FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

July 2, 2025

Tim Pearson
Conservation Agent
Littleton Conservation Commission
37 Shattuck Street
P.O. Box 1305
Littleton, MA 01460

RE: Request for Amendment to Order of Conditions for DEP#204-0991,
The Reconstruction of Foster Street, MassDOT Project #609054
Littleton, MA.

Attached:

- Groundwater test pit results summary
- Alternatives analysis for replacement of leaching catch basins
- Plan set markup and detail of crushed stone diaphragm trench
- Equivalency calculations for leaching catch basins and crushed stone diaphragm trench

CC: Stephen Jahnle, DPW Director, Town of Littleton; Chris Deloge, Resident Engineer, MassDOT

Dear Commission Members:

On behalf of the Town of Littleton Department of Public Works director Stephen Jahnle, we are requesting an Amended Order of Conditions for the Reconstruction of Foster Street Project (MassDEP File No. 204-0991). The Order of Conditions (OOC) was issued on December 12, 2023. The request is for an allowance for the reduction in the proposed number of leaching catch basin structures from 5 to 1 due to the discovery of high seasonal groundwater throughout the project limits during construction. To replace the stormwater storage volume that the 4 leaching catch basins would have provided, a 100ft crushed stone diaphragm is now proposed at the roadside of Foster Street to offset the loss of the 4 leaching catch basins.

Following up from our last appearance before the commission on 6/10/2025. We have performed the following actions:

- 3 additional groundwater test pits were performed within the Foster Street corridor. The total of groundwater test pits performed on site now total 10 distributed throughout the 0.7-mile corridor.
- An alternatives analysis narrative has been created describing stormwater infiltration options to replace the 4 leaching catch basins.

- Prepared revised plans, details, and volumetric calculations showing a 100ft long crushed stone diaphragm trench along the side of Foster Street designed to provide an equivalent amount of stormwater storage for infiltration as compare to the 4 leaching catch basins that could not be installed.

Background

The project was permitted as a limited project and a redevelopment project for road widening less than one lane due to the addition of a paved shared-use path. As a redevelopment project, Stormwater standard #7 was responded to by the following in the NOI, "This project is a redevelopment project. Standards 2, 3, and 4 are met to the maximum extent practicable. Standards 1, 8, 9, and 10 are met fully".

The project plans originally included 5 MassDOT standard underground leaching cement concrete catch basin structures, 4.0' x 6.5' in dimensional size, located along the back of curb on Foster Street. The 5 leaching catch basins were each connected to a proposed new traditional deep sump catch basin for added groundwater recharge. Three of the leaching catch basins were located inside of the 100' buffer area to BVW. Design guidelines require that seasonal high groundwater be at least a minimum 2ft below the bottom of the proposed leeching catch basin structures for stormwater infiltration.

The project did not include groundwater elevation testing during the design phase due to the invasive nature of the tests adjacent to or in some cases within a public roadway. Groundwater test pits were performed during construction to determine estimated seasonal high groundwater elevation by a licensed soil evaluator in Massachusetts. The results of the groundwater test pits have shown that seasonal high groundwater elevations are too high for the installation of the proposed leaching catch basins at each the original proposed 5 locations. See attached markup of the project plans showing the location of the groundwater test pits and a memo from Dillis & Roy, a firm specializing in soil evaluation, describing the estimated seasonal high groundwater results at each test pit location.

At nine of the ten test pit locations, the estimated seasonal high groundwater was 5.0ft or less in depth from the ground surface. Neither a standard MassDOT leeching catch basin nor the smallest size available leeching basin structure, a mini-leeching catch basin, are feasible for installation. The standard MassDOT leeching catch basins requires a minimum of 8.5 feet of seasonal high groundwater depth, while the mini-leeching catch basin would require a minimum of 5.9 feet in depth. See attached construction details of the available leeching basin structures.

