



Healthy Homes, Caring Communities, Positive Aging

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DEPARTMENT OF
PLANNING & ZONING

January 20, 2017

Dear Development Review Board:

We are writing this letter to clarify and provide our point of view regarding the location of the affordable housing being constructed at Cambrian Rise. As seasoned developers, we pay attention to the details that each location provides us. We have chosen the location as submitted because we believe it is the best way to develop our housing on the best part of the site.

- CSC, and CHT to a limited extent, needs to be near the public transportation hub. This was a critical factor in selecting this site for affordable housing - to be close to public transportation. In addition, the topography of the site at the top of the hill will make accessibility easier for seniors.
- CHT and CSC each have complicated and phased funding mechanisms that are not on the same track or the project as a whole. This location allows us to coordinate our funding applications and development schedule with each other and be independent of the market conditions and construction for the rest of Cambrian Rise.
- In fact, our intention is to move quickly. Because our sites are at the first section of public street infrastructure to be constructed, we will be able to start construction. Building L will start in 2017 (in one or two phases) followed by Phase 1 of Building K the year after.
- Although the proposed central green is attractive, we believe fronting on a public park to our south is equally attractive, with southern orientation and fewer views of adjacent buildings as well. Being adjacent to the recreation path and community gardens is also a plus.
- Both buildings will have great views of the Green Mountains to the east and the Lake to the west. Furthermore, CSC's experience is that many seniors prefer views of activity rather than quiet green area. The porches and common rooms allow direct views of North Ave., South Street and the main site entry and views toward commercial space, the transportation hub and a restaurant.
- 'Affordable Housing' is not one monolithic strata of the senior and family rental population. Each building contains a variety of income levels ranging from recently homeless on up to some market rate dwelling units. Each building already embodies the socio-economic elements of an integrated neighborhood. And CHT residents have the opportunity for mobility to homeownership.

During earlier iterations of the site plan there were other options for locating the affordable housing. From the list above we believe you can see that we are on the exact portion of the site we want to be for both logistical and quality of life reasons. We were not pushed to the edges because we offer affordable housing. The richness of the overall site plan is full of pedestrian links and passages that assure we are well integrated into the entire neighborhood. Thank you for your time and consideration.

Michael Monte, COO CFO
Champlain Housing Trust

Cindy Reid, Director of Development
Cathedral Square Corporation

CAMBRIAN RISE

PROJECT PHASING

The Phasing Plan prepared by TJ Boyle Associates (L-EX4) depicts a breakdown of the sequence in which the various building and infrastructure components of the project are projected to be constructed. In particular, it depicts which sections of the public improvements (road and utilities) will be constructed concurrent with each building(s). The numbers assigned to each phase represent the current concept, but are not intended to represent the final sequence of construction, which will be determined by market conditions and other factors.

The various phasing plans prepared by Civil Engineering Associates (C6.10, - C6.16) and by VHB (two sheets) depict the sequence in which certain stormwater improvements will be constructed, depending on the final project phasing. The plan necessarily depicts temporary improvements required as the project is constructed in the initial years, ending with the construction/implementation of the final design, when and as the project nears completion. The dates assigned to each phase represent the current concept, but are not intended to represent the final sequence of construction, which will be determined by market conditions and other factors.

It is the desire of the Applicant to secure a Unified Certificate of Occupancy when and as each phase is completed and ready for occupancy, regardless of whether the infrastructure improvements servicing that phase are temporary or permanent. This will be a requirement of the project financing for each phase.

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MEMO

TO: Eric Farrell, Owiso Makuku, Charlie Pughe
Copy: Laura Wheelock, BTV DPW
FROM: Mark Smith, PE.
DATE: December 28, 2016
SUBJECT: Cambrian Rise – Development Changes

Several changes to the mix of land use are proposed since the Transportation Impact Assessment (TIA), dated 12/21/16 for the Cambrian Rise development project on North Avenue in Burlington, Vermont.

This memorandum is provided as a supplement to the TIA, documenting these changes and their effects on the traffic analysis presented in the original Assessment cited above.

