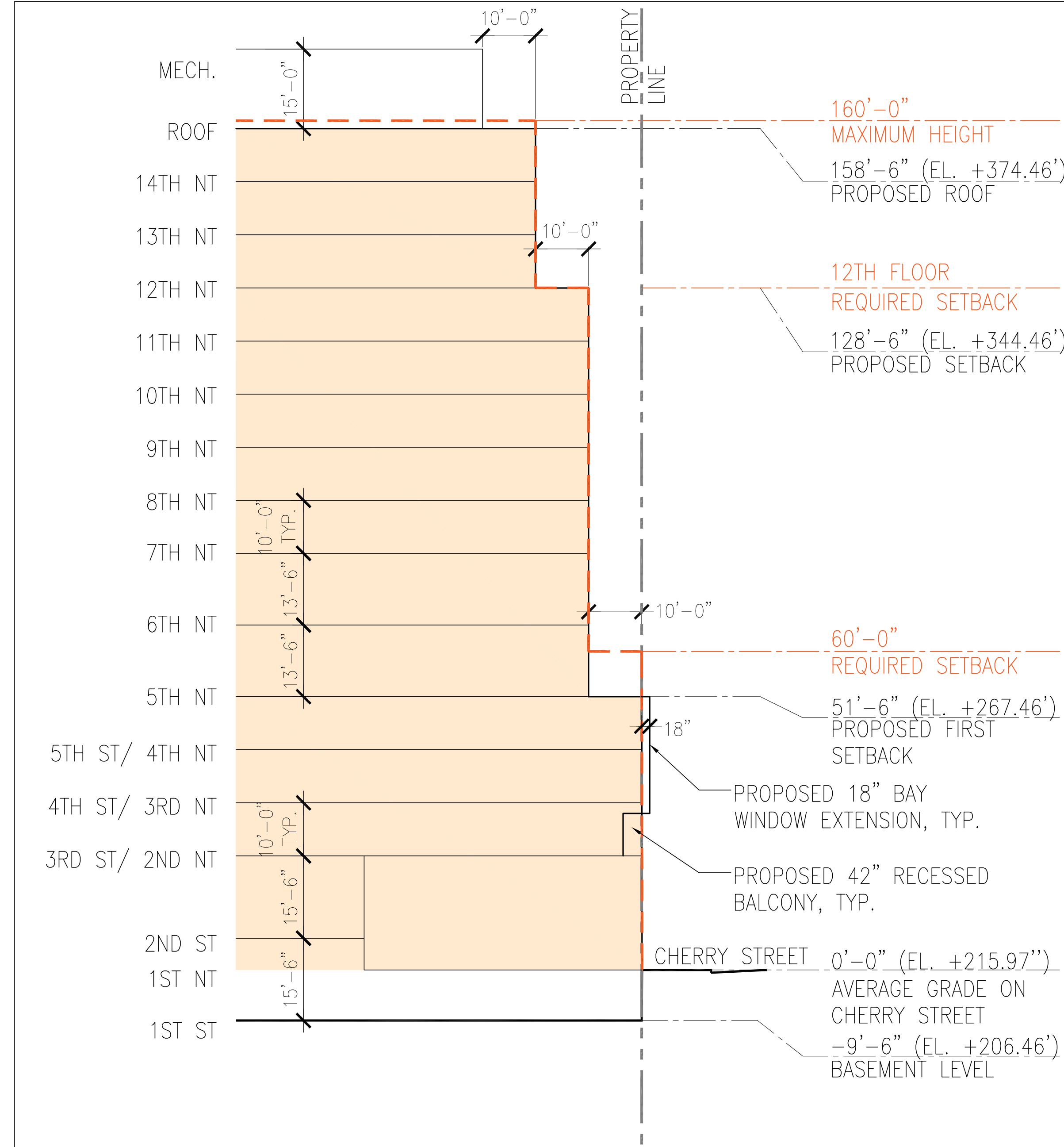
AVERAGE GRADE CALCULATIONS:

PINE STREET:	
$\frac{205.75' + 214.53'}{2}$	= 210.14'
CHERRY STREET:	
$\frac{214.53' + 217.41'}{2}$	= 215.97'
ST. PAUL STREET NORTH:	
$\frac{213.86' + 217.41'}{2}$	= 215.64'
ST. PAUL STREET SOUTH:	
$\frac{211.40' + 213.86'}{2}$	= 212.63'
BANK STREET:	
$\frac{204.16' + 211.40'}{2}$	= 207.78'

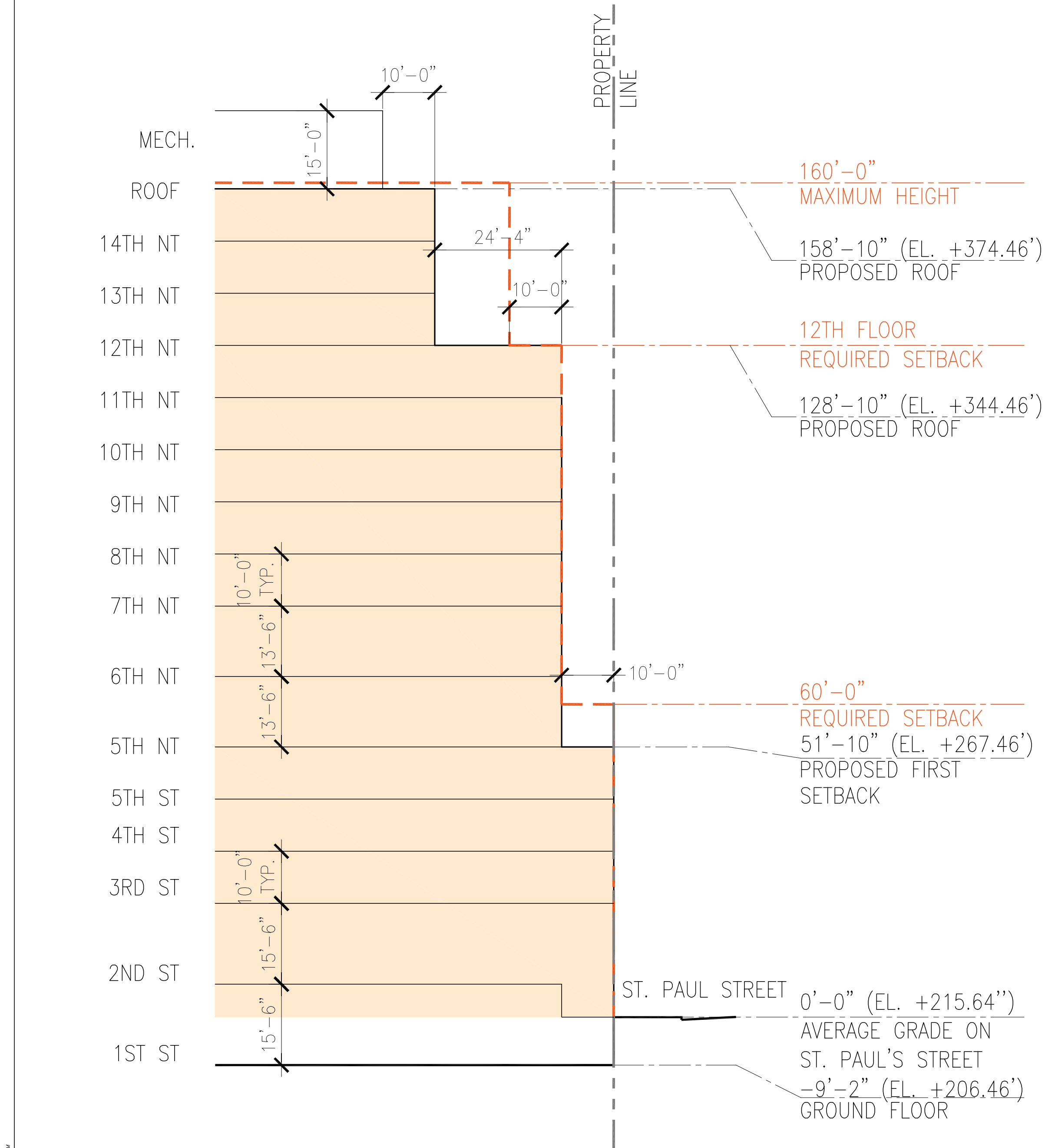
LEGEND:

- GREEN ROOF (11,015 SF)
- PV ARRAY
- PEDESTAL PAVER SYSTEM
- FLEXI-PAVE PLAY SURFACE

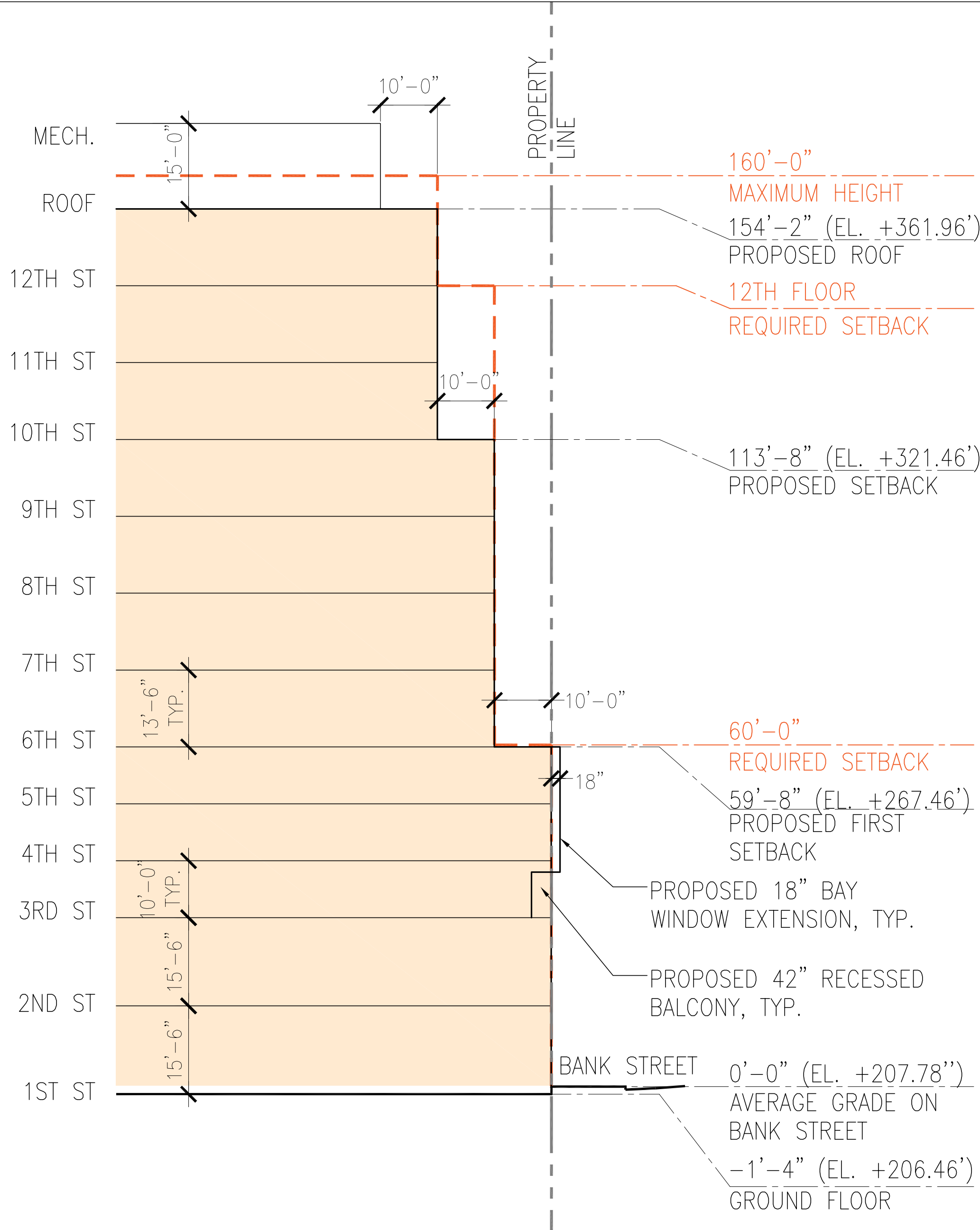
1 SITE PLAN
1" = 20'-0"



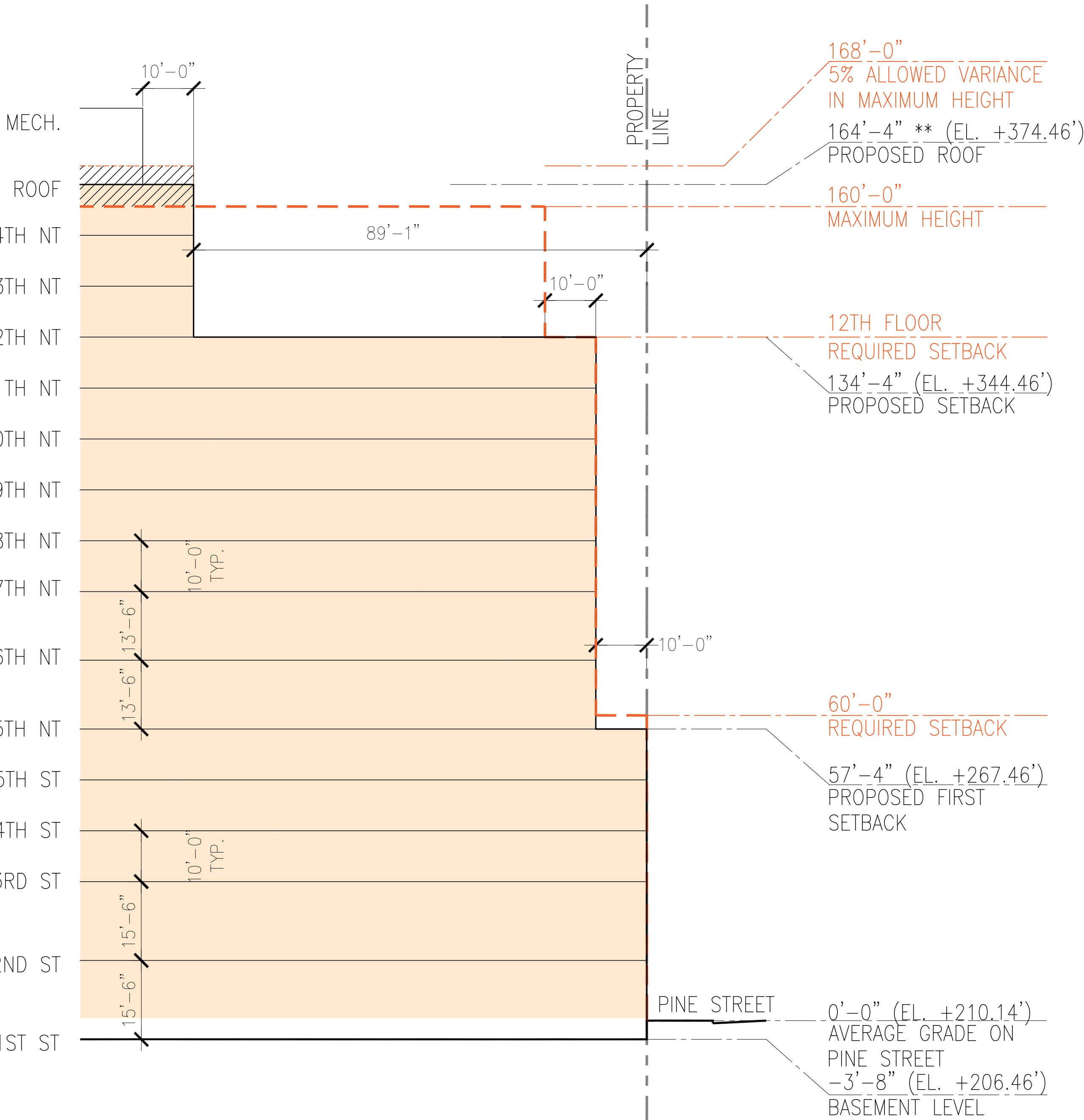
01 PROPOSED NORTH TOWER BUILDING SETBACK - CHERRY STREET
1/16" = 1'-0"



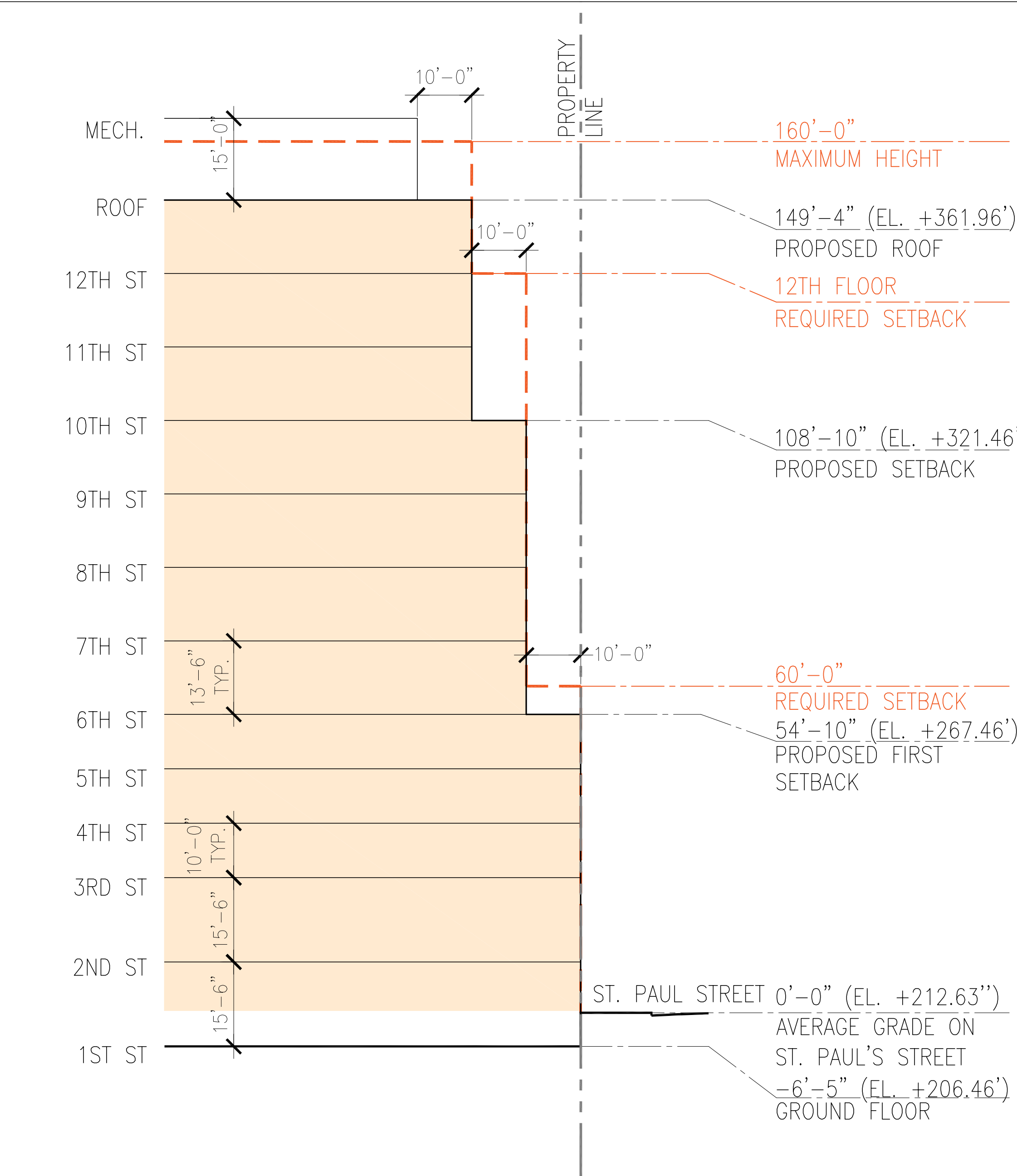
04 PROPOSED NORTH TOWER BUILDING SETBACK - ST PAUL ST NORTH
1/16" = 1'-0"



02 PROPOSED SOUTH TOWER BUILDING SETBACK - BANK STREET
1/16" = 1'-0"



05 PROPOSED NORTH TOWER BUILDING SETBACK - PINE STREET
1/16" = 1'-0"



03 PROPOSED SOUTH TOWER BUILDING SETBACK - ST PAUL ST SOUTH
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. 4'-4" HEIGHT INCREASE @ PINE STREET NORTH TOWER = 2.71% OF 160'-0"

P K PKSB ARCHITECTS, PC
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Landscape Architect
(802)-862-0098
www.segroup.com

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Approval:

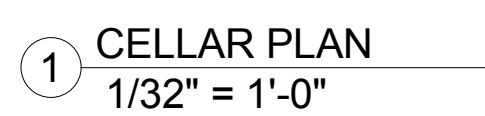
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1/11/17		P & Z RESUBMISSION I
1/20/17		P & Z RESUBMISSION II
2/16/17		P & Z RESUBMISSION III

Burlington Town Center,
Devonwood Investors, LLC
101 Cherry Street
Burlington, VT 05401

BUILDING SECTIONS

Project Number: 1317-01	Revision & Date:
Drawn By:	
Checked By:	
Date:	
AS NOTED	

Z-021

[illegible]

CELLAR PLAN	
Project Number: 1317-01	Signature & Date:
Drawn By: Designer	
Checked By: Checker	
Date: As indicated	

A-050

NOT FOR CONSTRUCTION

Date	No.	Description
12/15/16		P&Z Submission
1/11/17		P&Z Resubmission I
1/20/17		P&Z Resubmission II
2/16/17		P&Z Resubmission III

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

FLOOR PLANS 1-4TH
FLOOR

Project Number 1317-01	Designer & Seal
Designer	
Checker	
Scale As indicated	

A-051



④ 3RD FL NT, 4TH FL ST
1/32" = 1'-0"



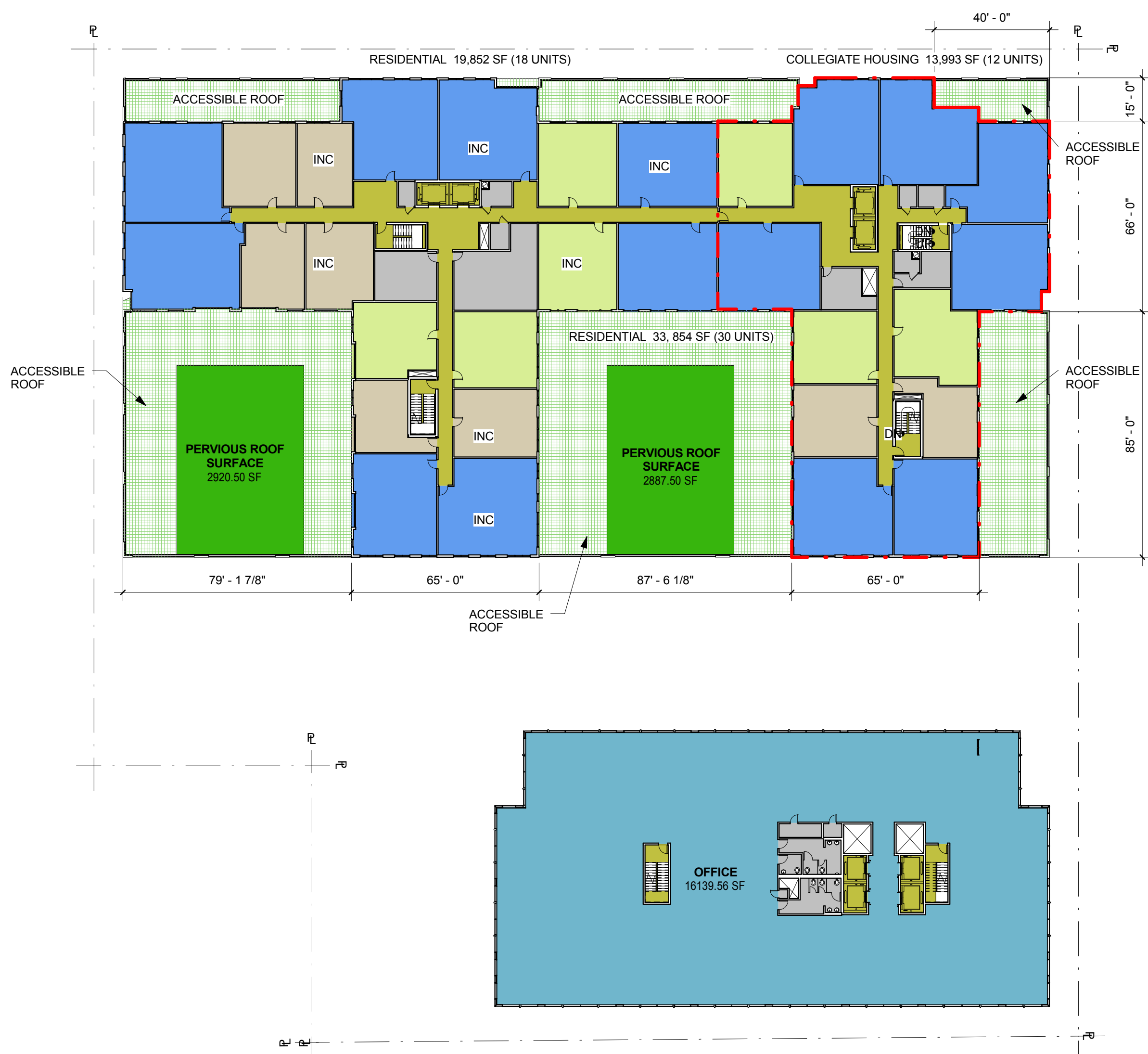
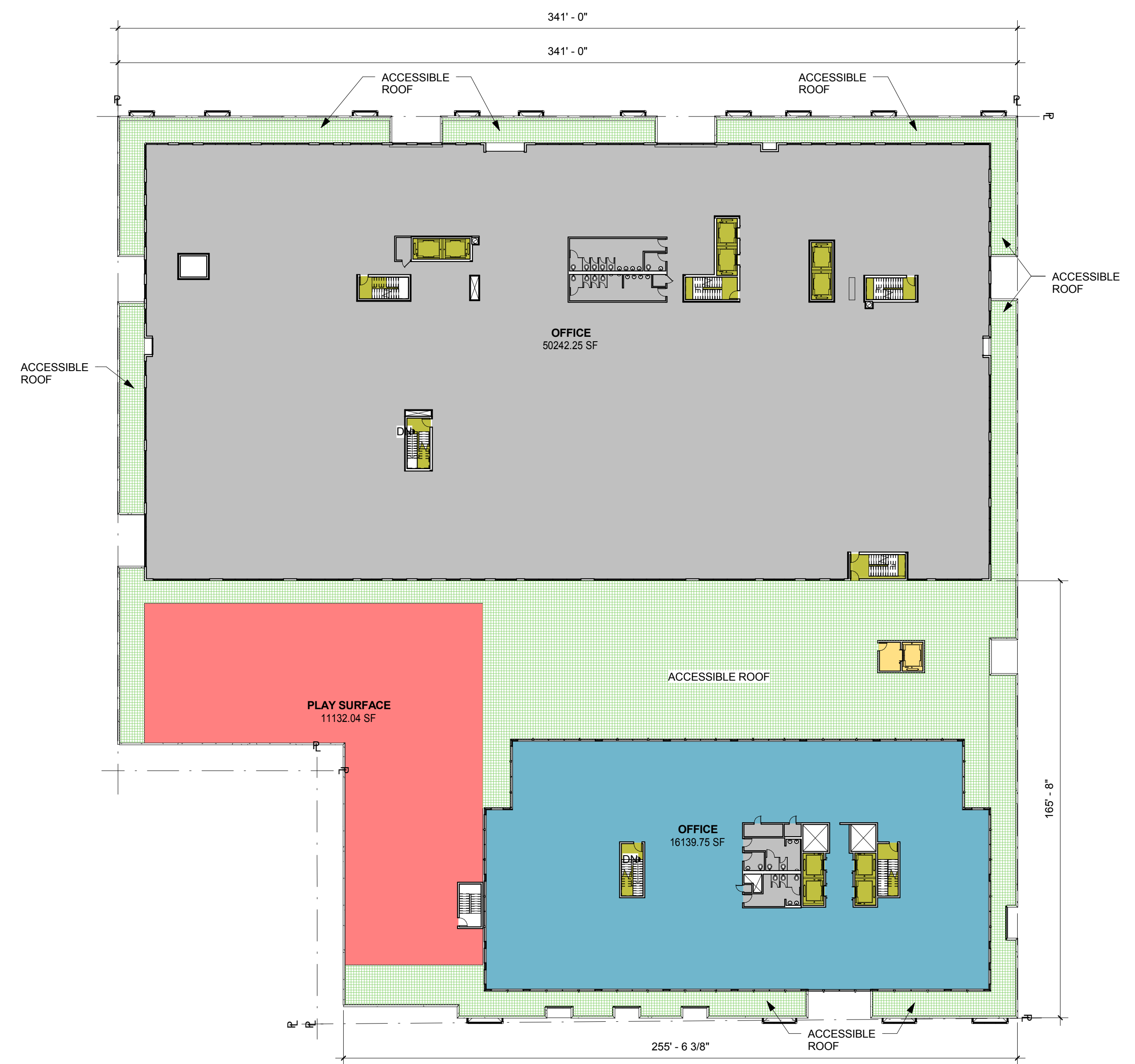
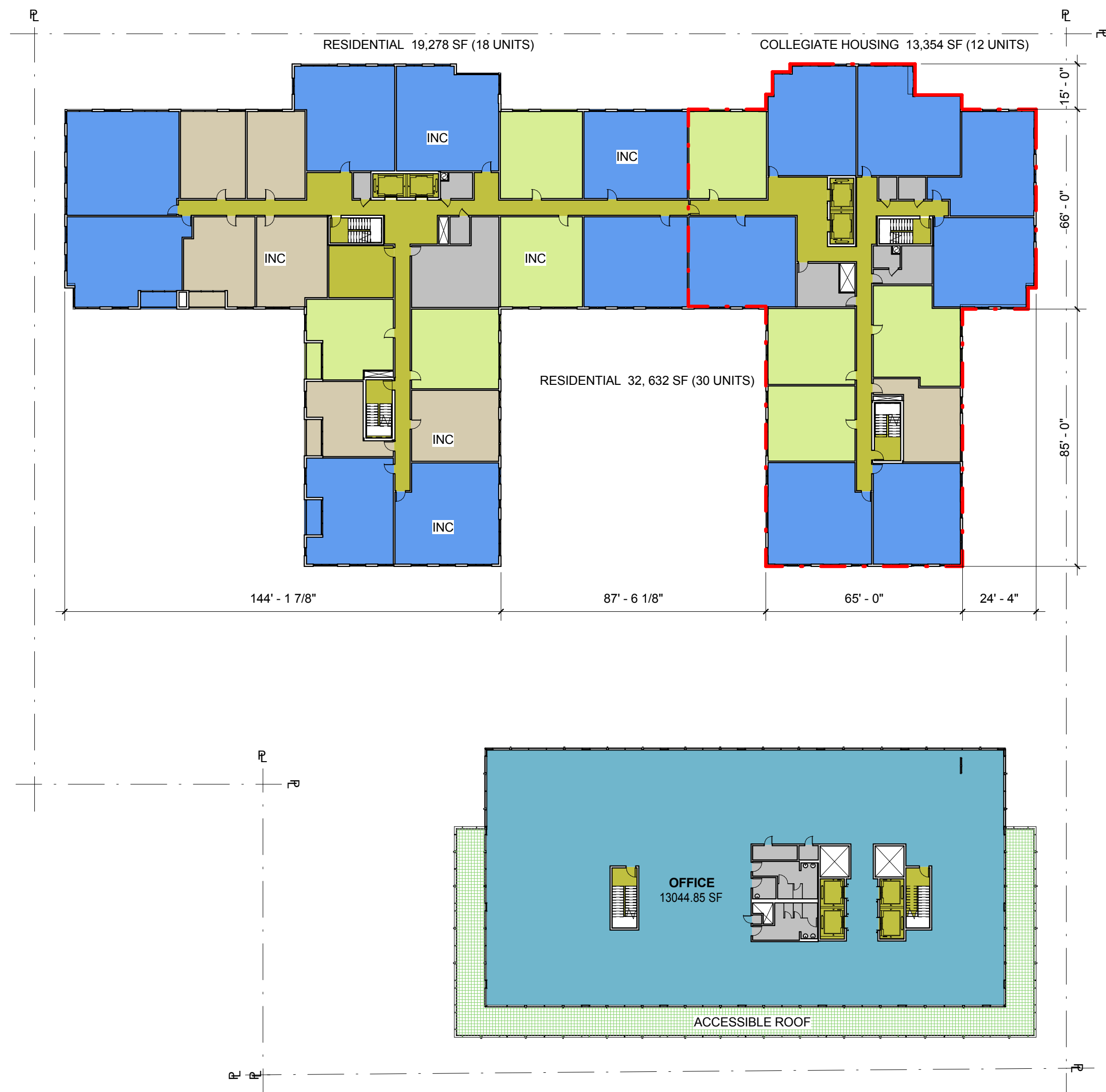
② 2ND FL ST
1/32" = 1'-0"



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

Project

Date

No.

Description

12/15/16 P&Z Submission

1/11/17 P&Z Resubmission I

1/20/17 P&Z Resubmission II

2/16/17 P&Z Resubmission III

Date No. Description

Project

Burlington Town Center

Devonwood Investors, LLC

101 Cherry Street

Burlington, VT 05401

Drawing Title

FLOOR PLANS

4TH-11TH FLOORS

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

Scale

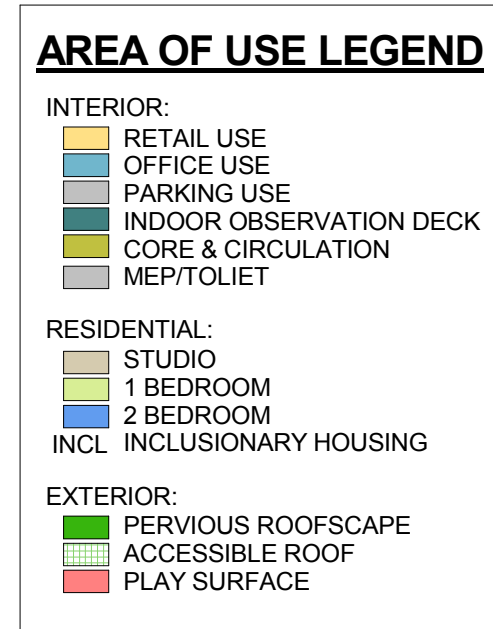
As indicated

Drawing Number

A-052

Sheet

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The image displays three architectural floor plans for a building, likely a university campus, showing residential and collegiate housing units.

Top Left Plan: Labeled "RESIDENTIAL 8,710 (6 UNITS)". The dimensions are 65' - 0" wide by 134' - 0" deep. It shows a central corridor area with yellow rooms and blue rooms, and an "ACCESSIBLE ROOF" area at the bottom.

Top Right Plan: Labeled "COLLEGIATE HOUSING 10,140 (10 UNITS)". The dimensions are 65' - 0" wide by 156' - 0" deep. It shows a central corridor area with yellow rooms and blue rooms, and an "ACCESSIBLE ROOF" area at the bottom.

Bottom Plan: A detailed view of a section with dimensions 116' - 2 7/8" wide by 116' - 0" deep. It shows a "MECHANICAL ROOM 3380.62 SF" and an "INDOOR OBSERVATION DECK 2430.01 SF". The area is surrounded by an "ACCESSIBLE ROOF".

The image contains two architectural drawings of building footprints, each with dimensions and labels.

Left Building Footprint:

- Overall width: 10'-0" (left), 45'-0" (center), 10'-0" (right).
- Overall height: 9'-4" (top), 114'-8" (center), 134'-0" (bottom).
- Internal features include a yellow rectangular area at the top, a yellow rectangular area at the bottom, and a yellow rectangular area on the right side.
- A label "ACCESSIBLE ROOF" with an arrow points to the bottom right corner of the footprint.

Right Building Footprint:

- Overall width: 10'-0" (left), 45'-0" (center), 10'-0" (right).
- Overall height: 10'-0" (top), 138'-0" (center), 156'-0" (bottom).
- Internal features include a yellow rectangular area at the top, a yellow rectangular area at the bottom, and a yellow rectangular area on the right side.
- A label "ACCESSIBLE ROOF" with an arrow points to the bottom right corner of the footprint.

Below the drawings is a large rectangular grid pattern, likely representing a site plan or a detailed view of the building's footprint.

The site plan illustrates the proposed development layout. Key features include:

- Building Footprints:**
 - RESIDENTIAL 10,140 (10 UNITS):** Located on the left, with a width of 65'-0".
 - RESIDENTIAL 20,280 (20 UNITS):** Located in the center, with a width of 87'-6 1/8".
 - COLLEGIATE HOUSING 10,140 (10 UNITS):** Located on the right, with a width of 69'-4".
 - OFFICE 15,844.22 SF:** Located at the bottom, with a width of 156'-0".
- Pervious Roof Surfaces:**
 - PERVIOUS ROOF SURFACE 2443.83 SF:** Adjacent to the left residential building.
 - PERVIOUS ROOF SURFACE 3135.64 SF:** Adjacent to the center residential building.
- Accessible Roofs:** Indicated by green hatched areas surrounding the buildings and pervious roof surfaces.
- Dimensions and Setbacks:**
 - Overall site width: 156'-0".
 - Setbacks from the left boundary: 10'-0" and 79'-1 7/8".
 - Setbacks from the right boundary: 10'-0" and 20'-0".
 - Setbacks from the bottom boundary: 10'-0" and 20'-0".

P **K**
S **B** +
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330 WEST 42 STREET
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Colchester, VT 05446

Hallam ICS 38 Eastwood Drive, Suite 200 South Burlington, VT 05403	MEP/FP Consultant (802)-658-4891 www.Hallam-ICS.com
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SE Group 131 Church Street, 3rd Floor Burlington, VT 05401	Landscape Architect (802)-862-0098 www.segroup.com
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NOT FOR CONSTRUCTION

[illegible]

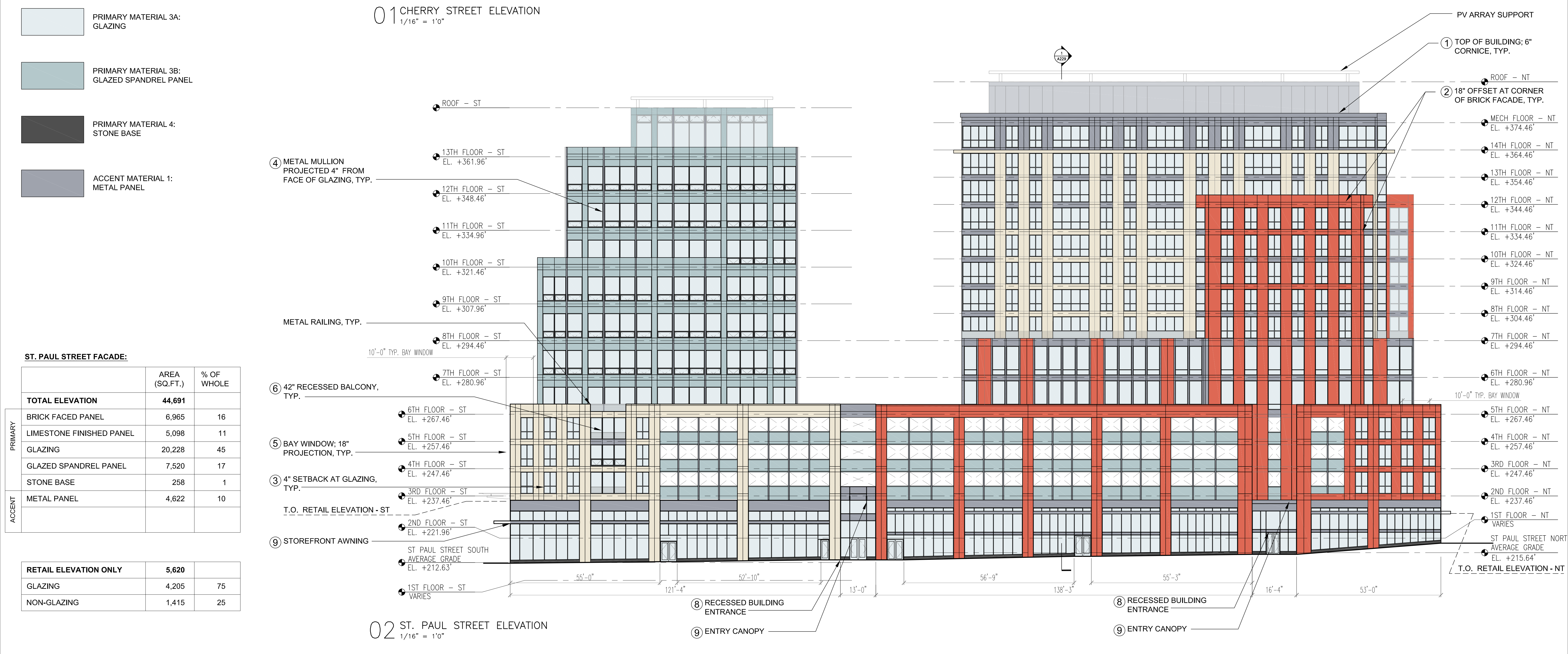
Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

FLOOR PLANS 12TH
FLOOR - ROOF

Project Number: 1317-01	Signature & Date:
Drawn By: Designer	
Checked By: Checker	
Scale: As indicated	

A-053



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South Burlington, VT 05403

Freeman French Freeman, Inc.
81 Maple Street
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Hardy Structural Engineering
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SE Group
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Burlington, VT 05401

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www.pconstruction.com

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www.fffinc.com

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www.hardyse.com

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www.hallam-ics.com

Civil Engineer
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Geotechnical Engineer
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www.geodesign.net

Landscape Architect
(802)-862-0098
www.segroup.com

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Approval:

Date	No.	Description
12/15/16		P & Z SUBMISSION
1/11/17		P & Z RESUBMISSION I
1/20/17		P & Z RESUBMISSION II
2/16/17		P & Z RESUBMISSION III

Project:

Burlington Town Center, Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

Drawing Title:

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:			
	AREA (SQ.FT.)	% OF WHOLE	
PRIMARY	TOTAL ELEVATION	36,250	
	BRICK FACED PANEL	1,742	5
	LIMESTONE FINISHED PANEL	3,839	11
	GLAZING	19,955	55
	GLAZED SPANDREL PANEL	7,990	22
ACCENT	STONE BASE	152	< 1
	METAL PANEL	2,572	7

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:			
	AREA (SQ.FT.)	% OF WHOLE	
PRIMARY	TOTAL ELEVATION	30,645	
	BRICK FACED PANEL	7,306	24
	LIMESTONE FINISHED PANEL	4,730	15
	GLAZING	13,472	44
	GLAZED SPANDREL PANEL	2,010	7
ACCENT	STONE BASE	192	< 1
	METAL PANEL	2,935	10

RETAIL ELEVATION ONLY		
GLAZING	4,008	74
NON-GLAZING	1,412	26



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Date	No.	Description
12/15/16		P & Z SUBMISSION
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1/20/17		P & Z RESUBMISSION II
2/16/17		P & Z RESUBMISSION III

Burlington Town Center,
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

Drawing Title

**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

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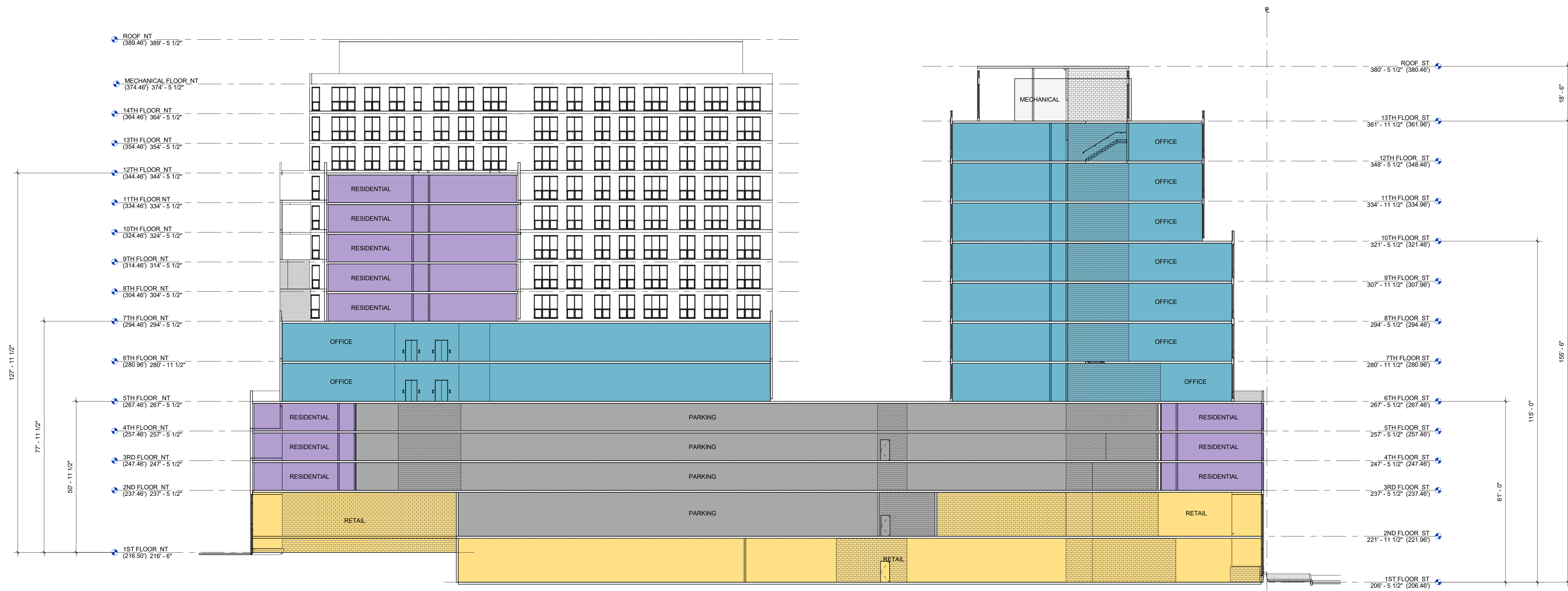
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(802) 555-6225
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Landscape Architect
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SECTION - NORTH/SOUTH
THROUGH BOTH TOWERS
1/16" = 1'-0"

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Approved

12/15/16 P&Z Submission

1/11/17 P&Z Resubmission I

1/20/17 P&Z Resubmission II

Date No. Description

Project

Burlington Town Center

Devonwood Investors, LLC

101 Cherry Street

Burlington, VT 05401

Drawing Title

BUILDING SECTION

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

Date

1/16" = 1'-0"

Drawing Number

A-211

Sheet

1/16" = 1'-0"

Drawing Title

BUILDING SECTION

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

Date

1/16" = 1'-0"

Drawing Number

A-211

Sheet

1/16" = 1'-0"

Drawing Title

BUILDING SECTION

Project Number

1317-01

Drawn By

Designer

Checked By

Checker

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Drawing Number

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Project Number

1317-01

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Checked By

Checker

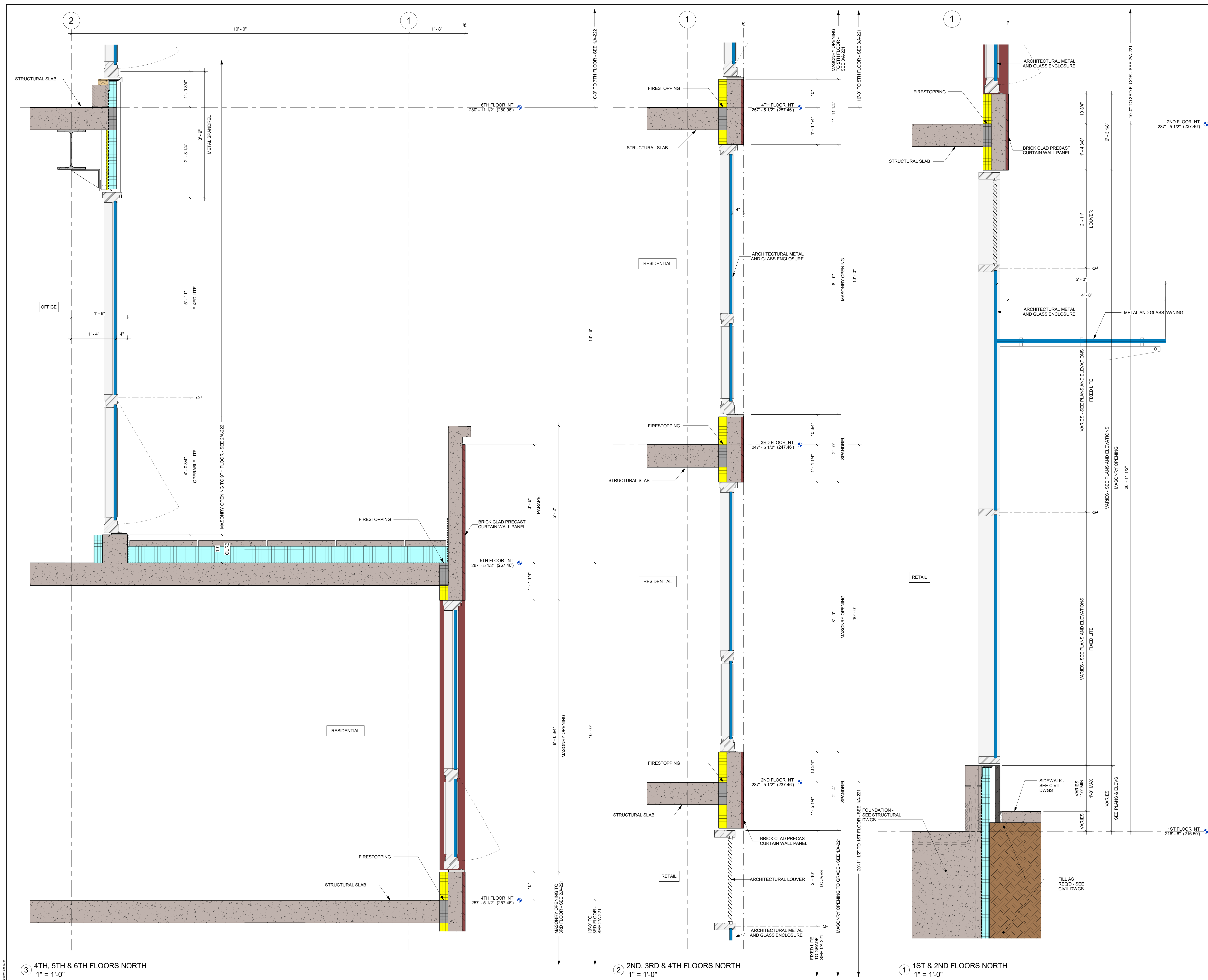
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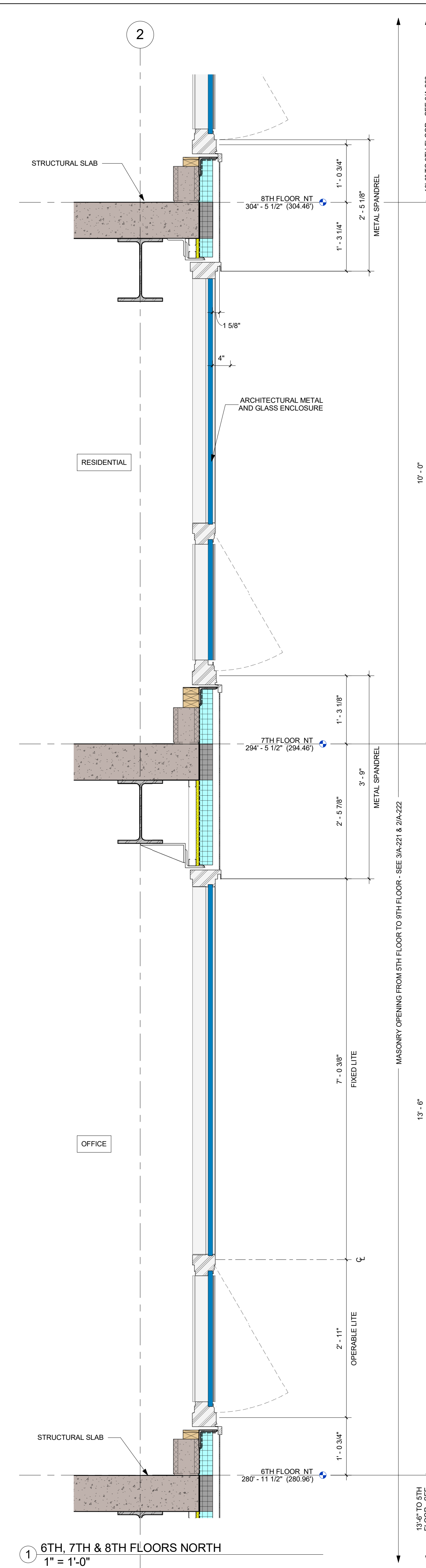
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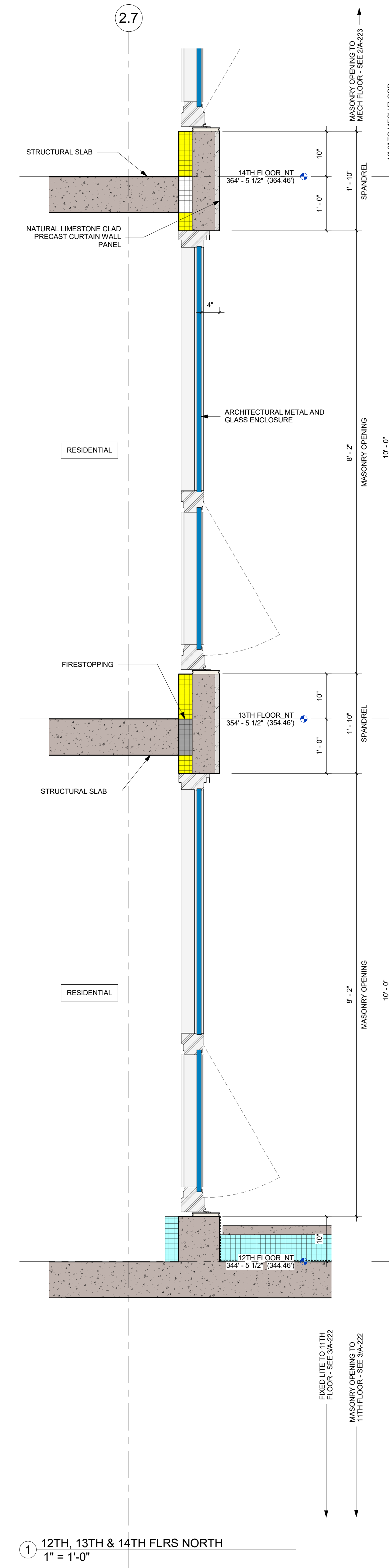
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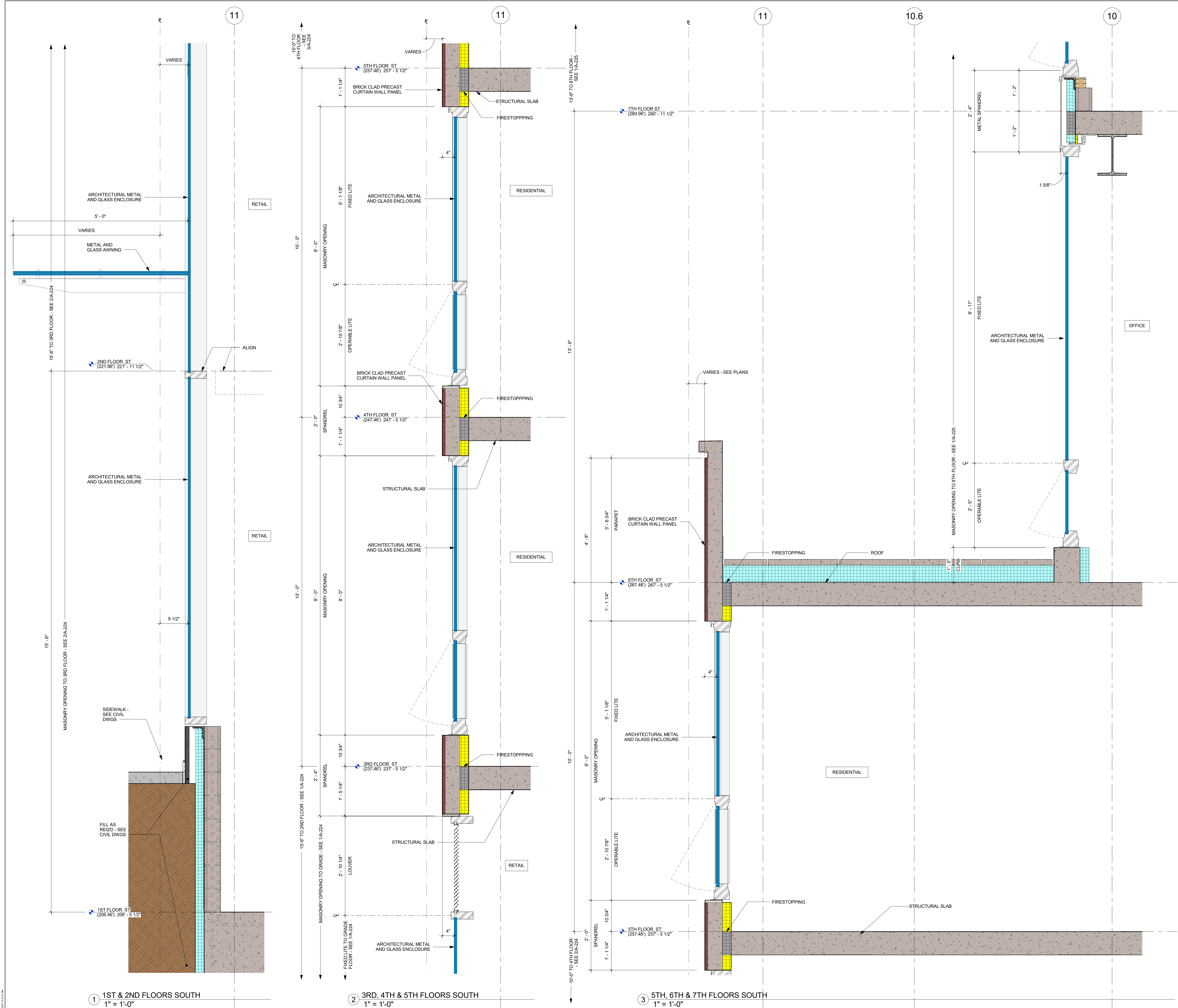


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Date	No.	Description
12/15/16		P&Z Submission
1/20/17		P&Z Resubmission II

Burlington Town Center
Devonwood Investors, LLC

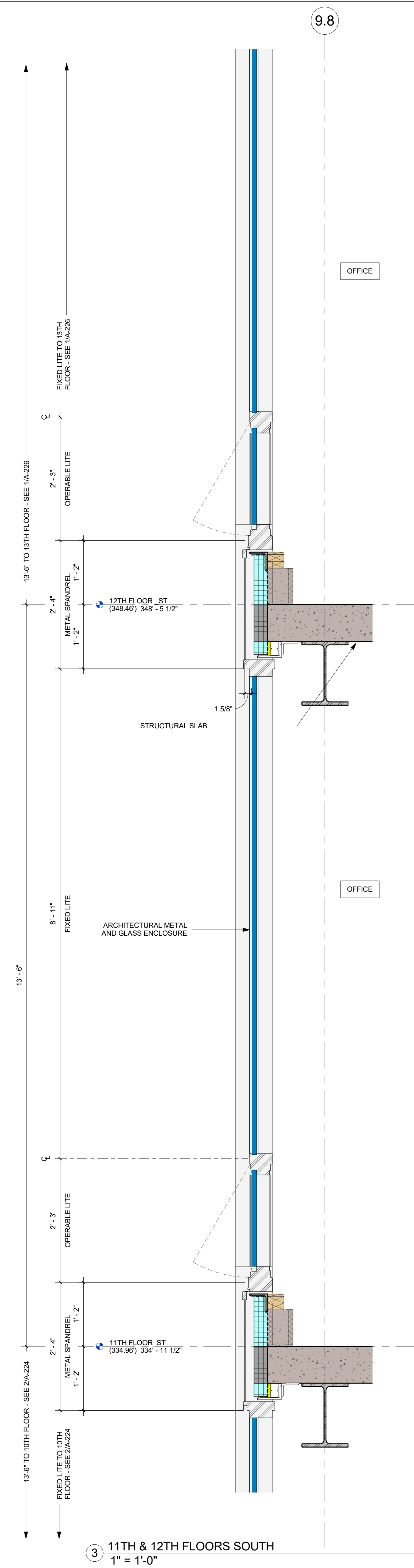
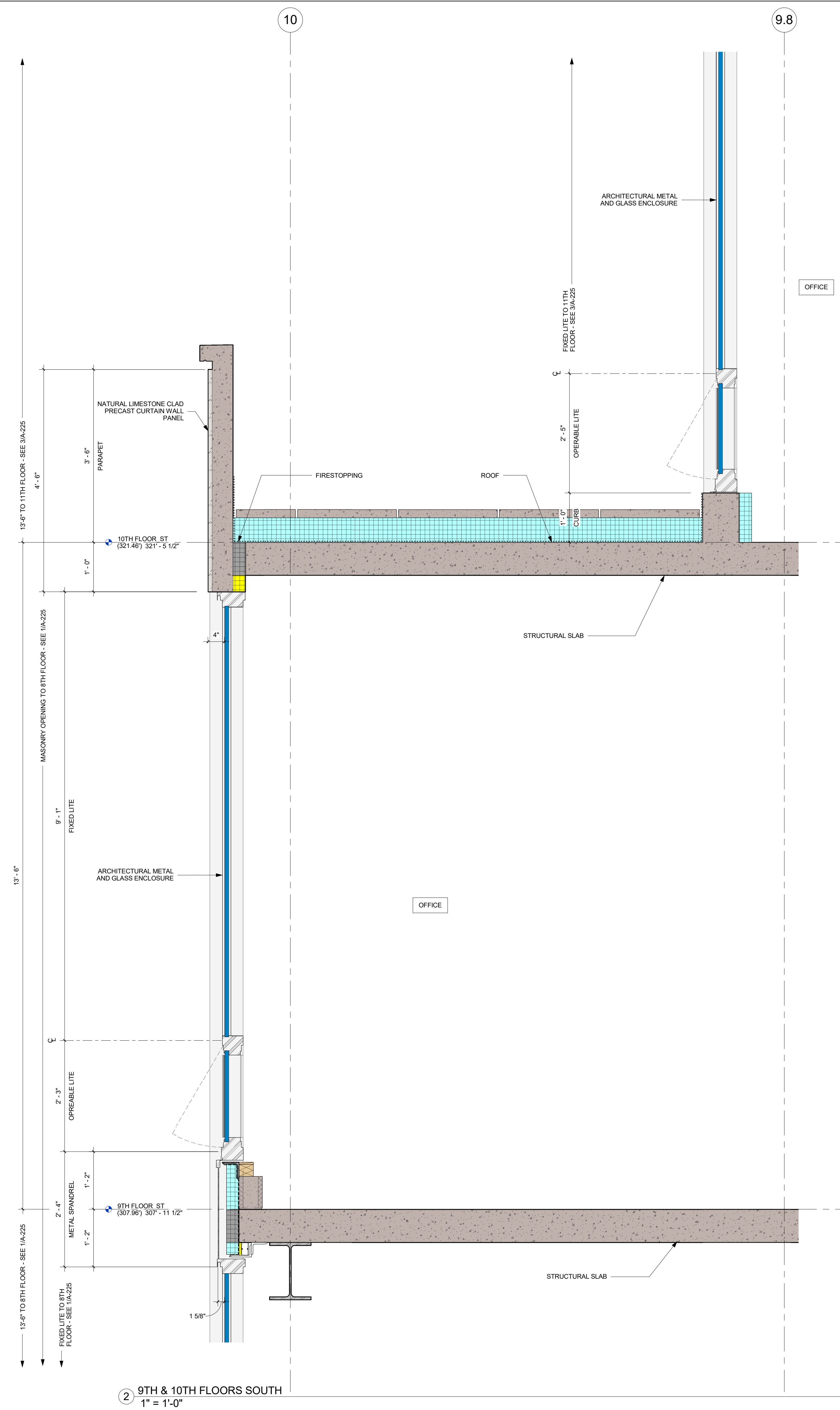
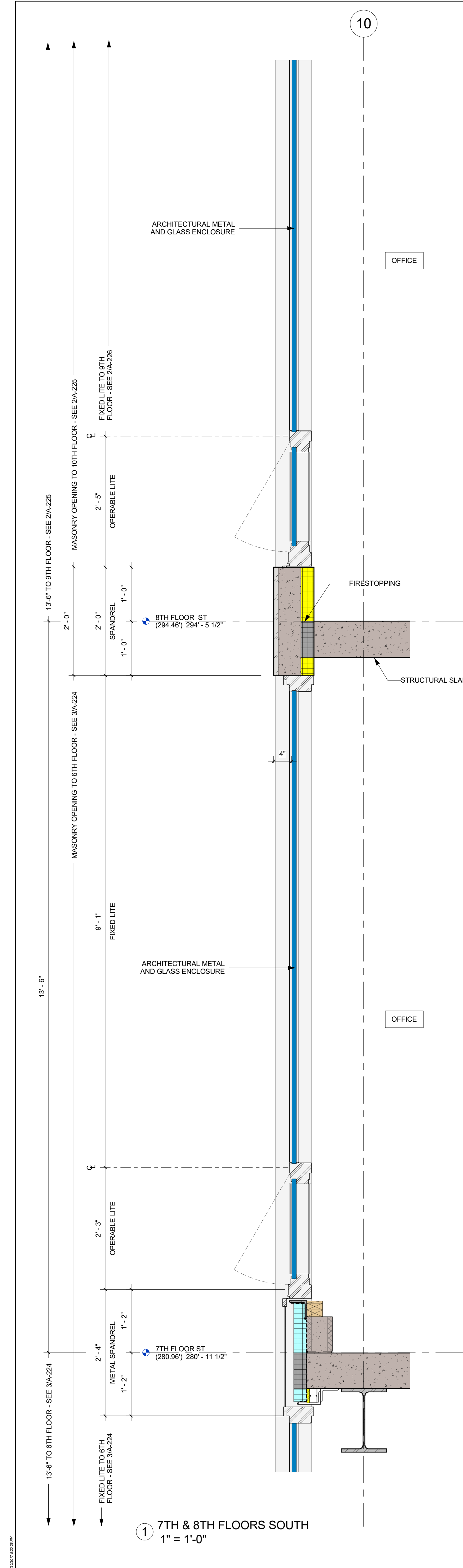
101 Cherry Street
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WALL SECTIONS IV -
BANK STREET

Project Number	Signature & Date
1317-01	
Drawn By	
Designer	
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Checker	
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1" = 1'-0"

A-224



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[illegible]

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
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Drawing Title:

WALL SECTIONS V -
BANK STREET

Project Number	Signature & Seal
1317-01	
Drawn By	
Designer	
Checked By	
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Scale	
1" = 1'-0"	

A-225

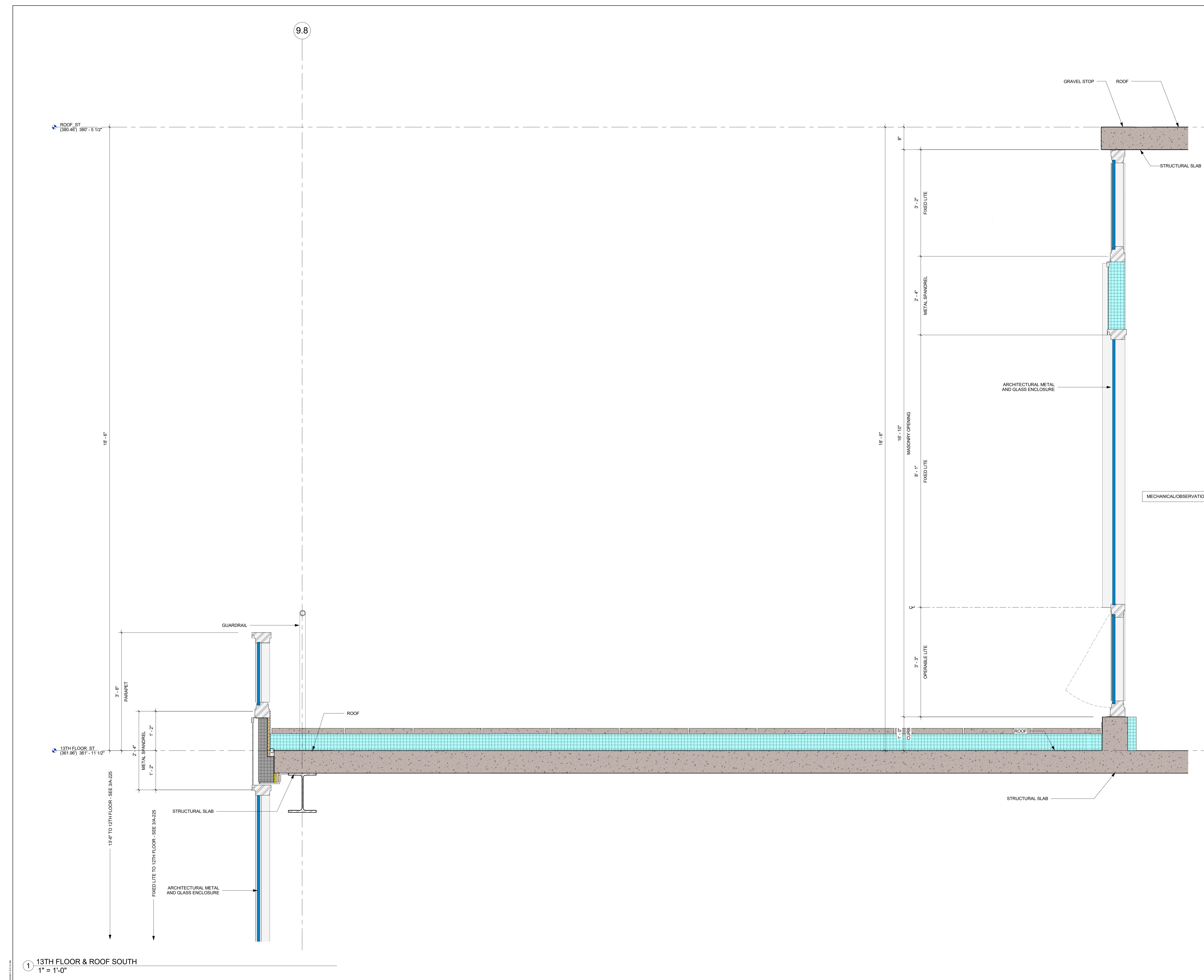
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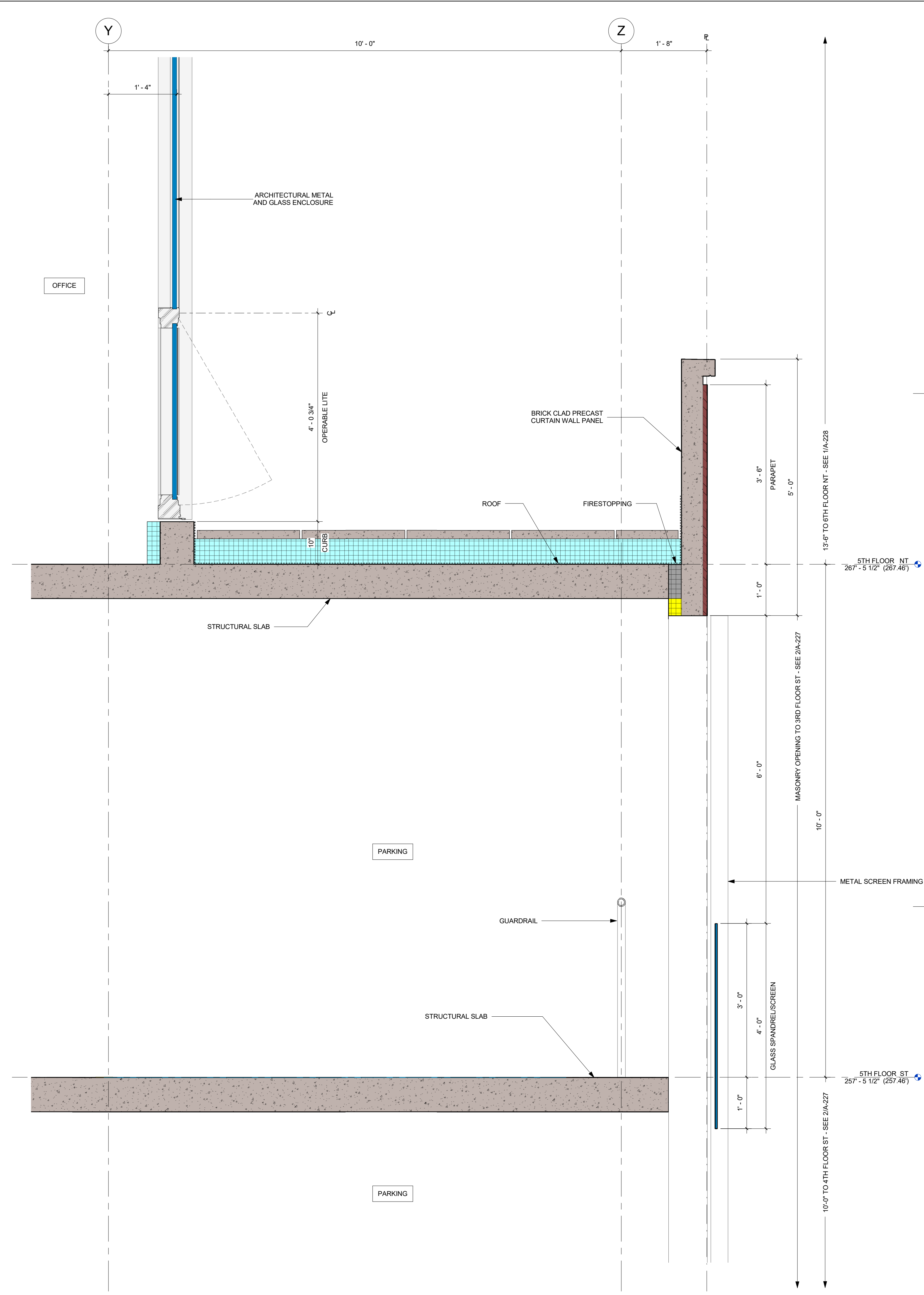
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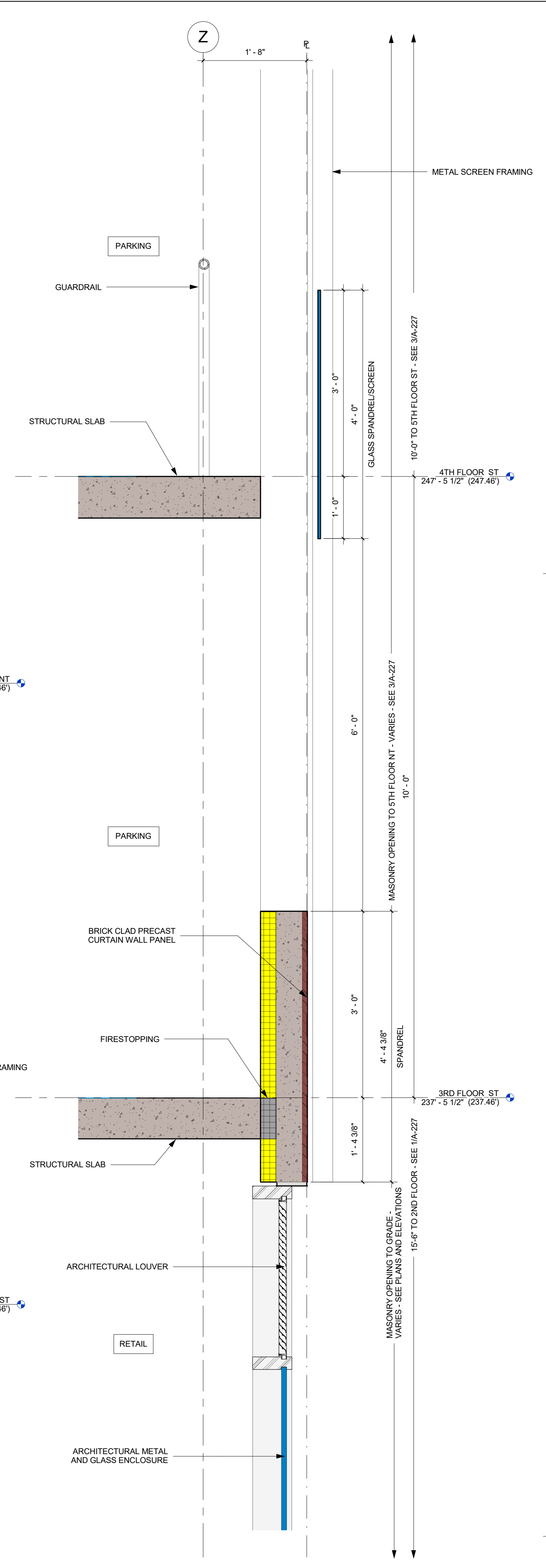
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Checked By Checker	
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A-226

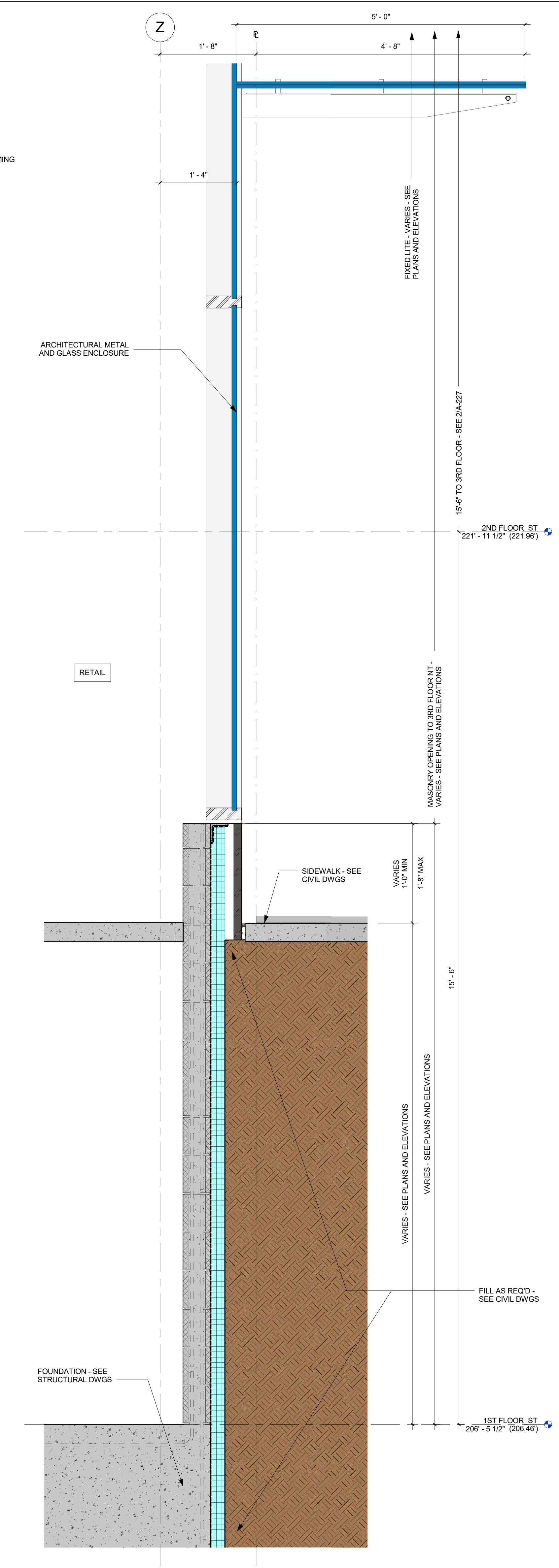




3 5TH FLR ST & 5TH FLR NT EAST
1" = 1'-0"



2 3RD & 4TH FLOORS ST EAST
1" = 1'-0"



1 1ST & 2ND FLOORS ST EAST
1" = 1'-0"

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Date	No.	Description
1/20/17		P&Z Resubmission II

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
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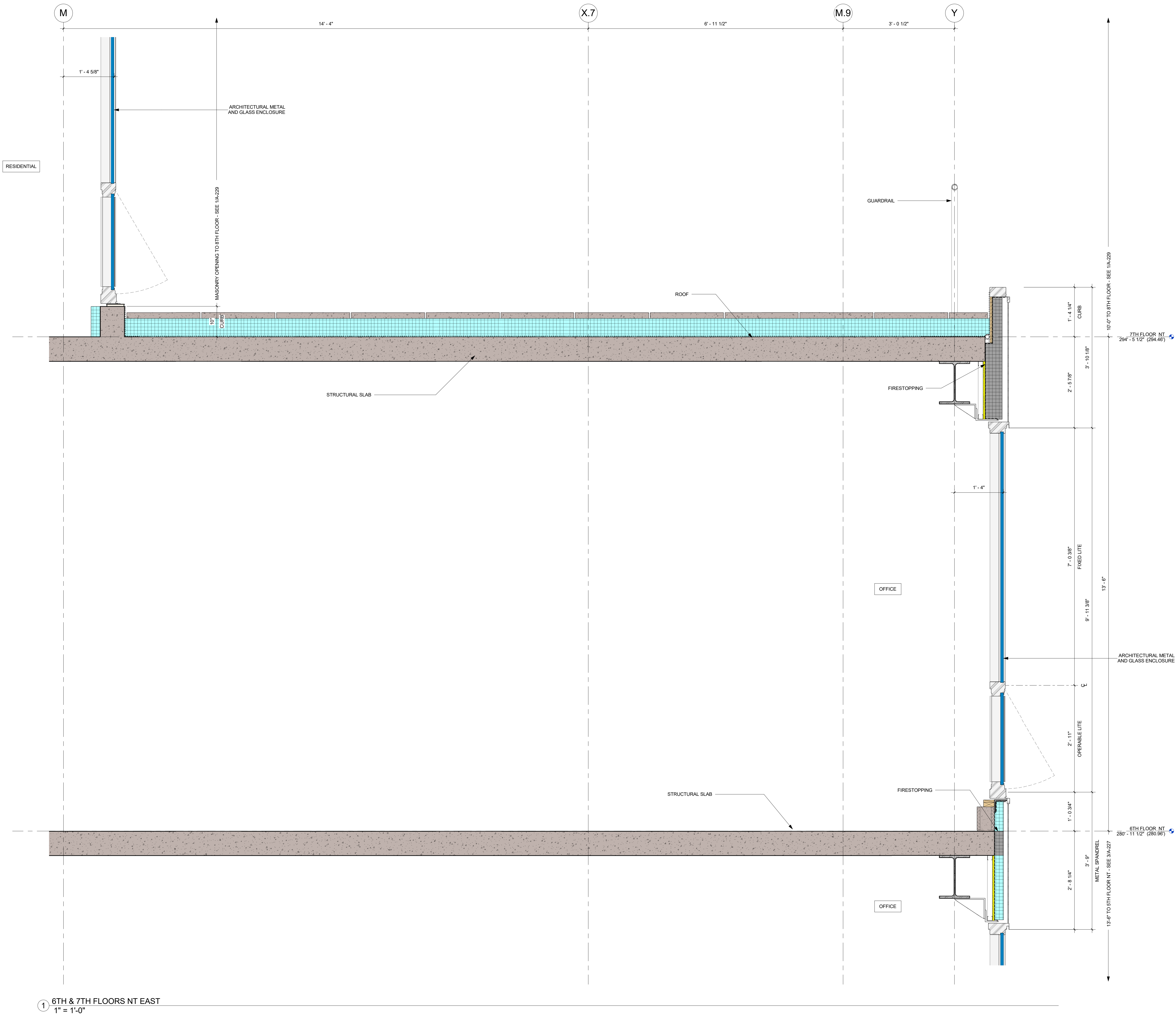
**WALL SECTIONS VII -
ST. PAUL STREET**

Project Number	Revision & Date
1317-01	

Designer	Checker

Scale: 1" = 1'-0"

Drawing Number: **A-227**



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Date	No.	Description
1/20/17		P&Z Resubmission II

Burlington Town Center
Devonwood Investors, LLC
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WALL SECTIONS VIII -
ST. PAUL STREET

Project Number	Revision & Date
1317-01	
Drawn By	
Designer	
Checker	
Date	

Drawing Number
A-228

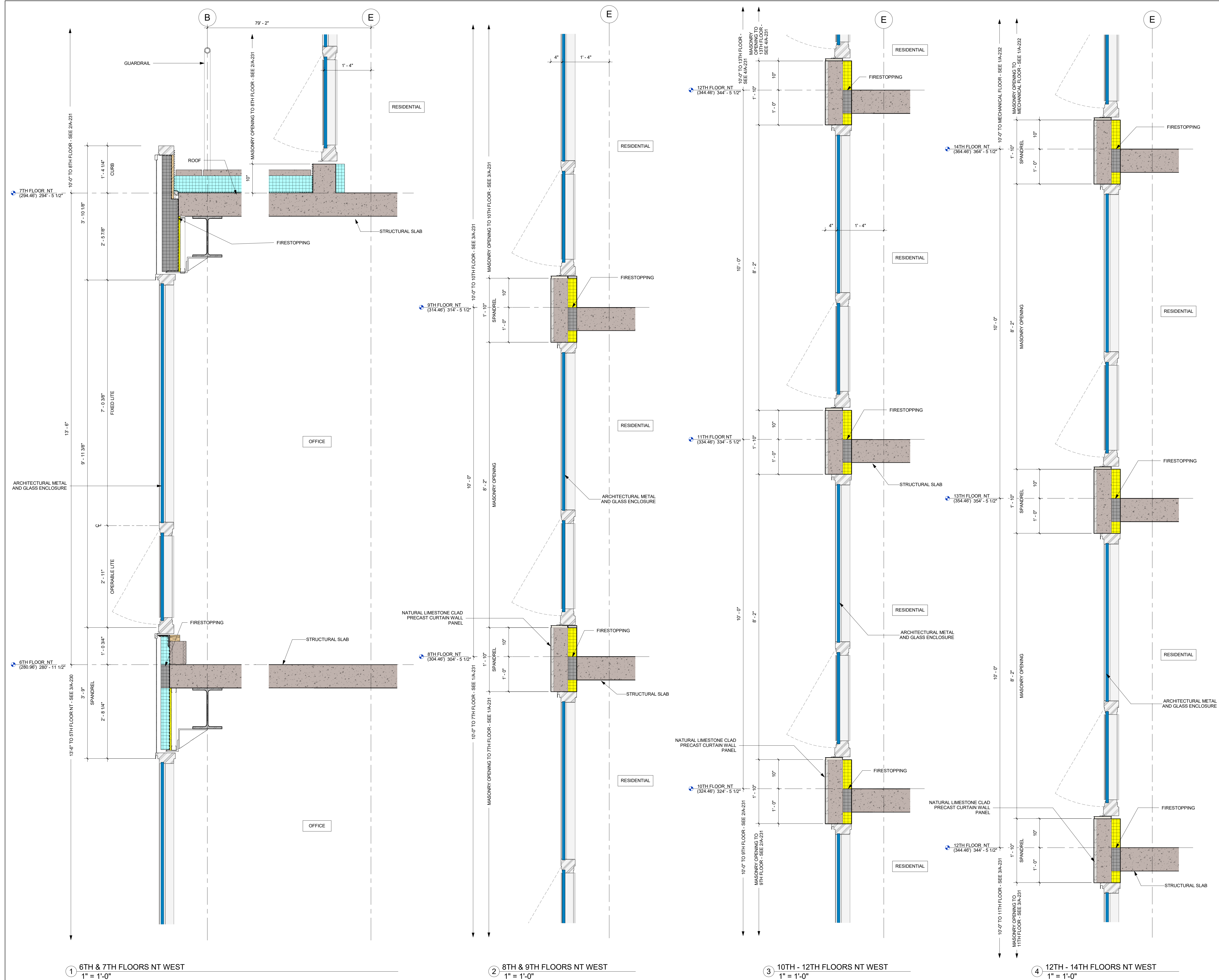
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Burlington, VT 05401

Project Number	Signature & Seal
1317-01	
Drawn By	
Designer	
Checked By	
Checker	
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Date	No.	Description
1/20/17		P&Z Resubmission II

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

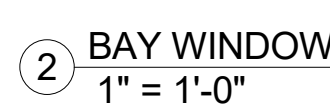
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WALL SECTIONS XI - PINE STREET

Project Number	Revision & Date
1317-01	

Drawn By:
Designer:
Checked By:
Checker:
Scale:
1" = 1'-0"

Drawing Number:
A-231

12614



NOT FOR CONSTRUCTION

1/20/17		P&Z Resubmission II
Date	No.	Description

Burlington Town Center
Devonwood Investors, LLC

101 Cherry Street
Burlington, VT 05401

BALCONY AND BAY WINDOW SECTION

Project Number: 1317-01	Signature & Seal
Drawn By: Designer	
Checked By: Checker	
Scale: 1" = 1'-0"	

ing Number:

A-234

BURLINGTON TOWN CENTER

BURLINGTON, VT



PLANNING & ZONING SUBMISSION

12/15/2016

Revised 01/11/2017

Revised 01/20/2017

Revised 02/16/2017

BURLINGTON TOWN CENTER PLANNING AND ZONING APPLICATION

12/15/2016

01/11/2017 Revised

01/20/2017 Revised

02/16/2017 Revised

TABLE OF CONTENTS

1.0 OWNER, APPLICANT, AND DESIGN TEAM

2.0 NARRATIVE

3.0 EXISTING CONDITIONS PHOTOGRAPHS

4.0 SPECIFICATIONS

5.0 DEVELOPMENT ANALYSIS

6.0 MAJOR IMPACT NARRATIVE

7.0 MAJOR IMPACT REVIEW INTERDEPARTMENTAL CHECKLIST

8.0 LIST OF DRAWINGS

9.0 FIGURES

10.0 APPENDIX – DOWNTOWN MIXED USE CORE OVERLAY COMPLIANCE CHECKLIST

1.0 OWNER, APPLICANT, AND DESIGN TEAM

1.1 PLANNING AND ZONING APPLICATIONS REQUIRED:

- 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 DESIGN TEAM:

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 NEIGHBORHOOD MEETING:

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 PROJECT INTRODUCTION:

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 DISTRICT SPECIFIC REGULATIONS: 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>1,350 sf</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.

