RIVERWOODS DURHAM

STONE QUARRY DRIVE

DURHAM, NEW HAMPSHIRE

PLANNING BOARD SUBMISSION

Plan Issue Dates:

Design Review	April 19, 2017
Site Plan Submission	July 19, 2017
Site Plan Re-Submission	October 16, 2017

Applicant:

The RiverWoods Group
7 RiverWoods Drive
Exeter, New Hampshire 03833
Tel. (603) 772-4700

Owner (Subject Parcel):

Rockingham Properties 1, LTD
P.O. Box 423
Belmont, MA 02178
Tel. (603) 772-4700

Architect:

Architecture
1414 UNDERWOOD AVE.
WAUWATOSA, WI 53213
414.431.3131 TEL
414.431.0531 FAX
WWW.AGARCH.COM

Landscape Architect:

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

MEP:

PEC
Professional EngineeringConsultants, P.A.
623 Massachusetts, Suite
200 Lawrence, KS 66044
Tel. (785) 842-6464

Civil Engineer:

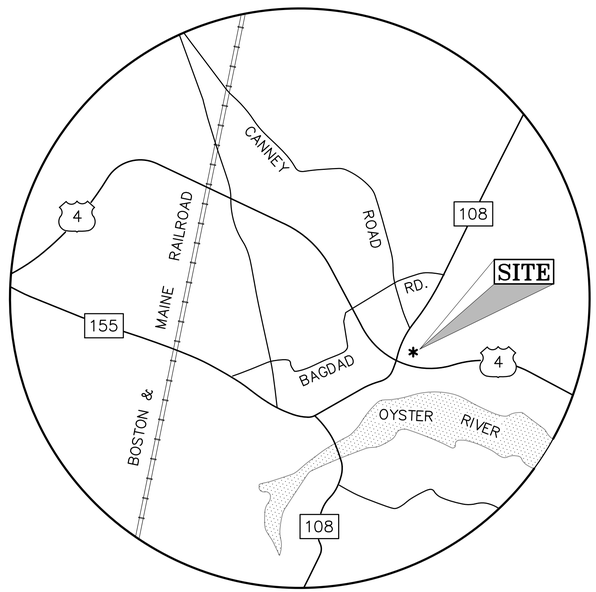
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

Wetlands/Soils Scientist:

GZA GeoEnvironmental, Inc.
5 Commerce Park
North Bedford, NH 03110 Tel.
(603) 232-8739

Surveyor:

ATLANTIC SURVEY COMPANY
25 Nute Road, Dover, New Hampshire 03820



LOCATION PLAN

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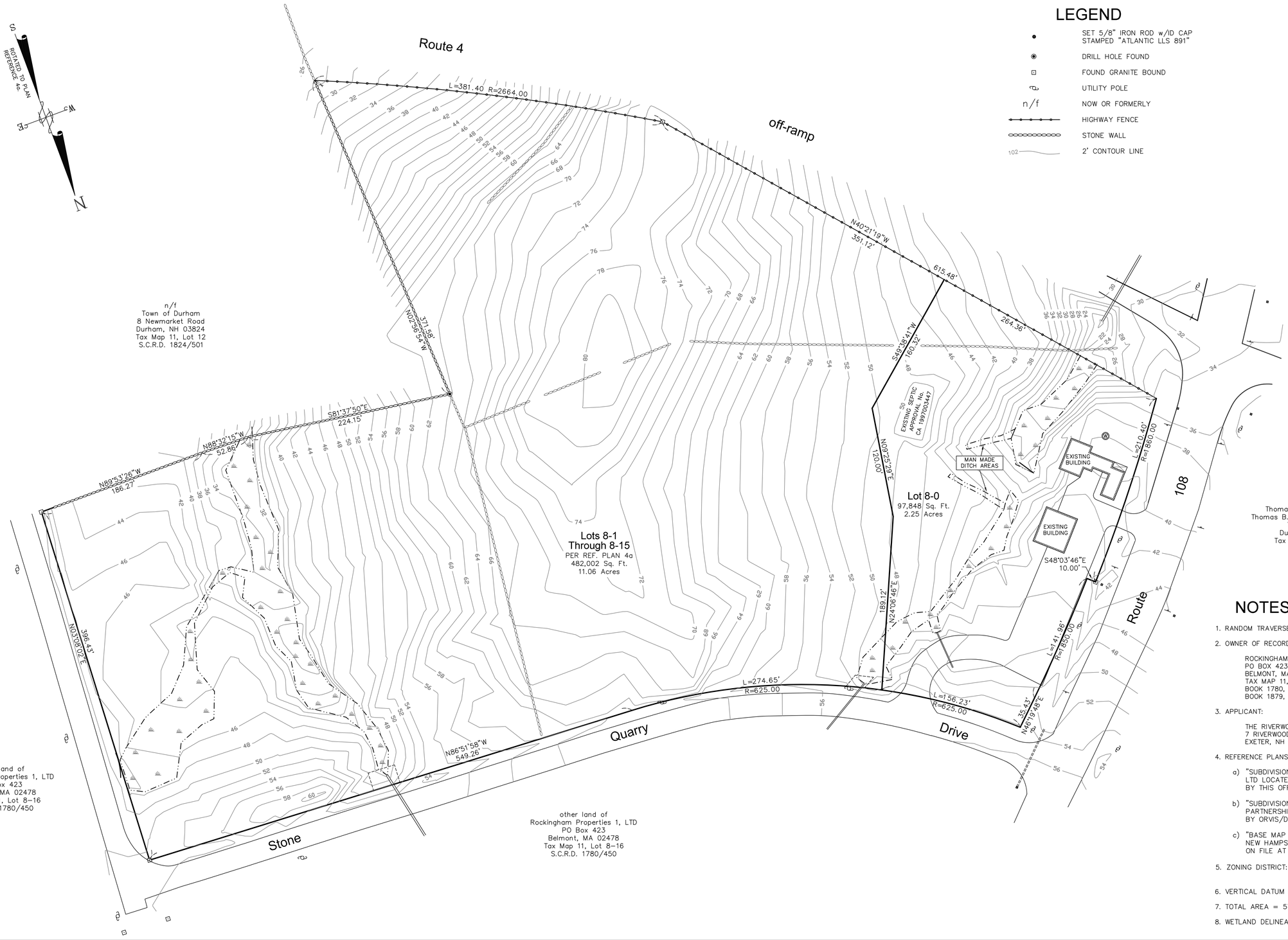
PERMIT APPROVAL NOTES:

CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL REGULATORY APPROVALS HAVE BEEN RECEIVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING THE PROJECT IN ACCORDANCE WITH ALL CONDITIONS OF THE APPROVALS.

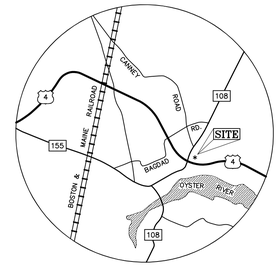
- TOWN OF DURHAM PLANNING BOARD CONDITIONAL SITE PLAN APPROVAL, DATED _____.
- NHDES ALTERATION OF TERRAIN PERMIT AOT-xxxxx, DATED _____.

P4836



LEGEND

- SET 5/8" IRON ROD w/ID CAP STAMPED "ATLANTIC LLS 891"
- DRILL HOLE FOUND
- FOUND GRANITE BOUND
- UTILITY POLE
- n/f — NOW OR FORMERLY
- HIGHWAY FENCE
- STONE WALL
- 102 — 2' CONTOUR LINE



LOCATION PLAN

NOTES

1. RANDOM TRAVERSE ERROR OF CLOSURE IS LESS THAN 1 PART IN 10,000.
2. OWNER OF RECORD:

   ROCKINGHAM PROPERTIES 1, LTD
   PO BOX 423
   BELMONT, MA 02178
   TAX MAP 11, LOTS 8-0 & 8-1 TROUGH 8-15
   BOOK 1780, PAGE 450 S.C.R.D.
   BOOK 1879, PAGE 132 S.C.R.D.
3. APPLICANT:

   THE RIVERWOODS GROUP
   7 RIVERWOODS DRIVE
   EXETER, NH 03833
4. REFERENCE PLANS:

   a) "SUBDIVISION OF LAND PREPARED FOR ROCKINGHAM PROPERTIES 1 LTD LOCATED AT ROUTE 108 & STONE QUARRY DRIVE, DURHAM, NH BY THIS OFFICE DATED DEC., 2001 S.C.R.D. PLAN No. 53-49.

   b) "SUBDIVISION PLAN-ROCKINGHAM PROPERTIES 1 LIMITED PARTNERSHIP-DURHAM, STRAFFORD COUNTY-NEW HAMPSHIRE" BY ORVIS/DREW LLC DATED OCT. 1997 S.C.R.D. PLAN No. 53-49.

   c) "BASE MAP FOR THE TOWN OF DURHAM-N.H. ROUTE 4-DURHAM, NEW HAMPSHIRE" BY DOUCET SURVEY DATED JUNE 22, 1996 ON FILE AT THE TOWN OF DURHAM PUBLIC WORKS.
5. ZONING DISTRICT: (OR) OFFICE AND RESEARCH
   (WCO) WETLAND CONSERVATION OVERLAY
6. VERTICAL DATUM BASED ON NGVD 29.
7. TOTAL AREA = 579,850 Sq.Ft. – 13.31 Acres.
8. WETLAND DELINEATED BY JAMES H. LONG OF GZA GEOENVIRONMENTAL.

ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

ATLANTIC SURVEY COMPANY
149 Mill Road, Durham, New Hampshire 03824

PREPARED BY:
SURVEYORS
ENGINEERS
PLANNERS
603-659-8939

STATE OF NEW HAMPSHIRE — No. 891 ADAM R. FOGG — LICENSED LAND SURVEYOR
SIGNATURE

DATE:	APRIL, 2017
FIELDWORK BY:	AF, TF
DESIGNED BY:	AF
CAD FILE:	17109
PROJECT No.:	00166
SHEET	1 OF 1

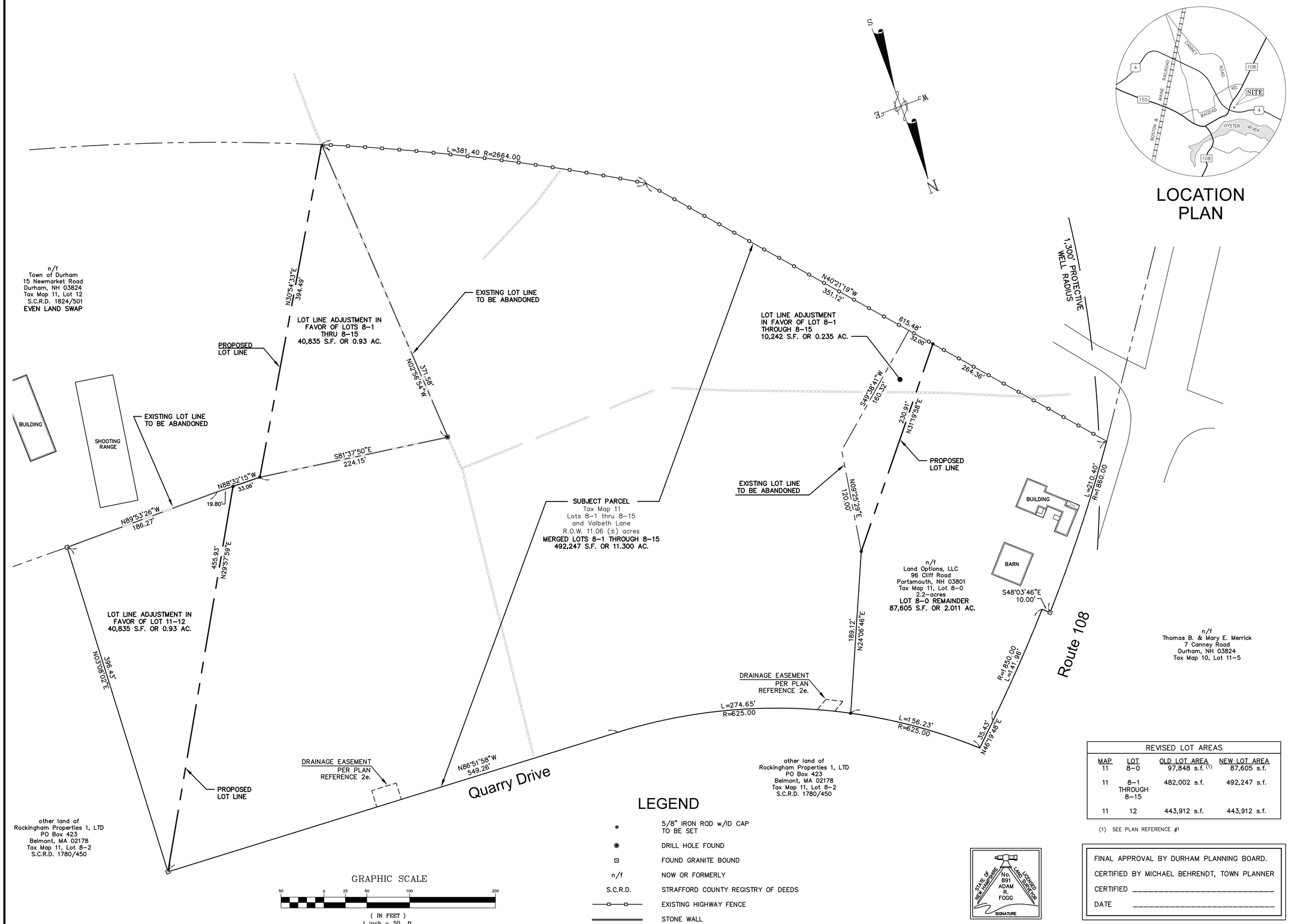
EXISTING CONDITIONS PLAN

PREPARED FOR

The Riverwoods Group

LOCATED AT

Route 108 & Stone Quarry Drive, Durham, N.H.



LOCATION PLAN

LEGEND

•	5/8" IRON ROD w/ID CAP TO BE SET
◉	DRILL HOLE FOUND
⊡	FOUND GRANITE BOUND
n/f	NOW OR FORMERLY
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
	EXISTING HIGHWAY FENCE
	STONE WALL

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISED LOT AREAS			
MAP	LOT	OLD LOT AREA	NEW LOT AREA
11	8-0	97,848 s.f. (1)	87,605 s.f.
11	8-1 THROUGH 8-15	482,002 s.f.	492,247 s.f.
11	12	443,912 s.f.	443,912 s.f.

(1) SEE PLAN REFERENCE #1

STATE OF NEW HAMPSHIRE No. 891 ADAM R. FOGG LICENSED LAND SURVEYOR
SIGNATURE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ATLANTIC SURVEY COMPANY
25 Nute Road, Dover, New Hampshire 03820

NOTES

1. RANDOM TRAVERSE ERROR OF CLOSURE IS LESS THAN 1 PART IN 10,000.
2. REFERENCE PLANS:
   a) "TEMPORARY SHOOTING RANGE PREPARED FOR TOWN OF DURHAM POLICE DEPARTMENT" BY MJS ENGINEERING, P.C., DATED 2/16/15
   b) "EXISTING CONDITIONS PLAN PREPARED FOR THE RIVERWOODS GROUP", BY ATLANTIC SURVEY COMPANY, DATED APRIL 2017
   c) "BASE MAP FOR THE TOWN OF DURHAM-NEW HAMPSHIRE" BY DOUCET SURVEY DATED JUNE 22, 1996 ON FILE AT THE TOWN OF DURHAM PUBLIC WORKS.
   d) "SUBDIVISION OF LAND PREPARED FOR ROCKINGHAM PROPERTIES 1 LTD LOCATED AT ROUTE 108 & STONE QUARRY DRIVE, DURHAM, NH BY ATLANTIC SURVEY CO, LLC. DATED DEC., 2001 S.C.R.D. PLAN No. 53-49.
   e) "SUBDIVISION PLAN-ROCKINGHAM PROPERTIES PROPERTIES PARTNERSHIP 1-DURHAM, STRAFFORD COUNTY-NEW HAMPSHIRE"BY BY ORVIS/DREW LLC DATED OCT. 1997. S.C.R.D. PLAN No. 53-49.
   f) "BASE MAP FOR THE TOWN OF DURHAM-. NEW HAMPSHIRE" BY DOUCET SURVEY DATED JUNE 22, 1996 ON FILE AT THE TOWN OF DURHAM PUBLIC WORKS.

DRAWN BY: RMB
APPROVED BY: JKC, AF
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

OWNERS:

MAP 11 LOTS 8-1 TO 8-15
ROCKINGHAM PROPERTIES 1, LTD
S.C.R.D. BOOK 1780 PAGE 450
S.C.R.D. BOOK 1879 PAGE 132
P.O. BOX 423
BELMONT, MA 02178

LOT 8-0
LAND OPTIONS, LLC
S.C.R.D. BOOK 4484 PAGE 508
96 CLIFF ROAD
PORTSMOUTH, NH 03801

LOT 11-12
TOWN OF DURHAM
S.C.R.D. BOOK 1827 PAGE 501
15 NEWMARKET ROAD
DURHAM, NH 03824

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

Lot Line Adjustment Plan
PREPARED FOR
THE RIVERWOODS GROUP
LOCATED AT
STONE QUARRY DR & RTE 108
DURHAM, NH

SHEET NUMBER:

G - 1.0

LEGEND

	UTILITY POLE
n/f	NOW OR FORMERLY
	HIGHWAY FENCE
	STONE WALL
102	2' CONTOUR LINE
	JURISDICTIONAL WETLAND
	WETLAND SYMBOL
	75' WETLANDS SETBACK
G G	EXIST. GAS LINE
OHW	EXIST. OVERHEAD WIRES
D D	EXIST. DRAIN LINE
	EXIST. CULVERT
	PROP. SEDIMENTATION BARRIER
PW	PROP. WATER LINE
WV	PROP. GATE VALVE
PS	PROP. SEWER LINE
ETC	PROP. UNDERGROUND ELEC./TELE./COMMUNICATION
PE	PROP. ELECTRICAL CONDUIT
	PROP. LIGHT POLE
PG	PROP. GAS LINE
PD	PROP. DRAIN LINE
PUD	PROP. PERFORATED UNDERDRAIN
	PROP. STORMWATER MANAGEMENT GALLERY (SMG)
PDMH	PROP. DRAIN MANHOLE
PCB	PROP. CATCH BASIN
PDI	PROP. DROP INLET STRUCTURE
PAD	PROP. AREA DRAIN

CONSTRUCTION NOTES:

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. THE LANDOWNER AND CONTRACTOR ARE RESPONSIBLE FOR COMPLYING WITH ALL LOCAL, STATE, AND FEDERAL WETLANDS REGULATIONS, INCLUDING ANY PERMITTING AND SETBACKS REQUIREMENTS REQUIRED UNDER THESE REGULATIONS. SEE PROJECT MANUAL APPENDICES FOR COPY OF PERMITS.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AND NOTIFY OWNER'S AUTHORIZED REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. SITE CONSTRUCTION SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AS PUBLISHED IN THE FEDERAL REGISTER, VOL. 56, NO. 144, DATED JULY 26, 1991.
4. COORDINATE ALL WORK WITHIN TEN (10') FEET OF PROPOSED BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL DRAWINGS.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING STRUCTURES, BITUMINOUS CONCRETE, DEBRIS, AND CONSTRUCTION WASTE PRODUCTS WHICH ARE NOT AUTHORIZED, TO BE USED AS PART OF CONSTRUCTION. DISPOSE OF EXCESS MATERIALS OFF-SITE IN ACCORDANCE WITH NH DEPARTMENT OF ENVIRONMENTAL SERVICES REQUIREMENTS.
6. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
7. STRIPE PARKING AND DRIVES AS SHOWN INCLUDING PARKING SPACES. ALL MARKINGS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F.
8. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO ADA REQUIREMENTS AND "MANUAL ON UNIFORM TRAFFIC DEVICES" AND "STANDARD ALPHABETS OF HIGHWAY SIGNS AND PAVEMENT MARKINGS" LATEST EDITIONS.
9. UPON COMPLETION OF CONSTRUCTION, THE DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
10. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL.
11. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
12. THE PROJECT AREA IS OUTSIDE THE 100-YEAR FLOOD ZONE. EXCAVATED MATERIAL NOT USED AS FILL MATERIAL ON SITE, SHALL ONLY BE PLACED IN UPLANDS AREA OUTSIDE OF THE 100 YEAR FLOOD ZONE.
13. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION. VOIDS BETWEEN STONES AND CLUMPS OF MATERIAL SHALL BE FILLED WITH FINE MATERIALS.
14. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, MULCH, AND APPROPRIATE SOIL STABILIZATION TECHNIQUES.
15. CONTRACTOR TO ESTABLISH AND MAINTAIN TEMPORARY BENCHMARKS (TBMS) AND PERFORM CONSTRUCTION SURVEY LAYOUT.
16. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE ENGINEER, SURVEYOR, OR OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR DAMAGE TO EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES AT NO EXTRA COST TO THE OWNER.
17. CONTRACTOR SHALL MAINTAIN AND PROVIDE RECORD DRAWINGS TO RIVERWOODS AND TO THE TOWN OF DURHAM.
18. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES AND VEGETATION AND/OR MULCHING STOCKPILES.
19. WORK HOURS FOR CONSTRUCTION WILL BE AS APPROVED BY RIVERWOODS AND THE TOWN OF DURHAM. STANDARD WORK HOURS SHALL BE 7AM TO 6 PM.
20. FILL SPACED WITHIN 3 FEET OF THE OUTSIDE OF FOUNDATION WALLS SHALL CONSIST OF STRUCTURAL FILL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
21. ALL ENTRANCE SLABS AND SIDEWALKS WITHIN 5 FEET OF THE BUILDING SHALL HAVE 4 FEET DEPTH OF STRUCTURAL FILL.

GRADING NOTES:

1. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ACCEPTED. ABRUPT RIDGES AT TOPS AND BOTTOM WILL NOT BE ACCEPTED.
2. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES AND PLANTING BEDS.
3. MAXIMUM SLOPE IN DISTURBED AREAS SHALL BE NO STEEPER THAN 3:1 (h:v), UNLESS OTHERWISE NOTED. WHERE SLOPES IN DISTURBED AREAS ARE STEEPER THAN 3:1, CONTRACTOR SHALL PROVIDE CURLEX II EROSION CONTROL BLANKET FROM AMERICAN EXCELSIOR COMPANY (800) 777-7645 OR APPROVED EQUAL UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL ADJUST UTILITY ELEMENTS MEANT TO BE FLUSH WITH GRADE (CLEANOUTS, UTILITY MANHOLES, CATCH BASINS, INLETS, ETC.) THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
5. CROSS SLOPES AT ALL WALKS SHALL BE PITCHED TO DRAIN 1 1/2% MINIMUM 2% MAXIMUM.
6. PITCH ALL WALKS AND PATIOS AWAY FROM BUILDINGS AT 1-1/2% MINIMUM; PITCH WITHIN 5 FEET OF STAIRS OR DOORS SHALL NOT EXCEED 2%.
7. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS.
8. ALL UNSUITABLE MATERIALS AND SURPLUS MATERIALS WHICH CAN NOT BE APPROPRIATELY WASTED ON SITE SHALL BE REMOVED AT NO ADDITIONAL COST TO THE OWNER.
9. THE GRADING ON THE PLANS SHOWS THE GENERAL INTENT AND DIRECTION OF THE STORMWATER FLOW. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY FIELD CONDITIONS THAT WILL IMPACT THE GRADING DESIGN SHOWN ON THIS PLAN FOR RESOLUTION.
10. SAWCUT AND REMOVE EXISTING PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT OR CURB LINE IN ALL AREAS WHERE NEW PAVEMENT OR CURBING ABUTS EXISTING PAVEMENT.

UTILITY NOTES:

1. COORDINATE UTILITY WORK WITH UTILITY COMPANIES.
2. ALL ELECTRIC, CABLE, AND TELECOMMUNICATION SERVICES AND CONDUITS SHALL BE LOCATED UNDERGROUND WHERE SHOWN. UNDERGROUND UTILITIES INSTALLATIONS SHALL MEET THE MINIMUM REQUIREMENTS OF TOWN OF DURHAM AND UTILITY COMPANIES. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING IN CABLES.
3. CONTRACTOR SHALL VERIFY THE EXACT LOCATION & ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. ANY DISCREPANCIES BETWEEN FIELD AND PLAN SHALL BE IMMEDIATELY REPORTED TO ENGINEER.
4. ALL SEWER, DRAINAGE AND WATER INSTALLATIONS SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF THE DURHAM PUBLIC WORKS DEPARTMENT AND THE NHDES. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
5. SEE ELECTRICAL SITE PLAN FOR TYPICAL ELECTRIC/COMMUNICATION CONDUIT TRENCH SECTION.
6. VERIFY LOCATION OF UTILITY BOXES WITH OWNER AND UTILITY COMPANIES.
7. ALL UTILITY STRUCTURES SHALL BE SET FLUSH WITH PROPOSED GRADE.

