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DEPARTMENT OF
PLANNING & ZONING

TOM MITCHELL
1891 NORTH AVENUE
RESIDENTIAL SUBDIVISION

CITY OF BURLINGTON

LIST OF DRAWINGS

C-1 .....EXISTING CONDITIONS
C-2 .....SITE PLAN
C-3 .....GRADING & UTILITY PLAN
C-4 .....DETAILS
C-5 .....DETAILS
C-6 .....SPECIFICATIONS
C-7 .....SPECIFICATIONS

EC-1.....EPSC/STORMWATER PLAN

OWNER

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

PROJECT ENGINEER

CHAMPLAIN CONSULTING ENGINEERS
85 PRIM ROAD, P.O. BOX 453
COLCHESTER, VERMONT 05446
CONTACT: MARTIN E. COURCELLE, P.E.
(802) 863-8060
(802) 864-1878 FAX

-- NOTE --

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

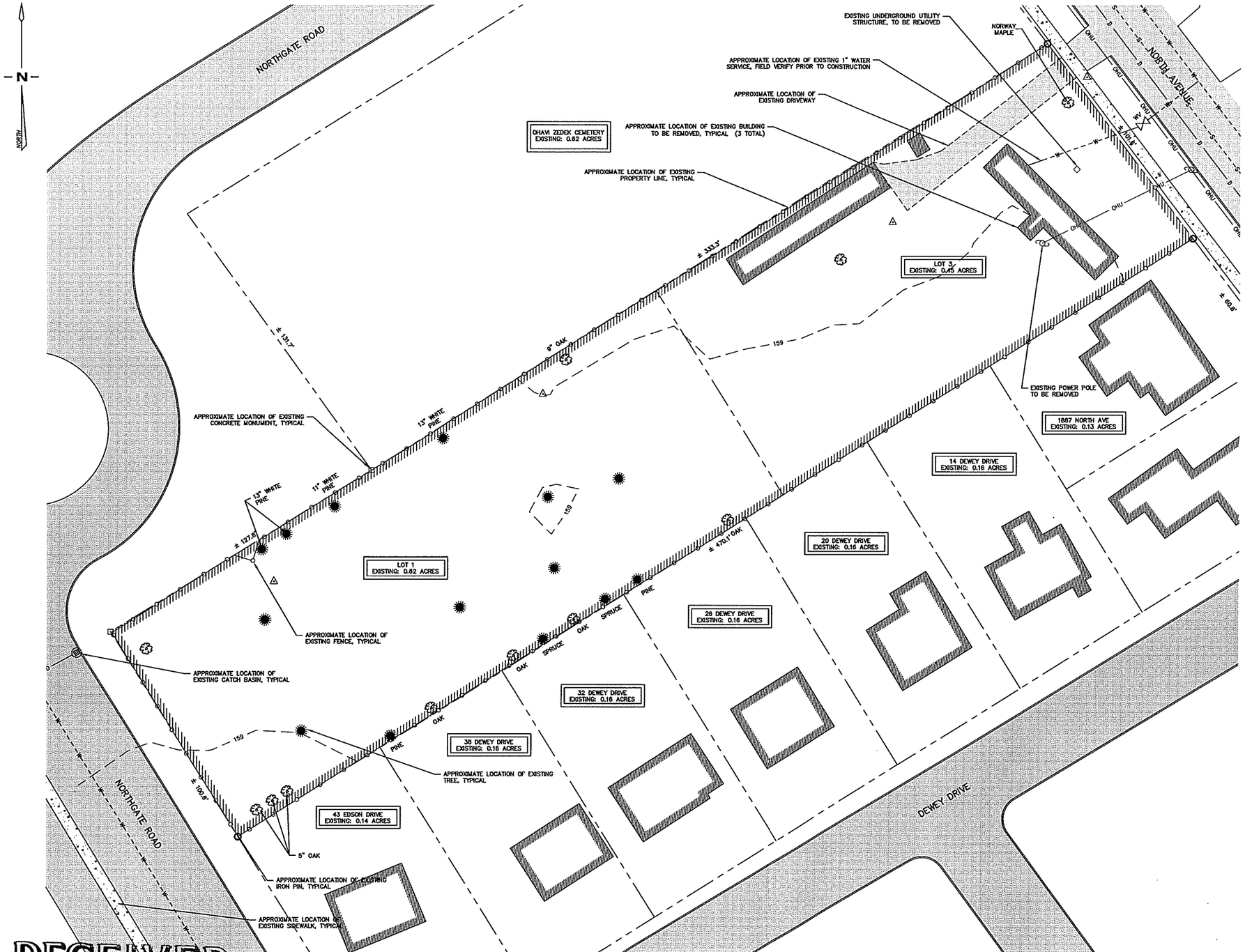
FINAL APPROVAL

SIGNED _____ DATE 3/10/15

PLANNING & ZONING DEPARTMENT
BURLINGTON, VERMONT

For entire 11-page plan set.

PERMIT SET



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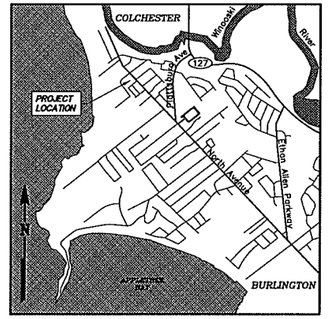
1 EXISTING CONDITIONS
C-1
SCALE 1" = 20'

Graphic Scale
20 0 20 40 60 80 feet



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:

1. 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.

2. 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.

3. WHERE DIMENSIONS ON THE PROJECT DRAWINGS ARE UNCLEAR, CONTACT THE PROJECT ENGINEER IMMEDIATELY FOR CLARIFICATION.

4. IT IS THE GENERAL CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE PROJECT DRAWINGS REFLECT THE LATEST REVISIONS.

5. THIS IS A SITE PLAN NOT A BOUNDARY SURVEY. PROPERTY BOUNDARIES SHOWN ON THIS PLAN ARE CONSIDERED TO BE APPROXIMATE.

6. PROPOSED BUILDING LOCATIONS SHOWN ARE THEORETICAL ONLY.

REFERENCE MAPS:

1. 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 AB9591). NAVD 1988 DATUM.

2. MAP TITLED "PLAT OF SURVEY, MITCHELL PROPERTY", PREPARED BY WARREN A. ROBENSTIEN., DATED AUGUST 8.

3. ADDITIONAL FEATURES FROM VERMONT DEPARTMENT OF TAXES, VERMONT MAPPING PROGRAM, ORTHOPHOTO #8090224, YEAR TAKEN 2004

4. ADDITIONAL PROPERTY BOUNDARIES TAKEN FROM CITY OF BURLINGTON TAX MAP #23.

5. EXISTING SEWER, WATER AND STORMWATER UTILITY INFORMATION TAKEN FROM DRAFT GIS PROVIDED BY THE CITY OF BURLINGTON, VERMONT.

LEGEND

- EXISTING PROPERTY LINE
- 165 EXISTING CONTOUR
- EXISTING FENCE
- W EXISTING WATER LINE & VALVE
- S EXISTING SEWER LINE & MANHOLE
- D EXISTING STORM LINE & CATCH BASIN
- OHU EXISTING OVERHEAD UTILITY LINE & POLE
- SURVEY CONTROL POINT
- CONCRETE MONUMENT FOUND
- IRON PIN FOUND
- EXISTING TREE TO BE REMOVED
- ± 470.1' EXISTING PROPERTY LINE DIMENSION

THIS TOPOGRAPHIC SURVEY WAS PRODUCED IN PART FROM DIGITAL ORTHOGRAPHIC FILES WITHOUT THE BENEFIT OF "DIG SAFE" MARKINGS. ANY UTILITIES SHOWN ARE NOT WARRANTED TO BE EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT "DIG SAFE" AT 1-888-344-7233 BEFORE COMMENCING ANY WORK AND SHALL PRESERVE EXISTING UTILITIES WHICH ARE NOT PART OF THE DEMOLITION PLAN.

