

Burlington Development Review Board

149 Church Street, City Hall
Burlington, VT 05401

www.burlingtonvt.gov/pz/DRB

Telephone: (802) 865-7188

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Samantha Tilton
Jim Drummond, (Alternate)
Zoraya Hightower, (Alternate)



BURLINGTON DEVELOPMENT REVIEW BOARD

Tuesday October 2nd, 2018, 5:00 PM

PUBLIC HEARING NOTICE

The Burlington Development Review Board will hold a meeting on
Tuesday October 2nd, 2018 at 5:00pm in Contois Auditorium, City Hall.

- 1. 19-0170SD/CU; 1288 North Ave (RL, Ward 7N) 1288 North Ave LLC**
Subdivide existing lot into two lots. Retain duplex on lot 1 and construct duplex and related site improvements on lot 2.
- 2. 19-0176CU; 322 North Winooski Ave (NMU, Ward 2C) 322 North Winooski Ave LLC**
Change of use to Recording Studio
- 3. 18-0669CA/VR; 1580 North Ave (RL, Ward 7N) Michael and Annette Walker**
Stockade fence, mobile storage unit, extend driveway. Setback variance requested for shed and driveway.
- 4. 19-0202CA/MA; 44 Lakeside Ave (ELM, Ward 5S) Cloverleaf Properties**
Renovate buildings for assembly, office, and seasonal recreational use. Rework parking and circulation.
- 5. 19-0001CA/CU; 50 Clymer St (RL, Ward 6S) Faith Ingulsrud and Eric Avildsen**
Demolish Garage.

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.

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BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday October 2nd, 2018, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT AGENDA

I. Agenda

II. Communications

III. Minutes

IV. Consent

- 1. 18-1027SN; 152 Pearl St (FD5, Ward 2C) First Unitarian Universalist of Burlington**
Replacing 2 non-conforming signs with 1 in substantial greater compliance. (Project Manager: Mary O'Neil)
- 2. 19-0170SD/CU; 1288 North Ave (RL, Ward 7N) 1288 North Ave LLC**
Subdivide existing lot into two lots. Retain duplex on lot 1 and construct duplex and related site improvements on lot 2. (Project Manager: Scott Gustin)
- 3. 19-0176CU; 322 North Winooski Ave (NMU, Ward 2C) 322 North Winooski Ave LLC**
Change of use to Recording Studio. (Project Manager: Scott Gustin)
- 4. 19-0001CA/CU; 50 Clymer St (RL, Ward 6S) Faith Ingulsrud and Eric Avildsen**
Demolish Garage. (Project Manager: Ryan Morrison)

V. Public Hearing

- 1. 18-0669CA/VR; 1580 North Ave (RL, Ward 7N) Michael and Annette Walker**
Stockade fence, mobile storage unit, extend driveway. Setback variance requested for shed and driveway. (Project Manager: Ryan Morrison)
- 2. 19-0202CA/MA; 44 Lakeside Ave (ELM, Ward 5S) Cloverleaf Properties**
Renovate buildings for assembly, office, and seasonal recreational use. Rework parking and circulation. (Project Manager: Scott Gustin)
- 3. 19-0021CA/MA; 375 North Ave (NAC-CR, Ward 4N) 375 North Avenue LLC**
Amendment to PUD approved under ZP17-0623CA/MA increasing the overall unit count from 739 to 770. Redesign of building M, adding additional stories to buildings G, M, P, Q , & R. (Project Manager: Mary O'Neil)

VI. Adjournment

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.

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

18-1027 SN

Application for Zoning Permit for sign of First Unitarian Universalist Society of
Burlington

The signs on the lawn of the meetinghouse of the First Unitarian Universalist Society of Burlington at the head of Church Street need to be replaced. The wooden sign to the west of walkway, the Wayside Pulpit which usually displays an inspirational quote, is badly deteriorated. The sign on the east side of walkway that displays the name of the minister, the time of services, etc., is worn and damaged, having been vandalized. And, most importantly, "Unitarian Church" is written at the top of this sign, and although most people commonly refer to the building that way, that name is NOT correct. It should say "First Unitarian Universalist Society of Burlington".

It is our opinion that the current sign ordinance for the district in which the building lies is not appropriate for an historic structure, (i.e., the oldest church in Burlington, built in 1816), sitting 140' back from the curb, in a lot 333' wide. The 61' façade of the building facing Pearl Street determines the permitted size of the sign; that is not appropriate in this case.

We are proposing to have a single sign that is in greater compliance with the sign ordinance than are our current signs, and although it would not strictly meet the letter of the law, it would be reasonable:

1. One sign would replace two existing signs.
2. The single sign would be smaller than the existing two signs.
3. The new sign would be placed closer to the curb than the existing signs are.
4. The new single sign would have our correct name.

Considering the fact that this building is probably the most photographed structure in Burlington, perhaps in Vermont, we feel that it should be properly identified by a sign with its correct name. Furthermore, that sign should be of a size and in a location that would be noticed and would appear in all those pictures.

RECEIVED
SEP 13 2018

DEPARTMENT OF
PLANNING & ZONING

SIGN FABRICATOR TO DESIGN AND PROPOSE RAISED LETTERS FONT AND KERNING

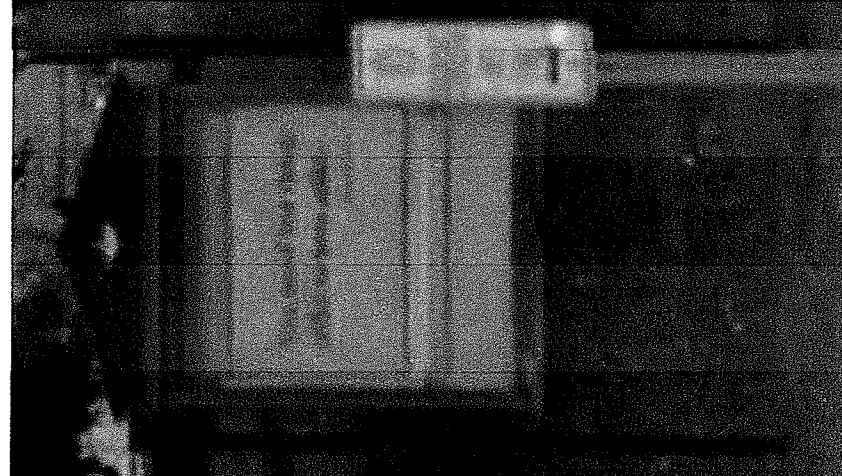
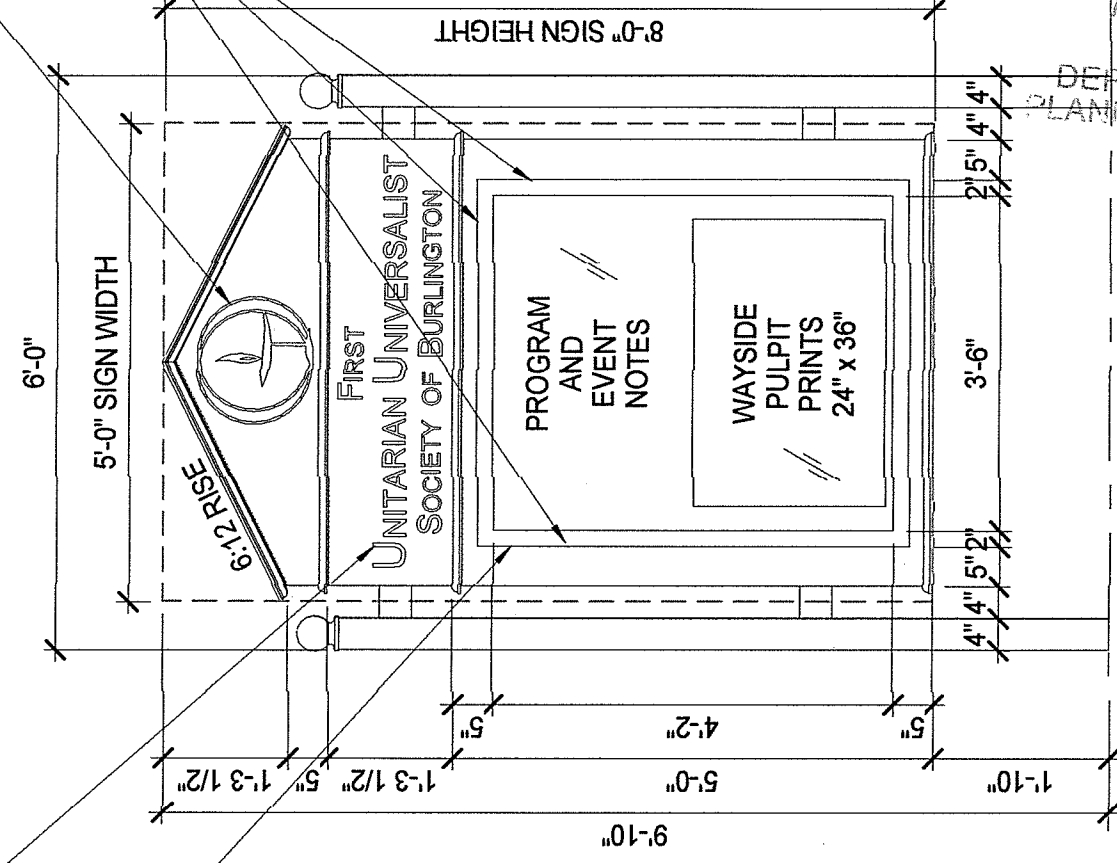
SIGN AREA AS SHOWN 40 SQUARE FEET
EXISTING COMBINED SIGN AREA REPORTED AS 42.64 SQUARE FEET

CHALICE SYMBOL TO BE RAISED
AND SURFACE BEHIND TO BE
SOFTLY ILLUMINATED

HINGED GLASS PANEL
DOOR FOR MANUAL
CONTENTS CHANGES

OPTION: CHALICE FLAME AS ART
GLASS - ILLUMINATED

PROVIDE LED STRIP ILLUMINATION
OF CONTENTS BEHIND GLASS
PANEL @ TOP AND SIDES - LEDS
TO BE FULLY CONCEALED



EXISTING WEST "WAYSIDE PULPIT" SIGN

UU = APPROXIMATELY 2 3/4" LETTERS
WITH 4" LEADING CAPITALS
CHALICE - 1' 2 1/2" T x 1' 4" W
9' 10" TOTAL SIGN HEIGHT

**BEST READABLE DISTANCE ABOUT 30-40'
MAXIMUM READABLE DISTANCE ABOUT 90'**

EXISTING EAST SUNDAY PROGRAM SIGN

AUGUST 22, 2018

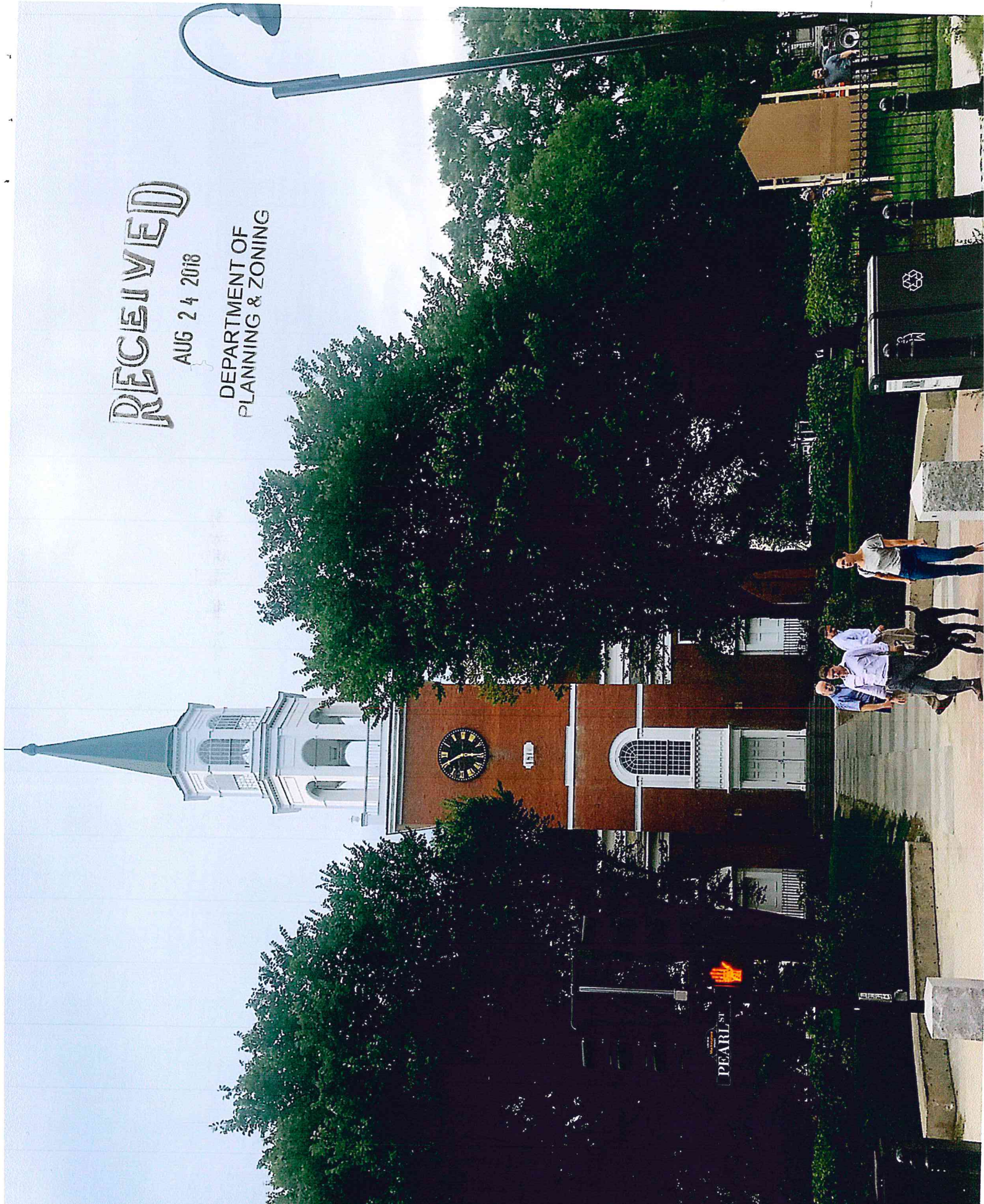
RECEIVED
AUG 24 2018

The current proposed sign application shows substantially greater compliance with the sign ordinance by the following:

1. One sign replaces the existing two signs.
2. The revised application is for a sign smaller than the existing two signs, i.e., new sign would be 40 square feet whereas existing two signs have combined size of 42.64 square feet.
3. The new sign is approximately 10 feet closer to curb than either of existing signs.

RECEIVED
AUG 24 2018

DEPARTMENT OF
PLANNING & ZONING



Mock up of new sign -

Department of Planning and Zoning

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Jay Appleton, Senior GIS/IT Programmer/Analyst
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Shaleigh Draper, Zoning Clerk



MEMORANDUM

To: Development Review Board

From: Mary O'Neil, AICP, Principal Planner

Date: October 2, 2018

RE: ZP18-1027SN; 152 Pearl Street (Unitarian Universalist Society of Burlington)

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.

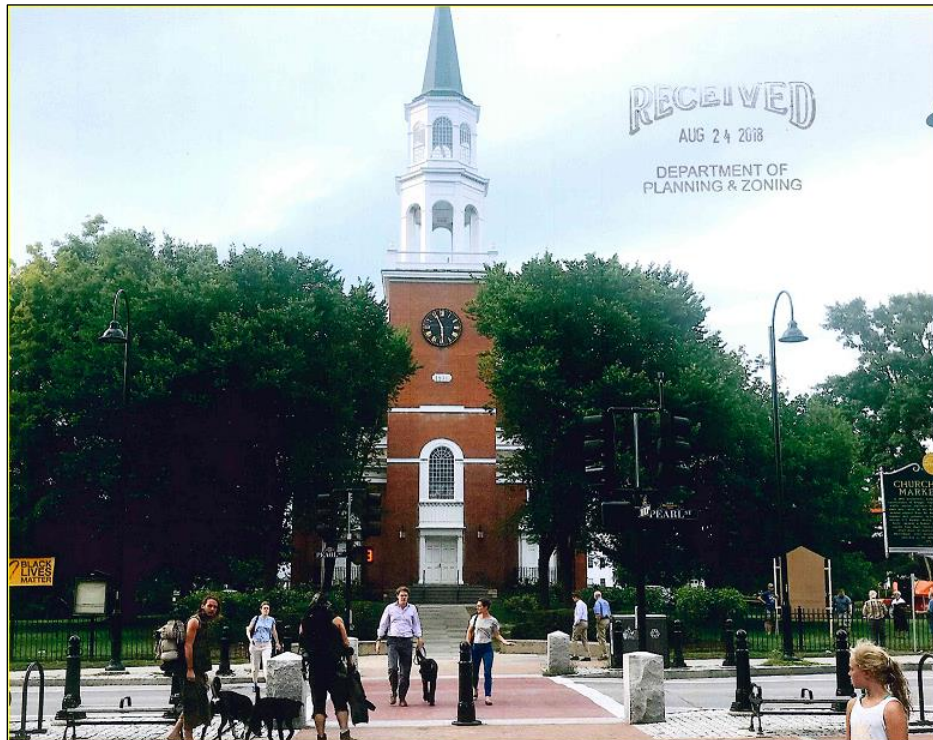
File Number: ZP18-1027SN

Zone: FD5 **Ward:** 2C

Date application accepted: May 10, 2018, revised August 24, 2018.

Applicant/ Owner: Mary Gade / First Unitarian Universalist Society

Request: Replace two non-conforming signs with a single sign for the the Unitarian Universalist organization.



Background:

- **Non-Applicability of Zoning Permit Requirements 17-0705NA;** replace perimeter railing on deck using same design and materials. January 2017.

- **Non-Applicability of Zoning Permit Requirements 17-0321NA;** restore building window sash in lantern room of tower. September 2019.
- **Non-Applicability of Zoning Permit Requirements 16-1093NA;** removal of non structural partition. April 2016.
- **Non-Applicability of Zoning Permit Requirements 16-1205NA;** installation of historic marker. May 2016.
- **Non-Applicability of Zoning Permit Requirements;** renovation of 100 sq. ft. interior office, relocate door, add counter with sliding glass. May 2015.
- **Non-Applicability of Zoning Permit Requirements 15-0826NA;** rebuild existing walkway from church steps to Parl Street using existing materials and new similar material. February 2015.
- **Non-Applicability of Zoning Permit Requirements 15-0081NA;** replace existing roof on north flat roof of Meetinghouse. July 2014.
- **Zoning Permit 14-0879CA;** construct brick labyrinth on ground around tree in front yard. April 2014.
- **Zoning Permit 14-0292CA;** installation of two street lamps on drive/walkway, east side of building. September 2013.
- **Zoning Permit 13-0755CA;** install tw new exterior light fixtures above entranceway and walkway. February 2013.
- **Zoning Permit 12-0904CA;** installation of outdoor lighting for carport and garage. April 2012.
- **Zoning Permit 12-0156CA;** construct carport with solar roof over existing paved parking area at north of property. August 2011.
- **Non-Applicability of Zoning Permit Requirements 12-0533NA;** replace 36 aluminum storm windows with new aluminum story windows. November 2011.
- **Non-Applicability of Zoning Permit Requirements;** replace front steps and deck. May 2009.
- **Non-Applicability of Zoning Permit Requirements;** replace east and south double doors with no change in design, location, size, style or material. September 2008.
- **Zoning Permit 00-460 / COA 096-062B;** repave existing church and office parking lot (accessed from Clarke and Elmwood.) Proposal includes small area of expansion – grael to pavement (approximately 135 sf). No overall increase in coverage or change in use. April 2000.
- **Zoning Permit 99-316 / COA 093-062A;** installation of a mechanical equipment (gas fired furnace) on a pad on the west side of the existing church. Proposal to be surrounded with black vinyl coated chain link fencing. January 1999.
- **Zoning Permit 93-294 / 093-062;** 3000 sf rear addition to existing church, with site improvements. December 1992.

- **Zoning Permit 89-462**; install 87' of 6' wrought iron type fencing along south property line; renewal of permit 87-500. October 1989.
- **Zoning Permit 87-501 / COA 87-170**; construct handicap access ramp on Clarke Street side of building; pressure treated lumber with iron railing. September 1987.
- **Zoning Permit 87-500 / COA 87-170A**; install 74' of wrought iron type fencing along property line. September 1987.
- **Zoning Permit (n.n.)**; Unitarian Church to use a portion of the front lawn at Pearl and Church Streets as a semi-public use for a sidewalk café. May 1978.

Overview: 152 Pearl Street currently has two non-conforming signs fronting Pearl Street. A single new sign is proposed, larger in area than allowable by the ordinance. The DRB may allow a sign to be in substantially greater compliance than the existing nonconforming sign(s) subject to the development review criteria in Article 6, and provisions of Section 7.1.6.

Recommended motion: Consent approval, per the following findings and conditions.

I. Findings

Article 2: Administrative Mechanisms

Section 2.7.8 Withhold Permit

Per this standard, the applicant is required to remedy all violations and close out all zoning permits issued after July 13, 1989 prior to issuance of a Certificate of Occupancy for this permit. Review of the electronic zoning file shows all open permits have been closed and Certificates of Occupancy issued. **Affirmative finding.**

Article 6: Development Review Standards

Part 1: Land Division Design Standards

Part 2: Site Plan Design Standards

Sec. 6.2.2 Review Standards

(a) Protection of Important Natural Features:

Not applicable.

(b) Topographical Alterations:

Not applicable.

(c) Protection of Important Public Views:

Not applicable.

(d) Protection of Important Cultural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Archeological sites likely to yield

information important to the city's or the region's pre-history or history shall be evaluated, documented, and avoided whenever feasible. Where the proposed development involves sites listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8(b).

The First Unitarian Universalist Church will not be altered as part of this application, which is reserved to changes in signage. **Affirmative finding.**

(e) Supporting the Use of Renewable Energy Resources:

Not applicable.

(f) Brownfield Sites:

Not applicable.

(g) Provide for nature's events:

Not applicable.

(h) Building Location and Orientation:

Not applicable.

(i) Vehicular Access:

Not applicable.

(j) Pedestrian Access:

Not applicable.

(k) Accessibility for the Handicapped:

Not applicable.

(l) Parking and Circulation:

Not applicable.

(m) Landscaping and Fences:

Not applicable.

(n) Public Plazas and Open Space:

Not applicable.

(o) Outdoor Lighting:

Not applicable.

(p) *Integrate infrastructure into the design:*

Not applicable.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

(a) *Relate development to its environment:*

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. The introduction of new buildings to a historic district listed on a state or national register of historic places shall make every effort to be compatible with nearby historic buildings.

See 6.2.2. (d), above.

(c) *Protection of Important Public Views:*

Not applicable.

(d) *Provide an active and inviting street edge:*

The proposed new sign will be located so as to adequately inform the public, and will replace the failing existing signs with attractive and redesigned new frame. **Affirmative finding.**

(e) *Quality of materials:*

Vermont Statute §4413, Limitations on Municipal Bylaws, precludes design review of churches and other places of worship. Not applicable.

(f) *Reduce energy utilization:*

Not applicable.

(g) *Make advertising features complementary to the site:*

See Articles 7 and 14, below.

(h) *Integrate infrastructure into the building design:*

Not applicable.

(i) *Make spaces secure and safe:*

Not applicable.

Article 7: Signs

Section 7.1.6 Non-Conforming Signs

Any sign or other advertising device which does not conform to the provisions of this ordinance in terms of location, area, illumination, type or height shall be deemed a non-conforming sign. Non-conforming signs may remain in use at the same location, and ordinary maintenance and repair of such signs shall be permitted.

*A non-conforming sign shall not be relocated, enlarged, replaced, redesigned, or altered in any way (except for a change of lettering, logo or colors using the same materials within an existing sign frame subject to obtaining a zoning permit) except to bring the sign into **complete or substantially greater compliance** with this Article. In such cases, the DRB may allow a sign to be in substantially greater compliance than the existing nonconforming sign subject to the development review criteria in Article 6.*

152 Pearl Street is currently non-conforming to signage in both the number of signs (2 existing, only 1 allowed under this ordinance) and sign area (currently 42.64 sf total area; only 30.5 allowed.) The applicants propose reducing the number of signs from 2 to 1 (bringing into conformity for number), and reducing the total sign area from 42.64 to 40 sf; not full conformity, but less than the existing non-conforming sign area. The sign will also be relocated closer to the curb, which will bring it toward greater conformity in location. Through these efforts, the signage may be determined to be in substantially greater compliance than existing. **Affirmative finding.**

Section 7.1.10 Sign Location and Area

a. Obstruction: No sign shall be placed in a such a way that it prevents clear and unobstructed view of a highway or official sign or of approaching or merging traffic.

No obstruction is proposed. **Affirmative finding.**

b. Setbacks: No portion of any freestanding sign shall be located any closer to any property line than fifty percent (50%) of the required yard setback for the district in which it is located.

See Section 14-3-5, below.

c. Calculation of Sign Area:

See submission materials and Table 7.2.1-1 below.

Table 7.2.1-1 Sign Regulation Summary

Freestanding Sign FD5	Dimensional Requirements:
	Size: ½ sf. per each linear foot of building frontage
	Max. Height 14'
	Illumination: Yes
152 Pearl Street (UUC)	
	Size: ½ sf. per each linear foot of building frontage = 30.5 (building is 61'); 42.64 existing non-conforming; 40 sf proposed.
	Height 8'
	Illumination: Concealed LEDS

Affirmative finding for height and illumination; substantially greater compliance in sign area.

Section 7.2.3 Signs in Form and Mixed Use Districts

(b) Freestanding Signs:

Freestanding signs are permitted provided:

- 1. Only one such sign shall be permitted for each separate street frontage devoted to an establishment;*
- 2. The area of any such sign shall not exceed one half (1/2) square foot per one (1) linear foot of frontage or a total of sixty (60) square feet, whichever is less, and*
- 3. The height of any freestanding sign shall not exceed fourteen (14) feet.*

The application proposes reducing from 2 signs to one (conforming); and installation height of less than 14' (conforming.) The current sign area is non-conforming at 42.64 sf (non-conforming.) The building frontage is 61', so a conforming sign would have to be +/- 30.1 sf. 40 sf sign area is proposed; greater than dimensional standards of the zoning district, but less than the existing non-conformity. See Table 7.2.1-1 above and Section 7.1.6, Non-conforming Signs.

Affirmative finding for number and height. Area move to greater conformity.

Article 14: Plan BTV Downtown Code

Section 14.3.5-C Lot Occupation and Building Placement

Frontage Buildout and Building Setback

Front Setback: Principal Buildings 0 ft min; 6 ft. maximum but in no event less than 12' from the curb.

Section 7.1.10 requires that signs be placed ½ the required front setback; in this case, the setback is 0-3 from the front property line. As the sidewalk is quite wide at this location, the sign(s) would meet the 12' minimum distance from the curb.

The existing signs are placed approximately 35' from the front property line. Installation is proposed at 17' from the property property line; not in compliance with the ordinance, but in substantially great compliance with the requirements of Article 7; allowed under Section 7.1.6.

Affirmative finding for greater compliance.

Section 14.7.2 Non-Conformities

In addition to that as specified in Article 5, Part 3 Non-Conformities of the Burlington Comprehensive Development Ordinance, any non-conformity which lawfully existed at the time of adoption of the applicable provisions of this or any Article or any amendment thereto may be continued subject to the following provisions:

a) Any Building, Structure, Frontage, Development, Site, sign, Improvement, or other appurtenance thereto which legally existed on the effective date of this Article that does not conform to the requirements of this Article may continue until a Substantial Modification is requested or Abandonment occurs. At such time, the affected portion(s) of the Building, Structure, Frontage, Development, Site, sign, Improvement, or other appurtenance thereto shall be required to comply with all applicable provisions of this Article;

b) Any modification other than a Substantial Modification an existing Building, Structure, Frontage, Development, Site, sign, Improvement, or other appurtenance thereto shall be permitted by Right only if such changes result in greater conformance with the specifications of this Article;

c) Any change or modification shall not create any new nonconformity; and,

d) Buildings listed or eligible for listing on the State or National Register of Historic Places shall not be required to make any modifications under a) and b) above that would threaten their historic integrity.

The proposed sign changes result in conformity with number and height and greater conformity in area and location under the specifications of this article. The change to the non-conforming signs will not threaten the historic integrity of the First Universal Unitarian Church, which is listed on the National Register of Historic Places within the *Head of Pearl Street Historic District*.

Affirmative finding.

II. Conditions of Approval

1. Standard Permit Conditions 1-15.

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

Department of Planning and Zoning

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Burlington, VT 05401
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Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Shaleigh Draper, Zoning Clerk



TO: Development Review Board
FROM: Scott Gustin
DATE: October 2, 2018
RE: 19-0176CU; 322 North Winooski Avenue

=====

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Zone: NMU Ward: 2C

Owner/Applicant: Glenn Eames / Tank Studio, Inc.

Request: Change of use to recording studio.

Applicable Regulations:

Article 3 (Applications, Permits, & Project Reviews), Article 8 (Parking)

Background Information:

The applicant is seeking approval to convert an existing bike sales/repair facility into a recording studio. The subject space is 4,916 sf in size. A recording studio is a conditional use in the NMU zone. No site or exterior building changes are proposed.

Previous zoning actions for this property are noted below:

- 4/14/08, Approval to install a new window
- 9/29/06, Approval to install cupola and half-circle window
- 10/23/02, Approval to install sign
- 2/20/02, Approval to install awning and windows
- 11/6/01, Approval to change use to bicycle sales/repair and to install windows
- 2/23/95, Approval of a 24' X 34' addition
- 7/11/75, Approval for a manufacturing use

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

I. Findings

Article 3: Applications, Permits, and Project Reviews:

Part 5, Conditional Use & Major Impact Review:

Section 3.5.6 (a) Conditional Use Review Standards

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

- 1. Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*

The property is served by municipal utilities. Sufficient water and sewer service are available. A State of Vermont wastewater permit may be required for the new use. A capacity letter issued by the Dept. of Public Works will be required prior to issuance if applicable. **(Affirmative finding as conditioned)**

- 2. The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;*

The subject property is located within the Neighborhood Mixed Use (NMU) zone. This zone is intended primarily to preserve and enhance historically commercial areas while reinforcing the compact scale and development patterns of the city's older neighborhoods. Uses are intended to provide neighborhood oriented goods and services and employment opportunities within walking or biking distance of residential neighborhoods. The proposed recording studio is one of many small-scale commercial uses allowed within this mixed use zone. It fits within the scale and mixed use context of the NMU zone. **(Affirmative finding)**

- 3. The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*

The proposed recording studio is not expected to generate nuisance impacts from noise, odor, dust, and the like that may be more typically associated with industrial uses. **(Affirmative finding)**

- 4. The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies;*

No traffic analysis has been provided or is required for this application. The proposed recording studio is small in scale and is expected to generate minimal traffic impacts. **(Affirmative finding)**

and,

- 5. The utilization of renewable energy resources;*

No renewable energy utilization is included in this proposal. Future incorporation is not precluded by the use. **(Affirmative finding)**

and,

- 6. Any standards or factors set forth in existing City bylaws and city and state ordinances;*

No identified conflicts. Required building and/or life safety codes will be under the review of the building inspector. **(Affirmative finding)**

(b) Major Impact Review Standards
Not applicable.

(c) Conditions of Approval:

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

1. Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.

The proposed recording studio is not expected to produce offsite noise or glare substantial enough to require mitigation. **(Affirmative finding)**

2. Time limits for construction.

No construction timeline or phasing are included in this proposal. The standard 2-year timeframe for zoning permits will apply. **(Affirmative finding)**

3. Hours of operation and/or construction to reduce the impacts on surrounding properties.

Hours of operation are noted as between 8:00 AM and 2:00 AM. These hours are not expected to be continuous. Rather, the recording studio will operate on an appointment basis within these hours.

No exterior construction is associated with this proposal. **(Affirmative finding)**

4. That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions; and,

Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time.

5. Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.

See the recommended conditions.

Article 8: Parking

Sec. 8.1.8, Minimum Off-Street Parking Requirements

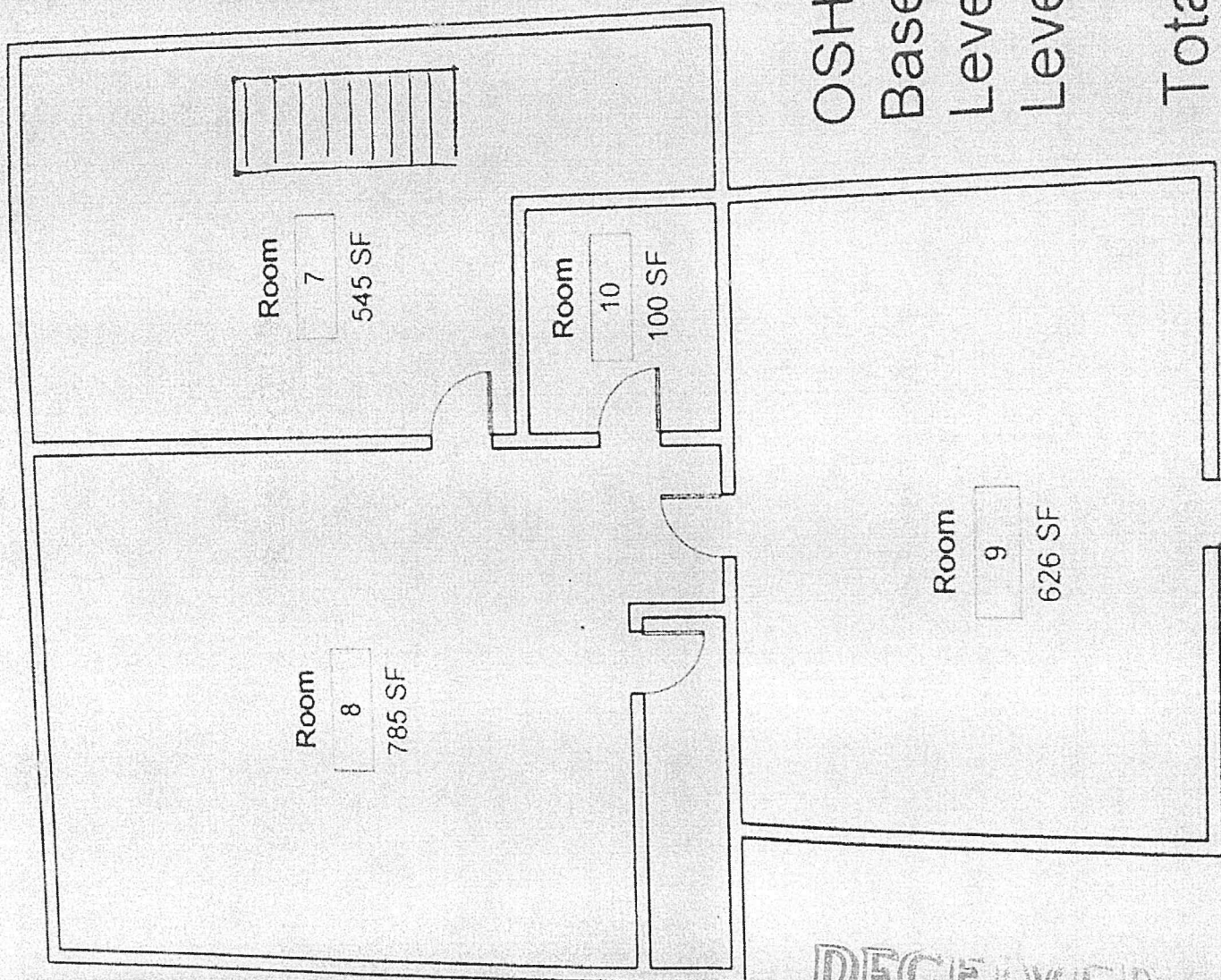
The recording studio requires 5 off-street parking spaces. There are only 3 parking spaces onsite. The 5-space requirement is the same as that for the previous bicycle sales/repair facility. That use received a 1-space parking waiver from the DRB. The other space is a grandfathered nonconforming that had been carried over from the prior use. As there is no increase in the minimum parking requirement, that 1-space nonconformity may be carried over with this new use. See Sec. 8.1.5 for the requested 1-space parking waiver. **(Affirmative finding)**

Sec. 8.1.5, Waivers from Parking Requirements/Parking Management Plans

The applicant has submitted a parking management plan that articulates the basis for a 1-space parking waiver. The property is readily accessible by foot and alternative transportation. Perhaps more importantly, the business will be by appointment only. Only one client will be present at a time. The management plan also refers to nearby after-hours parking that may be available. Without securing it by way of easement or deed, this off-site parking cannot be counted towards the minimum requirement, nor does it need to be with a 1-space waiver. **(Affirmative finding as conditioned)**

II. Conditions of Approval

1. A State of Vermont wastewater permit may be required.
2. A 1-space parking waiver is included in this approval. The applicant shall report back to the Department of Planning & Zoning every year for 3 years from the date of this approval as to the actual onsite parking demand.
3. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state as required.
4. Standard Conditions 1-15.



OSH:

Basement = 1,430 sf

Level 1 = 2,056 sf

Level 2 = 1,430 sf

Total: 4,916 sf

RECEIVED

AUG 24 2018

DEPARTMENT OF
PLANNING & ZONING



Scott Gustin

From: Robert O'Dea <rob@tankstudio.org>
Sent: Friday, August 31, 2018 7:29 PM
To: Scott Gustin
Cc: Glenn Eames; Ben Collette
Subject: Re: 322 North Winooski Avenue

Hello Scott,

Sorry for the incomplete info.

- Number of anticipated employees,
3 employees

- Days and hours of business operation
8:00a-2:00a (our business is by appointment only. We're usually there only when booked with a session)

- Brief description of the business
The Tank Studio is a full service audio production facility located in Burlington, VT (Currently at 274 N. Winooski Ave).

We provide recording, mixing, mastering and commercial voice over services to independant musicians, record labels and advertising agencies

We also offer media transfer services, digitizing analog and digital media of all kinds - Reel to Reel, Cassette, Vinyl, DAT and DTRS.

Our facility will also be open to other engineers who are competent and capable of recording/mixing themselves, but need to rent a professional facility to do so.

Thanks,
Rob O'Dea
802.233.7485

On Aug 31, 2018, at 4:10 PM, Scott Gustin <SGustin@burlingtonvt.gov> wrote:

Hello Rob,
I've looked at your zoning permit application for a new recording studio at 322 North Winooski Avenue. As submitted, the application is not yet complete. In order to complete the application, please send the following items along to me:

- Number of anticipated employees,
- Days and hours of business operation
- Brief description of the business

Tank Studio parking management plan for 322 North Winooski Ave
(formerly Old Spokes Home)

RECEIVED
SEP 26 2018
DEPARTMENT OF
PLANNING & ZONING

The Tank Studio (Robert O'Dea and Ben Collette) will renovate the existing structure at 322 N. Winooski Ave for use as a recording studio. For the change of use to Recording Studio, Tank Studio requests the 1-space deficiency "grandfathered" to the previous tenant (Old Spokes Home) as well as a 1-space waiver.

Burlington Parking Regulations require 1 parking space per thousand square feet for the use of Recording Studio. Previous tenant's bike sales/repair use (Old Spokes Home) also required 1 parking spaces per thousand square feet.

Prior use/tenant had a 1-space deficiency "grandfathered" and a 1-space waiver was provided by the DRB. This waiver was based on provided bicycle racks for bike parking as a portion of clientele simply drop off or pick up bicycles for repair, plus the availability of public transit, the location in proximity to a residential neighborhood with associated walk-in traffic and the emphasis on the use of bicycles.

We request the 1-space waiver based on the following:

- 1) Mr. O'Dea and Collette are the only employees of the Tank Studio. Mr. O'Dea lives in downtown Burlington and often commutes by bike or foot to the place of business. Even in the event that both employees drive and park, that still provides one space for the client.
- 2) The recording studio is a "by appointment only" type business so there is never more than one client parking at a time. The amount of customer traffic will be greatly reduced from a retail type business to an appointment only business that serves a single client at a time.
- 3) Our studio provides recording services, which also includes providing "house" instruments for musicians to use including drums, bass, guitar, keyboards, etc. Rarely do our clients bring their own instruments and if so, it is usually a single guitar, bass or keyboard, which can often be transported by bike, foot or public transit
- 4) Many of our clients live in Burlington and our proximity to the residential neighborhoods and the public transit system make our place of business easily accessible without the use of a car that needs parking. Many of our existing clients use the city's bus system, walk, bike or taxi/uber/lyft to our current location, which is down the street from the proposed new location at 322 N. Winooski Ave.
- 5) Our current location, at 274 North Winooski Ave, provides two guaranteed parking spots in the lot adjacent to the building. Vermont Legal Aid employees fill up the rest of the lot and we have rarely needed a third space during Legal Aid business hours (8am - 4pm).

- 6) We plan to maintain our location at 274 North Winooski as an additional place of business. Its proximity to the new location at 322 North Winooski can provide overflow parking when needed. Our clients tend to favor afternoon/evening appointments and the lot at 274 has a plethora of spaces open after 4pm that are available for our use.
- 7) There are no plans to alter the exterior of the building or the lot itself. All existing parking spaces will be available, landscaping will stay the same and no dumpsters or trash receptacles will be placed on site.

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, FAICP, Director
Meagan Tuttle, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Shaleigh Draper, Zoning Clerk



TO: Development Review Board
FROM: Scott Gustin
DATE: October 2, 2018
RE: 19-0202CA/MA; 44 Lakeside Avenue

=====

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: ELM Ward: 5S

Owner/Applicant: Lakeside Ovens, LLC / John Caulo, Land/Plan

Request: Renovate buildings for assembly, office, and seasonal recreational use. Rework parking and circulation.

Applicable Regulations:

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

Background Information:

The applicant is seeking approval to renovate the existing oven factory into a mix of office and assembly space. The seasonal recreational use (boat rental) associated with the several outbuildings on the beach has been approved under separate zoning permit. Exterior building changes are relatively minimal and amount to new windows and entry systems for building 50. More significant is the proposed site work that will entail rerouting onsite circulation and provision of additional surface parking to accommodate the proposed uses. Lastly, several lots will be merged into one lot.

The Conservation Board reviewed this application at their September 10, 2018 meeting. Significant discussion was had as to the placement of parking as close to the lakeshore and provision of public access to the property and lakeshore. Recent survey work shows that the bike path actually runs across the property within an easement. Direct access from the bike path has been made for the seasonal recreational use at the northern end of the site. While the property remains under private ownership, strides have been made to enable public access and to afford the recreating public additional opportunity to experience Burlington's lakefront. Ultimately, the Conservation Board voted to recommend approval of the project as designed so long as the applicant works in good faith with the city as to revamping the bike path where it runs across the property and improving public access. Note that the site plan has been revised since Conservation Board review to avoid onsite class 3 wetlands and US Army Corps of Engineer's permitting.

Previous zoning actions for this property:

- 7/23/18, Approval for exterior renovations to building 44 and demo of loading dock
- 5/8/18, Approval to construct one additional outbuilding and a gazebo and establish a seasonal boat rental use
- 9/8/17, Approval for 3 outbuildings
- 9/20/16, Approval for conversion of warehouse to office space
- 1/16/13, Approval to install new piping and exhaust fans on roof
- 9/1/09, Approval to construct link between two existing buildings
- 2/3/06, Approval to install replacement windows and balcony
- 12/7/05, Approval for interior fit up of office space
- 1/11/96, Approval to construct boat dock
- 12/23/77, Approval to enclose loading dock and to construct an office space

Recommendation: Initial review and continuation of the public hearing to address the outstanding items in the findings below.

I. Findings

Article 3: Applications and Reviews

Part 5, Conditional Use & Major Impact Review:

Section 3.5.6 (a) Conditional Use Review Standards

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

1. *Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*

The proposed development will involve connection to the city's wastewater system. There is an onsite septic system that apparently serves the oven factory. Sufficient water and sewer service are available. A State of Vermont wastewater permit will be required for the new connection. A capacity letter issued by the Dept. of Public Works will be required prior to issuance of a zoning permit. **(Affirmative finding as conditioned)**

2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;*

The subject property is located within the Enterprise – Light Manufacturing zone. This zone is intended primarily for manufacturing, distribution, processing and the like. While the oven factory will discontinue, it will be replaced by a variety of office and assembly uses intended as “incubator” and “accelerator” spaces. The proposed uses are consistent with the intent of the E-LM zone. **(Affirmative finding)**

3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*

The proposed office and assembly spaces are not expected to generate nuisance impacts from noise, odor, dust, and the like that may be more typically associated with heavy industry.

(Affirmative finding)

4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies;*

A traffic analysis has been provided. It includes the standard items as to anticipated trip generation, high crash location identification, and intersection level of service (LOS) in build and no-build scenarios. 2019 projections are made without the Champlain Parkway. Projections for 2014 include it. The traffic study generously assumes a 20% trip reduction due to alternative means of transportation to and from the site. Conversely, the study projects gross trip generation for the new uses, rather than a net difference from the existing manufacturing use.

Anticipated trip generation is significant. In the AM peak hour, 145 trip ends are anticipated. In the PM peak hour, 127 trip ends are anticipated. A total weekday trip generation estimate is not evident in the traffic study.

LOS impacts on nearby intersections are fairly modest. Those intersections included are Pine St/Lakeside Ave, Champlain Parkway/Lakeside Ave, Pine Street/Flynn Ave, and Lakeside Ave/Central Ave. Intersection level of service LOS remains good in all scenarios with mostly A's and B's. The Champlain Parkway/Lakeside Ave intersection LOS will be C in both build and no-build scenarios in 2024. The Lakeside Ave/Pine St intersection LOS will drop from A to B in the 2019 build scenario.

Written comments from the Department of Public Works have not yet been provided. Such comments are anticipated and will inform provision of any conditions related to traffic. **(No finding possible)**

and,

5. *The utilization of renewable energy resources;*

No renewable energy utilization is included in this proposal. Future incorporation is not precluded by the project design. **(Affirmative finding)**

and,

6. *Any standards or factors set forth in existing City bylaws and city and state ordinances;*

As conditioned.

(b) Major Impact Review Standards

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

No significant air or noise pollution is anticipated as a result of this development.

See Sec. 5.5.3 for stormwater management. **(Affirmative finding)**

2. Have sufficient water available for its needs;
See Sec. 3.5.6 (a) 1.

3. Not unreasonably burden the city's present or future water supply or distribution system;
See Sec. 3.5.6 (a) 1.

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;
See Sec. 3.5.6 (a) 4.

6. Not cause an unreasonable burden on the city's ability to provide educational services;
No impacts on the city's educational system are anticipated as a result of this purely commercial development. **(Affirmative finding)**

7. Not place an unreasonable burden on the city's ability to provide municipal services;
The proposed renovations and changes in use will generate additional impacts on city services; however, those impacts are expected to be relatively modest. Impacts will be mitigated by payment of impact fees based on the area of buildings converted from industrial to office uses. An articulation of that interior breakdown of uses is needed. **(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;
See Article 6 for effects on significant natural areas, historic buildings, and archaeological significance.

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 development is located within the ELM zone – an area of the city specifically zoned for a variety of commercial land uses. The project will not adversely impact the city's present or future growth patterns. The scale of existing onsite development will not change and is not expected to have an undue adverse impact on the city's ability to accommodate growth.
(Affirmative finding)

10. Be in substantial conformance with the city's municipal development plan;
Several provisions of the Municipal Development Plan target the Enterprise zones for new commercial investment and redevelopment (Land Use Policies, pg. I-2; Growth Areas, pg. I-22 {The Enterprise District}). The site is easily accessible by bike or by foot with its location along the bike path. Bus service is located nearby as well (Transportation System Plan, pg. V-12). As required, the renovated buildings will comply with present energy efficiency standards of the city and state (Energy Plan, pg. VIII-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;*

The proposed commercial redevelopment will have no impact on the present or projected housing needs of the city. **(Affirmative finding)**

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

Little impact on the city's park and recreation needs is expected as a result of this development. What impact there is will be mitigated by payment of impact fees. **(Affirmative finding as conditioned)**

(c) Conditions of Approval:

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

1. *Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.*

The proposed redevelopment will likely not generate offsite noise or glare substantial enough to require mitigation. **(Affirmative finding)**

2. *Time limits for construction.*

No construction timeline or phasing are included in the project plans. The standard 2-year timeframe for zoning permits will apply. **(Affirmative finding)**

3. *Hours of operation and/or construction to reduce the impacts on surrounding properties.*

No information has yet been provided as to the proposed hours of operation of the businesses and must be.

Proposed days and hours of construction are Monday – Friday from 7:00 AM – 5:30 PM.

Saturday from 8:00 AM – 3:30 PM. No work on Sunday. These construction hours are consistent with those recently approved for several large projects. **(No finding possible)**

4. *That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions; and,*

Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time.

5. *Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.*

See the recommended conditions.

Article 4: Maps & Districts

Sec. 4.4.3, Enterprise Districts:

(a) Purpose

(1) Light Manufacturing (E-LM)

The subject property is located in the E-LM zone which is intended as the primary commercial/industrial center of Burlington. The proposed office and assembly spaces are consistent with the variety of commercial uses allowed in this zone. **(Affirmative finding)**

(b) Dimensional Standards & Density

Building FAR remains unchanged.

Lot coverage will increase to 49%. This percentage is under the maximum allowable 80% coverage.

The front yard setback along Lakeside Avenue remains unchanged. Side yard setbacks are not applicable in the E-LM zone, nor is the lakeshore setback. No construction is proposed anywhere near the rear property line at the far northern end of the site.

Building height remains unchanged. **(Affirmative finding)**

(c) Permitted & Conditional Uses

General office and assembly (manufacturing) are both permitted uses in the E-LM zone. In this case, the manufacturing use amounts to a number of small-scale “maker” and “accelerator” spaces. **(Affirmative finding)**

(d) District Specific Regulations

Not applicable.

Sec. 4.5.4, Natural Resource Protection Overlay District

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

Almost the entire property is affected by the Riparian and Littoral Conservation Zone, an overlay that extends 250’ inland from the 95.5’ elevation along the lakeshore. This overlay zone establishes criteria for tree clearing and stormwater management. The Conservation Board reviewed the project under these standards and recommended approval as noted previously. Minimal tree clearing is proposed and stormwater management will meet or exceed applicable standards. **(Affirmative finding)**

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.3 (b) above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable.

Sec. 5.2.5, Setbacks

See Sec. 4.4.3 (b) above.

Sec. 5.2.6, Building Height Limits

See Sec. 4.4.3 (b) above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See Sec. 4.5.3 (b) above.

Sec. 5.5.1, Nuisance Regulations

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

Sec. 5.5.2, Outdoor Lighting

An outdoor lighting plan has been provided. A variety of fixtures are proposed for different applications, including bollards, poles, wall packs, and canisters. All will use LED light sources. A photometric plan has been submitted that depicts point-by-point illumination levels. No summary table articulating average, minimum, maximum, and uniformity ratios for walkways, parking, and building entries has been provided. Without such information, compliance with this criterion cannot be determined. **(No finding possible)**

Sec. 5.5.3, Stormwater and Erosion Control

Proposed stormwater management centers on constructed gravel wetlands. These new stormwater elements will collect runoff from impervious surfaces within the site and will provide water quality treatment prior to discharge into Lake Champlain. The Conservation Board reviewed the stormwater management proposal and found it to be acceptable. Final review and approval by the city's stormwater program staff is pending. **(Affirmative finding as conditioned)**

Article 6: Development Review Standards:

Part 1, Land Division Design Standards

Sec. 6.1.2, Review Standards

(a) Protection of important natural features

The proposed boundary merger will have no impact on important natural features. **(Affirmative finding)**

(b) Block size and arrangement

Block size and arrangement will remain unchanged. **(Affirmative finding)**

(c) Arrangement of Lots

Several irregular lots will be combined into one triangular lot. **(Affirmative finding)**

(d) Connectivity of streets within the city street grid

Not applicable.

(e) Connectivity of sidewalks, trails, and natural systems

Not applicable.

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

See Sec. 4.5.4, *Natural Resource Protection Overlay Districts*.

(b) Topographical alterations

No significant topographical alterations are proposed. The site is largely flat with a gently sloping lakeshore. Proposed grading will direct stormwater runoff into receiving stormwater management infrastructure. **(Affirmative finding)**

(c) Protection of important public views

There are no identified public view corridors from or through the subject property. That said, it is visible from the bike path and from the lake. As proposed, the new parking lot will be set back from the bike path, and the existing asphalt between the lakeshore and building 44 will be removed. The Conservation Board felt that, at least as perceived from the lake, public views of the property would improve. **(Affirmative finding)**

(d) Protection of important cultural resources

The property has no known archaeological significance. The immediate lakeshore is identified as an archaeologically sensitive area (as it is for much of the city's waterfront). Construction of the new parking lot may encroach into this sensitive area. In the event that artifacts are uncovered during earthwork, it is the applicant's responsibility to cease earthwork and contact the Vermont Division for Historic Preservation for direction. **(Affirmative finding as conditioned)**

(e) Supporting the use of alternative energy

See Sec. 6.3.2 (f).

(f) Brownfield sites

Although the property is located relatively close to several contaminated sites, it does not appear on the Vermont DEC Hazardous Site List. **(Affirmative finding)**

(g) Provide for nature's events

See Sec. 5.5.3 for stormwater management.

Ample room will remain for onsite snow storage. Several building entries will be sheltered. **(Affirmative finding)**

(h) Building location and orientation

Building location and orientation will remain unchanged. **(Not applicable)**

(i) Vehicular access

Vehicular access will continue to come from Lakeside Avenue. The road frontage; however, will be significantly reworked to eliminate the very long curb cut along Lakeside Avenue. A new green belt with street trees will be installed along most of the property's road frontage with the front parking area pulled back from the street. The City Arborist has reviewed and approved the street tree plan. **(Affirmative finding)**

(j) Pedestrian access

Pedestrian access to the site will be improved. Two new connections to the bike path are proposed. The existing sidewalk that dead-ends at the eastern end of the Lakeside Avenue frontage will be extended across the length of the property's street frontage. Such extension will require DPW review and approval (as will the entirety of the new green belt). A new walkway will extend from this new sidewalk into the property. Several interior walkways will facilitate pedestrian circulation within the site, including a number of walkways connecting the parking areas with the buildings. The large parking lot to be constructed at the northern end of the site has just two pedestrian walkway connections. Most users would be forced to walk within the vehicular circulation aisles to reach these two walkways. Such configuration is contrary to the requirement that pedestrians be afforded safe routes separate from vehicles. Introduction of

walkways on both sides of the interior parking island would remedy this situation. **(Affirmative finding as conditioned)**

(k) Accessibility for the handicapped

Several clusters of handicap parking spaces are depicted near the buildings' entrances. It is the applicant's responsibility to comply with all applicable ADA requirements. **(Affirmative finding)**

(l) Parking and circulation

Almost all parking will be set behind the buildings along Lakeside Avenue. The existing front yard parking lot will be revamped and pulled back from the street with a new green belt and sidewalk as noted above.

Curbing is evident along portions of the parking and circulation areas. Much of the parking is without curbing. Continuous curbing is not required; however, this criterion requires curb stops or similar items at the edges of parking areas in order to prevent parking creep. The site plans must be revised accordingly.

The proposed parking areas will require shade trees. This criterion establishes a target of 30% shading of the parking areas with new shade trees. At least 1 shade tree for every 5 parking spaces is required. A total of 388 parking spaces are proposed (including the tandem spaces.) Seventy-eight shade trees are required. Only 44 new trees are proposed, and not all of them are to serve as shade trees. The required number of shade trees may be reduced by up to 30% if the DRB determines that full compliance is not feasible due to site constraints and required compliance with minimum parking requirements. With a 30% waiver, 55 shade trees would be required. Additional shade trees are required in either event. No shade analysis has been provided and is required. **(No finding yet possible)**

(m) Landscaping, fences, and retaining walls

A comprehensive landscaping plan has been submitted and encompasses a diversity of plantings. As noted previously, tree clearing will be minimal. New street trees will line the newly created green belt along Lakeside Avenue. New trees will also line the walkway along the building's street façade. Within the site, new tree plantings abound, mostly along or within the parking and circulation areas. Shrubs, ground cover, and perennials are also included in the planting mix. The constructed gravel wetlands will be planted with wet-tolerant species. Trees will continue to line much of the property's lakeshore, and much of what is present-day lawn will be converted to meadow. **(Affirmative finding)**

(n) Public plazas and open space

No public plazas or open space are included in this proposal. As noted before, public access into the site will be improved. **(Affirmative finding)**

(o) Outdoor lighting

See Sec. 5.5.2.

(p) Integrate infrastructure into the design

Existing and proposed ground-mounted mechanical equipment will be enclosed with metal panel screening. Similar screening will be provided for trash and recycling facilities onsite. The site plan notes a trash and recycling enclosure along building 50's primary façade – facing Lakeside

Avenue. While screening will be provided, an alternative location out of view of the public street should be sought. Any new utility lines must be buried. **(Affirmative finding as conditioned)**

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

(a) Relate development to its environment

1. Massing, Height, and Scale

Unchanged. **(Not applicable)**

2. Roofs and Rooflines

Unchanged. **(Not applicable)**

3. Building Openings

The fenestration of building 50 will be reworked with the introduction of additional windows on all elevations. While somewhat different stylistically from what is there now, the proposed fenestration fits the industrial aesthetic of the long, low brick buildings well. **(Affirmative finding)**

(b) Protection of important architectural resources

The buildings are not included on an historic register. The exterior alterations to building 50 will have no adverse impact on Burlington's important architectural resources. **(Affirmative finding)**

(c) Protection of important public views

See 6.2.2 (c) above.

(d) Provide an active and inviting street edge

Only building 50 is being altered as part of this application. Its southern façade faces Lakeside Avenue and will be improved with additional glazing, entryway enhancements, and some modest architectural accents. As noted previously, the street-side dumpster and recycling enclosure should be located elsewhere. **(Affirmative finding as conditioned)**

(e) Quality of materials

Relatively little will change as to building cladding. Brick will remain the predominant exterior material. Metal cable railing systems will be installed along with wooden rain screens at some of the entries. Aluminum-frame windows will be installed throughout. **(Affirmative finding)**

(f) Reduce energy utilization

Few energy details are included in the application plans. The renovated building must comply with the current energy efficiency requirements of the city and state. **(Affirmative finding as conditioned)**

(g) Make advertising features complimentary to the site

No exterior signs are included in the project plans. Signs are subject to separate zoning permit. **(Affirmative finding as conditioned)**

(h) Integrate infrastructure into the building design

No roof-mounted mechanical equipment is depicted in the elevation plans. **(Affirmative finding)**

(i) Make spaces safe and secure

Egress requirements per the applicable building code will apply. Building entries, walkways, and parking areas are illuminated. **(Affirmative finding)**

Article 8: Parking

Sec. 8.1.8, Minimum Off-Street Parking Requirements

The minimum parking requirement is based on the two primary uses: general office and assembly/manufacturing. Nowhere in the application is a square footage of manufacturing space noted. All of the parking information provided by the applicant is based on general office use. Without this delineation, an accurate parking requirement cannot be determined. **(No finding possible)**

Sec. 8.1.9, Maximum Parking Spaces

This section limits surface parking to 125% of the Neighborhood Parking District minimum parking requirement. As with the criterion above, compliance with this criterion cannot be determined without an exact delineation of the area used for which activities. **(No finding possible)**

Sec. 8.1.10, Off-Street Loading Requirements

This criterion requires an onsite loading area for all nonresidential construction outside of the downtown parking district. While the buildings are already in place, they are being renovated for new interior uses. A single loading area is depicted on the north side of building 50 – inaccessible by vehicles. Provision for loading is needed and must be reflected in revised plans. **(No finding possible)**

Sec. 8.1.11, Parking Dimensional Requirements

Paved parking spaces are dimensionally compliant at 9' X 20.' The tandem and stacked spaces are slightly smaller at 9' X 18' but remain acceptable. Back-up space is narrower than the standard 24' length; however, the 20' back-up length that is provided affords sufficient space for the required 20' wide two-way drive aisles. **(Affirmative finding)**

Sec. 8.1.12, Limitations, Location, Use of Facilities

(a) Offsite parking facilities

Not applicable.

(b) Downtown street level setback

Not applicable.

(c) Front yard parking restricted

Not applicable.

(d) Shared parking in the Neighborhood Parking Districts

All of the uses on onsite will share the onsite parking facilities. **(Affirmative finding)**

(e) Single story structures in Shared Use Districts

Not applicable (no new buildings are proposed).

(f) Joint use of facilities

As enabled by this section, parking for all of the proposed uses will share spaces within the onsite parking areas. **(Affirmative finding)**

(g) Availability of facilities

None of the proposed parking will be used for the storage or display of vehicles or materials by offsite users. Parking will be for employees and visitors. **(Affirmative finding)**

(h) Compact car parking

As noted above, the tandem and stacked parking spaces are slightly sub-standard but are acceptable. The limitation on compact parking spaces pertains only to parking garages. **(Affirmative finding)**

Sec. 8.1.13, Parking for Disabled Persons

The site plan depicts several clusters of handicap parking spaces in close proximity to building entries. Associated striping is also shown. ADA compliance is administered via the city's building permit process. **(Affirmative finding as conditioned)**

Sec. 8.1.14, Stacked and Tandem Parking Restrictions

A number of tandem parking spaces (2-deep) are proposed as are some stacked spaces (3-deep). The applicant has represented that they are not needed in order to meet the minimum parking requirement. If that is the case, the tandem and stacked spaces are acceptable. Determination of compliance cannot yet be determined without an articulation of how much space will be used for which activities. **(No finding possible)**

Sec. 8.2.5, Bicycle Parking Requirements

Several outdoor bike rack locations are depicted on the site plan; however, additional details are lacking. No total number of short versus long term (outdoor versus indoor/sheltered) bike parking has been provided, nor have any details been provided as to what type of bike racks or indoor/sheltered storage will be provided. As with car parking, an articulation of how much space will be occupied by which uses is needed. Without that, compliance cannot be determined. **(No finding possible)**

Article 10: Subdivision

Sec. 10.1.5, Lot Line Adjustments

(a) Lot Line Adjustment Submission Requirements

The required boundary survey prepared by a VT-licensed land surveyor has been provided. It lacks the required Administrative Officer's endorsement block. One must be added. **(Affirmative finding as conditioned)**

II. Conditions of Approval

The following conditions are partial only – they are based on “affirmative as conditioned” above. They do not address criteria with “no finding possible.”

1. Prior to issuance of the zoning permit, revised or supplemental information addressing the following items shall be submitted, subject to staff review and approval:
 - a. Obtain a wastewater capacity letter from the Dept. of Public Works;

- b. Provide a delineation of total general office use versus assembly/manufacturing space and an articulation of how much existing manufacturing space will be converted to general office use;
 - c. Obtain final approval of the EPSC and stormwater management plans from the city's Stormwater Program;
 - d. Provide loading area details;
 - e. Relocate the trash/recycling enclosure from the south side of building 50 to another location behind this, or other, building(s) onsite;
 - f. Provide walkways along both sides of the landscaping island centered within the northern parking area; and,
 - g. Provision of the required Administrative Officer's endorsement block on the boundary survey.
2. The applicant shall work in good faith with the city as to revamping the bike path where it runs across the subject property and to improve public access.
 3. In the event that artifacts are uncovered during earthwork, the applicant shall cease earthwork and contact the Vermont Division for Historic Preservation for direction.
 4. Days and hours of construction shall be limited to Monday – Friday 7:00 AM – 5:30 PM and Saturday 8:00 AM – 3:30 PM. No construction activity on Sunday.
 5. Within 180 days of the date of final approval, the property plat mylar, with the required Administrative Officer's endorsement block and signature, shall be filed with the City Clerk per Sec. 10.1.11 of the Comprehensive Development Ordinance. Failure to do so shall render void the boundary merger.
 6. Impact fees based on the building area converted from manufacturing space to general office space shall be paid to the Department of Planning & Zoning at **least 7 days prior to issuance of a certificate of occupancy.**
 7. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state as required.
 8. Any construction within the public street right-of-way requires review and approval by the City Council in conjunction with the Department of Public Works.
 9. All new construction is required to meet the Guidelines for Energy Efficient construction according to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances.
 10. All exterior signage is subject to separate zoning approval.
 11. All new utility lines shall be buried.
 12. Standard Permit Conditions 1-15.



SITE PLAN
1" = 30'

ZONING REQUIREMENTS:

DISTRICT: ENTERPRISE-LIGHT MANUFACTURING;
DENSITY INTENSITY: FAR 2 MAX
LOT COVERAGE: MAX: 80%
BUILDING HEIGHT: MAX: 45'
FRONT SETBACK: MIN: 5'
SIDE SETBACK: MIN: 0'
REAR SETBACK: MIN: 10%

EXISTING COVERAGE AREAS

EXG PARCEL AREA: 607,000 SF
EXG BUILDING 32: 4,950 SF
EXG BUILDING 50: 79,500 SF
EXG BUILDING 44: 52,000 SF
EXG GRAVEL SURFACES: 18,620 SF
EXG ASPHALT SURFACES: 105,920 SF
TOTAL EXISTING SURFACES: 267,490 SF
44% CURRENT COVERAGE

80% MAXIMUM ALLOWABLE COVERAGE

PHASE 2 FAR CALCULATION:

EXG BUILDING 32: 9,200 SF
PROPOSED BUILDING 50: 85,500 SF
PROPOSED BUILDING 44: 52,000 SF
TOTAL: 146,700 GSF

PARCEL AREA: 607,000 SF

PHASE 1 FAR: 0.24
2.0 MAXIMUM FAR FOR ENTERPRISE-LIGHT MANUFACTURING

PHASE 2 COVERAGE AREAS

EXG PARCEL AREA: 607,000 SF
EXG BUILDING 32: 4,950 SF
EXG BUILDING 50: 79,500 SF
EXG BUILDING 44: 52,000 SF
(EXCLUDING DEMOLISHED LOADING DOCK AND PIPE BARN):
EXG AND PROPOSED GRAVEL SURFACES: 0 SF
EXG AND PROPOSED CONCRETE SURFACES: 27,100 SF
EXG AND PROPOSED BIKE PATH (ASPHALT): 14,310 SF
EXG AND PROPOSED ASPHALT SURFACES: 105,920 SF
PROPOSED STRUCTURAL PAVERS: 255,10 SF
TOTAL EXISTING SURFACES: 297,020 SF
49% TOTAL COVERAGE

80% MAXIMUM ALLOWABLE COVERAGE

DRAWING KEY

EXISTING BUILDING

PROPOSED ASPHALT PAVEMENT

PROPOSED CONCRETE

PROPOSED GRANITE PAVERS, SLAB, OR BENCH

PROPOSED GRAVEL SURFACE

PROPOSED MEADOW

SITE AREA FOR CONSTRUCTION MANAGER TO PRICE

EXISTING TREE/SHRUB TO REMAIN

EXISTING DEAD OR DECLINING TREE TO BE REMOVED

EXISTING TREE/SHRUB TO BE REMOVED

PROPOSED TREE/SHRUB WITH KEY DESIGNATION

PROPOSED GROUND COVER/SHRUBS WITH KEY DESIGNATION

PROPOSED WETLAND PLANTINGS

POST MOUNTED SIGN WITH KEY DESIGNATION

PARKING NOTES - PHASE 2:

PARKING REQUIREMENTS BASED ON BTV ZONING ARTICLE 8.
@ SHARED USE DISTRICT:
OFFICE USE BASED ON 2 CARS/1000 GFA
BUILDING 50@ 79,500 SF + 4,600 SF MEZZANINE
BUILDING 44 @ 52,000 SF
BUILDING 32 (2 FLOORS AT 4,600 SF) 9,200 SF
SUB-TOTAL: OFFICE USE: 145,100 @ 2 CARS/1000 SF = 291 CARS
BURLINGTON SURF CLUB = 20 (SEASONAL)
TOTAL: 311 CARS

MAXIMUM ALLOWABLE 125% = 389 CARS

PROPOSED PARKING:
PAVED PARKING: 270 SPACES (10 EV, 1 OF WHICH IS COMPACT)
TOTAL: 388 SPACES

ACCESSIBLE PARKING:
SOUTH LOT FOR BUILDING 32:
1 VAN ACCESSIBLE
SOUTH LOT FOR BUILDING 50:
5 ACCESSIBLE SPACES + 1 VAN ACCESSIBLE
CENTRAL LOT FOR BUILDING 44:
3 ACCESSIBLE SPACES + 2 VAN ACCESSIBLE
NORTH LOT FOR OUTSIDE EVENTS @ BUILDING 44:
1 VAN ACCESSIBLE
BURLINGTON SURF CLUB LOT
1 VAN ACCESSIBLE

ACCESSIBLE PARKING REQUIREMENTS:
ADA TABLE 202:
BUILDING 50
• FOR 151-200 PARKING SPACES, 6 MINIMUM ACCESSIBLE SPACES
BUILDING 44
• FOR 101-150 PARKING SPACES, 5 MINIMUM ACCESSIBLE SPACES
BUILDING 32
• FOR 1-25 PARKING SPACES, 1 MINIMUM ACCESSIBLE SPACE
BURLINGTON SURF CLUB
• FOR 1-25 PARKING SPACES, 1 MINIMUM ACCESSIBLE SPACE
FOR ALL PARKING:
• ONE VAN ACCESSIBLE FOR EACH 6 OR FRACTION OF 6 ACCESSIBLE SPACES

PLANTING SCHEDULE

SEE LANDSCAPE DRAWING FOR PLANTING SCHEDULE.

SITE LIGHTING KEY

KEY	QUANTITY	CATEGORY	SPEC
*P	X	POLE LIGHT	REASON LIGHTING, KICK POLE LIGHT
*L	X	BUILDING MOUNTED LIGHT	HUBBEL LIGHTING, WALL MOUNT
*T	X	TREE LIGHT	TBD
*B	X	BOLLARD LIGHT	HUBBEL LIGHTING, KICK KIB
*R	X	RECESSED CEILING LIGHT	TBD

PROGRESS PRINT
09/21/2018

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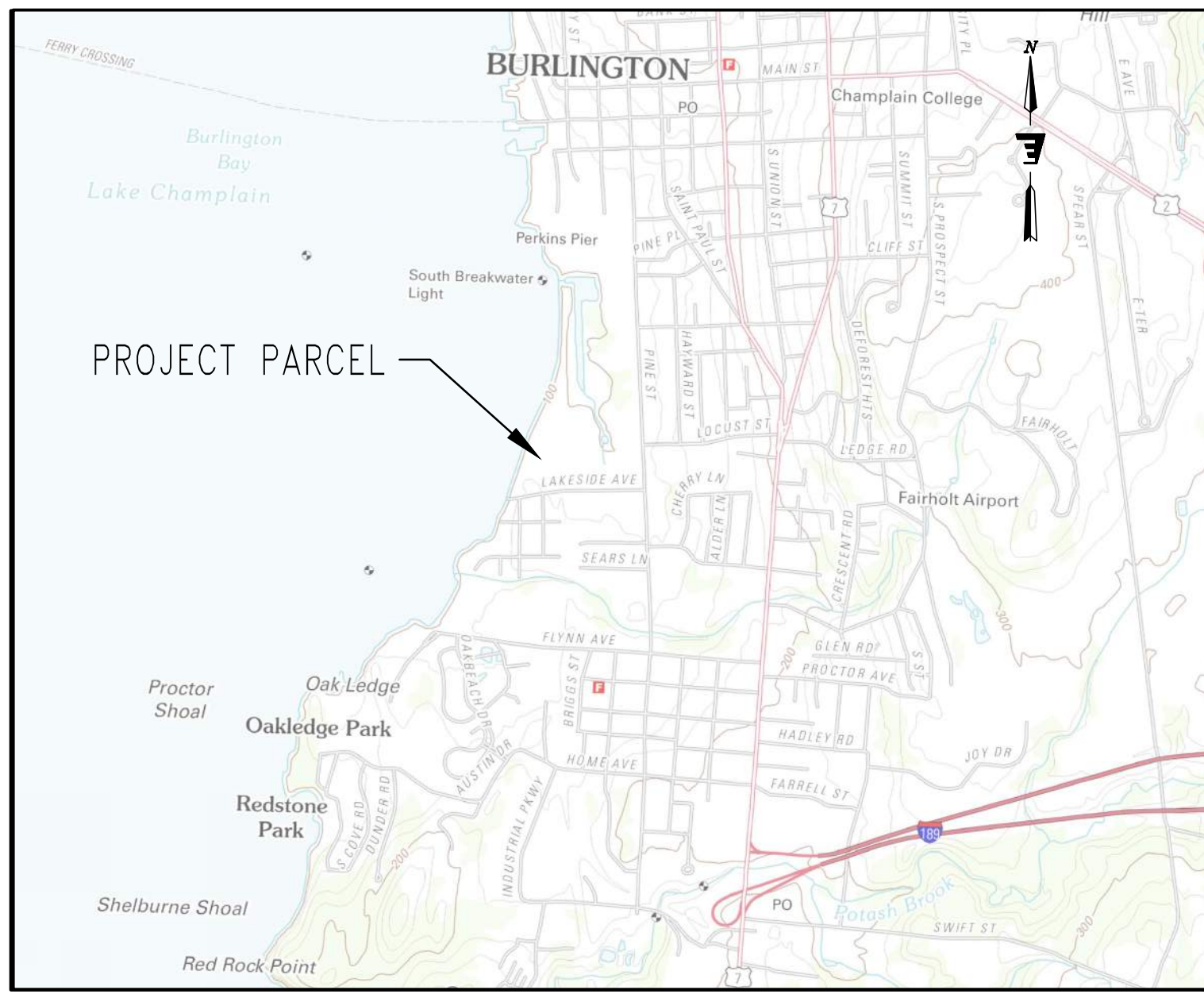
SAS PROJECT NUMBER: 0917

PROJECT
HULA
•
BURLINGTON,
VERMONT

DATE: 09/21/2018
SCALE: AS NOTED
CHECKED: SS
DRAWN BY: SAL, JM, OS
REVISIONS

PHASE
CONCEPT
SITE PLAN

L-1.0



LOCATION MAP

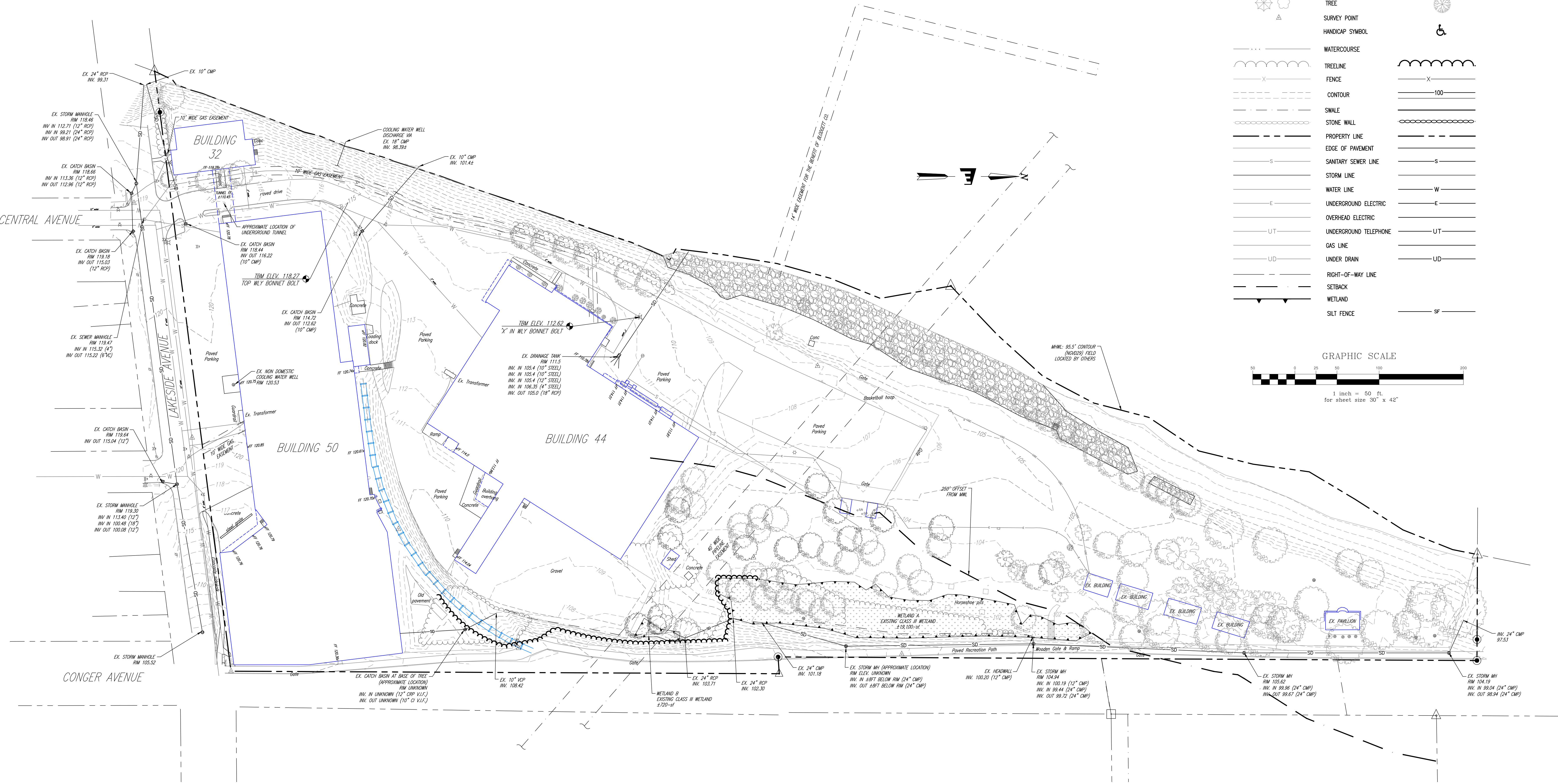
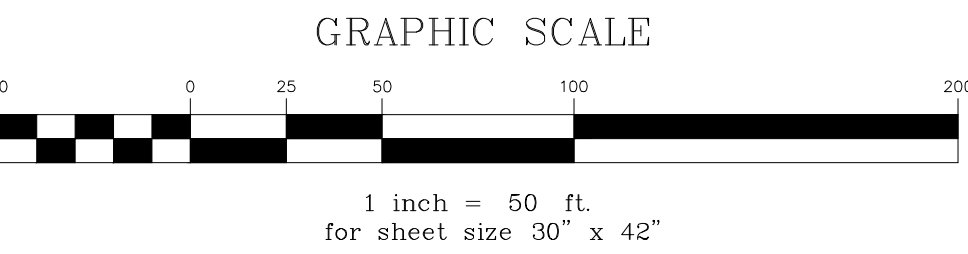
SCALE: 1" = 2,000'

SURVEY NOTES

1. PROPERTY IS TAX MAP PARCEL ID 053-2-011-000. THE PHYSICAL ADDRESS OF THE PROPERTY IS 32, 44 & 50 LAKESIDE AVENUE, BURLINGTON, VERMONT 05401.
2. EXISTING PHYSICAL FEATURES AND TOPOGRAPHY SHOWN HERE IS TAKEN FROM A SURVEY TITLED "EXISTING CONDITIONS PLAN, BLODGETT CAMPUS, LAKESIDE AVENUE, BURLINGTON, VERMONT", PREPARED BY KREBS AND LANSING CONSULTING ENGINEERS, INC, DATED APRIL 16, 2018.
3. WETLAND DELINEATION PERFORMED BY GILMAN & BRIGGS ENVIRONMENTAL ON JUNE 29, 2018.
4. THIS PLAN IS NOT A BOUNDARY SURVEY. PROPERTY LINES AND EASEMENTS DEPICTED ON THIS PLAN ARE BASED ON A PLAT ENTITLED, "PLAT OF RESURVEY, LAKESIDE OVENS, LLC, 44 & 50 LAKESIDE AVENUE, CITY OF BURLINGTON, VERMONT", PREPARED BY CIVIL ENGINEERING ASSOCIATES. THE PLAT IS RECORDED IN BOOK 0539C PAGE 539 OF THE CITY OF BURLINGTON LAND RECORDS.
5. UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. EXISTING UTILITIES SHOWN ON PLANS WERE TAKEN FROM FIELD OBSERVATIONS OF VISIBLE UTILITIES AND ARE NOT GUARANTEED TO BE ACCURATE OR COMPLETE. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING UTILITY LOCATIONS PRIOR TO COMMENCING WORK. NOTIFY ENGINEER OF ANY DISCREPANCY BETWEEN UTILITIES AS SHOWN AND AS FOUND. THE CONTRACTOR SHALL CONTACT DIG SAFE (811 or 888-344-7233) A MINIMUM OF 72 HOURS, BUT NOT INCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO ANY CONSTRUCTION.
6. NORTH ORIENTATION IS REFERENCED TO APPROXIMATE VERMONT GRID NORTH DERIVED FROM GPS READINGS OBSERVED BY OTHERS.
7. ELEVATIONS ARE REFERENCED TO APPROXIMATE NAVD 88 DERIVED FROM GPS READINGS OBSERVED BY OTHERS.

LEGEND

EXISTING FEATURES		PROPOSED FEATURES
C/O	CLEAN OUT	C/O
MANHOLE	MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN	CATCH BASIN
STORM MANHOLE	STORM MANHOLE	STORM MANHOLE
TAPPING SLEEVE AND VALVE	TAPPING SLEEVE AND VALVE	TAPPING SLEEVE AND VALVE
CULVERT	CULVERT	CULVERT
BOLLARD	BOLLARD	BOLLARD
CONCRETE HEADWALL	CONCRETE HEADWALL	CONCRETE HEADWALL
FLARED END SECTION	FLARED END SECTION	FLARED END SECTION
GATE VALVE	GATE VALVE	GATE VALVE
HYDRANT	HYDRANT	HYDRANT
WATER SHUT OFF	WATER SHUT OFF	WATER SHUT OFF
WELL	WELL	WELL
LIGHT POLE	LIGHT POLE	LIGHT POLE
UTILITY POWER POLE	UTILITY POWER POLE	UTILITY POWER POLE
SOIL BORING	SOIL BORING	SOIL BORING
TEST PIT	TEST PIT	TEST PIT
SIGN	SIGN	SIGN
SPOT ELEVATION	SPOT ELEVATION	SPOT ELEVATION
TREE	TREE	TREE
SURVEY POINT	SURVEY POINT	SURVEY POINT
HANDICAP SYMBOL	HANDICAP SYMBOL	HANDICAP SYMBOL
WATERCOURSE	WATERCOURSE	WATERCOURSE
TREELINE	TREELINE	TREELINE
FENCE	FENCE	FENCE
CONTOUR	CONTOUR	CONTOUR
SWALE	SWALE	SWALE
STONE WALL	STONE WALL	STONE WALL
PROPERTY LINE	PROPERTY LINE	PROPERTY LINE
EDGE OF PAVEMENT	EDGE OF PAVEMENT	EDGE OF PAVEMENT
SANITARY SEWER LINE	SANITARY SEWER LINE	SANITARY SEWER LINE
STORM LINE	STORM LINE	STORM LINE
WATER LINE	WATER LINE	WATER LINE
UNDERGROUND ELECTRIC	UNDERGROUND ELECTRIC	UNDERGROUND ELECTRIC
OVERHEAD ELECTRIC	OVERHEAD ELECTRIC	OVERHEAD ELECTRIC
UNDERGROUND TELEPHONE	UNDERGROUND TELEPHONE	UNDERGROUND TELEPHONE
GAS LINE	GAS LINE	GAS LINE
UNDER DRAIN	UNDER DRAIN	UNDER DRAIN
RIGHT-OF-WAY LINE	RIGHT-OF-WAY LINE	RIGHT-OF-WAY LINE
SETBACK	SETBACK	SETBACK
WETLAND	WETLAND	WETLAND
SILT FENCE	SILT FENCE	SILT FENCE



FOR PERMIT REVIEW
NOT FOR CONSTRUCTION
09/20/2018

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SAS PROJECT NUMBER: 0917

PROJECT

HULA

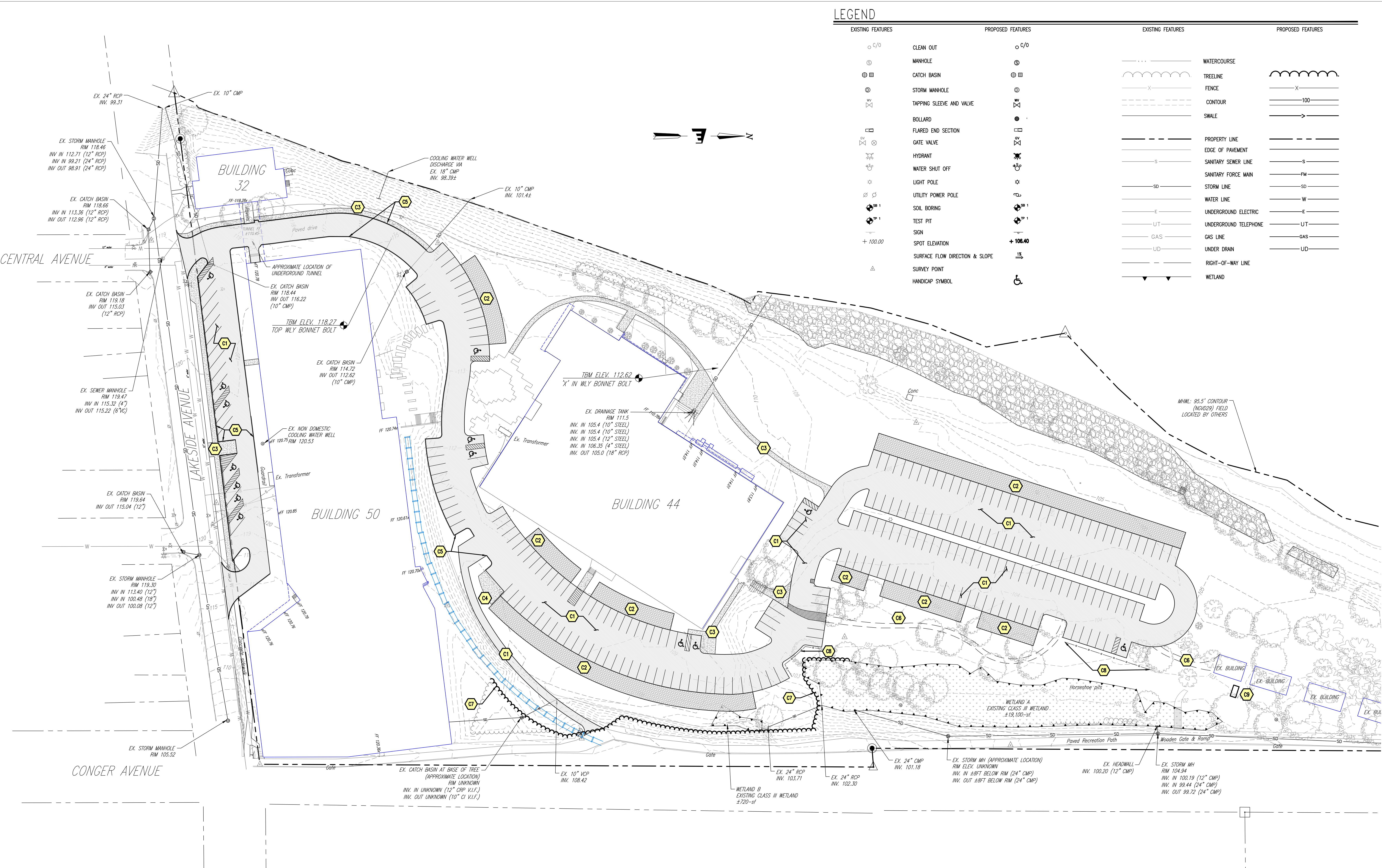
BURLINGTON,
VERMONT

DATE: 09/20/2018
SCALE: AS NOTED
CHECKED: KW
DRAWN BY: HKW

REVISIONS

OVERALL
EXISTING
CONDITIONS
PLAN

C1.0



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PROPOSED SITE FEATURES

- C1 PAVED DRIVES, PATHS, SURFACE PARKING & STRIPING
- C2 PERMEABLE TANDEM SURFACE PARKING
- C3 CONCRETE SIDEWALK/PATIO
- C4 EXTERIOR CONCRETE PAD
- C5 CURB
- C6 GRAVEL PATH
- C7 CLEARING LIMITS
- C8 TIMBER GUARDRAIL
- C9 PROPOSED BUILDING (BEACH CLUB RESTROOMS)

REFER TO SITE NOTES & DETAILS ON SHEET C3.3

PROPOSED SURFACE LEGEND

- PROPOSED BITUMINOUS PAVEMENT
- PROPOSED PERMEABLE PARKING
- PROPOSED CONCRETE

LEGEND

EXISTING FEATURES	PROPOSED FEATURES	EXISTING FEATURES	PROPOSED FEATURES
C/O	CLEAN OUT	C/O	
MANHOLE	MANHOLE	MANHOLE	
CATCH BASIN	CATCH BASIN	CATCH BASIN	
STORM MANHOLE	STORM MANHOLE	STORM MANHOLE	
TAPPING SLEEVE AND VALVE	TAPPING SLEEVE AND VALVE	TAPPING SLEEVE AND VALVE	
BOLLARD	BOLLARD	BOLLARD	
FLARED END SECTION	FLARED END SECTION	FLARED END SECTION	
GATE VALVE	GATE VALVE	GATE VALVE	
HYDRANT	HYDRANT	HYDRANT	
WATER SHUT OFF	WATER SHUT OFF	WATER SHUT OFF	
LIGHT POLE	LIGHT POLE	LIGHT POLE	
UTILITY POWER POLE	UTILITY POWER POLE	UTILITY POWER POLE	
SOIL BORING	SOIL BORING	SOIL BORING	
TEST PIT	TEST PIT	TEST PIT	
SIGN	SIGN	SIGN	
SPOT ELEVATION	SPOT ELEVATION	SPOT ELEVATION	
SURFACE FLOW DIRECTION & SLOPE	SURFACE FLOW DIRECTION & SLOPE	SURFACE FLOW DIRECTION & SLOPE	
SURVEY POINT	SURVEY POINT	SURVEY POINT	
HANDICAP SYMBOL	HANDICAP SYMBOL	HANDICAP SYMBOL	
		WATERCOURSE	
		TREELINE	
		FENCE	
		CONTOUR	
		SWALE	
		PROPERTY LINE	
		EDGE OF PAVEMENT	
		SANITARY SEWER LINE	
		SANITARY FORCE MAIN	
		STORM LINE	
		WATER LINE	
		UNDERGROUND ELECTRIC	
		UNDERGROUND TELEPHONE	
		GAS LINE	
		UNDER DRAIN	
		RIGHT-OF-WAY LINE	
		WETLAND	

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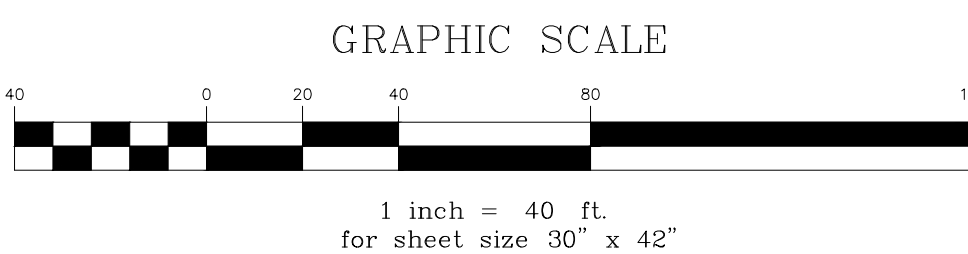
HULA

BURLINGTON,
VERMONT

DATE: 09/20/2018
SCALE: AS NOTED
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DRAWN BY: HKW

REVISIONS

SITE
LAYOUT
PLAN



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09/20/2018

C2.0

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LEGEND

EXISTING FEATURES

- C/O
- MANHOLE
- CATCH BASIN
- STORM MANHOLE
- TAPPING SLEEVE AND VALVE
- BOLLARD
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- WATER SHUT OFF
- LIGHT POLE
- UTILITY POWER POLE
- SOIL BORING
- TEST PIT
- SIGN
- SPOT ELEVATION
- SURFACE FLOW DIRECTION & SLOPE
- SURVEY POINT
- HANDICAP SYMBOL

PROPOSED FEATURES

- C/O
- MANHOLE
- CATCH BASIN
- STORM MANHOLE
- TAPPING SLEEVE AND VALVE
- BOLLARD
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- WATER SHUT OFF
- LIGHT POLE
- UTILITY POWER POLE
- SOIL BORING
- TEST PIT
- SIGN
- SPOT ELEVATION
- SURFACE FLOW DIRECTION & SLOPE
- SURVEY POINT
- HANDICAP SYMBOL

EXISTING FEATURES

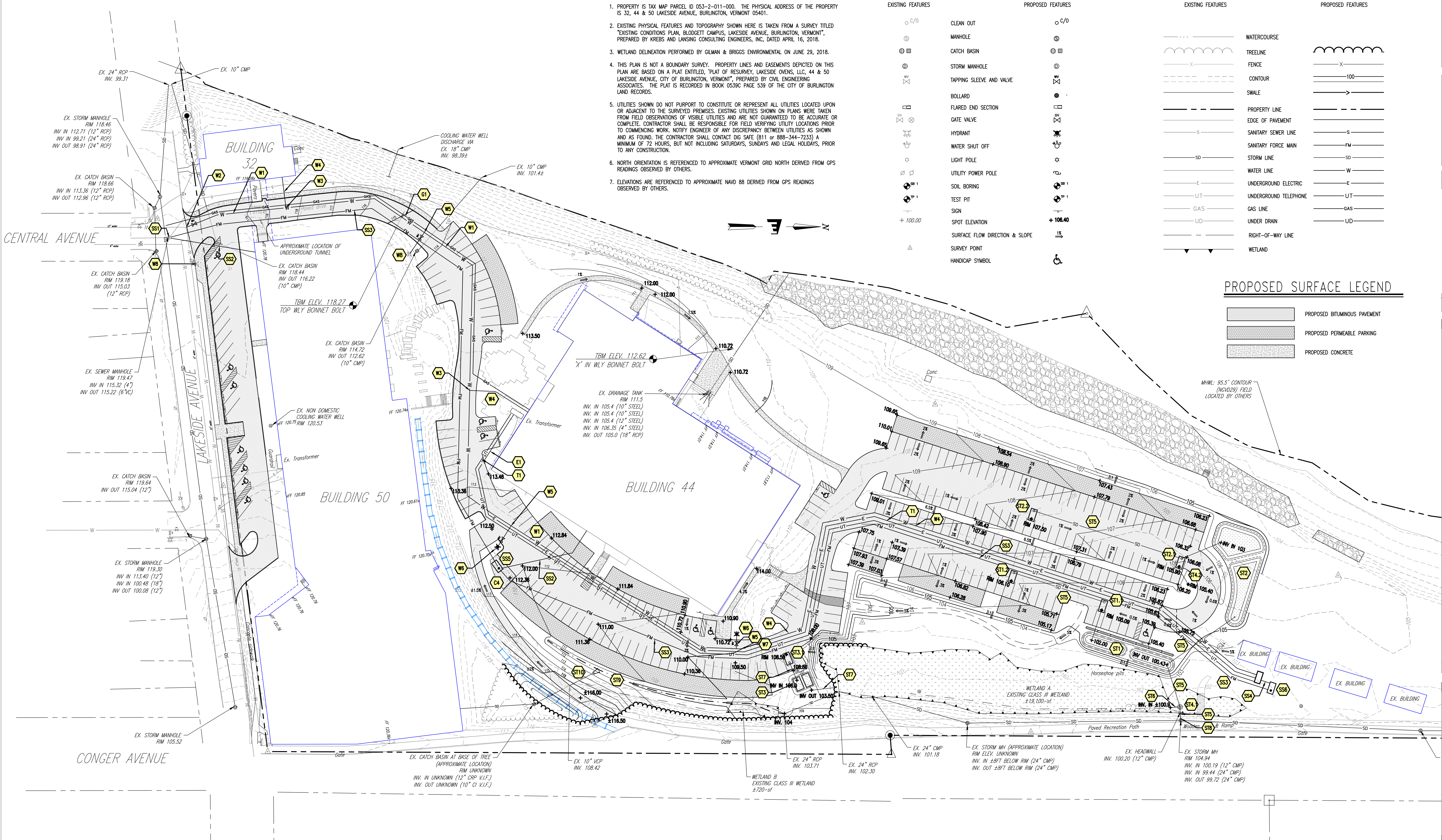
- WATERCOURSE
- TREELINE
- FENCE
- CONTOUR
- SWALE
- PROPERTY LINE
- EDGE OF PAVEMENT
- SANITARY SEWER LINE
- SANITARY FORCE MAIN
- STORM LINE
- WATER LINE
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- GAS LINE
- UNDER DRAIN
- RIGHT-OF-WAY LINE
- WETLAND

PROPOSED FEATURES

- WATERCOURSE
- TREELINE
- FENCE
- CONTOUR
- SWALE
- PROPERTY LINE
- EDGE OF PAVEMENT
- SANITARY SEWER LINE
- SANITARY FORCE MAIN
- STORM LINE
- WATER LINE
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- GAS LINE
- UNDER DRAIN
- RIGHT-OF-WAY LINE
- WETLAND

PROPOSED SURFACE LEGEND

- PROPOSED BITUMINOUS PAVEMENT
- PROPOSED PERMEABLE PARKING
- PROPOSED CONCRETE



WATER SCHEDULE

- W1 8" DIA. CLASS 52 DUCTILE IRON WATERLINE WITH BENDS
- W2 12" X 8" TAPPING SLEEVE AND VALVE
- W3 8" X 8" X 2" TEE AND GATE VALVE
- W4 2" DIA. WATER SERVICE LINE
- W5 8" X 8" X 6" TEE AND GATE VALVE
- W6 FIRE HYDRANT, 6" DIA. DUCTILE IRON CLASS 52 LEAD, VALVE AND FITTINGS
- W7 8" X 2" REDUCER
- W8 RAISE EXISTING HYDRANT

REFER TO PROPOSED WATER PROFILE ON SHEET C2.3 AND NOTES & DETAILS ON SHEET C3.0

SANITARY SEWER SCHEDULE

- SS1 EX. SEWER MANHOLE - CORE & BOOT FOR NEW & REPLACED SERVICE LINE RM 118.47 8" INV. IN 115.32 3" INV. IN 115.32 EX. 6" INV. OUT 115.22
- SS2 8" DIA. SDR 35 GRAVITY SEWER SERVICE LINE
- SS3 3" DIA. POLYETHYLENE SEWER FORCE MAIN
- SS4 4" DIA. SDR 35 GRAVITY SEWER SERVICE LINE
- SS5 2,000-GALLON DUPLEX PUMP STATION WITH GRINDER AND BACKUP GENERATOR, USE CAMP 5'X10' HEAVY DUTY 2,000-GALLON PUMP STATION PROVIDE STORAGE FOR 25% OF DAILY DESIGN FLOW DESIGN FLOW: 4440-GALLONS PER DAY REG. STORAGE: 0.25 X 4440 = 1110-GALLONS USE 2,000-GALLON TANK
- SS6 1,000-GALLON DUPLEX PUMP STATION WITH GRINDER USE CAMP STANDARD 1,000-GALLON LEDGE TANK PROVIDE STORAGE FOR 25% OF DAILY DESIGN FLOW DESIGN FLOW: 2760-GALLONS PER DAY REG. STORAGE: 0.25 X 2760 = 690-GALLONS USE 1,000-GALLON TANK

REFER TO PROPOSED SEWER PROFILE ON SHEET C2.4 AND NOTES & DETAILS ON SHEET C3.1

ELECTRICAL/TELECOM/GAS SCHEDULE

- E1 (4) 2" SCH 40 PVC BURIED CONDUITS FROM EX. TRANSFORMER TO BEACH CLUB
- T1 (4) 2" SCH 40 PVC BURIED CONDUITS FROM BUILDING 44 TO BEACH CLUB
- G1 2" NATURAL GAS SERVICE LINE FROM LAKESIDE AVENUE TO BUILDING 44

REFER TO ELECTRICAL & MECHANICAL DRAWINGS

STORMWATER STRUCTURE SCHEDULE

- ST1 PROPOSED GRAVEL WETLAND TREATMENT AREA #1 RM 118.47 12" INV. IN 110.37 12" INV. IN 110.37 12" INV. OUT 110.27
- ST1.1 PROPOSED PRETREATMENT TANK RM 110.59 12" INV. IN 110.27 12" INV. OUT 110.17
- ST1.2 PROPOSED PRETREATMENT TANK RM 110.10 12" INV. IN 110.27 12" INV. OUT 110.17
- ST2 PROPOSED GRAVEL WETLAND TREATMENT AREA #2 RM 110.59 12" INV. IN 110.32 12" INV. IN 110.32 12" INV. OUT 110.42
- ST2.1 PROPOSED PRETREATMENT TANK RM 110.59 12" INV. IN 110.32 12" INV. IN 110.32 12" INV. OUT 110.42
- ST2.2 PROPOSED PRETREATMENT TANK RM 110.59 12" INV. IN 110.32 12" INV. IN 110.32 12" INV. OUT 110.42
- ST3 PROPOSED MODULAR BIOFILTRATION SYSTEM (2) 13' X 7' UNITS RM 110.59 12" INV. IN 110.42
- ST4 4-FT DIA. STORM MANHOLE RM 110.37 12" INV. IN 110.37 12" INV. OUT 110.27
- ST4.1 4-FT DIA. STORM MANHOLE RM 110.37 12" INV. IN 110.37 12" INV. OUT 110.27
- ST4.2 4-FT DIA. STORM MANHOLE RM 110.37 12" INV. IN 110.37 12" INV. OUT 110.27
- ST5 12" PVC STORM PIPE
- ST6 12" HDPE STORM PIPE 10-LF AT 2% SLOPE
- ST7 6" PVC STORM PIPE
- ST8 CORE & BOOT FOR REPLACED TIE IN AT STRUCTURE
- ST9 STORMWATER CONVEYANCE SWALE
- ST10 EXTEND EXISTING OUTFALL TO DISCHARGE TO SWALE INSTALL FLARED END SECTION

REFER TO PROPOSED STORM PROFILES ON SHEET C2.5 AND NOTES & DETAILS ON SHEET C3.2

STORMWATER PIPING SCHEDULE

- ST11 33-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST11.1 98-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST11.2 44-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST12 160-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST12.1 20-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST12.2 20-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST13 87-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST13.1 47-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST13.2 15-LF OF 12" PVC AT MIN. 0.5% SLOPE
- ST13.3 20-LF OF 6" PVC AT MIN. 0.5% SLOPE
- ST13.4 30-LF OF 6" PVC AT MIN. 0.5% SLOPE

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SAS PROJECT NUMBER: 0917

PROJECT

HULA
BURLINGTON,
VERMONT

DATE: 09/20/2018
SCALE: AS NOTED
CHECKED: KW
DRAWN BY: HKW

REVISIONS

GRADING
&
UTILITY
PLAN

C2.1

SURVEY NOTES

- PROPERTY IS TAX MAP PARCEL ID 053-2-011-000. THE PHYSICAL ADDRESS OF THE PROPERTY IS 32, 44 & 50 LAKESIDE AVENUE, BURLINGTON, VERMONT 05401.
- EXISTING PHYSICAL FEATURES AND TOPOGRAPHY SHOWN HERE IS TAKEN FROM A SURVEY TITLED "EXISTING CONDITIONS PLAN, BLODGETT CAMPUS, LAKESIDE AVENUE, BURLINGTON, VERMONT", PREPARED BY KREBS AND LANSING CONSULTING ENGINEERS, INC, DATED APRIL 16, 2018.
- WETLAND DELINEATION PERFORMED BY GILMAN & BRIGGS ENVIRONMENTAL ON JUNE 29, 2018.
- THIS PLAN IS NOT A BOUNDARY SURVEY. PROPERTY LINES AND EASEMENTS DEPICTED ON THIS PLAN ARE BASED ON A PLAT ENTITLED, "PLAT OF RESURVEY, LAKESIDE OVENS, LLC, 44 & 50 LAKESIDE AVENUE, CITY OF BURLINGTON, VERMONT", PREPARED BY CIVIL ENGINEERING ASSOCIATES. THE PLAT IS RECORDED IN BOOK 0539C PAGE 539 OF THE CITY OF BURLINGTON LAND RECORDS.
- UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. EXISTING UTILITIES SHOWN ON PLANS WERE TAKEN FROM FIELD OBSERVATIONS OF VISIBLE UTILITIES AND ARE NOT GUARANTEED TO BE ACCURATE OR COMPLETE. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING UTILITY LOCATIONS PRIOR TO COMMENCING WORK. NOTIFY ENGINEER OF ANY DISCREPANCY BETWEEN UTILITIES AS SHOWN AND AS FOUND. THE CONTRACTOR SHALL CONTACT DIG SAFE (811 or 888-344-7233) A MINIMUM OF 72 HOURS, BUT NOT INCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO ANY CONSTRUCTION.
- NORTH ORIENTATION IS REFERENCED TO APPROXIMATE VERMONT GRID NORTH DERIVED FROM GPS READINGS OBSERVED BY OTHERS.
- ELEVATIONS ARE REFERENCED TO APPROXIMATE NAVD 88 DERIVED FROM GPS READINGS OBSERVED BY OTHERS.

EXISTING FEATURES

- C/O
- MANHOLE
- CATCH BASIN
- STORM MANHOLE
- TAPPING SLEEVE AND VALVE
- BOLLARD
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- WATER SHUT OFF
- LIGHT POLE
- UTILITY POWER POLE
- SOIL BORING
- TEST PIT
- SIGN
- SPOT ELEVATION
- SURFACE FLOW DIRECTION & SLOPE
- SURVEY POINT
- HANDICAP SYMBOL

PROPOSED FEATURES

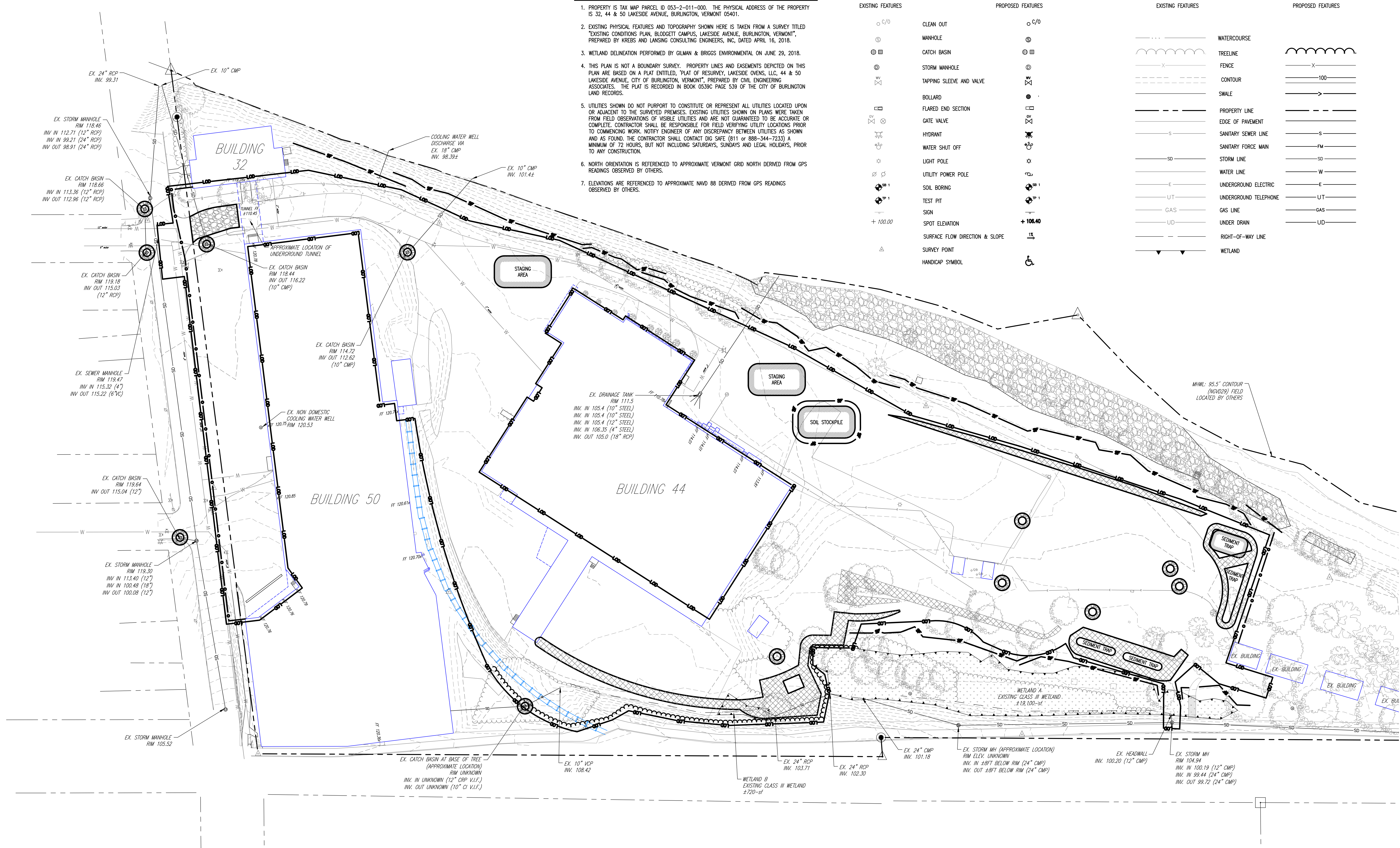
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EXISTING FEATURES

- WATERCOURSE
- TREELINE
- FENCE
- CONTOUR
- SWALE
- PROPERTY LINE
- EDGE OF PAVEMENT
- SANITARY SEWER LINE
- SANITARY FORCE MAIN
- STORM LINE
- WATER LINE
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- GAS LINE
- UNDER DRAIN
- RIGHT-OF-WAY LINE
- WETLAND

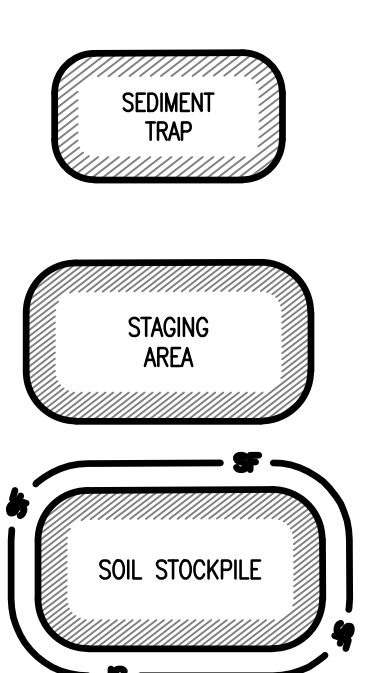
PROPOSED FEATURES

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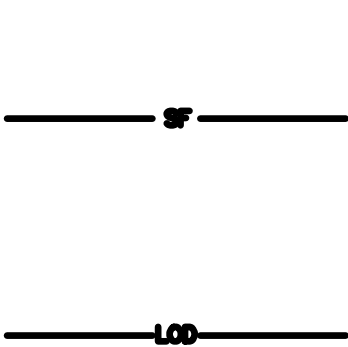


EROSION CONTROL LEGEND

- EROSION PREVENTION AND SEDIMENT CONTROL STRATEGY**
THE FOLLOWING TECHNIQUES WILL BE UTILIZED AS PART OF A SEDIMENT AND EROSION CONTROL PROGRAM. THE SEDIMENT AND EROSION CONTROL PROGRAM WILL BE IMPLEMENTED IN STAGES. CERTAIN ITEMS FROM ONE STAGE WILL LIKELY OVERLAP OR TAKE PLACE CONCURRENTLY WITH ITEMS FROM OTHER STAGES.
- TEMPORARY INLET PROTECTION** - INSTALL AS INDICATED ON PLANS. STONE TO BE REMOVED AND REPLACED WITH CLEAN STONE WHEN SEDIMENT IS $\leq 1/2$ DEPTH OF STONE. REMOVE ALL SEDIMENT IF COLLECTED IN STRUCTURE AS SOON AS POSSIBLE.
- STONE CHECK DAM**
THIS STRUCTURAL MEASURE IS ALONG DITCHES/ SWALES AND IN OTHER LOCATIONS INDICATED ON THIS PLAN TO SLOW STORMWATER RUNOFF AND TRAP SEDIMENT PARTICLES. THESE WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED.
- PERMANENT EROSION CONTROL NETTING**
THIS STRUCTURAL MEASURE IS INSTALLED IN AREAS THAT HAVE SLOPES 3:1 AND GREATER AND IN OTHER LOCATIONS INDICATED ON THIS PLAN TO STABILIZE THE SLOPE AND REDUCE THE EROSION POTENTIAL. THE NETTING IS TYPICALLY IMPREGNATED WITH GRASS SEED AND SOMETIMES STAPLED TO THE EXPOSED SOIL. THESE WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED.
- TEMPORARY STABILIZED CONSTRUCTION ENTRANCE**
THIS STRUCTURAL MEASURE IS A STABILIZED PAD OF AGGREGATE UNDERLAIN WITH FILTER FABRIC LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA. THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY OR STREETS. THIS WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED. ONCE REMOVED, THE IMPACTED AREA SHALL BE SEEDED AND MULCHED.



- TEMPORARY SEDIMENT BASIN**
THIS STRUCTURAL MEASURE INVOLVES CONSTRUCTING TEMPORARY SEDIMENT BASINS IN THE LOCATION OF PROPOSED STORMWATER PONDS. GENERALLY THE STORMWATER PONDS CAN BE CONSTRUCTED AS SHOWN ON THE PLANS HOWEVER ORIFICE ON THE OUTLET STRUCTURES SHALL BE OMITTED UNTIL THE SITE IS STABILIZED TO IMPROVE RUNOFF AND ALLOW FOR SETTLING OF SUSPENDED FINES. THIS WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED. ONCE THE SITE IS STABILIZED, SEDIMENT SHALL BE REMOVED FROM THE BASINS AND THE OUTLET ORIFICE SHALL BE DRILLED INTO THE OUTLET STRUCTURE AS NOTED ON THE PLANS.
- TEMPORARY STAGING AND WASTE AREAS (APPROXIMATE)**
THESE ARE APPROVED LOCATIONS WHERE NON-SOIL, NON-ERODIBLE MATERIALS MAY BE STORED. SOILS SHALL NOT BE STORED IN THESE AREAS.
- TEMPORARY SOIL STOCKPILE AREAS (APPROXIMATE)**
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.
- CONSTRUCTION (C) OR CHAIN LINK (L) FENCING**
THIS STRUCTURAL MEASURE IS INSTALLED ALONG THE PERIMETER OF THE PROJECT AREA. IN MANY CASES THE LIMIT OF DISTURBANCE WILL COINCIDE WITH THE FENCING OR INDICATE BUFFER AREAS TO BE PROTECTED. THE FENCING IS EFFECTIVE WHEN USED TO SEPARATE THE PROJECT AREA FROM ADJACENT AREAS USED BY THE PUBLIC. THESE WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED. CONFIRM LOCATION, EXTENTS AND GATES WITH OWNER. FENCE LOCATION AND GATES TO BE RE-ADJUSTED AS NECESSARY BASED ON OWNER REQUIREMENTS AND COORDINATION.



- TEMPORARY SILT FENCING**
THIS 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. SILT FENCING IS EFFECTIVE IN REDUCING STORMWATER RUNOFF VELOCITIES, ASSIST IN THE DEPOSITION OF TRANSPORTED SEDIMENT LOAD AND PREVENT EROSION OF SOILS ONTO ADJACENT AREAS. THESE WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE PROJECT SITE HAS BEEN PERMANENTLY STABILIZED.
- 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.

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SAS PROJECT NUMBER: 0917

PROJECT

HULA

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VERMONT

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DRAWN BY: HKW

REVISIONS

EROSION
PREVENTION
&
SEDIMENT
CONTROL
PLAN

C2.2

WATER NOTES

- WATER MAINS**
1. PERFORM A HYDROSTATIC AND LEAKAGE TEST ACCORDING TO AWWA C600(LATEST REVISION) ON EACH PIPE LINE.
 2. THE ENGINEER SHALL BE GIVEN AT LEAST 48 HOURS NOTICE BEFORE THE TEST IS CONDUCTED. TEST MUST BE WITNESSED BY THE ENGINEER.
 3. SPECIFIED TEST PRESSURE IS A MINIMUM OF 200 PSI OR 1.5X THE WORKING PRESSURE, WHICHEVER IS GREATER, AND PRESSURE DURING TEST SHALL NOT VARY BY MORE THAN 5 PSI. SEE THE CURRENT EDITION OF AWWA C600 FOR ALLOWABLE LEAKAGE.

- EXISTING UTILITIES**
1. LOCATION OF UTILITY INSTALLATIONS AND UNDERGROUND STRUCTURES ARE SHOWN AS APPROXIMATE ON THE CONTRACT DOCUMENTS. SOME UTILITIES MAY NOT BE SHOWN.
 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, PRIOR TO COMMENCING DEMOLITION.

- PIPE BEDDING**
1. SAND BLANKET/BEDDING SHALL MEET REQUIREMENTS OF EARTHWORK SPECIFICATIONS.
 2. TRENCH FINAL BACKFILL MATERIAL -- MATERIAL WILL EXCLUDE PIECES OF PAVEMENT, ORGANIC MATTER, TOPSOIL, ALL WET OR SOFT MUCK, PEAT, CLAY, LARGE ROCKS(GREATER THAN 12" DIMENSION), OR ANY MATERIAL DETERMINED BY THE ENGINEER THAT WILL NOT BE SUITABLE.

- PIPE TRENCH BACKFILL**
1. MEET EARTHWORK SPECIFICATIONS FOR PLACEMENT AND COMPACTION.

- DUCTILE IRON PIPE (WATER)**
1. D.I. PIPE CONFORM TO AWWA/ANSI C151.
 2. LININGS AND LINING REPAIR TO AWWA/ANSI C104.
 3. JOINTS CONFORM TO AWWA/ANSI C 111 AND C115.
 4. FITTINGS CONFORM TO AWWA/ANSI C110, C153, C105.
 5. KEEP INSIDE OF PIPE CLEAN AND FREE OF DEBRIS.
 6. REJECT ANY PIPE WHICH IS DROPPED DURING HANDLING.
 7. MECHANICAL JOINT GLANDS SHALL BE "MEGA-LOG" RETAINER GLANDS.
 8. DUCTILE IRON FITTINGS: ANSI A21.10, 350 PSI PRESSURE RATING.
 9. JOINTS: MECHANICAL, PUSH-ON, AND FLANGED:
 - A. RUBBER GASKET JOINT, ANSI A21.11
 - B. MECHANICAL AND PUSH-ON JOINTS: ANSI A21.11
 - C. FLANGED JOINT: 3/8" THICK RING OR FULL FACED RUBBER, ANSI A21.15.
 10. BOLTS/NUTS:
 - A. MECHANICAL JOINT: ANSI A21.11
 - B. FLANGED JOINT: ANSI A21.15
 12. LININGS:
 - A. INTERIOR-- CEMENT LINED, DOUBLE THICKNESS BITUMINOUS SEAL
 - B. EXTERIOR--BITUMINOUS COATING APPROX. 1 MIL THICK, ANSI A21.51, ANSI A21.15, AND ANSI A21.10.
 - C. FLANGE MACHINED FACE COATING: ANSI A21.15.
 13. LAYING PIPE:
 - A. PIPE SHALL BE LAD WITH BELL ENDS FACING IN THE DIRECTION OF LAYING.
 - B. WHERE PIPE IS LAD ON A SLOPE OF SIX OR MORE THE LAYING SHALL START AT THE LOW END AND PROCEED UPHILL, WITH THE BELL ENDS UPGRADE.
 - C. A WATERTIGHT PLUG SHALL BE PLACED IN THE OPEN ENDS OF INSTALLED PIPE WHEN PIPE LAYING IS NOT IN PROGRESS.
 - D. MAX. PERMISSIBLE DEFLECTION IS 75% OF AWWA SPEC. C600.

- CHLORINATION OF DOMESTIC WATER LINES**
1. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 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. REPEITION OF PROCEDURE.

- GATE VALVES**
1. RESILIENT SEAT GATE VALVES BY KENNEDY "KEN-SEAL" OR EQUAL.
 2. IRON BODY GATE VALVES TO MEET AWWA C-509-87.
 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 COUNTERCLOCKWISE.

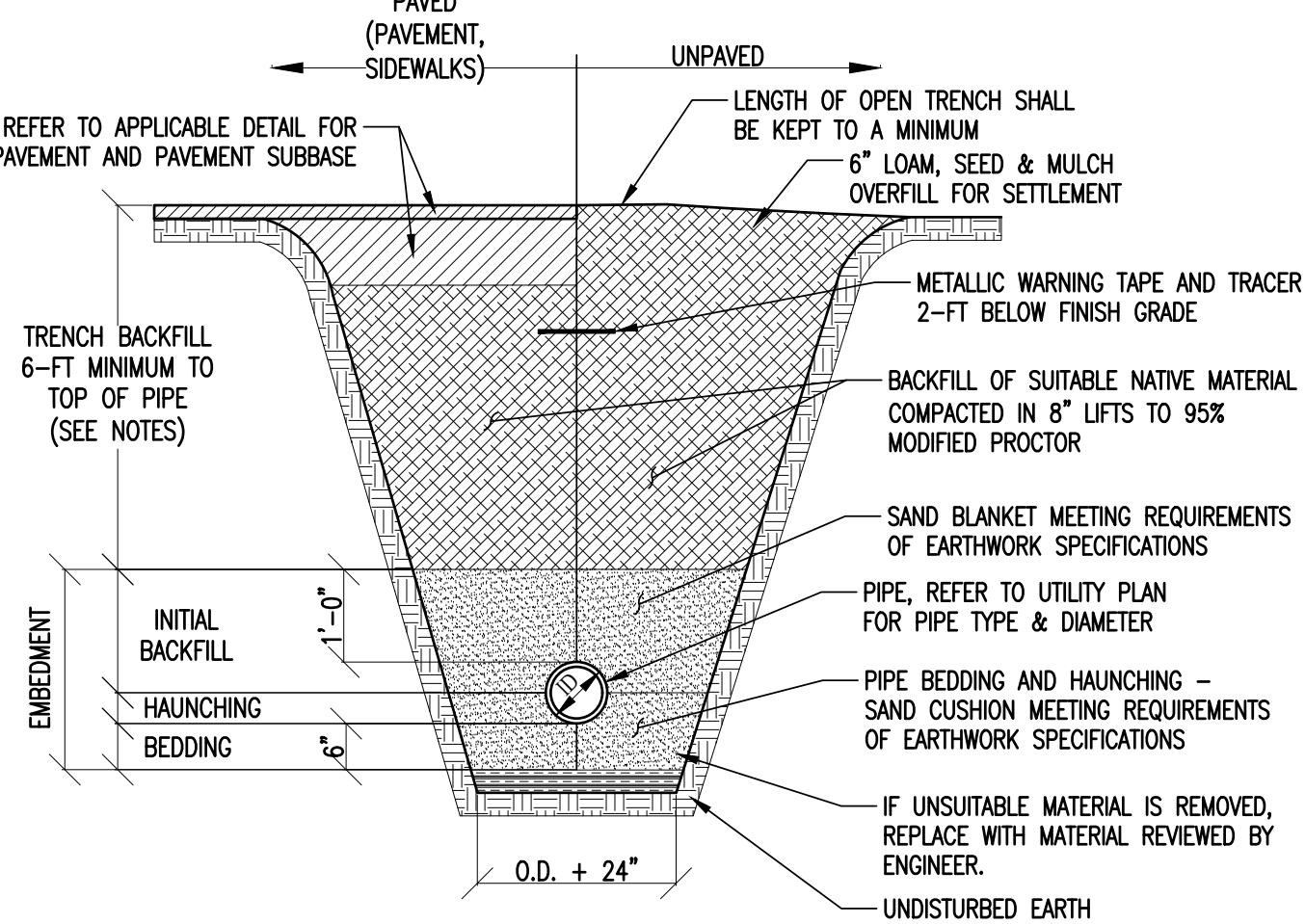
- TAPPING SLEEVES AND VALVES**
1. TAPPING VALVES TO MEET ANSI/AWWA C509-87, STANDARD FOR RESILIENT SEATED GATE VALVES.
 2. VALVES SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI.
 3. VALVES SHALL OPEN COUNTERCLOCKWISE.
 4. INLET FLANGES SHALL BE CLASS 125, ANSI B16.1, OR ANSI/AWWA C110/A21.10.
 5. OUTLET CONNECTION: STANDARDIZED 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.

- TAPPING SLEEVES**
1. AWWA C559, 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. BOLTS AND NUTS, MECHANICAL JOINTS: HIGH STRENGTH CAST IRON OR HIGH STRENGTH LOW ALLOY STEEL, ANSI/AWWA C111/A21.11-90.
 6. BOLTS AND NUTS, FLANGED JOINTS: HIGH STRENGTH, LOW CARBON STEEL CONFORMING TO ANSI/AWWA C110/A21.10-87, APPENDIX.
 7. COAT ALL NUTS AND BOLTS WITH A RUST RESISTANT LUBRICANT.
 8. ALL BOLTS AND NUTS USED WITH PIPE SLEEVES SHALL BE BRUSH COATED HEAVILY AFTER FINAL TIGHTENING WITH STOMASTIC COLD-APPLIED MATERIAL TO THOROUGHLY COVER ALL EXPOSED SURFACES OF BOLTS AND NUTS.

- VALVE BOXES**
1. ACCEPTABLE MANUFACTURER'S: MUELLER, CLOW, OR EQUAL.
 2. CLOW F-2452 SLIDING TYPE, TWO PIECE, OR EQUAL.
 3. 5 1/2 INCH SHAFT.
 4. SIZE 664-A (40-60 INCH OVERALL LENGTH).
 5. CAST IRON.
 6. CLOW F-2460 LIDS OR EQUAL.
 7. THE WORD "WATER" TO BE CAST INTO TOP OF COVERS, AND ARROW SHOWING DIRECTION OF OPENING.

- CONCRETE**
1. CONCRETE SHALL HAVE:
 - A. MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS
 - B. AIR ENTRAINMENT OF .4% TO .6% BY VOLUME
 - C. WATER CEMENT RATIO OF 0.49 LBS. WATER/CEMENT.
 - D. SLUMP OF 2 TO 4 INCHES.
 2. CONCRETE SHALL NOT BE PLACED WHEN AMBIENT TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT OR MORE THAN 90 DEGREES FAHRENHEIT.
 3. CONCRETE SHALL NOT BE DROPPED MORE THAN SIX FEET INSIDE A FORM.
 4. MAINTAIN TEMPERATURE OF CONCRETE SURFACE AT MINIMUM 50 DEGREES FAHRENHEIT FOR 72 HOURS AFTER PLACING CONCRETE. PRESENT ALL ENCLOSURES FOR A MINIMUM OF 2 HOURS TO PROVIDE A MIN. SURFACE TEMPERATURE OF 45 DEGREES FAHRENHEIT.
 5. ALLOW TO SET AND CURE ALL THRUST BLOCKS, CONCRETE SUPPORTS, AND ANCHORS A MINIMUM OF 24 HOURS BEFORE BACKFILLING.
 6. COMPLETELY CURE AND SET CONCRETE BEFORE ANY HYDROSTATIC OR LEAKAGE TESTING OF PIPELINE SYSTEMS.
 7. NONSHRINK GROUT SHALL BE HALCO TRADEMARK, AS MANUFACTURED BY LEVIN & FINK INDUSTRIAL PRODUCTS.
 8. DO NOT PLACE ANY MORTAR OR GROUT WHEN AMBIENT TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT.
 9. MORTAR FOR MANHOLES SHALL CONSIST OF THE FOLLOWING:
 - A. CEMENT--TYPE II, ASTM C150.
 - B. HYDRATED LIME--TYPE M, ASTM C207.
 - C. SAND--ASTM C 33, FINE AGGREGATES FOR CONCRETE.
 - D. WATER--CLEAN, SUITABLE FOR DRINKING.

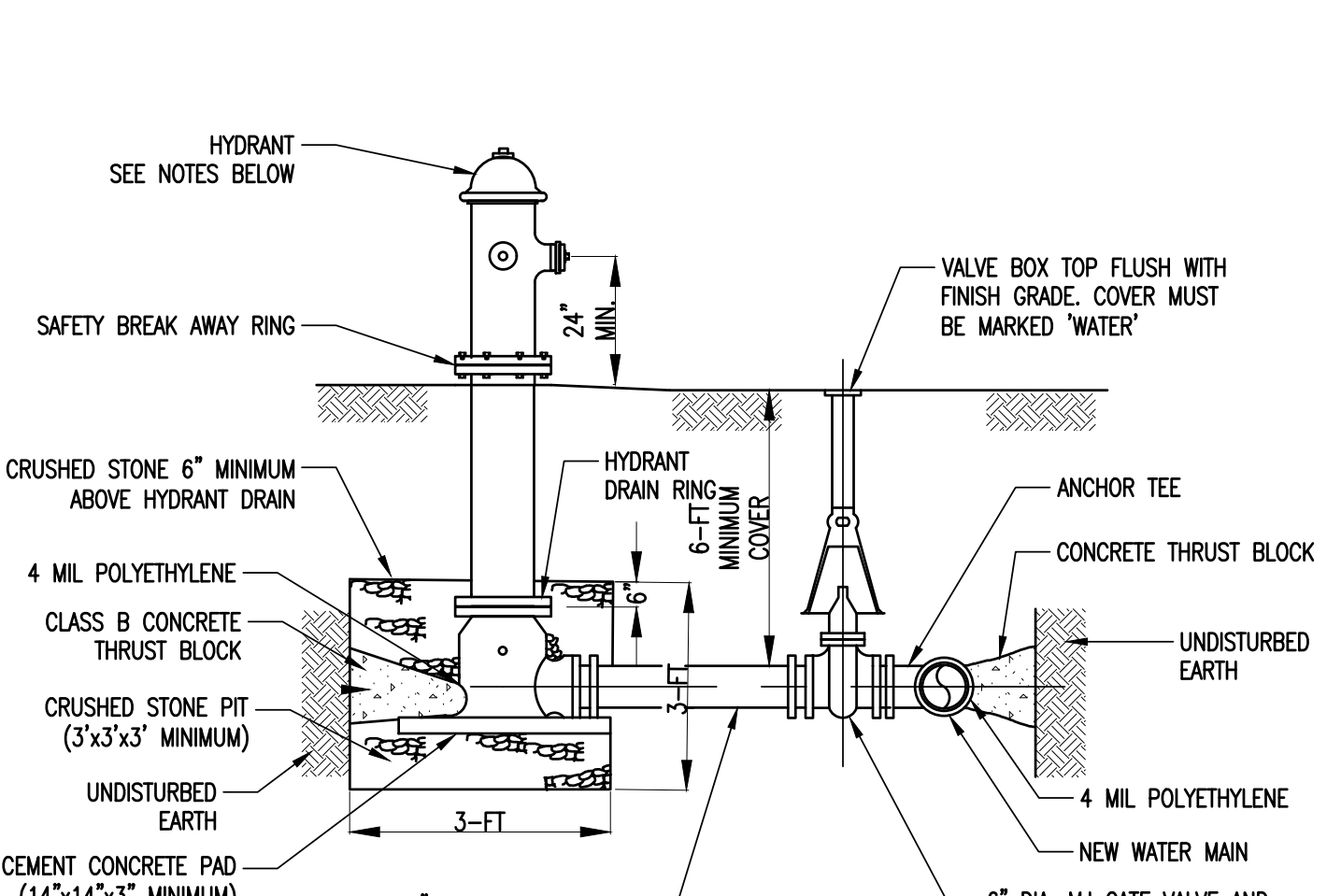
- GENERAL**
1. CONTRACTOR SHALL NOTIFY BURLINGTON DEPARTMENT OF PUBLIC WORKS AT LEAST 48 HOURS BEFORE BEGINNING WATER LINE WORK.
 2. "AS BUILT" DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR AT THE TIME OF COMPLETION OF THE SYSTEM.



- WATER TRENCH NOTES:**
1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
 2. BEDDING TO PROVIDE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR FULL LENGTH OF PIPE.
 3. PROVIDE 6'-FT MINIMUM COVER OVER WATER PIPE.
 4. INSTALL WATER PIPE IN ACCORDANCE WITH AWWA STANDARD C600.
 5. BACKFILL SHALL BE OF SUITABLE MATERIAL REMOVED FROM EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER, OR OTHER UNDESIRABLE MATERIALS SHALL NOT BE USED FOR BACKFILL WITHIN TWO FEET OF THE TOP OF THE PIPE.
 6. 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.