One test pit location, Test Pit-33, had an estimated high seasonal groundwater of 9ft in depth. This is enough depth for the installation of a standard MassDOT catch basin. One new proposed leeching basin is proposed here along the southerly curbline Foster Street, approximately 200ft west of Balsam Lane. The location is outside of the 100ft buffer area to BVW. In summary, 5 leaching catch basins were proposed in the original permitting plans, however one leaching catch basin is now proposed due to the discovery of high groundwater throughout most of the project corridor.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Abutter Notification

An abutter's list was sourced from the Town of Littleton assessor's office including abutters that are 1,000ft from the linear project limits in accordance with M.G.L. Chapter 131: Section 40. Notification was sent the day of this request.

Sincerely,

Aaron Keegan, PE
Project Engineer
Fuss & O'Neill, Inc.
(413) 333-5461
aaron.keegan@fando.com

GROUNDWATER TEST PIT RESULTS
SUMMARY DATA

DILLIS & ROY
CIVIL DESIGN GROUP

WWW.DILLISANDROY.COM
PH. 978.779.6091
F. 978.779.0260

CIVIL ENGINEERING LAND SURVEYING WETLAND CONSULTING

Groundwater Elevation Test Method Memorandum

JN 8313

Date: September 26, 2024

Revised: June 20, 2025

To: Bryan Blackerby, Onyx Corporation

From: Francis McPartlan, PE (MA)

CC: Jack Maloney, Dillis & Roy Civil Design Group

RE: Ground Water Elevation Test Results

Foster Street

Littleton, Massachusetts

Jack Maloney, Massachusetts Soil Evaluator Number SE13704, determined the depth to estimated seasonal high groundwater (ESHGW) at four (4) test pits. The test pits were excavated by Onyx Corporation using vacuum excavation methodology on September 26, 2024.

Test Pit	Total Depth	ESHGW
TP-22	44 inches	36 inches
TP-24	44 inches	34 inches
TP-25	46 inches	38 inches
TP-27	**70 inches**	**60 inches**

Additional test pits were excavated by Onyx Corporation using vacuum excavation methodology on October 25, 2024.

Test Pit	Total Depth	ESHGW
TP-32	38 inches	36 inches
TP-33	108 inches	>108 inches

An additional test pit was excavated by Onyx Corporation using vacuum excavation methodology on November 13, 2024.

Test Pit	Total Depth	ESHGW
TP-6+80	48 inches	48 inches

Three additional test pits were excavated by Onyx Corporation using vacuum excavation methodology on June 20, 2025. TP-1 is located at STA 0+70, 20' left at the intersection of Foster Street and Taylor Street. TP-2 is located at STA 34+28, 20' left on Foster Street. TP-3 is located at STA 35+80, 20' left.

Test Pit	Total Depth	ESHGW	Refusal
TP-1	55 inches	42 inches	N/A
TP-2	18 inches	N/A	18 inches
TP-3	36 inches	N/A	36 inches

