

OSRD SITE PLAN & DEFINITIVE SUBDIVISION PLAN for HICKORY HILL WAY

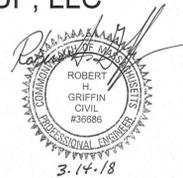
20, 30 & 40 WEBSTER AVENUE

Beverly, MA
DECEMBER 2017

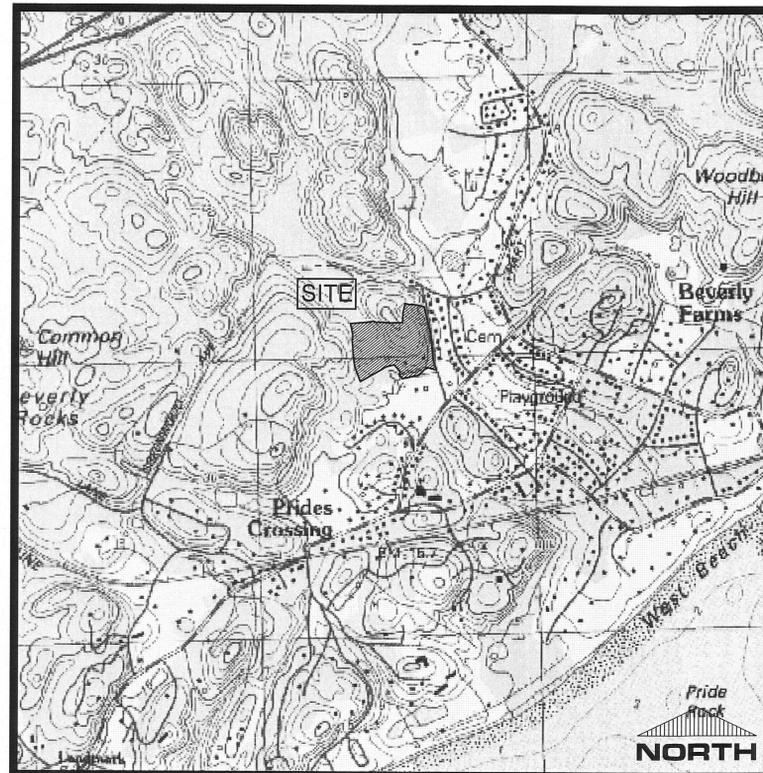
REVISIONS		
NO.	DATE	DESCRIPTION
1	1/16/18	REVISE PER PLANNING DEPT. STAFF COMMENTS.
2	2/14/18	REVISE FOR CONSERVATION COMMISSION FILING
2	3/14/18	REVISE PER CITY COMMENTS

OWNER & APPLICANT: BENCO LLC
P.O. BOX 2281
HAMILTON, MA 01982

ENGINEER: GRIFFIN ENGINEERING GROUP, LLC
495 CABOT ST, 2ND FLOOR
BEVERLY, MA 01915



SURVEYOR: AMERICAN LAND
SURVEY ASSOCIATES
KIRK BENSON, PLS
42 CHERRY STREET
GLOUCESTER, MA 01930



LOCUS PLAN SCALE: 1" = 800' +/-

List of Drawings:

- I-1: INDEX SHEET
- C-1a: EXISTING CONDITIONS -PART A
- C-1b: EXISTING CONDITIONS -PART B
- C-2a: PLAN OF LAND - PART A
- C-2b: PLAN OF LAND - PART B
- C-3a: OSRD SITE PLAN - PART A
- C-3b: OSRD SITE PLAN - PART B
- C-4: UTILITIES PLAN
- C-5: ROADWAY PROFILE & SECTION
- C-6: COMMON DRIVEWAY PROFILE & SECTION
- C-7: DETAILS I
- C-8: DETAILS II
- C-9: DETAILS III
- C-10: DETAILS IV

CITY OF BEVERLY
PLANNING BOARD

DATE:

I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE

FOR REGISTRY USE ONLY

I, _____, CLERK OF THE CITY OF BEVERLY, MA, CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE BEVERLY PLANNING BOARD HAS BEEN RECEIVED AND RECORDED IN THIS OFFICE AND THAT NO APPEAL WAS RECEIVED DURING THE TWENTY (20) DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SUCH NOTICE.

BEVERLY CITY CLERK

DATE

DATE:

No.	Date	Description
1	1/16/18	ADD SETBACKS & STEEP SLOPES.

Revisions



1.16.18



495 Cabot Street, 2nd Floor
Beverly, MA 01915

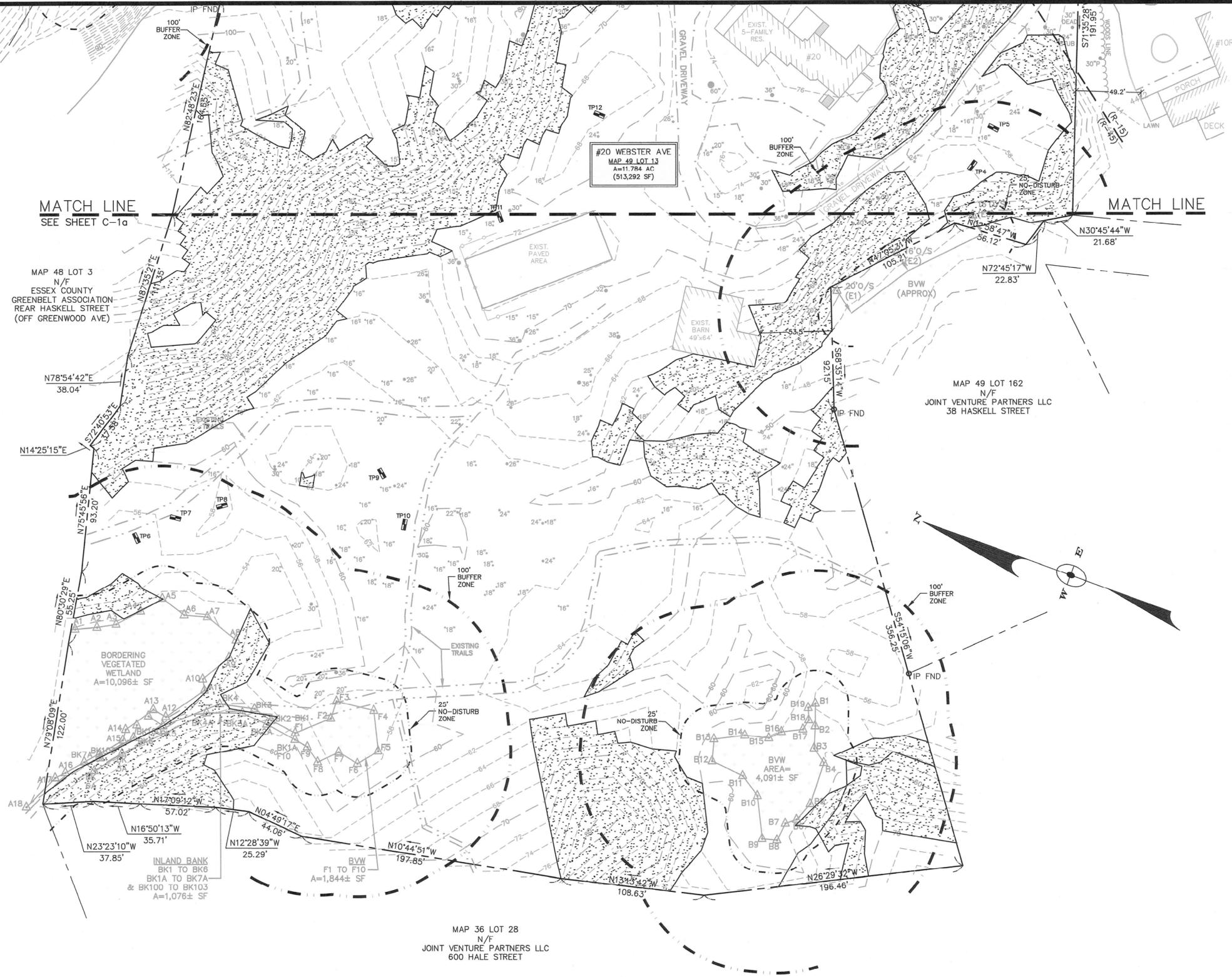
Tel: 978-927-5111
Fax: 978-927-5103

BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

HICKORY HILL WAY
EXISTING CONDITIONS
PART B

Scale: 1"=40'
Job No.: 1665
File Name: p/p/b/c
Date: 12/20/17

C-1b



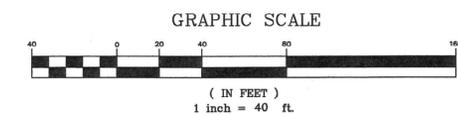
- LEGEND**
- PROPERTY LINE
 - 153- EXIST. CONTOUR
 - EXIST. BUILDING
 - EXIST. EDGE OF PAVEMENT
 - D EXIST. DRAIN
 - W EXIST. WATER
 - S EXIST. SEWER
 - G EXIST. GAS
 - 24" P EXIST. TREE
 - ▲ WETLAND LINE
 - TEST PIT

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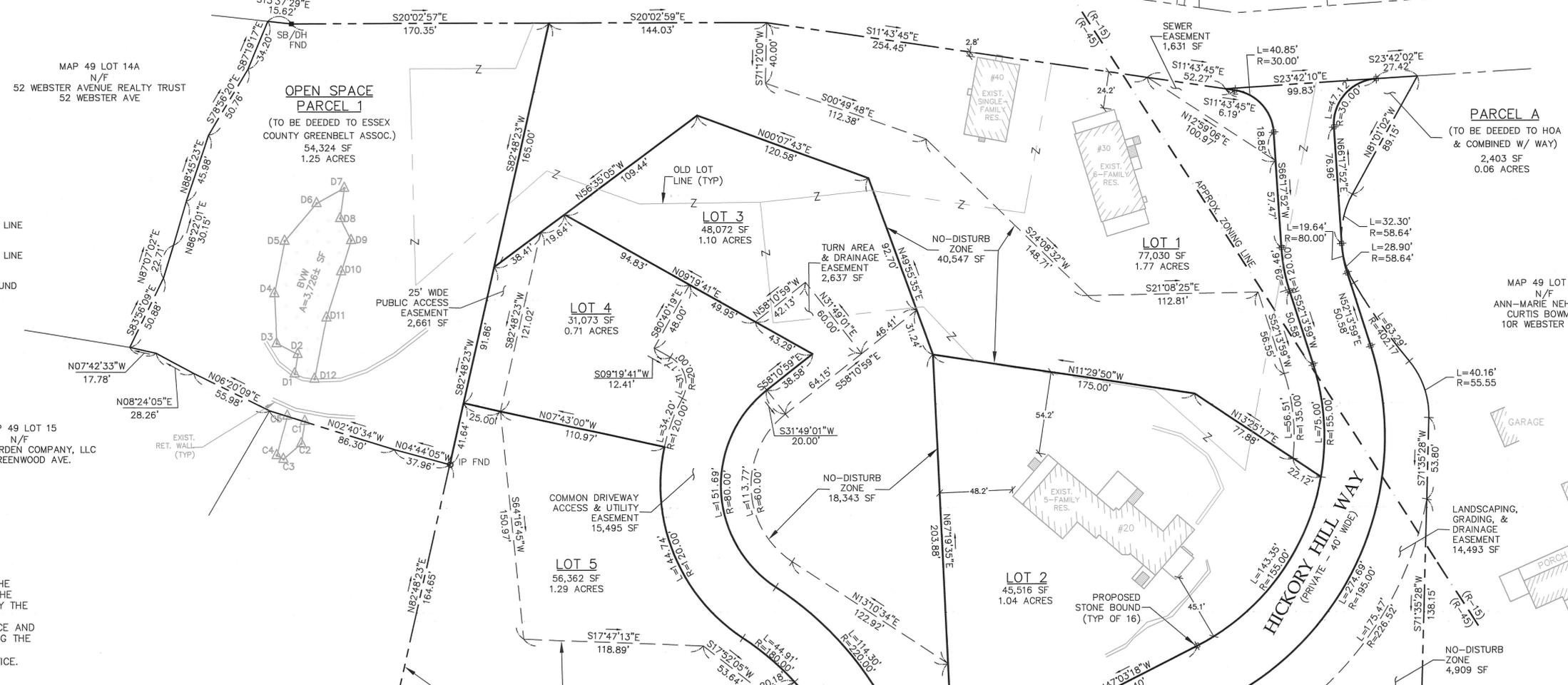
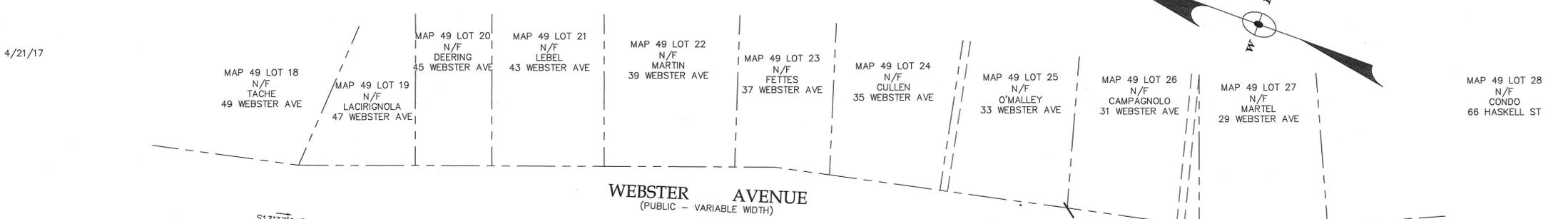
DATE _____
FOR REGISTRY USE ONLY



REFERENCES & NOTES:
 1) ASSESSORS MAP 49 LOT 13, 13A, & 13B
 2) ZONING DISTRICT: R-45 & R-15
 3) LOCUS DEED: BK. 35767 PG. 31
 4) LOCUS PLAN: PL. BK. 381, PL. 33

ADDITIONAL REFERENCES:
 1) PL. BK. 35 PL. 28B
 2) BK. 2360 PG. 80
 3) BK. 2204 PG. 558
 4) PL. BK. 390 PL. 87
 5) BEVERLY GIS
 6) O.R.A.D. - DEP FILE #5-1213, ISSUED 4/21/17

OSRD DIMENSIONAL REQUIREMENTS
 MINIMUM LOT AREA: 6,000 SF
 MINIMUM FRONTAGE: NA
 SETBACKS:
 FRONT: 20'
 SIDE: 10'
 REAR: 25'



LEGEND

- N72°32'14"E 177.24' EXIST. PROPERTY LINE
- N23°43'25"W 127.48' PROP. PROPERTY LINE
- PROP. STONE BOUND TO BE SET

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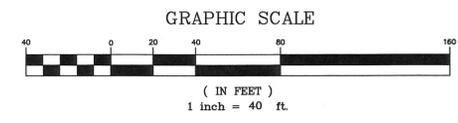
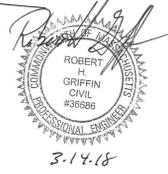
BEVERLY CITY CLERK _____ DATE _____

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DATE _____ FOR REGISTRY USE ONLY

MATCH LINE
SEE SHEET C-2b

MATCH LINE



CITY OF BEVERLY
PLANNING BOARD

DATE: _____

No.	Date	Description
2	3/14/18	REVISE LOT 5, LOT 6 & LOT 11 NO DISTURB ZONES.
1	1/16/18	ADD EXIST. BUILDING SETBACKS. REVISE LOT NUMBERS.