WATER TRENCH DETAIL

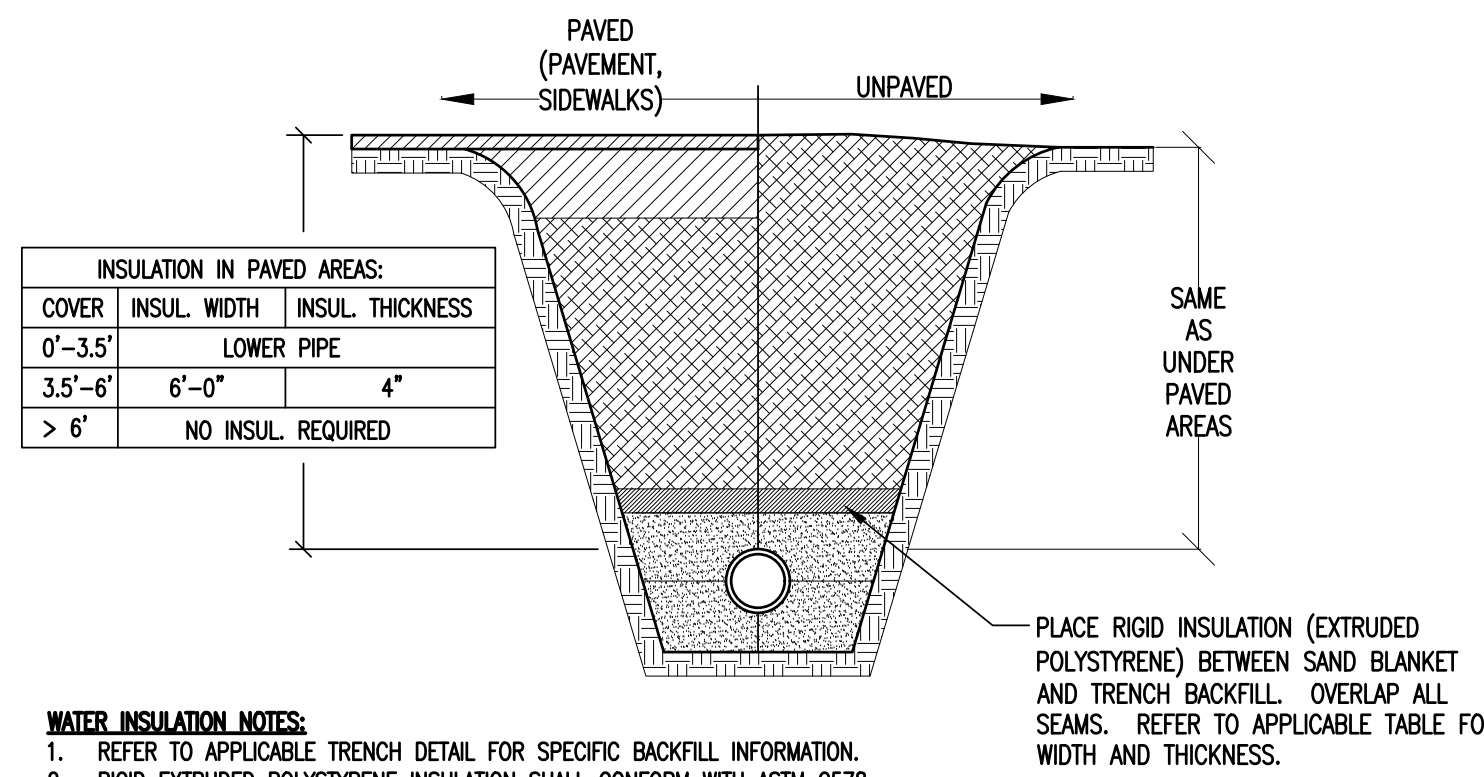
NOT TO SCALE 1



- HYDRANT NOTES:**
1. ALL HYDRANT DRAINS MUST BE PLUGGED.
 2. PROVIDE A MINIMUM OF 3'-FT CLEAR FROM BACK OF CURB TO HYDRANT INSTALLATION.
 3. HYDRANTS SHALL BE IN ACCORDANCE WITH AWWA C-502, 3-WAY POST TYPE BREAKAWAY KENNEDY DB1 WITH (2) 2 1/2" HOSE NOZZLES AND ONE 4 1/2" STEAMER NOZZLE. HYDRANTS SHALL BE PROVIDED WITH A 6.5'-FT BURY (RISER). IN ALL CASES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK WITH THE PUBLIC WORKS DEPARTMENT TO SECURE APPROVAL OF THE SELECTED HYDRANT(S) AND ASSURE COMPATIBILITY.

FIRE HYDRANT DETAIL

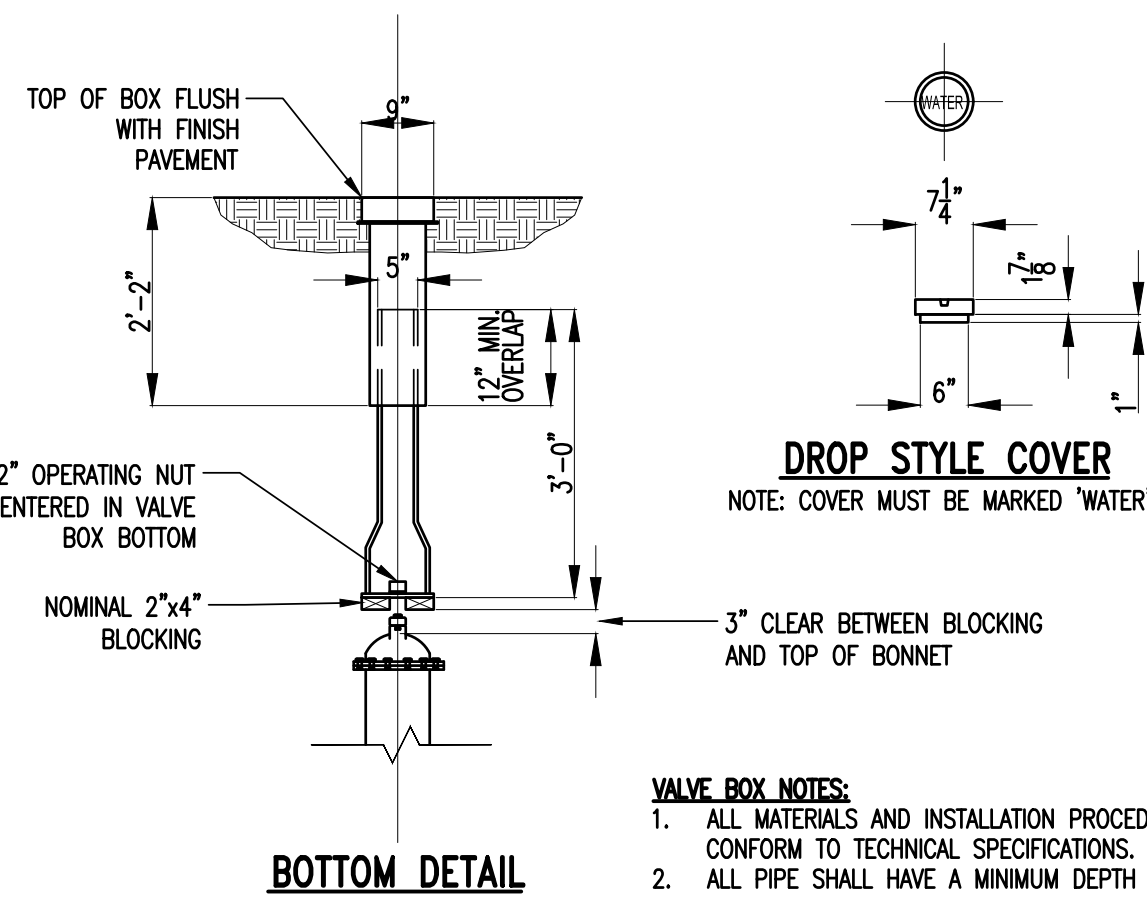
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- WATER INSULATION NOTES:**
1. REFER TO APPLICABLE TRENCH DETAIL FOR SPECIFIC BACKFILL INFORMATION.
 2. RIGID EXTRUDED POLYSTYRENE INSULATION SHALL CONFORM WITH ASTM C278 -- STANDARD SPECIFICATION FOR RIGID CELLULAR POLYSTYRENE THERMAL INSULATION AND SHALL BE DOW STYROFOAM HIGH LOAD 40 OR EQUIVALENT.

INSULATION OVER SHALLOW WATER LINE DETAIL

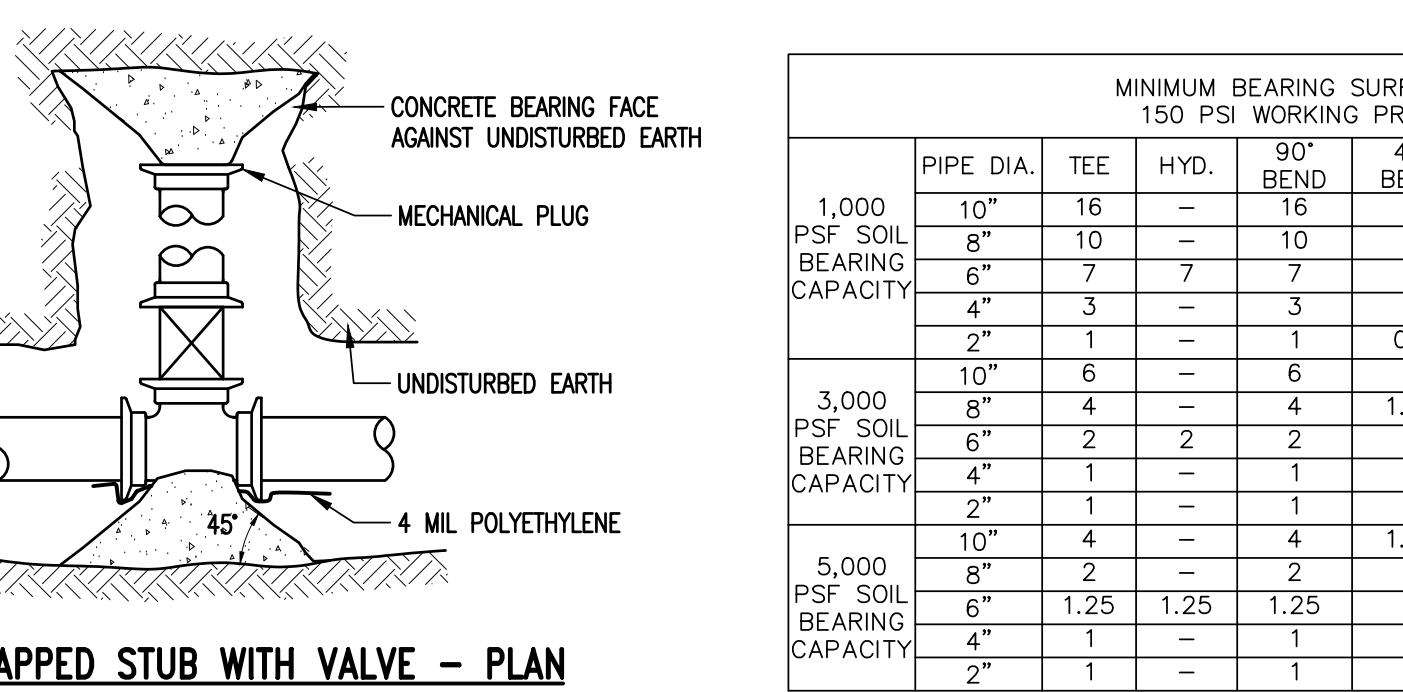
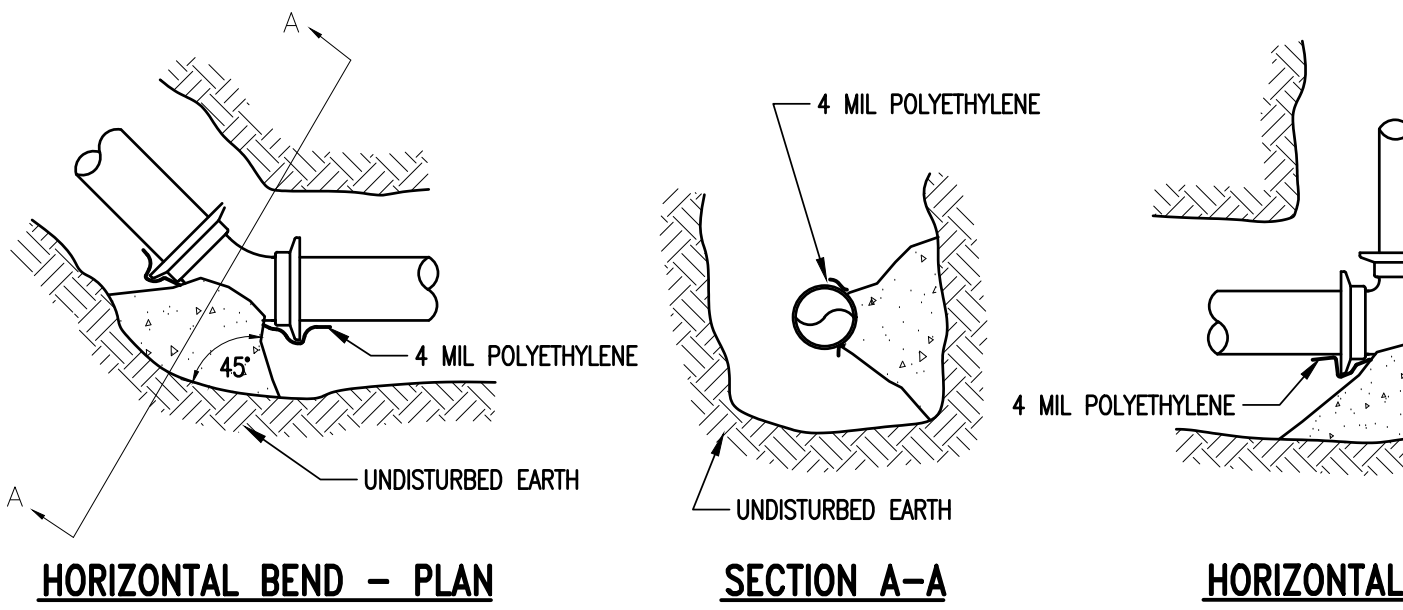
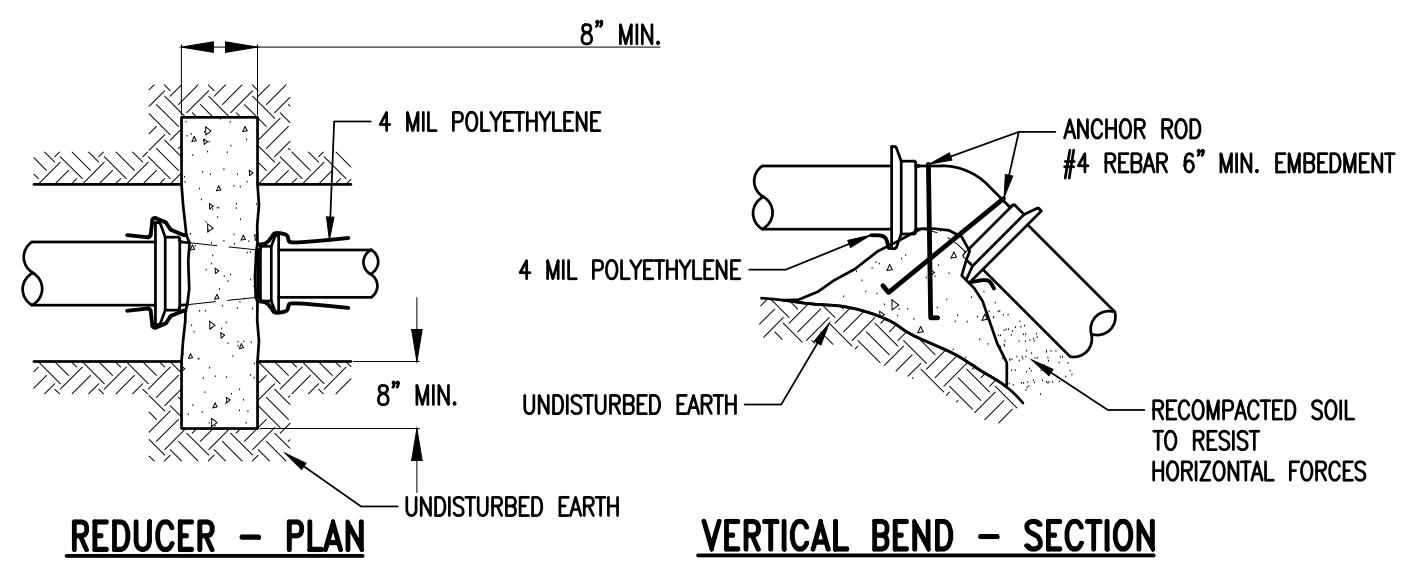
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BOTTOM DETAIL

VALVE BOX DETAIL

NOT TO SCALE 5



MINIMUM BEARING SURFACE (SF) 150 PSI WORKING PRESSURE							
PIPE DIA.	TEE.	HYD.	90° BEND	45° BEND	22.5° BEND	11.25° BEND	END CAP
1,000 PSF SOIL BEARING CAPACITY	10"	16"	16"	6"	3"	2"	13"
	8"	10"	10"	4"	2"	1"	10"
	6"	7"	7"	2"	1"	0.5"	7"
	4"	3"	3"	1"	0.5"	0.5"	3"
	2"	1"	1"	0.5"	0.5"	0.5"	1"
3,000 PSF SOIL BEARING CAPACITY	10"	6"	6"	2"	1"	2"	6"
	8"	4"	4"	1.25"	1"	1"	4"
	6"	2"	2"	1"	1"	1"	2"
	4"	1"	1"	1"	1"	1"	1"
	2"	1"	1"	1"	1"	1"	1"
5,000 PSF SOIL BEARING CAPACITY	10"	4"	4"	1.25"	1"	1"	4"
	8"	2"	2"	1"	1"	1"	2"
	6"	1.25"	1.25"	1.25"	1"	1"	1.25"
	4"	1"	1"	1"	1"	1"	1"
	2"	1"	1"	1"	1"	1"	1"

- 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 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AND AIR ENTRAINMENT OF .4%-0.6% BY VOLUME.
 5. UTILIZE MEGALUG MECHANICAL JOINT RESTRAINTS ON ALL FITTINGS IN ADDITION TO CONCRETE THRUST BLOCKS.

TYPICAL BEARING THRUST BLOCK DETAIL

NOT TO SCALE 3

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SAS PROJECT NUMBER: 0917

PROJECT

HULA
•
BURLINGTON,
VERMONT

DATE: 09/20/2018
SCALE: AS NOTED
CHECKED: KW
DRAWN BY: HKW

REVISIONS

WATER
DETAILS
&
NOTES

C3.0

FOR PERMIT REVIEW
NOT FOR CONSTRUCTION
09/20/2018

SANITARY SEWER NOTES

CONTRACTOR SHALL CONFORM TO GUIDELINES DETAILED IN THE VERMONT STATE SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR READING AND FOLLOWING THE FULL COMPLETE EDITION PROVIDED BY THE STATE.

A. THE BUILDING SEWER SHALL BE CONSTRUCTED IN A MANNER WHICH WILL PREVENT LEAKING, BREAKING OR CLOGGING.

B. SIZING AND SLOPE: MINIMUM BUILDING SEWER SIZE IS 4 INCHES (UNLESS SHOWN ON THE PLAN) AND A MINIMUM SLOPE IS 1/8" PER FOOT.

C. 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 ELLS OR LONG SWEEP FITTINGS. MANHOLES ARE ACCEPTABLE IN LIEU OF CLEANOUTS, WHERE BUILDING SEWERS ARE TO BE INSTALLED AT A DEPTH OF LESS THAN 3 FEET UNDER DRIVEWAYS ARE ANTICIPATED, EXTRA HEAVY CAST IRON PIPE SHALL BE USED.

D. LEAKAGE: BUILDING SEWERS SHALL MEET THE LEAKAGE STANDARDS PRESCRIBED IN THE STATE OF VERMONT SPECIFICATIONS (EPR- CHAPTER 1). SEE BELOW FOR MORE DETAIL.

E. 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%

F. CHANGES IN PIPE SIZE: WHEN A SMALLER SEWER JOINS A LARGE ONE, THE INVERT OF THE LARGER SEWER SHALL BE LOWERED SUFFICIENTLY TO MAINTAIN THE SAME ENERGY GRADIENT.

G. MATERIAL: PVC SDR 35, ASTM D3034, WITH PUSH-ON GASKETED JOINTS. GASKETS SHALL CONFORM TO ASTM D3212. SEWER JOINTS SHALL BE CONSTRUCTED TO MINIMIZE INFILTRATION AND TO PREVENT THE ENTRANCE OF ROOTS INTO THE SYSTEM.

H. 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.

I. BEDDING: SEE TRENCH DETAIL DRAWING FOR MATERIALS. TRENCH BACKFILL SHALL BE OF A SUITABLE NATIVE MATERIAL FREE FROM DEBRIS, FROZEN MATERIAL, LARGE CLOUDS OR STONES, ORGANIC MATTER, OR OTHER UNSTABLE MATERIALS.

J. 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 7A).

LEAKAGE TESTS FOR GRAVITY SEWERS

PERFORM A PRESSURIZED AIR TEST ON THE GRAVITY LINE IN ACCORDANCE WITH THE VERMONT ENVIRONMENTAL PROTECTION RULES ON EACH SECTION OF THE GRAVITY SEWER. THE ENGINEER SHALL BE GIVEN 72 HOURS NOTICE BEFORE THE TEST IS CONDUCTED. TEST MUST BE WITNESSED BY THE ENGINEER.

PLUG ALL OPENINGS IN THE TEST SECTION. ADD AIR UNTIL THE INTERNAL PRESSURE OF THE LINE IS RAISED TO APPROXIMATELY 4.0 POUNDS/SQUARE INCH (PSI) GREATER THAN THE AVERAGE PRESSURE OF ANY GROUND WATER. AFTER THIS PRESSURE IS REACHED, ALLOW THE PRESSURE TO STABILIZE. THE PRESSURE WILL NORMALLY DROP AS THE AIR TEMPERATURE STABILIZES. THIS USUALLY TAKES 2 TO 5 MINUTES DEPENDING ON THE PIPE SIZE. THE PRESSURE MAY BE REDUCED TO 3.5 PSI BEFORE STARTING THE TEST.

WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE THE STARTING TEST PRESSURE OF 3.5 PSI ABOVE THE PIPE, START THE TEST. IF THE PRESSURE DROPS MORE THAN 1.0 PSI DURING THE TEST TIME, THE LINE IS PRESUMED TO HAVE FAILED THE TEST. IF A 1.0 PSI DROP DOES NOT OCCUR WITHIN THE TEST TIME, THE LINE HAS PASSED THE TEST. THE TEST TIME SHALL BE DETERMINED FROM THE FOLLOWING TABLE. IF THE SECTION OF LINE TO BE TESTED INCLUDES MORE THAN ONE PIPE SIZE, CALCULATE THE TEST TIME FOR EACH SIZE AND ADD THE TEST TIMES TO ARRIVE AT THE TOTAL TEST TIME FOR THE SECTION.

PIPE SIZE (IN)	T (TIME) (MIN./1,000FT)
3	0.2
4	0.3
6	0.7
8	1.2

K. INSTALLATION: PIPE SHALL BE LAID WITH BELL ENDS FACING UPGRADE AND LAYING SHALL START AT THE DOWNGRADE END.

L. WATER LINE SEPARATION
a. HORIZONTAL SEPARATION: SEWERS SHALL BE LAID FLAT AT LEAST TEN FEET HORIZONTALLY 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, BOULDERS OR OTHER UNUSUAL CONDITIONS) THE WATER LINE MAY BE IN A SEPARATE TRENCH OR ON AN EARTH SHELF IN 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 IMPRACTICABLE 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:

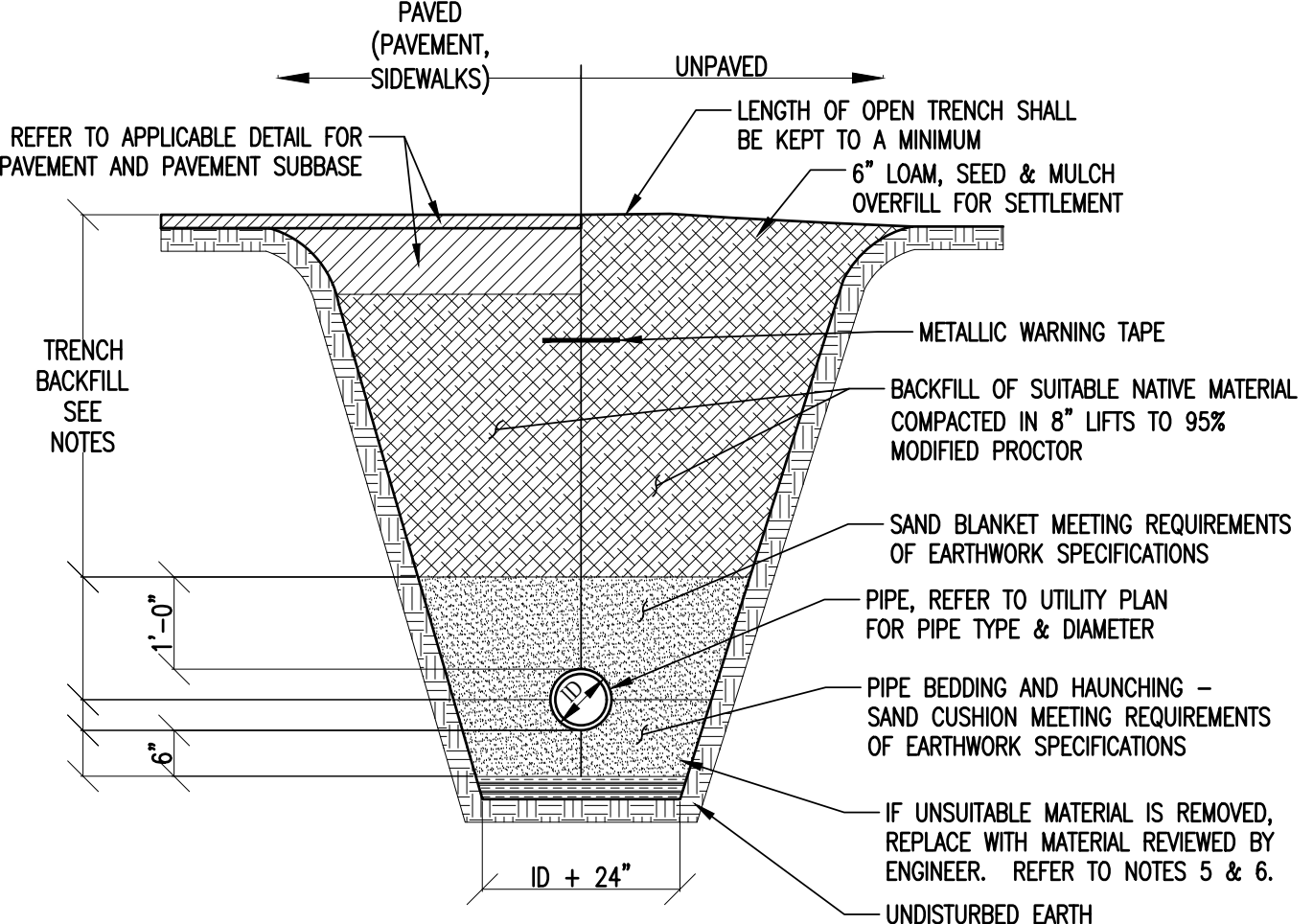
- 1) THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AWAY AS POSSIBLE FROM WATER JOINTS.
- 2) THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICHEVER IS GREATER.
- 3) THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS 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.
- 4) WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.

M. 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. MANHOLES 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 WATER TIGHT 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:

AFTER THE MANHOLE HAS BEEN ASSEMBLED IN PLACE, ALL LIFTING HOLES AND EXTERIOR JOINTS SHALL BE FILLED WITH AND POINTED WITH AN APPROPRIED NON-SHRINKING MORTAR. ALL PIPES AND OTHER OPENINGS INTO THE MANHOLE SHALL BE SUITABLY PLUGGED AND THE PLUGS PLACED TO PREVENT BLOWOUT.

EACH MANHOLE SHALL BE CHECKED FOR INFILTRATION BY FILLING WITH WATER TO THE TOP OF THE CONE SECTION. A STABILIZATION PERIOD OF ONE HOUR SHALL BE PROVIDED TO ALLOW FOR ABSORPTION. AT THE END OF THIS PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE. IF NECESSARY, AND THE MEASURING TIME OF AT LEAST SIX HOURS BEGIN. AT THE END OF THE TEST PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE MEASURING THE VOLUME OF WATER ADDED. THIS AMOUNT SHALL BE CONVERTED TO A 24 HOUR RATE AND THE LEAKAGE DETERMINED ON THE BASIS OF DEPTH. THE LEAKAGE FOR EACH MANHOLE SHALL NOT EXCEED ONE GALLON PER VERTICAL FOOT FOR A 24 HOUR PERIOD FOR EXFILTRATION AND THERE SHALL BE NO VISIBLE INFILTRATION. IF AN AIR TEST IF 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.

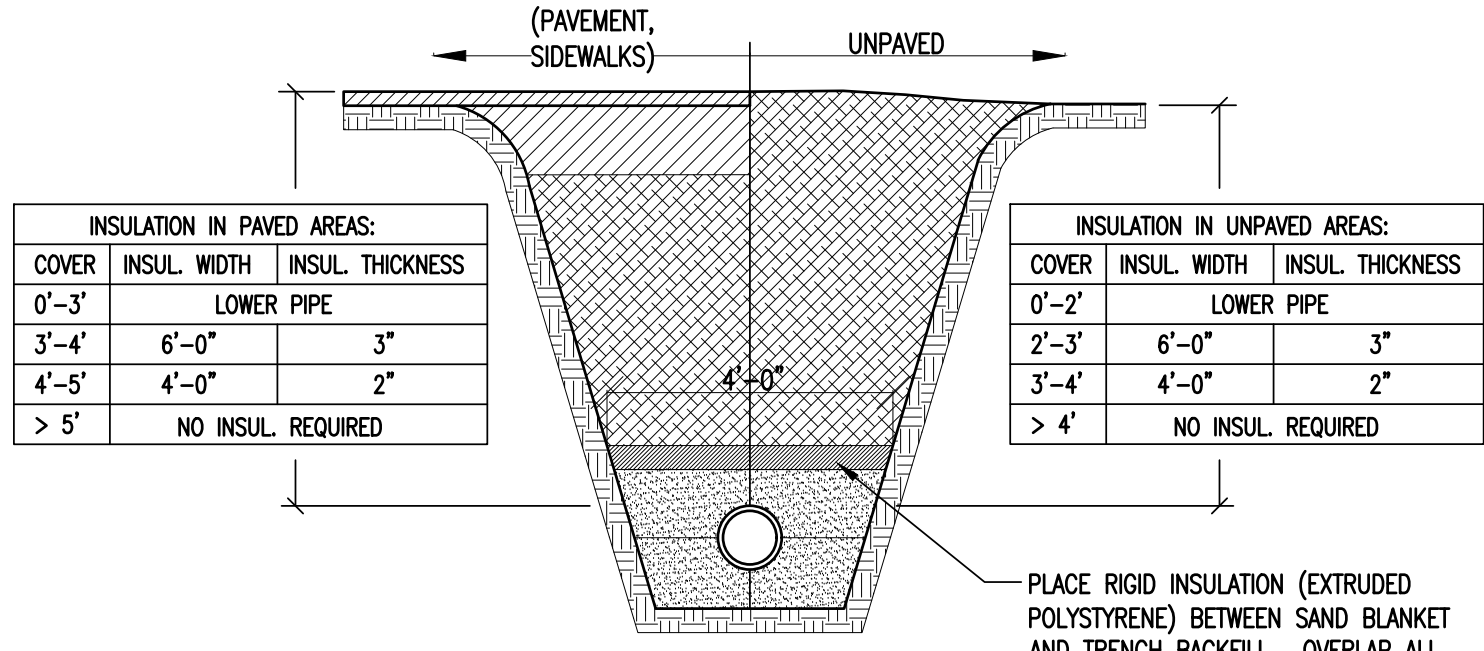


SANITARY SEWER TRENCH NOTES:

1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
2. BEDDING TO PROVIDE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR FULL LENGTH OF PIPE.
3. FOR BUILDING SEWERS THE MINIMUM DEPTH TO THE TOP OF THE PIPE SHALL BE 4'-0", WHERE BUILDING SEWERS ARE TO BE INSTALLED AT A DEPTH LESS THAN 3'-0" UNDER DRIVEWAYS, EXTRA HEAVY CAST IRON OR OTHER HIGH STRENGTH PIPE SHALL BE USED. OTHERWISE, REFER TO INSULATION OVER SHALLOW SEWER LINE DETAIL.
4. FOR SEWER COLLECTION SYSTEMS THE MINIMUM DEPTH TO THE TOP OF THE PIPE SHALL BE 5'-0". THIS DEPTH SHALL BE INCREASED TO 6'-0" IN AREAS TO BE FLOWED DURING THE WINTER MONTHS. OTHERWISE, REFER TO INSULATION OVER SHALLOW SEWER LINE DETAIL.
5. BACKFILL SHALL BE OF A SUITABLE MATERIAL REMOVED FROM EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. DEBRIS, FROZEN MATERIAL, LARGE CLOUDS OR STONES, ORGANIC MATTER, OR OTHER UNSTABLE MATERIALS SHALL NOT BE USED FOR BACKFILL WITHIN TWO FEET OF THE TOP OF THE PIPE.
6. 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.
7. SEWERS ON 20 PERCENT SLOPES OR GREATER SHALL BE ANCHORED SECURELY WITH CONCRETE ANCHORS OR EQUIVALENT, SPACED AS FOLLOWS:
 - A. NOT OVER 36 FEET CENTER TO CENTER ON GRADES 20 PERCENT AND UP TO 35 PERCENT
 - B. NOT OVER 24 FEET CENTER TO CENTER ON GRADES 35 PERCENT AND UP TO 50 PERCENT
 - C. NOT OVER 16 FEET CENTER TO CENTER ON GRADES 50 PERCENT AND OVER

SANITARY SEWER TRENCH DETAIL

NOT TO SCALE

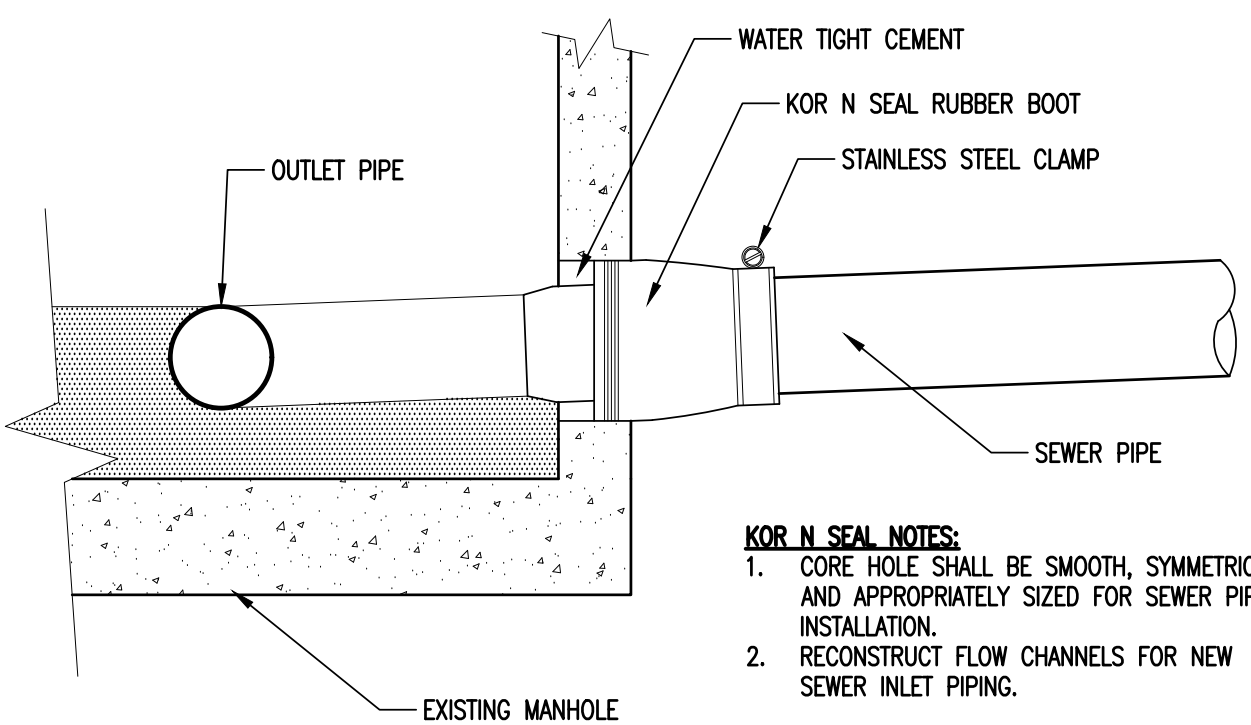


SANITARY INSULATION NOTES:

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

INSULATION OVER SHALLOW SEWER LINE DETAIL

NOT TO SCALE

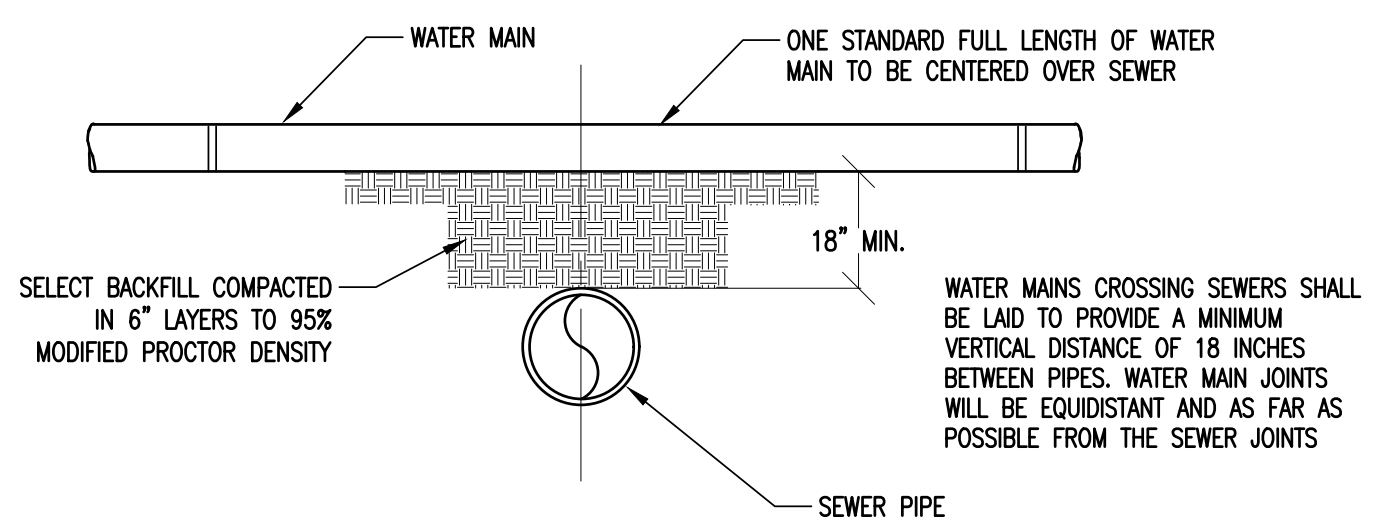


KOR N SEAL NOTES:

1. CORE HOLE SHALL BE SMOOTH, SYMMETRICAL, AND APPROPRIATELY SIZED FOR SEWER PIPE INSTALLATION.
2. RECONSTRUCT FLOW CHANNELS FOR NEW SEWER INLET PIPING.

MANHOLE CONNECTION DETAIL

NOT TO SCALE



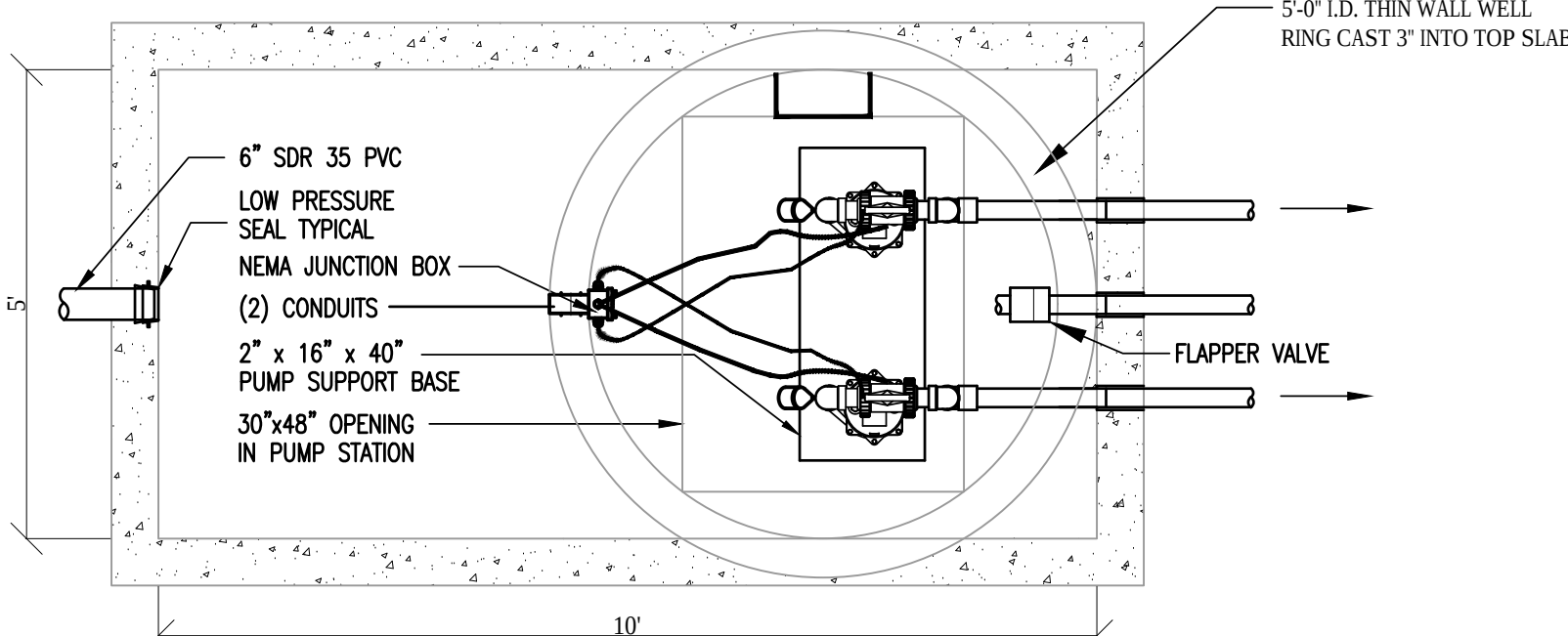
WATER MAIN ABOVE SEWER

SEPARATION NOTES:

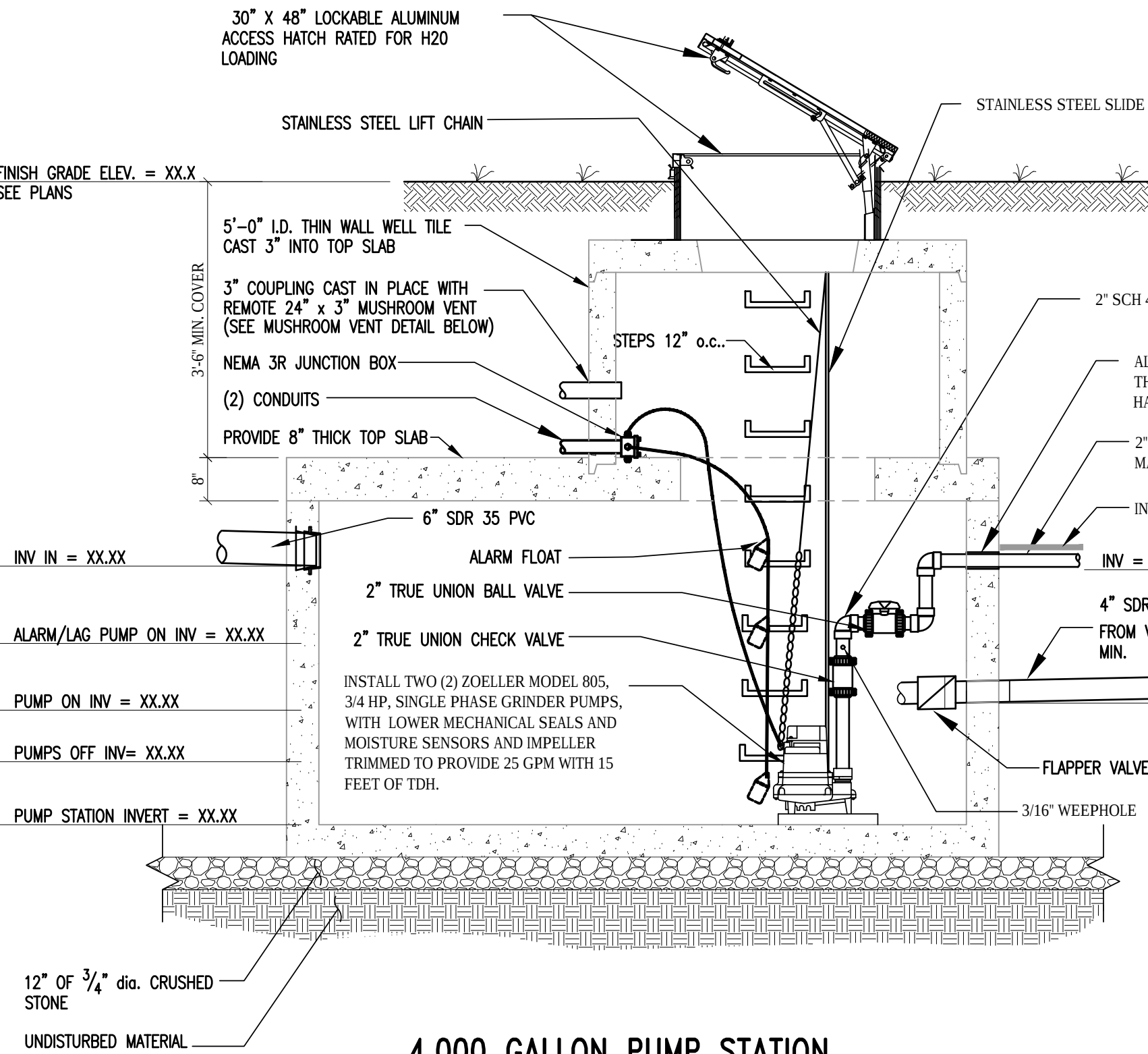
1. WATER MAIN RELATIONS TO SEWER SHALL BE IN ACCORDANCE WITH THE "RECOMMENDED STANDARDS FOR WATER WORKS" SO-CALLED TEN STATE STANDARDS.
2. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IF THIS DISTANCE CANNOT BE OBTAINED, THEN THE PIPES SHALL BE INSTALLED IN A SEPARATE TRENCH AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
3. WHEN IT IS IMPOSSIBLE TO MAINTAIN 18" VERTICAL SEPARATION OR WHERE THE SEWER MUST BE LAID ABOVE THE WATER MAIN: 1) THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AS POSSIBLE FROM WATER JOINTS. 2) THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICH EVER IS GREATER. 3) 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.

SANITARY SEWER / WATER LINE CROSSING

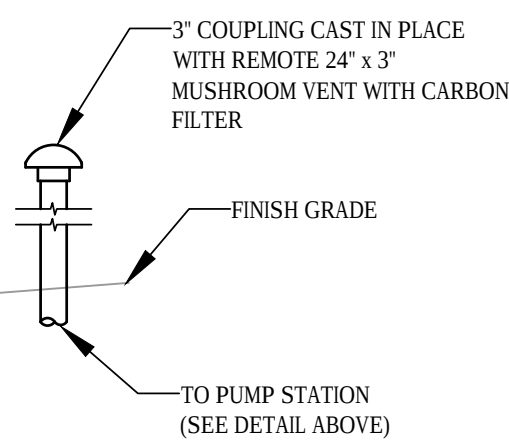
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PLAN VIEW OF PUMP STATION



4,000 GALLON PUMP STATION



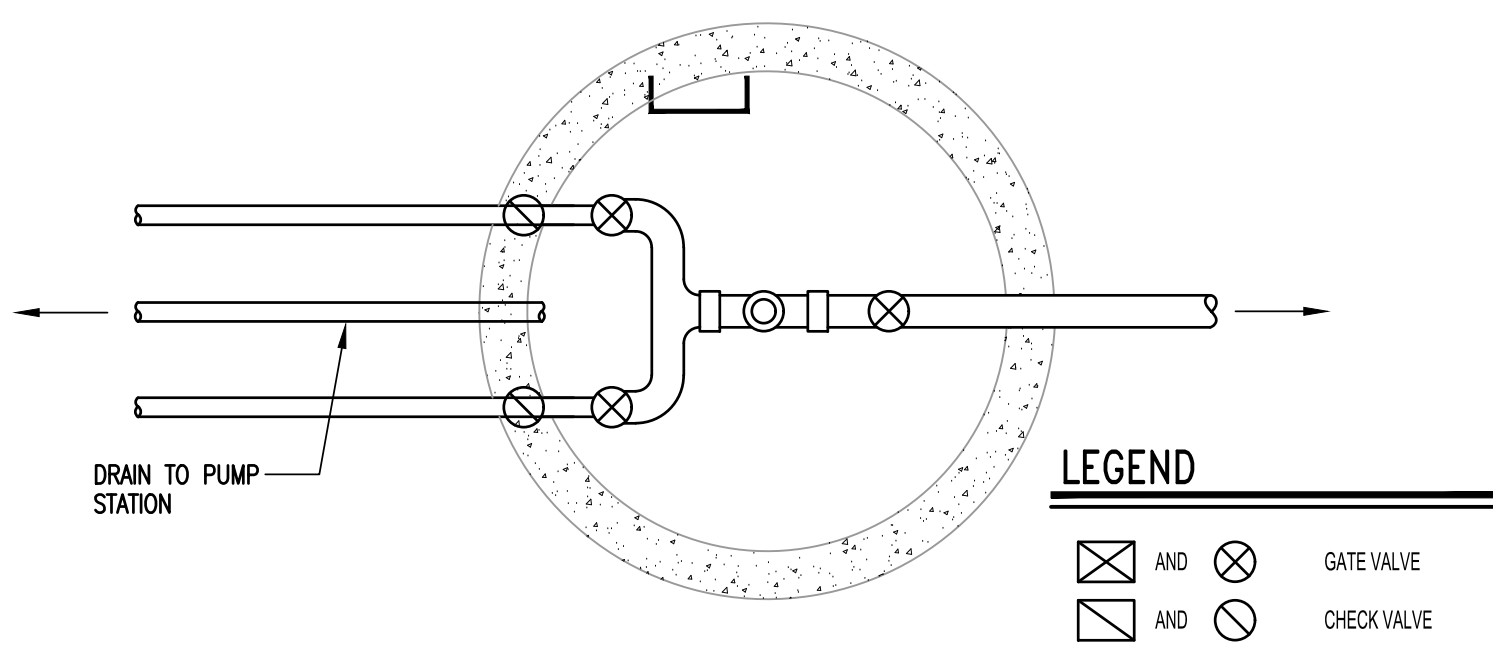
MUSHROOM VENT DETAIL

PUMP STATION NOTES:

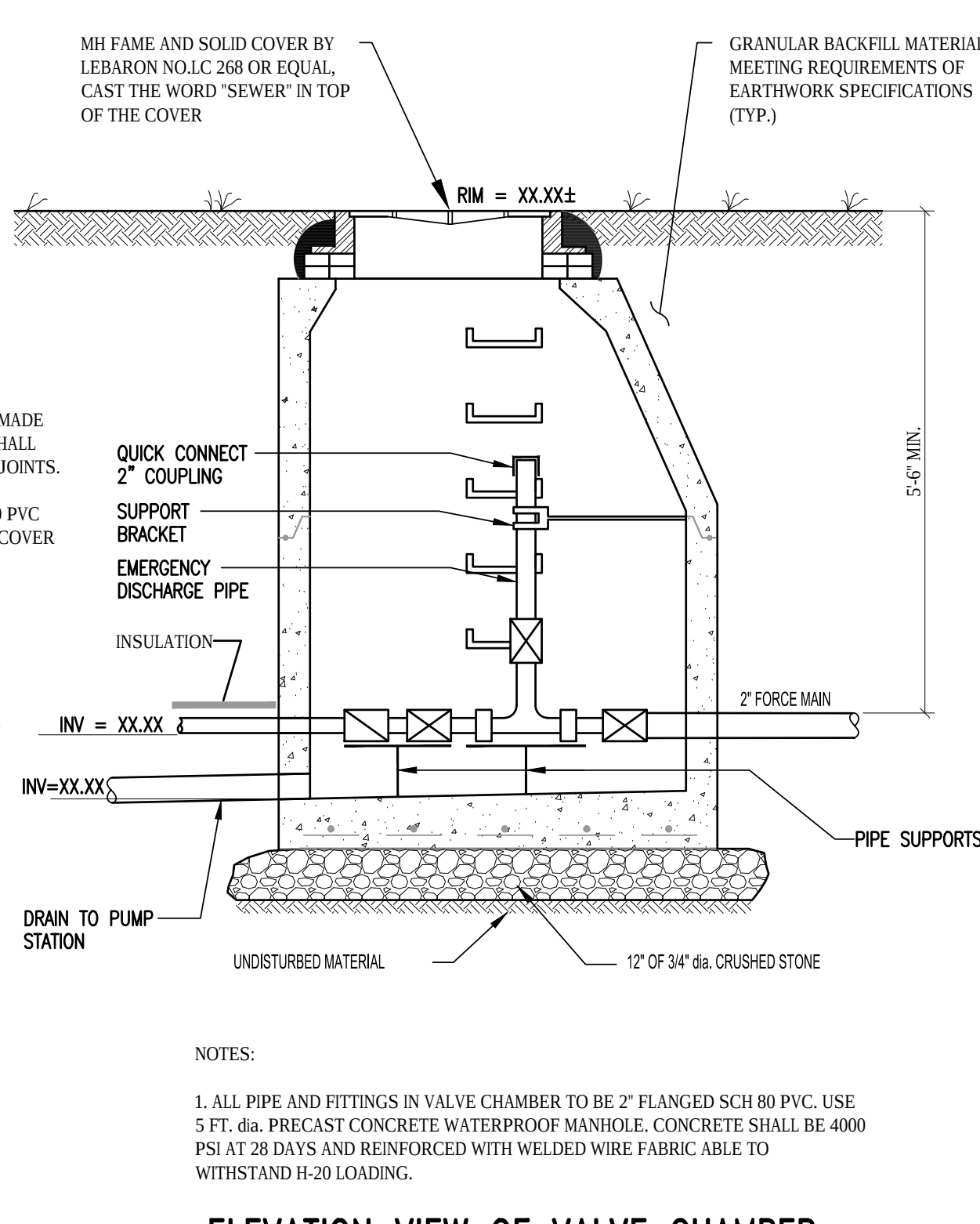
1. ITEMS OF WORK SHALL INCLUDE ALL NECESSARY MATERIALS AND THEIR INSTALLATION AS REQUIRED TO OPERATE THE PUMPING SYSTEM.
2. PUMP STATION SHALL BE REINFORCED CONCRETE, BOTH PUMP STATION AND HATCH RATED TO SUPPORT H20 LOADING.
3. CONTROL PANEL TO BE LOCATED IN THE BUILDING AND SHALL CONTAIN:
 - A. PUMP ALTERNATOR
 - B. RUN LIGHTS
 - C. MANUAL ON/OFF AUTOMATIC CONTROL
 - D. ALARM SILENCE BUTTON
 - E. AUDIO AND VISUAL ALARM TO BE MOUNTED ON THE CONTROL PANEL BOX.
 - F. 120 VOLT RECEPTACLE.
 - G. PROVIDE ONLY AN EXTRA DRY CONTACT FOR A DIAL UP ALARM (A COMPLETE DIAL UP MODEM SHOULD NOT BE INCLUDED).
 - H. PUMP TIMER AND COUNTER SHALL BE AN ELAPSED TIME METER FOR EACH PUMP AND AN EVENT COUNTER TO TRACK SYSTEM CYCLES.
4. LOCATION OF VENT TO BE COORDINATED WITH ARCHITECT AND ENGINEER.
5. SPARE PARTS TO BE SUPPLIED TO INCLUDE:
 - A. EXTRA FLOAT SWITCH
 - B. EXTRA MAGNETIC CONTACTORS.
 - C. TWO ORIGINAL SETS OF MANUALS FOR BOTH THE PUMPS AND CONTROL PANELS.

BUILDING 44 PUMP STATION DETAIL

NOT TO SCALE



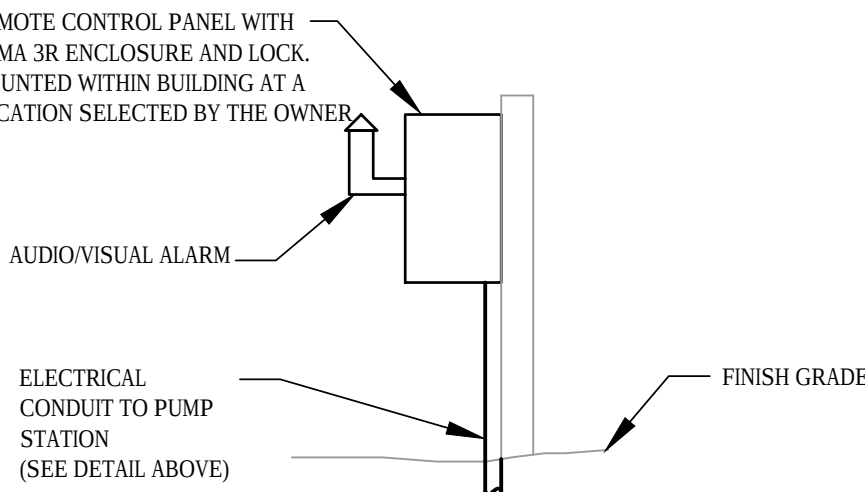
PLAN VIEW OF VALVE CHAMBER



ELEVATION VIEW OF VALVE CHAMBER

NOTES:

1. ALL PIPE AND FITTINGS IN VALVE CHAMBER TO BE 2" FLANGED SCH 80 PVC. USE 5 FT. dia. PRECAST CONCRETE WATERPROOF MANHOLE. CONCRETE SHALL BE 4000 PSI AT 28 DAYS AND REINFORCED WITH WELDED WIRE FABRIC ABLE TO WITHSTAND H-20 LOADING.



CONTROL PANEL AND ALARM DETAIL

6. ALL ELECTRICAL COMPONENTS TO BE UNDERWRITERS LABORATORY APPROVED, INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
7. ALL PIPE AND FITTINGS IN PUMP STATION SHALL BE FLANGED SCHEDULE 40 PVC.
8. TANK SHALL BE INSTALLED LEVEL ON A COMPACTED 12" GRAVEL BASE.
9. STEPS TO BE COPOLYMER POLYPROPYLENE PLASTIC WITH -6" GRADE 60 REBAR CONTINUOUS THROUGHOUT.
10. SLIDE RAILS AND DISCONNECT FITTINGS SHALL BE INSTALLED SO THAT THE PUMPS CAN BE REMOVED WITHOUT ENTERING THE PUMP STATION. A STAINLESS STEEL LIFT CHAIN AND REQUIRED MOUNTING HARDWARE WILL BE PROVIDED FOR EACH PUMP WITHIN THE PUMP STATION.
11. THE PUMP CHAMBER AND VALVE PIT SHALL BE FILLED WITH WATER AND SUBJECTED TO A 24 HOUR HYDROSTATIC LEAKAGE TEST. NO LEAKAGE WILL BE ALLOWED DURING THE TEST PERIOD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A WATER TIGHT STRUCTURE.
12. THE FORCE MAIN LEAKAGE TEST SHALL EXTEND FROM THE RECEIVING MANHOLE INTO THE 1,500 GALLON PUMP CHAMBER INTERIOR.
13. SHOP DRAWINGS OF THE PUMP STATION, VALVE PIT, AND COMPONENTS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

BEACH CLUB PUMP STATION DETAIL

NOT TO SCALE

FOR PERMIT REVIEW
NOT FOR CONSTRUCTION
09/20/2018

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SAS PROJECT NUMBER: 0917

PROJECT

HULA

BURLINGTON,
VERMONT

DATE: 09/20/2018

SCALE: AS NOTED

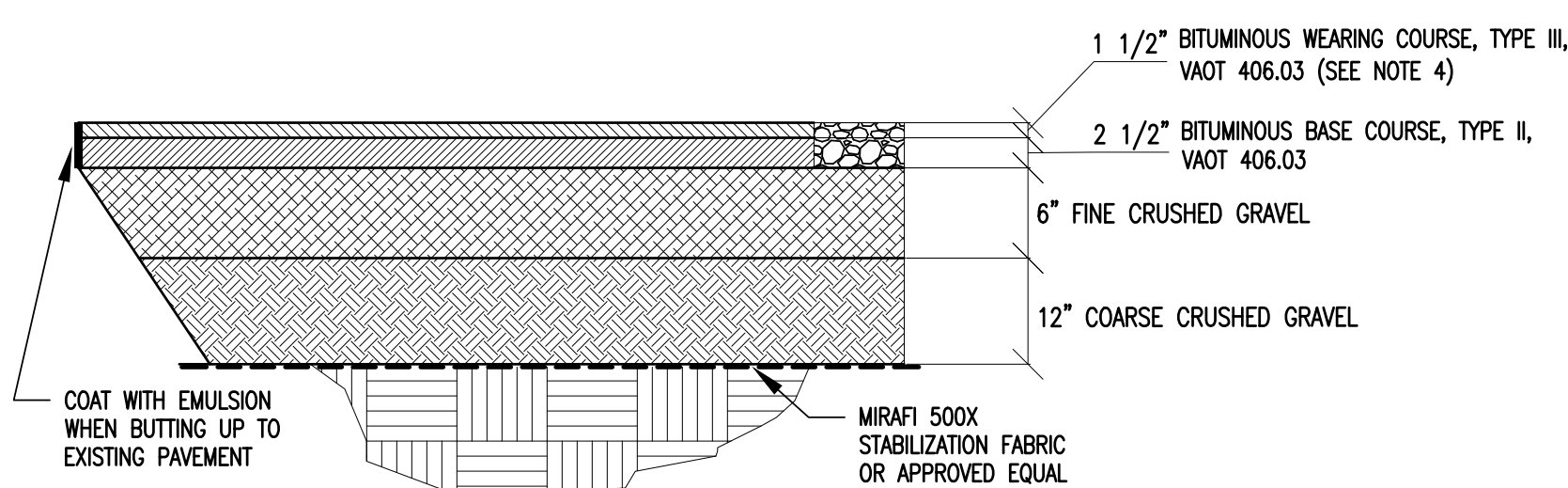
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REVISIONS

SANITARY
DETAILS
&
NOTES

C3.1

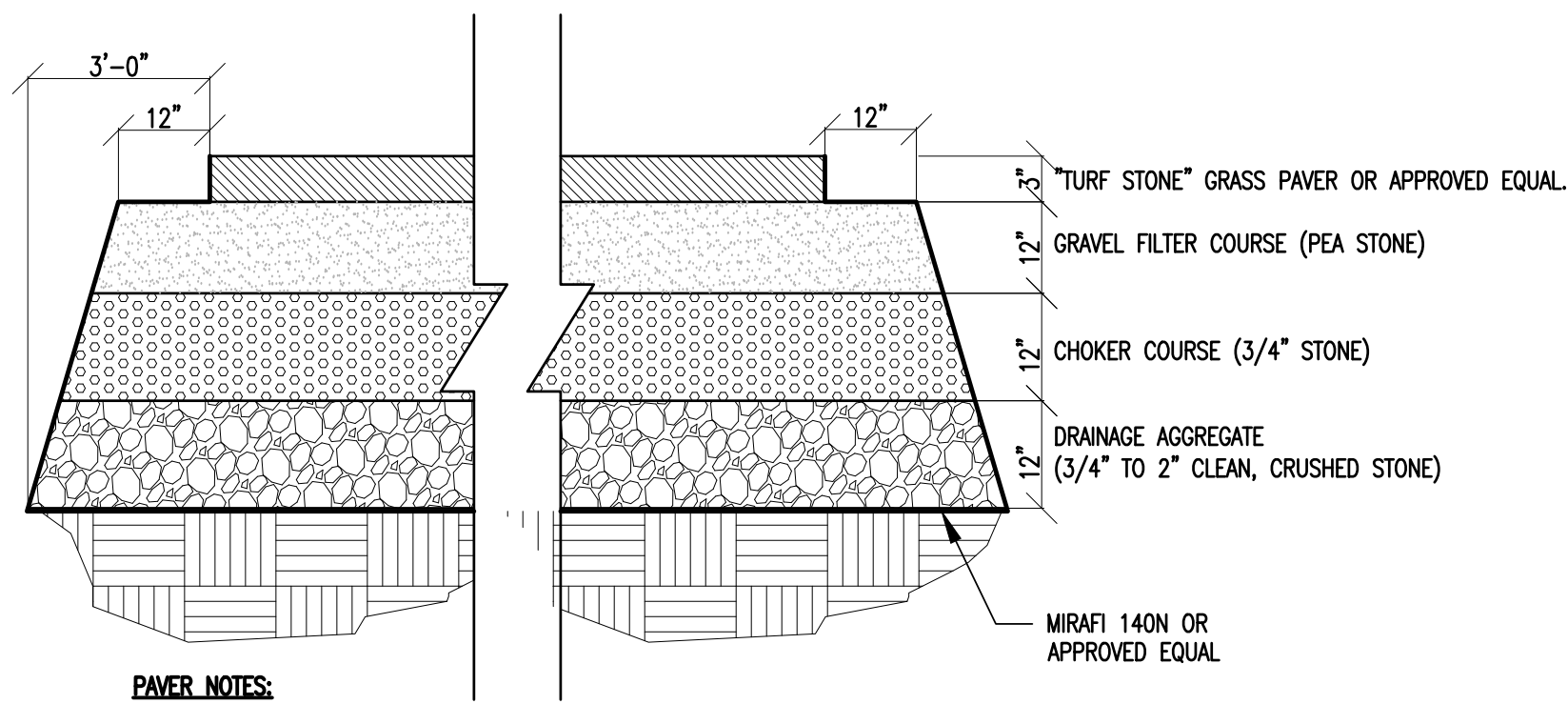


PAVEMENT NOTES:

1. IN ALL PAVEMENT AREAS TO BE PATCHED, SAW CUT AND REMOVE EXISTING PAVEMENT.
2. EXCAVATE BASE MATERIAL AND SUB-BASE MATERIAL IF INADEQUATE.
3. COMPACT ALL FILL MATERIAL TO 95% MODIFIED PROCTOR DENSITY.

TYPICAL PAVEMENT DETAIL

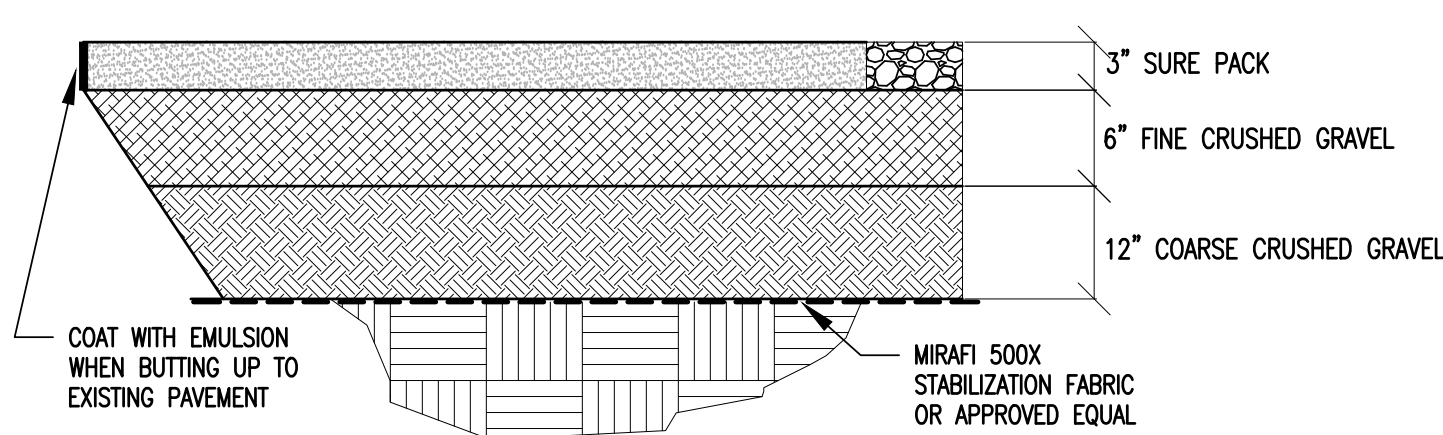
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PAVER NOTES:

TYPICAL CONCRETE PAVER DETAIL

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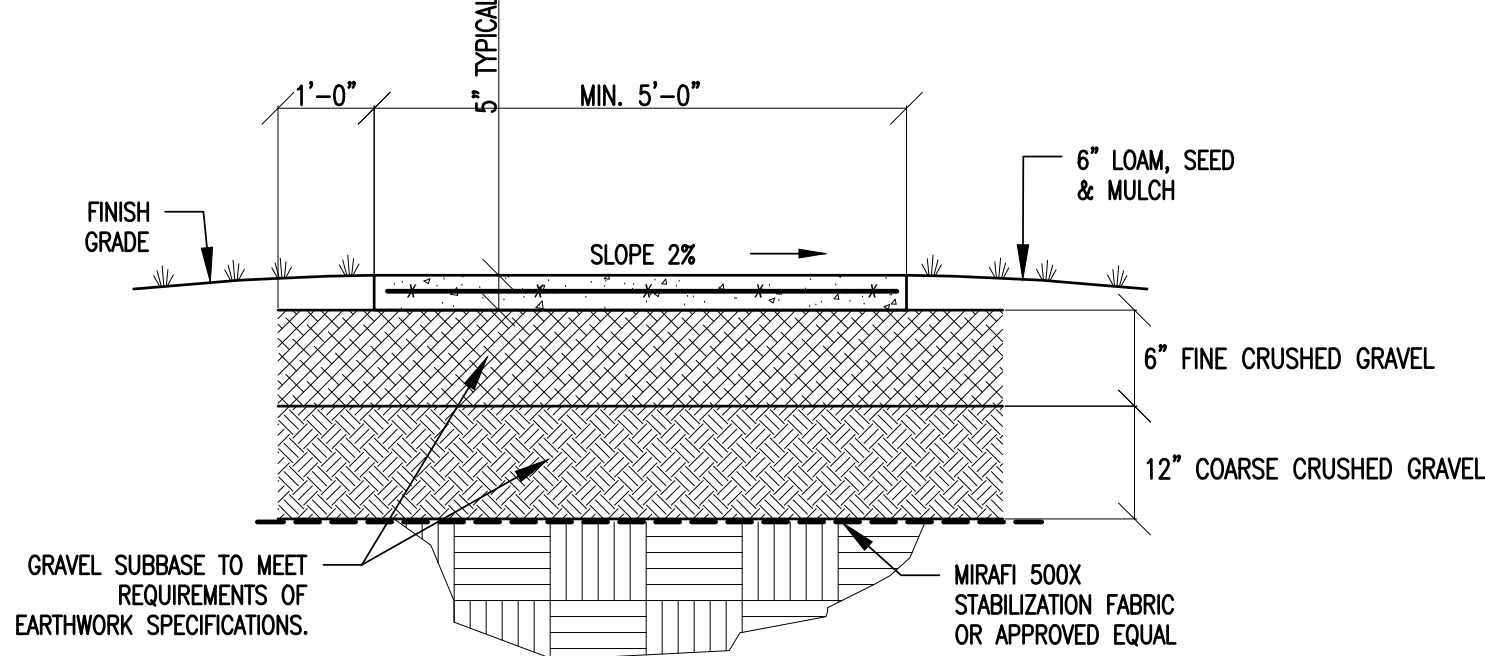


PAVEMENT NOTES:

1. IN ALL PAVEMENT AREAS TO BE PATCHED, SAW CUT AND REMOVE EXISTING PAVEMENT.
2. EXCAVATE BASE MATERIAL AND SUB-BASE MATERIAL IF INADEQUATE.
3. COMPACT ALL FILL MATERIAL TO 95% MODIFIED PROCTOR DENSITY.

TYPICAL GRAVEL WALK DETAIL

NOT TO SCALE 3

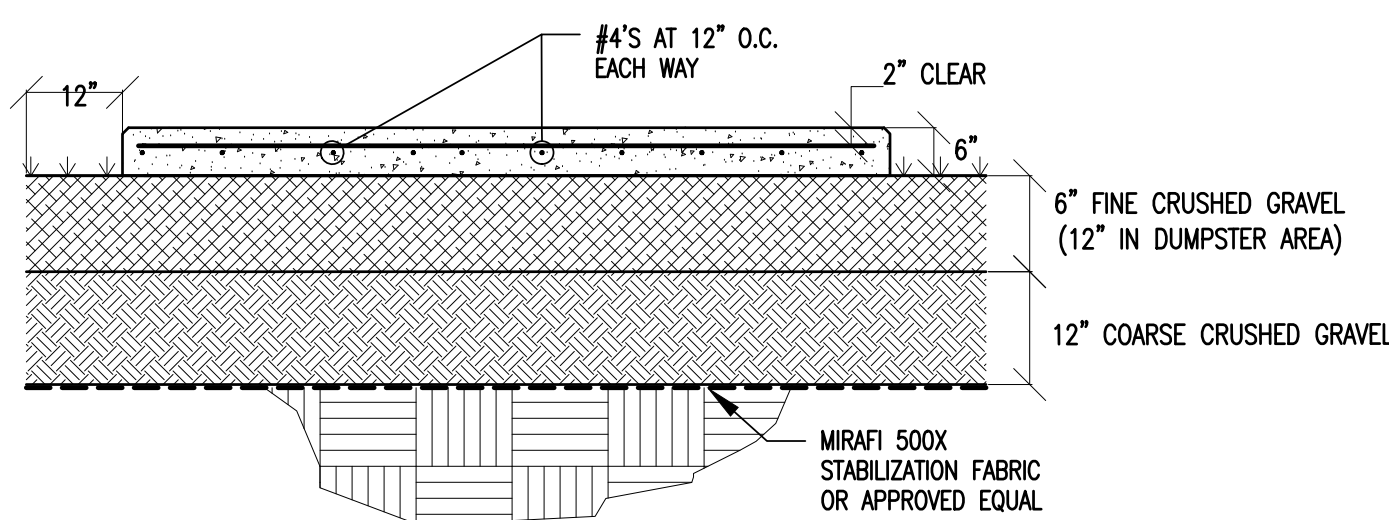


CONCRETE SIDEWALK NOTES:

1. PLACE A TOOLED JOINT 1/8\"
2. PLACE EXPANSION JOINT EVERY 20'-0\"
3. BROOM FINISH WITH SMOOTH TROWELED EDGES. TREAT WITH SILANE-SILOXANE OR EQUIVALENT.
4. CAST-IN-PLACE CONCRETE TO BE 4000 psi CONCRETE, 5%-7% AIR ENTRAINMENT WITH 6x6-W4.0x14.0 REINFORCING CENTERED IN SIDEWALK.
5. WHERE SIDEWALK IS ADJACENT TO ENTRY/EXIT DOOR PADS WITH FROST WALL FOUNDATIONS, SIDEWALK SHALL BE DOWNLEED TO PAD. USE EXTENDED STRUCTURAL FILL SUBBASE AS DIRECTED BY GEOTECHNICAL REPORT DATED SEPTEMBER 29, 2017 PREPARED BY S.W. COLE ENGINEERING, INC.
6. WHERE SIDEWALK IS ADJACENT TO OTHER HARDSCAPE FEATURES (CURB, WALL, LIGHTBASE, ETC.) SEPARATE WITH EXPANSION MATERIAL.

CONCRETE SIDEWALK DETAIL

NOT TO SCALE 4

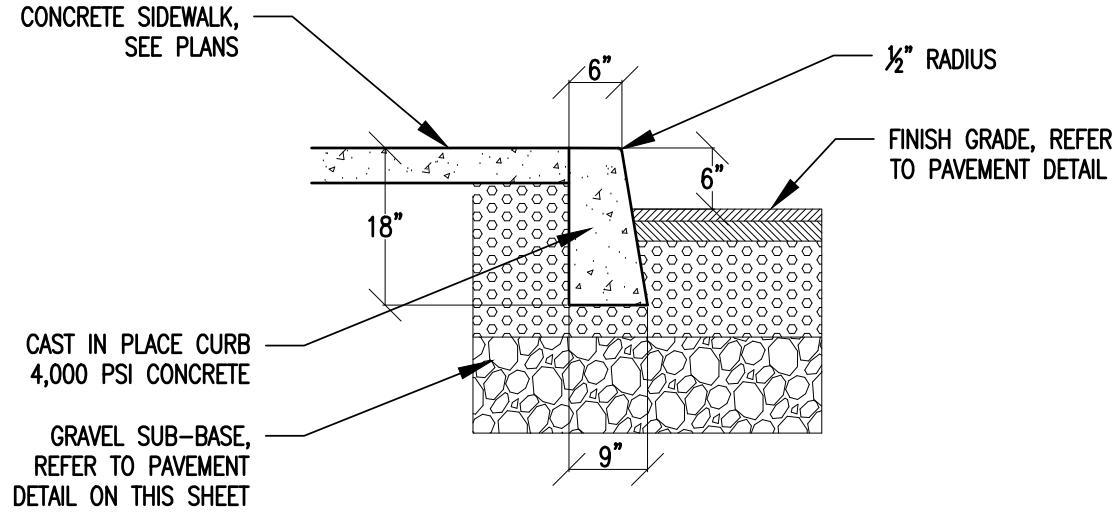


EXTERIOR CONCRETE PAD NOTES:

1. CONCRETE TO BE 4000psi WITH 5-7% AIR ENTRAINMENT.
2. BROOM FINISH WITH SMOOTH TROWELED EDGES. TREAT WITH SILANE-SILOXANE OR EQUIVALENT.
3. REFER TO SITE PLAN FOR SIZE AND LOCATION.

EXTEIOR CONCRETE PAD DETAIL

NOT TO SCALE 5

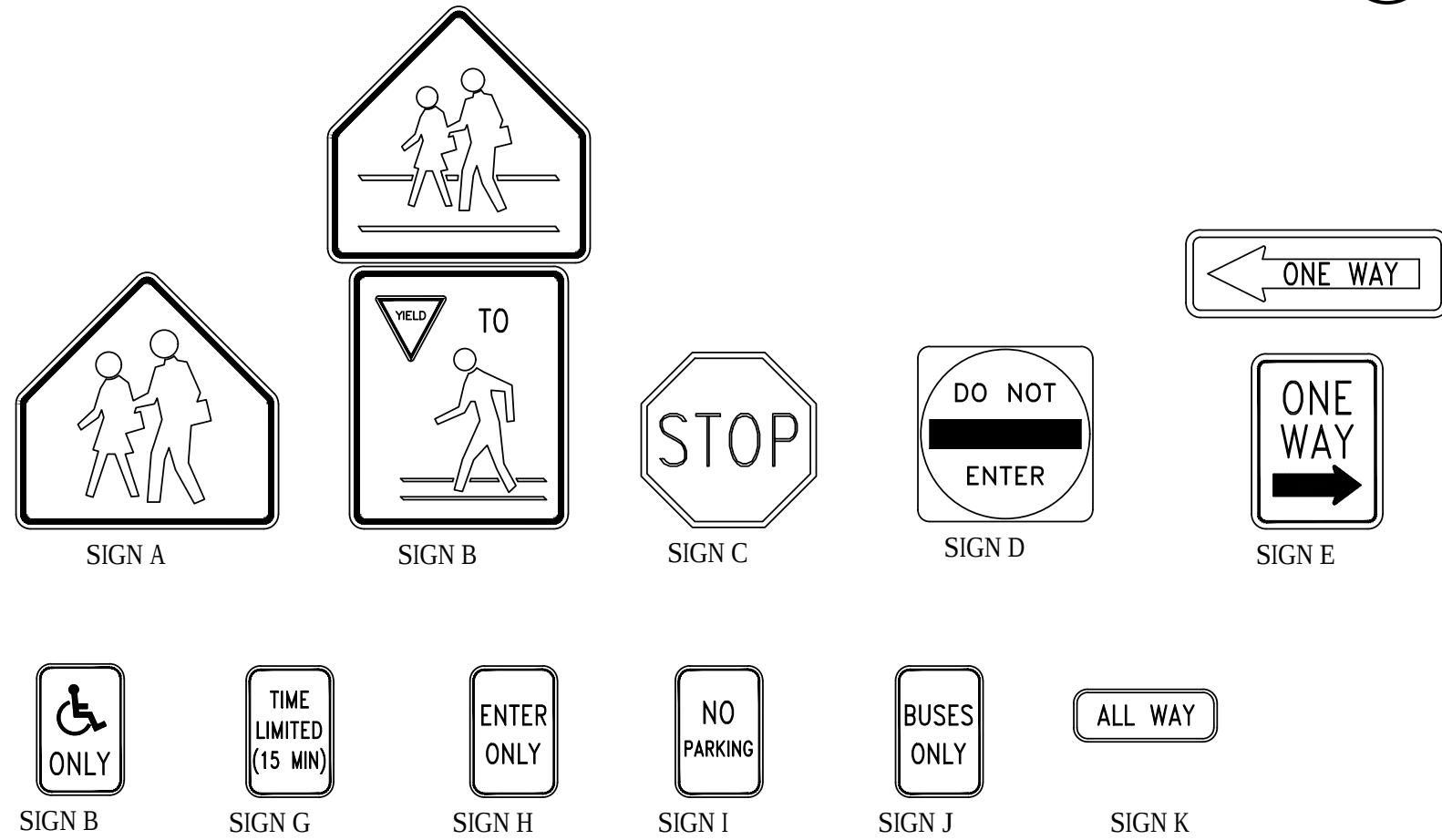


CONCRETE CURB NOTES:

1. CONSTRUCT CURBS IN 10'-0\"
2. EXPANSION JOINTS AT 20'-0\"
3. CONCRETE CURBS SHALL BE CONSTRUCTED IN ACCORDANCE WITH VIRTRANS SPECIFICATIONS.
4. INSTALL 1/2\"

CONCRETE CURB DETAIL

NOT TO SCALE 6

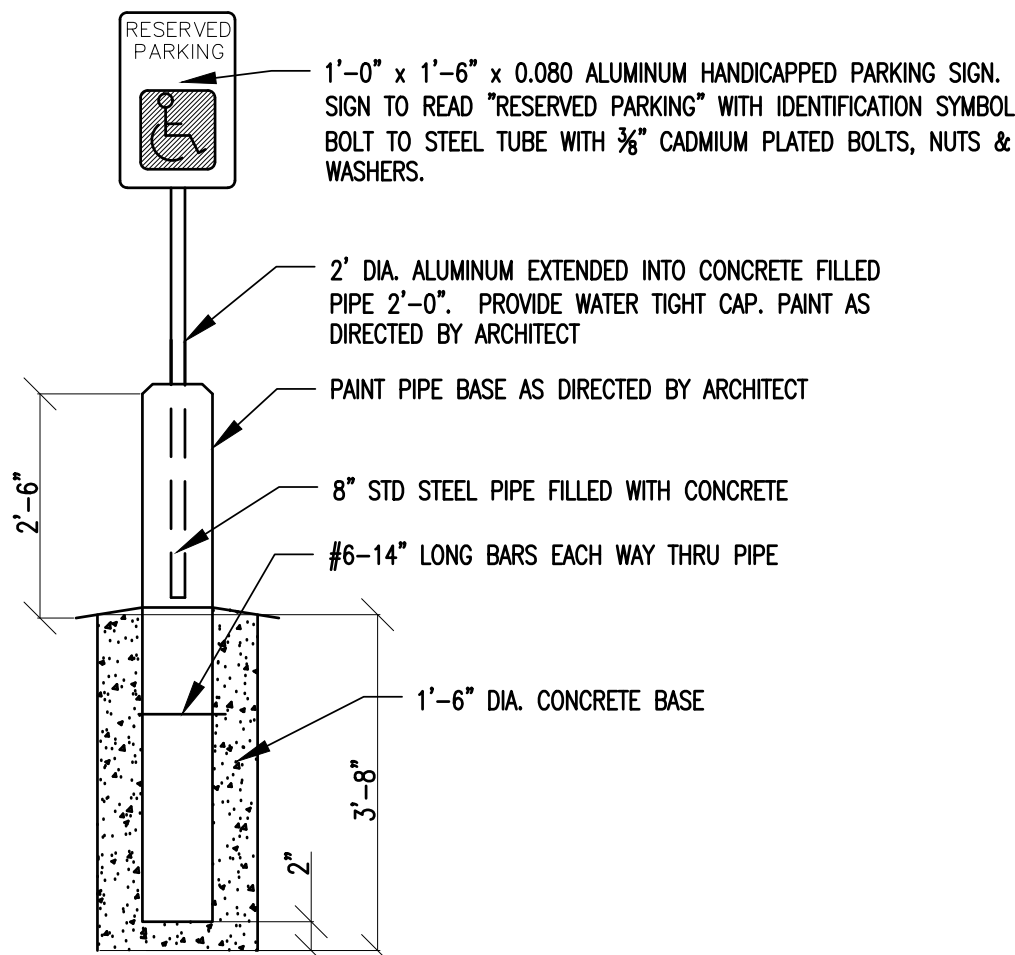


SIGN KEY:

SIGN	MUTCD DESIGNATIONS	COMMON NAME	SIZE
A	S1-1	PEDESTRIANS	24" x 24"
B	S2-1, VR-004A	PEDEST. CROSSING, YIELD	36" x 36", 24" x 30"
C	R1-1	STOP	24" x 24"
D	R5-1	DO NOT ENTER	24" x 24"
E	R6-2	ONE WAY	18" x 24"
F	---	HANDICAPPED PARKING	STANDARD
G	---	TIME LIMITED (15 MIN)	STANDARD
H	---	ENTER ONLY	STANDARD
I	---	NO PARKING	STANDARD
J	---	BUSSES' ONLY	STANDARD
K	R1-3P	ALL WAY	18" x 6"

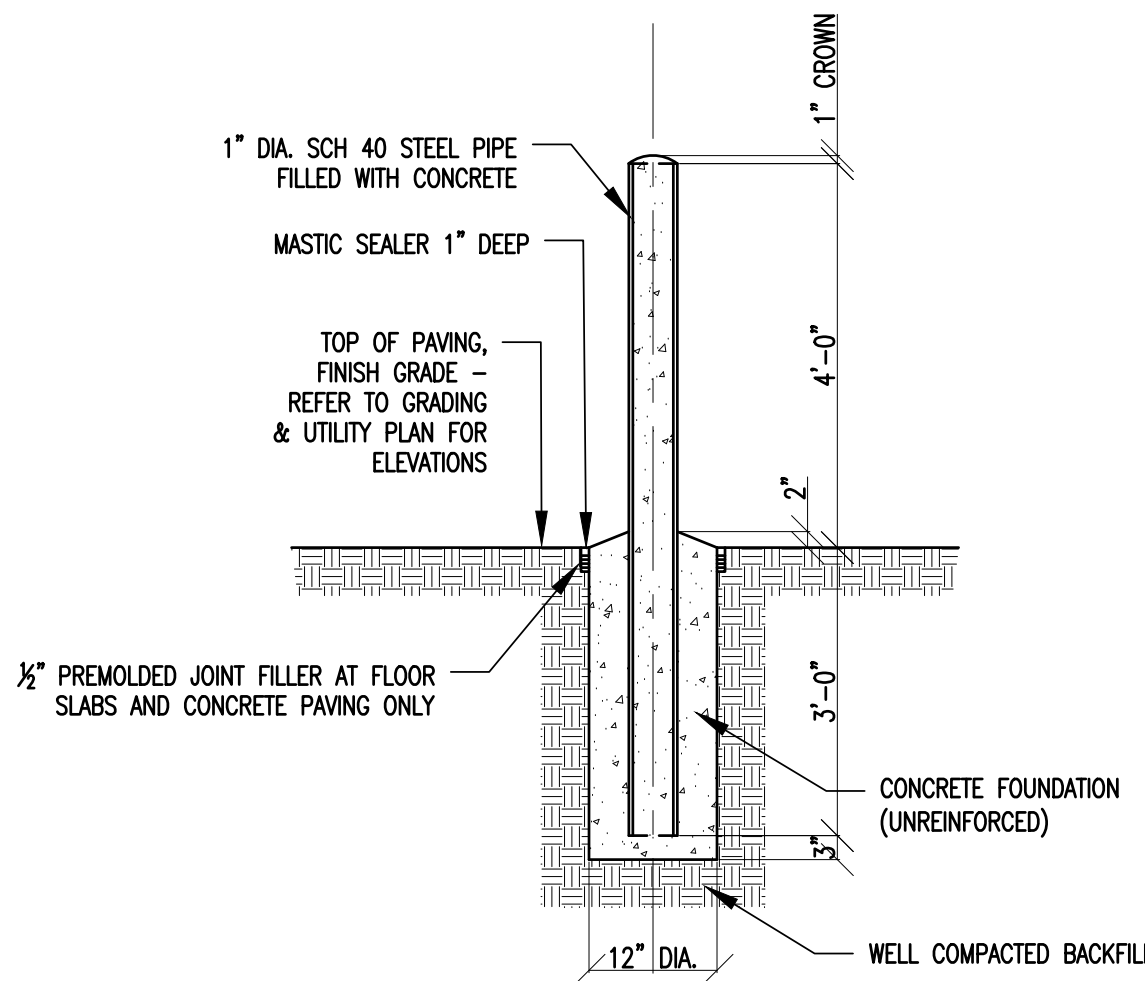
SIGNAGE KEY AND DETAIL

NOT TO SCALE 7



HANDICAPPED PARKING SIGN DETAIL

NOT TO SCALE 8

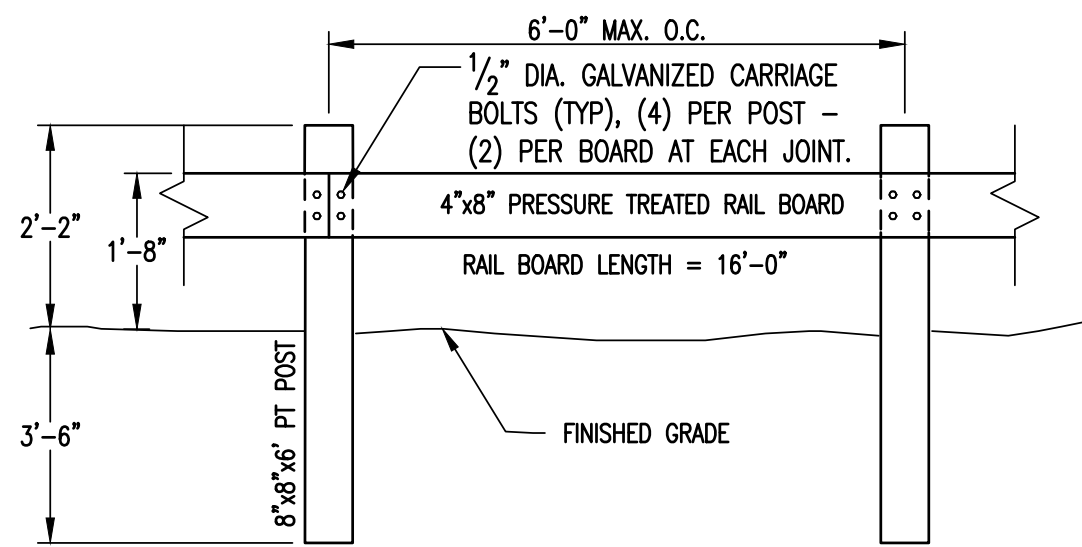


BOLLARD NOTES:

1. REFER TO SITE LAYOUT PLAN FOR LOCATIONS.
2. CONTRACTOR TO COORDINATE TO INSURE NO CONFLICT BETWEEN BOLLARDS AND OTHER CONCRETE WORK.
3. BOLLARD SHALL BE PAINTED WITH AN EXTERIOR GRADE PAINT - COORDINATE COLOR WITH ARCHITECT/OWNER.

BOLLARD DETAIL

NOT TO SCALE 9



TIMBER GUARDRAIL NOTES:

1. WOOD RAIL SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS.
2. GUARDRAIL POSTS AND RAILS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1,200 PSI OF MORE FOR EXTREME FIBER IN BENDING IN ACCORDANCE WITH AASHTO M 168.
3. WOOD POSTS SHALL BE SOUND AND REASONABLY STRAIGHT. THE ENDS SHALL BE CUT SQUARE OR AS INDICATED. POSTS WITH HOLLOW KNOTS, OPEN OR PLUGGED HOLES, OR SEASON CHECKS EXCEEDING 1/4\"
4. WOOD RAILS SHALL BE STRAIGHT AND SOUND, FREE FROM LOOSE KNOTS AND OTHER DEFECTS, AND SHALL BE SURFACES ON ALL SIDES.
5. ALL WOOD POSTS, BLOCKS AND RAILS SHALL BE FACTORY PRESSURE TREATED WITH PRESERVATIVE MATERIALS AND SHALL CONSIST OF ONE OF THE FOLLOWING:

TREATMENT

	MINIMUM NET RETENTION, POUNDS PER CUBIC FOOT
WATERBORNE, ALKALINE COPPER QUATERNARY	0.40 TO 0.60 POUNDS PER CUBIC FT

6. WOOD POSTS SHALL BE SET PLUMB AT THE REQUIRED LOCATIONS BY EITHER AUGURING, EXCAVATION OR DRIVING. THE BOTTOM OF THE HOLES SHALL BE THOROUGHLY TAMPED TO GRADE. THE FACE OF THE POST NEAREST THE ROAD SHALL PRESENT A VERTICAL LINE FROM TOP TO BOTTOM.
7. POST HOLES SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL PLACED IN LAYERS THOROUGHLY COMPACTED WITH A POWER TAMPER.

TIMBER GUARD RAIL DETAIL

NOT TO SCALE 10

EARTHWORK SPECIFICATIONS

1. PRIOR TO THE START OF THE WORK, A PRE-CONSTRUCTION MEETING WILL BE HELD WITH THE CITY DPW, CONSTRUCTION ADMINISTRATOR, CONTRACTOR, OWNER & PROJECT ENGINEERS TO REVIEW PROCEDURES, IDENTIFY RESPONSIBILITIES, UNLESS STATED OTHERWISE, ALL MATERIALS AND METHODS SHALL BE IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE APPLICABLE STATE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. CLEARING AND GRUBBING-- ALL TOPSOIL AND UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE DRIVEWAY, PARKING LOT, AND SIDEWALK LIMITS. THE DRIVEWAY AND PARKING LOT BASE MATERIAL SHALL EXTEND ONE FOOT BEYOND THE EDGE OF PAVING.
3. BASE COURSE-- THE BASE COURSE SHALL CONSIST OF TWELVE INCHES OF GRAVEL AND SIX INCHES OF CRUSHED GRAVEL. GRADATION CURVES COMPLYING WITH AASHTO T27 AND T11 SHALL BE PROVIDED FOR THE ENGINEERS REVIEW PRIOR TO CONSTRUCTION.
4. COMPACTION SHALL BE PERFORMED USING VIBRATORY ROLLERS AND WATER IN LIFTS OF NO GREATER THAN TWELVE INCHES. COMPACTION SHALL BE PERFORMED UNTIL THE REQUIRED DENSITY IS ACHIEVED. DENSITY SHALL BE DETERMINED BY AASHTO T208 METHOD AND SHALL NOT BE LESS THAN 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED IN ACCORDANCE WITH AASHTO T99.
5. COMPACTION TESTING SHALL BE PERFORMED FOR EVERY LAYER OF MATERIAL PLACED AND FOR EVERY 1000 SQUARE FEET OF AREA.
6. PAVEMENT SHALL MEET APPLICABLE STATE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION REQUIREMENTS, IN ADDITION TO APPLICABLE TOWN ROAD STANDARDS.
7. PAVEMENT SHALL NOT BE INSTALLED WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT, NOR WHEN THE ROAD BASE TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT. PAVEMENT SHALL NOT FALL BELOW 185 DEGREES FAHRENHEIT PRIOR TO THE COMPLETION OF ROLLING. PAVEMENT SHALL NOT BE INSTALLED WHEN THE SUBGRADE IS FROZEN OR THE GRADES ARE INCORRECT.
8. ALL REMAINING DISTURBED AREAS WITHIN THE RIGHT OF WAY SHALL BE FERTILIZED AND SEEDED IN ACCORDANCE WITH APPLICABLE STATE SPECIFICATIONS.
9. THE SEEDING OF SLOPES AND DITCHES SHALL REQUIRE THE USE OF EROSION CONTROL MATTING.
10. COST OF INITIAL INSPECTION AND TESTING SHALL BE PAID BY THE OWNER. SUBSEQUENT TESTING DUE TO FAILURE SHALL BE PAID BY THE CONTRACTOR.
11. ALL EARTHWORK MATERIALS SHALL BE OBTAINED FROM APPROVED SOURCES. THEY SHALL CONSIST OF SATISFACTORILY GRADED, FREE DRAINING MATERIAL, REASONABLY FREE FROM LOAM, SILT, CLAY AND ORGANIC MATERIAL. EARTHWORK MATERIALS SHALL MEET THE REQUIREMENTS OF THE FOLLOWING TABLES:

A. SAND BLANKET/BEDDING:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	2 INCHES	100
	1-1/2 INCHES	90 - 100
	3/4 INCHES	70 - 100
	NO. 4	60 - 100
	NO. 100	0 - 20
	NO. 200	0 - 6
B. 3/4\"	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	1/2 INCH	100
	3/8 INCH	85 - 100
	NO. 4	10 - 30
	NO. 8	0 - 10
	NO. 16	0 - 5
C. 1/2\"	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	1 INCH	100
	3/4 INCHES	90 - 100
	3/8 INCHES	20 - 55
	NO. 4	0 - 10
	NO. 8	0 - 5
D. COARSE CRUSHED GRAVEL:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	NO. 4	20 - 60
	NO. 100	0 - 12
	NO. 200	0 - 6
E. FINE CRUSHED GRAVEL:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	2 INCHES	100
	1-1/2 INCHES	90 - 100
	3/4 INCHES	30 - 60
	NO. 100	0 - 12
	NO. 200	0 - 6
F. GRANULAR BACKFILL:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	3 INCHES	100
	NO. 4	45 - 75
	NO. 100	0 - 12
	NO. 200	0 - 6
G. STRUCTURAL FILL:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	4 INCH	100
	3 INCH	90 - 100
	1 1/2 INCH	25 - 90
	NO. 40	0 - 30
	NO. 200	0 - 6
H. DRAINAGE AGGREGATE:	SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
	1 1/2 INCH	100
	1 INCH	95 - 100
	3/4 INCH	25 - 60
	NO. 4	0 - 10
	NO. 8	0 - 5
I. TYPE I STONE: THE LONGEST DIMENSION OF THE STONE SHALL VARY FROM 1 TO 12-INCHES, AND AT LEAST 50% OF THE VOLUME OF THE STONE IN PLACE SHALL HAVE A LEAST DIMENSION OF 4-INCHES.		
J. TYPE II STONE: THE LONGEST DIMENSION OF THE STONE SHALL VARY FROM 2 TO 36-INCHES, AND AT LEAST 50% OF THE VOLUME OF THE STONE IN PLACE SHALL HAVE A MINIMUM DIMENSION OF 12-INCHES.		

SMITH
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PROJECT

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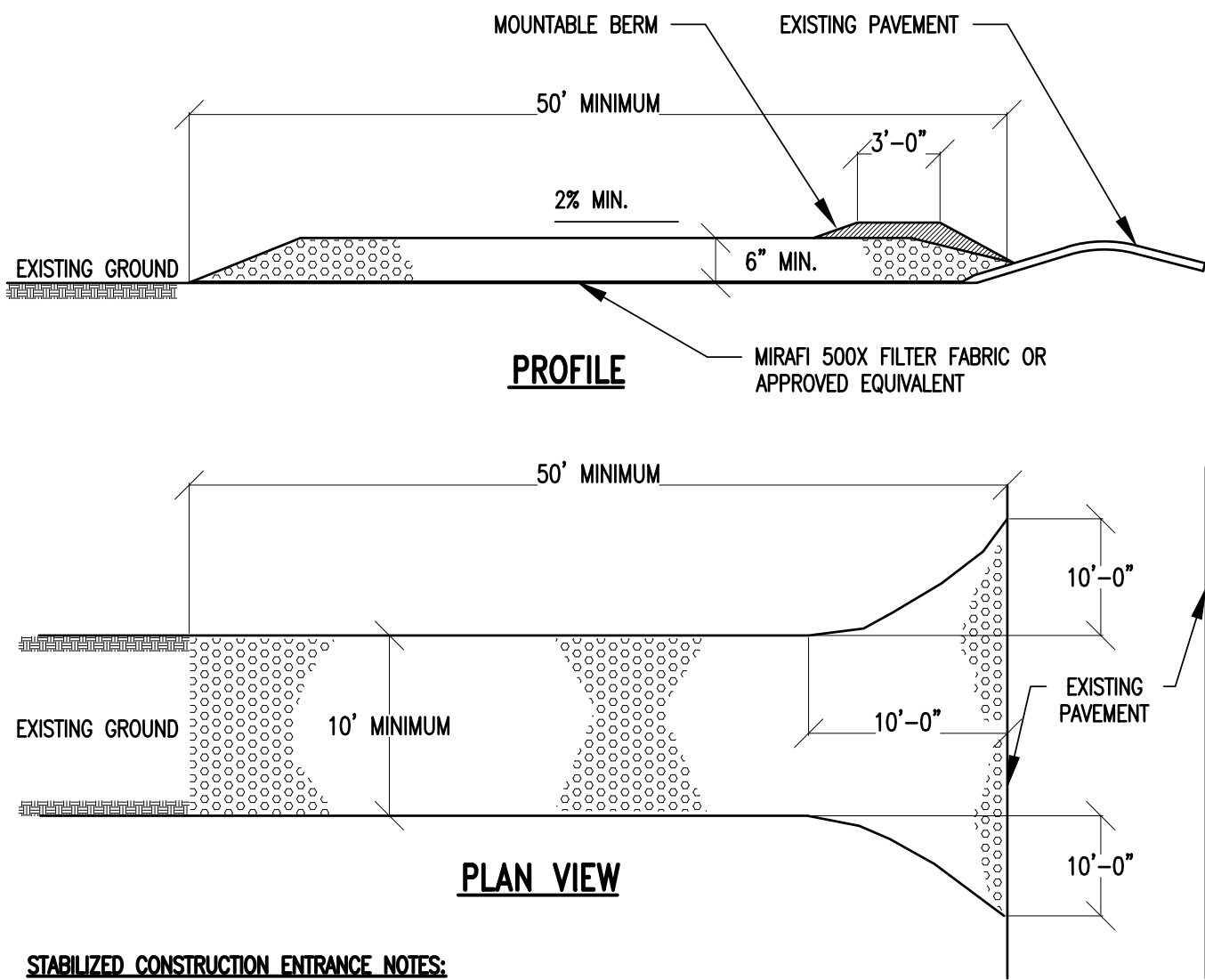
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REVISIONS

SITE
DETAILS

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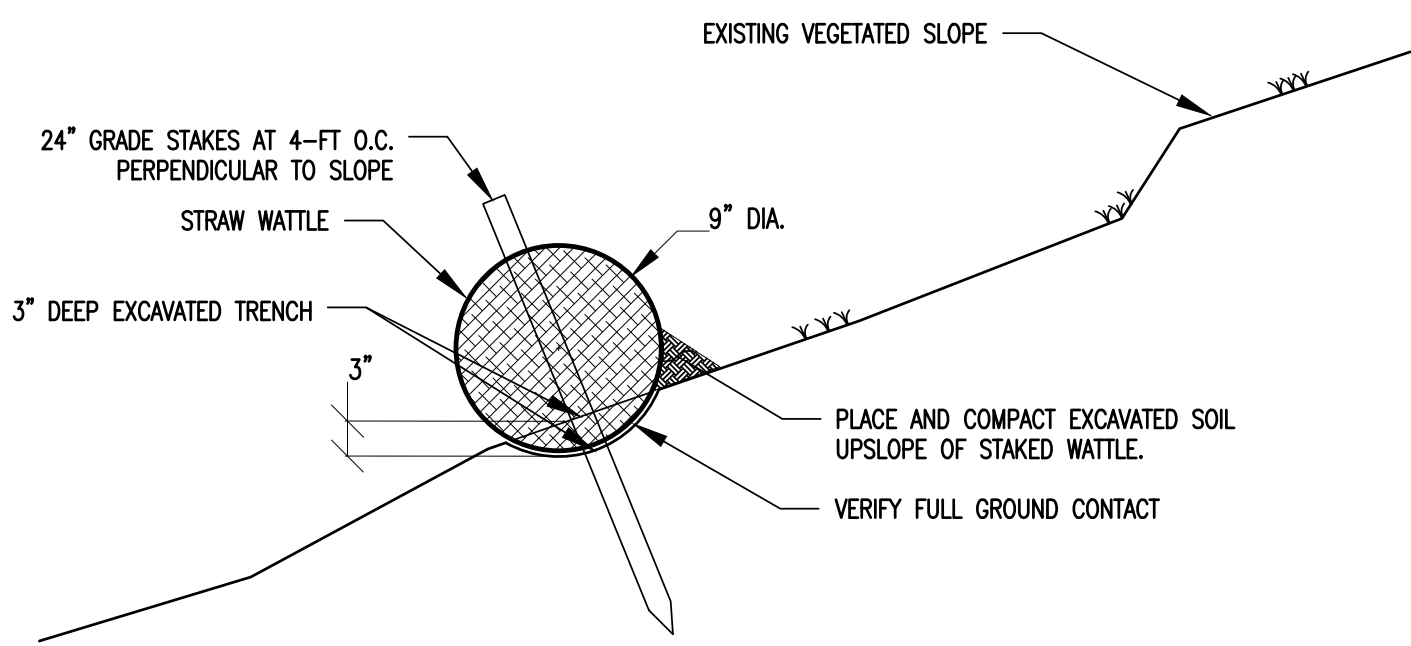
FOR PERMIT REVIEW
NOT FOR CONSTRUCTION
09/20/2018



- STABILIZED CONSTRUCTION ENTRANCE NOTES:**
1. STONE SIZE: USE TYPE 1 STONE MEETING REQUIREMENTS OF EARTHWORK SPECIFICATIONS.
 2. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCE SHALL BE PIPED ACROSS THE ENTRANCE.
 3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. REPAIR AND/OR CLEANOUT ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
 4. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
 5. WHEELS SHALL BE CLEARED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

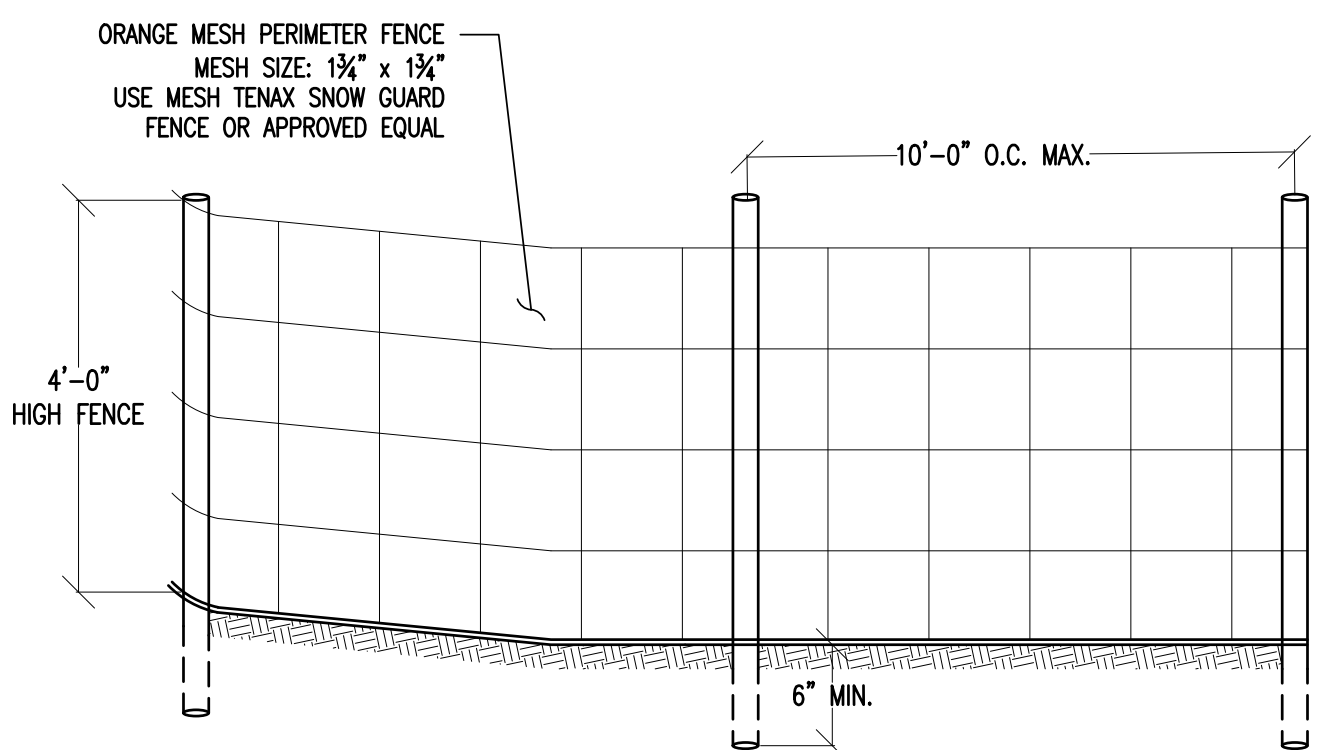
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- STRAW WATTLE NOTES:**
1. STRAW WATTLE PRODUCT TO BE NORTH AMERICAN GREEN SEEDMAX-SW69 OR APPROVED EQUIVALENT.
 2. WATTLES TO BE 9" DIAMETER AND CONSIST OF AGRICULTURAL STRAW WRAPPED IN BIODEGRADABLE, ORGANIC JUTE NET.
 3. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

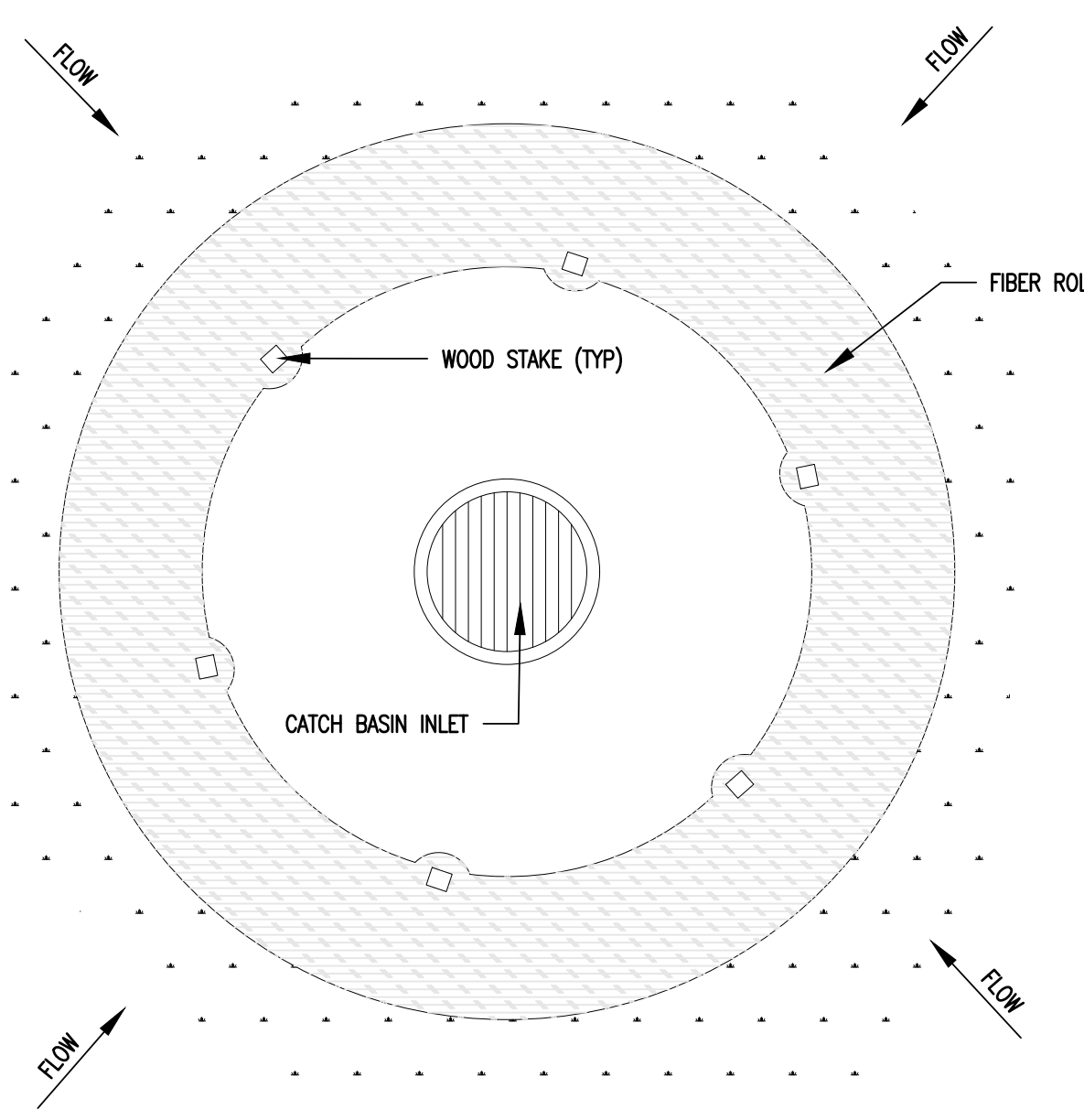
STRAW WATTLE DETAIL

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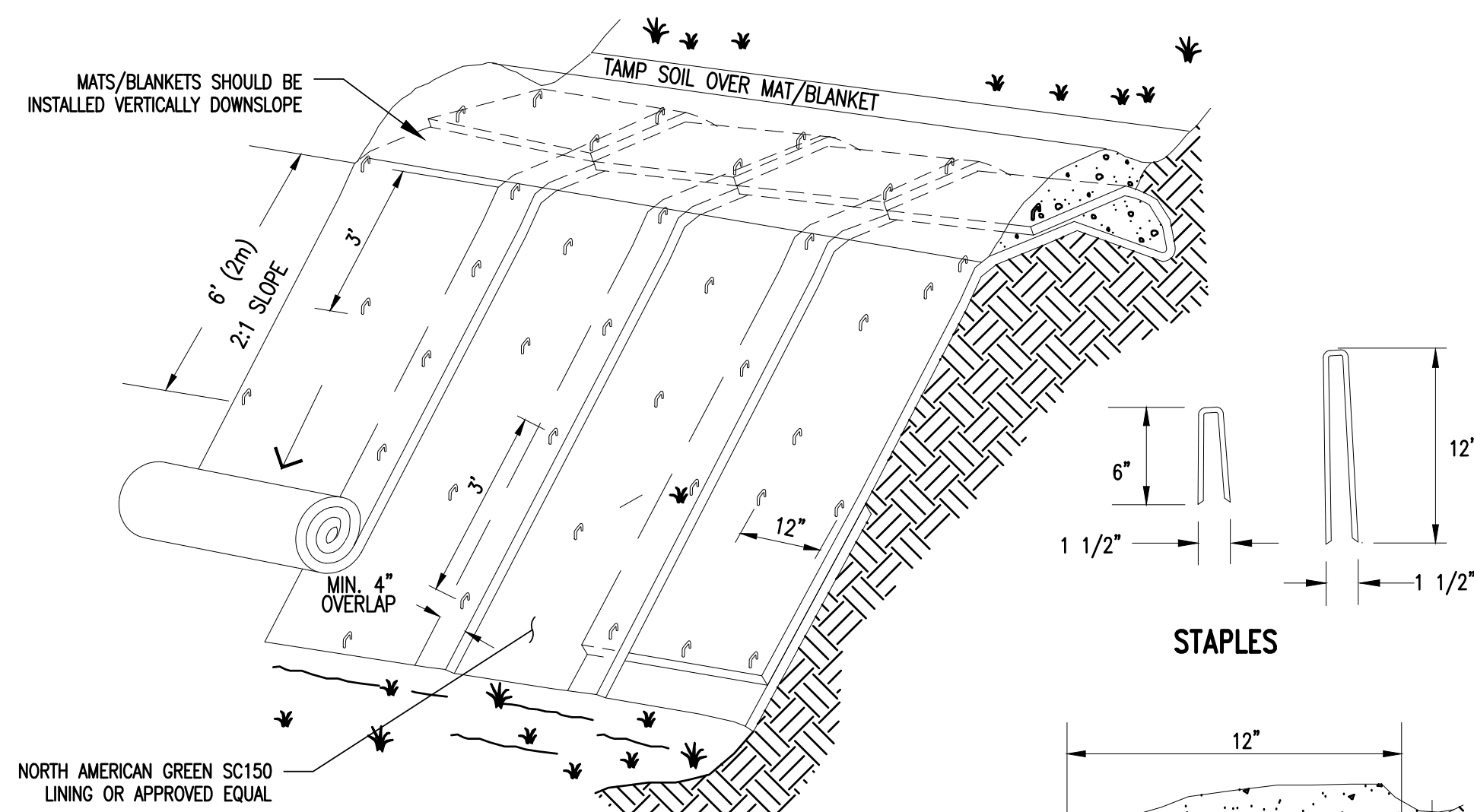
ORANGE CONSTRUCTION FENCE DETAIL

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FIBER ROLL INLET PROTECTION DETAIL

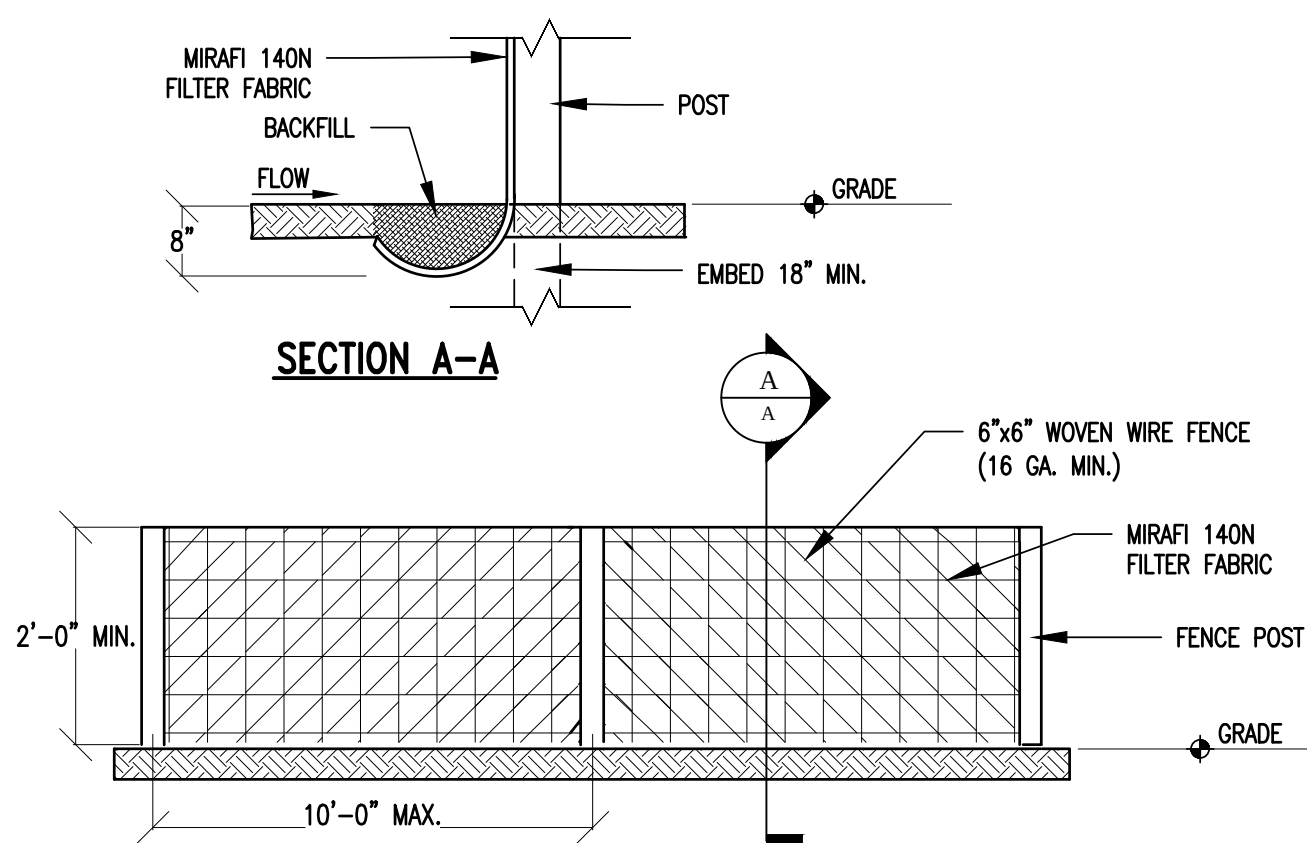
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- EROSION CONTROL MATTING NOTES:**
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
 2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
 3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION CONTROL MATTING DETAIL

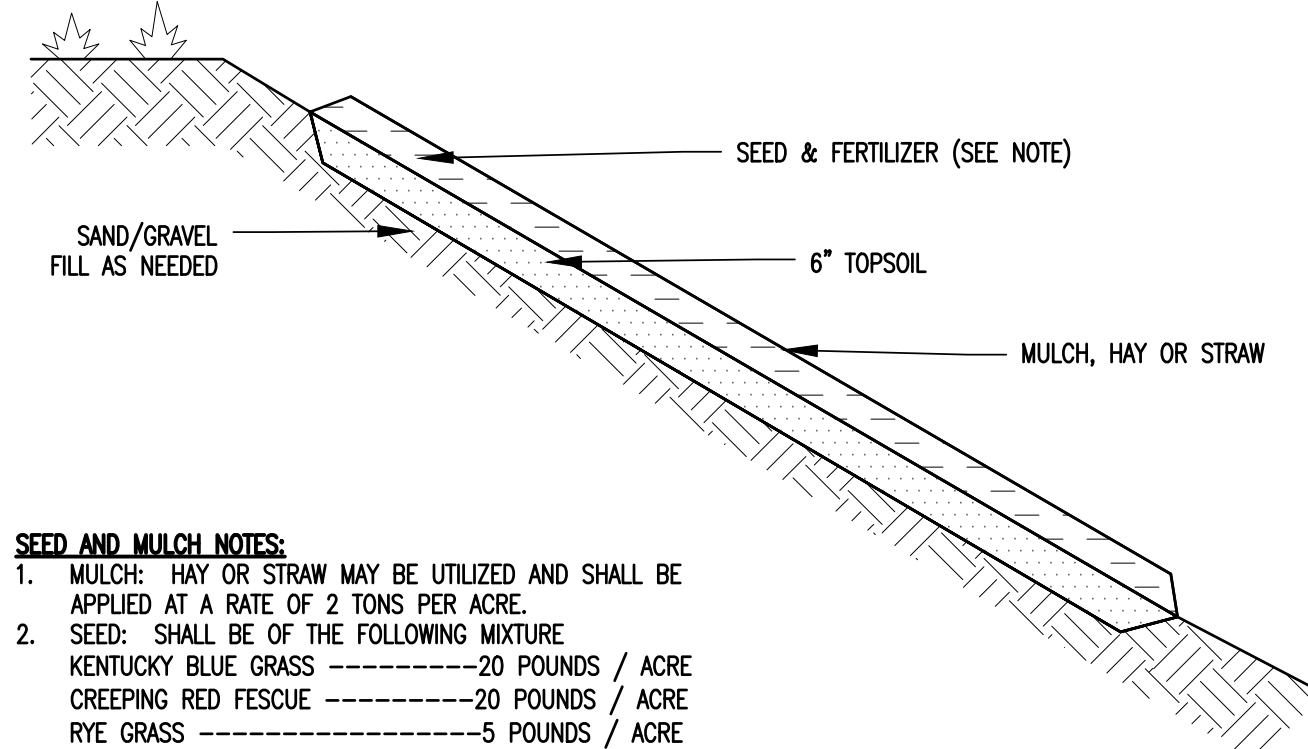
NOT TO SCALE 5



- SILT FENCE NOTES:**
1. SILT FENCE SHALL BE PRE-FABRICATED EROSION CONTROL FENCE BY MIRAFI OR APPROVED EQUIVALENT, OR CONSTRUCTED IN PLACE AS SPECIFIED HEREIN.
 2. CONSTRUCTED IN PLACE SILT FENCE:
 - A. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
 - B. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE TIES SPACED EVERY 24" AT TOP OF MID SECTION.
 - C. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6", FOLDED AND STAPLED.
 3. INSPECTION SHALL BE FREQUENT (MINIMUM ONCE A WEEK AND AFTER EVERY RAINFALL). MAINTENANCE SHALL BE PERFORMED AS NEEDED, AND SEDIMENT REMOVED WHEN 'BULGES' DEVELOP IN SILT FENCE.

SILT FENCE DETAIL

NOT TO SCALE 6



- SEED AND MULCH NOTES:**
1. MULCH: HAY OR STRAW MAY BE UTILIZED AND SHALL BE APPLIED AT A RATE OF 2 TONS PER ACRE.
 2. SEED: SHALL BE OF THE FOLLOWING MIXTURE

KENTUCKY BLUE GRASS	-----20 POUNDS / ACRE
CREeping RED FESCUE	-----20 POUNDS / ACRE
RYE GRASS	-----5 POUNDS / ACRE
 3. COVER SEED WITH 1/4 INCH SOIL UNLESS A HYDROSEEDER IS USED.
 4. MULCH ANCHORING: SHALL BE ACCOMPLISHED BY DEGRADABLE MULCH NETTING. USE WHEN SLOPES ARE GREATER THAN 10%.
 5. TOPSOIL AND MULCHING NOT TO BE APPLIED IN AREAS OF TRAVEL WAYS.
 6. SEEDING AND MULCHING OF DISTURBED AREAS SHALL TAKE PLACE WITHIN 48 HOURS OF FINAL GRADING.

SEEDED & MULCHED AREAS DETAIL

NOT TO SCALE 7

URBAN MIX GRASS SEED- FOR USE IN GRASSED LAWN AREAS AROUND BUILDING & PARKING		
% BY WEIGHT	LBS. LIVE SEED BY ACRE	TYPE OF SEED
37.5	45.0	CREeping RED FESCUE
31.25	37.5	KENTUCKY BLUEGRASS
31.25	37.5	WINTER HARDY, PERENNIAL RYE
100	120.0 # LIVE SEED/ ACRE	
CONSERVATION MIX GRASS SEED- FOR USE IN ALL OTHER AREAS		
% BY WEIGHT	LBS. LIVE SEED PER ACRE	TYPE OF SEED
35	77.0	CREeping RED FESCUE
20	44.0	KENTUCKY BLUE GRASS
15	33.0	CUTTER PERENNIAL RYE GRASS
15	33.0	ANNUAL RYE GRASS
10	22.0	TALL FESCUE
5	11.0	WHITE CLOVER
100	220.0 # LIVE SEED/ACRE	

FERTILIZER- 10 LBS. PER 1000S.F. SPRING SEEDING FALL SEEDING

LIME- 90 LBS. PER 1000S.F. DOLOMITIC GROUND LIMESTONE NOT LESS THAN 85% OF THE TOTAL CARBONATE

TOP SOIL 6" MINIMUM APPROVED TOPSOIL

STRAW MULCH- 2 BALES PER 1000S.F. APPLY BINDER OR NETTING AS NEEDED

SEED SPECIFICATION

NOT TO SCALE 8

EPSC 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. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 24-HOURS PRIOR TO ANY EARTH DISTURBING ACTIVITIES AND SHALL POST THE EROSION PREVENTION AND SEDIMENT CONTROL PLAN NOTICE IN FULL VIEW AT ALL TIMES DURING EARTH DISTURBANCE.
3. DISTURBANCE LIMITS ARE TO BE MARKED, AND THE FOLLOWING MANAGEMENT PRACTICES INSTALLED, PRIOR TO BEGINNING EARTHWORK IN ANY GIVEN AREA; SILT FENCE, CONSTRUCTION ENTRANCE, INLET PROTECTION & TREE PROTECTION FENCING.
4. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VERMONT DEC LOW RISK SITE HANDBOOK FOR EROSION PREVENTION & SEDIMENT CONTROL", DATED 2006.
5. DURING THE NON-WINTER CONSTRUCTION SEASON, ALL DISTURBED AREAS ARE TO BE STABILIZED (TEMPORARY OR FINAL) WITHIN 14-DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, ANY DISTURBANCE WITHIN THIS WORK AREA MUST BE STABILIZED AT THE END OF EACH WORK DAY, WITH THE FOLLOWING EXCEPTIONS:
 - A. STABILIZATION IS NOT REQUIRED IF WORK IS TO CONTINUE IN THE AREA WITHIN 24 HOURS AND NO PRECIPITATION IS FORECAST DURING THAT PERIOD
 - B. WORK IS OCCURRING WITHIN A SELF-CONTAINED EXCAVATION, 2-FEET OR MORE IN DEPTH.
6. THE PERIOD BETWEEN NOVEMBER 1ST AND APRIL 15TH IS CONSIDERED THE "WINTER CONSTRUCTION PERIOD". IF SOILS WILL BE EXPOSED AFTER NOVEMBER 1ST, A PLAN FOR WINTER CONSTRUCTION MUST BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER ON OR BEFORE OCTOBER 1ST. THE CONTRACTOR SHALL ENSURE SEDIMENT CONTROL IS INSTALLED PRIOR TO THE SOIL FREEZING. AN INSPECTION WILL BE REQUIRED IF THE PROJECT IS COMPLETED DURING THE WINTER MONTHS TO ENSURE THE SITE IS SECURED FOR THE REMAINDER OF THE SEASON.
7. DURING THE WINTER CONSTRUCTION SEASON, ANY NEW DISTURBANCE MUST BE STABILIZED (TEMPORARY OR FINAL) AT THE END OF EACH WORK DAY, WITH THE FOLLOWING EXCEPTIONS:
 - A. STABILIZATION IS NOT REQUIRED IF WORK IS TO CONTINUE IN THE AREA WITHIN 24 HOURS AND NO PRECIPITATION IS FORECAST DURING THAT PERIOD
 - B. WORK IS OCCURRING WITHIN A SELF-CONTAINED EXCAVATION, 2-FEET OR MORE IN DEPTH.
7. IN NO CASE SHALL SOIL BE EXPOSED FOR MORE THAN 14 DAY WITHOUT BEING STABILIZED.
8. ALL DISTURBED AREAS ARE TO BE PERMANENTLY STABILIZED WITHIN 48 HOURS OF FINAL GRADING.
9. THE PERIMETER OF THE SITE AND ALL BMPs SHALL BE INSPECTED AT THE END OF EACH WORK DAY TO ENSURE SEDIMENT DOES NOT LEAVE THE SITE. IF SEDIMENT HAS TRAVELED BEYOND THE PROJECT LIMITS, IT SHALL BE RELOCATED IN AN UPGRADED AREA ON SITE AT THE END OF EACH WORK DAY.
10. ALL STABILIZATION INVOLVING SEEDING IS TO BE COMPLETED BY SEPTEMBER 15TH.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTION OF THE ADJACENT ROADWAYS FOR OFF-SITE TRACKING OF SOIL MATERIALS. SOIL, STONE, AND DEBRIS FOUND LEAVING THE SITE ARE TO BE REMOVED (WHEN FOUND) BY SWEEPING AT THE END OF EACH CONSTRUCTION DAY, OR MORE FREQUENTLY WHEN NEEDED TO PREVENT IMPACTS TO ADJACENT ROADS AND SIGNALS.
12. IF DEWATERING IS REQUIRED FOR CONSTRUCTION, THE CONTRACTOR MUST UTILIZE SEDIMENT FILTER BAGS (OR ALTERNATE APPROVED BY THE ENGINEER) TO PREVENT DISCHARGE OF SEDIMENT-LADEN WATER OFF SITE.
13. 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.
14. STOCKPILED MATERIAL (TOPSOIL, BORROW, ETC.) SHALL HAVE SILT FENCE CONSTRUCTED AROUND THE PERIMETER. THE STOCKPILED MATERIAL SHALL BE SEEDING 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.
15. 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. S150BN AS MANUFACTURED OR APPROVED EQUIVALENT. INSTALL NETTING OVER MULCHED SLOPES SO THAT ALL PARTS ARE IN CONTACT WITH THE SOIL AND MULCH. PIN NETTING WITH WIRE STAPLES 3 FEET O.C. TO ENSURE FULL BONDING WITH SOIL SURFACE. THE SLOPE SURFACES 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.
16. THE OWNER SHALL BE NOTIFIED WHEN SITE WORK IS COMPLETED AND THE SITE IS STABILIZED.

