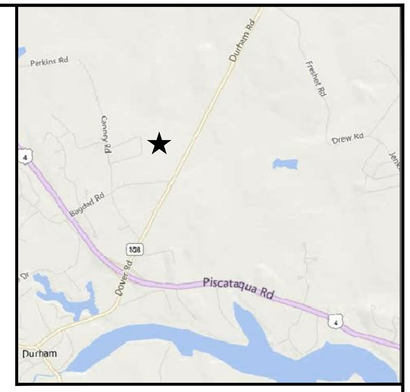
SITE PLAN

for

MICHAEL & MARTI MULHERN

93 BAGDAD ROAD
DURHAM, NH
OCTOBER 28, 2020
REVISED FEBRUARY 4, 2021



LOCUS MAP
SCALE 1:12 000

TABLE OF CONTENTS

OWNER
MICHAEL & MARTI MULHERN
97 BAGDAD RD
DURHAM, NH 03824

CIVIL ENGINEER
MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
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TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3830

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

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO DURHAM PLANNING BOARD	2/4/21	MJS
1.	REVISED SUBMISSION TO DURHAM PLANNING BOARD	12/9/20	MJS
0.	INITIAL SUBMISSION TO DURHAM	10/28/20	MJS

MATCH LINE

BERNDTSON FAMILY REV TRUST
123 DOVER ROAD
DURHAM, N.H.
SCRD 1041-640

ACCESS EASEMENT
SEE SCRD 967-219

DURHAM EVANGELICAL CHURCH
114 DOVER ROAD
DURHAM, N.H.
SCRD 3435-417

TM10, L8-4
GOMBOSSY LIVING TRUST
115 DOVER ROAD
DURHAM, N.H.
SCRD 3592-584

TM10, L8-5
YING SHI
121 DOVER ROAD
DURHAM, N.H.
SCRD 3669-184

STELLA BROWN
111 DOVER ROAD
DURHAM, N.H.
SCRD 2362-425

CENTERLINE OF UNNAMED STREAM
TO GERRISH BROOK

125' POORLY DRAINED BUFFER (TOWN)

75' WETLAND BUFFER (TOWN)

MATTHEW ANCTIL & MELANIE
HARVEY
107 DOVER ROAD
DURHAM, N.H.
SCRD 4317-554

MAGBURY
DURHAM

STREAM CENTERLINE

GREG A. IMBRIE
93 BAGDAD ROAD
DURHAM, N.H.
SCRD 4605-287

GEOFFREY DIXON &
SUZANNE YOUNG
103 DOVER ROAD
DURHAM, N.H.
SCRD 2556-522

ACCESS AND UTILITY EASEMENT
SEE SCRD 959-121
SEE SCRD 4601-768
SEE SCRD 4601-770

JUAN & AMANDA
NIEVES
95 BAGDAD ROAD
DURHAM, N.H.
SCRD 4369-791

GAIL J. KELLEY
REV. TR.
11 GERRISH DRIVE
DURHAM, N.H.
SCRD 3801-31

SEWER & DRAINAGE EASEMENT

APPROX. 15' CONSTRUCTION EASEMENT

RW

EXISTING PLAYGROUND AREA

TM10, L6-10
GAIL J. KELLEY
REV. TR.
11 GERRISH DRIVE
DURHAM, N.H.
SCRD 3801-31

EXISTING 50' TOWN R-O-W

43.56'

STREAM CENTERLINE (TYP.)

TM10, L6-9
MICHAEL P. &
MOLLY P. WHITE
20 AMBLER WAY
DURHAM, N.H.
SCRD 4347-556

TM10, L6-8
PETER M. &
KIMBERLY SWEETMAN
18 AMBLER WAY
DURHAM, N.H.
SCRD 3154-925

TM10, L6-7
BRYAN &
MARY OLIVER
16 AMBLER WAY
DURHAM, N.H.
SCRD 2003-778

TM10, L6-61
DANIEL SHANK
3012 TULE AVE. APT 3214
FORT WORTH, TX 76116
SCRD 3445-410

TM10, L6-6
JUDITH K. GETCHEL
12 AMBLER WAY
DURHAM, N.H.
SCRD 2624-342

EXISTING HOUSE

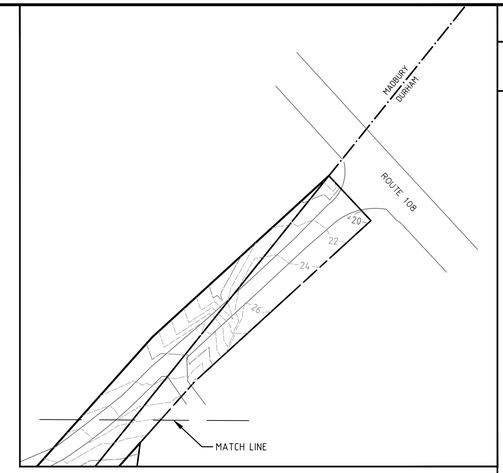
TIMOTHY & DENISE
DAY
89 BAGDAD ROAD
DURHAM, N.H.
SCRD 1808-353

BAGDAD ROAD

AMBLER WAY

GERRISH DR.

0 60 100 200 300
SCALE: 1" = 60'



RT 108 ACCESS

GENERAL NOTES:

OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

1. ZONE: RESIDENTIAL (RB)
OVERLAY DISTRICTS: WCOD
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT AREA	40,000 SF
MINIMUM FRONTAGE	150 FEET
MINIMUM FRONT SETBACK	30 FEET (MINOR AND COLLECTOR) 40 FEET (ARTERIAL)
MINIMUM SIDE SETBACK	20 FEET
MINIMUM REAR SETBACK	30 FEET

2. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT LOT.
3. WETLANDS WERE DELINEATED BY MICHAEL MARIANO OF HIGHLAND SOIL SERVICES.
4. SURVEY FIELD WORK WAS COMPLETED BY TRI-TECH AND NORWAY PLAINS ASSOCIATES.

NO.	DATE	REVISIONS
9	4/10/20	INITIAL SUBMISSION TO DURHAM PLANNING BOARD
		MCS
		INT.

SEAL
NEW HAMPSHIRE
MICHAEL J. MULHERN
No. 9667
LICENSED PROFESSIONAL ENGINEER
STATE OF

DATE ISSUED: 4/7/20
SCALE: 1"=60'
DESIGNED BY: MJS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE:

EXISTING CONDITIONS PLAN
prepared for
MULHERN
MAP 10, LOT 8-6
93 BAGDAD ROAD
DURHAM, NH 03824

MJS ENGINEERING, P.C.
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E-mail: mjs@mjs-engineering.com

JOB: 19-063

C100

LOCUS MAP
SCALE 1:12 000

GENERAL NOTES:

OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

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MINIMUM SIDE SETBACK	20 FEET
MINIMUM REAR SETBACK	30 FEET

2. THE INTENT OF THIS PLAN IS TO SHOW THE OVERALL LAYOUT OF THE PROPOSED DEVELOPMENT.
3. WETLANDS WERE DELINEATED BY MICHAEL MARIANO OF HIGHLAND SOIL SERVICES.
4. SURVEY FIELD WORK WAS COMPLETED BY TRI-TECH AND NORWAY PLAINS ASSOCIATES.
5. TOTAL WETLAND DISTURBANCE AREA = 8 068 SF (0.19 Ac)
6. TOTAL BUFFER DISTURBANCE AREA = 40 219 SF (0.92 Ac)
7. TOTAL AREA OF DISTURBANCE = 195 821 SF (4.50 Ac)

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

0 60 100 200 300
SCALE: 1" = 60'

NO.	REVISIONS	DATE	INT.
2	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL

STATE OF NEW HAMPSHIRE MICHAEL J. SIEVERT No. 8397 LICENSED PROFESSIONAL ENGINEER

DATE ISSUED:	10/28/20
SCALE:	1"=60'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilZL.dwg

OVERALL SITE PLAN
prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063
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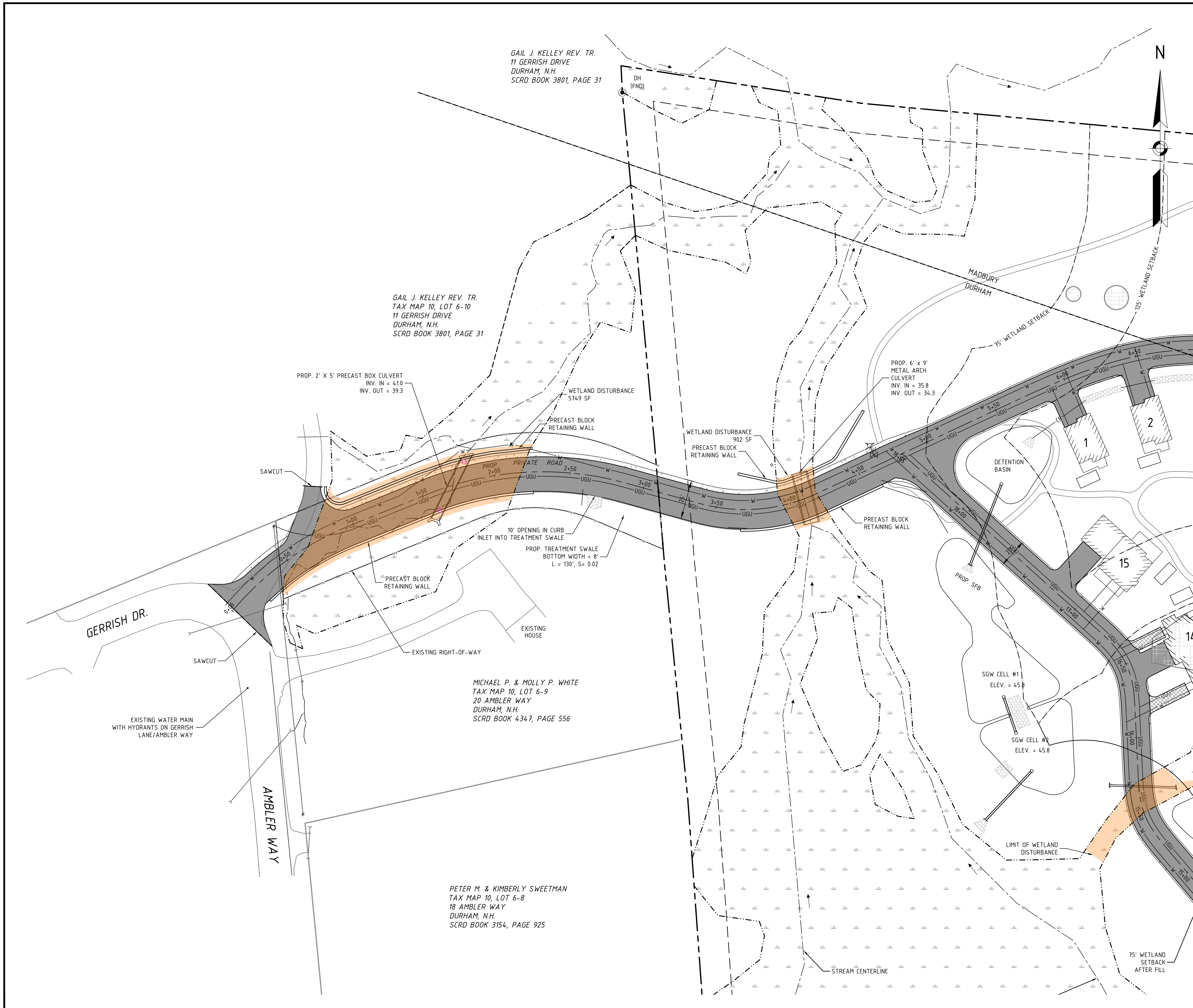

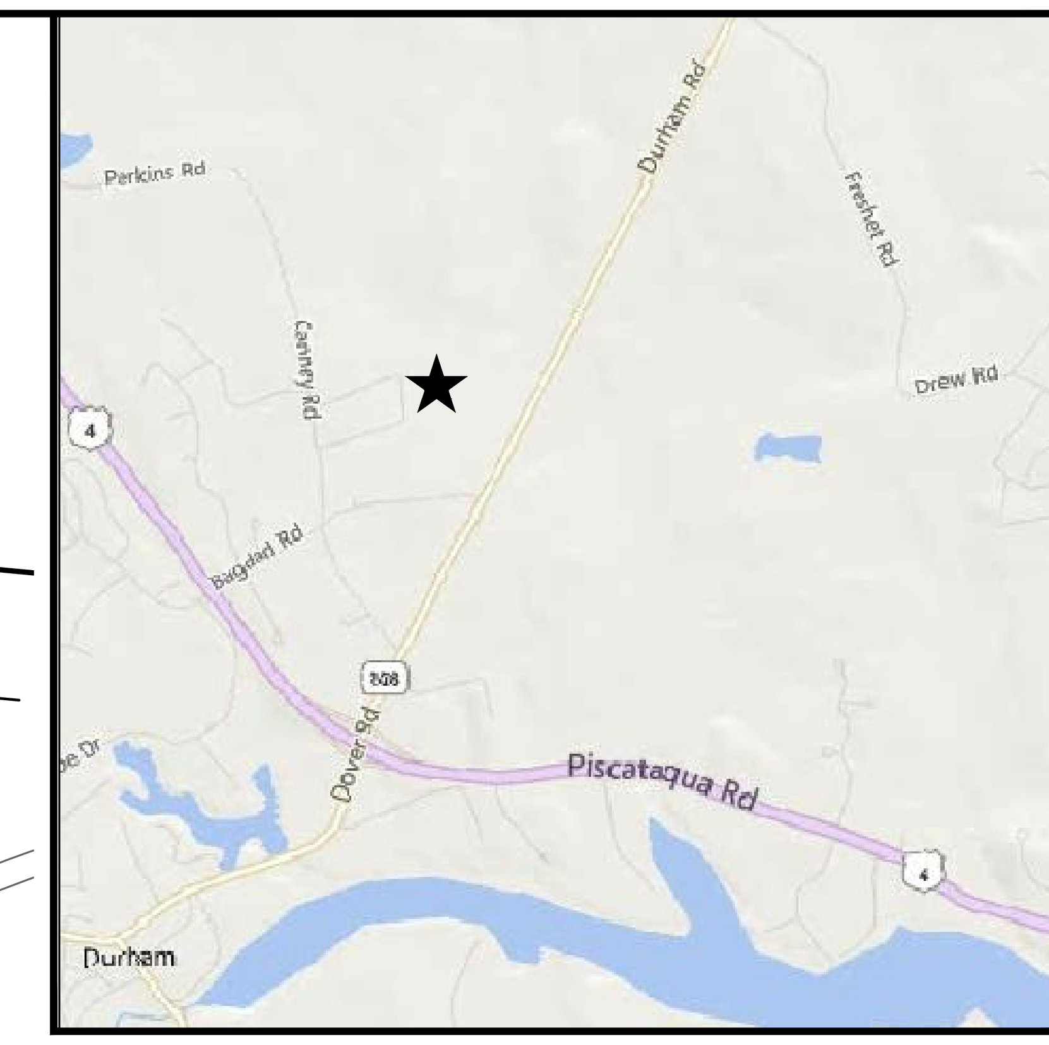

LOCUS MAP
SCALE 1:12 000

GENERAL NOTES:

OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

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MINIMUM SIDE SETBACK	20 FEET
MINIMUM REAR SETBACK	30 FEET

2. THE INTENT OF THIS PLAN IS TO SHOW THE LAYOUT OF THE PROPOSED DEVELOPMENT.
3. WETLANDS WERE DELINEATED BY MICHAEL MARIANO OF HIGHLAND SOIL SERVICES.
4. SURVEY FIELD WORK WAS COMPLETED BY TRI-TECH AND NORWAY PLAINS ASSOCIATES.
5. TOTAL WETLAND DISTURBANCE AREA = 9217 SF
6. TOTAL AREA OF DISTURBANCE = 197 677 SF (4.5 Ac)

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

0 30 60 100
SCALE: 1" = 30'

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL
STATE OF NEW HAMPSHIRE
MICHAEL J. SIEVERT
No. 8397
LICENSED PROFESSIONAL ENGINEER

DATE ISSUED:	10/28/20
SCALE:	1"=30'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilZL.dwg

ENTRANCE SITE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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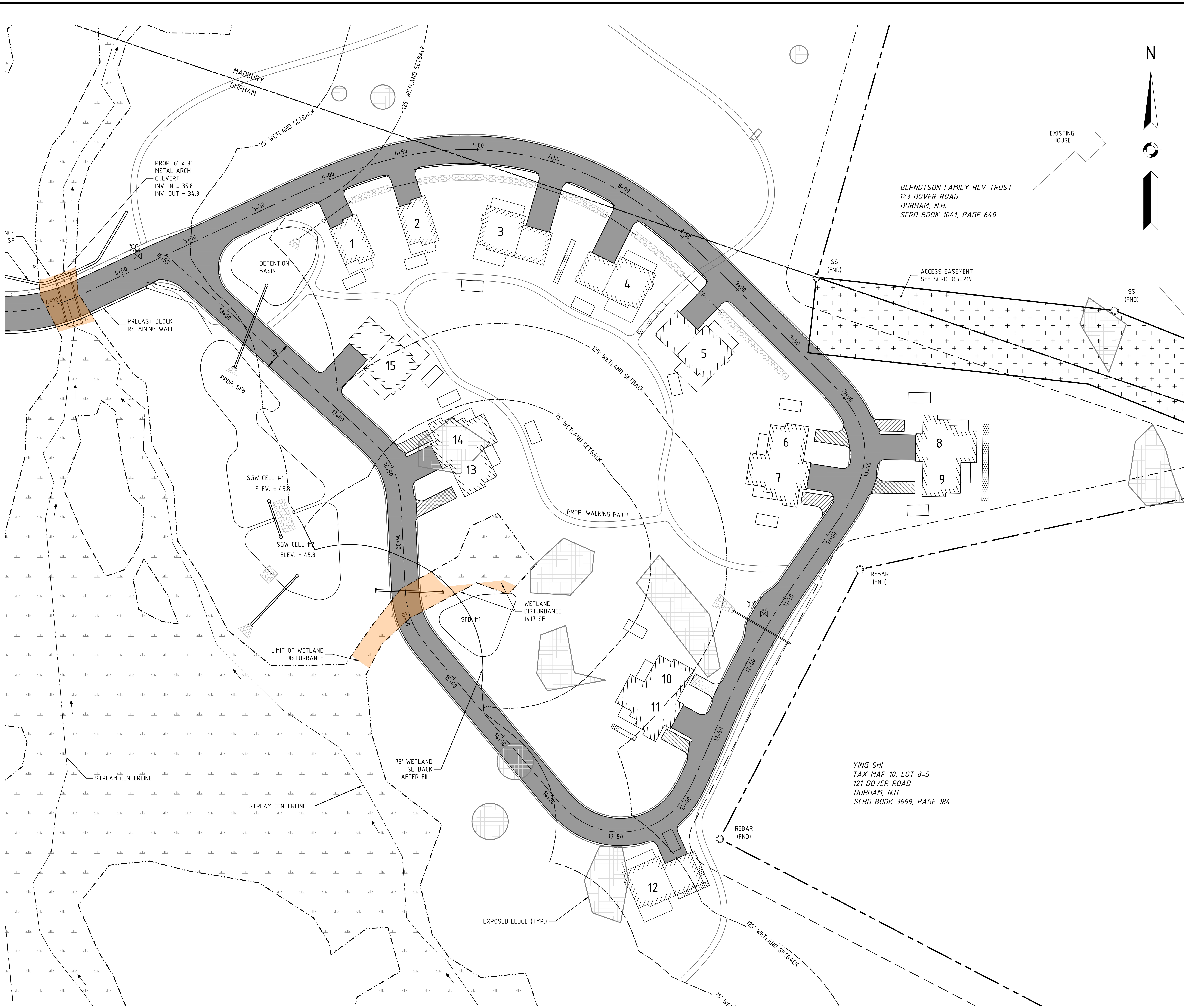
JOB: 19-063

C102



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STATE OF NEW HAMPSHIRE · MICHAEL J. SIEVERT No. 8397 LICENSED PROFESSIONAL ENGINEER

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DESIGNED BY: MCS
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APPROVED BY: MJS
DWG FILE: 19063 CivilZL.dwg

CLUSTER SITE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

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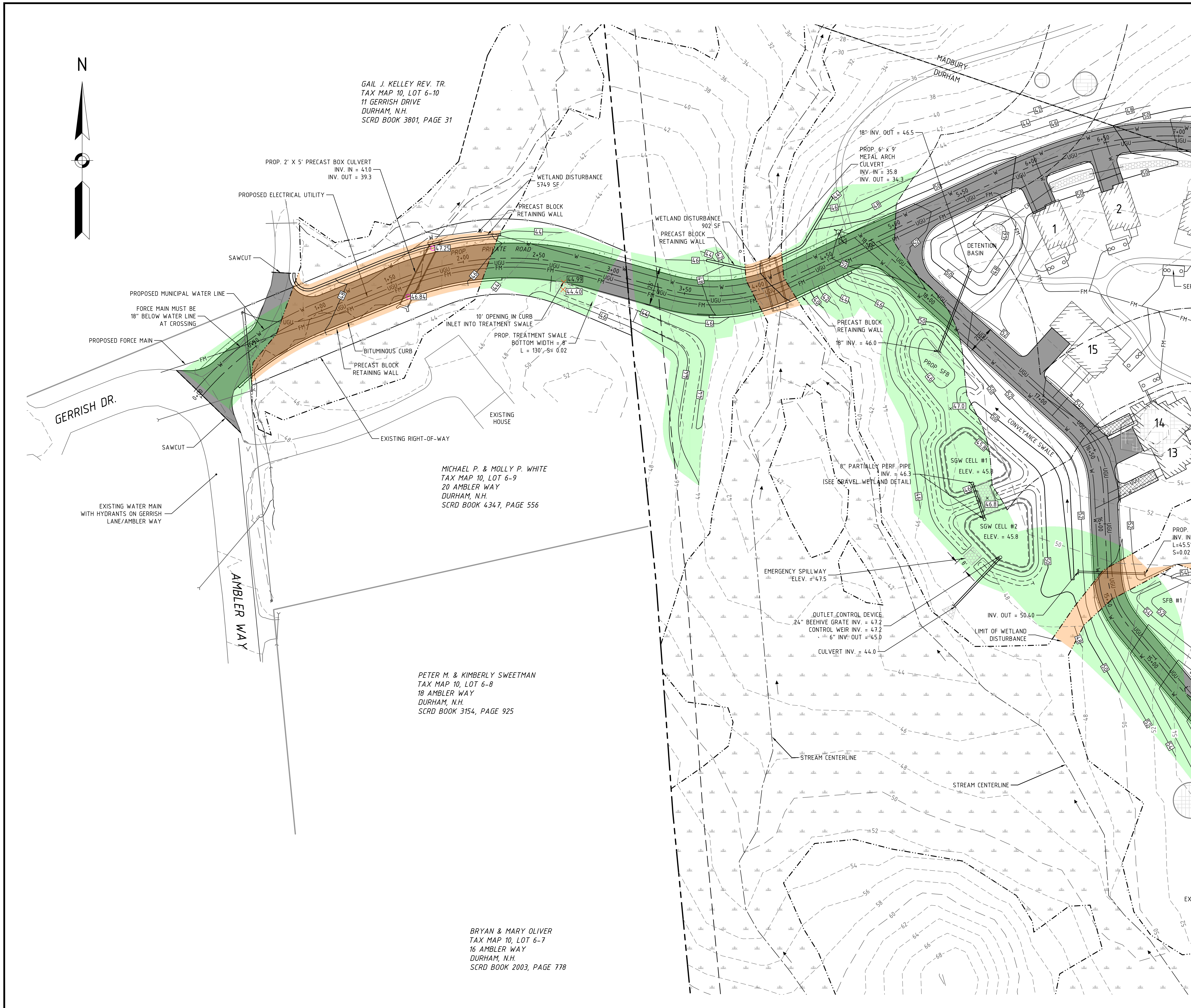