1.0 PROPOSED CHANGES

The development has been revised to include the following additional components:

- 2 hotel rooms
- 6 apartment units
- 2,950 s.f. of technical college space
- 250 s.f. of restaurant space

Vehicle trip generation, as determined by the methods used in the TIA, now includes the following:

Primary trips, as determined by the Institute of Transportation Engineers *Trip Generation Manual*, are summarized by land use code (ITE LUC) in Table 1.

TABLE 1. PRIMARY TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
223	Mid-Rise Apartment	673	d.u.	90	199	194	140
311	All-Suites Hotel	42	room	9	7	8	9
540	Junior/Community College	16,550	s.f.	37	13	24	18
565	Daycare Center	4,025	s.f.	26	23	23	26
710	General Office Building	22,541	s.f.	31	4	6	28
826	Specialty Retail Center	2,675	s.f.	0	0	3	4
932	High-Turnover (Sit-Down) Restaurant	2,650	s.f.	16	13	9	6
	sub-total			208	260	267	231
	total			467		498	

Pass-by trips are not expected to change from the original assessment.



Trips that are associated with each land use, but are expected to take advantage of other uses within the development, are shown in Table 2.

TABLE 2. INTERNAL CAPTURE TRIPS

ITE LUC	Description	Units/size		AM Peak		PM Peak	
				enter	exit	enter	exit
223	Mid-Rise Apartment	673	d.u.	1	4	3	5
311	All-Suites Hotel	42	room	0	2	1	0
540	Junior/Community College	16,550	s.f.	0	0	0	0
565	Daycare Center	4,025	s.f.	8	8	8	8
710	General Office Building	22,541	s.f.	6	3	3	1
826	Specialty Retail Center	2,675	s.f.	0	0	2	2
932	High-Turnover (Sit-Down) Restaurant	2,650	s.f.	7	5	2	3
	sub-total			22	22	19	19
	total			44		38	

In summary, including a 10% reduction in trips due to the effects of Transportation Demand Management, the total external vehicle trips due to the project are shown in Table 3.

TABLE 3. TOTAL EXTERNAL VEHICLE TRIPS

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	

The net effect of the additional land use is an additional 12 trips in the AM peak hour and 11 trips in the PM peak hour. The total daily trip generation is expected to be 4,620 vehicles per day.

2.0 NET EFFECT OF CHANGES ON TRAFFIC

The net effect of these additional land uses is generally negligible throughout the study area (adding 0.1 seconds of average delay or 1% of capacity utilization (v/c)). Minor exceptions include:

- 1 sec. / 2 sec. average delay added to the Berry St. approach to North Avenue (2022 PM / 2027 PM)
- 4 sec. average delay added to the eastbound approach at Maple and Pine St. (without the planned Champlain Parkway improvements)

Maximum vehicle queue increases were generally negligible as well. Small increases (3-7 ft.) are noted from North St/North Ave. to Battery/Pearl St.

END OF MEMO





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City of Burlington
Department of Public Works
Technical Services Engineering Division
645 Pine Street, Suite A
Burlington, VT 05402
P 802-863-9094 / F 802-863-0466 / TTY 802-863-0450
www.burlingtonvt.gov/DPW

To: *City of Burlington Planning & Zoning
Eric Farrell – Cambrian Rise*

From: *Norman J. Baldwin P.E. – City Engineer/Ass't Director, DPW
Laura K. Wheelock P.E. - Public Works Engineer, DPW*

Subject: *Cambrian Rise, BCCH, LLC & 375 North Ave.*

The Department of Public Works (DPW) has been working with the Cambrian Rise Development Team to review and discuss details of the project as it relates to the public Right-of-Way (ROW) along North Avenue, the project intersections on North Avenue, as well as the internal streets as the applicant has indicated that they would like to turn over to the City 60-foot public ROW for the three internal streets. DPW has conducted our review on both the progress plans dated 12/23/2016 as well as the Traffic Impact Assessment dated 12/21/16 and corresponding memo dated 12/28/16. Water Resources review to be submitted separately.

Traffic Impact Assessment (TIA):

DPW has been working with the Development Team for over a year to review various iterations of the projects traffic impact within the City's transportation network. The projects impacts are primarily concentrated in the northern areas of the Old North End with some project generated traffic reaching as far south as Main Street; as well as the southern areas of the New North End.