Revisions

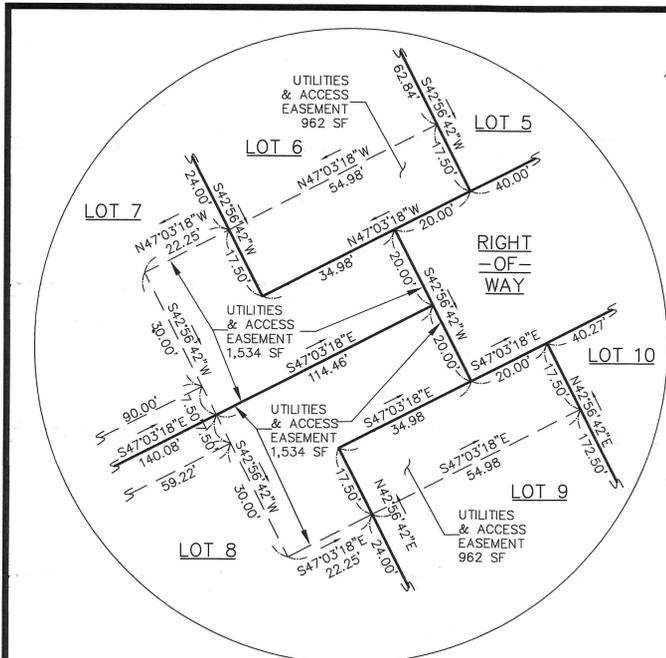
AMERICAN LAND SURVEY ASSOCIATES
 42 CHERRY STREET
 GLOUCESTER, MA 01930
 978-281-7878

Griffin Engineering Group, LLC
 495 Cabot Street, 2nd Floor
 Beverly, MA 01915
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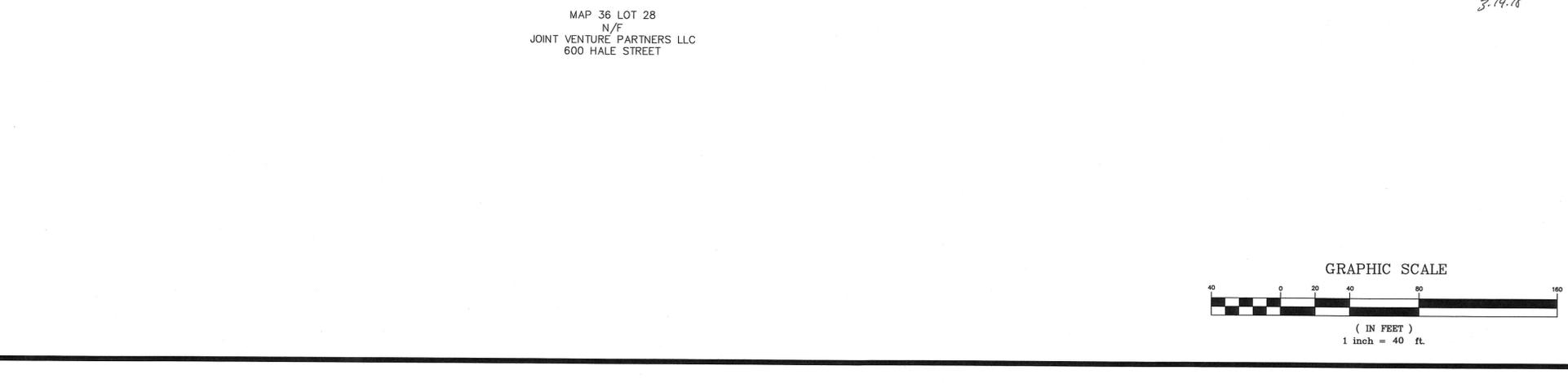
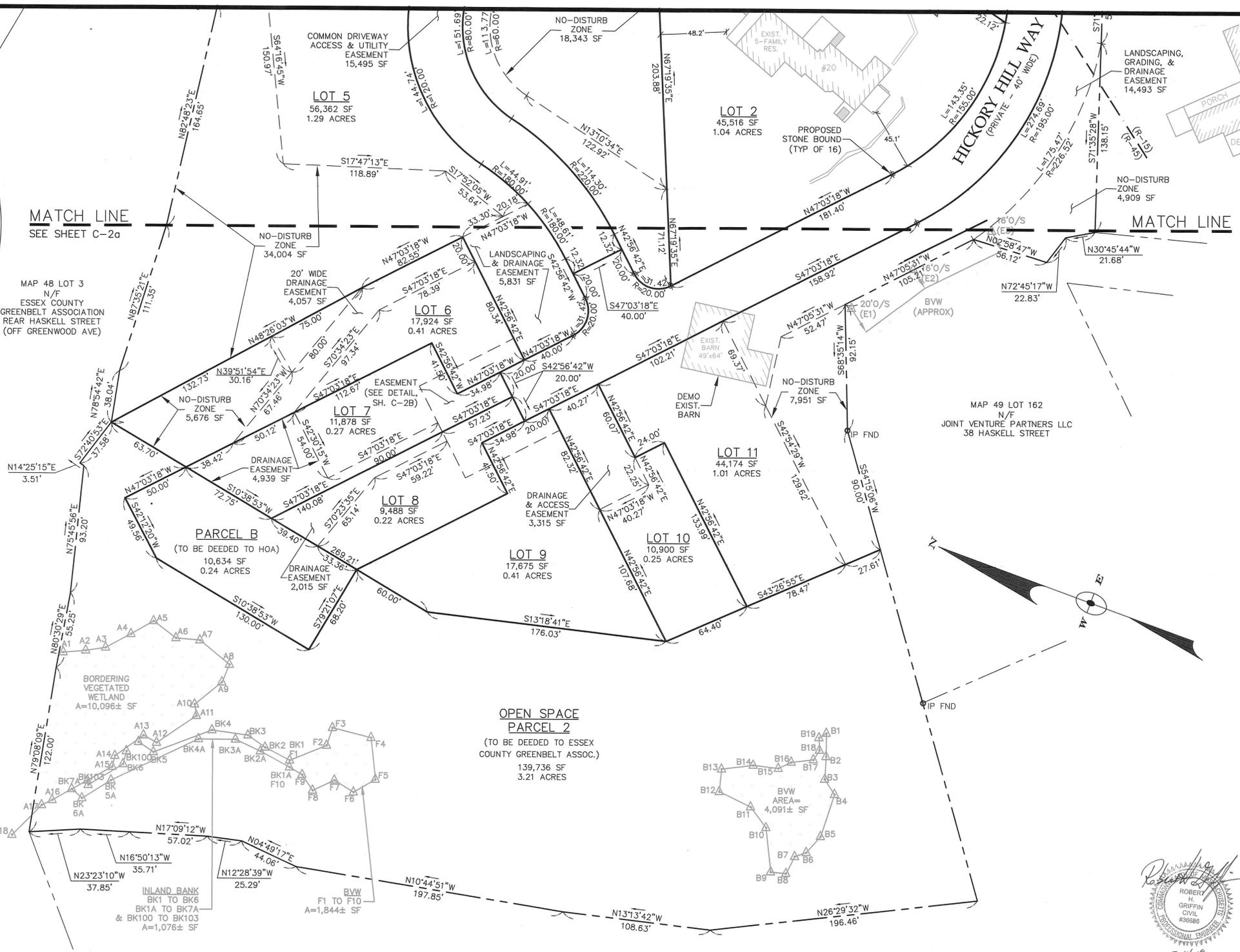
BENCO LLC
 #20, #30, & #40
 WEBSTER AVENUE
 BEVERLY, MA

HICKORY HILL WAY
 PLAN OF LAND
 PART A

Scale: 1"=40'
 Job No.: 1665
 File Name: p/p/b/c
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EASEMENT DETAIL
NOT TO SCALE



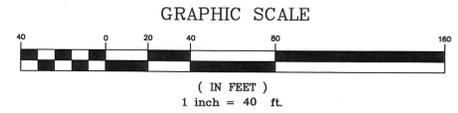
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CITY OF BEVERLY
PLANNING BOARD

DATE: _____

No.	Date	Description
2	3/14/18	REVISE LOT 5, LOT 6 & LOT 11 NO DISTURB ZONES. ADD PARCEL B.
1	1/16/18	ADD EXIST. BUILDING SETBACKS. REVISE LOT NUMBERS.

Revisions

AMERICAN
LAND SURVEY
ASSOCIATES

42 CHERRY STREET
GLOUCESTER, MA 01930
978-281-7878



495 Cabot Street, 2nd Floor
Beverly, MA 01915

Tel: 978-927-5111
Fax: 978-927-5103

BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

HICKORY HILL WAY
PLAN OF LAND
PART B

Scale: 1"=40'
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C-2b

OSRD CALCULATIONS:
 TOTAL TRACT AREA = 513,292 + 50,845 + 45,232 = 609,369 SF (13.99 AC.)
 PRIMARY CONSERVATION AREA (WETLANDS) = 20,833± SF (0.48 ACRES)
 25' NO-DISTURB ZONE = 38,724 SF (0.89 ACRES)
 AREAS >20% SLOPE (OUTSIDE 25' NDZ) = 170,780 SF (3.92 ACRES)

BUILDABLE AREA (BY DEFINITION IS TOTAL AREA LESS WETLANDS,
 25' NO-DISTURB ZONE & AREAS HAVING MORE THAN 20% SLOPE)
 = 609,369 - 20,833 - 38,724 - 170,780 = 379,032 SF (8.70 ACRES)

MIN. OPEN SPACE (50% OF BUILDABLE AREA)
 REQUIRED = 50% x 379,032 = 189,516 SF (4.35 ACRES)
 PROVIDED = 54,324 + 139,736 = 194,060 (4.46 ACRES) = 51.2%

MIN. NO DISTURB AREA (50% OF TOTAL TRACT)
 REQUIRED = 50% x 609,369 = 304,685 SF (6.99 ACRES)
 PROVIDED = 194,060 + 111,430 = 305,490 (7.01 ACRES) = 50.1%

BASIC MAXIMUM NUMBER OF LOTS PER YIELD PLAN = 11
 MAX. NUMBER OF NEW BUILDING LOTS PER YIELD PLAN = 9
 NUMBER OF NEW BUILDING LOTS PROVIDED = 9

LEGEND

- EXIST. PROPERTY LINE
- 153- EXIST. CONTOUR
- EXIST. BUILDING
- - - EXIST. EDGE OF PAVEMENT
- D EXIST. DRAIN
- W EXIST. WATER
- S EXIST. SEWER
- G EXIST. GAS
- 24"± EXIST. TREE
- WETLAND LINE
- PROP. PROPERTY LINE
- 164- PROP. CONTOUR
- - - PROP. EDGE OF PAVEMENT
- PROP. CURBING
- D PROP. DRAIN
- TEST PIT
- LIMIT OF CLEARING
- xx EROSION CONTROLS

***OSRD SETBACK RELIEF REQUESTED**
 LOTS 4 & 5: REDUCE REAR YARD SETBACK FROM 25' TO 10'
 LOT 6: REDUCE REAR YARD SETBACK FROM 25' TO 20'
 LOT 7 & 8: REDUCE SIDE YARD SETBACK FROM 10' TO 7'

OSRD DIMENSIONAL REQUIREMENTS
 MINIMUM LOT AREA: 6,000 SF
 MINIMUM FRONTAGE: NA
 SETBACKS:
 FRONT: 20'
 SIDE: 10'
 REAR: 25'

NOTE:
 HOUSE FOOTPRINTS ARE ILLUSTRATIVE. FOOTPRINTS PER PROJECT ARCHITECT, S&V.