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE
JEFFREY K. CLIFFORD No. 6524 LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

LAND OWNER - SUBJECT PARCEL:
ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

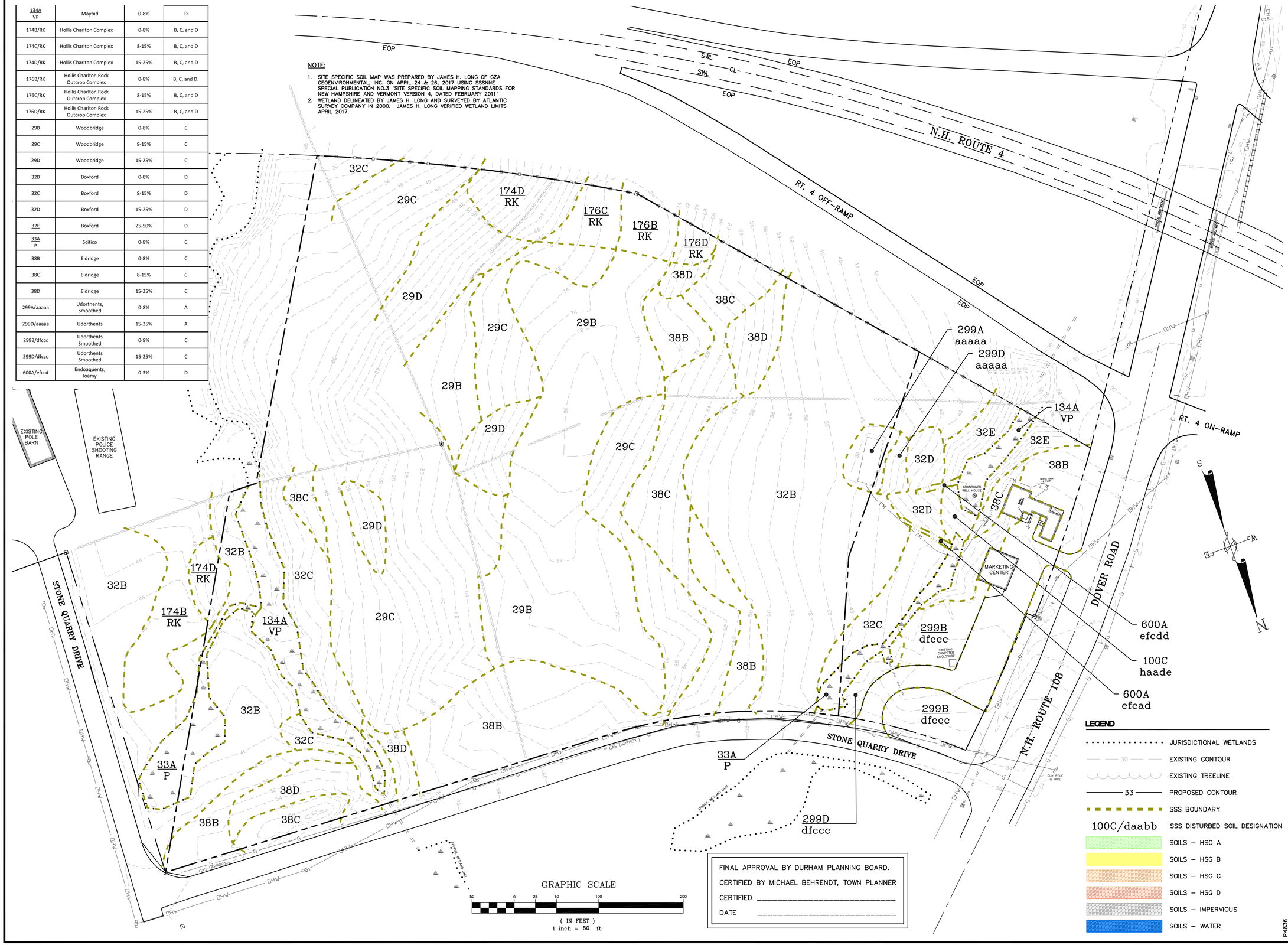
TITLE:
GENERAL NOTES & LEGEND

SHEET NUMBER:
G - 1.1

134A VP	Maybid	0-8%	D
174B/RK	Hollis Charlton Complex	0-8%	B, C, and D
174C/RK	Hollis Charlton Complex	8-15%	B, C, and D
174D/RK	Hollis Charlton Complex	15-25%	B, C, and D
176B/RK	Hollis Charlton Rock Outcrop Complex	0-8%	B, C, and D.
176C/RK	Hollis Charlton Rock Outcrop Complex	8-15%	B, C, and D
176D/RK	Hollis Charlton Rock Outcrop Complex	15-25%	B, C, and D
29B	Woodbridge	0-8%	C
29C	Woodbridge	8-15%	C
29D	Woodbridge	15-25%	C
32B	Boxford	0-8%	D
32C	Boxford	8-15%	D
32D	Boxford	15-25%	D
32E	Boxford	25-50%	D
33A P	Scitico	0-8%	C
38B	Eldridge	0-8%	C
38C	Eldridge	8-15%	C
38D	Eldridge	15-25%	C
299A/aaaaa	Udorthents, Smoothed	0-8%	A
299D/aaaaa	Udorthents	15-25%	A
299B/dfccc	Udorthents Smoothed	0-8%	C
299D/dfccc	Udorthents Smoothed	15-25%	C
600A/efccd	Endoaquents, loamy	0-3%	D

NOTE:

1. SITE SPECIFIC SOIL MAP WAS PREPARED BY JAMES H. LONG OF GZA GEOENVIRONMENTAL, INC. ON APRIL 24 & 26, 2017 USING SSSNNE SPECIAL PUBLICATION NO.3 "SITE SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT VERSION 4, DATED FEBRUARY 2011"
2. WETLAND DELINEATED BY JAMES H. LONG AND SURVEYED BY ATLANTIC SURVEY COMPANY IN 2000. JAMES H. LONG VERIFIED WETLAND LIMITS APRIL 2017.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

FINAL APPROVAL BY DURHAM PLANNING BOARD.

CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER

CERTIFIED _____

DATE _____

LEGEND

- JURISDICTIONAL WETLANDS
- 30 EXISTING CONTOUR
- EXISTING TREELINE
- 33 PROPOSED CONTOUR
- SSS BOUNDARY
- 100C/daabb SSS DISTURBED SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER

P4836

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, New Hampshire 03110
Tel. (603) 232-8739

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
APPROVAL

ISSUE DATE:
OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

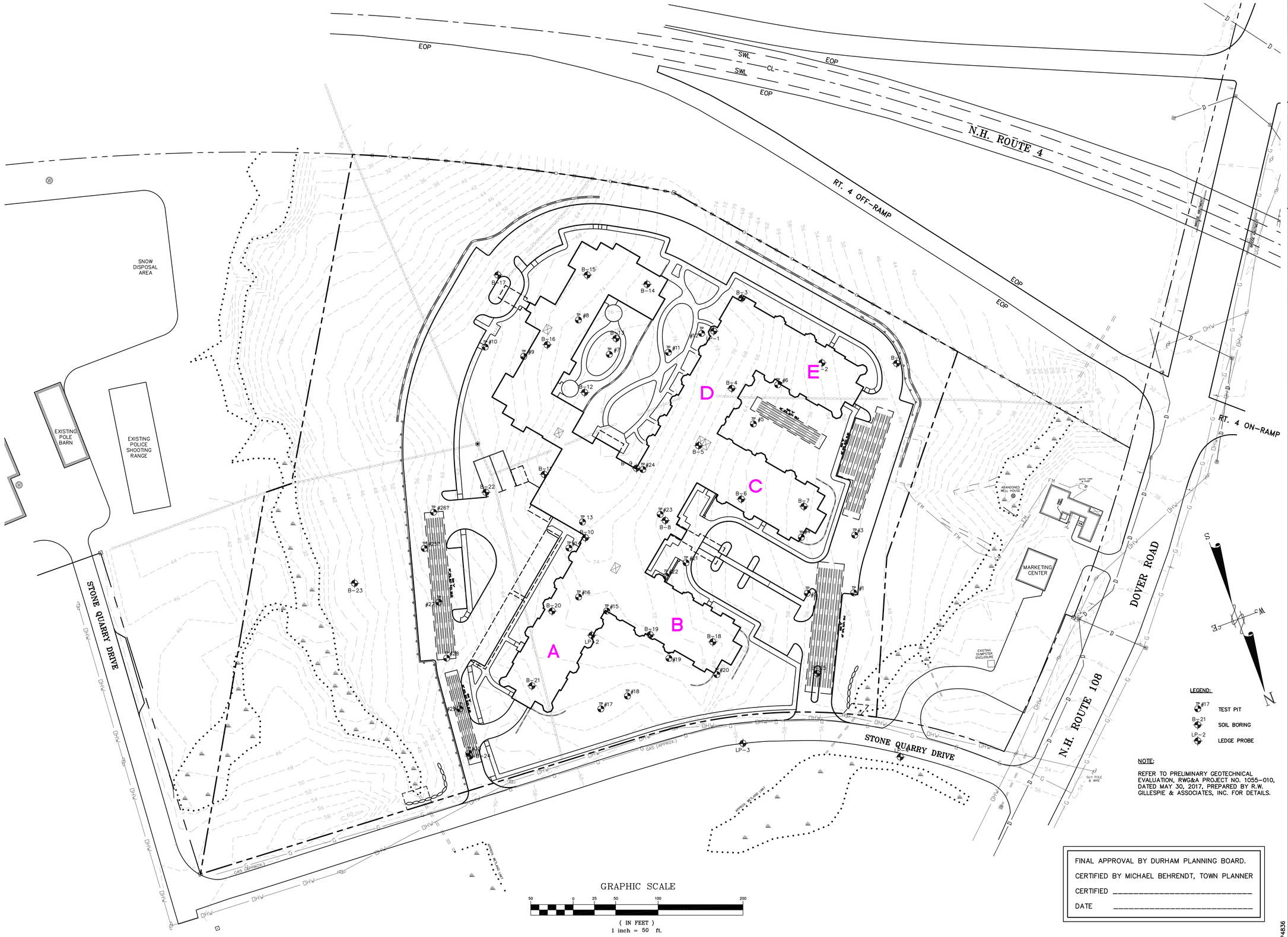
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

SITE SPECIFIC SOILS MAP

SHEET NUMBER:

G - 2.0



FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
APPROVAL

ISSUE DATE:
OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

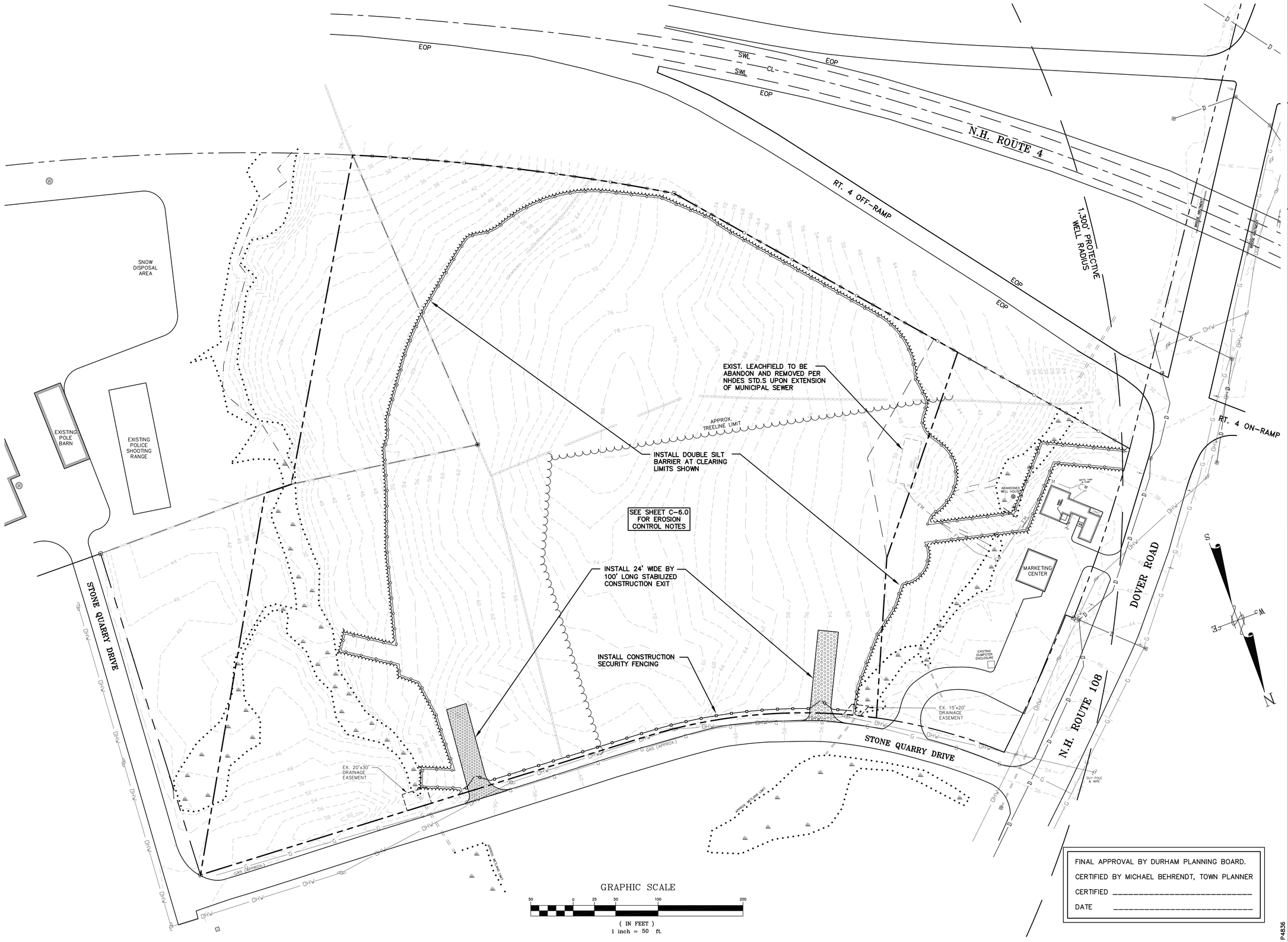
LAND OWNER - SUBJECT PARCEL:
ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:
GEOTECHNICAL INVESTIGATION PLAN

SHEET NUMBER:
G - 2.1



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE
JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER

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ISSUE DATE: OCTOBER 16, 2017

REVISIONS

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2	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

SITE PREPARATION PLAN

SHEET NUMBER:

C - 1.0

ZONING SUMMARY:

PROPERTY REFERENCE: MAP 11, LOTS 8-1 THROUGH 8-15 AND VALBETH LANE (SUBJECT PARCELS) AND PORTIONS OF LOT 8-0 AND LOT 12

TOTAL SITE AREA: 492,247 S.F. OR 11.30 AC.

ZONING: OFFICE AND RESEARCH DISTRICT-ROUTE 108 (OR) WETLANDS CONSERVATION OVERLAY DISTRICT (WCO)

	REQ'D	PROVIDED
SETBACKS		
FRONT YARD	50' MIN.	50'
SIDE YARD	25' MIN.	25'
REAR YARD	25' MIN.	9'
WETLANDS BUFFER	75' MIN.	<75' CUP REQUESTED
MAX. IMPERVIOUS	50% MAX.	44%
BUILDING HEIGHT:	50'/75' MAX.	SEE ARCH. DWG.S
OVERALL BLDG. FOOTPRINT:		87,778 S.F.

FLOOR AREA:

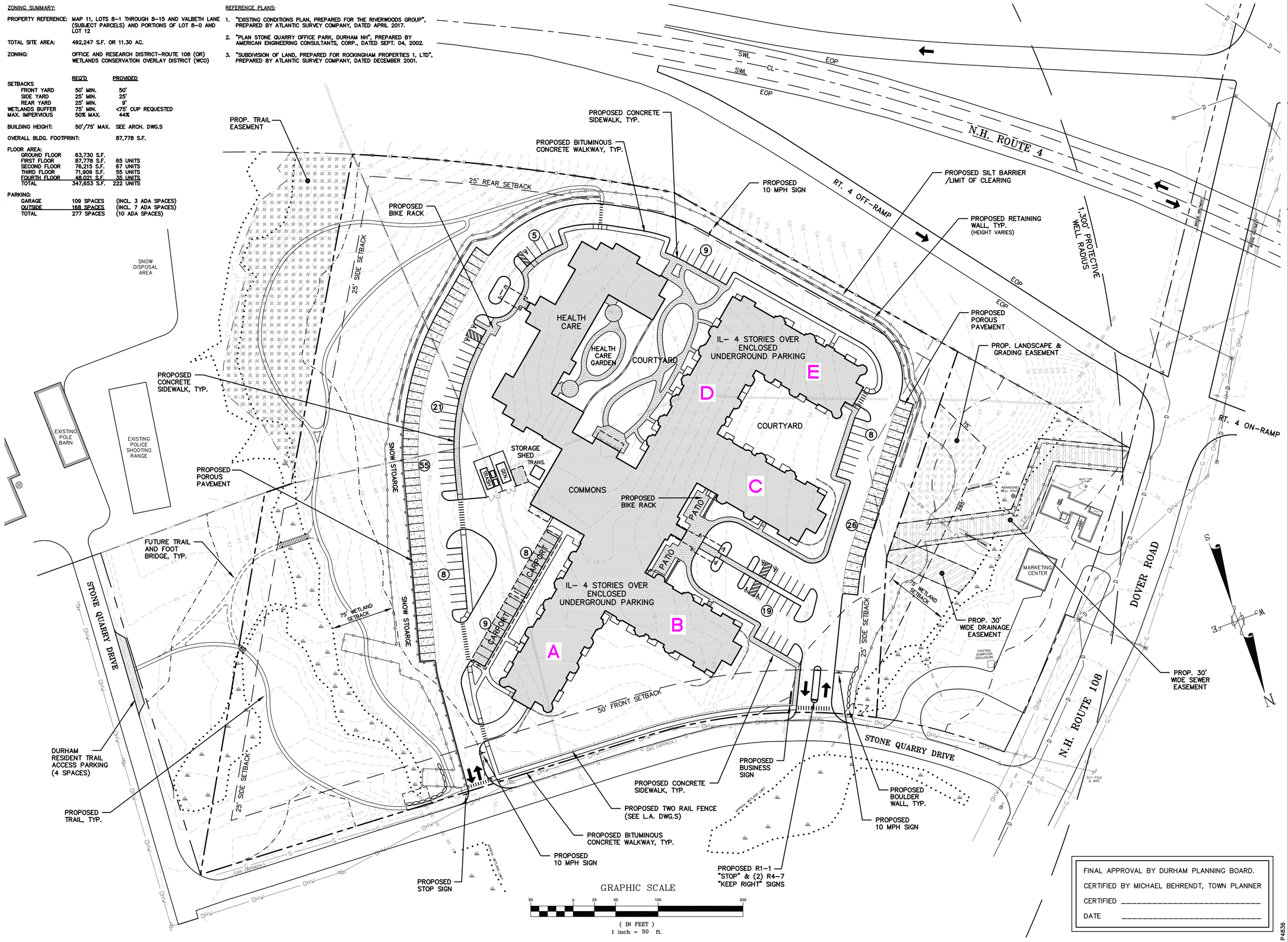
GROUND FLOOR	63,730 S.F.	
FIRST FLOOR	87,778 S.F.	65 UNITS
SECOND FLOOR	76,215 S.F.	67 UNITS
THIRD FLOOR	71,909 S.F.	55 UNITS
FOURTH FLOOR	48,021 S.F.	35 UNITS
TOTAL	347,653 S.F.	222 UNITS

PARKING:

GARAGE	109 SPACES	(INCL. 3 ADA SPACES)
OUTSIDE	168 SPACES	(INCL. 7 ADA SPACES)
TOTAL	277 SPACES	(10 ADA SPACES)

REFERENCE PLANS:

1. "EXISTING CONDITIONS PLAN, PREPARED FOR THE RIVERWOODS GROUP", PREPARED BY ATLANTIC SURVEY COMPANY, DATED APRIL 2017.
2. "PLAN STONE QUARRY OFFICE PARK, DURHAM NH", PREPARED BY AMERICAN ENGINEERING CONSULTANTS, CORP., DATED SEPT. 04, 2002.
3. "SUBDIVISION OF LAND, PREPARED FOR ROCKINGHAM PROPERTIES 1, LTD", PREPARED BY ATLANTIC SURVEY COMPANY, DATED DECEMBER 2001.



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APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

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P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

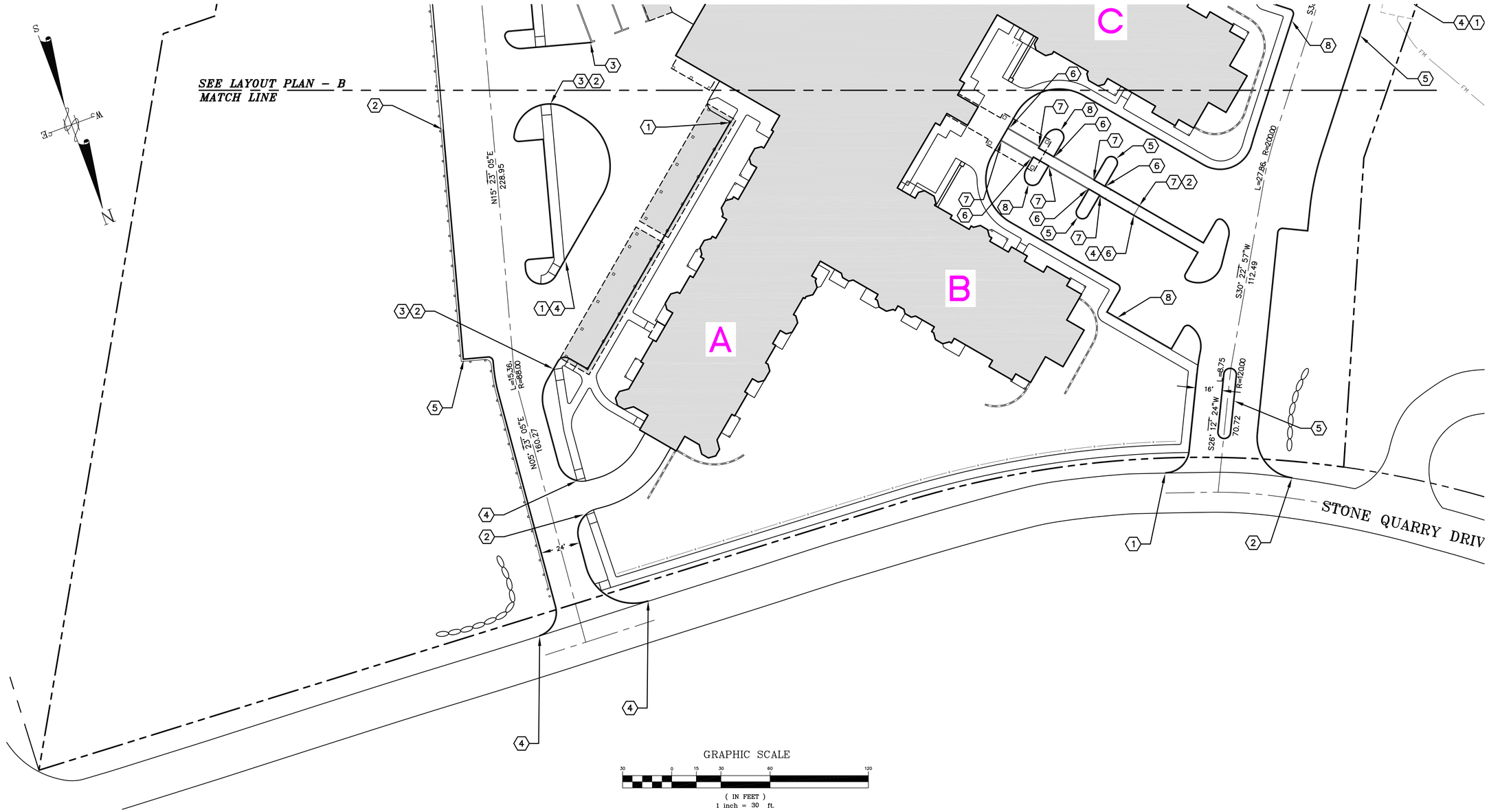
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

SITE PLAN

SHEET NUMBER:

C - 2.0



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

KEY NOTES

1. BEGIN VERTICAL GRANITE CURB (VGC)
2. BEGIN SLOPE GRANITE CURB (SGC)
3. END VERTICAL GRANITE CURB (VGC)
4. END SLOPE GRANITE CURB (SGC)
5. INSTALL SLOPE GRANITE CURB (SGC)
6. BEGIN VERTICAL GRANITE CURB
7. END VERTICAL GRANITE CURB
8. INSTALL VERTICAL GRANITE CURB

FINAL APPROVAL BY DURHAM PLANNING BOARD.
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APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 30'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

LAYOUT PLAN – A

SHEET NUMBER:

C - 2.1

KEY NOTES

1. BEGIN VERTICAL GRANITE CURB (VGC)
2. BEGIN SLOPE GRANITE CURB (SGC)
3. END VERTICAL GRANITE CURB (VGC)
4. END SLOPE GRANITE CURB (SGC)
5. INSTALL SLOPE GRANITE CURB (SGC)
6. BEGIN VERTICAL GRANITE CURB
7. END VERTICAL GRANITE CURB
8. INSTALL VERTICAL GRANITE CURB

FINAL APPROVAL BY DURHAM PLANNING BOARD.
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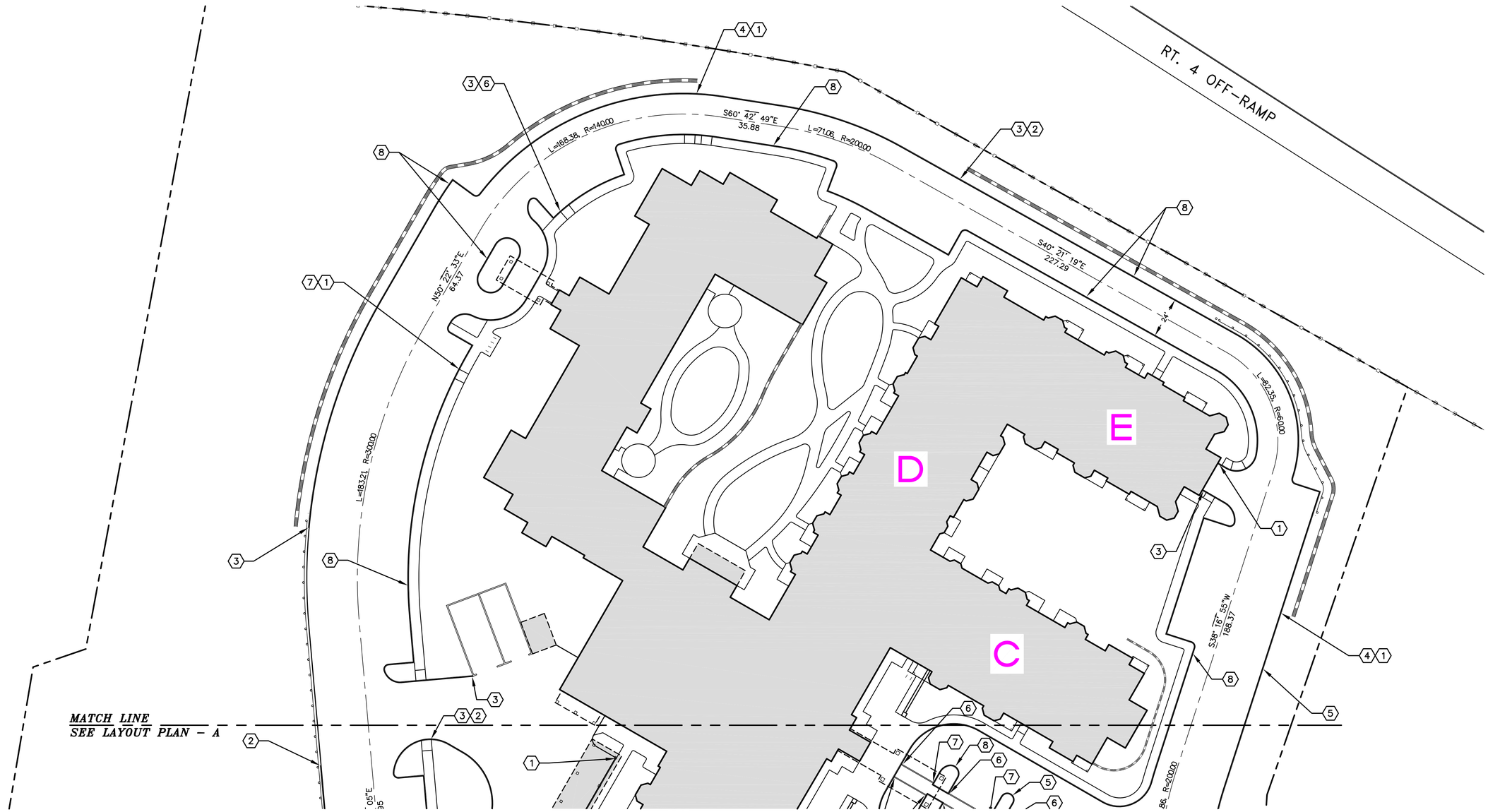

GRAPHIC SCALE
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(IN FEET)
1 inch = 30 ft.