GENERAL NOTES:

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91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

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LEGEND:

CB	CATCH BASIN
CPP	CORRUGATED PLASTIC PIPE
DMH	STORM DRAIN MANHOLE
EX.	EXISTING
HW	HEADWALL
PROP.	PROPOSED
SFB	SEDIMENT FOREBAY
SGW	SUBSURFACE GRAVEL WETLAND
SMH	SANITARY MANHOLE

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

0 30 60 100
SCALE: 1" = 30'

NO.	REVISIONS	DATE	INT.
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3.	REVISED SUBMISSION TO THE DURHAM CONSERVATION COMMISION	1/20/21	MCS
2.	REVISED SUBMISSION TO THE DURHAM CONSERVATION COMMISION	12/23/20	MCS
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL
STATE OF NEW HAMPSHIRE - MICHAEL J. SIEVERT No. 8397 LICENSED PROFESSIONAL ENGINEER

DATE ISSUED:	10/28/20
SCALE:	1"=30'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilZL.dwg

GRADING AND DRAINAGE PLAN
ENTRANCE
prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

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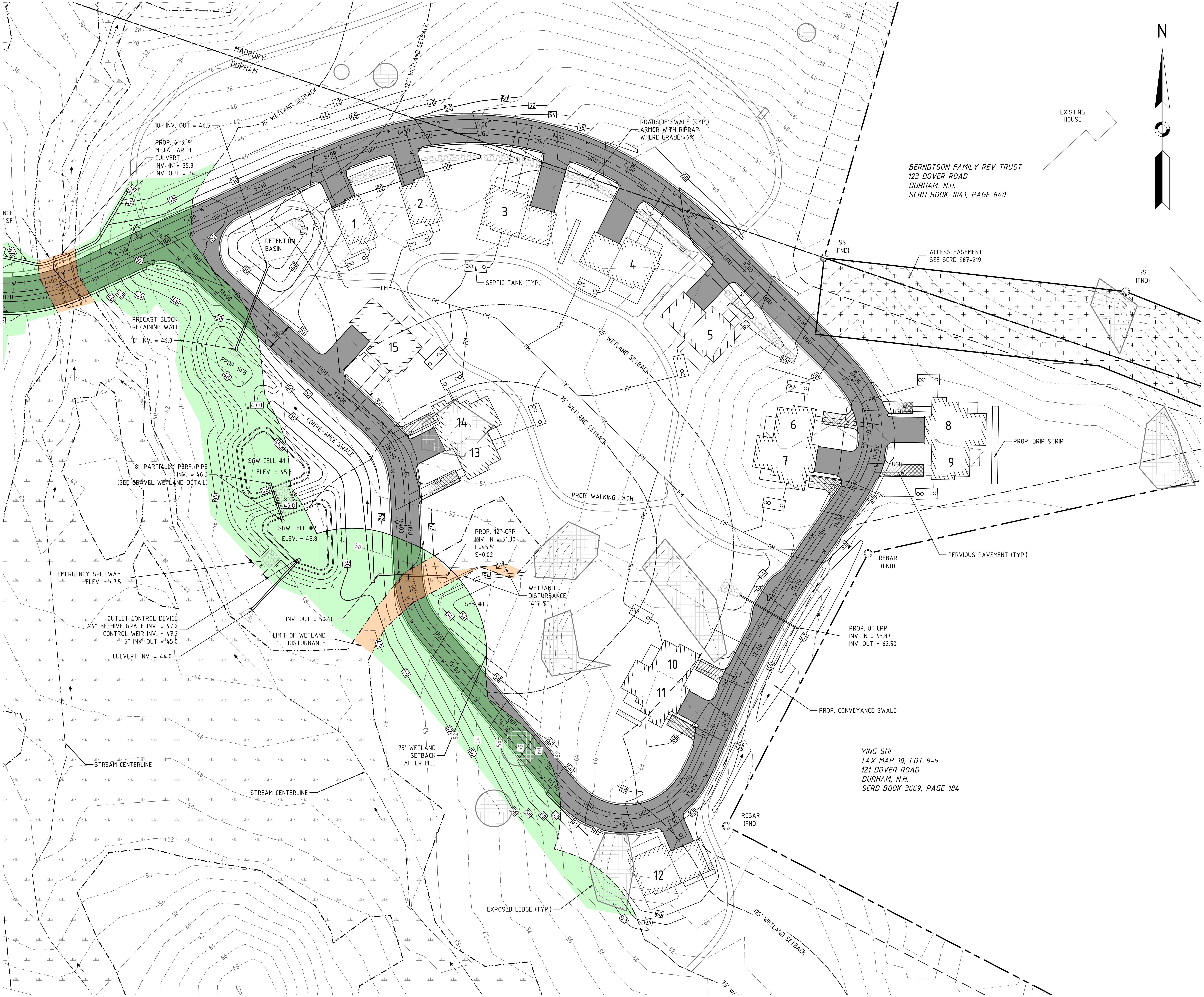

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91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
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EX.	EXISTING
HW	HEADWALL
PROP.	PROPOSED
SFB	SEDIMENT FOREBAY
SGW	SUBSURFACE GRAVEL WETLAND
SMH	SANITARY MANHOLE

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

0 30 60 100
SCALE: 1" = 30'

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
3.	REVISED SUBMISSION TO THE DURHAM CONSERVATION COMMISION	1/20/21	MCS
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1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL
STATE OF NEW HAMPSHIRE MICHAEL J. SIEVERT No. 8397 LICENSED PROFESSIONAL ENGINEER

DATE ISSUED:	10/28/20
SCALE:	1"=30'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilZL.dwg

GRADING AND DRAINAGE PLAN
CLUSTER
prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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E-mail: mjs@mjs-engineering.com

JOB: 19-063

C105

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GENERAL NOTES:

OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

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4. SURVEY FIELD WORK WAS COMPLETED BY TRI-TECH AND NORWAY PLAINS ASSOCIATES.

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

0 60 100 200 300
SCALE: 1" = 60'

NO.	REVISIONS	DATE	INT.
3.	INITIAL SUBMISSION TO DURHAM	10/28/20	MCS
2.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
1.	REVISED SUBMISSION TO DURHAM PLANNING BOARD	12/9/20	MCS

SEAL

DATE ISSUED: 11/4/20
SCALE: 1"=60'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 Civil-OPNSPC_B.dwg

PROPOSED OPEN SPACE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

C106

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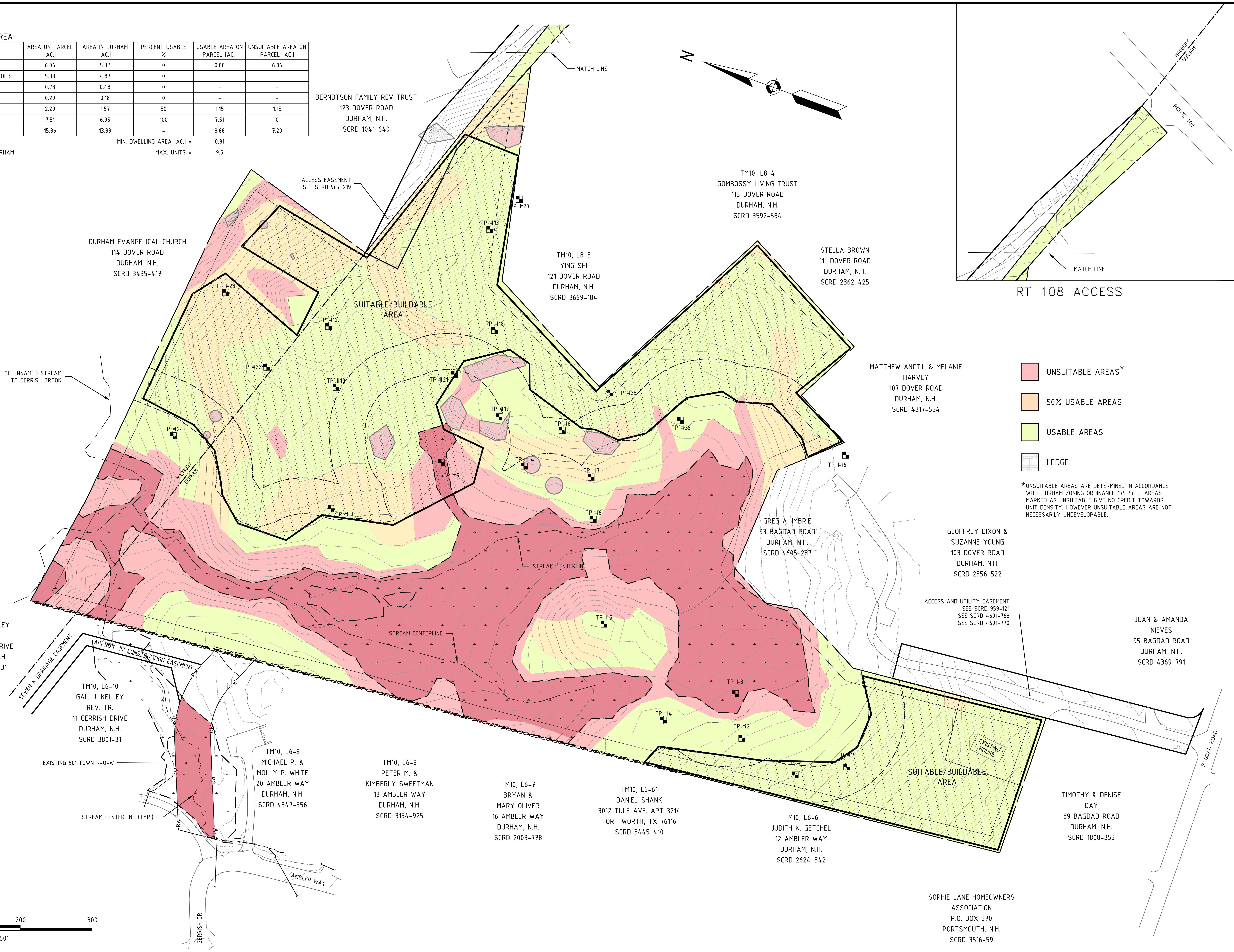
CALCULATION OF USABLE AREA

LOCATION	AREA ON PARCEL [AC.]	AREA IN DURHAM [AC.]	PERCENT USABLE [%]	USABLE AREA ON PARCEL [AC.]	UNSUITABLE AREA ON PARCEL [AC.]
COMBINED UNSUITABLE AREAS	6.06	5.37	0	0.00	6.06
POORLY & S/W POORLY DRAINING SOILS	5.33	4.87	0	-	-
SLOPES >25%	0.78	0.48	0	-	-
LEDGE	0.20	0.18	0	-	-
SLOPES 15-25%	2.29	1.57	50	1.15	1.15
UNRESTRICTED USABLE AREA	7.51	6.95	100	7.51	0
TOTAL	15.86	13.89	-	8.66	7.20

MIN. DWELLING AREA [AC.] = 0.91

MAX. UNITS = 9.5

CALCULATION IN ACCORDANCE WITH DURHAM ZONING ORDINANCE 175-56C



RT 108 ACCESS

SCALE: 1" = 60'

NO.	REVISIONS	DATE	INT.
0	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	4/10/20	MCS

SEAL: STATE OF NEW HAMPSHIRE – MICHAEL J. SIEVERT No. 8397 LICENSED PROFESSIONAL ENGINEER

DATE ISSUED: 10/28/20
SCALE: 1"=60'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 CivilZC-SA.dwg

SITE ANALYSIS PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

MJS ENGINEERING, P.C.
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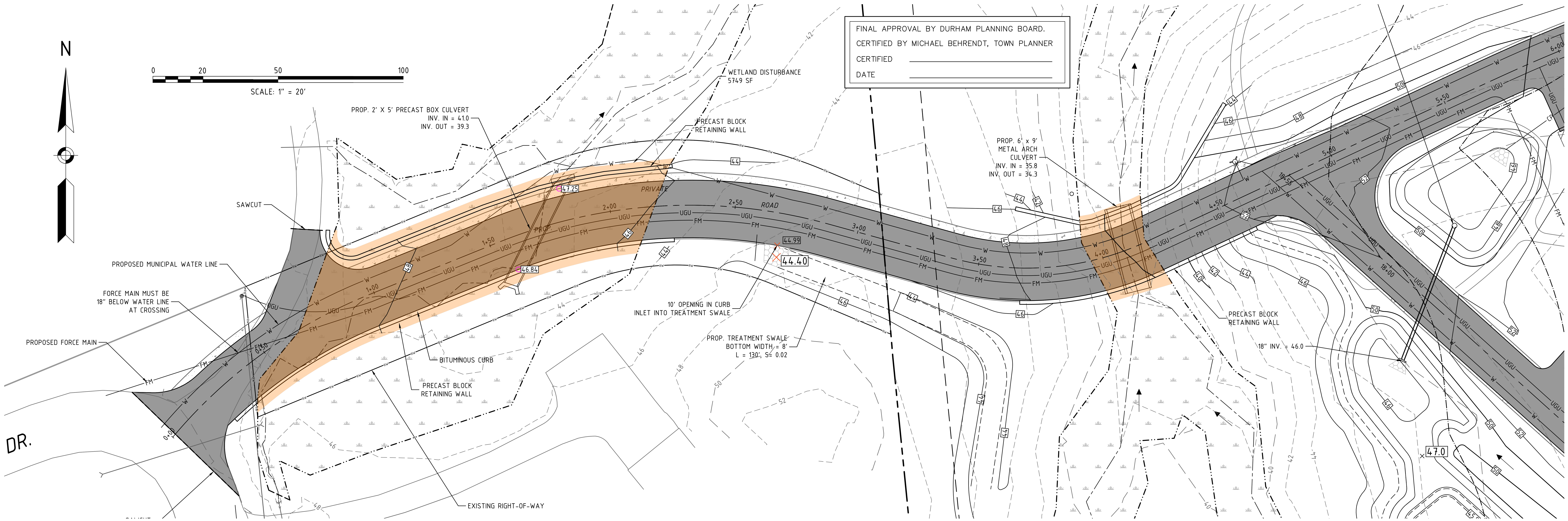
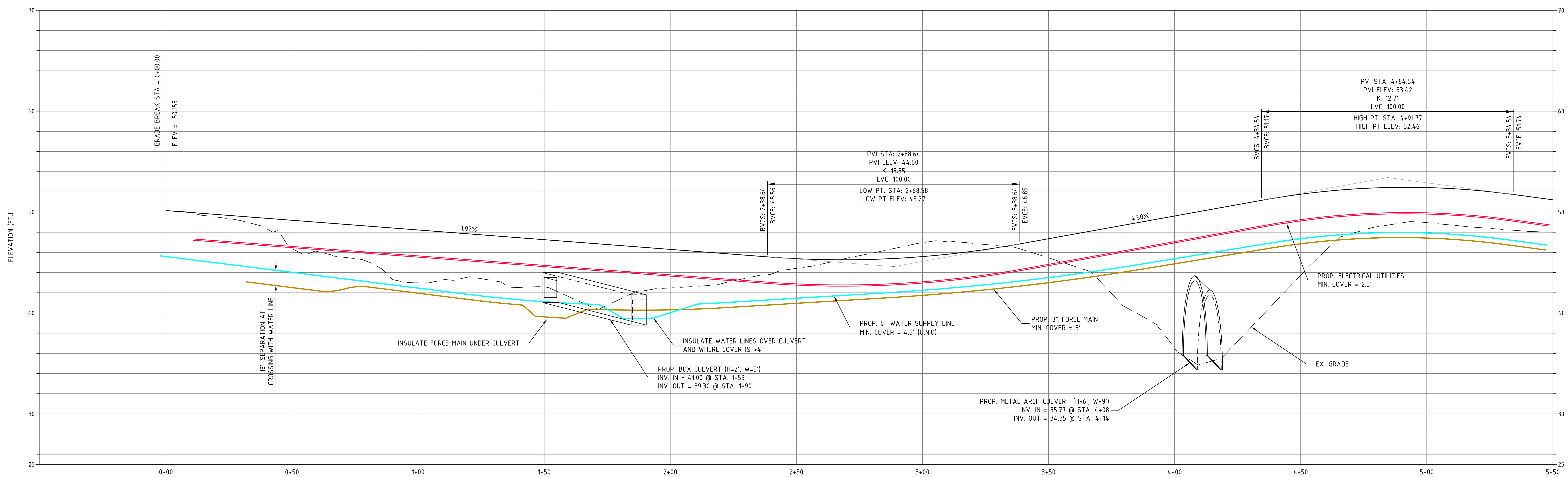
JOB: ----

C107





ROAD PROFILE

VERTICAL EXAGGERATION: 4
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

NO.	REVISIONS	DATE	INT.
2	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL

DATE ISSUED:	10/28/20
SCALE:	1"=20'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilZL.dwg

ROAD PLAN & PROFILE

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

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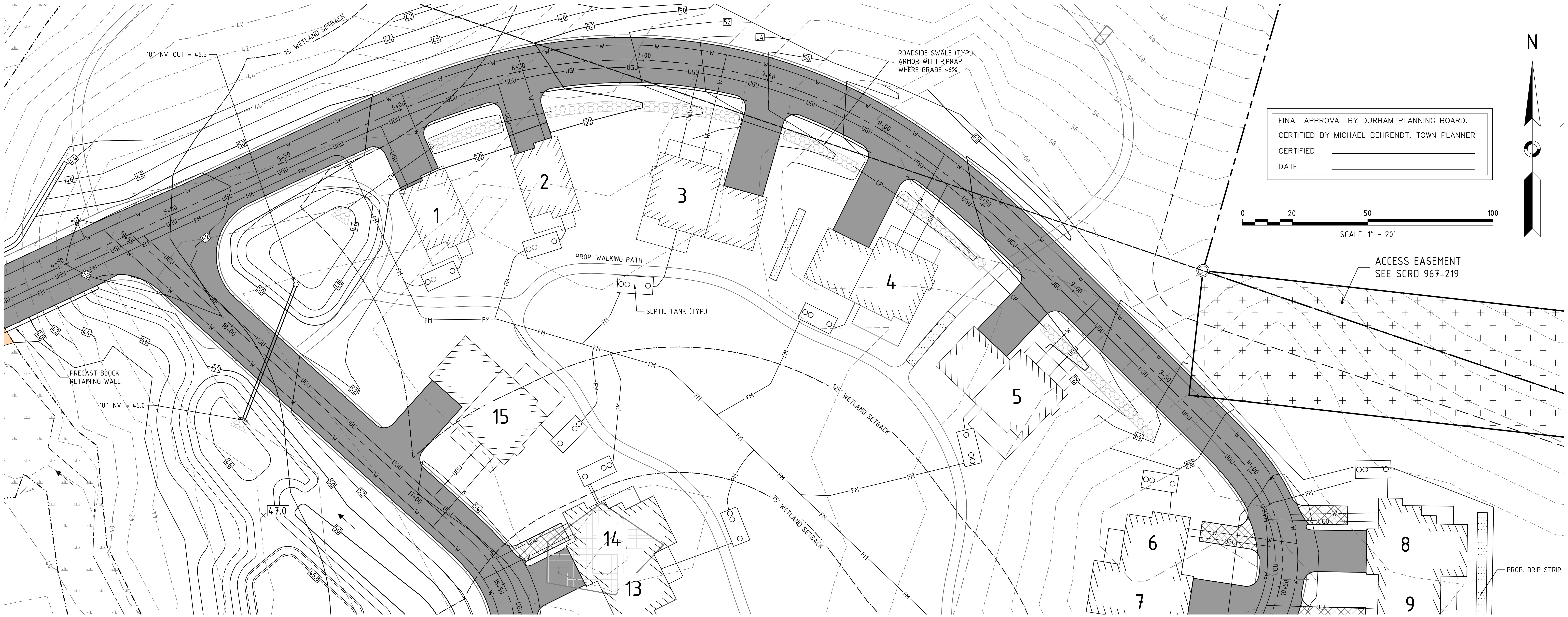

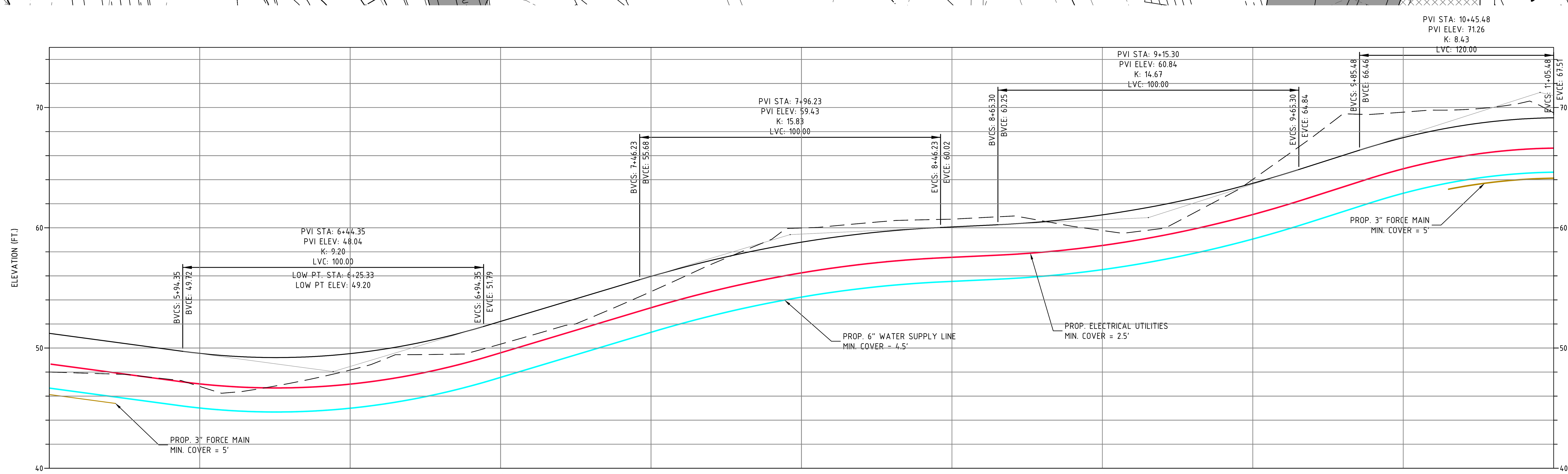

ROAD (2) PROFILE

VERTICAL EXAGGERATION: 4
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

NO.	REVISIONS	DATE	INT.
2	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL

DATE ISSUED:	10/28/20
SCALE:	1"=20'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 Civil2L.dwg