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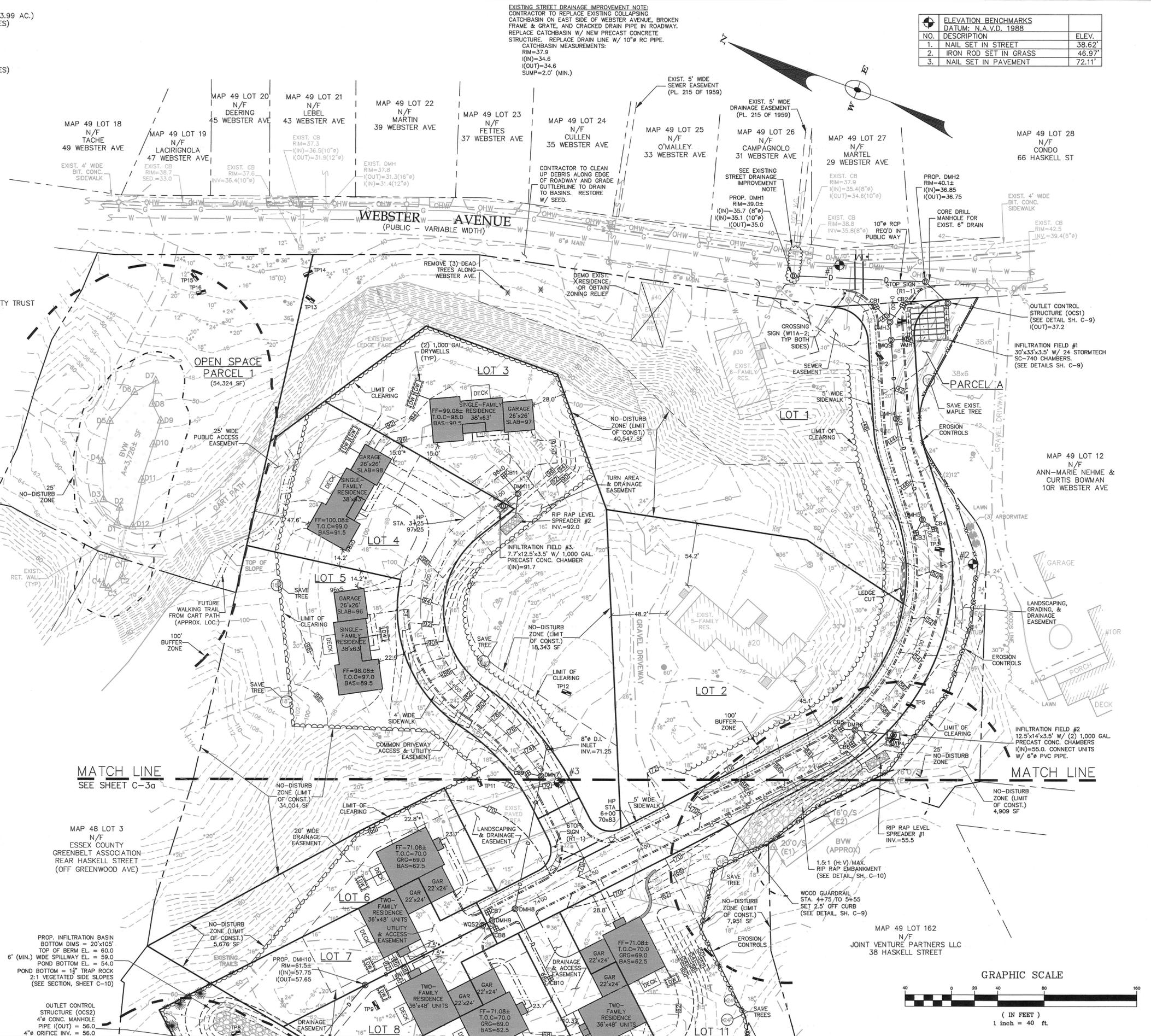
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DATE _____



ELEVATION BENCHMARKS		
DATUM: N.A.V.D. 1988		
NO.	DESCRIPTION	ELEV.
1.	NAIL SET IN STREET	38.62'
2.	IRON ROD SET IN GRASS	46.97'
3.	NAIL SET IN PAVEMENT	72.11'

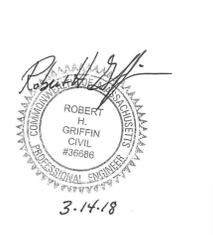
CITY OF BEVERLY
 PLANNING BOARD

DATE: _____

No.	Date	Description
3	3/14/18	REDUCE ROAD WIDTH, ADD SIDEWALK TO COMMON DRIVEWAY, CROSSWALK, EXISTING DRAINAGE NOTE. REVISE INFILTRATION BASIN & RIP RAP EMBANKMENT. ADD WEBSTER AVE. CLEAN UP NOTE. REVISE NO-DISTURB ZONE & OSRD CALCS.
2	2/14/18	ADD EROSION CONTROLS
1	1/16/18	ADD SETBACKS, CLEARING LIMIT, NO-DISTURB & EASEMENT CALLOUTS. REVISE OSRD CALCS & LOT NUMBERS.

No.	Date	Description
3	3/14/18	REDUCE ROAD WIDTH, ADD SIDEWALK TO COMMON DRIVEWAY, CROSSWALK, EXISTING DRAINAGE NOTE. REVISE INFILTRATION BASIN & RIP RAP EMBANKMENT. ADD WEBSTER AVE. CLEAN UP NOTE. REVISE NO-DISTURB ZONE & OSRD CALCS.
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Revisions



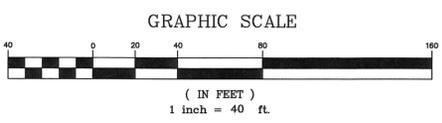
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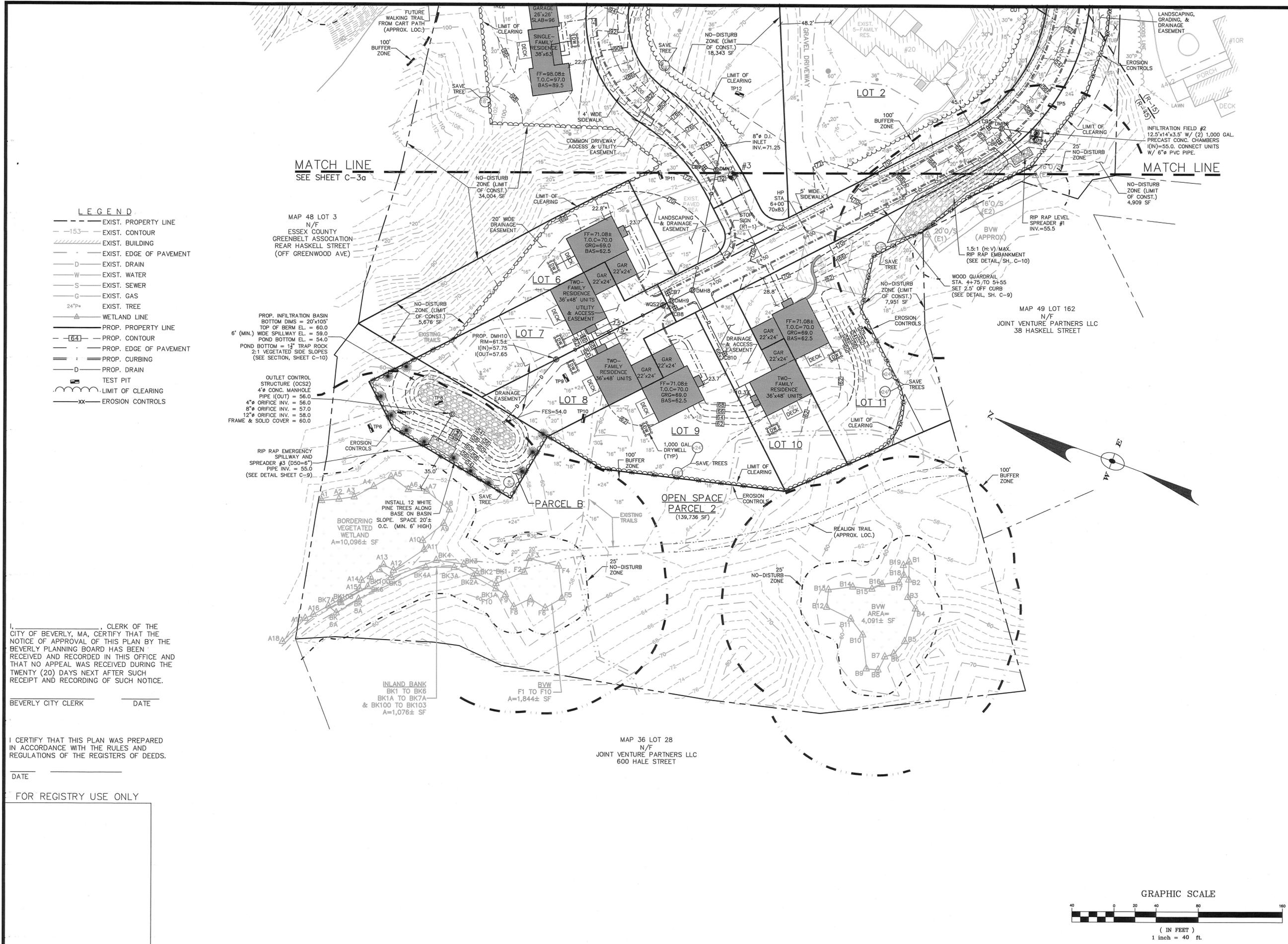
BENCO LLC
 #20, #30, & #40
 WEBSTER AVENUE
 BEVERLY, MA

HICKORY HILL WAY

OSRD SITE PLAN
 PART A

Scale: 1"=40'
 Job No.: 1665
 File Name: p/p/b/c
 Date: 12/20/17





- LEGEND**
- EXIST. PROPERTY LINE
 - 153- EXIST. CONTOUR
 - EXIST. BUILDING
 - - - EXIST. EDGE OF PAVEMENT
 - - - EXIST. DRAIN
 - - - EXIST. WATER
 - - - EXIST. SEWER
 - - - EXIST. GAS
 - 24" P+ EXIST. TREE
 - △ WETLAND LINE
 - PROP. PROPERTY LINE
 - - - PROP. CONTOUR
 - - - PROP. EDGE OF PAVEMENT
 - - - PROP. CURBING
 - - - PROP. DRAIN
 - D TEST PIT
 - LIMIT OF CLEARING
 - XX EROSION CONTROLS

MAP 48 LOT 3
N/F
ESSEX COUNTY GREENBELT ASSOCIATION REAR HASKELL STREET (OFF GREENWOOD AVE)

PROP. INFILTRATION BASIN
BOTTOM DIMS = 20'x105'
TOP OF BERM EL. = 60.0
6' (MIN.) WIDE SPILLWAY EL. = 59.0
POND BOTTOM EL. = 54.0
POND BOTTOM = 1 1/2" TRAP ROCK
2:1 VEGETATED SIDE SLOPES
(SEE SECTION, SHEET C-10)

OUTLET CONTROL STRUCTURE (OCS2)
4" CONC. MANHOLE
PIPE (OUT) = 56.0
4" ORIFICE INV. = 56.0
8" ORIFICE INV. = 57.0
12" ORIFICE INV. = 58.0
FRAME & SOLID COVER = 60.0

RIP RAP EMERGENCY SPILLWAY AND SPREADER #3 (D50=6")
PIPE INV. = 55.0
(SEE DETAIL SHEET C-9)

INSTALL 12 WHITE PINE TREES ALONG BASE ON BASIN SLOPE. SPACE 20'± O.C. (MIN. 6" HIGH)

BORDERING VEGETATED WETLAND
A=10,096± SF

INLAND BANK
BK1 TO BK6
BK1A TO BK7A
& BK100 TO BK103
A=1,076± SF

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CITY OF BEVERLY PLANNING BOARD

DATE: _____

No.	Date	Description
3	3/14/18	REDUCE ROAD WIDTH, ADD SIDEWALK TO COMMON DRIVEWAY, CROSSWALK, EXISTING DRAINAGE NOTE, REVISE INFILTRATION BASIN & RIP RAP EMBANKMENT
2	2/14/18	ADD EROSION CONTROLS
1	1/16/18	ADD SETBACKS, CLEARING LIMIT, NO-DISTURB & EASEMENT CALLOUTS. REVISE LOT NUMBERS.

No. Date Description

Revisions

Griffin Engineering Group, LLC

495 Cabot Street, 2nd Floor
Beverly, MA 01915

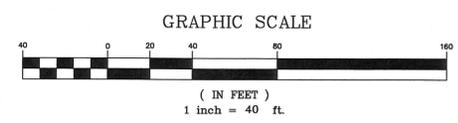
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BEVERLY, MA

HICKORY HILL WAY
OSRD SITE PLAN
PART B

Scale: 1"=40'
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File Name: p/p/b/c
Date: 12/20/17

C-3b



DATE:

2	3/14/18	REDUCE ROAD WIDTH, ADD SIDEWALK TO COMMON DRIVEWAY, REVISE WATER & SEWER MAIN LAYOUT, ADD STREET LIGHTS & CROSSWALKS
1	1/16/18	ADD CLEARING LIMIT, NO-DISTURB & EASEMENT CALLOUTS. REVISE LOT NUMBERS.

