EXHIBIT 20
Received 10/11/16

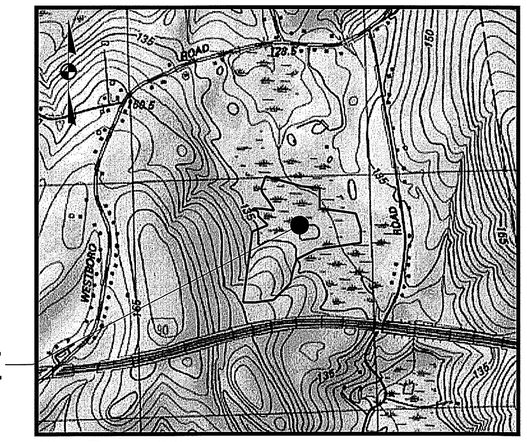
Definitive Conventional Subdivision Plans

June 10, 2016 (Revised October 11, 2016)

Estates at Bull Meadow

North Grafton, Massachusetts 01536

PROJECT SITE



SCALE: 1"=1000'±
ZONING DISTRICT: R40

Applicant:
Bull Meadow, LLC.
2 Rachel Road
Boylston, MA 01505
(978)833-4747

Record Owner:
Bull Meadow, LLC.
Mr. Gordon Lewis, Manager
2 Rachel Road
Boylston, MA 01505
(978) 833-4747

Civil Engineer:
McCarty Engineering, Inc.
42 Jungle Road
Leominster, MA 01453
(978) 534-1318

Surveyor:
Whitman & Bingham Associates, LLC.
510 Mechanic Street
Leominster, MA 01453
(978) 537-5296

Wetland Consultant:
EcoTec, Inc.
102 Grove Street
Worcester, MA 01605
(508)752-9494

Sheet	Sheet Title						
	Cover Sheet						
1	Existing Conditions Survey (1 of 2)	9	Layout and Materials Plan (3 of 3)	17	Roadway and Utility Profiles (4 of 4)	25	Construction Details (3 of 4)
2	Existing Conditions Survey (2 of 2)	10	Grading and Drainage Plan (1 of 2)	18	Water Main Extension Plan	26	Construction Details (4 of 4)
3	Lotting Plan (1 of 4)	11	Grading and Drainage Plan (2 of 2)	19	Erosion Control Plan (1 of 2)	27	Stormtech Detail Sheet
4	Lotting Plan (2 of 4)	12	Utility Plan (1 of 2)	20	Erosion Control Plan (2 of 2)	28	Conditions of Approval
5	Lotting Plan (3 of 4)	13	Utility Plan (2 of 2)	21	Wetland Crossing and Replication Plan		
6	Lotting Plan (4 of 4)	14	Roadway and Utility Profiles (1 of 4)	22	Construction Phasing Plan		
7	Overall Subdivision Plan (1 of 3)	15	Roadway and Utility Profiles (2 of 4)	23	Construction Details (1 of 4)		
8	Layout and Materials Plan (2 of 3)	16	Roadway and Utility Profiles (3 of 4)	24	Construction Details (2 of 4)		

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

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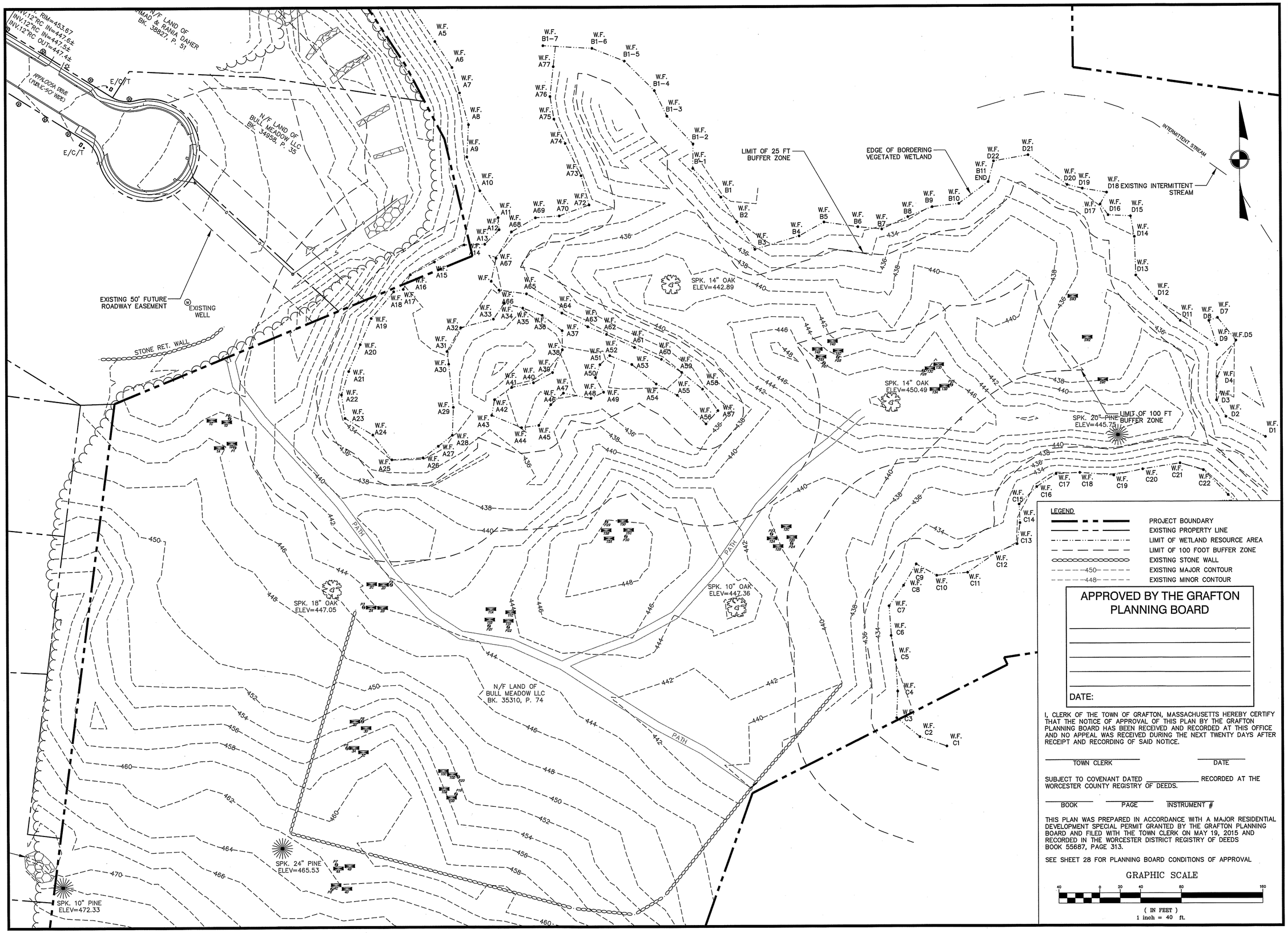

LEGEND

- PROJECT BOUNDARY
- EXISTING PROPERTY LINE
- LIMIT OF WETLAND RESOURCE AREA
- LIMIT OF 100 FOOT BUFFER ZONE
- EXISTING STONE WALL
- 450 EXISTING MAJOR CONTOUR
- 448 EXISTING MINOR CONTOUR

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK _____ DATE _____

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK _____ PAGE _____ INSTRUMENT # _____

THIS PLAN WAS PREPARED IN ACCORDANCE WITH A MAJOR RESIDENTIAL DEVELOPMENT SPECIAL PERMIT GRANTED BY THE GRAFTON PLANNING BOARD AND FILED WITH THE TOWN CLERK ON MAY 19, 2015 AND RECORDED IN THE WORCESTER DISTRICT REGISTRY OF DEEDS BOOK 55687, PAGE 313.

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
Registered
PROFESSIONAL ENGINEER

10/11/2016

Drawn By: BRM
Designed By: BRM
Checked By: BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Existing Conditions Survey (1 of 2)

Job No: 066
File Name: 066P-CEC01
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 1 OF 28

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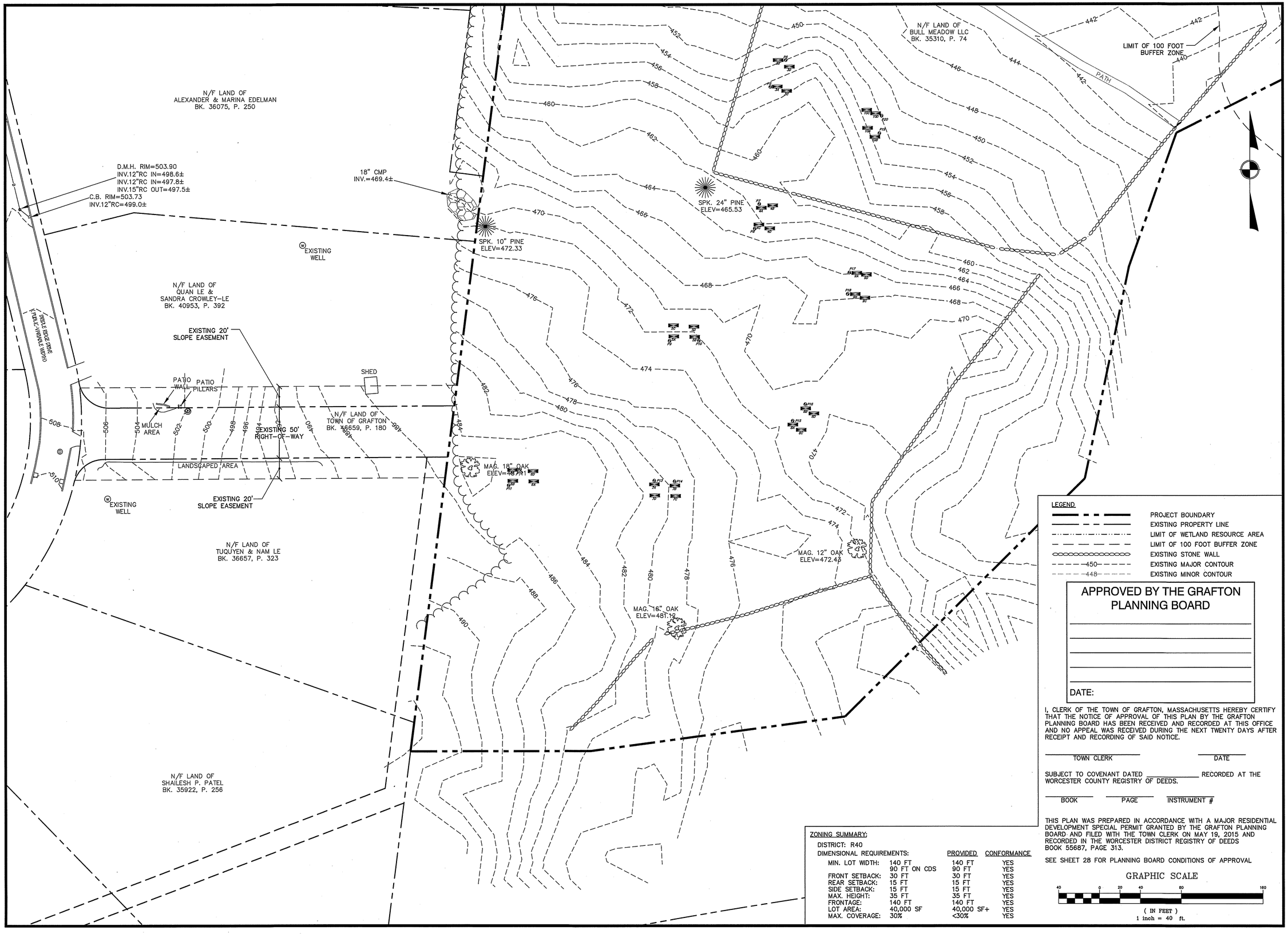

LEGEND

	PROJECT BOUNDARY
	EXISTING PROPERTY LINE
	LIMIT OF WETLAND RESOURCE AREA
	LIMIT OF 100 FOOT BUFFER ZONE
	EXISTING STONE WALL
450	EXISTING MAJOR CONTOUR
448	EXISTING MINOR CONTOUR

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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BOOK PAGE INSTRUMENT #

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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

ZONING SUMMARY:

DISTRICT: R40

DIMENSIONAL REQUIREMENTS:		PROVIDED	CONFORMANCE
MIN. LOT WIDTH:	140 FT	140 FT	YES
	90 FT ON CDS	90 FT	YES
FRONT SETBACK:	30 FT	30 FT	YES
REAR SETBACK:	15 FT	15 FT	YES
SIDE SETBACK:	15 FT	15 FT	YES
MAX. HEIGHT:	35 FT	35 FT	YES
FRONTAGE:	140 FT	140 FT	YES
LOT AREA:	40,000 SF	40,000 SF+	YES
MAX. COVERAGE:	30%	<30%	YES

NOT FOR CONSTRUCTION

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By: BRM Designed By: BRM Checked By: BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Existing Conditions
Survey
(2 of 2)

Job No: 066
File Name: 066P-CEC02
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 2 OF 28

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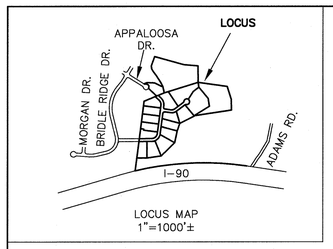


APPROVED BY THE GRAFTON PLANNING BOARD DATE: _____

NOTES:

1. OWNER/APPLICANT: BULL MEADOW, LLC
   BK. 53605, P. 383
   BK. 35310, P. 74
   BK. 34958, P. 35

2. PLAN REFERENCES: P.B. 750, P. 55
   P.B. 784, P. 109
   P.B. 799, P. 108
   P.B. 911, P. 97

3. THE SUBJECT PREMISES IS GRAPHICALLY SITUATED IN THE R-40 ZONING DISTRICT WITH THE FOLLOWING MIMINUM DIMENSIONAL REQUIREMENTS:
   - MINIMUM LOT AREA: 40,000 S.F.
   - MINIMUM LOT FRONTAGE: 140 FT.
   - MINIMUM FRONT SETBACK: 30 FT.
   - MINIMUM SIDE SETBACK: 15 FT.
   - MINIMUM REAR SETBACK: 15 FT.

4. THE SUBJECT PREMISES IS NOT GRAPHICALLY SITUATED IN THE 100-YEAR FLOOD HAZARD ZONE PER FLOOD INSURANCE RATE MAPS 25027C0831F AND 25027C0832F DATED JULY 16, 2014.

5. OPEN SPACE PARCELS A AND B ARE NOT TO BE CONSIDERED BUILDING LOTS, NO FURTHER BUILDING MAY OCCUR WITHOUT FURTHER APPROVAL BY THE PLANNING BOARD PURSUANT TO THE SUBDIVISION CONTROL LAW.

6. SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL.

⊡ DENOTES GRANITE BOUND TO BE SET

I HEREBY CERTIFY THAT NO NOTICE OF APPEALS WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER THE RECEIPT AND RECORDING OF THE NOTICE FROM THE GRAFTON PLANNING BOARD OF THE APPROVAL OF THIS PLAN.

TOWN OF GRAFTON CLERK DATE

COMMONWEALTH OF MASSACHUSETTS
JAMES E. WHITMAN
37866
REGISTERED PROFESSIONAL LAND SURVEYOR

10/11/2016

I CERTIFY THAT THIS PLAN MEETS WITH REGULATIONS OF REGISTERS OF DEEDS

ESTATES AT BULL MEADOW

DEFINITIVE SUBDIVISION PLAN OF LAND

IN GRAFTON, MA

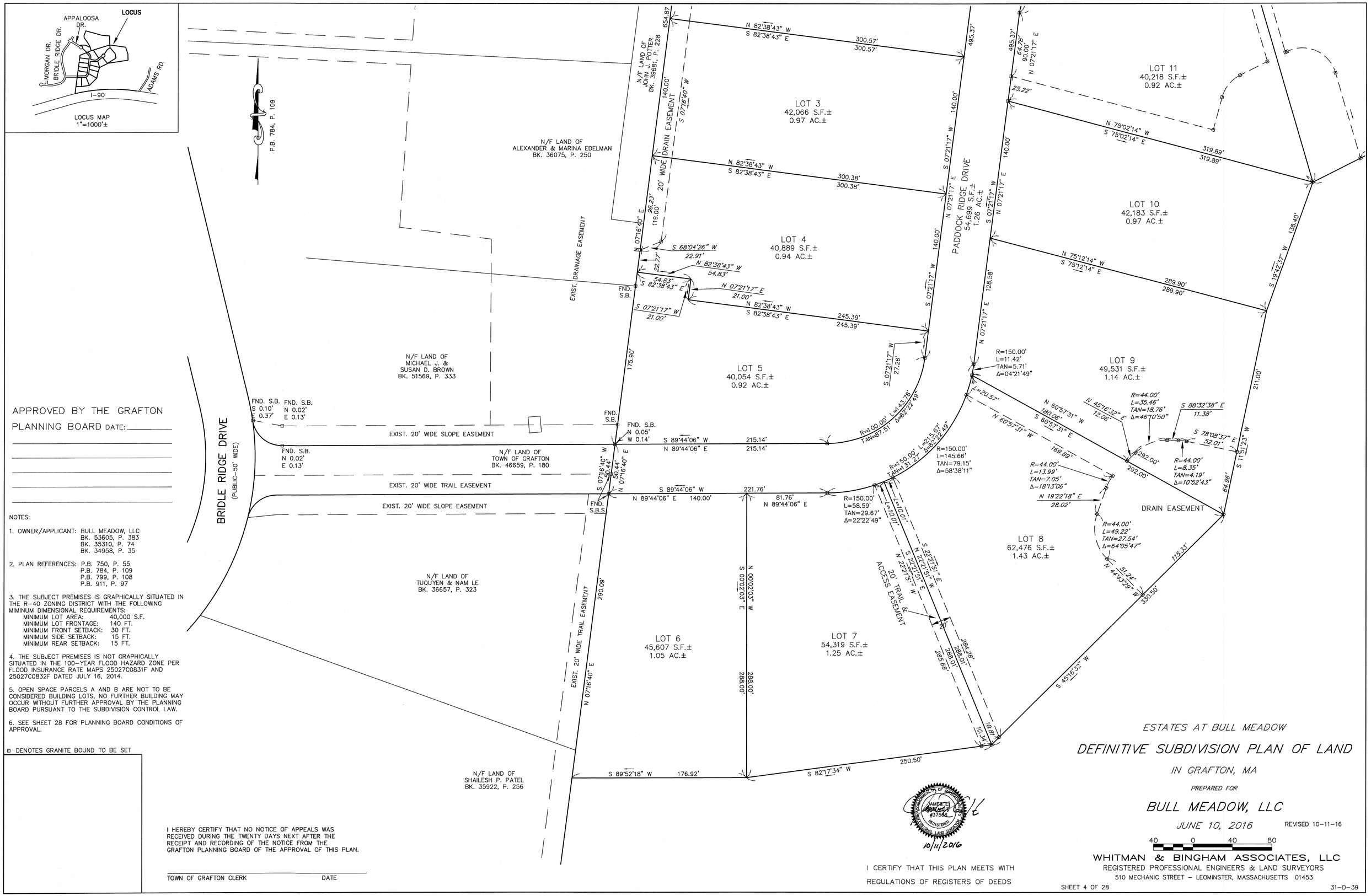
PREPARED FOR

BULL MEADOW, LLC

JUNE 10, 2016 REVISED 10-11-16

100 0 100 200

WHITMAN & BINGHAM ASSOCIATES, LLC
REGISTERED PROFESSIONAL ENGINEERS & LAND SURVEYORS
510 MECHANIC STREET – LEOMINSTER, MASSACHUSETTS 01453



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TOWN OF GRAFTON CLERK DATE

COMMONWEALTH OF MASSACHUSETTS JAMES E. BINGHAM #37546 REGISTERED PROFESSIONAL LAND SURVEYOR

10/11/2016

I CERTIFY THAT THIS PLAN MEETS WITH REGULATIONS OF REGISTERS OF DEEDS

ESTATES AT BULL MEADOW

DEFINITIVE SUBDIVISION PLAN OF LAND

IN GRAFTON, MA

PREPARED FOR

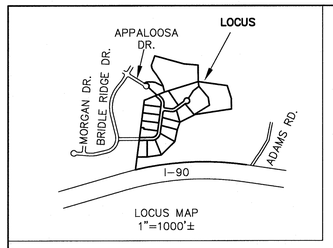
BULL MEADOW, LLC

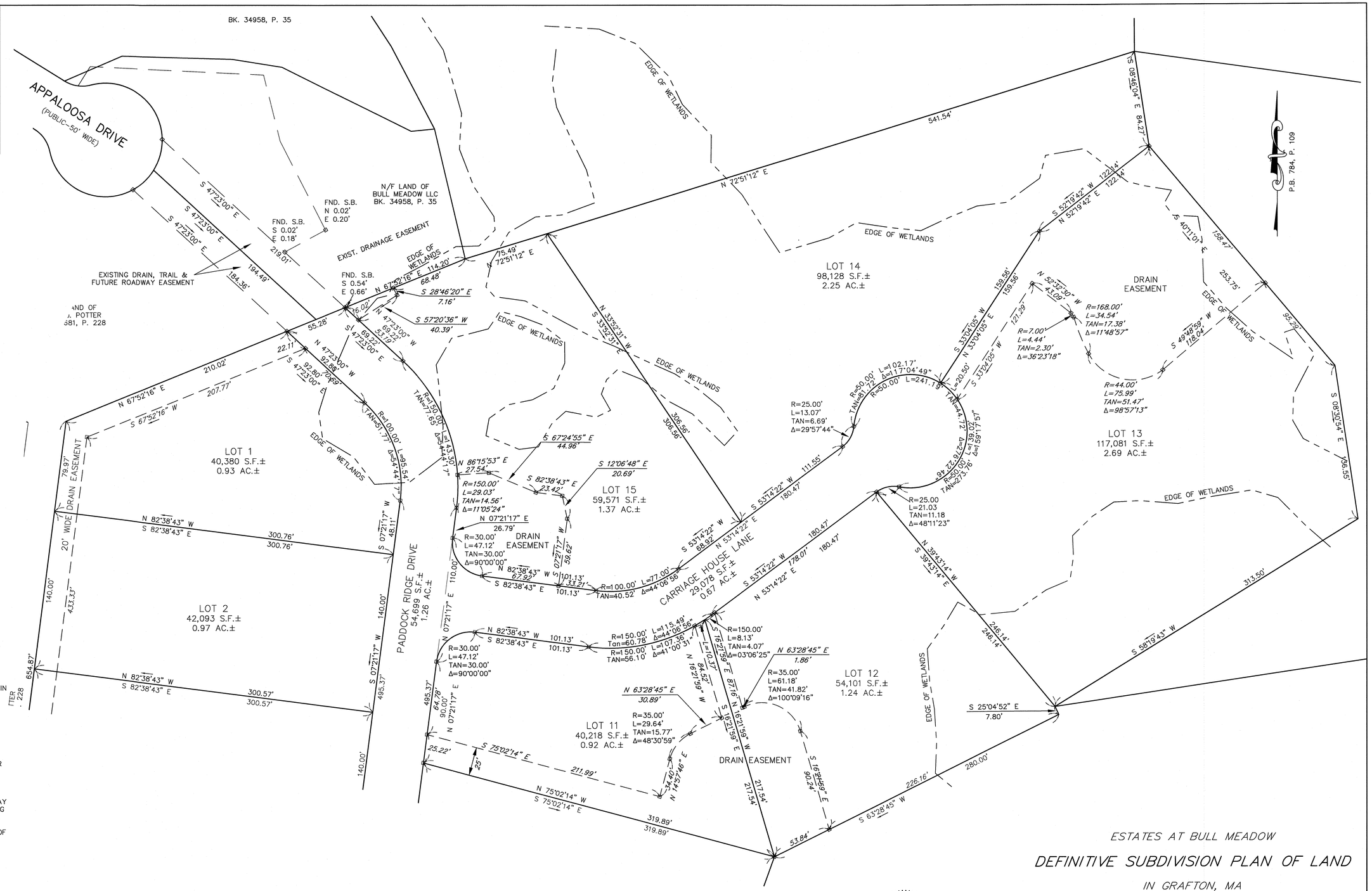
JUNE 10, 2016 REVISED 10-11-16

40 0 40 80

WHITMAN & BINGHAM ASSOCIATES, LLC
REGISTERED PROFESSIONAL ENGINEERS & LAND SURVEYORS
510 MECHANIC STREET – LEOMINSTER, MASSACHUSETTS 01453

SHEET 4 OF 28 31-D-39





APPROVED BY THE GRAFTON PLANNING BOARD DATE:_____

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   BK. 53605, P. 383
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6. SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL.

