"LAKELAND HILLS"

A COMPREHENSIVE PERMIT PLAN

NORFOLK, MASSACHUSETTS

PURSUANT TO THE M.G.L. CHAPTER 40B

NOVEMBER 27, 2019

PREPARED FOR:

LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

PREPARED BY:

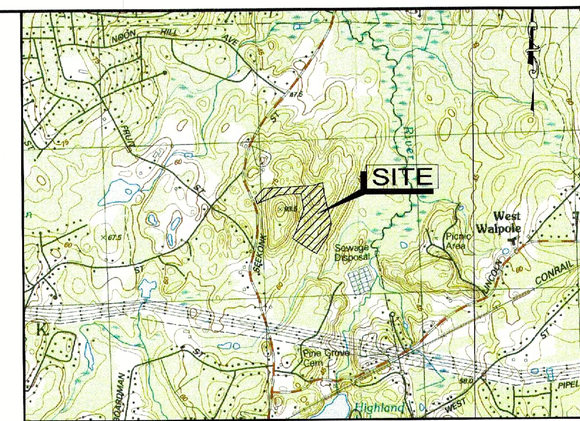
ANDREWS SURVEY & ENGINEERING, INC.
104 MENDON STREET
P.O. BOX 312
UXBRIDGE, MA 01569
P: 508.278.3897
F: 508.278.2289

ENVIRONMENTAL:

B&C ASSOCIATES, INC.
2 RICE STREET
HUDSON, MA 01749
P: 978.568.0135

COMPREHENSIVE PERMIT PLAN NOTE:

THE PROJECT DESIGN PRESENTED WITHIN THIS COMPREHENSIVE PERMIT PLAN SET IS INTENDED TO ILLUSTRATE THE GENERAL FEASIBILITY OF THE PROJECT. AS SUCH THE DESIGN PRESENTED HEREIN IS NOT INTENDED FOR CONSTRUCTION. PROPOSED LAYOUT INFORMATION AND PROPOSED GRADING INFORMATION (WHERE SHOWN) ARE NOT TO BE CONSIDERED FINAL.



LOCUS MAP
1" = 1500'

OWNER OF RECORD:
EDWARD B. & SANDRA A. O'HARTE
136 SEEKONK STREET
NORFOLK, MA 02056

DEED REFERENCE:
CERT. #191525

PLAN REFERENCE:
L.C. PLAN 43114A

NORFOLK ASSESSORS INFORMATION:
MAP 23, BLOCK 76, LOT 71 ~ TOTAL AREA: 21.22± ACRES

NORFOLK ZONING INFORMATION:
ZONE: RESIDENCE R-3
MINIMUM FRONTAGE: 200'
MINIMUM LOT AREA: 55,000 S.F.
BUILDING SETBACKS: FRONT 50', SIDE 25', REAR 25'

DRAWING DATE	LAST REVISION	SHEET NO.	SHEET TITLE
11/27/19		C-0.0	COVER SHEET
11/27/19		C-1.1	LEGEND, ABBREVIATIONS, & GENERAL NOTES
11/27/19		C-1.2	INDEX SHEET
11/27/19		C-2.1 - C-2.3	EXISTING CONDITIONS PLANS
11/27/19		C-2.4	ADDITIONAL SOIL TESTING
11/27/19		C-3.1 - C-3.3	LAYOUT & MATERIALS PLANS
11/27/19	(EXCLUDED)	C-4.1 - C-4.3	UTILITY PLANS
11/27/19		C-5.1 - C-5.3	GRADING & DRAINAGE PLANS
11/27/19		C-6.1 - C-6.4	TOPOGRAPHIC PLAN & PROFILE
11/27/19		C-7.1 - C-7.6	CONSTRUCTION DETAILS
11/27/19		C-8.1	ZONING PLAN

GOVERNMENT / UTILITY CONTACTS

NORFOLK POLICE DEPT.
14 SHARON AVENUE
P: 508-528-3206
F: 508-528-9762

NORFOLK FIRE DEPT.
117 MAIN STREET
P: 508-528-3207

NORFOLK BUILDING DEPARTMENT
ONE LIBERTY LANE
P: 508-528-5088
F: 508-541-3300

NORFOLK DEPARTMENT OF PUBLIC WORKS
33 MEDWAY BRANCH
P: 508-528-4990
F: 508-528-2773

NORFOLK CONSERVATION COMMISSION
ONE LIBERTY LANE
P: 508-541-8455
F: 508-541-3300

NORFOLK PLANNING BOARD
ONE LIBERTY LANE
P: 508-528-2961
F: 508-541-3300

ASE
Andrews Survey & Engineering, Inc.
Land Surveying - Civil Engineering - Site Planning
P.O. Box 312, 104 Mendon Street
Uxbridge, Massachusetts 01569
P: 508-278-3897 F: 508-278-2289
500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

CAD FILE	...\dwg\permit\2015-219_C2_R1.dwg
DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28323 REGISTERED PROFESSIONAL ENGINEER 11/27/19 P.E.

COMMONWEALTH OF MASSACHUSETTS BYRON J. ANDREWS No. 47389 REGISTERED PROFESSIONAL LAND SURVEYOR 11/27/19 P.L.S.

SHEET TITLE

COVER SHEET

DRAWING NO.

C-0.0

PLAN NO. L-5239

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GENERAL NOTES

PART 1 – TOPOGRAPHIC AND PROPERTY LINE INFORMATION

A. NOTICE TO CONTRACTOR: THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION SHALL BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.

B. PROPERTY LINE AND TOPOGRAPHY:

- EXISTING PROPERTY LINE, UTILITY INFORMATION AND TOPOGRAPHIC INFORMATION PERFORMED BY ANDREWS SURVEY & ENGINEERING, INC.

C. THE LIMIT OF BORDERING VEGETATED WETLANDS SHOWN HEREON WAS DELINEATED BY B & C ASSOCIATES, INC. AND LOCATED BY FIELD SURVEY. NORFOLK CONSERVATION COMMISSION CONFIRMED WETLAND FLAG (WF51 THROUGH WF90) LOCATIONS THROUGH ORAD #240-592 DEP/NCC ISSUED ON 1/10/2018 AND DELINEATES ALL WETLAND RESOURCES BOTH UNDER THE STATE WETLAND PROTECTION ACT AND THE TOWN OF NORFOLK BYLAW BOTH ON THE PROJECT SITE AND ON NEARBY PROPERTIES TO THE EXTENT RELEVANT TO THE PROPOSED WORK.

D. DATUM: MASSACHUSETTS STATE PLANE (NAD83)

E. BENCHMARKS: NAVD88

F. COORDINATE SYSTEM: MASSACHUSETTS STATE PLANE (NAD83)

G. CONSTRUCTION STAKING CONTROL: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY TO PERFORM THE WORK.

H. FLOODPLAIN: THE PROPERTY DOES NOT LIE IN A FLOOD HAZARD AREA OR 100-YEAR FLOODPLAIN ACCORDING TO THE MOST RECENT FLOOD INSURANCE RATE MAPS FOR NORFOLK, MAP NUMBER 25021C0164E, EFFECTIVE DATE 7/17/12.

PART 2 – EXECUTION

2.1 DEMOLITION, SEDIMENTATION, AND EROSION CONTROL

A. THE FIRST STAGE INVOLVES ACTIVITIES NEEDED TO ADDRESS STORMWATER MANAGEMENT, EXCAVATING MATERIAL DESIGNATED FOR OFF-SITE REMOVAL OR ON-SITE RELOCATION AND FENCING SELECTED AREAS. STAGE ONE WILL PREPARE SITE FOR CONVENTIONAL CONSTRUCTION.

B. THE SECOND STAGE WILL CONSIST OF ROUTINE CONSTRUCTION INVOLVING BUILDING, PAVING, LANDSCAPING, AND UTILITIES.

C. THERE ARE GENERAL PHASES OF CONSTRUCTION. IN EACH PHASE OF CONSTRUCTION, IMPLEMENT STANDARD EROSION AND SEDIMENT CONTROL PRACTICES PRIOR TO INITIATING EARTH DISTURBING ACTIVITIES, AND MAINTAIN THESE PRACTICES THROUGHOUT THE COURSE OF CONSTRUCTION.

D. DURING DEMOLITION, EXCAVATIONS AS MUCH AS 20 FEET MAY BE REQUIRED FOR THE INSTALLATION OF FOUNDATIONS, RETAINING WALLS, AND UTILITIES. EXCAVATIONS SHALL BE CUT TO A STABLE SLOPE OR BE TEMPORARILY BRACED, DEPENDING ON THE EXCAVATION DEPTHS AND THE ENCOUNTERED SUBSURFACE CONDITIONS. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT EXCAVATION AND SLOPE STABILIZATION METHODS PRIOR TO THE START OF CONSTRUCTION TO THE ENGINEER FOR REVIEW.

E. BASED ON THE COMPOSITION OF SOILS ENCOUNTERED DURING THE EXPLORATION PROGRAM, SITE SOILS ARE GENERALLY CLASSIFIED AS TYPES B AND C SOILS AS DEFINED BY (USGS) NATIONAL RESOURCES CONSERVATION SERVICE (NRCS), FORMERLY SOIL CONSERVATION SURVEY (SCS). TEMPORARY CONSTRUCTION SLOPES SHOULD BE DESIGNED IN STRICT COMPLIANCE WITH THE MOST RECENT GOVERNING REGULATIONS. STOCKPILES SHOULD BE PLACED WELL AWAY FROM THE EDGE OF THE EXCAVATION AND THEIR HEIGHT SHOULD BE CONTROLLED TO PREVENT SURCHARGE TO THE SIDES OF THE EXCAVATION. SURFACE DRAINAGE SHOULD BE CONTROLLED TO AVOID FLOW OF SURFACE WATER INTO THE EXCAVATIONS.

F. CONSTRUCTION SLOPES SHOULD BE REVIEWED FOR MASS MOVEMENT. IF POTENTIAL STABILITY PROBLEMS ARE OBSERVED, WORK SHOULD CEASE AND A GEOTECHNICAL ENGINEER SHOULD BE CONTACTED IMMEDIATELY. THE RESPONSIBILITY FOR EXCAVATION SAFETY AND STABILITY OF TEMPORARY CONSTRUCTION SLOPES SHOULD LIE SOLELY WITH THE CONTRACTOR.

2.2 – TYPICAL PRACTICES TO BE APPLIED TO THE SITE INCLUDE THE FOLLOWING:

A. PRIOR TO EARTH DISTURBANCE IN ANY WORK AREA, INSTALL EROSION CONTROL BARRIERS BETWEEN THE WORK AREA AND THE SURFACE WATER RESOURCE TO WHICH IT DRAINS.

B. DISCHARGE WATER FROM DEWATERING OPERATIONS TO A TEMPORARY SILTATION TRAP OR SEDIMENTATION BASIN.

C. PROVIDE TEMPORARY BERMS AND SWALES TO DIVERT SURFACE WATER AWAY FROM THE AREAS THAT WILL BE EXPOSED BY CONSTRUCTION ACTIVITY TO MINIMIZE THE AMOUNT OF SURFACE WATER COMING INTO CONTACT WITH EXPOSED SOILS. PROVIDE STABLE OUTLETS FOR THESE DEVICES, AND LINE OR VEGETATE THESE DIVERSIONS TO PROVIDE FOR THEIR STABILITY DURING CONSTRUCTION.

D. LIMIT THE EXTENT OF EXPOSED SOILS TO AREAS THAT CAN BE WORKED AND RESTABILIZED WITHIN THE CONSTRUCTION SEASON AND DURING THE SPECIFIC CONSTRUCTION PHASE.

E. WHEN EARTHWORK CONSTRUCTION ACTIVITY IN AN AREA IS COMPLETE, STABILIZE THE AREA WITH A SUITABLE SURFACE AS DESCRIBED BELOW.

F. IN ADDITION TO THESE PRACTICES, FOLLOW THE SPECIAL PRACTICES DESCRIBED BELOW. COMPLY WITH THE DIRECTIONS OF THE APPLICANT'S REPRESENTATIVE TO ADDRESS EROSION AND SEDIMENTATION CONDITIONS THAT MAY ARISE ON A CASE BY CASE BASIS DURING CONSTRUCTION.

G. THE FOLLOWING IS A DESCRIPTION OF MINIMUM CONSTRUCTION REQUIREMENTS AND DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES WITH REGARD TO DETERMINING THE ADEQUACY OF MEANS AND METHODS OF CONSTRUCTION.

2.3 – CONSTRUCTION SEQUENCING

A. SEQUENCING SHALL BE AS SHOWN ON THE PLAN AND AS DICTATED BY THE REQUIREMENTS OF CONSTRUCTION.

2.4 – MAINTENANCE

A. DURING THE PERIOD OF CONSTRUCTION AND/OR UNTIL LONG TERM VEGETATION IS ESTABLISHED:

B. SEEDED AREAS WILL BE FERTILIZED AND RESEEDED AS NECESSARY TO INSURE VEGETATION ESTABLISHMENT.

C. TEMPORARY SEDIMENTATION BASINS WILL BE CHECKED AFTER EACH SIGNIFICANT RAINFALL AND CLEANED AS NEEDED TO RETAIN STORAGE CAPACITY.

D. TEMPORARY DRAINAGE SWALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY.

E. THE EROSION CONTROL BARRIERS AND OTHER EROSION AND SEDIMENT CONTROL MEASURES/DEVICES SHALL BE INSPECTED, CLEANED, REPLACED AND/OR REPAIRED AS NECESSARY, PERIODICALLY AND AFTER EACH SIGNIFICANT RAINFALL.

F. SWEEP ON-SITE PAVED AREAS AND OFF-SITE STREETS AS NECESSARY TO PREVENT SILT AND DEBRIS ORIGINATING ON-SITE FROM ENTERING CLOSED DRAINAGE SYSTEMS AND/OR ENVIRONMENTALLY SENSITIVE AREAS. WHEN NECESSARY UTILIZE WATER SPRAYING, SURFACE ROUGHENING AND/OR APPLY POLYMERS, SPRAY-ON TACKIFIERS, CHLORIDES AND BARRIERS FOR DUST CONTROL.

2.5 – GENERAL

A. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH (USDA) NATURAL RESOURCES CONSERVATION SERVICE (NRCS, FORMERLY SCS) GUIDELINES AND ALL LOCAL, COUNTY AND MUNICIPAL REGULATIONS.

B. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF ANY SITE WORK OR EARTHWORK OPERATIONS, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN IN PLACE UNTIL ALL SITE WORK IS COMPLETE AND GROUNDCOVER IS ESTABLISHED.

C. ALL WORK SHALL BE IN ACCORDANCE WITH THE PERMITS AND APPROVALS ISSUED AND THE CONSTRUCTION SPECIFICATIONS. BLASTING IS PROHIBITED ON THE PROJECT SITE.

D. STOCKPILES SHALL BE SURROUNDED ON THEIR PERIMETERS WITH STAKED STRAW WATTLES AND/OR SILTATION FENCES TO PREVENT AND/OR CONTROL SILTATION AND EROSION.

PART 2 – CONTINUED

E. TOPS OF STOCKPILES SHALL BE COVERED IN SUCH A MANNER THAT STORMWATER DOES NOT INFILTRATE THE MATERIALS AND THEREBY RENDER THE SAME UNSUITABLE FOR FILL USE.

F. ALL DISTURBED OR EXPOSED AREAS SHALL BE PERMANENTLY STABILIZED WITHIN FIVE (5) BUSINESS DAYS OF COMPLETION OF CONSTRUCTION OF A GIVEN AREA. EXPOSED AREAS WHERE NO WORK HAS OCCURRED FOR FOURTEEN (14) DAYS SHALL BE TEMPORARILY STABILIZED WITH HYDROSEED OR OTHER APPROVED METHOD.

G. THE LOCATION OF TEMPORARY DRAINAGE SWALES AND SEDIMENTATION TRAPS ARE APPROXIMATE ONLY AND SHALL BE RELOCATED AS REQUIRED AS CONSTRUCTION PROGRESSES.

H. HAYBALE DIKES SHALL BE CONSTRUCTED AT ALL EXISTING & PROPOSED CATCH BASINS LOCATED IN FILL AREAS & SUBJECT TO STORMWATER RUN-OFF FROM PROPOSED FILL AREAS DURING CONSTRUCTION, OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. NO SEDIMENTS SHALL ENTER THE ON-SITE OR OFF-SITE DRAINAGE SYSTEMS AT ANY TIME.

I. CULVERT/PIPE INLETS AND OUTFALLS SHALL BE PROTECTED BY STRAW WATTLE FILTERS UNTIL DISTURBED AREAS ARE PERMANENTLY STABILIZED.

J. EROSION CONTROLS SHALL BE PERIODICALLY INSPECTED AND REPLACED AS REQUIRED.

K. ALL PROPOSED NON-RIPRAP SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH EXCELSIOR BLANKETS AND PROTECTED FROM EROSION.

L. THE CONTRACTOR SHALL KEEP ON SITE AT ALL TIMES ADDITIONAL STRAW WATTLES AND EXTRA SILTATION FENCING FOR INSTALLATION AT THE DIRECTION OF THE OWNER'S REPRESENTATIVE OR LOCAL OFFICIALS TO MITIGATE ANY EMERGENCY CONDITION.

M. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL MUNICIPAL REQUIREMENTS.

N. THE CONTRACTOR SHALL PROTECT AND/OR CAP OFF ALL EXISTING ON-SITE UTILITY SERVICES DESIGNATED AS SUCH ON THESE DRAWINGS.

O. THE LIMIT OF WORK LINE FOR THE AREA TO BE CLEARED AND GRUBBED SHALL BE THE SAME AS THE LIMIT OF WORK LINE NECESSARY FOR GRADING PURPOSES, (I.E., THE GRADING LIMITS AROUND THE PERIMETER OF THE PROJECT AREA).

P. THE AREA OR AREAS OF ENTRANCE AND EXIT TO AND FROM THE SITE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

Q. FOLLOWING THE ADDITION OF A BINDER COURSE, THE CONTRACTOR SHALL SWEEP ALL ON-SITE PAVEMENT, IF NECESSARY, UNTIL ALL SITE CONSTRUCTION IS COMPLETED.

R. THE MATERIALS AND METHODS USED IN THE CONSTRUCTION OF ROADWAYS SHALL CONFORM TO THE REQUIREMENTS OF "TOWN OF NORFOLK CONSTRUCTION STANDARDS AND SPECIFICATIONS". WHEN NO CITY SPECIFICATION IS PROVIDED THE MATERIALS AND METHODS USED IN THE CONSTRUCTION OF ROADWAYS SHALL CONFORM TO THE REQUIREMENTS OF "THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS, STANDARDS & SPECIFICATIONS FOR HIGHWAYS & BRIDGES," LATEST EDITION.

PART 3 – STORM DRAINS

A. STORM DRAIN PIPING (INDICATED BY LETTER "D") SHALL BE CORRUGATED POLYETHYLENE PIPE (HDPE) AS INDICATED, PER AASHTO M294 AND M252 MANUFACTURED WITH HIGH DENSITY POLYETHYLENE PLASTIC. HDPE SHALL BE ADS N-12 PIPE AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC. OR HANCOR HI Q PIPE AS MANUFACTURED BY HANCOR, INC. OR APPROVED EQUAL.

B. STORM DRAIN MANHOLES (INDICATED BY LETTERS "DMH") SHALL BE PRECAST 4', 5' OR 6' DIAMETER CONCRETE PER ASTM C478 (AS CALLED FOR ON DRAWINGS OR FIELD CONDITIONS REQUIRE) WITH RUBBER GASKET JOINTS CONFORMING TO ASTM C443. PIPE TO MANHOLE CONNECTIONS SHALL BE MORTARED PIPE OPENINGS.

C. CATCH BASINS (INDICATED BY LETTERS "CB") SHALL BE PRECAST 5' DIAMETER CONCRETE PER ASTM C478, (ALTERNATE TO P SLAB WHERE NECESSARY) AND RUBBER GASKET JOINTS CONFORMING TO ASTM C443, WITH 4 FOOT SUMPS AND GAS TRAP OUTLET ELBOW. PIPE TO STRUCTURE CONNECTIONS SHALL BE MORTARED PIPE OPENINGS.