No. Date Description

Revisions

Robert Griffin
ROBERT H. GRIFFIN
CIVIL
#36686
3.14.18



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Beverly, MA 01915
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BEVERLY, MA

HICKORY HILL WAY
UTILITIES PLAN

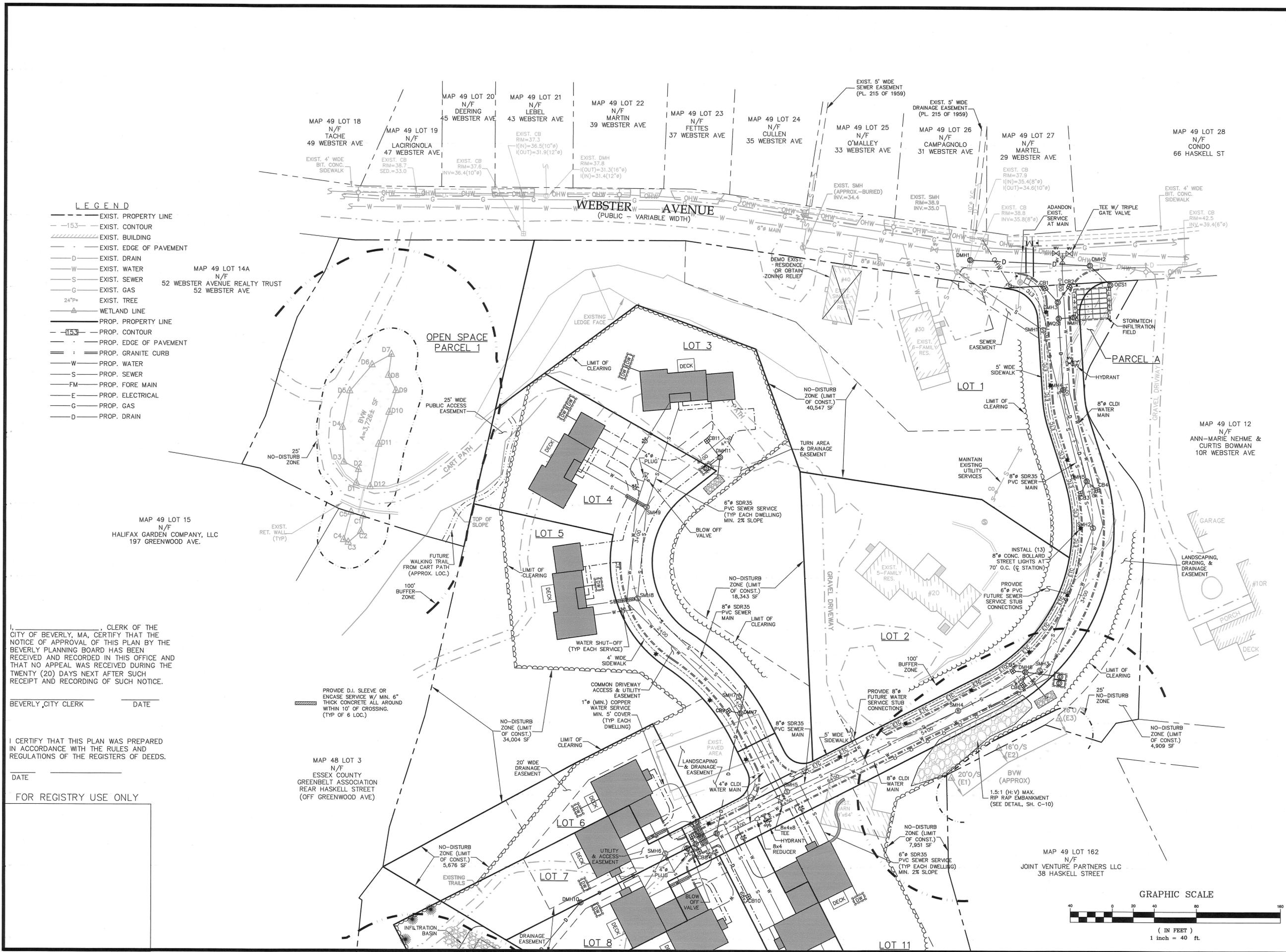
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C-4



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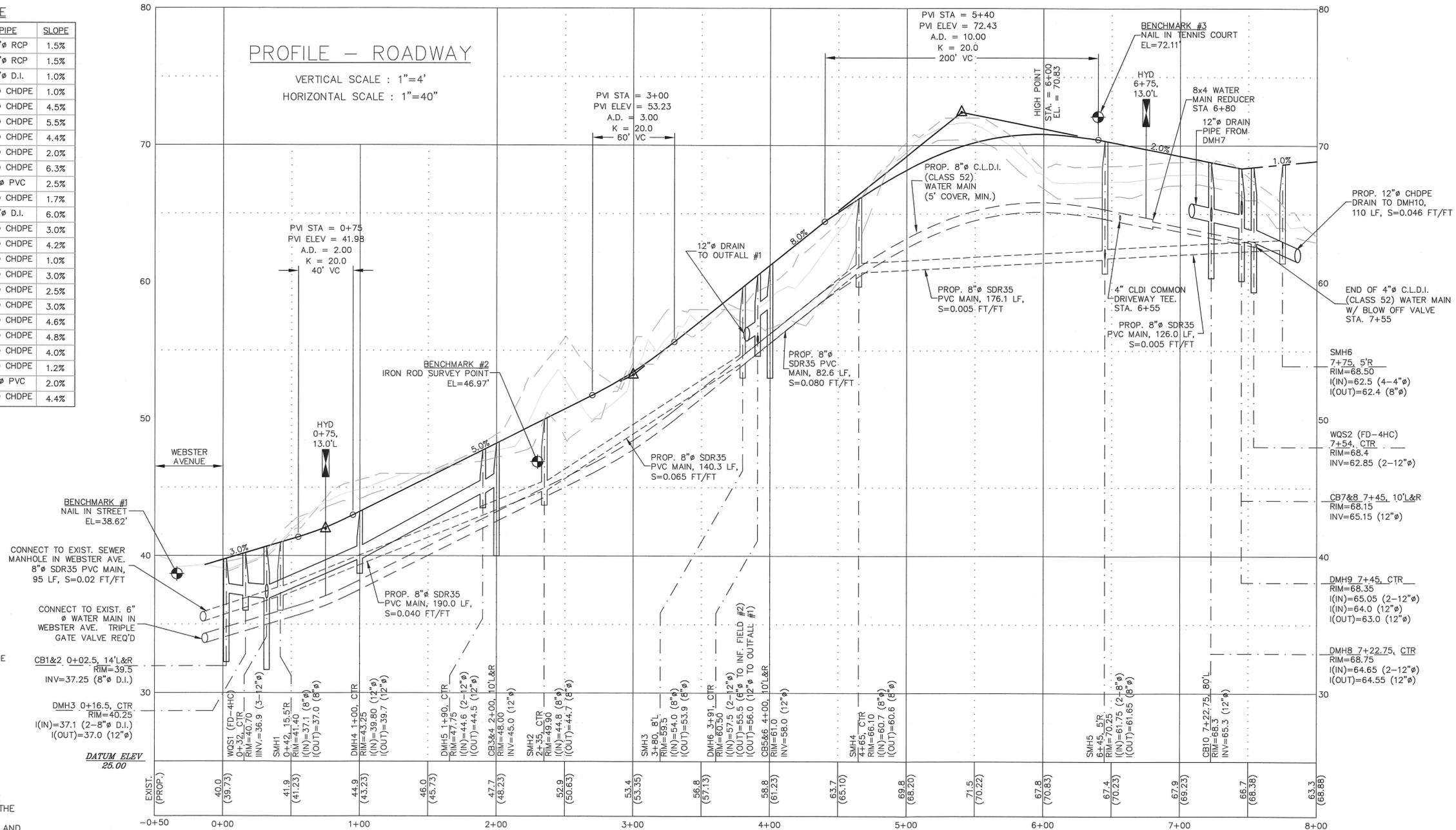
DATE _____
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DRAIN PIPE SCHEDULE

PIPE	LENGTH	PIPE	SLOPE
DMH2 TO DMH1	110.0'	10" RCP	1.5%
OCS1 TO DMH2	23.0'	10" RCP	1.5%
CB1&2 TO DMH3	14.0'	8" D.I.	1.0%
DMH3 TO WQS1	11.5'	12" CHDPE	1.0%
CB3&4 TO DMH5	9.0'	12" CHDPE	4.5%
DMH5 TO DMH4	85.7'	12" CHDPE	5.5%
DMH4 TO WQS1	64.0'	12" CHDPE	4.4%
WQS1 TO INF. FIELD #1	10.0'	12" CHDPE	2.0%
CB5&6 TO DMH6	8.0'	12" CHDPE	6.3%
DMH6 TO INF. FIELD #2	25.0'	6" PVC	2.5%
DMH6 TO OUTFALL #1	30.0'	12" CHDPE	1.7%
INLET TO DMH7	25.0'	8" D.I.	6.0%
CB9 TO DMH7	8.0'	12" CHDPE	3.0%
DMH7 TO DMH8	112.3'	12" CHDPE	4.2%
CB10 TO DMH8	63.3'	12" CHDPE	1.0%
DMH8 TO DMH9	18.3'	12" CHDPE	3.0%
CB7&8 TO DMH9	4.0'	12" CHDPE	2.5%
DMH9 TO WQS2	5.0'	12" CHDPE	3.0%
WQS2 TO DMH10	110.0'	12" CHDPE	4.6%
DMH10 TO FES	76.5'	12" CHDPE	4.8%
OCS2 TO OUTFALL #3	25.0'	12" CHDPE	4.0%
CB11 TO DMH11	17.0'	12" CHDPE	1.2%
DMH11 TO INF. FIELD #3	10.0'	6" PVC	2.0%
DMH11 TO OUTFALL #2	16.0'	12" CHDPE	4.4%

PROFILE - ROADWAY

VERTICAL SCALE : 1"=4'
HORIZONTAL SCALE : 1"=40'



LEGEND

- EXISTING CENTERLINE GRADE
- EXISTING GRADE 12' RIGHT
- EXISTING GRADE 12' LEFT
- PROPOSED CENTERLINE GRADE
- SEWER LINE
- WATER LINE
- DRAINAGE LINE

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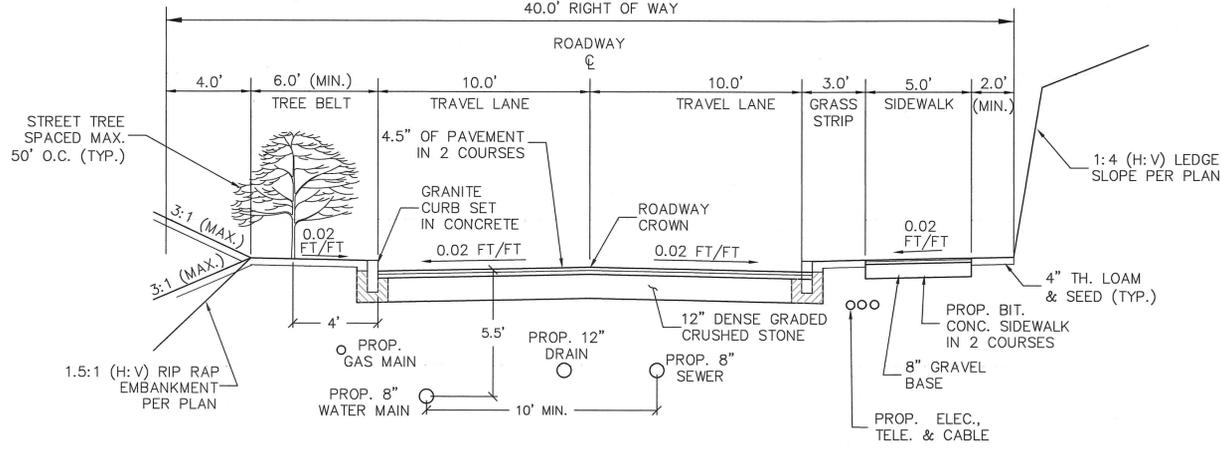
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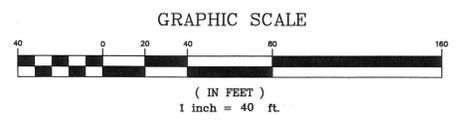
PROFILE NOTES:

- 1) ALL CATCHBASINS, DRAIN, & SEWER MANHOLES TO BE PRECAST CONCRETE WITH FLAT TOPS.
- 2) ALL CATCHBASINS TO HAVE 4' (MIN.) DEEP SUMP WITH A HOOD ON THE OUTLET PIPE.
- 3) ALL DRAIN PIPES TO BE 12" CORRUGATED HDPE (SMOOTH) UNLESS NOTED OTHERWISE.
- 4) CONTRACTOR TO ABANDON EXISTING WATER, SEWER SERVICE CONNECTIONS FOR #20 WEBSTER AT THE MAINS PER UTILITY PROVIDER SPECIFICATIONS. CONNECT SERVICES TO NEW ROADWAY UTILITY STUBS. MINIMUM 10' HORIZONTAL SEPARATION REQ'D.
5. PROPOSED GAS, ELECTRIC, TELEPHONE, & CABLE SERVICE NOT SHOWN ON PROFILE. SAID UTILITIES SIZE AND LOCATION PER SERVICE PROVIDER. ALL UTILITIES TO BE UNDERGROUND
6. NO SURFACE WATERS ARE PRESENT IN THE VICINITY OF THE PROPOSED ROADWAY.



TYPICAL ROADWAY SECTION
SCALE: 1"=4'

- ROADWAY SECTION NOTES:
1. REMOVE ALL LOAM, ROOTS, SUBSOIL AND DELETERIOUS MATERIALS.
 2. COMPACT ALL LAYERS, AND SUBGRADE, TO 95% MOD. PROCTOR.
 3. MATERIAL REFERENCES ARE TO 1995 EDITION OF MASS. HIGHWAY STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
 4. 4" LOAM, SEED AND MULCH ALL DISTURBED AREAS. LOAM = M 1.05.0
SEED = M 6.03.0 SLOPE MIX
MULCH = M 6.04.0 ANY TYPE
 5. IN LEDGE, REMOVE LEDGE TO MIN. DEPTH OF 24" BELOW FINISH GRADE; BACKFILL WITH COMPACTED GRAVEL.



CITY OF BEVERLY
PLANNING BOARD

DATE: _____

No.	Date	Description
1	3/14/18	REVISE SEWER MANHOLES & PIPES, ROADWAY TYPICAL SECTION & PIPE SCHEDULE.

