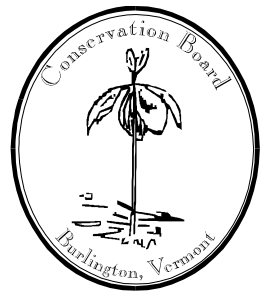


Burlington Conservation Board

149 Church Street
Burlington, VT 05401
<http://www.ci.burlington.vt.us/planning/>
Telephone: (802) 865-7188
(802) 865-7195 (FAX)

*Matt Moore, Chair
Will Flender, Vice Chair
Scott Mapes
Don Meals
Jeff Severson
Miles Waite
Damon Lane
Zoe Richards
Stephanie Young*



Conservation Board Meeting Public Notice

December 1, 2014 at 5:30 PM

**Public Works Main Conference Room – Dept. of Public Works
645 Pine Street**

Agenda

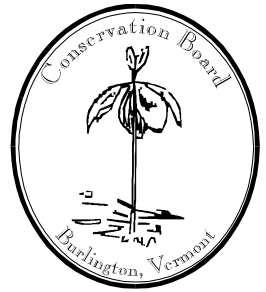
- I. Minutes (5:30) – Accept minutes from November 3, 2014 meeting**
- II. Board Comment (5:35)**
- III. Public Comment (5:45)**
- IV. Project Review (5:50)**
 - 1. 15-0451CA/MA: 234-240 College St (DT, Ward 3) Sisters & Brothers Investment Group, LLP**
Demolish rear portion of building, construct new 5-story addition at rear for 9 units. Results in change from 19 to 25 residential units for a net increase of 6.
 - 2. Review of Keystone Development Corp. VT revised Wetland Permit application for solar installation**
0 Sunset Cliff Rd, in relation to potential solar utility installation.
- V. Update & Discussion (6:50)**
 - 1. Burlington College**
 - 2. Follow-up relative to stormwater performance standards & work group**
 - 3. Proposed “Major Impact” changes**
- VI. Adjournment (7:50)**

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

Burlington Conservation Board

149 Church Street
Burlington, VT 05401
<http://www.ci.burlington.vt.us/planning/>
Telephone: (802) 865-7189
(802) 865-7195 (FAX)

Matt Moore, Chair
Will Flender, Vice Chair
Scott Mapes
Don Meals
Jeff Severson
Miles Waite
Damon Lane
Zoe Richards
Stephanie Young



Conservation Board Meeting Minutes

Monday, November 3, 2014 – 5:30 pm

Planning & Zoning Conference Room – City Hall Lower Level
149 Church Street

Attendance

- **Board Members:** Zoe Richards (ZR), Jeff Severson (JS), Scott Mapes (SM), Matt Moore (MM), Miles Waite (MW), Will Flender (WF), Stephanie Young (SY), Stephanie Young (SY)
- **Absent:** Don Meals (DM)
- **Public:** Bob Duncan, Bill Nedde (87-95 North Ave)
- **Staff:** Scott Gustin (Planning & Zoning), Dan Cahill, Jesse Bridges (Parks & Recreation), Megan Moir (Public Works)

MM, Chair, called the meeting to order at 5:30 p.m.

Minutes of October 6, 2014

A MOTION was made by MM and SECONDED by MW:

Approve as written.

Vote: 6-0-2

Board Comment

SG noted the potential Grove Street wildlife crossing upgrade of the existing Centennial Brook culvert. Jesse Bridges said he followed up with Patrick O'Brien and was told that the culvert under Grove Street is a box culvert. SG said it may well be but, but it is of a size such that it only contains brook bed. There is no room for terrestrial animal movement. ZR suggested grad students looking into an updated analysis of actual wildlife use or obstruction thereof. SG agreed doing so would be a good idea. He also noted the potential for an NR 206 senior capstone project as soon as the upcoming spring semester at UVM.

Public Comment

None.

Open Space Subcommittee

Dan Cahill said he was anticipating an application from Rock Point tonight, but one has not yet been submitted. MW asked what's expected. Mr. Cahill said a partial acquisition and conservation easement adjacent to the Arms Grant property is anticipated. He expects that an application will be received shortly. Following that, an appraisal would be done. He said the trails on this property are in need of significant upgrading. MM suggested getting the Lake Champlain Land Trust involved. He also advised against the city holding a conservation easement – that should be done by a conservation organization.

Mr. Cahill addressed the 28 Archibald Street acquisition project. We are waiting until January to receive clarification as to the Dept. of Health's suggested remediation. He is asking the Board for disbursement from the Conservation Legacy Fund of \$58,900 or up to 30% of the total acquisition costs of this project. He noted that acquisition costs include all project costs. Mr. Cahill said the property has been of consistent value to the neighborhood.

The programs and services of the Dept. of Planning and Zoning are accessible to people with disabilities.
For accessibility information call 865-7188 (865-7142 TTY).

A MOTION was made by WF and SECONDED by JS:

Approve up to \$60,000 disbursement or 30% of total project cost, whichever is less, for this acquisition project and recommend approval to the City Council.

Vote: 8-0-0

Project Review

1. 15-0525CA/MA: 87-95 North Ave (NMU, Ward 7) COTS

Renovation and addition to existing building for 14 new residential units as part of mixed use building. Includes demolition of house and lot merger at 7 Haswell Street.

Bob Duncan, Bill Nedde appeared on behalf of this application.

Bob Duncan overviewed the property layout and the existing versus proposed conditions. The proposed construction will consist of a partial demolition and a new 3 story addition. There has been consideration as to how the lot configuration can be improved and include more green space. He noted that the project plans call for about 2,500 sf new green space. MW asked about the adjacent parking lot property. Mr. Duncan overviewed the history of the property and why an easement resulted rather than outright ownership of this adjacent parking lot property. Mr. Duncan noted the overall reduction in lot coverage on both properties will come down to 83%. Most of this reduction has been achieved by removal of asphalt. He pointed out the formalized green spaced immediately adjacent to the building and the bike parking facilities.

Bill Nedde overviewed the project erosion control and stormwater management. He said the sandy soils have excellent infiltration rates of about 20" per hour. There is a small area of fill on the property.

EPSC will include silt fence, stabilized construction entrance, inlet protections. Ponding water is not expected. Sequence of construction will be important to keep turbid water out of the new infiltration chambers during construction.

The proposed stormwater management will infiltrate runoff. He has consulted with Megan Moir. He noted that half of the roof runoff will be infiltrated. About 5,000 sf surface runoff will also be infiltrated. JS asked why the full roof area will not be infiltrated. Mr. Nedde said that mechanical separation would have been required – we're committing to a certain area of roof, not which particular part. He pointed out the watershed maps of the property. He addressed the capacity of the infiltration chambers. They will handle the one year storm for the 10,000 impervious surface being captured. WF, what happens to the rest? Mr. Nedde said it would continue to flow to where it flows today.

SM asked about an area of pavement outside of the captured impervious. Would grades allow pitching this area so that it may be captured too? Mr. Nedde said that grading of the HC parking in this area precludes doing so. SM asked if perhaps a new collector catch basin could be installed to intercept additional runoff before it heads down Depot Street. Mr. Nedde said that if the soils are appropriate, perhaps it could be done; however, the stormwater management system would have to be lowered to accommodate this lower portion of the site. MW noted an area of contaminated soils onsite. He had a copy of a site investigation report from 1997.

MM noted that he's recused from this review.

A MOTION was made by WF and SECONDED by SM:

Recommend approval of the project to DRB.

Vote: 7-0-0

Update & Discussion

1. Discussion with Megan Moir relative to stormwater performance standards

Megan Moir appeared on behalf of this item.

Megan Moir noted the city was successful in obtaining Technical Assistance Grant from EPA. It enables communities to look at all of the Clean Water Act obligations collectively and prioritize them. Doing so enables the city to establish priorities and timelines for them. Tetra Tech will be working with the city in executing this effort. SM asked if there's been any recent discussion of the city handling wastewater permitting. Ms. Moir said she's mentioned it. She's struggling with the level of staffing. Organizational improvements have been made. Ms. Moir is now in the water department. SM asked if he should speak with Laurie Adams about this. MW said Steve Roy is involved. He is the one who writes the capacity letter. Ms. Moir said there are conversations about asset management and improvements. MW said the fees obtained from the permits could fund a half-time position to do the permitting.

Ms. Moir noted the priority list for the state's clean water revolving fund. One project is to do a thorough assessment of all the city's corrugated pipes – view and rank them as to condition. Another project is to evaluate the CSO at the base of Colchester Avenue. This one is considered to be the most deleterious to water quality. Another project involves the assessment of stormwater outfalls. MM asked for some examples. She noted Gazo Ave and also ones off the west side of the Belt Line. Ms. Moir noted the likely need to raise stormwater rates to fund these fixes.

Ms. Moir would like to formalize our project review tiers and requirements for stormwater performance standards. She noted the idea of payments in lieu of or offsite projects. We can't miss out on redevelopment opportunities for improving stormwater management system. She's envisioning a work group including one or two BCB members, a consultant, a developer, a planning & zoning staff member. She'd like SM's experience but also a newer BCB member with less stormwater experience. What do we want to do with small scale residential development? How do we figure out the compartments relative to whole sites vs. just new impervious? Review the stormwater credit manual. Presently, we don't provide credits to homeowners. Perhaps we should. She noted the idea of a green area ratio. It's a points-based system for LID measures. Minimum points need to be achieved. There should be a menu provided for folks to pick and choose from. She noted the idea of EPSC ticket system for infractions. Offsets for tree removal. Potential fees for project review of applications. Right now, her review time is paid for out of the general fund. She noted the idea of a "seed fund" to help homeowners with LID projects.

MM suggested meeting with the NPAs. He also noted the community development block grants – speak with CEDO for details. He noted the concept of neighborhood-wide improvements vs. individual properties.

Ms. Moir said she's not looking for volunteers tonight. She'd like to get the effort going in January. Deciding next month would be good. She expects a nearly year-long effort. SM said he's willing to participate.

MM, put this on the BCB's next agenda. Volunteers and input relative to scope and content of the anticipated effort.

Adjournment

The meeting adjourned at 7:12 PM.

RECEIVED
NOV 18 2014

DEPARTMENT OF
PLANNING & ZONING

**234 – 240 College Street
Stormwater Management Plan**



TRUDELL
Consulting Engineers

General Information

Project Address: 234 – 240 College Street
Owner: Sisters and Brothers Investment Group
Engineer: Trudell Consulting Engineers (TCE)

The Applicant, Sisters and Brothers Investment Group, proposes to build an addition to an existing apartment building. A "blue roof" system is proposed to reduce peak runoff rates from the redeveloped impervious surface. The site drains to the City of Burlington combined sewer system which discharges to the Main Plant and eventually to Lake Champlain.

Existing Conditions

Currently, the site consists of a building and alleys. The entire parcel is approximately 5,500 square feet in size, fully impervious. The existing building has a footprint of approximately 3,400 square feet.

The drainage pattern of the site is northeasterly; both alleys on the parcel slope away from College Street down to the rear parking area offsite to the northeast. The local low point is a catch basin that is connected to the historical "ravine sewer", a 3' x 2' stone combined sewer that is located deep below existing grade.

Soils for the site are not mapped, as NRCS information in the downtown Burlington area is not available. Correspondence with Megan Moir (Stormwater Program Manager for the City of Burlington) indicated that the soils could be characterized as Hydrologic Soil Group (HSG) C.

A site map showing the parcel and surrounding existing utilities is attached to this narrative.

Proposed Conditions

The proposed project consists of demolishing portions of the existing building and constructing a 1,900 square foot addition. As a result of this project, some area that is currently paved surface will be converted to roof. This will reduce the amount of sediment generated from the site. Stormwater discharge from the proposed building expansion will be conveyed by roof drain to the north of the building, where it will run northeast to the nearby catch basin. As this is the local low point, it is the most feasible discharge point. Running a discharge westward

towards South Winooski Avenue would encroach on neighboring properties as well as run uphill, and discharges to the south into College Street would also inevitably drain into the old ravine sewer.

Stormwater Management Plan

Due to the limited extent of the new building (1,900 square feet) and the small parcel size, the space available is constrained. As a matter of practicality, the only space available for stormwater treatment is the new building area. The available options for treating stormwater in such an area are also limited. Subsurface infiltration is not warranted due to the close proximity of buildings, and the unknown soil conditions. Use of rain barrels or cisterns has a limited benefit; they must be drained in between storm events, and as the entire area is 100% impervious, the collected rainwater would have only minimal use. The small site size precludes the use of surface detention structures.

The remaining options for treatment are on the new rooftop. A "blue roof" was chosen for this site, which provides temporary storage on the roof with a flow-controlled drain to reduce the peak discharge rate from the roof. A Zurn model Z105 roof drain outlet with 1 notch and flow restrictor plate was chosen. Each of these drain outlets provides 4.75 gpm of discharge for every inch of head. Roof scuppers were raised above the roof elevation to allow temporary ponding, and double as overflow structures in the case of larger storm events. As the proposed roof sits above the existing roof, capture of additional runoff is not possible. One roof drain is proposed for this section of roof; coupled with the most restrictive model of roof drain outlet, this maximizes the potential for peak flow reduction.

A hydrologic model was prepared that includes the "greenfield" condition of the expanded building area (meadow, HSG C as per Megan Moir's statement). Results of the pre versus post 1-year, 5-year, and 10-year storms are provided below:

Table 1: Hydrologic Modeling Results – Building Roof

Storm Event	Predevelopment Condition	Postdevelopment Condition
1-Year Storm (2.1")	0.03 cfs	0.01 cfs
5-Year Storm (2.82")	0.06 cfs	0.06 cfs
10-Year Storm (3.10")	0.08 cfs	0.09 cfs

Looking at the site as a whole, the overall discharge rate of the site is reduced from existing conditions. Refer to the table below for a summary of hydrologic modeling site-wide:

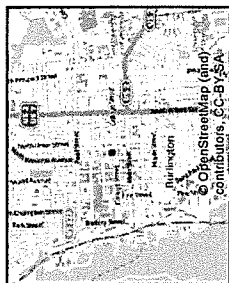
Table 2: Hydrologic Modeling Results – Overall Site

Storm Event	Existing Condition	Postdevelopment Condition
1-Year Storm (2.1")	0.44 cfs	0.30 cfs
5-Year Storm (2.82")	0.60 cfs	0.42 cfs
10-Year Storm (3.10")	0.68 cfs	0.51 cfs

Conclusions

Due to the extremely compact nature of this project site, large reductions in peak runoff are not practicable. However, maximizing the detention capabilities of the proposed building expansion result in an 32% reduction in peak flows for the 1-year storm event. Viewing the proposed building expansion as an isolated entity, its effective hydrologic performance is equal to an undeveloped meadow during small storm events (5-year storms and smaller) that account for over 90% of any given average rain event during the course of the year.

Project Location



Legend

- Project Parcel
- Manholes
- Gravity Mains
- Inlets
- Tax Parcel Boundary

Notes

Sources: Bing Aerial Photography (2012);
Project Area by TCE (2014); Manholes,
Gravity Mains and Inlets from the City of
Burlington (2014).

Disclaimer: The accuracy of information presented
is determined by its source. TCE is not responsible
for any errors or omissions. The information is for
information only and should not be used for any
inspection and/or survey by a registered surveyor.
This map is not a replacement for surveyed
information or engineering studies.