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TOWN OF GRAFTON CLERK DATE

COMMONWEALTH OF MASSACHUSETTS
JAMES E. SULLIVAN
#37566
REGISTERED PROFESSIONAL LAND SURVEYOR
10/11/2016

I CERTIFY THAT THIS PLAN MEETS WITH REGULATIONS OF REGISTERS OF DEEDS

ESTATES AT BULL MEADOW

DEFINITIVE SUBDIVISION PLAN OF LAND

IN GRAFTON, MA

PREPARED FOR

BULL MEADOW, LLC

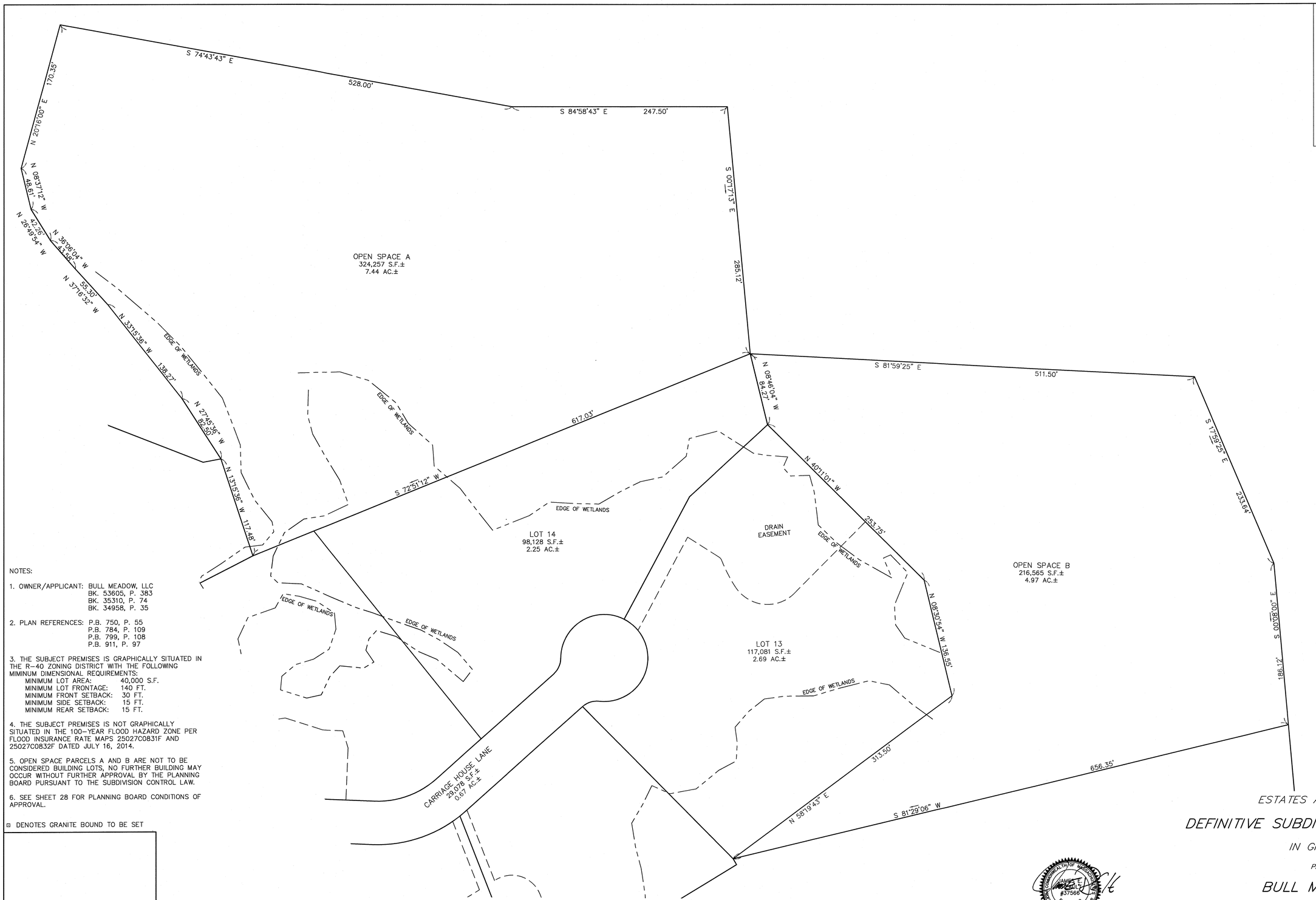
JUNE 10, 2016 REVISED 10-11-16

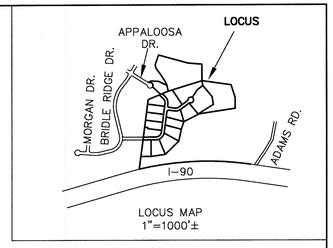
40 0 40 80

WHITMAN & BINGHAM ASSOCIATES, LLC
REGISTERED PROFESSIONAL ENGINEERS & LAND SURVEYORS
510 MECHANIC STREET – LEOMINSTER, MASSACHUSETTS 01453

SHEET 5 OF 28

31-D-39





LOCUS MAP
1"=1000'±

APPROVED BY THE GRAFTON PLANNING BOARD DATE: _____

NOTES:

1. OWNER/APPLICANT: BULL MEADOW, LLC
BK. 53605, P. 383
BK. 35310, P. 74
BK. 34958, P. 35

2. PLAN REFERENCES: P.B. 750, P. 55
P.B. 784, P. 109
P.B. 799, P. 108
P.B. 911, P. 97

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6. SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL.

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TOWN OF GRAFTON CLERK DATE

COMMONWEALTH OF MASSACHUSETTS
JAMES E. BINGHAM
#37566
REGISTERED PROFESSIONAL LAND SURVEYOR
10/11/2016

I CERTIFY THAT THIS PLAN MEETS WITH REGULATIONS OF REGISTERS OF DEEDS

ESTATES AT BULL MEADOW

DEFINITIVE SUBDIVISION PLAN OF LAND

IN GRAFTON, MA

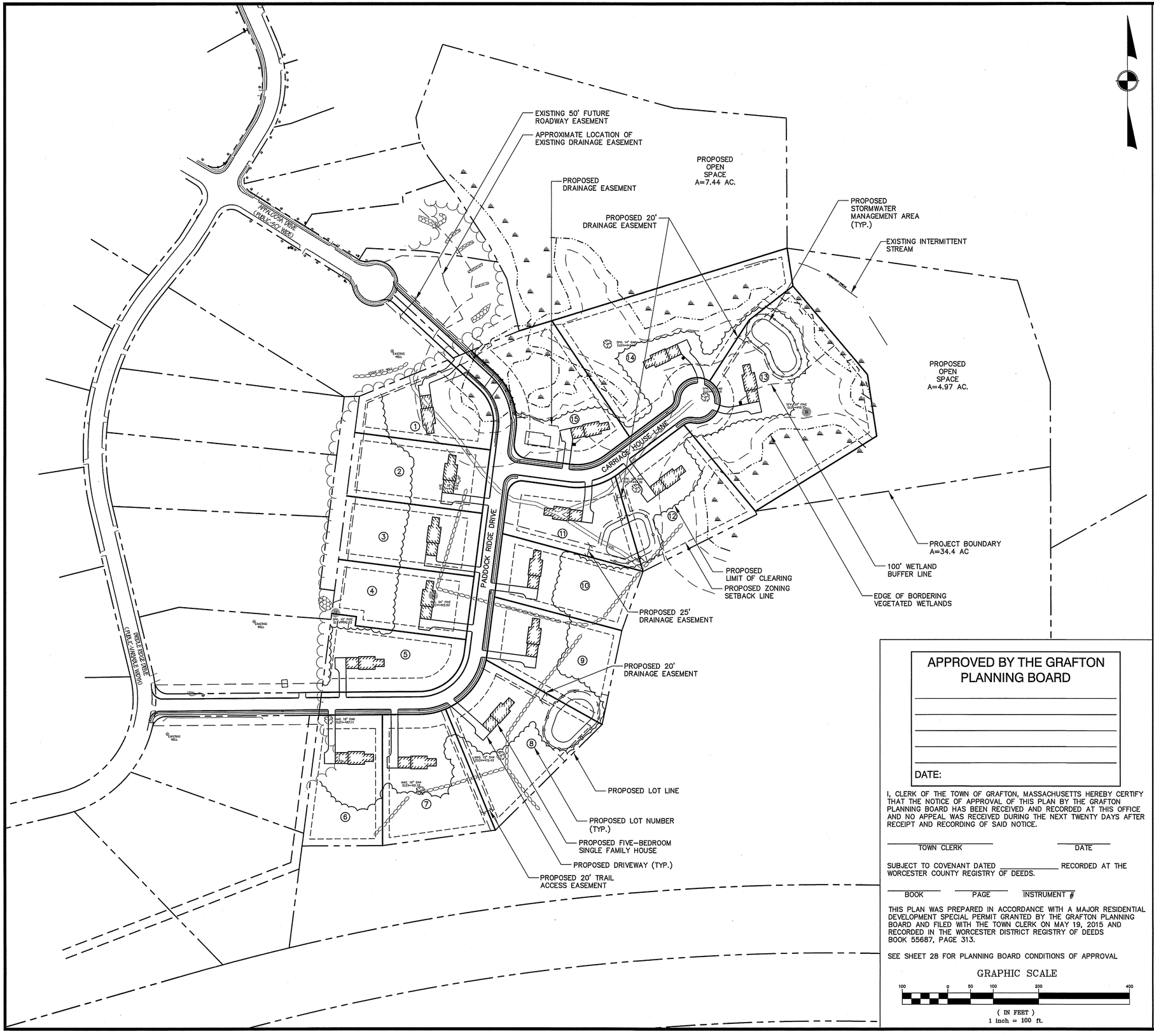
PREPARED FOR

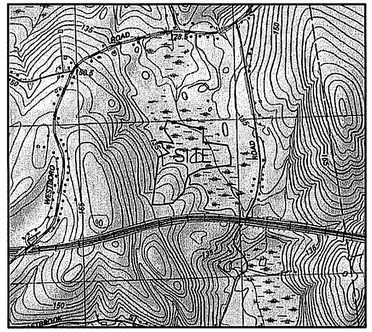
BULL MEADOW, LLC

JUNE 10, 2016 REVISED 10-11-16

50 0 50 100

WHITMAN & BINGHAM ASSOCIATES, LLC
REGISTERED PROFESSIONAL ENGINEERS & LAND SURVEYORS
510 MECHANIC STREET – LEOMINSTER, MASSACHUSETTS 01453





LOCUS PLAN

1"=1,500 FT.±

NOTES:

1. WETLAND DELINEATION SHOWN WAS COMPLETED BY ECOTEC, INC. ON NOVEMBER 13, 2013 AND WAS GPS LOCATED ON DECEMBER 12, 2013 BY WHITMAN & BINGHAM ASSOCIATES.
2. THE PROPOSED SUBDIVISION WILL BE SERVICED BY DOMESTIC WATER AND FIRE PROTECTION. A NEW DUCTILE IRON WATER SERVICE WILL BE EXTENDED FROM THE INTERSECTION OF OLD WESTBORO ROAD AND BRIDLE RIDGE DRIVE APPROXIMATELY 2,500 LF TO THE END OF THE CUL-DE-SAC ON APPALOOSA DRIVE.

LEGEND:

① PROPOSED LOT NUMBER

ZONING SUMMARY:

DISTRICT: R40

DIMENSIONAL REQUIREMENTS:		PROVIDED	CONFORMANCE
MIN. LOT WIDTH:	140 FT	140 FT	YES
	90 FT ON CDS	90 FT	YES
FRONT SETBACK:	30 FT	30 FT	YES
REAR SETBACK:	15 FT	15 FT	YES
SIDE SETBACK:	15 FT	15 FT	YES
MAX. HEIGHT:	35 FT	35 FT	YES
FRONTAGE:	140 FT	140 FT	YES
LOT AREA:	40,000 SF	40,000 SF+	YES
MAX. COVERAGE:	30%	<30%	YES

DESIGN FEATURES:

LENGTH OF ROADWAY: 2,125 FT.
ROAD A 1,660 FT.
ROAD B 465 FT.
NUMBER OF LOTS: 15
ON-SITE SEPTIC SYSTEMS: YES
TOWN WATER: YES

RECORD OWNERS:

BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505
PARCEL ID: 110/31.0-0000-0123.0
BOOK 34958, PAGE 35

BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505
PARCEL ID: 110/32.0-0000-0005.A
BOOK 35310, PAGE 74

MassDOT
10 PARK PLAZA
BOSTON, MA 02116
PARCEL ID: 110/31.0-0000-0100.0
BOOK 3919, PAGE 318

MassDOT
10 PARK PLAZA
BOSTON, MA 02116
PARCEL ID: 110/32.0-0000-0100.0
BOOK N/A, PAGE N/A

TOWN OF GRAFTON
30 PROVIDENCE ROAD
GRAFTON, MA 01519
PARCEL ID: 110/31.0-0000-0214.B
BOOK 46659, PAGE 180

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK PAGE INSTRUMENT #

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Overall Conventional Subdivision Plan (1 of 3)

Job No: 066
File Name: 066P-CSP01
Date: June 10, 2016
Scale: 1"=100'

Sheet No. 7 OF 28

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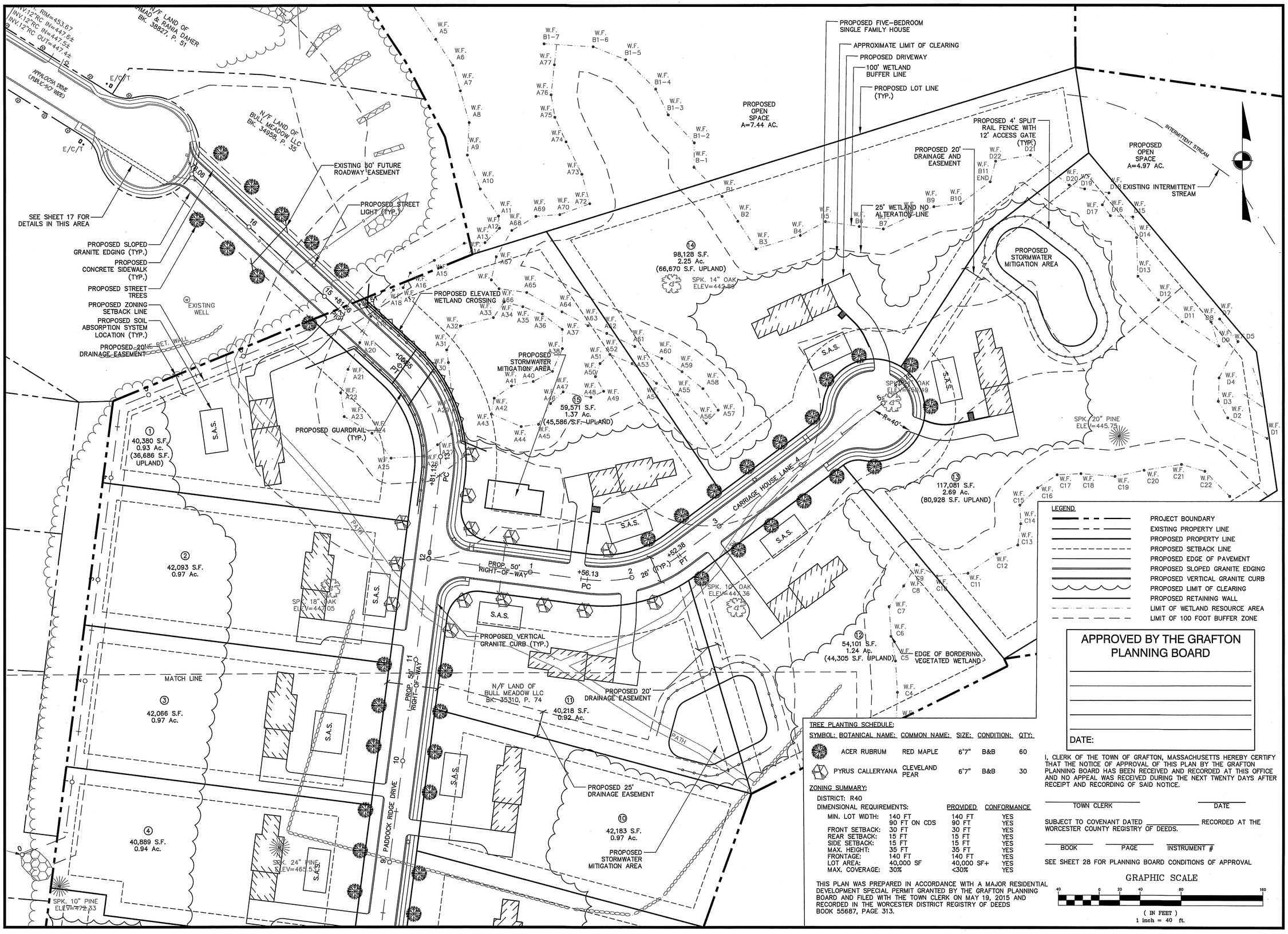

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI CIVIL NO. 46279 — REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	

LEGEND

- PROJECT BOUNDARY
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- PROPOSED SETBACK LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SLOPED GRANITE EDGING
- PROPOSED VERTICAL GRANITE CURB
- PROPOSED LIMIT OF CLEARING
- PROPOSED RETAINING WALL
- LIMIT OF WETLAND RESOURCE AREA
- LIMIT OF 100 FOOT BUFFER ZONE

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

TREE PLANTING SCHEDULE:

SYMBOL:	BOTANICAL NAME:	COMMON NAME:	SIZE:	CONDITION:	QTY:
	ACER RUBRUM	RED MAPLE	6'7"	B&B	60
	PYRUS CALLERYANA	CLEVELAND PEAR	6'7"	B&B	30

ZONING SUMMARY:

DISTRICT: R40

DIMENSIONAL REQUIREMENTS:		PROVIDED	CONFORMANCE
MIN. LOT WIDTH:	140 FT	140 FT	YES
	90 FT ON CDS	90 FT	YES
FRONT SETBACK:	30 FT	30 FT	YES
REAR SETBACK:	15 FT	15 FT	YES
SIDE SETBACK:	15 FT	15 FT	YES
MAX. HEIGHT:	35 FT	35 FT	YES
FRONTAGE:	140 FT	140 FT	YES
LOT AREA:	40,000 SF	40,000 SF+	YES
MAX. COVERAGE:	30%	<30%	YES

THIS PLAN WAS PREPARED IN ACCORDANCE WITH A MAJOR RESIDENTIAL DEVELOPMENT SPECIAL PERMIT GRANTED BY THE GRAFTON PLANNING BOARD AND FILED WITH THE TOWN CLERK ON MAY 19, 2015 AND RECORDED IN THE WORCESTER DISTRICT REGISTRY OF DEEDS BOOK 55687, PAGE 313.