See FIGURE 2-C for AVERAGE GRADE SKETCHES

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 URBAN DESIGN STANDARDS: 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.

See **FIGURE 2-D RESIDENTIAL UNIT PROTOTYPES.**

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 PUBLIC AMENITY:

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 GREEN BUILDING: 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 STORMWATER MANAGEMENT: 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 OUTDOOR LIGHTING: Zoning Section 5.5.2

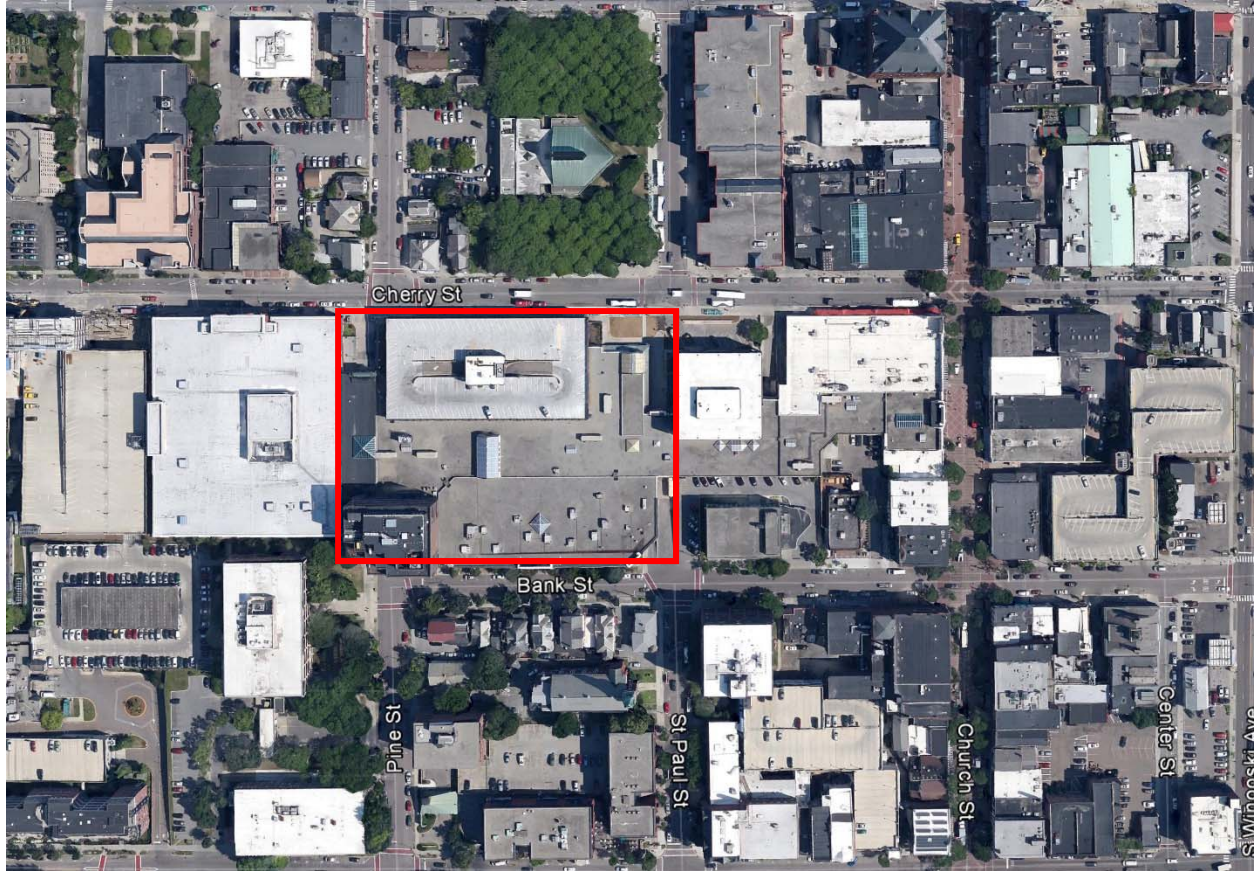
The intent of exterior lighting is to minimize light pollution while providing safe and inviting streetscapes for pedestrians and retail activities. Sidewalk lighting for pedestrians will be wall-mounted downlights mounted at brick piers at either side of the main entries. Additional lighting at main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

2.14 ADJUSTED PARCEL 2 COVERAGE CALCULATION: (See Proposed Site Plan for more info)

Proposed:

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

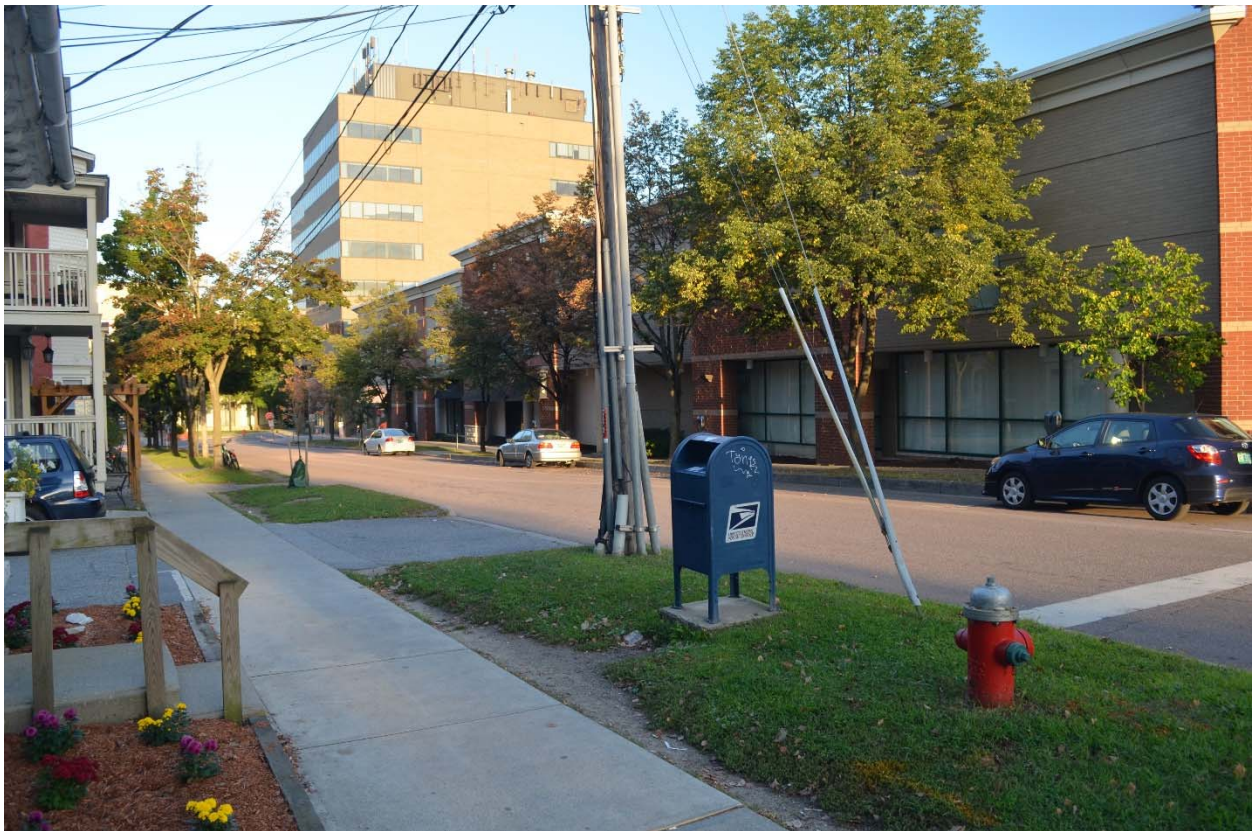
3.0 EXISTING CONDITIONS PHOTOGRAPHS



3.1 AERIAL VIEW OF DEVELOPMENT SITE



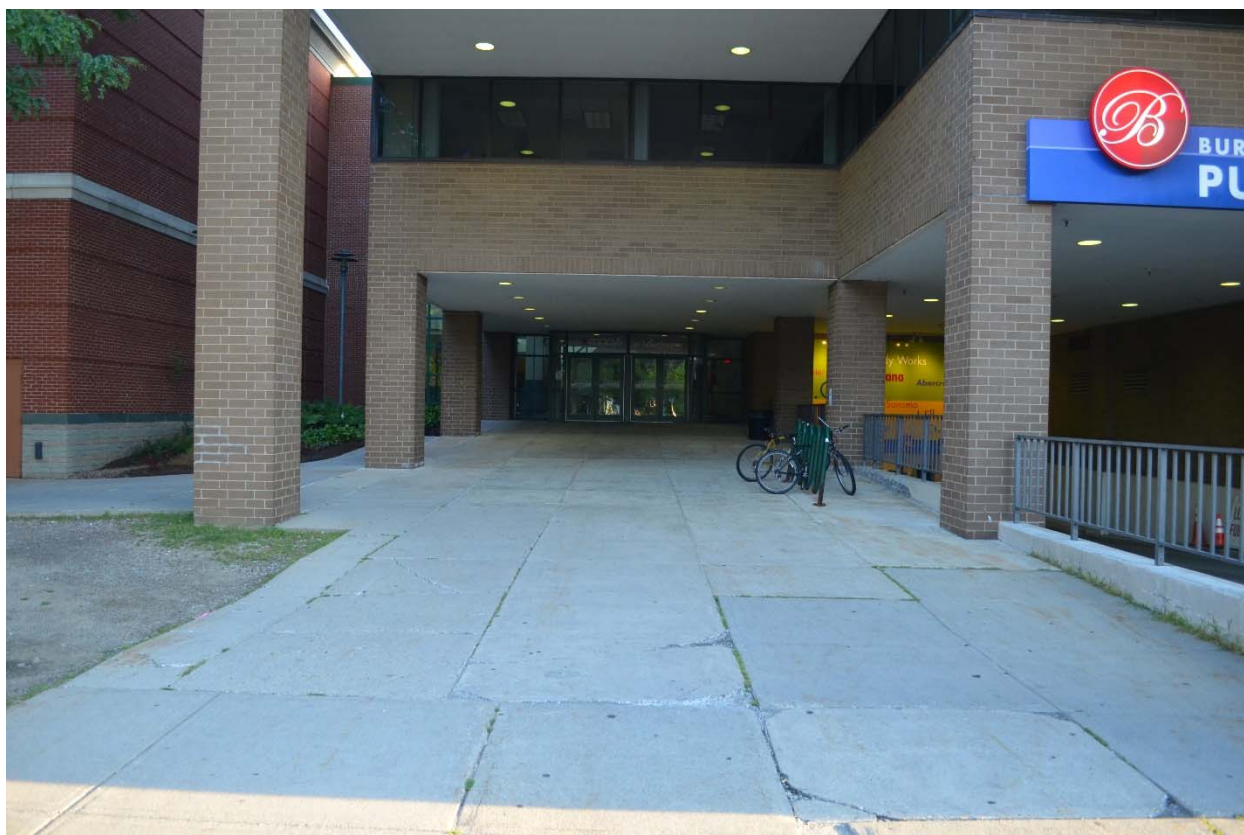
3.2 BANK STEET - LOOKING WEST



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

BUILDING FAÇADE

- 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
- **Retail Glass Alternatives** See FIGURE 4-C-3
- Aluminum Windows (Upper floors) See FIGURE 4-D
- **Glazing Spec. Upper Stories** See FIGURE 4-D-2
- 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
- **Garage Lighting** See FIGURE 4-P

ROOF AREAS

- 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 no 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.



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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

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,



Kevin Worden, P.E.
Vice President

Cc: Donald Sinex

Dsinex@devonwoodinvestors.com



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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



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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](mailto: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', with a stylized flourish at the end.

Kevin Worden, P.E.
Vice President

Cc: Donald Sinex Dsine@devonwoodinvestors.com



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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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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:

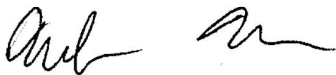
Attached are the electric and gas load projections we have provided for the above captioned project.

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
Total cfm	52,915 ft^3/minute	Product of unit value and area
Pressure change	1.0 inches w.c.	Air handler and ductwork
Fan horsepower	10.4 HP	Airflow 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) (ft^2)	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~~ **OMITTED – SEE RECORDABLE PLAT**

C-101 EXISTING CONDITIONS PLAN

C-102 DEMOLITION PLAN

C-103 SITE PLAN

C-104 GRADING PLAN

C-105 UTILITY PLAN

C-106 EROSION PREVENTION AND SEDIMENT CONTROL PLAN

C-107 **ST. PAUL AND PINE STREET DIMENSIONS**

C-201 ST PAUL STREET PROFILE

C-202 CHERRY STREET PROFILE

C-203 PINE STREET PROFILE

C-204 BANK STREET PROFILE

C-205 **PINE STREET SECTIONS**

C-206 **ST. PAUL STREET SECTIONS**

C-300 SITE DETAILS AND NOTES

C-301 WATER DETAILS AND NOTES

C-302 SEWER DETAILS AND NOTES

C-303 STORMWATER DETAILS

C-304 **STORMWATER DETAILS**

C-305 **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-050 **CELLAR PLAN**

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

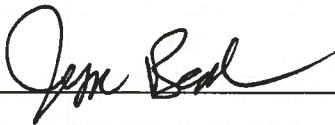
9.0 FIGURES

FIG. 1-A	PRE-APPLICATION PUBLIC NEIGHBORHOOD MEETING CERTIFICATION
FIG. 2-A	LEED V4 – BUILDING DESIGN AND CONSTRUCTION CHECKLIST
FIG. 2-B	LEED PROJECT REGISTRATION
FIG. 2-C	AVERAGE GRADE SKETCHES
FIG. 2-D	RESIDENTIAL UNIT PROTOTYPES
FIG. 4-A	BRICK-FACED PANEL
FIG. 4-B	LIMESTONE FINISHED PANEL
FIG. 4-C	ALUMINUM STOREFRONT AND ENTRANCE DOORS
FIG. 4-C-2	RETAIL GLASS
FIG. 4-C-3	RETAIL GLASS ALTERNATIVES
FIG. 4-D	ALUMINUM WINDOWS UPPER FLOORS
FIG. 4-D-2	GLAZING SPEC UPPER STORIES
FIG. 4-E	ALUMINUM PANELS
FIG. 4-F	PAINTED METAL AND STAINLESS STEEL CABLE RAILING
FIG. 4-G	GLASS AND STEEL CANOPY
FIG. 4-H	EXTERIOR WALL-MOUNTED LIGHT FIXTURE
FIG. 4-I	EXTERIOR CANOPY-MOUNTED LIGHT FIXTURE
FIG. 4-J	PRE-CAST CONCRETE ROOF PAVERS AND PEDESTAL SYSTEM
FIG. 4-K	POROUS PAVEMENT
FIG. 4-L	FLUID-APPLIED MEMBRANE ROOFING
FIG. 4-M	GREEN ROOFING SYSTEM
FIG. 4-N	SOLAR PANELS
FIG. 4-O	EXTERIOR POLE-MOUNTED LIGHT FIXTURE A
FIG. 4-P	GARAGE LIGHTING
FIG. 5-A	TRAFFIC IMPACT STUDY
FIG. 5-A-2	TRAFFIC STUDY MODIFICATIONS
FIG. 5-A-3	80 ADDITIONAL TRIPS MEMO
FIG. 5-B	BURLINGTON CITY CENTER PHASE I OCCUPANCY SCHEDULE
FIG. 5-C	NOISE IMPACT ASSESSMENT FOR BURLINGTON TOWN CENTER
FIG. 6-A	DUST MITIGATION AND CONTROL MEASURES

Pre-Application Public Neighborhood Meeting Certification

I, Jesse Beck, certify that 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) at _____.

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: 

STATE OF VERMONT

COUNTY OF Chittenden

The above and foregoing Affidavit as subscribed before me this 6 day of December, A.D., 2015 personally by Jesse Beck.


NotaryPublic

My Commission expires: Feb. 10, 2016

Seal





freeman | french | freeman

FIGURE 1-A
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

NPA (choose one)	Wards 1 & 8	Wards 2 & 3	Wards 4 & 7	Ward 5	Ward 6
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Date of Assembly : 6-22-16 Location: Miller Ctr.

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

1 MARY HART 7
W3 Miller

2 Don Sinex + 1

3 Rosal Bergman

4 Martie Majoros

5 Margaret Tenness

6 Jude Hill

7 Kelby Cross

8 Pat Hattney

9 Marie Moisis

10 Diane H Morris

11 DEAN WBAUER

12 Wayne Dutchman

13 Pat Dutchman

14 Martin Waldron

15 ARNE KRIEGER

16 Mathea Melpus 7

17 Caryn + Michael Long Ward 1

18 G Simpson Ward C

19 Jon Yn Ward 2

20 CHAS Trombly 7

Sandi Amemoria 7

NPA Liaison Phet keomanyvanh: 802-865-7172

21 Klick + Sherrin Albers

22 Betsy Lawrence

23 Michael Palmer

24 Shuley Washburn

25 Lord Alton

26 Sheryl Chamberlain

27 Patricia Branch

28 Chuck Branch

29 Paul Cruz

30 JOANNE Hunt

31 Saman Chopel

32 Leering Chodon

33 Ngodup Dharma

34 Ken McGarvey

35 Jay McGarvey

36 Bakt Payne

37 Karl Whitten

38 Ken Pelletier WMS

39 Robert Herendson +

40 ANN TAYLOR

Janet Patterson



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.

FIGURE 1-A



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: UVM Medical

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

- 1 Dana Hamenick
- 2 William O. Suiter
- 3 William P. Hildebrand
- 4 Jason Williams
- 5 Nancy Kirby
- 6 Bob Butan
- 7 Richard Hillyard
- 8 Tyler Mitchell BFD
- 9 Scott Kipeter BFD
- 10 Angie Chappi-Sokol
- 11 Jonathan Chappi-Sokol
- 12 Sharon Bushor
- 13 Lisa Kingsbury
- 14 Jim Barr
- 15 Caryn Long
- 16 Edmon Turzovich
- 17 Selene Colburn
- 18 Lani Ravin
- 19 Ghad Mahnke
- 20 F. Van Wehovich

- 21 Mary Heid.
- 22 Mark Pater
- 23 Adam Hoop
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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

Curt McCormack (D) 318-2585

curt.mccormack@gmail.com

Jill Krowinski (D) 363-3907 jkrowinski@leg.state.vt.us

Chittenden District 6-5:

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johannah.donovan@gmail.com

Mary Sullivan (D) 862-6632

marysull@yahoo.com

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.

FIGURE 1-A



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: Morgan Room,

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

1 Heather Scott

2 Mark Heinzer

3 Karen Freudenberger

4 Diane Gayer

5 Margaret Murray

6 Tom and Adrienne Donohue

7 Anita Reppin

8 Jared Knepper

9 Sandy Yensen

10 Michael Rooney & Susan Dorn

11 ANN TAYLOR

12 Mr D. Aschman

13 Gary Chassman

14 Deborah Boothby

15 STEVE GOODKIND

16 Mary Gade

17 Jim Barr

18 Caryn Long

19 Greg Eperwood

20 Joe Speidel

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DRAFT DRAFT DRAFT DRAFT

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 its 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-

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

1	<u>Eyan McLauren</u>	21
2	<u>[Signature]</u>	22
3	<u>R. St. [Signature]</u>	23
4	<u>Chester Sanford</u>	24
5	<u>Sam Wilson</u>	25
6	<u>Sharon Webster</u>	26
7	<u>Sara Giannoni</u>	27
8	<u>Lynn Martin</u>	28
9	<u>MICHAEL MCCORMICK</u>	29
10	<u>TOMMY ROSSITER</u>	30
11	<u>Barbara WYNNO TH</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
16		36
17		37
18		38
19		39
20		40



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.

FIGURE 1-A



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,
or email to cedofd@burlingtonvt.gov

- | | | |
|----|------------------|----|
| 1 | Sue Plisinski | 21 |
| 2 | Tony Rowington | 22 |
| 3 | BARBARA GAIDA | 23 |
| 4 | Joseph Gaida | 24 |
| 5 | Mark & Lynn | 25 |
| 6 | Russell Aminzade | 26 |
| 7 | Jack Ward | 27 |
| 8 | Phet Keomany | 28 |
| 9 | Rebecca Galvin | 29 |
| 10 | Marcia Gustafson | 30 |
| 11 | Justin Winrock | 31 |
| 12 | Tom Winrock | 32 |
| 13 | ANN TAYLOR | 33 |
| 14 | Allison Wanhagen | 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.

FIGURE 1-A



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 : 12 Oct. 2016 Location: McClure Lobby Con

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

1	Ibnar Avilix Stratibus	21
2	Selene Colburn	22
3	GENESE GRILL	23
4	Charles Simpson	24
5	Brian Cina	25
6	Maria McClellan	26
7	Sandy Wynne	27
8	Scott Kulpatnek	28
9	Tyler Mitchell BFD	29
10	Lauren Beriozberia	30
11		31
12		32
13		33
14		34
15		35
16		36
17		37
18		38
19		39
20		40

FIGURE 1-A



Ward 1 and 8 NPA list serve

Name	Street	Phone Number	Email Address
Dana Hamenick			
Lisa Kingsbury			
Nkandu Gumbi			
Brian Cina			
Richard Hillier			
Maria McClellan			
Adele Hohentzserpan			
Phat Keomany			
Erhard Mahnke			
Joe Spidel			

FIGURE 1-A



Ward 1 and 8 NPA list serve

Name	Street	Phone Number	Email Address	V
Mark Porter				
Lauren Berrizbeitia				
Sharon Bushor				
Selene Colburn				
Ibnar A. Stratibus				
David Felsen				
Sandy Wynn				
Jessie Beck				
Liz Miller				
Scott Kilpatrick				

FIGURE 1-A

Ashley Bond
James Bond
Peter Kaye 31
Laurie + Mark Koto



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

FIGURE 1-A



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 : 10-13-16 Location: McClure Multi-Gen

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

1 Catherine LaPenta

2 Nate Benner

3 Emily LaPenta

4 Sam Miller

5 Sharon Webster

6 Harry Appelgate

7 Rosie Blick

8 Rosemary Ringer

9 Aloyse Rowley

10 Carole Langlois

11 David Palmer

12 Joan Palmer

13 Melissa Cain

14 Max Tracy

15 Gideon Turner

16 Gerald Gower

17 ~~Out~~

18 Patrick Johnson

19 Roger Letowitz

20 Barbara McGrew

21 Jack Daggitt

22 Jean O'Sullivan

23 Robert Herendeen

24 Barbara Wysocki

25 Charlie Moring

26 Michael McDonnell

27 Peo DeFranco

28 Lynn Martin

29 Genese Grill

30 Amy Prenowitz

31 Jane Knodel

32 Tony Bonin

33 Carol Spivey

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:

Quality	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] Perform and document discovery and implementation on Energy-Related Systems and Water-Related Systems	Full Team 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] 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).	None in Vermont- Not Applicable Using Option 2- Individual Credits

Option 2: Individual Credits

1	Design	LTc2 Sensitive Land Protection [1] 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	Architect Previously developed site, this point is a given, easy documentation
1 1	Design	LTc3 High-Priority Site [1-2] 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]	Architect Determine if we meet the requirements of options 1 or 2.
3 2	Design	LTc4 Surrounding Density and Diverse Uses [1-5] 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.	Architect 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] Locate any functional entry of the project within a 1/4-mile walking distance of existing or planned bus, streetcar, or rideshare stops with minimum 72 daily weekday trips (see reference guide).	Architect One of the few sites in Vermont where this credit is achievable.
1	Design	LTc6 Bicycle Facilities [1] 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	Architect 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] 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	Architect, Civil, Landscape We are providing more parking than the zoning requirement and are therefore ineligible for this point.
1	Design	LTc8 Green Vehicles [1] 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	Architect, Civil, Landscape 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 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.	Civil Assume General Construction Permit from requirements State will be most stringent. Civil engineer to verify.
1	Design	SSc1 Site Assessment [1] Complete and document a site survey or assessment that includes the following information: topography, hydrology, climate, vegetation, soils, human use, human health effects.	Landscape Architect, Civil, Architect Create site diagram as part of concept design. By EV and SE Group
2	Design	SSc2 Site Development - Protect or Restore Habitat [1-2] 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. 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]	Landscape Architect, Civil

FIGURE 2-A

Quality	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, pourous 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	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

Quality		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

Quality		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	6	2	Design	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).

FIGURE 2-A

Quality	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	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 EA c1.
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

Quality	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
2	Const.	EAc7 Green Power and Carbon Offsets [1-2] 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).	Owner 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	Materials & Resources (MR) 13 Points Possible	
Y	Design	MRp1 Storage & Collection of Recyclables 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.	Owner, Architect, Civil Provide standard waste handling procedures that will be used at this facility.
Y	Const.	MRp2 Construction and Demolition Waste Management Planning 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 commingled 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.	Specifications, Contractor 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	MRc1 Building Life-Cycle Impact Reduction [2-5] 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]	Full Team Would require a whole building life-cycle assessment. Potentially costly.

FIGURE 2-A

Quality		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

Quality		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)	
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.
			16 Points Possible	

FIGURE 2-A

Quality	Phase	Title, [Available Points]	Team / Comments
Yes ? No			
Y	Prereq 2	EQp2 Environmental Tobacco Smoke Control 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.	Owner Provide compliant property smoking policy.
1	Design	EQc1 Enhanced Indoor Air Quality Strategies [1-2] 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.	Mechanical, Architect Assess options and strategies to confirm number of points to target.
2	Const.	EQc2 Low-Emitting Materials [1-3] 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).	Architect, Interiors, Contractor 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] Develop and implement an indoor air quality (IAQ) management plan for the construction and pre-occupancy phases of the building.	Specifications, Contractor Specify requirement for creation and implementation of compliant construction indoor air quality management plan.
2	Const.	EQc4 Indoor Air Quality Assessment [1-2] 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.	Owner, Contractor 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] 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.	Mechanical Confirm design will be able to meet ASHRAE 55-2010.

FIGURE 2-A

Quality		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; AHRJ 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

Quality	Phase	Title, [Available Points]	Team / Comments
Yes ?	No		
5	0	0	6 Points Possible
Innovation			
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 Rate s; 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	Potentially provide tenant fitup design guidelines (a core and shell credit)
1		Innovation in Design or Pilot Credit	
		See above	
		Pilot Credit	
		See above	
1		LEED® Accredited Professional	Architect
			Achieved, complete form.
3	2	1	4 Points Possible
Regional Priority			
Earn up to 4 points out of six possible priority points based on achieved credits above.			
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	100 of 110 Points Possible*
Project Totals (pre-certification estimates)			
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.

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 thank you for your
registration and
pleasing

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

PRINT ORDER

DONE

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.

FIGURE 2-B

FIGURE 4-A

BRICK-FACED PANEL

Manufacturer: Saramac

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

Image:

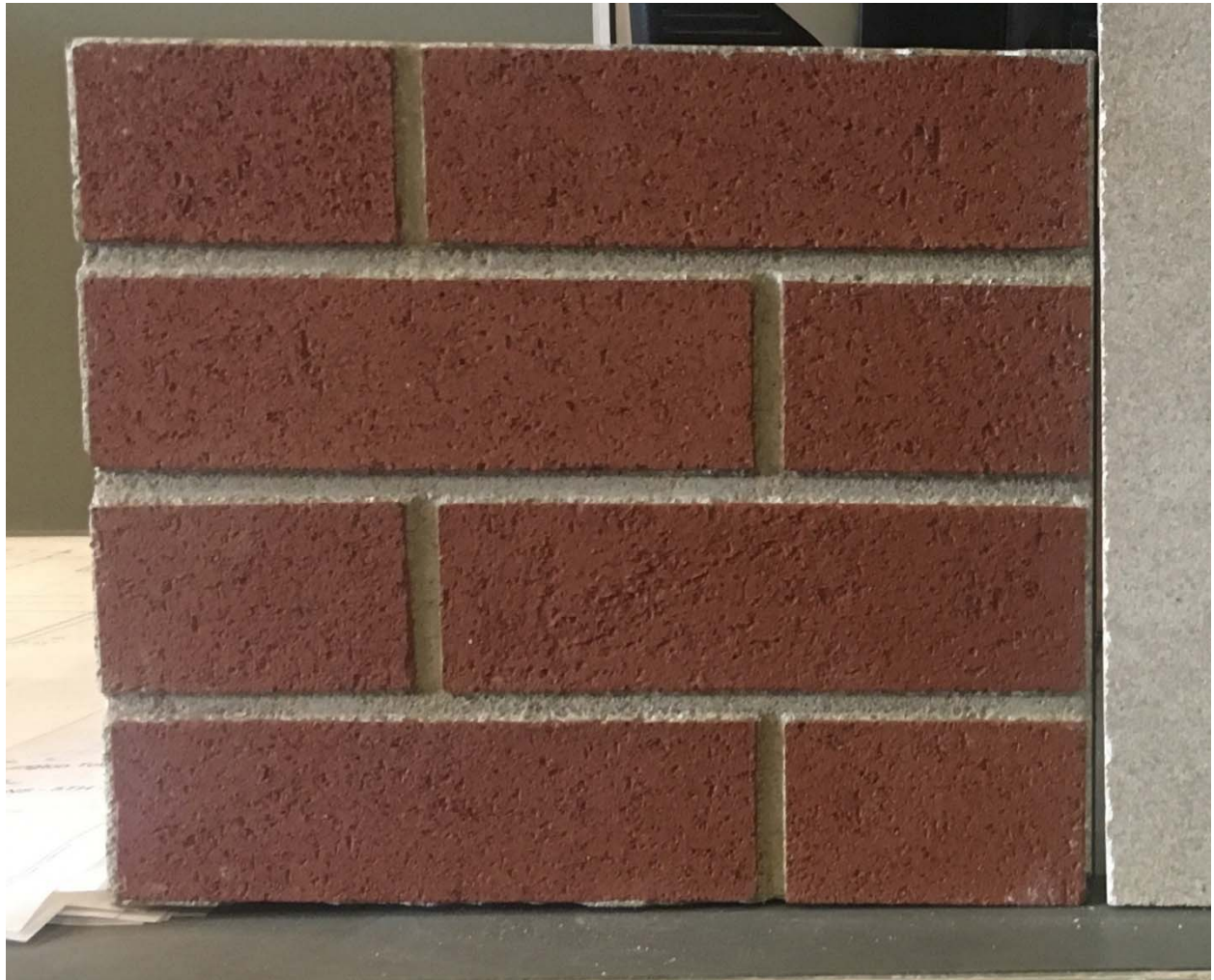


FIGURE 4-B

LIMESTONE FINISHED PANEL

Manufacturer: Saramac

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

Image:



FIGURE 4-C

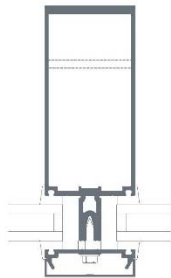
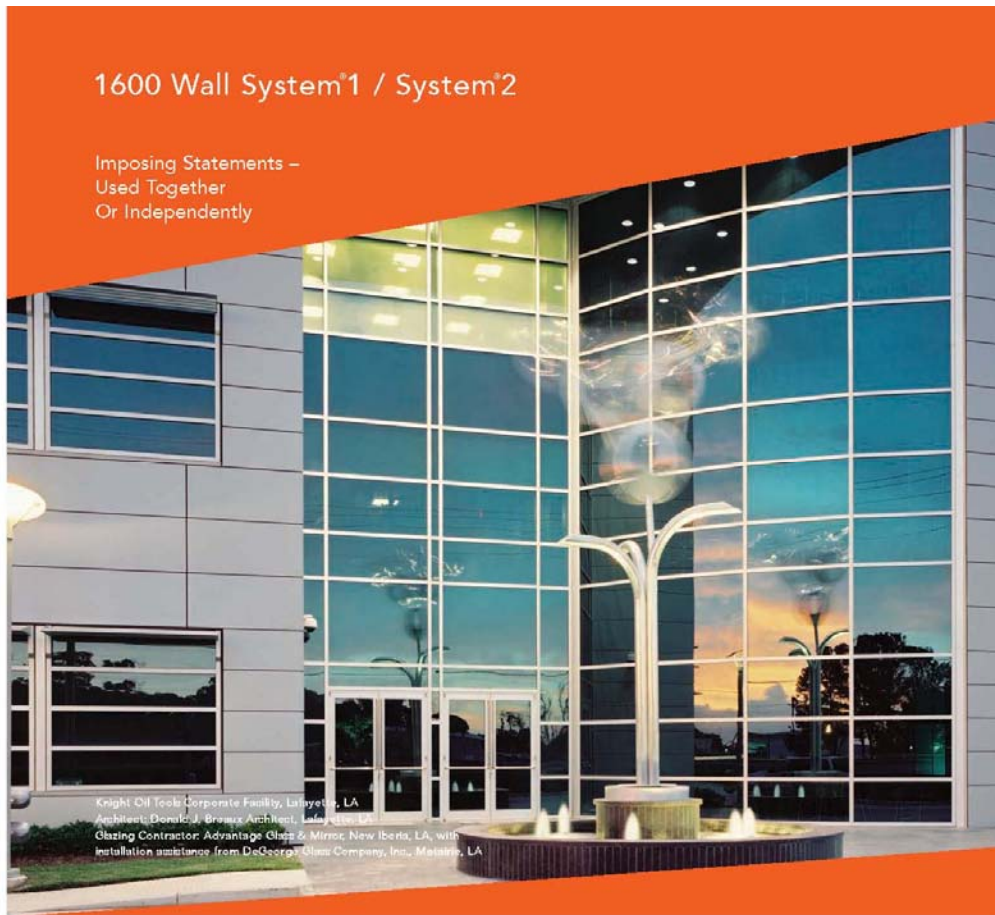
ALUMINUM STOREFRONT AND ENTRANCE DOORS

Manufacturer: Kawneer 1600

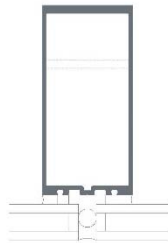
Website:

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

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) ⁴
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™**

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

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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.



FIGURE 4-C-2

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 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					
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
CLEAR Glass													
	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
OPTIBLUE® Glass													
	1/4	6	44	64	64	6	6	1.02	0.93	5.8	0.84	0.73	0.88
SOLEXIA® Glass													
	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
ATLANTICA® Glass													
	1/4	6	16	67	34	7	5	1.02	0.93	5.8	0.61	0.53	1.26
AZURIA® Glass													
	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
PACIFICA® Glass													
	1/4	6	15	42	27	5	5	1.02	0.93	5.8	0.56	0.49	0.86
SOLARBLUE® Glass													
	1/4	6	31	56	47	6	5	1.02	0.93	5.8	0.71	0.61	0.92
SOLARBRONZE® Glass													
	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
OPTIGRAY® Glass													
	1/4	6	33	63	51	6	6	1.02	0.93	5.2	0.74	0.64	0.98
SOLARGRAY® Glass													
	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
GRAYLITE II Glass													
	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.ppgideascales.com or by calling PPG at 1-888-774-4332.

For data on:
 Solargreen® Glass — see Atlantica® Glass
 Sorex® Glass — see Sorex® Glass
 Azurite® 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/m²•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				
Coated												
VISTACOO [®] (2) AZURIA [®] Glass												
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
VISTACOO [®] (2) PACIFICA [®] Glass												
1/4	6	12	32	22	10	7	1.02	0.93	5.8	0.51	0.44	0.73
SOLARCOOL [®] (1) SOLEXIA [®] Glass												
1/4	6	9	30	23	37	30	1.02	0.93	5.8	0.43	0.37	0.81
SOLARCOOL [®] (2) SOLEXIA [®] Glass												
1/4	6	9	30	23	23	12	1.03	0.93	5.8	0.50	0.43	0.70
SOLARCOOL [®] (1) AZURIA [®] Glass												
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
SOLARCOOL [®] (2) AZURIA [®] Glass												
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
SOLARCOOL [®] (1) PACIFICA [®] Glass												
1/4	6	4	16	13	36	30	1.02	0.93	5.8	0.35	0.31	0.52
SOLARCOOL [®] (2) PACIFICA [®] Glass												
1/4	6	4	16	13	10	7	1.02	0.93	5.8	0.44	0.38	0.42
SOLARCOOL [®] (1) SOLARBLUE [®] Glass												
1/4	6	9	21	24	36	30	1.02	0.93	5.8	0.44	0.38	0.55
SOLARCOOL [®] (2) SOLARBLUE [®] Glass												
1/4	6	9	21	24	14	10	1.02	0.93	5.8	0.51	0.45	0.47
SOLARCOOL [®] (1) SOLARBRONZE [®] Glass												
1/4	6	7	21	27	36	30	1.02	0.93	5.8	0.46	0.40	0.53
SOLARCOOL [®] (2) SOLARBRONZE [®] Glass												
1/4	6	7	21	27	13	11	1.03	0.93	5.8	0.53	0.47	0.45
SOLARCOOL [®] (1) SOLARGRAY [®] Glass												
1/4	6	7	17	23	36	30	1.02	0.93	5.8	0.43	0.37	0.46
SOLARCOOL [®] (2) SOLARGRAY [®] Glass												
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).

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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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Glass colors represented are approximate.

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Thickness (inches)	Transmittance Visible %	Exterior Visible Reflectance %	Interior Visible Reflectance %	U-Value (Winter Nighttime) (Btu/hr·ft²·°F)	Solar Heat Gain Coefficient (SHGC)	Light To Solar Gain (LSG)	Thermal Stress Risk
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

④ 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.

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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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
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.

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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 Glass colors represented are approximate.

While Vitro has made a good faith effort to verify the reliability of this computer based tool, it may contain unknown programming errors that may result in incorrect results. The user is encouraged to use good judgment and report any questionable results to Vitro for evaluation. The applicability and subsequent results of data simulated by this tool will be compromised if the user fails to input the correct information. Vitro makes no warranty or guarantee as to the results obtained by the user of this tool and assumes no responsibility for the accuracy of the data from non-Vitro manufacturers available for simulations in this program.



Thickness (inches)	Transmittance Visible %	Exterior Visible Reflectance %	Interior Visible Reflectance %	U-Value (Winter Nighttime) (Btu/h·ft ² ·°F)	Solar Heat Gain Coefficient (SHGC)	Light To Solar Gain (LSG)	Thermal Stress Risk
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.

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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Thickness (inches)	Transmittance Visible %	Exterior Visible Reflectance %	Interior Visible Reflectance %	U-Value (Winter Nighttime) (Btu/h·ft²·°F)	Solar Heat Gain Coefficient (SHGC)	Light To Solar Gain (LSG)	Thermal Stress Risk
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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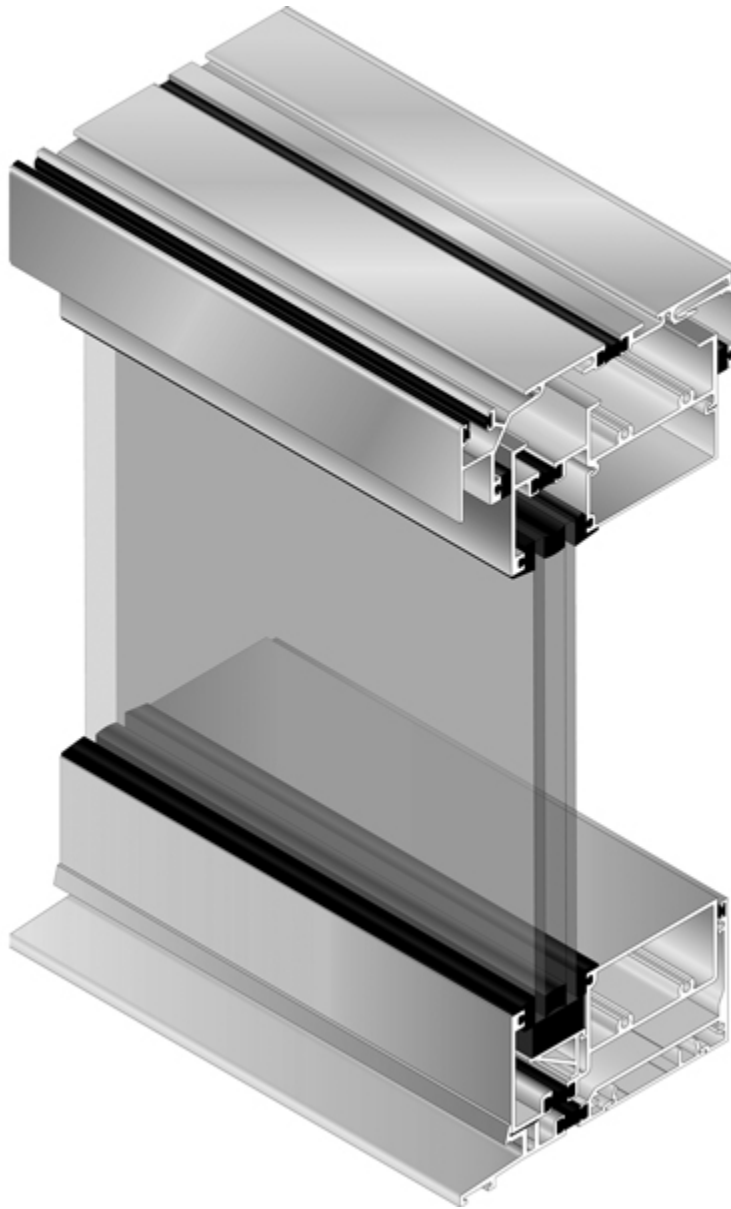
FIGURE 4-D

ALUMINUM WINDOWS UPPER FLOORS

Manufacturer: Kawneer FG 501T

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

Image:



TYPICAL UPPER STORY INSULATED GLAZING UNIT

ARCHITECTURAL GUIDE SPECIFICATION
SECTION 08 81 00 GLASS GLAZING

FIG. 4-D-2

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)

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.

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:

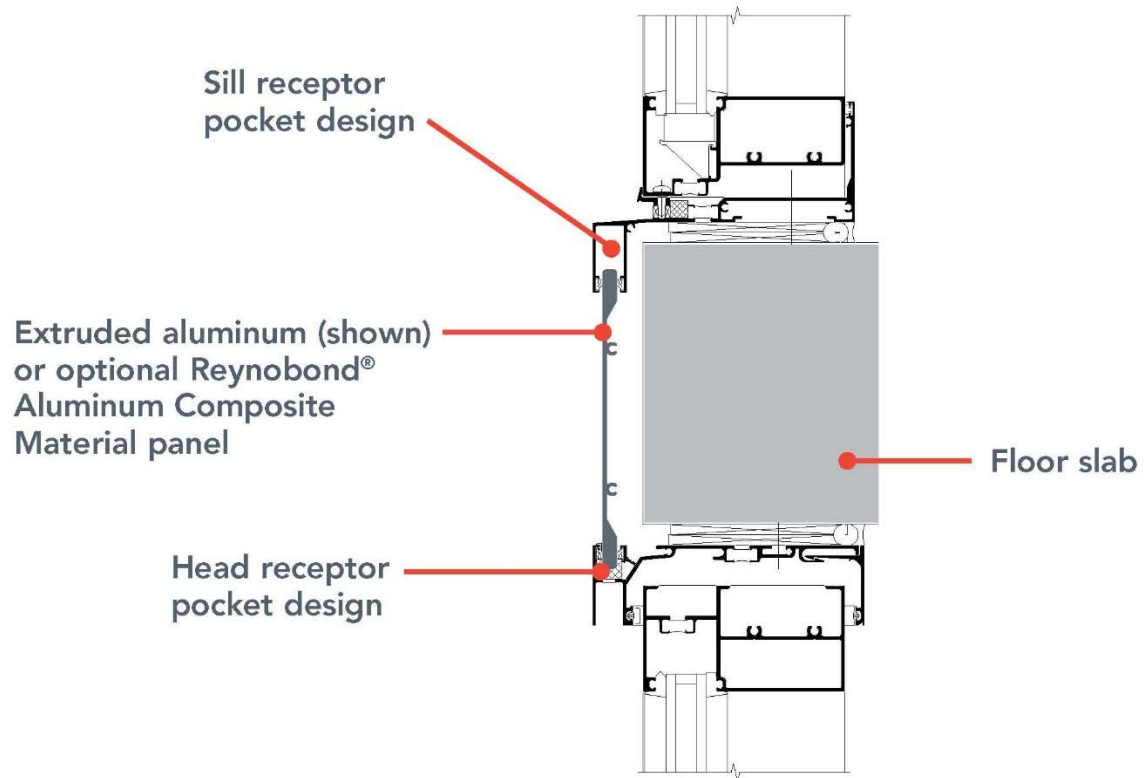


FIGURE 4-F

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:



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.

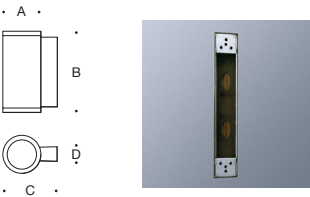
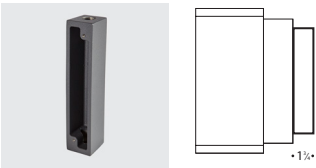
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

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:
79547 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		β	A	B	C	D	Wiring box*
66 698*	18W LED	19.5°	5 7/8	11 3/4	7 7/8	1 5/8	19537

β = Beam angle *Small opening wiring box included.

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



FIGURE 4-I

EXTERIOR CANOPY-MOUNTED LIGHT FIXTURE

Manufacturer: Bega 77 529

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

Image:

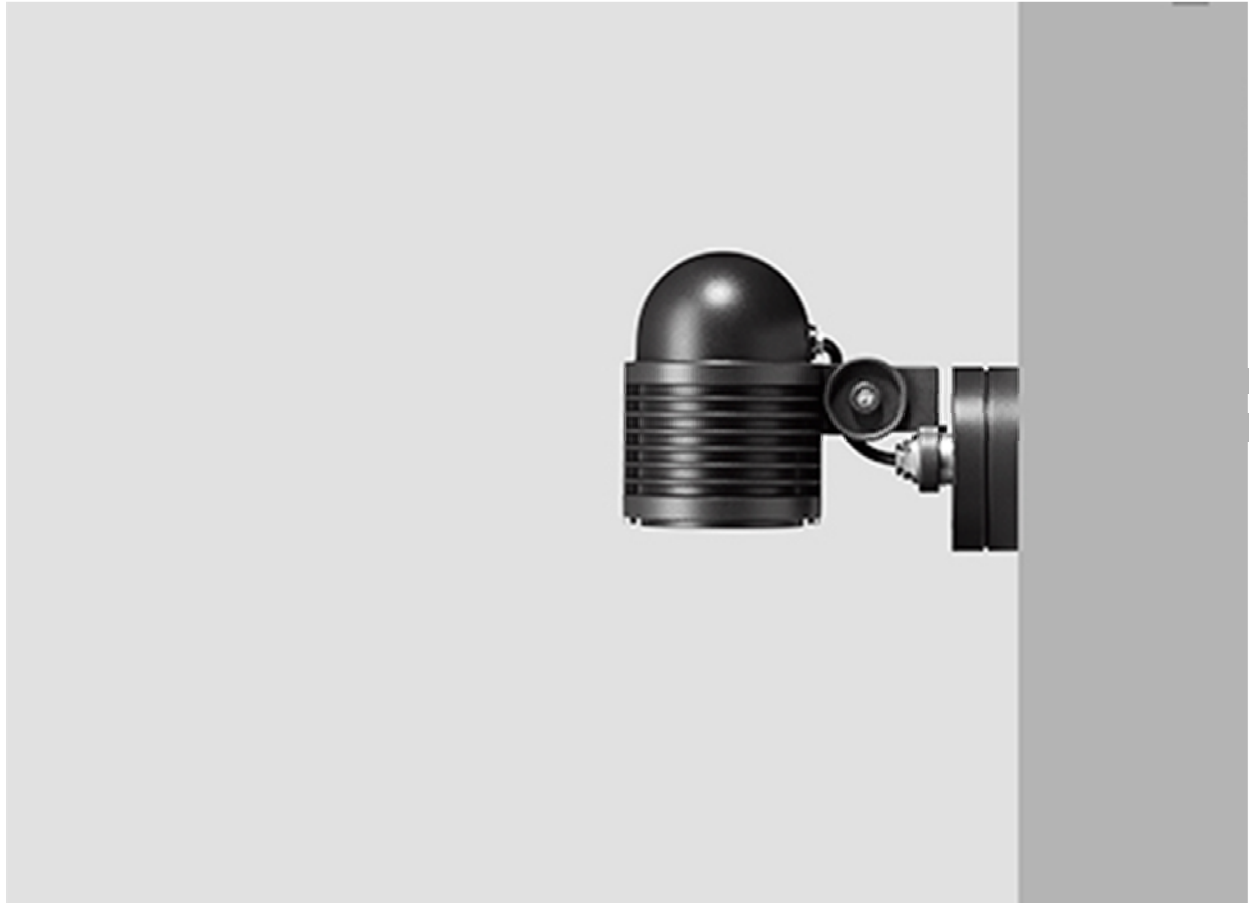


FIGURE 4-J

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:

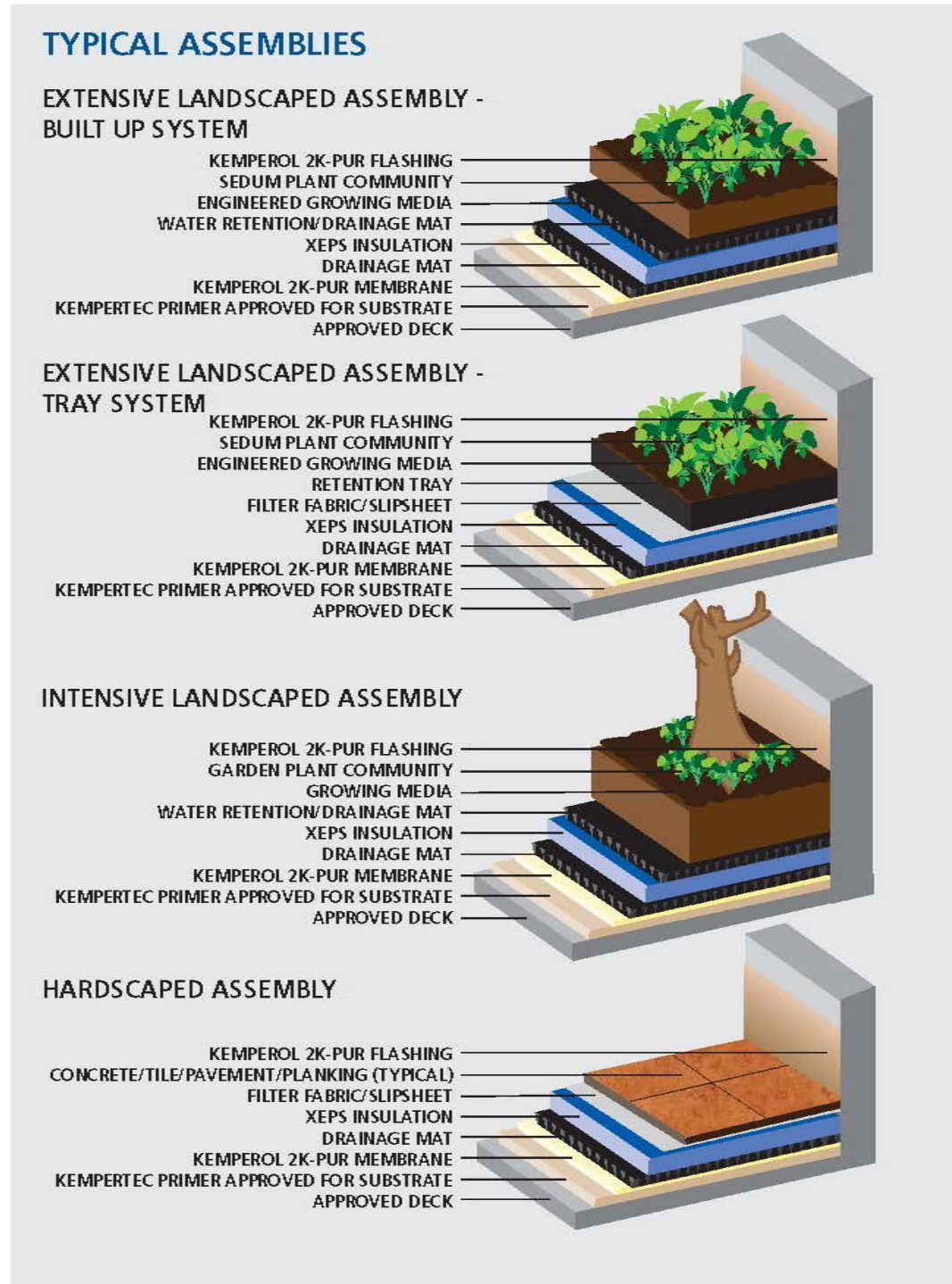


FIGURE 4-N

SOLAR PANELS

Manufacturer: Solar City

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

Image:



FIGURE 4-O

EXTERIOR POLE-MOUNTED LIGHT FIXTURE A

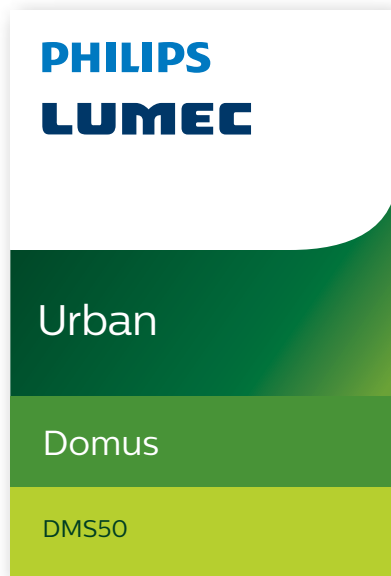
Manufacturer: Lumec – Domus DMS50

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

Image:



FIGURE 4-O



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 35W32LED4K 55W32LED4K 55W48LED4K 70W64LED4K 72W32LED4K 80W48LED4K 90W80LED4K 108W48LED4K 110W64LED4K 135W80LED4K 145W64LED4K 180W80LED4K 3000K 35W32LED3K 55W32LED3K 55W48LED3K 70W64LED3K 72W32LED3K 80W48LED3K 90W80LED3K 108W48LED3K 110W64LED3K 135W80LED3K 145W64LED3K 180W80LED3K	T	ACDR Acrylic globe	Globe LE2A ⁶ Type II (ASYM) with globe LE3A ⁶ Type III (ASYM) with globe LE4A ⁶ Type IV (ASYM) with globe Sag lens LE2S Type II (ASYM) Sag glass lens LE3S Type III (ASYM) Sag glass lens LE4S Type IV (ASYM) Sag glass lens LE5S ¹ Type V (SYMM) Sag glass lens Flat lens LE2F Type II (ASYM) Flat glass lens LE3F Type III (ASYM) Flat glass lens LE4F Type IV (ASYM) Flat glass lens LE5F ¹ Type V (SYMM) Flat glass lens	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

Ordering guide (continued)

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

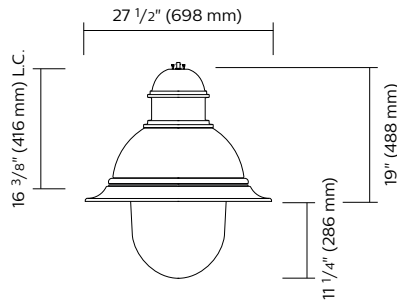
DMS50 Domus LED pendant

Urban luminaire

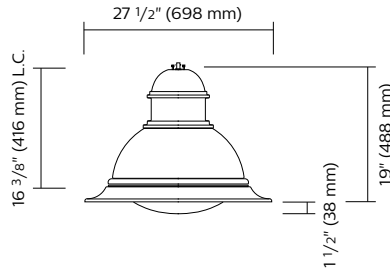
Dimensions

EPA: 1.35 ft² max.

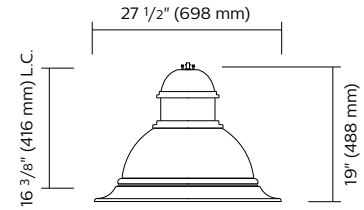
Weight: 42 lbs (19.1kg) max.



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					Type LE2F			Type LE3F			Type LE4F			Type LE5F		
Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	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					Type LE2F			Type LE3F			Type LE4F			Type LE5F		
Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	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					Type LE2S			Type LE3S			Type LE4S			Type LE5S		
Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	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.

FIGURE 4-O

DMS50 Domus LED pendant

Urban luminaire

LED Wattage and Lumen Values: 3000K Domus luminaire (continued)

Globe (ACDR)					Type LE2A			Type LE3A			Type LE4A		
Ordering Code	Total LEDs	LED Current (mA)	Average System Watts ¹	Color Temp.	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.

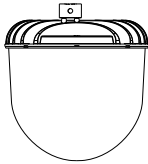
DMS50 Domus LED pendant

Urban luminaire

Specifications (continued):

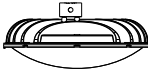
Optical system (continued):

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.



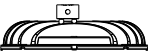
LE2A - Type II (ASYM) with globe (ACDR)
LE3A - Type III (ASYM) with globe (ACDR)
LE4A - Type IV (ASYM) with globe (ACDR)

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.

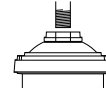
Ordering Code	Scenario	Dimming Time	Dimming Level
CDMG525	Safety	4 hours	25% power dimming
CDMG550	Safety	4 hours	50% power dimming
CDMG575	Safety	4 hours	75% power dimming
CDMG25	Median	6 hours	25% power dimming
CDMG50	Median	6 hours	50% power dimming
CDMG75	Median	6 hours	75% power dimming
CDMGE25	Economy	8 hours	25% power dimming
CDMGE50	Economy	8 hours	50% power dimming
CDMGE75	Economy	8 hours	75% power dimming

Surge protector

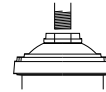
Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA. **SP2** 20kV/20kA optional.

Luminaire adaptor

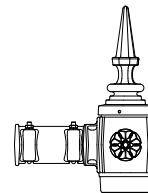
MA1: The luminaire is suspended by means of a mounting adaptor with a 1¼" (32mm) NPT threaded hole accepting a threaded tube from the mounting. Retrofit adaptor for existing mounting.



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 2¾" (41 to 60mm) and is adjustable to more or less 5°. The adaptor features a cast aluminum decorative cover and finial.



SMB: The luminaire is suspended by means of a decorative side-mounted cast aluminum adaptor. This adaptor accepts tubes from 1½" to 2¾" (41 to 60mm) and is adjustable to more or less 5°.

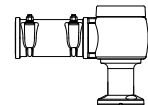


FIGURE 4-O

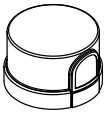
DMS50 Domus LED pendant

Urban luminaire

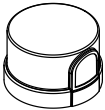
Specifications (continued):

Luminaire options

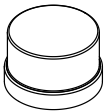
BO:	Bridge and Overpass
HS:	House side shield
PH7:	Photoelectric cell, bottom type



PH8:	Photoelectric Cell, Twist-lock Type. Allows a 90 degree rotation.
PHXL:	Extended life photoelectric cell, Twist-lock Type. Allows a 90 degree rotation.



PH9:	Shorting cap, Twist-lock Type
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RC:	Receptacle 3 pins
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RCD:	Receptacle 5 pins
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RCD7:	Receptacle 7 pins
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SP2:	Integral surge protector
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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 and 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.

LED products (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.

Quality control

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.

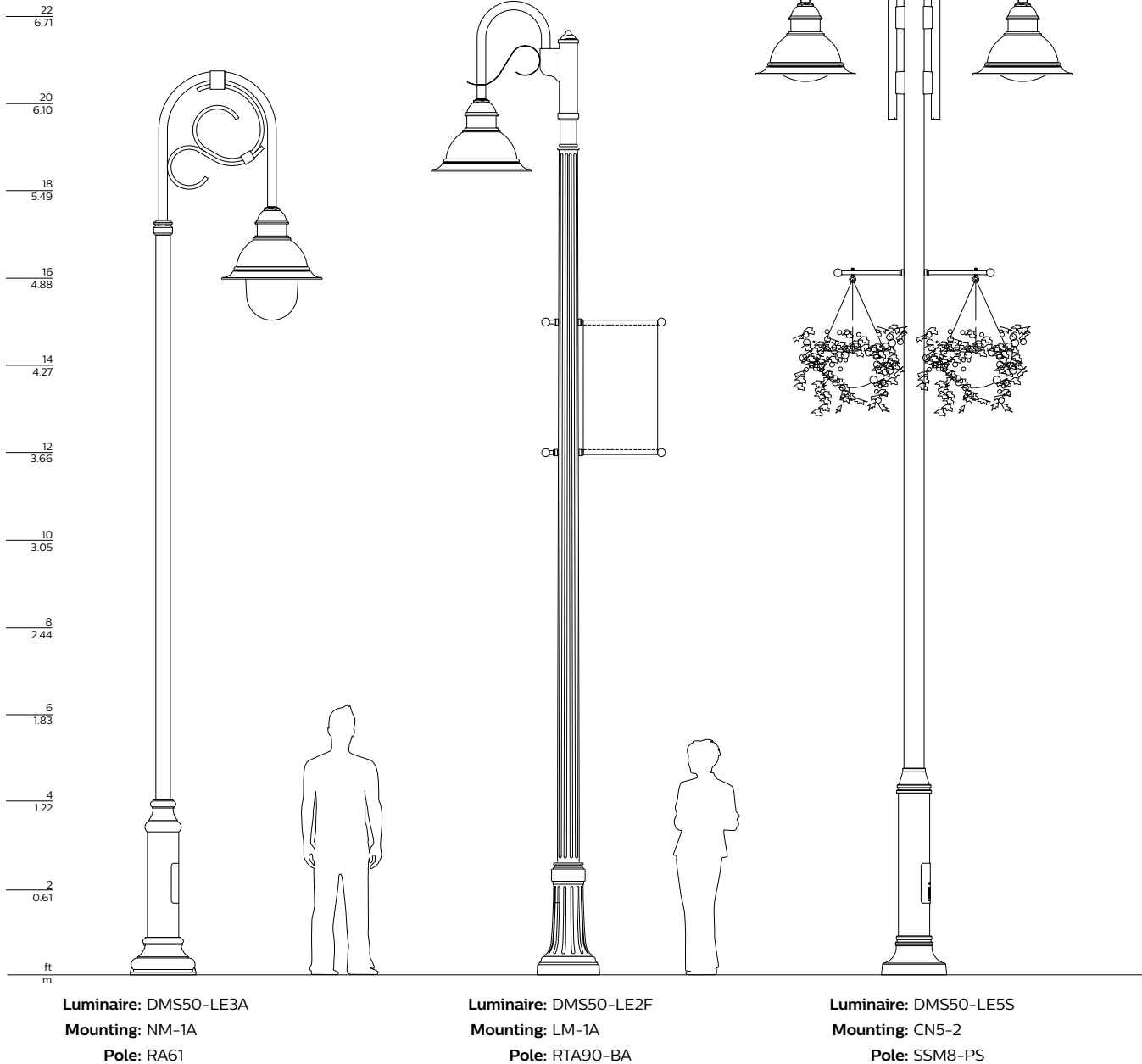
FIGURE 4-O

DMS50 Domus LED pendant

Urban luminaire

Specifications (continued):

Poles & Brackets Sample configurations.



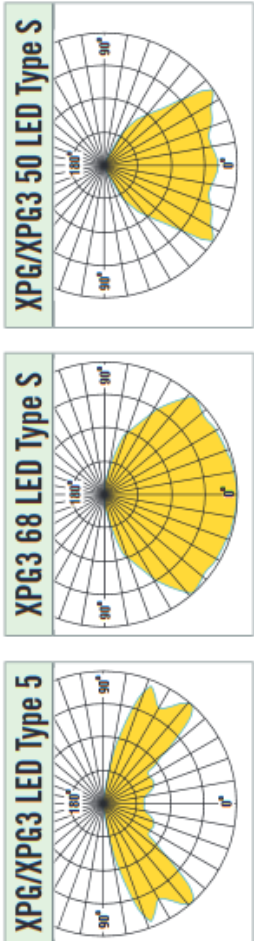
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Philips Lighting Canada Ltd.
 281 Hillmount Rd, Markham, ON, Canada L6C 2S3
 Tel. 800-668-9008

Basis of Design: LSI Crossover LED Parking Garage Light – “XPG3”



Multiple beam spreads to contain light within parking structure

FIG. 4-P



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.

40 IDX Drive
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 **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 ☐ 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>
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;	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 5 th floor North Tower/6 th 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 <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 ☐ 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 <u>Explanation:</u>
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 <u>Explanation:</u>
<u>3. Use</u>		☐ 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 <u>Explanation:</u>

Ordinance Requirement (summarized)	Applicant Compliance Documentation	Staff Compliance Confirmation
4. Parking (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>
<u>5. 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 <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 ☐ Not 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 ☐ In compliance ☐ Not in compliance <u>Explanation:</u>
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 <u>Explanation:</u>
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 <u>Explanation:</u>
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).	See Project Narrative section 2.11 and FIGURES 2-A LEED Checklist and 2-B USGBC Registration Receipt.	☐ In compliance ☐ Not in compliance <u>Explanation:</u>

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>

BURLINGTON TOWN CENTER

02/16/2017

FIGURE 5 SUPPLEMENTS

FIG. 5-A TRAFFIC IMPACT STUDY
FIG. 5-A-2 TRAFFIC STUDY MODIFICATIONS
FIG. 5-A-3 80 ADDITIONAL TRIPS MEMO

01/23/2017
02/06/2017
02/09/2017

TRAFFIC IMPACT STUDY

Burlington Town Center Traffic Impact Study

Burlington, Vermont

PREPARED FOR

Devonwood Investors, LLC
101 Cherry Street, Suite 440
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PREPARED BY



40 IDX Drive
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JANUARY 23, 2017

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Appendices

APPENDIX A: Traffic Volume Data

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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.

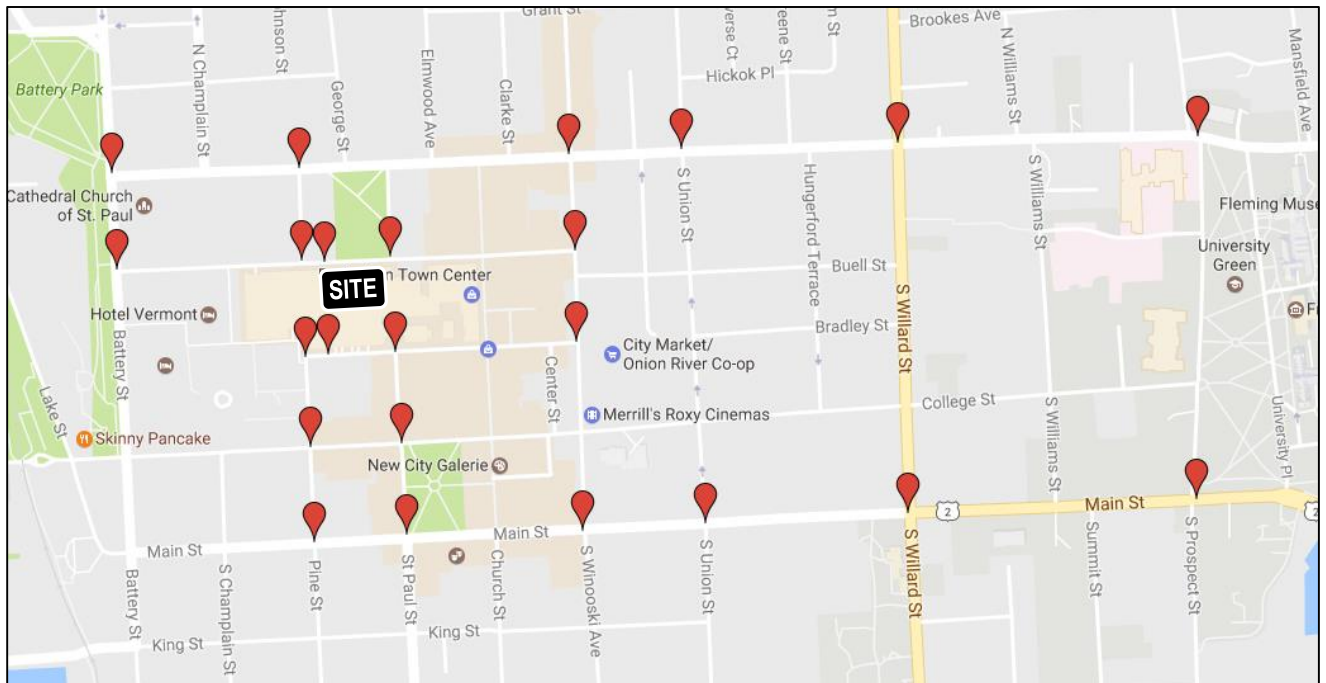
This report was developed to address the following Major Impact Review Standard, as outlined in the City of Burlington's *Comprehensive Development Ordinance* (Section 3.5.6(b)):

- *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 23 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: 1left, 1right NB: 1through, 2right
6. Pearl Street / Pine Street			Single lane approaches
7. Pearl Street / Winooski Avenue			EB: 1through, 1right WB: 1through, 1left NB: 1left, 1right SB: 1through, 1through/right, 1left
8. Pearl Street / Union Street			EB: 1through, 1left NB: 1through/right, 1left
9. Pearl Street / Willard Street			Single lane approaches
10. Pearl St / Prospect St / Colchester Ave			WB: 1through, 1left NB: 1through, 1left, 1right
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: 1through/right, 1left WB: 1through, 1left, 1right SB: 1through, 1right, 1left
16. Main Street / S. Union Street			EB: 1through, 1left NB: 1through/left, 1right
17. Main Street / S. Willard Street			EB: 1through/right, 1left WB: 1through/right, 1left
18. Main Street / S. Prospect Street			EB: 1through, 1through/right WB: 1through, 1left, 1right NB: 1through, 1right SB: 1through/right, 2left
19. Bank Street / St. Paul Street		All-way stop	Single lane approaches
20. Bank Street / S. Winooski Avenue			EB: 1left, 1right NB: 1through, 1through/left SB: 1through, 1through/right
21. Cherry Street / S. Winooski Avenue			EB: 1left, 1right NB: 1through, 1through/left SB: 1through, 1through/right
22. Cherry Street / St. Paul Street			EB/WB: Single lane approaches SB: Downtown Transit Center
23. Cherry Street / Battery Street			WB: Single lane approach NB: 1through, 1through/right SB: 1through, 1through/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.

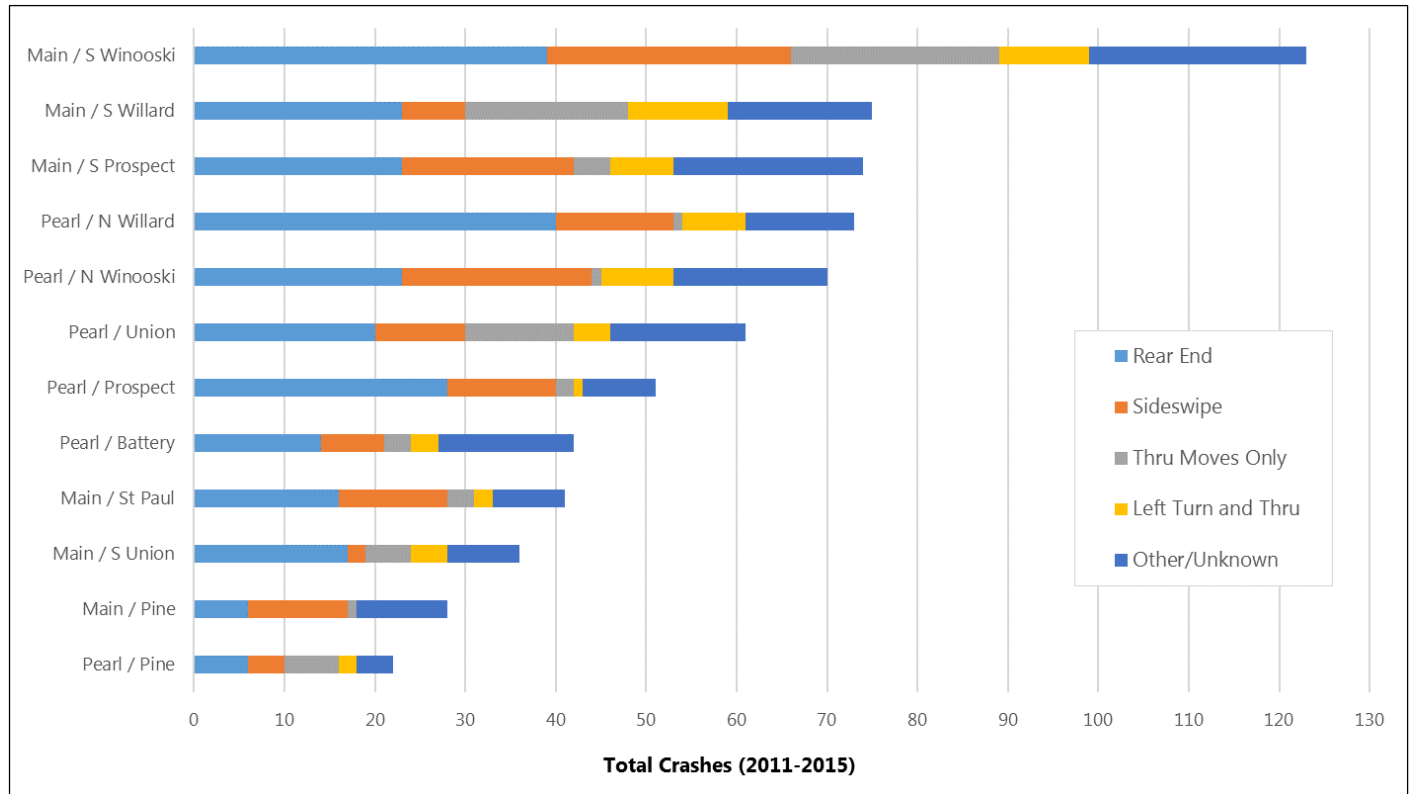
In addition to reviewing the 2010-2014 VTrans HCL report, the latest reported crash data (2011 – 2015) for the study area was reviewed via the online VTrans Public Crash Data Query Tool.² Figure 2 below summarizes reported crashes by type within 150 feet of study intersections.

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 (GMT) Downtown Transit Center. The proposed layout of the project is shown in **Figure 3**³ 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 total units (299,602 square feet) with available parking for 192 units (192 units used for trip generation calculations⁴)
- 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.

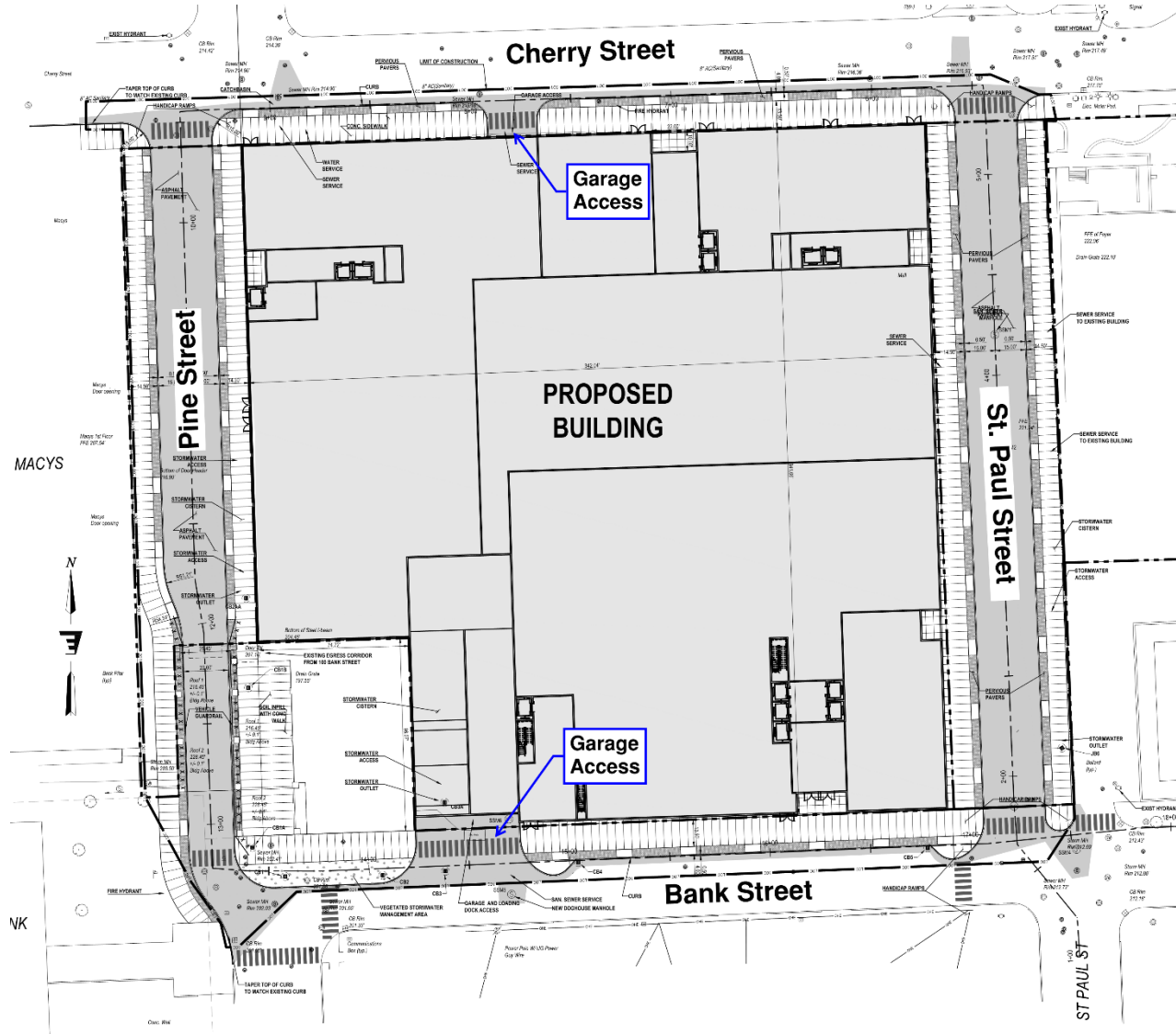
In addition, redevelopment will include replacing the existing parking garage (capacity approximately 570 spaces) with a new parking garage which is estimated to have a capacity of approximately 761 vehicles. The project will also incorporate approximately 170 bicycle parking spaces (120 long-term and 50 short-term spaces).

³ Site Plan developed for Devonwood Investors by Engineering Ventures, P.C., dated 12/2/2016 (Sheet C1.3).

⁴ In the event the additional 80 units were made available for general public use, the total site vehicular trip generation would increase by 25 trips (6%) during the AM peak hour and by 20 trips (3%) during the PM peak hour. We would not anticipate any significant changes to this report's conclusions with these additional trips added to the network.

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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.⁵ The land use codes assumed for this project include Apartment (*Land Use Code 220*), 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 weekday

⁵ Trip Generation Manual, 9th Edition, Institute of Transportation Engineers, 2012.

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>	Transit	Bike & Pedestrian	Internal Capture	External Trips	<u>Net New Trips</u> <i>Vehicles</i>
	(a)	(b)	(c)	(d)	(e) = (a) - (b) - (c) - (d)	(f) = (e)
Weekday Morning						
Enter	440	20	110	40	270	270
Exit	<u>190</u>	<u>10</u>	<u>50</u>	<u>15</u>	<u>115</u>	115
Total	630	30	160	55	385	385
Weekday Evening						
Enter	470	25	115	75	255	255
Exit	<u>685</u>	<u>35</u>	<u>170</u>	<u>110</u>	<u>370</u>	370
Total	1,155	60	285	185	625	625

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 development⁶.

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 (9% of AM trips and 16% of PM trips) was determined based on information published by the Transportation Research Board (TRB) in *NCHRP Report 684*.⁷

⁶ VTrans Transportation Demand Management (TDM) Guidance – Draft 2. Vermont Agency of Transportation, Vermont, 2015.

⁷ "Enhancing Internal Trip Capture Estimation for Mixed-Use Developments", Transportation Research Board, Washington D.C., 2011.

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*⁸ (see **Figure 5** below).

Figure 5: Source of External Trips Destined for Downtown Burlington (source: Plan BTV Transportation Study, RSG, 2011)

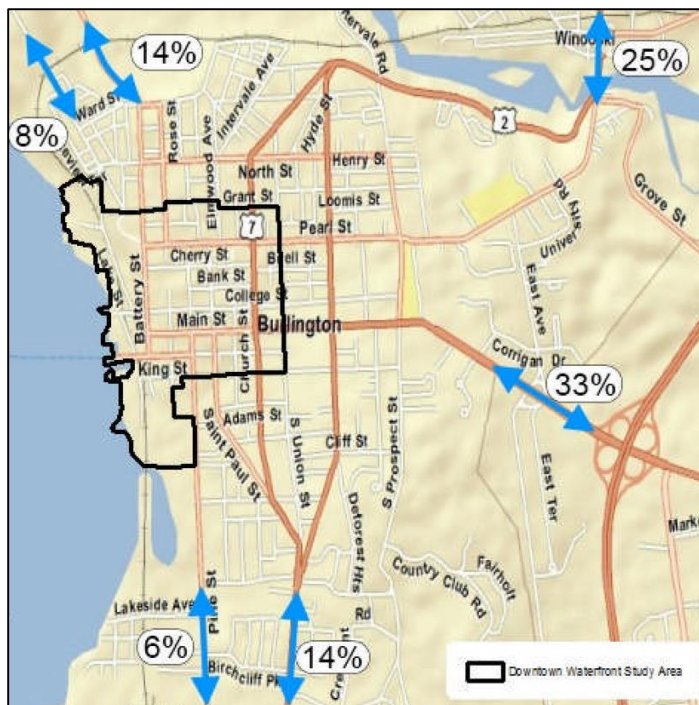


Figure 6 shows the general distribution of net new trips generated by the Burlington Town Center across the City and at each of the major access points to downtown Burlington. At each entry point into the City, the figure shows the percentage and number of site-generated trips estimated to travel through that gateway, and the corresponding percentage increase in peak hour traffic at 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.

⁸ *PlanBTV Transportation Study: Final Report*, RSG, Inc., October 2011.

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Figure 6: City-Wide Trip Distribution Map

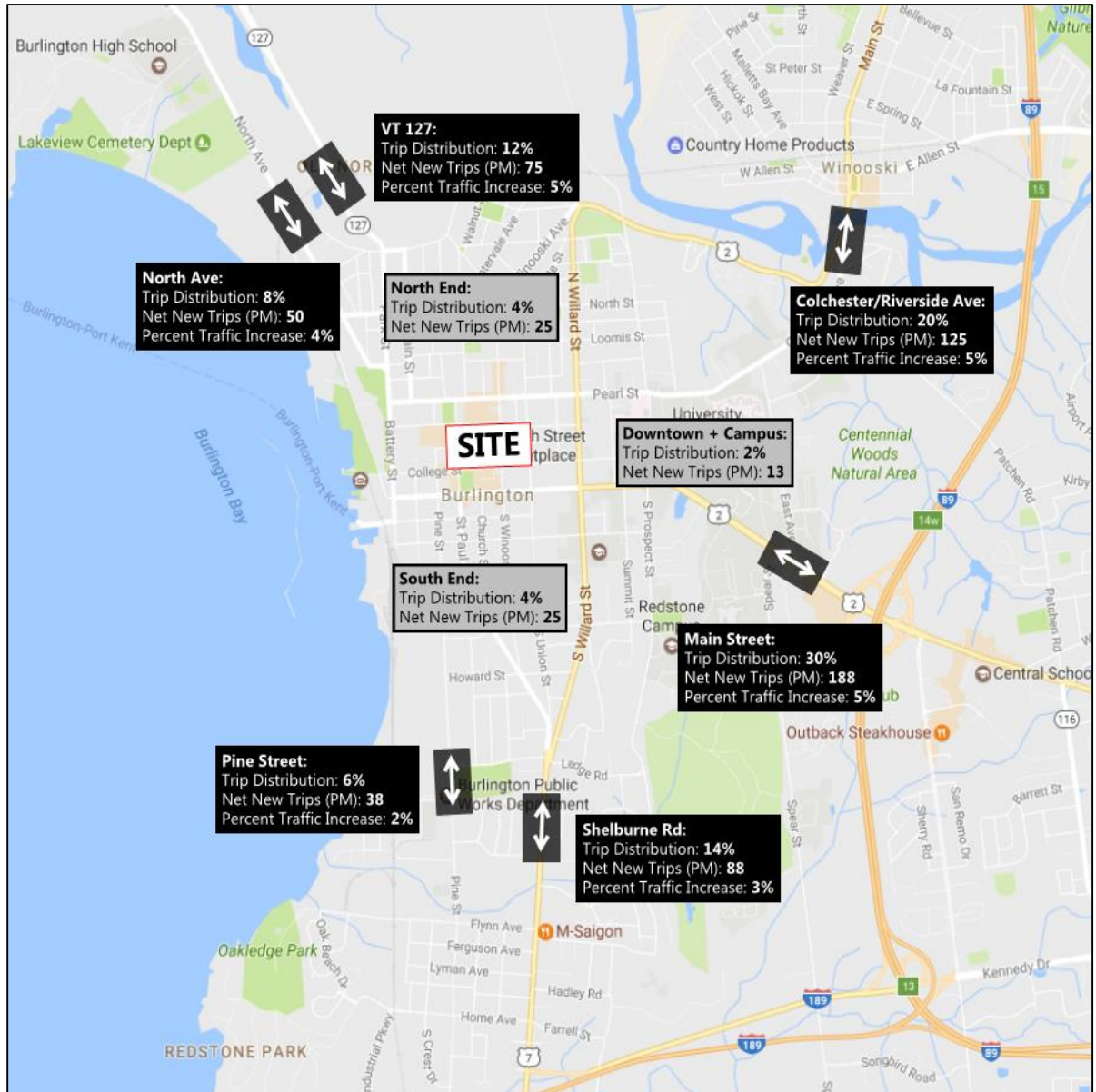


Figure 7 below shows the existing weekday evening peak hour trips at the six major gateways into downtown Burlington along with the percentage increase in trips at that gateway resulting from the project. As the figure shows, the proposed Burlington Town Center is not anticipated to increase traffic along any of the City's main gateways by more than 5% 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	50	4%
Route 127	1,589	75	5%
Colchester Ave	2,461	125	5%
Pine St	1,483	38	2%
Shelburne Road (US 7)	2,563	88	3%
Main St (US 2)	3,505	188	5%

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 23 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.⁹ Detailed calculations for the DHV adjustments are provided in the Appendix.

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 Redbook¹⁰ for the urban street group

⁹ 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.

¹⁰ Continuous Traffic Counter Report (The Redbook), Vermont Agency of Transportation, 2016.

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 RSG¹¹ 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.¹²

¹¹ *Cambrian Rise – 351 North Ave Preliminary Traffic Assessment: Meeting with Burlington DPW Technical Review Committee*, RSG, November 2016.

¹² 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.

