# "LAKELAND HILLS"

# A COMPREHENSIVE PERMIT PLAN

## NORFOLK, MASSACHUSETTS

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

NOVEMBER 19, 2018

PREPARED FOR:

LAKELAND HILLS, LLC
136 SEEKONK STREET
NORFOLK, MA 02056

PREPARED BY:

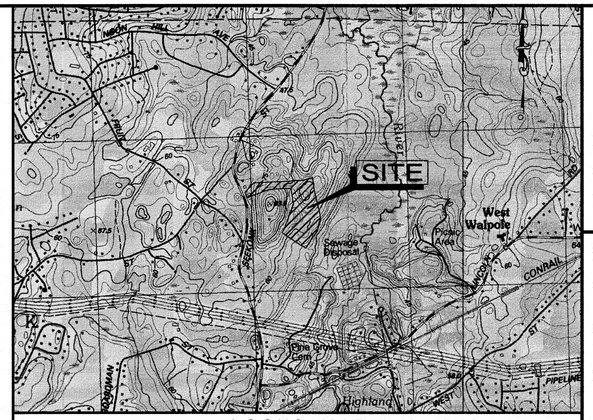

ANDREWS SURVEY & ENGINEERING, INC.
104 MENDON STREET
P.O. BOX 312
UXBRIDGE, MA 01569
P: 508.278.3897
F: 508.278.2289


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 |
|---|---|---|---|
| 11/19/18 | 7/25/19 | C-0.0 | COVER SHEET |
| 11/19/18 | 7/25/19 | C-1.1 | LEGEND, ABBREVIATIONS, & GENERAL NOTES |
| 11/19/18 | 7/25/19 | C-1.2 | INDEX SHEET |
| 11/19/18 | 7/25/19 | C-2.1 - C-2.3 | EXISTING CONDITIONS PLANS |
| 11/19/18 | 7/25/19 | C-3.1 - C-3.3 | LAYOUT & MATERIALS PLANS |
| 11/19/18 | 7/25/19 | C-4.1 - C-4.3 | UTILITY PLANS |
| 11/19/18 | 7/25/19 | C-5.1 - C-5.3 | GRADING & DRAINAGE PLANS |
| 11/19/18 | 7/25/19 | C-6.1 - C-6.4 | TOPOGRAPHIC PLAN & PROFILE |
| 11/19/18 | 7/25/19 | C-7.1 - C-7.6 | CONSTRUCTION DETAILS |
| 11/19/18 | 7/25/19 | 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
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Andrews Survey & Engineering, Inc.
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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

| NO. | DATE | DESCRIPTION |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28323 REGISTERED PROFESSIONAL ENGINEER
7/29/19
P.E.

COMMONWEALTH OF MASSACHUSETTS BYRON J. ANDREWS No. 47380 REGISTERED PROFESSIONAL LAND SURVEYOR
7/29/19
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 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.

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 TOP 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

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| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

LEGEND, ABBREVIATIONS & GENERAL NOTES

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MARIVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/26/19

DRAWING NO.

C-1.1

PLAN NO. L-5239

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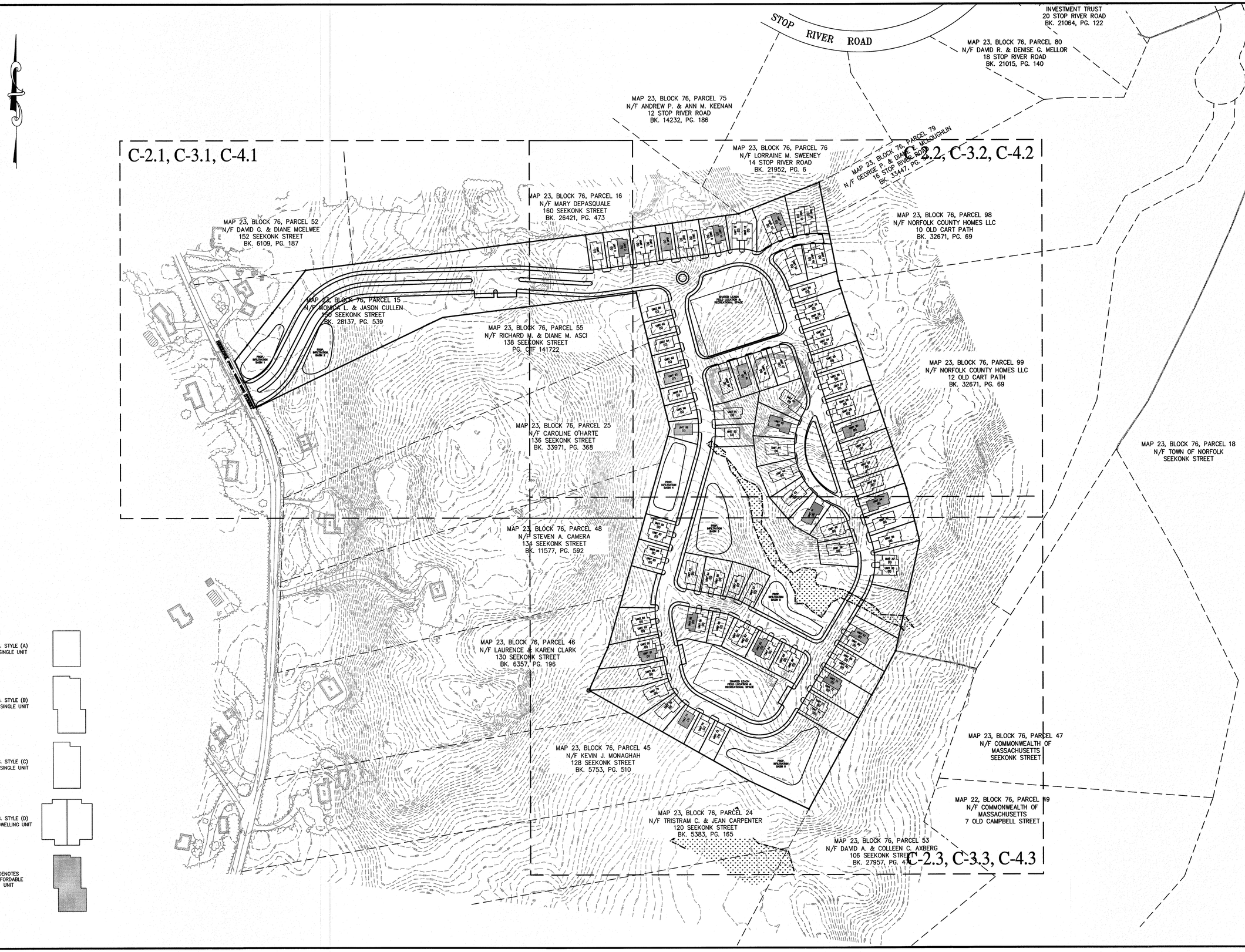



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PROJECT:
LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

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

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| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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. MAINVILLE
CIVIL
No. 28323
7/29/19

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:

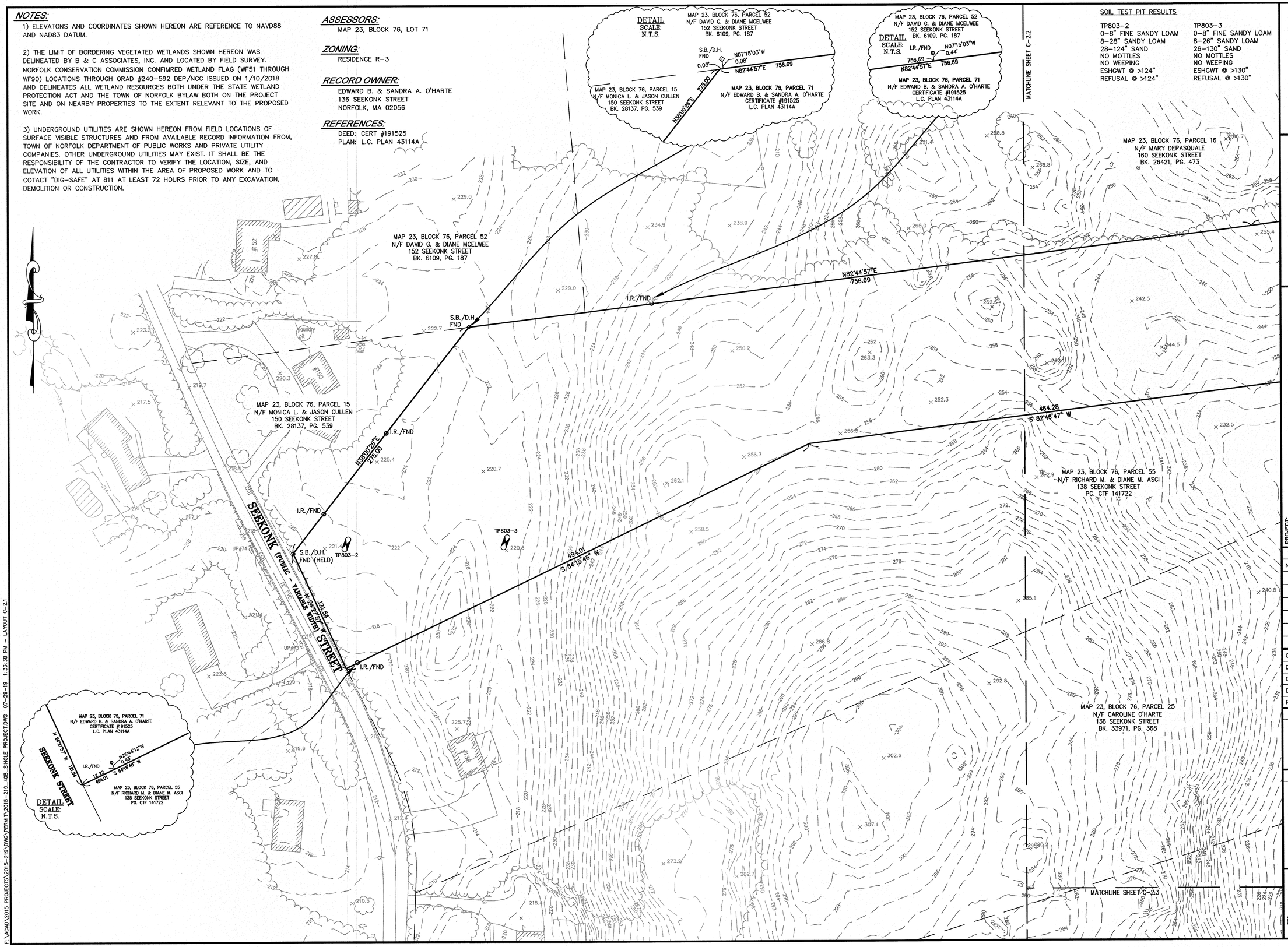
RESIDENCE R–3

## 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

| 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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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 )
1 inch = 40 feet

SHEET TITLE

# EXISTING CONDITIONS PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47380
PROFESSIONAL LAND SURVEYOR
7/29/19

DRAWING NO.
C–2.1

PLAN NO. L–5239

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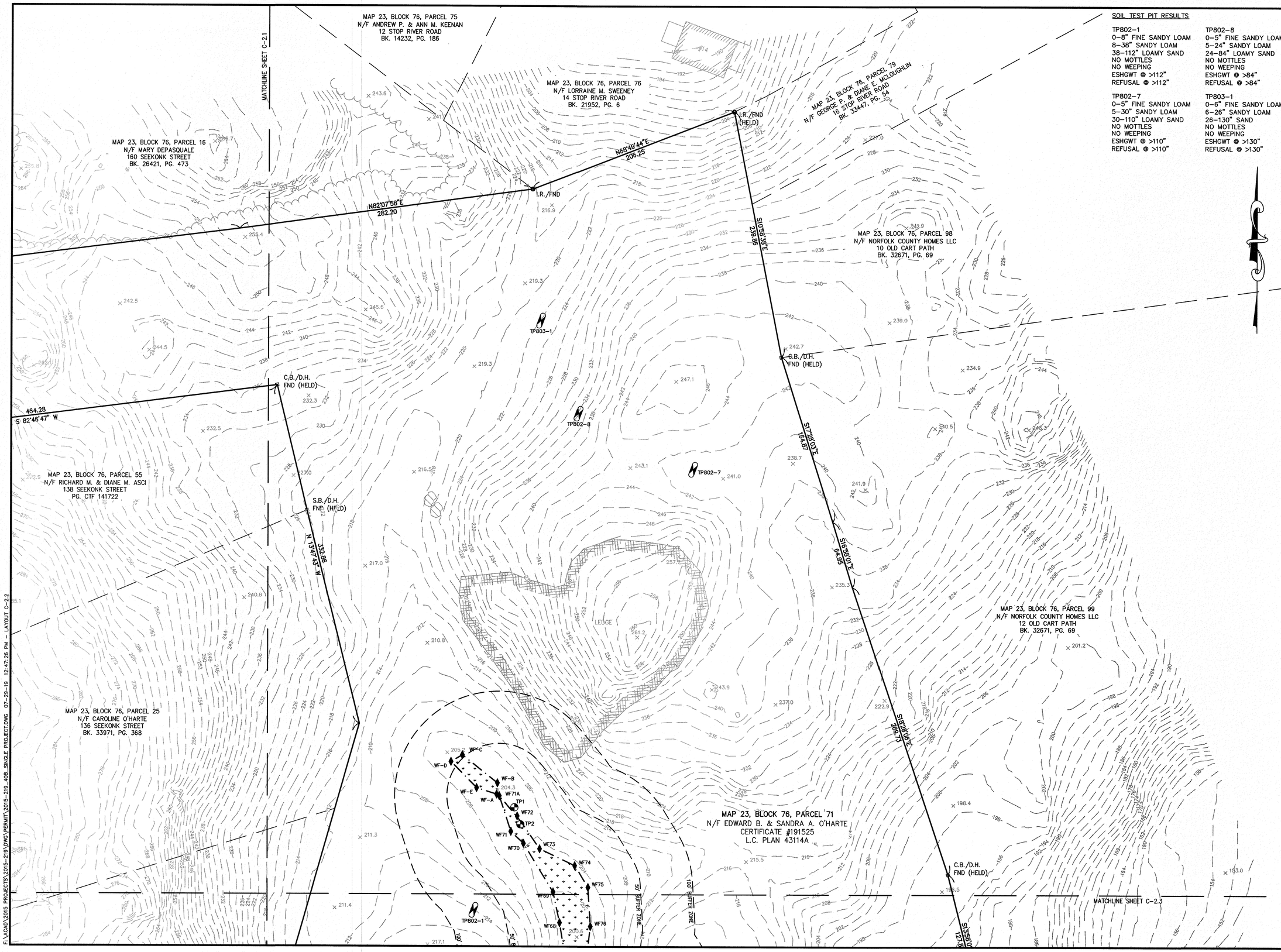


SOIL TEST PIT RESULTS

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

TP802-7
0-5" FINE SANDY LOAM
5-30" SANDY LOAM
30-110" LOAMY SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >110"
REFUSAL @ >110"

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

TP803-1
0-6" FINE SANDY LOAM
6-26" SANDY LOAM
26-130" SAND
NO MOTTLES
NO WEEPING
ESHGWT @ >130"
REFUSAL @ >130"

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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 )
1 inch = 40 feet

SHEET TITLE

# EXISTING CONDITIONS PLAN

SHEET 2 OF 3

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47389
PROFESSIONAL LAND SURVEYOR
7/25/19

DRAWING NO.
C-2.2

PLAN NO. L-5239

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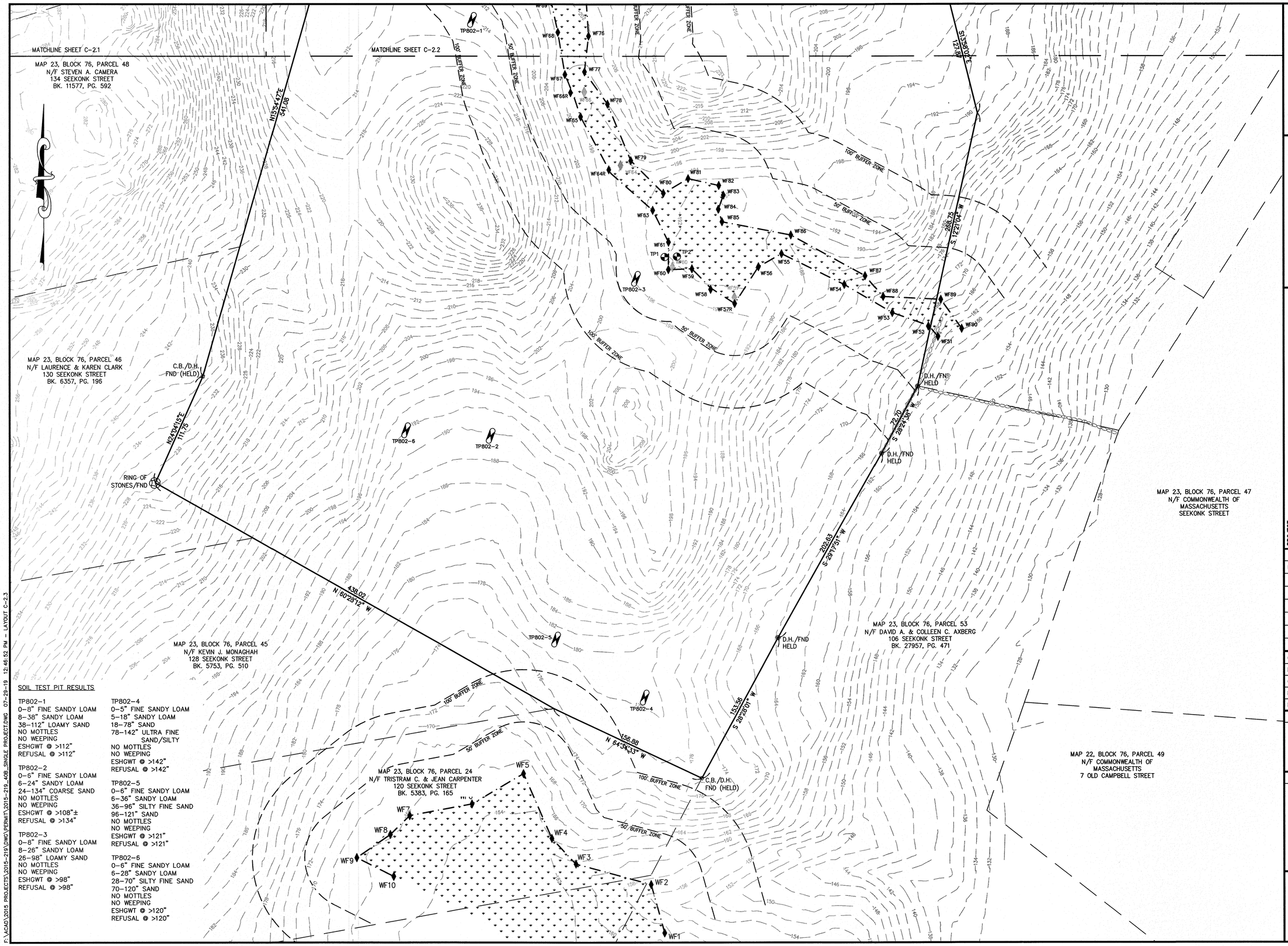


SOIL TEST PIT RESULTS

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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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 )
1 inch = 40 feet

SHEET TITLE

# EXISTING CONDITIONS PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47389
REGISTERED PROFESSIONAL LAND SURVEYOR
7/29/19

DRAWING NO.