Based on the mix of uses identified in the RSG memo 12/28/2016; the anticipated external project trips will be 381 in the AM Peak, and 425 in the PM Peak. In general the impact to the levels of service, queue lengths, or overall delay at studied intersections is minor.

The only exception is the intersection of North Ave/Berry/Washington. This intersection currently has stop control on the side street approaches, and is slightly offset. It is anticipated that with the project generated traffic the Level of Service (LOS) in the PM Peak will change from a C to an E, and the corresponding delay to vehicles will change from 23 seconds to 46 seconds in the 5 year buildout future year of 2027. DPW has discussed this intersection with the developer, and the change in LOS and delay is significant, it is however within an acceptable change per VTrans Traffic Impact Assessment Guidelines. To mitigate concerns and impacts that are anticipated in future years DPW will continue to monitor and assess this intersection for improvements that can be implemented with impact fees.

DPW has also asked the Development Team to address crosswalks both immediately adjacent to the project and for 1000 feet north and south of their project to ensure the addition of crosswalks at the project's southern drive work with other existing or planned crosswalks along North Ave. The TIA had two findings with regards to crosswalk locations:

1. The existing crosswalk (and bus stop) near Champlain Farms should be removed, as the ultimate spacing of crosswalks and stops will be more uniform with the planned crossings and stops at the Project's southern drive.
2. New crosswalk should be placed proximate to the new Parks & Recreation redeveloped path near Covent Square with that project
3. At the northern project drive, a crosswalk should be considered if/when future activity warrants such a facility.
4. Per the project plan set, crosswalks shown at the project intersection of South Road/North Ave.

Conditions from the Traffic Study:

DPW's agrees with the review of the crosswalk recommendations and requests for the third recommendation that the Applicant be made responsible prior to the close of their permit to conduct pedestrian counts and submit a memo to DPW reviewing the northern project drive on North Ave and the warrant for installation of a crosswalk at that location to be paid by the Applicant should a crosswalk warrant be met.

Progress Plans Dated 12/23/2016:

DPW reviewed the project plans for impacts on North Ave, as well as the three internal project streets in anticipation that the Applicant will seek to have these streets and their ROW accepted by the City in the future. DPW's findings are as follows.

North Ave

The proposed improvements as shown in the submitted plan meet or exceed City Standards as currently specified with the following exceptions, notes, or comments:

1. The Applicant will be required to replace the sidewalk more than 5 years old on the West side of North Ave between the southern property line (Building K) and the northern property line (north of North drive)
2. The signal at North Ave and South Road should be installed during phase one of the project and left in flash, until either trip/pedestrian warrants are met, at which time the signal should become active.
3. A No Parking flashing beacon should be installed at/near the intersection of North Ave and South Road, the cost of the beacon is the responsibility of the Applicant. Due to the unique nature of these beacons DPW will install the beacon and seek reimbursement for the materials and cost of installation.
4. DPW and Applicant to discuss narrowing of the painted median on the north side of the intersection of North Ave and South Road, DPW to review final plan before line work is implemented.
5. Bike lane shall have stop bars marked within the bike lanes, these could be offset from the travel lane stop bars if appropriate.
6. Bike lane markings across intersection at South Road shall be consistent with City typical markings in both size and configuration. This should include skip lines at the intersection and bike size chevron in the lane. Also diagonal line striping in the separated portion of the bike lane should be removed

7. DPW and Applicant to review bicycle left turns at North Ave and South Road. DPW would like to see a pull off ahead of the crosswalk to allow bicycles to utilize the pedestrian push button, an alternative we would consider is a bicycle box in the lane striping. DPW to review and approve final plan before work is implemented.
8. At the Northwest corner of North Ave and South Road the proposed bus stop area shows a significant amount of concrete/hardscape area. This area will need to be revisited/revised with DPW.
9. Applicant will seek to adjust property boundary lines in the future on North Ave to place the sidewalk along North Ave back in the ROW.