MASSDOT 125644 - RECONSTRUCTION OF FOSTER STREET - LITTLETON, MA
TEST PIT EXPLORATION PLAN / TRACKING RECAP

Updated 9/17/2024

TEST PIT #	LOCATION	DESCRIPTION	DWG SHEET NO.	NOTES / COMMENTS	WIDTH	LENGTH	DEPTH	TOTAL CY	DATE PERFORMED
TP-01	STA 3+29.29, 11.0 R	PROP. TEST PIT - GAS , DRAINAGE	57	PR-CB-03: 2'-4" DEEP FROM TOP OF ASPHALT 8" PLASTIC GAS; 2'-4" FROM CENTER OF CB TO GAS	1.00	1.00	2.33	0.09	9/4/2024
TP-02	STA 6+81.35, 11.0 R	PROP. TEST PIT - GAS, PROP. WATER & PROP. DRAINAGE	58	PR-CB-04: 2'-3" DEEP FROM TOP OF ASPHALT TO GAS; APPEARS CB4 WILL FIT	1.00	1.00	2.25	0.08	9/4/2024
TP-03	STA 7+11.5, 4.25 RT	PROP. TEST PIT - GAS, PROP. WATER, AND CB	58	2'-3" DEEP FROM TOP OF ASPHALT TO GAS	1.00	1.00	2.25	0.08	9/4/2024
TP-04	STA 8+65.5, 12.25 RT	PROP. TEST PIT - GAS	58	2'-7" DEEP FROM TOP OF ASPHALT TO GAS	1.00	1.00	2.58	0.10	9/4/2024
TP-05	STA 10+29.83, 3.83 RT	PROP. TEST PIT - GAS, PROP. WATER , DRAIN	59	GAS: 8" PLASTIC GAS 10FT OFF FROM PROPOSED TEST PIT, 3FT DOWN FROM TOP OF ASPHALT	2.00	2.00	3.50	0.52	9/16/2024
TP-06	STA 13+92.42, 13.00 RT	PROP. TEST PIT - GAS	59	GAS: 2'-7" DEEP FROM TOP OF ASPHALT TO GAS	3.00	3.00	2.50	0.83	9/4/2024
TP-07	STA 16+81.33, 2.37 RT	PROP. TEST PIT - GAS & PROP. DRAIN	60	REMODEL EX-CB-18 - NEW RCP	1.80	1.50	3.00	0.30	9/4/2024
TP-08	STA 22+60.33, 8.85 RT	PROP. TEST PIT - GAS & PROP. DRAIN	61	PR-CB-09	1.50	1.50	2.30	0.19	9/4/2024
TP-09	STA 23+98.33, 5.08 RT	PROP. TEST PIT - GAS & PROP. DRAIN	61	PR-CB-11 & RCP: 2'-4" DEEP FROM TOP OF ASPHALT TO GAS	1.00	1.00	2.30	0.09	9/4/2024
TP-10	STA 25+87.04, 5.19 RT	PROP. TEST PIT - GAS	62	PR-CB-12 & RCP: 3" STEEL FOUND 2'-8" DEEP FROM TOP OF ASPHALT	1.00	1.00	2.67	0.10	9/4/2024
TP-11	STA 26+32.25, 4.62 RT	PROP. TEST PIT - GAS	62	3" STEEL FOUND 3FT DOWN FROM TOP OF ASPHALT	1.50	1.50	3.00	0.25	9/4/2024
TP-12	STA 31+69.06, 6.77 RT	PROP. TEST PIT - GAS & PROP. DRAIN	63	REMODEL EX-DMH-12 - NEW RCP: GAS 4'-3" FROM TOP OF ASPHALT, DRAIN 2'-10" DOWN; WATER 5' DOWN	3.00	3.00	5.00	1.67	9/5/2024
TP-13	STA 35+94.04, 6.85 RT	PROP. TEST PIT - GAS & PROP. DRAIN	64	PR-CB-17: GAS LINE 3'-2" DOWN FROM TOP OF ASPHALT 5'-6" OFF OF PROPOSED TESET PIT (OFF EDGE OF ROAD)	1.50	1.50	3.17	0.26	9/5/2024
TP-14	STA 38+00, 10.5 RT	PROP. TEST PIT - GAS & PROP. WATER	64	GAS 3'-5" DOWN FROM TO OF ASPHALT; WATER 5'-7" DOWN FROM TOP OF ASPHALT (10" DI PIPE)	1.50	1.50	5.58	0.47	9/5/2024
TP-15	STA 39+10.17, 8.25 RT	PROP. TEST PIT - GAS & PROP. WATER	64	PROPOSED HYDRANT: GAS 3' DOWN FROM TOP OF ASPHALT DIRECTLY UNDER HMA BERM; WATER NOT FOUND - NEED LWD TO LAYOUT	2.00	5.00	7.00	2.59	9/5/2024