REVISION DATE & DESCRIPTION	BY
06/04/14 - ADDED TREES	
MID UTILITY CLOSET	MEC

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STATE OF VERMONT
MARTIN E. COURCELLE
NO. 8745
CIVIL
LICENSED
PROFESSIONAL ENGINEER

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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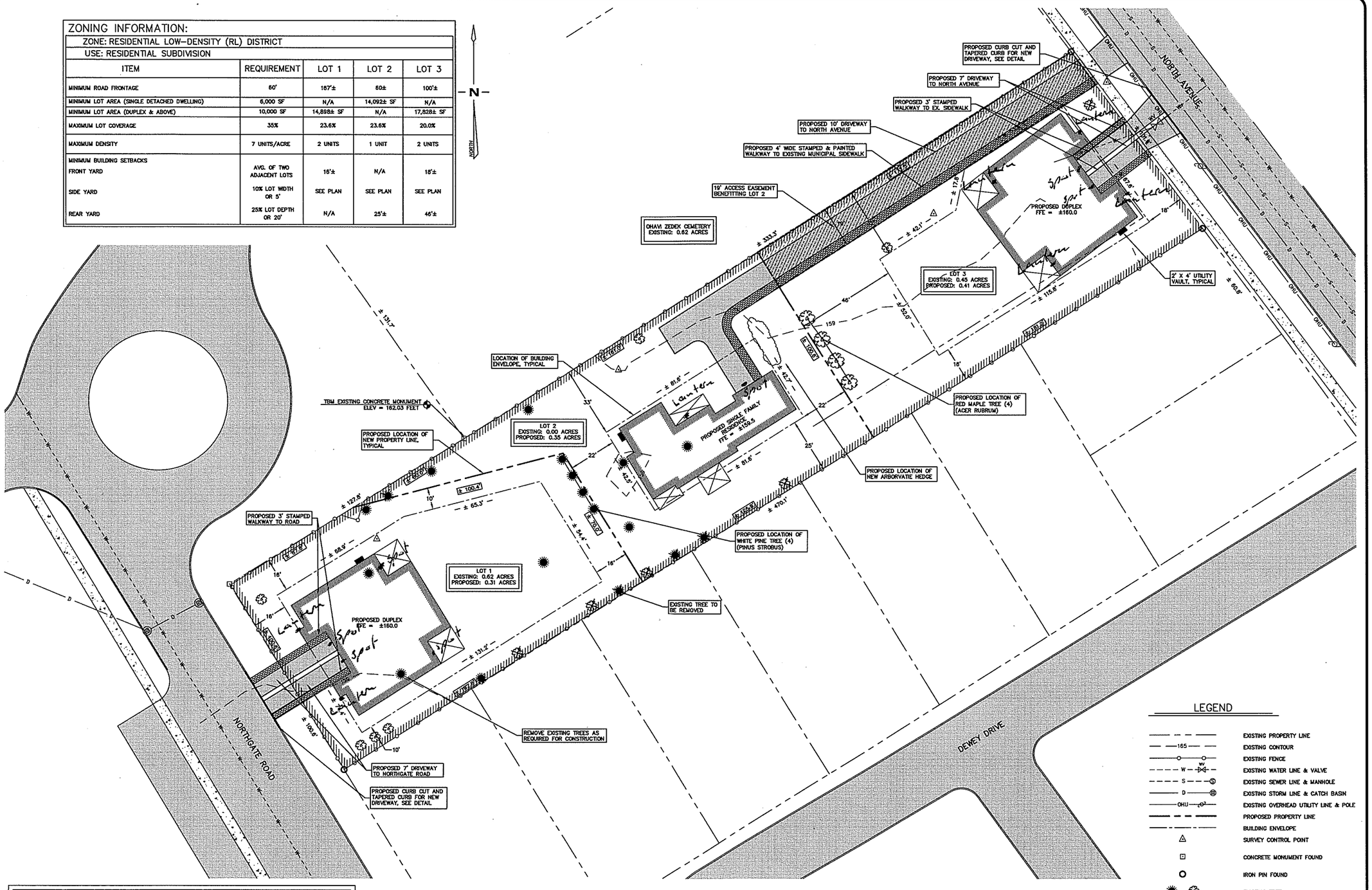
ZONING INFORMATION:

ZONE: RESIDENTIAL LOW-DENSITY (RL) DISTRICT

USE: RESIDENTIAL SUBDIVISION

ITEM	REQUIREMENT	LOT 1	LOT 2	LOT 3
MINIMUM ROAD FRONTAGE	60'	167'±	60±	100'±
MINIMUM LOT AREA (SINGLE DETACHED DWELLING)	6,000 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'±



PLANTING SCHEDULE:

DECIDUOUS TREES

QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE/SPEC.
4	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

1 C-2 SITE PLAN
SCALE 1" = 20'

Graphic Scale
20 0 20 40 60 80 feet

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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
- 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
03/12/14 - REVISED PER CITY	MEC
03/25/14 - REVISED PER CITY	MEC
06/24/14 - ADDED TREES AND UTILITY CLOSET	MEC
03/06/15 - ADDED LOT 2 ACCESS EASEMENT ACROSS LOT 3	MEC

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STATE OF VERMONT
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TOM MITCHELL
RESIDENTIAL SUBDIVISION
1891 NORTH AVENUE
BURLINGTON VERMONT
SITE PLAN

DRAWN	CCE
CHECKED	MEC
SCALE	1" = 20'
DATE	10/31/13
JOB NO.	29104
SHEET	C-2

OF 7 SHEETS

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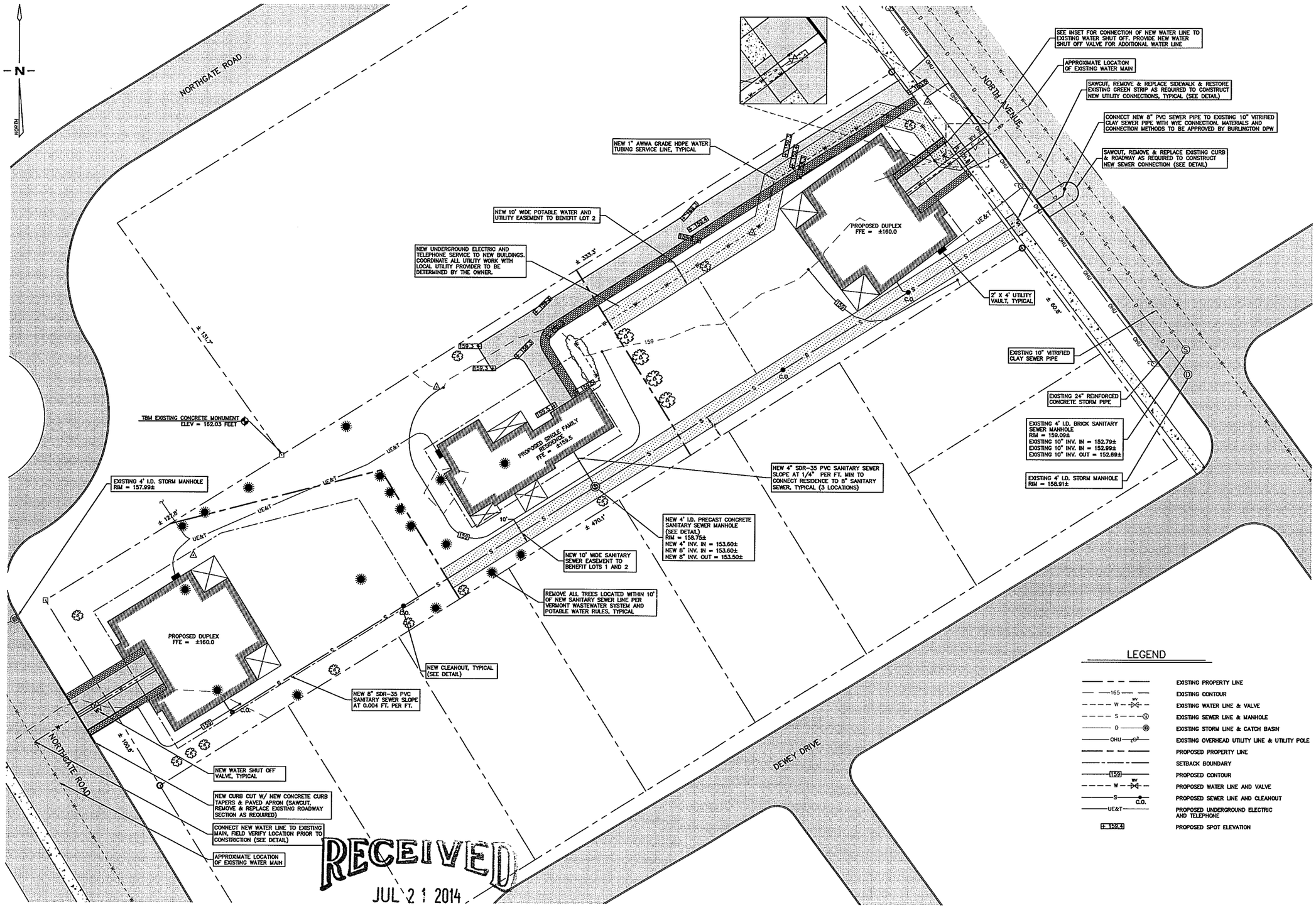