ROAD PLAN & PROFILE

prepared for

MULHERN

TAX MAP 10, LOT 8-6

93 BAGDAD ROAD, DURHAM, NH 03824

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Newmarket, NH 03857

JOB: 19-063

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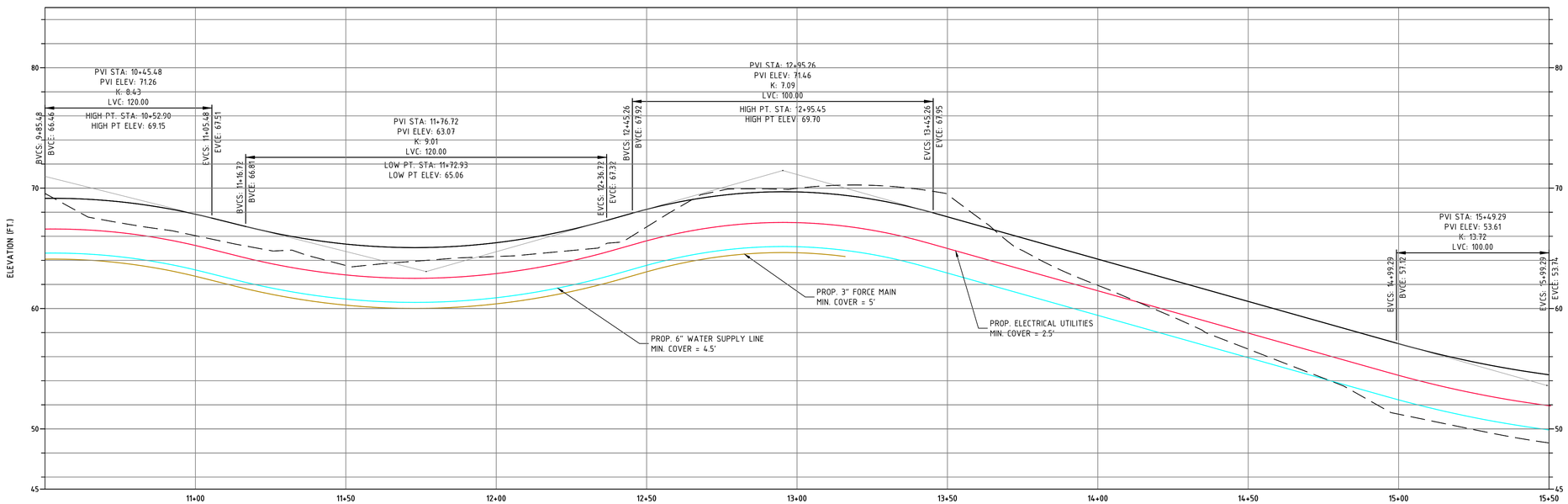

ROAD PROFILE

VERTICAL EXAGGERATION: 4
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

NO.	DATE
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

REVISIONS

SEAL: MICHAEL J. SEVERT No. 6580 STATE OF NEW HAMPSHIRE PROFESSIONAL ENGINEER

DATE ISSUED: 10/28/20
SCALE: 1"=20'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 CivilZL.dwg

ROAD PLAN & PROFILE

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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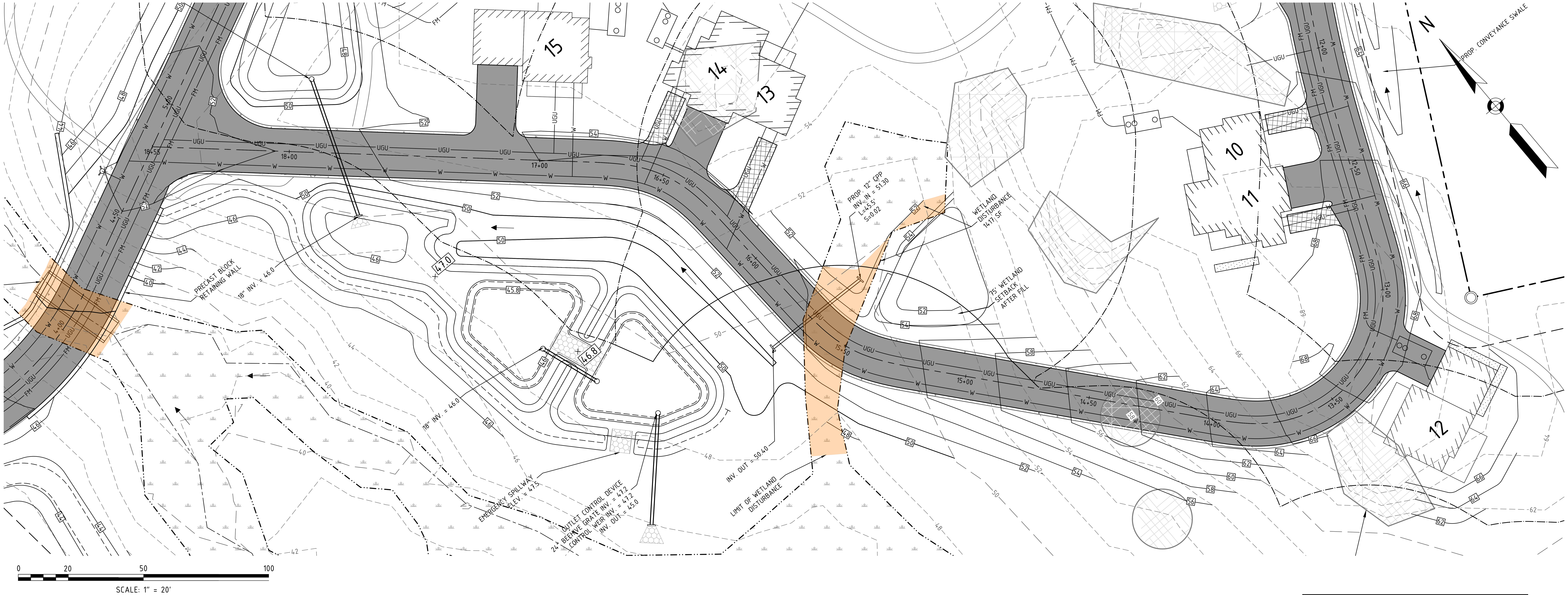
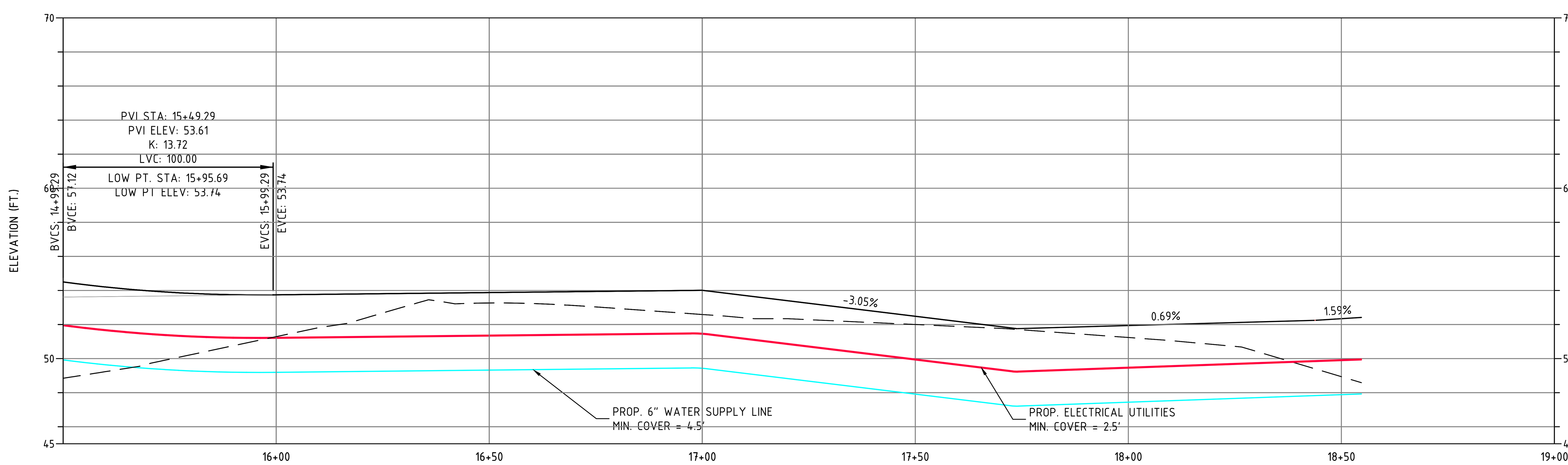
JOB: 19-063

C203



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



ROAD (1) PROFILE
VERTICAL EXAGGERATION: 4
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL
STATE OF NEW HAMPSHIRE · MICHAEL J. SIEVERT No. 8397 · LICENSED PROFESSIONAL ENGINEER

DATE ISSUED: 10/28/20
SCALE: 1"=20'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 CivilZL.dwg

ROAD PLAN & PROFILE

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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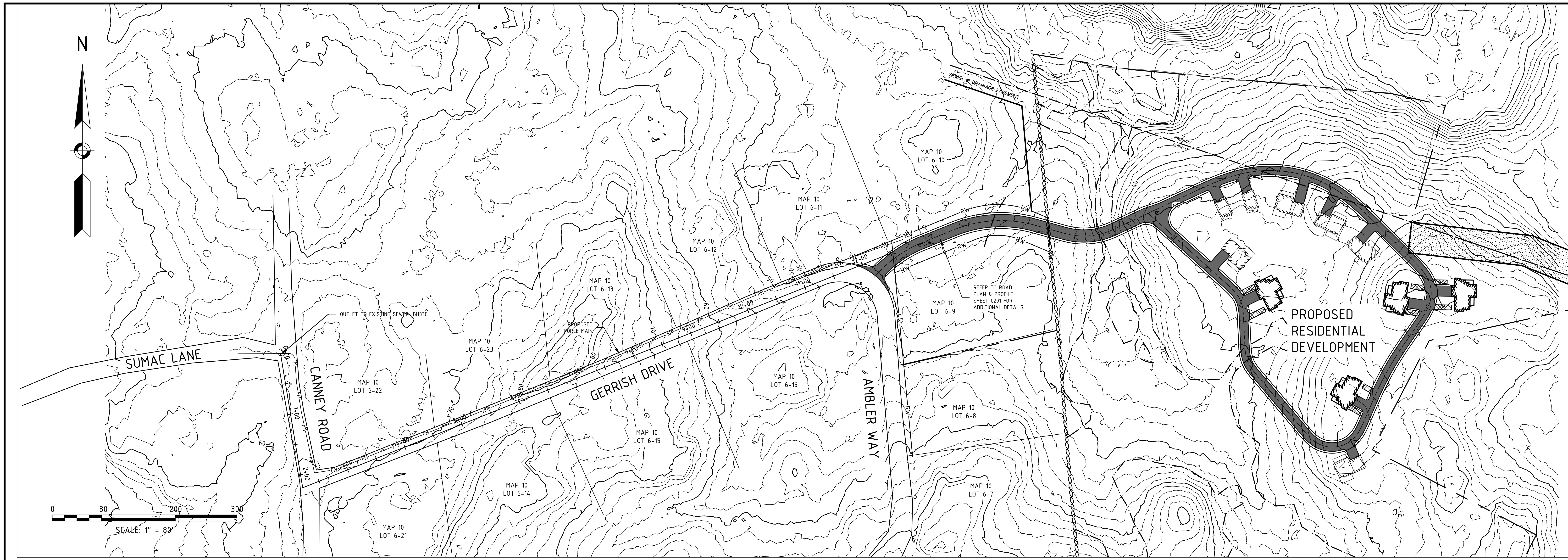
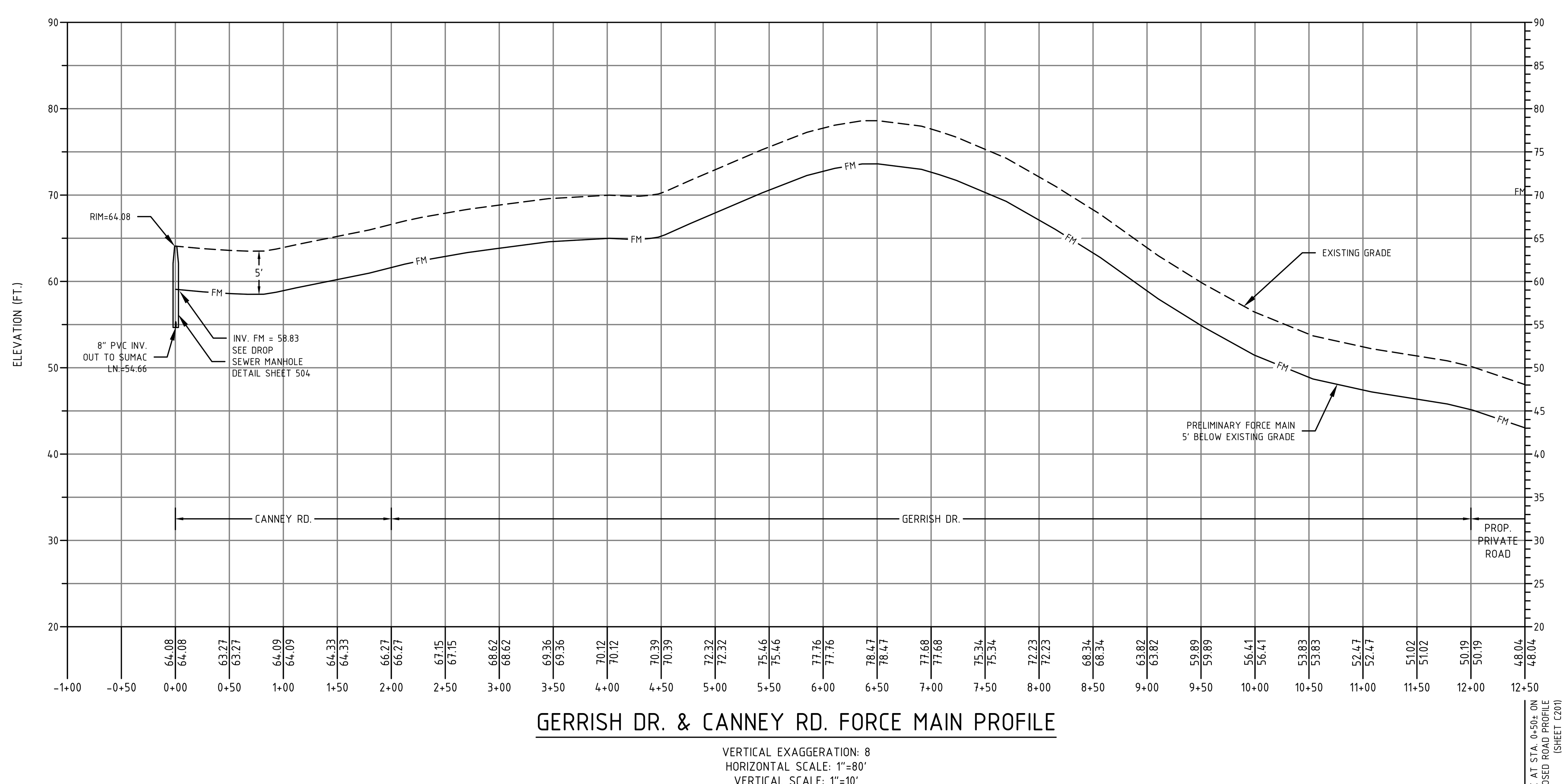
C204



NOTES:

1. THE PURPOSE OF THIS DRAWING IS TO SHOW THE APPROXIMATE EXISTING ELEVATIONS ALONG A CONCEPTUAL FORCE MAIN FOR EVALUATION PURPOSES ONLY.
2. VERTICAL DATA IS TAKEN FROM LiDAR DATA COLLECTED IN 2011 AND ACCESSED FROM GRANITNH.



GERRISH DR. & CANNEY RD. FORCE MAIN PROFILE

VERTICAL EXAGGERATION: 8
HORIZONTAL SCALE: 1"=80'
VERTICAL SCALE: 1"=10'

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

NO.	REVISIONS	DATE	INT.
0	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL

DATE ISSUED:	10/28/20
SCALE:	1"=30'
DESIGNED BY:	MCS
DRAWN BY:	MCS
APPROVED BY:	MJS
DWG FILE:	19063 CivilM-C205-MCS

OVERALL SITE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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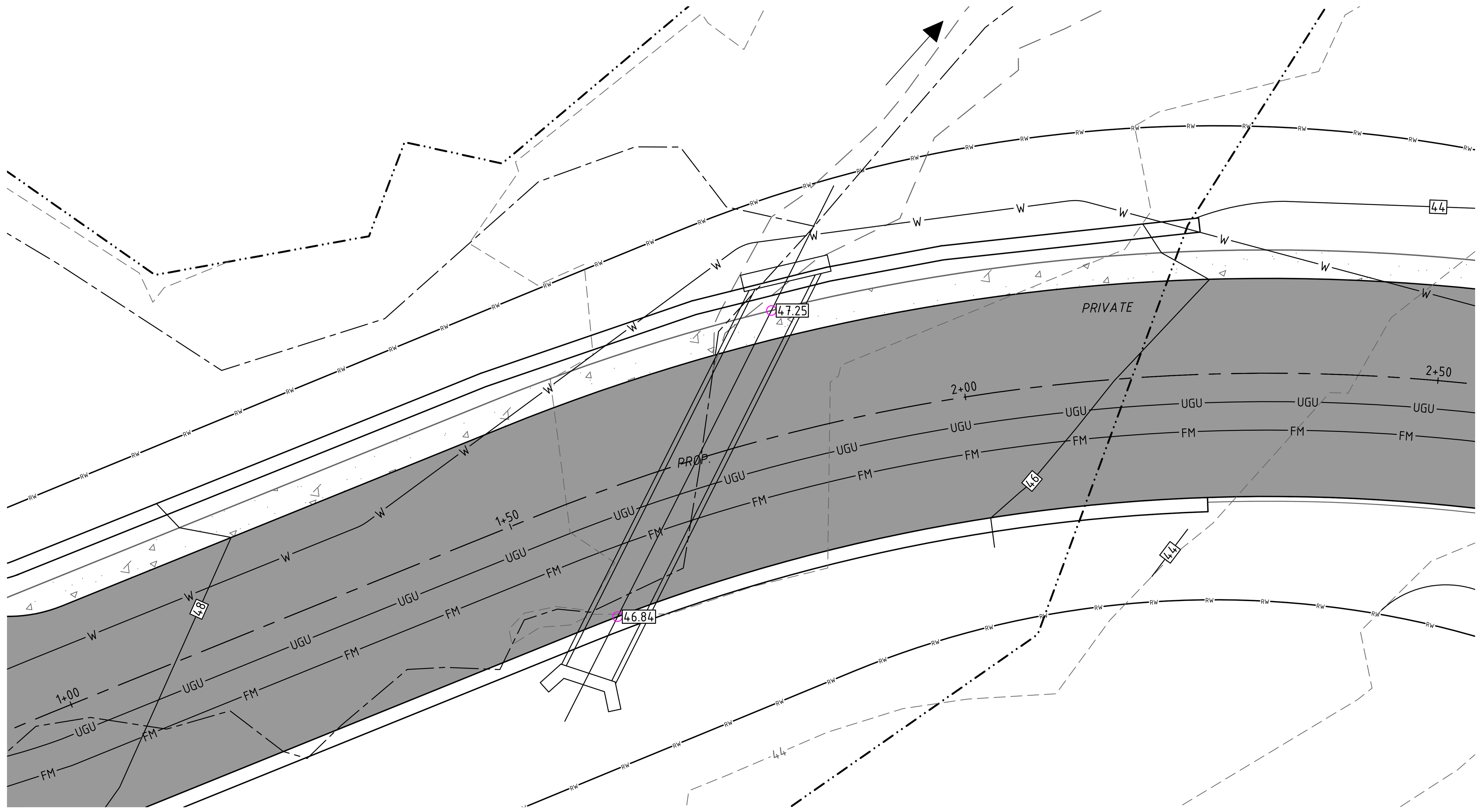
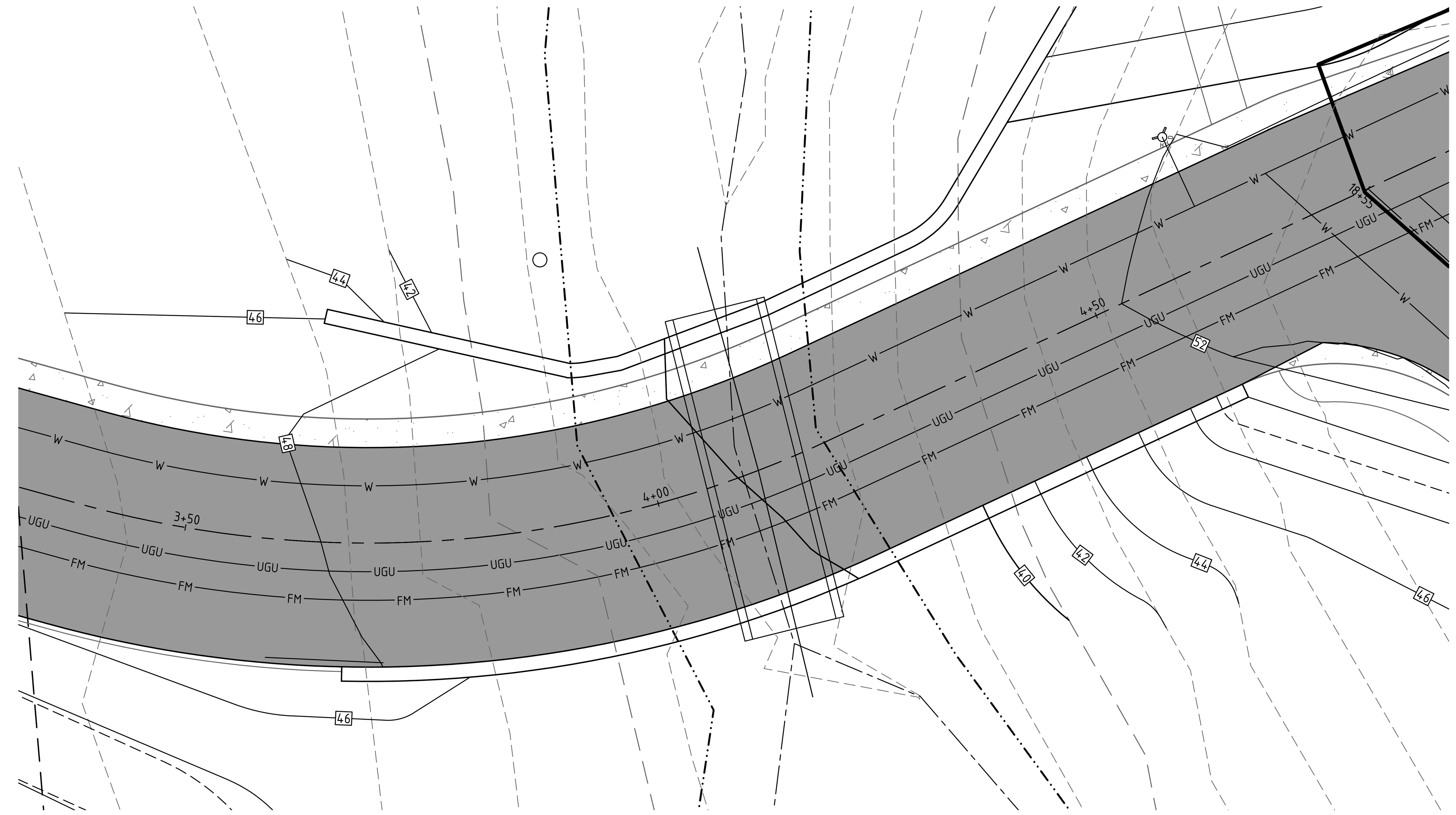
JOB: 19-063