SMITH
ALVAREZ
SIENKIEWYCZ
ARCHITECTS
117 St. Paul Street
3rd Floor
Burlington, VT
05401

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MECHANICAL/ELECTRICAL
LN CONSULTING
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P: 802-655-1753
F: 802-655-7628

SAS PROJECT NUMBER: 0917

PROJECT

HULA
BURLINGTON,
VERMONT

DATE: 09/20/2018
SCALE: AS NOTED
CHECKED: KW
DRAWN BY: HKW

REVISIONS

EPSC
NOTES
&
DETAILS

FOR PERMIT REVIEW
NOT FOR CONSTRUCTION
09/20/2018

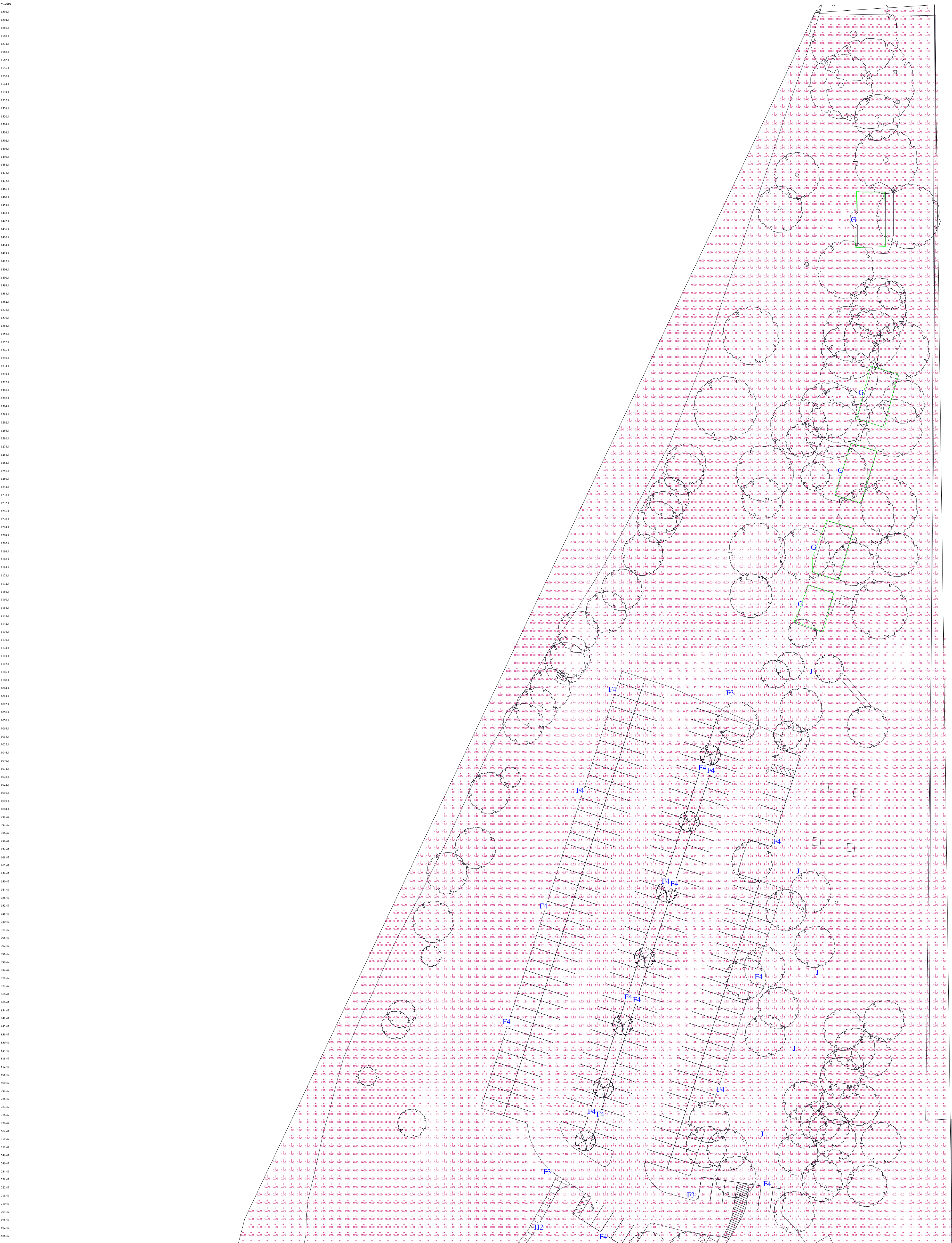
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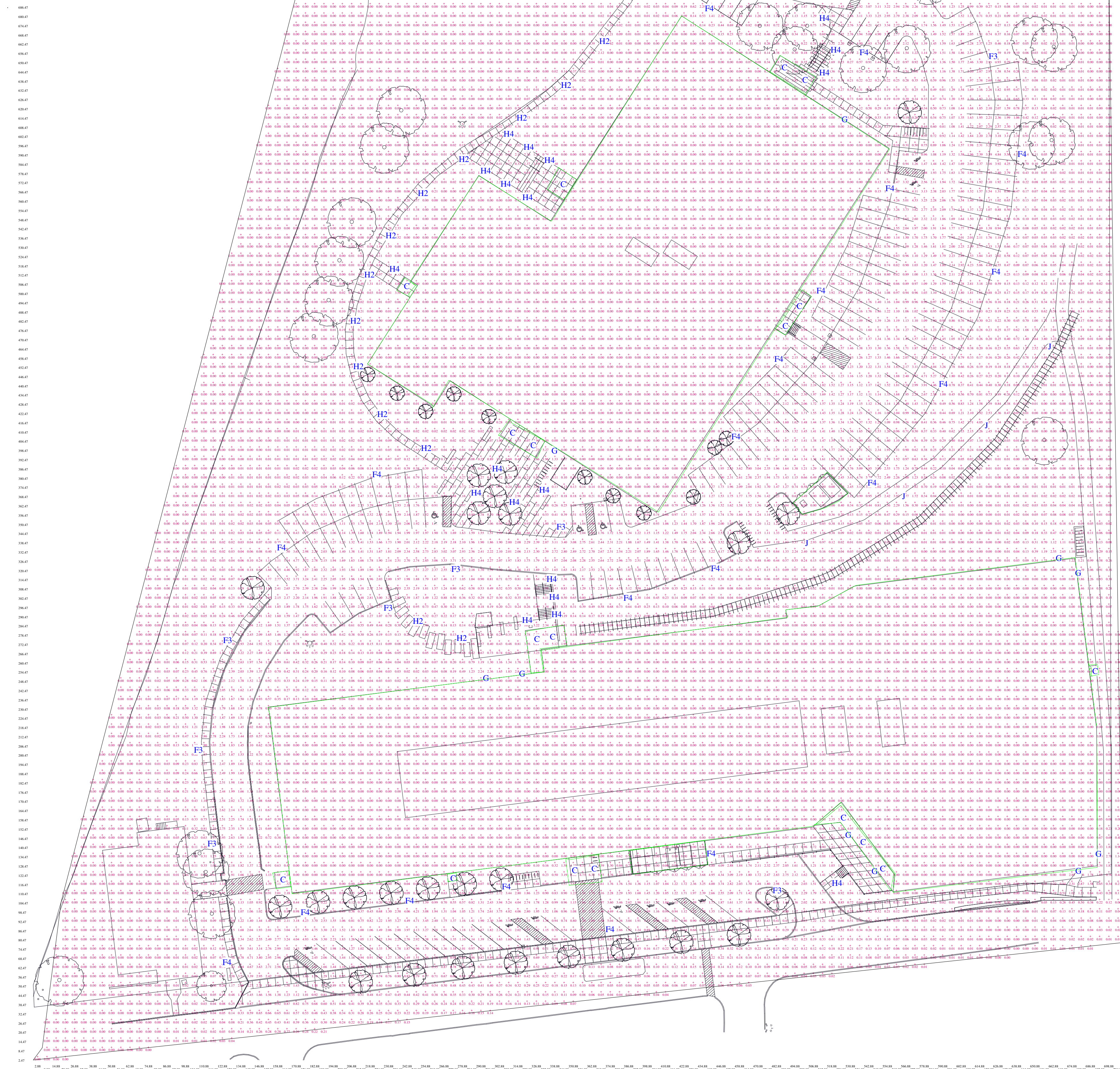
Computed in accordance with IES recommendations

Statistics					
GROUP	MIN	MAX	AVE	AVE/MIN	MAX/MIN
(+)	0.00	10.50	0.51	N/A	N/A

Luminaires Used

TYPE	QTY	TEST#	DESCRIPTION
C	18	LC6SL_6L	PRESCOLITE, LC6SL 6LCSL10L35K8, 6" LED Downlight, 3500K, 3 SDG, LAMPS: (1) NPSL757GT-V1, 1071 LUMENS, BLST: LED25W-36-C0700, LLF = 0.90
F3	11	ALED3T50	RAB LIGHTING IN, ALED3T50N - RWLED3T50N - RWLED3T50SFN - WPLED3T50N, CAST FINNED METAL HOUSING, 6 C, LED, MOLDED PLASTIC REFLECTOR LAMPS: (6) , 6522 LUMENS, BLST: , LLF = 0.90 @20.00
F4	36	ALED4T50	RAB LIGHTING IN, ALED4T50N - RWLED4T50N - RWLED4T50SFN - WPLED4T50N, CAST FINNED METAL HOUSING, 6 C, LED, MOLDED 2-PIECE PLASTIC RE LAMPS: (6) , 10504 LUMENS, BLST: , LLF = 0.90 @20.00
G	15	ra02318	RAB LIGHTING IN, WPLED10N (WALLPACK) - ALED10N (AREA LIGHTER) - BLE, CAST METAL HOUSING, ONE CIRCUIT REFLECTOR WITH SEMI-DIFFUSE F1 LAMPS: (1) , 1252 LUMENS, BLST: , LLF = 0.90
H2	14	303-B1-L	EATON - LUMIERE, 303-B1-LEDB1-4000-UNV-T4-DIM10-BK, LUMIERE EON 303-B1, SINGLE HEA, TEST IS SCALED FROM IESNA LM-7 LAMPS: (7) , 677 LUMENS, BLST: , LLF = 0.90 @3.50
H4	19	303-B1-L	EATON - LUMIERE, 303-B1-LEDB1-4000-UNV-T4-DIM10-BK, LUMIERE EON 303-B1, SINGLE HEA, TEST IS SCALED FROM IESNA LM-7 LAMPS: (7) , 846 LUMENS, BLST: , LLF = 0.90 @3.50
J	9	ALED18N	RAB LIGHTING IN, WPLED18N (WALLPACK) - ALED18N (AREA LIGHTER), CAST FINNED METAL HOUSING, MAC, CIRCUIT BOARD WITH 1 LED, MOLD LAMPS: (1) , 2520 LUMENS, BLST: , LLF = 0.90 @15.00





PROJECT: HULA/18164 GROUP: Permit Site Photometric AREA: ES1.11 Permit GRID: Ground
PREPARED BY:
VALUES ARE FC, SCALE: 1 IN= 40.0FT, HORZ GRID (U), HORZ CALC, Z= 0.0

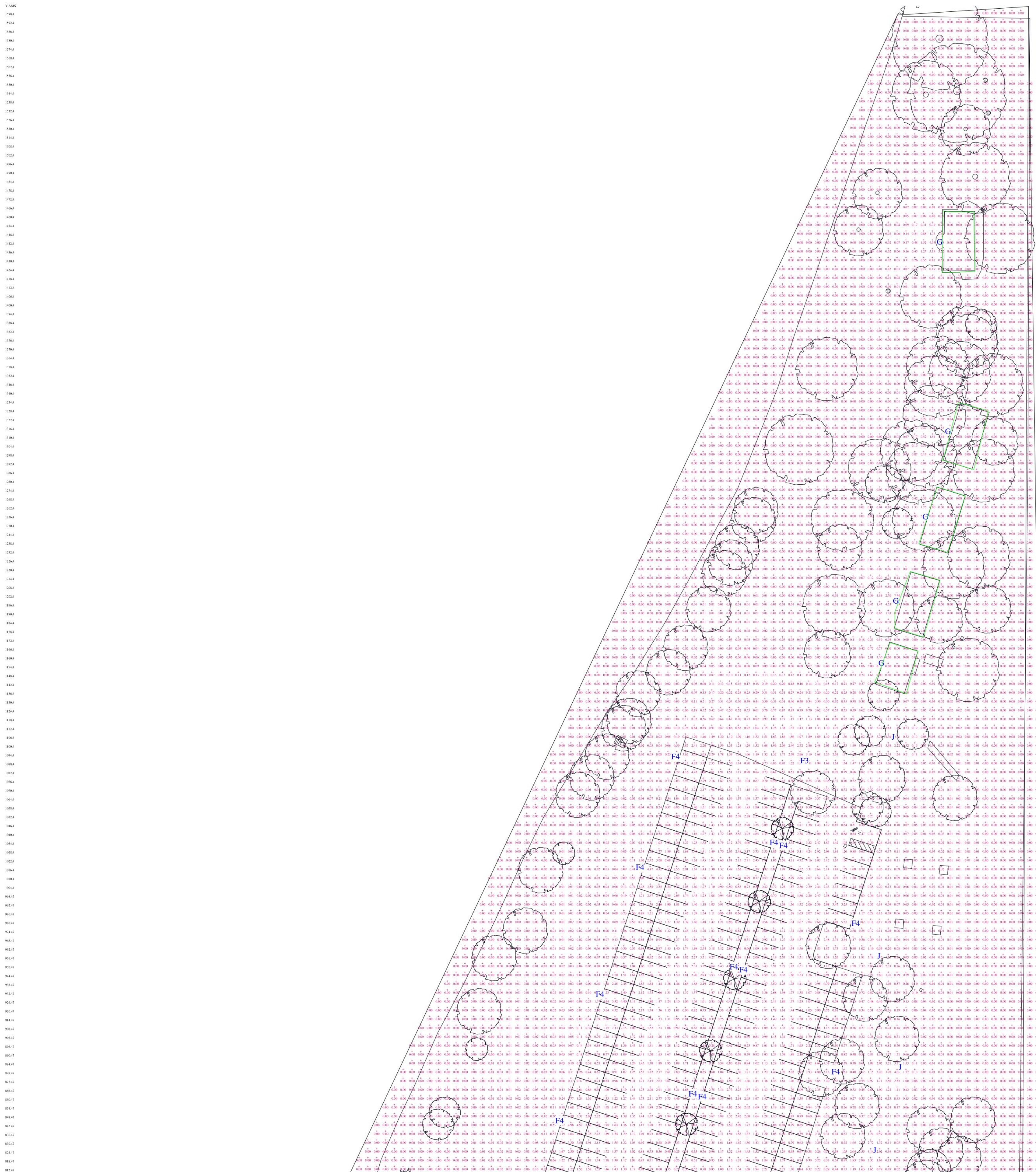
Computed in accordance with IES recommendations

Statistics						
	GROUP	MIN	MAX	AVE	AVE/MIN	MAX/MIN
(+)		0.00	10.50	0.51	N/A	N/A

Luminaires Used

TYPE	QTY	TEST#	DESCRIPTION
C	18	LC6SL_6L	PRESCOLITE, LC6SL, 6LCSL10L35K8, 6" LED Downlight, 3500K, 3 SDC, LAMPS: (1) NSFL75GT-V1, 1071 LUMENS, BLST: LED25W-36-C0700, LLF = 0.90
F3	11	ALED3T50	RAB LIGHTING IN, ALED3T50N - RWLED3T50N - RWLED3T50SFN - WPLED3T50N, CAST FINNED METAL HOUSING, 6 C, LED, MOLDED PLASTIC REFLECTOR LAMPS: (6) , 6522 LUMENS, BLST: , LLF = 0.90 @ 20.00
F4	36	ALED4T50	RAB LIGHTING IN, ALED4T50N - RWLED4T50N - RWLED4T50SFN - WPLED4T50N, CAST FINNED METAL HOUSING, 6 C, LED, MOLDED 2-PIECE PLASTIC RE LAMPS: (6) , 10504 LUMENS, BLST: , LLF = 0.90 @ 20.00
G	15	ra02318	RAB LIGHTING IN, WPLED10N (WALLPACK) - ALED10N (AREA LIGHTER) - BLE, CAST METAL HOUSING, ONE CIRCUI, REFLECTOR WITH SEMI-DIFFUSE FI LAMPS: (1) , 1252 LUMENS, BLST: , LLF = 0.90
H2	14	303-B1-L	EATON - LUMIERE, 303-B1-LEDB1-4000-UNV-T2-DIM10-BK, LUMIERE EON 303-B1, SINGLE HEA, TEST IS SCALED FROM IESNA LM-7 LAMPS: (7) , 677 LUMENS, BLST: , LLF = 0.90 @ 3.50
H4	19	303-B1-L	EATON - LUMIERE, 303-B1-LEDB1-4000-UNV-T4-DIM10-BK, LUMIERE EON 303-B1, SINGLE HEA, TEST IS SCALED FROM IESNA LM-7 LAMPS: (7) , 646 LUMENS, BLST: , LLF = 0.90 @ 3.50
J	9	ALED18N	RAB LIGHTING IN, WPLED18N (WALLPACK) - ALED18N (AREA LIGHTER), CAST FINNED METAL HOUSING, MAC, CIRCUIT BOARD WITH 1 LED, MOLD LAMPS: (1) , 2520 LUMENS, BLST: , LLF = 0.90 @ 15.00

LitePro 2030 Point-By-Point



PERMIT
DRAWING
09/21/2018

SMITH
ALVAREZ
SIENKIEWYCZ

ARCHITECTS

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3rd Floor
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05401

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ELECTRICAL
IN CONSULTING
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F: 802-655-7628

LNC PROJ. NUMBER: 18164

PROJECT

HULA
BURLINGTON,
VERMONT

DATE: 09/21/2018
SCALE: 1"=40'-0"
CHECKED: JEA
DRAWN BY: IWD

REVISIONS

PHASE

ACT 250 PERMIT SET

SITE PHOTOMETRIC
LIGHTING PLAN

ES1.11



6" LED Downlight LC6SL

1000/1400/1800 Lumens
120V-277V, 347V
0-10V Dimming

APPLICATIONS:

LiteFrame Commercial LC6SL is a 6" commercial grade LED downlight with available outputs between 1000-1800 lumens. This is suitable to replace most CFL downlighting applications, while realizing substantial energy and maintenance savings. Rated for a minimum of 50,000 hours life (70% lumen maintenance) with ambient plenum temperatures up to 35°C. Free Air Flow around the fixture is required for optimal life performance. This product is not recommended for use with 3rd party "FIREHAT" or insulation barriers.

HOUSING:

One-piece 22 gauge non-corrosive steel platform. Pre-wired J-box with snap-on cover for easy access. Snap-in connection from driver compartment allows easy installation of light engine/trim assembly and can be upgraded to accommodate technology improvements. Approved for 8 (4 in/4 out) No. 12 AWG conductors rated for 90°C through wiring.

REFLECTOR:

High purity aluminum, Alzak, iridescence suppressed, semi-diffuse reflector. Self-trim standard. Painted white self-trim (WT) available as option.

LED LIGHT ENGINE:

The LC6SL uses mid power Nichia LEDs, specifically mixed to provide a minimum of 80 CRI with 3 SDCM color consistency. The use of multiple mid power LEDs allows for optimal thermal management by effectively spreading the heat over a larger area and eliminating hot spots on the LEDs. A diffuse, yet highly transmissive lens obscures the view of the LEDs and creates a smooth, even look from below. The light engine is available in multiple Kelvin temperatures and the system is designed to provide optimal life and lumen maintenance (50,000 hours at 70% lumen maintenance). The reflector/light engine assembly is mechanically retained to the housing.

LED DRIVER:

The LC6SL utilizes a constant current LED driver. This same driver is capable of running all three different lumen outputs, resulting in a reduction of housing skus and simplified specification. The driver is UL8750, Class II compliant and universal 120V-277V.

DIMMING:

Comes standard with flicker-free 0-10V dimming to 10%. 0-10V to 1% dimming option is also available. See list of compatible dimmers on page (4). For the sizing of the control circuit, the dimming circuit may require up to 2mA of sink current.

INSTALLATION:

Light commercial bar hangers included (not with WWCP option). Universal adjustable mounting brackets also accept 1/2" EMT conduit or 1 1/2" or 3/4" lathing channel (by others) or Prescolite 24" bar hangers (B24 or B6). Wall wash orientation may be field adjusted in 90° increments to housing.

CERTIFICATIONS:

CSA certified to US and Canadian safety standards. Suitable for wet locations (EM, EMR and WW damp location). ENERGY STAR qualified.

WARRANTY:

5 year warranty. See www.prescolite.com for details.

DATE: _____ TYPE: _____

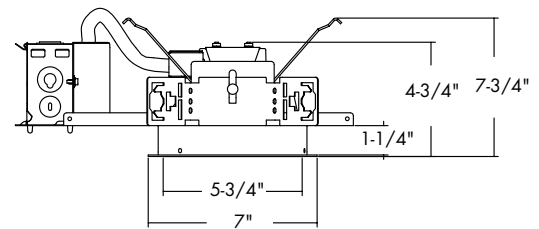
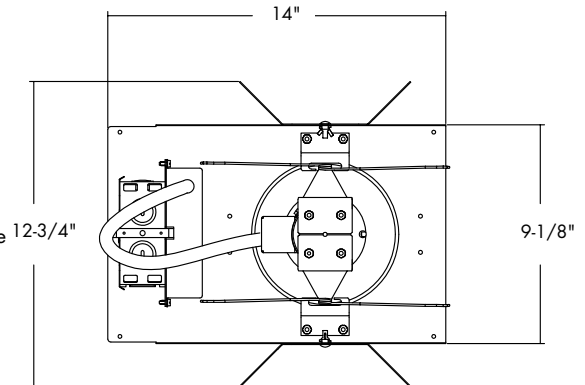
FIRM NAME: _____

PROJECT: _____

LiteFrame®



Ceiling Cutout: 6 1/4"
Maximum Ceiling Thickness 1 1/4"
For conversion to millimeters,
multiply inches by 25.4
Not to Scale



LC6SL 10L & 14L

- *See page 4 for LC6SL 18L line art
- *See page 4 for LC6SL EM line art
- *See page 4 for LC6SL CP line art
- *See page 4 for LC6SL WWCP line art

Order housing, reflector, and accessories separately

CATALOG NUMBER:

EXAMPLE: LC6SL-6LCSL14L35K9WT

HOUSING	DRIVER OPTIONS	VOLTAGE	HOUSING OPTIONS	TRIM APERTURE	OUTPUT	KELVIN	CRI	REF. FINISH/ COLOR OPTION	REFLECTOR OPTIONS	ACCESSORIES
☐ LC6SL Standard Lumen 0-10V Dimming to 10% 120V-277V	☐ Standard 0-10V 10% Dimming ☐ DM1 0-10V 1% Dimming	☐ Standard 120V-277V ☐ 347^{3,7,10} 347V	☐ EM^{2,4,8} Integral Battery Pack ☐ EMR⁴ Remote Battery Pack ☐ CP^{3,6,8} Chicago Plenum ☐ WWCP^{3,9} Wall Wash Chicago Plenum Housing	☐ 6LCSL Standard Lumen Clear Alzak Reflector	☐ 10L 1000 Lumen ☐ 14L 1400 Lumen ☐ 18L 1800 Lumen	☐ 27K 2700 Kelvin ☐ 30K 3000 Kelvin ☐ 35K 3500 Kelvin ☐ 40K 4000 Kelvin ☐ 50K 5000 Kelvin	☐ 8 80+ CRI ☐ 9 90+ CRI	☐ Standard Semi-Diffuse Clear Alzak ☐ WH Painted Matte White Reflector and Flange	☐ WT Painted White Flange Only ☐ WF Wide Flange ☐ WW^{4,5,7} Wall Wash ☐ EM^{2,4,8} Integral Battery Pack ☐ CP^{3,6} Chicago Plenum	☐ B24 Set of two(2) 24" bar hangers for T-bar ceilings ☐ B6 Set of two (2) bar hangers for ceiling joist up to 24" centers ☐ SCA6D Sloped ceiling adapter (see note on page 4) ☐ LiteGear¹ Inverter, single phase central lighting, 125VA-250VA ☐ LPS Series¹ LitePower micro-inverter, 20VA- 55VA

¹ See Central Inverter compatibility note and web links on page 4.
² EM must be selected on both the housing and the trim.
³ Not compatible with EM or EMR
⁴ Damp location only
⁵ Compatible with EMR only
⁶ CP must be selected on both the housing and the trim
⁷ Not compatible with CP
⁸ Not available with WW option
⁹ WW must be selected on trim
¹⁰ Not compatible with WWCP

PHOTOMETRIC DATA

LiteFrame - 6" LC6SL Downlight

DRIVER DATA	6LCSL10Lxxx	6LCSL14Lxxx	6LCSL18Lxxx
Input Voltage	120-277V	120-277V	120-277V
Input Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Input Current	0.111 (120v) 0.048 (277v)	0.148 (120v) 0.064 (277v)	0.185 (120v) 0.080 (277v)
Input Power	13.4W	17.8W	22.2W
Constant Current Output	700mA	700mA	700mA
Power Factor	≥0.90	≥0.90	≥0.90
THD	<25%	<20%	<20%
EMI Filtering	FCC 47CFR Part 15, Class A	FCC 47CFR Part 15, Class A	FCC 47CFR Part 15, Class A
Operating Temperature	-30°C to +35°C	-30°C to +28°C	-30°C to +25°C
Dimming	0-10V	0-10V	0-10V

Over-voltage, over-current, short-circuit protected

When operating in EM mode, the fixture will deliver approximately 30% of the published full lumen output.

Lumen Multiplier Table

Photometrics for the LC6SL are published below at a nominal 3500 Kelvin temperature. This table may be used to approximate the lumen values at different Kelvin temperatures. Power consumption would stay the same.

5000 Kelvin	1.09
4000 Kelvin	1.00
3500 Kelvin	1.00
3000 Kelvin	0.99
2700 Kelvin	0.96

LC6SL 6LCSL18L35K8

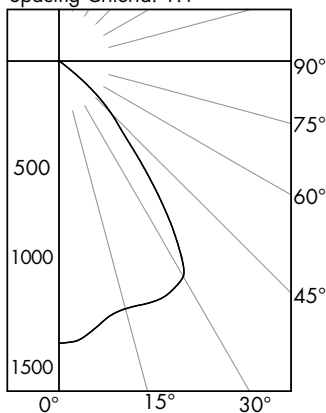
LED Light Engine: 3500K, 80+ CRI

System Wattage: 22.3W

Fixture Delivered Lumens: 1941

Fixture Efficacy: 87.0

Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG	CANDELA
0	1368
5	1345
15	1243
25	1247
35	923
45	357
55	27
65	5
75	1
85	0
90	0

Test No. 16.03178

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1935	99.7
0-90	1941	100.0
90-180	0	0.0
0-180	1941	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	27667
55°	2580
65°	648
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Room Cavity Ratio	% Effective Ceiling Cavity Reflectance															
	80%			70%			50%			30%			10%			
	20% Effective Floor Cavity Reflectance															
	% Wall Reflectance															
	70	50	30	10	70	50	30	10	50	30	10	50	30	10		
1	113	110	107	105	110	108	105	103	104	102	100	98	97	96	95	94
2	106	101	97	93	104	99	95	92	96	93	90	90	88	87	86	85
3	100	93	87	83	98	92	86	82	89	85	81	86	83	80	84	81
4	94	86	79	75	92	84	79	74	82	77	73	80	76	72	78	75
5	89	79	73	68	87	78	72	67	76	71	67	74	70	66	73	69
6	83	73	66	62	82	72	66	61	71	65	61	69	64	60	68	63
7	78	68	61	56	77	67	61	56	66	60	56	64	59	55	63	59
8	74	63	56	52	72	62	56	52	61	55	51	60	55	51	59	54
9	70	59	52	48	68	58	52	48	57	51	47	56	51	47	55	51
10	66	55	48	44	65	54	48	44	54	48	44	53	47	44	52	47

LC6SL 6LCSL18L35K8

Test No. 16.03178

LC6SL 6LCSL14L35K8

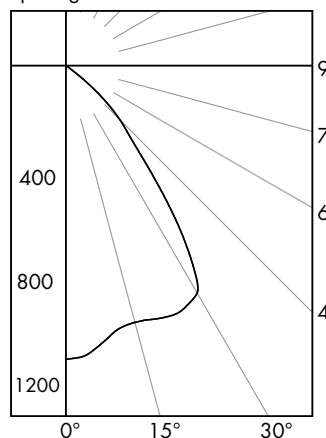
LED Light Engine: 3500K, 80+ CRI

System Wattage: 17.9W

Fixture Delivered Lumens: 1520

Fixture Efficacy: 84.9

Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG	CANDELA
0	1072
5	1050
15	971
25	990
35	721
45	277
55	20
65	4
75	1
85	0
90	0

Test No. 16.03177

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1515	99.7
0-90	1520	100.0
90-180	0	0.0
0-180	1520	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	21467
55°	1911
65°	519
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Room Cavity Ratio	% Effective Ceiling Cavity Reflectance															
	80%			70%			50%			30%			10%			
	20% Effective Floor Cavity Reflectance															
	% Wall Reflectance															
	70	50	30	10	70	50	30	10	50	30	10	50	30	10		
1	113	110	107	105	110	108	105	103	104	102	100	98	97	96	95	94
2	106	101	97	93	104	99	95	92	96	93	90	88	87	90	88	86
3	100	93	87	83	98	92	86	82	89	85	81	86	83	80	84	81
4	94	86	80	75	92	85	79	74	82	77	73	80	76	73	78	75
5	89	79	73	68	87	78	72	67	76	71	67	74	70	66	73	69
6	83	73	66	62	82	72	66	61	71	65	61	69	64	61	68	64
7	78	68	61	56	77	67	61	56	66	60	56	65	59	56	63	59
8	74	63	56	52	72	62	56	52	61	56	51	60	55	51	59	54
9	70	59	52	48	68	58	52	48	57	51	47	56	51	47	55	51
10	66	55	48	44	65	54	48	44	54	48	44	53	47	44	52	47

LC6SL 6LCSL14L35K8

Test No. 16.03177



Web: www.prescolite.com • Tech Support: (888) 777-4832
 701 Millennium Boulevard • Greenville, SC 29607 U.S.A. • Phone (864) 678-1000
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 Specifications subject to change without notice. • Printed in U.S.A. • LFR-LED-041 • 3/15/17



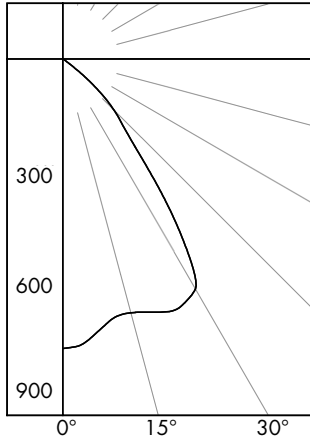
HUBBELL
Lighting, Inc.

PHOTOMETRIC DATA

LiteFrame - 6" LC6SL Downlight

LC6SL 6LC5L10L35K8

LED Light Engine: 3500K, 80+ CRI
System Wattage: 13.5W
Fixture Delivered Lumens: 1106
Fixture Efficacy: 81.9
Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG CANDELA

0	780
5	762
15	708
25	740
35	518
45	196
55	15
65	3
75	1
85	0
90	0

Test No. 16.03179

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1103	99.7
0-90	1106	100.0
90-180	0	0.0
0-180	1106	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	15190
55°	1433
65°	389
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

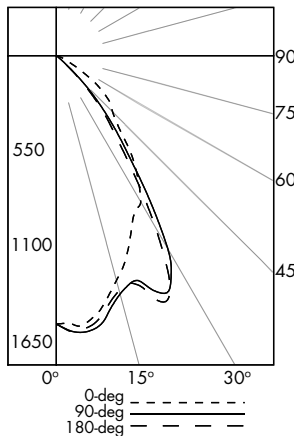
Room Cavity Ratio	% Effective Ceiling Cavity Reflectance																			
	80%				70%				50%				30%				10%			
	20% Effective Floor Cavity Reflectance																			
	% Wall Reflectance																			
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10			
1	113	110	107	105	110	108	105	103	104	102	100	100	98	97	96	95	94			
2	107	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86			
3	100	93	88	83	98	92	87	82	89	85	81	86	83	80	84	81	79			
4	94	86	80	75	92	85	79	74	82	77	74	80	76	73	78	75	72			
5	89	79	73	68	87	78	72	68	76	71	67	75	70	66	73	69	66			
6	83	73	67	62	82	73	66	62	71	65	61	69	65	61	68	64	60			
7	78	68	61	57	77	67	61	56	66	60	56	65	60	56	64	59	55			
8	74	63	57	52	73	63	56	52	61	56	52	60	55	51	59	55	51			
9	70	59	52	48	69	58	52	48	57	52	48	57	51	47	56	51	47			
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44			

LC6SL 6LC5L10L35K8

Test No. 16.03179

LC6SL 6LC5L18L35K8 WW

LED Light Engine: 3500K, 80+ CRI
System Wattage: 22.2W
Fixture Delivered Lumens: 1938
Fixture Efficacy: 87.3



CANDELA DISTRIBUTION

DEG	0	90	180
0	1527	1527	1527
5	1545	1581	1565
15	1324	1404	1383
25	1030	1489	1517
35	792	780	670
45	454	219	189
55	273	8	8
65	64	2	2
75	9	1	1
85	0	0	0
90	0	0	0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	0 DEG	90 DEG	180 DEG
45°	38311	18480	15949
55°	28400	832	832
65°	9036	282	282
75°	2075	231	231
85°	0	0	0

MULTIPLE UNITS			
1' 2' 3' 4'	UNITS ON 3' CENTER	UNITS ON 4' CENTER	

2' DISTANCE FIXTURE MOUNTED OUT FROM WALLS FOOTCANDLE DISTRIBUTION ON WALL SURFACE (DIRECT ONLY)

DISTANCE FROM CEILING IN FEET	15	11	6	2	1	15	5	15	15	1	15
1	15	11	6	2	1	15	5	15	15	1	15
2	40	36	26	13	5	41	27	41	40	10	40
3	36	35	28	18	11	41	36	41	36	22	36
4	22	22	22	19	13	33	39	33	25	27	25
5	14	14	14	14	13	27	30	27	20	25	20
6	10	10	9	9	9	24	22	24	16	19	16
7	7	7	6	6	6	19	18	19	14	14	14
8	5	5	5	4	4	15	15	15	12	11	12
9	4	4	3	3	3	12	13	12	10	9	10

LC6SL 6LC5L18L35K8 WW

Test No. 16.03309

Test No. 16.03309

Tested at 25°C Ambient in accordance to IESNA LM-79-2008



Web: www.prescolite.com • Tech Support: (888) 777-4832
701 Millennium Boulevard • Greenville, SC 29607 U.S.A. • Phone (864) 678-1000
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Specifications subject to change without notice. • Printed in U.S.A. • IFR-LED-041 • 3/15/17



HUBBELL
Lighting, Inc.

Dimming Compatibility Table

Dimming Ballast	Manufacturer	Web Link
DM/DM1	Lutron DTV	http://bit.ly/11jSvZg
DM/DM1	Leviton AWRMG-7xx, AWSMG-7xx, AWSMT-7xx	http://bit.ly/1BJn2R9

Central Inverters

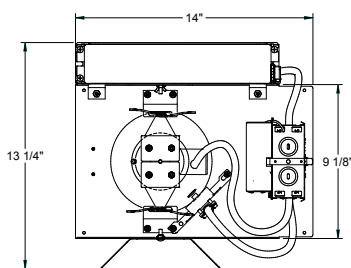
For full fixture output in back-up mode, we recommend you visit www.dual-lite.com for your Central Lighting Inverter options. Please contact your local Hubbell representative for any assistance with proper sizing and loading of your inverter selection. Central lighting inverters must be ordered separately.

LiteGear: www.dual-lite.com/products/litegear_lg_series

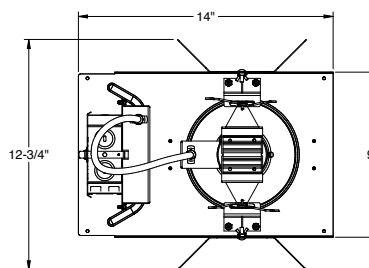
LPS Series: www.dual-lite.com/products/lps

SCA6D

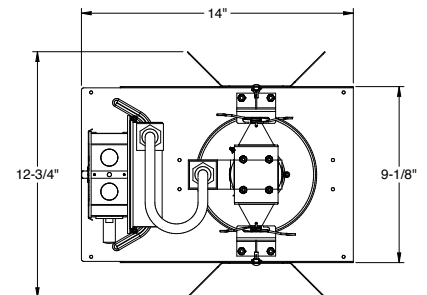
When ordering a sloped ceiling adapter, specify the degree of slope in 1° increments, maximum of 35°. For a more precise degree or wet ceiling applications, please contact factory. Sloped ceiling adapter and housing must be installed at the same time.



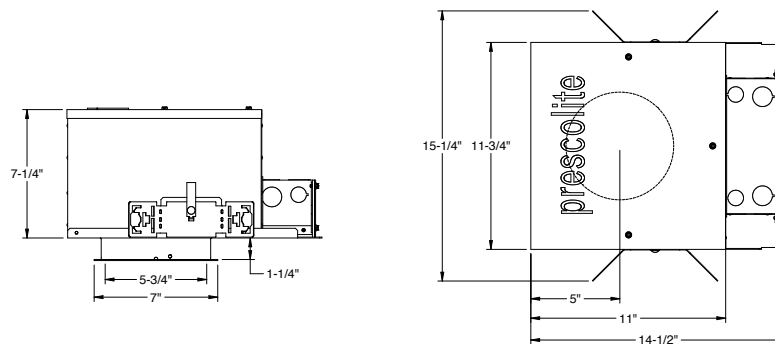
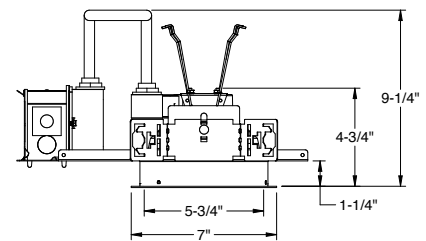
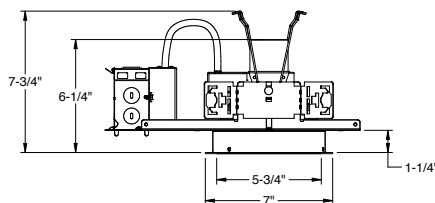
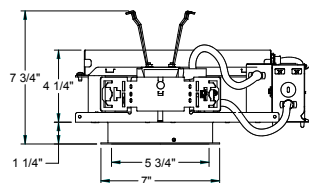
LC6SL EM



LC6SL 18L



LC6SL CP



LC6SL WWCP

ALED4T50NRG/BL



Color: Gray

Weight: 32.0 lbs

Project:	Type:
Prepared By:	Date:

Driver Info		LED Info	
Type:	Constant Current	Watts:	50W
120V:	0.46A	Color Temp:	4000K (Neutral)
208V:	0.27A	Color Accuracy:	72 CRI
240V:	0.23A	L70 Lifespan:	100000
277V:	0.20A	Lumens:	7256
Input Watts:	55W	Efficacy:	133 LPW
Efficiency:	91%		

Technical Specifications

Other

ALED4T50 with Bi-Level Operation:

Allows 50% and 100% output modes

Patents:

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

Equivalency:

Replaces 200W Metal Halide

Warranty:

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

Buy American Act Compliance:

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

Listings

DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities.
DLC Product Code: PSQ1RHAG

UL Listing:

Suitable for wet locations as a downlight

IESNA LM-79 & IESNA LM-80 Testing:

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

Dark Sky Conformance:

Conforms to (allows for conformance to) the IDA's fully shielding requirement, emitting no light above 90 degrees (with the exclusion of incidental light reflecting from fixture housing, mounts, and pole).

LED Characteristics

Lifespan:

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

LEDs:

Multi-chip, high-output, long-life LEDs

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Construction

IES Classification:

The Type IV distribution (also known as a Forward Throw) is especially suited for mounting on the sides of buildings and walls, and for illuminating the perimeter of parking areas. It produces a semiCircular distribution with essentially the same candlepower at lateral angles from 90° to 270°.

Effective Projected Area:

EPA = 0.75

IP Rating:

Ingress Protection rating of IP66 for dust and water

Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Cold Weather Starting:

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

Thermal Management:

Superior thermal management design with external Air-Flow fins provides maximum operational life, even in high ambient temperature environments

Housing:

Die cast aluminum housing, lens frame and mounting arm

Mounting:

Universal mounting arm compatible for hole spacing patterns from 1" to 5 1/2" center to center. Round Pole Adaptor plate included as a standard. Easy slide and lock to mount fixture with ease. Round pole diameter must be >4" to mount fixtures at 90° orientation.

Reflector:

Specular vacuum-metallized polycarbonate

Gaskets:

High temperature silicone gaskets

Finish:

Formulated for high-durability and long lasting color

Green Technology:

Mercury and UV-free. RoHS compliant components.

Technical Specifications (continued)

Electrical

Driver:

Constant Current, Class 2, 1400mA, 100-277V, 50-60Hz, 0.8A, Power Factor 99%

Surge Protection:

6kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2.

THD:

6.1% at 120V, 9.4% at 277V

Power Factor:

99.6% at 120V, 96% at 277V

Optical

BUG Rating:

B0 U0 G1

Features

- 66% energy cost savings vs. HID
- 100,000-hour LED lifespan
- 5-year warranty

Ordering Matrix

Family	Optics	Wattage	Mounting	Color Temp	Finish	Driver Options	Options	Other Options
ALED	4T	50	^	N	RG	/BL	^	^
	4T = Type IV	50 = 50W 66 = 66W	Blank = Pole mount SF = Slipfitter	Blank = 5000K (Cool) N = 4000K (Neutral) Y = 3000K (Warm)	Blank = Bronze RG = Roadway Gray W = White K = Black	Blank = 120-277V /480 = 480V /BL = Bi-Level /D10 = 0-10V Dimming	Blank = No Option /LC = Lightcloud® Controller /PCS = 120V Swivel Photocell /PCS2 = 277V Swivel Photocell /PCS4 = 480V Swivel Photocell /PCT4 = 480V Twistlock Photocell /WS2 = Multi-Level Motion Sensor 20 ft. /WS4 = Multi-Level Motion Sensor 40 ft.	Blank = Standard USA = BAA Compliant
	3T = Type III	78 = 78W						
	2T = Type II	105 = 105W 125 = 125W 150 = 150W						



LED 10W & 13 Wallpacks. Patent Pending thermal management system. 100,000 hour L70 lifespan. 5-year, no-compromise warranty.

Color: Bronze

Weight: 3.3 lbs

Project:

Type:

Prepared By:

Date:

Driver Info

Type: Constant Current
120V: 0.1A
208V: 0.07A
240V: 0.06A
277V: 0.05A
Input Watts: 12W
Efficiency: 82%

LED Info

Watts: 10W
Color Temp: 4000K (Neutral)
Color Accuracy: 74 CRI
L70 Lifespan: 100000
Lumens: 1208
Efficacy: 99 LPW

Technical Specifications

Listings

UL Listing:

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

IESNA LM-79 & IESNA LM-80 Testing:

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

LED Characteristics

Lifespan:

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

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Lumen Maintenance:

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

Construction

Finish:

Formulated for high-durability and long lasting color

Cold Weather Starting:

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

Maximum Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Thermal Management:

Cast aluminum Thermal Management system for optimal heat sinking. The LPACK is designed for cool operation, most efficient output and maximum LED life by minimizing LED junction temperature.

Housing:

Precision die cast aluminum housing, lens frame

Mounting:

Surface plate and Junction box

Green Technology:

Mercury and UV-free. RoHS compliant components.

Gaskets:

High Temperature Silicone

Electrical

Driver:

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

THD:

10.8% at 120V, 13.8% at 277V

Power Factor:

98.5% at 120V, 92.1% at 277V

Other

Patents:

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

Warranty:

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

Equivalency:

Equivalent to 70W Metal Halide

HID Replacement Range:

Replaces 35-100W Metal Halide

Buy American Act Compliance:

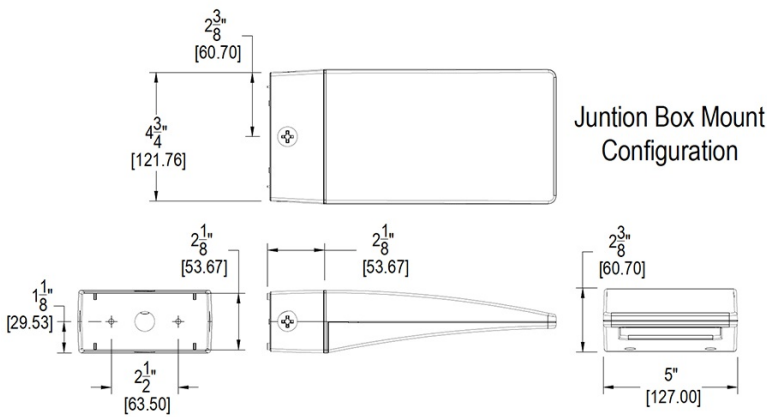
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

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

Ordering Matrix

Family	Wattage	Color Temp	Sensor	Surface Plate	Surface Place	Finish	Photocell	Other Options
WPLED								
	10 = 10W	Blank = 5000K (Cool)	Blank = No Sensor	Blank = No Surface Plate	S = Surface Plate	Blank = Bronze	Blank = No Photocell	USA = BAA Compliant
	13 = 13W	Y = 3000K (Warm) N = 4000K (Neutral)	MS = Mini Sensor			W = White	/PC = 120V Button /PCS = 120V Swivel /PC2 = 277V Button	Blank = Standard

DESCRIPTION

Eon 303-B1-LEDB1 is a compact, low profile, dimmable, LED bollard that provides downlight only via a fixed head. 303-B1-LEDB1 has a single head on one side of the luminaire. The bollard comes standard with universal input LED driver (120-277V, 50/60 Hz). Dimming is achieved with a standard ELV, reverse phase dimming driver or an optional 0-10V dimming driver. Eon fixtures may be used indoors or outdoors and carry an IP66 rating. The patented LumaLevel™ leveling system provides quick installation, easy adjustment, secure mounting and protection from vibration.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

The head of the 303-B1-LEDB1 is precision machined from corrosion-resistant 6061-T6 aluminum. Body is extruded aluminum and adjustable mounting base is cast from corrosion resistant aluminum alloy. Stainless steel hardware is included. Four (4) 3/8" x 12" galvanized anchor bolts and a galvanized steel anchor bolt template are standard. Specify option -LAB and order the anchor bolt/template kit separately (Catalog: 7581-01PK).

Optical

LightBAR™ and optical assembly are sealed by a clear, impact resistant tempered glass lens. The optical assembly is available in three distributions: T2 (lateral throw), T4 (forward throw) and T5X (Flood). Available in several color temperatures: 2700K, 3000K, 3500K,

4000K and TSAM (Amber). Both color temperature and distribution must be specified when ordering – see catalog logic for details. An edge-lit option is available.

Electrical

The bollard is standard with an ELV trailing edge phase dimmable driver that accepts a universal input (120-277, 50/60Hz). An optional 0-10V universal dimming driver is also available. Both driver options incorporate surge protection. The receptacle option incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. The photocell option comes in either a 120V or 277V. Please see Option section for more detail.

Finish

Luminaire and mounting base are double protected by a RoHS compliant chemical film undercoating and polyester powdercoat paint finish. The mounting base is painted black. The luminaire housing and head are available in a variety of standard colors. RAL and custom color matches are available upon request. As an option, the Eon bollards are also available in colors to match other outdoor Eaton product lines, such as Invue. See the Finish section in the ordering detail for more detail.

Warranty

Lumiere warrants the EON series of fixtures against defects in material and workmanship for five (5) years. Auxiliary equipment such as LED drivers carries the original manufacturer's warranty.



303-B1-LEDB1 EON LED

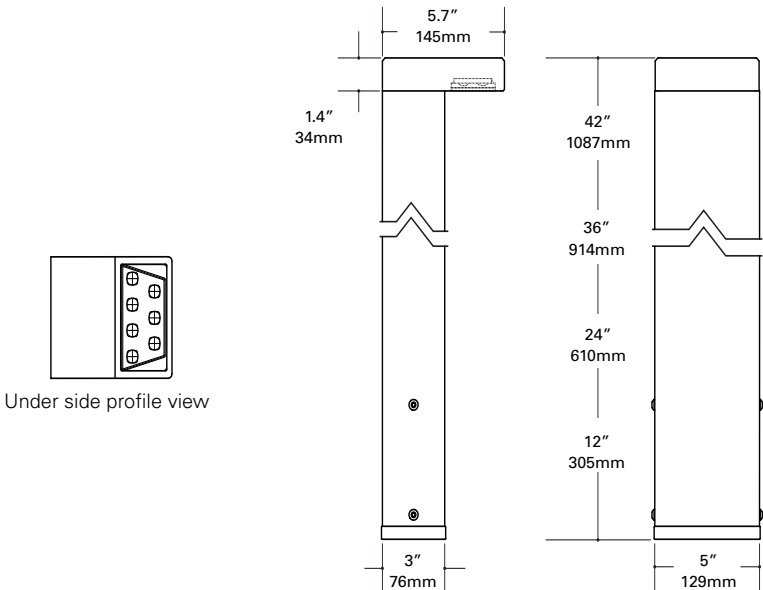
APPLICATIONS: BOLLARD

CERTIFICATION DATA

UL and cUL Wet Location Listed
LM79 / LM80 Compliant
ROHS Compliant
IP66 Ingress Protection Rated

TECHNICAL DATA

50°C Maximum Temperature Rating
External Supply Wiring 90°C Minimum



Under side profile view

ORDERING INFORMATION

Sample Number: 303-B1-LEDB1-2700-120-T2-DIM10-BK-42-EDGE-PC1-RFL-LAB

Series ¹	Color Temperature	Input Voltage	Optics	Dimming	Finish ³	Height ⁴	Options ⁶
303-B1-LEDB1 Head contains one (1) Mini LightBAR™	2700=2700K 3000=3000K 3500=3500K 4000= 4000K TSAM= Turtle Safe Amber (585-595nm)	UNV=120-277V ¹ 120=120V 277=277V ²	T2 = Type II, Lateral Throw T4 = Type IV, Forward Throw T5X = Type V, Extra Wide Flood	DIMELV=Trailing Edge Phase Dimming Driver DIM10=0-10V Dimming Driver	Painted BK=Black BZ=Bronze CS=City Silver WT=White Premium Paint AP=Grey DP=Dark Platinum GM=Graphite Metallic	12=12" ⁵ 24=24" 36=36" 42=42"	EDGE=Edge lit glass lens PC1=Photocontrol 120V ⁷ PC2=Photocontrol 208-277V ⁷ RIU=Receptacle - In Use (120V Only) ⁷ RFL=Receptacle - Flip-Lid (120V Only) ⁷ LAB=Less Anchor Bolts & Template ⁸

NOTES: 1 Universal Voltage (UNV) is standard unless specifying Photocontrol or Receptacle (RIU or RFL - 120V) options. 2 Specify for PC2 option only. 3 Custom and RAL color matching available upon request. Consult factory for further information. 4 Bollard heights are nominal (shown in inches). 5 12" length not available with RIU or RFL options. 6 Add suffix in the order shown. 7 Must specify voltage when ordering. 8 When specifying LAB option the anchor bolts and template need to be ordered separately 7581-01PK. 9 DesignLights Consortium™ Qualified and classified for DLC Standard. Refer to www.designlights.org for details on exact qualified EON 303-B1-LEDB1 product as not all configurations are DLC classified.

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	TM-21 Reported L70(10k) (Hours)	Theoretical L70 (Hours)
25°C	> 94%	> 60,000	365,000
40°C			
50°C			

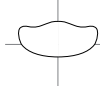
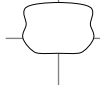
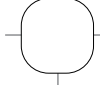
CURRENT DRAW

Model	Line Voltage	Current Draw
303-B1-LEDB1	120-277V, 50/60Hz	0.068A

MAX LOAD RATING

Options	Line Voltage	Max Load Rating
PC1	120V, 50/60Hz	1000VA, 8.3A
PC2	208-277V, 50/60Hz	
RIU or RFL	120V, 50/60Hz	1800VA, 15A

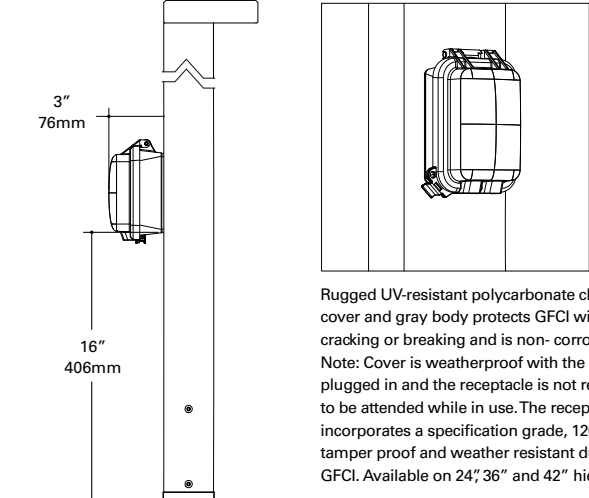
LUMENS - CRI/CCT TABLE

Optic Type	Distribution	Watts	Delivered Lumens	LPW	CCT (K) / Color	CRI nom. / Wavelength	B-U-G Rating
T2 (Lateral Throw)		8.5	361	44	2700	95	B0-U0-G0
			600	74	3000	75	
			419	51	3500	85	
			661	81	4000	75	
		6.5	184	28	TSAM (Amber)	585-595nm	
T4 (Forward Throw)		8.5	353	43	2700	95	B0-U0-G0
			587	72	3000	75	
			410	50	3500	85	
			647	79	4000	75	
		6.5	180	28	TSAM (Amber)	585-595nm	
T5X (Extra Wide Flood)		8.5	316	39	2700	95	B0-U0-G0
			525	65	3000	75	
			367	45	3500	85	
			579	71	4000	75	
		6.5	161	25	TSAM (Amber)	585-595nm	

OPTIONS

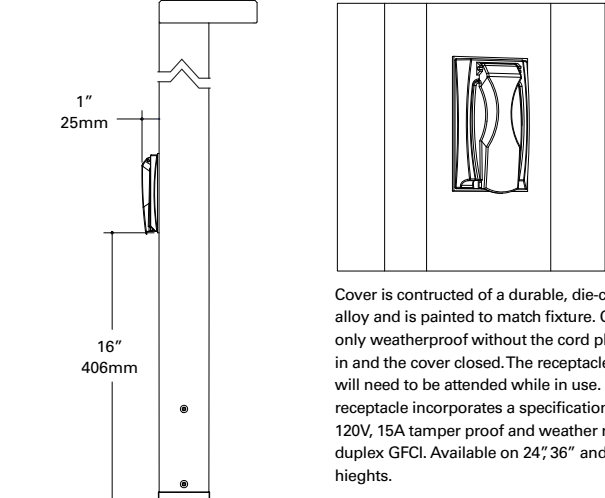
Receptacle Options (120V Only)

RIU - Receptacle In-Use



Rugged UV-resistant polycarbonate clear cover and gray body protects GFCI without cracking or breaking and is non-corrosive. Note: Cover is weatherproof with the cord plugged in and the receptacle is not required to be attended while in use. The receptacle incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. Available on 24", 36" and 42" heights.

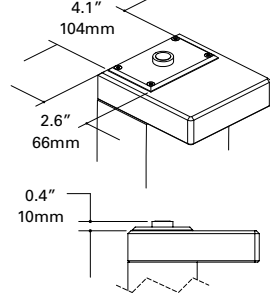
RFL - Receptacle Flip Lid



Cover is constructed of a durable, die-cast zinc-alloy and is painted to match fixture. Cover is only weatherproof without the cord plugged in and the cover closed. The receptacle will need to be attended while in use. The receptacle incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. Available on 24", 36" and 42" heights.

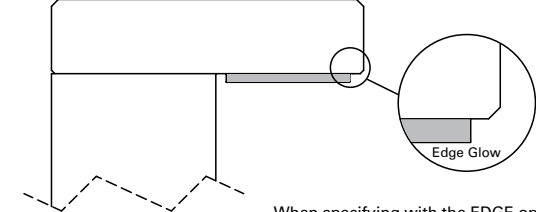
Photocontrol

PC1 (120V) or PC2 (277V)



Photocontrol cover is precision machined from corrosion-resistant 6061-T6 aluminum and is secured to bollard head with tamper resistant stainless steel hardware. The photocontrol option is available in dedicated 120V or 208-277V. When specifying a photocontrol option make sure to designate the appropriate voltage within the catalog logic.

Edge



When specifying with the EDGE option, the diffused glass becomes thicker adding a visible line of light around the edge accentuating the luminaries' aesthetics and styling.

TECHNICAL NOTES:

1. Adjustable mounting base - Cast aluminum mounting base is equipped with the patented LumaLevel™ leveling system that includes mounting base, 70 shore neoprene base, stainless steel hardware and a slot to accommodate two inbound and outbound 3/4" conduits. It provides quick installation, easy adjustment, secure mounting and protection from vibration.



Color: Bronze

Weight: 6.3 lbs

Project:

Type:

Prepared By:

Date:

Driver Info

Type: Constant Current
120V: 0.17A
208V: 0.11A
240V: 0.10A
277V: 0.09A
Input Watts: 29W
Efficiency: 88%

LED Info

Watts: 26W
Color Temp: 4000K (Neutral)
Color Accuracy: 71 CRI
L70 Lifespan: 100000
Lumens: 3468
Efficacy: 118 LPW

Technical Specifications

Listings

UL Listing:

Suitable for wet locations

DLC Listed:

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

DLC Product Code: P0000175R

IESNA LM-79 & IESNA LM-80 Testing:

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

Dark Sky Conformance:

Conforms to (allows for conformance to) the IDA's fully shielding requirement, emitting no light above 90 degrees (with the exclusion of incidental light reflecting from fixture housing, mounts, and pole).

LED Characteristics

Lifespan:

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

Lumen Maintenance:

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

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Construction

IES Classification:

The Type IV distribution (also known as a Forward Throw) is especially suited for mounting on the sides of buildings and walls, and for illuminating the perimeter of parking areas. It produces a semiCircular distribution with essentially the same candlepower at lateral angles from 90° to 270°.

Housing:

Precision die cast aluminum housing, lens frame

Gaskets:

High temperature silicone

Effective Projected Area:

EPA = 0.27.

Finish:

Formulated for high-durability and long lasting color

Green Technology:

Mercury and UV-free. RoHS compliant components

Ambient Temperature:

SuitableFor use in 40°C (104°F) ambient temperatures

Cold Weather Starting:

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

Electrical

Driver:

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

Other

Patents:

The ALED design is protected by U.S. PATENT D608,040 and patents pending in the U.S., Canada, China, Taiwan and Mexico.

Equivalency:

Equivalent to 70W Metal Halide

Warranty:

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

Buy American Act Compliance:

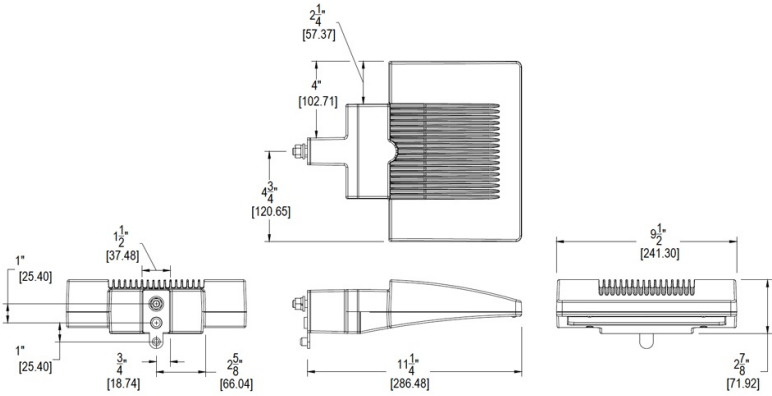
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

- High output LED light engine
- Maintains 70% of initial lumens at 100,000 hours
- Weatherproof high temperature silicone gaskets
- Superior heat sinking with die cast aluminum housing and external fins

Ordering Matrix

Family	Wattage	Color Temp	Photocell	Finish	Other Options
ALED	10 = 10W 13 = 13W 18 = 18W 20 = 20W	Blank = 5000K (Cool) Y = 3000K (Warm) N = 4000K (Neutral)	Blank = No Photocell /PC = 120V Button /PC2 = 277V Button	Blank = Bronze W = White	Blank = Standard USA = BAA Compliant

DESCRIPTION

Eon 303-B1-LEDB1 is a compact, low profile, dimmable, LED bollard that provides downlight only via a fixed head. 303-B1-LEDB1 has a single head on one side of the luminaire. The bollard comes standard with universal input LED driver (120-277V, 50/60 Hz). Dimming is achieved with a standard ELV, reverse phase dimming driver or an optional 0-10V dimming driver. Eon fixtures may be used indoors or outdoors and carry an IP66 rating. The patented LumaLevel™ leveling system provides quick installation, easy adjustment, secure mounting and protection from vibration.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

The head of the 303-B1-LEDB1 is precision machined from corrosion-resistant 6061-T6 aluminum. Body is extruded aluminum and adjustable mounting base is cast from corrosion resistant aluminum alloy. Stainless steel hardware is included. Four (4) 3/8" x 12" galvanized anchor bolts and a galvanized steel anchor bolt template are standard. Specify option -LAB and order the anchor bolt/template kit separately (Catalog: 7581-01PK).

Optical

LightBAR™ and optical assembly are sealed by a clear, impact resistant tempered glass lens. The optical assembly is available in three distributions: T2 (lateral throw), T4 (forward throw) and T5X (Flood). Available in several color temperatures: 2700K, 3000K, 3500K,

4000K and TSAM (Amber). Both color temperature and distribution must be specified when ordering – see catalog logic for details. An edge-lit option is available.

Electrical

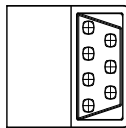
The bollard is standard with an ELV trailing edge phase dimmable driver that accepts a universal input (120-277, 50/60Hz). An optional 0-10V universal dimming driver is also available. Both driver options incorporate surge protection. The receptacle option incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. The photocell option comes in either a 120V or 277V. Please see Option section for more detail.

Finish

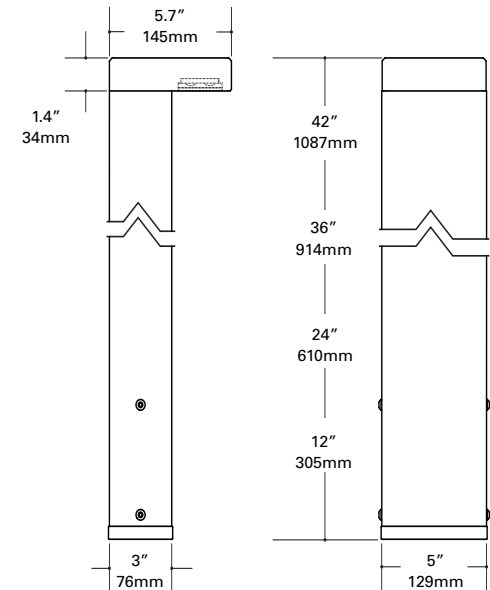
Luminaire and mounting base are double protected by a RoHS compliant chemical film undercoating and polyester powdercoat paint finish. The mounting base is painted black. The luminaire housing and head are available in a variety of standard colors. RAL and custom color matches are available upon request. As an option, the Eon bollards are also available in colors to match other outdoor Eaton product lines, such as Invue. See the Finish section in the ordering detail for more detail.

Warranty

Lumiere warrants the EON series of fixtures against defects in material and workmanship for five (5) years. Auxiliary equipment such as LED drivers carries the original manufacturer's warranty.



Under side profile view



303-B1-LEDB1 EON LED

APPLICATIONS: BOLLARD

CERTIFICATION DATA

UL and cUL Wet Location Listed
LM79 / LM80 Compliant
ROHS Compliant
IP66 Ingress Protection Rated

TECHNICAL DATA

50°C Maximum Temperature Rating
External Supply Wiring 90°C Minimum



ORDERING INFORMATION

Sample Number: 303-B1-LEDB1-2700-120-T2-DIM10-BK-42-EDGE-PC1-RFL-LAB

Series ¹	Color Temperature	Input Voltage	Optics	Dimming	Finish ³	Height ⁴	Options ⁶
303-B1-LEDB1 Head contains one (1) Mini LightBAR™	2700=2700K 3000=3000K 3500=3500K 4000= 4000K TSAM= Turtle Safe Amber (585-595nm)	UNV=120-277V ¹ 120=120V 277=277V ²	T2 = Type II, Lateral Throw T4 = Type IV, Forward Throw T5X = Type V, Extra Wide Flood	DIMELV=Trailing Edge Phase Dimming Driver DIM10=0-10V Dimming Driver	Painted BK=Black BZ=Bronze CS=City Silver WT=White Premium Paint AP=Grey DP=Dark Platinum GM=Graphite Metallic	12=12" ⁵ 24=24" 36=36" 42=42"	EDGE=Edge lit glass lens PC1=Photocontrol 120V ⁷ PC2=Photocontrol 208-277V ⁷ RIU=Receptacle - In Use (120V Only) ⁷ RFL=Receptacle - Flip-Lid (120V Only) ⁷ LAB=Less Anchor Bolts & Template ⁸

NOTES: 1 Universal Voltage (UNV) is standard unless specifying Photocontrol or Receptacle (RIU or RFL - 120V) options. 2 Specify for PC2 option only. 3 Custom and RAL color matching available upon request. Consult factory for further information. 4 Bollard heights are nominal (shown in inches). 5 12" length not available with RIU or RFL options. 6 Add suffix in the order shown. 7 Must specify voltage when ordering. 8 When specifying LAB option the anchor bolts and template need to be ordered separately 7581-01PK. 9 DesignLights Consortium™ Qualified and classified for DLC Standard. Refer to www.designlights.org for details on exact qualified EON 303-B1-LEDB1 product as not all configurations are DLC classified.

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	TM-21 Reported L70(10k) (Hours)	Theoretical L70 (Hours)
25°C	> 94%	> 60,000	365,000
40°C			
50°C			

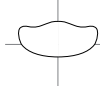
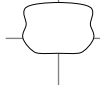
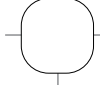
CURRENT DRAW

Model	Line Voltage	Current Draw
303-B1-LEDB1	120-277V, 50/60Hz	0.068A

MAX LOAD RATING

Options	Line Voltage	Max Load Rating
PC1	120V, 50/60Hz	1000VA, 8.3A
PC2	208-277V, 50/60Hz	
RIU or RFL	120V, 50/60Hz	1800VA, 15A

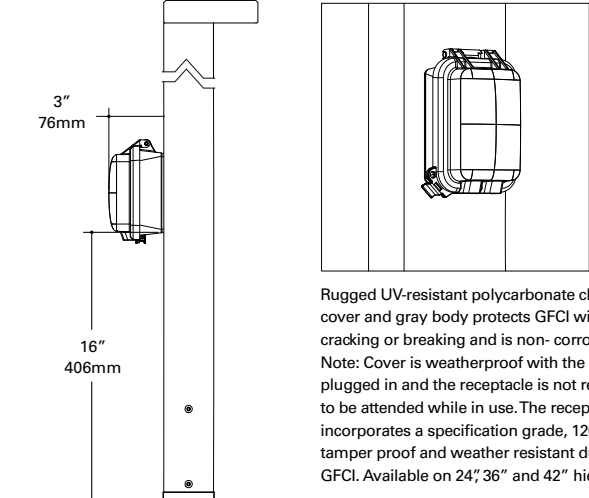
LUMENS - CRI/CCT TABLE

Optic Type	Distribution	Watts	Delivered Lumens	LPW	CCT (K) / Color	CRI nom./ Wavelength	B-U-G Rating
T2 (Lateral Throw)		8.5	361	44	2700	95	B0-U0-G0
			600	74	3000	75	
			419	51	3500	85	
			661	81	4000	75	
		6.5	184	28	TSAM (Amber)	585-595nm	
T4 (Forward Throw)		8.5	353	43	2700	95	B0-U0-G0
			587	72	3000	75	
			410	50	3500	85	
			647	79	4000	75	
		6.5	180	28	TSAM (Amber)	585-595nm	
T5X (Extra Wide Flood)		8.5	316	39	2700	95	B0-U0-G0
			525	65	3000	75	
			367	45	3500	85	
			579	71	4000	75	
		6.5	161	25	TSAM (Amber)	585-595nm	

OPTIONS

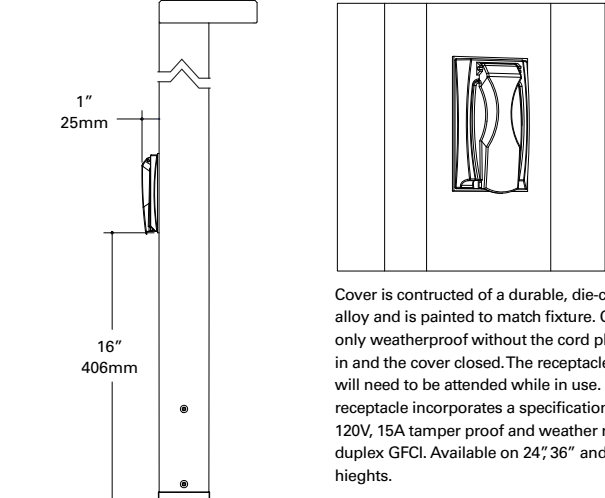
Receptacle Options (120V Only)

RIU - Receptacle In-Use



Rugged UV-resistant polycarbonate clear cover and gray body protects GFCI without cracking or breaking and is non-corrosive. Note: Cover is weatherproof with the cord plugged in and the receptacle is not required to be attended while in use. The receptacle incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. Available on 24", 36" and 42" heights.

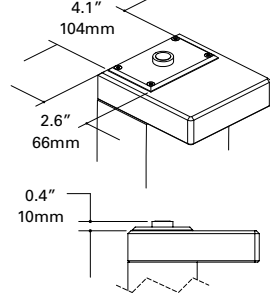
RFL - Receptacle Flip Lid



Cover is constructed of a durable, die-cast zinc-alloy and is painted to match fixture. Cover is only weatherproof without the cord plugged in and the cover closed. The receptacle will need to be attended while in use. The receptacle incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. Available on 24", 36" and 42" heights.

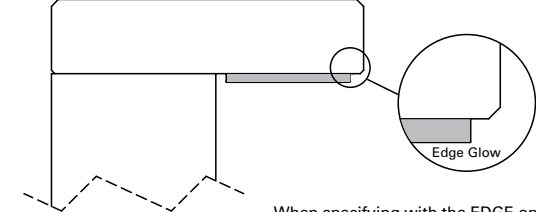
Photocontrol

PC1 (120V) or PC2 (277V)



Photocontrol cover is precision machined from corrosion-resistant 6061-T6 aluminum and is secured to bollard head with tamper resistant stainless steel hardware. The photocontrol option is available in dedicated 120V or 208-277V. When specifying a photocontrol option make sure to designate the appropriate voltage within the catalog logic.

Edge



When specifying with the EDGE option, the diffused glass becomes thicker adding a visible line of light around the edge accentuating the luminaries' aesthetics and styling.

TECHNICAL NOTES:

1. Adjustable mounting base - Cast aluminum mounting base is equipped with the patented LumaLevel™ leveling system that includes mounting base, 70 shore neoprene base, stainless steel hardware and a slot to accommodate two inbound and outbound 3/4" conduits. It provides quick installation, easy adjustment, secure mounting and protection from vibration.

DESCRIPTION

Eon 303-B1-LEDB2 is a compact, low profile, dimmable, LED bollard that provides downlight only via a fixed head. 303-B1-LEDB2 has a single head on one side of the luminaire. The bollard comes standard with universal input LED drivers (120-277V, 50/60 Hz). Dimming is achieved with a standard ELV, reverse phase dimming driver or an optional 0-10V dimming driver. Eon fixtures may be used indoors or outdoors and carry an IP66 rating. The patented LumaLevel™ leveling system provides quick installation, easy adjustment, secure mounting and protection from vibration.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

The head of the 303-B1-LEDB2 is precision machined from corrosion-resistant 6061-T6 aluminum. Body is extruded aluminum and adjustable mounting base is cast from corrosion resistant aluminum alloy. Stainless steel hardware is included. Four (4) 3/8" x 12" galvanized anchor bolts and a galvanized steel anchor bolt template are standard. Specify option -LAB and order the anchor bolt/template kit separately (Catalog: 7581-01PK).

Optical

LightBAR™ and optical assembly are sealed by a clear, impact resistant tempered glass lens. The optical assembly is available in three distributions: T2 (lateral throw), T4 (forward throw) and T5X (Flood). Available in several color temperatures: 2700K, 3000K, 3500K,

4000K and TSAM (Amber). Both color temperature and distribution must be specified when ordering – see catalog logic for details. An edge-lit option is available.

Electrical

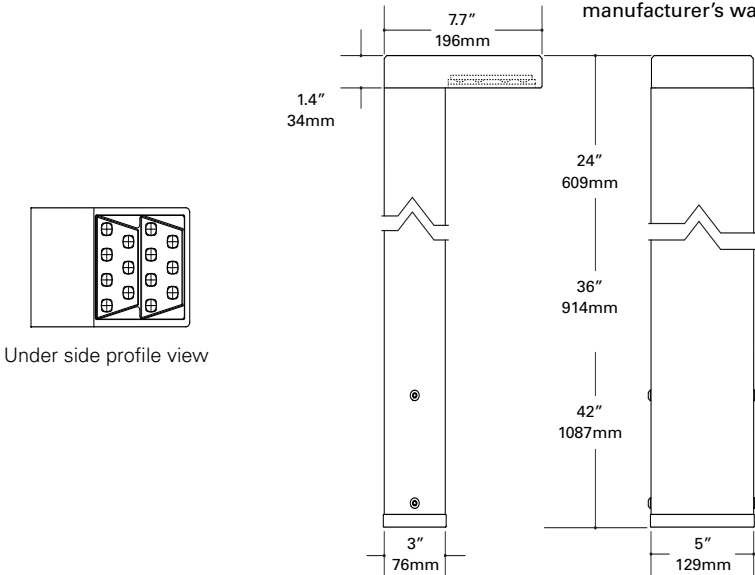
The bollard is standard with an ELV trailing edge phase dimmable driver that accepts a universal input (120-277, 50/60Hz). The standard driver is ELV trailing edge phase dimmable. An optional 0-10V dimming driver is also available. Both driver options incorporate surge protection. The receptacle option incorporates a specification grade, 120V, 15A tamper proof and weather resistant duplex GFCI. The photocell option comes in either a 120V or 277V. Please see Option section for more detail.

Finish

Luminaire and mounting base are double protected by a RoHS compliant chemical film undercoating and polyester powdercoat paint finish. The mounting base is painted black. The luminaire housing and head are available in a variety of standard colors. RAL and custom color matches are available upon request. As an option, the Eon bollards are also available in colors to match other outdoor Eaton product lines, such as Invue. See the Finish section in the ordering detail for more detail. The LightBAR™ cover plates are standard white.

Warranty

Lumière warrants the EON series of fixtures against defects in material and workmanship for five (5) years. Auxiliary equipment such as LED drivers carries the original manufacturer's warranty.



Under side profile view

303-B1-LEDB2 EON LED

APPLICATIONS: BOLLARD

CERTIFICATION DATA

UL and cUL Wet Location Listed
LM79 / LM80 Compliant
ROHS Compliant
IP66 Ingress Protection Rated

TECHNICAL DATA

50°C Maximum Temperature Rating
External Supply Wiring 90°C Minimum



ORDERING INFORMATION

Sample Number: 303-B1-LEDB2-2700-120-T2-DIM10-BK-42-EDGE-PC1-RFL-LAB

Series ¹	Color Temperature	Input Voltage	Optics	Dimming	Finish ³	Height ⁴	Options ⁵
303-B1-LEDB2 Head contains two (2) Mini LightBAR™	2700=2700K 3000=3000K 3500=3500K 4000= 4000K TSAM=Turtle Safe Amber (585-595nm)	UNV=120-277V ¹ 120=120V 277=277V ²	T2 = Type II, Lateral Throw T4 = Type IV, Forward Throw T5X = Type V, Extra Wide Flood	DIMELV=Trailing Edge Phase Dimming Driver DIM10=0-10V Dimming Driver	Painted BK=Black BZ=Bronze CS=City Silver WT=White Premium Paint AP=Grey DP=Dark Platinum GM=Graphite Metallic	24=24" 36=36" 42=42"	EDGE=Edge lit glass lens PC1=Photocontrol 120V ⁶ PC2=Photocontrol 208-277V ⁶ RIU=Receptacle - In Use (120V Only) ⁶ RFL=Receptacle - Flip-Lid (120V Only) ⁶ LAB=Less Anchor Bolts & Template ⁷

NOTES: 1 Universal Voltage (UNV) is standard unless specifying Photocontrol or Receptacle (RIU or RFL - 120V) options. 2 Specify for PC2 option only. 3 Custom and RAL color matching available upon request. Consult factory for further information. 4 Bollard heights are nominal (shown in inches). 5 Add suffix in the order shown. 6 Must specify voltage when ordering. 7 When specifying LAB option the anchor bolts and template need to be ordered separately 7581-01PK. 8 DesignLights Consortium™ Qualified and classified for DLC Standard. Refer to www.designlights.org for details on exact qualified EON 303-B1-LEDB2 product as not all configurations are DLC classified.

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	TM-21 Reported L70(10k) (Hours)	Theoretical L70 (Hours)
25°C	> 94%	> 60,000	365,000
40°C			
50°C			

CURRENT DRAW

Model	Line Voltage	Current Draw
303-B1-LEDB2	120-277V, 50/60Hz	0.13A

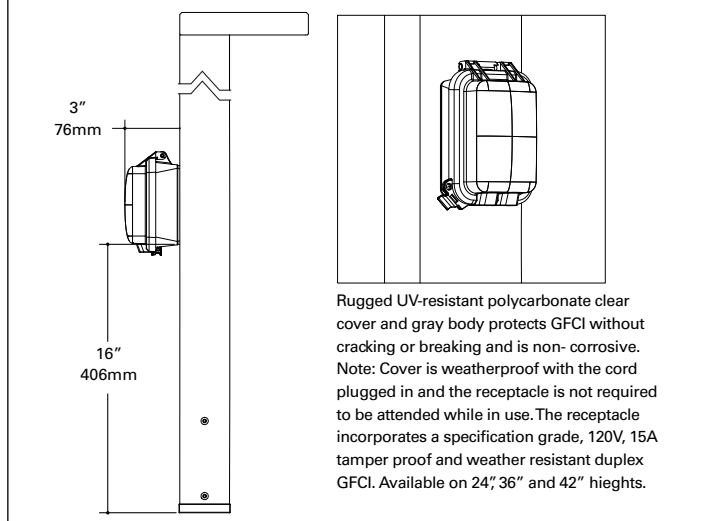
MAX LOAD RATING

Options	Line Voltage	Max Load Rating
PC1	120V, 50/60Hz	1000VA, 8.3A
PC2	208-277V, 50/60Hz	
RIU or RFL	120V, 50/60Hz	1800VA, 15A

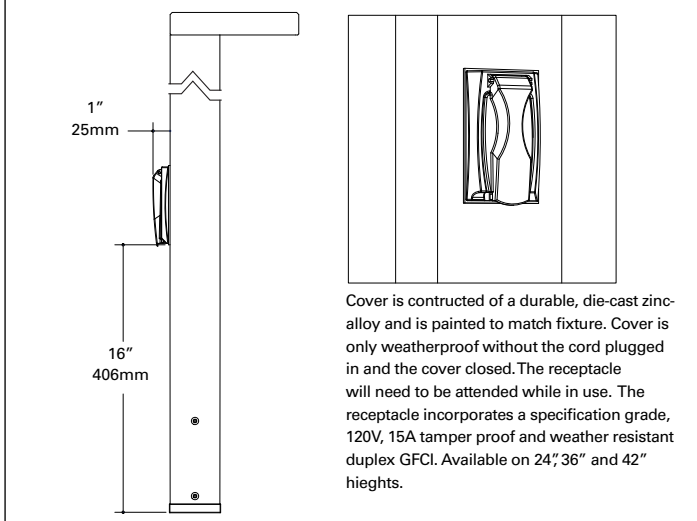
OPTIONS

Receptacle Options (120V Only)

RIU - Receptacle In-Use

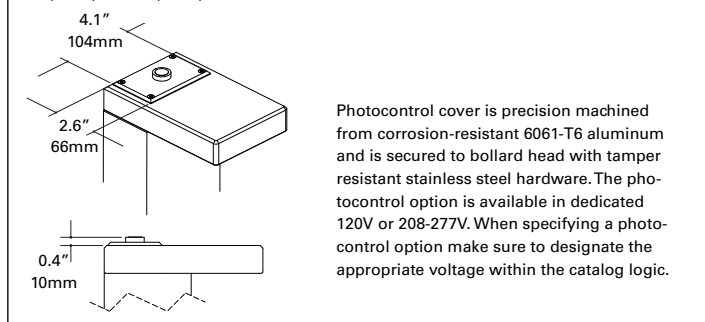


RFL - Receptacle Flip Lid

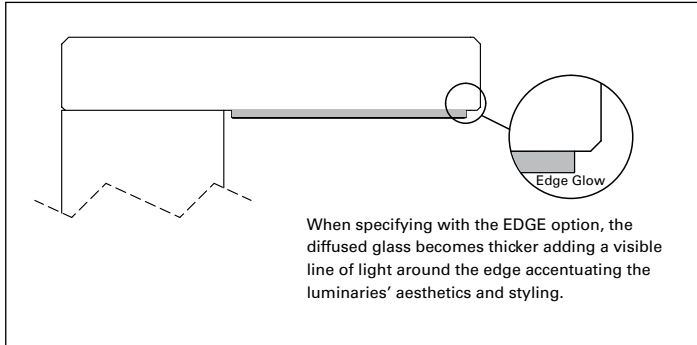


Photocontrol

PC1 (120V) or PC2 (277V)



Edge



TECHNICAL NOTES:

- Adjustable mounting base - Cast aluminum mounting base is equipped with the patented LumaLevel™ leveling system that includes mounting base, 70 shore neoprene base, stainless steel hardware and a slot to accommodate two inbound and outbound 3/4" conduits. It provides quick installation, easy adjustment, secure mounting and protection from vibration.

LUMENS - CRI/CCT TABLE

Optic Type	Distribution	Watts	Delivered Lumens	LPW	CCT (K) / Color	CRI nom. / Wavelength	B-U-G Rating
T2 (Lateral Throw)		15.5	783	51	2700	95	B1-U0-G1
			1300	84	3000	75	
			909	59	3500	85	
			1433	93	4000	75	
		12.1	398	31	TSAM (Amber)	585-595nm	
T4 (Forward Throw)		15.5	747	48	2700	95	B0-U0-G0
			1241	80	3000	75	
			868	56	3500	85	
			1368	88	4000	75	
		12.1	380	29	TSAM (Amber)	585-595nm	
T5X (Extra Wide Flood)		15.5	682	44	2700	95	B1-U0-G0
			1132	73	3000	75	
			792	51	3500	85	
			1248	81	4000	75	
		12.1	347	27	TSAM (Amber)	585-595nm	

FEATURES

- Sensor and wireless operation
- Field rotatable optics and housing
- Customizable side panels
- 120-277, 347 and 480VAC input
- IDA Dark Sky Approved with clear lenses and 3000K
- True IES distributions
- 3000K, 4000K, 5000K CCT
- Uniformly diffused lens
- 20kV/10kA surge protection
- Integral thermal protection
- IP66



3000K and warmer CCTs only

DIMENSIONS

MODEL	KB6
OVERALL HEIGHT	42" / 1067mm
OVERALL LENGTH	6" / 152mm
OVERALL WIDTH	6" / 152mm
WINDOW HEIGHT	19.9" / 51cm
WINDOW WIDTH	4" / 10cm
WEIGHT	30 lbs./13.6kg

* Housing and optical distribution are independently field rotate-able in 90° increments. Default factory orientations shown above.



FRONT



LEFT



BACK



RIGHT

DISTRIBUTION OUTPUT*

Street Side

House Side

SHIELDING SIDE

A

B

C

D

ORDERING INFORMATION

1	2	3	4	5	6	7
Model	Distribution	Shielding	Light Engine	Controls	Voltage	Fixture Finish

1. MODEL

KB6 6" Square x 42 OAH bollard

2. DISTRIBUTION

Y2	IES Type II, clear lens
Y3	IES Type III, clear lens
Y4	IES Type IV, clear lens
Y5	IES Type V, clear lens
YD	Symmetric distribution, diffused lens

3. SHIELDING

Optional, may choose from 1 to 3 sides closed from options A, B, C, D or you may choose HSS option.

A	Short side closed
B	Side 90° counterclockwise from short side closed
C	Side 180° counterclockwise from short side closed
D	Side 270° counterclockwise from short side closed
HSS	House side shield ²

4. LIGHT ENGINE

2050	5000K CCT, 29 watts
2040	4000K CCT, 29 watts
2030	3000K CCT, 29 watts
1050	5000K CCT, 14 watts
1040	4000K CCT, 14 watts
1030	3000K CCT, 14 watts
560nm monochromatic amber and or custom lumen package available by request. ¹	

5. CONTROL

May choose one

SC-MW	Motion Sensor
WIR	wiScape Connectivity
BPC	Button Type Photocell

6. VOLTAGE

120-277VAC input or may choose one.

347	347VAC input
480	480VAC input

7. FIXTURE FINISH

Standard Color

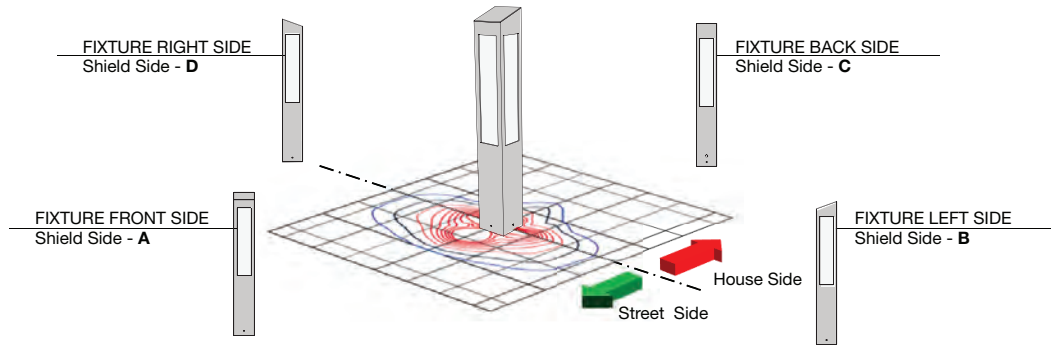
AGN	Antique Green
BL	Black
BLT	Matte Black
CRT	Corten
DB	Dark Bronze
DGN	Dark Green
GT	Graphite
LG	Light Grey
MAL	Matte Aluminum
MDB	Bronze Metallic
MG	Medium Grey
TT	Titanium
WH	Arctic White
WDB	Weathered Bronze
VBU	Verde Blue

Premium Color

SHK	Shamrock
SPP	Salt and Pepper
SFM	Seafoam
WCP	Weathered Copper
RAL	RAL 4 digit Color
CUSTOM	Custom Color

¹ Contact factory

² House side shield assembles to optical lens and is independent of outer housing.



LUMINAIRE PERFORMANCE

Configuration				Distribution	Optional Shielding		Ordering Code																	
Watts	Output	Closed Sides	IES Type				Bright White (5000K)				Neutral White (4000K)				Warm White (3000K)									
							Delivered Lumens	Efficacy (Lm/W)	BUG Rating		Delivered Lumens	Efficacy (Lm/W)	BUG Rating		Delivered Lumens	Efficacy (Lm/W)	BUG Rating							
					Shielding	Equivalent*																		
							2050				2040				2030									
30	Asymmetric	(none)	Type II	Y2	(none)	-	2451	82	1	0	2	2302	77	1	0	1	2289	76	1	0	1			
			TYPE III	Y3	(none)	-	2305	77	1	0	1	2165	72	1	0	1	2153	72	1	0	1			
			TYPE IV	Y4	(none)	-	2257	75	1	0	2	2120	71	1	0	2	2108	70	1	0	2			
		1 Side	Type II	Y2	C	HSS	2271	76	1	0	2	2221	74	1	0	1	2199	73	1	0	2			
			TYPE III	Y3	C	HSS	2107	70	1	0	1	2066	69	1	0	1	2041	68	1	0	1			
			TYPE IV	Y4	C	HSS	2107	70	1	0	2	2061	69	1	0	2	2041	68	1	0	2			
			-	Y5	C	A / B / D	1699	57	1	0	1	1662	55	1	0	1	1645	55	1	0	1			
				YD	C	A / B / D	679	23	0	3	1	685	23	0	3	1	634	21	0	3	1			
			2 Sides (adjacent)	-	Y5	BC	AB / CD / AD	1175	39	1	0	1	1149	38	1	0	1	1138	38	1	0	1		
		YD	BC		AB / CD / AD	457	15	0	3	1	461	15	0	3	1	427	14	0	3	1				
		3 Sides (adjacent)	-	Y5	BCD	ABC / ABD / ACD	581	19	0	0	1	568	19	0	0	1	581	19	0	0	1			
		YD		BCD	ABC / ABD / ACD	111	4	0	0	1	112	4	0	0	1	104	3	0	0	1				
	Symmetric	(none)	TYPE V	Y5	(none)	-	2163	72	2	0	1	2188	73	2	0	1	1978	66	2	0	1			
				YD	(none)	-	927	31	0	3	1	935	31	0	3	1	866	29	0	3	4			
			2 Sides (op-posing)	-	Y5	AC	BD	1110	37	1	0	1	1085	36	1	0	1	1075	36	1	0	1		
		YD			AC	BD	456	15.2	0	3	1	460	15	0	3	1	426	14	0	3	1			
									1050				1040				1030							
		15	Asymmetric	(none)	Type II	Y2	(none)	-	1323	95	1	0	1	1294	92	1	0	1	1281	92	1	0	1	
TYPE III	Y3				(none)	-	1233	88	1	0	1	1204	86	1	0	1	1192	85	1	0	1			
TYPE IV	Y4				(none)	-	1222	87	0	0	1	1195	85	0	0	1	1183	85	0	0	1			
1 Side	Type II			Y2	C	HSS	1226	88	1	0	1	1199	86	1	0	1	1187	85	1	0	1			
	TYPE III			Y3	C	HSS	1128	81	0	0	1	1103	79	0	0	1	1092	78	0	0	1			
	TYPE IV			Y4	C	HSS	1141	82	0	0	1	1116	80	0	0	1	1105	79	0	0	1			
	-			Y5	C	A / B / D	926	66	1	0	1	906	65	1	0	1	897	64	1	0	1			
				YD	C	A / B / D	373	27	0	3	1	373	27	0	3	1	350	25	0	3	1			
	2 Sides (adjacent)			-	Y5	BC	AB / CD / AD	640	46	0	0	1	626	45	0	0	1	620	44	0	0	1		
YD	BC				AB / CD / AD	251	18	0	3	1	251	18	0	3	1	236	17	0	3	1				
3 Sides (adjacent)	-			Y5	BCD	ABC / ABD / ACD	317	23	0	0	1	310	22	0	0	1	307	22	0	0	1			
YD				BCD	ABC / ABD / ACD	61	4	0	0	1	61	4	0	0	1	57	4	0	0	1				
Symmetric	(none)		TYPE V	Y5	(none)	-	1179	84	1	0	1	1189	85	1	0	1	1098	78	1	0	1			
				YD	(none)	-	509	36	0	3	1	509	36	0	3	1	478	34	0	3	1			
			2 Sides (op-posing)	-	Y5	AC	BD	612	44	1	0	1	599	43	1	0	1	593	42	1	0	1		
	YD				AC	BD	248	18	0	3	1	248	18	0	3	1	233	17	0	3	1			

* - Values are representative of the Distribution + Shielding Ordering Code combination, IES file may need to be rotated to match an equivalent shielding configuration.

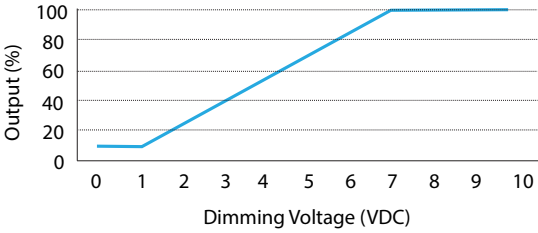
ELECTRICAL CHARACTERISTICS

Ordering Code	LED Current (mA)	System Wattage (W)	Input					Min. Power Factor	Max THD (%)	Dimming Range (V)	Source/Sink Current (mA)	Inrush Current Peak			
			Amps AC				HZ					(A)		T@50% (µs)	
			120	277	347	480						120	277	120	277
10XX	350mA	15	0.12	0.05	0.04	0.03	50/60	0.9	20	0-10	1	15		N/A	
20XX	700mA	30	0.25	0.11	0.09	0.06	50/60	0.9	20	0-10	1	21	49	160	

TM-21 LIFETIME CALCULATION

Ambient Environment °C	Projected Lumen Maintenance (Khrs)					Reported L70
	25	50	60	75	100	
25	98%	95%	94%	93%	90%	70Khrs.
40	98%	95%	94%	93%	90%	

DIMMING CURVE



Note: Fixture does not dim to off, fixture dims to 10% minimum output.

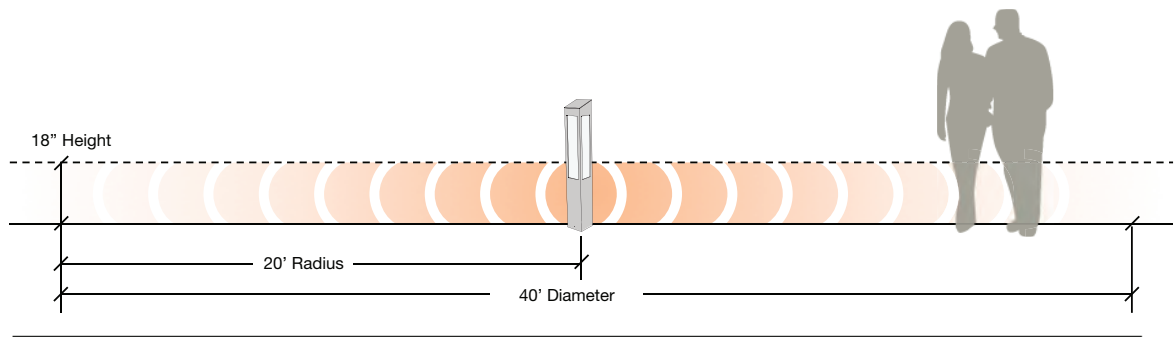
ISOLINE TEMPLATES 5' grid spacing.
Equivalent (rotated) configurations are shown in italics.

Shielding	Asymmetric Distribution					Symmetric Distribution	
	Type II	Type III	Type IV	Type V	Diffused Lens	Type V	Diffused Lens
 (none)	 KB6-Y2-1050	 KB6-Y3-1050	 KB6-Y4-1050			 KB6-Y5-1050	 KB6-YD-1050
 1 Side C or HSS	 KB6-Y2-C-1050	 KB6-Y3-C-1050	 KB6-Y4-C-1050	 KB6-Y5-C-1050	 KB6-YD-C-1050		
 2 Sides adjacent CD, AB, BC or AD				 KB6-Y5-CD-1050 <i>KB6-Y5-AB-1050</i> <i>KB6-Y5-BC-1050</i> <i>KB6-Y5-AD-1050</i>	 KB6-YD-CD-1050 <i>KB6-YD-AB-1050</i> <i>KB6-YD-BC-1050</i> <i>KB6-YD-AD-1050</i>		
 2 Sides opposing AC or BD						 KB6-Y5-AC-1050 <i>KB6-Y5-BD-1050</i>	 KB6-YD-AC-1050 <i>KB6-YD-BD-1050</i>
 3 Sides BCC, ABC, or ACD				 KB6-Y5-BCD-1050 <i>KB6-Y5-ABC-1050</i> <i>KB6-Y5-ACD-1050</i>	 KB6-YD-BCD-1050 <i>KB6-YD-ABC-1050</i> <i>KB6-YD-ACD-1050</i>		

- 0.5 FC
- 1 FC
- 2 FC
- 3 FC
- 4 FC
- 5 FC
- 6 FC
- 7 FC
- 8 FC

SENSOR COVERAGE

Motion Sensor uses microwave sensing technology that reacts to physical changes in within the coverage area. Careful consideration must be given to objects or activity that may trigger the sensor unintentionally.

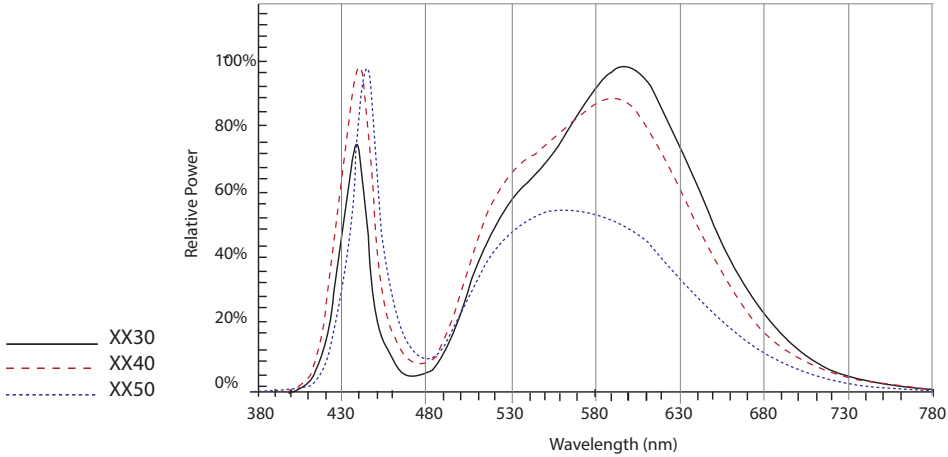


COLOR CHARACTERISTICS

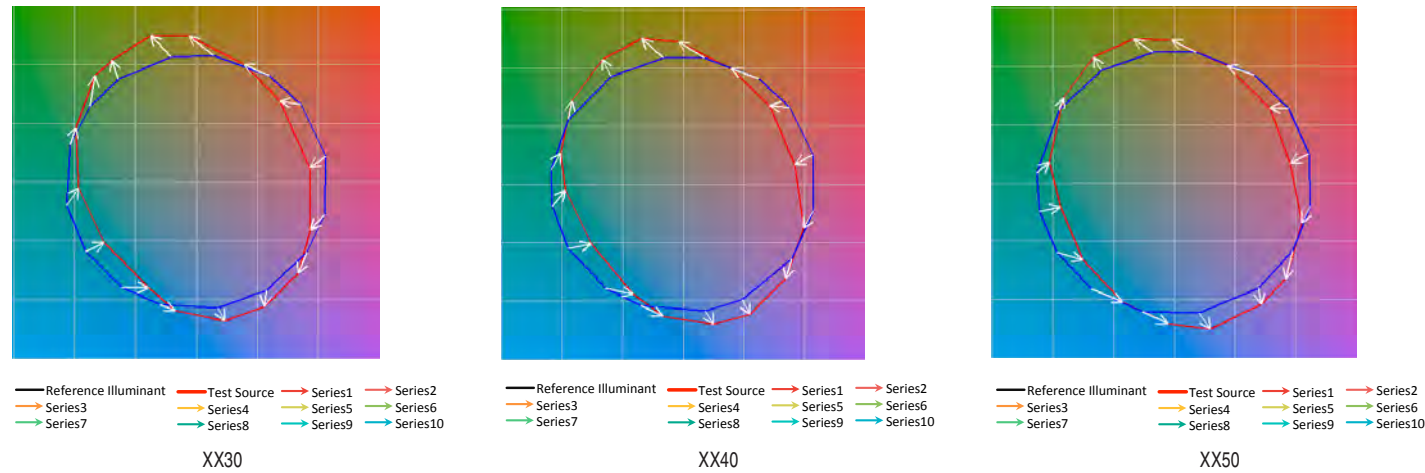
Value	Ordering Code		
	XX30	XX40	XX50
Rf	69	69	71
Rg	99	99	98
CCT(K)	3122	3852	5020
Duv	0.001	0.0004	0.0005
CIE Ra	74	73	74

Note: TM-30 reported at the discrete LED level, not fixture level.

SPECTRAL POWER DISTRIBUTION COMPARISON



COLOR VECTOR GRAPHIC



SPECIFICATIONS

HOUSING

- Housing shroud shall be extruded 6061-T6 aluminum alloy with a welded top cap that shall be free of any visible weld or grind marks
- Luminaire housing shall be free of any visible heat fins, hardware or fasteners.
- Bracketry shall be aluminum and hardware shall be stainless steel.
- Housing shall be independently field rotate-able of the optical distribution.
- Default factory orientations of shielding location relative to the optical system shall be:
 - A - Street Side
 - C - House Side

OPTICAL ARRAY

- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB).
- Optical lenses shall be clear injection molded PMMA acrylic.
- House side shield shall be field installable on any face of the housing.
- Light engine and optical distributions shall be field rotatable.

ELECTRICAL

- Luminaires shall have integral surge protection that shall be U.L. recognized and have a surge current rating of 10,000 Amps using the industry standard 8/20uSec wave and surge rating of 372J.
- Drivers shall be U.L. recognized.
- Drivers shall not be compatible with current sourcing dimmers, consult factory for current list of known compatible dimming systems. Approved dimmers include Lutron Diva AVTV, Lutron Nova NDTV and NDTV.
- Luminaire shall be capable of operating at 100% power in a 40° ambient environment. Both driver and optical array shall have integral thermal protection that shall dim the luminaire upon detection of fixture temperatures in excess of 85°C.
- Luminaires not configured with an optional control system shall be provided with 0-10 purple and gray dimming leads.

- Sensor enabled fixture settings shall come to full brightness upon detecting motion and go to 50% output after 5 minutes of detecting no motion.
- Motion Sensor shall use microwave sensing technology that reacts to physical changes in within the coverage area. Careful consideration must be given to objects or activity that may trigger the sensor unintentionally.

MOUNTING AND INSTALLATION

- Anchor bolts and anchor bolt template shall be included.

SERVICING

- Service access to the driver assembly shall require a 3/16" hex driver (information provided by engineering) to loosen (4) stainless steel set screws to allow the housing to be removed for access to the gear compartment. Gear compartment shall require a Philips driver (information provided by engineering) to open service panel.
- Driver assembly shall be mounted to a prewired internal tray with quick disconnects for removal.

FINISH

- Luminaire finish shall consist of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish.
- Luminaire finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.

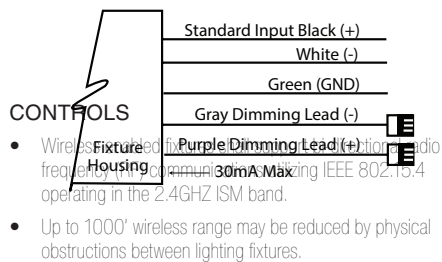
CERTIFICATION

- Luminaire shall be listed with UL for outdoor, wet location use, UL1598, UL 8750 and Canadian CSA Std. C22.2 no.250.
- IDA approved, 3000K and warmer CCTs only.

WARRANTY / TERMS AND CONDITIONS OF SALE

Download:

<http://www.hubbellighting.com/resources/warranty/>



ALED4T50NRG/BL



Color: Gray

Weight: 32.0 lbs

Project:	Type:
Prepared By:	Date:

Driver Info		LED Info	
Type:	Constant Current	Watts:	50W
120V:	0.46A	Color Temp:	4000K (Neutral)
208V:	0.27A	Color Accuracy:	72 CRI
240V:	0.23A	L70 Lifespan:	100000
277V:	0.20A	Lumens:	7256
Input Watts:	55W	Efficacy:	133 LPW
Efficiency:	91%		

Technical Specifications

Other

ALED4T50 with Bi-Level Operation:

Allows 50% and 100% output modes

Patents:

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

Equivalency:

Replaces 200W Metal Halide

Warranty:

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

Buy American Act Compliance:

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

Listings

DLC Listed:

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

DLC Product Code: PSQ1RHAG

UL Listing:

Suitable for wet locations as a downlight

IESNA LM-79 & IESNA LM-80 Testing:

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

Dark Sky Conformance:

Conforms to (allows for conformance to) the IDA's fully shielding requirement, emitting no light above 90 degrees (with the exclusion of incidental light reflecting from fixture housing, mounts, and pole).

LED Characteristics

Lifespan:

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

LEDs:

Multi-chip, high-output, long-life LEDs

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Construction

IES Classification:

The Type IV distribution (also known as a Forward Throw) is especially suited for mounting on the sides of buildings and walls, and for illuminating the perimeter of parking areas. It produces a semiCircular distribution with essentially the same candlepower at lateral angles from 90° to 270°.

Effective Projected Area:

EPA = 0.75

IP Rating:

Ingress Protection rating of IP66 for dust and water

Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Cold Weather Starting:

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

Thermal Management:

Superior thermal management design with external Air-Flow fins provides maximum operational life, even in high ambient temperature environments

Housing:

Die cast aluminum housing, lens frame and mounting arm

Mounting:

Universal mounting arm compatible for hole spacing patterns from 1" to 5 1/2" center to center. Round Pole Adaptor plate included as a standard. Easy slide and lock to mount fixture with ease. Round pole diameter must be >4" to mount fixtures at 90° orientation.

Reflector:

Specular vacuum-metallized polycarbonate

Gaskets:

High temperature silicone gaskets

Finish:

Formulated for high-durability and long lasting color

Green Technology:

Mercury and UV-free. RoHS compliant components.

Technical Specifications (continued)

Electrical

Driver:

Constant Current, Class 2, 1400mA, 100-277V, 50-60Hz, 0.8A, Power Factor 99%

Surge Protection:

6kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2.

THD:

6.1% at 120V, 9.4% at 277V

Power Factor:

99.6% at 120V, 96% at 277V

Optical

BUG Rating:

B0 U0 G1

Features

- 66% energy cost savings vs. HID
- 100,000-hour LED lifespan
- 5-year warranty

Ordering Matrix

Family	Optics	Wattage	Mounting	Color Temp	Finish	Driver Options	Options	Other Options
ALED	4T	50	^	N	RG	/BL	^	^
	4T = Type IV	50 = 50W 66 = 66W	Blank = Pole mount	Blank = 5000K (Cool)	Blank = Bronze	Blank = 120-277V	Blank = No Option	Blank = Standard
	3T = Type III	78 = 78W	SF = Slipfitter	N = 4000K (Neutral)	RG = Roadway Gray	/480 = 480V	/LC = Lightcloud® Controller	USA = BAA Compliant
	2T = Type II	105 = 105W 125 = 125W 150 = 150W		Y = 3000K (Warm)	W = White K = Black	/BL = Bi-Level /D10 = 0-10V Dimming	/PCS = 120V Swivel Photocell /PCS2 = 277V Swivel Photocell /PCS4 = 480V Swivel Photocell /PCT4 = 480V Twistlock Photocell /WS2 = Multi-Level Motion Sensor 20 ft. /WS4 = Multi-Level Motion Sensor 40 ft.	

FEATURES

- Integral Motion Sensor
- wiScape enabled
- IDA approved
- 20kV/10kA surge protection
- ANSI C136.41 receptacle
- IES Type II, III and IV distributions
- 3000K, 4000K, 5000K CCT
- Integral thermal protection
- 0-10V dimming ready
- IP66 optical system
- 120-277, 347 and 480VAC input
- ANSI C136.31-2010 4G Rated



3000K and warmer CCTs only
MO-XX30 configurations only



ORDERING CODE

1	2	3	4	5	6	7	8	9	10
Model	Optics	Optical Finish	Light Engine	Controls	Fuse	Voltage	Mounting	Mounting Options	Fixture Finish

1. MODEL

5" wide luminaire

KM51	Single fixture
KM52	Two fixtures 180° apart
KM53	Three fixtures 90° apart
KM54	Four fixtures 90° apart

2. OPTICS

Distribution Type, see "Luminaire Performance" on page 3

T2	IES Type II
T3	IES Type III
T4	IES Type IV

3. OPTICAL FINISH

Standard white or may choose one. See 'Luminaire Performance' on page 3 for detail.

MO	Optics in Matte Black finish
FO	Optics in fixture finish

4. LIGHT ENGINE

Lumen package, see 'Luminaire Performance' on page 3 for detail

7050	5000K CCT, CRI 70, 70watts
7040	4000K CCT, CRI 70, 70 watts
7030	3000K CCT, CRI 70, 70 watts
5050	5000K CCT, CRI 70, 50 watts
5040	4000K CCT, CRI 70, 50 watts
5030	3000K CCT, CRI 70, 50 watts

560nm monochromatic amber and or custom lumen package available by request. ¹

5. CONTROL

May choose one

MCPCR	7-Position Receptacle
WIR	wiScape connectivity
WIRSC	wiScape + motion sensor
SCP	Motion Sensor + Photocell ⁴

SCPREMOTE Handheld commissioning tool ⁴

6. FUSE

(may choose one)

SF	120, 277, 347 Volt input
DF	208, 240, 480 Volt input

7. VOLTAGE

120-277VAC input standard or may choose one

347	347VAC input
480	480VAC input

8. MOUNTING

Integral Pole

Square Straight Aluminum, 10.5"Ø Bolt Circle

PS510-188	10' luminaire height.
PS512-188	12' luminaire height.
PS514-188	14' luminaire height.
PS516-188	16' luminaire height.
PS518-188	18' luminaire height.
PS520-188	20' luminaire height.

Tenon Mount

TA23	Slips over a 2 3/8" / 60mm Ø x 4" / 102mm tall tenon
------	---

Side Mount

SMK	Mounts to the side of a square pole, KM51 only
-----	---

Wall Mount

WMK	KM51 only
-----	-----------

9. MOUNTING OPTIONS

Twin mount at staggered heights

Mounting holes for a fixture at 180°, KM51-...

PS5... only, may choose one

TS8	8' from bottom
TS10	10' from bottom
TS12	12' from bottom
TS14	14' from bottom
TS16	16' from bottom
TS18	18' from bottom

Pole Accessories

May choose one

GFI	GFCI receptacle, 24" from top of pole
RBC	Duplex receptacle box with clear cover, wiring device(s) not included.

10. FIXTURE FINISH

Standard Color

AGN	Antique Green
BL	Black
BLT	Matte Black
CRT	Corten
DB	Dark Bronze
DGN	Dark Green
GT	Graphite
LG	Light Grey
MAL	Matte Aluminum
MDB	Bronze Metallic
MG	Medium Grey
TT	Titanium
WH	Arctic White
WDB	Weathered Bronze
VBU	Verde Blue

Premium Color

SHK	Shamrock
SPP	Salt and Pepper
SFM	Seafoam
WCP	Weathered Copper
RAL	RAL 4 digit Color
CUSTOM	Custom Color

¹ Contact factory

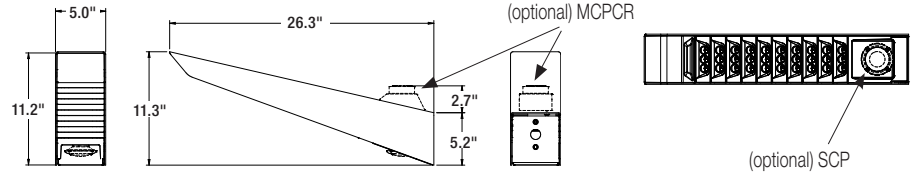
⁴ Handheld commissioning tool is required to separately configure or adjust any number of SCP sensors

Kick™ – KM5 Kick Mini Medium Scale

TYPE

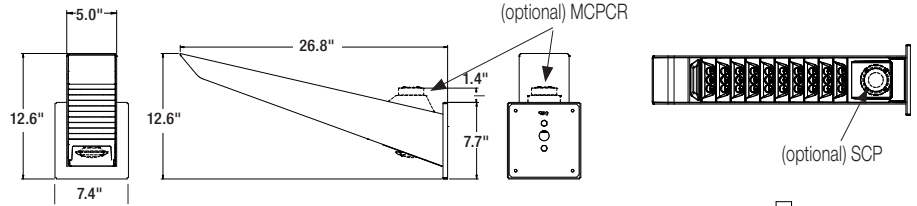
Side Mounted Luminaire(s)

MODEL	KM5X-...-SMK
OVERALL HEIGHT	11.3" / 287mm
OVERALL LENGTH	26.3" / 668mm
OVERALL WIDTH	5" / 127mm
WEIGHT	13.25 lbs.
EPA	0.75



Wall Mounted Luminaire(s)

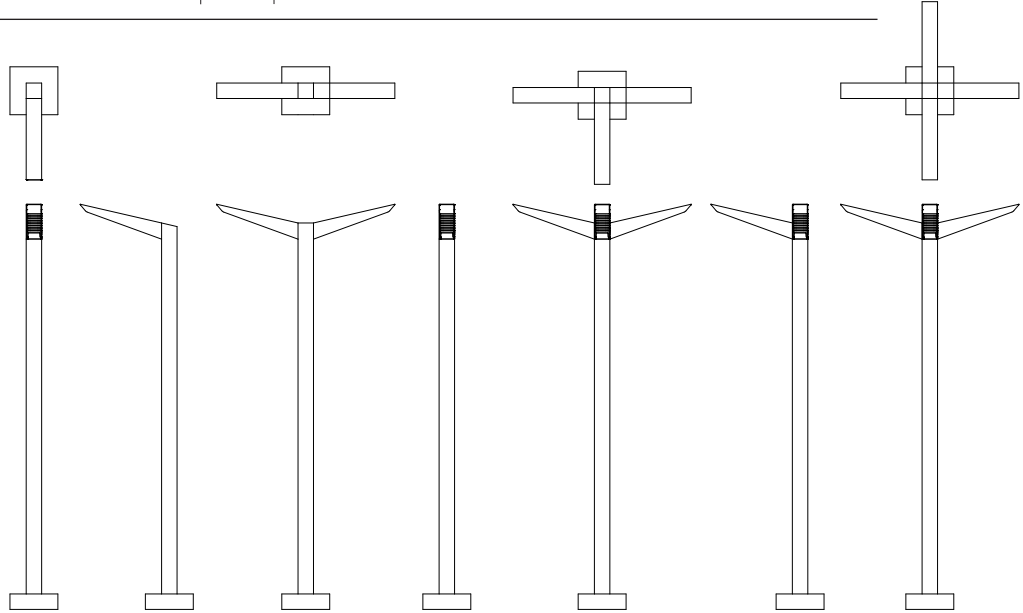
MODEL	KM51-...-WMK
OVERALL HEIGHT	12.6" / 320mm
OVERALL LENGTH	26.8" / 681mm
OVERALL WIDTH	7.4" / 188mm
WEIGHT	15 lbs.



Integral Pole Luminaire

See page 6 for height and mounting detail

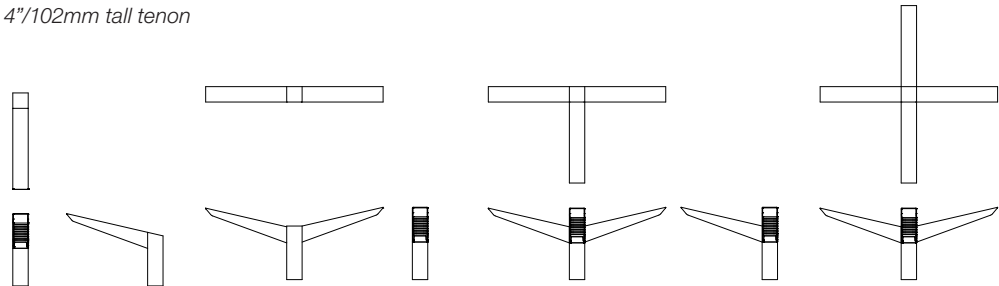
* Weight and EPA for fixtures only



MODEL	KM51-...-PS5XX-188	KM52-...-PS5XX-188	KM53-...-PS5XX-188	KM54-...-PS5XX-188
OVERALL LENGTH	31.3" / 795mm	15.5" / 394mm	31.3" / 795mm	57.6" / 1463mm
OVERALL WIDTH	15.5" / 394mm	57.6" / 1463mm	57.6" / 1463mm	57.6" / 1463mm
WEIGHT	13.25 lbs.	13.25 lbs.	13.25 lbs.	13.25 lbs.
EPA*	.75	1.5	2	2

Tenon Mount Luminaire

Slips over a 2 3/8"/60mm diameter by 4"/102mm tall tenon



MODEL	KM51-...-TA23	KM52-...-TA23	KM53-...-TA23	KM54-...-TA23
OVERALL HEIGHT	17.4" / 442mm	17.4" / 442mm	17.4" / 442mm	17.4" / 442mm
OVERALL LENGTH	31.3" / 795mm	5" / 127mm	31.3" / 795mm	57.6" / 1463mm
OVERALL WIDTH	5" / 127mm	57.6" / 1463mm	57.6" / 1463mm	57.6" / 1463mm
WEIGHT	13.25 lbs.	13.25 lbs.	13.25 lbs.	13.25 lbs.
EPA	1.14	1.89	2.4	2.4



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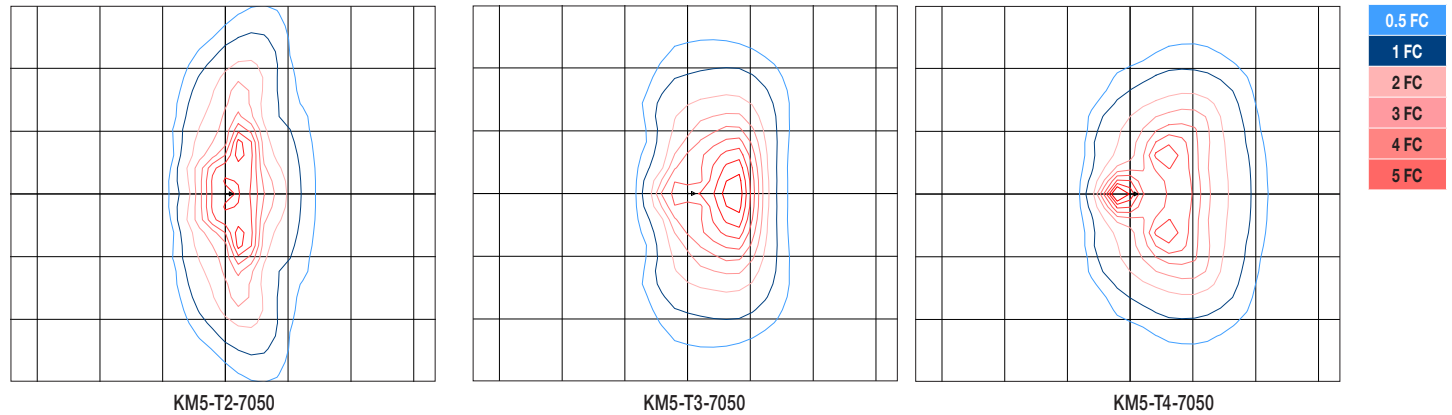
JOB _____
TYPE _____
NOTES _____

LUMINAIRE PERFORMANCE

Configuration				Ordering Code														
Light Engine	Optical Finish	Distribution	Ordering Code	Bright White (5000K)					Neutral White (4000K)					Warm White (3000K)				
				Delivered Lumens	Efficacy (Lm/W)	BUG Rating			Delivered Lumens	Efficacy (Lm/W)	BUG Rating			Delivered Lumens	Efficacy (Lm/W)	BUG Rating		
						B	U	G			B	U	G			B	U	G
7000 SERIES	Standard	Type II	T2	7365	105	2	2	2	7408	106	2	2	2	6976	100	2	2	2
		Type III	T3	7620	109	2	2	1	7664	109	2	2	1	7218	103	2	2	1
		Type IV	T4	7893	113	2	2	2	7939	113	2	2	2	7476	107	2	2	1
	Fixture Finish	Type II	T2-FO	5972	85	2	2	2	6007	86	2	2	2	5657	81	2	2	2
		Type III	T3-FO	6038	86	2	2	1	6073	87	2	2	1	5719	82	2	2	1
		Type IV	T4-FO	6800	97	2	2	2	6840	98	2	2	2	6441	92	2	2	1
	Matte Optics	Type II	T2-MO	5972	85	2	0	1	6007	86	2	0	1	5657	81	2	0	1
		Type III	T3-MO	6038	86	1	0	1	6073	87	1	0	1	5719	82	1	0	1
		Type IV	T4-MO	6800	97	2	0	1	6840	98	2	0	1	6441	92	2	0	1
5000 SERIES	Standard	Type II	T2	5614	112	2	2	1	5647	113	2	2	1	5317	106	2	2	1
		Type III	T3	5808	116	1	2	1	5842	117	1	2	1	5502	110	1	2	1
		Type IV	T4	6016	120	1	2	1	6052	121	1	2	1	5699	114	1	2	1
	Fixture Finish	Type II	T2-FO	4552	91	2	2	1	4579	92	2	2	1	5312	106	2	2	1
		Type III	T3-FO	4602	92	1	2	1	4629	93	1	2	1	4359	87	1	2	1
		Type IV	T4-FO	5183	104	1	2	1	5214	104	1	2	1	4910	98	1	2	1
	Matte Optics	Type II	T2-MO	4552	91	1	0	1	4579	92	1	0	1	4312	86	1	0	1
		Type III	T3-MO	4602	92	1	0	1	4629	93	1	0	1	4359	87	1	0	1
		Type IV	T4-MO	5183	104	1	0	1	5214	104	1	0	1	4910	98	1	0	1

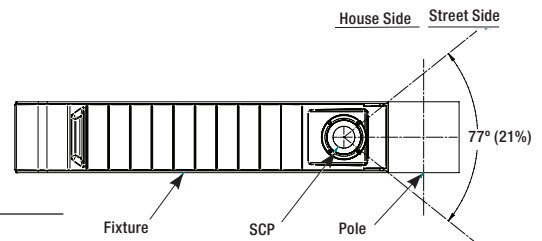
-MO.ies files should be used for -FO configurations in application layouts.

ISOLINE TEMPLATES 16' Mounting Height, 16' Grid Spacing



SENSOR DETECTION RANGE

		SENSOR MOUNTING HEIGHT							RATIO
		8'	10'	12'	14'	16'	18'	20'	
COVERAGE	SCP	20'	25'	30'	35'	40'	45'	50'	1:2.5
DIAMETER	WIRSC	16'	20'	24'	28'	32'	36'	40'	1:2



ELECTRICAL CHARACTERISTICS

Ordering Code	LED Current (mA)	System Wattage (W)	Line Input		Input				Min. Power Factor	Max THD (%)	Driver Operating Temp. Range	Inrush Current Peak				Dimming	
					Amps AC							(A)		T@50% (µs)		Dimming Range (V)	Source/ Sink Current (mA)
			VAC	HZ	120	277	347V	480V				120	277	120	277		
70XX	700	70	120-277, 347, 480	50 / 60	0.3	0.1	0.2	0.2	0.9	20	-40°C-55°C	15	32	100	0-10	1	
50XX	500	50	120-277, 347, 480		0.2	0.1	0.1	0.1									



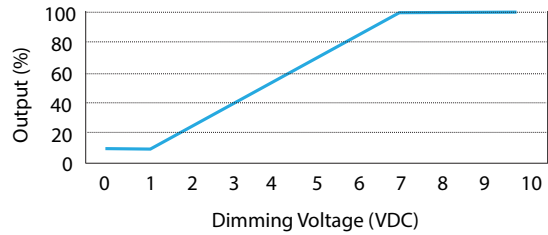
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JOB _____
TYPE _____
NOTES _____

TM-21 LIFETIME CALCULATION

Ambient Environment °C	Projected Lumen Maintenance (Khrs)					Reported L70
	25	50	60 (TM-21)	75	100	
25	98%	95%	94%	93%	90%	>60Khrs.
40	98%	96%	95%	93%	90%	

DIMMING CURVE



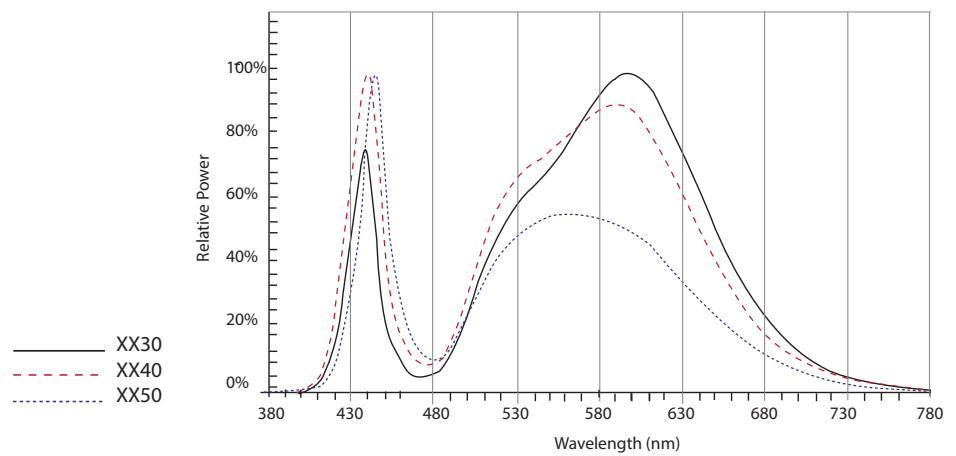
Note: Fixture does not dim to off, fixture dims to 10% minimum output.

COLOR CHARACTERISTICS

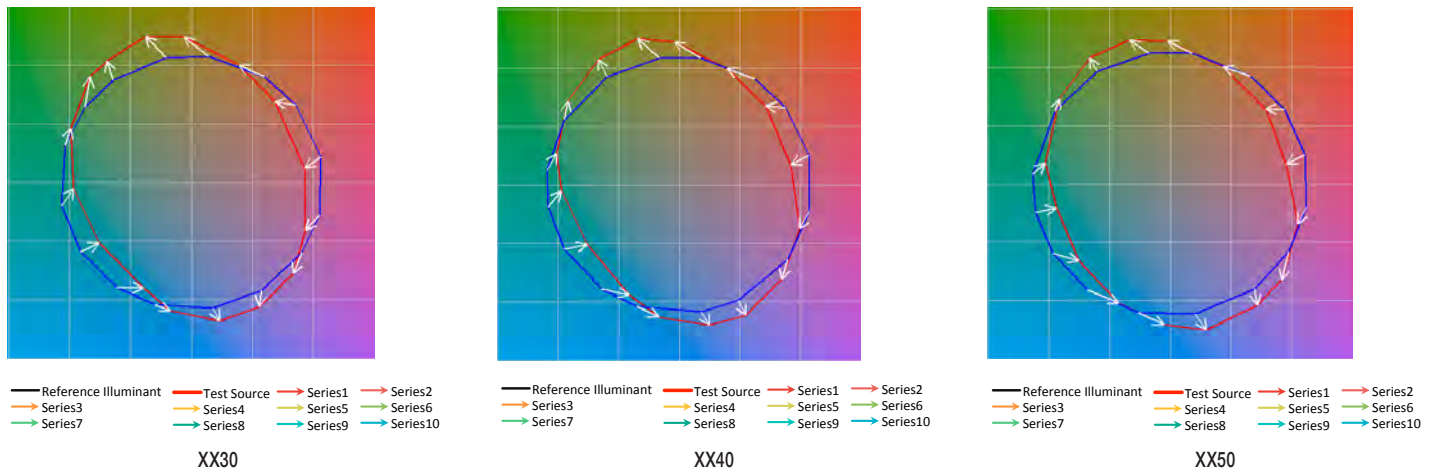
Value	Ordering Code		
	XX30	XX40	XX50
Rf	69	69	71
Rg	99	99	98
CCT(K)	3122	3852	5020
Duv	0.001	0.0004	0.0005
CIE Ra	74	73	74

Note: TM-30 reported at the discrete LED level, not fixture level.

SPECTRAL POWER DISTRIBUTION COMPARISON



COLOR VECTOR GRAPHIC



SPECIFICATIONS

HOUSING

- Housing shroud shall be of fabricated 5052-H32 aluminum alloy with a rear mounting interface that shall be of fabricated 304 stainless steel.
- Housing mounting interface shall have a stamped silicone gasket.
- Luminaire housing shall be free of any visible heat fins, hardware or fasteners.
- Bracketry and hardware shall be stainless steel.

OPTICAL ARRAY

- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB) with a uniform conformal coating over the panel surface and electrical features.
- Optical lenses shall be clear injection molded PMMA acrylic.
- Each MCPCB and optic shall be sealed to an extruded 6063-T6 aluminum alloy heat spreader and sealed with a continuous one piece injection molded silicone rubber gasket. IP66.
- Patent Pending design of optical array shall independently shield each LED optic across the length of the aperture.
- Optical surfaces shall be painted white unless the optional fixture finish (FO) or matte black finish (MO) is selected.
- Optional matte black finish optics (MO) are required to meet UO classification with zero percent uplight.
- Optional fixture finish optical surfaces (FO) shall not exceed BUG ratings of the standard white finish and shall be greater than or equal to the delivered lumens of the optional matte black optical surface finish (MO).

ELECTRICAL

- Drivers shall be in direct contact with the aluminum housing across the entire surface area of the widest face for maximum thermal transfer.
- Luminaires shall have integral surge protection that shall be U.L. recognized and have a surge current rating of 10,000 Amps using the industry standard 8/20uSec wave and surge rating of 372J. Surge protection device shall be wired in series.
- Drivers shall be U.L. recognized.
- Drivers shall not be compatible with current sourcing dimmers, consult factory for current list of known compatible dimming systems approved dimmers include Lutron Diva AVTV, Lutron Nova NDTV and NTFTV.
- Luminaire shall be capable of operating at 100% brightness in a 40°C environment.

Both driver and optical array shall have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C.

- Luminaires not configured with a control system or ANSI C136 receptacle option shall be provided with 0-10 purple and gray dimming leads.



CONTROLS

- Wireless enabled fixtures shall support bi-directional radio frequency (RF) communications utilizing IEEE 802.15.4 operating in the 2.4GHz ISM band.
- Up to 1000' wireless range may be reduced by physical obstructions between lighting fixtures.
- Motion Sensor shall use passive infrared (PIR) sensing technology that reacts to changes in infrared energy (moving body heat) within the coverage area. Careful consideration must be given to obstructions that may block the sensor's line of sight.
- Factory default settings for SCP option shall be:
 - High mode: 10V
 - Low mode: 1V
 - Ramp-up rate: disabled
 - Fade-down rate: disabled
 - Photocell: Off
 - Sensitivity: Full
 - Time Delay: Fade to low: 5 minutes
 - Time Delay: Fade to off: 1 hour

MOUNTING AND INSTALLATION

- Integral pole mount luminaires shall require

assembly of fixture(s) to the pole, mounting hardware, anchor bolts and anchor bolt template shall be included. *See page 6 for additional considerations specific to the integral pole.*

- Tenon mount luminaires shall require assembly of fixture(s) to the tenon adapter, mounting hardware shall be included. Tenon adapter shall be secured to the tenon with eight 5/16-18 stainless steel set screws.
- Side mount luminaires shall be supplied with hardware compatible with AAL mountings.
- Twin mounted staggered height fixtures shall be configured separately.
- Wall mount luminaires shall require assembly of fixture to mounting plate.

SERVICING

- Service access to the optical array and driver assembly shall be via a tool-less internal latch and have an audible click.
- Optical array shall be able to hang freely in an open service position for inspection of internal wire connections. Once in service position, the optical array shall be able to be removed for service by lifting the assembly up off the rear hinge and disconnecting the wiring plugs.
- Driver assembly shall be mounted to a prewired internal tray with quick disconnects for removal.

FINISH

- Luminaire finish shall consist of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish.
- Luminaire finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.

CERTIFICATION

- Luminaire shall be listed with UL for outdoor, wet location use, UL1598, UL 8750 and Canadian CSA Std. C22.2 no.250.
- ANSI C136.31-2010 4G Vibration tested and compliant.
- IEC 66262 Mechanical Impact Code IK10
- IDA approved, 3000K and warmer CCTs only.

WARRANTY / TERMS AND CONDITIONS OF SALE

Download:
<http://www.hubbellighting.com/resources/warranty/>

SPECIFICATIONS

Integral Pole

MODEL	HEIGHT		SHAFT		MAXIMUM ALLOWABLE EPA (MPH)			
	OVERALL	POLE	SECTION	WT	70	80	90	100
KM5X-PS510-188	10' 9" / 3.28m	10'	5" SQ X .188"	61 lbs	32.2	24.5	18.0	14.5
KM5X-PS512-188	12' 9" / 3.89m	12'	5" SQ X .188"	69 lbs	29.0	21.5	15.7	12.5
KM5X-PS514-188	14' 9" / 4.50m	14'	5" SQ X .188"	78 lbs	25.0	18.5	13.5	10.5
KM5X-PS516-188	16' 9" / 5.10m	16'	5" SQ X .188"	86 lbs	21.7	15.7	11.3	8.5
KM5X-PS518-188	18' 9" / 5.71m	18'	5" SQ X .188"	95 lbs	18.5	12.8	9.0	6.5
KM5X-PS520-188	20' 9" / 6.32m	20'	5" SQ X .188"	103 lbs	15.0	9.7	6.5	4.2

CONSTRUCTION

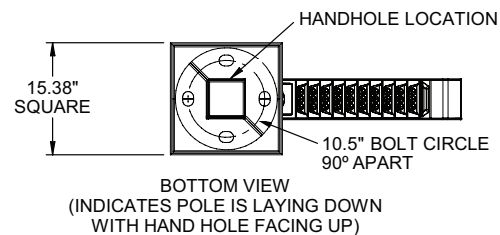
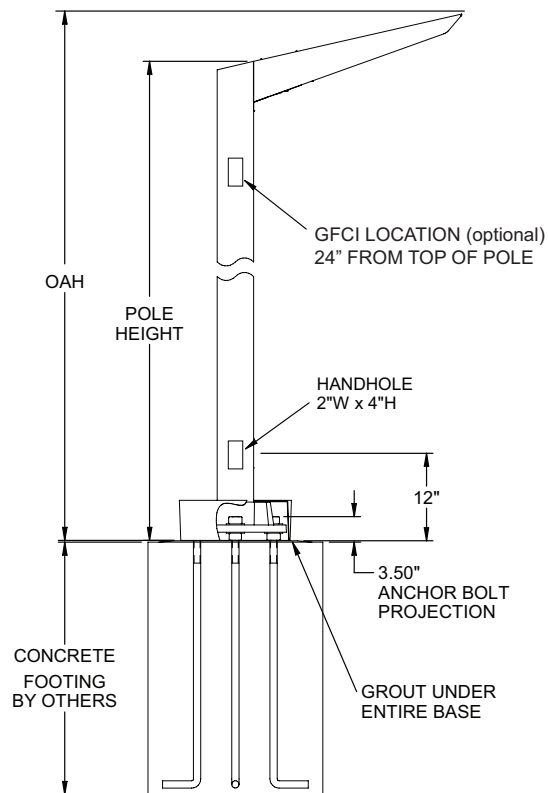
- Base shall be cast aluminum #356 alloy and be heat treated to a T-6 condition.
- Shaft shall be extruded aluminum 6061 alloy and heat treated to a T-6 condition.
- Anchor bolts shall be hot dip galvanized steel. Eight galvanized hex nuts and flat washers, and a bolt circle template shall be provided. Anchor bolt for poles are 1" x 36" x 4".