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1 C-3 GRADING AND UTILITY PLAN
SCALE 1" = 20'

Graphic Scale
20 0 20 40 60 80 feet

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REVISION DATE & DESCRIPTION	BY
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03/25/14 - REVISED PER CITY	MEC
06/24/14 - ADDED TREES AND UTILITY CLOSET	MEC

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STATE OF VERMONT MARK E. CONCELLE NO. 8745 CIVIL LICENSED PROFESSIONAL ENGINEER

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

DRAWN	CCE
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SHEET	C-3

OF 7 SHEETS

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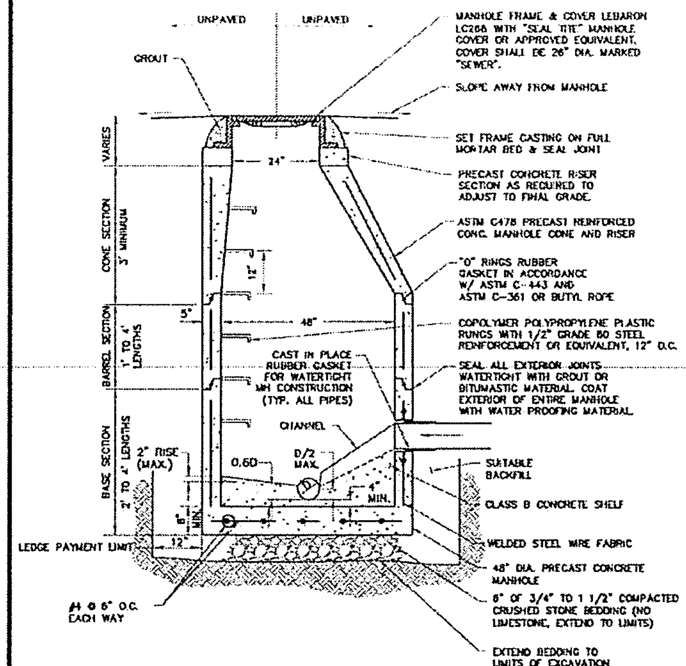
DEPARTMENT OF PLANNING & ZONING



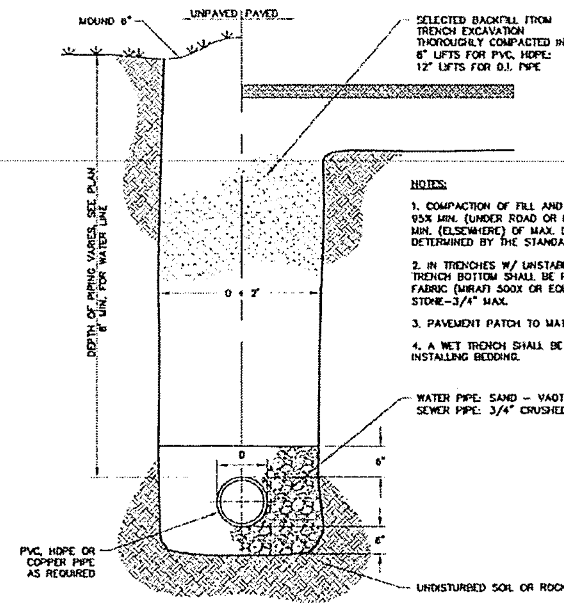
NOTES:

1. FORM INVERT 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 WATERTIGHT CONNECTION OR ANY WATERTIGHT 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 / C-4) TYPICAL PRECAST SANITARY MANHOLE
N.T.S.



NOTES:

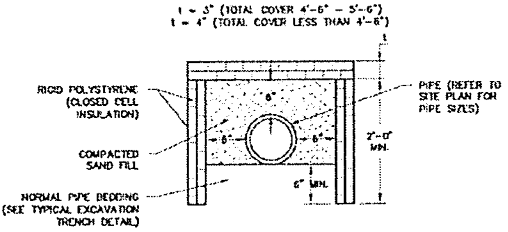
1. COMPACTION OF FILL AND BEDDING SHALL BE TO 95% MIN. (UNDER ROAD OR DRIVEWAYS) AND 90% MIN. (ELSEWHERE) OF MAX. DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST.

2. IN TRENCHES W/ UNSTABLE MATERIALS, THE TRENCH BOTTOM SHALL BE FIRST STABILIZED BY FABRIC (MIRAFI 500X OR EQUIV.) & 6" CRUSHED STONE–3/4" MAX.

3. PAVEMENT PATCH TO MATCH EXISTING SECTION.

4. A WET TRENCH SHALL BE DEWATERED PRIOR TO INSTALLING BEDDING.

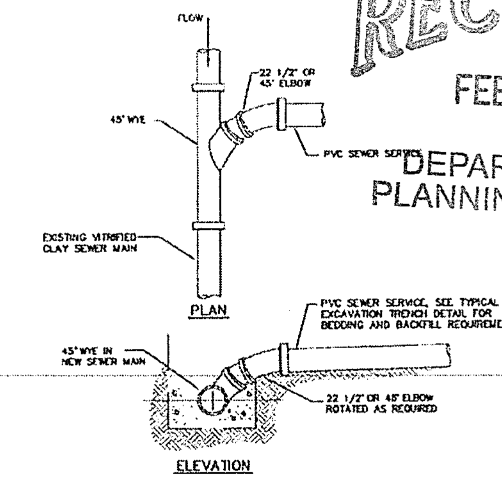
(2 / C-4) TYPICAL EXCAVATION TRENCH DETAIL
N.T.S.



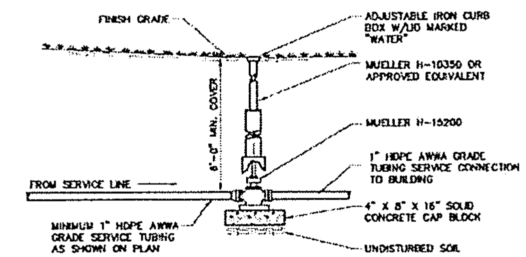
NOTE:

1.) INSTALL WHEN COVER IS LESS THAN 5'-6"

(3 / C-4) SEWER INSULATION DETAIL
N.T.S.



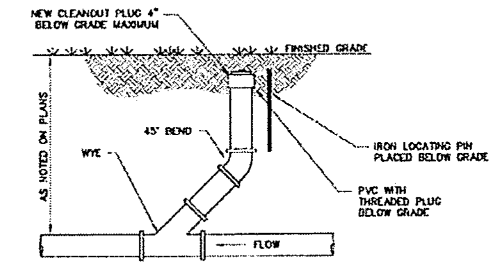
(4 / C-4) SEWER SERVICE DETAIL
N.T.S.



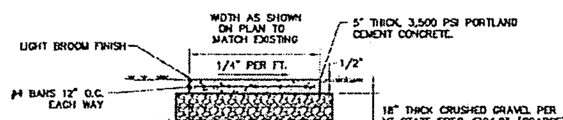
NOTES

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. CURB BOXES AND STOPS SHALL NOT BE CONSTRUCTED BENEATH DRIVES OR SIDEWALKS.

(5 / C-4) TYPICAL WATER SERVICE DETAIL
N.T.S.



(6 / C-4) TYPICAL CLEANOUT IN GRASS DETAIL
N.T.S.



NOTES:

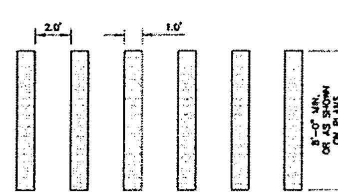
1. PROVIDE CONSTRUCTION EXPANSION & CONTRACTION JOINTS EVERY 10' WITH DUMMY JOINTS EVERY 5'.

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" X 18" SMOOTH STEEL RODS (GREASED) @ 18" O.C.

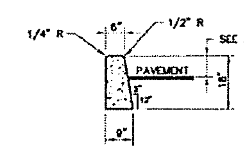
(7 / C-4) CONCRETE SIDEWALK CROSS-SECTION
N.T.S.



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 / C-4) CROSSWALK DETAIL
N.T.S.



NOTES:

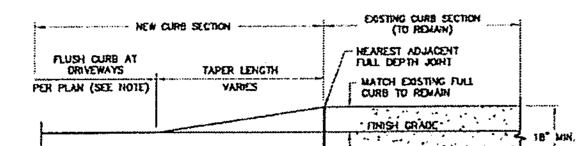
1. CURBING SHALL BE VAOT CLASS B CONCRETE, 3,500 PSI.

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 / C-4) CONCRETE CURB DETAIL
N.T.S.