FIGURE 5-A

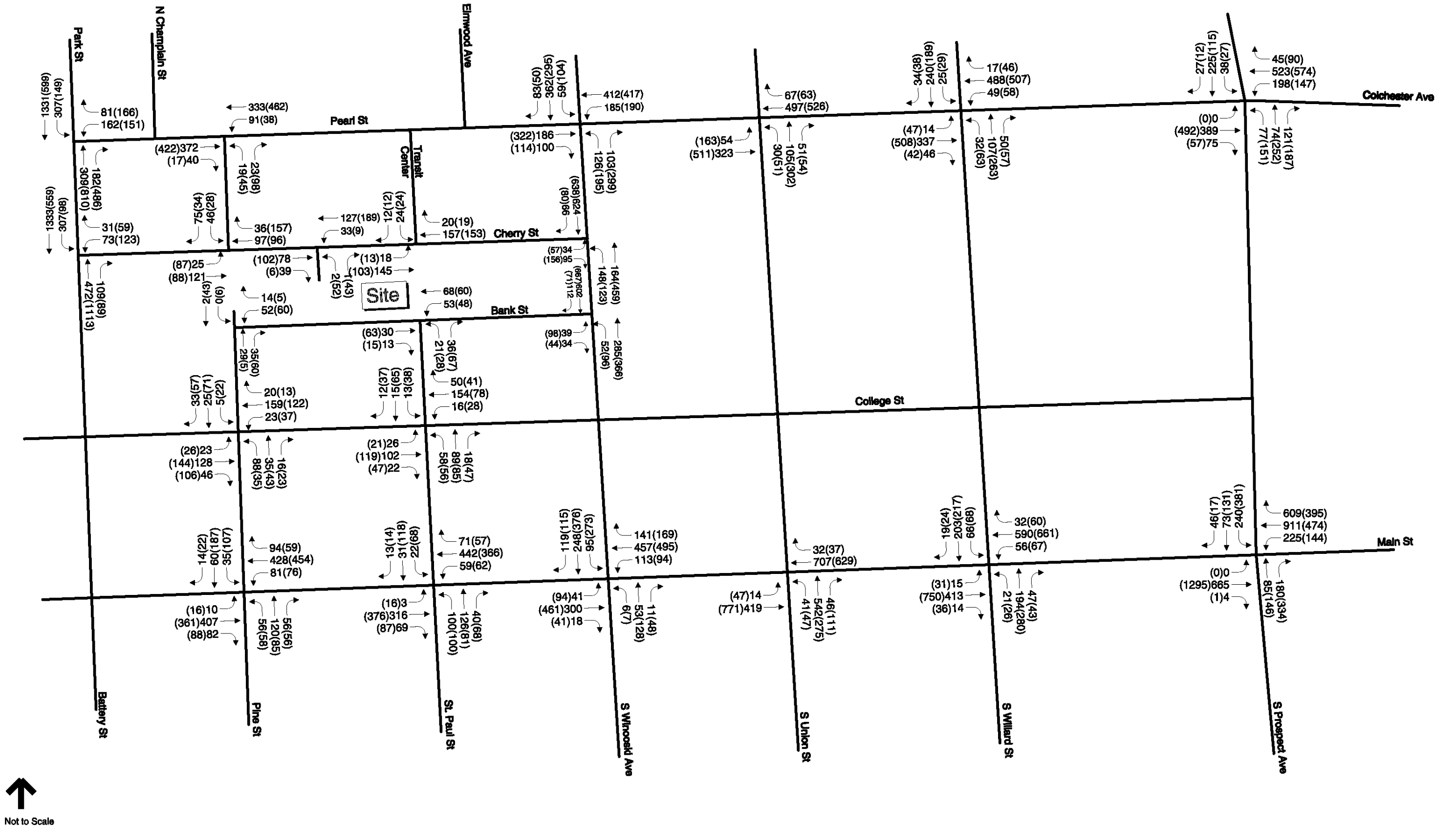


FIGURE 5-A

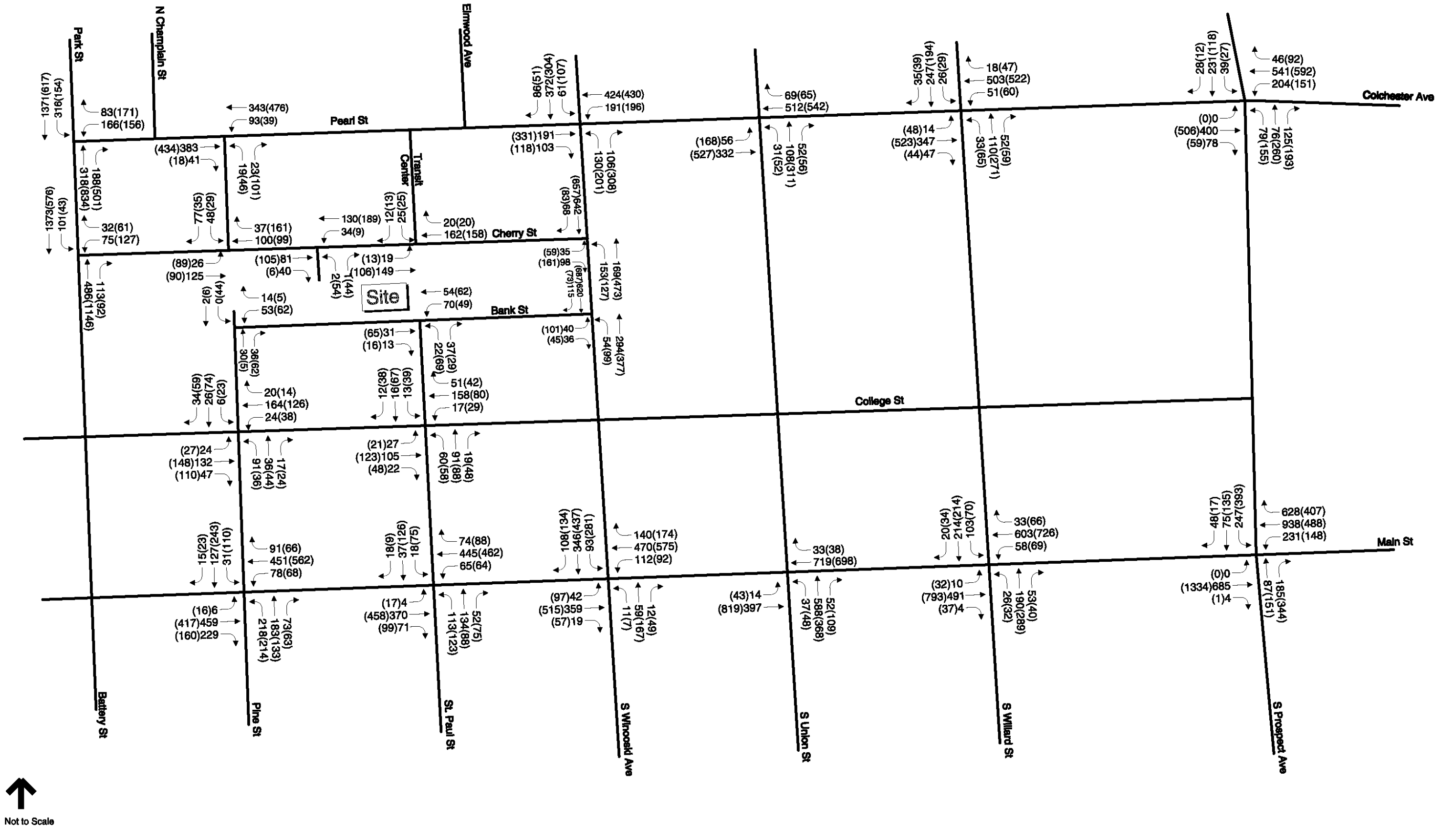
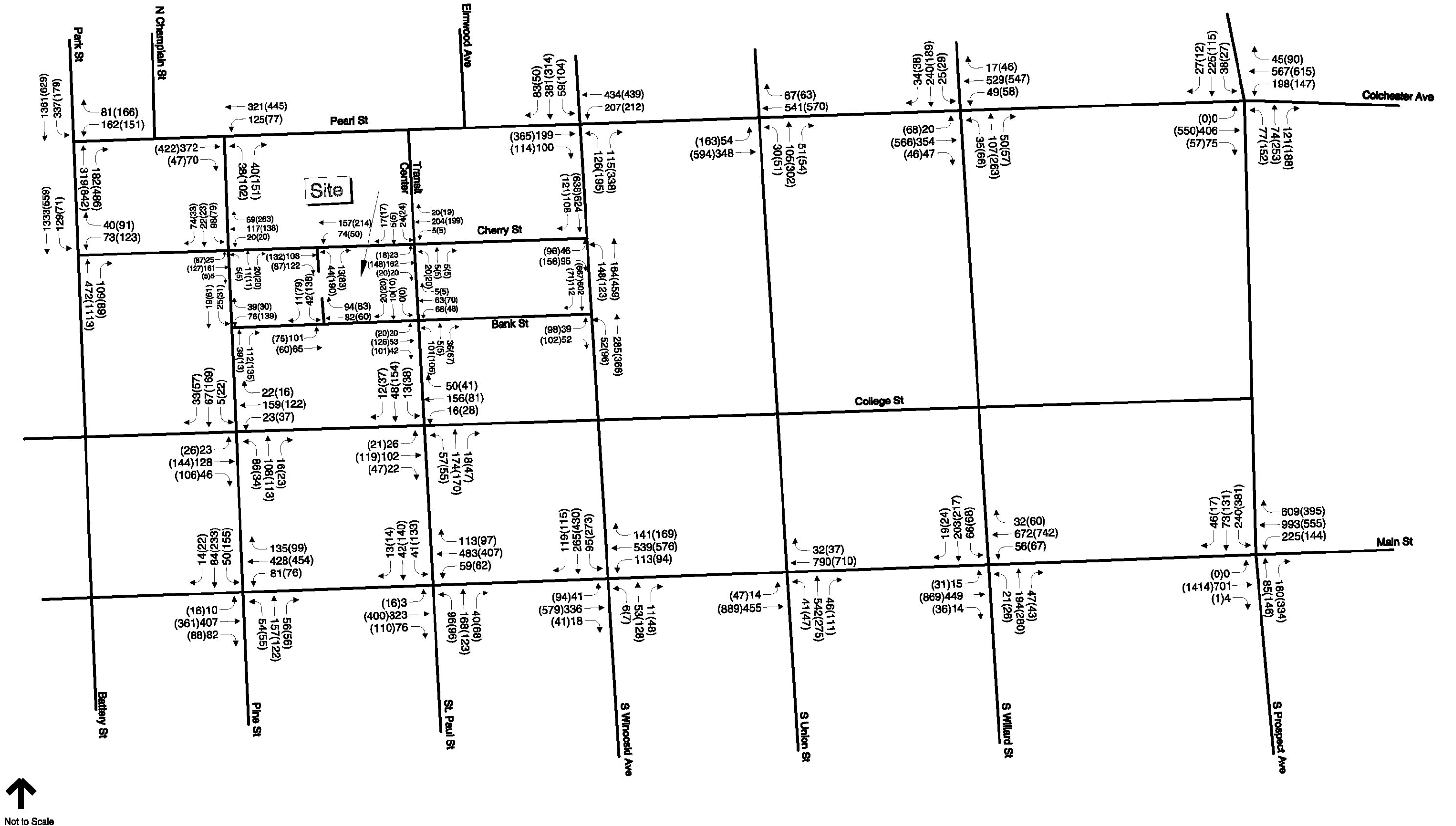


FIGURE 5-A



↑
Not to Scale



Figure 10
 2019 Build Weekday
 Peak Hour Traffic Volumes

FIGURE 5-A

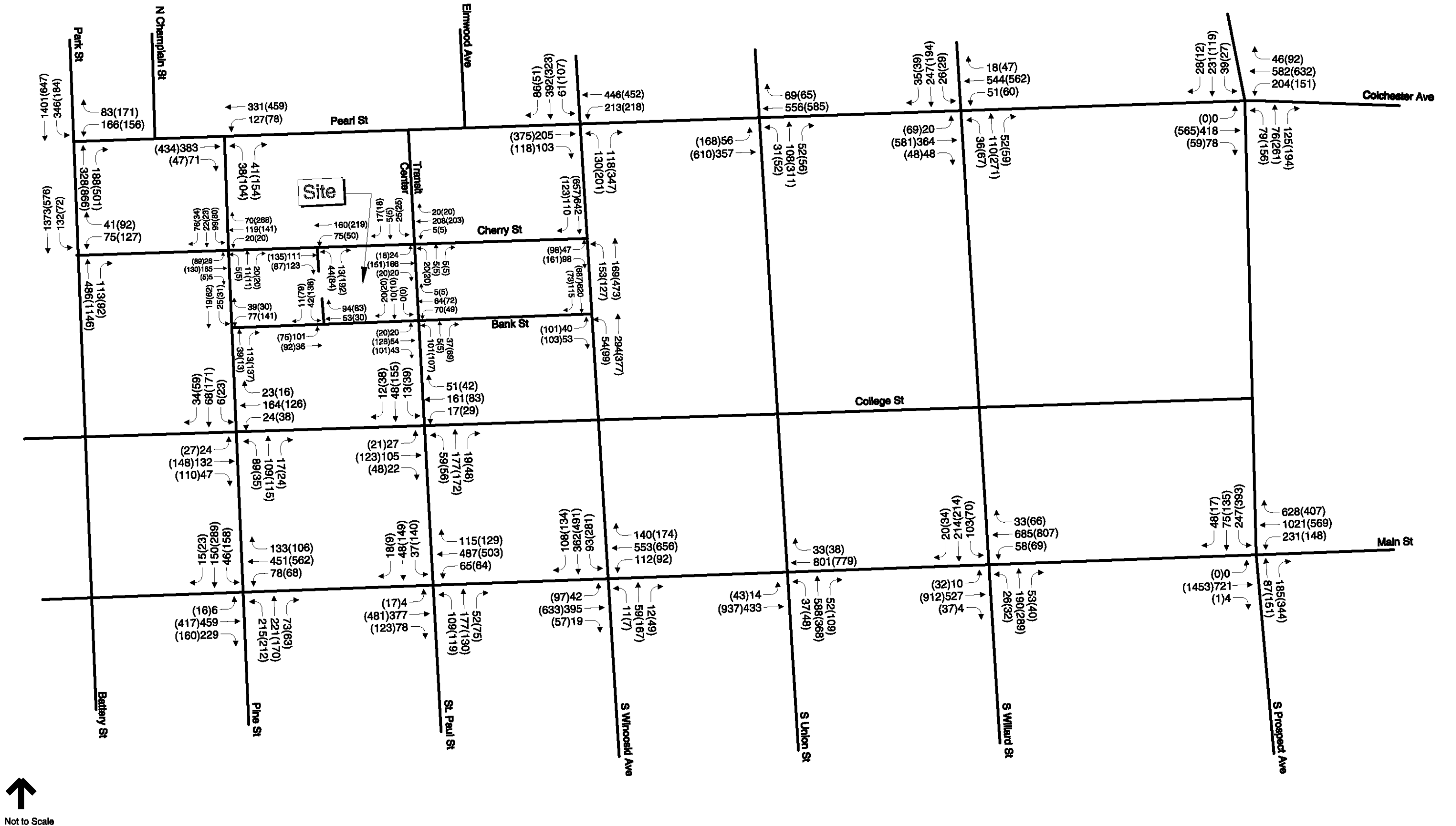


Figure 11
2024 Build Weekday
Peak Hour Traffic Volumes
Including Champlain Parkway

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*.¹³ 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 intersection of Cherry Street and St. Paul Street.

As shown in the two tables, nearly all of the signalized intersections were found to operate at LOS D or better in each of the No Build and Build scenarios. The intersection of Pine Street and Main Street in the 2024 PM Build conditions operates at LOS E due to the requirement to utilize signal timing and phasing consistent with the Champlain Parkway FSEIS (modified signal splits show LOS D conditions). Volume-to-capacity ratios also remain less than 1.0 at the signalized intersections under all scenarios except for Pine Street and Main Street – due to the Champlain Parkway FSEIS timing and phasing assumptions. On average, the trips generated by the project increase signalized intersection delay by 4-6 seconds during the peak hours.

¹³ *Highway Capacity Manual*, Federal Highway Administration, Transportation Research Board, 2000.

FIGURE 5-A

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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
Battery St/Park St at Pearl St	Weekday AM	0.82	15.0	B	0.84	15.7	B
	Weekday PM	0.69	11.3	B	0.71	12.3	B
Pine St at Pearl St	Weekday AM	0.40	15.4	B	0.54	23.1	C
	Weekday PM	0.42	13.5	B	0.61	19.4	B
N/S Winooski Ave at Pearl St	Weekday AM	0.47	11.3	B	0.52	12.5	B
	Weekday PM	0.55	12.0	B	0.59	14.5	B
N/S Union St at Pearl St	Weekday AM	0.46	12.4	B	0.54	16.0	B
	Weekday PM	0.64	14.6	B	0.75	21.9	C
N/S Willard St at Pearl St	Weekday AM	0.55	10.6	B	0.62	16.7	B
	Weekday PM	0.68	14.6	B	0.88	25.9	C
Prospect St at Pearl St/Colchester Ave	Weekday AM	0.68	28.3	C	0.84	36.6	D
	Weekday PM	0.75	31.6	C	0.88	43.3	D
Pine St at Main St	Weekday AM	0.52	13.0	B	0.61	16.3	B
	Weekday PM	0.64	13.5	B	0.81	19.0	B
Saint Paul St at Main St	Weekday AM	0.58	14.6	B	0.66	15.6	B
	Weekday PM	0.49	13.6	B	0.57	14.0	B
S Winooski Ave at Main St	Weekday AM	0.58	12.9	B	0.67	16.1	B
	Weekday PM	0.71	16.6	B	0.83	22.0	C
S Union St at Main St	Weekday AM	0.85	22.1	C	0.91	33.8	C
	Weekday PM	0.71	16.3	B	0.83	23.3	C
S Willard St at Main St	Weekday AM	0.62	13.5	B	0.72	19.4	B
	Weekday PM	0.74	18.2	B	0.87	27.1	C
S Prospect St at Main St	Weekday AM	0.76	23.4	C	0.95	31.4	C
	Weekday PM	0.85	35.0	C	0.98	52.7	D
S Winooski Ave at Cherry St	Weekday AM	0.31	6.3	A	0.34	6.6	A
	Weekday PM	0.42	7.7	A	0.46	8.9	A
S Winooski Ave at Bank St	Weekday AM	0.31	4.8	A	0.31	5.1	A
	Weekday PM	0.37	6.3	A	0.38	7.2	A
Battery St at Cherry St	Weekday AM	0.67	7.9	A	0.70	8.4	A
	Weekday PM	0.58	8.4	A	0.61	10.0	A
St Paul St at Cherry St	Weekday AM	Not Evaluated for No Build			0.21	15.9	B
	Weekday PM				0.20	15.4	B

* 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
Battery St/Park St at Pearl St	Weekday AM	0.82	15.0	B	0.84	15.7	B
	Weekday PM	0.79	15.7	B	0.81	18.5	B
Pine St at Pearl St	Weekday AM	0.40	15.4	B	0.54	23.1	C
	Weekday PM	0.43	13.8	B	0.63	20.0	B
N/S Winooski Ave at Pearl St	Weekday AM	0.47	11.3	B	0.51	12.3	B
	Weekday PM	0.57	12.3	B	0.62	14.9	B
N/S Union St at Pearl St	Weekday AM	0.46	12.4	B	0.54	16.0	B
	Weekday PM	0.70	17.3	B	0.81	24.4	C
N/S Willard St at Pearl St	Weekday AM	0.55	10.6	B	0.62	16.7	B
	Weekday PM	0.75	15.6	B	0.89	26.4	C
Prospect St at Pearl St/Colchester Ave	Weekday AM	0.72	27.8	C	0.84	36.6	D
	Weekday PM	0.83	47.9	D	0.90	47.1	D
Pine St at Main St	Weekday AM	0.49	17.6	B	0.52	17.9	B
	Weekday PM	0.83	38.2	D	1.01	69.3	E
Saint Paul St at Main St	Weekday AM	0.48	15.9	B	0.58	15.5	B
	Weekday PM	0.55	19.7	B	0.62	18.1	B
S Winooski Ave at Main St	Weekday AM	0.59	14.3	B	0.70	53.6	D
	Weekday PM	0.83	23.3	C	0.93	31.3	C
S Union St at Main St	Weekday AM	0.89	25.4	C	0.93	29.1	C
	Weekday PM	0.87	27.1	C	0.90	27.4	C
S Willard St at Main St	Weekday AM	0.64	15.5	B	0.70	15.2	B
	Weekday PM	0.82	31.2	C	0.87	23.1	C
S Prospect St at Main St	Weekday AM	0.78	23.1	C	0.95	30.9	C
	Weekday PM	0.89	37.3	D	0.98	53.3	D
S Winooski Ave at Cherry St	Weekday AM	0.32	6.4	A	0.35	6.7	A
	Weekday PM	0.47	8.3	A	0.51	9.6	A
S Winooski Ave at Bank St	Weekday AM	0.32	4.6	A	0.32	5.2	A
	Weekday PM	0.39	6.4	A	0.40	7.4	A
Battery St at Cherry St	Weekday AM	0.73	8.9	A	0.78	10.6	B
	Weekday PM	0.65	9.6	A	0.68	10.7	B
St Paul St at Cherry St	Weekday AM	Not Evaluated for No Build			0.21	15.4	B
	Weekday PM				0.21	15.0	B

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

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 0.52. It should be noted that the intersections of Pine Street at Cherry Street, Pine Street and Bank Street, and St. Paul Street at Bank Street are slightly offset in their geometry which could cause slight inefficiencies in their operation. These intersections are expected to operate at LOS A so these inefficiencies should not adversely affect intersection operations.

7.3 Signal Warrant Analysis

A preliminary signal warrant analysis for three of the four intersections immediately adjacent to the Burlington Town Center was conducted for the 2024 Build conditions scenario. These include the Bank Street intersections with Pine Street and St. Paul Street, and the Cherry Street intersection with Pine Street. Signal warrant analyses were conducted using the three volume-based warrants (i.e. 8-hour, 4-hour, and peak-hour signal warrants) following the methodology contained within Chapter 4 of the *Manual on Uniform Traffic Control Devices (MUTCD)*¹⁴. For these three intersections, none of the volume-based warrants were found to be met.

The fourth intersection around the Burlington Town Center, Cherry Street and St. Paul Street, was not evaluated as it is assumed to be fully signalized once the St. Paul Street connection between Bank and Cherry Streets is completed with this project. This intersection's southbound approach serves the Burlington Downtown Transit Center and is currently signalized to accommodate the bus movements.

¹⁴ Manual on Uniform Traffic Control Devices, Federal Highway Administration, 2009.

FIGURE 5-A

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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 from Cherry St	0.07	0	-	0.14	0	-	0.07	0	-	0.14	0	-
WB from Cherry St	0.02	1.7	A	0.06	2.9	A	0.02	1.7	A	0.06	2.9	A
NB from Garage	0	9.9	B	0.11	12.5	B	0	10.1	B	0.1	12.3	B
Bank St at Pine St/(Parking Garage)												
WB from Bank St	0.08	9.9	A	0.14	7.9	A	0.08	9.6	A	0.14	7.9	A
NB from Pine St	0.04	0	-	0.16	7.5	A	0.04	0	-	0.16	7.5	A
SB from Garage	0	0	-	0.05	7.7	A	0	0	-	0.05	7.7	A
Bank St at Parking Garage												
EB from Bank St	DOES NOT EXIST IN NO BUILD CONDITIONS			0.09	5.5	A	DOES NOT EXIST IN NO BUILD CONDITIONS			0.08	5.3	A
WB from Bank St				0.10	0	-				0.1	0	-
SB from Garage				0.11	13.7	B				0.1	12.9	B
Cherry St at Pine St												
EB from Cherry St	0.02	1.4	A	0.25	9.4	A	0.02	1.4	A	0.25	9.4	A
WB from Cherry St	0.08	0	-	0.26	9.2	A	0.08	0	-	0.26	9.2	A
NB from Pine St	--	--	--	0.05	8.1	A	--	--	--	0.05	8.1	A
SB from Pine St	0.16	10.8	B	0.26	9.5	A	0.15	10.1	B	0.26	9.5	A
College St at Pine St												
EB from College St	0.25	9.1	A	0.27	9.8	A	0.25	9.1	A	0.27	9.8	A
WB from College St	0.26	9.3	A	0.28	10.0	A	0.26	9.3	A	0.28	10	A
NB from Pine St	0.19	9.2	A	0.30	10.3	B	0.19	9.2	A	0.30	10.3	B
SB from Pine St	0.08	8.2	A	0.15	9.0	A	0.08	8.2	A	0.15	9	A
College St at St. Paul St												
EB from College St	0.19	8.8	A	0.21	9.4	A	0.19	8.8	A	0.21	9.4	A
WB from College St	0.28	9.2	A	0.30	9.9	A	0.28	9.2	A	0.30	9.9	A
NB from St. Paul St	0.22	9.3	A	0.34	10.6	B	0.22	9.3	A	0.34	10.6	B
SB from St. Paul St	0.05	8.2	A	0.11	8.8	A	0.05	8.2	A	0.11	8.8	A
Bank St at St. Paul St												
EB from Bank St	0.05	7.2	A	0.14	8.0	A	0.05	7.20	A	0.14	8	A
WB from Bank St	0.14	7.9	A	0.17	8.5	A	0.14	7.90	A	0.17	8.5	A
NB from St. Paul St	0.06	7.3	A	0.18	8.5	A	0.06	7.30	A	0.18	8.5	A
SB from St. Paul St	--	--	--	0.04	7.4	A	--	--	--	0.04	7.4	A

FIGURE 5-A

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Table 6: Unsignalized Intersection Capacity Analyses Summary - PM Weekday Peak Hour

	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 from Cherry St	0.06	0	-	0.13	0	-	0.07	0	-	0.13	0	-
WB from Cherry St	0.01	0.4	A	0.04	1.8	A	0.01	0.4	A	0.04	1.8	A
NB from Garage	0.13	10.4	B	0.48	17.1	C	0.13	10.3	B	0.48	17.1	C
Bank St at Pine St/(Parking Garage)												
WB from Bank St	0.09	10.2	B	0.21	8.7	A	0.07	9.3	A	0.21	8.8	A
NB from Pine St	0.04	0	-	0.16	7.7	A	0.04	0	-	0.16	7.7	A
SB from Garage	0	1	A	0.12	8.2	A	0	0.9	A	0.12	8.2	A
Bank St at Parking Garage												
EB from Bank St	DOES NOT EXIST IN NO BUILD CONDITIONS			0.06	4.8	A	DOES NOT EXIST IN NO BUILD CONDITIONS			0.05	3.6	A
WB from Bank St				0.08	0	-				0.07	0	-
SB from Garage				0.39	15.5	C				0.29	11.9	B
Cherry St at Pine St												
EB from Cherry St	0.07	4.3	A	0.30	10.1	A	0.07	4.2	A	0.31	10.2	B
WB from Cherry St	0.15	0	-	0.51	11.7	B	0.15	0	-	0.52	12	B
NB from Pine St	--	--	--	0.05	8.7	A	--	--	--	0.05	8.7	A
SB from Pine St	0.10	11.6	B	0.20	9.8	A	0.1	10.9	B	0.21	9.9	A
College St at Pine St												
EB from College St	0.35	10.1	B	0.40	11.6	B	0.37	10.3	B	0.41	11.9	B
WB from College St	0.24	9.5	A	0.27	10.6	B	0.25	9.6	A	0.28	10.8	B
NB from Pine St	0.15	9.1	A	0.26	10.5	B	0.15	9.2	A	0.27	10.7	B
SB from Pine St	0.21	9.3	A	0.37	11.4	B	0.22	9.4	A	0.38	11.7	B
College St at St. Paul St												
EB from College St	0.25	9.5	A	0.28	10.5	B	0.26	9.6	A	0.29	10.7	B
WB from College St	0.20	9.1	A	0.23	10.1	B	0.21	9.2	A	0.24	10.2	B
NB from St. Paul St	0.25	9.5	A	0.39	11.5	B	0.26	9.7	A	0.40	11.7	B
SB from St. Paul St	0.19	9.1	A	0.33	10.8	B	0.20	9.2	A	0.34	11	B
Bank St at St. Paul St												
EB from Bank St	0.09	7.5	A	0.30	9.3	A	0.09	7.6	A	0.30	9.3	A
WB from Bank St	0.13	7.9	A	0.17	8.8	A	0.13	8.0	A	0.17	8.8	A
NB from St. Paul St	0.10	7.4	A	0.24	9.2	A	0.11	7.5	A	0.24	9.2	A
SB from St. Paul St	--	--	--	0.06	8.0	A	--	--	--	0.40	7.8	A

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 385 net new vehicle trips (270 entering and 115 exiting) during the weekday morning peak hour and 625 net new vehicle trips (255 entering and 370 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, nearly all of the signalized intersections were found to operate at LOS D or better in each of the No Build and Build scenarios. The intersection of Pine Street and Main Street operates at LOS E in the 2024 PM Build scenario due to the requirement to utilize signal timing and phasing consistent with the Champlain Parkway FSEIS (modified signal splits show LOS D conditions). Volume-to-capacity ratios also remain less than 1.0 at the signalized intersections under all scenarios except for Pine Street and Main Street – again, due to the Champlain Parkway FSEIS timing and phasing assumptions. On average, the trips generated by the project increase signalized intersection delay by 4-6 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 5% 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.
- A new traffic signal is proposed at the modified St. Paul Street/Cherry Street intersection to integrate with the existing signal constructed for the GMT Downtown Transit Center. This signal will accommodate both site-generated trips, newly re-routed cross-town trips, and buses entering and 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

Town: Burlington

Count Date(s): 6/14/2016

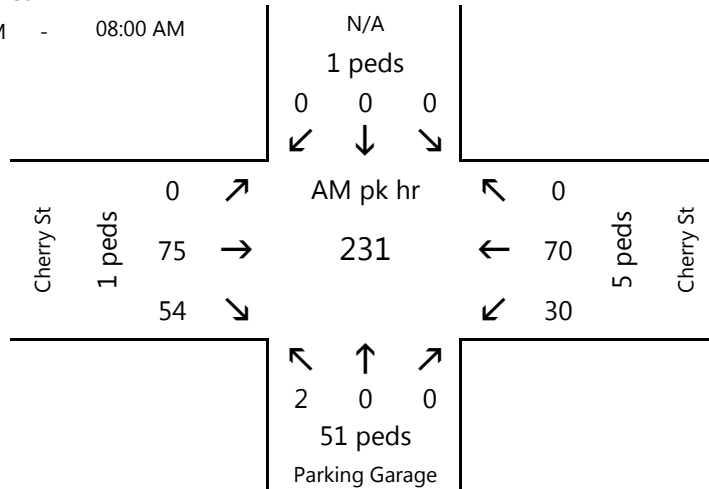
Counter: VHB

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

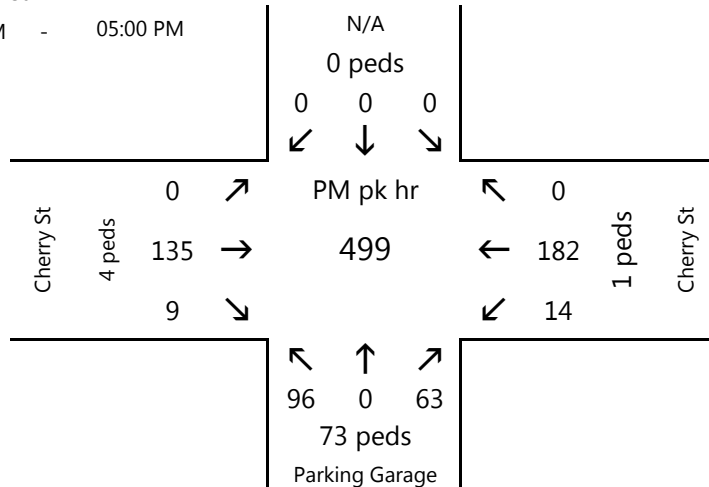
07:00 AM - 08:00 AM



% 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: _____

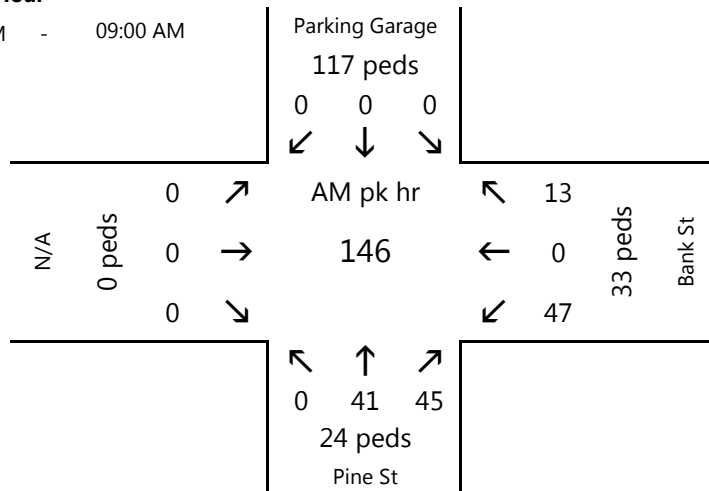
Intersection: Bank St / Pine St/Parking Garage **Town:** Burlington
 Count Date(s): 6/14/2016 **Counter:** VHB

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

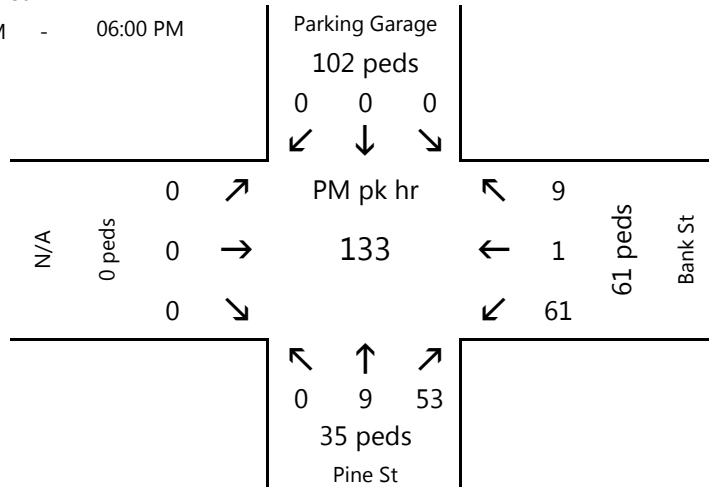
08:00 AM - 09:00 AM



% Auto: 45.6%
 % Med: 0.0%
 % Heavy: 0.0%
 total % Trucks: 0.0%

PM Peak Hour

05:00 PM - 06:00 PM



% Auto: 40.2%
 % 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: Pine St / Cherry St

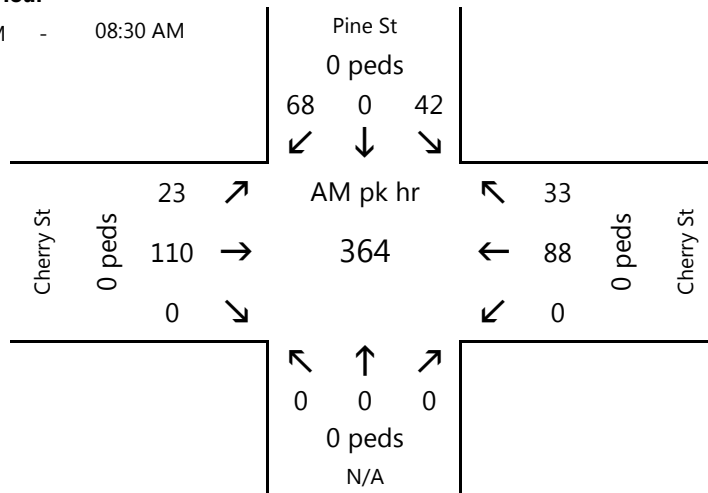
Intersection: Pine St / Cherry St Town: Burlington
 Count Date(s): 12/2/2016 (AM) 11/30/2016 (PM) Counter: VHB

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

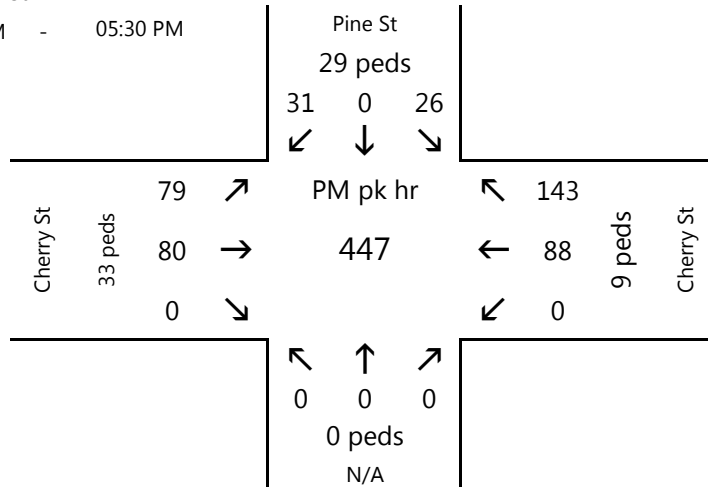
07:30 AM - 08:30 AM



% 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

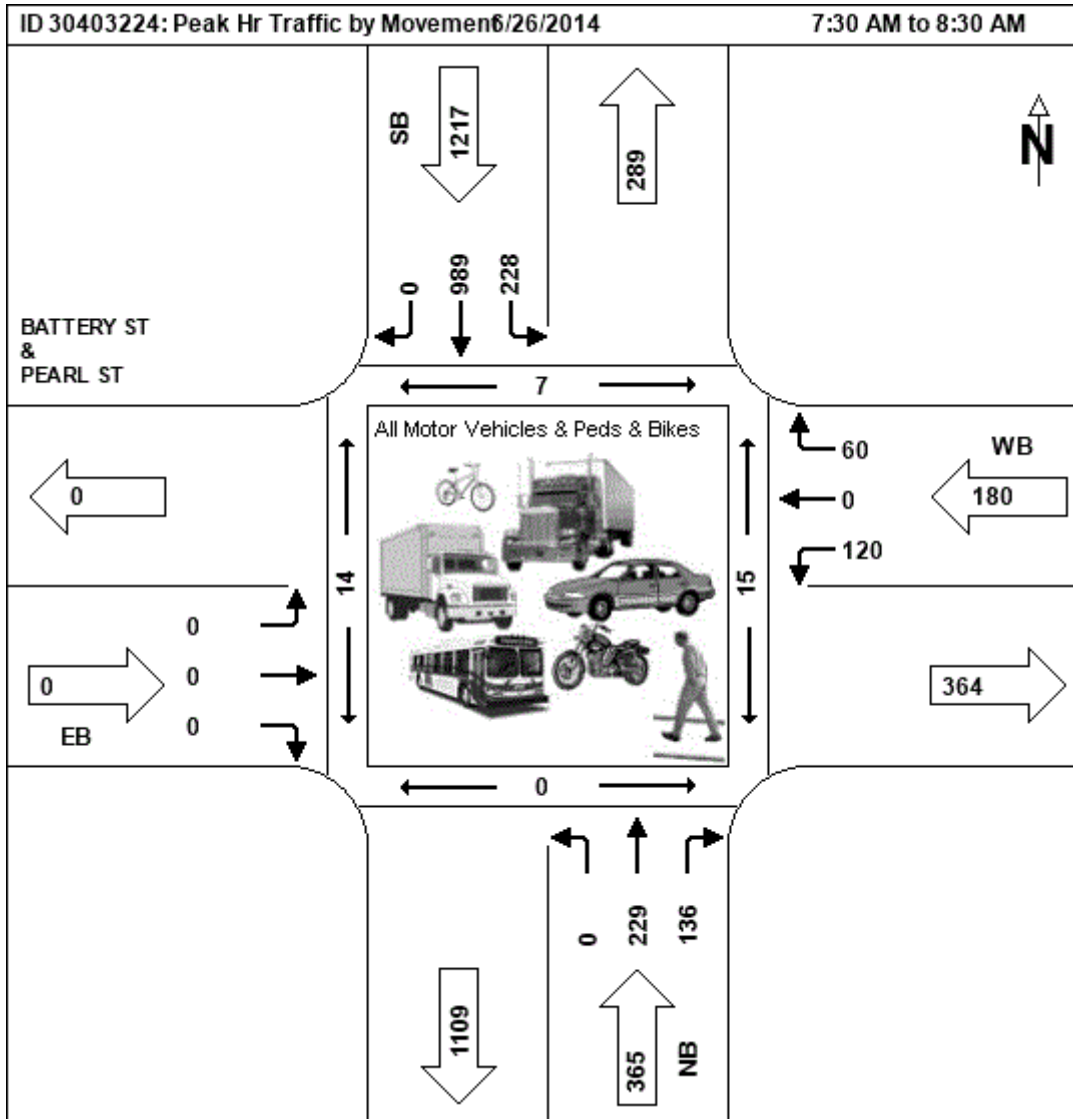
Corridor:
 Road 3: BATTERY ST
 Road 4:

|<<|<|>|>>| 1-1 of 1

AM Peak Hour
06/26/2014

NB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total	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

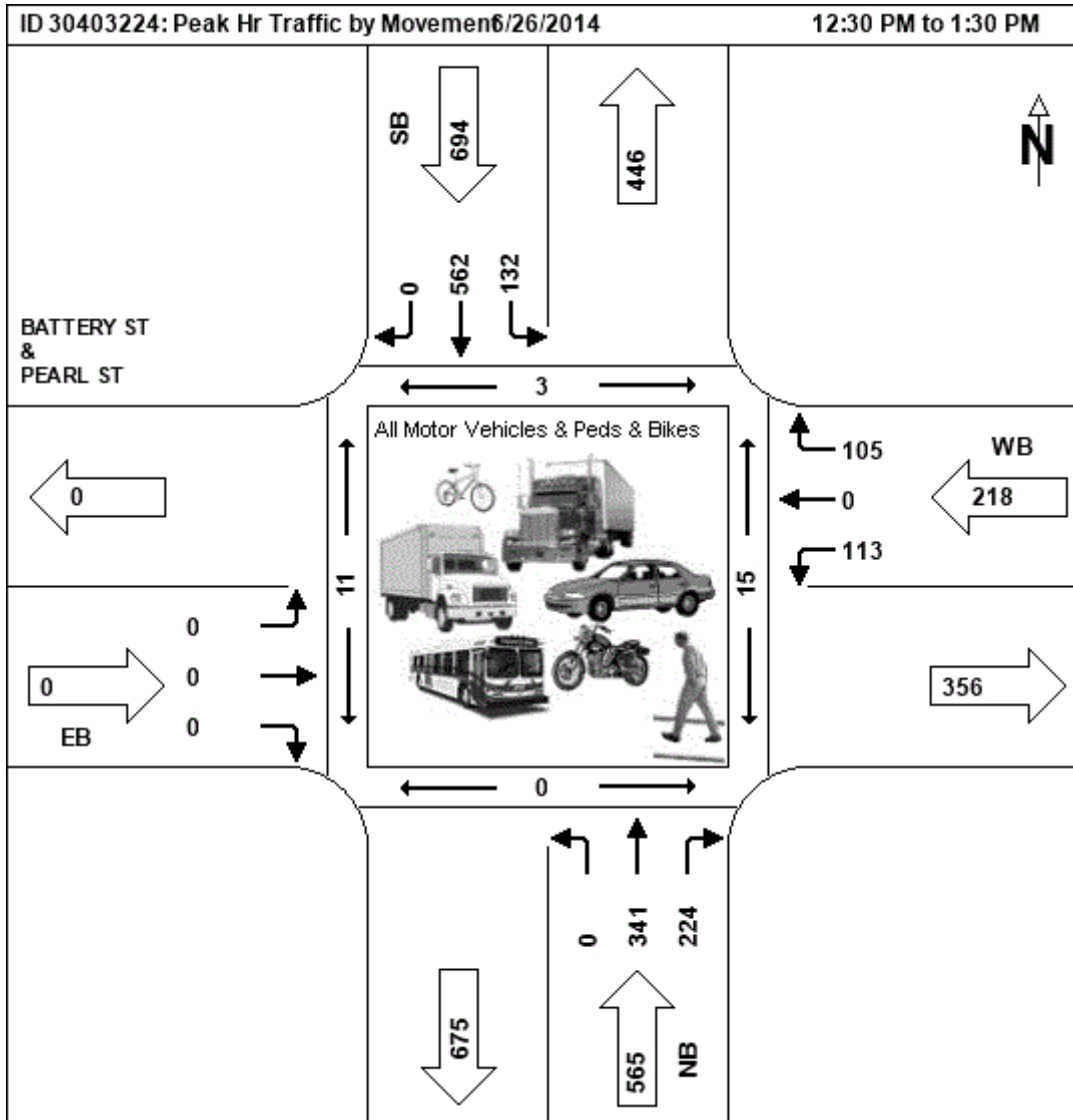


Midday Peak Hour
06/26/2014

NB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Int
Time					Total					Total					Total	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			

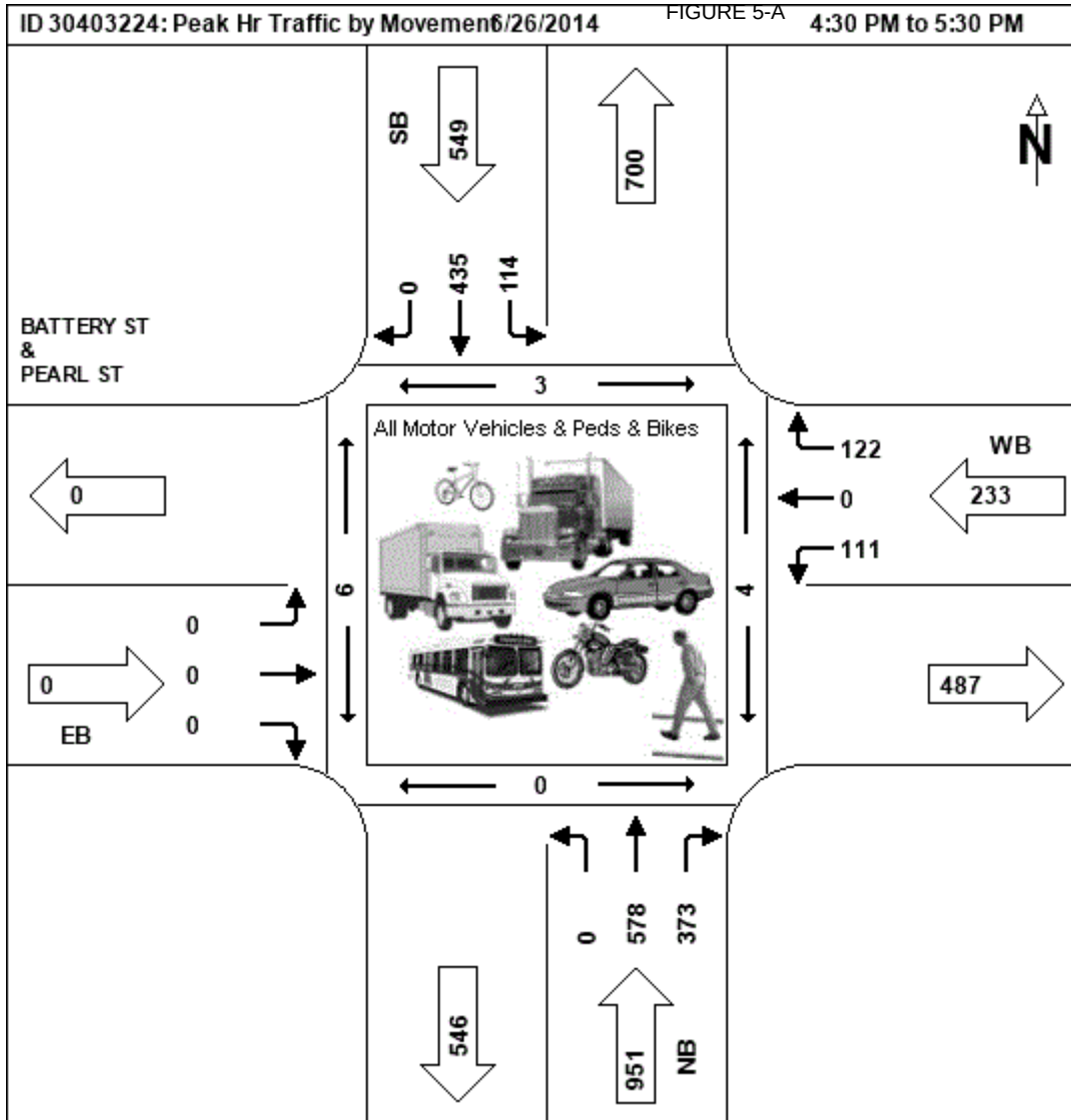
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



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			

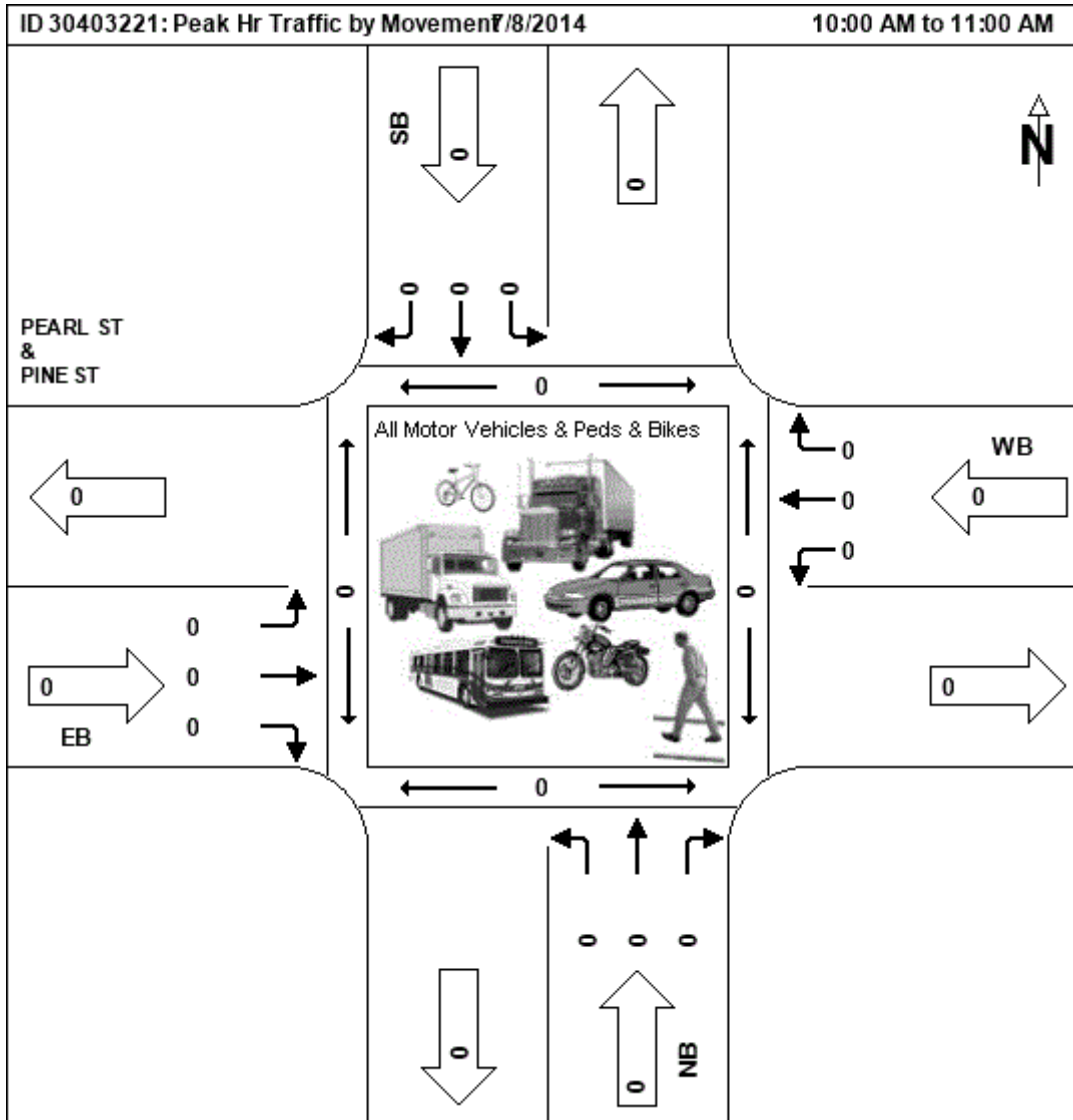
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



Corridor:
Road 3: PEARL ST
Road 4:

[illegible]

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM Peak Hour
07/08/2014

NB						EB					WB					
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Int Total
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			

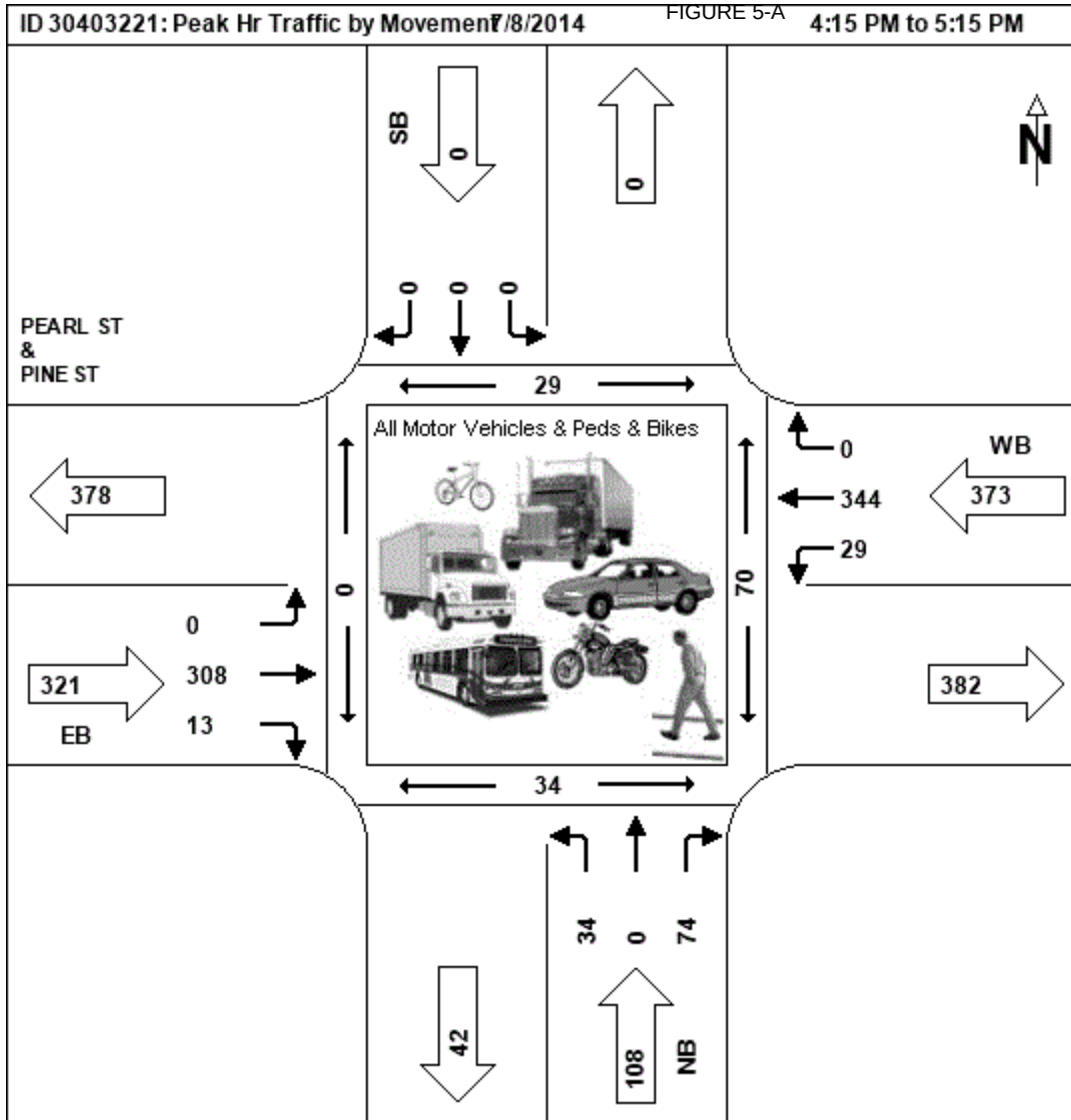


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403620
 Community: BURLINGTON
 Road 1: ALT-7
 Road 2: PEARL ST

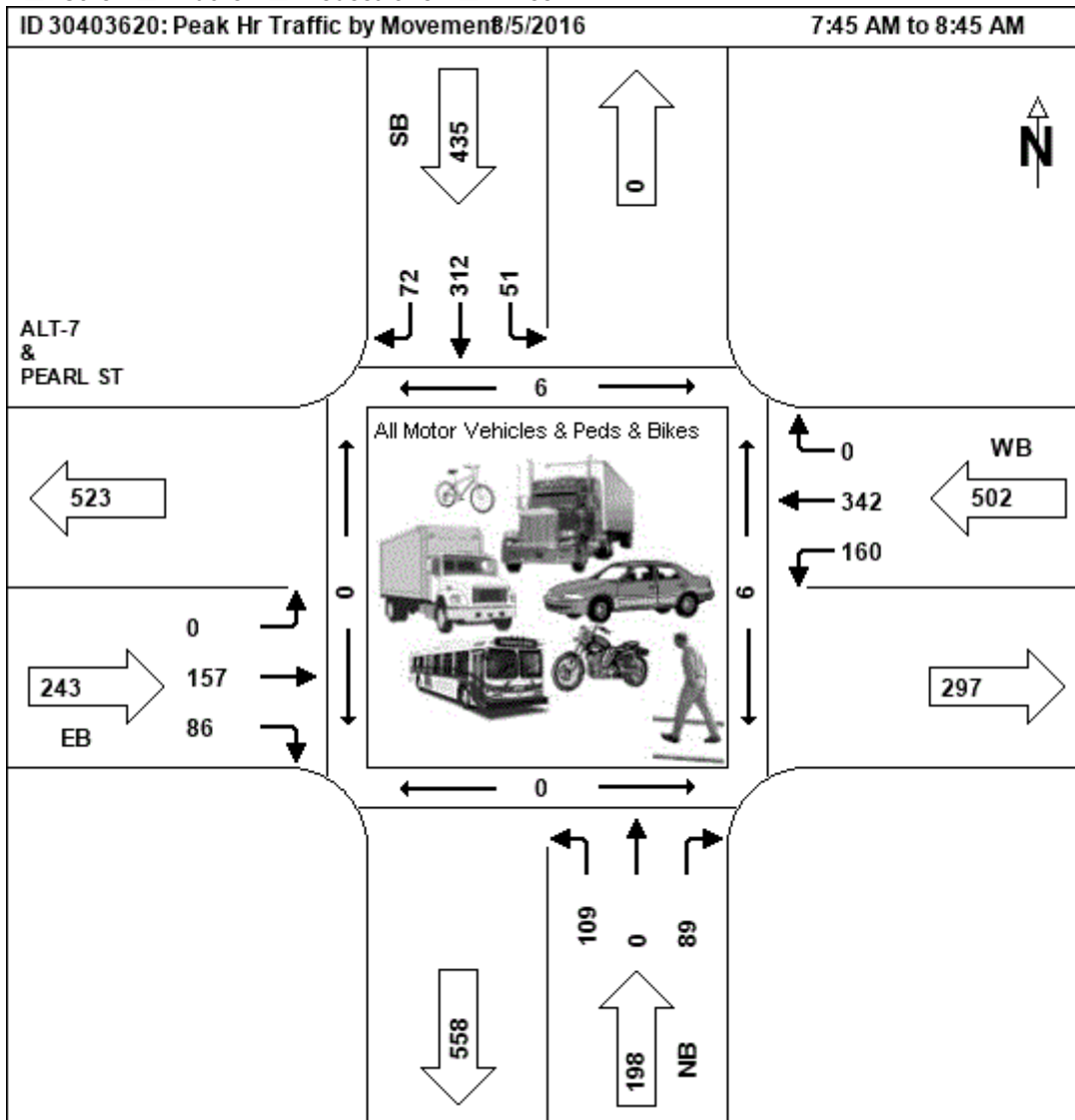
Corridor: NA
 Road 3: ALT-7
 Road 4: PEARL ST

|<<|<|>|>>| 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

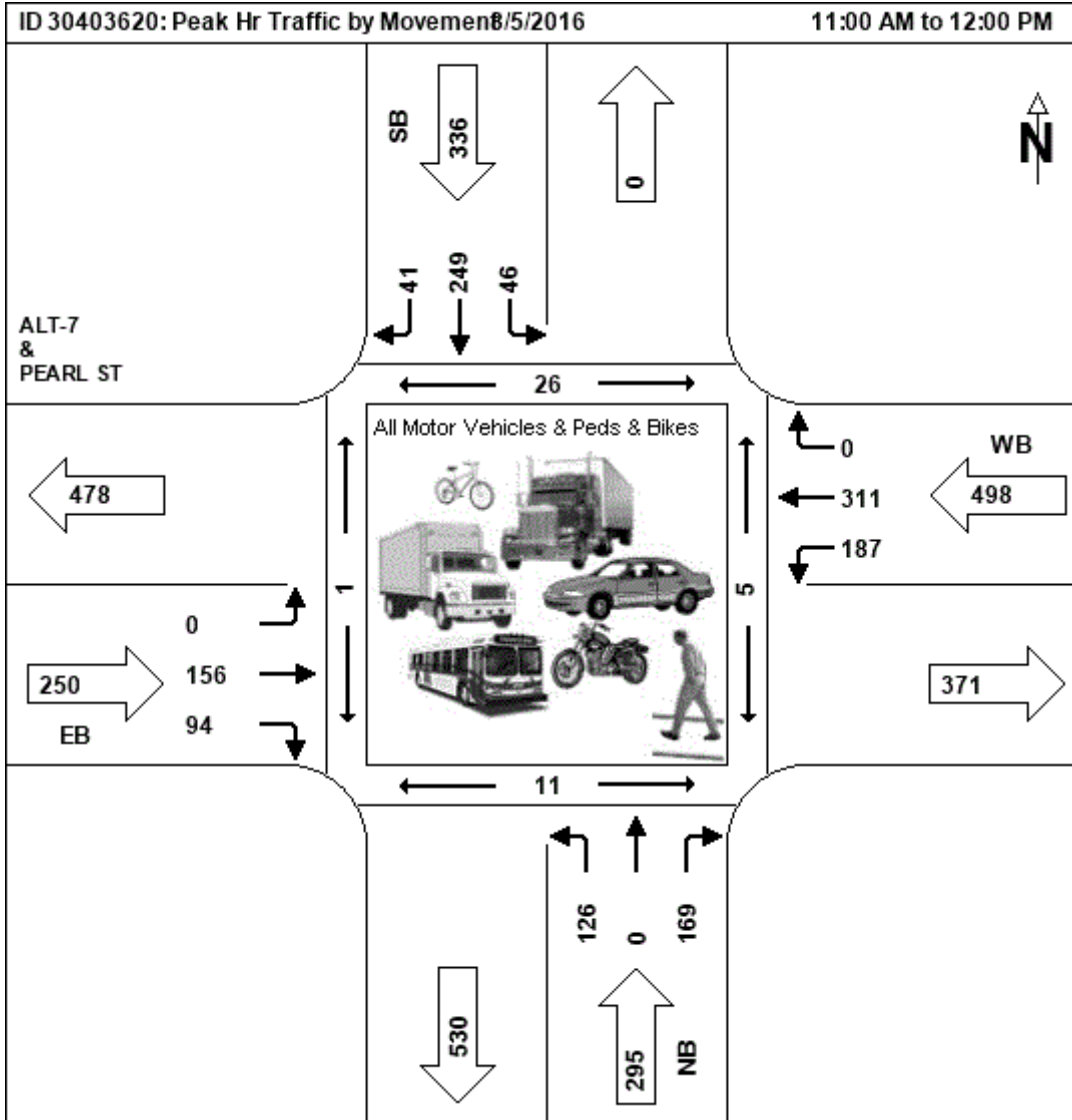


Midday Peak Hour
08/05/2016

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	293
11:45 AM	42	0	40	0	82	0	38	33	6	71	11	75	12	1	98	52	87	390
Total	126	0	169	5	295	0	156	94	11	250	46	249	41	1	336	187	311	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

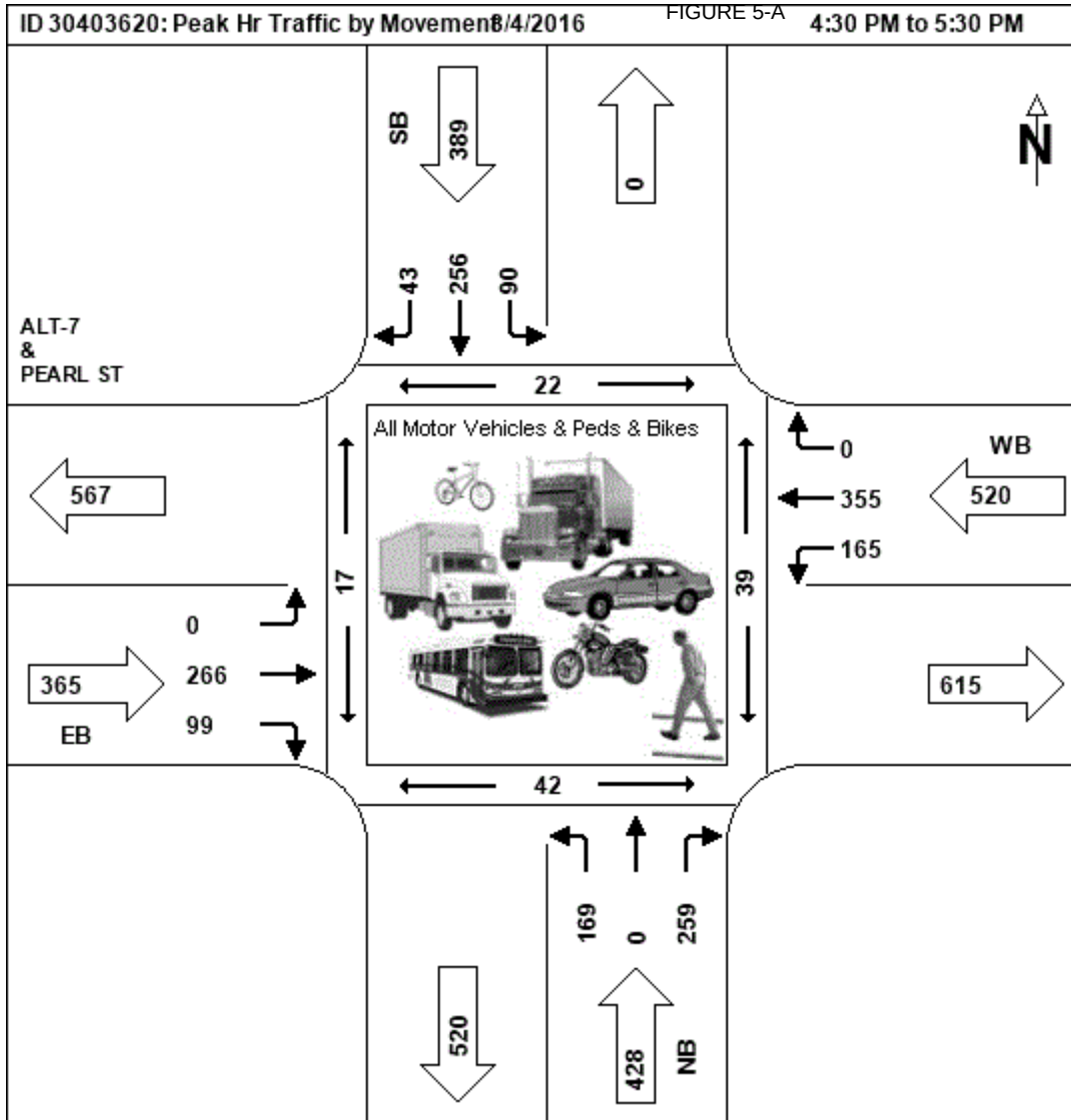


FIGURE 5-A

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

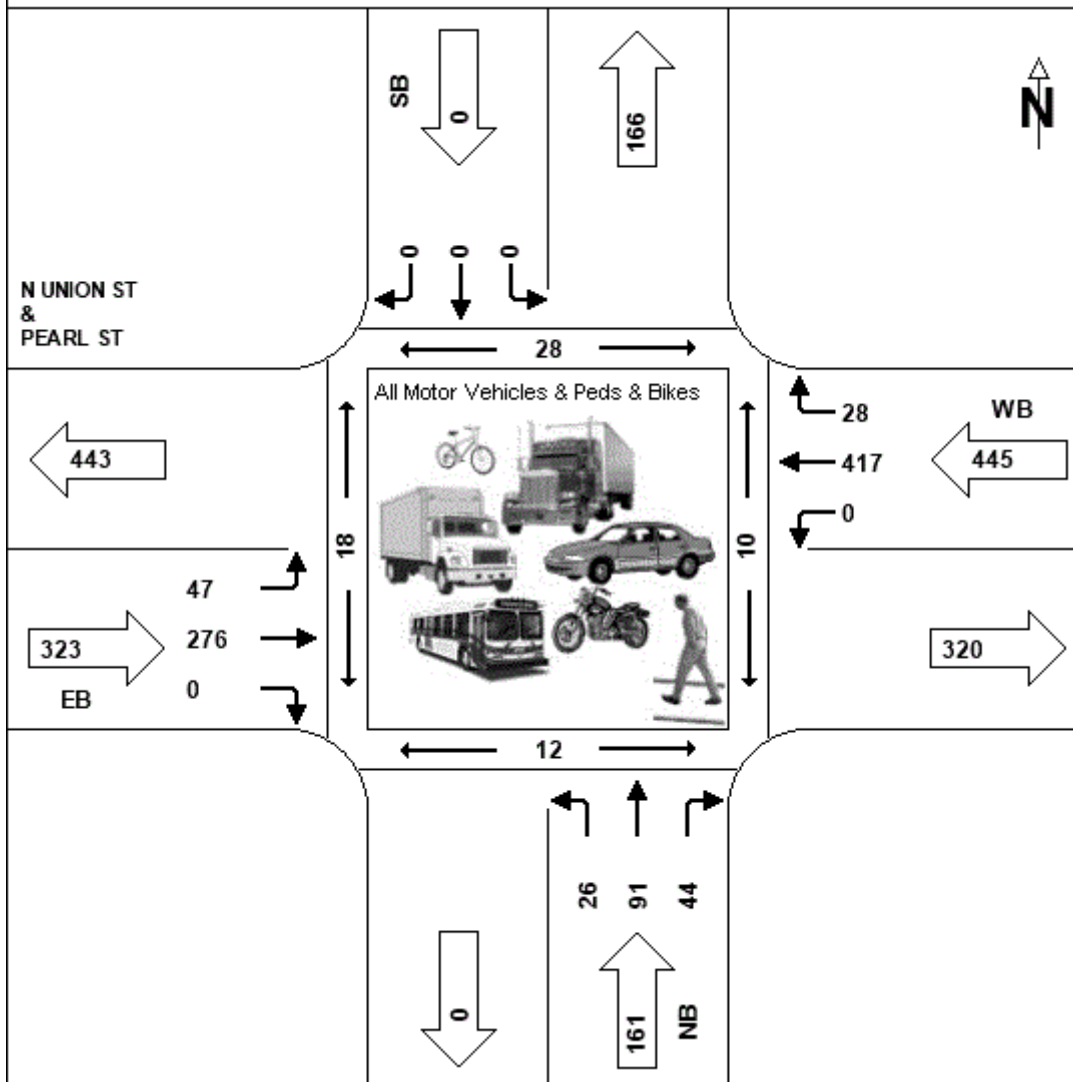
AM Peak Hour
06/17/2016

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

ID 30403325: Peak Hr Traffic by Movement 6/17/2016

7:30 AM to 8:30 AM



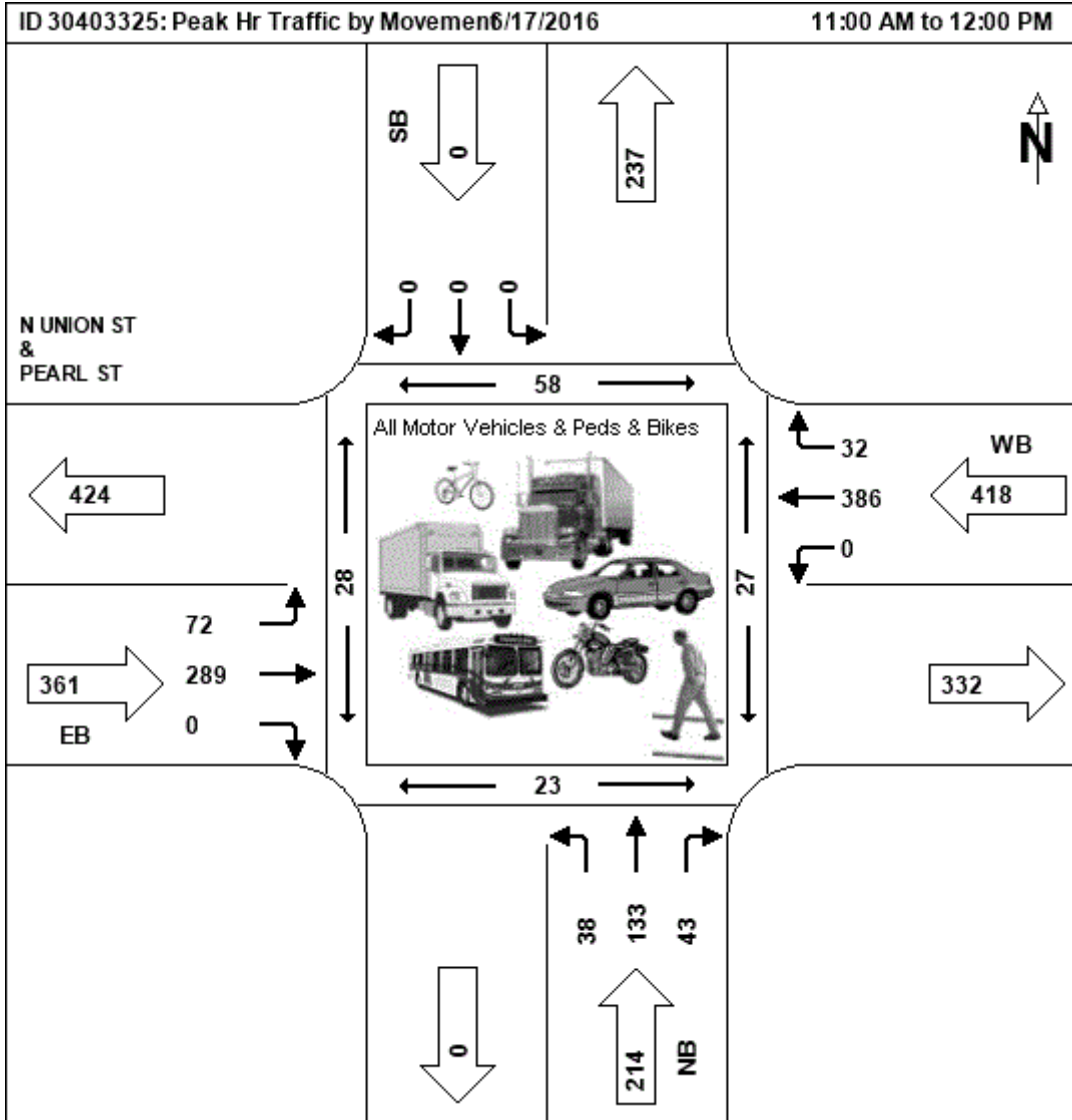
Midday Peak Hour
06/17/2016

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		0.79	0.92	0.67		0.85	0.86	0.85		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

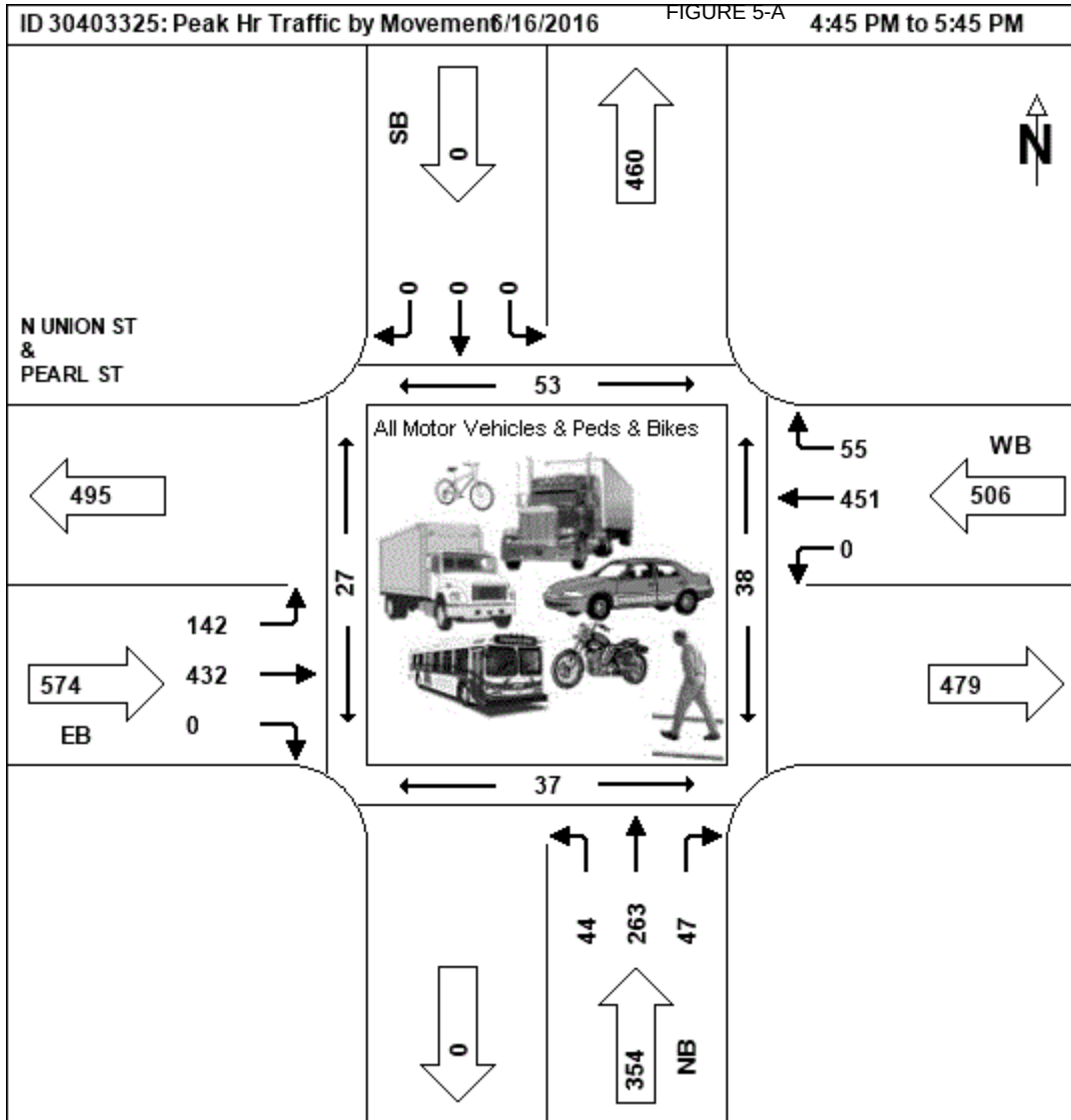


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403745
 Community: BURLINGTON
 Road 1: US-7
 Road 2: PEARL ST

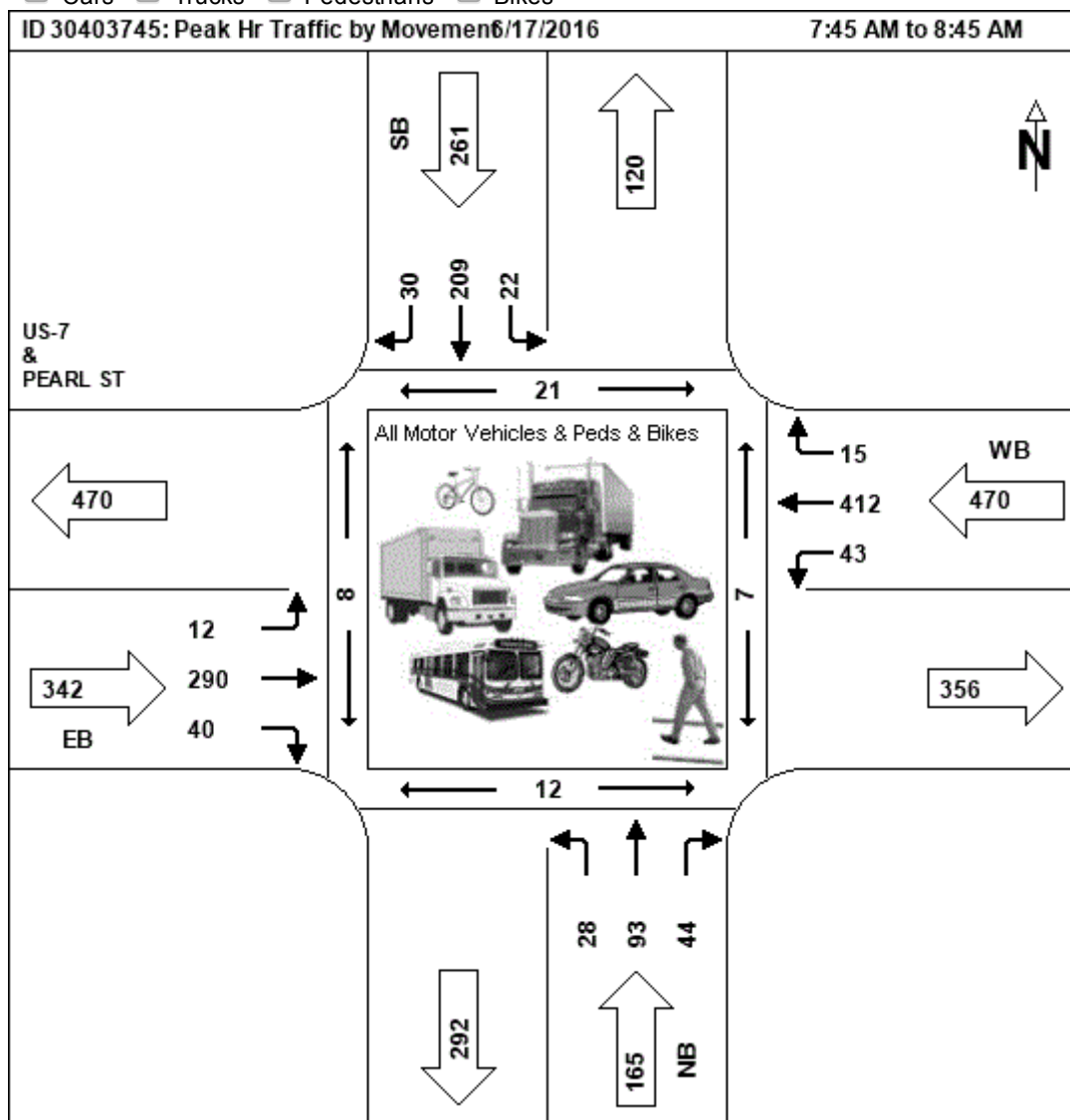
Corridor: NA
 Road 3: US-7
 Road 4: PEARL ST

|<<|<|>|>>| 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																					

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

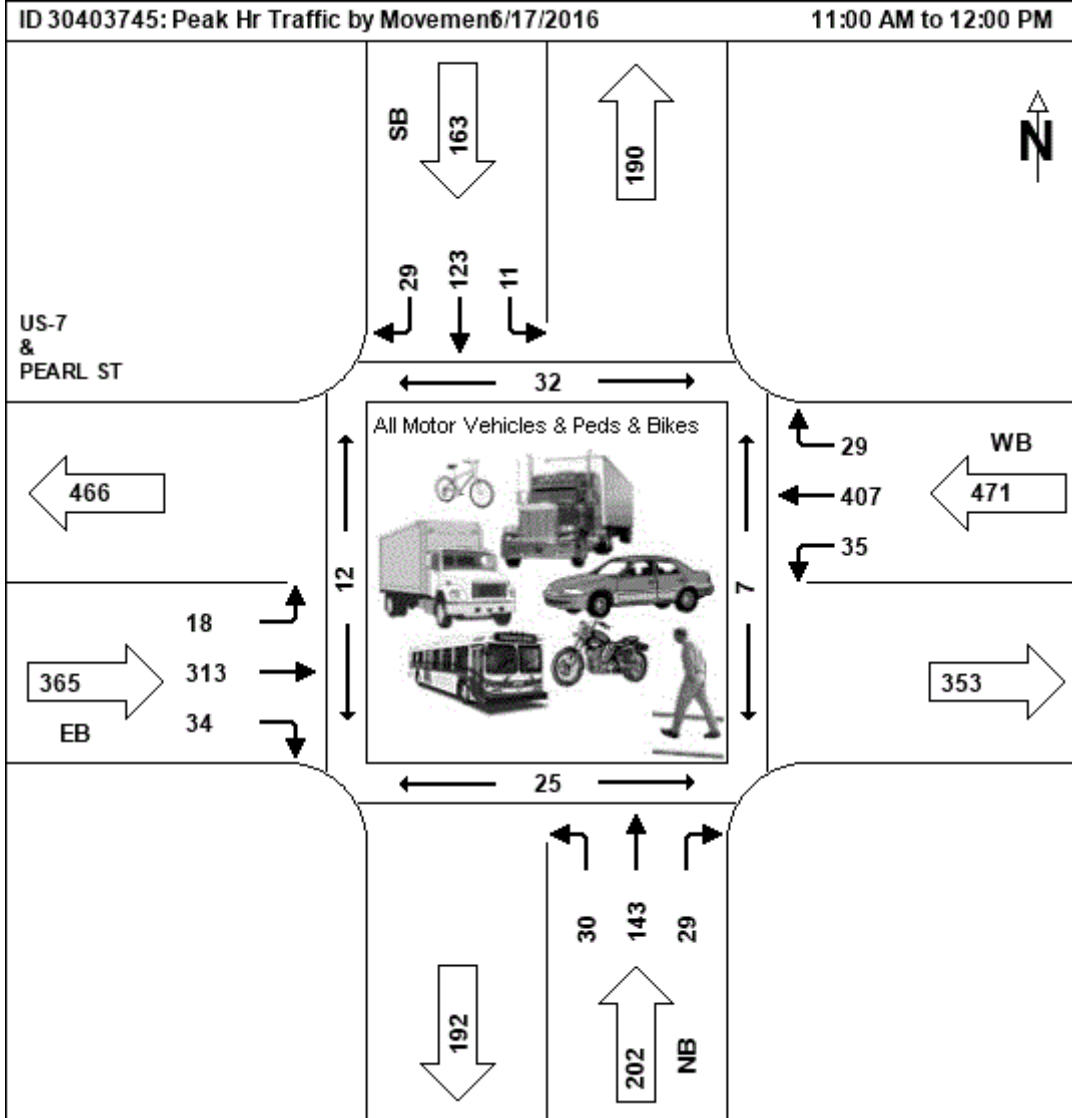


Midday Peak Hour 06/17/2016

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
11:00 AM	8	34	5	3	47	2	76	9	7	87	4	26	6	0	36	10	112	7	13	129	299