C-2.3

PLAN NO. L-5239

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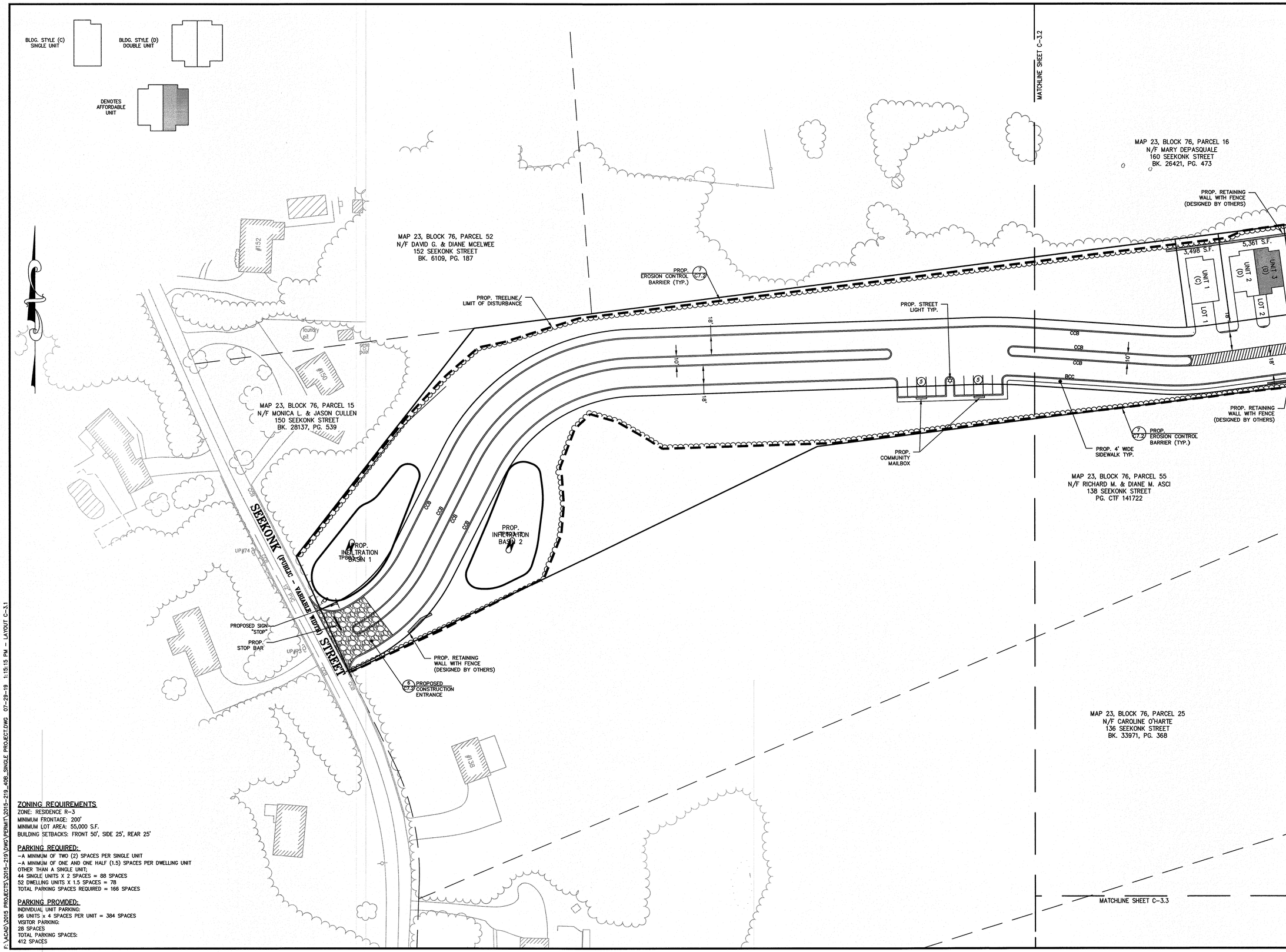


## ZONING REQUIREMENTS

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;
44 SINGLE UNITS X 2 SPACES = 88 SPACES
52 DWELLING UNITS X 1.5 SPACES = 78
TOTAL PARKING SPACES REQUIRED = 166 SPACES

## PARKING PROVIDED:

INDIVIDUAL UNIT PARKING:
96 UNITS x 4 SPACES PER UNIT = 384 SPACES
VISITOR PARKING:
28 SPACES
TOTAL PARKING SPACES:
412 SPACES


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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

# LAYOUT & MATERIALS PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MANNVILLE
CIVIL
No. 28323
7/29/19

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
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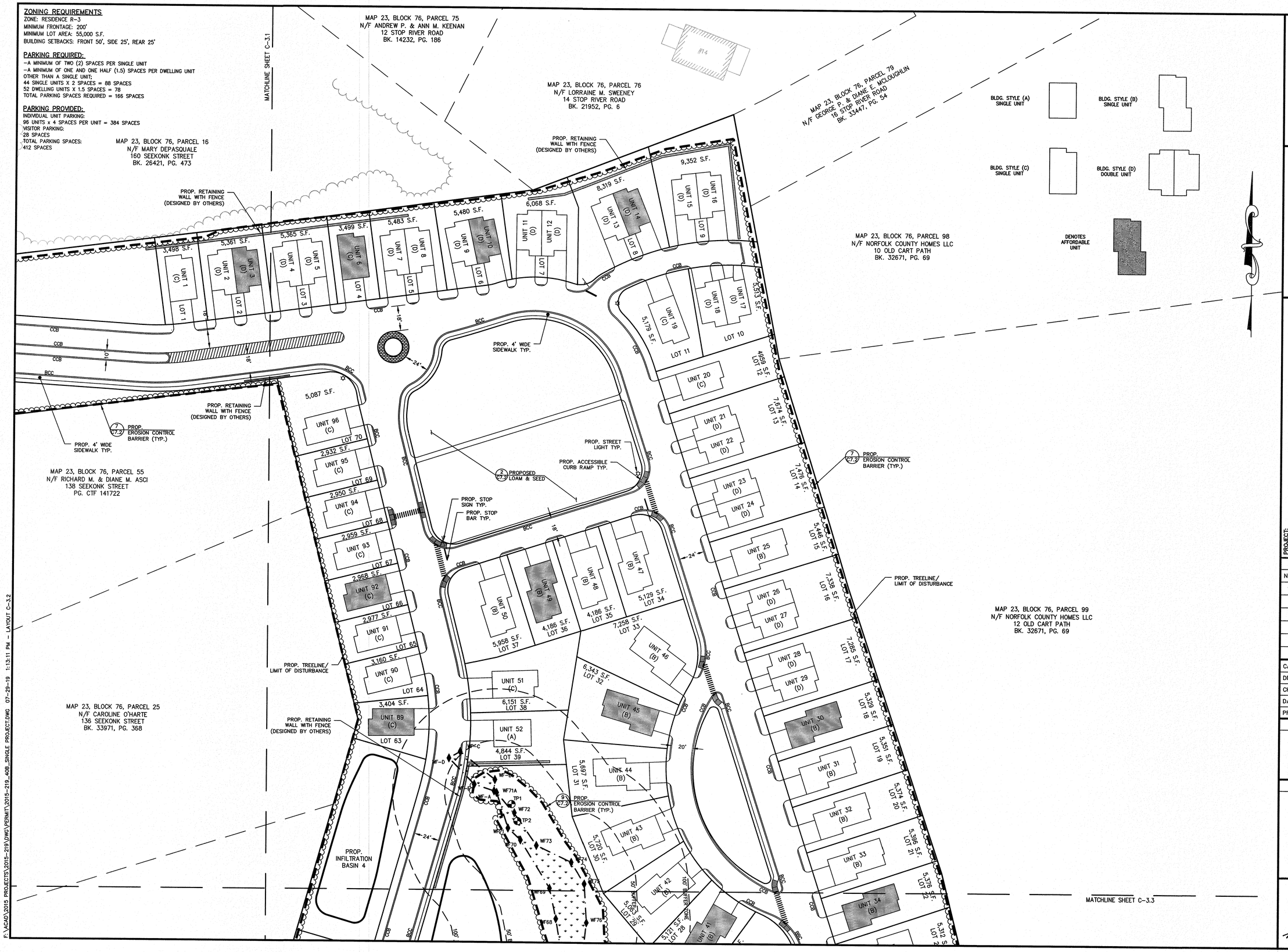



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APPLICANT: LAKELAND HILLS, LLC 136 SEEKONK STREET NORFOLK, MA 02056

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( 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
7/29/19

DRAWING NO.
C-3.2

PLAN NO. L-5239

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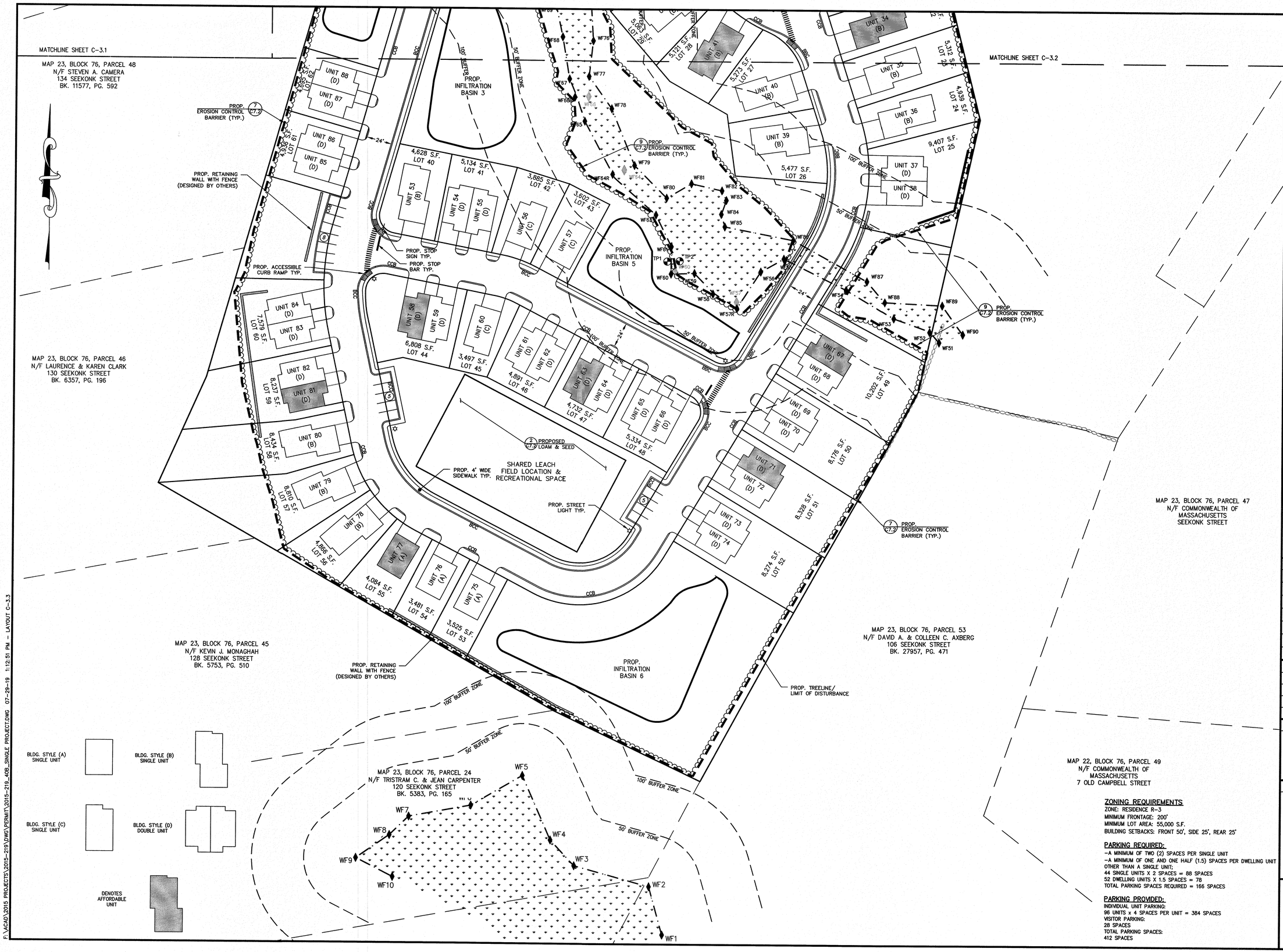


**ZONING REQUIREMENTS**

ZONE: RESIDENCE R-3
MINIMUM FRONTAGE: 200'
MINIMUM LOT AREA: 55,000 S.F.
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( IN FEET )
1 inch = 40 feet

SHEET TITLE

# LAYOUT & MATERIALS PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/25/19

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

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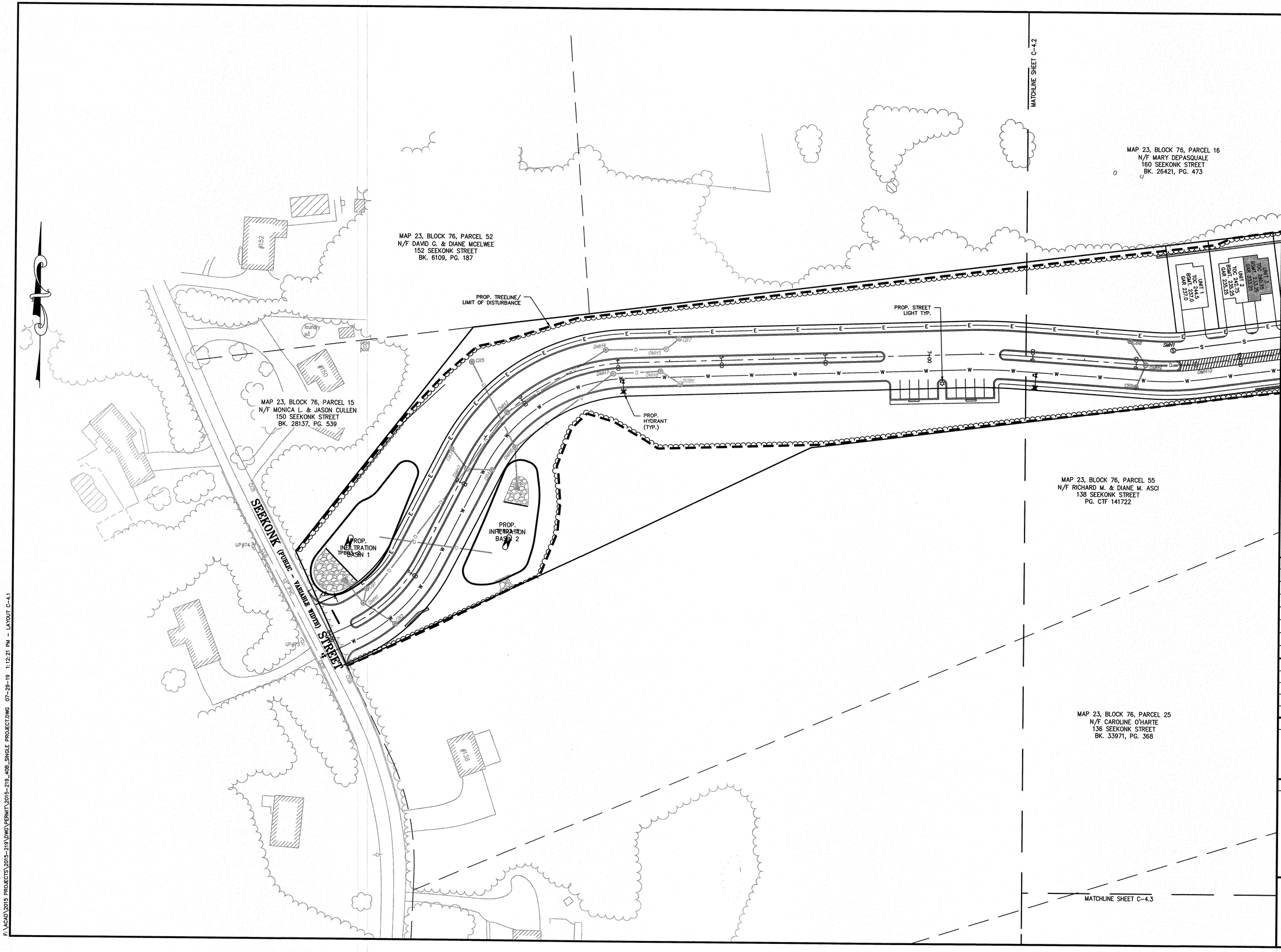



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500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963


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 | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 feet

SHEET TITLE

# UTILITY PLAN

SHEET 1 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/25/19

DRAWING NO.