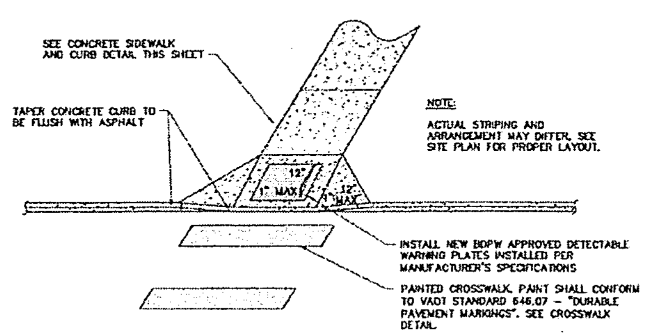


NOTES:

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" BELOW GRADE WITH A 1/2" RADIUS.

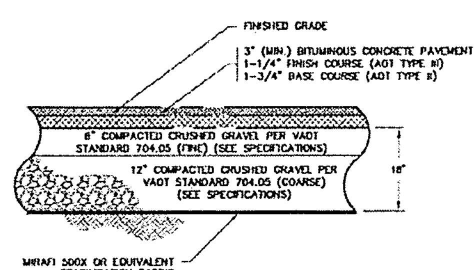
(10 / C-4) TYPICAL CURB TAPER
N.T.S.



NOTE:

ACTUAL STRIPING AND ARRANGEMENT MAY DIFFER, SEE SITE PLAN FOR PROPER LAYOUT.

(11 / C-4) HANDICAP RAMP/CROSS WALK DETAIL
N.T.S.



NOTES:

1). SEE TYPICAL TRENCH SECTION & SPECIFICATIONS REGARDING BACKFILL & SUBBASE REQUIREMENTS.

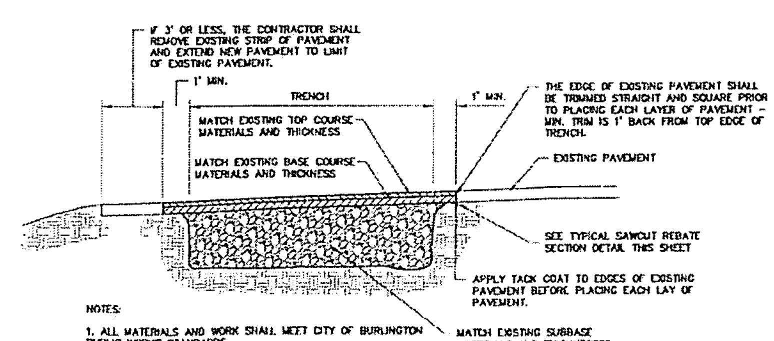
2). SIGNS & OTHER SAFETY DEVICES SHALL BE INSTALLED & MAINTAINED THROUGHOUT PAVING OPERATIONS.

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 SWEPT CLEAN OF ALL DEBRIS IMMEDIATELY FOLLOWING PAVING OPERATIONS.

(12 / C-4) TYPICAL DRIVEWAY/PARKING AREA SECTION
N.T.S.



NOTES:

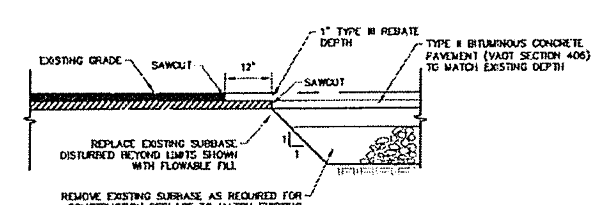
1. ALL MATERIALS AND WORK SHALL MEET CITY OF BURLINGTON PUBLIC WORKS STANDARDS.

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 / C-4) 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 RECUT & 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 / C-4) TYPICAL SAWCUT/REBATE SECTION
N.T.S.

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TOM MITCHELL
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1891 NORTH AVENUE
DETAILS

BURLINGTON VERMONT

DRAWN	CCE
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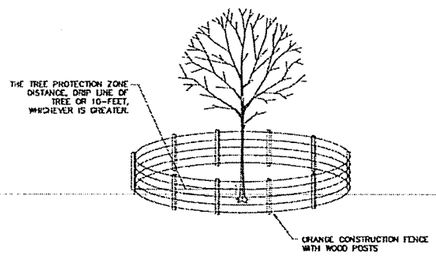
SHEET	C-4

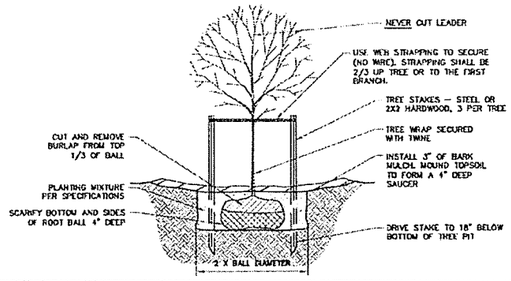
OF 7 SHEETS



NOTES:

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

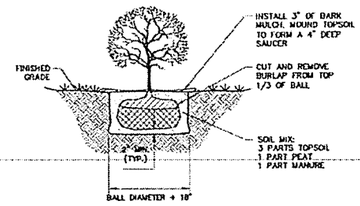
1 C-5 TREE PROTECTION DETAIL
N.T.S.



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.

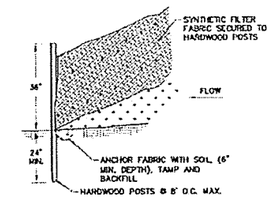
2 C-5 TYPICAL TREE PLANTING DETAIL
N.T.S.



NOTE:

SHRUB SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT BORE TO PREVIOUS EXISTING GRADE

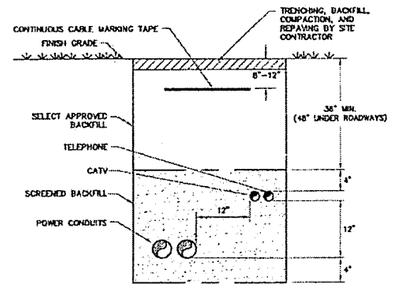
3 C-5 SHRUB PLANTING DETAIL
N.T.S.



NOTES:

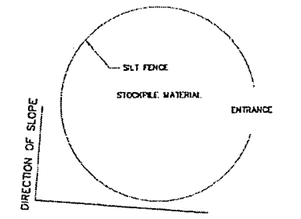
1. SILT FENCE SHALL BE INSTALLED & MAINTAINED DOWNSLOPE OF ALL DISTURBED AREAS & MATERIAL STOCKPILES TO PROTECT UNDISTURBED GRASSED OR LANDSCAPED AREAS, ROADWAYS OR WALKWAYS.
2. NO CONSTRUCTION ACTIVITY OR TRAFFIC SHALL BE ALLOWED DOWNSLOPE OF INSTALLED FENCES.
3. END SECTIONS OF FENCE SHALL BE ANGLED 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 C-5 SILT FENCE DETAIL
N.T.S.

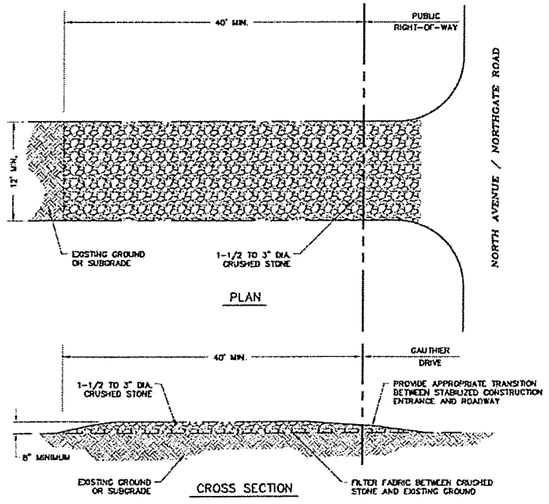


THE GENERAL CONTRACTOR SHALL COORDINATE ALL UTILITY WORK WITH LOCAL UTILITY PROVIDERS TO BE DETERMINED BY THE OWNER.

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



6 C-5 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. ALL SEDIMENT TRACKED, 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 C-5 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	MORLAND BENT GRASS
100	100 # LIVE SEED/ACRE	

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

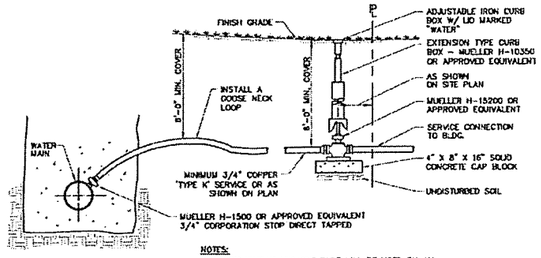
LIME – 90 LBS PER 1000 SQ FT
DOLOMITIC GROUND LIMESTONE
NOT LESS THAN 85% OF THE TOTAL CARBONATE

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 SEEDED 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-SEEDED IN THE MANNER SPECIFIED ABOVE.