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SCALE: 1 " = 30'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

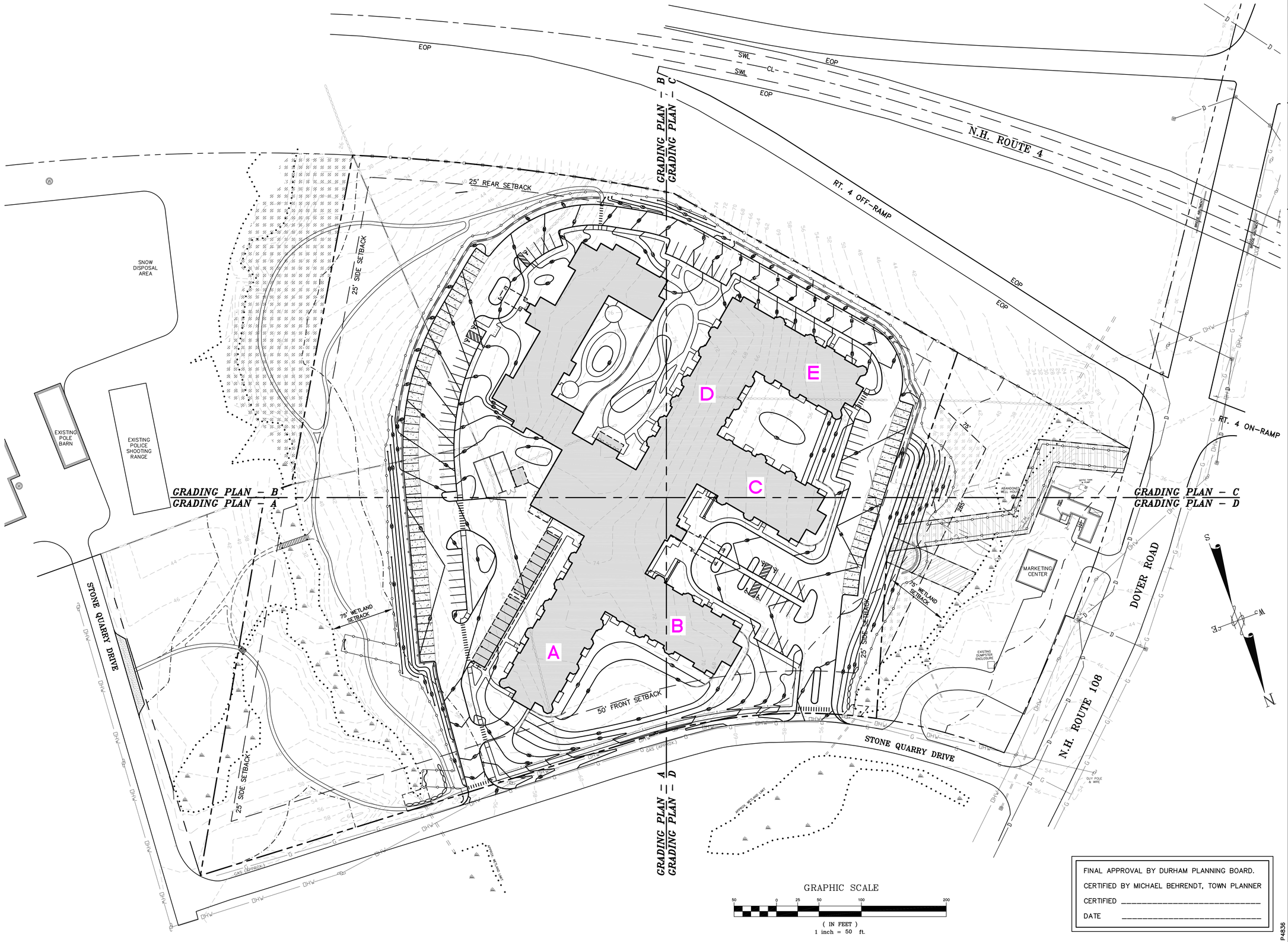
TITLE:

LAYOUT PLAN – B

SHEET NUMBER:

C - 2.2

P4836



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

FINAL APPROVAL BY DURHAM PLANNING BOARD.
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CERTIFIED _____
DATE _____

P4836

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STATE OF NEW HAMPSHIRE
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APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 50'

LAND OWNER – SUBJECT PARCEL:
ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

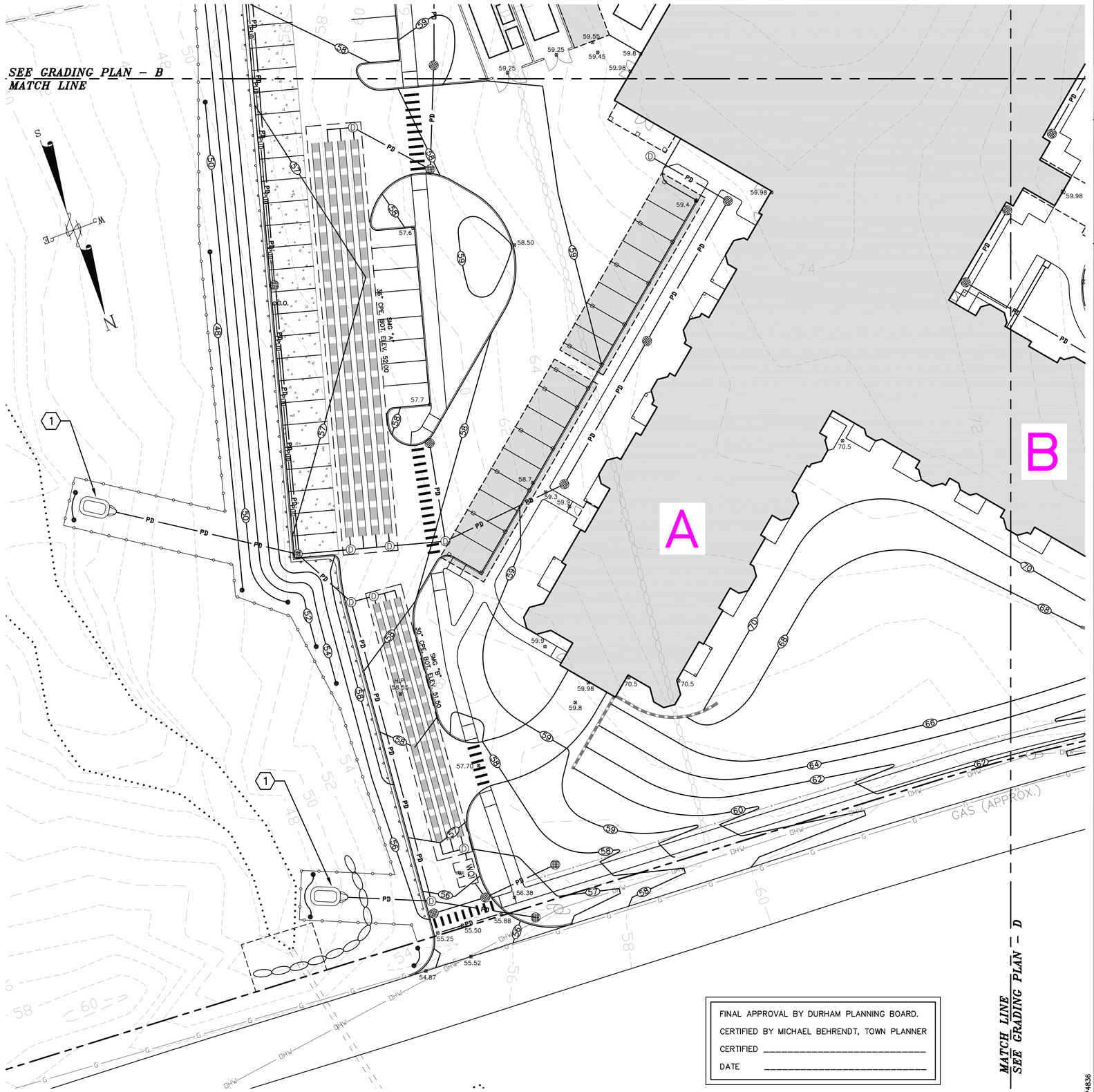
PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:
OVERALL GRADING PLAN

SHEET NUMBER:
C - 3.0

KEY NOTES

(1) INSTALL PLUNGE POOL AT OUTFALL



NOTE:

SEE LANDSCAPE ARCHITECT PLANS FOR BUILDING DRIP STRIP LOCATIONS AND DETAIL.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
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STATE OF NEW HAMPSHIRE
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DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE:
1 " = 20'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

GRADING PLAN – A

SHEET NUMBER:

C - 3.1

FINAL APPROVAL BY DURHAM PLANNING BOARD.

CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER

CERTIFIED _____

DATE _____

NOTE:

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GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

ALTUS ENGINEERING, INC.

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APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE:
1 " = 20'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD

P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP

7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM

STONE QUARRY DRIVE
DURHAM, NH

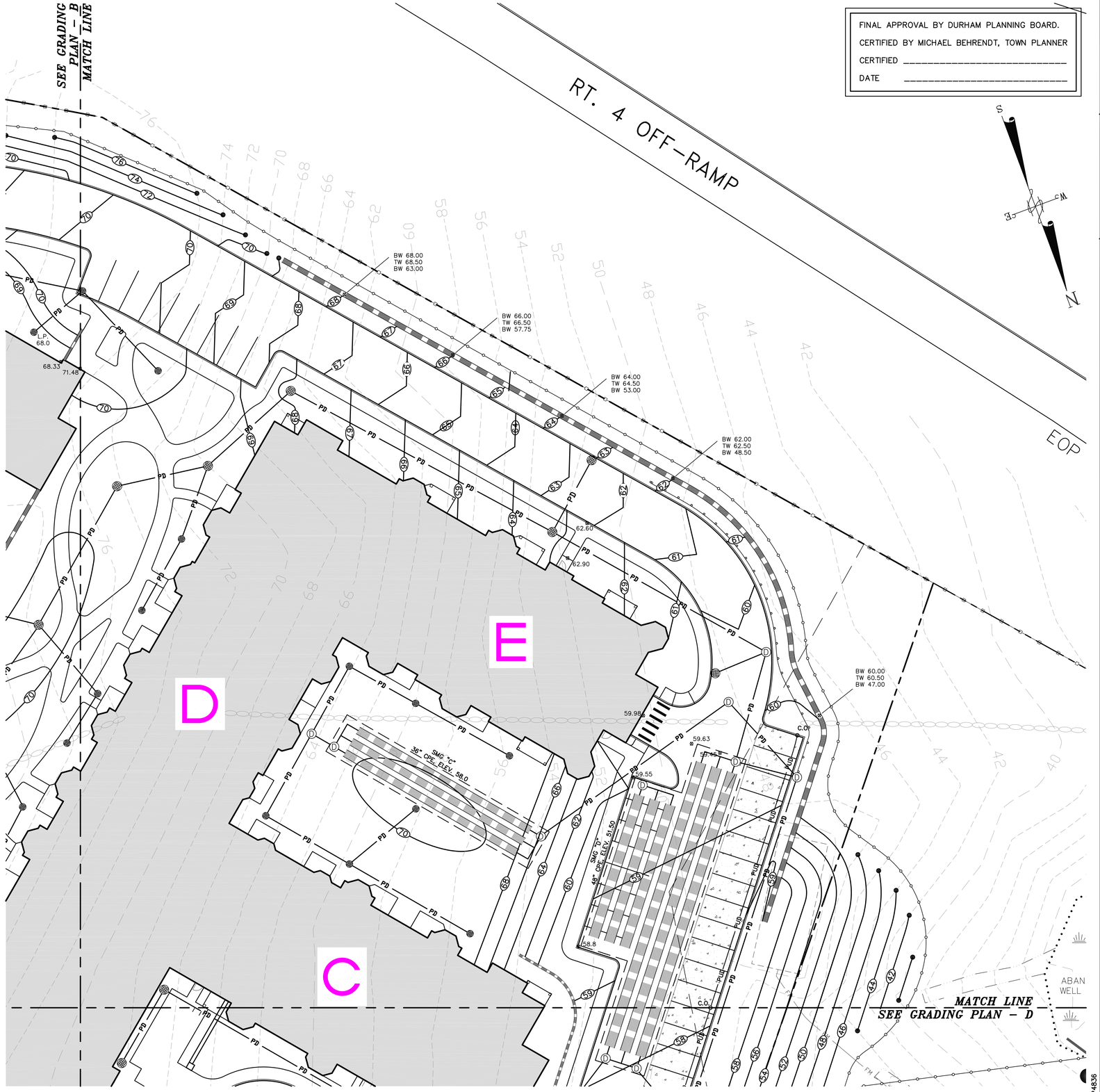
TITLE:

GRADING PLAN – B

SHEET NUMBER:

C - 3.2

P4836



NOTE:

SEE LANDSCAPE ARCHITECT PLANS FOR BUILDING DRIP STRIP LOCATIONS AND DETAIL.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

FINAL APPROVAL BY DURHAM PLANNING BOARD.

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APPROVED BY: JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1 " = 20'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

GRADING PLAN – C

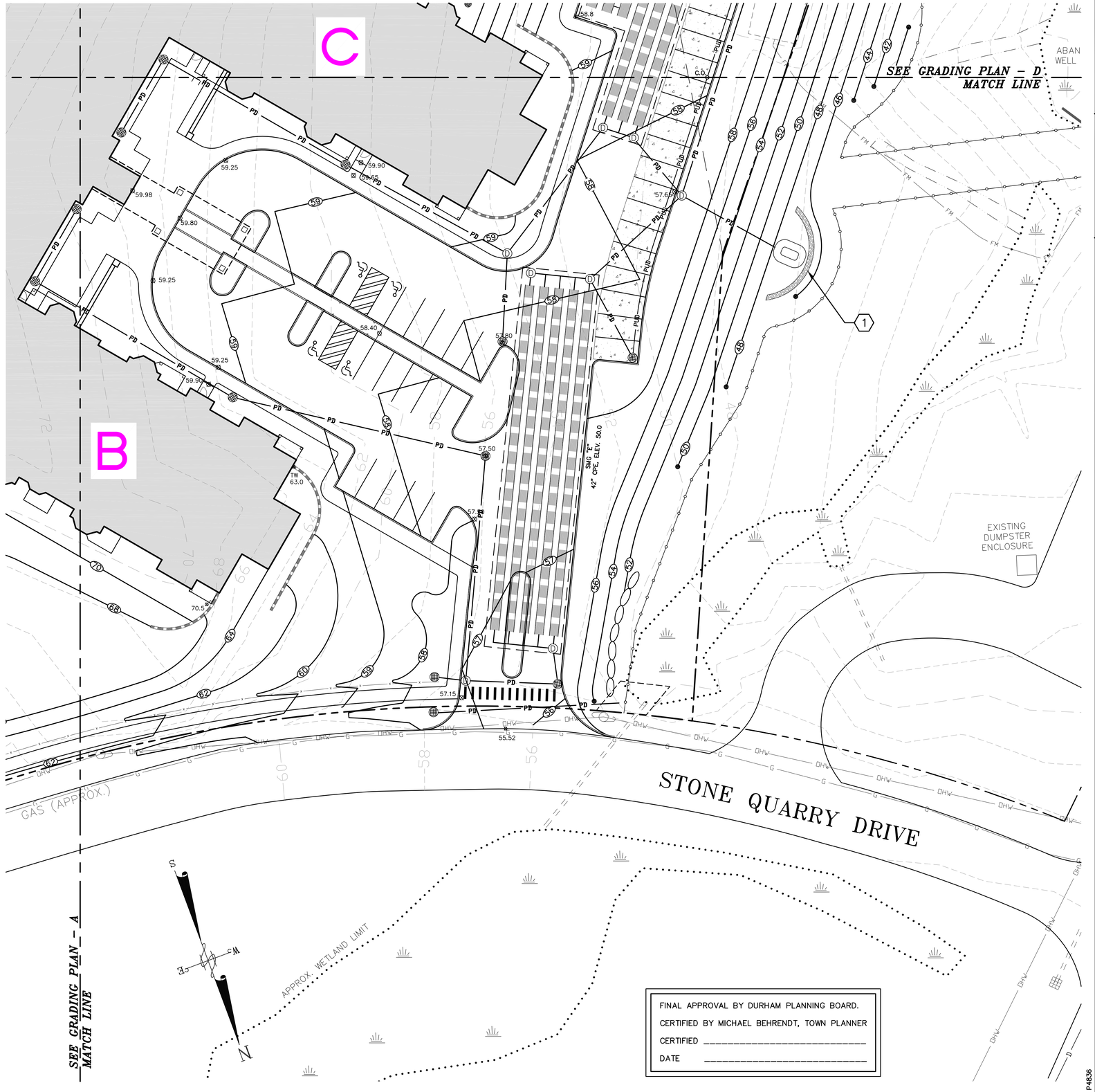
SHEET NUMBER:

C - 3.3

P4836

KEY NOTES

(1) INSTALL PLUNGE POOL AT OUTFALL W/40' STONE LIP LEVEL SPREADER



NOTE:

SEE LANDSCAPE ARCHITECT PLANS FOR BUILDING DRIP STRIP LOCATIONS AND DETAIL.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
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APPROVED BY: JKC
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SCALE: 1 " = 20'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

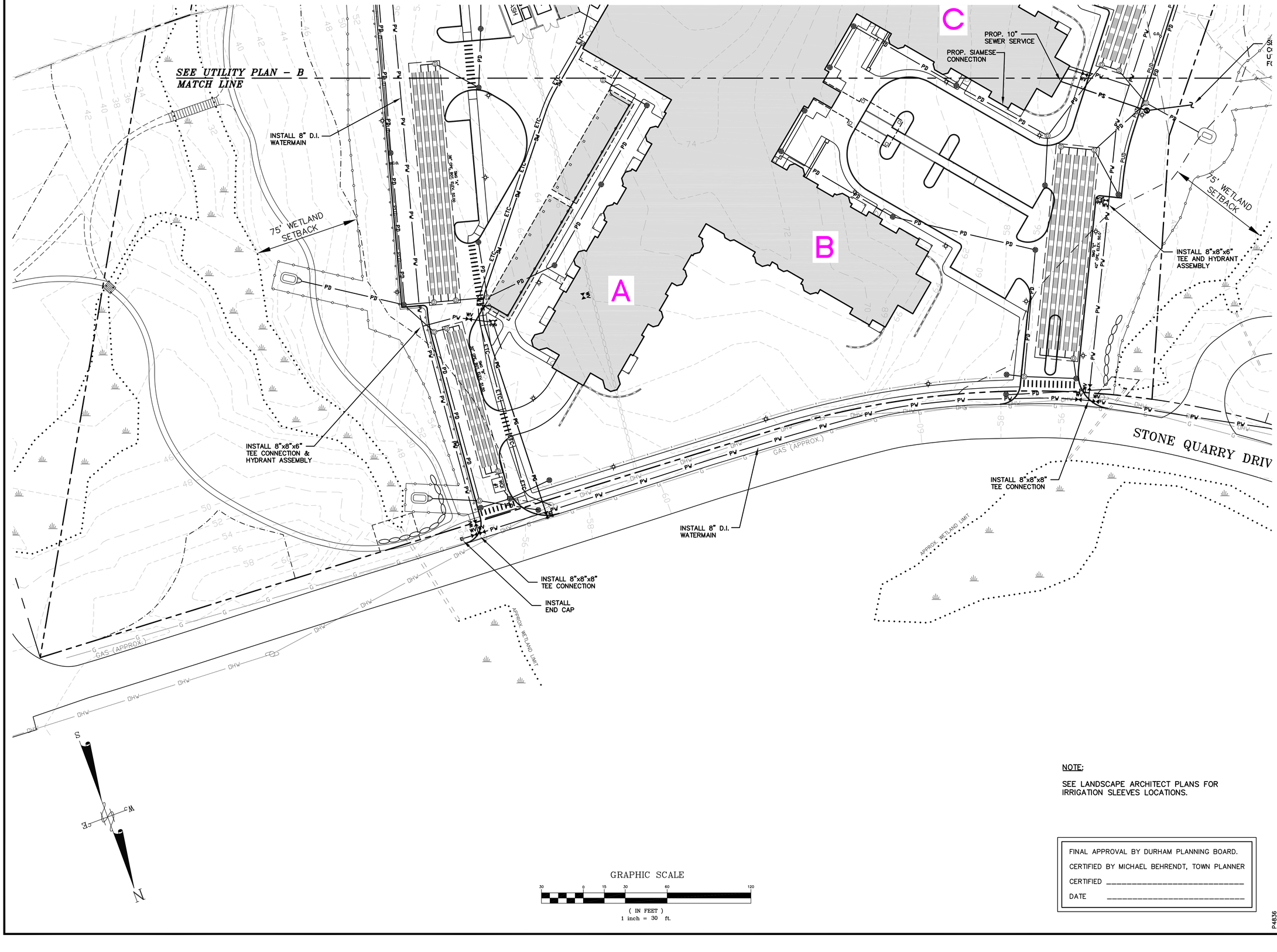
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

GRADING PLAN – D

SHEET NUMBER:

C - 3.4



NOTE:

SEE LANDSCAPE ARCHITECT PLANS FOR IRRIGATION SLEEVES LOCATIONS.

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APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

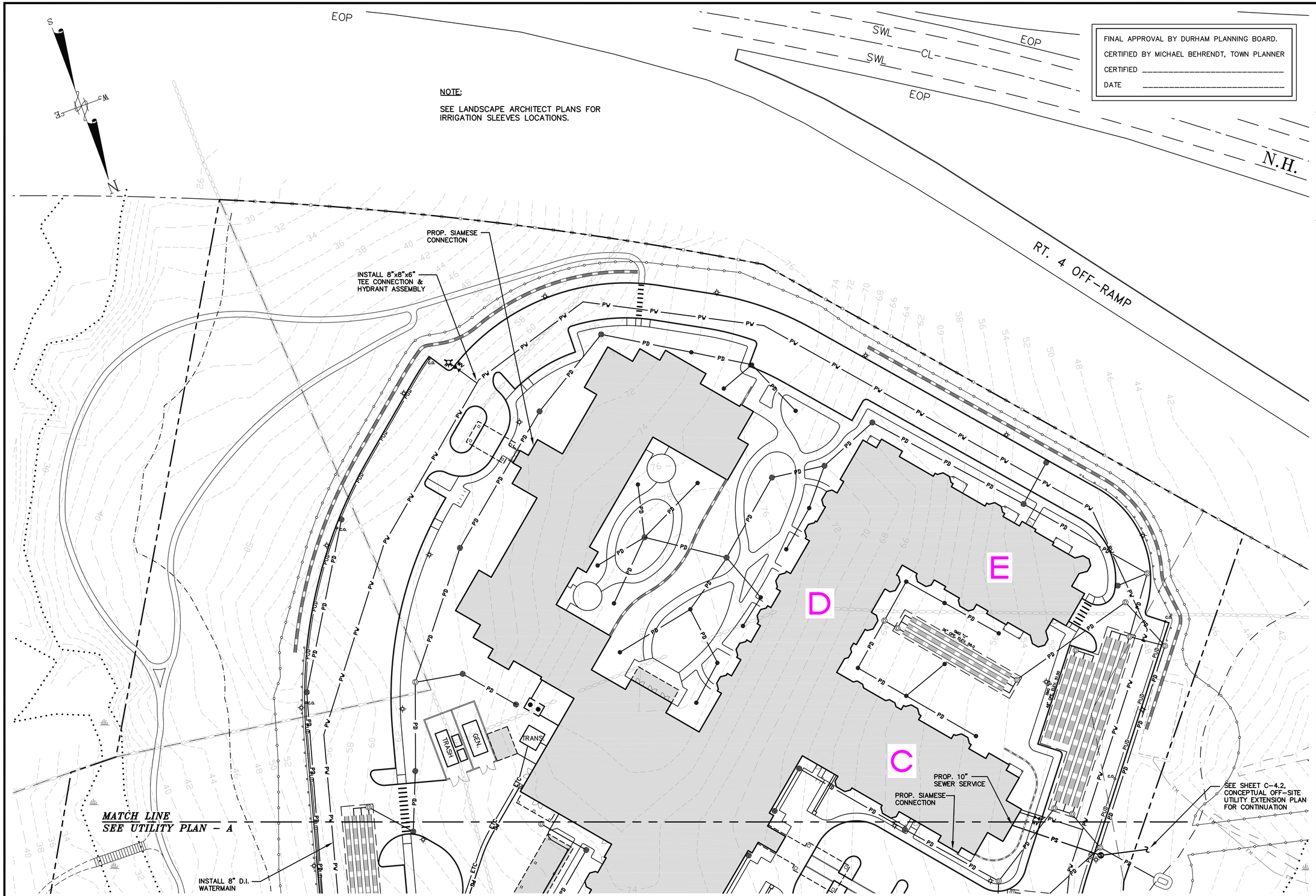
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

UTILITY PLAN – A

SHEET NUMBER:

C - 4.0



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BELMONT, MA 02178

APPLICANT:
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7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:
UTILITY PLAN - B

SHEET NUMBER:
C - 4.1

P4836

NOTES:

1. SEWER AND WATER OFF-SITE EXTENSIONS ARE SHOWN AS CONCEPTUAL ONLY. FINAL ALIGNMENT, PROFILES AND ASSOCIATED EASEMENTS ARE SUBJECT TO REVIEW AND APPROVAL BY NHDOT, NHDES,TOWN OF DURHAM AND PRIVATE LAND OWNER.
2. ROADWAY STATIONING BASED ON NHDOT PLANS.