ROBERT H. GRIFFIN
REGISTERED PROFESSIONAL ENGINEER
3.14.18



495 Cabot Street, 2nd Floor
Beverly, MA 01915
Tel: 978-927-5111
Fax: 978-927-5103

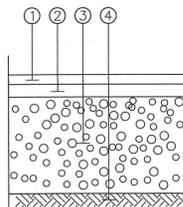
BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

HICKORY HILL WAY
ROADWAY PROFILE
& SECTION

Scale: 1"=40'
Job No.: 1665
File Name: p/p/b/c
Date: 12/20/17

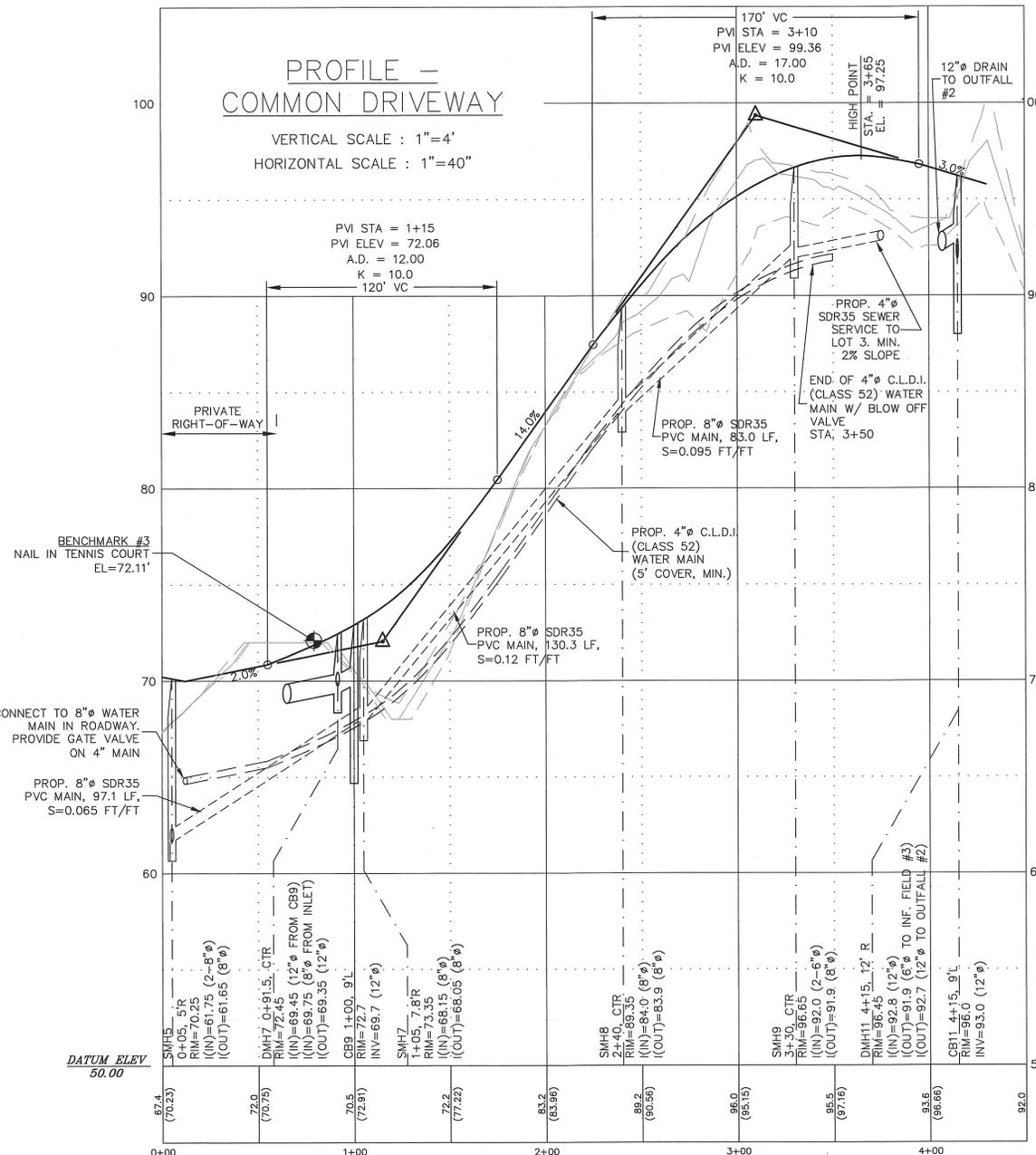
- GENERAL NOTES**
1. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE CONSIDERED APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES IN THE LOCATION OF ANY UTILITIES SHOWN OR ENCOUNTERED DURING CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER.
 2. THE CONTRACTOR SHALL CALL DIG-SAFE 72 HOURS PRIOR TO CONSTRUCTION TO INFORM UTILITY COMPANIES OF ANY EXCAVATION ADJACENT TO EXISTING UTILITIES.
 3. THE CONTRACTOR SHALL NOTIFY THE OWNER, UTILITY COMPANIES, POLICE, FIRE AND DPW PRIOR TO ANY BLASTING.
 4. WHENEVER EXISTING STRUCTURES ARE ENCOUNTERED, THE CONTRACTOR SHALL REPAIR ANY DAMAGED STRUCTURES OR REPLACE ANY REMOVED STRUCTURES, AND MAKE ANY IMPROVEMENTS ABOVE OR BELOW GRADE TO A CONDITION BETTER THAN OR EQUAL TO EXISTING CONDITIONS.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL WASTE MATERIAL AT AN APPROVED SITE. BURIAL OF WASTE MATERIAL ON-SITE IS NOT PERMITTED.
 6. THE CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES FROM ON-SITE CONSTRUCTION ACTIVITIES AND REMOVE ANY SEDIMENT OR DEBRIS DEPOSITED THEREON IMMEDIATELY.
 7. DRAINAGE GENERATED AS A RESULT OF DEWATERING SHALL BE DISCHARGED TO EXISTING DRAINAGE COURSES WITH PROPER FILTRATION AND EROSION CONTROL MEASURES. DISCHARGE ONTO PAVEMENT OR PRIVATE PROPERTY SHALL NOT BE ALLOWED.
 8. IF ANY PART OF THIS DESIGN IS TO BE ALTERED IN ANY WAY, THE ENGINEER AS WELL AS THE APPROVING AUTHORITIES SHALL BE NOTIFIED IN WRITING BEFORE CONSTRUCTION.
 9. ONLY THOSE PLANS APPROVED BY THE CITY OF BEVERLY ARE TO BE USED FOR CONSTRUCTION.
 10. GRANULAR FILL SHALL BE NON-PLASTIC, WITH LESS THAN 10% PASSING #200 SIEVE.
 11. UNLESS OTHERWISE NOTED, COMPACT ALL LAYERS TO 95% MODIFIED PROCTOR.
 12. ALL WATER, SEWER, AND DRAINAGE WORK SHALL COMPLY WITH THE CITY OF BEVERLY REQUIREMENTS. ALL WORK WITHIN 10' OF THE PROPOSED RESIDENCE TO CONFORM TO MASSACHUSETTS BUILDING CODE, AND ANY LOCAL BOARD OF HEALTH SUPPLEMENTARY REGULATIONS.
 13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS.
 14. SAFETY MEASURES, DAY-TO-DAY CONTROL OF WORK AND CONSTRUCTION METHODS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
 15. PLACE 4" LOAM AND SUNNY LAWN SEED MIXTURE (200 LB/ACRE), STARTER FERTILIZER, LIME AS REQUIRED OVER ALL DISTURBED AREAS. PROVIDE EROSION CONTROL SEED MIX AND BLANKETS ON 2:1 (H:V) INFILTRATION BASIN EMBANKMENTS SLOPES. SEED MIX TO BE NEW ENGLAND EROSION CONTROL/RESTORATION FOR DETENTION BASINS AND MOIST SITES BY NEW ENGLAND WETLANDS PLANT, INC. OR APPROVED EQUAL.
 16. IN CASES WHERE LEDGE OR BOULDERS ARE PRESENT, THE ENGINEER WILL NOT BE RESPONSIBLE FOR ASSURING THE AMOUNT OF ROCK TO BE ENCOUNTERED.
 17. CONTRACTOR TO PROVIDE INDIVIDUAL WATER, SEWER, GAS, ELECTRICAL, TELEPHONE, AND CABLE BUILDING SERVICES TO LOT LINE DURING THE CONSTRUCTION OF THE ROADWAY.
 18. PROPOSED RESIDENCE FOOTPRINT, ON-LOT UTILITIES AND GRADING ARE SHOWN FOR CONCEPTUAL PURPOSES ONLY.
 19. SHOULD THE RODENT POPULATION BE DISPLACED (LEAVE ITS NATURAL HABITAT) BECAUSE OF LAND DEVELOPMENT, THEN THE DEVELOPER MUST BEAR THE RESPONSIBILITY OF RETAINING THE SERVICES OF A PROFESSIONAL EXTERMINATING COMPANY TO ABATE THE RODENT MIGRATION PROBLEM. THIS SERVICE MUST ADEQUATELY SOLVE THE PROBLEM AND MUST BE COMPLETED AT THE EXPENSE OF THE DEVELOPER.

- KEY:**
1. 1 1/2" CLASS 1 BIT. CONCRETE TOP COURSE TYPE I-1 (M3.11.0 - TABLE A).
 2. 3" CLASS 1 BIT. CONCRETE BINDER COURSE (M3.11.0 - TABLE A).
 3. 12" DENSE GRADED CRUSHED STONE FOR SUB-BASE (M2.01.7).
 4. PREPARED SUBGRADE.

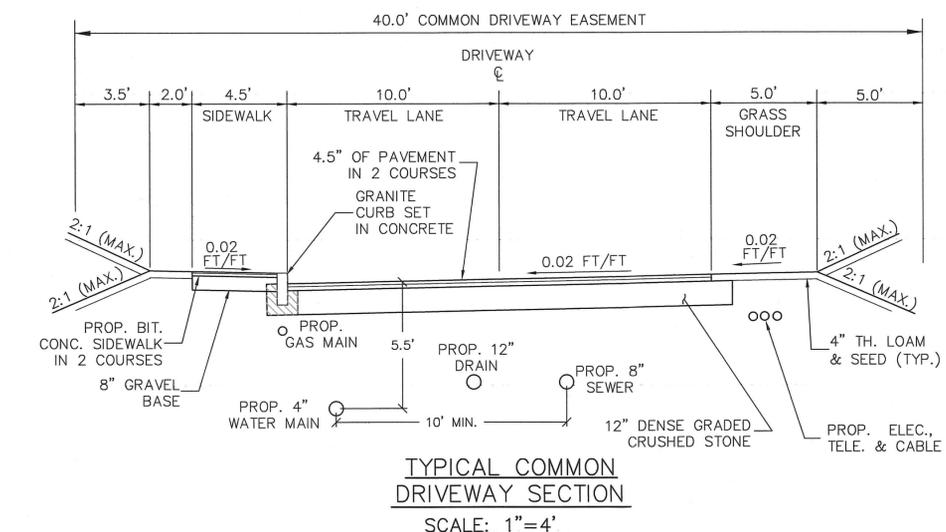


FULL DEPTH PAVEMENT
N.T.S.

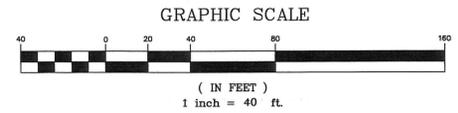
- NOTES:**
- 1) DETAIL TYPICAL FOR ROADWAY & COMMON DRIVEWAY.
 - 2) REMOVE ALL LEDGE TO MIN. DEPTH OF 24" BELOW BINDER COARSE AND REPLACE WITH DENSE GRADED CRUSHED STONE (M2.01.7)



- LEGEND**
- EXISTING CENTERLINE GRADE
 - EXISTING GRADE 12' RIGHT
 - EXISTING GRADE 12' LEFT
 - PROPOSED CENTERLINE GRADE
 - SEWER LINE
 - WATER LINE
 - DRAINAGE LINE



TYPICAL COMMON DRIVEWAY SECTION
SCALE: 1"=4'



_____, CLERK OF THE CITY OF BEVERLY, MA, CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE BEVERLY PLANNING BOARD HAS BEEN RECEIVED AND RECORDED IN THIS OFFICE AND THAT NO APPEAL WAS RECEIVED DURING THE TWENTY (20) DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SUCH NOTICE.

BEVERLY CITY CLERK _____ DATE _____

I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE _____
FOR REGISTRY USE ONLY

CITY OF BEVERLY
PLANNING BOARD

DATE: _____

No.	Date	Description
1	3/14/18	ADJUST SEWER, ADD SIDEWALK TO TYPICAL SECTION



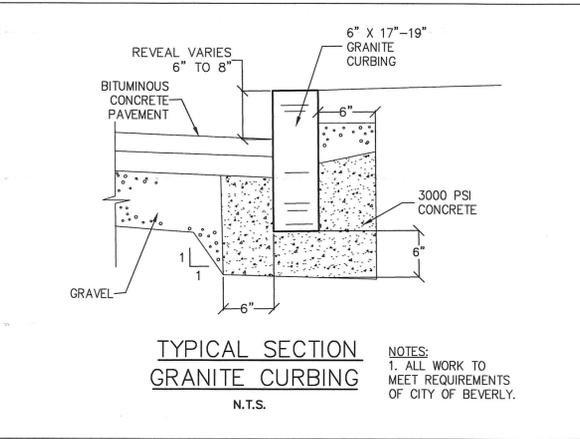
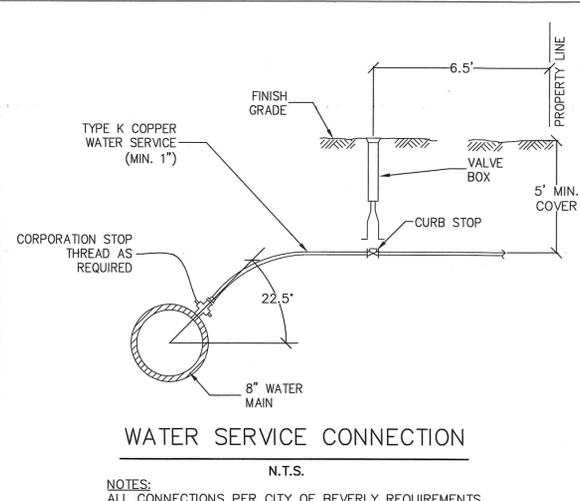
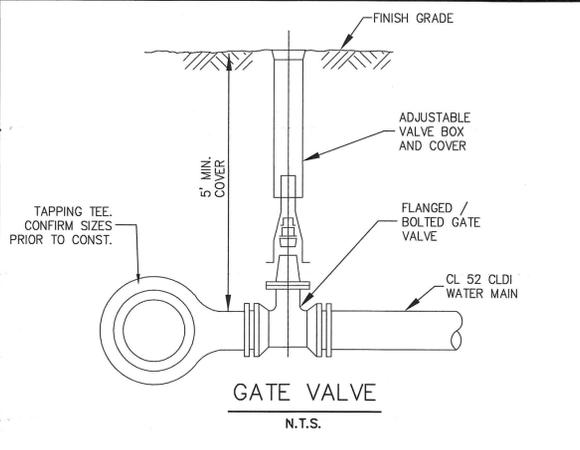
495 Cabot Street, 2nd Floor
Beverly, MA 01915
Tel: 978-927-5111
Fax: 978-927-5103

BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

HICKORY HILL WAY
COMMON DRIVEWAY
PROFILE & SECTION

Scale: 1"=40'
Job No.: 1665
File Name: p/p/b/c
Date: 12/20/17

C-6



I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE _____

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BEVERLY CITY CLERK _____ DATE _____