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

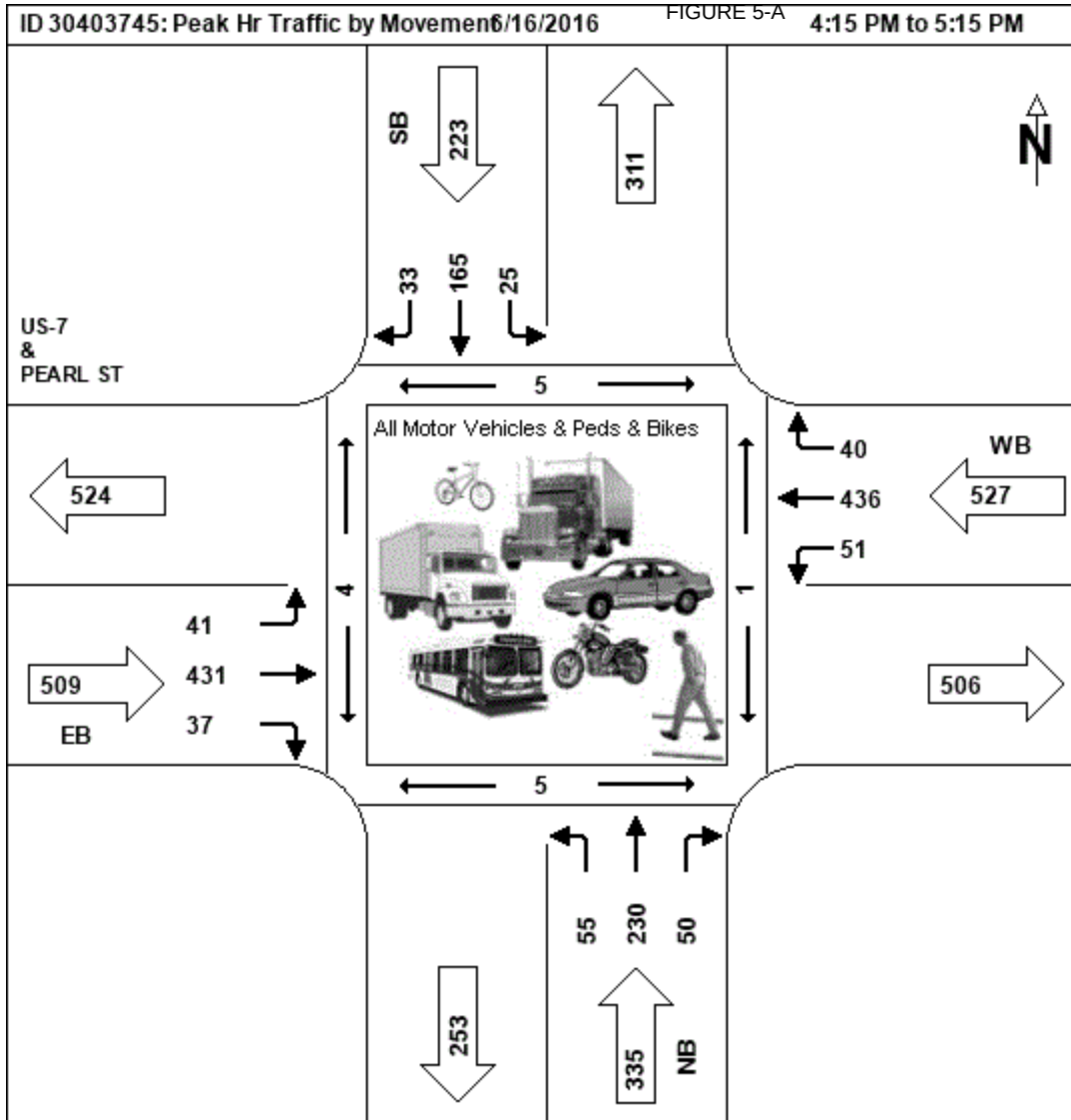


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403330
 Community: BURLINGTON
 Road 1: N PROSPECT ST
 Road 2: COLCHESTER AV

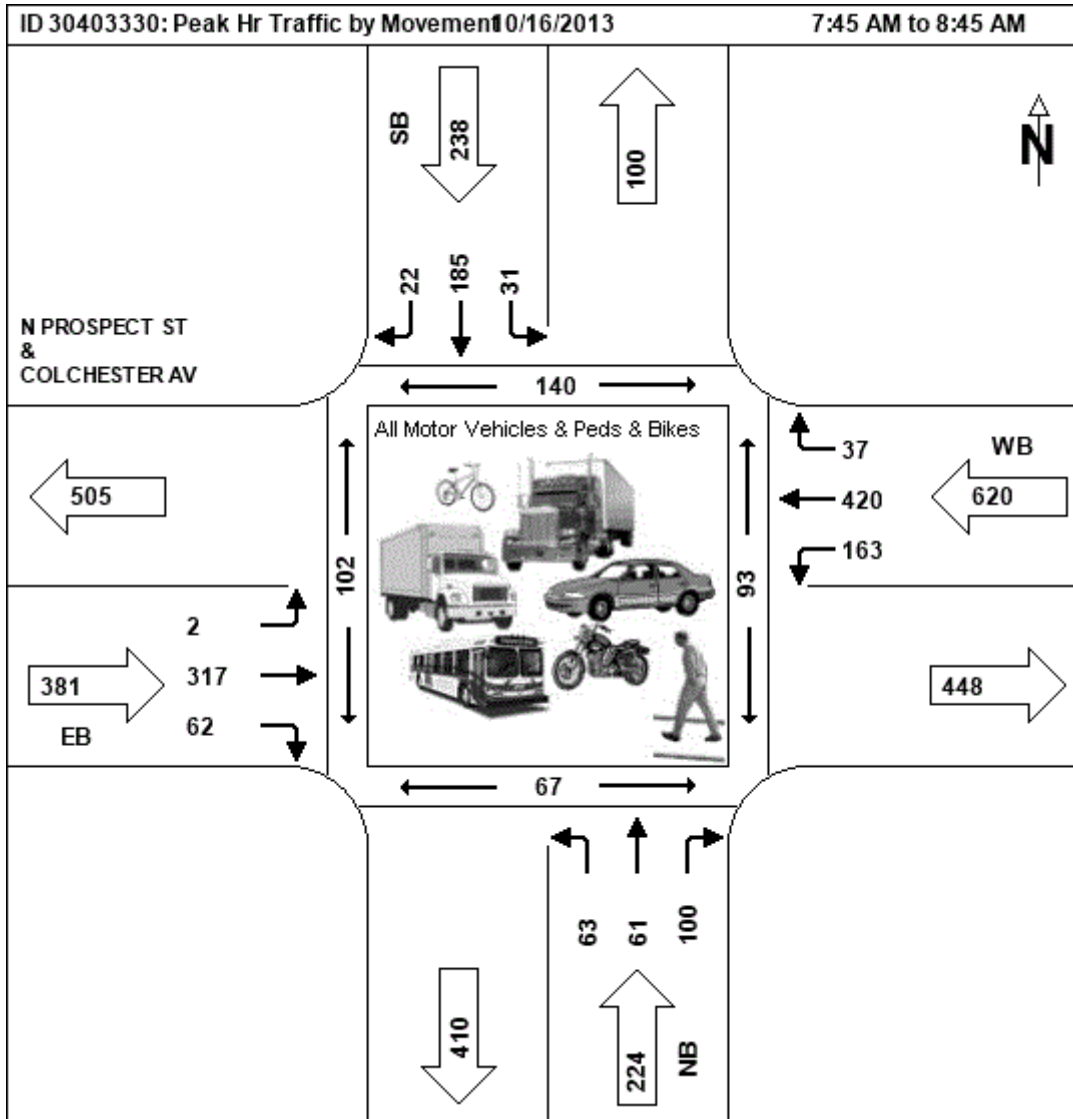
Corridor: NA
 Road 3: S PROSPECT ST
 Road 4: PEARL ST

|<<|<|>|>>| 1-5 of 5

AM Peak Hour 10/16/2013

NB						EB					SB					WB					
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	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



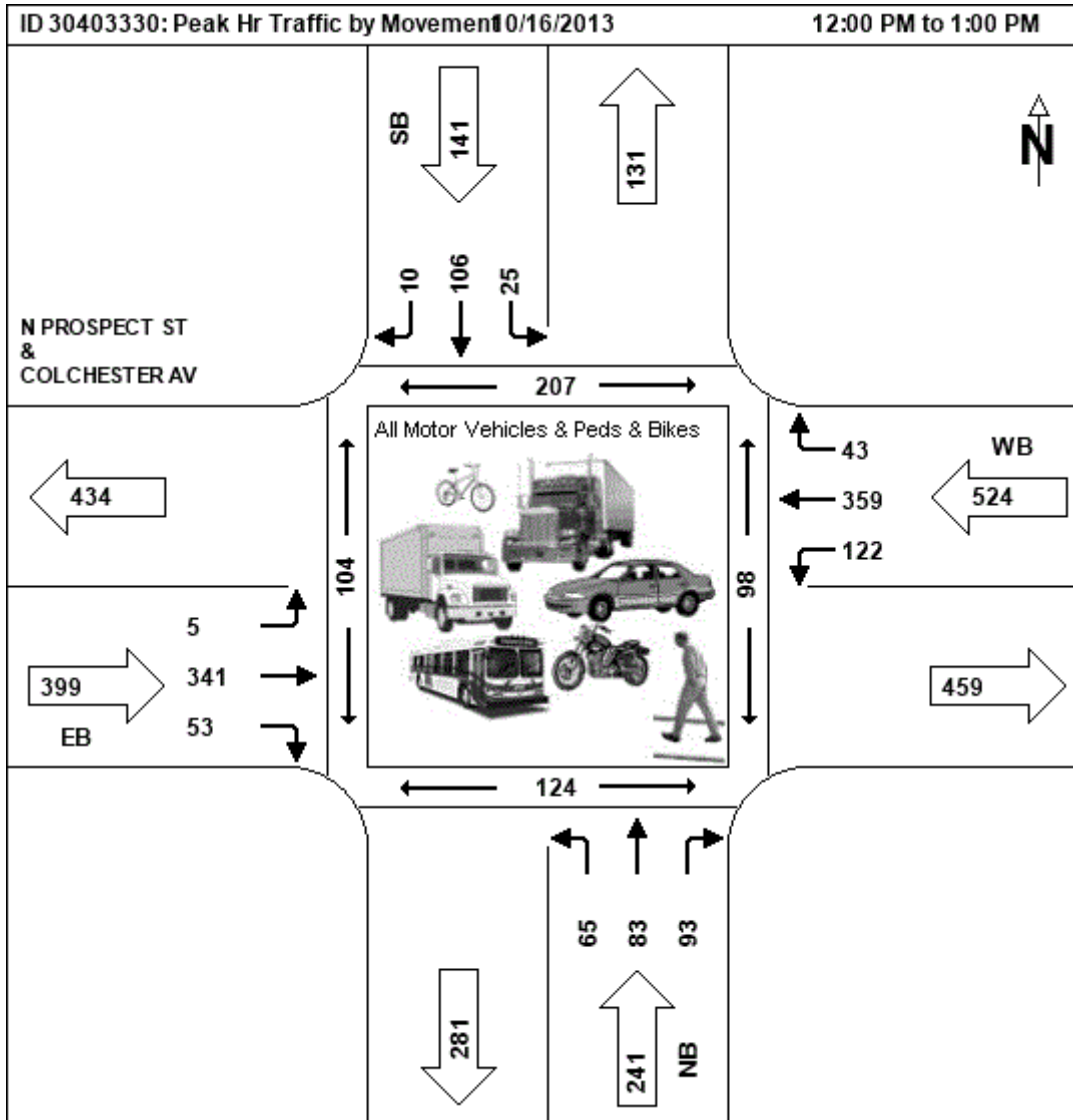
Midday Peak Hour 10/16/2013

NB					EB					SB					WB						
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
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 5A

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	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	App Total	Int Total
5:00 PM	31	49	46	39	0	104	7	57	3	26	3	31	42	117	11	48	170	439
5:15 PM	33	62	29	22	1	89	7	33	7	23	3	41	29	115	24	56	168	422
5:30 PM	36	53	43	33	2	97	19	27	7	24	2	28	32	115	15	30	162	445
5:45 PM	25	45	37	26	1	103	14	19	5	22	2	25	18	120	24	30	162	416
Total	125	209	155	120	4	393	47	136	22	95	10	125	127	467	74	164	662	1722
PHF	0.87	0.84	0.84		0.93	0.50	0.94	0.62	0.94	0.79	0.91	0.83	0.96	0.72	0.97	0.77		0.97
HV %	0	0	5		0	3	0		0	3	0		7	1	0			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

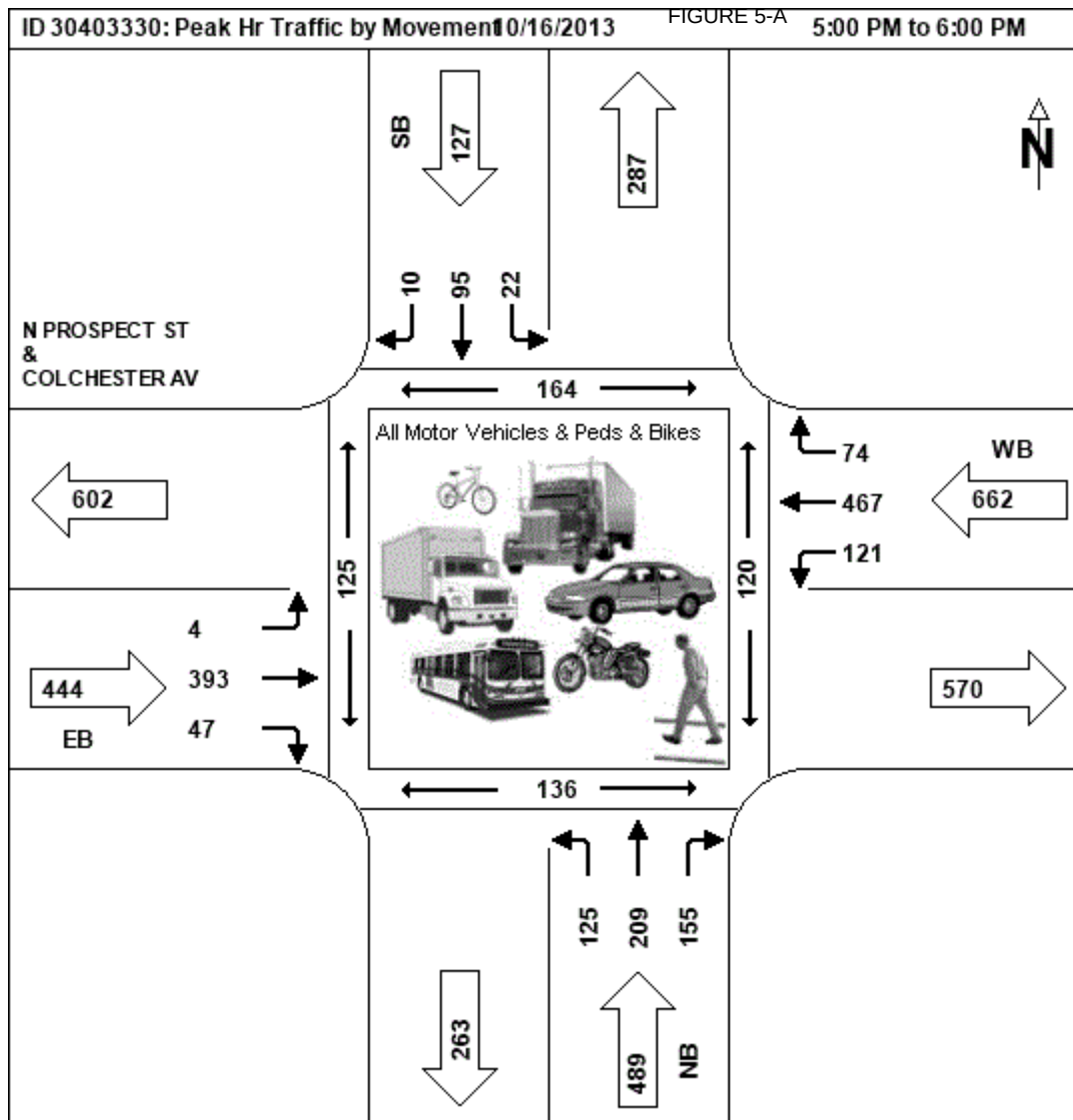


FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington, VT **Sheet:**
Calculated by: E. Quallen **Date:** 12/2/16
Checked by:
Title: BTV Town Center Traffic Counts
Intersection: College St / Pine St

Intersection: College St / Pine St

Town: Burlington

Count Date(s): 11/30/2016

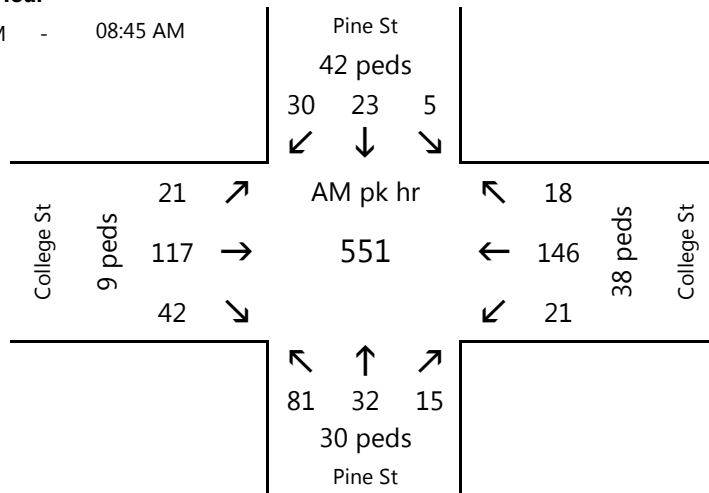
Counter: VHB

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

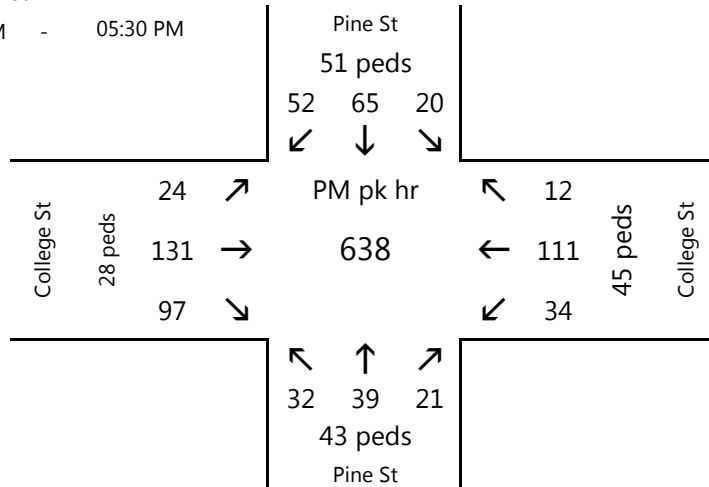
07:45 AM - 08:45 AM



% 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

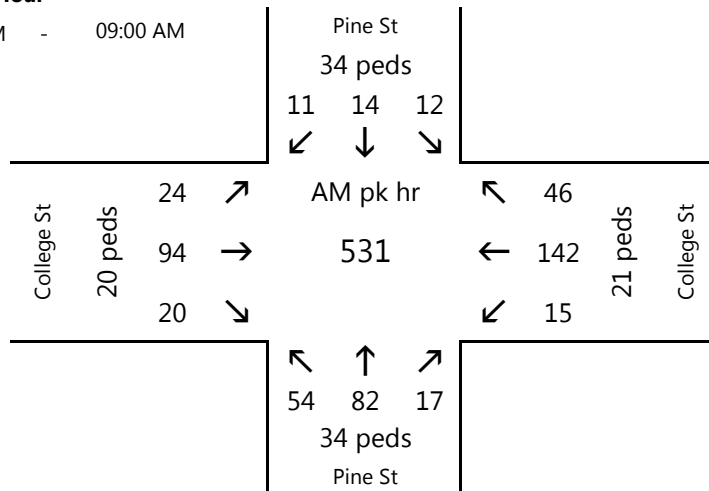
Town: Burlington
Counter: VHB

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

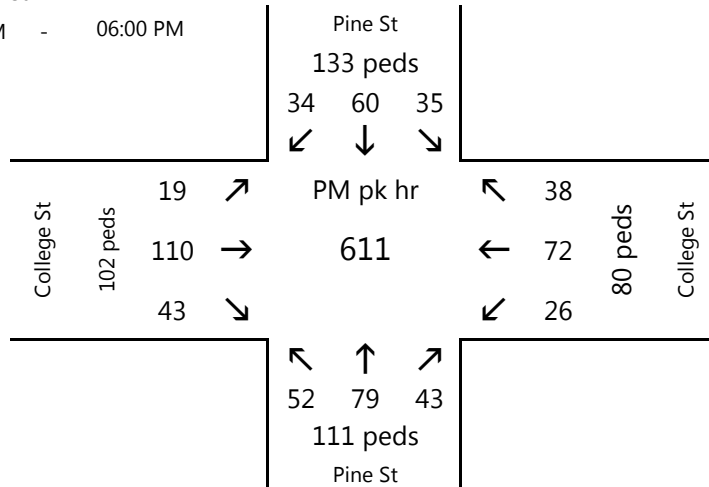
08:00 AM - 09:00 AM



% 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

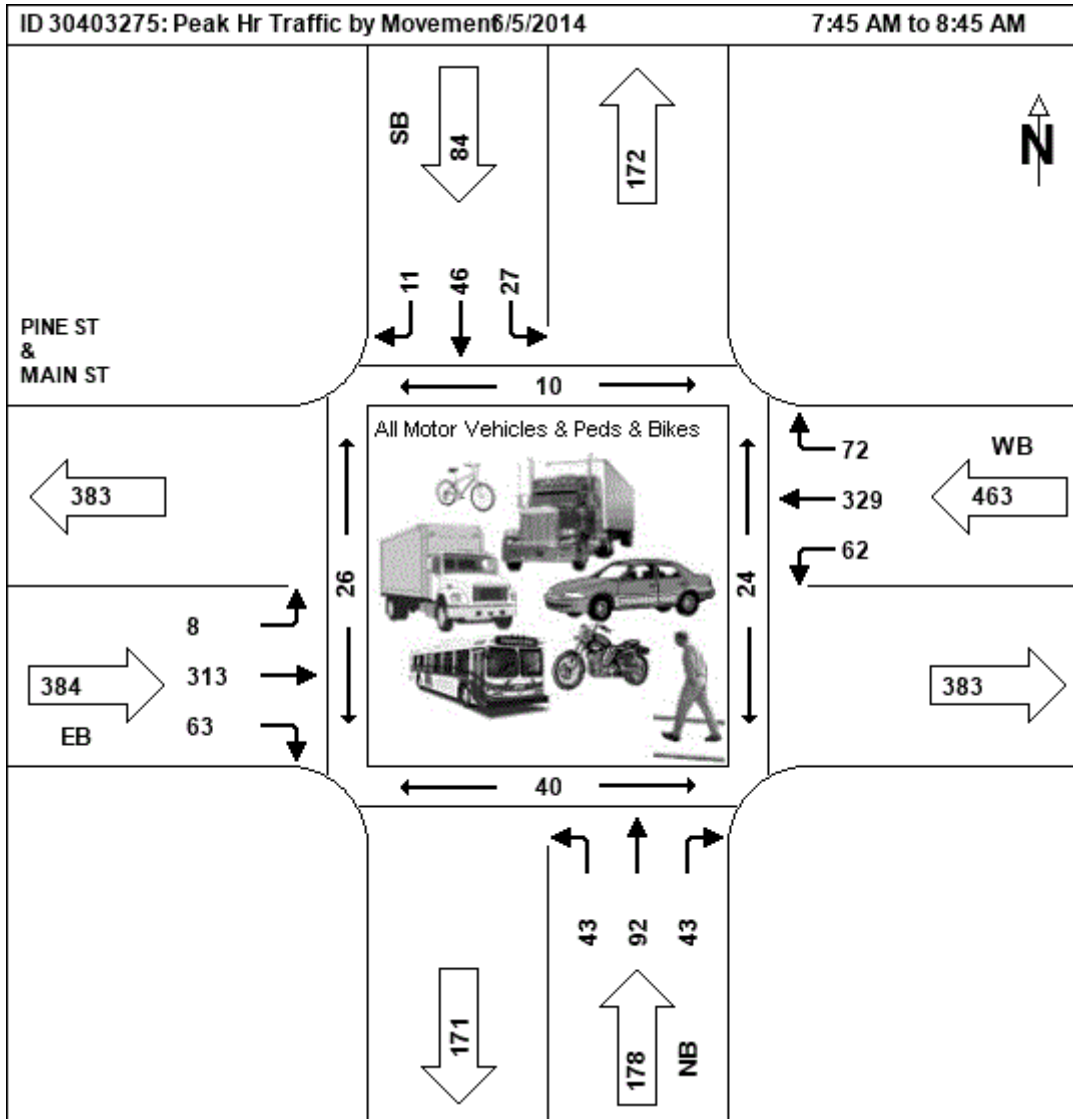
Corridor: NA
 Road 3: PINE ST
 Road 4: MAIN ST

<< < > >> 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

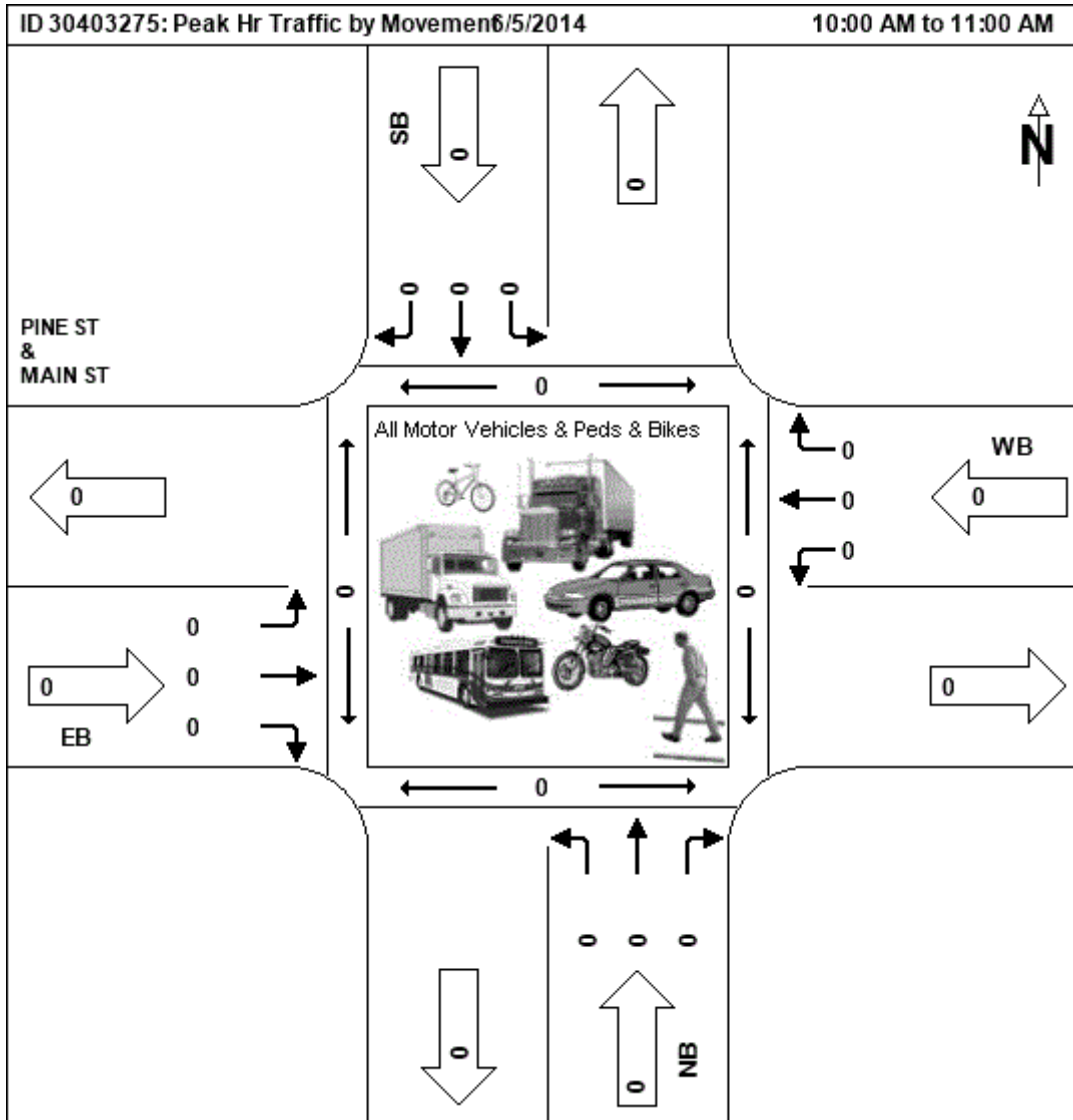


Midday Peak Hour
06/05/2014

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	97	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

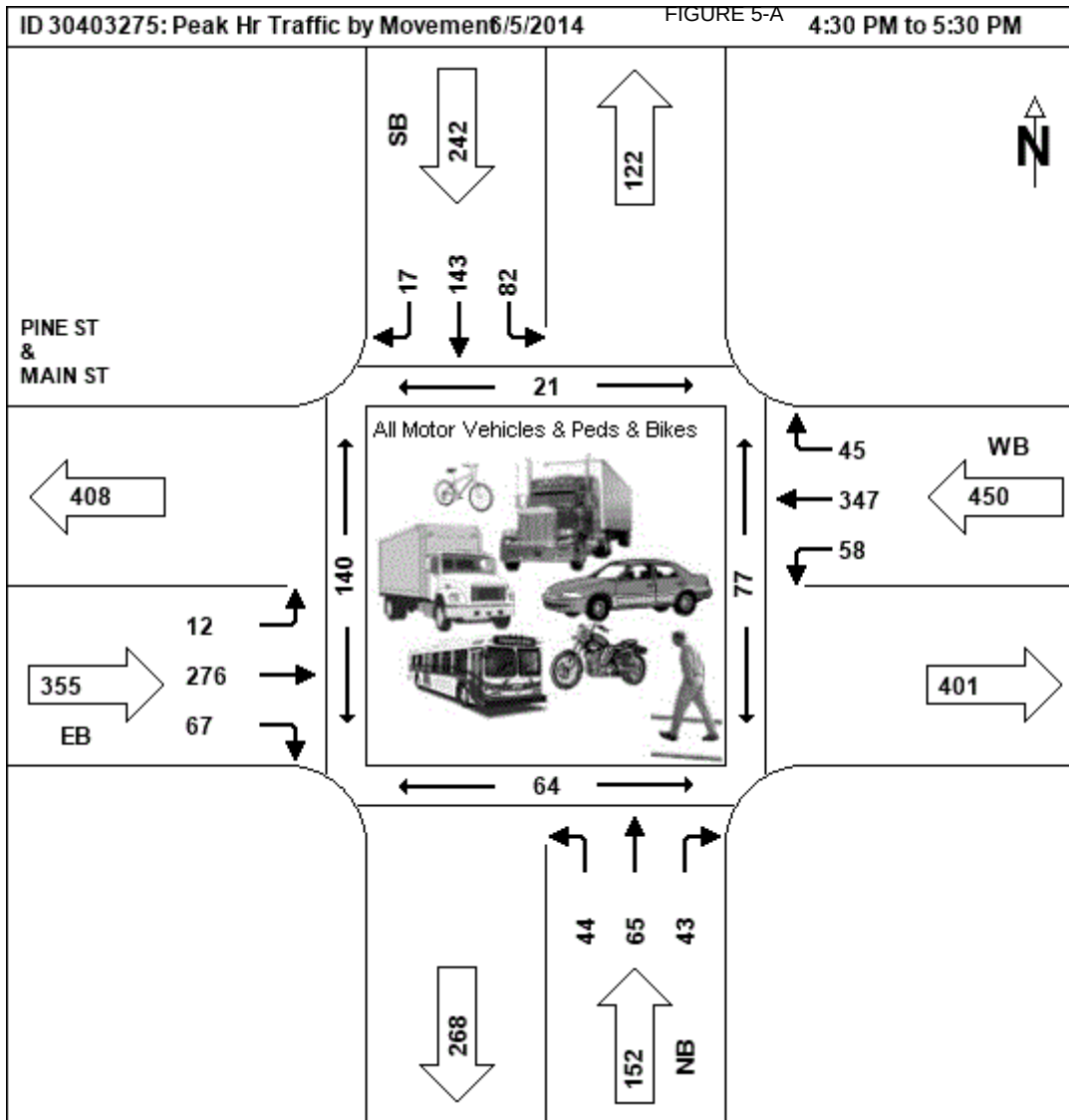


FIGURE 5-A

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

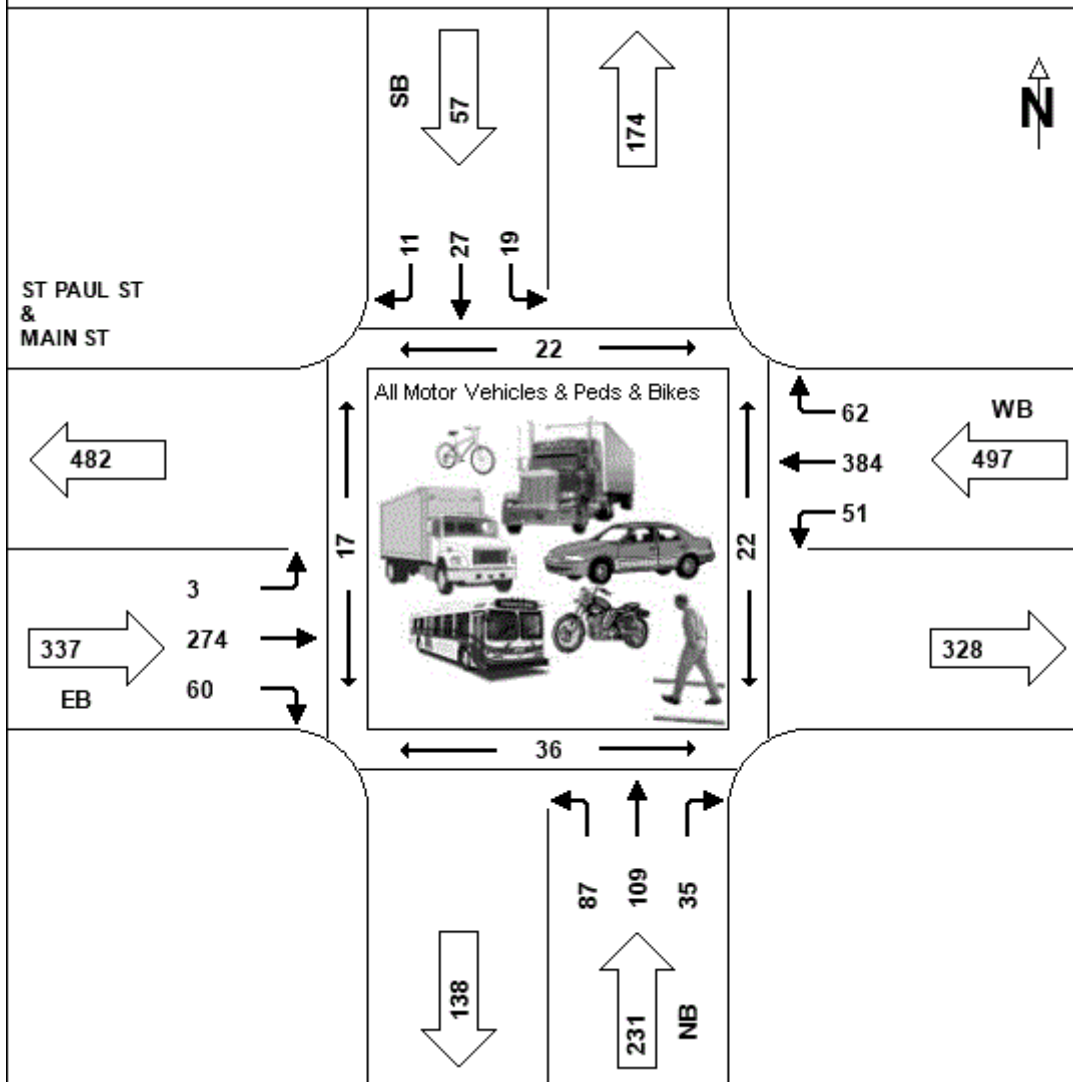
AM Peak Hour
06/14/2016

NB					EB					SB					WB					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	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

ID 30403270: Peak Hr Traffic by Movement 6/14/2016

7:45 AM to 8:45 AM

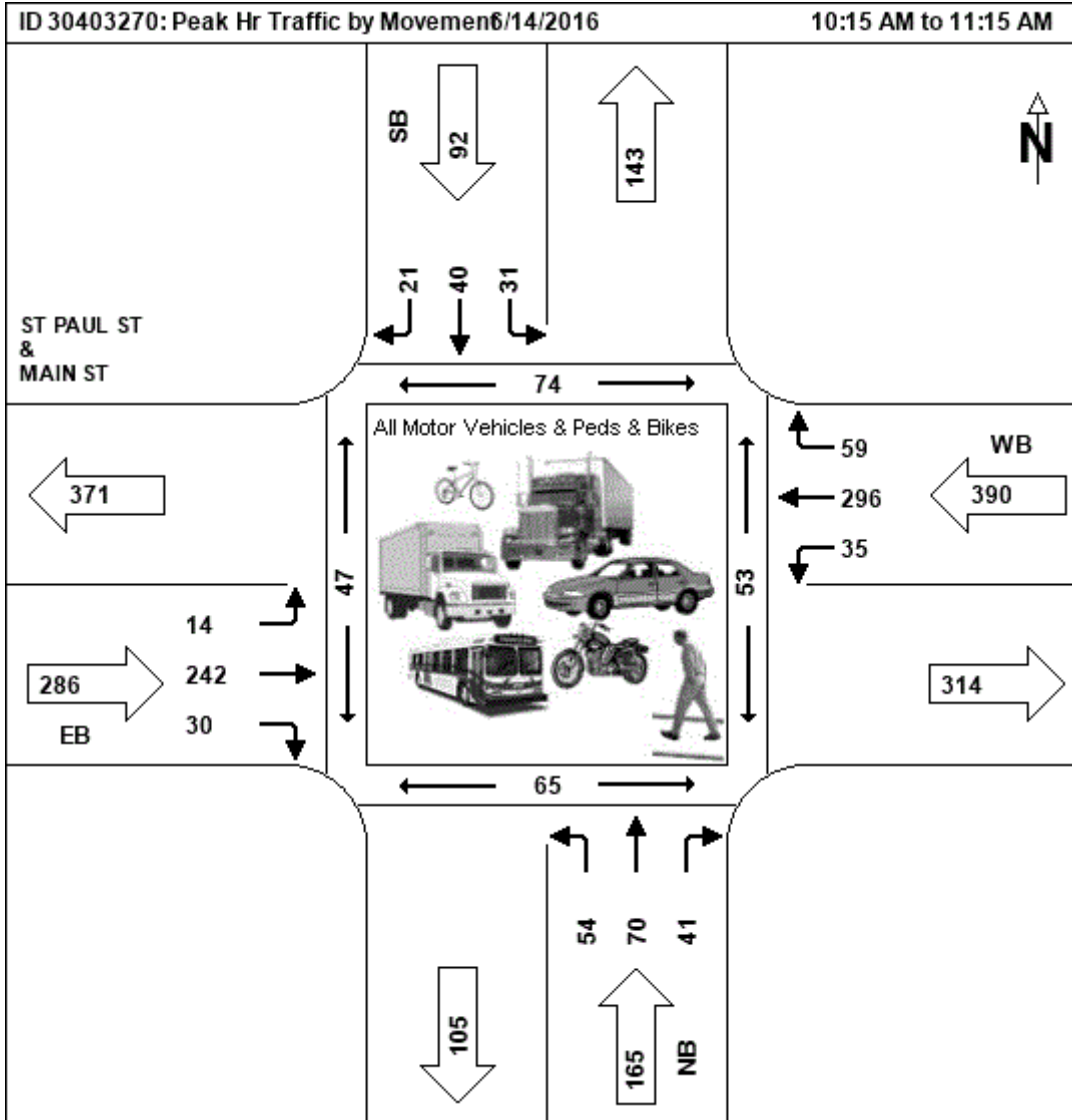


Midday Peak Hour
06/14/2016

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
10:15 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

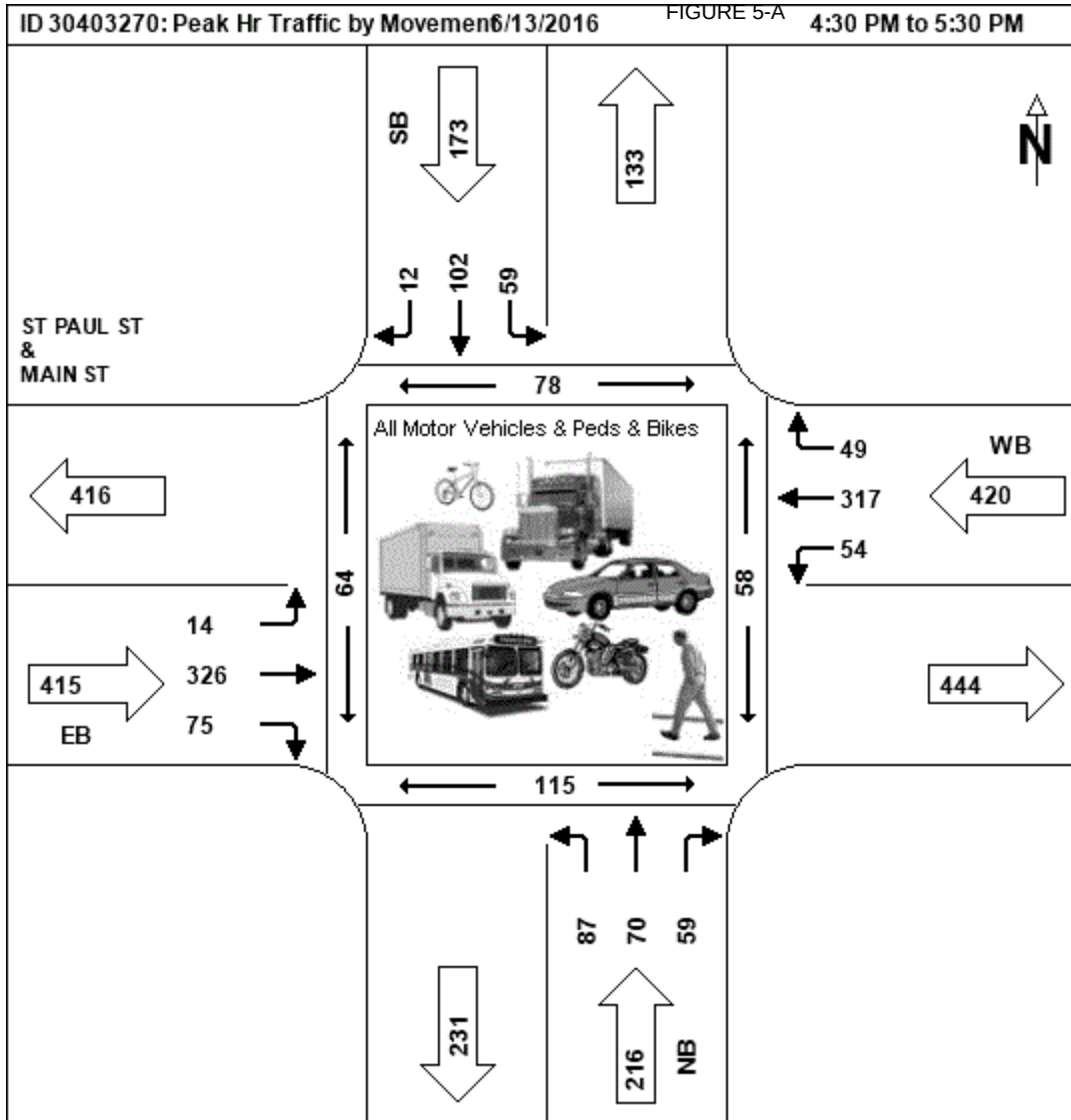


FIGURE 5-A

Peak Hour Data for Intersection

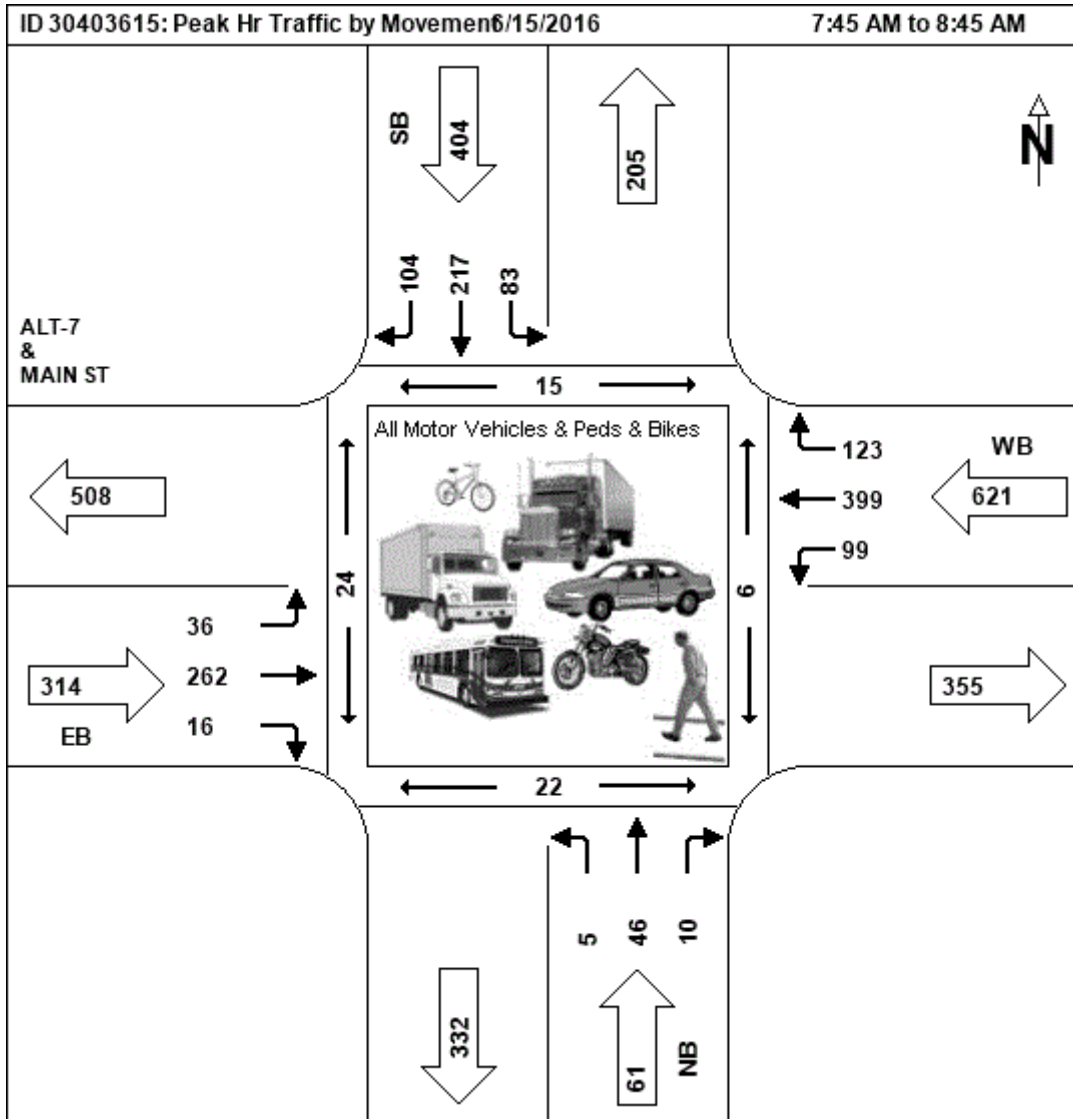
Int ID: 30403615
 Community: BURLINGTON
 Road 1: ALT-7
 Road 2: MAIN ST

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																					

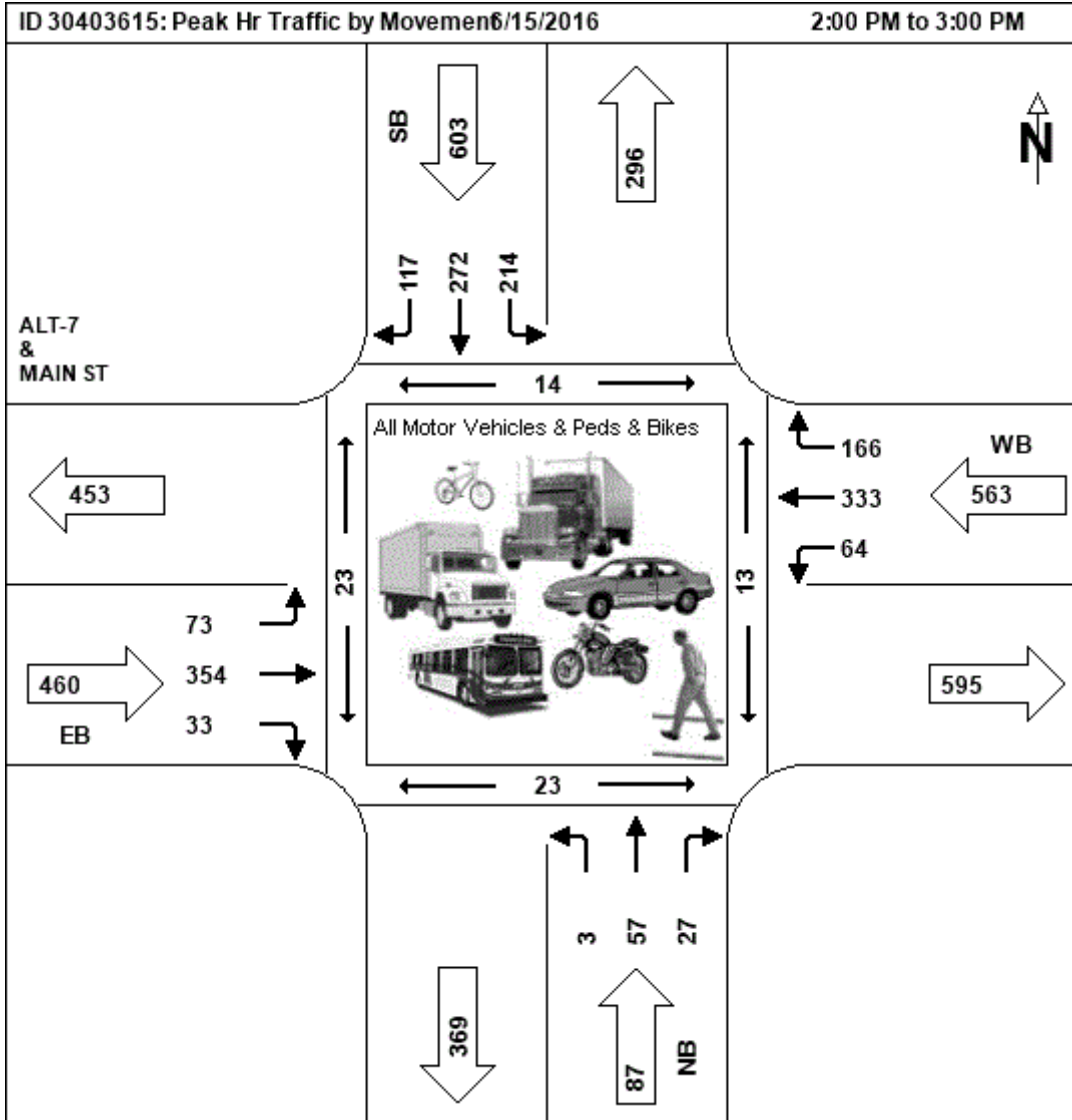


Midday Peak Hour
06/15/2016

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
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	138	403
2:30 PM	2	11	9	2	22	23	89	6	5	118	56	69	21	146	427
2:45 PM	0	13	3	4	16	20	85	6	2	111	57	72	39	168	448
Total	3	57	27	13	87	73	354	33	23	460	214	272	117	603	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	0.92
HV %	0	2	0			3	4	0			3	6	9	0	2

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



PM 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
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

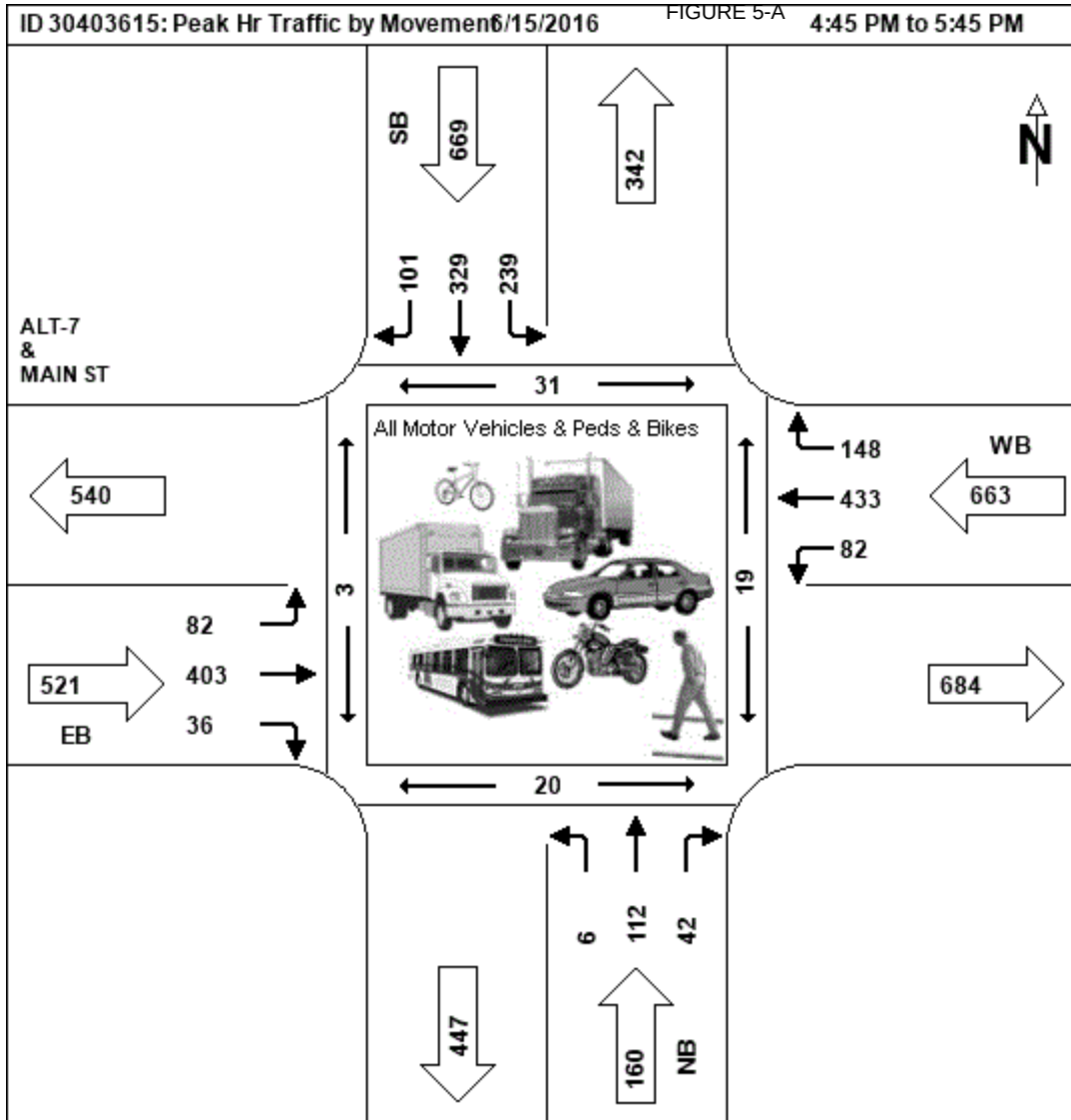


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403265
 Community: BURLINGTON
 Road 1: S UNION ST
 Road 2: MAIN ST

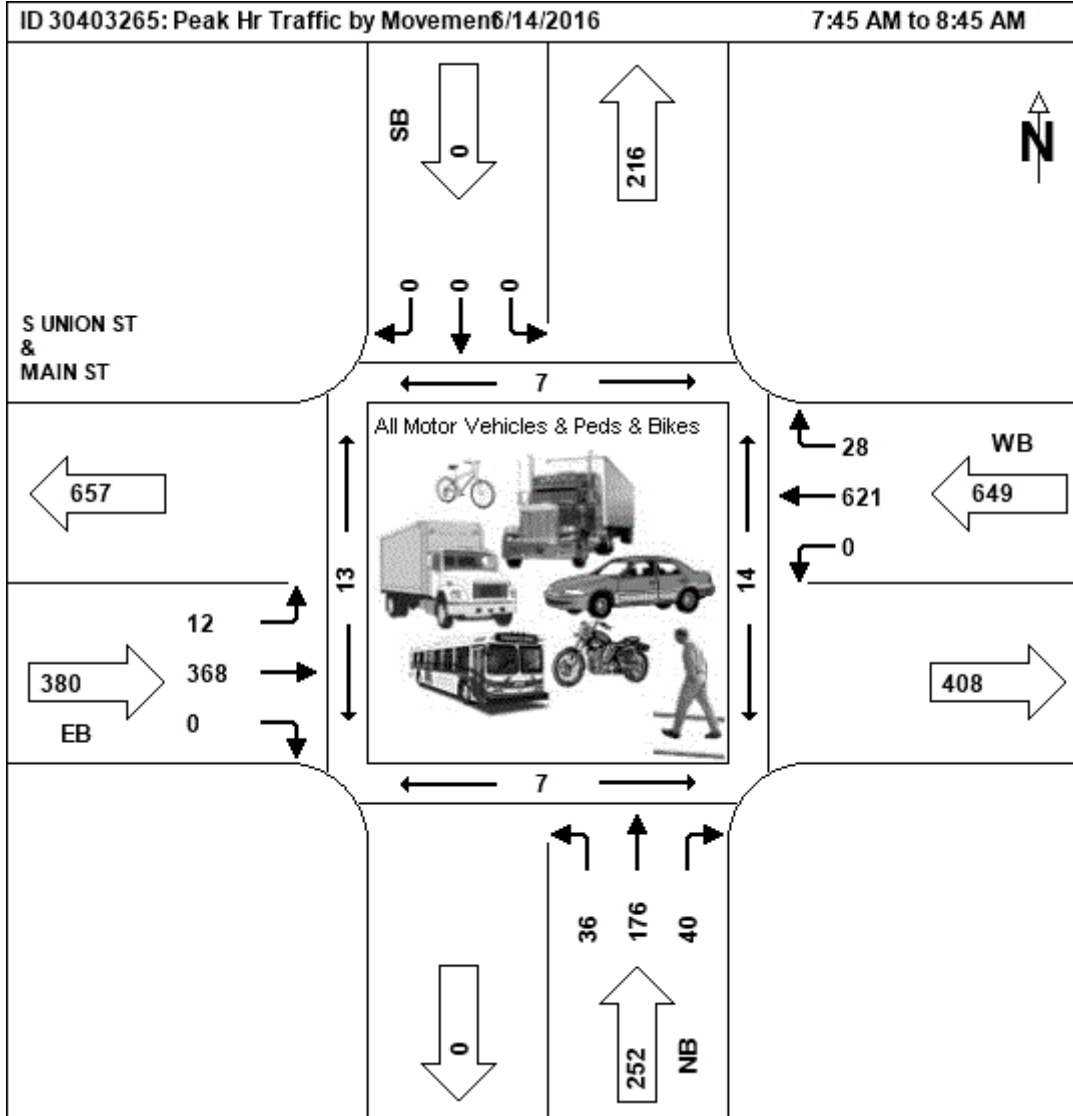
Corridor: NA
 Road 3: S UNION ST
 Road 4: MAIN ST

|<<|<|>|>>| 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	0.50	0.82			0.81							0.94	0.58		0.95	
HV %	11	2	3			17	7										4	4			

☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes

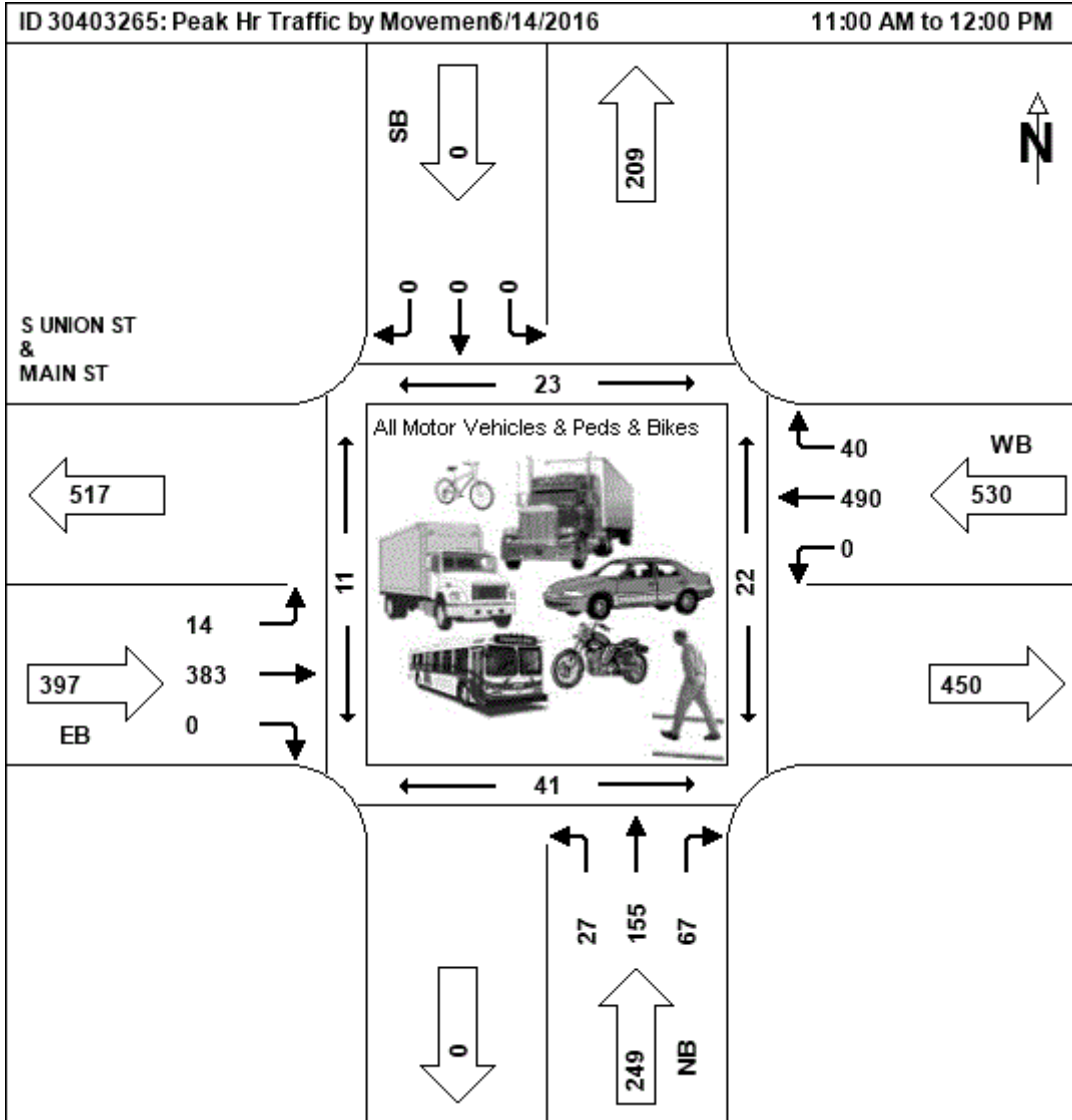


Midday Peak Hour
06/14/2016

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

ID 30403265: Peak Hr Traffic by Movement

FIGURE 5-A

4:30 PM to 5:30 PM

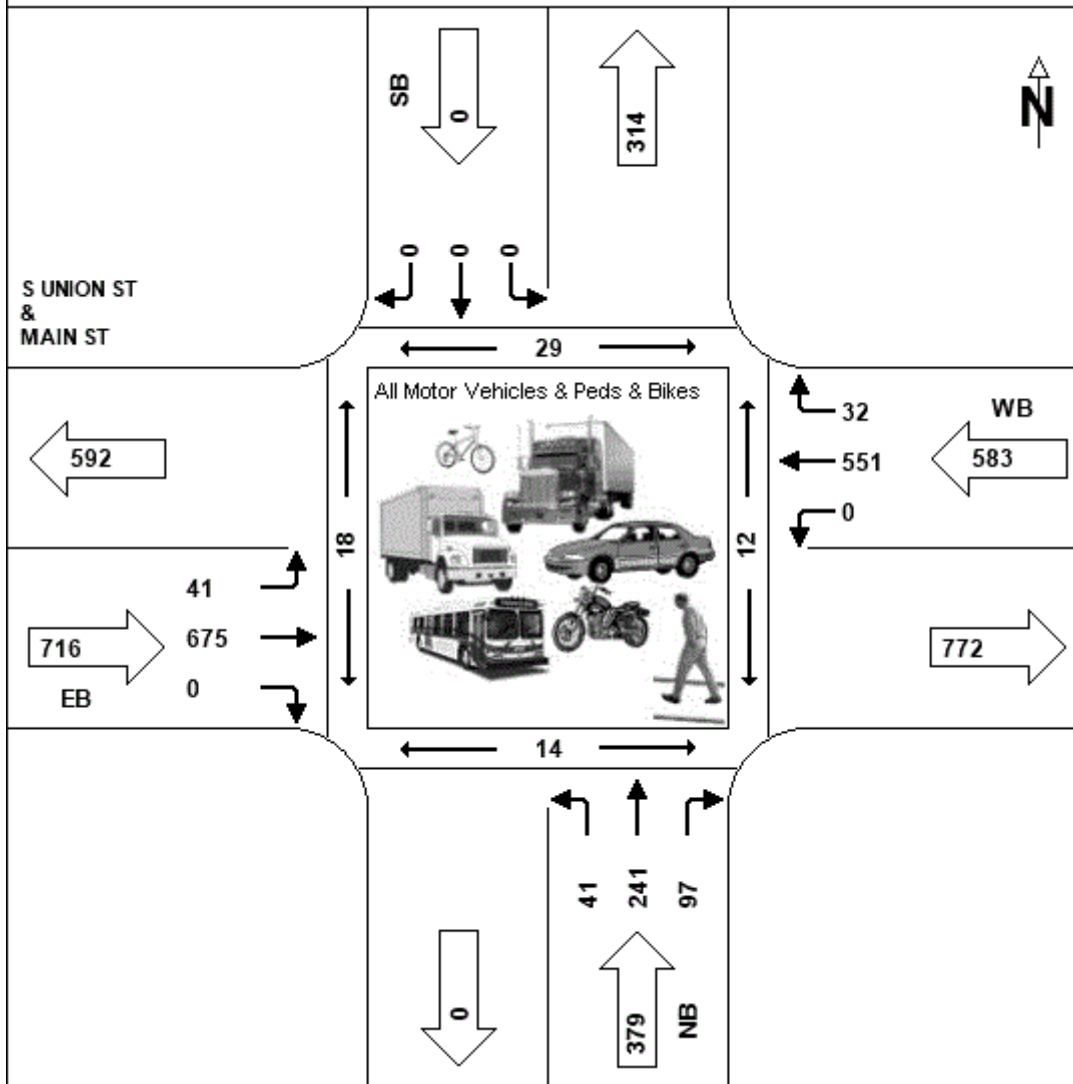


FIGURE 5-A

Peak Hour Data for Intersection

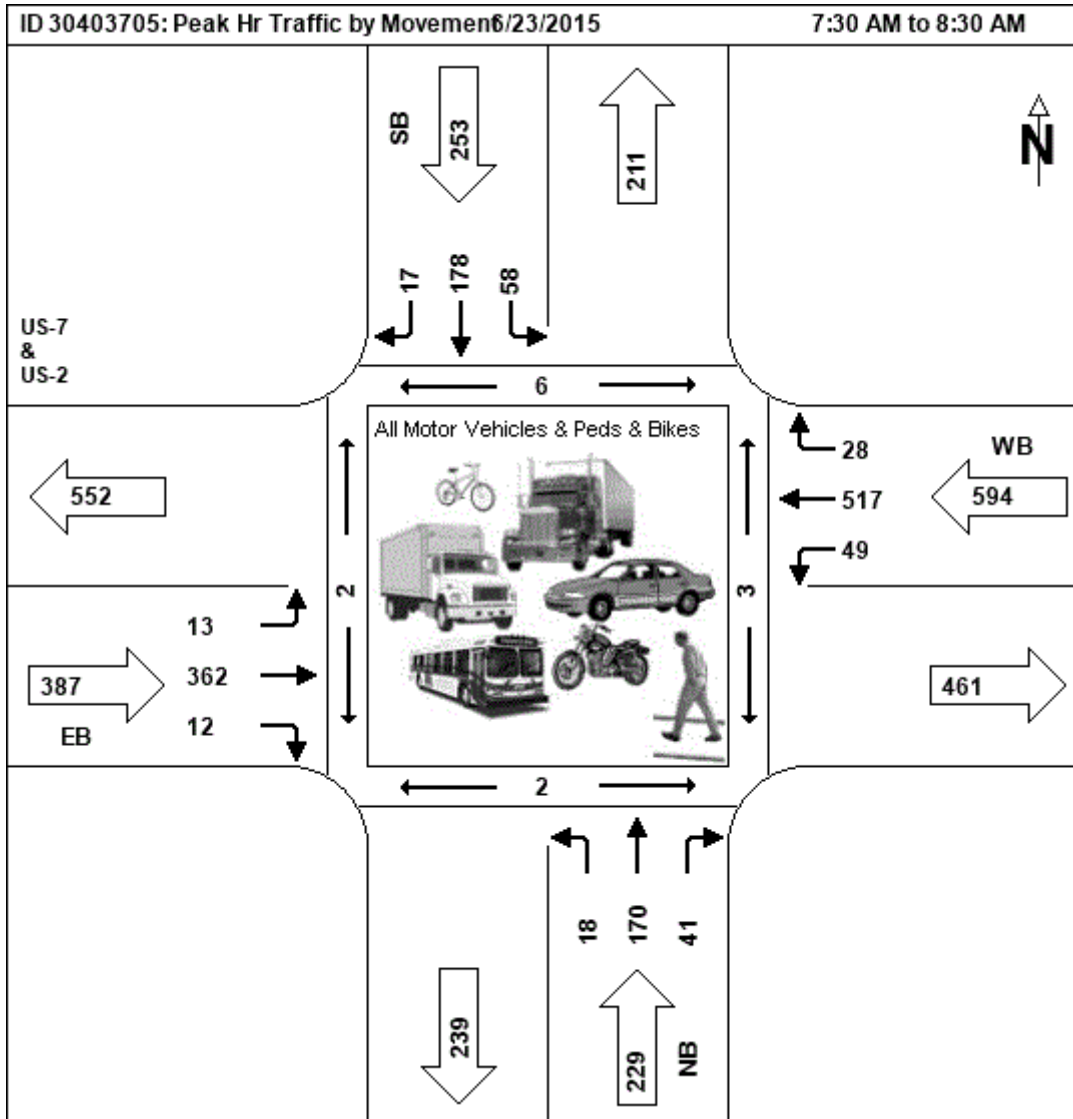
Int ID: 30403705
 Community: BURLINGTON
 Road 1: US-7
 Road 2: US-2

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																					



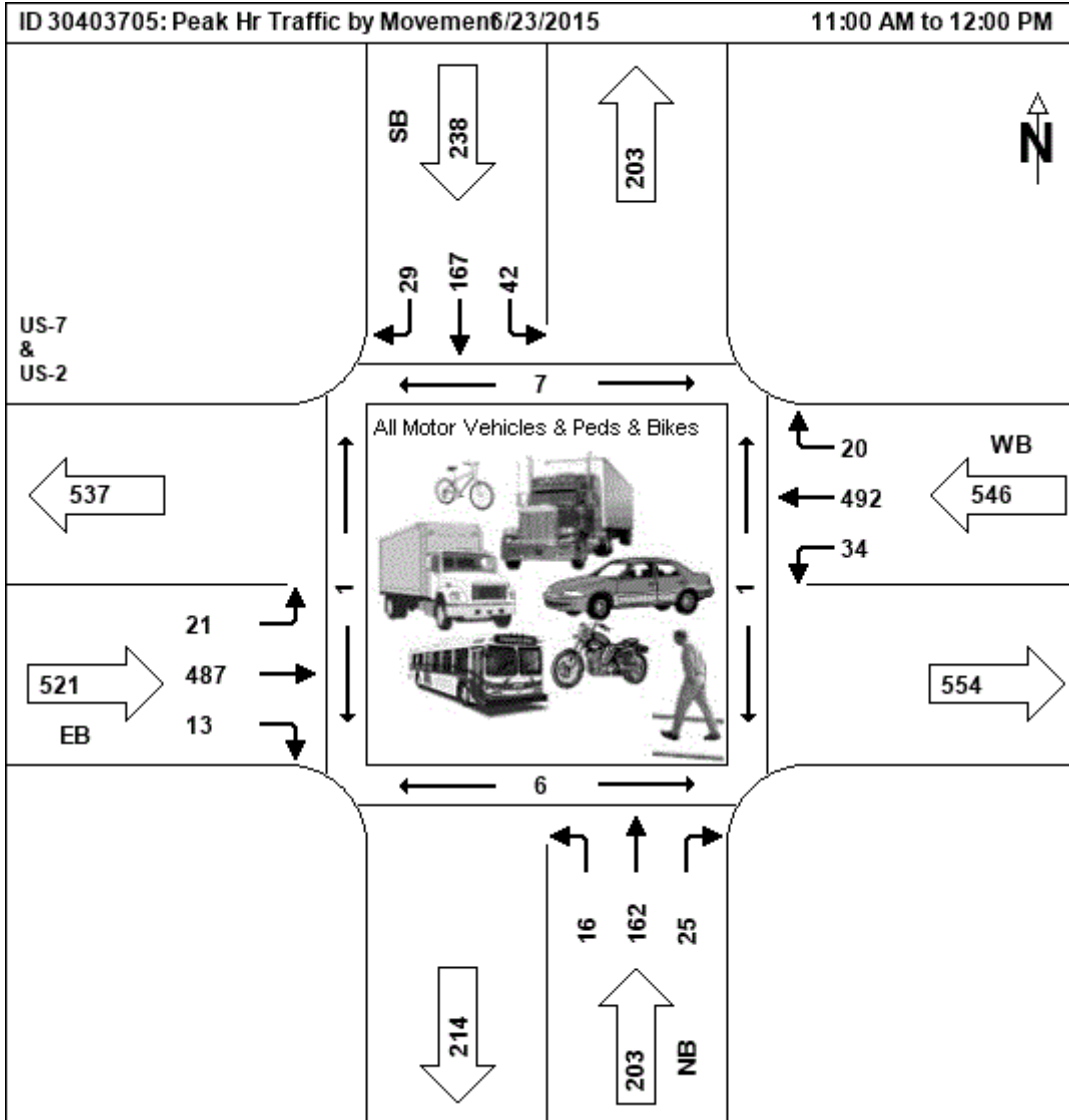
Midday Peak Hour
06/23/2015

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

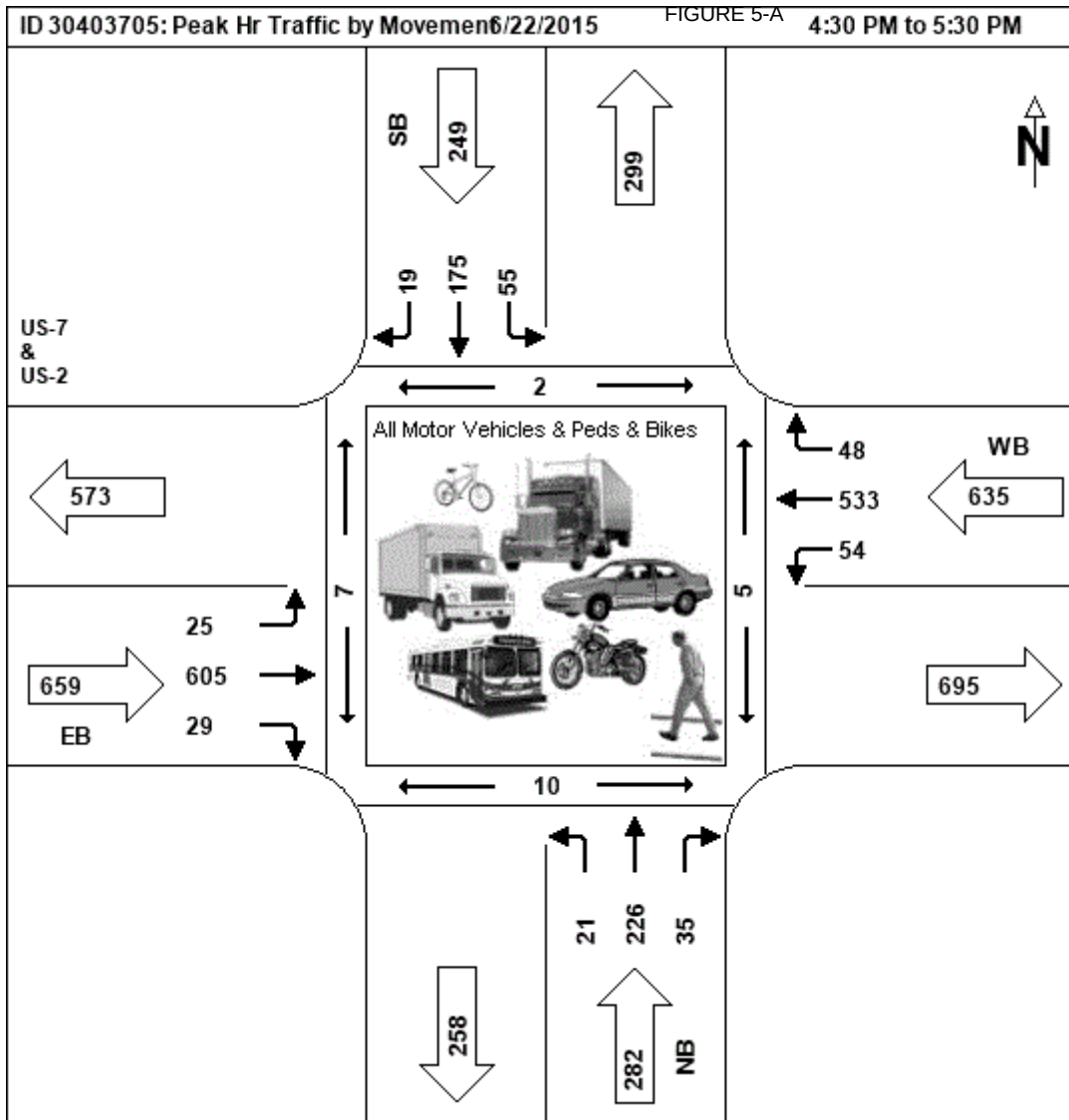


FIGURE 5-A

Peak Hour Data for Intersection

Int ID: 30403710
 Community: BURLINGTON
 Road 1: S PROSPECT ST
 Road 2: US-2

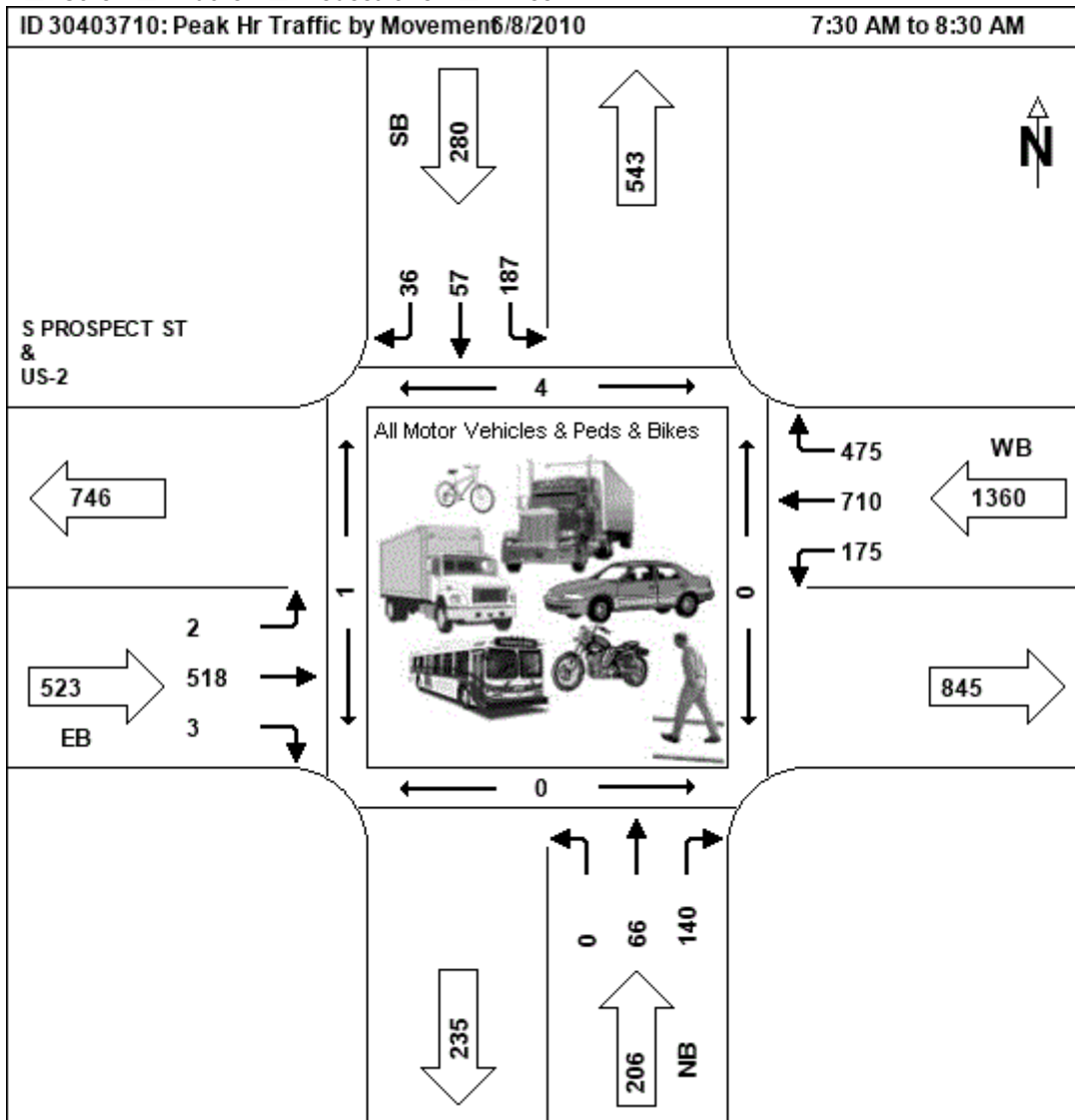
Corridor: NA
 Road 3: S PROSPECT ST
 Road 4: US-2

|<<|<|>|>>| 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

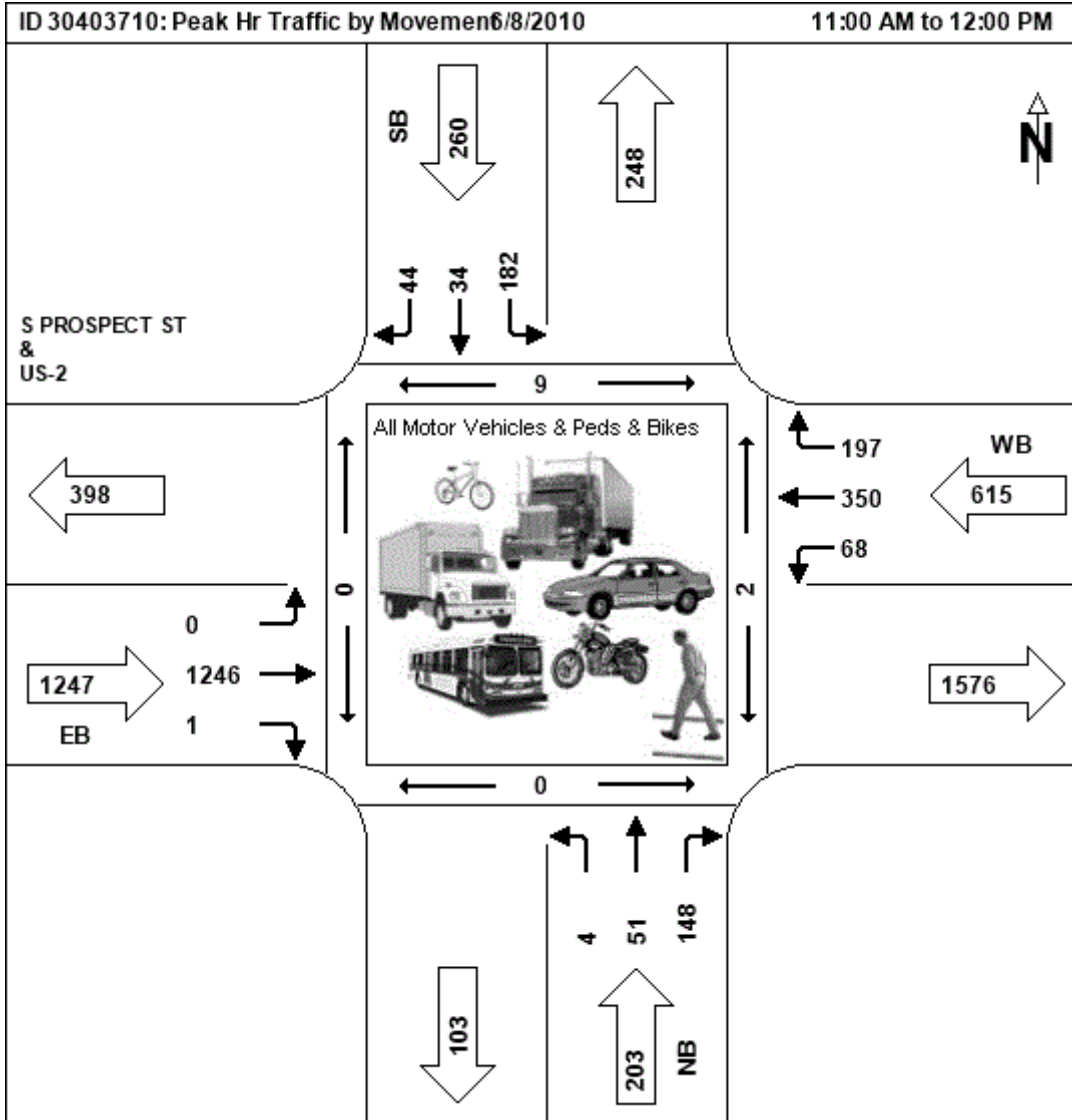


Midday Peak Hour
06/08/2010

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

Start Time	NB					EB					SB					WB					App Total	Int Total
	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App 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

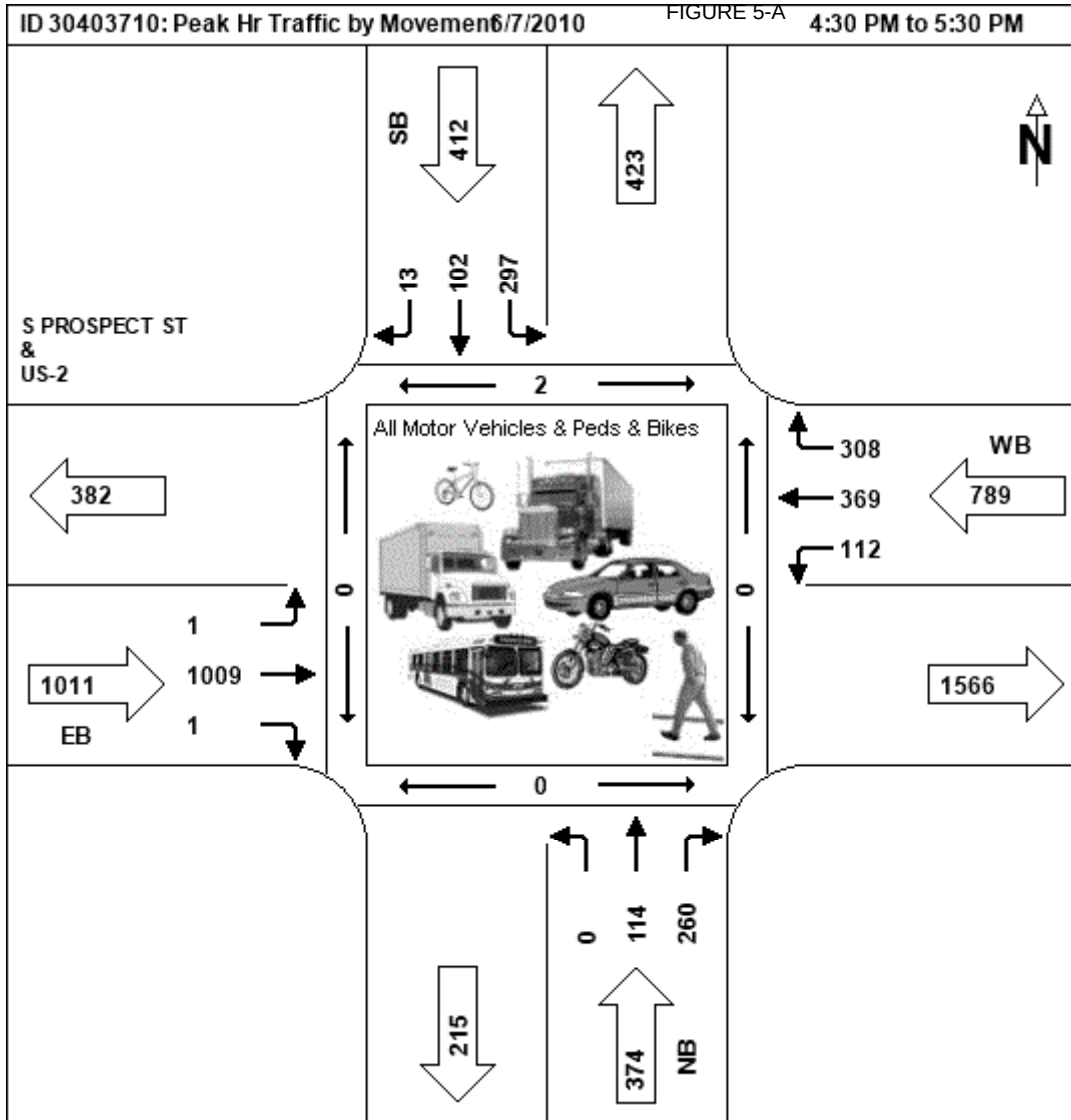


FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Mall Traffic **Project #:** 57881.00
Location: Burlington **Sheet:**
Calculated by: ELQ **Date:** 1/10/17
Checked by:
Title: Burlington Town Center TIS
Intersection: S Winooski Avenue and Cherry Street