BEGIN 12" SEWER EXTENSION. CORE EXISTING SM AND INSTALL DROP STRUCTURE

EXIST. SMH RIM 14.15 INV. OUT=-3.1±

PSMH 1

24" RCP

15" RCP DRAINAGE INV. OUT=3.90

2" PVC DRAIN

30" DI

PUMP STATION

24" RCP

8' DIA. SMH RIM=9.9 INV IN (2")=1.21 INV. IN (NW)=-4.24± INV. IN (SW)=-4.20± INV. OUT(E)=-4.74 INV. OUT (SE)=-4.24

6' DIA. SMH RIM=8.0 INV =+/- -4.18

2" PVC FORCE MAIN

24" RCP

18" DI FORCE MAIN METER PIT

PSMH 2

PSMH 3

PROPOSED 12" PVC SEWER (TYP)

DENSE STAND OF TREES

EXIST. CB RIM 16.1 INV.=11.4

EXIST. CB RIM 17.5 INV.=10.2

INV.=10.2

EXIST. CB RIM 20.1 INV.=12.8

EXIST. CB RIM 17.3 INV.=13.3

DOVER ROAD

N.H. ROUTE 108

INV.=8.06

INV.=11.48

PSMH 4

SAWCUT PAVEMENT, TRENCH AND PATCH, TYPICAL

EXIST. CB RIM 21.93 INV.=18.35

OLD PISCATAQUA ROAD

EXIST. CB RIM 20.69 INV.=13.9

PSMH 5

TRAFFIC ALERT SIGN AND METER PEDESTAL

BEGIN WATER MAIN EXTENSION. INSTALL 8x12 REDUCER AND 12" GATE VALVE

EXIST. CB RIM 22.8 INV.=18.7

EXIST. CB RIM 26.4 INV.=20.7

INSTALL 6" SEWER SERVICE LATERAL AND CAP. TYP. OF 2

PSMH 6

UNDERGROUND UTILITY MARKER

DENSE STAND OF TREES

HOLD OR RESET POLE

MATCH LINE

INV.=22.2

PSMH 7

CUT AND COVER SEWER AND WATER SLEEVES AT RAMP. SAWCUT PAVEMENT AND PATCH

EXIST. CB RIM 26.9 INV.=24.6

EXIST. CB RIM 26.9 INV.=22.9

#50

#52

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: REVIEW ONLY

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	07/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

N.H. ROUTE 108

RT. 4 OFF-RAMP

RT. 4 ON-RAMP

N.H. ROUTE 4

EOP

BRIDGE ABUTMENT

EXIST. CB RIM 26.9 INV.=24.6

EXIST. CB RIM 26.9 INV.=22.9

EXIST. CB RIM 29.5 INV.=24.5

EXIST. CB RIM 32.0 INV.=27.9

EXIST. CB RIM 42.3 INV.=36.3

EXIST. CB RIM 29.4 INV.=23.7

EXIST. CB RIM 26.3 INV.=21.9

EXIST. CB RIM 34.6 INV.=30.8

EXIST. CB RIM 40.6 INV.=36.1

EXIST. CB RIM 55.9 INV.=XX.X

PROPOSED 12" DI WATER

STUB W/ END CAP FOR FUTURE EXTENSION

PROVIDE 3' x 12" DIA. STUB FOR FUTURE EXTENSION

INSTALL 12x12x8 TEE AND (3) GATE VALVES

PSMH 10

PSMH 9

INV.=22.2

INV.=23.5

INV.=20.0

INV.=19.4

INV.=51.5

INV.=49.3

CUT AND COVER SEWER AND WATER SLEEVES AT RAMP. SAWCUT AND PATCH PAVEMENT

RECONSTRUCT ROCK SLOPE

CUT AND COVER SEWER AND WATER SLEEVES UNDER BRIDGE

PSMH 8

PROPOSED 30' WIDE EASEMENT

CONNECT OFFICE BUILDING TO SEWER

CONNECT OFFICE TO WATER MAIN

CONNECT BARN BUILDING TO SEWER

BARN

OFFICE

EXIST. PORCH

SEPTIC TANK & PUMP

ABANDONED WELL HOUSE

EXISTING DUMPSTER ENCLOSURE

NO PARKING

PROPOSED HYDRANT

STONE QUARRY DRIVE

PROPOSED 8" DI WATER

PSMH 11

PSMH 12

PSMH 13

WETLAND DISTURBANCE =976 S.F.
WETLAND BUFFER DISTURBANCE = 9,312 S.F.

75' WETLAND SETBACK

RELOCATED LOT LINE

PROPOSED 30' WIDE EASEMENT

PROPOSED RIVERWOODS DURHAM CCRC

SEE SHEET C-5.0 AND C-5.1 FOR CONTINUATION OF SEWER AND WATER LINES

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DRAWN BY: DMM
APPROVED BY: JKC
DRAWING FILE: 4836.51SEWER.DWG

SCALE: 1 " = 40'

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

CONCEPTUAL OFF-SITE UTILITY EXTENSION PLAN

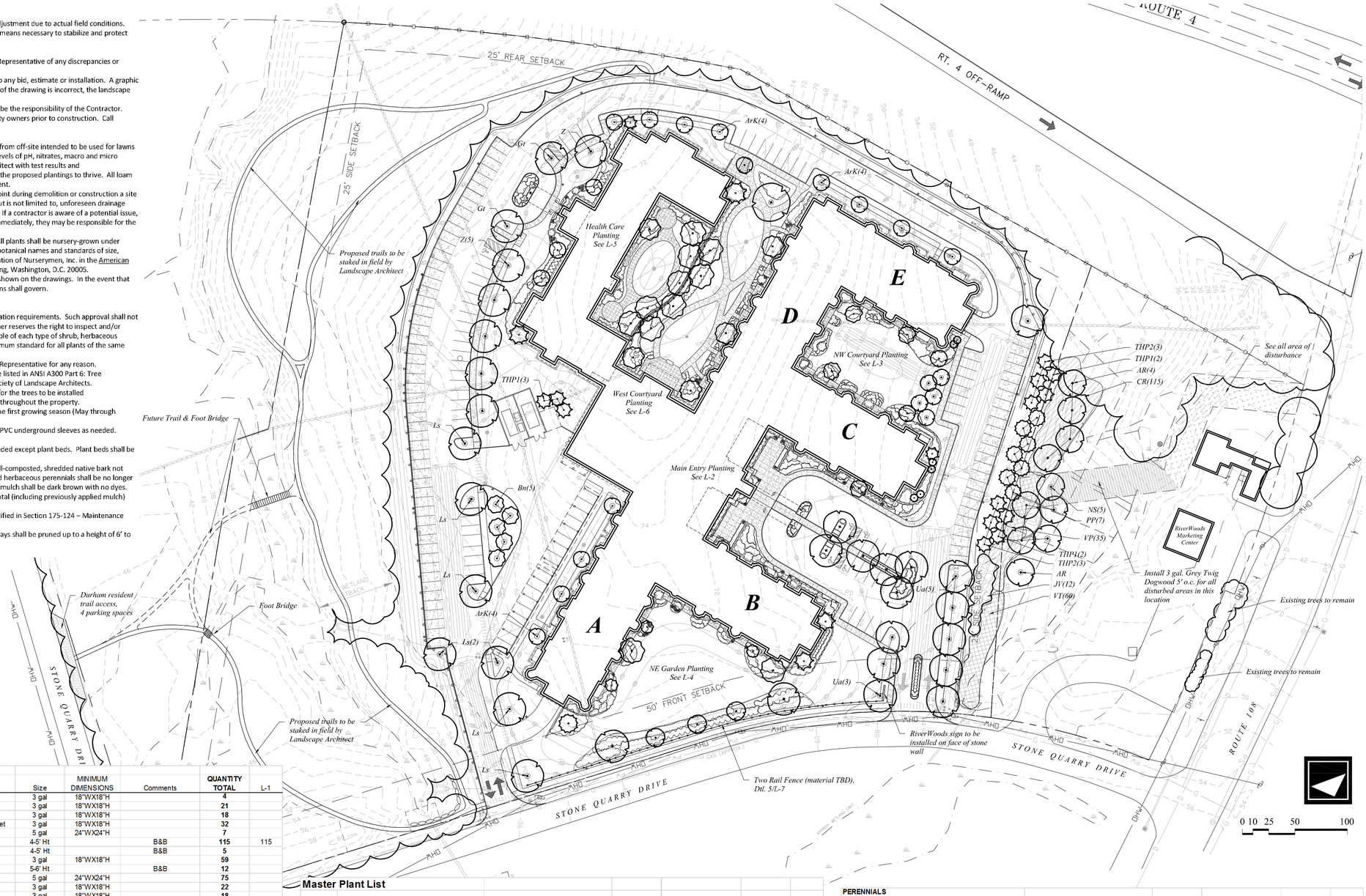
SHEET NUMBER:

C - 4.2

P4836.51

LANDSCAPE NOTES

1. Design is based on drawings by Altus Engineering dated October 16, 2017 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
5. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
6. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
7. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
8. The Contractor shall procure any required permits prior to construction.
9. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
10. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
11. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock ANSI Z60.1, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
12. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
13. All plants shall be legibly tagged with proper botanical name.
14. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
15. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
16. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
17. Trees should be planted using commonly accepted best management practices, such as those listed in ANSI A300 Part 6: Tree Maintenance Standard Practices (Transplanting), which is available from the International Society of Landscape Architects.
18. The contractor shall ensure that there is adequate rooting space and overhead space and fit for the trees to be installed
19. Only low phosphorus/slow release nitrogen fertilizers for landscaping materials may be used throughout the property.
20. Upon completion, contractor shall provide water and other tree care as appropriate during the first growing season (May through October).
21. All landscaping shall be provided with an underground sprinkling system. Install appropriate PVC underground sleeves as needed.
22. All irrigation valve boxes shall be located within plant bed areas.
23. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
24. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be dark brown with no dyes.
25. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
26. Maintenance of Landscaping. The provision for maintenance of landscaping materials as specified in Section 175-124 – Maintenance Requirements of the Article XXII – Landscaping in the Durham Zoning Ordinance, shall apply.
27. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy.
28. Landscape Architect is not responsible for the means and methods of the contractor.



Master Plant List

TREES

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-1
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	5
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	12
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14' Ht	B&B	21	5
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	
Gt	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	2
Ham	*Hamamelis x intermedia "Arnold promise'*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	7
Jm	*Juniperus chinensis 'Mountbatten*	Mountbatten Juniper	7-8' Ht	B&B	7	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	12
Ns	*Nyssa Sylvatica*	Black Tupelo	3-3.5" Cal	B&B	5	5
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	7
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	7
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	6
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	8
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	6

SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-1
Az1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	
Az2	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	
Cl	*Clethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	
Cor	*Cornus alba 'Ivory Halo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	115
Enk	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of -Sharon	5-6' Ht		B&B	12	
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	
HyP	*Hydrangea anomela petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	
HYPG	*Hydrangea paniculata 'Grandiflora'*	P.G. Hydrangea	5-6' Ht		B&B TREEFORM	3	
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's Dwarf Hydrangea	5 gal	24"WX24"H		12	
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers Oakleaf Hydrangea	5 gal	24"WX24"H		3	
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	
Ig	*Ilex glabra 'Compacta'*	Inkberry	5 gal	24"WX24"H		38	
It	*Itea virginica 'Little Henry'*	Little Henry Sweetspire	3 gal	18"WX18"H		17	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	3 gal	18"WX18"H		31	
Jsg	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	
Leu	*Leucothoe fontanesiana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	
Mp	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3' Ht		B&B	23	
Ra	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	3 gal	18"WX18"H		176	
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	
Ros	*Rosa 'Knockout'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24' W		B&B	47	
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	
VP	*Viburnum prunifolium*	Blackhaw Viburnum	4-5' Ht		B&B	35	35
VpT	*Viburnum plicatum tomentosum 'Mariesii'*	Marie's Doublefile Viburnum	4-5' Ht		B&B	11	
VT	*Viburnum trilobum*	American Cranberry Viburnum	4-5' Ht		B&B	60	60

PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-1
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	
An	*Anemone hupehensis 'September Charm'*	Japanese Anemone	1 gal		34	
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	
Ast2	*Astilbe 'Deutschland'*	White Early Astilbe	1 gal		55	
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	
C	*Coreopsis grandiflora 'Uethro Tull'*	Tickseed	1 gal		12	
Cal	*Calamagrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	1 gal		24	
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOPSIZE		87	
	Narcissus 'Mount Hood'		TOPSIZE		87	
	Narcissus Sweet Harmony		TOPSIZE		87	
Day	*Daylily Mix*					
	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	
	Hemerocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	
	Hemerocallis 'Gordon Biggs'	Gordon Biggs Daylilly	1 gal		64	
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	
Ir	*Iris sibirica 'Ceasar's Brother*	Dark Pansy Purple Siberian Iris	1 gal		29	
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	
Rud	*Rudbeckia fulgida 'Goldsturm'*	Black-Eyed Susan	1 gal		51	
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

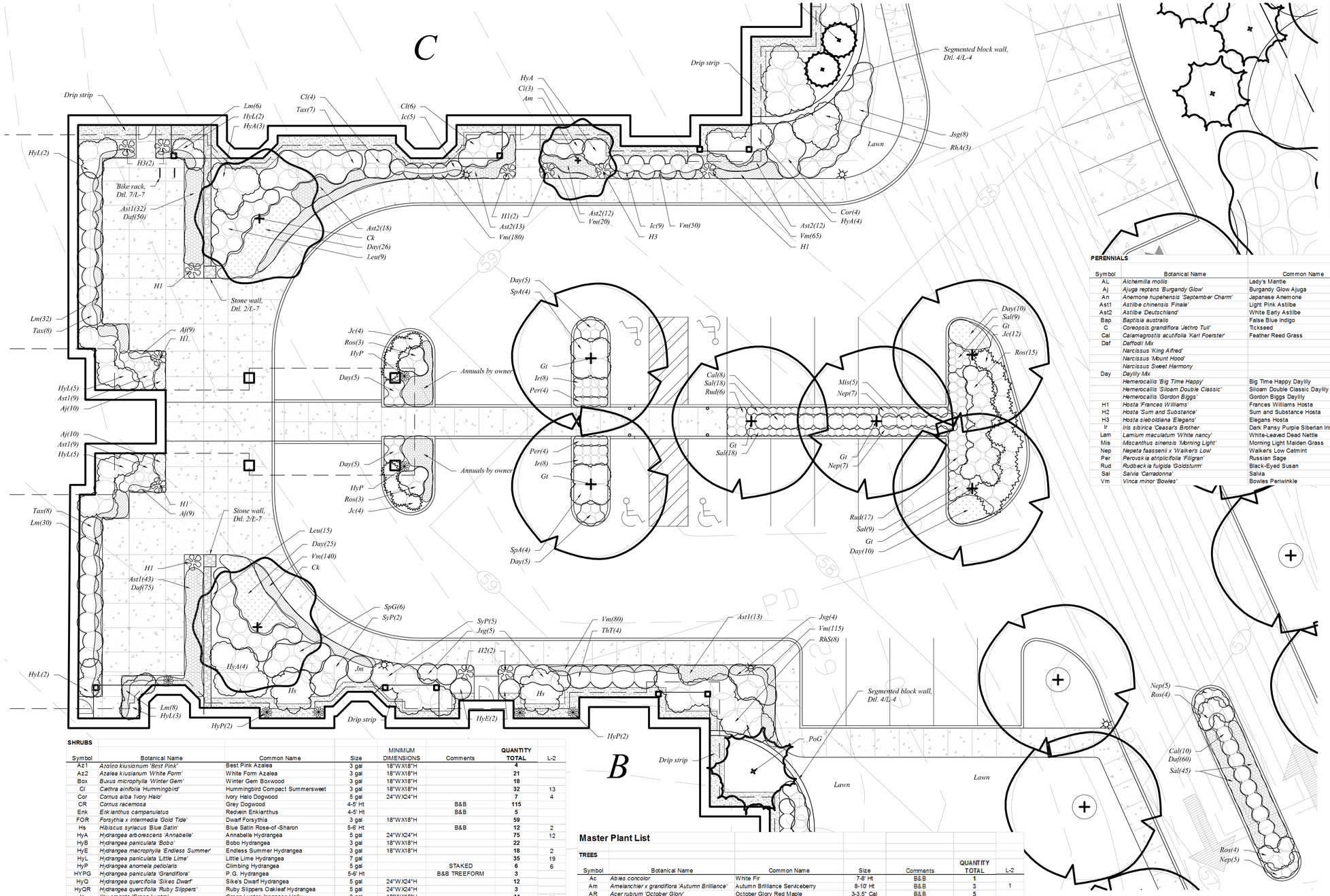
SITE LANDSCAPE PLAN

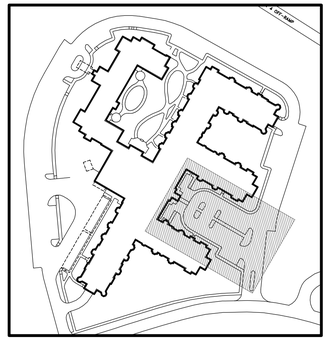
Stone Quarry Drive Durham, New Hampshire

Drawn By: VM
Checked By: RW
Scale: 1" = 50' - 0"
Date: July 19, 2017
Revisions: October 16, 2017

L-1

Sheet 1 of 9





PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-2
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	38
An	*Anemone hupehensis 'September Charm'*	Japanese Anemone	1 gal		34	
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	106
Ast2	*Astilbe 'Deutschland'*	White Early Astilbe	1 gal		55	55
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	
C	*Coreopsis grandiflora 'Jethro Tull'*	Tickseed	1 gal		12	
Cal	*Calamagrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	1 gal		24	18
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOPSIZE		87	62
	Narcissus 'Mount Hood'		TOPSIZE		87	62
	Narcissus Sweet Harmony		TOPSIZE		87	62
Day	*Daylily Mix*					
	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	30
	Hemerocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	30
	Hemerocallis 'Gordon Biggs'	Gordon Biggs Daylily	1 gal		64	30
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	7
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	2
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	5
Ir	*Iris sibirica 'Ceasars Brother'*	Dark Pansy Purple Siberian Iris	1 gal		29	16
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	76
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	5
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	24
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	8
Rud	*Rudbeckia fulgida 'Goldsturm'*	Black-Eyed Susan	1 gal		51	23
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	99
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	600

SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-2
AZ1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	
AzZ	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	
Cl	*Cethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	13
Cor	*Cornus alba 'Ivory Halo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	4
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	
Enk	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of -Sharon	5-6' Ht		B&B	12	2
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	12
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	2
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	19
HyP	*Hydrangea anomela petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	6
HYPG	*Hydrangea paniculata 'Grandiflora'*	P. G. Hydrangea	5-6' Ht		B&B TREEFORM	3	
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's Dwarf Hydrangea	5 gal	24"WX24"H		12	
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers Oakleaf Hydrangea	5 gal	24"WX24"H		3	
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	14
Ig	*Ilex glabra 'Compacta'*	Inkberry	5 gal	24"WX24"H		38	
It	*Itea virginica 'Little Henry'*	Little Henry Sweetspire	3 gal	18"WX18"H		17	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	3 gal	18"WX18"H		31	20
Jsg	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	17
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	
Leu	*Leucothoe fontaneslana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	24
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	
Mp	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	3
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3' Ht		B&B	23	8
Ra	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	3 gal	18"WX18"H		176	
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	
Ros	*Rosa 'Knock out'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	29
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	8
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	6
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	7
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24' W		B&B	47	23
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	4
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	
VP	*Viburnum prunifolium*	Blackhaw Viburnum	4-5' Ht		B&B	35	
VpT	*Viburnum plicatum tomentosum 'Mariesii'*	Marie's Doublefile Viburnum	4-5' Ht		B&B	11	
VT	*Viburnum trilobum*	American Cranberry Viburnum	4-5' Ht		B&B	60	

Master Plant List

TREES

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-2
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	1
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14' Ht	B&B	21	
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	2
Gt	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	6
Ham	*Hamamelis x intermedia "Arnold promise'*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	
Jm	*Juniperus chinensis 'Mountbatten'*	Mountbatten Juniper	7-8' Ht	B&B	7	1
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	
Ns	*Nyssa Sylvatica*	Black Tupelo	3-3.5" Cal	B&B	5	
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	1
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	

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woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

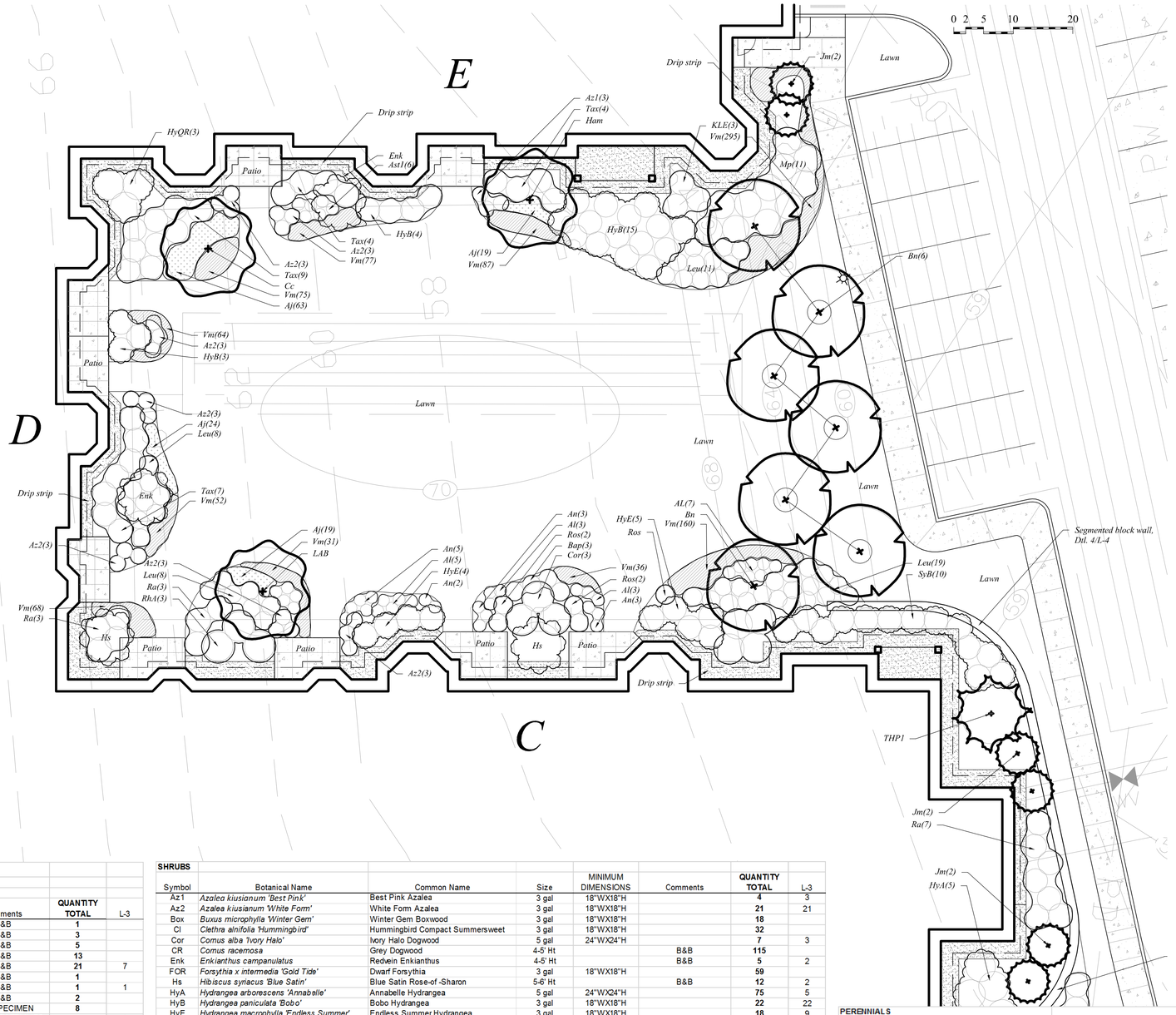
MAIN ENTRY LANDSCAPE PLAN

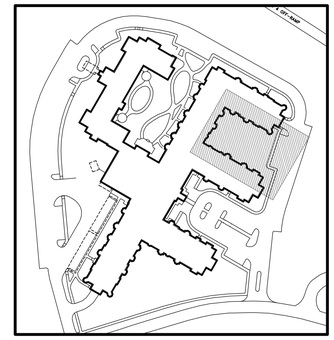
Stone Quarry Drive Durham, New Hampshire

Drawn By:	VM
Checked By:	RW
Scale:	1" = 10' - 0"
Date:	July 19, 2017
Revisions:	October 16, 2017

L-2

Sheet 2 of 9





Key Plan

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LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

NORTH WEST COURTYARD LANDSCAPE PLAN

Stone Quarry Drive Durham, New Hampshire

Drawn By:	VM
Checked By:	RW
Scale:	1" = 10' - 0"
Date:	July 19, 2017
Revisions:	October 16, 2017