Project Streets (South, West, North)

The proposed improvements as shown in the submitted plan meet or exceed City Standards as currently specified with the following exceptions, notes, or comments:

1. A crosswalk needs be placed at the west side of the intersection of South Road and West Road. This will facilitate pedestrian movements given the planned commercial activity in the area, adjacent recreational facilities, and ability for DPW to maintain and clear snow at the intersection.
2. Applicant to review location of stop bars relative to the crosswalks at the intersection of North Road and West Road. Crosswalks should be placed in front of stop bars.
3. Signage and Striping:
 - a. Crosswalk warning signs MUST reflect YIELD to pedestrians, per VT State Law
 - b. Share the lane signage should be independent of the pedestrian crossing signs
 - c. The only on street striping should be for crosswalks, stop bars, and in the immediate vicinity of the proposed signal for center line delineation. No line striping should be placed for individual parking spaces, center line, or fog lines.
 - d. No speed limit signs within the development
4. Sidewalk configuration/alignment and connection to Lakeview Cemetery will need to be reviewed by DPW/Parks prior to construction if Applicant pursues acceptance of project streets by the City.
5. Applicant to review bicycle/pedestrian connection from Building O and P to the bike path to the west to determine whether additional connection will be at back of building or at end of sidewalk.
6. Applicant will be required to submit design drawings for retaining wall along North Road, stamped by a Professional Engineer registered in the State of Vermont.

General Comments

1. Applicant will be required to place monuments at all parcel boundaries.
2. All public infrastructure intended to be part of the dedication must be within the proposed limits of the ROW.
3. Any materials used in the ROW that exceed City Standards will be the responsibility of the Applicant, and the Applicant will be required to enter into a License Agreement with DPW, unless otherwise waived, for the care, maintenance, replacement, removal for the life that material unless otherwise replaced with a Standard material, at which time the Agreement can be dissolved.

4. For the dedication process the Applicant must, at minimum, provide the following:
 - a. As-built drawings of all infrastructure in the ROW
 - b. Certification from the engineer of record that infrastructure constructed was completed per plans and specification
 - c. All documentation by the project resident engineer for all infrastructure in the ROW. This shall include but is not limited to: Notes, photographs, reports, quality control testing, change orders, submittals.
 - d. The City shall be invited to participate at all construction meetings
 - e. The City shall have the right to have oversight during construction, review of resident engineer documentation, submittals.
5. Review the sequence of work to connect South Road sidewalk/path to the proposed Parks Path, a connection to those facilities in advance of 2022.
6. There is a discrepancy between the phasing of the project shown on P1.0 by CEA and sheet 2 of 2 by VHB with regard to when Building H, Q, and R will be constructed. Of concern is the varying stormwater treatments that occur during construction, treatment types shown varies.

Should you have any questions please contact me at LWheelock@burlingtonvt.gov or 540-0397.

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Chapin Spencer
PUBLIC WORKS DIRECTOR

Norman J. Baldwin, P.E.
CITY ENGINEER



October 10, 2016

David S. Marshall, P.E.
Civil Engineering Associates
10 Mansfield View Lane
South Burlington, VT 05403
60 Westminster Drive
Burlington, VT 05408

Note: The first three pages attached to this document represent the design flows contemplated in October, 2017. The remaining attached pages date 1-4-17 represent the current design flows which are less than that identified in this allocation letter. D. Marshall

Re: Water/Sewer Capacity for 311-329 North Avenue (Cambrian Rise)

A handwritten signature in black ink, appearing to be "D. Marshall", written over a horizontal line.

Dear Dave,

This letter is to inform you, the State of Vermont Environmental District and other interested parties that the City of Burlington's water and wastewater facilities have sufficient capacity to handle flows associated with a large residential development the above address. Using the State Environmental Protection Rules, you have calculated the water and sewer demands to be 158,457 gpd (gals/day) and 135,050 gpd, respectively. Your calculations are provided with this capacity letter.

Flow from this area is treated at our Main Wastewater Plant on Lavalley Lane. It is important to note that this letter only addresses treatment plant and not distribution or collection system capacities. At this time, we are collectively working on a design and agreement to remove stormwater inputs to our combined sewer system on North Avenue in order to mitigate impacts from increased sewage flow during storm events. This design will need to be constructed before a certificate of occupancy can be provided by the City of Burlington.