C-4.1

PLAN NO. L-5239

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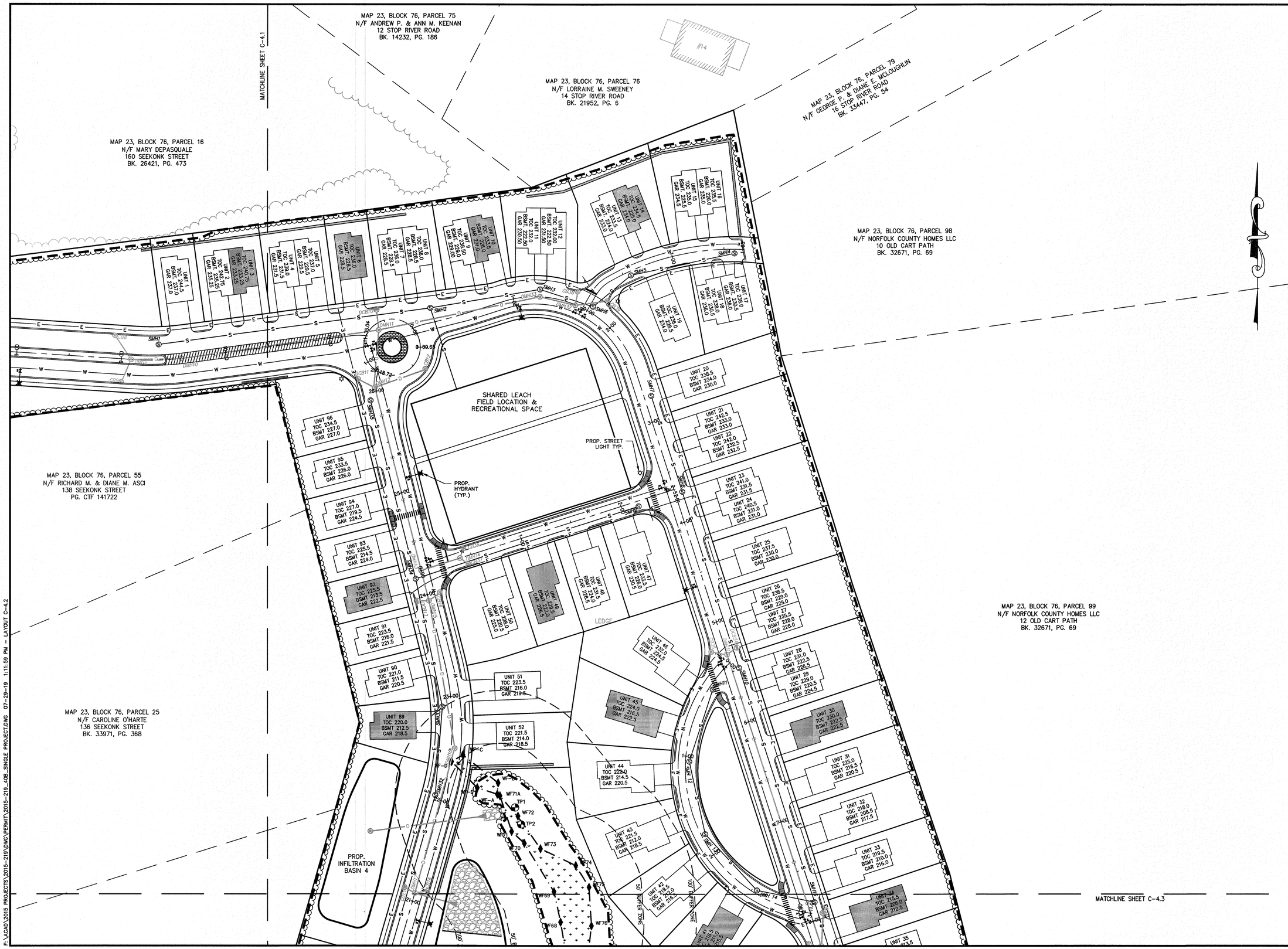



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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

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

REVISIONS

| NO. | DATE | DESCRIPTION |
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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 feet

SHEET TITLE

# UTILITY PLAN

SHEET 2 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
7/25/19

DRAWING NO.

C-4.2

PLAN NO. L-5239

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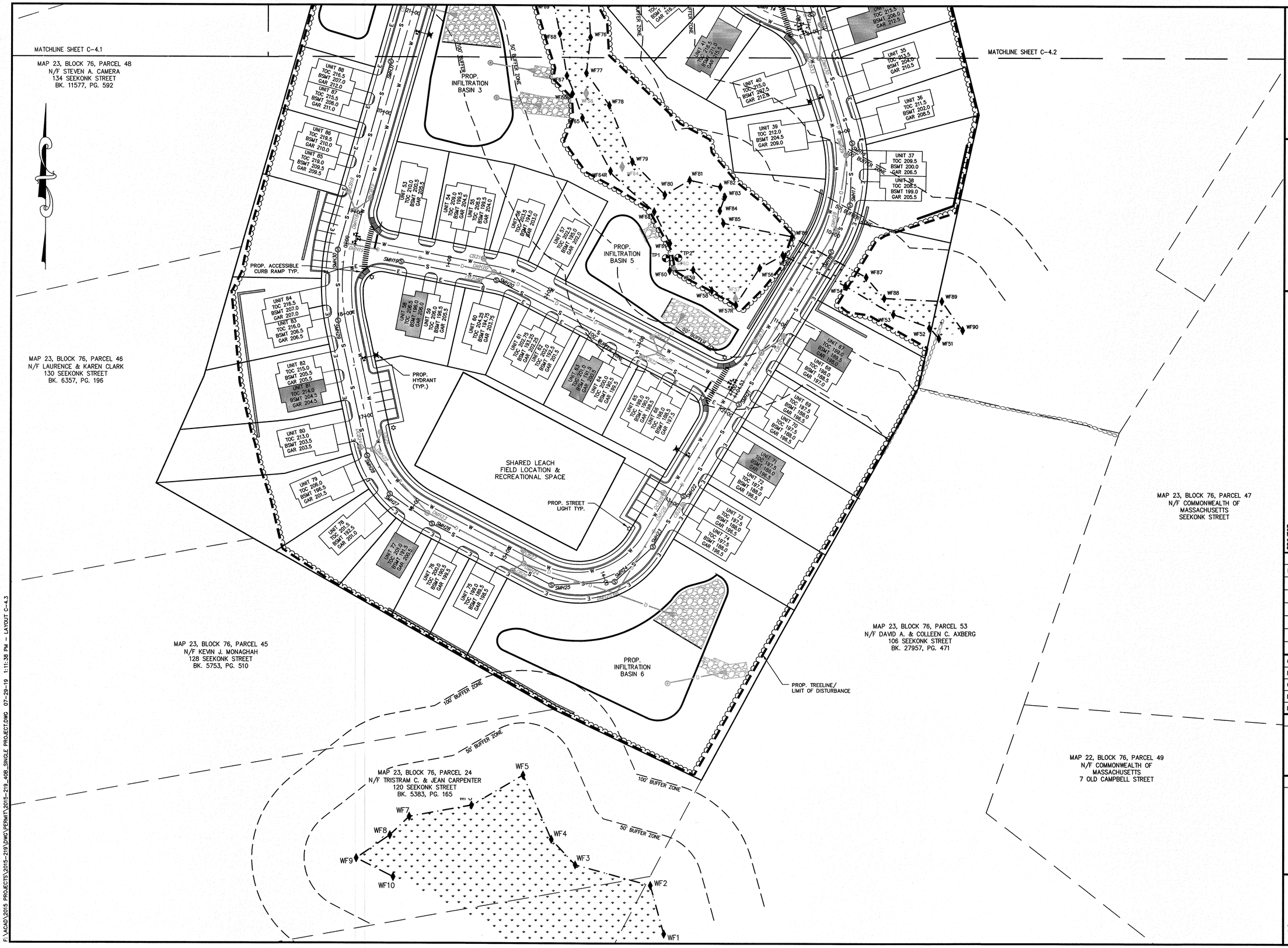



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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

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

REVISIONS

| NO. | DATE | DESCRIPTION |
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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 feet

SHEET TITLE

# UTILITY PLAN

SHEET 3 OF 3

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/25/19

DRAWING NO.

C-4.3

PLAN NO. L-5239

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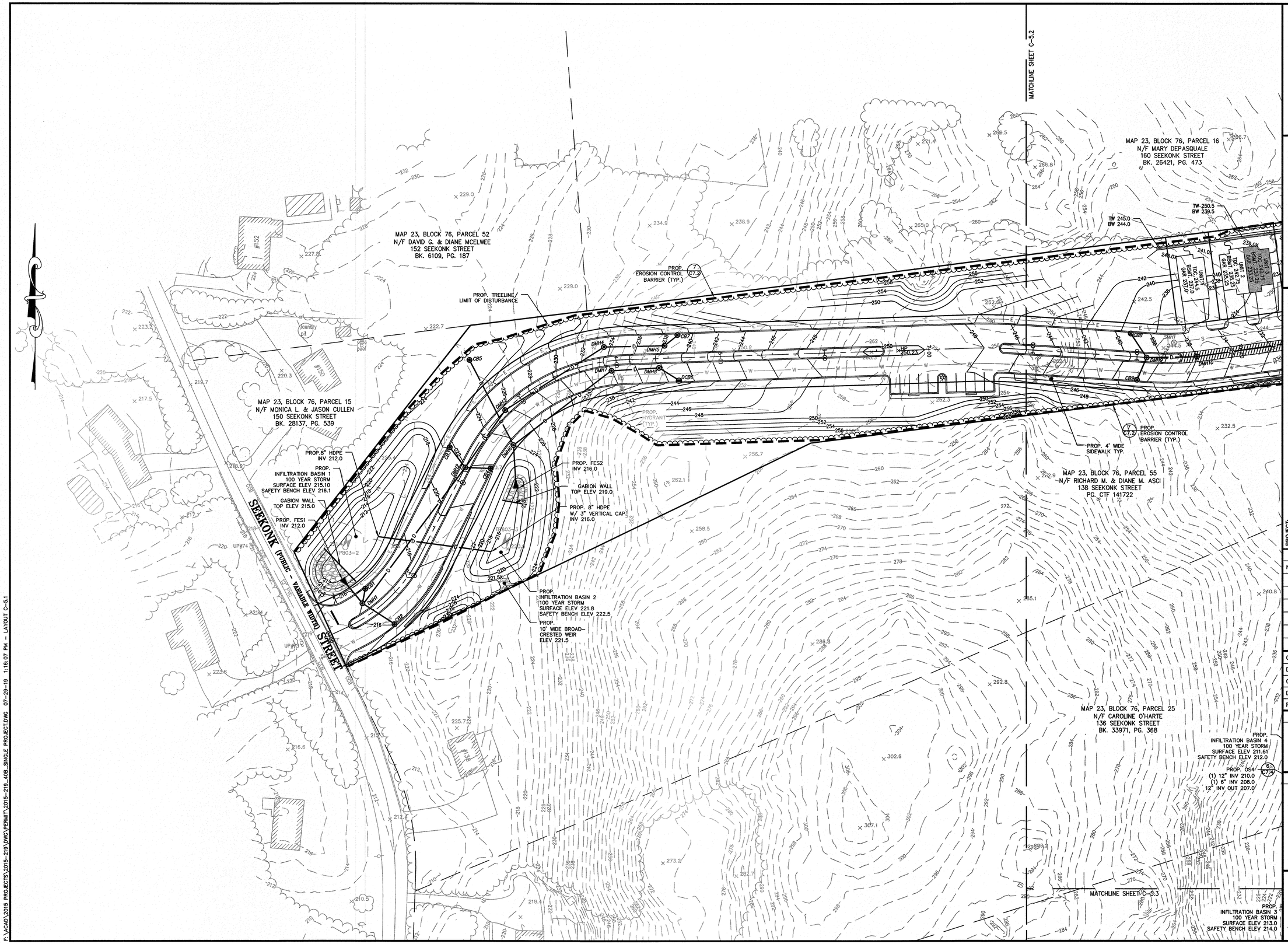



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PROJECT: LAKELAND HILLS TOWNHOUSE COMMUNITY 144 SEEKONK STREET NORFOLK, MA 02056

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

REVISIONS

| NO. | DATE | DESCRIPTION |
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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

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
7/24/19

DRAWING NO.

C-5.1

PLAN NO. L-5239

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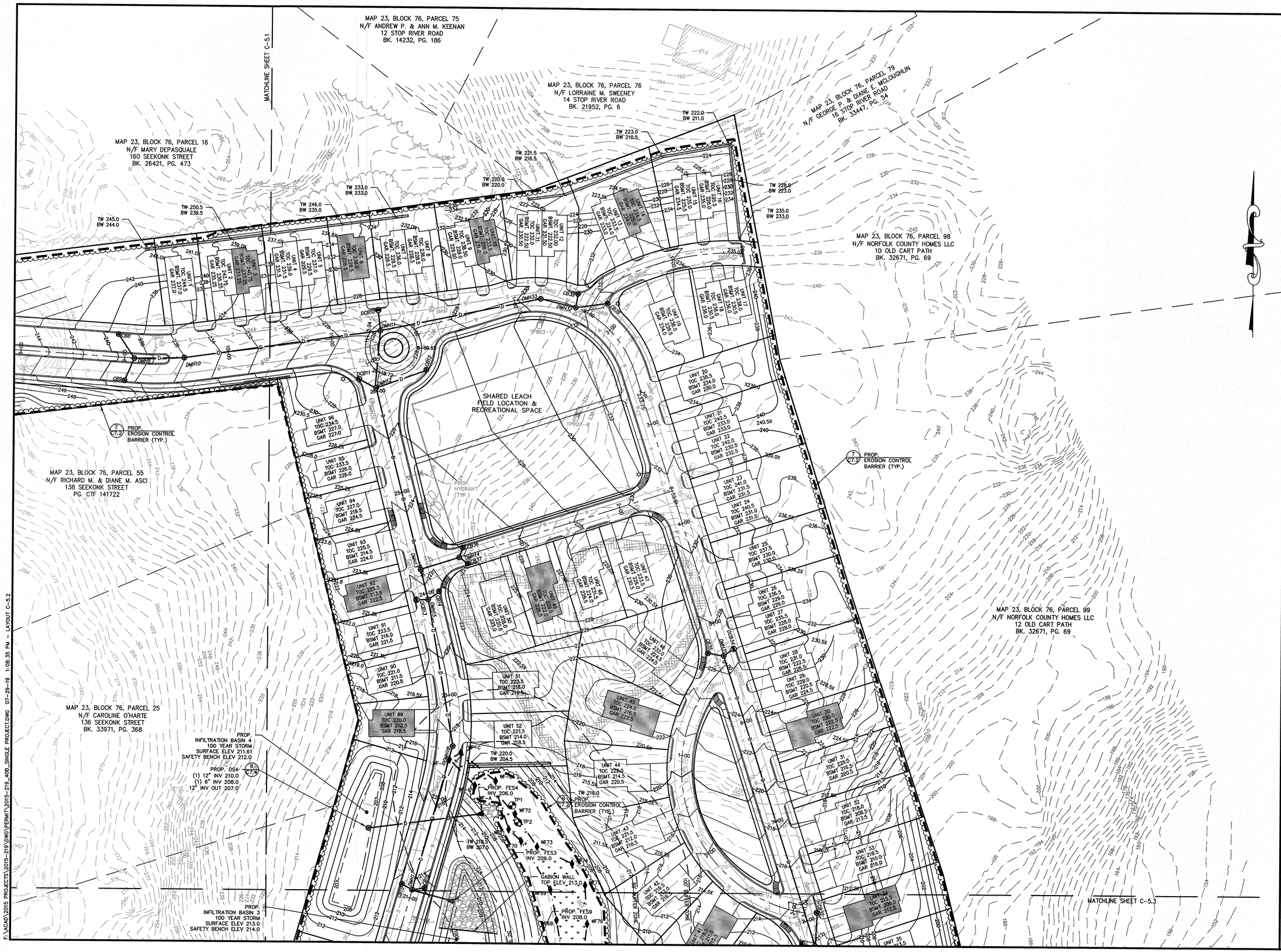


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North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963


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 |
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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

GRAPHIC SCALE

40 0 20 40 80

( 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
7/29/19

DRAWING NO.
C-5.2

PLAN NO. L-5239

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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

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| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

GRAPHIC SCALE

40 0 20 40 80

( 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
7/25/19

DRAWING NO.