Intersection: S Winooski Ave / Cherry St
 Count Date(s): 7/23/2014

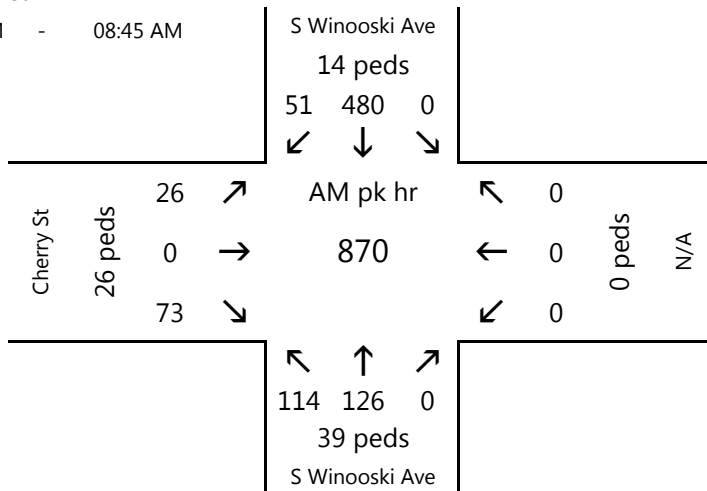
Town: Burlington
 Counter: Vtrans

Peak Hour Volumes

	SB				WB				NB				EB				Total
	S Winooski Ave				N/A				S Winooski Ave				Cherry St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	51	480	0	14	0	0	0	0	0	126	114	39	73	0	26	26	870
PM pk hr	62	493	0	31	0	0	0	0	0	355	95	58	121	0	44	109	1170

AM Peak Hour

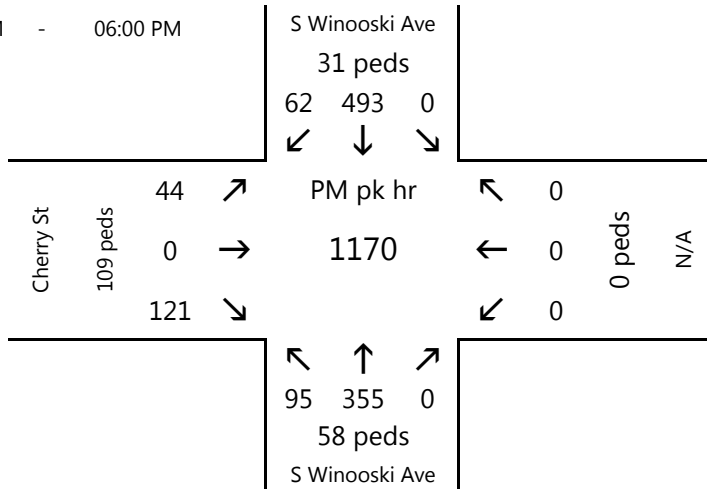
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	96%	0%	97%	80%
med	0%	0%	0%	0%
heavy	4%	0%	3%	20%
% trucks	4%	0%	3%	20%

PM Peak Hour

05:00 PM - 06:00 PM



%	SB	WB	NB	EB
auto	98%	0%	100%	95%
med	0%	0%	0%	0%
heavy	2%	0%	0%	5%
% trucks	2%	0%	0%	5%

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Mall Traffic **Project #:** 57881.00
Location: Burlington **Sheet:**
Calculated by: ELQ **Date:** 1/13/17
Checked by:
Title: Burlington Town Center TIS
Intersection: S Winooski Avenue at Bank Street

Intersection: S Winooski Ave / Bank St
 Count Date(s): 1/12/2017

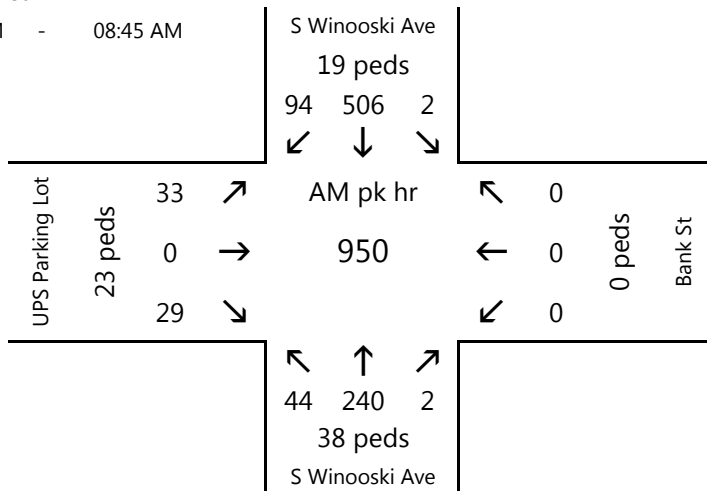
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	S Winooski Ave				Bank St				S Winooski Ave				UPS Parking Lot				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	94	506	2	19	0	0	0	0	2	240	44	38	29	0	33	23	950
PM pk hr	60	563	11	86	6	0	2	81	3	309	81	180	37	0	83	61	1155

AM Peak Hour

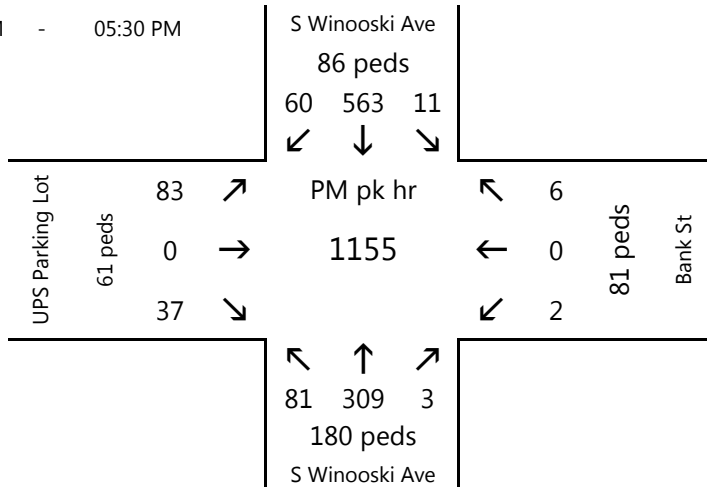
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	98%	0%	97%	94%
med	0%	0%	0%	0%
heavy	2%	0%	3%	6%
% trucks	2%	0%	3%	6%

PM Peak Hour

04:30 PM - 05:30 PM



%	SB	WB	NB	EB
auto	99%	100%	99%	100%
med	0%	0%	0%	0%
heavy	1%	0%	1%	0%
% trucks	1%	0%	1%	0%

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Mall Traffic **Project #:** 57881.00
Location: Burlington **Sheet:** _____
Calculated by: ELQ **Date:** 1/18/17
Checked by: _____ **Date:** _____
Title: Burlington Town Center TIS
Intersection: Battery Street at Cherry Street

Intersection: Cherry St / Battery St

Town: Burlington

Count Date(s): 1/17/2017

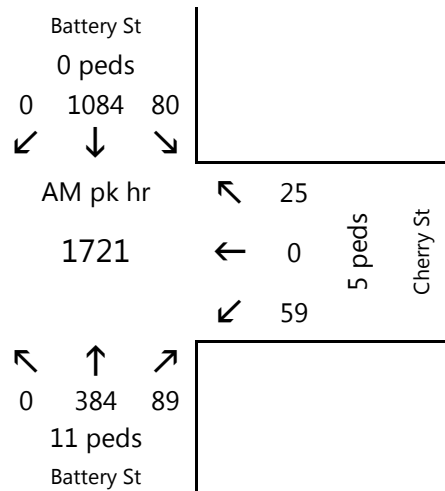
Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Battery St				Cherry St				Battery St				N/A				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	0	1084	80	0	25	0	59	5	89	384	0	11	0	0	0	0	1721
PM pk hr	0	445	33	6	47	0	98	0	71	886	0	12	0	0	0	0	1580

AM Peak Hour

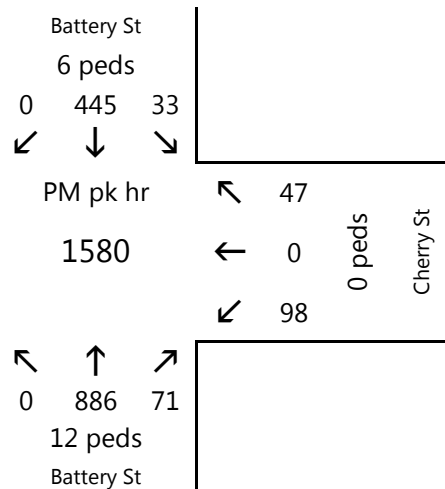
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	99%	0%	96%	0%
med	0%	0%	0%	0%
heavy	1%	0%	4%	0%
% trucks	1%	0%	4%	0%

PM Peak Hour

04:30 PM - 05:30 PM



%	SB	WB	NB	EB
auto	99%	94%	98%	0%
med	0%	0%	0%	0%
heavy	1%	6%	2%	0%
% trucks	1%	6%	2%	0%

FIGURE 5-A



Computations - Traffic Volumes

Project: BTV Town Center **Project #:** 57881.00
Location: Burlington **Sheet:** _____
Calculated by: EMC **Date:** 1/11/17
Checked by: ELQ **Date:** 1/12/17
Title: Burlington Town Center TIS
Intersection: Bank Street and Saint Paul Street

Intersection: Bank St / St Paul St
 Count Date(s): 1/10/2017

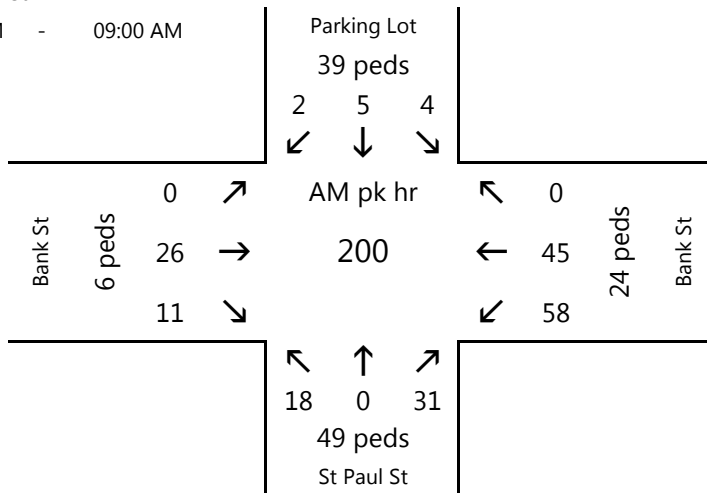
Town: Burlington
 Counter: VHB

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Parking Lot				Bank St				St Paul St				Bank St				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	2	5	4	39	0	45	58	24	31	0	18	49	11	26	0	6	200
PM pk hr	4	5	3	7	0	51	41	42	57	0	24	47	13	54	0	10	252

AM Peak Hour

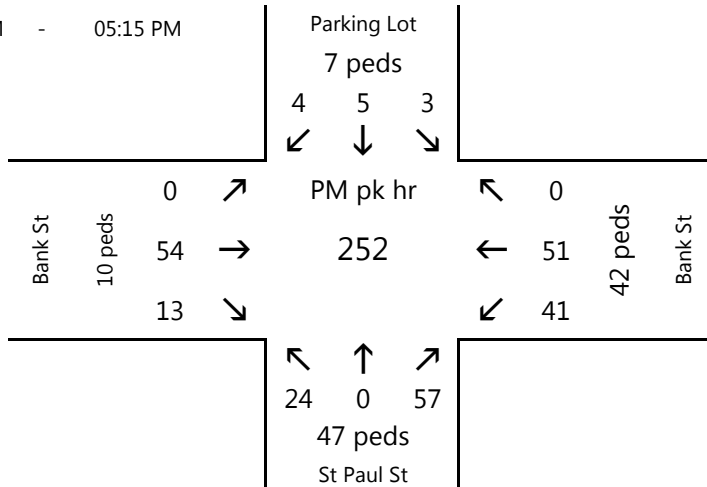
08:00 AM - 09:00 AM



%	SB	WB	NB	EB
auto	100%	96%	100%	98%
med	0%	0%	0%	0%
heavy	0%	4%	0%	2%
% trucks	0%	4%	0%	2%

PM Peak Hour

04:15 PM - 05:15 PM



%	SB	WB	NB	EB
auto	100%	99%	99%	100%
med	0%	0%	0%	0%
heavy	0%	1%	1%	0%
% trucks	0%	1%	1%	0%



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, QUEEACHE 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)	Other - 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 vv--
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 --vv--
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 ^<

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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	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--

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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	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

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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
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 --v--
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)



Computations

Project: Burlington Town Center TIS Project #: 57881.00
 Location: Burlington, VT Sheet: _____
 Calculated by: ELQ Date: 1/13/17
 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

2016 (November)

Seasonal Adjustment: 1.06
 2016-2019 Growth: 1.02
Total Adjustment: 1.08

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

2016 (December)

Seasonal Adjustment: 1.06
 2016-2019 Growth: 1.02
Total Adjustment: 1.08

2017 (January)

Seasonal Adjustment: 1.16
 2016-2019 Growth: 1.01
Total Adjustment: 1.17

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

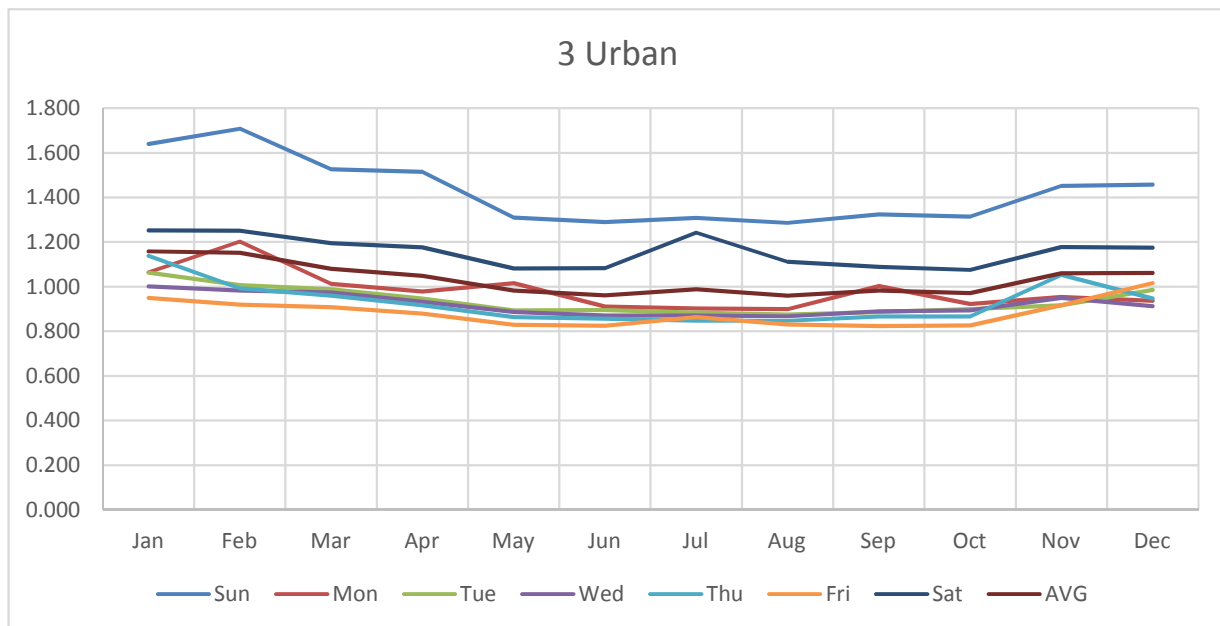
Year: 2016
TM Count: 16
***AADT from ATR**

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

2015 SEASONAL ADJUSTMENT FACTORS

The factors in the table below are the product of the Monthly Average Daily Traffic Factor and the Day of Week Factor (MADT x DOW). These combined factors are used to adjust short-term counts to an AADT.

Monthly DOW Factors								
Group	3 Urban							
From Year:	2015	To Year:		2015				
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	AVG
Jan	1.639	1.064	1.063	1.001	1.138	0.949	1.252	1.158
Feb	1.708	1.202	1.007	0.983	0.992	0.919	1.251	1.152
Mar	1.526	1.013	0.988	0.974	0.959	0.908	1.195	1.080
Apr	1.514	0.978	0.947	0.933	0.916	0.879	1.176	1.049
May	1.309	1.016	0.893	0.886	0.864	0.829	1.081	0.983
Jun	1.289	0.911	0.895	0.870	0.856	0.825	1.083	0.961
Jul	1.308	0.902	0.883	0.870	0.848	0.863	1.242	0.988
Aug	1.286	0.899	0.875	0.867	0.847	0.830	1.111	0.959
Sep	1.324	1.002	0.886	0.890	0.867	0.823	1.089	0.983
Oct	1.314	0.922	0.900	0.894	0.866	0.826	1.075	0.971
Nov	1.452	0.954	0.917	0.949	1.053	0.917	1.178	1.060
Dec	1.458	0.937	0.986	0.912	0.946	1.016	1.175	1.061



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

FIGURE 5-A

Trip Generation - Burlington Town Center TIS

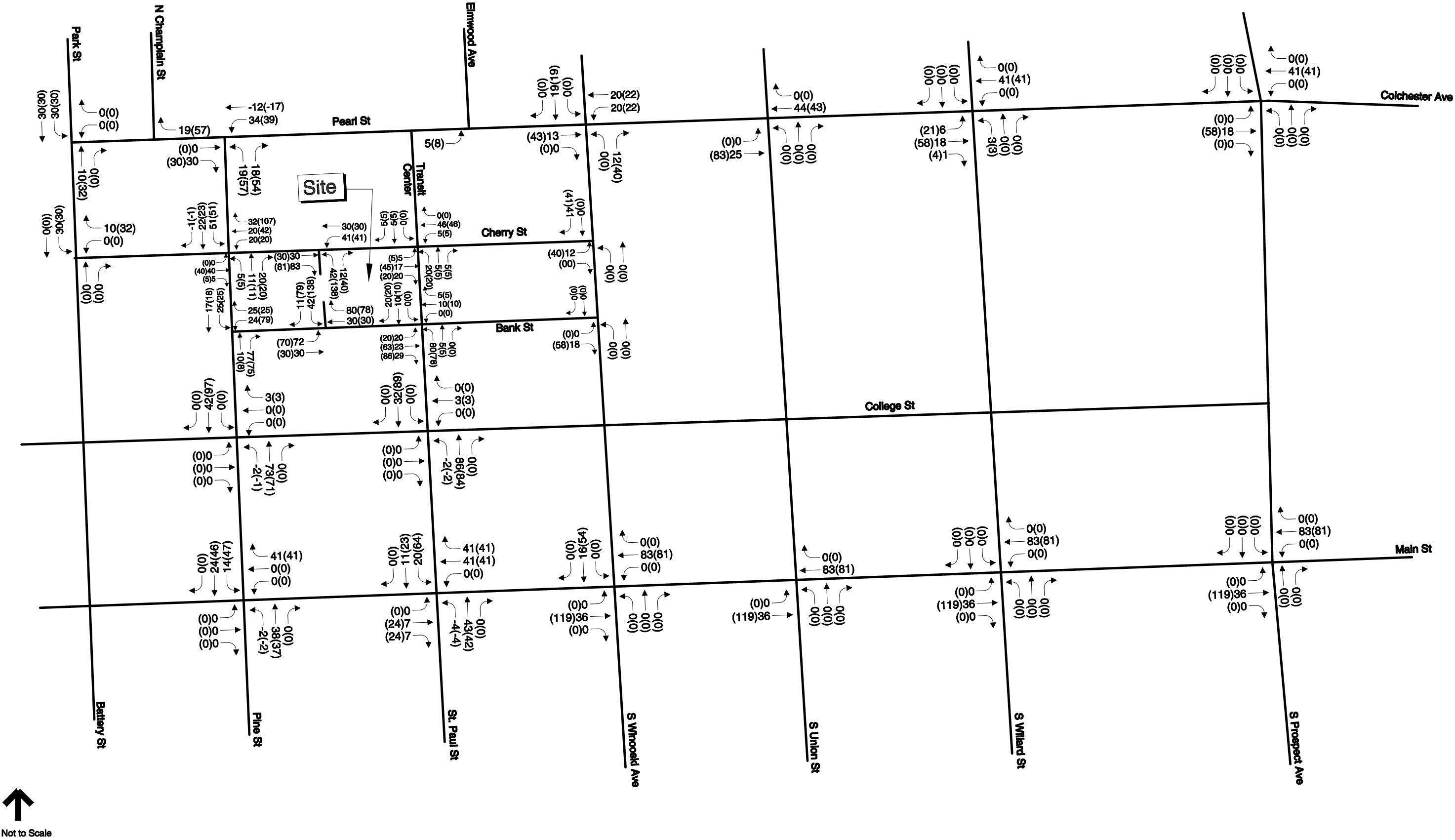
Total Site generated trips (not accounting for internal, pass-by, or diverted trips)

[illegible]



Supporting Traffic Volume Networks

FIGURE 5-A

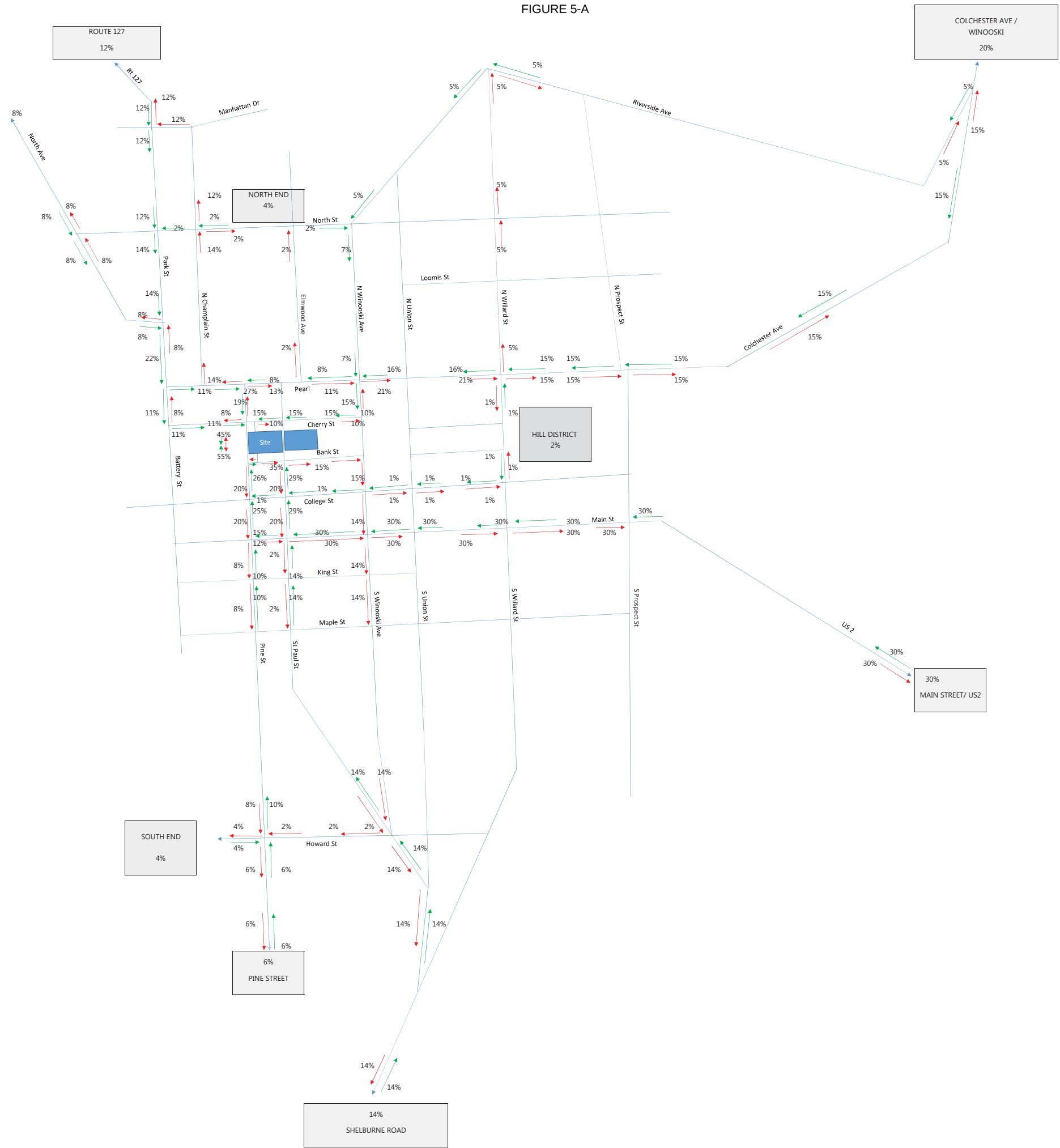


↑
Not to Scale

Legend
AM Peak Hour Volume
(PM Peak Hour Volume)

Trip Generation Assumptions

FIGURE 5-A





Signalized Intersection Capacity Analysis

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

5: Battery St/Park St & Pearl St

01/20/2017

						
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)	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		2739
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	68	0	57	0	0
Lane Group Flow (vph)	162	13	309	125	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)	12.5	12.5	53.2	53.2		53.2
Actuated g/C Ratio	0.16	0.16	0.68	0.68		0.68
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)	275	246	1233	1844		1875
v/s Ratio Prot	c0.09		0.17			
v/s Ratio Perm		0.01		0.05		c0.60
v/c Ratio	0.59	0.05	0.25	0.07		0.87
Uniform Delay, d1	30.2	27.6	4.7	4.1		9.6
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	3.2	0.1	0.5	0.1		6.0
Delay (s)	33.4	27.7	5.2	4.1		15.6
Level of Service	C	C	A	A		B
Approach Delay (s)	31.5		4.8			15.6
Approach LOS	C		A			B
Intersection Summary						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			77.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			85.9%		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

01/20/2017

						
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

01/20/2017

												
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	6.0	6.0	4.0		6.0		6.0	4.0	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	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	67	0	0	0	0	0	61	0	0	0
Lane Group Flow (vph)	0	186	33	185	412	0	126	0	42	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)		15.5	15.5	15.5	15.5		19.1		19.1	19.1	19.1	
Effective Green, g (s)		17.5	15.5	15.5	17.5		19.1		19.1	21.1	19.1	
Actuated g/C Ratio		0.38	0.33	0.33	0.38		0.41		0.41	0.45	0.41	
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)		676	509	383	676		364		627	774	1363	
v/s Ratio Prot		0.10			c0.23						0.13	
v/s Ratio Perm			0.02	0.16			c0.14		0.03	0.03		
v/c Ratio		0.28	0.07	0.48	0.61		0.35		0.07	0.08	0.33	
Uniform Delay, d1		10.1	10.6	12.4	11.8		9.5		8.3	7.2	9.4	
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	1.0	1.6		2.6		0.2	0.2	0.6	
Delay (s)		10.4	10.7	13.3	13.3		12.1		8.6	7.4	10.0	
Level of Service		B	B	B	B		B		A	A	B	
Approach Delay (s)		10.5			13.3			10.5			9.7	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			46.6			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			56.3%			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

01/20/2017

												
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

01/20/2017

												
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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	389	75	198	525	45	77	74	121	38	225	27
Future Volume (vph)	0	389	75	198	525	45	77	74	121	38	225	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		0.27	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1761		488	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	389	75	198	525	45	77	74	121	38	225	27
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	105	0	4	0
Lane Group Flow (vph)	0	457	0	198	570	0	77	74	16	0	286	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)		27.1		40.1	40.1		9.3	9.3	9.3		16.5	
Effective Green, g (s)		29.1		42.1	42.1		11.3	11.3	11.3		18.5	
Actuated g/C Ratio		0.35		0.50	0.50		0.13	0.13	0.13		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)		610		376	892		230	242	206		389	
v/s Ratio Prot		c0.26		0.06	c0.32		c0.05	0.04			c0.16	
v/s Ratio Perm				0.21					0.01			
v/c Ratio		0.75		0.53	0.64		0.33	0.31	0.08		0.74	
Uniform Delay, d1		24.2		24.7	15.3		32.9	32.8	31.7		30.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		8.2		1.3	3.5		0.9	0.7	0.2		7.1	
Delay (s)		32.4		26.1	18.8		33.8	33.5	31.9		37.5	
Level of Service		C		C	B		C	C	C		D	
Approach Delay (s)		32.4			20.7			32.9			37.5	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			28.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			83.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			87.6%			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

01/20/2017

												
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	6.0		4.0	4.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.98			1.00	0.85		1.00	0.85		0.98	
Flt Protected		1.00			0.99	1.00		0.98	1.00		0.98	
Satd. Flow (prot)		1759			1786	1531		1772	1531		1741	
Flt Permitted		0.99			0.87	1.00		0.89	1.00		0.88	
Satd. Flow (perm)		1739			1564	1531		1596	1531		1560	
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	14	0	0	0	56	0	0	34	0	8	0
Lane Group Flow (vph)	0	485	0	0	509	38	0	176	22	0	101	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.4			20.4	20.4		18.2	18.2		18.2	
Effective Green, g (s)		22.4			22.4	20.4		20.2	20.2		20.2	
Actuated g/C Ratio		0.44			0.44	0.40		0.40	0.40		0.40	
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)		769			692	617		637	611		622	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.33	0.02		c0.11	0.01		0.06	
v/c Ratio		0.63			0.74	0.06		0.28	0.04		0.16	
Uniform Delay, d1		10.9			11.7	9.2		10.3	9.3		9.8	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.7			4.1	0.0		1.1	0.1		0.6	
Delay (s)		12.6			15.7	9.3		11.3	9.4		10.3	
Level of Service		B			B	A		B	A		B	
Approach Delay (s)		12.6			14.7			10.9			10.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		50.6			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		76.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

01/20/2017

												
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)		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	0.96	
Flt Protected		1.00	1.00	0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1800	1531	1711	1763			1762	1531	1711	1721	
Flt Permitted		0.99	1.00	0.55	1.00			0.84	1.00	0.62	1.00	
Satd. Flow (perm)		1791	1531	993	1763			1515	1531	1112	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)	3	316	69	59	442	71	100	126	40	22	31	13
RTOR Reduction (vph)	0	0	44	0	12	0	0	0	25	0	8	0
Lane Group Flow (vph)	0	319	25	59	501	0	0	226	15	22	36	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)		17.3	17.3	17.3	17.3			18.1	18.1	18.1	18.1	
Effective Green, g (s)		17.3	17.3	17.3	17.3			18.1	18.1	18.1	18.1	
Actuated g/C Ratio		0.36	0.36	0.36	0.36			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)		653	558	362	643			578	584	424	657	
v/s Ratio Prot				c0.28								0.02
v/s Ratio Perm		0.18	0.02	0.06				c0.15	0.01	0.02		
v/c Ratio		0.49	0.05	0.16	0.78			0.39	0.03	0.05	0.05	
Uniform Delay, d1		11.6	9.7	10.2	13.4			10.6	9.1	9.2	9.2	
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	5.9			2.0	0.1	0.2	0.2	
Delay (s)		12.2	9.8	10.4	19.3			12.6	9.2	9.5	9.4	
Level of Service		B	A	B	B			B	A	A	A	
Approach Delay (s)		11.8			18.4			12.1			9.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.6				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		77.9%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

01/20/2017

												
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)	6.0	4.0		4.0	4.0			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	0.99		1.00	0.96			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1785		1711	1737			1755		1711	1801	1531
Flt Permitted	0.22	1.00		0.52	1.00			0.97		0.71	1.00	1.00
Satd. Flow (perm)	403	1785		929	1737			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	300	18	113	457	141	6	53	11	95	248	119
RTOR Reduction (vph)	0	4	0	0	22	0	0	7	0	0	0	76
Lane Group Flow (vph)	41	314	0	113	576	0	0	63	0	95	248	43
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	20.5	20.5		20.5	20.5			18.2		18.2	18.2	18.2
Effective Green, g (s)	20.5	22.5		22.5	22.5			18.2		18.2	18.2	18.2
Actuated g/C Ratio	0.40	0.44		0.44	0.44			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)	162	792		412	770			612		459	646	549
v/s Ratio Prot		0.18			c0.33						c0.14	
v/s Ratio Perm	0.10			0.12				0.04		0.07		0.03
v/c Ratio	0.25	0.40		0.27	0.75			0.10		0.21	0.38	0.08
Uniform Delay, d1	10.0	9.5		8.9	11.7			10.8		11.3	12.1	10.7
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.3		0.4	4.0			0.3		1.0	1.7	0.3
Delay (s)	10.8	9.8		9.3	15.7			11.2		12.3	13.8	11.0
Level of Service	B	A		A	B			B		B	B	B
Approach Delay (s)		10.0			14.7			11.2			12.8	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			50.7			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			63.2%			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

01/20/2017

												
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	0.15	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	265	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	3	0	0	0	27	0	0	0
Lane Group Flow (vph)	14	419	0	0	736	0	0	583	19	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)	25.2	25.2			25.2			22.0	22.0			
Effective Green, g (s)	27.2	27.2			27.2			24.0	24.0			
Actuated g/C Ratio	0.46	0.46			0.46			0.41	0.41			
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)	121	827			822			727	620			
v/s Ratio Prot		0.23			c0.41							
v/s Ratio Perm	0.05							0.32	0.01			
v/c Ratio	0.12	0.51			0.90			0.80	0.03			
Uniform Delay, d1	9.1	11.3			14.7			15.5	10.6			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.4	0.5			12.3			9.1	0.1			
Delay (s)	9.6	11.8			27.0			24.6	10.7			
Level of Service	A	B			C			C	B			
Approach Delay (s)		11.7			27.0			23.6			0.0	
Approach LOS		B			C			C			A	
Intersection Summary												
HCM 2000 Control Delay		22.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		59.2			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		76.6%			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

01/20/2017

												
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

01/20/2017

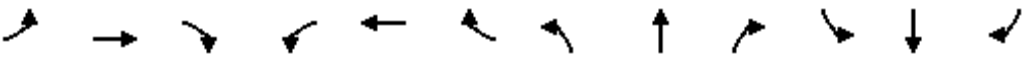
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	665	4	225	911	609	0	85	180	240	73	46
Future Volume (vph)	0	665	4	225	911	609	0	85	180	240	73	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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	665	4	225	911	609	0	85	180	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	157	0	0	0
Lane Group Flow (vph)	0	668	0	225	911	609	0	85	23	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)		33.9		16.2	56.1	56.1		9.8	9.8	7.0	22.8	
Effective Green, g (s)		35.9		18.2	58.1	58.1		11.8	11.8	9.0	24.8	
Actuated g/C Ratio		0.39		0.20	0.64	0.64		0.13	0.13	0.10	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)		1349		342	1151	978		233	198	328	462	
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		0.50		0.66	0.79	0.62		0.36	0.12	0.73	0.26	
Uniform Delay, d1		20.7		33.5	12.0	9.8		36.1	35.0	39.8	25.8	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.3		4.5	5.6	3.0		1.0	0.3	8.2	0.3	
Delay (s)		22.0		38.0	17.6	12.8		37.1	35.2	47.9	26.1	
Level of Service		C		D	B	B		D	D	D	C	
Approach Delay (s)		22.0			18.5			35.8			40.7	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			23.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			90.9				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

19: S Winooski Ave & Cherry St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	95	148	164	624	66
Future Volume (vph)	34	95	148	164	624	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.90			1.00	0.99	
Flt Protected	0.99			0.98	1.00	
Satd. Flow (prot)	1601			3342	3372	
Flt Permitted	0.99			0.61	1.00	
Satd. Flow (perm)	1601			2076	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	95	148	164	624	66
RTOR Reduction (vph)	83	0	0	0	11	0
Lane Group Flow (vph)	46	0	0	312	679	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	5.8			27.1	27.1	
Effective Green, g (s)	5.8			27.1	27.1	
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)	206			1252	2035	
v/s Ratio Prot	c0.03				c0.20	
v/s Ratio Perm				0.15		
v/c Ratio	0.22			0.25	0.33	
Uniform Delay, d1	17.5			4.2	4.4	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.6			0.5	0.4	
Delay (s)	18.1			4.6	4.9	
Level of Service	B			A	A	
Approach Delay (s)	18.1			4.6	4.9	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			44.9		Sum of lost time (s)	12.0
Intersection Capacity Utilization			50.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: S Winooski Ave & Bank St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	39	34	52	285	602	112
Future Volume (vph)	39	34	52	285	602	112
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3395	3341	
Flt Permitted	0.95	1.00		0.81	1.00	
Satd. Flow (perm)	1711	1531		2773	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	34	52	285	602	112
RTOR Reduction (vph)	0	31	0	0	18	0
Lane Group Flow (vph)	39	3	0	337	696	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.2	4.2		30.3	30.3	
Effective Green, g (s)	4.2	4.2		30.3	30.3	
Actuated g/C Ratio	0.09	0.09		0.65	0.65	
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)	154	138		1806	2177	
v/s Ratio Prot	c0.02				c0.21	
v/s Ratio Perm		0.00		0.12		
v/c Ratio	0.25	0.02		0.19	0.32	
Uniform Delay, d1	19.7	19.3		3.2	3.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1		0.2	0.4	
Delay (s)	20.6	19.3		3.4	4.0	
Level of Service	C	B		A	A	
Approach Delay (s)	20.0			3.4	4.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			4.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			46.5		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WT		NT			ST
Traffic Volume (vph)	73	31	472	109	98	1333
Future Volume (vph)	73	31	472	109	98	1333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.96		0.97			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1670		3325			3410
Flt Permitted	0.97		1.00			0.86
Satd. Flow (perm)	1670		3325			2936
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	31	472	109	98	1333
RTOR Reduction (vph)	27	0	22	0	0	0
Lane Group Flow (vph)	77	0	559	0	0	1431
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	6.8		38.9			38.9
Effective Green, g (s)	6.8		38.9			38.9
Actuated g/C Ratio	0.12		0.67			0.67
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	196		2241			1979
v/s Ratio Prot	c0.05		0.17			
v/s Ratio Perm						c0.49
v/c Ratio	0.39		0.25			0.72
Uniform Delay, d1	23.5		3.7			6.0
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.3		0.3			2.3
Delay (s)	24.8		3.9			8.3
Level of Service	C		A			A
Approach Delay (s)	24.8		3.9			8.3
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.67			
Actuated Cycle Length (s)			57.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			77.2%		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

01/20/2017

						
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

01/20/2017

	→	↘	↙	←	↖	↗
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)	4.0			4.0	4.0	
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			1699	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	56	0
Lane Group Flow (vph)	436	0	0	500	87	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	17.1			17.1	18.1	
Effective Green, g (s)	19.1			19.1	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)	724			687	685	
v/s Ratio Prot	0.24				0.05	
v/s Ratio Perm				0.29		
v/c Ratio	0.60			0.73	0.13	
Uniform Delay, d1	11.1			11.9	8.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.4			3.9	0.4	
Delay (s)	12.5			15.7	8.6	
Level of Service	B			B	A	
Approach Delay (s)	12.5			15.7	8.6	
Approach LOS	B			B	A	
Intersection Summary						
HCM 2000 Control Delay			13.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			47.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			68.2%		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

01/20/2017

												
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)		4.0	6.0	6.0	4.0		6.0		6.0	4.0	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	0.48	1.00		0.54		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	866	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	76	0	0	0	0	0	177	0	0	0
Lane Group Flow (vph)	0	322	38	190	417	0	195	0	122	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)		15.6	15.6	15.6	15.6		19.1		19.1	19.1	19.1	
Effective Green, g (s)		17.6	15.6	15.6	17.6		19.1		19.1	21.1	19.1	
Actuated g/C Ratio		0.38	0.33	0.33	0.38		0.41		0.41	0.45	0.41	
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)		678	511	289	678		401		626	773	1368	
v/s Ratio Prot		0.18			c0.23						0.10	
v/s Ratio Perm			0.02	0.22			c0.20		0.08	0.06		
v/c Ratio		0.47	0.07	0.66	0.62		0.49		0.20	0.13	0.25	
Uniform Delay, d1		11.0	10.6	13.3	11.8		10.2		8.9	7.5	9.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	5.3	1.7		4.2		0.7	0.4	0.4	
Delay (s)		11.6	10.7	18.6	13.5		14.4		9.6	7.8	9.5	
Level of Service		B	B	B	B		B		A	A	A	
Approach Delay (s)		11.3			15.1			11.5			9.1	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			46.7			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			64.7%			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

01/20/2017

												
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)	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	0.98				
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)	476	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)	22.3	22.3			22.3		18.3	18.3				
Effective Green, g (s)	24.3	24.3			24.3		20.3	20.3				
Actuated g/C Ratio	0.46	0.46			0.46		0.39	0.39				
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)	219	832			820		660	679				
v/s Ratio Prot		0.28			0.33			c0.20				
v/s Ratio Perm	c0.34						0.03					
v/c Ratio	0.74	0.61			0.71		0.08	0.51				
Uniform Delay, d1	11.6	10.6			11.3		10.2	12.3				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	12.8	1.4			2.8		0.2	2.7				
Delay (s)	24.4	12.0			14.1		10.5	15.1				
Level of Service	C	B			B		B	B				
Approach Delay (s)		15.0			14.1			14.5			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		52.6			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		69.7%			ICU Level of Service			C				
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

01/20/2017

												
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)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		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		0.39	1.00			0.91			0.94	
Satd. Flow (perm)		1662		711	1778			1613			1653	
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	4	0	0	5	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	593	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			16.5			16.5	
Effective Green, g (s)		30.1		30.1	30.1			18.5			18.5	
Actuated g/C Ratio		0.53		0.53	0.53			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)		883		378	945			527			540	
v/s Ratio Prot					0.31							
v/s Ratio Perm		c0.36		0.08				c0.23			0.15	
v/c Ratio		0.67		0.15	0.58			0.71			0.45	
Uniform Delay, d1		9.6		6.8	9.0			16.7			15.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		4.1		0.9	2.6			4.3			0.6	
Delay (s)		13.7		7.6	11.6			20.9			15.7	
Level of Service		B		A	B			C			B	
Approach Delay (s)		13.7			11.2			20.9			15.7	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			14.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			56.6			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			102.7%			ICU Level of Service			G			
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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	492	57	147	574	90	152	253	188	27	115	12
Future Volume (vph)	0	492	57	147	574	90	152	253	188	27	115	12
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		0.99		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		1.00		0.20	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1775		361	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	492	57	147	574	90	152	253	188	27	115	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	150	0	3	0
Lane Group Flow (vph)	0	545	0	147	664	0	152	253	38	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)		30.2		41.2	41.2		15.9	15.9	15.9		12.7	
Effective Green, g (s)		32.2		43.2	43.2		17.9	17.9	17.9		14.7	
Actuated g/C Ratio		0.37		0.49	0.49		0.20	0.20	0.20		0.17	
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)		650		285	867		348	367	312		295	
v/s Ratio Prot		c0.31		0.04	c0.38		0.09	c0.14			c0.09	
v/s Ratio Perm				0.21					0.03			
v/c Ratio		0.84		0.52	0.77		0.44	0.69	0.12		0.51	
Uniform Delay, d1		25.4		29.3	18.2		30.5	32.4	28.5		33.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		12.2		1.6	6.4		0.9	5.3	0.2		1.5	
Delay (s)		37.7		30.8	24.6		31.4	37.7	28.7		34.8	
Level of Service		D		C	C		C	D	C		C	
Approach Delay (s)		37.7			25.7			33.2			34.8	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			87.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			99.9%			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

01/20/2017

												
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)		4.0			4.0	6.0		4.0	4.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.97			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.98	1.00		0.98	
Satd. Flow (prot)		1752			1788	1531		1765	1531		1754	
Flt Permitted		0.98			0.89	1.00		0.81	1.00		0.85	
Satd. Flow (perm)		1713			1606	1531		1453	1531		1512	
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	17	0	0	0	35	0	0	34	0	5	0
Lane Group Flow (vph)	0	448	0	0	530	24	0	143	22	0	311	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.6			20.6	20.6		18.2	18.2		18.2	
Effective Green, g (s)		22.6			22.6	20.6		20.2	20.2		20.2	
Actuated g/C Ratio		0.44			0.44	0.41		0.40	0.40		0.40	
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)		762			714	620		577	608		601	
v/s Ratio Prot												
v/s Ratio Perm		0.26			0.33	0.02		0.10	0.01		0.21	
v/c Ratio		0.59			0.74	0.04		0.25	0.04		0.52	
Uniform Delay, d1		10.6			11.7	9.1		10.2	9.4		11.6	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.2			4.2	0.0		1.0	0.1		3.2	
Delay (s)		11.8			15.9	9.1		11.2	9.5		14.8	
Level of Service		B			B	A		B	A		B	
Approach Delay (s)		11.8			15.2			10.7			14.8	
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		0.64										
Actuated Cycle Length (s)		50.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		87.1%			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

01/20/2017

												
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	0.98	
Flt Protected		1.00	1.00	0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)		1797	1531	1711	1764			1752	1531	1711	1772	
Flt Permitted		0.97	1.00	0.45	1.00			0.77	1.00	0.64	1.00	
Satd. Flow (perm)		1748	1531	805	1764			1380	1531	1158	1772	
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	8	0
Lane Group Flow (vph)	0	392	29	62	410	0	0	181	27	68	124	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)		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			552	612	463	708	
v/s Ratio Prot				c0.23							0.07	
v/s Ratio Perm		0.22	0.02	0.08				c0.13	0.02	0.06		
v/c Ratio		0.67	0.06	0.23	0.69			0.33	0.04	0.15	0.18	
Uniform Delay, d1		12.9	10.2	10.9	13.1			9.4	8.3	8.7	8.8	
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			1.6	0.1	0.7	0.5	
Delay (s)		15.8	10.3	11.3	16.5			11.0	8.5	9.4	9.3	
Level of Service		B	B	B	B			B	A	A	A	
Approach Delay (s)		14.8			15.9			10.3			9.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		13.6				HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		45.5				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		80.3%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

01/20/2017

												
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	4.0		4.0	4.0			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	0.99		1.00	0.96			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1779		1711	1732			1734		1711	1801	1531
Flt Permitted	0.18	1.00		0.34	1.00			0.98		0.71	1.00	1.00
Satd. Flow (perm)	324	1779		610	1732			1705		1282	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	22	0	0	21	0	0	0	74
Lane Group Flow (vph)	94	496	0	94	642	0	0	162	0	273	376	41
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.2	24.2		24.2	24.2			20.2		20.2	20.2	20.2
Effective Green, g (s)	24.2	26.2		26.2	26.2			20.2		20.2	20.2	20.2
Actuated g/C Ratio	0.43	0.46		0.46	0.46			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)	139	826		283	804			610		459	645	548
v/s Ratio Prot		0.28			c0.37						0.21	
v/s Ratio Perm	0.29			0.15				0.10		c0.21		0.03
v/c Ratio	0.68	0.60		0.33	0.80			0.27		0.59	0.58	0.08
Uniform Delay, d1	12.9	11.2		9.6	12.9			12.8		14.8	14.7	11.9
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	12.3	1.2		0.7	5.6			1.1		5.6	3.8	0.3
Delay (s)	25.2	12.5		10.3	18.4			13.9		20.3	18.5	12.2
Level of Service	C	B		B	B			B		C	B	B
Approach Delay (s)		14.5			17.4			13.9			18.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			56.4			Sum of lost time (s)			10.0			
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

16: Main St & S Union St

01/20/2017

												
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)	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			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)	425	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	72	0	0	0
Lane Group Flow (vph)	47	771	0	0	662	0	0	322	39	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)	27.3	27.3			27.3			18.1	18.1			
Effective Green, g (s)	29.3	29.3			29.3			20.1	20.1			
Actuated g/C Ratio	0.51	0.51			0.51			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)	216	919			912			626	536			
v/s Ratio Prot		0.43			0.37							
v/s Ratio Perm	0.11							0.18	0.03			
v/c Ratio	0.22	0.84			0.73			0.51	0.07			
Uniform Delay, d1	7.7	12.0			10.9			14.8	12.4			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.5	6.8			2.9			3.0	0.3			
Delay (s)	8.2	18.8			13.8			17.8	12.7			
Level of Service	A	B			B			B	B			
Approach Delay (s)		18.2			13.8			16.5			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		16.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		57.4			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		64.3%			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

01/20/2017

												
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)	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	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		0.15	1.00			0.96			0.85	
Satd. Flow (perm)	353	1788		265	1778			1698			1512	
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)	27.6	27.6		27.6	27.6			18.1			18.1	
Effective Green, g (s)	29.6	29.6		29.6	29.6			20.1			20.1	
Actuated g/C Ratio	0.51	0.51		0.51	0.51			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)	181	917		135	912			591			526	
v/s Ratio Prot		c0.44			0.40							
v/s Ratio Perm	0.09			0.25				0.20			c0.20	
v/c Ratio	0.17	0.85		0.50	0.78			0.58			0.58	
Uniform Delay, d1	7.5	12.2		9.2	11.4			15.3			15.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	7.8		2.9	4.5			4.1			4.6	
Delay (s)	8.0	20.0		12.0	15.9			19.4			19.9	
Level of Service	A	B		B	B			B			B	
Approach Delay (s)		19.5			15.6			19.4			19.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			57.7			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			89.8%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	1295	1	144	474	395	0	146	334	381	131	17
Future Volume (vph)	0	1295	1	144	474	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)		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	0.98	
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	1295	1	144	474	395	0	146	334	381	131	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	136	0	0	0
Lane Group Flow (vph)	0	1296	0	144	474	395	0	146	198	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		8.0	52.1	52.1		15.6	15.6	10.0	31.6	
Effective Green, g (s)		40.1		10.0	54.1	54.1		17.6	17.6	12.0	33.6	
Actuated g/C Ratio		0.42		0.10	0.57	0.57		0.18	0.18	0.13	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)		1433		178	1018	865		331	281	416	621	
v/s Ratio Prot		c0.38		c0.08	0.26	0.26		0.08		c0.11	0.08	
v/s Ratio Perm									c0.13			
v/c Ratio		0.90		0.81	0.47	0.46		0.44	0.70	0.92	0.24	
Uniform Delay, d1		26.0		41.9	12.3	12.2		34.7	36.6	41.4	22.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		9.7		23.0	1.5	1.7		0.9	7.8	24.5	0.2	
Delay (s)		35.7		64.9	13.8	13.9		35.6	44.4	65.8	22.2	
Level of Service		D		E	B	B		D	D	E	C	
Approach Delay (s)		35.7			21.1			41.7			53.6	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			35.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			95.7				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			77.4%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

19: S Winooski Ave & Cherry St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	156	123	459	638	80
Future Volume (vph)	57	156	123	459	638	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.90			1.00	0.98	
Flt Protected	0.99			0.99	1.00	
Satd. Flow (prot)	1601			3385	3364	
Flt Permitted	0.99			0.70	1.00	
Satd. Flow (perm)	1601			2409	3364	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	156	123	459	638	80
RTOR Reduction (vph)	111	0	0	0	14	0
Lane Group Flow (vph)	102	0	0	582	704	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.9			23.7	23.7	
Effective Green, g (s)	6.9			23.7	23.7	
Actuated g/C Ratio	0.16			0.56	0.56	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	259			1340	1871	
v/s Ratio Prot	c0.06				0.21	
v/s Ratio Perm				c0.24		
v/c Ratio	0.39			0.43	0.38	
Uniform Delay, d1	16.0			5.5	5.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			1.0	0.6	
Delay (s)	17.0			6.6	5.9	
Level of Service	B			A	A	
Approach Delay (s)	17.0			6.6	5.9	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			42.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			64.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: S Winooski Ave & Bank St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	98	44	96	366	667	71
Future Volume (vph)	98	44	96	366	667	71
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3386	3372	
Flt Permitted	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	1711	1531		2494	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	44	96	366	667	71
RTOR Reduction (vph)	0	39	0	0	11	0
Lane Group Flow (vph)	98	5	0	462	727	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	5.3	5.3		26.9	26.9	
Effective Green, g (s)	5.3	5.3		26.9	26.9	
Actuated g/C Ratio	0.12	0.12		0.61	0.61	
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)	205	183		1517	2052	
v/s Ratio Prot	c0.06				c0.22	
v/s Ratio Perm		0.00		0.19		
v/c Ratio	0.48	0.03		0.30	0.35	
Uniform Delay, d1	18.2	17.2		4.2	4.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.1		0.5	0.5	
Delay (s)	19.9	17.2		4.7	4.8	
Level of Service	B	B		A	A	
Approach Delay (s)	19.1			4.7	4.8	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			44.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			54.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	59	1113	89	41	559
Future Volume (vph)	123	59	1113	89	41	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.96		0.99			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1666		3383			3410
Flt Permitted	0.97		1.00			0.82
Satd. Flow (perm)	1666		3383			2822
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	59	1113	89	41	559
RTOR Reduction (vph)	33	0	8	0	0	0
Lane Group Flow (vph)	149	0	1194	0	0	600
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.3		29.4			29.4
Effective Green, g (s)	8.3		29.4			29.4
Actuated g/C Ratio	0.17		0.59			0.59
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	278		2001			1669
v/s Ratio Prot	c0.09		c0.35			
v/s Ratio Perm						0.21
v/c Ratio	0.53		0.60			0.36
Uniform Delay, d1	18.9		6.4			5.3
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	2.0		1.3			0.6
Delay (s)	20.9		7.7			5.9
Level of Service	C		A			A
Approach Delay (s)	20.9		7.7			5.9
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			8.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			49.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			67.0%		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

01/21/2017

						
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)	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	1.00	1.00	1.00		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	1531		3389
Flt Permitted	0.95	1.00	1.00	1.00		0.80
Satd. Flow (perm)	1711	1531	1801	1531		2739
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	68	0	57	0	0
Lane Group Flow (vph)	162	13	309	125	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)	12.5	12.5	53.2	53.2		53.2
Actuated g/C Ratio	0.16	0.16	0.68	0.68		0.68
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)	275	246	1233	1048		1875
v/s Ratio Prot	c0.09		0.17			
v/s Ratio Perm		0.01		0.08		c0.60
v/c Ratio	0.59	0.05	0.25	0.12		0.87
Uniform Delay, d1	30.2	27.6	4.7	4.2		9.6
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	3.2	0.1	0.5	0.2		6.0
Delay (s)	33.4	27.7	5.2	4.4		15.6
Level of Service	C	C	A	A		B
Approach Delay (s)	31.5		4.9			15.6
Approach LOS	C		A			B
Intersection Summary						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			77.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			85.9%		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

01/21/2017

						
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

01/21/2017

												
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	6.0	6.0	4.0		6.0		6.0	4.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00	0.81	1.00	
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	1378	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	1378	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	67	0	0	0	0	0	61	0	0	0
Lane Group Flow (vph)	0	186	33	185	412	0	126	0	42	59	445	0
Confl. Peds. (#/hr)										150		
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		19.1		19.1	19.1	19.1	
Effective Green, g (s)		17.5	15.5	15.5	17.5		19.1		19.1	21.1	19.1	
Actuated g/C Ratio		0.38	0.33	0.33	0.38		0.41		0.41	0.45	0.41	
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)		676	509	383	676		364		627	623	1363	
v/s Ratio Prot		0.10			c0.23						0.13	
v/s Ratio Perm			0.02	0.16			c0.14		0.03	0.04		
v/c Ratio		0.28	0.07	0.48	0.61		0.35		0.07	0.09	0.33	
Uniform Delay, d1		10.1	10.6	12.4	11.8		9.5		8.3	7.3	9.4	
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	1.0	1.6		2.6		0.2	0.3	0.6	
Delay (s)		10.4	10.7	13.3	13.3		12.1		8.6	7.6	10.0	
Level of Service		B	B	B	B		B		A	A	B	
Approach Delay (s)		10.5			13.3			10.5			9.7	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			46.6			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			56.3%			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

01/21/2017

												
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

01/21/2017

												
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

01/21/2017

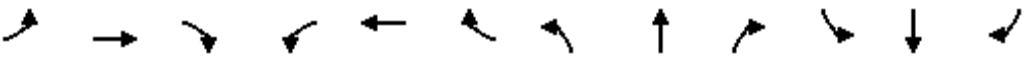
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔		↔	
Traffic Volume (vph)	0	389	75	198	525	45	77	74	121	38	225	27
Future Volume (vph)	0	389	75	198	525	45	77	74	121	38	225	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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		447	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	389	75	198	525	45	77	74	121	38	225	27
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	105	0	5	0
Lane Group Flow (vph)	0	456	0	198	570	0	77	74	16	0	285	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		334	830		220	231	197		420	
v/s Ratio Prot		c0.26		0.06	c0.32		c0.05	0.04			c0.16	
v/s Ratio Perm				0.22					0.01			
v/c Ratio		0.83		0.59	0.69		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		13.8		2.8	4.6		1.0	0.8	0.2		4.3	
Delay (s)		36.9		26.2	19.7		29.7	29.4	27.9		29.3	
Level of Service		D		C	B		C	C	C		C	
Approach Delay (s)		36.9			21.4			28.8			29.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			72.2			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			87.6%			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

01/21/2017

												
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	5.0		4.0	3.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.98			1.00	0.85		1.00	0.85		0.98	
Flt Protected		1.00			0.99	1.00		0.98	1.00		0.98	
Satd. Flow (prot)		1759			1786	1531		1772	1531		1741	
Flt Permitted		0.99			0.86	1.00		0.88	1.00		0.88	
Satd. Flow (perm)		1742			1553	1531		1587	1531		1554	
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	6	0	0	0	27	0	0	37	0	6	0
Lane Group Flow (vph)	0	493	0	0	509	67	0	176	19	0	103	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		45.6			45.6	45.6		28.2	28.2		28.2	
Effective Green, g (s)		46.6			46.6	45.6		29.2	30.2		29.2	
Actuated g/C Ratio		0.52			0.52	0.51		0.32	0.34		0.32	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		901			804	775		514	513		504	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.33	0.04		c0.11	0.01		0.07	
v/c Ratio		0.55			0.63	0.09		0.34	0.04		0.20	
Uniform Delay, d1		14.6			15.6	11.5		23.1	20.1		22.0	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.7			1.6	0.0		1.8	0.1		0.2	
Delay (s)		15.3			17.2	11.5		24.9	20.2		22.2	
Level of Service		B			B	B		C	C		C	
Approach Delay (s)		15.3			16.3			23.8			22.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		17.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		76.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

01/21/2017

												
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)	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	0.97		1.00	0.98		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1752		1711	1763		1711	1736		1711	1721	
Flt Permitted	0.30	1.00		0.46	1.00		0.73	1.00		0.65	1.00	
Satd. Flow (perm)	536	1752		830	1763		1312	1736		1174	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)	3	316	69	59	442	71	100	126	40	22	31	13
RTOR Reduction (vph)	0	17	0	0	12	0	0	23	0	0	8	0
Lane Group Flow (vph)	3	368	0	59	501	0	100	143	0	22	36	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)	16.1	16.1		16.1	16.1		18.1	18.1		18.1	18.1	
Effective Green, g (s)	16.1	16.1		16.1	16.1		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)	186	610		289	614		514	680		459	674	
v/s Ratio Prot		0.21			c0.28			c0.08			0.02	
v/s Ratio Perm	0.01			0.07			0.08			0.02		
v/c Ratio	0.02	0.60		0.20	0.82		0.19	0.21		0.05	0.05	
Uniform Delay, d1	9.9	12.4		10.6	13.7		9.3	9.3		8.7	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.7		0.4	8.2		0.8	0.7		0.2	0.2	
Delay (s)	9.9	14.1		10.9	21.9		10.1	10.0		8.9	8.9	
Level of Service	A	B		B	C		B	B		A	A	
Approach Delay (s)		14.1			20.8			10.0			8.9	
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			0.49									
Actuated Cycle Length (s)			46.2			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

15: S Winooski Ave & Main St

01/21/2017

												
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)	6.0	4.0		4.0	4.0			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	0.99		1.00	0.96			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1785		1711	1737			1755		1711	1801	1531
Flt Permitted	0.22	1.00		0.52	1.00			0.97		0.71	1.00	1.00
Satd. Flow (perm)	398	1785		929	1737			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	300	18	113	457	141	6	53	11	95	248	119
RTOR Reduction (vph)	0	4	0	0	22	0	0	7	0	0	0	76
Lane Group Flow (vph)	41	314	0	113	576	0	0	63	0	95	248	43
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	20.0	20.0		20.0	20.0			18.0		18.0	18.0	18.0
Effective Green, g (s)	20.0	22.0		22.0	22.0			18.0		18.0	18.0	18.0
Actuated g/C Ratio	0.40	0.44		0.44	0.44			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)	159	785		408	764			614		461	648	551
v/s Ratio Prot		0.18			c0.33						c0.14	
v/s Ratio Perm	0.10			0.12				0.04		0.07		0.03
v/c Ratio	0.26	0.40		0.28	0.75			0.10		0.21	0.38	0.08
Uniform Delay, d1	10.0	9.5		8.9	11.7			10.6		11.1	11.9	10.5
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	1.5		1.7	6.8			0.3		1.0	1.7	0.3
Delay (s)	13.9	11.0		10.6	18.5			11.0		12.1	13.6	10.8
Level of Service	B	B		B	B			B		B	B	B
Approach Delay (s)		11.4			17.3			11.0			12.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			63.2%			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

01/21/2017

												
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)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1790		1711	1780				
Flt Permitted	0.15	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	267	1801			1790		1711	1780				
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	3	0	0	5	0	0	0	0
Lane Group Flow (vph)	14	419	0	0	736	0	41	583	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	26.0	26.0			26.0		21.0	21.0				
Effective Green, g (s)	27.0	27.0			27.0		22.0	22.0				
Actuated g/C Ratio	0.46	0.46			0.46		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)	122	824			819		638	663				
v/s Ratio Prot		0.23			c0.41			c0.33				
v/s Ratio Perm	0.05						0.02					
v/c Ratio	0.11	0.51			0.90		0.06	0.88				
Uniform Delay, d1	9.2	11.3			14.7		11.9	17.3				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.9	2.2			14.8		0.0	12.7				
Delay (s)	11.1	13.5			29.5		11.9	30.0				
Level of Service	B	B			C		B	C				
Approach Delay (s)		13.5			29.5			28.8			0.0	
Approach LOS		B			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			25.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			59.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			78.8%				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

01/21/2017

												
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)	5.0	5.0		5.0	5.0			5.0			5.0	
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	0.26	1.00		0.43	1.00			0.96			0.88	
Satd. Flow (perm)	466	1792		782	1787			1685			1573	
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	14	0	0	5	0
Lane Group Flow (vph)	15	425	0	56	618	0	0	248	0	0	283	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	25.0	25.0		25.0	25.0			18.0			18.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0			19.0			19.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			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)	220	847		369	844			582			543	
v/s Ratio Prot		0.24			c0.35							
v/s Ratio Perm	0.03			0.07				0.15			c0.18	
v/c Ratio	0.07	0.50		0.15	0.73			0.43			0.52	
Uniform Delay, d1	7.9	10.0		8.2	11.7			13.8			14.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.6	2.1		0.9	5.6			2.3			3.6	
Delay (s)	8.5	12.1		9.1	17.3			16.1			17.9	
Level of Service	A	B		A	B			B			B	
Approach Delay (s)		12.0			16.6			16.1			17.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			81.2%			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

01/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	665	4	225	911	609	0	85	180	240	73	46
Future Volume (vph)	0	665	4	225	911	609	0	85	180	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	665	4	225	911	609	0	85	180	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	155	0	0	0
Lane Group Flow (vph)	0	668	0	225	911	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	11.6	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		3.6	6.4	3.3		0.8	0.2	18.3	0.3	
Delay (s)		21.9		32.6	18.0	12.7		32.0	30.4	54.4	22.9	
Level of Service		C		C	B	B		C	C	D	C	
Approach Delay (s)		21.9			18.0			30.9			44.0	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			23.1				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

19: S Winooski Ave & Cherry St

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	95	148	164	624	66
Future Volume (vph)	34	95	148	164	624	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.90			1.00	0.99	
Flt Protected	0.99			0.98	1.00	
Satd. Flow (prot)	1601			3342	3372	
Flt Permitted	0.99			0.61	1.00	
Satd. Flow (perm)	1601			2072	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	95	148	164	624	66
RTOR Reduction (vph)	82	0	0	0	11	0
Lane Group Flow (vph)	47	0	0	312	679	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	5.8			25.1	25.1	
Effective Green, g (s)	5.8			25.1	25.1	
Actuated g/C Ratio	0.14			0.59	0.59	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	216			1212	1972	
v/s Ratio Prot	c0.03				c0.20	
v/s Ratio Perm				0.15		
v/c Ratio	0.22			0.26	0.34	
Uniform Delay, d1	16.5			4.3	4.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.5			0.5	0.5	
Delay (s)	17.0			4.9	5.1	
Level of Service	B			A	A	
Approach Delay (s)	17.0			4.9	5.1	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.32			
Actuated Cycle Length (s)			42.9		Sum of lost time (s)	12.0
Intersection Capacity Utilization			50.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: S Winooski Ave & Bank St

01/21/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	39	34	52	285	602	112
Future Volume (vph)	39	34	52	285	602	112
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3395	3341	
Flt Permitted	0.95	1.00		0.81	1.00	
Satd. Flow (perm)	1711	1531		2779	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	34	52	285	602	112
RTOR Reduction (vph)	0	32	0	0	18	0
Lane Group Flow (vph)	39	2	0	337	696	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	2.9	2.9		28.2	28.2	
Effective Green, g (s)	2.9	2.9		28.2	28.2	
Actuated g/C Ratio	0.07	0.07		0.65	0.65	
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)	115	103		1818	2185	
v/s Ratio Prot	c0.02				c0.21	
v/s Ratio Perm		0.00		0.12		
v/c Ratio	0.34	0.02		0.19	0.32	
Uniform Delay, d1	19.2	18.8		2.9	3.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.1		0.2	0.4	
Delay (s)	20.9	18.9		3.2	3.6	
Level of Service	C	B		A	A	
Approach Delay (s)	20.0			3.2	3.6	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	43.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	73	31	472	109	98	1333
Future Volume (vph)	73	31	472	109	98	1333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.96		0.97			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1670		3325			3410
Flt Permitted	0.97		1.00			0.86
Satd. Flow (perm)	1670		3325			2951
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	31	472	109	98	1333
RTOR Reduction (vph)	28	0	26	0	0	0
Lane Group Flow (vph)	76	0	555	0	0	1431
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	4.9		26.8			26.8
Effective Green, g (s)	4.9		26.8			26.8
Actuated g/C Ratio	0.11		0.61			0.61
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	187		2039			1809
v/s Ratio Prot	c0.05		0.17			
v/s Ratio Perm						c0.48
v/c Ratio	0.41		0.27			0.79
Uniform Delay, d1	18.1		3.9			6.3
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.5		0.3			3.6
Delay (s)	19.5		4.3			10.0
Level of Service	B		A			A
Approach Delay (s)	19.5		4.3			10.0
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			8.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			43.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			77.2%		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

01/21/2017

						
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	1.00		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	1531		3387
Flt Permitted	0.95	1.00	1.00	1.00		0.55
Satd. Flow (perm)	1711	1531	1801	1531		1865
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	45	0	241	0	0
Lane Group Flow (vph)	156	126	834	260	0	771
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	7.6	7.6	21.1	21.1		21.1
Effective Green, g (s)	7.6	7.6	21.1	21.1		21.1
Actuated g/C Ratio	0.19	0.19	0.52	0.52		0.52
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	319	285	933	793		966
v/s Ratio Prot	c0.09		c0.46			
v/s Ratio Perm		0.08		0.17		0.41
v/c Ratio	0.49	0.44	0.89	0.33		0.80
Uniform Delay, d1	14.8	14.7	8.8	5.7		8.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	1.1	12.8	1.1		6.9
Delay (s)	16.0	15.8	21.6	6.8		14.9
Level of Service	B	B	C	A		B
Approach Delay (s)	15.9		16.0			14.9
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay			15.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			40.7		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

01/21/2017

	→	↘	↙	←	↖	↗
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)	4.0			4.0	4.0	
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			0.94	0.98	
Satd. Flow (perm)	1791			1697	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	58	0
Lane Group Flow (vph)	449	0	0	515	89	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)	19.4			19.4	20.1	
Actuated g/C Ratio	0.41			0.41	0.42	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	731			693	680	
v/s Ratio Prot	0.25				c0.06	
v/s Ratio Perm				c0.30		
v/c Ratio	0.61			0.74	0.13	
Uniform Delay, d1	11.1			11.9	8.4	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.5			4.3	0.4	
Delay (s)	12.6			16.3	8.8	
Level of Service	B			B	A	
Approach Delay (s)	12.6			16.3	8.8	
Approach LOS	B			B	A	
Intersection Summary						
HCM 2000 Control Delay			13.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			47.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.9%		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

01/21/2017

												
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)		4.0	6.0	6.0	4.0		6.0		6.0	4.0	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	0.47	1.00		0.54		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	847	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	78	0	0	0	0	0	183	0	0	0
Lane Group Flow (vph)	0	331	40	196	430	0	201	0	125	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)		15.8	15.8	15.8	15.8		19.1		19.1	19.1	19.1	
Effective Green, g (s)		17.8	15.8	15.8	17.8		19.1		19.1	21.1	19.1	
Actuated g/C Ratio		0.38	0.34	0.34	0.38		0.41		0.41	0.45	0.41	
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)		683	515	285	683		395		623	769	1363	
v/s Ratio Prot		0.18			c0.24						0.11	
v/s Ratio Perm			0.03	0.23			c0.21		0.08	0.06		
v/c Ratio		0.48	0.08	0.69	0.63		0.51		0.20	0.14	0.26	
Uniform Delay, d1		11.1	10.6	13.4	11.9		10.4		9.0	7.6	9.2	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	6.7	1.8		4.6		0.7	0.4	0.5	
Delay (s)		11.6	10.7	20.2	13.7		15.0		9.7	7.9	9.7	
Level of Service		B	B	C	B		B		A	A	A	
Approach Delay (s)		11.4			15.7			11.8			9.3	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			46.9			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			66.1%			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

01/21/2017

												
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)	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	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1775		1711	1759				
Flt Permitted	0.24	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	432	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	12	0	0	0	0
Lane Group Flow (vph)	168	527	0	0	599	0	52	355	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	21.1	21.1			21.1		18.2	18.2				
Effective Green, g (s)	23.1	23.1			23.1		20.2	20.2				
Actuated g/C Ratio	0.45	0.45			0.45		0.39	0.39				
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)	194	810			799		673	692				
v/s Ratio Prot		0.29			0.34			c0.20				
v/s Ratio Perm	c0.39						0.03					
v/c Ratio	0.87	0.65			0.75		0.08	0.51				
Uniform Delay, d1	12.7	11.0			11.7		9.7	11.8				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	30.8	1.9			3.9		0.2	2.7				
Delay (s)	43.5	12.8			15.6		9.9	14.5				
Level of Service	D	B			B		A	B				
Approach Delay (s)		20.3			15.6			14.0			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		17.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		51.3			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		71.5%			ICU Level of Service			C				
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

01/21/2017

												
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)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		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		0.90		0.37	1.00			0.91			0.94	
Satd. Flow (perm)		1597		672	1778			1614			1657	
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	6	0	0	14	0	0	14	0
Lane Group Flow (vph)	0	610	0	60	563	0	0	381	0	0	248	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			14.7			14.7	
Effective Green, g (s)		22.1		22.1	22.1			16.7			16.7	
Actuated g/C Ratio		0.47		0.47	0.47			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)		754		317	839			575			591	
v/s Ratio Prot					0.32							
v/s Ratio Perm		c0.38		0.09				c0.24			0.15	
v/c Ratio		0.81		0.19	0.67			0.66			0.42	
Uniform Delay, d1		10.5		7.2	9.5			12.7			11.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		9.1		1.3	4.2			2.9			0.5	
Delay (s)		19.7		8.5	13.8			15.6			11.9	
Level of Service		B		A	B			B			B	
Approach Delay (s)		19.7			13.3			15.6			11.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			46.8			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			105.8%			ICU Level of Service			G			
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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	506	59	151	592	92	156	261	194	27	119	12
Future Volume (vph)	0	506	59	151	592	92	156	261	194	27	119	12
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		0.99		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		1767	
Flt Permitted		1.00		0.15	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1775		276	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	506	59	151	592	92	156	261	194	27	119	12
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	150	0	4	0
Lane Group Flow (vph)	0	560	0	151	684	0	156	261	44	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)		20.1		31.2	31.2		15.5	15.5	15.5		11.9	
Effective Green, g (s)		22.1		33.2	33.2		17.5	17.5	17.5		13.9	
Actuated g/C Ratio		0.29		0.43	0.43		0.23	0.23	0.23		0.18	
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)		512		252	764		390	411	349		320	
v/s Ratio Prot		c0.32		0.06	c0.39		0.09	c0.14			c0.09	
v/s Ratio Perm				0.20					0.03			
v/c Ratio		1.09		0.60	0.90		0.40	0.64	0.13		0.48	
Uniform Delay, d1		27.2		29.5	20.1		25.1	26.7	23.5		28.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		67.7		3.8	15.2		0.7	3.2	0.2		1.1	
Delay (s)		95.0		33.3	35.3		25.8	29.9	23.6		29.3	
Level of Service		F		C	D		C	C	C		C	
Approach Delay (s)		95.0			35.0			26.8			29.3	
Approach LOS		F			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			47.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			76.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			102.5%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	417	160	68	562	66	214	133	63	110	243	23
Future Volume (vph)	16	417	160	68	562	66	214	133	63	110	243	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	5.0		4.0	3.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.97	1.00		0.99	
Satd. Flow (prot)		1733			1791	1531		1747	1531		1760	
Flt Permitted		0.94			0.85	1.00		0.55	1.00		0.62	
Satd. Flow (perm)		1637			1534	1531		993	1531		1116	
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	417	160	68	562	66	214	133	63	110	243	23
RTOR Reduction (vph)	0	8	0	0	0	19	0	0	28	0	2	0
Lane Group Flow (vph)	0	585	0	0	630	47	0	347	35	0	374	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		56.4			56.4	56.4		47.4	47.4		47.4	
Effective Green, g (s)		57.4			57.4	56.4		48.4	49.4		48.4	
Actuated g/C Ratio		0.48			0.48	0.47		0.40	0.41		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		783			733	719		400	630		450	
v/s Ratio Prot												
v/s Ratio Perm		0.36			c0.41	0.03		c0.35	0.02		0.34	
v/c Ratio		0.75			0.86	0.07		0.87	0.06		0.83	
Uniform Delay, d1		25.4			27.7	17.4		32.9	21.3		32.1	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		3.9			9.9	0.0		21.6	0.2		12.4	
Delay (s)		29.3			37.6	17.4		54.5	21.4		44.5	
Level of Service		C			D	B		D	C		D	
Approach Delay (s)		29.3			35.7			49.4			44.5	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay		38.2			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		111.7%			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

01/21/2017

												
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	0.97		1.00	0.98		1.00	0.93		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1753		1711	1757		1711	1676		1711	1783	
Flt Permitted	0.26	1.00		0.25	1.00		0.67	1.00		0.65	1.00	
Satd. Flow (perm)	474	1753		459	1757		1208	1676		1177	1783	
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	17	0	0	15	0	0	46	0	0	6	0
Lane Group Flow (vph)	17	540	0	64	535	0	123	117	0	75	129	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)	16.9	16.9		16.9	16.9		18.0	18.0		18.0	18.0	
Effective Green, g (s)	16.9	16.9		16.9	16.9		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		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)	170	631		165	633		463	643		451	684	
v/s Ratio Prot		c0.31			0.30			0.07			0.07	
v/s Ratio Perm	0.04			0.14			c0.10			0.06		
v/c Ratio	0.10	0.86		0.39	0.85		0.27	0.18		0.17	0.19	
Uniform Delay, d1	10.0	13.9		11.2	13.8		9.9	9.6		9.5	9.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	11.0		1.5	10.1		1.4	0.6		0.8	0.6	
Delay (s)	10.2	24.9		12.7	23.9		11.3	10.2		10.3	10.2	
Level of Service	B	C		B	C		B	B		B	B	
Approach Delay (s)		24.5			22.7			10.7			10.2	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			46.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

01/21/2017

												
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	4.0		4.0	4.0			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	0.99		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1774		1711	1738			1745		1711	1801	1531
Flt Permitted	0.20	1.00		0.26	1.00			0.98		0.69	1.00	1.00
Satd. Flow (perm)	360	1774		476	1738			1716		1234	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	8	0	0	22	0	0	20	0	0	0	86
Lane Group Flow (vph)	97	564	0	92	727	0	0	203	0	281	437	48
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	20.0	20.0		20.0	20.0			18.0		18.0	18.0	18.0
Effective Green, g (s)	20.0	22.0		22.0	22.0			18.0		18.0	18.0	18.0
Actuated g/C Ratio	0.40	0.44		0.44	0.44			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)	144	780		209	764			617		444	648	551
v/s Ratio Prot		0.32			c0.42						c0.24	
v/s Ratio Perm	0.27			0.19				0.12		0.23		0.03
v/c Ratio	0.67	0.72		0.44	0.95			0.33		0.63	0.67	0.09
Uniform Delay, d1	12.3	11.5		9.7	13.5			11.6		13.3	13.5	10.6
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	22.4	5.8		6.6	22.7			1.4		6.7	5.5	0.3
Delay (s)	34.7	17.3		16.3	36.2			13.0		20.0	19.1	10.9
Level of Service	C	B		B	D			B		B	B	B
Approach Delay (s)		19.8			34.0			13.0			18.1	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				10.0		
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

16: Main St & S Union St

01/21/2017

												
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)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.97				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1788		1711	1739				
Flt Permitted	0.17	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	302	1801			1788		1711	1739				
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	3	0	0	19	0	0	0	0
Lane Group Flow (vph)	43	819	0	0	733	0	48	458	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	26.1	26.1			26.1		18.4	18.4				
Effective Green, g (s)	27.1	27.1			27.1		19.4	19.4				
Actuated g/C Ratio	0.48	0.48			0.48		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)	144	863			857		587	597				
v/s Ratio Prot		c0.45			0.41			c0.26				
v/s Ratio Perm	0.14						0.03					
v/c Ratio	0.30	0.95			0.86		0.08	0.77				
Uniform Delay, d1	8.9	14.0			13.0		12.5	16.5				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	5.2	20.5			10.7		0.1	5.9				
Delay (s)	14.2	34.5			23.6		12.6	22.4				
Level of Service	B	C			C		B	C				
Approach Delay (s)		33.5			23.6			21.5			0.0	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM 2000 Control Delay		27.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		56.5			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		77.4%			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

01/21/2017

												
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)	5.0	5.0		5.0	5.0			5.0			5.0	
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	0.15	1.00		0.15	1.00			0.95			0.84	
Satd. Flow (perm)	277	1789		277	1778			1680			1493	
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	8	0
Lane Group Flow (vph)	32	827	0	69	786	0	0	353	0	0	310	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	25.0	25.0		25.0	25.0			18.0			18.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0			19.0			19.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			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)	130	845		130	840			580			515	
v/s Ratio Prot		c0.46			0.44							
v/s Ratio Perm	0.12			0.25				c0.21			0.21	
v/c Ratio	0.25	0.98		0.53	0.94			0.61			0.60	
Uniform Delay, d1	8.7	14.2		10.2	13.7			14.9			14.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	4.5	26.2		14.6	18.9			4.7			5.1	
Delay (s)	13.1	40.4		24.9	32.6			19.6			20.0	
Level of Service	B	D		C	C			B			C	
Approach Delay (s)		39.4			32.0			19.6			20.0	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			31.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			93.4%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	1334	1	148	488	407	0	151	344	393	135	17
Future Volume (vph)	0	1334	1	148	488	407	0	151	344	393	135	17
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	0.98	
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	1334	1	148	488	407	0	151	344	393	135	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	148	0	0	0
Lane Group Flow (vph)	0	1335	0	148	488	407	0	151	196	393	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)		33.1		6.0	45.1	45.1		14.2	14.2	9.1	29.3	
Effective Green, g (s)		35.1		8.0	47.1	47.1		16.2	16.2	11.1	31.3	
Actuated g/C Ratio		0.41		0.09	0.55	0.55		0.19	0.19	0.13	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)		1389		158	981	834		337	287	426	641	
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		0.96		0.94	0.50	0.49		0.45	0.68	0.92	0.24	
Uniform Delay, d1		25.0		38.9	12.3	12.2		31.1	32.7	37.2	19.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		16.5		52.6	1.8	2.0		1.0	6.6	25.4	0.2	
Delay (s)		41.5		91.5	14.1	14.2		32.1	39.3	62.6	19.4	
Level of Service		D		F	B	B		C	D	E	B	
Approach Delay (s)		41.5			25.1			37.1			50.6	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			37.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			86.4				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			79.4%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

19: S Winooski Ave & Cherry St

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	161	127	473	657	83
Future Volume (vph)	59	161	127	473	657	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.90			1.00	0.98	
Flt Protected	0.99			0.99	1.00	
Satd. Flow (prot)	1601			3385	3364	
Flt Permitted	0.99			0.69	1.00	
Satd. Flow (perm)	1601			2371	3364	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	59	161	127	473	657	83
RTOR Reduction (vph)	88	0	0	0	16	0
Lane Group Flow (vph)	132	0	0	600	724	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	7.4			21.6	21.6	
Effective Green, g (s)	7.4			21.6	21.6	
Actuated g/C Ratio	0.18			0.53	0.53	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	288			1249	1772	
v/s Ratio Prot	c0.08				0.22	
v/s Ratio Perm				c0.25		
v/c Ratio	0.46			0.48	0.41	
Uniform Delay, d1	15.0			6.1	5.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.2			1.3	0.7	
Delay (s)	16.2			7.5	6.6	
Level of Service	B			A	A	
Approach Delay (s)	16.2			7.5	6.6	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			8.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			41.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			65.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: S Winooski Ave & Bank St

01/21/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	101	45	99	377	687	73
Future Volume (vph)	101	45	99	377	687	73
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3386	3372	
Flt Permitted	0.95	1.00		0.72	1.00	
Satd. Flow (perm)	1711	1531		2468	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	101	45	99	377	687	73
RTOR Reduction (vph)	0	39	0	0	11	0
Lane Group Flow (vph)	101	6	0	476	749	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	5.2	5.2		24.8	24.8	
Effective Green, g (s)	5.2	5.2		24.8	24.8	
Actuated g/C Ratio	0.12	0.12		0.59	0.59	
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)	211	189		1457	1991	
v/s Ratio Prot	c0.06				c0.22	
v/s Ratio Perm		0.00		0.19		
v/c Ratio	0.48	0.03		0.33	0.38	
Uniform Delay, d1	17.1	16.2		4.4	4.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.1		0.6	0.5	
Delay (s)	18.8	16.2		5.0	5.1	
Level of Service	B	B		A	A	
Approach Delay (s)	18.0			5.0	5.1	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	61	1146	92	43	576
Future Volume (vph)	127	61	1146	92	43	576
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.96		0.99			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1666		3383			3409
Flt Permitted	0.97		1.00			0.81
Satd. Flow (perm)	1666		3383			2780
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	61	1146	92	43	576
RTOR Reduction (vph)	14	0	9	0	0	0
Lane Group Flow (vph)	174	0	1229	0	0	619
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.2		22.4			22.4
Effective Green, g (s)	8.2		22.4			22.4
Actuated g/C Ratio	0.19		0.53			0.53
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	320		1778			1461
v/s Ratio Prot	c0.10		c0.36			
v/s Ratio Perm						0.22
v/c Ratio	0.54		0.69			0.42
Uniform Delay, d1	15.5		7.5			6.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.9		2.2			0.9
Delay (s)	17.4		9.7			7.1
Level of Service	B		A			A
Approach Delay (s)	17.4		9.7			7.1
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			42.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			69.4%		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

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	81	319	182	337	1361
Future Volume (vph)	162	81	319	182	337	1361
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		2703
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	162	81	319	182	337	1361
RTOR Reduction (vph)	0	69	0	52	0	0
Lane Group Flow (vph)	162	12	319	130	0	1698
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		1929
v/s Ratio Prot	c0.09		0.18			
v/s Ratio Perm		0.01		0.05		c0.63
v/c Ratio	0.63	0.05	0.25	0.07		0.88
Uniform Delay, d1	35.2	32.2	4.4	3.8		9.7
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.0	0.1	0.5	0.1		6.2
Delay (s)	40.2	32.3	4.9	3.9		15.9
Level of Service	D	C	A	A		B
Approach Delay (s)	37.6		4.5			15.9
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			15.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			88.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			88.2%		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