This letter is good for one (1) year from the date of writing. If this letter is not filed with the proper offices, or if the proper permits are not obtained within that year, you will need to reapply. Any changes in flow estimates or property usage also requires reapplication. Please feel free to call me at 865-7258 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to be "Steve Roy", written over a horizontal line.

Steve Roy, P.E.
Project Engineer
Burlington Public Works
northave311-329_cap

Cambrian Rise Water Supply Design Flows

311-329 North Avenue

6-Oct-16

<u>No.</u>	<u>Description</u>		<u>GPD</u>	<u>GPD</u>
Building A				
65	1-Bedroom Units	x	135 GPD/Unit =	8,775
Building B				
35	1-Bedroom Units	x	135 GPD/Unit =	4,725
13	2-Bedroom Units	x	270 GPD/Unit =	3,510
Building C				
56	1-Bedroom Units	x	135 GPD/Unit =	7,560
14	2-Bedroom Units	x	270 GPD/Unit =	3,780
7	3-Bedroom Units	x	405 GPD/Unit =	2,835
23	Employees (4.6k Comm.)	x	15 GPD/Empl. =	341
	10 % Low Flow Reduc. Credit			(34)
Buildings E & F				
96	1-Bedroom Units	x	135 GPD/Unit =	12,960
22	2-Bedroom Units	x	270 GPD/Unit =	5,940
Building G				
180	Empl/Students (18k Comm.)	x	15 GPD/Unit =	2,700
	10 % Low Flow Reduc. Credit			(270)
200	Seat Restaurant	x	30 GPD/Empl. =	6,000
	10 % Low Flow Reduc. Credit			(600)
Building K				
63	1-Bedroom Units	x	135 GPD/Unit =	8,505
7	2-Bedroom Units	x	270 GPD/Unit =	1,890
Building L				
36	1-Bedroom Units	x	135 GPD/Unit =	4,860
33	2-Bedroom Units	x	270 GPD/Unit =	8,910
7	3-Bedroom Units	x	405 GPD/Unit =	2,835
Building H				
27	1-Bedroom Units	x	135 GPD/Unit =	3,645
33	2-Bedroom Units	x	270 GPD/Unit =	8,910
Building I				
20	2-Bedroom Units	x	270 GPD/Unit =	5,400
8	3-Bedroom Units	x	405 GPD/Unit =	3,240
105	Employees (21k SF)	x	15 GPD/Empl. =	1,572
	10 % Low Flow Reduc. Credit			(157)
Buildings M & N				
4	1-Bedroom Units	x	135 GPD/Unit =	540
52	2-Bedroom Units	x	270 GPD/Unit =	14,040
22	3-Bedroom Units	x	405 GPD/Unit =	8,910
Building O & P				
25	1-Bedroom Units	x	135 GPD/Unit =	3,375
24	2-Bedroom Units	x	270 GPD/Unit =	6,480
1	3-Bedroom Units	x	405 GPD/Unit =	405
Building Q				
35	1-Bedroom Units	x	135 GPD/Unit =	4,725
18	2-Bedroom Units	x	270 GPD/Unit =	4,860
27	2-Bedroom Units (Potential)	x	270 GPD/Unit =	7,290
Total Sewer Design Flow to Pump Sta. (GPD) =				158,457
Average Daily Design Flow (GPM) =				220.1

