

**Department of Planning and Zoning**

149 Church Street  
Burlington, VT 05401  
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*David White, AICP, Director*  
*Ken Lerner, Assistant Director*  
*Sandrine Thibault, AICP, Comprehensive Planner*  
*Jay Appleton, GIS Manager*  
*Scott Gustin, AICP, Senior Planner*  
*Mary O'Neil, AICP, Senior Planner*  
*Nic Anderson, Zoning Clerk*  
*Elsie Tillotson, Department Secretary*



**TO:** Design Advisory Board  
**FROM:** Scott Gustin  
**DATE:** February 25, 2014  
**RE:** 14-0747SD, 1891 North Avenue

Zone: RL                                      Ward: 4  
Owner/Representative: Tom Mitchell

**Request:** Subdivide two lots into three lots, remove existing single family house, construct two duplexes and one single family house.

**OVERVIEW:**

The applicant is seeking approval of a proposed 3-lot, 5-dwelling unit subdivision. Two existing adjacent lots would be subdivided and reconfigured into 3 lots. Two duplexes and one single family home would be constructed. An existing mobile home along North Avenue would be demolished and replaced with one of the two new duplexes. This proposal amounts to a minor subdivision (i.e. less than 5 net new dwelling units or lots) and may be reviewed as a combined preliminary/final plat application. This application went through sketch plan review by the Development Review Board on July 17, 2012.

**ARTICLE 6: DEVELOPMENT REVIEW STANDARDS**

*Part 1, Land Division Design Standards*

*Sec. 6.1.2, Review Standards*

*(a) Protection of important natural features*

The property contains no significant natural areas as defined in the Open Space Protection Plan or as depicted in any of the Natural Resource Protection Overlay District maps. A number of trees are present. If any of them are specimen trees (i.e. 30" + caliper and/or more than 100 years old as determined by a certified arborist), they must be labeled on the plans and preserved insofar as practicable. The plans as presented do not make any such indication. The plans note a number of individual tree locations and that they are to be removed. Whether any of these trees qualify as "specimen trees" must be clarified. Further, it must be clarified if all of the trees presently onsite will be removed.

*(b) Block size and arrangement*

No new blocks are proposed.

*(c) Arrangement of Lots*

Lot 3 will be regularly shaped. Lot 1 will be somewhat irregular to allow for an irregular lot 2. The irregular shape of lot 2 is proposed in order to meet the minimum lot frontage requirement of 60' along a public roadway. Such lots are discouraged and shall be allowed only where

topography and existing block and lot arrangement allow no suitable alternative. If lot 2 is to be created, there is no other alternative for public road frontage. The Development Review Board reviewed this configuration at sketch plan and did not find it objectionable. A suggestion was made to implement an easement between lots 1 and 2 to allow lot 1 a complete backyard (i.e. as if the “flag” on lot 2 did not exist). The application plans do not indicate any such proposed easement. Note than an access and utility easement for lot 2 across lot 3 will be required for lot 2’s driveway and utility lines.

*(d) Connectivity of streets within the city street grid*

No new streets are proposed. New private driveways will access the existing street network.

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

The existing public sidewalk system will be unaffected by the proposed development. There are no nearby trail networks or contiguous lengths of green space.

***Part 2, Site Plan Design Standards***

***Sec. 6.2.2, Review Standards***

*(a) Protection of important natural features*

See Sec. 6.1.2 (a) above.

*(b) Topographical alterations*

The property is essentially flat and will remain so. Some limited grading is proposed to direct stormwater runoff into surrounding green spaces.

*(c) Protection of important public views*

There are no important public views from or through the property.

*(d) Protection of important cultural resources*

The site has no known archaeological resources.

*(e) Supporting the use of alternative energy*

No alternative energy resources have been depicted in the sketch plan.

*(f) Brownfield sites*

The property is not included on the Vermont DEC’s Hazardous Sites List.

*(g) Provide for nature’s events*

A stormwater management plan has been submitted for review and approval by the Stormwater Administrator. Proposed management is simple given the ample green space and very pervious soils. Rooftop runoff will be collected by gutters and dispersed by way of downspouts onto surrounding green space for infiltration into the ground. Driveways will be graded to direct runoff onto adjacent green space for infiltration. No stormwater runoff will be directed into the city system. As required, an erosion prevention and sediment control plan has also been submitted for review and approval by the Stormwater Administrator. There is ample room onsite for seasonal snow storage.

*(h) Building location and orientation*

The two duplexes will be located along existing public streets and will be aligned with neighboring homes. Garage and driveway parking space will be provided for both duplexes. Both duplex structures appear to be identical. Each building is 59' wide, and each has a 22' wide garage. Per this criterion, garages facing the street shall not exceed 24' width or 50% of the entire structure width, whichever is less. As proposed, the 22' wide garages are under this limit at 37% of the structure width. The new single family home will sit between the two duplexes and will have no discernible impact on the North Avenue or Northgate Road streetscapes. The single family home will have an attached garage, but it does not face the street. As a result the garage width limitations of this criterion do not apply.

*(i) Vehicular access*

The existing curb cut along North Avenue will be used for the new duplex on lot 3 and the new single family home on lot 2. A new curb cut will be established along Northgate Road. Public Works approval will be required for the new curb cut. The duplexes will have two 10' wide driveways for each unit, and the single family home will have a 12' wide driveway. These widths are within the acceptable range of 7' – 18' for residential driveways.

*(j) Pedestrian access*

None of the new homes have front walkways connecting to the public sidewalk as required by this criterion. This deficiency must be corrected. The dwelling units on lots 2 and 3 must have walkways connecting to the North Avenue sidewalk. The dwelling units on lot 1 must have a walkway up to the curb (there is no sidewalk on the west side of Northgate Road).

*(k) Accessibility for the handicapped*

There is no indication that any of the dwelling units will be handicap accessible or that they need to be.

*(l) Parking and circulation*

All of the proposed dwelling units will have associated parking. Both required spaces will be provided within the attached garage for the single family home. Each duplex unit will have one garage space and one driveway space. The parking and driveway arrangement for the single family home allow vehicles to enter and leave without backing out onto a city street. The duplex on lot 1 will require vehicles to back out onto Northgate Road. While not ideal, backing out onto this relatively low volume street may be acceptable. The duplex on lot 3 will require vehicles to back out onto North Avenue. Backing out onto North Avenue is unsafe and unacceptable. Alternative circulation is needed.

*(m) Landscaping and fences*

Very basic landscaping information has been provided. Between sheet C-1 which notes "existing tree to be removed" (perhaps all of them) in the legend and sheet C-2 which notes "existing tree" and "proposed tree" in the legend, it is unclear which existing trees (if any) will remain. Clarification is needed. New trees amount to four new white pines and two new red maples. A much more robust landscaping plan is needed in order to define spaces within the development and to screen parking areas and utilities.

*(n) Public plazas and open space*

No public plazas or open space are included in this proposal.

*(o) Outdoor lighting*

No outdoor lighting information has been provided. Details as to fixture type, locations, and illumination levels relative to the standards of this criterion and Sec. 5.5.2 are needed.

*(p) Integrate infrastructure into the design*

All utility lines must be buried. There is no evidence that electric utility “hot boxes” will be screened with new landscaping or otherwise. If any of these large green boxes are proposed, screening should be provided. There are no communal recycling or trash facilities. These items will be handled separately by each homeowner.

**Part 3, Architectural Design Standards**

**Sec. 6.3.2, Review Standards**

*(a) Relate development to its environment*

*1. Massing, Height, and Scale*

The subject property is sited between single family homes along Dewey Drive and the very large Northgate Apartments complex. The homes along Dewey Drive are relatively small as compared to the Northgate Apartments; however, the apartment buildings are sectionalized in components roughly approximate to the scale of the Dewey Drive homes. The new homes included in this proposal retain this consistent scale. The two duplexes (which are mirror images of each other) read as individual dwelling units connected by way of a shared garage. This arrangement lessens perceived building bulk and provides a degree of separation of the living quarters. The proposed single family home is smaller than the duplexes and is comprised of several distinct components. Its massing and scale are consistent with neighboring single family homes. All three of the proposed buildings are well under the 35’ height limit. The single family home is just a single story. The two duplexes are two stories with a height of just 21’ to the midpoint of the roof rise. The proposed building heights are consistent with nearby homes.

*2. Roofs and Rooflines*

Pitched gable roofs with varying orientations are proposed. This roof form is common amongst neighborhood homes.

*3. Building Openings*

Fenestration amongst all of the proposed buildings is similar. It is evenly placed throughout each structure and consists of fairly basic one-over-one double-hung windows with some smaller awing windows interspersed on the side elevations. The double-hung units are more vertical than horizontal as required. Building entries are sheltered with entry porches.

*(b) Protection of important architectural resources*

An existing mobile home will be demolished as part of this proposal. It is not historically significant, nor are any neighboring structures historically significant.

*(c) Protection of important public views*

See 6.2.2 (c) above.

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

The proposed duplexes reinforce the existing street edge created by existing homes along North Avenue and Northgate Road. Both clearly face the street and have readily identifiable front entries

within open porches. As noted above, they lack walkways connecting their front entries to the public sidewalk. The single family home is situated between the two duplexes and, as such, does not have a street presence.

*(e) Quality of materials*

All of the homes will be clad in fiber cement clapboards and trim. Asphalt shingles will be installed on the roofs. Duplex porches will be sided with cedar shakes, and the single family home will utilize wooden railings for its porch. The proposed materials palette is one common to new construction and is of acceptable quality and durability. Window materials are not noted and must be.

*(f) Reduce energy utilization*

The proposed construction must comply with the city's current energy efficiency requirements. Nothing above and beyond the minimum requirements is noted in the project plans.

*(g) Make advertising features complimentary to the site*

Not applicable.

*(h) Integrate infrastructure into the building design*

No utility meter locations are depicted on the project plans. They must be depicted and screened. No exterior mechanical equipment is included in the project plans. If any is proposed, it must be depicted on the project plans and screened. Trash should be stored inside the garages until curb side pick-up days.

*(i) Make spaces safe and secure*

The new buildings will be subject to current egress requirements. Building entries should be illuminated. Lighting details are needed as noted above.

**RECOMMENDED MOTION:**

Initial project review and table pending receipt of additional or revised plans to address the following:

1. Clarity of tree retention versus removal. What trees will be removed and what trees, if any, will remain? Are any of the existing trees "specimen trees?"
2. Front walkways that connect each new home to the public sidewalk or street network.
3. Revised vehicular circulation for the duplex on lot 3 that eliminates the need to back out onto North Avenue.
4. A more robust landscaping plan that defines spaces within the development and screens parking areas and utilities
5. Outdoor lighting fixture locations, cut sheets, and illumination levels.
6. Window materials and cut sheets
7. Utility meter locations and screening. Locations and screening of mechanical equipment, if any is proposed.

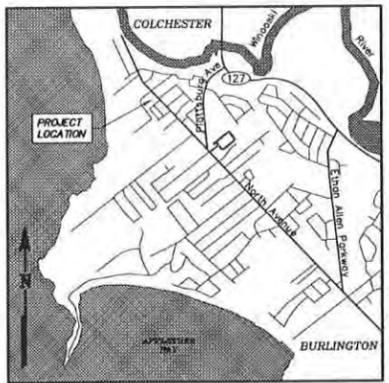
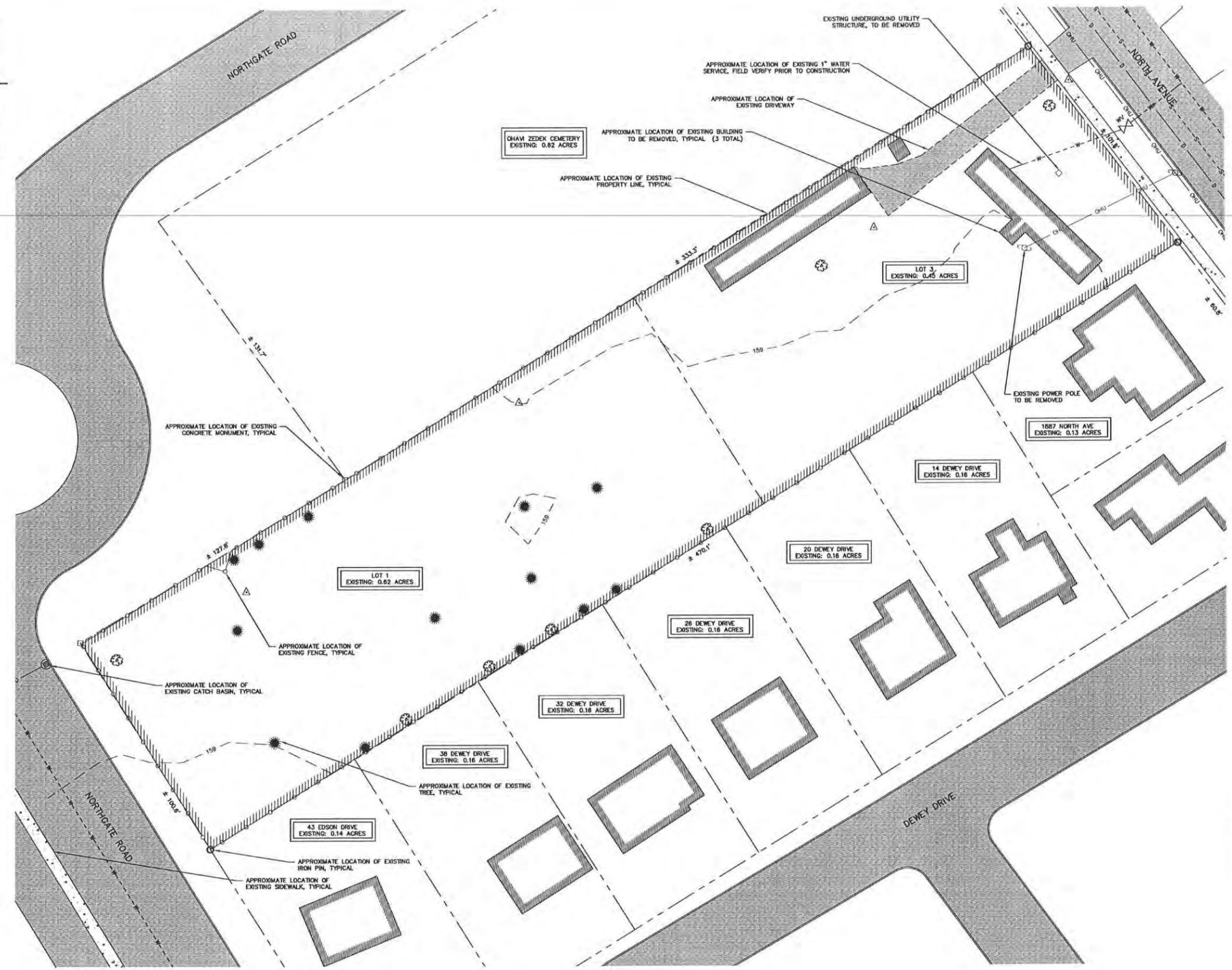


1891 North Ave  
Springer

North East  
Corner







LOCATION MAP  
N.T.S.

DESIGN SUMMARY:

1. PROJECT DESCRIPTION:  
SITE PLAN OF A PROPOSED RESIDENTIAL SUBDIVISION OF TWO EXISTING PARCELS LOCATED AT 1891 NORTH AVENUE IN THE CITY OF BURLINGTON, VERMONT.

2. PROJECT CONTACTS:

OWNER: TOM MITCHELL  
27 REVERE COURT  
BURLINGTON, VERMONT 05405  
CONTACT: (802) 355-4222

CIVIL ENGINEER:

CHAMPLAIN CONSULTING ENGINEERS  
85 PRIM ROAD, P.O. BOX 453  
COLCHESTER, VERMONT 05446  
CONTACT: MARTIN E. COURCELLE, P.E.  
(802) 863-8060

GENERAL NOTES:

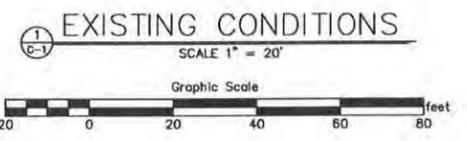
- PRIOR TO COMMENCING SITE WORK, THE GENERAL CONTRACTOR SHALL VERIFY EXISTING FIELD CONDITIONS. THE PROJECT ENGINEER SHALL BE NOTIFIED IMMEDIATELY WHERE DISCREPANCIES EXIST BETWEEN THE PROJECT DRAWINGS AND ACTUAL FIELD CONDITIONS.
- THE GENERAL CONTRACTOR SHALL CONTACT DIG SAFE (1-888-344-7233) SEVENTY TWO HOURS PRIOR TO ANY EXCAVATION TO ACCURATELY ESTABLISH THE LOCATION OF ALL UNDERGROUND UTILITIES ON THE PROJECT SITE.
- WHERE DIMENSIONS ON THE PROJECT DRAWINGS ARE UNCLEAR, CONTACT THE PROJECT ENGINEER IMMEDIATELY FOR CLARIFICATION.
- IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE PROJECT DRAWINGS REFLECT THE LATEST REVISIONS.
- THIS IS A SITE PLAN NOT A BOUNDARY SURVEY. PROPERTY BOUNDARIES SHOWN ON THIS PLAN ARE CONSIDERED TO BE APPROXIMATE.
- PROPOSED BUILDING LOCATIONS SHOWN ARE THEORETICAL ONLY.