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK — DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK — PAGE — INSTRUMENT #

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name
Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title
Layout and Materials Plan
(2 of 3)

Job No: 066
File Name: 066P-CMA01
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 8 OF 28

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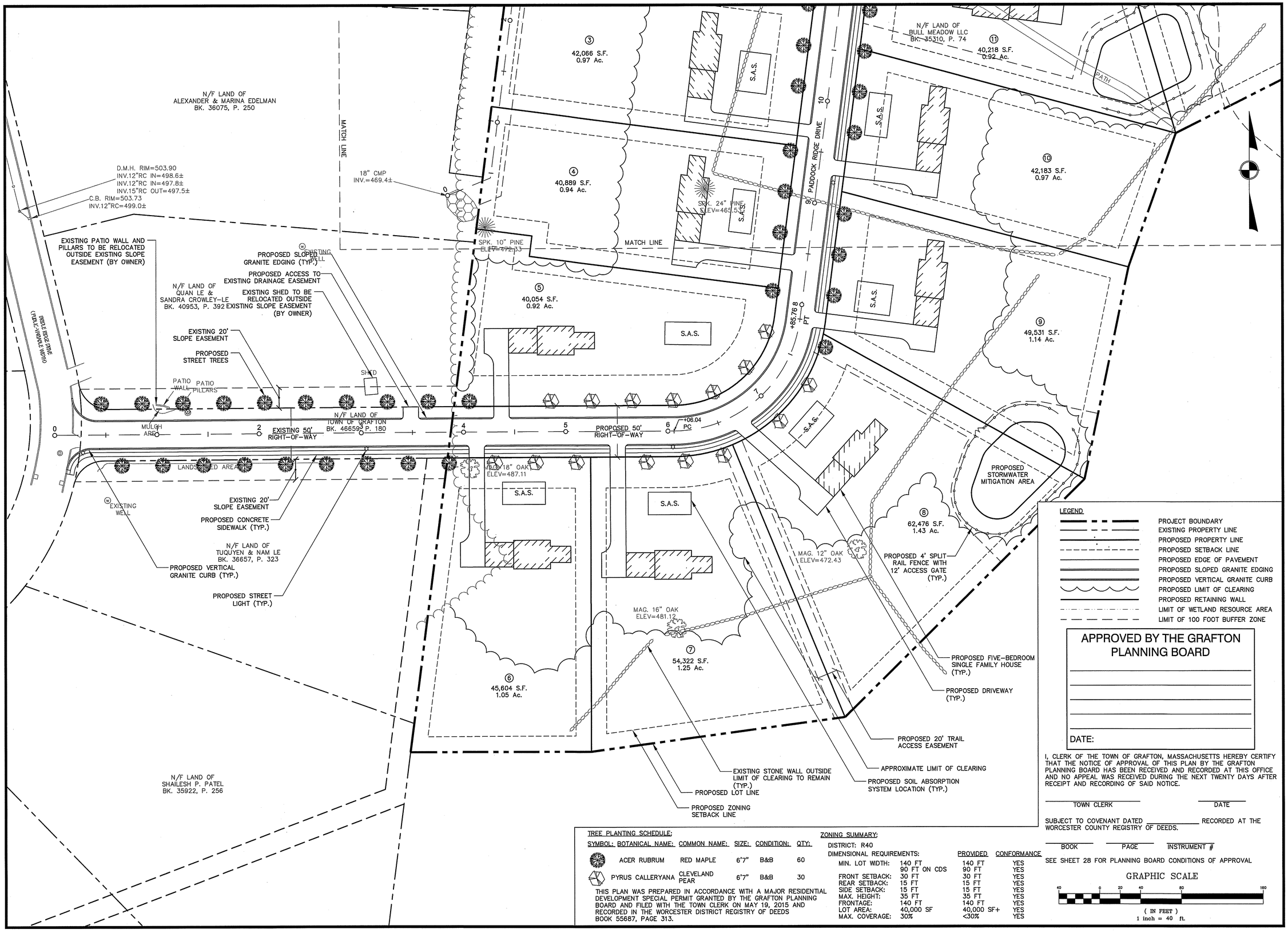

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

B. Marchetti 10/11/2016

Drawn By: BRM | Designed By: BRM | Checked By: BRM

LEGEND

- PROJECT BOUNDARY
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- PROPOSED SETBACK LINE
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- LIMIT OF 100 FOOT BUFFER ZONE

APPROVED BY THE GRAFTON PLANNING BOARD

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GRAPHIC SCALE

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TREE PLANTING SCHEDULE;

SYMBOL:	BOTANICAL NAME:	COMMON NAME:	SIZE:	CONDITION:	QTY:
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DISTRICT: R40

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	90 FT ON CDS	90 FT	YES
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MAX. HEIGHT:	35 FT	35 FT	YES
FRONTAGE:	140 FT	140 FT	YES
LOT AREA:	40,000 SF	40,000 SF+	YES
MAX. COVERAGE:	30%	<30%	YES

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www.mccartydb.com

Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Layout and Materials Plan (3 of 3)

Job No: 066
File Name: 066P-CMA02
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 9 OF 28

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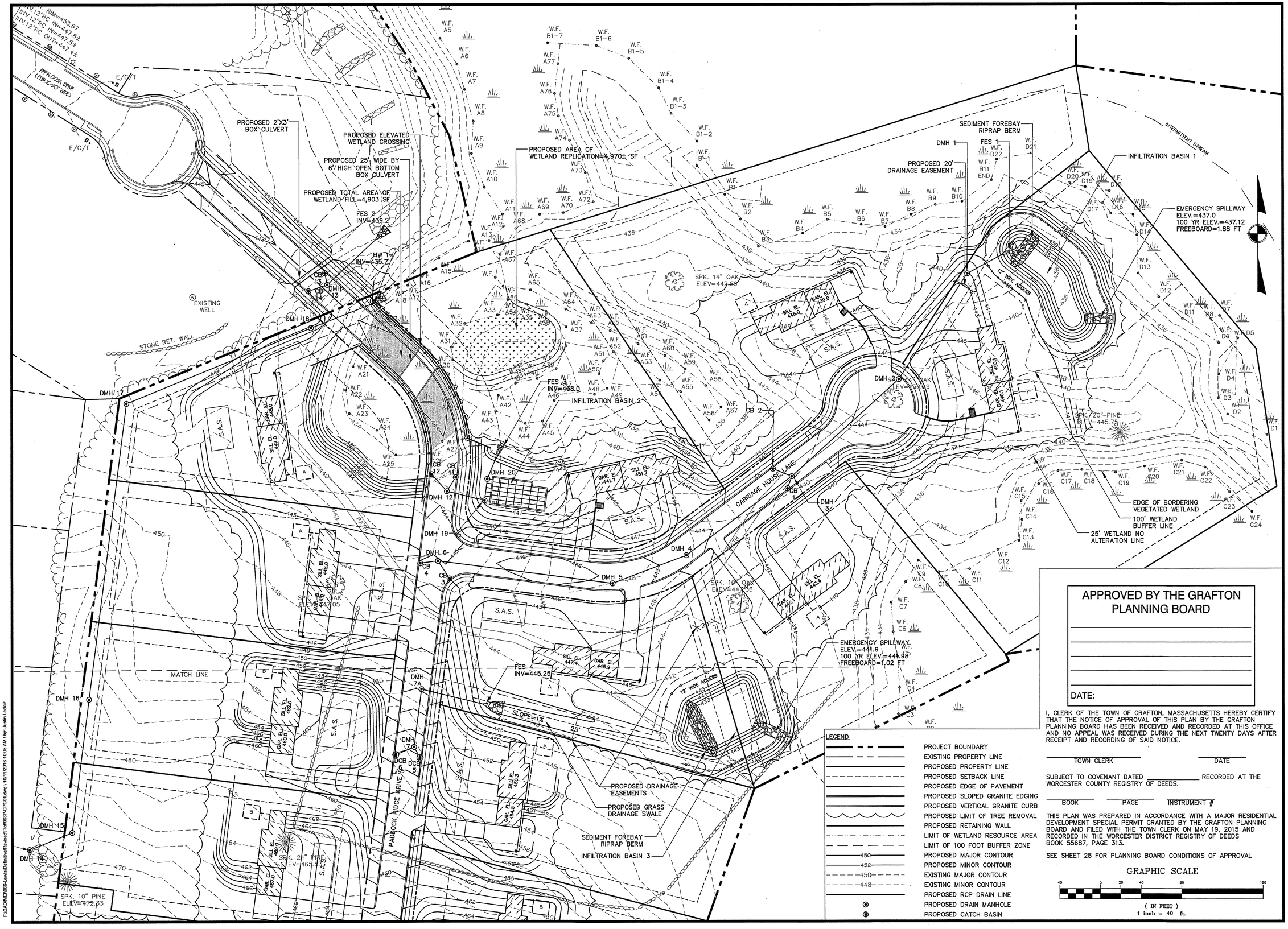

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PREPARED FOR:
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2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
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COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI CIVIL NO. 46279 — REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

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- LIMIT OF WETLAND RESOURCE AREA
- LIMIT OF 100 FOOT BUFFER ZONE
- 450 PROPOSED MAJOR CONTOUR
- 452 PROPOSED MINOR CONTOUR
- 450 EXISTING MAJOR CONTOUR
- 448 EXISTING MINOR CONTOUR
- PROPOSED RCP DRAIN LINE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

McCarty Engineering, Inc.
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42 Jungle Road, Leominster, MA 01453
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www.mccartydb.com

Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Grading and Drainage Plan (1 of 2)

Job No: 066
File Name: 066P-CPG01
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 10 OF 28

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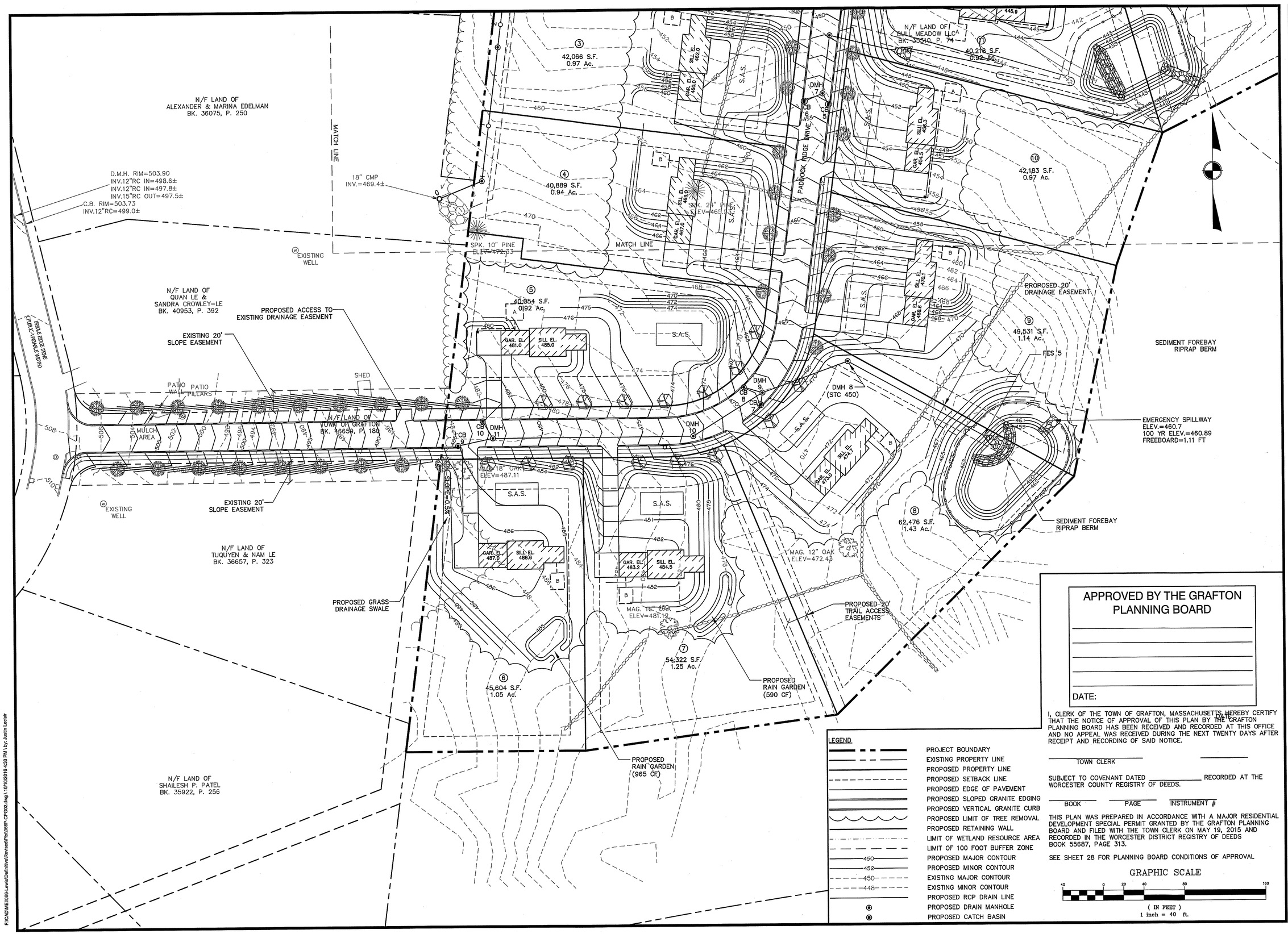

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/16

Drawn By:	Designed By:	Checked By:
BRM	BRM	JKM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

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GRAPHIC SCALE

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(IN FEET)
1 inch = 40 ft.

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phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
Grafton, MA 01519

Sheet Title

Grading and Drainage Plan
(2 of 2)

Job No: 066
File Name: 066P-CPG02
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
11
OF 28

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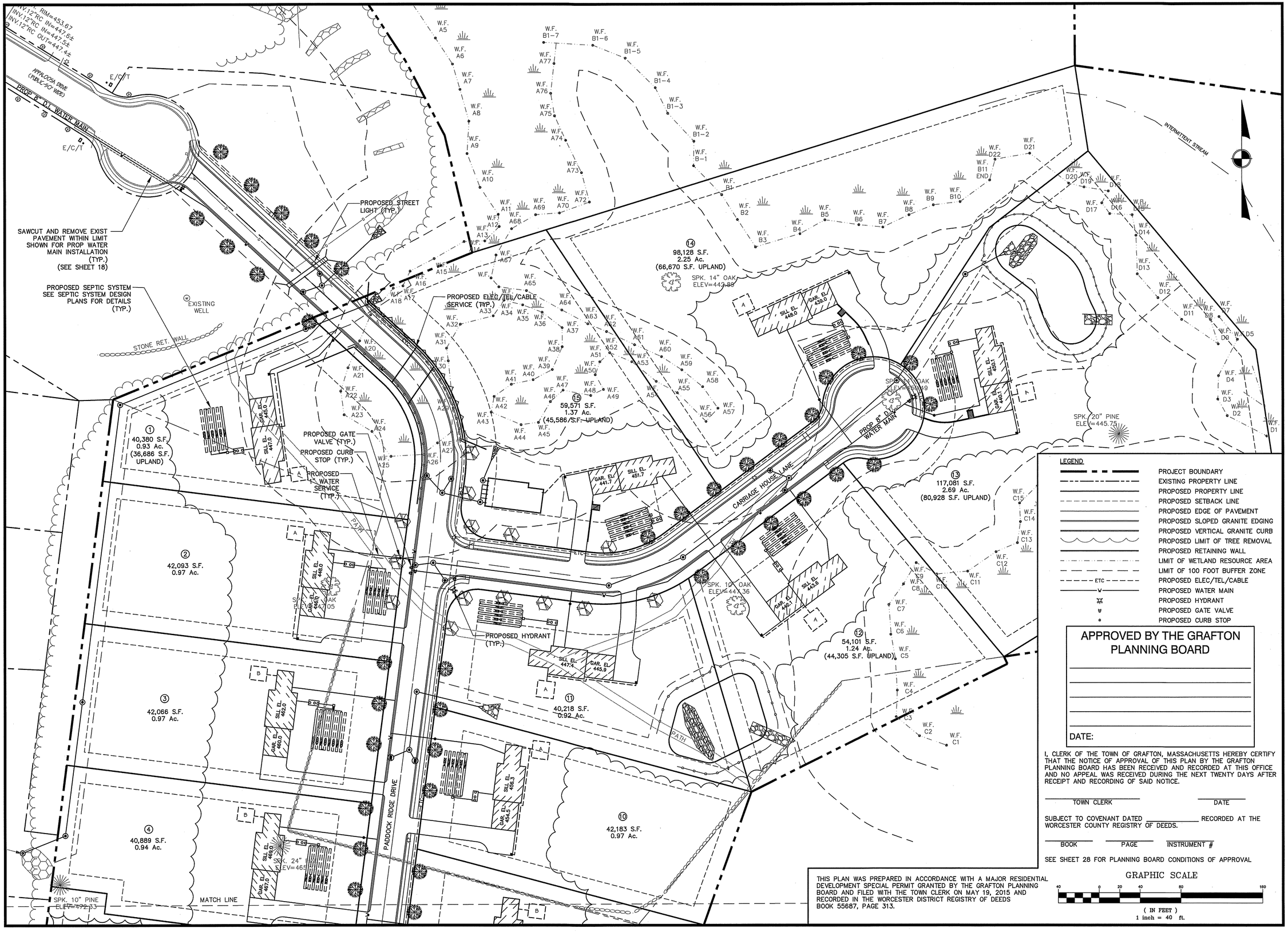

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- LIMIT OF 100 FOOT BUFFER ZONE
- ETC — PROPOSED ELEC/TEL/CABLE
- W — PROPOSED WATER MAIN
- PROPOSED HYDRANT
- PROPOSED GATE VALVE
- PROPOSED CURB STOP

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
Registered
PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Utility Plan
(1 of 2)

Job No: 066
File Name: 066P-CPU01
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 12 OF 28

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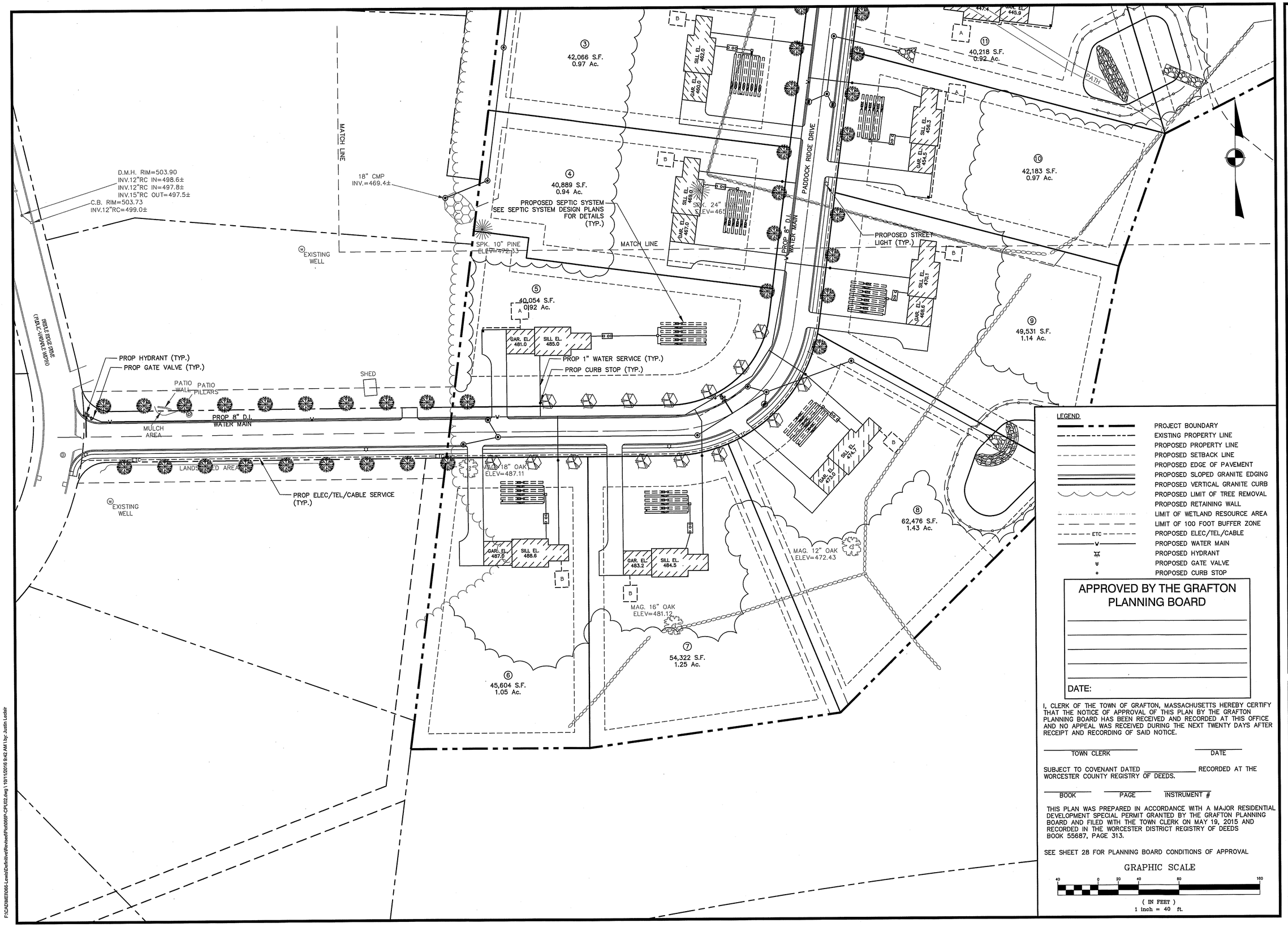

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10/11/2016

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BRM	BRM	TSK

McCarty Engineering, Inc.
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Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Utility Plan (2 of 2)

Job No: 066
File Name: 066P-CPU02
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 13 OF 28