Cambrian Rise

Gravity Wastewater Design Flows

311-329 North Avenue

6-Oct-16

Gravity Flow to North Avenue

<u>No.</u> <u>Description</u>	<u>GPD</u>	<u>GPD</u>
Building A		
65 1-Bedroom Units	x 140 GPD/Unit =	9,100
Building B		
35 1-Bedroom Units	x 140 GPD/Unit =	4,900
13 2-Bedroom Units	x 210 GPD/Unit =	2,730
Building C		
56 1-Bedroom Units	x 140 GPD/Unit =	7,840
14 2-Bedroom Units	x 210 GPD/Unit =	2,940
7 3-Bedroom Units	x 210 GPD/Unit =	1,470
Buildings E & F		
96 1-Bedroom Units	x 140 GPD/Unit =	13,440
22 2-Bedroom Units	x 210 GPD/Unit =	4,620
Building G		
180 Empl/Students (18k Comm.)	x 15 GPD/Unit =	2,700
20 % Low Flow Reduc. Credit		(540)
200 Seat Restaurant	x 30 GPD/Empl. =	6,000
20 % Low Flow Reduc. Credit		(1,200)
Building K		
63 1-Bedroom Units	x 140 GPD/Unit =	8,820
7 2-Bedroom Units	x 210 GPD/Unit =	1,470
Building L		
36 1-Bedroom Units	x 140 GPD/Unit =	5,040
33 2-Bedroom Units	x 210 GPD/Unit =	6,930
7 3-Bedroom Units	x 210 GPD/Unit =	1,470
Total Sewer Design Flow via Gravity (GPD) =		77,730
Average Daily Design Flow (GPM) =		81.0
Peaking Factor =		4.0
Peak Flow Rate (GPM) =		324
Peak Flow Rate (CFS) =		0.72

Cambrian Rise Pumped Wastewater Design Flows

311-329 North Avenue

15-Sep-16

PS Flow to North Avenue

Building C

23 Employees (4.6k Comm.)	x	15 GPD/Empl.	=	341
20 % Low Flow Reduc. Credit				(68)

Building H

27 1-Bedroom Units	x	140 GPD/Unit	=	3,780
33 2-Bedroom Units	x	210 GPD/Unit	=	6,930

Building I

20 2-Bedroom Units	x	210 GPD/Unit	=	4,200
8 3-Bedroom Units	x	210 GPD/Unit	=	1,680
105 Employees (21k SF)	x	15 GPD/Empl.	=	1,572
20 % Low Flow Reduc. Credit				(314)

Buildings M & N

4 1-Bedroom Units	x	140 GPD/Unit	=	560
52 2-Bedroom Units	x	210 GPD/Unit	=	10,920
22 3-Bedroom Units	x	210 GPD/Unit	=	4,620

Building O & P

25 1-Bedroom Units	x	140 GPD/Unit	=	3,500
24 2-Bedroom Units	x	210 GPD/Unit	=	5,040
1 2-Bedroom Units	x	210 GPD/Unit	=	210

Building Q

35 1-Bedroom Units	x	140 GPD/Unit	=	4,900
27 2-Bedroom Units (Potential)	x	210 GPD/Unit	=	5,670
18 2-Bedroom Units	x	210 GPD/Unit	=	3,780