REFERENCE MAPS:

- MAP TITLED "TOPOGRAPHIC SURVEY, MITCHELL PROPERTY", PREPARED BY VERMONT LAND SURVEYORS, INC., DATED NOVEMBER 5, 2012, VLS JOB #201215. VERTICAL DATUM IS BASED UPON A CLASS II VERTICAL CONTROL POINT (PID A86591), NAVD 1988 DATUM.
- MAP TITLED "PLAT OF SURVEY, MITCHELL PROPERTY", PREPARED BY WARREN A. ROSENSTEN, DATED AUGUST 8.
- ADDITIONAL FEATURES FROM VERMONT DEPARTMENT OF TAXES, VERMONT MAPPING PROGRAM, ORTHOPHOTO #090224, YEAR TAKEN 2004.
- ADDITIONAL PROPERTY BOUNDARIES TAKEN FROM CITY OF BURLINGTON TAX MAP #23.
- EXISTING SEWER, WATER AND STORMWATER UTILITY INFORMATION TAKEN FROM DRAFT GIS PROVIDED BY THE CITY OF BURLINGTON, VERMONT.

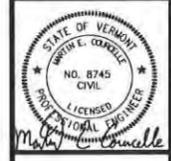
LEGEND

	EXISTING PROPERTY LINE
	EXISTING CONTOUR
	EXISTING FENCE
	EXISTING WATER LINE & VALVE
	EXISTING SEWER LINE & MANHOLE
	EXISTING STORM LINE & CATCH BASIN
	EXISTING OVERHEAD UTILITY LINE & POLE
	SURVEY CONTROL POINT
	CONCRETE MONUMENT FOUND
	IRON PIN FOUND
	EXISTING TREE TO BE REMOVED
	EXISTING PROPERTY LINE DIMENSION



REVISION DATE	DESCRIPTION	BY

**Champlain Consulting ENGINEERS**  
85 PRIM ROAD, P.O. BOX 453  
COLCHESTER, VERMONT 05446  
(802) 863-8060 - 864-1878 FAX  
www.champlainconsulting.com



TOM MITCHELL  
RESIDENTIAL SUBDIVISION  
1891 NORTH AVENUE  
EXISTING CONDITIONS  
BURLINGTON VERMONT

DRAWN	CCE
CHECKED	MEC
SCALE	1" = 20'
DATE	10/31/13
JOB NO.	29104
SHEET	C-1

OF 7 SHEETS

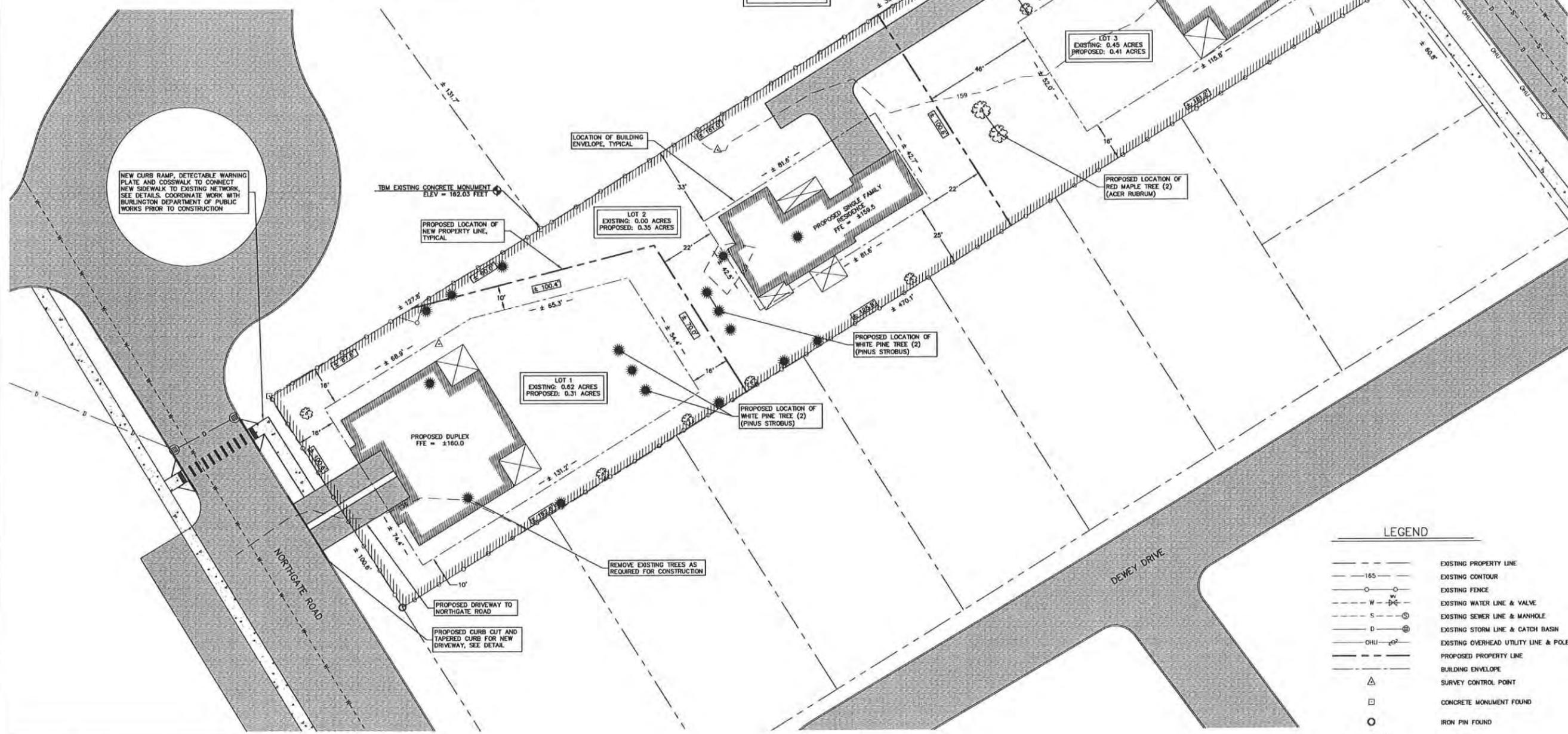
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**ZONING INFORMATION:**

ZONE: RESIDENTIAL LOW-DENSITY (RL) DISTRICT  
 USE: RESIDENTIAL SUBDIVISION

ITEM	REQUIREMENT	LOT 1	LOT 2	LOT 3
MINIMUM ROAD FRONTAGE	80'	167'±	80'	100'±
MINIMUM LOT AREA (SINGLE DETACHED DWELLING)	8,000 SF	N/A	14,092± SF	N/A
MINIMUM LOT AREA (DUPLEX & ABOVE)	10,000 SF	14,898± SF	N/A	17,828± SF
MAXIMUM LOT COVERAGE	35%	23.6%	23.6%	20.0%
MAXIMUM DENSITY	7 UNITS/ACRE	2 UNITS	1 UNIT	2 UNITS
MINIMUM BUILDING SETBACKS				
FRONT YARD	AVG. OF TWO ADJACENT LOTS	16'±	N/A	18'±
SIDE YARD	10% LOT WIDTH OR 5'	SEE PLAN	SEE PLAN	SEE PLAN
REAR YARD	25% LOT DEPTH OR 20'	N/A	25'±	46'±



NEW CURB RAMP, DETECTABLE WARNING PLATE AND CROSSWALK TO CONNECT NEW SIDEWALK TO EXISTING NETWORK. SEE DETAILS. COORDINATE WORK WITH BURLINGTON DEPARTMENT OF PUBLIC WORKS PRIOR TO CONSTRUCTION.

OHAM ZEDEK CEMETERY EXISTING: 0.62 ACRES

LOCATION OF BUILDING ENVELOPE, TYPICAL

LOT 2 EXISTING: 0.00 ACRES PROPOSED: 0.35 ACRES

LOT 3 EXISTING: 0.45 ACRES PROPOSED: 0.41 ACRES

PROPOSED SINGLE FAMILY RESIDENCE FFE = ±158.5

PROPOSED DUPLEX FFE = ±160.0

LOT 1 EXISTING: 0.62 ACRES PROPOSED: 0.31 ACRES

PROPOSED DUPLEX FFE = ±160.0

PROPOSED LOCATION OF WHITE PINE TREE (2) (PINUS STROBUS)

PROPOSED LOCATION OF WHITE PINE TREE (2) (PINUS STROBUS)

REMOVE EXISTING TREES AS REQUIRED FOR CONSTRUCTION

PROPOSED DRIVEWAY TO NORTHGATE ROAD

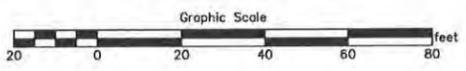
PROPOSED CURB CUT AND TAPERED CURB FOR NEW DRIVEWAY, SEE DETAIL

**PLANTING SCHEDULE:**

DECIDUOUS TREES			
QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE/SPEC.
2	ACER RUBRUM	RED MAPLE	2.5 IN., B&B
EVERGREEN TREES			
4	PINUS STROBUS	WHITE PINE	5-6 FT., B&B

NOTE: PLANT SPECIES MAY CHANGE DEPENDING UPON LOCAL HEALTHY STOCK AVAILABLE

**SITE PLAN**  
SCALE 1" = 20'



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**LEGEND**

---	EXISTING PROPERTY LINE
- - -	EXISTING CONTOUR
---	EXISTING FENCE
W -	EXISTING WATER LINE & VALVE
S -	EXISTING SEWER LINE & MANHOLE
D -	EXISTING STORM LINE & CATCH BASIN
OH -	EXISTING OVERHEAD UTILITY LINE & POLE
---	PROPOSED PROPERTY LINE
---	BUILDING ENVELOPE
△	SURVEY CONTROL POINT
□	CONCRETE MONUMENT FOUND
○	IRON PIN FOUND
☀	EXISTING TREE
☀	PROPOSED TREE
± 470.1'	EXISTING PROPERTY LINE DIMENSION
± 158.0'	PROPOSED PROPERTY LINE DIMENSION
± 50.0'	BUILDING ENVELOPE DIMENSION

REVISION DATE & DESCRIPTION	BY

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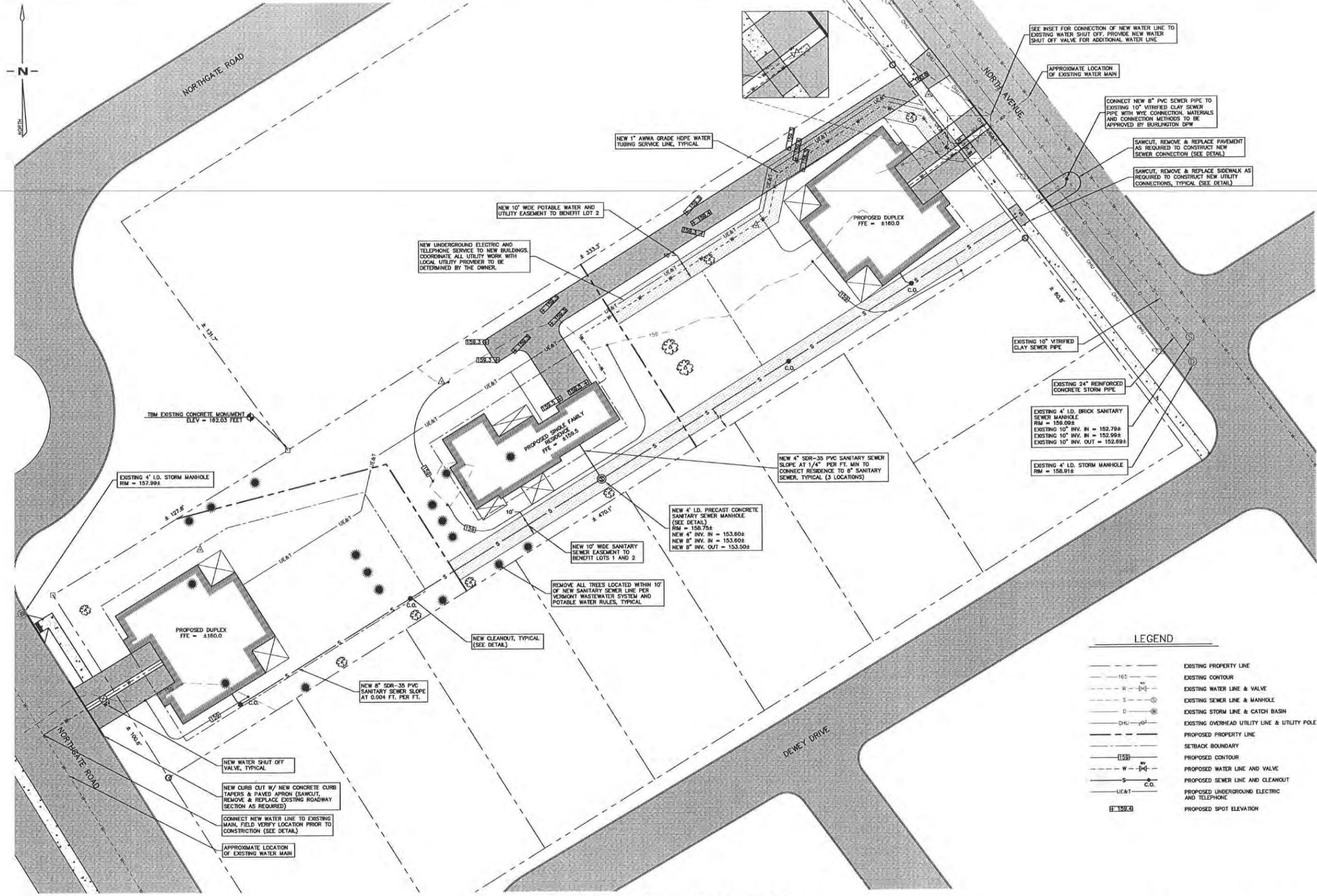
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**TOM MITCHELL**  
 RESIDENTIAL SUBDIVISION  
 1891 NORTH AVENUE  
 SITE PLAN  
 BURLINGTON VERMONT

DRAWN CCE  
 CHECKED MEC  
 SCALE 1" = 20'  
 DATE 10/31/13  
 JOB NO. 29104  
 SHEET

**C-2**  
 OF 7 SHEETS



SEE INSET FOR CONNECTION OF NEW WATER LINE TO EXISTING WATER SHUT OFF. PROVIDE NEW WATER SHUT OFF VALVE FOR ADDITIONAL WATER LINE.

APPROXIMATE LOCATION OF EXISTING WATER MAIN

CONNECT NEW 8" PVC SEWER PIPE TO EXISTING 10" VITRIFIED CLAY SEWER PIPE WITH WYE CONNECTION. MATERIALS AND CONNECTION METHODS TO BE APPROVED BY BURLINGTON DPW

SAWCUT, REMOVE & REPLACE PAVEMENT AS REQUIRED TO CONSTRUCT NEW SEWER CONNECTION (SEE DETAIL)

SAWCUT, REMOVE & REPLACE SIDEWALK AS REQUIRED TO CONSTRUCT NEW UTILITY CONNECTIONS, TYPICAL (SEE DETAIL)

NEW 10" WIDE POTABLE WATER AND UTILITY EASEMENT TO BENEFIT LOT 2

NEW UNDERGROUND ELECTRIC AND TELEPHONE SERVICE TO NEW BUILDINGS. COORDINATE ALL UTILITY WORK WITH LOCAL UTILITY PROVIDER TO BE DETERMINED BY THE OWNER.

PROPOSED DUPLEX FFE = ±160.0

EXISTING 10" VITRIFIED CLAY SEWER PIPE

EXISTING 24" REINFORCED CONCRETE STORM PIPE

EXISTING 4" I.D. BRICK SANITARY SEWER MANHOLE  
RM = 159.09±  
EXISTING 10" INV. IN = 152.79±  
EXISTING 10" INV. IN = 152.99±  
EXISTING 10" INV. OUT = 152.69±

EXISTING 4" I.D. STORM MANHOLE  
RM = 158.91±

NEW 4" SDR-35 PVC SANITARY SEWER SLOPE AT 1/4" PER FT. MIN TO CONNECT RESIDENCE TO 8" SANITARY SEWER, TYPICAL (3 LOCATIONS)

NEW 4" I.D. PRECAST CONCRETE SANITARY SEWER MANHOLE (SEE DETAIL)  
RM = 158.75±  
NEW 4" INV. IN = 153.60±  
NEW 8" INV. IN = 153.60±  
NEW 8" INV. OUT = 153.50±

NEW 10" WIDE SANITARY SEWER EASEMENT TO BENEFIT LOTS 1 AND 2

REMOVE ALL TREES LOCATED WITHIN 10' OF NEW SANITARY SEWER LINE PER VERMONT WASTEWATER SYSTEM AND POTABLE WATER RULES, TYPICAL

NEW CLEANOUT, TYPICAL (SEE DETAIL)

NEW 8" SDR-35 PVC SANITARY SEWER SLOPE AT 0.004 FT. PER FT.