8 C-5 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 C-5 WATER VALVE DETAIL
N.T.S.

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Matthew E. Cornelle

TOM MITCHELL
RESIDENTIAL SUBDIVISION
1891 NORTH AVENUE
BURLINGTON VERMONT
DETAILS

DRAWN: CCE
CHECKED: MEC
SCALE: N.T.S.
DATE: 10/31/13
JOB NO.: 29104
SHEET: C-5
OF 7 SHEETS

GENERAL SPECIFICATIONS

The Standard Specifications shall refer to the Vermont Agency of Transportation Standard Specifications for Construction (Latest Edition). All site work shall also be completed in accordance with the City of Burlington's Public Works standards. Any discrepancies with the plans or specifications shall be reported to the Engineer prior to beginning that work.

A. Earthwork

1. The site shall be cleared of all debris and vegetation, and all topsoil shall be stripped prior to placing any fill material. Debris and vegetation shall be disposed of at an approved location.

2. The excavated material from on site shall not be used within five feet (5') of the building or under parking lots, roads or sidewalks. General imported fill material shall not be larger than two inches (2") or have more than 20% passing the NO. 200 sieve. All excess excavated material shall be disposed of at an approved location.

3. Grading

a. Perform all rough grading, including excavation, formation of embankments, shaping, sloping, compaction, construction of ditches, disposal of surplus or unsuitable material, and any work necessary to prepare the sub-grades of all roadways, walks and parking areas. Grading shall be brought to the bottom of the base course under paved or surfaced areas and to within a minimum of 24 inches of finished grade under side slopes and/or embankment areas to receive loam along roadways, walks or parking areas.

b. Accomplish all excavation and fill within the slope and grade lines as indicated on the Drawings unless otherwise authorized in writing by the Owner. Parking lots shall be graded to full cross section width of sub-grade before placing any type of sub-base or pavement except that partial width construction is permissible where necessary for the maintenance of traffic.

c. Do not use frozen material in the construction of embankments.

d. Place all embankment materials in horizontal layers of uniform thickness across the full width of embankment, except when it is impractical to construct full width of the embankment and partial width layers are authorized by the Owner. Do not place or place stumps, trees, rubbish or other unsuitable material in embankments. Begin layers of embankment at the deepest part of the fill.

e. Areas of soft, yielding or otherwise unsuitable material that will not meet compaction requirements shall be removed, replaced with suitable material and properly compacted at no cost to the Owner.

f. Place embankments for paved or surface areas in horizontal layers of depths which will result in layers of compacted material not exceeding 8 inches. Compact each layer as specified before placing each new layer. Use effective spreading equipment on each layer to obtain uniform thickness prior to compacting. Each layer shall be kept crowned to shed water to the outside edges of embankment and continuous leveling and manipulating will be required to assure uniform density. Construction equipment shall be routed over the entire surface of each layer.

g. If, during the construction of the embankments, there is any indication that serious bulging, cracking, or unsafe movement may occur, the placing of fill shall be stopped or retarded to allow the material to stabilize.

h. All ditches and drains shall be constructed so they will effectively drain the roadway or parking lot before any sub-base or surface course material is placed. In handling materials, tools and equipment, the Contractor shall protect the sub-grade from damage. In no case shall vehicles be allowed to travel in a single track and form ruts. If ruts are formed, the sub-grade shall be reshaped and compacted and any pockets of clay, sand or soft material that may have been left in the sub-grade shall be removed, replaced with approved material and properly compacted at the Contractor's expense. The sub-grade shall be kept in such condition that it will drain. Sub-base, base or surface material shall not be deposited on the sub-grade until the sub-grade has been checked and approved by the Owner. After the sub-grade has been approved, hauling shall not be done nor equipment moved over the sub-grade which will distort the cross section. A tolerance of 1/2 inch above or below the finished sub-grade will be allowed provided that this 1/2 inch above or below sub-grade is not maintained for a distance longer than 50 feet, and that the required cross section is maintained.

4. Compaction

a. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.

b. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum dry density for soils which exhibit a well defined moisture-density relationship determined in accordance with ASTM D 2049.

1. Lawn or unpaved areas: Compact top 6" of sub-grade and each layer of backfill or fill material to 90% maximum dry density.

2. Compaction under paved and surfaced areas: The entire area of each layer shall be uniformly compacted to at least the required minimum density using compaction equipment consisting of rollers, compactors or a combination thereof. Earth-moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment. Each layer for its full width shall be compacted to not less than 90 percent of the maximum dry density as determined by the Standard Method of Test for Moisture-Density Relations of Soils, ASTM-D698, Method C, except that the material in the top two feet of any embankment, immediately below the sub-grade shall be compacted to not less than 95 percent of the maximum dry density. The field density determination will be made by a qualified testing laboratory using a nuclear density gauge.

3. Concrete Slabs: Compact each layer of backfill or material to 95% maximum dry density.

c. Moisture Control: Where sub-grades or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of sub-grade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

5. Backfill and Fill.

a. General:

Place acceptable soil material in layers to required subgrade elevation, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material.

2. Under grassed areas, use satisfactory excavated or borrow material.

3. Under walks and pavements, use subbase materials as shown in details.

b. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Review of construction below finished grade

2. Testing, review, and recording locations of underground utilities.

3. Removal of trash and debris.

c. Ground Surface Preparation:

Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fill. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface. Where existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum dry density.

d. Placement and Compaction:

Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.

1. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or material on surfaces that are muddy, frozen, or contain frost or ice.

e. No fill shall be placed within 10' of any tree trunk without approval of the Owner.

B. Access Drive and Parking Lot Area

1. The sub-grade shall be prepared in accordance with Section 203.12 of the Standard Specifications

2. Sand Borrow and Cushion: VAOT 703.03

Sand borrow and sand cushion shall consist of material reasonably free from silt, loam, clay, or organic matter. It shall be obtained from approved sources and shall meet the requirements of the following table as determined in accordance with AASHTO T 27.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieve
2"	100
1 1/2"	90 - 100
1/2"	70 - 100
No. 4	60 - 100
No. 100	0 - 20
No. 200	0 - 8

3. Crushed Gravel for Sub-base. All materials shall be secured from approved sources. This gravel shall consist of angular and round fragments of hard durable rock of uniform quality throughout, reasonably free from thin elongated pieces, soft or disintegrated stone, dirt, organic or other objectionable matter. The grading requirements shall conform to the following table (Section 704.05):

Grading	Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
Coarse	6"	95 - 100
	No. 4	25 - 50
	No. 100	0 - 12
	No. 200	0 - 8
Fine	2"	100
	1 1/2"	90 - 100
	No. 4	30 - 60
	No. 100	0 - 12
	No. 200	0 - 8

The crushed gravel shall be compacted to 95% of the maximum dry density as determined by AASHTO-T99.

4. Bituminous Concrete Pavement: The materials, grading and composition, placement, and finishing for bituminous concrete pavement (Type II and III) shall meet the requirements of the Vermont Agency of Transportation Standard Specifications Sections 406, 702, and 704.10. Other requirements are as follows: Application of bituminous concrete pavement shall meet all the requirements of the Vermont Standard Specifications for Construction, Section 406, or as periodically amended, but not limited to, the following

a. Weather Limitations: Bituminous material shall not be placed between November 1, and May 1. Material shall not be placed when the air temperature at the paving site in the shade and away from artificial heat is 40 degrees Fahrenheit or below.

b. Compaction: Immediately after the bituminous mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. Along forms, curbs, headers, walls and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot or lightly oiled hand tampers, smoothing irons, or mechanical tampers. On depressed areas, a trench roller may be used, or cleated compression strips may be used under the roller to transmit compression to the depressed area.

c. Surface Tolerances: The surface will be tested by the Engineer using a 16-foot straightedge at selected locations parallel with the centerline. Any variations exceeding 3/16 of an inch between any two contacts shall be satisfactorily eliminated. A 10-foot straightedge may be used on a vertical curve. The straightedges shall be provided by the Contractor.

d. Matching Surfaces: When a new pavement is to match an existing bituminous pavement for a roadway or trench, the Contractor shall vertically smooth cut the existing pavement along a straight line a minimum of one foot (1') into the existing pavement, over the existing gravel base. The smooth cut shall be thoroughly cleaned and coated with Emulsified Asphalt, RS-1, just prior to paving.

5. Stabilization Fabric: Stabilization fabric where required by the Engineer shall be Mirafi 500X or approved equal. The fabric shall be installed in accordance with manufacturer's requirements.