L-3

Sheet 3 of 9

Master Plant List

TREES

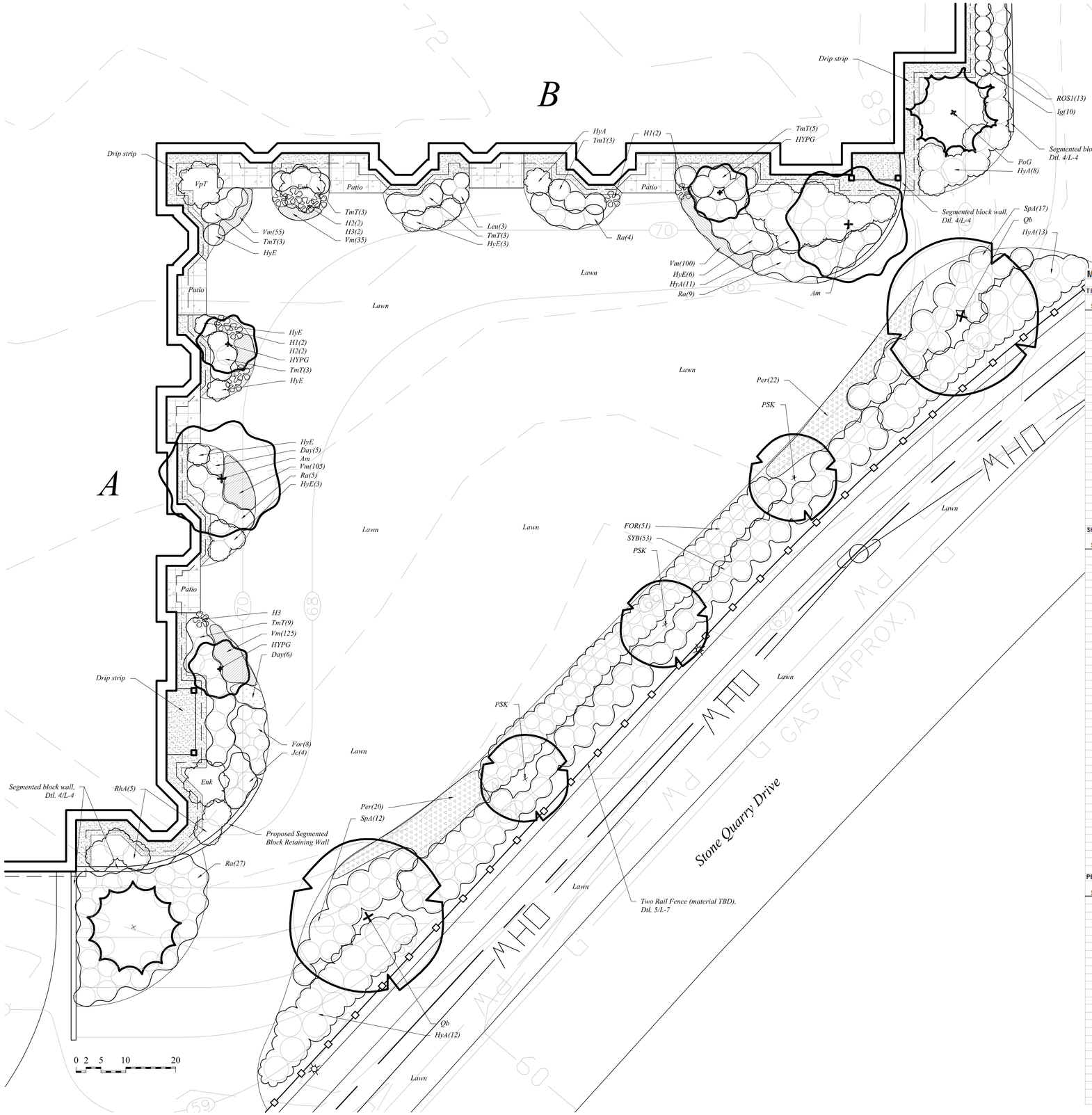
Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-3
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14' Ht	B&B	21	7
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	1
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	
Gt	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	
Ham	*Hamamelis x intermedia "Arnold promise'*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	1
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	1
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	
Jm	*Juniperus chinensis 'Mountbatten*	Mountbatten Juniper	7-8' Ht	B&B	7	6
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	
Ns	*Nyssa Sylvatica*	Black Tupelo	3-3.5" Cal	B&B	5	
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	1
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	

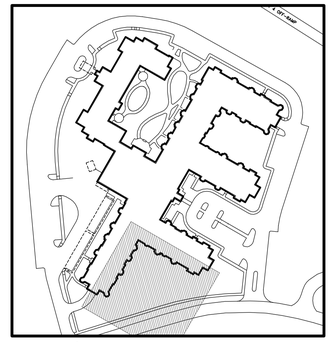
SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-3
Az1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	3
Az2	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	21
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	
Cl	*Clethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	
Cor	*Cornus alba 'Ivory Halo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	3
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	
Enk	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	2
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of -Sharon	5-6' Ht		B&B	12	2
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	5
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	22
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	9
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	
HyP	*Hydrangea anomela petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	
HYPG	*Hydrangea paniculata 'Grandiflora'*	P.G. Hydrangea	5-6' Ht		B&B TREEFORM	3	
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's Dwarf Hydrangea	5 gal	24"WX24"H		12	
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers Oakleaf Hydrangea	5 gal	24"WX24"H		3	3
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	
Ig	*Ilex glabra 'Compacta'*	Inkberry	5 gal	24"WX24"H		38	
It	*Itea virginica 'Little Henry'*	Little Henry Sweetspire	3 gal	18"WX18"H		17	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	3 gal	18"WX18"H		31	
Jsg	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	3
Leu	*Leucothoe fontanesiana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	46
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	
Mp	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	11
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	3
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3' Ht		B&B	23	
Rs	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	3 gal	18"WX18"H		176	13
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	
Ros	*Rosa 'Knockout'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	5
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	10
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24' W		B&B	47	24
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	
VP	*Vibumum prunifolium*	Blackhaw Viburnum	4-5' Ht		B&B	35	
VpT	*Vibumum plicatum tomentosum 'Mariesii'*	Marie's Doublefile Viburnum	4-5' Ht		B&B	11	
VT	*Vibumum trilobum*	American Cranberry Vibumum	4-5' Ht		B&B	60	

PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-3
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	18
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	106
An	*Anemone hupehensis "Septem ber Charm '*	Japanese Anemone	1 gal		34	13
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	6
Ast2	*Astilbe 'Deutschland'*	White Early Astilbe	1 gal		55	
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	3
C	*Coreopsis grandiflora 'Jethro Tull'*	Tickseed	1 gal		12	
Cal	*Calam agrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	1 gal		24	
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOPSIZE		87	
	Narcissus 'Mount Hood'		TOPSIZE		87	
	Narcissus 'Sweet Harmony		TOPSIZE		87	
Day	*Daylily Mix*					
	Hem erocallis 'Big Tim e Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	
	Hem erocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	
	Hem erocallis 'Gordon Biggs'	Gordon Biggs Daylily	1 gal		64	
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	
Ir	*Iris sibirica 'Ceasar's Brother*	Dark Pansy Purple Siberian Iris	1 gal		29	
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	
Rud	*Rudbeckia fulgida 'Goldstum '*	Black-Eyed Susan	1 gal		51	
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	858





Key Plan

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

NORTH EAST GARDEN LANDSCAPE PLAN

Stone Quarry Drive Durham, New Hampshire

Master Plant List

TREES

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-4
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	1
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14 Ht	B&B	21	
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	
Gt	*Gleditsia triacanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	
Ham	*Hamamelis x intermedia 'Arnold promise'*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	
Jm	*Juniperus chinensis 'Mountbatten'*	Mountbatten Juniper	7-8' Ht	B&B	7	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	
Ns	*Nyssa Sylvatica*	Black Tupelo	3-3.5" Cal	B&B	5	
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	1
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	3
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	2
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	

SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-4
Az1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	
Az2	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	
Cl	*Clethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	
Cor	*Cornus alba 'IvoryHalo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	
Erik	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	2
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	59
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of-Sharon	5-6' Ht		B&B	12	
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	45
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	7
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	
HyP	*Hydrangea anomala petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	
HYPG	*Hydrangea paniculata 'Grandiflora'*	P.G. Hydrangea	5-6' Ht		B&B TREEFORM	3	3
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's DwarfHydrangea	5 gal	24"WX24"H		12	
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers OakleafHydrangea	5 gal	24"WX24"H		3	
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	
Ig	*Ilex glabra 'Compacta'*	Inkberry	5 gal	24"WX24"H		38	10
It	*Itea virginica 'Little Henry'*	Little Henry Sweetspire	3 gal	18"WX18"H		17	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	3 gal	18"WX18"H		31	4
Jsg	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	
Leu	*Leucothoe fontanesiana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	3
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	
Myc	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	5
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3 Ht		B&B	23	
Ra	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	3 gal	18"WX18"H		176	45
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	13
Ros	*Rosa 'Knockout'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	29
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	53
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24"W		B&B	47	
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	29
VP	*Viburnum prunifolium*	Blackhaw Viburnum	4-5' Ht		B&B	35	
VpT	*Viburnum plicatum tomentosum 'Mariesii'*	Marie's Doublefile Viburnum	4-5' Ht		B&B	11	1
VT	*Viburnum trilobum*	American Cranberry Viburnum	4-5' Ht		B&B	60	

PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-4
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	
An	*Anemone hupehensis 'September Charm'*	Japanese Anemone	1 gal		34	
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	
Ast2	*Astilbe 'Deutschland'*	White EarlyAstilbe	1 gal		55	
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	
C	*Coreopsis grandiflora 'Jethro Tull'*	Tickseed	1 gal		12	
Cal	*Calamagrostis acutifolia Karl Foerster'*	Feather Reed Grass	1 gal		24	
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOP SIZE		87	
	Narcissus 'Mount Hood'		TOP SIZE		87	
	Narcissus Sweet Harmony		TOP SIZE		87	
Day	*Daylily Mix*					
	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	4
	Hemerocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	4
	Hemerocallis 'Gordon Biggs'	Gordon Biggs Daylily	1 gal		64	4
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	4
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	4
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	3
Ir	*Ins sibirica 'Ceasar's Brother'*	Dark Pansy-Purple Siberian Iris	1 gal		29	
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	42
Rud	*Rudbeckia fulgida 'Goldstrum'*	Black-Eyed Susan	1 gal		51	
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	420

Drawn By:	VM
Checked By:	RW
Scale:	1" = 10' - 0"
Date:	July 19, 2017
Revisions:	October 16, 2017

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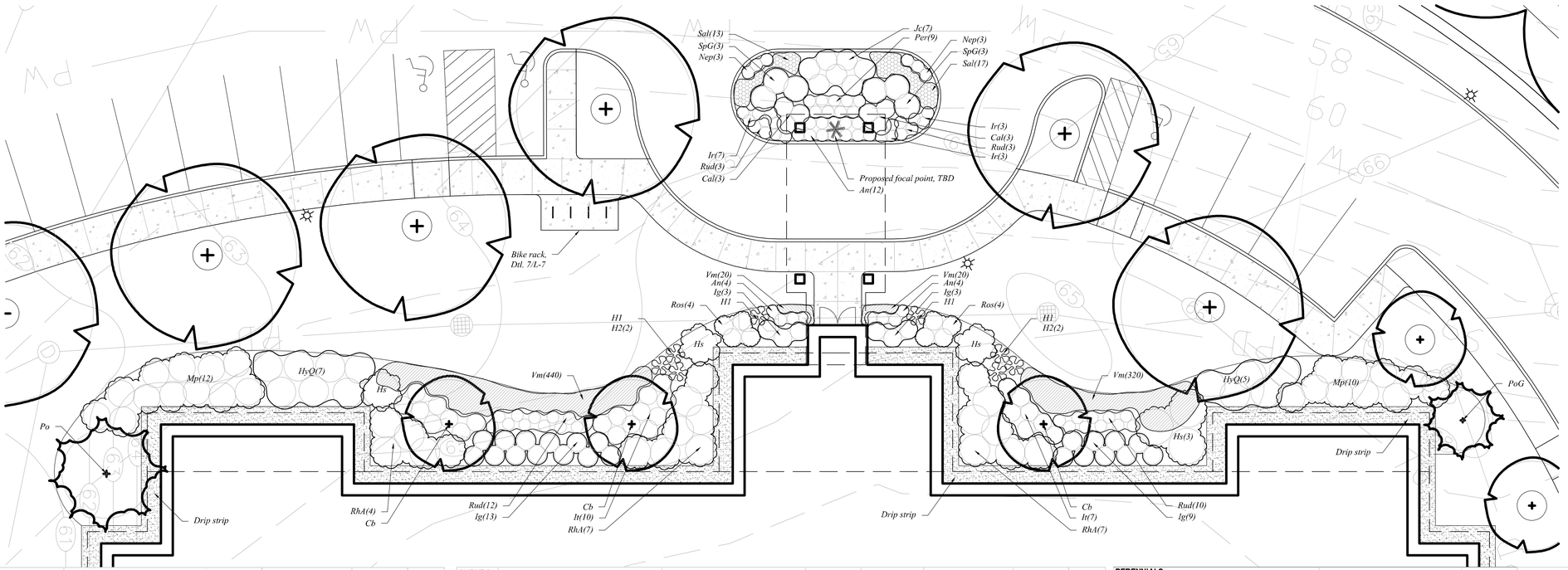


Master Plant List

TREES

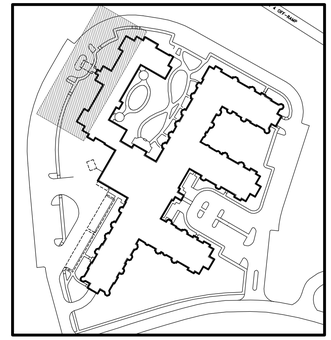
Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-5
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14' Ht	B&B	21	
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	1
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	
Gt	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	
Ham	*Hamamelis x intermedia "Arnold promise'*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	
Jm	*Juniperus chinensis 'Mountbatten*	Mountbatten Juniper	7-8' Ht	B&B	7	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	
Ns	*Nyssa Sylvatica*	Black Tupelo	3-3.5" Cal	B&B	5	
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	1
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	1
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	2

SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-5
Az1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	
Az2	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	
Cl	*Clethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	
Cor	*Cornus alba 'Ivory Halo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	
Enk	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of-Sharon	5-6' Ht		B&B	12	6
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	
HyP	*Hydrangea anomela petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	
HYPG	*Hydrangea paniculata 'Grandiflora'*	P.G. Hydrangea	5-6' Ht		B&B TREEFORM	3	
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's Dwarf Hydrangea	5 gal	24"WX24"H		12	12
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers Oakleaf Hydrangea	5 gal	24"WX24"H		3	
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	
Ig	*Ilex glabra 'Compacta'*	Ink berry	5 gal	24"WX24"H		38	28
It	*Itea virginica 'Little Henry'*	Little Henry Sweets pire	3 gal	18"WX18"H		17	17
Jc	*Juniperus chinensis 'Sargentii'*	Sargent Juniper	3 gal	18"WX18"H		31	7
Js g	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	
Leu	*Leucothoe fontanesiana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	
Mp	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	22
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	18
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3' Ht		B&B	23	
Ra	*Rhus aromatica 'GrowLow'*	Grow Low Sumac	3 gal	18"WX18"H		176	
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	
Ros	*Rosa 'Knockout'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	8
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	6
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24" W		B&B	47	
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	
VP	*Viburnum prunifolium*	Black haw Viburnum	4-5' Ht		B&B	35	
VpT	*Viburnum plicatum tomentosum 'Mariesii'*	Mariés Doublefile Viburnum	4-5' Ht		B&B	11	
VT	*Viburnum trilobum*	American Cranberry Viburnum	4-5' Ht		B&B	60	

PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-5
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	
An	*Anemone hupehensis 'September Charm'*	Japanese Anemone	1 gal		34	
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	
Ast2	*Astilbe 'Deutschland'*	White Early Astilbe	1 gal		55	
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	
C	*Coreopsis grandiflora 'Jethro Tull'*	Tickseed	1 gal		12	
Cal	*Calamagrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	1 gal		24	6
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOPSIZE		87	
	Narcissus 'Mount Hood'		TOPSIZE		87	
	Narcissus Sweet Harmony		TOPSIZE		87	
Day	*Daylily Mix*					
	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	
	Hemerocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	
	Hemerocallis 'Gordon Biggs'	Gordon Biggs Daylily	1 gal		64	
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	4
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	4
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	
Ir	*Iris sibirica 'Ceasar's Brother*	Dark Pansy Purple Siberian Iris	1 gal		29	13
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	6
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	7
Rud	*Rudbeckia fulgida 'Goldsturm'*	Black-Eyed Susan	1 gal		51	28
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	30
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	800



Key Plan

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

HEALTH CARE LANDSCAPE PLAN

Stone Quarry Drive Durham, New Hampshire

Drawn By:	VM
Checked By:	RW
Scale:	1" = 10' - 0"
Date:	July 19, 2017
Revisions:	October 16, 2017

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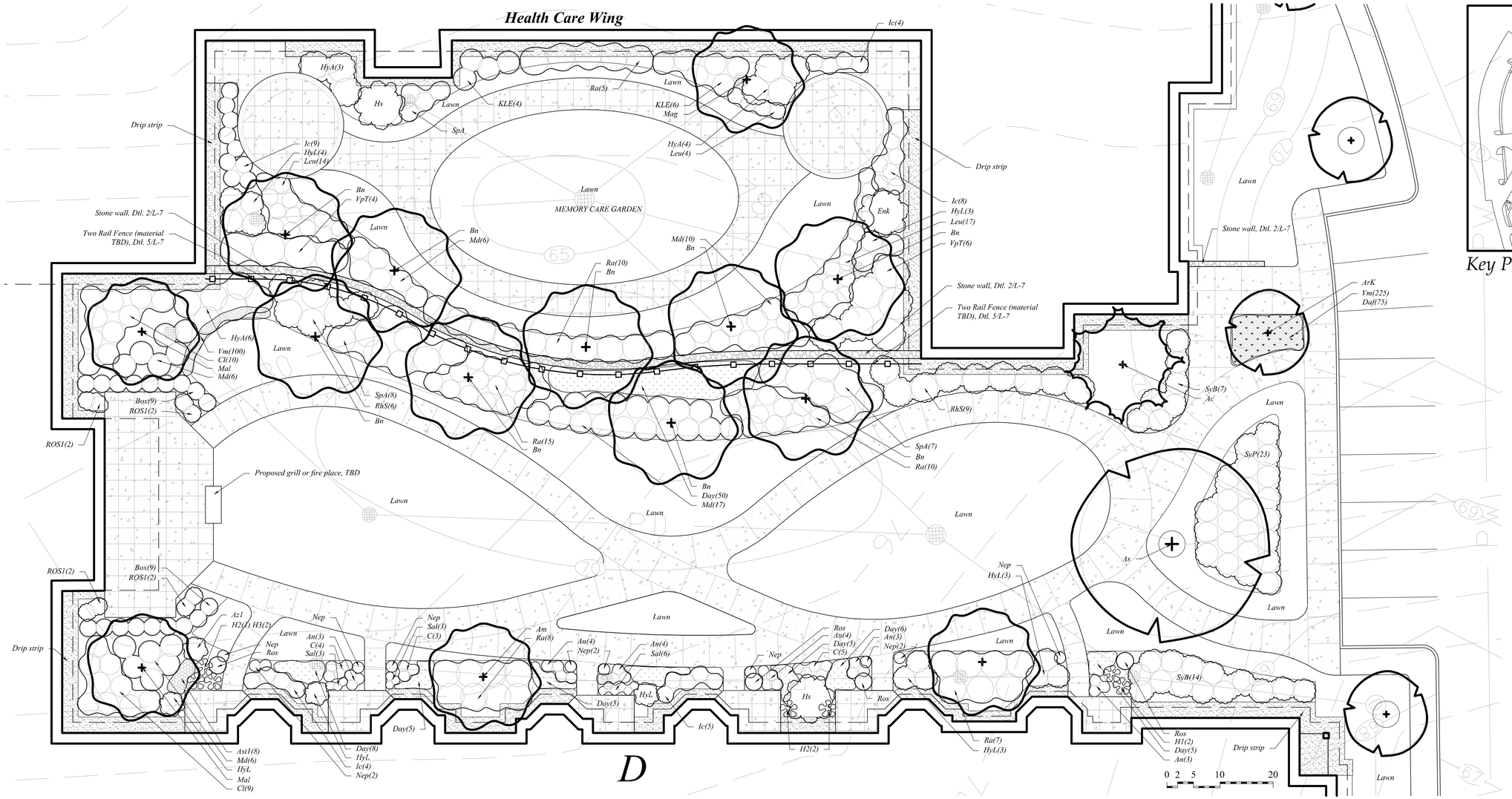
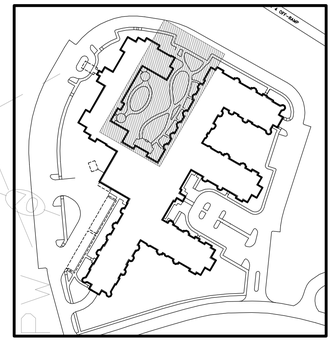
Sheet 5 of 9





Key Plan

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

WEST COURTYARD LANDSCAPE PLAN

Stone Quarry Drive Durham, New Hampshire

Master Plant List

TREES

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-6
Ac	*Abies concolor*	White Fir	7-8' Ht	B&B	1	1
Am	*Amelanchier x grandiflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	8-10' Ht	B&B	3	1
AR	*Acer rubrum 'October Glory'*	October Glory Red Maple	3-3.5" Cal	B&B	5	
ArK	*Acer rubrum 'Karpick'*	Karpick Red Maple	3-3.5" Cal	B&B	13	1
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	12-14' Ht	B&B	21	9
Cb	*Carpinus betulus 'Frans Fontaine'*	Hornbeam	3-3.5" Cal	B&B	1	
Cc	*Crataegus cus-galli 'Inermis'*	Thornless Cockspur Hawthorn	2-2.5" Cal	B&B	1	
Ck	*Cornus kousa*	Kousa Dogwood	8-10' Ht	B&B	2	
Gt	*Gleditsia triacanthos inermis 'Halka'*	Halka Thornless Honeylocust	3-3.5" Cal	B&B SPECIMEN	8	
Ham	*Hamamelis x intermedia "Arnold promise"*	Arnold Promise Witchhazel	5-6' Ht	B&B MULTISTEMMED	1	
LAB	*Laburnum x watereri 'Vossii'*	Golden Chain Tree	2-2.5" Cal	B&B	1	
Mag	*Magnolia 'Butterfly'*	Butterfly magnolia	8-10' Ht	B&B	1	1
Mal	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2-2.5" Cal	B&B	1	1
Ls	*Liquidambar styraciflua*	American Sweetgum	3-3.5" Cal	B&B	7	
Jm	*Juniperus chinensis 'Mountbatten*	Mountbatten Juniper	7-8' Ht	B&B	7	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht	B&B	12	
Ns	*Nyssa Sylvetica*	Black Tupelo	3-3.5" Cal	B&B	5	
Po	*Picea orientalis*	Oriental Spruce	8-10' Ht	B&B	1	
PoG	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	8-10' Ht	B&B	3	
PP	*Picea pungens' Glauca'*	Colorado Blue Spruce	8-10' Ht	B&B	7	
PSK	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	2-2.5" Cal	B&B	3	
Qb	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal	B&B	2	
THP1	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	12' Ht	B&B FULL	8	
THP2	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	14' Ht	B&B FULL	6	
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	3-3.5" Cal	B&B	8	
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	3-3.5" Cal	B&B	8	

SHRUBS

Symbol	Botanical Name	Common Name	Size	MINIMUM DIMENSIONS	Comments	QUANTITY TOTAL	L-6
Az1	*Azalea kiusianum 'Best Pink'*	Best Pink Azalea	3 gal	18"WX18"H		4	1
Az2	*Azalea kiusianum 'White Form'*	White Form Azalea	3 gal	18"WX18"H		21	
Box	*Buxus microphylla 'Winter Gem'*	Winter Gem Boxwood	3 gal	18"WX18"H		18	18
Cl	*Clethra alnifolia 'Hummingbird'*	Hummingbird Compact Summersweet	3 gal	18"WX18"H		32	19
Cor	*Cornus alba 'Ivory Halo'*	Ivory Halo Dogwood	5 gal	24"WX24"H		7	
CR	*Cornus racemosa*	Grey Dogwood	4-5' Ht		B&B	115	
Enk	*Enkianthus campanulatus*	Redvein Enkianthus	4-5' Ht		B&B	5	1
FOR	*Forsythia x intermedia 'Gold Tide'*	Dwarf Forsythia	3 gal	18"WX18"H		59	
Hs	*Hibiscus syriacus 'Blue Satin'*	Blue Satin Rose-of -Sharon	5-6' Ht		B&B	12	2
HyA	*Hydrangea arborescens 'Annabelle'*	Annabelle Hydrangea	5 gal	24"WX24"H		75	13
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	3 gal	18"WX18"H		22	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	3 gal	18"WX18"H		18	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	7 gal			35	16
HyP	*Hydrangea anomela petiolaris*	Climbing Hydrangea	5 gal		STAKED	6	
HYPG	*Hydrangea paniculata 'Grandiflora'*	P.G. Hydrangea	5-6' Ht		B&B TREEFORM	3	
HyQ	*Hydrangea quercifolia 'Sikes Dwarf'*	Sike's Dwarf Hydrangea	5 gal	24"WX24"H		12	
HyQR	*Hydrangea quercifolia 'Ruby Slippers'*	Ruby Slippers Oakleaf Hydrangea	5 gal	24"WX24"H		3	
Ic	*Ilex crenata 'Green Lustre'*	Green Luster Japanese Holly	3 gal	18"WX18"H		44	30
Ig	*Ilex glabra 'Compacta'*	Inkberry	5 gal	24"WX24"H		38	
It	*Itea virginica 'Little Henry'*	Little Henry Sweetspire	3 gal	18"WX18"H		17	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	3 gal	18"WX18"H		31	
Jsg	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2-2.5' Ht		B&B	17	
KLE	*Kalmia latifolia 'Elf'*	Elf Dwarf Mountain Laurel	5 gal	24"WX24"H		13	10
Leu	*Leucothoe fontanesiana 'Compacta'*	Compact Drooping Leucothoe	3 gal	18"WX18"H		108	35
Md	*Microbiota decussata*	Russian Cypress	3 gal	18"WX18"H		45	45
Mp	*Myrica pensylvanica*	Northern Bayberry	3-4' Ht		B&B FULL	33	
RhA	*Rhododendron 'Aglo'*	Aglo Rhododendron	2-2.5' Ht		B&B	29	
RhS	*Rhododendron 'Scintillation'*	Scintillation Rhododendron	2.5 - 3' Ht		B&B	23	15
Ra	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	3 gal	18"WX18"H		176	118
ROS1	*Rosa 'Dwarf Pavement'*	Pink Fragrant Low semi-double Rose	3 gal	18"WX18"H		21	8
Ros	*Rosa 'Knockout'*	Double Red Knockout Rose	3 gal	18"WX18"H		46	4
SpA	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	3 gal	18"WX18"H		56	19
SpG	*Spiraea x 'Goldmound'*	Goldmound Spirea	3 gal	18"WX18"H		12	
SYB	*Syringa 'Bloomerang'*	Bloomerange Lilac	2.5-3' Ht		B&B	84	21
SyP	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	3-4' Ht		B&B	30	23
Tax	*Taxus media 'Everlow'*	Everlow Yew	18-24' W		B&B	47	
ThT	*Thuja occidentalis 'Techny'*	Techny Arborvitae	6-7' Ht		B&B	4	
TmT	*Taxus media 'Tauntonii'*	Taunton Yew	3 gal	18"WX18"H		29	
VP	*Vibumum prunifolium*	Blackhaw Viburnum	4-5' Ht		B&B	35	
VpT	*Vibumum plicatum tomentosum 'Mariesii'*	Marie's Doublefile Vibumum	4-5' Ht		B&B	11	10
VT	*Vibumum trilobum*	American Cranberry Vibumum	4-5' Ht		B&B	60	