SBI - College St. Apartments
234 College St.
Burlington, VT

Subsurface Utilities Map

Project: 14-0141
Prepared By: LMJ
11/14/2014
1 inch = 100 feet





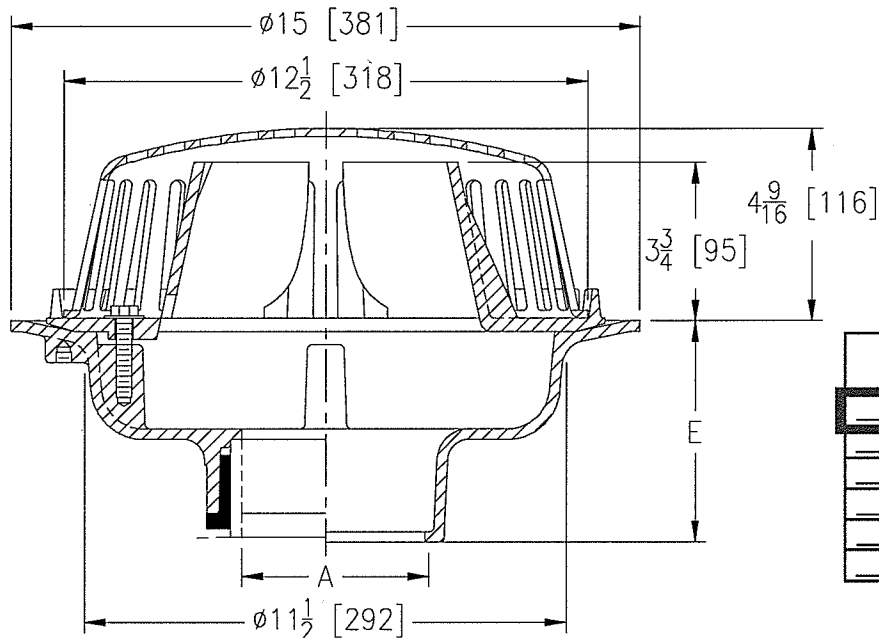
Z105

CONTROL-FLO ROOF DRAIN W/ PARABOLIC WEIR

SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Specify Number of Notches in Weir	
___-N1	One Notch
___-N2	Two Notches
___-N3	Three Notches
___-N4	Four Notches
___-N5	Five Notches
___-N6	Six Notches

A- Pipe Size In.	Approx. Wt. Lbs. [kg]	Dome Open Area Sq. In. [cm ²]
2-3-4 [51-76-102]	34 [15]	103 [665]

ENGINEERING SPECIFICATION: ZURN Z105

15 [381] Diameter Control-Flo Roof Drain for Dead-Level roof construction. Dura-Coated cast iron body, Control-Flo weir shall be linear function with integral membrane flashing clamp/gravel guard and Poly-Dome. All data shall be verified proportional to flow rates.

OPTIONS (Check/specify appropriate options)**PIPE SIZE**

2, 3, 4 [51, 76, 102]
2, 3, 4 [51, 76, 102]
2, 3, 4 [51, 76, 102]
2, 3, 4 [51, 76, 102]

(Specify size/type) OUTLET

___ IC Inside Caulk
___ IP Threaded
___ NH No-Hub
___ NL Neo-Loc

E BODY HT. DIM.

5-1/4 [133]
3-3/4 [95]
5-1/4 [133]
4-9/16 [116]

PREFIXES

___ Z D.C.C.I. Body with Poly-Dome*
___ ZA D.C.C.I. Body with Aluminum Dome
___ ZC D.C.C.I. Body with Cast Iron Dome
___ ZRB D.C.C.I. Body with Plain Bronze Dome

Note: Restrictor Plate Required to limit flow rate to 4.75 gpm/inch of head

SUFFIXES

___ -C Underdeck Clamp
___ -DE Deck Extension
___ -DP Top-Set® Deck Plate (Replaces both -C & -R)
___ -DR Top-Set® Drain Riser
___ -DX Dex-o-Tex Flange
___ -E Static Extension 1 [25] thru 4 [102] (Specify Ht.)
___ -EA Adjustable Extension Assembly 2-1/8 [54] thru 3-1/2 [89]
___ -G Galvanized Cast Iron
___ -R Roof Sump Receiver
___ -SC Secondary Clamping Collar

___ -TC Neo-Loc Test Cap Gasket (2-4 [51-102] NL Bottom Outlet Only)
___ -VP Vandal Proof Secured Top
___ -XJ Vertical Expansion Joint (See Z190)
___ -10 6 [152] High Parabolic Weir for Sloped Roof (Z or ZA)
___ -90 90° Threaded Side Outlet Body

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

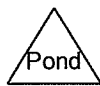
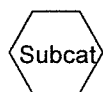
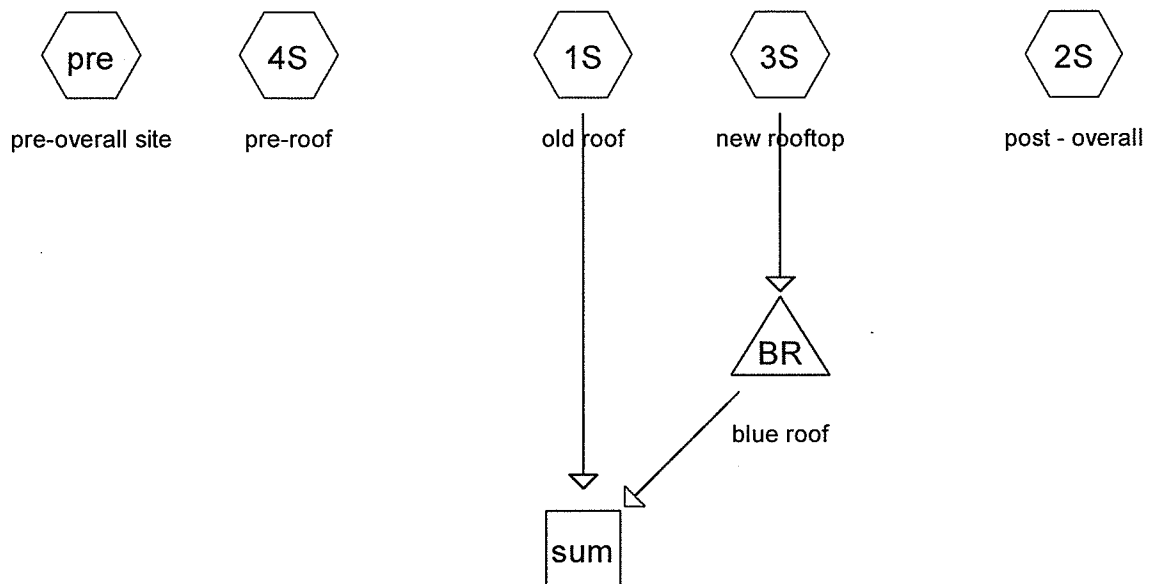
REV. H DATE: 08/17/12 C.N. NO. 1246

DWG. NO. 58816

PRODUCT NO. Z105

ZURN INDUSTRIES, LLC ♦ SPECIFICATION DRAINAGE OPERATION ♦ 1801 Pittsburgh Ave. ♦ Erie, PA 16514
Phone: 814/455-0921 ♦ Fax: 814/454-7929 ♦ World Wide Web: www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED ♦ 3544 Nashua Drive ♦ Mississauga, Ontario L4V1L2 ♦ Phone: 905/405-8272 Fax: 905/405-1292



14-141

Type II 24-hr 1-year Rainfall=2.10"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 2

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: old roof

Runoff Area=3,660 sf 100.00% Impervious Runoff Depth=1.87"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.29 cfs 0.013 af

Subcatchment 2S: post - overall

Runoff Area=5,570 sf 100.00% Impervious Runoff Depth=1.87"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.44 cfs 0.020 af

Subcatchment 3S: new rooftop

Runoff Area=1,910 sf 100.00% Impervious Runoff Depth=1.87"
Tc=0.0 min CN=98.0 Runoff=0.15 cfs 0.007 af

Subcatchment 4S: pre-roof

Runoff Area=1,910 sf 0.00% Impervious Runoff Depth=0.31"
Tc=0.0 min CN=71.0 Runoff=0.03 cfs 0.001 af

Subcatchment pre: pre-overall site

Runoff Area=5,570 sf 0.00% Impervious Runoff Depth=0.31"
Flow Length=89' Slope=0.0620 '/' Tc=6.7 min CN=71.0 Runoff=0.06 cfs 0.003 af

Reach sum:

Inflow=0.30 cfs 0.020 af
Outflow=0.30 cfs 0.020 af

Pond BR: blue roof

Peak Elev=137.33' Storage=156 cf Inflow=0.15 cfs 0.007 af
Primary=0.01 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Total Runoff Area = 0.427 ac Runoff Volume = 0.044 af Average Runoff Depth = 1.24"
40.17% Pervious = 0.172 ac 59.83% Impervious = 0.256 ac

Summary for Subcatchment 1S: old roof

remainder of project site

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.29 cfs @ 11.91 hrs, Volume= 0.013 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
Type II 24-hr 1-year Rainfall=2.10"

Area (sf)	CN	Description
3,660	98.0	Paved parking, HSG C
3,660		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.30"

Summary for Subcatchment 2S: post - overall[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.44 cfs @ 11.91 hrs, Volume= 0.020 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
Type II 24-hr 1-year Rainfall=2.10"

Area (sf)	CN	Description
5,570	98.0	Paved parking, HSG C
5,570		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.30"

Summary for Subcatchment 3S: new rooftop[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
Type II 24-hr 1-year Rainfall=2.10"

Area (sf)	CN	Description
1,910	98.0	Paved parking, HSG C
1,910		100.00% Impervious Area

Summary for Subcatchment 4S: pre-roof

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-year Rainfall=2.10"

Area (sf)	CN	Description
1,910	71.0	Meadow, non-grazed, HSG C
1,910		100.00% Pervious Area

Summary for Subcatchment pre: pre-overall site

Runoff = 0.06 cfs @ 12.00 hrs, Volume= 0.003 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-year Rainfall=2.10"

Area (sf)	CN	Description
5,570	71.0	Meadow, non-grazed, HSG C
5,570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	89	0.0620	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 2.30"

Summary for Reach sum:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.128 ac, 100.00% Impervious, Inflow Depth = 1.87" for 1-year event

Inflow = 0.30 cfs @ 11.91 hrs, Volume= 0.020 af

Outflow = 0.30 cfs @ 11.91 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond BR: blue roof

zurn drain uses 1 notch internal weir & restrictor plate. From mfr, 1" head = 475 gpm discharge

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 1.87" for 1-year event

Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af

Outflow = 0.01 cfs @ 12.31 hrs, Volume= 0.007 af, Atten= 92%, Lag= 24.6 min

Primary = 0.01 cfs @ 12.31 hrs, Volume= 0.007 af

Secondary = 0.00 cfs @ 12.31 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 137.33' @ 12.31 hrs Surf.Area= 1,910 sf Storage= 156 cf

Flood Elev= 138.25' Surf.Area= 1,910 sf Storage= 1,910 cf

Plug-Flow detention time= 231.0 min calculated for 0.007 af (100% of inflow)

Center-of-Mass det. time= 230.9 min (987.9 - 756.9)

14-141

Type II 24-hr 1-year Rainfall=2.10"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 5

Volume	Invert	Avail.Storage	Storage Description
#1	137.25'	1,910 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.25	1,910	0	0
138.25	1,910	1,910	1,910

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	8.0" Horiz. discharge pipe C= 0.600 Limited to weir flow at low heads
#2	Device 1	137.25'	Zurn Z105 drain Head (feet) 0.00 0.08 0.17 0.25 0.33 0.42 0.50 Disch. (cfs) 0.000 0.011 0.021 0.032 0.042 0.053 0.064
#3	Secondary	137.33'	1.0' long x 0.50' rise overflow scuppers X 4.00 Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.01 cfs @ 12.31 hrs HW=137.33' TW=0.00' (Dynamic Tailwater)

└─1=discharge pipe (Passes 0.01 cfs of 0.16 cfs potential flow)

└─2=Zurn Z105 drain (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.31 hrs HW=137.33' TW=0.00' (Dynamic Tailwater)

└─3=overflow scuppers (Weir Controls 0.00 cfs @ 0.13 fps)

14-141

Type II 24-hr 5-year Rainfall=2.82"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 6

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: old roof

Runoff Area=3,660 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.39 cfs 0.018 af

Subcatchment 2S: post - overall

Runoff Area=5,570 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.60 cfs 0.028 af

Subcatchment 3S: new rooftop

Runoff Area=1,910 sf 100.00% Impervious Runoff Depth=2.59"
Tc=0.0 min CN=98.0 Runoff=0.21 cfs 0.009 af

Subcatchment 4S: pre-roof

Runoff Area=1,910 sf 0.00% Impervious Runoff Depth=0.66"
Tc=0.0 min CN=71.0 Runoff=0.06 cfs 0.002 af

Subcatchment pre: pre-overall site

Runoff Area=5,570 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=89' Slope=0.0620 '/' Tc=6.7 min CN=71.0 Runoff=0.14 cfs 0.007 af

Reach sum:

Inflow=0.42 cfs 0.028 af
Outflow=0.42 cfs 0.028 af

Pond BR: blue roof

Peak Elev=137.35' Storage=197 cf Inflow=0.21 cfs 0.009 af
Primary=0.01 cfs 0.008 af Secondary=0.05 cfs 0.001 af Outflow=0.06 cfs 0.009 af

Total Runoff Area = 0.427 ac Runoff Volume = 0.065 af Average Runoff Depth = 1.81"
40.17% Pervious = 0.172 ac 59.83% Impervious = 0.256 ac

14-141

Prepared by Trudell Consulting Engineers
 HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Type II 24-hr 5-year Rainfall=2.82"

Printed 11/17/2014

Page 7

Summary for Subcatchment 1S: old roof

remainder of project site

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.39 cfs @ 11.91 hrs, Volume= 0.018 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 5-year Rainfall=2.82"

Area (sf)	CN	Description
3,660	98.0	Paved parking, HSG C
3,660		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.30"

Summary for Subcatchment 2S: post - overall

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.60 cfs @ 11.91 hrs, Volume= 0.028 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 5-year Rainfall=2.82"

Area (sf)	CN	Description
5,570	98.0	Paved parking, HSG C
5,570		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.30"

Summary for Subcatchment 3S: new rooftop

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

Runoff = 0.21 cfs @ 11.90 hrs, Volume= 0.009 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 5-year Rainfall=2.82"

Area (sf)	CN	Description
1,910	98.0	Paved parking, HSG C
1,910		100.00% Impervious Area

14-141

Type II 24-hr 5-year Rainfall=2.82"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 8

Summary for Subcatchment 4S: pre-roof

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.06 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-year Rainfall=2.82"

Area (sf)	CN	Description
1,910	71.0	Meadow, non-grazed, HSG C
1,910		100.00% Pervious Area

Summary for Subcatchment pre: pre-overall site

Runoff = 0.14 cfs @ 11.99 hrs, Volume= 0.007 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-year Rainfall=2.82"

Area (sf)	CN	Description
5,570	71.0	Meadow, non-grazed, HSG C
5,570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	89	0.0620	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 2.30"

Summary for Reach sum:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.128 ac, 100.00% Impervious, Inflow Depth = 2.59" for 5-year event
Inflow = 0.42 cfs @ 11.91 hrs, Volume= 0.028 af
Outflow = 0.42 cfs @ 11.91 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond BR: blue roof

zurn drain uses 1 notch internal weir & restrictor plate. From mfr, 1" head = 475 gpm discharge

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 2.59" for 5-year event
Inflow = 0.21 cfs @ 11.90 hrs, Volume= 0.009 af
Outflow = 0.06 cfs @ 11.98 hrs, Volume= 0.009 af, Atten= 71%, Lag= 5.0 min
Primary = 0.01 cfs @ 11.98 hrs, Volume= 0.008 af
Secondary = 0.05 cfs @ 11.98 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 137.35' @ 11.98 hrs Surf.Area= 1,910 sf Storage= 197 cf
Flood Elev= 138.25' Surf.Area= 1,910 sf Storage= 1,910 cf

Plug-Flow detention time= 199.2 min calculated for 0.009 af (100% of inflow)
Center-of-Mass det. time= 199.2 min (948.9 - 749.7)

14-141

Type II 24-hr 5-year Rainfall=2.82"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 9

Volume	Invert	Avail.Storage	Storage Description
#1	137.25'	1,910 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.25	1,910	0	0
138.25	1,910	1,910	1,910