D. COORDINATES OF MANHOLES REFER TO CENTERS OF STRUCTURES AND CATCH BASINS REFER TO THE CENTER BACK OF THE FRAME AND GRATE.

E. FLARED END SECTIONS (FES) SHALL BE CORRUGATED POLYETHYLENE PIPE (HDPE) AS INDICATED, PER AASHTO M170 MANUFACTURED TO MEET ASTM C76.

F. FLARED END SECTIONS (FES) SHALL BE CORRUGATED POLYETHYLENE PIPE AS INDICATED, MANUFACTURED WITH HIGH DENSITY POLYETHYLENE PLASTIC. ADS N-12 OR APPROVED EQUAL.

PART 4 – UTILITIES

4.1 – WATER DISTRIBUTION AND FIRE PROTECTION

A. WATER MAINS 3" DIA. AND LARGER SHALL HAVE 5'-0" MINIMUM COVER AND SHALL BE CEMENT LINED DUCTILE IRON (CLDI), CLASS 52 MINIMUM, CONFORMING TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) A21.50, A21.4, A21.10 AND A21.51. JOINTS AT FITTINGS, VALVES AND HYDRANT LATERALS SHALL BE MECHANICAL JOINT PER ANSI A21.11, WITH GASKETS. JOINTS AT OTHER LOCATIONS SHALL BE PUSH-ON TYPE WITH GASKETS PER ANSI A21.11. ALL FITTINGS, VALVES, HYDRANTS AND CAPS SHALL BE CLASS 350 PROVIDED WITH THRUST RESTRAINTS (THRUST BLOCKS AND RETAINING RODS) IN CONFORMANCE WITH THE DETAILS.

B. GENERALLY, WATER MAIN FITTINGS IDENTIFIED ON THIS DRAWING ARE SHOWN FOR INSTALLATION LOCATION PURPOSES. THE CONTRACTOR IS ADVISED THAT NOT ALL FITTINGS AND SUPPLY LINES ARE NOTED, SHOWN, OR INDICATED.

C. ALL HYDRANTS SHALL BE INSTALLED WITH A 6" CLDI LATERAL AND SHALL BE INSTALLED WITH A 6" GATE VALVE, BOX, AND TEE FITTING. ALL HYDRANTS SHALL MEET AND BE INSTALLED IN ACCORDANCE WITH ALL LOCAL MUNICIPAL STANDARDS.

D. ALL WATER MAIN APPURTENANCES, MATERIALS, AND METHODS OF INSTALLATION SHALL MEET OR EXCEED ALL LOCAL MUNICIPAL REQUIREMENTS.

E. PRESSURE AND LEAKAGE TEST, DISINFECTION AND FLUSHING SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL STANDARDS AND REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS IN CONNECTIONS WITH UTILITY TESTS, FLUSHING, AND INSPECTIONS AS REQUIRED BY THE LOCAL MUNICIPALITY.

F. EXISTING SERVICES SHALL BE CUT AND A WATERTIGHT PLUG SHALL BE INSTALLED. EXISTING GATE VALVES TO BE ABANDONED SHALL BE PERMANENTLY CLOSED AND CAPPED, AND WATER SERVICES SHOULD BE SHUT OFF AT THE MAIN CORPORATION.

4.2 – UTILITY SEPARATION

A. A MINIMUM 10 FEET CLEAR HORIZONTAL DISTANCE SHALL BE MAINTAINED BETWEEN SANITARY SEWER MAINS AND WATER MAINS. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET, THE WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH AND THE ELEVATION OF THE CROWN OF THE SEWER SHALL BE AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN.

B. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER MAINS CROSS STORM DRAIN LINES.

C. WHERE SANITARY SEWERS CROSS WATER MAINS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST TWO FEET BELOW THE INVERT OF THE WATER MAIN. IF THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE CONTRACTOR SHALL DO THE FOLLOWING:

THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED WITH MECHANICAL-JOINT PIPE FOR A DISTANCE OF TEN FEET ON EACH SIDE OF THE SEWER. ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. IN ADDITION, THE WATER MAIN SHALL BE ENCASED IN CONCRETE.

D. PRIMARY ELECTRICAL ENCASED CONDUIT MUST BE SEPARATED FROM GAS BY 3' MIN. AND FROM OTHER UTILITIES BY 2' MINIMUM.

E. TELEPHONE AND FIRE ALARM WHICH SHARE THE SAME TRENCH MUST HAVE A 1' VERTICAL SEPARATION.

F. GAS MAINS MUST BE SEPARATED FROM OTHER UTILITIES BY 2' MINIMUM.

PART 4 – CONTINUED

4.3 – ELECTRIC AND COMMUNICATIONS

A. INSTALLATION OF COMMUNICATIONS (TELEPHONE, CABLE AND FIRE ALARM) SYSTEMS SHALL BE COORDINATED AND SCHEDULED BY THE CONTRACTOR WITH THE APPROPRIATE UTILITY COMPANY SERVICING THE PROJECT SITE.

B. COORDINATES REFER TO THE CENTER OF STRUCTURES UNLESS OTHERWISE NOTED OR DETAILED. CONTRACTOR SHALL COORDINATE LIGHT BASE LOCATIONS WITH PROPOSED CURBING AND PARKING LOT STRIPING.

C. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ELECTRICAL SERVICE PRIOR TO ORDERING ANY EQUIPMENT.

PART 5 – PAVEMENT AND CURBING

A. JOINTS BETWEEN NEW BITUMINOUS CONCRETE PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.

B. CURBING SHALL BE INSTALLED AS FOLLOWS:

BITUMINOUS MODIFIED CAPE COD CURB ALONG ROADWAY.

C. DIMENSIONS REFER TO FACE OF CURB UNLESS NOTED OTHERWISE.

D. ALL LIMITS OF PAVING SHALL BE CURBED UNLESS NOTED OR DETAILED OTHERWISE.

PART 6 – TRAFFIC CONTROL

A. INCLUDING, BUT NOT LIMITED TO, ALL CROSSWALKS, STOP LINES AND LEGENDS.

- LEGENDS SHALL BE PREFORMED PERMANENT PLASTIC. PAVEMENT MARKINGS SHALL BE THERMO PLASTIC (ALKYD). THE MARKINGS, LEGENDS SHALL BE INSTALLED IN ACCORDANCE WITH THE THE RELEVANT PORTIONS OF MASSACHUSETTS HIGHWAY DEPARTMENT (MHD) STANDARD SPECIFICATIONS. THE CONTRACTOR'S ATTENTION ALSO IS DIRECTED TO THE STANDARD SPECIFICATIONS, FOR REQUIREMENTS REGARDING THE AMBIENT AIR TEMPERATURE AT THE TIME OF APPLICATION.

PART 7 – QUALITY ASSURANCE

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS FROM ACCEPTABLE MANUFACTURERS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. CONFORM TO CONDITIONS OF APPROVAL ISSUED BY REGULATORY AGENCIES INCLUDING, BUT NOT NECESSARILY LIMITED TO, LOCAL PLANNING BOARD, CONSERVATION COMMISSION, CITY COUNCIL, BOARD OF HEALTH, PUBLIC WORKS / HIGHWAY DEPARTMENT, STATE ENVIRONMENTAL PROTECTION DEPARTMENT, AND U.S. GOVERNMENT, ENVIRONMENTAL PROTECTION AGENCY. WHERE CONDITIONS OF REGULATORY APPROVAL DIFFER FROM REQUIREMENTS CONTAINED HEREIN OR ON THE DRAWINGS, COMPLY WITH THE MORE STRINGENT REQUIREMENT.

PART 8 – INSPECTION AND MAINTENANCE

BITUMINOUS CONCRETE

A. INSPECT ALL CATCH BASINS (CB) AND MANHOLES AT LOCATIONS SHOWN ON SITE PLANS. LOOK FOR SETTLING OF PAVEMENT, REPAIR AS REQUIRED. LOOK AT LEVEL OF SAND, SILT IN SUMPS. HAVE SUMPS CLEANED IF OUTLET PIPE IS BLOCKED. VERIFY THAT ELBOW (OIL TRAP) ON PIPE OUTLET IS SECURELY IN PLACE. CLEAN ALL LEAVES, TRASH, AND PINE NEEDLES FROM CB GRATE.

B. LOOK FOR SIGNS OF CRACKING & POTHOLES, REPAIR AS REQUIRED.

C. LOOK FOR SIGNS OF EROSION AT EDGES OF ROADWAY. INSPECT FOR BROKEN CURB. SEVERE EROSION MAY BE CAUSED BY PIPE BLOCKAGE AND RESULTING OVERFLOWS OUT OF CATCH BASINS. REMOVE DRAIN MANHOLE COVERS AND CB GRATES IN AREA AND LOOK FOR BLOCKAGES WHERE SURFACE EROSION IS EVIDENT.

LAWNS

B. INSPECT AFTER EACH SIGNIFICANT RAINFALL (½" OR MORE) FOR FIRST 6 MONTHS AFTER CONSTRUCTION TO ENSURE SURFACE VEGETATION IS HEALTHY, DISCHARGE DEVICES ARE NOT BLOCKED AND BANKS ARE NOT ERODING. CHECK ALL COMPONENTS AFTER EACH MAJOR STORM (MORE THAN 2" RAINFALL IN 24 HOURS). CLEAN/REPAIR AS REQUIRED.

LANDSCAPING

A. INSPECT FOR DISEASED/DYING TREES, SHRUBS, GROUND COVER, & GRASS; REPLACE AS REQUIRED.

B. INSPECT MULCH BEDS. SUPPLEMENT AS REQUIRED TO PROVIDE THE SPECIFIED MINIMUM DEPTH (LOOSE MEASURE).

RIP RAP (STONE) SLOPE PROTECTION

A. INSPECT STONE SLOPE PROTECTION, CUT EMERGING YOUNG TREES GROWING IN STONES. INSPECT STONE AT PIPE OUTLETS. REMOVE DEBRIS. REPAIR AS REQUIRED.

9.0 MONITORING WELL

A. MONITORING WELL TO BE MINIMUM 2IN DIAMETER PERFORATED SCH-40 PVC PIPE.

B. PIPE SHALL BE WRAPPED IN FILTER FABRIC IF INSTALLED IN OPEN HOLE.

C. END OF PIPE TO BE HAVE SCREW CAP AND BE RAISED 1 FOOT ABOVE THE SURROUNDING GROUND.

10.0 SNOW STORAGE/REMOVAL

A. SNOW REMOVAL SHALL BE AT THE EXPENSE OF THE HOME OWNER'S ASSOCIATION, SIMILAR TO LANDSCAPING AND OVERALL MAINTENANCE OF THE DEVELOPMENT.

B. SNOW STORAGE AREAS SHALL BE UTILIZED AS DEPICTED ON THIS PLAN OR IN OTHER AREAS NOT WITHIN RESOURCE AREAS ON THE SITE.

C. SIGNS SHALL BE AFFIXED TO THE CHAIN LINK FENCES INTEGRATED WITH THE RETAINING WALLS ADJACENT TO THE RESOURCE AREAS. SIGNS SHALL INDICATED RESOURCE AREA, NO SNOW DUMPING.

D. IF EXCESSIVE SNOW AMOUNTS OCCUR, SNOW SHALL BE TAKEN OFF SITE TO AN APPROPRIATE LOCATION.

LEGEND

STONE BOUND W/D.H.	S.B.
CATCH BASIN	
DOUBLE CATCH BASIN	
DRAIN MANHOLE	
OUTLET STRUCTURE	OS
SEWER MANHOLE	SMH
UTILITY POLE	UP
WETLAND FLAG	WF
PROPOSED WATER GATE VALVE	
EXISTING HYDRANT	
PROPOSED HYDRANT	
EXISTING WELL	
CURB	
DRAIN LINE	D
UTILITY LINE	UGU
SEWER LINE	S
WATER LINE	W
STONEWALL	
TREE LINE	

ABBREVIATIONS

APPROXIMATE	APPROX.
BOOK	BK.
BITUMINOUS CONCRETE CURB	BCC
CAPE COD BERM	CCB
CEMENT LINED DUCTILE IRON	CLDI
IRON PIPE	I.P.
DRILL HOLE	D.H.
FOUND	FND
ELEVATION	ELEV.
EXISTING	EXIST.
FLARED END SECTION	FES
HIGH DENSITY POLYETHYLENE PIPE	HDPE
INVERT	INV.
NOW OR FORMERLY	N/F
OUTLET STRUCTURE	OS
PLAN BOOK	P.B.
PAGE	P.G.
PLAN	PL.
RETAINING	RET.
TIMBER GUARDRAIL	TGR
TYPICAL	TYP.
TEMPORARY BENCHMARK	TBM
NOT TO SCALE	N.T.S.
UTILITY POLE	UP
WETLAND FLAG	WF

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500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

CAD FILE	...\dwg\permit\2015-219_C2_R1.dwg
DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

LEGEND, ABBREVIATIONS & GENERAL NOTES

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28323 REGISTERED PROFESSIONAL ENGINEER 11/27/19

DRAWING NO. C-1.1

PLAN NO. L-5239

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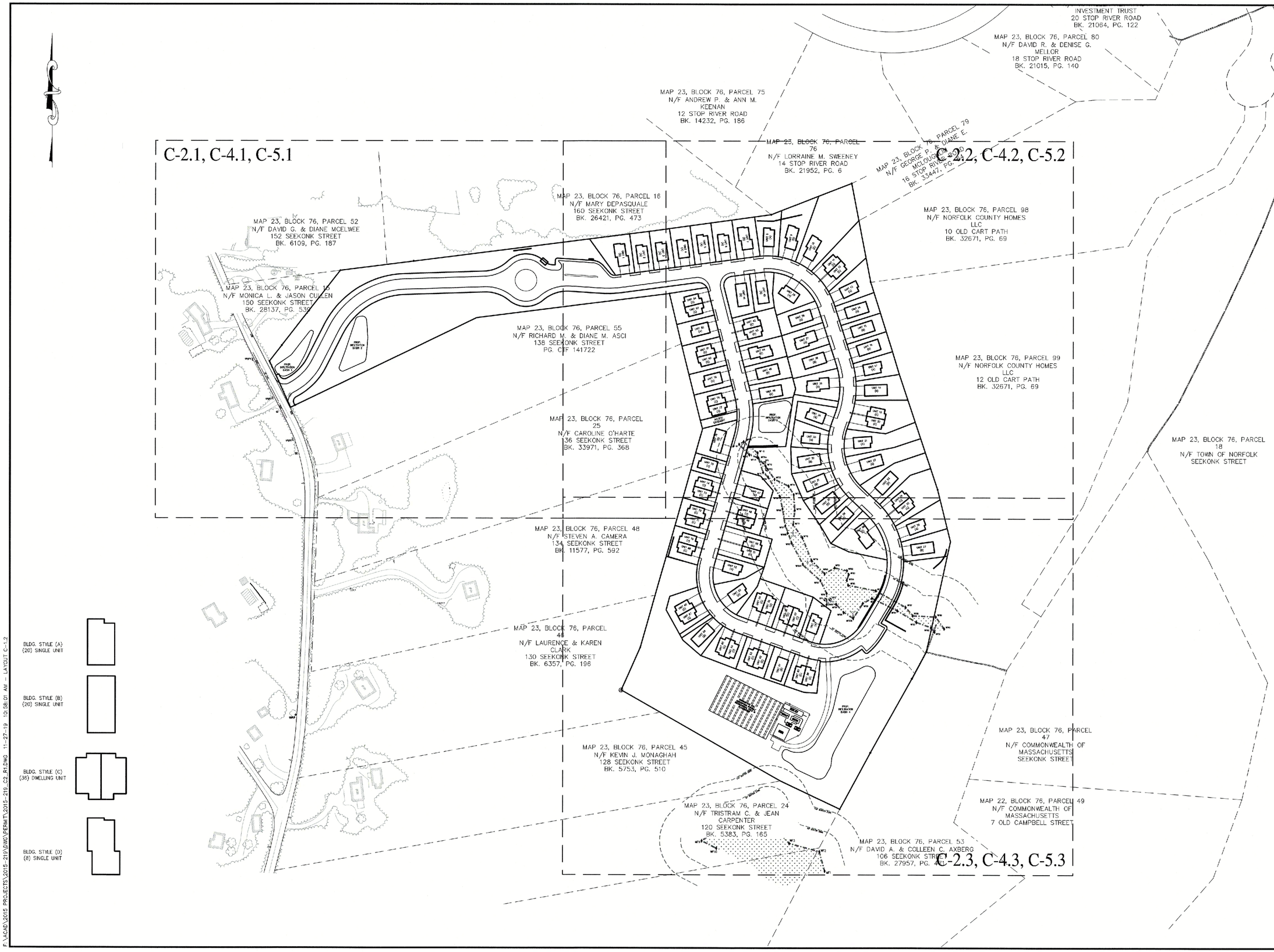

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PROJECT: LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

REVISIONS

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DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 inch = 100 feet

SHEET TITLE

INDEX SHEET

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MANVILLE
CIVIL
NO. 26323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-1.2

PLAN NO. L-5239

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NOTES:

1) ELEVATONS AND COORDINATES SHOWN HEREON ARE REFERENCE TO NAVD88 AND NAD83 DATUM.

2) THE LIMIT OF BORDERING VEGETATED WETLANDS SHOWN HEREON WAS DELINEATED BY B & C ASSOCIATES, INC. AND LOCATED BY FIELD SURVEY. NORFOLK CONSERVATION COMMISSION CONFIMRED WETLAND FLAG (WF51 THROUGH WF90) LOCATIONS THROUGH ORAD #240-592 DEP/NCC ISSUED ON 1/10/2018 AND DELINEATES ALL WETLAND RESOURCES BOTH UNDER THE STATE WETLAND PROTECTION ACT AND THE TOWN OF NORFOLK BYLAW BOTH ON THE PROJECT SITE AND ON NEARBY PROPERTIES TO THE EXTENT RELEVANT TO THE PROPOSED WORK.

3) UNDERGROUND UTILITIES ARE SHOWN HEREON FROM FIELD LOCATIONS OF SURFACE VISIBLE STRUCTURES AND FROM AVAILABLE RECORD INFORMATION FROM, TOWN OF NORFOLK DEPARTMENT OF PUBLIC WORKS AND PRIVATE UTILITY COMPANIES. OTHER UNDERGROUND UTILITIES MAY EXIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION, SIZE, AND ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO COTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.