6. All pavement markings shall be VT. 7.05 or 7.06 Fast Dry Traffic Paint.

C. Cast-in-place Curbing

1. All cast-in-place curbing shall be placed to the lines and grades established in the plans in accordance with Section 616.06 of the Standard Specifications. Use Class "B" Concrete (Fc' = 3,500 psi).

D. Concrete Sidewalk

1. All concrete sidewalks shall be placed to the lines and grades established in the plans in accordance with Section 618.03 of the Standard Specifications.

E. Sanitary Sewer

1. Description

This item shall consist of the excavation and backfilling required for the routing of the gravity sanitary sewer main, facilities and installation of service connections. This work shall include all pipe, manholes, structures and other appurtenances necessary to complete the system indicated in the drawings. All sanitary sewer materials and construction of same shall be shown on the contract and shall meet the requirements of the City of Burlington Public Works Department.

2. Materials

PVC Sewer Pipe: PVC sewer pipe shall conform in all respects to the latest revision of ASTM Specifications D-3034 or F679, Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR 35. Wall thickness of all PVC pipe shall meet ASTM Specifications for SDR 35 pipe. All pipe and fittings shall be clearly marked as follows:

- Manufacturer's Name and Trademark
- Nominal Pipe Size – 4" or 8"
- Material Designation 12454C PVC
- Legend "Type PSM SDR 35 PVC Sewer Pipe" or "PS 46 PVC Sewer Pipe"
- Designation ASTM D-3034 or F679

Joints shall be push-on type using elastomeric gaskets and shall conform to ASTM D-3212. The gaskets shall be factory installed. The pipe shall be furnished in nominal 13-foot lengths. Sufficient numbers of short lengths and full machine fittings shall be provided for use at manholes and connections. All connections will require the use of manufactured fittings. Field fabricated, saddle-type connections are not acceptable.

3. Installation

a. Excavations shall be made at a point at least six inches (12" where trench is in ledge) below the pipe invert to accommodate the bedding material. All excavations are to be kept dry while pipe is being laid and until each joint and pipe have been inspected by the Engineer and approval given to commence backfilling operations.

b. The bell end of the pipe shall face upgrade at all times and be placed in such a position as to make the invert even when the succeeding section is inserted. Where required by adverse grading conditions, the Contractor shall fill any gully to make a suitable bedding for the sewer pipe. The fill shall be pneumatically compacted to a 90 percent dry density (95% in roads) as determined by the AASHTO-T-99, Method A (Standard Proctor) test, upon which the six inches (6") of bedding material shall be placed. Any pipe which is not laid to grade and alignment shall be re-laid to the satisfaction of the Engineer. The bedding material shall be placed and compacted on each side of the pipe to a height of one-half the pipe diameter for the full width of the excavated trench and as shown on the accepted plans.

c. Backfill shall consist of approved material placed in six-inch (6") layers with each layer being thoroughly compacted to not less than 95 percent of maximum dry density as determined by the AASHTO-T-90 Standard Proctor by means approved by the Engineer.

No stones in excess of one and one-half inch (1 1/2") diameter shall be placed within two feet (2') of the outside of the pipe. Particular precautions shall be taken in placement and compaction of the backfill material in order not to damage and/or break the pipe. The backfill shall be brought up evenly on both sides of the pipe for its full length. Walking or working on the completed pipeline except as may be necessary in tamping or backfilling shall not be permitted until the trench has been backfilled to a height of at least two feet (2') on the top of the pipes. During construction, earth, backfill or other materials shall be prevented from contaminating the pipe.

d. Leakage Tests and Allowances for Gravity Sewers: Prior to testing for acceptance, the pipe should be cleaned by passing through the pipe a full gauge squeegee. It shall be the responsibility of the Contractor to have the pipe cleaned.

Immediately following the pipe cleaning, the pipe installation shall be tested with low-pressure air. Air shall be slowly supplied to the plugged air installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any groundwater that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The pipeline shall be considered acceptable when tested at an average pressure of 3.0 pounds per square inch greater than the average back pressure of any groundwater that may submerge the pipe if:

1. the total rate of air loss from any section tested in its entirety between manhole cleanout structures does not exceed 2.0 cubic feet per minute, or

2. the section under test does not lose air at a rate greater than 0.0030 cubic feet per minute per square foot of internal pipe surface.

The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure of any groundwater that may submerge the pipe is not less than that computed according to the following table.

MINIMUM TEST TIME FOR VARIOUS PIPE SIZES

Diameter (Inches)	Time (Seconds/100 Feet)
4	18
6	40
8	70

e. Vacuum Test: This method of testing manholes for leakage involves the use of a device for sealing the top of the manhole cone section and pumping the air out of the manhole, creating a vacuum and holding this vacuum for a prescribed period of time. The procedure for this test is as follows:

i. All lifting holes and exterior joints shall be filled and pointed with an approved non-shrinking mortar. The completed manhole shall not be backfilled prior to testing. Manholes which have been backfilled shall be excavated to expose the entire exterior prior to vacuum testing or the manhole shall be tested for leakage by means of the exfiltration leakage test.

ii. All pipes and other openings into the manhole shall be suitably plugged in a manner to prevent displacement.

iii. A plate with an inflatable rubber ring the size of the top of the manhole shall be installed by inflating the ring with air to pressure adequate to prevent leakage of air between the rubber ring and the manhole wall.

iv. Air shall then be pumped out of the manhole through an opening in the plate until a vacuum is created inside of the manhole equal to 10 inches of mercury on an approved vacuum gauge. The removal of air shall then be stopped and the test begun.

v. The manhole shall pass this test if the vacuum holds at 10" Hg or drops no lower than 9" Hg within the following times:

Depth of 4' Diameter Manhole	Time Minutes	Time Seconds
0' - 10'	2	0
10' - 15'	2	30
15' - 20'	3	0
20' - 25'	3	30

vi. If the vacuum drop exceeds 1" Hg during the specified time periods, the manhole shall be resealed and steps 2 through 5 above repeated until the vacuum holds for the specified time.

vii. After the manhole passes the vacuum test, it shall be backfilled carefully so that no leaks are created. If the manhole is disturbed in any way during backfill, it shall be vacuum tested according to steps 1 through 5 above. If the manhole fails the vacuum test, the Contractor shall test the manhole using the manhole exfiltration test.

viii. The Contractor shall provide the Engineer with a written log of each manhole leakage test result.

ix. Manholes shall be tested and accepted prior to building manhole inverts.

f. The Contractor shall be responsible for verifying the location and maintaining the integrity of all utilities shown on the plan.

g. The Contractor shall coordinate all construction with the City of Burlington.

F. Underground Utilities

For underground electrical and telephone (cable) services, the Contractor shall trench, place bedding, place conduit, and backfill in accordance with the utility company's requirements.

SECTION 01340 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Submit Shop Drawings, Product Data, and Samples required by the Contract Documents

1.02 RELATED DOCUMENTS

A. The Conditions of the Contract and General Requirements of the Contract Documents apply to the General Contractor, Subcontractors, materials suppliers and all other persons furnishing labor and materials under this Section.

1.03 SHOP DRAWINGS

A. Drawings shall be presented in a clear and thorough manner

1. Details shall be identified by reference to sheet & detail or schedule shown on Contract Drawings.

1.04 PRODUCT DATA

A. Preparation.

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities
3. Show dimensions and clearances required.

B. Manufacturer's standard schematic drawings and diagrams

1. Modify drawings and diagrams to delete information which is not applicable to the Work.
2. Supplement standard information to provide information specifically applicable to the Work.

1.05 SAMPLES

A. Office samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.

1.06 CONTRACTOR RESPONSIBILITIES

A. Review Shop Drawings, Product Data, and Samples prior to submission.

B. Determine and verify

1. Field measurements
2. Field construction criteria.
3. Catalog numbers and similar data
4. Conformance with specifications.

C. Coordinate each submittal with requirements of the Work and of the Contract Documents

D. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents

E. Begin no fabrication or work which requires submittals until return of submittals with Engineer approval.

1.07 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with the approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.

B. Number of submittals required:

1. Shop Drawings: Submit the number of opaque reproductions which the Contractor requires, plus three copies, which will be retained by the Engineer.
2. Product Data: Submit the number of copies which the Contractor requires, plus two copies, which will be retained by the Engineer.
3. Samples: Submit the number stated in each individual specification section, or as appropriate for review and approval.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contract identification
4. The names of:
   a. Contractor.
   b. Supplier.
   c. Manufacturer.
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from the Contract Documents.
10. Identification of all revisions on resubmittals.
11. A blank space for Contractor and Engineer review stamps.
12. Contractor's stamp, initialed or signed, certifying review of the submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and Contract Documents.

1.08 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Engineer and resubmit until approved.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Engineer.