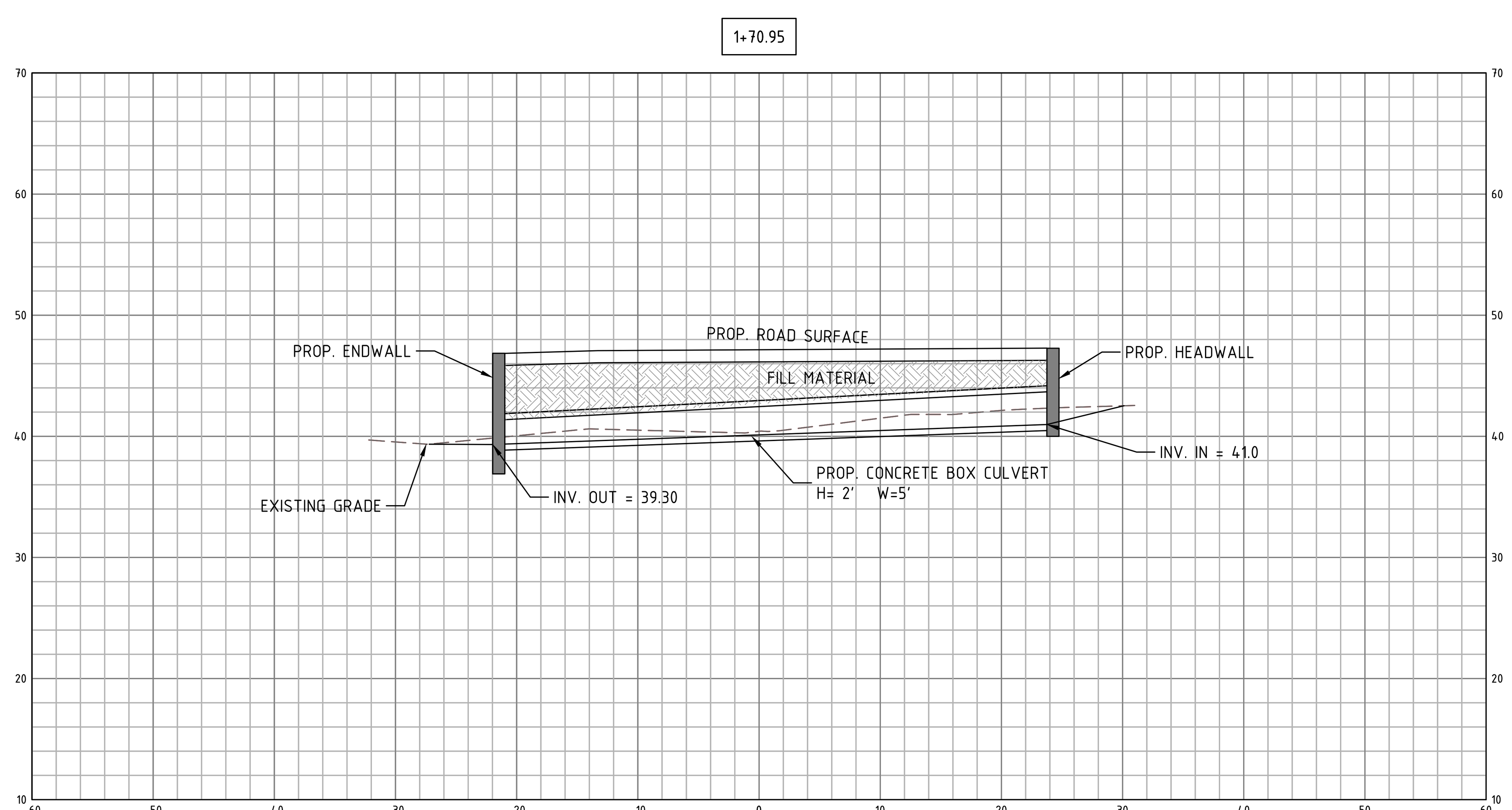
C205



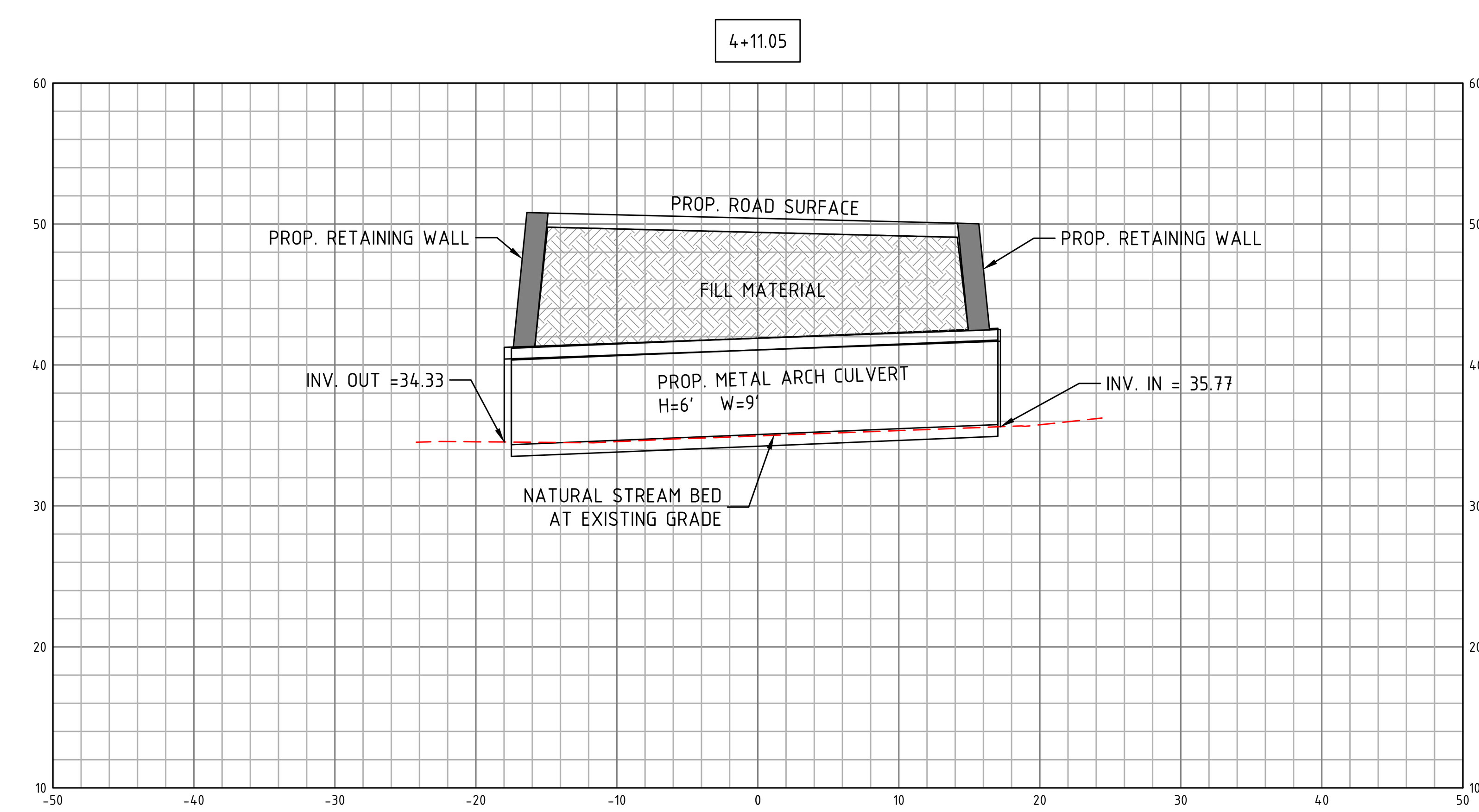
WETLAND CROSSING #1 PLAN VIEW



WETLAND CROSSING #2 PLAN VIEW



WETLAND CROSSING #1 SECTION VIEW



WETLAND CROSSING #2 SECTION VIEW

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/8/20	MCS
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

SEAL

STATE OF NEW HAMPSHIRE · MICHAEL J. SIEVERT No. 8397 LICENSED · PROFESSIONAL ENGINEER

DATE ISSUED: 10/28/20
SCALE: 1"=30'
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APPROVED BY: MJS
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ROAD CROSS-SECTIONS

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

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CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES:

AREA OF DISTURBANCE/STABILIZATION
A. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL THE AREA OF UNSTABILIZED SOIL EXCEED 5 ACRES AT ANY ONE TIME BEFORE THE AREA IS STABILIZED.
B. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
1. IN AREAS TO BE PAVED, BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM NO. 304.1 OR 304.2 HAVE BEEN INSTALLED;
2. IN AREAS NOT TO BE PAVED
2.A. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
2.B. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
2.C. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
C. DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITHIN 45 DAYS AND PERMANENTLY STABILIZED NO LATER THAN 3 DAYS AFTER FINAL GRADING.

EROSION CONTROL PRACTICES:
A. INSTALLATION:
1. INSTALL ALL EROSION CONTROLS AS SHOWN ON THE GRADING PLAN, TYPICAL DETAILS, AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE. MANUFACTURER'S SPECIFICATIONS SHALL BE FOLLOWED.
B. INSPECTION:
1. INSPECT ALL EROSION CONTROLS WEEKLY AND AFTER EVERY RAIN EVENT OF 0.5 INCHES OR GREATER UNLESS OTHERWISE NOTED.
2. TEMPORARY STABILIZATION PRACTICES SHALL BE INSPECTED ONCE PER WEEK DURING CONSTRUCTION UNTIL EXPOSED SURFACES ARE STABILIZED.
3. ANY SIGNS OF RILL OR GULLY EROSION SHALL BE IMMEDIATELY REPAIRED.
C. MAINTENANCE:
1. MAINTAIN EROSION CONTROLS PER THE TYPICAL DETAILS AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE.
D. REMOVAL
1. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE 85% VEGETATIVE COVER HAS BEEN ESTABLISHED.
2. AFTER REMOVAL, ALL DISTURBED AREAS SHALL BE REGRADED, FERTILIZED, AND RESEEDED. MONITOR TO ENSURE VEGETATIVE GROWTH IS ESTABLISHED AND REPAIR AS NEEDED UNTIL MINIMUM OF 85% VEGETATIVE COVER IS ESTABLISHED.

COLD WEATHER SITE STABILIZATION

A. TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE ADDITIONAL STABILIZATION TECHNIQUES SPECIFIED IN THIS SECTION SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1.
B. SUBJECT TO (C), BELOW, THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE:
1. LIMITED TO ONE ACRE; AND
2. PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT.
C. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WNTER CONSTRUCTION PLAN IS DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST AND SUBMITTED TO THE DEPARTMENT FOR APPROVAL AS A REQUEST TO WAIVE THE ONE-ACRE LIMIT.
D. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING OR TACKIFIER OR WITH AT LEAST 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(B).
E. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF 15% OR GREATER THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH A PROPERLY INSTALLED AND ANCHORED EROSION CONTROL BLANKET OR WITH AT LEAST 4 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(B).
F. ANCHORED HAY MULCH OR EROSION CONTROL MIX THAT MEETS THE CRITERIA OF ENV-WQ 1506.05(B) SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH.
G. EROSION CONTROL BLANKETS SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
H. ALL PROPOSED STABILIZATION IN ACCORDANCE WITH (D) OR (E), ABOVE, SHALL BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
I. ALL DITCHES OR SWALES THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.
J. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WNTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3-INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, TABLE 304-1, ITEM NO. 304.1, 304.2, OR 304.3, AVAILABLE AS NOTED IN APPENDIX B.

TEMPORARY VEGETATION

A. SITE PREPARATION
1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED ABOVE.
2. ENSURE RUNOFF IS DIVERTED FROM SEEDED AREA.
3. ON SLOPES OF 4:1 OR STEEPER, CREATE HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.
B. SEED BED PREPARATION
1. REMOVE STONES AND TRASH FROM AREA TO BE SEEDED.
2. COMPACTED SOIL SHALL BE LOOSENED TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME, AND SEED.
3. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
C. SEEDING
1. SEED PER THE FOLLOWING RECOMMENDATIONS

SEASON	APPLICATION DATE	MIXTURE TYPE	QUANTITY (lb./Ac.)
EARLY SPRING	NO LATER THAN 5/15	OATS	80
LATE SPRING/ FALL	4/1 TO 6/1 & 8/15 TO 9/15	PERENNIAL RYE	30
EARLY SPRING/ FALL	4/1 TO 5/15 & 8/15 TO 9/15	ANNUAL RYE	40
FALL	8/15 TO 9/15	WINTER RYE	112

2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
3. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH IN THE YEAR IN WHICH THE AREA BEING SEEDED WAS DISTURBED.
4. AREAS SEEDED BETWEEN MAY 15TH AND AUGUST 15TH SHALL BE COVERED WITH HAY OR STRAW MULCH MEETING THE FOLLOWING CRITERIA:
4.A. HAY AND STRAW MULCHES SHALL BE ANCHORED WITH MULCH NETTING OR TACKIFIER SO THAT THEY ARE NOT BLOWN AWAY BY WIND OR WASHED AWAY BY FLOWING WATER;
4.B. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, SLOPE, FLOW CONDITIONS, AND TIME OF YEAR;
4.C. HAY OR STRAW MULCH SHALL BE APPLIED AT A RATE OF 1.5 TO 2 TONS PER ACRE, EQUIVALENT TO 70 TO 90 POUNDS PER 1,000 SQUARE FEET;
5. IF VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA IS NOT ACHIEVED PRIOR TO OCTOBER 15TH, ONE OR MORE ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED.
D. MAINTENANCE
1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AND AFTER ANY RAINFALL EXCEEDING ½ INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD ALSO BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
3. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
4. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (E.G., MULCH) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION
A. SITE PREPARATION
1. REFER TO SITE PREPARATION FOR TEMPORARY SEEDING.
B. SEED BED PREPARATION
1. REFER TO SEED BED PREPARATION FOR TEMPORARY SEEDING IN CONJUNCTION WITH THESE NOTES.
2. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
3. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
4. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
5. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
6. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
C. SEEDING
1. UNLESS OTHERWISE NOTED, GRASS SEED MIXTURE 'C' SHALL BE APPLIED AT THE SPECIFIED RATE AS NOTED IN THE 'SEED MIXTURES FOR PERMANENT VEGETATION' TABLE.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING OPERATIONS SHOULD BE ON THE CONTOUR.
3. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND TO REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
5. SLOPES MUST BE NO STEEPER THAN 2 TO 1.
6. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
7. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
8. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH IN THE YEAR IN WHICH THE AREA BEING SEEDED WAS DISTURBED.
9. AREAS SEEDED BETWEEN MAY 15TH AND AUGUST 15TH SHALL BE COVERED WITH HAY OR STRAW MULCH MEETING THE FOLLOWING CRITERIA:
9.A. HAY AND STRAW MULCHES SHALL BE ANCHORED WITH MULCH NETTING OR TACKIFIER SO THAT THEY ARE NOT BLOWN AWAY BY WIND OR WASHED AWAY BY FLOWING WATER;
9.A. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, SLOPE, FLOW CONDITIONS, AND TIME OF YEAR;
9.B. HAY OR STRAW MULCH SHALL BE APPLIED AT A RATE OF 1.5 TO 2 TONS PER ACRE, EQUIVALENT TO 70 TO 90 POUNDS PER 1,000 SQUARE FEET;
10. IF VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA IS NOT ACHIEVED PRIOR TO OCTOBER 15TH, ONE OR MORE ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED.
D. MAINTENANCE
1. PERMANENTLY SEEDED AREAS SHOULD BE INSPECTED MONTHLY.
2. MOW SEEDED AREAS AS NECESSARY.
3. BASED ON INSPECTION, AREAS SHOULD BE REPAIRED AND/OR RESEEDED TO ENSURE 85% OF THE SOIL SURFACE IS COVERED BY VEGETATION.

MULCHING & EROSION CONTROL MATTING
A. GENERAL
1. APPLY PRIOR TO A STORM EVENT. CLOSELY MONITOR THE WEATHER TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.
2. MULCHING WITHIN A SPECIFIED TIME PERIOD FROM ORIGINAL SOIL EXPOSURE
2.A. WITHIN 100 FEET OF WETLANDS THE TIME PERIOD SHOULD BE NO GREATER THAN 7 DAYS.
2.B. IN OTHER AREAS IT SHALL BE NO GREATER THAN 14 DAYS.
3. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, FLOW CONDITIONS, AND TIME OF YEAR.
B. TEMPORARY MULCHING
1. HAY OR STRAW MULCHES
1.A. ORGANIC MULCHES INCLUDING HAY AND STRAW SHALL BE AIR-DRIED, FREE OF UNDESIRABLE SEEDS AND COARSE MATERIALS.
1.B. APPLICATION RATE SHALL BE 2 BALES/1,000 SF (70-90 POUNDS) OR 1.5-2.0 TONS/ACRE TO COVER 75-90% OF THE GROUND.
1.C. ANCHORING SHALL BE ONE OF THE FOLLOWING
1.C.1. NETTING SHALL BE JUTE, WOOD FIBER, OR BIODEGRADABLE PLASTIC NETTING INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
1.C.2. TACKIFIER: APPLY POLYMER OR ORGANIC TACKIFIER TO ANCHOR HAY OR STRAW MULCH. APPLY PER MANUFACTURER'S SPECIFICATIONS. TYPICAL APPLICATION RATES ARE 40-60 LBS/ACRE FOR POLYMER MATERIAL AND 80-120 LBS/ACRE FOR ORGANIC LIQUID.
1.D. WINTER APPLICATION: APPLY TO A DEPTH OF 4 INCHES OR DOUBLE THE ABOVE LISTED APPLICATION RATE. NOTE THAT IF SEEDING IS NECESSARY, MULCH WILL NEED TO BE REMOVED AND THE AREA SEEDED AND MULCHED IN THE SPRING.
1.E. MAINTENANCE
1.E.1. INSPECT PERIODICALLY AND AFTER RAIN STORMS FOR RILLS OR DISPLACEMENT OF MULCH. REPAIR AS NECESSARY. CONTINUE INSPECTIONS UNTIL 85% VEGETATIVE COVER IS ESTABLISHED.
2. EROSION CONTROL BLANKET OR MATTING
2.A. REFER TO PLANS FOR TYPICAL EROSION CONTROL MATTING DETAIL. INSTALL PER MANUFACTURERS SPECIFICATIONS.
2.B. APPLICATION AND TIMING
2.B.1. DURING THE GROWING SEASON (APRIL 15 – SEPTEMBER 15) USE ON THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER), ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS, AND WETLANDS.
2.B.2. DURING THE LATE FALL AND WINTER (SEPTEMBER 15 – APRIL 15) IN ADDITION TO THOSE LISTED ABOVE USE ON SIDE SLOPES OF GRASSED WATERWAYS AND MODERATE SLOPES (GREATER THAN 8%).
3. MAINTENANCE
3.A. INSPECT PERIODICALLY AND BEFORE AND AFTER STORM EVENTS TO ENSURE CONTACT WITH THE SOIL UNTIL 85% VEGETATIVE COVER IS ESTABLISHED. REPAIR AND RESTAPLE AS NECESSARY.
C. PERMANENT MULCHING
1. WOOD CHIPS OR GROUND BARK
1.A. APPLY TO A THICKNESS OF 2 TO 6 INCHES. APPLICATION RATES ARE 10-20 TONS/ACRE OR 460-920 POUNDS/1,000 SF.
1.B. MAINTENANCE: INSPECT ANNUALLY AND AFTER RAIN EVENTS OF 2.5 INCHES OR MORE IN A 24 HOUR PERIOD. REPAIR/REPLACE AS NECESSARY.
2. EROSION CONTROL MIX
2.A. SHALL BE PLACED AT A THICKNESS OF 2 INCHES OR MORE FOR MULCHING.
2.B. COMPOSITION OF THE MIX SHALL BE AS FOLLOWS:
2.B.1. ORGANIC MATTER CONTENT SHALL BE BETWEEN 25-65% DRY WEIGHT BASIS.
2.B.2. PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING THE 3" SCREEN, 90-100% PASSING THE 1" SCREEN, 70-100% PASSING THE 0.75 INCH SCREEN, AND 30-75% PASSING THE 0.25 INCH SCREEN.
2.B.3. THE ORGANIC PORTION SHALL BE ELONGATED AND FIBROUS SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS. IT SHALL NOT CONTAIN WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS.
2.B.4. THE MIX SHALL NOT CONTAIN SILTS, CLAYS, OR FINE SANDS.
2.B.5. SOLUBLE SALTS CONTENT SHALL BE < 4.0MMHOS/CM AND A pH OF 5.0-8.0,
2.C. PLACEMENT OF BERM
2.C.1. PLACE BERM ALONG A LEVEL CONTOUR. BERM MUST BE A MINIMUM OF 12" HIGH ON THE UPHILL SIDE AND 2 FEET WIDE. UPSLOPE AREA MUST HAVE A SLOPE OF LESS THAN 5%.
2.D. MAINTENANCE: INSPECT PERIODICALLY AND AUGMENT AS NEEDED TO MAINTAIN INITIAL THICKNESS. REPLACE IF NO LONGER FUNCTIONING AS INTENDED.

SOIL STOCKPILES
A. GENERAL
1. STOCKPILES MUST BE LOCATED 50 FEET FROM DITCHES AND CULVERT INLETS.
B. PROTECTION OF STOCKPILES
1. PROTECT SOIL AND AGGREGATE STOCKPILES WITH TEMPORARY PERIMETER SEDIMENT BARRIER SUCH AS SILT FENCE OR SILT SOCK.
2. COVER ACTIVE STOCKPILES WITH ANCHORED PROTECTIVE COVERING PRIOR TO EXPECTED STORM EVENTS.
3. INACTIVE STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR TEMPORARILY SEEDED AND MULCHED PER THE TEMPORARY VEGETATION AND MULCHING NOTES ON THIS PAGE.
4. STOCKPILES THAT ARE A SOURCE OF DUST SHALL BE COVERED.

DUST CONTROL
A. DUST SHALL BE CONTROLLED ON SITE DURING CONSTRUCTION BY IMPLEMENTING THE FOLLOWING DUST CONTROL MEASURES
1. MULCHING AND VEGETATIVE COVER TO REDUCE DUST.
2. MECHANICAL SWEEPERS AND FINE WATER SPRAYS.
3. COVER SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.