ASSESSORS:

MAP 23, BLOCK 76, LOT 71

ZONING:

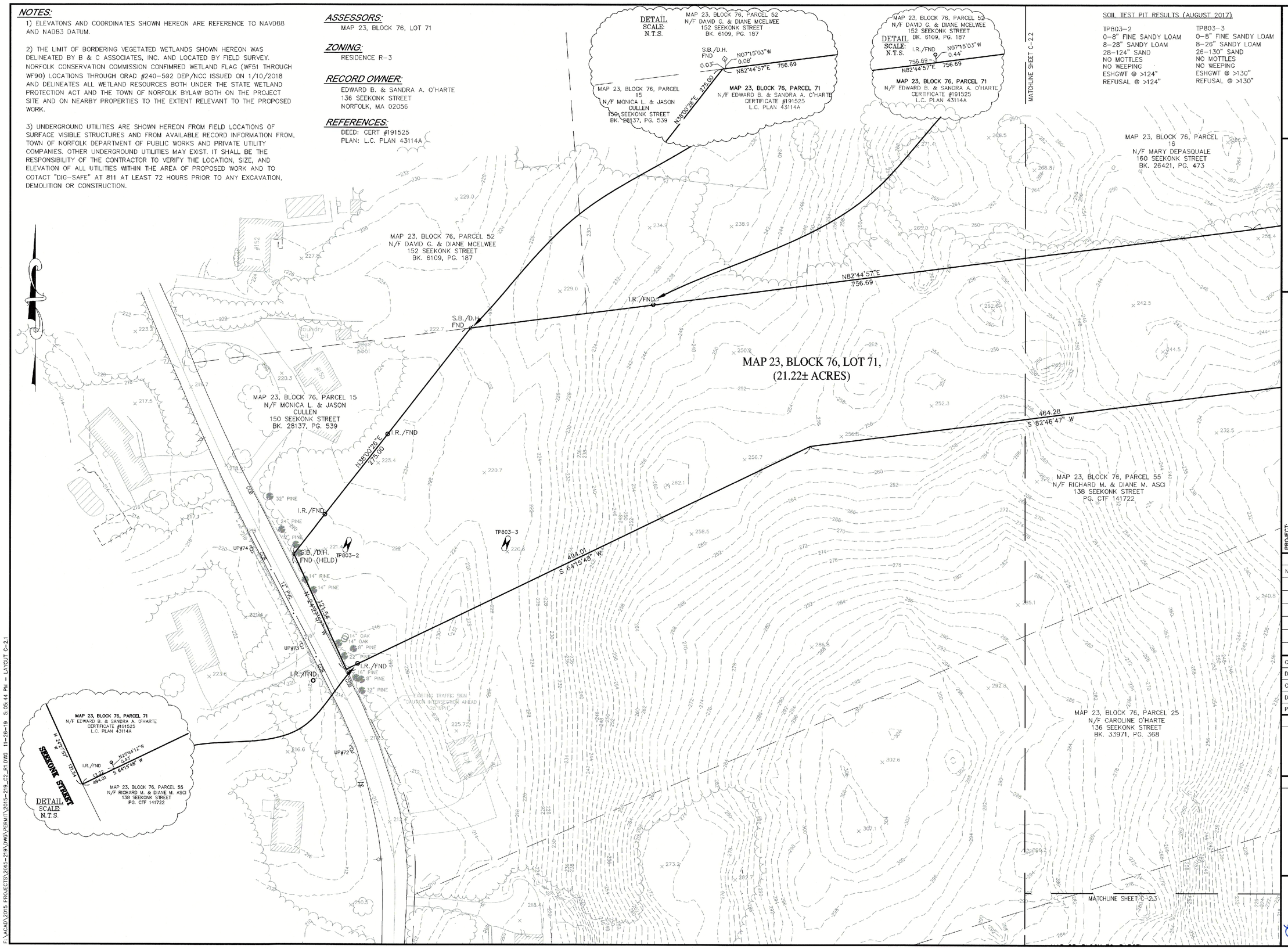
RESIDENCE R-3

RECORD OWNER:

EDWARD B. & SANDRA A. O'HARTE
136 SEEKONK STREET
NORFOLK, MA 02056

REFERENCES:

DEED: CERT #191525
PLAN: L.C. PLAN 43114A



SOIL TEST PIT RESULTS (AUGUST 2017)

TP803-2	TP803-3
0-8" FINE SANDY LOAM	0-8" FINE SANDY LOAM
8-28" SANDY LOAM	8-26" SANDY LOAM
28-124" SAND	26-130" SAND
NO MOTTLES	NO MOTTLES
NO WEEPING	NO WEEPING
ESHGWT @ >124"	ESHGWT @ >130"
REFUSAL @ >124"	REFUSAL @ >130"

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DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 feet

SHEET TITLE

EXISTING CONDITIONS PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47389
11/27/19

DRAWING NO.

C-2.1

PLAN NO. L-5239

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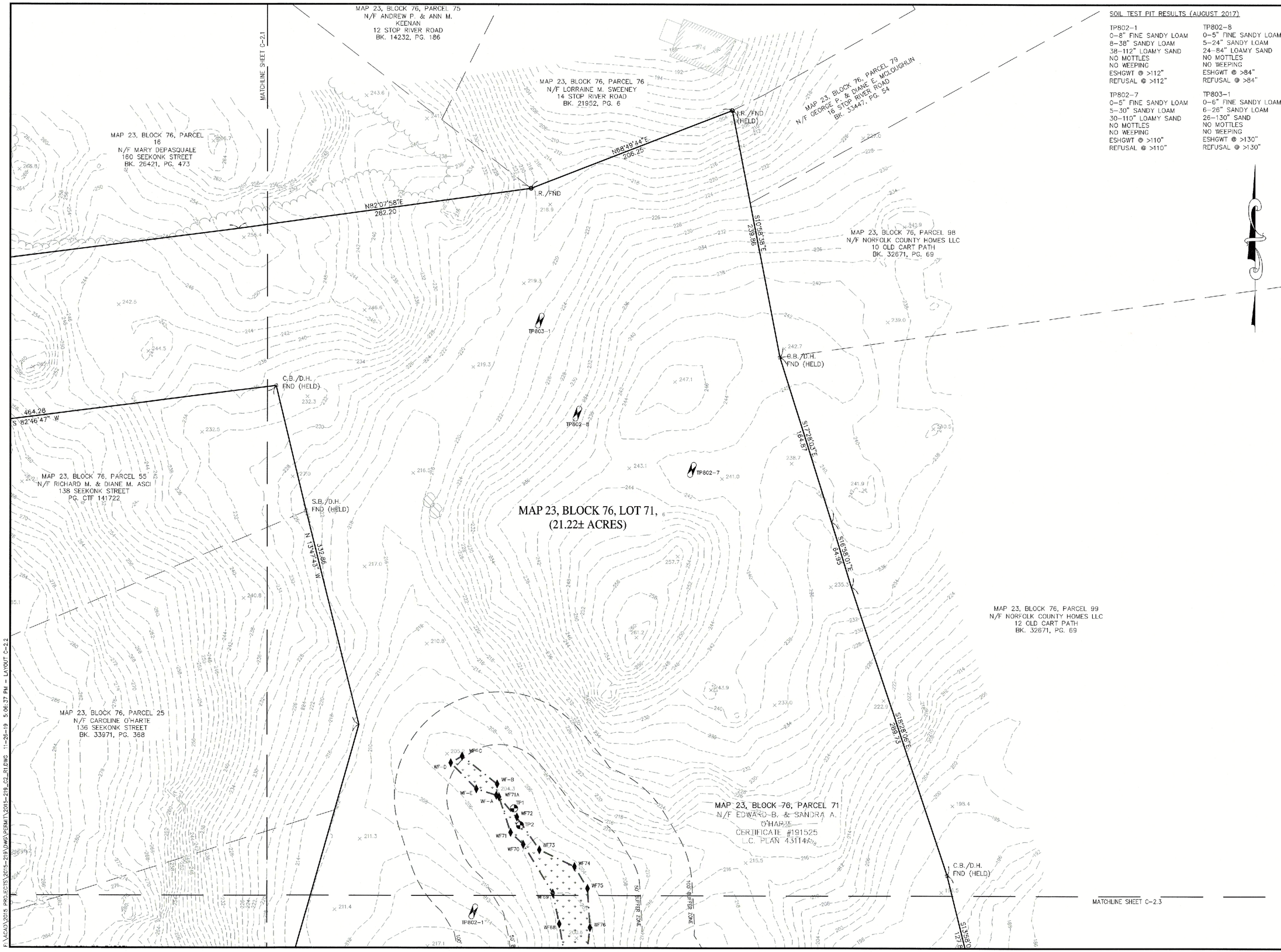

SOIL TEST PIT RESULTS (AUGUST 2017)

TP802-1	TP802-8
0–8" FINE SANDY LOAM	0–5" FINE SANDY LOAM
8–38" SANDY LOAM	5–24" SANDY LOAM
38–112" LOAMY SAND	24–84" LOAMY SAND
NO MOTTLES	NO MOTTLES
NO WEEPING	NO WEEPING
ESHGWT @ >112"	ESHGWT @ >84"
REFUSAL @ >112"	REFUSAL @ >84"

TP802-7	TP803-1
0–5" FINE SANDY LOAM	0–6" FINE SANDY LOAM
5–30" SANDY LOAM	6–26" SANDY LOAM
30–110" LOAMY SAND	26–130" SAND
NO MOTTLES	NO MOTTLES
NO WEEPING	NO WEEPING
ESHGWT @ >110"	ESHGWT @ >130"
REFUSAL @ >110"	REFUSAL @ >130"

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GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 feet

SHEET TITLE

EXISTING CONDITIONS PLAN

SHEET 2 OF 3

COMMONWEALTH OF MASSACHUSETTS BYRON J. ANDREWS No. 47389 PROFESSIONAL SURVEYOR

DRAWING NO. C-2.2

PLAN NO. L-5239

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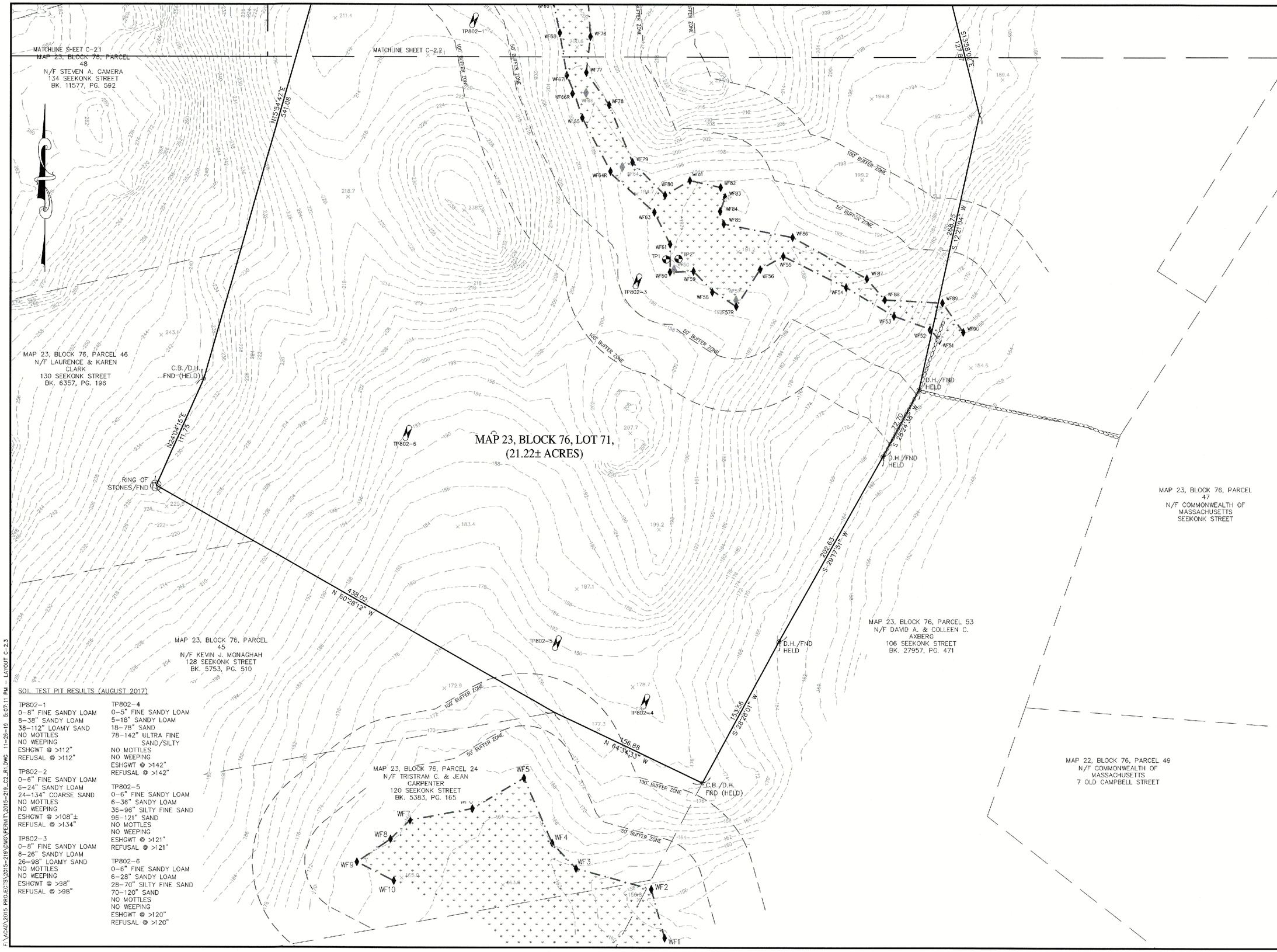

SOIL TEST PIT RESULTS (AUGUST 2017)

TP802-1
0-8" FINE SANDY LOAM
8-38" SANDY LOAM
38-112" LOAMY SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >112"
REFUSAL @ >112"

TP802-2
0-6" FINE SANDY LOAM
6-24" SANDY LOAM
24-134" COARSE SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >108"±
REFUSAL @ >134"

TP802-3
0-8" FINE SANDY LOAM
8-26" SANDY LOAM
26-98" LOAMY SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >98"
REFUSAL @ >98"

TP802-4
0-5" FINE SANDY LOAM
5-18" SANDY LOAM
18-78" SAND
78-142" ULTRA FINE SAND/SILTY
NO MOTTLES
NO WEEPING
ESHGWT @ >142"
REFUSAL @ >142"

TP802-5
0-6" FINE SANDY LOAM
6-36" SANDY LOAM
36-96" SILTY FINE SAND
96-121" SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >121"
REFUSAL @ >121"

TP802-6
0-6" FINE SANDY LOAM
6-28" SANDY LOAM
28-70" SILTY FINE SAND
70-120" SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >120"
REFUSAL @ >120"

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GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 feet

SHEET TITLE

EXISTING CONDITIONS PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47389
REGISTERED PROFESSIONAL SURVEYOR

11/27/19

DRAWING NO.

C-2.3

PLAN NO. L-5239

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TEST PIT LOCATION (NO MONITORING WELL)

TEST PIT LOCATION (WITH MONITORING WELL)

BORING/WELL LOCATION

OBSERVATION TEST HOLE DATA
PERFORMED BY: DANIEL A. O'DRISCOLL
WITNESSED BY: SARA WHITE, TETRA TECH
OCTOBER 1-3, 2019

TH #2014
TOP PIPE 219.69
GROUND EL. 219.31
0-6" A LOAM
6-12" Bw SANDY LOAM
12-112" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2015
0-8" A LOAM
8-34" Bw SANDY LOAM
34-95" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2016
TOP PIPE 222.34
GROUND EL. 220.07
0-4" A LOAM
4-24" Bw SANDY LOAM
24-32" C1 SAND
32-132" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2017
TOP PIPE 252.97
GROUND EL. 251.98
0-8" A LOAM
8-24" Bw SANDY LOAM
24-80" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2018
TOP PIPE 253.62
GROUND EL. 253.22
0-20" HTM FILL
20-24" A LOAM
24-37" Bw SANDY LOAM
37-54" C1 SAND
54-144" C2 SAND
MOTTLING OBSERVED @ 48"
GROUNDWATER OBSERVED @ 125"

TH #2019
0-6" A LOAM
6-16" Bw LOAMY SAND
16-60" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2020
0-12" A LOAM
12-24" Bw SANDY LOAM
24-30" C1 LOAMY SAND
30-60" C2 SAND
60-88" C3 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2022
TOP PIPE 220.14
GROUND EL. 219.12
0-6" A LOAM
6-30" Bw SANDY LOAM
30-108" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2023
TOP PIPE 231.63
GROUND EL. 227.47
0-6" A LOAM
6-26" Bw SANDY LOAM
26-38" C1 SAND
38-130" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2024
TOP PIPE 240.75
GROUND EL. 240.04
0-6" A LOAM
6-20" Bw SANDY LOAM
20-33" C1 SAND
33-110" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2027
0-6" A LOAM
6-20" Bw SANDY LOAM
20-100" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2028
0-8" A LOAM
8-26" Bw SANDY LOAM
26-72" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2029
TOP PIPE 222.67
GROUND EL. 219.93
0-10" A LOAM
10-30" Bw SANDY LOAM
30-84" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2030
0-8" A LOAM
8-23" Bw SANDY LOAM
23-75" C1 SAND
MOTTLING OBSERVED @ 48"
NO GROUNDWATER OBSERVED

TH #2031
0-6" A LOAM
6-22" Bw SILT LOAM
22-48" C1 SILT LOAM
48-75" C2 SAND
MOTTLING OBSERVED @ 24"
NO GROUNDWATER OBSERVED

TH #2032
TOP PIPE 215.64
GROUND EL. 214.49
0-8" A LOAM
8-18" Bw SANDY LOAM
18-28" C1 SANDY LOAM
28-115" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2033
0-8" A LOAM
8-24" Bw SANDY LOAM
24-104" C1 SANDY LOAM
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2034
0-8" A LOAM
8-26" Bw SANDY LOAM
26-56" C1 LOAMY SAND
56-92" C2 SAND
MOTTLING OBSERVED @ 54"
NO GROUNDWATER OBSERVED

TH #2035
TOP PIPE 201.31
GROUND EL. 199.42
0-6" A LOAM
6-30" Bw SANDY LOAM
30-40" C1 LOAMY SAND
40-96" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2036
TOP PIPE 196.95
GROUND EL. 196.02
0-6" A LOAM
6-22" Bw SANDY LOAM
22-36" C1 LOAMY SAND
36-118" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2038
0-8" A LOAM
8-24" Bw SANDY LOAM
24-40" C1 SANDY LOAM
40-148" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2039
TOP PIPE 188.56
GROUND EL. 186.09
0-6" A LOAM
6-20" Bw SANDY LOAM
20-31" C1 SAND
31-100" C2 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2041
0-6" A LOAM
8-30" Bw SANDY LOAM
30-135" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2043
0-6" A LOAM
8-24" Bw SANDY LOAM
24-100" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

TH #2044
0-6" A LOAM
8-30" Bw SANDY LOAM
30-80" C1 SILT LOAM
MOTTLING OBSERVED @ 28
GROUNDWATER OBSERVED @ 28"

TH #2045
TOP PIPE 172.96
GROUND EL. 171.02
0-6" A LOAM
8-30" Bw SANDY LOAM
30-100" C1 SAND
NO MOTTLING OBSERVED
NO GROUNDWATER OBSERVED

MONITORING WELL DATA

MW-1
TOP CASING 187.92
GROUND EL. 184.74

MW-2
TOP CASING 182.16
GROUND EL. 179.18

MW-3
TOP CASING 199.46
GROUND EL. 196.38

MW-4
TOP CASING 192.14
GROUND EL. 189.11

MW-5
TOP CASING 181.57
GROUND EL. 178.49

MW-6
TOP CASING 170.31
GROUND EL. 167.16

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APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

CAD FILE	.\dwg\2015-219_40B_SINGLE PROJECT ADDITIONAL TESTING LOCATIONS.dwg
DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

GRAPHIC SCALE

30 0 40 80 160

(IN FEET)
1 inch = 80 feet

SHEET TITLE

ADDITIONAL SOIL TESTING LOCATIONS

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 26323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-2.4