EXISTING 4" I.D. STORM MANHOLE  
RM = 157.99±

TBM EXISTING CONCRETE MONUMENT  
ELEV = 162.03 FEET

NEW WATER SHUT OFF VALVE, TYPICAL

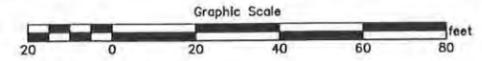
NEW CURB CUT W/ NEW CONCRETE CURB TAPERS & PAVED APRON (SAWCUT, REMOVE & REPLACE EXISTING ROADWAY SECTION AS REQUIRED)

CONNECT NEW WATER LINE TO EXISTING MAIN, FIELD VERIFY LOCATION PRIOR TO CONSTRUCTION (SEE DETAIL)

APPROXIMATE LOCATION OF EXISTING WATER MAIN

LEGEND	
	EXISTING PROPERTY LINE
	EXISTING CONTOUR
	EXISTING WATER LINE & VALVE
	EXISTING SEWER LINE & MANHOLE
	EXISTING STORM LINE & CATCH BASIN
	EXISTING OVERHEAD UTILITY LINE & UTILITY POLE
	PROPOSED PROPERTY LINE
	SETBACK BOUNDARY
	PROPOSED CONTOUR
	PROPOSED WATER LINE AND VALVE
	PROPOSED SEWER LINE AND CLEANOUT
	PROPOSED UNDERGROUND ELECTRIC AND TELEPHONE
	PROPOSED SPOT ELEVATION

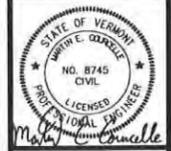
1  
C-3 GRADING AND UTILITY PLAN  
SCALE 1" = 20'



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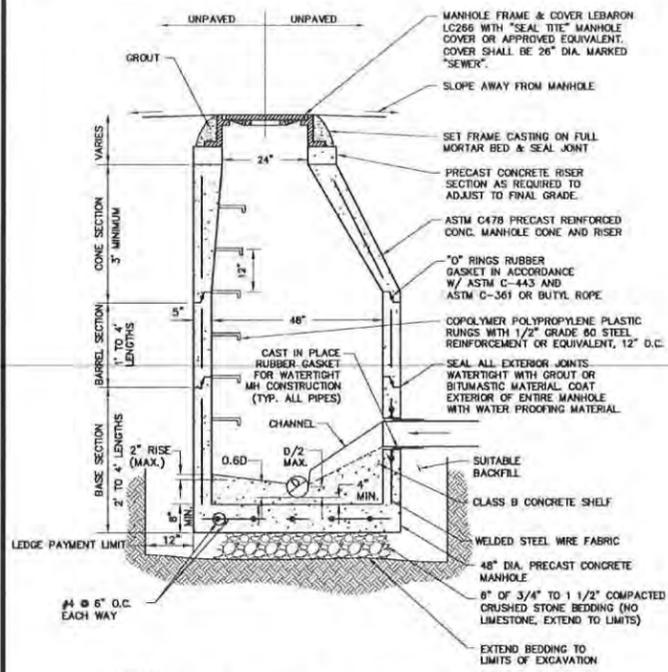


**TOM MITCHELL**  
RESIDENTIAL SUBDIVISION  
1891 NORTH AVENUE  
GRADING AND UTILITY PLAN  
BURLINGTON VERMONT

DRAWN	CCE
CHECKED	MEC
SCALE	1" = 20'
DATE	10/31/13
JOB NO.	29104
SHEET	C-3

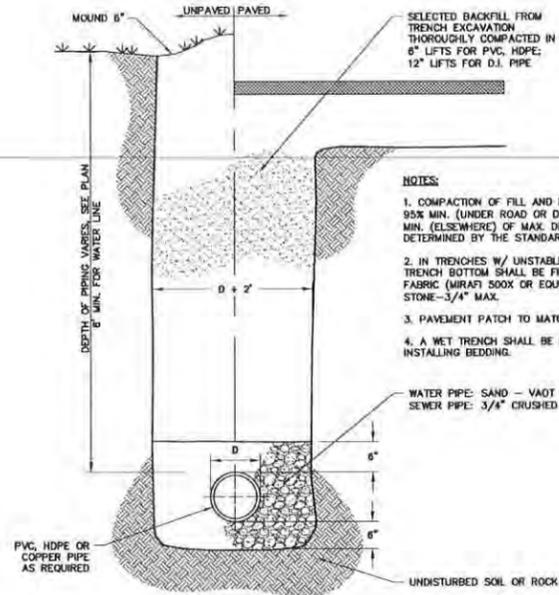
C-3  
OF 7 SHEETS

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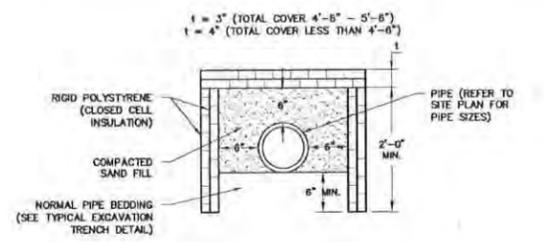
- NOTES:**
1. FORM RIVERT TO SAME RADIUS AS LARGEST PIPE LEAVING SANITARY MANHOLE ALL INVERTS & TRANSITIONS TO BE SMOOTH. NO SHARP BENDS ALLOWED.
  2. INLET & OUTLET PIPES SHALL BE JOINED TO THE MANHOLE WITH A FLEXIBLE WATER TIGHT CONNECTION OR ANY WATER TIGHT CONNECTION ARRANGEMENT THAT ALLOWS DIFFERENTIAL SETTLEMENT OF PIPE AND MANHOLE TO OCCUR.
  3. ALL SANITARY SEWER MANHOLES MUST BE TESTED AND INSPECTED PRIOR TO BACKFILLING THE STRUCTURE.

1 TYPICAL PRECAST SANITARY MANHOLE  
N.T.S.

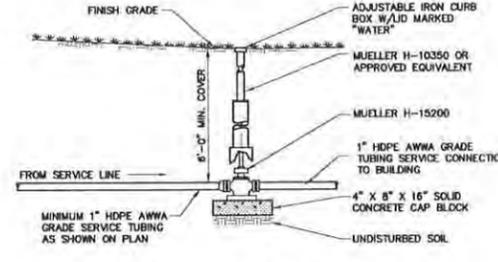


- NOTES:**
1. COMPACTION OF FILL AND BEDDING SHALL BE TO 95% MIN. (UNDER ROAD OR DRIVEWAYS) AND 90% MIN. (ELSEWHERE) OF MAX. DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST.
  2. IN TRENCHES W/ UNSTABLE MATERIALS, THE TRENCH BOTTOM SHALL BE FIRST STABILIZED BY FABRIC (MIRAFI 500X OR EQUIV.) & 6\"/>

2 TYPICAL EXCAVATION TRENCH DETAIL  
N.T.S.

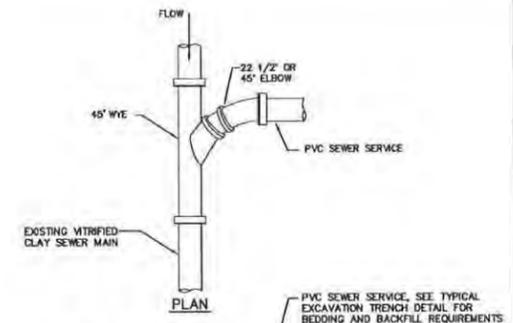


3 SEWER INSULATION DETAIL  
N.T.S.

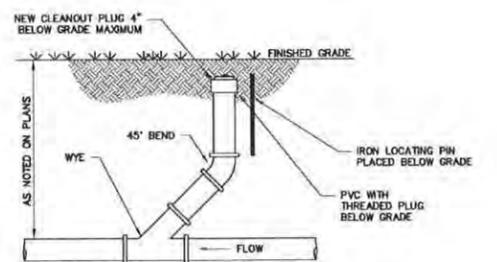


- NOTES:**
1. TEFLON THREAD SEALANT TAPE WILL BE USED ON ALL CONNECTION STOPS PRIOR TO INSULATION.
  - A. SPIRAL WRAP COMPLETELY COVERING THE THREAD AREA WITH TWO WRAPS.
  - B. PIPE DOPE OR OTHER LIQUID THREAD SEALANTS ARE NOT ACCEPTABLE.
  2. LEAVE ONE TO THREE THREADS SHOWING OUTSIDE OF PIPE (A TORQUE OF 35 LB.FT. OR LESS IS RECOMMENDED).
  3. CURB BOXES AND STOPS SHALL NOT BE CONSTRUCTED BENEATH DRIVES OR SIDEWALKS.

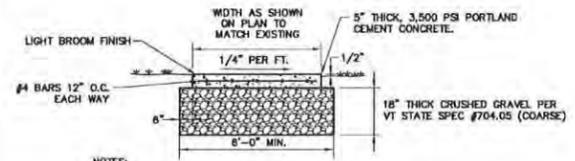
5 TYPICAL WATER SERVICE DETAIL  
N.T.S.



4 SEWER SERVICE DETAIL  
N.T.S.

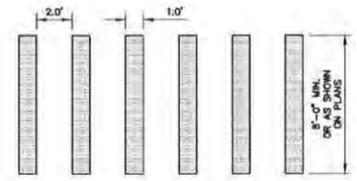


6 TYPICAL CLEANOUT IN GRASS DETAIL  
N.T.S.



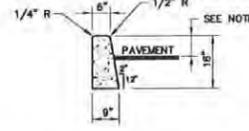
- NOTES:**
1. PROVIDE CONSTRUCTION EXPANSION & CONTRACTION JOINTS EVERY 10' WITH DUMMY JOINTS EVERY 5'.
  2. ALL EXPOSED SURFACES SHALL RECEIVE TWO COATS OF AN APPROVED ANTI-SPALLING COMPOUND.
  3. PLACE AN APPROVED EXPANSION MATERIAL BETWEEN NEW CONCRETE WALKWAYS & NEW OR EXISTING CURB, WALL, WALKWAY OR DRIVEWAY.
  4. ALL CONSTRUCTION JOINTS SHALL HAVE 3/4\"/>

7 CONCRETE SIDEWALK CROSS-SECTION  
N.T.S.



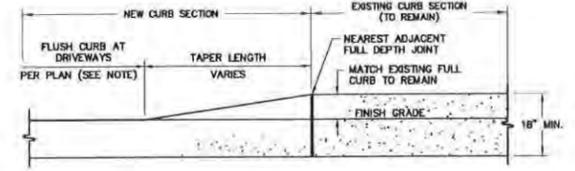
- NOTES:**
1. ACTUAL STRIPING AND ARRANGEMENT MAY DIFFER, SEE SITE PLAN FOR PROPER LAYOUT.
  2. PAINT SHALL CONFORM TO VAOT STANDARD 646.07 - \"DURABLE PAVEMENT MARKINGS\".

8 CROSSWALK DETAIL  
N.T.S.



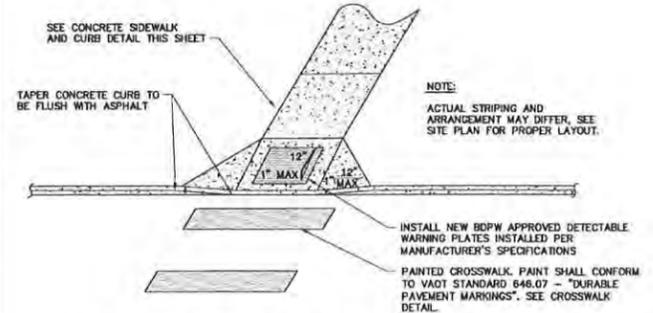
- NOTES:**
1. CURBING SHALL BE VAOT CLASS B CONCRETE, 3,500 P.S.I.
  2. CURBING EXPANSION JOINTS SHALL BE CONSTRUCTED EVERY 10' AND SHALL BE CONSTRUCTED OF AN APPROVED MATERIAL CONFORMING TO AASHTO DESIGNATION M-153.
  3. ALL EXPOSED SURFACES SHALL RECEIVE TWO COATS OF AN APPROVED ANTI-SPALLING COMPOUND.
  4. REVEAL SHALL BE TO MATCH EXISTING WHERE APPLICABLE OR AS SPECIFIED IN THE PLANS AS APPROPRIATE.

9 CONCRETE CURB DETAIL  
N.T.S.

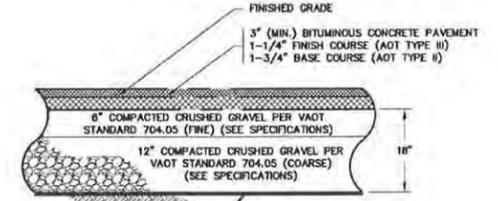


- NOTES:**
1. TAPERS TO FLUSH CURB SHALL HAVE NO VERTICAL REVEAL.
  2. TAPERS CONSTRUCTED AT THE END OF LENGTHS OF NEW OR EXISTING CURB SHALL TERMINATE 1\"/>

10 TYPICAL CURB TAPER  
N.T.S.

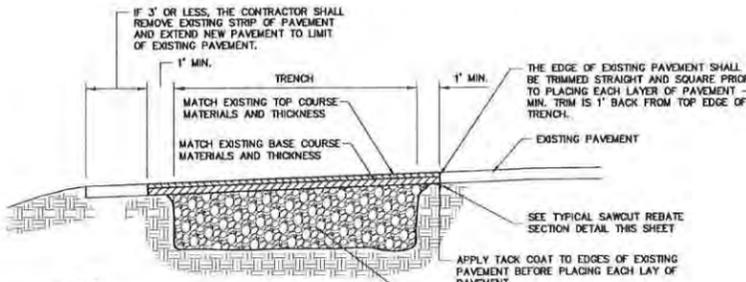


11 HANDICAP RAMP/CROSSWALK DETAIL  
N.T.S.



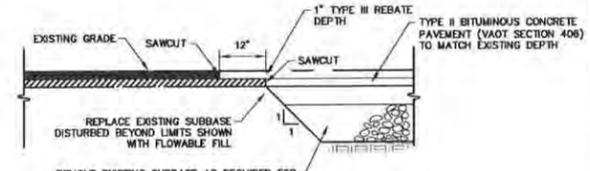
- NOTES:**
- 1) SEE TYPICAL TRENCH SECTION & SPECIFICATIONS REGARDING BACKFILL & SUBBASE REQUIREMENTS.
  - 2) SIGNS & OTHER SAFETY DEVICES SHALL BE INSTALLED & MAINTAINED THROUGHOUT PAVING OPERATIONS.
  - 3) ALL PAVEMENT DAMAGED DURING CONSTRUCTION SHALL BE SAWCUT, REMOVED & REPLACED.
  - 4) AREAS TO RECEIVE PAVEMENT SHALL BE FREE OF LOOSE MATERIAL, MUD & STANDING WATER.
  - 5) ALL AREAS PAVED SHALL BE SWEEPED CLEAN OF ALL DEBRIS IMMEDIATELY FOLLOWING PAVING OPERATIONS.

12 TYPICAL DRIVEWAY/PARKING AREA SECTION  
N.T.S.



- NOTES:**
1. ALL MATERIALS AND WORK SHALL MEET CITY OF BURLINGTON PUBLIC WORKS STANDARDS.
  2. ALL PAVEMENT SHALL HAVE A COMPACTED THICKNESS TO MATCH EXISTING.
  3. ALL EXISTING ROAD LINES SHALL BE RE-MARKED AS NECESSARY.
  4. SHOULDER SHALL BE REPLACED, IF NECESSARY, AS IT EXISTED PRIOR TO CONSTRUCTION.

13 TYPICAL TRENCH/ROAD PAVEMENT REPAIR  
N.T.S.



- NOTES:**
1. EXISTING PAVEMENT SHALL BE SAWCUT STRAIGHT & PLUMB (TYPICAL).
  2. COAT SAWCUT WITH EMULSIFIED ASPHALT PRIOR TO PLACING PATCH MATERIAL PER SPECIFICATIONS.
  3. ALL PAVEMENT SHALL HAVE A COMPACTED THICKNESS TO MATCH EXISTING.
  4. ALL EXISTING ROAD LINES WITHIN THE DISTURBED AREA SHALL BE REPLACED AS REQUIRED.
  5. EXISTING PAVEMENT DAMAGED DURING CONSTRUCTION SUBSEQUENT TO INITIAL SAWCUTTING SHALL BE RE-CUT & PATCHED PER THE DETAIL.
  6. ALL WORK & TRAFFIC CONTROL TO BE APPROVED BY THE CITY OF BURLINGTON DEPARTMENT OF PUBLIC WORKS. THE CONTRACTOR SHALL COORDINATE ALL WORK.
  7. SEE SPECIFICATIONS.