TP-16	STA 39+25.5, 8.92 RT	PROP. TEST PIT - WATER, GAS	64	WATER MAIN 5FT DOWN FROM TOP OF ASPHALT; DIRECTLY UNDER EDGE OF ROAD	2.50	2.50	5.50	1.27	9/16/2024
TP-17	STA 35+96.5, 7.08 LT	PROP. TEST PIT - GAS, DRAINAGE	64	PR-GI-02: GAS FOUND 3' DOWN FROM TOP OF ASPHALT	1.50	1.50	3.00	0.25	9/5/2024
TP-18	STA 31+66.5, 12.58 LT	PROP. TEST PIT - GAS & PROP. DRAIN	63	PR-CB-14: GAS FOUND 3'-9" DOWN FROM TOP OF ASPHALT	1.50	1.50	4.00	0.33	9/5/2024
TP-19	STA 30+71.2, 15.83 LT	PROP. TEST PIT - GAS	63	PROPOSED GRANITE CURB: 2" STEEL LINE FOUND 2'-8" DOWN FROM TOP OF ASPHALT, 8" STEEL LINE FOUND 3'9" DOWN FROM TOP OF ASPHALT	1.50	1.50	4.00	0.33	9/5/2024
TP-20	STA 29+65.8, 15.67 LT	PROP. TEST PIT - GAS, CURB	62	PROPOSED GRANITE CURB: 2" STEEL LINE FOUND 2'-8" DOWN FROM TOP OF ASPHALT, 8" STEEL LINE FOUND 3'-5" DOWN FROM TOP OF ASPHALT	1.50	1.50	3.50	0.29	9/5/2024
TP-21	STA 26+36.1, 19.04 LT	PROP. TEST PIT - GAS	62	GAS: 12" STEEL PIPE 2'-10" DOWN FROM TOP OF ASPHALT	2.00	2.00	3.00	0.44	9/16/2024
TP-22	STA 25+88.81, 20.83 LT	TEST PIT - GROUNDWATER ELEVATION	62	LB-05: NO GROUNDWATER ENCOUNTERED; PREVIOUS TOP OF GROUNDWATER MEASUREMENT 3FT FROM TOP OF ASPHALT.	2.00	2.00	3.67	0.54	9/16/2024
TP-23	STA 25+23.75, 8.17 LT	PROP. TEST PIT	62	STREET ELEVATION 236.45. 3" ST LINE 2'-6" DEEP FROM TOP OF ASPHALT. 9'-3" DEAD ENDED FROM FACE OF CURB	3.00	3.00	3.00	1.00	9/4/2024
TP-24	STA 22+59.77, 21.25 LT	TEST PIT - GROUNDWATER ELEVATION	61	LB-04: NO GROUNDWATER ENCOUNTERED; PREVIOUS TOP OF GROUNDWATER MEASUREMENT 3FT FROM TOP OF ASPHALT.	2.00	2.00	3.67	0.54	9/16/2024
TP-25	STA 16+89.53, 21.67 LT	TEST PIT - GROUNDWATER ELEVATION	60	LB-03: NO GROUNDWATER ENCOUNTERED; PREVIOUS TOP OF GROUNDWATER MEASUREMENT 3'-2" FROM TOP OF ASPHALT.	2.00	2.00	3.83	0.57	9/16/2024
TP-26	STA 14+11.89, 12.25 LT	TEST PIT - WATER, DRAIN	59	PR-DMH-05: WATER PIPE 5FT DOWN TO TOP OF PIPE; DRAINAGE PIPE 2'-4" TO TOP OF PIPE	2.00	2.00	5.33	0.79	9/16/2024
TP-27	STA 14+04.57, 20.83 LT	TEST PIT - GROUNDWATER ELEVATION	59	LB-02: NO GROUNDWATER ENCOUNTERED; PREVIOUS TOP OF GROUNDWATER MEASUREMENT 5FT FROM TOP OF ASPHALT.	2.00	2.00	5.83	0.86	9/16/2024
TP-28	STA 6+81.56, 14.58 LT	TEST PIT - WATER & PROP. DRAIN	58	PR-CBDB-01 - LOCATED ON BACKSIDE OF BERM - 5.25FT DEEP; STREET ELEVATION 209.06	2.00	4.00	5.25	1.56	9/3/2024
TP-29	STA 6+79.86, 22.08 LT	F&C TEST PIT REQUIRED FOR GROUNDWATER ELEVATION	58	LB-01 - NO GROUNDWATER FOUND	1.00	1.00	6.00	0.22	9/3/2024
TP-30	STA 3+31.83, 6.83 LT	PROP.TEST PIT - WATER & PROP. DRAIN	57	PR-GI-01 - 4.5 FT DEEP 12" AC MAIN	2.00	4.00	4.50	1.33	9/3/2024
TP-31	STA 3+9.25, 15.5 LT	PROP. TEST PIT - TELECOM, CURB	57	PROPOSED CURBING - 4.5' DEEP TWO (2) DIRECT BURIAL LINES\	1.00	1.00	4.50	0.17	9/3/2024