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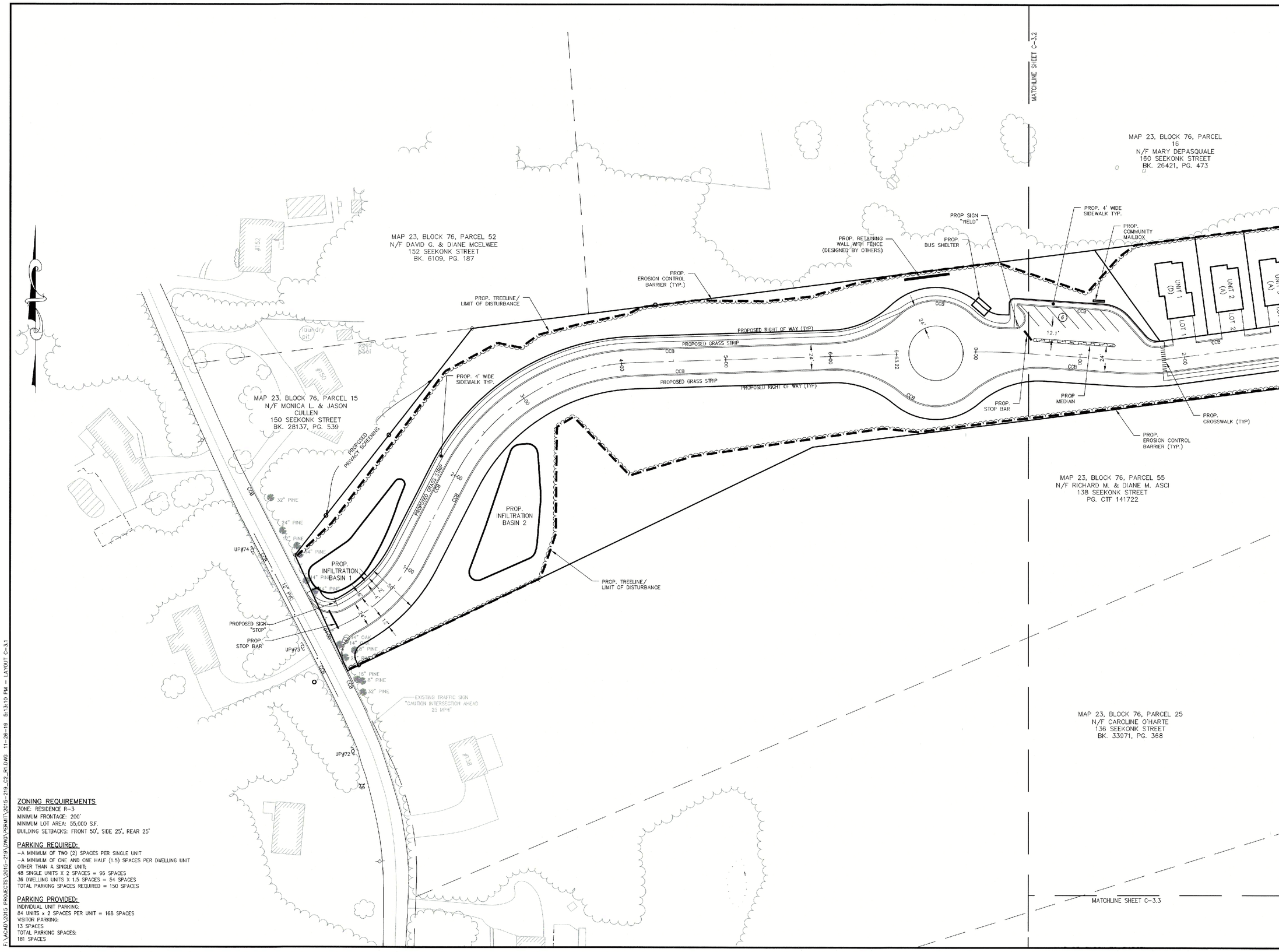

ZONING REQUIREMENTS
ZONE: RESIDENCE R-3
MINIMUM FRONTAGE: 200'
MINIMUM LOT AREA: 55,000 S.F.
BUILDING SETBACKS: FRONT 50', SIDE 25', REAR 25'

PARKING REQUIRED:
-A MINIMUM OF TWO (2) SPACES PER SINGLE UNIT
-A MINIMUM OF ONE AND ONE HALF (1.5) SPACES PER DWELLING UNIT OTHER THAN A SINGLE UNIT;
48 SINGLE UNITS X 2 SPACES = 96 SPACES
36 DWELLING UNITS X 1.5 SPACES = 54 SPACES
TOTAL PARKING SPACES REQUIRED = 150 SPACES

PARKING PROVIDED:
INDIVIDUAL UNIT PARKING:
84 UNITS x 2 SPACES PER UNIT = 168 SPACES
VISITOR PARKING:
13 SPACES
TOTAL PARKING SPACES:
181 SPACES

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SHEET TITLE

LAYOUT & MATERIALS PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.
C-3.1

PLAN NO. L-5239

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ZONING REQUIREMENTS
ZONE: RESIDENCE R-3
MINIMUM FRONTAGE: 200'
MINIMUM LOT AREA: 55,000 S.F.
BUILDING SETBACKS: FRONT 50', SIDE 25', REAR 25'

PARKING REQUIRED:
-A MINIMUM OF TWO (2) SPACES PER SINGLE UNIT
-A MINIMUM OF ONE AND ONE HALF (1.5) SPACES PER DWELLING UNIT OTHER THAN A SINGLE UNIT;
48 SINGLE UNITS X 2 SPACES = 96 SPACES
36 DWELLING UNITS X 1.5 SPACES = 54 SPACES
TOTAL PARKING SPACES REQUIRED = 150 SPACES

PARKING PROVIDED:
INDIVIDUAL UNIT PARKING:
84 UNITS x 2 SPACES PER UNIT = 168 SPACES
VISITOR PARKING:
13 SPACES
TOTAL PARKING SPACES:
181 SPACES

ASE
Andrews Survey & Engineering, Inc.
Land Surveying - Civil Engineering - Site Planning
P.O. Box 312, 104 Mendon Street
Uxbridge, Massachusetts 01569
P: 508-278-3897 F: 508-278-2289
500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

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DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2018
PROJECT NO.	2015-219

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 feet

SHEET TITLE

LAYOUT & MATERIALS PLAN

SHEET 2 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.
C-3.2

PLAN NO. L-5239

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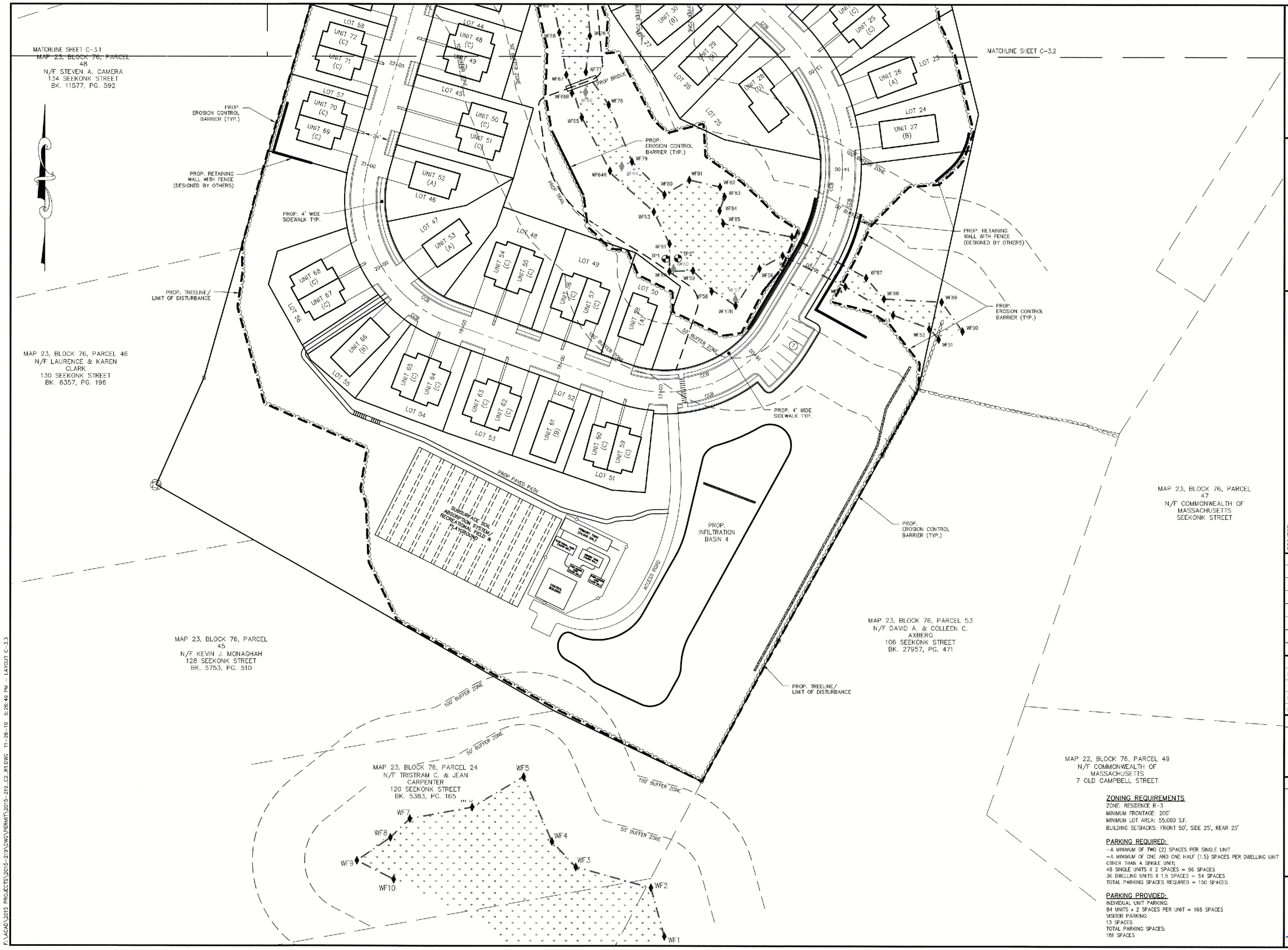

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MINIMUM LOT AREA: 55,000 S.F.
BUILDING SETBACKS: FRONT 50', SIDE 25', REAR 25'

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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

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GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 feet

SHEET TITLE

LAYOUT & MATERIALS PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 26323
PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.
C-3.3
PLAN NO. L-5239

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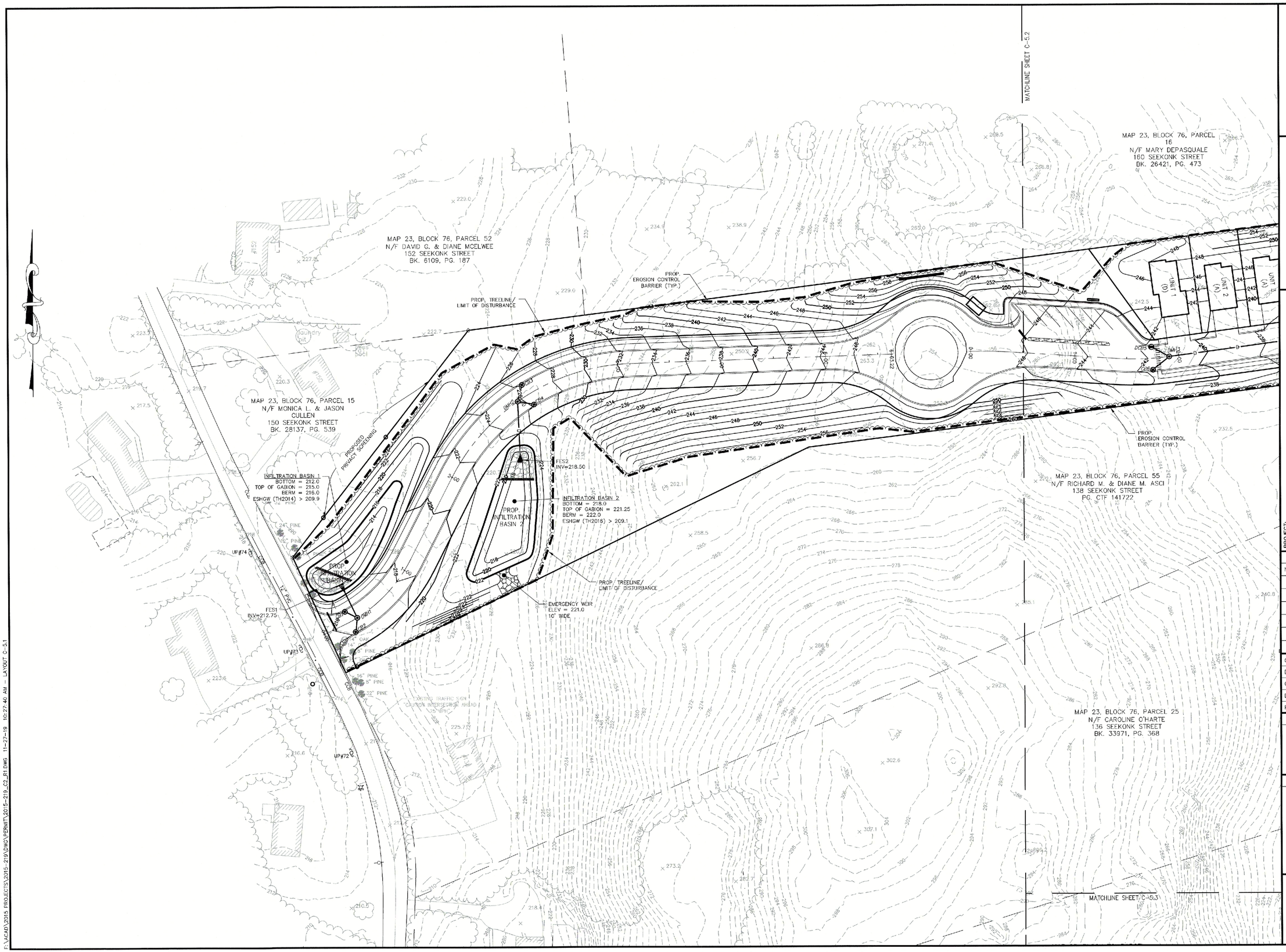

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PROJECT: LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

REVISIONS

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GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 feet

SHEET TITLE

GRADING & DRAINAGE PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

C-5.1

PLAN NO. L-5239

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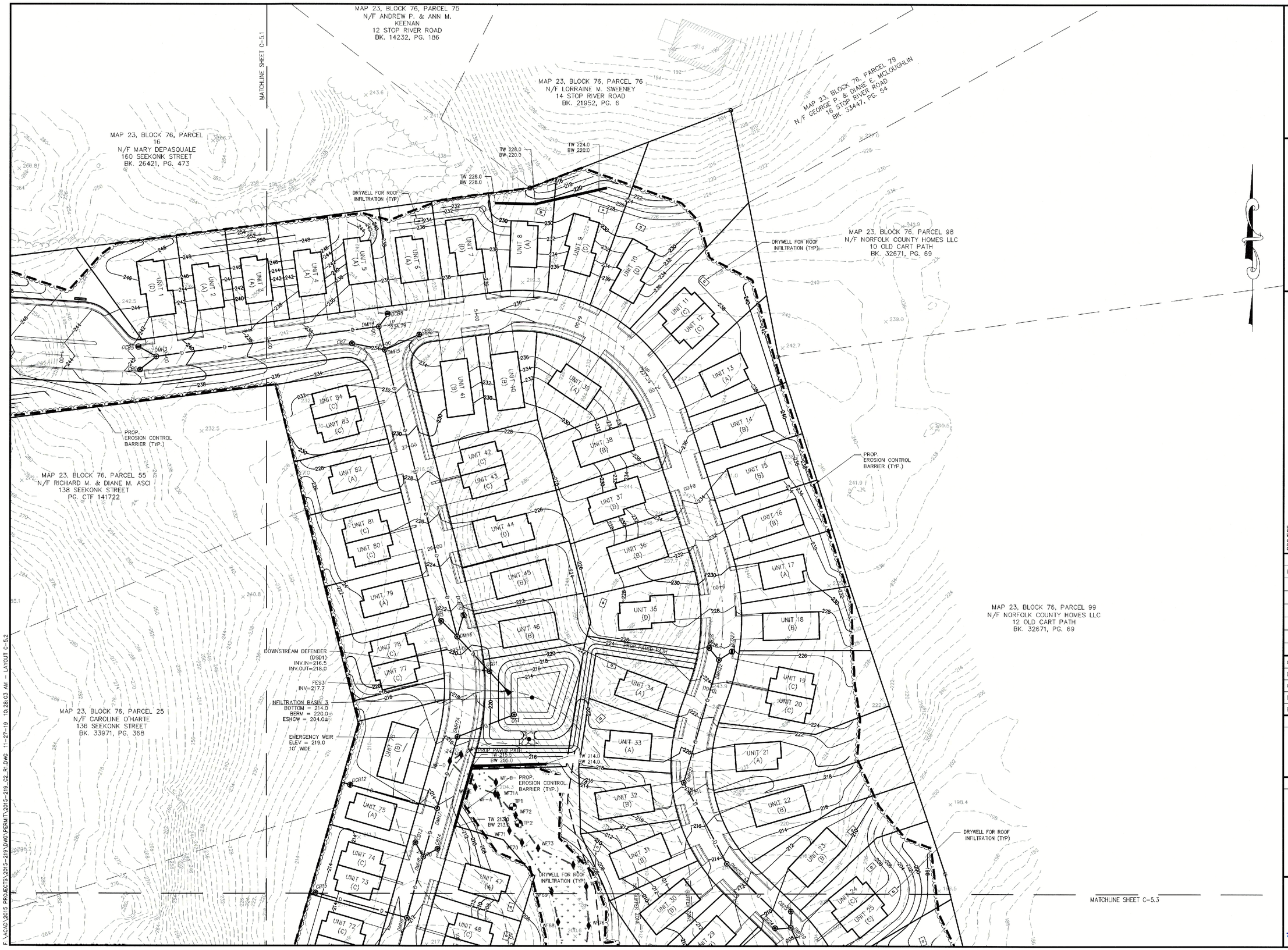

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PROJECT:
LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT:
LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

REVISIONS

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PROJECT NO.	2015-219

GRAPHIC SCALE

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(IN FEET)
1 inch = 40 feet

SHEET TITLE

GRADING & DRAINAGE PLAN

SHEET 2 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

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PLAN NO. L-5239

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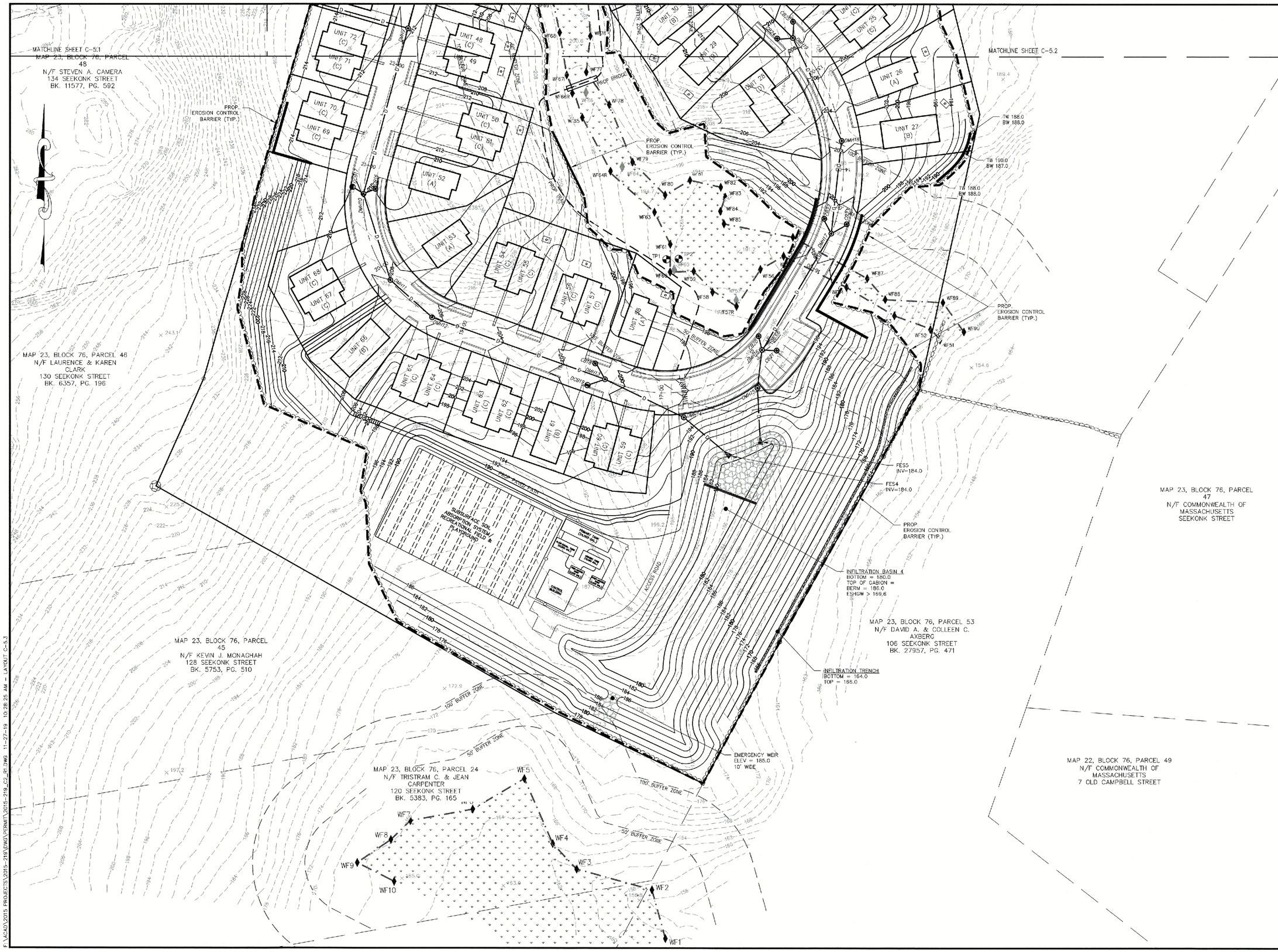