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	8.0" Horiz. discharge pipe C= 0.600 Limited to weir flow at low heads
#2	Device 1	137.25'	Zurn Z105 drain Head (feet) 0.00 0.08 0.17 0.25 0.33 0.42 0.50 Disch. (cfs) 0.000 0.011 0.021 0.032 0.042 0.053 0.064
#3	Secondary	137.33'	1.0' long x 0.50' rise overflow scuppers X 4.00 Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.01 cfs @ 11.98 hrs HW=137.35' TW=0.00' (Dynamic Tailwater)└─**1=discharge pipe** (Passes 0.01 cfs of 0.23 cfs potential flow)└─**2=Zurn Z105 drain** (Custom Controls 0.01 cfs)**Secondary OutFlow** Max=0.05 cfs @ 11.98 hrs HW=137.35' TW=0.00' (Dynamic Tailwater)└─**3=overflow scuppers** (Weir Controls 0.05 cfs @ 0.50 fps)

14-141

Type II 24-hr 10-year Rainfall=3.20"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 10

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: old roof

Runoff Area=3,660 sf 100.00% Impervious Runoff Depth=2.97"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.45 cfs 0.021 af

Subcatchment 2S: post - overall

Runoff Area=5,570 sf 100.00% Impervious Runoff Depth=2.97"
Flow Length=89' Slope=0.0620 '/' Tc=0.8 min CN=98.0 Runoff=0.68 cfs 0.032 af

Subcatchment 3S: new rooftop

Runoff Area=1,910 sf 100.00% Impervious Runoff Depth=2.97"
Tc=0.0 min CN=98.0 Runoff=0.24 cfs 0.011 af

Subcatchment 4S: pre-roof

Runoff Area=1,910 sf 0.00% Impervious Runoff Depth=0.88"
Tc=0.0 min CN=71.0 Runoff=0.08 cfs 0.003 af

Subcatchment pre: pre-overall site

Runoff Area=5,570 sf 0.00% Impervious Runoff Depth=0.88"
Flow Length=89' Slope=0.0620 '/' Tc=6.7 min CN=71.0 Runoff=0.19 cfs 0.009 af

Reach sum:

Inflow=0.51 cfs 0.032 af
Outflow=0.51 cfs 0.032 af

Pond BR: blue roof

Peak Elev=137.36' Storage=215 cf Inflow=0.24 cfs 0.011 af
Primary=0.01 cfs 0.009 af Secondary=0.08 cfs 0.002 af Outflow=0.09 cfs 0.011 af

Total Runoff Area = 0.427 ac Runoff Volume = 0.076 af Average Runoff Depth = 2.13"
40.17% Pervious = 0.172 ac 59.83% Impervious = 0.256 ac

14-141

Prepared by Trudell Consulting Engineers
 HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Type II 24-hr 10-year Rainfall=3.20"

Printed 11/17/2014

Page 11

Summary for Subcatchment 1S: old roof

remainder of project site

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.45 cfs @ 11.91 hrs, Volume= 0.021 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 10-year Rainfall=3.20"

Area (sf)	CN	Description
3,660	98.0	Paved parking, HSG C
3,660		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n=0.011 P2= 2.30"

Summary for Subcatchment 2S: post - overall

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.68 cfs @ 11.91 hrs, Volume= 0.032 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 10-year Rainfall=3.20"

Area (sf)	CN	Description
5,570	98.0	Paved parking, HSG C
5,570		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0620	1.79		Sheet Flow, Smooth surfaces n=0.011 P2= 2.30"

Summary for Subcatchment 3S: new rooftop

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.01$ hrs
 Type II 24-hr 10-year Rainfall=3.20"

Area (sf)	CN	Description
1,910	98.0	Paved parking, HSG C
1,910		100.00% Impervious Area

14-141

Prepared by Trudell Consulting Engineers
HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Type II 24-hr 10-year Rainfall=3.20"

Printed 11/17/2014

Page 12

Summary for Subcatchment 4S: pre-roof

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.08 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-year Rainfall=3.20"

Area (sf)	CN	Description
1,910	71.0	Meadow, non-grazed, HSG C
1,910		100.00% Pervious Area

Summary for Subcatchment pre: pre-overall site

Runoff = 0.19 cfs @ 11.99 hrs, Volume= 0.009 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-year Rainfall=3.20"

Area (sf)	CN	Description
5,570	71.0	Meadow, non-grazed, HSG C
5,570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	89	0.0620	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 2.30"

Summary for Reach sum:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.128 ac, 100.00% Impervious, Inflow Depth = 2.97" for 10-year event

Inflow = 0.51 cfs @ 11.91 hrs, Volume= 0.032 af

Outflow = 0.51 cfs @ 11.91 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond BR: blue roof

urn drain uses 1 notch internal weir & restrictor plate. From mfr, 1" head = 475 gpm discharge

Inflow Area =	0.044 ac, 100.00% Impervious, Inflow Depth = 2.97" for 10-year event
Inflow =	0.24 cfs @ 11.90 hrs, Volume= 0.011 af
Outflow =	0.09 cfs @ 11.97 hrs, Volume= 0.011 af, Atten= 61%, Lag= 4.3 min
Primary =	0.01 cfs @ 11.97 hrs, Volume= 0.009 af
Secondary =	0.08 cfs @ 11.97 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 137.36' @ 11.97 hrs Surf.Area= 1,910 sf Storage= 215 cf

Flood Elev= 138.25' Surf.Area= 1,910 sf Storage= 1,910 cf

Plug-Flow detention time= 186.2 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 186.4 min (933.4 - 746.9)

14-141

Type II 24-hr 10-year Rainfall=3.20"

Prepared by Trudell Consulting Engineers

Printed 11/17/2014

HydroCAD® 10.00-12 s/n 02145 © 2014 HydroCAD Software Solutions LLC

Page 13

Volume	Invert	Avail.Storage	Storage Description
#1	137.25'	1,910 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.25	1,910	0	0
138.25	1,910	1,910	1,910

Device	Routing	Invert	Outlet Devices
#1	Primary	137.25'	8.0" Horiz. discharge pipe C= 0.600 Limited to weir flow at low heads
#2	Device 1	137.25'	Zurn Z105 drain Head (feet) 0.00 0.08 0.17 0.25 0.33 0.42 0.50 Disch. (cfs) 0.000 0.011 0.021 0.032 0.042 0.053 0.064
#3	Secondary	137.33'	1.0' long x 0.50' rise overflow scuppers X 4.00 Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.01 cfs @ 11.97 hrs HW=137.36' TW=0.00' (Dynamic Tailwater)

└─1=discharge pipe (Passes 0.01 cfs of 0.26 cfs potential flow)

└─2=Zurn Z105 drain (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.08 cfs @ 11.97 hrs HW=137.36' TW=0.00' (Dynamic Tailwater)

└─3=overflow scuppers (Weir Controls 0.08 cfs @ 0.59 fps)



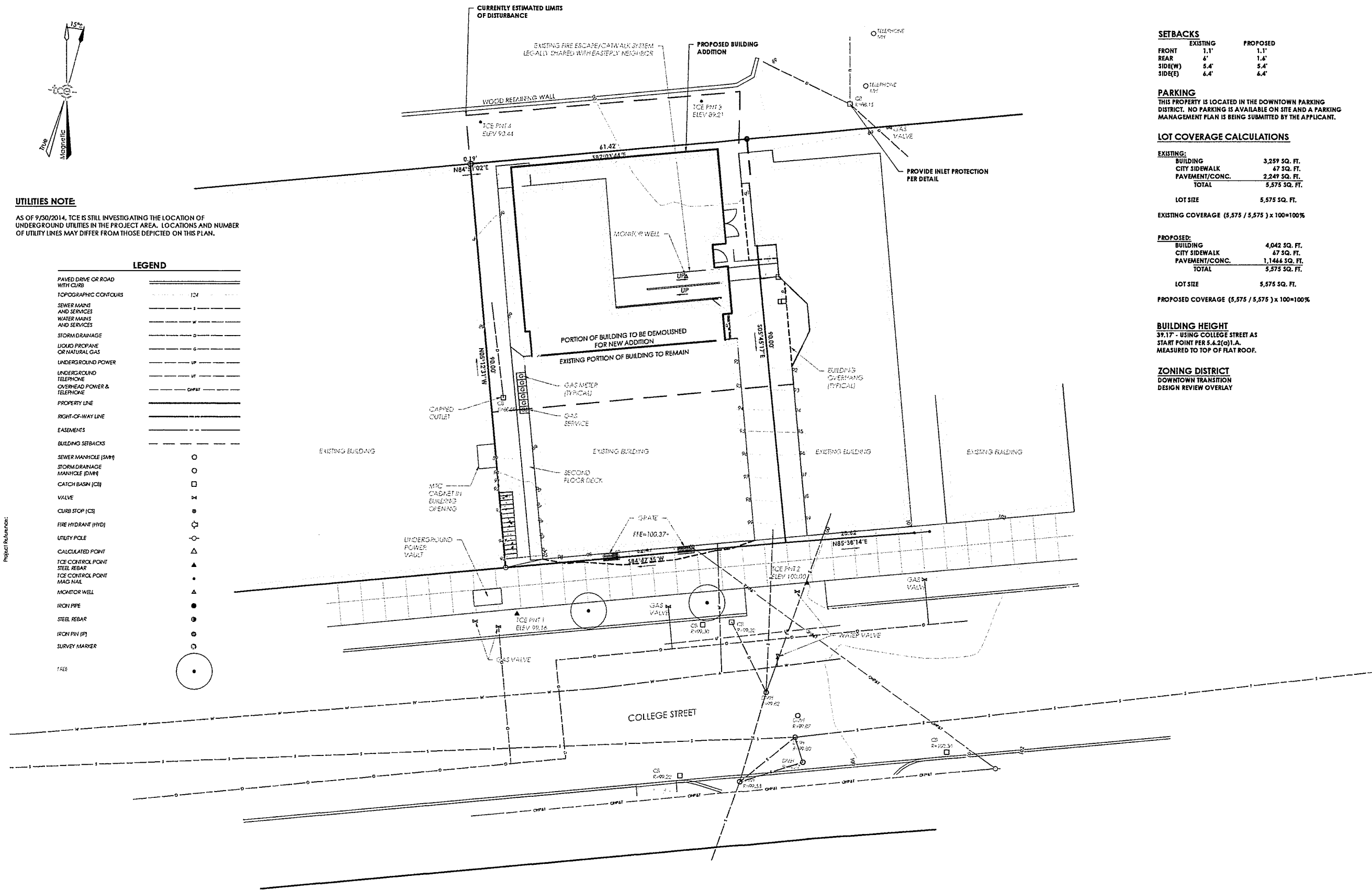
UTILITIES NOTE

AS OF 9/30/2014, TCE IS STILL INVESTIGATING THE LOCATION OF UNDERGROUND UTILITIES IN THE PROJECT AREA. LOCATIONS AND NUMBER OF UTILITY LINES MAY DIFFER FROM THOSE DEPICTED ON THIS PLAN.

LEGEND

PAVED DRIVE OR ROAD WITH CURB	=====
TOPOGRAPHIC CONTOURS	----- 124 -----
SEWER MAINS AND SERVICES	----- S -----
WATER MAINS AND SERVICES	----- W -----
STORM DRAINAGE	----- D -----
LIQUID PROPANE OR NATURAL GAS	----- G -----
UNDERGROUND POWER	----- U -----
UNDERGROUND TELEPHONE	----- T -----
OVERHEAD POWER & TELEPHONE	----- O/PAT -----
PROPERTY LINE	=====
RIGHT-OF-WAY LINE	=====
EASEMENTS	-----
BUILDING SETBACKS	-----
SEWER MANHOLE (SMH)	○
STORM DRAINAGE MANHOLE (DMH)	□
CATCH BASIN (CB)	⊗
VALVE	⊕
CURB STOP (CS)	⊙
FIRE HYDRANT (HYD)	⊕
UTILITY POLE	⊙
CALCULATED POINT	△
TCE CONTROL POINT	▲
STEEL REBAR	●
TCE CONTROL POINT	▲
MAG. NAIL	•
MONITOR WELL	⊙
IRON PIPE	⊙
STEEL REBAR	●
IRON PIN (IP)	⊙
SURVEY MARKER	⊙
TSEE	•

Project Reference:



SETBACKS

	EXISTING	PROPOSED
FRONT	1.1'	1.1'
REAR	4'	1.4'
SIDE(W)	5.4'	5.4'
SIDE(E)	6.4'	6.4'

PARKING

THIS PROPERTY IS LOCATED IN THE DOWNTOWN PARKING DISTRICT. NO PARKING IS AVAILABLE ON SITE AND A PARKING MANAGEMENT PLAN IS BEING SUBMITTED BY THE APPLICANT.

LOT COVERAGE CALCULATIONS

EXISTING:	
BUILDING	3,259 SQ. FT.
CITY SIDEWALK	67 SQ. FT.
PAVEMENT/CONC.	2,249 SQ. FT.
TOTAL	5,575 SQ. FT.

LOT SIZE 5,575 SQ. FT.

EXISTING COVERAGE (5,575 / 5,575) x 100=100%

PROPOSED:	
BUILDING	4,042 SQ. FT.
CITY SIDEWALK	67 SQ. FT.
PAVEMENT/CONC.	1,146 SQ. FT.
TOTAL	5,575 SQ. FT.

LOT SIZE 5,575 SQ. FT.

PROPOSED COVERAGE (5,575 / 5,575) x 100=100%

BUILDING HEIGHT

39.17' - USING COLLEGE STREET AS START POINT PER 5.6.2(a)1.A. MEASURED TO TOP OF FLAT ROOF.

ZONING DISTRICT

DOWNTOWN TRANSITION DESIGN REVIEW OVERLAY



TRUDELL CONSULTING ENGINEERS
418 BLAIR PARK ROAD | WILKISTON, VERMONT 05491
802.879.6321 | WWW.TCEVT.COM

Revisions
No. Description Date

Use of these Drawings
1. Unless otherwise noted, these Drawings are intended for preliminary planning, coordination with other disciplines, and/or approval from the regulatory authorities. They are not intended as construction drawings unless as such.

2. Only drawings specifically marked "For Construction" are intended to be used in conjunction with contract documents, specifications, owner/contractor agreements, and to be fully coordinated with other disciplines, including but not limited to, the Architect, if applicable. These Drawings shall not be used for construction layout. Contact TCE for any construction surveying services or to obtain electronic data suitable for construction layout.

3. These Drawings are specific to the Project and are not transferable. As instruments of service, these drawings, copies thereof, furnished by TCE are its exclusive property. Changes to the drawings may only be made by TCE. Errors or omissions are discovered, they shall be brought to the attention of TCE immediately.

4. By use of these drawings for construction of the Project, the Owner represents that they have reviewed, approved, and accepted the drawings and have met with all applicable parties/disciplines to ensure these plans are properly coordinated with other aspects of the Project. Owner and Architect are responsible for any buildings shown, including on area measured a minimum five (5) feet around any building.