WARNINGS

- Caution must be exercised in the selection of a design wind speed when the pole is to be installed in a special wind region (as indicated by the wind map) or in an area where wind speed is unpredictable.
- AAL recommends consulting a local engineer when the pole is to be installed in an area that may be subject to vibration, oscillations, and other fatigue effects which are not covered by the AAL warranty.
- The use of banners or other appendages can severely affect the loading of a pole. No banner or other appendage may be attached to an AAL pole unless approved by AAL.
- If the products are to be used on an existing foundation or on other structures, the customer assumes all responsibility for the structural integrity of the existing foundation, anchorage or structures and all the consequences arising there from.

CAUTION

- Poles should never be erected without the luminaire installed. Warranty is voided if the pole is erected without the luminaire.





6" LED Downlight LC6SL

1000/1400/1800 Lumens
120V-277V, 347V
0-10V Dimming

APPLICATIONS:

LiteFrame Commercial LC6SL is a 6" commercial grade LED downlight with available outputs between 1000-1800 lumens. This is suitable to replace most CFL downlighting applications, while realizing substantial energy and maintenance savings. Rated for a minimum of 50,000 hours life (70% lumen maintenance) with ambient plenum temperatures up to 35°C. Free Air Flow around the fixture is required for optimal life performance. This product is not recommended for use with 3rd party "FIREHAT" or insulation barriers.

HOUSING:

One-piece 22 gauge non-corrosive steel platform. Pre-wired J-box with snap-on cover for easy access. Snap-in connection from driver compartment allows easy installation of light engine/trim assembly and can be upgraded to accommodate technology improvements. Approved for 8 (4 in/4 out) No. 12 AWG conductors rated for 90°C through wiring.

REFLECTOR:

High purity aluminum, Alzak, iridescence suppressed, semi-diffuse reflector. Self-trim standard. Painted white self-trim (WT) available as option.

LED LIGHT ENGINE:

The LC6SL uses mid power Nichia LEDs, specifically mixed to provide a minimum of 80 CRI with 3 SDCM color consistency. The use of multiple mid power LEDs allows for optimal thermal management by effectively spreading the heat over a larger area and eliminating hot spots on the LEDs. A diffuse, yet highly transmissive lens obscures the view of the LEDs and creates a smooth, even look from below. The light engine is available in multiple Kelvin temperatures and the system is designed to provide optimal life and lumen maintenance (50,000 hours at 70% lumen maintenance). The reflector/light engine assembly is mechanically retained to the housing.

LED DRIVER:

The LC6SL utilizes a constant current LED driver. This same driver is capable of running all three different lumen outputs, resulting in a reduction of housing skus and simplified specification. The driver is UL8750, Class II compliant and universal 120V-277V.

DIMMING:

Comes standard with flicker-free 0-10V dimming to 10%. 0-10V to 1% dimming option is also available. See list of compatible dimmers on page (4). For the sizing of the control circuit, the dimming circuit may require up to 2mA of sink current.

INSTALLATION:

Light commercial bar hangers included (not with WWCP option). Universal adjustable mounting brackets also accept 1/2" EMT conduit or 1 1/2" or 3/4" lathing channel (by others) or Prescolite 24" bar hangers (B24 or B6). Wall wash orientation may be field adjusted in 90° increments to housing.

CERTIFICATIONS:

CSA certified to US and Canadian safety standards. Suitable for wet locations (EM, EMR and WW damp location). ENERGY STAR qualified.

WARRANTY:

5 year warranty. See www.prescolite.com for details.

DATE: _____ TYPE: _____

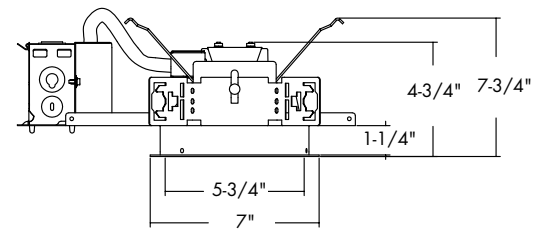
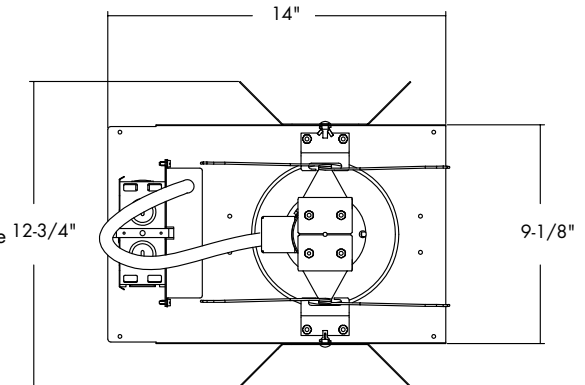
FIRM NAME: _____

PROJECT: _____

LiteFrame®



Ceiling Cutout: 6 1/4"
Maximum Ceiling Thickness 1 1/4"
For conversion to millimeters,
multiply inches by 25.4
Not to Scale



LC6SL 10L & 14L

- *See page 4 for LC6SL 18L line art
- *See page 4 for LC6SL EM line art
- *See page 4 for LC6SL CP line art
- *See page 4 for LC6SL WWCP line art

Order housing, reflector, and accessories separately

CATALOG NUMBER:

EXAMPLE: LC6SL-6LCSL14L35K9WT

HOUSING	DRIVER OPTIONS	VOLTAGE	HOUSING OPTIONS	TRIM APERTURE	OUTPUT	KELVIN	CRI	REF. FINISH/ COLOR OPTION	REFLECTOR OPTIONS	ACCESSORIES
☐ LC6SL Standard Lumen 0-10V Dimming to 10% 120V-277V	☐ Standard 0-10V 10% Dimming ☐ DM1 0-10V 1% Dimming	☐ Standard 120V-277V ☐ 347^{3,7,10} 347V	☐ EM^{2,4,8} Integral Battery Pack ☐ EMR⁴ Remote Battery Pack ☐ CP^{3,6,8} Chicago Plenum ☐ WWCP^{3,9} Wall Wash Chicago Plenum Housing	☐ 6LCSL Standard Lumen Clear Alzak Reflector	☐ 10L 1000 Lumen ☐ 14L 1400 Lumen ☐ 18L 1800 Lumen	☐ 27K 2700 Kelvin ☐ 30K 3000 Kelvin ☐ 35K 3500 Kelvin ☐ 40K 4000 Kelvin ☐ 50K 5000 Kelvin	☐ 8 80+ CRI ☐ 9 90+ CRI	☐ Standard Semi-Diffuse Clear Alzak ☐ WH Painted Matte White Reflector and Flange	☐ WT Painted White Flange Only ☐ WF Wide Flange ☐ WW^{4,5,7} Wall Wash ☐ EM^{2,4,8} Integral Battery Pack ☐ CP^{3,6} Chicago Plenum	☐ B24 Set of two(2) 24" bar hangers for T-bar ceilings ☐ B6 Set of two (2) bar hangers for ceiling joist up to 24" centers ☐ SCA6D Sloped ceiling adapter (see note on page 4) ☐ LiteGear¹ Inverter, single phase central lighting, 125VA-250VA ☐ LPS Series¹ LitePower micro-inverter, 20VA-55VA

¹ See Central Inverter compatibility note and web links on page 4.
² EM must be selected on both the housing and the trim.
³ Not compatible with EM or EMR
⁴ Damp location only
⁵ Compatible with EMR only
⁶ CP must be selected on both the housing and the trim
⁷ Not compatible with CP
⁸ Not available with WW option
⁹ WW must be selected on trim
¹⁰ Not compatible with WWCP

PHOTOMETRIC DATA

LiteFrame - 6" LC6SL Downlight

DRIVER DATA	6LCSL10Lxxx	6LCSL14Lxxx	6LCSL18Lxxx
Input Voltage	120-277V	120-277V	120-277V
Input Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Input Current	0.111 (120v) 0.048 (277v)	0.148 (120v) 0.064 (277v)	0.185 (120v) 0.080 (277v)
Input Power	13.4W	17.8W	22.2W
Constant Current Output	700mA	700mA	700mA
Power Factor	≥0.90	≥0.90	≥0.90
THD	<25%	<20%	<20%
EMI Filtering	FCC 47CFR Part 15, Class A	FCC 47CFR Part 15, Class A	FCC 47CFR Part 15, Class A
Operating Temperature	-30°C to +35°C	-30°C to +28°C	-30°C to +25°C
Dimming	0-10V	0-10V	0-10V

Over-voltage, over-current, short-circuit protected

When operating in EM mode, the fixture will deliver approximately 30% of the published full lumen output.

Lumen Multiplier Table

Photometrics for the LC6SL are published below at a nominal 3500 Kelvin temperature. This table may be used to approximate the lumen values at different Kelvin temperatures. Power consumption would stay the same.

5000 Kelvin	1.09
4000 Kelvin	1.00
3500 Kelvin	1.00
3000 Kelvin	0.99
2700 Kelvin	0.96

LC6SL 6LCSL18L35K8

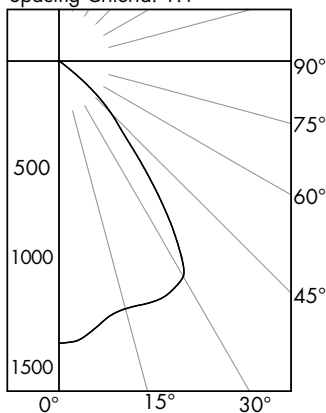
LED Light Engine: 3500K, 80+ CRI

System Wattage: 22.3W

Fixture Delivered Lumens: 1941

Fixture Efficacy: 87.0

Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG	CANDELA
0	1368
5	1345
15	1243
25	1247
35	923
45	357
55	27
65	5
75	1
85	0
90	0

Test No. 16.03178

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1935	99.7
0-90	1941	100.0
90-180	0	0.0
0-180	1941	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	27667
55°	2580
65°	648
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Room Cavity Ratio	% Effective Ceiling Cavity Reflectance																								
	80%					70%					50%					30%					10%				
	20% Effective Floor Cavity Reflectance																								
	% Wall Reflectance																								
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10								
1	113	110	107	105	110	108	105	103	104	102	100	98	98	97	96	95	94								
2	106	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86								
3	100	93	87	83	98	92	86	82	89	85	81	86	83	80	84	81	78								
4	94	86	79	75	92	84	79	74	82	77	73	80	76	72	78	75	72								
5	89	79	73	68	87	78	72	67	76	71	67	74	70	66	73	69	66								
6	83	73	66	62	82	72	66	61	71	65	61	69	64	60	68	63	60								
7	78	68	61	56	77	67	61	56	66	60	56	64	59	55	63	59	55								
8	74	63	56	52	72	62	56	52	61	55	51	60	55	51	59	54	51								
9	70	59	52	48	68	58	52	48	57	51	47	56	51	47	55	51	47								
10	66	55	48	44	65	54	48	44	54	48	44	53	47	44	52	47	44								

LC6SL 6LCSL18L35K8

Test No. 16.03178

LC6SL 6LCSL14L35K8

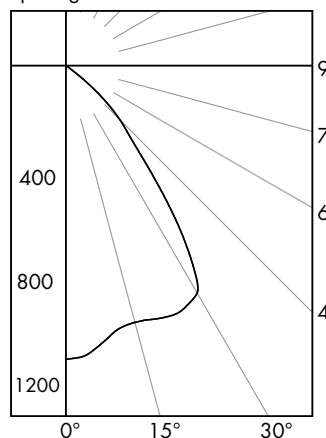
LED Light Engine: 3500K, 80+ CRI

System Wattage: 17.9W

Fixture Delivered Lumens: 1520

Fixture Efficacy: 84.9

Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG	CANDELA
0	1072
5	1050
15	971
25	990
35	721
45	277
55	20
65	4
75	1
85	0
90	0

Test No. 16.03177

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1515	99.7
0-90	1520	100.0
90-180	0	0.0
0-180	1520	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	21467
55°	1911
65°	519
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Room Cavity Ratio	% Effective Ceiling Cavity Reflectance																								
	80%					70%					50%					30%					10%				
	20% Effective Floor Cavity Reflectance																								
	% Wall Reflectance																								
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10								
1	113	110	107	105	110	108	105	103	104	102	100	100	98	97	96	95	94								
2	106	101	97	93	104	99	95	92	96	93	90	90	88	86	85	84	83								
3	100	93	87	83	98	92	86	82	89	85	81	86	83	80	78	77	76								
4	94	86	80	75	92	85	79	74	82	77	73	78	74	73	71	70	69								
5	89	79	73	68	87	78	72	67	76	71	67	74	70	68	67	65	64								
6	83	73	66	62	82	72	66	61	71	65	61	69	64	61	60	58	57								
7	78	68	61	56	77	67	61	56	66	60	56	65	59	56	55	53	52								
8	74	63	56	52	72	62	56	52	61	55	51	60	55	51	50	48	47								
9	70	59	52	48	68	58	52	48	57	51	47	56	51	47	46	44	43								
10	66	55	48	44	65	54	48	44	54	48	44	53	47	44	43	41	40								

LC6SL 6LCSL14L35K8

Test No. 16.03177



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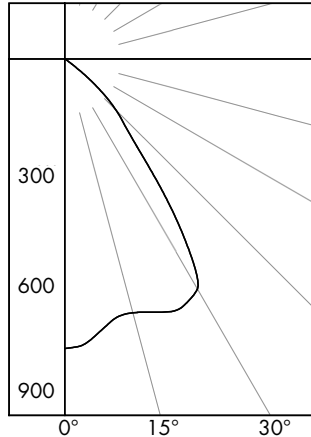
HUBBELL
Lighting, Inc.

PHOTOMETRIC DATA

LiteFrame - 6" LC6SL Downlight

LC6SL 6LC5L10L35K8

LED Light Engine: 3500K, 80+ CRI
System Wattage: 13.5W
Fixture Delivered Lumens: 1106
Fixture Efficacy: 81.9
Spacing Criteria: 1.1



CANDELA DISTRIBUTION

DEG CANDELA

0	780
5	762
15	708
25	740
35	518
45	196
55	15
65	3
75	1
85	0
90	0

Test No. 16.03179

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LUMINAIRE
0-60	1103	99.7
0-90	1106	100.0
90-180	0	0.0
0-180	1106	100.0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average
45°	15190
55°	1433
65°	389
75°	212
85°	0

COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

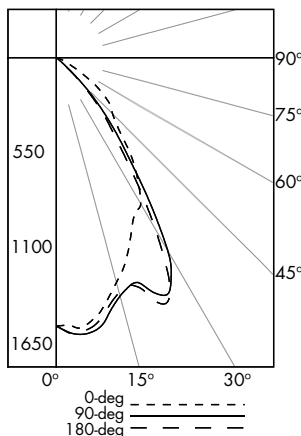
Room Cavity Ratio	% Effective Ceiling Cavity Reflectance																			
	80%				70%				50%				30%				10%			
	20% Effective Floor Cavity Reflectance																			
	% Wall Reflectance																			
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10			
1	113	110	107	105	110	108	105	103	104	102	100	100	98	97	96	95	94			
2	107	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86			
3	100	93	88	83	98	92	87	82	89	85	81	86	83	80	84	81	79			
4	94	86	80	75	92	85	79	74	82	77	74	80	76	73	78	75	72			
5	89	79	73	68	87	78	72	68	76	71	67	75	70	66	73	69	66			
6	83	73	67	62	82	73	66	62	71	65	61	69	65	61	68	64	60			
7	78	68	61	57	77	67	61	56	66	60	56	65	60	56	64	59	55			
8	74	63	57	52	73	63	56	52	61	56	52	60	55	51	59	55	51			
9	70	59	52	48	69	58	52	48	57	52	48	57	51	47	56	51	47			
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44			

LC6SL 6LC5L10L35K8

Test No. 16.03179

LC6SL 6LC5L18L35K8 WW

LED Light Engine: 3500K, 80+ CRI
System Wattage: 22.2W
Fixture Delivered Lumens: 1938
Fixture Efficacy: 87.3



CANDELA DISTRIBUTION

DEG	0	90	180
0	1527	1527	1527
5	1545	1581	1565
15	1324	1404	1383
25	1030	1489	1517
35	792	780	670
45	454	219	189
55	273	8	8
65	64	2	2
75	9	1	1
85	0	0	0
90	0	0	0

LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	0 DEG	90 DEG	180 DEG
45°	38311	18480	15949
55°	28400	832	832
65°	9036	282	282
75°	2075	231	231
85°	0	0	0

MULTIPLE UNITS			
1' 2' 3' 4'	UNITS ON 3' CENTER	UNITS ON 4' CENTER	

2' DISTANCE FIXTURE MOUNTED OUT FROM WALLS FOOTCANDLE DISTRIBUTION ON WALL SURFACE (DIRECT ONLY)

DISTANCE FROM CEILING IN FEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	15	11	6	2	1															
2	40	36	26	13	5															
3	36	35	28	18	11															
4	22	22	22	19	13															
5	14	14	14	14	13															
6	10	10	9	9	9															
7	7	7	6	6	6															
8	5	5	5	4	4															
9	4	4	3	3	3															

LC6SL 6LC5L18L35K8 WW

Test No. 16.03309

Test No. 16.03309

Tested at 25°C Ambient in accordance to IESNA LM-79-2008



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Lighting, Inc.

Dimming Compatibility Table

Dimming Ballast	Manufacturer	Web Link
DM/DM1	Lutron DTV	http://bit.ly/11jSvZg
DM/DM1	Leviton AWRMG-7xx, AWSMG-7xx, AWSMT-7xx	http://bit.ly/1BJn2R9

Central Inverters

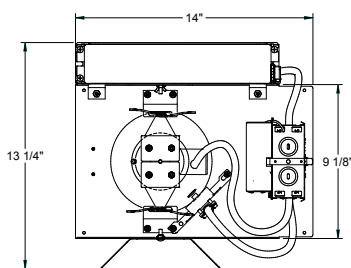
For full fixture output in back-up mode, we recommend you visit www.dual-lite.com for your Central Lighting Inverter options. Please contact your local Hubbell representative for any assistance with proper sizing and loading of your inverter selection. Central lighting inverters must be ordered separately.

LiteGear: www.dual-lite.com/products/litegear_lg_series

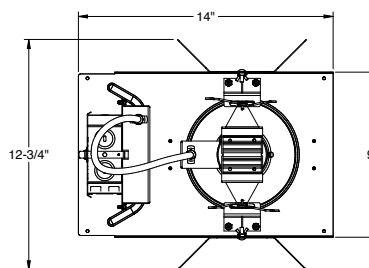
LPS Series: www.dual-lite.com/products/lps

SCA6D

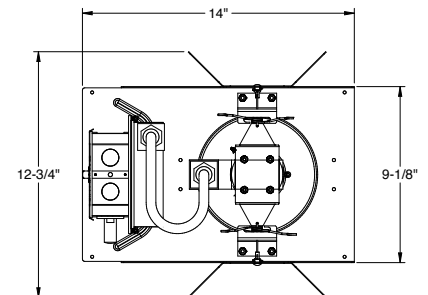
When ordering a sloped ceiling adapter, specify the degree of slope in 1° increments, maximum of 35°. For a more precise degree or wet ceiling applications, please contact factory. Sloped ceiling adapter and housing must be installed at the same time.



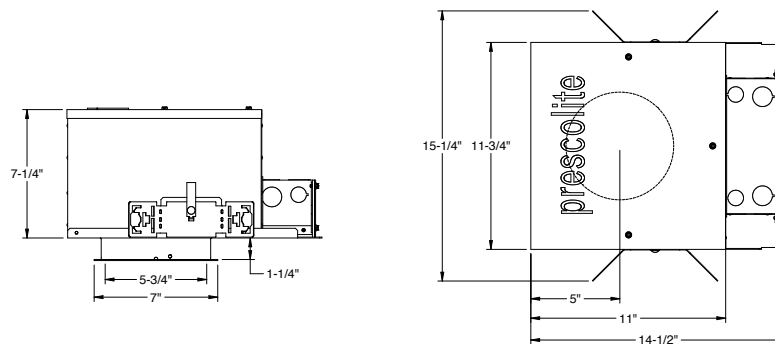
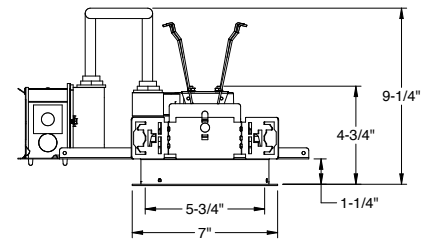
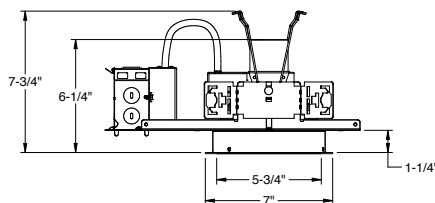
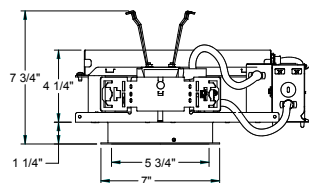
LC6SL EM



LC6SL 18L



LC6SL CP



LC6SL WWCP



Color: Bronze

Weight: 6.3 lbs

Project:

Type:

Prepared By:

Date:

Driver Info

Type: Constant Current
120V: 0.17A
208V: 0.11A
240V: 0.10A
277V: 0.09A
Input Watts: 29W
Efficiency: 88%

LED Info

Watts: 26W
Color Temp: 4000K (Neutral)
Color Accuracy: 71 CRI
L70 Lifespan: 100000
Lumens: 3468
Efficacy: 118 LPW

Technical Specifications

Listings

UL Listing:

Suitable for wet locations

DLC Listed:

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

DLC Product Code: P0000175R

IESNA LM-79 & IESNA LM-80 Testing:

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

Dark Sky Conformance:

Conforms to (allows for conformance to) the IDA's fully shielding requirement, emitting no light above 90 degrees (with the exclusion of incidental light reflecting from fixture housing, mounts, and pole).

LED Characteristics

Lifespan:

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

Lumen Maintenance:

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

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Construction

IES Classification:

The Type IV distribution (also known as a Forward Throw) is especially suited for mounting on the sides of buildings and walls, and for illuminating the perimeter of parking areas. It produces a semiCircular distribution with essentially the same candlepower at lateral angles from 90° to 270°.

Housing:

Precision die cast aluminum housing, lens frame

Gaskets:

High temperature silicone

Effective Projected Area:

EPA = 0.27.

Finish:

Formulated for high-durability and long lasting color

Green Technology:

Mercury and UV-free. RoHS compliant components

Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Cold Weather Starting:

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

Electrical

Driver:

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

Other

Patents:

The ALED design is protected by U.S. PATENT D608,040 and patents pending in the U.S., Canada, China, Taiwan and Mexico.

Equivalency:

Equivalent to 70W Metal Halide

Warranty:

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

Buy American Act Compliance:

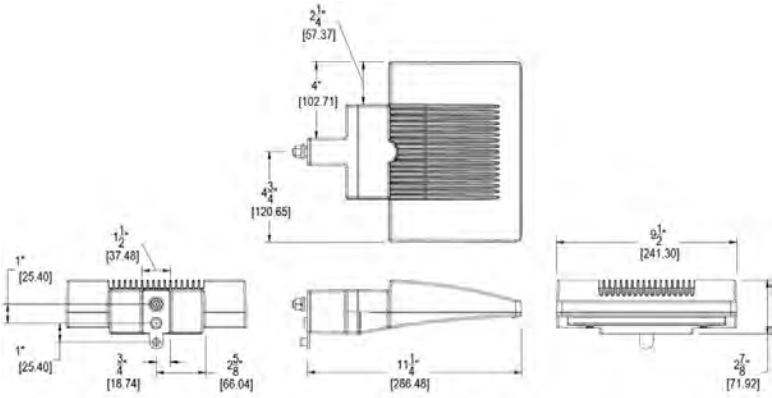
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

- High output LED light engine
- Maintains 70% of initial lumens at 100,000 hours
- Weatherproof high temperature silicone gaskets
- Superior heat sinking with die cast aluminum housing and external fins

Ordering Matrix

Family	Wattage	Color Temp	Photocell	Finish	Other Options
ALED	10 = 10W 13 = 13W 18 = 18W 20 = 20W	Blank = 5000K (Cool) Y = 3000K (Warm) N = 4000K (Neutral)	Blank = No Photocell /PC = 120V Button /PC2 = 277V Button	Blank = Bronze W = White	Blank = Standard USA = BAA Compliant



Ultra-high efficiency LED 18 Watt wallpack. Patent Pending thermal management system. 100,000 hour L70 lifespan. 5-year, no-compromise warranty.

Color: Bronze

Weight: 7.5 lbs

Project:

Type:

Prepared By:

Date:

Driver Info

Type: Constant Current
120V: 0.17A
208V: 0.11A
240V: 0.09A
277V: 0.08A
Input Watts: 20W
Efficiency: 89%

LED Info

Watts: 18W
Color Temp: 4000K (Neutral)
Color Accuracy: 71 CRI
L70 Lifespan: 100000
Lumens: 2503
Efficacy: 124 LPW

Technical Specifications

Listings

UL Listing:

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

DLC Listed:

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

DLC Product Code: P0000175K

IESNA LM-79 & LM-80 Testing:

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

LED Characteristics

Lifespan:

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

LED:

Multi-chip, high-output, long-life LED

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Electrical

Driver:

Constant Current, Class 2, 100-277V, 50/60 Hz, 4 kV surge protection, 500mA, 100-240VAC: 0.3-0.15A, 277VAC: 0.15A, Power Factor: 99%

Construction

Maximum Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Cold Weather Starting:

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

Thermal Management:

Superior heat sinking with external Air-Flow fins

Finish:

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

Reflector:

Semi-specular, vacuum-metalized polycarbonate

Gaskets:

High-temperature silicone gaskets

Housing:

Die-cast aluminum housing, lens frame and mounting arm

Mounting:

Heavy-duty mounting arm with "O" ring seal & stainless steel screws

Green Technology:

Mercury and UV-free. RoHS compliant components.

Other

Patents:

The design of WPLED18 is protected by US patent D608,040, Canada patent 138280, and China patent CN301649064S

Warranty:

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

Replacement:

Replaces 150W Metal Halide

Buy American Act Compliance:

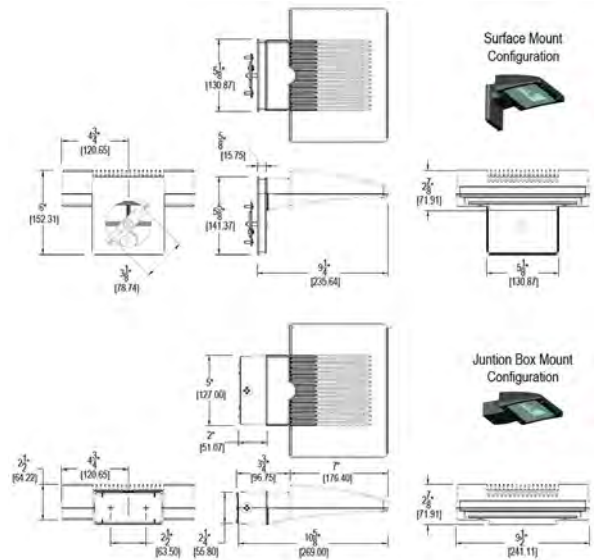
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

- Ultra-high efficiency LED 18 Watt wallpack
- Replaces 150W Metal Halide Wallpacks
- 100,00-Hour LED Lifespan
- 5-Year, No-Compromise Warranty

Ordering Matrix

Family	Wattage	Color Temp	Finish	Emergency Battery Backup	Options	Other Options
WPLED	18	N	Λ	Λ	Λ	Λ
18 = 18W Blank = 5000K (Cool) Blank = Bronze Blank = No Battery Backup Blank = No Option Blank = Standard						
N = 4000K (Neutral) W = White /E = Standard Battery Backup /PC = 120V Button Photocell USA = BAA Compliant						
Y = 3000K (Warm) /EC = Battery Backup with Cold Start /PC2 = 277V Button Photocell						



12, 18 and 26 Watt SLIM wallpacks are ultra efficient and deliver impressive light distribution with a compact low-profile design that's super easy to install as a downlight or uplight.

Color: Bronze

Weight: 4.5 lbs

Project:

Type:

Prepared By:

Date:

Driver Info

Type: Constant Current
120V: 0.18A
208V: 0.11A
240V: 0.09A
277V: 0.08A
Input Watts: 21W
Efficiency: 85%

LED Info

Watts: 18W
Color Temp: 4000K (Neutral)
Color Accuracy: 72 CRI
L70 Lifespan: 100000
Lumens: 2565
Efficacy: 122 LPW

Technical Specifications

Listings

UL Listing:

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

DLC Listed:

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

DLC Product Code: P0000171P

ADA Compliant:

SLIM™ is ADA Compliant

IESNA LM-79 & LM-80 Testing:

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

Construction

IP Rating:

Ingress Protection rating of IP66 for dust and water

Cold Weather Starting:

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

Maximum Ambient Temperature:

Suitable for use in 40°C (104°F) ambient temperatures

Housing:

Precision die-cast aluminum housing

Mounting:

Heavy-duty mounting bracket with hinged housing for easy installation

Recommended Mounting Height:

Up to 14 ft

Lens:

Tempered glass lens

Reflector:

Specular thermoplastic

Gaskets:

High-temperature silicone

Finish:

Formulated for high-durability and long lasting color

Green Technology:

Mercury and UV-free. RoHS compliant components.

LED Characteristics

LED:

Multi-chip, long-life LED

Lifespan:

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

Color Consistency:

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

Color Stability:

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

Color Uniformity:

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

Electrical

Driver:

Constant Current, Class 2, 100-277V, 50/60 Hz., 4KV surge protection, 120V: 0.19A, 208V: 0.11A, 240V: 0.10A, 277V: 0.08A

Other

Patents:

The design of the SLIM™ is protected by patents in U.S. Pat D681,864, and pending patents in Canada, China, Taiwan and Mexico.

HID Replacement Range:

Replaces 100W Metal Halide

Buy American Act Compliance:

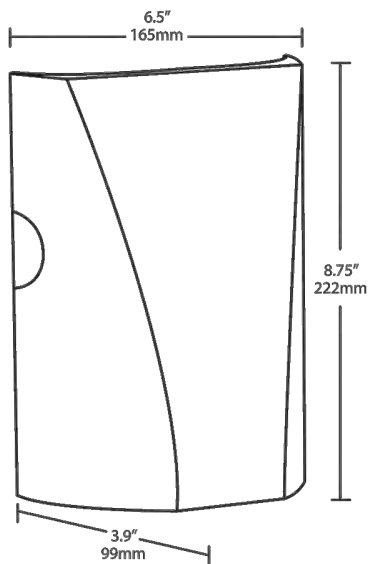
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Optical

BUG Rating:

B1 U0 G0

Dimensions



Features

- Full cutoff, fully shielded LED wallpack
- Can be used as a downlight or uplight
- Contractor friendly features for easy installation
- 100,000-hour LED Life
- 5-Year, No-Compromise Warranty

Ordering Matrix

Family	Wattage	Color Temp	Finish	Driver	Options
SLIM	18	N	Λ	Λ	Λ
	12 = 12W	N = 4000K (Neutral)	Blank = Bronze	Blank = Standard (120-277V)	Blank = No Option
	18 = 18W	Y = 3000K (Warm)	W = White	/D10 = Dimmable	/PC = 120V Button
	26 = 26W	Blank = 5000K (Cool)			/PC2 = 277V Button
					/LC = Lightcloud Controller

LNC2 SERIES

Cat.#

Job

Type



HUBBELL
Outdoor Lighting

Approvals

SPECIFICATIONS

The small sized LNC2 is designed for perimeter illumination for safety, security and identification. No uplight and prismatic lenses offer neighbor friendly lighting at typical mounting heights of 8-15'. Units have protective polyester finish for long lasting appearance. Ideal for schools, factories, hospitals, warehouses and retail applications. Energy efficient LEDs provide up to 85% energy savings when compared to traditional light sources with little to no maintenance.

Construction:

Rugged die-cast aluminum housing protects components and provides an architectural appearance. Casting thermally conducts LED heat to optimize performance and long life. Powder paint finish provides durability in outdoor environments.

Electrical:

- 120V-277V universal voltage 50/60Hz 0-10V dimming drivers
- 347V and 480V dimmable driver option in 12L-070 configuration
- Minimum operating temperature is -40°C/-40°F (excludes 12L-035 and P15 configurations)
- Drivers have greater than .90 power factor and less than 20% Total Harmonic Distortion
- Driver RoHS and IP66
- 10kA surge protector

LED(s) CCT:

- 3000K CCT nominal, 4000K CCT nominal, 5000K CCT nominal (70 CRI)
- 9, 12 and 18 LED configurations available see pages 2 and 3 for electrical and photometric details

Optical:

Zero uplight distributions using individual acrylic LED optics provide IES type II, III and IV distributions. Optional (CS) acrylic diffuser available for reduced glare. Prismatic refractor lens provides ~10% uplight for increased vertical FC and forward light projection ideal for security lighting.

Lumen Maintenance:

L96 at 60,000hrs (Projected per IESNA TM-21-11), see table on page 2 for all values

Installation:

Quick-mount adapter provides easy installation to wall or to recessed junction boxes (4" square junction box). Designed for direct j-box mount. Optional 1/2" conduit hubs available (standard for sensor, SiteSync and battery versions).

Options/Controls:

- Universal button photocontrol
- Occupancy sensor options available for complete on/off and dimming control
- SiteSync pre-commissioned wireless controls (with or without sensor)
- Integral Battery Backup provides emergency lighting for the required 90 minute path of egress
- Dual Driver and Dual Power Feed option for 18L-070 versions

Listings:

- Listed to UL1598 and CSAC22.2#250.0-24 for wet locations
- DesignLights Consortium® (DLC) qualified. Please refer to the DLC website for specific product qualifications at www.designlights.org
- Made-to-order versions are IP-65 rated

Warranty:

Five year limited warranty (for more information visit: <https://www.hubbell.com/hubbelllighting/en/warranty>)

PRODUCT IMAGE(S)



Standard 9, 12, and 18L Version*



Prismatic Version



Surface Conduit Hubs, Sensor & SiteSync Version

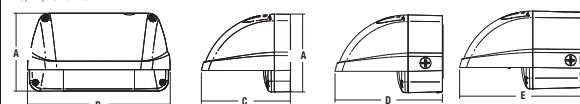


Battery Backup Version

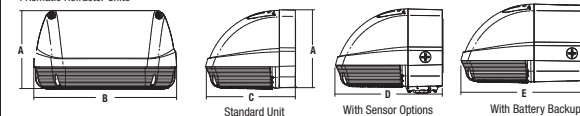
*Shown with CS acrylic diffuser

DIMENSIONS

9, 12, 18L units



Prismatic Refractor Units



A	B	C	D	E
5.54"	10.16"	6.33"	7.64"	9.10"
40.7 mm	258 mm	160.7 mm	194 mm	231 mm

BASE MODEL 7.0 lbs / 3.2 kg

PC SENSOR 7.5 lbs / 3.4 kg • BBU MODELS 9.5 lbs / 4.3 kg

SHIPPING INFORMATION (Stock)

Catalog Number	G.W(kg)/CTN	Carton Dimensions			Carton Qty. per Master Pack
		Length Inch (cm)	Width Inch (cm)	Height Inch (cm)	
LNC2-12LU	14.3 (6.5)	14.5 (37)	11.4 (29)	8.4 (21.5)	2
LNC2-18LU	14.8 (6.7)	14.9 (38)	11.4 (29)	8.4 (21.5)	2

CERTIFICATIONS/LISTINGS



C US



Turtle Friendly



*3000K and warmer CCTs only



LISTED

ORDERING INFORMATION – ORDERING EXAMPLE: LNC2-12L-4K-070-3-1-DB-PCU-EH-CS

LNC2

SERIES

LED SELECTION

CCT/CRI

DRIVE CURRENT

VOLTAGE

MOUNTING

CONTROL OPTIONS

OPTIONS

LNC2 Small
LitePak
LNC2

9L 9 LEDs
12L 12 LEDs
18L 18 LEDs
P15 15w Prismatic Refractor
P25 25w Prismatic Refractor
P35 35w Prismatic Refractor

3K 3000K, 70 CRI
4K 4000K, 70 CRI
5K 5000K, 70 CRI
AM Amber (350mA only)

070 700mA
035 350mA (12L & 18L only)

IES DISTRIBUTION

2' IES Type II
3' IES Type III
4' IES Type IV

FT Forward Throw (Prismatic Refractor only)

U 120V-277V
1 120V
2 208V
3 240V
4 277V
5⁸ 480V
F⁸ 347V

Leave Blank for down position
NV² Inverted

FINISH

DB Dark Bronze Textured
BL Black Textured
GYS Gray Smooth
PS Platinum Silver Smooth
WH White Textured
CC Custom Color

SCP^{4,5} Occupancy Sensor Programmable (Dim)
PCU Universal Button Photocontrol
SWP⁶ SiteSync Pre-Commission
SWPM SiteSync Pre-^{6,7} Commission w/ OCC Sensor

SPECIFY SCP HEIGHT

8F Up to 8ft mount height
20F Up to 20ft mount height

EH³ Battery Backup Unit with Heater (-30°C)
E³ Battery Backup Unit (0°C)
F³ Fuse & Fuse-holder (not available with Battery Backup)
CS Comfort Shield (N/A with Prismatic Refractor)
2DR Dual Driver (18L - 700mA only)
2PF Dual Power Feed (18L - 700mA only)
CH Surface Conduit Hubs

1 IES distributions only available with 9L, 12L, and 18L versions

2 Not available with occupancy sensor, battery backup or prismatic refractor options

3 Must specify voltage (120 or 277 only for E & EH)

4 Must order minimum of one remote control to program dimming settings, 0-10V fully adjustable dimming with automatic daylight calibration and different time delay settings, 120-277V only

5 PCU option not applicable, included in sensor

6 18L - 700mA versions only. Not available with 2DR or 2PF options. Must specify group and zone information at time of order

7 Specify time delay; dimming level and mounting height

8 12L - 700mA version only



HUBBELL
Outdoor Lighting

Hubbell Outdoor Lighting • 701 Millennium Boulevard • Greenville, SC 29607 • Phone: 864-678-1000

Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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STOCK ORDERING INFORMATION

Catalog Number	System Watts	Delivered Lumens	Distribution	Voltage	CCT	# Drivers/ Current	Weight lbs. (kg)	Finish	Options
LNC2-12LU-4K-3-1	29w	2,662	3	120-277V	4000K	1@700mA	7.0 (13.3)	Dark Bronze	*
LNC2-12LU-5K-3-1	29w	2,868	3	120-277V	5000K	1@700mA	7.0 (13.3)	Dark Bronze	*
LNC2-12LU-5K-3-1-PC-U	29w	2,868	3	120-277V	5000K	1@700mA	7.0 (13.3)	Dark Bronze	Photocell*
LNC2-18LU-4K-3-1	42w	3,806	3	120-277V	4000K	2@700mA	7.0 (13.3)	Dark Bronze	*
LNC2-18LU-5K-3-1	42w	4,106	3	120-277V	5000K	2@700mA	7.0 (13.3)	Dark Bronze	*
LNC2-18LU-5K-3-1-PC-U	42w	4,106	3	120-277V	5000K	2@700mA	7.0 (13.3)	Dark Bronze	Photocell*
LNC2-P35-4K-PCU	37w	4,025	FT	120-277V	4000K	1@900mA	7.0 (13.3)	Dark Bronze	Photocell
LNC2-P35-PCU	37w	4,108	FT	120-277V	5000K	1@900mA	7.0 (13.3)	Dark Bronze	Photocell

*Frosted acrylic comfort shield/lens included with unit

REPLACEMENT PART/ACCESSORIES

CATALOG NUMBER	DESCRIPTION
LNC2-CS	Frosted acrylic comfort shield/lens, reduces glare and improves uniformity with only 15% lumen reduction
SCP-REMOTE*	Remote control for SCP option. Order at least one per project to program and control fixtures

*Must order minimum of one remote control to program dimming settings, 0-10V fully adjustable dimming with automatic daylight calibration and different time delay settings, 120V or 277V only

PERFORMANCE DATA

Standard 9, 12 and 18L Versions

# OF LEDS	DRIVE CURRENT	SYSTEM WATTS	DIST. TYPE	5K (5000K nominal, 70 CRI)					4K (4000K nominal, 70 CRI)					3K (3000K nominal, 80 CRI)				
				LUMENS	LPW ¹	B	U	G	LUMENS	LPW ¹	B	U	G	LUMENS	LPW ¹	B	U	G
9	700mA	21W	2	2,083	97	1	0	1	2,072	97	1	0	1	1,927	90	1	0	1
			3	1,972	92	0	0	1	1,962	92	0	0	1	1,825	85	0	0	1
			4	2,097	98	0	0	1	2,087	98	0	0	1	1,941	91	0	0	1
12	350mA	14W	2	1,513	110	0	0	1	1,506	109	0	0	1	1,440	104	0	0	1
			3	1,433	104	0	0	1	1,426	103	0	0	1	1,364	99	0	0	1
			4	1,524	110	0	0	1	1,543	112	0	0	1	1,476	107	0	0	1
	700mA	29W	2	2,777	97	1	0	1	2,763	97	1	0	1	2,570	90	1	0	1
			3	2,629	92	1	0	1	2,616	91	1	0	1	2,433	85	1	0	1
			4	2,797	98	1	0	1	2,783	97	1	0	1	2,588	90	1	0	1
18	350mA	21W	2	2,270	107	1	0	1	2,259	106	1	0	1	2,074	97	1	0	1
			3	2,149	101	0	0	1	2,138	100	0	0	1	1,963	92	0	0	1
			4	2,286	107	0	0	1	2,275	107	0	0	1	2,125	100	0	0	1
	700mA	43W	2	4,261	99	1	0	1	4,240	98	1	0	1	3,943	91	1	0	1
			3	4,033	93	1	0	1	4,014	93	1	0	1	3,733	86	1	0	1
			4	4,290	99	1	0	1	4,270	99	1	0	1	3,971	92	1	0	1

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown. Actual performance may differ as a result of end-user environment and application. LNC2-12L battery mode produces 1,546 initial lumens. Meets UL924 90 minute discharge pattern.

PERFORMANCE DATA

Prismatic Refractor

# OF LEDS	DRIVE CURRENT	SYSTEM WATTS	DIST. TYPE	5K (5000K nominal, 70 CRI)					4K (4000K nominal, 70 CRI)					3K (3000K nominal, 80 CRI)				
				LUMENS	LPW ¹	B	U	G	LUMENS	LPW ¹	B	U	G	LUMENS	LPW ¹	B	U	G
1	350mA	13W	FT	1,741	132	0	3	2	1,706	129	0	3	2	1,648	125	0	3	2
	600mA	25W		2,929	117	1	3	2	2,806	112	1	3	2	2,773	111	1	3	2
	900mA	37W		4,108	112	1	3	3	4,025	110	1	3	3	3,889	106	1	3	3

PROJECTED LUMEN MAINTENANCE

Standard 9, 12 and 18L Versions

Ambient Temp.	OPERATING HOURS					
	0	25,000	50,000	TM-21-11 ¹ L96 60,000	100,000	L70 (hours)
25°C / 77°F	1.00	0.98	0.97	0.96	0.95	>791,000
40°C / 104°F	0.99	0.98	0.96	0.96	0.95	>635,000

1. Projected per IESNA TM-21-11 * (Nichia 219B, 700mA, 85°C Ts, 10,000hrs)

Data references the extrapolated performance projections for the LNC-12LU-5K base model in a 40°C ambient, based on 10,000 hours of LED testing per IESNA LM-80-08.

Prismatic Refractor

Ambient Temp.	OPERATING HOURS					
	0	25,000	50,000	TM-21-11 ¹ L96 60,000	100,000	L70 (hours)
25°C / 77°F	1.00	0.94	0.89	0.87	0.80	>160,000
40°C / 104°F	0.99	0.93	0.88	0.86	0.78	>150,000



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Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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ELECTRICAL DATA

Standard 9, 12 and 18L Versions

# OF LEDs	DRIVE CURRENT (mA)	INPUT VOLTAGE (V)	CURRENT (Amps)	SYSTEM POWER (w)
9	700mA	120	0.18	21
		277	0.08	21
12	350mA	120	0.12	14
		277	0.05	14
	700mA	120	0.24	29
		277	0.10	29
		347	0.08	29
		480	0.06	29
18	350mA	120	0.18	21
		277	0.08	21
	700mA	120	0.36	43
		277	0.16	43

Prismatic Refractor

# OF LEDs	DRIVE CURRENT (mA)	INPUT VOLTAGE (V)	CURRENT (Amps)	SYSTEM POWER (w)
1	350mA	120	0.11	13
		277	0.05	13
	600mA	120	0.21	25
		277	0.09	25
	900mA	120	0.31	37
		277	0.13	37

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Standard 9, 12, 18L and Prismatic Versions

AMBIENT TEMPERATURE		LUMEN MULTIPLIER
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	1.00
40°C	104°F	0.99
50°C	122°F	0.98

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

NV - Inverted Mounting Options

(Requires Factory Installed lens Option)



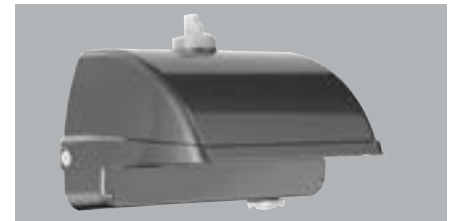
Inverted mounting capabilities for uplighting applications. Specially designed frosted acrylic diffuser option softens output, improves uniformity and protects LED lenses.

SCP - Programmable Occupancy Sensor



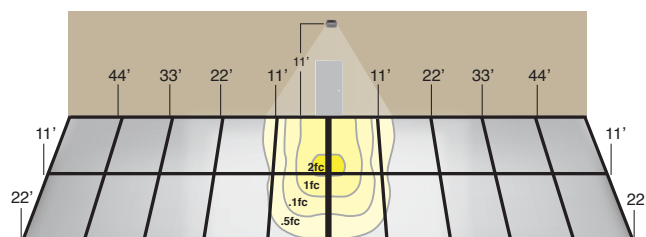
Sensor offers greater control and energy savings with SCP programmable sensor with adjustable delay and dimming levels (Factory default is 10%) Visit: <http://www.hubbelllighting.com/solutions/controls/> for control application information

SWP & SWPM - SiteSync™



When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project locations Group information, and Operating schedules. For more detailed information please visit www.HubbellLighting.com/products/sitesync or contact Hubbell Lighting tech support at (800) 345-4928.

LNC2 – BATTERY BACK UP



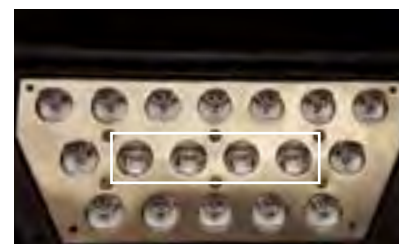
11' Mounting Height

Provides Life Safety Code average illuminance of 1.0 fc. Assumes open space with no obstructions and mounting height of 11'.

Diagrams for illustration purposes only, please consult factory for application layout.

Battery backup units consume 6 watts when charging a dead battery and 2 watts during maintenance charging. EH (units with a heater) consume up to an additional 8 watts when charging if the battery temp is lower than 10°C

E & EH EMERGENCY BATTERY BACKUP



Standard versions utilize 9, 12 or 18 High Power LEDs to generate 1,600 - 4,200 lumens in Normal Mode and use 4 LEDs for up to 700 lumens in Emergency Mode. Prismatic refractor versions utilize 1 COB LED to generate approximately 900 lumens in emergency mode.



Memorandum

To: John Caulo
LandPlan Development Services, LLC

Date: July 20, 2018

Project #: 58083.00

From: David Saladino, P.E., AICP
Nina Truslow

Re: Blodgett Oven Site Redevelopment
Traffic Impact Study and Parking Assessment
Burlington, VT

VHB has completed a Traffic Impact Study (TIS) for the proposed redevelopment of the Blodgett Oven property located at 44-50 Lakeside Avenue in Burlington, Vermont. The site lies adjacent to Lake Champlain, and is bordered on the south by Lakeside Avenue and on the east by the Burlington Bike Path and Vermont Rail System railroad tracks. The three buildings currently on the site have historically served manufacturing and office uses.

The proposed redevelopment program consists of a program of adaptive reuse and renovation of two of the three buildings located within the project site. Specifically, the redevelopment program includes the following components:

- 44 Lakeside Avenue will be renovated to provide 52,000 square feet of office space with an obsolete 700 square-foot loading dock removed;
- 50 Lakeside Avenue will be renovated provide an 84,500 square foot job creating "Innovation Hub" for the creative economy, resulting in a mixture of office and assembly "maker space" uses;
- 32 Lakeside Avenue will remain unaltered, continuing to provide 9,200 square feet of office space; and
- Parking on the site will be reconfigured to increase total parking capacity.

This Traffic Impact Study includes the following elements:

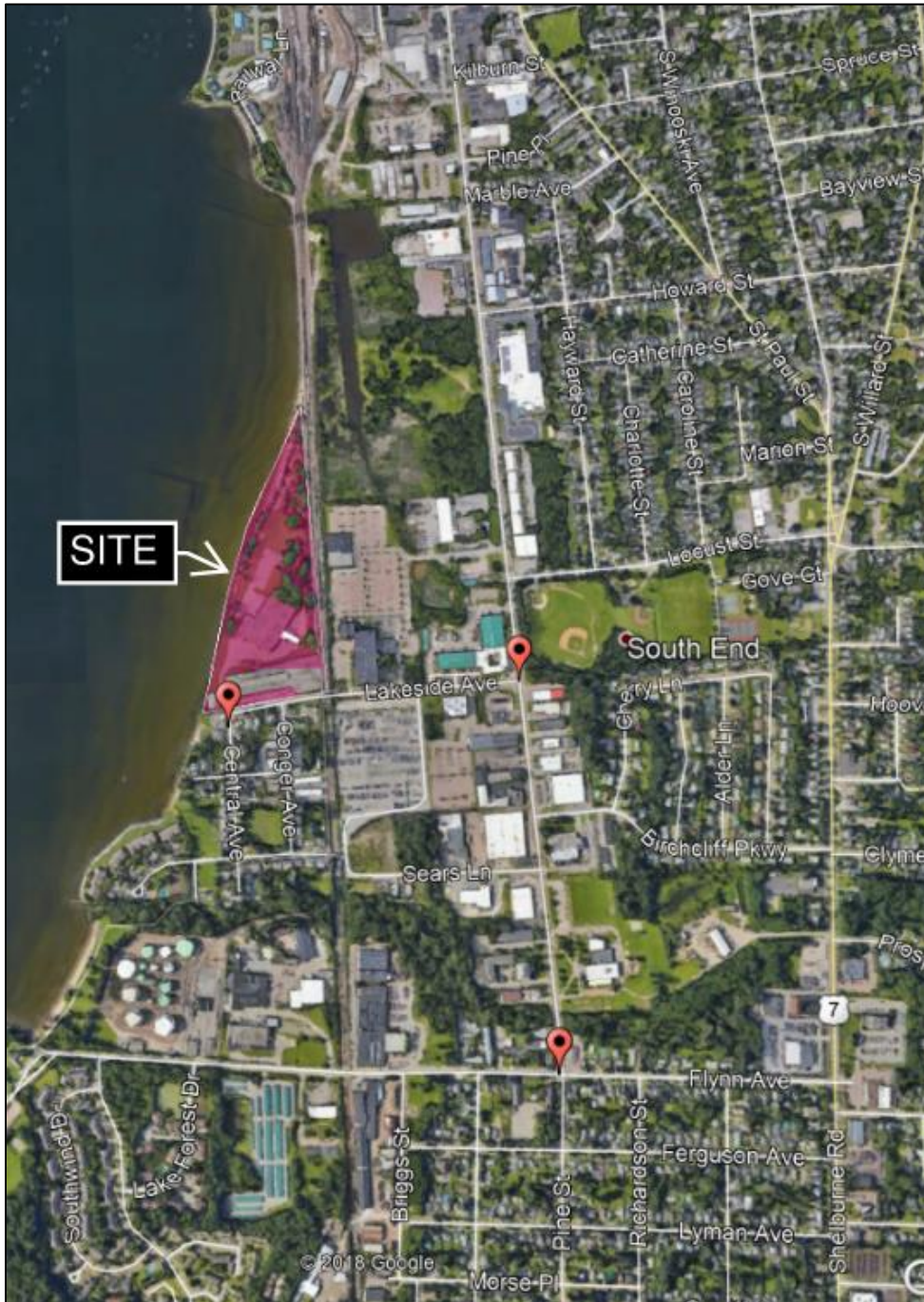
- A description of the existing roadway network near the site;
- A summary of the crash data within the study area;
- A description of the proposed development program;
- A trip generation and distribution estimate for the proposed development program;
- An evaluation of traffic operations at the following intersections: (1) Pine Street / Flynn Avenue, (2) Lakeside Avenue / Pine Street, and (3) Lakeside Avenue / Central Avenue;
- A parking demand evaluation; and
- Conclusions and recommendations to support the project.

EXISTING CONDITIONS

The project site is comprised of three parcels consisting of 14.89 acres bounded by Lakeside Avenue to the south, rail lines and the Burlington Bike Path to the east, and Lake Champlain to the west. The site can currently be accessed via a driveway opposite Central Avenue or by direct access from Lakeside Avenue. The three existing buildings on the site have historically served manufacturing and office uses. The location of the site in relation to the local street network is shown in **Figure 1**.

40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403-7771
P 802.497.6100

Figure 1: Site Location Map and Study Intersections



Roadway Characteristics

Lakeside Avenue is a local street that connects a small lakeside neighborhood, the Blodgett Oven site, and other businesses to Pine Street and carries approximately 2,900 vehicles per day¹. It extends from Pine Street and continues westerly approximately 0.3 miles, terminating at Central Avenue, in close proximity to Lake Champlain. Lakeside Avenue is a two-lane urban street with no posted speed limit. Land use along the road is comprised of a mix of office, industrial, retail, institutional, and residential. There are intermittent sidewalks on the road as land use changes.

Pine Street is a north-south minor arterial that extends from the southern city limit of Burlington north to Pearl Street. Pine Street carries approximately 13,000 vehicles near the project area². Pine Street is a two-lane urban street with sidewalks on both sides of the road and bike markings or lanes in the vicinity of the project area. Land uses along the road is mixed, with primarily retail and industrial uses adjacent to the project area.

Flynn Avenue is a local, urban street that extends from US Route 7 westerly to Oakledge Park and Lake Champlain. Flynn Avenue carries approximately 3,000 vehicles per day near the intersection with Pine Street. The street has one lane in each direction and there are sidewalks on both sides. Parallel parking is allowed on both sides of the street. Land use along the road is primarily residential, office, industrial, and recreational.

Central Avenue is a two-lane local street that begins at Lakeside Avenue and continues approximately 960-feet south. Sidewalks line the road on both sides. Land use on the road is primarily residential.

Project Area Intersections

Pine Street and Flynn Avenue intersect at a four-way signalized intersection. The southbound Pine Street approach has a dedicated left-turn lane and a shared right/through lane. All other approaches have one lane. Both streets have markings to accommodate bicycles at the intersection. There are pedestrian-actuated crosswalks at every approach. Right turns on red are prohibited from the northbound approach.

Pine Street and Lakeside Avenue meet at a four-way, signalized intersection, with the westbound approach serving the driveway of Feldman's Bagels. The southbound Lakeside Avenue approach has two lanes, a shared left/through lane and an exclusive right turn lane with a coincident bike lane. The northbound Lakeside Avenue approach has a shared through/right turn lane and an exclusive left turn lane. The intersection has pedestrian-actuated walking signals at all crossings except across the Feldman's driveway.

The Lakeside Avenue and Central Avenue intersection is a four-way intersection with two approaches serving private driveways. The southbound approach is the driveway for the Blodgett parking lot and the eastbound approach is the driveway for the St. John's club. There are no traffic controls or road markings at this intersection.

¹ VTrans Transportation Data Management System. <http://vtrans.ms2soft.com>. Queried 07/09/18.

² 2015 (Route Log) AADTs – Federal Aid Urban Streets, Vermont Agency of Transportation, 2016.

CRASH SUMMARY

For a section of roadway to be considered a High Crash Location (HCL), the location must have experienced at least five crashes in five years and the actual-to-critical rate ratio must be greater than or equal to 1.00. A review of VTrans' most recent High Crash Location (HCL) Report (2012-2016) revealed that one roadway segment within the project study area is classified as a HCL by VTrans.³

The VTrans Public Crash Data Query Tool⁴ was used to investigate crash data from the most recent five years (2013-2017) along the HCL described above. The HCL section is along Pine Street between milemarker 0.3-0.6. For reference, this segment runs from Birchcliff Parkway to north of Locust Street. The Pine Street intersection with Lakeside Avenue is located at milemarker 0.4. Within the period 2013-2017, there were the following within the HCL:

- 55 total crashes within the 0.3 mile HCL segment;
- 32 crashes (58% of all crashes within the HCL) occurred at the Lakeside Avenue / Pine Street intersection;
- Three crashes along the HCL involved a pedestrian, and five involved a cyclist;
- 35% of the crashes in the HCL were rear ends, 18% were left-turns, and 9% were through movements.

In addition, available 2013-2017 crash data along the streets and intersections of interest in this study were queried. Most relevant to the proposed project is crash information along Lakeside Avenue and the Lakeside Avenue / Central Avenue intersection. There were no reported crashes at this intersection, and a total of six crashes along the length of Lakeside Avenue over this time period. Of these crashes, none resulted in injury or fatality.

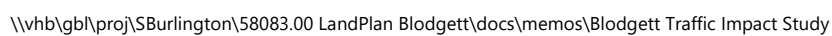
The relevant section of the 2012-2016 VTrans HCL Report and crash data from the last five years on Lakeside Avenue, Pine Street, Lakeside & Pine, and Pine & Flynn is included in the Appendix.

PROPOSED DEVELOPMENT

The proposed development program consists of renovating the two larger buildings on site (84,500 SF building at 50 Lakeside Avenue and 52,000 SF building at 44 Lakeside Avenue). The smaller 9,200 SF building is to remain as is. Parking areas will be reconfigured to increase capacity by approximately 200 parking spaces. In addition, access management will be significantly improved by providing a curbed island between Lakeside Avenue and the adjacent parking area, which is currently an uncontrolled curb cut. Primary access and egress will be provided via the main driveway opposite Central Avenue and a parking lot exit adjacent to Lakeside Avenue to the east of the driveway. The proposed site plan is shown in **Figure 2** on the following page.

³ High Crash Location Report: Intersections and Segments (2012-2016), Vermont Agency of Transportation, 2017.

⁴ VTrans Transportation Data Management System, <http://vtrans.ms2soft.com>. Queried 07/09/2018.



TRIP GENERATION

Trip generation estimates for the proposed Blodgett Oven Site redevelopment were calculated based on rates published by the Institute of Transportation Engineers (ITE) Trip Generation Manual⁵ for the weekday morning and evening peak hours. The land use codes used to estimate the peak period trip generation of the proposed development were as follows: 712 (small office) for the 9,200 SF building at 32 Lakeside Avenue and 710 (general office building) for the 52,000 SF building at 44 Lakeside Avenue and the 84,500 SF building at 50 Lakeside Avenue.

Given the project location, proposed site amenities, and the growing mix of technology-, knowledge-, and creative-based businesses locating in Burlington's South End, it would be reasonable to assume that some significant portion of future employees would seek out alternative commuting options such as bicycling, walking, taking the bus, or carpooling to and from work. Proposed site amenities such as direct access to the Burlington Bike Path and on-site bicycle parking, connectivity to the City's sidewalk network, as well as direct access to GMT bus stops will provide multiple commuting options to these employees. Considering Burlington commute data from the American Community Survey⁶ and the site's location, it is assumed that non-vehicular commute trips (i.e. walking, cycling, and transit trips) will comprise approximately 20% of the trips generated by this site on a typical day.

Table 1 summarizes the trip generation estimate for the proposed development. Calculations supporting the proposed trip generation estimates for the proposed development are provided in the Appendix.

Table 1: Trip Generation Summary

	Net New Trips Total	Bike, Ped, Transit Reduction	Net New Trips (Vehicles)
Peak Period			
Weekday Morning		20%	
Enter	155	-31	124
Exit	<u>26</u>	<u>-5</u>	21
Total	181	-36	145
Weekday Evening		20%	
Enter	26	-5	21
Exit	<u>132</u>	<u>-26</u>	106
Total	158	-31	127

Although the Blodgett site has historically generated high traffic volumes, no reduction was taken to account for previously-generated volumes to provide a conservative assessment.

⁵ Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington D.C., 2017.

⁶ 2012-2016 American Community Survey 5-Year Estimates, U.S. Census Bureau. Accessed 12 July 2018.

OTHER DEVELOPMENT VOLUMES AND ROADWAY NETWORK IMPROVEMENTS

The traffic analysis considered impacts to background traffic growth and trip distribution resulting from the Burlington City Place development and the construction of the Champlain Parkway. Both projects are slated to be completed by the Build+5 year of 2024. Estimated volumes generated by the Burlington City Place development were taken from the Burlington Town Center Mall Traffic Impact Study prepared by VHB in 2016⁷. These volumes are included in the Appendix.

The Champlain Parkway's construction over the next couple of years will have a significant impact on trip distribution from and to destinations along Lakeside Avenue, as many site-generated trips will choose to travel on the parkway rather than Pine Street once the parkway opens. Champlain Parkway roadway improvements, projected traffic volumes, and proposed signal timing and phasing schemes were based on the latest information developed for the project.

The Burlington City Place project is expected to have a lesser degree of impact to the study area intersections due to its relative distance from the site and the traffic dispersal effect of the City's grid network.

TRIP DISTRIBUTION

Figure 1 and **Figure 2** below show the estimated distribution of net new trips generated by the proposed redevelopment program in 2019 and 2024, respectively. The two distributions are different because the Champlain Parkway will provide a new route from South Burlington and alter traffic volumes at many intersections in the local traffic network. Both distributions were generated using the number of net new trips and knowledge of existing traffic patterns.

From the 2019 distribution, 95% of trips entering the Blodgett site are estimated to travel from Pine Street and Lakeside Avenue, and 5% are estimated to arrive from the residential neighborhood along Central Avenue. In 2024, however, this percentage is predicted to be significantly reduced as the Champlain Parkway will be a more convenient northbound arterial from the south end of Burlington. In the 2024 trip distribution, 60% of trips arriving via Lakeside Avenue are assumed to have used the Champlain Parkway.

⁷ Burlington Town Center Traffic Impact Study. VHB, 23 January 2017.

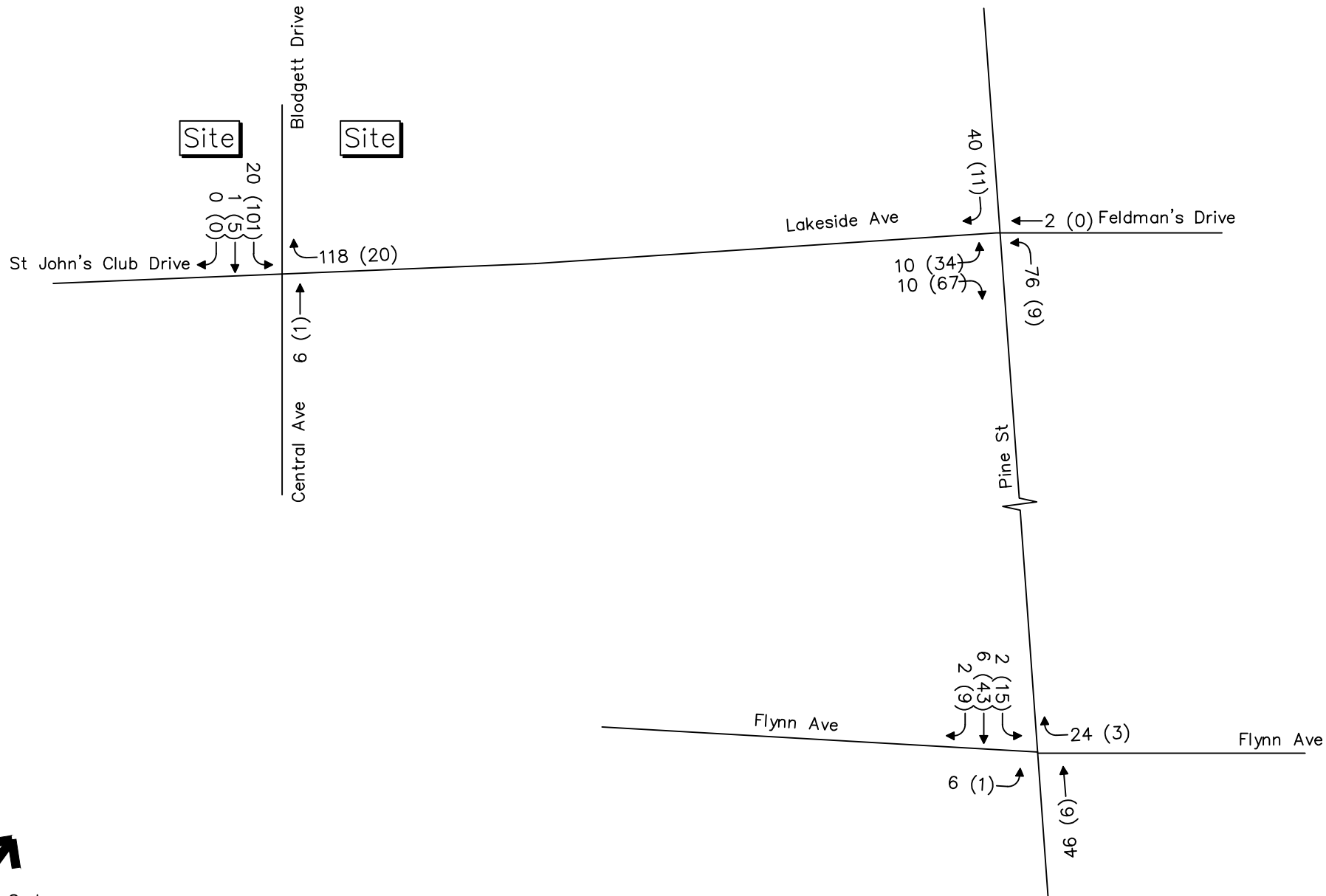
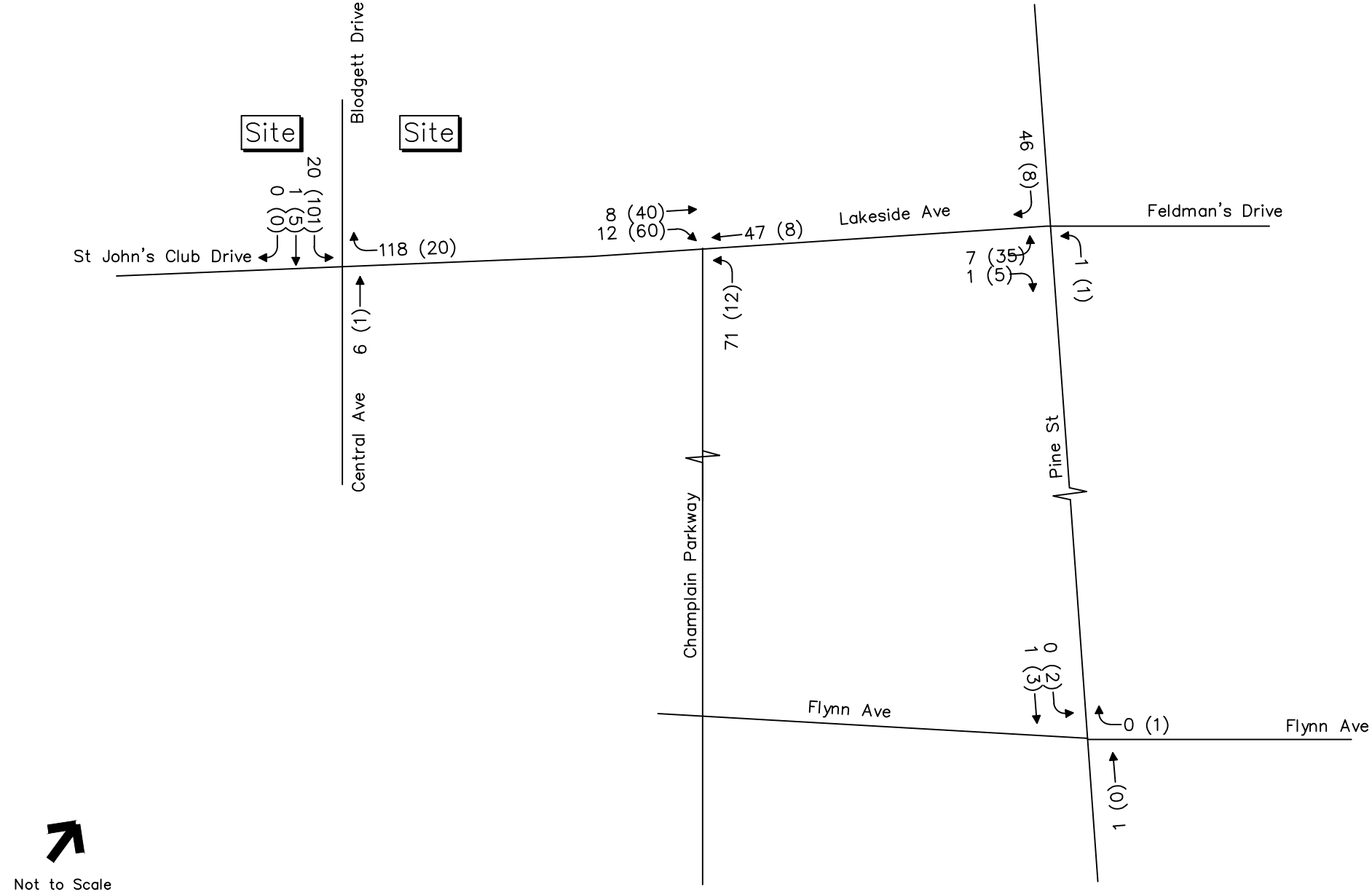


Figure 3
2019 Blodgett Trip Distribution,
Peak Hour Traffic Volumes



Not to Scale

Legend
AM Peak Hour
(PM Peak Hour)



Figure 4
2024 Blodgett Trip Distribution,
Peak Hour Traffic Volumes

TRAFFIC NETWORKS

The weekday morning and evening peak periods were selected for analysis purposes as they represent the peak conditions for both the site-generated traffic and the adjacent street system. Turning movement count data at the adjacent study intersections of Lakeside Avenue / Central Avenue, Pine Street / Lakeside Avenue, and Pine Street / Flynn Avenue were obtained from recent counts conducted by VHB on Tuesday, June 12th and Wednesday, June 13th, 2018. To evaluate the impact of the proposed development within the study area, 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.

Seasonal Variation

Since it is impractical to design for the highest volume encountered during the year, VTrans guidelines recommend a compromise between capacity and cost. Design Hourly Volume (DHV) criteria allow roads to be designed for the 30th highest hourly volume of the year. Historical data from the closest, most comparable VTrans Automatic Traffic Recorder (ATR) station on Pine Street (DXCP) as well as expected DHV values in the VTrans Red Book⁸ were reviewed to establish appropriate DHV adjustment factors. The DHV adjustment factor was calculated to be 1.18 for the Pine Street / Flynn Avenue intersection and 1.30 for all other intersections. Detailed calculations for the DHV adjustments are provided in the Appendix.

Background Growth

Background 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 2017 VTrans Redbook suggests a background growth rate of 1.02 for projecting traffic volumes from 2019 to 2024.

No Build and Build Traffic Networks

The 2019 No Build traffic volumes were developed by applying the growth factors from the VTrans regression analysis chart to DHV-adjusted peak hour traffic volumes. Because the Burlington City Place and Champlain Parkway projects are also considered in this study, three traffic network estimates were generated for year 2024. The directional distribution of the new site-generated traffic was approximated based on existing and expected travel patterns in the area. Based on the expected trip distribution, the site-generated trips were added to the 2024 No Build volumes to establish the three scenarios summarized in the figures below.

⁸ Continuous Traffic Counter Report (The Redbook), Vermont Agency of Transportation, 2017

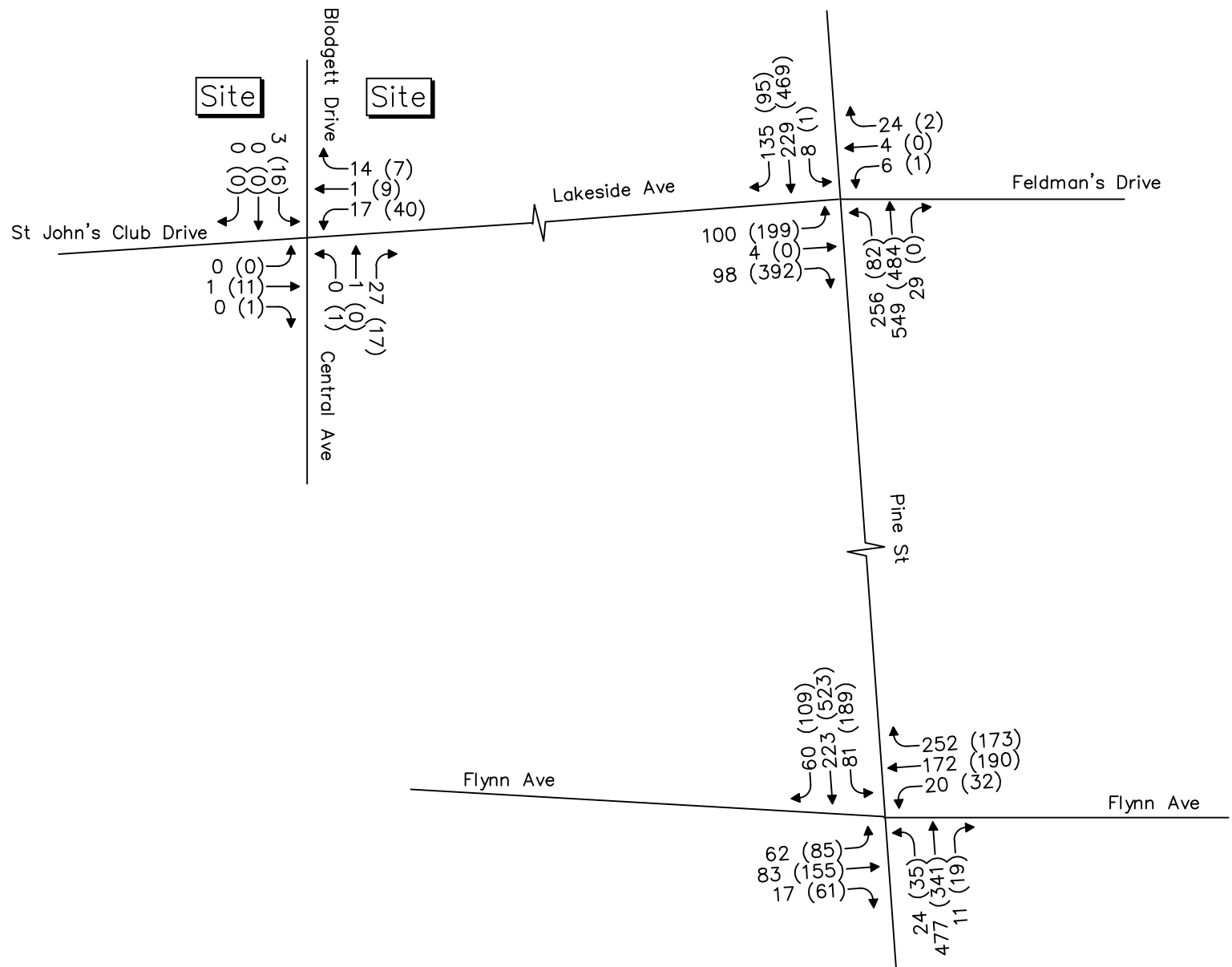
The following are the traffic networks and scenarios developed for this project:

2019 Traffic Network Scenarios

1. 2019 AM & PM No Build – **Figure 5**
2. 2019 AM & PM Build – **Figure 6**

2024 Traffic Network Scenarios

1. 2024 AM & PM No Build and Burlington City Place (BCP) – **Figure 7**
2. 2024 AM & PM No Build, Burlington City Place (BCP) and Champlain Parkway (CP) – **Figure 8**
3. 2024 AM & PM Build, Burlington City Place (BCP) and Champlain Parkway (CP) – **Figure 9**



Not to Scale

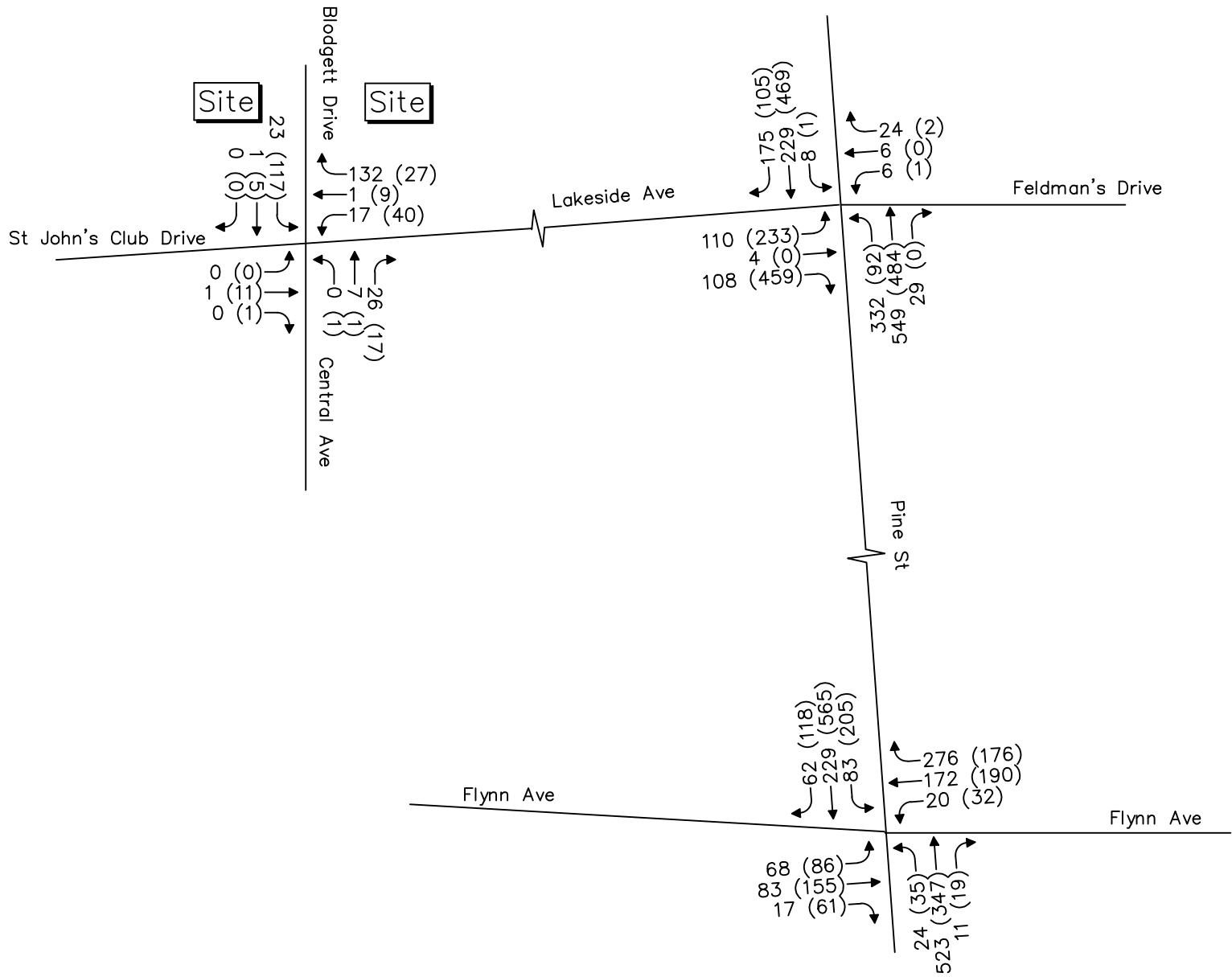
Legend

AM Peak Hour
(PM Peak Hour)



Figure 5

2019 No Build Weekday
Peak Hour Traffic Volumes



Not to Scale

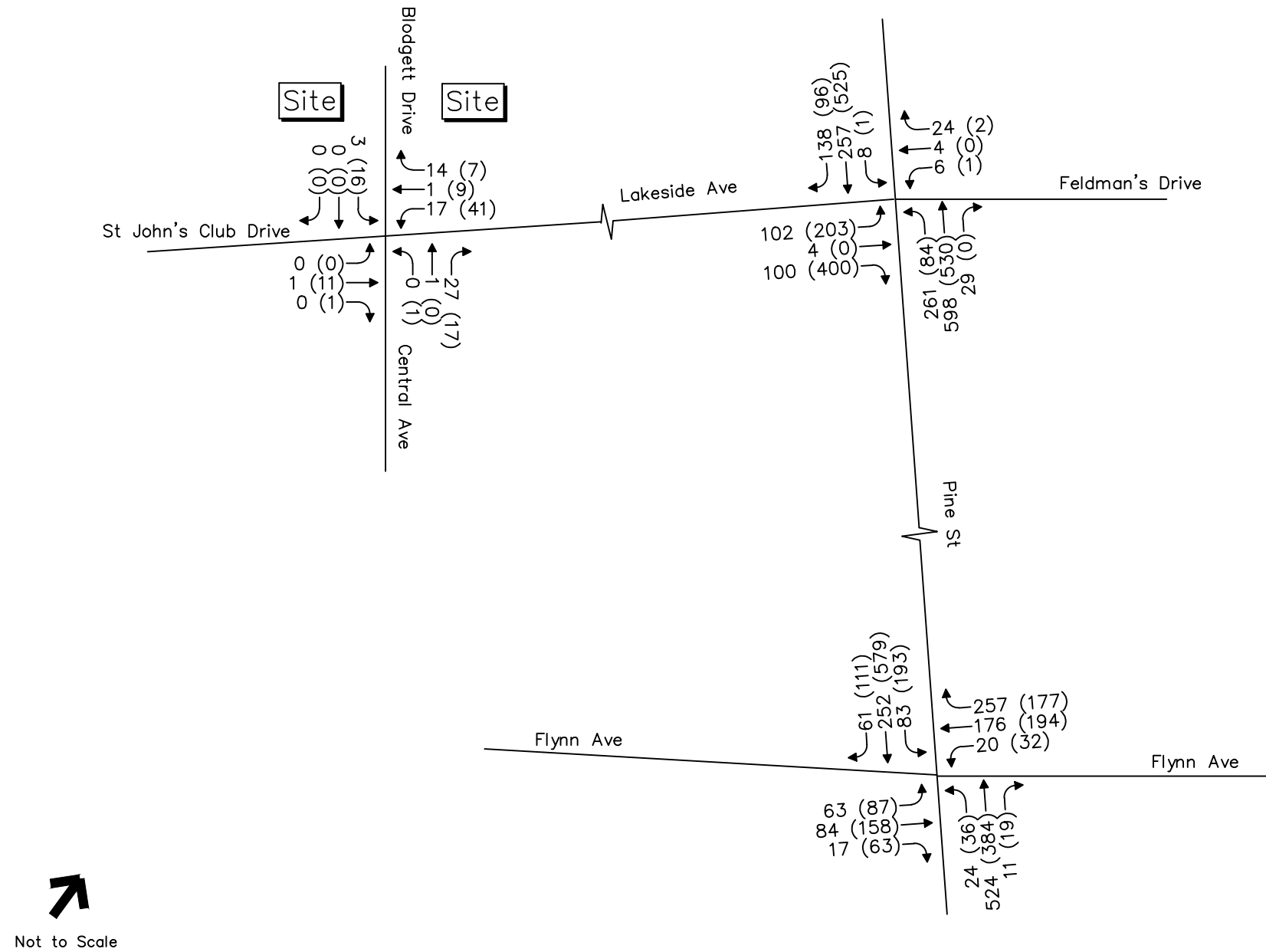
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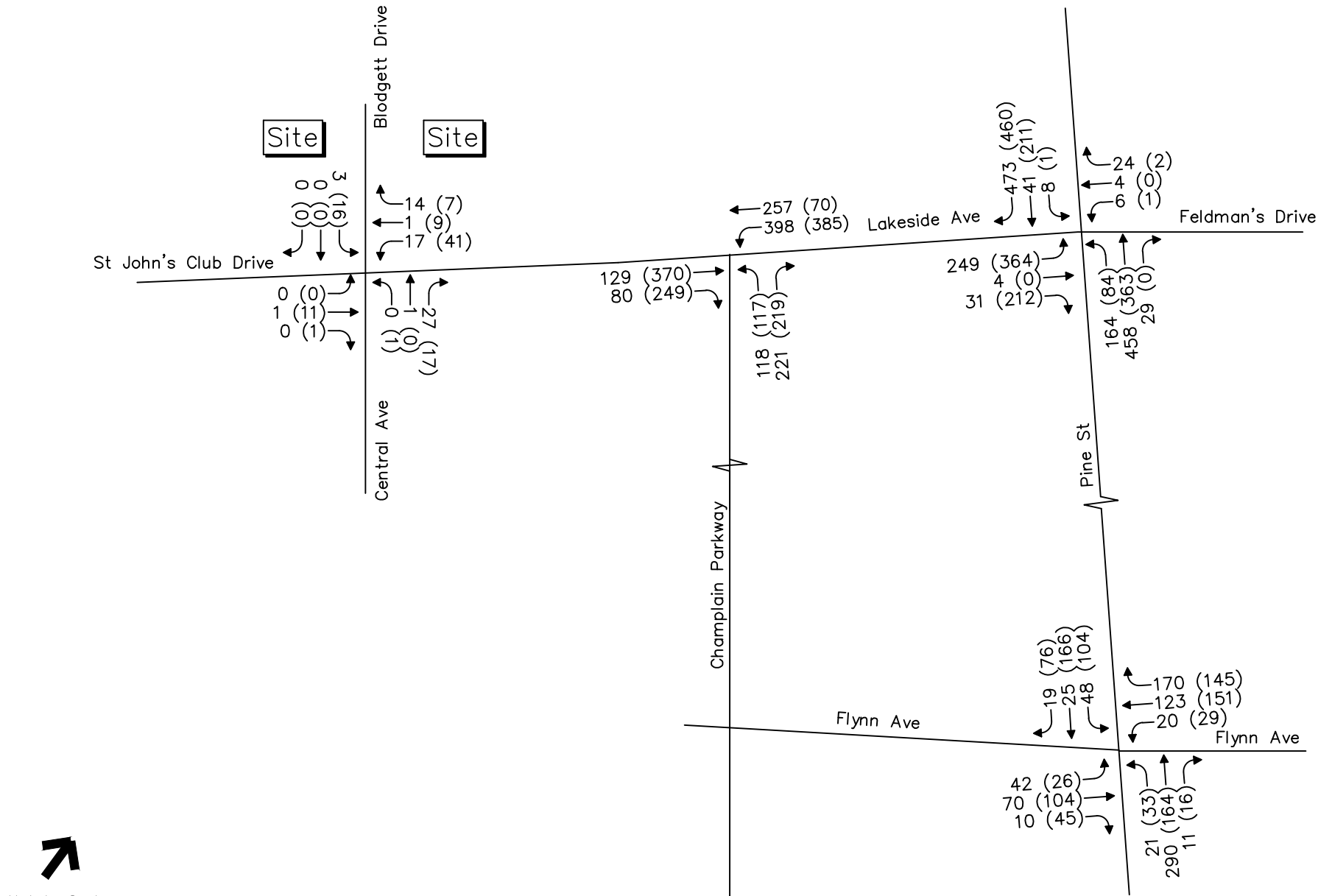
AM Peak Hour
(PM Peak Hour)

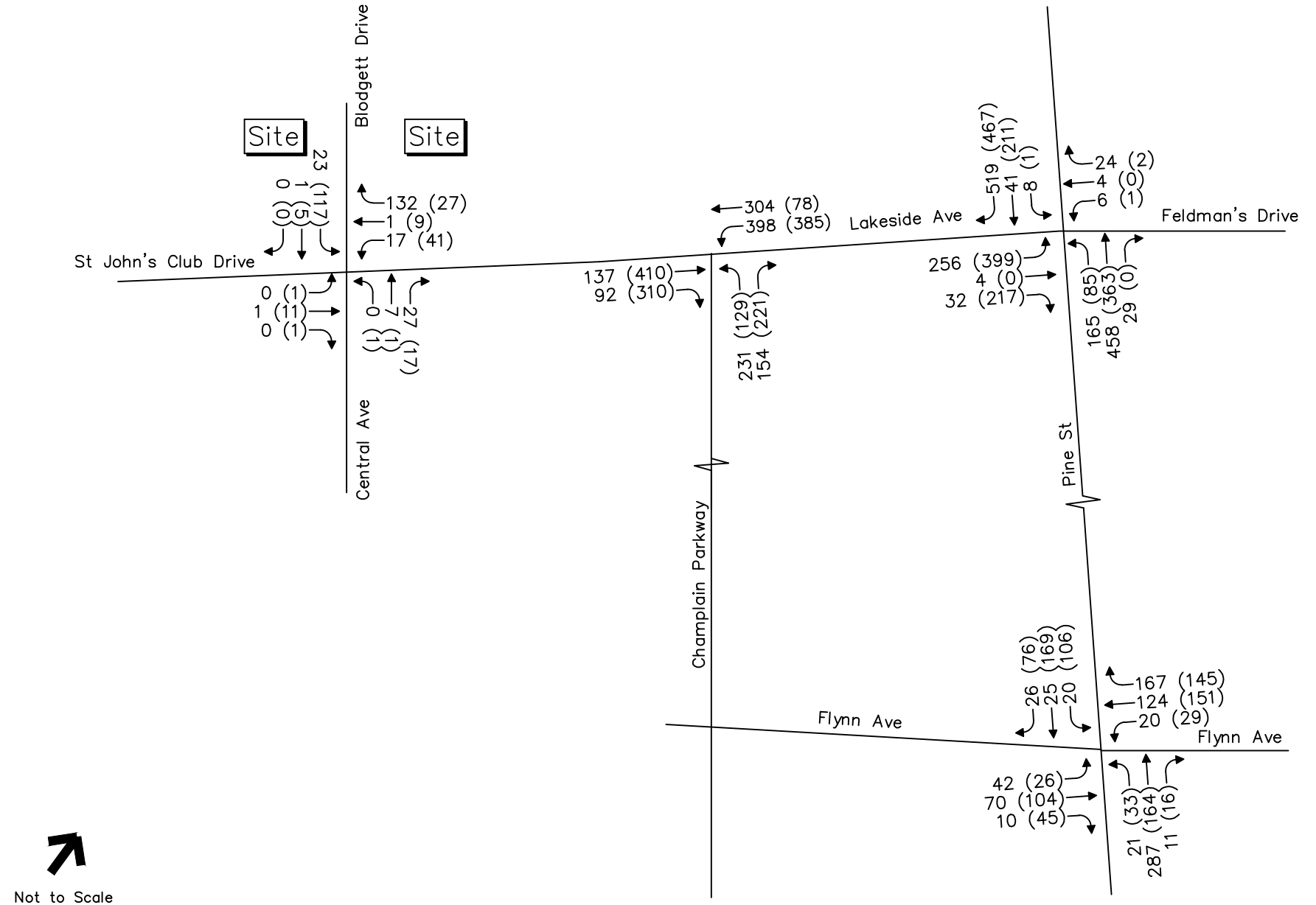


Figure 6

2019 Build Weekday
Peak Hour Traffic Volumes







Legend

AM Peak Hour
(PM Peak Hour)



Figure 9

2024 Build, BCP & CP Weekday
Peak Hour Traffic Volumes

TRAFFIC ANALYSES

Intersection Capacity Analysis

Intersection capacity analyses were performed for the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the 2000 Highway Capacity Manual.⁹ 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.

Signalized Intersections

Table 3 summarizes the operational analysis at the two signalized study intersections during the 2019 and 2024 morning and evening peak hours under the five operational scenarios described above. As shown in the table, all study area intersections are expected to operate at acceptable conditions in all scenarios under consideration.

⁹ Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

Table 2: Signalized Intersection Capacity Analysis Summary

2019							
Intersection	Peak Hour	No Build			Build		
		v/c*	Delay**	LOS***	v/c	Delay	LOS
Lakeside Ave & Pine St	Weekday AM	0.64	9.6	A	0.65	10.6	B
	Weekday PM	0.72	13.1	B	0.73	13.9	B
Pine St & Flynn Ave	Weekday AM	0.61	16.1	B	0.63	17.3	B
	Weekday PM	0.72	18.3	B	0.74	18.3	B
Champlain Park. & Lakeside Ave	Weekday AM	--	--	--	--	--	--
	Weekday PM	--	--	--	--	--	--

2024										
Intersection	Peak Hour	No Build & BCP			No Build, BCP & CP			Build, BCP & CP		
		v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Lakeside Ave & Pine St	Weekday AM	0.67	10.4	B	0.77	18.4	B	0.77	18.9	B
	Weekday PM	0.75	13.6	B	0.68	19.5	B	0.69	20.0	B
Pine St & Flynn Ave	Weekday AM	0.64	16.7	B	0.44	13.1	B	0.41	11.3	B
	Weekday PM	0.75	19.3	B	0.44	11.0	B	0.44	11.0	B
Champlain Park. & Lakeside Ave	Weekday AM	--	--	--	0.62	21.1	C	0.70	26.4	C
	Weekday PM	--	--	--	0.65	32.8	C	0.69	33.9	C

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

BCP: Burlington City Place

CP: Champlain Parkway

Unsignalized Intersections

Table 3 summarizes the operational analysis at the unsignalized intersection of Lakeside Avenue and Central Avenue during the 2019 and 2024 morning and evening peak hours under the five operational scenarios considered in this study. As shown in the table, the intersection of Lakeside Avenue and Central Avenue is expected to operate at LOS A in each scenario.

Table 3: Unsignalized Intersection Capacity Summary

2019							
		No Build			Build		
	Peak Hour	v/c*	Delay**	LOS***	v/c	Delay	LOS
Lakeside Ave & Central Ave							
EB Movements from St. John's Club	Weekday AM	0.00	7.0	A	0.00	7.0	A
WB Movements from Lakeside Ave		0.03	7.0	A	0.15	7.0	A
NB Movements from Central Ave		0.03	7.0	A	0.04	7.0	A
SB Movements from Blodgett Site		0.00	7.0	A	0.03	8.0	A
EB Movements from St. John's Club	Weekday PM	0.01	7.0	A	0.01	7.3	A
WB Movements from Lakeside Ave		0.07	7.4	A	0.09	7.5	A
NB Movements from Central Ave		0.02	6.6	A	0.02	6.7	A
SB Movements from Blodgett Site		0.02	7.0	A	0.15	7.8	A

2024										
		No Build & BCP			No Build, BCP & CP			Build, BCP & CP		
	Peak Hour	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Lakeside Ave & Central Ave										
EB Movements from St. John's Club	Weekday AM	0.00	7.0	A	0.00	7.0	A	0.00	7.1	A
WB Movements from Lakeside Ave		0.03	7.3	A	0.03	7.3	A	0.15	7.0	A
NB Movements from Central Ave		0.03	6.5	A	0.03	6.5	A	0.04	6.8	A
SB Movements from Blodgett Site		0.00	7.0	A	0.00	7.0	A	0.03	7.5	A
EB Movements from St. John's Club	Weekday PM	0.01	7.0	A	0.01	7.0	A	0.01	7.3	A
WB Movements from Lakeside Ave		0.07	7.4	A	0.07	7.4	A	0.09	7.5	A
NB Movements from Central Ave		0.02	6.6	A	0.02	6.6	A	0.02	6.7	A
SB Movements from Blodgett Site		0.02	7.1	A	0.02	7.1	A	0.15	7.8	A

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

BCP: Burlington City Place

CP: Champlain Parkway

PARKING ASSESSMENT

The proposed site redevelopment plan includes 370 on-site parking spaces. Of these spaces, 128 spaces will be tandem and unpaved in the site's northern and central lots. The footprint area of the three buildings on site were used to generate parking estimates using the Institute of Transportation Engineers (ITE) and the Urban Land Institute's (ULI) Parking Demand calculations. As discussed previously in this study, it is assumed that non-auto trips will account for approximately 20% of site-generated trips.

As shown in **Table 4** below, using these assumptions, the peak parking demand for the site should be 288 parking spaces. Conservatively, if there was no shift to alternative commuting modes, the peak parking demand is estimated at 360 spaces.

Table 4: Parking Demand Estimation

Building	Size (sf)	Use	Weekday Peak Parking Generation Rate (per ksf GLA)	Peak Parking Demand	
				20% Non- Auto	0% Non- Auto
50 Lakeside Avenue	84,500	Office	2.47	167	209
44 Lakeside Avenue	52,000	Office	2.47	103	128
32 Lakeside Avenue	9,200	Office	2.47	18	23
Total				288	360

Based on these calculations the site will have an excess of 82 parking spaces during peak periods with only 46 of the tandem parking spots used during peak times. In the event that all employees drove their own cars, the above methodology calculates a parking demand of 360 spaces, which is less than the total supply of 370 spaces.

CONCLUSIONS

The proposed Blodgett Oven Site redevelopment program consists of a program of adaptive reuse and renovation of two of the three buildings located at 44-50 Lakeside Avenue. In total, the redevelopment program includes 145,700 square feet of office space, expanded parking capacity, internal circulation and access improvements, enhanced connectivity to the Burlington Bike Path, and other site amenities.

The trip generation estimates conducted for this study indicate that the proposed development program will generate approximately 145 new vehicle trips during the morning peak hour and 127 new vehicle trips during the evening peak hour.

Primary access and egress is proposed to be provided via the main driveway opposite Central Avenue and a parking lot exit adjacent to Lakeside Avenue. Improved access management will be implemented by providing a green strip between the street and parking lot for a length of Lakeside Avenue that is currently an open curb cut.

The crash data investigation revealed one designated High Crash Locations proximate to the project site. There were six reported crashes within the last five years on Lakeside Ave, all of which only resulted in property damage.

The parking assessment concluded that the peak on-site parking demand generated by the redevelopment can be accommodated by the proposed parking plan.

From a traffic operations perspective, the intersection capacity analysis results demonstrated that all study area intersections are expected to operate under acceptable levels of service for all scenarios evaluated. Therefore, no mitigation improvements are recommended due to the Blodgett Site Reconstruction project.

In conclusion, based on the results of this Traffic Impact Study, the proposed Blodgett Oven Site Redevelopment project is not anticipated to generate unreasonable congestion or unsafe conditions on the adjacent roadway network.



Technical Appendix Traffic

- Traffic Volume Data
- Crash Data Summary
- Traffic Volume Adjustments
- Trip Distribution: Burlington City Place & Champlain Parkway
- Unsignalized & Signalized Intersection Capacity Analyses



Traffic Volume Data



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/20/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Lakeside Avenue / Central Avenue**

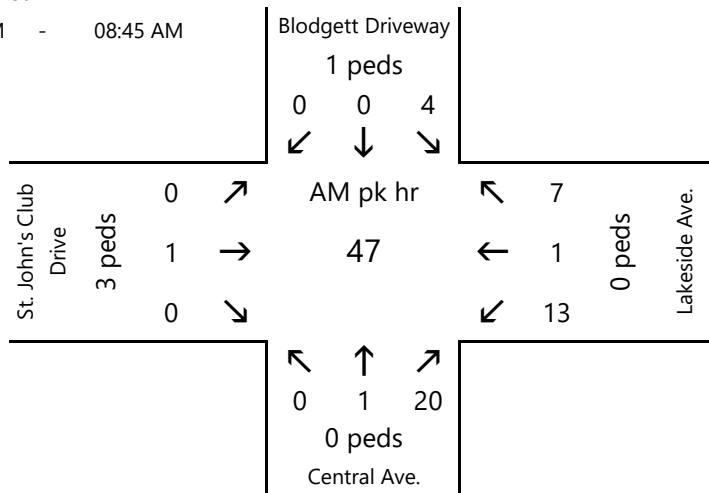
Intersection: **Lakeside Avenue / Central Avenue** Town: **Burlington, VT**
 Count Date(s): **6/12/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Blodgett Driveway				Lakeside Ave.				Central Ave.				St. John's Club Drive				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	0	0	4	1	7	1	13	0	20	1	0	0	0	1	0	3	47
PM pk hr	1	1	10	16	10	9	31	6	13	0	1	8	1	11	1	2	89

AM Peak Hour

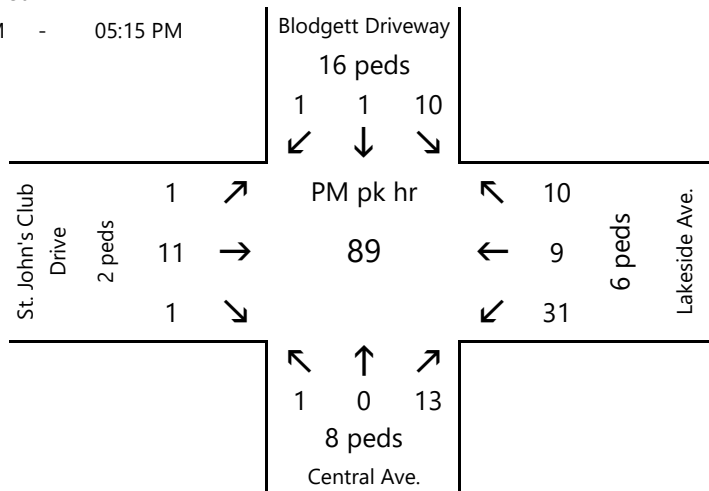
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	80%	90%	100%	75%
med	0%	0%	0%	0%
heavy	20%	10%	0%	25%
% trucks	20%	10%	0%	25%

PM Peak Hour

04:15 PM - 05:15 PM



%	SB	WB	NB	EB
auto	100%	100%	100%	100%
med	0%	0%	0%	0%
heavy	0%	0%	0%	0%
% trucks	0%	0%	0%	0%



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/19/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Pine Street / Lakeside Avenue**

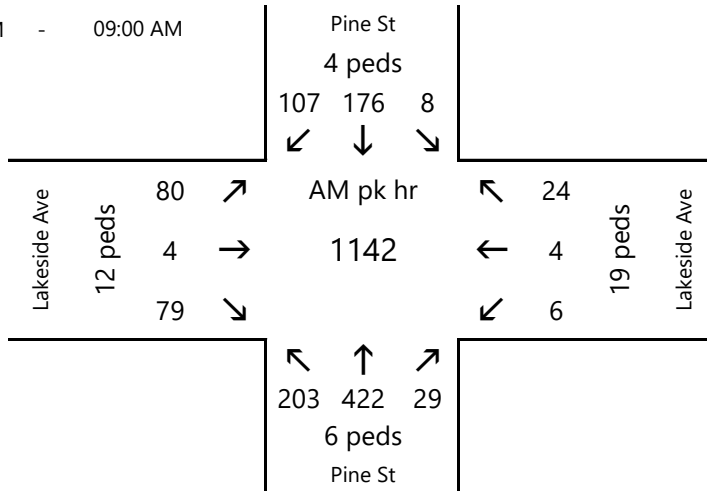
Intersection: **Pine St / Lakeside Ave** Town: **Burlington**
 Count Date(s): **6/13/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St				Lakeside Ave				Pine St				Lakeside Ave				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	107	176	8	4	24	4	6	19	29	422	203	6	79	4	80	12	1142
PM pk hr	86	361	1	7	2	0	1	38	0	372	75	9	309	0	157	7	1364

AM Peak Hour

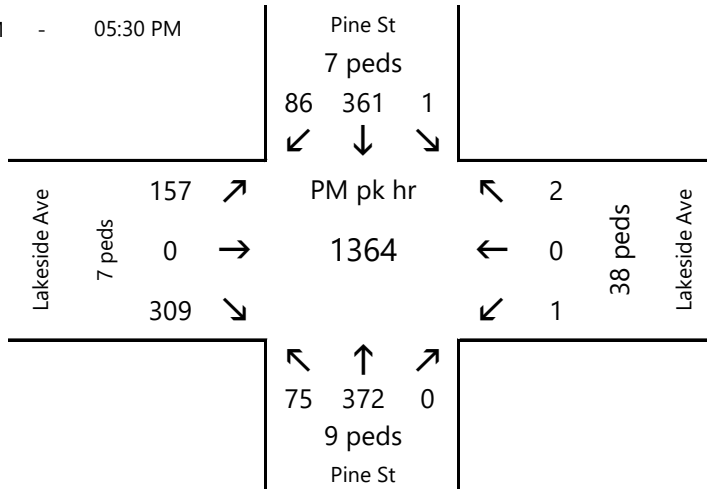
08:00 AM - 09:00 AM



%	SB	WB	NB	EB
auto	91%	100%	98%	91%
med	0%	0%	0%	0%
heavy	9%	0%	2%	9%
% trucks	9%	0%	2%	9%

PM Peak Hour

04:30 PM - 05:30 PM



%	SB	WB	NB	EB
auto	98%	100%	98%	99%
med	0%	0%	0%	0%
heavy	2%	0%	2%	1%
% trucks	2%	0%	2%	1%



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/20/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Pine Street / Flynn Avenue**

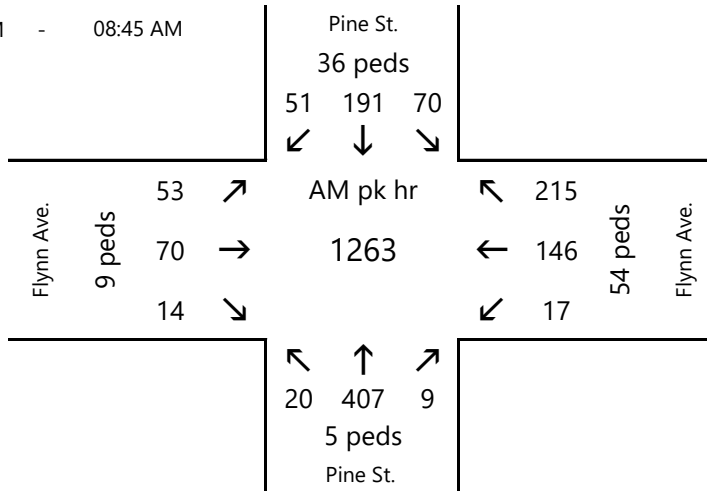
Intersection: **Pine Street / Flynn Avenue** Town: **Burlington, VT**
 Count Date(s): **6/12/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St.				Flynn Ave.				Pine St.				Flynn Ave.				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	51	191	70	36	215	146	17	54	9	407	20	5	14	70	53	9	1263
PM pk hr	94	450	163	22	150	161	27	23	16	295	30	9	52	131	74	10	1643

AM Peak Hour

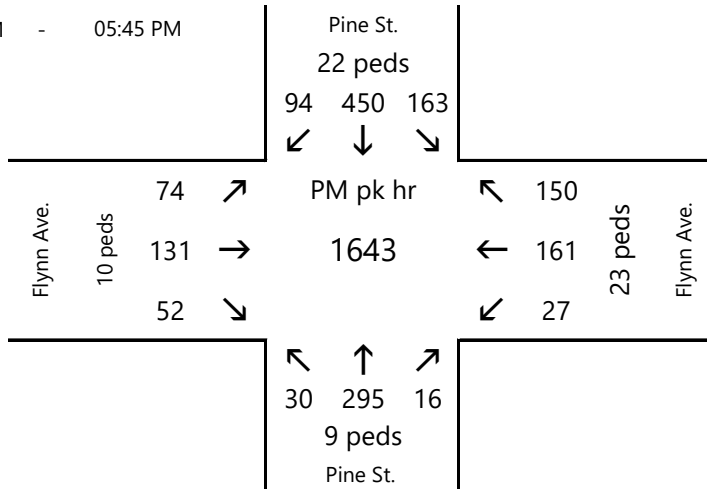
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	94%	98%	99%	91%
med	0%	0%	0%	0%
heavy	6%	2%	1%	9%
% trucks	6%	2%	1%	9%

PM Peak Hour

04:45 PM - 05:45 PM



%	SB	WB	NB	EB
auto	99%	98%	98%	99%
med	0%	0%	0%	0%
heavy	1%	2%	2%	1%
% trucks	1%	2%	2%	1%



Crash Data Summary

High Crash Location Report: Sections and Intersections

2012-2016



Office of Highway Safety Division
Data Section

***THIS DOCUMENT IS EXEMPT FROM DISCOVERY OR
ADMISSION UNDER 23 U.S.C. 409.***

Vermont Agency of Transportation
 Formal Statewide Sections - Route Log Order /2 - Statewide
 Years: 2012 - 2016

08/01/2017

H.C.L No.	/3.	Route	System	Town	Mileage	AADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Crash/1.)
	553	MAPLE ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.700 - 1.000	2,400	5	10	0	3	8	6.398	7.610	1.189	\$35,590
	767	SOUTH MAIN ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.000 - 0.300	3,000	5	10	0	2	8	6.068	6.088	1.003	\$26,740
	470	SOUTH MAIN ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.600 - 0.900	3,100	5	13	0	0	13	6.022	7.659	1.272	\$11,300
	305	CHURCH ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.000 - 0.300	1,300	5	8	0	1	7	7.458	11.240	1.507	\$20,950
	213	FOREST ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.700 - 1.000	740	5	6	0	2	4	8.629	14.809	1.716	\$37,033
	590	GROVE ST., RUTLAND CITY	Minor Arterial (u)	Rutland City	0.200 - 0.500	2,027	5	10	0	8	5	7.776	9.011	1.159	\$76,450
	109	LINCOLN AVE., RUTLAND CITY	Urban Collector (u)	Rutland City	0.100 - 0.400	958	5	9	1	4	5	8.070	17.159	2.126	\$212,278
	609	STRONGS AVE., RUTLAND CITY	Principal Arterial (u)	Rutland City	0.000 - 0.300	9,800	5	43	0	15	33	7.019	8.014	1.142	\$39,544
	432	VT. 127 BELTLINE, BURLINGTON	Freeway/Expressway (u)	Burlington	0.000 - 0.300	14,060	5	27	0	3	24	2.650	3.507	1.324	\$19,878
	367	VT. 127 BELTLINE, BURLINGTON	Freeway/Expressway (u)	Burlington	3.100 - 3.400	8,310	5	19	1	13	11	2.953	4.176	1.414	\$146,042
*	119	COLCHESTER AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.100 - 0.400	14,663	5	88	1	27	67	5.250	10.962	2.088	\$52,802
	196	EAST AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	12,683	5	66	0	6	61	5.370	9.505	1.770	\$18,489
	249	NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	1.900 - 2.200	13,300	5	63	0	13	52	5.330	8.652	1.623	\$27,589
	683	NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	2.600 - 2.900	10,800	5	35	0	6	30	5.513	5.919	1.074	\$24,857
	21	PEARL ST., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	8,040	5	88	0	7	82	5.803	19.991	3.445	\$17,569
	404	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.300 - 0.600	12,480	5	50	0	13	37	5.384	7.318	1.359	\$31,372
	579	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.800 - 1.100	11,827	5	41	0	6	35	5.431	6.332	1.166	\$22,598
	172	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	1.100 - 1.400	8,450	5	49	0	10	40	5.752	10.591	1.841	\$27,286
	69	ST. PAUL ST., BURLINGTON	Urban Collector (u)	Burlington	0.200 - 0.500	9,400	5	59	0	12	49	4.776	11.464	2.400	\$27,385
	602	S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.000 - 0.300	3,100	5	17	0	2	15	8.696	10.016	1.152	\$20,382
	621	S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.400 - 0.700	3,400	5	18	0	4	15	8.528	9.670	1.134	\$29,083
	70	MALLETTS BAY AVE., WINOOSKI CITY	Minor Arterial (u)	Winooski City	0.000 - 0.300	3,013	5	28	0	4	25	7.090	16.974	2.394	\$22,732
	610	MALLETTS BAY AVE., WINOOSKI CITY	Minor Arterial (u)	Winooski City	0.300 - 0.600	4,423	5	18	0	6	14	6.522	7.433	1.140	\$38,289
	177	W SPRING ST., WINOOSKI CITY	Urban Collector (u)	Winooski City	0.000 - 0.300	3,617	5	21	1	7	16	5.812	10.604	1.825	\$109,538
	486	DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.100 - 3.400	13,653	5	42	0	7	38	4.475	5.619	1.255	\$24,974
	13	DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.700 - 4.000	14,677	5	137	0	12	127	4.423	17.049	3.855	\$18,227
	762	SWIFT ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	1.000 - 1.300	5,893	5	17	0	0	17	5.230	5.269	1.007	\$11,300

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Lakeside Ave

<u>Street</u>	<u>Town</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of</u>	
					<u>Injuries</u>	<u>Fatalities</u>
LAKESIDE AV	Burlington	December 14, 2013, 12:38 PM	Cloudy	Rear End	0	0
LAKESIDE AV	Burlington	March 13, 2013, 8:42 AM	Cloudy	Same Direction Sideswipe	0	0
LAKESIDE AV	Burlington	March 23, 2013, 3:17 PM	Clear	Rear End	0	0
LAKESIDE AVE	Burlington	May 13, 2016, 2:39 PM	Rain	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--	0	0
LAKESIDE AV	Burlington	November 21, 2014, 2:15 PM	Cloudy	No Turns, Thru moves only,	0	0
LAKESIDE AV	Burlington	November 24, 2015, 12:26 PM	Clear	Broadside ^< Head On	0	0
TOTAL:					0	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Intersection of Pine St and Flynn Ave

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
PINE ST.	Burlington		0 August 23, 2017, 9:18 AM	Clear	Rear End	0	0
PINE ST.	Burlington		0 August 24, 2017, 11:07 AM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		0 August 25, 2016, 5:16 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		August 31, 2016, 5:08 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 February 3, 2015, 7:27 AM	Clear	Broadside ^<	1	0
PINE ST.	Burlington	0.02	January 5, 2017, 2:05 PM	Clear	Rear End	0	0
					Right Turn and Thru, Same Direction		
PINE ST.	Burlington	0.02	July 14, 2015, 5:42 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 July 2, 2017, 7:55 AM	Clear	Broadside ^<	1	0
PINE ST.	Burlington		June 18, 2015, 2:08 PM	Clear	Rear End	0	0
PINE ST.	Burlington		June 24, 2017, 2:10 PM	Cloudy	Rear End	0	0
					Right Turn and Thru, Same Direction		
PINE ST.	Burlington		0 March 28, 2013, 6:12 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
PINE ST.	Burlington	0.02	March 6, 2013, 7:17 AM	Clear	Rear End	0	0
PINE ST.	Burlington		0 May 1, 2013, 12:46 PM	Clear	Opp Direction Sideswipe	0	0
PINE ST.	Burlington		0 May 13, 2013, 2:37 PM	Cloudy	Other - Explain in Narrative	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 May 9, 2015, 11:45 AM	Cloudy	Broadside ^<	1	0
PINE ST.	Burlington		0 November 10, 2015, 12:10 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		0 November 29, 2017, 5:00 AM	Unknown		0	0
PINE ST.	Burlington		0 October 10, 2014, 6:02 PM	Clear	Opp Direction Sideswipe	0	0
PINE ST.	Burlington	0.11	October 23, 2014, 8:09 PM	Rain	Single Vehicle Crash	1	0
					Left Turn and Thru, Broadside v<--		
PINE ST.	Burlington	0.02	October 31, 2016, 6:27 PM	Clear	No Turns, Thru moves only,	0	0
					Broadside ^<		
PINE ST.	Burlington		0 September 26, 2013, 6:26 AM	Clear		1	0
PINE ST.	Burlington		0 September 9, 2013, 8:57 AM	Clear	Other - Explain in Narrative	0	0
FLYNN AVE.	Burlington		April 10, 2017, 3:30 AM	Clear	Same Direction Sideswipe	0	0
FLYNN AVE.	Burlington	0.01	August 17, 2013, 8:06 AM	Cloudy	Rear End	0	0
FLYNN AVE.	Burlington		0 January 3, 2013, 7:05 AM	Cloudy	Other - Explain in Narrative	0	0
FLYNN AVE.	Burlington	0.05	July 4, 2013, 8:48 AM			0	0
FLYNN AVE.	Burlington	0.04	June 14, 2014, 8:00 AM	Cloudy	Other - Explain in Narrative	0	0
					Right Turn and Thru, Head On v^--		
FLYNN AVE.	Burlington		0 June 2, 2014, 10:16 AM	Clear		0	0
FLYNN AVE.	Burlington		0 May 12, 2017, 6:40 PM	Clear	Same Direction Sideswipe	0	0
FLYNN AVE.	Burlington		0 May 31, 2016, 3:56 PM	Clear	Rear-to-rear	0	0
TOTAL:						5	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Intersection of Pine St and Lakeside Ave

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
PINE ST.	Burlington	0.41	April 1, 2014, 5:45 PM	Cloudy	Other - Explain in Narrative	1	0
PINE ST.	Burlington	0.38	April 29, 2014, 5:23 PM	Cloudy	Other - Explain in Narrative	1	0
PINE ST.	Burlington	0.41	August 12, 2013, 11:51 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.41	August 17, 2016, 12:19 PM	Clear	Rear End	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.41	August 24, 2017, 5:46 AM	Clear	-->v--	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	August 4, 2015, 3:45 PM	Clear	-->v--	1	0
PINE ST.	Burlington	0.31	August 9, 2017, 11:57 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.46	December 1, 2016, 4:14 PM	Cloudy	Rear End	0	0
PINE ST.	Burlington		December 16, 2013, 11:38 AM	Clear	Rear-to-rear	0	0
PINE ST.	Burlington	0.41	December 21, 2016, 7:09 AM	Clear	Same Direction Sideswipe	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	December 3, 2014, 3:43 PM	Rain	-->v--	0	0
PINE ST.	Burlington	0.4	February 16, 2015, 6:34 AM	Unknown	Rear End	0	0
				Freezing			
PINE ST.	Burlington	0.22	February 9, 2017, 4:43 PM	Precipitation	Rear End	0	0
PINE ST.	Burlington	0.42	January 18, 2017, 9:57 PM	Clear	Single Vehicle Crash	0	0
PINE ST.	Burlington	0.38	January 21, 2013, 4:20 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	January 21, 2015, 3:09 PM	Clear	Rear End	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.41	January 24, 2014, 7:26 AM	Clear	-->v--	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	January 9, 2017, 6:07 AM	Clear	-->v--	0	0
PINE ST.	Burlington		July 11, 2017, 11:18 AM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.39	July 18, 2013, 1:33 PM	Clear	Broadside ^<	0	0
PINE ST.	Burlington	0.4	July 19, 2017, 4:00 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington	0.42	July 20, 2017, 8:49 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.37	July 4, 2013, 5:46 PM	Cloudy	Single Vehicle Crash	0	0
PINE ST.	Burlington	0.39	July 7, 2016, 1:40 PM	Clear	Other - Explain in Narrative	0	0
PINE ST.	Burlington	0.41	June 30, 2014, 2:12 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	March 13, 2017, 3:38 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	May 22, 2013, 5:00 PM	Cloudy	Other - Explain in Narrative	1	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.38	May 30, 2013, 5:38 AM	Clear	-->v--	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.4	November 30, 2015, 4:11 PM	Clear	Broadside ^<	0	0
PINE ST.	Burlington	0.41	October 22, 2013, 5:49 PM			0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	October 30, 2014, 7:25 AM	Cloudy	-->v--	1	0
PINE ST.	Burlington	0.4	September 22, 2014, 12:54 PM	Clear	Rear End	1	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.4	September 25, 2015, 8:07 AM	Clear	Broadside ^<	0	0
PINE ST.	Burlington		September 4, 2014, 11:32 AM	Clear	Other - Explain in Narrative	0	0
LAKESIDE / Burlington			December 14, 2013, 12:38 PM	Cloudy	Rear End	0	0
					Left Turn and Thru, Same Direction		
LAKESIDE / Burlington			May 13, 2016, 2:39 PM	Rain	Sideswipe/Angle Crash vv--	0	0
TOTAL:						6	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Street: Pine St (MM 0.0 - 0.5)

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
Pine St.	Burlington	0.38	January 21, 2013, 4:20 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.31	February 2, 2013, 11:50 AM	Cloudy	Rear End	0	0
Pine St.	Burlington	0.02	March 6, 2013, 7:17 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.36	March 11, 2013, 11:04 AM	Cloudy	Rear End	0	0
					Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.00	March 28, 2013, 6:12 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
Pine St.	Burlington	0.17	April 9, 2013, 4:07 PM	Clear	Rear End	1	0
Pine St.	Burlington	0.00	May 1, 2013, 12:46 PM	Clear	Opp Direction Sideswipe	0	0
Pine St.	Burlington	0.00	May 13, 2013, 2:37 PM	Cloudy	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.40	May 22, 2013, 5:00 PM	Cloudy	Other - Explain in Narrative	1	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.38	May 30, 2013, 5:38 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.37	July 4, 2013, 5:46 PM	Cloudy	Single Vehicle Crash	0	0
Pine St.	Burlington	0.20	July 9, 2013, 4:10 PM			0	0
Pine St.	Burlington	0.21	July 10, 2013, 11:32 AM			0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.39	July 18, 2013, 1:33 PM	Clear	Broadside ^<	0	0
Pine St.	Burlington	0.41	August 12, 2013, 11:51 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.00	September 9, 2013, 8:57 AM	Clear	Other - Explain in Narrative	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	September 26, 2013, 6:26 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.12	October 11, 2013, 2:53 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.38	October 13, 2013, 11:26 AM			0	0
Pine St.	Burlington	0.41	October 22, 2013, 5:49 PM			0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.41	January 24, 2014, 7:26 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.41	April 1, 2014, 5:45 PM	Cloudy	Other - Explain in Narrative	1	0
Pine St.	Burlington	0.10	April 8, 2014, 12:19 PM		Rear End	0	0
Pine St.	Burlington	0.38	April 29, 2014, 5:23 PM	Cloudy	Other - Explain in Narrative	1	0
Pine St.	Burlington	0.35	May 15, 2014, 7:45 AM	Cloudy	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.35	June 26, 2014, 8:58 AM	Cloudy	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.41	June 30, 2014, 2:12 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.25	September 2, 2014, 3:04 PM	Clear	Rear End	1	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.26	September 6, 2014, 1:52 PM	Rain	Broadside ^<	0	0
Pine St.	Burlington	0.39	September 12, 2014, 3:58 PM			0	0
Pine St.	Burlington	0.40	September 22, 2014, 12:54 PM	Clear	Rear End	1	0
Pine St.	Burlington	0.00	October 10, 2014, 6:02 PM	Clear	Opp Direction Sideswipe	0	0
Pine St.	Burlington	0.11	October 23, 2014, 8:09 PM	Rain	Single Vehicle Crash	1	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	October 30, 2014, 7:25 AM	Cloudy	-->v--	1	0
Pine St.	Burlington	0.22	November 20, 2014, 4:31 PM	Clear	Same Direction Sideswipe	0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	December 3, 2014, 3:43 PM	Rain	-->v--	0	0
Pine St.	Burlington	0.30	January 15, 2015, 4:15 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.40	January 21, 2015, 3:09 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	February 3, 2015, 7:27 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.40	February 16, 2015, 6:34 AM	Unknown	Rear End	0	0
Pine St.	Burlington	0.10	April 12, 2015, 8:26 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	May 9, 2015, 11:45 AM	Cloudy	Broadside ^<	1	0
Pine St.	Burlington	0.21	May 21, 2015, 4:17 PM	Clear	Opp Direction Sideswipe	1	0
Pine St.	Burlington	0.39	June 23, 2015, 8:38 AM	Rain	Rear End	1	0
Pine St.	Burlington	0.37	June 25, 2015, 11:58 AM	Clear	Rear-to-rear	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	July 12, 2015, 6:07 PM	Clear	Broadside ^<	1	0
					Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.02	July 14, 2015, 5:42 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	August 4, 2015, 3:45 PM	Clear	-->v--	1	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.40	September 25, 2015, 8:07 AM	Clear	Broadside ^<	0	0
Pine St.	Burlington	0.00	November 10, 2015, 12:10 PM	Clear	Same Direction Sideswipe	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.40	November 30, 2015, 4:11 PM	Clear	Broadside ^<	0	0

Pine St.	Burlington	0.39 March 2, 2016, 6:30 AM	Clear	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.00 March 31, 2016, 8:28 AM	Cloudy	Left Turn and Thru, Broadside v<--	0	0
Pine St.	Burlington	0.27 June 15, 2016, 10:42 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.39 July 7, 2016, 1:40 PM	Clear	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.41 August 17, 2016, 12:19 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.00 August 25, 2016, 5:16 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.02 October 31, 2016, 6:27 PM	Clear	Left Turn and Thru, Broadside v<--	0	0
Pine St.	Burlington	0.46 December 1, 2016, 4:14 PM	Cloudy	Rear End	0	0
				Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.21 December 6, 2016, 11:55 AM		Sideswipe/Angle Crash ^^--	0	0
Pine St.	Burlington	0.41 December 21, 2016, 7:09 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.02 January 5, 2017, 2:05 PM	Clear	Rear End	0	0
				Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40 January 9, 2017, 6:07 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.42 January 18, 2017, 9:57 PM	Clear	Single Vehicle Crash	0	0
Pine St.	Burlington	0.22 February 9, 2017, 4:43 PM	Freezing Pr	Rear End	0	0
Pine St.	Burlington	0.40 March 13, 2017, 3:38 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.27 June 1, 2017, 10:18 AM	Clear	Other - Explain in Narrative	0	0
				No Turns, Thru moves only,		
Pine St.	Burlington	0.00 July 2, 2017, 7:55 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.40 July 19, 2017, 4:00 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.42 July 20, 2017, 8:49 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.31 August 9, 2017, 11:57 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.00 August 23, 2017, 9:18 AM	Clear	Rear End	0	0
				Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.41 August 24, 2017, 5:46 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.00 August 24, 2017, 11:07 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.23 October 6, 2017, 5:23 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.42 November 8, 2017, 12:43 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.37 November 13, 2017, 1:40 PM			0	0
Pine St.	Burlington	0.00 November 29, 2017, 5:00 AM			0	0
Pine St.	Burlington	0.26 December 8, 2017, 2:29 PM		Rear End	0	0
TOTAL:					16	0



Traffic Volume Adjustments

20-YEAR 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 2017 to 2037 20-year AADT growth factor of 1.09 which was developed from Vermont population and labor statistics.