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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

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GRAPHIC SCALE

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(IN FEET)
1 inch = 40 feet

SHEET TITLE

GRADING & DRAINAGE PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-5.3

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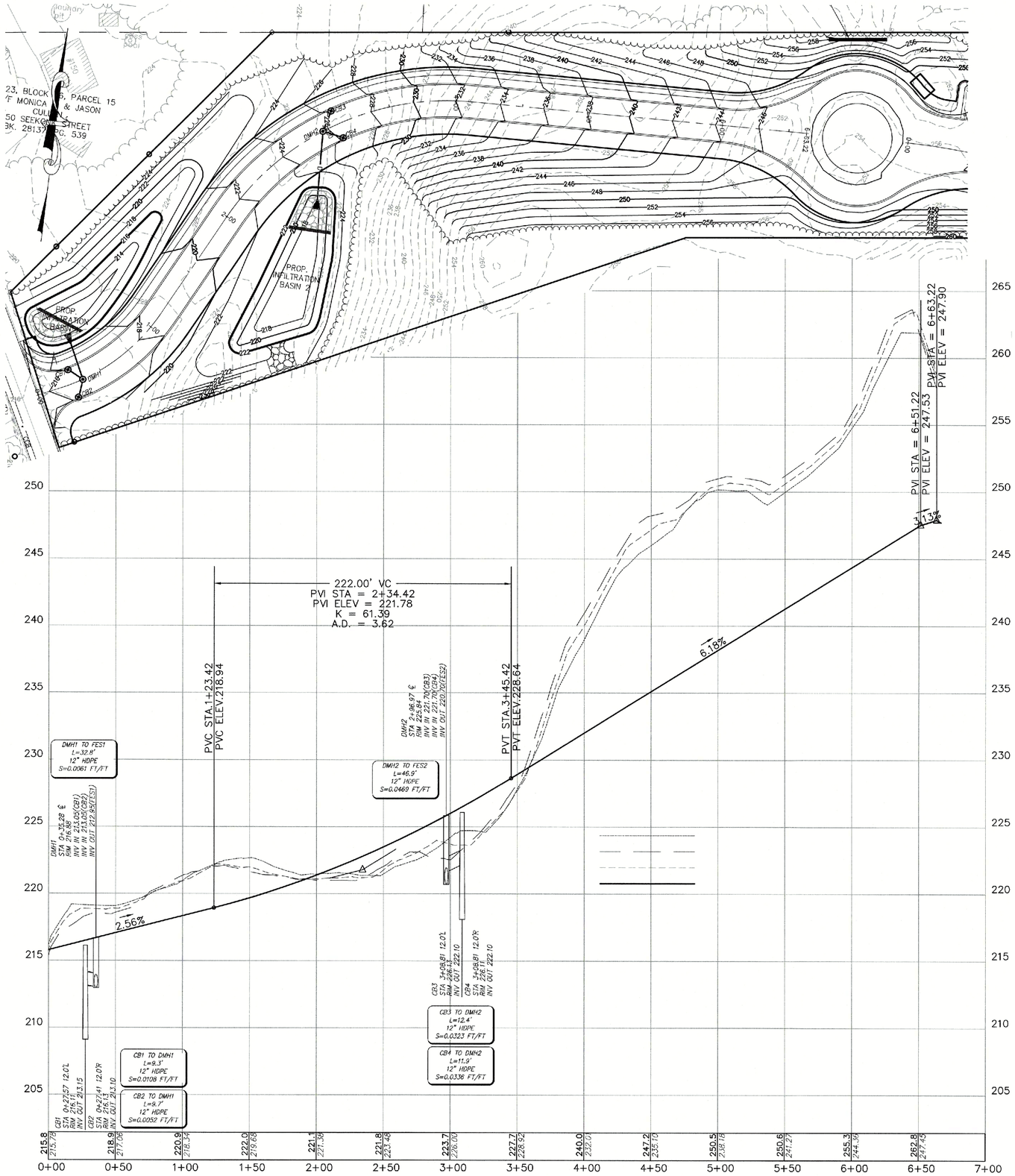

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PROJECT:
LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT:
LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

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GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
HORIZONTAL: 1 inch = 40 feet
VERTICAL: 1 inch = 4 feet

SHEET TITLE

TOPOGRAPHIC PLAN AND PROFILE ENTRANCE

(STATION 0+00 TO 6+63.22)

SHEET 1 OF 4

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MANVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER

11/27/19

DRAWING NO.

C-6.1

PLAN NO. L-5239

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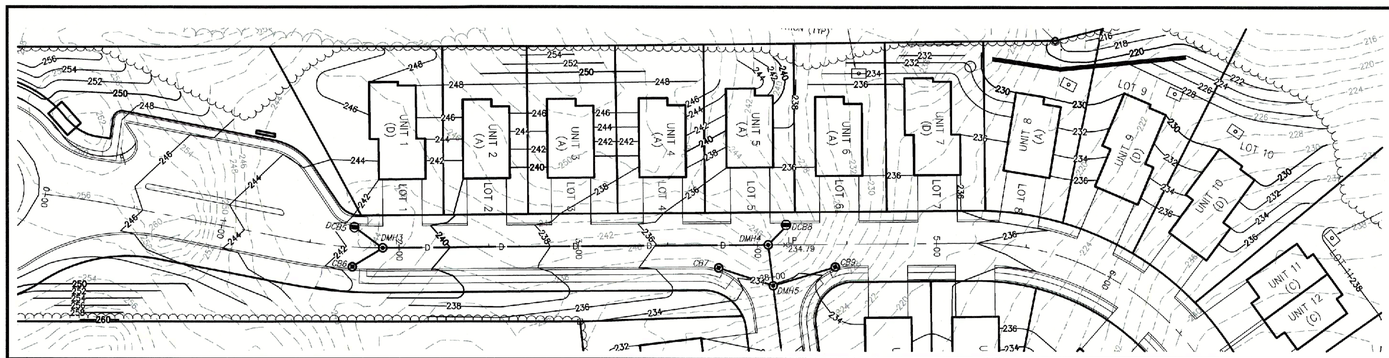

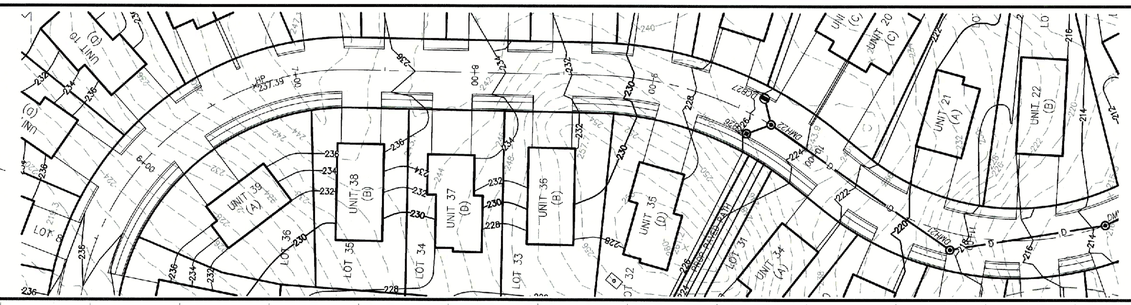

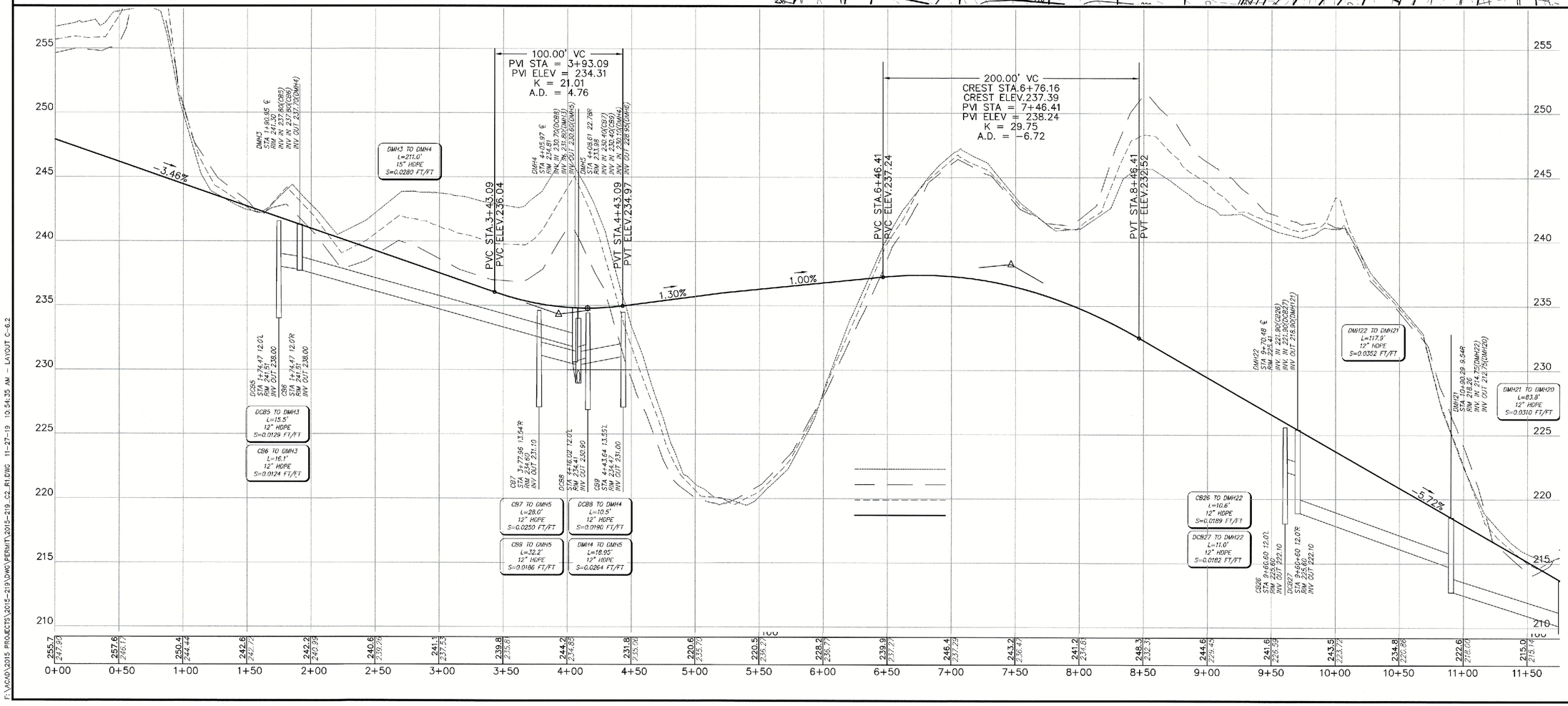

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PROJECT: LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

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PROJECT NO.	2015-219

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
HORIZONTAL: 1 inch = 40 feet
VERTICAL: 1 inch = 4 feet

SHEET TITLE

TOPOGRAPHIC PLAN AND PROFILE (STATION 0+00 TO 11+50)

SHEET 2 OF 4

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
11/25/19

DRAWING NO.

C-6.2

PLAN NO. L-5239

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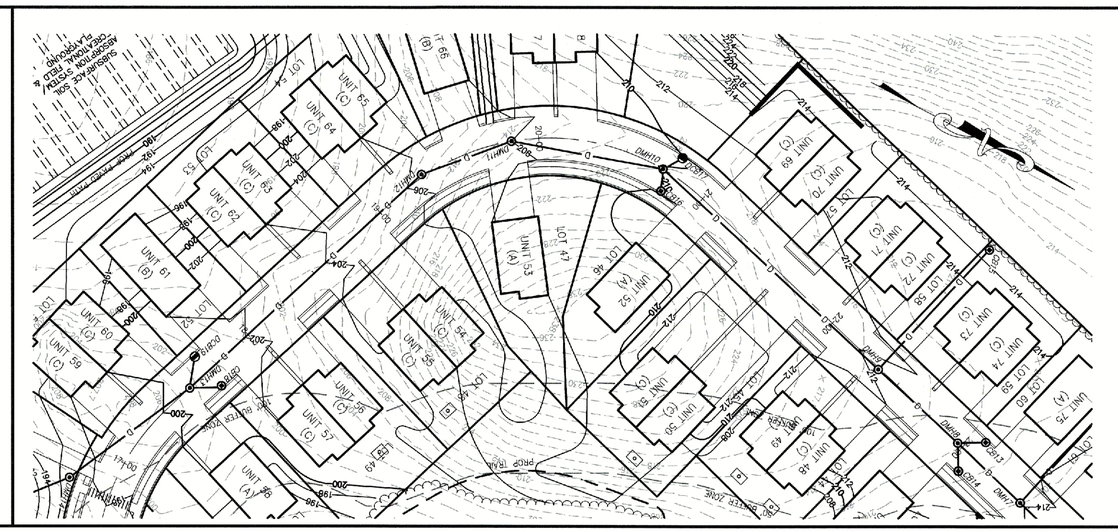

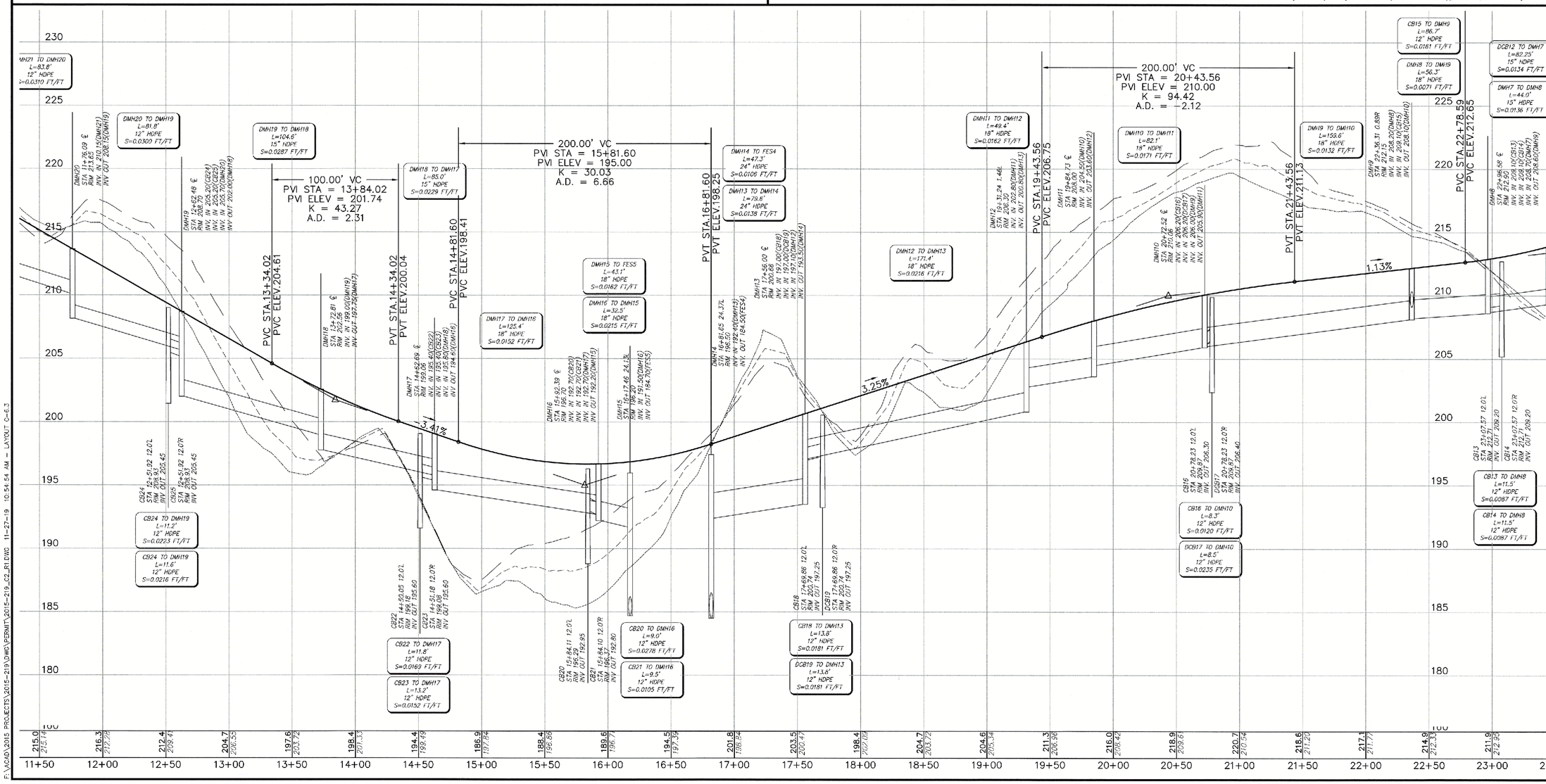

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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

REVISIONS

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DATE	NOVEMBER 27, 2019
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GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
HORIZONTAL: 1 inch = 40 feet
VERTICAL: 1 inch = 4 feet

SHEET TITLE

TOPOGRAPHIC PLAN AND PROFILES (STATION 11+50 TO 23+00)

SHEET 3 OF 4

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MANNVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-6.3

PLAN NO. L-5239

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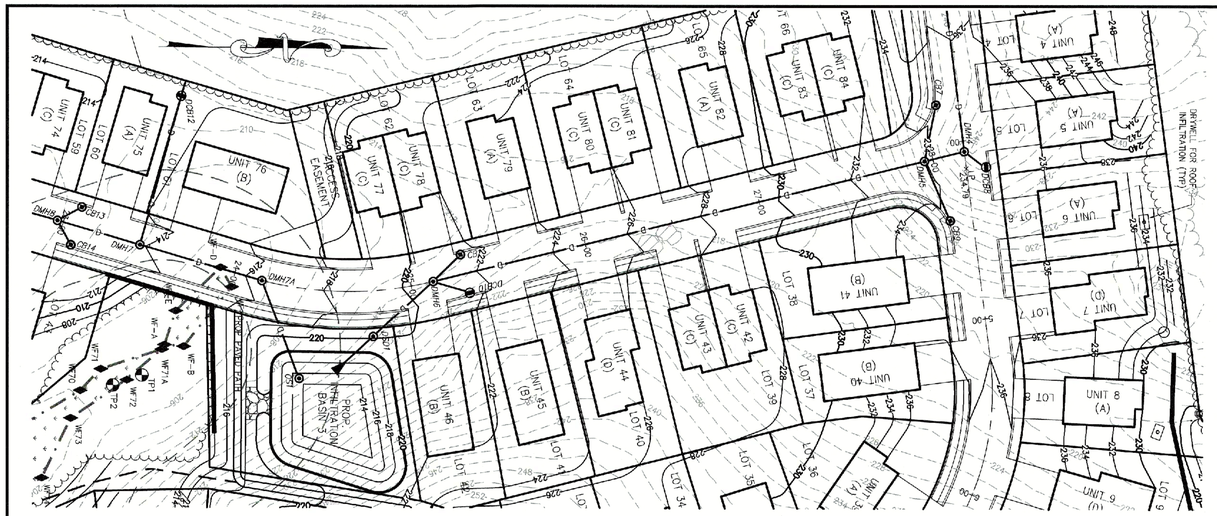