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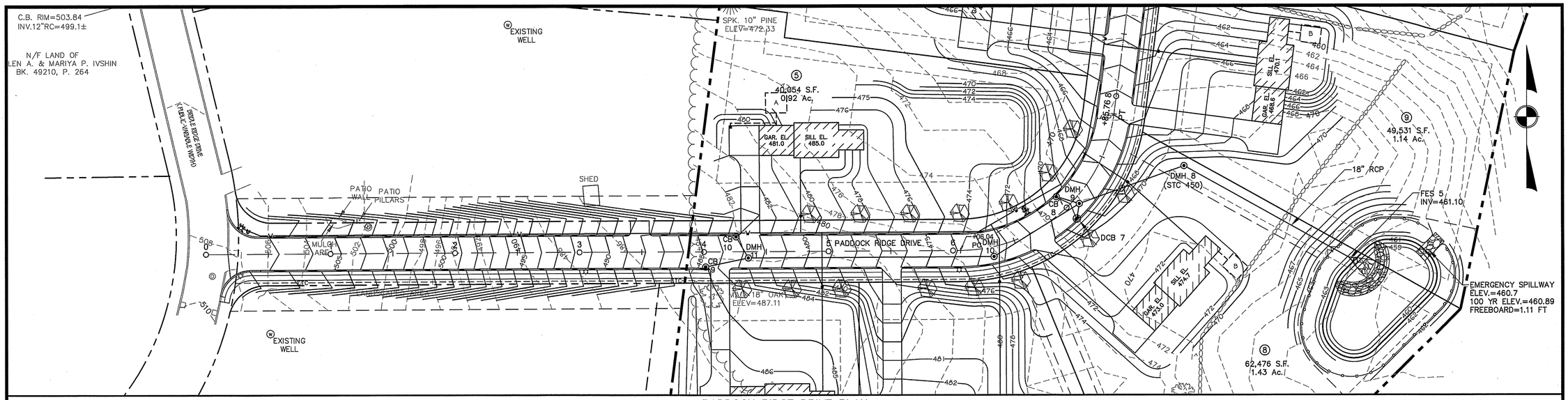
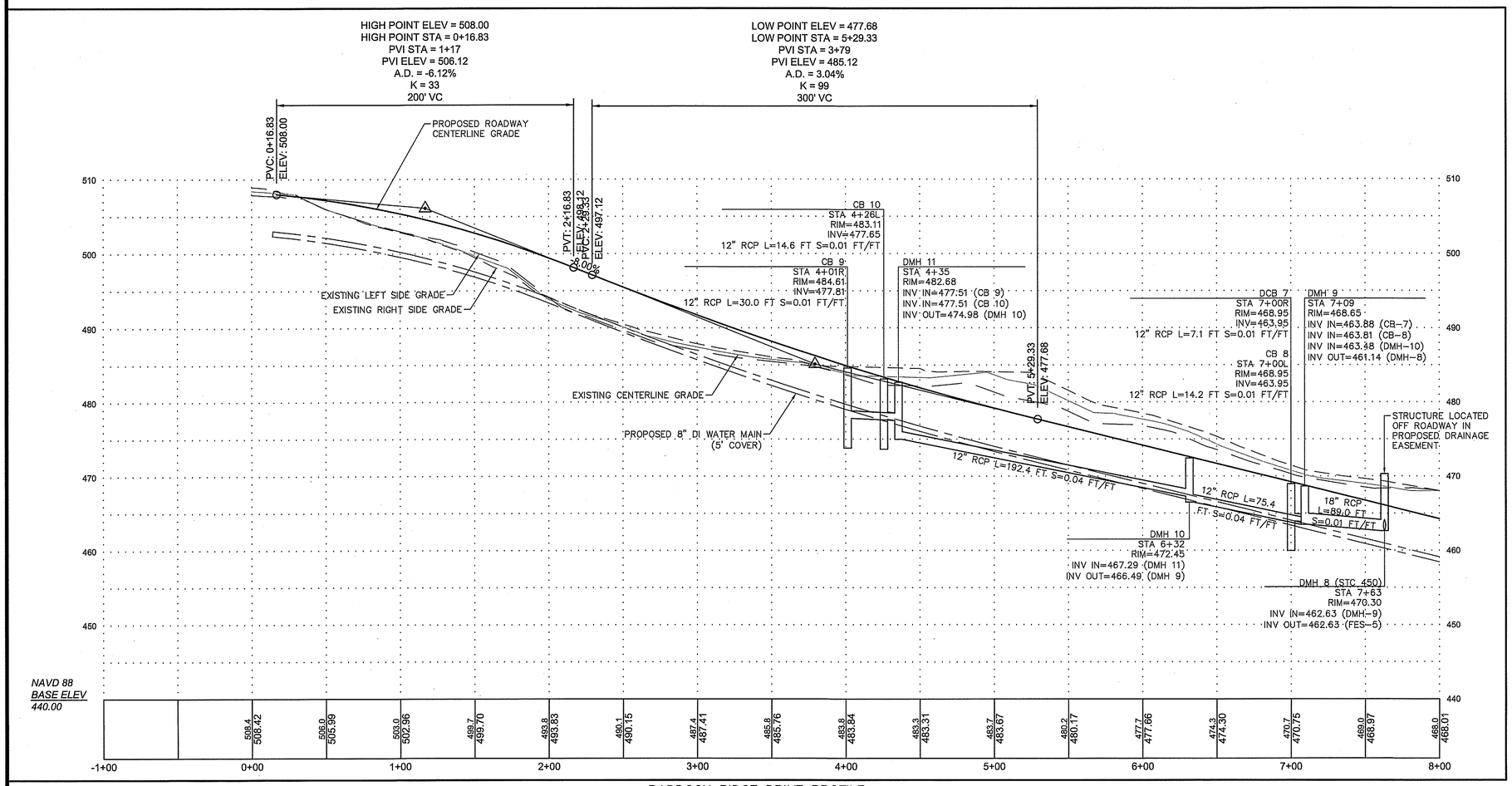


PADDOCK RIDGE DRIVE PLAN
SCALE: 1"=40'



PADDOCK RIDGE DRIVE PROFILE
VERT. SCALE: 1"=8'
HOR. SCALE: 1"=40'

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PREPARED FOR:
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2 RACHEL ROAD
BOYLSTON, MA 01505

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BRIAN R. MARCHETTI
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REGISTERED PROFESSIONAL ENGINEER
10/11/16

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

APPROVED BY THE GRAFTON PLANNING BOARD

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GRAPHIC SCALE
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Project Name
Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title
Roadway and Utility Profile
(1 of 4)

Job No: 066
File Name: 066P-CPF01
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
14
OF 28

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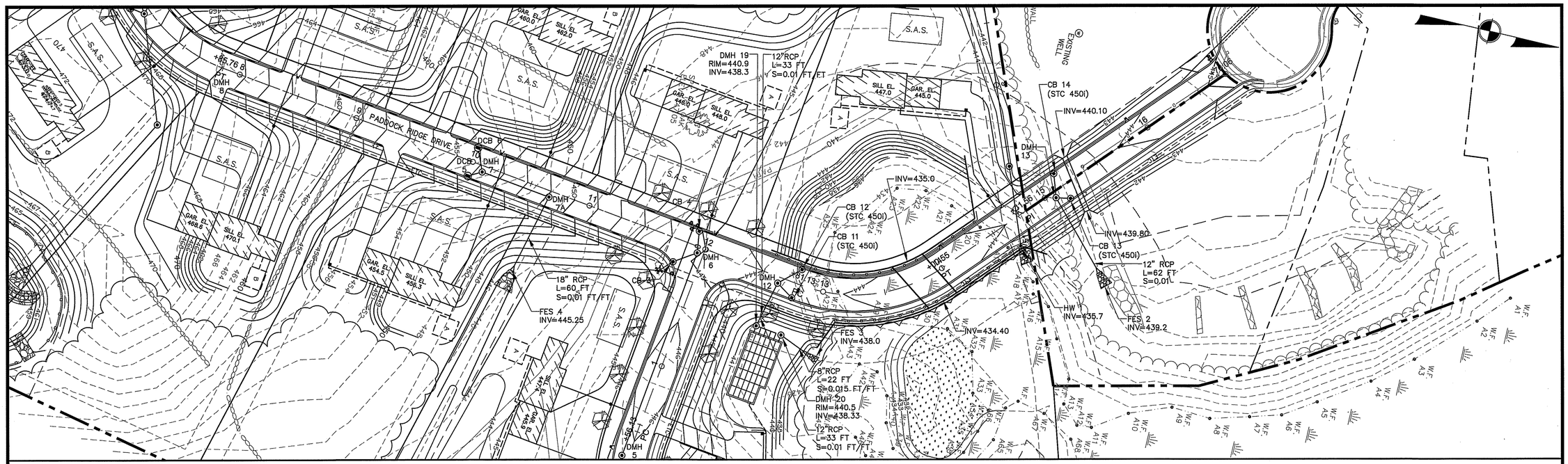
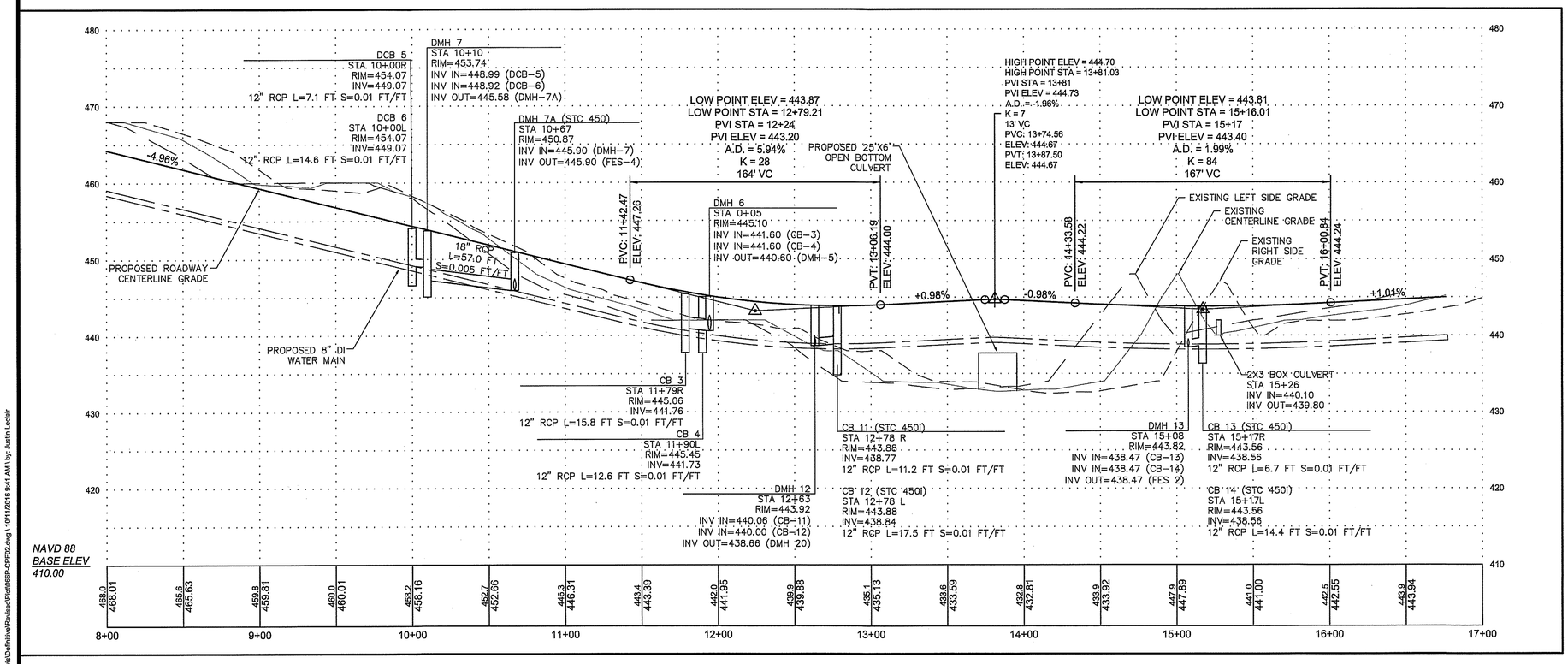


PADDOCK RIDGE DRIVE PLAN
SCALE: 1"=40'



PADDOCK RIDGE DRIVE PROFILE
VERT. SCALE: 1"=8'
HOR. SCALE: 1"=40'

GENERAL NOTES:
1. THE 12" RCP PIPE BETWEEN CB 11, CB 12 AND DMH 20 SHALL BE CLASS V RCP.

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
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10/11/2016

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Sheet Title
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(2 of 4)

Job No: 066
File Name: 066P-CPF02
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
15
OF 28

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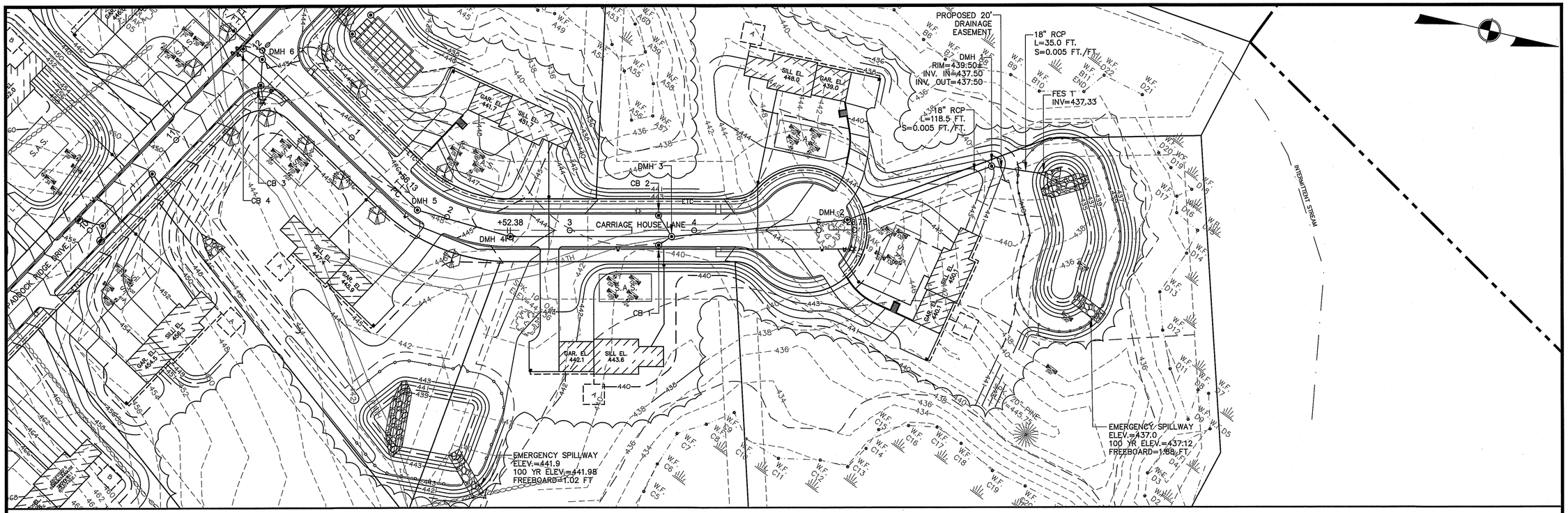
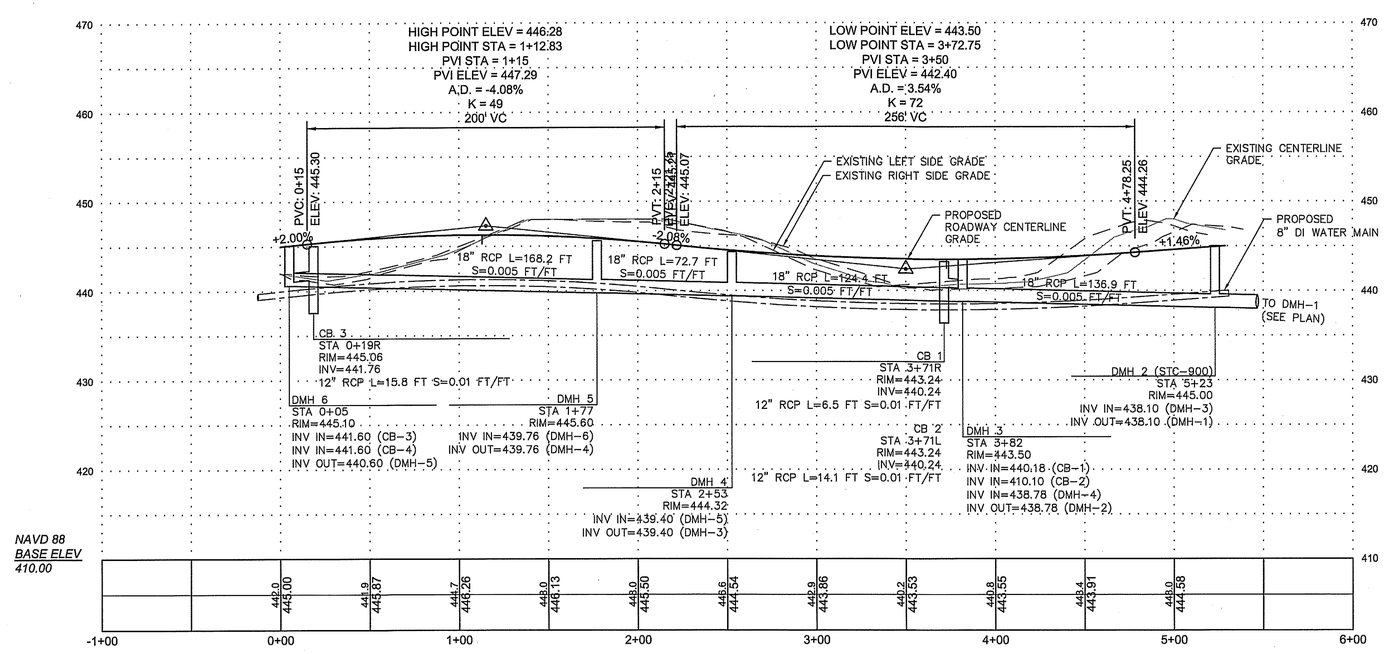


CARRIAGE HOUSE LANE PLAN
SCALE: 1"=40'



CARRIAGE HOUSE LANE PROFILE
VERT. SCALE: 1"=8'
HOR. SCALE: 1"=40'

GENERAL NOTES:
1. THE 24" RCP PIPE BETWEEN DMH 6 AND INFILTRATION BASIN 1 SHALL BE CLASS V RCP.

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK PAGE INSTRUMENT #

THIS PLAN WAS PREPARED IN ACCORDANCE WITH A MAJOR RESIDENTIAL DEVELOPMENT SPECIAL PERMIT GRANTED BY THE GRAFTON PLANNING BOARD AND FILED WITH THE TOWN CLERK ON MAY 19, 2015 AND RECORDED IN THE WORCESTER DISTRICT REGISTRY OF DEEDS BOOK 55687, PAGE 313.

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NOT FOR CONSTRUCTION
THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS BRIAN R. MARCHETTI CIVIL NO. 46279 REGISTERED PROFESSIONAL ENGINEER
10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name
Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title
Roadway and Utility Profile
(3 of 4)

Job No: 066
File Name: 066P-CPF03
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
16
OF 28

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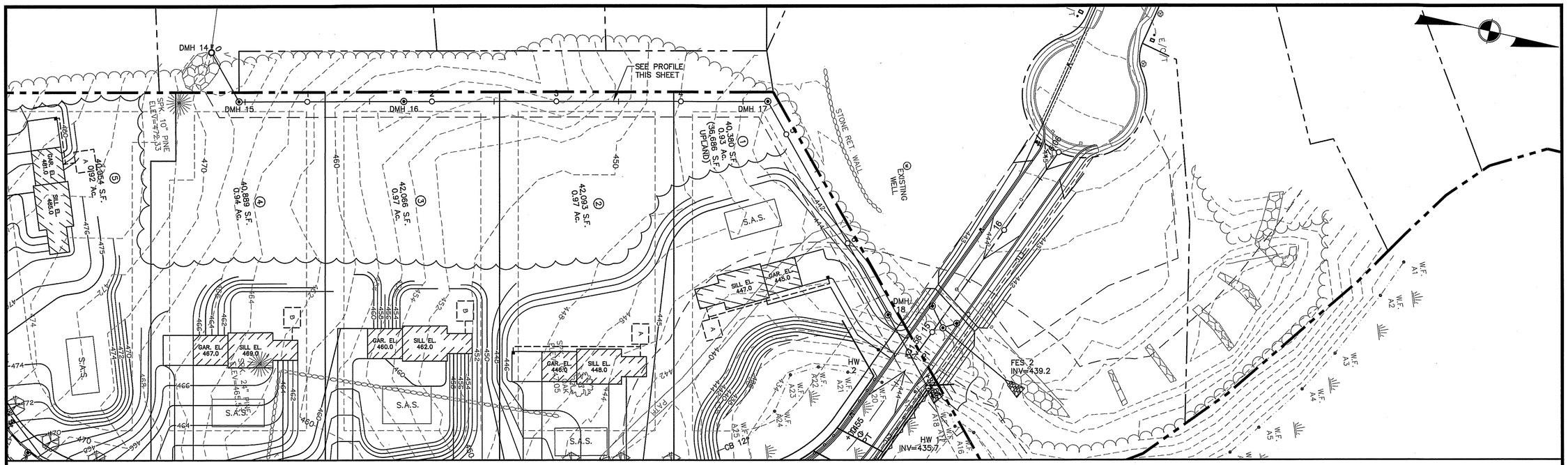
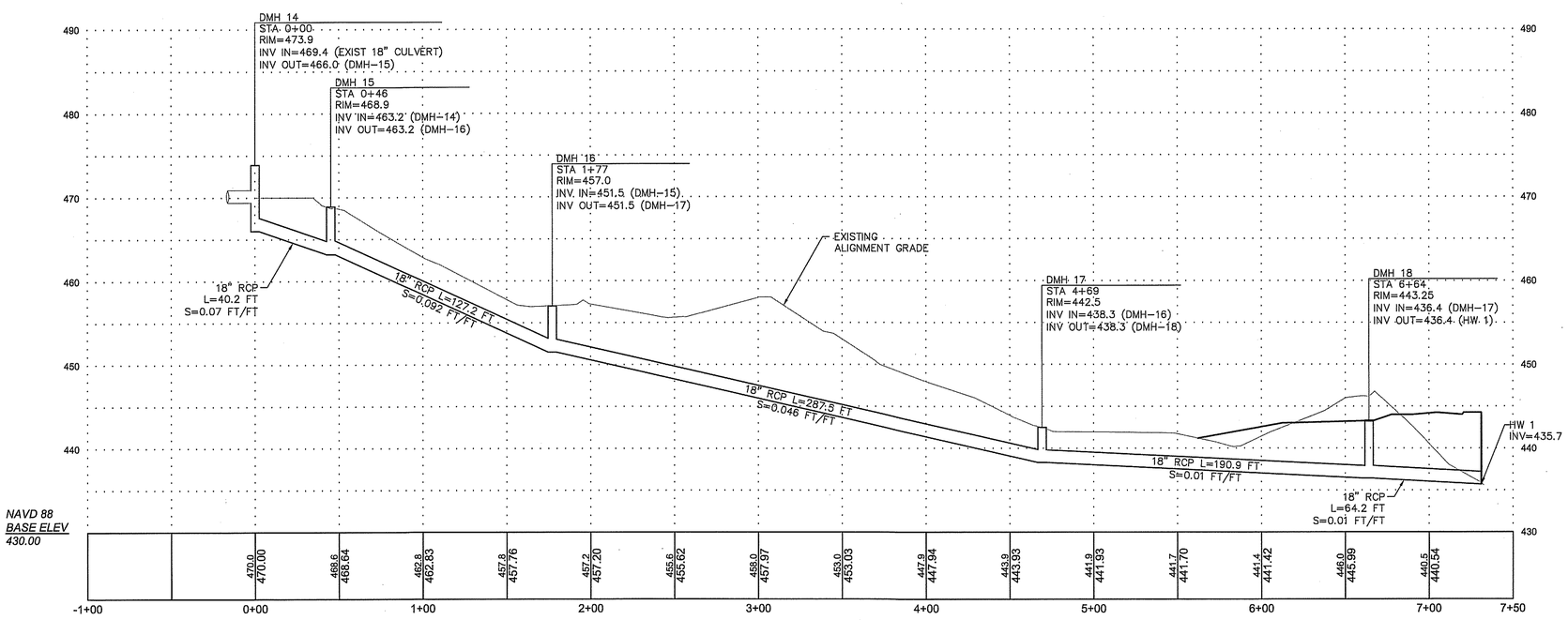


CROSS COUNTRY DRAIN PLAN
SCALE: 1"=40'



CROSS COUNTRY DRAIN PROFILE
VERT. SCALE: 1"=8'
HOR. SCALE: 1"=40'

NOT FOR CONSTRUCTION

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER
10/11/16

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Roadway and
Utility Profile
(4 of 4)

Job No: 066
File Name: 066P-CPF04
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
17
OF 28