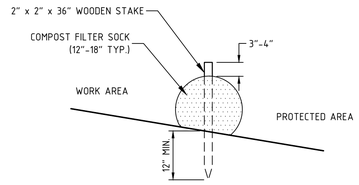
SEED MIXTURE SELECTION BASED ON SOIL TYPE

USE	SOIL DRAINAGE			
	SEEDING MIXTURE	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A B C D	FAIR POOR POOR FAIR	GOOD GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT EXCELLENT
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A C	GOOD GOOD	GOOD EXCELLENT	GOOD EXCELLENT
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A B C	GOOD GOOD GOOD	GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E F	FAIR FAIR	EXCELLENT EXCELLENT	EXCELLENT EXCELLENT

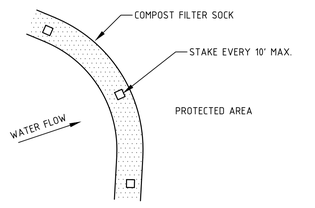
NOTE: POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREAS AND ATHLETIC FIELDS.

SEED MIXTURES FOR PERMANENT VEGETATION

MIXTURE	SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SF
A	TALL FESCUE CREEPING RED FESCUE REDTOP *TOTAL*	20 20 2 *42*	0.45 0.45 0.05 *0.95*
B	TALL FESCUE CREEPING RED FESCUE CROWN VETCH OR FLATPEA *TOTAL*	15 10 15 – 30 *40 OR 55*	0.35 0.25 0.35 – 0.75 *0.95 OR 1.35*
C	TALL FESCUE CREEPING RED FESCUE BIRDSFOOT TREFOIL *TOTAL*	20 20 8 *48*	0.45 0.45 0.20 *1.10*
D	TALL FESCUE FLATPEA *TOTAL*	20 30 *50*	0.45 0.75 *1.20*
E	CREPPING RED FESCUE KENTUCKY BLUEGRASS *TOTAL*	50 50 *100*	1.15 1.15 *2.30*
F	TALL FESCUE	*150*	*3.60*



CROSS-SECTION



PLAN VIEW

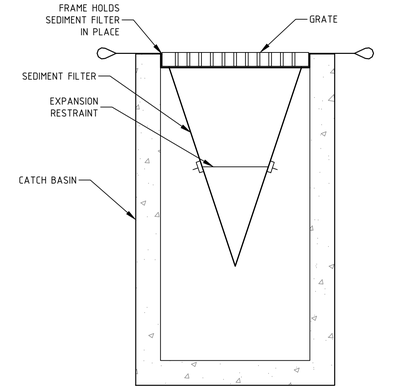
NOTES:
1. ALL COMPOST MATERIAL TO MEET MANUFACTURES SPECIFICATIONS.
2. FILTER SOCKS SHOULD BE INSTALLED FOLLOWING EXISTING CONTOURS.

COMPOST FILTER SOCK DETAIL
NTS

CONSTRUCTION SEQUENCING:
1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH CITY OFFICIALS, OWNER, AND CONTRACTORS IF REQUIRED BY THE CONDITIONS OF APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
2. CONTACT DIG-SAFE, INDIVIDUAL UTILITIES, AND CITY DEPARTMENTS TO GET ALL UTILITIES MARKED PRIOR TO START OF CONSTRUCTION.
3. INSTALL PERIMETER CONTROLS PRIOR TO ALL EARTHMOVING WORK.
4. CLEAR/GRUB ONLY WITHIN THE LIMITS OF GRADING AS SHOWN ON THE PLANS. REMOVE ORGANICS ONLY FROM THOSE AREAS THAT CAN BE WORKED AND STABILIZED WITHIN 45 DAYS OF REMOVAL.
5. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
6. MAINTAIN ACCESS TO ALL OTHER PROPERTIES AT ALL TIMES UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE PRIOR TO ANY CLOSURE.
7. CLEAR AND GRUB THE ROADWAY BEGINNING FROM THE EDGE OF GERRISH DR. AT STATION 0+00 AND PROCEED INTO THE SITE TO THE RAVINE. PREPARE TEMPORARY ACCESS ROAD FOR CONSTRUCTION PURPOSES.
A. STUMPS MAY BE DISPOSED ON-SITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
8. STOCKPILES
A. STOCKPILE LOAM FOR RE-USE AS NEEDED.
B. TEMPORARILY STABILIZE LOAM STOCKPILES WITH:
1. WINTER RYE GRASS- PRIOR TO SEPTEMBER 15TH
2. MULCH- FROM SEPTEMBER 15TH TO MAY 1ST
9. CONSTRUCT AND STABILIZE ALL TEMPORARY AND PERMANENT SEDIMENT, EROSION, AND STORMWATER CONTROL FACILITIES AS LISTED ABOVE.
A. THESE SHALL BE INSTALLED BEFORE ANY MAJOR EARTH MOVING OPERATIONS.
B. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPS ARE STABILIZED. REFER TO SEDIMENT TRAP DETAIL.
C. STORMWATER PONDS, INFILTRATION BASINS, AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
D. REFER TO INDIVIDUAL DETAILS FOR CONSTRUCTION REQUIREMENTS.
10. ROAD CONSTRUCTION PHASE 1: BEGIN ROAD CONSTRUCTION AT STATION 0+00 AND PROCEED INTO SITE TO RAVINE CROSSING. COMPLETE ROAD CONSTRUCTION FROM 0+00 TO RAVINE CROSSING PRIOR TO BEGINNING PHASE 2 ROAD CONSTRUCTION PAST RAVINE.
A. CUTS AND FILLS:
1. CONSTRUCT IN LOCATIONS AND TO GRADES AS SHOWN ON THE PLANS.
2. FILLS:
A. PLACE MAXIMUM 12" LIFTS AND COMPACT TO 95% MAXIMUM DRY DENSITY.
B. ALL MATERIAL BASED ON PROCTOR TEST SHALL BE FREE OF DELETERIOUS MATERIALS SUCH AS LOAM, STUMPS, BRUSH, AND ROCK LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING PLACED.
3. LOAM AND SEED SLOPES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
B. DRAINAGE AND UTILITY STRUCTURES
1. INSTALL AS SHWN IN ACCORDANCE WITH DETAILS AND DRY STABILIZE.
C. BASE MATERIALS: BANK RUN AND CRUSHED GRAVEL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY TO THE DEPTHS SPECIFIED IN THE PARKING LOTS CROSS-SECTION DETAILS.
D. STABILIZE ALL PARKING AREAS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
11. INSPECT, MAINTAIN, AND IF NECESSARY, REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS STATED IN EROSION CONTROL NOTES ON THIS SHEET.
12. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES ONCE INITIAL GROWTH IS ESTABLISHED.

ADDITIONAL NOTES:
1. NO FUEL SHALL BE STORED ON SITE DURING CONSTRUCTION.
2. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
3. ALL CONSTRUCTION MATERIALS THAT ARE SPILLED OR DEPOSITED ON THE PUBLIC ROADWAYS SHALL BE REMOVED BY THE CONTRACTOR.
4. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

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



NOTES:
1. SEDIMENT FILTER TRAP SHALL BE ACF REGULAR FLOW SILTSACK OR APPROVED EQUAL.
2. FILTERS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.

CATCH BASIN SEDIMENT FILTER DETAIL
NTS

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
0.	INITIAL SUBMISSION TO DURHAM	10/28/20	MCS

SEAL

DATE ISSUED: 11/4/20
SCALE: N/A
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 DetIC.dwg

CONSTRUCTION DETAILS

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Stonewall St., P.O. Box 329
Newmarket, NH 03857
Phone: (603) 659-4979, Fax: (603) 659-4627
E-Mail: info@mjsengineering.com

JOB: 19-063

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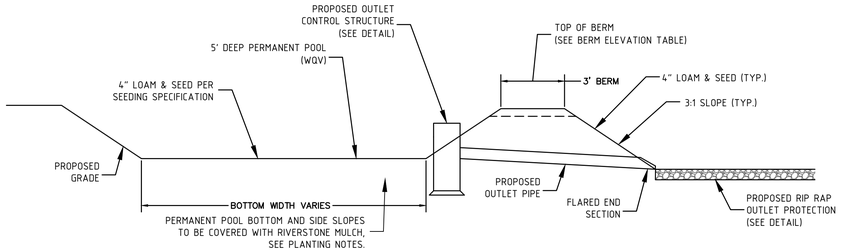


CONSTRUCTION NOTES:

1. DO NOT PLACE STORMWATER POND INTO SERVICE UNTIL THE BMP HAS BEEN SEEDED AND STABILIZED. ALL CONTRIBUTING AREAS SHALL BE FULLY STABILIZED.
2. CLEAR AND GRUB THE AREA WHERE THE STORMWATER POND IS TO BE LOCATED. STOCKPILE LOAM FOR REUSE LATER.
3. THE FOUNDATION AREA SHALL BE SCARIFIED PRIOR TO PLACING FILL. ALL UNSUITABLE MATERIAL UNDER THE BERM SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION MATERIAL.
4. THE BERM SHALL BE CONSTRUCTED BEGINNING FROM THE LOWEST POINT UNIFORMLY ALONG ITS ENTIRE LENGTH. PLACE MATERIALS IN MAXIMUM 12" LOOSE LIFTS COMPACTED TO 95% MAXIMUM DRY DENSITY. EMBANKMENT SOIL SHALL HAVE NO ORGANIC MATTER OR FROZEN MATERIAL AND NO STONES LARGER THAN 2/3 OF THE MAXIMUM LOOSE LIFT THICKNESS. STONES AROUND ANY STRUCTURES AND/OR CONDUITS SHALL NOT EXCEED 3 INCHES. EMBANKMENT FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

SIEVE SIZE:	% PASSING:
#4	80-90
#40	50-80
#100	30-45
#200	15-30

5. ALL PIPE TO PIPE CONNECTIONS SHALL BE WATER-TIGHT.
6. ALL DISTURBED AREAS SHALL RECEIVE FOUR INCHES OF LOAM AND SEEDED PER THE CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES.

PLANTING NOTES:

1. PERMANANT POOL BOTTOM AND SIDE SLOPES TO BE COVERED WITH 2" DEEP RIVERSTONE (1-1/2" TO 2" STONES).
2. POND BOTTOM
   POND BOTTOM EXCLUDING PERMANENT POOL TO BE SEEDED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES (50 LBS./ACRE).

   POND BERM AND SIDE SLOPES
   BERM AND SIDE SLOPES EXCLUDING PERMANENT POOL SHALL BE SEEDED WITH NEW ENGLAND CONSERVATION/WILDLIFE MIX (30 LBS PER ACRE).

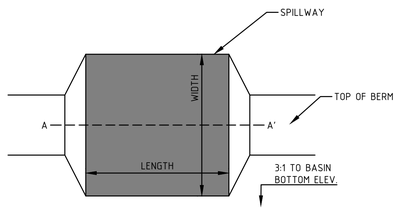
   AVAILABLE FROM:
   NEW ENGLAND WETLAND PLANTS, INC.
   820 WEST STREET
   AMHERST, MA 01002
   (413)-548-8000

STORMWATER POND MAINTENANCE:

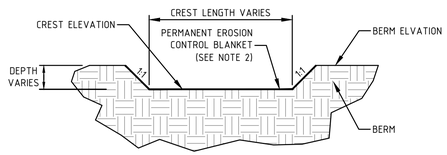
1. THE BOTTOM, SIDE SLOPES AND CREST SHALL BE MOWED AND THE VEGETATION MAINTAINED IN A HEALTHY CONDITION.
2. EMBANKMENTS SHOULD BE INSPECTED ANNUALLY BY A QUALIFIED PROFESSIONAL FOR SETTLEMENT, EROSION, SEEPAGE, ANIMAL BURROWS, AND WOODY VEGETATION. REPAIR AS NECESSARY.
3. A QUALIFIED PROFESSIONAL SHALL INSPECT THE OUTLET PIPE, SPILLWAY, AND OUTLET PROTECTION ANNUALLY. REPAIR AS NECESSARY.
4. TRASH AND DEBRIS SHALL BE REMOVED FROM THE BASIN AND PIPE INLETS AND OUTLETS WHENEVER PRESENT.
5. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH EXCEEDS 4 INCHES.

TYPICAL STORMWATER POND DETAIL
NTS

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



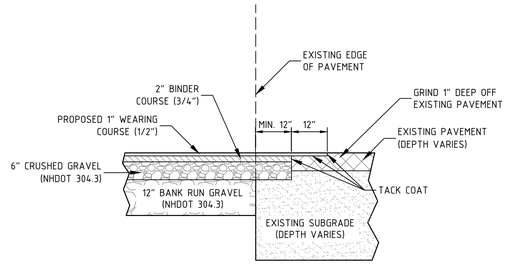
PLAN VIEW



CROSS-SECTION A-A'

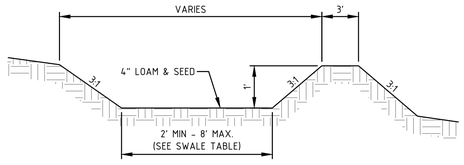
NOTES:
1. SPILLWAYS ARE LOCATED AT SEDIMENT FOREBAY OUTLETS, STORMWATER POND AND INFILTRATION BASIN.
2. PERMANENT EROSION CONTROL BLANKET SHOULD BE TENSAR P300 OR APPROVED EQUAL
3. INSTALL TURF REINFORCEMENT PER MANUFACTURER'S SPECIFICATIONS.

TYPICAL SPILLWAY DETAIL
NTS



NOTES:
1. SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED BY NHDOT.
2. INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
3. PLACE BINDER COURSE.
4. GRIND EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
5. TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.

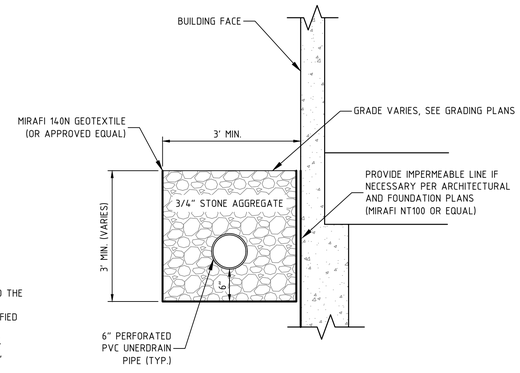
TYPICAL PAVEMENT SAWCUT DETAIL
NTS



CONSTRUCITON NOTES:
1. REFER TO BERM CONSTRUCTION NOTES IN STORMWATER POND DETAIL FOR BERM CONSTRUCTION REQUIREMENTS.
2. SWALE SHALL HAVE GREATER THAN 85% VEGETATIVE GROWTH PRIOR TO RECEIVING RUNOFF.
3. BOTTOM OF THE SWALE MUST BE ABOVE SEASON HIGH WATER TABLE.

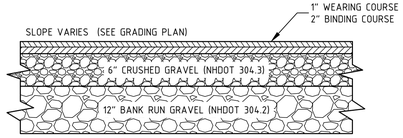
MAINTENANCE NOTES:
1. INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATION, VEGETATION LOSS, AND PRESENCE OF INVASIVE SPECIES.
2. PERFORM PERIODIC MOWING. DO NOT MOW GRASS SHORTER THAN 4 INCHES.
3. REMOVE DEBRIS AND ACCUMULATED SEDIMENT BASED ON INSPECTION.
4. REPAIR ERODED AREAS, REMOVE INVASIVE SPECIES AND DEAD VEGETATION, AND RESEED WITH APPLICABLE GRASS MIX AS WARRANTED BY INSPECTION.

CONVEYANCE SWALE DETAIL
NTS



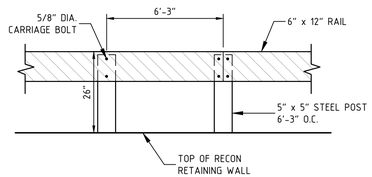
NOTES:
1. SEE PLANS FOR LOCATION.

DRIP STRIP DETAIL
NTS



NOTES:
1. DELETERIOUS MATERIALS ENCOUNTERED BELOW PARKING AREA SHALL BE COMPLETELY REMOVED.
2. COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR.

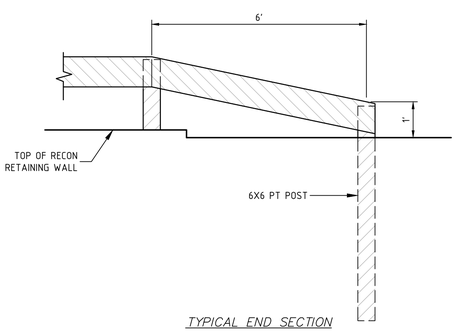
DRIVEWAY PAVEMENT CROSS-SECTION
NTS



NOTE:
1. REFER TO SHEET C103 FOR LOCATION AND GRADING AROUND GUARD RAIL.

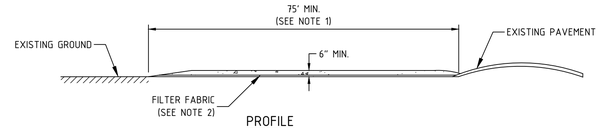
REFERENCE:
TIMBER BRIDGE DESIGN, CONSTRUCTION, INSPECTION, AND MAINTENANCE PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE.

GUARD RAIL DETAIL
NTS

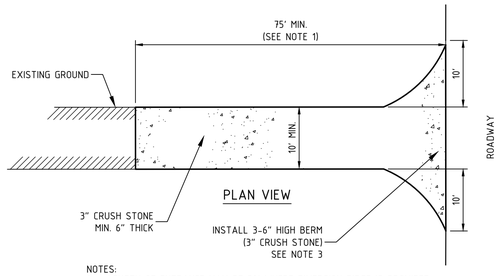


TYPICAL END SECTION

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



PROFILE



PLAN VIEW

NOTES:
1. LENGTH OF ENTRANCE MAY BE 50' WHERE DIVERSION RIDGE IS PROVIDED.
2. GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY. PLACE FILTER FABRIC AND 6" OF 3" CRUSHED STONE TO MATCH SLOPE OF EXISTING ROAD.
3. PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
4. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE ENTRANCE.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
NTS

NO.	REVISIONS	DATE	INT.
0.	INITIAL SUBMISSION TO DURHAM	10/28/20	MCS
1.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS

SEAL

DATE ISSUED: 11/4/20
SCALE: N/A
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 DetlC.dwg

CONSTRUCTION DETAILS

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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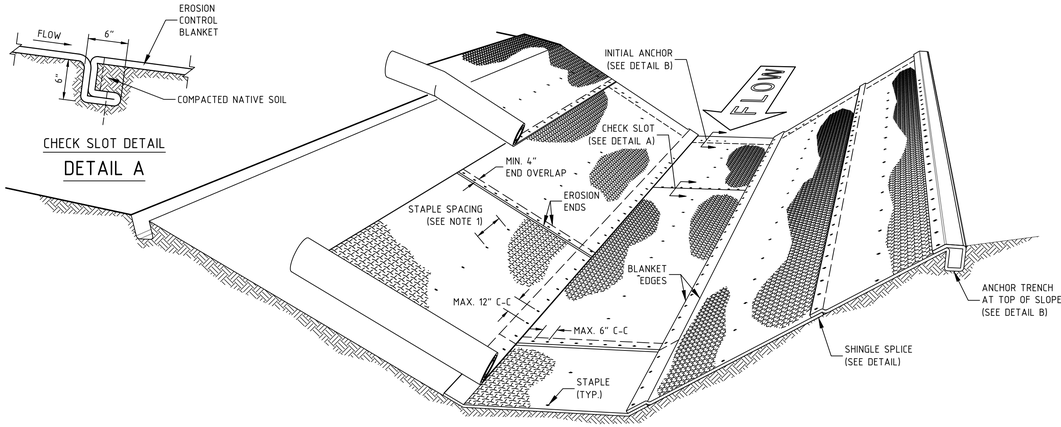
JOB: 19-063

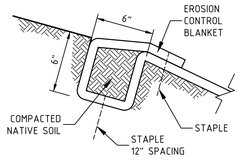
C502



CHECK SLOT DETAIL

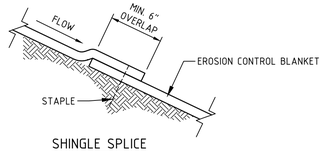
DETAIL A

CHANNEL INSTALLATION



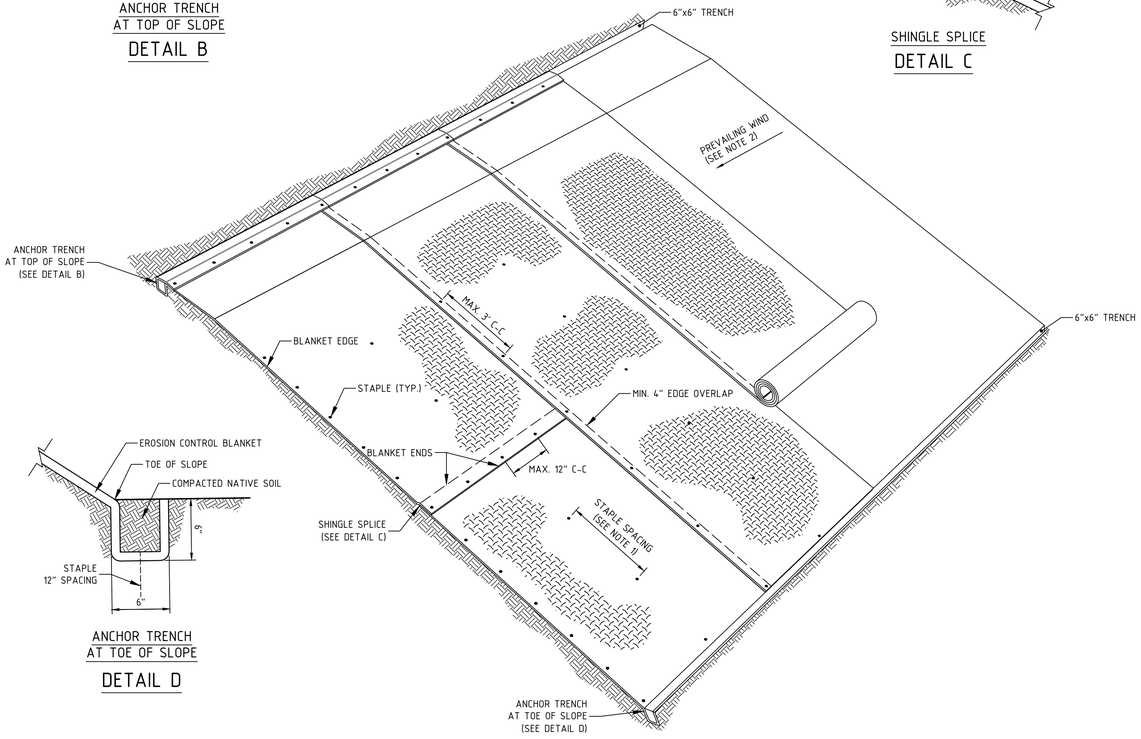
ANCHOR TRENCH AT TOP OF SLOPE

DETAIL B



SHINGLE SPLICE

DETAIL C



ANCHOR TRENCH AT TOE OF SLOPE

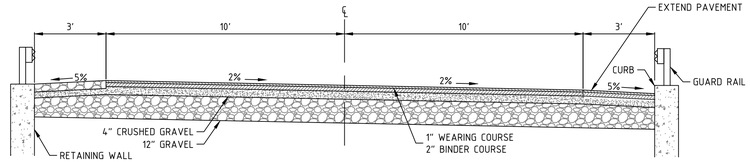
DETAIL D

SLOPE INSTALLATION

NOTES:
1. INSTALL STAPLES ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
2. OVERLAP IN THE DIRECTION OF THE PREVAILING WIND.
3. INSTALL STAPLES ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
4. PROVIDE CHECK SLOTS ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
5. ROLL ENDS MAY BE SPLICED IN A CHECK SLOT.
6. TRAPEZOIDAL DITCH SHOWN. SIMILAR DETAILS FOR A V-DITCH.