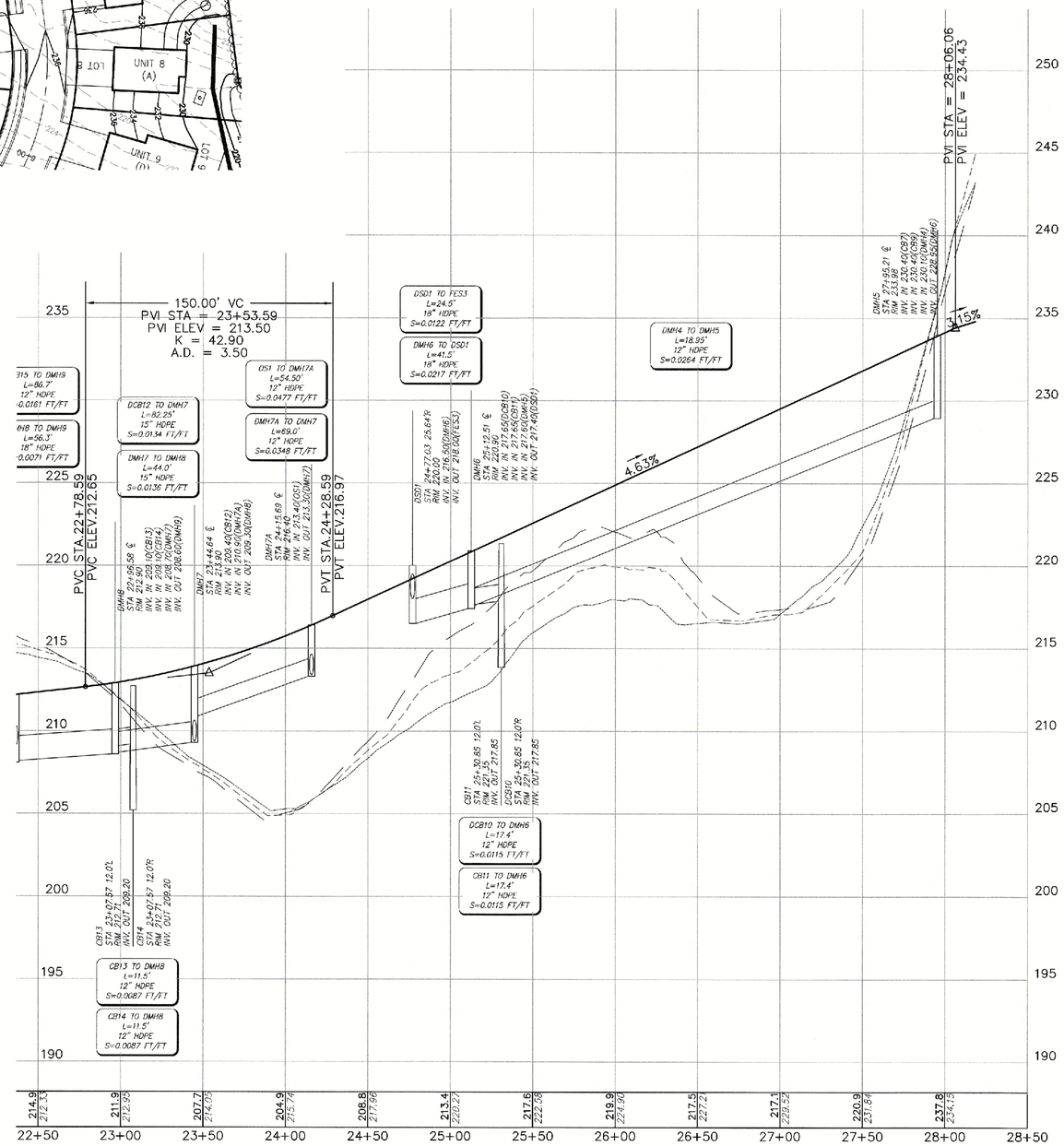

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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

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CHECKED BY	RMM, BJA
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PROJECT NO.	2015-219

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
HORIZONTAL: 1 inch = 40 feet
VERTICAL: 1 inch = 4 feet

SHEET TITLE

TOPOGRAPHIC PLAN AND PROFILE (STATION 23+00 TO 28+50)

SHEET 4 OF 4

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 36323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-6.4

PLAN NO. L-5239

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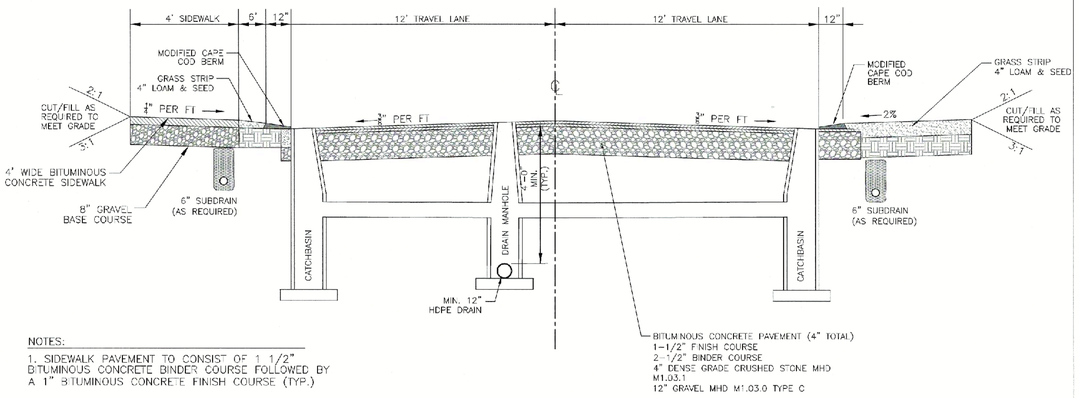
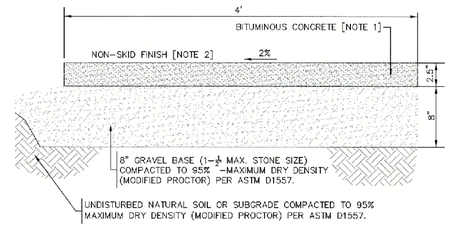


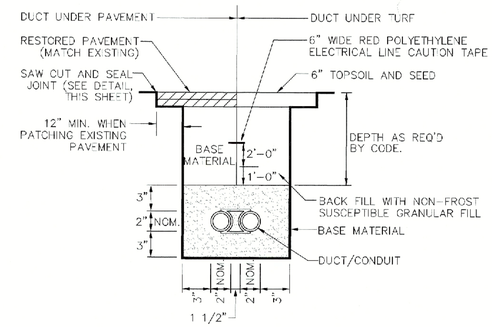
NOTES:
1. SIDEWALK PAVEMENT TO CONSIST OF 1 1/2" BITUMINOUS CONCRETE BINDER COURSE FOLLOWED BY A 1" BITUMINOUS CONCRETE FINISH COURSE (TYP.)

1 ROADWAY CROSS SECTION
SCALE: N.T.S.

NOTES:
[1] MHD M3.11.03 CLASS I, TYPE I-1 BITUMINOUS CONCRETE (1" WEARING COURSE ON 1-1/2" BINDER COURSE). 1/2" MAXIMUM AGGREGATE OR PARTICLE SIZE. COMPACT TO TEST AVERAGE OF 95%. NO TEST LOWER THAN 93%.
[2] SLOPE 5% MAXIMUM.

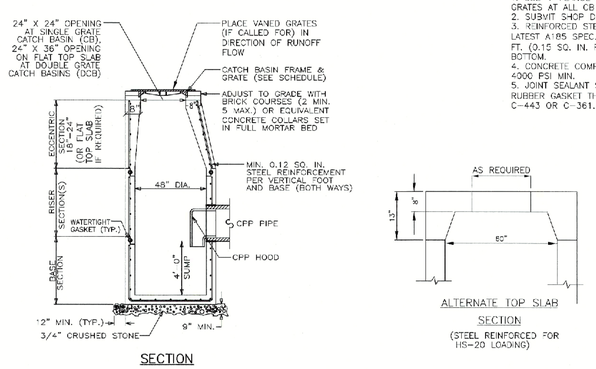


2 BITUMINOUS CONCRETE SIDEWALK
SCALE: N.T.S.



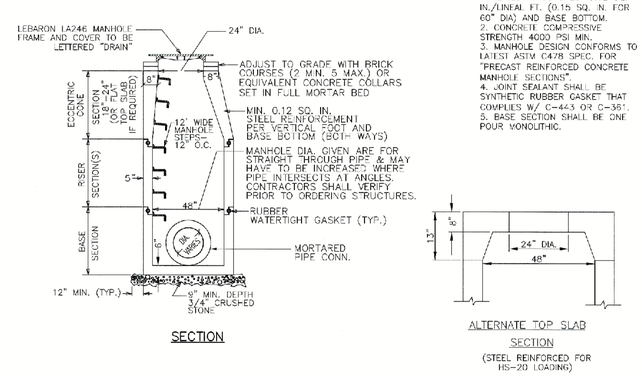
3 UNENCASED DUCT/CONDUIT DETAIL
SCALE: N.T.S.

NOTES:
1. USE 4-FLANGE LEBARON LF248-2 GRATES AT ALL CB STRUCTURES.
2. SUBMIT SHOP DRAWINGS FOR APPROVAL.
3. REINFORCED STEEL CONFORMS TO LATEST A185 SPEC. 0.12 SQ. IN./LINEAL FT. (0.15 SQ. IN. FOR 60" DIA) AND BASE BOTTOM.
4. CONCRETE COMPRESSIVE STRENGTH 4000 PSI MIN.
5. JOINT SEALANT SHALL BE SYNTHETIC RUBBER GASKET THAT COMPLIES W/ C-443 OR C-361.

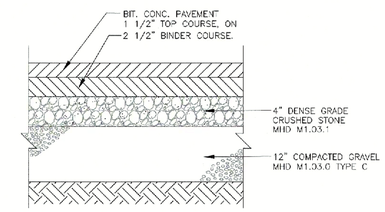


4 PRECAST CONCRETE SINGLE GRATE (CB) CATCH BASIN & DOUBLE GRATE (DCB) DEEP SUMP CATCH BASIN
SCALE: N.T.S.

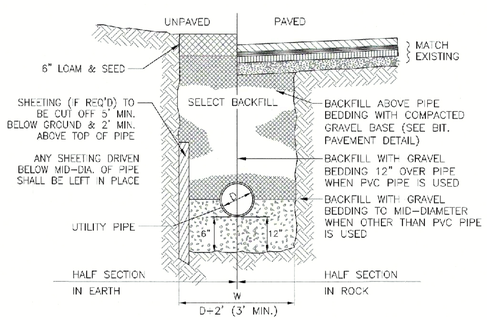
NOTES:
1. REINFORCED STEEL CONFORMS TO LATEST A185 SPEC. 0.12 SQ. IN./LINEAL FT. (0.15 SQ. IN. FOR 60" DIA) AND BASE BOTTOM.
2. CONCRETE COMPRESSIVE STRENGTH 4000 PSI MIN.
3. MANHOLE DESIGN CONFORMS TO LATEST ASTM C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".
4. JOINT SEALANT SHALL BE SYNTHETIC RUBBER GASKET THAT COMPLIES W/ C-443 OR C-361.
5. BASE SECTION SHALL BE ONE POUR MONOLITHIC.



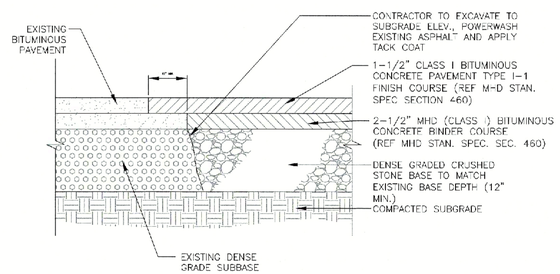
5 TYPICAL PRECAST CONCRETE 48" DIAMETER DRAIN MANHOLE (DMH) FOR PIPE DIAMETERS 24" OR LESS
SCALE: N.T.S.



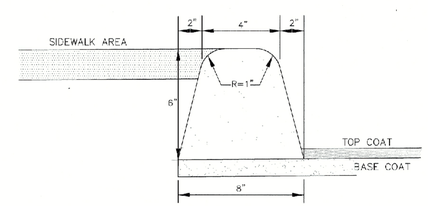
6 BITUMINOUS CONCRETE PAVEMENT DETAIL
SCALE: N.T.S.



7 TYPICAL UTILITY TRENCH DETAIL
SCALE: N.T.S.



8 PAVEMENT JOINTING
SCALE: N.T.S.



9 BITUMINOUS CONCRETE CURB (BCC)
SCALE: N.T.S.

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P: 508-278-3897 F: 508-278-2289
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North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

CAD FILE	...\dwg\permit\2015-219_C2_R1.dwg
DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 1 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28320 REGISTERED PROFESSIONAL ENGINEER 11/27/19

DRAWING NO. C-7.1

PLAN NO. L-5239

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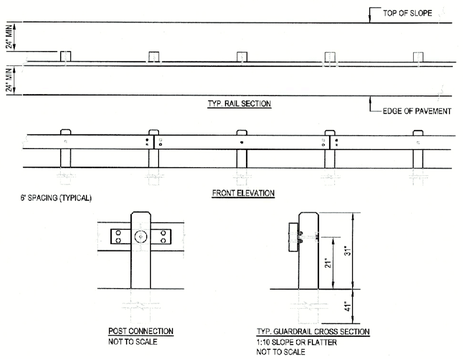
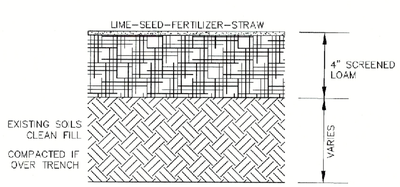
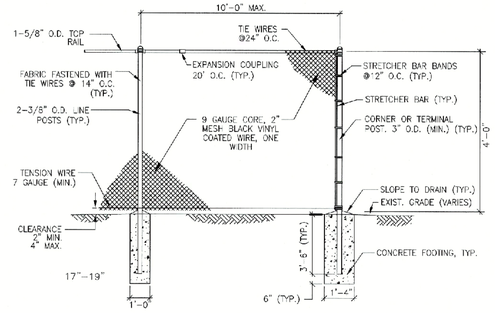


NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. IF TOP OF SLOPE IS CLOSER THAN 24" INCREASE POST LENGTH TO 7'.
4. DRIVE POSTS OR AUGER, BACKFILL WITH NATIVE SOIL AND COMPACT EVERY 12".
5. ALL TIMBER #1 S4S SOUTHERN PINE, PRESSURE TREATED: AWPA-C14, WOOD FOR USE IN HWY. CONSTR.
6. TYP. POST: 8" X 8" X 6' - TYP. RAIL: 4" X 12" X 11' 11 1/2"
7. FASTENERS: ASTM A307; A242; F436 TYPE 3; A563 DH3.
8. TIMBARRIER™ SPLICE PLATE & PLATE WASHER ASTM-A588.
9. UNDER EACH BOLT HEAD ON FACE OF RAIL INSTALL ONE 7/8" WASHER.
10. REFER TO DRAWINGS 651-003b OR 651-003c FOR TERMINAL DETAILS
11. CONTRACTORS NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info REFERENCE NUMBER 651-003.

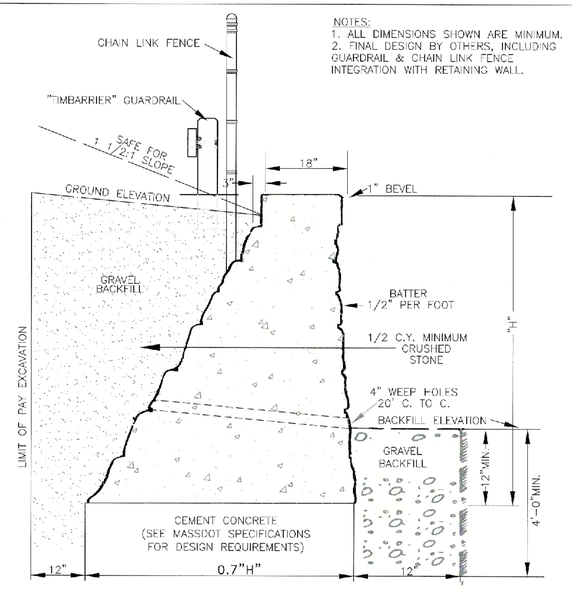
1 "TIMBARRIER" GUARDRAIL
SCALE: N.T.S.



2 LOAM & SEED DETAIL
SCALE: N.T.S.

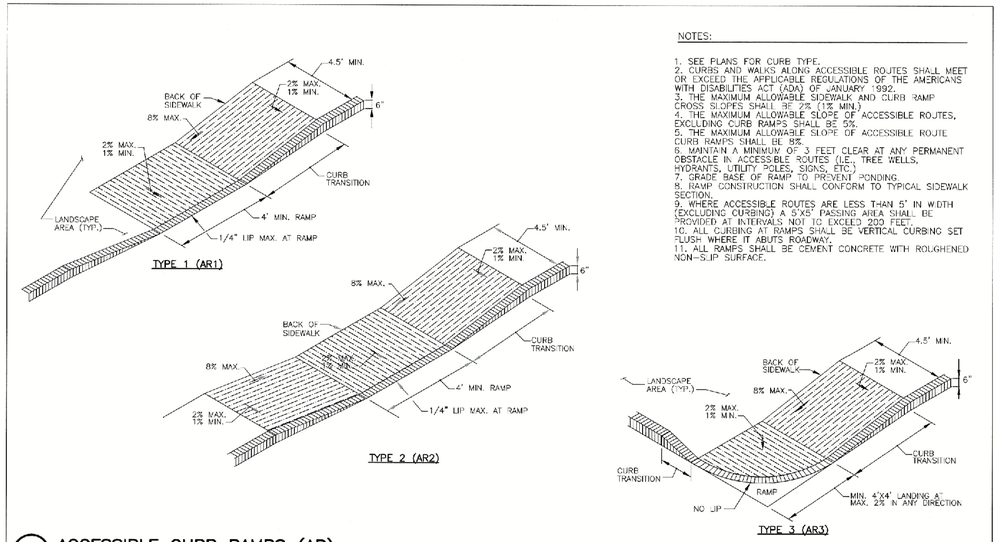


3 CHAIN LINK FENCE (CLF)
SCALE: N.T.S.



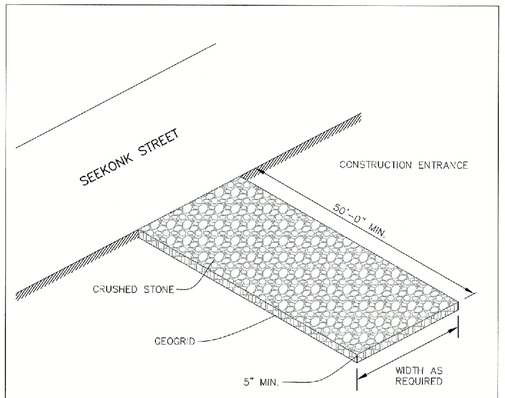
NOTES:
1. ALL DIMENSIONS SHOWN ARE MINIMUM.
2. FINAL DESIGN BY OTHERS, INCLUDING GUARDRAIL & CHAIN LINK FENCE INTEGRATION WITH RETAINING WALL.

4 CONCRETE RETAINING WALL
SCALE: N.T.S.

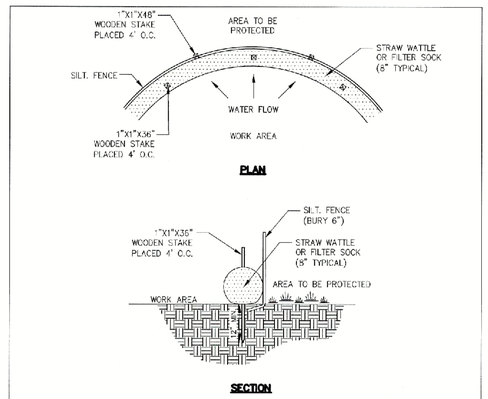


NOTES:
1. SEE PLANS FOR CURB TYPE.
2. CURBS AND WALKS ALONG ACCESSIBLE ROUTES SHALL MEET OR EXCEED THE APPLICABLE REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) OF JANUARY 1992.
3. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 2% (1% MIN.)
4. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTES, EXCLUDING CURB RAMPS SHALL BE 5%.
5. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%.
6. MAINTAIN A MINIMUM OF 3 FEET CLEAR AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTES (I.E., TREE WELLS, HYDRANTS, UTILITY POLES, SIGNS, ETC.)
7. GRADE BASE OF RAMP TO PREVENT PONDING.
8. RAMP CONSTRUCTION SHALL CONFORM TO TYPICAL SIDEWALK SECTION.
9. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5'X5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
10. ALL CURBING AT RAMPS SHALL BE VERTICAL CURBING SET FLUSH WHERE IT ABUTS ROADWAY.
11. ALL RAMPS SHALL BE CEMENT CONCRETE WITH ROUGHENED NON-SLIP SURFACE.