Total Sewer Design Flow to Pump Sta.(GPD) = 57,320

Average Daily Design Flow (GPM) = 59.7

Peaking Factor = 4.0

Peak Flow Rate (GPM) = 239

Peak Flow Rate (CFS) = 0.53

Cambrian Rise
Water Supply Design Flows
 311-375 North Avenue

4-Jan-17

<u>No.</u>	<u>Description</u>	<u>GPD</u>	<u>GPD</u>
Building A			
65	1-Bedroom Units	x 135 GPD/Unit =	8,775
	Pre-Existing Allocation and Permit in Place for this Bldg		(8,820)
			WW-4-3619-1
Building B			
69	1-Bedroom Units	x 135 GPD/Unit =	9,315
2	2-Bedroom Units	x 270 GPD/Unit =	540
	Pre-Existing Allocation and Permit in Place for this Bldg		(5,304)
			WW-4-3619
Building C			
67	1-Bedroom Units	x 135 GPD/Unit =	9,045
6	2-Bedroom Units	x 270 GPD/Unit =	1,620
8	3-Bedroom Units	x 405 GPD/Unit =	3,240
50	Employees (4.6k Comm.)	x 15 GPD/Empl. =	750
	10 % Low Flow Reduc. Credit		(75)
Buildings E & F			
85	1-Bedroom Units	x 135 GPD/Unit =	11,475
24	2-Bedroom Units	x 270 GPD/Unit =	6,480
1	3-Bedroom Units	x 210 GPD/Unit =	210
116	Person Assembly Area	x 5 GPD/Empl. =	579
	10 % Low Flow Reduc. Credit		(58)
Building G			
200	Seat Restaurant	x 30 GPD/Empl. =	6,000
1	Bakery	x 100 GPD/Unit =	100
	10 % Low Flow Reduc. Credit		(610)
Building K			
63	1-Bedroom Units	x 135 GPD/Unit =	8,505
7	2-Bedroom Units	x 270 GPD/Unit =	1,890
Building L			
36	1-Bedroom Units	x 135 GPD/Unit =	4,860
33	2-Bedroom Units	x 270 GPD/Unit =	8,910
7	3-Bedroom Units	x 405 GPD/Unit =	2,835
Building H			
19	1-Bedroom Units	x 135 GPD/Unit =	2,565
38	2-Bedroom Units	x 270 GPD/Unit =	10,260
29	Employees (5.7k Comm.)	x 15 GPD/Empl. =	428
	10 % Low Flow Reduc. Credit		(43)
Building I			
20	2-Bedroom Units	x 270 GPD/Unit =	5,400
8	3-Bedroom Units	x 405 GPD/Unit =	3,240
115	Student Daycare + Employ.	x 15 GPD/Empl. =	1,725
10	Non Resid. @ Health Club	x 10 GPD/Empl. =	100
	10 % Low Flow Reduc. Credit		(183)
Buildings M & N			
11	1-Bedroom Units	x 135 GPD/Unit =	1,485
42	2-Bedroom Units	x 270 GPD/Unit =	11,340
26	3-Bedroom Units	x 405 GPD/Unit =	10,530
15	Employees (3.0 SF)	x 15 GPD/Empl. =	225
	10 % Low Flow Reduc. Credit		(23)
Building O & P			
24	1-Bedroom Units	x 135 GPD/Unit =	3,240
28	2-Bedroom Units	x 270 GPD/Unit =	7,560
6	Employees (1.3 SF)	x 15 GPD/Empl. =	90
	10 % Low Flow Reduc. Credit		(9)
Building Q			
24	2-Bedroom Units	x 270 GPD/Unit =	6,480
10	3-Bedroom Units	x 405 GPD/Unit =	4,050
Building R			
42	Hotel Rooms - 2 Pers Occup.	x 100 GPD/Unit =	4,200
	10 % Low Flow Reduc. Credit		(420)
Total Water Supply Design Flow (GPD) =			142,502
Average Daily Design Flow (GPM) =			197.9

Cambrian Rise

Summary of Wastewater Design Flows

311-375 North Avenue

4-Jan-17

Gravity Flow to North Avenue

<u>Description</u>	<u>GPD</u>
Building A	9,100
Building B	10,080
Building C	12,320
Buildings E & F	17,613
Building G	4,880
Building K	10,290
Building L	13,440
Infiltration	290
Subtotal	78,013
Pre-Existing Allocations & Permits in Place for Exist Bldgs	(14,124)
Increase	63,889

Flow to Pump Station and then to North Ave.

Building C	600
Buildings E & F	1,948
Building H	10,982
Building I	7,340
Buildings M & N	16,000
Building O & P	9,312
Building Q	7,140
Building R	4,200
Infiltration	943
Increase	58,465
Total Increase	122,354