14 TYPICAL SAWCUT/REBATE SECTION  
N.T.S.

REVISION DATE & DESCRIPTION	BY

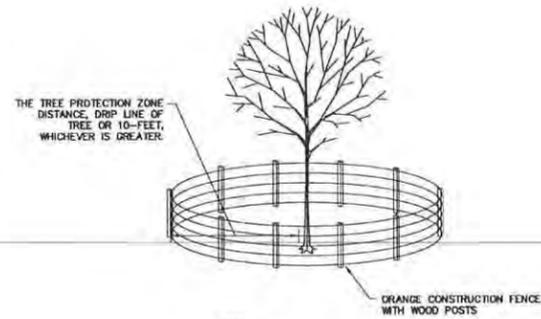
**Champlain Consulting Engineers**  
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**TOM MITCHELL**  
 RESIDENTIAL SUBDIVISION  
 1891 NORTH AVENUE  
 BURLINGTON, VERMONT  
 DETAILS

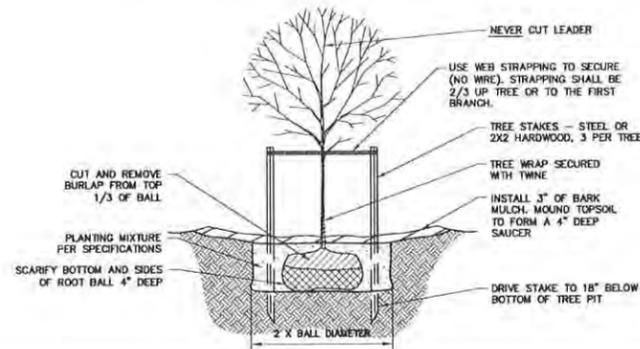
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 SCALE: N.T.S.  
 DATE: 10/21/13  
 JOB NO.: 29104  
 SHEET

**C-4**  
 OF 7 SHEETS



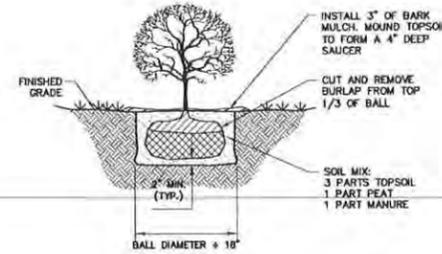
**NOTES:**  
 1. TREE PROTECTION DETAIL TO BE USED ON TREES GREATER THAN 30" IN CALIPER OR OVER 100 YEARS OLD.

1 TREE PROTECTION DETAIL  
 N.T.S.



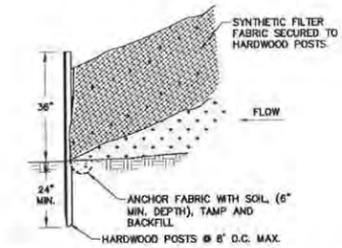
**NOTES:**  
 1. STAKE TREES UNDER 3" CALIPER.  
 2. GUY TREES 3" CALIPER & LARGER.  
 3. TREE ROOT COLLAR SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT BORE TO PREVIOUSLY EXISTING GRADE, EXCEPT IN AREAS OF COMPACTED FILL.  
 4. PLANT TREES SO ROOT COLLAR IS 2"-3" ABOVE FINISHED GRADE.

2 TYPICAL TREE PLANTING DETAIL  
 N.T.S.



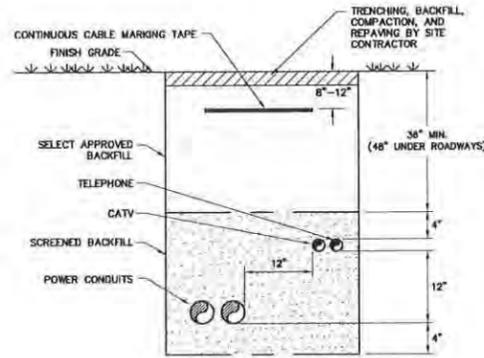
**NOTE:**  
 SHRUB SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT BORE TO PREVIOUS EXISTING GRADE.

3 SHRUB PLANTING DETAIL  
 N.T.S.



**NOTES:**  
 1. SILT FENCE SHALL BE INSTALLED & MAINTAINED DOWNSLOPE OF ALL DISTURBED AREAS & MATERIAL STOCKPILES TO PROTECT UNDISTURBED GRASSED OR LANDSCAPED AREAS, ROADWAYS OR WALKWAYS.  
 2. NO CONSTRUCTION ACTIVITY OR TRAFFIC SHALL BE ALLOWED DOWNSLOPE OF INSTALLED FENCES.  
 3. END SECTIONS OF FENCE SHALL BE ANGLED UPSLOPE & SHALL EXTEND BEYOND THE DISTURBED AREA SUCH THAT ALL SEDIMENT, SILT OR DEBRIS IS CONTAINED.  
 4. INSPECTIONS & MAINTENANCE SHALL BE PERFORMED AS REQUIRED UNTIL PERMANENT VEGETATION IS IN PLACE & THERE IS NO DANGER OF FURTHER EROSION.

4 SILT FENCE DETAIL  
 N.T.S.

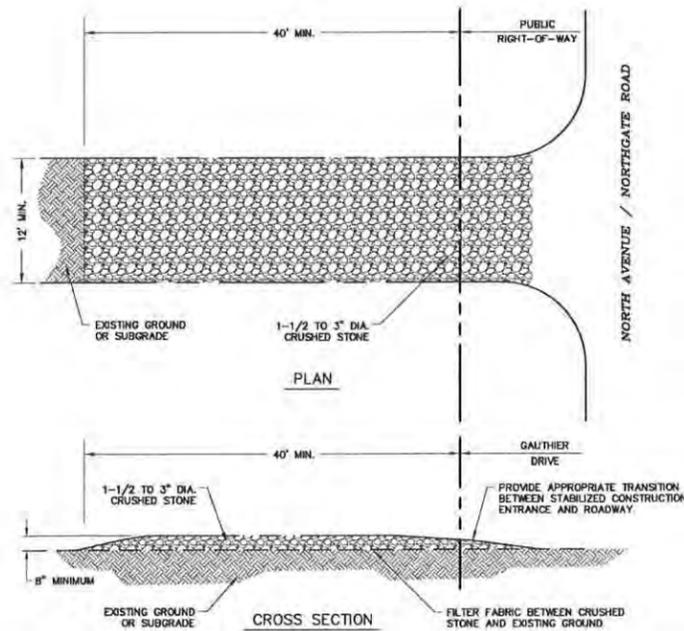


THE GENERAL CONTRACTOR SHALL COORDINATE ALL UTILITY WORK WITH LOCAL UTILITY PROVIDERS TO BE DETERMINED BY THE OWNER.

5 UNDERGROUND ELECTRIC & TELEPHONE CONDUIT TRENCH DETAIL  
 N.T.S.



6 STOCKPILE EROSION CONTROL  
 N.T.S.



**NOTES:**  
 1. TO BE USED AT ALL CONSTRUCTION ACCESS POINTS. NO VEHICLES SHALL ACCESS THE SITE WHERE A STABILIZED ENTRANCE IS NOT PROVIDED.  
 2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN-OUT OF ANY MEASURES USED TO TRAP SEDIMENT, SPILLED, OR WASHED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.  
 3. THE USE OF CALCIUM CHLORIDE OR WATER MAY BE NECESSARY TO CONTROL DUST DURING THE SUMMER.

7 TEMPORARY STABILIZED CONSTRUCTION ENTRANCE DETAIL  
 N.T.S.

SEEDING SPECIFICATION

CONSERVATION MIX GRASS SEED		
% BY WEIGHT	LBS. LIVE SEED PER ACRE	TYPE OF SEED
35	35	CREeping RED FESCUE
23	23	KENTUCKY BLUEGRASS
15	15	ANNUAL RYE
11	11	WINTER HARDY, PERENNIAL RYE
6	6	WHITE CLOVER
10	10	HIGHLAND BENT GRASS
100	100	# LIVE SEED/ACRE

FERTILIZER - 10 LBS PER 1000 SQ FT  
 SPRING SEEDING  
 FALL SEEDING

LIME - 80 LBS PER 1000 SQ FT  
 DOLOMITIC GROUND LIMESTONE  
 NOT LESS THAN 85% OF THE TOTAL CARBONATE

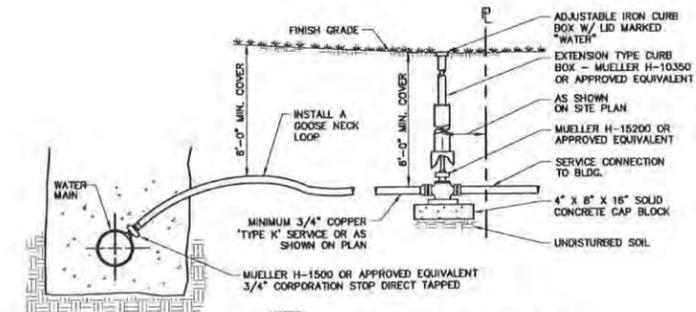
TOPSOIL  
 4" MINIMUM APPROVED TOPSOIL

STRAW MULCH - 2 BALES PER 1000 SQ FT  
 APPLY BINDER OR NETTING AS NEEDED

MAINTENANCE, GUARANTEE AND ACCEPTANCE OF SEEDING

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND MAINTENANCE, INCLUDING WATERING, OF SEEDING AREA UNTIL THE SEEDING IS INSPECTED AND ACCEPTED BY THE OWNER. INSPECTION SHALL BE MADE AFTER THE SECOND MOWING. THE CONTRACTOR SHALL NOTIFY THE OWNER 48 HOURS IN ADVANCE WHEN THE SECOND MOWING IS SCHEDULED. RE-SEEDING SHALL BE DONE UNTIL ALL AREAS ARE COMPLETELY COVERED WITH A MATURE STAND OF GRASS. AN AREA SHALL BE CONSIDERED COVERED WHEN THE ENTIRE SURFACE CONTAINS A VIGOROUS STAND OF GRASS. AREAS THAT, IN THE OPINION OF THE OWNER, ARE PREDOMINANTLY WEEDS SHALL BE TILLED, FINE GRADED, FERTILIZED AND RE-SEEDING IN THE MANNER SPECIFIED ABOVE.

8 SITE RESTORATION  
 N.T.S.



**NOTES:**  
 1. TEFLON THREAD SEALANT TAPE WILL BE USED ON ALL CORPORATION STOPS PRIOR TO INSERTION.  
 A. SPIRAL WRAP COMPLETELY COVERING THE THREAD AREA WITH TWO WRAPS.  
 B. PIPE DOPE OR OTHER LIQUID THREAD SEALANTS ARE NOT ACCEPTABLE.  
 2. LEAVE ONE TO THREE THREADS SHOWING OUTSIDE OF PIPE (A TORQUE OF 35 LBS OR LESS IS RECOMMENDED.)  
 3. CORPORATION STOPS SHALL NOT BE PLACED LESS THAN 1' APART ALONG PIPE.  
 4. CORPORATION BOXES AND STOPS SHALL NOT BE CONSTRUCTED BENEATH DRIVES OR SIDEWALKS.  
 5. VALVE ROD AND PINS SHALL BE STAINLESS STEEL.

9 WATER VALVE DETAIL  
 N.T.S.

REVISION DATE & DESCRIPTION	BY

**Champlain Consulting ENGINEERS**  
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**TOM MITCHELL**  
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 1891 NORTH AVENUE  
 DETAILS  
 BURLINGTON VERMONT

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 10/31/13  
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C-5



POTABLE WATER SYSTEMS

A. Materials

- 1. HDPE PVC Pipe: Pipe shall be HDPE material having a minimum material designation code of PE 4710 or PE 3608. The material shall meet the requirements of ASTM D 3550 and shall have a minimum soil classification of PE45474C for PE 4710 and PE345464C for PE 3608. In addition, the pipe shall be listed as meeting NSF-61. The pipe shall meet the requirements of AWWA C901. Minimum size: 3/4".
2. Fittings: Fittings shall be made from material meeting the same requirements as the pipe. Fittings shall be fabricated by the manufacturer of the pipe. Fittings shall meet the appropriate AWWA standard for the size involved and shall be Pressure Class 150.
3. Valve Box: Cast Iron New England style side-type, five and one-quarter inch (5 1/4") shaft, 5 inch by 6 foot. Tested per NFPA 22. Cover shall be cast iron, marked "WATER" and indicating direction of opening.

B. Installation

1. All pipe and fittings shall be inspected and tested in accordance with the manufacturer's specifications and the aforementioned AWWA Specifications. The Contractor shall furnish for approval certification from the pipe manufacturer that all tests have been performed with satisfactory results. Pipe shall not be installed without the Engineer's or the City of Burlington Department of Public Works approval.

2. Pipe, fittings, and accessories shall be carefully handled to avoid damage. Prior to the date of acceptance of the project work by the Owner, the Contractor shall replace any new pipe or accessory found to be defective at any time, including after installation, at no expense to the Owner. All installation and testing shall be done in accordance with AWWA Standard C600-93 and ANSI Specification A21.11.

3. All pipe showing cracks shall be rejected. If cracks occur in the pipe, the Contractor may, at his own expense and with the approval of the Engineer, cut off the cracked portion at a point at least 12 inches from the visible limits of the crack and use the sound portion of the pipe.

4. All pipe and fittings shall be cleared of all foreign matter and debris prior to installation and shall be kept clean until the time of acceptance by the Owner.

5. At all times, when the pipe laying is not actually in progress, the open ends of the pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed. The pipe shall be installed in trenches and at the line and grade shown on the Contract Drawings. Any deflection joints shall be within the limits specified by the manufacturer.

6. All piping and appurtenances connected to the equipment shall be supported so that no stress will be imposed on the equipment. If the equipment manufacturer's specifications include that piping loads are not to be transferred, the Contractor shall submit certification of compliance.

7. A minimum 18 inch vertical separation between the outside pipe surfaces shall be maintained where force mains cross water mains. Force mains shall cross water mains at or near right angles with one full length of water pipe centered on the force main so both joints are at maximum separation from the force main. Special structural support for the water main and the force main may be required.

8. There shall be no physical connection between the distribution system and any pipes, pumps, hydrants, or tanks which are supplied or may be supplied with a water that is, or may be contaminated.

9. All trenching safety standards shall be in conformance with all applicable State and Federal guidelines and as specified on the plans.

10. The Contractor shall, at all times, keep the trenches entirely free of water until work is finished and trenches are ready for backfilling.

11. Valve boxes are to be installed on all buried valves. The boxes shall be cast iron with a minimum 5 1/4" diameter and long enough to extend from the valve to finished grade. The boxes shall enclose the operating nut and stuffing box of the valves. Valve boxes shall not transfer loads onto the valve.

Covers shall be close fitting and dirt tight with the top of the cover flush with the top of the box rim. Covers shall be marked "WATER" with an arrow indicating direction of opening.

12. Chlorination of the water service shall be conducted only after the service has been flushed and a clear stream is obtained as determined by the Engineer. All chlorination testing shall be done by an independent third party approved by the Engineer and the City of Burlington.

The Contractor shall furnish all labor, equipment, materials, and tools necessary to disinfect the pipe and appurtenances in accordance with the AWWA Standard for Disinfecting Water Mains C651-86 (tablet method not acceptable).

The method of disinfection shall be by the continuous feed method unless otherwise approved by the Engineer. After filling, flushing, and addition of chlorine solution, the chlorine concentration within the pipe shall be at least 10 mg/l. All disinfection shall be performed under the supervision of the Engineer. The disinfection process shall be deemed acceptable only after two samples of water from the flushed disinfectant main show no evidence of bacteriological contamination.

13. The Contractor shall furnish all gauges, testing plugs, caps, and all other necessary equipment and labor to perform a pressure test. All pressure testing shall be done by an independent third party approved by the Engineer and the Department of Public Works. The Contractor shall develop and maintain for two hours, 150 percent (150% of the working pressure measured in pounds per square inch (150 psi - minimum). Failure to hold the designated pressure for the two hour period constitutes a failure of the section tested. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:

L = ND^3 \* P / 7,400
Where:
L = Allowable Leakage (Gals/Hr)
D = Nominal Diameter of Pipe (in)
P = Average Test Pressure (psi)
N = Number of Joints in the Pipeline Tested

All testing shall be conducted in accordance with AWWA C600-93 latest revision.

14. If there is an area where a cover of five feet (5') cannot be maintained over the water line, the Contractor shall notify the Engineer (in writing) for a revised design.

15. All revisions affecting the water line must be approved by the Department of Environmental Conservation - Water Supply Division. As-Built plans shall be provided to the Water Supply Division and the City of Burlington Department of Public Works.

EROSION PREVENTION & SEDIMENT CONTROL

A. General Notes

1. The Contractor shall construct and maintain all erosion measures in accordance with the Vermont Standards & Specifications for Erosion Prevention & Sediment Control' Latest Edition and City of Burlington Public Works Standards and Specifications.

B. Construction Sequence

1. The Contractor shall be responsible for establishing all erosion control measures delineated on the plans and any additional measures that are necessary to minimize erosion. The Contractor shall have erosion control materials and installation equipment on site at all times.

2. Silt fences shall be installed along the base of any fill slopes, around stockpiled material and around the limits of the project location. This shall remain in place until the project site has been stabilized.

3. Control silt through the application of calcium chloride or water.

4. Excavated material from earth excavation and ditch digging shall be disposed of offsite or used for project fill material if determined suitable by the Owner's Representative.

5. All temporary erosion control measures required for any proposed winter work shall be installed prior to October 1. These measures shall be in place prior to the commencement of any snowwork or earth-moving.

C. Temporary Measures

1. Silt Fences - The silt fences shall be placed in accordance with the construction detail. The fence shall generally be located 10 feet from the toe of the slope or as shown on the plan. The ends of the fence shall be placed uphill to form a horseshoe shape to trap all runoff.

The silt fences shall be inspected periodically for damage or build-up of sediments. All damaged fences shall be repaired or replaced. Sediment deposits shall be removed from the fence as they build up and be placed in an area where there is no danger of further erosion.