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PLAN NO. L-5239

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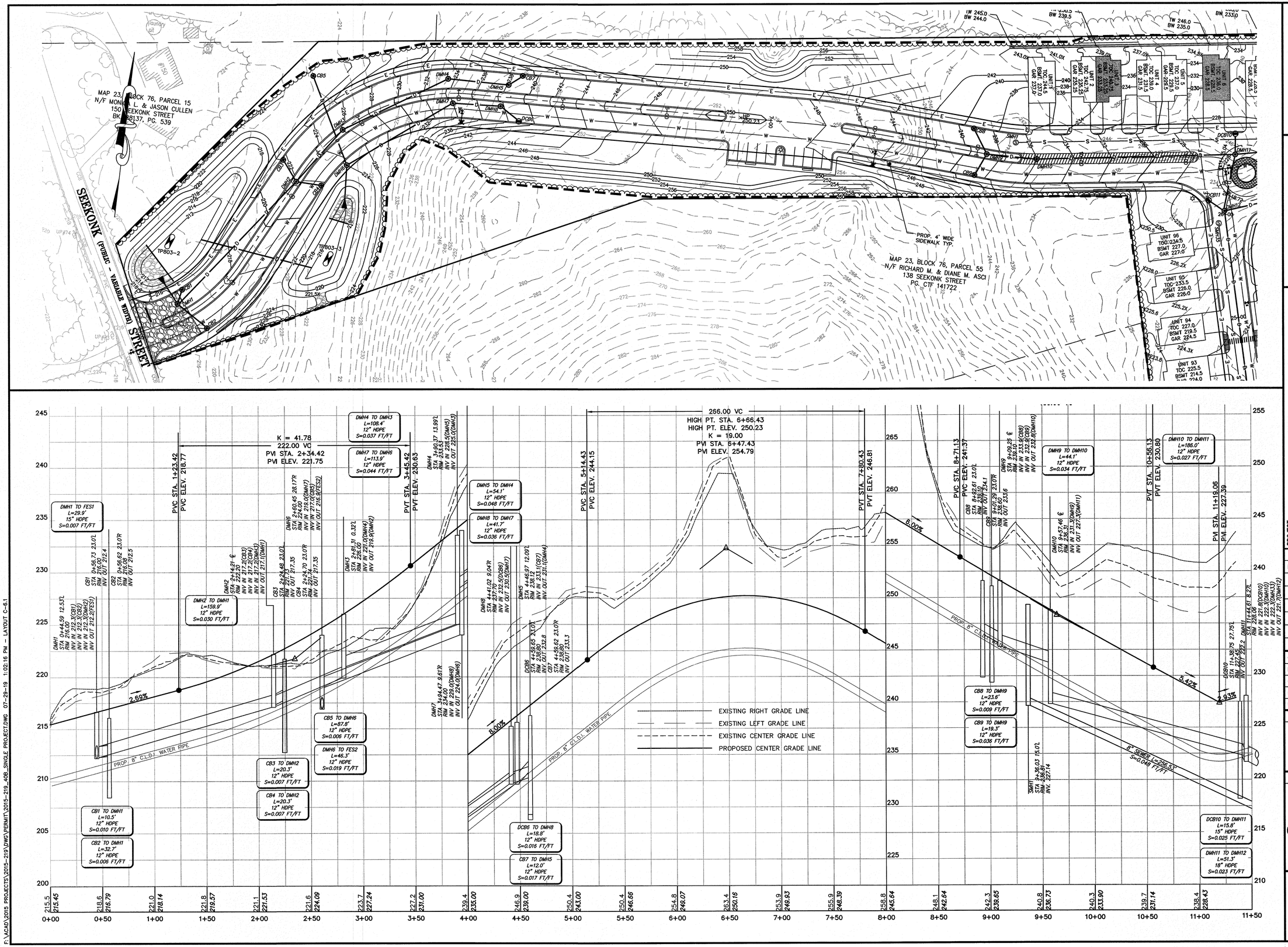



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P: 508-316-0452 F: 508-316-0963


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 | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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+26.69)

SHEET 1 OF 4

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/25/19

DRAWING NO.

C-6.1

PLAN NO. L-5239

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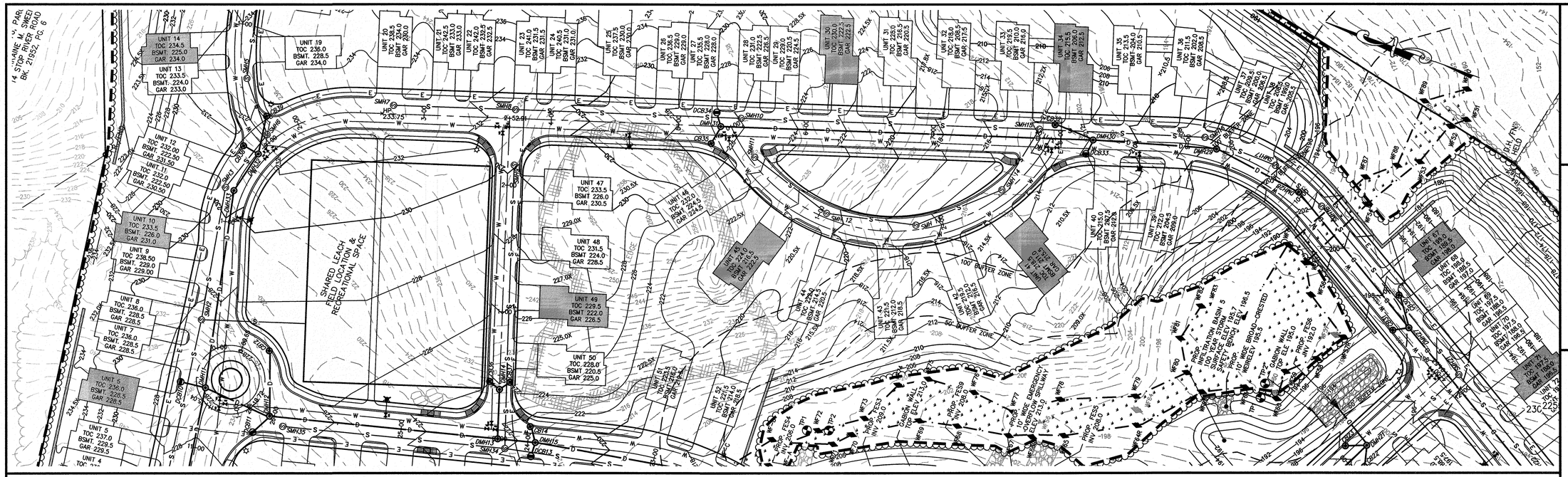


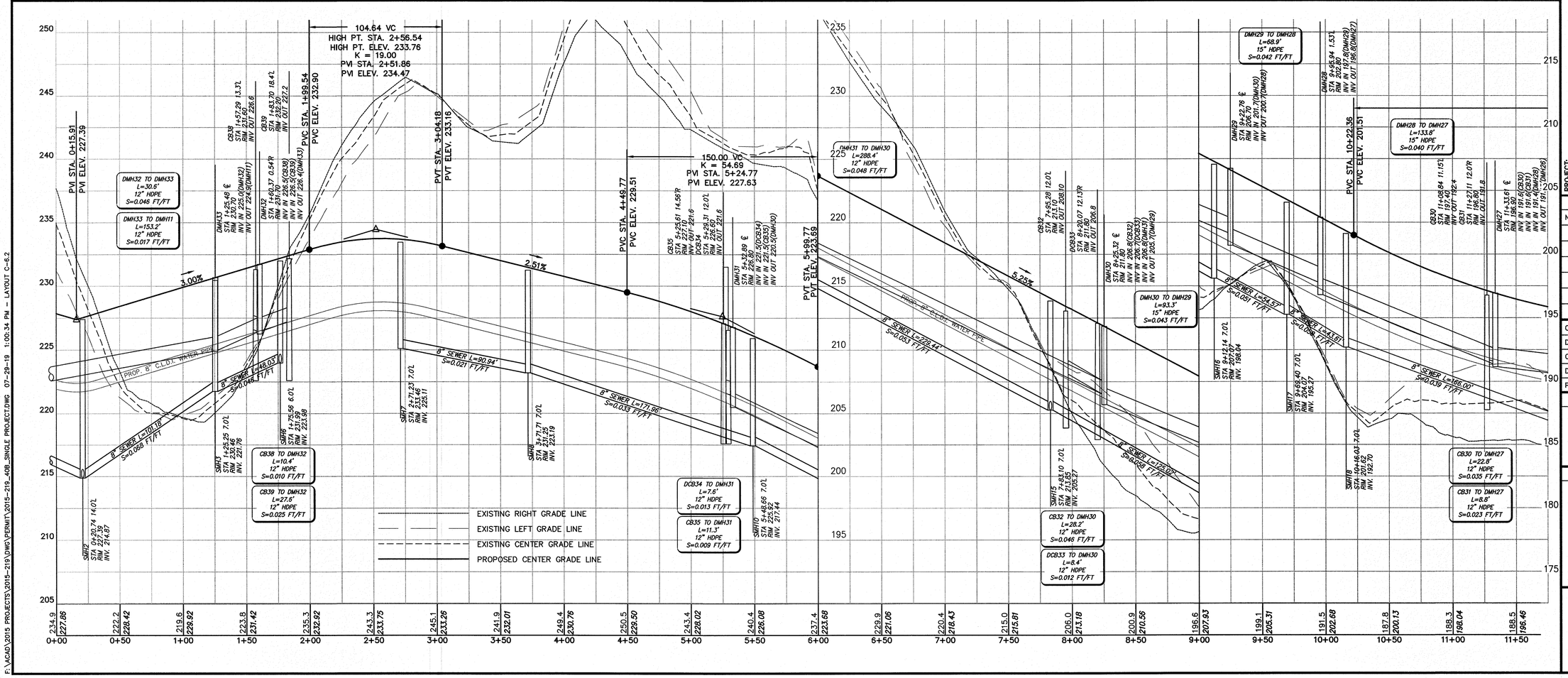



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500 East Washington Street
North Attleboro, Massachusetts 02760
P: 508-316-0452 F: 508-316-0963


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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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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. MANNVILLE
CIVIL
No. 28323
REGISTERED PROFESSIONAL ENGINEER
7/29/19

DRAWING NO.

C-6.2

PLAN NO. L-5239

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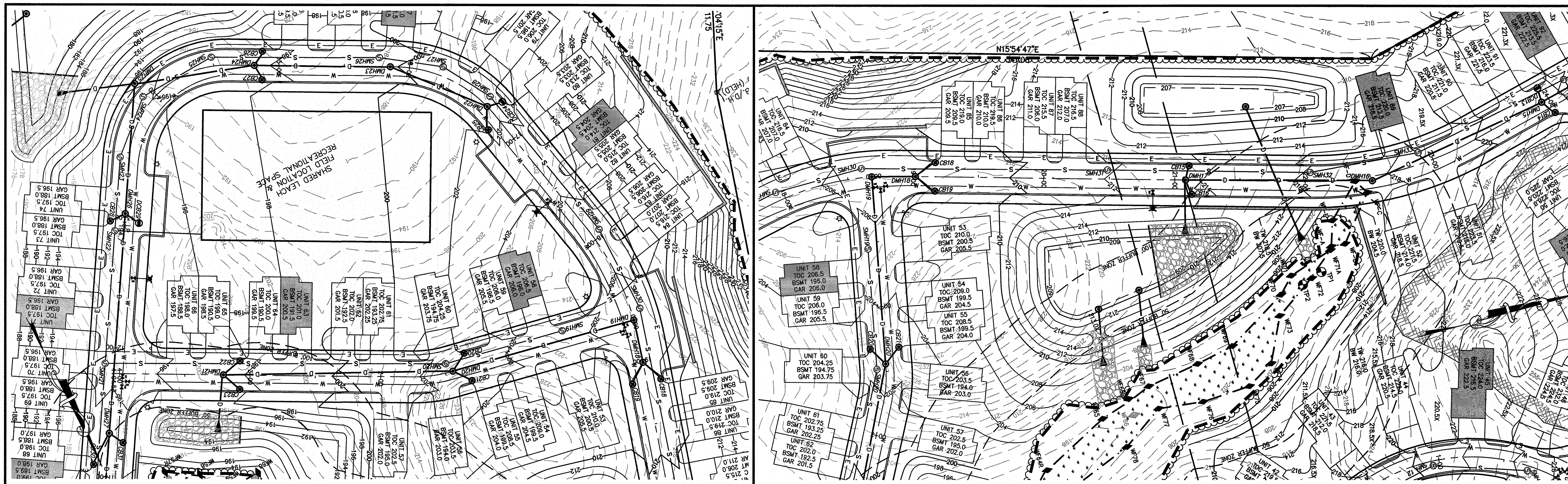


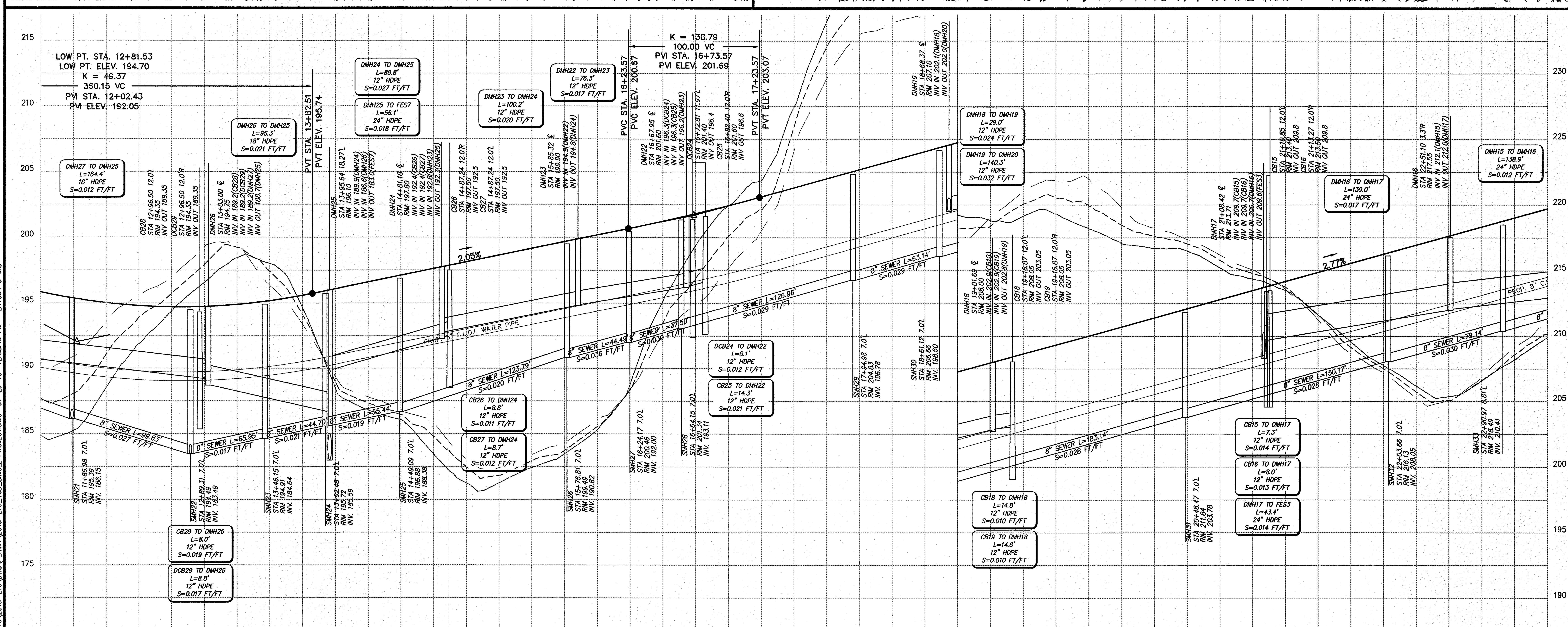


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| 196.46 | 195.38 | 194.80 | 194.74 | 195.18 | 196.09 | 197.12 | 198.14 | 199.16 | 200.19 | 201.23 | 202.44 | 203.80 | 205.19 | 206.57 | 207.95 | 209.34 | 210.72 | 212.10 | 213.49 | 214.87 | 216.25 | 217.63 | 219.02 |
| 11+50 | 12+00 | 12+50 | 13+00 | 13+50 | 14+00 | 14+50 | 15+00 | 15+50 | 16+00 | 16+50 | 17+00 | 17+50 | 18+00 | 18+50 | 19+00 | 19+50 | 20+00 | 20+50 | 21+00 | 21+50 | 22+00 | 22+50 | 23+00 |

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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 |
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| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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 11+50 TO 23+00)

SHEET 3 OF 4

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

7/29/19

DRAWING NO.