Cambrian Rise

Gravity Wastewater Design Flows

311-375 North Avenue

4-Jan-17

Gravity Flow to North Avenue

<u>No.</u>	<u>Description</u>	<u>GPD</u>	<u>GPD</u>
Building A			
65	1-Bedroom Units	x 140 GPD/Unit =	9,100
	Pre-Existing Allocation and Permit in Place for this Bldg		(8,820)
			WW-4-3619-1
Building B			
69	1-Bedroom Units	x 140 GPD/Unit =	9,660
2	2-Bedroom Units	x 210 GPD/Unit =	420
	Pre-Existing Allocation and Permit in Place for this Bldg		(5,304)
			WW-4-3619
Building C			
67	1-Bedroom Units	x 140 GPD/Unit =	9,380
6	2-Bedroom Units	x 210 GPD/Unit =	1,260
8	3-Bedroom Units	x 210 GPD/Unit =	1,680
Buildings E & F			
85	1-Bedroom Units	x 140 GPD/Unit =	11,900
24	2-Bedroom Units	x 210 GPD/Unit =	5,040
1	3-Bedroom Units	x 210 GPD/Unit =	210
116	Person Assembly Area	x 5 GPD/Empl. =	579
20	% Low Flow Reduc. Credit	x 579 =	(116)
Building G			
200	Seat Restaurant (2.1k SF)	x 30 GPD/Seat =	6,000
1	Bakery	x 100 GPD/Unit =	100
20	% Low Flow Reduc. Credit	x 6,100 =	(1,220)
Building K			
63	1-Bedroom Units	x 140 GPD/Unit =	8,820
7	2-Bedroom Units	x 210 GPD/Unit =	1,470
Building L			
36	1-Bedroom Units	x 140 GPD/Unit =	5,040
33	2-Bedroom Units	x 210 GPD/Unit =	6,930
7	3-Bedroom Units	x 210 GPD/Unit =	1,470
			63,599
Infiltration			
450	LF 8" Sewer Main	x 0.455 GPD/LF =	205
250	LF 6" Sewer Service	x 0.341 GPD/LF =	85
0	LF 8" Sewer Service	x 0.455 GPD/LF =	-
			290
Total Sewer Design Flow to Pump Sta.(GPD) =			63,889
	Average Daily Design Flow (GPM) =		66.6
	Peaking Factor =		4.0
	Peak Flow Rate (GPM) =		266
	Peak Flow Rate (CFS) =		0.59

Cambrian Rise Pumped Wastewater Design Flows

311-375 North Avenue

4-Jan-17

Flow to Pump Station and then flow to North Avenue

Building C

50 Employees (10k Comm.)	x	15 GPD/Empl.	=	750
20 % Low Flow Reduc. Credit				(150)

Buildings E & F

11 1-Bedroom Units	x	140 GPD/Unit	=	1,540
1 2-Bedroom Units	x	210 GPD/Unit	=	210
17 Employees (3.3k SF)	x	15 GPD/Empl.	=	248
20 % Low Flow Reduc. Credit				(50)

Building H

19 1-Bedroom Units	x	140 GPD/Unit	=	2,660
38 2-Bedroom Units	x	210 GPD/Unit	=	7,980
29 Employees (5.7k Comm.)	x	15 GPD/Empl.	=	428
20 % Low Flow Reduc. Credit				(86)

Building I

20 2-Bedroom Units	x	210 GPD/Unit	=	4,200
8 3-Bedroom Units	x	210 GPD/Unit	=	1,680
115 Student Daycare + Employ.	x	15 GPD/Empl.	=	1,725
10 Non Resid. @ Health Club	x	10 GPD/Empl.	=	100
20 % Low Flow Reduc. Credit	x	1,825	=	(365)

Buildings M & N

11 1-Bedroom Units	x	140 GPD/Unit	=	1,540
42 2-Bedroom Units	x	210 GPD/Unit	=	8,820
26 3-Bedroom Units	x	210 GPD/Unit	=	5,460
15 Employees (3.0 SF)	x	15 GPD/Empl.	=	225
20 % Low Flow Reduc. Credit				(45)

Building O & P

24 1-Bedroom Units	x	140 GPD/Unit	=	3,360
28 2-Bedroom Units	x	210 GPD/Unit	=	5,880
6 Employees (1.3 SF)	x	15 GPD/Empl.	=	90
20 % Low Flow Reduc. Credit				(18)

Building Q

24 2-Bedroom Units	x	210 GPD/Unit	=	5,040
10 3-Bedroom Units	x	210 GPD/Unit	=	2,100

Building R

42 Hotel Rooms - 2 Pers Occup	x	100 GPD/Unit	=	4,200
				57,522

Infiltration

1450 LF 8" Sewer Main	x	0.455 GPD/LF	=	659
500 LF 6" Sewer Service	x	0.341 GPD/LF	=	170
250 LF 8" Sewer Service	x	0.455 GPD/LF	=	114
				943

Total Sewer Design Flow to Pump Sta.(GPD) = 58,465

Average Daily Design Flow (GPM) = 60.9

Peaking Factor = 4.0

Peak Flow Rate (GPM) = 244

Peak Flow Rate (CFS) = 0.54