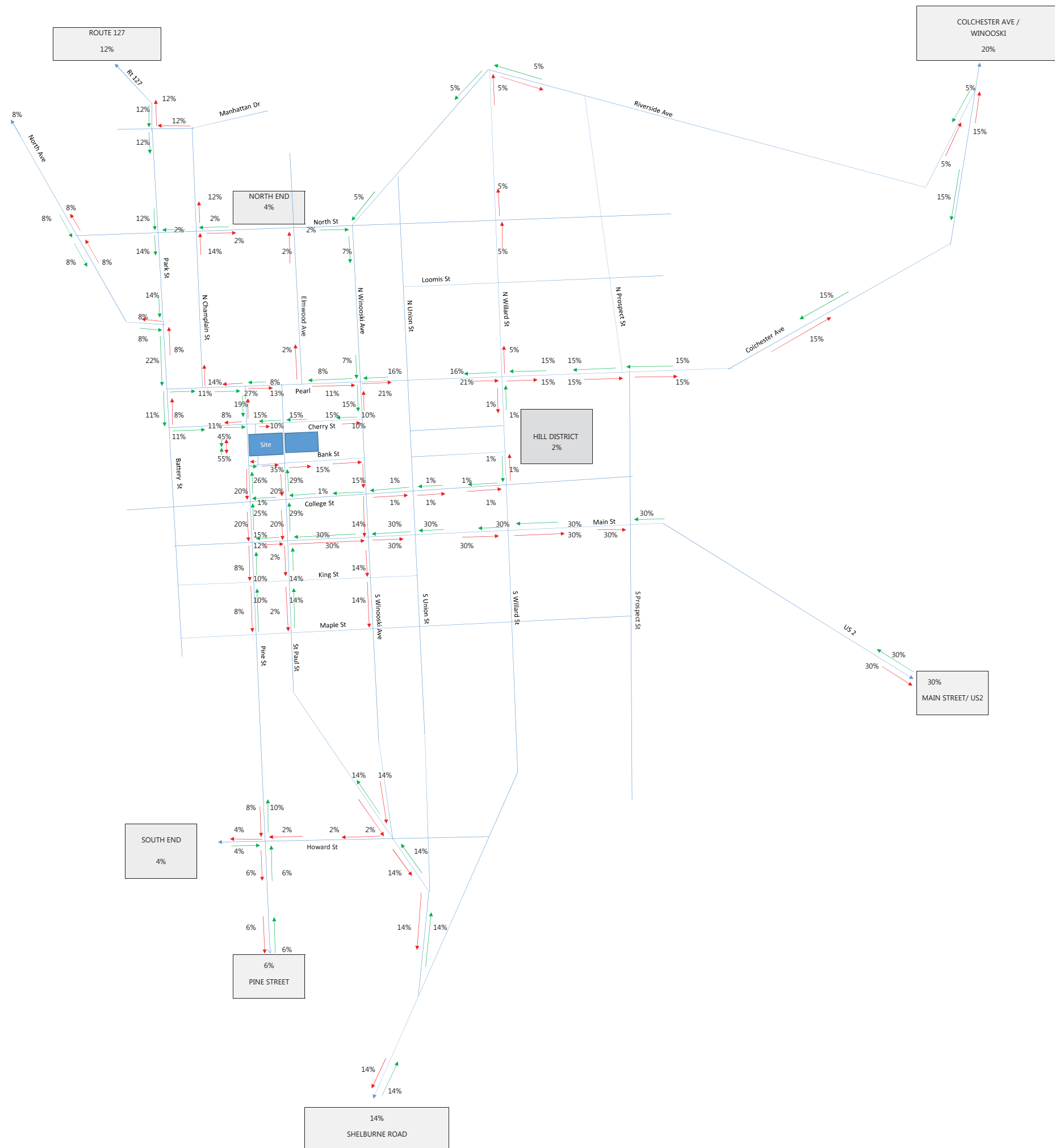
TO FUTURE YEAR	FROM CURRENT YEAR		
	2017	2018	2019
2017	1.00		
2018	1.00	1.00	
2019	1.01	1.00	1.00
2020	1.01	1.01	1.00
2021	1.02	1.01	1.01
2022	1.02	1.02	1.01
2023	1.03	1.02	1.02
2024	1.03	1.03	1.02
2025	1.04	1.03	1.03
2026	1.04	1.04	1.03
2027	1.05	1.04	1.04
2028	1.05	1.05	1.04
2029	1.05	1.05	1.05
2030	1.06	1.05	1.05
2031	1.06	1.06	1.05
2032	1.07	1.06	1.06
2033	1.07	1.07	1.06
2034	1.08	1.07	1.07
2035	1.08	1.08	1.07
2036	1.09	1.08	1.08
2037	1.09	1.09	1.08
2038	1.09	1.09	1.09
2039	1.10	1.09	1.09
2040	1.10	1.10	1.09
2041	1.11	1.10	1.10
2042	1.11	1.11	1.10
2043	1.12	1.11	1.11

2016 Redbook DHV Chart

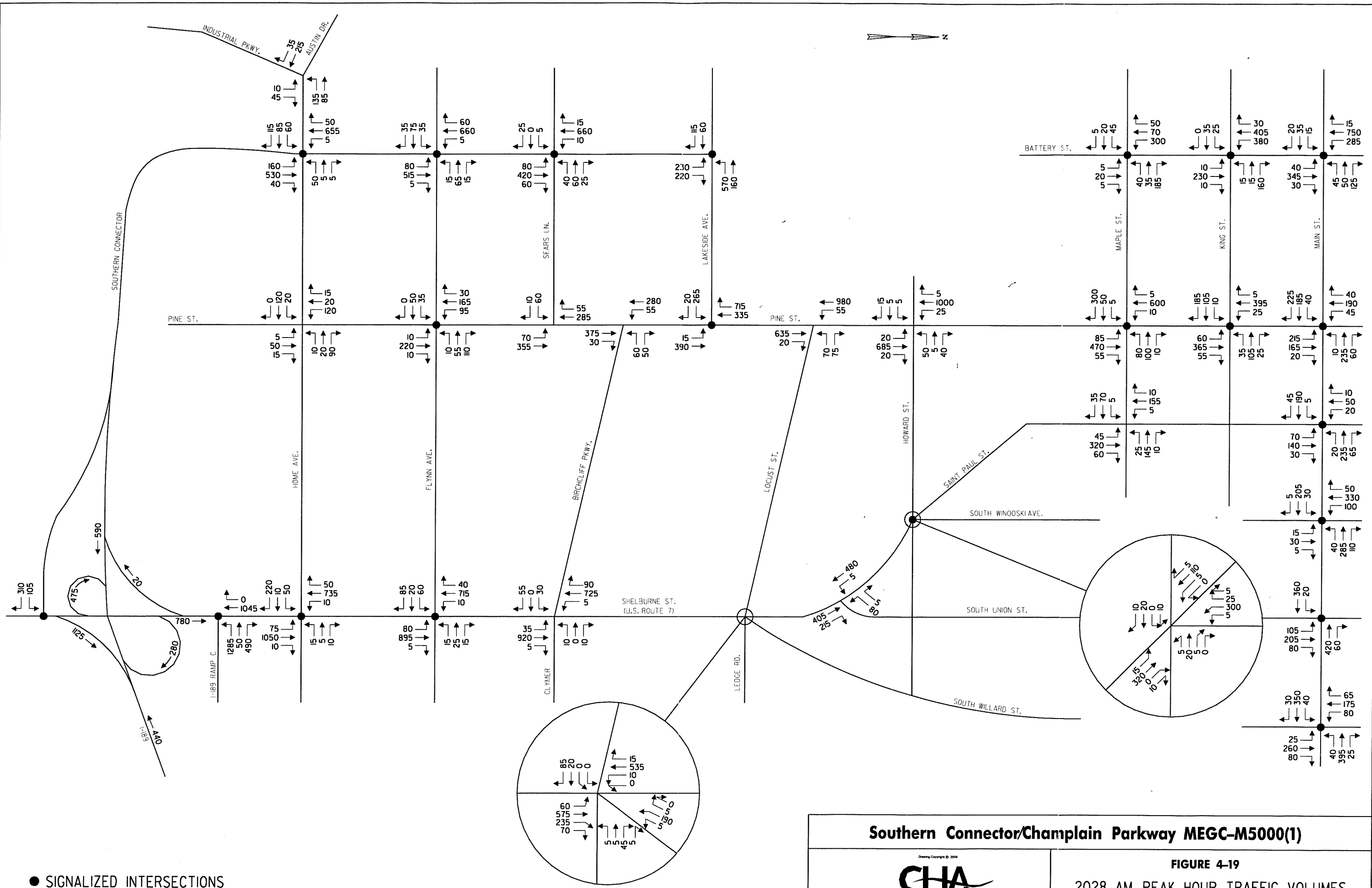
AADT	Predicted DHV by Seasonal Factor Group by AADT					
	Rural Interstate SF1	Rural Non-Interstate SF2	Urban SF3	Summer Recreational SF4	Summer/Winter Recreational SF5	Summer/Winter Recreational TH SF6
11000	1300	1200	1200		1400	
11100	1300	1200	1200		1400	
11200	1400	1200	1300		1400	
11300	1400	1200	1300		1400	
11400	1400	1200	1300		1500	
11500	1400	1200	1300		1500	
11600	1400	1200	1300		1500	
11700	1500	1200	1300		1500	
11800	1500	1200	1300		1500	
11900	1500	1200	1300		1500	
12000	1500	1200	1300		1500	
12100	1500	1300	1300		1600	
12200	1500	1300	1400			
12300	1600	1300	1400			
12400	1600	1300	1400			
12500	1600	1300	1400			
12600	1600	1300	1400			
12700	1600	1300	1400			
12800	1600	1300	1400			
12900	1700	1300	1400			
13000	1700	1300	1400			
13100	1700	1300	1400			
13200	1700	1300	1500			
13300	1700	1300	1500			
13400	1700	1400	1500			
13500	1800	1400	1500			
13600	1800		1500			
13700	1800		1500			
13800	1800		1500			
13900	1800		1500			
14000	1800		1500			
14100	1900		1500			
14200	1900		1500			
14300	1900		1500			
14400	1900		1600			
14500	1900		1600			
14600	2000		1600			
14700	2000		1600			
14800	2000		1600			
14900	2000		1600			
15000	2100		1600			
15100	2100		1600			



Trip Distribution: Burlington City Place & Champlain Parkway



FILE NAME: H:\B559\BPT\SE\SE\display\traffic\2008\2008am.SHIFT.ctb
DATE/TIME: 8/16/2009
USER: 1933



● SIGNALIZED INTERSECTIONS

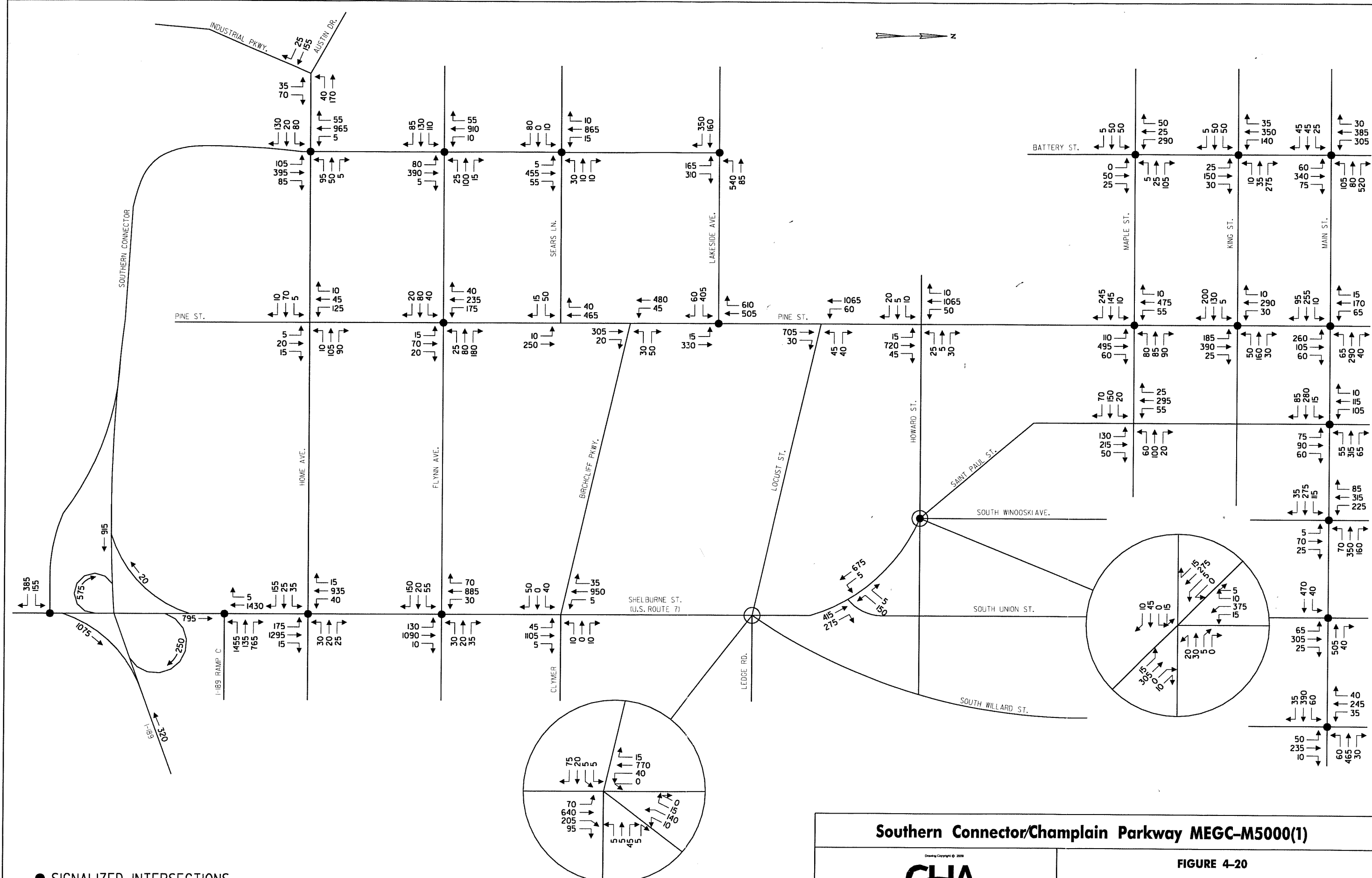
NOT TO SCALE

Southern Connector/Champlain Parkway MEGC-M5000(1)



FIGURE 4-19

2028 AM PEAK HOUR TRAFFIC VOLUMES
BUILD ALTERNATIVE 2



NOT TO SCALE

Southern Connector/Champlain Parkway MEGC-M5000(1)



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FIGURE 4-20

2028 PM PEAK HOUR TRAFFIC VOLUMES
BUILD ALTERNATIVE 2

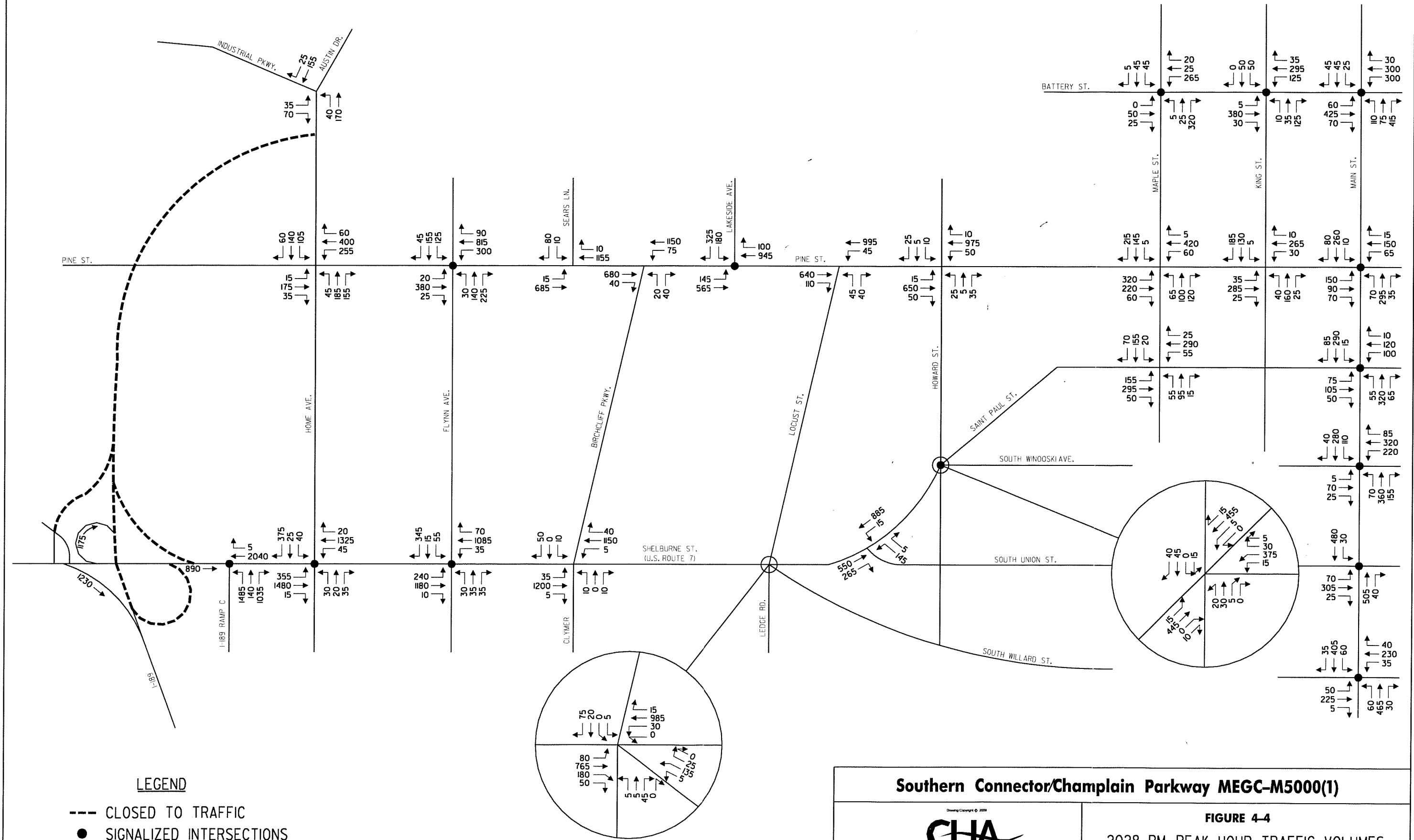
--- CLOSED TO TRAFFIC
● SIGNALIZED INTERSECTIONS

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Unsignalized & Signalized Intersection Capacity Analysis

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
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)	0	1	0	17	1	14	0	1	26	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	27	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	26	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				6.8								
Level of Service				A								
Intersection Capacity Utilization				19.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	4	98	6	4	24	256	549	29	8	229	135
Future Volume (vph)	100	4	98	6	4	24	256	549	29	8	229	135
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.86		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.86			0.90		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1762	1546			1429		1764	1845			1859	1533
Flt Permitted	0.73	1.00			1.00		0.46	1.00			0.97	1.00
Satd. Flow (perm)	1363	1546			1441		848	1845			1816	1533
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)	100	4	98	6	4	24	256	549	29	8	229	135
RTOR Reduction (vph)	0	78	0	0	23	0	0	2	0	0	0	93
Lane Group Flow (vph)	100	24	0	0	11	0	256	576	0	0	237	42
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	9.7	9.7			1.8		28.4	28.4			14.9	14.9
Effective Green, g (s)	9.7	9.7			1.8		28.4	28.4			14.9	14.9
Actuated g/C Ratio	0.20	0.20			0.04		0.59	0.59			0.31	0.31
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	298	311			53		662	1089			562	474
v/s Ratio Prot	c0.02	0.02					0.07	c0.31				
v/s Ratio Perm	c0.05				0.01		0.16				0.13	0.03
v/c Ratio	0.34	0.08			0.21		0.39	0.53			0.42	0.09
Uniform Delay, d1	16.5	15.6			22.5		5.1	5.9			13.2	11.8
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0			0.7		0.1	0.5			0.5	0.1
Delay (s)	16.8	15.6			23.2		5.2	6.3			13.7	11.9
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		16.2			23.2			6.0			13.0	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.6				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			48.1				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			70.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	83	17	20	172	252	24	477	11	81	223	60
Future Volume (vph)	62	83	17	20	172	252	24	477	11	81	223	60
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.98	0.95		1.00		1.00	0.99	
Flpb, ped/bikes		0.98			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			0.97	0.85		1.00		1.00	0.97	
Flt Protected		0.98			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1751			1684	1433		1846		1770	1788	
Flt Permitted		0.74			0.97	1.00		0.98		0.31	1.00	
Satd. Flow (perm)		1321			1633	1433		1809		572	1788	
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)	62	83	17	20	172	252	24	477	11	81	223	60
RTOR Reduction (vph)	0	4	0	0	9	70	0	1	0	0	9	0
Lane Group Flow (vph)	0	158	0	0	226	139	0	511	0	81	274	0
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		15.6			15.6	22.6		24.3		36.3	36.3	
Effective Green, g (s)		15.6			15.6	22.6		24.3		36.3	36.3	
Actuated g/C Ratio		0.25			0.25	0.37		0.39		0.59	0.59	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		332			411	638		710		470	1048	
v/s Ratio Prot						0.02				0.02	c0.15	
v/s Ratio Perm		0.12			c0.14	0.07		c0.28		0.08		
v/c Ratio		0.47			0.55	0.22		0.72		0.17	0.26	
Uniform Delay, d1		19.7			20.1	13.6		15.9		7.6	6.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.5			1.9	0.2		3.6		0.2	0.1	
Delay (s)		21.1			22.0	13.7		19.5		7.7	6.4	
Level of Service		C			C	B		B		A	A	
Approach Delay (s)		21.1			18.1			19.5			6.7	
Approach LOS		C			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		16.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		61.9			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		83.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
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)	0	11	1	41	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	57	18	16								
Volume Left (vph)	0	41	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	983	819								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				25.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	0	400	1	0	2	84	493	0	1	479	96
Future Volume (vph)	203	0	400	1	0	2	84	493	0	1	479	96
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.96			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.85			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1754	1528			1628		1769	1863			1862	1540
Flt Permitted	0.76	1.00			1.00		0.25	1.00			1.00	1.00
Satd. Flow (perm)	1395	1528			1655		458	1863			1861	1540
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)	203	0	400	1	0	2	84	493	0	1	479	96
RTOR Reduction (vph)	0	288	0	0	3	0	0	0	0	0	0	61
Lane Group Flow (vph)	203	112	0	0	0	0	84	493	0	0	480	35
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	14.3	14.3			2.5		27.0	27.0			18.8	18.8
Effective Green, g (s)	14.3	14.3			2.5		27.0	27.0			18.8	18.8
Actuated g/C Ratio	0.28	0.28			0.05		0.53	0.53			0.37	0.37
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	436	425			80		322	980			682	564
v/s Ratio Prot	c0.06	0.07					0.02	c0.26				
v/s Ratio Perm	c0.07				0.00		0.12				c0.26	0.02
v/c Ratio	0.47	0.26			0.00		0.26	0.50			0.70	0.06
Uniform Delay, d1	15.6	14.4			23.2		7.5	7.8			13.9	10.5
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.1			0.0		0.2	0.4			3.3	0.0
Delay (s)	15.9	14.5			23.2		7.7	8.2			17.2	10.6
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		15.0			23.2			8.2			16.1	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			51.3				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			89.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	158	63	32	194	177	36	347	19	193	533	111
Future Volume (vph)	87	158	63	32	194	177	36	347	19	193	533	111
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.97		1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00	1.00	
Frt		0.97			0.99	0.85		0.99		1.00	0.97	
Flt Protected		0.99			0.99	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1747			1729	1459		1834		1770	1801	
Flt Permitted		0.78			0.93	1.00		0.91		0.33	1.00	
Satd. Flow (perm)		1383			1627	1459		1673		613	1801	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	158	63	32	194	177	36	347	19	193	533	111
RTOR Reduction (vph)	0	10	0	0	3	38	0	2	0	0	8	0
Lane Group Flow (vph)	0	298	0	0	241	121	0	400	0	193	636	0
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.5			22.5	32.7		23.3		38.5	38.5	
Effective Green, g (s)		22.5			22.5	32.7		23.3		38.5	38.5	
Actuated g/C Ratio		0.32			0.32	0.46		0.33		0.54	0.54	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		438			515	774		549		498	976	
v/s Ratio Prot						0.02				0.06	c0.35	
v/s Ratio Perm		c0.22			0.15	0.06		c0.24		0.15		
v/c Ratio		0.68			0.47	0.16		0.73		0.39	0.65	
Uniform Delay, d1		21.1			19.5	11.1		21.1		10.4	11.5	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		4.7			0.9	0.1		4.8		0.5	1.6	
Delay (s)		25.8			20.4	11.2		25.9		10.9	13.1	
Level of Service		C			C	B		C		B	B	
Approach Delay (s)		25.8			16.8			25.9			12.6	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		71.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		106.3%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	132	0	7	26	23	1	0
Future Volume (vph)	0	1	0	17	1	132	0	7	26	23	1	0
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)	0	1	0	17	1	132	0	7	26	23	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	150	33	24								
Volume Left (vph)	0	17	0	23								
Volume Right (vph)	0	132	26	0								
Hadj (s)	0.03	-0.47	-0.44	0.23								
Departure Headway (s)	4.2	3.6	3.8	4.4								
Degree Utilization, x	0.00	0.15	0.03	0.03								
Capacity (veh/h)	837	995	908	779								
Control Delay (s)	7.2	7.2	6.9	7.6								
Approach Delay (s)	7.2	7.2	6.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				31.1%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	4	108	6	6	24	332	549	29	8	229	175
Future Volume (vph)	110	4	108	6	6	24	332	549	29	8	229	175
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.87		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.86			0.91		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1762	1545			1459		1764	1845			1859	1533
Flt Permitted	0.73	1.00			1.00		0.43	1.00			0.97	1.00
Satd. Flow (perm)	1360	1545			1471		798	1845			1812	1533
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)	110	4	108	6	6	24	332	549	29	8	229	175
RTOR Reduction (vph)	0	83	0	0	23	0	0	3	0	0	0	128
Lane Group Flow (vph)	110	29	0	0	13	0	332	575	0	0	237	47
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	11.4	11.4			1.9		27.4	27.4			13.2	13.2
Effective Green, g (s)	11.4	11.4			1.9		27.4	27.4			13.2	13.2
Actuated g/C Ratio	0.23	0.23			0.04		0.56	0.56			0.27	0.27
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	354	360			57		630	1035			490	414
v/s Ratio Prot	c0.03	0.02					0.10	c0.31				
v/s Ratio Perm	c0.04				0.01		0.20				0.13	0.03
v/c Ratio	0.31	0.08			0.23		0.53	0.56			0.48	0.11
Uniform Delay, d1	15.6	14.6			22.7		6.2	6.8			14.9	13.4
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0			0.7		0.4	0.7			0.8	0.1
Delay (s)	15.8	14.6			23.5		6.6	7.5			15.7	13.5
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		15.2			23.5			7.1			14.8	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			10.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			48.8				Sum of lost time (s)		20.0			
Intersection Capacity Utilization			71.0%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	83	17	20	172	276	24	523	11	83	229	62
Future Volume (vph)	68	83	17	20	172	276	24	523	11	83	229	62
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.98	0.95		1.00		1.00	0.99	
Flpb, ped/bikes		0.97			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			0.97	0.85		1.00		1.00	0.97	
Flt Protected		0.98			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1747			1668	1431		1847		1770	1788	
Flt Permitted		0.67			0.97	1.00		0.98		0.30	1.00	
Satd. Flow (perm)		1186			1619	1431		1813		556	1788	
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	83	17	20	172	276	24	523	11	83	229	62
RTOR Reduction (vph)	0	5	0	0	12	65	0	1	0	0	9	0
Lane Group Flow (vph)	0	163	0	0	235	156	0	557	0	83	282	0
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		16.4			16.4	23.4		27.7		39.7	39.7	
Effective Green, g (s)		16.4			16.4	23.4		27.7		39.7	39.7	
Actuated g/C Ratio		0.25			0.25	0.35		0.42		0.60	0.60	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		294			401	614		759		462	1073	
v/s Ratio Prot						0.03				0.02	c0.16	
v/s Ratio Perm		0.14			c0.15	0.08		c0.31		0.09		
v/c Ratio		0.56			0.59	0.25		0.73		0.18	0.26	
Uniform Delay, d1		21.7			21.9	15.2		16.1		7.7	6.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		2.8			2.6	0.2		3.7		0.2	0.1	
Delay (s)		24.5			24.4	15.4		19.8		7.9	6.4	
Level of Service		C			C	B		B		A	A	
Approach Delay (s)		24.5			20.2			19.8			6.7	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			66.1				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			86.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	40	9	27	1	1	17	117	5	0
Future Volume (vph)	0	11	1	40	9	27	1	1	17	117	5	0
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)	0	11	1	40	9	27	1	1	17	117	5	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	76	19	122								
Volume Left (vph)	0	40	1	117								
Volume Right (vph)	1	27	17	0								
Hadj (s)	-0.02	-0.07	-0.49	0.23								
Departure Headway (s)	4.3	4.2	3.7	4.3								
Degree Utilization, x	0.01	0.09	0.02	0.15								
Capacity (veh/h)	805	835	926	811								
Control Delay (s)	7.3	7.6	6.8	8.1								
Approach Delay (s)	7.3	7.6	6.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	7.8											
Level of Service	A											
Intersection Capacity Utilization	32.4%			ICU Level of Service			A					
Analysis Period (min)	15											
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	0	459	1	0	2	92	484	0	1	469	105
Future Volume (vph)	233	0	459	1	0	2	92	484	0	1	469	105
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.96			0.75		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.85			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1753	1525			1239		1769	1863			1862	1540
Flt Permitted	0.76	1.00			1.00		0.24	1.00			1.00	1.00
Satd. Flow (perm)	1395	1525			1259		446	1863			1861	1540
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)	233	0	459	1	0	2	92	484	0	1	469	105
RTOR Reduction (vph)	0	316	0	0	3	0	0	0	0	0	0	68
Lane Group Flow (vph)	233	143	0	0	0	0	92	484	0	0	470	37
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Confl. Bikes (#/hr)			1			18			2			
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	14.9	14.9			0.6		28.3	28.3			18.7	18.7
Effective Green, g (s)	14.9	14.9			0.6		28.3	28.3			18.7	18.7
Actuated g/C Ratio	0.28	0.28			0.01		0.53	0.53			0.35	0.35
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	453	427			14		351	991			654	541
v/s Ratio Prot	c0.09	0.09					0.02	c0.26				
v/s Ratio Perm	c0.05				0.00		0.12				c0.25	0.02
v/c Ratio	0.51	0.33			0.00		0.26	0.49			0.72	0.07
Uniform Delay, d1	16.0	15.2			26.0		7.7	7.9			15.0	11.5
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.4	0.2			0.0		0.1	0.4			3.8	0.1
Delay (s)	16.4	15.4			26.0		7.8	8.3			18.7	11.5
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		15.7			26.0			8.2			17.4	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			53.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			92.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	155	61	32	190	176	35	347	19	205	565	118
Future Volume (vph)	86	155	61	32	190	176	35	347	19	205	565	118
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.97		1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00	1.00	
Frt		0.97			0.99	0.85		0.99		1.00	0.97	
Flt Protected		0.99			0.99	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1747			1728	1460		1834		1770	1800	
Flt Permitted		0.78			0.93	1.00		0.91		0.33	1.00	
Satd. Flow (perm)		1389			1626	1460		1669		612	1800	
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)	86	155	61	32	190	176	35	347	19	205	565	118
RTOR Reduction (vph)	0	10	0	0	3	39	0	2	0	0	8	0
Lane Group Flow (vph)	0	292	0	0	237	119	0	399	0	205	675	0
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.2			22.2	32.7		23.2		38.7	38.7	
Effective Green, g (s)		22.2			22.2	32.7		23.2		38.7	38.7	
Actuated g/C Ratio		0.31			0.31	0.46		0.33		0.55	0.55	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		434			509	776		546		505	982	
v/s Ratio Prot						0.02				0.06	c0.38	
v/s Ratio Perm		c0.21			0.15	0.06		0.24		0.16		
v/c Ratio		0.67			0.47	0.15		0.73		0.41	0.69	
Uniform Delay, d1		21.2			19.6	11.1		21.1		10.3	11.7	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		4.5			0.9	0.1		5.0		0.5	2.0	
Delay (s)		25.7			20.5	11.2		26.1		10.8	13.7	
Level of Service		C			C	B		C		B	B	
Approach Delay (s)		25.7			16.8			26.1			13.1	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		70.9			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		107.8%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
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)	0	1	0	17	1	14	0	1	26	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	27	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	26	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				6.8								
Level of Service				A								
Intersection Capacity Utilization				19.1%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	4	100	6	4	24	261	598	29	8	257	138
Future Volume (vph)	102	4	100	6	4	24	261	598	29	8	257	138
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.91		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.86			0.90		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1761	1546			1515		1764	1847			1859	1532
Flt Permitted	0.73	1.00			0.91		0.42	1.00			0.98	1.00
Satd. Flow (perm)	1363	1546			1396		783	1847			1818	1532
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	4	100	6	4	24	261	598	29	8	257	138
RTOR Reduction (vph)	0	77	0	0	22	0	0	3	0	0	0	95
Lane Group Flow (vph)	102	27	0	0	12	0	261	624	0	0	265	43
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	11.3	11.3			3.2		28.7	28.7			15.4	15.4
Effective Green, g (s)	11.3	11.3			3.2		28.7	28.7			15.4	15.4
Actuated g/C Ratio	0.23	0.23			0.06		0.57	0.57			0.31	0.31
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	332	349			89		612	1060			559	471
v/s Ratio Prot	c0.02	0.02					0.07	c0.34				
v/s Ratio Perm	c0.05				0.01		0.17				0.15	0.03
v/c Ratio	0.31	0.08			0.13		0.43	0.59			0.47	0.09
Uniform Delay, d1	16.2	15.2			22.1		5.8	6.9			14.0	12.3
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0			0.2		0.2	0.8			0.6	0.1
Delay (s)	16.4	15.3			22.3		6.0	7.7			14.7	12.4
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		15.8			22.3			7.2			13.9	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			10.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			50.0				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			74.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	84	17	20	176	257	24	524	11	83	252	61
Future Volume (vph)	63	84	17	20	176	257	24	524	11	83	252	61
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.98	0.95		1.00		1.00	0.99	
Flpb, ped/bikes		0.98			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			0.97	0.85		1.00		1.00	0.97	
Flt Protected		0.98			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1751			1683	1431		1848		1770	1794	
Flt Permitted		0.68			0.97	1.00		0.98		0.30	1.00	
Satd. Flow (perm)		1207			1631	1431		1811		563	1794	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	63	84	17	20	176	257	24	524	11	83	252	61
RTOR Reduction (vph)	0	5	0	0	9	66	0	1	0	0	7	0
Lane Group Flow (vph)	0	159	0	0	231	147	0	558	0	83	306	0
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		15.1			15.1	22.1		27.3		39.3	39.3	
Effective Green, g (s)		15.1			15.1	22.1		27.3		39.3	39.3	
Actuated g/C Ratio		0.23			0.23	0.34		0.42		0.61	0.61	
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)		283			382	602		767		474	1094	
v/s Ratio Prot						0.03				0.02	c0.17	
v/s Ratio Perm		0.13			c0.14	0.08		c0.31		0.09		
v/c Ratio		0.56			0.60	0.24		0.73		0.18	0.28	
Uniform Delay, d1		21.7			22.0	15.2		15.5		7.3	5.9	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		2.6			2.7	0.2		3.5		0.2	0.1	
Delay (s)		24.3			24.7	15.4		18.9		7.4	6.0	
Level of Service		C			C	B		B		A	A	
Approach Delay (s)		24.3			20.3			18.9			6.3	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		16.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		64.4			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		85.9%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

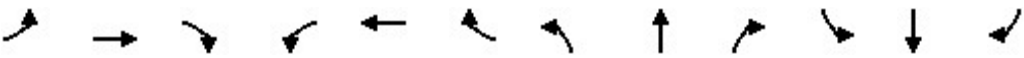
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
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)	0	1	0	17	1	14	0	1	27	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	28	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	27	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				6.8								
Level of Service				A								
Intersection Capacity Utilization				19.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	249	4	31	6	4	24	164	458	29	8	41	473
Future Volume (vph)	249	4	31	6	4	24	164	458	29	8	41	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00			1.00	1.00
Frt	1.00	0.87			0.90		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	1570			1635		1752	1841			1845	1529
Flt Permitted	0.95	1.00			1.00		0.73	1.00			0.50	1.00
Satd. Flow (perm)	1770	1570			1649		1337	1841			924	1529
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)	249	4	31	6	4	24	164	458	29	8	41	473
RTOR Reduction (vph)	0	18	0	0	23	0	0	2	0	0	0	387
Lane Group Flow (vph)	249	17	0	0	11	0	164	485	0	0	49	86
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	16.7	24.9			1.7		22.7	22.7			10.7	10.7
Effective Green, g (s)	16.7	24.9			1.7		22.7	22.7			10.7	10.7
Actuated g/C Ratio	0.28	0.42			0.03		0.39	0.39			0.18	0.18
Clearance Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	504	667			47		560	713			168	279
v/s Ratio Prot	c0.14	0.01					0.03	c0.26				
v/s Ratio Perm					c0.01		0.08				0.05	0.06
v/c Ratio	0.49	0.03			0.23		0.29	0.68			0.29	0.31
Uniform Delay, d1	17.4	9.8			27.8		12.5	14.9			20.7	20.7
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.0			0.9		0.1	2.6			1.0	0.6
Delay (s)	17.7	9.8			28.7		12.6	17.5			21.6	21.4
Level of Service	B	A			C		B	B			C	C
Approach Delay (s)		16.7			28.7			16.3			21.4	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			18.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			58.6				Sum of lost time (s)		27.5			
Intersection Capacity Utilization			75.0%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

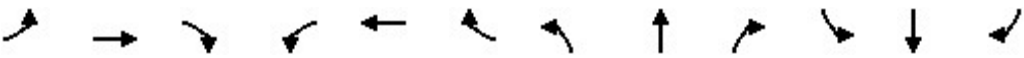
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	70	10	20	123	170	21	290	11	48	25	19
Future Volume (vph)	42	70	10	20	123	170	21	290	11	48	25	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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.98	0.95		1.00		1.00	0.99	
Flpb, ped/bikes		0.98			1.00	1.00		1.00		0.98	1.00	
Frt		0.99			0.98	0.85		1.00		1.00	0.94	
Flt Protected		0.98			0.99	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1769			1692	1424		1840		1740	1716	
Flt Permitted		0.82			0.94	1.00		0.98		0.45	1.00	
Satd. Flow (perm)		1468			1608	1424		1815		821	1716	
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	70	10	20	123	170	21	290	11	48	25	19
RTOR Reduction (vph)	0	4	0	0	7	73	0	1	0	0	8	0
Lane Group Flow (vph)	0	118	0	0	160	73	0	321	0	48	36	0
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		8.9			8.9	13.5		18.0		27.6	27.6	
Effective Green, g (s)		8.9			8.9	13.5		18.0		27.6	27.6	
Actuated g/C Ratio		0.19			0.19	0.29		0.39		0.59	0.59	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		280			307	566		702		578	1018	
v/s Ratio Prot						c0.01				0.01	0.02	
v/s Ratio Perm		0.08			c0.10	0.04		c0.18		0.04		
v/c Ratio		0.42			0.52	0.13		0.46		0.08	0.04	
Uniform Delay, d1		16.5			16.9	12.2		10.6		4.8	3.9	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.4			2.1	0.1		0.5		0.1	0.0	
Delay (s)		17.9			18.9	12.3		11.1		4.9	3.9	
Level of Service		B			B	B		B		A	A	
Approach Delay (s)		17.9			15.8			11.1			4.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		13.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		46.5			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		55.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Champlain Parkway & Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩			↩	↩		↩	
Traffic Volume (vph)	0	129	80	398	257	0	161	0	154	20	5	0
Future Volume (vph)	0	129	80	398	257	0	161	0	154	20	5	0
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	5.0			7.0	6.0		6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)		1863	1583	1770	1863			1770	1583		1791	
Flt Permitted		1.00	1.00	0.95	1.00			0.74	1.00		0.74	
Satd. Flow (perm)		1863	1583	1770	1863			1380	1583		1382	
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	129	80	398	257	0	161	0	154	20	5	0
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	129	21	398	257	0	0	161	78	0	25	0
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		
Actuated Green, G (s)		20.1	20.1	23.2	38.3			14.9	38.1		15.9	
Effective Green, g (s)		20.1	20.1	23.2	38.3			14.9	38.1		15.9	
Actuated g/C Ratio		0.27	0.27	0.31	0.51			0.20	0.51		0.21	
Clearance Time (s)				6.0	5.0			7.0	6.0		6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		497	423	546	948			273	802		292	
v/s Ratio Prot		c0.07		c0.22	c0.14				0.03			
v/s Ratio Perm			0.01					c0.12	0.02		0.02	
v/c Ratio		0.26	0.05	0.73	0.27			0.59	0.10		0.09	
Uniform Delay, d1		21.7	20.5	23.2	10.5			27.4	9.6		23.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.3	0.0	4.8	0.2			3.2	0.1		0.1	
Delay (s)		22.0	20.5	28.0	10.7			30.6	9.7		23.9	
Level of Service		C	C	C	B			C	A		C	
Approach Delay (s)		21.4			21.2			20.4			23.9	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			21.1									
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			75.2									
Intersection Capacity Utilization			52.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

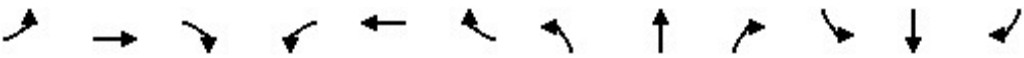
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	132	0	7	27	23	1	0
Future Volume (vph)	0	1	0	17	1	132	0	7	27	23	1	0
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)	0	1	0	17	1	132	0	7	27	23	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	150	34	24								
Volume Left (vph)	0	17	0	23								
Volume Right (vph)	0	132	27	0								
Hadj (s)	0.03	-0.47	-0.44	0.23								
Departure Headway (s)	4.2	3.6	3.8	4.4								
Degree Utilization, x	0.00	0.15	0.04	0.03								
Capacity (veh/h)	837	994	909	779								
Control Delay (s)	7.2	7.2	6.9	7.6								
Approach Delay (s)	7.2	7.2	6.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			31.1%	ICU Level of Service				A				
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	4	32	6	4	24	165	458	29	8	41	519
Future Volume (vph)	256	4	32	6	4	24	165	458	29	8	41	519
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.97			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00			1.00	1.00
Frt	1.00	0.87			0.90		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	1569			1635		1752	1841			1845	1529
Flt Permitted	0.95	1.00			1.00		0.73	1.00			0.50	1.00
Satd. Flow (perm)	1770	1569			1649		1337	1841			928	1529
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)	256	4	32	6	4	24	165	458	29	8	41	519
RTOR Reduction (vph)	0	18	0	0	23	0	0	2	0	0	0	424
Lane Group Flow (vph)	256	18	0	0	11	0	165	485	0	0	49	95
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	17.3	25.5			1.7		22.8	22.8			10.9	10.9
Effective Green, g (s)	17.3	25.5			1.7		22.8	22.8			10.9	10.9
Actuated g/C Ratio	0.29	0.43			0.03		0.38	0.38			0.18	0.18
Clearance Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	516	674			47		555	707			170	281
v/s Ratio Prot	c0.14	0.01					0.03	c0.26				
v/s Ratio Perm					c0.01		0.08				0.05	0.06
v/c Ratio	0.50	0.03			0.23		0.30	0.69			0.29	0.34
Uniform Delay, d1	17.4	9.7			28.2		12.8	15.3			20.9	21.1
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.0			0.9		0.1	2.8			0.9	0.7
Delay (s)	17.7	9.7			29.1		12.9	18.0			21.8	21.8
Level of Service	B	A			C		B	B			C	C
Approach Delay (s)		16.7			29.1			16.7			21.8	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			18.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			59.3				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			77.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

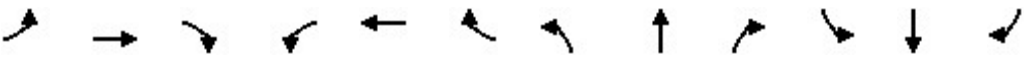
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	70	10	20	123	170	21	291	11	48	25	20
Future Volume (vph)	42	70	10	20	123	170	21	291	11	48	25	20
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.98	0.95		1.00		1.00	0.99	
Flpb, ped/bikes		0.98			1.00	1.00		1.00		0.98	1.00	
Frt		0.99			0.98	0.85		1.00		1.00	0.93	
Flt Protected		0.98			0.99	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1772			1693	1428		1840		1741	1713	
Flt Permitted		0.84			0.95	1.00		0.99		0.46	1.00	
Satd. Flow (perm)		1509			1622	1428		1819		841	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)	42	70	10	20	123	170	21	291	11	48	25	20
RTOR Reduction (vph)	0	4	0	0	7	74	0	1	0	0	8	0
Lane Group Flow (vph)	0	118	0	0	160	72	0	322	0	48	37	0
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		8.7			8.7	13.2		17.2		25.7	25.7	
Effective Green, g (s)		8.7			8.7	13.2		17.2		25.7	25.7	
Actuated g/C Ratio		0.21			0.21	0.31		0.41		0.61	0.61	
Clearance Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		309			332	579		737		605	1038	
v/s Ratio Prot						c0.01				0.01	0.02	
v/s Ratio Perm		0.08			c0.10	0.04		c0.18		0.04		
v/c Ratio		0.38			0.48	0.12		0.44		0.08	0.04	
Uniform Delay, d1		14.5			14.9	10.5		9.1		4.1	3.4	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.1			1.5	0.1		0.4		0.1	0.0	
Delay (s)		15.6			16.4	10.6		9.5		4.2	3.4	
Level of Service		B			B	B		A		A	A	
Approach Delay (s)		15.6			13.7			9.5			3.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		11.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		42.4			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												

HCM Signalized Intersection Capacity Analysis

12: Champlain Parkway & Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩			↩	↩		↩	
Traffic Volume (vph)	0	137	92	398	304	0	231	0	154	20	5	0
Future Volume (vph)	0	137	92	398	304	0	231	0	154	20	5	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	5.0			7.0	6.0		6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)		1863	1583	1770	1863			1770	1583		1791	
Flt Permitted		1.00	1.00	0.95	1.00			0.74	1.00		0.74	
Satd. Flow (perm)		1863	1583	1770	1863			1380	1583		1377	
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	137	92	398	304	0	231	0	154	20	5	0
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	109	0	0	0
Lane Group Flow (vph)	0	137	24	398	304	0	0	231	45	0	25	0
Turn Type		NA	Perm	Prot	NA		Perm	NA	Over	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2			6		
Actuated Green, G (s)		22.5	22.5	24.5	42.1			20.5	24.5		21.5	
Effective Green, g (s)		22.5	22.5	24.5	42.1			20.5	24.5		21.5	
Actuated g/C Ratio		0.27	0.27	0.29	0.50			0.24	0.29		0.25	
Clearance Time (s)				6.0	5.0			7.0	6.0		6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		496	421	513	928			334	458		350	
v/s Ratio Prot		c0.07		c0.22	c0.16				0.03			
v/s Ratio Perm			0.02					c0.17			0.02	
v/c Ratio		0.28	0.06	0.78	0.33			0.69	0.10		0.07	
Uniform Delay, d1		24.6	23.1	27.5	12.7			29.1	21.9		23.9	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.3	0.1	7.2	0.2			6.1	0.1		0.1	
Delay (s)		24.9	23.2	34.7	12.9			35.2	22.0		24.0	
Level of Service		C	C	C	B			D	C		C	
Approach Delay (s)		24.2			25.3			29.9			24.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			84.5			Sum of lost time (s)			27.0			
Intersection Capacity Utilization			59.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
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)	0	11	1	41	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	57	18	16								
Volume Left (vph)	0	41	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	983	819								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				25.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	0	400	1	0	2	84	530	0	1	525	96
Future Volume (vph)	203	0	400	1	0	2	84	530	0	1	525	96
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
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.96			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.85			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1753	1527			1627		1769	1863			1862	1540
Flt Permitted	0.76	1.00			1.00		0.22	1.00			1.00	1.00
Satd. Flow (perm)	1395	1527			1654		408	1863			1861	1540
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)	203	0	400	1	0	2	84	530	0	1	525	96
RTOR Reduction (vph)	0	291	0	0	3	0	0	0	0	0	0	59
Lane Group Flow (vph)	203	109	0	0	0	0	84	530	0	0	526	37
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	14.4	14.4			2.6		28.5	28.5			20.3	20.3
Effective Green, g (s)	14.4	14.4			2.6		28.5	28.5			20.3	20.3
Actuated g/C Ratio	0.27	0.27			0.05		0.54	0.54			0.38	0.38
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	425	415			81		302	1003			714	590
v/s Ratio Prot	c0.06	0.07					0.02	c0.28				
v/s Ratio Perm	c0.07				0.00		0.13				c0.28	0.02
v/c Ratio	0.48	0.26			0.00		0.28	0.53			0.74	0.06
Uniform Delay, d1	16.4	15.1			23.9		7.8	7.9			14.0	10.3
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.1			0.0		0.2	0.5			4.0	0.0
Delay (s)	16.7	15.2			23.9		8.0	8.4			18.0	10.3
Level of Service	B	B			C		A	A			B	B
Approach Delay (s)		15.7			23.9			8.3			16.8	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			52.9				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			93.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	158	63	32	194	177	36	384	19	193	579	111
Future Volume (vph)	87	158	63	32	194	177	36	384	19	193	579	111
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.97		1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00	1.00	
Frt		0.97			0.99	0.85		0.99		1.00	0.98	
Flt Protected		0.99			0.99	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1746			1729	1458		1836		1770	1804	
Flt Permitted		0.77			0.94	1.00		0.91		0.31	1.00	
Satd. Flow (perm)		1363			1628	1458		1679		586	1804	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	158	63	32	194	177	36	384	19	193	579	111
RTOR Reduction (vph)	0	10	0	0	3	39	0	2	0	0	7	0
Lane Group Flow (vph)	0	298	0	0	241	120	0	437	0	193	683	0
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		23.1			23.1	33.3		25.3		40.5	40.5	
Effective Green, g (s)		23.1			23.1	33.3		25.3		40.5	40.5	
Actuated g/C Ratio		0.31			0.31	0.45		0.34		0.55	0.55	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		427			510	758		577		486	992	
v/s Ratio Prot						0.02				0.05	c0.38	
v/s Ratio Perm		c0.22			0.15	0.06		c0.26		0.16		
v/c Ratio		0.70			0.47	0.16		0.76		0.40	0.69	
Uniform Delay, d1		22.2			20.3	11.9		21.4		10.6	12.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		5.3			0.9	0.1		5.6		0.5	2.0	
Delay (s)		27.5			21.3	12.0		27.1		11.1	14.0	
Level of Service		C			C	B		C		B	B	
Approach Delay (s)		27.5			17.6			27.1			13.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay		19.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		73.6			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		110.6%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
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)	0	11	1	41	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	57	18	16								
Volume Left (vph)	0	41	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	983	819								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			25.7%	ICU Level of Service				A				
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	0	212	1	0	2	84	363	0	1	211	460
Future Volume (vph)	364	0	212	1	0	2	84	363	0	1	211	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.96			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00			1.00	1.00
Frt	1.00	0.85			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1519			1619		1762	1863			1862	1536
Flt Permitted	0.95	1.00			1.00		0.57	1.00			1.00	1.00
Satd. Flow (perm)	1770	1519			1646		1060	1863			1859	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)	364	0	212	1	0	2	84	363	0	1	211	460
RTOR Reduction (vph)	0	109	0	0	3	0	0	0	0	0	0	360
Lane Group Flow (vph)	364	103	0	0	0	0	84	363	0	0	212	100
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	26.7	34.0			0.8		25.2	25.2			15.3	15.3
Effective Green, g (s)	26.7	34.0			0.8		25.2	25.2			15.3	15.3
Actuated g/C Ratio	0.38	0.48			0.01		0.36	0.36			0.22	0.22
Clearance Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	673	735			18		419	668			405	334
v/s Ratio Prot	c0.21	c0.07					0.01	c0.19				
v/s Ratio Perm					0.00		0.06				0.11	0.07
v/c Ratio	0.54	0.14			0.00		0.20	0.54			0.52	0.30
Uniform Delay, d1	17.0	10.0			34.3		16.8	17.9			24.2	23.0
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.5	0.0			0.0		0.1	0.9			1.2	0.5
Delay (s)	17.4	10.0			34.3		16.9	18.8			25.5	23.5
Level of Service	B	B			C		B	B			C	C
Approach Delay (s)		14.7			34.3			18.5			24.1	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			70.2				Sum of lost time (s)			28.0		
Intersection Capacity Utilization			72.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

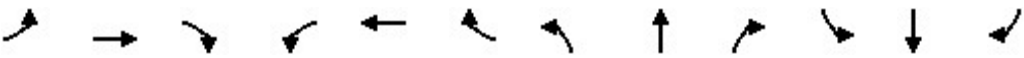
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	104	45	29	151	145	33	164	16	104	166	76
Future Volume (vph)	26	104	45	29	151	145	33	164	16	104	166	76
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.97		1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00		1.00		0.99	1.00	
Frt		0.97			0.99	0.85		0.99		1.00	0.95	
Flt Protected		0.99			0.99	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		1758			1725	1455		1819		1753	1755	
Flt Permitted		0.93			0.93	1.00		0.91		0.49	1.00	
Satd. Flow (perm)		1646			1619	1455		1674		911	1755	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	104	45	29	151	145	33	164	16	104	166	76
RTOR Reduction (vph)	0	14	0	0	4	44	0	3	0	0	19	0
Lane Group Flow (vph)	0	161	0	0	191	86	0	210	0	104	223	0
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		12.4			12.4	17.9		11.8		22.3	22.3	
Effective Green, g (s)		12.4			12.4	17.9		11.8		22.3	22.3	
Actuated g/C Ratio		0.28			0.28	0.40		0.26		0.50	0.50	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		456			449	745		441		558	875	
v/s Ratio Prot						0.01				0.02	c0.13	
v/s Ratio Perm		0.10			c0.12	0.05		c0.13		0.07		
v/c Ratio		0.35			0.43	0.12		0.48		0.19	0.26	
Uniform Delay, d1		12.9			13.2	8.4		13.8		6.6	6.4	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.9	0.1		0.8		0.2	0.2	
Delay (s)		13.6			14.1	8.5		14.7		6.8	6.6	
Level of Service		B			B	A		B		A	A	
Approach Delay (s)		13.6			11.9			14.7			6.7	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		11.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		44.7			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		64.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Champlain Parkway & Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩	↩		↩	↩		↩	
Traffic Volume (vph)	0	370	249	385	70	0	118	0	221	5	0	0
Future Volume (vph)	0	370	249	385	70	0	118	0	221	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		7.0			6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00			1.00	1.00		1.00	
Frt		1.00	0.85		1.00			1.00	0.85		1.00	
Flt Protected		1.00	1.00		0.96			0.95	1.00		0.95	
Satd. Flow (prot)		1863	1583		1787			1770	1583		1770	
Flt Permitted		1.00	1.00		0.37			0.75	1.00		0.68	
Satd. Flow (perm)		1863	1583		693			1405	1583		1269	
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	370	249	385	70	0	118	0	221	5	0	0
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	149	0	0	0
Lane Group Flow (vph)	0	370	172	0	455	0	0	118	72	0	5	0
Turn Type		NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9			8	2		2	6		
Actuated Green, G (s)		59.4	59.4		58.0			29.0	37.0		29.0	
Effective Green, g (s)		59.4	59.4		58.0			29.0	37.0		29.0	
Actuated g/C Ratio		0.53	0.53		0.51			0.26	0.33		0.26	
Clearance Time (s)					7.0			6.0	6.0		6.0	
Vehicle Extension (s)					3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		980	832		433			360	602		325	
v/s Ratio Prot		c0.20			c0.07				0.01			
v/s Ratio Perm			0.11		c0.46			c0.08	0.04		0.00	
v/c Ratio		0.38	0.21		1.05			0.33	0.12		0.02	
Uniform Delay, d1		15.8	14.2		27.5			34.0	26.6		31.3	
Progression Factor		1.00	1.00		1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.2	0.1		57.2			2.4	0.1		0.1	
Delay (s)		16.1	14.3		84.7			36.5	26.7		31.4	
Level of Service		B	B		F			D	C		C	
Approach Delay (s)		15.4			84.7			30.1			31.4	
Approach LOS		B			F			C			C	
Intersection Summary												
HCM 2000 Control Delay			41.2									
HCM 2000 Level of Service											D	
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			112.9								25.0	
Intersection Capacity Utilization			65.7%								C	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

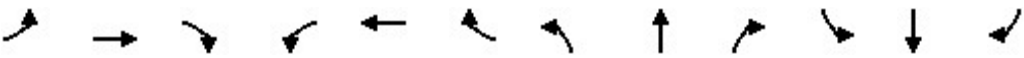
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	27	1	1	17	117	4	0
Future Volume (vph)	0	11	1	41	9	27	1	1	17	117	4	0
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)	0	11	1	41	9	27	1	1	17	117	4	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	77	19	121								
Volume Left (vph)	0	41	1	117								
Volume Right (vph)	1	27	17	0								
Hadj (s)	-0.02	-0.07	-0.49	0.23								
Departure Headway (s)	4.3	4.2	3.7	4.3								
Degree Utilization, x	0.01	0.09	0.02	0.15								
Capacity (veh/h)	806	835	925	810								
Control Delay (s)	7.3	7.6	6.8	8.1								
Approach Delay (s)	7.3	7.6	6.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization				32.4%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

HCM Signalized Intersection Capacity Analysis

3: Pine St & Lakeside Ave/Feldman's Drive

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	399	0	217	1	0	2	85	363	0	1	211	467
Future Volume (vph)	399	0	217	1	0	2	85	363	0	1	211	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.96			0.98		1.00	1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00			1.00	1.00
Frt	1.00	0.85			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1518			1618		1762	1863			1862	1535
Flt Permitted	0.95	1.00			1.00		0.57	1.00			1.00	1.00
Satd. Flow (perm)	1770	1518			1645		1050	1863			1859	1535
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)	399	0	217	1	0	2	85	363	0	1	211	467
RTOR Reduction (vph)	0	109	0	0	3	0	0	0	0	0	0	367
Lane Group Flow (vph)	399	108	0	0	0	0	85	363	0	0	212	100
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	28.2	35.5			0.8		25.1	25.1			15.3	15.3
Effective Green, g (s)	28.2	35.5			0.8		25.1	25.1			15.3	15.3
Actuated g/C Ratio	0.39	0.50			0.01		0.35	0.35			0.21	0.21
Clearance Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Vehicle Extension (s)	2.0	2.0			2.0		1.0	3.0			3.0	3.0
Lane Grp Cap (vph)	697	752			18		405	653			397	328
v/s Ratio Prot	c0.23	c0.07					0.01	c0.19				
v/s Ratio Perm					0.00		0.06				0.11	0.06
v/c Ratio	0.57	0.14			0.00		0.21	0.56			0.53	0.30
Uniform Delay, d1	17.0	9.8			35.0		17.7	18.8			25.0	23.7
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.7	0.0			0.0		0.1	1.0			1.4	0.5
Delay (s)	17.7	9.8			35.0		17.8	19.8			26.4	24.2
Level of Service	B	A			D		B	B			C	C
Approach Delay (s)		14.9			35.0			19.4			24.9	
Approach LOS		B			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			71.6				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			74.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Pine St & Flynn Ave

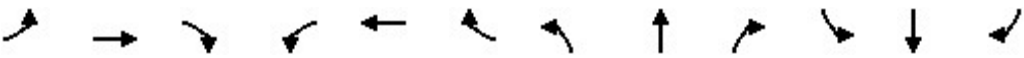
07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	104	45	29	151	145	33	164	16	106	169	76
Future Volume (vph)	26	104	45	29	151	145	33	164	16	106	169	76
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			0.95	0.95		1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.97		1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00		1.00		0.99	1.00	
Frt		0.97			0.99	0.85		0.99		1.00	0.95	
Flt Protected		0.99			0.99	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		1758			1725	1455		1819		1753	1756	
Flt Permitted		0.93			0.93	1.00		0.91		0.49	1.00	
Satd. Flow (perm)		1646			1619	1455		1673		911	1756	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	104	45	29	151	145	33	164	16	106	169	76
RTOR Reduction (vph)	0	14	0	0	4	44	0	3	0	0	18	0
Lane Group Flow (vph)	0	161	0	0	191	86	0	210	0	106	227	0
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		12.4			12.4	17.9		11.8		22.3	22.3	
Effective Green, g (s)		12.4			12.4	17.9		11.8		22.3	22.3	
Actuated g/C Ratio		0.28			0.28	0.40		0.26		0.50	0.50	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		456			449	745		441		558	876	
v/s Ratio Prot						0.01				0.02	c0.13	
v/s Ratio Perm		0.10			c0.12	0.05		c0.13		0.07		
v/c Ratio		0.35			0.43	0.12		0.48		0.19	0.26	
Uniform Delay, d1		12.9			13.2	8.4		13.8		6.6	6.4	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.9	0.1		0.8		0.2	0.2	
Delay (s)		13.6			14.1	8.5		14.7		6.8	6.6	
Level of Service		B			B	A		B		A	A	
Approach Delay (s)		13.6			11.9			14.7			6.7	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			44.7				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			65.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Champlain Parkway & Lakeside Ave

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱			↰	↱		↰	↱
Traffic Volume (vph)	0	410	310	385	78	0	129	0	221	5	0	0
Future Volume (vph)	0	410	310	385	78	0	129	0	221	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	6.0	5.0			7.0	6.0		6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00		0.95	
Satd. Flow (prot)		1863	1583	1770	1863			1770	1583		1770	
Flt Permitted		1.00	1.00	0.95	1.00			0.75	1.00		0.67	
Satd. Flow (perm)		1863	1583	1770	1863			1405	1583		1256	
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	410	310	385	78	0	129	0	221	5	0	0
RTOR Reduction (vph)	0	0	123	0	0	0	0	0	106	0	0	0
Lane Group Flow (vph)	0	410	187	385	78	0	0	129	115	0	5	0
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		
Actuated Green, G (s)		37.1	37.1	31.3	52.6			28.4	59.7		29.4	
Effective Green, g (s)		37.1	37.1	31.3	52.6			28.4	59.7		29.4	
Actuated g/C Ratio		0.32	0.32	0.27	0.46			0.25	0.52		0.26	
Clearance Time (s)				6.0	5.0			7.0	6.0		6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		604	513	484	857			349	826		323	
v/s Ratio Prot		c0.22		c0.22	0.04				0.04			
v/s Ratio Perm			0.12					c0.09	0.03		0.00	
v/c Ratio		0.68	0.36	0.80	0.09			0.37	0.14		0.02	
Uniform Delay, d1		33.4	29.6	38.5	17.4			35.5	14.1		31.7	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		3.0	0.4	8.8	0.0			3.0	0.1		0.1	
Delay (s)		36.5	30.0	47.3	17.4			38.5	14.1		31.7	
Level of Service		D	C	D	B			D	B		C	
Approach Delay (s)		33.7			42.3			23.1			31.7	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.9									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			114.3								26.0	
Intersection Capacity Utilization			63.4%								B	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												



Department of Planning and Zoning

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Layne Darfler, Planning Technician
Shaleigh Draper, Zoning Clerk



MEMORANDUM

To: Development Review Board

From: Mary O'Neil & Scott Gustin, Principal Planners

Date: October 2, 2018

RE: ZP19-0021CA; 375 North Avenue Cambrian Rise

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 Number: ZP19-0021CA/MA

Zone: NAC-CR Ward: 4N

Date application accepted: July 30, 2018; revised September 4, 2018.

Applicant/ Owner: Eric Farrell, BC Community Housing

Request: Amend Planned Unit Development permitted under **17-0623CA/MA** to increase total residential unit count from 739 to 770; revisions to Buildings M, P, Q, & R with an additional story added to each. Redesign of building M; includes 2 levels of parking, expanded surface parking area and amenity spaces. Further revision to Buildings B and G (originally amended May 2018) to expand volume of upper stories and introduction of additional storefront glazing at the ground level.



Background (Permitting addresses vary from 329, 351, 351-375 and 375 North Avenue):
Future permitting will be assigned to newly addressed Cambrian Way as appropriate.

- **Zoning Permit 18-0721CA:** Relocation of proposed path on SW side of building to align with existing opening on west elevation and small path leading from main path to vicinity of electrical transformer; modified paths near entry until adjacent buildings are complete; temporary black coated chain link construction fence surrounding west and south boundaries of building landscaping; new low stone wall. March 2018.
- **Zoning Permit 18-0791CA;** Revisions to Buildings B & G, with additional floor added to Building B. No change to total units in project; revisions to design of buildings and proposed transportation hub; revision to road phasing plan. May 2018.
- **Zoning Permit 18-0028AP;** Appeal of administrative decision relative to Impact Fees for orphanage renovation (zoning permit 16-0007CA/MA). DRB upholds staff decision, August 2017.
- **Zoning Permit 17-1307CA;** temporary fence and path for temporary dog park for residents of 375 North Avenue. June 2017.
- **Zoning Permit 17-0853CA;** Request for amendment of ZP17-0623CA/MA; Condition of approval #13 limiting construction days and times and Condition #3 addressing 10-year performance bond for construction. May 2017.
- **Zoning Permit 17-0716CA;** Replace two small windows on north and south gable ends located at the west elevation of former Orphanage building with one larger window in each gable end at the west elevation. January 2017.
- **Zoning Permit 17-0623CA/MA;** Proposed development consisting of 11 buildings containing 739 residential units, approximately 45,000 sq. ft. of non-residential support/amenity space, approximately 40,000 sq. ft. of neighborhood commercial spaces and 1,092 parking spaces. March 2017.
- **Zoning Permit 17-0376CA;** Install new windows within new openings on western building elevation. September 2016.
- **Zoning Permit 17-0252SP;** Second sketch plan review of planned unit development with mixed commercial and residential uses, related buildings, and infrastructure. October 2016.
- **Zoning Permit 17-0010CA;** Revisions to west chapel elevation (amendment to zoning permit 16-0007CA / MA). Openings for windows restored or added. July 2016.
- **Zoning Permit 16-1487CA;** Change to top floor, add veranda on roof. Amendment to zoning permit 16-0007CA/MA. July 2016.
- **Zoning Permit 16-0622CA;** Request change of materials for existing slate roof to standing seam copper on the former St. Joseph's Orphanage. Former address 351 North Avenue. January 2016.
- **Zoning Permit 16-1183SP;** Sketch plan review of 700+ unit planned unit development with mixed commercial and residential uses, related buildings, and infrastructure.
- **Zoning Permit 16-0007CA/MA;** Approval to convert building into 63 apartments and related site improvements. Approved September 2015; amended February 2016. June 2016.

- **Zoning Permit 15-0702LL**; Lot line adjustment with 329 North Avenue. Approved December 2014. [Plat recorded 1/16/2015; Plat file 509C.]
- **Zoning Permit 14-1286CA**; Installation of CCTA bus shelter on Burlington College property. Approved June 2014.
- **Zoning Permit 12-0706SN**; replace existing non-conforming freestanding sign with new freestanding sign for Burlington College – Main Campus. Approved March, 2012.
- **Zoning Permit 12-0121CA**; Install rooftop air handler, five ac units, bike racks, and remove walls from garage. Approved August 11, 2011.
- **Zoning Permit 11-0282CU**; convert existing institutional office use and group home use to post-secondary school. No site or exterior building changes proposed. Approved November 2010.
- **Zoning Permit 09-526CA**; Demolish single car garage. Approved February 2009.
- Non-applicability of zoning permit requirements; continued use of existing group home. June 1998.
- **Zoning Permit 92-096 / COA 092-016**; Removal of existing wooden cross with installation of fiberglass statuary of St. Mary on top of Diocese building. Overall height to be 104' with exterior illumination to surround statue. Approved September 1991.
- Notice of selective landscape removal on west. No change in grade of site or drainage of runoff water. December 1991.
- **Zoning Permit 79-352**; install septic tank and seepage bed. July 1979.
- **Zoning Permit 77-03**; renovation of existing structure "St. Josephs Child Center" into office space and three apartments for Bishop and two priests. Approved January 1977.
- **Zoning Permit 77-628**; Convert St. Joseph's Child Center into office building, three apartments and three guests' rooms. Remove some windows and brick up openings. Install new windows. Erect 28'6" x 30' addition and 32' x 66' addition. December 1976.

Overview: Although the zoning district (NAC-CR) measures density by Floor Area Ratio (FAR) rather than unit count, the Development Agreement capped the number of residential units for the Cambrian Rise development at 770, which is now requested. That number will act as a reservoir from which to draw dwelling units during construction of each building; allowing for flexibility in construction and agility to respond to market demand. Inclusionary unit requirements will correspond to the overall unit count as appropriate. The mix of uses within the project has changed to eliminate the commercial bakery and post-secondary school in favor of significantly more office space.

The applicant proposes adding a new story to four buildings: M, P, Q and R. Building M has been redesigned with a larger building footprint, two levels of parking, expanded surface parking, relocated trash and bicycle storage facilities, and updated landscaping. Buildings B and G had been revised in May 2018 to include new top floors. The applicant is now seeking to make them full top floors.

A revised traffic plan has been submitted and forwarded to the Department of Public Works for review.

Applicable Regulations:

Article 3 (Applications and Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Criteria & Guidelines), Article 8 (Parking), Article 9 (Inclusionary and Replacement Housing), Article 10 (Subdivision), and Article 11 (Planned Unit Development)

Recommended motion: Continue review to respond to DPW concerns about traffic study, per the following findings:

I. Findings

Article 3: Applications and Reviews

Part 3: Impact Fees

Sec. 3.3.2, Applicability

The additional building area, and division of uses (commercial, residential, etc.) assumed in this permit application will affect overall impact fees. Impact fees due will be adjusted to reflect this additional building area. The evidenced and anticipated revision of buildings within this development will require the applicant to maintain an ongoing spread sheet of area and uses within each building to facilitate final calculations of fees. **Affirmative finding as conditioned.**

Section 3.3.6 Effect of Project Change on Impact Fees

If a proposed development is substantially modified in terms of square footage, a request for an adjustment to the impact fee may be made by filing a zoning permit application subject to the applicable filing fees. Any adjustment, if approved, is subject to the Impact Fee Administrative Regulations in effect at time of subsequent approval. Any change which increases a project size or impact shall require a new zoning permit and an accompanying adjustment to the impact fee amount.

The impact fees for all new area for each building will be calculated under the current (FY19) Impact Fee schedule. **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 days prior to occupancy of a new building or any portion thereof.

Affirmative finding as conditioned.

Part 5, Conditional Use & Major Impact Review:

Section 3.5.4: Submission Requirements

Any development subject to Major Impact Review under this Part shall also include an affidavit or certification documenting that the Pre-Application Public Neighborhood Meeting and requirements set forth by the department of Planning and Zoning.

The applicant has demonstrated compliance with this requirement. **Affirmative finding.**

Section 3.5.6 Review Criteria

(a) Conditional Use Review Standards

Not applicable.

(b) Major Impact Review Standards

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

A comprehensive stormwater management plan has been developed and previously approved for this project under ZP17-0623CA/MA. No water quality impacts to Lake Champlain are anticipated as a result of this proposal.

Air and noise pollution are expected to be minimal. No industrial uses typically associated with air or noise pollution are included in the project plans. **Affirmative finding.**

2. Have sufficient water available for its needs;

A letter of capacity for the increased number of dwelling units shall be required as a condition of approval. **Affirmative finding as conditioned.**

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

The addition of 31 new residential units in a zone specifically identified for growth should not unnecessarily burden the present or future water supply. **Affirmative finding.**

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

The overall PUD approval included adoption of a prepared EPSC and Stormwater Management plan. Reference to those plans and conditions is made. **Affirmative finding.**

5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;
An updated traffic analysis has been submitted as part of this request, and forwarded to the City Engineer for review. On September 25, 2018, DPW engineers provided a series of comments and questions about that revised report:

- How will trips for services be distributed within the city network?
- How does this memorandum fit within the approved traffic study?
- Need an explanation how new uses and trips associated with those uses will be either internal trips, or mitigated by bike/ped/transit or bypass cars.
- DPW believes the uses being proposed are NOT common in that area of Burlington and are new uses that will draw cars to this location. DPW would like to see that addressed in the trips, and how their assumptions compare to what is approved.
- DPW would like to see the approved vs proposed LOS for adjacent network intersections.

As of this date, no further information or response has been received from the applicant. **No finding possible.**

6. Not cause an unreasonable burden on the city's ability to provide educational services;
Single detached residential units are commonly the most significant per-unit dwelling type for families with school age children in Vermont. This project contains none of that housing type; it contains exclusively attached multi-family dwellings of various sizes. With 770 residential units (an increase of 31) the project can be reasonably expected to contain at least some families with school-age children. The original application estimated ~52 school-age children. This figure is based on estimates for the studio, 1-, 2-, and 3-bedroom units. ZP17-0623CA/MA provided information addressing impacts per unit type and what the anticipated unit-to-school children ratio is based on. Impact fees would be paid to help offset impacts on educational demand.
Affirmative finding as conditioned.

7. Not place an unreasonable burden on the city's ability to provide municipal services;
The Fire Department provided technical comments relative to fire safety at Technical Review for ZP17-0623CA/MA. These technical requirements will be administered through the offices of the Fire Marshal and the Building Inspector. The Fire Marshal has issued an ability to serve letter regarding the original project, and has confirmed the continuing validity of that support in a September 7, 2018 email to staff. The Fire Marshal notes that the adopted fire, life safety, and building/trades codes and ordinances in effect at the time of design will govern protection of the structures.

The Burlington Police Department issued an ability to serve letter dated January 13, 2017. The letter anticipates increased demand on police services for the overall development, but expects that the development will not adversely impact the department in the context of providing police services to the site.

As per the original approval and incorporating these changes, Impact fees will be paid to help fund necessary capital improvements necessitated by this development. **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;
Not applicable.

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 project is proposed in an area long targeted in the city's Municipal Development Plan for intensified development. The NAC-CR purpose and intent narrative articulates standards for this growth center. Insofar as the proposed development is consistent with the intent of the NAC-CR zone, it is consistent with the city's anticipated growth patterns. Improvements to public infrastructure, at the cost of the applicants, were approved under earlier permitting. **Affirmative finding.**

10. Be in substantial conformance with the city's municipal development plan;
The application demonstrates substantial conformance with the Municipal Development Plan.

The property is located within an area identified as a center for growth and development (Future Land Use Map – Centers for Growth and Development & Land Use Policies, pg. I-2).

The introduction of a variety of attached multi-family housing unit types and bedroom counts is consistent with the city policy to support the development of additional housing opportunities within identified activity centers (Land Use Plan, pg. I-2 & Housing Plan, pg. IX-1).

The project will handle essentially all of its stormwater onsite utilizing the available green spaces and sandy soils for infiltration, as originally permitted under ZP17-0623CA/MA (Natural Environment Action Plan, pg. II-12).

The development will provide inclusionary housing units commensurate with the number of residential units constructed (City Policies, pg. IX-1) as required by the Comprehensive Development Ordinance.

The project incorporates alternative energies (solar and geothermal), thereby reducing utilization of fossil fuels (City Policies, pg. VIII-1).

The project will provide ready access to GMT bus service. Carshare Vermont service is anticipated. The project includes far more than the minimum requirement for bike storage and maintenance facilities and provides easy access to the waterfront bike path (Stressing Other Modes of Travel, pg. V-12). **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;

As noted above, the proposed development is located in an area targeted for higher intensity development. The proposed housing model is multi-family or mixed use buildings. There is; however, a variety of bedroom counts and price points (including inclusionary, “work force,” and market rate units). There is also a mix of owner-occupied and rental units. Senior housing units will be provided in a building that is outside this review. The development, as previously permitted, addresses city policy to provide a variety of housing types. **Affirmative finding.**

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 will likely utilize the city’s park and recreation facilities. As part of the overall development previously approved, the 12-acre parcel that hugs the development site to the south and west was conveyed to the city for conservation and designation as an “urban wild.” Within the development, a variety of recreational features are included, such as a community pool, fitness center, garden spaces, and paths. Parks impact fees will be paid to help offset any related impact on public park needs. Per the development agreement, a \$300K credit will apply to parks impact fees due. **Affirmative finding as conditioned.**

(c) Conditions of Approval

1. Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.

The revisions to building M have included screening/landscaping at the point of garage openings to mitigate visual impacts. Improvements are incorporated to the site landscaping, see T.J. Boyle Plan, 7.6.2018. **Affirmative finding.**

2. Time limits for construction.

The zoning permit approval for the Cambrian Rise project contains a 10-year buildout and related phasing schedule. No change to the 10-year timeframe is included in this amendment request. Phasing for the proposed public road and associated public improvements has previously been approved for 4 phases (18-0791CA). **Affirmative finding.**

3. Hours of operation and/or construction to reduce the impacts on surrounding properties.

Residential use has no limitation on hours of operation. The construction hours were amended under ZP17-0853CA to allow construction Monday-Saturday, 7:00 AM to 6:00 PM and on Sunday 7:00 AM to 6:00 PM for interior construction only, under specific conditions of that permit which shall remain in effect for this project.

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; and,

Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time.

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.

To be addressed in conditions of approval.

Article 4: Zoning Maps and Districts

Sec. 4.4.2 Neighborhood Mixed Use Districts

(a) Purpose

(4) Neighborhood Activity Center – Cambrian Rise (NAC-CR)

The Neighborhood Activity Center – Cambrian Rise District is intended to create a new center for mixed use development that allows for a range of housing types and tenures, and to accommodate a diverse range of complimentary general office, institutional and neighborhood oriented small-scale retail and service uses. Development should be compact, pedestrian-oriented and enhance the community with creative design, durable materials, and quality construction. Buildings should be oriented towards the streets. Human scale elements should help to define new streets as civic spaces. Parking should be located as to be screened from view from public streets and community spaces.

Changes proposed to the originally permitted project do not alter the compact site design and street layout, which provide the framework for the new mixed use neighborhood. Sidewalks,

shared use paths, hardscaping, and street-level treatments of the proposed buildings maintain a pedestrian-friendly environment. The redesign of building M (formerly M & N), and new building volume added to B/G, M, P Q and R will add new FAR. All buildings will remain as originally oriented to the street.

The new 31 units (total 770) will be part of a unit pool to be dispersed building by building.

Affirmative finding.

b) Dimensional Standards and Density

Table 4.4.2-1 Dimensional Standards and Density

NAC-CR	Max Intensity (FAR) 2.0	Max Lot Coverage 60%	Setbacks			Building Height Min 22' Max 65' (Allowable bonus up to 75' for IZ)
			Front Min 0 Max 20'	Side 10' only applicable to periphery of NAC-CR and not to individual parcels.	Rear 20' only applicable to periphery of NAC-CR and not to individual parcels.	
Proposal	1.13	63.6*	No change	Meets minimum setback on south	Meets minimum rear setback on west.	Building M: 198.5 ground average + 75' = 273.5 proposed Building P: Ground average: 186 + 75 = 261; 255 proposed. Building Q/R: Frontage midpoint 189' + 75' = 264'

*Additional coverage allowable per **Table. 9.1.12-2, Lot Coverage Allowance** table for IZ units. Maximum additional coverage in NAC-CR is 72%.

Affirmative finding as conditioned.

c) Permitted and Conditional Uses

No new uses are specifically identified. A couple of previously proposed uses (commercial bakery and college) have been deleted as noted previously. The applicant will be required to provide a spreadsheet of proposed uses and breakdown of area for final computation of Impact Fees. **Affirmative finding as conditioned.**

(d) District Specific Regulations

1. Ground Floor Residential Uses Restricted

Not applicable in NAC-CR.

2. Exceptions to Maximum Lot Coverage in NAC District

Not applicable in NAC-CR.

3. Development Bonuses/Additional Allowances

The following exceptions to maximum allowable base building height and FAR in Table 4.4.2-1 above may be approved in any combination subject to the maximum limits set forth in Table 4.4.2-2 below at the discretion of the DRB. The additional FAR allowed shall correspond to the proportion of the additional building height granted to the maximum available.

A. Inclusionary Housing (see table, below and Article 9.)

B. Senior Housing

Not applicable in NAC-CR.

C. Maximum Bonus

In no case shall any development bonuses or allowances granted, either individually or in combination, enable a building to exceed the maximum FAR and maximum building height permitted in any district as defined below:

Table 4.4.2-2 Maximum FAR and Building Heights with Bonuses

NAC-Cambrian Rise	Maximum FAR 2.5	Maximum Height 75'
Proposal:	1.13 FAR	See Table 4.4.2-1, above.

Affirmative finding as conditioned.

Article 5: Citywide General Regulations

Section 5.2.1 Existing Small Lots.

Not applicable.

Section 5.2.2 Required Frontage or Access

All buildings front on streets to be accepted by the City; soon to be identified as Cambrian Way.

Affirmative finding.

Section 5.2.3 Lot Coverage Requirements

See Table 4.4.2-1, above.

Section 5.2.4 Buildable Area Calculation

Not applicable in the NAC-CR zone.

Section 5.2.5 Setbacks

See Table 4.4.2-1, above.

Section 5.2.6 Building Height Limits

See Table 4.4.2-1 and 4.4.2-2, above.

Section 5.2.7 Density and Intensity of Development Calculations

See Table 4.4.2-1, above.

Section 5.5.1 Nuisance Regulations

Nothing in the proposal appears to constitute a nuisance under this criterion. **Affirmative finding.**

Section 5.5.2 Outdoor Lighting

See Sec. 6.2.2 (o).

Section 5.5.3 Stormwater and Erosion Control

A comprehensive stormwater management plan and Erosion Prevention and Sediment Control Plan have been approved for the overall project.

Final review and approval by the city's stormwater program will be required if redesign of building M has impacted or altered those plans in any way. **Affirmative finding as conditioned.**

Article 6: Development Review Standards:

Part 1: Land Division Design Standards

Not applicable.

Part 2: Site Plan Design Standards

Sec. 6.2.2 Review Standards

(a) Protection of Important Natural Features

The redesign of Building M has minimal change to the site and no effect on nearby natural features. **Affirmative finding.**

(b) Topographical Alterations

The proposed site revisions result in no identifiable changes to the grading plan. **Affirmative finding.**

(c) Protection of Important Public Views

Public views from and through this property are not affected by the site or building changes. **Affirmative finding.**

(d) Protection of Important Cultural Resources

No historic resources are impacted by this proposal. Not applicable.

(e) Supporting the Use of Renewable Energy Resources

The proposed amendment makes no changes affecting this criterion. **Affirmative finding.**

(f) Brownfield Sites:

Not applicable.

(g) Provide for nature's events

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

There are no noted changes to the approved stormwater management plan. If redesign to Building M spurs additional review by the Stormwater program, their approval will be a condition of release.

Snow management as previously articulated remains unchanged. **Affirmative finding as conditioned.**

(h) Building Location and Orientation

Building location and orientation remain unchanged. Building M continues to have a prominent and commanding presence on South Road (soon to be Cambrian Rise). **Affirmative finding.**

(i) *Vehicular Access*

Curb cuts shall be arranged and limited in number to reduce congestion and improve traffic safety. A secondary access point from side roads is encouraged where possible to improve traffic flow and safety along major streets. The width and radius of curb cuts should be kept to the minimum width necessary, and sight triangles and sufficient turnarounds for vehicles shall be provided to reduce the potential for accidents at point of egress.

Vehicular access to the site remains essentially unchanged. The redesign of building M has afforded 2 parking decks; one accessible via South Road and the east of the building; the second from South Road with a westerly entrance. See T.J. Boyle Plan, Building M Site Plan Update, and Plan L-EX3. **Affirmative finding.**

(j) *Pedestrian Access*

Pedestrians shall be provided one or more direct and unobstructed paths between a public sidewalk and the primary building entrance. Well defined pedestrian routes shall be provided through parking areas to primary building access points and be designed to provide a physical separation between vehicles and pedestrians in a manner that minimizes conflicts and improves safety. Where sidewalks and driveways meet, the sidewalk shall be clearly marked by differentiated ground materials and/or pavement markings.

Pedestrian access will change slightly with the redesigned building entrance to Building M (on the north, and a rear (east) residential entry.) Pedestrian access to buildings P, Q and R will remain as originally approved under ZP17-0623CA/MA. **Affirmative finding.**

(k) *Accessibility for the Handicapped*

*Special attention shall be given to the location and integration of accessible routes, parking spaces, and ramps for the disabled. Special attention shall also be given to identifying accessible access points between buildings and parking areas, public streets and sidewalks. The federal Americans with Disabilities Act Accessibility Guidelines (ADAAG) shall be used as a guide in determining the adequacy of the proposed development in addressing the needs of the disabled. No changes to handicap accessibility are defined in the amended plans. Full compliance with ADA requirements will be under the jurisdiction of the building inspector. **Affirmative finding as conditioned.***

(l) *Parking and Circulation*

To the extent possible, parking should be placed at the side or rear of the lot and screened from view from surrounding properties and adjacent public rights of ways. Any off-street parking occupying street level frontage in a Downtown Mixed Use District shall be setback from the edge of the front property line in order to provide space for active pedestrian-oriented uses. Where street-level parking is provided within an existing structure, the cars shall be screened from the sidewalk and the area shall be activated with landscaping, public art, or other design amenities. Parking areas of more than 20 spaces should be broken into smaller areas separated by landscaping.

The redesign of Building M provides 2 levels of structured parking, with newly ordered surface parking east of the building. Additional parking spaces will be provided (162 structured parking, instead of 79; surface parking 35 instead of 26.) See associated information in Article 8 for total parking count for Cambrian Rise.

Parking shall be laid out to provide ease in maneuvering of vehicles and so that vehicles do not have to back out onto city streets. Dimensions of spaces shall at a minimum meet the requirements as provided in Article 8. The perimeter of all parking areas shall be designed with anchored curb stops, landscaping, or other such physical barriers to prevent vehicles from encroaching into adjacent green spaces.

Parking spaces and related circulation aisles remain dimensionally unchanged. Total parking count for the entire development is proposed to be 1,129 (1,237 including on-street) spaces; compliant for the uses and residential density identified in this application. See *Breakdown of Parking* submission information.

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

The requirement for 1 shade tree for every 5 parking spaces is met across the development. Shade trees depicted with this amendment remain compliant. **Affirmative finding.**

(m) Landscaping, Fences, and Retaining Walls

Except for some minor adjustments to the redesigned building M site, the overall landscaping plan remains essentially unchanged. Raised garden beds are proposed on the westerly boundary, with vegetated screening for the parking area on the west elevation. **Affirmative finding.**

(n) Public Plazas and Open Space

Where public open space is provided as an amenity to the site plan, it should be sited on the parcel to maximize solar exposure, with landscaping and hardscape (including fountains, sitting walls, public art, and street furniture) to encourage its use by the public in all seasons. Public plazas should be visually and physically accessible from public rights-of-ways and building entrances where appropriate and shall be designed to maximize accessibility for all individuals, including the disabled and encourage social interaction.

Public plazas and open space within the overall development remain. This amendment provides a 6th floor common roof deck on building M on the northwest corner for all residents of the building to enjoy. Additionally, an outdoor patio is located west of the building, and the rear/residential entry provides a comfortable patio-type area for drop-offs. **Affirmative finding.**

(o) Outdoor Lighting

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

No additional information or changes have been submitted relative to outdoor lighting. If any changes are proposed, fixture and lumens information shall be provided to staff for review and approval. Overall lighting as approved in ZP17-0623CA/MA remains in effect.

Affirmative finding as conditioned.

(p) Integrate infrastructure into the design

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

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

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

Waste hauler access has been adjusted on building M to the westerly Parking2 access point, within a covered structure. No other changes are noted. **Affirmative finding.**

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

(a) Relate development to its environment

Building M, although re-designed, continues to strengthen the street wall whilst wrapping around toward the west/lake. Within the context of the neighborhood, this now taller building with those additions proposed for P, R and Q will be in step with the neighborhood. The revisions to Buildings G and B are modest and amount to increasing the volume of the top stories approved in a prior amendment. The upper story setback will largely be eliminated; however, the upper floor of these two buildings will continue to read as separate and distinct from the lower floors.

Affirmative finding.

(b) Protection of Important Architectural Resources

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves buildings listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8. The introduction of new buildings to a historic district listed on a state or national register of historic places shall make every effort to be compatible with nearby historic buildings.

Not applicable.

(c) Protection of Important Public Views

See Section 6.2.2. (c).

(d) Provide an active and inviting street edge:

The proposed revisions to building M increase the stature and presence of the important place it occupies. The street level glazing of Building G will be improved with the introduction of shopfront windows. The street presence of buildings P, Q and R remains largely unchanged; the new floors an almost undetectable expansion of the existing designs. **Affirmative finding.**

(e) Quality of materials

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

The revised Building M will incorporate storefront glazing on the northwest street front, with wood grain non-combustible siding at demising walls and dark masonry. Glass railings are proposed for terraces, and fiberglass windows and doors.

Buildings P, Q and R will duplicate materials already approved on the upper floors. The materials palette for Buildings B and G remains largely unchanged. **Affirmative finding.**

(f) Reduce energy utilization

The buildings must 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. Solar panels are proposed for the roof of Building M. **Affirmative finding as conditioned)**

(g) Make advertising features complementary to the site

No exterior signage is included in this application. Any such signage will require separate permitting. **Affirmative finding as conditioned.**

(h) Integrate infrastructure into the building design

See Section 6.2.2 (p) above.

(i) Make spaces secure and safe

All appropriate means of ingress and egress, and code requirements for building and life safety as defined by the building inspector and fire marshal must be observed. For multi-unit buildings, resident intercom systems are recommended.

Affirmative finding as conditioned.

Article 8: Parking

Sec. 8.1.8, Minimum Off-Street Parking Requirements

The application proposes an increase in the overall residential unit count from 739 (approved) to the maximum of 770.

The proposed development is located in the Shared Use Parking District. Within this district, the following minimum parking standards apply:

- Multi-family attached dwellings – 1 space per unit

- Restaurant – 3 spaces per 1,000 sf
- General office – 2 spaces per 1,000 sf (incorrect calculation in applicant table)
- General retail (small < 4,000 sf) – 2 spaces per 1,000 sf
- Large daycare - 1 space per every 2 employees + 1 per every 5 children
- Hotel – 0.75 space per room

Proposed parking is adequate; a minimum of **1,085** parking spaces is required. A total of 1,129 off-street parking spaces is proposed (including garage and surface parking). The proposed parking exceeds the minimum requirements for the combination of 770 residential units (770 spaces) and non-residential uses (359):

- Multi-family attached dwellings – 770 required
- Restaurant is 3,000 sf – 9 required
- General office is 117,700 sf – 235 required
- General retail (5,650 sf total in small < 4,000 sf units) – 11 required
- Large daycare – 22 required
- Hotel – (.75 x 50 rooms) 38 required

The revised parking table indicates compliance with the minimums noted above but does not parse out exactly how many spaces are allocated to each individual use (i.e. how the excess parking spaces are allocated). **Affirmative finding.**

Sec. 8.2.5, Bicycle Parking Requirements

As with vehicular parking, bicycle parking requirements are tied to use and, in some cases, the size thereof. A total of 906 bike parking spaces are now proposed (624 indoor/covered and 282 outdoor/rack spaces). The applicants' bike parking table shows building, use, requirements (long and short term), and total spaces provided. A total of 192 long term bike parking spaces is required. A total of 93 short term bike parking spaces is required. The development will be providing 906 overall. Long term spaces will be enclosed within the buildings onsite. Short term spaces will be provided at racks throughout the development. **Affirmative finding.**

Article 9: Inclusionary and Replacement Housing

With the increase in dwelling units comes an increase in the number of required inclusionary housing units. Per Table 9.1.8-1, *Inclusionary Zoning Percentages*, 25% of the total unit count must be inclusionary (25% of 770 is 193 dwelling units {up from 185 in the original project}) in the NAC-CR zone. As originally approved, inclusionary units are to include a mix of rentals and condo units. Written approval of the amended inclusionary housing proposal by the manager of the city's Housing Trust Fund is required. **Affirmative finding as conditioned.**

Article 11: Planned Development

Sec. 11.1.5 Approval Requirements.

The following requirements shall be met for the DRB to approve a planned unit development:

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

There is no Minimum Project Size for the NAC-CR district. **Affirmative finding.**

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

There is no change to the setbacks of the originally approved project.

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

(d) The project shall meet the requirements of Article 10 for subdivision review where applicable;

The interior lots have already been subdivided. Not applicable.

(e) Density, frontage, and lot coverage requirements of the underlying zoning district have been met as calculated across the entire project;

See Table 4.4.2-1, above.

(f) All other requirements of the underlying zoning district have been met as calculated across the entire project;

Reference is made to the original PUD approval under ZP17-0623CA/MA.

(g) Open space or common land shall be assured and maintained in accordance with the conditions as prescribed by the DRB;

Reference is made to the original PUD approval under ZP17-0623CA/MA as conditioned.

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

The overall build-out is subject to previously approved phasing schedule(s) for both the overall development and public infrastructure; both of which remain in effect.

(i) The intent as defined in Sec. 11.1.1 is met in a way not detrimental to the city's interests;

Reference is made to the original PUD approval under ZP17-0623CA/MA.

and,

(j) The proposed development shall be consistent with the municipal development plan.

See Sec. 3.5.6 (b) 10.

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

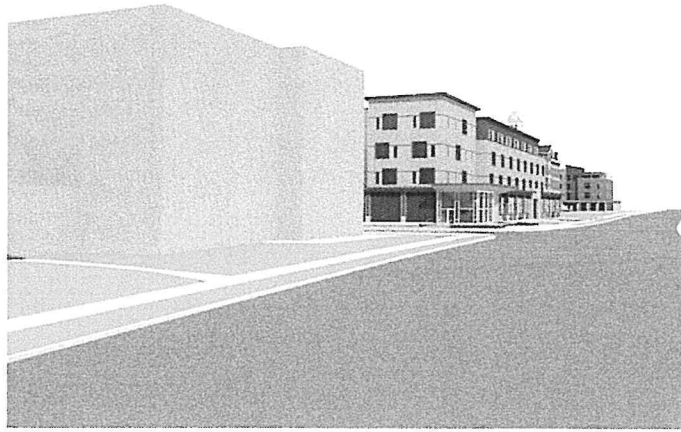
Affirmative finding.

II. Recommended Conditions of Approval, if considered:

1. All conditions of ZP17-0623CA/MA and as subsequently amended not expressly altered herein or by permits issued subsequent to that approval shall remain in effect.
2. **Prior to release of this amended zoning permit**, written approval of the amended inclusionary housing proposal by the manager of the city's Housing Trust Fund is required.
3. Any conditions relative to the revised traffic study that are forwarded from the Department of Public Works shall be incorporated into this decision.

4. Construction hours, as amended under ZP17-0853CA are Monday-Saturday, 7:00 AM to 6:00 PM and on Sunday 7:00 AM to 6:00 PM for interior construction only. As conditioned in that permit, the applicant, either directly or through CEDO as liaison, shall communicate with residential neighbors across North Avenue on construction activities likely to create disruptive noise, and shall provide advance notice at least a week before any substantial earth moving, site compaction and blasting, including the likely dates and times.
5. Impact fees based on the net new building area shall be paid at **least 7 days prior to issuance of a certificate of occupancy**. The impact fees for all new area for each building will be calculated under the current (FY19) Impact Fee schedule.
6. The lighting plan and photometric approved under ZP17-0623CA/MA remains in effect. If changes are proposed to the original lighting information, fixture information, location, and lumens shall be provided to staff for review and approval.
7. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state as required. It is the applicant's obligation to amend State Wastewater and Act 250 permits to reflect changes within this review.
8. All exterior signage is subject to separate zoning approval.
9. If new uses are identified or new residential units requested, parking requirements shall be recalculated to reflect said changes.
10. If the redesign of building M has altered any of the EPSC or Stormwater Management plans previously approved under ZP17-0623CA/MA, final review and approval by the Stormwater program will be required.
11. Standard Conditions 1-15.

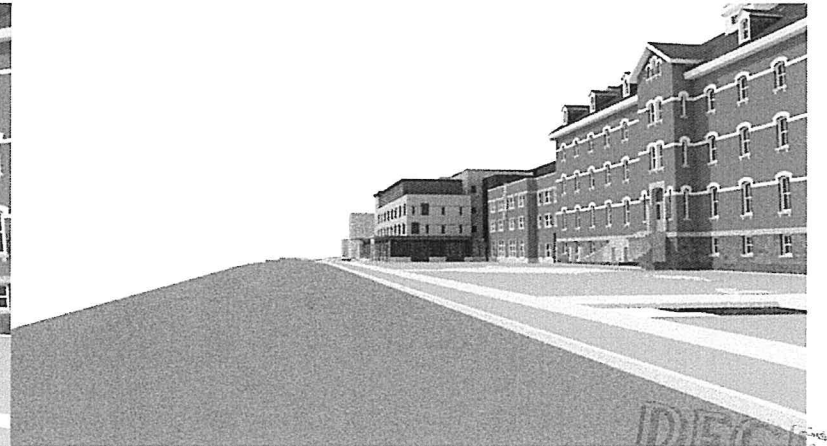
NOTE: These are staff comments only. The Development Review Board, who may approve, table, modify, or deny projects, makes decisions.



VIEW ALONG NORTH AVE FROM SOUTH



VIEW ALONG NORTH AVE FROM NORTH



VIEW FROM SOUTH WEST



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BURLINGTON, VERMONT

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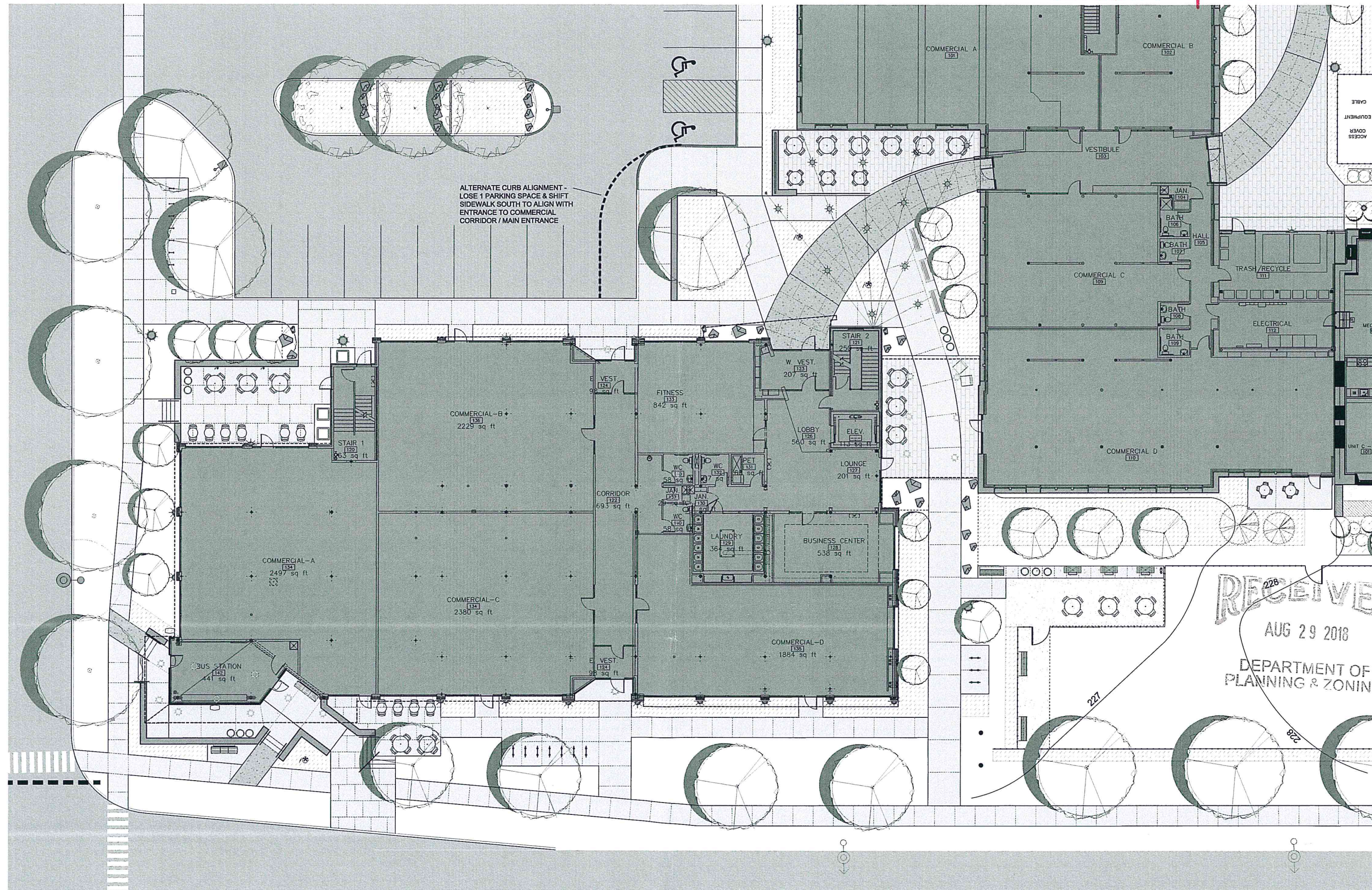
ZONING AMENDMENT

**Duncan
Wisniewski**
ARCHITECTURE
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T: 802.864.6693

DATE: 08.22.18
DRAWN: ABC

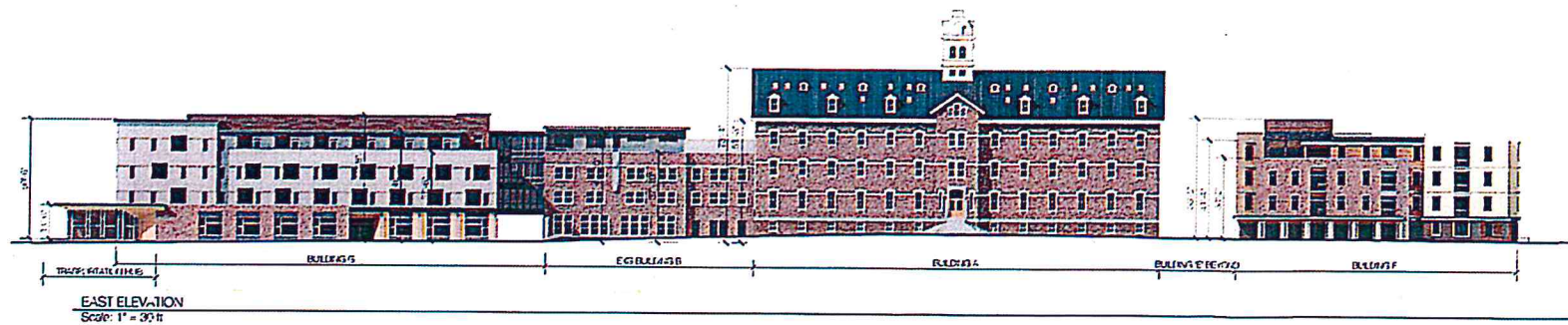
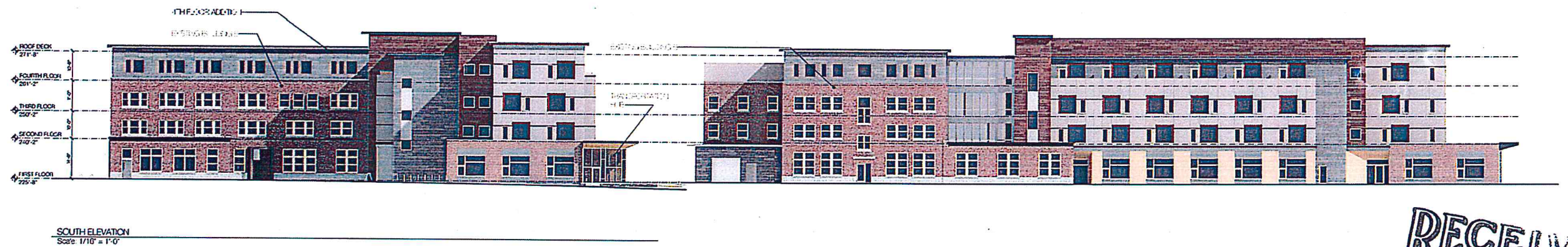
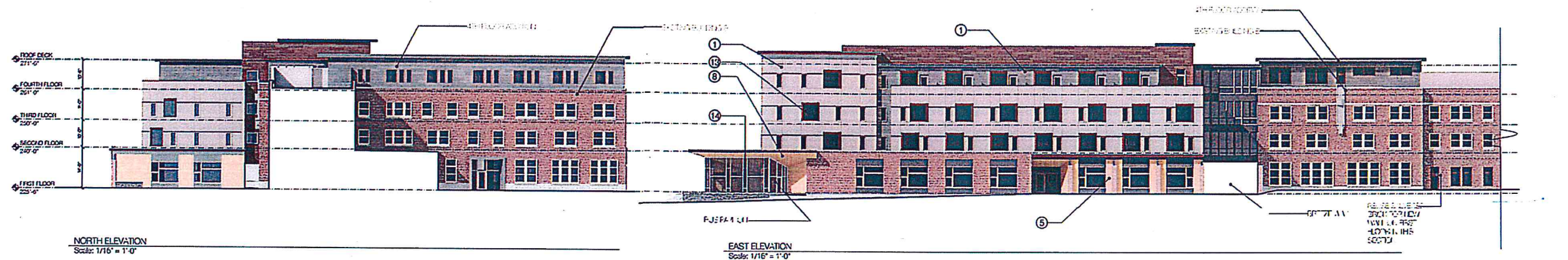
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Prior Buildings B+G



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ELEVATION NOTES:	
① REFLECTIVE TINT	⑩ 5/8" DIA 1/2" DEPT LIFTN ROOF
② REFLECTIVE TINT	⑪ COMPOSITE RM
③ CORRUGATED METAL ROOF	⑫ ALUMINUM
④ POLYURETHANE INSULATION	⑬ REFLECTIVE TINT
⑤ WOOD SINGLES	⑭ STRUCTURAL FRAMING SYSTEM
⑥ WOOD SINGLES	⑮ ARCTIC PANEL
⑦ EXPOSED CONCRETE WALL	⑯ SCREENING
⑧ BRICK MASONRY VENEER	⑰
⑨ STONE MASONRY VENEER	

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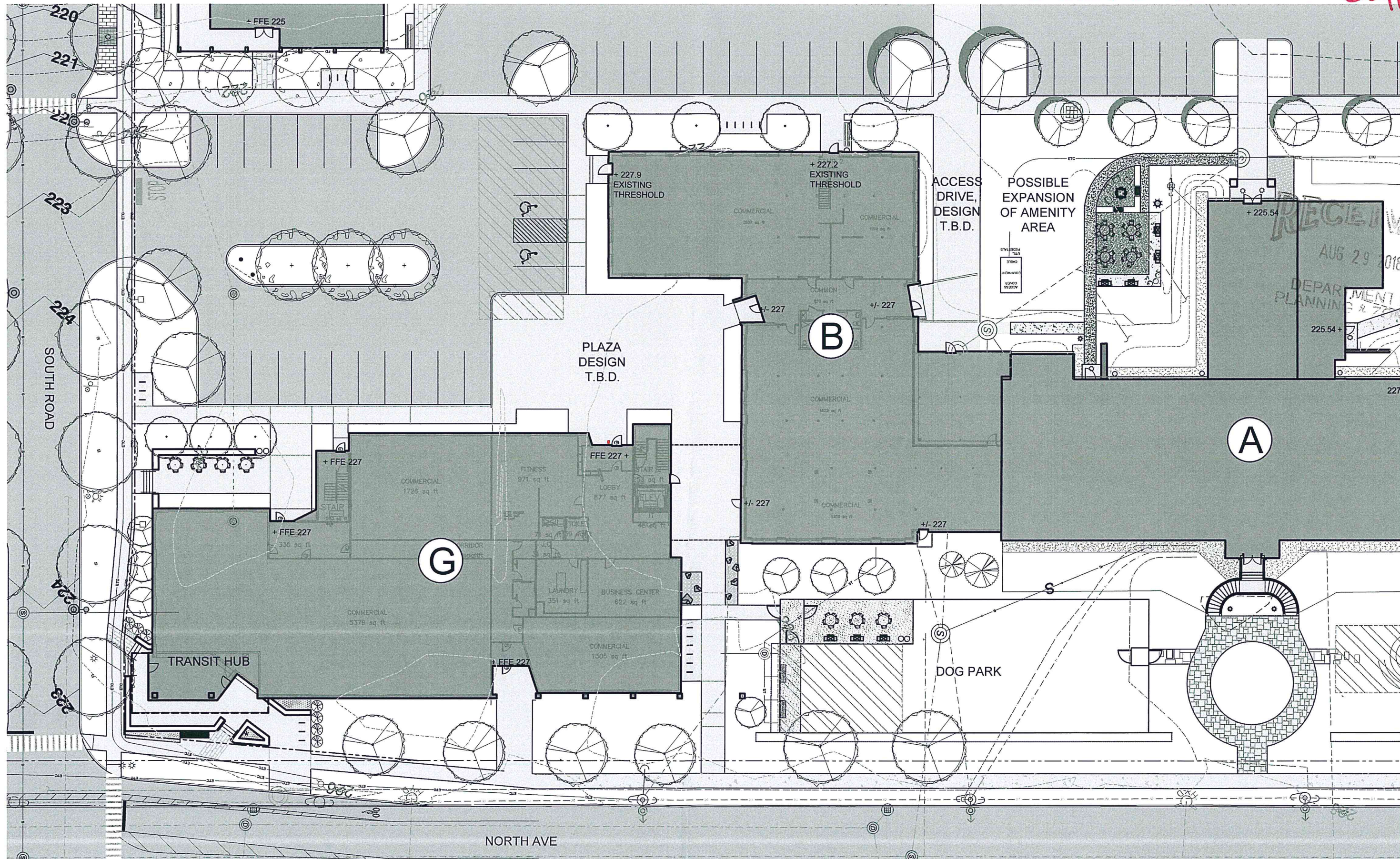
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SCHEMATIC DESIGN

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DATE: 03.12.18
DRAWN: ABC
BG-2

Submitted for 5.1.18 DRB Cap



T. J. Boyle Associates LLC

landscape architects • planning consultants

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www.tjboyle.com



EB / MJB
team

03-13-2018
date

1" = 30'

Cambrian Rise

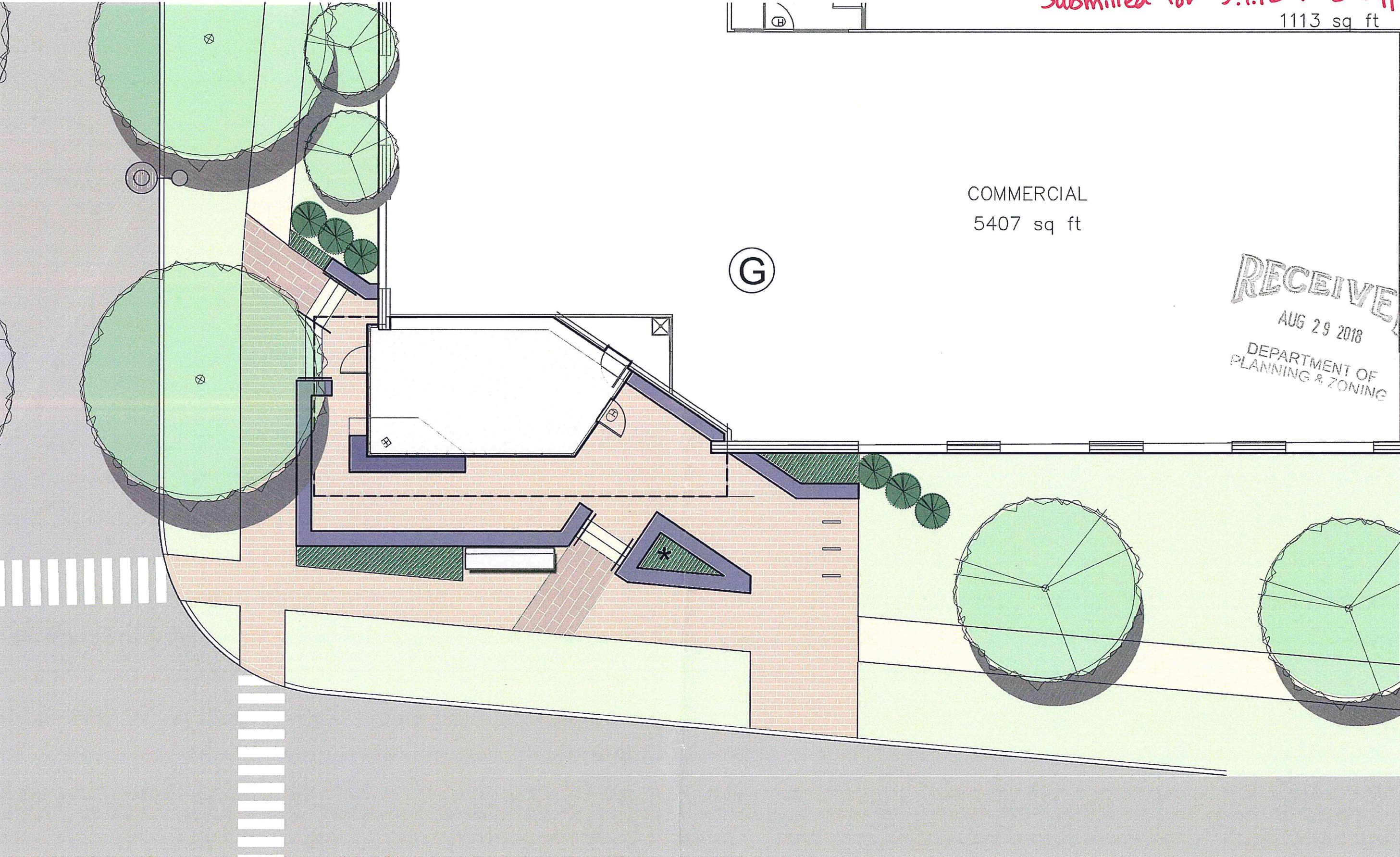
Draft B&G Site plan

Submitted for 5.1.18 DRB App
1113 sq ft

COMMERCIAL
5407 sq ft

G

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EB / MJB 03-01-2018

team

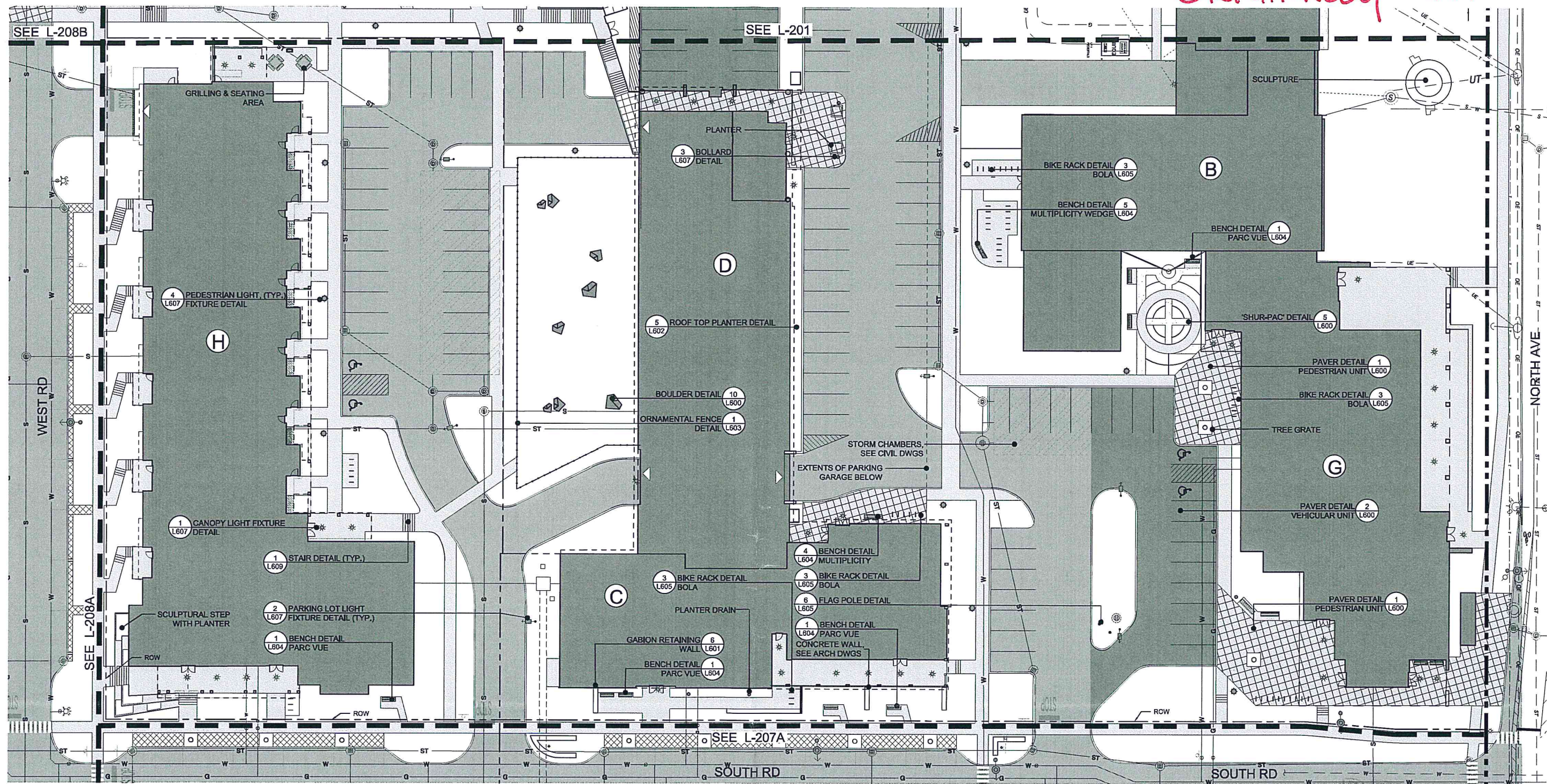
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1" = 10'

Cambrian Rise

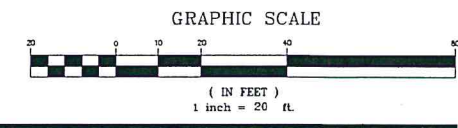
Transportation Hub Design Study

ORIGINALLY APPROVE



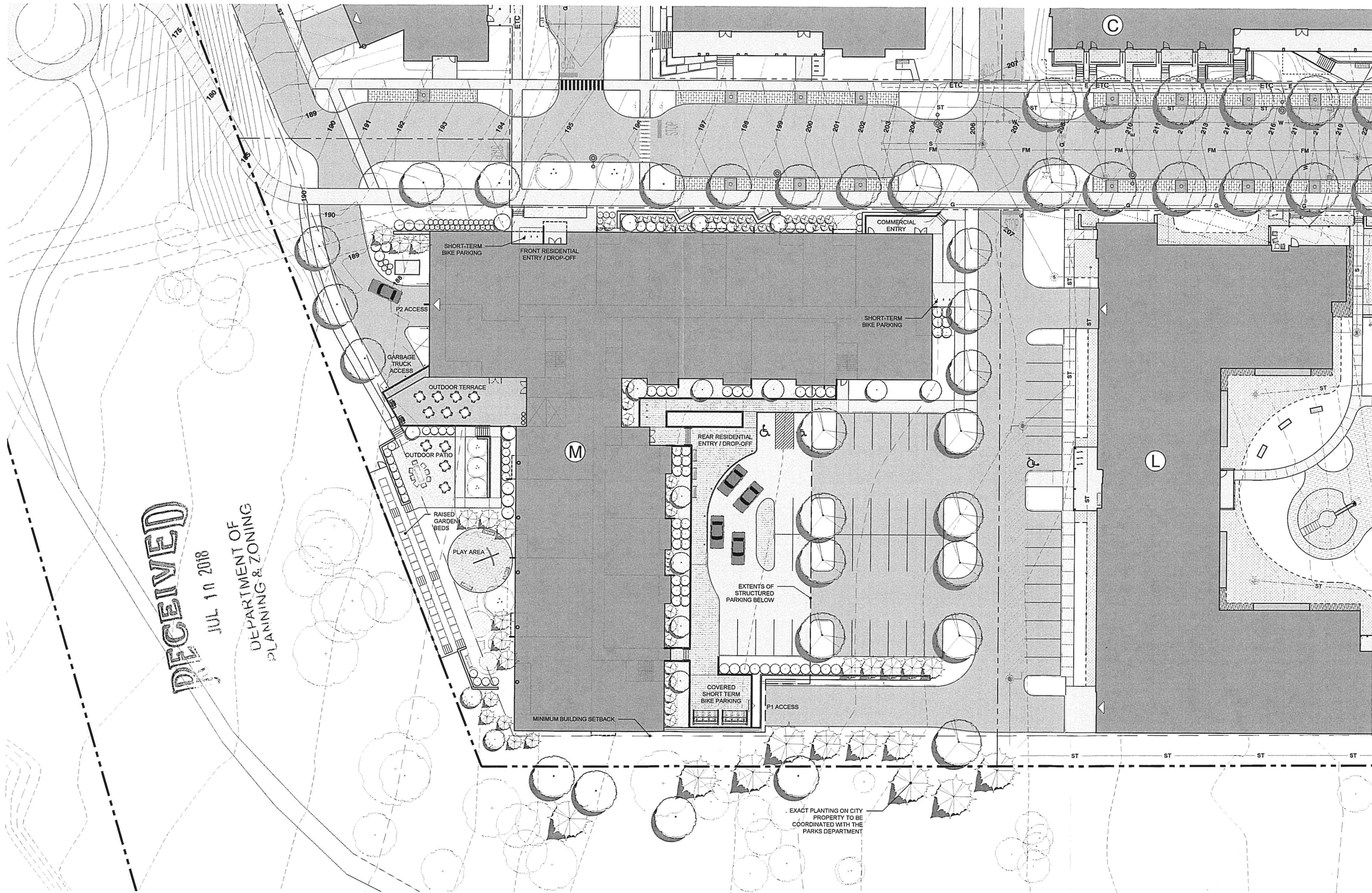
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SUBMITTED FOR PERMITTING 1/04/2017		date	Owner: BC Community Housing	landscape architects planning consultants	MJB design by TKD	TKD / EB / JS 01/04/2017 1" = 20'	T. J. Boyle Associates, LLC CAMBRIAN RISE HARDSCAPE PLAN - BGCH	L-202
				301 college street burlington vermont 05401 802 658 3555				

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JUL 10 2018

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SUBMITTED FOR
PERMIT APPROVAL

revisions	date	revisions	date

T. J. Boyle Associates, LLC

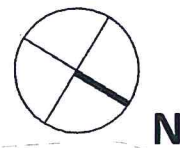
landscape architects • planning consultants



EB / MJB
team date

2018-07-06

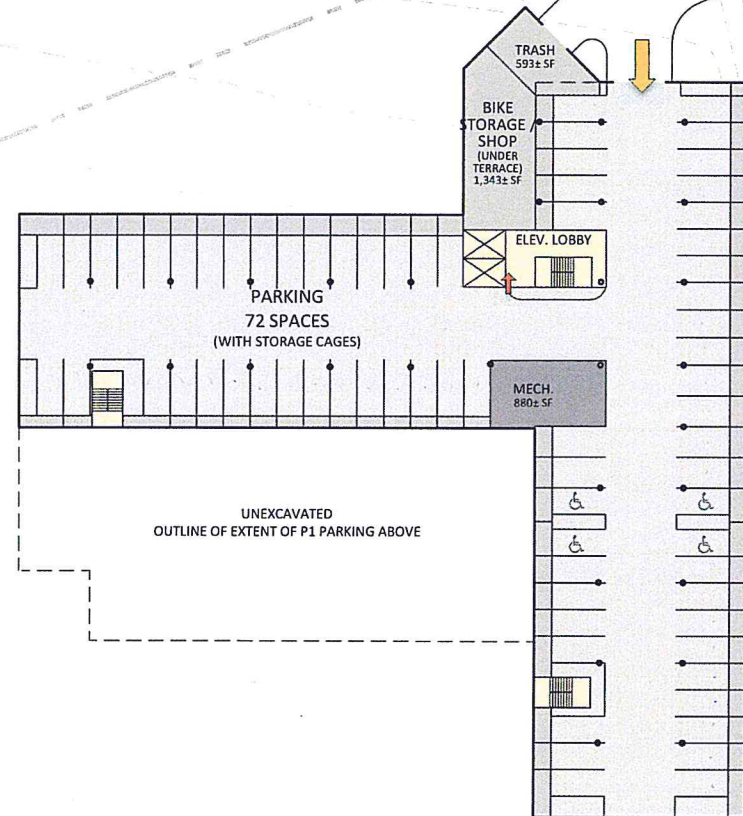
Cambrian Rise



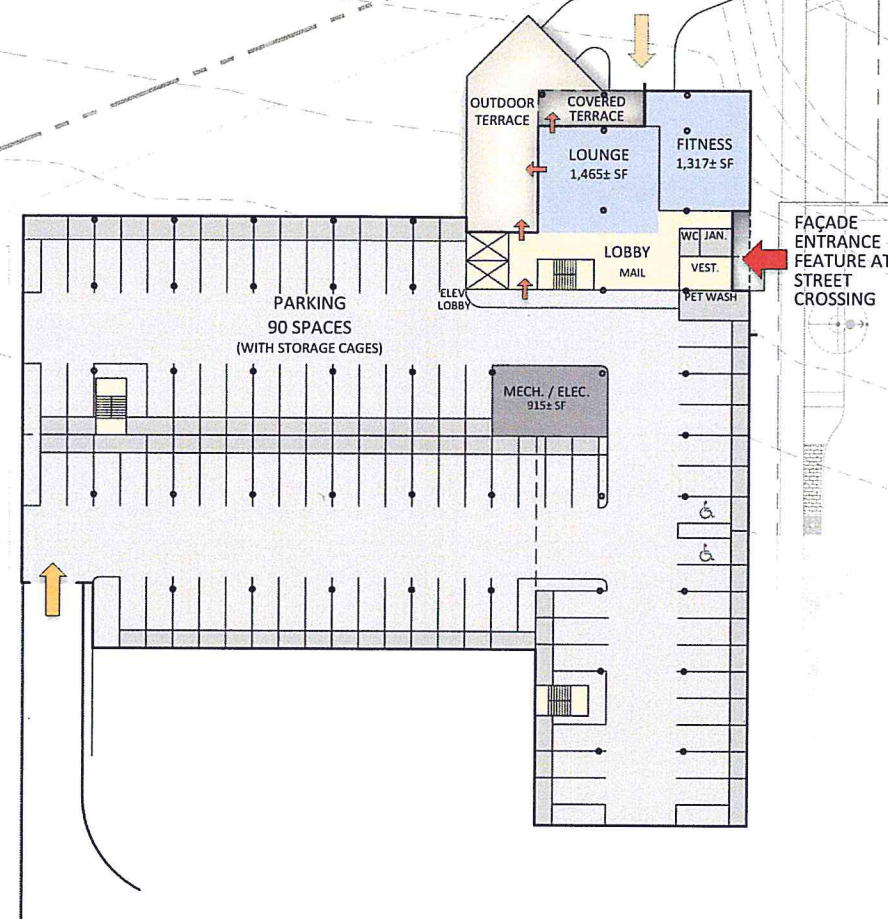
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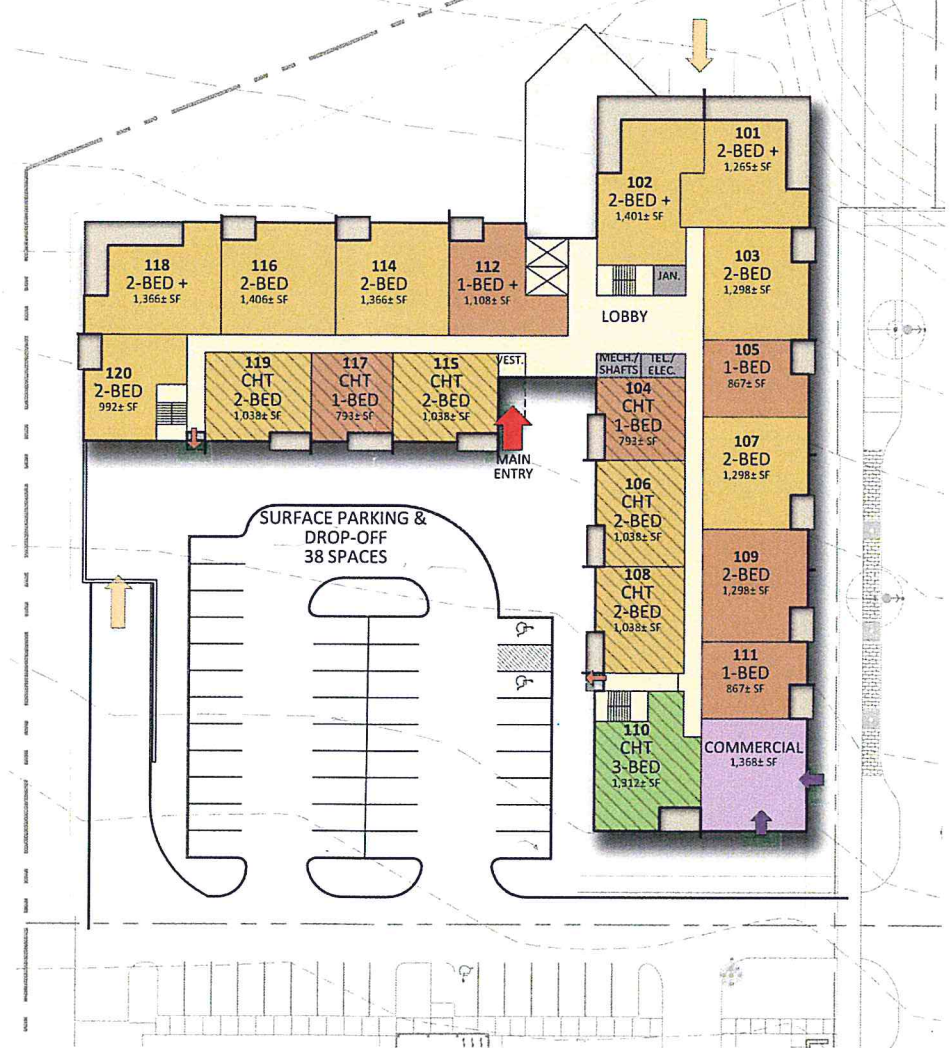
OPTION 3F2



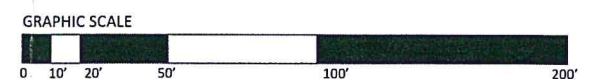
P2 PARKING | LEVEL 186'-0"



P1 PARKING | LEVEL 196'-6"



1ST FLOOR MAIN ENTRANCE | LEVEL 208'-2"



Cambrian Rise Building M | Burlington, VT
OPTION 3F2 | Conceptual Plans scale: 1" = 60'-0"

youkel [architecture + development]

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t: 802-864 9696 www.youkel.com

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*unit area only
22890*

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Cambrian Rise Building M I Burlington, VT
East Elevation (South Road) SCALE: 1" = 20'-0"

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1

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West Elevation SCALE: 1" = 20'-0"

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East Elevation SCALE: 1" = 20'-0"

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South Elevation SCALE: 1" = 20'-0"

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LINCOLN BROWN ILLUSTRATION

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LINCOLN BROWN ILLUSTRATION

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★ See Revised of 9/4/18
To see PI parking access



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LINCOLN BROWN ILLUSTRATION

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LINCOLN BROWN

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at height of 253.0'
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AS APPROVED
at height of 253.0'

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PROPOSED

at height of 255.0'
max height allowed: 2

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AS APPROVED



ELEVATION NOTES:	
① FBER CEMENT PANEL	⑩ STANDING SEAM METAL ROOF
② FBER CEMENT LAP SDNG	⑪ COMPOSITE TRIM
③ CORRUGATED METAL SDNG	⑫ ALUMINUM TRIM
④ BOARD AND BATTEN SDNG	⑬ FBERGLASS WINDOW
⑤ WOOD SDNG	⑭ STOREFRONT FRAMING SYSTEM
⑥ WOOD SHINGLE SDNG	⑮ ACCENT PANEL
⑦ EXPOSED CONCRETE WALL	⑯ SCREENING
⑧ BRICK MASONRY VENEER	
⑨ STONE MASONRY VENEER	

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PERMIT SET

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Duncan
Wisniewski
ARCHITECTURE
255 SOUTH CHAMPLAIN STREET
BURLINGTON, VERMONT 05401
T: 802.864.6693

REVISED: 01.04.17
DATE: 12.22.2016
DRAWN: ABC/SJB

OP-2

AS APPROVED
at 243.0'
maximum: 261'

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PROPOSED

at height
255.0'
max. allowed
261.0'



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AS APPROVED
at height of 243.0'

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PROPOSED

At height of 264.0
Max. height allowed

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AS APPROVED

at height of 249.5'
max. height allowed: 264'

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G, R

AS APPROVED

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PROPOSED

at height of 264
max. height allowed

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PROPOSED

RECEIVED
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PROPOSED

at height of 264.0
max height allowed

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PROPOSED

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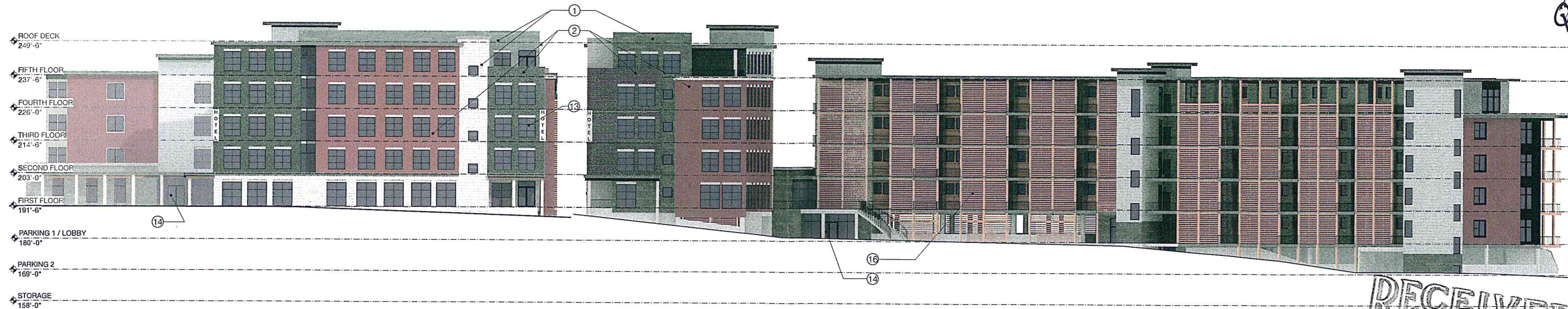
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AS APPROVED

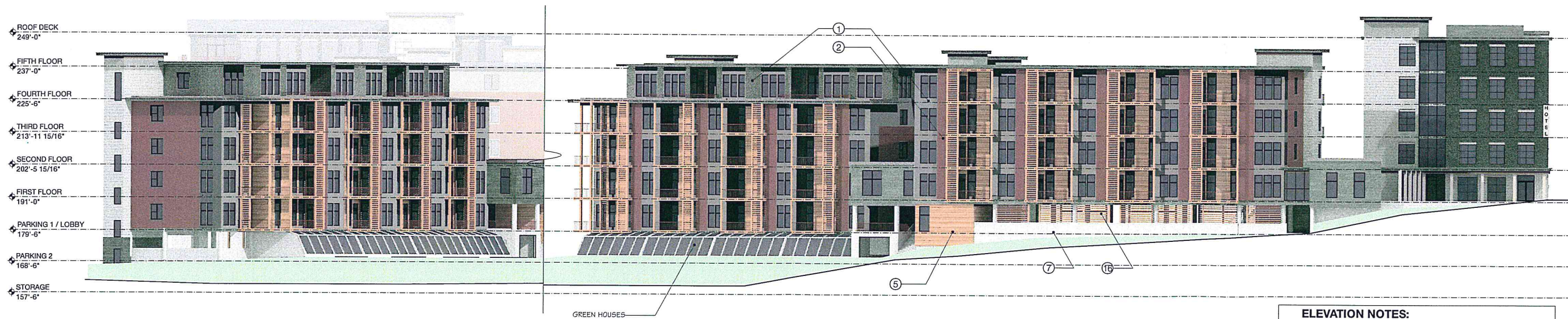


EAST ELEVATION
Scale: 1/16" = 1'-0"

NORTH ELEVATION
Scale: 1/16" = 1'-0"

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WEST ELEVATION
Scale: 1/16" = 1'-0"

SOUTH ELEVATION
Scale: 1/16" = 1'-0"

ELEVATION NOTES:

- | | |
|-------------------------|-----------------------------|
| ① FBER CEMENT PANEL | ⑩ STANDING SEAM METAL ROOF |
| ② FBER CEMENT LAP SDNG | ⑪ COMPOSITE TRM |
| ③ CORRUGATED METAL SDNG | ⑫ ALUMINUM TRM |
| ④ BOARD AND BATTEN SDNG | ⑬ FIBERGLASS WINDOW |
| ⑤ WOOD SDNG | ⑭ STOREFRONT FRAMING SYSTEM |
| ⑥ WOOD SHINGLE SDNG | ⑮ ACCENT PANEL |
| ⑦ EXPOSED CONCRETE WALL | ⑯ SCREENING |
| ⑧ BRICK MASONRY VENEER | ⑰ METAL PANEL SDNG |
| ⑨ STONE MASONRY VENEER | |

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BURLINGTON, VERMONT

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Duncan
Wisniewski
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REVISED: 01.12.17
DATE: 12.30.16
DRAWN: ABC

QR-2

Revised 8/19/18

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LAKEVIEW CEMETERY

BLDG I, NORTH RD
SETBACK DISTANCE: 5.4'
FRONTAGE MID-POINT: 197.0'
BLDG MAX ALLOWED: 262.0'
w/ IZ BONUS: 272.0'
BLDG PROPOSED: 264.5'

BLDG I, WEST RD
SETBACK DISTANCE: 4.5'
FRONTAGE MID-POINT: 190.5'
BLDG MAX ALLOWED: 255.5'
w/ IZ BONUS: 265.5'
BLDG PROPOSED: 264.5'

BLDG Q&R, WEST RD
SETBACK DISTANCE: 6.6'
FRONTAGE MID-POINT: 189.0'
BLDG MAX ALLOWED: 254.0'
w/ IZ BONUS: 264.0'
BLDG PROPOSED: 264.0'

BLDG E & F, NORTH ROAD
SETBACK DISTANCE: 10.0'
FRONTAGE MIDPOINT: 217.0'
BLDG MAX ALLOWED: 282.0'
w/ IZ BONUS: 292.0'
BLDG PROPOSED: 269.5'

BLDG E & F, NORTH AVE
SETBACK DISTANCE: 30.0'
GROUND AVG: 216.0'
BLDG MAX ALLOWED: 281.0'
w/ IZ BONUS: 291.0'
BLDG PROPOSED: 269.5'

BLDG A, NORTH AVE
EXISTING SETBACK: 74.65'
BLDG EXISTING: 298.0'

BLDG B, NORTH AVE
SETBACK (EX. LOT LINE): 20.0'
GROUND AVG: 226.0'
BLDG MAX ALLOWED: 291.0'
w/ IZ BONUS: 301.0'
BLDG PROPOSED: 275.5'

BLDG C, SOUTH RD
SETBACK DISTANCE: 14.0'
GROUND AVG: 211.0'
BLDG MAX ALLOWED: 276.0'
w/ IZ BONUS: 286.0'
BLDG PROPOSED: 281.0'

BLDG K, NORTH AVE
SETBACK (EX. LOT LINE): 22.5'
GROUND AVG: 219.75'
BLDG MAX ALLOWED: 284.75'
w/ IZ BONUS: 294.75'
BLDG PROPOSED: 267.0'

BLDG K, SOUTH RD
SETBACK DISTANCE: 16.9'
GROUND AVG: 219.75'
BLDG MAX ALLOWED: 284.75'
w/ IZ BONUS: 294.75'
BLDG PROPOSED: 267.0'

BLDG H, WEST RD
SETBACK DISTANCE: 9.9'
FRONTAGE MID POINT: 195.0'
BLDG MAX ALLOWED: 260.0'
w/ IZ BONUS: 270.0'
BLDG PROPOSED: 249.0'

BLDG P, WEST RD
SETBACK DISTANCE: 10.5'
GROUND AVG: 186.0'
BLDG MAX ALLOWED: 251.0'
w/ IZ BONUS: 261.0'
BLDG PROPOSED: 255.0'

BLDG H, SOUTH RD
SETBACK DISTANCE: 9.3'
FRONTAGE MID POINT: 193.25'
BLDG MAX ALLOWED: 258.25'
w/ IZ BONUS: 268.25'
BLDG PROPOSED: 253.5'

BLDG M, SOUTH RD
SETBACK DISTANCE: 13.0'
GROUND AVERAGE: 198.50'
BLDG MAX ALLOWED: 263.50'
w/ IZ BONUS: 273.50'
BLDG PROPOSED: 273.50'

BLDG L, SOUTH RD
SETBACK DISTANCE: 6.2'
FRONTAGE MID-POINT: 215.0'
BLDG MAX ALLOWED: 280.0'
w/ IZ BONUS: 290.0'
BLDG PROPOSED: 259.0'

CALCULATION NOTES:

FRONTAGE LOW POINT:
IS THE LOWEST PROPOSED GRADE ELEVATION ALONG THE FRONTAGE OF A BUILDING,
INCLUDING 10' OUT FROM THE FACE, AND WILL BE USED TO DETERMINE THE BUILDING HEIGHT
WHERE THE BUILDING HAS A SETBACK OF LESS THAN 10' IN FUTURE BUILDING UPDATES.