5. It is the User's responsibility to ensure this copy contains most current revisions.

For Permitting Only

Project Title

Sisters & Brothers Group, LLP

234-240 College Street
Burlington Vermont

Sheet Title

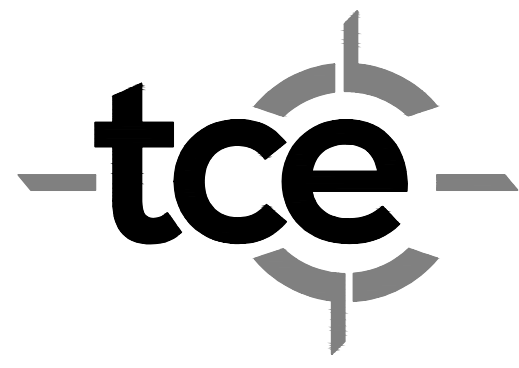
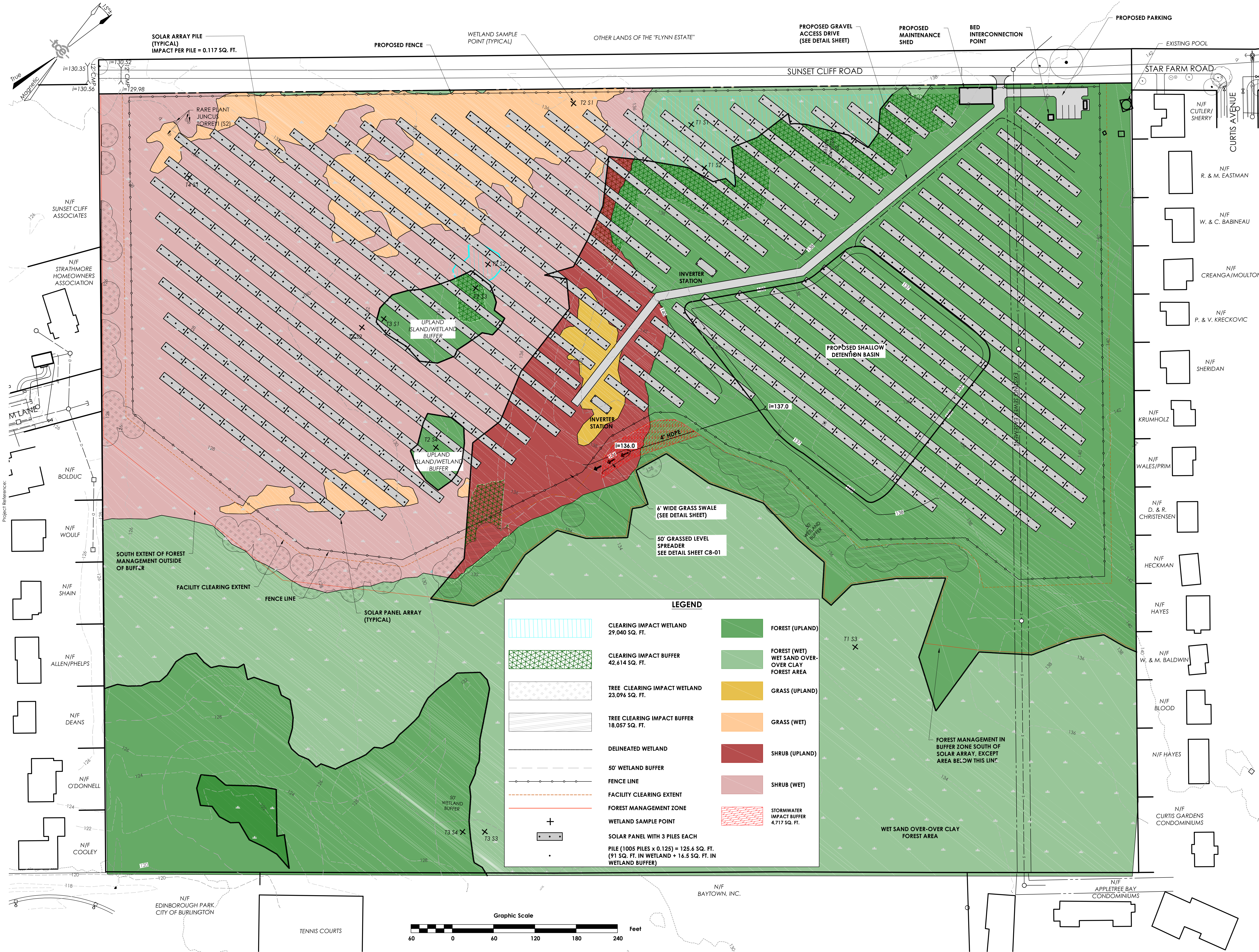
Proposed Site Plan

Date: 9/30/2014
Scale: 1"= 10'
Project Number: 14-141
Drawn By: AGM
Project Engineer: AGM
Approved By: _____
Field Book: 290

Graphic Scale



C2-01

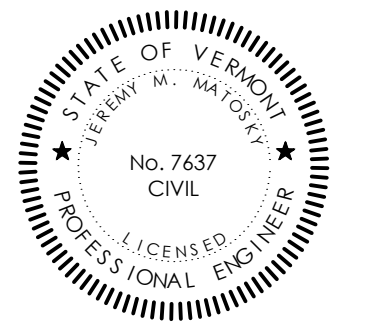


TRUDELL CONSULTING ENGINEERS
478 BLAIR PARK ROAD | WILLISTON, VERMONT 05495
802.879.4331 | WWW.TCEVT.COM

Revisions	No.	Description	Date	By
1.	Update Wetland, Wetland Buffer & Impacts	04/24/14	KED	
2.	Add Vegetation Cover Type as per Laura Lapierre	07/23/14	KED	
3.	Add Tree Impact to Wetland and Buffer	09/05/14	KED	

WETLAND NOTE:
THE WETLAND DELINEATION SHOWN ON THIS PLAN WAS PERFORMED IN NOVEMBER 2012, AND RECONFIRMED APRIL 2014, ACCORDING TO STANDARDS OF THE 1987 US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE NORTHEAST REGIONAL SUPPLEMENT. THIS DELINEATION WAS PERFORMED BY KARINA DAILEY OF TRUDELL CONSULTING ENGINEERS AND APRIL MOULAERT OF EMR2 CONSULTING.

- Use of These Drawings
1. Unless otherwise noted, these Drawings are intended for preliminary planning, coordination with other disciplines or utilities, and/or approval from the regulatory authorities. They are not intended as construction drawings unless noted as such.
 2. Only drawings specifically marked "For Construction" are intended to be used in conjunction with contract documents, specifications, owner/contractor agreements and to be fully coordinated with other disciplines, including but not limited to, the Architect, if applicable. These Drawings shall not be used for construction layout. Contact TCE for any construction surveying services or to obtain electronic data suitable for construction layout.
 3. These Drawings are specific to the Project and are not transferable. As instruments of service, these drawings, and copies thereof, furnished by TCE are its exclusive property. Changes to the drawings may only be made by TCE. If errors or omissions are discovered, they shall be brought to the attention of TCE immediately.
 4. By use of these drawings for construction of the Project, the Owner represents that they have reviewed, approved, and accepted the drawings and have met with all applicable parties/disciplines to insure these plans are properly coordinated with other aspects of the Project. The Owner and Architect, are responsible for any buildings shown, including an area measured a minimum five (5) feet around any building.
 5. It is the User's responsibility to ensure this copy contains the most current revisions.



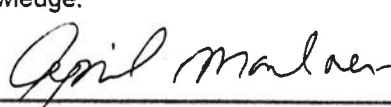
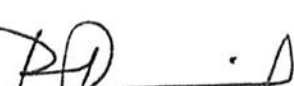
Project Title
**South Forty Solar Farm
Sunset Cliff Road
Burlington, Vermont**

Sheet Title
**Wetland Impact
Plan**

Date:	04/01/2014
Scale:	1" = 60'
Project Number:	13-113
Drawn By:	RMP
Project Engineer:	JMM
Approved By:	
Field Book:	

C10-01

Vermont Wetland Permit Application/Determination Petition

QUESTION	INSTRUCTIONS AND APPLICANT ANSWER	STAFF NOTE
1. Applicant	If the applicant is someone other than the landowner, the landowner information must also be included below.	
1.1. Applicant Name	Keystone Development Corporation c/o Frank von Turkovich	
1.2. Applicant Address	300 Swift Street, South Burlington, VT 05403	
1.3. Applicant Phone Number	802-578-2536	
1.4. Applicant Email	fventurkovich@fvtlaw.com	
1.5. Applicant Signature (original signature required)	By signing this application you are certifying that all the information contained within is true, accurate, and complete to the best of your knowledge. x  Date: 10/20/14	
2. Representative	Consultant, engineer, or other representative that is responsible for filling out this application, if other than the applicant or landowner	
2.1. Representative Name	April Moulaert, PWS	
2.2. Representative Address	36 Westminster Drive Burlington, VT 05408	
2.3. Representative Phone Number	802-999-9905	
2.4. Applicant Email	april.moulaert@gmail.com	
2.5. Representative Signature (original signature required)	By signing this application you are certifying that all the information contained within is true, accurate, and complete to the best of your knowledge. x  Date: 10/20/14	
3. Landowner	Landowner must sign the application. Use this space if landowner is different from the applicant	
3.1. Landowner Name	The Applicant has a long-term lease on the land.	
3.2. Landowner Address		
3.3. Landowner Phone Number		
3.4. Landowner Email		
3.5. Landowner Easement	Attach copies of any easements, agreements or other documents conveying permission, and agreement with the landowner stating who will be responsible for meeting the terms and conditions of the permit. List the attachment for this information in this section. The landowner has a long-term lease on the land with rights to obtain permits.	
3.6. Landowner Signature (original signature required)	By signing this application you are certifying that all the information contained within is true, accurate, and complete to the best of your knowledge. x  Date: 10/20/14	
4. Location of Wetland and Project	Location description should include the road the wetland is located on, the compass direction of the wetland in relation to the road, 911 street address if available, and any other distinguishing geographic features.	

	This wetland is located on the south side of Sunset Cliff Road in the New North End of Burlington, Vermont. A location map is attached to this application.		
5. Site Visit Date and Attendees	Date of visit with District Wetlands Ecologist	List people present for site visits including Ecologist, landowner, and representatives.	
	There were several site visits including 11/28/12, and 5/2/2014.	2012 visit - Alan Quackenbush, April Moulaert, and Karina Dailey. 2014 visit – April, Karina, Frank, and Laura Lapierre	
6. Wetland Classification	The wetland is a Class II wetland because (Choose one): The wetland meets the presumption of significance		
7. Description of Entire Wetland or Wetland Complex	Answer the following questions regarding the entire wetland or wetland complex. A wetland complex is generally defined as two or more wetland types that are contiguous and interrelated. Specific questions about the wetland in the project area will follow.		
7.1. Size of Wetland Complex in Acres	Can be obtained from the Environmental Interest Locator Map for mapped wetlands The wetland complex is approximately 22 acres.		
7.2. Natural Community Types Present	List all wetland types in the wetland or wetland complex and their abundance or relative abundance. For example: 50 acres of softwood forested swamp; or 30% scrub swamp, 70% emergent wetland The wetland complex includes approximately 13 acres of forested wetland, 3 acres of wet meadow, and 6 acres of scrub shrub wetland.		
7.3. Landscape Position	Where is the wetland located on the landscape? Examples: bottom of a basin, edge of a stream, shore of a lake, etc. This wetland is an isolated wetland. It is not associated with a perennial watercourse.		
7.4. Wetland Hydrology	Describe the main source of wetland hydrology for the wetland complex. List any river, streams, lakes and ponds. There are no rivers, streams, lakes or ponds on this site. The main source of hydrology for the complex appears to be a combination of a high water table and precipitation. Include answers to the following where appropriate:		
7.4.1. Direction of flow	For example: stream flows from north to south through the wetland complex. N/A		
7.4.2. Influence of hydrology on wetland complex	For example: The river provides flood water to the wetland in the spring. N/A		
7.4.3. Relation to the project area	Distance between the project area and any nearby surface waters. There is a stream approximately 1,400 feet away from the southern boundary of the site. Lake Champlain is approximately 850 feet away from the southeast boundary of the site.		
7.4.4. Hydroperiod	Discuss frequency and duration of flooding, ponding, and/or soil saturation. The soils on this site mainly have a high water table and/ or standing water in the fall and the spring and after rain events.		
7.5. Surrounding Landuse of the Wetland Complex	For example: rural residential and forested; agricultural and undeveloped, The wetland complex is surrounded by dense residential development, with some small isolated patches of forest.		
7.6. Relation to Other Nearby Wetlands	Provide any information on wetlands or wetland complexes that are close enough to contribute to the overall function of the wetland in question. N/A		
7.7. Pre-project Cumulative Impacts to the Wetland	Identify any cumulative ongoing impacts outside of the project that may influence the wetland. Examples include but are not limited to wetland encroachments off the subject property, land management in or surrounding the wetland, or development that influences hydrology or water quality.		

		This property has an agricultural history. The wetland complex is located in the City of Burlington and is surrounded by dense residential development. Several informal walking trails run through this property and are generally used for dog walking.	
8. Description of Subject Wetland		Subject Wetland is defined as the area of wetland in the project area, but not limited to the portion of the wetland to be directly impacted by the project. For the purposes of this application, the subject wetland should encompass any portion of the larger wetland or wetland complex that could be directly or indirectly impacted by the project, as defined by hydrology, vegetation and/or physical characteristics.	
8.1. Context of Subject Wetland		Describe where the subject wetland is in the context of the larger wetland or wetland complex described above. Since the majority of the wetland complex is located on the project site, the subject wetland is the same as the wetland complex.	
8.2. Wetland Landuse		For example: mowed lawn; old field; naturally vegetated. Describe any previous and ongoing disturbance in the subject wetland. Historically, like much of Vermont, the project site used to be in agricultural use. In recent years the wooded areas on the property have been left intact. The field along Sunset Cliff Road has been mowed and/or brush hogged periodically.	
8.3. Wetland Vegetation		List dominant wetland community type and associated dominant plant species. The dominant wetland community type on the property would be the forested wetland. Typical species in the forested wetland include red maple (<i>Acer rubrum</i>), American elm (<i>Ulmus americana</i>), buckthorn (<i>Rhamnus cathartica</i>) and skunk cabbage (<i>Symplocarpus foetidus</i>).	
8.4. Wetland Soils		Use USDA NRCS information where possible and use the ACOE Delineation Manual soil description The NRCS Soil Survey has mapped a few different soil series in the wetland on the site. The wetland soils on this site are a mix of Au Gres sand-over-clay soils and Covington clays. Both have a restricting layer of clay that reduces the rate of water infiltration through the soil. Hydric soil indicators include a depleted soil matrix, sandy redox, and iron-manganese masses.	
8.5. Wetland Hydrology		Use descriptions from the ACOE Delineation Manual. The wetland hydrologic indicators include soil saturation, high water table, surface water, and oxidized rhizospheres found within the upper 12 inches of the soil profile.	
8.6. Buffer Zone		Describe the buffer zone of the subject wetland including:	
8.6.1. General landuse		For example: mowed road shoulder; forested; old field; paved road and residential lawns etc. Describe any previous and ongoing disturbance in the buffer zone. Land uses in the buffer zone include a road and woods.	
8.6.2. Buffer vegetation		List community type and dominant plant species The buffer zone in the upland forest on this site is dominated by white pine (<i>Pinus strobus</i>) and red maple (<i>Acer rubrum</i>).	
8.6.3. Buffer soils		Use USDA NRCS information where possible, and the ACOE Delineation Manual soil description The soils in the majority of the buffer zone are mapped by NRCS as Au Gres sandy loams. This soil series consists of very deep, somewhat poorly drained sandy soils.	