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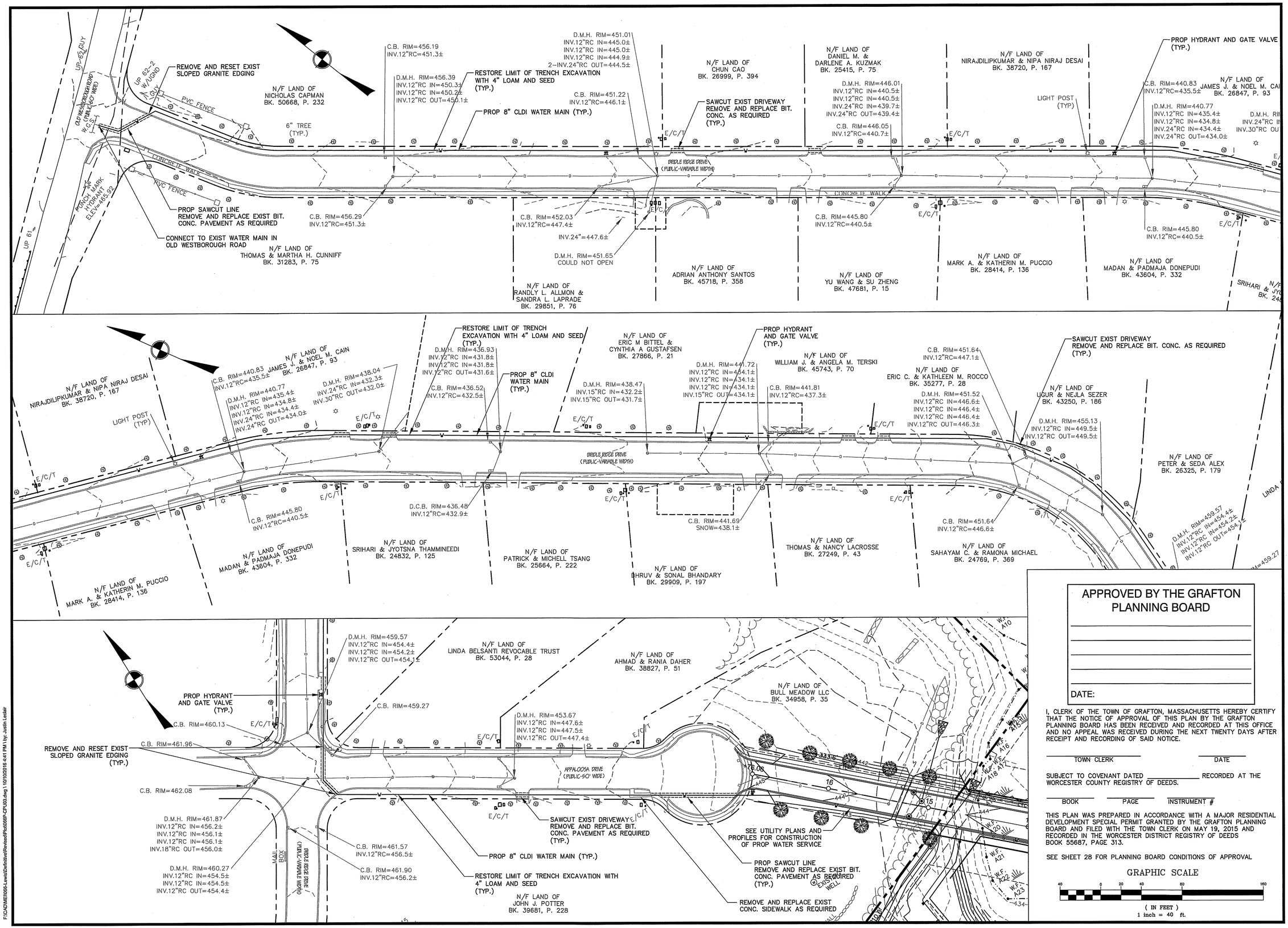

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	TSTRM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

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Civil Engineers
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www.mccartydb.com

Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Water Main Extension Plan

Job No: 066
File Name: 066P-CPU03
Date: June 10, 2016
Scale: 1"=120'

Sheet No. 18 OF 28

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CONSTRUCTION EROSION & SEDIMENTATION NOTES:

1. REFERENCE STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION SEQUENCING/PHASING.
2. PRIOR TO ANY LAND DISTURBANCE ACTIVITIES COMMENCING ON THE SITE, THE APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY MARKING THE LIMITS OF CONSTRUCTION.
3. PERIMETER SEDIMENTATION AND SILTATION CONTROL SYSTEMS SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE. THESE SYSTEMS TO BE INSPECTED AND MAINTAINED ON A PERIODIC BASIS TO CONTROL SOILS ON SITE.
4. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST NOT BE DISTURBED UNLESS THE APPLICANT HAS OBTAINED PRIOR APPROVAL FROM THE TOWN OF GRAFTON.
5. TEMPORARY CONSTRUCTION BERMS SHALL BE CONSTRUCTED AT ALL ENTRANCES/EXIT POINTS OF THE SITE TO REDUCE THE AMOUNT OF SOILS CARRIED ONTO ROADWAYS AND OFF SITE.
6. DUST SHALL ALSO BE CONTROLLED AT THE SITE AT ALL TIMES.
7. MONITORING AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL. MEASURES THROUGHOUT THE COURSE OF SITE CONSTRUCTION SHALL BE REQUIRED ON A DAILY BASIS. SEDIMENT SHALL BE REMOVED ONCE THE VOLUME REACHES ¼ TO ½ THE HEIGHT OF THE EROSION CONTROL DEVICE.
8. SOIL STOCKPILES MUST BE STABILIZED OR COVERED AT THE END OF EACH WORKDAY. STOCKPILE SIDE SLOPES SHALL NOT BE GREATER THAN 2:1. ALL STOCKPILES SHALL BE SURROUNDED BY A SEDIMENT CONTROL DEVICE.
9. DISTURBED AREA REMAINING IDLE FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED.
10. PERMANENT SEEDING SHALL BE UNDERTAKEN IN THE SPRING FROM MARCH THRU MAY, AND IN LATE SUMMER AND EARLY FALL FROM AUGUST THRU OCTOBER 15. DURING PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15 WHEN SEEDING IS FOUND TO BE IMPRACTICAL, AN APPROPRIATE TEMPORARY MULCH AND/OR NON-ASPHALTIC SOIL TACKIFIER WITH WINTER RYE SHALL BE APPLIED. PERMANENT SEEDING MAY BE UNDERTAKEN IN THE SUMMER IF PLANS PROVIDE FOR ADEQUATE MULCHING AND WATERING.
11. TEMPORARY SEDIMENT TRAPPING DEVICES MUST NOT BE REMOVED UNTIL PERMANENT STABILIZATION IS ESTABLISHED IN ALL CONSTRUCTION AREAS ASSOCIATED WITH THE PROJECT. SIMILARLY, STABILIZATION MUST BE ESTABLISHED PRIOR TO CONVERTING TEMPORARY SEDIMENT TRAPS/BASINS INTO PERMANENT (POST-CONSTRUCTION) STORMWATER MANAGEMENT FACILITIES. ALL FACILITIES USED FOR TEMPORARY MEASURES SHALL BE CLEANED AND RESTABILIZED PRIOR TO BEING PUT INTO FINAL OPERATION.
12. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF REMOVAL OF THE TEMPORARY MEASURES.
13. THE CONTRACTOR SHALL REGULARLY INSPECT THE PERIMETER OF THE PROPERTY TO CLEANUP AND REMOVE LOOSE CONSTRUCTION DEBRIS BEFORE IT LEAVES THE SITE. ALL DEMOLITION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE TO A LEGAL DUMP SITE. ALL TRUCKS LEAVING THE SITE SHALL BE COVERED.
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15. AFTER INSTALLATION OF EACH DRAINAGE INLET A SILT SACK SHALL BE INSTALLED AROUND THE INLET TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM.
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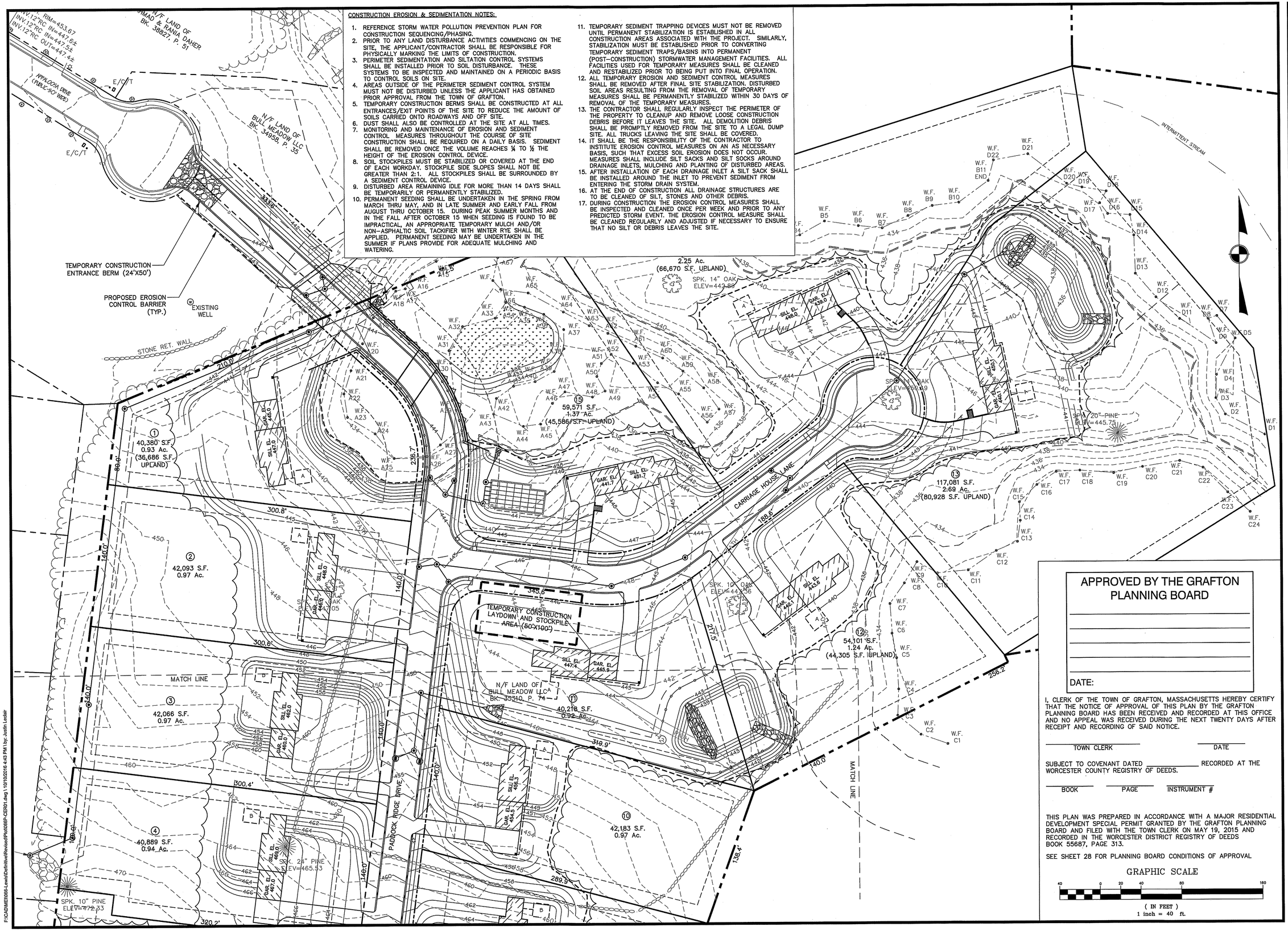

APPROVED BY THE GRAFTON PLANNING BOARD

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOT FOR CONSTRUCTION

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

B R Marchetti 10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Erosion Control Plan
(1 of 2)

Job No: 066
File Name: 066P-CER01
Date: June 10, 2016
Scale: 1"=40'

Sheet No. 19 OF 28

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CONSTRUCTION EROSION & SEDIMENTATION NOTES:

1. REFERENCE STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION SEQUENCING/PHASING.
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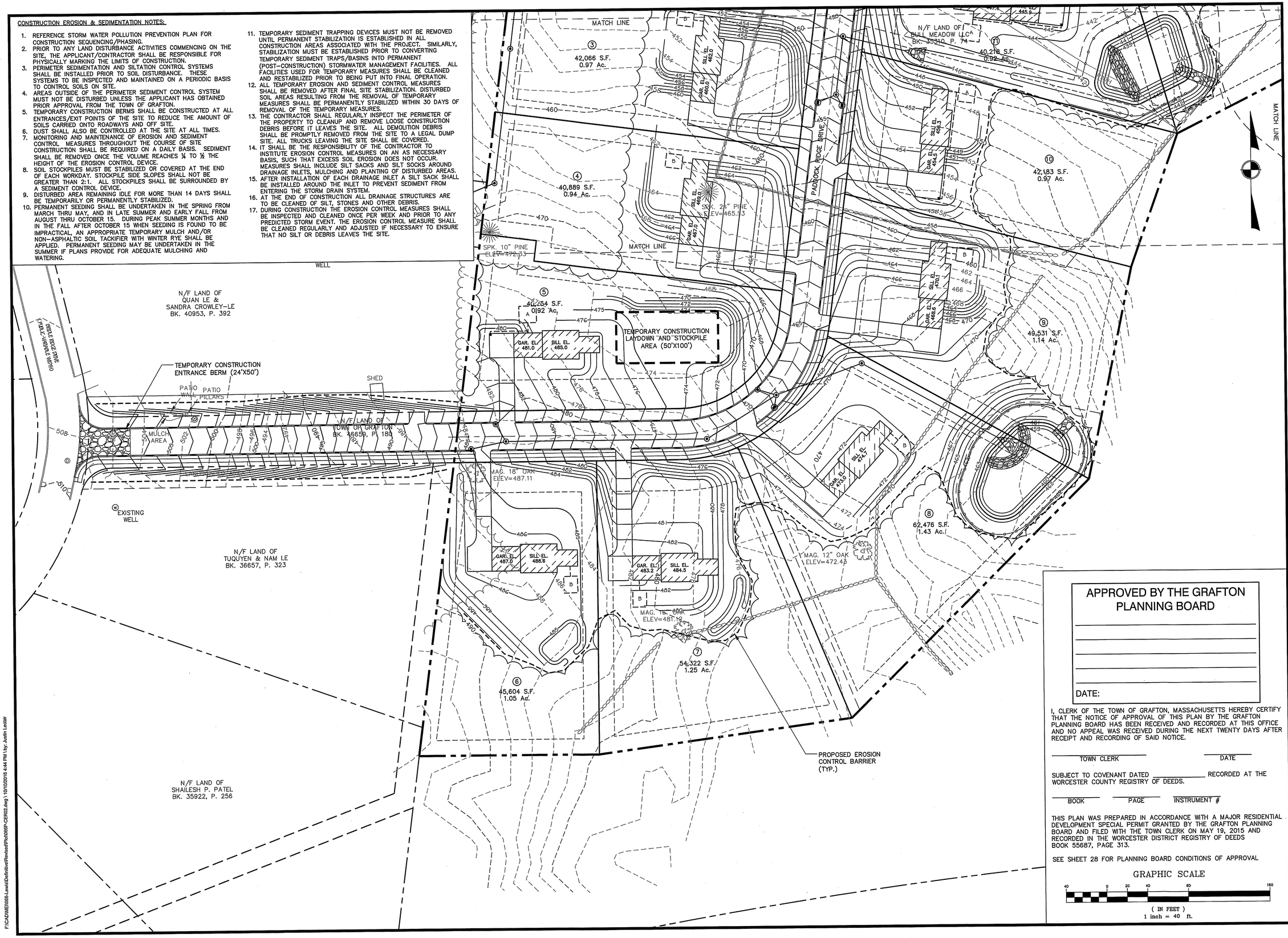

APPROVED BY THE GRAFTON PLANNING BOARD

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

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(IN FEET)
1 inch = 40 ft.

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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By: BRM
Designed By: BRM
Checked By: TSW

McCarty Engineering, Inc.
Civil Engineers
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Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Erosion Control Plan
(2 of 2)

Job No: 066
File Name: 066P-CER02
Date: June 10, 2016
Scale: 1"=40'

Sheet No.
20
OF 28

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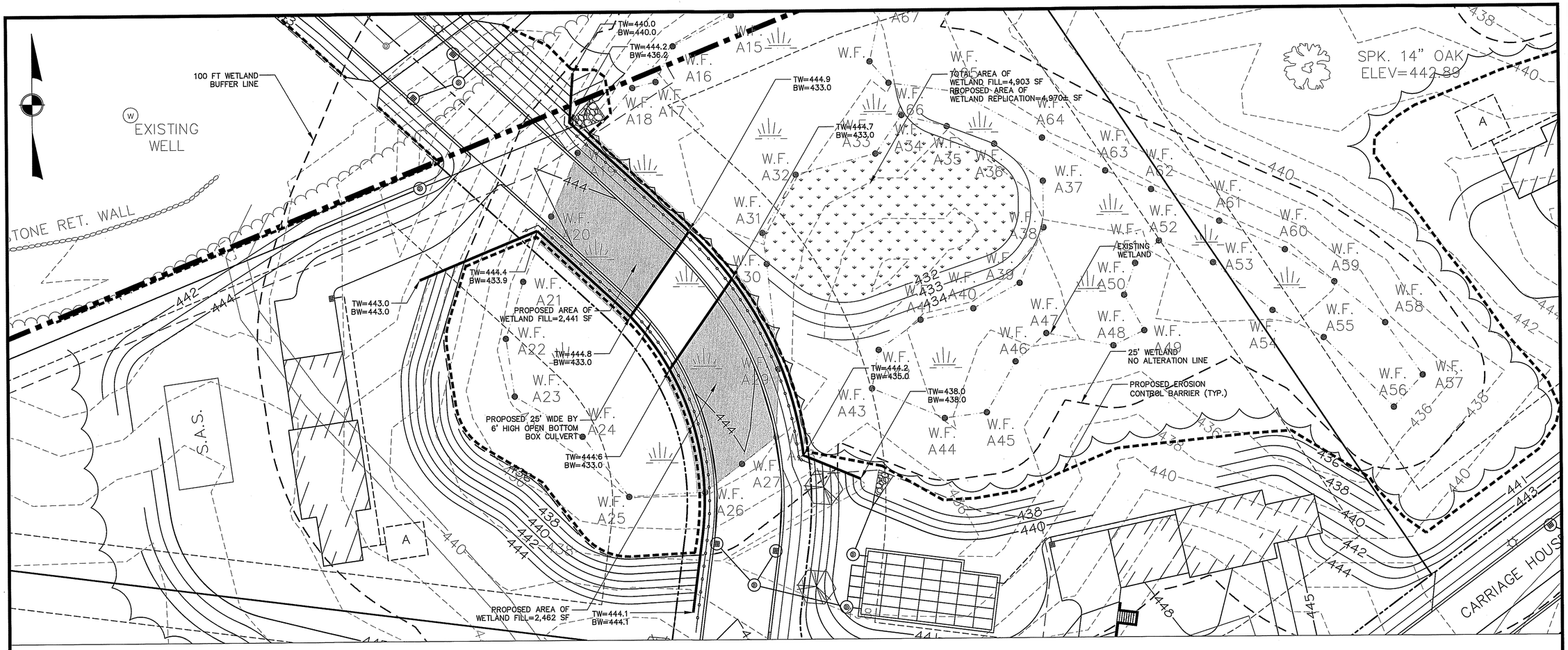


BORDERING VEGETATED WETLAND REPLICATION CONSTRUCTION PROTOCOL:

1. THE FOLLOWING PROTOCOL CONFORMS TO THE GENERAL STANDARDS IN THE MA WETLANDS PROTECTION ACT REGULATIONS AT 310 CMR 10.55(4)(b)

2. THE WETLAND BOUNDARIES (I.E., DOWNGRADIENT EDGES OF THE WETLAND REPLICATION AREA) WILL BE MARKED IN THE FILED.

3. PRIOR TO THE START OF EARTH–MOVING ACTIVITIES IN THE REPLICATION AREA, AN EROSION CONTROL BARRIER OF PROPERLY INSTALLED SILTATION FENCE (I.E, THE BOTTOM FEW INCHES OF THE SILTATION FENCE INSTALLED IN A NARROW, TRENCH AND THE TRENCH FILLED WITH SOIL AROUND THE SILTATION FENCE) WILL BE INSTALLED ALONG THE WETLAND BOUNDARIES BETWEEN THE WETLAND AND THE WETLAND REPLICATION AREA. THE WETLAND REPLICATION AREA WILL THEN BE CLAEARED AND GRUBBED, WITH THE EXCEPTION OF THE TREES THAT HAVE BEEN MARKED TO BE SAVED.

4. THE PROPOSED FINAL GRADE OF THE REPLICATION AREA SHOULD APPROXIMATE THE ELEVATION OF THE ADJACENT WETLAND AREAS (430±), AS NOTED ON THE SITE PLANS. THE REPLICATION AREA WILL BE EXCAVATED TO A DEPTH OF 12 INCHES BELOW THE PROPOSED FINAL GRADE. THE EXCAVATION AND PLANTING WORK WILL BE CLOSELY SUPERVISED BY A QUALIFIED WETLAND SCIENTIST. MINOR MODIFICATIONS TO THE PROPOSED GRADING MAY BE MADE IN THE FILE BY THE WETLAND SCIENTIST IN RESPONSE TO OBSERVED SUBSURFACE HYDROLOGIC CONDITIONS. ALL EXCAVATED MATERIAL WILL BE DISPOSED OF AWAY FROM ALL WETLAND RESOURCE AREAS.

5. EXISTING TOPSOIL WITHIN THE IMPACT AREA WILL BE EXCAVATED, STOCKPILED AND KEPT MOIST BY WATERING AND/OR COVERING OR IMMEDIATELY TRANSPORTED TO THE REPLICATION AREA.

6. RELOCATED WETLAND TOPSOIL WILL BE SUPPLEMENTED WITH A 1:1 MIXTURE OF HIGH QUALITY, LOAMY TOPSOIL AND LEAF MOLD COMPOST, AS NECESSARY, TO APPROXIMATE 12 INCHES IN THICKNESS THROUGHOUT THE REPLICATION AREA. THE SUBSTRATE WILL BE ROUGHLY GRADED TO PROVIDE AN APPROPRIATE MICTROTOPOGRAPHY. A MINIMUM OF 4 INCHES OF LOAMY TOPSOIL WILL BE APPLIED TO THE SIDE–SLOPES OF THE WETLAND REPLICATION AREA. THE SIDE SLOPES SHOULD BE STABILIZED AS NECESSARY TO PREVENT EROSION.