2. Erosion Matting - Erosion matting shall be placed on all grass-lined swales with profits grades exceeding 5.0% and shall be placed and maintained in accordance with the Vermont Agency of Transportation Standard Specifications Sections 654 and 755.07.

3. Duet Control - During construction, duet will be controlled with water distributed by a truck-mounted spray bar. At the direction of the Engineer, Calcium Chloride (ASTM M 144 or Sodium Chloride M 143) may be used.

4. All stockpile material (topsoil, borrow, etc.) will have a silt fence constructed around the perimeter. Seed and mulch stockpile material as soon as possible to prevent soil erosion and sedimentation off site. Locate stockpiles on the uphill side of the disturbed area, if possible. During windy conditions, stockpiled material shall be covered or watered appropriately to prevent wind erosion.

5. Slopes greater than 1:3 shall have erosion control netting installed to stabilize the slope and reduce the erosion potential. Netting shall be installed on mulched slopes so that all parts are in contact with the soil and mulch. Pin netting with wire staples 3 feet o.c. to ensure full bonding with soil surface.

D. Permanent Measures

1. Grass Lined Swales - All swales that are not stone-lined shall be topsoiled, seeded, fertilized and mulched. Any area which shows signs of erosion shall be reseeded immediately until permanent vegetation is established.

2. Restoration - As soon as construction is completed in a given area, it shall be topsoiled, seeded, fertilized and mulched.

The topsoil shall be submitted to the Extension Service for analysis. Fertilizer shall be applied at approximately a rate of 400 pounds per acre depending on soil analysis. If necessary, lime shall be applied to the topsoil to produce a soil pH of approximately 6.0.

After the finished grade has been established and the fertilizer spread, plant the specific seed mixture and work firmly into the soil. Apply seed on the prepared seed bed with approved mechanical seeders or hydroseeding equipment. Upon completion of the above planting operations, roll all areas, leaving the surface of all areas true to grade, smooth, and free from hollows or other irregularities. Thoroughly water all newly planted areas immediately after planting using a fine spray. Protect banks and seedbeds and prevent or repair erosion that occurs. Banks, swales or other graded areas that have been washed out or have become damaged shall be repaired immediately. Unless approval is granted by the Engineer to plant off season, seeding will be conducted only during the period from April 15th to October 15th. So as not to cause interference, no seeding is to proceed before other phases of the work have progressed sufficiently.

After seeding, mulch shall be applied at a rate of 2 tons per acre.

E. Winter Construction

1. If due to the project schedule, construction during the winter months is necessary, the contractor shall follow the winter construction procedures outlined in the "Vermont Handbook for Soil Erosion and Sediment Control on Construction Sites".

a. Minimize disturbance between October and May.

b. All erosion control measures shall be in place prior to the ground freezing.

c. Mulch shall be applied to all disturbed area at a rate of 90 pounds per 1,000 square feet. The Contractor shall maintain all areas that are mulched until permanent vegetation can be established.

F. Maintenance, Guarantee and Acceptance

1. The Contractor shall be responsible for the care and maintenance including watering of seeded areas, until the seeding is inspected and accepted by the Owner.

2. Reseeding shall be done until all areas are completely covered with a mature stand of grass. An area shall be considered covered when the entire surface contains a verdant stand of grass. Areas that, in the opinion of the Engineer, are predominantly weeds shall be plowed up, fire graded, fertilized and reseeded in the manner specified previously, exercising caution not to cause damage to new or existing plant material.

3. The contractor shall maintain and guarantee all seeded areas until acceptance by the owner.

TOPSOIL

A. A minimum 4" layer of topsoil shall be distributed and fine graded on all areas that are designated for turf establishment or planting.

B. Topsoil shall be of native soil stockpiled on site or from a local source and screened to provide a natural, friable, workable consistency that will promote healthy, vigorous, sustained turf grass and plant material growth. Screened material as required shall be undertaken to ensure that the topsoil is free of refuse, debris, building materials, roots, stones larger than 1/4" in diameter, brush, weeds, noxious herbicides and any other material that would be detrimental to plant establishment and health.

C. Any new topsoil brought on site and/or soils used from the site must be of a quality which has demonstrated the capability of supporting turf grass and/or plant material health, and to be reasonably free draining.

D. Topsoil shall be free, in particular, of quackgrass rhizomes (Agropyron repens) and the nut-like tubers of nut grass (Cyperus esculentus) and/or other local weed seeds which may germinate during or after turf grass seeding and establishment. If a sterility or herbicide has been or is used on the topsoil, the landscape contractor shall assume responsibility for allowing for the proper disposition of such sterility, herbicides or other toxic materials prior to the placement of topsoil on the site, and so as to not affect plant establishment or growth.

E. In establishing the proper medium for turf grass and plant establishment, the landscape contractor shall ensure that the proper pH of between 6 and 7 is present for the health and maintenance of the turf grass and plants to be installed.

F. A supplemental additive to the topsoil for establishing the proper pH and for planting pits and areas to provide a suitable growing medium for trees, shrubs and ground covers shall be employed as necessary. The additive shall be an organic compost, "Nutri-Humus" or equal as supplied by Vermont Natural Agriculture Products, Route 51, Middlebury, VT (802-385-1137) or another vendor. The content of the organic compost shall be 1-1/2% nitrogen, 1% phosphorus, 1% potassium and the remainder dry matter content. No sludge or municipal sludge shall be included in this mix or application.

FLOWABLE FILL

PART 1 - EXECUTION

1.01 SECTION INCLUDES

A. Flowable Fill (cement stabilized backfill)

1.02 RELATED SECTIONS

A. General Specifications

B. Cast-in-Place Concrete

1.03 SUBMITTALS

A. Submit the following in accordance with Section D1333, Submittal Procedures.

1. Provide design mixes and test reports.

2. Batch tickets.

3. Field test reports.

1.04 DESCRIPTION

A. Flowable fill may be used for replacement of structural subsurface material where traditional methods of compaction are impractical, trenches, pipe structures, fill for abandoned water and sewer lines, other works where utilities exist and firm support is required or as directed in the plans.

B. The use of flowable fill around or adjacent to utility lines or structures shall be reviewed and approved by The City of Burlington Public Works Department.

1.05 QUALITY ASSURANCE

A. When work or portions of work of this section are completed and require testing, notify the Engineer.

B. Ensure all required cast-in-place concrete, embedment items, and utility work has been completed prior to placing flowable fill.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide materials and construction requirements for Flowable Fill conforming to Vermont Agency of Transportation Standard Specifications

2.02 FLOWABLE FILL

A. Mix and deliver flowable fill in accordance with ASTM C94.

B. Use accelerating admixtures in cold weather only when approved by the Engineer. Use of admixtures will not relax flowable placement requirements.

C. Use set retarding admixtures during hot weather only when approved by the Engineer.

D. Do not use calcium chloride as a setretarder.

E. Add air-entraining agent if required to produce a flowable mix.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that all items of cast-in-place concrete, grading, trenching, and all utilities and other embedded items are in place prior to placing flowable fill.

B. Flowable fill shall not be used as a substitute for sand bedding or earth backfill for primary utilities unless approved by the City of Burlington Public Works Department.

3.02 PREPARATION

A. Remove all loose material from the uneven turf and the concrete structures.

B. Set elevation marks or otherwise determine the proper top elevation for the flowable fill.

3.03 PLACEMENT OF FLOWABLE FILL

A. Notify the Engineer a minimum of 24 hours prior to placement of flowable fill.

B. Flowable fill may be placed by direct discharge from the truck, by pumping, or by other approved methods.

C. The flowable fill shall be placed in a uniform manner that will prevent voids or segregation of the bedding and filling material. If required, the flowable fill shall be consolidated with internal vibrators.

D. Pipes, reinforcement, inserts, or other embedded parts shall be placed, supported, and secured in a manner that shall prevent the flowable fill from displacing, sagging, or from flexing embedded items.

E. Flowable fill shall be brought up uniformly to the fill line shown on the plans. Formed walls or other bulkheads shall be constructed to withstand the exerted hydrostatic pressure and confine the material within a designated space.

F. Placement of flowable fill shall start only when weather conditions are favorable. The temperature shall be at least 35 degrees F and rising. Flowable fill shall not be placed on frozen ground or when it is raining.

3.04 CURING AND PROTECTION

A. Immediately after placement, protect flowable fill from premature drying, excessively hot or cold temperatures and mechanical injury.

B. The flowable fill shall not be subjected to load and shall remain undisturbed by construction activities for at least 24 hours after placement.

3.05 FIELD QUALITY CONTROL

A. Testing of flowable fill is not necessarily required. If testing is requested by the Owner, it shall be in accordance with the appropriate Specification.

B. Provide unobstructed access to work and cooperate with appointed firm.

3.06 DEFECTIVE FLOWABLE FILL

A. Do not accept or place defective flowable fill that is not in conformance with acceptance criteria. Return the best flowable fill to the supplier.

B. Defective flowable fill is flowable fill having excessive honeycombs, embedded debris, higher than maximum compressive strength, or not conforming to required tests, details, dimensions, tolerances or specified requirements. Repair or replace defective flowable fill as directed by the Engineer.

C. Replace flowable fill not in conformance with details, tolerances, and other construction requirements of Contractor's expense.

END OF SECTION

TOPSOIL SPECIFICATION

A. Use suitable topsoil previously stockpiled on the site. Amend stockpiled silt subsoil with sand and organic material as necessary to create additional topsoil. Furnish any additional topsoil from off-site sources.
B. Topsoil, whether stripped from site, amended on-site, or supplied from off-site, shall be a sandy loam as defined by the USDA Soil Conservation Service Soil Classification System, and conforming to the following:

Table with 4 columns: Mechanical Analysis, % of Total, Textured Class, Weight, Average %
Silt (0.002-0.05 mm dia. range) 15 to 35 25
Clay (less than 0.002 mm dia. range) 5 to 25 15

- 3. Free of stones 1 in. in longest dimension, earth clods, plant parts, and debris.
4. Organic matter content equal to 4 to 12% of total dry weight.

C. Topsoil shall have a pH value range of 6.0 to 8.5.
1. If planting soil mixture does not fall within the required pH range, limestone or aluminum sulfate shall be added to bring the pH within the specified limit.
2. If pH is below desired level add ground limestone. If pH is above desired level add aluminum sulfate.

PLANTING NOTES

- 1. No planting will be installed until all grading and construction has been completed in immediate area.
2. Contractor to verify all utilities on property and to protect all utilities during excavation.
3. If there is a discrepancy between the number of plants shown on the plan and the number of plants shown in the plant list, the number of plants shown on the plan will take precedence.
4. All container material to be grown in container a minimum of 6 months.
5. All material shall comply with the latest edition of the American standard for nursery stock, American Association of Nurserymen.
6. Contractor shall repair all damage to property from planting operations at no cost to the owner.
7. Contractor shall guarantee new plant material through one calendar year from time of provisional acceptance.
8. All proposed plants shall be located carefully as shown on the plans and the placement shall be approved by the owner.
9. All disturbed areas not to be paved or planted shall be loamed and seeded as shown. See specifications for soil preparation and seed mix.
10. Wrapping material shall be first quality, heavy waterproof crepe paper manufactured for this purpose. Wrap all trees planted. Trees shall be wrapped during period from 9/15-12/1.
11. Two inch (2") deep, finely shredded bark mulch will be installed under all trees and shrubs that are isolated from ground cover areas and general shrub masses.
12. Soil mix: 1/3 peat moss, 1/3 screened loam, 1/3 dehydrated manure.
13. Maintain all plantings through 1 year guarantee period, including watering.

Revision table with columns: REVISION DATE & DESCRIPTION, NO.

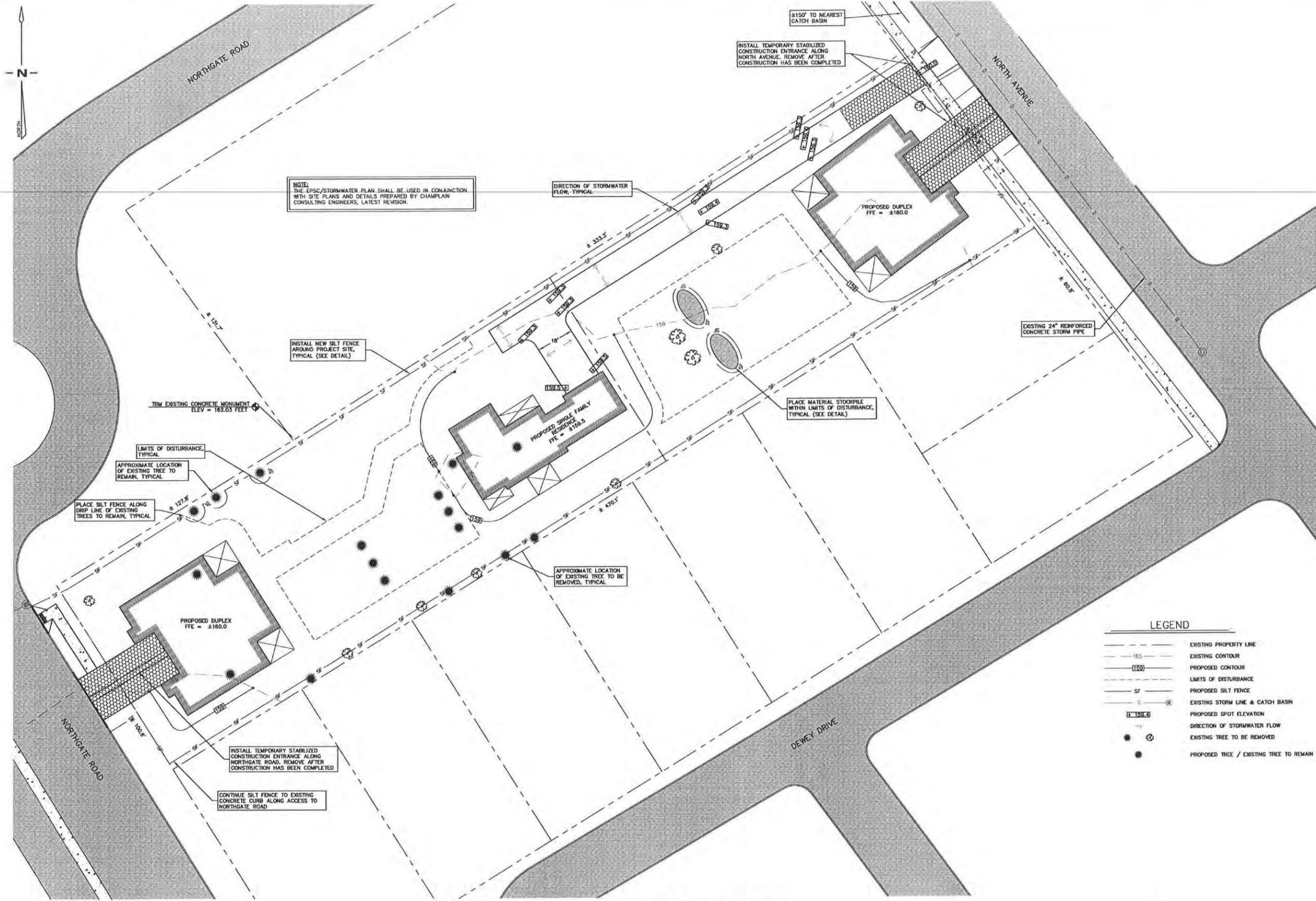
Champlain Consulting ENGINEERS
185 PRIME ROAD, P.O. BOX 453
COLCHESTER, VERMONT 05446
(802) 863-8060 • 864-1878 FAX
www.champlainconsulting.com



TOM MITCHELL
RESIDENTIAL SUBDIVISION
1891 NORTH AVE
SPECIFICATIONS
BURLINGTON VERMONT

Table with columns: DRAWN, CHECKED, SCALE, DATE, JOB NO., SHEET

C-7
OF 7 SHEETS



NOTE:  
THE EPSC/STORMWATER PLAN SHALL BE USED IN CONJUNCTION WITH SITE PLANS AND DETAILS PREPARED BY CHAMPLAIN CONSULTING ENGINEERS, LATEST REVISION.