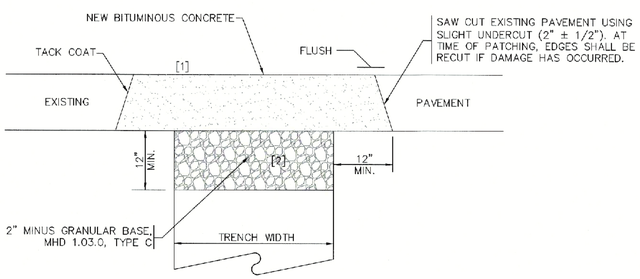
5 ACCESSIBLE CURB RAMPS (AR)
SCALE: N.T.S.



6 CONSTRUCTION ENTRANCE
SCALE: N.T.S.

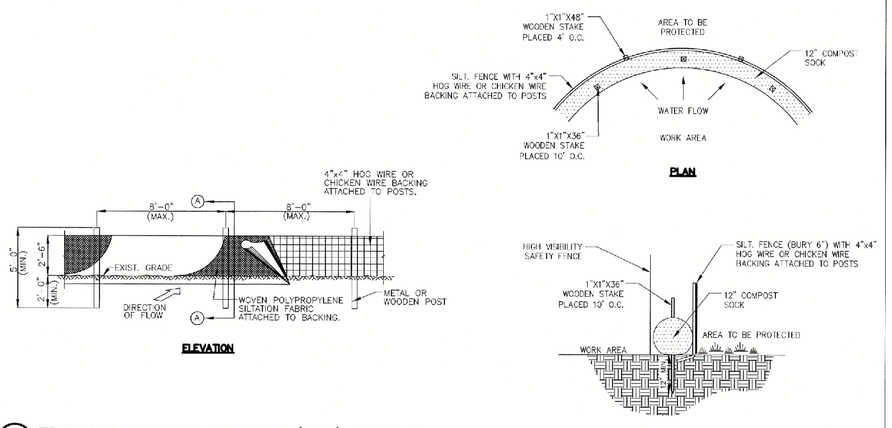


7 EROSION CONTROL BARRIER (ECB) TYPE A
SCALE: N.T.S.



NOTES:
[1] GRANULAR BASE COMPACTION: 95% PER ASTM D-1557 MODIFIED PROCTOR METHOD
[2] BIT. CONCRETE COMPACTION: 95%

8 TRENCH PATCH
SCALE: N.T.S.



9 EROSION CONTROL BARRIER (ECB) TYPE B
SCALE: N.T.S.

10

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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

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CAD FILE	...\dwg\permit\2015-219_C2_R1.dwg
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DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 2 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MARIVILLE CIVIL No. 28323 PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-7.2

PLAN NO. L-5239

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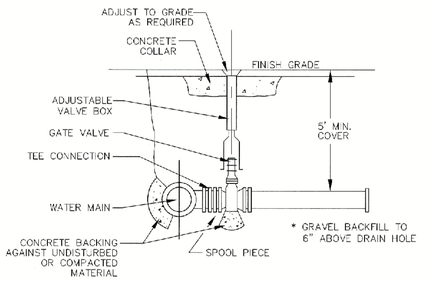
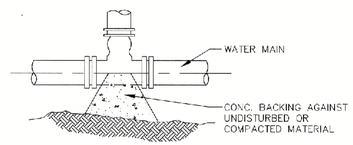
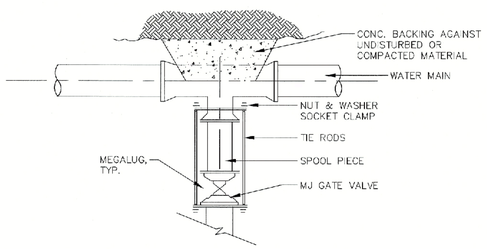


TYPICAL VALVE DETAIL

NOTES:
1. ALL SERVICE FITTINGS SHALL BE COMPRESSION TYPE WITH PACK JOINT.
2. VALVES TO OPEN IN DIRECTION SPECIFIED BY NORFOLK DPW.
3. MECHANICAL JOINTS TO BE MEGALUG, OR APPROVED EQUAL.
4. VALVE BOXES SHALL HAVE CEMENT CONCRETE COLLARS.



TYPICAL TEE



TYPICAL VALVE CONNECTION – RESTRAINED JOINT TEE

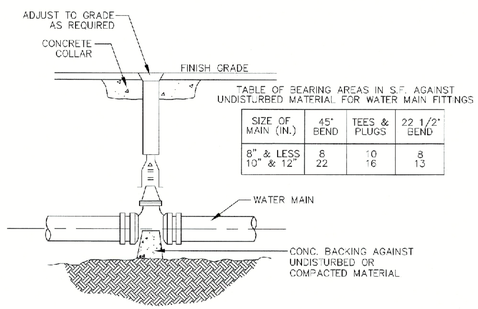
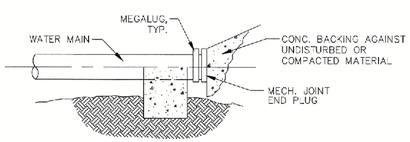


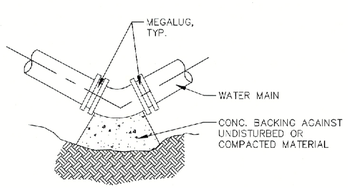
TABLE OF BEARING AREAS IN S.F. AGAINST UNDISTURBED MATERIAL FOR WATER MAIN FITTINGS

SIZE OF MAIN (IN.)	45° BEND	TEES & PLUGS	22 1/2° BEND
8" & LESS	8	10	8
10" & 12"	22	16	13

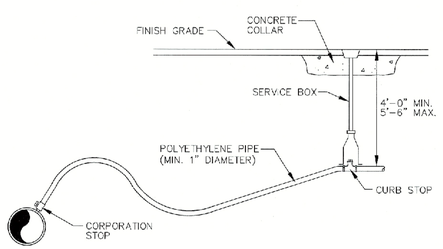
TYPICAL VALVE



TYPICAL PLUG DETAIL



TYPICAL BEND DETAIL

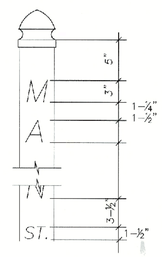


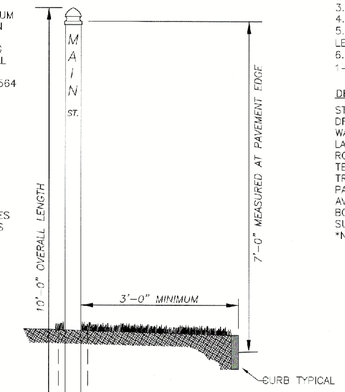
TYPICAL WATER SERVICE DETAIL

NOTE:
WATER APPURTENCES TO CONFORM WITH LOCAL WATER COMPANY SPECIFICATIONS.

1 TYPICAL WATER SUPPLY DETAILS
SCALE: N.T.S.

MATERIAL – POST AND CAP:
1. NOMINAL 5" x 5" SQUARE SECTION POST
2. MATCHING GOTHIC CAP
3. WHITE 100% VIRGIN VINYL WITH TITANIUM DIOXIDE CONTENT FOR UV PROTECTION
4. 0.200 IN. WALL THICKNESS
5. AS MANUFACTURED BY KROY BUILDING PRODUCTES, INC. OR APPROVED EQUAL
6. JOIN CAP TO POST WITH CLEAR PVC SOLVENT CEMENT MEETING ASTM D-2564





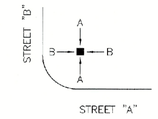
NOTES:
1. DIG HOLE WITH APPROPRIATELY SIZED POST HOLE DIGGER OR AUGER.
2. POST MUST BE SET PLUMB.
3. BACKFILL IN LIFTS OF NO MORE THAN 6". TAMP EARTH LIFT THOROUGHLY.

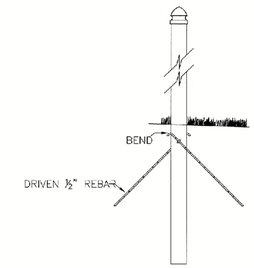
LETTERING:
1. HELVETICA MEDIUM STYLE
2. VINYL – FOR EXTERIOR USE
3. PRESSURE SENSITIVE ADHESIVE
4. REFLECTIVE BLACK
5. STREET NAME – 3" HIGH LETTERS
6. DESIGNATION (ST, DR, ETC) 1-½" HIGH

DESIGNATION ABBREVIATIONS:

STREET	* ST
DRIVE	* DR
WAY	* WAY
LANE	* LA
ROAD	* RD
TERRACE	* TER
TRAIL	* TR
PATH	* PATH
AVENUE	* AVE
BOULEVARD	* BLVD

SUBMIT OTHERS FOR APPROVAL
NO PERIODS USED

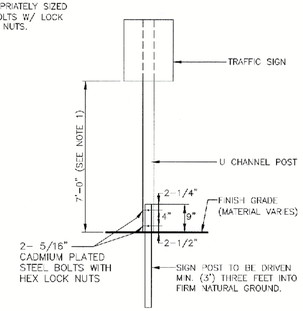




PULL UP DETERRANT:
1. STAINLESS STEEL EYEBOLTS AND NUTS
2. SNUG NUTS ONLY – DO NOT OVERTIGHTEN
3. DRIVEN ½" REBAR 2 FOOT MINIMUM LENGTH

2 TYPICAL STREET SIGN
SCALE: N.T.S.

NOTES:
1. SEE TRAFFIC CONTROL SCHEDULE FOR EXACT MOUNTING HEIGHT.
2. CHANNEL POST SECTIONS TO BE CONNECTED WITH AT LEAST TWO(2) APPROPRIATELY SIZED GALVANIZED BOLTS W/ LOCK WASHERS AND NUTS.

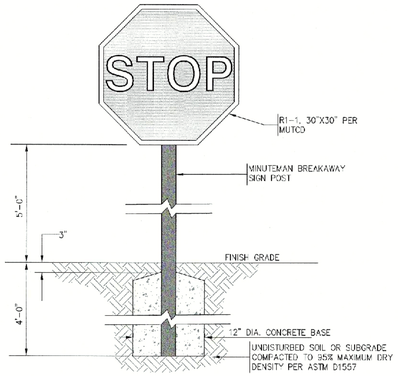


3 TYPICAL BREAKAWAY SIGN POST DETAIL
SCALE: N.T.S.

SIGN NO.	SIGN	SIZE AND COLOR
R1-1	STOP	30"X30"; WHITE ON RED
D-3	STREET NAME	6" X VARIES"; WHITE ON GREEN 3" MIN LETTERS
R1-2	YIELD	36"X36"X36"; RED ON WHITE
	NOT A THRU STREET	18"X24"; BLACK ON WHITE

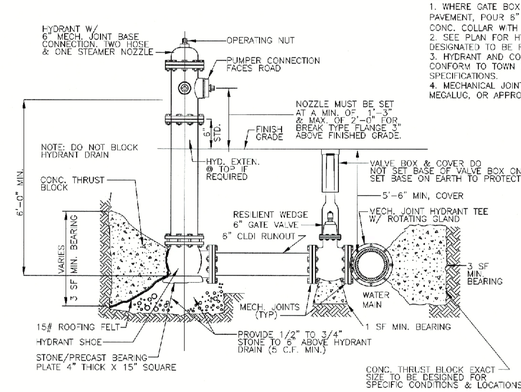
NOTES:
1. ALL SIGNS ARE REFLECTORIZED AND HAVE 7'-0" CHANNEL MOUNTING HEIGHT.
2. ALL REGULATORY SIGNS SHALL MEET THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

4 TRAFFIC CONTROL SIGNAGE
SCALE: N.T.S.



5 STOP SIGN
SCALE: N.T.S.

NOTES:
1. WHERE GATE BOX NOT IN PAVEMENT, POUR 8" DEEP x10"x10" CONC. COLLAR WITH 6"x6" W.W. MESH.
2. SEE PLAN FOR HYDRANTS DESIGNATED TO BE RELOCATED.
3. HYDRANT AND CONNECTIONS SHALL CONFORM TO TOWN OF NORFOLK DPW SPECIFICATIONS.
4. MECHANICAL JOINTS TO BE MEGALUG, OR APPROVED EQUAL.



6 TYPICAL FIRE HYDRANT CONNECTION DETAIL
SCALE: N.T.S.

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P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

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DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 3 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MANVILLE CIVIL No. 28323 11/27/19

DRAWING NO.

C-7.3

PLAN NO. L-5239

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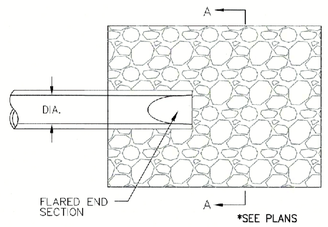
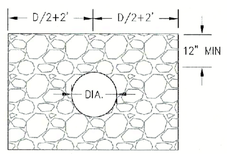
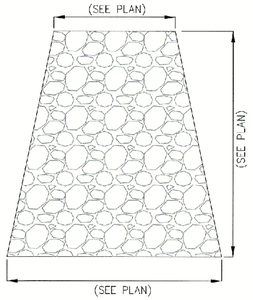
NOTES:

1. MINIMUM STONE DIAMETER: 6"
2. MINIMUM WEIGHT OF STONE: 50 LBS.
3. MAXIMUM WEIGHT OF STONE: 125 LBS.
4. PLACE ALL RIP-RAP OVER FILTER FABRIC, AMOCO 4508 OR APPROVED EQUAL.



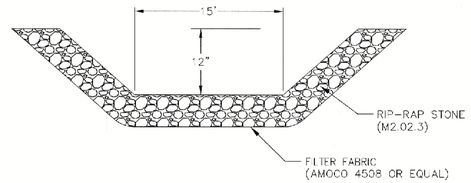


SECTION A-A
NTS



TYPICAL OUTFALL RIP-RAP APRON

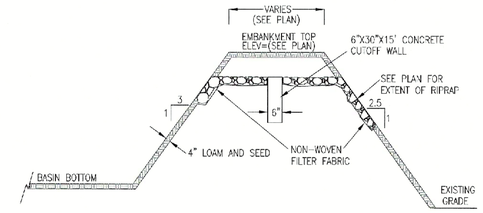
1 STONE RIP-RAP FOR PIPE ENDS
SCALE: N.T.S.



2 STONE RIP-RAP EMERGENCY SPILLWAY
SCALE: N.T.S.

NOTES:

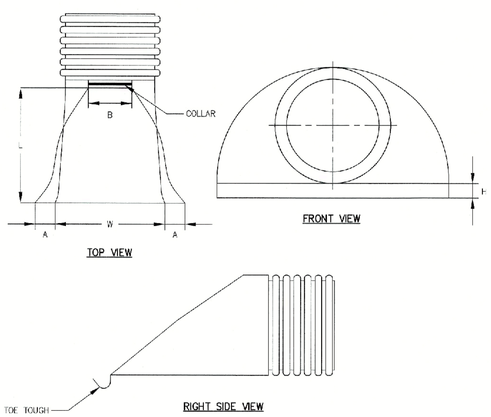
1. EMBANKMENT TO BE CONSTRUCTED OF CLEAN FILL FREE OF ORGANIC SOILS/MATERIALS WITH NO STONES OVER 12" MAX. DIMENSION. EMBANKMENT TO TO BE CONSTRUCTED IN COMPACTED LIFTS NOT TO EXCEED 8".
2. BASIN BOTTOM AND SIDE SLOPES (INSIDE AND OUT) TO BE COVERED WITH 4" LOAM AND SEED.
3. RIPRAP SPILLWAY STONE TO BE 4" MINIMUM, 6" MAXIMUM.



SECTION

3 TYPICAL EMBANKMENT/SPILLWAY
SCALE: N.T.S.

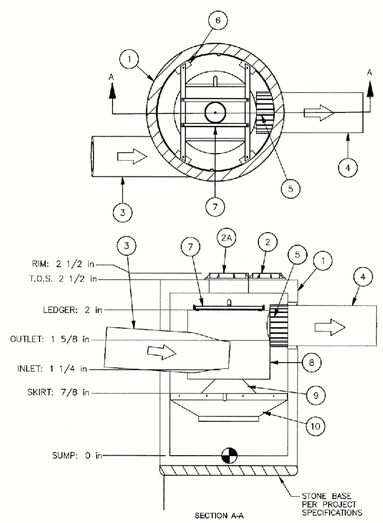
PIPE DIAMETER (INCHES)						
DIAMETER (INCHES)	12	15	18	24	30	36
A (INCHES)	6.5	6.5	7.5	7.5	7.5	7.5
B (MAX) (INCHES)	10.0	10.0	15.0	18.0	22.0	25.0
H (INCHES)	6.5	6.5	6.5	6.5	8.6	8.6
L (INCHES)	25.0	25.0	32.0	36.0	58.0	58.0
W (INCHES)	29.0	29.0	35.0	45.0	63.0	63.0



4 CORRUGATED POLYETHYLENE FLARED-END SECTION (FES)
SCALE: N.T.S.

CAPACITIES:

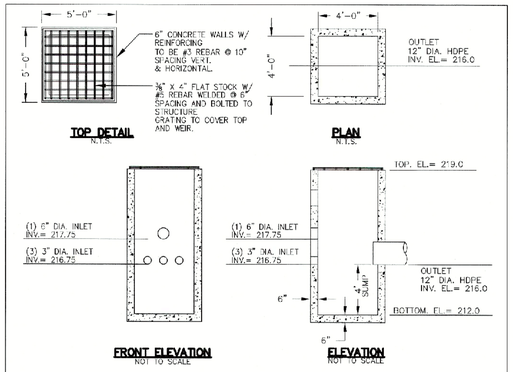
1. Peak treatment flow: 8.0 cfs (227 l/s)
2. Sediment storage capacity: 2.10 Cu. yd. (1.61 cu. m.)
3. Oil storage capacity: 216 Gal. (818 liters)



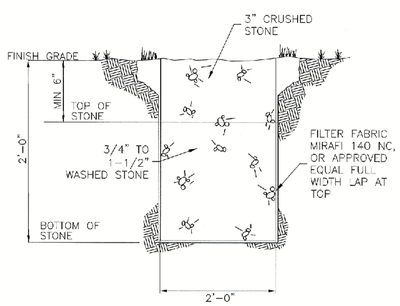
SECTION A-A

Parts List		
ITEM	DESCRIPTION	SIZE
1	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)	72 in
2	FRAME AND COVER	18 in
2A	FRAME AND COVER	24 in
3	INLET PIPE (BY OTHERS)	18 in
4	OUTLET PIPE (BY OTHERS)	18 in
5	PIPE COUPLING (BY OTHERS)	
6	LEDGER ANGLE	
7	SUPPORT FRAME	
8	DIP PLATE	
9	CENTER SHAFT AND CONE	
10	BENCHING SKIRT	

5 6 FT DIA. DOWNSTREAM DEFENDER
SCALE: N.T.S.



6 OUTLET STRUCTURE (OS1) – ORIFICE/GRATE DETAIL
SCALE: N.T.S.



7 INFILTRATION TRENCH
SCALE: N.T.S.

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500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

NO.	DATE	DESCRIPTION

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DRAWN BY	KNL, RJF
CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 4 OF 6

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 26323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.