C. Samples: Submit new samples as required for initial submittal.

1.09 DISTRIBUTION

A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Engineer stamp of approval to:

1. Job site file.
2. Record documents file.
3. Other affected contractors.
4. Subcontractors.
5. Supplier or Fabricator.
6. Others as required.

B. Distribute samples which carry the Engineer stamp of approval as directed by the Engineer.

1.10 ENGINEER DUTIES

A. Review submittals with reasonable promptness and in accord with the established project schedule.

B. Affix review stamp and initials or signature, and indicate requirements for resubmittal, or approval of submittal.

C. Return submittals to the Contractor for distribution, or for resubmissions.

END OF SECTION

SECTION 02220 – DEMOLITION CONTROL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. The Conditions of the Contract and General Requirements of the Contract Documents apply to the General Contractor, Subcontractors, materials supplier and all other persons furnishing labor and materials under this Section.

1.02 DESCRIPTION OF WORK

A. Work included: Provide all labor, materials, equipment and incidentals necessary to accomplish the required building and the site demolition as indicated on the Contract Documents.

B. Responsibility: Demolition – Remove: All work as indicated on the Contract Documents, including the following:

C. Maintain dust-free atmosphere during demolition and construction phases of this work. It will be the responsibility of the Contractor to devise methods and construct proper barriers to maintain such conditions. Method of execution shall be reviewed and approved by the Owner and/or Engineer.

D. Adequate precautions shall be taken to protect all personnel and the Owner's property during the progress of the Work.

E. Methods and scheduling of work shall be approved by the Owner before execution. Coordinate all work with other Contractors.

F. Any items of value scheduled for removal shall not leave the premises until the Owner has directed for their storage or been apprised of their salvage value and has accepted such value to be credited to the Contract between Owner and General Contractor.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 DISPOSAL AND DEMOLITION

A. Debris accumulation from demolition work shall be removed at the end of each working day and be disposed of or recycled in a legally acceptable manner.

END OF SECTION

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TOM MITCHELL
RESIDENTIAL SUBDIVISION
1891 NORTH AVENUE
SPECIFICATIONS
BURLINGTON VERMONT

DRAWN	CCE
CHECKED	MEC
SCALE	NONE
DATE	10/31/13
JOB NO.	29104
SHEET	C-6

OF 7 SHEETS

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 3350 and shall have a minimum cell classification of PE445474C 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. Fitting: 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 160.

3. Valve Box: Cast Iron New England style slide-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 portions 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 strain 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 mains so both end 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 all 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 disinfected 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:

$$L = \frac{ND\sqrt{P}}{7,400}$$

whichever is Less

$$L = \frac{SD\sqrt{P}}{133,200}$$

S = Length of Pipe Tested (ft)
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 materials and around the limits of the project location. This shall remain in place until the project site has been stabilized.

3. Control dust 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 sitework or earth-moving.

C. Temporary Measures

1. Silt Fences - The silt fences shall be constructed in accordance with the construction detail. The fence shall generally be placed 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 profile 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. Dust Control - During construction, dust will be controlled with water distributed by a truck-mounted spray bar. At the direction of the Engineer, Calcium Chloride AASHTO 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. Install netting over mulched slopes so that all parts are in contact with the soil and mulch. Pin netting with wire staples 3 feet o.c. to ensure full bonding with soil surface.

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 and maintained 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 at 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 swales 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 verdurous stand of grass. Areas that, in the opinion of the Engineer, are predominantly weeds shall be plowed up, fine 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, enriched turf grass and plant material growth. Screening or other methods 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, residual 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 sterilant or herbicide has been or is used on the topsoil, the landscape contractor shall assume responsibility for allowing for the proper dissipation of such sterilants, 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, Foote St., Middlebury, VT (802-388-1137) 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 01330, 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 subbase material where traditional methods of compaction are impractical, trenches, pipe structures, fill for abandoned water and sewer lines, other works where cavities 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 cold weather placement requirements.

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

D. Do not use calcium chloride as an admixture.

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 bone 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 soil 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 floating 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 dedicated 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 fresh flowable fill to the supplier.

B. Defective flowable fill is flowable fill having excessive honeycomb, embedded debris, higher than maximum compressive strength, or not conforming to required lines, 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 at 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:

1. Mechanical Analysis:

% of Total Textural Class	Weight	Average %
Sand (0.05-2.0 mm dia range)	45 to 75	60
Silt (0.002-0.05 mm dia range)	15 to 35	25
Clay (less than 0.002 mm dia. range)	5 to 25	15

2. 95% of topsoil passing a 2.0 mm sieve.

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 6.5.

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.

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SPECIFICATIONS
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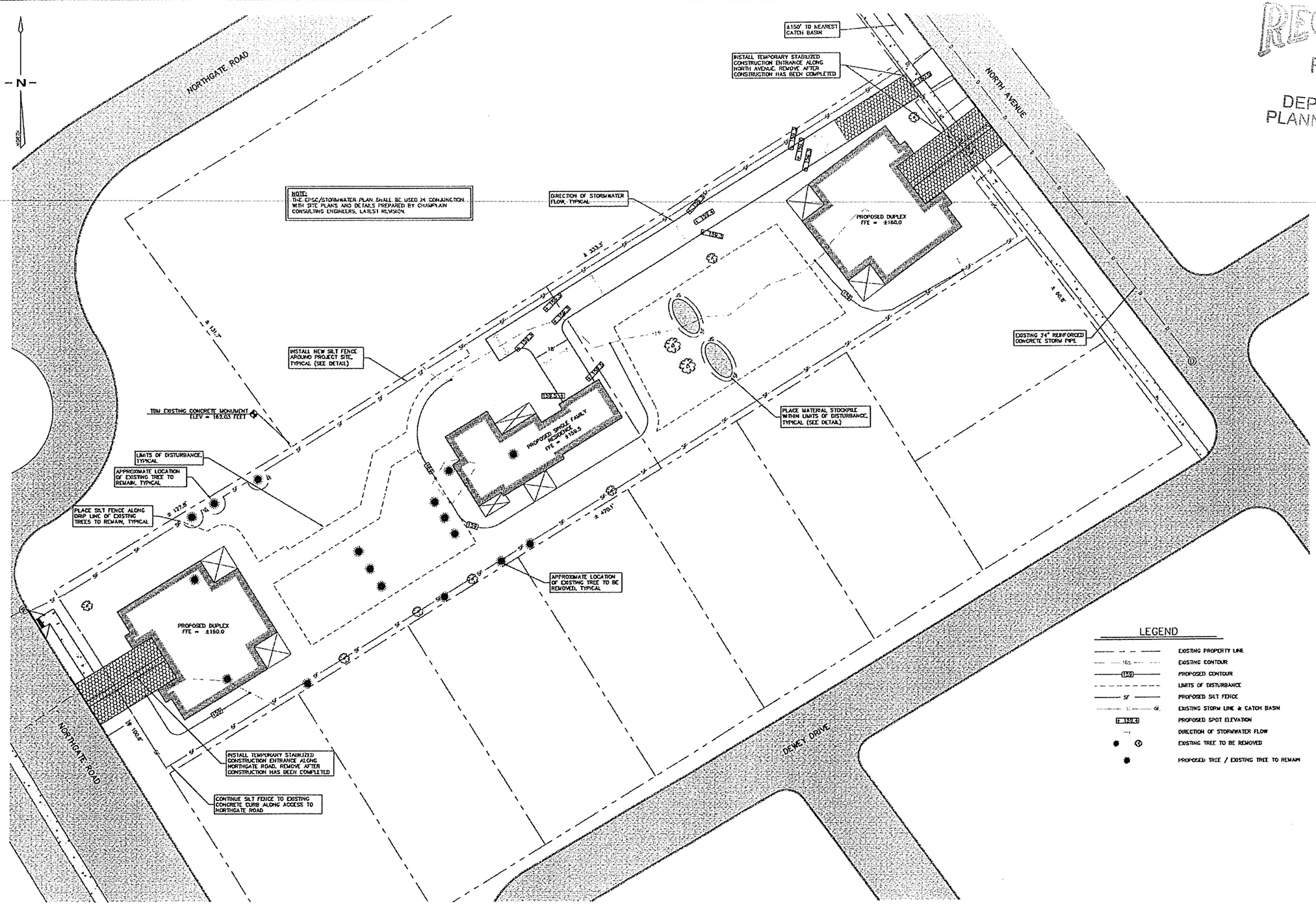
OF 7 SHEETS



STORMWATER/EPSC PLAN

SCALE 1" = 20'