ROLLED EROSION CONTROL DETAIL

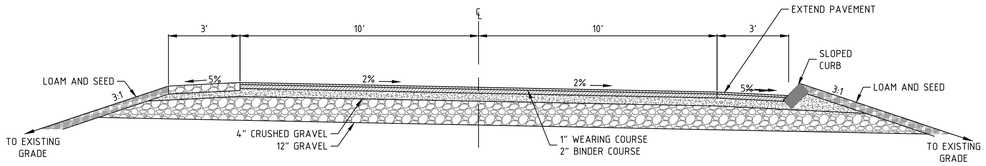
NTS



TYPICAL PUBLIC ROAD WITH RETAINING WALLS CROSS-SECTION

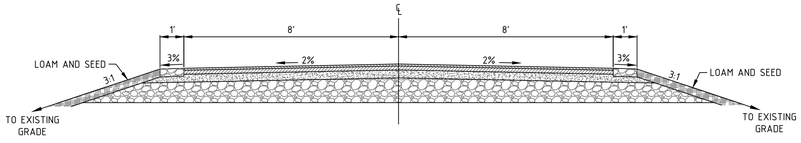
NTS

NOTE:
1. STA. RT 0+25 TO 2+25
2. STA. LT 0+98 TO 2+20



TYPICAL PUBLIC ROAD CROSS-SECTION

NTS



TYPICAL PRIVATE DRIVE CROSS-SECTION

NTS

NOTE:
1. SOME SECTION OF LOOP ROAD ARE SUPERELEVATED. (SEE GRADING PLAN)

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

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
0.	INITIAL SUBMISSION TO DURHAM	10/28/20	MCS

SEAL

DATE ISSUED: 11/4/20
SCALE: N/A
DESIGNED BY: MCS
DRAWN BY: MCS
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DWG FILE: 19063 DetIC.dwg

CONSTRUCTION DETAILS

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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JOB: 19-063

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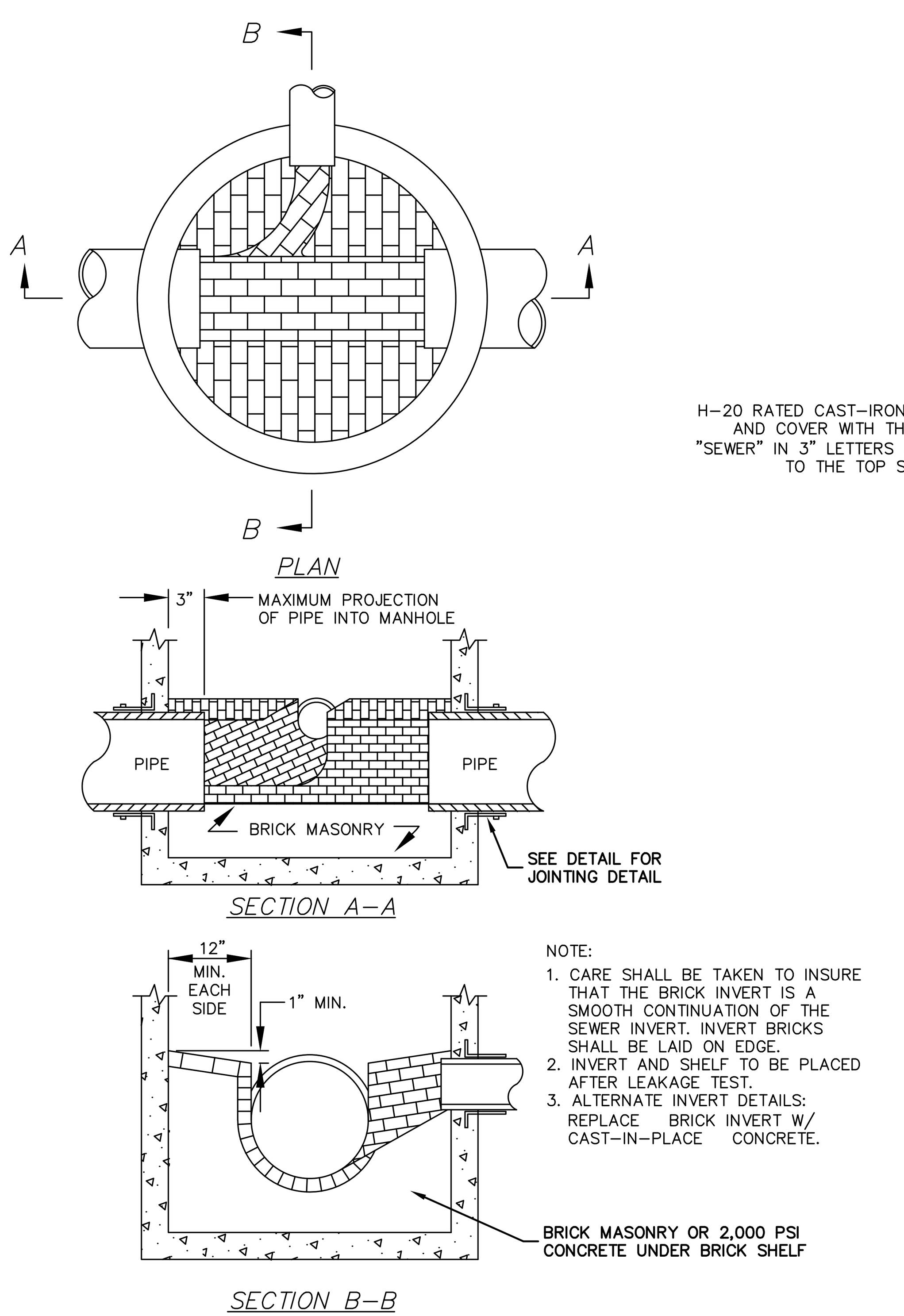
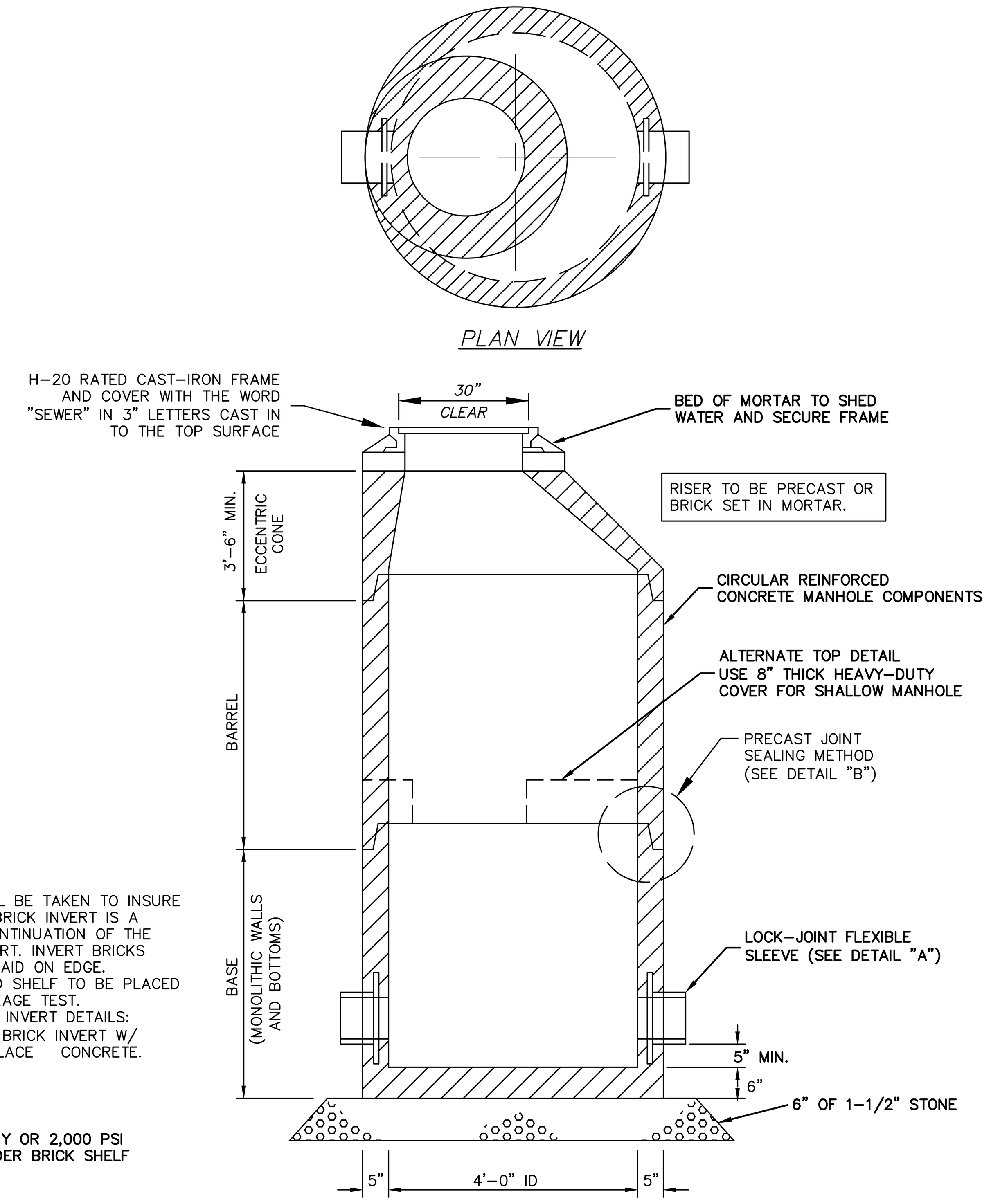


NOTE:
1. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
2. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
3. ALTERNATE INVERT DETAILS: REPLACE BRICK INVERT W/ CAST–IN–PLACE CONCRETE.

TYPICAL SEWER MANHOLE INVERT

NTS



TYPICAL SEWER MANHOLE

NTS

NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.

SEWER NOTES:

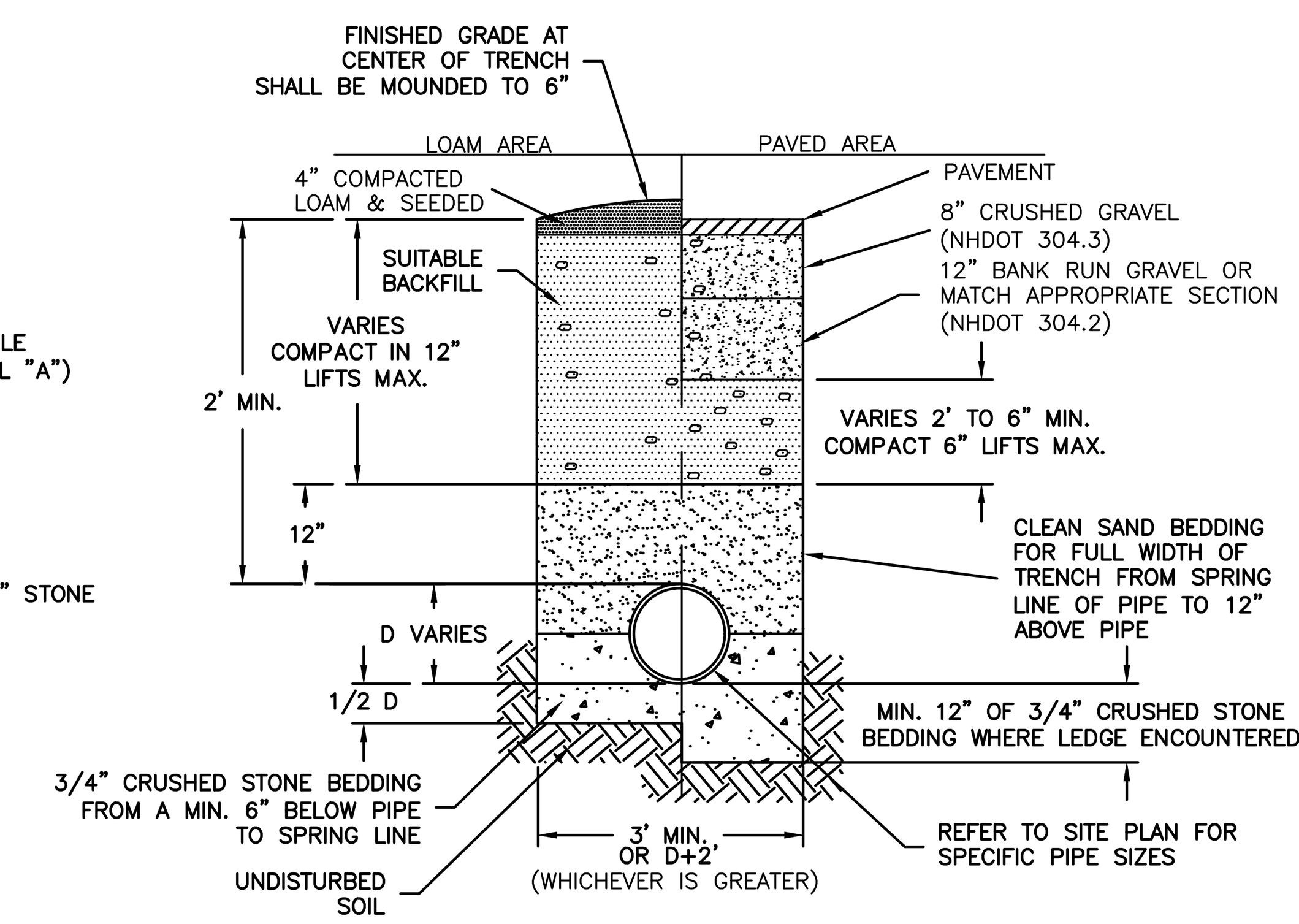
PER THE REQUIREMENTS OF "STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWERAGE AND WASTEWATER TREATMENT FACILITIES."

GRAVITY SEWER CONSTRUCTION MATERIALS (Env–Wq 704.05)

(A) PLASTIC GRAVITY SEWER PIPE AND FITTINGS SHALL BE 8 INCH PVC SDR 35 SEWER PIPE (EXCEPT SEWER SERVICE SHALL BE 6" SRD 35 PVC) AND SHALL COMPLY WITH ASTM D3034–04a.
(B) PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 PSI AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412–02 DURING MANUFACTURE.
(C) JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212–96(a)(2003)e1 AND SHALL BE PUSH–ON, BELL AND SPIGOT TYPE.

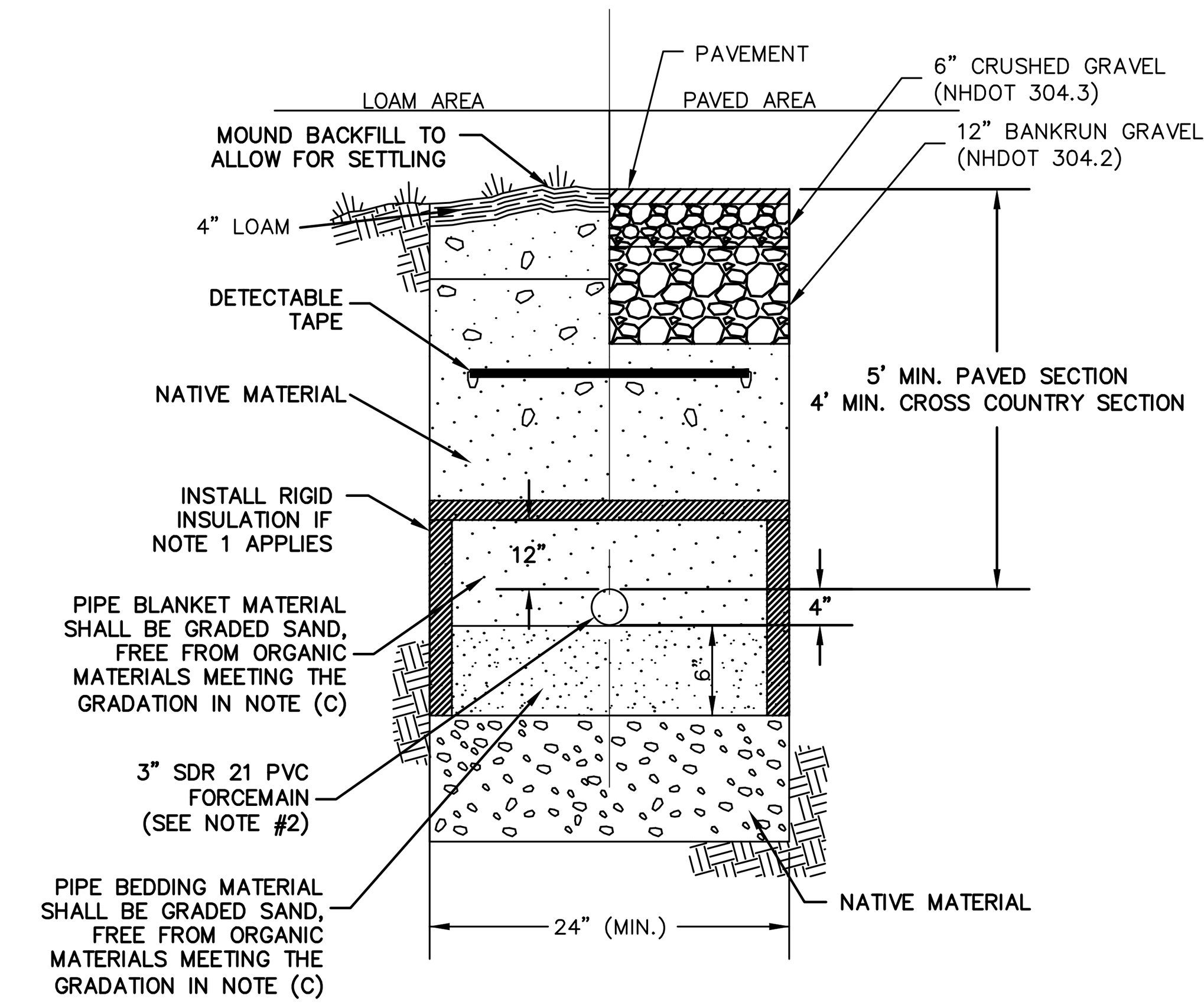
GRAVITY SEWER PIPE TESTING REQUIREMENTS (Env–Wq 704.07)

(A) ALL NEW SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW–PRESSURE AIR TESTS.
(B) LOW–PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
(1) ASTM F1417–92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW–PRESSURE AIR"; OR
(2) UNI–BELL PVC PIPE ASSOCIATION UNI–B–6, "LOW–PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).
(C) ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
(D) ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS FOLLOWING INSTALLATION.
(E) THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 7½ PERCENT OF AVERAGE INSIDE DIAMETER.



STANDARD DRAINAGE PIPE TRENCH

NTS



SEWER FORCE MAIN TRENCH

NTS

NOTES
1. USE RIGID INSULATION AS SHOWN IF PIPE COVER IS LESS THAN 4' UNDER PAVED SECTION OR 5' UNDER CROSS COUNTRY SECTION.
2. THERE SHALL BE NO GLUE JOINTS ON THE FORCEMAIN.

TRENCH CONSTRUCTION (PER Env–Wq 704.09 NUMERATION)

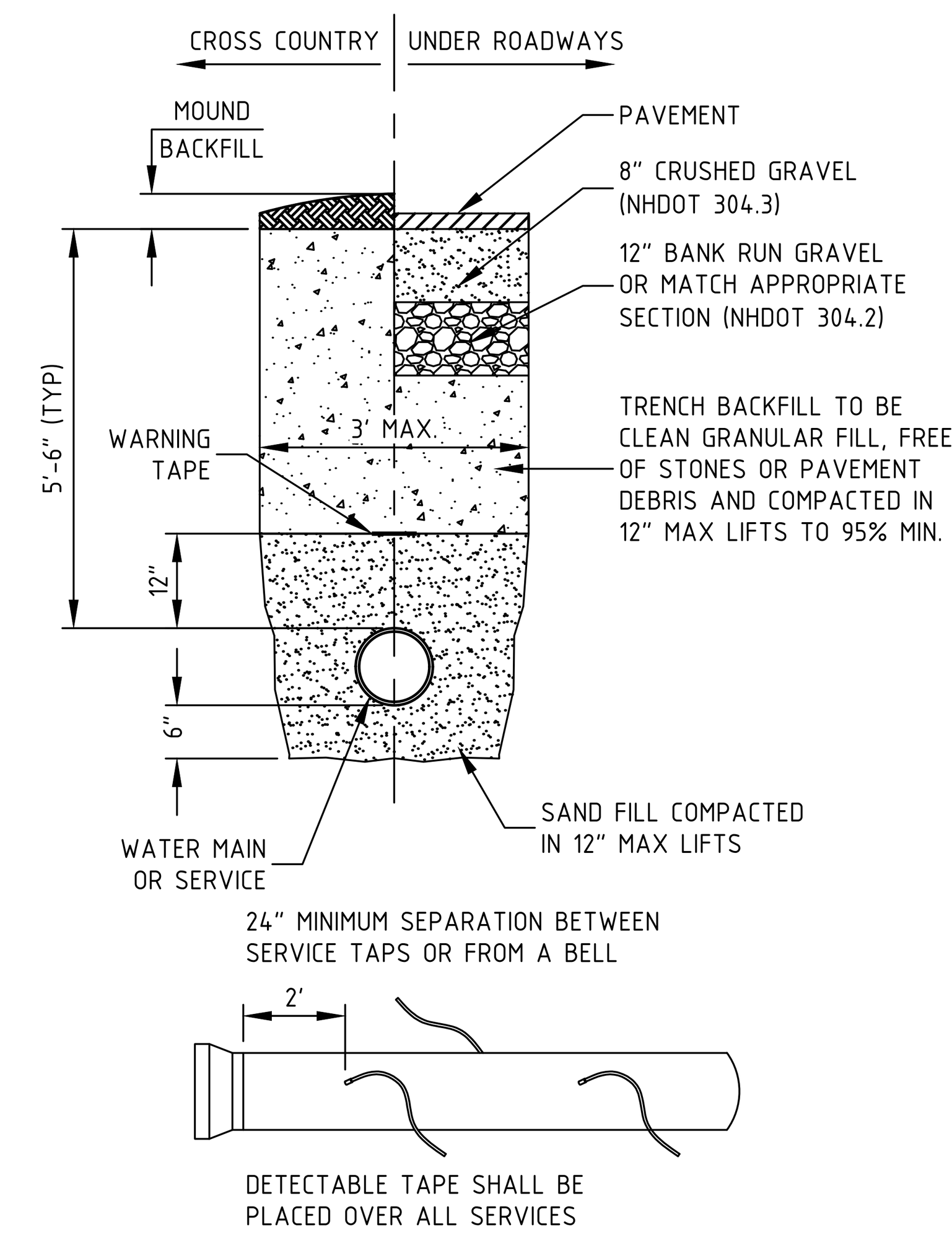
(A) TRENCH DIMENSIONS SHALL BE AS FOLLOWS:
(1) FOR SEWER PIPE LESS THAN 15" IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36".
(B) PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33–03 STONE SIZE NO. 67.
(C) THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES THROUGH A 1/2 INCH SIEVE AND A MAXIMUM OF 15% PASSES THROUGH A #200 SIEVE.
(E) PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6 INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.
(F) PIPE SAND MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
(G) COMPACTION SHALL BE IN 12 INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
(H) BACKFILL MATERIALS SHALL BE COMPACTED IN 3–FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION (OR OTHER PAVED AREAS) WHERE THE FINAL 3 FEET SHALL BE COMPACTED IN 12–INCH LAYERS TO THE ROAD BASE SURFACE.
(I) TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING: DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
(J) TRENCH BACKFILL AT CROSS–COUNTRY LOCATIONS SHALL BE AS DESCRIBED IN (I) ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK OR PEAT, MAY BE USED PROVIDED THE COMPLETED CONSTRUCTION WILL BE STABLE, AND PROVIDED THAT ACCESS TO THE SEWER FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED.
(K) BACKFILL SHALL BE MOUNDED 6 INCHES ABOVE ORIGINAL GROUND AT CROSS–COUNTRY LOCATIONS.
(L) BASE COURSE FOR TRENCH REPAIR SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NH DOT.
(O) PRECAUTIONS SHALL BE TAKEN TO AVOID GROUNDWATER POOLING AT THE SURFACE BY PROVIDING DRAINAGE TO A SUITABLE OUTLET AT CATCH BASINS OR RUNOFF SWALES.