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PLAN NO. L-5239

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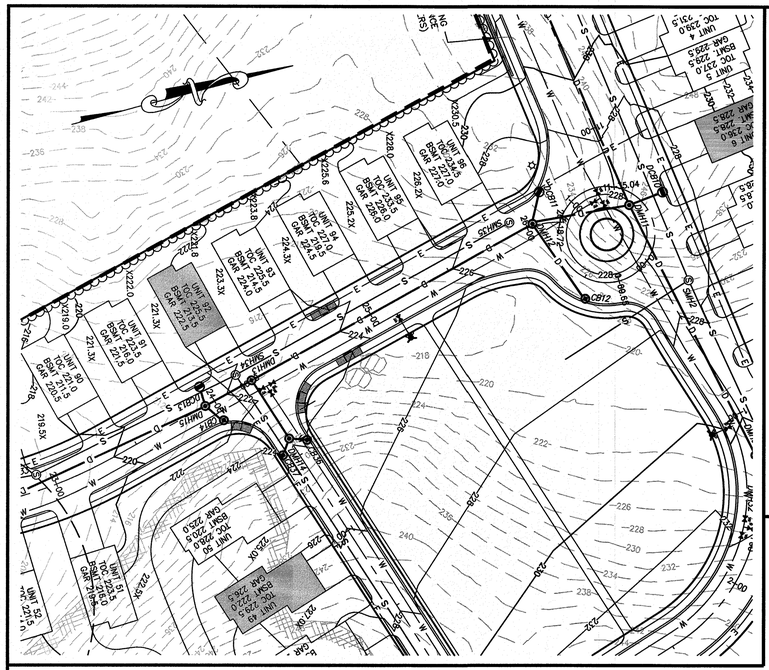

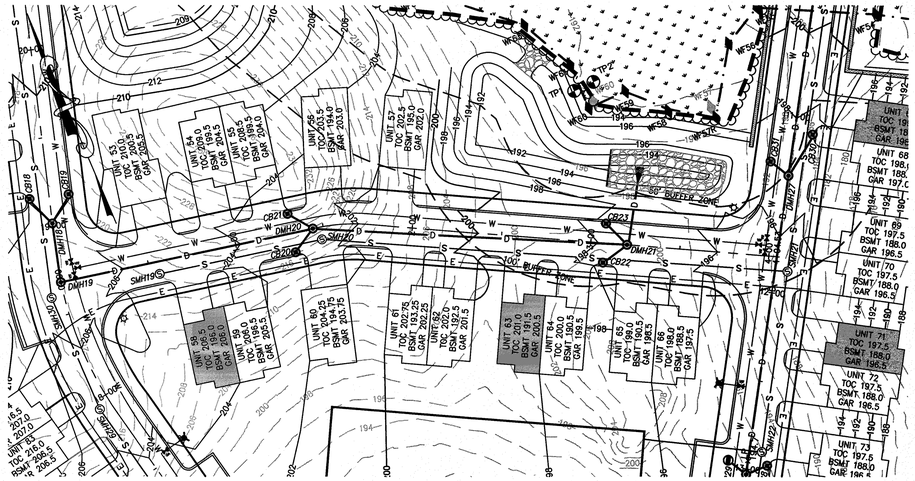

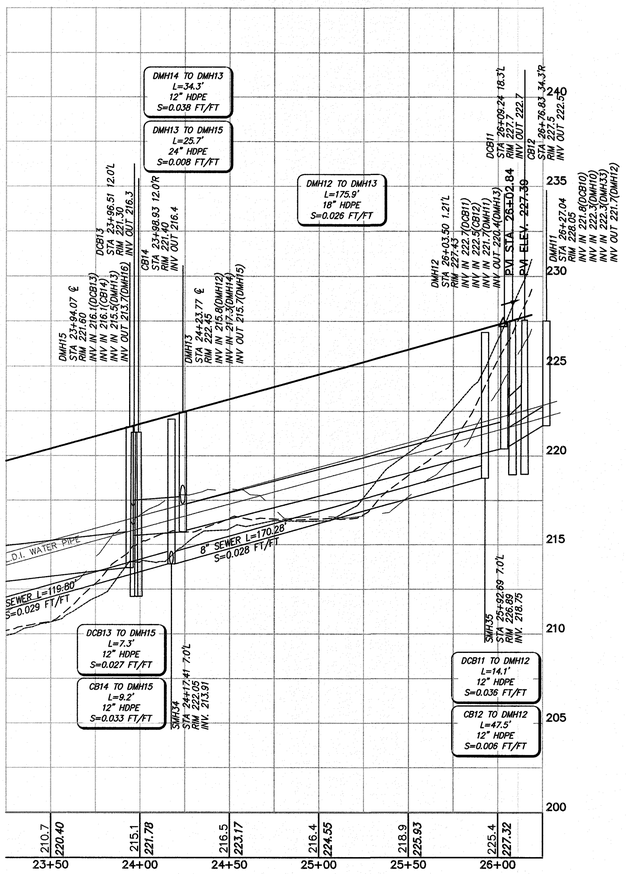


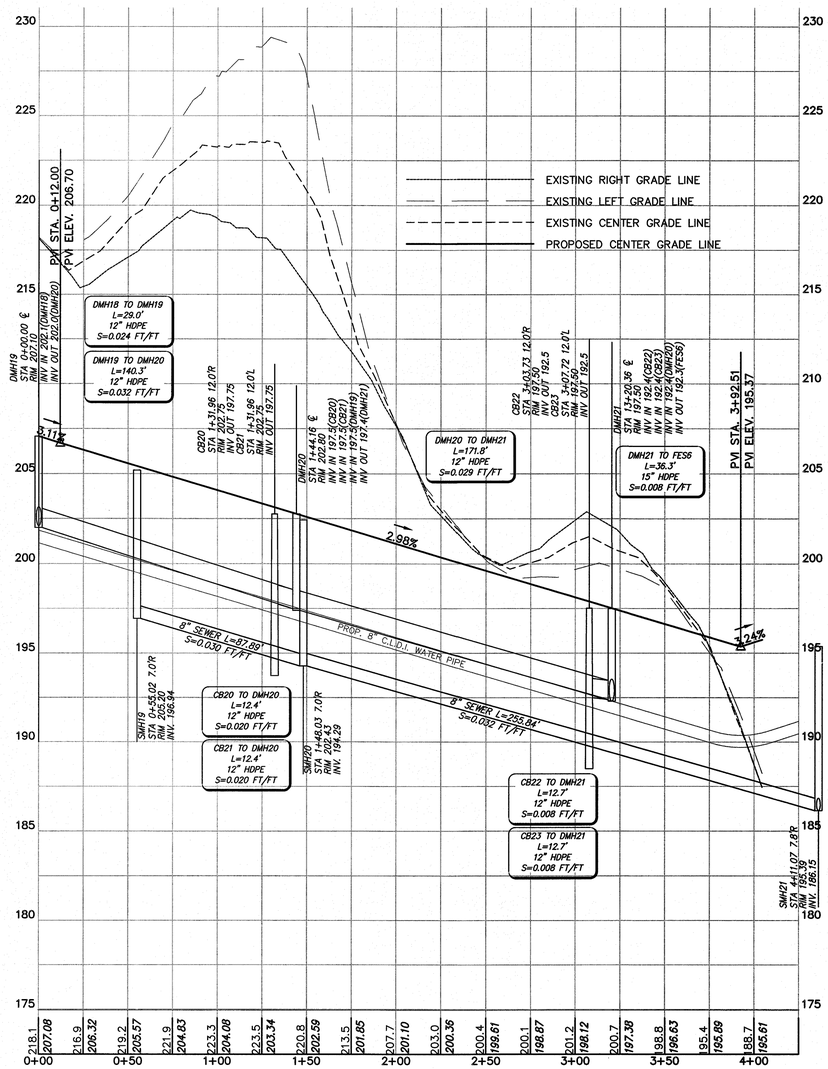



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PROJECT: LAKELAND HILLS
TOWNHOUSE COMMUNITY
144 SEEKONK STREET
NORFOLK, MA 02056

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

**REVISIONS**

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| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

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| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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 PROFILES
(STATION 23+00 TO 25+79.46)
(STATION 0+00 TO 4+03.23)

SHEET 4 OF 5

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 39323
REGISTERED PROFESSIONAL ENGINEER
7/25/19

DRAWING NO.

C-6.4

PLAN NO. L-5239

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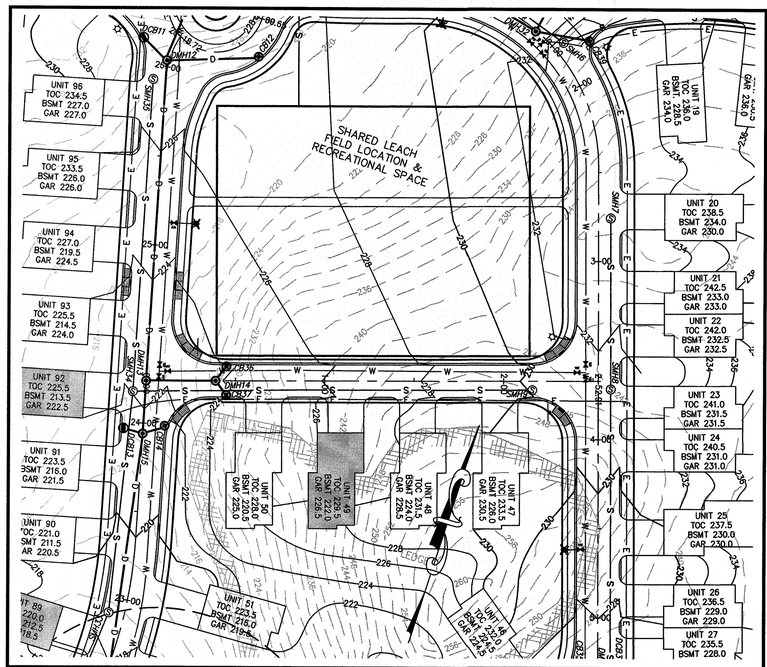


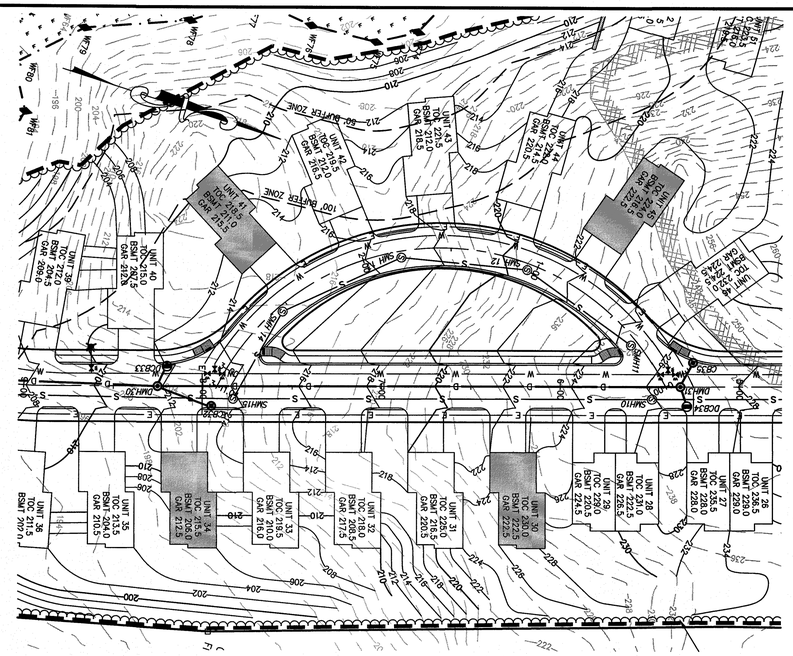


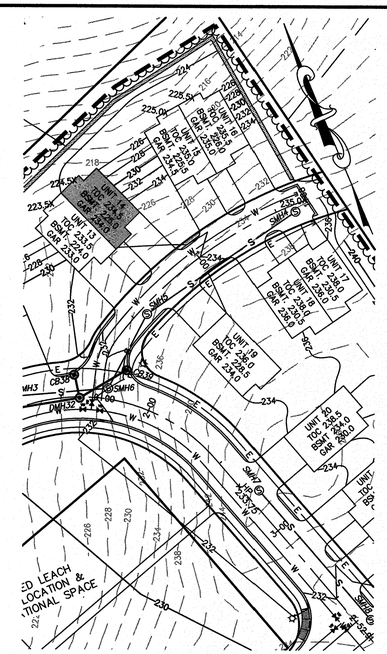


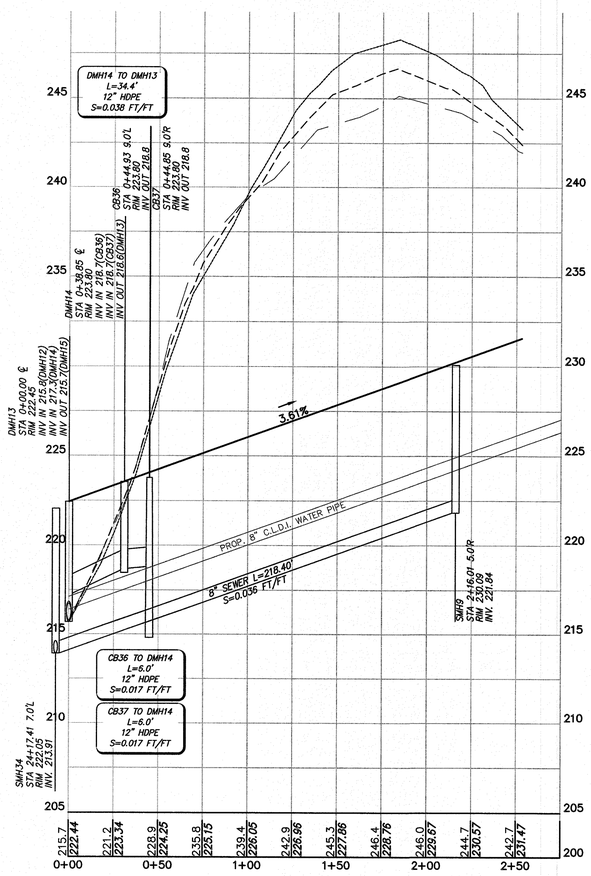


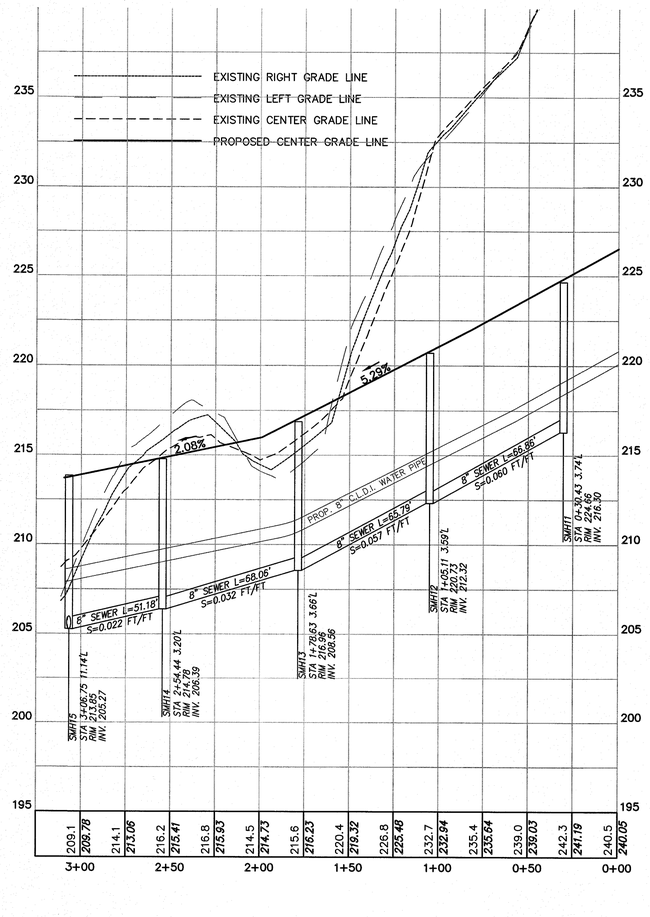


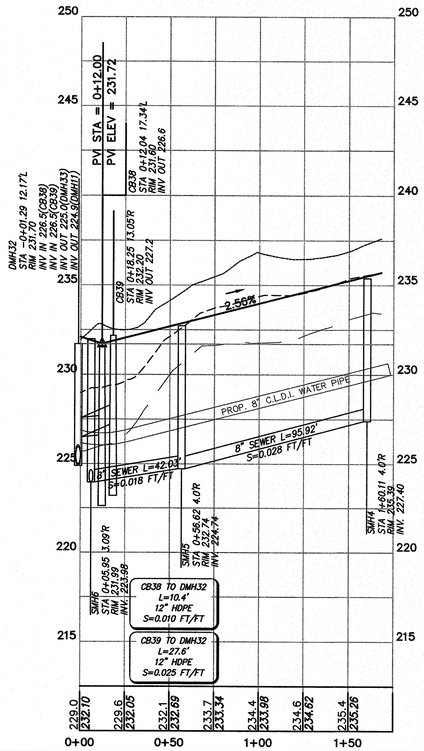



**ASE**

**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 |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| 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 PROFILES

(STATION 0+00 TO 2+52.91)
(STATION 0+00 TO 3+04.17)
(STATION 0+00 TO 1+76.37)

SHEET 5 OF 5

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 26323
REGISTERED PROFESSIONAL ENGINEER
7/29/19

DRAWING NO.