GROUND AVERAGE:
IS THE AVERAGE OF THE LOWEST AND HIGHEST PROPOSED GRADE ELEVATIONS AROUND THE
ENTIRE PERIMETER OF THE BUILDING, INCLUDING 10' OUT FROM THE FACE, EXCLUDING
EXCEPTIONALLY HIGH AND LOW POINTS AT BUILDING ENTRANCES THAT ARE NOT
REPRESENTATIVE OF THE OVERALL BUILDING HEIGHT. THIS IS USED TO DETERMINE THE
BUILDING HEIGHT WHERE THE BUILDING HAS A SETBACK OF GREATER THAN 10'.

SETBACKS:
MEASURED FROM THE SIDEWALK TO THE CLOSEST BUILDING FACADE, DOES NOT INCLUDE
BALCONIES, PORCHES, OR ONE-STORY BUILDING PROJECTIONS

SUBMITTED FOR
APPROVAL
8/17/2018

DATE	SUBMISSION	DATE	SUBMISSION	DATE	SUBMISSION
11-23-2016	PERMIT SET - DRAFT	07-09-2018	Building HEIGHT EX REVISED		
01-04-2017	PERMIT SET	08-07-2018	Building M Update		
01-31-2017	PERMIT SET - REVISED				

Owner:
BC Community Housing

landscape architects planning consultants
301 college street burlington vermont 05401 802 658 3555



MJB
design by
MJB
checked by

TKD / EB / JS
01/31/2017
1" = 50'

T. J. Boyle Associates, LLC

CAMBRIAN RISE

EXHIBIT - BUILDING HEIGHT

L-EX3

Project: Burlington College 13210 Hwy Cr. Masterplan/EXHIBIT/PERMIT/2018 EX BLDG HEIGHT Aug. 8/7/2018 11:45 PM, DWG to PDF.plt

BIKE PARKING		RESIDENTIAL BIKE STORAGE/RACK CALCULATIONS										NON-RESIDENTIAL BIKE STORAGE/RACK CALCULATIONS				Updated: 8.28.18	
Building	Use	Residential Unit Count	Outdoor Racks PROVIDED (space for)	Long Term Bike Parking Req'd 1 per 4 units	Short Term Bike Parking Req'd 1 per 10 units	Non-Residential Square Footage	Non-Residential Square Footages + Uses			NON-RES. LONG TERM	NON-RES SHORT TERM	Non-Residential Use Bike Parking Required					
							Primary	Non-res. Secondary	Non-res. Tertiary	Req'd Parking Standard (LT)	Req'd Parking Long Term	Req'd Parking Standard (ST)	Req'd Parking Short Term				
Burlington College Parcel																	
A	Residential	65	20	16.25	6.50	20,200	Restaurant	Retail	Office	1 per 20,000sf	1.01	3 per 5,000sf	12.12	Req'd Bike Parking 140,64 sub-total spaces			
B & G	Former College	90	62	22.50	9.00	8,150	Office	Retail		1 per 5,000sf	1.63	1 per 5,000sf	1.63				
C	Multi-Use	100	22	25.00	10.00	23,000	Garage	For Resident Use									
D	Parking Garage	-				35,000	Restaurant	Office		1 per 5,000	7.00	1 per 10,000	3.50				
E & F	Residential	70	30	17.50	7.00												
Sub-total - College Parcel		325	134	81.25	32.50					9.64	17.25						
BC Community Housing, LLC parcel																	
H	Residential	60	16	15.00	6.00	6,250	Office	Daycare		1 per 5,000	1.25	1 per 10,000	0.63	91.00			
I	Commercial	30		0.00	0.00	60,000	Office		1 per 20,000	3.00	1 per 10,000	6.00	41.00				
J	Fitness	146	48	26.00	14.60	3,000	Fitness	For Resident Use							179.00		
K & L	CSC/CSC Res*	114	22	28.50	11.40	1,500	Retail	Office	1 per 5,000	0.30	1 per 5,000	0.30				106.00	
M	Residential	60	14	15.00	6.00	1,500	Retail		1 per 20,000	0.08	1 per 5,000	0.30					82.00
P	Residential	65	18	16.25	6.50					2.00	2 per 20 rooms	4.00		117.00			
Q	Residential												11.23				
R	Commercial														163.10		
Sub-total - BCCH Parcel		445	148	100.75	44.50	50 Room Hotel	BCCH + Non-Profit Parcel Bike Parking Totals:			6.63		11.23					
Grand Totals			282	Req'd Long+Short Term TOTAL: 259.00						16.27	28.48	REQUIRED TOTAL: 303.74					
parking adjusted to reflect 70 senior/elderly units																	
							Long Term (LT)		Short Term (ST)			Interior/covered (LT)		Exterior (ST)			
							Required: 135		74			Bike Parking 624		282			
							NonResidential: 7		19			Bike Parking					
							Total Req'd: 192		93			TOTAL PROVIDED: 906					

Breakdown of Parking Supplied for Cambrian Rise Residents		Updated: 8.28.18			
Spaces for Rental Units	Spaces for Condos (incl Bldg H) + Non- Profits	Street Spaces	TOTALS		
				Total Garage:	
				386	518
				Total Surface Lots:	
				103	122
				SUBTOTALS:	
				489	640
				Total On-Street:	
				North Rd	38
				South Rd	27
West Rd	43				
TOTAL with On-Street spaces:		1237			

OVERVIEW OF PARKING AT CAMBRIAN RISE									Updated: 8.28.18
Building	Use	Type	Residential Unit Count	Non-residential Square Footage	Non-residential Primary	Non-residential Secondary	Non-res. Tertiary	No. Levels	Parking Spaces Provided Structured + Surface
Burlington College Parcel									
A	Residential	For Rent	65					5 Story	
B & G	Former College	For Rent/Sale	90	20,200	Restaurant	Retail	Office	3 Story	
C	Multi-Use	For Rent	100	8,150	Office	Retail		5 Story	
D	Parking Garage	For Rent	-	23,000	Garage			3 Story	
E & F	Residential	For Rent	70	35,000	Restaurant	Office		5 Story	
Sub-total - College Parcel			325	86,350					
Relative Percentage (based upon building SF)						College Parcel Parking Total:			442 spaces
BC Community Housing, LLC parcel									
H	Residential	For Rent	60	6,250	Office	Daycare		4 Story	91
I	Residential	For Rent		60,000	Office			5 Story	41
J	Fitness	N/A		3,000	Fitness			1 Story	
K & L	CSC/CSC Residential	Sell Off	146					4 Story	155
M	Residential	For Sale	114	1,500	Retail	Office		4 Story	197
P	Residential	For Sale	60	1,500	Retail			4 Story	78
Q	Residential	For Sale	65					5 Story	83
R	Commercial			43,000	50 room Hotel				42
Sub-total - BCCH Parcel			445	115,250		BCCH + Non-Profit Parcel Parking Total:			687
Grand Totals			770	201,600					1129

PARKING REQUIREMENTS FOR ALL CAMBRIAN RISE SITES										Updated: 9.21.18
1105 Required Spaces		Allocated as Shown								
Residential Uses		Non-Residential	Commercial Uses						Professional/Trade College	
Buildings	Apartment Units	Commercial	Bakery	Restaurant	Hotel	Office	Daycare	Retail		
	1		2.5	3.0	0.75	2.0	1.0	2.0	3.0	
	space/unit	in Square Ft	spaces/per 1000sf	spaces/per 1000sf	spaces/hotel room	spaces/per 1000sf	per 5 children+1	spaces/per 1000sf	spaces/per 1000sf	TOTALS
Building A	65									65
	Residential	90								90
Bldgs B+G (Comm)			0	9						9
Restaurant		3,000								34
General Office		17,200						34		
Building C	100									100
Comm./Bldg C										
General Office		4,000				8				8
Retail		4,150						8		9
Bldg D Garage		23,000								
Building E	70									70
Building F										
Comm/Bldg E+F						70				70
General Office		35,000								
Building H	60									60
Commercial		3,250				7				7
Daycare (75 total kids w 14 staff)**		3,000					22			22
Building I										
Office		60,000				120				120
Building J										
Fitness		3,000								
Building K/CSC	70									70
Building L/CHT	76									76
Building M	114									114
Office/Service		1,500				3				3
Building P	60									60
Retail		1,500						3		3
Building Q	65									65
Bldg R - 50 Room Hotel		43,000			50					50
TOTAL REQ'D PARKING:			0	9	50	208	22	12	0	1105
Total Residential (in Units):		770								
Total Non-Residential (in SF):		201,600								
NON-RESIDENTIAL SUMMARY										
118,600	sf/commercial space									904
83,000	sf/non-residential + support space									225
201,600	sf TOTAL NON-RESIDENTIAL									1129
	* for residents and immediately adjacent neighbors									
	** this is a conservative "guesstimate", based on 40 children									
	at a staff rate of 1:4 and 35 children at a staff rate of 1:10									

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DEPARTMENT OF
PLANNING & ZONING



MEMO

TO: Eric Farrell, Owiso Makuku
Farrell Properties
FROM: Mark Smith, PE
DATE: September 12, 2018
SUBJECT: Cambrian Rise – Traffic Considerations Due to Development Program Changes
(Act 250 Permit #4C1301) DRAFT

Several changes to the mix and size of land uses within the Cambrian Rise development project on North Avenue in Burlington, Vermont have been proposed since the publication of the Transportation Impact Assessment (TIA), and subsequent update 12/28/16. This memorandum is provided as a further supplement to the TIA, documenting the latest changes and their effect on the traffic analysis results.

1.0 PREVIOUSLY APPROVED TRIP ESTIMATED

Table 1 summarizes the development land uses and expected external trips, as approved by the City and Act 250 Commission. Note these figures do not include the Liberty House apartments¹ (65 units) which were previously approved and accounted for separately. The estimate does include an accounting for internal capture (trips beginning and ending within the development itself), pass-by trips (new business patrons that are diverted from the existing adjacent traffic stream), and a reduction for Transportation Demand Management measures.

TABLE 1. PREVIOUSLY APPROVED DEVELOPMENT PLAN AND EXTERNAL TRIP ESTIMATE

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
223	Mid-Rise Apartment	673	d.u.	80	176	172	122
311	All-Suites Hotel	42	room	8	5	6	8
540	Junior/Community College	16,550	s.f.	33	12	22	16
565	Daycare Center	4,025	s.f.	16	13	14	16
710	General Office Building	22,541	s.f.	22	1	2	24
826	Specialty Retail Center	2,675	s.f.	0	0	1	2
932	High-Turnover (Sit-Down) Restaurant	2,650	s.f.	8	7	13	8
	sub-total			167	214	230	196
	total			381		425	

¹ The Liberty House was a renovation of the existing Burlington College building (and before that the Catholic Diocese orphanage) on-site.

2.0 PROPOSED CHANGES

The development has been revised to eliminate the building use designated as Junior/Community College entirely, and will now include the following revised components:

1. 1 additional apartment dwelling unit (d.u.)
2. A smaller daycare center (3,000 vs. 4,025 s.f.)
3. More office space (60,250 vs. 22,541 s.f.)
4. More retail space, including;
 - o 2,000 s.f. convenience store
 - o 4,350 s.f. general retail (e.g. shopping center)
5. Slightly more restaurant space (3,000 vs. 2,650 s.f.), and
6. A new business collaboration center (the Vermont Innovation Commons), which includes:
 - o A 40 room “dormitory style” hotel, and
 - o 40,000 s.f. of office space for business collaboration (best described for trip generation purposes as Research and Development Office space).

Most of these changes are predictable and conform to well documented land use categories, however the Vermont Innovation Commons (VIC) is a relatively new concept. While it includes building spaces that are similar to the land use categories selected (hotel, and research and development office space), the way that these spaces are used is likely to create fewer peak hour external trips compared to the traditional (surveyed) uses, as follows:

In this case, the living accommodations are integral to the office space and occupied by many (if not all) of the same people. Stays in the living space will be extended, up to six weeks or more, thus many trips typical of these separate uses will be on-site and the standard trip generation and internal capture methods used in this analysis do not reflect this.

In addition, the VIC will include many exclusive on-site accommodations that reduce the need to look for services elsewhere, thus reducing external trips, such as:

- Dining facilities
- Café/lounge
- Laundry
- Fitness studio
- Yoga studio

3.0 VEHICLE TRIP GENERATION

Expected primary vehicle trips from the entire development, as now proposed, have been revised using the Institute of Transportation Engineers *Trip Generation Manual*, updated using the latest survey data set (10th Edition), and are summarized by land use code (ITE LUC) in Table 1.

TABLE 2. PRIMARY TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	674	d.u.	80	164	169	108
311	All-Suites Hotel	50	room	9	8	9	9
311	Hotel (VIC)	40	room	9	6	7	7
565	Daycare Center	3,000	s.f.	17	16	16	18
710	General Office Building	60,250	s.f.	60	10	11	58
760	R&D Office (VIC)	40,000	s.f.	13	4	3	17
820	Retail (e.g. Shopping Center)	4,350	s.f.	2	1	5	6
826	Convenience Market	2,000	s.f.	24	24	20	19
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	16	13	10	6
		sub-total		231	247	249	248
		total		478		498	

Primary trips are those trips expected from isolated suburban developments, not accounting for trips already on the road network that would be diverted from the adjacent highway to the new development (referred to as pass-by trips), or trips that would be made within the project due to the mix of land use (referred to as internal capture), or trips due to the effects of Transportation Demand Management, which take advantage of the availability of alternate transportation modes (i.e. biking, walking transit, etc.).

Pass-by trips are estimated using the average pass-by rates surveyed by ITE² for that land use. These trips are anticipated in addition to the primary trips. In this case only the retail, convenience market and restaurant are expected to attract pass-by trips.

TABLE 3. PASS-BY TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	674	d.u.				
311	All-Suites Hotel	50	room				
311	Hotel (VIC)	40	room				
565	Daycare Center	3,000	s.f.				
710	General Office Building	60,250	s.f.				
760	R&D Office (VIC)	40,000	s.f.				
820	Retail (e.g. Shopping Center)	4,350	s.f.	1	0	3	3
826	Convenience Market	2,000	s.f.	38	38	31	29
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	0	0	8	5
		sub-total		39	39	41	37
		total		77		78	

² Trip generation handbook, 2nd edition.

Trips that are associated with each land use but are expected to take advantage of other uses within the development have been estimated using the recommended methodology in the latest ITE Trip Generation Manual³, and are shown in Table 4.

TABLE 4. INTERNAL CAPTURE TRIPS

ITE LUC	Description	Units/size	d.u.	AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	674	d.u.	1	6	6	8
311	All-Suites Hotel	50	room	0	2	2	0
311	Hotel (VIC)	40	room	0	2	1	0
565	Daycare Center	3,000	s.f.	9	8	8	9
710	General Office Building	60,250	s.f.	5	4	2	1
760	R&D Office (VIC)	40,000	s.f.	4	2	2	1
820	Retail (e.g. Shopping Center)	4,350	s.f.	1	0	2	1
826	Convenience Market	2,000	s.f.	5	5	2	6
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	9	4	3	3
	sub-total			34	33	28	29
	total			67		57	

Accounting for the anticipated effects of Transportation Demand Management, as suggested in the VTrans TDM Guidance, a 15% reduction in trips results in the values shown in Table 5.

TABLE 5. MULTIMODAL / TDM TRIP REDUCTION

ITE LUC	Description	Units/size	d.u.	AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	674	d.u.	12	25	25	16
311	All-Suites Hotel	50	room	1	1	1	1
311	Hotel (VIC)	40	room	1	1	1	1
565	Daycare Center	3,000	s.f.	3	2	2	3
710	General Office Building	60,250	s.f.	9	1	2	9
760	R&D Office (VIC)	40,000	s.f.	2	1	0	2
820	Retail (e.g. Shopping Center)	4,350	s.f.	0	0	1	1
826	Convenience Market	2,000	s.f.	9	9	8	7
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	2	2	3	2
	sub-total			40	43	44	43
	total			83		86	

In summary, the expected total external vehicle trips (traffic entering and leaving the project site) due to the revised land uses are shown in Table 6.

³ NCHRP Report 6842 - Internal Capture

TABLE 6. TOTAL EXTERNAL VEHICLE TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	674	d.u.	67	134	138	84
311	All-Suites Hotel	50	room	8	5	5	8
311	Hotel (VIC)	40	room	8	3	5	6
565	Daycare Center	3,000	s.f.	6	5	5	6
710	General Office Building	60,250	s.f.	46	4	7	48
760	R&D Office (VIC)	40,000	s.f.	7	2	0	13
820	Retail (e.g. Shopping Center)	4,350	s.f.	1	1	5	6
826	Convenience Market	2,000	s.f.	48	48	41	35
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	5	7	12	6
sub-total				195	210	219	214
total				405		433	

The net effect of the development program change is an additional 24 trips in the AM peak hour and 8 trips in the PM peak hour. The total daily trip generation is expected to be 5,028 vehicles per day, an increase of 401 trips.

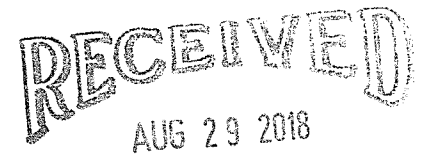
4.0 CONCLUSIONS

The changes in the development program include adding a convenience market which significantly increased the expected total pass-by trips - 77/78 in the AM/PM peak hours. Noting that these are not new trips, and are already on the adjacent street, but are expected to turn into the development to patronize the new convenience store (and to a lesser degree the retail use and restaurant). Thus, the additional impact is only at the development access points, as these trips turn off and then return onto the street network. These intersections are expected to operate at good levels of service in both the AM and PM peak hours.

In addition, the intent of the convenience market is to serve residents and occupants of the development (there currently exists a convenience store across North Avenue at the Shell Station). Thus, external trips are likely overestimated here.

In conclusion, the aggregate impact of the proposed development land use changes on the adjacent street network is expected to be less than the previous (approved) iteration of development land use, in both the AM and PM peak hours.

END OF MEMO



MEMO

TO: Eric Farrell, Owiso Makuku, Charlie Pughe
FROM: Mark Smith, PE.
DATE: July 19, 2018
SUBJECT: Cambrian Rise – Traffic Considerations due to Development Changes (Act 250 Permit #4C1301) DRAFT

DEPARTMENT OF
PLANNING & ZONING

Several changes to the mix of land use within this project are proposed since the Transportation Impact Assessment (TIA), and subsequent update 12/28/16 (submitted and approved by the Environmental Commission 1/26/18) for the Cambrian Rise development project on North Avenue in Burlington, Vermont.

This memorandum is provided as a further supplement to the TIA, documenting these changes and their effects on the traffic analysis presented in the original Assessment cited above.

1.0 PREVIOUSLY APPROVED TRIP ESTIMATED

Table 1 summarizes the development land uses and expected external trips, as approved. Note these figures do not include the Liberty House apartments (65 units) which were previously approved and accounted for separately. The estimate does include an accounting for internal capture (trips beginning and ending within the development itself), some pass-by trips for the restaurant, and a reduction for Transportation Demand Management measures.

TABLE 1. PREVIOUSLY APPROVED DEVELOPMENT PLAN AND EXTERNAL TRIP ESTIMATE

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
223	Mid-Rise Apartment	673	d.u.	80	176	172	122
311	All-Suites Hotel	42	room	8	5	6	8
540	Junior/Community College	16,550	s.f.	33	12	22	16
565	Daycare Center	4,025	s.f.	16	13	14	16
710	General Office Building	22,541	s.f.	22	1	2	24
826	Specialty Retail Center	2,675	s.f.	0	0	1	2
932	High-Turnover (Sit-Down) Restaurant	2,650	s.f.	8	7	13	8
	sub-total			167	214	230	196
	total			381		425	



2.0 PROPOSED CHANGES

The development has been revised to eliminate the building space designated as Junior/Community College entirely, and will now include the following components:

1. 32 additional apartment units
2. A smaller daycare center (3,000 vs. 4,025 s.f.)
3. More general office space (27,126 vs. 22,541 s.f.)
4. More retail space, including;
 - o 3,000 s.f. convenience store
 - o 3,547 s.f. general retail (e.g. shopping center)
5. Slightly more restaurant space (3,000 vs. 2,650 s.f.)
6. A new business collaboration center (the Vermont Innovation Commons), which includes:
 - o A 40 room “dormitory style” hotel, and
 - o 43,437 s.f. of office space for business collaboration (best described as Research and Development Office space).

While most of these changes are predictable and conform to well documented land use categories, the Vermont Innovation Commons is a fairly new concept. While it includes building spaces that fit well within the categories selected (hotel, and research and development office space), the way that these spaces are used are very likely to create fewer peak hour external trips, as follows:

In this case, the living accommodations are integral to the office space and occupied by many of the same people. Stays in the living space will be extended, up to six weeks, thus many trips from “home to work” and vice versa will be on-site and the standard trip generation and internal capture methods used in this analysis do not reflect this.

3.0 VEHICLE TRIP GENERATION

Expected primary vehicle trips from the entire development, as now proposed, have been revised using the Institute of Transportation Engineers *Trip Generation Manual*, updated from the 9th Edition using the latest survey data set (10th Edition), and are summarized by land use code (ITE LUC) in Table 1.

TABLE 2. PRIMARY TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	705	d.u.	84	172	176	113
311	All-Suites Hotel	42	room	8	7	7	8
310	Hotel	40	room	11	8	12	12
565	Daycare Center	3,000	s.f.	17	16	16	18
710	General Office Building	27,126	s.f.	27	4	5	26
760	Research and Development Center	40,437	s.f.	14	5	3	18
820	Retail (e.g. Shopping Center)	3,547	s.f.	2	1	4	5
826	Convenience Market	3,000	s.f.	37	37	29	28
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	16	13	10	6
	sub-total	sub-total		215	262	264	233
	Total	total		476		497	

Primary trips are those trips expected from isolated suburban developments, not accounting for trips already on the road network that would be diverted from the adjacent highway to the new development (pass-by trips), or trips that would be made within the project due to the mix of land use (referred to as internal capture), or trips due to the effects of Transportation Demand Management, which take advantage of the availability of alternate transportation modes (biking, walking transit, etc.).

Pass-by trips are estimated using the average pass-by rates surveyed by ITE¹ for that land use. These trips are anticipated in addition to the primary trips.

TABLE 3. PASS-BY TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	705	d.u.				
311	All-Suites Hotel	42	room				
310	Hotel	40	room				
565	Daycare Center	3,000	s.f.				
710	General Office Building	27,126	s.f.				
760	Research and Development Center	40,437	s.f.				
820	Retail (e.g. Shopping Center)	3,547	s.f.	1	0	2	2
826	Convenience Market	3,000	s.f.	57	57	46	44
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	0	0	8	5
	sub-total	sub-total		58	58	56	51
	Total	total		115		107	

Trips that are associated with each land use but are expected to take advantage of other uses within the development have been estimated using the recommended methodology in the latest ITE Trip Generation Manual², and are shown in Table 4.

TABLE 4. INTERNAL CAPTURE TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	705	d.u.	3	6	22	15
311	All-Suites Hotel	42	room	0	2	3	2
310	Hotel	40	room	0	2	3	1
565	Daycare Center	3,000	s.f.	5	5	6	6
710	General Office Building	27,126	s.f.	4	3	4	3
760	Research and Development Center	40,437	s.f.	4	3	3	3
820	Retail (e.g. Shopping Center)	3,547	s.f.	2	1	2	2
826	Convenience Market	3,000	s.f.	7	11	16	27
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	15	7	8	8
	sub-total	sub-total		40	40	67	67
	Total	total		81		133	

Accounting for the anticipated effects of Transportation Demand Management, as suggested in the VTrans TDM Guidance, a 15% reduction in trips results in the values shown in Table 5.

¹ Trip generation handbook, 2nd edition.

² NCHRP Report 6842 - Internal Capture

TABLE 5. MULTIMODAL / TDM TRIP REDUCTION

ITE LUC	Description	Units/size	d.u.	AM Peak		PM Peak	
				enter	exit	enter	exit
221	Mid-Rise Apartment	705	d.u.	12	25	23	15
311	All-Suites Hotel	42	room	1	1	1	1
310	Hotel	40	room	2	1	1	2
565	Daycare Center	3,000	s.f.	2	2	2	2
710	General Office Building	27,126	s.f.	3	0	0	3
760	Research and Development Center	40,437	s.f.	1	0	0	2
826	Convenience Market	3,000	s.f.	13	12	9	7
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	0	1	2	0
	sub-total	sub-total		35	42	38	33
	Total	total		77		71	

In summary, the expected total external vehicle trips (traffic entering and leaving the project site) due to the revised land uses are shown in Table 6.

TABLE 6. TOTAL EXTERNAL VEHICLE TRIPS

ITE LUC	Description	Units/size	d.u.	enter	exit	enter	exit
221	Mid-Rise Apartment	705	d.u.	68	141	131	83
311	All-Suites Hotel	42	room	6	4	4	5
310	Hotel	40	room	9	5	8	9
565	Daycare Center	3,000	s.f.	10	9	9	10
710	General Office Building	27,126	s.f.	20	1	1	20
760	Research and Development Center	40,437	s.f.	8	1	0	13
820	Retail (e.g.Shopping Center)	3,547	s.f.	0	0	4	4
826	Convenience Market	3,000	s.f.	74	70	50	38
932	High-Turnover (Sit-Down) Restaurant	3,000	s.f.	1	5	9	3
	sub-total	sub-total		197	237	215	185
	Total	total		434		400	

The net effect of the additional land use is an additional 53 trips in the AM peak hour and reduction of 25 trips in the PM peak hour. The total daily trip generation is expected to be 5,042 vehicles per day and increase of 422 trips.

4.0 CONCLUSIONS

The estimated change in traffic entering and leaving the project due to the changes in land use are only significant in the AM peak hour.

The changes include adding a convenience market which has a significant pass-by rate, resulting in 115 trips in the AM peak hour. Noting that these 115 trips are already on the adjacent street but are expected to turn into the development to patronize the new convenience store, the impact is only on the development access, as these trips turn off and then return onto the street network. These intersections are expected to operate at good levels of service in both the AM and PM peak hours

In addition, the intent of the convenience market is to serve residents and occupants of the development (there currently exists a convenience store across North Avenue at the Shell Station). Thus, external trips are likely overestimated here.

In conclusion, the aggregate impact of the proposed development land use changes on the adjacent street network is expected to be significantly less than the previous (approved) iteration of development land use in both the AM and PM peak hours.

END OF MEMO

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

David E. White, FAICP, 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, Associate Planner
Layne Darfler, Zoning Technician
Shaleigh Draper, Planning & Zoning Clerk



TO: Development Review Board
FROM: Ryan Morrison
DATE: October 2, 2018
RE: 18-0669VR; 1580 North Avenue

=====

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: RL Ward: 7N

Owner/Applicant: Michael Walker

Request: Variance from front yard setbacks on a corner lot.

Applicable Regulations:
Article 12 (Appeals and Variances)

Background Information:

The applicant is seeking a variance from the applicable front yard setback on an existing, developed lot. The subject property fronts on North Avenue and Plattsburg Avenue. This corner lot is 5,640 sf in size, and contains a 720 sf home (built in 1961), with an attached garage (240 sf) and rear deck (160 sf). The shape of this lot is unique and not that of more common corner properties. The intersection of North Ave. and Plattsburg Ave. is more acute of an angle than more common 90° corners. As a result of the lot layout and neighboring properties, the front yard setbacks off of North Ave. and Plattsburg render this property almost entirely within required front yard setbacks off both streets. The applicant is proposing a 2 ft setback off the front property line (Plattsburg Ave. side) for the shed, and a 6 ft setback off the same property line for the extended driveway space.

No development is included in this variance request. A proposed fence and some existing but presently unpermitted items including the shed and widened driveway will be reviewed under separate zoning permit.

Previous zoning actions for this property are as follows:

- 5/21/85, Application to erect a 3' picket fence to run 40' along rear property line along Plattsburg Ave and 20' within the property lines to the corner of the house.
- 1/4/13, Application to replace aluminum siding with new vinyl siding and PVC trim, and to replace two second floor double hung windows with new, larger vinyl double hung windows.

Recommendation: Variance approval of front yard setback requirements as per, and subject to, the following findings and conditions:

I. Findings

Article 12: Variances and Appeals

Sec. 12.1.1 Variances

(a) That there are unique physical circumstances or conditions, including irregularity, narrowness, or shallowness of lot size or shape, or exceptional topographical or other physical conditions peculiar to the particular property, and that unnecessary hardship is due to such conditions, and not the circumstances or conditions generally created by the provisions of the zoning regulation in the neighborhood or district in which the property is located.

The lot is small at just 5,640 sf, and has 94' of road frontage along North Ave., and 144' of frontage along Plattsburgh Ave. North Ave. and Plattsburgh Ave. do not intersect at a 90° angle, like more traditional intersections meet. They intersect at a much more acute angle, which directly affects the shape of the subject property. The requested variance relates specifically to this situation. The lot has two frontages which are subject to the front yard setback standards of Table 4.4.5-3 *Residential District Dimensional Standards*. The front yard setback is based on the average of 2 adjacent lots on both sides of the subject lot, +/- 5'. In this case, the front yard setback off North Ave. is based on the average of the two properties at 1586 and 1592 North Ave, and the front yard setback off of Plattsburgh Ave. is based on the average of the two properties at 36 and 42 Plattsburg Ave. These properties all have one front yard – on North Ave. and on Plattsburg Ave. The two North Ave. homes have front yard setbacks of 33' and 34', and the Plattsburg Ave. homes have front yard setbacks of 23' and 22'. The average of these setbacks is 34' for the North Ave. frontage, and 23' for the Plattsburg Ave. frontage. A 34' (+/- 5') setback on a 23' – 97' deep lot (North Ave. frontage), combined with a 23' (+/- 5') setback off of the Plattsburg Ave. frontage results in an unbuildable lot (see attached aerial photo showing setback lines and buildable area). Compliance with the front yard setbacks is effectively impossible.

Affirmative finding

(b) That because of such physical circumstances or conditions, there is no possibility that the property can be developed in strict conformity with the provisions of the zoning regulation and that the authorization of a variance is, therefore, necessary to enable the reasonable use of property.

As noted above, a 34' (+/- 5') front yard setback off the North Ave. frontage, combined with a 23' (+/- 5') front yard setback off the Plattsburg Ave. frontage, results in virtually no building envelop. Compliance with these front yard setbacks is impossible. **Affirmative finding**

(c) The unnecessary hardship has not been created by the applicant.

The hardship relative to the front yard setbacks is related to the fact that front yard setback requirements are based on neighboring properties. The resultant setbacks affect almost the entire lot. It is not a hardship created by the applicant. **Affirmative finding**

(d) That the variance, if authorized, will not alter the essential character of the neighborhood or district in which the property is located, substantially or permanently impair the appropriate use

or development of adjacent property, reduce access to renewable energy resources, nor be detrimental to the public welfare.

The variance from the requirements of the front yard setback would not alter the essential character of the neighborhood or district in which the subject property is located. The variance would enable the single family use to have a common accessory structure (shed) and a driveway of enough width to accommodate side by side parking – a very common situation for residential properties.

Affirmative finding

(e) That the variance, if authorized, will represent the minimum variance that will afford relief and will represent the least deviation possible from the zoning regulation and from the plan.

The requested variance is the minimum amount necessary to afford relief for the existing home, while allowing continued use of the relatively small, open back yard. Variance approval will allow the driveway and shed to be reviewed under separate permit. **Affirmative finding**

(f) The variance, if granted, will not result in the extension of a non-complying situation or allow the initiation of a nonconforming use of land.

The variance from the front yard setback requirement would not result in the extension of a noncomplying situation or allow a nonconforming use of land. The variance would simply enable the property owner the ability to have extra driveway space/parking, and an accessory structure that many other properties are able to enjoy. **Affirmative finding**

II. Conditions of Approval

1. This variance approval is for relief from the front yard setback requirement of Table 4.4.5-3, *Residential District Dimensional Standards*.
2. The shed may be setback a distance of 2 ft, and the extended driveway/parking space may be setback a distance of 6 ft, from the Plattsburg Avenue front property line.
3. Per Sec. 12.1.3, *Filing a Request, Public Hearing, and DRB Decision*, this variance approval shall be valid for a period of 2 years.

TO RYAN MORRISON, DEPT OF PLANNING AND ZONING BURLINGTON VT.

REASON - ZONING PERMIT APPLICATION FOR 1580 NORTH AVE. BURLINGTON, VT 05408
05/05/2018

HELLO MY NAME IS MICHAEL WALKER, AND I RESIDE AT THE ADDRESS 1580 NORTH AVE. BURLINGTON VT. I'AM REQUESTING FOR A VARIANCE AT THIS SAID PROPERTY, FOR THE REASONS BELOW.

SEC. 12.1.1

- A. DUE TO THE ODD SHAPED LOT AT THIS PROOERTY IT IS TOTALLY REDICULOUS TO BE ABLE TO PUT ANY STORAGE SHED ANYWHERE ON THIS PROPERTY, JUST TO BE ABLE TO HAVE A NORMAL AREA TO STORE YOUR LAWN EQUIPMENT.
- B. DUE TO THE SHAPE OF THIS PROPERTY THERE IS NO POSSIBLE WAY TO PUT ANYTHING ON THIS PROERTY THAT WILL ABEY THE SRTICT CONFORMITY PROVISIONS OF THE ZONING REGULATIONS.
- C. THERE IS NO WAY THAT I MYSELF HAS CREATED ANY OF THESE HARDSHIPS CAUSED BY THE ODD SHAPED PROPERTY.
- D. ANY OF THE ITEMS I AM REQUESTING WILL IN NO WAY CHANGE ANY OF THE ESSENTIAL CHARACTERISTICS OF THE SAID NEIGHBORHOOD.
- E. IF ANY OF THESE VARIANCES ARE ALLOWED, WILL DEFINITELY BE A BIG RELEIF TO ME AND ANY OTHER PERSON OR PERSONS LIVING AT SAID PROPERTY.
- F. ALL OF THESE REQUESTS WILL ONLY BE NORMAL USE OF ANY SAID SURROUNDING PROPERTIES.

SEC. 12.1.2

- A. I AM IN NO WAY ASKING FOR A VARIANCE TO BUILD ANY RENEWABLE ENERGY RESOURCES.
- B. I MYSELF DID NOT CREATE ANY OF THIS HARDSHIP.
- C. I MYSELF IS NOT ASKING TO CHANGE THE ESSENTIAL CHARACTERISTICS OF THIS NEIGHBORHOOD, BY PERMANENTLY IMPAIRING ANY USE OR DEVELOPMENT TO ANY OF THE SURROUNDING RESIDENTS.
- D. YES I AM ONLY ASKING FOR THE MINIMUM VARIANCE TO BE ABLE TO FUNCTION IN A NORMAL LIVING SITUATION AND TO HELP CREATE A SAFER NEIGHBORHOOD.

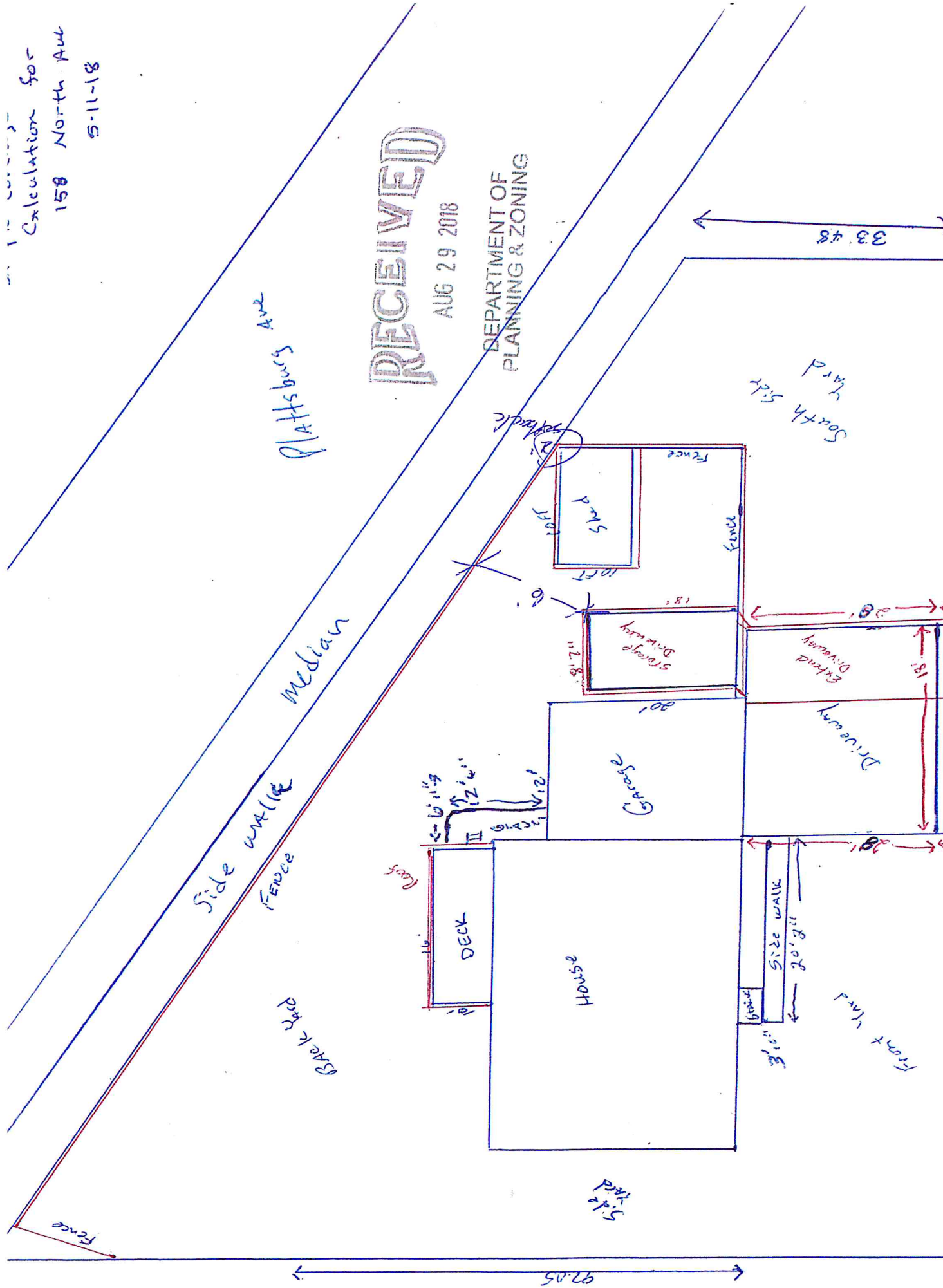
SEC. 12.1.3

- A. MY NAME IS MR MICHAEL WALKER
- B. I LIVE ON THE CORNER OF NORTH AVE. AND PLATTSBURG AVE. WHICH IN TURN CREATES A V SHAPED PROPERTY WITH MAIN STREETS IN FRONT AND IN BACK OF MY PROPERTY, WHICH CREATES A VARY UNAKWARD SITUATION IN TRYING TO CONFROM TO THESE REGULATIONS.
- C. DO NOT UNDERSTAND WHAT YOU ARE LOOKING FOR ON THIS QUESTION.
- D. TO ALLOW THIS REQUEST FOR THE VARIANCE

E. IF ALLOWED THIS REQUEST I AM TRYING TO REMAIN IN GOOD STANDINGS IN THE CITY OF BURLINGTON AND TO ACCOMATATE THE COMPLAINTANTS THAT HAVE BEEN UPSET WITH THIS PROPERTY. SO I HAVE FELT THAT IF I PARK IN THE DRIVEWAY AND NOT IN THE STREET DUE TO THE NARROW RAODS I AM TRYING TO MAKE IT SAFER FOR RESIDENTS SO NOT TO HAVE TO CROSS INTO ON COMING TRAFFIC DUE TO ME HAVING TO PARK IN THE STREET IF THIS IS NOT ALLOWED. I AM ALSO TRYING TO MAKE THE AREA LOOK NEATER BY HAVING THESE ITEMS INSIDE THE FENCE TO MAKE THE PROPERTY LOOK CLEANER. THANK YOU FOR YOUR TIME AND CONSIDERATION.

SINCERELY MR. MICHAEL WALKER.

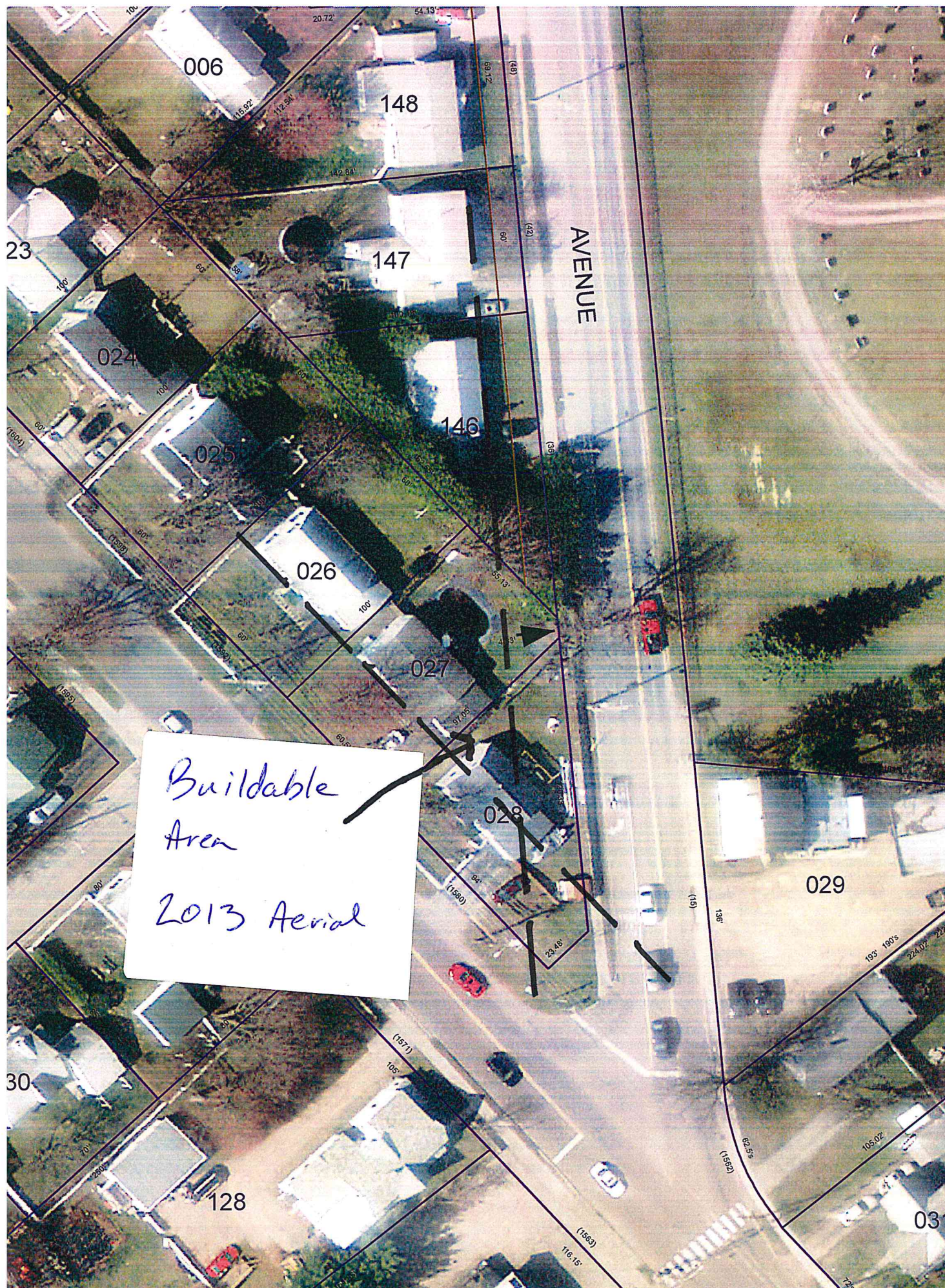
Calculation for
158 North Ave
5-11-18



RECEIVED

AUG 29 2018

DEPARTMENT OF
PLANNING & ZONING



Buildable
Area
2013 Aerial



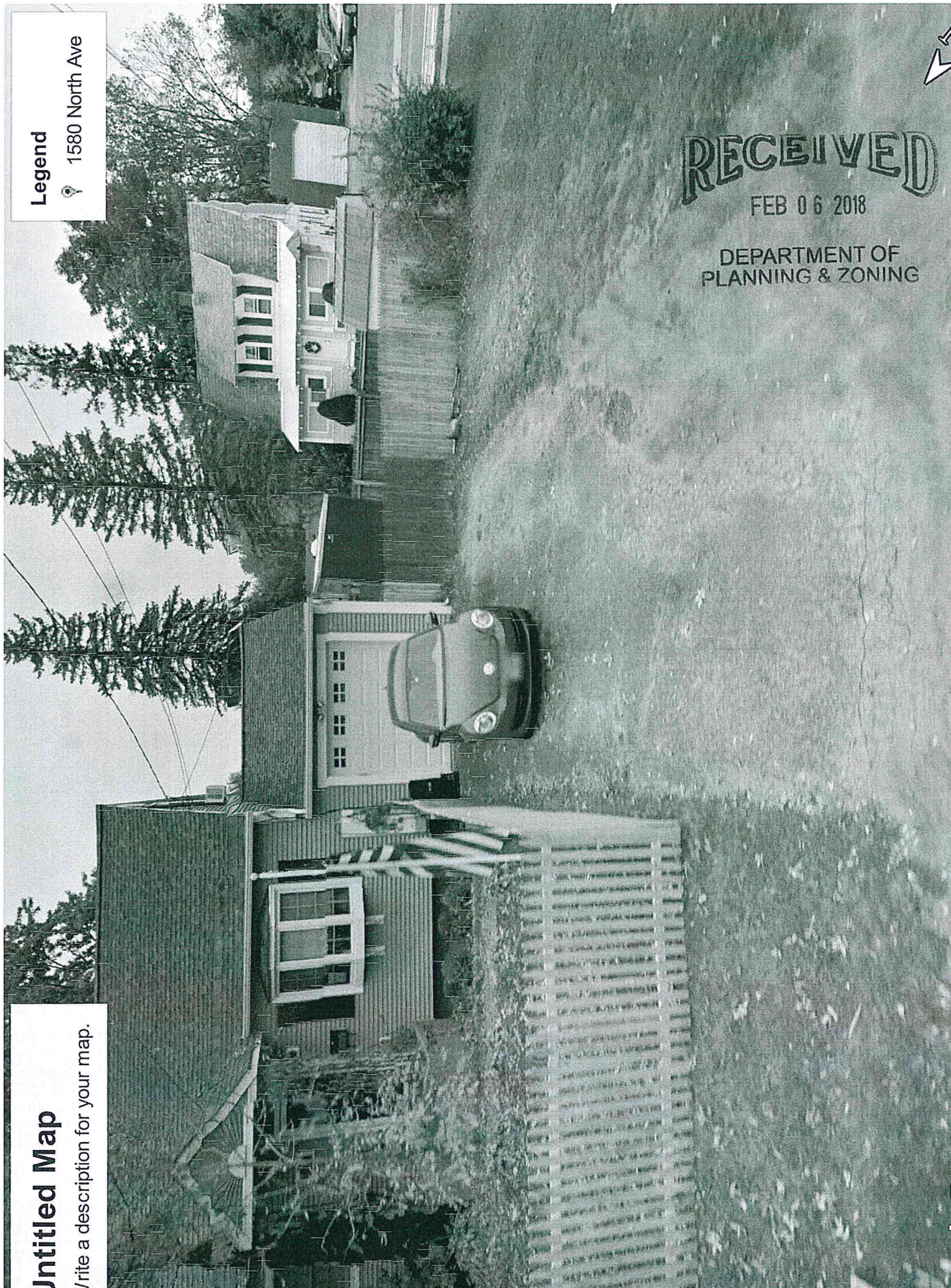
Untitled Map

Write a description for your map.

Legend



1580 North Ave



RECEIVED

FEB 06 2018

DEPARTMENT OF
PLANNING & ZONING

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, FAICP, 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, Associate Planner
Layne Darfler, Zoning Technician
Shaleigh Draper, Planning & Zoning Clerk



MEMORANDUM

TO: Development Review Board
FROM: Ryan Morrison, Associate Planner
DATE: October 2, 2018
RE: 19-0001CA/CU; 50 Clymer Street

=====

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

Zone: RL Ward: 6S

Applicant/Owner: Eric Avildsen & Faith Ingulsrud

Request: Demolish a fire damaged garage.



Applicable Regulations:

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

Background Information:

The garage at 50 Clymer Street suffered severe fire damage in May, 2018. The 11,000 sf property is developed residentially with a single family residence. The detached 2 car garage is included in the State Register of Historic Structures, noted for its '*single story, two bay hipped roof structure with hinged wooden doors and clapboards*'. The City's building inspector visited the property in June and determined that while the damaged garage did not appear to be at the level of a 'dangerous building requiring immediate removal', it did need to be secured to prevent unauthorized persons from entering it. Photo evidence of the damaged structure make it quite clear that the structure is beyond repair.

Previous zoning actions for this property are listed below:

- July 20, 2017 – ZP18-0029CA, approval to remove the existing back porch and replace with a one-story addition; add 220 sf open porch to the west wall of the house with a roof connected to the kitchen addition; new deck.
- April 20, 2018 – ZP18-0919CA, approval to add a window to the 2nd story of the north elevation; add larger deck approved under ZP18-0029CA.

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

I. Findings

Article 3: Applications, Permits and Project Reviews

Part 5, Conditional Use & Major Impact Review:

Section 3.5.6 Review Criteria

(a) Conditional Use Review Standards

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

1. *Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*

The garage is not connected to municipal utilities, and there will be no changes to the property's existing utility services as a result of garage demolition. **Affirmative finding**

2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;*

The property is located within an established residential neighborhood in the low density residential (RL) zoning district. The RL zone is intended primarily for low-density residential development in the form of single detached dwellings and duplexes. This district is typically characterized by a compact and cohesive residential development pattern reflective of the respective neighborhoods' development history. The demolition of the garage will not conflict with the purpose of the underlying zone, nor the character of the neighborhood. In fact, removing the fire damaged structure will improve the property's appearance in the

neighborhood. The applicant intends to replace the garage in the near future under separate permit. **Affirmative finding**

3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*

It is expected that there will be some impacts from noise, odor and vibrations during the short demolition process. However, the end result will be void of these impacts. **Affirmative finding**

4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies;*

There will be no impacts to the transportation system as a result of this proposal. **Affirmative finding**

5. *The utilization of renewable energy resources;*

This proposal has no impact on utilization of renewable energy resources. **Affirmative finding**

and,

6. *Any standards or factors set forth in existing City bylaws and city and state ordinances;*
City building codes will apply as conditioned. **Affirmative finding as conditioned**

(b) Major Impact Review Standards

Not applicable.

(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.*

Garage demolition will not require these mitigation measures. **Affirmative finding**

2. *Time limits for construction.*

The applicant notes that demolition is anticipated this fall. Plans are still in the conceptual mode for the replacement structure, and the applicant expects to commence construction of the replacement garage in the next building season. **Affirmative finding**

3. *Hours of operation and/or construction to reduce the impacts on surrounding properties.*

Not applicable. Hours of operation are not applicable to this residential use.

Demolition hours are not noted in the application. Typical work construction hours are Monday – Friday from 7:30 AM – 5:30 PM. Saturday construction may occur for interior work only. No construction activity on Sunday. **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; and,

Not applicable

5. Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.

See the recommended conditions. **Affirmative finding**

Article 4: Zoning Maps & Districts

Sec. 4.4.5, Residential Districts:

(a) Purpose

(3) Residential Low Density (RL)

The subject property is located in the RL zone. This zone is intended primarily for low density residential development in the form of single family detached dwellings and duplexes. The proposal entails removing a freestanding, fire damaged garage. The single family residence will still remain on the property. Consistency with the intent of the zone will continue after the garage is demolished and after its replacement is constructed. **Affirmative finding**

(b) Dimensional Standards & Density

The existing lot coverage is 23.8%. After removal of the garage, lot coverage will decrease to 20.2%, well below the 35% maximum allowance for the zone. Setbacks and building height do not pertain to the proposed demolition. **Affirmative finding**

(c) Permitted & Conditional Uses

Accessory structures are permitted uses within the RL zone. This one will be demolished. **Affirmative finding**

(d) District Specific Regulations

1. Setbacks

No setback encroachments are sought. **Not applicable**

2. Height

No height bonuses are being sought. **Not applicable**

3. Lot Coverage

No lot coverage bonuses are being sought. **Not applicable**

4. Accessory Residential Structures and Uses

The existing accessory structure will be removed. **Not applicable**

5. Residential Density

A. Additional Unit to multi-family

Not applicable

B. Additions to Existing Residential Structures

No additions are proposed. **Not applicable**

C. Residential Occupancy Limits

In all residential districts, the occupancy of any dwelling unit is limited to members of a family as defined in Article 13.

Not applicable

6. Uses

No neighborhood commercial use is included in this proposal. **Not applicable**

7. Residential Development Bonuses

No development bonuses are being sought. **Not applicable**

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.5 (b) above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable

Sec. 5.2.5, Setbacks

See Sec. 4.4.5 (b) above.

Sec. 5.2.6, Building Height Limits

See Sec. 4.4.5 (b) above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See Sec. 4.4.5 (b) above.

Sec. 5.4.8 Historic Buildings and Sites

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

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

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

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

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

(a) Applicability:

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

The garage at 50 Clymer Street, built ca. 1910, is listed on the State of Vermont Register of Historic Structures. These standards, therefore, apply. **Affirmative finding**

(b) Standards and Guidelines:

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

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

The garage was constructed c. 1910, and the home was constructed ca. 1930. The garage remained from an earlier structure that was replaced by the current dwelling. The applicant proposes no changes to the home. Due to the extensive fire damage to the garage, the applicant is proposing to demolish it, and rebuild in the next building season – spring 2019. Photographs, as well as correspondence between the applicant and the city's building inspector, provide adequate evidence that the structure is in need of full replacement. Under Sec. 5.4.8 (d) 2 F, the applicant is tasked with agreeing to redevelop the site after demolition pursuant to an approved redevelopment plan. The applicant notes, however, that they are not yet ready with redevelopment plans, but are eager to remove the charred structure from their property. For the time between demolition and redevelopment, they plan to grade and grass the site. In order to ensure that the structure is replaced, issuance of a certificate of occupancy for this permit should be dependant upon the redevelopment of the garage. **Affirmative finding as conditioned**

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 only way to preserve the property is to demolish the fire damaged garage and rebuild in a manner consistent with the historic characteristics of the property. **Affirmative finding**

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

The garage is unsalvageable and should be removed from the property. There is no need to try to replicate it with the new garage. **Affirmative finding**

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

Not applicable

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

Not applicable

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.*

Given the current state of the garage, complete demolition is warranted. **Affirmative finding**

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

Not applicable

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

No archaeological resources have been identified at this address. If any work associated with the project uncovers any archaeological remains or resources, proper authorities shall be contacted for appropriate recovery, assessment and disposition. **Affirmative finding**

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

The historic materials and features of the garage have already been destroyed by the fire. Demolition is warranted. **Affirmative finding**

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

The proposal involves the full demolition of the historic structure. **Affirmative finding**

(c) Demolition by Neglect:

No owner of a historic building, or lessee who is obligated by lease to maintain and repair such a structure (other than the interior), shall allow, cause, or permit the structure to suffer or experience demolition by neglect. Examples of such disrepair and deterioration include, but are not limited to, the following:

1. Deterioration of walls or other vertical supports; walls, partitions or vertical supports that split, lean, list, or buckle, thus jeopardizing structural integrity;
2. Deterioration or inadequate foundations that jeopardize structural integrity;
3. Deterioration of roofs, ceilings, or other horizontal members;
4. Deterioration of fireplaces or chimneys;
5. Deterioration or crumbling exterior stucco or mortar;
6. Ineffective waterproofing of exterior walls, roof, or foundations, including broken windows or doors;
7. Lack of weather protection that jeopardizes the structural integrity of walls, roofs, plumbing, electricity, or overall structural integrity, including lack of paint, lack of adequate heating, and lack of adequate ventilation;
8. Vandalism caused by lack of reasonable security precautions; and/or
9. Deterioration of any feature so as to create a hazardous condition that could require demolition for public safety.

In such cases, the building inspector shall notify the property owner of any violation of this section. Such person shall have sixty (60) days to remedy any such violation. In the event the violation is not corrected within sixty (60) days of notification, the city shall be authorized to perform all repairs necessary to correct the violation and to place a lien on the property for the costs of such repairs and reasonable administrative and legal fees incurred.

There is no reason to suspect that the garage was the subject of neglect. **Affirmative finding**

(d) Demolition of Historic Buildings:

The purpose of this subsection is:

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

1. Application for Demolition

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

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

See the email correspondence between Brad Biggie (City Building Inspector and the applicant). While the garage was not considered to be at the level of a dangerous building requiring an order for immediate removal, the damage was significant enough to warrant Mr. Biggie's request that the garage be secured to prevent unauthorized persons from entering. He was of the impression that the garage would be removed and replaced. The damage to the garage is quite evident, and requiring the applicants to hire an engineer or architect to confirm the damage would be excessive. **Affirmative finding**

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

The applicants are still in the planning phase for the replacement structure. The new design will be subject to design review upon submittal of a zoning permit application. **Affirmative finding**

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

- (i) *the estimated market value of the property on which the structure lies, both before and after demolition or removal; and,*
- (ii) *the feasibility of rehabilitation or reuse of the structure proposed for demolition or partial demolition;*

Not applicable. There is no claim for economic hardship.

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

The applicants are currently exploring redevelopment plans. In the meantime, they would like to remove the burnt garage from the property. Sec. 5.4.8 (d) 2 F (iii) places a general timeframe of 6 months between demolition and redevelopment. The applicants are currently exploring redevelopment plans, but in the meantime, they would like to remove the burnt garage from the property as it is an eyesore. **Affirmative finding**

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

Not applicable. Plans for the replacement garage have not yet been furnished.

2. Standards for Review of Demolition:

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

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

There is no reason to suggest that the garage was not sound prior to the fire. Now, after the damage, the garage is unsound. **Affirmative finding**

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

Photographs of the damage show extensive fire damage to the roof, the upper clapboards, and the doors. The City's building inspector confirmed that structure needed to be secured, and understood that it would be removed and replaced. **Affirmative finding**

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

Redevelopment of the structure would provide a community wide benefit. The structure is clearly of no use any longer, and given its charred remains, it could be considered an eyesore within the neighborhood. **Affirmative finding**

And all of the following:

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

While the applicants have no redevelopment proposal yet, they confirmed that they will rebuild a garage in the near future (in Spring 2019). **Affirmative finding.**

- E. *All historically and architecturally important design, features, construction techniques, examples of craftsmanship and materials have been properly documented using the applicable standards of the Historic American Building Survey (HABS) and made available to historians, architectural historians and others interested in Burlington's architectural history; and,*

The existing structure is documented in the State Register of Historic Structures as a '1 story, 2 bay hipped roof garage with original hinged wooden doors and clapboards. Garage/shed remained from an earlier structure that was replaced by the present dwelling.' Photos of the garage are also included with this application. **Affirmative finding**

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

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

The applicants acknowledge that they will have to replace the structure. The architectural character of the neighborhood will need to be retained with the new construction. **Affirmative finding**

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

The applicants note that they expect to rebuild in the next building season (Spring 2019). **Affirmative finding**

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

As noted above, the applicants are still in the planning stages for the replacement structure. They are proposing demolition prior to a finalized redevelopment plan to remove the charred structure. With the building season coming to an end soon, they are planning to construct the replacement garage in the next building season (spring, 2019). **Affirmative finding**

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

Not applicable

Article 8: Parking

Sec. 8.1.8, Minimum Off-Street Parking Requirements

The parking requirement for a single family residential use in the Neighborhood Parking District is 2 spaces. The driveway is 74 ft deep before it reaches the garage, and is long enough to adequately handle 2 tandem parking spaces. **Affirmative finding**

II. Conditions of Approval

1. **Prior to issuance of a certificate of occupancy**, a zoning permit application for a replacement garage shall be submitted and approved by staff of the Planning and Zoning Department.
2. Construction of the replacement structure shall commence by June, 2019.
3. Construction hours shall be limited to Monday – Friday from 7:30 AM – 5:30 PM. No construction activity on Saturday or Sunday.
4. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required.
5. Standard Permit Conditions 1-15 shall apply.

RECEIVED

JUL 02 2018

DEPARTMENT OF
PLANNING & ZONING

- NOTE -

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

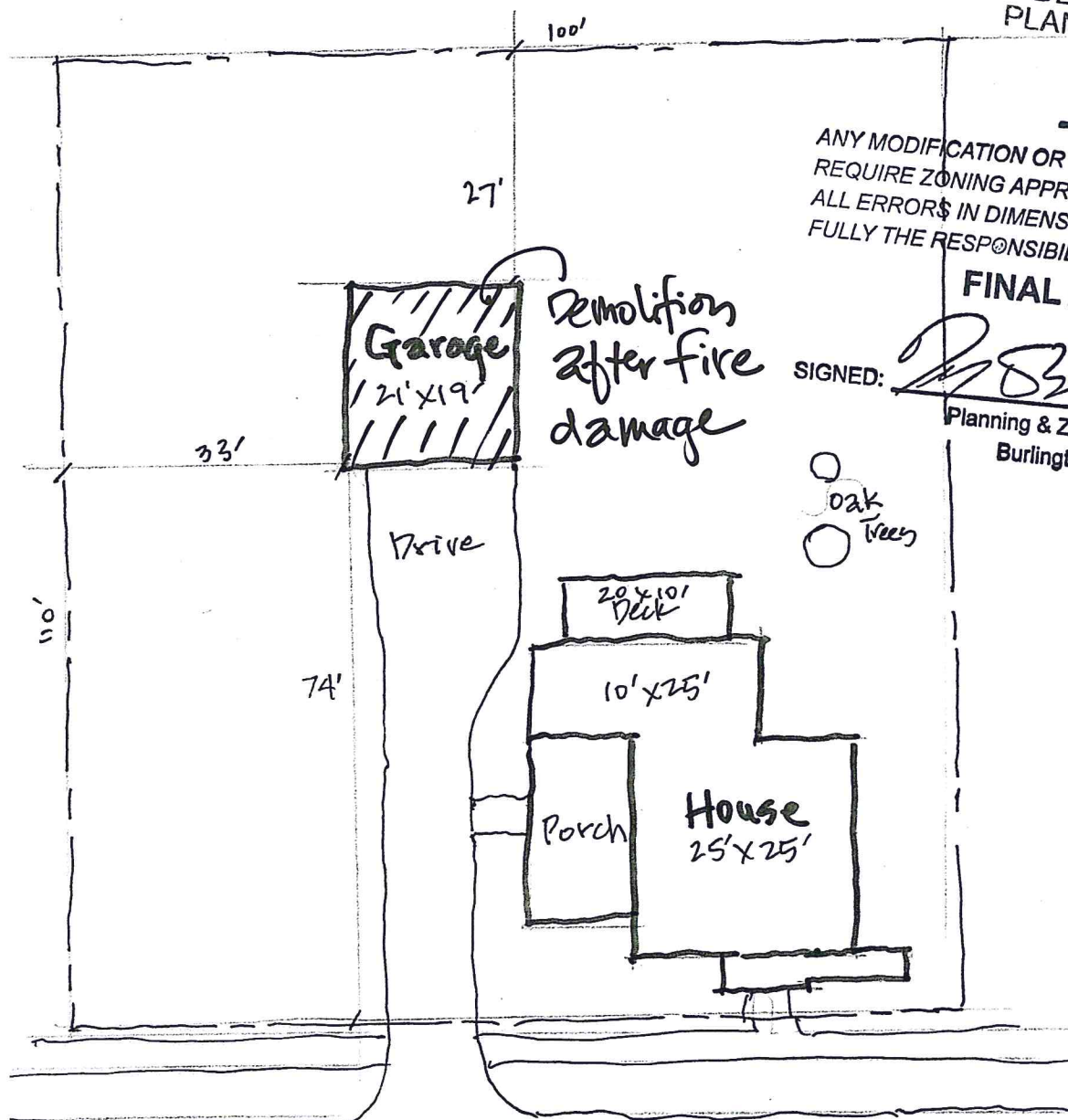
FINAL APPROVAL

SIGNED:

[Signature]

DATE:

Planning & Zoning Department
Burlington, Vermont



Clymer Street

North

2018

Ingulorud / Avildsen

SITE PLAN

50 Clymer St.

1" = 20'

Lot Coverage - 50 Clymer Street Proposed Addition 2018

RECEIVED

JUL 02 2018

DEPARTMENT OF
PLANNING & ZONING

Existing	Feet	Square Feet
House	25 X 25'	625
Garage	21 X 19	399
Driveway	18 X 22 + 42 X 10	816
Front Stoop	4 X 10 + 3 X 6	58
Ramp to Front Stoop	11 X 3	33
Back Porch	25 X 10 + 11 X 2	272
Back Stoop	4 X 6 + 2 X 3	30
Back Entry to Basement	5 X 3	15
Asphalt Walkway	31 X 2.5 + 2.5 x 12	107.5
TOTAL		2355.5

LOT SIZE	100 X 110	11,000
Existing lot Coverage		21%

Proposed	Feet	Square Feet
House	25 X 25'	625
Garage	21 X 19	399 Demolish
Driveway	18 X 22 + 42 X 10	816
Front Stoop	4 X 10 + 3 X 6	58
Ramp to Front Stoop	11 X 3	33
Proposed Addition	25 X 10	250
Proposed Porch	11 X 20	220
Proposed Deck	10 X 20	200
Walkway	3 x 6	18
TOTAL		2619

<i>Existing</i>		
Proposed Lot Coverage		24%

Remove 399 sf garage = 2220 sf/11

20.2%

Google Maps 45 Clymer St



Image capture: Oct 2014 © 2018 Google

Burlington, Vermont

Google, Inc.

Street View - Oct 2014



41 Clymer Street, c. 1926

A 2 ½-story, gable roof Colonial Revival house with cornice returns and a one-story hip porch on the front (north) facade. The primary entrance is located in the sidehall of the eaves side. A one-story, partially enclosed shed roof porch extends across the rear facade. The fenestration is 4/1 wood sash with a decorative leaded window on the lower level of the west facade. The building is clad in original wood clapboards and sits on a concrete foundation.

a. Garage, c. 1926

A 1-story, 1 bay gable roof garage with wood clapboards and an overhead door.

45 Clymer Street, c. 1926

A 2-story, Colonial Revival style jerkinhead roof house with cornice returns and a one-story enclosed flat roof porch with flared kneewall spanning the front (north) facade. The building is clad in wood shingles on the upper level and porch, with wood clapboards on the lower level. The fenestration is 4/1 wood sash on the main block and 1/1 sash within the enclosed porch.

a. Garage, c. 1980

A 1-story, 2 bay gambrel roof garage with modern overhead doors and a large rectangular opening in the gambrel end.

50 Clymer Street, c. 1930

A large, 2 ½-story Colonial Revival style house with eaves front (south) entrance and a one-story shed roof sunroom addition to the west. The primary entrance is sheltered beneath a small gable roof supported by plain squared columns. The fenestration is 1/1 replacement sash throughout and the building is clad in vinyl siding.

a. Garage, c. 1910

1 story, 2 bay hipped roof garage with original hinged wooden doors and clapboards. Garage/shed remained from an earlier structure that was replaced by the present dwelling.

Layne Darfler

From: William Reilly <wjreilly7@gmail.com>
Sent: Wednesday, September 23, 2020 1:36 PM
To: Layne Darfler
Cc: Theodore Miles
Subject: Re: Zoning Violation# 293920: 254 S. Union St.

[WARNING] External Message

Hello Layne, Ted,

Good points, clarification needed.

- The site plan submitted today matches the site plan on file (7.8.91). The area designated as above ground pool is now listed as gravel (23'X25'=575').
- The path was misidentified as a side walk on the 7.8.91 site plan. It was never a side walk and has been a path (3'x90'=270') for 30+ years.
- Adding the former pool location/gravel area (575') & path (270') to total lot coverage: $845' + 4,405' = 5,250'$
 $5,250/4,405 \times 100 = 11.9\%$ lot coverage. ~~11.9%~~ 21.6% per updated site plan
- Bedrooms are on the same floor as shown. We are not a B&B/ AirBnB, we do not serve meals. We provide bedrooms. We do however, pay state and local rooms & meals taxes. B&B is a Burlington city designation to describe short term rentals. The term B&B implies that meals are served. That is not true. We are an owner occupied residence that for 30+ years has periodically leased rooms thereby continuing the practice of previous owners going back to the early 1950's.

Hope this explains things.
(attachment)

October 26, 2020

Hello Burlington DRB board members,

I am writing at the request of my neighbors Bill Reilly and Cyn Secondi. I understand from Bill that, because of city regulations, they must document their long-standing practice of renting rooms.

Our kids grew up together and I can confirm they have rented portions of their home for as long as I lived in the South Union Street neighborhood (since 1989).

Sincerely,

Andrea Gray
153 Howard Street
Burlington

Ryan Morrison

From: William Reilly <wjreilly7@gmail.com>
Sent: Wednesday, October 28, 2020 4:51 PM
To: Ryan Morrison
Cc: Marc Wiener; csecondi@gmail.com
Subject: Re: 254 South Union Street short term rental application
Attachments: Andrea Grey.docx

[WARNING] External Message

Hello Ryan,

Thanks for the guidance.

Attached please find.

- Updated site plan highlighting the parking area
- 3 letters from neighbors confirming room rental going back more than 15 years.
 - Marc Jacobs
 - Andrea Grey
 - Polly Thompson

That should be the documentation needed. Comments and questions welcomed.

Be well, take care,

Polly Thompson

20 Westminster Terrace Bellows Falls, VT 05101

October 23, 2020

To Whom It May Concern:

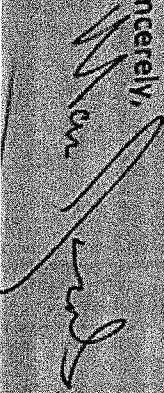
In September 1980, my husband Julian Thompson and I rented an apartment from William and Cyndie Reilly. The apartment was located in their residence at 254 S. Union St.

October 24, 2020

To Whom It May Concern:

I live at 260 South Union Street and have been a neighbor of Bill and Cyndie Reilly since 1994. I can confirm they have rented rooms since at least 1992 when I purchased 260 South Union Street. Years ago, it was not at all unusual for young families owning houses in this neighborhood to rent out rooms to defray the cost of owning homes.

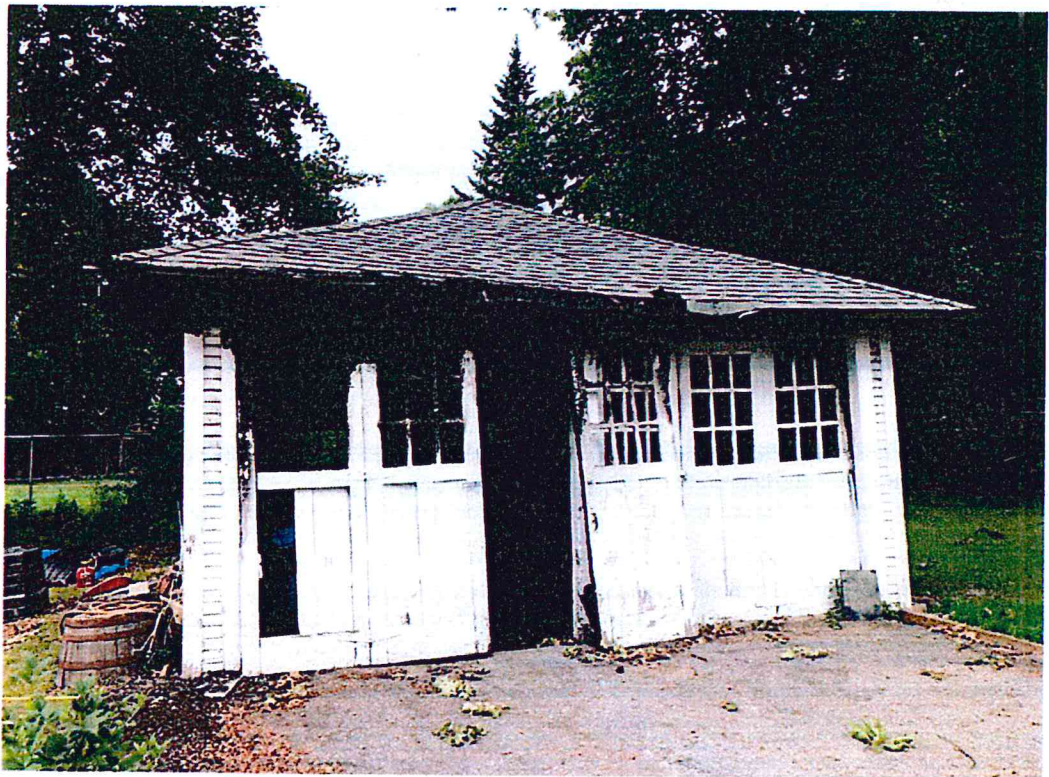
Sincerely,



William Reilly
254 South Union Guest House
Burlington, VT 05401
www.254southunion.com
802-522-0031



Limited Asbestos Site Inspection



**50 Clymer Street
Burlington, Vermont**

Conducted on Behalf of:

Eric Avildsen
50 Clymer Street
Burlington, Vermont 05401

September 18, 2018

Alderson project #18VT131



September 18, 2018

Eric Avildsen
50 Clymer Street
Burlington, Vermont 05401

Re: Limited sampling for suspect asbestos containing building materials from the exterior of the fire damaged, detached garage at the residence located at 50 Clymer Street Burlington, Vermont

Dear Eric:

Enclosed is documentation related to limited asbestos sampling activities performed by Alderson, Inc. on Monday September 10, 2018 from the exterior of the fire damaged, detached garage at the residence located at 50 Clymer Street Burlington, Vermont. Sampling activities were performed prior to any renovation / demolition activities.

On Monday September 10, 2018, Alderson collected eight (8) bulk samples of suspect asbestos containing materials. All bulk samples were submitted to a federally accredited analytical service, and analyzed by Polarized Light Microscopy (PLM) (Visual Estimation Method) according to EPA Method 600/R-93/116. Identification of asbestos by PLM is based on optical crystallographic properties, and gives a qualitative differentiation between types of asbestos and other fibrous materials. It also allows for a quantitative estimate of percent asbestos using EPA approved methods.

NOTICE

Some suspect materials may be present in locations that were not visible and / or accessible to the inspector. In the event materials not identified in this report are discovered during renovation / demolition activities, the discovered materials must be presumed as containing asbestos and treated accordingly.

Alderson, Inc. is not responsible for any conclusions or interpretations made by a third-party vendor that contracts with or acts on behalf of the Owner on the basis of the information made available by the Owner or Alderson, Inc.

The Bulk Sample Analysis Inventory, Inventory of Asbestos Containing Materials, Analytical Service Bulk Sample Report and Alderson's certification information are attached to this report.

Thank you for the opportunity to service your professional environmental management needs. If you have any questions concerning this inspection report, please contact us at (802) 660-8899.

Sincerely,


Charles A. Catlett
President
Alderson, Inc.

Creating
Environ

ALDERSON
266 Pine
P.O. Box 4
Burlington
05402
P 802-660-8899
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W alderso

Asbestos Inspection Report
In order to confirm asbestos containing materials
50 Clymer Street
Burlington, Vermont

September 18, 2018
Alderson, Inc.



Inventory of Confirmed Asbestos Containing Materials

Homogenous Area and Sample #	Material Type	Material Condition	Material Location	Analytical Result	Approximate Quantity
East exterior #091018-7	Window glazing	Damaged	Northeast exterior window of garage	Positive for asbestos 2% Chrysotile	3 square feet

50 Clymer Street
Burlington, Vermont

Courtesy of: Alderson, Inc.
September 18, 2018
Page 1 of 1

Inventory of Bulk Samples Collected / Asbestos Findings

Sample Number	Homogeneous Area	Material Type	% Fibrous	% Non-Fibrous	Asbestos % Type
091018-1	Exterior	Asphalt roofing	20% Glass	80% Non-fibrous	NAD
091018-2	Exterior	Asphalt roofing	20% Glass	80% Non-fibrous	NAD
091018-3	West exterior	Window glazing		100% Non-fibrous	NAD
091018-4	West exterior	Window glazing		100% Non-fibrous	NAD
091018-5	North exterior	Window glazing		100% Non-fibrous	NAD
091018-6	North exterior	Window glazing		100% Non-fibrous	NAD
091018-7	East exterior	Window glazing		98% Non-fibrous	2% Chrysotile
091018-8	East exterior	Window glazing		100% Non-fibrous	NAD

Note: Asbestos containing materials are greater than 1% asbestos. Trace is considered less than 1% asbestos.

**EMSL Analytical, Inc.**

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

http://www.EMSL.com / cinnaslab@EMSL.com

EMSL Order: 041827494**Customer ID:** ABID50**Customer PO:****Project ID:****Attention:** Chuck Catlett
Alderson, Inc.
266 Pine Street
Burlington, VT 05402**Phone:** (802) 660-8899**Fax:** (802) 660-1977**Received Date:** 09/11/2018 9:30 AM**Analysis Date:** 09/15/2018**Collected Date:** 09/10/2018**Project:** 50 Clymer Street**Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy**

Sample	Description	Appearance	% Fibrous	<u>Non-Asbestos</u> % Non-Fibrous	<u>Asbestos</u> % Type
091018-1 041827494-0001	Exterior Asphalt - Roofing	Gray/Black Fibrous Homogeneous	20% Glass	80% Non-fibrous (Other)	None Detected
091018-2 041827494-0002	Exterior Asphalt - Roofing	Gray/Black Fibrous Homogeneous	20% Glass	80% Non-fibrous (Other)	None Detected
091018-3 041827494-0003	Exterior Window W - Glazing	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091018-4 041827494-0004	Exterior Window W - Glazing	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091018-5 041827494-0005	Exterior Window N - Glazing	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091018-6 041827494-0006	Exterior Window N - Glazing	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091018-7 041827494-0007	Exterior Window E - Glazing	Tan Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
091018-8 041827494-0008	Exterior Window E - Glazing	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Report Comment: Cert #PB303220(BV) - Cert #PB795502(SS)

Analyst(s)Benjamin Verghese (4)
Seri Smith (4)
Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 09/15/2018 13:41:36

ASBESTOS ABATEMENT ENTITY

ALDERSON INC.
P.O BOX 484, 266 PINE STREET
BURLINGTON, VT 05402

Vermont Department of Health
Environmental Health
P.O. Box 70 - Drawer 30
Burlington, VT 05402-0070

LICENSE: AE474000

EXPIRES: Monday, March 04, 2019

CERTIFICATE OF LICENSE
VERMONT ASBESTOS REGULATORY PROGRAM

THIS CERTIFICATE SHALL REMAIN IN FORCE UNTIL THE EXPIRATION DATE UNLESS REVOKED
OR VOIDED BEFORE THAT TIME.
THIS CERTIFICATE IS NOT TRANSFERABLE AND IS VALID ONLY FOR THE ABOVE PARTY.

COPY OF THIS CERTIFICATE MUST BE ON SITE AT ALL TIMES.

ASBESTOS CONSULTING ENTITY

ALDERSON INC.
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BURLINGTON, VT 05402

Vermont Department of Health
Environmental Health
P.O. Box 70 - Drawer 30
Burlington, VT 05402-0070

LICENSE: CE474000

EXPIRES: Monday, March 04, 2019

CERTIFICATE OF LICENSE
VERMONT ASBESTOS REGULATORY PROGRAM

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OR VOIDED BEFORE THAT TIME.
THIS CERTIFICATE IS NOT TRANSFERABLE AND IS VALID ONLY FOR THE ABOVE PARTY.

COPY OF THIS CERTIFICATE MUST BE ON SITE AT ALL TIMES.

ASBESTOS INSPECTOR/MANAGEMENT PLANNER

CHARLES A. CATLETT
27 FERGUSON AVENUE
BURLINGTON, VT 05401

Vermont Department of Health
Environmental Health
P.O. Box 70 - Drawer 30
Burlington, VT 05402-0070

LICENSE: MP205956

EXPIRES: Monday, February 25, 2019

CERTIFICATE OF LICENSE
VERMONT ASBESTOS REGULATORY PROGRAM

THIS CERTIFICATE SHALL REMAIN IN FORCE UNTIL THE EXPIRATION DATE UNLESS REVOKED
OR VOIDED BEFORE THAT TIME. THIS CERTIFICATE IS NOT TRANSFERABLE AND IS VALID ONLY
FOR THE ABOVE PARTY.

COPY OF THIS CERTIFICATE AND PHOTO ID CARD MUST BE ON SITE AT ALL TIMES.

Department of Planning and Zoning

149 Church Street

Burlington, VT 05401

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

Telephone: (802) 865-7188

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David E. White, FAICP, Director
Meagan Tuttle, AICP, Comprehensive Planner
Jay Appleton, Senior GIS/IT Programmer/Analyst
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, Associate Planner
Layne Darfler, Planning Technician
Shaleigh Draper, Planning & Zoning Clerk



TO: Development Review Board
FROM: Ryan Morrison
DATE: October 2, 2018
RE: 19-0170SD/CU; 1288 North Avenue

=====

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: RL Ward: 7N

Owner/Representative: 1288 North Ave LLC

Request: Combined preliminary & final plat review to subdivide existing lot into two lots. Retain the duplex on Lot 1 and construct a duplex and related site improvements on Lot 2.

Applicable Regulations:

Article 3 (Applications, Permits and Project Reviews), Article 4 (Zoning Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Review Standards), Article 8 (Parking), Article 10 (Subdivision Review)

Background Information:

The applicant is seeking combined preliminary and final plat approval to subdivide an existing lot into two lots. The 59,677 sq ft property contains a duplex and a garage/barn. The proposed subdivision will result with the existing duplex and garage/barn situating on Lot 1, and the proposed duplex situating on Lot 2. There are no accessory structures proposed on Lot 2 at this time.

The proposal has been forwarded to the City Engineer's office, to the Burlington Fire Marshal, to the Director of the Parks & Recreation Department, to Burlington Electric, and to the Burlington School District as required. Comments from the City Engineer and the Fire Marshal have been received.

The City Engineer provided the following comments:

- A separate sewer service is required. Chapter 26-71 states: *A separate and independent building sewer shall be provided for every building; except where one (1) building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the front building may be extended to the rear building and the whole considered as one (1)*

building sewer, but the city does not and will not assume any obligation or responsibility for damage caused by or resulting from any such single connection.

- Lot #2-Sheet PL1-OF-1, the plan set indicates the proposed lot will only have 3 corners established, corner points “10”, “1”, and “3”. The proposed parcel should have monumenting on all four corners.
- Driveway easement for Lot #2 needs to be noted in the deeds for Lot #1 and Lot #2.

The Fire Marshal provided the following comments:

- As the front doors of the proposed duplex dwelling unit, as drawn, are less than 50 feet from the designated fire department access road off North Avenue, a sprinkler requirement will not be applied, at this time based on the submitted plans, to the structure under NFPA 1 Chapter 18 (Fire Department Access and Water Supply). Should the existing barn on Lot #1 be converted to residential use in the future, a sprinkler system will be required under the fire code in existence at that time (NFPA 1 Chapter 18, as previously noted).
- Future construction shall comply with the governing code set(s) adopted by the State of Vermont and City of Burlington at the time of construction.

Previous zoning actions for this property are noted below.

- **Zoning Permit 18-0567CU**; convert single family dwelling to a duplex. Approved January 17, 2018.
- **Zoning Permit 18-0765CA**; replacement windows. Approved April 10, 2018.
- **Non-Applicability of Zoning Permit 18-0761NA**; add 3rd bedroom to living room/kitchen area. Approved March 9, 2018.

Recommendation: **Consent Approval** as per, and subject to, the findings and conditions below:

I. Findings

Article 3: Applications, Permits and Project 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 according to Section 3.3.4.

Impact fees shall apply. The fees will be based on the net new square footage of the building. The total living space of the proposed duplex is 1,841 sf. **Affirmative finding as conditioned**

Section 3.3.8 Time and Place of Payment

(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: Conditional Use and Major Impact Review

Section 3.5.6 Review Criteria

(a) Conditional Use Review Standards

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

1. *Existing or planned public utilities, facilities, or services are capable of supporting the proposed use in addition to the existing uses in the area;*

The addition of a new duplex will have minimal impact on public utilities, facilities and services. A letter of confirmation from DPW will be required to assure adequate water and sewer capacity. Additionally, the proposal triggers the need for a state wastewater permit. **Affirmative finding as conditioned**

2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the Municipal Development Plan;*

The property is within an established residential neighborhood and a residential zoning district. The RL zoning district is intended primarily for low-density residential development in the form of single detached dwellings and duplexes. This district is typically characterized by a compact and cohesive residential development pattern reflective of the respective neighborhoods' development history. The MDP provides the following support:

- *Support the development of additional housing opportunities within the city...* (MDP, Housing Plan, Page IX-1.
- *Support the creation of new rental and owner-occupied housing on every parcel of land in Burlington that is zoned for residential development at the number of units allowed by zoning.* (MDP, Housing Plan, Page IX-12.) **Affirmative finding**

3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*

No significant impacts are anticipated. **Affirmative finding**

4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation, safety for all modes; and adequate transportation demand management strategies;*

This parcel fronts on North Avenue, a classified major street. Bus stops exist along North Avenue to the north and south of the subject property, both under 250 ft away. Sidewalks on both sides of North Avenue provide pedestrian access between the subject property and the surrounding neighborhood. Traffic impacts are expected to be minimal. **Affirmative finding**

5. *The utilization of renewable energy resources;*
Nothing within the application prevents the use of wind, solar, water, geothermal or other renewable energy resource. **Affirmative finding**
and;
6. *Any standards or factors set forth in existing City bylaws and city and state ordinances.*
The applicant will be required to secure a state wastewater permit, and any associated trades permits for construction. **Affirmative finding as conditioned**

(c) Conditions of Approval

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

1. *Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area;*
The applicants note that they will be installing landscaping around the new duplex. The plans will need to be revised to include the proposed landscaping. **Affirmative finding as conditioned**
2. *Time limits for construction.*
There is a two-year time frame to complete the project. **Affirmative finding**
3. *Hours of operation and/or construction to reduce the impact on surrounding properties.*
Typical work construction hours are Monday – Friday from 7:30 AM – 5:30 PM. Saturday construction may occur for interior work only. No construction activity on Sunday. **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 additional physical alteration or change of use will require review and approval under 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.*
None identified. It is the applicant's obligation to secure any additional permits (from state or federal offices) as required. **Affirmative finding**

Article 4: Zoning Maps & Districts

Sec. 4.4.5, Residential Districts:

(a) Purpose

(1) Residential Low Density (RL)

The RL district is intended primarily for low-density residential development in the form of single detached dwellings and duplexes. The district is typically characterized by a compact and cohesive residential development pattern of the respective neighborhood's development history.

The property is located in the RL zone. The subdivision will result in the existing duplex and garage/barn situating on Lot 1, and a new duplex situating on Lot 2. Both lots will exceed 10,000 sf in size (Lot 1: 45,302 sf and Lot 2: 14,375sf), and are large enough for duplexes.

Affirmative finding

(b) Dimensional Standards & Density

The minimum lot size in the RL zone is 6,000 sf for a single family use, and 10,000 sf for a duplex use. Both lots will exceed 10,000 sf and will comply with the minimum lot size requirement for duplex uses.

Lot 1:

$45,302 / 43,560 \text{ (acre)} = 1.04 \text{ acres}$

$2 \text{ units} / 1.04 = 1.9 \text{ units}$; less than the 7 unit/acre limitation

Lot 2:

$14,375 / 43,560 \text{ (acre)} = 0.33 \text{ acres}$

$2 \text{ units} / 0.33 = 6.06 \text{ units}$; less than the 7 unit/acre limitation

Minimum lot frontage is 60 ft. Proposed Lot 1 will have 72 ft of frontage, and Lot 2 will have 60 ft of frontage.

Building setbacks of the RL zone require: a front yard setback to be the average of 2 adjacent lots on both sides, +/- 5 feet; a side yard setback of 10% of lot width; and a rear yard setback of 25% of lot depth. The average setback for Lot 2, based on the neighboring 4 homes (2 on either side), is 18'. This results in a front yard setback range of 13' – 23'. The duplex will be setback 18' from the front property line. The new duplex will have 6' side yard setbacks on both sides, which equates to 10% of the lot width. A rear setback of 168' will far exceed the minimum 61' setback requirement.

Lot coverage information has not yet been provided. The applicant states that lot coverage will be far below the 35% allowance. According to the plans, Lot 1's lot coverage percentage will be quite low. Lot 2 will have a higher lot coverage, but it does not appear that it will exceed the 35% maximum allowance. Prior to release of the zoning permit, lot coverage calculations will need to be submitted, reviewed and approved by Planning and Zoning staff.

The building height of the proposed duplex will be 28' 2" to the midpoint of the sloped roof, well enough below the 35 ft limit. **Affirmative finding as conditioned**

(c) Permitted & Conditional Uses

Duplexes in the RL zone are conditional uses. **Affirmative finding**

(d) District Specific Regulations

1. Setbacks

A. Encroachment for Residential Driveways

Not applicable

B. Encroachment into the Waterfront Setback
Not applicable

2. Height

A. Exceptions in the Waterfront RM District
Not applicable

3. Lot Coverage

A. Exceptions for Accessory Residential Features
Not applicable

4. Accessory Residential Structures and Uses

An accessory structure and/or use as provided under Sec. 5.1.1 and 5.1.2 customarily incidental and subordinate to a principal residential use, including but not limited to private garages, carriage houses, barns, storage sheds...

Not applicable. No new accessory structures are proposed.

5. Residential Density

Not applicable

6. Uses

Not applicable

7. Residential Development Bonuses

Not applicable

Article 5: Citywide General Regulations

Sec. 5.2.2, Required Frontage of Access

The existing lot has 132 ft of frontage on North Avenue. After the subdivision, both lots will continue to have frontage on North Avenue. Lots 1 and 2 will share the existing driveway that currently serves the property. The driveway is mostly situated on what will become Lot 1. The subdivision plan identifies the shared driveway on Lot 1 within an access easement. **Affirmative finding**

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.5 (b) above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable. The existing lot is 59,677 sq. ft. (less than 2 acres).

Sec. 5.2.5, Setbacks

See Sec. 4.4.5 (b) above. Additionally, Sec. 5.2.5 (b) 6 exempts common or shared driveways along property lines from setback requirements. **Affirmative finding**

Sec. 5.2.6, Building Height Limits

See Sec. 4.4.5 (b) above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See Sec. 4.4.5 (b) above.

Sec. 5.5.1, Nuisance Regulations

Nothing in the proposal appears to constitute a nuisance under this criterion. **Affirmative finding**

Sec. 5.5.2, Outdoor Lighting

Lighting fixture spec sheets have been provided, and the elevation drawings show the location of the proposed fixtures. The fixtures comply with the lighting standards of this section.

Affirmative finding

Sec. 5.5.3, Stormwater and Erosion Control

An Erosion Prevention and Sediment Control Plan was submitted to the Stormwater Program Manager. Prior to release of this permit, the plan must be approved. **Affirmative finding as conditioned**

Article 6: Development Review Standards:

Part 1, Land Division Design Standards

Sec. 6.1.2, Review Standards

(a) Protection of important natural features

The subdivision itself will have no impact on important natural features. **Affirmative finding**

(b) Block size and arrangement

Not applicable.

(c) Arrangement of Lots

The proposed subdivision will split the existing lot lengthwise into two lots. Both lots will front on North Avenue. Lot sizes along this stretch of North Avenue vary widely. **Affirmative finding**

Interior lot lines extending from a street should be perpendicular or radial to the street right-of-way line to the greatest extent possible.

While Lot 2 only goes back so far within the overall property, the new property line dividing Lot 1 from Lot 2 is perpendicular to North Ave. The property as it is today is 455 ft deep. Lot 2 will be 245 ft deep. Lot 1 will occupy the rest of the area behind Lot 2. **Affirmative finding**

(d) Connectivity of streets within the city street grid

Not applicable

(e) Connectivity of sidewalks, trails, and natural systems

Not applicable

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

The subject property contains no important natural features as identified in the Open Space Protection Plan. The back 50% of the property is wooded. There are a few small trees that will be removed that are presently located in the footprint of the new duplex. **Affirmative finding**

(b) Topographical alterations

The property is almost entirely flat. No significant topographical alteration is included in the project plans. **Affirmative finding**

(c) Protection of important public views

The subject property is not affected by any identified public view corridor. **Affirmative finding**

(d) Protection of important cultural resources

The property contains no archaeologically significant site points, nor is it located within an archaeologically sensitive area. The property is of no known historical significance. **Affirmative finding**

(e) Supporting the use of alternative energy

There is no indication that the proposed home will utilize alternative energy. Solar energy utilization is encouraged. In any event, the home will not adversely impact the actual or potential use of alternative energies by neighboring properties. **Affirmative finding**

(f) Brownfield sites

The subject property is not an identified brownfield. **Affirmative finding**

(g) Provide for nature's events

As total lot coverage will exceed 2,500 sf, a residential stormwater plan has been provided. As noted above, the city's stormwater program manager is reviewing the proposed stormwater management.

The front and rear entries into the duplex are sheltered, and ample room is available onsite for seasonal snow storage. **Affirmative finding**

(h) Building location and orientation

The proposed duplex is appropriately oriented towards the street. The building will be situated on the lot similar to other homes in the neighborhood. Ample lawn and open space will surround the home. **Affirmative finding**

(i) Vehicular access

A shared driveway providing access to Lots 1 and 2 of this subdivision will provide adequate access to both duplexes. A parking area of sufficient size for 4 parking spaces exists behind the existing duplex on Lot 1. The new duplex will have a single car garage space for each unit which, when combined with the parking/driveway area provided behind, will adequately park 4 vehicles on Lot 2. The driveway width is acceptable at 15'. **Affirmative finding**

(j) Pedestrian access

This criterion requires that a walkway connect the duplex to the public sidewalk. The site plan does not indicate such a walkway. The plans will need to be revised to include a walkway.

Affirmative finding as conditioned

(k) Accessibility for the handicapped

No handicap accessibility is evident or required with this proposal. **Affirmative finding**

(l) Parking and circulation

Four parking spaces will be provided for the new duplex in the rear (2 garage spaces and 2 exterior spaces), complete with ample turnaround space so vehicles don't have to back out onto the street. These spaces meet the minimum parking requirement of 2 spaces per dwelling unit. Circulation is simple with access provided to the surface parking spaces. **Affirmative finding**

(m) Landscaping and fences

The plans do not indicate any landscaping, and they should. The applicant notes the new duplex will have a newly established lawn area as well as shrubs and flowers typical of residences in the area. **Affirmative finding as conditioned**

(n) Public plazas and open space

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

(o) Outdoor lighting

See Sec. 5.5.2.

(p) Integrate infrastructure into the design

The applicant acknowledges that utility lines must be underground. The elevation drawing shows the utility meters on the south side of the home. The meters will need to be screened from view from the public street. The site plan will need to be revised to show the location of the trash/recycling area. This area is required to be screened from view from the public street.

Affirmative finding as conditioned

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

(a) Relate development to its environment

1. Massing, Height, and Scale

The massing, height, and scale of the proposed duplex are consistent with that of existing homes within this neighborhood. The homes come in a variety of typically suburban forms and styles. The proposed duplex will have a covered front porch entry, which will provide for a clear distinction between the first and second floor. Building openings on the front façade will break up any possibility of a blank wall. The overall height of 28' 2" is consistent with several homes in the neighborhood. **Affirmative finding**

2. Roofs and Rooflines

The duplex will have gable roof lines with a front dormer. This roof form is common in the neighborhood. **Affirmative finding**

3. Building Openings

The front doors will be protected under the front porch roof. Fenestration is appropriately scaled and placed in consistent rhythm throughout the building. **Affirmative finding**

(b) Protection of important architectural resources

There are no historically significant structures on, or near, the subject property. **Affirmative finding**

(c) Protection of important public views

See 6.2.2 (c) above.

(d) Provide an active and inviting street edge

The front doorways are clearly articulated. There are no large blank walls or expanses of roof. Fenestration and roof variations work successfully to provide an active and inviting street elevation. **Affirmative finding**

(e) Quality of materials

The proposed duplex will be clad in vinyl siding and trim. The windows will be vinyl as well. Asphalt shingles will be installed. The front and rear decks will be PT wood with vinyl clad posts. The materials proposed are of acceptable quality and durability for new construction such as this. **Affirmative finding**

(f) Reduce energy utilization

The proposed duplex must comply with the current energy efficiency standards of Burlington and the State of Vermont. **Affirmative finding as conditioned**

(g) Make advertising features complimentary to the site

Not applicable. No advertising is included in this proposal.

(h) Integrate infrastructure into the building design

The utility meters are located on the south side wall. They will need to be screened. **Affirmative finding as conditioned**

(i) Make spaces safe and secure

The proposed building must comply with the city's current egress requirements. Building entries will be illuminated. **Affirmative finding**

Article 8: Parking

Table 8.1.8-1 requires 2 parking spaces per unit in the Neighborhood Parking District. A total of 4 parking spaces will be required to accommodate the duplex. This is achieved with 2 garage parking spaces, and room for 2 exterior spaces. The paved area behind the new duplex will be wide enough and deep enough to accommodate the 2 exterior parking spaces, with more than enough back-up room. **Affirmative finding.**

Article 10: Subdivision Review

Sec. 10.1.7, Combined Preliminary and Final Plat

For subdivisions that will create fewer than five (5) lots or dwelling units, and are not otherwise subject to consideration under Major Impact Review pursuant to the provisions of Article 3, Part 5 or Planned Unit Development pursuant to the provisions of Article 11, the applicant may request, and the DRB may authorize the hearings on preliminary and final subdivision plats to be combined into a single public hearing.

In such cases, the submission requirements for final subdivision plats pursuant to Sec. 10.1.9 shall be met at the time of application, and decisions by the DRB shall be based on the project's conformance with the review criteria for both preliminary (Sec. 10.1.8(d)) and final plats (Sec. 10.1.9(d)).

The proposed subdivision is for two lots and thus qualifies to be considered in a combined hearing. **Affirmative finding**

Sec. 10.1.9, Final Plat Review

(a) Final Plat and Construction Detail Submission Requirements

6. Final Plat Specifications

This criterion requires that the final plat plan be drawn at a scale of 1" = 40', and be on sheets sized 24" x 36" with one inch margins on three sides and a two inch margin on the side to be bound. The plan is already scaled at 1" = 40'. The final plat plan will need to meet the margin size requirements. **Affirmative finding as conditioned**

(d) Review Criteria

1. The requirements of the underlying zoning district(s) and all applicable overlay district(s) as set forth in Article 4

See Article 4 of these findings.

3. The requirements of Article 5 with regard to Special Uses and Performance Standards as applicable

See Article 5 of these findings.

4. The land division and site development principles and design standards in Article 6.

See Article 6 of these findings.

Sec. 10.1.11, Recording of Final Plats

(a) Certifications and Endorsement

Prior to recording the mylar plat plan, all of the required endorsement blocks must be depicted on the plan itself and signed by the appropriate individuals. **Affirmative finding as conditioned**

II. Conditions of Approval

- 1. Within 180 days of the date of final approval**, the subdivision plat mylar, with all applicable endorsement signatures, shall be filed with the City Clerk per Sec. 10.1.11 of the Comprehensive Development Ordinance. Failure to do so shall render void the final plat approval.
- 2. Prior to the release of the permit**, lot coverage calculations for each lot shall be submitted to Planning and Zoning staff for review and approval.

3. **Prior to filing the mylar** in the city land records, the subdivision plat shall be revised to reflect the following:
 - a. Sheet size of 24" x 36" with one-inch margins on three sides and a two-inch margin on the side to be bound.
 - b. Obtain signatures for all certifications and endorsements required under Sec. 10.1.11 (a) of the Comprehensive Development Ordinance. These signature blocks shall be included on the final plat plan.
4. **Prior to the release of the zoning permit**, the site plan shall be revised to include:
 - a. A walkway between the new duplex and the sidewalk.
 - b. The location of trash and recycling storage.
 - c. All landscaping proposed around the duplex.
5. Utility lines to the new duplex shall be underground and the utility meters shall be sufficiently screen from view from the public street.
6. **Prior to the release of the zoning permit**, the applicant shall secure a letter of adequate capacity from DPW for water and sewer services.
7. **Prior to the release of the zoning permit**, the EPSC plan shall be reviewed and approved by the Stormwater Program Manager.
8. At least **7 days prior to the issuance of a certificate of occupancy**, the applicant shall pay to the Planning & Zoning Department the impact fee as calculated by staff based on the net new square footage of the proposed development.
9. Construction hours shall be limited to Monday – Friday from 7:30 AM – 5:30 PM. Saturday construction may occur for interior work only. No construction activity on Sunday.
10. The occupancy of both dwelling units is limited to members of a family as defined in Article 13.
11. A state wastewater permit will be required, and is the responsibility of the applicant to secure.
12. Any additional physical alteration or change of use will require review and approval under regulations in effect at that time.
13. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required.
14. Standard permit conditions 1-15.





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DEC 12 2019

BURLINGTON
PERMITTING & INSPECTION

Parking Management Plan

Request for Waiver from Parking Requirements

Submitted by Alan Perry on December 12, 2019 with Zoning Permit Application.

My plan is to turn a 4 unit apartment building into 5 units. The main reason for this change is to reduce noise and the "party" atmosphere that comes with a 4-5 bedroom apartment. My hopes are to make quieter, safer living conditions for the other units and the neighborhood.

With this proposal, there would be a need for 10 parking spaces to accommodate the 5 units. Currently there are 9 parking spaces (see attached lot sketch). I am requesting a waiver for the 1 parking space short of the required 10.

The existing 5 bedroom unit will become a 3 bedroom and a 1 bedroom. My thought is that the one bedroom would have 1 space available to park. This would leave 8 spaces for the remaining 4 units.

There is also a bus stop (refer to sketch for location) at the sidewalk next to the building. This could attract future tenants without vehicles that use public transit.

Respectfully submitted,



Alan Perry

Scott Gustin

From: Norm Baldwin
Sent: Thursday, September 20, 2018 2:14 PM
To: Scott Gustin
Cc: Steve Roy; Megan Moir
Subject: 1288 North Avenue Sub-Division Review.

Scott,

here are the things that I have identified in consultation with Steve Roy and Megan Moir.

- Separate Sewer Service required-

Chapter 26-71 (r) states:

A separate and independent building sewer shall be provided for every building; except where one (1) building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the front building may be extended to the rear building and the whole considered as one (1) buildingsewer, but the city does not and will not assume any obligation or responsibility for damage caused by or resulting from any such single connection.

- Lot #2-Sheet PL1-OF-1 the plan set indicates the proposed lot will only have 3 corners established, corner points "10", "1", and "3". The proposed parcel should have monumenting on all four corners,
- Driveway easement for Lot #2 needs to be noted in the deeds for Lot #1 and Lot #2.

I have copied Steve Roy on this email.

Norman J. Baldwin, P.E.
City Engineer/Ass't Director
Burlington Public Works Department
645 Pine Street
Burlington, Vermont 05401

V: 802.865.5826
F: 802.863.0466
EMAIL: nbaldwin@burlingtonvt.gov

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.

Scott Gustin

From: Barry Simays
Sent: Friday, September 14, 2018 3:53 PM
To: Scott Gustin
Subject: 1288 North Ave subdivision review

Scott,

I have reviewed the sheets you provided re: the 2 – lot subdivision proposal at 1288 North Avenue. As the front door of the proposed duplex dwelling unit as drawn are less than 50 feet from the designated fire department access road on North Avenue, I will not apply a sprinkler requirement to that proposed structure under NFPA 1 Chapter 18 (Fire Department Access and Water Supply) at this time based on the submitted plans. Should the existing barn in the rear of Lot #1 be converted to residential use in the future, a sprinkler system will be required under the fire code in existence at that time (NFPA 1 Chapter 18, as noted previously).

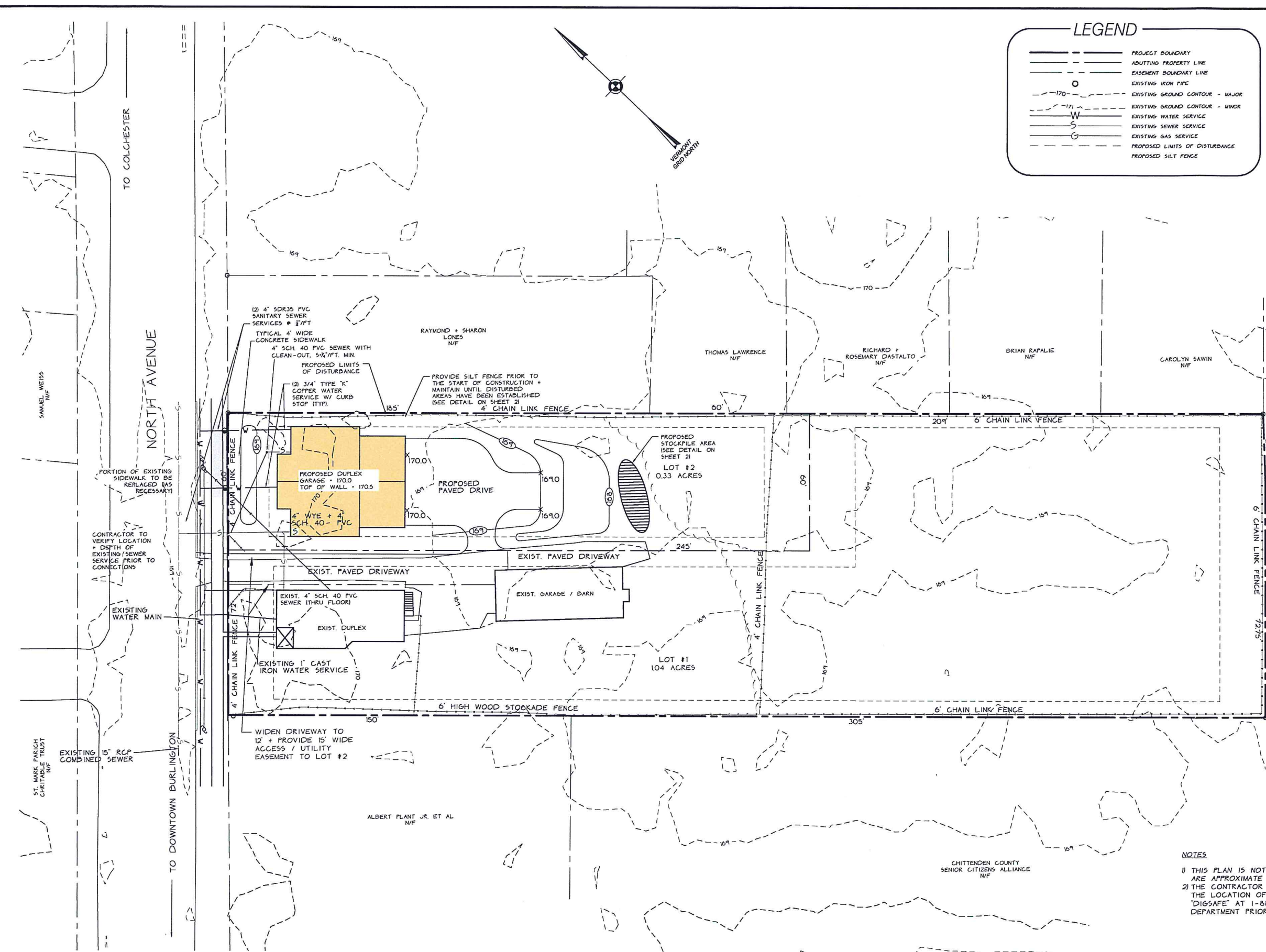
Future construction shall comply with the governing code set(s) adopted by the State of Vermont and City of Burlington at the time of construction.

I have reviewed the submitted plan set dated 7/22/2018 from O’leary-Burke with respect to Fire Department Access and Water Supply, and have no additional comments for this project.

Thank you,

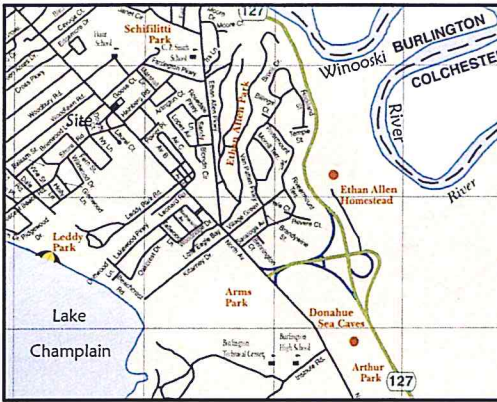
BC Barry Simays, *CFPS, CFI, IAAI-FIT*
Fire Marshal
Burlington Fire Department
132 North Avenue
Burlington, VT 05401
(802) 864-5577
(802) 658-7665 (Fax)
bsimays@burlingtonvt.gov

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.



LEGEND

- PROJECT BOUNDARY
- ADJOINING PROPERTY LINE
- EASEMENT BOUNDARY LINE
- EXISTING IRON PIPE
- EXISTING GROUND CONTOUR - MAJOR
- EXISTING GROUND CONTOUR - MINOR
- EXISTING WATER SERVICE
- EXISTING SEWER SERVICE
- EXISTING GAS SERVICE
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED SILT FENCE



Location Plan
n.t.s.

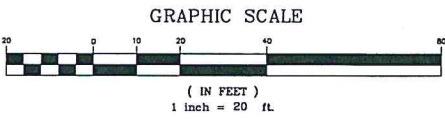
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PLANNING & ZONING

PARCEL INFORMATION:

PARCEL SIZE: 137 ACRES
BOOK 1381, PAGE 278; SPAN# 114-035-1483
CURRENT USE: DUPLEX (TO BE RETAINED ON LOT #1)
ZONED: RL DISTRICT
MIN. LOT SIZE: 6,000 SF.
MIN. LOT FRONTAGE: 60 FT.
MIN. SETBACKS:
FRONT YARD: AVG. OF 2 ON EITHER SIDE +/- 5' - 18' +/- 5' - 13' - 23'
SIDE YARD: 10% OF LOT WIDTH
REAR YARD: 25% OF LOT DEPTH OR 20'
PROPOSAL: TWO (2) LOT SUBDIVISION, RETAIN EXISTING DUPLEX ON LOT #1 AND PROPOSE A DUPLEX FOR LOT #2. THE PROPOSED DUPLEX WILL REQUIRE CONDITIONAL USE APPROVAL.

NOTES

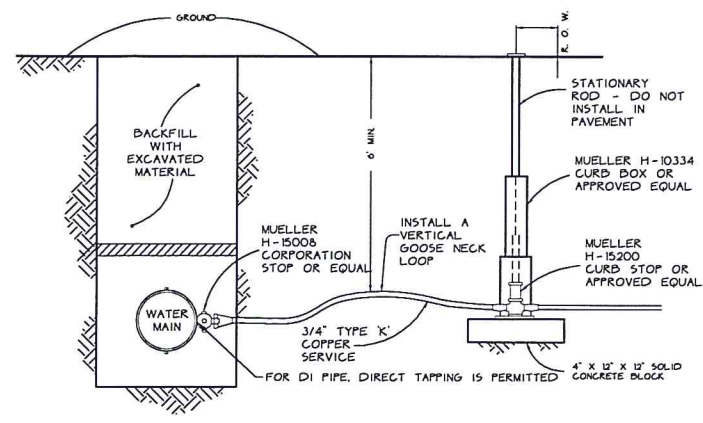
- 1) THIS PLAN IS NOT TO BE USED FOR PROPERTY CONVEYANCE. EXTERIOR DIMENSIONS ARE APPROXIMATE AND SHOULD NOT BE CONSIDERED A BOUNDARY SURVEY.
- 2) THE CONTRACTOR SHALL CONTACT ALL UTILITIES BEFORE EXCAVATION TO VERIFY THE LOCATION OF ANY UNDERGROUND LINES. THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-344-7233 AND THE CITY OF BURLINGTON PUBLIC WORKS DEPARTMENT PRIOR TO ANY EXCAVATION.



Owner & Applicant
1288 NORTH AVENUE, LLC.
C/O RICH GARDNER
875 ROOSEVELT HIGHWAY
COLCHESTER, VT 05446

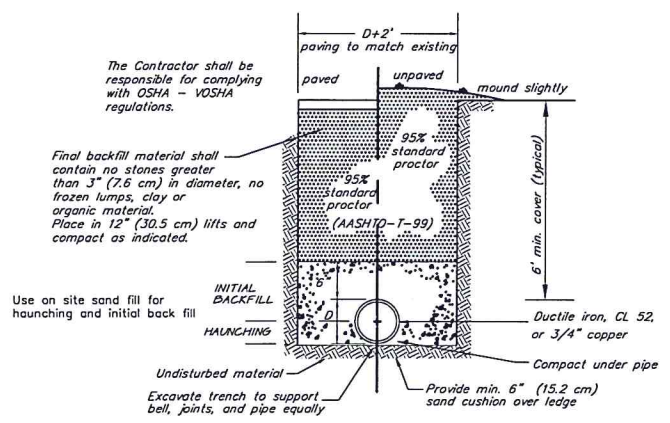
DATE	REVISION	BY
SURVEY OBCA	☐ RECORD DRAWING ☐ PRELIMINARY	DATE
DESIGN OBCA	☒ FINAL ☐ SKETCH/CONCEPT	DATE
DRAWN GHT/DWB		DATE
EXERCISE DWB		DATE
SCALE 1" = 20'		DATE

O'LEARY-BURKE CIVIL ASSOCIATES, PLC		1288 NORTH AVENUE BURLINGTON, VT
13 Corporate Drive 15803 LCT, VT PHONE: 878-9990 FAX: 878-9990		
2 LOT SUBDIVISION		
SUBDIVISION PLAN		



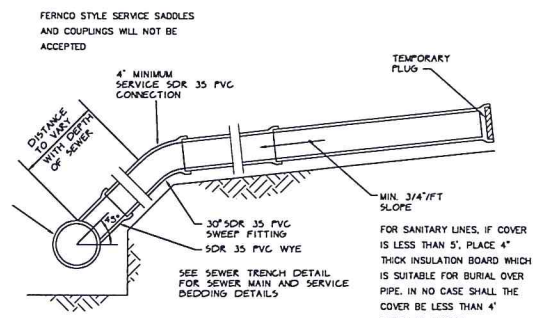
WATER SERVICE DETAIL

NTS



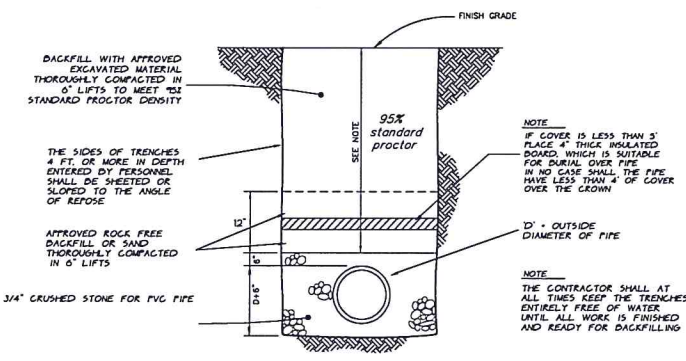
TYPICAL WATER TRENCH DETAILS

N.T.S.



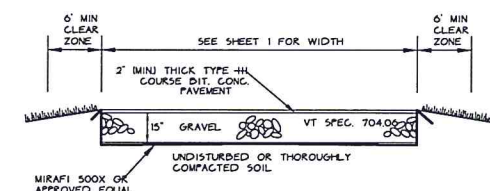
SANITARY SEWER SERVICE CONNECTION

NTS



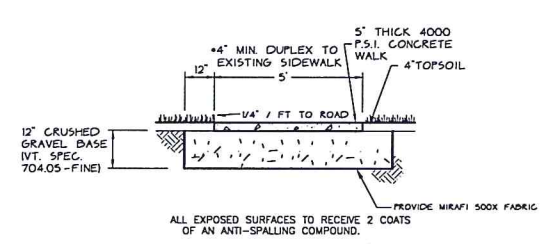
SEWER SERVICE TRENCH DETAIL

NTS



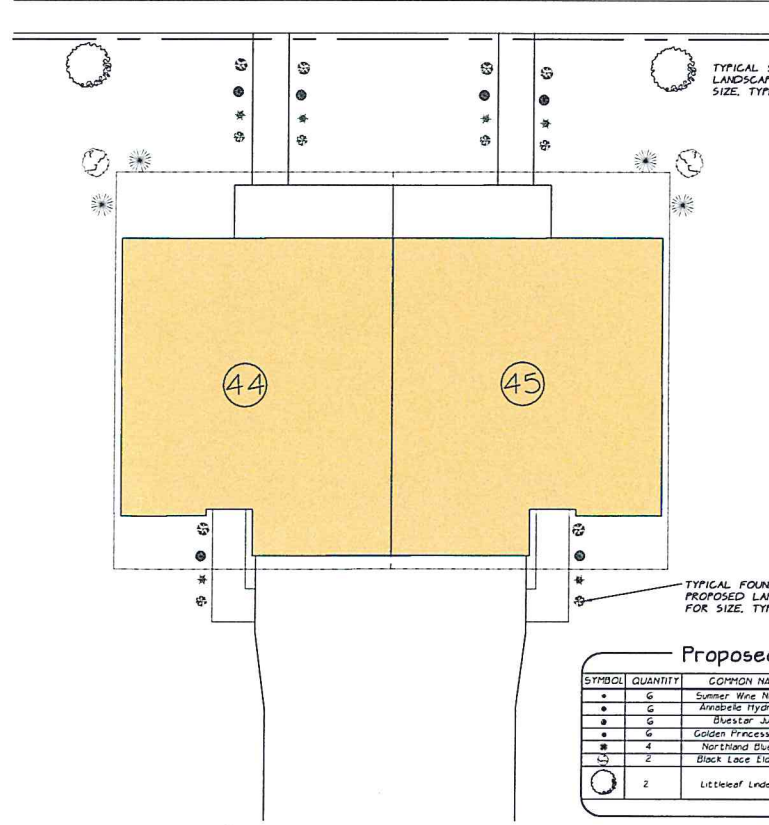
DRIVEWAY DETAIL

NTS



TYPICAL SIDEWALK SECTION

NTS

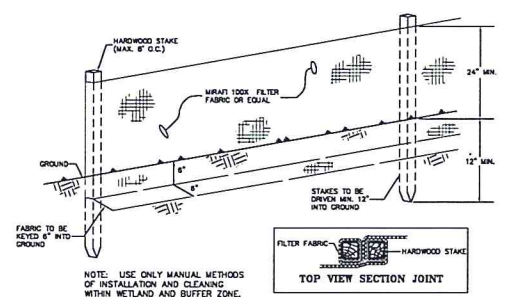


LOT #2 PLANTING PLAN

SYMBOL	QUANTITY	COMMON NAME	BOTANICAL NAME	SIZE	COST
•	6	Summer Wine Nectar	Physocarpus	5 gal	\$60 ea / \$360
•	6	Annabelle Hydrangea	Hydrangea	5 gal	\$60 ea / \$360
•	6	Bluestar Juniper	Juniperus Sabina	5 gal	\$60 ea / \$360
•	6	Golden Princess Spruce	Spruce	5 gal	\$60 ea / \$360
•	6	Northland Blueberry	Vaccinium	5 gal	\$60 ea / \$360
•	6	Black Lace Elderberry	Sambucus	5 gal	\$60 ea / \$360
•	2	Littleleaf Linden	Tilia cordata	2.5' Caliper	\$400 Each / \$800
				Total	\$2,600

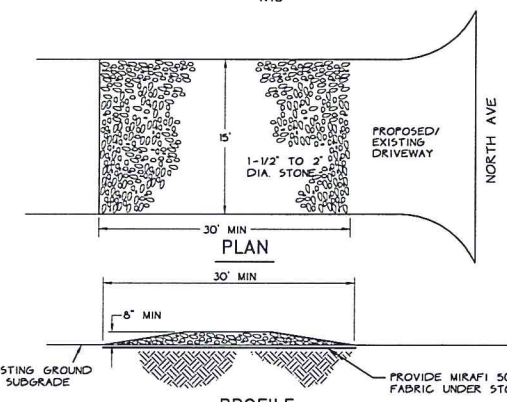
EROSION CONTROL SPECIFICATIONS

- SEE OTHER DRAWINGS OF THESE PLANS FOR ADDITIONAL STORMWATER AND EROSION CONTROL SPECIFICATIONS AND DETAILS.
- THE DRIVEWAY AND YARD FINISH GRADE SLOPES SHALL NOT BE STEEPER THAN 3 ON 1. THE FINISHED GRADE SLOPES SHALL BE IMMEDIATELY GRADED AND MULCHED.
- ALL DISTURBED AREAS SHALL BE STABILIZED WITH SEEDING AND MULCHING PRIOR TO NOVEMBER 1 OF EACH YEAR. ANY DISTURBED AREAS OUTSIDE OF THE ROADWAY SHALL BE IMMEDIATELY SEEDING AND MULCHED WITHIN 14 DAYS.
- THE EROSION CONTROL METHODS USED DURING CONSTRUCTION OF THE DEVELOPMENT SHALL PROCEED IN THE FOLLOWING SEQUENCE:
 - THE CONTRACTOR SHALL INSTALL AND MAINTAIN CONSTRUCTION ENTRANCE, SILT FENCES, INLET PROTECTION AND OTHER EROSION CONTROL MEASURES, IF REQUIRED, AS ORDERED BY THE ENGINEER. THE EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REPAIRED AFTER EVERY RAINFALL UNTIL THE NEW IMPROVEMENTS ARE PAVED AND ALL DISTURBED AREAS HAVE BEEN GRASSED. THE REPAIR OF THE EROSION CONTROL MEASURES WILL INCLUDE REMOVING ANY SEDIMENTATION. THE SEDIMENT MAY BE PLACED AS FILL IN THE LOW AREAS, IF APPROVED BY THE ENGINEER.
 - THE TOPSOIL SHALL BE REMOVED FROM THE AREAS TO BE GRADED AND STOCKPILED. A SILT FENCE SHALL BE PLACED CONTINUOUSLY AROUND THE BOTTOM OF THE FILE.
 - IN AREAS NEAR THE NEW CONSTRUCTION, THE CONTRACTOR SHALL ENCLOSE THE TRUNKS OF TREES TO BE SAVED WITH WOODEN SNOW FENCING ALONG THE DRIFLINE TO PROTECT THE FROM INJURY.
 - THE SITE GRADING WILL THEN BE DONE. THE CONTRACTOR WILL INSTALL AND MAINTAIN INLET PROTECTION AROUND THE CATCH BASINS UNTIL THE DRIVEWAY HAS BEEN PAVED AND GRASS HAS BEEN ESTABLISHED ON THE SLOPES.
 - THE CONTRACTOR WILL TOPSOIL, SEED, AND MULCH THE DISTURBED AREAS AS SOON AS POSSIBLE FOLLOWING COMPLETION OF ADJACENT CONSTRUCTION.
 - OPEN CUT AREAS SHALL BE MULCHED OUTSIDE OF ACTUAL WORK AREAS.
- DURING CONSTRUCTION, THE PROJECT SHALL BE IN COMPLIANCE WITH THE LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL.



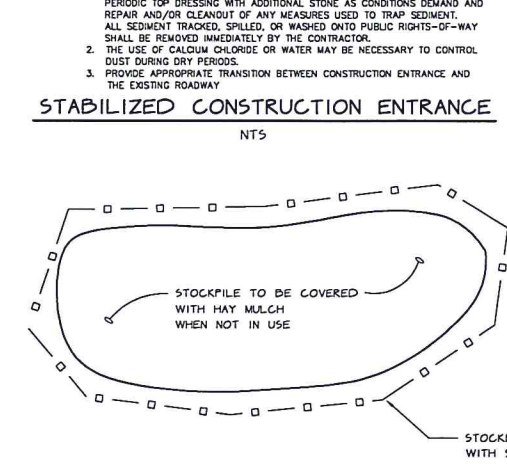
TEMPORARY SILT FENCE

NTS



STABILIZED CONSTRUCTION ENTRANCE

NTS



TEMPORARY FILL MATERIAL STOCKPILE

NTS

MULCHING SPECIFICATIONS

DISTURBED AREAS ARE TO BE MULCHED WITHIN A WEEK OF DISTURBANCE. HAY MULCH SHALL BE SPREAD UNIFORMLY OVER THE AREA AT A RATE OF TWO TONS PER ACRE OR AT A RATE THAT IS SUFFICIENT TO PROVIDE ADEQUATE COVERAGE.

WITHIN 48 HOURS OF FINAL GRADING, THE EXPOSED SOIL MUST BE SEEDED AND MULCHED.

SNOW MANAGEMENT PLAN :

FOLLOWING THE ACCUMULATION OF ANY SNOW FALL EVENT WHICH GENERATES MORE THAN 1" OF SNOW OR ICE THE SITE SHALL BE CLEARED AND ALL SNOW AND ICE STORED IN THE IDENTIFIED SNOW STORAGE AREAS ON THE EPC CONSTRUCTION PLANS. ALL SNOW STORAGE AREAS SHALL BE DOWN GRADIENT OF ANY DISTURBED AREAS AND THE STORAGE OF SNOW IN STORMWATER TREATMENT STRUCTURES IS PROHIBITED.

WINTER CONSTRUCTION REQUIREMENTS

- ALL WORK SHALL BE IN ACCORDANCE WITH THE LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL.
- PROVIDE ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- A MINIMUM 25 FT BUFFER SHALL BE MAINTAINED FROM PERIMETER CONTROLS SUCH AS SILT FENCE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROM GROUND.
- MULCH USED FOR TEMPORARY STABILIZATION MUST BE APPLIED AT DOUBLE THE STANDARD RATE, OR A MINIMUM OF 3 INCHES WITH AN 80-100 COVER.
- TO ENSURE COVER OF DISTURBED SOIL IN ADVANCE OF A MELT EVENT, AREAS OF DISTURBED SOIL MUST BE STABILIZED AT THE END OF EACH WORK DAY, WITH THE FOLLOWING EXCEPTIONS:
 - IF NO PRECIPITATION WITHIN 24 HOURS IS FORECAST, WORK WILL RESUME IN THE SAME DISTURBED AREA WITHIN 24 HOURS. DAILY STABILIZATION IS NOT NECESSARY.
 - DISTURBED AREAS THAT COLLECT AND RETAIN RUNOFF, SUCH AS HOUSE FOUNDATIONS OR OPEN UTILITY TRENCHES.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1 INCH THICKNESS.
- USE STONE TO STABILIZE AREAS SUCH AS THE PERIMETER OF BUILDINGS UNDER CONSTRUCTION OR WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED. STONE PATHS SHOULD BE 10-20 FEET WIDE TO ACCOMMODATE VEHICULAR TRAFFIC.
- IN AREAS OF DISTURBANCE THAT DRAIN TO A WATER BODY WITHIN 100 FEET, TWO ROWS OF SILT FENCE MUST BE INSTALLED ALONG THE CONTOUR.

WINTER INSPECTION SCHEDULE	AFTER A THAW OR A RAINFALL GENERATING RUNOFF FROM SITE
INSPECT SILT FENCING WITH SKI TAPE	X
INSPECT AREAS TEMPORARILY MULCHED	X
INSPECT TEMPORARY STOCKPILES	X
INSPECT STABILIZED CONSTRUCTION ENTRANCES	X
INSPECT AREAS THAT HAVE BEEN TOPSOILED + MULCHED	X
INSPECT STORMWATER SWALES, SPREADERS, OUTFLOW DEVICES	X

STUMP DISPOSAL SPECIFICATIONS

ALL SUITABLE TREES THAT MUST BE CUT WILL BE USED AS FIREWOOD. THE STUMPS, BRUSH, + EXCESS UNUSABLE EARTH WILL BE DISPOSED OF AT THE LOCATION DESIGNATED BY THE ENGINEER. CONTINGENT UPON APPROVAL FROM THE TOWN BUILDING INSPECTOR, SAID AREAS SHALL BE A MINIMUM OF TWO FEET ABOVE THE SEASONAL HIGH GROUNDWATER OR THE STUMPS SHALL BE HAULED OFF-SITE TO A STATE-APPROVED LANDFILL. IF ON-SITE STUMP DISPOSAL IS IMPLEMENTED, THE FOLLOWING GUIDELINES SHALL BE MET:

- WHENEVER POSSIBLE, STUMP DISPOSAL SITES SHOULD BE LOCATED ON NEARLY LEVEL TO MODERATELY SLOPING LANDS (SLOPES LESS THAN 12%).
- DISPOSAL SITES WILL NOT BE LOCATED IN OR WITHIN 100 FEET OF FLOWING WATERCOURSES OR STREAMS OR IN ACTIVELY ERODING GULLIES.
- DISPOSAL SITES SHALL NOT BE LOCATED IN FLOODED OR FLOOD-PRONE LANDS, MARSHES, OR OTHER AQUIFER RECHARGE AREAS.
- STUMPS WILL BE PLACED ON THE SITE IN A SINGLE LIFT PRIOR TO BACKFILLING. WHEN ADDITIONAL STUMPS ARE TO BE DEPOSITED ON THE SAME SITE, EACH SUCCESSIVE LAYER OR LIFT OF STUMPS WILL BE BACKFILLED.
- STUMPS DEPOSITED IN DRAINAGEWAYS OR DEPRESSIONS SHALL BE BACKFILLED AND REPAIRED SO AS TO DIVERT OVERLAND FLOWS FROM THE DISPOSAL AREA.
- A MINIMUM OF TWO FEET (2') OF OVERBURDEN WILL BE PLACED OVER ALL DISPOSAL SITES.
- THE TWO FEET OF OVERBURDEN WILL BE COVERED WITH A MINIMUM OF FOUR INCHES (4") OF TOPSOIL, GRADED, SEEDED, AND MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS.

EROSION AND SEDIMENT CONTROL SEQUENCING

(WINTER STABILIZATION WORK TO BE COMPLETED PRIOR TO OCTOBER 15)

- CONSTRUCTION FENCING TO BE INSTALLED TO MINIMIZE THE AREA TO BE DISTURBED.
- SILT FENCING TO BE INSTALLED AT DOWN-GRADIENT LOCATIONS TO PREVENT ANY SILT FROM EXITING SITE.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE ONTO SITE.
- EXCAVATE FOR FOUNDATION, STOCKPILE FILL AND/OR TOPSOIL AND SURROUND WITH SILT FENCING. WITHIN 24 HOURS PROVIDE MULCH OR EROSION CONTROL MATTING OVER STOCKPILES.
- INSTALL HOUSE SERVICES AND BACKFILL ALL EXCAVATIONS. PROVIDE STABILIZED WORK AREA AROUND HOUSE.
- EROSION CONTROL MEASURES TO BE INSPECTED AND MAINTAINED DURING THE CONSTRUCTION PERIOD.
- AS EARLY AS POSSIBLE IN THE SPRING, THE FINISH SITE GRADING, TOPSOILING AND SEEDING WILL BE COMPLETED. THE EROSION CONTROL MEASURES ARE TO BE MAINTAINED UNTIL GRASS IS ESTABLISHED.