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	372	70	125	321	38	40
Future Volume (vph)	372	70	125	321	38	40
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)	1762			1776	1636	
Flt Permitted	1.00			0.64	0.98	
Satd. Flow (perm)	1762			1152	1636	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	372	70	125	321	38	40
RTOR Reduction (vph)	13	0	0	0	26	0
Lane Group Flow (vph)	429	0	0	446	52	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.4			22.4	18.3	
Effective Green, g (s)	22.4			22.4	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)	748			489	568	
v/s Ratio Prot	0.24				0.03	
v/s Ratio Perm				0.39		
v/c Ratio	0.57			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			21.3	0.3	
Delay (s)	12.6			35.5	11.9	
Level of Service	B			D	B	
Approach Delay (s)	12.6			35.5	11.9	
Approach LOS	B			D	B	
Intersection Summary						
HCM 2000 Control Delay			23.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			52.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			67.2%		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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	199	100	207	434	0	126	0	115	59	381	83
Future Volume (vph)	0	199	100	207	434	0	126	0	115	59	381	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	3329	
Flt Permitted		1.00	1.00	0.63	1.00		0.49		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1139	1801		874		1531	1711	3329	
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	199	100	207	434	0	126	0	115	59	381	83
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	0	199	35	207	434	0	126	0	45	59	464	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)		16.1	16.1	16.1	16.1		18.1		18.1	18.1	18.1	
Effective Green, g (s)		16.1	16.1	16.1	16.1		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)		627	533	396	627		342		599	670	1304	
v/s Ratio Prot		0.11			c0.24						0.14	
v/s Ratio Perm			0.02	0.18			c0.14		0.03	0.03		
v/c Ratio		0.32	0.07	0.52	0.69		0.37		0.08	0.09	0.36	
Uniform Delay, d1		11.0	10.0	12.0	12.9		10.0		8.8	8.9	9.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.1	1.2	3.3		3.0		0.2	0.3	0.8	
Delay (s)		11.3	10.1	13.2	16.2		13.0		9.0	9.1	10.7	
Level of Service		B	B	B	B		B		A	A	B	
Approach Delay (s)		10.9			15.3			11.1			10.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			46.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			60.4%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	348	0	0	541	67	30	105	51	0	0	0
Future Volume (vph)	54	348	0	0	541	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			0.99		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1774		1711	1712				
Flt Permitted	0.24	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	439	1801			1774		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	348	0	0	541	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	348	0	0	599	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)	21.3	21.3			21.3		18.1	18.1				
Effective Green, g (s)	21.3	21.3			21.3		18.1	18.1				
Actuated g/C Ratio	0.41	0.41			0.41		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)	181	746			735		602	602				
v/s Ratio Prot		0.19			c0.34			c0.07				
v/s Ratio Perm	0.12						0.02					
v/c Ratio	0.30	0.47			0.82		0.05	0.21				
Uniform Delay, d1	10.1	10.9			13.3		11.0	11.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.9	0.5			6.9		0.2	0.8				
Delay (s)	11.0	11.4			20.3		11.1	12.4				
Level of Service	B	B			C		B	B				
Approach Delay (s)		11.3			20.3			12.2			0.0	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			51.4				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			60.3%				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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	354	47	49	529	17	35	107	50	25	240	34
Future Volume (vph)	20	354	47	49	529	17	35	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)		1705		882	1792			1556			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)	20	354	47	49	529	17	35	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	412	0	49	544	0	0	166	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)		682		352	716			560			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	0.76			0.30			0.47	
Uniform Delay, d1		11.9		9.5	12.9			11.5			12.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.9		0.8	7.4			1.4			2.6	
Delay (s)		15.8		10.4	20.3			12.8			14.9	
Level of Service		B		B	C			B			B	
Approach Delay (s)		15.8			19.5			12.8			14.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			66.7%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	406	75	198	567	45	77	74	121	38	225	27
Future Volume (vph)	0	406	75	198	567	45	77	74	121	38	225	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	1781		1711	1801	1531		1766	
Flt Permitted		1.00		0.25	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1763		445	1781		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	406	75	198	567	45	77	74	121	38	225	27
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	109	0	5	0
Lane Group Flow (vph)	0	474	0	198	612	0	77	74	12	0	285	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		286	777		172	181	153		379	
v/s Ratio Prot		c0.27		0.05	c0.34		c0.05	0.04			c0.16	
v/s Ratio Perm				0.25					0.01			
v/c Ratio		0.96		0.69	0.79		0.45	0.41	0.08		0.75	
Uniform Delay, d1		25.7		25.1	17.6		30.8	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		31.1		7.1	7.9		1.9	1.5	0.2		8.2	
Delay (s)		56.8		32.2	25.5		32.6	32.1	29.8		34.9	
Level of Service		E		C	C		C	C	C		C	
Approach Delay (s)		56.8			27.1			31.2			34.9	
Approach LOS		E			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			72.6			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			95.7%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	407	82	81	428	135	54	157	56	50	84	14
Future Volume (vph)	10	407	82	81	428	135	54	157	56	50	84	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	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.98			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		1759			1786	1531		1778	1531		1748	
Flt Permitted		0.99			0.85	1.00		0.89	1.00		0.84	
Satd. Flow (perm)		1737			1528	1531		1595	1531		1490	
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	135	54	157	56	50	84	14
RTOR Reduction (vph)	0	14	0	0	0	80	0	0	36	0	6	0
Lane Group Flow (vph)	0	485	0	0	509	55	0	211	20	0	142	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.7			20.7	20.7		18.2	18.2		18.2	
Effective Green, g (s)		20.7			20.7	20.7		18.2	18.2		18.2	
Actuated g/C Ratio		0.41			0.41	0.41		0.36	0.36		0.36	
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)		706			621	622		570	547		532	
v/s Ratio Prot												
v/s Ratio Perm		0.28			0.33	0.04		0.13	0.01		0.10	
v/c Ratio		0.69			0.82	0.09		0.37	0.04		0.27	
Uniform Delay, d1		12.4			13.4	9.3		12.1	10.6		11.6	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		2.8			8.3	0.1		1.8	0.1		1.2	
Delay (s)		15.2			21.8	9.4		14.0	10.8		12.8	
Level of Service		B			C	A		B	B		B	
Approach Delay (s)		15.2			19.2			13.3			12.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		50.9			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		93.2%			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/St Paul St & Main St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	323	76	59	483	113	96	168	40	41	42	13
Future Volume (vph)	3	323	76	59	483	113	96	168	40	41	42	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	1749			1768	1531	1711	1737	
Flt Permitted		0.99	1.00	0.55	1.00			0.86	1.00	0.60	1.00	
Satd. Flow (perm)		1791	1531	982	1749			1549	1531	1074	1737	
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	323	76	59	483	113	96	168	40	41	42	13
RTOR Reduction (vph)	0	0	45	0	17	0	0	0	26	0	8	0
Lane Group Flow (vph)	0	326	31	59	579	0	0	264	14	41	47	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)		20.9	20.9	20.9	20.9			18.2	18.2	18.2	18.2	
Effective Green, g (s)		20.9	20.9	20.9	20.9			18.2	18.2	18.2	18.2	
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)		732	626	401	715			551	545	382	618	
v/s Ratio Prot				c0.33								0.03
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	0.81			0.48	0.03	0.11	0.08	
Uniform Delay, d1		10.9	9.1	9.5	13.3			12.8	10.7	11.0	10.9	
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	6.9			3.0	0.1	0.6	0.2	
Delay (s)		11.3	9.1	9.7	20.3			15.7	10.8	11.6	11.1	
Level of Service		B	A	A	C			B	B	B	B	
Approach Delay (s)		10.9			19.3			15.1			11.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			51.1			Sum of lost time (s)			12.0			
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

15: S Winooski Ave & Main St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	336	18	113	539	141	6	53	11	95	265	119
Future Volume (vph)	41	336	18	113	539	141	6	53	11	95	265	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
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1787		1711	1745			1755		1711	1801	1531
Flt Permitted	0.21	1.00		0.52	1.00			0.97		0.71	1.00	1.00
Satd. Flow (perm)	374	1787		934	1745			1704		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	336	18	113	539	141	6	53	11	95	265	119
RTOR Reduction (vph)	0	3	0	0	17	0	0	7	0	0	0	80
Lane Group Flow (vph)	41	351	0	113	663	0	0	63	0	95	265	39
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	25.2	25.2		25.2	25.2			18.2		18.2	18.2	18.2
Effective Green, g (s)	25.2	25.2		25.2	25.2			18.2		18.2	18.2	18.2
Actuated g/C Ratio	0.45	0.45		0.45	0.45			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
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	170	812		424	793			559		420	591	502
v/s Ratio Prot		0.20			c0.38						c0.15	
v/s Ratio Perm	0.11			0.12				0.04		0.07		0.03
v/c Ratio	0.24	0.43		0.27	0.84			0.11		0.23	0.45	0.08
Uniform Delay, d1	9.2	10.2		9.4	13.3			13.0		13.5	14.6	12.8
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.4		0.3	7.6			0.4		1.2	2.5	0.3
Delay (s)	10.0	10.6		9.7	20.9			13.4		14.7	17.1	13.1
Level of Service	A	B		A	C			B		B	B	B
Approach Delay (s)		10.5			19.3			13.4			15.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			55.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	455	0	0	790	32	41	542	46	0	0	0
Future Volume (vph)	14	455	0	0	790	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	0.09	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	169	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	455	0	0	790	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	455	0	0	820	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)	42.6	42.6			42.6			34.0	34.0			
Effective Green, g (s)	42.6	42.6			42.6			34.0	34.0			
Actuated g/C Ratio	0.48	0.48			0.48			0.38	0.38			
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	865			861			688	587			
v/s Ratio Prot		0.25			c0.46							
v/s Ratio Perm	0.08							0.32	0.02			
v/c Ratio	0.17	0.53			0.95			0.85	0.04			
Uniform Delay, d1	13.0	16.0			22.0			24.9	17.1			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	1.0	0.6			20.0			12.3	0.1			
Delay (s)	14.0	16.6			42.1			37.2	17.2			
Level of Service	B	B			D			D	B			
Approach Delay (s)		16.5			42.1			35.8			0.0	
Approach LOS		B			D			D			A	
Intersection Summary												
HCM 2000 Control Delay			33.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			88.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			84.3%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	449	14	56	672	32	21	194	47	66	203	19
Future Volume (vph)	15	449	14	56	672	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	0.17	1.00		0.40	1.00			0.96			0.88	
Satd. Flow (perm)	310	1792		717	1788			1683			1563	
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	449	14	56	672	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	461	0	56	701	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)	25.8	25.8		25.8	25.8			20.1			20.1	
Effective Green, g (s)	25.8	25.8		25.8	25.8			20.1			20.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			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	798		319	796			584			542	
v/s Ratio Prot		0.26			c0.39							
v/s Ratio Perm	0.05			0.08				0.15			c0.18	
v/c Ratio	0.11	0.58		0.18	0.88			0.43			0.52	
Uniform Delay, d1	9.4	12.0		9.7	14.6			14.5			15.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.0		0.3	11.2			2.3			3.6	
Delay (s)	9.7	13.0		9.9	25.8			16.8			18.7	
Level of Service	A	B		A	C			B			B	
Approach Delay (s)		12.9			24.7			16.8			18.7	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			57.9			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

18: S Prospect St & Main St

01/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	701	4	225	993	609	0	85	180	240	73	46
Future Volume (vph)	0	701	4	225	993	609	0	85	180	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	701	4	225	993	609	0	85	180	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	159	0	0	0
Lane Group Flow (vph)	0	704	0	225	993	609	0	85	21	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)		27.6		14.4	48.0	48.0		9.3	9.3	6.1	21.4	
Effective Green, g (s)		27.6		14.4	48.0	48.0		9.3	9.3	6.1	21.4	
Actuated g/C Ratio		0.34		0.18	0.59	0.59		0.11	0.11	0.07	0.26	
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)		1158		302	1062	902		205	174	248	445	
v/s Ratio Prot		0.21		0.13	c0.55	0.40		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.61		0.75	0.94	0.68		0.41	0.12	0.97	0.27	
Uniform Delay, d1		22.4		31.8	15.3	11.4		33.5	32.4	37.6	23.8	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.4		9.6	15.8	4.0		1.4	0.3	47.6	0.3	
Delay (s)		24.8		41.3	31.1	15.4		34.9	32.7	85.2	24.1	
Level of Service		C		D	C	B		C	C	F	C	
Approach Delay (s)		24.8			27.1			33.4			64.9	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			31.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			81.4				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			75.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

19: Cherry St & S Winooski Ave

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑	↑↑	
Traffic Volume (vph)	46	95	148	164	624	108
Future Volume (vph)	46	95	148	164	624	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.91			1.00	0.98	
Flt Protected	0.98			0.98	1.00	
Satd. Flow (prot)	1611			3342	3346	
Flt Permitted	0.98			0.60	1.00	
Satd. Flow (perm)	1611			2046	3346	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	95	148	164	624	108
RTOR Reduction (vph)	82	0	0	0	19	0
Lane Group Flow (vph)	59	0	0	312	713	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.1			26.7	26.7	
Effective Green, g (s)	6.1			26.7	26.7	
Actuated g/C Ratio	0.14			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)	219			1219	1994	
v/s Ratio Prot	c0.04				c0.21	
v/s Ratio Perm				0.15		
v/c Ratio	0.27			0.26	0.36	
Uniform Delay, d1	17.4			4.3	4.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.7			0.5	0.5	
Delay (s)	18.0			4.8	5.1	
Level of Service	B			A	A	
Approach Delay (s)	18.0			4.8	5.1	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.34			
Actuated Cycle Length (s)			44.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			52.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: Bank St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	39	52	52	285	602	112
Future Volume (vph)	39	52	52	285	602	112
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3395	3341	
Flt Permitted	0.95	1.00		0.81	1.00	
Satd. Flow (perm)	1711	1531		2773	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	52	52	285	602	112
RTOR Reduction (vph)	0	47	0	0	18	0
Lane Group Flow (vph)	39	5	0	337	696	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.2	4.2		29.4	29.4	
Effective Green, g (s)	4.2	4.2		29.4	29.4	
Actuated g/C Ratio	0.09	0.09		0.64	0.64	
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)	157	141		1787	2154	
v/s Ratio Prot	c0.02				c0.21	
v/s Ratio Perm		0.00		0.12		
v/c Ratio	0.25	0.03		0.19	0.32	
Uniform Delay, d1	19.2	18.9		3.3	3.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.1		0.2	0.4	
Delay (s)	20.1	19.0		3.5	4.0	
Level of Service	C	B		A	A	
Approach Delay (s)	19.4			3.5	4.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			5.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			45.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	73	40	472	109	129	1333
Future Volume (vph)	73	40	472	109	129	1333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.95		0.97			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1661		3325			3406
Flt Permitted	0.97		1.00			0.82
Satd. Flow (perm)	1661		3325			2813
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	40	472	109	129	1333
RTOR Reduction (vph)	35	0	20	0	0	0
Lane Group Flow (vph)	78	0	561	0	0	1462
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	7.1		43.3			43.3
Effective Green, g (s)	7.1		43.3			43.3
Actuated g/C Ratio	0.11		0.69			0.69
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	188		2307			1951
v/s Ratio Prot	c0.05		0.17			
v/s Ratio Perm						c0.52
v/c Ratio	0.41		0.24			0.75
Uniform Delay, d1	25.7		3.5			6.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.5		0.3			2.7
Delay (s)	27.2		3.8			8.8
Level of Service	C		A			A
Approach Delay (s)	27.2		3.8			8.8
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			8.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			62.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			78.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

23: St Paul St & Cherry St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	162	20	5	204	20	20	5	5	24	5	17
Future Volume (vph)	23	162	20	5	204	20	20	5	5	24	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		0.99			1.00			0.97			0.97	
Satd. Flow (prot)		1767			1777			1703			1667	
Flt Permitted		0.94			0.99			0.87			0.89	
Satd. Flow (perm)		1669			1757			1531			1527	
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)	23	162	20	5	204	20	20	5	5	24	5	17
RTOR Reduction (vph)	0	10	0	0	9	0	0	2	0	0	8	0
Lane Group Flow (vph)	0	195	0	0	220	0	0	28	0	0	38	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)		8.8			8.8			21.8			21.8	
Effective Green, g (s)		8.8			8.8			21.8			21.8	
Actuated g/C Ratio		0.21			0.21			0.51			0.51	
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)		344			362			783			781	
v/s Ratio Prot												
v/s Ratio Perm		0.12			0.13			0.02			0.02	
v/c Ratio		0.57			0.61			0.04			0.05	
Uniform Delay, d1		15.2			15.3			5.2			5.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.1			2.9			0.1			0.1	
Delay (s)		17.3			18.2			5.3			5.3	
Level of Service		B			B			A			A	
Approach Delay (s)		17.3			18.2			5.3			5.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.21										
Actuated Cycle Length (s)		42.6			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		36.2%			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

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	151	166	842	486	179	629
Future Volume (vph)	151	166	842	486	179	629
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		0.55
Satd. Flow (perm)	1711	1531	1801	2694		1888
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	151	166	842	486	179	629
RTOR Reduction (vph)	0	96	0	196	0	0
Lane Group Flow (vph)	151	70	842	290	0	808
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		1127
v/s Ratio Prot	c0.09		c0.47			
v/s Ratio Perm		0.05		0.11		0.43
v/c Ratio	0.48	0.25	0.78	0.18		0.72
Uniform Delay, d1	20.1	19.2	8.4	5.0		7.8
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.5	5.7	0.2		3.9
Delay (s)	21.2	19.6	14.0	5.2		11.7
Level of Service	C	B	B	A		B
Approach Delay (s)	20.4		10.8			11.7
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			12.3		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			90.3%		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

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	47	77	445	102	151
Future Volume (vph)	422	47	77	445	102	151
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	0.92	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1776			1787	1623	
Flt Permitted	1.00			0.79	0.98	
Satd. Flow (perm)	1776			1422	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	422	47	77	445	102	151
RTOR Reduction (vph)	8	0	0	0	82	0
Lane Group Flow (vph)	461	0	0	522	171	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	21.9			21.9	18.3	
Effective Green, g (s)	21.9			21.9	18.3	
Actuated g/C Ratio	0.42			0.42	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	745			596	568	
v/s Ratio Prot	0.26				c0.11	
v/s Ratio Perm				c0.37		
v/c Ratio	0.62			0.88	0.30	
Uniform Delay, d1	11.9			13.9	12.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.5			13.6	1.4	
Delay (s)	13.4			27.5	13.7	
Level of Service	B			C	B	
Approach Delay (s)	13.4			27.5	13.7	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			19.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			52.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			82.7%		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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	114	212	439	0	195	0	338	104	314	50
Future Volume (vph)	0	365	114	212	439	0	195	0	338	104	314	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	3351	
Flt Permitted		1.00	1.00	0.46	1.00		0.53		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	837	1801		963		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	365	114	212	439	0	195	0	338	104	314	50
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	196	0	0	0
Lane Group Flow (vph)	0	365	40	212	439	0	195	0	142	104	364	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)		18.8	18.8	18.8	18.8		22.3		22.3	22.3	22.3	
Effective Green, g (s)		18.8	18.8	18.8	18.8		22.3		22.3	22.3	22.3	
Actuated g/C Ratio		0.35	0.35	0.35	0.35		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)		637	542	296	637		404		642	718	1407	
v/s Ratio Prot		0.20			0.24						0.11	
v/s Ratio Perm			0.03	c0.25			c0.20		0.09	0.06		
v/c Ratio		0.57	0.07	0.72	0.69		0.48		0.22	0.14	0.26	
Uniform Delay, d1		13.9	11.4	14.8	14.7		11.2		9.8	9.5	10.0	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.3	0.1	8.0	3.1		4.1		0.8	0.4	0.4	
Delay (s)		15.1	11.4	22.8	17.8		15.3		10.6	9.9	10.5	
Level of Service		B	B	C	B		B		B	A	B	
Approach Delay (s)		14.3			19.4			12.3			10.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			53.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.4%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	594	0	0	570	63	51	302	54	0	0	0
Future Volume (vph)	163	594	0	0	570	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)	415	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	594	0	0	570	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	594	0	0	626	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)	23.9	23.9			23.9		19.2	19.2				
Effective Green, g (s)	23.9	23.9			23.9		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)	180	781			770		596	613				
v/s Ratio Prot		0.33			0.35			c0.20				
v/s Ratio Perm	c0.39						0.03					
v/c Ratio	0.91	0.76			0.81		0.09	0.56				
Uniform Delay, d1	14.5	13.2			13.6		12.1	14.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	41.0	4.4			6.5		0.3	3.7				
Delay (s)	55.5	17.6			20.2		12.3	18.3				
Level of Service	E	B			C		B	B				
Approach Delay (s)		25.7			20.2			17.5			0.0	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		21.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		55.1			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.0%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	566	46	58	547	46	66	263	57	29	189	38
Future Volume (vph)	68	566	46	58	547	46	66	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)		1775		1711	1780			1750			1755	
Flt Permitted		0.81		0.36	1.00			0.90			0.93	
Satd. Flow (perm)		1444		654	1780			1581			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)	68	566	46	58	547	46	66	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	676	0	58	588	0	0	376	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)		722		327	890			474			490	
v/s Ratio Prot					0.33							
v/s Ratio Perm		c0.47		0.09				c0.24			0.15	
v/c Ratio		0.94		0.18	0.66			0.79			0.50	
Uniform Delay, d1		14.1		8.2	11.2			19.3			17.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		21.0		1.2	3.8			12.7			3.6	
Delay (s)		35.1		9.4	15.0			32.0			20.9	
Level of Service		D		A	B			C			C	
Approach Delay (s)		35.1			14.5			32.0			20.9	
Approach LOS		D			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			115.1%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	550	57	147	615	90	152	253	188	27	115	12
Future Volume (vph)	0	550	57	147	615	90	152	253	188	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)		1778		1711	1766		1711	1801	1531		1766	
Flt Permitted		1.00		0.15	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1778		273	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	550	57	147	615	90	152	253	188	27	115	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	153	0	3	0
Lane Group Flow (vph)	0	603	0	147	705	0	152	253	35	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		210	825		314	331	281		254	
v/s Ratio Prot		c0.34		0.04	c0.40		0.09	c0.14			c0.09	
v/s Ratio Perm				0.29					0.02			
v/c Ratio		0.99		0.70	0.85		0.48	0.76	0.12		0.59	
Uniform Delay, d1		28.9		33.4	20.8		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		35.0		9.8	11.0		1.2	10.1	0.2		3.7	
Delay (s)		63.9		43.1	31.8		33.4	44.2	30.2		39.0	
Level of Service		E		D	C		C	D	C		D	
Approach Delay (s)		63.9			33.7			37.0			39.0	
Approach LOS		E			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			88.1			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			111.8%			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	361	88	76	454	99	55	122	56	155	233	22
Future Volume (vph)	16	361	88	76	454	99	55	122	56	155	233	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		6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.97			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.98	1.00		0.98	
Satd. Flow (prot)		1752			1788	1531		1773	1531		1754	
Flt Permitted		0.97			0.88	1.00		0.81	1.00		0.80	
Satd. Flow (perm)		1709			1582	1531		1455	1531		1431	
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	99	55	122	56	155	233	22
RTOR Reduction (vph)	0	17	0	0	0	58	0	0	36	0	4	0
Lane Group Flow (vph)	0	448	0	0	530	41	0	177	20	0	406	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		21.0			21.0	21.0		18.2	18.2		18.2	
Effective Green, g (s)		21.0			21.0	21.0		18.2	18.2		18.2	
Actuated g/C Ratio		0.41			0.41	0.41		0.36	0.36		0.36	
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)		700			648	627		517	544		508	
v/s Ratio Prot												
v/s Ratio Perm		0.26			0.34	0.03		0.12	0.01		0.28	
v/c Ratio		0.64			0.82	0.06		0.34	0.04		0.80	
Uniform Delay, d1		12.1			13.4	9.1		12.1	10.8		14.9	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		2.0			7.9	0.0		1.8	0.1		12.4	
Delay (s)		14.1			21.3	9.2		13.9	10.9		27.3	
Level of Service		B			C	A		B	B		C	
Approach Delay (s)		14.1			19.4			13.2			27.3	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay		19.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		51.2			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		104.5%			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/St Paul St & Main St

01/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩			↩	↩	↩	↩	
Traffic Volume (vph)	16	400	110	62	407	97	96	123	68	133	140	14
Future Volume (vph)	16	400	110	62	407	97	96	123	68	133	140	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	1749			1762	1531	1711	1776	
Flt Permitted		0.97	1.00	0.43	1.00			0.79	1.00	0.62	1.00	
Satd. Flow (perm)		1748	1531	778	1749			1429	1531	1119	1776	
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	400	110	62	407	97	96	123	68	133	140	14
RTOR Reduction (vph)	0	0	68	0	18	0	0	0	43	0	6	0
Lane Group Flow (vph)	0	416	42	62	486	0	0	219	25	133	148	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)		18.4	18.4	18.4	18.4			18.2	18.2	18.2	18.2	
Effective Green, g (s)		18.4	18.4	18.4	18.4			18.2	18.2	18.2	18.2	
Actuated g/C Ratio		0.38	0.38	0.38	0.38			0.37	0.37	0.37	0.37	
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)		661	579	294	662			535	573	419	665	
v/s Ratio Prot				c0.28								0.08
v/s Ratio Perm		0.24	0.03	0.08				c0.15	0.02	0.12		
v/c Ratio		0.63	0.07	0.21	0.73			0.41	0.04	0.32	0.22	
Uniform Delay, d1		12.3	9.6	10.2	13.0			11.2	9.7	10.8	10.4	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.9	0.1	0.4	4.2			2.3	0.1	2.0	0.8	
Delay (s)		14.2	9.7	10.6	17.2			13.5	9.8	12.8	11.1	
Level of Service		B	A	B	B			B	A	B	B	
Approach Delay (s)		13.3			16.5			12.7			11.9	
Approach LOS		B			B			B			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)			48.6			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			86.5%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	579	41	94	576	169	7	128	48	273	430	115
Future Volume (vph)	94	579	41	94	576	169	7	128	48	273	430	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
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1783		1711	1739			1734		1711	1801	1531
Flt Permitted	0.16	1.00		0.27	1.00			0.98		0.70	1.00	1.00
Satd. Flow (perm)	283	1783		479	1739			1700		1258	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	579	41	94	576	169	7	128	48	273	430	115
RTOR Reduction (vph)	0	4	0	0	18	0	0	21	0	0	0	77
Lane Group Flow (vph)	94	616	0	94	727	0	0	162	0	273	430	38
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	27.1	27.1		27.1	27.1			19.1		19.1	19.1	19.1
Effective Green, g (s)	27.1	27.1		27.1	27.1			19.1		19.1	19.1	19.1
Actuated g/C Ratio	0.47	0.47		0.47	0.47			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
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	131	830		223	809			557		412	591	502
v/s Ratio Prot		0.35			c0.42						c0.24	
v/s Ratio Perm	0.33			0.20				0.10		0.22		0.02
v/c Ratio	0.72	0.74		0.42	0.90			0.29		0.66	0.73	0.08
Uniform Delay, d1	12.5	12.7		10.3	14.3			14.5		16.8	17.3	13.5
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	17.1	3.6		1.3	12.7			1.3		8.1	7.7	0.3
Delay (s)	29.5	16.3		11.6	27.0			15.8		24.9	24.9	13.8
Level of Service	C	B		B	C			B		C	C	B
Approach Delay (s)		18.0			25.3			15.8			23.3	
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)			58.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			98.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	889	0	0	710	37	47	275	111	0	0	0
Future Volume (vph)	47	889	0	0	710	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			1789			1788	1531			
Flt Permitted	0.21	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	375	1801			1789			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	889	0	0	710	37	47	275	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	80	0	0	0
Lane Group Flow (vph)	47	889	0	0	744	0	0	322	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)	33.6	33.6			33.6			18.0	18.0			
Effective Green, g (s)	33.6	33.6			33.6			18.0	18.0			
Actuated g/C Ratio	0.53	0.53			0.53			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)	198	951			945			506	433			
v/s Ratio Prot		c0.49			0.42							
v/s Ratio Perm	0.13							0.18	0.02			
v/c Ratio	0.24	0.93			0.79			0.64	0.07			
Uniform Delay, d1	8.1	14.0			12.1			19.9	16.7			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	0.6	15.7			4.4			6.0	0.3			
Delay (s)	8.7	29.7			16.5			25.9	17.0			
Level of Service	A	C			B			C	B			
Approach Delay (s)		28.6			16.5			23.7			0.0	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			23.3									
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			63.6									
Intersection Capacity Utilization			73.9%									
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	869	36	67	742	60	26	280	43	68	217	24
Future Volume (vph)	31	869	36	67	742	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		0.10	1.00			0.96			0.77	
Satd. Flow (perm)	313	1790		182	1780			1701			1370	
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	869	36	67	742	60	26	280	43	68	217	24
RTOR Reduction (vph)	0	2	0	0	4	0	0	6	0	0	4	0
Lane Group Flow (vph)	31	903	0	67	798	0	0	343	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)	39.5	39.5		39.5	39.5			21.1			21.1	
Effective Green, g (s)	39.5	39.5		39.5	39.5			21.1			21.1	
Actuated g/C Ratio	0.54	0.54		0.54	0.54			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)	170	973		99	968			494			398	
v/s Ratio Prot		c0.50			0.45							
v/s Ratio Perm	0.10			0.37				0.20			c0.22	
v/c Ratio	0.18	0.93		0.68	0.82			0.69			0.77	
Uniform Delay, d1	8.4	15.2		11.9	13.7			22.9			23.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	14.4		16.8	5.8			7.8			13.1	
Delay (s)	8.9	29.6		28.7	19.5			30.7			36.6	
Level of Service	A	C		C	B			C			D	
Approach Delay (s)		28.9			20.2			30.7			36.6	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			27.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			72.6			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

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1414	1	144	555	395	0	146	334	381	131	17
Future Volume (vph)	0	1414	1	144	555	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	1414	1	144	555	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	1415	0	144	555	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	0.31	0.26		0.08		c0.11	0.08	
v/s Ratio Perm									c0.13			
v/c Ratio		1.03		1.03	0.57	0.47		0.52	0.82	1.01	0.25	
Uniform Delay, d1		29.2		44.7	14.6	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		32.5		83.8	2.4	1.9		1.6	19.9	48.3	0.2	
Delay (s)		61.6		128.5	16.9	15.5		39.4	59.7	91.4	24.0	
Level of Service		E		F	B	B		D	E	F	C	
Approach Delay (s)		61.6			31.1			53.5			72.6	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			52.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			97.4				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			85.7%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

19: Cherry St & S Winooski Ave

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑	↑↑	
Traffic Volume (vph)	96	156	123	459	638	121
Future Volume (vph)	96	156	123	459	638	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.92			1.00	0.98	
Flt Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1619			3385	3339	
Flt Permitted	0.98			0.69	1.00	
Satd. Flow (perm)	1619			2359	3339	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	156	123	459	638	121
RTOR Reduction (vph)	105	0	0	0	25	0
Lane Group Flow (vph)	147	0	0	582	734	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	9.1			22.8	22.8	
Effective Green, g (s)	9.1			22.8	22.8	
Actuated g/C Ratio	0.21			0.52	0.52	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	335			1225	1734	
v/s Ratio Prot	c0.09				0.22	
v/s Ratio Perm				c0.25		
v/c Ratio	0.44			0.48	0.42	
Uniform Delay, d1	15.2			6.7	6.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			1.3	0.8	
Delay (s)	16.1			8.1	7.3	
Level of Service	B			A	A	
Approach Delay (s)	16.1			8.1	7.3	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			8.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			43.9		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

20: Bank St

01/20/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	98	102	96	366	667	71
Future Volume (vph)	98	102	96	366	667	71
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3386	3372	
Flt Permitted	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	1711	1531		2482	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	102	96	366	667	71
RTOR Reduction (vph)	0	86	0	0	12	0
Lane Group Flow (vph)	98	16	0	462	726	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	6.7	6.7		24.7	24.7	
Effective Green, g (s)	6.7	6.7		24.7	24.7	
Actuated g/C Ratio	0.15	0.15		0.57	0.57	
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)	264	236		1412	1919	
v/s Ratio Prot	c0.06				c0.22	
v/s Ratio Perm		0.01		0.19		
v/c Ratio	0.37	0.07		0.33	0.38	
Uniform Delay, d1	16.5	15.7		5.0	5.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1		0.6	0.6	
Delay (s)	17.3	15.8		5.6	5.7	
Level of Service	B	B		A	A	
Approach Delay (s)	16.6			5.6	5.7	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			43.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			54.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	91	1113	89	71	559
Future Volume (vph)	123	91	1113	89	71	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.99			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1650		3383			3402
Flt Permitted	0.97		1.00			0.73
Satd. Flow (perm)	1650		3383			2490
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	91	1113	89	71	559
RTOR Reduction (vph)	32	0	9	0	0	0
Lane Group Flow (vph)	182	0	1193	0	0	630
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	10.6		28.4			28.4
Effective Green, g (s)	10.6		28.4			28.4
Actuated g/C Ratio	0.21		0.56			0.56
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	342		1883			1386
v/s Ratio Prot	c0.11		c0.35			
v/s Ratio Perm						0.25
v/c Ratio	0.53		0.63			0.45
Uniform Delay, d1	18.0		7.7			6.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.6		1.6			1.1
Delay (s)	19.6		9.4			7.8
Level of Service	B		A			A
Approach Delay (s)	19.6		9.4			7.8
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			10.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			51.0		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

23: St Paul St & Cherry St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	148	20	5	199	19	20	5	5	24	5	17
Future Volume (vph)	18	148	20	5	199	19	20	5	5	24	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		1766			1778			1703			1667	
Flt Permitted		0.95			0.99			0.87			0.89	
Satd. Flow (perm)		1688			1758			1533			1528	
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)	18	148	20	5	199	19	20	5	5	24	5	17
RTOR Reduction (vph)	0	11	0	0	9	0	0	2	0	0	8	0
Lane Group Flow (vph)	0	175	0	0	214	0	0	28	0	0	38	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)		8.8			8.8			22.2			22.2	
Effective Green, g (s)		8.8			8.8			22.2			22.2	
Actuated g/C Ratio		0.20			0.20			0.52			0.52	
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)		345			359			791			788	
v/s Ratio Prot												
v/s Ratio Perm		0.10			0.12			0.02			0.02	
v/c Ratio		0.51			0.60			0.03			0.05	
Uniform Delay, d1		15.2			15.5			5.1			5.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.2			2.7			0.1			0.1	
Delay (s)		16.3			18.2			5.2			5.3	
Level of Service		B			B			A			A	
Approach Delay (s)		16.3			18.2			5.2			5.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.20										
Actuated Cycle Length (s)		43.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		32.6%			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

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						 
Traffic Volume (vph)	162	81	319	182	337	1361
Future Volume (vph)	162	81	319	182	337	1361
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	1.00		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	1531		3388
Flt Permitted	0.95	1.00	1.00	1.00		0.79
Satd. Flow (perm)	1711	1531	1801	1531		2703
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	162	81	319	182	337	1361
RTOR Reduction (vph)	0	69	0	52	0	0
Lane Group Flow (vph)	162	12	319	130	0	1698
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	1092		1929
v/s Ratio Prot	c0.09		0.18			
v/s Ratio Perm		0.01		0.08		c0.63
v/c Ratio	0.63	0.05	0.25	0.12		0.88
Uniform Delay, d1	35.2	32.2	4.4	4.0		9.7
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.0	0.1	0.5	0.2		6.2
Delay (s)	40.2	32.3	4.9	4.2		15.9
Level of Service	D	C	A	A		B
Approach Delay (s)	37.6		4.6			15.9
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			15.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			88.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			88.2%		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

01/21/2017

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (vph)	372	70	125	321	38	40
Future Volume (vph)	372	70	125	321	38	40
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)	1762			1776	1636	
Flt Permitted	1.00			0.64	0.98	
Satd. Flow (perm)	1762			1152	1636	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	372	70	125	321	38	40
RTOR Reduction (vph)	13	0	0	0	26	0
Lane Group Flow (vph)	429	0	0	446	52	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.4			22.4	18.3	
Effective Green, g (s)	22.4			22.4	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)	748			489	568	
v/s Ratio Prot	0.24				c0.03	
v/s Ratio Perm				c0.39		
v/c Ratio	0.57			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			21.3	0.3	
Delay (s)	12.6			35.5	11.9	
Level of Service	B			D	B	
Approach Delay (s)	12.6			35.5	11.9	
Approach LOS	B			D	B	
Intersection Summary						
HCM 2000 Control Delay			23.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			52.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			67.2%		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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	199	100	207	434	0	126	0	115	59	381	83
Future Volume (vph)	0	199	100	207	434	0	126	0	115	59	381	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	3329	
Flt Permitted		1.00	1.00	0.63	1.00		0.49		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1139	1801		874		1531	1711	3329	
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	199	100	207	434	0	126	0	115	59	381	83
RTOR Reduction (vph)	0	0	63	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	0	199	37	207	434	0	126	0	44	59	464	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)		17.9	17.9	17.9	17.9		18.3		18.3	18.3	18.3	
Effective Green, g (s)		17.9	17.9	17.9	17.9		18.3		18.3	18.3	18.3	
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)		668	568	422	668		331		581	649	1263	
v/s Ratio Prot		0.11			c0.24						0.14	
v/s Ratio Perm			0.02	0.18			c0.14		0.03	0.03		
v/c Ratio		0.30	0.07	0.49	0.65		0.38		0.08	0.09	0.37	
Uniform Delay, d1		10.7	9.8	11.6	12.6		10.8		9.5	9.6	10.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.0	0.9	2.2		3.3		0.3	0.3	0.8	
Delay (s)		11.0	9.8	12.5	14.7		14.1		9.8	9.9	11.6	
Level of Service		B	A	B	B		B		A	A	B	
Approach Delay (s)		10.6			14.0			12.1			11.4	
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			0.51									
Actuated Cycle Length (s)			48.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			60.4%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	348	0	0	541	67	30	105	51	0	0	0
Future Volume (vph)	54	348	0	0	541	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			0.99		1.00	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1774		1711	1712				
Flt Permitted	0.24	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	439	1801			1774		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	348	0	0	541	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	348	0	0	599	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)	21.3	21.3			21.3		18.1	18.1				
Effective Green, g (s)	21.3	21.3			21.3		18.1	18.1				
Actuated g/C Ratio	0.41	0.41			0.41		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)	181	746			735		602	602				
v/s Ratio Prot		0.19			c0.34			c0.07				
v/s Ratio Perm	0.12						0.02					
v/c Ratio	0.30	0.47			0.82		0.05	0.21				
Uniform Delay, d1	10.1	10.9			13.3		11.0	11.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.9	0.5			6.9		0.2	0.8				
Delay (s)	11.0	11.4			20.3		11.1	12.4				
Level of Service	B	B			C		B	B				
Approach Delay (s)		11.3			20.3			12.2			0.0	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			51.4				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			60.3%				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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	354	47	49	529	17	35	107	50	25	240	34
Future Volume (vph)	20	354	47	49	529	17	35	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)		1705		882	1792			1556			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)	20	354	47	49	529	17	35	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	412	0	49	544	0	0	166	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)		682		352	716			560			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	0.76			0.30			0.47	
Uniform Delay, d1		11.9		9.5	12.9			11.5			12.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.9		0.8	7.4			1.4			2.6	
Delay (s)		15.8		10.4	20.3			12.8			14.9	
Level of Service		B		B	C			B			B	
Approach Delay (s)		15.8			19.5			12.8			14.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			66.7%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	406	75	198	567	45	77	74	121	38	225	27
Future Volume (vph)	0	406	75	198	567	45	77	74	121	38	225	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	1781		1711	1801	1531		1766	
Flt Permitted		1.00		0.25	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1763		445	1781		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	406	75	198	567	45	77	74	121	38	225	27
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	109	0	5	0
Lane Group Flow (vph)	0	474	0	198	612	0	77	74	12	0	285	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		286	777		172	181	153		379	
v/s Ratio Prot		c0.27		0.05	c0.34		c0.05	0.04			c0.16	
v/s Ratio Perm				0.25					0.01			
v/c Ratio		0.96		0.69	0.79		0.45	0.41	0.08		0.75	
Uniform Delay, d1		25.7		25.1	17.6		30.8	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		31.1		7.1	7.9		1.9	1.5	0.2		8.2	
Delay (s)		56.8		32.2	25.5		32.6	32.1	29.8		34.9	
Level of Service		E		C	C		C	C	C		C	
Approach Delay (s)		56.8			27.1			31.2			34.9	
Approach LOS		E			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			72.6			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			95.7%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	407	82	81	428	135	54	157	56	50	84	14
Future Volume (vph)	10	407	82	81	428	135	54	157	56	50	84	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		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.98			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		1759			1786	1531		1778	1531		1748	
Flt Permitted		0.99			0.86	1.00		0.89	1.00		0.85	
Satd. Flow (perm)		1742			1554	1531		1607	1531		1507	
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	135	54	157	56	50	84	14
RTOR Reduction (vph)	0	6	0	0	0	39	0	0	38	0	4	0
Lane Group Flow (vph)	0	493	0	0	509	96	0	211	18	0	144	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		45.8			45.8	45.8		28.0	28.0		28.0	
Effective Green, g (s)		46.8			46.8	46.8		29.0	29.0		29.0	
Actuated g/C Ratio		0.52			0.52	0.52		0.32	0.32		0.32	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		905			808	796		517	493		485	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.33	0.06		c0.13	0.01		0.10	
v/c Ratio		0.55			0.63	0.12		0.41	0.04		0.30	
Uniform Delay, d1		14.5			15.4	11.1		23.8	20.9		22.9	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.7			1.5	0.1		2.4	0.1		0.3	
Delay (s)		15.1			17.0	11.1		26.2	21.1		23.2	
Level of Service		B			B	B		C	C		C	
Approach Delay (s)		15.1			15.7			25.1			23.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		17.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		86.6%			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/St Paul St & Main St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	323	76	59	483	113	96	168	40	41	42	13
Future Volume (vph)	3	323	76	59	483	113	96	168	40	41	42	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	0.97		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1749		1711	1749		1711	1749		1711	1737	
Flt Permitted	0.25	1.00		0.46	1.00		0.72	1.00		0.63	1.00	
Satd. Flow (perm)	452	1749		831	1749		1299	1749		1130	1737	
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	323	76	59	483	113	96	168	40	41	42	13
RTOR Reduction (vph)	0	17	0	0	17	0	0	15	0	0	8	0
Lane Group Flow (vph)	3	382	0	59	579	0	96	193	0	41	47	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)	20.9	20.9		20.9	20.9		18.2	18.2		18.2	18.2	
Effective Green, g (s)	20.9	20.9		20.9	20.9		18.2	18.2		18.2	18.2	
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)	184	715		339	715		462	622		402	618	
v/s Ratio Prot		0.22			c0.33			c0.11			0.03	
v/s Ratio Perm	0.01			0.07			0.07			0.04		
v/c Ratio	0.02	0.53		0.17	0.81		0.21	0.31		0.10	0.08	
Uniform Delay, d1	9.0	11.4		9.6	13.3		11.4	11.9		11.0	10.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.8		0.2	6.9		1.0	1.3		0.5	0.2	
Delay (s)	9.0	12.2		9.9	20.3		12.5	13.2		11.5	11.1	
Level of Service	A	B		A	C		B	B		B	B	
Approach Delay (s)		12.2			19.3			13.0			11.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			51.1			Sum of lost time (s)			12.0			
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

15: S Winooski Ave & Main St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	336	18	113	539	141	6	53	11	95	265	119
Future Volume (vph)	41	336	18	113	539	141	6	53	11	95	265	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1787		1711	1745			1755		1711	1801	1531
Flt Permitted	0.20	1.00		0.41	1.00			0.97		0.66	1.00	1.00
Satd. Flow (perm)	360	1787		737	1745			1710		1183	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	336	18	113	539	141	6	53	11	95	265	119
RTOR Reduction (vph)	0	3	0	0	16	0	0	7	0	0	0	58
Lane Group Flow (vph)	41	351	0	113	664	0	0	63	0	95	265	61
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	19.0	19.0		19.0	19.0			20.2		30.2	30.2	30.2
Effective Green, g (s)	20.0	20.0		20.0	20.0			21.2		31.2	31.2	31.2
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.35		0.51	0.51	0.51
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)	117	583		240	570			592		646	918	780
v/s Ratio Prot		0.20			c0.38					0.01	c0.15	
v/s Ratio Perm	0.11			0.15				0.04		0.06		0.04
v/c Ratio	0.35	0.60		0.47	1.16			0.11		0.15	0.29	0.08
Uniform Delay, d1	15.7	17.3		16.4	20.6			13.6		8.0	8.6	7.7
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	8.1	4.5		6.5	92.1			0.4		0.1	0.8	0.2
Delay (s)	23.7	21.8		22.9	112.7			13.9		8.1	9.4	7.9
Level of Service	C	C		C	F			B		A	A	A
Approach Delay (s)		22.0			99.9			13.9			8.8	
Approach LOS		C			F			B			A	
Intersection Summary												
HCM 2000 Control Delay			53.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			61.2			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			67.6%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	455	0	0	790	32	41	542	46	0	0	0
Future Volume (vph)	14	455	0	0	790	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)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1791		1711	1780				
Flt Permitted	0.11	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	198	1801			1791		1711	1780				
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	455	0	0	790	32	41	542	46	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	0
Lane Group Flow (vph)	14	455	0	0	820	0	41	584	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	37.4	37.4			37.4		26.5	26.5				
Effective Green, g (s)	38.4	38.4			38.4		27.5	27.5				
Actuated g/C Ratio	0.51	0.51			0.51		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)	100	911			906		619	644				
v/s Ratio Prot		0.25			c0.46			c0.33				
v/s Ratio Perm	0.07						0.02					
v/c Ratio	0.14	0.50			0.91		0.07	0.91				
Uniform Delay, d1	10.0	12.4			17.1		15.8	23.0				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.6	0.4			12.3		0.0	16.5				
Delay (s)	10.6	12.8			29.4		15.9	39.4				
Level of Service	B	B			C		B	D				
Approach Delay (s)		12.8			29.4			37.9			0.0	
Approach LOS		B			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			28.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			75.9				Sum of lost time (s)			10.0		
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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	449	14	56	672	32	21	194	47	66	203	19
Future Volume (vph)	15	449	14	56	672	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)	5.0	5.0		5.0	5.0			5.0			5.0	
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	0.26	1.00		0.44	1.00			0.96			0.83	
Satd. Flow (perm)	473	1792		790	1788			1690			1476	
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	449	14	56	672	32	21	194	47	66	203	19
RTOR Reduction (vph)	0	2	0	0	3	0	0	12	0	0	4	0
Lane Group Flow (vph)	15	461	0	56	701	0	0	250	0	0	284	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	34.1	34.1		34.1	34.1			15.3			15.3	
Effective Green, g (s)	35.1	35.1		35.1	35.1			16.3			16.3	
Actuated g/C Ratio	0.57	0.57		0.57	0.57			0.27			0.27	
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)	270	1024		451	1022			448			391	
v/s Ratio Prot		0.26			c0.39							
v/s Ratio Perm	0.03			0.07				0.15			c0.19	
v/c Ratio	0.06	0.45		0.12	0.69			0.56			0.73	
Uniform Delay, d1	5.8	7.6		6.1	9.3			19.4			20.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	1.4		0.6	3.8			1.5			6.6	
Delay (s)	6.2	9.0		6.6	13.0			20.9			27.1	
Level of Service	A	A		A	B			C			C	
Approach Delay (s)		8.9			12.6			20.9			27.1	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			61.4			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			85.5%			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

01/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	701	4	225	993	609	0	85	180	240	73	46
Future Volume (vph)	0	701	4	225	993	609	0	85	180	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	701	4	225	993	609	0	85	180	240	73	46
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	159	0	0	0
Lane Group Flow (vph)	0	704	0	225	993	609	0	85	21	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		14.0	47.1	47.1		9.3	9.3	7.1	22.4	
Effective Green, g (s)		27.1		14.0	47.1	47.1		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	0.27	
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)		1136		293	1040	884		205	174	289	466	
v/s Ratio Prot		0.21		0.13	c0.55	0.40		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.62		0.77	0.95	0.69		0.41	0.12	0.83	0.26	
Uniform Delay, d1		22.9		32.2	16.2	12.1		33.6	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	18.9	4.4		1.4	0.3	18.0	0.3	
Delay (s)		25.4		43.6	35.1	16.4		34.9	32.7	54.6	23.3	
Level of Service		C		D	D	B		C	C	D	C	
Approach Delay (s)		25.4			29.9			33.4			44.2	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			30.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			81.5				Sum of lost time (s)		24.0			
Intersection Capacity Utilization			75.8%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

19: Cherry St & S Winooski Ave

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	46	95	148	164	624	108
Future Volume (vph)	46	95	148	164	624	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.91			1.00	0.98	
Flt Protected	0.98			0.98	1.00	
Satd. Flow (prot)	1611			3342	3346	
Flt Permitted	0.98			0.60	1.00	
Satd. Flow (perm)	1611			2042	3346	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	95	148	164	624	108
RTOR Reduction (vph)	82	0	0	0	20	0
Lane Group Flow (vph)	59	0	0	312	712	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.0			24.7	24.7	
Effective Green, g (s)	6.0			24.7	24.7	
Actuated g/C Ratio	0.14			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)	226			1181	1935	
v/s Ratio Prot	c0.04				c0.21	
v/s Ratio Perm				0.15		
v/c Ratio	0.26			0.26	0.37	
Uniform Delay, d1	16.4			4.5	4.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.6			0.5	0.5	
Delay (s)	17.0			5.0	5.4	
Level of Service	B			A	A	
Approach Delay (s)	17.0			5.0	5.4	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			42.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			52.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: Bank St

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	39	52	52	285	602	112
Future Volume (vph)	39	52	52	285	602	112
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3395	3341	
Flt Permitted	0.95	1.00		0.81	1.00	
Satd. Flow (perm)	1711	1531		2772	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	52	52	285	602	112
RTOR Reduction (vph)	0	47	0	0	19	0
Lane Group Flow (vph)	39	5	0	337	695	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.2	4.2		27.3	27.3	
Effective Green, g (s)	4.2	4.2		27.3	27.3	
Actuated g/C Ratio	0.10	0.10		0.63	0.63	
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)	165	147		1739	2096	
v/s Ratio Prot	c0.02				c0.21	
v/s Ratio Perm		0.00		0.12		
v/c Ratio	0.24	0.03		0.19	0.33	
Uniform Delay, d1	18.2	17.8		3.4	3.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.1		0.2	0.4	
Delay (s)	18.9	17.9		3.7	4.2	
Level of Service	B	B		A	A	
Approach Delay (s)	18.3			3.7	4.2	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			5.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.32			
Actuated Cycle Length (s)			43.5		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	73	40	472	109	129	1333
Future Volume (vph)	73	40	472	109	129	1333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.95		0.97			1.00
Flt Protected	0.97		1.00			1.00
Satd. Flow (prot)	1661		3325			3406
Flt Permitted	0.97		1.00			0.83
Satd. Flow (perm)	1661		3325			2837
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	40	472	109	129	1333
RTOR Reduction (vph)	35	0	26	0	0	0
Lane Group Flow (vph)	78	0	555	0	0	1462
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	5.0		26.2			26.2
Effective Green, g (s)	5.0		26.2			26.2
Actuated g/C Ratio	0.12		0.61			0.61
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	192		2016			1720
v/s Ratio Prot	c0.05		0.17			
v/s Ratio Perm						c0.52
v/c Ratio	0.40		0.28			0.85
Uniform Delay, d1	17.7		4.0			6.9
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.4		0.3			5.5
Delay (s)	19.1		4.4			12.4
Level of Service	B		A			B
Approach Delay (s)	19.1		4.4			12.4
Approach LOS	B		A			B
Intersection Summary						
HCM 2000 Control Delay			10.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			43.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			78.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

23: St Paul St & Cherry St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	162	20	5	204	20	20	5	5	24	5	17
Future Volume (vph)	23	162	20	5	204	20	20	5	5	24	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		0.99			1.00			0.97			0.97	
Satd. Flow (prot)		1767			1777			1703			1667	
Flt Permitted		0.94			0.99			0.87			0.89	
Satd. Flow (perm)		1671			1757			1528			1525	
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)	23	162	20	5	204	20	20	5	5	24	5	17
RTOR Reduction (vph)	0	10	0	0	9	0	0	2	0	0	8	0
Lane Group Flow (vph)	0	195	0	0	220	0	0	28	0	0	38	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)		8.8			8.8			21.0			21.0	
Effective Green, g (s)		8.8			8.8			21.0			21.0	
Actuated g/C Ratio		0.21			0.21			0.50			0.50	
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)		351			369			767			766	
v/s Ratio Prot												
v/s Ratio Perm		0.12			0.13			0.02			0.02	
v/c Ratio		0.55			0.60			0.04			0.05	
Uniform Delay, d1		14.7			14.9			5.3			5.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			2.6			0.1			0.1	
Delay (s)		16.6			17.5			5.4			5.4	
Level of Service		B			B			A			A	
Approach Delay (s)		16.6			17.5			5.4			5.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.21										
Actuated Cycle Length (s)		41.8			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		36.2%			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

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	171	866	501	184	647
Future Volume (vph)	156	171	866	501	184	647
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	1.00		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	1531		3384
Flt Permitted	0.95	1.00	1.00	1.00		0.54
Satd. Flow (perm)	1711	1531	1801	1531		1864
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	156	171	866	501	184	647
RTOR Reduction (vph)	0	40	0	242	0	0
Lane Group Flow (vph)	156	131	866	259	0	831
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	7.7	7.7	21.1	21.1		21.1
Effective Green, g (s)	7.7	7.7	21.1	21.1		21.1
Actuated g/C Ratio	0.19	0.19	0.52	0.52		0.52
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	322	288	931	791		963
v/s Ratio Prot	c0.09		c0.48			
v/s Ratio Perm		0.09		0.17		0.45
v/c Ratio	0.48	0.46	0.93	0.33		0.96dl
Uniform Delay, d1	14.8	14.7	9.2	5.7		8.6
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	1.1	16.8	1.1		10.1
Delay (s)	15.9	15.8	26.0	6.8		18.7
Level of Service	B	B	C	A		B
Approach Delay (s)	15.9		18.9			18.7
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay			18.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			40.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			92.4%		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

01/21/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	434	47	78	459	104	154
Future Volume (vph)	434	47	78	459	104	154
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	0.92	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1777			1788	1623	
Flt Permitted	1.00			0.78	0.98	
Satd. Flow (perm)	1777			1413	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	434	47	78	459	104	154
RTOR Reduction (vph)	7	0	0	0	83	0
Lane Group Flow (vph)	474	0	0	537	175	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.7			22.7	18.3	
Effective Green, g (s)	22.7			22.7	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)	761			605	560	
v/s Ratio Prot	0.27				c0.11	
v/s Ratio Perm				c0.38		
v/c Ratio	0.62			0.89	0.31	
Uniform Delay, d1	11.8			14.0	12.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.6			14.7	1.5	
Delay (s)	13.4			28.7	14.2	
Level of Service	B			C	B	
Approach Delay (s)	13.4			28.7	14.2	
Approach LOS	B			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			53.0		Sum of lost time (s)	12.0
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

7: S Winooski Ave/N Winooski Ave & Pearl St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑		↑		↑	↑	↑↓	↑
Traffic Volume (vph)	0	375	118	218	452	0	201	0	347	107	323	51
Future Volume (vph)	0	375	118	218	452	0	201	0	347	107	323	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	0.46	1.00		0.53		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	821	1801		954		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	375	118	218	452	0	201	0	347	107	323	51
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	189	0	0	0
Lane Group Flow (vph)	0	375	41	218	452	0	201	0	158	107	374	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)		17.8	17.8	17.8	17.8		21.2		21.2	21.2	21.2	
Effective Green, g (s)		17.8	17.8	17.8	17.8		21.2		21.2	21.2	21.2	
Actuated g/C Ratio		0.35	0.35	0.35	0.35		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)		628	534	286	628		396		636	711	1392	
v/s Ratio Prot		0.21			0.25						0.11	
v/s Ratio Perm			0.03	c0.27			c0.21		0.10	0.06		
v/c Ratio		0.60	0.08	0.76	0.72		0.51		0.25	0.15	0.27	
Uniform Delay, d1		13.7	11.1	14.7	14.4		11.0		9.7	9.3	9.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.1	11.4	4.0		4.6		0.9	0.4	0.5	
Delay (s)		15.2	11.2	26.1	18.4		15.6		10.6	9.7	10.3	
Level of Service		B	B	C	B		B		B	A	B	
Approach Delay (s)		14.2			20.9			12.5			10.2	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			51.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			71.8%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	610	0	0	585	65	52	311	56	0	0	0
Future Volume (vph)	168	610	0	0	585	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)	395	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	610	0	0	585	65	52	311	56	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	12	0	0	0	0
Lane Group Flow (vph)	168	610	0	0	643	0	52	355	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	23.2	23.2			23.2		18.1	18.1				
Effective Green, g (s)	23.2	23.2			23.2		18.1	18.1				
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)	171	783			773		581	597				
v/s Ratio Prot		0.34			0.36			c0.20				
v/s Ratio Perm	c0.43						0.03					
v/c Ratio	0.98	0.78			0.83		0.09	0.59				
Uniform Delay, d1	14.8	12.9			13.3		12.0	14.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	63.3	4.9			7.6		0.3	4.3				
Delay (s)	78.1	17.8			20.9		12.3	18.9				
Level of Service	E	B			C		B	B				
Approach Delay (s)		30.8			20.9			18.1			0.0	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		24.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		53.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		78.8%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	581	48	60	562	47	67	271	59	29	194	39
Future Volume (vph)	69	581	48	60	562	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			0.92	
Satd. Flow (perm)		1448		645	1780			1562			1624	
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)	69	581	48	60	562	47	67	271	59	29	194	39
RTOR Reduction (vph)	0	4	0	0	5	0	0	10	0	0	10	0
Lane Group Flow (vph)	0	694	0	60	604	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)		34.0		34.0	34.0			19.0			19.0	
Effective Green, g (s)		34.0		34.0	34.0			19.0			19.0	
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)		757		337	931			456			474	
v/s Ratio Prot					0.34							
v/s Ratio Perm		c0.48		0.09				c0.25			0.16	
v/c Ratio		0.92		0.18	0.65			0.85			0.53	
Uniform Delay, d1		14.2		8.2	11.2			21.6			19.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		17.7		1.2	3.5			17.6			4.2	
Delay (s)		31.9		9.3	14.7			39.3			23.5	
Level of Service		C		A	B			D			C	
Approach Delay (s)		31.9			14.2			39.3			23.5	
Approach LOS		C			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			26.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			117.9%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	565	59	151	632	92	156	261	194	27	119	12
Future Volume (vph)	0	565	59	151	632	92	156	261	194	27	119	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)		1778		1711	1766		1711	1801	1531		1767	
Flt Permitted		1.00		0.13	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1778		238	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	565	59	151	632	92	156	261	194	27	119	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	158	0	3	0
Lane Group Flow (vph)	0	620	0	151	724	0	156	261	36	0	155	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		195	823		317	334	284		255	
v/s Ratio Prot		c0.35		0.04	c0.41		0.09	c0.14			c0.09	
v/s Ratio Perm				0.31					0.02			
v/c Ratio		1.02		0.77	0.88		0.49	0.78	0.13		0.61	
Uniform Delay, d1		29.2		34.4	21.4		32.3	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		43.1		17.3	12.9		1.2	11.3	0.2		4.0	
Delay (s)		72.2		51.7	34.3		33.5	45.6	30.2		39.5	
Level of Service		E		D	C		C	D	C		D	
Approach Delay (s)		72.2			37.3			37.6			39.5	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			47.1			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			114.4%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	417	160	68	562	106	212	170	63	158	289	23
Future Volume (vph)	16	417	160	68	562	106	212	170	63	158	289	23
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		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.97	1.00		0.98	
Satd. Flow (prot)		1733			1791	1531		1752	1531		1759	
Flt Permitted		0.94			0.85	1.00		0.55	1.00		0.51	
Satd. Flow (perm)		1637			1534	1531		991	1531		910	
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	417	160	68	562	106	212	170	63	158	289	23
RTOR Reduction (vph)	0	8	0	0	0	19	0	0	25	0	2	0
Lane Group Flow (vph)	0	585	0	0	630	87	0	382	38	0	468	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		56.4			56.4	56.4		47.4	47.4		47.4	
Effective Green, g (s)		57.4			57.4	57.4		48.4	48.4		48.4	
Actuated g/C Ratio		0.48			0.48	0.48		0.40	0.40		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		783			733	732		399	617		367	
v/s Ratio Prot												
v/s Ratio Perm		0.36			c0.41	0.06		0.39	0.02		c0.51	
v/c Ratio		0.75			0.86	0.12		0.96	0.06		1.28	
Uniform Delay, d1		25.4			27.7	17.3		34.8	21.9		35.8	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		3.9			9.9	0.1		35.5	0.2		143.7	
Delay (s)		29.3			37.6	17.4		70.3	22.1		179.5	
Level of Service		C			D	B		E	C		F	
Approach Delay (s)		29.3			34.7			63.5			179.5	
Approach LOS		C			C			E			F	
Intersection Summary												
HCM 2000 Control Delay		69.3			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		1.01										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		118.6%			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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	481	123	64	503	129	119	130	75	140	149	9
Future Volume (vph)	17	481	123	64	503	129	119	130	75	140	149	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	0.97		1.00	0.97		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1746		1711	1746		1711	1702		1711	1785	
Flt Permitted	0.22	1.00		0.25	1.00		0.66	1.00		0.63	1.00	
Satd. Flow (perm)	402	1746		452	1746		1183	1702		1133	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	481	123	64	503	129	119	130	75	140	149	9
RTOR Reduction (vph)	0	18	0	0	18	0	0	36	0	0	4	0
Lane Group Flow (vph)	17	586	0	64	614	0	119	169	0	140	154	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)	21.7	21.7		21.7	21.7		18.1	18.1		18.1	18.1	
Effective Green, g (s)	21.7	21.7		21.7	21.7		18.1	18.1		18.1	18.1	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		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)	168	731		189	731		413	594		395	623	
v/s Ratio Prot		0.34			c0.35			0.10			0.09	
v/s Ratio Perm	0.04			0.14			0.10			c0.12		
v/c Ratio	0.10	0.80		0.34	0.84		0.29	0.28		0.35	0.25	
Uniform Delay, d1	9.1	13.2		10.2	13.5		12.2	12.2		12.5	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	6.3		1.1	8.4		1.8	1.2		2.5	0.9	
Delay (s)	9.4	19.5		11.3	21.9		13.9	13.4		15.0	12.9	
Level of Service	A	B		B	C		B	B		B	B	
Approach Delay (s)		19.2			20.9			13.6			13.9	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			51.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			77.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	633	57	92	656	174	7	167	49	281	491	134
Future Volume (vph)	97	633	57	92	656	174	7	167	49	281	491	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1778		1711	1744			1745		1711	1801	1531
Flt Permitted	0.13	1.00		0.22	1.00			0.98		0.34	1.00	1.00
Satd. Flow (perm)	226	1778		400	1744			1713		619	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	633	57	92	656	174	7	167	49	281	491	134
RTOR Reduction (vph)	0	4	0	0	11	0	0	11	0	0	0	86
Lane Group Flow (vph)	97	686	0	92	819	0	0	212	0	281	491	48
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	48.0	48.0		48.0	48.0			19.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	49.0		48.0	48.0			19.0		32.0	32.0	32.0
Actuated g/C Ratio	0.53	0.54		0.53	0.53			0.21		0.36	0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	120	968		213	930			361		317	640	544
v/s Ratio Prot		0.39			c0.47					0.08	c0.27	
v/s Ratio Perm	0.43			0.23				0.12		c0.24		0.03
v/c Ratio	0.81	0.71		0.43	0.88			0.59		0.89	0.77	0.09
Uniform Delay, d1	17.2	15.2		12.7	18.5			32.0		27.1	25.7	19.3
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	42.4	4.4		6.3	11.7			6.8		24.3	8.6	0.3
Delay (s)	59.6	19.6		19.0	30.2			38.8		51.4	34.3	19.6
Level of Service	E	B		B	C			D		D	C	B
Approach Delay (s)		24.5			29.1			38.8			37.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			31.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			105.1%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	937	0	0	779	38	48	368	109	0	0	0
Future Volume (vph)	43	937	0	0	779	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)	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	0.97				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1789		1711	1739				
Flt Permitted	0.14	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	256	1801			1789		1711	1739				
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	937	0	0	779	38	48	368	109	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	17	0	0	0	0
Lane Group Flow (vph)	43	937	0	0	815	0	48	460	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	32.1	32.1			32.1		19.8	19.8				
Effective Green, g (s)	33.1	33.1			33.1		20.8	20.8				
Actuated g/C Ratio	0.53	0.53			0.53		0.34	0.34				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	136	963			956		574	584				
v/s Ratio Prot		c0.52			0.46			c0.26				
v/s Ratio Perm	0.17						0.03					
v/c Ratio	0.32	0.97			0.85		0.08	0.79				
Uniform Delay, d1	8.1	14.0			12.3		14.0	18.6				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.3	22.5			7.4		0.1	6.9				
Delay (s)	9.4	36.5			19.7		14.1	25.5				
Level of Service	A	D			B		B	C				
Approach Delay (s)		35.3			19.7			24.4			0.0	
Approach LOS		D			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			27.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			61.9				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			82.0%				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

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	912	37	69	807	66	32	289	40	70	214	34
Future Volume (vph)	32	912	37	69	807	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)	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	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	0.15	1.00		0.11	1.00			0.95			0.78	
Satd. Flow (perm)	269	1790		200	1780			1690			1378	
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	912	37	69	807	66	32	289	40	70	214	34
RTOR Reduction (vph)	0	2	0	0	4	0	0	7	0	0	7	0
Lane Group Flow (vph)	32	947	0	69	869	0	0	354	0	0	311	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	35.1	35.1		35.1	35.1			16.7			16.7	
Effective Green, g (s)	36.1	36.1		36.1	36.1			17.7			17.7	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.29			0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	157	1045		116	1039			484			394	
v/s Ratio Prot		c0.53			0.49							
v/s Ratio Perm	0.12			0.35				0.21			c0.23	
v/c Ratio	0.20	0.91		0.59	0.84			0.73			0.79	
Uniform Delay, d1	6.1	11.4		8.2	10.4			19.9			20.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.9	12.8		20.5	8.0			5.6			10.1	
Delay (s)	9.0	24.1		28.7	18.4			25.5			30.4	
Level of Service	A	C		C	B			C			C	
Approach Delay (s)		23.6			19.2			25.5			30.4	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			23.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			61.8			Sum of lost time (s)			8.0			
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

18: S Prospect St & Main St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1453	1	148	569	407	0	151	344	393	135	17
Future Volume (vph)	0	1453	1	148	569	407	0	151	344	393	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	1453	1	148	569	407	0	151	344	393	135	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	143	0	0	0
Lane Group Flow (vph)	0	1454	0	148	569	407	0	151	201	393	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	13.1	35.5	
Effective Green, g (s)		45.0		10.0	61.0	61.0		16.4	16.4	13.1	35.5	
Actuated g/C Ratio		0.41		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)		1418		157	1012	860		272	231	400	579	
v/s Ratio Prot		c0.43		c0.09	0.32	0.27		0.08		c0.12	0.09	
v/s Ratio Perm									c0.13			
v/c Ratio		1.03		0.94	0.56	0.47		0.56	0.87	0.98	0.26	
Uniform Delay, d1		31.8		49.0	15.2	14.2		42.7	45.0	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		30.6		54.7	2.3	1.9		2.4	28.2	40.1	0.2	
Delay (s)		62.3		103.6	17.5	16.0		45.1	73.2	87.7	27.1	
Level of Service		E		F	B	B		D	E	F	C	
Approach Delay (s)		62.3			28.3			64.6			70.8	
Approach LOS		E			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			53.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			108.5				Sum of lost time (s)			24.0		
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

19: Cherry St & S Winooski Ave

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	98	161	127	473	657	123
Future Volume (vph)	98	161	127	473	657	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.92			1.00	0.98	
Flt Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1619			3385	3340	
Flt Permitted	0.98			0.68	1.00	
Satd. Flow (perm)	1619			2318	3340	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	161	127	473	657	123
RTOR Reduction (vph)	83	0	0	0	26	0
Lane Group Flow (vph)	176	0	0	600	754	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	9.6			20.7	20.7	
Effective Green, g (s)	9.6			20.7	20.7	
Actuated g/C Ratio	0.23			0.49	0.49	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	367			1134	1634	
v/s Ratio Prot	c0.11				0.23	
v/s Ratio Perm				c0.26		
v/c Ratio	0.48			0.53	0.46	
Uniform Delay, d1	14.2			7.4	7.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			1.8	0.9	
Delay (s)	15.2			9.2	8.1	
Level of Service	B			A	A	
Approach Delay (s)	15.2			9.2	8.1	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			42.3		Sum of lost time (s)	12.0
Intersection Capacity Utilization			69.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

20: Bank St

01/21/2017

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	101	103	99	377	687	73
Future Volume (vph)	101	103	99	377	687	73
Ideal Flow (vphpl)	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		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		0.99	1.00	
Satd. Flow (prot)	1711	1531		3386	3372	
Flt Permitted	0.95	1.00		0.72	1.00	
Satd. Flow (perm)	1711	1531		2453	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	101	103	99	377	687	73
RTOR Reduction (vph)	0	81	0	0	12	0
Lane Group Flow (vph)	101	22	0	476	748	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	6.6	6.6		22.7	22.7	
Effective Green, g (s)	6.6	6.6		22.7	22.7	
Actuated g/C Ratio	0.16	0.16		0.55	0.55	
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)	273	244		1348	1853	
v/s Ratio Prot	c0.06				c0.22	
v/s Ratio Perm		0.01		0.19		
v/c Ratio	0.37	0.09		0.35	0.40	
Uniform Delay, d1	15.5	14.8		5.2	5.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		0.7	0.7	
Delay (s)	16.3	15.0		5.9	6.0	
Level of Service	B	B		A	A	
Approach Delay (s)	15.6			5.9	6.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			41.3		Sum of lost time (s)	12.0
Intersection Capacity Utilization			55.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

22: Battery St & Cherry St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	92	1146	92	72	576
Future Volume (vph)	127	92	1146	92	72	576
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.99			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1651		3383			3402
Flt Permitted	0.97		1.00			0.70
Satd. Flow (perm)	1651		3383			2410
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	92	1146	92	72	576
RTOR Reduction (vph)	13	0	10	0	0	0
Lane Group Flow (vph)	206	0	1228	0	0	648
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.9		21.8			21.8
Effective Green, g (s)	8.9		21.8			21.8
Actuated g/C Ratio	0.21		0.51			0.51
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	344		1727			1230
v/s Ratio Prot	c0.12		c0.36			
v/s Ratio Perm						0.27
v/c Ratio	0.60		0.71			0.53
Uniform Delay, d1	15.3		8.0			7.0
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	2.8		2.5			1.6
Delay (s)	18.1		10.5			8.6
Level of Service	B		B			A
Approach Delay (s)	18.1		10.5			8.6
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			42.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			80.3%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

FIGURE 5-A

HCM Signalized Intersection Capacity Analysis

23: St Paul St & Cherry St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	151	20	5	203	20	20	5	5	25	5	18
Future Volume (vph)	18	151	20	5	203	20	20	5	5	25	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		1767			1777			1703			1666	
Flt Permitted		0.95			0.99			0.87			0.89	
Satd. Flow (perm)		1690			1758			1528			1522	
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)	18	151	20	5	203	20	20	5	5	25	5	18
RTOR Reduction (vph)	0	11	0	0	9	0	0	2	0	0	9	0
Lane Group Flow (vph)	0	178	0	0	219	0	0	28	0	0	39	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)		8.8			8.8			21.2			21.2	
Effective Green, g (s)		8.8			8.8			21.2			21.2	
Actuated g/C Ratio		0.21			0.21			0.50			0.50	
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)		354			368			771			768	
v/s Ratio Prot												
v/s Ratio Perm		0.11			0.12			0.02			0.03	
v/c Ratio		0.50			0.59			0.04			0.05	
Uniform Delay, d1		14.7			15.0			5.2			5.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.1			2.6			0.1			0.1	
Delay (s)		15.8			17.6			5.3			5.4	
Level of Service		B			B			A			A	
Approach Delay (s)		15.8			17.6			5.3			5.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.21										
Actuated Cycle Length (s)		42.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		32.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

FIGURE 5-A

Timings

13: Pine St & Main St

01/23/2017

												
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9	
Lane Configurations												
Traffic Volume (vph)	10	407	81	428	94	56	120	56	35	60		
Future Volume (vph)	10	407	81	428	94	56	120	56	35	60		
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		
Protected Phases		2		6			8			4	9	
Permitted Phases	2		6		6	8		8	4			
Detector Phase	2	2	6	6	6	8	8	8	4	4		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	8.0	
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	22.0	22.0	22.0	22.0	22.0	23.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	32.0	32.0	32.0	28.0	28.0	23.0	
Total Split (%)	38.9%	38.9%	38.9%	38.9%	38.9%	35.6%	35.6%	35.6%	31.1%	31.1%	26%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
Lost Time Adjust (s)		-1.0		-1.0	0.0		-1.0	-2.0		-1.0		
Total Lost Time (s)		4.0		4.0	5.0		4.0	3.0		4.0		
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None	
Act Effct Green (s)		46.6		46.6	45.6		30.8	31.8		30.8		
Actuated g/C Ratio		0.52		0.52	0.51		0.34	0.35		0.34		
v/c Ratio		0.55		0.63	0.12		0.32	0.10		0.20		
Control Delay		19.8		23.2	8.3		24.0	6.5		20.4		
Queue Delay		0.0		2.2	0.0		0.0	0.0		0.0		
Total Delay		19.8		25.4	8.3		24.0	6.5		20.4		
LOS		B		C	A		C	A		C		
Approach Delay		19.8		22.8			19.8			20.4		
Approach LOS		B		C			B			C		
Intersection Summary												
Cycle Length: 90												
Actuated Cycle Length: 90												
Offset: 44 (49%), Referenced to phase 8:NBTL, Start of Yellow												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.63												
Intersection Signal Delay: 21.1												
Intersection LOS: C												
Intersection Capacity Utilization 76.6%												
ICU Level of Service D												
Analysis Period (min) 15												

Splits and Phases: 13: Pine St & Main St

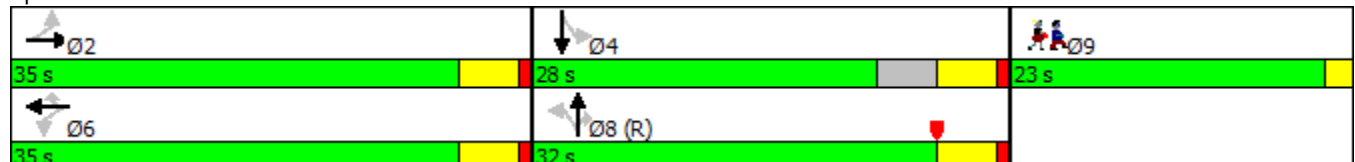


FIGURE 5-A

Phasings

13: Pine St & Main St

01/23/2017



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Protected Phases	2		6		8		8		4		9
Permitted Phases	2		6		6	8		8	4		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	8.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	32.0	32.0	32.0	28.0	28.0	23.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	38.9%	35.6%	35.6%	35.6%	31.1%	31.1%	26%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0	27.0	27.0	27.0	23.0	23.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)											7.0
Flash Dont Walk (s)											14.0
Pedestrian Calls (#/hr)											5
90th %ile Green (s)	30.0	30.0	30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	21.0
90th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Ped
70th %ile Green (s)	47.7	47.7	47.7	47.7	47.7	32.3	32.3	32.3	32.3	32.3	0.0
70th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
50th %ile Green (s)	47.7	47.7	47.7	47.7	47.7	32.3	32.3	32.3	32.3	32.3	0.0
50th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
30th %ile Green (s)	49.7	49.7	49.7	49.7	49.7	30.3	30.3	30.3	30.3	30.3	0.0
30th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
10th %ile Green (s)	53.0	53.0	53.0	53.0	53.0	27.0	27.0	27.0	27.0	27.0	0.0
10th %ile Term Code	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 44 (49%), Referenced to phase 8:NBT, Start of Yellow

Control Type: Actuated-Coordinated

FIGURE 5-A

Timings

13: Pine St & Main St

01/23/2017

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	10	407	81	428	135	54	157	56	50	84	
Future Volume (vph)	10	407	81	428	135	54	157	56	50	84	
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2		6			8			4	9
Permitted Phases	2		6		6	8		8	4		
Detector Phase	2	2	6	6	6	8	8	8	4	4	
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	8.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	32.0	32.0	32.0	32.0	32.0	23.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	38.9%	35.6%	35.6%	35.6%	35.6%	35.6%	26%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)		46.8		46.8	46.8		30.6	30.6		30.6	
Actuated g/C Ratio		0.52		0.52	0.52		0.34	0.34		0.34	
v/c Ratio		0.55		0.63	0.16		0.39	0.10		0.29	
Control Delay		19.6		22.9	7.4		25.2	6.8		22.7	
Queue Delay		0.0		2.1	0.0		0.0	0.0		0.0	
Total Delay		19.6		25.1	7.4		25.2	6.8		22.7	
LOS		B		C	A		C	A		C	
Approach Delay		19.6		21.4			21.4			22.7	
Approach LOS		B		C			C			C	
Intersection Summary											
Cycle Length: 90											
Actuated Cycle Length: 90											
Offset: 44 (49%), Referenced to phase 8:NBTL, Start of Yellow											
Natural Cycle: 80											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.63											
Intersection Signal Delay: 20.9											
Intersection LOS: C											
Intersection Capacity Utilization 86.6%											
ICU Level of Service E											
Analysis Period (min) 15											

Splits and Phases: 13: Pine St & Main St

											
Ø2				Ø4						Ø9	
35 s				32 s						23 s	
											
Ø6				Ø8 (R)							
35 s				32 s							

FIGURE 5-A

Phasings

13: Pine St & Main St

01/23/2017



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Protected Phases	2		6		8		8		4		9
Permitted Phases	2		6		6	8		8	4		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	8.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	32.0	32.0	32.0	32.0	32.0	23.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	38.9%	35.6%	35.6%	35.6%	35.6%	35.6%	26%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)											7.0
Flash Dont Walk (s)											14.0
Pedestrian Calls (#/hr)											5
90th %ile Green (s)	30.0	30.0	30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	21.0
90th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Ped
70th %ile Green (s)	48.7	48.7	48.7	48.7	48.7	31.3	31.3	31.3	31.3	31.3	0.0
70th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
50th %ile Green (s)	47.7	47.7	47.7	47.7	47.7	32.3	32.3	32.3	32.3	32.3	0.0
50th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
30th %ile Green (s)	49.7	49.7	49.7	49.7	49.7	30.3	30.3	30.3	30.3	30.3	0.0
30th %ile Term Code	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord	Skip
10th %ile Green (s)	53.0	53.0	53.0	53.0	53.0	27.0	27.0	27.0	27.0	27.0	0.0
10th %ile Term Code	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 44 (49%), Referenced to phase 8:NBT, Start of Yellow

Control Type: Actuated-Coordinated

FIGURE 5-A

Timings

13: Pine St & Main St

01/23/2017

												
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9	
Lane Configurations												
Traffic Volume (vph)	16	417	68	562	66	214	133	63	110	243		
Future Volume (vph)	16	417	68	562	66	214	133	63	110	243		
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		
Protected Phases		2		6			8			4	9	
Permitted Phases	2		6		6	8		8	4			
Detector Phase	2	2	6	6	6	8	8	8	4	4		
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	8.0	
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	23.0	
Total Split (s)	43.0	43.0	43.0	43.0	43.0	54.0	54.0	54.0	54.0	54.0	23.0	
Total Split (%)	35.8%	35.8%	35.8%	35.8%	35.8%	45.0%	45.0%	45.0%	45.0%	45.0%	19%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
Lost Time Adjust (s)		-1.0		-1.0	0.0		-1.0	-2.0		-1.0		
Total Lost Time (s)		4.0		4.0	5.0		4.0	3.0		4.0		
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None	
Act Effct Green (s)		57.4		57.4	56.4		50.0	51.0		50.0		
Actuated g/C Ratio		0.48		0.48	0.47		0.42	0.42		0.42		
v/c Ratio		0.75		0.86	0.09		0.84	0.09		0.81		
Control Delay		33.5		42.1	12.1		51.2	8.6		45.7		
Queue Delay		0.0		49.9	0.0		0.0	0.0		0.0		
Total Delay		33.5		92.0	12.1		51.2	8.6		45.7		
LOS		C		F	B		D	A		D		
Approach Delay		33.5		84.4			44.6			45.7		
Approach LOS		C		F			D			D		
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 10 (8%), Referenced to phase 8:NBTL, Start of Yellow												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.86												
Intersection Signal Delay: 55.0												
Intersection LOS: D												
Intersection Capacity Utilization 111.7%												
ICU Level of Service H												
Analysis Period (min) 15												

Splits and Phases: 13: Pine St & Main St

 Ø2	 Ø4	 Ø9
43 s	54 s	23 s
 Ø6	 Ø8 (R)	
43 s	54 s	

FIGURE 5-A

Phasings

13: Pine St & Main St

01/23/2017

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Protected Phases	2		6		8		8		4		9
Permitted Phases	2		6		6	8		8	4		
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	8.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	54.0	54.0	54.0	54.0	54.0	23.0
Total Split (%)	35.8%	35.8%	35.8%	35.8%	35.8%	45.0%	45.0%	45.0%	45.0%	45.0%	19%
Maximum Green (s)	38.0	38.0	38.0	38.0	38.0	49.0	49.0	49.0	49.0	49.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)											7.0
Flash Dont Walk (s)											14.0
Pedestrian Calls (#/hr)											5
90th %ile Green (s)	38.0	38.0	38.0	38.0	38.0	49.0	49.0	49.0	49.0	49.0	21.0
90th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Ped
70th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
70th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
50th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
50th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
30th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
30th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
10th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
10th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 10 (8%), Referenced to phase 8:NBTL, Start of Yellow											
Control Type: Actuated-Coordinated											

FIGURE 5-A

Timings

13: Pine St & Main St

01/23/2017

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	16	417	68	562	106	212	170	63	158	289	
Future Volume (vph)	16	417	68	562	106	212	170	63	158	289	
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2		6			8			4	9
Permitted Phases	2		6		6	8		8	4		
Detector Phase	2	2	6	6	6	8	8	8	4	4	
Switch Phase											
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	8.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	54.0	54.0	54.0	54.0	54.0	23.0
Total Split (%)	35.8%	35.8%	35.8%	35.8%	35.8%	45.0%	45.0%	45.0%	45.0%	45.0%	19%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)		57.4		57.4	57.4		50.0	50.0		50.0	
Actuated g/C Ratio		0.48		0.48	0.48		0.42	0.42		0.42	
v/c Ratio		0.75		0.86	0.14		0.93	0.10		1.24	
Control Delay		33.5		42.1	14.2		63.9	9.9		159.4	
Queue Delay		0.0		49.9	0.0		0.0	0.0		0.0	
Total Delay		33.5		92.0	14.2		63.9	9.9		159.4	
LOS		C		F	B		E	A		F	
Approach Delay		33.5		80.8			56.3			159.4	
Approach LOS		C		F			E			F	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 0 (0%), Referenced to phase 8:NBTL, Start of Yellow											
Natural Cycle: 150											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 1.24											
Intersection Signal Delay: 79.9						Intersection LOS: E					
Intersection Capacity Utilization 118.6%						ICU Level of Service H					
Analysis Period (min) 15											

Splits and Phases: 13: Pine St & Main St

		
Ø2	Ø4	Ø9
43 s	54 s	23 s
		
Ø6	Ø8 (R)	
43 s	54 s	

FIGURE 5-A

Phasings

13: Pine St & Main St

01/23/2017

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Protected Phases	2		6		6		8		4		9
Permitted Phases	2		6		6	8		8	4		
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	8.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	23.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	54.0	54.0	54.0	54.0	54.0	23.0
Total Split (%)	35.8%	35.8%	35.8%	35.8%	35.8%	45.0%	45.0%	45.0%	45.0%	45.0%	19%
Maximum Green (s)	38.0	38.0	38.0	38.0	38.0	49.0	49.0	49.0	49.0	49.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)											7.0
Flash Dont Walk (s)											14.0
Pedestrian Calls (#/hr)											5
90th %ile Green (s)	38.0	38.0	38.0	38.0	38.0	49.0	49.0	49.0	49.0	49.0	21.0
90th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Ped
70th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
70th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
50th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
50th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
30th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
30th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
10th %ile Green (s)	61.0	61.0	61.0	61.0	61.0	49.0	49.0	49.0	49.0	49.0	0.0
10th %ile Term Code	Max	Max	Max	Max	Max	Coord	Coord	Coord	Coord	Coord	Skip
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 0 (0%), Referenced to phase 8:NBTL, Start of Yellow											
Control Type: Actuated-Coordinated											



Unsignalized Intersection Capacity Analysis

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	78	39	33	127	2	1
Future Volume (Veh/h)	78	39	33	127	2	1
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)	78	39	33	127	2	1
Pedestrians						22
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	966			239		
pX, platoon unblocked					0.96	
vC, conflicting volume			139		312	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			139		263	120
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)			1417		668	914
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	117	160	3			
Volume Left	0	33	2			
Volume Right	39	0	1			
cSH	1700	1417	734			
Volume to Capacity	0.07	0.02	0.00			
Queue Length 95th (ft)	0	2	0			
Control Delay (s)	0.0	1.7	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			25.2%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

01/20/2017

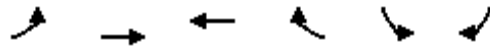
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	14	29	35	0	2
Future Volume (Veh/h)	52	14	29	35	0	2
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	52	14	29	35	0	2
Pedestrians	49		32			69
Lane Width (ft)	11.0		11.0			11.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	4		3			6
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	130	164			113	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	164			113	
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	98			100	
cM capacity (veh/h)	805	792			1413	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	66	64	2			
Volume Left	52	0	0			
Volume Right	14	35	0			
cSH	802	1700	1413			
Volume to Capacity	0.08	0.04	0.00			
Queue Length 95th (ft)	7	0	0			
Control Delay (s)	9.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.9	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		31.0%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

01/20/2017



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		33	9		29	
Lane Width (ft)		11.0	11.0		11.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		3	1		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		815	390			
pX, platoon unblocked						
vC, conflicting volume	162				324	177
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	162				324	177
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	91
cM capacity (veh/h)	1381				636	820
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	146	133	121			
Volume Left	25	0	46			
Volume Right	0	36	75			
cSH	1381	1700	739			
Volume to Capacity	0.02	0.08	0.16			
Queue Length 95th (ft)	1	0	15			
Control Delay (s)	1.4	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			40.9%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/20/2017

												
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: St Paul St & College St

01/20/2017

												
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

21: St Paul St & Bank St

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	13	68	53	21	36
Future Volume (vph)	30	13	68	53	21	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	13	68	53	21	36
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	43	121	57			
Volume Left (vph)	0	68	21			
Volume Right (vph)	13	0	36			
Hadj (s)	-0.15	0.15	-0.27			
Departure Headway (s)	4.0	4.2	4.0			
Degree Utilization, x	0.05	0.14	0.06			
Capacity (veh/h)	878	839	860			
Control Delay (s)	7.2	7.9	7.3			
Approach Delay (s)	7.2	7.9	7.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			23.3%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	102	6	9	184	52	43
Future Volume (Veh/h)	102	6	9	184	52	43
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)	102	6	9	184	52	43
Pedestrians					22	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	966			239		
pX, platoon unblocked					0.95	
vC, conflicting volume			130		329	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		272	127
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		92	95
cM capacity (veh/h)			1428		667	905
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	108	193	95			
Volume Left	0	9	52			
Volume Right	6	0	43			
cSH	1700	1428	757			
Volume to Capacity	0.06	0.01	0.13			
Queue Length 95th (ft)	0	0	11			
Control Delay (s)	0.0	0.4	10.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			29.0%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

01/20/2017

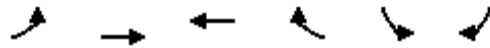
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	60	5	5	60	6	43
Future Volume (Veh/h)	60	5	5	60	6	43
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	5	5	60	6	43
Pedestrians	49		32			69
Lane Width (ft)	11.0		11.0			11.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	4		3			6
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	171	153			114	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	171	153			114	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	759	803			1412	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	65	65	49			
Volume Left	60	0	6			
Volume Right	5	60	0			
cSH	762	1700	1412			
Volume to Capacity	0.09	0.04	0.00			
Queue Length 95th (ft)	7	0	0			
Control Delay (s)	10.2	0.0	1.0			
Lane LOS	B		A			
Approach Delay (s)	10.2	0.0	1.0			
Approach LOS	B					
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		31.3%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

01/20/2017



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		33	9		29	
Lane Width (ft)		11.0	11.0		11.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		3	1		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		815	390			
pX, platoon unblocked						
vC, conflicting volume	282				474	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	282				474	236
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				94	96
cM capacity (veh/h)	1248				494	760
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	175	253	62			
Volume Left	87	0	28			
Volume Right	0	157	34			
cSH	1248	1700	611			
Volume to Capacity	0.07	0.15	0.10			
Queue Length 95th (ft)	6	0	8			
Control Delay (s)	4.3	0.0	11.6			
Lane LOS	A		B			
Approach Delay (s)	4.3	0.0	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		46.4%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/20/2017

												
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: St Paul St & College St

01/20/2017

												
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

21: St Paul St & Bank St

01/20/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	63	15	48	60	28	67
Future Volume (vph)	63	15	48	60	28	67
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	63	15	48	60	28	67
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	78	108	95			
Volume Left (vph)	0	48	28			
Volume Right (vph)	15	0	67			
Hadj (s)	-0.08	0.12	-0.33			
Departure Headway (s)	4.1	4.3	4.0			
Degree Utilization, x	0.09	0.13	0.10			
Capacity (veh/h)	843	814	859			
Control Delay (s)	7.5	7.9	7.4			
Approach Delay (s)	7.5	7.9	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.8%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/21/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	78	39	33	127	2	1
Future Volume (Veh/h)	78	39	33	127	2	1
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)	78	39	33	127	2	1
Pedestrians						28
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	966			1067		
pX, platoon unblocked						
vC, conflicting volume			145			318
vC1, stage 1 conf vol						126
vC2, stage 2 conf vol						
vCu, unblocked vol			145			318
tC, single (s)			4.1			6.4
tC, 2 stage (s)						6.2
tF (s)			2.2			3.5
p0 queue free %			98			100
cM capacity (veh/h)			1402			643
						902
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	117	160	3			
Volume Left	0	33	2			
Volume Right	39	0	1			
cSH	1700	1402	711			
Volume to Capacity	0.07	0.02	0.00			
Queue Length 95th (ft)	0	2	0			
Control Delay (s)	0.0	1.7	10.1			
Lane LOS			A			
Approach Delay (s)	0.0	1.7	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

01/21/2017

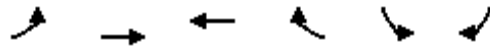
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	14	29	35	0	2
Future Volume (Veh/h)	52	14	29	35	0	2
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	52	14	29	35	0	2
Pedestrians	32		16			78
Lane Width (ft)	11.0		11.0			11.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	3		1			7
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	96	156			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	156			96	
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	98			100	
cM capacity (veh/h)	865	805			1456	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	66	64	2			
Volume Left	52	0	0			
Volume Right	14	35	0			
cSH	852	1700	1456			
Volume to Capacity	0.08	0.04	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	9.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		29.9%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

01/21/2017



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)		815	1218			
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