9. Wetland Determination		If the application involves a wetland determination please answer the following. If not, skip to Section 10.	
9.1.	Reason for Petition	Please choose one from the dropdown menu: Add a Section 4.6 presumed wetland to the VSWI map	
9.2.	Previous	Please list all determinations and decisions, if any, issued by the Secretary, Panel or former Water Resources Board, pertaining to the wetland or buffer at issue:	

	Decisions		
9.3.	Narrative	Please provide any narrative to support the petition for a wetland determination here. This section is not required for petitions to add a Section 4.6 presumed wetland to the VSWI map, but is required for all other petitions.	
If the application is only for a Wetland Determination only, skip to Section 13			

10. Project Description		
10.1. Overall Project	Description of the project. For example: six-lot residential subdivision; expansion of an existing commercial building, access drive to a single family residence. The overall project is the installation and operation of a 2.5 megawatt (MW) (AC) solar array.	
10.2. Project Purpose	For example: To construct a residential subdivision, upgrade existing road to improve access, extend a trail system The purpose of this project is to build a solar array with a 2.5 MW capacity.	
10.3. Acres Owned by Applicant	Acreage of subject property. 40 acres.	
10.4. Acres Involved in the Project	Acreage of area involved in the project. Approximately 22 acres.	
11. Project Details	Provide details regarding specific impacts to the wetland and buffer zone	
11.1. Specific Impacts to Wetland and Buffer Zone	List portions of the project that will specifically impact the wetland or buffer zone. The project is a 2.5 MW (AC) solar array that will be connected to Burlington Electric's distribution system. The current design consists of an 18 acre +/- solar field located on the 40 acre +/- property. The solar array will consist of approximately eleven thousand 300-watt (+/-) PV modules mounted on fixed support structures. The array support structures will use driven steel foundation piles and hold the solar panels at a fixed 30 degree tilt angle, facing true solar south. The use of driven piles will minimize soil and vegetation disturbance. The support structures will be designed to hold the bottom of the solar panels at approximately 48" above existing grade so that ground snow accumulation in winter does not affect solar generation. The height of the arrays will be approximately 11' above grade. Arrays will be placed in east-west rows set a sufficient distance apart (approximately 35 ft) to minimize self-shading. The direct current solar power will be converted to alternating current (15 kVA nominal) by inverters at two locations within the solar field. Inverter design includes five Advanced Energy AE-500NX (500 kW) inverters. Inverters and medium voltage transformers will be housed in two prefabricated enclosures (1.5MW and 1MW). The solar array area will be located on the northern portion of the property which consists of a mix of open field, scrub shrub vegetation, and upland forest. This area will be cleared of trees and shrubs to allow optimal solar generation. The cleared area will be surrounded by a wire mesh fence (approximately 7' high) to meet National Electric Code (NEC) requirements. The project will be accessed off of Sunset Cliff Road by way of a single 12' wide gravel access road through the solar array area (in the upland only) to provide access to the two inverter/transformer enclosures (which will also be	

	located in the upland). To avoid and minimize impacts on the Class Two wetland, the project has been designed as follows: • Solar array support structures and inverter enclosure foundations will be pile driven steel to eliminate the need for concrete footings and foundation excavation. • Electrical conduit will be run above grade in the wetland and its buffer zone. • With the exception of the stormwater outlet within the wetland buffer, no earth moving, grading or excavation will take place within the wetland or its buffer zone. • The rare wetland natural community, described in Section 20, of this application, will not be impacted by the proposed project. Select tree and shrub clearing will occur on portions of the parcel to avoid overshadowing of the solar panels and allow proper maintenance of the facility. Clearing will follow a Vegetation Management Plan that has been submitted to the Agency (see attachment). Impacts consist of vegetation clearing as depicted on the attached Wetland Impact Plan (C10-01) and a small amount of impact as a result of the driven solar array supports.									
11.2.Dimension Details	Square footage of buildings, dimension of roads including fill footprint. 1005 piles at 0.125sf per pile.									
11.3.Bridges and Culverts	Culvert circumference, length, placement and shapes, or bridge details. N/A									
11.4.Construction Sequence	Describe any details pertaining to the worked planned in the wetland and buffer in terms of sequence or phasing that is relevant The first step in construction will be to stake out and clearly demarcate the project boundary. The next step will be the installation of erosion and sediment controls. Vegetation cutting will then occur. Once the areas are cleared the panels will be installed on the site. Fencing will be installed around the perimeter of the solar array once construction is completed.									
11.5.Stormwater Design	List any stormwater permits obtained or applied for. Describe any stormwater and/or erosion controls proposed to prevent discharges to the wetland and buffer zone. An operational stormwater permit (General Permit 3-9015) is not required for the project since the total amount of impervious surface proposed is under the jurisdictional threshold of one acre. A Construction General Permit (General Permit 3-9020) will be obtained as more than one acre of disturbed earth is anticipated for the site. During construction, stormwater Best Management Practices (BMPs) will be installed in accordance with ANR guidelines for construction sites.									
11.6.Permanent Demarcation of Limits of Impact	Describe any plantings, fencing, signage, or other memorialization that provides permanent on-the-ground boundaries for the limits of disturbance for ongoing uses. No memorialization is proposed along the limits of disturbance for this project since there will be very little activity on the site once it is constructed.									
12.Wetland and Buffer Zone Impacts										
12.1.Wetland Impacts	Summarize the square footage of impact in the appropriate category. If more than one wetland is impacted, provide that information and use the supplemental wetland sheets. <table><tr><td colspan="2">Totals</td></tr><tr><td>Wetland Fill</td><td>91 s.f.</td></tr><tr><td>Temporary Wetland Impact</td><td>0 s.f.</td></tr><tr><td>Other Permanent Wetland Impact</td><td>23,096+29,040 s.f.</td></tr></table>	Totals		Wetland Fill	91 s.f.	Temporary Wetland Impact	0 s.f.	Other Permanent Wetland Impact	23,096+29,040 s.f.	
Totals										
Wetland Fill	91 s.f.									
Temporary Wetland Impact	0 s.f.									
Other Permanent Wetland Impact	23,096+29,040 s.f.									

	Describe in detail the proposed impact. 1005 piles are proposed for the array layout. Each pile is calculated to be 0.125sf of impact, therefore total impact within the wetland is 91sf. Approximately 23,096sf of tree clearing impact is proposed within the wetland portion of the Forest Management Zone in addition to the 29,040sf of wetland clearing within the facility clearing extent.							
12.2.Buffer Zone Impacts	Summarize the square footage of impact in the appropriate category. If more than one wetland is impacted, provide that information and use the supplemental wetland sheets. Totals <table border="1"><tr><td>Temporary Buffer Impact</td><td>0 s.f.</td></tr><tr><td>Permanent Buffer Impact</td><td>16.5+4,717 s.f.</td></tr><tr><td>Other Permanent Buffer Impact</td><td>18,057+42,614 s.f.</td></tr></table> Describe in detail the proposed impact. Buffer impact includes the 16.5sf associated with the driven piles and approximately 4,717sf of impact associated with the stormwater control outlet. Additionally, approximately 18,057sf of tree clearing impact is proposed within the wetland buffer portion of the Forest Management Zone in addition to the 42,614 sf of buffer clearing within the facility extent.	Temporary Buffer Impact	0 s.f.	Permanent Buffer Impact	16.5+4,717 s.f.	Other Permanent Buffer Impact	18,057+42,614 s.f.	
Temporary Buffer Impact	0 s.f.							
Permanent Buffer Impact	16.5+4,717 s.f.							
Other Permanent Buffer Impact	18,057+42,614 s.f.							
12.3.Cumulative Impacts	List any potential cumulative or ongoing, direct and indirect impacts on the functions of the wetland that could result from the proposed project. The main impact to the wetland as a result of this project is the cutting of vegetation. The vegetation cutting is not expected to have an undue adverse impact on the quality of wildlife habitat found on the site. Wildlife studies were conducted on this site and no unusual wildlife species were identified. The wildlife species found on this site are common and typical of that found in a suburban environment.							
12.4.Avoidance and Minimization	Please refer to Section 9.5b of the rules on Mitigation Sequencing for this section.							
12.4.1. Avoidance	Can the proposed activity be practicably located outside the wetland/buffer zone, or on another site owned or controlled by the applicant or reasonably available to satisfy the basic project purpose? If not, indicate why. This answer should include any examination of alternatives that you have explored including using other properties, requesting easements, and altering the project design. The Applicant does not have any other land in the area that could host a 2.5 MW project, which is the size of the Power Purchase Agreement the Applicant has with the Burlington Electric Department.							
12.4.2. Minimization	If the proposed activity cannot practicably be located outside the wetland/buffer zone, have all practicable measures have been taken to avoid adverse impacts on protected functions? Please include any information on on-site alternatives that have been examined; minimizing the size and scope of the project to avoid impacts; or relocating portions of the project to avoid impacts The Applicant has sized this project so that it has the capacity to generate 2.5 MW of energy. The Applicant has avoided direct impacts to the significant natural community, as directed by the Agency of Natural Resources. The Applicant has proposed the smallest footprint possible in order to have a viable project. In the wetlands and the forest management zone, all pre-construction tree and shrub clearing will be performed by hand using a chainsaw or hand held brush cutter. All wetland and buffer forest management will be conducted during dry or frozen conditions to minimize soil disturbance.							

	During tree clearing, installation of the solar arrays, and construction of the upland access road, accepted erosion control measures will be used to minimize the amount of sediment discharged to the wetland. Also, proposed for this project is a stormwater detention basin, intended to ensure the upland sitework does not result in an increase in peak stormwater flows into the wetland and onto adjoining properties.	
12.4.3. Mitigation	If avoidance of adverse effects on protected functions cannot be practically achieved, has the proposed activity has been planned to minimize adverse impacts on the protected functions and a plan has been developed for the prompt restoration of any adverse impacts on protected functions? Include any information on best management practices to be used for the project both for the initial construction and ongoing use. Also include any proposed restoration of temporary impacts, previously disturbed wetland or buffer zones or proposed conservation that are being used to offset the proposed impacts. Approximately 11 acres is proposed to be conserved as a designated unique natural community (Wet Sand-Over-Clay Forest). This natural community currently contains a variety of invasive species. As mitigation, the Applicant is proposing to perform invasive species control in the wetland and its buffer zone. Please refer to the attached Vegetation Management Plan for more details on the Non-Native Invasive Species Control Plan (NISCP).	
12.4.4. Compensation	Please refer to Section 9.5c of the rules for compensation, which is appropriate when the project will result in an undue adverse impact. If compensation is proposed please include a summary here. As is supported in this application, the Applicant does not believe any undue adverse impact will occur to the wetland. To the extent that there is any adverse impact, it has been thoroughly mitigated under Section 9.5b (1)-(3). However, if the Secretary determines that additional mitigation is required, the Applicant believes this project qualifies for mitigation under a compensation agreement or otherwise.	
13. Supporting materials	Where appropriate list the accompanying material by title, author, date and last revision date. Submit these documents and plans with the application.	
13.1. Location map	Provide a project location map that is 8 ½" x 11" and reproducible in black and white. An Environmental Interest Locator Map is appropriate using the USGS topography map base layer, roads, and VSWI wetlands at minimum. Attached.	
13.2. Site Plans	List by title, author, date and last revision date. Plans should include wetland delineation and buffer zones, limits of disturbance, erosion controls, building envelopes and permanent memorialization. C10-01 Wetland Impact Plan, TCE, 4/1/2014 and revised 9/5/2014.	
13.3. ACOE Delineation Forms	List by author, location, and date. Required only for Individual Permits. ACOE delineation forms are attached to this submittal. The forms were prepared by Karina Dailey (TCE) on 11/6/12.	
13.4. Other Supporting Documents	Provide any other documentation that supports the application. List photographs; easements; agreements; may include a GIS-compatible wetland submittal for determinations; etc. Vegetation Management Plan L.W. Seddon, LLC – Design Memo Winter Wildlife Assessment Memo Avian Study for South Forty Solar September 26, 2014 TCE Memo	
13.5. List of Abutters (Neighbors with land adjoining wetland or buffer zone)	Attach list of names and mailing addresses or submit as word mailing document. See attached.	

13.5.1. Newspaper Notification	If choosing the option to fulfill the notice requirement with a newspaper notice, list the newspaper to be used here. A list of names and addresses for immediately adjacent landowners (500 foot radius) of the project area is required for the List of Abutters. ***NOTE: The applicant will be billed directly by the newspaper you list here. Use of newspaper notification may extend the notice period, depending on when the notice posts in the newspaper.																																						
14. Check Which Functions are Present in the Subject Wetland and in the Wetland Complex.	Wetland Function Summary: (if more than one wetland use supplemental wetland sheets)																																						
	<table border="1"> <thead> <tr> <th>Functions & Values</th><th>Subject Wetland</th><th>Wetland Complex</th><th>Functions & Values</th><th>Subject Wetland</th><th>Wetland Complex</th></tr> </thead> <tbody> <tr> <td>Flood/Storm Storage</td><td>☒</td><td>☒</td><td>RTE Species</td><td>☒</td><td>☒</td></tr> <tr> <td>Surface & Groundwater Protection</td><td>☒</td><td>☒</td><td>Education & Research</td><td>☐</td><td>☐</td></tr> <tr> <td>Fish Habitat</td><td>☐</td><td>☐</td><td>Recreation/Economic</td><td>☐</td><td>☐</td></tr> <tr> <td>Wildlife Habitat</td><td>☒</td><td>☒</td><td>Open Space/Aesthetics</td><td>☐</td><td>☐</td></tr> <tr> <td>Exemplary Natural Community</td><td>☒</td><td>☒</td><td>Erosion Control</td><td>☐</td><td>☐</td></tr> </tbody> </table>		Functions & Values	Subject Wetland	Wetland Complex	Functions & Values	Subject Wetland	Wetland Complex	Flood/Storm Storage	☒	☒	RTE Species	☒	☒	Surface & Groundwater Protection	☒	☒	Education & Research	☐	☐	Fish Habitat	☐	☐	Recreation/Economic	☐	☐	Wildlife Habitat	☒	☒	Open Space/Aesthetics	☐	☐	Exemplary Natural Community	☒	☒	Erosion Control	☐	☐	
	Functions & Values		Subject Wetland	Wetland Complex	Functions & Values	Subject Wetland	Wetland Complex																																
	Flood/Storm Storage		☒	☒	RTE Species	☒	☒																																
	Surface & Groundwater Protection		☒	☒	Education & Research	☐	☐																																
	Fish Habitat		☐	☐	Recreation/Economic	☐	☐																																
	Wildlife Habitat		☒	☒	Open Space/Aesthetics	☐	☐																																
Exemplary Natural Community	☒	☒	Erosion Control	☐	☐																																		
15. Coverage under Vermont General Wetland Permit	If applying for an Individual Vermont Wetland Permit or Determination, please proceed to number 16 and answer the remaining application questions. If applying for Coverage under the Vermont General Wetland Permit, please complete question 15.1 prior to submitting application.																																						
15.1.VWP Vermont General Permit eligibility checklist	If applying for coverage under the Vermont General Wetland Permit, please verify the following to complete the application: ☐The activity qualifies as an eligible activity for coverage under the Vermont General Wetland Permit ☐The proposed project will meet the conditions applicable to the proposed project in the Vermont Wetland General Permit ☐The activity does not qualify as an Allowed Use under Section 6 of the Vermont Wetland Rules. ☐The activity will not result in an undue adverse impact on protected wetland functions and values, nor does it need additional conditions to protect functions and values. ☐ All impacts have been avoided and minimized to the greatest extent possible. ☐The wetland complex is not significant for Function 5.5 Exemplary Wetland Natural Community or 5.6 Rare, Threatened and Endangered Species Habitat. ☐The activity is not located in or adjacent to a vernal pool, fen, or bog. ☐The wetland is not at or above 2,500' in elevation (headwaters wetland).																																						

- | | |
|--|--|
| | ☐ The project is not located in a Class I wetland or associated buffer zone.
☐ The activity is not an as-built project that constitutes a violation of the Vermont Wetland Rules. |
|--|--|

Stop here if applying for Coverage under the Vermont General Wetland Permit	
--	--

Complete the following Functions and Values checklist if applying for an Individual Wetland Permit and/or a Wetland Determination	
--	--

Functions and Values	For each Function and Value, first evaluate the entire wetland or wetland complex and check all that apply. Secondly, evaluate how the wetland in the project area contributes to that function. Thirdly explain how the project will not result in adverse impacts to this function. Include any information on specific avoidance and minimization measures. If more than one wetland complex is involved, use the Supplemental Wetland Forms.
-----------------------------	---

16. Storage for Flood Water and Storm Runoff	☒ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☒ Constricted outlet or no outlet and an unconstricted inlet. ☒ Physical space for floodwater expansion and dense, persistent, emergent vegetation or dense woody vegetation that slows down flood waters or stormwater runoff during peak flows and facilitates water removal by evaporation and transpiration. ☐ If a stream is present, its course is sinuous and there is sufficient woody vegetation to intercept surface flows in the portion of the wetland that floods. ☒ Physical evidence of seasonal flooding or ponding such as water stained leaves, water marks on trees, drift rows, debris deposits, or standing water. ☐ Hydrologic or hydraulic study indicates wetland attenuates flooding. If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level. ☐ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>lower</i> level. ☐ Significant flood storage capacity upstream of the wetland, and the wetland in question provides this function at a negligible level in comparison to upstream storage (unless the upstream storage is temporary such as a beaver impoundment). ☐ Wetland is contiguous to a major lake or pond that provides storage benefits independently of the wetland. ☐ Wetland's storage capacity is created primarily by recent beaver dams or other temporary structures.
---	--

	☐ Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively. ☒ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>higher</i> level. ☒ History of downstream flood damage to public or private property. ☒ Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by a loss or reduction of the water storage function. ☒ 1. Developed public or private property. ☐ 2. Stream banks susceptible to scouring and erosion. ☐ 3. Important habitat for aquatic life. ☒ The wetland is large in size and naturally vegetated. ☒ Any of the following conditions present upstream of the wetland may indicate a large volume of runoff may reach the wetland. ☒ 1. A large amount of impervious surface in urbanized areas. ☐ 2. Relatively impervious soils. ☐ 3. Steep slopes in the adjacent areas.	
16.1. Subject Wetland	Please explain how the subject wetland contributes to the function listed above The subject wetland contributes to this function since it has the physical and vegetative characteristics that make the wetland have this function.	
16.2. Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function. The Applicant is not proposing to add a significant amount of impervious surface to the wetland or its buffer zone. In addition, there will be no earth moving in the wetland or its buffer zone. Some woody and herbaceous vegetation will be cut from the wetland and its buffer zone but the herbaceous vegetation will continue to grow after the solar array is installed. Therefore, the wetland will continue to provide storage for storm runoff once this project is completed. This project will not have an undue adverse impact on this function.	
17. Surface and Ground Water Protection	☒ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☒ Constricted or no outlets. ☒ Low water velocity through dense, persistent vegetation. ☐ Hydroperiod permanently flooded or saturated. ☐ Wetlands in depositional environments with persistent vegetation wider than 20 feet. ☐ Wetlands with persistent vegetation comprising a defined delta, island, bar or peninsula.	