PERENNIALS

Symbol	Botanical Name	Common Name	Size	Comments	QUANTITY TOTAL	L-6
AL	*Alchemilla mollis*	Lady's Mantle	1 gal		18	
Aj	*Ajuga reptans 'Burgandy Glow'*	Burgandy Glow Ajuga	1 gal		144	
An	*Anemone hupehensis 'September Charm'*	Japanese Anemone	1 gal		34	21
Ast1	*Astilbe chinensis 'Finale'*	Light Pink Astilbe	1 gal		120	8
Ast2	*Astilbe 'Deutschland'*	White Early Astilbe	1 gal		55	
Bap	*Baptisia australis*	False Blue Indigo	1 gal		3	
C	*Coreopsis grandiflora 'Uethro Tull'*	Tickseed	1 gal		12	12
Cal	*Calamegrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	1 gal		24	
Daf	*Daffodil Mix*					
	Narcissus 'King Alfred'		TOPSIZE		87	25
	Narcissus 'Mount Hood'		TOPSIZE		87	25
	Narcissus 'Sweet Harmony		TOPSIZE		87	25
Day	*Daylily Mix*					
	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	1 gal	MIX EVENLY	64	30
	Hemerocallis 'Siloam Double Classic'	Siloam Double Classic Daylily	1 gal		64	30
	Hemerocallis 'Gordon Biggs'	Gordon Biggs Daylily	1 gal		64	30
H1	*Hosta 'Frances Williams'*	Frances Williams Hosta	1 gal		17	2
H2	*Hosta 'Sum and Substance'*	Sum and Substance Hosta	1 gal		13	3
H3	*Hosta sieboldiana 'Elegans'*	Elegans Hosta	1 gal		10	2
Ir	*Iris sibirica 'Ceasar's Brother*	Dark Pansy Purple Siberian Iris	1 gal		29	
Lam	*Lamium maculatum 'White nancy'*	White-Leaved Dead Nettle	1 gal		76	
Mis	*Miscanthus sinensis 'Morning Light'*	Morning Light Maiden Grass	1 gal		5	
Nep	*Nepeta faassenii x 'Walker's Low'*	Walker's Low Catmint	1 gal		41	11
Per	*Perovskia atriplicifolia 'Filigran'*	Russian Sage	1 gal		57	
Rud	*Rudbeckia fulgida 'Goldsturm'*	Black-Eyed Susan	1 gal		51	
Sal	*Salvia 'Carradonna'*	Salvia	1 gal		141	12
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	2.5" Pots	SET 8" ON CENTER	3053	325

Drawn By:	VM
Checked By:	RW
Scale:	1" = 10' - 0"
Date:	July 19, 2017
Revisions:	October 16, 2017

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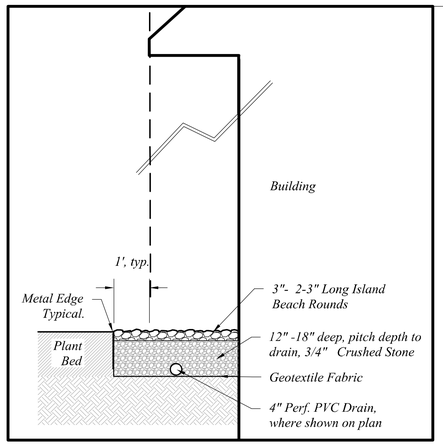
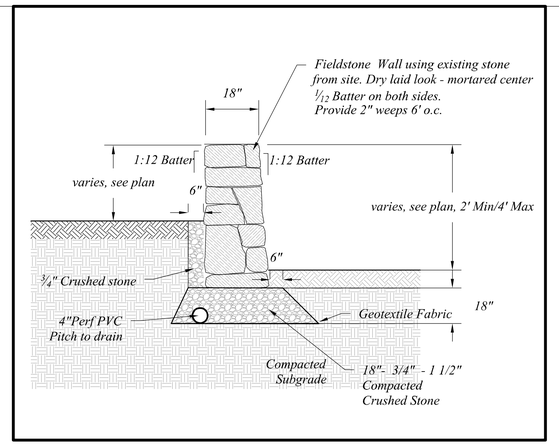
Sheet 6 of 9



1 DRIP STRIP SECTION 0 1 2 4
Scale: ½"=1'-0"



2 STONE RETAINING WALL SECTION 0 1 2 4
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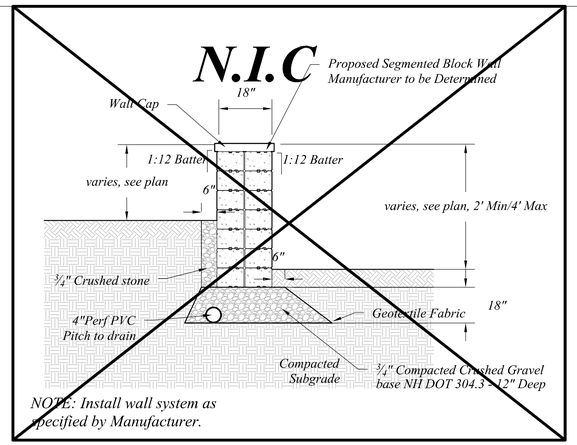
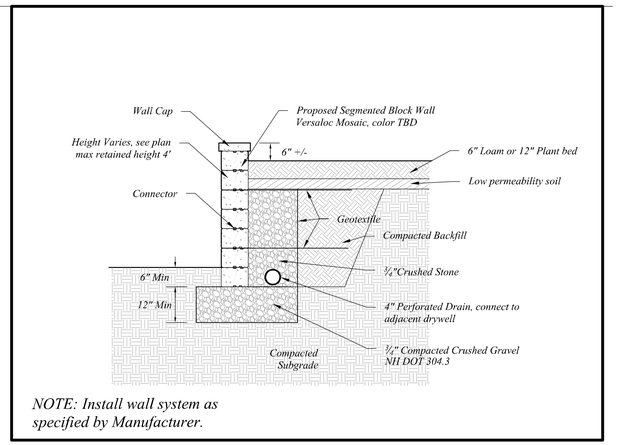


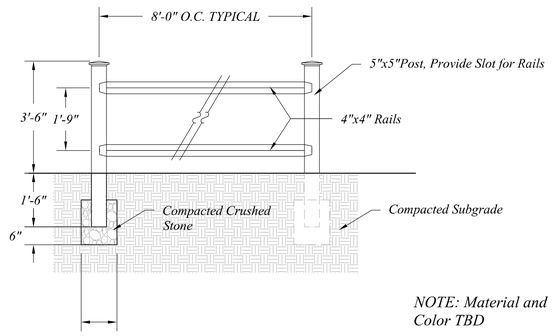
NOTE: Install wall system as specified by Manufacturer.

3 SEGMENTED BLOCK WALL-DOUBLE SIDED 0 1 2 4
Scale: ½"=1'-0"



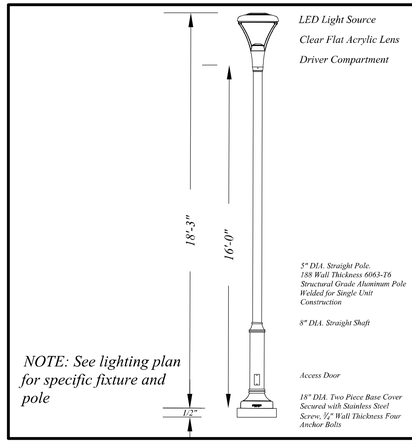
NOTE: Install wall system as specified by Manufacturer.

4 SEGMENTED BLOCK WALL-SINGLE SIDED 0 1 2 4
Scale: ½"=1'-0"



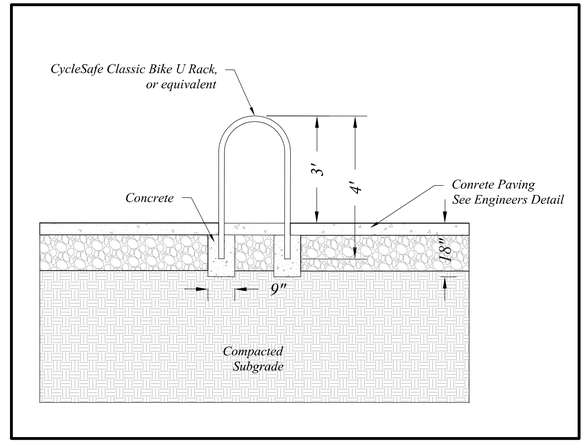
NOTE: Material and Color TBD

5 DIAMOND RAIL FENCE 0 1 2 4
Scale: ½"=1'-0"

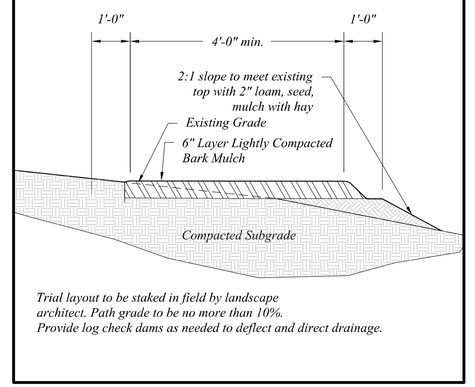


NOTE: See lighting plan for specific fixture and pole

6 LIGHT FIXTURE & POLE
Scale: ¼"=1'-0"

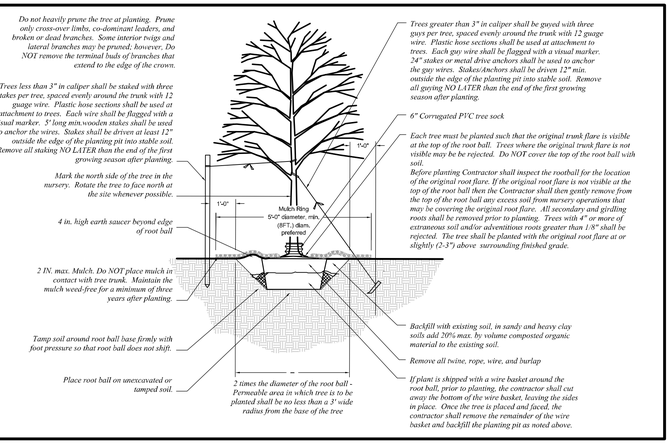


7 BIKE RACK
Scale: ¼"=1'-0"

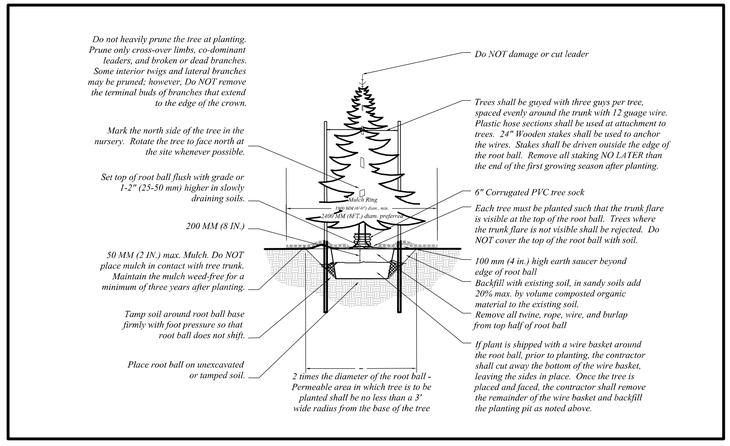


Trial layout to be staked in field by landscape architect. Path grade to be no more than 10%. Provide log check dams as needed to deflect and direct drainage.

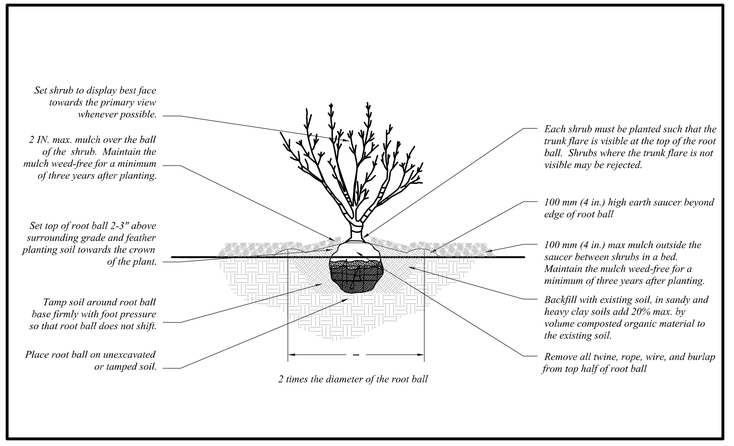
8 WOODLAND PATH 0 1 2 4
Scale: ½"=1'-0"



9 TREE PLANTING
NTS



10 EVERGREEN PLANTING
NTS



11 SHRUB PLANTING
NTS

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LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

LANDSCAPE DETAILS

Stone Quarry Drive Durham, New Hampshire

Drawn By:	YY
Checked By:	RW
Scale:	as noted
Date:	July 13, 2017
Revisions:	2017-10-16

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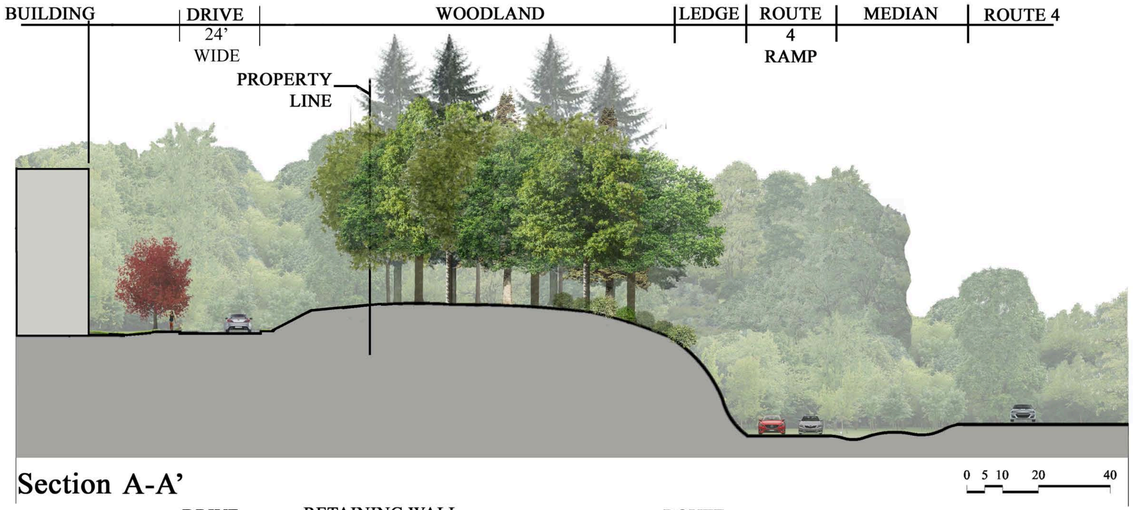
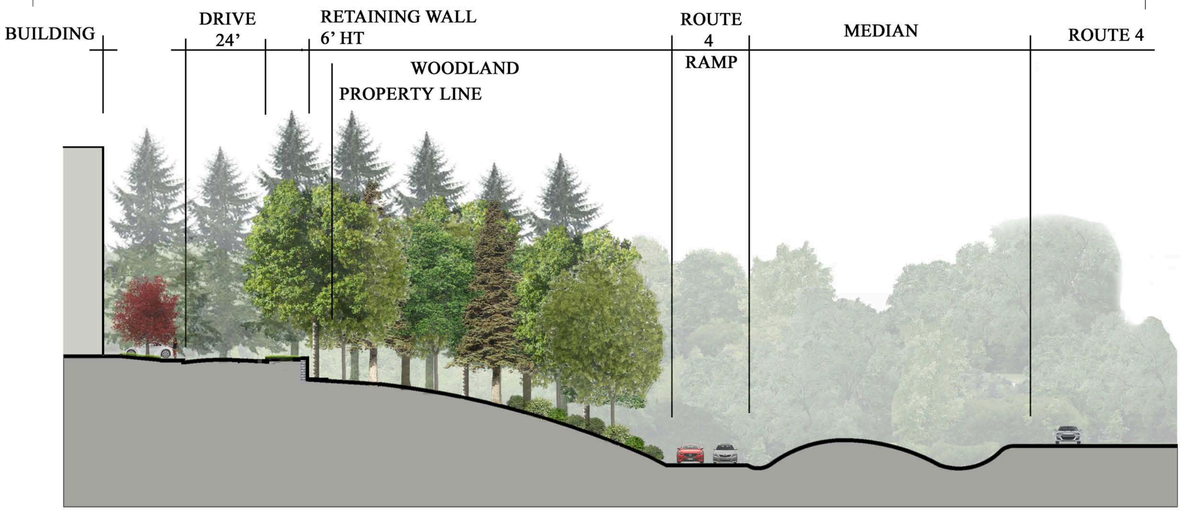
Sheet 7 of 7

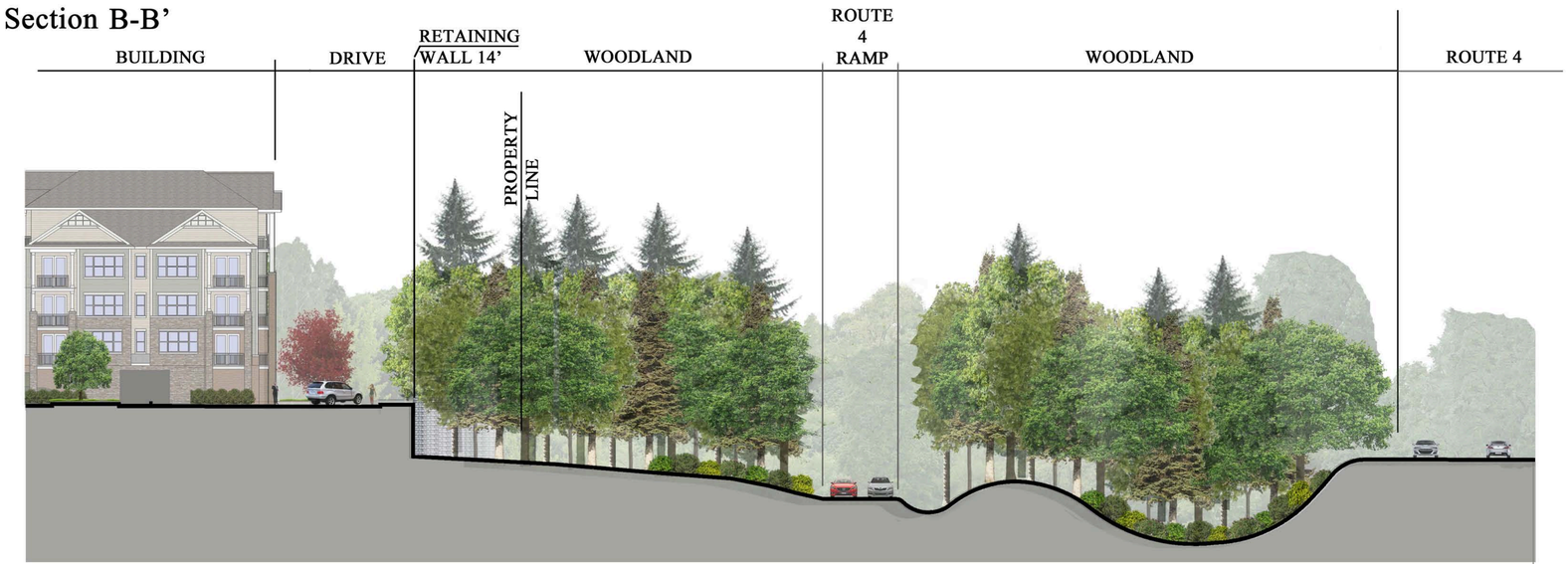


Section A-A'

0 5 10 20 40



Section B-B'



Section C-C'

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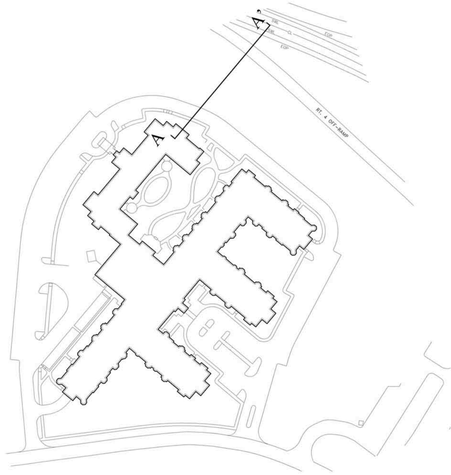

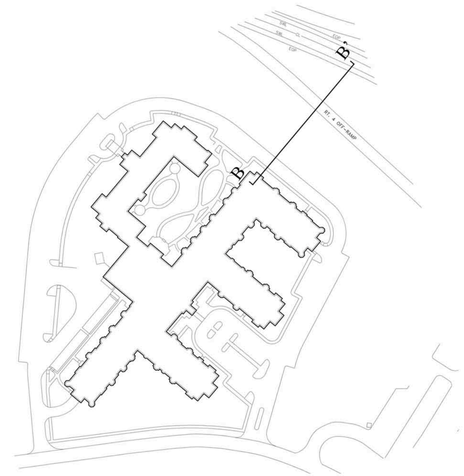

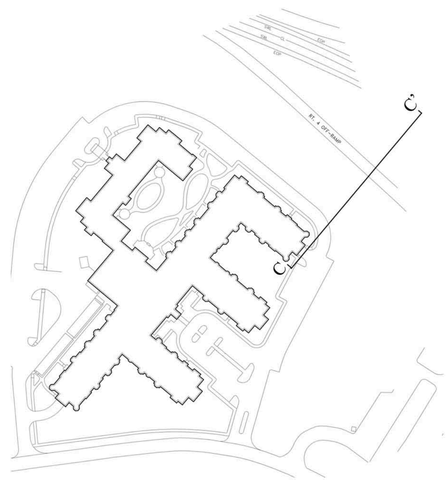

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LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

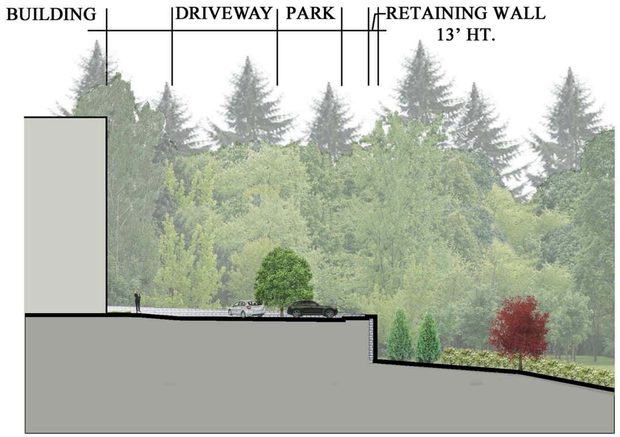
SITE SECTIONS

Stone Quarry Drive Durham, New Hampshire

Drawn By:	
Checked By:	RW
Scale:	
Date:	2017-09-25
Revisions:	2017-10-16

L-8

Sheet 8 of 9



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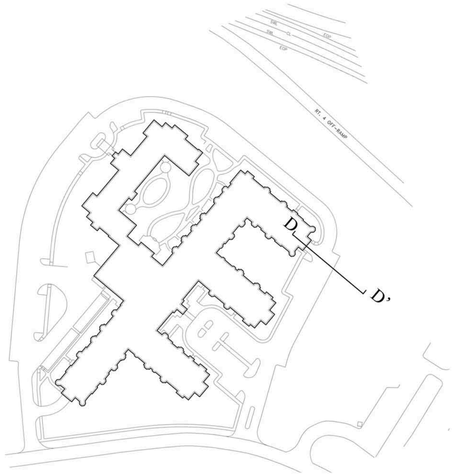

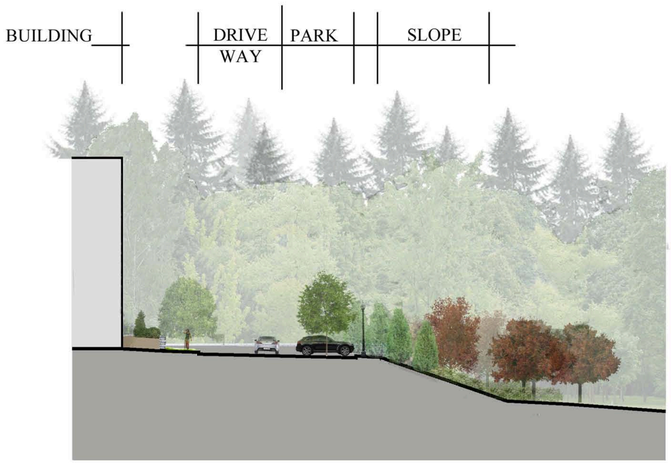

Section E-E'