DIRECTION OF STORMWATER FLOW, TYPICAL

INSTALL TEMPORARY STABILIZED CONSTRUCTION ENTRANCE ALONG NORTH AVENUE. REMOVE AFTER CONSTRUCTION HAS BEEN COMPLETED

INSTALL NEW SILT FENCE AROUND PROJECT SITE, TYPICAL (SEE DETAIL)

TBM EXISTING CONCRETE MONUMENT  
ELEV = 162.03 FEET

LIMITS OF DISTURBANCE, TYPICAL

APPROXIMATE LOCATION OF EXISTING TREE TO REMAIN, TYPICAL

PLACE SILT FENCE ALONG DRIP LINE OF EXISTING TREES TO REMAIN, TYPICAL

PROPOSED DUPLEX  
FFE = ±160.0

PROPOSED SINGLE FAMILY RESIDENCE  
FFE = ±169.5

PLACE MATERIAL STOCKPILE WITHIN LIMITS OF DISTURBANCE, TYPICAL (SEE DETAIL)

EXISTING 24" REINFORCED CONCRETE STORM PIPE

APPROXIMATE LOCATION OF EXISTING TREE TO BE REMOVED, TYPICAL

INSTALL TEMPORARY STABILIZED CONSTRUCTION ENTRANCE ALONG NORTHGATE ROAD. REMOVE AFTER CONSTRUCTION HAS BEEN COMPLETED

CONTINUE SILT FENCE TO EXISTING CONCRETE CURB ALONG ACCESS TO NORTHGATE ROAD

**LEGEND**

	EXISTING PROPERTY LINE
	EXISTING CONTOUR
	PROPOSED CONTOUR
	LIMITS OF DISTURBANCE
	PROPOSED SILT FENCE
	EXISTING STORM LINE & CATCH BASIN
	PROPOSED SPOT ELEVATION
	DIRECTION OF STORMWATER FLOW
	EXISTING TREE TO BE REMOVED
	PROPOSED TREE / EXISTING TREE TO REMAIN

**1** STORMWATER/EPSC PLAN  
SCALE 1" = 20'

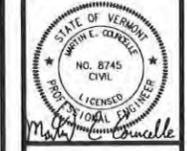


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NO.	REVISION, DATE & BY

**Champlain Consulting ENGINEERS**  
185 PRIMM ROAD, P.O. BOX 453  
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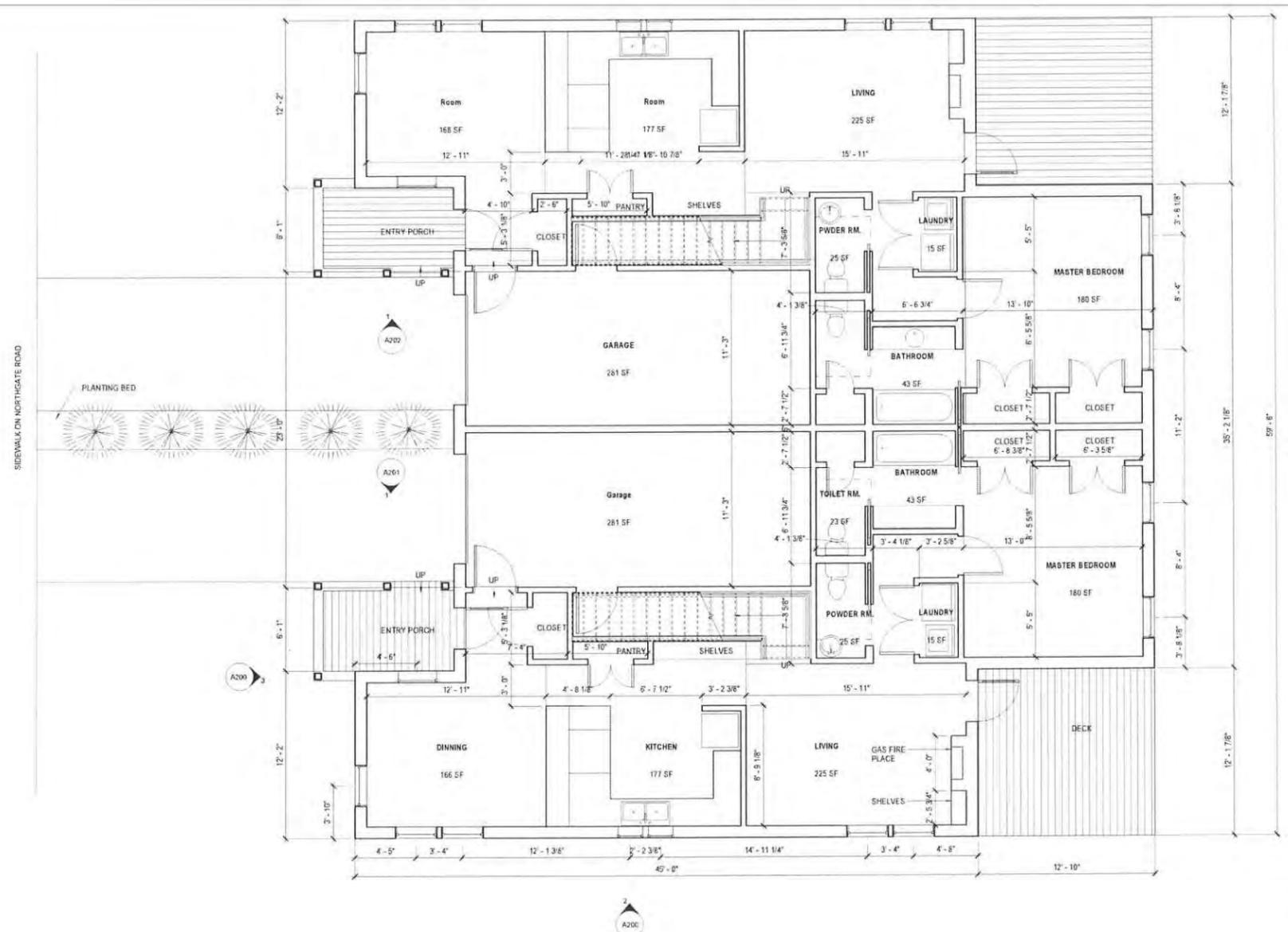


**TOM MITCHELL**  
RESIDENTIAL SUBDIVISION  
1891 NORTH AVENUE  
STORMWATER/EPSC PLAN  
BURLINGTON VERMONT

DRAWN: CCE  
CHECKED: MEC  
SCALE: 1" = 20'  
DATE: 10/31/13  
JOB NO.: 29104  
SHEET

**EC-1**  
OF 1 SHEETS

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1  
 A100 LEVEL 1  
 SCALE 1/4" = 1'-0"

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4. COORDINATE ALL WATER, SEWER AND ELECTRICAL CONNECTIONS WITH SUB-CONTRACTOR.

MITCHELL PROJECT  
 DUPLEX #2  
 NORTHGATE ROAD  
 BURLINGTON, VT

08.23.13

FLOOR PLAN -  
 LEVEL 1

A100

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1 LEVEL 1  
 SCALE: 1/4" = 1'-0"

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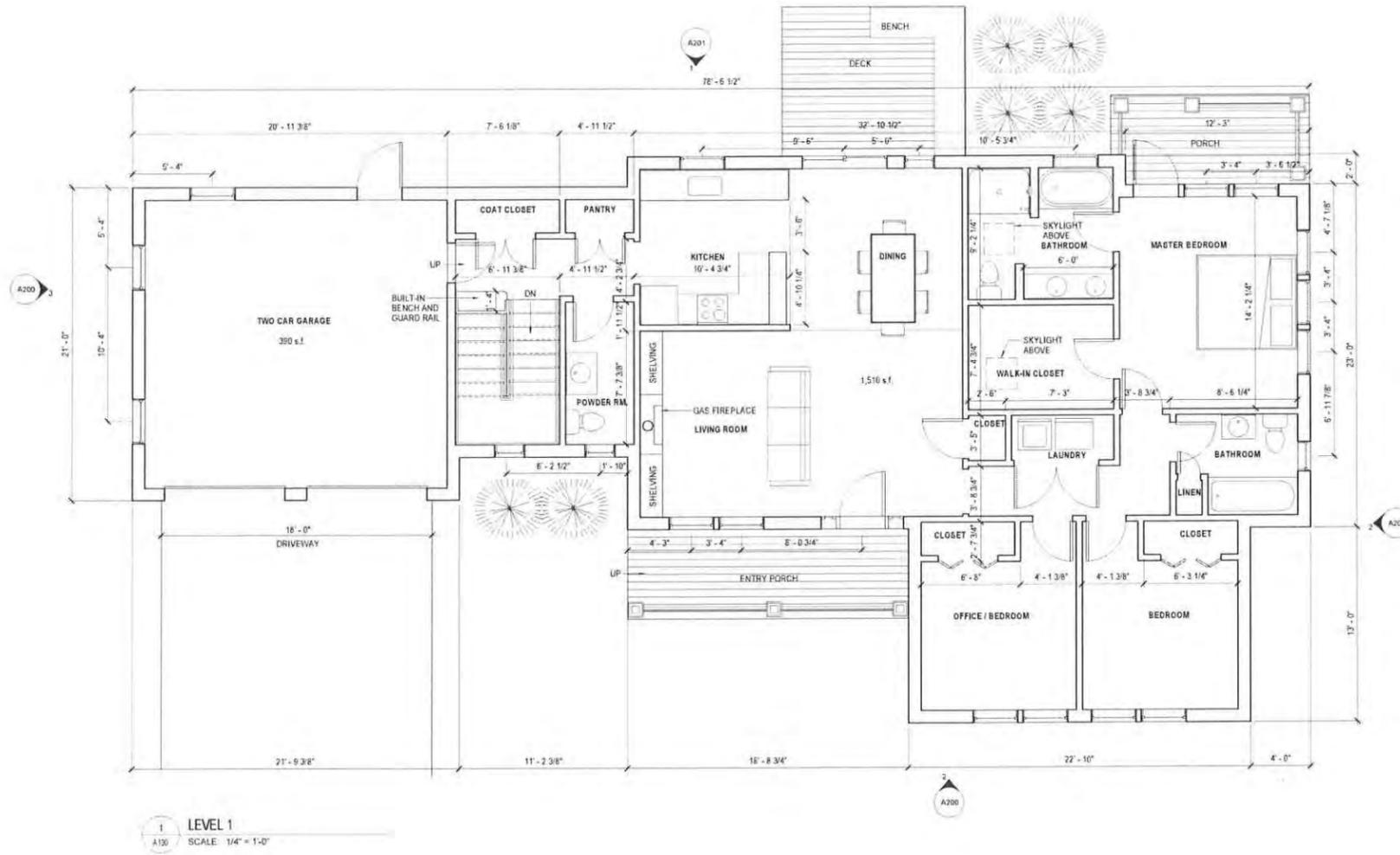
MITCHELL PROJECT  
 DUPLEX #1  
 NORTH AVENUE  
 BURLINGTON, VT

08.23.13

FLOOR PLAN -  
 LEVEL 1

11/13/13  
**A100**

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1  
 A100 LEVEL 1  
 SCALE: 1/4" = 1'-0"

MITCHELL PROJECT  
 SINGLE FAMILY  
 NORTH AVENUE  
 BURLINGTON, VT

09.16.13

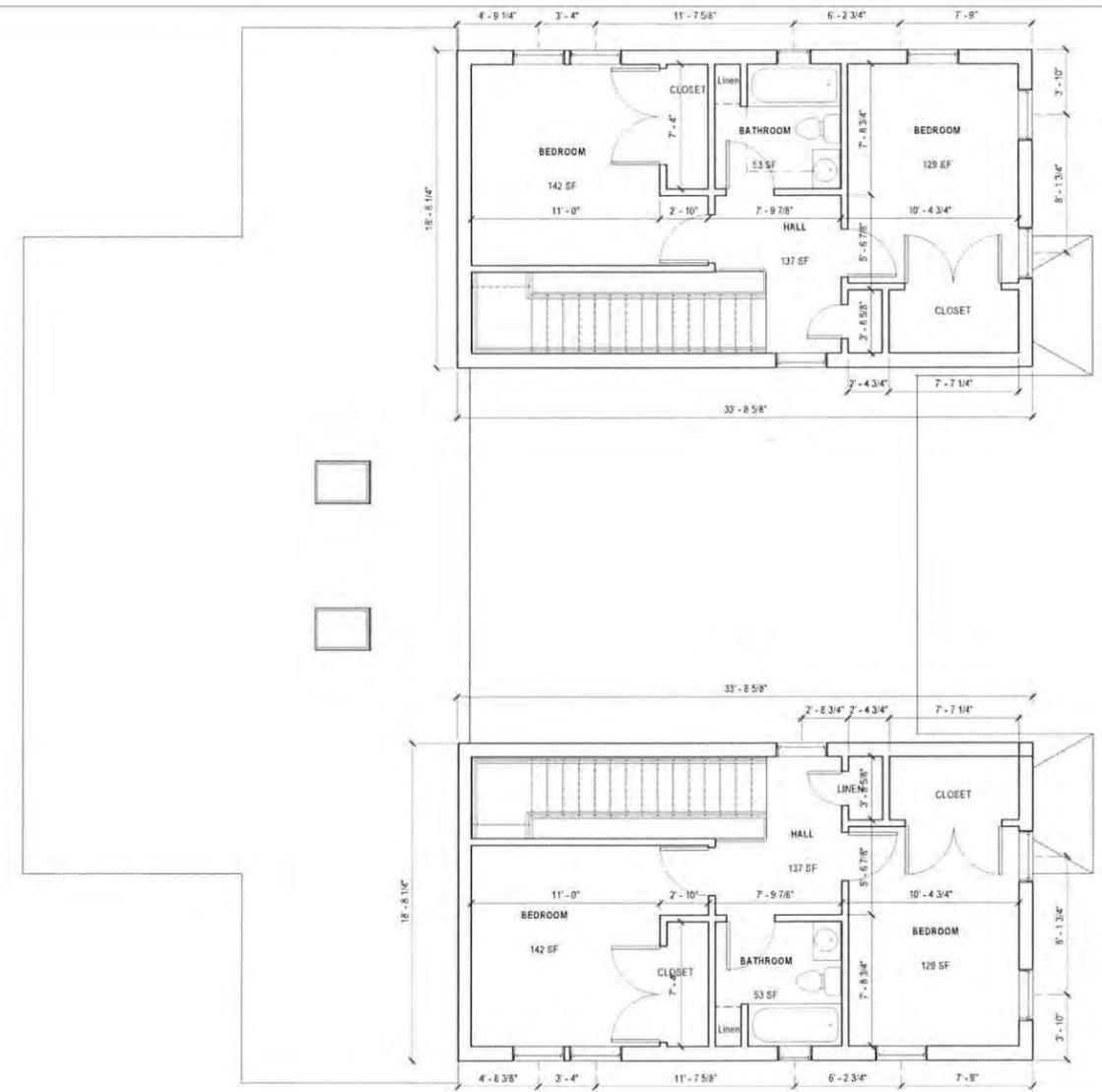
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FLOOR PLAN -  
 LEVEL 1

SHEET NO  
**A100**

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1 LEVEL 2  
 A101 SCALE: 1/4" = 1'-0"

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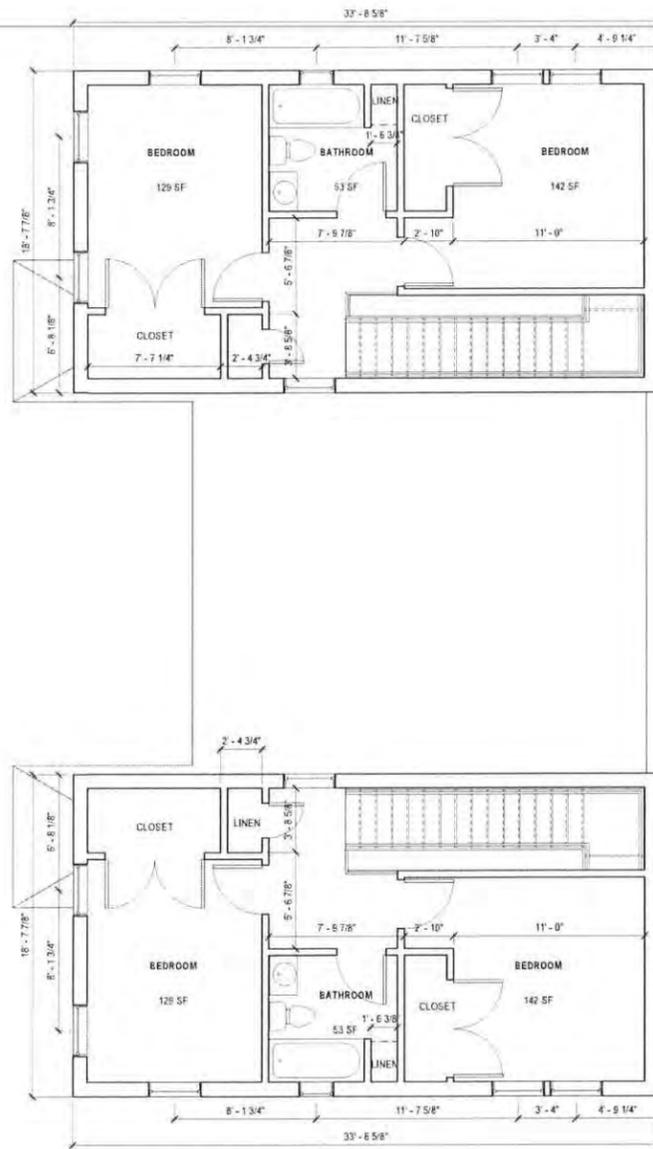
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FLOOR PLAN -  
 LEVEL 2

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1 LEVEL 2  
 A101 SCALE 1/4" = 1'-0"

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 DUPLEX #2  
 NORTHGATE ROAD  
 BURLINGTON, VT