C-6.5

PLAN NO. L-5239

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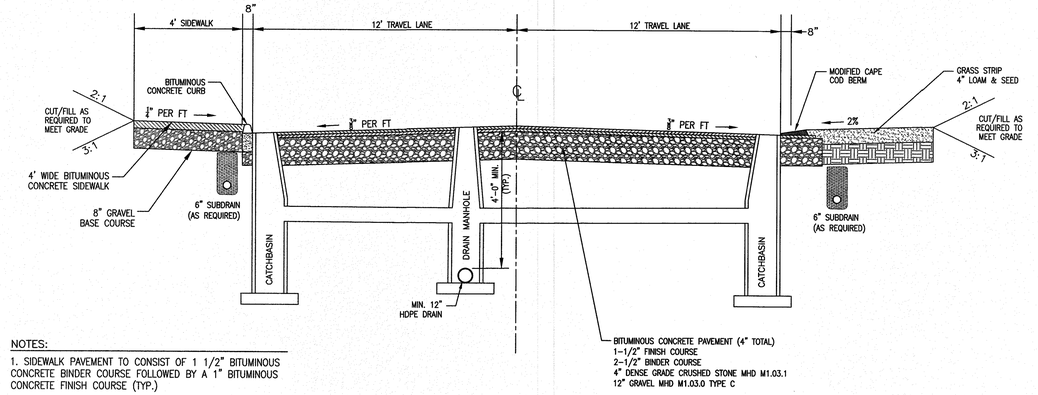
F:\ACAD\2015 PROJECTS\2015-219\DWG\PERMIT\2015-219_40B_SINGLE PROJECT.DWG 07-29-19 12:55:12 PM - LAYOUT C-6.5



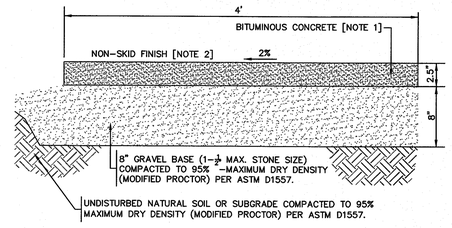

NOTES:

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

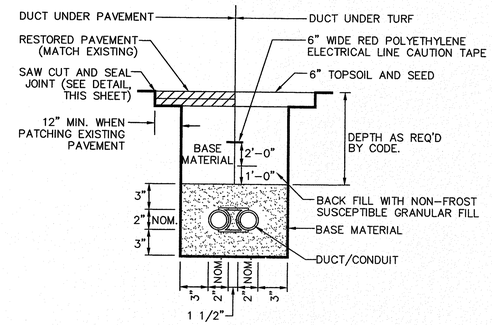
## 1 ROADWAY CROSS SECTION
SCALE: N.T.S.

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.



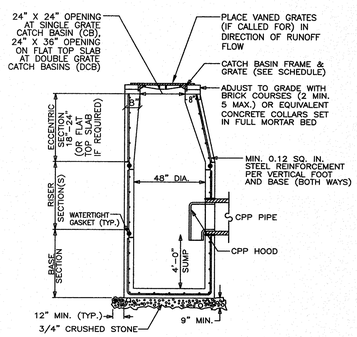

## 2 BITUMINOUS CONCRETE SIDEWALK
SCALE: N.T.S.



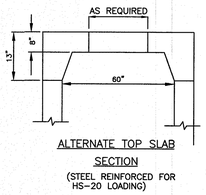

## 3 UNENCASED DUCT/CONDUIT DETAIL
SCALE: N.T.S.

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.




SECTION

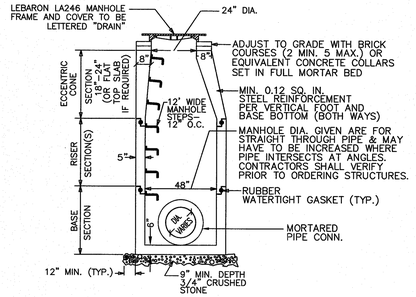



ALTERNATE TOP SLAB SECTION
(STEEL REINFORCED FOR HS-20 LOADING)

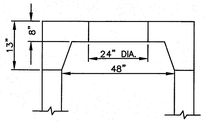
## 4 PRECAST CONCRETE SINGLE GRATE (CB) CATCH BASIN & DOUBLE GRATE (DCB) DEEP SUMP CATCH BASIN
SCALE: N.T.S.

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.

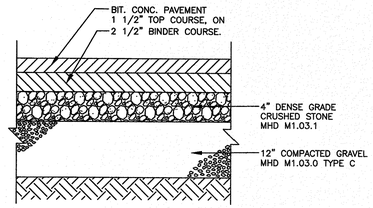



SECTION

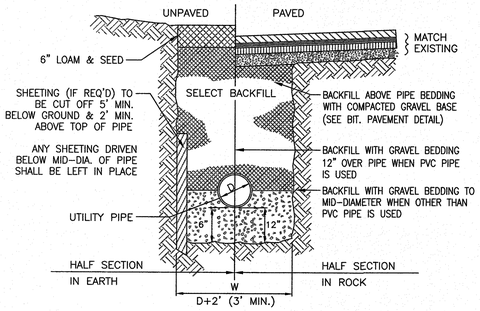



ALTERNATE TOP SLAB SECTION
(STEEL REINFORCED FOR HS-20 LOADING)

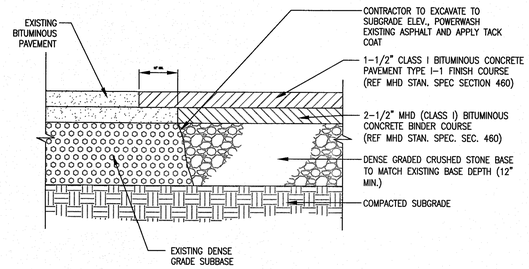
## 5 TYPICAL PRECAST CONCRETE 48" DIAMETER DRAIN MANHOLE (DMH) FOR PIPE DIAMETERS 24" OR LESS
SCALE: N.T.S.



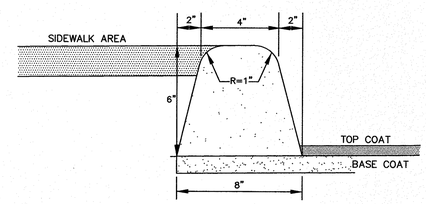

## 6 BITUMINOUS CONCRETE PAVEMENT DETAIL
SCALE: N.T.S.




## 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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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 | TRB, RJF |
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| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 1 OF 6

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MARVILLE
CIVIL
No. 28323
7/22/19

DRAWING NO.

C-7.1

PLAN NO. L-5239

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P:\ACAD\2015 PROJECTS\2015-219 LAKELAND HILLS\DWG\PERMIT\2015-219 LAKELAND HILLS 40B SINGLE PROJECT.DWG 07/25/19 10:07:21 AM -- LJAYCOUT 0-7.1

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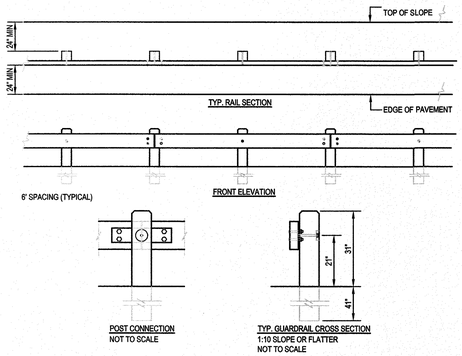
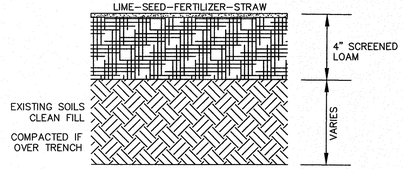
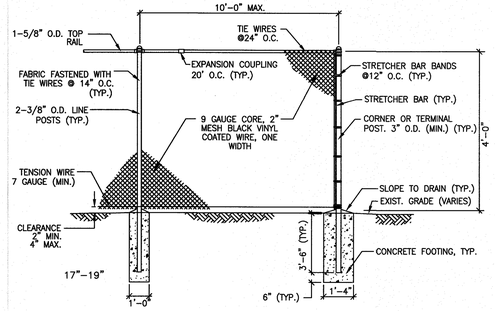



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. IF TOP OF SLOPE IS CLOSER THAN 24" INCREASE POST LENGTH TO 7'.
4. DRIVE POSTS OR AUGER, BACKFILL WITH NATIVE SOIL AND COMPACT EVERY 12".
5. ALL TIMBER #1 S4S SOUTHERN PINE, PRESSURE TREATED: AWPA-C14, WOOD FOR USE IN HWY. CONSTR.
6. TYP. POST: 8" X 8" X 8' - 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.

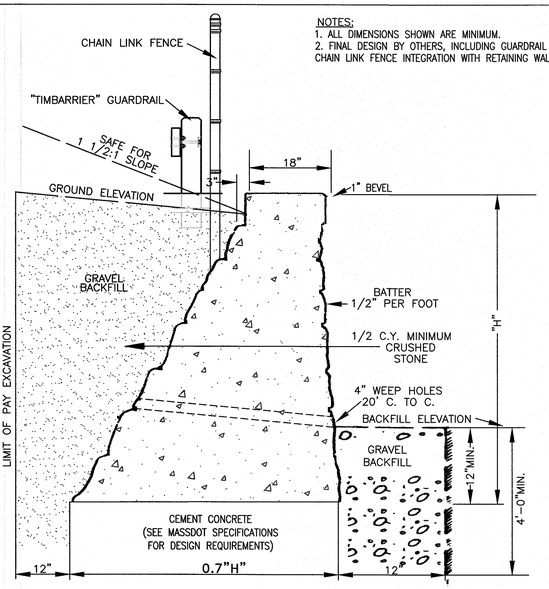



## 2 LOAM & SEED DETAIL
SCALE: N.T.S.



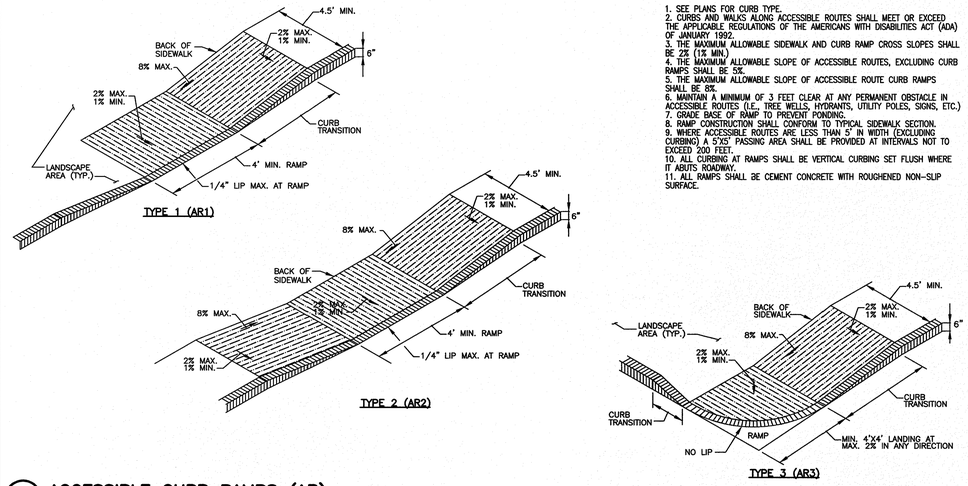

## 3 CHAIN LINK FENCE (CLF)
SCALE: N.T.S.

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

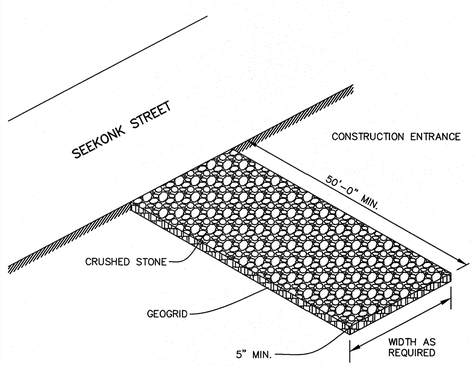



## 4 CONCRETE RETAINING WALL
SCALE: N.T.S.

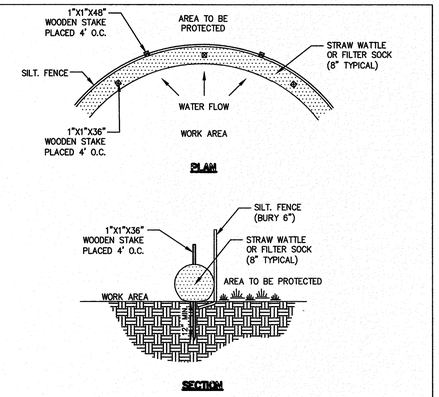
NOTES:
1. SEE PLANS FOR CURB TYPE.
2. CURBS AND WALKS ALONG ACCESSIBLE ROUTES SHALL MEET OR EXCEED THE APPLICABLE REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) OF JANUARY 1992.
3. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 2% (1% MIN.)
4. THE MAXIMUM ALLOWABLE SLOPE 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.



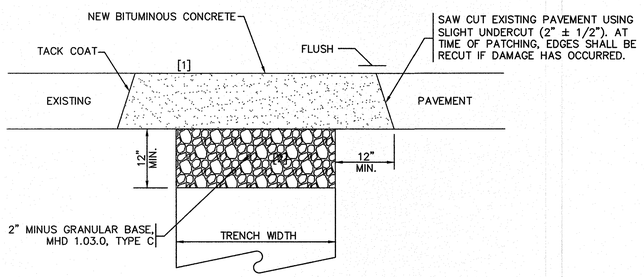

## 5 ACCESSIBLE CURB RAMPS (AR)
SCALE: N.T.S.




## 6 CONSTRUCTION ENTRANCE
SCALE: N.T.S.

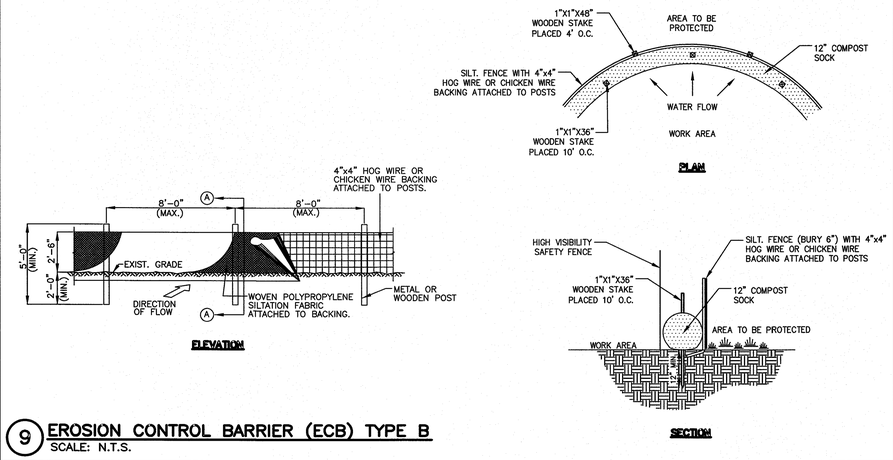



## 7 EROSION CONTROL BARRIER (ECB) TYPE A
SCALE: N.T.S.




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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SHEET TITLE

CONSTRUCTION DETAILS

SHEET 2 OF 6

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RICHARD M. MAINVILLE
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DRAWING NO.
C-7.2

PLAN NO. L-5239

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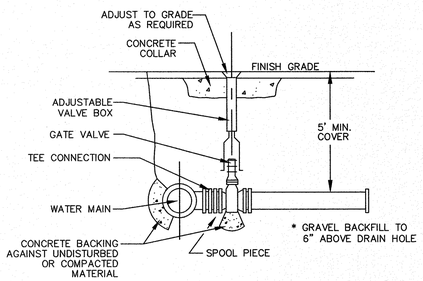
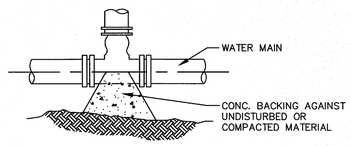
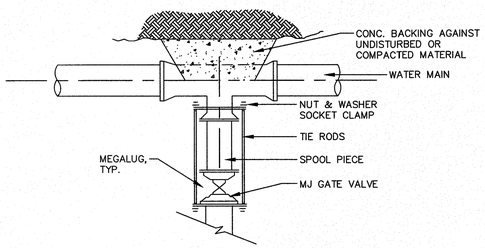



TYPICAL VALVE DETAIL

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

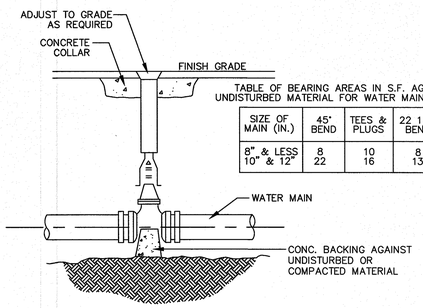
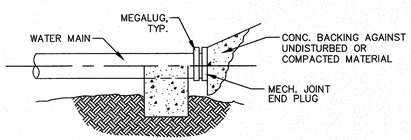


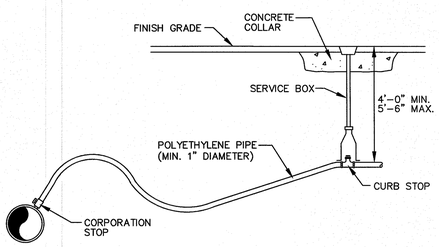

TABLE OF BEARING AREAS IN S.F. AGAINST UNDISTURBED MATERIAL FOR WATER MAIN FITTINGS

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

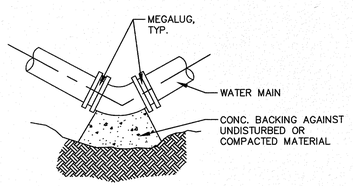
TYPICAL VALVE




TYPICAL PLUG DETAIL




TYPICAL WATER SERVICE DETAIL

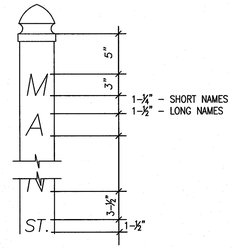


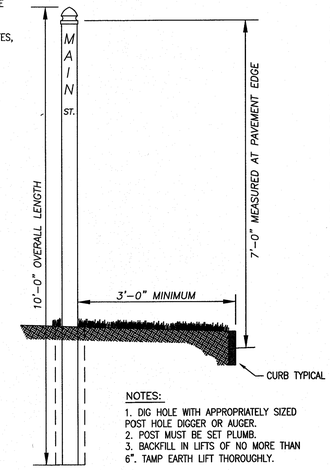

TYPICAL BEND DETAIL

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

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

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



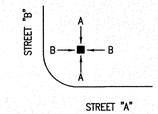

NOTES:
1. DIG HOLE WITH APPROPRIATELY SIZED POST HOLE DIGGER OR AUGER.
2. POST MUST BE SET PLUMB.
3. BACKFILL IN LIFTS OF NO MORE THAN 6". TAMP EARTH LIFT THOROUGHLY.