01/21/2017

												
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: St Paul St & College St

01/21/2017

												
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

21: St Paul St & Bank St

01/21/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	13	68	53	21	36
Future Volume (vph)	30	13	68	53	21	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	13	68	53	21	36
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	43	121	57			
Volume Left (vph)	0	68	21			
Volume Right (vph)	13	0	36			
Hadj (s)	-0.15	0.15	-0.27			
Departure Headway (s)	4.0	4.2	4.0			
Degree Utilization, x	0.05	0.14	0.06			
Capacity (veh/h)	878	839	860			
Control Delay (s)	7.2	7.9	7.3			
Approach Delay (s)	7.2	7.9	7.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			23.3%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/21/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	105	6	9	189	54	44
Future Volume (Veh/h)	105	6	9	189	54	44
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)	105	6	9	189	54	44
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	966			1067		
pX, platoon unblocked						
vC, conflicting volume				111	315	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				111	315	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 %				99	92	95
cM capacity (veh/h)				1479	674	946
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	111	198	98			
Volume Left	0	9	54			
Volume Right	6	0	44			
cSH	1700	1479	774			
Volume to Capacity	0.07	0.01	0.13			
Queue Length 95th (ft)	0	0	11			
Control Delay (s)	0.0	0.4	10.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay				2.7		
Intersection Capacity Utilization	29.5%			ICU Level of Service		A
Analysis Period (min)	15					

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St/Parking Garage & Bank St

01/21/2017

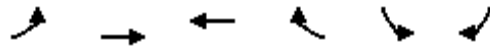
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	5	5	62	6	44
Future Volume (Veh/h)	62	5	5	62	6	44
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	62	5	5	62	6	44
Pedestrians						
Lane Width (ft)						
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	92	36			67	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92	36			67	
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	100			100	
cM capacity (veh/h)	905	1037			1535	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	67	67	50			
Volume Left	62	0	6			
Volume Right	5	62	0			
cSH	913	1700	1535			
Volume to Capacity	0.07	0.04	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	9.3	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.9			
Approach LOS	A					
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		17.8%		ICU Level of Service		A
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Cherry St & Pine St

01/21/2017



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	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	89	90	99	161	29	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		815	1218			
pX, platoon unblocked						
vC, conflicting volume	260				448	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260				448	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 %	93				95	96
cM capacity (veh/h)	1304				530	863
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	179	260	64			
Volume Left	89	0	29			
Volume Right	0	161	35			
cSH	1304	1700	672			
Volume to Capacity	0.07	0.15	0.10			
Queue Length 95th (ft)	5	0	8			
Control Delay (s)	4.2	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	4.2	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			38.5%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/21/2017

												
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	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	14	36	44	24	23	74	59
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	285	178	104	156								
Volume Left (vph)	27	38	36	23								
Volume Right (vph)	110	14	24	59								
Hadj (s)	-0.18	0.03	-0.04	-0.16								
Departure Headway (s)	4.6	5.0	5.2	5.0								
Degree Utilization, x	0.37	0.25	0.15	0.22								
Capacity (veh/h)	728	671	607	648								
Control Delay (s)	10.3	9.6	9.2	9.4								
Approach Delay (s)	10.3	9.6	9.2	9.4								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			9.8									
Level of Service			A									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: St Paul St & College St

01/21/2017

												
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	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	80	42	58	88	48	39	67	38
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	192	151	194	144								
Volume Left (vph)	21	29	58	39								
Volume Right (vph)	48	42	48	38								
Hadj (s)	-0.09	-0.09	-0.05	-0.07								
Departure Headway (s)	4.9	4.9	4.9	5.0								
Degree Utilization, x	0.26	0.21	0.26	0.20								
Capacity (veh/h)	682	668	680	662								
Control Delay (s)	9.6	9.2	9.7	9.2								
Approach Delay (s)	9.6	9.2	9.7	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.4									
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

21: St Paul St & Bank St

01/21/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	65	16	49	62	29	69
Future Volume (vph)	65	16	49	62	29	69
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	16	49	62	29	69
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	81	111	98			
Volume Left (vph)	0	49	29			
Volume Right (vph)	16	0	69			
Hadj (s)	-0.08	0.12	-0.33			
Departure Headway (s)	4.1	4.3	4.0			
Degree Utilization, x	0.09	0.13	0.11			
Capacity (veh/h)	841	811	855			
Control Delay (s)	7.6	8.0	7.5			
Approach Delay (s)	7.6	8.0	7.5			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/20/2017

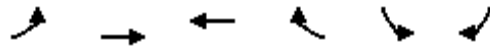
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	108	122	74	157	44	13
Future Volume (Veh/h)	108	122	74	157	44	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	108	122	74	157	44	13
Pedestrians						28
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	247					
pX, platoon unblocked						
vC, conflicting volume			258			502
vC1, stage 1 conf vol						197
vC2, stage 2 conf vol						
vCu, unblocked vol			258			502
tC, single (s)			4.1			6.4
tC, 2 stage (s)						6.2
tF (s)			2.2			3.5
p0 queue free %			94			91
cM capacity (veh/h)			1275			486
						824
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	230	231	57			
Volume Left	0	74	44			
Volume Right	122	0	13			
cSH	1700	1275	536			
Volume to Capacity	0.14	0.06	0.11			
Queue Length 95th (ft)	0	5	9			
Control Delay (s)	0.0	2.9	12.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.9	12.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			40.2%	ICU Level of Service		A
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

01/20/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	65	82	94	42	11
Future Volume (Veh/h)	101	65	82	94	42	11
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)	101	65	82	94	42	11
Pedestrians					117	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					10	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	293				513	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	293				513	246
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				90	98
cM capacity (veh/h)	1139				426	712
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	176	53			
Volume Left	101	0	42			
Volume Right	0	94	11			
cSH	1139	1700	465			
Volume to Capacity	0.09	0.10	0.11			
Queue Length 95th (ft)	7	0	10			
Control Delay (s)	5.5	0.0	13.7			
Lane LOS	A		B			
Approach Delay (s)	5.5	0.0	13.7			
Approach LOS			B			
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		35.8%	ICU Level of Service	A		
Analysis Period (min)		15				

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	76	39	39	112	25	19
Future Volume (vph)	76	39	39	112	25	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	76	39	39	112	25	19
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	115	151	44			
Volume Left (vph)	76	0	25			
Volume Right (vph)	39	112	0			
Hadj (s)	-0.04	-0.41	0.15			
Departure Headway (s)	4.3	3.8	4.4			
Degree Utilization, x	0.14	0.16	0.05			
Capacity (veh/h)	807	912	780			
Control Delay (s)	7.9	7.5	7.7			
Approach Delay (s)	7.9	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			28.9%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Pine St & Cherry St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	161	5	20	117	69	5	11	20	98	22	74
Future Volume (vph)	25	161	5	20	117	69	5	11	20	98	22	74
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)	25	161	5	20	117	69	5	11	20	98	22	74
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	191	206	36	194								
Volume Left (vph)	25	20	5	98								
Volume Right (vph)	5	69	20	74								
Hadj (s)	0.04	-0.15	-0.27	-0.09								
Departure Headway (s)	4.8	4.6	4.9	4.8								
Degree Utilization, x	0.25	0.26	0.05	0.26								
Capacity (veh/h)	707	740	660	694								
Control Delay (s)	9.4	9.2	8.1	9.5								
Approach Delay (s)	9.4	9.2	8.1	9.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization				39.2%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/20/2017

												
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	108	16	5	67	33
Future Volume (vph)	23	128	46	23	159	22	86	108	16	5	67	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	108	16	5	67	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	204	210	105								
Volume Left (vph)	23	23	86	5								
Volume Right (vph)	46	22	16	33								
Hadj (s)	-0.08	-0.01	0.07	-0.15								
Departure Headway (s)	4.9	5.0	5.1	5.1								
Degree Utilization, x	0.27	0.28	0.30	0.15								
Capacity (veh/h)	672	667	649	633								
Control Delay (s)	9.8	10.0	10.3	9.0								
Approach Delay (s)	9.8	10.0	10.3	9.0								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			9.9									
Level of Service			A									
Intersection Capacity Utilization			39.3%	ICU Level of Service				A				
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: St Paul St & College St

01/20/2017

												
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	57	174	18	13	48	12
Future Volume (vph)	26	102	22	16	156	50	57	174	18	13	48	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	57	174	18	13	48	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	222	249	73								
Volume Left (vph)	26	16	57	13								
Volume Right (vph)	22	50	18	12								
Hadj (s)	-0.02	-0.09	0.04	-0.03								
Departure Headway (s)	5.0	4.9	5.0	5.2								
Degree Utilization, x	0.21	0.30	0.34	0.11								
Capacity (veh/h)	656	690	679	623								
Control Delay (s)	9.4	9.9	10.6	8.8								
Approach Delay (s)	9.4	9.9	10.6	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			9.9									
Level of Service			A									
Intersection Capacity Utilization			41.1%	ICU Level of Service		A						
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	53	42	68	63	5	101	5	36	0	10	20
Future Volume (vph)	20	53	42	68	63	5	101	5	36	0	10	20
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)	20	53	42	68	63	5	101	5	36	0	10	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	115	136	142	30								
Volume Left (vph)	20	68	101	0								
Volume Right (vph)	42	5	36	20								
Hadj (s)	-0.15	0.11	0.02	-0.37								
Departure Headway (s)	4.3	4.5	4.5	4.3								
Degree Utilization, x	0.14	0.17	0.18	0.04								
Capacity (veh/h)	795	750	750	772								
Control Delay (s)	8.0	8.5	8.5	7.4								
Approach Delay (s)	8.0	8.5	8.5	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			35.4%	ICU Level of Service	A							
Analysis Period (min)			15									

FIGURE 5-A

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/20/2017

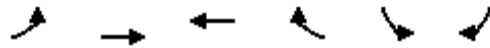
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	132	87	50	214	190	83
Future Volume (Veh/h)	132	87	50	214	190	83
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	132	87	50	214	190	83
Pedestrians						28
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	247					
pX, platoon unblocked					0.92	
vC, conflicting volume	247				518	204
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	247				431	204
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				62	90
cM capacity (veh/h)	1287				501	817
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	219	264	273			
Volume Left	0	50	190			
Volume Right	87	0	83			
cSH	1700	1287	568			
Volume to Capacity	0.13	0.04	0.48			
Queue Length 95th (ft)	0	3	65			
Control Delay (s)	0.0	1.8	17.1			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.8	17.1			
Approach LOS			C			
Intersection Summary						
Average Delay	6.8					
Intersection Capacity Utilization	52.9%			ICU Level of Service		A
Analysis Period (min)	15					

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

01/20/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	60	60	83	138	79
Future Volume (Veh/h)	75	60	60	83	138	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)	75	60	60	83	138	79
Pedestrians					117	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					10	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260				428	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260				428	218
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				72	89
cM capacity (veh/h)	1171				490	737
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	135	143	217			
Volume Left	75	0	138			
Volume Right	0	83	79			
cSH	1171	1700	558			
Volume to Capacity	0.06	0.08	0.39			
Queue Length 95th (ft)	5	0	46			
Control Delay (s)	4.8	0.0	15.5			
Lane LOS	A		C			
Approach Delay (s)	4.8	0.0	15.5			
Approach LOS			C			
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			43.1%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

01/20/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	139	30	13	135	31	61
Future Volume (vph)	139	30	13	135	31	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	139	30	13	135	31	61
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	169	148	92			
Volume Left (vph)	139	0	31			
Volume Right (vph)	30	135	0			
Hadj (s)	0.09	-0.51	0.10			
Departure Headway (s)	4.5	3.9	4.6			
Degree Utilization, x	0.21	0.16	0.12			
Capacity (veh/h)	752	876	746			
Control Delay (s)	8.7	7.7	8.2			
Approach Delay (s)	8.7	7.7	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.2			
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

4: Pine St & Cherry St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	87	127	5	20	138	263	5	11	20	79	23	33
Future Volume (vph)	87	127	5	20	138	263	5	11	20	79	23	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)	87	127	5	20	138	263	5	11	20	79	23	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	219	421	36	135								
Volume Left (vph)	87	20	5	79								
Volume Right (vph)	5	263	20	33								
Hadj (s)	0.10	-0.33	-0.27	0.00								
Departure Headway (s)	5.0	4.3	5.4	5.4								
Degree Utilization, x	0.30	0.51	0.05	0.20								
Capacity (veh/h)	683	799	568	593								
Control Delay (s)	10.1	11.7	8.7	9.8								
Approach Delay (s)	10.1	11.7	8.7	9.8								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay			10.8									
Level of Service			B									
Intersection Capacity Utilization			60.6%	ICU Level of Service		B						
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/20/2017

												
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	113	23	22	169	57
Future Volume (vph)	26	144	106	37	122	16	34	113	23	22	169	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	113	23	22	169	57
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	276	175	170	248								
Volume Left (vph)	26	37	34	22								
Volume Right (vph)	106	16	23	57								
Hadj (s)	-0.18	0.02	-0.01	-0.09								
Departure Headway (s)	5.2	5.5	5.6	5.3								
Degree Utilization, x	0.40	0.27	0.26	0.37								
Capacity (veh/h)	643	589	580	620								
Control Delay (s)	11.6	10.6	10.5	11.4								
Approach Delay (s)	11.6	10.6	10.5	11.4								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.1								
Level of Service				B								
Intersection Capacity Utilization				40.7%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: St Paul St & College St

01/20/2017

												
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	81	41	55	170	47	38	154	37
Future Volume (vph)	21	119	47	28	81	41	55	170	47	38	154	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	81	41	55	170	47	38	154	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	187	150	272	229								
Volume Left (vph)	21	28	55	38								
Volume Right (vph)	47	41	47	37								
Hadj (s)	-0.09	-0.09	-0.03	-0.03								
Departure Headway (s)	5.4	5.5	5.2	5.2								
Degree Utilization, x	0.28	0.23	0.39	0.33								
Capacity (veh/h)	604	587	643	636								
Control Delay (s)	10.5	10.1	11.5	10.8								
Approach Delay (s)	10.5	10.1	11.5	10.8								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			10.8									
Level of Service			B									
Intersection Capacity Utilization			41.3%		ICU Level of Service					A		
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

01/20/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	126	101	48	70	5	106	5	67	4	16	25
Future Volume (vph)	20	126	101	48	70	5	106	5	67	4	16	25
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)	20	126	101	48	70	5	106	5	67	4	16	25
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	247	123	178	45								
Volume Left (vph)	20	48	106	4								
Volume Right (vph)	101	5	67	25								
Hadj (s)	-0.20	0.09	-0.07	-0.28								
Departure Headway (s)	4.4	4.8	4.8	4.7								
Degree Utilization, x	0.30	0.17	0.24	0.06								
Capacity (veh/h)	767	696	706	681								
Control Delay (s)	9.3	8.8	9.2	8.0								
Approach Delay (s)	9.3	8.8	9.2	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.1								
Level of Service				A								
Intersection Capacity Utilization				43.2%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/21/2017

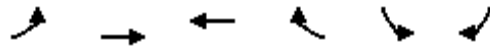
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	108	122	74	157	44	13
Future Volume (Veh/h)	108	122	74	157	44	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	108	122	74	157	44	13
Pedestrians						28
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	247					
pX, platoon unblocked					0.93	
vC, conflicting volume			258		502	197
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			258		421	197
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		91	98
cM capacity (veh/h)			1275		501	824
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	230	231	57			
Volume Left	0	74	44			
Volume Right	122	0	13			
cSH	1700	1275	550			
Volume to Capacity	0.14	0.06	0.10			
Queue Length 95th (ft)	0	5	9			
Control Delay (s)	0.0	2.9	12.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.9	12.3			
Approach LOS			B			
Intersection Summary						
Average Delay	2.7					
Intersection Capacity Utilization	40.2%		ICU Level of Service		A	
Analysis Period (min)	15					

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

01/21/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	65	82	94	42	11
Future Volume (Veh/h)	101	65	82	94	42	11
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)	101	65	82	94	42	11
Pedestrians					78	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	254				474	207
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254				474	207
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				91	99
cM capacity (veh/h)	1222				469	777
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	176	53			
Volume Left	101	0	42			
Volume Right	0	94	11			
cSH	1222	1700	511			
Volume to Capacity	0.08	0.10	0.10			
Queue Length 95th (ft)	7	0	9			
Control Delay (s)	5.3	0.0	12.9			
Lane LOS	A		B			
Approach Delay (s)	5.3	0.0	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			35.6%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	76	39	39	112	25	19
Future Volume (vph)	76	39	39	112	25	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	76	39	39	112	25	19
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	115	151	44			
Volume Left (vph)	76	0	25			
Volume Right (vph)	39	112	0			
Hadj (s)	-0.04	-0.41	0.15			
Departure Headway (s)	4.3	3.8	4.4			
Degree Utilization, x	0.14	0.16	0.05			
Capacity (veh/h)	807	912	780			
Control Delay (s)	7.9	7.5	7.7			
Approach Delay (s)	7.9	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			28.9%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Pine St & Cherry St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	161	5	20	117	69	5	11	20	98	22	74
Future Volume (vph)	25	161	5	20	117	69	5	11	20	98	22	74
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)	25	161	5	20	117	69	5	11	20	98	22	74
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	191	206	36	194								
Volume Left (vph)	25	20	5	98								
Volume Right (vph)	5	69	20	74								
Hadj (s)	0.04	-0.15	-0.27	-0.09								
Departure Headway (s)	4.8	4.6	4.9	4.8								
Degree Utilization, x	0.25	0.26	0.05	0.26								
Capacity (veh/h)	707	740	660	694								
Control Delay (s)	9.4	9.2	8.1	9.5								
Approach Delay (s)	9.4	9.2	8.1	9.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization				39.2%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/21/2017

												
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	108	16	5	67	33
Future Volume (vph)	23	128	46	23	159	22	86	108	16	5	67	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	108	16	5	67	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	204	210	105								
Volume Left (vph)	23	23	86	5								
Volume Right (vph)	46	22	16	33								
Hadj (s)	-0.08	-0.01	0.07	-0.15								
Departure Headway (s)	4.9	5.0	5.1	5.1								
Degree Utilization, x	0.27	0.28	0.30	0.15								
Capacity (veh/h)	672	667	649	633								
Control Delay (s)	9.8	10.0	10.3	9.0								
Approach Delay (s)	9.8	10.0	10.3	9.0								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay				9.9								
Level of Service				A								
Intersection Capacity Utilization				39.3%	ICU Level of Service	A						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: St Paul St & College St

01/21/2017

												
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	57	174	18	13	48	12
Future Volume (vph)	26	102	22	16	156	50	57	174	18	13	48	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	57	174	18	13	48	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	222	249	73								
Volume Left (vph)	26	16	57	13								
Volume Right (vph)	22	50	18	12								
Hadj (s)	-0.02	-0.09	0.04	-0.03								
Departure Headway (s)	5.0	4.9	5.0	5.2								
Degree Utilization, x	0.21	0.30	0.34	0.11								
Capacity (veh/h)	656	690	679	623								
Control Delay (s)	9.4	9.9	10.6	8.8								
Approach Delay (s)	9.4	9.9	10.6	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			9.9									
Level of Service			A									
Intersection Capacity Utilization			41.1%	ICU Level of Service		A						
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	53	42	68	63	5	101	5	36	0	10	20
Future Volume (vph)	20	53	42	68	63	5	101	5	36	0	10	20
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)	20	53	42	68	63	5	101	5	36	0	10	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	115	136	142	30								
Volume Left (vph)	20	68	101	0								
Volume Right (vph)	42	5	36	20								
Hadj (s)	-0.15	0.11	0.02	-0.37								
Departure Headway (s)	4.3	4.5	4.5	4.3								
Degree Utilization, x	0.14	0.17	0.18	0.04								
Capacity (veh/h)	795	750	750	772								
Control Delay (s)	8.0	8.5	8.5	7.4								
Approach Delay (s)	8.0	8.5	8.5	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			35.4%	ICU Level of Service		A						
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

01/21/2017

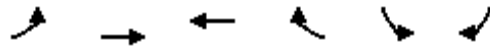
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	87	50	219	192	84
Future Volume (Veh/h)	135	87	50	219	192	84
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	135	87	50	219	192	84
Pedestrians						22
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	247					
pX, platoon unblocked					0.92	
vC, conflicting volume			244		520	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			244		432	200
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		62	90
cM capacity (veh/h)			1297		503	824
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	222	269	276			
Volume Left	0	50	192			
Volume Right	87	0	84			
cSH	1700	1297	570			
Volume to Capacity	0.13	0.04	0.48			
Queue Length 95th (ft)	0	3	66			
Control Delay (s)	0.0	1.8	17.1			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.8	17.1			
Approach LOS			C			
Intersection Summary						
Average Delay	6.8					
Intersection Capacity Utilization	53.3%		ICU Level of Service		A	
Analysis Period (min)	15					

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

01/21/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	75	92	30	83	138	79
Future Volume (Veh/h)	75	92	30	83	138	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)	75	92	30	83	138	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)						
pX, platoon unblocked						
vC, conflicting volume	113				314	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	113				314	72
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				79	92
cM capacity (veh/h)	1476				645	991
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	167	113	217			
Volume Left	75	0	138			
Volume Right	0	83	79			
cSH	1476	1700	739			
Volume to Capacity	0.05	0.07	0.29			
Queue Length 95th (ft)	4	0	31			
Control Delay (s)	3.6	0.0	11.9			
Lane LOS	A		B			
Approach Delay (s)	3.6	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			34.8%		ICU Level of Service	
Analysis Period (min)			15		A	

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

01/21/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	141	30	13	137	31	62
Future Volume (vph)	141	30	13	137	31	62
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	141	30	13	137	31	62
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	171	150	93			
Volume Left (vph)	141	0	31			
Volume Right (vph)	30	137	0			
Hadj (s)	0.09	-0.51	0.10			
Departure Headway (s)	4.5	3.9	4.6			
Degree Utilization, x	0.21	0.16	0.12			
Capacity (veh/h)	751	875	744			
Control Delay (s)	8.8	7.7	8.2			
Approach Delay (s)	8.8	7.7	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.2			
Level of Service			A			
Intersection Capacity Utilization			38.9%	ICU Level of Service	A	
Analysis Period (min)			15			

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

4: Pine St & Cherry St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	130	5	20	141	268	5	11	20	80	23	34
Future Volume (vph)	89	130	5	20	141	268	5	11	20	80	23	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)	89	130	5	20	141	268	5	11	20	80	23	34
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	224	429	36	137								
Volume Left (vph)	89	20	5	80								
Volume Right (vph)	5	268	20	34								
Hadj (s)	0.10	-0.33	-0.27	0.00								
Departure Headway (s)	5.0	4.4	5.4	5.5								
Degree Utilization, x	0.31	0.52	0.05	0.21								
Capacity (veh/h)	680	796	562	589								
Control Delay (s)	10.2	12.0	8.7	9.9								
Approach Delay (s)	10.2	12.0	8.7	9.9								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				11.0								
Level of Service				B								
Intersection Capacity Utilization				63.8%	ICU Level of Service	B						
Analysis Period (min)				15								

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

11: College St & Pine St

01/21/2017

												
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	115	24	23	171	59
Future Volume (vph)	27	148	110	38	126	16	35	115	24	23	171	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	115	24	23	171	59
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	285	180	174	253								
Volume Left (vph)	27	38	35	23								
Volume Right (vph)	110	16	24	59								
Hadj (s)	-0.18	0.02	-0.01	-0.09								
Departure Headway (s)	5.2	5.6	5.6	5.4								
Degree Utilization, x	0.41	0.28	0.27	0.38								
Capacity (veh/h)	636	579	572	612								
Control Delay (s)	11.9	10.8	10.7	11.7								
Approach Delay (s)	11.9	10.8	10.7	11.7								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			11.4									
Level of Service			B									
Intersection Capacity Utilization			41.6%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

12: St Paul St & College St

01/21/2017

												
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	56	172	48	39	155	38
Future Volume (vph)	21	123	48	29	83	42	56	172	48	39	155	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	56	172	48	39	155	38
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	192	154	276	232								
Volume Left (vph)	21	29	56	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	0.24	0.40	0.34								
Capacity (veh/h)	599	582	638	630								
Control Delay (s)	10.7	10.2	11.7	11.0								
Approach Delay (s)	10.7	10.2	11.7	11.0								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			11.0									
Level of Service			B									
Intersection Capacity Utilization			42.0%		ICU Level of Service				A			
Analysis Period (min)			15									

FIGURE 5-A

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

01/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	128	101	49	72	5	107	5	69	0	10	20
Future Volume (vph)	20	128	101	49	72	5	107	5	69	0	10	20
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)	20	128	101	49	72	5	107	5	69	0	10	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	249	126	181	30								
Volume Left (vph)	20	49	107	0								
Volume Right (vph)	101	5	69	20								
Hadj (s)	-0.19	0.09	-0.08	-0.37								
Departure Headway (s)	4.4	4.8	4.7	4.7								
Degree Utilization, x	0.30	0.17	0.24	0.04								
Capacity (veh/h)	784	703	709	689								
Control Delay (s)	9.3	8.8	9.2	7.8								
Approach Delay (s)	9.3	8.8	9.2	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.1									
Level of Service			A									
Intersection Capacity Utilization			45.3%	ICU Level of Service					A			
Analysis Period (min)			15									



Memorandum

To: Laura Wheelock, PE
Burlington DPW

Date: February 6, 2017

Project #: 57881.00

From: David Saladino, PE, AICP

Re: Summary of Burlington Town Center Traffic Study Modifications

VHB has compiled the following **responses** to **comments** on the 1/23/2017 Burlington Town Center (BTC) Traffic Impact Study provided by the Burlington Department of Public Works on 1/30/2017 and by CHA Consulting on 2/2/2017 and 2/3/2017.

Response to Burlington DPW Comments (1/30/17)

- **UVM-Medical Center:**

DPW Comment: One large item that doesn't quite sit right is around one of the tenants (UVM Medical Center) who have negotiated 450 parking spaces, 300 within a municipal garage, and 150 within the project's garage. From our experience with them as a previous garage tenant they have very defined in/out times for their shifts, we do not have exact numbers only that it is visibly clear to our parking garage managers the in/out consistency.

In review of the traffic study the office use type generated trips do not seem to accurately represent this known trip flow for this one tenant of the office space. In fact knowing that the employer is seeking 450 spaces, and the AM Peak office trips in is 328 entering by your trip gen table there seems to be a fundamental disconnect of what one of the tenants will need for use, and the trips being represented. We understand that they will be reductions for multimodal, and inter-development trips, and the fact that not all of them arrive in the peak hour it still is a large % of the 328 if not all of it. Given the UVM Medical Center does not account for all of the office space leased in the building it is hard to believe the number of trips being presented in the traffic study is an accurate representation of what will be generated.

At bare minimum the traffic study needs to show distribution of trips coming into the Lakeview and College Street Garages where UVM has negotiated for 300 parking spaces between those two garages.

- o **VHB Response – Parking:** Although the final distribution of UVM-MC staff parking may not have been finalized yet, the trip distribution assumptions can be adjusted to account for 2/3 (300/450) of the UVM-MC trips headed to either the Lakeview or College Street garages and 1/3 headed to the BTC garage.
 - **Analysis:** The table below shows an estimate of the number of UVM-MC trips entering and exiting the Lakeview, College Street, and BTC garages during the AM and PM peak hours. The distribution is based on the assumption of 135 UVM-MC spaces in the Lakeview Garage, 165 UVM-MC spaces in the College Street Garage, and 150 UVM-MC spaces in the BTC Garage.

40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403-7771
P 802.497.6100

UVM-MC Parking Allocation								
	UVM-MC		Bike &	Internal	External	Trips to Garages		
<u>Peak Period</u>	<u>Trips</u>	<u>Transit</u>	<u>Pedestrian</u>	<u>Capture</u>	<u>Vehicles</u>	<u>Lakeview</u>	<u>College St</u>	<u>BTC</u>
Weekday Morning		5%	25%	9%				
Enter	143	7	36	13	87	26	32	29
Exit	<u>19</u>	<u>1</u>	<u>5</u>	<u>2</u>	12	<u>4</u>	<u>4</u>	<u>4</u>
Total	162	8	40	15	99	30	36	33
Weekday Evening		5%	25%	16%				
Enter	25	1	6	4	13	4	5	4
Exit	<u>121</u>	<u>6</u>	<u>30</u>	<u>19</u>	65	<u>20</u>	<u>24</u>	<u>22</u>
Total	146	7	37	23	79	24	29	26

Assumptions

300	spaces in municipal garage
135	30% spaces in Lakeview garage
165	37% spaces in College St garage
150	33% spaces in BTC garage
100,000	square feet of UVM-MC office space

To provide a conservative assessment, the additional trips headed to and from the Lakeview and College Street garages were added on top of the existing 2024 AM and PM peak hour Build volumes from the 1/23/17 TIS (rather than redistributing the trips to the three garages). As a further conservative assumption, all of the Lakeview Garage trips were distributed through both the Pine & Cherry intersection and the Battery & Cherry intersection (rather than distributing the trips between these two intersections). All of the Lakeview Garages trips were routed through the College & Pine intersection.

The figure below compares the results of the 2024 AM and PM *unsignalized* intersection capacity analysis results for the Cherry/Pine and College/Pine intersections assuming all UVM-MC trips park in the BTC garage ("Original" scenario) against the results with the UVM-MC trips distributed across the three garages as described above ("With Garages" scenario). As the results show, even with the conservative assumptions described above, the additional UVM-MC trips have an insignificant impact on v/c, delay, or Level of Service at these three intersections.

ORIGINAL				WITH GARAGES		
Intersection / Movement	2024 AM Build			2024 AM Build		
	v/c	Delay	LOS	v/c	Delay	LOS
Cherry St at Pine St						
EB from Cherry St	0.25	9.4	A	0.26	9.5	B
WB from Cherry St	0.26	9.2	A	0.28	9.4	A
NB from Pine St	0.05	8.1	A	0.05	8.2	A
SB from Pine St	0.26	9.5	A	0.28	9.7	A
College St at Pine St						
EB from College St	0.27	9.8	A	0.31	10.2	B
WB from College St	0.28	10	A	0.29	10.2	B
NB from Pine St	0.30	10.3	B	0.31	10.6	B
SB from Pine St	0.15	9	A	0.15	9.2	A

ORIGINAL				WITH GARAGES		
Intersection / Movement	2024 PM Build			2024 PM Build		
	v/c	Delay	LOS	v/c	Delay	LOS
Cherry St at Pine St						
EB from Cherry St	0.31	10.2	B	0.34	10.6	B
WB from Cherry St	0.52	12	B	0.53	12.2	B
NB from Pine St	0.05	8.7	A	0.05	8.8	A
SB from Pine St	0.21	9.9	A	0.21	10.0	A
College St at Pine St						
EB from College St	0.41	11.9	B	0.43	12.3	B
WB from College St	0.28	10.8	B	0.29	11.1	B
NB from Pine St	0.27	10.7	B	0.31	11.2	B
SB from Pine St	0.38	11.7	B	0.39	11.9	B

The figure below compares the results of the 2024 AM and PM *signalized* intersection capacity analysis results for the Cherry/Battery intersection assuming all UVM-MC trips park in the BTC garage ("Original" scenario) against the results with the UVM-MC trips distributed across the three garages as described above ("With Garages" scenario). As the results show, even with the conservative assumptions described above, the additional UVM-MC trips have an insignificant impact on v/c, delay, or Level of Service at these three intersections.

ORIGINAL					WITH GARAGE		
Intersection	Peak Hour	2024 Build			2024 Build		
		v/c	Delay	LOS	v/c	Delay	LOS
Battery St at	Weekday AM	0.78	10.6	B	0.82	12.6	B
Cherry St	Weekday PM	0.68	10.7	B	0.69	11.4	B

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

- o **VHB Response – Trip Generation:** The ITE Parking Generation manual identifies an average rate of 2.8 parking spaces per 1,000 sf for general office use. The ITE Trip Generation Manual identifies an average trip generation rate of 1.6 trips per 1,000 sf for general office use during the AM peak. In general terms, a comparison of these two rates (i.e. parking rate nearly 60% higher than peak trip generation) reflects the difference in parking “needs” vs. peak hour trip generation for an office use. For UVM-MC’s case, it is not clear how they determined 450 spaces to be the correct value for their use, but it is likely that the space will be occupied by general support staff/office workers who would reasonably be expected to generate trips at the rate identified in the *Trip Generation* manual for a general office use.
 - **Recommendation:** No change to the trip generation calculations. See CHA’s comment 1c below from 2/3/17 concurring with this determination.

- **Day Care:**

DPW Comment: The trip generation for the daycare also seems low, was there a discount taken for the 100/400 daycare kid spaces that were reserved by the UVM Medical center who is already parking in the garage under the office use? If no, knowing the daycare is looking to take 400 kids and only counting ~120 trips for drop off in a peak hour seem low as well even understanding the reduction for bike/walk/transit/interdevelopment/multiple kids per family.

- o **VHB Response:** VHB’s trip generation estimate for the proposed 19,500 square foot day care facility is based on the ITE *Day Care Center* land use trip rate. It was assumed that 75% of the trips would be internally captured (i.e. either BTC residents who drop off their kids before work or employees who work at the BTC and drop off their kids before work). The day care space was not considered in the broader internal capture analysis.

Per student trip generation figures for the Day Care use fit the data slightly better than the building footprint data (although R² values are still fairly low for the per student rates) – but this size day care center is well outside of the range of the ITE data for both the per area and per student trip rates.

The table below compares the trip generation for a 19.5 ksf (400 student) day care center using the per area and per student rates. As the table shows, the per student rates lead to approximately 80 more total trips in the AM and PM peak hour. These 80 additional total trips would then translate into 21 new external trips (assuming 25/75% external/internal split).

	AM Peak		PM Peak	
	Rate	#	Rate	#
By Area	12.18	238	12.34	241
By Students	0.8	320	0.81	324
Difference		82		83
New External Trips		21		21

Accounting for multimodal trips, the number of new external trips would decrease to 14 net new peak hour vehicle trips. Given the variability in the data and the relatively small change in trips generation,

these trips can be considered as part of the overly conservative assumption VHB made to maintain all of the mall's existing traffic (200+ peak hour trips) on the network prior to adding in the proposed BTC trip generation on top.

- **Recommendation:** No change to the trip generation calculations. See CHA's comments 1a and 1b below from 2/3/17 concurring with this determination.

- **Garage Entrance/Exit:**

DPW Comment: With regards to the traffic distribution on the network there is a fundamental question if the garage entrance/exits will serve public/private equally, or if one entrance will be kept private and the other public. If they are kept segregated this would change trip distributions dramatically. But is clearly something we need to know and have confirmed.

- o **VHB Response:** Both the Cherry Street and Bank Street garage entrances will access the same garage space which will have a combination of public and private spaces.

- **Recommendation:** No change to the trip distribution assumptions.

- **Trip Distribution**

DPW Comment: Moving on with the assumption that they both serve public/private equally we would like to see the following trip distributions changed.

1. Pearl Street change from 13% to 8% east of Pine
 - **VHB Response:** The net effect of this change is to shift 6 cars from Pearl to Cherry during the AM peak and 19 cars during PM peak. Given the negligible change in traffic volumes that would result from this change, and the fact that the Winooski/Cherry and Winooski/Pearl intersections operate at LOS A/B conditions, VHB does not recommend revising the analysis to incorporate this change.
2. Cherry Street change from 10% to 15% east of site
 - **VHB Response:** Part of changes noted in previous bullet. Same response.
3. College street seems underutilized. We have a reasonable amount of cars that use college as a bypass for Main Street.
 - **VHB Response:** We kept the full 30% allocation along Main Street to be conservative in our assessment of congestion impacts along Main Street. Any diversion to College Street would lessen the impact on the Main Street intersections.
4. For the south end make trips on Pine and St. Paul 10% each to even out this choice.

- **VHB Response:** In order to hold to the macro-level distribution assumption shown in Figure 5 (from PlanBTV Transportation Study) the trip generation assigned 14% to trips towards Shelburne Road and 6% down Pine Street.
- 5. 14% trips on S. Winooski seems really high as a way for people to get south of main street.
 - **VHB Response:** The net effect of this change (i.e. splitting trips down St. Paul and Winooski) is an additional 19 cars during the PM peak on St. Paul and 19 fewer vehicles traveling on South Winooski. Given the negligible change in traffic volumes that would result from this change, and the fact that the St. Paul/Main intersection operates at LOS B conditions, VHB does not recommend revising the analysis to incorporate this change.
- 6. 2% on st. paul street seems very low given that the exit for the garage is mid block.
 - **VHB Response:** See response to #5
- 7. 8% on Pine also seems too low
 - **VHB Response:** Per the response to #4 above, VHB held to a 6% distribution down Pine per the PlanBTV Transportation Study
- 8. 2% cars on Howard street does not make any sense as a path of travel.
 - **VHB Response:** This 2% designation was arbitrarily assigned to Howard Street in the graphic, but is intended to represent 2% of the traffic headed to some destination in the South End. The BTC traffic analysis did not include these intersections in any of the traffic analysis.

Response to CHA Consulting Comments (2/2)

CHA Comment: Per our conversation today, attached are the ETC and ETC+20 No-Build and Build volumes from the Champlain Parkway FSEIS. As we discussed, the original volumes were forecasted to represent 2008 and 2028 design horizons. Through the Act 250 process, it was demonstrated that these original projections were very conservative, and they continue to be applicable to the Parkway's current design schedule, reflecting design years of 2018 and 2038. Please reevaluate and revise your projections of the 2024 No-Build and Build volumes for the BTC project in the context of these volumes and your more current base volumes, and revise the congestion analyses accordingly.

- o **VHB Response:** See response to #2 below.

Response to CHA Consulting Comments (2/3)

CHA Comment: I wanted to provide you an update on my review of the BTC traffic impact study by VHB.

1. I agree with VHB's trip generation estimates for the BTC project as reflected in their January 23, 2017 TIS.

- a. While I agree with your concern that a 75% internal capture for the Day Care Center trips may seem to be too high when only thinking about the relation between the on-site uses of the BTC, I do think that it is reasonable when thinking about the relation of this use to the entire downtown CCD. The Day Care will be available as a resource for other downtown workers in addition to the residents and workers at the BTC, and these trips are already represented in the network. The Day Care's primary client base is not anticipated to be a primary downtown destination attracting trips from outside of the downtown only for this service. These considerations support the use of a 25% factor for primary new trips.
 - i. **VHB Response: Agreed**
 - b. I reviewed VHB's response to my comment about the comparison of the ITE Trip Generation trip rate data for the Day Care Center based on building size and number of students (Feb 1, 2017 email from Dave Saladino). I note that their assessment of the 21 net new external trips does not consider the effect of trips by other modes, which further reduces the difference to about 14 vehicle trips during the AM and PM peak hours (7 enter/7 exit). This difference in trips resulting from these two different estimating methods is not significant, and is less than the variability of traffic volumes on the network that one could expect from daily and seasonal variation of traffic flow. Based on this assessment, I do not believe that it is necessary to revise the traffic congestion analysis for this small difference in trips.
 - i. **VHB Response: Agreed**
 - c. I agree with VHB's response to your concern that the trip generation is underestimated based on the relationship of UVM-MC reserved parking supply and peak-hour trip generation. I would also note that this was a similar issue during Act 250 for the Champlain Parkway, where our peak hour trip generation projections for the Innovation Center at 128 Lakeside Avenue were contested to be under-estimated because of the parking demand. In that case, we substantiated that our trip generation estimates based on ITE rates were accurate based on driveway counts and parking accumulation checks.
 - i. **VHB Response: Agreed**
 - d. I agree with VHB's approach to redistribute the UVM-MC component of the BTC trips to include their off-site parking sites as origins/destinations.
 - i. **VHB Response: Agreed**
2. My review of the 2024 No-Build and Build volumes presented in the TIS identified an issue with the volume adjustments made by VHB to account for the Champlain Parkway project. In discussing this issue with VHB, it was determined that they had used an incorrect source within the Parkway FSEIS document as a basis for their volumes. VHB will be revising their volume networks for the 2024 No-Build and Build conditions, and will be providing their supporting calculations in addition to the volume diagrams for review before finalizing their congestion analysis.
- a. **VHB Response:** The 2024 AM and PM No Build traffic volumes for the five Main street intersections from Pine Street east to South Willard Street were updated based on the current Champlain Parkway FSEIS traffic volumes provided by Dave Kahlbaugh on 2/2/17. The 2024 No Build volumes were calculated by growing the 2019 No Build volumes by 3% and then accounting for the effect of the opening of the Champlain Parkway. The effect of the Parkway was estimated by calculating the "delta" between the FSEIS ETC + 20 No Build and the ETC + 20 Build scenario

volumes. In general, the revised Parkway volumes reduced the 2024 No Build volumes a fair bit from the volumes included in the 1/23/17 Traffic Impact Study.

The table below compares the results of the 2024 AM and PM No Build and Build signalized intersection capacity analysis results for the five Main street intersections from Pine Street east to South Willard Street as presented in the 1/23/17 Traffic Study ("Original") and the results incorporating the latest Parkway volumes ("Updated Champlain Parkway Vols"). As the results show, the revised Parkway volumes generally result in negligible to improved delays and Levels of Service. Of note, the LOS E condition that was reported in the TIS at the Pine / Main intersection during the 2024 PM Build scenario is reduced to LOS D conditions with the corrected Parkway adjustments in place. The revised Synchro reports are included in the Appendix.

ORIGINAL								UPDATED CHAMPLAIN PKWY VOLS					
Intersection	Peak Hour	2024 No Build			2024 Build			2024 No Build			2024 Build		
		v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Pine St at Main St	Weekday AM	0.49	17.6	B	0.52	17.9	B	0.49	17.1	B	0.51	17.6	B
	Weekday PM	0.83	38.2	D	1.01	69.3	E	0.68	28.7	C	0.83	42.0	D
Saint Paul St at Main St	Weekday AM	0.48	15.9	B	0.58	15.5	B	0.48	15.2	B	0.57	15.1	B
	Weekday PM	0.55	19.7	B	0.62	18.1	B	0.46	14.8	B	0.54	15.2	B
S Winooski Ave at Main St	Weekday AM	0.59	14.3	B	0.70	53.6	D	0.57	13.9	B	0.68	48.9	D
	Weekday PM	0.83	23.3	C	0.93	31.3	C	0.74	19.0	B	0.86	26.4	C
S Union St at Main St	Weekday AM	0.89	25.4	C	0.93	29.1	C	0.90	26.9	C	0.92	30.0	C
	Weekday PM	0.87	27.1	C	0.90	27.4	C	0.80	20.1	C	0.80	16.5	B
S Willard St at Main St	Weekday AM	0.64	15.5	B	0.70	15.2	B	0.69	16.0	B	0.75	17.8	B
	Weekday PM	0.82	31.2	C	0.87	23.1	C	0.81	26.2	C	0.86	22.1	C

* Volume to capacity ratio
** Delay expressed in seconds per vehicle
*** Level of service

Please let me know if you have any thoughts on these responses. I'd be happy to come to DPW to discuss these responses in person or to talk through them by phone

Thanks,
Dave



Computations - AM Peak Hour Vols

Project: 57881.00	Location: Burlington, VT
Calculated by: E. Quillen	Date: 1/16/17
Checked by:	Date:

ITE LUC: 220
 Entering: 4
 Exit Code: 48

Legend
Enter Site

Pine Street Diversions
5% From Main St
3% From College St
1% From Bank St
2% From Cherry St
5% From Pearl St

Legend
Pine St Add

Pine Street Diversions
5% From Main St
3% From College St
1% From Bank St
2% From Cherry St
5% From Pearl St

[illegible]



Calculated by: E. Quallen	Date: 1/16/17
Checked by: D. Saladino	Date: 1/30/00

ITE LUC: 220
Entering: 15

Legend
Enter Site
Exit Site

Legend
Pine St Add
Pine St Sless

Pine Street Diversions
5% From Main St
3% From College St
1% From Bank St
2% From Cherry St
5% From Pearl St

[illegible]

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	384	184	88	391	91	13	163	68	36	92	10
Future Volume (vph)	11	384	184	88	391	91	13	163	68	36	92	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	5.0		4.0	3.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		1.00	1.00		0.99	
Satd. Flow (prot)		1722			1784	1531		1794	1531		1760	
Flt Permitted		0.99			0.82	1.00		0.98	1.00		0.89	
Satd. Flow (perm)		1707			1481	1531		1761	1531		1595	
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)	11	384	184	88	391	91	13	163	68	36	92	10
RTOR Reduction (vph)	0	13	0	0	0	26	0	0	47	0	4	0
Lane Group Flow (vph)	0	566	0	0	479	65	0	176	21	0	134	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		48.4			48.4	48.4		25.4	25.4		25.4	
Effective Green, g (s)		49.4			49.4	48.4		26.4	27.4		26.4	
Actuated g/C Ratio		0.55			0.55	0.54		0.29	0.30		0.29	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		936			812	823		516	466		467	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.32	0.04		c0.10	0.01		0.08	
v/c Ratio		0.61			0.59	0.08		0.34	0.04		0.29	
Uniform Delay, d1		13.7			13.5	10.0		25.0	22.1		24.5	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.1			1.1	0.0		1.8	0.2		0.3	
Delay (s)		14.8			14.6	10.1		26.8	22.2		24.9	
Level of Service		B			B	B		C	C		C	
Approach Delay (s)		14.8			13.9			25.5			24.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		17.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		87.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	295	71	60	420	74	78	124	47	23	32	18
Future Volume (vph)	4	295	71	60	420	74	78	124	47	23	32	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	0.97		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1748		1711	1760		1711	1726		1711	1703	
Flt Permitted	0.32	1.00		0.49	1.00		0.72	1.00		0.65	1.00	
Satd. Flow (perm)	573	1748		874	1760		1304	1726		1169	1703	
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	295	71	60	420	74	78	124	47	23	32	18
RTOR Reduction (vph)	0	19	0	0	14	0	0	27	0	0	11	0
Lane Group Flow (vph)	4	347	0	60	480	0	78	144	0	23	39	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)	15.8	15.8		15.8	15.8		18.1	18.1		18.1	18.1	
Effective Green, g (s)	15.8	15.8		15.8	15.8		18.1	18.1		18.1	18.1	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		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)	197	601		300	605		514	680		460	671	
v/s Ratio Prot		0.20			c0.27			c0.08			0.02	
v/s Ratio Perm	0.01			0.07			0.06			0.02		
v/c Ratio	0.02	0.58		0.20	0.79		0.15	0.21		0.05	0.06	
Uniform Delay, d1	9.9	12.3		10.6	13.6		9.0	9.2		8.6	8.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.3		0.3	7.1		0.6	0.7		0.2	0.2	
Delay (s)	10.0	13.7		10.9	20.7		9.6	9.9		8.8	8.8	
Level of Service	A	B		B	C		A	A		A	A	
Approach Delay (s)		13.6			19.6			9.8			8.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			45.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			64.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	295	14	117	445	135	11	39	12	98	246	123
Future Volume (vph)	42	295	14	117	445	135	11	39	12	98	246	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		4.0	4.0			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	0.99		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1711	1788		1711	1738			1738		1711	1801	1531
Flt Permitted	0.24	1.00		0.53	1.00			0.93		0.72	1.00	1.00
Satd. Flow (perm)	429	1788		946	1738			1633		1290	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	295	14	117	445	135	11	39	12	98	246	123
RTOR Reduction (vph)	0	3	0	0	22	0	0	8	0	0	0	79
Lane Group Flow (vph)	42	306	0	117	558	0	0	54	0	98	246	44
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	20.0	20.0		20.0	20.0			18.0		18.0	18.0	18.0
Effective Green, g (s)	20.0	22.0		22.0	22.0			18.0		18.0	18.0	18.0
Actuated g/C Ratio	0.40	0.44		0.44	0.44			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)	171	786		416	764			587		464	648	551
v/s Ratio Prot		0.17			c0.32						c0.14	
v/s Ratio Perm	0.10			0.12				0.03		0.08		0.03
v/c Ratio	0.25	0.39		0.28	0.73			0.09		0.21	0.38	0.08
Uniform Delay, d1	10.0	9.5		8.9	11.6			10.6		11.1	11.9	10.5
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	1.4		1.7	6.1			0.3		1.0	1.7	0.3
Delay (s)	13.4	10.9		10.6	17.6			10.9		12.1	13.6	10.8
Level of Service	B	B		B	B			B		B	B	B
Approach Delay (s)		11.2			16.5			10.9			12.5	
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)			50.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			62.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	402	0	0	704	33	37	553	57	0	0	0
Future Volume (vph)	14	402	0	0	704	33	37	553	57	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1790		1711	1775				
Flt Permitted	0.15	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	267	1801			1790		1711	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)	14	402	0	0	704	33	37	553	57	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	6	0	0	0	0
Lane Group Flow (vph)	14	402	0	0	734	0	37	604	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	26.0	26.0			26.0		21.3	21.3				
Effective Green, g (s)	27.0	27.0			27.0		22.3	22.3				
Actuated g/C Ratio	0.46	0.46			0.46		0.38	0.38				
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)	121	820			815		643	667				
v/s Ratio Prot		0.22			c0.41			c0.34				
v/s Ratio Perm	0.05						0.02					
v/c Ratio	0.12	0.49			0.90		0.06	0.91				
Uniform Delay, d1	9.3	11.3			14.9		11.8	17.5				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.9	2.1			15.0		0.0	15.8				
Delay (s)	11.2	13.4			29.9		11.8	33.3				
Level of Service	B	B			C		B	C				
Approach Delay (s)		13.3			29.9			32.1			0.0	
Approach LOS		B			C			C			A	
Intersection Summary												
HCM 2000 Control Delay		26.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		59.3			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		79.9%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	396	9	73	573	33	21	190	43	103	194	40
Future Volume (vph)	10	396	9	73	573	33	21	190	43	103	194	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
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			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1711	1795		1711	1786			1752			1745	
Flt Permitted	0.27	1.00		0.46	1.00			0.95			0.82	
Satd. Flow (perm)	491	1795		820	1786			1677			1455	
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	396	9	73	573	33	21	190	43	103	194	40
RTOR Reduction (vph)	0	2	0	0	4	0	0	13	0	0	9	0
Lane Group Flow (vph)	10	403	0	73	602	0	0	241	0	0	328	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	25.0	25.0		25.0	25.0			18.0			18.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0			19.0			19.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			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)	232	848		387	844			579			502	
v/s Ratio Prot		0.22			c0.34							
v/s Ratio Perm	0.02			0.09				0.14			c0.23	
v/c Ratio	0.04	0.48		0.19	0.71			0.42			0.65	
Uniform Delay, d1	7.8	9.9		8.4	11.5			13.8			15.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.9		1.1	5.1			2.2			6.5	
Delay (s)	8.2	11.8		9.5	16.6			16.0			21.7	
Level of Service	A	B		A	B			B			C	
Approach Delay (s)		11.7			15.9			16.0			21.7	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			16.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			85.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	384	184	88	391	133	10	201	68	51	115	10
Future Volume (vph)	11	384	184	88	391	133	10	201	68	51	115	10
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		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		1.00	1.00		0.99	
Satd. Flow (prot)		1722			1784	1531		1796	1531		1761	
Flt Permitted		0.99			0.82	1.00		0.99	1.00		0.86	
Satd. Flow (perm)		1707			1481	1531		1775	1531		1541	
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)	11	384	184	88	391	133	10	201	68	51	115	10
RTOR Reduction (vph)	0	13	0	0	0	38	0	0	48	0	2	0
Lane Group Flow (vph)	0	566	0	0	479	95	0	211	20	0	174	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		48.4			48.4	48.4		25.4	25.4		25.4	
Effective Green, g (s)		49.4			49.4	49.4		26.4	26.4		26.4	
Actuated g/C Ratio		0.55			0.55	0.55		0.29	0.29		0.29	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		936			812	840		520	449		452	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.32	0.06		c0.12	0.01		0.11	
v/c Ratio		0.61			0.59	0.11		0.41	0.04		0.38	
Uniform Delay, d1		13.7			13.5	9.8		25.5	22.8		25.3	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.1			1.1	0.1		2.3	0.2		0.5	
Delay (s)		14.8			14.6	9.8		27.9	23.0		25.9	
Level of Service		B			B	A		C	C		C	
Approach Delay (s)		14.8			13.6			26.7			25.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			91.4%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St. Paul St/St Paul St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	302	78	60	462	115	74	167	47	42	43	18
Future Volume (vph)	4	302	78	60	462	115	74	167	47	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	0.97		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1745		1711	1747		1711	1741		1711	1721	
Flt Permitted	0.27	1.00		0.48	1.00		0.72	1.00		0.62	1.00	
Satd. Flow (perm)	478	1745		867	1747		1291	1741		1124	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	302	78	60	462	115	74	167	47	42	43	18
RTOR Reduction (vph)	0	19	0	0	18	0	0	17	0	0	12	0
Lane Group Flow (vph)	4	361	0	60	559	0	74	197	0	42	49	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	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)	192	701		348	702		465	627		405	620	
v/s Ratio Prot		0.21			c0.32			c0.11			0.03	
v/s Ratio Perm	0.01			0.07			0.06			0.04		
v/c Ratio	0.02	0.52		0.17	0.80		0.16	0.31		0.10	0.08	
Uniform Delay, d1	9.1	11.4		9.7	13.3		11.0	11.6		10.7	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6		0.2	6.3		0.7	1.3		0.5	0.3	
Delay (s)	9.2	12.0		9.9	19.5		11.7	13.0		11.2	10.9	
Level of Service	A	B		A	B		B	B		B	B	
Approach Delay (s)		12.0			18.6			12.6			11.0	
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			0.57									
Actuated Cycle Length (s)			50.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			71.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	315	14	117	528	135	11	39	12	98	262	123
Future Volume (vph)	42	315	14	117	528	135	11	39	12	98	262	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1711	1789		1711	1746			1738		1711	1801	1531
Flt Permitted	0.20	1.00		0.44	1.00			0.93		0.67	1.00	1.00
Satd. Flow (perm)	360	1789		799	1746			1637		1202	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	315	14	117	528	135	11	39	12	98	262	123
RTOR Reduction (vph)	0	3	0	0	15	0	0	8	0	0	0	60
Lane Group Flow (vph)	42	326	0	117	648	0	0	54	0	98	262	63
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	19.0	19.0		19.0	19.0			20.2		30.2	30.2	30.2
Effective Green, g (s)	20.0	20.0		20.0	20.0			21.2		31.2	31.2	31.2
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.35		0.51	0.51	0.51
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)	117	584		261	570			567		654	918	780
v/s Ratio Prot		0.18			c0.37					0.01	c0.15	
v/s Ratio Perm	0.12			0.15				0.03		0.06		0.04
v/c Ratio	0.36	0.56		0.45	1.14			0.10		0.15	0.29	0.08
Uniform Delay, d1	15.7	17.0		16.2	20.6			13.5		8.0	8.6	7.7
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	3.8		5.5	81.1			0.3		0.1	0.8	0.2
Delay (s)	24.1	20.8		21.7	101.7			13.9		8.1	9.4	7.9
Level of Service	C	C		C	F			B		A	A	A
Approach Delay (s)		21.2			89.7			13.9			8.7	
Approach LOS		C			F			B			A	
Intersection Summary												
HCM 2000 Control Delay			48.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			61.2			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			66.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	438	0	0	786	33	37	553	57	0	0	0
Future Volume (vph)	14	438	0	0	786	33	37	553	57	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1791		1711	1775				
Flt Permitted	0.11	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	196	1801			1791		1711	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)	14	438	0	0	786	33	37	553	57	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	0
Lane Group Flow (vph)	14	438	0	0	817	0	37	606	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	37.6	37.6			37.6		27.1	27.1				
Effective Green, g (s)	38.6	38.6			38.6		28.1	28.1				
Actuated g/C Ratio	0.50	0.50			0.50		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)	98	906			901		626	650				
v/s Ratio Prot		0.24			c0.46			c0.34				
v/s Ratio Perm	0.07						0.02					
v/c Ratio	0.14	0.48			0.91		0.06	0.93				
Uniform Delay, d1	10.2	12.5			17.4		15.7	23.4				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.7	0.4			12.6		0.0	20.2				
Delay (s)	10.9	12.9			30.0		15.8	43.6				
Level of Service	B	B			C		B	D				
Approach Delay (s)		12.9			30.0			42.0			0.0	
Approach LOS		B			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			30.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			76.7				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			84.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

02/05/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	432	9	73	655	33	21	190	43	103	194	40
Future Volume (vph)	10	432	9	73	655	33	21	190	43	103	194	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
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			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1711	1795		1711	1788			1752			1745	
Flt Permitted	0.26	1.00		0.45	1.00			0.96			0.76	
Satd. Flow (perm)	466	1795		803	1788			1686			1346	
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	432	9	73	655	33	21	190	43	103	194	40
RTOR Reduction (vph)	0	1	0	0	3	0	0	11	0	0	8	0
Lane Group Flow (vph)	10	440	0	73	685	0	0	243	0	0	329	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	34.1	34.1		34.1	34.1			17.4			17.4	
Effective Green, g (s)	35.1	35.1		35.1	35.1			18.4			18.4	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			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)	257	992		443	988			488			390	
v/s Ratio Prot		0.25			c0.38							
v/s Ratio Perm	0.02			0.09				0.14			c0.24	
v/c Ratio	0.04	0.44		0.16	0.69			0.50			0.84	
Uniform Delay, d1	6.5	8.4		7.0	10.3			18.7			21.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.4		0.8	4.0			0.8			15.3	
Delay (s)	6.8	9.9		7.8	14.3			19.5			36.5	
Level of Service	A	A		A	B			B			D	
Approach Delay (s)		9.8			13.7			19.5			36.5	
Approach LOS		A			B			B			D	

Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	337	125	73	462	66	169	103	48	110	213	23
Future Volume (vph)	16	337	125	73	462	66	169	103	48	110	213	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	5.0		4.0	3.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Frt		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.97	1.00		0.98	
Satd. Flow (prot)		1734			1788	1531		1746	1531		1757	
Flt Permitted		0.98			0.86	1.00		0.57	1.00		0.71	
Satd. Flow (perm)		1697			1546	1531		1031	1531		1259	
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	337	125	73	462	66	169	103	48	110	213	23
RTOR Reduction (vph)	0	8	0	0	0	19	0	0	27	0	2	0
Lane Group Flow (vph)	0	470	0	0	535	47	0	272	21	0	344	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		56.4			56.4	56.4		47.4	47.4		47.4	
Effective Green, g (s)		57.4			57.4	56.4		48.4	49.4		48.4	
Actuated g/C Ratio		0.48			0.48	0.47		0.40	0.41		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		811			739	719		415	630		507	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.35	0.03		0.26	0.01		c0.27	
v/c Ratio		0.58			0.72	0.07		0.66	0.03		0.68	
Uniform Delay, d1		22.6			25.0	17.4		29.0	21.1		29.4	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.0			3.5	0.0		7.9	0.1		3.6	
Delay (s)		23.6			28.5	17.4		36.9	21.2		33.0	
Level of Service		C			C	B		D	C		C	
Approach Delay (s)		23.6			27.3			34.5			33.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		28.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		91.2%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	378	89	64	372	58	103	68	80	75	116	14
Future Volume (vph)	17	378	89	64	372	58	103	68	80	75	116	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	0.97		1.00	0.98		1.00	0.92		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1749		1711	1764		1711	1655		1711	1772	
Flt Permitted	0.40	1.00		0.35	1.00		0.67	1.00		0.66	1.00	
Satd. Flow (perm)	716	1749		628	1764		1213	1655		1193	1772	
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	378	89	64	372	58	103	68	80	75	116	14
RTOR Reduction (vph)	0	19	0	0	13	0	0	48	0	0	8	0
Lane Group Flow (vph)	17	448	0	64	417	0	103	100	0	75	122	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)	15.4	15.4		15.4	15.4		18.1	18.1		18.1	18.1	
Effective Green, g (s)	15.4	15.4		15.4	15.4		18.1	18.1		18.1	18.1	
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)	242	591		212	597		482	658		474	704	
v/s Ratio Prot		c0.26			0.24			0.06			0.07	
v/s Ratio Perm	0.02			0.10			c0.08			0.06		
v/c Ratio	0.07	0.76		0.30	0.70		0.21	0.15		0.16	0.17	
Uniform Delay, d1	10.2	13.4		11.1	13.0		9.0	8.8		8.8	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.6		0.8	3.6		1.0	0.5		0.7	0.5	
Delay (s)	10.3	19.0		11.9	16.6		10.0	9.3		9.5	9.4	
Level of Service	B	B		B	B		B	A		A	A	
Approach Delay (s)		18.7			16.0			9.6			9.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			45.5			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												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	470	37	97	500	179	7	132	49	286	382	119
Future Volume (vph)	102	470	37	97	500	179	7	132	49	286	382	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		4.0	4.0			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	0.99		1.00	0.96			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1781		1711	1729			1734		1711	1801	1531
Flt Permitted	0.20	1.00		0.33	1.00			0.98		0.73	1.00	1.00
Satd. Flow (perm)	360	1781		587	1729			1704		1323	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)	102	470	37	97	500	179	7	132	49	286	382	119
RTOR Reduction (vph)	0	6	0	0	26	0	0	26	0	0	0	76
Lane Group Flow (vph)	102	501	0	97	653	0	0	162	0	286	382	43
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	20.0	20.0		20.0	20.0			18.0		18.0	18.0	18.0
Effective Green, g (s)	20.0	22.0		22.0	22.0			18.0		18.0	18.0	18.0
Actuated g/C Ratio	0.40	0.44		0.44	0.44			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)	144	783		258	760			613		476	648	551
v/s Ratio Prot		0.28			c0.38						0.21	
v/s Ratio Perm	0.28			0.17				0.10		c0.22		0.03
v/c Ratio	0.71	0.64		0.38	0.86			0.26		0.60	0.59	0.08
Uniform Delay, d1	12.6	10.9		9.4	12.6			11.3		13.1	13.0	10.5
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	25.4	4.0		4.1	12.2			1.1		5.5	3.9	0.3
Delay (s)	38.0	14.9		13.5	24.8			12.4		18.6	16.9	10.8
Level of Service	D	B		B	C			B		B	B	B
Approach Delay (s)		18.8			23.4			12.4			16.6	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				10.0		
Intersection Capacity Utilization			91.6%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	784	0	0	648	38	43	283	114	0	0	0
Future Volume (vph)	58	784	0	0	648	38	43	283	114	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.96				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1787		1711	1723				
Flt Permitted	0.23	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	410	1801			1787		1711	1723				
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)	58	784	0	0	648	38	43	283	114	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	27	0	0	0	0
Lane Group Flow (vph)	58	784	0	0	683	0	43	370	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	26.2	26.2			26.2		16.4	16.4				
Effective Green, g (s)	27.2	27.2			27.2		17.4	17.4				
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)	204	897			890		545	549				
v/s Ratio Prot		c0.44			0.38			c0.21				
v/s Ratio Perm	0.14						0.03					
v/c Ratio	0.28	0.87			0.77		0.08	0.67				
Uniform Delay, d1	8.0	12.2			11.1		13.0	16.1				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	3.5	11.6			6.3		0.1	3.3				
Delay (s)	11.5	23.7			17.4		13.1	19.4				
Level of Service	B	C			B		B	B				
Approach Delay (s)		22.9			17.4			18.8			0.0	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		20.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		54.6			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		74.9%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

02/05/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	758	37	69	681	61	27	299	50	70	239	24
Future Volume (vph)	32	758	37	69	681	61	27	299	50	70	239	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
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			1762			1765	
Flt Permitted	0.16	1.00		0.15	1.00			0.96			0.84	
Satd. Flow (perm)	283	1788		277	1778			1691			1495	
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	758	37	69	681	61	27	299	50	70	239	24
RTOR Reduction (vph)	0	3	0	0	6	0	0	10	0	0	5	0
Lane Group Flow (vph)	32	792	0	69	736	0	0	366	0	0	328	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	25.0	25.0		25.0	25.0			18.0			18.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0			19.0			19.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			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)	133	845		130	840			584			516	
v/s Ratio Prot		c0.44			0.41							
v/s Ratio Perm	0.11			0.25				0.22			c0.22	
v/c Ratio	0.24	0.94		0.53	0.88			0.63			0.64	
Uniform Delay, d1	8.6	13.7		10.2	13.1			15.0			15.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	4.2	19.0		14.6	12.4			5.0			5.9	
Delay (s)	12.9	32.7		24.9	25.5			20.1			21.0	
Level of Service	B	C		C	C			C			C	
Approach Delay (s)		31.9			25.4			20.1			21.0	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/05/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔	↔		↔	
Traffic Volume (vph)	16	337	125	73	462	106	167	140	48	158	259	23
Future Volume (vph)	16	337	125	73	462	106	167	140	48	158	259	23
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		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.97	1.00		0.98	
Satd. Flow (prot)		1734			1788	1531		1753	1531		1756	
Flt Permitted		0.98			0.86	1.00		0.58	1.00		0.59	
Satd. Flow (perm)		1697			1546	1531		1036	1531		1057	
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	337	125	73	462	106	167	140	48	158	259	23
RTOR Reduction (vph)	0	8	0	0	0	23	0	0	24	0	2	0
Lane Group Flow (vph)	0	470	0	0	535	83	0	307	24	0	438	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		56.4			56.4	56.4		47.4	47.4		47.4	
Effective Green, g (s)		57.4			57.4	57.4		48.4	48.4		48.4	
Actuated g/C Ratio		0.48			0.48	0.48		0.40	0.40		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		811			739	732		417	617		426	
v/s Ratio Prot												
v/s Ratio Perm		0.28			0.35	0.05		0.30	0.02		0.41	
v/c Ratio		0.58			0.72	0.11		0.74	0.04		1.03	
Uniform Delay, d1		22.6			25.0	17.3		30.4	21.7		35.8	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.0			3.5	0.1		11.0	0.1		51.1	
Delay (s)		23.6			28.5	17.3		41.4	21.8		86.9	
Level of Service		C			C	B		D	C		F	
Approach Delay (s)		23.6			26.7			38.8			86.9	
Approach LOS		C			C			D			F	
Intersection Summary												
HCM 2000 Control Delay		42.0			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		107.6%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	401	113	64	413	99	99	110	80	140	139	14
Future Volume (vph)	17	401	113	64	413	99	99	110	80	140	139	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	0.97		1.00	0.97		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1741		1711	1748		1711	1687		1711	1776	
Flt Permitted	0.32	1.00		0.32	1.00		0.66	1.00		0.64	1.00	
Satd. Flow (perm)	579	1741		575	1748		1188	1687		1149	1776	
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	401	113	64	413	99	99	110	80	140	139	14
RTOR Reduction (vph)	0	21	0	0	18	0	0	45	0	0	6	0
Lane Group Flow (vph)	17	493	0	64	494	0	99	145	0	140	147	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)	18.6	18.6		18.6	18.6		18.2	18.2		18.2	18.2	
Effective Green, g (s)	18.6	18.6		18.6	18.6		18.2	18.2		18.2	18.2	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.37	0.37		0.37	0.37	
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)	220	663		219	666		443	629		428	662	
v/s Ratio Prot		c0.28			0.28			0.09			0.08	
v/s Ratio Perm	0.03			0.11			0.08			c0.12		
v/c Ratio	0.08	0.74		0.29	0.74		0.22	0.23		0.33	0.22	
Uniform Delay, d1	9.6	13.0		10.5	13.0		10.5	10.5		10.9	10.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	4.5		0.7	4.5		1.2	0.9		2.0	0.8	
Delay (s)	9.8	17.6		11.3	17.5		11.6	11.4		13.0	11.2	
Level of Service	A	B		B	B		B	B		B	B	
Approach Delay (s)		17.3			16.8			11.5			12.1	
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			0.54									
Actuated Cycle Length (s)			48.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	588	37	97	581	179	7	132	49	286	436	119
Future Volume (vph)	102	588	37	97	581	179	7	132	49	286	436	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1785		1711	1737			1734		1711	1801	1531
Flt Permitted	0.18	1.00		0.27	1.00			0.98		0.40	1.00	1.00
Satd. Flow (perm)	316	1785		484	1737			1700		717	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)	102	588	37	97	581	179	7	132	49	286	436	119
RTOR Reduction (vph)	0	3	0	0	12	0	0	14	0	0	0	77
Lane Group Flow (vph)	102	622	0	97	748	0	0	174	0	286	436	42
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	48.0	48.0		48.0	48.0			19.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	49.0		48.0	48.0			19.0		32.0	32.0	32.0
Actuated g/C Ratio	0.53	0.54		0.53	0.53			0.21		0.36	0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	168	971		258	926			358		343	640	544
v/s Ratio Prot		0.35			c0.43					c0.07	0.24	
v/s Ratio Perm	0.32			0.20				0.10		c0.22		0.03
v/c Ratio	0.61	0.64		0.38	0.81			0.49		0.83	0.68	0.08
Uniform Delay, d1	14.5	14.3		12.3	17.2			31.2		26.7	24.7	19.2
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	15.2	3.2		4.1	7.5			4.7		15.8	5.8	0.3
Delay (s)	29.7	17.6		16.4	24.7			35.9		42.5	30.4	19.5
Level of Service	C	B		B	C			D		D	C	B
Approach Delay (s)		19.3			23.8			35.9			33.0	
Approach LOS		B			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			26.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			97.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Main St & S Union St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	902	0	0	729	38	43	238	114	0	0	0
Future Volume (vph)	58	902	0	0	729	38	43	238	114	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	0.95				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1711	1801			1789		1711	1713				
Flt Permitted	0.21	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	382	1801			1789		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)	58	902	0	0	729	38	43	238	114	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	30	0	0	0	0
Lane Group Flow (vph)	58	902	0	0	764	0	43	322	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	32.2	32.2			32.2		15.8	15.8				
Effective Green, g (s)	33.2	33.2			33.2		16.8	16.8				
Actuated g/C Ratio	0.57	0.57			0.57		0.29	0.29				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	218	1030			1024		495	496				
v/s Ratio Prot		c0.50			0.43			c0.19				
v/s Ratio Perm	0.15						0.03					
v/c Ratio	0.27	0.88			0.75		0.09	0.65				
Uniform Delay, d1	6.3	10.6			9.3		15.0	18.0				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.7	8.5			3.0		0.1	2.9				
Delay (s)	6.9	19.1			12.3		15.1	21.0				
Level of Service	A	B			B		B	C				
Approach Delay (s)		18.4			12.3			20.3			0.0	
Approach LOS		B			B			C			A	
Intersection Summary												
HCM 2000 Control Delay		16.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		58.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		74.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: S Willard St & Main St

02/05/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	877	37	69	762	61	27	299	50	70	239	24
Future Volume (vph)	32	877	37	69	762	61	27	299	50	70	239	24
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	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	1781			1762			1765	
Flt Permitted	0.18	1.00		0.12	1.00			0.96			0.78	
Satd. Flow (perm)	317	1790		210	1781			1705			1388	
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	877	37	69	762	61	27	299	50	70	239	24
RTOR Reduction (vph)	0	2	0	0	4	0	0	9	0	0	4	0
Lane Group Flow (vph)	32	912	0	69	819	0	0	367	0	0	329	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	35.1	35.1		35.1	35.1			17.4			17.4	
Effective Green, g (s)	36.1	36.1		36.1	36.1			18.4			18.4	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.29			0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	183	1033		121	1028			501			408	
v/s Ratio Prot		c0.51			0.46							
v/s Ratio Perm	0.10			0.33				0.22			c0.24	
v/c Ratio	0.17	0.88		0.57	0.80			0.73			0.81	
Uniform Delay, d1	6.2	11.4		8.3	10.3			19.8			20.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.1	10.9		18.1	6.4			5.5			11.1	
Delay (s)	8.3	22.3		26.4	16.7			25.3			31.4	
Level of Service	A	C		C	B			C			C	
Approach Delay (s)		21.8			17.5			25.3			31.4	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			22.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			62.5			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			98.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												



To: Laura Wheelock, PE
Burlington DPW

Date: February 9, 2017

Memorandum

Project #: 57881.00

From: David Saladino, PE, AICP

Re: Burlington Town Center Traffic Study Addendum
Impact of 80 Additional Residential Units

As requested during the February 8, 2017 meeting with the Burlington Town Center (BTC) team and DPW staff, VHB has prepared this supplement to the BTC Traffic Impact Study (TIS) to evaluate the trip generation and traffic operations implications associated with converting the 80 residential units currently called out in the TIS as student housing with no on-site parking to publicly-available housing with the opportunity to access on-site parking.

Trip Generation

Figure 1 and **Figure 2** below summarize the *total* trip generation of the BTC project during the AM and PM peak hours with the number of residential (apartment) units increased from 192 to 272 total units.

Figure 1: Trip Generation Details – AM Peak Hour

Site Land Uses and Descriptions				AM PK HR OF ADJACENT STREET TRAFFIC									
Code	Land Use	Size	Unit	directional dist.		# studies	average		Total by Avg	regression		# trips	
				% enter	% exit		Avg Rate	Std Dev.		r ²	total by Eq'n	Method Chosen	Total Trips
1	2	3	4	16	17	18	19	20	21	22	23	24	25
220	Apartment	272	ea	20%	80%	78	0.51	0.73	139	0.83	137.01	regression	137
565	Day Care Center	19.5	1k sf	53%	47%	67	12.18	6.40	238	n/a	n/a	average	238
710	General Office Building	230	1k sf	88%	12%	218	1.56	1.40	359	0.83	373	regression	373
820	Shopping Center	108	1k sf	62%	38%	104	0.96	1.31	104	0.56	163	average	104
												Total New Trips	545
												Additional Trips from 80 Units (All Modes)	7
													31

Figure 2: Trip Generation Details - PM Peak Hour

Site Land Uses and Descriptions				PM PK HR OF ADJACENT STREET TRAFFIC									
Code	Land Use	Size	Unit	directional dist.		# studies	average		Total by Avg	regression		# trips	
				% enter	% exit		Avg Rate	Std Dev.		r ²	total by Eq'n	Method Chosen	Total Trips
1	2	3	4	26	27	28	29	30	31	32	33	34	35
220	Apartment	272	ea	65%	35%	90	0.62	0.82	169	0.77	167	regression	167
565	Day Care Center	19.5	1k sf	47%	53%	68	12.38	6.93	241	n/a	n/a	average	241
710	General Office Building	230	1k sf	17%	83%	236	1.49	1.37	343	0.82	336	regression	336
820	Shopping Center	108	1k sf	48%	52%	426	3.71	2.74	401	0.81	631	regression	631
												Total New Trips	582
												Additional Trips from 80 Units (All Modes)	29
													15

40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403-7771
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Figure 3 below summarizes the number of *net new vehicle trips* generated by the BTC project with 272 residential units in place after accounting for non-auto and internally captured trips. The additional 80 residential units were found to generate an additional 25 new vehicle trips during the AM peak hour and an additional 20 new vehicle trips during the PM peak hour.

Figure 3: Trip Generation Summary

<u>Total New Trips</u> <i>All Modes</i>		Transit	Bike & Pedestrian	Internal Capture	External Trips (e) = (a) - (b) - (c) - (d)	<u>Net New Trips</u> <i>Vehicles</i> (f) = (e)
	(a)	(b)	(c)	(d)		
Weekday Morning						
Enter	455	25	115	40	275	275
Exit	<u>220</u>	<u>10</u>	<u>55</u>	<u>20</u>	<u>135</u>	<u>135</u>
Total	675	35	170	60	410	410
Weekday Evening						
Enter	500	25	125	80	270	270
Exit	<u>695</u>	<u>35</u>	<u>175</u>	<u>110</u>	<u>375</u>	<u>375</u>
Total	1,195	60	300	190	645	645

These additional peak hour trips were distributed onto the street network following the distribution assumptions used in the TIS. With the new trips distributed onto the network, no intersection saw an increase of more than 15 vehicles during either peak hour.

Capacity Analysis

Figure 4 below shows the twelve intersections (red circles) selected to evaluate the effects of the trips generated by the 80 additional residential units.

Figure 4: Intersections Selected for Analysis

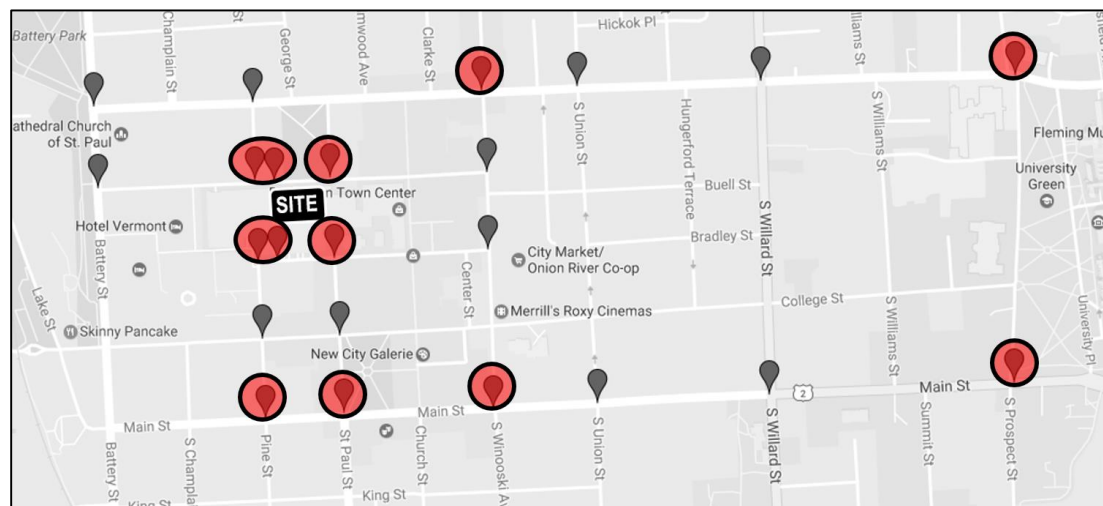


Figure 5 below compares the volume-to-capacity ratio, average delay, and Level of Service for the seven selected signalized intersections with 192 residential units in place (along with all of the other uses included in the TIS) against the results with 272 residential units in place. As the figure shows, the trips generated by the additional 80 residential units have negligible effects on traffic operations, with average delays increasing by no more than 3 seconds at any intersection.

Figure 5: 2024 Signalized Intersection Analysis – 2024 AM & PM Peak Hours

Intersection	Peak Hour	2024 Build (192 Units)			2024 Build (272 Units)		
		v/c	Delay	LOS	v/c	Delay	LOS
N/S Winooski Ave at Pearl St	Weekday AM	0.51	12.3	B	0.53	12.5	B
	Weekday PM	0.62	14.9	B	0.63	15.0	B
Prospect St at Pearl St/Colchester Ave	Weekday AM	0.84	36.6	D	0.84	39.4	D
	Weekday PM	0.90	47.1	D	0.90	47.3	D
Pine St at Main St	Weekday AM	0.51	17.6	B	0.51	17.6	B
	Weekday PM	0.83	42.0	D	0.83	42.5	D
Saint Paul St at Main St	Weekday AM	0.57	15.1	B	0.57	15.1	B
	Weekday PM	0.54	15.2	B	0.54	15.3	B
S Winooski Ave at Main St	Weekday AM	0.68	48.9	D	0.69	49.1	D
	Weekday PM	0.86	26.4	C	0.86	26.5	C
S Prospect St at Main St	Weekday AM	0.95	30.9	C	0.98	33.3	C
	Weekday PM	0.98	53.3	D	0.98	53.5	D
St Paul St at Cherry St	Weekday AM	0.21	15.4	B	0.22	15.6	B
	Weekday PM	0.21	15.0	B	0.21	15.1	B

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

Figure 6 below compares the volume-to-capacity ratio, average delay, and Level of Service for the five selected unsignalized intersections during the 2024 AM peak hour with 192 and 272 residential units in place. As the figure shows, the trips generated by the additional 80 residential units have negligible effects on traffic operations, with average delays increasing by no more than 1 second on any intersection approach and all LOS grades remaining at LOS B or better.

Figure 6: 2024 Unsignalized Intersection Analysis – 2024 AM Peak Hour

Intersection / Movement	2024 AM Build (192 Units)			2024 AM Build (272 Units)		
	v/c	Delay	LOS	v/c	Delay	LOS
Cherry Street at Parking Garage						
EB from Cherry St	0.14	0	-	0.14	0	-
WB from Cherry St	0.06	2.9	A	0.06	2.9	A
NB from Garage	0.1	12.3	B	0.12	12.6	B
Bank St at Pine St/(Parking Garage)						
WB from Bank St	0.14	7.9	A	0.14	8.0	A
NB from Pine St	0.16	7.5	A	0.16	7.5	A
SB from Garage	0.05	7.7	A	0.05	7.7	A
Bank St at Parking Garage						
EB from Bank St	0.08	5.3	A	0.08	6.2	A
WB from Bank St	0.10	0	-	0.09	0	-
SB from Garage	0.10	12.9	B	0.12	12.9	B
Cherry St at Pine St						
EB from Cherry St	0.25	9.4	A	0.26	9.5	A
WB from Cherry St	0.26	9.2	A	0.28	9.3	A
NB from Pine St	0.05	8.1	A	0.05	8.2	A
SB from Pine St	0.26	9.5	A	0.27	9.6	A
Bank St at St. Paul St						
EB from Bank St	0.14	8	A	0.15	8.1	A
WB from Bank St	0.17	8.5	A	0.18	8.5	A
NB from St. Paul St	0.18	8.5	A	0.18	8.6	A
SB from St. Paul St	0.04	7.4	A	0.04	7.5	A

Figure 7 below compares the volume-to-capacity ratio, average delay, and Level of Service for the five selected unsignalized intersections during the 2024 PM peak hour with 192 and 272 residential units in place. As the figure shows, the trips generated by the additional 80 residential units have negligible effects on traffic operations, with average delays increasing by no more than 1 second on any intersection approach and all LOS grades remaining at LOS B or better.