	☐ Presence of seeps or springs. ☒ Wetland contains a high amount of microtopography that helps slow and filter surface water. ☐ Position in the landscape indicates the wetland is a headwaters area. ☐ Wetland is adjacent to surface waters. ☐ Wetland recharges a drinking water source. ☐ Water sampling indicates removal of pollutants or nutrients. ☐ Water sampling indicates retention of sediments or organic matter. ☐ Fine mineral soils and alkalinity not low. ☒ The wetland provides an obvious filter between surface water or ground water and land uses that may contribute point or nonpoint sources of sediments, toxic substances or nutrients to the wetland, such as: steep erodible slopes; row crops; dumps; areas of pesticide, herbicide or fertilizer application; feed lots; parking lots or heavily traveled road; and septic systems. If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level. ☐ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>lower</i> level. ☐ Presence of dead forest or shrub areas in sufficient amounts to result in diminished nutrient uptake. ☐ Presence of ditches or channels that confine water and restrict contact of water with vegetation. ☐ Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively. ☐ Current use in the wetland results in disturbance that compromises this function. ☒ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>higher</i> level. ☐ The wetland is adjacent to a well head or source protection area, and provides ground water recharge. ☐ The wetland provides flows to Class A surface waters. ☐ The wetland contributes to the protection or improvement of water quality of any impaired waters. ☒ The wetland is large in size and naturally vegetated.	
17.1. Subject Wetland	Please explain how the subject wetland contributes to the function listed above	

	The subject wetland contributes to this function since it has the physical and vegetative characteristics that make the wetland have this function.	
17.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function. The Applicant is not proposing to add a significant amount of impervious surface to the wetland or its buffer zone. In addition, there will be no earth moving in the wetland or its buffer zone. Some woody and herbaceous vegetation will be cut from the wetland and its buffer zone but herbaceous vegetation will continue to grow after the solar array is installed. Therefore, the wetland will continue to provide surface and groundwater protection once this project is complete. This project will not have an undue adverse impact on this function.	
18.Fish Habitat	☐ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☐ Contains woody vegetation that overhangs the banks of a stream or river and provides any of the following: shading that controls summer water temperature; cover including refuges created by overhanging branches or undercut banks; source of terrestrial insects as fish food; or streambank stability. ☐ Provides spawning, nursery, feeding or cover habitat for fish (documented or professionally judged). Common habitat includes deep marsh and shallow marsh associates with lakes and streams, and seasonally flooded wetlands associated with streams and rivers. ☐ Documented or professionally judged spawning habitat for northern pike. ☐ Provides cold spring discharge that lowers the temperature of receiving waters and creates summer habitat for salmonoid species. ☐ The wetland is located along a tributary that does not support fish, but contributes to a larger body of water that does support fish. The tributary supports downstream fish by providing cooler water, and food sources.	
18.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above	
18.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function.	
19.Wildlife Habitat	☒ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☐ Provides resting, feeding staging or roosting habitat to support waterfowl migration, and feeding habitat for wading birds. Good habitats for these species include open water wetlands. ☐ Habitat to support one or more breeding pairs or broods of	

	waterfowl including all species of ducks, geese, and swans. Good habitats for these species include open water habitats adjacent shallow marsh, deep marsh, shrub wetland, forested wetland, or naturally vegetated buffer zone. ☐ Provides a nest site, a buffer for a nest site or feeding habitat for wading birds including but not limited to: great blue heron, black-crowned night heron, green-backed heron, cattle egret, or snowy egret. Good habitats for these species include open water or deep marsh adjacent to forested wetlands, or standing dead trees. ☐ Supports or has the habitat to support one or more breeding pairs of any migratory bird that requires wetland habitat for breeding, nesting, rearing of young, feeding, staging roosting, or migration, including: Virginia rail, common snipe, marsh wren, American bittern, northern water thrush, northern harrier, spruce grouse, Cerulean warbler, and common loon. ☒ Supports winter habitat for white-tailed deer. Good habitats for these species include softwood swamps. Evidence of use includes deer browsing, bark stripping, worn trails, or pellet piles. ☐ Provides important feeding habitat for black bear, bobcat, or moose based on an assessment of use. Good habitat for these types of species includes wetlands located in a forested mosaic. ☐ Has the habitat to support muskrat, otter or mink. Good habitats for these species include deep marshes, wetlands adjacent to bodies of water including lakes, ponds, rivers and streams. ☐ Supports an active beaver dam, one or more lodges, or evidence of use in two or more consecutive years by an adult beaver population. ☒ Provides the following habitats that support the reproduction of Uncommon Vermont amphibian species including: ☒ 1. Wood Frog, Jefferson Salamander, Blue-spotted Salamander, or Spotted Salamander. Breeding habitat for these species includes vernal pools and small ponds. ☐ 2. Northern Dusky Salamander and the Spring Salamander. Habitat for these species includes headwater seeps, springs, and streams. ☐ 3. The Four-toed salamander; Fowler's Toad; Western or Boreal Chorus frog, or other amphibians found in Vermont of similar significance. ☐ Supports or has the habitat to support significant populations of Vermont amphibian species including, but not limited to Pickerel Frog, Northern Leopard Frog, Mink Frog, and others found in Vermont of similar significance. Good habitat for these types of species includes large	
--	---	--

marsh systems with open water components.

- ☐ Supports or has the habitat to support populations of uncommon Vermont reptile species including: Wood Turtle, Northern Map Turtle, Eastern Musk Turtle, Spotted Turtle, Spiny Softshell, Eastern Ribbonsnake, Northern Watersnake, and others found in Vermont of similar significance.
- ☐ Supports or has the habitat to support significant populations of Vermont reptile species, including Smooth Greensnake, DeKay's Brownsnake, or other more common wetland-associated species.
- ☐ Meets four or more of the following conditions indicative of wildlife habitat diversity:
 - ☐ 1. Three or more wetland vegetation classes (greater than 1/2 acre) present including but not limited to: open water contiguous to, but not necessarily part of, the wetland, deep marsh, shallow marsh, shrub swamp, forested swamp, fen, or bog;
 - ☐ 2. The dominant vegetation class is one of the following types: deep marsh, shallow marsh, shrub swamp or, forested swamp;
 - ☐ 3. Located adjacent to a lake, pond, river or stream;
 - ☐ 4. Fifty percent or more of surrounding habitat type is one or more of the following: forest, agricultural land, old field or open land;
 - ☐ 5. Emergent or woody vegetation occupies 26 to 75 percent of wetland, the rest is open water;
 - ☐ 6. One of the following:
 - ☐ i. hydrologically connected to other wetlands of different dominant classes or open water within 1 mile;
 - ☐ ii. hydrologically connected to other wetlands of same dominant class within 1/2 mile;
 - ☐ iii. within 1/4 mile of other wetlands of different dominant classes or open water, but not hydrologically connected;
- ☐ Wetland or wetland complex is owned in whole or in part by state or federal government and managed for wildlife and habitat conservation; and
- ☒ Contains evidence that it is used by wetland dependent wildlife species.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level.

- ☒ Check box if any of the following conditions apply that may

	indicate the wetland provides this function at a <i>lower</i> level. ☐ The wetland is small in size for its type and does not represent fugitive habitat in developed areas (vernal pools and seeps are generally small in size, so this does not apply). ☒ The surrounding land use is densely developed enough to limit use by wildlife species (with the exception of wetlands with open water habitat). Can be negated by evidence of use. ☐ The current use in the wetland results in frequent cutting, mowing or other disturbance. ☐ The wetland hydrology and character is at a drier end of the scale and does not support wetland dependent species. ☐ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>higher</i> level. ☐ The wetland complex is large in size and high in quality. ☐ The habitat has the potential to support several species based on the assessment above. ☐ Wetland is associated with an important wildlife corridor. ☐ The wetland has been identified as a locally important wildlife habitat by an ANR Wildlife Biologist.	
19.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above While the wetland does offer potential wildlife habitat since it meets several of the criterion listed in the functional analysis, the potential is limited by the densely developed urban neighborhoods that largely surround it. The wetland provides this function at a low level.	
19.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function. The Applicant has proposed the smallest footprint possible in order to have a viable project. The wetland contains wildlife species that are commonly found in suburban areas. The remainder of the site will remain undeveloped. Therefore, this project will not result in any undue, adverse impact to this function.	
20.Exemplary Wetland Natural Community	☒ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☒ Wetlands that are identified as high quality examples of Vermont's natural community types recognized by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department, including rare types such as dwarf shrub bogs, rich fens, alpine peatlands, red maple-black gum swamps and the more common types including deep bulrush marshes, cattail marshes, northern white cedar swamps, spruce-fir-tamarack swamps, and red maple-black ash seepage swamps are automatically significant for this function. The wetland is also likely to be significant if any of the following conditions are met:	

	☒ Is an example of a wetland natural community type that has been identified and mapped by, or meets the ranking and mapping standards of, the Natural Heritage Information Project of the Vermont Fish and Wildlife Department. ☐ Contains ecological features that contribute to Vermont's natural heritage, including, but not limited to: ☐ Deep peat accumulation reflecting a long history of wetland formation; ☐ Forested wetlands displaying very old trees and other old growth characteristics; ☐ A wetland natural community that is at the edge of the normal range for that type; ☐ A wetland mosaic containing examples of several to many wetland community types; or ☐ A large wetland complex containing examples of several wetland community types. List species or communities of concern:	
20.1. Subject Wetland	Please explain how the subject wetland contributes to the function listed above Part of the subject wetland contains an example of the significant C-ranked Wet Sand-Over-Clay Forest.	
20.2. Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function. The Applicant's consultants have worked with State Natural Heritage Program staff to define the extent of this significant natural community. The Natural Heritage Program requested that the Applicant avoid impacts to the significant natural community and provide a 50-foot buffer zone around it, while allowing for some limited cutting in the buffer zone per a Vegetative Management Plan. The project design has incorporated these requests. Therefore, the proposed project will not have an undue adverse impact to this function.	
21. Rare, Threatened, and Endangered Species Habitat	☒ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☒ Wetlands that contain one or more species on the federal or state threatened or endangered lists, as well as species that are rare in Vermont, are automatically significant for this function. The wetland is also likely to be significant if any of the following apply: ☐ There is credible documentation that the wetland provides important habitat for any species on the federal or state threatened or endangered species lists; ☐ There is credible documentation that threatened or endangered species have been present in past 10 years; ☐ There is credible documentation that the wetland provides important habitat for any species listed as rare in Vermont (S1 or S2 ranks), state historic (SH rank), or rare to	

	uncommon globally (G1, G2, or G3 ranks) by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department; ☐ There is creditable documentation that the wetland provides habitat for multiple uncommon species of plants or animals (S3 rank). List name of species and ranking: Juncus torreyi (Torrey's Rush), S2	
21.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above A small population of Juncus torreyi (Torrey's Rush) was located in the subject wetland near Sunset Cliff Road. The Applicant has consulted with Bob Popp, State Botanist, who requested that the plants either be transplanted and/or seeds collected and sowed in suitable habitat.	
21.2.Statement of no adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function. Since the Applicant is willing to transplant specimens of Juncus torreyi to a suitable location on-site, the proposed project will not result in any undue, adverse impact on this function.	
22.Education and Research in Natural Sciences	☐ Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function. ☐ Owned by or leased to a public entity dedicated to education or research. ☐ History of use for education or research. ☐ Has one or more characteristics making it valuable for education or research.	
22.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above	
22.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function.	
23.Recreational Value and Economic Benefits	☐ Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function. ☐ Used for, or contributes to, recreational activities. ☐ Provides economic benefits. ☐ Provides important habitat for fish or wildlife which can be fished, hunted or trapped under applicable state law. ☐ Used for harvesting of wild foods. Comments:	
23.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above	

23.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function.	
24.Open Space and Aesthetics	☐ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☐ Can be readily observed by the public; and ☐ Possesses special or unique aesthetic qualities; or ☐ Has prominence as a distinct feature in the surrounding landscape; ☐ Has been identified as important open space in a municipal, regional or state plan. Comments:	
24.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above	
24.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance and minimization measures relevant to this function.	
25.Erosion Control through Binding and Stabilizing the Soil	☐ Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function. ☐ Erosive forces such as wave or current energy are present and any of the following are present as well: ☐ Dense, persistent vegetation along a shoreline or stream bank that reduces an adjacent erosive force. ☐ Good interspersion of persistent emergent vegetation and water along course of water flow. ☐ Studies show that wetlands of similar size, vegetation type, and hydrology are important for erosion control. What type of erosive forces are present: ☐ Lake fetch and waves ☐ High current velocities: ☐ Water level influenced by upstream impoundment If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level. ☐ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>lower</i> level. ☐ The stream is artificially channelized and/or lacks	

	vegetation that contributes to controlling the erosive force. ☐ Check box if any of the following conditions apply that may indicate the wetland provides this function at a <i>higher</i> level. ☐ The stream contains high sinuosity. ☐ Has been identified through fluvial geomorphic assessment to be important in maintaining the natural condition of the stream or river corridor.	
25.1.Subject Wetland	Please explain how the subject wetland contributes to the function listed above	
25.2.Statement of no undue adverse impact	Please explain how the proposed project will not result in any undue adverse impact to this function. Include any avoidance and minimization measures relevant to this function.	

Vermont Wetland Section
Wetland Application Database Form
(AFFIX TO THE FRONT OF THE APPLICATION)

Applicant Name: Keystone Development Corporation		Representative Name: April Moulaert & Karina Dailey	
Town where project is located: Burlington		County: Chittenden	
Project Location Description: 0 Sunset Cliff Road 911 Street Address or direction from nearest intersection			
Project Summary: Installation of a 2.5 MW solar array on a 40 acre undeveloped parcel.			
Permit Type Requested (check all that apply) ☐ Vermont General Permit Coverage ☐ Wetland Determination ☒ Vermont Wetland Permit			
Impact Calculations: Total up proposed impacts from wetland tables listed below			
Total Wetland Impact 91.0 + 23,096=23,187 (s.f.)		Total Buffer Zone Impact 16.5+4,717+42,614+18,057=65,404.5 (s.f.)	
Total Wetland Clearing (qualified linear projects only) 29,040 (per Alan Q) (s.f.)		Total Buffer Zone Clearing (qualified linear projects only) (s.f.)	
Permit Fees: Make check payable to - State of Vermont			
Wetland Impact Fee: (\$0.75/sf) \$17,390.25		Administrative Fee: \$120	
Buffer Impact Fee: (\$0.25/sf) \$16,351.1		Total Check Amount: \$24,969.97	
Clearing Fee: (\$0.25/sf) \$7,260		=\$41,001.35 *Already Paid - \$16,031.38	
Existing Land Use Type: (check all that apply) ☐ Forestry ☐ Residential (Subdivision) ☐ Industrial/ commercial ☐ Agriculture ☐ Transportation ☐ Parks/Rec/Trail ☐ Residential (Single Family) ☐ Institutional ☒ Undeveloped			
Proposed Land Use Type: (check all that apply) ☐ Forestry ☐ Residential (Subdivision) ☒ Industrial/ commercial ☐ Agriculture ☐ Transportation ☐ Parks/Rec/Trail ☐ Residential (Single Family) ☐ Institutional ☐ No Change			
Proposed Impact Type: (check all that apply) ☐ Buildings ☒ Utilities ☐ Parking ☐ Septic/Well ☐ Stormwater ☐ Driveway ☐ Road ☐ Parks/Path ☐ Agriculture ☐ Pond ☐ Lawn ☐ Dry Hydrant ☐ Beaver dam alteration ☐ Silviculture ☐ Aesthetics ☐ Other ☐ No Impact			
Wetland 1: South Forty (Label using Wetland ID from application if applicable, use supplemental sheets if more than one wetland is being impacted)		Location: Sunset Cliff Road, Burlington, VT	
Wetland Type: Several		WL Size Class : PFO and PSS and PEM and combinations	
Proposed Alterations			
Wetland Alteration:	Buffer Zone Alteration:	Wetland Alteration Type (check all that apply)	
Wetland Fill: 91s.f.	4733.5	☐ Dredge ☐ Drain	
Temporary: s.f.	Temporary: s.f.	☒ Cut Vegetation ☐ Stormwater	
Permanent: : 23,187s.f.	Permanent: : 60,671 s.f.	☐ Trench/Fill ☐ Other	
Mitigation			
Avoidance and Minimization (s.f. of wetland NOT impacted):		Wetland: 479,160s.f. Buffer Zone 500,000s.f.	
Wetland Mitigation: (s.f. Gained)		Buffer Zone Mitigation (s.f. Gained):	
Restoration s.f.	Enhancement 500,000s.f.	Restoration s.f.	Enhancement s.f.