7. AN EROSION CONTROL BARRIER COMPRISING ONLY TOED–IN SILTATION FENCE WILL BE PROPERLY INSTALLED BETWEEN THE COMPLETED REPLICATION AREA AND THE ADJACENT UPLAND SIDE SLOPES.

8. PLANTING WILL BE DONE ONLY DURING THE BEGINNING (APRIL 15 THROUGH JUNE) OR END (SEPTEMBER 1 TO NOVEMBER 15) OF THE GROWING SEASON. PLANTING IN THE MID–GROWING SEASON IS ONLY ACCEPTABLE IF IRRIGATION IS PROVIDED. THE PLANTINGS AND SEED MIXTURE IDENTIFIED IN THE TABLE BELOW WILL BE PLANTED IN THE REPLICATION AREA UNLESS THE HERBACEOUS LAYER CAN BE TRANSPLANTED INTO THE REPLICATION AREA.

9. THE REPLICATION AREA WILL BE MULCHED WITH 1 TO 2 INCHES OF LEAF COMPOST OR WEED FREE STRAW TO PROVIDE FOR TEMPORARY EROSION CONTROL AND MOISTURE RETENTION.

10. THE SIDE–SLOPES OF THE WETLAND REPLICATION AREA WILL BE SEEDED WITH A GRASS/WILDFLOWER OR CONSERVATION MIXTURE DESIGNED TO PROVIDE PERMANENT COVER. AFTER SEEDING, THE SIDE–SLOPES WILL BE MULCHED WITH A THIN LAYER OF STRAW TO PROVIDE FOR TEMPORARY EROSION CONTROL.

11. THE REPLICATION AREAS WILL BE INSPECTED, BY A QUALIFIED WETLAND SCIENTIST, AT THE END OF EACH GROWING SEASON FOR A MINIMUM OF TWO YEARS OR UNTIL SUCH TIME AS THE REQUIRED 75% OF THE VEGETATIVE COVER WITH THE WETLAND SPECIES HAS BEEN ESTABLISHED. WRITTEN RESULTS OF THESE INSPECTIONS WILL BE SUBMITTED TO THE CONSERVATION COMMISSION.

12. AFTER THE WETLAND REPLICATION AREA HAS BECOME VEGETATIVELY STABILIZED AND FOLLOWING APPROVAL OF THE ISSUING AUTHORITY, THE SILTATION FENCE AND ALL WOODEN STAKES WILL BE REMOVED AND DISPOSED OF PROPERLY.

- PLANTING PLAN FOR WETLAND REPLICATION AREA:

SPECIES; SIZE; SPACING:	NUMBER:
SAPLINGS; 6 TO 8' HEIGHT, CONTAINER OR BALLED, BURLAPPED; 15' ON–CENTER AVERAGE	
RED MAPLE (ACER RUBRUM)	22
SHRUBS; 2.5 TO 3' IN HEIGHT, CONTAINER, 6' ON–CENTER AVERAGE SPACING	138 TOTAL*
HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM)	
ARROW–WOOD (VIBURMUM DENTATUM)	
WINTERBERRY (ILEX VERTICILLATA)	
SILKY DOGWOOD (CORNUS AMOMUM)	
HERBACEOUS	
NEW ENGLAND WETLAND PLANTS, NEW ENGLAND WETMIX (OR EQUIVALENT)	2.0 LBS.

- DEPENDING UP AVAILABILITY FROM LOCAL NURSERY STOCK, AT LEAST THREE (3) OF THE LISTED SPECIES WILL BE SELECTED, WITH A LEAST FORTY (40) SPECIMENS OF EACH SELECTED SPECIES PLANTED, FOR A TOTAL.

WETLAND CROSSING SEQUENCE OF WORK:

- INSTALL EROSION CONTROL BARRIER (ECB) AT LOCATION SHOWN ON PLAN.
- INSTALL ADDITIONAL ECB PROTECTION THROUGH SECTION OF WETLAND AT PROPOSED CULVERT.
- CLEAR TREES IN WORK AREA WITHOUT CROSSING EQUIPMENT OVER THE SECTION OF WETLAND TO REMAIN.
- ALL WORK IS TO BE ACCESSED FROM EITHER SIDE OF THE PROPOSED CROSSING. ONLY FOOT TRAFFIC IS PERMITTED IN RESOURCE AREA.
- REMOVE & DISPOSE STUMPS.
- STRIP & STOCKPILE WETLAND SOILS TO BE USED IN REPLICATION AREA. IF WITHIN 100FT WETLAND BUFFER STOCKPILE SHOULD BE SURROUNDED IN HAYBALES & COVERED IN 4 MIL POLY.
- FORM & POUR CONCRETE FOOTING FOR OPEN BOTTOM CULVERT.
- INSTALL CULVERT & ANCHOR TO FOOTING.
- PREPARE CRUSHED STONE BASE FOR PRECAST CONCRETE BLOCK RETAINING WALLS.
- IF DEWATERING IS REQUIRED:
  - USE ELECTRIC SUBMERSIBLE PUMP.
  - USE SUFFICIENT HOSE LENGTHS TO PUMP TO TEMP DRAINAGE SWALE.
  - CONSTRUCT 10X10X1' APRON OF 6–12" RIP RAP AT DISCHARGE POINT.
  - PERIODICALLY INSPECT DISCHARGE POINT & SWALE FOR BUILDUP OF SEDIMENT.
- INSTALL PRECAST CONCRETE BLOCK WALLS.
- IMPORT, PLACE, & COMPACT STRUCTURAL FILL BETWEEN WALLS.
- CONTINUE WITH WALL CONSTRUCTION & FILL PLACEMENT TO SUBGRADE.
- INSTALL TEMPORARY FENCE AT TOP OF WALL.
- INSTALL UTILITIES IN CROSSING AREA.
- INSTALL GRAVEL FOR ROADWAY BASE.
- INSTALL BINDER COURSE OF PAVEMENT.
- INSTALL GRANITE CURBING.
- CONSTRUCT CONCRETE SIDEWALK.
- INSTALL GUARDRAIL & FENCING.
- LOAM & HYDROSEED SHOULDERS.
- PROCEED WITH CONSTRUCTION OF WETLAND REPLICATION AREA.

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK — DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK — PAGE — INSTRUMENT #

THIS PLAN WAS PREPARED IN ACCORDANCE WITH A MAJOR RESIDENTIAL DEVELOPMENT SPECIAL PERMIT GRANTED BY THE GRAFTON PLANNING BOARD AND FILED WITH THE TOWN CLERK ON MAY 19, 2015 AND RECORDED IN THE WORCESTER DISTRICT REGISTRY OF DEEDS BOOK 55687, PAGE 313.

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision

COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI — CIVIL — NO. 46279 — REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By: JLL | Designed By: BRM | Checked By: BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

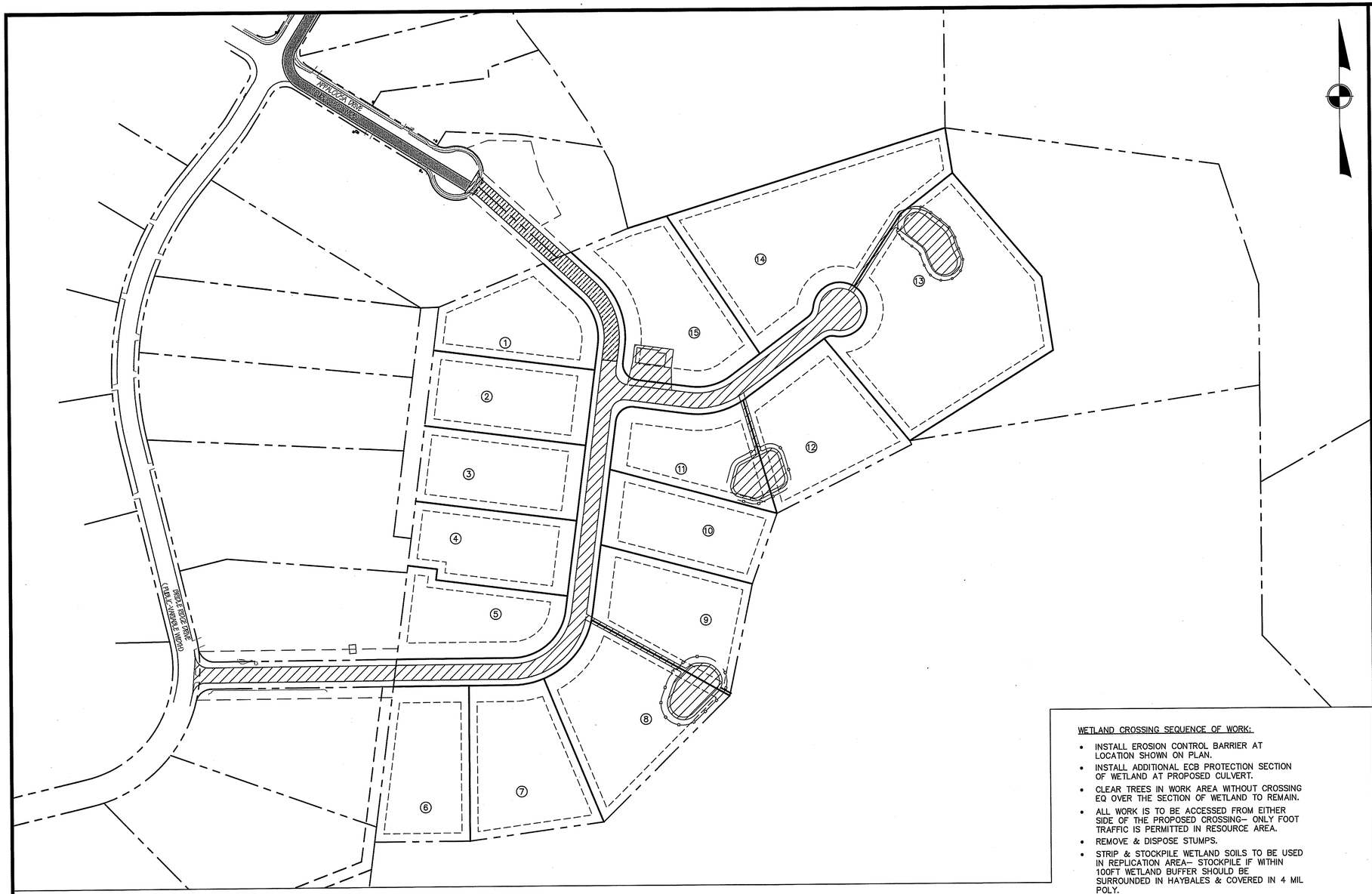
Sheet Title

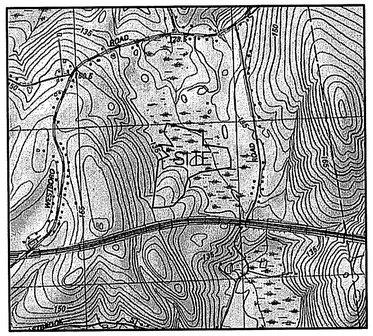
Wetland Crossing
&
Replication Area Plan

Job No: 066
File Name: 066P-WRA01
Date: October 11, 2016
Scale: 1"=20'

Sheet No. 21 OF 28

F:\CADD\ME\066S-Lewis\Definitive\Revised\Plots\066P-WRA01.dwg \10/11/2016 10:08 AM \ by: Brian Marchetti





LOCUS PLAN
1"=1,500 FT.±

LEGEND:

- ① PROPOSED LOT NUMBER
- PHASE 1 WATERLINE EXTENSION TO OLD WESTBOROUGH RD.
- PHASE 2 ROADWAY/DRAINAGE/UTILITY CONSTRUCTION
- PHASE 3 WETLAND CROSSING

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision

COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI — CIVIL — NO. 46279 — REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
JLL	BRM	TSKM

WETLAND CROSSING SEQUENCE OF WORK:

- INSTALL EROSION CONTROL BARRIER AT LOCATION SHOWN ON PLAN.
- INSTALL ADDITIONAL ECB PROTECTION SECTION OF WETLAND AT PROPOSED CULVERT.
- CLEAR TREES IN WORK AREA WITHOUT CROSSING EQ OVER THE SECTION OF WETLAND TO REMAIN.
- ALL WORK IS TO BE ACCESSED FROM EITHER SIDE OF THE PROPOSED CROSSING– ONLY FOOT TRAFFIC IS PERMITTED IN RESOURCE AREA.
- REMOVE & DISPOSE STUMPS.
- STRIP & STOCKPILE WETLAND SOILS TO BE USED IN REPLICATION AREA– STOCKPILE IF WITHIN 100FT WETLAND BUFFER SHOULD BE SURROUNDED IN HAYBALES & COVERED IN 4 MIL POLY.
- FORM & POUR CONCRETE FOOTING FOR OPEN BOTTOM CULVERT.
- INSTALL CULVERT & ANCHOR TO FOOTING.
- PREPARE CRUSHED STONE BASE FOR PRECAST CONCRETE BLOCK RETAINING WALLS.
- NOTE IF DEWATERING IS REQUIRED:
  - •• USE ELECTRIC SUBMERSIBLE PUMP.
  - •• USE SUFFICIENT HOSE LENGTHS TO PUMP TO TEMP DRAINAGE SWALE.
  - •• CONSTRUCT 10X10X1' APRON OF 6–12" RIP RAP AT DISCHARGE POINT.
  - •• PERIODICALLY INSPECT DISCHARGE POINT & SWALE FOR BUILDUP OF SEDIMENT.
- INSTALL PRECAST CONCRETE BLOCK WALLS.
- IMPORT, PLACE, & COMPACT STRUCTURAL FILL BETWEEN WALLS.
- CONTINUE WITH WALL CONSTRUCTION & FILL PAVEMENT TO SUBGRADE.
- INSTALL TEMPORARY FENCE AT TOP OF WALL.
- INSTALL UTILITIES IN CROSSING AREA.
- INSTALL GRAVEL FOR ROADWAY BASE.
- INSTALL BINDER COURSE OF PAVEMENT.
- INSTALL GRANITE CURBING.
- CONSTRUCT CONCRETE SIDEWALK.
- INSTALL GUARDRAIL & FENCING.
- LOAM & HYDROSEED SHOULDERS.
- PROCEED WITH CONSTRUCTION OF WETLAND REPLICATION AREA.

SEQUENCE OF WORK, SUBDIVISION CONSTRUCTION:

- LIMIT OF CLEARING TO BE MARKED OUT FOR ENTIRE PROJECT.
- CUT TREES & CHIP – CHIPS TO BE HAULED OFF SITE.
- INSTALL EROSION CONTROL BARRIER AND CONSTRUCTION ENTRANCE.
- REMOVE & DISPOSE STUMPS. STUMPS CAN BE GROUND ON–SITE AND GRINDING TO BE HAULED OFF SITE. WHOLE STUMPS CAN BE HAULED OFFSITE TO A DISPOSAL FACILITY.
- STRIP AND STOCKPILE TOP & SUBSOIL. MAINTAIN A STOCKPILE ON SITE, OUTSIDE OF THE 100 FT BUFFER ZONE, SUFFICIENT TO LOAM LOTS AND DISTURBED AREAS AT THE COMPLETION OF CONSTRUCTION. EXCESS LOAM CAN BE HAULED OFF SITE.
- COMPLETE ROUGH GRADING OF THE SITE TO ESTABLISH SUBGRADE. INFILTRATION BASINS 1,2,3,4 SHALL BE ESTABLISHED TO WITHIN 1FT OF FINISH GRADE. CONSTRUCT TEMPORARY SWALES AS NEEDED TO DIRECT RUNOFF TO THE INFILTRATION BASINS. BASINS SHOULD BE MONITORED THROUGHOUT THE CONSTRUCTION PROCESS TO ENSURE THAT THEY DO NOT BECOME SILTED UP.
- INSTALL STORMWATER DRAINAGE SYSTEMS STARTING WITH CROSS COUNTRY DRAINAGE THAT PICKS UP DISCHARGE FROM THE NORTH GRAFTON ESTATES DETENTION BASIN. ONCE CROSS COUNTRY DRAIN IS COMPLETE, DRAINAGE IMPROVEMENTS SHOULD BE INSTALLED STARTING AT THE INFILTRATION BASINS AND WORKING UPSTREAM. AS EACH CATCHBASIN IS INSTALLED, IT SHOULD BE EQUIPPED WITH A CATCHBASIN INLET FILTER. FILTERS SHOULD BE INSPECTED REGULARLY & CLEANED AS NEEDED.
- INSTALLATION OF WETLANDS CROSSING: SEE SEPARATE SCOPE OF WORK ON WETLAND CROSSING AND REPLICATION AREA PLAN.
- INSTALLATION OF WATER MAINS & SERVICE STUBS.
- INSTALLATION OF ELECTRIC CONDUIT.
- INSTALLATION OF ROADWAY GRAVEL.
- INSTALLATION OF BINDER COURSE OF PAVEMENT.
- INSTALLATION OF CURBING.
- ONCE BINDER COURSE OF PAVEMENT & CURBS ARE INSTALLED, WORK CAN PROCEED ON THE INDIVIDUAL HOUSE LOTS.
- TYPICAL HOUSE LOT SEQUENCED:
  - •• LOTS WERE CLEARED, STUMPED & STRIPPED AS PART OF ROADWAY CONSTRUCTION SEQUENCE.
  - •• EXCAVATE FOR FOUNDATIONS.
  - •• FORM & POUR CONCRETE FOUNDATION.
  - ••• EXCAVATE PIT FOR WASHOUT OF TRUCK TOOLS & EQUIPMENT.
  - •• BACKFILL FOUNDATION.
  - •• SUB–GRADING OF LOT.
  - •• HOUSE CONSTRUCTION: FRAME, ROOF, SIDE, INTERIOR CONSTRUCTION ETC.
  - •• INSTALLATION OF SEPTIC SYSTEM.
  - •• INSTALLATION OF WATER SERVICE.
  - •• INSTALLATION OF UNDERGROUND ELECTRIC SERVICE.
  - •• INSTALLATION OF GAS SERVICE.
  - •• FINAL GRADING OF LOT.
  - •• INSTALLATION OF GRAVEL FOR DRIVEWAY.
  - •• INSTALLATION OF HARDSCAPES (WALKWAYS, PATIOS, ETC.).
  - •• PAVE BINDER COURSE OF DRIVEWAY.
  - •• LOAM & LANDSCAPE INSTALLATION.
  - •• INSTALLATION OF TOP COAT OF DRIVEWAY.
  - •• HYDROSEED.
- INSTALLATION OF CONCRETE SIDEWALKS.
- FINAL SHAPING OF INFILTRATION BASINS, INSTALLATION OF FOREBAYS, ETC.
- INSTALLATION OF STREET TREES.
- INSTALLATION OF FENCING.
- INSTALLATION OF SCREENED LOAM ON ALL REMAINING DISTURBED AREAS.
- CLEAR ALL CATCHBASIN SUMPS & FILTERS.
- CLEAN & INSPECT ALL ROADWAY SURFACES.
  - •• CUT & PATCH ANY DAMAGED SECTIONS OF BINDER.
- SAWCUT CONTROL JOINTS WHERE NEW ROADS MEET EXISTING ROADS.
- INSTALLATION OF TOP COURSE OF PAVEMENT & SIGNAGE.
- PREPARE AS–BUILT PLANS.

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

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BOOK — PAGE — INSTRUMENT #

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow Definitive Plan N. Grafton, MA 01536

Sheet Title

Construction Phasing Plan

Job No: 066
File Name: 066P-CSPP01
Date: October 11, 2016
Scale: 1"=100'

Sheet No. 22 OF 28

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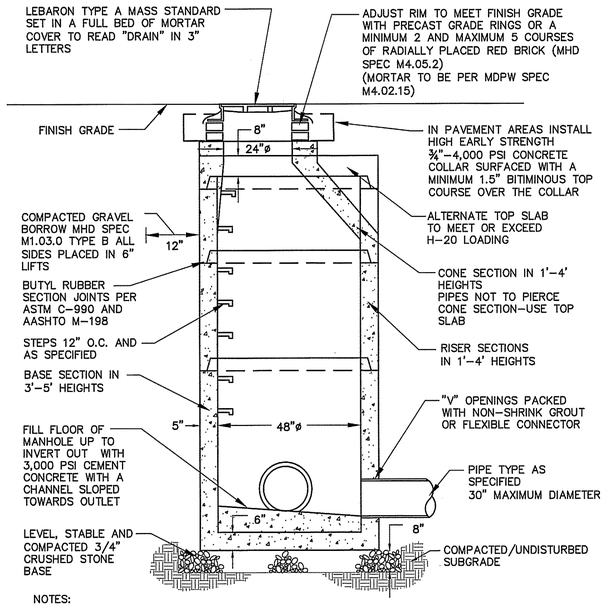
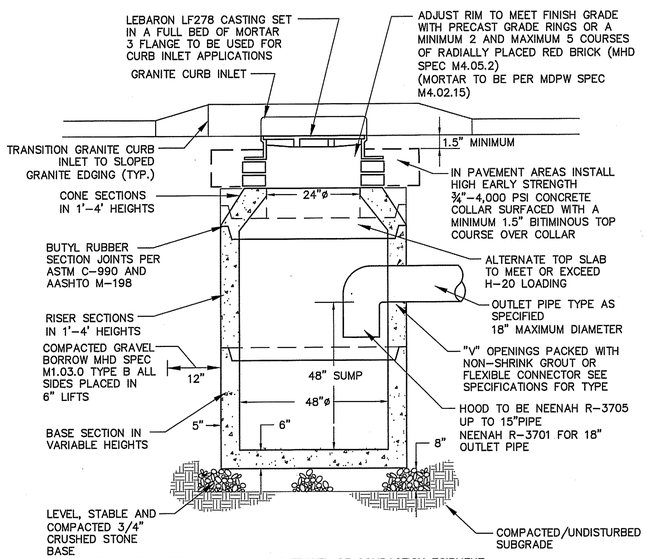


NOTES:

1. EXCAVATION TO ALLOW FOR FREE TRAVEL OF COMPACTION EQIPMENT
2. ALL COMPACTION TO A MINIMUM 95 PERCENT DRY DENSITY DETERMINED BY ASTM D1557
3. ALL PRECAST TO MEET OR EXCEED ASTM C–478 AND ASSHTO M 199 SPECIFICATIONS
4. REINFORCED STEEL TO MEET OR EXCEED ASTM A185 AND H–20 LOADING REQUIREMENTS
5. ALL PRECAST CONCRETE TO BE 4,000 PSI MIMIMUM AND MEET ASTM C–478 (6.1)
6. IF NO STEPS ARE SPECIFIED THAN AS THE LOCAL MUNICIPALITY REQUIRES OR IF NO MUNICIPLAITY REQUIREMENTS THEN COPOLYMER POLYPROPYLENE COATED REINFORCED PER ASTM C–478 AND OSHA (STD 1–1.9)
7. CONTRACTOR TO CONFIRM WITH CITY OR TOWN DPW THAT BRICK INVERTS ARE NOT A REQUIREMENT
8. FILL ALL INTERNAL AND EXTERNAL HOLES WITH NON–SHRINK GROUT

PRECAST CONCRETE DRAIN MANHOLE DETAIL

N.T.S.