C-7.4

PLAN NO. L-5239

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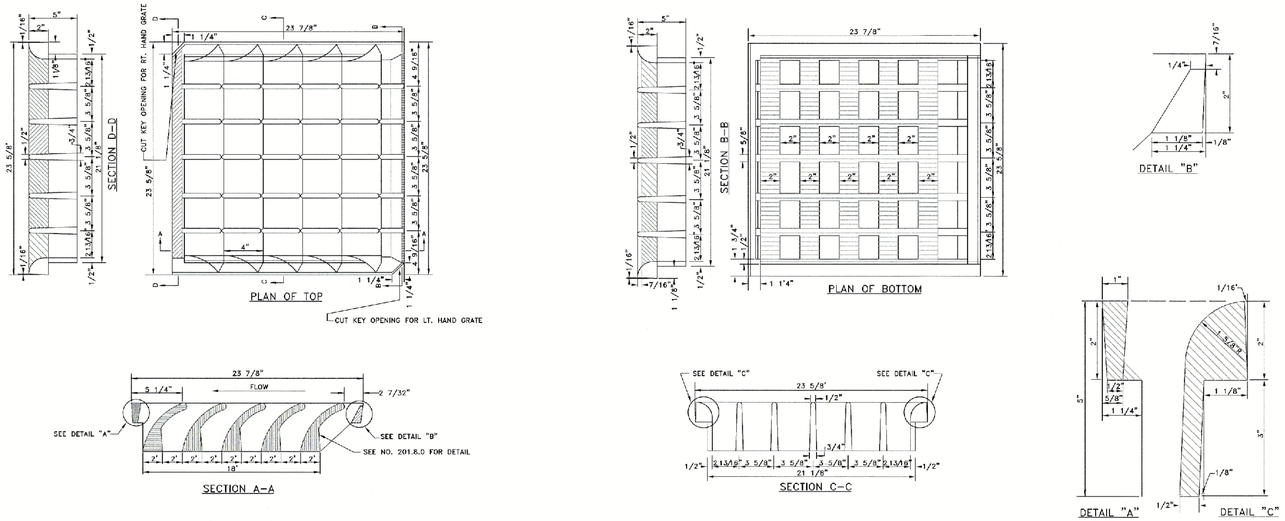
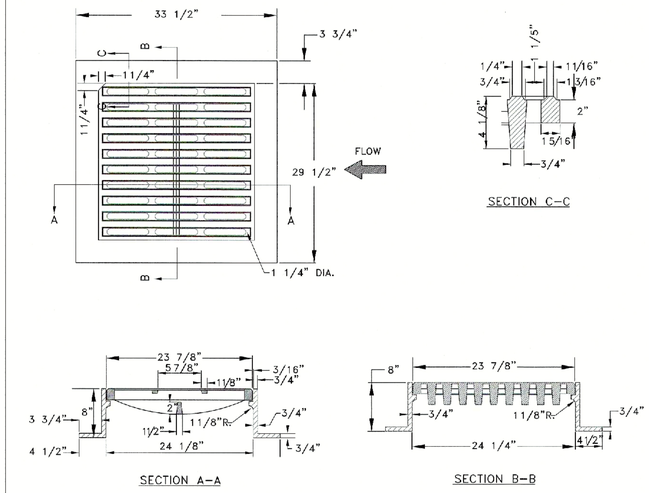
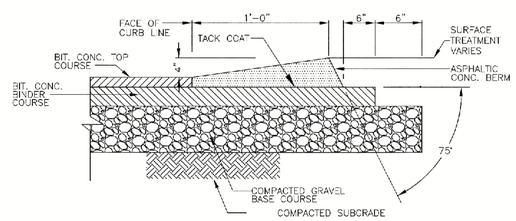


1 CASCADE CATCH BASIN GRATE (LEBARON LK120D)
SCALE: N.T.S.



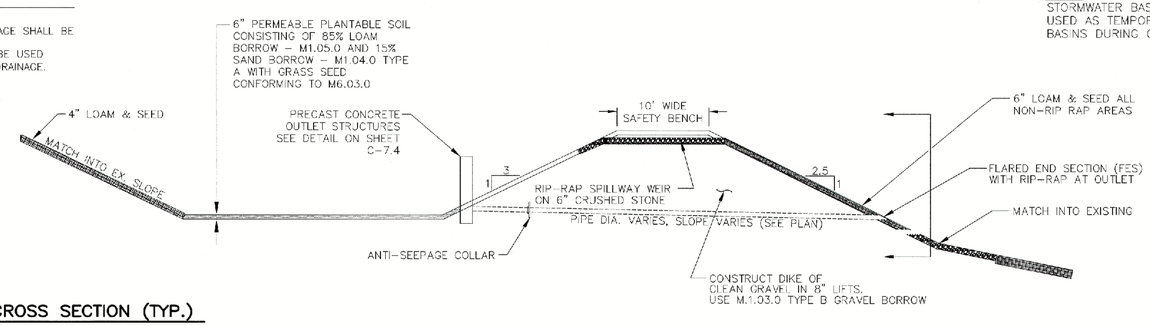
2 CATCH BASIN GRATE (LEBARON LF248–2)
SCALE: N.T.S.



3 MODIFIED ASPHALTIC CAPE COD BERM (CCB)
SCALE: N.T.S.

NOTES:

1. ALL PVC PIPE AND FITTINGS USED FOR EXTERIOR/UNDERGROUND STORM DRAINAGE SHALL BE GASKETED.
2. GLUED PVC CONNECTIONS SHALL NOT BE USED FOR EXTERIOR/UNDERGROUND STORM DRAINAGE.



NOTE:
STORMWATER BASIN SHALL NOT BE USED AS TEMPORARY SEDIMENT BASINS DURING CONSTRUCTION.

4 STORMWATER BASIN CROSS SECTION (TYP.)
SCALE: N.T.S.

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500 East Washington Street
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PROJECT:
LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

APPLICANT:
LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

REVISIONS

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DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 5 OF 6

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
11/27/19

DRAWING NO.
C–7.5

PLAN NO. L–5239

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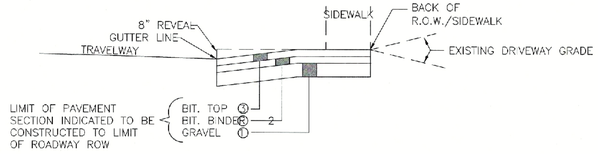
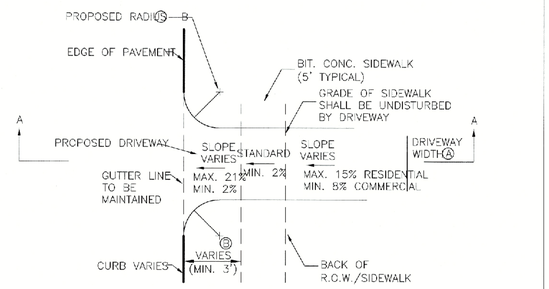


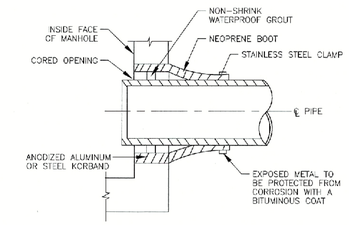
TYPE	MAX. Ⓐ	MIN.	MAX. Ⓑ	MIN.	①	②	③
RESIDENTIAL	12'	8'	10'	5'	12"	2"	1"
COMMERCIAL	24'	20'	30'	20'	12"	2.5"	1.5"

MAXIMUM ALLOWABLE GRADE CHANGE*	DESIRABLE	MAXIMUM
LOW VOLUME DRIVEWAY ON LOCAL STREET	± 6%	± 6% (CREST CURVE)
		± 9% (SAG CURVE)

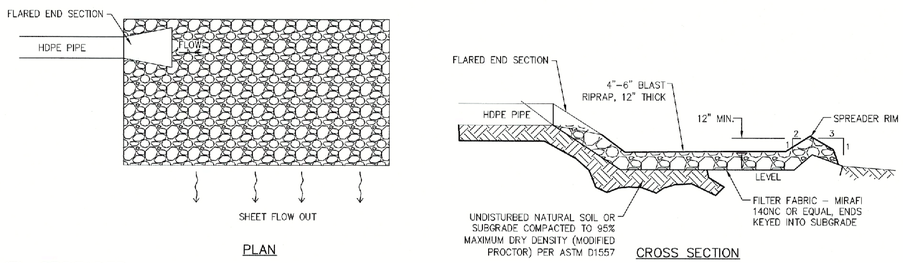
*MORE ABRUPT CHANGES REQUIRE VERTICAL CURVES AT LEAST 10' LONG

1 TYPICAL DRIVEWAY OPENING
SCALE: N.T.S.

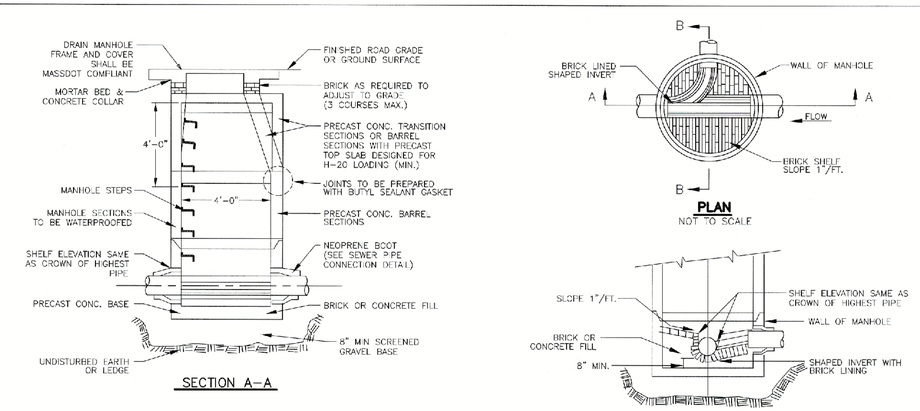




2 SEWER PIPE CONNECTION
SCALE: N.T.S.

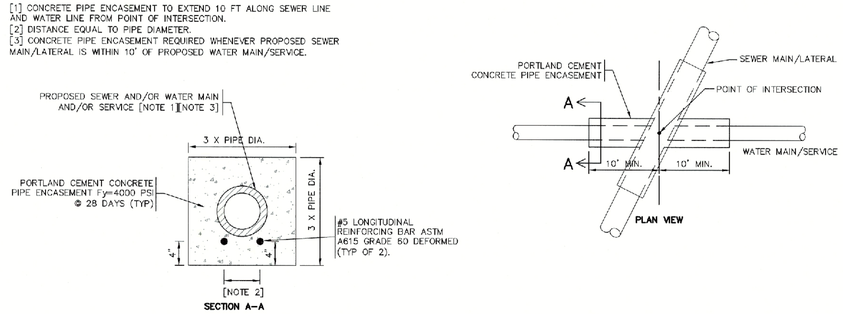


3 LEVEL SPREADER
SCALE: N.T.S.

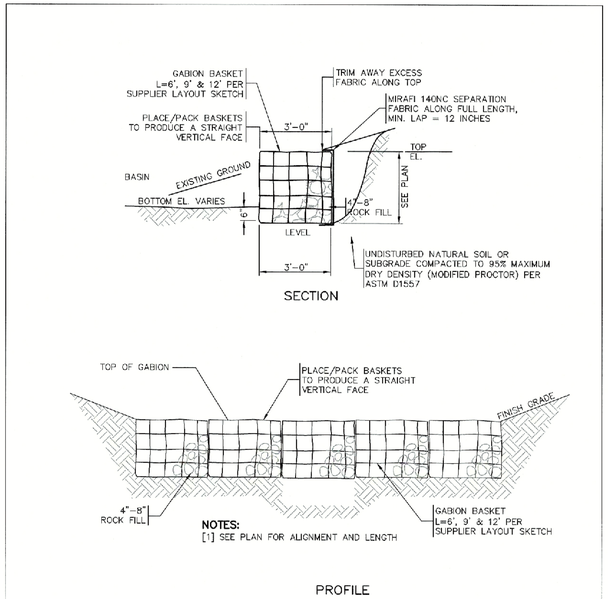


4 TYPICAL PRECAST CONCRETE 48" DIAMETER SEWER MANHOLE (SMH)
SCALE: N.T.S.

NOTES:
[1] CONCRETE PIPE ENCASEMENT TO EXTEND 10 FT ALONG SEWER LINE AND WATER LINE FROM POINT OF INTERSECTION.
[2] DISTANCE EQUAL TO PIPE DIAMETER.
[3] CONCRETE PIPE ENCASEMENT REQUIRED WHENEVER PROPOSED SEWER MAIN/LATERAL IS WITHIN 10' OF PROPOSED WATER MAIN/SERVICE.

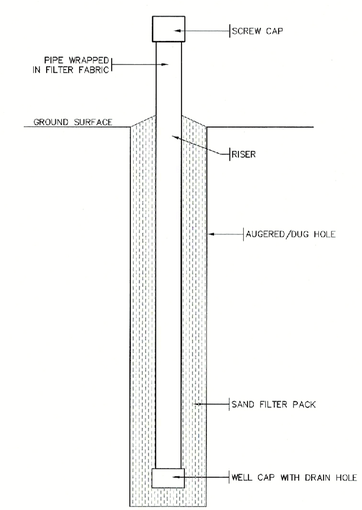


5 PIPE ENCASEMENT
SCALE: N.T.S.

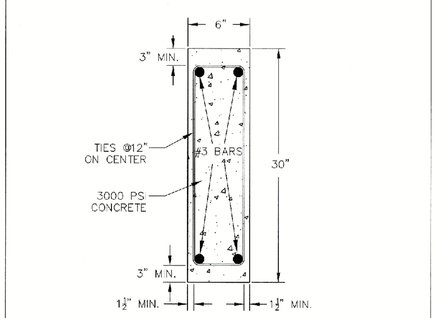


8 GABION FOREBAY DETAIL
SCALE: N.T.S.

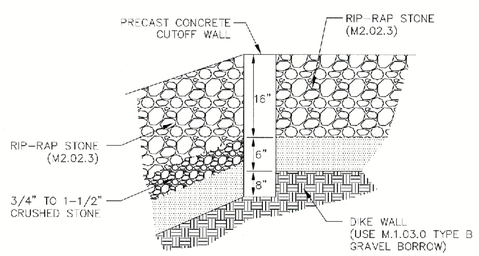
NOTES:
1. EMBANKMENT TO BE CONSTRUCTED OF CLEAN FILL FREE OF MONITORING WELL TO BE MINIMUM 2IN DIAMETER PERFORATED SCH-40 PVC PIPE.
2. PIPE SHALL BE WRAPPED IN FILTER FABRIC IF INSTALLED IN OPEN HOLE.
3. END OF PIPE TO BE HAVE SCREW CAP AND BE RAISED 1 FOOT ABOVE THE SURROUNDING GROUND.



9 MONITORING WELL DETAIL
SCALE: N.T.S.



6 CUTOFF WALL DETAIL
SCALE: N.T.S.



7 CUTOFF WALL CONFIGURATION DETAIL
SCALE: N.T.S.

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500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963

PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

REVISIONS

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CHECKED BY	RMM, BJA
DATE	NOVEMBER 27, 2019
PROJECT NO.	2015-219

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 6 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28323 REGISTERED PROFESSIONAL ENGINEER 11/27/19

DRAWING NO. C-7.6

PLAN NO. L-5239

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ZONING ANALYSIS TABLES – DIMENSIONAL REQUIREMENTS

ZONING CRITERIA	LOT 1	LOT 2	LOT 3	LOT 4	LOT 5	LOT 6	LOT 7	LOT 8	LOT 9	LOT 10	LOT 11	LOT 12	LOT 13	LOT 14	LOT 15	LOT 16	LOT 17	LOT 18	LOT 19	LOT 20	LOT 21	LOT 22	LOT 23	LOT 24	LOT 25	LOT 26	LOT 27	LOT 28	LOT 29	LOT 30	LOT 31	LOT 32	LOT 33	LOT 34	LOT 35
LOT AREA	6,705 SF	4,440 SF	4,636 SF	4,596 SF	4,702 SF	4,807 SF	5,180 SF	5,362 SF	8,185 SF	16,391 SF	9,454 SF	6,259 SF	4,906 SF	4,615 SF	4,829 SF	4,997 SF	6,156 SF	10,391 SF	8,281 SF	8,757 SF	8,041 SF	10,518 SF	6,534 SF	6,362 SF	8,468 SF	4,969 SF	5,013 SF	5,157 SF	4,924 SF	4,692 SF	4,673 SF	6,337 SF	6,082 SF	5,575 SF	5,299 SF
FRONTAGE	46.0'	47.0'	50.0'	48.7'	50.0'	51.3'	55.0'	44.0'	42.5'	44.5'	65.0'	38.2'	47.4'	46.4'	48.2'	42.7'	45.2'	71.8'	67.7'	77.1'	65.4'	64.2'	40.6'	47.3'	134.7'	46.2'	39.6'	43.2'	45.3'	42.7'	60.2'	79.6'	61.0'	53.3'	54.5'
MIN. FRONT SETBACK	20.0'	20.0'	20.0'	20.0'	25.0'	20.0'	20.0'	22.3'	25.0'	20.7'	23.8'	25.5'	20.0'	20.0'	20.0'	21.8'	20.0'	34.2'	20.0'	25.8'	20.8'	21.2'	25.3'	21.2'	20.5'	19.9'	20.0'	20.2'	20.5'	20.0'	19.9'	24.8'	20.0'	25.0'	19.8'
MIN. SIDE SETBACK	10.0'	10.0'	11.0'	10.5'	11.8'	11.9'	10.6'	10.4'	9.7'	11.7'	8.6'	11.0'	10.6'	10.5'	10.5'	9.7'	9.9'	15.5'	10.7'	41.3'	10.6'	10.5'	9.7'	12.3'	15.4'	10.0'	9.6'	9.9'	10.9'	10.4'	11.4'	10.3'	14.0'	11.1'	11.7'
MIN. REAR SETBACK	20.0'	29.6'	29.4'	29.6'	24.8'	30.0'	20.1'	28.7'	37.8'	101.9'	59.8'	31.0'	25.3'	24.8'	24.6'	33.4'	35.6'	58.8'	113.7'	109.7'	81.2'	69.3'	47.7'	31.9'	39.6'	24.5'	16.7'	17.2'	14.7'	21.4'	23.5'	27.4'	32.8'	25.5'	26.9'

ZONING CRITERIA	LOT 36	LOT 37	LOT 38	LOT 39	LOT 40	LOT 41	LOT 42	LOT 43	LOT 44	LOT 45	LOT 46	LOT 47	LOT 48	LOT 49	LOT 50	LOT 51	LOT 52	LOT 53	LOT 54	LOT 55	LOT 56	LOT 57	LOT 58	LOT 59	LOT 60	LOT 61	LOT 62	LOT 63	LOT 64	LOT 65	LOT 66
LOT AREA	6,385 SF	4,607 SF	5,816 SF	7,308 SF	5,317 SF	5,141 SF	4,807 SF	5,515 SF	5,784 SF	8,118 SF	5,128 SF	6,014 SF	7,495 SF	7,183 SF	4,796 SF	5,764 SF	4,211 SF	5,718 SF	6,316 SF	4,173 SF	6,880 SF	5,895 SF	5,320 SF	5,324 SF	3,228 SF	6,333 SF	5,815 SF	4,713 SF	6,518 SF	4,901 SF	6,643 SF
FRONTAGE	124.3'	59.1'	61.2'	69.5'	50.4'	45.4'	44.5'	68.7'	68.5'	69.8'	75.0'	92.7'	89.5'	70.5'	51.2'	62.2'	52.5'	69.7'	63.0'	37.3'	71.4'	76.3'	69.0'	69.1'	41.8'	103.1'	62.7'	50.3'	69.9'	52.8'	68.4'
MIN. FRONT SETBACK	20.8'	19.4'	20.0'	20.0'	20.0'	25.0'	20.3'	20.0'	20.0'	52.6'	21.5'	19.8'	27.0'	20.0'	21.2'	20.0'	20.0'	20.0'	20.1'	20.4'	23.8'	14.5'	14.5'	14.5'	20.0'	20.0'	22.6'	20.0'	20.0'	20.0'	20.0'
MIN. SIDE SETBACK	12.3'	10.8'	11.1'	10.0'	9.9'	9.7'	7.8'	11.5'	9.5'	11.0'	9.3'	9.1'	9.0'	10.3'	9.6'	9.1'	10.2'	9.7'	11.5'	4.2'	10.8'	17.4'	10.0'	10.0'	5.9'	8.1'	3.4'	12.1'	10.9'	12.4'	11.0'
MIN. REAR SETBACK	33.7'	14.4'	20.1'	41.1'	31.6'	27.1'	25.1'	12.1'	21.6'	19.7'	51.1'	64.5'	29.9'	37.7'	27.2'	16.3'	6.8'	17.8'	17.5'	12.3'	17.3'	18.6'	18.6'	18.6'	13.1'	31.1'	26.0'	29.6'	29.3'	28.8'	28.0'

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APPLICANT:
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SHEET TITLE

ZONING PLAN

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

C-8.1

PLAN NO. L-5239

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