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FLOOR PLAN -  
 LEVEL 2

A101

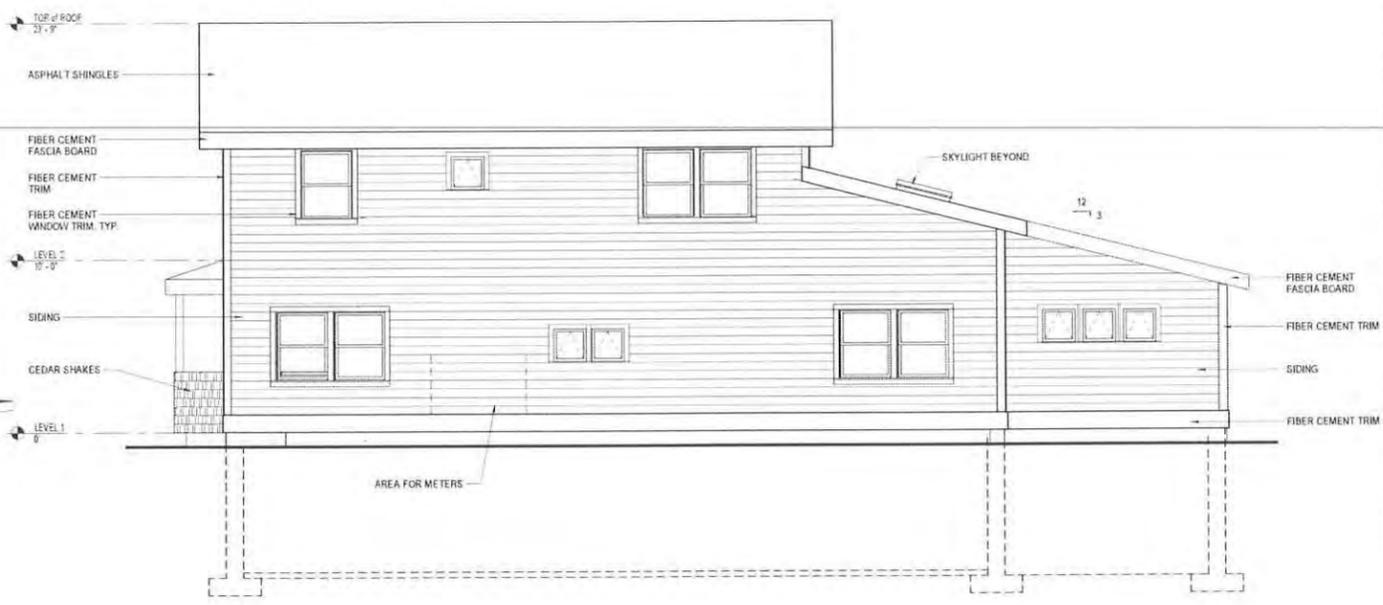
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4 SOUTH EAST  
 A200 SCALE



2 ELEVATION - SOUTH  
 A200 SCALE 1/4" = 1'-0"



1 SOUTH WEST  
 A200 SCALE



3 ELEVATION - WEST  
 A200 SCALE 1/4" = 1'-0"

MITCHELL PROJECT  
 DUPLEX #2  
 NORTHGATE ROAD  
 BURLINGTON, VT

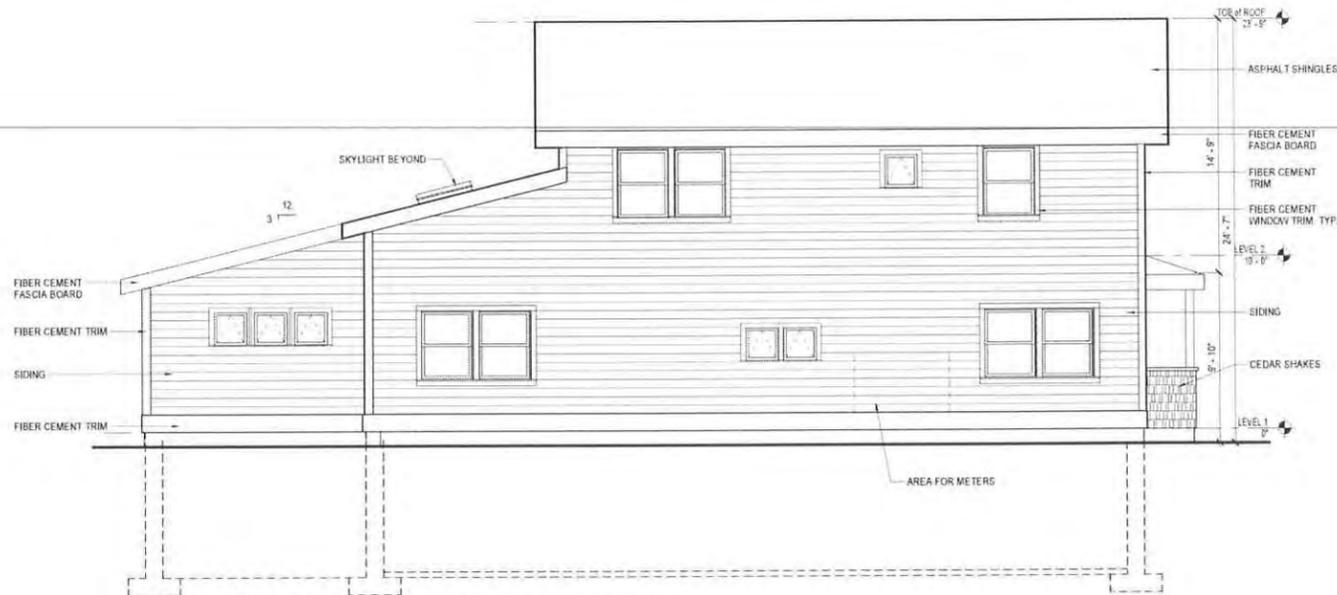
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ELEVATIONS

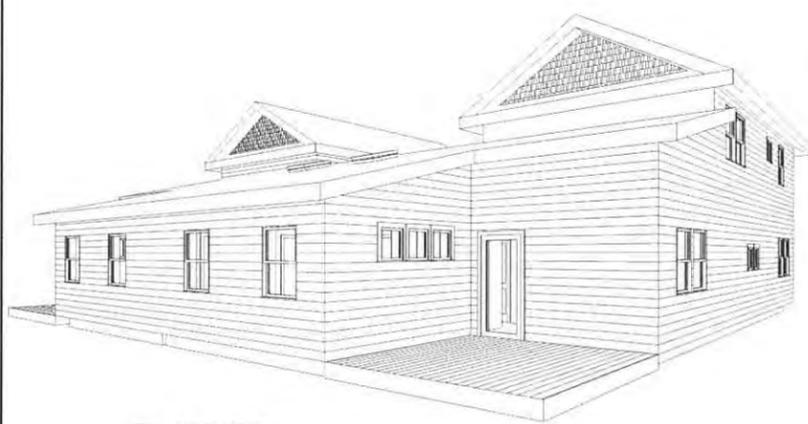
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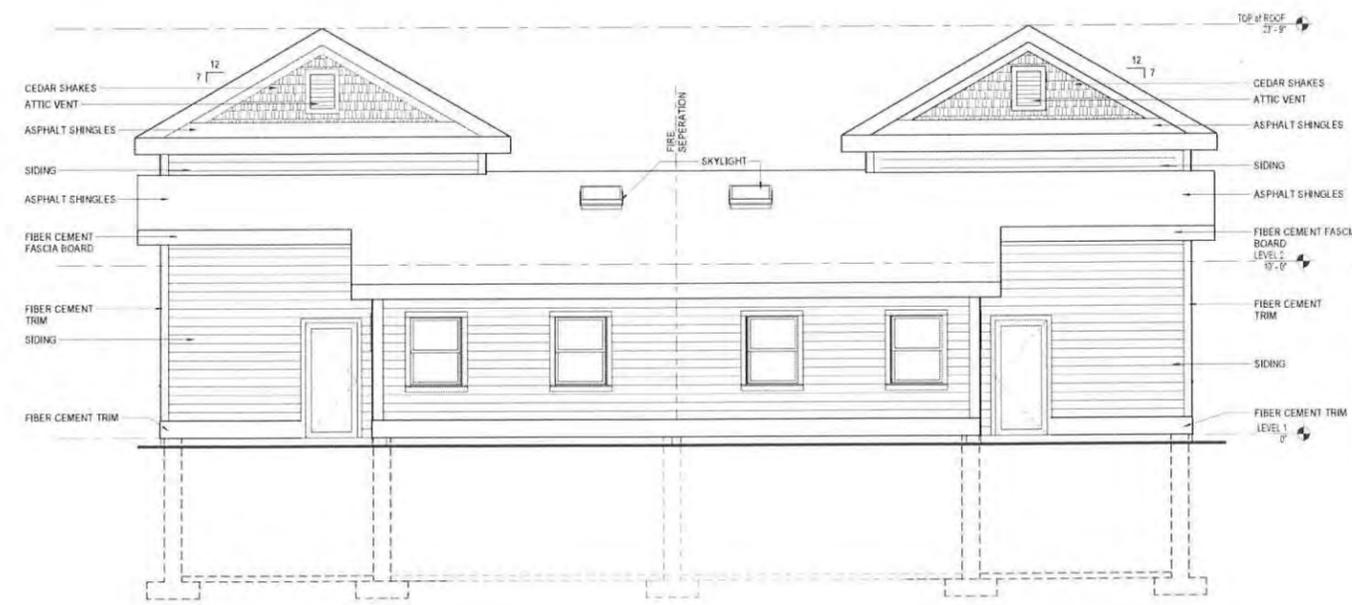
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2 ELEVATION - SOUTH  
SCALE: 1/4" = 1'-0"



1 SOUTH WEST  
SCALE: 1/4" = 1'-0"



3 ELEVATION - WEST  
SCALE: 1/4" = 1'-0"

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NORTH AVENUE  
BURLINGTON, VT

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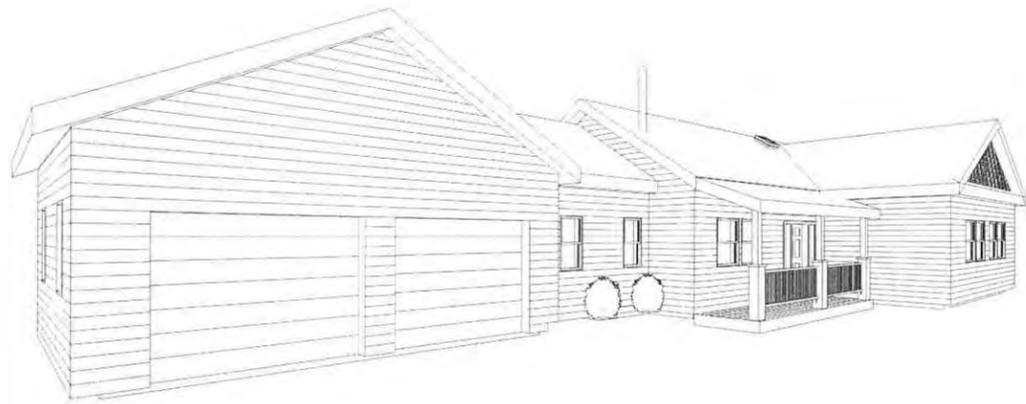
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CHITING  
A200

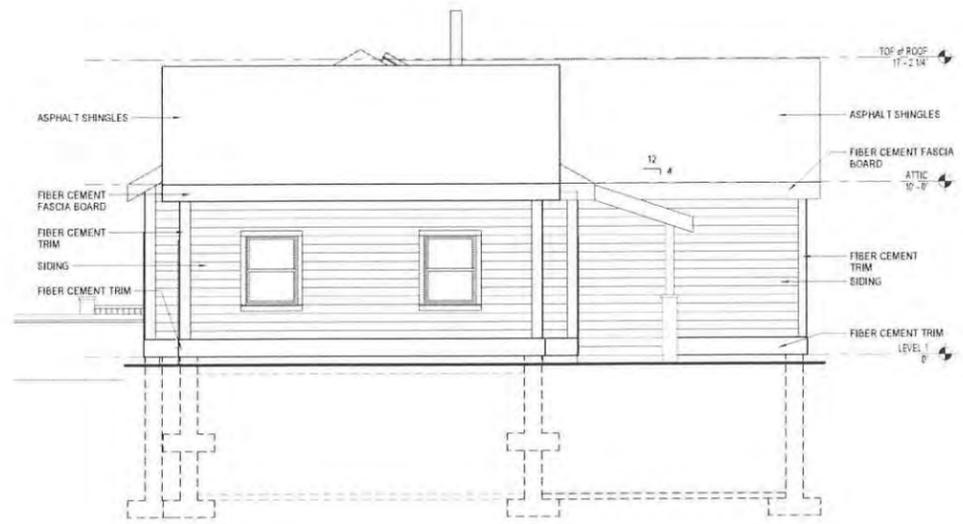
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2 ELEVATION - SOUTH  
 SCALE: 1/4" = 1'-0"



1 SOUTH WEST  
 SCALE: NOT TO SCALE



3 ELEVATION - WEST  
 SCALE: 1/4" = 1'-0"

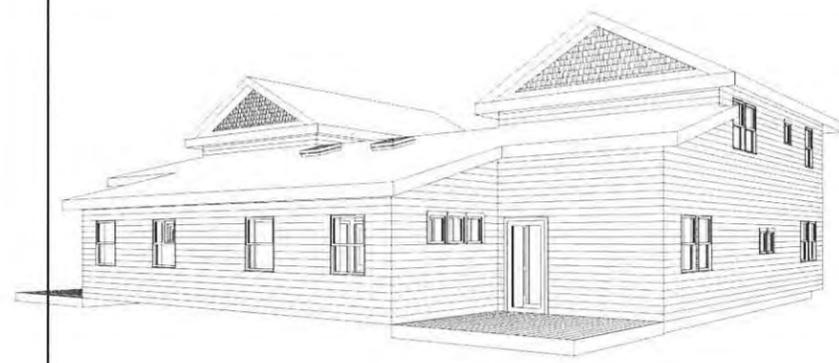
MITCHELL PROJECT  
 SINGLE FAMILY  
 NORTH AVENUE  
 BURLINGTON, VT

09.18.13

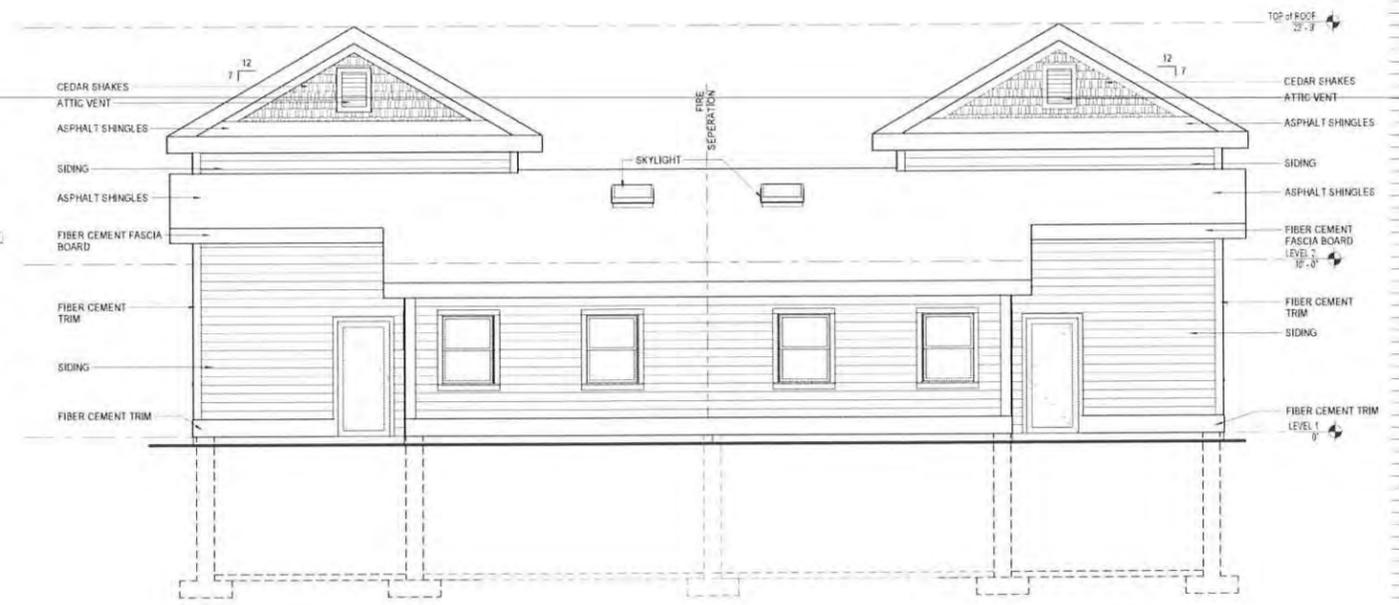
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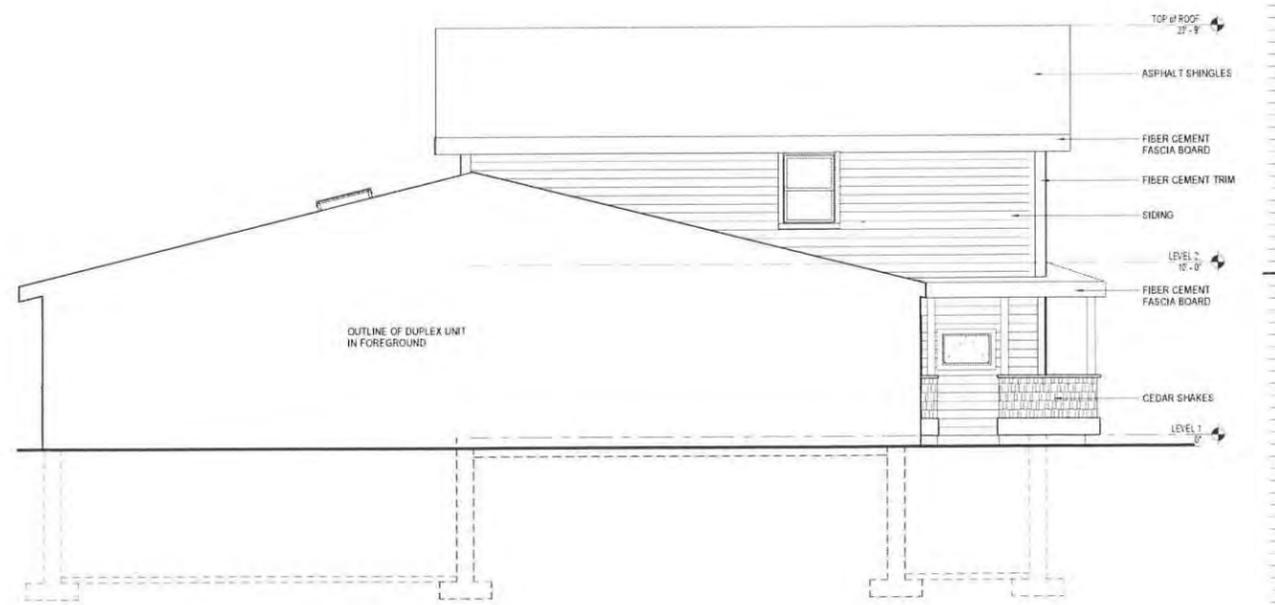
3 NORTH EAST  
 A201 SCALE