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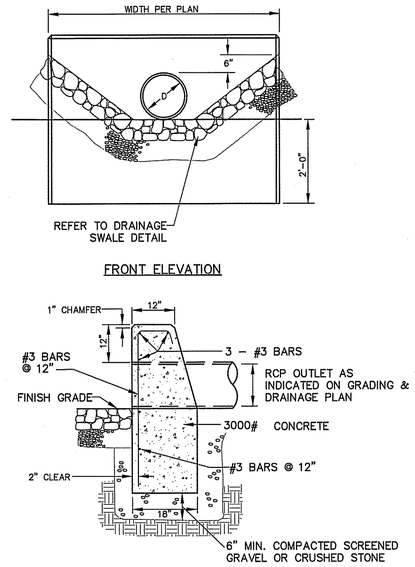
5. ALL PRECAST CONCRETE TO BE 4,000 PSI MIMIMUM AND MEET ASTM C–478 (6.1)
6. ALL INTERIOR HOLES TO BE SEALED WITH NON–SHRINK GROUT
7. MIN. STRUCTURE DEPTH SHALL BE 7.5 FT.

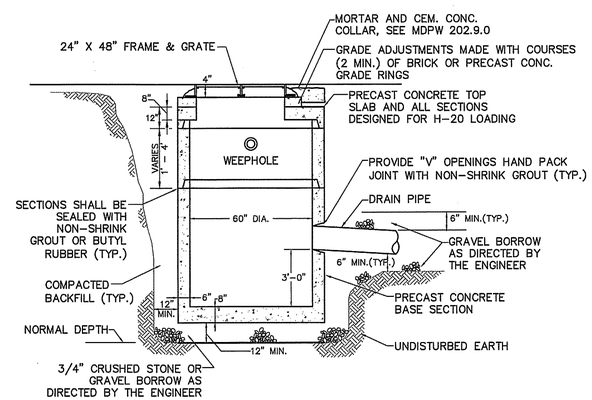
PRECAST CONCRETE CATCH BASIN DETAIL

N.T.S.



HEADWALL DETAIL

N.T.S.

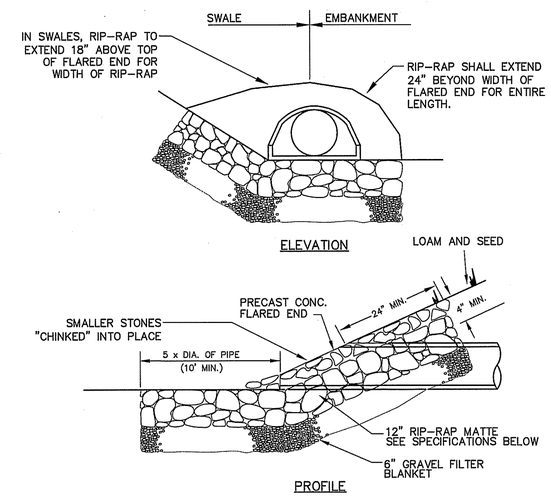


NOTES:

1. CATCH BASIN SHALL BE PRECAST CEMENT CONCRETE MANUFACTURED IN ACCORDANCE WITH ASTM C–478 DESIGNED FOR H–20 LOADING.
2. DRAIN PIPE FOR LATERAL CONNECTIONS SHALL BE INSTALLED AND TEMPORARILY PLUGGED AS REQUIRED OR DIRECTED.
3. SEE GENERAL PLANS FOR PIPE SIZE, LINE AND GRADE.
4. BACKFILL MATERIAL SHALL CONSIST OF SUITABLE EXCAVATED MATERIAL AND/OR GRAVEL BORROW AS DIRECTED BY THE ENGINEER.
5. INSTALL FRAME & GRATE WITH 24" SIDE ALONG CURB INLET.

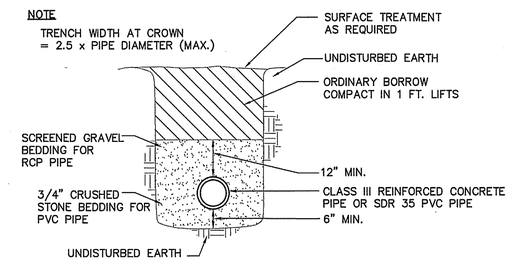
PRECAST CONCRETE DOUBLE CATCH BASIN DETAIL

N.T.S.



FLARED END W/RIP–RAP DETAIL

N.T.S.



DRAIN PIPE TRENCH DETAIL

N.T.S.

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI — CIVIL — NO. 46279 — Registered PROFESSIONAL ENGINEER

10/11/2016

Drawn By: BRM | Designed By: BRM | Checked By: BRM

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Civil Engineers
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Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Construction Details
(1 of 4)

Job No: 066
File Name: 066P-CDT01
Date: June 10, 2016
Scale: AS SHOWN

Sheet No. 23 OF 28

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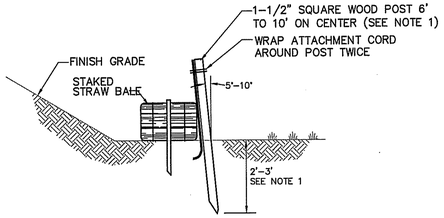
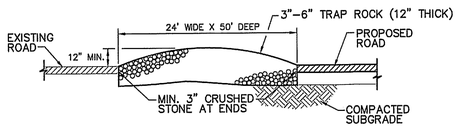
NOTES:
1. DEPTH MAY VARY WITH TRIBUTARY AREA: 2 FT. FOR 100 SF/LF FENCE; 3 FT. FOR 500 SF/LF FENCE, UNLESS POST IS TO BE SET IN PEAT THEN 3 FT. OR DEPTH POSSIBLE BY PUSHING BY HAND SHALL BE REQUIRED.
2. STRAW WATTLES MAY BE USED A SUBSTITUTE TO STAKED STRAWBALES WITH PRIOR APPROVAL OF THE LOCAL CONSERVATION COMMISSION.

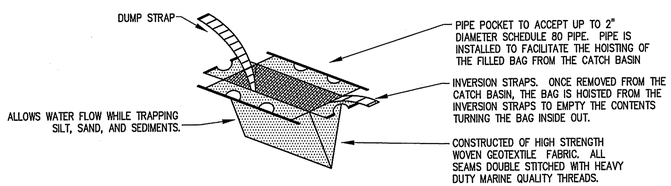


STRAW BALE / SILT FENCE DETAIL
N.T.S.



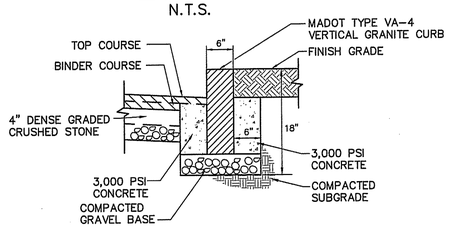
NOTES:
1. THE PURPOSE OF THIS TEMPORARY BERM IS TO REMOVE MUD FROM THE TIRES OF VEHICLES LEAVING THE SITE DURING CONSTRUCTION.
2. PROVIDE LEVEL AREA OF CRUSHED STONE 50 FEET IN FROM EDGE OF EXISTING ROAD.

TEMPORARY ENTRANCE BERM
N.T.S..



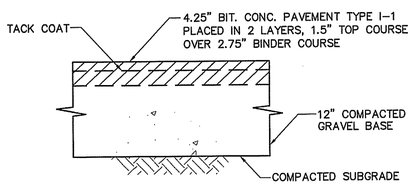
NOTES:
1. PRODUCT TO BE "SILT SACK" MANUFACTURED BY REED AND GRAHM, INC. SACRAMENTO, CA, OR APPROVED EQUAL.

SILT BAG
N.T.S.

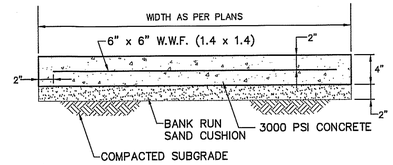


NOTE:
LEAVE VOID TO ALLOW CONCRETE TO FLOW UNDER AND AROUND CURB

VERTICAL GRANITE CURB DETAIL
N.T.S.

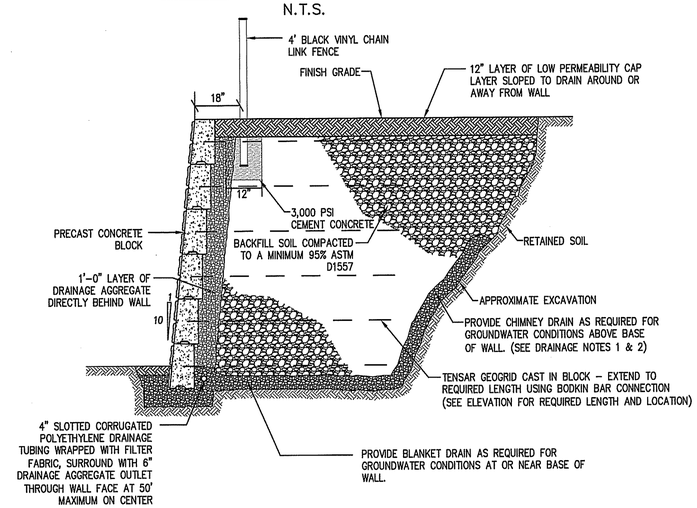


BITUMINOUS CONCRETE PAVEMENT DETAIL
N.T.S.

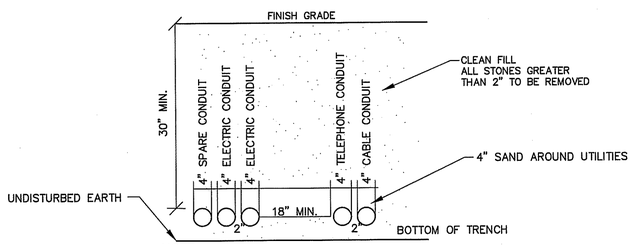


NOTE:
CONSTRUCTION JOINTS ARE TO BE AT 6' INTERVALS

CONCRETE SIDEWALK DETAIL
N.T.S.

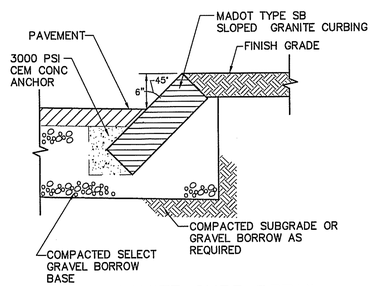


PRECAST CONCRETE RETAINING WALL DETAIL
N.T.S.

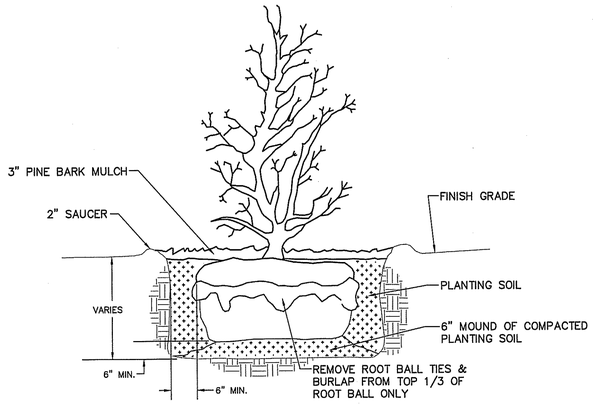


NOTE:
ELECTRIC CONDUITS SHALL BE CONCRETE ENCASED IF REQUIRED BY ELECTRICAL PROVIDER.

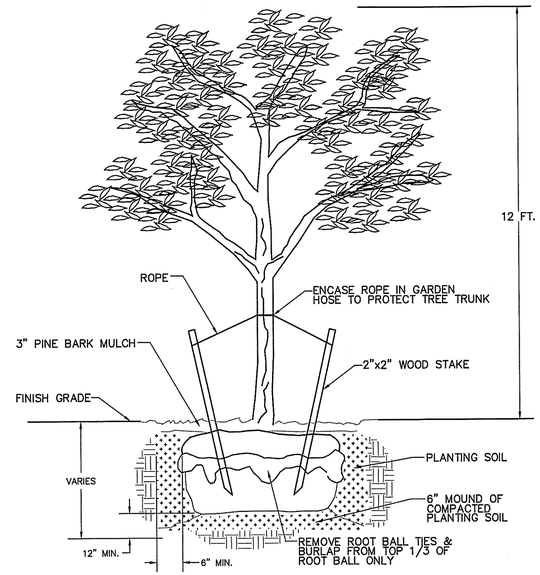
TYPICAL ELECTRIC UTILITY TRENCH DETAIL
N.T.S.



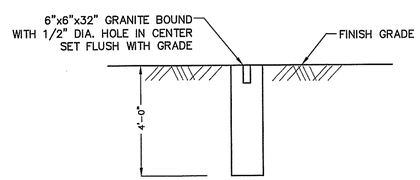
SLOPED GRANITE CURB DETAIL
N.T.S.



TYPICAL SHRUB PLANTING DETAIL
N.T.S.



TYPICAL TREE PLANTING DETAIL
N.T.S.



GRANITE BOUND DETAIL
N.T.S.

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APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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TOWN CLERK DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK PAGE INSTRUMENT #

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

NOT FOR CONSTRUCTION
THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS — BRIAN R. MARCHETTI CIVIL NO. 46279 REGISTERED PROFESSIONAL ENGINEER
10/11/2016

Drawn By: BRM
Designed By: BRM
Checked By: BRM

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name
Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title
Construction Details
(2 of 4)

Job No: 066
File Name: 066P-CDT02
Date: June 10, 2016
Scale: AS SHOWN

Sheet No. 24 OF 28

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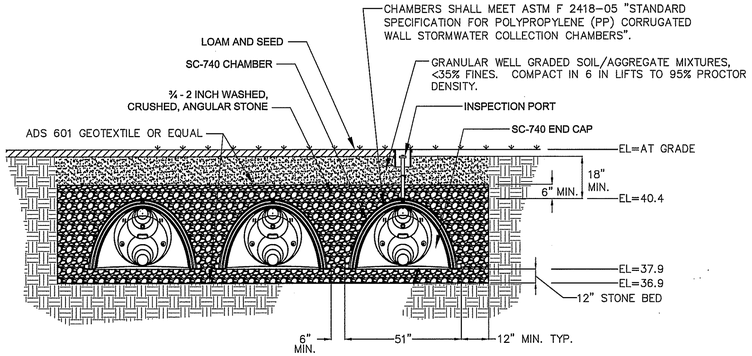
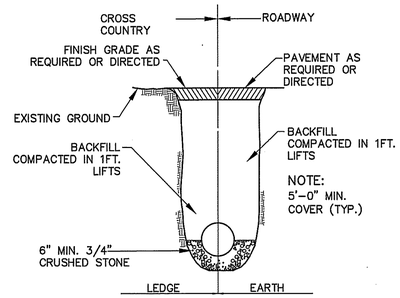


NOTES:
TYPE A = 8 CHAMBERS
TYPE B = 6 CHAMBERS

SC-740 DRY WELL

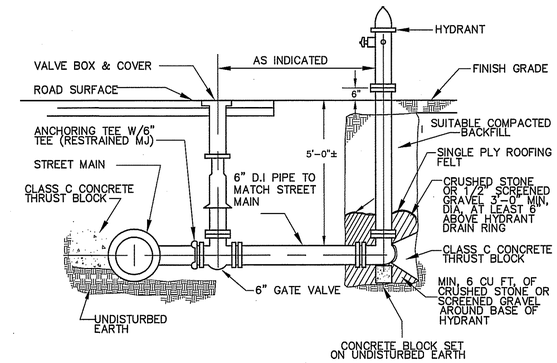
N.T.S.



NOTE:
BACKFILL MATERIAL SHALL CONSIST OF EXCAVATED MATERIAL AND/OR GRAVEL BORROW AS DIRECTED BY THE ENGINEER.

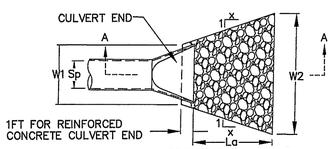
TYPICAL WATER MAIN TRENCH DETAIL

N.T.S.

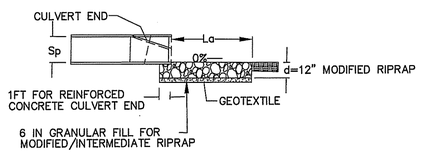


HYDRANT CONNECTION DETAIL

N.T.S.



CULVERT END PLAN VIEW



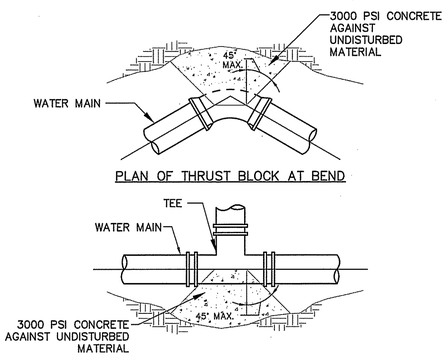
SECTION A-A
CULVERT END AND ENDWALL

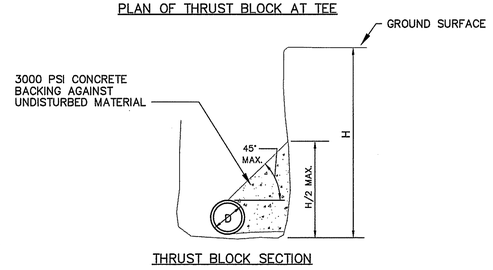
APRON SIZING CRITERIA

	X	W1	W2
TYPE A RIPRAP APRON	3	3Sp	3Sp+0.7La

RAP OUTLET PROTECTION (TYPE A)

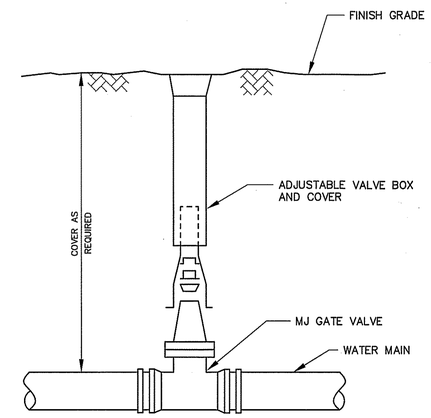
N.T.S.





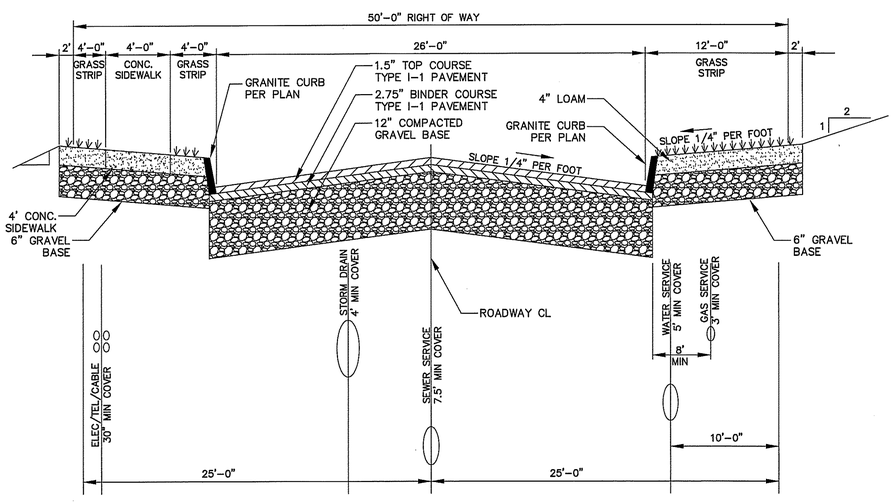
WATER MAIN THRUST BLOCK DETAIL

N.T.S.



BURIED GATE VALVE DETAIL

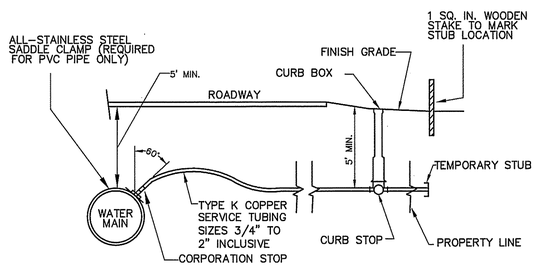
N.T.S.



NOTES:
1. GAS SERVICE IS NOT INCORPORATED INTO THE DESIGN OF THIS SUBDIVISION.
2. SEWER SERVICE IS NOT INCORPORATED INTO THE DESIGN OF THIS SUBDIVISION. THE PROPOSED LOTS WILL BE SERVICED BY INDIVIDUAL SEPTIC SYSTEMS.

MINOR STREET B STANDARD CROSS-SECTION

N.T.S.



NOTE:
TUBING, CORPORATION COCK & CURB STOP SHALL BE AS REQUIRED.

WATER SERVICE DETAIL

N.T.S.