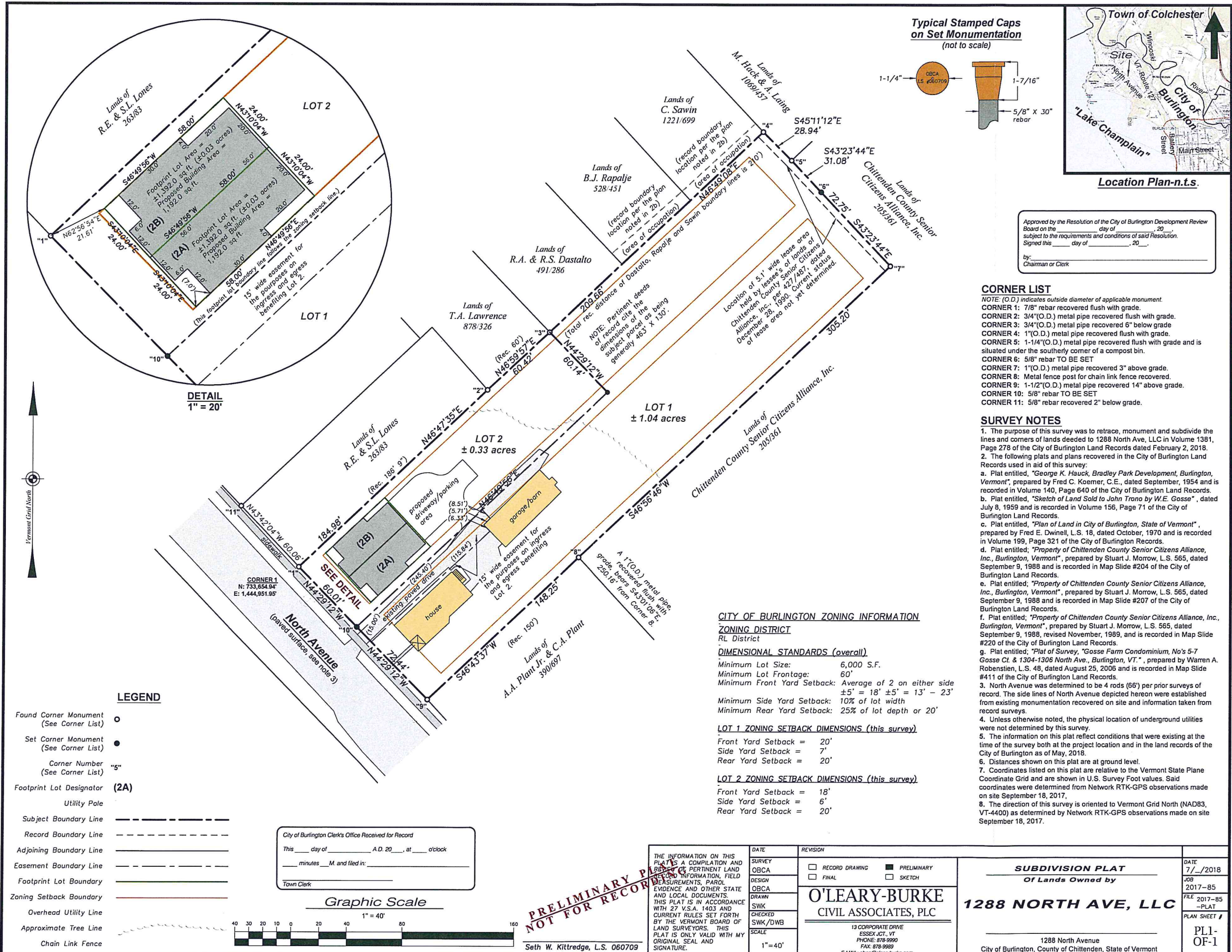
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AUG 23 2018

DEPARTMENT OF
PLANNING & ZONING

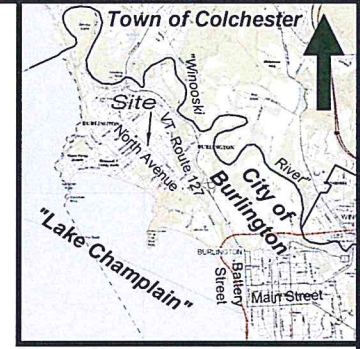
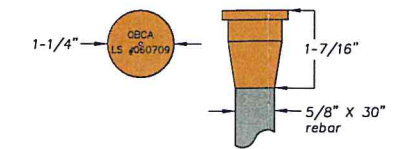
DATE	REVISION	BY
SURVEY	OBICA	OBICA
DESIGN	OBICA	OBICA
DRAWN	OBICA	OBICA
CHECKED	OBICA	OBICA
SCALE	OBICA	OBICA

☐ RECORD DRAWING ☐ PRELIMINARY ☒ FINAL ☐ SKETCH/CONCEPT	2 LOT SUBDIVISION 1265 NORTH AVENUE DURLINGTON, VT
---	--

O'LEARY-BURKE CIVIL ASSOCIATES, PLLC 13 Corporate Drive LEXINGTON, VT	PLAN 5
--	--------



Typical Stamped Caps
on Set Monumentation
(not to scale)



Approved by the Resolution of the City of Burlington Development Review Board on the _____ day of _____, 20____,
subject to the requirements and conditions of said Resolution.
Signed this _____ day of _____, 20____,
by: _____
Chairman or Clerk

- CORNER LIST**
- NOTE: (O.D.) indicates outside diameter of applicable monument.
- CORNER 1: 7/8" rebar recovered flush with grade.
 - CORNER 2: 3/4"(O.D.) metal pipe recovered flush with grade.
 - CORNER 3: 3/4"(O.D.) metal pipe recovered 6" below grade.
 - CORNER 4: 1"(O.D.) metal pipe recovered flush with grade.
 - CORNER 5: 1-1/4"(O.D.) metal pipe recovered flush with grade and is situated under the southerly corner of a compost bin.
 - CORNER 6: 5/8" rebar TO BE SET
 - CORNER 7: 1"(O.D.) metal pipe recovered 3" above grade.
 - CORNER 8: Metal fence post for chain link fence recovered.
 - CORNER 9: 1-1/2"(O.D.) metal pipe recovered 14" above grade.
 - CORNER 10: 5/8" rebar TO BE SET
 - CORNER 11: 5/8" rebar recovered 2" below grade.

- SURVEY NOTES**
- The purpose of this survey was to retrace, monument and subdivide the lines and corners of lands deeded to 1288 North Ave, LLC in Volume 1381, Page 278 of the City of Burlington Land Records dated February 2, 2018.
 - The following plats and plans recovered in the City of Burlington Land Records used in aid of this survey:
 - a. Plat entitled, "George K. Hauck, Bradley Park Development, Burlington, Vermont", prepared by Fred C. Koerner, C.E., dated September, 1954 and is recorded in Volume 140, Page 640 of the City of Burlington Land Records.
 - b. Plat entitled, "Sketch of Land Sold to John Trono by W.E. Gosse", dated July 8, 1959 and is recorded in Volume 156, Page 71 of the City of Burlington Land Records.
 - c. Plat entitled, "Plan of Land in City of Burlington, State of Vermont", prepared by Fred E. Dwinell, L.S. 18, dated October, 1970 and is recorded in Volume 199, Page 321 of the City of Burlington Records.
 - d. Plat entitled, "Property of Chittenden County Senior Citizens Alliance, Inc., Burlington, Vermont", prepared by Stuart J. Morrow, L.S. 565, dated September 9, 1988 and is recorded in Map Slide #204 of the City of Burlington Land Records.
 - e. Plat entitled, "Property of Chittenden County Senior Citizens Alliance, Inc., Burlington, Vermont", prepared by Stuart J. Morrow, L.S. 565, dated September 9, 1988 and is recorded in Map Slide #207 of the City of Burlington Land Records.
 - f. Plat entitled, "Property of Chittenden County Senior Citizens Alliance, Inc., Burlington, Vermont", prepared by Stuart J. Morrow, L.S. 565, dated September 9, 1988, revised November, 1989, and is recorded in Map Slide #220 of the City of Burlington Land Records.
 - g. Plat entitled, "Plat of Survey, 'Gosse Farm Condominium, No's 5-7 Gosse Ct. & 1304-1306 North Ave., Burlington, VT.", prepared by Warren A. Robenstien, L.S. 48, dated August 25, 2006 and is recorded in Map Slide #411 of the City of Burlington Land Records.
 - North Avenue was determined to be 4 rods (66') per prior surveys of record. The side lines of North Avenue depicted hereon were established from existing monumentation recovered on site and information taken from record surveys.
 - Unless otherwise noted, the physical location of underground utilities were not determined by this survey.
 - The information on this plat reflect conditions that were existing at the time of the survey both at the project location and in the land records of the City of Burlington as of May, 2018.
 - Distances shown on this plat are at ground level.
 - Coordinates listed on this plat are relative to the Vermont State Plane Coordinate Grid and are shown in U.S. Survey Foot values. Said coordinates were determined from Network RTK-GPS observations made on site September 18, 2017.
 - The direction of this survey is oriented to Vermont Grid North (NAD83, VT-4400) as determined by Network RTK-GPS observations made on site September 18, 2017.

CITY OF BURLINGTON ZONING INFORMATION

ZONING DISTRICT
RL District

DIMENSIONAL STANDARDS (overall)

Minimum Lot Size: 6,000 S.F.
Minimum Lot Frontage: 60'
Minimum Front Yard Setback: Average of 2 on either side
 $\pm 5' = 18' \pm 5' = 13' - 23'$
Minimum Side Yard Setback: 10% of lot width
Minimum Rear Yard Setback: 25% of lot depth or 20'

LOT 1 ZONING SETBACK DIMENSIONS (this survey)

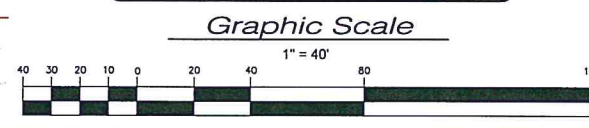
Front Yard Setback = 20'
Side Yard Setback = 7'
Rear Yard Setback = 20'

LOT 2 ZONING SETBACK DIMENSIONS (this survey)

Front Yard Setback = 18'
Side Yard Setback = 6'
Rear Yard Setback = 20'

- LEGEND**
- Found Corner Monument (See Corner List) ○
 - Set Corner Monument (See Corner List) ●
 - Corner Number (See Corner List) "5"
 - Footprint Lot Designator (2A)
 - Utility Pole
 - Subject Boundary Line
 - Record Boundary Line
 - Adjoining Boundary Line
 - Easement Boundary Line
 - Footprint Lot Boundary
 - Zoning Setback Boundary
 - Overhead Utility Line
 - Approximate Tree Line
 - Chain Link Fence

City of Burlington Clerk's Office Received for Record
This _____ day of _____, A.D. 20____, at _____ o'clock
_____ minutes _____ M. and filed in: _____
Town Clerk



**PRELIMINARY PLAT
NOT FOR RECORD**

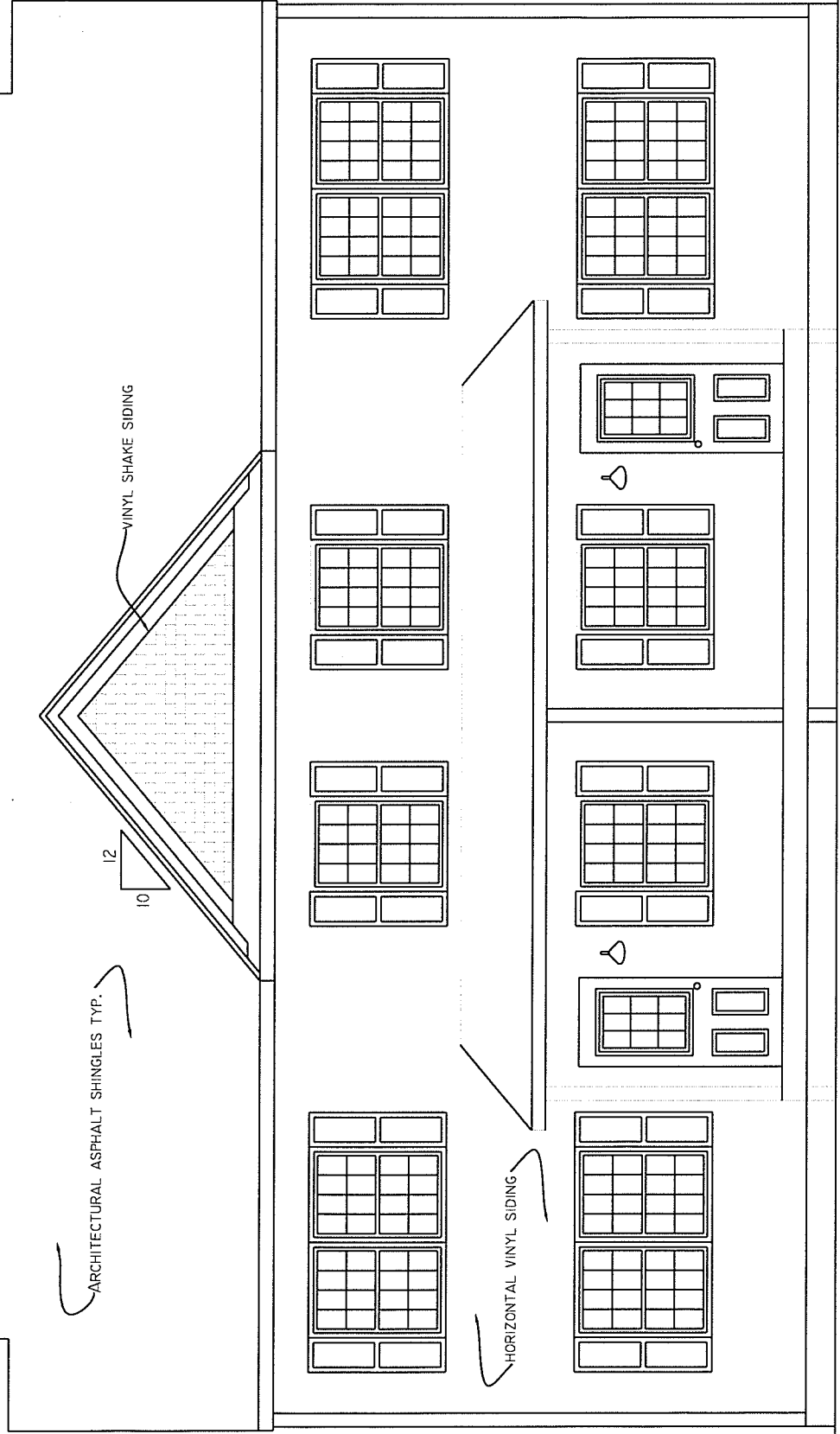
Seth W. Kittredge, L.S. 060709

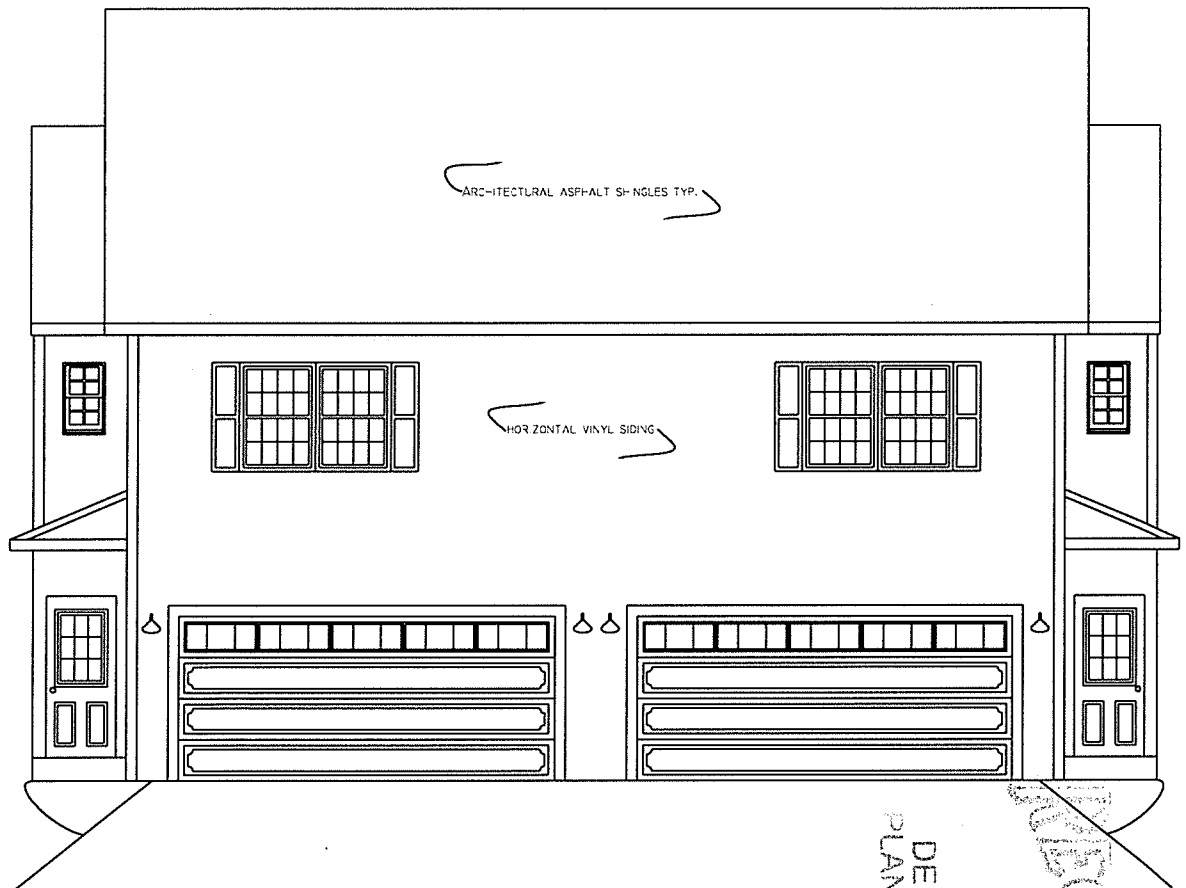
THE INFORMATION ON THIS PLAT IS A COMPILATION AND REVISION OF PERTINENT LAND RECORD INFORMATION, FIELD MEASUREMENTS, PARCEL EVIDENCE AND OTHER STATE AND LOCAL DOCUMENTS. THIS PLAT IS IN ACCORDANCE WITH 27 V.S.A. 1403 AND CURRENT RULES SET FORTH BY THE VERMONT BOARD OF LAND SURVEYORS. THIS PLAT IS ONLY VALID WITH MY ORIGINAL SEAL AND SIGNATURE.		DATE SURVEY OBCA DESIGN OBCA DRAWN SWK CHECKED SWK/DWB SCALE 1"=40'	REVISION ☐ RECORD DRAWING ☐ FINAL ☒ PRELIMINARY ☐ SKETCH	SUBDIVISION PLAT Of Lands Owned by 1288 NORTH AVE, LLC City of Burlington, County of Chittenden, State of Vermont	DATE 7/___/2018 JOB 2017-85 FILE 2017-85 -PLAT PLAN SHEET # PL1-OF-1
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AUG 23 2018

DEPARTMENT OF
PLANNING & ZONING





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AUG 23 2018

RECEIVED

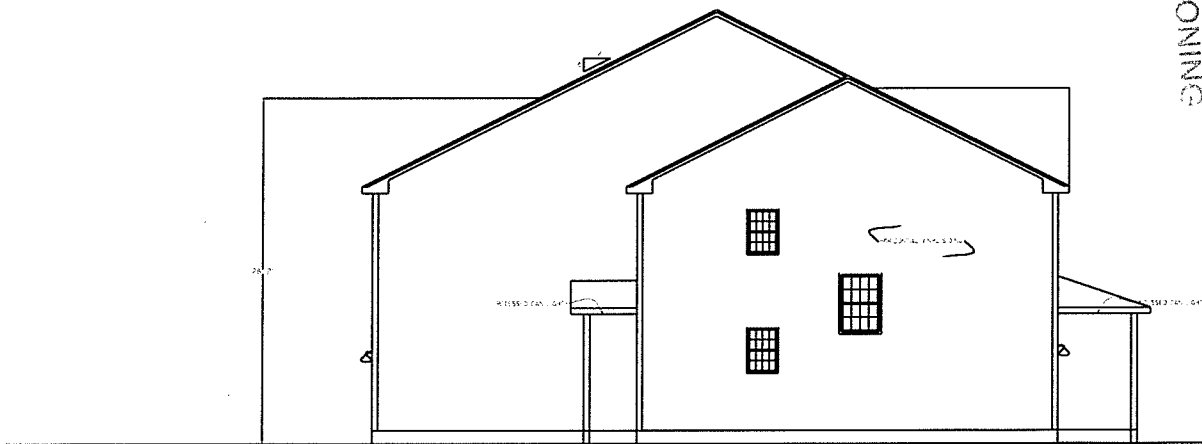
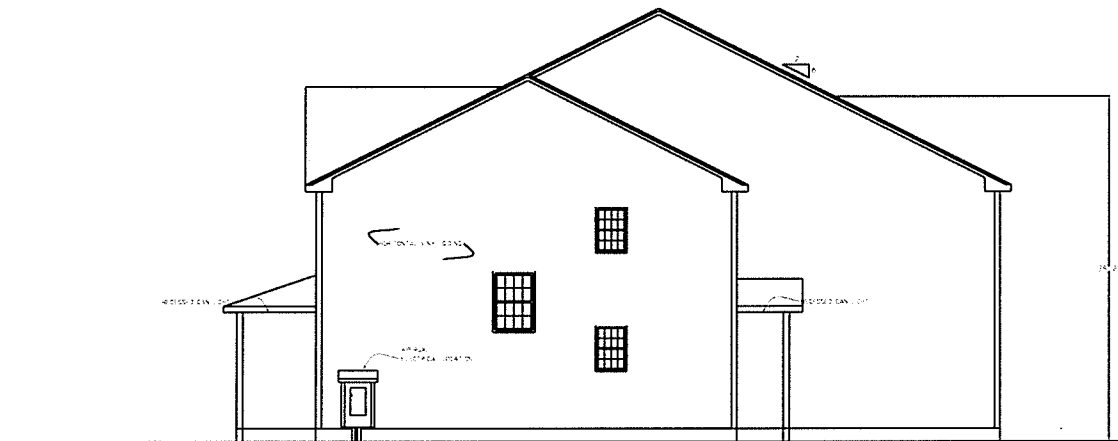
REAR ELEVATION

ALL DIMENSIONS ARE APPROXIMATE. ILLUSTRATIONS ARE THE ARTIST'S
RENDERING ONLY. ANY CHANGES DURING CONSTRUCTION MAY OCCUR.

8-13-18

1288 North Ave LLC

1288 NORTH AVE
BURLINGTON, VT



DEPARTMENT OF
PLANNING & ZONING

AUG 23 2018



SIDE ELEVATIONS

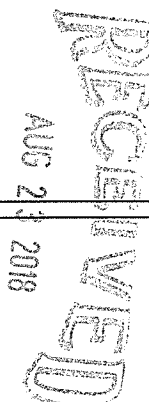
ALL DIMENSIONS ARE APPROXIMATE. ILLUSTRATIONS ARE THE ARTIST'S
REPRESENTATION OF THE PROPOSED CONSTRUCTION.

8-13-18

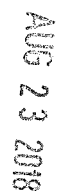
1288 North Ave LLC

1288 NORTH AVE
BURLINGTON, VT

2nd floor: 1,122 sqft

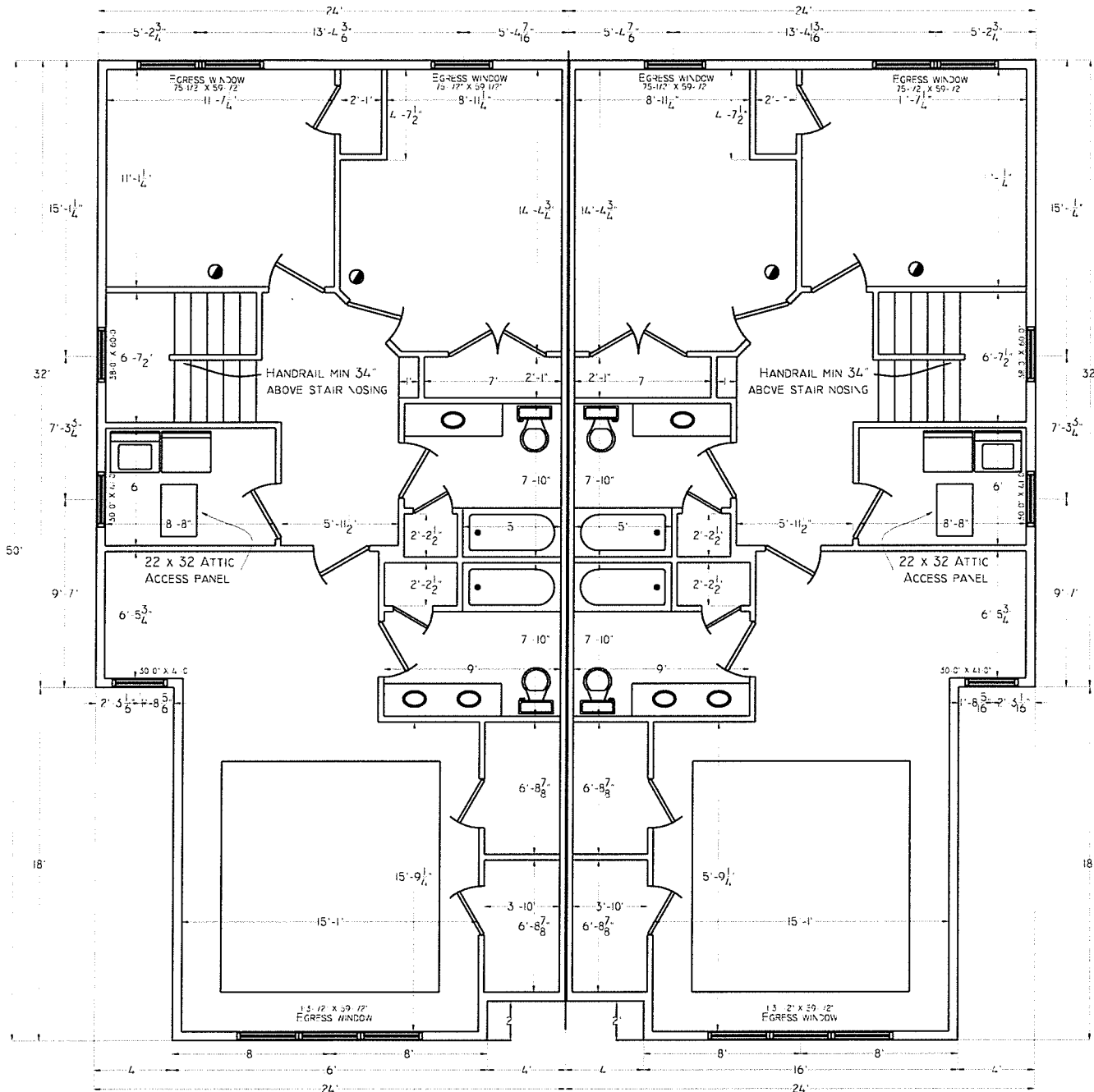


1288 NORTH AVE
BURLINGTON, VT



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PLANNING & ZONING



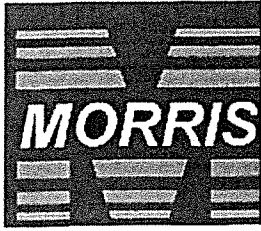
2ND FLOOR

1288 North Ave LL

ALL DIMENSIONS ARE APPROXIMATE. ILLUSTRATIONS ARE THE ART ST'S
REPRESENTATION OF THE BUILDING AS SHOWN ON THE PLANS.

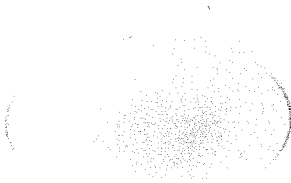
1288 NORTH AVE
BURLINGTON, VT

4-15-18



Surface LED Recessed Lighting Retrofit Kit

- [Email a Friend](#)



[View Larger](#)

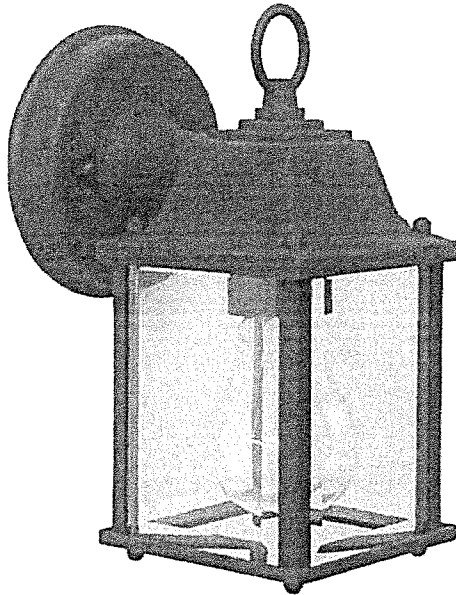
LED Surface Mount Recessed Lighting Retrofit Kits provide an energy efficient alternative to Incandescent lighting.

LED Surface Mount Recessed Lighting Retrofit Kits features include:

- Perfect for Residential and Commerical Installations
- New DOB (Driver on PCB) Technology
- Can be Installed with 4" Junction Box
- Can be installed in most 5" & 6" Downlights
- Recessed Cans - Simple Screw In Installation Including In-Line Pluggable Disconnect
- Includes Torsion Springs and brackets for Recessed Can Mounting
- Aluminum Housing/Trim - Paintable
- TRIAC Dimming
- Compatible with most LED dimmers
- Dimmable Down to 10%
- Guaranteed Single Bin Color Consistency with enhanced illumination uniformity
- Input Voltage: 120VAC
- Beam Angle 120°
- Input Current: 0.1 Amps
- Operating Temperature: -31°F to 122°F
- 50,000+ Hour LED Life Expectancy
- IP43 Damp Location Rated
- IC (Insulation Contact) Rated
- cULus Listed
- 5 year Warranty
- Order Qty of 1 = 1 Piece

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CRAFTMADE



Coach Lights Cast - Z192-TB

1 Light Small Wall Mount

Finish: Textured Matte Black



The very definition of classic outdoor lighting, the Coach Lights collection is a welcome - and welcoming - sight for homes of every size. The simple, straightforward shape of the body, with panels of sparkling glass, is a perfect complement to the graceful contours of the sloping roof.

- Die-Cast/sand-cast aluminum components
- Finish is treated with UV guard

Specs

Mounting Location	Wet
Bulb Wattage	100
Bulb Type	Incandescent
Bulb Size	A-Type
Bulbs	1
Bulb Base	Medium
Carton Size (CU FT)	0.22

Dimensions

Height (in.)	8.66
Width (in.)	4.53
Top to Outlet (in.)	2.50
Bottom to Outlet (in.)	6.16
Backplate Width (in.)	4.25

Downloads

RECEIVED
AUG 23 2018

DEPARTMENT OF
PLANNING & ZONING



Memorandum

To: John Caulo
LandPlan Development Services, LLC

Date: September 25, 2018

Project #: 58083.00

From: David Saladino, P.E., AICP
Erica Quallen, E.I.T.

Re: Blodgett Oven Site Redevelopment
Traffic Impact Study and Parking Assessment
Burlington, VT

VHB has completed a Traffic Impact Study (TIS) for the proposed redevelopment of the Blodgett Oven property located at 44-50 Lakeside Avenue in Burlington, Vermont. The site lies adjacent to Lake Champlain and is bordered on the south by Lakeside Avenue and on the east by the Burlington Bike Path and Vermont Rail System railroad tracks. The three buildings currently on the site have historically served manufacturing and office uses.

The proposed redevelopment program consists of a program of adaptive reuse and renovation of two of the three buildings located within the project site. Specifically, the redevelopment program includes the following components:

- 44 Lakeside Avenue will be renovated to provide 52,000 square feet of office space with an obsolete 700 square-foot loading dock removed;
- 50 Lakeside Avenue will be renovated provide an 84,500 square foot job creating "Innovation Hub" for the creative economy, resulting in a mixture of office and assembly "maker space" uses;
- 32 Lakeside Avenue will remain unaltered, continuing to provide 9,200 square feet of office space; and
- Parking on the site will be reconfigured to increase total parking capacity.

This Traffic Impact Study includes the following elements:

- A description of the existing roadway network near the site;
- A summary of the crash data within the study area;
- A description of the proposed development program;
- A trip generation and distribution estimate for the proposed development program;
- An evaluation of traffic operations at the following intersections: (1) Pine Street / Flynn Avenue, (2) Lakeside Avenue / Pine Street, and (3) Lakeside Avenue / Central Avenue;
- A parking demand evaluation; and
- Conclusions and recommendations to support the project.

EXISTING CONDITIONS

The project site is comprised of three parcels consisting of 14.89 acres bounded by Lakeside Avenue to the south, rail lines and the Burlington Bike Path to the east, and Lake Champlain to the west. The site can currently be accessed via a driveway opposite Central Avenue or by direct access from Lakeside Avenue. The three existing buildings on the site have historically served manufacturing and office uses. The location of the site in relation to the local street network is shown in **Figure 1**.

40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403-7771
P 802.497.6100

Figure 1: Site Location Map and Study Intersections



Roadway Characteristics

Lakeside Avenue is a local street that connects a small lakeside neighborhood, the Blodgett Oven site, and other businesses to Pine Street and carries approximately 2,900 vehicles per day¹. It extends from Pine Street and continues westerly approximately 0.3 miles, terminating at Central Avenue, in close proximity to Lake Champlain. Lakeside Avenue is a two-lane urban street with no posted speed limit. Land use along the road is comprised of a mix of office, industrial, retail, institutional, and residential. There are intermittent sidewalks on the road as land use changes.

Pine Street is a north-south minor arterial that extends from the southern city limit of Burlington north to Pearl Street. Pine Street carries approximately 13,000 vehicles near the project area². Pine Street is a two-lane urban street with sidewalks on both sides of the road and bike markings or lanes in the vicinity of the project area. Land uses along the road is mixed, with primarily retail and industrial uses adjacent to the project area.

Flynn Avenue is a local, urban street that extends from US Route 7 westerly to Oakledge Park and Lake Champlain. Flynn Avenue carries approximately 3,000 vehicles per day near the intersection with Pine Street. The street has one lane in each direction and there are sidewalks on both sides. Parallel parking is allowed on both sides of the street. Land use along the road is primarily residential, office, industrial, and recreational.

Central Avenue is a two-lane local street that begins at Lakeside Avenue and continues approximately 960-feet south. Sidewalks line the road on both sides. Land use on the road is primarily residential.

CRASH SUMMARY

For a section of roadway to be considered a High Crash Location (HCL), the location must have experienced at least five crashes in five years and the actual-to-critical rate ratio must be greater than or equal to 1.00. A review of VTrans' most recent High Crash Location (HCL) Report (2012-2016) revealed that one roadway segment within the project study area is classified as a HCL by VTrans.³

The VTrans Public Crash Data Query Tool⁴ was used to investigate crash data from the most recent five years (2013-2017) along the HCL described above. The HCL section is along Pine Street between milemarker 0.3-0.6. For reference, this segment runs from Birchcliff Parkway to north of Locust Street. The Pine Street intersection with Lakeside Avenue is located at milemarker 0.4. Within the period 2013-2017, there were the following within the HCL:

- 55 total crashes within the 0.3 mile HCL segment;
- 32 crashes (58% of all crashes within the HCL) occurred at the Lakeside Avenue / Pine Street intersection;
- Three crashes along the HCL involved a pedestrian, and five involved a cyclist;
- 35% of the crashes in the HCL were rear ends, 18% were left-turns, and 9% were through movements.

¹ VTrans Transportation Data Management System. <http://vtrans.ms2soft.com>. Queried 07/09/18.

² 2015 (Route Log) AADTs – Federal Aid Urban Streets. Vermont Agency of Transportation, 2016.

³ High Crash Location Report: Intersections and Segments (2012-2016). Vermont Agency of Transportation, 2017.

⁴ VTrans Transportation Data Management System. <http://vtrans.ms2soft.com>. Queried 07/09/2018.

In addition, available 2013-2017 crash data along the streets and intersections of interest in this study were queried. Most relevant to the proposed project is crash information along Lakeside Avenue and the Lakeside Avenue / Central Avenue intersection. There were no reported crashes at this intersection, and a total of six crashes along the length of Lakeside Avenue over this time period. Of these crashes, none resulted in injury or fatality.

The relevant section of the 2012-2016 VTrans HCL Report and crash data from the last five years on Lakeside Avenue, Pine Street, Lakeside & Pine, and Pine & Flynn is included in the Appendix.

PROPOSED DEVELOPMENT

The proposed development program consists of renovating the two larger buildings on site (84,500 SF building at 50 Lakeside Avenue and 52,000 SF building at 44 Lakeside Avenue). The smaller 9,200 SF building is to remain as is. Parking areas will be reconfigured to increase capacity by approximately 200 parking spaces. In addition, access management will be significantly improved by providing a curbed island between Lakeside Avenue and the adjacent parking area, which is currently an uncontrolled curb cut. Primary access and egress will be provided via the main driveway opposite Central Avenue and a parking lot exit adjacent to Lakeside Avenue to the east of the driveway. The proposed site plan is shown in **Figure 2** on the following page.

TRIP GENERATION

Trip generation estimates for the proposed Blodgett Oven Site redevelopment were calculated based on rates published by the Institute of Transportation Engineers (ITE) Trip Generation Manual⁵ for the weekday morning and evening peak hours. The land use codes used to estimate the peak period trip generation of the proposed development were as follows: 712 (small office) for the 9,200 SF building at 32 Lakeside Avenue and 710 (general office) for both the 52,000 SF building at 44 Lakeside Avenue and the 84,500 SF building at 50 Lakeside Avenue.

Given the project location, proposed site amenities, and the growing mix of technology-, knowledge-, and creative-based businesses locating in Burlington's South End, it would be reasonable to assume that some significant portion of future employees would seek out alternative commuting options such as bicycling, walking, taking the bus, or carpooling to and from work. Proposed site amenities such as direct access to the Burlington Bike Path and on-site bicycle parking, connectivity to the City's sidewalk network, as well as direct access to GMT bus stops will provide multiple commuting options to these employees. Considering Burlington commute data from the American Community Survey⁶ and the site's location, it is assumed that non-vehicular commute trips (i.e. walking, cycling, and transit trips) will comprise approximately 10% of the trips generated by this site on a typical day. The City of Burlington has assumed that the non-auto trip reduction could be as high as 15% but a value of 10% was used in order to be conservative.

Table 1 summarizes the trip generation estimate for the proposed development. Calculations supporting the proposed trip generation estimates for the proposed development are provided in the Appendix.

Table 1: Trip Generation Summary

	Net New Trips	Bike, Ped, Transit	Net New Trips
<u>Peak Period</u>	Total	Reduction	(Vehicles)
Weekday Morning		10%	
Enter	155	-16	139
Exit	<u>26</u>	<u>-3</u>	23
Total	181	-19	162
Weekday Evening		10%	
Enter	26	-3	23
Exit	<u>132</u>	<u>-13</u>	119
Total	158	-16	142

⁵ Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington D.C., 2017.

⁶ 2012-2016 American Community Survey 5-Year Estimates, U.S. Census Bureau. Accessed 12 July 2018.

Although the Blodgett site has historically generated high traffic volumes, no reduction was taken to account for previously-generated volumes to provide a conservative assessment. However, the Net New Trips in the table above do take into consideration existing trip generation at the 9,200 SF building which will remain as is.

OTHER DEVELOPMENT VOLUMES AND ROADWAY NETWORK IMPROVEMENTS

The traffic analysis considered impacts to background traffic growth and trip distribution resulting from the Burlington City Place development and the construction of the Champlain Parkway. Both projects are slated to be completed by the Build+5 year of 2024. Estimated volumes generated by the Burlington City Place development were taken from the Burlington Town Center Mall Traffic Impact Study prepared by VHB in 2016⁷. These volumes are included in the Appendix.

The Champlain Parkway's construction in the future will have a significant impact on trip distribution from and to destinations along Lakeside Avenue, as many site-generated trips will choose to travel on the parkway rather than Pine Street once the parkway opens. Champlain Parkway roadway improvements, projected traffic volumes, and proposed signal timing and phasing schemes were based on the latest information developed for the project.

The Burlington City Place project is expected to have a lesser degree of impact to the study area intersections due to its relative distance from the site and the traffic dispersal effect of the City's grid network.

VHB recently completed a Traffic Impact Study for the relocation and expansion of Petra Cliffs Climbing Center on Briggs Street. The trip generation volumes developed as part of that TIS were included in the 2024 weekday evening peak hour analysis (with the Champlain Parkway)⁸.

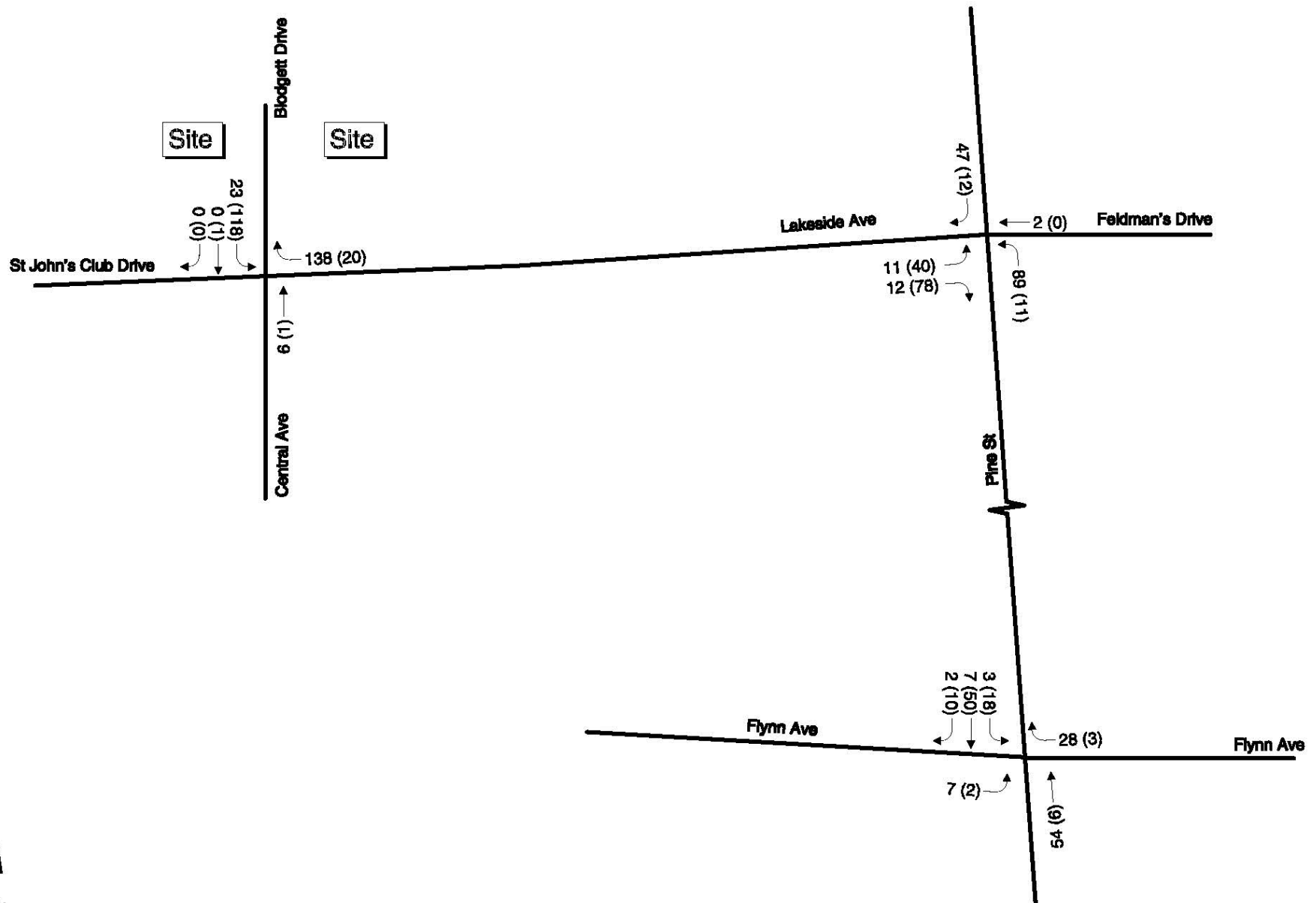
TRIP DISTRIBUTION

Figure 3 and **Figure 4** below show the estimated distribution of net new trips generated by the proposed redevelopment program in 2019 and 2024, respectively. The two distributions are different because the Champlain Parkway will provide a new route from South Burlington and alter traffic volumes at many intersections in the local traffic network. Both distributions were generated using the number of net new trips and knowledge of existing traffic patterns.

From the 2019 distribution, 95% of trips entering the Blodgett site are estimated to travel from Pine Street and Lakeside Avenue, and 5% are estimated to arrive from the residential neighborhood along Central Avenue. In 2024, however, this percentage is predicted to be significantly reduced as the Champlain Parkway will be a more convenient northbound arterial from the south end of Burlington. In the 2024 trip distribution, 60% of trips arriving via Lakeside Avenue are assumed to have used the Champlain Parkway.

⁷ Burlington Town Center Traffic Impact Study, VHB, 23 January 2017.

⁸ Petra Cliffs Climbing Center Traffic Impact Study, VHB, 31 August 2018. Analysis completed only for 2024 PM Peak Hour with Champlain Parkway.



Not to Scale

Legend

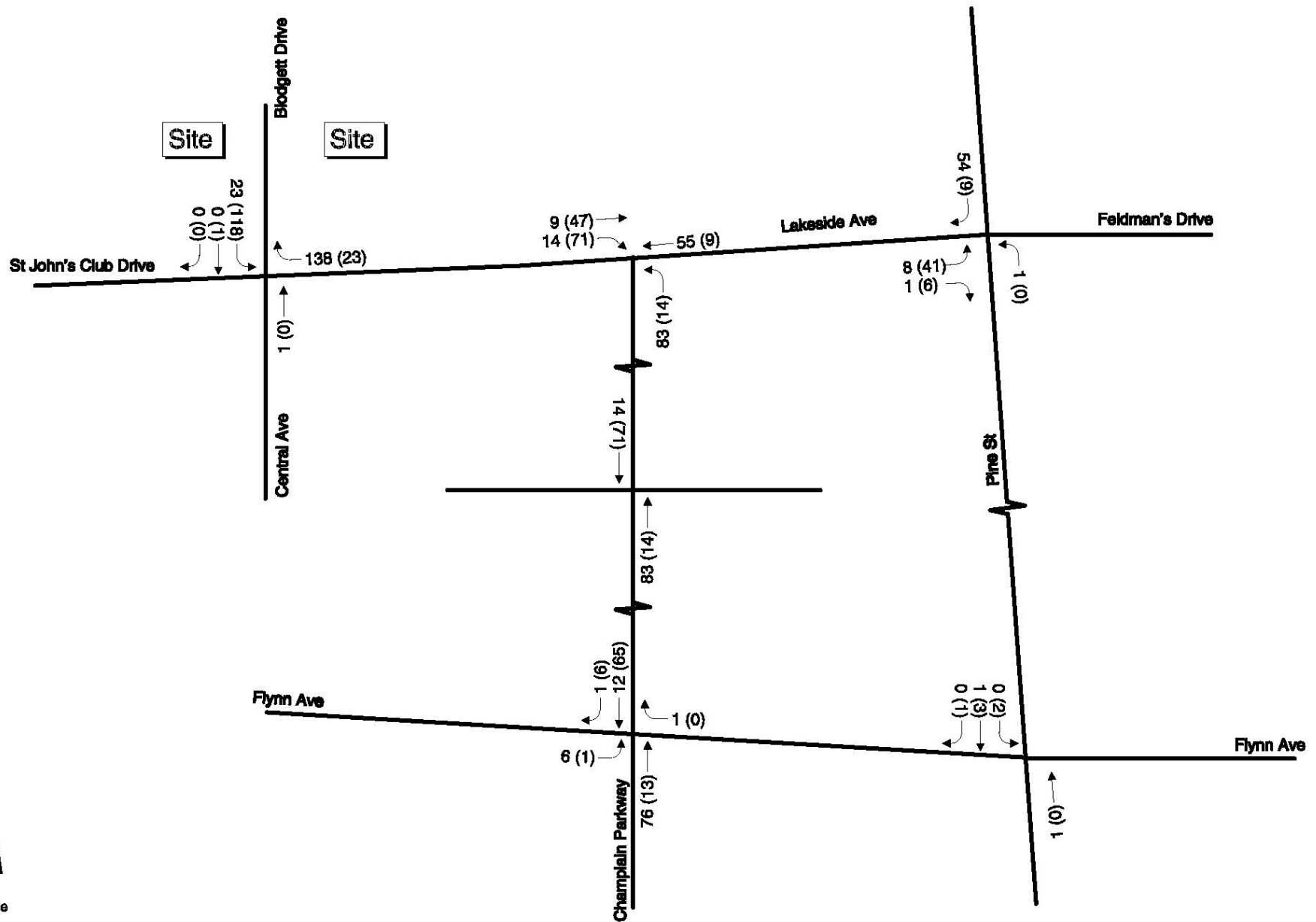
AM Peak Hour

(PM Peak Hour)



Figure 3

2019 Blodgett Trip Distribution, Weekday
Peak Hour Traffic Volumes



Not to Scale

Legend

AM Peak Hour
(PM Peak Hour)



Figure 4

2024 Blodgett Trip Distribution, Weekday
Peak Hour Traffic Volumes

TRAFFIC NETWORKS

The weekday morning and evening peak periods were selected for analysis purposes as they represent the peak conditions for both the site-generated traffic and the adjacent street system. Turning movement count data at the adjacent study intersections of Lakeside Avenue / Central Avenue, Pine Street / Lakeside Avenue, and Pine Street / Flynn Avenue were obtained from recent counts conducted by VHB on Tuesday, June 12th and Wednesday, June 13th, 2018. To evaluate the impact of the proposed development within the study area, 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.

Seasonal Variation

Since it is impractical to design for the highest volume encountered during the year, VTrans guidelines recommend a compromise between capacity and cost. Design Hourly Volume (DHV) criteria allow roads to be designed for the 30th highest hourly volume of the year. Historical data from the closest, most comparable VTrans Automatic Traffic Recorder (ATR) station on Pine Street (DXCP) as well as expected DHV values in the VTrans Red Book⁹ were reviewed to establish appropriate DHV adjustment factors. The DHV adjustment factor was calculated to be 1.18 for the Pine Street / Flynn Avenue intersection and 1.30 for all other intersections. Detailed calculations for the DHV adjustments are provided in the Appendix.

Background Growth

Background 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 2017 VTrans Redbook suggests a background growth rate of 1.02 for projecting traffic volumes from 2019 to 2024.

No Build and Build Traffic Networks

The 2019 No Build traffic volumes were developed by applying the growth factors from the VTrans regression analysis chart to DHV-adjusted peak hour traffic volumes. Because the Burlington City Place and Champlain Parkway projects are also considered in this study, three traffic network estimates were generated for year 2024. The directional distribution of the new site-generated traffic was approximated based on existing and expected travel patterns in the area. Based on the expected trip distribution, the site-generated trips were added to the 2024 No Build volumes to establish the three scenarios summarized in the figures below.

The following are the traffic networks and scenarios developed for this project:

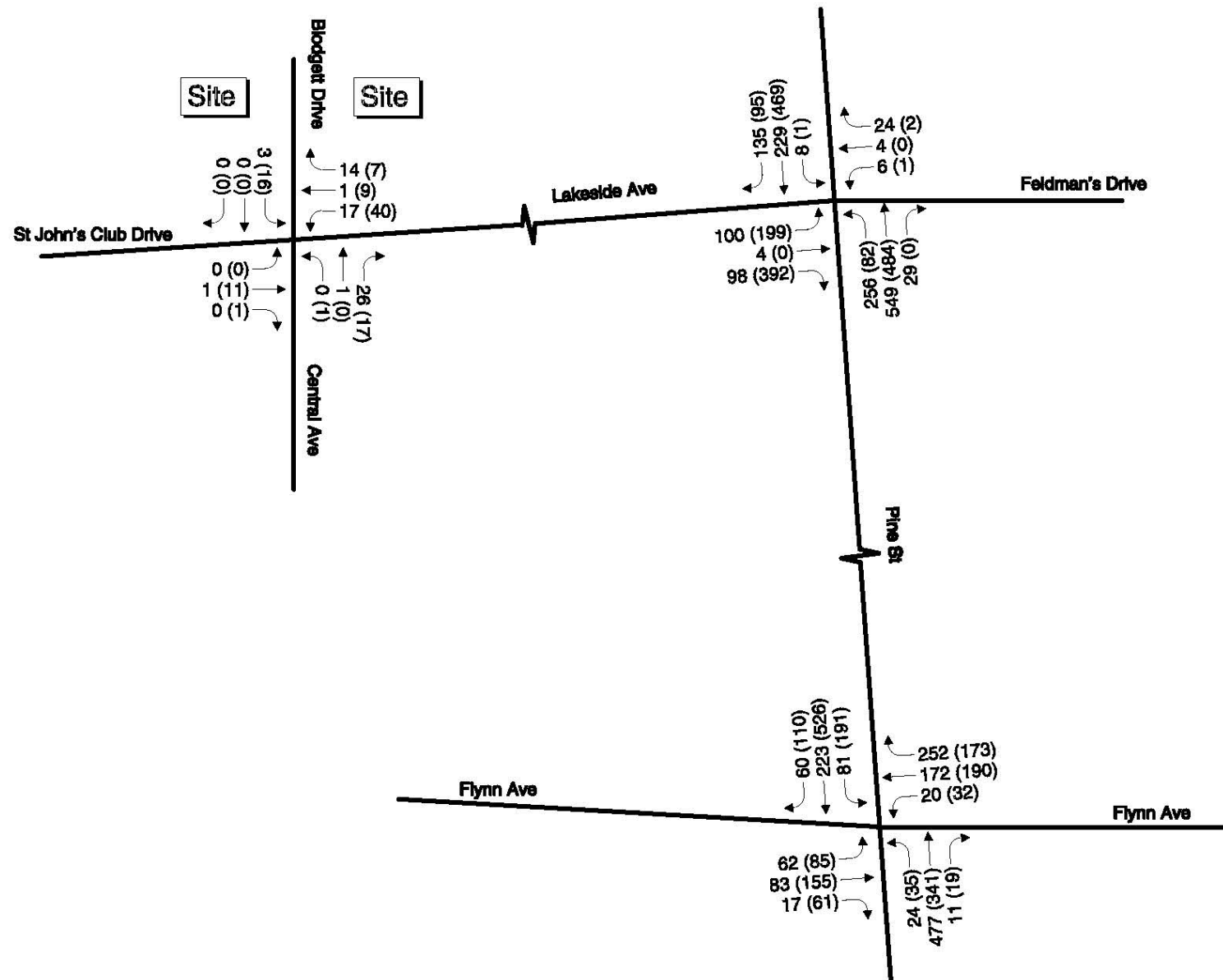
2019 Traffic Network Scenarios

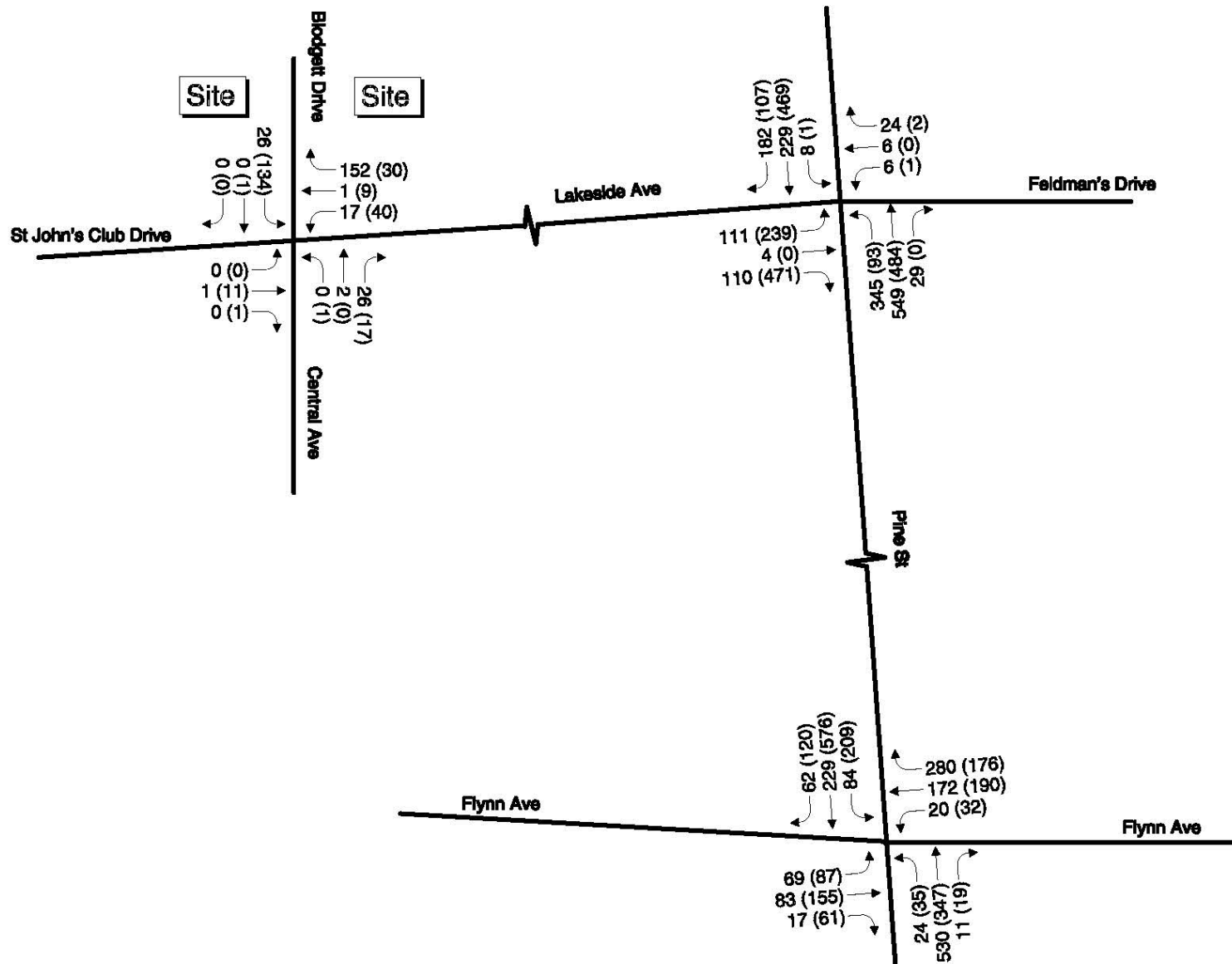
⁹ Continuous Traffic Counter Report (The Redbook), Vermont Agency of Transportation, 2017

1. 2019 AM & PM No Build – **Figure 5**
2. 2019 AM & PM Build – **Figure 6**

2024 Traffic Network Scenarios

1. 2024 AM & PM No Build and Burlington City Place (BCP) – **Figure 7**
2. 2024 AM & PM No Build, Burlington City Place (BCP) and Champlain Parkway (CP) – **Figure 8**
3. 2024 AM & PM Build, Burlington City Place (BCP) and Champlain Parkway (CP) – **Figure 9**





Not to Scale

Legend

AM Peak Hour

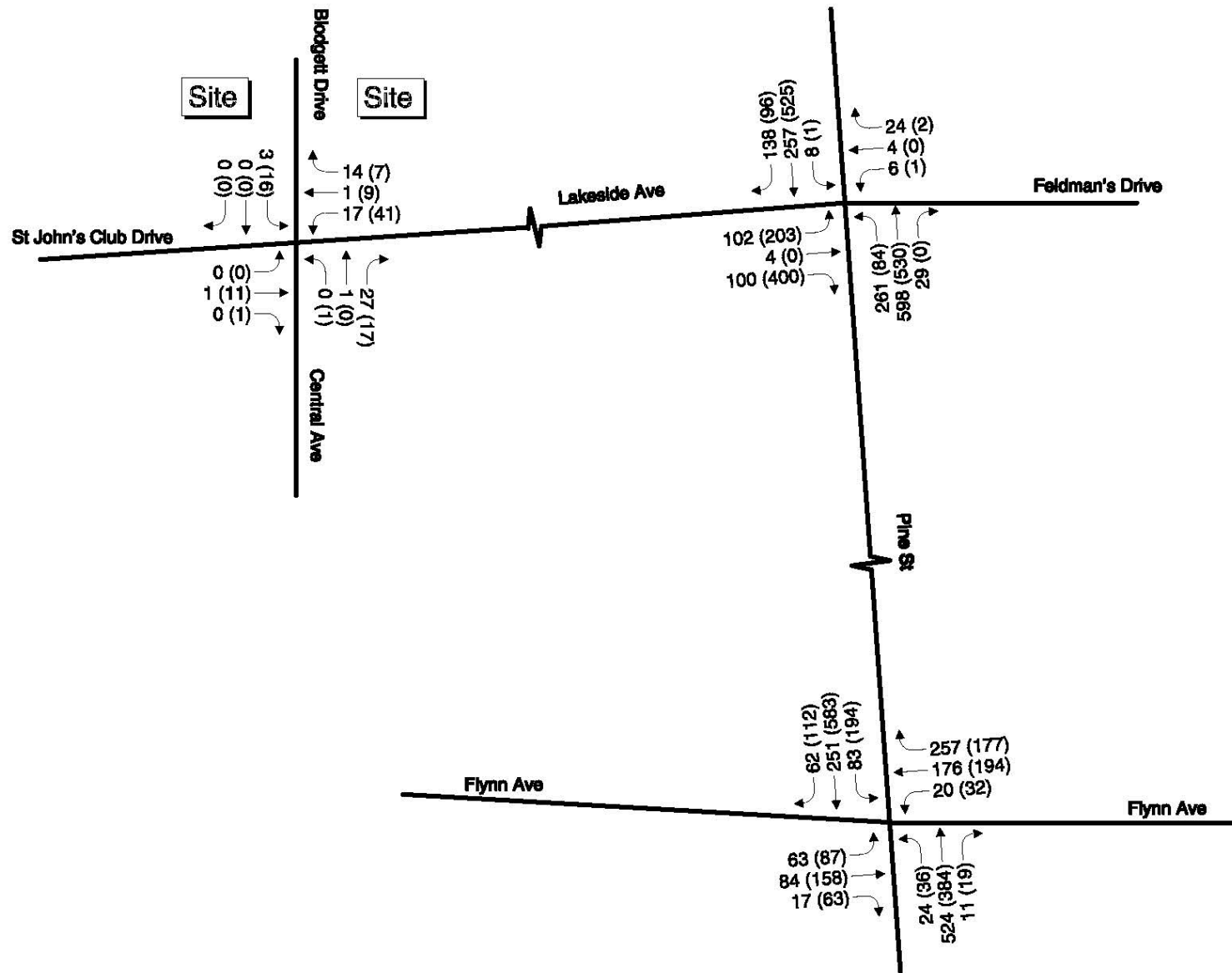
(PM Peak Hour)



Figure 6

2019 Build Weekday

Peak Hour Traffic Volumes



Not to Scale

Legend

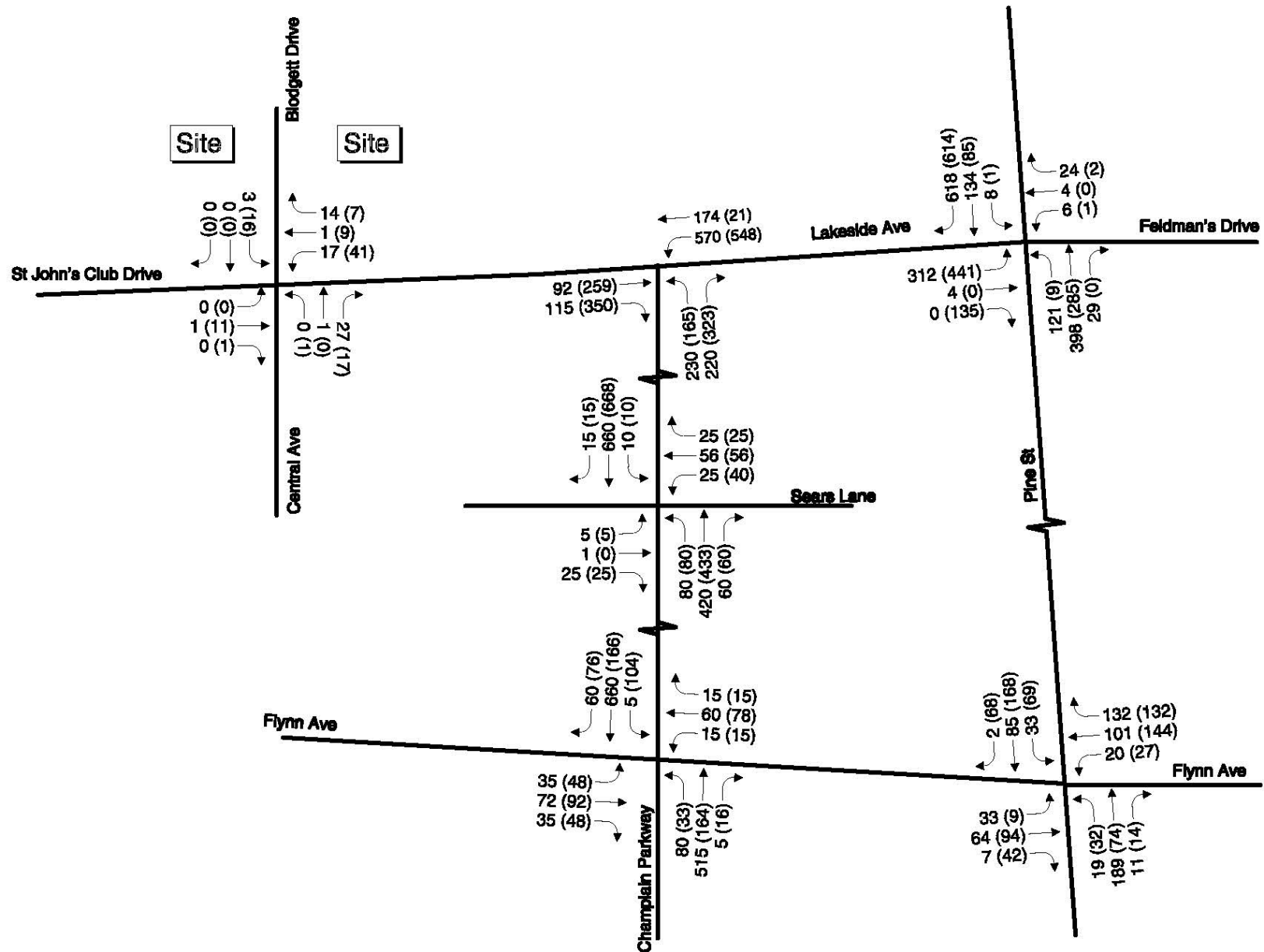
AM Peak Hour

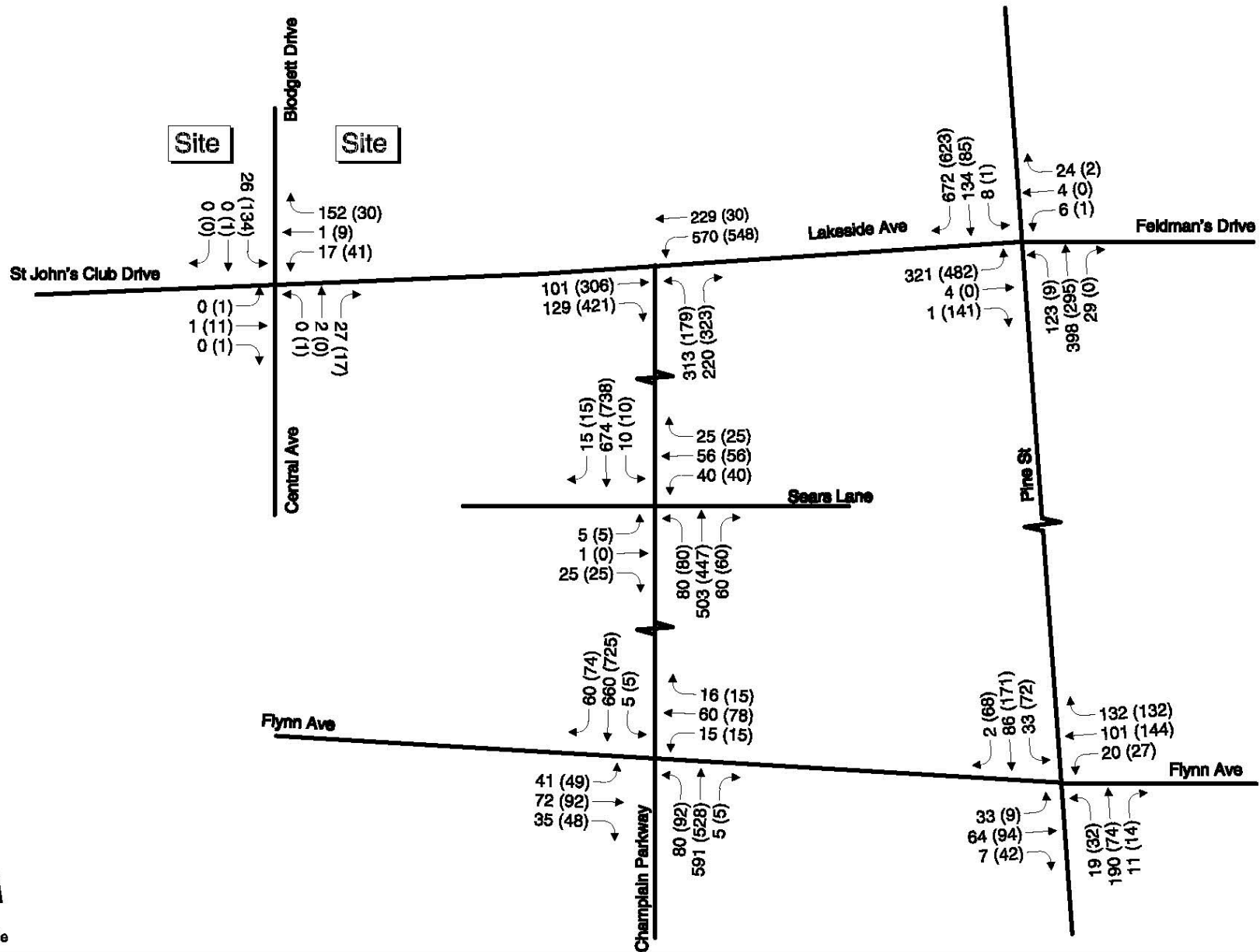
(PM Peak Hour)



Figure 7

2024 No Build & BCP Weekday
Peak Hour Traffic Volumes





TRAFFIC ANALYSES

Intersection Capacity Analysis

Intersection capacity analyses were performed for the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the 2000 Highway Capacity Manual.¹⁰ 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.

Signalized Intersections

Table 2, Table 3, and Table 4 summarize the operational analysis at the two signalized study intersections during the 2019 and 2024 morning and evening peak hours under the five operational scenarios described above. In addition to the scenarios outlined in the previous section, a 2024 Build with Burlington City Place and Champlain Parkway scenario was run with mitigation in place at the intersection of Pine Street and Flynn Avenue, which was outlined in the City Market traffic study and also included in the Petra Cliffs traffic study. These mitigation strategies include a right turn lane and the inclusion of an advanced walk phase in place of the planned exclusive pedestrian phase. As shown in the overall intersection results, the proposed development is not expected to worsen traffic conditions by an unreasonable amount. Certain approaches, notably the eastbound approach at Lakeside Ave and Pine Street and westbound approach at Lakeside Ave and Champlain Parkway are expected to experience decreased levels of service, but do not greatly impact the overall intersection performance. These changes are due to the crossing of an inflection point in capacity for the eastbound and westbound left turning movement which results in higher delay for the approach.

Unsignalized Intersections

Table 5 summarizes the operational analysis at the unsignalized intersection of Lakeside Avenue and Central Avenue during the 2019 and 2024 morning and evening peak hours under the five operational scenarios considered in this study. As shown in the table, the intersection of Lakeside Avenue and Central Avenue is expected to operate at LOS A on all approaches in each scenario.

¹⁰ Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

Table 2: Signalized Intersection Capacity Analysis Summary

2019 AM Peak Hour						
Intersection	No Build			Build		
	v/c*	Delay**	LOS***	v/c	Delay	LOS
Lakeside Ave & Pine St	0.71	9.2	A	0.71	10.5	B
EB from Lakeside Ave	0.26	12.3	B	0.29	12.9	B
WB from Feldman's Driveway	0.14	15.4	B	0.15	16.0	B
NB from Pine St	0.38	7.1	A	0.49	8.6	A
SB from Pine St	0.31	11.7	B	0.40	12.9	B
Pine St & Flynn Ave	0.86	20.1	C	0.93	24.8	C
EB from Flynn Ave	0.39	19.7	B	0.47	22.0	C
WB from Flynn Ave	0.71	21.8	C	0.79	26.4	C
NB from Pine St	0.75	27.4	C	0.84	35.4	D
SB from Pine St	0.22	7.8	A	0.24	8.2	A

2019 PM Peak Hour						
Intersection	No Build			Build		
	v/c*	Delay**	LOS***	v/c	Delay	LOS
Lakeside Ave & Pine St	0.88	11.3	B	0.93	13.5	B
EB from Lakeside Ave	0.55	12.2	B	0.67	16.2	B
WB from Feldman's Driveway	0.01	0.0	A	0.01	0.0	A
NB from Pine St	0.34	7.8	A	0.35	7.9	A
SB from Pine St	0.38	13.9	B	0.42	15.9	B
Pine St & Flynn Ave	1.04	19.8	B	1.09	20.3	C
EB from Flynn Ave	0.72	29.8	C	0.74	30.9	C
WB from Flynn Ave	0.69	23.3	C	0.69	23.4	C
NB from Pine St	0.71	26.9	C	0.72	27.6	C
SB from Pine St	0.47	11.1	B	0.51	12.1	B

* Volume to capacity ratio; If the approach has multiple lanes, the v/c shown is the average

** Delay expressed in seconds per vehicle

*** Level of service

Table 3: Signalized Intersection Capacity Analysis Summary (Continued)

2024 AM Peak Hour												
Intersection	No Build, BCP			No Build, BCP & CP			Build, BCP & CP			Build, BCP & CP w/ City Market Mitigation ⁺		
	v/c*	Delay**	LOS***	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Lakeside Ave & Pine St	0.74	10.3	B	0.80	38.0	D	0.83	51.4	D	SAME AS BUILD, BCP & CP		
EB from Lakeside Ave	0.28	13.4	B	0.42	68.1	E	0.61	166.7	F			
WB from Feldman's Driveway	0.17	16.5	B	0.58	92.3	F	0.58	92.3	F			
NB from Pine St	0.45	8.2	A	0.29	14.9	B	0.26	12.0	B			
SB from Pine St	0.34	12.7	B	0.53	39.8	D	0.48	30.0	C			
Pine St & Flynn Ave	0.89	21.5	C	0.42	11.1	B	0.42	11.9	B	SAME AS BUILD, BCP & CP		
EB from Flynn Ave	0.40	20.2	C	0.19	12.6	B	0.20	13.0	B			
WB from Flynn Ave	0.73	22.8	C	0.41	11.0	B	0.44	11.8	B			
NB from Pine St	0.79	30.2	C	0.33	13.6	B	0.36	14.4	B			
SB from Pine St	0.24	8.1	A	0.07	5.7	A	0.08	6.4	A			
Champlain Park. & Lakeside Ave	NOT INCLUDED IN 2024 AM PEAK HOUR NO BUILD, BCP ANALYSIS			0.63	39.1	D	0.68	61.1	E	SAME AS BUILD, BCP & CP		
EB from Lakeside Ave				0.34	44.8	D	0.37	45.1	D			
WB from Lakeside Ave				0.49	35.5	D	0.70	84.2	F			
NB from Champlain Parkway				0.49	42.3	D	0.46	34.6	C			
SB from DPW Driveway				0.08	37.8	D	0.06	32.8	C			
Champlain Park. & Sears Lane	NOT INCLUDED IN 2024 AM PEAK HOUR NO BUILD, BCP ANALYSIS			0.66	21.2	C	0.66	24.2	C	SAME AS BUILD, BCP & CP		
EB from Sears Lane				0.11	0.8	A	0.11	0.8	A			
WB from Sears Lane				0.63	60.9	E	0.63	60.9	E			
NB from Champlain Parkway				0.55	19.9	B	0.48	19.8	B			
SB from Champlain Parkway				0.35	16.1	B	0.36	22.9	C			
Champlain Park. & Flynn Ave	NOT INCLUDED IN 2024 AM PEAK HOUR NO BUILD, BCP ANALYSIS			0.65	29.5	C	0.67	26.9	C	0.67	16.9	B
EB from Flynn Ave				0.65	59.0	E	0.69	61.6	E	0.32	34.8	C
WB from Flynn Ave				0.41	48.3	D	0.40	47.2	D	0.37	36.2	D
NB from Champlain Parkway				0.43	17.4	B	0.46	17.5	B	0.41	11.3	B
SB from Champlain Parkway				0.33	31.5	C	0.34	26.0	C	0.34	16.2	B

* Volume to capacity ratio; if the approach has multiple lanes, the v/c shown is the average

** Delay expressed in seconds per vehicle

*** Level of service

+ City Market Mitigation includes right turn lane and advanced walk pedestrian phase at the intersection of Flynn Ave and Champlain Parkway

BCP: Burlington City Place

CP: Champlain Parkway

Table 4: Signalized Intersection Capacity Analysis Summary (Continued)

2024 PM Peak Hour												
Intersection	No Build, BCP			No Build, BCP & CP			Build, BCP & CP			Build, BCP & CP w/ City Market Mitigation ⁺		
	v/c*	Delay**	LOS***	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Lakeside Ave & Pine St	0.94	12.2	B	0.72	43.9	D	0.72	44.6	D	SAME AS BUILD, BCP & CP		
EB from Lakeside Ave	0.59	14.0	B	0.41	36.8	D	0.45	38.7	D			
WB from Feldman's Driveway	0.01	0.0	A	0.06	73.0	E	0.06	73.0	E			
NB from Pine St	0.37	8.1	A	0.19	26.6	C	0.19	26.2	C			
SB from Pine St	0.40	14.6	B	0.52	57.1	E	0.53	57.6	E			
Pine St & Flynn Ave	1.11	23.5	C	0.58	10.9	B	0.63	13.1	B	SAME AS BUILD, BCP & CP		
EB from Flynn Ave	0.78	35.0	D	0.22	11.0	B	0.26	12.7	B			
WB from Flynn Ave	0.73	26.0	C	0.48	13.3	B	0.56	16.3	B			
NB from Pine St	0.80	33.8	C	0.25	15.9	B	0.31	18.5	B			
SB from Pine St	0.53	13.3	B	0.19	6.7	A	0.22	8.1	A			
Champlain Park. & Lakeside Ave	NOT INCLUDED IN 2024 PM PEAK HOUR NO BUILD, BCP ANALYSIS			0.70	42.2	D	0.74	47.5	D	SAME AS BUILD, BCP & CP		
EB from Lakeside Ave				0.66	57.7	E	0.74	65.0	E			
WB from Lakeside Ave				0.40	29.9	C	0.43	31.8	C			
NB from Champlain Parkway				0.57	36.9	B	0.58	40.4	D			
SB from DPW Driveway				0.03	50.6	D	0.03	50.0	D			
Champlain Park. & Sears Lane	NOT INCLUDED IN 2024 PM PEAK HOUR NO BUILD, BCP ANALYSIS			0.65	22.5	C	0.69	20.9	C	SAME AS BUILD, BCP & CP		
EB from Sears Lane				0.18	61.3	E	0.18	61.3	E			
WB from Sears Lane				0.73	88.2	F	0.73	88.2	F			
NB from Champlain Parkway				0.50	20.3	C	0.50	20.5	C			
SB from Champlain Parkway				0.36	11.2	B	0.38	8.9	A			
Champlain Park. & Flynn Ave	NOT INCLUDED IN 2024 PM PEAK HOUR NO BUILD, BCP ANALYSIS			0.74	31.8	C	0.78	32.6	C	0.75	26.5	C
EB from Flynn Ave				0.88	98.8	F	0.89	99.5	F	0.48	74.9	E
WB from Flynn Ave				0.45	62.8	E	0.45	62.6	E	0.52	59.5	E
NB from Champlain Parkway				0.52	23.6	C	0.53	23.5	C	0.51	16.5	B
SB from Champlain Parkway				0.37	16.9	B	0.40	20.0	B	0.38	18.4	B

* Volume to capacity ratio; If the approach has multiple lanes, the v/c shown is the average

** Delay expressed in seconds per vehicle

*** Level of service

+ City Market Mitigation includes right turn lane and advanced walk pedestrian phase at the intersection of Flynn Ave and Champlain Parkway

BCP: Burlington City Place

CP: Champlain Parkway

Table 5: Unsignalized Intersection Capacity Summary

2019							
Peak Hour	No Build			Build			
	v/c*	Delay**	LOS***	v/c	Delay	LOS	
Lakeside Ave & Central Ave							
EB from St. John's Club	Weekday AM	0.00	7.0	A	0.00	7.2	A
WB from Lakeside Ave		0.03	7.0	A	0.17	7.2	A
NB from Central Ave		0.03	6.5	A	0.03	6.8	A
SB from Blodgett Site		0.00	7.2	A	0.03	7.6	A
EB from St. John's Club	Weekday PM	0.01	7.1	A	0.01	7.4	A
WB from Lakeside Ave		0.06	7.4	A	0.09	7.6	A
NB from Central Ave		0.02	6.6	A	0.02	6.8	A
SB from Blodgett Site		0.02	7.4	A	0.16	8.2	A

2024									
Peak Hour	No Build & BCP			No Build, BCP & CP			Build, BCP & CP		
	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Lakeside Ave & Central Ave									
EB from St. John's Club	0.00	7.0	A	0.00	7.0	A	0.00	7.2	A
WB from Lakeside Ave	0.03	7.0	A	0.03	7.0	A	0.17	7.2	A
NB from Central Ave	0.03	6.5	A	0.03	6.5	A	0.03	6.8	A
SB from Blodgett Site	0.00	7.2	A	0.00	7.2	A	0.03	7.6	A
EB from St. John's Club	0.01	7.1	A	0.01	7.1	A	0.01	7.4	A
WB from Lakeside Ave	0.06	7.4	A	0.06	7.4	A	0.09	7.6	A
NB from Central Ave	0.02	6.6	A	0.02	6.6	A	0.02	6.8	A
SB from Blodgett Site	0.02	7.4	A	0.02	7.4	A	0.16	8.2	A

* Volume to capacity ratio

** Delay expressed in seconds per vehicle

*** Level of service

BCP: Burlington City Place

CP: Champlain Parkway

PARKING ASSESSMENT

The proposed site redevelopment plan includes 370 on-site parking spaces. Of these spaces, 128 spaces will be tandem and unpaved in the site's northern and central lots. The footprint area of the three buildings on site were used to generate parking estimates using the Institute of Transportation Engineers (ITE) and the Urban Land Institute's (ULI) Parking Demand calculations. As discussed previously in this study, it is assumed that non-auto trips will account for approximately 10% of site-generated trips.

As shown in **Table 6**, using these assumptions, the peak parking demand for the site should be 324 parking spaces. Conservatively, if there was no shift to alternative commuting modes, the peak parking demand is estimated at 360 spaces.

Table 6: Parking Demand Estimation

Building	Size (sf)	Use	Weekday Peak Parking Generation Rate (per ksf GLA)	Peak Parking Demand	
				10% Non- Auto	0% Non- Auto
50 Lakeside Avenue	84,500	Office	2.47	188	209
44 Lakeside Avenue	52,000	Office	2.47	116	128
32 Lakeside Avenue	9,200	Office	2.47	20	23
Total				324	360

Based on these calculations the site will have an excess of 46 parking spaces during peak periods with 82 of the tandem parking spots used during peak times. In the event that all employees drove their own cars, the above methodology calculates a parking demand of 360 spaces, which is less than the total supply of 370 spaces.

CONCLUSIONS

The proposed Blodgett Oven Site redevelopment program consists of a program of adaptive reuse and renovation of two of the three buildings located at 44-50 Lakeside Avenue. In total, the redevelopment program includes 145,700 square feet of office space, expanded parking capacity, internal circulation and access improvements, enhanced connectivity to the Burlington Bike Path, and other site amenities.

The trip generation estimates conducted for this study indicate that the proposed development program will generate approximately 162 new vehicle trips during the morning peak hour and 142 new vehicle trips during the evening peak hour.

Primary access and egress is proposed to be provided via the main driveway opposite Central Avenue and a parking lot exit adjacent to Lakeside Avenue. Improved access management will be implemented by providing a green strip between the street and parking lot for a length of Lakeside Avenue that is currently an open curb cut.

The crash data investigation revealed one designated High Crash Locations proximate to the project site. There were six reported crashes within the last five years on Lakeside Ave, all of which only resulted in property damage.

The parking assessment concluded that the peak on-site parking demand generated by the redevelopment can be accommodated by the proposed parking plan.

From a traffic operations perspective, the intersection capacity analysis results demonstrated that all study area intersections are expected to operate under acceptable levels of service for all scenarios evaluated. Certain movements, as described in the Signalized Intersections section, are expected to experience higher delays but do not greatly impact the overall intersection performance. As with the intersection of Flynn Ave and Champlain Parkway in the City Market traffic study, there are potential mitigation strategies that could be implemented in order to improve performance at the intersections of Lakeside Ave and Pine Street as well as Lakeside Ave and Champlain Parkway. One mitigation measure which could be used at these intersections is the inclusion of an advanced walk pedestrian phase rather than an exclusive pedestrian phase. This would result in a decrease in delay for the westbound Lakeside Ave approach and eastbound Lakeside Ave approach of 13 seconds and 60 seconds, respectively. It should be noted that this would be not be able to be implemented until the permitted time period for the Champlain Parkway has passed and changes can be made to the Parkway design.

In conclusion, based on the results of this Traffic Impact Study, the proposed Blodgett Oven Site Redevelopment project is not anticipated to generate unreasonable congestion or unsafe conditions on the adjacent roadway network.



Technical Appendix Traffic

- Traffic Volume Data
- Crash Data Summary
- Traffic Volume Adjustments
- Trip Generation Calculations and Trip Distribution
- Trip Distribution: Burlington City Place & Champlain Parkway
- Traffic Networks
- Unsignalized & Signalized Intersection Capacity Analyses



Traffic Volume Data



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/20/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Lakeside Avenue / Central Avenue**

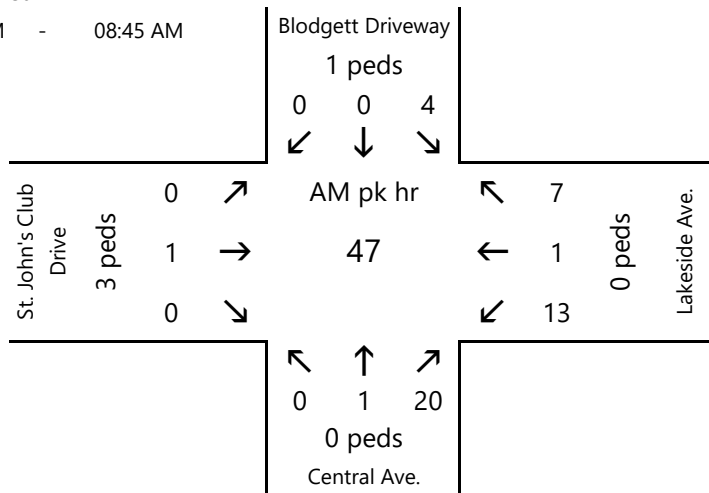
Intersection: **Lakeside Avenue / Central Avenue** Town: **Burlington, VT**
 Count Date(s): **6/12/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Blodgett Driveway				Lakeside Ave.				Central Ave.				St. John's Club Drive				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	0	0	4	1	7	1	13	0	20	1	0	0	0	1	0	3	47
PM pk hr	1	1	10	16	10	9	31	6	13	0	1	8	1	11	1	2	89

AM Peak Hour

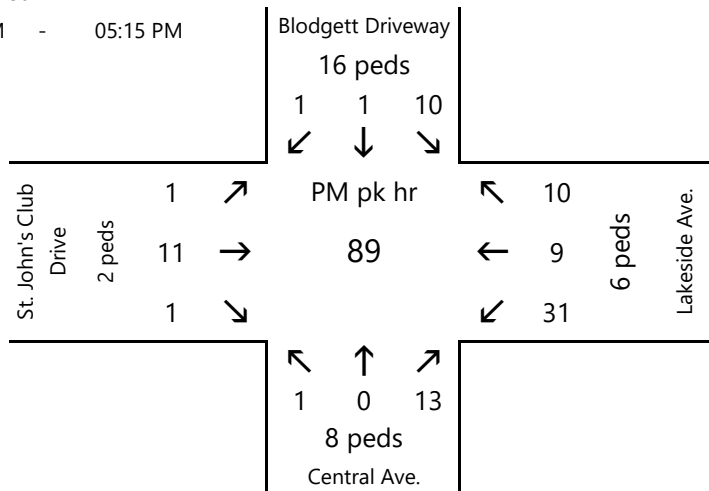
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	80%	90%	100%	75%
med	0%	0%	0%	0%
heavy	20%	10%	0%	25%
% trucks	20%	10%	0%	25%

PM Peak Hour

04:15 PM - 05:15 PM



%	SB	WB	NB	EB
auto	100%	100%	100%	100%
med	0%	0%	0%	0%
heavy	0%	0%	0%	0%
% trucks	0%	0%	0%	0%



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/19/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Pine Street / Lakeside Avenue**

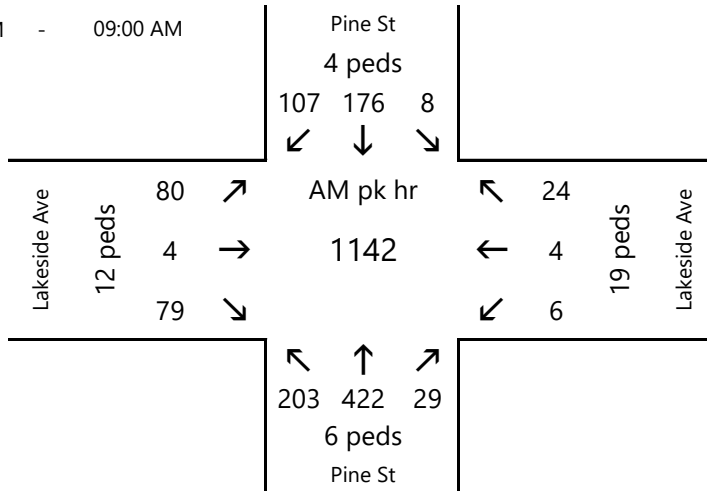
Intersection: **Pine St / Lakeside Ave** Town: **Burlington**
 Count Date(s): **6/13/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St				Lakeside Ave				Pine St				Lakeside Ave				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	107	176	8	4	24	4	6	19	29	422	203	6	79	4	80	12	1142
PM pk hr	86	361	1	7	2	0	1	38	0	372	75	9	309	0	157	7	1364

AM Peak Hour

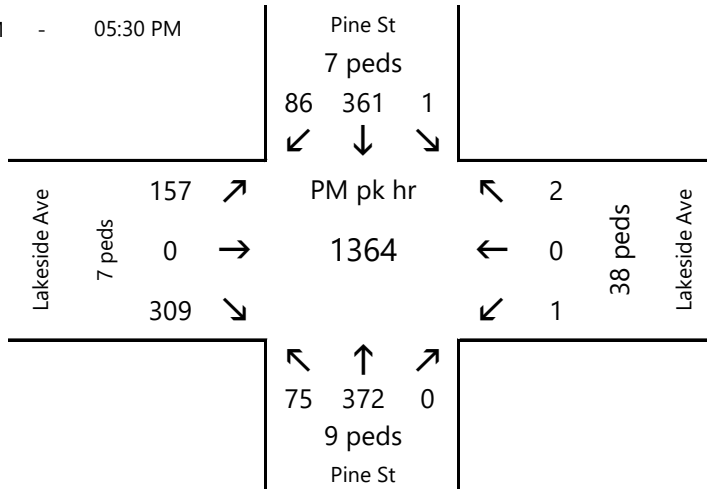
08:00 AM - 09:00 AM



%	SB	WB	NB	EB
auto	91%	100%	98%	91%
med	0%	0%	0%	0%
heavy	9%	0%	2%	9%
% trucks	9%	0%	2%	9%

PM Peak Hour

04:30 PM - 05:30 PM



%	SB	WB	NB	EB
auto	98%	100%	98%	99%
med	0%	0%	0%	0%
heavy	2%	0%	2%	1%
% trucks	2%	0%	2%	1%



Computations - Traffic Volumes

Project: **Blodgett Oven Site** Project #: **58083.00**
 Location: **Burlington, VT** Sheet:
 Calculated by: **NAT** Date: **6/20/18**
 Checked by: Date:
 Title: **Blodgett Oven Site Redevelopment**
 Intersection: **Pine Street / Flynn Avenue**

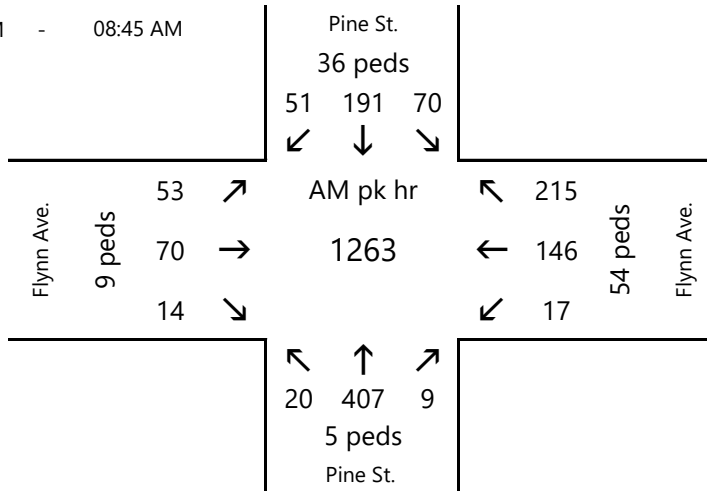
Intersection: **Pine Street / Flynn Avenue** Town: **Burlington, VT**
 Count Date(s): **6/12/2018** Counter: **VHB**

Peak Hour Volumes

	SB				WB				NB				EB				Total
	Pine St.				Flynn Ave.				Pine St.				Flynn Ave.				
	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	RT	Thru	LT	Ped	
AM pk hr	51	191	70	36	215	146	17	54	9	407	20	5	14	70	53	9	1263
PM pk hr	94	450	163	22	150	161	27	23	16	295	30	9	52	131	74	10	1643

AM Peak Hour

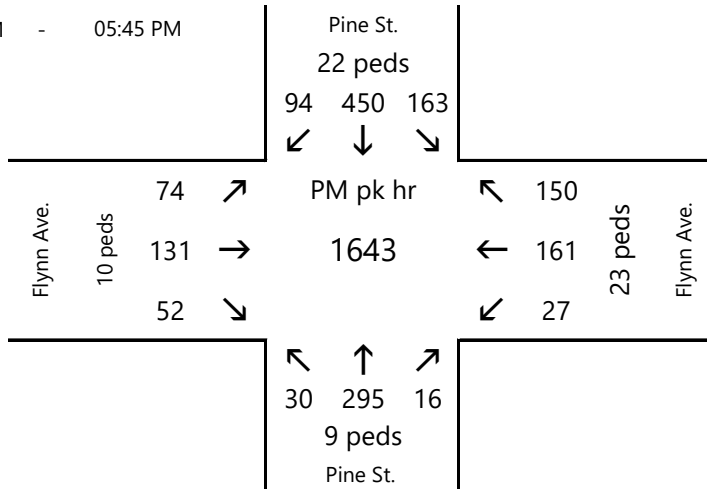
07:45 AM - 08:45 AM



%	SB	WB	NB	EB
auto	94%	98%	99%	91%
med	0%	0%	0%	0%
heavy	6%	2%	1%	9%
% trucks	6%	2%	1%	9%

PM Peak Hour

04:45 PM - 05:45 PM



%	SB	WB	NB	EB
auto	99%	98%	98%	99%
med	0%	0%	0%	0%
heavy	1%	2%	2%	1%
% trucks	1%	2%	2%	1%



Crash Data Summary

High Crash Location Report: Sections and Intersections

2012-2016



Office of Highway Safety Division
Data Section

***THIS DOCUMENT IS EXEMPT FROM DISCOVERY OR
ADMISSION UNDER 23 U.S.C. 409.***

Vermont Agency of Transportation
 Formal Statewide Sections - Route Log Order /2 - Statewide
 Years: 2012 - 2016

08/01/2017

H.C.L No.	/3.	Route	System	Town	Mileage	AADT	Years	Crashes	Fatalities	Injuries	PDO Crashes	Critical Rate	Actual Rate	Ratio Actual/Critical	Severity Index (\$/Crash/1.)
	553	MAPLE ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.700 - 1.000	2,400	5	10	0	3	8	6.398	7.610	1.189	\$35,590
	767	SOUTH MAIN ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.000 - 0.300	3,000	5	10	0	2	8	6.068	6.088	1.003	\$26,740
	470	SOUTH MAIN ST., BRATTLEBORO	Urban Collector (u)	Brattleboro	0.600 - 0.900	3,100	5	13	0	0	13	6.022	7.659	1.272	\$11,300
	305	CHURCH ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.000 - 0.300	1,300	5	8	0	1	7	7.458	11.240	1.507	\$20,950
	213	FOREST ST., RUTLAND CITY	Urban Collector (u)	Rutland City	0.700 - 1.000	740	5	6	0	2	4	8.629	14.809	1.716	\$37,033
	590	GROVE ST., RUTLAND CITY	Minor Arterial (u)	Rutland City	0.200 - 0.500	2,027	5	10	0	8	5	7.776	9.011	1.159	\$76,450
	109	LINCOLN AVE., RUTLAND CITY	Urban Collector (u)	Rutland City	0.100 - 0.400	958	5	9	1	4	5	8.070	17.159	2.126	\$212,278
	609	STRONGS AVE., RUTLAND CITY	Principal Arterial (u)	Rutland City	0.000 - 0.300	9,800	5	43	0	15	33	7.019	8.014	1.142	\$39,544
	432	VT. 127 BELTLINE, BURLINGTON	Freeway/Expressway (u)	Burlington	0.000 - 0.300	14,060	5	27	0	3	24	2.650	3.507	1.324	\$19,878
	367	VT. 127 BELTLINE, BURLINGTON	Freeway/Expressway (u)	Burlington	3.100 - 3.400	8,310	5	19	1	13	11	2.953	4.176	1.414	\$146,042
*	119	COLCHESTER AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.100 - 0.400	14,663	5	88	1	27	67	5.250	10.962	2.088	\$52,802
	196	EAST AVE., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	12,683	5	66	0	6	61	5.370	9.505	1.770	\$18,489
	249	NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	1.900 - 2.200	13,300	5	63	0	13	52	5.330	8.652	1.623	\$27,589
	683	NORTH AVE., BURLINGTON	Minor Arterial (u)	Burlington	2.600 - 2.900	10,800	5	35	0	6	30	5.513	5.919	1.074	\$24,857
	21	PEARL ST., BURLINGTON	Minor Arterial (u)	Burlington	0.000 - 0.300	8,040	5	88	0	7	82	5.803	19.991	3.445	\$17,569
	404	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.300 - 0.600	12,480	5	50	0	13	37	5.384	7.318	1.359	\$31,372
	579	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	0.800 - 1.100	11,827	5	41	0	6	35	5.431	6.332	1.166	\$22,598
	172	PINE ST., BURLINGTON	Minor Arterial (u)	Burlington	1.100 - 1.400	8,450	5	49	0	10	40	5.752	10.591	1.841	\$27,286
	69	ST. PAUL ST., BURLINGTON	Urban Collector (u)	Burlington	0.200 - 0.500	9,400	5	59	0	12	49	4.776	11.464	2.400	\$27,385
	602	S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.000 - 0.300	3,100	5	17	0	2	15	8.696	10.016	1.152	\$20,382
	621	S UNION ST., BURLINGTON	Principal Arterial (u)	Burlington	0.400 - 0.700	3,400	5	18	0	4	15	8.528	9.670	1.134	\$29,083
	70	MALLETTS BAY AVE., WINOOSKI CITY	Minor Arterial (u)	Winooski City	0.000 - 0.300	3,013	5	28	0	4	25	7.090	16.974	2.394	\$22,732
	610	MALLETTS BAY AVE., WINOOSKI CITY	Minor Arterial (u)	Winooski City	0.300 - 0.600	4,423	5	18	0	6	14	6.522	7.433	1.140	\$38,289
	177	W SPRING ST., WINOOSKI CITY	Urban Collector (u)	Winooski City	0.000 - 0.300	3,617	5	21	1	7	16	5.812	10.604	1.825	\$109,538
	486	DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.100 - 3.400	13,653	5	42	0	7	38	4.475	5.619	1.255	\$24,974
	13	DORSET ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	3.700 - 4.000	14,677	5	137	0	12	127	4.423	17.049	3.855	\$18,227
	762	SWIFT ST., SOUTH BURLINGTON	Urban Collector (u)	South Burlington	1.000 - 1.300	5,893	5	17	0	0	17	5.230	5.269	1.007	\$11,300

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Lakeside Ave

<u>Street</u>	<u>Town</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of</u>	
					<u>Number of Injuries</u>	<u>Fatalities</u>
LAKESIDE AV	Burlington	December 14, 2013, 12:38 PM	Cloudy	Rear End	0	0
LAKESIDE AV	Burlington	March 13, 2013, 8:42 AM	Cloudy	Same Direction Sideswipe	0	0
LAKESIDE AV	Burlington	March 23, 2013, 3:17 PM	Clear	Rear End	0	0
LAKESIDE AVE	Burlington	May 13, 2016, 2:39 PM	Rain	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--	0	0
LAKESIDE AV	Burlington	November 21, 2014, 2:15 PM	Cloudy	No Turns, Thru moves only,	0	0
LAKESIDE AV	Burlington	November 24, 2015, 12:26 PM	Clear	Broadside ^< Head On	0	0
TOTAL:					0	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Intersection of Pine St and Flynn Ave

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
PINE ST.	Burlington		0 August 23, 2017, 9:18 AM	Clear	Rear End	0	0
PINE ST.	Burlington		0 August 24, 2017, 11:07 AM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		0 August 25, 2016, 5:16 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		August 31, 2016, 5:08 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 February 3, 2015, 7:27 AM	Clear	Broadside ^<	1	0
PINE ST.	Burlington	0.02	January 5, 2017, 2:05 PM	Clear	Rear End	0	0
					Right Turn and Thru, Same Direction		
PINE ST.	Burlington	0.02	July 14, 2015, 5:42 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 July 2, 2017, 7:55 AM	Clear	Broadside ^<	1	0
PINE ST.	Burlington		June 18, 2015, 2:08 PM	Clear	Rear End	0	0
PINE ST.	Burlington		June 24, 2017, 2:10 PM	Cloudy	Rear End	0	0
					Right Turn and Thru, Same Direction		
PINE ST.	Burlington		0 March 28, 2013, 6:12 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
PINE ST.	Burlington	0.02	March 6, 2013, 7:17 AM	Clear	Rear End	0	0
PINE ST.	Burlington		0 May 1, 2013, 12:46 PM	Clear	Opp Direction Sideswipe	0	0
PINE ST.	Burlington		0 May 13, 2013, 2:37 PM	Cloudy	Other - Explain in Narrative	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington		0 May 9, 2015, 11:45 AM	Cloudy	Broadside ^<	1	0
PINE ST.	Burlington		0 November 10, 2015, 12:10 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington		0 November 29, 2017, 5:00 AM	Unknown		0	0
PINE ST.	Burlington		0 October 10, 2014, 6:02 PM	Clear	Opp Direction Sideswipe	0	0
PINE ST.	Burlington	0.11	October 23, 2014, 8:09 PM	Rain	Single Vehicle Crash	1	0
					Left Turn and Thru, Broadside v<--		
PINE ST.	Burlington	0.02	October 31, 2016, 6:27 PM	Clear	No Turns, Thru moves only,	0	0
					Broadside ^<		
PINE ST.	Burlington		0 September 26, 2013, 6:26 AM	Clear	Broadside ^<	1	0
PINE ST.	Burlington		0 September 9, 2013, 8:57 AM	Clear	Other - Explain in Narrative	0	0
FLYNN AVE.	Burlington		April 10, 2017, 3:30 AM	Clear	Same Direction Sideswipe	0	0
FLYNN AVE.	Burlington	0.01	August 17, 2013, 8:06 AM	Cloudy	Rear End	0	0
FLYNN AVE.	Burlington		0 January 3, 2013, 7:05 AM	Cloudy	Other - Explain in Narrative	0	0
FLYNN AVE.	Burlington	0.05	July 4, 2013, 8:48 AM			0	0
FLYNN AVE.	Burlington	0.04	June 14, 2014, 8:00 AM	Cloudy	Other - Explain in Narrative	0	0
					Right Turn and Thru, Head On v^--		
FLYNN AVE.	Burlington		0 June 2, 2014, 10:16 AM	Clear	Right Turn and Thru, Head On v^--	0	0
FLYNN AVE.	Burlington		0 May 12, 2017, 6:40 PM	Clear	Same Direction Sideswipe	0	0
FLYNN AVE.	Burlington		0 May 31, 2016, 3:56 PM	Clear	Rear-to-rear	0	0
TOTAL:						5	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Intersection of Pine St and Lakeside Ave

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
PINE ST.	Burlington	0.41	April 1, 2014, 5:45 PM	Cloudy	Other - Explain in Narrative	1	0
PINE ST.	Burlington	0.38	April 29, 2014, 5:23 PM	Cloudy	Other - Explain in Narrative	1	0
PINE ST.	Burlington	0.41	August 12, 2013, 11:51 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.41	August 17, 2016, 12:19 PM	Clear	Rear End	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.41	August 24, 2017, 5:46 AM	Clear	-->v--	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	August 4, 2015, 3:45 PM	Clear	-->v--	1	0
PINE ST.	Burlington	0.31	August 9, 2017, 11:57 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.46	December 1, 2016, 4:14 PM	Cloudy	Rear End	0	0
PINE ST.	Burlington		December 16, 2013, 11:38 AM	Clear	Rear-to-rear	0	0
PINE ST.	Burlington	0.41	December 21, 2016, 7:09 AM	Clear	Same Direction Sideswipe	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	December 3, 2014, 3:43 PM	Rain	-->v--	0	0
PINE ST.	Burlington	0.4	February 16, 2015, 6:34 AM	Unknown	Rear End	0	0
				Freezing			
PINE ST.	Burlington	0.22	February 9, 2017, 4:43 PM	Precipitation	Rear End	0	0
PINE ST.	Burlington	0.42	January 18, 2017, 9:57 PM	Clear	Single Vehicle Crash	0	0
PINE ST.	Burlington	0.38	January 21, 2013, 4:20 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	January 21, 2015, 3:09 PM	Clear	Rear End	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.41	January 24, 2014, 7:26 AM	Clear	-->v--	0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	January 9, 2017, 6:07 AM	Clear	-->v--	0	0
PINE ST.	Burlington		July 11, 2017, 11:18 AM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.39	July 18, 2013, 1:33 PM	Clear	Broadside ^<	0	0
PINE ST.	Burlington	0.4	July 19, 2017, 4:00 PM	Clear	Same Direction Sideswipe	0	0
PINE ST.	Burlington	0.42	July 20, 2017, 8:49 AM	Clear	Rear End	0	0
PINE ST.	Burlington	0.37	July 4, 2013, 5:46 PM	Cloudy	Single Vehicle Crash	0	0
PINE ST.	Burlington	0.39	July 7, 2016, 1:40 PM	Clear	Other - Explain in Narrative	0	0
PINE ST.	Burlington	0.41	June 30, 2014, 2:12 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	March 13, 2017, 3:38 PM	Clear	Rear End	0	0
PINE ST.	Burlington	0.4	May 22, 2013, 5:00 PM	Cloudy	Other - Explain in Narrative	1	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.38	May 30, 2013, 5:38 AM	Clear	-->v--	0	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.4	November 30, 2015, 4:11 PM	Clear	Broadside ^<	0	0
PINE ST.	Burlington	0.41	October 22, 2013, 5:49 PM			0	0
					Left Turn and Thru, Angle Broadside		
PINE ST.	Burlington	0.4	October 30, 2014, 7:25 AM	Cloudy	-->v--	1	0
PINE ST.	Burlington	0.4	September 22, 2014, 12:54 PM	Clear	Rear End	1	0
					No Turns, Thru moves only,		
PINE ST.	Burlington	0.4	September 25, 2015, 8:07 AM	Clear	Broadside ^<	0	0
PINE ST.	Burlington		September 4, 2014, 11:32 AM	Clear	Other - Explain in Narrative	0	0
LAKESIDE / Burlington			December 14, 2013, 12:38 PM	Cloudy	Rear End	0	0
					Left Turn and Thru, Same Direction		
LAKESIDE / Burlington			May 13, 2016, 2:39 PM	Rain	Sideswipe/Angle Crash vv--	0	0
TOTAL:						6	0

Blodgett Oven Site Redevelopment--Traffic Impact Study
Crash Summary (2013-2017)
Street: Pine St (MM 0.0 - 0.5)

<u>Street</u>	<u>Town</u>	<u>Mile Mark</u>	<u>Date & Time</u>	<u>Weather</u>	<u>Direction of Collision</u>	<u>Number of Injuries</u>	<u>Number of Fatalities</u>
Pine St.	Burlington	0.38	January 21, 2013, 4:20 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.31	February 2, 2013, 11:50 AM	Cloudy	Rear End	0	0
Pine St.	Burlington	0.02	March 6, 2013, 7:17 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.36	March 11, 2013, 11:04 AM	Cloudy	Rear End	0	0
					Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.00	March 28, 2013, 6:12 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
Pine St.	Burlington	0.17	April 9, 2013, 4:07 PM	Clear	Rear End	1	0
Pine St.	Burlington	0.00	May 1, 2013, 12:46 PM	Clear	Opp Direction Sideswipe	0	0
Pine St.	Burlington	0.00	May 13, 2013, 2:37 PM	Cloudy	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.40	May 22, 2013, 5:00 PM	Cloudy	Other - Explain in Narrative	1	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.38	May 30, 2013, 5:38 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.37	July 4, 2013, 5:46 PM	Cloudy	Single Vehicle Crash	0	0
Pine St.	Burlington	0.20	July 9, 2013, 4:10 PM			0	0
Pine St.	Burlington	0.21	July 10, 2013, 11:32 AM			0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.39	July 18, 2013, 1:33 PM	Clear	Broadside ^<	0	0
Pine St.	Burlington	0.41	August 12, 2013, 11:51 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.00	September 9, 2013, 8:57 AM	Clear	Other - Explain in Narrative	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	September 26, 2013, 6:26 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.12	October 11, 2013, 2:53 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.38	October 13, 2013, 11:26 AM			0	0
Pine St.	Burlington	0.41	October 22, 2013, 5:49 PM			0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.41	January 24, 2014, 7:26 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.41	April 1, 2014, 5:45 PM	Cloudy	Other - Explain in Narrative	1	0
Pine St.	Burlington	0.10	April 8, 2014, 12:19 PM		Rear End	0	0
Pine St.	Burlington	0.38	April 29, 2014, 5:23 PM	Cloudy	Other - Explain in Narrative	1	0
Pine St.	Burlington	0.35	May 15, 2014, 7:45 AM	Cloudy	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.35	June 26, 2014, 8:58 AM	Cloudy	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.41	June 30, 2014, 2:12 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.25	September 2, 2014, 3:04 PM	Clear	Rear End	1	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.26	September 6, 2014, 1:52 PM	Rain	Broadside ^<	0	0
Pine St.	Burlington	0.39	September 12, 2014, 3:58 PM			0	0
Pine St.	Burlington	0.40	September 22, 2014, 12:54 PM	Clear	Rear End	1	0
Pine St.	Burlington	0.00	October 10, 2014, 6:02 PM	Clear	Opp Direction Sideswipe	0	0
Pine St.	Burlington	0.11	October 23, 2014, 8:09 PM	Rain	Single Vehicle Crash	1	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	October 30, 2014, 7:25 AM	Cloudy	-->v--	1	0
Pine St.	Burlington	0.22	November 20, 2014, 4:31 PM	Clear	Same Direction Sideswipe	0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	December 3, 2014, 3:43 PM	Rain	-->v--	0	0
Pine St.	Burlington	0.30	January 15, 2015, 4:15 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.40	January 21, 2015, 3:09 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	February 3, 2015, 7:27 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.40	February 16, 2015, 6:34 AM	Unknown	Rear End	0	0
Pine St.	Burlington	0.10	April 12, 2015, 8:26 PM	Clear	Rear End	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	May 9, 2015, 11:45 AM	Cloudy	Broadside ^<	1	0
Pine St.	Burlington	0.21	May 21, 2015, 4:17 PM	Clear	Opp Direction Sideswipe	1	0
Pine St.	Burlington	0.39	June 23, 2015, 8:38 AM	Rain	Rear End	1	0
Pine St.	Burlington	0.37	June 25, 2015, 11:58 AM	Clear	Rear-to-rear	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.00	July 12, 2015, 6:07 PM	Clear	Broadside ^<	1	0
					Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.02	July 14, 2015, 5:42 PM	Clear	Sideswipe/Angle Crash ^^--	0	0
					Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40	August 4, 2015, 3:45 PM	Clear	-->v--	1	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.40	September 25, 2015, 8:07 AM	Clear	Broadside ^<	0	0
Pine St.	Burlington	0.00	November 10, 2015, 12:10 PM	Clear	Same Direction Sideswipe	0	0
					No Turns, Thru moves only,		
Pine St.	Burlington	0.40	November 30, 2015, 4:11 PM	Clear	Broadside ^<	0	0

Pine St.	Burlington	0.39 March 2, 2016, 6:30 AM	Clear	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.00 March 31, 2016, 8:28 AM	Cloudy	Left Turn and Thru, Broadside v<--	0	0
Pine St.	Burlington	0.27 June 15, 2016, 10:42 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.39 July 7, 2016, 1:40 PM	Clear	Other - Explain in Narrative	0	0
Pine St.	Burlington	0.41 August 17, 2016, 12:19 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.00 August 25, 2016, 5:16 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.02 October 31, 2016, 6:27 PM	Clear	Left Turn and Thru, Broadside v<--	0	0
Pine St.	Burlington	0.46 December 1, 2016, 4:14 PM	Cloudy	Rear End	0	0
				Right Turn and Thru, Same Direction		
Pine St.	Burlington	0.21 December 6, 2016, 11:55 AM		Sideswipe/Angle Crash ^^--	0	0
Pine St.	Burlington	0.41 December 21, 2016, 7:09 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.02 January 5, 2017, 2:05 PM	Clear	Rear End	0	0
				Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.40 January 9, 2017, 6:07 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.42 January 18, 2017, 9:57 PM	Clear	Single Vehicle Crash	0	0
Pine St.	Burlington	0.22 February 9, 2017, 4:43 PM	Freezing Pr	Rear End	0	0
Pine St.	Burlington	0.40 March 13, 2017, 3:38 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.27 June 1, 2017, 10:18 AM	Clear	Other - Explain in Narrative	0	0
				No Turns, Thru moves only,		
Pine St.	Burlington	0.00 July 2, 2017, 7:55 AM	Clear	Broadside ^<	1	0
Pine St.	Burlington	0.40 July 19, 2017, 4:00 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.42 July 20, 2017, 8:49 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.31 August 9, 2017, 11:57 AM	Clear	Rear End	0	0
Pine St.	Burlington	0.00 August 23, 2017, 9:18 AM	Clear	Rear End	0	0
				Left Turn and Thru, Angle Broadside		
Pine St.	Burlington	0.41 August 24, 2017, 5:46 AM	Clear	-->v--	0	0
Pine St.	Burlington	0.00 August 24, 2017, 11:07 AM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.23 October 6, 2017, 5:23 PM	Clear	Rear End	0	0
Pine St.	Burlington	0.42 November 8, 2017, 12:43 PM	Clear	Same Direction Sideswipe	0	0
Pine St.	Burlington	0.37 November 13, 2017, 1:40 PM			0	0
Pine St.	Burlington	0.00 November 29, 2017, 5:00 AM			0	0
Pine St.	Burlington	0.26 December 8, 2017, 2:29 PM		Rear End	0	0
TOTAL:					16	0



Traffic Volume Adjustments

20-YEAR 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 2017 to 2037 20-year AADT growth factor of 1.09 which was developed from Vermont population and labor statistics.