Creation	s.f.	Conservation	s.f..	Creation	s.f	Conservation	s.f
Reason for Mitigation:		☐ Correction of Violation	☐ Mitigation to offset permit impacts	☐ Voluntary			

All Applications Should be Mailed To:

Vermont Wetlands Program
Water Quality Division
103 South Main St
Building 10 North
Waterbury, VT 05671-0408

Staff To Complete

Wetland Project Number:			
Wetland Project Name:		DEC ID#:	
Date Application Received:			
Request for Information Date:		Information Received Date:	
Request for Information Date:		Information Received Date:	
Date Application Complete:		Distribution Complete Date:	
Notice Begin Date:		Notice End Date:	
Final Action Date:		Public Meeting Date:	
Check#	Check Amount	Date Check Received	
Check#	Check Amount	Date Check Received	



LAKE CHAMPLAIN

STARR FARM BCH

CURTIS AVE

PLEASANT AVE

STARR FARM RD

GREY MEADOW DR

YORK DR

WESTERN

CUMBERLAND RD

EASTMAN FARM RD

EDINBOROUGH DR

MUIRFIELD RD

WESTMINSTER DR

NOTTINGHAM LN

APPLETREE POINT RD

ALEXIS DR

SURF RD

0 200 400 800 1,200 1,600 Feet

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



TRUDELL CONSULTING ENGINEERS
802.879.6331 www.tcevt.com

Project Location



Legend

 Project Parcel

Notes

Sources: Bing aerial photography (2012);
VT E911 Roads (2011);
Project Parcel by TCE (2013).

Disclaimer: The accuracy of information presented is determined by its sources. TCE is not responsible for any errors or omissions that may exist. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not a replacement for surveyed information or engineering studies.

**South Forty Solar Farm
Sunset Cliff Road
Burlington, VT**

Location Map

Project: 2013113
Prepared By: LMJ
02/21/14
1 Inch = 500 Feet

Memorandum

To: Wetland adjoiner's, Burlington Planning Commission, Burlington Conservation Commission, and the Chittenden County Regional Planning Commission

From: Karina Dailey, Trudell Consulting Engineers

Subject: South Forty, LLC – Amended Vermont Wetland Permit Application

Date: November 15, 2014

This notice is to inform you that Keystone Development Corporation c/o Frank von Turkovich (South Forty Solar, LLC), 300 Swift St, South Burlington, VT 05403) has re-submitted an application to the State of Vermont, Agency of Natural Resources, Watershed Management Division for revised wetland and buffer impacts associated with a 2.5MW proposed solar array that will be connected to Burlington Electric's distribution system. The project is located on the south side of Sunset Cliff Road in the New North End of Burlington, VT.

Impacts consist of vegetation clearing (approximately 1.2 acres of wetland will be cleared of vegetation and approximately 1.4 acres of wetland buffer) and approximately 91 square feet of direct wetland impact and 4,733 square feet of buffer impact as a result of the stormwater control outlet and the driven solar array supports. Impacts have been avoided and minimized to the greatest extent practicable. The attached map shows the location of the project.

Complete copies of the application are available for review at the City of Burlington City Clerk's office, the Chittenden County Regional Planning Commission, and the office of Trudell Consulting Engineers. You may also contact me at (802) 879-6331x110 if you have further questions about the project.

The Vermont Wetland Rules require that the adjoining landowners and the City of Burlington be notified of this application.

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

David White, AICP, Director
Ken Lerner, Assistant Director
Sandrine Thibault, AICP, Comprehensive Planner
Jay Appleton, Senior Programmer
Scott Gustin, AICP, Senior Planner
Mary O'Neil, AICP, Senior Planner
Vacant, Zoning Clerk
Elsie Tillotson, Department Secretary



TO: Conservation Board
FROM: Scott Gustin
DATE: December 1, 2014
RE: Proposed Major Impact Amendments

Changes to the major impact thresholds presently in the Comprehensive Development Ordinance are proposed. These changes have been considered by the Planning Commission Ordinance Committee, but no action by the Planning Commission has yet been taken. This item is before the Conservation Board primarily because “major impact” status is one of the thresholds that requires application review by the Conservation Board. “Major impact” is also a threshold for certain application requirements and regulatory standards under Chapter 26: Wastewater, Stormwater, & Pollution Control. The proposed changes to major impact may or may not be adopted, and if they are adopted, they may well be different than currently proposed. In any event, the Conservation Board may wish to establish a different threshold for project review other than simply “major impact” status. The same holds true for applicable standards under Chapter 26. This is an item that may best be tackled by the working group focusing on stormwater performance standards this coming winter.

PART 5. CONDITIONAL USE AND MAJOR IMPACT REVIEW

Sec. 3.5.1 Purpose

These conditional use regulations are enacted to provide for a more detailed consideration of development proposals which may present a greater impact on the community

Additionally, it is the intent of these regulations through the creation of a major impact review:

- (a) To ensure that projects of major significance or impact receive a comprehensive review under established criteria; and,
- (b) To ensure that the city's natural, physical and fiscal resources and city services and infrastructure are adequate to accommodate the impact of such developments, both individually and cumulatively.

Sec. 3.5.2 Applicability

(a) Conditional Use Review:

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

1. any use identified under **Article 4** and **Appendix A – Use Table** as a “Conditional Use” or “CU;”
2. any Special Use specifically identified as being subject to conditional use review under **Article 5, Part 3;**
3. ~~any application subject to Article 9 – Inclusionary and Replacement Housing;~~
4. ~~all applications for an Institutional Parking Management Plan pursuant to the provision of Article 8, Part 3;~~
5. ~~all applications subject to Article 10 – Subdivision; and;~~
6. ~~all applications subject to Article 11 – Planned Development;~~

(b) Major Impact Review:

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

<u>Zoning Districts</u>				
	<u>Downtown</u>	<u>Neighborhood</u>	<u>Residential-</u>	<u>RCO-A,</u>
	<u>Mixed Use,</u>	<u>Mixed Use,</u>	<u>Medium</u>	<u>RCO-C,</u>
	<u>Institutional</u>	<u>Institutional,</u>	<u>Density,</u>	<u>RCO-RG,</u>
	<u>Core Campus</u>	<u>Enterprise,</u>	<u>Residential-</u>	
			<u>Low Density,</u>	

Commented [DEW1]: Addressed in unit trigger below as applicable

Commented [DEW2]: Addressed in lot trigger below as applicable

Commented [DEW3]: Addressed in unit and lot trigger below as applicable

Formatted: Font: 11 pt, Bold

Formatted Table

Formatted: Font: Bold

Formatted: Centered

Formatted: Font: 11 pt, Bold

Formatted: Font: 11 pt, Bold

Formatted: Centered

Formatted: Font: Bold

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold, Underline

		<u>Residential – High Density</u>		
<u>Dwelling Units</u>	<u>NA</u>	<u>Creation of twenty-five (25) or more dwelling units</u>	<u>Creation of five ten (105) or more dwelling units or the creation through adaptive reuse, substantial rehabilitation or conversion of ten (10) or more dwelling units;</u>	<u>NA</u>
<u>Land Subdivision</u>	<u>NA</u>	<u>NA</u>	<u>Creation of five ten (105) or more lots;</u>	<u>NA</u>
<u>Non-residential or Mixed Use Development</u>	<u>NA</u>	<u>A development footprint¹ of twenty thousand (20,000) s.f. or more, or the creation of forty thousand (40,000) s.f. or more of gross floor area.</u>	<u>A development footprint¹ of eight thousand (8,000) s.f. or more, or the construction or substantial rehabilitation of reation of fifteen thousand (15,000) s.f. or more of gross floor area of non-residential development.</u>	<u>Creation of five thousand (5,000) s.f. or more of gross floor area²</u>

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

Commented [SG4]: Make it 10 to be consistent with creation of new dwelling units.

Formatted: Font: Bold

Commented [DEW5]: Thresholds must bear some relationship to the types of impact being evaluated and the context of the proposed location

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

¹ Development Footprint: total area of impervious coverage – buildings and parking.

² Farm structures are exempt per 10 VSA 6001.

<u>Land disturbance</u>			<u>one acre or more;</u>	
<u>Site improvements involving</u>			<u>fifty (50) or more parking spaces;</u>	
<u>Natural Areas</u>	<u>Site improvements and land development on parcels that contain designated wetlands as regulated pursuant to Article 4, or natural areas</u>			

Commented [DEW6]: inherent to other development triggers and not by itself a major impact

Formatted: Font: Bold

Formatted Table

Formatted: Font: 11 pt, No underline

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Commented [DEW7]: inherent to non-residential development triggers and not by itself a major impact

Formatted: Font: 11 pt, Bold

Commented [DEW8]: development in these areas is not necessarily major. addressed in other development triggers if it is

Formatted: Font: Bold

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold, Underline

	of state or local significance as identified in the municipal development plan;		
Brownfields	Site improvements and land development on parcels seeking a waiver under Article 5, Part 4, Sec. 5.4.9 Brownfields ; or		
Cumulative Impact;			Multiple projects by the same applicant or responsible party within any consecutive twelve (12) month period on the same property or on a property within 1000 feet of the subject property that in the aggregate equal or exceed the above criteria.

Commented [DEW9]: development in these areas is not necessarily major. addressed in other development triggers if it is

Formatted: Font: Bold

Formatted: Font: 11 pt, No underline

Formatted: Font: Bold

Commented [DEW10]: addressed in other development triggers

Formatted: Font: 11 pt, No underline

Formatted: Left, Tab stops: 1", List tab

Major Impact Review shall not be applicable in the Downtown Mixed Use Districts and the Institutional Core Campuses

Sec. 3.5.3 Exemptions

Conditional Use and Major Impact Review shall not apply to applications involving one or more of the following:

~~(a)~~ Single family dwellings;

~~(b)~~(a) Temporary structures;

~~(c)~~(b) Substantial rehabilitation that does not expand the floor area of an existing building or the structural capacity of existing development;

~~(d)~~(c) Projects that do not result in a change of use or increased parking demand ~~as determined by the administrative officer~~; and,

~~(e)~~(d) Subsurface site improvements including but not limited to underground utility lines and subsurface drainage ways.

Sec. 3.5.4 Submission Requirements

In addition to the applicable application and submission requirements under in **Section 3.2.2**, all applications for a zoning permit subject to Conditional Use and/or Major Impact Review under this Part shall provide any additional information necessary for the adequate review of the proposal under the applicable review criteria of **Section 3.5.6** pursuant to **Section 3.2.3**.

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 requirement pursuant to Sec. 3.2.1(d) has been satisfied in accordance with the procedures and requirements set forth by the department of planning and zoning.

Pursuant to **Sec. 3.2.8(D)**, the DRB may require the applicant to pay the reasonable costs and fees incident to an independent technical review of the application.

Sec. 3.5.5 Public Hearing Required

Applications involving Conditional Use and Major Impact Review shall require a public hearing pursuant to the provisions of **Article 2** to provide an opportunity for public input and comment to the DRB on the proposed use and its conformity with the review criteria listed below.

Sec. 3.5.6 Review Criteria

The application and supporting documentation submitted for proposed development involving Conditional Use and/or Major Impact Review, including the plans contained therein, shall indicate how the proposed use and associated development will comply with the review criteria specified below:

(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. Based on the scale and characteristics of the proposed use and its development, the proposal is consistent with the purpose and intent of the zoning district and specifically stated policies and standards of the municipal development plan;
2. The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses allowed by right in the same zoning district;
3. 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; and.

Commented [SG11]: We should use language consistent with other sections of the CDO.

- ~~1.4. The capacity of Existing or planned public community utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area.;~~
- ~~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;~~
- ~~3. Traffic on roads and highways in the vicinity evaluated in terms of increased demand for parking, travel during peak commuter hours, safety, contributing to congestion, as opposed to complementing the flow of traffic and/or parking needs; if not in a commercial district, the impact of customer traffic and deliveries must be evaluated;~~
- ~~4. Any standards or factors set forth in existing City bylaws and city and state ordinances;~~
- ~~5. The utilization of renewable energy resources; and,~~

~~In addition to the General Standards specified above, the DRB;~~

- ~~5. shall consider the cumulative impact of the proposed use. For purposes of residential construction, if an area is zoned for housing and a lot can accommodate the density, the cumulative impact of housing shall be considered negligible;~~
- ~~6. in considering a request relating to a greater number of unrelated individuals residing in a dwelling unit within the RL, RL-W, RM and RM-W districts than is allowed as a permitted use, in addition to the criteria set forth in Subsection (a) hereof, no conditional use permit may be granted unless all facilities within the dwelling unit, including bathroom and kitchen facilities are accessible to the occupants without passing through any bedroom. Additionally, each room proposed to be occupied as a bedroom must contain at least one hundred twenty (120) square feet. There must also be a parking area located on the premises at a location other than the front yard containing a minimum of one hundred eighty (180) square feet for each proposed adult of the dwelling unit in excess of the number of occupants allowed as a permitted use. All other green space standards must be observed.~~
- ~~7. may control the location and number of vehicular access points to the property, including the erection of parking barriers.~~
- ~~8. may limit the number, location and size of signs.~~
- ~~9. may require suitable mitigation measures, including landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.~~
- ~~10. may specify a time limit for construction, alteration or enlargement of a structure to house a conditional use.~~

Formatted: Indent: Left: 0.5"

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 1" + Tab after: 1.25" + Indent at: 1.25"

Formatted: Indent: Left: 0.75", Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 1" + Tab after: 1.25" + Indent at: 1.25"

Commented [DEW12]: this does not belong here. move to Sec 4.4.5 (d)5C

Commented [DEW13]: a sign issue – doesn't belong here

- ~~11. may specify hours of operation and/or construction to reduce the impact on surrounding properties.~~
- ~~12. may require that any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions.~~
- ~~13. may consider performance standards, should the proposed use merit such review.~~
- ~~14. may attach such additional reasonable conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.~~

(b) Major Impact Review Standards:

Before a major impact development may receive approval, the DRB must be satisfied, based on documentation provided by appropriate city agencies, experts, interested parties and/or the applicant that the proposed development, ~~in addition to meeting the review standards for conditional use review above,~~ shall:

1. Not result in undue water, air or noise pollution;
2. Have sufficient water available for its needs;
3. Not unreasonably burden the city's present or future water supply or distribution system;
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;
5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;
6. Not cause an unreasonable burden on the city's ability to provide educational services;
7. Not place an unreasonable burden on the city's ability to provide municipal services;
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;
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;
10. Be in substantial conformance with the city's municipal development plan and all incorporated plans;
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; and/or
12. Not have an undue adverse impact on the present or projected park and recreation needs of the city.