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E1	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NO SET TEST PITS.DWG Plotted on 5-Jun-2025 4:16 PM

DANIEL SWEENEY (CLASS A TRUSTEE)
ARTURO J. GUTIERREZ, JOHN A. CATALDO (CLASS B TRUSTEES)
TAYLOR STREET, LITTLETON TRUST
BK/PG 32096/213
PARCEL #R10 6 0
TAYLOR STREET

LIMIT OF WORK
STA 205+00.00
N3012961.1405
E653254.4720

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

2641–2651 SANTA ANNA AVENUE, LLC
BK/PG 68756/572
PLAN NO 1425 OF 1981
PARCEL #R10 2 1
305 FOSTER STREET

CONTINUED ON SHEET NO. 10

NAD 83

NEW TEST PIT
JUNE 2025,
LOCATON #1
ESHGW=42"

BEGINNING OF PROJECT
PROJ. NO. 609054
STA 0+00.00
N3012786.8847
E653296.9381

STA 203+20.63 ALIGN_TAYLOR = STA 0+00.00 ALIGN_FOSTER
N 3012786.8847 E 653296.9381

TAYLOR STREET (PUBLIC)

FOSTER STREET (PUBLIC)
N 70° 36' 10" E 403.30'

2018 TOWN LAYOUT

PT +57.68
N 12° 51' 04" W 96.62'

Δ=4° 01' 39"
L=249.54' R=3550.00'

PC +08.14
N 16° 52' 43" W 208.14'

PC +03.30
Δ=7° 27' 10"
L=130.08' R=1000.00'

1959 SHLD No. 4853

DMH 2
RIM=332.72'
CB 1
RIM=332.18'
CB 3
RIM=332.13'
CB 4
RIM=315.95'

T.B.M.
SPIKE IN U.P. #104
ELEV.=305.59

DANIEL SWEENEY (CLASS A TRUSTEE)
ARTURO J. GUTIERREZ, JOHN A. CATALDO (CLASS B TRUSTEES)
TAYLOR STREET, LITTLETON TRUST
BK/PG 32096/215
PLAN 1268 OF 1957
PARCEL #R10 7 0
225 TAYLOR STREET

JOHN K. GRADY, TRUSTEE OF THE
FOSTER/TAYLOR REALTY TRUST
BK/PG 25198/143
PLAN NO 228 OF 1992
PARCEL #R09 32 0
230 TAYLOR STREET

TEST PIT-32
ESTIMATED
SEASONAL HIGH
GROUND WATER= 36"

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF
CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

FOR PROFILE: SEE SHEET NO. 17

SCALE: 1" = 20'

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	HT.	QTY.	SIZE
TREES					
AC	ACER RUBRUM	MAPLE–RED–'OCTOBER GLORY'	50	5	2"–2.5" CAL.

PLANTING LEGEND

- PROPOSED TREE PLANTING
- X / XX — PLANT QUANTITY AND SPECIES

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E2	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 11

N

NAD 83

2641–2651 SANTA ANNA AVENUE, LLC
BK/PG 68756/572
PLAN NO 1425 OF 1981
PARCEL #R10 2 1
305 FOSTER STREET

TEST PIT-29
ESTIMATED
SEASONAL HIGH
GROUNDWATER= 48"

LEACHING 01 CATCH BASIN WAS PROPOSED HERE. GROUNDWATER TOO HIGH.