Figure 7: 2024 Signalized Intersection Analysis – 2024 PM Peak Hour

	2024 PM Build (192 Units)			2024 PM Build (272 Units)		
	v/c	Delay	LOS	v/c	Delay	LOS
Cherry Street at Parking Garage						
EB from Cherry St	0.13	0	-	0.13	0	-
WB from Cherry St	0.04	1.8	A	0.04	1.8	A
NB from Garage	0.48	17.1	C	0.50	17.5	C
Bank St at Pine St/(Parking Garage)						
WB from Bank St	0.21	8.8	A	0.22	8.8	A
NB from Pine St	0.16	7.7	A	0.17	7.7	A
SB from Garage	0.12	8.2	A	0.12	8.2	A
Bank St at Parking Garage						
EB from Bank St	0.05	3.6	A	0.05	3.7	A
WB from Bank St	0.07	0	-	0.07	0	-
SB from Garage	0.29	11.9	B	0.30	12.1	B
Cherry St at Pine St						
EB from Cherry St	0.31	10.2	B	0.31	10.3	B
WB from Cherry St	0.52	12	B	0.53	12.1	B
NB from Pine St	0.05	8.7	A	0.05	8.7	A
SB from Pine St	0.21	9.9	A	0.21	10.0	A
EB from Bank St	0.30	9.3	A	0.31	9.4	A
WB from Bank St	0.17	8.8	A	0.17	8.8	A
NB from St. Paul St	0.24	9.2	A	0.25	9.3	A
SB from St. Paul St	0.40	7.8	A	0.04	7.9	A

Please let me know if you have any questions on the above assessment. I'd be happy to come to DPW to discuss these responses in person or to talk through them by phone

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

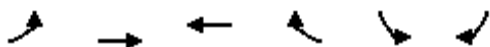
02/09/2017

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	111	124	76	160	51	15
Future Volume (Veh/h)	111	124	76	160	51	15
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)	111	124	76	160	51	15
Pedestrians					28	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				247		
pX, platoon unblocked					0.92	
vC, conflicting volume			263		513	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			263		429	201
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		90	98
cM capacity (veh/h)			1269		493	819
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	235	236	66			
Volume Left	0	76	51			
Volume Right	124	0	15			
cSH	1700	1269	542			
Volume to Capacity	0.14	0.06	0.12			
Queue Length 95th (ft)	0	5	10			
Control Delay (s)	0.0	2.9	12.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.9	12.6			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			41.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

02/09/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	36	53	96	49	22
Future Volume (Veh/h)	103	36	53	96	49	22
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)	103	36	53	96	49	22
Pedestrians					78	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	227				421	179
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227				421	179
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				90	97
cM capacity (veh/h)	1250				504	805
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	139	149	71			
Volume Left	103	0	49			
Volume Right	0	96	22			
cSH	1250	1700	570			
Volume to Capacity	0.08	0.09	0.12			
Queue Length 95th (ft)	7	0	11			
Control Delay (s)	6.2	0.0	12.2			
Lane LOS	A		B			
Approach Delay (s)	6.2	0.0	12.2			
Approach LOS			B			
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			34.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

02/09/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	81	39	39	114	25	19
Future Volume (vph)	81	39	39	114	25	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	81	39	39	114	25	19
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	120	153	44			
Volume Left (vph)	81	0	25			
Volume Right (vph)	39	114	0			
Hadj (s)	-0.03	-0.41	0.15			
Departure Headway (s)	4.3	3.8	4.5			
Degree Utilization, x	0.14	0.16	0.05			
Capacity (veh/h)	804	909	776			
Control Delay (s)	8.0	7.5	7.7			
Approach Delay (s)	8.0	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			29.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Pine St & Cherry St

02/09/2017

												
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	166	5	20	121	75	5	11	20	100	22	76
Future Volume (vph)	26	166	5	20	121	75	5	11	20	100	22	76
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	166	5	20	121	75	5	11	20	100	22	76
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	216	36	198								
Volume Left (vph)	26	20	5	100								
Volume Right (vph)	5	75	20	76								
Hadj (s)	0.05	-0.16	-0.27	-0.10								
Departure Headway (s)	4.8	4.6	4.9	4.8								
Degree Utilization, x	0.26	0.28	0.05	0.27								
Capacity (veh/h)	702	737	650	687								
Control Delay (s)	9.5	9.3	8.2	9.6								
Approach Delay (s)	9.5	9.3	8.2	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.4									
Level of Service			A									
Intersection Capacity Utilization			40.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

02/09/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑		↑		↑	↑	↑↓	↑
Traffic Volume (vph)	0	207	103	213	446	0	130	0	120	61	392	86
Future Volume (vph)	0	207	103	213	446	0	130	0	120	61	392	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	3329	
Flt Permitted		1.00	1.00	0.63	1.00		0.48		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	1131	1801		862		1531	1711	3329	
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	207	103	213	446	0	130	0	120	61	392	86
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	75	0	0	0
Lane Group Flow (vph)	0	207	39	213	446	0	130	0	45	61	478	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)		18.5	18.5	18.5	18.5		18.3		18.3	18.3	18.3	
Effective Green, g (s)		18.5	18.5	18.5	18.5		18.3		18.3	18.3	18.3	
Actuated g/C Ratio		0.38	0.38	0.38	0.38		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)		682	580	428	682		323		574	641	1248	
v/s Ratio Prot		0.11			c0.25						0.14	
v/s Ratio Perm			0.03	0.19			c0.15		0.03	0.04		
v/c Ratio		0.30	0.07	0.50	0.65		0.40		0.08	0.10	0.38	
Uniform Delay, d1		10.6	9.7	11.6	12.5		11.2		9.8	9.9	11.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.0	0.9	2.3		3.7		0.3	0.3	0.9	
Delay (s)		10.9	9.7	12.5	14.8		14.9		10.1	10.2	12.0	
Level of Service		B	A	B	B		B		B	B	B	
Approach Delay (s)		10.5			14.0			12.6			11.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			48.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			61.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	421	78	204	583	46	79	76	125	39	231	28
Future Volume (vph)	0	421	78	204	583	46	79	76	125	39	231	28
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	1781		1711	1801	1531		1766	
Flt Permitted		1.00		0.22	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1763		395	1781		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	421	78	204	583	46	79	76	125	39	231	28
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	111	0	4	0
Lane Group Flow (vph)	0	492	0	204	629	0	79	76	14	0	294	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)		23.1		36.1	36.1		9.2	9.2	9.2		16.7	
Effective Green, g (s)		23.1		36.1	36.1		9.2	9.2	9.2		16.7	
Actuated g/C Ratio		0.29		0.45	0.45		0.11	0.11	0.11		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)		509		293	803		196	207	176		368	
v/s Ratio Prot		c0.28		0.06	c0.35		c0.05	0.04			c0.17	
v/s Ratio Perm				0.25					0.01			
v/c Ratio		0.97		0.70	0.78		0.40	0.37	0.08		0.80	
Uniform Delay, d1		28.1		27.6	18.6		32.9	32.7	31.6		30.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		32.4		7.0	7.5		1.4	1.1	0.2		11.5	
Delay (s)		60.4		34.6	26.2		34.2	33.8	31.8		41.5	
Level of Service		E		C	C		C	C	C		D	
Approach Delay (s)		60.4			28.2			33.0			41.5	
Approach LOS		E			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			39.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			98.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	384	184	88	391	133	10	201	68	53	117	10
Future Volume (vph)	11	384	184	88	391	133	10	201	68	53	117	10
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		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		1.00	1.00		0.99	
Satd. Flow (prot)		1722			1784	1531		1796	1531		1761	
Flt Permitted		0.99			0.82	1.00		0.99	1.00		0.86	
Satd. Flow (perm)		1707			1481	1531		1774	1531		1536	
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)	11	384	184	88	391	133	10	201	68	53	117	10
RTOR Reduction (vph)	0	13	0	0	0	38	0	0	48	0	2	0
Lane Group Flow (vph)	0	566	0	0	479	95	0	211	20	0	178	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		48.4			48.4	48.4		25.4	25.4		25.4	
Effective Green, g (s)		49.4			49.4	49.4		26.4	26.4		26.4	
Actuated g/C Ratio		0.55			0.55	0.55		0.29	0.29		0.29	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		936			812	840		520	449		450	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.32	0.06		c0.12	0.01		0.12	
v/c Ratio		0.61			0.59	0.11		0.41	0.04		0.40	
Uniform Delay, d1		13.7			13.5	9.8		25.5	22.8		25.4	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.1			1.1	0.1		2.3	0.2		0.6	
Delay (s)		14.8			14.6	9.8		27.9	23.0		26.0	
Level of Service		B			B	A		C	C		C	
Approach Delay (s)		14.8			13.6			26.7			26.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		17.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		91.6%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St. Paul St/St Paul St & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	303	80	60	462	116	74	168	47	45	44	18
Future Volume (vph)	4	303	80	60	462	116	74	168	47	45	44	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	0.97		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1744		1711	1746		1711	1742		1711	1722	
Flt Permitted	0.27	1.00		0.48	1.00		0.72	1.00		0.62	1.00	
Satd. Flow (perm)	478	1744		861	1746		1290	1742		1123	1722	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	303	80	60	462	116	74	168	47	45	44	18
RTOR Reduction (vph)	0	19	0	0	18	0	0	17	0	0	12	0
Lane Group Flow (vph)	4	364	0	60	560	0	74	198	0	45	50	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)	20.4	20.4		20.4	20.4		18.2	18.2		18.2	18.2	
Effective Green, g (s)	20.4	20.4		20.4	20.4		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)	192	703		347	703		463	626		403	619	
v/s Ratio Prot		0.21			c0.32			c0.11			0.03	
v/s Ratio Perm	0.01			0.07			0.06			0.04		
v/c Ratio	0.02	0.52		0.17	0.80		0.16	0.32		0.11	0.08	
Uniform Delay, d1	9.1	11.4		9.7	13.3		11.0	11.7		10.8	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6		0.2	6.3		0.7	1.3		0.6	0.3	
Delay (s)	9.1	12.0		9.9	19.5		11.7	13.0		11.4	10.9	
Level of Service	A	B		A	B		B	B		B	B	
Approach Delay (s)		12.0			18.6			12.7			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		0.57										
Actuated Cycle Length (s)		50.6			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		71.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

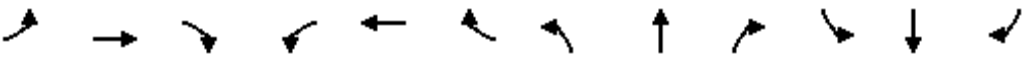
02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	321	14	117	529	135	11	39	12	98	265	123
Future Volume (vph)	42	321	14	117	529	135	11	39	12	98	265	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1711	1789		1711	1746			1738		1711	1801	1531
Flt Permitted	0.20	1.00		0.44	1.00			0.93		0.67	1.00	1.00
Satd. Flow (perm)	360	1789		784	1746			1636		1202	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	321	14	117	529	135	11	39	12	98	265	123
RTOR Reduction (vph)	0	3	0	0	15	0	0	8	0	0	0	60
Lane Group Flow (vph)	42	332	0	117	649	0	0	54	0	98	265	63
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	19.0	19.0		19.0	19.0			20.2		30.2	30.2	30.2
Effective Green, g (s)	20.0	20.0		20.0	20.0			21.2		31.2	31.2	31.2
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.35		0.51	0.51	0.51
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)	117	584		256	570			566		654	918	780
v/s Ratio Prot		0.19			c0.37					0.01	c0.15	
v/s Ratio Perm	0.12			0.15				0.03		0.06		0.04
v/c Ratio	0.36	0.57		0.46	1.14			0.10		0.15	0.29	0.08
Uniform Delay, d1	15.7	17.0		16.3	20.6			13.5		8.0	8.6	7.7
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	4.0		5.8	81.8			0.3		0.1	0.8	0.2
Delay (s)	24.1	21.0		22.1	102.4			13.9		8.1	9.4	7.9
Level of Service	C	C		C	F			B		A	A	A
Approach Delay (s)		21.4			90.3			13.9			8.8	
Approach LOS		C			F			B			A	
Intersection Summary												
HCM 2000 Control Delay			49.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			61.2			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			66.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	726	4	231	1022	628	0	87	185	247	75	48
Future Volume (vph)	0	726	4	231	1022	628	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	726	4	231	1022	628	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	729	0	231	1022	628	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)		26.9		14.2	47.1	47.1		9.4	9.4	7.0	22.4	
Effective Green, g (s)		26.9		14.2	47.1	47.1		9.4	9.4	7.0	22.4	
Actuated g/C Ratio		0.33		0.17	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)		1128		298	1040	884		207	176	285	465	
v/s Ratio Prot		0.21		0.14	c0.57	0.41		c0.05		c0.07	0.07	
v/s Ratio Perm									0.01			
v/c Ratio		0.65		0.78	0.98	0.71		0.42	0.12	0.87	0.26	
Uniform Delay, d1		23.3		32.1	16.8	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		11.9	24.0	4.8		1.4	0.3	23.0	0.3	
Delay (s)		26.1		44.0	40.8	17.1		34.9	32.7	59.8	23.4	
Level of Service		C		D	D	B		C	C	E	C	
Approach Delay (s)		26.1			33.3			33.4			47.7	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			33.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			81.5				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			77.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	57	47	70	64	5	103	5	37	0	10	20
Future Volume (vph)	20	57	47	70	64	5	103	5	37	0	10	20
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)	20	57	47	70	64	5	103	5	37	0	10	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	124	139	145	30								
Volume Left (vph)	20	70	103	0								
Volume Right (vph)	47	5	37	20								
Hadj (s)	-0.16	0.11	0.02	-0.37								
Departure Headway (s)	4.3	4.6	4.6	4.3								
Degree Utilization, x	0.15	0.18	0.18	0.04								
Capacity (veh/h)	794	746	744	763								
Control Delay (s)	8.1	8.5	8.6	7.5								
Approach Delay (s)	8.1	8.5	8.6	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				35.8%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

23: St Paul St & Cherry St

02/09/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	24	168	20	5	209	20	20	5	5	25	5	17
Future Volume (vph)	24	168	20	5	209	20	20	5	5	25	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		0.99			1.00			0.97			0.97	
Satd. Flow (prot)		1768			1778			1703			1668	
Flt Permitted		0.94			0.99			0.87			0.89	
Satd. Flow (perm)		1667			1758			1527			1521	
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)	24	168	20	5	209	20	20	5	5	25	5	17
RTOR Reduction (vph)	0	9	0	0	9	0	0	3	0	0	9	0
Lane Group Flow (vph)	0	203	0	0	225	0	0	28	0	0	39	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)		8.8			8.8			20.8			20.8	
Effective Green, g (s)		8.8			8.8			20.8			20.8	
Actuated g/C Ratio		0.21			0.21			0.50			0.50	
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)		352			371			763			760	
v/s Ratio Prot												
v/s Ratio Perm		0.12			0.13			0.02			0.03	
v/c Ratio		0.58			0.61			0.04			0.05	
Uniform Delay, d1		14.7			14.8			5.3			5.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.3			2.8			0.1			0.1	
Delay (s)		17.0			17.6			5.4			5.5	
Level of Service		B			B			A			A	
Approach Delay (s)		17.0			17.6			5.4			5.5	
Approach LOS		B			B			A			A	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

1: Parking Garage & Cherry St

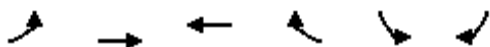
02/09/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	92	52	219	195	85
Future Volume (Veh/h)	135	92	52	219	195	85
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	92	52	219	195	85
Pedestrians						22
Lane Width (ft)						11.0
Walking Speed (ft/s)						3.5
Percent Blockage						2
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	247					
pX, platoon unblocked					0.92	
vC, conflicting volume				249	526	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				249	437	203
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	61	90
cM capacity (veh/h)				1291	497	822
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	227	271	280			
Volume Left	0	52	195			
Volume Right	92	0	85			
cSH	1700	1291	565			
Volume to Capacity	0.13	0.04	0.50			
Queue Length 95th (ft)	0	3	68			
Control Delay (s)	0.0	1.8	17.5			
Lane LOS			A	C		
Approach Delay (s)	0.0	1.8	17.5			
Approach LOS				C		
Intersection Summary						
Average Delay				6.9		
Intersection Capacity Utilization				54.0%	ICU Level of Service	A
Analysis Period (min)				15		

HCM Unsignalized Intersection Capacity Analysis

2: Bank St & Parking Garage

02/09/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	92	30	88	141	81
Future Volume (Veh/h)	79	92	30	88	141	81
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)	79	92	30	88	141	81
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	118				324	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	118				324	74
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				78	92
cM capacity (veh/h)	1470				634	988
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	171	118	222			
Volume Left	79	0	141			
Volume Right	0	88	81			
cSH	1470	1700	729			
Volume to Capacity	0.05	0.07	0.30			
Queue Length 95th (ft)	4	0	32			
Control Delay (s)	3.7	0.0	12.1			
Lane LOS	A		B			
Approach Delay (s)	3.7	0.0	12.1			
Approach LOS			B			
Intersection Summary						
Average Delay		6.5				
Intersection Capacity Utilization		35.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Pine St & Bank St

02/09/2017

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	142	30	13	141	31	62
Future Volume (vph)	142	30	13	141	31	62
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	142	30	13	141	31	62
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	172	154	93			
Volume Left (vph)	142	0	31			
Volume Right (vph)	30	141	0			
Hadj (s)	0.09	-0.52	0.10			
Departure Headway (s)	4.5	3.9	4.6			
Degree Utilization, x	0.22	0.17	0.12			
Capacity (veh/h)	749	874	743			
Control Delay (s)	8.8	7.7	8.2			
Approach Delay (s)	8.8	7.7	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.3			
Level of Service			A			
Intersection Capacity Utilization			39.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Pine St & Cherry St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	132	5	20	142	270	5	11	20	83	23	34
Future Volume (vph)	89	132	5	20	142	270	5	11	20	83	23	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)	89	132	5	20	142	270	5	11	20	83	23	34
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	226	432	36	140								
Volume Left (vph)	89	20	5	83								
Volume Right (vph)	5	270	20	34								
Hadj (s)	0.10	-0.33	-0.27	0.01								
Departure Headway (s)	5.0	4.4	5.4	5.5								
Degree Utilization, x	0.31	0.53	0.05	0.21								
Capacity (veh/h)	678	794	559	587								
Control Delay (s)	10.3	12.1	8.7	10.0								
Approach Delay (s)	10.3	12.1	8.7	10.0								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				11.1								
Level of Service				B								
Intersection Capacity Utilization				64.2%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

7: S Winooski Ave/N Winooski Ave & Pearl St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	376	118	219	453	0	201	0	348	107	324	51
Future Volume (vph)	0	376	118	219	453	0	201	0	348	107	324	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	0.46	1.00		0.53		1.00	0.95	1.00	
Satd. Flow (perm)		1801	1531	819	1801		953		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	376	118	219	453	0	201	0	348	107	324	51
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	188	0	0	0
Lane Group Flow (vph)	0	376	41	219	453	0	201	0	160	107	375	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)		17.9	17.9	17.9	17.9		21.2		21.2	21.2	21.2	
Effective Green, g (s)		17.9	17.9	17.9	17.9		21.2		21.2	21.2	21.2	
Actuated g/C Ratio		0.35	0.35	0.35	0.35		0.41		0.41	0.41	0.41	
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)		630	536	286	630		395		635	709	1390	
v/s Ratio Prot		0.21			0.25						0.11	
v/s Ratio Perm			0.03	c0.27			c0.21		0.10	0.06		
v/c Ratio		0.60	0.08	0.77	0.72		0.51		0.25	0.15	0.27	
Uniform Delay, d1		13.6	11.1	14.7	14.4		11.1		9.8	9.3	9.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.1	11.6	3.9		4.6		0.9	0.5	0.5	
Delay (s)		15.2	11.1	26.3	18.3		15.7		10.7	9.8	10.3	
Level of Service		B	B	C	B		B		B	A	B	
Approach Delay (s)		14.2			20.9			12.5			10.2	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			51.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			72.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: S Propsect St/N Prospect St & Pearl St/Colchester Ave

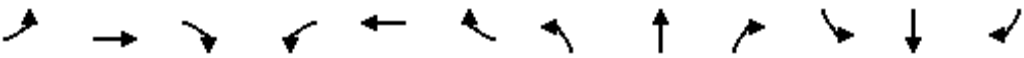
02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	566	59	151	634	92	156	261	194	27	119	12
Future Volume (vph)	0	566	59	151	634	92	156	261	194	27	119	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)		1778		1711	1766		1711	1801	1531		1767	
Flt Permitted		1.00		0.13	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)		1778		237	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	566	59	151	634	92	156	261	194	27	119	12
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	158	0	3	0
Lane Group Flow (vph)	0	621	0	151	726	0	156	261	36	0	155	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		195	823		317	334	284		255	
v/s Ratio Prot		c0.35		0.04	c0.41		0.09	c0.14			c0.09	
v/s Ratio Perm				0.32					0.02			
v/c Ratio		1.03		0.77	0.88		0.49	0.78	0.13		0.61	
Uniform Delay, d1		29.2		34.5	21.4		32.3	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		43.5		17.3	13.1		1.2	11.3	0.2		4.0	
Delay (s)		72.7		51.7	34.5		33.5	45.6	30.2		39.5	
Level of Service		E		D	C		C	D	C		D	
Approach Delay (s)		72.7			37.5			37.6			39.5	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			47.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			114.5%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Pine St & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔	↔		↔	
Traffic Volume (vph)	16	337	125	73	462	108	167	141	48	159	259	23
Future Volume (vph)	16	337	125	73	462	108	167	141	48	159	259	23
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		0.96			1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00			0.99	1.00		0.97	1.00		0.98	
Satd. Flow (prot)		1734			1788	1531		1753	1531		1756	
Flt Permitted		0.98			0.86	1.00		0.58	1.00		0.59	
Satd. Flow (perm)		1697			1546	1531		1038	1531		1053	
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	337	125	73	462	108	167	141	48	159	259	23
RTOR Reduction (vph)	0	8	0	0	0	23	0	0	24	0	2	0
Lane Group Flow (vph)	0	470	0	0	535	85	0	308	24	0	439	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		56.4			56.4	56.4		47.4	47.4		47.4	
Effective Green, g (s)		57.4			57.4	57.4		48.4	48.4		48.4	
Actuated g/C Ratio		0.48			0.48	0.48		0.40	0.40		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		811			739	732		418	617		424	
v/s Ratio Prot												
v/s Ratio Perm		0.28			0.35	0.06		0.30	0.02		0.42	
v/c Ratio		0.58			0.72	0.12		0.74	0.04		1.04	
Uniform Delay, d1		22.6			25.0	17.3		30.4	21.7		35.8	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.0			3.5	0.1		11.0	0.1		53.3	
Delay (s)		23.6			28.5	17.4		41.4	21.8		89.1	
Level of Service		C			C	B		D	C		F	
Approach Delay (s)		23.6			26.6			38.8			89.1	
Approach LOS		C			C			D			F	
Intersection Summary												
HCM 2000 Control Delay		42.5			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		107.7%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: St Paul St & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	402	113	64	415	101	99	113	80	141	139	14
Future Volume (vph)	17	402	113	64	415	101	99	113	80	141	139	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	0.97		1.00	0.97		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1741		1711	1748		1711	1689		1711	1776	
Flt Permitted	0.32	1.00		0.32	1.00		0.66	1.00		0.64	1.00	
Satd. Flow (perm)	572	1741		574	1748		1188	1689		1146	1776	
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	402	113	64	415	101	99	113	80	141	139	14
RTOR Reduction (vph)	0	21	0	0	18	0	0	43	0	0	6	0
Lane Group Flow (vph)	17	494	0	64	498	0	99	150	0	141	147	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)	18.7	18.7		18.7	18.7		18.2	18.2		18.2	18.2	
Effective Green, g (s)	18.7	18.7		18.7	18.7		18.2	18.2		18.2	18.2	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.37	0.37		0.37	0.37	
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)	218	665		219	668		442	628		426	661	
v/s Ratio Prot		0.28			c0.28			0.09			0.08	
v/s Ratio Perm	0.03			0.11			0.08			c0.12		
v/c Ratio	0.08	0.74		0.29	0.75		0.22	0.24		0.33	0.22	
Uniform Delay, d1	9.6	13.0		10.5	13.0		10.5	10.6		11.0	10.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	4.5		0.7	4.5		1.2	0.9		2.1	0.8	
Delay (s)	9.8	17.5		11.2	17.6		11.7	11.5		13.1	11.3	
Level of Service	A	B		B	B		B	B		B	B	
Approach Delay (s)		17.3			16.9			11.5			12.1	
Approach LOS		B			B			B			B	
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)			48.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: S Winooski Ave & Main St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	591	37	97	585	179	7	132	49	286	437	119
Future Volume (vph)	102	591	37	97	585	179	7	132	49	286	437	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0		5.0	5.0			5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1711	1785		1711	1737			1734		1711	1801	1531
Flt Permitted	0.17	1.00		0.27	1.00			0.98		0.40	1.00	1.00
Satd. Flow (perm)	311	1785		481	1737			1700		717	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)	102	591	37	97	585	179	7	132	49	286	437	119
RTOR Reduction (vph)	0	2	0	0	12	0	0	14	0	0	0	77
Lane Group Flow (vph)	102	626	0	97	752	0	0	174	0	286	437	42
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	48.0	48.0		48.0	48.0			19.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	49.0		48.0	48.0			19.0		32.0	32.0	32.0
Actuated g/C Ratio	0.53	0.54		0.53	0.53			0.21		0.36	0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	165	971		256	926			358		343	640	544
v/s Ratio Prot		0.35			c0.43					c0.07	0.24	
v/s Ratio Perm	0.33			0.20				0.10		c0.22		0.03
v/c Ratio	0.62	0.64		0.38	0.81			0.49		0.83	0.68	0.08
Uniform Delay, d1	14.6	14.4		12.3	17.3			31.2		26.7	24.7	19.2
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	16.1	3.3		4.2	7.7			4.7		15.8	5.8	0.3
Delay (s)	30.8	17.7		16.5	25.0			35.9		42.5	30.5	19.5
Level of Service	C	B		B	C			D		D	C	B
Approach Delay (s)		19.5			24.0			35.9			33.0	
Approach LOS		B			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			97.3%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: S Prospect St & Main St

02/09/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑	↑		↑	↑	↑↑	↑	
Traffic Volume (vph)	0	1455	1	148	574	407	0	151	344	393	135	17
Future Volume (vph)	0	1455	1	148	574	407	0	151	344	393	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	1455	1	148	574	407	0	151	344	393	135	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	143	0	0	0
Lane Group Flow (vph)	0	1456	0	148	574	407	0	151	201	393	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	13.1	35.5	
Effective Green, g (s)		45.0		10.0	61.0	61.0		16.4	16.4	13.1	35.5	
Actuated g/C Ratio		0.41		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)		1418		157	1012	860		272	231	400	579	
v/s Ratio Prot		c0.43		c0.09	0.32	0.27		0.08		c0.12	0.09	
v/s Ratio Perm									c0.13			
v/c Ratio		1.03		0.94	0.57	0.47		0.56	0.87	0.98	0.26	
Uniform Delay, d1		31.8		49.0	15.3	14.2		42.7	45.0	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		31.0		54.7	2.3	1.9		2.4	28.2	40.1	0.2	
Delay (s)		62.7		103.6	17.6	16.0		45.1	73.2	87.7	27.1	
Level of Service		E		F	B	B		D	E	F	C	
Approach Delay (s)		62.7			28.3			64.6			70.8	
Approach LOS		E			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			53.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			108.5				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			87.8%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

21: St Paul St & Bank St

02/09/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	129	103	49	72	5	112	5	69	0	10	20
Future Volume (vph)	20	129	103	49	72	5	112	5	69	0	10	20
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)	20	129	103	49	72	5	112	5	69	0	10	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	252	126	186	30								
Volume Left (vph)	20	49	112	0								
Volume Right (vph)	103	5	69	20								
Hadj (s)	-0.20	0.09	-0.07	-0.37								
Departure Headway (s)	4.4	4.8	4.8	4.7								
Degree Utilization, x	0.31	0.17	0.25	0.04								
Capacity (veh/h)	781	699	707	685								
Control Delay (s)	9.4	8.8	9.3	7.9								
Approach Delay (s)	9.4	8.8	9.3	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.1								
Level of Service				A								
Intersection Capacity Utilization				45.6%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

23: St Paul St & Cherry St

02/09/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	18	152	20	5	205	20	20	5	5	25	5	18
Future Volume (vph)	18	152	20	5	205	20	20	5	5	25	5	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		1767			1778			1703			1666	
Flt Permitted		0.95			0.99			0.87			0.89	
Satd. Flow (perm)		1690			1758			1528			1522	
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)	18	152	20	5	205	20	20	5	5	25	5	18
RTOR Reduction (vph)	0	11	0	0	9	0	0	2	0	0	9	0
Lane Group Flow (vph)	0	179	0	0	221	0	0	28	0	0	39	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)		8.8			8.8			21.2			21.2	
Effective Green, g (s)		8.8			8.8			21.2			21.2	
Actuated g/C Ratio		0.21			0.21			0.50			0.50	
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)		354			368			771			768	
v/s Ratio Prot												
v/s Ratio Perm		0.11			0.13			0.02			0.03	
v/c Ratio		0.51			0.60			0.04			0.05	
Uniform Delay, d1		14.7			15.0			5.2			5.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.1			2.8			0.1			0.1	
Delay (s)		15.8			17.8			5.3			5.4	
Level of Service		B			B			A			A	
Approach Delay (s)		15.8			17.8			5.3			5.4	
Approach LOS		B			B			A			A	

Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



MEMORANDUM

Project: **Burlington Town Center**

FFF Project Number: **A1636**

Date: **Feb. 16, 2017**

Freeman French Freeman Inc. | Architecture • Planning • Interiors

81 Maple Street • Burlington Vermont 05401

802-864-6844 • www.fffinc.com

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To: City of Burlington: Department of Planning and Zoning, Development Review Board

From: Jesse Robbins, FFF

Subject: **Burlington Town Center- Above Grade Parking**

The Burlington Comprehensive Development ordinance, in the Downtown Mixed Use Core Overlay Amendment, stipulates the following regarding parking structures:

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.

Attached is the developer's correspondence to the City in May 2016 regarding the significant costs and impacts of underground parking, showing why underground parking is not feasible for this project. In addition to the significant impacts noted in that correspondence, underground parking also is detrimental because:

1. Parking floors would have no natural day light and would have to be mechanically ventilated adding to energy costs.
2. The driver parking experience is diminished in a below grade garage and can be disorienting.
3. Underground garages cannot be easily adaptable for future uses. Above ground can be adapted for residential, office, and other uses for the future; our design includes features to simplify possible future conversion. There are precedents for garage conversions as the need for parking decreases, transit systems improve, and dependence on private autos decreases.

To clarify the attached correspondence of May, 2016, regarding the financial costs and disruptions associated with construction of underground parking, we offer the following:

Below Grade Parking Garage is not feasible Under Any Scenario

It should be clear to all reviewing the matter that the cost of placing the garage underground from just the excavation cost perspective is prohibitive and the garage cannot and will not be placed underground. The project would fail if it had to incur the expense of excavating and trucking way 234,250 cu yards of even clean material. The developer's decision regarding the infeasibility of below grade parking is firm.

If you add the possibility (and it is very likely) that the soil is contaminated then the cost of an underground garage is even more prohibitive. Removing the contaminated soil adds up to an additional \$31.6 million to the cost of the

development. However, to be very clear, even if the excavated soils at the BTC site turn out to be clean and do not require special handling the garage still cannot be placed underground because the excavation, special handling and trucking costs are prohibitive even with clean soils so the developer will not and cannot place the garage underground regardless of the quality of the excavated soils.

Attachments:

- Letter and emails dated May 29, 2016

CC:

File A1636	Art Klugo, PC	Jesse Beck, FFF	Brian Dunkiel, DSERH
John Haselbauer, PKSB	William Fellows, PKSB	Don Sinex, Devonwood	

Jesse Robbins

Subject: FW: BTC redevelopment underground garage impact/cost information
Attachments: BCC Garage Cost Comparison Ltr_16-0513.pdf

----- Forwarded message -----

From: <elizabeth.miller@elizabethmillervt.com>

Date: Thu, May 19, 2016 at 10:55 AM

Subject: BTC redevelopment underground garage impact/cost information

To: brian@burlingtonvt.gov, DEWhite@burlingtonvt.gov, Ken Braverman <kenneth.braverman@gmail.com>

Below is Don Sinex's letter to Brian Dunkiel, his representative in the Planning Commission and DRB processes, regarding the reasons why the underground garage is not feasible. I also attach a letter to Brian from PC confirming Don's summary. Don authorized me to send these to you for your information. The information is also reflected in the FAQ document I sent Brian Lowe yesterday. Please let me know if you have any questions.

Liz Miller

Elizabeth Miller PLC

[802-522-3090](tel:802-522-3090), cell

elizabeth.miller@elizabethmillervt.com

www.elizabethmillervt.com

5/13/2016

Brian,

The excavation at the BTC in order to put the garage underground is uneconomical, environmentally challenging and so disruptive to the City that I decided to abandon that notion more than a year ago.

Excavation and Cost of an Underground Garage

The development site for Phase I is app 127,750 sf in total area and to put the garage underground we would have to excavate to a level of 45 feet below grade. The amount of material that would have to be removed is determined as follows: $127,750 \times 45 / 27$ to arrive at cu yards, or 234,250 cu yards.

To remove this amount of excavated material and assuming trucks can carry at least 12 yds of material per trip, it would take app 19,500 trucks.

To determine the amount of required trucking time assume a 12 hour day and that we can get a truck in the hole load it and get it out of the hole in 10 minutes. During a 12 hour day (pushing it due to nighttime and vision issues), we can load app 72 trucks a day (a 12 hour day). At that rate it would take 276 days to load and

transport all fill out of the hole working 12 hours a day 276 days straight. That amounts to 9+ months of digging and trucking which will be noisy dirty and traffic congestive for the City - a nightmare scenario!

The hard cost to put the garage underground, to dig, shore-up and reinforce the hole as you go down, trucking out the material and pouring the walls to retail the earth was estimated by PC at \$22.00 million USD on top of the garage cost of another \$23.30 million or a total of \$45.30 million.

The above ground garage that we now plan in comparison is estimated to cost \$22.10 million in total. The underground garage will cost nearly 2 x the above ground garage at a minimum.

Environmental Issues

It can reasonably be assumed that some level of contamination of the soils at BTC is very likely. Sites within 75 feet of the BTC site were found to exceed statutory threshold levels for soil contamination. If the soil was contaminated it would be handled as solid waste and this will increase the cost by an estimated \$135 per yard to cover the added trucking time, protective trucking costs and the dumping fees at Coventry if Coventry could take the soil. If the soil had to be trucked out of State that could add even more costs. At 234,250 cubic yards of contaminated soil the potential cost to dispose of the material could run as high as \$31.60 million.

In total a below-grade garage will cost almost \$53.60 million more than the proposed above ground garage. This alone makes it impossible to do a below-grade garage. When you add the inconvenience, disruption, dirt and noise factor it is a impossible scenario not to mention the added cost the extra time (9 months) will add to the development project.

I have asked PC to review my calculations and cost estimates and to shoot you a note to confirm the matter.

Don Sinex
Devonwood Investors, LLC



CONSTRUCTION

AT PC WE GO ABOVE AND BEYOND ON EVERY JOB, PERIOD.

May 13, 2016

Mr. Brian Dunkiel, Esq.
Dunkiel Saunders
91 College Street
Burlington, VT 05402

Re: Burlington City Center Redevelopment Project
Below-grade Parking Garage and Above-grade Parking Garage Cost Comparison
PC Project Number 14748

Dear Brian:

At the request of Mr. Don Sinex, PC Construction has reviewed the attached memo against our previous estimates and are in agreement with the information provided.

Should you have any questions, please don't hesitate to give me a call anytime.

Sincerely,

Art Klugo
Construction Executive

Attachment: Don Sinex email to Brian Dunkiel, dated May 13, 2016



**POLICE DEPARTMENT
CITY OF BURLINGTON**

RECEIVED
FEB 14 2017
DEPARTMENT OF
PLANNING & ZONING

Devonwood Investors, LLC
Attn: Kevin Worden, P.E.
Engineering Ventures, PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

**Re: Burlington Vermont Police Department Letter of Approval (Ability-to-serve)
Burlington Town Center Re-development**

Dear Mr. Worden,

Please accept this letter as receipt of your request for the Burlington Vermont Police Department to consider this Agency's ability to provide continued police services relating to the Burlington Town Center Re-development Project. Specifically that the Burlington Vermont Police Department need consider that this project will "not place an unreasonable burden on the city's ability to provide municipal services".

When considering the impact of this project, and others like it, it is challenging to forecast the specific needs that will result from a project of this magnitude. We do believe however, that the police department will be able to maintain appropriate and acceptable response times should police be needed in the area affected by this project. We see our police response as being consistent to current practices.

The Burlington Police Department welcomes the City's opportunity to grow and provide additional services to its residents and visitors alike. We as a public safety agency do our best to anticipate safety needs and implement preventative measures as applicable. When reviewing how a project of this capacity will affect policing service, many needs must be considered and this process will continue throughout the project's completion.

The police department looks forward to assisting Devonwood Investors, LLC and will notify all respected parties should any safety concerns present themselves during this development process. And will work with all parties towards an effective resolution.

Sincerely,

Jason Lawson, Lieutenant
Burlington Police Department
Burlington, Vermont 05401



BURLINGTON
**PARKS
RECREATION
WATERFRONT**

RECEIVED
FEB 02 2017
DEPARTMENT OF
PLANNING & ZONING

MEMO

Date: February 2, 2017
To: Kevin Worden
From: Jesse Bridges, Director *Jesse Bridges*
RE: Capacity to Serve - Burlington Town Center Mall Redevelopment
Cc: Scott Gustin

This memo serves as our acknowledgment of capacity to serve the redevelopment proposed for the current Burlington Town Center Mall site.

With over 520 acres of parkland in Burlington there is adequate acreage to serve the increased residential and visitor needs. The acreage translates to 12.2 acres per thousand residents, just about the national average for a population our size. However, we also have a regional park district home to 465 acres. When combined the acreage per resident increases to 23.5 acres per thousand residents, almost double the national average.

Additionally the residents of this project will be served by the adaptive renovation of the former St. Joseph's school and creation of the O.N.E. Community Center within walking distance. Additionally the projects location gives it excellent connection to the acres of parkland via the new trail through the former Burlington College parcel as well as through existing connections through Waterfront Park.



VermontGas

February 2, 2017

RECEIVED
FEB 02 2017
DEPARTMENT OF
PLANNING & ZONING

Kevin Worden, P.E.
Engineering Ventures, PC
208 Flynn Avenue
Suite 2A
Burlington, VT 05401

RE: Ability to Serve and Energy Efficiency - Act 250 Criteria 9(F) and 9(J)
PROJECT : Burlington Town Center Project with Devonwood Investors, LLC
Within the Downtown Mixed Use Core Overlay District.

Dear Kevin,

Vermont Gas Systems (VGS) will be pleased to provide natural gas service for the above referenced project. We have reviewed the proposed building site and have determined that a feasibility study will not be required. The necessary infrastructure is very close to the proposed site, and we can serve the additional load of the proposed project without affecting our present firm customers. This is the information you've requested regarding the 9(J) portion of the above referenced Act 250 permit application.

In addition to demonstrating that VGS has the ability to provide natural gas service to your site and project, as required in Criterion 9(J), Act 250 will also require you to demonstrate, under Criterion 9(F), that your project is designed to utilize energy in an efficient manner. Technical assistance to meet the State Energy Code and life cycle cost analyses are available through Vermont Gas' energy efficiency programs. A copy of the **2011 Vermont Commercial Building Energy Standards** may be viewed by going to http://www2.iccsafe.org/states/vermont/Energy/energy_frameset.htm. Incentives may also be available for measures clearly exceeding the Act 250 permit requirements. It is our hope that Vermont Gas can help you not only comply with the Act 250 permit requirements, but help your building projects be very energy efficient, with low operating costs.

VGS' Energy Services Engineers work together with Efficiency Vermont project managers to assist customers gas energy conservation initiatives. VGS also works with the Burlington Electric Department's energy efficiency engineers to assist natural gas customers in the City of Burlington. For more information, or for assistance with the energy efficiency of your project, please contact Ray Keller at Vermont Gas at (802) 863-4511 ext. 389 or by e-mail at RKeller@vermontgas.com. For Efficiency Vermont contact Tim Perrin (888) 921-5990 ext. 1158 or by e-mail at TPerrin@veic.org, and for the Burlington Electric Department contact Chris Burns (802) 865-7337 or by e-mail at CBurns@burlingtonelectric.com.

Please don't hesitate to call me at (802) 951-0369, if you have any questions regarding natural gas service to your property or for an application to receive natural gas.

Sincerely,

Dale Lavalley
Dale Lavalley
Commercial Sales Representative



January 4, 2017

Kevin Worden
Engineering Ventures
208 Flynn Ave. Suite 2A
Burlington, VT 05401

Re: Ability to Serve Burlington Town Center, Burlington, VT

Dear Kevin:

The Burlington Electric Department (BED) will be able to provide electric service to this project based on your estimated project electrical load of 2 MVA. However, provision of electric service to this project will be contingent on compliance with the design provided to you by BED and all applicable rules and regulations of BED and the State of Vermont Public Service Board.

BED energy services staff will work with you to ensure that the design complies with the current version of the Vermont Commercial Building Energy Standards (CBES). In addition, BED is interested in assisting with the identification, analysis and implementation of cost-effective energy efficient design, emerging technologies and alternative energy system options. Please call Chris Burns, Director of Energy Services at 802-865-7337 (cburns@burlingtonelectric.com) to begin this process. Early involvement by BED and periodic review will expedite the approval process and assure access to available energy efficiency rebates.

If you have further questions or concerns, please feel free to contact me at 865-7323.

Sincerely,

Jaimie Cortez

Chief of Field Services
802-865-7323
jcortez@burlingtonelectric.com



January 4, 2017

Kevin Worden, P.E.
Engineering Ventures PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

Re: Ability to Serve
Project Location: Burlington Town Center, 49 Church Street

Mr. Worden,

This letter is to confirm that Burlington Telecom provides fiber-optic telecommunications, broadband and cable television services to the residences and businesses within the City of Burlington and has the ability to provide these services to the project address of 49 Church Street, without requiring additional infrastructure upgrades.

If you have any questions, please do not hesitate to contact me at (802) 540-0984.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeremy Patrie'. The signature is fluid and cursive, with a large loop at the end.

Jeremy Patrie
Sr. Division Manager,
Operations, Engineering and Service Support

Chapin Spencer
PUBLIC WORKS DIRECTOR

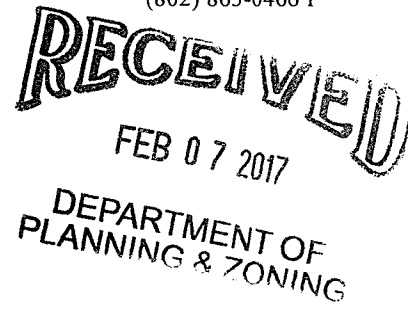
Norman J. Baldwin, P.E.
CITY ENGINEER



P.O. Box 849
BURLINGTON, VT
05402
(802) 863-9094 P
(802) 863-0466 F

February 7, 2017

Jeff Zweber, PE
Engineering Ventures, PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401



Re: Water/Sewer Capacity for Burlington Town Center at 49 Church Street

Dear Mr. Zweber,

This letter is to inform you, the State of Vermont Environmental District and other interested parties that the City of Burlington's water and wastewater facilities have sufficient capacity to handle demand associated with redevelopment of the Burlington Town Center at the above address.

Using your calculated design flows from the State Environmental Protection Rules, we have reserved a total of 100,000 gpd (gals/day) for water and sewer. Sewage from this area is treated at our Main Wastewater Plant on Lavalley Lane. It is important to note that this letter only addresses treatment plant and not distribution or collection system capacities.

This letter and reserved flows are good for one (1) year from the date of writing. If this letter is not filed with the proper offices, or if the proper permits are not obtained within that year, you will need to reapply. Any changes in flow estimates or property usage also requires reapplication. Please feel free to call me at 865-7258 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "S. T. Roy".

Steve Roy, P.E.
Project Engineer
Burlington Public Works



Burlington Fire Department
Office of the City Fire Marshal



Fax (802) 658-7665

132 NORTH AVENUE • BURLINGTON, VERMONT 05401

(TTY) (802) 865-7142

Plan Review and Inspection Services: (802) 864-5577

Public Information and Education: (802) 864-6923

www.burlingtonvt.gov/fire

9 February 2017

Devonwood Investors, LLC
Attn: Kevin Worden, P.E.
Engineering Ventures, PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

RECEIVED
FEB 09 2017

DEPARTMENT OF
PLANNING & ZONING

Re: Fire Department Letter of Approval (Ability-to-serve)
Burlington Town Center Re-development
Devonwood Investors, LLC
Church St/Cherry St/Pine St/Bank St/St. Paul St (Development address not assigned)
Burlington, Vermont

Dear Mr. Worden,

This letter is to inform you that Chief Engineer Steven Locke and I have reviewed the conceptual plans for the Burlington Town Center re-development project as presented by Freeman French Freeman Architects in my office on the morning of 9 February 2017. We feel this project will not adversely impact our fire department or our ability to serve this site. Furthermore, this project should not have an adverse effect on the surrounding properties as it relates to safety and fire suppression.

This review is based on conceptual development site plans to include fire hydrant layout, fire department access road specifications, proposed fire protection systems requirements as required by adopted codes based on building construction specifications known at this time, the general project phasing plan, and BFD general operational considerations as presented this morning. In addition to this plan review meeting, The Technical Review Committee (TRC) staff comments filed by the Burlington Fire Marshal's Office on 14 January 2016 remain in effect for this project.

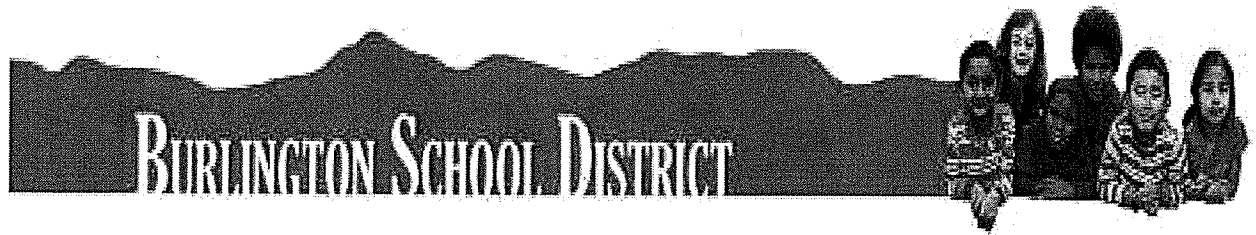
For the record, while no single development project in the City of Burlington can be identified as the sole trigger for significant impact on the service that the Burlington Fire Department provides to our citizens on a daily basis, it must be noted that the cumulative volume of current and future development within the City will certainly impact the service provision of our department over time. We do anticipate seeing an increase in both fire and emergency medical services (EMS) annual requests for service as a result of your proposed mixed-use residential, business, and commercial high-rise development following project completion.

We appreciate your notification of this project to us, and for giving us the opportunity to comment. If you should have any questions in the future, please do not hesitate to contact me directly.

Yours in Public Safety,

BC Barry J. Simays CFI, IAAI-FIT
Fire Marshal

Cc: Chief Engineer Steven A. Locke
File, Firehouse database # 5302-00



14 FEB 2017

Kevin Worden, P.E.,
Vice President Engineering Ventures PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

RECEIVED

FEB 14 2017

DEPARTMENT OF
PLANNING & ZONING

Dear Mr. Worden,

We have reviewed the information in your letter, enclosed herein. Based on the number of projected school aged children (18) we do not expect this development will cause an unreasonable burden on the city's ability to provide educational services.

If there are changes to your design that substantially change your estimate please let us know.

Sincerely,

A handwritten signature in dark ink, appearing to read "L. Paul Irish".

L. Paul Irish
Sr. Director, Infrastructure and Technology

cc: Yaw Obeng, Superintendent, Burlington School District

—————YAW OBENG SUPERINTENDENT—————



14 FEB 2017

Kevin Worden, P.E.,
Vice President Engineering Ventures PC
208 Flynn Avenue, Suite 2A
Burlington, VT 05401

Dear Mr. Worden,

We have reviewed the information in your letter, enclosed herein. Based on the number of projected school aged children (18) we do not expect this development will cause an unreasonable burden on the city's ability to provide educational services.

If there are changes to your design that substantially change your estimate please let us know.

Sincerely,

A handwritten signature in dark ink, appearing to read "L. Paul Irish".

L. Paul Irish
Sr. Director, Infrastructure and Technology

cc: Yaw Obeng, Superintendent, Burlington School District

—YAW OBENG SUPERINTENDENT—

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

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 21, 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

Development Review Board Hearing dates: February 7, 14, and 21, 2017.

Request: 965,352 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 adjustments.

Applicable Regulations:

Article 2 (Administrative Mechanisms), 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: **Major Impact and Certificate of Appropriateness approval**, as per and subject to, the following findings and conditions.

I. Findings

Article 2: Administrative Mechanisms

Part 7: Enforcement

Sec. 2.7.8, Withhold Permit

A number of zoning permits have been approved for the subject property, and not all of them have final certificates of occupancy. Per this section, prior to issuance of a final certificate of occupancy for this proposed development, any zoning permits not yet closed out with final certificates of occupancy must be addressed. **(Affirmative finding as conditioned)**

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 as 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 as 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 provided communication assuring 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 (p. 18, narrative.) The Department of Public Works has provided a memorandum of the status of their review, dated February 14, 2017. We anticipate an updated status of that review February 21, 2017. **(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. 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. Communication from Burlington School District confirms an ability to provide services to the anticipated new student count from this development. (Letter dated February 14, 2017.) If this project receives final approval, impact fees would be paid to help offset impacts on the school system. **(Affirmative finding as 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, Parks and Recreation, Burlington School Department, the fire marshal's office, Burlington Police Department and Vermont Gas. The Department of Public Works has provided a letter assuring adequate water and sewer capacity for the proposed development. Any new impacts on city services will be offset through the payment of required Impact Fees. **(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 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. Although the south side of Bank Street is within the Church Street Historic District and includes historic structures, the development parcel itself was assessed in 2003 and 2008 during preparation of the Church Street Historic District nomination and was deemed ineligible for listing on the National Register of Historic Places. The existing retail mall has no historic significance. The project area remains within an existing streetscape that includes large, multistory newer construction (100 Bank Street on the west, 150 Bank and 76 St. Paul (Keybank) on the east/southeast.) Development at 75 Cherry Street will restore sections of Pine and St. Paul Street (original circulation prior to Urban Renewal), returning the travel pattern consistent with its earlier configuration. There will be no shadow impacts on the south side of Bank Street from the proposed development. Existing historic structures along Bank Street, which have faced modern infill for 40+ years will remain undisturbed, unaltered and intact. New development will enhance the

streetscape, providing a more enjoyable pedestrian experience; restore original traffic circulation patterns and replace non-historic development that has deadened the street wall on Bank Street. The project proposes no undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, or scenic or natural beauty of the area.

(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 as 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 as 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 has submitted a revised construction phasing schedule (February 16, 2017) requesting a three-year construction/permit life. Additionally, the occupancy schedule is as listed below. 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 2.16.2017 document:

- 1st Phase of occupancy: (9.1.2019)
 - ◆ UVMCC Office Space
 - ◆ Parking Garage Levels P + 12
 - ◆ Cherry St + Bank Street improvements
 - ◆ Retail Space, Bank + Cherry Streets
- 2nd Phase of occupancy (6.30.2020)
 - ◆ Residential Tower, East Wing (103 units)
 - ◆ Residential L3, L4+L5 (61 units, includes inclusionary)
 - ◆ Bank Street office tower
 - ◆ Parking Garage Levels L3 + L4
- 3rd Phase of occupancy (8.1.2020)
 - ◆ Residential Tower; Center + West Wings (109 units)
 - ◆ Retail Space; St. Paul + Pine Streets
 - ◆ St. Paul and Pine Street improvements

Any phasing schedule is at the discretion of the DRB. **(Affirmative finding as conditioned)**

3. Hours of operation and/or construction to reduce the impacts on surrounding properties.

The applicant has requested an aggressive program with construction proposed to occur 7 days/week. Per that request:

- Proposed normal work hours
 - ◆ M-F 7:00 am – 7:00 pm
 - ◆ Saturday and Sunday 7:00 am – 4:00 pm.
- Proposed extended work hours
 - ◆ (4) 24- hour periods per month throughout the duration of the project utilized for long-duration (concrete finishing), large equipment hoisting (MEP) or other items that require longer than normal work hours.
 - ◆ Relieves daytime impacts during holidays, peak tourist and/or event periods.

Unless specifically requested and altered by the DRB, construction hours are typically limited Monday-Friday 7:00 am – 5:30 pm, and Saturday work hours for indoor work only. Construction is usually prohibited on Sundays. While it is understood that the applicant wishes to move steadily in the construction period (and limited Saturday hours may be considered) the Board has set a precedent for a prohibition on Sunday construction activities. Development for 7 days a week for three continuous years presents a heavy burden to downtown residents and businesses alike. Additionally, the house of worship north of the project may be negatively impacted by Sunday construction activity.

These requested hours of construction are at the discretion of the Board.

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 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;

Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time. **(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.

This remains 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. (Available within revised packet of 2/16/2017.)

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 facade;*
- 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 facade 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.

Section 5.4.8

(a) Applicability:

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

75 Cherry Street / Burlington Town Center Mall was evaluated during the preparation of the Church Street Historic District nomination to the National Register of Historic Places in 2003 and

2008. It was confirmed that the property is not eligible for the National Register, and has been deemed non-contributing to the nomination. The project development therefore does not meet applicability standards of this section. **(Not applicable)**

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. Final written acceptance 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. The most current photometric plan depicts acceptable illumination levels at all building entries. Parking garage lighting has been partially addressed with provision of a fixture cutsheet. An acceptable LED fixture is proposed. Illumination levels are lacking and must be provided to ensure compliance with Sec. 5.5.2 (f).
(Affirmative finding as conditioned)

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 as 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

See Section 2.8, p. 6 of the applicant's narrative.

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 as 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. The proposal does not exceed 125% of the minimum number of parking spaces required for the Neighborhood Parking District. **(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 8.1.14 Stacked and Tandem Parking Restrictions

Except as otherwise provided below, all parking facilities shall be designed so that each motor vehicle may proceed to and from the parking space provided for it without the moving of any other motor vehicle.

- (a) *Stacked of valet parking may be allowed if an attendant is present to move vehicles. If stacked parking is used for required parking spaces, a written guarantee must be filed with the City ensuring that an attendant will always be present when the lot is in operation. The requirements for minimum or maximum spaces continue to apply for stacked parking.*

The applicant will provide a written commitment that a parking attendant will be present when the garage is in operation. The garage will be open 24 hours a day, 7 days a week. Stacked and valet stalls will be signed and striped to distinguish from open stalls. An attendant will be available on each floor where stacked parking is being utilized. The attendant will park the tenant/visitor's car and provide the vehicle owner a valet slip for retrieving the car. Tenants using valet service will be directed to a spot on each floor to drop the car off for an attendant. Signs at each entrance will direct a customer to the valet stand. **(Affirmative finding as conditioned.)**

Section 8.2.5, Bicycle Parking Requirements

Use	Area	Long Term		Short Term	
Retail	126,813	1 per 20,000 sf	7	1 per 5,000	26
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			121		50 maximum requirement*
Required total	171				

**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 as 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 as 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 inclusionary units are interspersed throughout the residential components of the development. Per this criterion, they must be made available for occupancy on a schedule concurrent with the market-rate units. **(Affirmative finding as conditioned)**

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. A mylar of the lot line adjustment, signed by the Zoning Administrator, shall be filed within the city's land records within 180 days of approval. **(Affirmative finding as conditioned)**

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 as 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 as conditioned)**

II. Conditions of Approval

In anticipation of Department of Public Works' acceptance and comment relative to traffic generation and related mitigation measures, the following conditions are recommended.

1. **Within 180 days of approval**, a mylar of the lot line adjustment, signed by the Zoning Administrator, shall be filed within the city's land records.
2. **Prior to release of the zoning permit**, the following items shall be provided, subject to staff review and approval:
 - a. 2 preschool drop-off parking spaces identified on a parking deck plan as appropriate;
 - b. A revised photometric plan that depicts lighting levels from all outdoor lighting fixtures;
 - c. Illumination levels within the parking garage;
 - d. Written acceptance of the proposed street lights from Burlington Electric Department; and,
 - e. Articulation of DMUC overlay compliance for elevation drawings for the affected westerly façade of the remaining mall building following demolition.

3. **Prior to release of the zoning permit**, the stormwater management plan and the erosion prevention and sediment control plan shall receive final written approval by the city's stormwater program.
4. Impact fees must be paid **at least seven (7) days prior to issuance of a certificate of occupancy** of a new building or phase. 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 may be paid by project phase.
5. **Prior to issuance of a certificate of occupancy**, written approval of the inclusionary housing proposal by the manager of the city's Housing Trust Fund shall be obtained.
6. **Prior to issuance of the final certificate of occupancy**, any zoning permits not yet closed out with final certificates of occupancy must be closed out or superseded as needed.
7. The permit period shall be for **three years from the date of decision**. This approval incorporates the 3-phase "Construction Phasing" schedule included in the application. Certificates of occupancy may be obtained for each separate phase as the project is under construction.
8. The applicant has requested extended construction hours. Unless specifically altered by the DRB, construction hours will be limited Monday-Friday 7:00 am – 7:00 pm, and Saturday work hours 7:00 am-4:00 pm. No construction shall occur on Sundays. At the discretion of the DRB, limited 24-hour construction periods shall be permitted per month. These are to be specifically defined by the Board.
9. Per the requirements of Sec. 10.1.10, *Performance Bond and Guarantee of Completion*, a performance guarantee for all new public improvements shall be provided, subject to review and approval by the City Attorney.
10. As new public streets are included in this project, procedures for acceptance outlined in Sec. 10.1.12, *Dedication of Public Streets*, must be followed
11. Any and all construction within the public street right-of-way is subject to encumbrance permitting with the Department of Public Works and the City Council.
12. The applicant shall provide a written guarantee of parking attendants for valet parking service per Section 8.1.14.
13. A State of Vermont wastewater permit is required.
14. It is the applicant's responsibility to comply with all applicable ADA requirements.
15. All new construction is required to meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances.
16. Any outdoor signage will require a separate sign permit.
17. Standard Permit Conditions 1-15.



CITY OF BURLINGTON
DEPARTMENT OF PUBLIC WORKS

Water Resources Division
www.burlingtonvt.gov/dpw

MEMORANDUM

To: Engineering Ventures PC
Fr: Martin S. Lee, PE, Water Resources Engineer
Jenna Calvi, Stormwater Program Manager
Re: Burlington Town Center Review of 2/10/17 Draft Design Drawings
Date: February 21, 2017

The Public Works Water Resources Division has completed a review of the most recent draft design drawings for the Burlington Town Center development project. The 2/10/17 design drawings depicts a project that can conditionally meet the expectations of the Water Resources Division. We are requesting additional information and we do want the opportunity to review revised design drawings prior to construction. Following are the review comments related to stormwater, wastewater and water infrastructure.

Stormwater: While we are satisfied with the preliminary Stormwater management plan, The Stormwater Program is still awaiting the final complete Stormwater application, pending submittal to Vermont DEC. We are unable to provide more specific comments or final approval until that application is made available for review.

Based on the information we have received, as discussed in an email on February 13, the Curve Number used to model the pre-development condition of the Burlington Town Center site must be consistent throughout the application. We have requested that the pre-development condition be modeled as Meadow in good condition.

Wastewater: A sewer system review checklist has been completed for this project and is attached to this memo. Many of the checklist items that are not complete are due to these drawings not being final. The intent of this checklist is to provide a guidance tool which informs the development team about the City's expectations. It is expected that checklist items 1 through 11 will either be checked as "yes" or "N/A" prior to construction.

Engineering Ventures provided design wastewater flow information and the instantaneous peak wastewater flow is expected to be 579 gpm. It is recommended that the sewage wastewater flow from the building be split more equally between the sewer on Cherry Street and Bank Street. Additionally we would require that the sewer service connection to the separated sewer on Cherry Street be located at manhole MT2.10 which is approximately 100-feet west of the manhole proposed in the 2/10/17 design drawings.

Non-Discrimination

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at 865-7145.

Manhole MT2.10 has a downgradient sewer line that provides more than twice as much flow capacity than the manhole proposed in the 2/10/17 design drawings.

Water: A water system review checklist has been completed for this project and is attached to this memo. As mentioned above this checklist is a guidance tool for the development review team. Please see the City's Water System Details sheet to help address checklist items 2, 3, 8, 12, 15, 16, 20, 22 and 27.

The new Pine Street block does not include a fire hydrant which leaves a distance of 400-feet between fire hydrants on this new block. The recommended distance between fire hydrants in a commercial area is 300-feet. Burlington's Fire Marshal shall provide guidance as to whether a fire hydrant is needed on the new block of Pine Street.

The size of the new water main on St. Paul Street should be a 10-inch water main to improve capacity and to provide continuity to the existing 10-inch water line on St. Paul Street. Per the review checklist, all proposed city water lines shall be C-900 and not ductile iron.

The peak flow information provided by Engineering Ventures has been used to evaluate the capacity of Burlington's water distribution system. Burlington's hydraulic model indicates that a peak water system demand of 579 gpm can be handled within our water distribution system.

Our recent hydrant flushing data indicates that each fire hydrant directly adjacent to the proposed project has the capacity to flow at a minimum of 1,000 gpm. Our City water system model shows that street level water system pressures will not drop below 20 psi (Vermont Supply Rule Standard) when the hydrants are operated. We would like the opportunity to re-evaluate our water system model when more information about project fire demands are provided.

The water system design and construction shall meet the standards of the Vermont Water Supply Rule.

BURLINGTON DPW - WATER SYSTEM REVIEW

water&sewer_checklist_revE_011717

PROJECT: Burlington Town Center

LOCATION: Pine, St. Paul, Cherry and Bank Streets

OWNER: Devonwood Investors

ENGINEER: Engineering Ventures

DATE REC'D: February 10, 2017

DATE REV'D: Week of February 13, 2017

PLAN DATE/REV: [Click here to enter text.](#)

REV'D BY: Martin S. Lee, PE

	Yes	No	N/A	Insuff. Info
1.Are the water mains located under/adjacent to the proposed street(s)?	☒	☐	☐	☐
2.Are the public water mains C900 pipe, 8" minimum with tracer wire?	☐	☒	☐	☐
3.Is the depth of all water mains between 6' and 9' below grade?	☐	☐	☐	☒
4.Does the proposed design avoid 90 degree bends?	☒	☐	☐	☐
5.Does the proposed design include dead ends?	☐	☒	☐	☐
6.Do new tee connections include valves on all three legs?	☐	☒	☐	☐
7.If the mains are shown bending vertically or horizontally, do they conform to allowable pipe deflection radii?	☐	☐	☐	☒
8.Do all mains meet horizontal and vertical separation from sewers?	☐	☐	☐	☒
9.Are fire hydrants located every 500' residential and 300' commercial?	☐	☒	☐	☐
10. Are there fire hydrants located within 100' of a sprinklered building?	☐	☐	☐	☒
11. Are fire hydrants set back at least 3' from paved areas?	☒	☐	☐	☐
12. Do fire hydrants meet City specifications?	☐	☐	☐	☒
13. Are the fire hydrants connected to main with 6" pipe and valve?	☒	☐	☐	☐
14. Are there hydrants at high point(s) to aid in air removal?	☐	☐	☐	☒
15. Are there mechanical thrust restraint and thrust blocks at all fittings?	☐	☐	☐	☒
16. Do all valves meet City specifications (open right)?	☐	☐	☐	☒
17. Are all valves and curbstops located within City right-of-way?	☐	☐	☐	☒
18. Are there any special easement requirements on this project?	☐	☒	☐	☐
19. Do all valves include a valve box at grade w/covers marked "water"?	☐	☐	☐	☒
20. Are all services up to 2" using type K copper or CTS pipe?	☐	☐	☐	☒
21. Do all services leave water mains and enter buildings at right angles?	☒	☐	☐	☐
22. Do the plans include a water system specifications drawing?	☐	☒	☐	☐
23. Do the plans include water use estimates using the applicable table from the latest Vermont Environmental Standards?	☐	☐	☒	☐
24. Is the project large enough to require Needed Fire Flow (NFF) and/or hydraulic analysis for domestic and fire flow demands, or to prove whether or not the project may have an adverse impact to existing customers?	☒	☐	☐	☐
25. Does or should (circle one) the design include a looped water system?	☐	☐	☒	☐
26. Do multifamily dwellings have means for separate metering?	☐	☐	☒	☐
27. Do the plans include standards for pressure testing and disinfection?	☐	☒	☐	☐

BURLINGTON DPW - SEWER SYSTEM REVIEW

water&sewer_checklist_revE_011717

PROJECT: Burlington Town Center

LOCATION: Pine, St. Paul, Cherry and Bank Streets

OWNER: Devonwood Investors

ENGINEER: Engineering Ventures

DATE REC'D: February 10, 2017

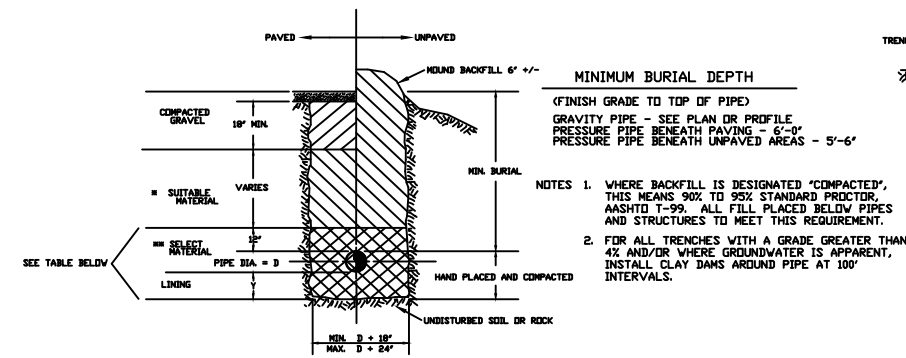
DATE REV'D: Week of February 13, 2017

PLAN DATE/REV: [Click here to enter text.](#)

REV'D BY: Martin S. Lee, PE

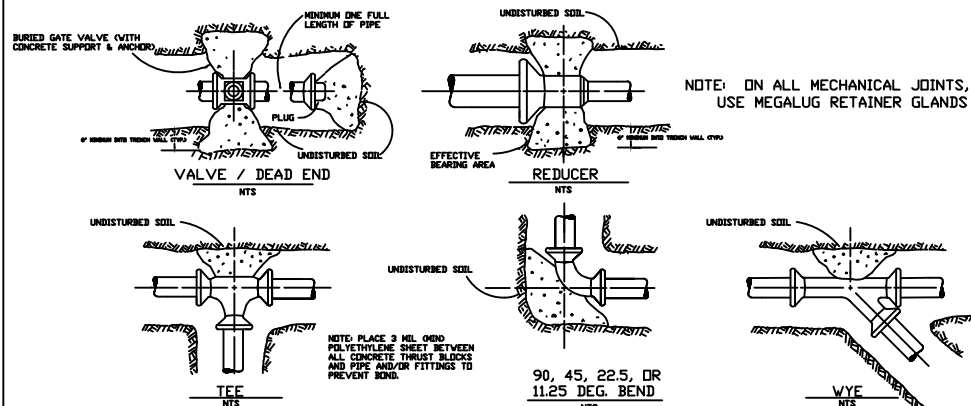
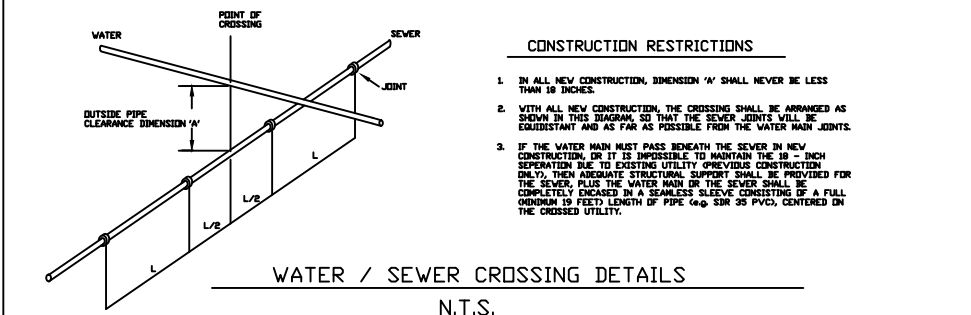
	Yes	No	N/A	Insuff. Info
1. Are the sewers located under the proposed street(s)?	☒	☐	☐	☐
2. Are the sewer pipes SDR 35 PVC or approved equal?	☐	☐	☐	☒
3. Are the pipe depth(s) between 4 ft to 8 ft, or approved?	☐	☐	☐	☒
4. Are the sewer pipes sealed at the manholes?	☐	☐	☐	☒
5. Do the service connections meet DPW standards?	☐	☐	☐	☒
6. Are manholes located at changes in direction or grade?	☒	☐	☐	☐
7. Are manholes every 400 to 600 feet, depending on sewer size?	☒	☐	☐	☐
8. Are manholes precast w/plastic rungs and cover marked "sewer"?	☐	☐	☐	☒
9. Do the manholes have adequate invert(s) and bench?	☒	☐	☐	☐
10. Does the project plans include ave. and peak estimated flows?	☐	☐	☒	☐
11. Does this project discharge into a combined sewer system?	☒	☐	☐	☐
a. If yes, is a capacity study warranted?	☒	☐	☐	☐
12. Does this project discharge to a pump station?	☐	☒	☐	☐
a. If yes, is a capacity study warranted?	☐	☐	☒	☐
b. Does the station have adequate emergency storage for this project?	☐	☐	☒	☐
13. Does the project require construction of a new pump station?	☐	☒	☐	☐
a. If yes, does DPW want to take it over?	☐	☐	☒	☐
b. If the developer wants DPW to own, does the station meet State and DPW standards?	☐	☐	☒	☐

Station type: NA Capacity: NA



Y - DIMENSION	CONDITION & PIPE	SELECT MATERIAL	LINING
0'	DUCTILE IRON PIPE IN "ORDINARY SOIL"	TYPE I II OR III	-
6'	ALL PIPE OVER BEDROCK OR LEDGE	TYPE II OR III	SAND OR TYPE III
4'	DUCTILE IRON PIPE IN CLAY OR MUCK	TYPE II OR III	SAND
6'	PLASTIC - ALL	SAND	SAND

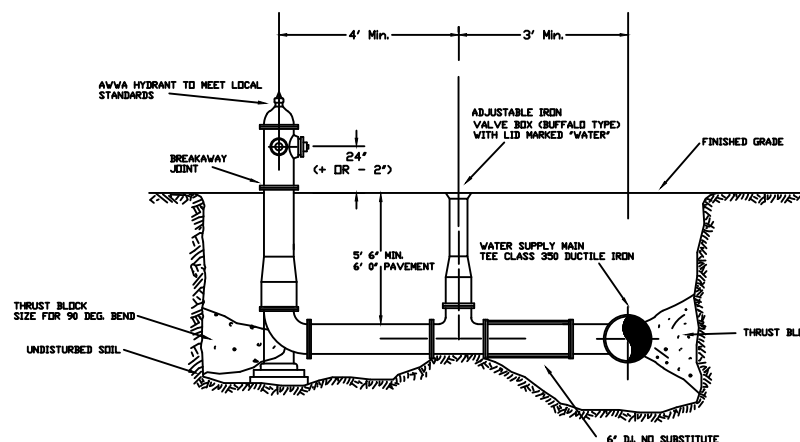
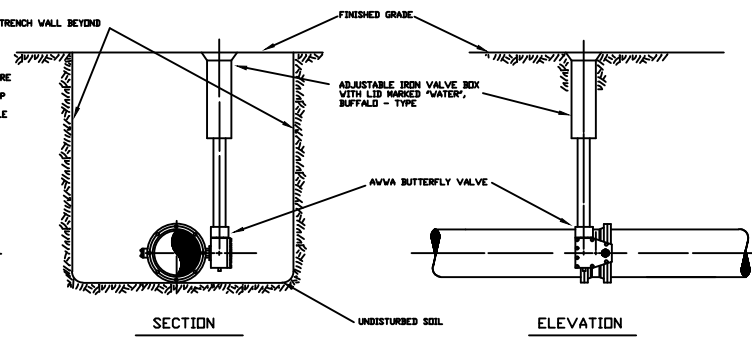
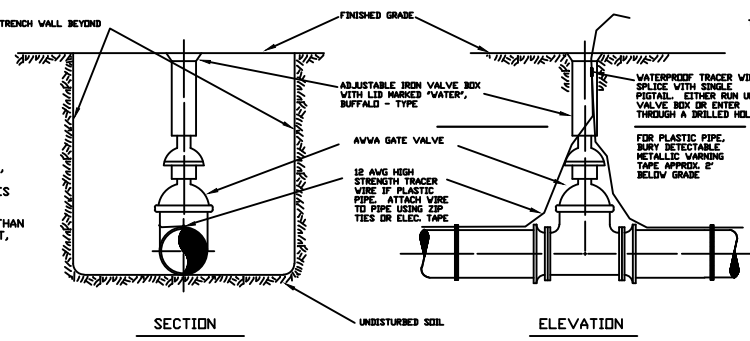
- SUITABLE MATERIAL SHALL CONTAIN NO STONES GREATER THAN 4" IN DIAMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OR ORGANIC MATERIAL. ALL MATERIAL TO BE PLACED IN MAXIMUM OF 12" LIFTS AND COMPACTED BEFORE PLACING NEXT LIFT.
- TYPE I MATERIAL SHALL BE EITHER GRAVEL OR EXCAVATED MATERIAL CONTAINING NO STONES GREATER THAN 1 1/2" IN DIAMETER, NO FROZEN MATERIAL, NO CLAY, AND NO ORGANIC MATERIAL.
- TYPE II MATERIAL SHALL BE CLEAN, HARD, CRUSHED OR NATURAL STONE WITH A GRADATION BY WEIGHT OF 100% PASSING A 1 1/2" SQUARE OPENING, NOT MORE THAN 25% PASSING A 3/4" SQUARE OPENING, AND NOT MORE THAN 5% PASSING A 1/2" SQUARE OPENING.
- TYPE III MATERIAL SHALL BE CLEAN, HARD, CRUSHED STONE FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING AND 0 TO 5% PASSING A 1/4" SQUARE OPENING.



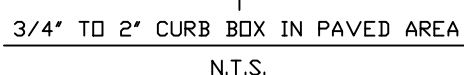
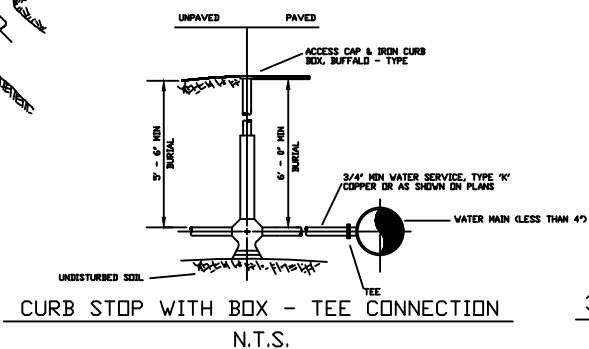
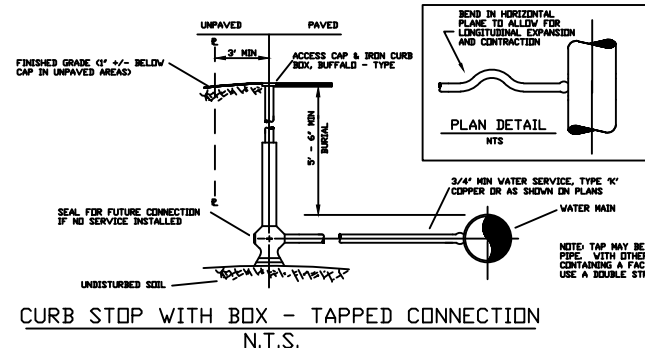
MINIMUM AREA OF BEARING SURFACE OF CONC. THRUST BLOCKS (IN SQUARE FEET)

ENDS TEES	3'				4'				6'				8'				12'				SOIL CONDITION	SAFE BEARING LOAD (PSF)
	0.5" ELB.	0.5" ELB.	0.5" ELB.	0.5" TEES	0.5" ELB.	0.5" ELB.	0.5" ELB.	0.5" TEES	0.5" ELB.	0.5" ELB.	0.5" ELB.	0.5" TEES	0.5" ELB.	0.5" ELB.	0.5" ELB.	0.5" TEES	0.5" ELB.	0.5" ELB.				
0.5	0.5	0.5	0.5	0.5	1.0	0.5	1.0	1.5	1.0	0.5	2.0	2.5	1.5	1.0	4.0	5.5	3.0	1.5	GROUND SHALE	10,000		
1.0	1.0	1.0	0.5	1.5	2.0	1.0	0.5	3.0	4.0	2.0	1.0	4.5	6.5	3.5	2.0	10.0	14.0	7.5	4.0	CONCRETE GRAVEL & SAND	4,000	
1.5	1.0	1.5	0.5	2.0	2.5	1.5	1.0	3.5	5.0	3.0	1.5	6.0	8.5	5.0	2.5	13.0	18.5	10.0	5.0	CONCRETE & FINE CORRECT SAND	3,000	
2.0	1.5	1.5	1.0	2.5	3.0	2.0	1.0	5.5	7.5	4.0	2.0	9.0	13.0	7.0	3.5	20.0	27.5	15.0	8.0	KEVIN JAIL CAN & CO.	2,000	
3.0	4.5	2.5	1.5	5.0	7.0	4.0	2.0	10.5	15.0	8.0	4.0	18.0	25.0	14.0	7.0	39.0	55.0	30.0	15.0	SOFT CLAY	1,000	

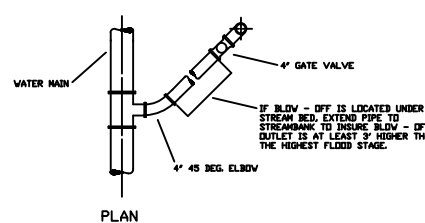
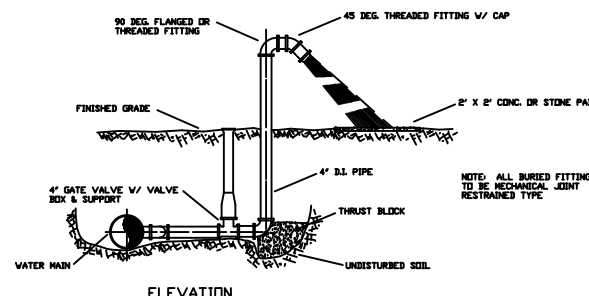
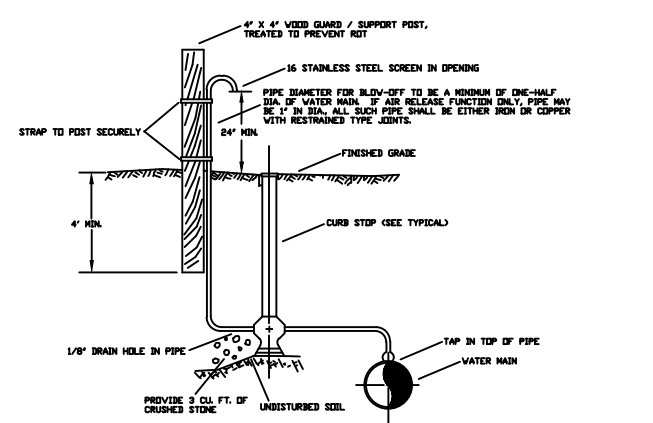
MAXIMUM WATER PRESSURE = 300 PSI NOTE: REDUCER BEARING AREA = 45 DEG. BEND, LARGER PIPE



- ALL HYDRANT DRAINS MUST BE PLUGGED SEE SPECIFICATION NO. 8
- WHERE VALVE CANNOT BE RESTRAINED TO MAIN TEE, ANCHOR VALVE AS IN BURIED GATE VALVE DETAIL
- USE MEGALUG RETAINER GLANDS FOR ALL CONNECTIONS



N.T.S.



NOTE: TYPICAL AIR RELEASE / BLOW - OFF (TYPE "A" OR "B") MAY BE USED TEMPORARILY DURING CONSTRUCTION. SHALL BE REMOVED AT END OF CONSTRUCTION IF A PERMANENT AIR RELEASE / BLOW - OFF IS REQUIRED, USE HYDRANT AS DETAILED - THIS SHEET.

NOTES:

- Before construction of any utilities or improvements, the Owner/Supplier or Contractor shall notify the Department of Public Works, in WRITING, of his intent to proceed and shall arrange for a meeting with the DPW, the Engineer, and the Contractor to discuss the Project.
- All water mains, fittings, appurtenances and other materials, and construction shall conform to all applicable AWWA, State and City standards and regulations. In the case of conflict between these standards and regulations, the decision of the Vermont Department of Health or VTDEC Water Supply shall be binding.
- All water mains, fittings, appurtenances shall be installed in a manner. Installation shall be by the Public Works Department, unless specific approval is given by the Public Works Department for installation by the Contractor, which shall be under the general inspection of the Public Works Department. Before any water line work is commenced by the Contractor, he shall notify the Public Works Department at least 14 days in advance of his intention to proceed.
- Connection to an existing water main shall be done by or under supervision of, and with the approval of the Public Works Department. It is the Contractor's responsibility to secure ALL necessary permits to make the connection and to coordinate all parties involved in the process. The Public Works Department shall be notified AT LEAST twenty-four (24) hours in advance of the intended connection time.
- An inspector employed by the Public Works Department shall be present at least two (2) days in advance of all water line installations. Said inspector shall be on the premises for all water line installations. For inspection shall be borne by the Project Owner.
- As-Builts prepared by the Owner's Engineer are required by the Public Works Department at the time of the completion of the water line.
- All water mains shall have horizontal and vertical distances as shown on this drawing.
- All public and private water mains 12" or greater shall be ductile iron, class 52, double-cement lined, mechanical or push-on joint pipe less than 4' in diameter, shall be type K copper. Plastic pipe will be allowed if approved by the City Engineer. See Note 21 below for C-pipe details.
- All water line fittings shall be ductile iron, (AWWA C-110), cement lined. For water lines less than 4 inches in diameter, fittings (other than elbows) shall be no-lead brass.
- All buried valves shall conform to AWWA C-504 or C-509, and be wedge gate valves up to 10 inch in size, and either resilient seat or butterfly valves for larger sizes. All gate valves shall open right (clockwise) and shall have adjustable iron valve boxes extending to finished grade (see Typical Details).
- Hydrants shall be in accordance with AWWA C-502, 3-way post type breakaway, Mueller Centurion A-423, Kennedy K81 or American Darling with two (2) 2-1/2" hose nozzles and one (1) 4-1/2" steamer nozzle. Hydrants shall be box-type double-start. Hydrants shall be provided with 6.5' bury (riser). In all cases, it is the Contractor's responsibility with the Public Works Department to secure approval of the selected hydrant(s) and assure compatibility. All hydrant drains shall be plugged, or a non-draining hydrant shall be installed. All hydrants shall be set back a minimum of three (3) feet from paved surfaces. In addition, wherever a traffic hazard appears to exist (in the opinion of the Public Works Department), the hydrant shall be protected by curbing and post-stanchions.
- Curb boxes shall be Buffalo type with telescoping top and bolt-on top.
- All water lines and appurtenances shall be pressure and leak-tested before being placed into service, according to AWWA Standard C-600. Test pressure shall be 200 psi (+/- 5psi), measured at or near the point in the portion of the system being tested, and the test shall run for two (2) hours. The Public Works Department shall be given twenty-four (24) hours notice before the test is to be conducted. Personnel shall be present for the test. Allowable leakage shall be computed by the following formula: $L = (S \times D \times \sqrt{P}) / 133200$, where L=number of gallons allowed leakage per hour, S=length of pipe tested in feet, D=nominal pipe diameter, P=average test pressure (psi gauge). The person(s) conducting the test(s) shall, in WRITING, certify the results to the Public Works Department.
- All water lines, before being put into service, shall be disinfected in accordance with AWWA C-601, or as directed by the Public Works Department. Contractor shall install 1" diameter tap in water main for chlorine injection. Tap shall be located as directed by the Public Works Department. Disinfection shall be accomplished by introducing a concentration of 50 parts per million (ppm) of available chlorine into recently-flushed water main. The disinfecting solution, after remaining in the water main for 24 hours, shall have a concentration of at least 25 ppm of chlorine. The person(s) responsible for disinfection shall certify, in WRITING, to the Public Works Department and Vermont Department of Health that this disinfection procedure was followed and the required minimum results were obtained. Actual sampling shall be performed by Public Works Department. Contractor shall be responsible for all sampling and analysis costs.
- Water main valves and curb stops shall be inside city right-of-way.
- No valves, hydrants, curb stops, etc. shall be operated without prior approval by the Public Works Department.
- All taps larger than 1" require the use of bronze saddles.
- All brass unions and adapters shall be low-lead by Kennedy or Mueller.
- All corporations and curb stops shall be Red Hat, Mueller or Cam with nitrile gaskets.
- If approved by the City Engineer, plastic water mains 4" and larger shall be AWWA C900 PVC pipe with a pressure class of 305 psi (CDR14). Material shall conform to AWWA C901 and be HDPE CTS pipe with a pressure class of 200 psi (SDR 9). All plastic pipe will require a 12 AWG high copper clad steel tracer wire with blue insulation fastened directly to pipe with nylon tie wraps or electrical tape. This tracer wire shall be a continuous run (no splices) between valves with ends for attaching signal at every valve box, end of pipe run or every 500' or whichever is less. If no valve boxes are located within 500' of each other, a magnetized tracer box is required. Waterproof splices shall be at valve boxes as per the detail on this sheet. Tracer wire, tracer and wire nuts shall be manufactured by Copperhead Industries or approved equal. In addition, detectable underground tape labeled "Caution Buried Water Line Below" shall be manufactured by Trumbull Industries or approved equal and buried approx. 2' below finished grade.



- Engineering Division -
Water Details

DATE: rev date 5/14	MODIFIED: s.roy	CHECK: s.roy
SCALE: N.A.	FILE: wtrdetail_2014.dwg	DRAWN BY: F.L.I. (198)



Tuesday February 21st, 2017

City of Burlington, Planning and Zoning Office

Re: Burlington Town Center - Section 8.1.14 Attended Parking Commitment

To Whom It May Concern:

I am writing as applicant for the 75 Cherry Street, Burlington Town Center redevelopment project to address Zoning Ordinance Section 8.1.14(a) Stacked and Tandem Parking Restrictions, and provide the written guarantee required therein.

As expressed in the materials we provided in the application process, the project's proposed parking structure will use stacked parking to maximize parking capacity. As required by the above-referenced Section, the project will "ensure that a parking attendant will always be present when the lot is in operation." Please accept this letter as the project's filed written guarantee of compliance.

Donald F. Sinex
BTC Mall Associates LLC
Managing Partner
Devonwood Investors LLC
101 Cherry Street, Suite 440
Burlington VT 05401
802.658.2545 x 202
Cell: 212.203.2018

RECEIVED
FEB 22 2017

DEPARTMENT OF
PLANNING & ZONING

101 Cherry Street, Suite 440, Burlington, VT 05401
802.658.2545 ~ burlingtontowncenter.com

Burlington Development Review Board

149 Church Street, City Hall
Burlington, VT 05401
www.burlingtonvt.gov/pz/DRB
Telephone: (802) 865-7188
Fax: (802) 865-7195

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 21, 2017, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT Minutes

Board Members Present: Brad Rabinowitz, Israel Smith, Geoff Hand, A.J.LaRosa, Wayne Senville, Jim Drummond (Alt), Robert Purvee (Alt)

Board Members Absent: Austin Hart, Alexandra Zipparo

Staff Members Present: Scott Gustin, Mary O'Neil, Ryan Morrison, Anita Wade

I. Agenda

Changes to Agenda: Request for deferral for 201 So Prospect to date and time to be determined.

II. Communications

Supplemental communications are accepted by the Board.

III. Minutes

IV. Public Hearing

1. **17-0253CA; 201 South Prospect Street (RL, Ward 6S) Bing Enterprises, Ltd**
Appeal of an administrative denial to replace 2 windows with 2 egress windows. (Project Manager, Ryan Morrison)
Item deferred.
2. **17-0617CA; 62-64 Buell Street (RH, Ward 8E) Earnest Palasits**
Appeal of administrative denial to replace railings and decking on porch.
(Project Manager, Ryan Morrison)

B.Rabinowitz: swears in applicant and staff.

R.Morrison: property is on both State and Federal historic registers. Presented the historic preservation requirements and the code enforcement violations.

E.Palasits: owner of the building is appealing decision and proposes to replace materials.

BRabinowitz: questions about the posts used.

E.Palasits: round square posts.

BRabinowitz: asks about the ornamental detail.

E.Palasits: hoping to do ornamental brackets. Presents handouts to Board.

BRabinowitz: questions railing thickness.

E.Palasits: higher railing only a little thicker. He did not know house was historic and was not told it had to be exactly the same. He did not know it had to be exactly the same.

G.Hand: asks applicant if he is appealing the denial.

E.Palasits: yes

RMorrison: applicant needs to replace pressure treated material and maintain architectural details at new construction. A precedent had been set previously and with decking.
 E.Palasits: said decking cannot be seen from the street.
 AJLaRosa: asks if only pressure treated material will be used on only railing and deck.
 E.Palasits: yes.
 BRabinowitz: disappointing to see the condition of the house with changes to the historic character.
 E.Palasits: would like it to look better and would like to use materials that are economical.
 BRabinowitz: closes public hearing.

3. **17-0662CA/MA; 75 Cherry Street (D, Ward 3C) BTC Mall Associates, LLC**

Continued review of 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: recused.
 BRabinowitz: swears in applicant and interested parties. Mentions this is the third hearing on project. DPW follow up on traffic, and water resources.
 JBeck: spoke on phase one for construction and transportation. Gives a perspectives on the streetscape views.
 A.Cluegill: gives slide presentation for construction activity and phases of occupancy. Using right of ways for phasing construction.
 BRabinowitz: phasing on St. Paul and Pine St. Questions on construction fencing for Bank St.
 A.Cluegill: meeting with DPW about encumbrance plan.
 BRabinowitz: St. Paul's St. eagles landing project has fencing that is disappointing and would like fencing for this project to be different.
 A.Cluegill: confirms this. Said 40% of workforce will car pool and 60% will be using offstreet parking lots. Will provide shuttling services. Intention is to provide sufficient parking available for project needs and staying off the street. Identified traffic routes for construction with each route already an existing truck route in the City.
 BRabinowitz: asks about setting up cranes and activity on Bank and Cherry St.
 W.Senville: estimate of the average number of trips.
 A.Cluegill: presents slides on peak charts based on schedule and work with other contractors. Doesn't have complete list.
 C.Spencer: speaks on traffic and stormwater related issues.
 L.Wheelock: addresses comments received last week about open streets and the turnover of St Paul and Pine St. Seeking an alternative and least amount of impact on transportation infrastructure.
 C.Spencer: dedicating bike facilities for shared lanes on Pine and St Paul St consistent with PlanBTV walk/bike.
 L.Wheelock: verifying the proximity of Champlain parkway. Identifies 4 areas for minor clarifications. Working on a model of what parkway will be. Overall, does not feel it will change level of service. Impacts between minor and moderate for transportation structure.
 W.Senville: questions on delays.
 L.Wheelock: looking at analysis and will continue to make sure inputs going in provide good results. Speaks of the impact on Bank and Cherry St and Pine St and St Paul. Said applicant has been responsive to requests.
 B.Rabinowitz: asks about significant changes to travel lanes and keeping track of process.

L.Wheelock: developing plans with applicant on the design to match city portion of streetscape and outside of areas.

J.Drummond: clearance on Pine St.

L.Wheelock: Pine St clearance will be 12' 6".

W.Senville: asks if any city streets have such limited clearance.

L.Wheelock: only one is Lakeside St.

C.Spencer: City discussed strong desire to have street grid restored and applicant has diligently tried to comply.

W.Senville: traffic control on Pine and Bank St.

L.Wheelock: there will be a stop control.

M.Lee: water resources engineer for DPW is reviewing stormwater, water and systems. Stormwater meets expectations and peak flows will be 100,000 gallon per day. Mentions a collection system.

C.Spencer: said there will be a new main on St Paul St.

W.Fellows: gives an overview. There is no phase 2 development, the project St Paul and Pine St considered pedestrian and now restored will be fully deeded to the City. There is no interior mall. Slides show different changes of materials and introduce areas with new vegetation. Discussed recent site work with DPW.

W.Senville: asks about entrance to existing mall crossing.

W.Fellows: points out the mid street crossing for more opportunity to have activated street coverage, plantings on the east side, and turning the mall inside out with all retail open on all four streets. Worked with City on how to fulfill BTV Plan.

J.Drummond: coordination with Macy's.

W.Senville: retail frontages.

W.Fellow: frontages vary to allow for flexibility. Balanced with office space.

B.Rabinowitz: David addresses the new zoning issues.

D.White: Went over requirements of overlay last meeting. Provided detail of standards. Approval is discretion of DRB and for applicant to meet major impact. Some measure of impact is possible with project. Board can approve this application with conditions with pre-release for zoning permit and pre-release for CO. Downtown overlay mixed use all elements are in compliance. Applicant has met community and city requirement for long time and continues to do so.

S.Gustin: spoke of the last two conditions in supplemental material.

W.Senville: questions on observation deck and portions of the roof.

W.Fellows: observation deck is open to public as a public amenity to the town.

W.Senville: staffed in some manner.

W.Fellows: yes, historic or museum quality.

J.Beck: mentions green roof, water retention roof.

B.Rabinowitz: opens to the public.

S.Goodkind: application is at odds with previous representations. More information needs to be addressed: project taking away taking away retail, public parking, tax revenues. Not getting good information on costs, public improvements, street activation and none on east of St Paul, Macy's, historic review, impact on businesses and neighbors, stormwater discharge permit..

M.Murray: lives in Montpelier and owns property on Shelburne St. Said the project will affect walkability of the area. Questions the 12 ft driveway under Bank St and understands a number of trucks are taller. DAB concerns. Parking will be a nightmare with 500 UVM employees working above 2nd floor and will be a problem.

B.Rabinowitz: CATMA presented parking plan for 500 employees.

J.Franco: questions St Paul and Pine St and design and purpose of great streets. Questions Macy's and entrances off Pine St. Act 250 with Macy's as a co-applicant because of the exposure of the front of Macy's. Street arrangement and coordination not being done.

S.Bushor: City Councilor Ward 1. Questions valet parking and the cost. Referred to letters submitted on 2/14 and information tonight. Asked why Burlington isn't more proactive with environmental issues and disappointed on this: capping soil, one level of underground parking, and clarifications on the observation deck. Boiler plate reports from fire and police departments. Concerns about vehicle and traffic impact on Main St. Small business concerns with the construction hours and demands.

M.Bushy: architect and chair of DAB. Comment that the DAB approves this project having held a vigorous review; all prescriptives and intent of ordinance were met.

W.Senville: did DAB look at all of St Paul and design?

M.Bushy: no

B.Dunkiel: felt Act 250 does not apply to Macy's and cannot require adjacent property owner to respond to something when no permit is issued. Discussed observation deck.

W.Senville: public access

DSinex: deck will be open to the public. Mentioned the entire project has changed ten major times. Better project now through numerous meetings with city council, NPA's and formal sessions which voted for TIF zoning. This project will bring life downtown and catalyst for other improvements. Leed participants for district heating would be first commercial large project and designing HVAC to tap into district heat. Project will prove remarkable for City and the old mall is dying and does not need to remain.

W.Senville: questions construction hours

D.Sinex: we won't work on Sunday and will try to limit number of trucks to protect adjacent business owners.

B.Rabinowitz; will not deliberate until March 6th.

Board discussion on regarding the number of days to meet their decision.

B.Rabinowitz: closed public hearing.

V. Other Business

VI. Adjournment

Brad Rabinowitz, Chairperson Development Review Board

A.Wade, Zoning Clerk

5.2.17

Date

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/dr/ agendas or the office notice board, one week before the hearing for the order in which items will be heard.