(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.
2. time limits for construction.
3. hours of operation and/or construction to reduce the impact on surrounding properties.
4. that any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions; 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.

Sec. 9.1.7 Certificate of Inclusionary Housing Compliance

As written

Sec. 9.1.8 Conditional Use Approval

A covered project, except subdivisions approved by the DRB pursuant to the provisions of the Article 10, must first receive approval of such board under conditional use criteria pursuant to the requirements of Article 3, Part 5. RESERVED

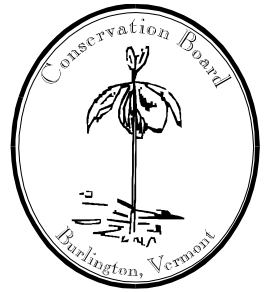
Sec. 9.1.9 Inclusionary Units, Rental and Sales

As written

Burlington Conservation Board

149 Church Street
Burlington, VT 05401
<http://www.ci.burlington.vt.us/planning/>
Telephone: (802) 865-7189
(802) 865-7195 (FAX)

Matt Moore, Chair
Will Flender, Vice Chair
Scott Mapes
Don Meals
Jeff Severson
Miles Waite
Damon Lane
Zoe Richards
Stephanie Young



Conservation Board Meeting Minutes

Monday, December 1, 2014 – 5:30 pm

Planning & Zoning Conference Room – City Hall Lower Level
149 Church Street

Attendance

- **Board Members:** Zoe Richards (ZR), Jeff Severson (JS), Scott Mapes (SM), Matt Moore (MM), Miles Waite (MW), Don Meals (DM), Stephanie Young (SY), Damon Lane (DL)
- **Absent:** Will Flender (WF)
- **Public:** Shane Mullen & Steve Guild (234 College St), Frank von Turkovich, George & Norma Webb, David Maughan, Maury Kost, Jennifer Murphy, Peter Ireland, (0 Sunset Cliff), Harris Roen, Eric Farrell, Owiso Makuku, Alicia Daniels, Gil Livingston, Bob Heiser (Burlington College)
- **Staff:** Scott Gustin (Planning & Zoning)

MM, Chair, called the meeting to order at 5:30 p.m.

Minutes of November 3, 2014

DL mentioned he was present at the November 3 meeting.

A MOTION was made by MW and SECONDED by DL:

Approve as corrected.

Vote: 7-1-0, motion carried

Board Comment

None.

Public Comment

None.

Open Space Subcommittee

No meeting today.

Project Review

1. **15-0451CA/MA: 234-240 College St (DT, Ward 3) Sisters & Brothers Investment Group**
Demolish rear portion of building, construct new 5-story addition at rear for 9 units. Results in change from 19 to 25 residential units for a net increase of 6.

Shane Mullen & Steve Guild appeared on behalf of this application.

Shane Mullen overviewed the project. The idea is to shave off the peak flows from the one year storm event to the extent feasible. The site is 100% impervious. Drainage flows to a rear catch basin which connects to the old stone sewer that was placed in the ravine years ago. Due to the proximity of other buildings and the unclear nature of the soils, the proposed stormwater management will utilize a "blue roof." The roof of the proposed addition will capture stormwater, hold it, and control its release. For the 1

The programs and services of the Dept. of Planning and Zoning are accessible to people with disabilities.
For accessibility information call 865-7188 (865-7142 TTY).

year storm event, water will pond to about 1 inch. Anything more will overflow down the roof scuppers. He said the peak flow reduction will be achieved for the 1, 5, and 10 year storms.

SM, is the peak flow simply being slowed down rather than being removed? Mr. Mullen said that is correct. MW, does the roof drain connect to the catch basin? Mr. Mullen, it will daylight on the ground surface. From there it will flow towards the existing catch basin. SM, is there any opportunity for infiltration before discharge into the combined system? Mr. Mullen said he would be uncomfortable introducing more groundwater into this area – fill soils and proximity to other buildings. SM said that the soils around the YMCA are fairly decent and sandy. MW asked if soil borings had been done. Steve Guild said not yet, but they will be.

DM, did you consider a green roof when considering the blue roof? Mr. Mullen said no. The proposed blue roof will require lower ongoing maintenance. Also, the additional water absorbed by the green roof would have been comparatively negligible. MW, has there been any consideration of harvesting rain water? Mr. Mullen said doing so would be interesting but he doesn't see any nearby applications for irrigation with captured runoff. MW, what about flushing toilets? SM said doing so in Burlington may run into difficulties with building code compliance.

MM asked about the feasibility of underground detention and infiltration. Mr. Guild said no soils analysis has yet been done. MM said that most projects before the BCB have some idea of what the soils are. Mr. Mullen said that even if the soils are good, he'd be reluctant to infiltrate due to the close proximity of other buildings and utilities. MM said if the applicant is committed to doing a geotech analysis, the door should be left open to creating a pervious surface to provide some degree of infiltration. Mr. Guild pointed out that there is no room for green space behind the building addition. There is a driveway on another property behind it. JS encouraged evaluation of infiltration following the soils analysis.

A MOTION was made by MW and SECONDED by ZR:

Approve the blue roof as proposed and request that soils information be forwarded to the Board when the geotechnical analysis is complete.

Vote: 5-1-2, motion carried

2. Review of Keystone Development Corp. VT revised Wetland Permit application for solar installation

0 Sunset Cliff Rd, in relation to potential solar utility installation.

Frank von Turkovich and Shane Mullen appeared on behalf of this item.

MW abstained from participation.

MM noted that the wetland permit application has been amended. We are now in a 15-day comment period. ZR asked if the Board's prior comments are still in effect. SM said he would assume they don't apply to the revised application, but he is not entirely sure.

Frank von Turkovich said he thinks the prior comments remain on file. He noted that changes to the application were made to address a number of comments from the BCB and others. He's confident in the accuracy of the wetlands map and delineation. Shane Mullen said the delineation reflected on the map was done this past spring. Mr. von Turkovich said that the map reflects some boundary changes. In general, they are more encompassing.

Mr. Mullen said that comments from the BCB, including those about vernal pools, were considered and reassessed. He said no vernal pools were found. ZR asked how that's possible. Mr. Mullen said a follow up site assessment occurred in May. They looked for amphibians and their eggs. JS said that the wetland was found to provide habitat for uncommon species. SY noted species such as wood frogs and Jefferson salamanders were thought to be present. ZR, it would be very helpful to have the folks who did

the assessment present to speak with. May seems pretty late to do a vernal pool assessment. Mr. von Turkovich said he could provide a response from his experts. JS said an email could clarify the methodology.

DM, on the top of page 6, it refers to the number of piles and area of impact. The numbers don't add up. Mr. von Turkovich said the total number of piles go beyond what's in the wetland area. Also, the size of the piles has changed. DM said the numbers should be looked at and corrected if need be.

SM asked if we are submitting comments on this project's wetlands permit application or not. MM said we are not required to submit any additional comments to DEC. The applicant is here to address questions we have. From here we can decide whether to comment or not.

SM has questions relative to stormwater and related runoff coefficient numbers. SM, what's the total area being cleared? Mr. von Turkovich said that about 10 or 12 acres would be cleared. He's concerned that the stormwater model does not sufficiently address the impacts of canopy clearing. Mr. Mullen said that the proposed stormwater management system accounts for the canopy clearing and its impacts on runoff. He noted that the surface area of the proposed detention basin is almost 2 acres. JS mentioned that the site plans included in the permit application depict the stormwater detention basin, but there is no mention of it in the wetland permit application. Mr. Mullen replied that an operational stormwater permit is not required. A construction general permit, however, will be obtained.

MM said it seems to him that the total numbers between the original and revised applications are significantly different. Mr. von Turkovich agreed. MM noted for example, its gone from 84 sf to 23,000 sf of wetland impacts. Mr. von Turkovich said that the updated delineation included some new area. Also, the former director of the VT Wetlands Program classified much of the open field as former agriculture. Now, the application reflects actual vegetation in this area.

SM, has your geotechnical report found that piles in these soils will be okay? Mr. von Turkovich said that his soils consultant is confident in the pile driving method.

Mr. von Turkovich said that he hopes the BCB's interest goes beyond the wetland permit application. He'd like the Board to look at this project holistically. He hopes the Board feels the proposed utilization of this property for solar power generation is a net gain.

JS, did BED require a 2.5 megawatt facility? Mr. von Turkovich said no. JS, did you consider a smaller facility? Mr. von Turkovich said that various sizes have been considered – larger and smaller. This proposal seems to be the best fit for this property.

George Webb, supports solar use for this property. His main concern was its appearance from the road, but the applicant has met with him to address his concerns. Solar is an alternative energy that VT is pursuing.

David Maughan, will there be a general discussion among the Board members? MM, not decided yet.

Maury Kost, main concern is with the amount of clearing that will be done. Her understanding is that some 6 acres of 12 will be cleared. Mr. von Turkovich said that most of the pine trees will be removed from the 10 acre stand. Ms. Kost, what about along Curtis Avenue? Mr. von Turkovich said he'll keep as much of that vegetation intact as possible.

David Maughan, the community is concerned about the aesthetic impact of the project. Any development will have to consider reducing visual impact. This is the last large "natural" parcel in Burlington. MM said that aesthetics are not within the purview of the BCB.

Peter Ireland, Strathmore, has the Board seen Sheila McIntyre's recent report? SG said the Board has seen information from her from previous project review this past spring. Mr. Ireland said she's done a more recent one and will have it sent to the Board.

JS said that open space and aesthetics are considered under the wetlands permit application.

DM asked what, if any, open meeting law requirements will affect Board comment and how they go about doing it. SM, we can comment and submit them to SG for submission to DEC. SG said that sending written comments reflecting tonight's discussion is ok. Sending along new information or getting into an email discussion would not be ok. As individuals, Board members can comment to DEC as they wish.

SM, his comments remain as previously stated. He'd add one further. The structural support system could significantly change if the goetech report precludes using piles in these soils. This should be raised as a concern to DEC. SM is concerned that the model does not sufficiently support pre- and post-clearing development runoff due to change in vegetation.

DM, not sure if comments from prior review remain. SG said the Board could simply reiterate them. If they've been addressed – great. If not, they are reiterated for further consideration.

ZR asked what the other issues were. MM noted impacts to wetlands and buffers. Calculation of very minor impacts. This appears to be addressed in the revised application. JS said he disagrees that this item has been addressed. MM went on to note other concerns related to hydrologic modeling. We've heard tonight that the stormwater management system was not in the original application, but we've seen it before.

ZR, do we keep our comments as is or revise? DL, let's invite JS's comments and then decide.

DM to SM, the question of post-construction monitoring. SM, that was from prior comments. He does not care to revisit it tonight. He's heard from the applicant that he is not interested in doing it. This is a way to find out if their modeling is accurate or not. DM, every applicant runs the same model, but we don't ask them to do post-construction modeling.

JS said the application significantly underestimates the degree of wetland and buffer impacts. He believes the additional acreage is not just square footage. There are undo adverse impacts relative to stormwater and flood storage capacity, surface water quality treatment, and wildlife functions. The application does not take into account the vast majority of impacts to the wetland that will take place with the proposed clearing. The application primarily addresses fill and pilings. A large area of wildlife habitat will be removed. Ditto stormwater detention and surface water. The application is supposed to show how impacts to these wetland functions have been minimized. He noted that BED buys power from rooftop installations up to full solar arrays. He also noted that BED is at 100% renewable energy now. This project will not improve BED's portfolio. MM said this concern goes beyond what the BCB is considering tonight. JS pointed out the application contains no information supporting why a 2.5 megawatt facility is necessary. There's no demonstration as to why a smaller project is not feasible.

SG summarized, the application does not sufficient address:

Stormwater

Water quality

Wildlife habitat

Underestimates actual scope of impacts to wetland functions

Does not address why a smaller system is not feasible

DL said the project could be virtually any size. SY, is Sec. 12.4 getting at making projects smaller or just reducing impacts?

DM, if the structural support system had to change, would it require a new permit? JS, depending on the degree of change, it could.

MM said he feels the revised application more accurately reflects the scope of impact. A technical assessment of the impacts is beyond this Board's capacity.

Board members agreed to send the bullet list along to DEC.

Update & Discussion

1. Burlington College

JS recused from this discussion. MM said his employer could be involved in a project here, but is not yet involved. He is not presently involved.

Harris Roen attended a meeting with "The Friends of Burlington College" last week. The meeting was aimed at saving the College and also conserving the property. He said that he noted to the group that there is support from the BCB to do a conservation project here. SM, someone needs to approach the Board through the CLP with an application. MM, there's been no application. There is no secret that this property is of interest to the BCB. MW said the BCB's interest has always been in the North Ave/Bike Path trail. MM concurred. Mr. Roen noted the rare pine-oak-heath-sandplain forest.

Eric Farrell said if the college receives an offer to fully conserve the property, his offer to buy the property is off the table. Mr. Roen said that Trust for Public Land does projects of this size. He thinks the Board should be more proactive in pursuing conservation of this property, rather than just waiting for an application. ZR said that this is a very rare property in Burlington and provides connectivity among large adjacent green spaces.

Alicia Daniels brought along a letter she sent to the Mayor relative to the values of this property (to be placed on record).

ZR would like to be involved if the Mayor's Office is going to pursue use of the BCLF. MM said he was at a meeting with the Mayor a couple of weeks ago. He noted the Board's interest in conservation of part of the property. He also said he'll attend the Parks & Rec meeting tomorrow for further discussion.

DM, is somebody trying to assemble a conservation bid of ~ \$7 M? The city's BCLF cannot cover this amount. Mr. Roen said there's no a lead person at the city level for this, and it's a problem. ZR said we're not necessarily looking at a development/no development option. It's unlikely we'll get \$7 M together in the allotted time.

Gil Livingston and Bob Heiser of Vermont Land Trust (VLT) appeared.

Gil Livingston said VLT is trying to figure out what the community wants and is looking to speak with as many folks as possible. The \$7 M price tag is just for development rights. It does not include right of public access or fee simple ownership. Mr. Livingston has met with CHT, the Mayor's Office, Parks & Rec, and others. Looking to have a collaborative effort. He has not heard substantial interest in complete conservation and fee ownership. Most of what he's heard involves a balance between open space and development with a range of housing opportunities. Community gardens and a small neighborhood park have been mentioned as well.

ZR, what do you envision the public process to be? Folks may feel the 60-timeframe is not possible, and all is lost. Mr. Livingston said that a meaningful process within 60 days is infeasible and unfair to Eric Farrell. The process should focus on defining attributes that are of import to Burlington. What is the appropriate balance between development and conservation?

MM noted the trails-alternatives assessment that has been done and also the wildlife habitat and corridors studies. He's tried to communicate the Board's interests to decision makers. We have a real estate deal between two parties, and there is some public interest involved.

ZR, could we request that a rep from the Mayor's Office attend the Board's next meeting? It would be nice for us to be on the same page.

Mr. Roen said it may make sense for another design charrette to take place – like the one done in 2001.

MM said he's happy to pursue a more active role with the Board. ZR suggested an open space subcommittee meeting prior to the next BCB meeting. Mr. Roen said he'd bring this up with the Planning Commission. DM said a joint letter with Parks & Rec Commission may be best. MM asked SG to invite someone from the Mayor's Office to speak with the Board. SM said we should promote the city's interest in the property.

2. Follow-up relative to stormwater performance standards and work group

SM, MW, and DM volunteered to participate. ZR happy to participate as well if Megan would like.

3. Proposed "Major Impact" changes

SG noted Major Impact thresholds may be increased. Doing so is intended to limit major impact review to those projects that may actually have a significant impact on city services and facilities. This change, however, would likely reduce the number of projects coming before the Conservation Board. Presently, major impact review is a threshold for Conservation Board review.

DL said the Board may need to define an alternative review threshold.

SM noted the Board needs to know more about the potential form based code. Board thresholds could be embedded in that. He asked if the Board could have a presentation relative to that. SG said he'd invite David White to do so.

SM sees the stormwater working group being able to establish performance standards that may enable the Board to move away from Chapter 26 review. We'll have helped Megan develop the standards and run the show.

Adjournment

The meeting adjourned at 8:02 PM.