FORCE MAIN AND LOW PRESSURE SEWER CONSTRUCTION MATERIALS (PER Env–Wq 704.06 NUMERATION)

THIS SECTION REQUIRED TO MEET REQUIREMENTS OF Env–Wq 704.12 (d):
(A) FORCE MAINS SHALL BE CONSTRUCTED OF SDR 21 PVC MATERIAL.
(B) FORCE MAINS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.
(C) PVC PIPE USED FOR FORCE MAINS SHALL CONFORM TO ASTM D2241–05 OR ASTM D1785–05.

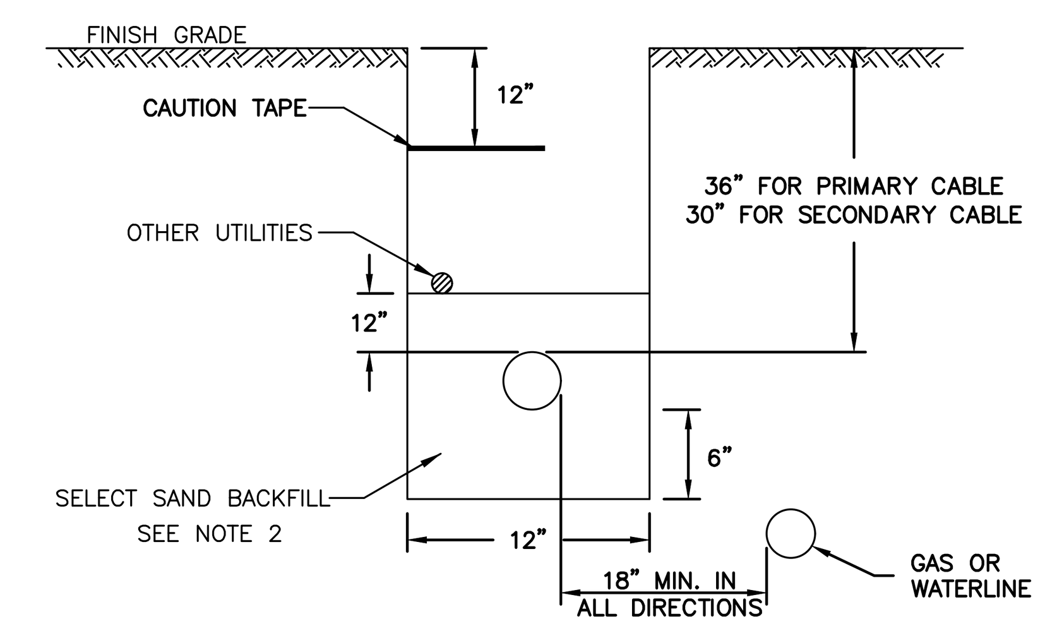
FORCE MAIN AND LOW PRESSURE SEWER TESTING (PER Env–Wq 704.08 NUMERATION)

FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4 OF AWWA C600–05 "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES", AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.



WATER MAIN TRENCH

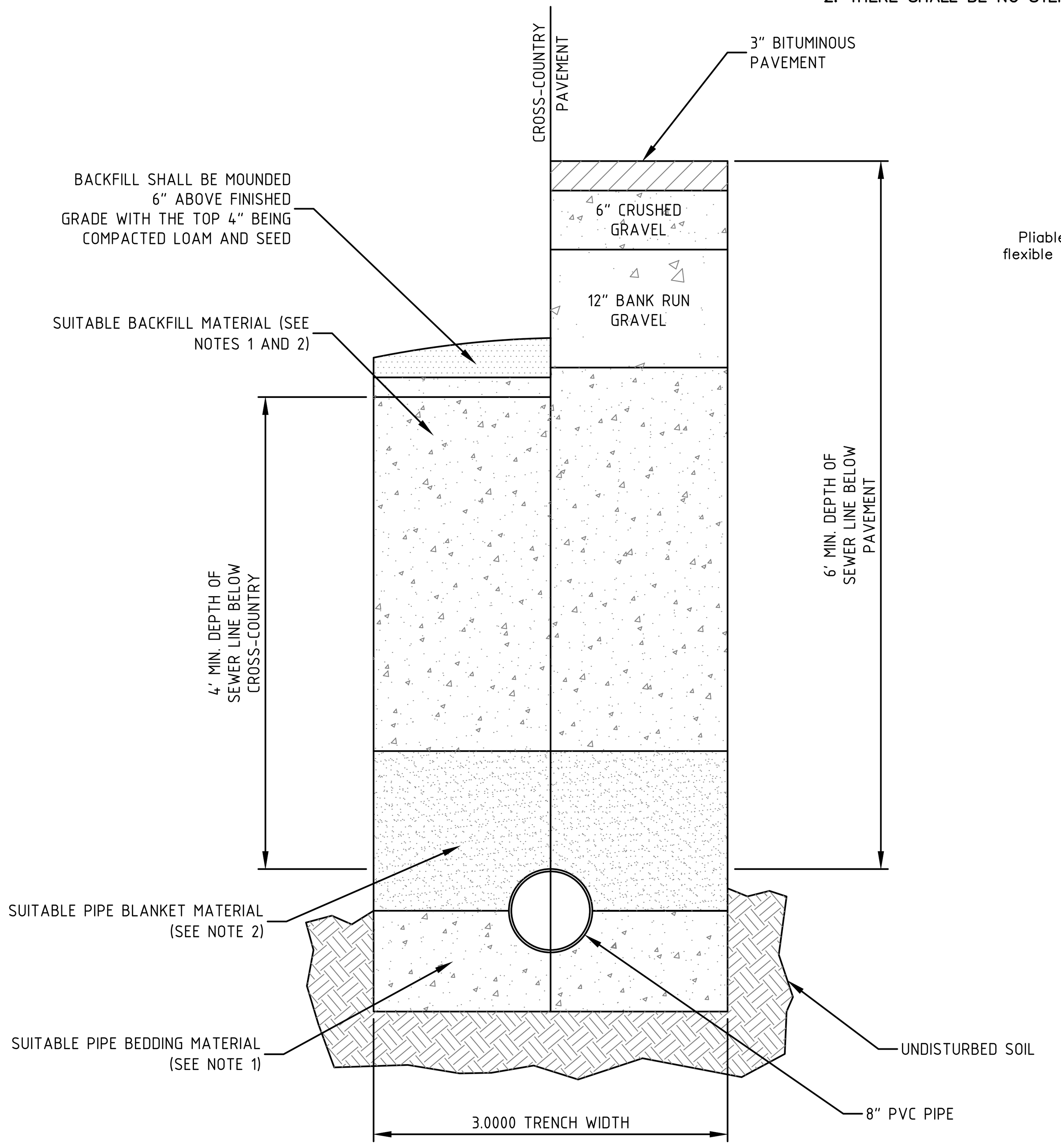
NTS



TELEPHONE & ELECTRICAL TRENCH

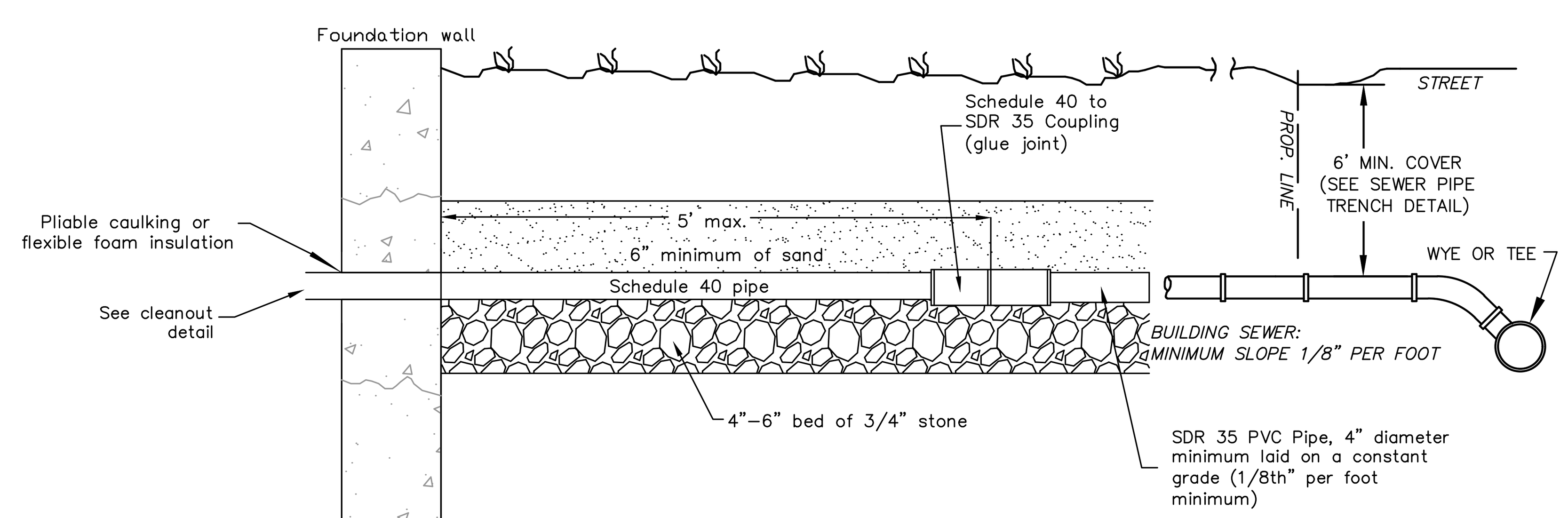
NTS

NOTES:
1. CONSTRUCTION TO BE IN ACCORDANCE WITH PSNH CONSTRUCTION STANDARDS FOR NEW ELECTRICAL SERVICE WORK BY CONTRACTORS, MOST RECENT EDITION.
2. SELECT SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. EXCEPT NATURALLY OCCURING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%. THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS AND RUBBISH. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6" LIFTS.
3. CONDUIT SIZES TO BE 5" 3–PHASE PRIMARY AND 4" 3–PHASE SECONDARY. ALL CONDUIT SIZES TO BE VERIFIED BY PSNH.
4. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE THE NATIONAL ELECTRIC CODE.



STANDARD SEWER PIPE TRENCH

NTS

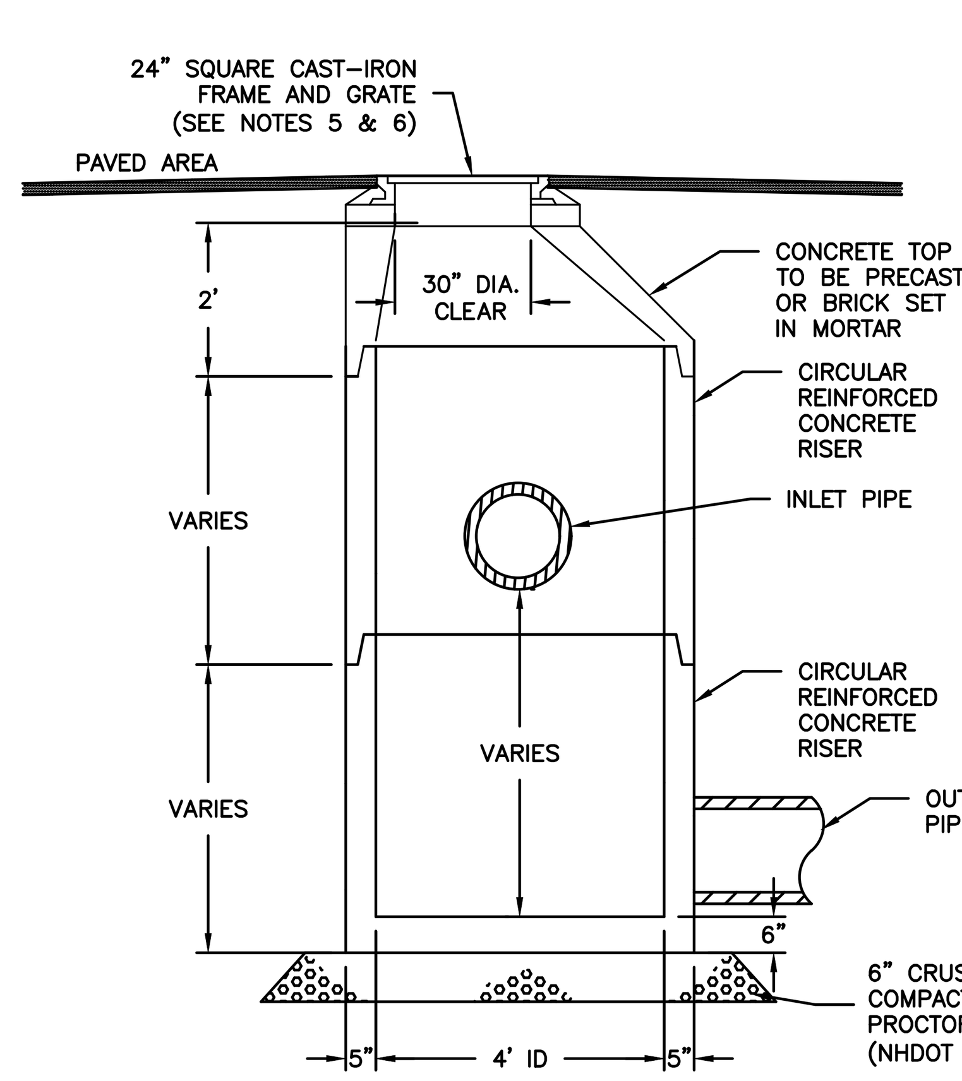


TYPICAL BUILDING SEWER CONNECTION

NTS

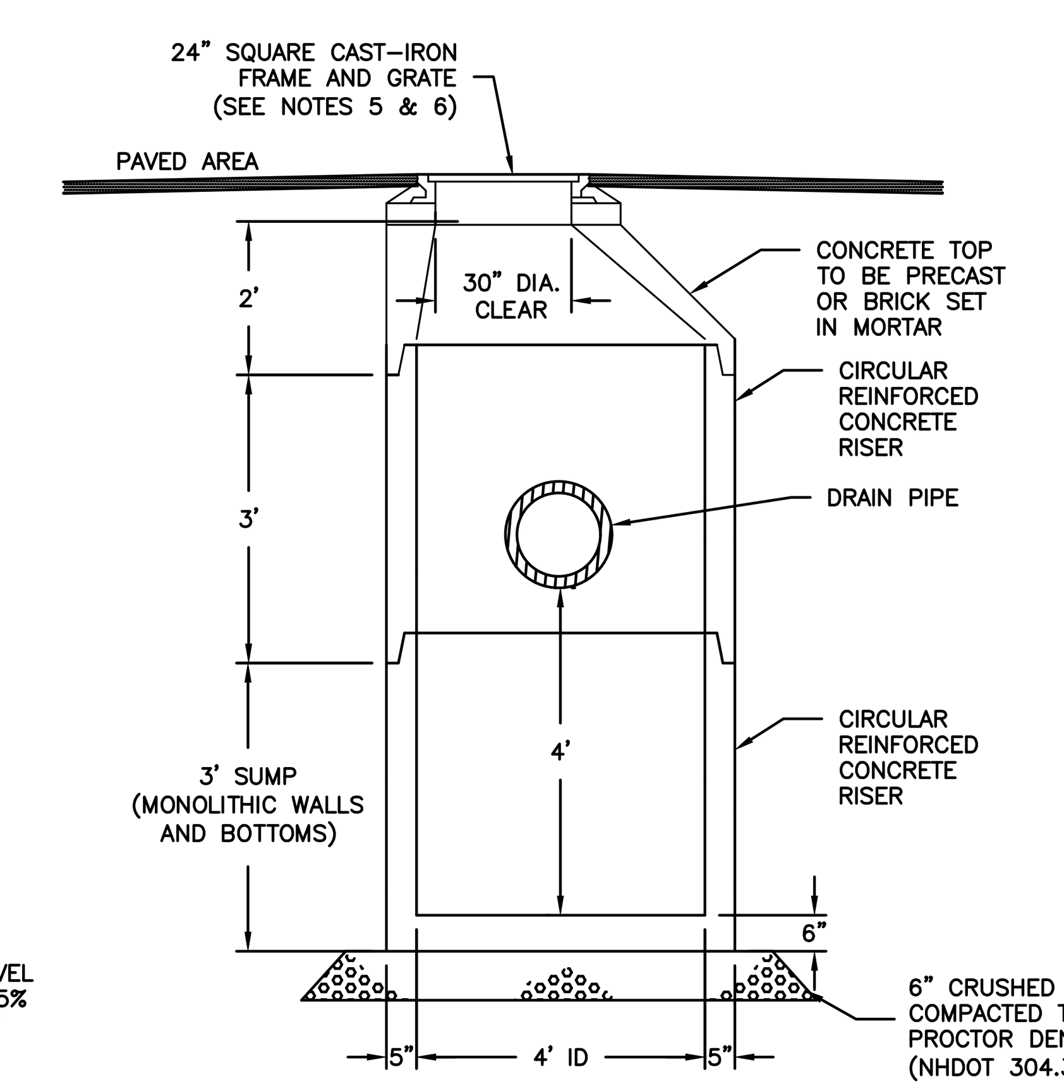
NOTES (IN ACCORDANCE WITH Env–Ws 706.05)

1. PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR ORDERED EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33 STONE SIZE NO. 67. THE PIPE BEDDING MATERIAL SHALL BE PLACED 6 INCHES BELOW THE BOTTOM OF THE PIPE. THE FILL MATERIAL SHALL BE PLACED ABOVE THE PIPE SAND BLANKET MATERIAL AND EXTEND TO THE FINISHED GRADE OR TO THE BOTTOM OF THE SELECT MATERIALS FOR A PAVED AREA.
2. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, 100% OF WHICH SHALL PASS THROUGH A 1/2 INCH SIEVE AND A MAXIMUM OF 15% OF WHICH SHALL PASS THROUGH A #200 SIEVE. THE SAND BLANKET SHALL COVER THE PIPE TO A DEPTH OF 12 INCHES.
3. BEDDING AND BLANKET MATERIALS SHALL BE COMPACTED IN 12 INCH LAYERS. BACKFILL MATERIAL SHALL BE COMPACTED IN 3 FOOT LAYERS TO THE FINISHED SURFACE EXCEPT FOR PAVED AREAS WHERE THE DEPTH BELOW PAVEMENT CONSISTING OF THE SELECT MATERIALS SHALL BE COMPACTED PER THE APPLICABLE PAVEMENT CONSTRUCTION GUIDELINES.
4. TRENCH BACKFILL MATERIAL FOR PAVED AREAS SHALL CONSIST OF THE NATURAL MATERIAL EXCAVATED FOR THE TRENCH WITH THE EXCEPTION OF: DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OF CLAY, EXCAVATED LEDGE MATERIAL, ROCKS OVER 6 INCHES IN THE LARGEST DIMENSION, AND ANY MATERIAL NOT APPROVED BY THE ENGINEER. TRENCH BACKFILL FOR CROSS-COUNTRY SHALL BE AS DESCRIBED ABOVE WITH THE EXCEPTION THAT TOP SOIL, LOAM, AND MUCK OR PEAT MAY BE USED AS LONG AS SUCH MATERIAL PROVIDES STABLE CONSTRUCTION.
5. ADDITIONAL REQUIREMENTS MAY BE FOUND IN Env-Ws 706.05.