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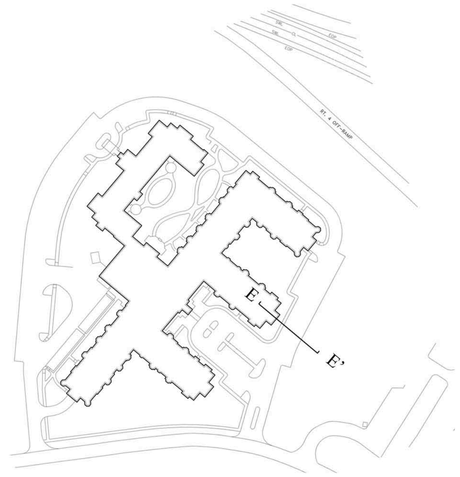

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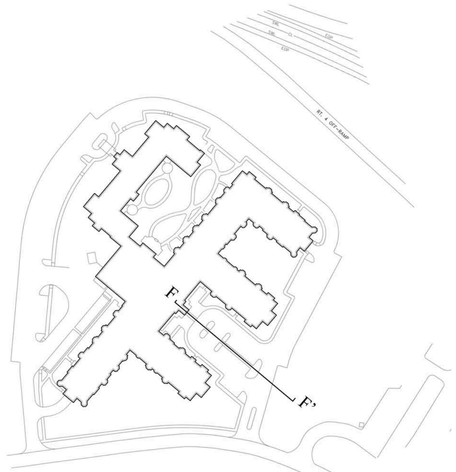

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LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

RiverWoods Durham

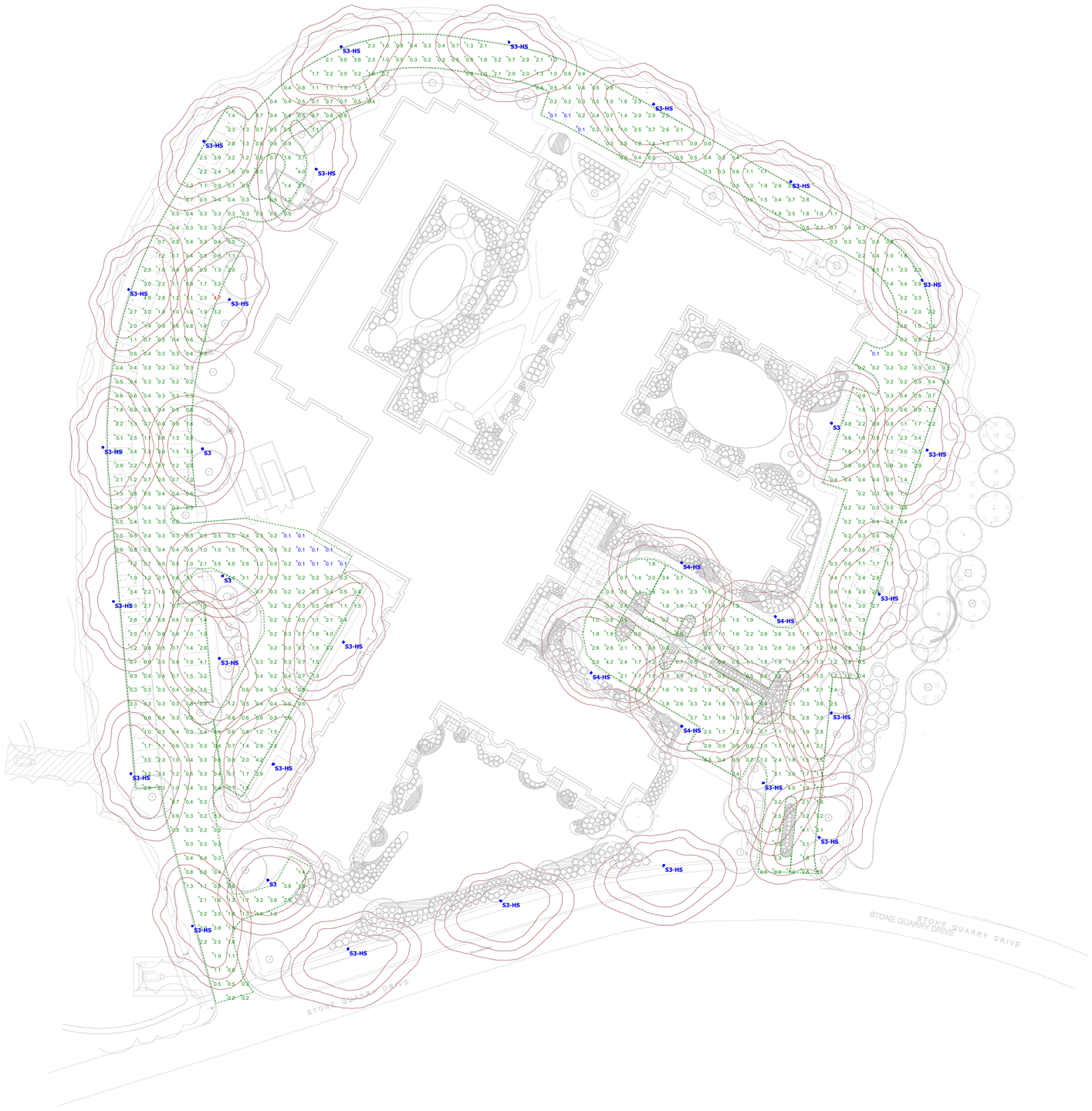
SITE SECTIONS

Stone Quarry Drive Durham, New Hampshire

Drawn By:	
Checked By:	RW
Scale:	
Date:	2017-09-21
Revisions:	2017-10-16

L-9

Sheet 9 of 9



Plan View
Scale - 1" = 40ft

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #1	+	1.2 fc	4.7 fc	0.1 fc	47.0:1	12.0:1

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	S3	4	Sternberg Lighting	SL760-FFG-84L45T3R-MDL03 pole mounted at 16' above grade	Solana Series, Post Top, Flat Frosted Acrylic, Type 3R Optic	84 LEDs	1	SL760-FFG-84L45T3R-MDL03.IES	6815	0.9	95.4
	S3-HS	24	Sternberg Lighting	SL760-FFG-84L45T3-MDL03-HSS pole mounted at 16' above grade	SL660 medium size Solana Post Top, Clear Flat Glass (AR)-HSS,Type 3	84 LED, 45k	1	SL660-FG-84L45T3-MDL03-HSS.IES	7179	0.9	92
	S4-HS	4	Sternberg Lighting	SL760-FFG-84L45T4-MDL03-HSS pole mounted at 16' above grade	SL660 medium size Solana Post Top, Clear Flat Glass (AR) HSS, Type 4	84 LED, 45k	1	SL660-FG-84L45T4-MDL03-HSS.IES	7673	0.9	92.3

Riverwoods - Durham
Site Lighting

Designer
Scott E Drouin, LC
Date
10/12/2017
Scale
Not to Scale
Drawing No.

Summary

VISIBLELIGHT

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

RIVERWOODS DURHAM
TAX MAP 11 LOT 8-1 TO 8-15
STONE QUARRY DRIVE
DURHAM, NEW HAMPSHIRE

LATITUDE: 043° 08' 20" N
LONGITUDE: 070° 54' 35" W

APPLICANT:
THE RIVERWOODS GROUP
C/O JUSTINE VOGEL, CEO
7 RIVERWOODS DRIVE
EXETER, NEW HAMPSHIRE 03833

DESCRIPTION

The project consists of the construction of a Continuing Care Retirement Community with associated site and utility improvements.

DISTURBED AREA

The total area to be disturbed is approximately 330,540 square feet or 7.6 acres.

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) is accordance with federal storm water permit requirements. The SWPPP must be prepared in a format acceptable to the Owner and three (3) copies provided to the Town at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities.

The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHR120000, including NOI requirements, effluent limitations, standards and management for construction.

The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required.

NAME OF RECEIVING WATER

Closed drainage system draining into unnamed wetlands and water course flowing to Oyster River.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All sediment control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater. A SWPPP inspection report shall be made after each inspection by a qualified inspector engaged by the Contractor. The qualified inspector shall be a Professional Engineer licensed in New Hampshire or be a Certified Professional in Erosion and Sediment Control approved by the Owner. Corrective actions shall be performed to address unacceptable level of turbidity as defined by the Construction General Permit and NHDES requirements.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from silt fence or other barriers when it has reached one-third the height of the tubular barrier or bale, or when "bulges" occur in silt fence.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the plans.
8. The Contractor's site superintendent shall be responsible for maintenance and repair of erosion control practices.
9. Perimeter controls shall be installed prior to earth moving operations.
10. All ditches and swales shall be stabilized prior to directing runoff to them.
11. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
12. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed;
    – or –
    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
    a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
    b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket)	As per manufacturer Specifications	Used in slope areas, water courses and other control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   Apply Fertilizer (refer to Landscape Drawings and Specs)

2. Seeding –
   a. Utilize annual rye grass at a rate of 40 lbs/acre.
   b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
   c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

3. Maintenance –
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
   a. See detail.
   b. Install per manufacturer's requirements.

2. Silt Fence (if used)
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

   b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

   c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

   d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

   e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

   f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

   g. The trench shall be backfilled and the soil compacted over the filter fabric.

   h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

4. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

   c. Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.

   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 6" to prepare a seedbed and mix fertilizer (refer to Landscape Drawings and Specifications) into the soil.

2. Fertilizer (refer to Landscape Drawings and Specifications) – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests.

3. Seed Mixture (See Landscape Drawings for additional information):

   3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
   3.2. Seed mixture shall conform to landscape specifications

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;

2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and

3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

HOUSEKEEPING

The following general performance standards apply to the proposed project both during and after construction.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials and equipment on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

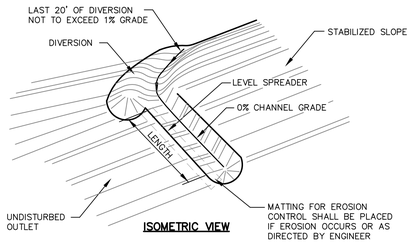
C. Fugitive sediment and dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

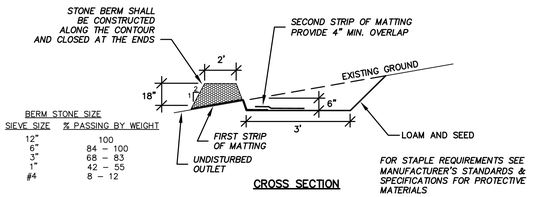
E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

	Spring	Fall or Yearly	After Major Storm
Inspect all slopes and embankments	x		x
Replant bare areas or areas with sparse growth	x		x
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x
Inspect ditches, swales and other open stormwater channels	x	x	x
Remove any obstructions and accumulated sediments or debris	x	x	
Control vegetated growth and woody vegetation		x	
Repair any erosion of the ditch lining		x	
Mow vegetated ditches		x	
Remove woody vegetation growing through riprap		x	
Repair any slumping side slopes		x	
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x	
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x
Repair any erosion damage at the culvert's inlet and outlet	x	x	x
Remove woody vegetation growing through riprap		x	
Remove accumulated winter sand along roadways	x		
Sweep pavement to remove sediment	x		
Grade road shoulders and remove excess sand either manually or by a front-end loader	x		
Grade gravel roads and gravel shoulders	x		
Clean out sediment contained in water bars or open-top culverts	x		
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x		
Mow grass swales monthly			
Inspect swale following significant rainfall event	x	x	x
Control vegetated growth and woody vegetation	x	x	
Repair any erosion of the ditch	x	x	
Remove debris and liter as necessary			
Eliminate potential source of unwanted sediment	x	x	
Routine Quarterly Vacuum Sweeping	x	x	
The use of sand in winter is prohibited			

NOTE:
ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24-HOUR PERIOD OR 0.5 INCHES IN A ONE-HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.



ISOMETRIC VIEW



BERM STONE SIZE	
SIEVE SIZE	% PASSING BY WEIGHT
12"	100
6"	84 – 100
3"	68 – 83
1"	42 – 55
#4	8 – 12

CROSS SECTION

LEVEL SPREADERS SHALL BE CONSTRUCTED PER STORMWATER MANAGEMENT FOR MAINE, "VOLUME III BMPS TECHNICAL DESIGN MANUAL, CHAPTER 5.2.2, BUFFER WITH STONE BERMED LEVEL LIP SPREADER", JANUARY 2006 SPECIFICATIONS.

LEVEL SPREADER

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE – JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

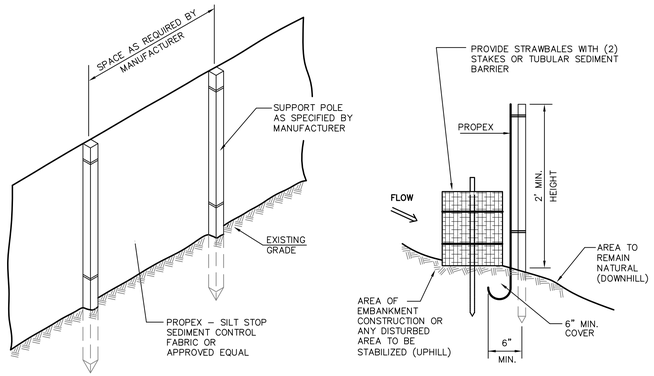
LAND OWNER – SUBJECT PARCEL:
ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:
EROSION CONTROL NOTES

SHEET NUMBER:
C - 6.0

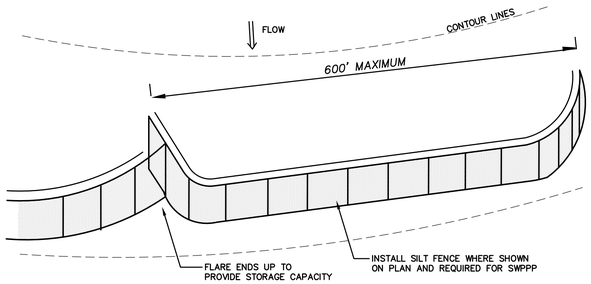


FRONT VIEW

SIDE VIEW

DOUBLE SILT BARRIER DETAIL

NOT TO SCALE



MAINTENANCE

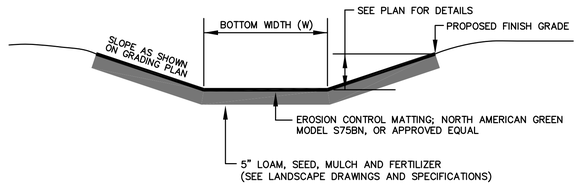
1. SILT FENCE SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALLAND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHALL BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

CONSTRUCTION SPECIFICATIONS

1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
4. FILTER CLOTH SHALL BE FASTENED SECURELYTO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.
5. WHEN TWO SECTIONS OF THE FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL OVERLAP BY 6 INCHES, FOLDED AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BULGES IN THE SLIT SILT DUE TO DEPOSITION OF SEDIMENT.

SILT FENCE LAYOUT

NOT TO SCALE



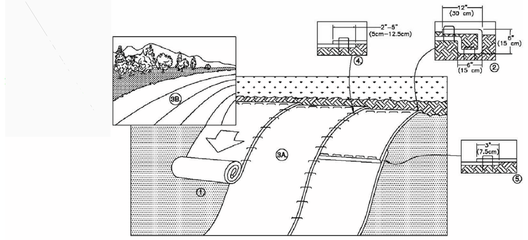
NOTES:

1. *THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.*
2. *THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.*
3. *EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.*
4. *CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.*
5. *VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.*
6. *MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.*
7. *THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.*
8. *APPLY LIME AND FERTILIZER PER LANDSCAPE DRAWINGS AND SPECIFICATIONS.*

GRASSED SWALE

NOT TO SCALE

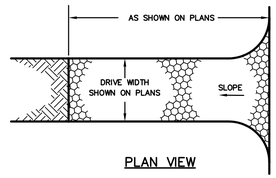
SLOPE INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   **IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

EROSION CONTROL BLANKET

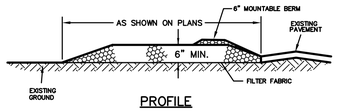
NOT TO SCALE



STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
3 inch	100
1 1/2 inch	90–100
1 inch	20–55
3/4 inch	0–15
3/8 inch	0–5

PLAN VIEW



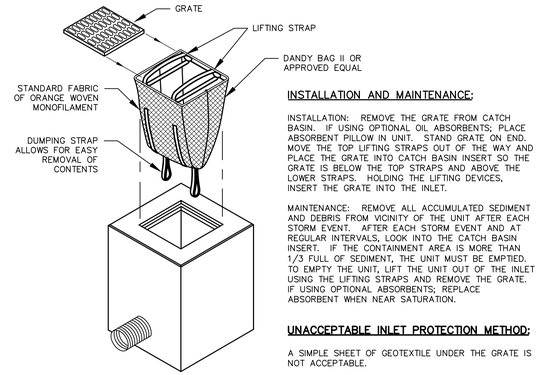
PROFILE

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS-OF-WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

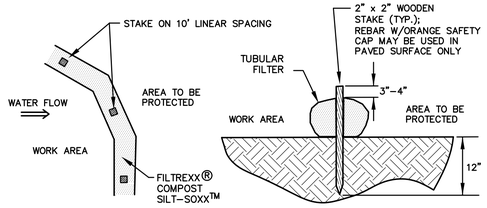
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION

NOT TO SCALE



PLAN VIEW

SECTION

NOTES:

1. *SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.*
2. *ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.*
3. *COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.*
4. *ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.*

TUBULAR SEDIMENT BARRIER DETAIL

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE – JEFFREY K. CLIFFORD No. 6524 – LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

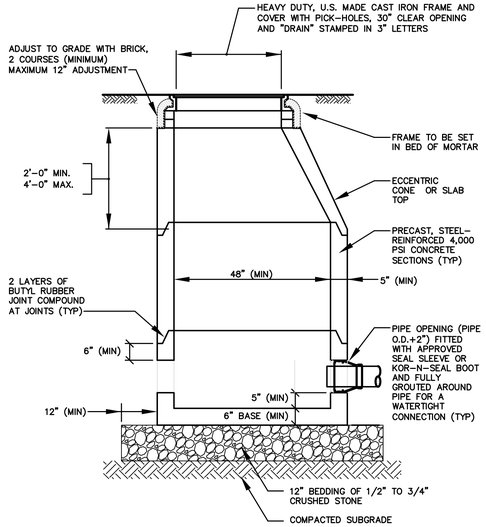
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

DETAIL SHEET

SHEET NUMBER:

C - 6.1

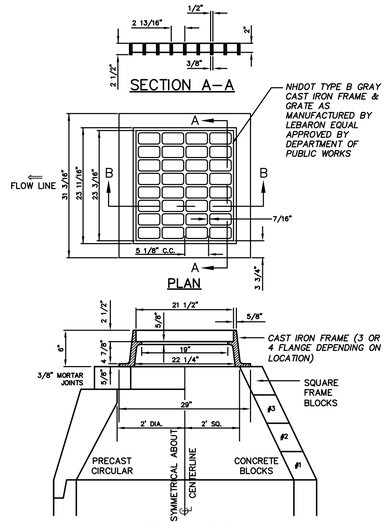


NOTES

1. *ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 psi).*
2. *CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.*
3. *THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.*
4. *RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.*
5. *ALL MANHOLE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.*
6. *USE H-20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4 FT OF GRADE.*
7. *MANHOLE STEPS ARE NOT PERMITTED.*

DRAIN MANHOLE DETAIL

NOT TO SCALE

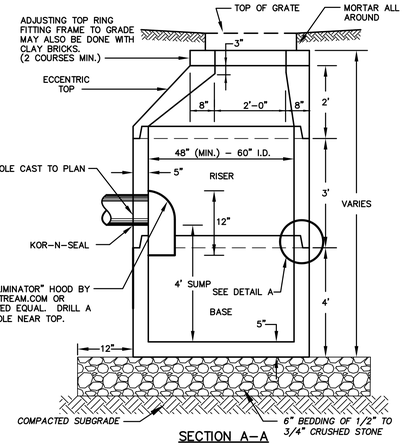


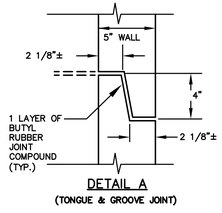
NOTES

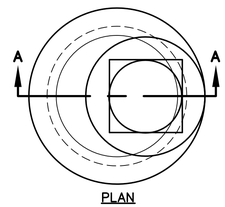
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.

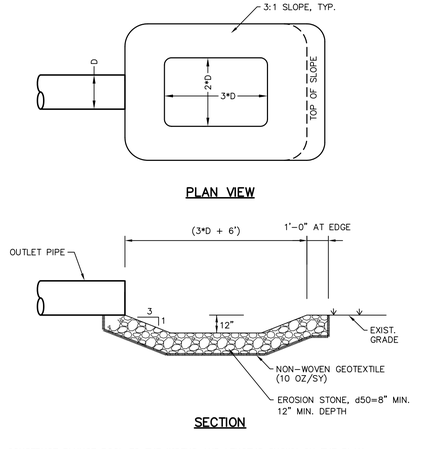
DEEP SUMP CATCH BASIN

NOT TO SCALE





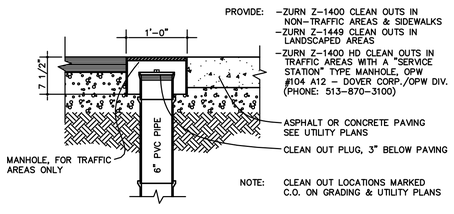




1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

PLUNGE POOL

NOT TO SCALE

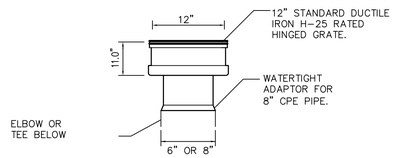


CLEANOUT DETAIL

NOT TO SCALE

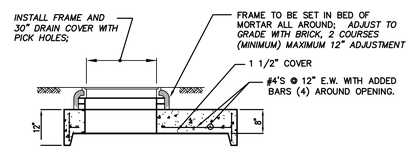
NOTES:

1. *INLINE DRAIN TO BE 12" DIAMETER PVC AS MANUFACTURED BY ADS (1-800-821-6710), NDS, INC. (1-800-726-1994) OR APPROVED EQUAL.*
2. *THE CONTRACTOR SHALL INSTALL THE INLINE DRAIN AS PER THE MANUFACTURERS RECOMMENDATIONS AND AS SHOWN IN THE DRAWINGS.*



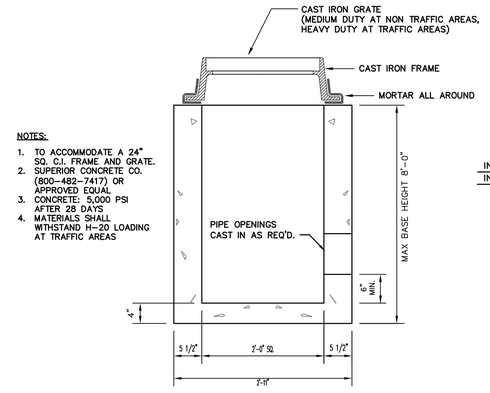
12" AREA DRAIN AND GRATE

NOT TO SCALE



SLAB TOP DETAIL

NOT TO SCALE

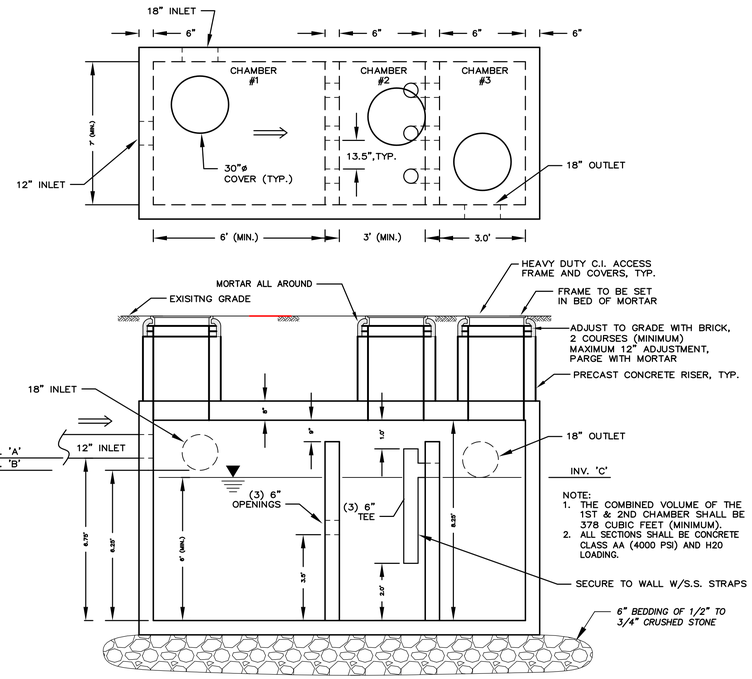


NOTES:

1. TO ACCOMMODATE A 24" SQ. C.I. FRAME AND GRATE.
2. SUPERIOR CONCRETE CO. (800-482-7417) OR APPROVED EQUAL
3. CONCRETE: 5,000 PSI AFTER 28 DAYS
4. MATERIALS SHALL WITHSTAND H-20 LOADING AT TRAFFIC AREAS

DROP INLET STRUCTURE

NOT TO SCALE



NOTE:
1. THE COMBINED VOLUME OF THE 1ST & 2ND CHAMBER SHALL BE 378 CUBIC FEET (MINIMUM).
2. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI) AND H20 LOADING.