Graphic Scale

20 0 20 40 60 80 feet

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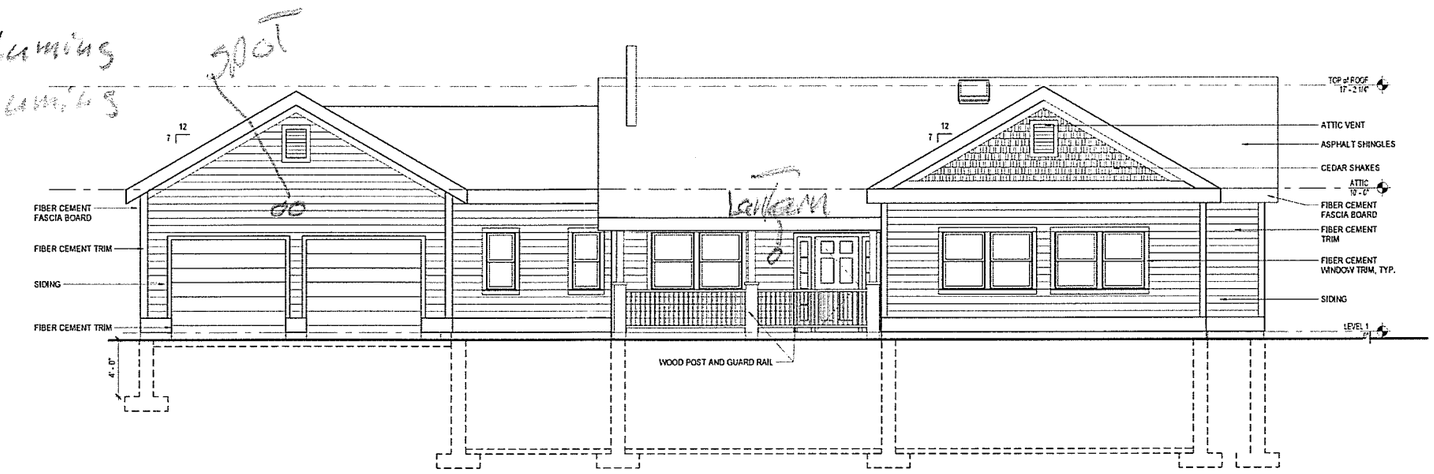
Lantern 850 Lumins
Spot 1000 Lumins



2 A200 ELEVATION - SOUTH
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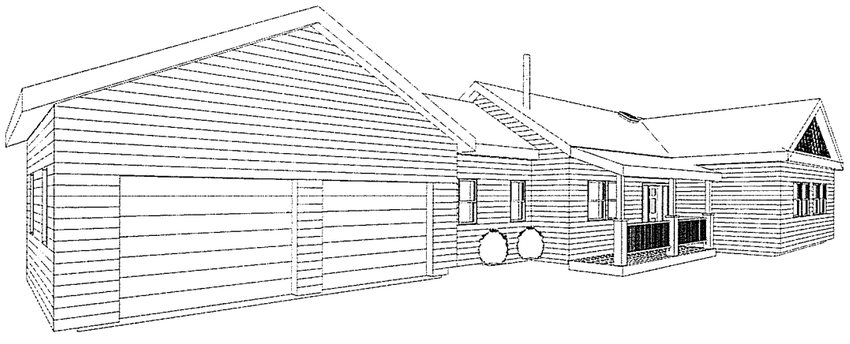

1 A200 SOUTH WEST
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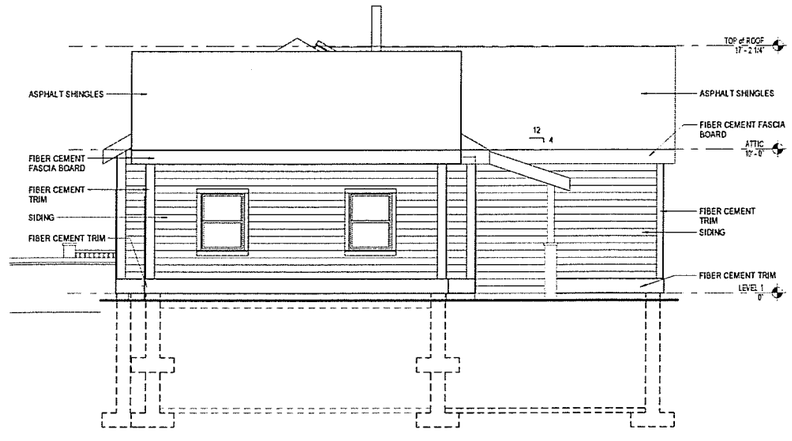

3 A200 ELEVATION - WEST
SCALE: 1/4" = 1'-0"

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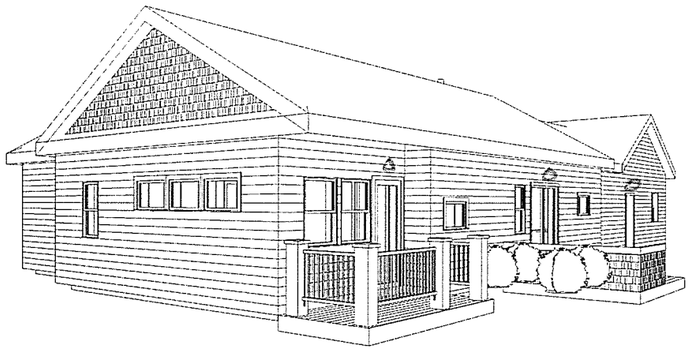

3 A201 NORTH EAST
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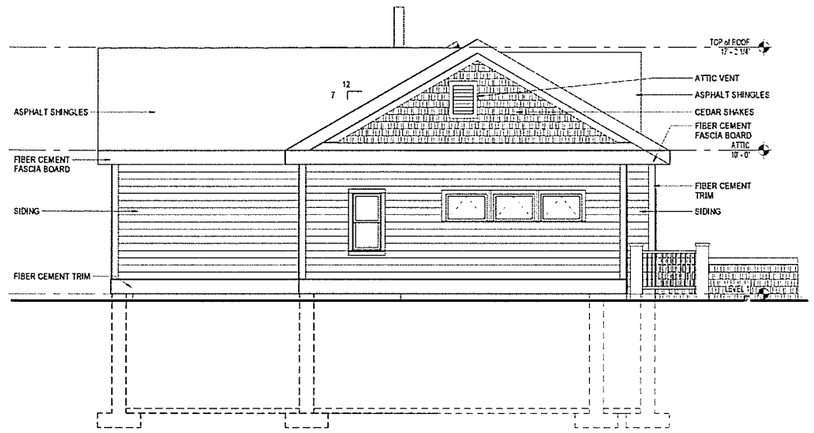

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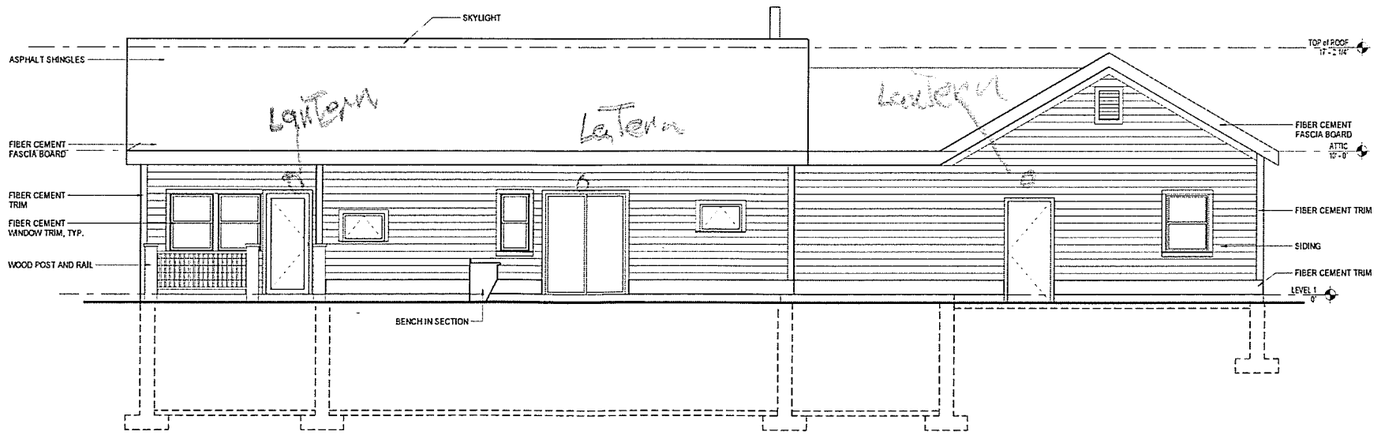

1 A201 ELEVATION - NORTH
SCALE: 1/4" = 1'-0"

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ELEVATIONS

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