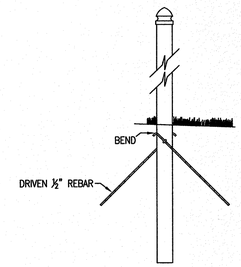
LETTERING:
1. HELVETICA MEDIUM STYLE
2. VINYL – FOR EXTERIOR USE
3. PRESSURE SENSITIVE ADHESIVE
4. REFLECTIVE BLACK
5. STREET NAME – 3" HIGH LETTERS
6. DESIGNATION (ST, DR, ETC) 1-½" HIGH

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*

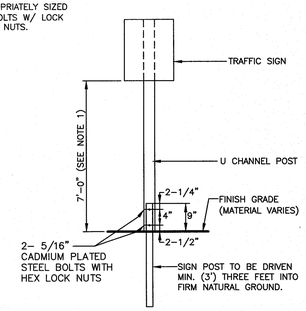



PULL UP DETERRANT:
1. STAINLESS STEEL EYEBOLTS AND NUTS
2. SNUG NUTS ONLY – DO NOT OVERTIGHTEN
3. DRIVEN ½" REBAR 2 FOOT MINIMUM LENGTH

## 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.

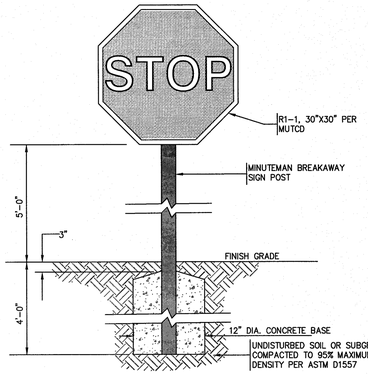



## 3 TYPICAL BREAKAWAY SIGN POST DETAIL
SCALE: N.T.S.

| 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 |

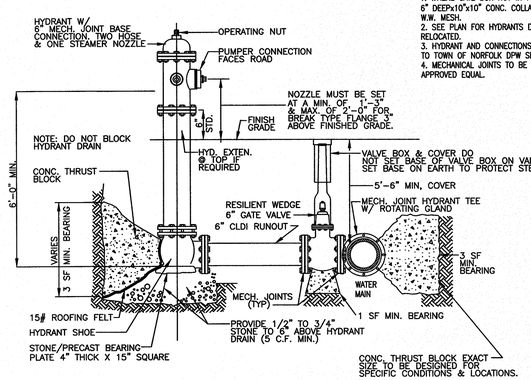
NOTES:
1. ALL SIGNS ARE REFLECTORIZED AND HAVE 7'-0" CHANNEL MOUNTING HEIGHT.
2. ALL REGULATORY SIGNS SHALL MEET THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

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




## 5 STOP SIGN
SCALE: N.T.S.

NOTES:
1. WHERE GATE BOX NOT IN PAVEMENT, POUR 6" DEEPx10'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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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 |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 3 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MANVILLE CIVIL No. 28323
7/25/19

DRAWING NO. C-7.3

PLAN NO. L-5239

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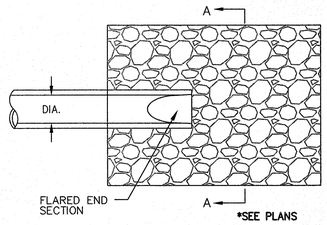
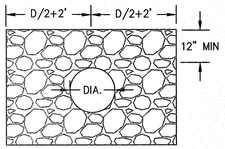
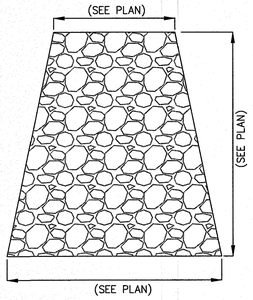
NOTES:

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.



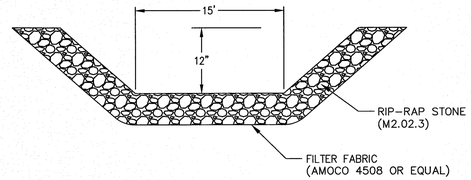




SECTION A-A
NTS




TYPICAL OUTFALL RIP-RAP APRON

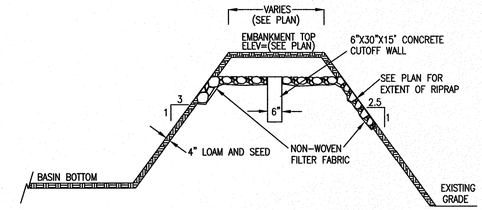
## 1 STONE RIP-RAP FOR PIPE ENDS
SCALE: N.T.S.




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

NOTES:

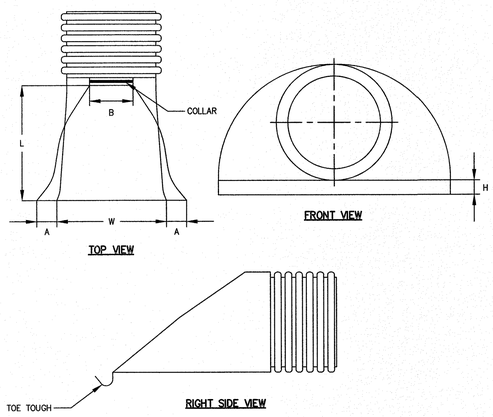
1. EMBANKMENT TO BE CONSTRUCTED OF CLEAN FILL FREE OF ORGANIC SOILS/MATERIALS WITH NO STONES OVER 12" MAX. DIMENSION. EMBANKMENT TO TO BE CONSTRUCTED IN COMPACTED LIFTS NOT TO EXCEED 8".
2. BASIN BOTTOM AND SIDE SLOPES (INSIDE AND OUT) TO BE COVERED WITH 4" LOAM AND SEED.
3. RIPRAP SPILLWAY STONE TO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



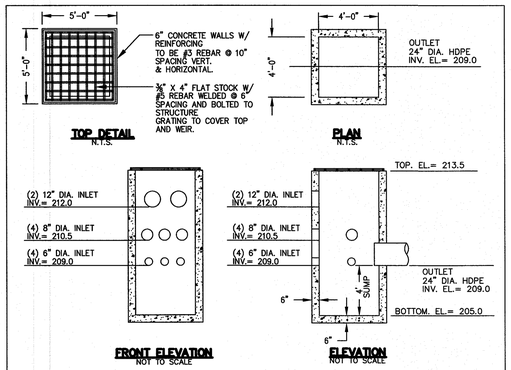

SECTION

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

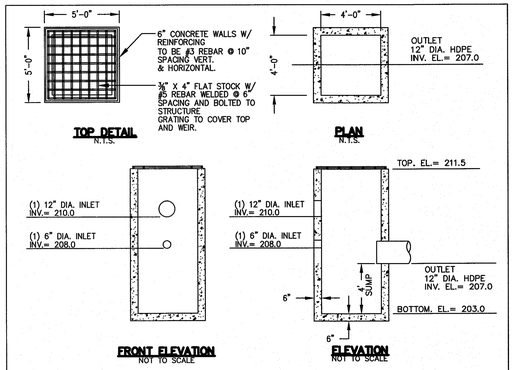
| PIPE DIAMETER (INCHES) | | | | | | |
|---|---|---|---|---|---|---|
| DIAMETER (INCHES) | 12 | 15 | 18 | 24 | 30 | 36 |
| A (INCHES) | 6.5 | 6.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| B (MAX) (INCHES) | 10.0 | 10.0 | 15.0 | 18.0 | 22.0 | 25.0 |
| H (INCHES) | 6.5 | 6.5 | 6.5 | 6.5 | 8.6 | 8.6 |
| L (INCHES) | 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 |



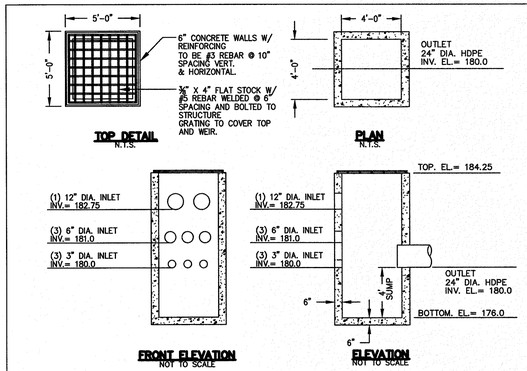

## 4 CORRUGATED POLYETHYLENE FLARED-END SECTION (FES)
SCALE: N.T.S.



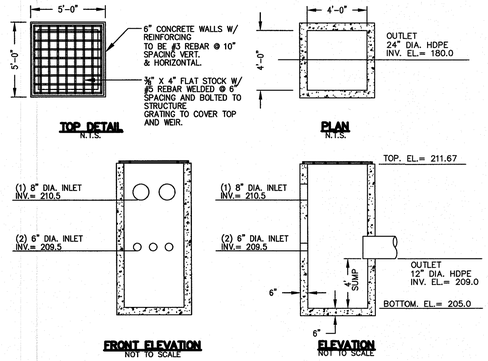

## 5 OUTLET STRUCTURE (OS3) - ORIFICE/GRATE DETAIL
SCALE: N.T.S.




## 6 OUTLET STRUCTURE (OS4) - ORIFICE/GRATE DETAIL
SCALE: N.T.S.




## 7 OUTLET STRUCTURE (OS6) - ORIFICE/GRATE DETAIL
SCALE: N.T.S.




## 8 OUTLET STRUCTURE (OS3B) - ORIFICE/GRATE DETAIL
SCALE: N.T.S.

9

10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Land Surveying - Civil Engineering - Site Planning

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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 |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 4 OF 6

COMMONWEALTH OF MASSACHUSETTS
RICHARD M. MAINVILLE
CIVIL
No. 38503
7/25/19

DRAWING NO.

C-7.4

PLAN NO. L-5239

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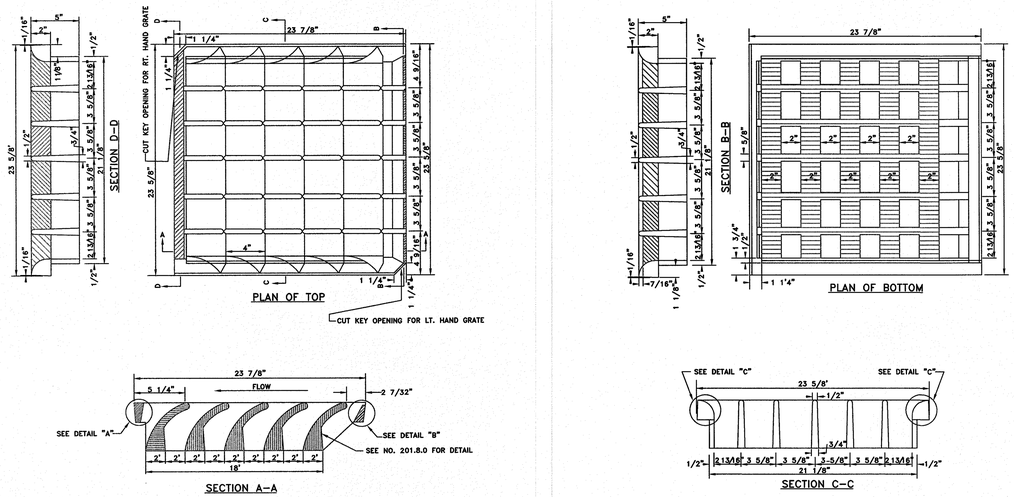
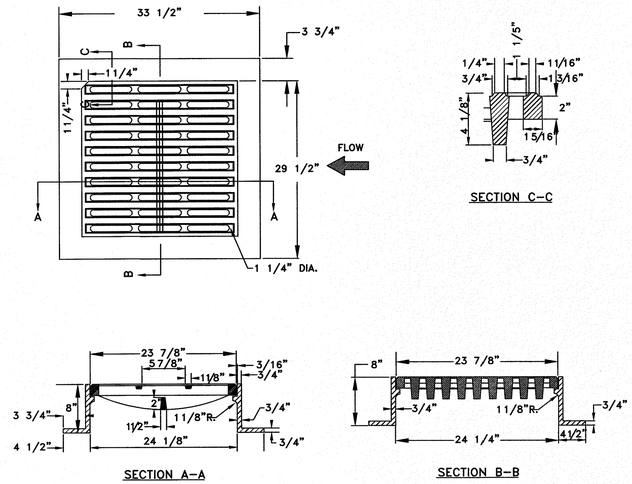
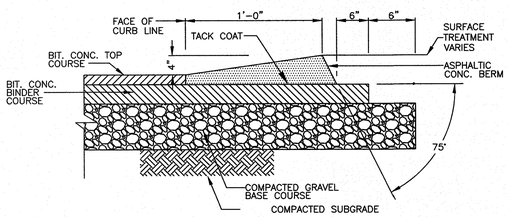



## 1 CASCADE CATCH BASIN GRATE (LEBARON LK120D)
SCALE: N.T.S.

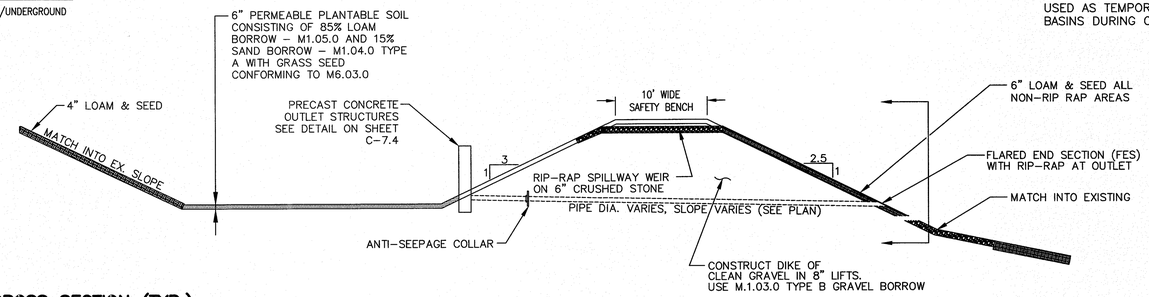



## 2 CATCH BASIN GRATE (LEBARON LF248–2)
SCALE: N.T.S.



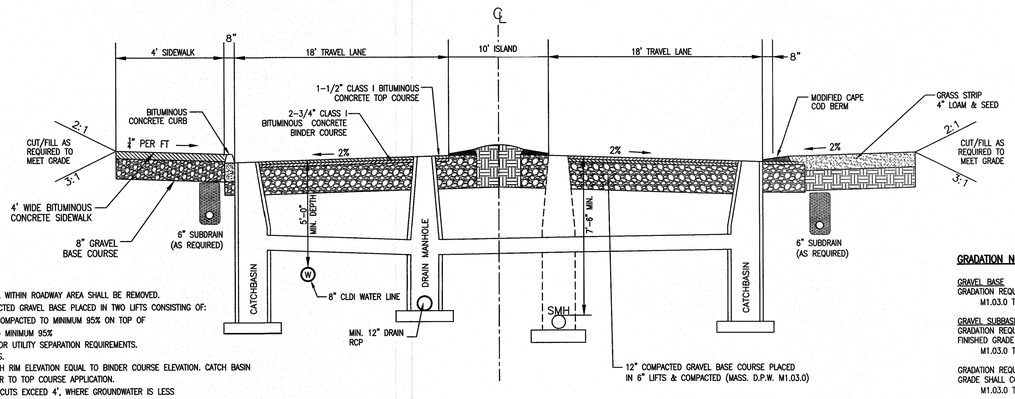

## 3 MODIFIED ASPHALTIC CAPE COD BERM (CCB)
SCALE: N.T.S.

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.



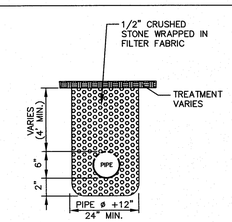

NOTE:
STORMWATER BASIN SHALL NOT BE USED AS TEMPORARY SEDIMENT BASINS DURING CONSTRUCTION.