TO FUTURE YEAR	FROM CURRENT YEAR		
	2017	2018	2019
2017	1.00		
2018	1.00	1.00	
2019	1.01	1.00	1.00
2020	1.01	1.01	1.00
2021	1.02	1.01	1.01
2022	1.02	1.02	1.01
2023	1.03	1.02	1.02
2024	1.03	1.03	1.02
2025	1.04	1.03	1.03
2026	1.04	1.04	1.03
2027	1.05	1.04	1.04
2028	1.05	1.05	1.04
2029	1.05	1.05	1.05
2030	1.06	1.05	1.05
2031	1.06	1.06	1.05
2032	1.07	1.06	1.06
2033	1.07	1.07	1.06
2034	1.08	1.07	1.07
2035	1.08	1.08	1.07
2036	1.09	1.08	1.08
2037	1.09	1.09	1.08
2038	1.09	1.09	1.09
2039	1.10	1.09	1.09
2040	1.10	1.10	1.09
2041	1.11	1.10	1.10
2042	1.11	1.11	1.10
2043	1.12	1.11	1.11

2016 Redbook DHV Chart

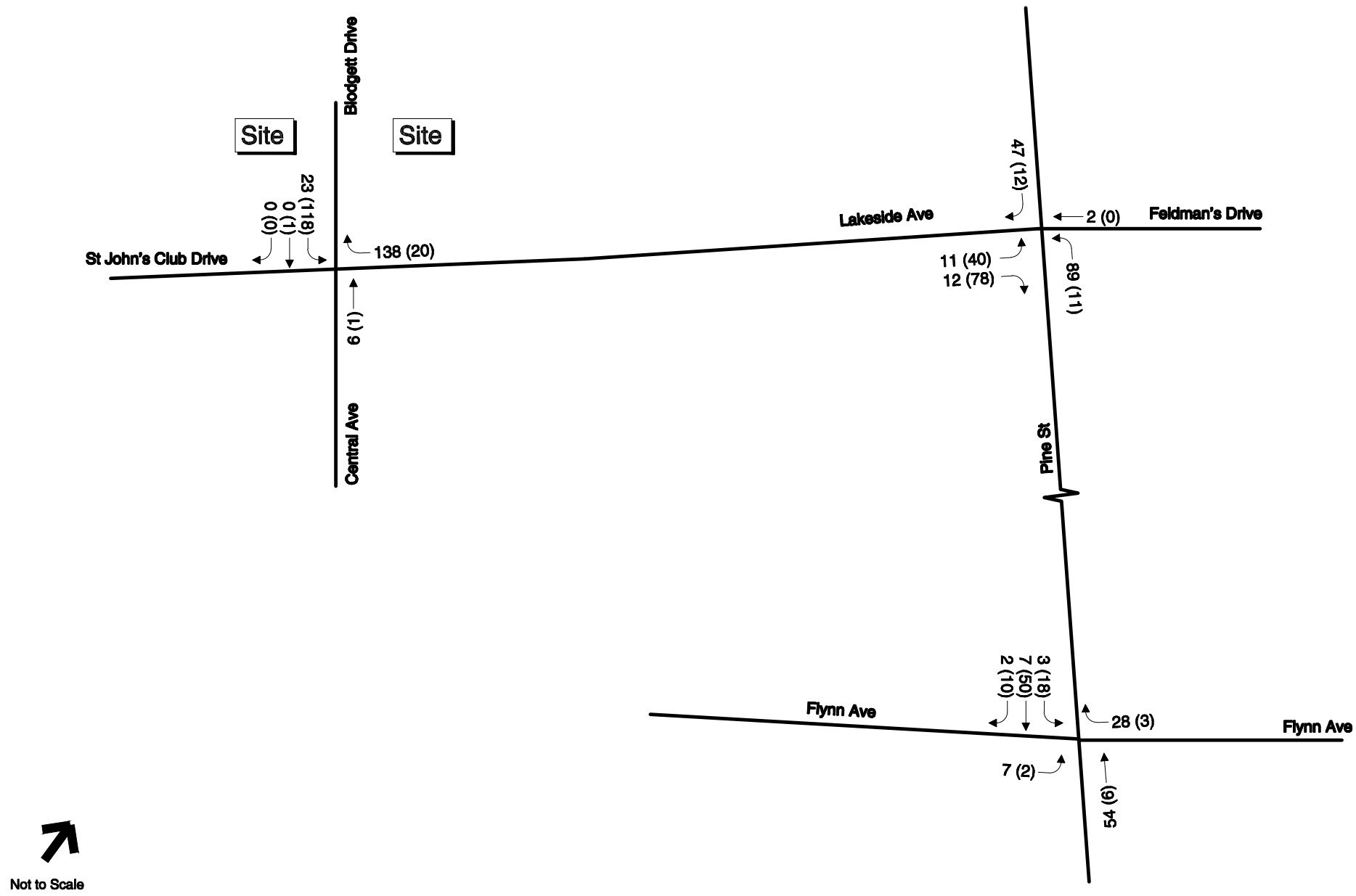
AADT	Predicted DHV by Seasonal Factor Group by AADT					
	Rural Interstate SF1	Rural Non-Interstate SF2	Urban SF3	Summer Recreational SF4	Summer/Winter Recreational SF5	Summer/Winter Recreational TH SF6
11000	1300	1200	1200		1400	
11100	1300	1200	1200		1400	
11200	1400	1200	1300		1400	
11300	1400	1200	1300		1400	
11400	1400	1200	1300		1500	
11500	1400	1200	1300		1500	
11600	1400	1200	1300		1500	
11700	1500	1200	1300		1500	
11800	1500	1200	1300		1500	
11900	1500	1200	1300		1500	
12000	1500	1200	1300		1500	
12100	1500	1300	1300		1600	
12200	1500	1300	1400			
12300	1600	1300	1400			
12400	1600	1300	1400			
12500	1600	1300	1400			
12600	1600	1300	1400			
12700	1600	1300	1400			
12800	1600	1300	1400			
12900	1700	1300	1400			
13000	1700	1300	1400			
13100	1700	1300	1400			
13200	1700	1300	1500			
13300	1700	1300	1500			
13400	1700	1400	1500			
13500	1800	1400	1500			
13600	1800		1500			
13700	1800		1500			
13800	1800		1500			
13900	1800		1500			
14000	1800		1500			
14100	1900		1500			
14200	1900		1500			
14300	1900		1500			
14400	1900		1600			
14500	1900		1600			
14600	2000		1600			
14700	2000		1600			
14800	2000		1600			
14900	2000		1600			
15000	2100		1600			
15100	2100		1600			

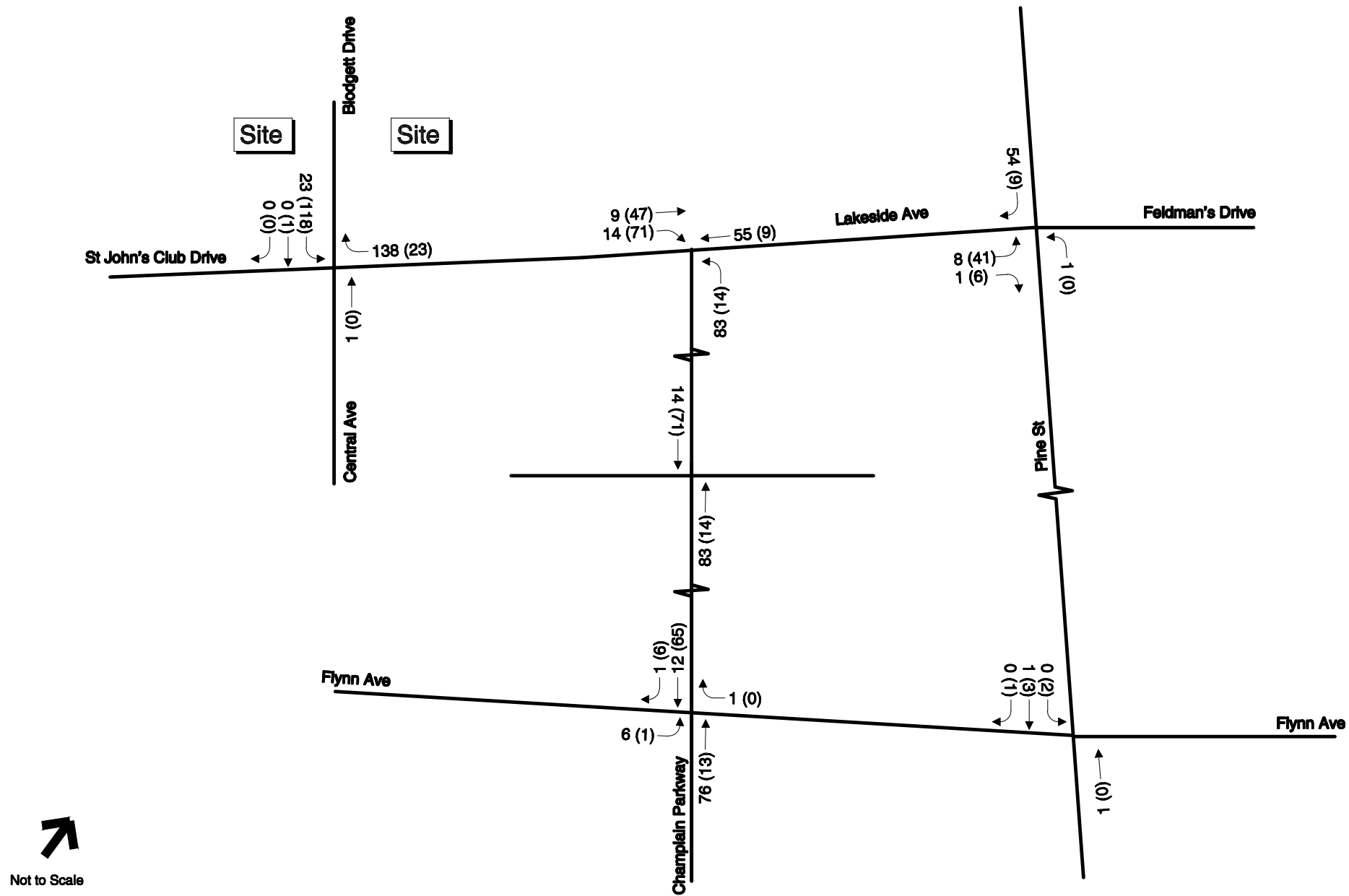
Trip Generation Calculations and Trip Distribution

Trip Generation - Blodgett Site

Total Site generated trips (not accounting for internal, pass-by, or diverted trips)

Site Land Uses and Descriptions				Weekday AM Peak Hour of Adajcent Street				Weekday PM Peak Hour of Adajcent Street			
Code	Land Use	Size	Unit	Total Trips	% Entering	Entering	Exiting	Total Trips	% Entering	Entering	Exiting
1	2	3	4								
EXISTING											
712	Small Office Building	9.2	1k sf	18	83%	15	3	23	32%	7	16
PROPOSED				18		15	3	23		7	16
712	Small Office Building	9.2	1k sf	18	83%	15	3	23	32%	7	16
710	General Office Building	52	1k sf	75	86%	64	11	61	16%	10	51
710	General Office Building	84.5	1k sf	106	86%	91	15	97	16%	16	81
				199		170	29	181		33	148
Source: <u>Trip Generation</u> , 10th Edition, Institute of Transportation Engineers, Washington D.C., 2017.											
NET NEW TRIPS				Total		Entering	Exiting	Total Trips		Entering	Exiting
				181		155	26	158		26	132

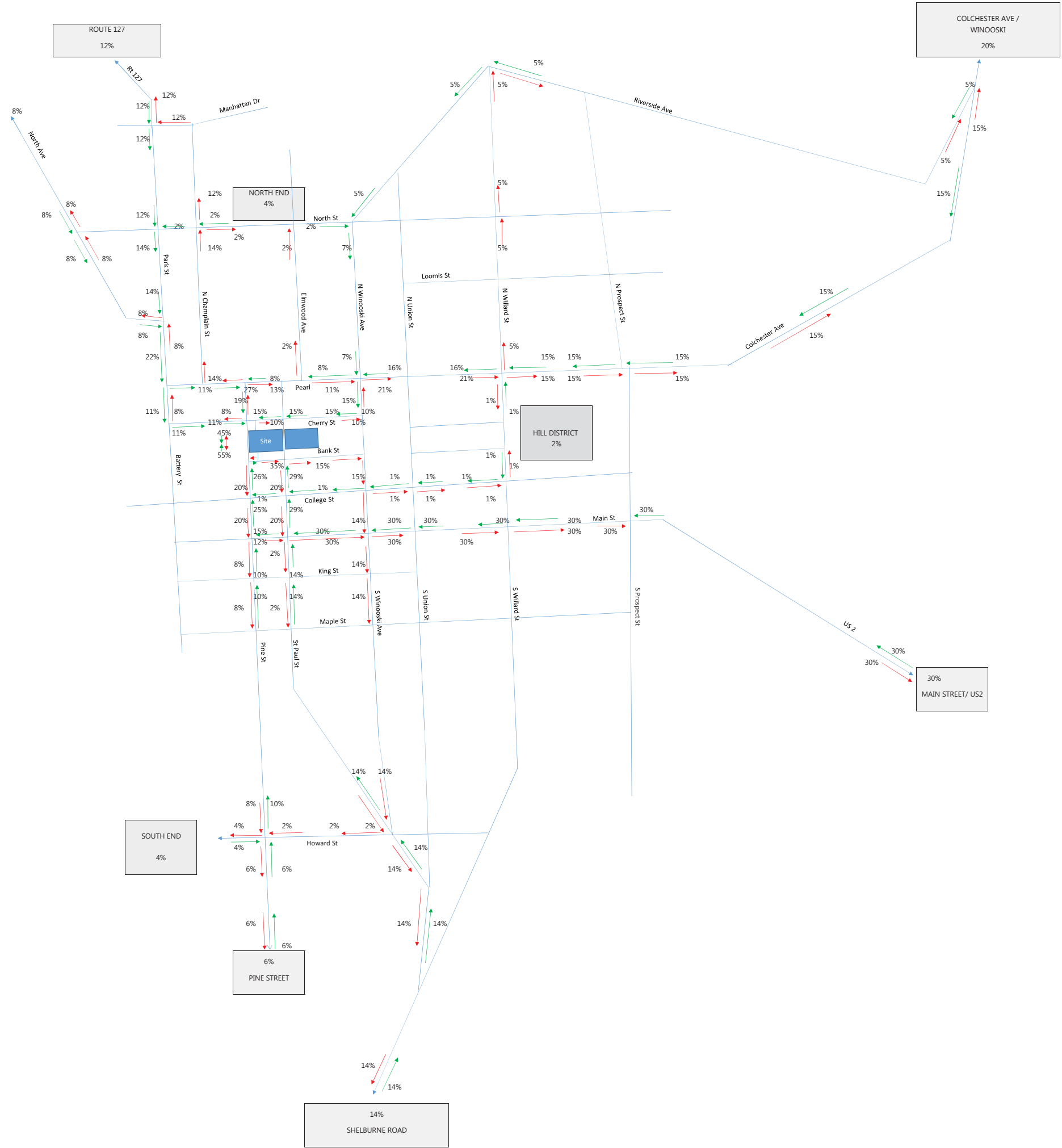






Trip Distribution: Burlington City Place & Champlain Parkway

Trip Generation Assumptions



FILE NAME: H:\B559\BPT\SE\SE\display\traffic\2008\2008am.SHIFT.ctb
DATE/TIME: 8/16/2009
USER: 1933

● SIGNALIZED INTERSECTIONS

NOT TO SCALE

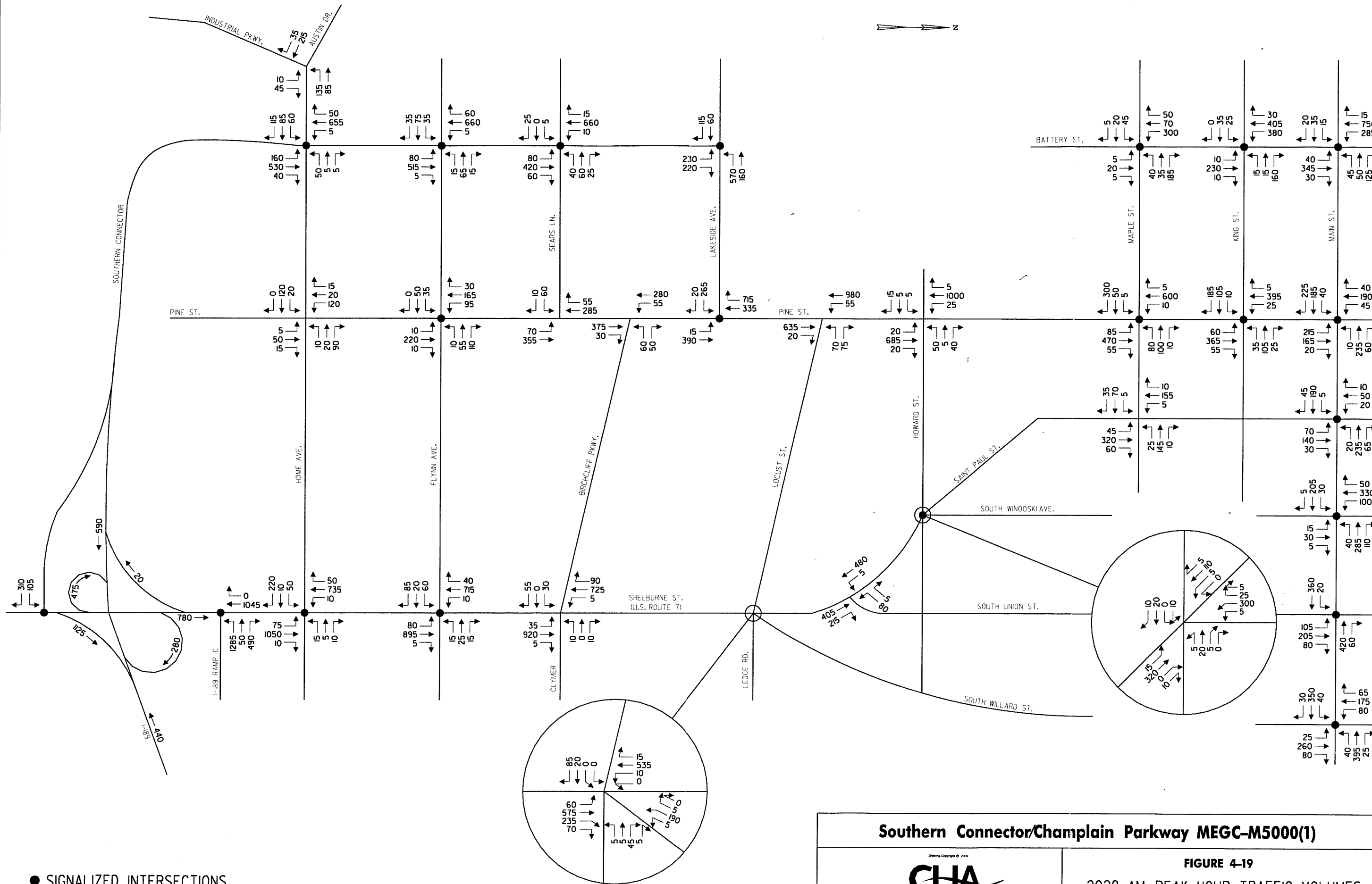
Southern Connector/Champlain Parkway MEGC-M5000(1)

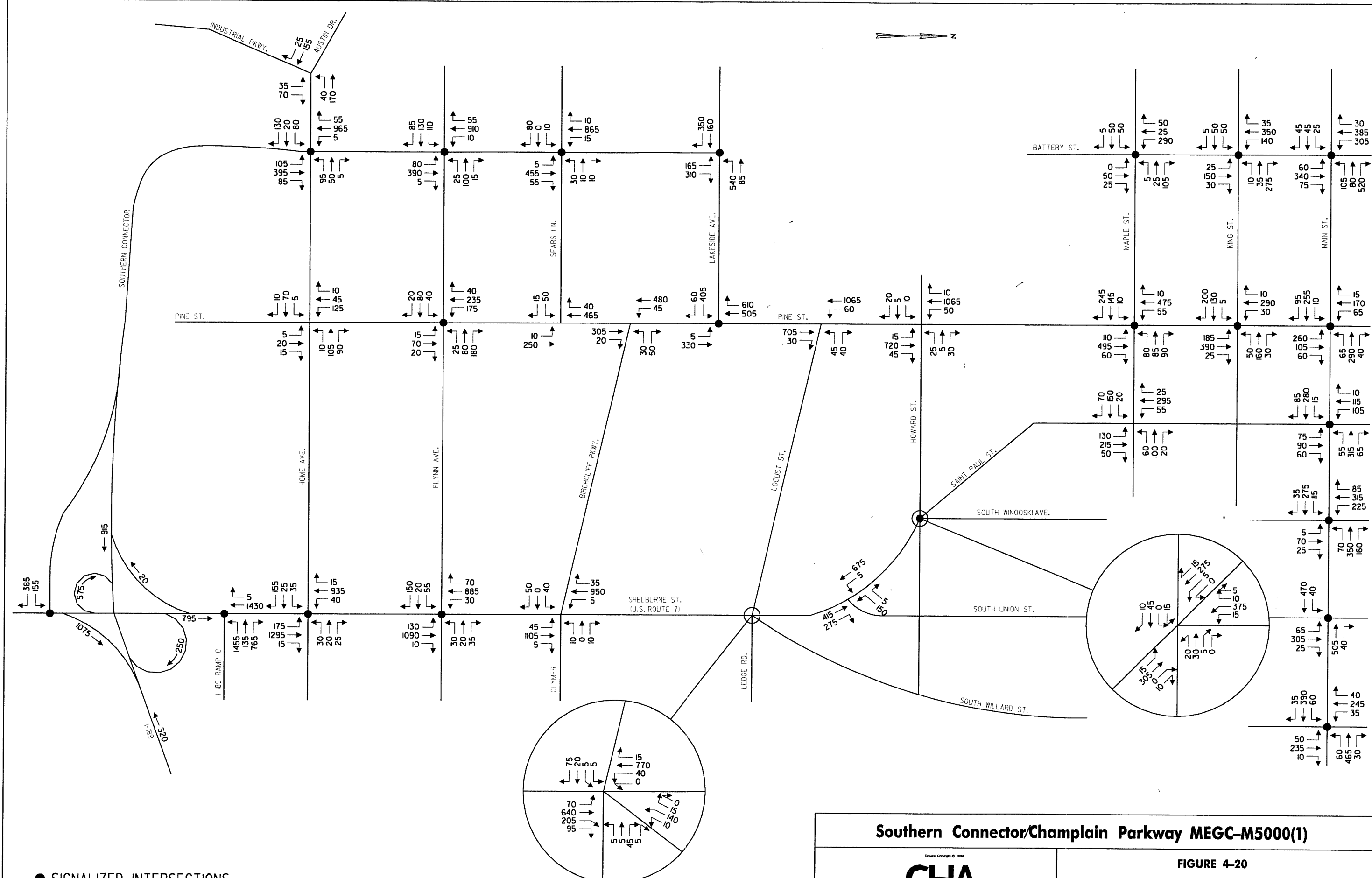


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FIGURE 4-19

2028 AM PEAK HOUR TRAFFIC VOLUMES
BUILD ALTERNATIVE 2





● SIGNALIZED INTERSECTIONS

NOT TO SCALE

Southern Connector/Champlain Parkway MEGC-M5000(1)



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FIGURE 4-20

2028 PM PEAK HOUR TRAFFIC VOLUMES
 BUILD ALTERNATIVE 2

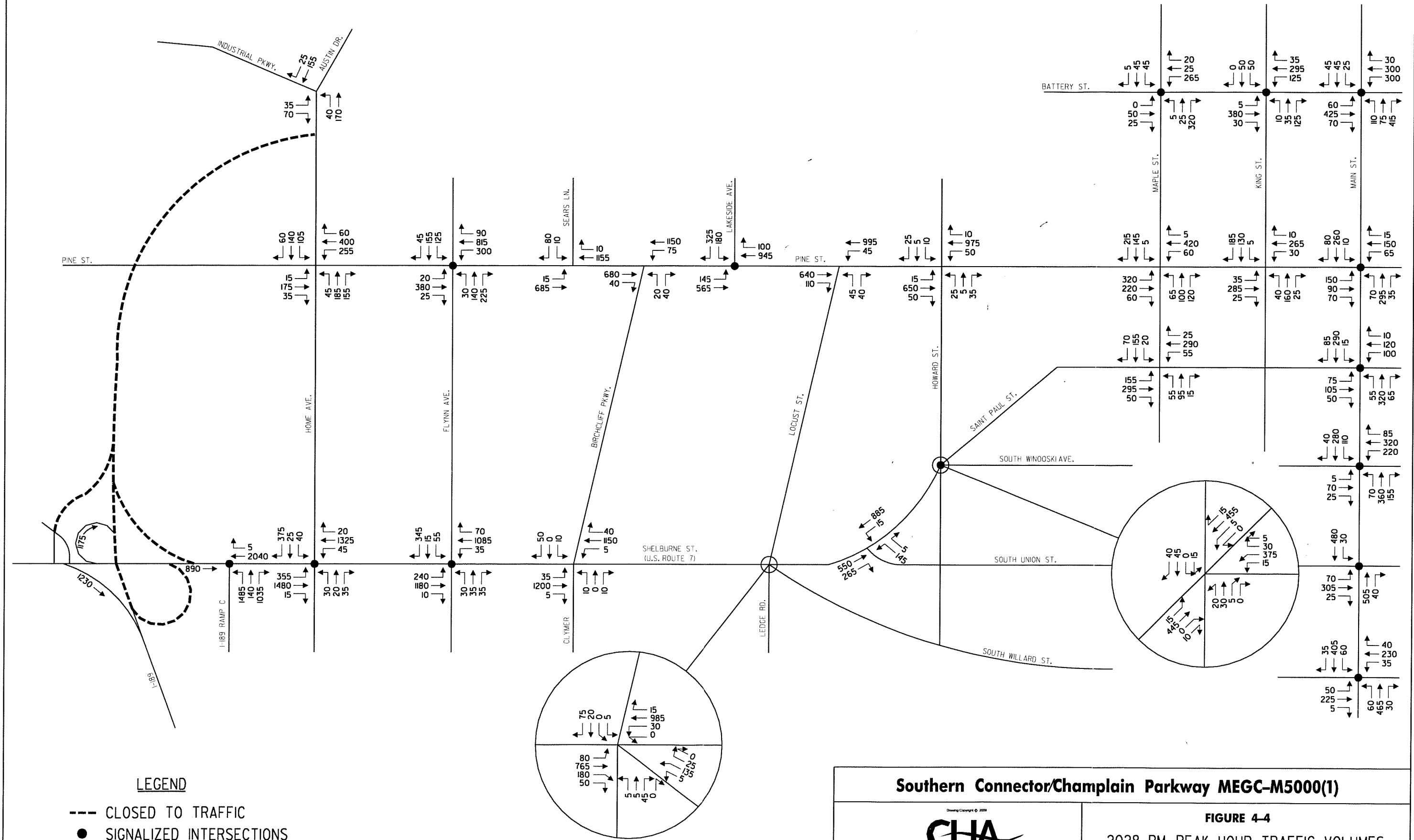
--- CLOSED TO TRAFFIC
● SIGNALIZED INTERSECTIONS

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Page 4-5



Southern Connector/Champlain Parkway MEGC-M5000(1)

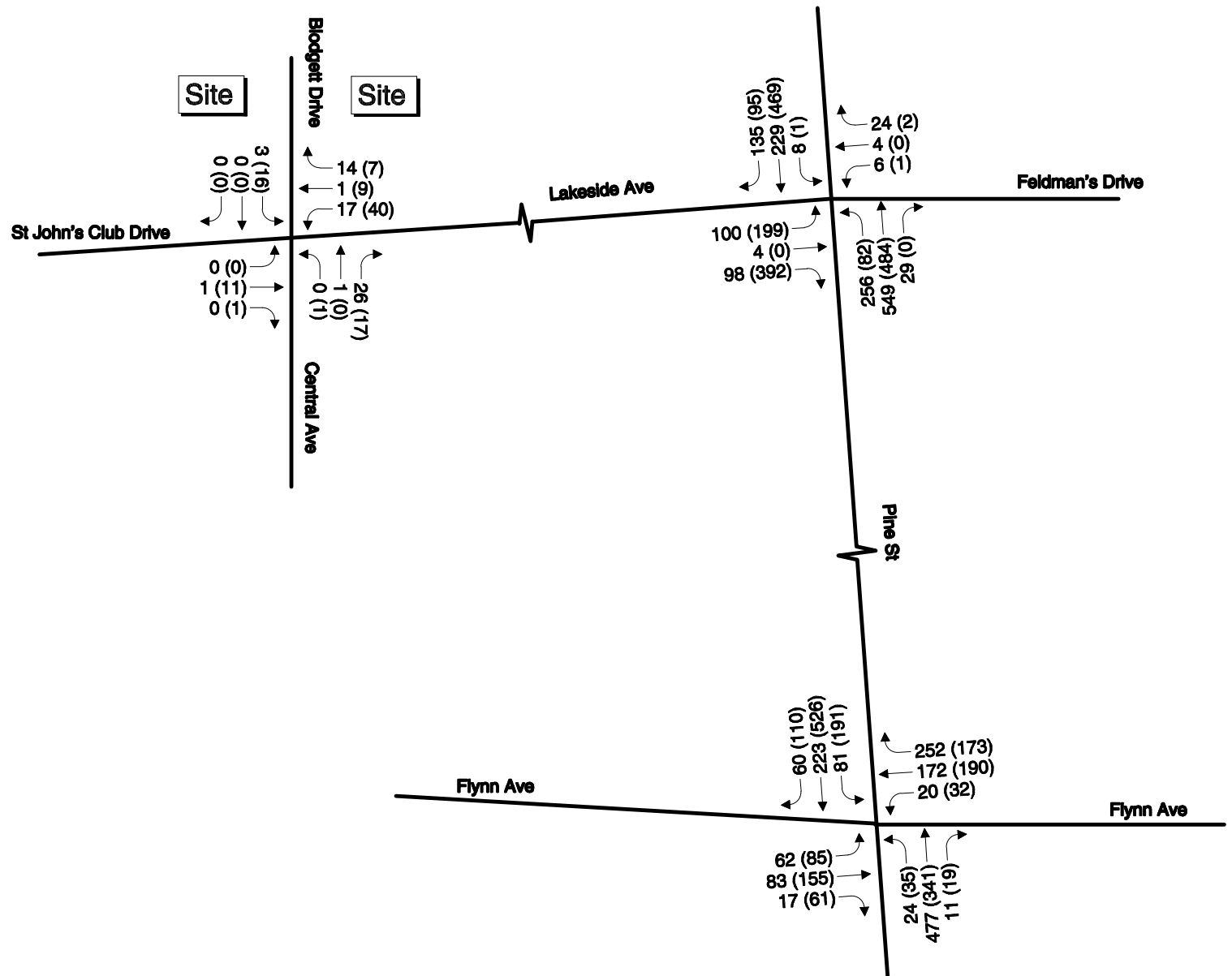


FIGURE 4-4

2028 PM PEAK HOUR TRAFFIC VOLUMES
 NO-BUILD ALTERNATIVE

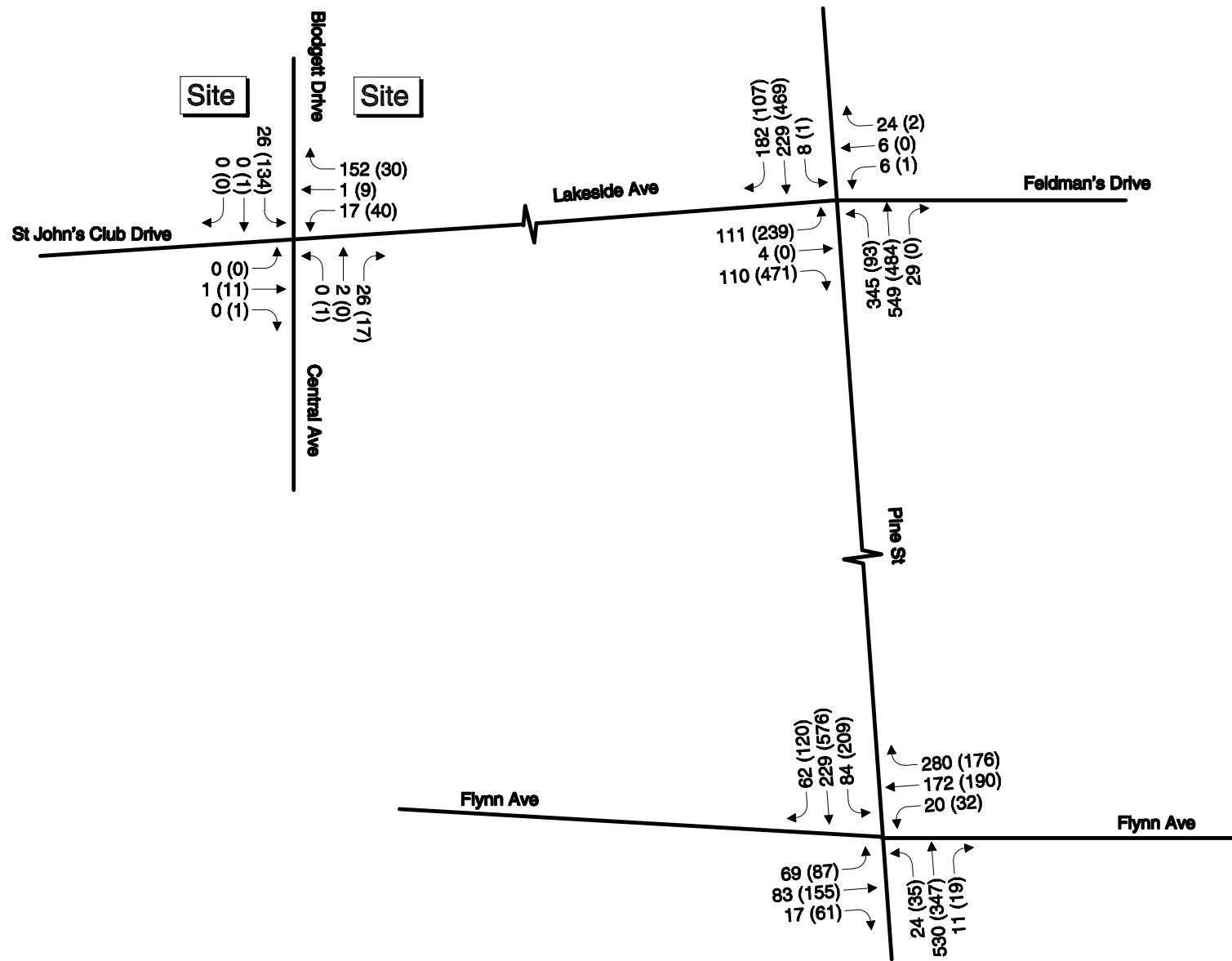


Traffic Networks



Not to Scale



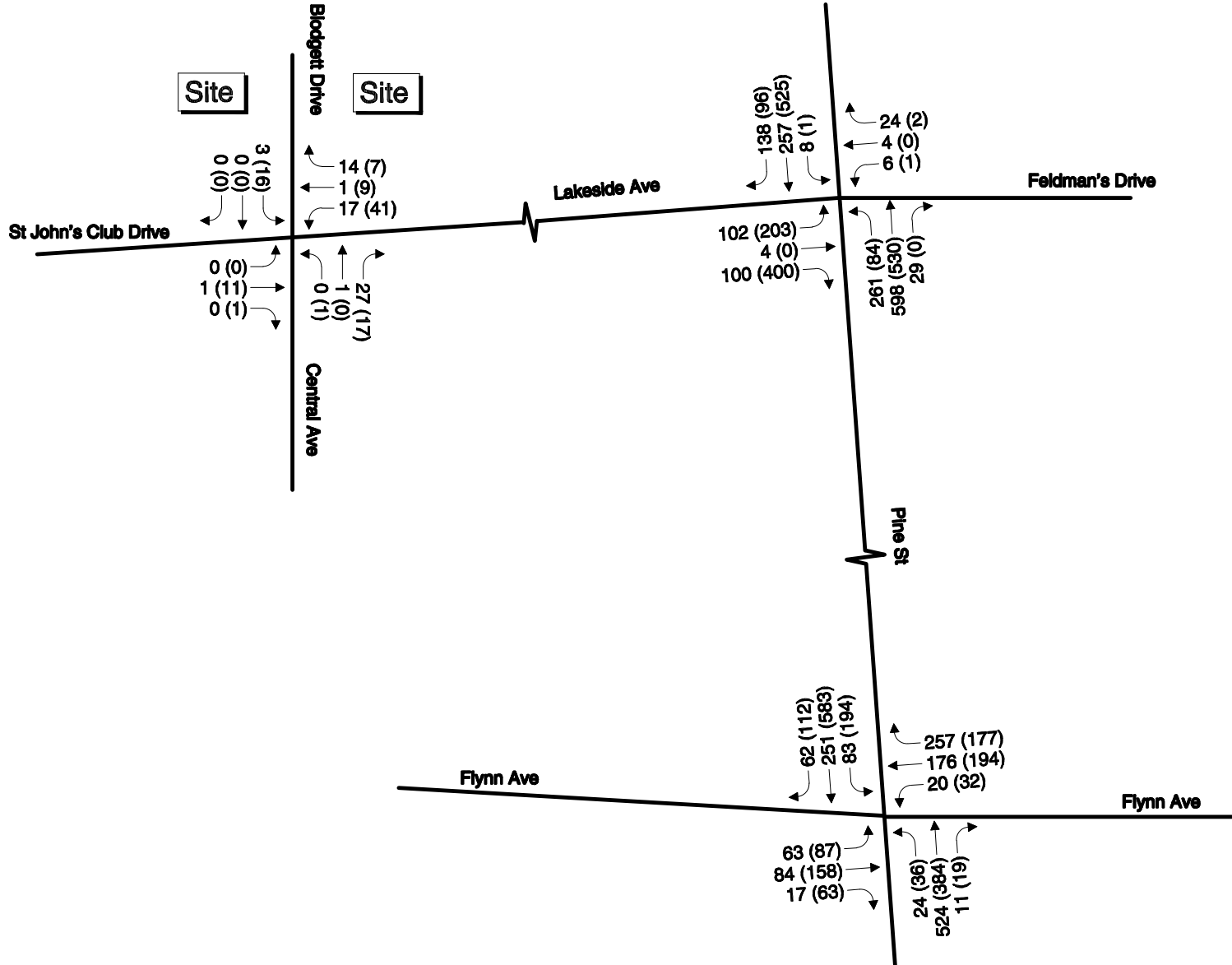


Not to Scale

Legend
AM Peak Hour
(PM Peak Hour)



Figure 6
2019 Build Weekday
Peak Hour Traffic Volumes

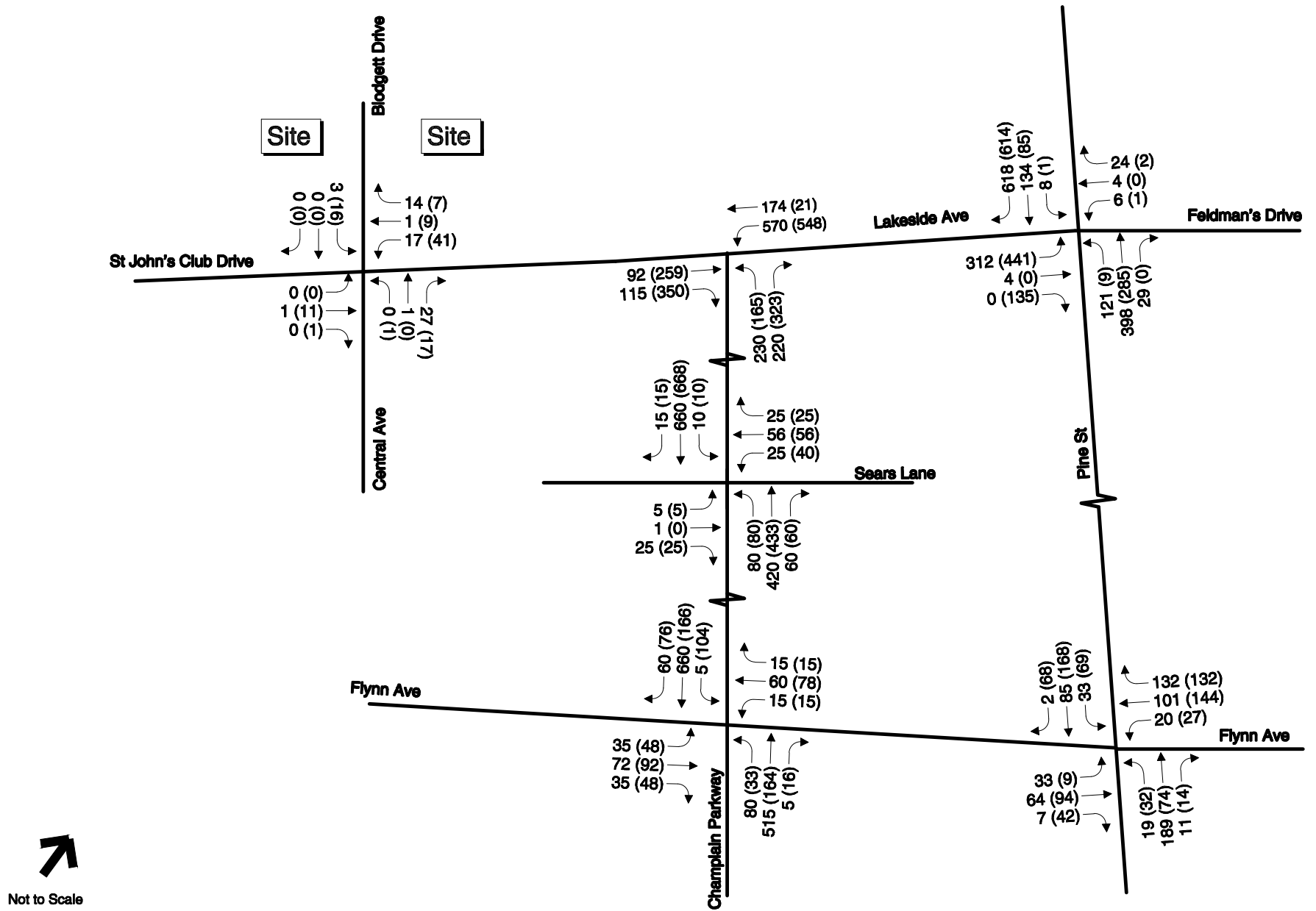


Not to Scale

Legend
AM Peak Hour
(PM Peak Hour)



Figure 7
2024 No Build & BCP Weekday
Peak Hour Traffic Volumes



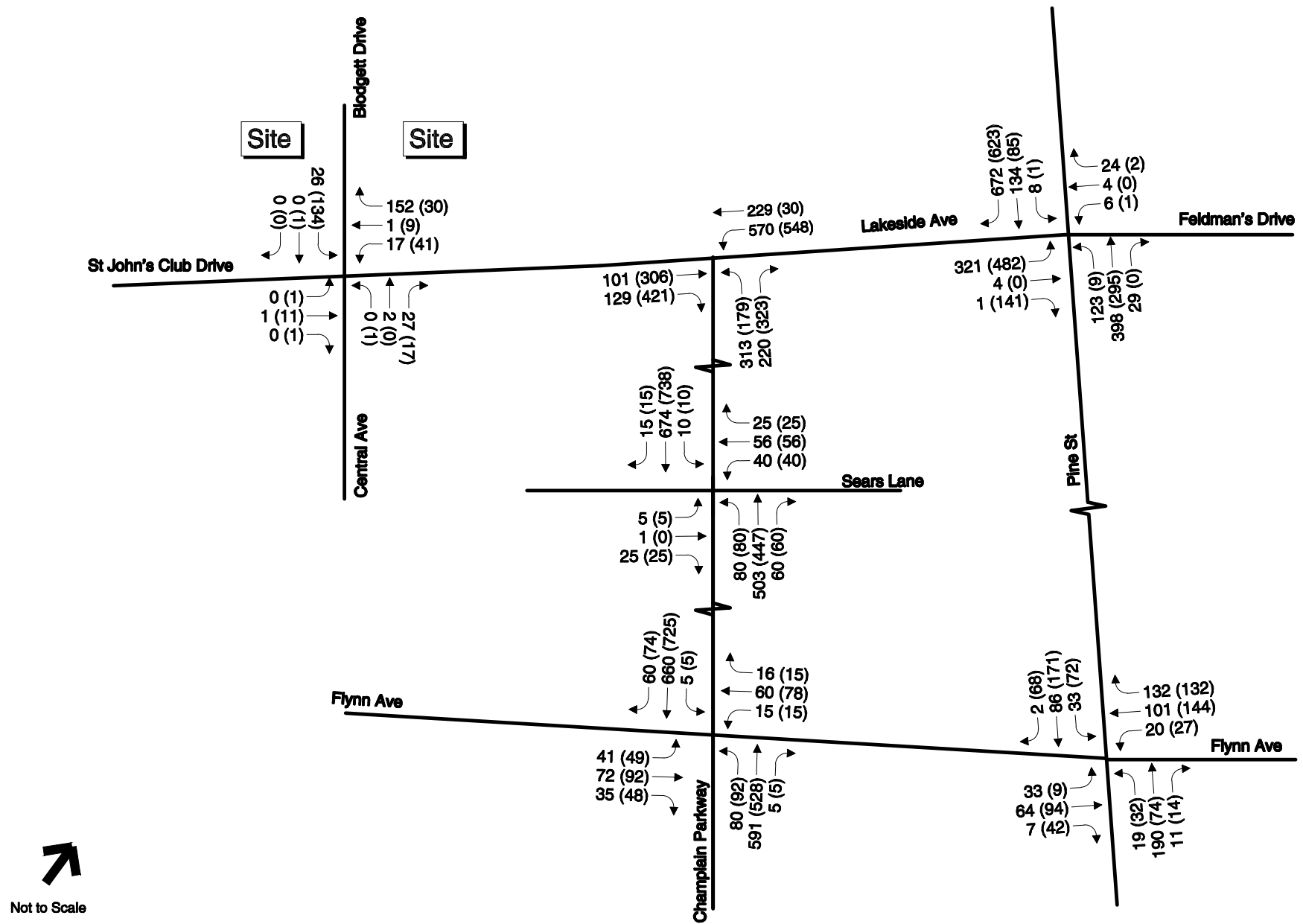


Figure 9
 2024 Build, BCP & CP Weekday
 Peak Hour Traffic Volumes

Unsignalized & Signalized Intersection Capacity Analysis

Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt					0.941			0.870				
Flt Protected					0.974						0.950	
Satd. Flow (prot)	0	1863	0	0	1707	0	0	1621	0	0	1770	0
Flt Permitted					0.974						0.950	
Satd. Flow (perm)	0	1863	0	0	1707	0	0	1621	0	0	1770	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1630			869			215	
Travel Time (s)		3.8			44.5			23.7			5.9	
Confl. Peds. (#/hr)	1					1	3					3
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
Adj. Flow (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	32	0	0	27	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 19.7%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	26	3	0	0
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)	0	1	0	17	1	14	0	1	26	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	27	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	26	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				6.8								
Level of Service				A								
Intersection Capacity Utilization				19.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	4	98	6	4	24	256	549	29	8	229	135
Future Volume (vph)	100	4	98	6	4	24	256	549	29	8	229	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.99	0.96			0.92		0.99	1.00			1.00	0.96
Frt		0.856			0.905			0.992				0.850
Flt Protected	0.950				0.991		0.950				0.998	
Satd. Flow (prot)	1770	1538	0	0	1547	0	1770	1844	0	0	1859	1583
Flt Permitted	0.735						0.457				0.975	
Satd. Flow (perm)	1355	1538	0	0	1557	0	841	1844	0	0	1815	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		98			24			6				166
Link Speed (mph)		25			25			25				25
Link Distance (ft)		1630			262			2150			922	
Travel Time (s)		44.5			7.1			58.6			25.1	
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
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
Adj. Flow (vph)	100	4	98	6	4	24	256	549	29	8	229	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	102	0	0	34	0	256	578	0	0	237	135
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effect Green (s)	9.7	9.5			6.1		28.4	31.6			14.1	14.1
Actuated g/C Ratio	0.23	0.22			0.14		0.67	0.74			0.33	0.33
v/c Ratio	0.27	0.24			0.14		0.34	0.42			0.39	0.22
Control Delay	18.2	6.5			15.4		6.7	7.2			16.6	3.2
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	18.2	6.5			15.4		6.7	7.2			16.6	3.2
LOS	B	A			B		A	A			B	A
Approach Delay		12.3			15.4			7.1			11.7	
Approach LOS		B			B			A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 42.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 9.2

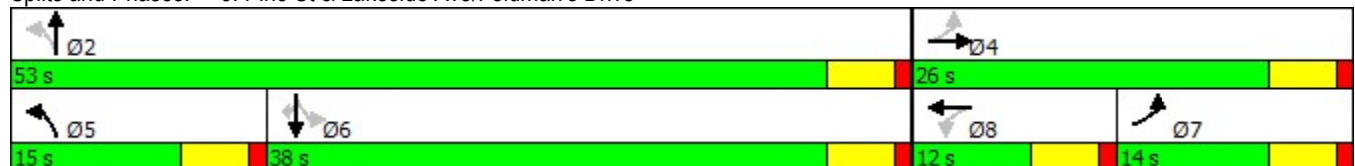
Intersection LOS: A

Intersection Capacity Utilization 70.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	83	17	20	172	252	24	477	11	81	223	60
Future Volume (vph)	62	83	17	20	172	252	24	477	11	81	223	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			0.96			1.00			0.99	
Frt		0.986			0.923			0.997			0.968	
Flt Protected		0.981			0.998			0.998		0.950		
Satd. Flow (prot)	0	1915	0	0	1754	0	0	1971	0	1770	1906	0
Flt Permitted		0.654			0.983			0.976		0.264		
Satd. Flow (perm)	0	1276	0	0	1727	0	0	1926	0	492	1906	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			101			2			31	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
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
Adj. Flow (vph)	62	83	17	20	172	252	24	477	11	81	223	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	162	0	0	444	0	0	512	0	81	283	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		18.0	18.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		19.1			19.1			21.0		31.2	31.2	
Actuated g/C Ratio		0.32			0.32			0.36		0.53	0.53	
v/c Ratio		0.39			0.71			0.75		0.16	0.28	
Control Delay		19.7			21.8			27.4		8.0	7.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		19.7			21.8			27.4		8.0	7.7	
LOS		B			C			C		A	A	
Approach Delay		19.7			21.8			27.4			7.8	
Approach LOS		B			C			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 20.1

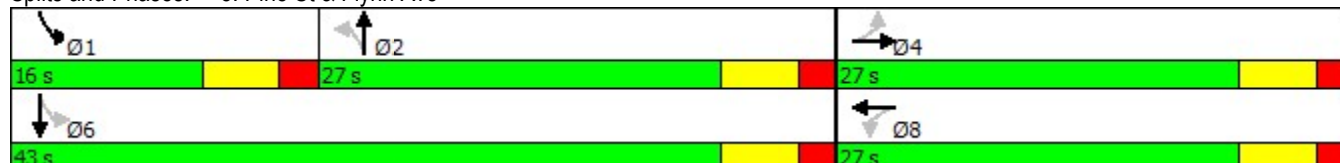
Intersection LOS: C

Intersection Capacity Utilization 85.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	17	1	152	0	2	26	26	0	0
Future Volume (vph)	0	1	0	17	1	152	0	2	26	26	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt					0.879			0.875				
Flt Protected					0.995						0.950	
Satd. Flow (prot)	0	1863	0	0	1629	0	0	1630	0	0	1770	0
Flt Permitted					0.995						0.950	
Satd. Flow (perm)	0	1863	0	0	1629	0	0	1630	0	0	1770	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1630			869			215	
Travel Time (s)		3.8			44.5			23.7			5.9	
Confl. Peds. (#/hr)	1					1	3					3
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
Adj. Flow (vph)	0	1	0	17	1	152	0	2	26	26	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	170	0	0	28	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 32.4%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	152	0	2	26	26	0	0
Future Volume (vph)	0	1	0	17	1	152	0	2	26	26	0	0
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)	0	1	0	17	1	152	0	2	26	26	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	170	28	26								
Volume Left (vph)	0	17	0	26								
Volume Right (vph)	0	152	26	0								
Hadj (s)	0.03	-0.48	-0.52	0.23								
Departure Headway (s)	4.2	3.5	3.7	4.5								
Degree Utilization, x	0.00	0.17	0.03	0.03								
Capacity (veh/h)	835	1000	913	759								
Control Delay (s)	7.2	7.2	6.8	7.6								
Approach Delay (s)	7.2	7.2	6.8	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	7.2											
Level of Service	A											
Intersection Capacity Utilization	32.4%			ICU Level of Service			A					
Analysis Period (min)	15											
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	4	110	6	6	24	345	549	29	8	229	182
Future Volume (vph)	112	4	110	6	6	24	345	549	29	8	229	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.99	0.96			0.93		0.99	1.00			1.00	0.96
Frt		0.855			0.910			0.992				0.850
Flt Protected	0.950				0.992		0.950				0.998	
Satd. Flow (prot)	1770	1536	0	0	1564	0	1770	1844	0	0	1859	1583
Flt Permitted	0.734						0.429				0.973	
Satd. Flow (perm)	1354	1536	0	0	1573	0	789	1844	0	0	1812	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		110			24			6				182
Link Speed (mph)		25			25			25				25
Link Distance (ft)		1630			262			2150			922	
Travel Time (s)		44.5			7.1			58.6			25.1	
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
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
Adj. Flow (vph)	112	4	110	6	6	24	345	549	29	8	229	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	114	0	0	36	0	345	578	0	0	237	182
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effect Green (s)	10.0	10.0			6.1		27.6	29.6			12.6	12.6
Actuated g/C Ratio	0.22	0.22			0.14		0.61	0.66			0.28	0.28
v/c Ratio	0.31	0.27			0.15		0.50	0.48			0.47	0.33
Control Delay	19.5	6.4			16.0		8.9	8.4			18.9	5.0
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	19.5	6.4			16.0		8.9	8.4			18.9	5.0
LOS	B	A			B		A	A			B	A
Approach Delay		12.9			16.0			8.6			12.9	
Approach LOS		B			B			A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 44.9

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 10.5

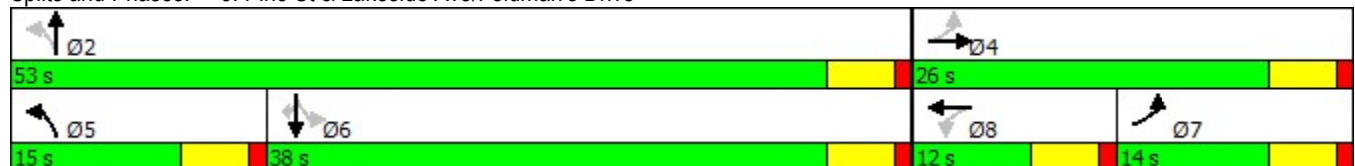
Intersection LOS: B

Intersection Capacity Utilization 71.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	83	17	20	172	280	24	530	11	84	229	62
Future Volume (vph)	69	83	17	20	172	280	24	530	11	84	229	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		10	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			0.96			1.00			0.99	
Frt		0.986			0.920			0.997			0.968	
Flt Protected		0.980			0.998			0.998		0.950		
Satd. Flow (prot)	0	1793	0	0	1636	0	0	1848	0	1770	1787	0
Flt Permitted		0.598			0.983			0.978		0.243		
Satd. Flow (perm)	0	1094	0	0	1610	0	0	1810	0	453	1787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			112			2			31	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
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
Adj. Flow (vph)	69	83	17	20	172	280	24	530	11	84	229	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	472	0	0	565	0	84	291	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		20.2			20.2			22.8		33.2	33.2	
Actuated g/C Ratio		0.33			0.33			0.37		0.54	0.54	
v/c Ratio		0.47			0.79			0.84		0.18	0.30	
Control Delay		22.0			26.4			35.4		8.3	8.2	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		22.0			26.4			35.4		8.3	8.2	
LOS		C			C			D		A	A	
Approach Delay		22.0			26.4			35.4			8.2	
Approach LOS		C			C			D			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 61.8

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 24.8

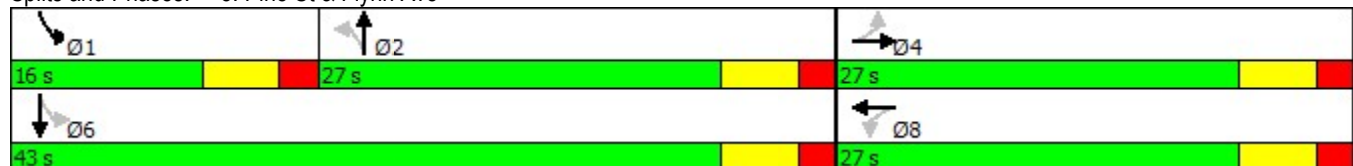
Intersection LOS: C

Intersection Capacity Utilization 93.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	1	40	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	40	9	7	1	0	17	16	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt		0.989			0.983			0.872				
Flt Protected					0.966			0.997			0.950	
Satd. Flow (prot)	0	1842	0	0	1769	0	0	1619	0	0	1770	0
Flt Permitted					0.966			0.997			0.950	
Satd. Flow (perm)	0	1842	0	0	1769	0	0	1619	0	0	1770	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1630			869			215	
Travel Time (s)		3.8			44.5			23.7			5.9	
Confl. Peds. (#/hr)	16		8	8		16	2		6	6		2
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
Adj. Flow (vph)	0	11	1	40	9	7	1	0	17	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	56	0	0	18	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 25.7%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	40	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	40	9	7	1	0	17	16	0	0
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)	0	11	1	40	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	56	18	16								
Volume Left (vph)	0	40	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	984	820								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			25.7%	ICU Level of Service				A				
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	0	392	1	0	2	82	484	0	1	469	95
Future Volume (vph)	199	0	392	1	0	2	82	484	0	1	469	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.98	0.96			0.97		1.00				1.00	0.97
Frt		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950					
Satd. Flow (prot)	1770	1515	0	0	1626	0	1770	1863	0	0	1863	1583
Flt Permitted	0.756						0.253				0.999	
Satd. Flow (perm)	1382	1515	0	0	1646	0	469	1863	0	0	1861	1534
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		439			166							166
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1630			262			2150			922	
Travel Time (s)		44.5			7.1			58.6			25.1	
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
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
Adj. Flow (vph)	199	0	392	1	0	2	82	484	0	1	469	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	392	0	0	3	0	82	484	0	0	470	95
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effct Green (s)	10.2	10.0			5.8		24.3	24.3			18.6	18.6
Actuated g/C Ratio	0.22	0.22			0.13		0.53	0.53			0.41	0.41
v/c Ratio	0.52	0.58			0.01		0.19	0.49			0.62	0.13
Control Delay	25.1	5.7			0.0		5.9	8.2			16.5	0.8
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	25.1	5.7			0.0		5.9	8.2			16.5	0.8
LOS	C	A			A		A	A			B	A
Approach Delay		12.2						7.8			13.9	
Approach LOS		B						A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 45.9

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.3

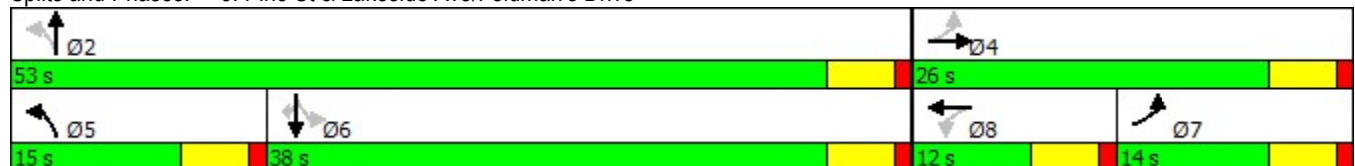
Intersection LOS: B

Intersection Capacity Utilization 87.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	155	61	32	190	173	35	341	19	191	526	110
Future Volume (vph)	85	155	61	32	190	173	35	341	19	191	526	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		0.99			0.98			1.00			0.99	
Frt		0.973			0.941			0.994			0.974	
Flt Protected		0.986			0.996			0.996		0.950		
Satd. Flow (prot)	0	1888	0	0	1819	0	0	1960	0	1770	1920	0
Flt Permitted		0.692			0.959			0.909		0.320		
Satd. Flow (perm)	0	1325	0	0	1750	0	0	1787	0	596	1920	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			60			4			24	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
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
Adj. Flow (vph)	85	155	61	32	190	173	35	341	19	191	526	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	395	0	0	395	0	191	636	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		18.6			18.6			19.1		34.4	34.4	
Actuated g/C Ratio		0.30			0.30			0.31		0.56	0.56	
v/c Ratio		0.72			0.69			0.71		0.35	0.58	
Control Delay		29.8			23.3			26.9		9.2	11.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		29.8			23.3			26.9		9.2	11.7	
LOS		C			C			C		A	B	
Approach Delay		29.8			23.3			26.9			11.1	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 61.2

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 19.8

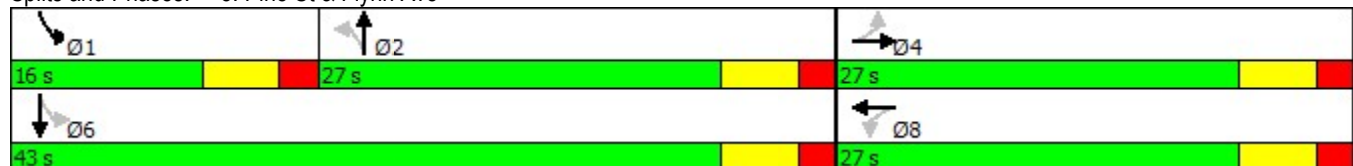
Intersection LOS: B

Intersection Capacity Utilization 104.3%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	1	40	9	30	1	0	17	134	1	0
Future Volume (vph)	0	11	1	40	9	30	1	0	17	134	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt		0.989			0.949			0.872				
Flt Protected					0.975			0.997			0.953	
Satd. Flow (prot)	0	1842	0	0	1724	0	0	1619	0	0	1775	0
Flt Permitted					0.975			0.997			0.953	
Satd. Flow (perm)	0	1842	0	0	1724	0	0	1619	0	0	1775	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1630			869			215	
Travel Time (s)		3.8			44.5			23.7			5.9	
Confl. Peds. (#/hr)	16		8	8		16	2		6	6		2
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
Adj. Flow (vph)	0	11	1	40	9	30	1	0	17	134	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	79	0	0	18	0	0	135	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 33.2%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

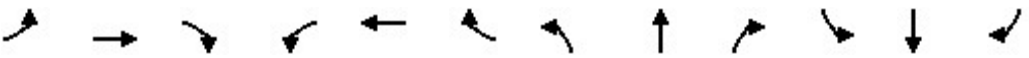
1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	40	9	30	1	0	17	134	1	0
Future Volume (vph)	0	11	1	40	9	30	1	0	17	134	1	0
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)	0	11	1	40	9	30	1	0	17	134	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	79	18	135								
Volume Left (vph)	0	40	1	134								
Volume Right (vph)	1	30	17	0								
Hadj (s)	-0.02	-0.09	-0.52	0.23								
Departure Headway (s)	4.3	4.2	3.7	4.4								
Degree Utilization, x	0.01	0.09	0.02	0.16								
Capacity (veh/h)	797	831	925	809								
Control Delay (s)	7.4	7.6	6.8	8.2								
Approach Delay (s)	7.4	7.6	6.8	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			33.2%	ICU Level of Service				A				
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	0	471	1	0	2	93	484	0	1	469	107
Future Volume (vph)	239	0	471	1	0	2	93	484	0	1	469	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.98	0.96			0.92		1.00				1.00	0.97
Frt		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950					
Satd. Flow (prot)	1770	1513	0	0	1544	0	1770	1863	0	0	1863	1583
Flt Permitted	0.756						0.237				0.999	
Satd. Flow (perm)	1382	1513	0	0	1564	0	440	1863	0	0	1861	1534
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		439			166							166
Link Speed (mph)		25			25			25				25
Link Distance (ft)		1630			262			2150				922
Travel Time (s)		44.5			7.1			58.6				25.1
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
Confl. Bikes (#/hr)			1			18			2			
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
Adj. Flow (vph)	239	0	471	1	0	2	93	484	0	1	469	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	471	0	0	3	0	93	484	0	0	470	107
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effect Green (s)	10.9	10.9			5.7		27.2	27.2			18.8	18.8
Actuated g/C Ratio	0.22	0.22			0.11		0.55	0.55			0.38	0.38
v/c Ratio	0.63	0.70			0.01		0.22	0.47			0.67	0.16
Control Delay	29.0	9.8			0.0		6.4	8.2			19.2	1.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	29.0	9.8			0.0		6.4	8.2			19.2	1.3
LOS	C	A			A		A	A			B	A
Approach Delay		16.2						7.9			15.9	
Approach LOS		B						A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 49.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 13.5

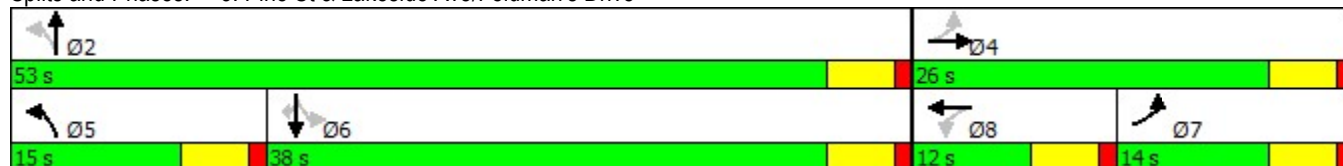
Intersection LOS: B

Intersection Capacity Utilization 92.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	155	61	32	190	176	35	347	19	209	576	120
Future Volume (vph)	87	155	61	32	190	176	35	347	19	209	576	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		0.99			0.98			1.00			0.99	
Frt		0.973			0.940			0.994			0.974	
Flt Protected		0.986			0.996			0.996		0.950		
Satd. Flow (prot)	0	1888	0	0	1817	0	0	1960	0	1770	1920	0
Flt Permitted		0.682			0.959			0.902		0.317		
Satd. Flow (perm)	0	1306	0	0	1748	0	0	1774	0	590	1920	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			61			4			24	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
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
Adj. Flow (vph)	87	155	61	32	190	176	35	347	19	209	576	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	303	0	0	398	0	0	401	0	209	696	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	5.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			0	
Act Effct Green (s)		18.9			18.9			19.4		34.7	34.7	
Actuated g/C Ratio		0.31			0.31			0.31		0.56	0.56	
v/c Ratio		0.74			0.69			0.72		0.38	0.64	
Control Delay		30.9			23.4			27.6		9.6	12.9	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		30.9			23.4			27.6		9.6	12.9	
LOS		C			C			C		A	B	
Approach Delay		30.9			23.4			27.6			12.1	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 61.8

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 20.3

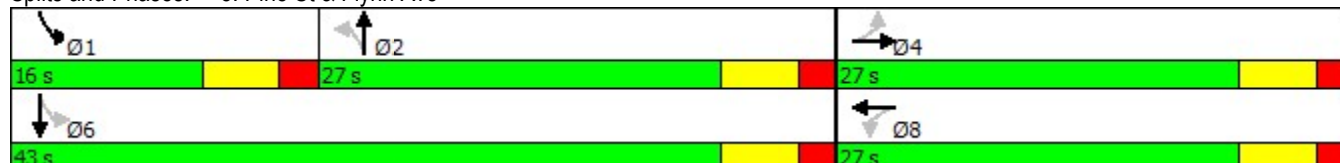
Intersection LOS: C

Intersection Capacity Utilization 108.7%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0	
Future Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. 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	
Ped Bike Factor													
Frt					0.941					0.870			
Flt Protected					0.974						0.950		
Satd. Flow (prot)	0	1863	0	0	1707	0	0	1621	0	0	1770	0	
Flt Permitted					0.974						0.950		
Satd. Flow (perm)	0	1863	0	0	1707	0	0	1621	0	0	1770	0	
Link Speed (mph)	25				25			25			25		
Link Distance (ft)	140				1630			869			215		
Travel Time (s)	3.8				44.5			23.7			5.9		
Confl. Peds. (#/hr)	1						1	3					1
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	
Adj. Flow (vph)	0	1	0	17	1	14	0	1	27	3	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1	0	0	32	0	0	28	0	0	3	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)	12				12			0			0		
Link Offset(ft)	0				0			0			0		
Crosswalk Width(ft)	16				16			16			16		
Two way Left Turn Lane													
Headway 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	
Turning Speed (mph)	15	9		15	9		15	9		15	9		
Sign Control	Stop				Stop				Stop		Stop		
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	19.1%				ICU Level of Service A								
Analysis Period (min)	15												
Description:	Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
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)	0	1	0	17	1	14	0	1	27	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	28	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	27	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			6.8									
Level of Service			A									
Intersection Capacity Utilization			19.1%	ICU Level of Service		A						
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	4	100	6	4	24	261	598	29	8	257	138
Future Volume (vph)	102	4	100	6	4	24	261	598	29	8	257	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.99	0.96			0.92		0.99	1.00			1.00	0.96
Frt		0.856			0.905			0.993				0.850
Flt Protected	0.950				0.991		0.950				0.998	
Satd. Flow (prot)	1770	1538	0	0	1547	0	1770	1847	0	0	1859	1583
Flt Permitted	0.735				0.914		0.421				0.976	
Satd. Flow (perm)	1355	1538	0	0	1423	0	775	1847	0	0	1817	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			24			6				166
Link Speed (mph)		25			25			25				25
Link Distance (ft)		1630			262			2150				922
Travel Time (s)		44.5			7.1			58.6				25.1
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		12
Confl. Bikes (#/hr)			1			18			2			
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
Adj. Flow (vph)	102	4	100	6	4	24	261	598	29	8	257	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	104	0	0	34	0	261	627	0	0	265	138
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effect Green (s)	9.7	9.5			6.0		28.7	30.4			14.8	14.8
Actuated g/C Ratio	0.21	0.21			0.13		0.63	0.66			0.32	0.32
v/c Ratio	0.30	0.26			0.17		0.39	0.51			0.45	0.23
Control Delay	20.0	6.9			16.5		7.4	8.6			17.6	3.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	20.0	6.9			16.5		7.4	8.6			17.6	3.3
LOS	B	A			B		A	A			B	A
Approach Delay		13.4			16.5			8.2			12.7	
Approach LOS		B			B			A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 45.8

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 10.3

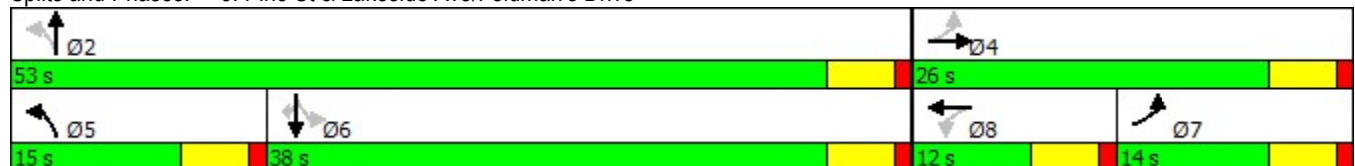
Intersection LOS: B

Intersection Capacity Utilization 74.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	84	17	20	176	257	24	524	11	83	251	62
Future Volume (vph)	63	84	17	20	176	257	24	524	11	83	251	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			0.96			1.00			0.99	
Frt		0.986			0.923			0.997			0.970	
Flt Protected		0.981			0.998			0.998		0.950		
Satd. Flow (prot)	0	1915	0	0	1754	0	0	1971	0	1770	1911	0
Flt Permitted		0.639			0.983			0.977		0.243		
Satd. Flow (perm)	0	1247	0	0	1727	0	0	1928	0	453	1911	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			100			2			29	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	36		5	5		36	9		54	54		9
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
Adj. Flow (vph)	63	84	17	20	176	257	24	524	11	83	251	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	453	0	0	559	0	83	313	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		19.4			19.4			22.0		32.2	32.2	
Actuated g/C Ratio		0.32			0.32			0.37		0.53	0.53	
v/c Ratio		0.40			0.73			0.79		0.17	0.30	
Control Delay		20.2			22.8			30.2		8.1	8.1	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		20.2			22.8			30.2		8.1	8.1	
LOS		C			C			C		A	A	
Approach Delay		20.2			22.8			30.2			8.1	
Approach LOS		C			C			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 60.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 21.5

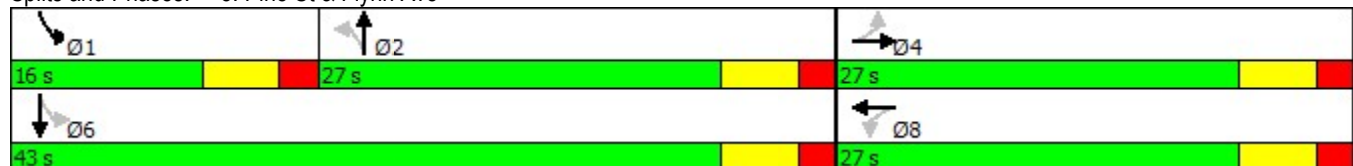
Intersection LOS: C

Intersection Capacity Utilization 89.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings

1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt					0.941			0.870				
Flt Protected					0.974						0.950	
Satd. Flow (prot)	0	1801	0	0	1650	0	0	1567	0	0	1711	0
Flt Permitted					0.974						0.950	
Satd. Flow (perm)	0	1801	0	0	1650	0	0	1567	0	0	1711	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1042			869			215	
Travel Time (s)		3.8			28.4			23.7			5.9	
Confl. Peds. (#/hr)	1					1	3					3
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
Adj. Flow (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	32	0	0	28	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 19.7%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
Future Volume (vph)	0	1	0	17	1	14	0	1	27	3	0	0
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)	0	1	0	17	1	14	0	1	27	3	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	32	28	3								
Volume Left (vph)	0	17	0	3								
Volume Right (vph)	0	14	27	0								
Hadj (s)	0.03	-0.12	-0.54	0.23								
Departure Headway (s)	4.0	3.8	3.4	4.2								
Degree Utilization, x	0.00	0.03	0.03	0.00								
Capacity (veh/h)	881	926	1037	840								
Control Delay (s)	7.0	7.0	6.5	7.2								
Approach Delay (s)	7.0	7.0	6.5	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				6.8								
Level of Service				A								
Intersection Capacity Utilization				19.7%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	312	4	0	6	4	24	121	398	29	8	134	618
Future Volume (vph)	312	4	0	6	4	24	121	398	29	8	134	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.99				0.94		0.99	1.00			1.00	0.97
Frt					0.905			0.990				0.850
Flt Protected	0.950				0.991		0.950				0.997	
Satd. Flow (prot)	1711	1801	0	0	1539	0	1711	1778	0	0	1795	1531
Flt Permitted	0.950				0.937		0.666				0.975	
Satd. Flow (perm)	1688	1801	0	0	1436	0	1188	1778	0	0	1755	1478
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		589			262			2150			922	
Travel Time (s)		16.1			7.1			58.6			25.1	
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		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
Adj. Flow (vph)	312	4	0	6	4	24	121	398	29	8	134	618
Shared Lane Traffic (%)												
Lane Group Flow (vph)	312	4	0	0	34	0	121	427	0	0	142	618
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	5.0		5.0	5.0		5.0	8.0		8.0	8.0	8.0
Minimum Split (s)	15.0	10.5		10.0	10.0		11.0	13.5		13.5	13.5	13.5
Total Split (s)	24.0	34.0		10.0	10.0		11.0	66.0		55.0	55.0	55.0
Total Split (%)	20.0%	28.3%		8.3%	8.3%		9.2%	55.0%		45.8%	45.8%	45.8%
Maximum Green (s)	17.0	28.5		5.0	5.0		5.0	60.5		49.5	49.5	49.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	4.0	2.5		2.0	2.0		3.0	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lead/Lag	Lead			Lag	Lag		Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Min	None		None	None		None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	26.8	34.3			5.0		70.2	70.7			57.0	57.0
Actuated g/C Ratio	0.22	0.29			0.04		0.58	0.59			0.48	0.48
v/c Ratio	0.82	0.01			0.58		0.17	0.41			0.17	0.88
Control Delay	68.4	41.8			92.3		13.0	15.4			19.2	44.5
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	68.4	41.8			92.3		13.0	15.4			19.2	44.5
LOS	E	D			F		B	B			B	D
Approach Delay		68.1			92.3			14.9			39.8	
Approach LOS		E			F			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 7:EBL, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 38.0

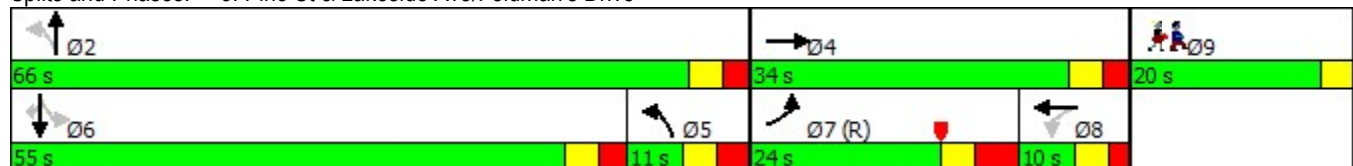
Intersection LOS: D

Intersection Capacity Utilization 79.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	64	7	20	101	132	19	189	11	33	85	2
Future Volume (vph)	33	64	7	20	101	132	19	189	11	33	85	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	11	11	14	11	11	14	11	11	14	11
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor					0.96			0.99		0.94		
Frt		0.991			0.930			0.993			0.997	
Flt Protected		0.984			0.996			0.996		0.950		
Satd. Flow (prot)	0	1938	0	0	1770	0	0	1950	0	1711	1981	0
Flt Permitted		0.873			0.971			0.971		0.515		
Satd. Flow (perm)	0	1719	0	0	1724	0	0	1901	0	867	1981	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			84			4			2	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		798			1013			787			2150	
Travel Time (s)		21.8			27.6			21.5			58.6	
Confl. Peds. (#/hr)				5		36			54	54		
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
Adj. Flow (vph)	33	64	7	20	101	132	19	189	11	33	85	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	253	0	0	219	0	33	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	0.92	1.04	1.04	0.92	1.04	1.04	0.92	1.04	1.04	0.92	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	38.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	3.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		12.9			12.9			14.0		18.1	19.2	
Actuated g/C Ratio		0.32			0.32			0.35		0.46	0.48	
v/c Ratio		0.19			0.41			0.33		0.05	0.09	
Control Delay		12.6			11.0			13.6		6.0	5.6	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		12.6			11.0			13.6		6.0	5.6	
LOS		B			B			B		A	A	
Approach Delay		12.6			11.0			13.6			5.7	
Approach LOS		B			B			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 39.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 11.1

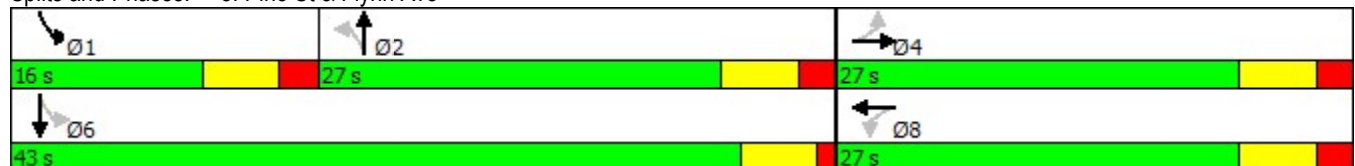
Intersection LOS: B

Intersection Capacity Utilization 42.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	40	56	25	80	420	60	10	660	15
Future Volume (vph)	5	0	25	40	56	25	80	420	60	10	660	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.887			0.972			0.981			0.997	
Flt Protected		0.992			0.984		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1722	0	1711	1766	0	1711	1795	0
Flt Permitted		0.962			0.879		0.950			0.950		
Satd. Flow (perm)	0	1536	0	0	1538	0	1711	1766	0	1711	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			9			7			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		938			543			1149			1003	
Travel Time (s)		25.6			14.8			31.3			27.4	
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
Adj. Flow (vph)	5	0	25	40	56	25	80	420	60	10	660	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	121	0	80	480	0	10	675	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		20.0	50.0		20.0	50.0	
Total Split (%)	20.8%	20.8%		20.8%	20.8%		16.7%	41.7%		16.7%	41.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		14.0	45.0		14.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		6.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.3			14.3		10.7	88.0		6.3	76.5	
Actuated g/C Ratio		0.12			0.12		0.09	0.73		0.05	0.64	
v/c Ratio		0.11			0.63		0.53	0.37		0.11	0.59	
Control Delay		0.8			60.9		67.5	12.0		51.6	15.5	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		0.8			60.9		67.5	12.0		51.6	15.5	
LOS		A			E		E	B		D	B	
Approach Delay		0.8			60.9			19.9			16.1	
Approach LOS		A			E			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 21.2

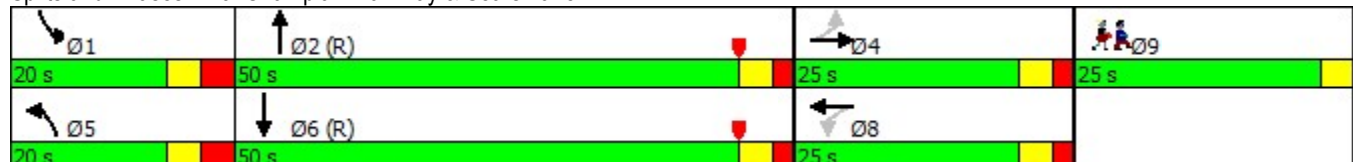
Intersection Capacity Utilization 65.5%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 9: Champlain Parkway & Sears Lane



Lanes, Volumes, Timings
9: Champlain Parkway & Sears Lane

09/21/2018

Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	21%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	92	115	570	174	0	230	0	220	20	5	0
Future Volume (vph)	0	92	115	570	174	0	230	0	220	20	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		250	0		0
Storage Lanes	0		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt			0.850						0.850			
Flt Protected				0.950				0.950			0.962	
Satd. Flow (prot)	0	1801	1531	1711	1801	0	0	1711	1531	0	1732	0
Flt Permitted				0.950				0.741			0.737	
Satd. Flow (perm)	0	1801	1531	1711	1801	0	0	1334	1531	0	1327	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1042			589			1003			158	
Travel Time (s)		28.4			16.1			27.4			4.3	
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
Adj. Flow (vph)	0	92	115	570	174	0	230	0	220	20	5	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	115	570	174	0	0	230	220	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	4	9	10
Permitted Phases			

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4 9	4 9	4 9	3	8		2	2	3	6	6	
Switch Phase												
Minimum Initial (s)				8.0	5.0		8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)				21.0	15.0		17.0	17.0	21.0	11.0	11.0	
Total Split (s)				42.0	62.0		28.0	28.0	42.0	28.0	28.0	
Total Split (%)				35.0%	51.7%		23.3%	23.3%	35.0%	23.3%	23.3%	
Maximum Green (s)				36.0	57.0		21.0	21.0	36.0	22.0	22.0	
Yellow Time (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)				3.0	2.0		4.0	4.0	3.0	3.0	3.0	
Lost Time Adjust (s)				0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)				6.0	5.0			7.0	6.0		6.0	
Lead/Lag				Lead				Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode				C-Min	None		None	None	C-Min	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		22.6	22.6	49.5	67.3			26.9	83.4		27.9	
Actuated g/C Ratio		0.19	0.19	0.41	0.56			0.22	0.70		0.23	
v/c Ratio		0.27	0.40	0.81	0.17			0.77	0.21		0.08	
Control Delay		42.9	46.3	40.5	19.4			69.4	14.0		37.8	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		42.9	46.3	40.5	19.4			69.4	14.0		37.8	
LOS		D	D	D	B			E	B		D	
Approach Delay		44.8			35.5			42.3			37.8	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 3:WBL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 39.1

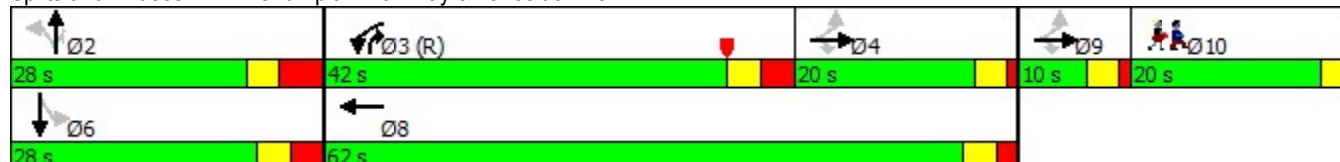
Intersection LOS: D

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 12: Champlain Parkway & Lakeside Ave



Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	1.0
Minimum Split (s)	9.0	9.0	20.0
Total Split (s)	20.0	10.0	20.0
Total Split (%)	17%	8%	17%
Maximum Green (s)	16.0	6.0	17.0
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	None	None
Walk Time (s)			7.0
Flash Dont Walk (s)			10.0
Pedestrian Calls (#/hr)			5
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Lanes, Volumes, Timings
17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	72	35	15	60	15	80	515	5	5	660	60
Future Volume (vph)	35	72	35	15	60	15	80	515	5	5	660	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.967			0.977			0.999			0.987	
Flt Protected		0.988			0.992		0.950			0.950		
Satd. Flow (prot)	0	1720	0	0	1745	0	1711	1799	0	1711	1777	0
Flt Permitted		0.887			0.914		0.950			0.950		
Satd. Flow (perm)	0	1544	0	0	1608	0	1711	1799	0	1711	1777	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			7							5
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1255			798			921			1149	
Travel Time (s)		34.2			21.8			25.1			31.3	
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
Adj. Flow (vph)	35	72	35	15	60	15	80	515	5	5	660	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	142	0	0	90	0	80	520	0	5	720	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings
17: Champlain Parkway & Flynn Ave

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		16.0	54.0		16.0	54.0	
Total Split (%)	20.8%	20.8%		20.8%	20.8%		13.3%	45.0%		13.3%	45.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		11.0	49.0		11.0	49.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-2.0	-1.0		-2.0	-1.0	
Total Lost Time (s)		4.0			4.0		3.0	4.0		3.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		16.1			16.1		12.1	88.6		8.0	78.2	
Actuated g/C Ratio		0.13			0.13		0.10	0.74		0.07	0.65	
v/c Ratio		0.65			0.41		0.47	0.39		0.04	0.62	
Control Delay		59.0			48.3		59.6	10.8		42.6	31.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		59.0			48.3		59.6	10.8		42.6	31.4	
LOS		E			D		E	B		D	C	
Approach Delay		59.0			48.3			17.4			31.5	
Approach LOS		E			D			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 29.5

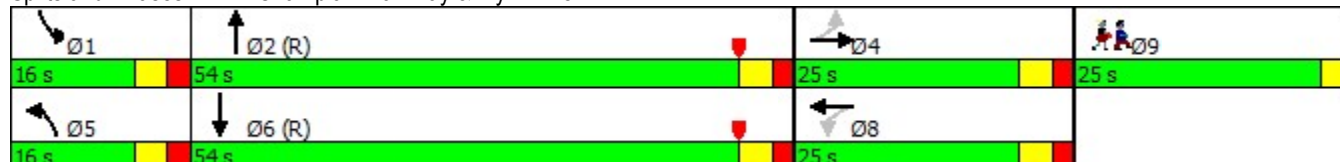
Intersection LOS: C

Intersection Capacity Utilization 65.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 17: Champlain Parkway & Flynn Ave



Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	21%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings

1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	17	1	152	0	2	27	26	0	0
Future Volume (vph)	0	1	0	17	1	152	0	2	27	26	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt					0.879			0.874				
Flt Protected					0.995						0.950	
Satd. Flow (prot)	0	1801	0	0	1575	0	0	1574	0	0	1711	0
Flt Permitted					0.995						0.950	
Satd. Flow (perm)	0	1801	0	0	1575	0	0	1574	0	0	1711	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1042			869			215	
Travel Time (s)		3.8			28.4			23.7			5.9	
Confl. Peds. (#/hr)	1					1	3					3
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
Adj. Flow (vph)	0	1	0	17	1	152	0	2	27	26	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	170	0	0	29	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 32.4%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	0	17	1	152	0	2	27	26	0	0
Future Volume (vph)	0	1	0	17	1	152	0	2	27	26	0	0
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)	0	1	0	17	1	152	0	2	27	26	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	170	29	26								
Volume Left (vph)	0	17	0	26								
Volume Right (vph)	0	152	27	0								
Hadj (s)	0.03	-0.48	-0.52	0.23								
Departure Headway (s)	4.2	3.5	3.7	4.5								
Degree Utilization, x	0.00	0.17	0.03	0.03								
Capacity (veh/h)	834	999	913	759								
Control Delay (s)	7.2	7.2	6.8	7.6								
Approach Delay (s)	7.2	7.2	6.8	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				32.4%	ICU Level of Service	A						
Analysis Period (min)				15								
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	4	1	6	4	24	123	398	29	8	134	672
Future Volume (vph)	321	4	1	6	4	24	123	398	29	8	134	672
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.99	0.99			0.94		0.99	1.00			1.00	0.97
Frt		0.970			0.905			0.990				0.850
Flt Protected	0.950				0.991		0.950				0.997	
Satd. Flow (prot)	1711	1735	0	0	1539	0	1711	1778	0	0	1795	1531
Flt Permitted	0.950				0.937		0.666				0.976	
Satd. Flow (perm)	1688	1735	0	0	1436	0	1188	1778	0	0	1756	1478
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		589			262			2150			922	
Travel Time (s)		16.1			7.1			58.6			25.1	
Confl. Peds. (#/hr)	4		6	6		4	12		19	19		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
Adj. Flow (vph)	321	4	1	6	4	24	123	398	29	8	134	672
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	5	0	0	34	0	123	427	0	0	142	672
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	5.0		5.0	5.0		5.0	8.0		8.0	8.0	8.0
Minimum Split (s)	15.0	10.5		10.0	10.0		11.0	13.5		13.5	13.5	13.5
Total Split (s)	24.0	34.0		10.0	10.0		11.0	66.0		55.0	55.0	55.0
Total Split (%)	20.0%	28.3%		8.3%	8.3%		9.2%	55.0%		45.8%	45.8%	45.8%
Maximum Green (s)	17.0	28.5		5.0	5.0		5.0	60.5		49.5	49.5	49.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	4.0	2.5		2.0	2.0		3.0	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lead/Lag	Lead			Lag	Lag		Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Min	None		None	None		None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	18.7	26.2			5.0		78.3	78.8			67.0	67.0
Actuated g/C Ratio	0.16	0.22			0.04		0.65	0.66			0.56	0.56
v/c Ratio	1.20	0.01			0.58		0.15	0.37			0.14	0.81
Control Delay	168.6	43.6			92.3		11.0	12.3			15.6	33.1
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	168.6	43.6			92.3		11.0	12.3			15.6	33.1
LOS	F	D			F		B	B			B	C
Approach Delay		166.7			92.3			12.0			30.0	
Approach LOS		F			F			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 7:EBL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 51.4

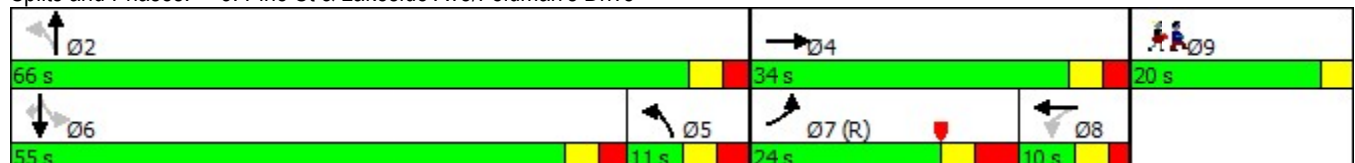
Intersection LOS: D

Intersection Capacity Utilization 83.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	64	7	20	101	132	19	190	11	33	86	2
Future Volume (vph)	33	64	7	20	101	132	19	190	11	33	86	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		10	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor					0.96			0.99		0.94		
Frt		0.991			0.930			0.993			0.997	
Flt Protected		0.984			0.996			0.996		0.950		
Satd. Flow (prot)	0	1756	0	0	1604	0	0	1767	0	1711	1795	0
Flt Permitted		0.873			0.971			0.972		0.510		
Satd. Flow (perm)	0	1558	0	0	1562	0	0	1725	0	859	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			84			4			2	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		798			1013			787			2150	
Travel Time (s)		21.8			27.6			21.5			58.6	
Confl. Peds. (#/hr)				5		36			54	54		
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
Adj. Flow (vph)	33	64	7	20	101	132	19	190	11	33	86	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	253	0	0	220	0	33	88	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		13.5			13.5			14.7		18.7	18.7	
Actuated g/C Ratio		0.33			0.33			0.36		0.45	0.45	
v/c Ratio		0.20			0.44			0.36		0.05	0.11	
Control Delay		13.0			11.8			14.4		6.3	6.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		13.0			11.8			14.4		6.3	6.5	
LOS		B			B			B		A	A	
Approach Delay		13.0			11.8			14.4			6.4	
Approach LOS		B			B			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 41.1

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 11.9

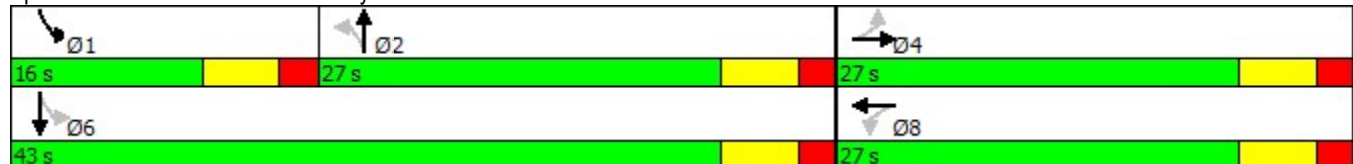
Intersection LOS: B

Intersection Capacity Utilization 42.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	40	56	25	80	503	60	10	674	15
Future Volume (vph)	5	0	25	40	56	25	80	503	60	10	674	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.887			0.972			0.984			0.997	
Flt Protected		0.992			0.984		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1722	0	1711	1772	0	1711	1795	0
Flt Permitted		0.962			0.879		0.950			0.950		
Satd. Flow (perm)	0	1536	0	0	1538	0	1711	1772	0	1711	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			9			6			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		938			543			1149			1003	
Travel Time (s)		25.6			14.8			31.3			27.4	
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
Adj. Flow (vph)	5	0	25	40	56	25	80	503	60	10	674	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	121	0	80	563	0	10	689	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

9: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		20.0	50.0		20.0	50.0	
Total Split (%)	20.8%	20.8%		20.8%	20.8%		16.7%	41.7%		16.7%	41.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		14.0	45.0		14.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		6.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.3			14.3		10.7	88.0		6.3	76.5	
Actuated g/C Ratio		0.12			0.12		0.09	0.73		0.05	0.64	
v/c Ratio		0.11			0.63		0.53	0.43		0.11	0.60	
Control Delay		0.8			60.9		66.0	13.2		45.8	22.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		0.8			60.9		66.0	13.2		45.8	22.6	
LOS		A			E		E	B		D	C	
Approach Delay		0.8			60.9			19.8			22.9	
Approach LOS		A			E			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 24.2

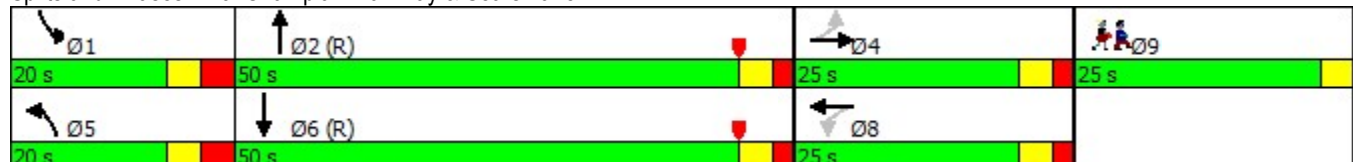
Intersection Capacity Utilization 66.3%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 9: Champlain Parkway & Sears Lane



Lanes, Volumes, Timings
9: Champlain Parkway & Sears Lane

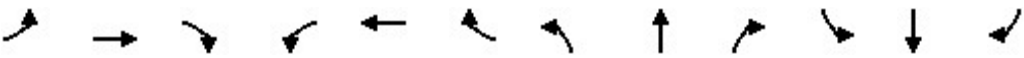
09/21/2018

Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	21%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	101	129	570	229	0	313	0	220	20	5	0
Future Volume (vph)	0	101	129	570	229	0	313	0	220	20	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		250	0		0
Storage Lanes	0		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt			0.850						0.850			
Flt Protected				0.950				0.950			0.962	
Satd. Flow (prot)	0	1801	1531	1711	1801	0	0	1711	1531	0	1732	0
Flt Permitted				0.950				0.741			0.734	
Satd. Flow (perm)	0	1801	1531	1711	1801	0	0	1334	1531	0	1322	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1042			589			1003			158	
Travel Time (s)		28.4			16.1			27.4			4.3	
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
Adj. Flow (vph)	0	101	129	570	229	0	313	0	220	20	5	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	101	129	570	229	0	0	313	220	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		

Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	4	9	10
Permitted Phases			

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4 9	4 9	4 9	3	8		2	2	3	6	6	
Switch Phase												
Minimum Initial (s)				8.0	5.0		8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)				21.0	15.0		17.0	17.0	21.0	11.0	11.0	
Total Split (s)				42.0	62.0		28.0	28.0	42.0	28.0	28.0	
Total Split (%)				35.0%	51.7%		23.3%	23.3%	35.0%	23.3%	23.3%	
Maximum Green (s)				36.0	57.0		21.0	21.0	36.0	22.0	22.0	
Yellow Time (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)				3.0	2.0		4.0	4.0	3.0	3.0	3.0	
Lost Time Adjust (s)				0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)				6.0	5.0			7.0	6.0		6.0	
Lead/Lag				Lead				Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode				C-Min	None		None	None	C-Min	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		23.2	23.2	36.0	54.4			39.8	82.8		40.8	
Actuated g/C Ratio		0.19	0.19	0.30	0.45			0.33	0.69		0.34	
v/c Ratio		0.29	0.44	1.11	0.28			0.71	0.21		0.06	
Control Delay		42.9	46.9	106.3	29.3			48.7	14.7		32.8	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		42.9	46.9	106.3	29.3			48.7	14.7		32.8	
LOS		D	D	F	C			D	B		C	
Approach Delay		45.1			84.2			34.6			32.8	
Approach LOS		D			F			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 3:WBL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 61.1

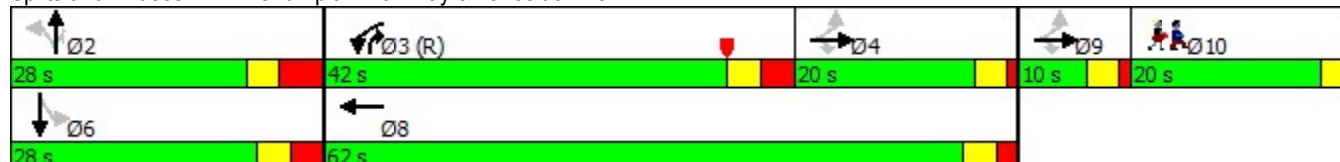
Intersection LOS: E

Intersection Capacity Utilization 68.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 12: Champlain Parkway & Lakeside Ave



Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	1.0
Minimum Split (s)	9.0	9.0	20.0
Total Split (s)	20.0	10.0	20.0
Total Split (%)	17%	8%	17%
Maximum Green (s)	16.0	6.0	17.0
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	None	None
Walk Time (s)			7.0
Flash Dont Walk (s)			10.0
Pedestrian Calls (#/hr)			5
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Lanes, Volumes, Timings
17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Future Volume (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.968			0.976			0.999			0.988	
Flt Protected		0.986			0.992		0.950			0.950		
Satd. Flow (prot)	0	1719	0	0	1743	0	1711	1799	0	1711	1779	0
Flt Permitted		0.862			0.916		0.950			0.950		
Satd. Flow (perm)	0	1502	0	0	1610	0	1711	1799	0	1711	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			8							5
Link Speed (mph)		25			25			25				25
Link Distance (ft)		1255			798			921				1149
Travel Time (s)		34.2			21.8			25.1				31.3
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
Adj. Flow (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	91	0	80	596	0	5	733	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11				11
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		16.0	54.0		16.0	54.0	
Total Split (%)	20.8%	20.8%		20.8%	20.8%		13.3%	45.0%		13.3%	45.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		11.0	49.0		11.0	49.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-2.0	-1.0		-2.0	-1.0	
Total Lost Time (s)		4.0			4.0		3.0	4.0		3.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		16.5			16.5		12.1	88.2		8.0	77.8	
Actuated g/C Ratio		0.14			0.14		0.10	0.74		0.07	0.65	
v/c Ratio		0.69			0.40		0.47	0.45		0.04	0.63	
Control Delay		61.6			47.2		59.6	11.9		45.0	25.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		61.6			47.2		59.6	11.9		45.0	25.8	
LOS		E			D		E	B		D	C	
Approach Delay		61.6			47.2			17.5			26.0	
Approach LOS		E			D			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 26.9

Intersection LOS: C

Intersection Capacity Utilization 67.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 17: Champlain Parkway & Flynn Ave

 Ø1	 Ø2 (R)	 Ø4	 Ø9
16 s	54 s	25 s	25 s
 Ø5	 Ø6 (R)	 Ø8	
16 s	54 s	25 s	

Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	21%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Future Volume (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	100		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt			0.850		0.976			0.999			0.988	
Flt Protected		0.982			0.992		0.950			0.950		
Satd. Flow (prot)	0	1768	1531	0	1743	0	1711	1799	0	1711	1779	0
Flt Permitted		0.860			0.940		0.950			0.950		
Satd. Flow (perm)	0	1549	1531	0	1652	0	1711	1799	0	1711	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80		10			1			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1255			798			921			1149	
Travel Time (s)		34.2			21.8			25.1			31.3	
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
Adj. Flow (vph)	41	72	35	15	60	16	80	591	5	5	672	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	113	35	0	91	0	80	596	0	5	733	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								

Lanes, Volumes, Timings

17: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	25.0	25.0	25.0	25.0	25.0		16.0	54.0		16.0	54.0	
Total Split (%)	26.3%	26.3%	26.3%	26.3%	26.3%		16.8%	56.8%		16.8%	56.8%	
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0		11.0	49.0		11.0	49.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	0.0		-1.0		-2.0	-1.0		-2.0	-1.0	
Total Lost Time (s)		4.0	5.0		4.0		3.0	4.0		3.0	4.0	
Lead/Lag							Lead	Lag		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	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0	9.0	9.0	9.0			9.0			9.0	
Pedestrian Calls (#/hr)	5	5	5	5	5			5			5	
Act Effect Green (s)		13.7	12.7		13.7		11.8	71.0		7.9	60.8	
Actuated g/C Ratio		0.14	0.13		0.14		0.12	0.75		0.08	0.64	
v/c Ratio		0.51	0.13		0.37		0.38	0.44		0.04	0.64	
Control Delay		45.2	1.3		36.2		42.6	7.1		40.4	16.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		45.2	1.3		36.2		42.6	7.1		40.4	16.0	
LOS		D	A		D		D	A		D	B	
Approach Delay		34.8			36.2			11.3			16.2	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 16.9

Intersection LOS: B

Intersection Capacity Utilization 66.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 17: Champlain Parkway & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt		0.989			0.983			0.872				
Flt Protected					0.965			0.997			0.950	
Satd. Flow (prot)	0	1842	0	0	1767	0	0	1619	0	0	1770	0
Flt Permitted					0.965			0.997			0.950	
Satd. Flow (perm)	0	1842	0	0	1767	0	0	1619	0	0	1770	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1630			869			215	
Travel Time (s)		3.8			44.5			23.7			5.9	
Confl. Peds. (#/hr)	16		8	8		16	2		6	6		2
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
Adj. Flow (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	57	0	0	18	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 25.7%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
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)	0	11	1	41	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	57	18	16								
Volume Left (vph)	0	41	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	983	819								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			25.7%	ICU Level of Service				A				
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	0	400	1	0	2	84	530	0	1	525	96
Future Volume (vph)	203	0	400	1	0	2	84	530	0	1	525	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.98	0.96			0.97		1.00				1.00	0.97
Frt		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950					
Satd. Flow (prot)	1770	1515	0	0	1626	0	1770	1863	0	0	1863	1583
Flt Permitted	0.756						0.219				0.999	
Satd. Flow (perm)	1382	1515	0	0	1646	0	407	1863	0	0	1861	1534
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		408			166							166
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1630			262			2150			922	
Travel Time (s)		44.5			7.1			58.6			25.1	
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
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
Adj. Flow (vph)	203	0	400	1	0	2	84	530	0	1	525	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	400	0	0	3	0	84	530	0	0	526	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	13.0		11.0	11.0		10.0	20.0		20.0	20.0	20.0
Total Split (s)	14.0	26.0		12.0	12.0		15.0	53.0		38.0	38.0	38.0
Total Split (%)	17.7%	32.9%		15.2%	15.2%		19.0%	67.1%		48.1%	48.1%	48.1%
Maximum Green (s)	9.0	21.0		7.0	7.0		10.0	48.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Lead/Lag	Lag			Lead	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		Min	Min	Min
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	7.0
Flash Dont Walk (s)		8.0		8.0	8.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)		0		0	0					0	0	0
Act Effct Green (s)	10.3	10.0			5.8		26.0	26.0			20.3	20.3
Actuated g/C Ratio	0.22	0.21			0.12		0.55	0.55			0.43	0.43
v/c Ratio	0.55	0.62			0.01		0.21	0.52			0.66	0.13
Control Delay	26.8	7.6			0.0		5.9	8.4			17.1	0.8
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	26.8	7.6			0.0		5.9	8.4			17.1	0.8
LOS	C	A			A		A	A			B	A
Approach Delay		14.0						8.1			14.6	
Approach LOS		B						A			B	

Intersection Summary

Area Type: Other

Cycle Length: 79

Actuated Cycle Length: 47.6

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 12.2

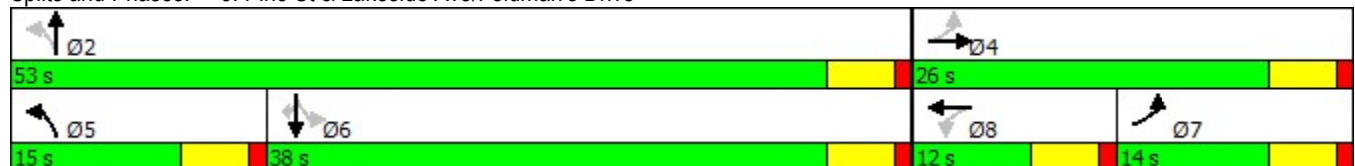
Intersection LOS: B

Intersection Capacity Utilization 93.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	158	63	32	194	177	36	384	19	194	583	112
Future Volume (vph)	87	158	63	32	194	177	36	384	19	194	583	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		0.99			0.98			1.00			0.99	
Frt		0.972			0.941			0.994			0.976	
Flt Protected		0.986			0.996			0.996		0.950		
Satd. Flow (prot)	0	1768	0	0	1705	0	0	1838	0	1770	1805	0
Flt Permitted		0.685			0.959			0.908		0.298		
Satd. Flow (perm)	0	1228	0	0	1641	0	0	1674	0	555	1805	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			60			3			22	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2703			1013			787			2150	
Travel Time (s)		73.7			27.6			21.5			58.6	
Confl. Peds. (#/hr)	22		9	9		22	10		23	23		10
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
Adj. Flow (vph)	87	158	63	32	194	177	36	384	19	194	583	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	308	0	0	403	0	0	439	0	194	695	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		20.1			20.1			21.0		36.2	36.2	
Actuated g/C Ratio		0.31			0.31			0.33		0.56	0.56	
v/c Ratio		0.78			0.73			0.80		0.37	0.68	
Control Delay		35.0			26.0			33.8		9.7	14.4	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		35.0			26.0			33.8		9.7	14.4	
LOS		D			C			C		A	B	
Approach Delay		35.0			26.0			33.8			13.3	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 64.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 23.5

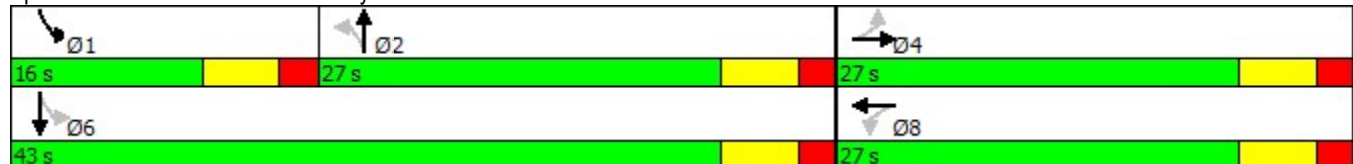
Intersection LOS: C

Intersection Capacity Utilization 111.0%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt		0.989			0.983			0.872				
Flt Protected					0.965			0.997			0.950	
Satd. Flow (prot)	0	1781	0	0	1708	0	0	1565	0	0	1711	0
Flt Permitted					0.965			0.997			0.950	
Satd. Flow (perm)	0	1781	0	0	1708	0	0	1565	0	0	1711	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1042			869			215	
Travel Time (s)		3.8			28.4			23.7			5.9	
Confl. Peds. (#/hr)	16		8	8		16	2		6	6		2
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
Adj. Flow (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	57	0	0	18	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 25.7%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

1: St John's Club Drive/Lakeside Ave

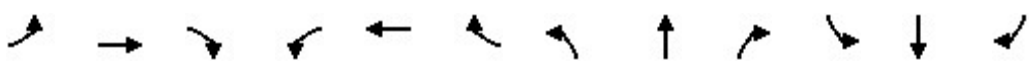
09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
Future Volume (vph)	0	11	1	41	9	7	1	0	17	16	0	0
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)	0	11	1	41	9	7	1	0	17	16	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	57	18	16								
Volume Left (vph)	0	41	1	16								
Volume Right (vph)	1	7	17	0								
Hadj (s)	-0.02	0.10	-0.52	0.23								
Departure Headway (s)	4.0	4.1	3.5	4.3								
Degree Utilization, x	0.01	0.06	0.02	0.02								
Capacity (veh/h)	882	869	983	819								
Control Delay (s)	7.1	7.4	6.6	7.4								
Approach Delay (s)	7.1	7.4	6.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			25.7%		ICU Level of Service				A			
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	0	135	1	0	2	9	295	0	1	85	614
Future Volume (vph)	441	0	135	1	0	2	9	295	0	1	85	614
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.98	0.96			0.88		0.99				1.00	0.97
Frt		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950				0.999	
Satd. Flow (prot)	1711	1474	0	0	1480	0	1711	1801	0	0	1799	1531
Flt Permitted	0.950						0.701				0.998	
Satd. Flow (perm)	1679	1474	0	0	1448	0	1255	1801	0	0	1797	1488
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		589			262			2150			922	
Travel Time (s)		16.1			7.1			58.6			25.1	
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
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
Adj. Flow (vph)	441	0	135	1	0	2	9	295	0	1	85	614
Shared Lane Traffic (%)												
Lane Group Flow (vph)	441	135	0	0	3	0	9	295	0	0	86	614
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	5.0		5.0	5.0		5.0	8.0		8.0	8.0	8.0
Minimum Split (s)	15.0	10.5		10.0	10.0		11.0	13.5		13.5	13.5	13.5
Total Split (s)	35.0	45.0		10.0	10.0		11.0	85.0		74.0	74.0	74.0
Total Split (%)	23.3%	30.0%		6.7%	6.7%		7.3%	56.7%		49.3%	49.3%	49.3%
Maximum Green (s)	28.0	39.5		5.0	5.0		5.0	79.5		68.5	68.5	68.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	4.0	2.5		2.0	2.0		3.0	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lead/Lag	Lead			Lag	Lag		Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Min	None		None	None		None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	63.0	66.5			5.0		72.5	68.5			66.3	66.3
Actuated g/C Ratio	0.42	0.44			0.03		0.48	0.46			0.44	0.44
v/c Ratio	0.61	0.21			0.06		0.01	0.36			0.11	0.93
Control Delay	37.8	33.4			73.0		16.6	26.9			24.0	61.8
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	37.8	33.4			73.0		16.6	26.9			24.0	61.8
LOS	D	C			E		B	C			C	E
Approach Delay		36.8			73.0			26.6			57.1	
Approach LOS		D			E			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 7:EBL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 43.9

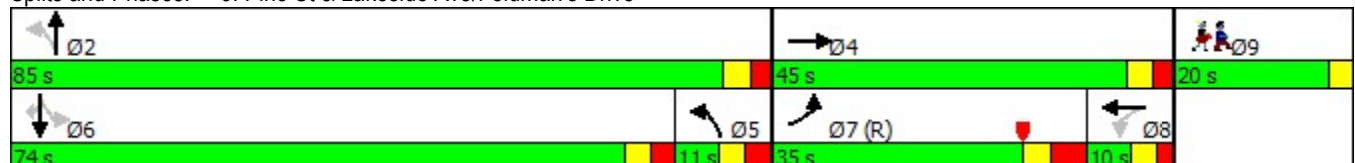
Intersection LOS: D

Intersection Capacity Utilization 71.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	94	42	27	144	132	32	74	14	69	168	68
Future Volume (vph)	9	94	42	27	144	132	32	74	14	69	168	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor					0.98			0.99		0.96		
Frt		0.961			0.941			0.984			0.957	
Flt Protected		0.997			0.996			0.987		0.950		
Satd. Flow (prot)	0	1904	0	0	1819	0	0	1913	0	1770	1901	0
Flt Permitted		0.969			0.963			0.862		0.630		
Satd. Flow (perm)	0	1850	0	0	1756	0	0	1670	0	1129	1901	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			59			10			47	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		728			1013			787			2150	
Travel Time (s)		19.9			27.6			21.5			58.6	
Confl. Peds. (#/hr)				9		22			23	23		
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
Adj. Flow (vph)	9	94	42	27	144	132	32	74	14	69	168	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	0	0	303	0	0	120	0	69	236	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		14.4			14.4			12.2		19.2	19.2	
Actuated g/C Ratio		0.34			0.34			0.29		0.45	0.45	
v/c Ratio		0.22			0.48			0.25		0.10	0.27	
Control Delay		11.0			13.3			15.9		7.1	6.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		11.0			13.3			15.9		7.1	6.5	
LOS		B			B			B		A	A	
Approach Delay		11.0			13.3			15.9			6.7	
Approach LOS		B			B			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 42.4

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 10.9

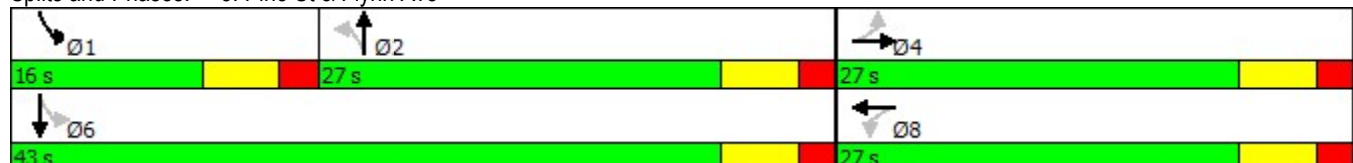
Intersection LOS: B

Intersection Capacity Utilization 57.7%

ICU Level of Service B

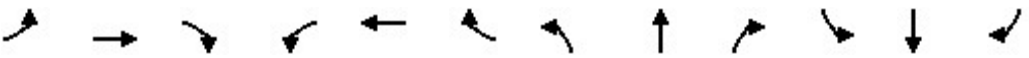
Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Volume (vph)	48	92	48	15	78	15	92	515	5	5	660	68
Future Volume (vph)	48	92	48	15	78	15	92	515	5	5	660	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.966			0.981			0.999			0.986	
Flt Protected		0.987			0.993		0.950			0.950		
Satd. Flow (prot)	0	1717	0	0	1754	0	1711	1799	0	1711	1775	0
Flt Permitted		0.817			0.902		0.950			0.950		
Satd. Flow (perm)	0	1421	0	0	1593	0	1711	1799	0	1711	1775	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1398			728			878			993	
Travel Time (s)		38.1			19.9			23.9			27.1	
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
Adj. Flow (vph)	48	92	48	15	78	15	92	515	5	5	660	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	0	0	108	0	92	520	0	5	728	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings

9: Champlain Parkway & Flynn Ave

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	35.0	35.0		35.0	35.0		25.0	65.0		25.0	65.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		16.7%	43.3%		16.7%	43.3%	
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	60.0		19.0	60.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		6.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		22.6			22.6		12.4	110.0		5.3	94.0	
Actuated g/C Ratio		0.15			0.15		0.08	0.73		0.04	0.63	
v/c Ratio		0.88			0.45		0.65	0.39		0.08	0.65	
Control Delay		98.8			62.8		86.9	12.4		86.6	16.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		98.8			62.8		86.9	12.4		86.6	16.4	
LOS		F			E		F	B		F	B	
Approach Delay		98.8			62.8			23.6			16.9	
Approach LOS		F			E			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 10.9 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 31.8

Intersection Capacity Utilization 74.4%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service D

Splits and Phases: 9: Champlain Parkway & Flynn Ave

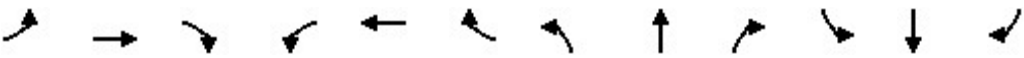
 Ø1	 Ø2 (R)	 Ø4	 Ø9
25 s	65 s	35 s	25 s
 Ø5	 Ø6 (R)	 Ø8	
25 s	65 s	35 s	

Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	17%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	350	548	21	0	165	0	323	5	0	0
Future Volume (vph)	0	259	350	548	21	0	165	0	323	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		200	0		200	0		0
Storage Lanes	0		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.850							0.850			
Flt Protected				0.950				0.950			0.950	
Satd. Flow (prot)	0	1801	1531	1711	1801	0	0	1711	1531	0	1711	0
Flt Permitted				0.950				0.754			0.497	
Satd. Flow (perm)	0	1801	1531	1711	1801	0	0	1358	1531	0	895	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1042			589			1129			97	
Travel Time (s)		28.4			16.1			30.8			2.6	
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
Adj. Flow (vph)	0	259	350	548	21	0	165	0	323	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	259	350	548	21	0	0	165	323	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		

Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	4	9	10
Permitted Phases			

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4 9	4 9	4 9	3	8		2	2	3	6	6	
Switch Phase												
Minimum Initial (s)				8.0	5.0		8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)				21.0	15.0		17.0	17.0	21.0	11.0	11.0	
Total Split (s)				45.0	65.0		35.0	35.0	45.0	35.0	35.0	
Total Split (%)				30.0%	43.3%		23.3%	23.3%	30.0%	23.3%	23.3%	
Maximum Green (s)				39.0	59.0		28.0	28.0	39.0	29.0	29.0	
Yellow Time (s)				3.0	2.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)				3.0	4.0		4.0	4.0	3.0	3.0	3.0	
Lost Time Adjust (s)				0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)				6.0	6.0			7.0	6.0		6.0	
Lead/Lag				Lead				Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	2.0		4.0	4.0	4.0	2.0	2.0	
Recall Mode				C-Min	None		None	None	C-Min	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		42.5	42.5	62.7	82.7			23.3	93.0		24.3	
Actuated g/C Ratio		0.28	0.28	0.42	0.55			0.16	0.62		0.16	
v/c Ratio		0.51	0.81	0.77	0.02			0.79	0.34		0.03	
Control Delay		48.3	64.8	30.5	14.1			74.1	17.9		50.6	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		48.3	64.8	30.5	14.1			74.1	17.9		50.6	
LOS		D	E	C	B			E	B		D	
Approach Delay		57.7			29.9			36.9			50.6	
Approach LOS		E			C			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 74 (49%), Referenced to phase 3:WBL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 42.2

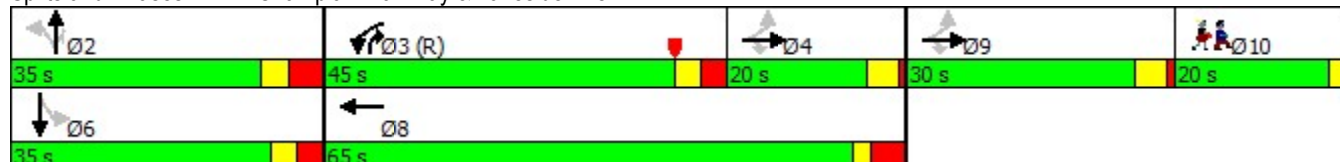
Intersection LOS: D

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 12: Champlain Parkway & Lakeside Ave



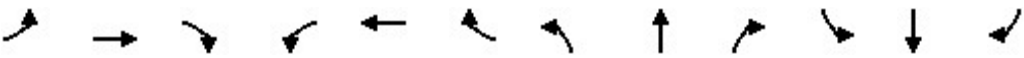
Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	1.0
Minimum Split (s)	22.5	9.5	20.0
Total Split (s)	20.0	30.0	20.0
Total Split (%)	13%	20%	13%
Maximum Green (s)	15.5	25.5	17.0
Yellow Time (s)	3.5	3.5	3.0
All-Red Time (s)	1.0	1.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?			
Vehicle Extension (s)	2.0	4.0	3.0
Recall Mode	None	None	None
Walk Time (s)			7.0
Flash Dont Walk (s)			10.0
Pedestrian Calls (#/hr)			5
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Lanes, Volumes, Timings
16: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	40	56	25	80	433	60	10	668	15
Future Volume (vph)	5	0	25	40	56	25	80	433	60	10	668	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	220		0	125		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.887			0.972			0.982			0.997	
Flt Protected		0.992			0.984		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1722	0	1711	1768	0	1711	1795	0
Flt Permitted		0.952			0.885		0.950			0.950		
Satd. Flow (perm)	0	1521	0	0	1549	0	1711	1768	0	1711	1795	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1020			573			993			1129	
Travel Time (s)		27.8			15.6			27.1			30.8	
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
Adj. Flow (vph)	5	0	25	40	56	25	80	433	60	10	668	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	121	0	80	493	0	10	683	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings
16: Champlain Parkway & Sears Lane

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

16: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	40.0	40.0		40.0	40.0		20.0	65.0		20.0	65.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		13.3%	43.3%		13.3%	43.3%	
Maximum Green (s)	35.0	35.0		35.0	35.0		15.0	60.0		14.0	60.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		16.1			16.1		11.4	113.9		5.7	102.5	
Actuated g/C Ratio		0.11			0.11		0.08	0.76		0.04	0.68	
v/c Ratio		0.18			0.73		0.62	0.37		0.16	0.56	
Control Delay		61.3			88.2		84.8	9.9		91.6	10.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		61.3			88.2		84.8	9.9		91.6	10.0	
LOS		E			F		F	A		F	B	
Approach Delay		61.3			88.2			20.3			11.2	
Approach LOS		E			F			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 149.5 (100%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 22.5

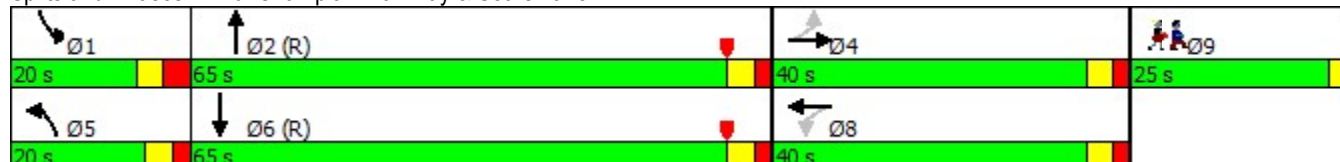
Intersection LOS: C

Intersection Capacity Utilization 65.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 16: Champlain Parkway & Sears Lane



Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	17%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
1: St John's Club Drive/Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	1	41	9	30	1	0	17	134	1	0
Future Volume (vph)	0	11	1	41	9	30	1	0	17	134	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Ped Bike Factor												
Frt		0.989			0.949			0.872				
Flt Protected					0.975			0.997			0.953	
Satd. Flow (prot)	0	1781	0	0	1666	0	0	1565	0	0	1716	0
Flt Permitted					0.975			0.997			0.953	
Satd. Flow (perm)	0	1781	0	0	1666	0	0	1565	0	0	1716	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		140			1042			869			215	
Travel Time (s)		3.8			28.4			23.7			5.9	
Confl. Peds. (#/hr)	16		8	8		16	2		6	6		2
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
Adj. Flow (vph)	0	11	1	41	9	30	1	0	17	134	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	80	0	0	18	0	0	135	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 33.3%	ICU Level of Service A											
Analysis Period (min) 15												
Description: Lakeside Ave and Central Avenue												

HCM Unsignalized Intersection Capacity Analysis

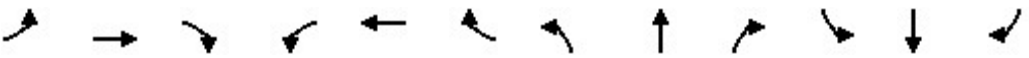
1: St John's Club Drive/Lakeside Ave

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	1	41	9	30	1	0	17	134	1	0
Future Volume (vph)	0	11	1	41	9	30	1	0	17	134	1	0
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)	0	11	1	41	9	30	1	0	17	134	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	80	18	135								
Volume Left (vph)	0	41	1	134								
Volume Right (vph)	1	30	17	0								
Hadj (s)	-0.02	-0.09	-0.52	0.23								
Departure Headway (s)	4.3	4.2	3.7	4.4								
Degree Utilization, x	0.01	0.09	0.02	0.16								
Capacity (veh/h)	797	830	924	808								
Control Delay (s)	7.4	7.6	6.8	8.2								
Approach Delay (s)	7.4	7.6	6.8	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			33.3%	ICU Level of Service					A			
Analysis Period (min)			15									
Description: Lakeside Ave and Central Avenue												

Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	482	0	141	1	0	2	9	295	0	1	85	623
Future Volume (vph)	482	0	141	1	0	2	9	295	0	1	85	623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	120		0	0		130
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor	0.98	0.96			0.88		0.99				1.00	0.97
Frt		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950				0.999	
Satd. Flow (prot)	1711	1474	0	0	1480	0	1711	1801	0	0	1799	1531
Flt Permitted	0.950						0.701				0.998	
Satd. Flow (perm)	1679	1474	0	0	1449	0	1255	1801	0	0	1797	1488
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		589			262			2150			922	
Travel Time (s)		16.1			7.1			58.6			25.1	
Confl. Peds. (#/hr)	7		9	9		7	7		38	38		7
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
Adj. Flow (vph)	482	0	141	1	0	2	9	295	0	1	85	623
Shared Lane Traffic (%)												
Lane Group Flow (vph)	482	141	0	0	3	0	9	295	0	0	86	623
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm

Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	

Lanes, Volumes, Timings

3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8			2			6		6
Detector Phase	7	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	5.0		5.0	5.0		5.0	8.0		8.0	8.0	8.0
Minimum Split (s)	15.0	10.5		10.0	10.0		11.0	13.5		13.5	13.5	13.5
Total Split (s)	35.0	45.0		10.0	10.0		11.0	85.0		74.0	74.0	74.0
Total Split (%)	23.3%	30.0%		6.7%	6.7%		7.3%	56.7%		49.3%	49.3%	49.3%
Maximum Green (s)	28.0	39.5		5.0	5.0		5.0	79.5		68.5	68.5	68.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	4.0	2.5		2.0	2.0		3.0	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	7.0	5.5			5.0		6.0	5.5			5.5	5.5
Lead/Lag	Lead			Lag	Lag		Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Min	None		None	None		None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	62.4	65.9			5.0		73.2	69.1			66.9	66.9
Actuated g/C Ratio	0.42	0.44			0.03		0.49	0.46			0.45	0.45
v/c Ratio	0.68	0.22			0.06		0.01	0.36			0.11	0.94
Control Delay	40.2	33.7			73.0		16.6	26.5			23.8	62.2
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	40.2	33.7			73.0		16.6	26.5			23.8	62.2
LOS	D	C			E		B	C			C	E
Approach Delay		38.7			73.0			26.2			57.6	
Approach LOS		D			E			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 7:EBL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 44.6

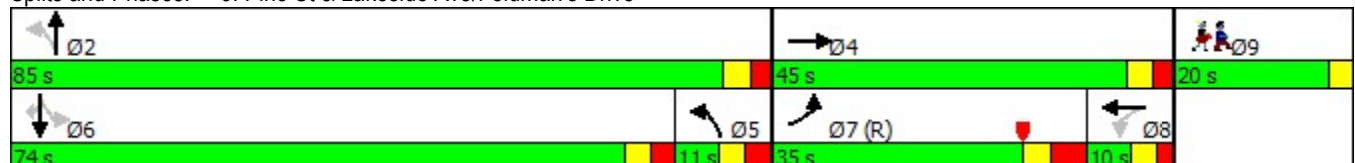
Intersection LOS: D

Intersection Capacity Utilization 72.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Pine St & Lakeside Ave/Feldman's Drive



Lanes, Volumes, Timings
3: Pine St & Lakeside Ave/Feldman's Drive

09/21/2018

Lane Group	Ø9
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	94	42	27	144	132	32	74	14	72	171	68
Future Volume (vph)	9	94	42	27	144	132	32	74	14	72	171	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	14	12	12	14	12
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor					0.97			0.99		0.96		
Frt		0.961			0.941			0.984			0.957	
Flt Protected		0.997			0.996			0.987		0.950		
Satd. Flow (prot)	0	1904	0	0	1817	0	0	1913	0	1770	1901	0
Flt Permitted		0.964			0.957			0.834		0.591		
Satd. Flow (perm)	0	1841	0	0	1742	0	0	1616	0	1060	1901	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			57			10			43	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		728			1013			787			2150	
Travel Time (s)		19.9			27.6			21.5			58.6	
Confl. Peds. (#/hr)				9		22			23	23		
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
Adj. Flow (vph)	9	94	42	27	144	132	32	74	14	72	171	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	0	0	303	0	0	120	0	72	239	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

8: Pine St & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		23.0	23.0		14.0	23.0	
Total Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		16.0	43.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		38.6%	38.6%		22.9%	61.4%	
Maximum Green (s)	21.0	21.0		21.0	21.0		21.0	21.0		10.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0			6.0			6.0		6.0	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	2.0	2.0					7.0	7.0			7.0	
Flash Dont Walk (s)	9.0	9.0					7.0	7.0			7.0	
Pedestrian Calls (#/hr)	10	10					10	10			10	
Act Effct Green (s)		12.3			12.3			10.1		17.1	17.1	
Actuated g/C Ratio		0.29			0.29			0.24		0.40	0.40	
v/c Ratio		0.26			0.56			0.31		0.13	0.30	
Control Delay		12.7			16.3			18.5		8.4	8.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		12.7			16.3			18.5		8.4	8.0	
LOS		B			B			B		A	A	
Approach Delay		12.7			16.3			18.5			8.1	
Approach LOS		B			B			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 42.6

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 13.1

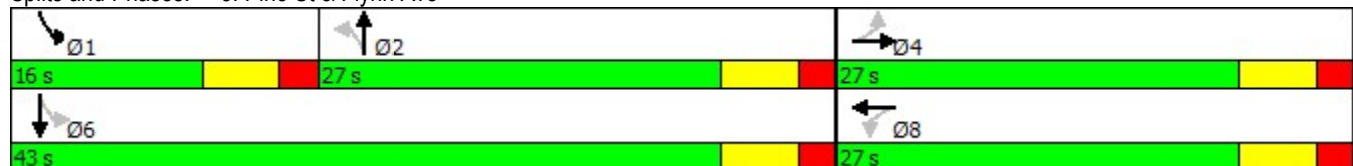
Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Pine St & Flynn Ave



Lanes, Volumes, Timings
9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Future Volume (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.966			0.981			0.999			0.986	
Flt Protected		0.987			0.993		0.950			0.950		
Satd. Flow (prot)	0	1717	0	0	1754	0	1711	1799	0	1711	1775	0
Flt Permitted		0.813			0.903		0.950			0.950		
Satd. Flow (perm)	0	1414	0	0	1595	0	1711	1799	0	1711	1775	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1398			728			878			993	
Travel Time (s)		38.1			19.9			23.9			27.1	
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
Adj. Flow (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	189	0	0	108	0	92	533	0	5	799	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings

9: Champlain Parkway & Flynn Ave

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	35.0	35.0		35.0	35.0		25.0	65.0		25.0	65.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		16.7%	43.3%		16.7%	43.3%	
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	60.0		19.0	60.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		6.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		22.7			22.7		12.4	109.9		5.3	93.9	
Actuated g/C Ratio		0.15			0.15		0.08	0.73		0.04	0.63	
v/c Ratio		0.89			0.45		0.65	0.40		0.08	0.72	
Control Delay		99.5			62.6		86.9	12.6		81.6	19.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		99.5			62.6		86.9	12.6		81.6	19.6	
LOS		F			E		F	B		F	B	
Approach Delay		99.5			62.6			23.5			20.0	
Approach LOS		F			E			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 10.9 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 32.6

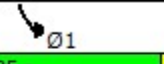
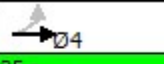
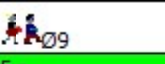
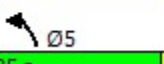
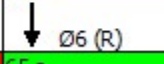
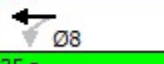
Intersection Capacity Utilization 78.2%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service D

Splits and Phases: 9: Champlain Parkway & Flynn Ave

			
25 s	65 s	35 s	25 s
			
25 s	65 s	35 s	

Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	17%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	306	421	548	30	0	179	0	323	5	0	0
Future Volume (vph)	0	306	421	548	30	0	179	0	323	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		200	0		200	0		0
Storage Lanes	0		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt			0.850						0.850			
Flt Protected				0.950				0.950			0.950	
Satd. Flow (prot)	0	1801	1531	1711	1801	0	0	1711	1531	0	1711	0
Flt Permitted				0.950				0.754			0.472	
Satd. Flow (perm)	0	1801	1531	1711	1801	0	0	1358	1531	0	850	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1042			589			1129			97	
Travel Time (s)		28.4			16.1			30.8			2.6	
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
Adj. Flow (vph)	0	306	421	548	30	0	179	0	323	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	421	548	30	0	0	179	323	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4 9		3	8			2	3		6	
Permitted Phases	4 9		4 9				2		2	6		

Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	4	9	10
Permitted Phases			

Lanes, Volumes, Timings

12: Champlain Parkway & Lakeside Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4 9	4 9	4 9	3	8		2	2	3	6	6	
Switch Phase												
Minimum Initial (s)				8.0	5.0		8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)				21.0	15.0		17.0	17.0	21.0	11.0	11.0	
Total Split (s)				45.0	65.0		35.0	35.0	45.0	35.0	35.0	
Total Split (%)				30.0%	43.3%		23.3%	23.3%	30.0%	23.3%	23.3%	
Maximum Green (s)				39.0	59.0		28.0	28.0	39.0	29.0	29.0	
Yellow Time (s)				3.0	2.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)				3.0	4.0		4.0	4.0	3.0	3.0	3.0	
Lost Time Adjust (s)				0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)				6.0	6.0			7.0	6.0		6.0	
Lead/Lag				Lead				Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	2.0		4.0	4.0	4.0	2.0	2.0	
Recall Mode				C-Min	None		None	None	C-Min	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)		45.0	45.0	58.9	78.9			24.6	90.5		25.6	
Actuated g/C Ratio		0.30	0.30	0.39	0.53			0.16	0.60		0.17	
v/c Ratio		0.57	0.92	0.82	0.03			0.81	0.35		0.03	
Control Delay		49.0	76.6	32.9	13.3			74.1	21.7		50.0	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		49.0	76.6	32.9	13.3			74.1	21.7		50.0	
LOS		D	E	C	B			E	C		D	
Approach Delay		65.0			31.8			40.4			50.0	
Approach LOS		E			C			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 74 (49%), Referenced to phase 3:WBL, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 47.5

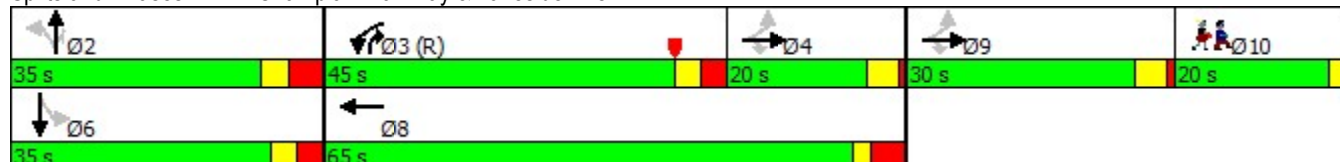
Intersection LOS: D

Intersection Capacity Utilization 74.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 12: Champlain Parkway & Lakeside Ave



Lanes, Volumes, Timings
12: Champlain Parkway & Lakeside Ave

09/21/2018

Lane Group	Ø4	Ø9	Ø10
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	1.0
Minimum Split (s)	22.5	9.5	20.0
Total Split (s)	20.0	30.0	20.0
Total Split (%)	13%	20%	13%
Maximum Green (s)	15.5	25.5	17.0
Yellow Time (s)	3.5	3.5	3.0
All-Red Time (s)	1.0	1.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?			
Vehicle Extension (s)	2.0	4.0	3.0
Recall Mode	None	None	None
Walk Time (s)			7.0
Flash Dont Walk (s)			10.0
Pedestrian Calls (#/hr)			5
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Lanes, Volumes, Timings
16: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	40	56	25	80	447	60	10	738	15
Future Volume (vph)	5	0	25	40	56	25	80	447	60	10	738	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	220		0	125		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.887			0.972			0.982			0.997	
Flt Protected		0.992			0.984		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1722	0	1711	1768	0	1711	1795	0
Flt Permitted		0.952			0.885		0.950			0.950		
Satd. Flow (perm)	0	1521	0	0	1549	0	1711	1768	0	1711	1795	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1020			573			993			1129	
Travel Time (s)		27.8			15.6			27.1			30.8	
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
Adj. Flow (vph)	5	0	25	40	56	25	80	447	60	10	738	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	121	0	80	507	0	10	753	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								

Lanes, Volumes, Timings
16: Champlain Parkway & Sears Lane

09/21/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	9
Permitted Phases	

Lanes, Volumes, Timings

16: Champlain Parkway & Sears Lane

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		11.0	20.0		11.0	20.0	
Total Split (s)	40.0	40.0		40.0	40.0		20.0	65.0		20.0	65.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		13.3%	43.3%		13.3%	43.3%	
Maximum Green (s)	35.0	35.0		35.0	35.0		15.0	60.0		14.0	60.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		6.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		16.1			16.1		11.4	113.9		5.7	102.5	
Actuated g/C Ratio		0.11			0.11		0.08	0.76		0.04	0.68	
v/c Ratio		0.18			0.73		0.62	0.38		0.16	0.61	
Control Delay		61.3			88.2		86.3	10.1		94.9	7.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		61.3			88.2		86.3	10.1		94.9	7.7	
LOS		E			F		F	B		F	A	
Approach Delay		61.3			88.2			20.5			8.9	
Approach LOS		E			F			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 149.5 (100%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 20.9

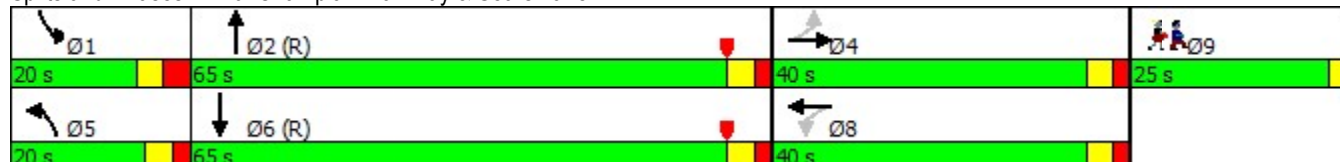
Intersection LOS: C

Intersection Capacity Utilization 68.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 16: Champlain Parkway & Sears Lane



Lane Group	Ø9
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	17%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings
9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Future Volume (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	200		0	150		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt			0.850		0.981			0.999			0.986	
Flt Protected		0.983			0.993		0.950			0.950		
Satd. Flow (prot)	0	1770	1531	0	1754	0	1711	1799	0	1711	1775	0
Flt Permitted		0.743			0.922		0.950			0.950		
Satd. Flow (perm)	0	1338	1531	0	1629	0	1711	1799	0	1711	1775	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1398			728			878			993	
Travel Time (s)		38.1			19.9			23.9			27.1	
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
Adj. Flow (vph)	49	92	48	15	78	15	92	528	5	5	725	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	48	0	108	0	92	533	0	5	799	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								

Lanes, Volumes, Timings

9: Champlain Parkway & Flynn Ave

09/21/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	23.0	23.0	11.0	23.0	23.0		11.0	23.0		11.0	23.0	
Total Split (s)	25.0	25.0	19.0	25.0	25.0		19.0	89.0		11.0	81.0	
Total Split (%)	20.0%	20.0%	15.2%	20.0%	20.0%		15.2%	71.2%		8.8%	64.8%	
Maximum Green (s)	20.0	20.0	13.0	20.0	20.0		13.0	84.0		5.0	76.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	3.0	2.0	2.0		3.0	2.0		3.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	6.0		5.0		6.0	5.0		6.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0			9.0			9.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effect Green (s)		15.8	31.3		15.8		10.5	97.0		5.0	82.7	
Actuated g/C Ratio		0.13	0.25		0.13		0.08	0.78		0.04	0.66	
v/c Ratio		0.83	0.13		0.52		0.64	0.38		0.07	0.68	
Control Delay		88.8	34.3		59.5		75.2	6.4		60.0	18.2	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		88.8	34.3		59.5		75.2	6.4		60.0	18.2	
LOS		F	C		E		E	A		E	B	
Approach Delay		74.9			59.5			16.5			18.4	
Approach LOS		E			E			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 26.5

Intersection LOS: C

Intersection Capacity Utilization 75.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: Champlain Parkway & Flynn Ave



Burlington Development Review Board

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AJ LaRosa
Austin Hart
Springer Harris
Geoff Hand
Alexandra Zipparo
Samantha Tilton
Jim Drummond, (Alternate)
Zoraya Hightower, (Alternate)*



BURLINGTON DEVELOPMENT REVIEW BOARD Tuesday October 2nd, 2018, 5:00 PM Contois Auditorium, City Hall, 149 Church St, Burlington, VT MINUTES

Board Members Present: B. Rabinowitz, A. LaRosa, A. Hart, S. Harris, A. Zipparo, S. Tilton, J. Drummond (Alt.), Z. Hightower (Alt.)

Board Members Absent: A. Hart, Z. Hightower, G. Hand

Staff Present: Scott Gustin, Mary O'Neil, Ryan Morrison, Layne Darfler

I. Agenda

No changes to the agenda

II. Communications

Communications submitted by DPW at 3:59 PM

III. Minutes

B. Rabinowitz: Minutes from the September 18th 2018 meeting will be discussed at deliberation

IV. Consent

1. 18-1027SN; 152 Pearl St (FD5, Ward 2C) First Unitarian Universalist of Burlington

Replacing 2 non-conforming signs with 1 in substantial greater compliance. (Project Manager: Mary O'Neil)

B. Rabinowitz: Have the applicants received the staff comments and recommendations? Do you have any questions?

Staff report received and no questions.

B. Rabinowitz: Does the Board have any objections to this project remaining on the consent agenda?

None

B. Rabinowitz: is there any members of the public here to speak regarding this project?

None

A. LaRosa: Motion to approve and adopt staff findings and recommendations

S. Tilton: Seconds the motion

6-0-0

2. 19-0170SD/CU; 1288 North Ave (RL, Ward 7N) 1288 North Ave LLC

Subdivide existing lot into two lots. Retain duplex on lot 1 and construct duplex and related site improvements on lot 2. (Project Manager: Scott Gustin)

B. Rabinowitz: Have the applicants received the staff comments and recommendations? Do you have any questions?

Staff report received and no questions.

B. Rabinowitz: Does the Board have any objections to this project remaining on the consent agenda?

None

B. Rabinowitz: is there any members of the public here to speak regarding this project?

None

S. Tilton: Motion to approve and adopt staff findings and recommendations

A. Zipparo: Seconds the motion

6-0-0

3. 19-0176CU; 322 North Winooski Ave (NMU, Ward 2C) 322 North Winooski Ave LLC

Change of use to Recording Studio. (Project Manager: Scott Gustin)

B. Rabinowitz: Have the applicants received the staff comments and recommendations? Do you have any questions?

Staff report received and no questions.

B. Rabinowitz: Does the Board have any objections to this project remaining on the consent agenda?

None

B. Rabinowitz: is there any members of the public here to speak regarding this project?

None

S. Harris: Motion to approve and adopt staff findings and recommendations

A. LaRosa: seconds the motion

6-0-0

4. 19-0001CA/CU; 50 Clymer St (RL, Ward 6S) Faith Ingulsrud and Eric Avildsen Demolish Garage. (Project Manager: Ryan Morrison)

B. Rabinowitz: Have the applicants received the staff comments and recommendations? Do you have any questions?

Staff report received and no questions.

B. Rabinowitz: Does the Board have any objections to this project remaining on the consent agenda?

None

B. Rabinowitz: is there any members of the public here to speak regarding this project?

None

A. Zipparo: Motion to approve and adopt staff findings and recommendations

A. LaRosa: Seconds the motion

6-0-0

V. Public Hearing

1. 18-0669CA/VR; 1580 North Ave (RL, Ward 7N) Michael and Annette Walker
Stockade fence, mobile storage unit, extend driveway. Setback variance requested for shed and driveway. (Project Manager: Ryan Morrison)

B. Rabinowitz: Have you received staff comments and recommendations?

M. Walker: Yes essentially this is a weird shaped lot and didn't realize I needed

None

B. Rabinowitz: Closed the public hearing

2. 19-0202CA/MA;44 Lakeside Ave (ELM, Ward 5S) Cloverleaf Properties

Renovate buildings for assembly, office, and seasonal recreational use. Rework parking and circulation. (Project Manager: Scott Gustin)

R. Scully: Former Blodgett Ovens Factory; we see this as an economic development initiative for Burlington. The goal of the project is to create an ecosystem for today's entrepreneurs. 35,000 square feet of combined space between the three buildings with open green space on the North.

J. Caulo: Provided overview of existing conditions; little less than 15 acres of land with 1600 feet of shoreline frontage. Existing uses and future uses continue to be office space and the existing curb cut along Lakeside will remain

K. Warden: We have been able to increase the parking while reducing the impervious surface area. Traditional double loaded and tandem parking area are permeable, the idea is to provide adequate parking for facility but we don't want to overpark the site. Looking for approval for a buddy parking system or coordinated parking spots.

B. Alvarez: Based on the current use we allocated 20 parking spaces; the parking analysis was based on office use for the existing footprint and uses therefor the total required spaces are 311; the number of spaces shown are 381 and 273 are conventional spaces with 108 being tandem spaces.

K. Warden: regarding the stormwater, there are 3 distinct additives on Lakeside. We have increased green spaces and provided more sidewalk, improved stormwater runoff and implements a high flow drainage system. Working with the City's stormwater department and there is a water well from Blodgett that will be used for geothermal as well as solar will be installed on the roofs.

A. Zipparo: concern about adequate bike parking and reason for so many car share spaces

R. Scully: plan is to introduce new bike path artery that would bring bike path traffic onto the site. Bike racks will be adequate both outside and inside buildings. Car share is to incentivize those who may be working on site but have an appointment to go to off site.

B. Alvarez: provided bike parking numbers

S. Harris: snow removal

K. Warden: provided overview of where the snow will be pushed or relocated to

A. LaRosa; What are the connections between the parking lot and the entrances and surf club; is there event spaces being planned or utilized?

R. Scully: provided overview of pedestrian routes; there is patio space as well as indoor space for events

A. LaRosa: concerns about event spaces and uses not being included in parking analysis and traffic impact

R. Scully: events would be for those working on property not expecting open public events.

S. Harris: will parking be permitted or unpermitted?

R. Scully: plan is to come up with assigned parking; will become first come first serve public parking after hours.

S. Gustin: we need a written parking management plan because you're not meeting the minimum without the buddy parking. Section 8.1.15 outlines it all;

A. Zipparo: if the applicants could include plan for events in the parking management

D. Salidino: Traffic study overview; provided handout to review and discuss. Discussed am/pm peak hours for traffic; Champlain Parkway on Lakeside Ave that intersection goes from d to f sees decrease in level of service. Recommendation is to retime the traffic signal and increase pedestrian access.

S. Gustin: central walkway from the parking area and relocating trash enclosure from lakeside Ave.

J. Caulo: Provided overview of trash management and mechanical/trash enclosure uses on front.

S. Gustin: criteria requires direct pedestrian access, your plan does not show direct access.

J. Caulo: want to make the pedestrian experience as friendly as possible.

B. Rabinowitz: any further questions?

None

B. Rabinowitz: Closed the Public Hearing

3. 19-0021CA/MA; 375 North Ave (NAC-CR, Ward 4N) 375 North Avenue LLC

Amendment to PUD approved under ZP17-0623CA/MA increasing the overall unit count from 739 to 770. Redesign of building M, adding additional stories to buildings G, M, P, Q, & R. (Project Manager: Mary O'Neil)

E. Farrell: amendment overview; Buildings B, G minor tweakings- redesign of bldg. M, P and Q designs remain just added a floor. B and G review of proposed changes, façade changes, relocation of trash collections, relocation of entrances, story changes for P and Q;

B. Rabinowitz: Is the max height the same or consistent throughout the whole site? What is the max height for the site?

E. Farrell: 75 feet is the max with inclusionary bonus grade at the building; site drops significantly at some spots.

A. LaRosa: You are getting 31 additional units with some inclusionary units; how are you changing the allocation of inclusionary units.

E. Farrell: 739 units with 516 apartments and 25% or 128 inclusionary units. In our rental inclusionary is satisfied by Cathedral Square and Champlain Housing; they are still going to do the same number even though we are reducing the number of rentals down to 400 so there will be more inclusionary than required in the Ordinance. For sale units increased as well; 206 inclusionary units that is 25 more than required.

A. Zipparo: Community garden discussion, concern about commercial enterprise aspect

E. Farrell: City acres will host community urban farm and plan to engage the residents via CSA or volunteer

B. Rabinowitz: Increasing units to 770 but the traffic study speaks to 673 units

E. Farrell: This is the latest; liberty house was not included because it was previously approved

O. Makaku: it is a miscommunication between those who did the study but the difference is 13- 14 trips.

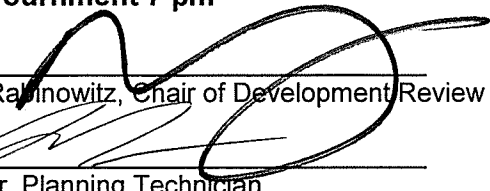
B. Rabinowitz: previous and the current plan don't show a big difference but you are adding 31 units so that should show up in the traffic study. We are going to need that information from Public Works to get the numbers correct.

M. O'Neil: Memo from traffic consultant responding to concerns

B. Rabinowitz: Any members of the public wish to speak

None

VI. Adjournment 7 pm



Bradford L. Rafinowitz, Chair of Development Review Board



Layne Darfler, Planning Technician

11/7/18

Date

10-16-2018

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