TYPICAL DRAIN MANHOLE

NTS



TYPICAL CATCH BASIN DETAIL

NTS

DRAINAGE STRUCTURE NOTES:
1. DRAINAGE STRUCTURE MATERIALS SHALL COMPLY WITH NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, DIVISION 600, SECTION 604.
2. SITE CONTRACTOR SHALL BACKFILL AROUND DRAINAGE STRUCTURES IN 6 TO 8 INCH LIFTS, ATTAINING 95% MAXIMUM PROCTOR DENSITY FOR EACH LIFT.
3. PIPE OPENINGS SHALL BE FULLY MORTARED ON OUTSIDE PRIOR TO BACK FILLING. INSIDE OF PIPE OPENINGS SHALL BE MORTARED AND ALLOWED TO CURE PER MANUFACTURERS REQUIREMENTS PRIOR TO RECEIVING RUNOFF.
4. JOINTS BETWEEN ADJACENT RISERS SHALL BE FULLY SEALED WITH ELASTOMERIC SEALANT PER MANUFACTURERS REQUIREMENTS.
5. WHEN FRAME/GRATE ARE LOCATED IN A PAVED AREA, THEY SHALL BE BROUGHT TO FINISH GRADE AFTER BINDER COURSE PAVEMENT IS PLACED. THE EXCAVATION REQUIRED AROUND THE GRATE AND FRAME SHALL BE BACKFILLED FLUSH WITH THE TOP OF BINDER COURSE WITH NHDOT CLASS B CONCRETE.
6. FRAME AND GRATE:
CATCH BASINS:
NEENAH LIFTMATE OR PAMREX

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

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
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CONSTRUCTION DETAILS
prepared for
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JOB: 19–063

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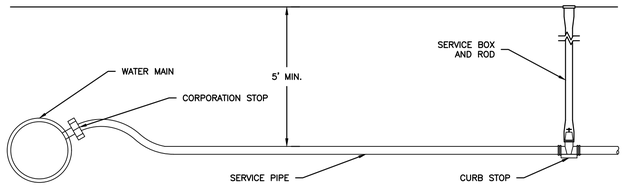
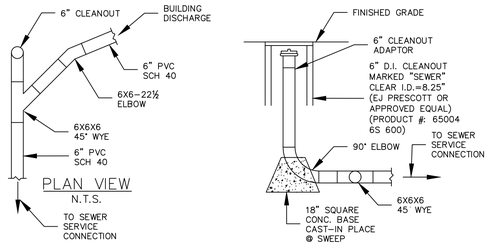
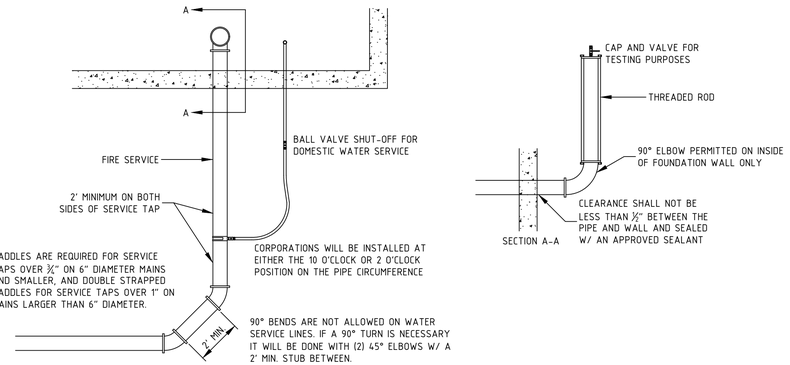


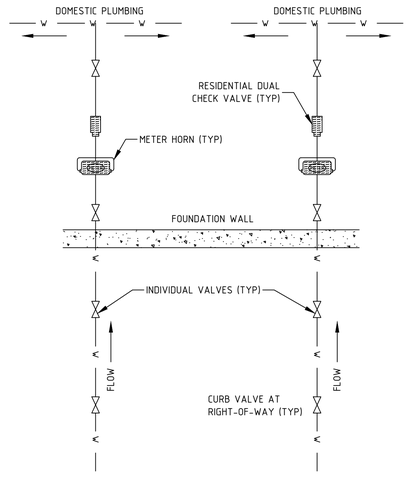
TYPICAL WATER SERVICE CONNECTION
NTS



CLEANOUT DETAIL
NTS

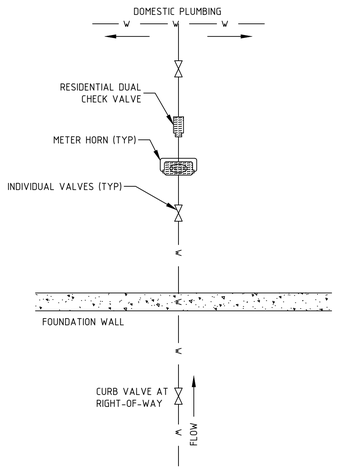


WATER SERVICE THROUGH FOUNDATION
NTS



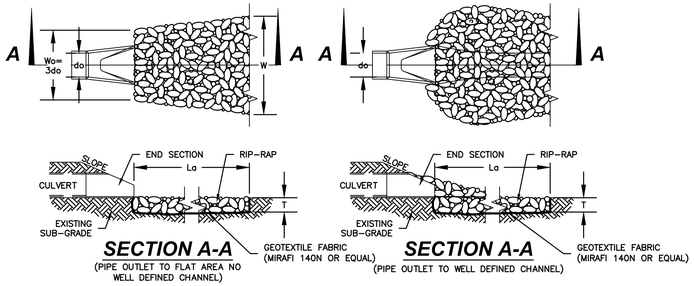
NOTE: ALL METERS SUPPLIED BY TOWN OF DURHAM GENERAL SERVICES DEPARTMENT

DUAL RESIDENTIAL WATER METER INSTALLATION
NTS



NOTE: ALL METERS SUPPLIED BY TOWN OF DURHAM GENERAL SERVICES DEPARTMENT

SINGLE FAMILY WATER METER INSTALLATION
NTS



RIP-RAP GRADATION

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	9	TO	12
85	7.8	TO	10.8
50	6	TO	9
15	1.8	TO	3

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	12	TO	16
85	10.4	TO	14.4
50	8	TO	12
15	2.4	TO	4

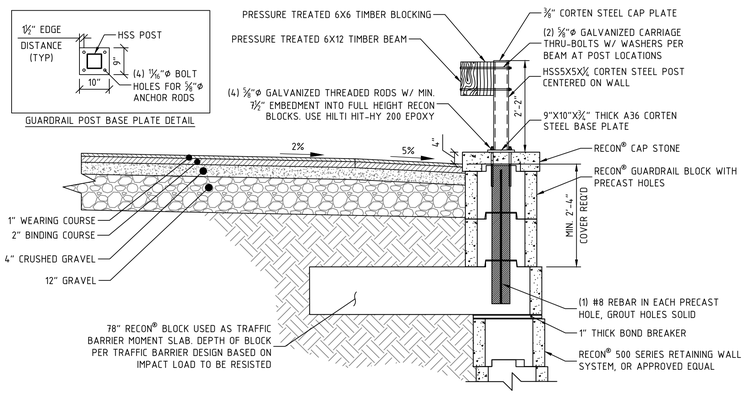
RIP RAP APRON DIMENSION TABLE

LOCATION	Wo	W	La	T	d50
RIP RAP #1 – SWP #1 OUTLET	3.75'	19'	16'	24"	8"
RIP RAP #2 – SWP #2 OUTLET	4.5'	23'	19'	24"	8"
RIP RAP #3 – 15" HDPE CULVERT AT STA 20+34	VARIES SEE PLAN			18"	6"
RIP RAP #4 – 18" HDPE CULVERT AT STA 33+47	VARIES SEE PLAN			24"	8"

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

CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC (MIRAFI 140N OR EQUAL) REQUIRED UNDER ALL ROCK RIP-RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP-RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP-RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

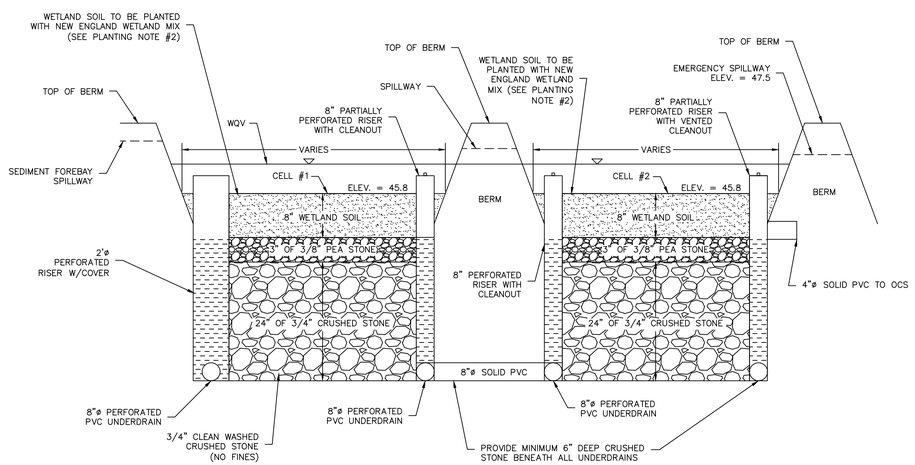
MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.



NOTES:
1. DELETERIOUS MATERIALS ENCOUNTERED BELOW ROAD SHALL BE COMPLETELY REMOVED.
2. COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR.

RETAINING WALL AND GUARDRAIL DETAIL
NTS

PIPE OUTLET PROTECTION DETAIL
NTS



GRAVEL WETLAND SECTION
NTS

GRAVEL WETLAND CONSTRUCTION NOTES:
1. DO NOT PLACE GRAVEL WETLANDS INTO SERVICE UNTIL EACH BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE GRAVEL WETLAND OR DURING ANY STAGE OF CONSTRUCTION.
3. CLEAR AND GRUB THE AREA WHERE THE GRAVEL WETLAND IS TO BE LOCATED. STOCKPILE LOAM FOR REUSE LATER.
4. THE FOUNDATION AREA SHALL BE SCARIFIED PRIOR TO PLACING FILL. ALL UNSUITABLE MATERIAL UNDER THE BERM SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION MATERIAL.
5. THE BERM SHALL BE CONSTRUCTED BEGINNING FROM THE LOWEST POINT UNIFORMLY ALONG ITS ENTIRE LENGTH. PLACE MATERIALS IN MAXIMUM 12" LOOSE LIFTS COMPACTED TO 95% MAXIMUM MODIFIED PROCTOR DENSITY. EMBANKMENT SOIL SHALL HAVE NO ORGANIC MATTER OR FROZEN MATERIAL AND NO STONES LARGER THAN 2/3 OF THE MAXIMUM LOOSE LIFT THICKNESS. STONES AROUND ANY STRUCTURES AND/OR CONDUITS SHALL NOT EXCEED 3 INCHES. EMBANKMENT FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

SIEVE SIZE:	% PASSING:
#4	80-90
#40	50-80
#100	30-45
#200	15-30

6. ALL PIPE TO PIPE CONNECTIONS SHALL BE WATER-TIGHT.
7. ALL DISTURBED AREAS NOT OTHERWISE PLANTED SHALL RECEIVE FOUR INCHES OF LOAM AND SEEDED PER THE CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES ON SHEET D101.

GRAVEL WETLAND MAINTENANCE:
8. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
9. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
10. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF GRAVEL WETLAND DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION INCLUDING BUT NOT LIMITED TO REMOVAL AND REPLACEMENT OF WETLAND SOIL AND REPLANTING.
11. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

PLANTING NOTES:
1. WETLAND SOIL MIX FOR GRAVEL WETLAND SHALL BE A SILT LOAM WITH A MINIMUM OF 15-20% ORGANIC CONTENT BY MASS. THE CLAY CONTENT SHALL NOT EXCEED 15% BY VOLUME. THE ORGANIC MATTER SHALL CONSIST OF DECIDUOUS LEAF COMPOST PROPERLY MATURED AND AT LEAST ONE YEAR OLD. THERE SHALL BE NO LEAF MULCH, COMPOSTED MIXED YARD DEBRIS, OR WOOD CHIPS.
2. GRAVEL WETLAND BOTTOM TO BE PLANTED WITH NEW ENGLAND WETLAND MIX AVAILABLE FROM:
   PIERSON NURSERIES INC.
   24 BUZZELL ROAD
   BIDDEFORD, ME 04005
   (207)-499-4992
3. GRAVEL WETLAND SLOPES AND BERM TO BE PLANTED WITH SEED MIX 'C' LISTED ON SHEET D101.

NO.	REVISIONS	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	2/4/21	MCS
1.	REVISED SUBMISSION TO DURHAM	11/4/20	MCS
0.	INITIAL SUBMISSION TO DURHAM	10/28/20	MCS

SEAL

DATE ISSUED: 11/4/20
SCALE: N/A
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19063 DetlC.dwg

CONSTRUCTION DETAILS

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
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NEWMARKET, NH 03857
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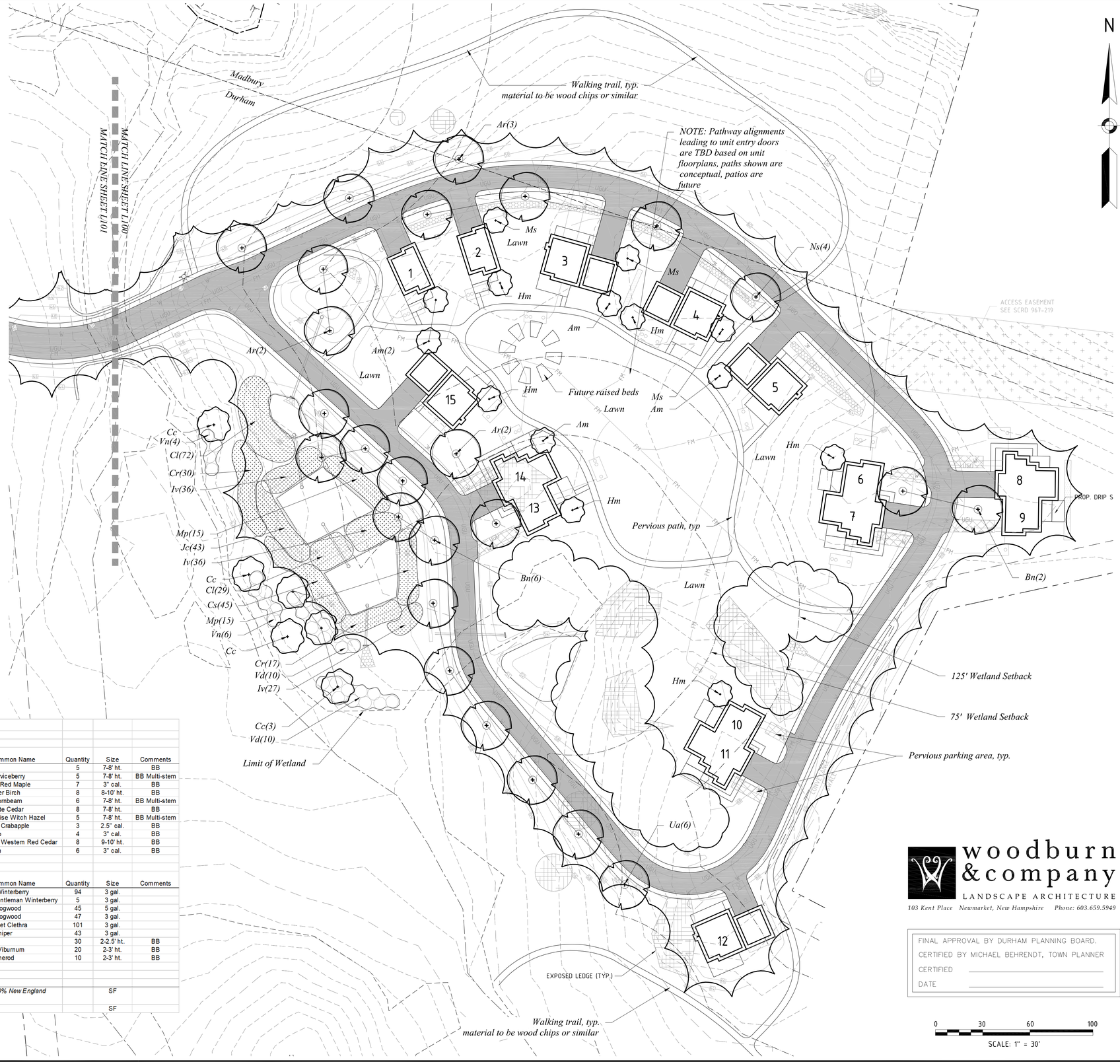
E-MAIL: INFO@MJSENGINEERING.COM

JOB: 19-063

C505



Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Ab	*Abies balsamea*	Balsam Fir	5	7-8' ht.	BB
Am	*Amelanchier canadensis*	Shablow Serviceberry	5	7-8' ht.	BB Multi-stem
Ar	*Acer rubrum 'Red Sunset'*	Red Sunset Red Maple	7	3" cal.	BB
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	8	8-10' ht.	BB
Cc	*Carpinus caroliniana*	American Hornbeam	6	7-8' ht.	BB Multi-stem
Ct	*Charmaecyparis thyioides*	Altantic White Cedar	8	7-8' ht.	BB
Hm	*Hamamelis intermedia x. 'Arnold Promise'*	Arnold Promise Witch Hazel	5	7-8' ht.	BB Multi-stem
Ms	*Malus 'Sugar Tyme'*	Sugar Tyme Crabapple	3	2.5" cal.	BB
Ns	*Nyssa sylvatica*	Black Tupelo	4	3" cal.	BB
Th	*Thuja plicata 'Green Giant'*	Green Giant Western Red Cedar	8	9-10' ht.	BB
Ua	*Ulmus americana 'Princeton'*	Priceton Elm	6	3" cal.	BB

SHRUBS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Iv	*Ilex verticillata 'Red Sprite'*	Red Sprite Winterberry	94	3 gal.	
	Ilex verticillata 'Southern Gentleman'	Southern Gentleman Winterberry	5	3 gal.	
Cs	*Comus sericea*	Red Osier Dogwood	45	5 gal.	
Cr	*Comus racemosa*	Grey Twig Dogwood	47	3 gal.	
Cl	*Clethra alnifolia*	Summersweet Clethra	101	3 gal.	
Jc	*Juniperus communis*	Common Juniper	43	3 gal.	
Mp	*Myrica pennsylvanica*	Bayberry	30	2-2.5' ht.	BB
Vd	*Viburnum dentatum*	Arrowwood Viburnum	20	2-3' ht.	BB
Vn	*Viburnum nudum*	Smooth Witherod	10	2-3' ht.	BB

SEEDING

Meadow & Road Shoulders	*50% New England Roadside Matrix Upland Seed Mix/ 50% New England Showy Wildflower Mix, by New England Wetland Plants*	SF	
Lawn Areas	Pennington Smart Seed Tall Fescue Blend	SF	

NO.	DATE	INT.
2.	REVISED SUBMISSION TO THE DURHAM CONSERVATION COMMISSION	01/20/21	VM
1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/09/20	VM
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	10/28/20	MCS

REVISIONS

SEAL

DATE ISSUED: 12/09/20
SCALE: 1"=30'
DESIGNED BY: RW
DRAWN BY: VM
APPROVED BY: RW
DWG FILE:

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

0 30 60 100
SCALE: 1" = 30'

LANDSCAPE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

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

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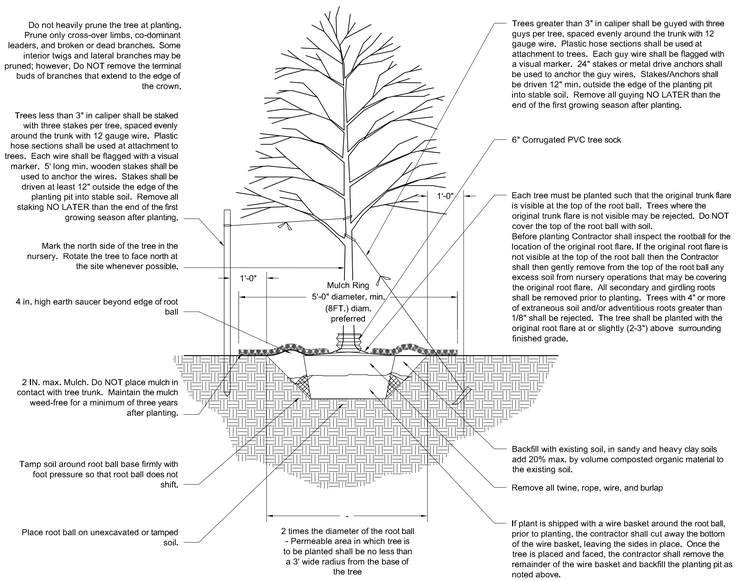
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Robert St., P.O. Box 455
Newmarket, NH 03857
Phone: (603) 659-4979, Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

JOB: 19-063

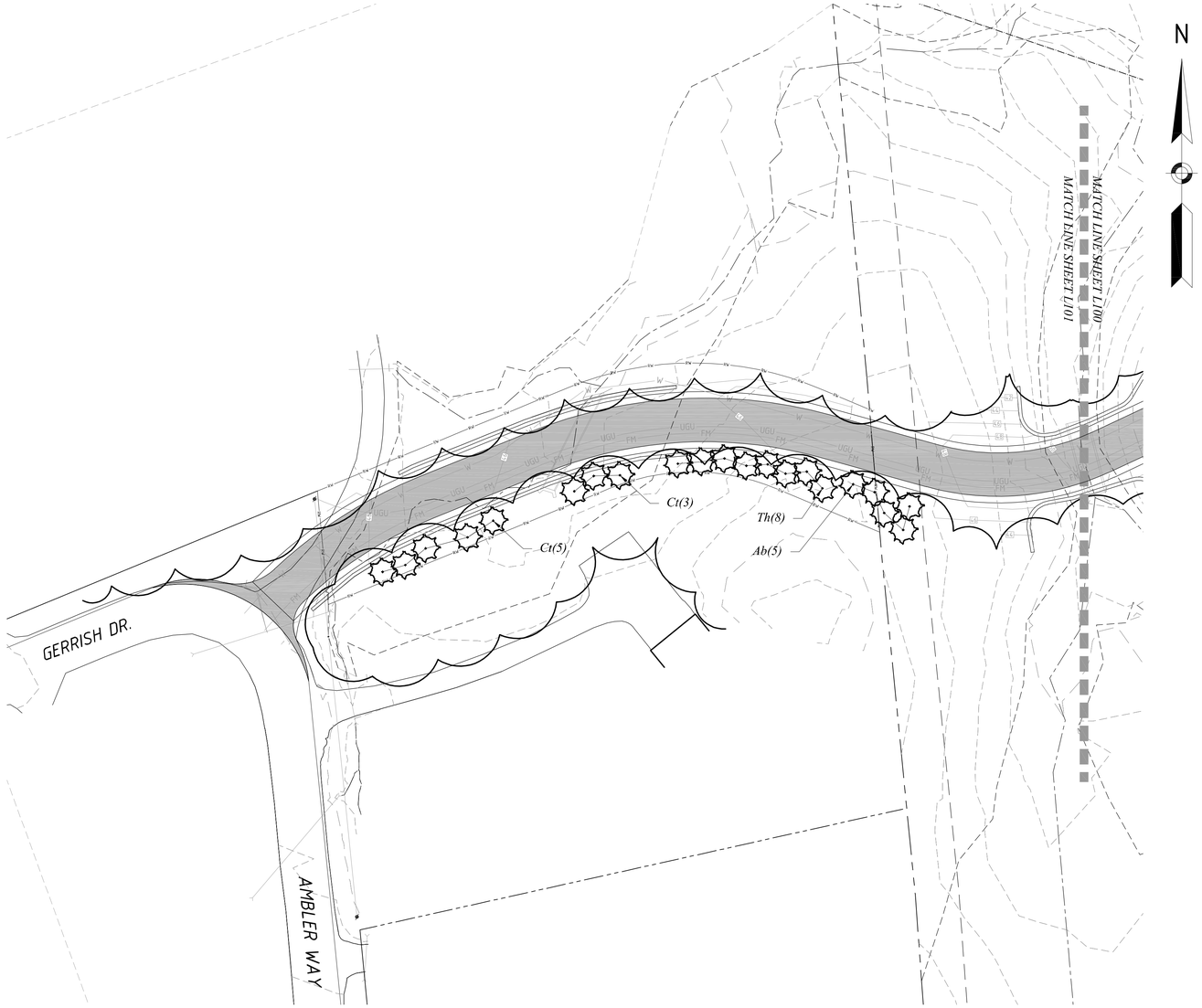
L100

Landscape Notes

1. Design is based on drawings by MJS Engineering dated 01/20/2020 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control to consist of Hay Bales and Erosion Control Fabric shall be staked in place between the work and Water bodies, Wetlands and/or drainage ways prior to any construction.
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
9. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
10. The Contractor shall procure any required permits prior to construction.
11. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
12. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
13. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
14. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
15. All plants shall be legibly tagged with proper botanical name.
16. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
17. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
18. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
19. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
20. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
21. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
22. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
23. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
24. Drip strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick metal edger.
25. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
26. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
27. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
28. Landscape Architect is not responsible for the means and methods of the contractor.



Tree Planting Detail



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1.	REVISED SUBMISSION TO THE DURHAM PLANNING BOARD	12/09/20	VM
2.	REVISED SUBMISSION TO THE DURHAM CONSERVATION COMMISSION	01/20/21	VM

SEAL

DATE ISSUED: 12/09/20
SCALE: 1"=30'
DESIGNED BY: RW
DRAWN BY: VM
APPROVED BY: RW
DWG FILE:

LANDSCAPE PLAN

prepared for
MULHERN
TAX MAP 10, LOT 8-6
93 BAGDAD ROAD, DURHAM, NH 03824

MJS ENGINEERING, P.C.
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E-mail: mjs@mjs-engineering.com

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

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

0 30 60 100
SCALE: 1" = 30'

JOB: 19-063

L101