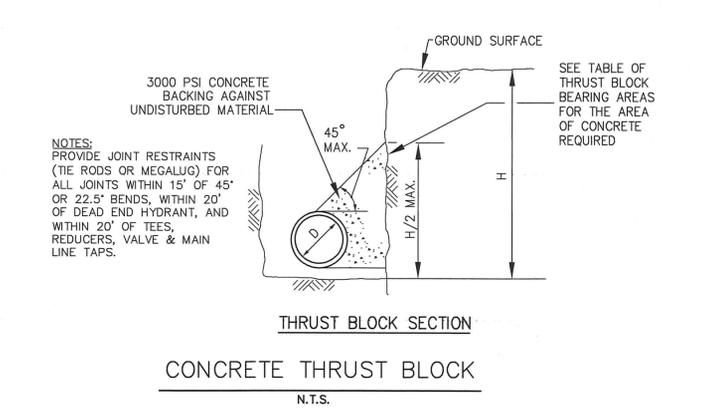
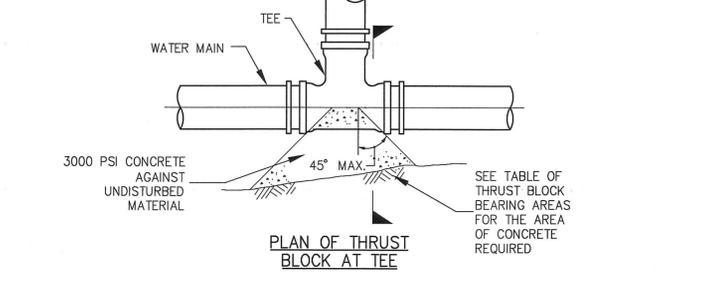
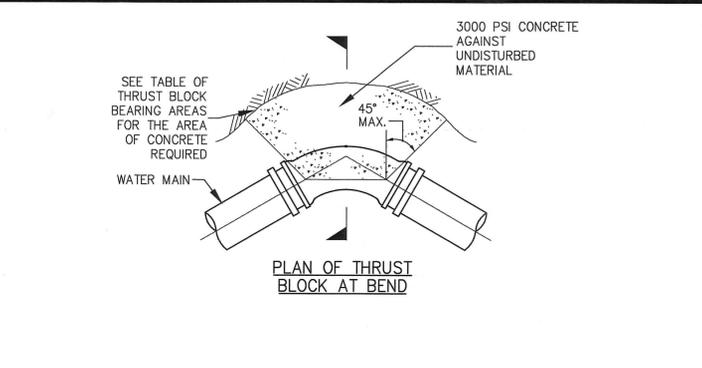


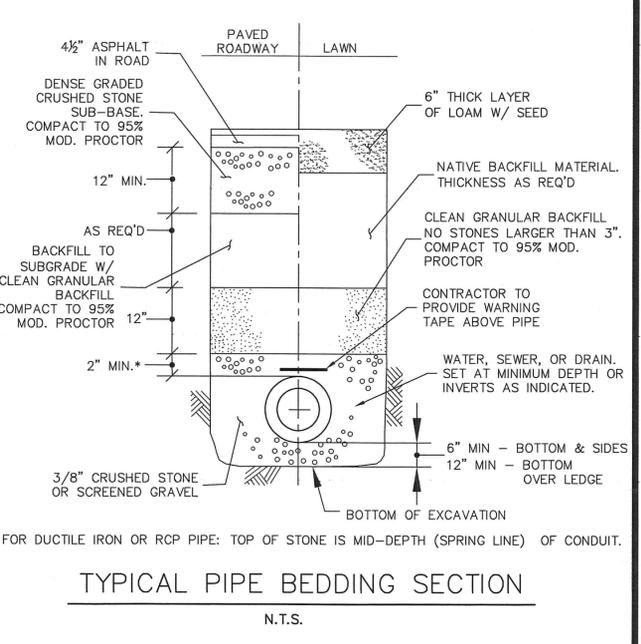
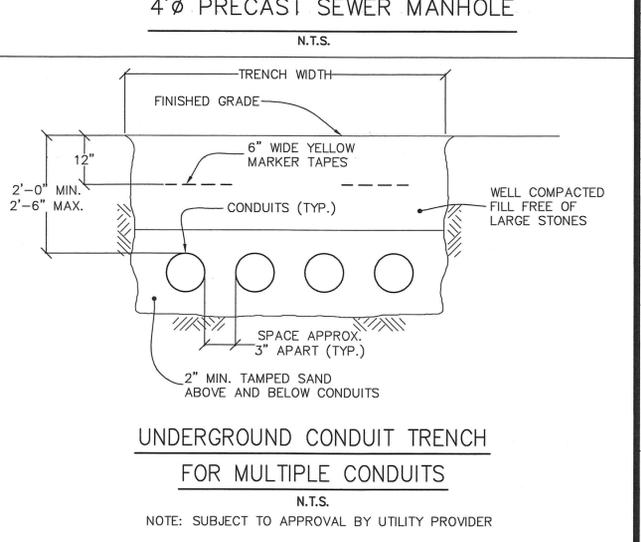
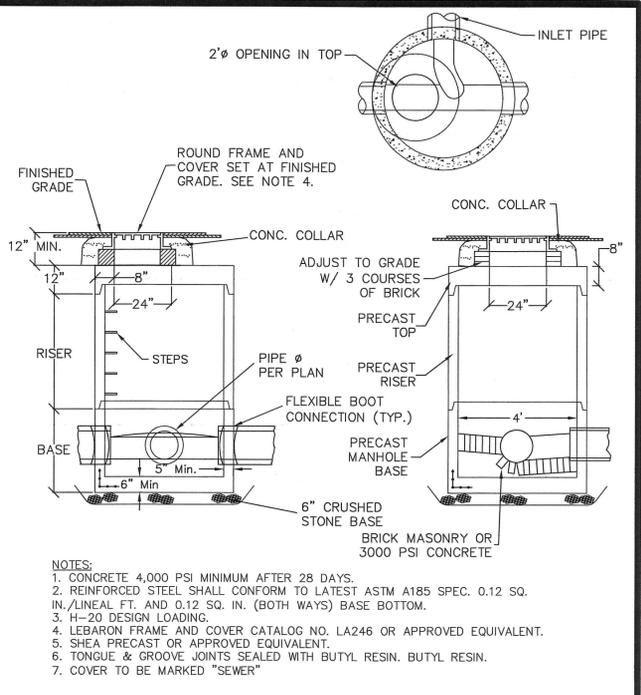
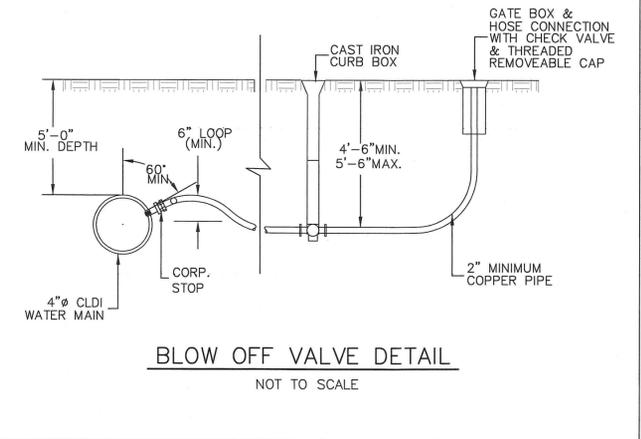
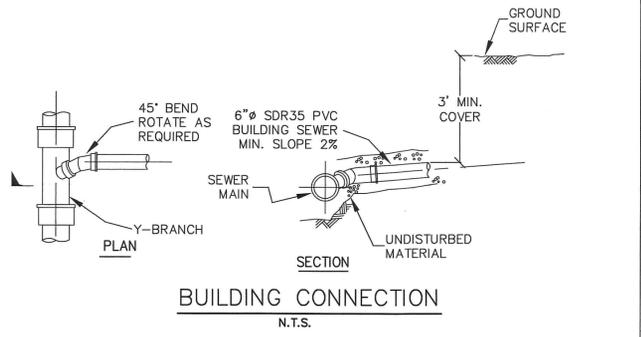
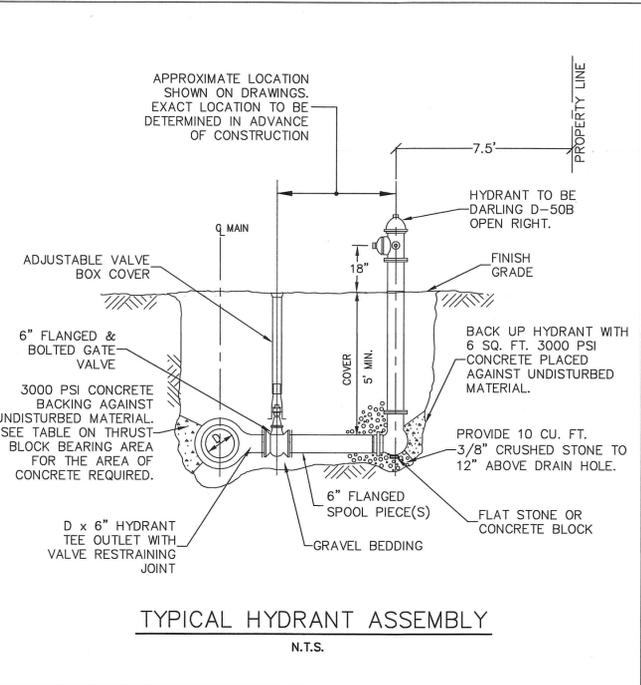
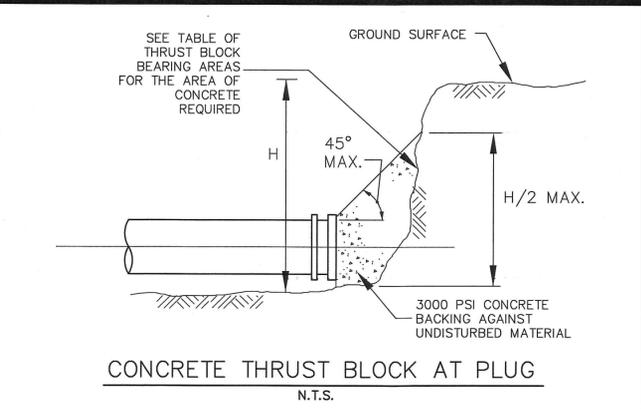
TABLE OF MINIMUM BEARING AREAS IN SQ. FT. AGAINST UNDISTURBED MATERIAL

PIPE SIZE	BEND	PRESSURE 150 PSI						
		TYPE OF SOIL CONDITION						
		A	B	C	D	E	F	G
6" and smaller	TEES & PLUGS	8.5	4.5	3	2.5	1.5	1.5	1
	90	12	6	4	3	2	1.5	1.5
	45	6.5	3.5	2.5	2	1.5	1	1
	22 1/2	3.5	2	1.5	1	1	0.5	0.5
8"	TEES & PLUGS	15.5	8	5.5	4	3	2	1.5
	90	21.5	11	7.5	5.5	4	3	2.5
	45	12	6	4	3	2	1.5	1.5
	22 1/2	6	3	2	1.5	1	1	1

TYPE OF SOIL CONDITION
 A - SOFT CLAY; FINE LOOSE SAND
 B - SAND & CLAY; MIXED OR IN LAYERS; FINE CONFINED SAND
 C - HARD DRY CLAY
 D - COARSE SAND
 E - GRAVEL
 F - SOFT ROCK
 G - HARD PAN

NOTES:
 1. FOR FITTINGS WITH LESS THAN 22 1/2 DEFLECTION USE BEARING AREAS FOR 22 1/2 DEFLECTION.
 2. JOINTS SHALL NOT BE ENCASED IN CONCRETE. BEARING AREAS MAY BE DISREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND ROCK FACE.

CONCRETE THRUST BLOCK BEARING AREA
N.T.S.



CITY OF BEVERLY PLANNING BOARD

DATE: _____

No.	Date	Description
1	3/14/18	MISC. REVISIONS

Revisions

Robert Griffin
 ROBERT H. GRIFFIN
 CIVIL ENGINEER
 #30686

3.14.18

Griffin Engineering Group, LLC

495 Cabot Street, 2nd Floor
 Beverly, MA 01915

Tel: 978-927-5111
 Fax: 978-927-5103

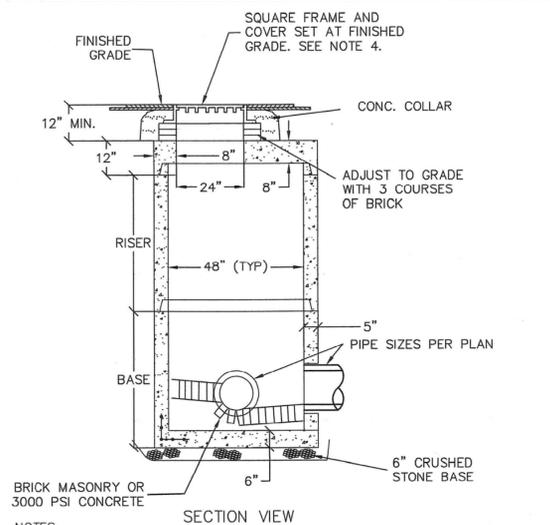
BENCO LLC
 #20, #30, & #40
 WEBSTER AVENUE
 BEVERLY, MA

HICKORY HILL WAY

DETAILS I

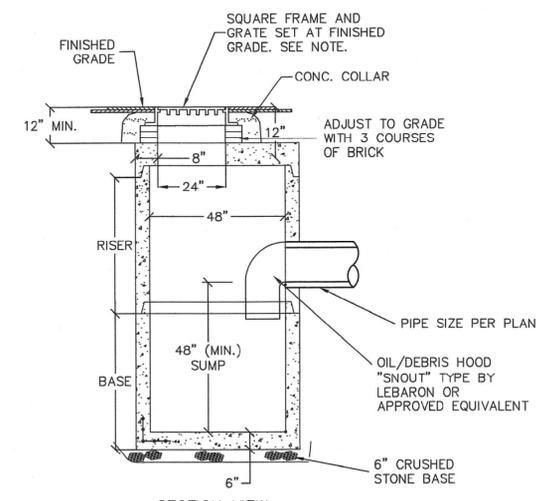
Scale: AS SHOWN
 Job No.: 1665
 File Name: p/p/b/c
 Date: 12/20/17

C-7



- NOTES:
1. CONCRETE 4,000 PSI MINIMUM AFTER 28 DAYS.
 2. REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
 3. H-20 DESIGN LOADING.
 4. LEBARON LA-246 FRAME & SOLID COVER (MARKED DRAIN) OR APPROVED EQUIVALENT.
 5. SHEA PRECAST OR APPROVED EQUIVALENT.
 6. TONGUE & GROOVE JOINTS SEALED WITH BUTYL RESIN. BUTYL RESIN.