2 ELEVATION - EAST  
 A201 SCALE 1/4" = 1'-0"



4 NORTH WEST  
 A201 SCALE



1 ELEVATION - PARTIAL NORTH  
 A201 SCALE 1/4" = 1'-0"

MITCHELL PROJECT  
 DUPLEX #2  
 NORTHGATE ROAD  
 BURLINGTON, VT

08.23.13

ELEVATIONS

PROJECT  
**A201**



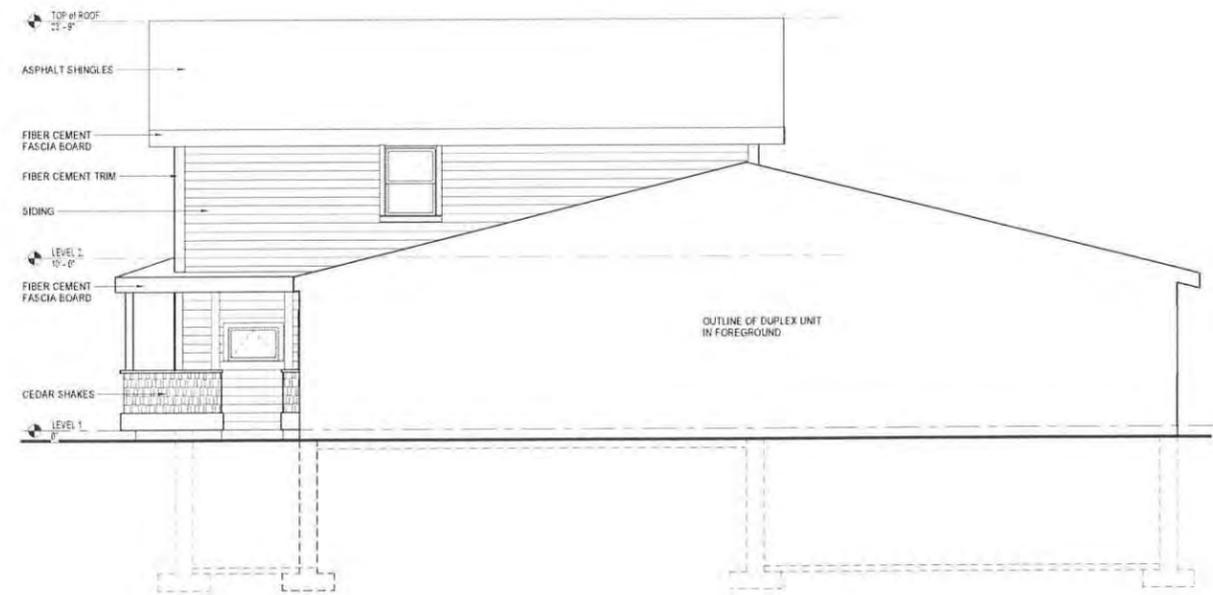
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A201 SCALE



4 NORTH WEST  
A201 SCALE



2 East  
A201 SCALE 1/4" = 1'-0"



1 Partial North  
A201 SCALE 1/4" = 1'-0"

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BURLINGTON, VT

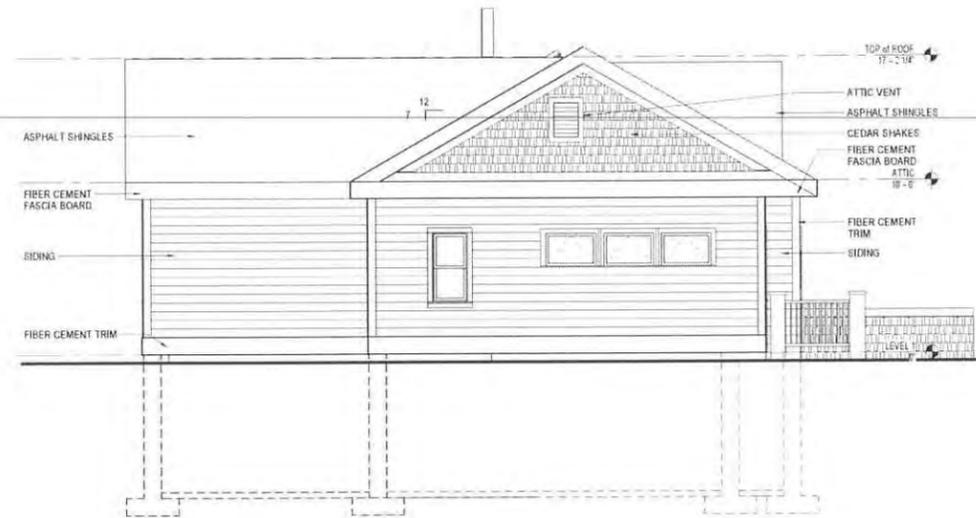
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ELEVATIONS

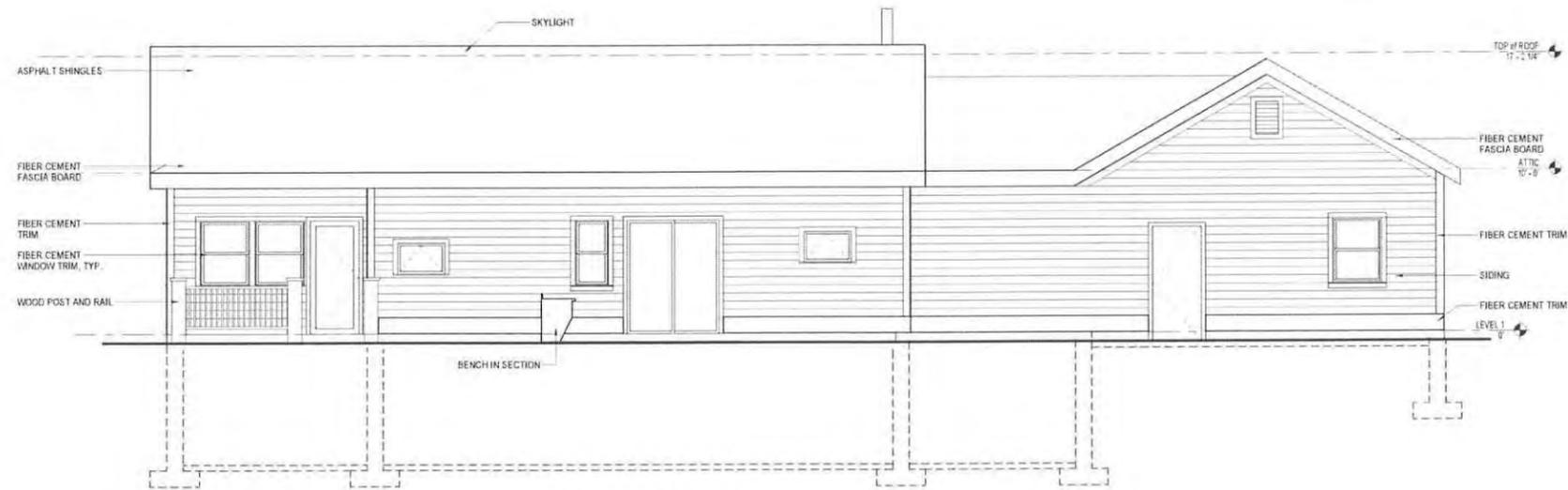
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3 NORTH EAST  
SCALE



2 ELEVATION - EAST  
SCALE 1/4" = 1'-0"



1 ELEVATION - NORTH  
SCALE 1/4" = 1'-0"

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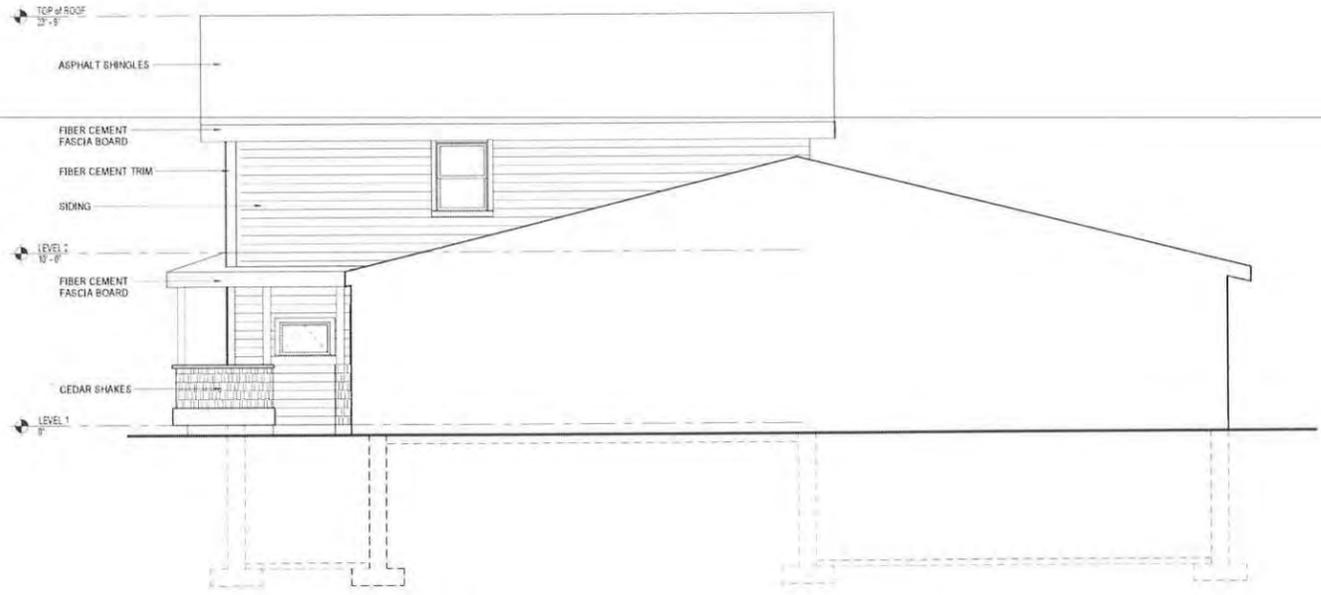
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SINGLE FAMILY  
NORTH AVENUE  
BURLINGTON, VT

09.16.13

ELEVATIONS

A201

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1 ELEVATION - PARTIAL SOUTH  
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2 ELEVATION - NORTH  
 SCALE: 1/4" = 1'-0"

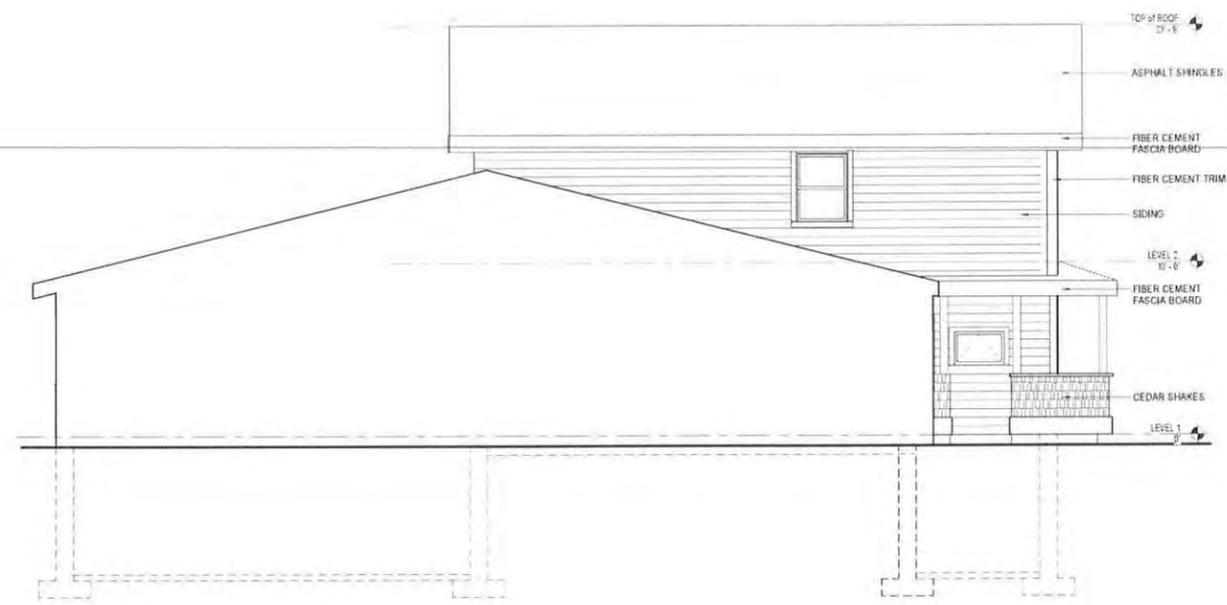
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 BURLINGTON, VT

08.23.13

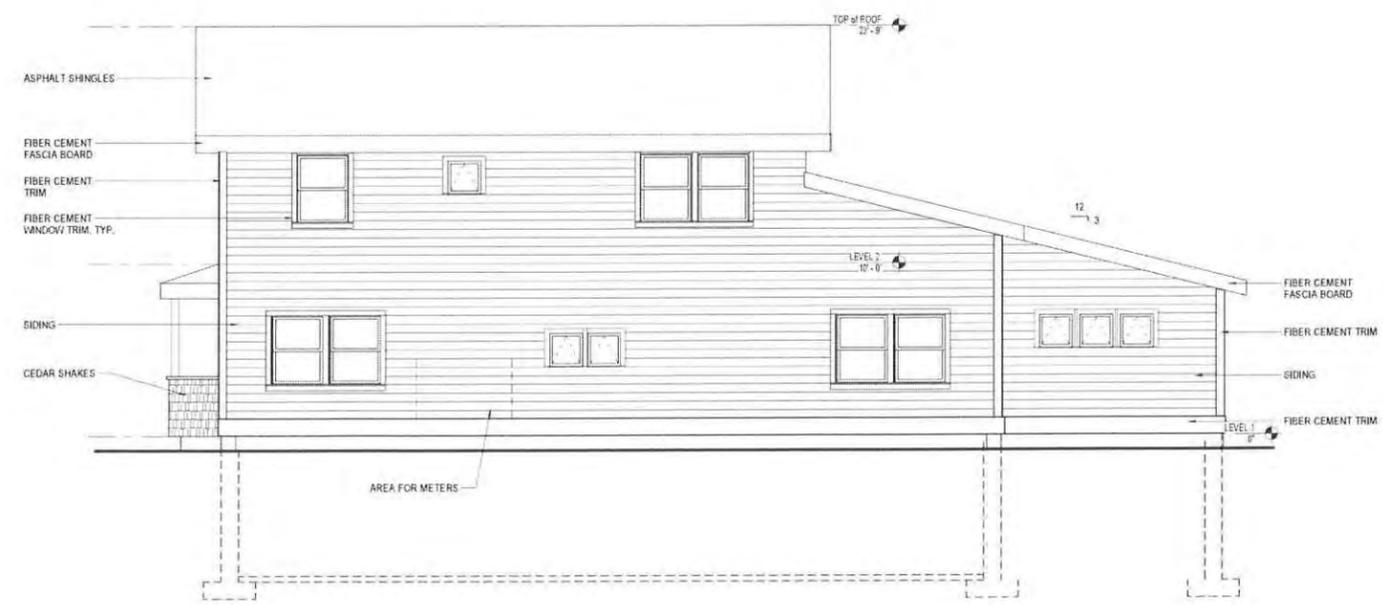
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1 ELEVATION - PARTIAL SOUTH  
 SCALE: 1/4" = 1'-0"



2 ELEVATION - NORTH  
 SCALE: 1/4" = 1'-0"

MITCHELL PROJECT  
 DUPLEX #1  
 NORTH AVENUE  
 BURLINGTON, VT

08.23.13

ELEVATIONS

PRELIMINARY  
**A202**

MISSA ALOISI ARCHITECTS