WATER QUALITY INLET DETAIL

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE — JEFFREY K. CLIFFORD No. 6524 — LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

LAND OWNER - SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

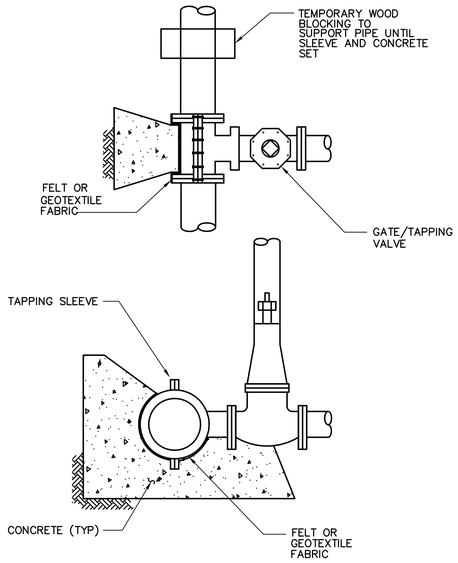
PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

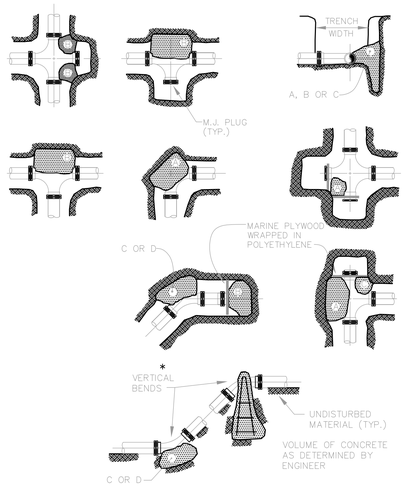
DETAIL SHEET

SHEET NUMBER: C - 6.2



TAPPING SLEEVE AND VALVE ASSEMBLY

NOT TO SCALE



TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES:

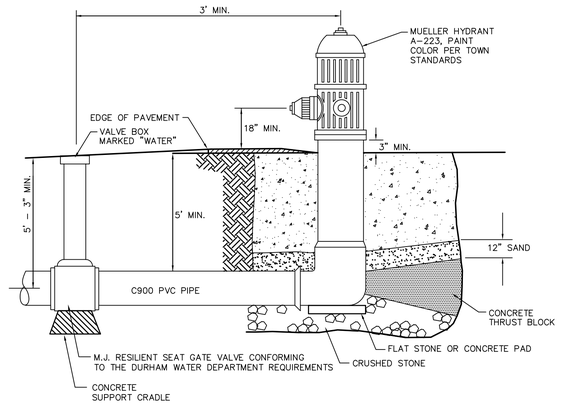
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.

THRUST BLOCK DETAIL

NOT TO SCALE

NOTES:

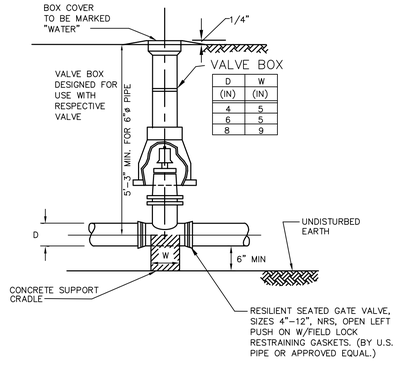
1. HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF TOWN OF DURHAM WATER AND FIRE DEPARTMENTS.
2. GATE VALVES TO OPEN XXXX.
3. DRAIN PORTS SHALL BE PLUGGED.



FIRE HYDRANT

(DURHAM HYDRANT STANDARD)

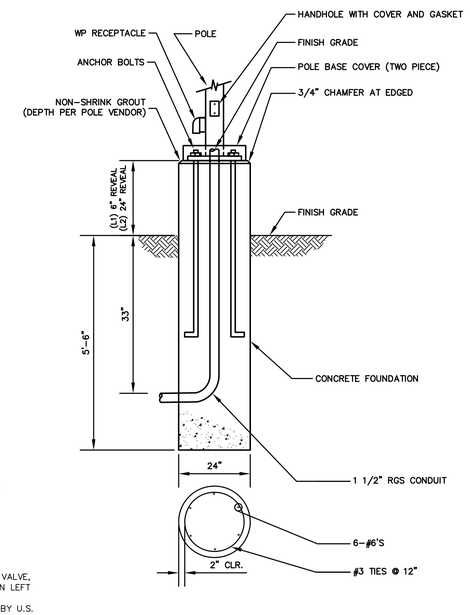
NOT TO SCALE



D (IN)	W (IN)
4	5
6	5
8	9

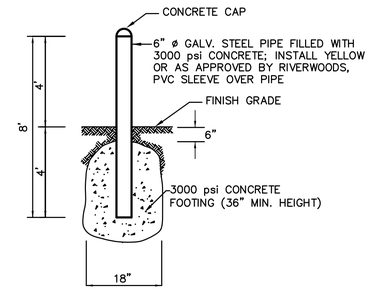
WATER VALVE DETAIL

NOT TO SCALE



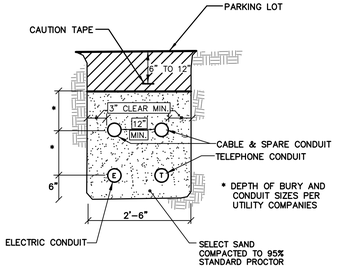
LIGHT POLE BASE DETAIL

NOT TO SCALE



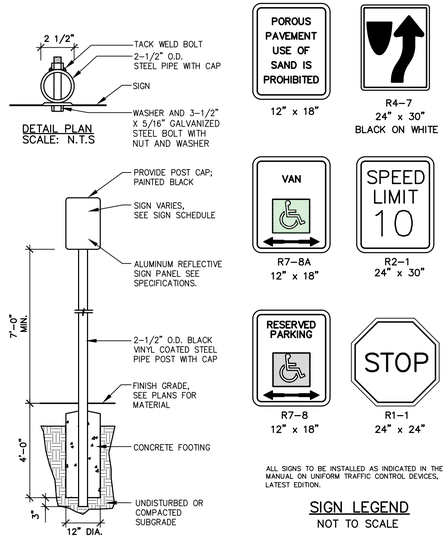
BOLLARD DETAIL

NOT TO SCALE



ELECTRIC/COMMUNICATION CONDUIT TRENCH SECTION

NOT TO SCALE



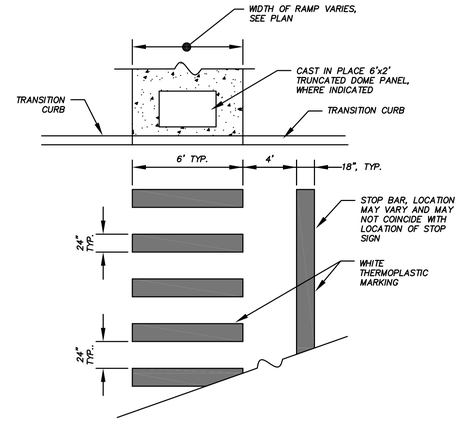
SIGN POST DETAIL

NOT TO SCALE

ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND

NOT TO SCALE



CROSSWALK DETAIL

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.

CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER

CERTIFIED _____

DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

STATE OF NEW HAMPSHIRE — JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER

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ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

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LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

DETAIL SHEET

SHEET NUMBER:

C - 6.3

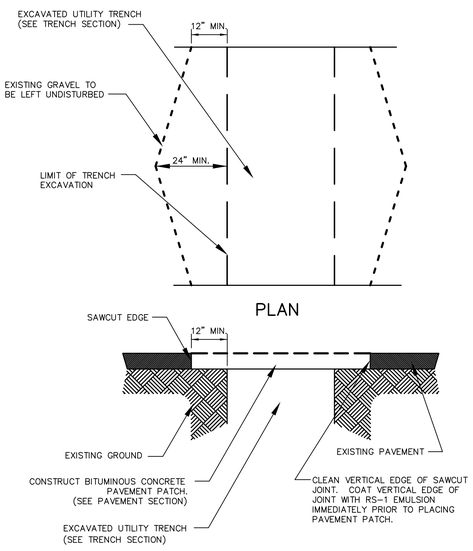
STANDARD TRENCH NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, STONE SIZE NO. 67.
   100% PASSING 1 INCH SCREEN
   90 – 100% PASSING 3/4 INCH SCREEN
   20 – 55% PASSING 3/8 INCH SCREEN
   0 – 10% PASSING #4 SIEVE
   0 – 5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90 – 100% PASSES 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST–IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER, FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.

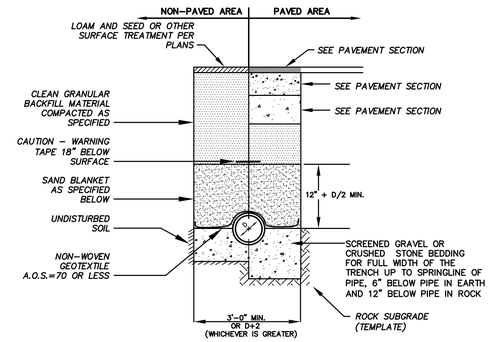
MANHOLE NOTES:

1. IT IS THE INTENTION OF THE NHDES THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE COMMISSION FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT IN ANY APPROVED MANHOLE. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MAN–HOLE CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE, A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.
4. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWN'S STANDARD SPECIFICATIONS.
5. INVERTS AND SHELVES MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES, OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
6. FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30–INCH CLEAR OPENING. A 3–INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWERS OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
7. BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33.
   100% PASSING 1 INCH SCREEN 0–10% PASSING #4 SIEVE
   90–100% PASSING 3/4 INCH SCREEN 0–5% PASSING #8 SIEVE
   20– 55% PASSING 3/8 INCH SCREEN
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2" TO 1/2" SHALL BE USED.
8. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000 LBS.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT 6.0 BAGS PER CUBIC YARD
   WATER 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE 1 INCH 9.
9. FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
   PVC PIPE – 60"
   RCP & CI PIPE – ALL SIZES – 48"
   AC & VC PIPE – UP THROUGH 12" DIAMETER – 18"
   AC & VC PIPE – LARGER THAN 12" DIAMETER – 36"
10. SHALLOW MANHOLE IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.



TYPICAL TRENCH PATCH

NOT TO SCALE



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER	
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING	
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAIN AND UTILITY TRENCH SECTION

NOT TO SCALE

1000 GALLON GREASE (SEPTIC) TANK

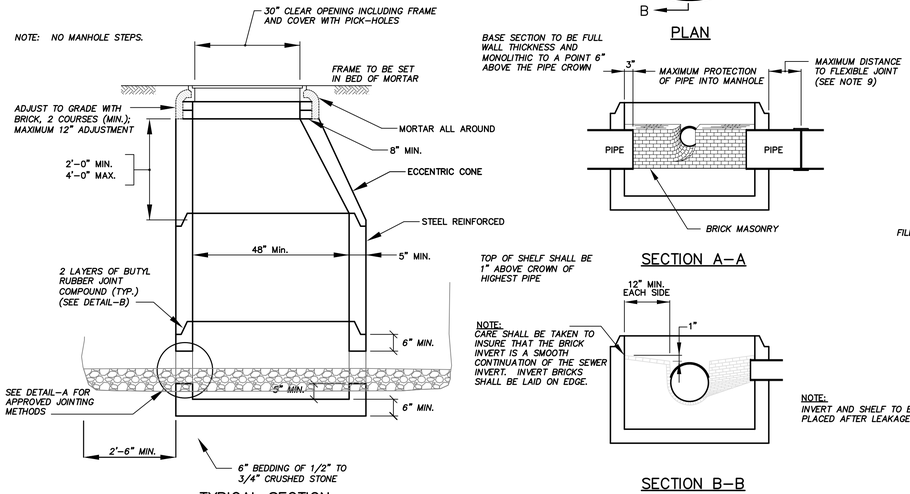
NOTES:

1) DESIGN LOAD SHALL BE H–20.
2) SEAL THE OUTSIDE OF THE TANK AND MANHOLE WITH TWO BITUMINOUS COATINGS.
3) SEAL, PRECAST SECTION JOINTS, WITH 1" BUTYL RUBBER OR EQUAL.

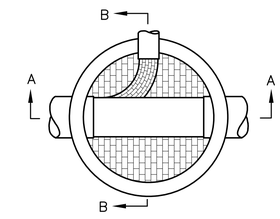
GREASE TRAP

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____



TYPICAL SECTION

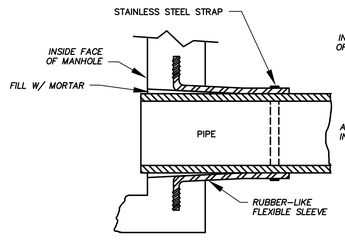


PLAN

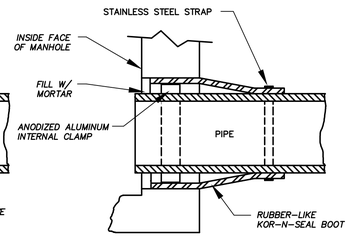
SECTION A–A

NOTE: INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST

SECTION B–B



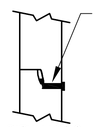
LOCK–JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)



KOR–N–SEAL JOINT SLEEVE
(OR EQUAL)

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL–A



BITUMASTIC

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL–B
(APPROVED MANHOLE SECTION JOINTING METHODS)

SEWER MANHOLE DETAILS

NOT TO SCALE

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433–2335
FAX: (603) 433–4194

STATE OF NEW HAMPSHIRE – JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER

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ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

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1	PB RE–SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

LAND OWNER – SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

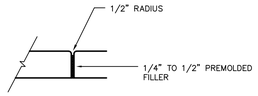
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

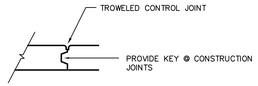
DETAIL SHEET

SHEET NUMBER:

C - 6.4

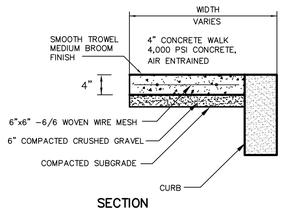


EXPANSION JOINT

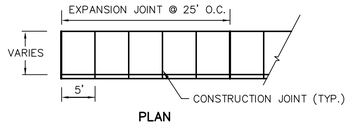


CONSTRUCTION/CONTROL JOINT

(TO BE INSTALLED AT ENTRY/DROP OFF AREAS)



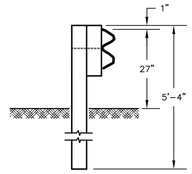
SECTION



PLAN

CONCRETE SIDEWALK DETAIL

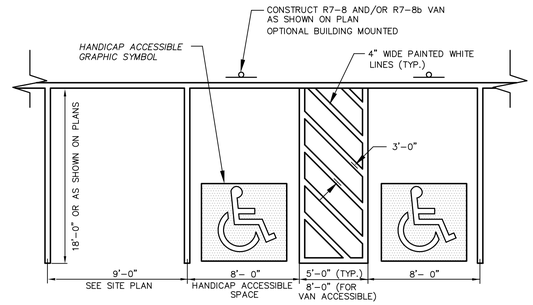
NOT TO SCALE



AASHTO DESIGNATION	G4(2W)
NH STANDARD BEAM GUARD RAIL DETAIL, SECTION 606	
POST SPACING	6'-3"
DEFLECTION DISTANCE *	3'
POST TYPE	6" x 8" TREATED WOOD POST
BEAM TYPE	"W" SECTION, 12 GA., "CORTEN" STEEL, NHDOT 606.2
OFFSET BRACKETS	6" x 8" x 14" TREATED BLOCK
PROVIDE TERMINAL SECTION AT EACH END	

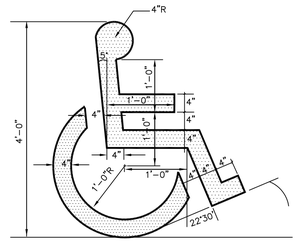
"W" BEAM GUARDRAIL DETAIL (WOOD POSTS)

NOT TO SCALE



STALL PARKING

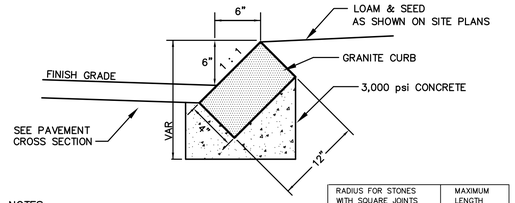
NOT TO SCALE



NOTE:
SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES

ADA SYMBOL

NOT TO SCALE



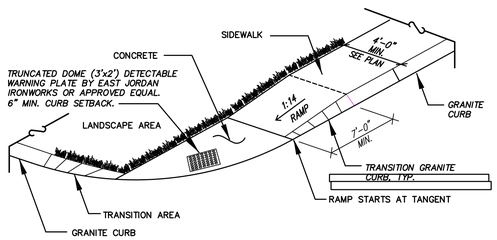
NOTES

1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

SLOPE GRANITE CURB

NOT TO SCALE

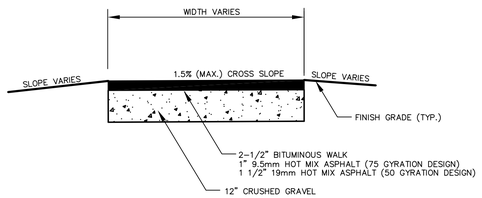


NOTE:

1. RAMP CROSS SECTION TO BE THE SAME AS ADJACENT SIDEWALK.
2. DIMENSIONS ARE SUBJECT TO CHANGE IN FIELD. ALL SLOPES AND DIMENSIONS TO COMPLY WITH A.D.A. REQUIREMENTS.

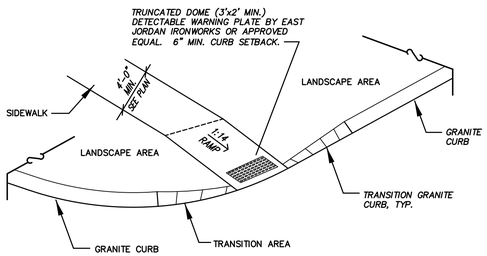
CURB CUT TYPE A

NOT TO SCALE



BITUMINOUS PAVEMENT SIDEWALK DETAIL

NOT TO SCALE

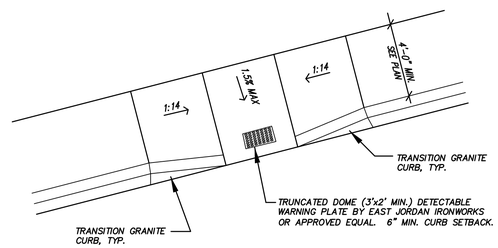


NOTE:

1. RAMP CROSS SECTION TO BE THE SAME AS ADJACENT SIDEWALK.
2. DIMENSIONS ARE SUBJECT TO CHANGE IN FIELD. ALL SLOPES AND DIMENSIONS TO COMPLY WITH A.D.A. REQUIREMENTS.

CURB CUT TYPE C

NOT TO SCALE

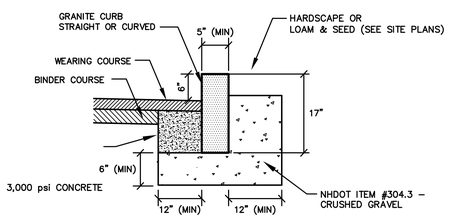


NOTE:

1. RAMP CROSS SECTION TO BE THE SAME AS ADJACENT SIDEWALK.
2. DIMENSIONS ARE SUBJECT TO CHANGE IN FIELD. ALL SLOPES AND DIMENSIONS TO COMPLY WITH A.D.A. REQUIREMENTS.

CURB CUT TYPE D

NOT TO SCALE



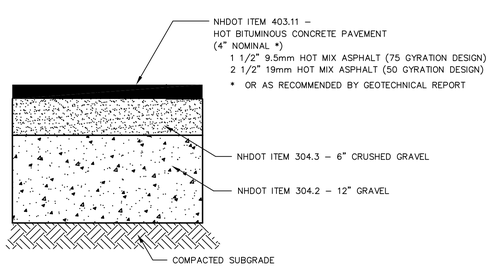
NOTES:

1. SEE PLANS FOR CURB LOCATION.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF CURB STONES = 3'
4. MAXIMUM LENGTH OF CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART.
6. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'

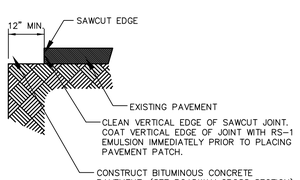
VERTICAL GRANITE CURB

NOT TO SCALE



BITUMINOUS PAVEMENT DETAIL

NOT TO SCALE



TYPICAL PAVEMENT SAWCUT DETAIL

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

REVISIONS

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DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

LAND OWNER - SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:

THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:

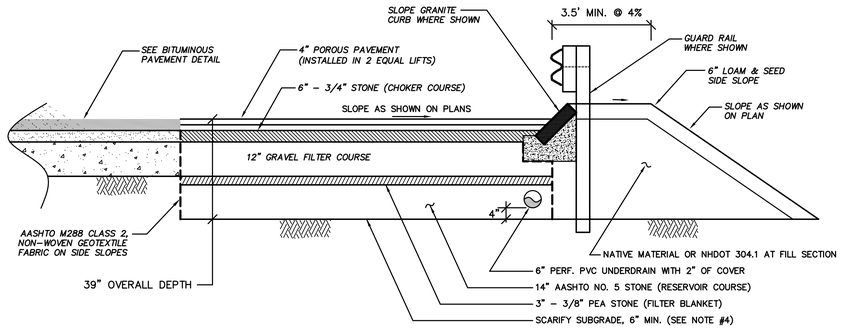
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

DETAIL SHEET

SHEET NUMBER:

C - 6.5



NOTES:

1. *CONTRACTOR SHALL PROVIDE SUBMITTALS FOR POROUS PAVEMENT AS NOTED IN THE SPECIFICATIONS A MINIMUM OF 14-DAYS PRIOR TO COMMENCING CONSTRUCTION.*
2. *CONTRACTOR SHALL NOTIFY ENGINEER A MINIMUM OF 7 DAYS IN ADVANCE OF WORK SO THAT THE ENGINEER CAN OBSERVE INSTALLATION OF POROUS PAVEMENT CROSS SECTION.*
3. *CONTRACTOR TO REMOVE ANY EXISTING BURIED LAYERS OF LOAM OR UNSUITABLE MATERIAL DURING THE EXCAVATION OF THE PARKING AREA AND/OR WHENEVER ENCOUNTERED IN TRENCHES.*
4. *AT AREAS REQUESTED BY ENGINEER, PROOF ROLL PRIOR TO SCARIFYING THE SUBGRADE.*

MATERIAL GRADATIONS

RESERVOIR COURSE	
SIEVE SIZE	% PASSING BY WEIGHT
1-1/2"	100
1"	90 – 100
3/4"	20 – 55
1/2"	0 – 10
3/8"	0 – 5

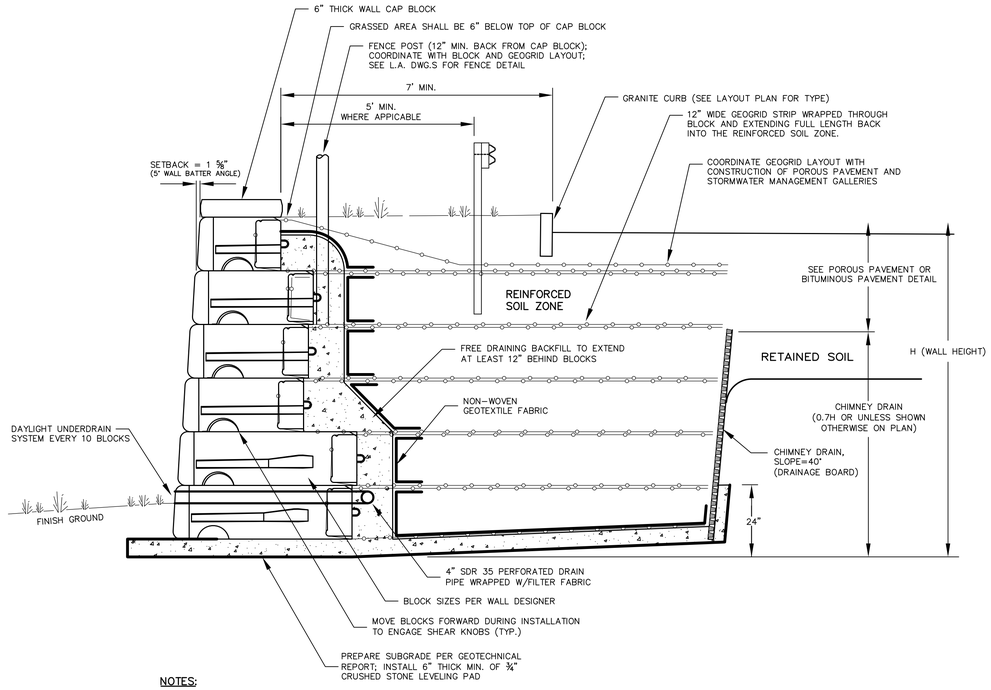
CHOKER COURSE STONE	
SIEVE SIZE	% PASSING BY WEIGHT
1-1/2"	100
1"	95 – 100
1/2"	25 – 60
# 4	0 – 10
# 8	0 – 5

FILTER BLANKET	
SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	85 – 100
# 4	10 – 30
# 8	0 – 10
# 16	0 – 5

GRAVEL FILTER COURSE	
SIEVE SIZE	% PASSING BY WEIGHT
6"	100
# 4	70 – 85
# 200	0 – 6

POROUS PAVEMENT DETAIL

NOT TO SCALE



NOTES:

1. RETAINING WALL TO BE EQUAL TO REDI-ROCK' SYSTEM, WWW.REDI-ROCK.COM OR APPROVED EQUAL.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. WALLS AND OPTIONAL REINFORCEMENT TO DE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN NH.
4. DO NOT SCALE DRAWING.
5. GEOTECHNICAL ENGINEER TO REVIEW THE WALL SHOP DRAWINGS AND THE SUBGRADE.
6. CONSTRUCTION OF WALL SHALL BE COORDINATED WITH CONSTRUCTION OF POROUS PAVEMENT AND STORMWATER MANAGEMENT GALLERIES.

TYPICAL LARGE BLOCK RETAINING WALL DETAIL

NOT TO SCALE

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

P4836

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133 COURT STREET PORTSMOUTH, NH 03801
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7 RIVERWOODS DRIVE
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STONE QUARRY DRIVE
DURHAM, NH

TITLE:

DETAIL SHEET

SHEET NUMBER:

C - 6.6