PRECAST DRAIN MANHOLE
N.T.S.



- NOTES:
1. CONCRETE 4,000 PSI MINIMUM AFTER 28 DAYS.
 2. REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
 3. H-20 DESIGN LOADING.
 4. LEBARON LF-248-2 THREE FLANGE OR APPROVED EQUIVALENT.
 5. SHEA PRECAST OR APPROVED EQUIVALENT.
 7. TONGUE & GROOVE JOINTS SEALED WITH BUTYL RESIN. BUTYL RESIN.
 8. GRANITE CURB INLET REQ'D ALONG BACK OF BASIN GRATE.

4'Ø PRECAST CATCH BASIN
N.T.S.

I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

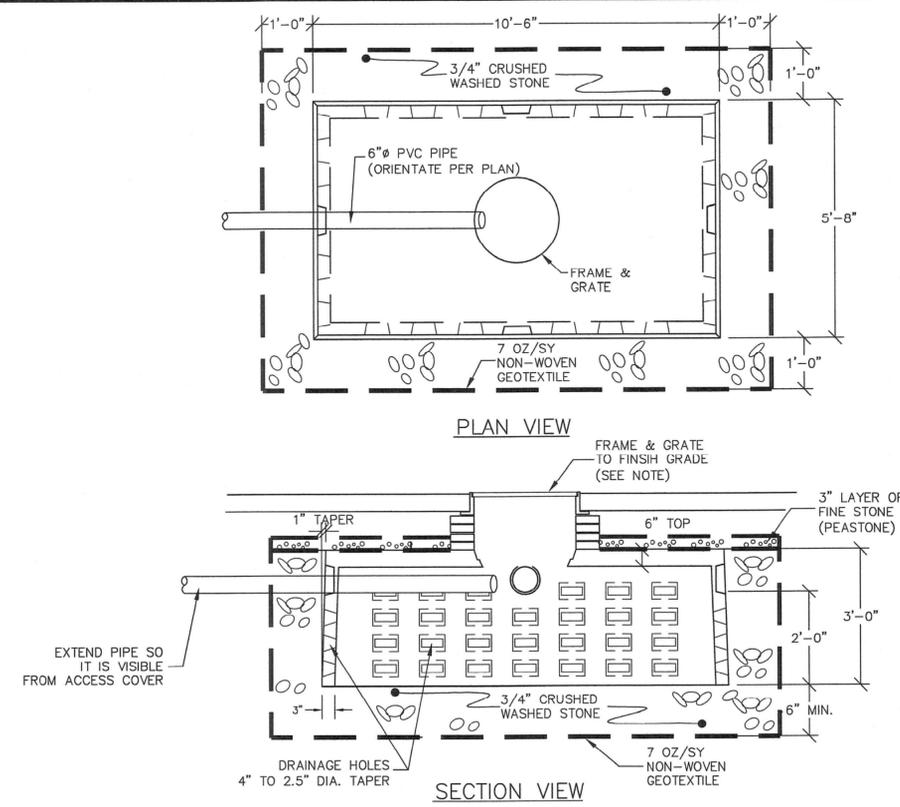
DATE _____

FOR REGISTRY USE ONLY

_____, CLERK OF THE CITY OF BEVERLY, MA, CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE BEVERLY PLANNING BOARD HAS BEEN RECEIVED AND RECORDED IN THIS OFFICE AND THAT NO APPEAL WAS RECEIVED DURING THE TWENTY (20) DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SUCH NOTICE.

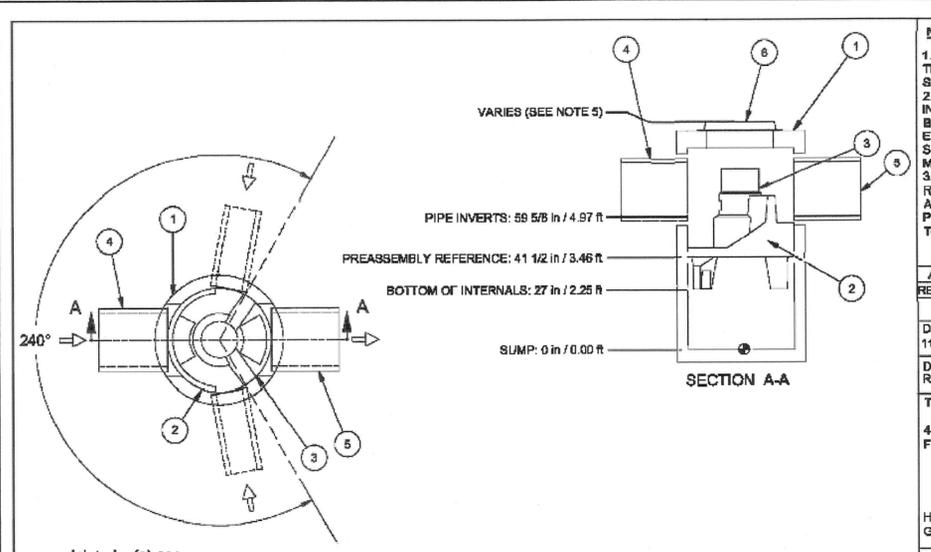
BEVERLY CITY CLERK _____ DATE _____

SOIL TEST PIT DATA (6/28/17 & 6/30/17)									
DEPTH	HORIZON	TEXTURE	COLOR	MOTTLES	OTHER				
TP1 (EL. 39.3)									
0-54	FILL								
54-66	Ab	FSL	10YR 3/2		GRANULAR, FRIABLE				
66-80	B	SL	10YR 4/6		MASSIVE, FRIABLE, SOME GRAVEL				
80-108	C1	S	10YR 4/6		SINGLE-GRAIN, LOOSE, MED.-COARSE SAND				
108-120	C2	FS	10YR 6/6	5YR 4/4	MASSIVE FRIABLE				
NO REFUSAL, ESHWT EL. 30.3 (108")									
TP2 (EL. 41.1)									
0-14	FILL								
14-24	Ab	FSL	10YR 3/2		GRANULAR, FRIABLE				
24-30	B	SL	10YR 4/6		MASSIVE, FRIABLE, SOME GRAVEL				
30-78	C1	S	10YR 4/6		SINGLE-GRAIN, LOOSE, VERY GRAVELLY				
78-120	C2	S	10YR 6/6	5YR 4/4	SINGLE-GRAIN, LOOSE, MED.-COARSE SAND				
NO REFUSAL, ESHWT EL. 31.6 (114")									
TP3 (EL. 47.0)									
0-10	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
10-20	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
20-56	C	SL	10YR 4/4	5YR 4/4	MASSIVE, FIRM IN PLACE				
REFUSAL, ESHWT EL. 44.0 (36")									
TP4 (EL. 56.3)									
0-10	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
10-30	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
30-72	C1	SL	10YR 3/4		MASSIVE, 30% GRAVEL & COBBLES				
REFUSAL, ROOTS TO 60" ESHWT EL. <50.3 (>72")									
TP5 (EL. 57.1)									
0-4	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
4-20	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
20-48	C1	SL	10YR 3/4		MASSIVE, 30% GRAVEL & COBBLES				
REFUSAL, ROOTS TO 48" ESHWT EL. <53.1 (>48")									
TP6 (EL. 55.6)									
0-7	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
7-26	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
26-66	C	LS	10YR 4/4		SINGLE GRAIN, FIRM IN PLACE				
REFUSAL, ROOTS TO 48" ESHWT EL. <50.1 (>66")									
TP7 (EL. 56.6)									
0-6	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
6-22	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
22-80	C1	S	10YR 4/4		SINGLE GRAIN, LOOSE COARSE				
80-102	C2	FS	10YR 4/4	5YR 4/4	MASSIVE FRIABLE				
NO REFUSAL, ESHWT EL. 49.9 (80")									
TP8 (EL. 57.2)									
0-8	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
6-20	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
20-36	C1	S	10YR 4/4		SINGLE GRAIN, LOOSE, COARSE				
36-102	C2	S	10YR 4/4	5YR 4/4	SINGLE GRAIN, LOOSE, MEDIUM				
NO REFUSAL, ESHWT EL. 50.5 (80")									
TP9 (EL. 60.5)									
0-8	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
8-28	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
28-52	C1	S	10YR 4/4		SINGLE GRAIN, LOOSE, COARSE				
52-72	C2	FS/LS	10YR 5/8	5YR 4/4	SINGLE GRAIN, LOOSE, FINE				
NO REFUSAL, ESHWT EL. 55.8 (57")									
TP10 (EL. 60.4)									
0-2	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
2-24	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
24-84	C1	S	10YR 4/4		SINGLE GRAIN, LOOSE, COARSE				
84-88	C2	FS/LS	10YR 5/8	5YR 4/4	SINGLE GRAIN, LOOSE, FINE				
NO REFUSAL, ROOTS TO 72" ESHWT EL. 53.9 (78")									
TP11 (EL. 71.0)									
0-18	A	FSL	10YR 3/2		GRANULAR, FRIABLE				
18-30	B	SL	10YR 4/4		MASSIVE, FRIABLE, SOME GRAVEL				
30-65	C	SL	2.5Y 6/4		SINGLE GRAIN, LOOSE, COBBLES				
NO REFUSAL, ESHWT EL. 69.0 (24")									
TP12 (EL. 67.2)									
0-48	O/A		10YR 3/2		OTHER				
STANDING WATER AT 18" NO REFUSAL, ESHWT EL. 66.2 (12")									



SHALLOW DRYWELL/INFILTRATION CHAMBER DETAIL
N.T.S.

- NOTES:
1. 1,000 GALLON DRYWELL SHALLOW: SHEA DW-JDWH OR APPROVED ALTERNATE.
 2. DRYWELLS TO BE H-20 RATED.
 3. PROVIDE SOLID COVERS TO GRADE ON INFILTRATION FIELDS #2&3 (EACH UNIT). RELIEF GRATES REQUIRED ON DRYWELLS.



ITEM	SIZE (in)	DESCRIPTION
1	48	I.D. PRECAST MANHOLE
2		LEDGER SUPPORT
3		SEPARATION MODULE
4	24	INLET PIPE (BY OTHERS)
5	24	OUTLET PIPE (BY OTHERS)
6	30	FRAME AND COVER (OR GRATE) (ROUND)

GENERAL NOTES:

1. General arrangement drawings only. Contact Hydro International for site specific fabrication drawings.
2. The diameter of the inlet & outlet pipes may be no more than 24".
3. Multiple inlet pipes possible (refer to project plans).
4. Inlet/outlet pipe angles may vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PRODUCT SPECIFICATIONS:

- A. The treatment system shall use an induced vortex to separate pollutants from wastewater runoff.
- B. The treatment system shall fit within the limits of excavation (area and depth) as shown in the project plans and shall not exceed the dimensions for the design flow rates specified herein.
- C. The treatment system shall remove greater than or equal to 95% of TSS based on the Target Particle Size (TPS) of 100 microns, and 85% of TSS based on the TPS of 200 microns at 0.7 cfs and 1.2 cfs, respectively.
- D. The treatment system shall comply with the Peak Citizen Flow Rates of up to 18 cfs with total catchment upstream conditions. If site conditions are laboratory tested, shall demonstrate sufficient catchment of base flow or equal to 5 mgd for all flows up to 200% of MFL+100.
- E. The treatment system shall be capable of capturing and retaining fine silt and sand size particles. Analysis of captured sediment from full scale field installations shall demonstrate particle size predominantly in the 20-micron range.

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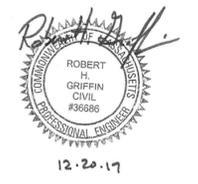
4' WATER QUALITY STRUCTURE
N.T.S.