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




NOTES:
1. ALL UNSUITABLE SUBGRADE MATERIAL WITHIN ROADWAY AREA SHALL BE REMOVED.
2. GRAVEL BASE SHALL BE 12" COMPACTED GRAVEL BASE PLACED IN TWO LIFTS CONSISTING OF:
   - 6" OF 3/4" PROCESSED GRAVEL COMPACTED TO MINIMUM 95% ON TOP OF
   - 6" GRADED GRAVEL COMPACTED TO MINIMUM 95%
3. REFER TO GENERAL NOTES SHEET FOR UTILITY SEPARATION REQUIREMENTS.
4. LOAM & SEED ALL DISTURBED AREAS.
5. CATCH BASINS TO BE INSTALLED WITH RIM ELEVATION EQUAL TO BINDER COURSE ELEVATION. CATCH BASIN RIM ELEVATIONS TO BE RAISED PRIOR TO TOP COURSE APPLICATION.
6. SUB–DRAINS ARE REQUIRED WHERE CUTS EXCEED 4', WHERE GROUNDWATER IS LESS THAN 3' BELOW GRADE, OR WHERE SPECIFIED BY ENGINEER. SUB–DRAINS TO DISCHARGE TO THE NEAREST DOWNSTREAM CATCH BASIN.

## 5 TYPICAL ROADWAY CROSS SECTION (0+22.63 TO 6+57.34 – 7+67.73 TO 9+43.32)
SCALE: N.T.S.




TYPICAL SUBDRAIN
N.T.S.

GRADATION NOTES:

GRAVEL BASE
GRADATION REQUIREMENTS FOR GRAVEL USED AS BASE MATERIAL SHALL CONFORM TO THE FOLLOWING:
M1.03.0 TYPE C* – 2 INCHES LARGEST DIMENSION (SEE GRADATION REQUIREMENTS BELOW)

GRAVEL SUBBASE
GRADATION REQUIREMENTS FOR GRAVEL USED AS SUBBASE MATERIAL TO A DEPTH OF FOUR FEET BELOW FINISHED GRADE SHALL CONFORM TO THE FOLLOWING:
M1.03.0 TYPE B* – 3 INCHES LARGEST DIMENSION (SEE GRADATION REQUIREMENTS BELOW)

GRADATION REQUIREMENTS FOR GRAVEL USED AS SUBBASE MATERIAL BELOW FOUR FEET FROM FINISHED GRADE SHALL CONFORM TO THE FOLLOWING:
M1.03.0 TYPE A* – 6 INCHES LARGEST DIMENSION (SEE GRADATION REQUIREMENTS BELOW)

* "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES" THE COMMONWEALTH OF MASSACHUSETTS (1988 EDITION)

GRADATION REQUIREMENTS

| SIEVE | %PASSING |
|---|---|
| 1/2" | 50–85 |
| NO. 4 | 40–75 |
| NO. 50 | 8–28 |
| NO. 200 | 0–8 |

## 6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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

| NO. | DATE | DESCRIPTION |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 5 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28923 7/24/19

DRAWING NO. C–7.5

PLAN NO. L–5239

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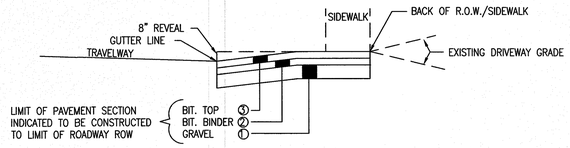
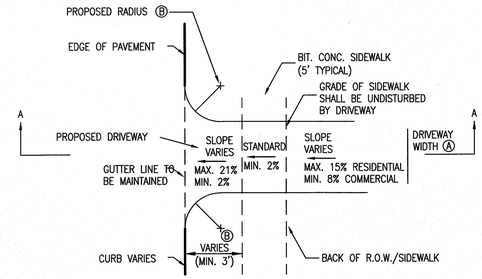
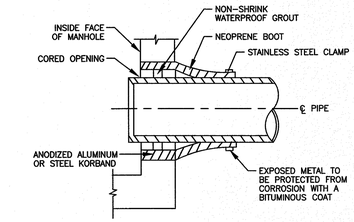



| TYPE | MAX. Ⓐ | MIN. | MAX. Ⓑ | MIN. | ① | ② | ③ |
|---|---|---|---|---|---|---|---|
| RESIDENTIAL | 12' | 8' | 10' | 5' | 12" | 2" | 1" |
| COMMERCIAL | 24' | 20' | 30' | 20' | 12" | 2.5" | 1.5" |
| MAXIMUM ALLOWABLE GRADE CHANGE* | | | | DESIRABLE | | MAXIMUM | |
| LOW VOLUME DRIVEWAY ON LOCAL STREET | | | | ± 6% | | ± 6% (CREST CURVE) | |
| | | | | | | ± 9% (SAG CURVE) | |

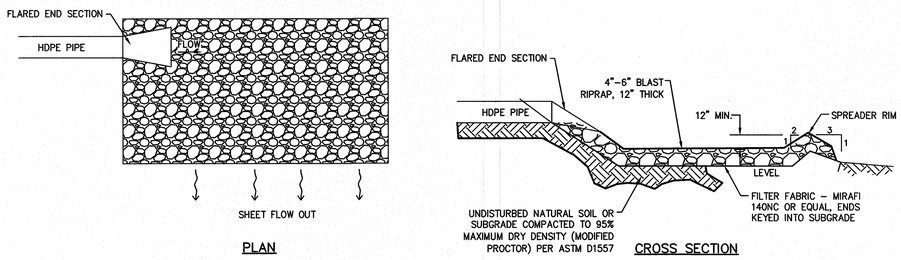
*MORE ABRUPT CHANGES REQUIRE VERTICAL CURVES AT LEAST 10' LONG



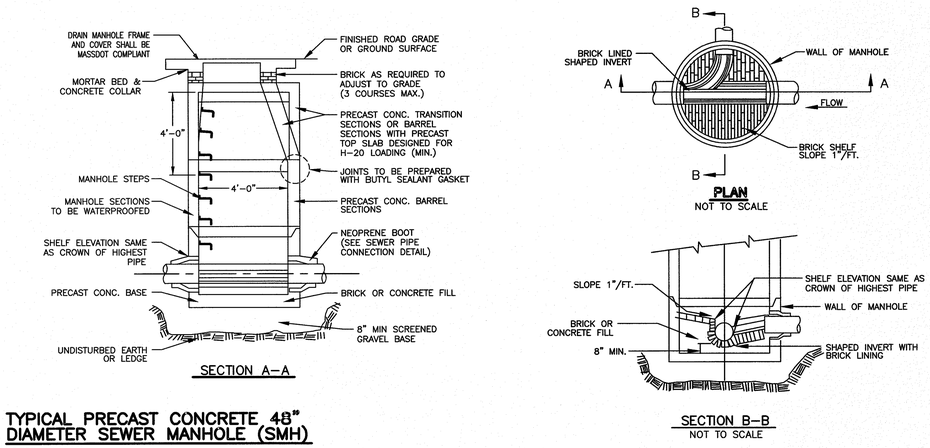

## ① TYPICAL DRIVEWAY OPENING
SCALE: N.T.S.




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

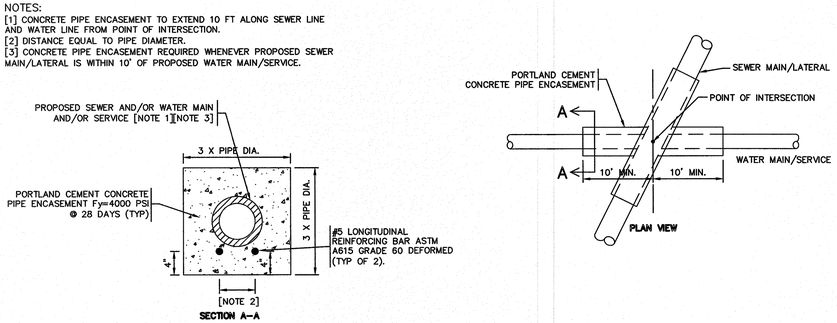



## ③ LEVEL SPREADER
SCALE: N.T.S.

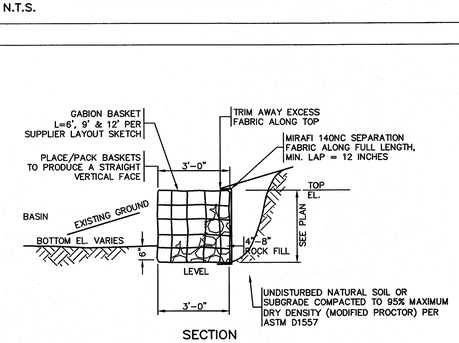



## ④ TYPICAL PRECAST CONCRETE 48" DIAMETER SEWER MANHOLE (SMH)
SCALE: N.T.S.

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.

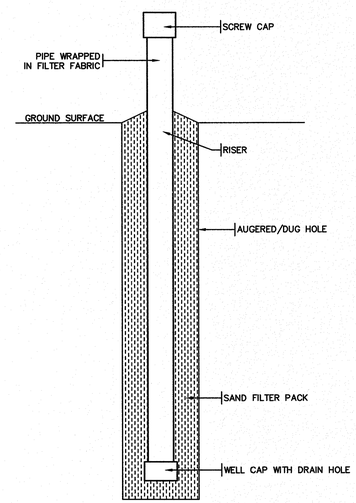



## ⑤ PIPE ENCASEMENT
SCALE: N.T.S.

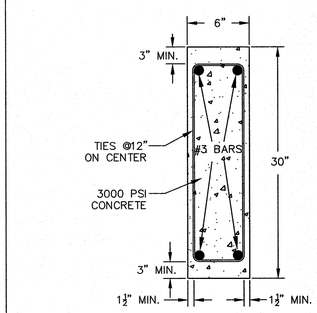



## ⑧ GABION FOREBAY DETAIL
SCALE: N.T.S.

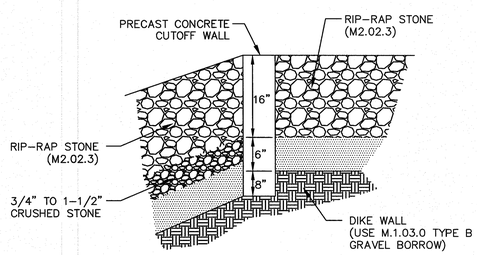
NOTES:
1. EMBANKMENT TO BE CONSTRUCTED OF CLEAN FILL FREE OF MONITORING WELL TO BE MINIMUM 2IN DIAMETER PERFORATED SCH-40 PVC PIPE.
2. PIPE SHALL BE WRAPPED IN FILTER FABRIC IF INSTALLED IN OPEN HOLE.
3. END OF PIPE TO BE HAVE SCREW CAP AND BE RAISED 1 FOOT ABOVE THE SURROUNDING GROUND.




## 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.


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 |
|---|---|---|
| 1 | 7/25/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

CONSTRUCTION DETAILS

SHEET 6 OF 6

COMMONWEALTH OF MASSACHUSETTS RICHARD M. MAINVILLE CIVIL No. 28323 Registered Professional Engineer 7/25/19

DRAWING NO. C-7.6

PLAN NO. L-5239

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F:\ACAD\2015 PROJECTS\2015-219\DWG\PERMIT\2015-219_40B_SINGLE PROJECT.DWG 07-29-19 10:05:21 AM - LAYOUT C-7.6

# 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 | 3,498 SF | 5,361 SF | 5,365 SF | 3,499 SF | 5,483 SF | 5,480 SF | 6,068 SF | 8,319 SF | 9,352 SF | 5,513 SF | 5,179 SF | 4,959 SF | 7,674 SF | 7,476 SF | 5,446 SF | 7,338 SF | 7,285 SF | 5,329 SF | 5,351 SF | 5,374 SF | 5,396 SF | 5,376 SF | 5,312 SF | 4,939 SF | 9,407 SF | 5,477 SF | 5,273 SF | 5,121 SF | 5,063 SF | 5,720 SF | 5,697 SF | 6,343 SF | 7,258 SF | 5,129 SF | 4,186 SF |
| FRONTAGE | 41.0' | 63.0' | 63.0' | 41.0' | 65.2' | 57.9' | 63.8' | 96.7' | 85.1' | 71.3' | 76.7' | 42.7' | 65.4' | 64.1' | 47.2' | 64.3' | 63.8' | 46.0' | 46.0' | 46.0' | 46.0' | 46.0' | 46.7' | 26.9' | 76.3' | 74.2' | 94.5' | 52.4' | 46.4' | 46.1' | 51.0' | 43.7' | 46.2' | 52.8' | 46.0' |
| MIN. FRONT SETBACK | 22.0' | 22.0' | 22.0' | 22.0' | 20.0' | 20.0' | 20.7' | 21.8' | 22.3' | 11.6' | 22.0' | 17.0' | 16.9' | 16.9' | 16.9' | 16.9' | 17.0' | 17.0' | 17.0' | 17.0' | 17.0' | 17.0' | 17.0' | 17.1' | 11.8' | 12.0' | 12.0' | 13.6' | 13.6' | 16.0' | 16.0' | 15.7' | 10.7' | 17.0' | 17.0' |
| MIN. SIDE SETBACK | 7.6' | 7.5' | 7.5' | 7.5' | 7.5' | 7.5' | 8.0' | 12.0' | 11.6' | 3.4' | 10.1' | 8.4' | 8.3' | 8.1' | 8.3' | 7.9' | 7.6' | 7.6' | 7.6' | 7.5' | 7.5' | 7.6' | 8.2' | 5.5' | 10.6' | 8.7' | 7.5' | 8.9' | 9.3' | 10.6' | 9.7' | 10.7' | 13.4' | 12.5' | 7.5' |
| MIN. REAR SETBACK | 19.4' | 19.1' | 19.2' | 19.4' | 21.6' | 21.5' | 18.7' | 30.1' | 36.6' | 21.2' | 20.3' | 55.8' | 55.5' | 55.1' | 44.6' | 53.7' | 54.3' | 44.9' | 45.4' | 45.8' | 46.3' | 45.8' | 42.7' | 39.8' | 34.1' | 20.0' | 17.2 | 20.0' | 20.0' | 20.0' | 25.0' | 31.5' | 48.9' | 20.0' | 20.0' |

| 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 67 | LOT 68 | LOT 69 | LOT 70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOT AREA | 4,186 SF | 5,958 SF | 6,151 SF | 4,844 SF | 4,628 SF | 5,134 SF | 3,885 SF | 3,602 SF | 6,808 SF | 3,497 SF | 4,891 SF | 4,732 SF | 5,334 SF | 10,202 SF | 8,176 SF | 8,328 SF | 8,274 SF | 3,525 SF | 3,481 SF | 4,084 SF | 4,866 SF | 8,810 SF | 8,434 SF | 8,237 SF | 7,579 SF | 4,936 SF | 4,695 SF | 3,404 SF | 3,160 SF | 2,977 SF | 2,968 SF | 2,959 SF | 2,950 SF | 2,932 SF | 5,087 SF |
| FRONTAGE | 46.0' | 60.1' | 47.8' | 51.9' | 54.2' | 55.9' | 39.0' | 40.3' | 94.3' | 52.8' | 66.9' | 63.0 | 70.5' | 78.4' | 62.8' | 63.2' | 62.8' | 40.9' | 41.0' | 39.3' | 38.2' | 37.4' | 43.9' | 63.0' | 63.9' | 65.7' | 62.5' | 62.1' | 48.5' | 41.0' | 41.0' | 41.0' | 41.0' | 41.0' | 63.4' |
| MIN. FRONT SETBACK | 17.0' | 17.0' | 22.0' | 21.8' | 14.0' | 14.0' | 12.7' | 13.0' | 12.1' | 12.4' | 12.0' | 12.0' | 12.0' | 13.2' | 14.0' | 14.0' | 14.0' | 12.0' | 12.0' | 11.7' | 11.5' | 12.0' | 12.0' | 12.0' | 12.1' | 9.9' | 14.0' | 14.5' | 13.4' | 14.0' | 14.2' | 14.1' | 14.1' | 14.0' | 14.0' |
| MIN. SIDE SETBACK | 7.5' | 7.5' | 12.3' | 7.6' | 9.4' | 3.4' | 5.3' | 4.5' | 8.4' | 7.1' | 7.5' | 7.5' | 7.5' | 7.7' | 7.3' | 7.4' | 7.2' | 7.5' | 7.5' | 7.5' | 6.6' | 6.0' | 6.3' | 7.0' | 7.5' | 7.5' | 7.0' | 6.5' | 7.5' | 7.5' | 7.5' | 7.5' | 7.5' | 7.5' | 7.5' |
| MIN. REAR SETBACK | 20.0' | 20.0' | 32.2' | 31.5' | 17.7' | 27.7' | 27.3' | 29.1' | 20.0' | 20.0' | 19.7' | 19.1' | 18.5' | 68.6' | 71.4' | 73.3' | 75.6' | 37.8' | 36.8' | 35.6' | 25.7' | 48.2' | 92.6' | 67.1' | 34.8' | 21.8' | 17.1' | 9.9' | 14.8' | 14.6' | 14.2' | 14.1' | 13.9' | 13.5' | 13.0' |


ASE

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500 East Washington Street
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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 |
|---|---|---|
| 1 | 7/29/19 | FULL ENGINEERING DESIGN |

| | |
|---|---|
| CAD FILE | .\dwg\2015-219_40B_SINGLE PROJECT.dwg |
| DRAWN BY | TRB, RJF |
| CHECKED BY | RMM, BJA |
| DATE | NOVEMBER 19, 2018 |
| PROJECT NO. | 2015-219 |

SHEET TITLE

ZONING PLAN

COMMONWEALTH OF MASSACHUSETTS
BYRON J. ANDREWS
No. 47389
LICENSED PROFESSIONAL LAND SURVEYOR
7/29/19

DRAWING NO.

C-8.1

PLAN NO. L-5239

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