NOT FOR CONSTRUCTION
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PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision
1	10/11/2016	TOWN COMMENTS

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46278
REGISTERED PROFESSIONAL ENGINEER

10/11/2016

Drawn By:	Designed By:	Checked By:
BRM	BRM	TSKM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

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SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name
Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title
Construction Details
(3 of 4)

Job No: 066
File Name: 066P-CDT03
Date: June 10, 2016
Scale: AS SHOWN

Sheet No.
25
OF 28

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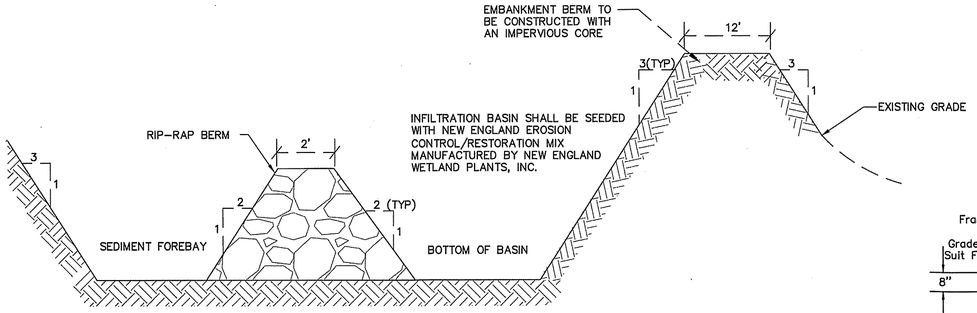
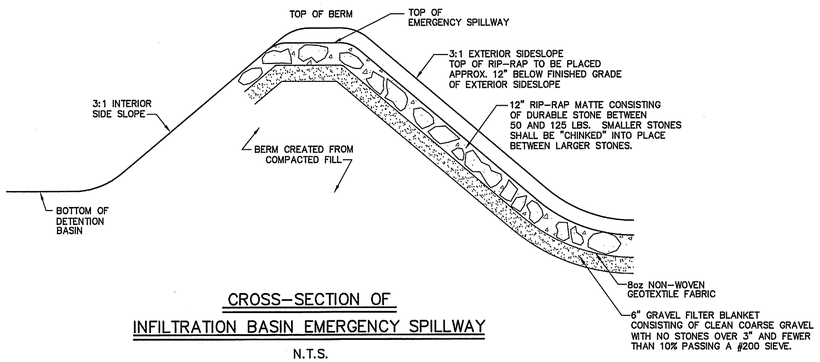


NOTE:
1. SEAL AROUND OUTLET PIPE WITH IMPERVIOUS BARRIER
2. A 6" PERFORATED UNDERDRAIN SHALL BE INSTALLED IN EACH INFILTRATION BASIN WITH A 6" VALVE THAT SHALL BE EASILY ACCESSIBLE AND SHALL REMAIN CLOSED DURING NORMAL OPERATION. THE UNDERDRAIN SHALL OUTLET IN THE RIP RAP MAT AS SHOWN ON THE GRADING AND DRAINAGE PLANS.

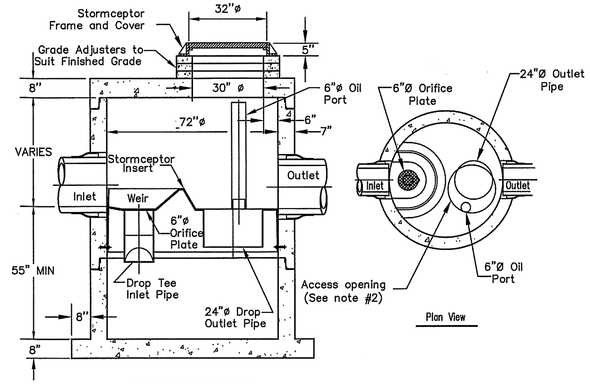
CROSS-SECTION OF TYPICAL INFILTRATION BASIN DETAIL

N.T.S.



CROSS-SECTION OF INFILTRATION BASIN EMERGENCY SPILLWAY

N.T.S.



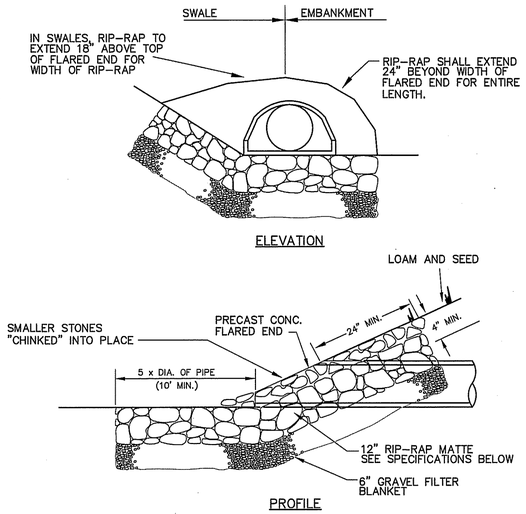
SECTION THRU CHAMBER

Plan View

NOTES:
1. THE USE OF FLEXIBLE CONNECTION IS RECOMMENDED AT THE INLET AND OUTLET WHERE APPLICABLE.
2. THE COVER SHOULD BE POSITIONED OVER THE INLET DROP PIPE AND THE OIL PORT.
3. THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: #4985148, #5498331, #5725760, #5753115, #5849181, #6068765, #6371690.
4. CONTACT A CONCRETE PIPE DIVISION REPRESENTATIVE FOR FURTHER DETAILS NOT LISTED ON THIS DRAWING.

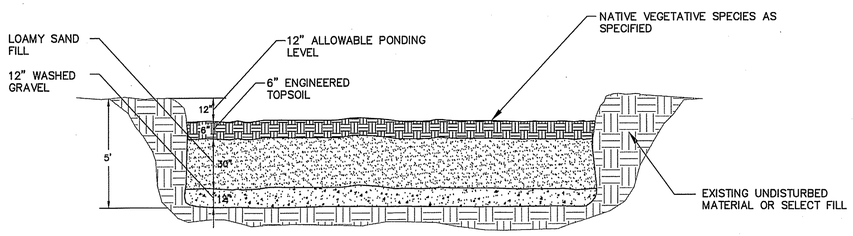
STC 900 WATER QUALITY UNIT

N.T.S..



FLARED END W/RIP-RAP DETAIL

N.T.S.



NOTES:
1. ENGINEERED TOPSOIL SHALL BE COMPOSED OF 50% SAND, 30% LOAM AND 20% COMPOST.

2. VEGETATION WITHIN RAIN GARDENS AND BIORETENTION BASINS MUST BE ABLE TO TOLERATE EXPECTED POLLUTANT LOADINGS, HIGHLY VARIABLE MOISTURE CONDITIONS AND PONDING WATER FLUCTUATIONS.

THE FOLLOWING SPECIES ARE RECOMMENDED FOR USE IN RAINGARDENS. MIXTURE OF PLANTINGS SHOULD BE CHOSEN TO MIMIC APPEARANCE OF ADJACENT WETLAND AREAS. THE NUMBER OF PLANTS REQUIRED VARIES WITH THE SIZE OF THE RAIN GARDEN BEING PROPOSED. ONCE THE GRADING OF THE RAINGARDEN IS COMPLETE AND THE FILL IS PLACED WITHIN IT, A LANDSCAPE ARCHITECT SHALL MAKE A SITE INSPECTION TO ADVISE THE CONTRACTOR ON THE NUMBER, SIZE, AND PLACEMENT OF THE PLANTINGS.

TREES:

ACER RUBRUM	RED MAPLE
BETULA NIGRA	RIVER BIRCH
LARIX LARCINA	EASTERN LARCH
LIQUIDAMBAR STYRACIFLUA	SWEETGUM
NYSSA SYLVATICA	BLACK GUM
SAMBUCUS CANADENSIS	AMERICAN ELDERBERRY

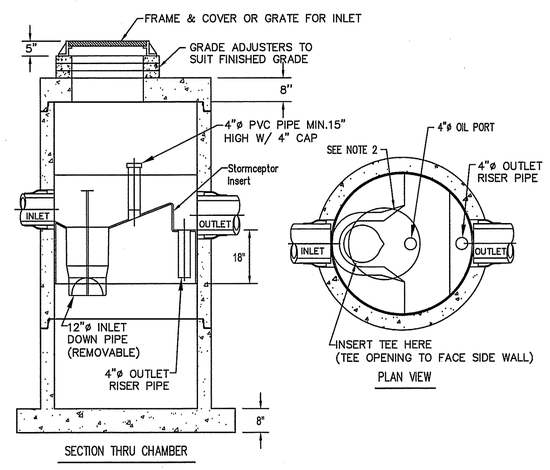
SHRUBS/GROUNDCOVER:

AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY
ARONIA ARBUTIFOLA	RED CHOKEBERRY
CORNUS SERICEA	RED TWIG DOGWOOD
HAMAMELIS VIRGINIANA	WITCH HAZEL
ILEX GLABRA	INKBERRY
ILEX VERTICULLATA	WINTERBERRY
KALMIA LATIFOLIA	MOUNTAIN LAUREL
VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY
VIBURNUM DENTATUM	ARROWWOOD

HERBACEOUS:

NEW ENGLAND WETLAND PLANTS –	WETLAND SEED MIX
ACORUS CALAMUS	SWEET FLAG
CAREX PENDULA	DROOPING SEDGE
EUPATORIUM MACULATUM	JOE PYE WEED
IRIS SIBERICA	SIBERIAN IRIS
IRIS VERSICOLOR	BLUE FLAG IRIS
LOBELIA CARDINALIS	CARDNIAL FLOWER
OSMUNDA REGALIS	ROYAL FERN
OSMUNDA CINNAMOMEA	CINNAMON FERN

RAINGARDEN DETAIL



SECTION THRU CHAMBER

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STC 450 WATER QUALITY UNIT

N.T.S.

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Definitive Plan
N. Grafton, MA 01536

Sheet Title
Construction Details
(4 of 4)

Job No: 066
File Name: 066P-CDT04
Date: June 10, 2016
Scale: AS SHOWN

Sheet No. 26 OF 28

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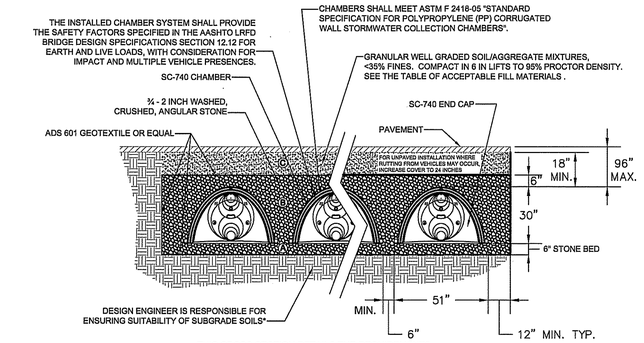
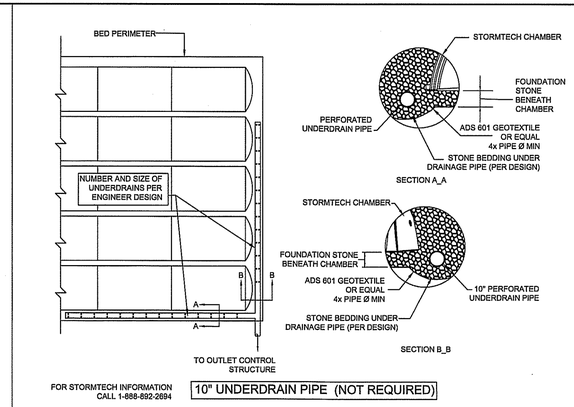


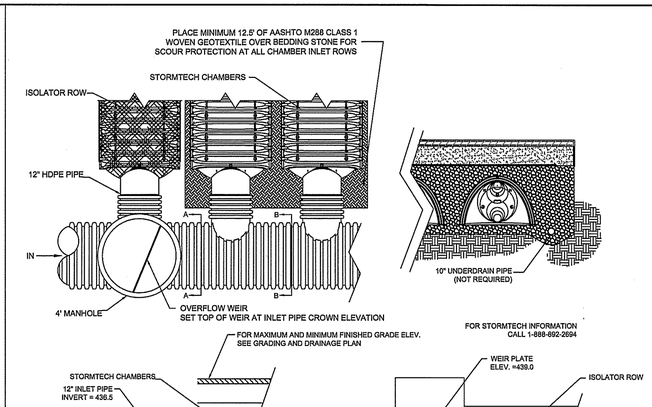
ST 1.0

SC-740 TYPICAL CROSS SECTION



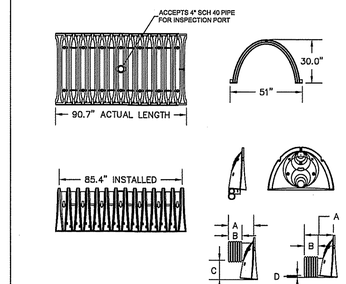
ST 2.0

STORMTECH UNDERDRAIN DETAIL



ST 8.0

STORMTECH ELEVATIONS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH) -	*51.0" x 30.0" x 85.4"*
CHAMBER STORAGE -	*45.9 CUBIC FEET*
MINIMUM INSTALLED STORAGE -	*74.9 CUBIC FEET*
WEIGHT -	*75 LBS.*

STUBS AT TOP OF END CAP FOR PARTS NUMBERS ENDING WITH "T"

STUBS AT BOTTOM OF END CAP FOR PARTS NUMBERS ENDING WITH "B"

PART #	CHAMBER	PIPE SIZE	A	B	C	D
SC740EPE06T	SC 740	6 in (150 mm)	10.90 in (277 mm)	3.85 in (98 mm)	18.50 in (470 mm)	N/A
SC740EPE06B	SC 740	6 in (150 mm)	10.90 in (277 mm)	3.85 in (98 mm)	N/A	0.50 in (13 mm)
SC740EPE12T	SC 740	12 in (300 mm)	14.70 in (373 mm)	7.70 in (196 mm)	12.50 in (318 mm)	N/A
SC740EPE12B	SC 740	12 in (300 mm)	14.70 in (373 mm)	7.70 in (196 mm)	N/A	1.30 in (30 mm)
SC740EPE18T	SC 740	18 in (375 mm)	18.40 in (467 mm)	10.38 in (263 mm)	9.00 in (229 mm)	N/A
SC740EPE18B	SC 740	18 in (375 mm)	18.40 in (467 mm)	10.38 in (263 mm)	N/A	1.30 in (33 mm)
SC740EPE18T	SC 740	18 in (450 mm)	18.70 in (500 mm)	10.73 in (272 mm)	5.00 in (127 mm)	N/A
SC740EPE18B	SC 740	18 in (450 mm)	18.70 in (500 mm)	10.73 in (272 mm)	N/A	1.60 in (41 mm)
SC740EPE24B	SC 740	24 in (600 mm)	28.50 in (470 mm)	8.45 in (240 mm)	N/A	6.10 in (3 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR INFORMATION REGARDING CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75". BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE H-10 STUB SO THAT THE FITTING SETS LEVEL.

ST 9.0

TECHNICAL DETAILS

ST 3.0

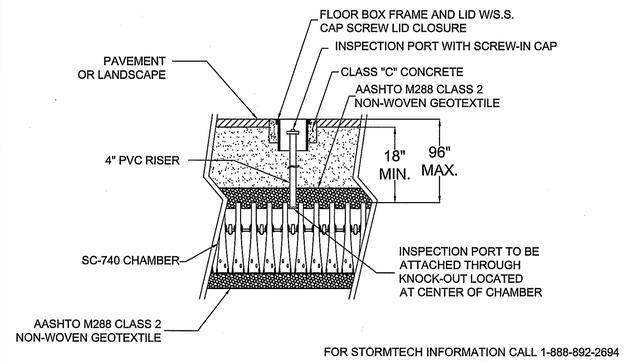
STORMTECH ACCEPTABLE FILL MATERIALS

ACCEPTABLE FILL MATERIALS
STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	AASHTO M145 DESIGNATION	COMPACTION/DENSITY REQUIREMENT
FILL MATERIAL FROM 18" TO GRADE ABOVE CHAMBERS	ANY SOIL/ROCK MATERIALS, NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
Ⓒ FILL MATERIAL FOR 6" TO 18" ELEVATION ABOVE CHAMBERS (24" FOR UNPAVED INSTALLATIONS)	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	A-1 A-2 A-3	COMPACT IN 6" LIFTS TO A MINIMUM 95% STANDARD PROCTOR DENSITY. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 LBS. DYNAMIC FORCE NOT TO EXCEED 20,000 LBS.
Ⓑ EMBEDMENT STONE SURROUNDING AND TO A 6" ELEVATION ABOVE CHAMBERS	WASHED ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN ¾ - 2 INCH	3, 357, 4, 467, 5, 56, 57	N/A	NO COMPACTION REQUIRED
Ⓐ FOUNDATION STONE BELOW CHAMBERS	WASHED ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN ¾ - 2 INCH	3, 357, 4, 467, 5, 56, 57	N/A	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY

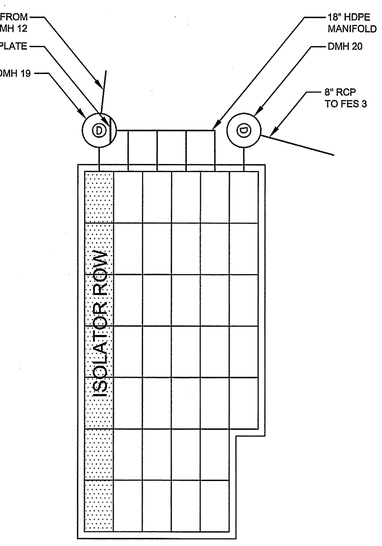
PLEASE NOTE: THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE WASHED CRUSHED ANGULAR. FOR EXAMPLE, THE STONE MUST BE SPECIFIED AS WASHED, CRUSHED, ANGULAR NO. 4 STONE.

NOTES:
1. ALL DESIGN SPECIFICATIONS FOR STORMTECH CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL.
2. THE INSTALLATION OF STORMTECH CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS.
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION. CALL **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM** TO RECEIVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS.
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND SAFETY FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.



ST 5.0

STORMTECH INSPECTION PORT DETAIL



UNDERGROUND INFILTRATION BASIN (SC-740 - 40 CHAMBERS)
SCALE: 1"=10'

GENERAL NOTES:

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

COMMONWEALTH OF MASSACHUSETTS BRIAN R. MARCHETTI CIVIL NO. 46279 REGISTERED PROFESSIONAL ENGINEER
10/11/2016

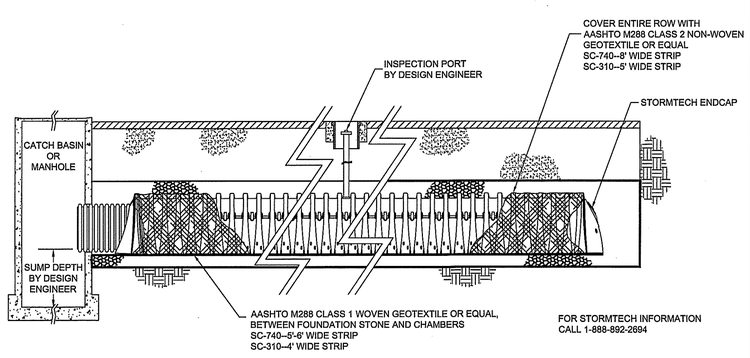
CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND SAFETY FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS LOADS SHALL BE CALCULATED IN ACCORDANCE WITH SECTION 3 AND SHALL INCLUDE H20 DESIGN TRUCK, IMPACT FACTOR, MULTIPLE PRESENCE, AND LANE LOAD.

ST 10.0

STORMTECH SC-740 CHAMBER LAYOUT

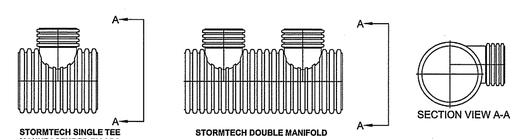
ST 4.0

STORMTECH ISOLATOR™ ROW MANIFOLD DETAIL



ST 6.0

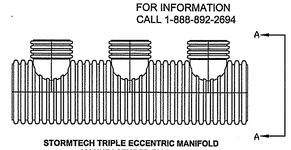
STORMTECH ISOLATOR™ ROW DETAIL



STORMTECH SINGLE TEE MANUFACTURED BY ADS

STORMTECH DOUBLE MANIFOLD MANUFACTURED BY ADS

FOR INFORMATION CALL 1-888-892-2694



STORMTECH TRIPLE ECCENTRIC MANIFOLD MANUFACTURED BY ADS

MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS. WHEN USING STANDARD END CAPS, CORRUGATE DPIPE UP TO 18 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 24" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

	HEADER PIPE SIZES									
STUB SIZE	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"
24"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL		-	-	-	-
18"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-
15"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

AVAIL - STANDARD HEADERS AVAILABLE

ST 7.0

ADS MANIFOLD DETAILS

StormTech® Detention•Retention•Recharge Subsurface Stormwater Management℠

PROJECT NAME
Estates at Bull Meadow
N. Grafton, MA 01536

This drawing was prepared to support the design engineer for the proposed conversion. It is the ultimate responsibility of the design engineer to assure that the stormwater system's design is in full compliance with all applicable laws and regulations. It is the design engineer's responsibility to ensure that the StormTech products are designed in accordance with StormTech minimum requirements. StormTech LLC does not approve plans, sizing, or system designs. The design engineer is responsible for all design decisions.

REVISIONS	DATE

STORMTECH, LLC
20 BEAVER RD., SUITE 104
WETHERSFIELD, CT 06109
tel: 888-892-2694
fax: 866-328-8401
WWW.STORMTECH.COM

DRAWING TITLE
Stormtech Infiltration Basin Details

STORMTECH SC-740 CHAMBER DETAIL SHEET

SAVED AS	066-CDT06		
DRAWN BY	JLL	CHECKED BY	BRM
SCALE	NTS	DRAWING NO.	
DATE	10/11/2016		
PROJECT NO.	066	27 of 28	

NOT FOR CONSTRUCTION

THESE PLANS WERE PREPARED FOR THE PURPOSE OF OBTAINING STATE AND LOCAL PERMITS AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION DOCUMENTS.

PREPARED FOR:
BULL MEADOW, LLC.
2 RACHEL ROAD
BOYLSTON, MA 01505

No.	Date	Revision

COMMONWEALTH OF MASSACHUSETTS
BRIAN R. MARCHETTI
CIVIL
NO. 46279
REGISTERED PROFESSIONAL ENGINEER

10/11/16

Drawn By:	Designed By:	Checked By:
BRM	BRM	BRM

APPROVED BY THE GRAFTON PLANNING BOARD

DATE:

I, CLERK OF THE TOWN OF GRAFTON, MASSACHUSETTS HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE GRAFTON PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

TOWN CLERK DATE

SUBJECT TO COVENANT DATED _____ RECORDED AT THE WORCESTER COUNTY REGISTRY OF DEEDS.

BOOK PAGE INSTRUMENT #

THIS PLAN WAS PREPARED IN ACCORDANCE WITH A MAJOR RESIDENTIAL DEVELOPMENT SPECIAL PERMIT GRANTED BY THE GRAFTON PLANNING BOARD AND FILED WITH THE TOWN CLERK ON MAY 19, 2015 AND RECORDED IN THE WORCESTER DISTRICT REGISTRY OF DEEDS BOOK 55687, PAGE 313.

SEE SHEET 28 FOR PLANNING BOARD CONDITIONS OF APPROVAL

McCarty Engineering, Inc.
Civil Engineers
42 Jungle Road, Leominster, MA 01453
phone:(978) 534-1318 fax: (978) 840-6907
www.mccartydb.com

Project Name

Estates at Bull Meadow
Definitive Plan
N. Grafton, MA 01536

Sheet Title

Conditions of Approval

Job No: 066
File Name: 066P-COND01
Date: October 11, 2016
Scale: NONE

Sheet No.
28
OF 28

F:\CADME\066-Lewis\Definitive\Revised\Plot\066P-COND.dwg \ 10/11/2016 10:08 AM \ by: Justin Ledair