CITY OF BEVERLY PLANNING BOARD

DATE: _____

No.	Date	Description

Revisions



495 Cabot Street, 2nd Floor
Beverly, MA 01915

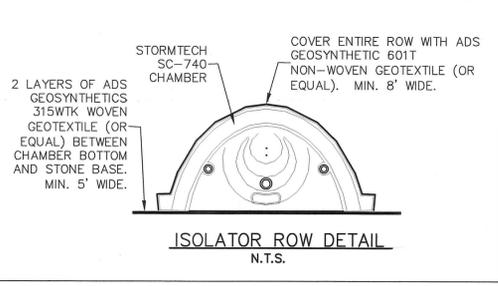
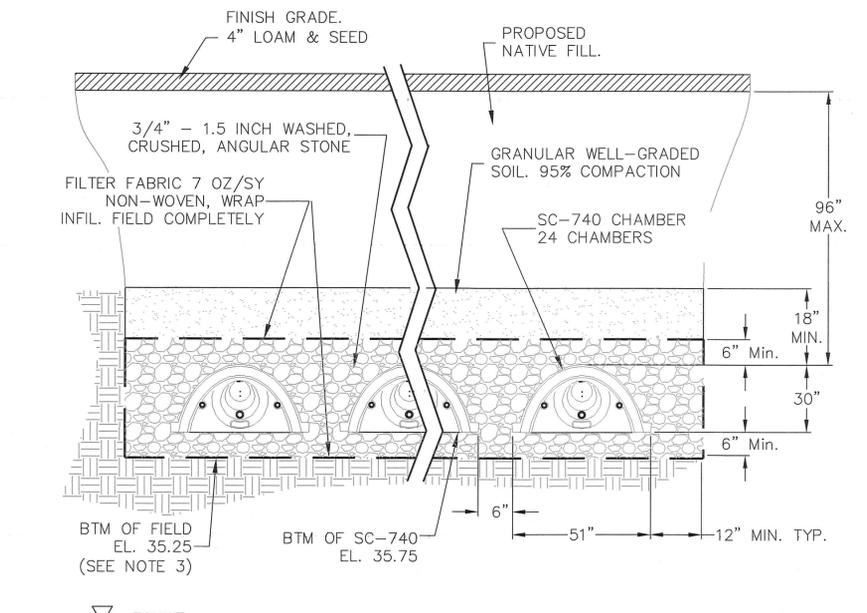
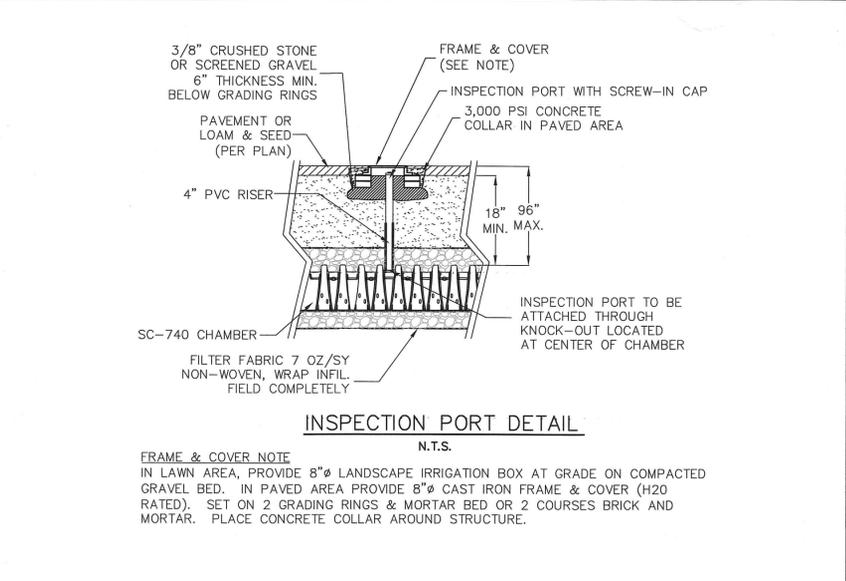
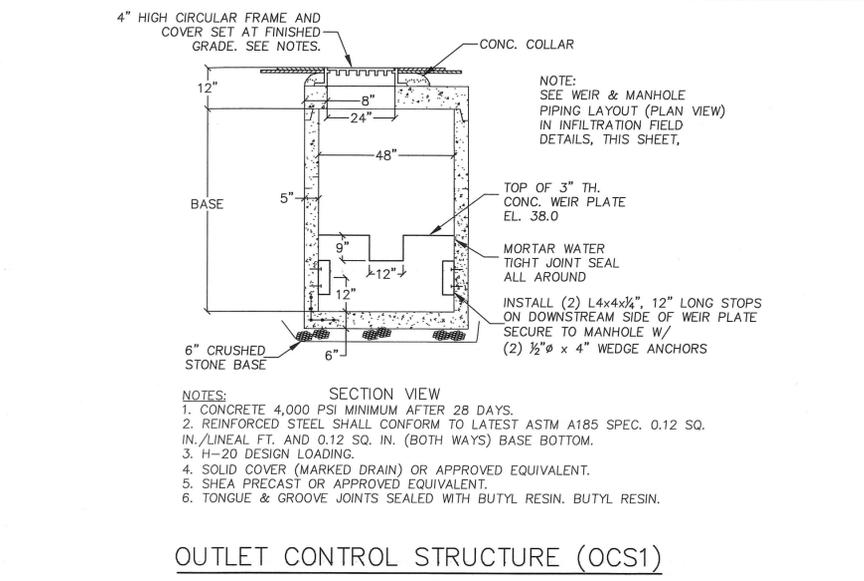
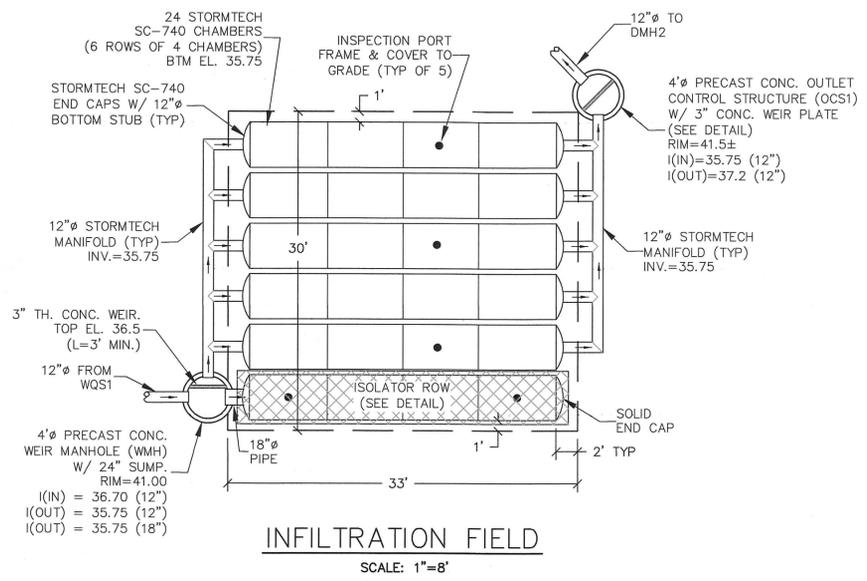
Tel: 978-927-5111
Fax: 978-927-5103

BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

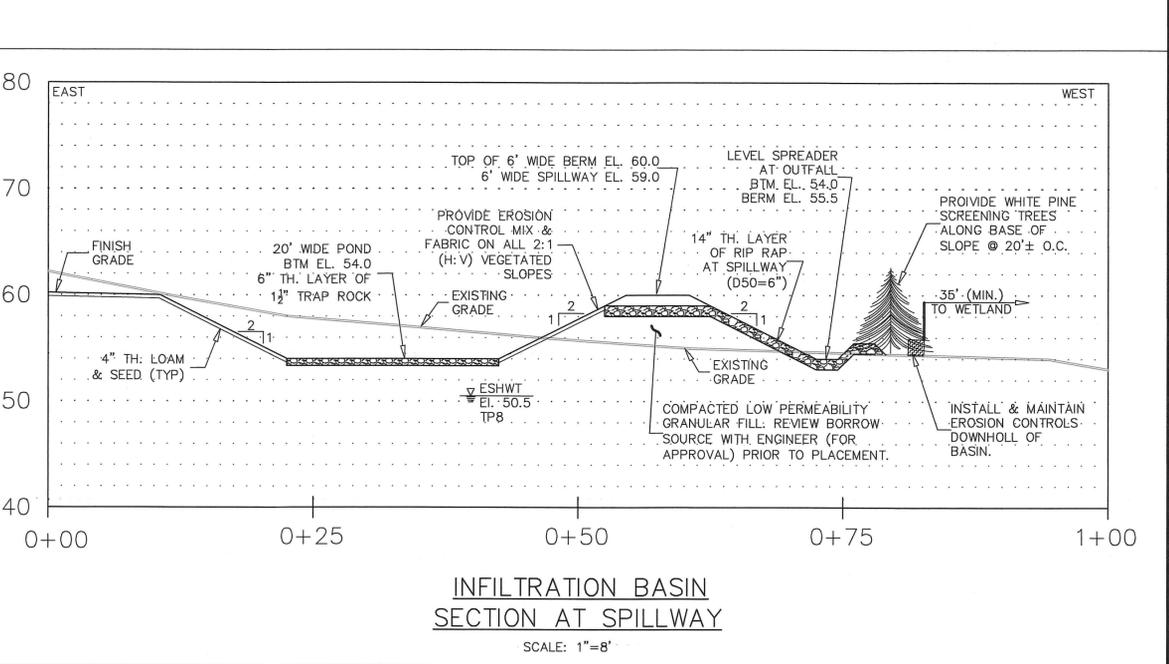
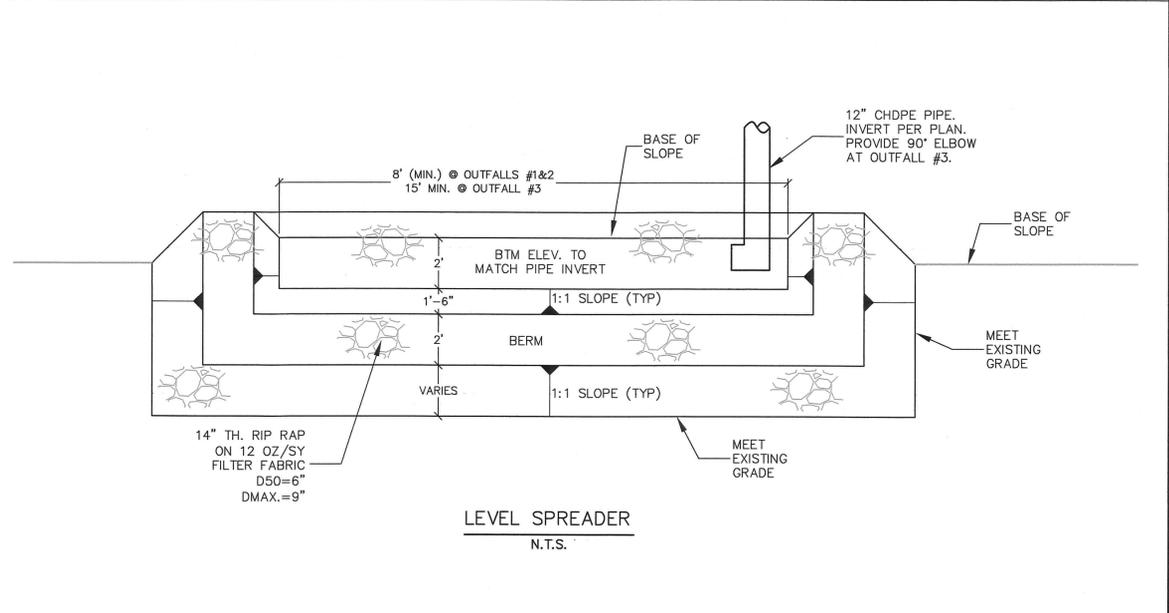
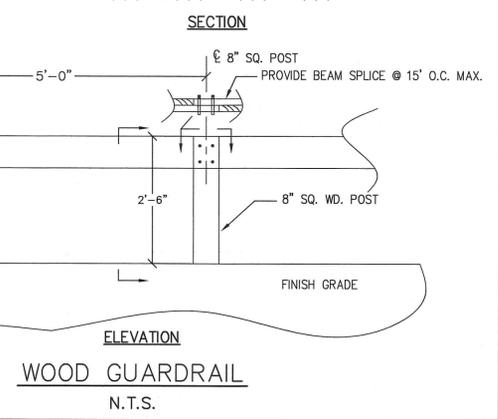
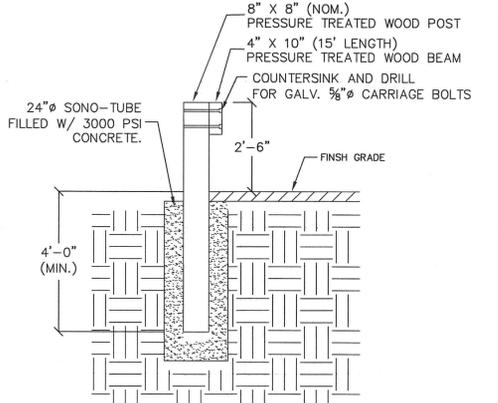
HICKORY HILL WAY
DETAILS II

Scale: AS SHOWN
Job No.: 1665
File Name: p/p/b/c
Date: 12/20/17

C-8



NOTES:
1. ALL STEEL TO BE ASTM A36, U.N.O.
2. ALL BOLTS THRU WOOD TO BE ASTM A307.
3. ALL STEEL, BOLTS, NUTS AND WASHERS TO BE GALVANIZED.
4. ALL WOOD TO BE SPRUCE PINE-FIR #2, W/ THE FOLLOWING PROPERTIES:
F_y = 875 psi, F_v = 85 psi, F_c = 600 psi, E = 1,400,000 psi
5. PRESERVATIVE PRESSURE TREAT ALL WOOD AFTER FABRICATION, WITH CHROMATED COPPER ARSENATE, TO A 0.60 pcf RETENTION. EACH PIECE SHALL BE STAMPED AND RATED FOR GROUND CONTACT.



NOTES:
1) PROPOSED FIELD DIMENSIONS 30' x 33'.
2) MANUFACTURED BY STORMTECH OF 20 BEAVER ROAD, SUITE 104, WETHERSFIELD, CT 06109 USA 888-892-2694
3) CONTRACTOR TO REMOVE ANY TOPSOIL, SUBSOIL & URBAN FILL FROM BELOW THE INFILTRATION FIELD AND ESTABLISH BOTTOM OF FIELD GRADE WITH CLEAN SAND MEETING THE SPECIFICATIONS OF "TITLE 5" SAND.

I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
DATE _____
FOR REGISTRY USE ONLY

_____, CLERK OF THE CITY OF BEVERLY, MA, CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE BEVERLY PLANNING BOARD HAS BEEN RECEIVED AND RECORDED IN THIS OFFICE AND THAT NO APPEAL WAS RECEIVED DURING THE TWENTY (20) DAYS NEXT AFTER SUCH NOTICE AND RECORDING OF SUCH NOTICE.
BEVERLY CITY CLERK _____ DATE _____

CITY OF BEVERLY PLANNING BOARD

DATE: _____

No.	Date	Description
1	3/14/18	REVISE BASIN SECTION

Revisions

Robert Griffin
ROBERT H. GRIFFIN
CIVIL ENGINEER
#50688
3.14.18

Griffin Engineering Group, LLC
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Beverly, MA 01915
Tel: 978-927-5111
Fax: 978-927-5103

BENCO LLC
#20, #30, & #40
WEBSTER AVENUE
BEVERLY, MA

HICKORY HILL WAY
DETAILS III

Scale: AS SHOWN
Job No.: 1665
File Name: p/p/b/c
Date: 12/20/17

C-9