ASIJA PROPERTIES, LLC & SANDEEP ASIJA
BK/PG 70688/365
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF
CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

FOSTER STREET (PUBLIC)

T.B.M. SPIKE IN U.P. #104 ELEV.=305.59

NOTE: C.B. 5 IS A DOUBLE SIZED STRUCTURE.

2018 TOWN LAYOUT

C +03.30
Δ=7° 27' 10"
L=130.08' R=1000.00'
PT +33.38
PC +48.87
N 63° 09' 00" E 15.49'
L=104.10' R=650.00'
Δ=9° 10' 33"
PT +52.96
N 72° 19' 32" E 376.71'
PC +29.68
L=98.9

B200 START
B201
B202
B203
B204
INTERMITTENT STREAM
C300
C301

100' BUFFER TO RESOURCE AREA
50' BUFFER TO RESOURCE AREA (LITTLETON)

A100 START
A101
A102
A103
A104
A105
A106 END
UNAMED OPEN BODY OF WATER

FOR PROFILE: SEE SHEET NO. 18

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E3	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

TEST PIT-25
ESTIMATED
SEASONAL HIGH
GROUNDWATER= 38"

LEACHING 02 CATCH
BASIN WAS PROPOSED
HERE. GROUNDWATER
TOO HIGH.

N

NAD 83

CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 12

EP ASIJA

ASIJA PROPERTIES, LLC
BK/PG 70688/3[illegible]
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF
CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

ANTHONY J. RIZZOLO, JR. & JOSEPHINE RIZZO
BK/PG 17691/108
PLAN NO 831 OF 1973
PARCEL #R09 [illegible] G
290 FOSTER STREET

FOSTER STREET
(PUBLIC)

B200 START
B201
B202
B203
B204
INTERMITTENT STREAM
C300
C301
INV 60" RCP
EL=245.64'
INV 60" RCP
EL=244.91'
CATV (COMCAST)
D400 START
D401
D402
D403
D404
D405
D406
D407
D408
D409
D410
INV 12" PVC
EL=250.24'
NOTE:
C.B. 10 IS A
DOUBLE-SIZED
STRUCTURE.
T.B.M.
SPIKE IN U.P. #99
ELEV.=265.19
T.B.M.
SPIKE IN U.P. #95
ELEV.=254.5
50' BUFFER TO RESOURCE AREA (LITTLETON)
100' BUFFER TO RESOURCE AREA
2018 TOWN LAYOUT
2016 TOWN LAYOUT
CB 10
RIM=265.16'
CB 11
RIM=265.34'
DMH 9
RIM=265.69'
CB 12
RIM=266.18'
DMH 15
RIM=254.68'
CB 14
RIM=254.44'
PC +29.68
Δ=1° 25' 01"
L=98.93' R=4000.00'
PT +28.61
PC +80.50
N 70° 54' 31" E 151.90'
Δ=35° 26' 20"
L=315.49' R=510.00'
DR1-1
C2
D2
10
11
12
13
14
15
EDGE OF PAVEMENT
STONE WALL
WOODS
TREE LINE
CULVERT #1
8"HW
12" RCP
20" RCP FE
EL=263.65'
POSTS
UNAMED
OPEN BODY OF WATER
A100 START
A101
A102
A103
A104
A105
E500 START
E501
WF#E502
FOR PROFILE: SEE SHEET NO. 19

0 20 50 100
SCALE: 1" = 20'

20170044A21_HPN01 NO SET TEST PITS.DWG Plotted on 6-Jun-2025 5:38 PM

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E4	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

TEST PIT-25
ESTIMATED
SEASONAL HIGH
GROUNDWATER= 38"

LEACHING 03 CATCH
BASIN WAS PROPOSED
HERE. GROUNDWATER
TOO HIGH.

ASIJA PROPERTIES, LLC & SANDEEP ASIJA
BK/PG 70688/365
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

CONTINUED ON SHEET NO. 11

CONTINUED ON SHEET NO. 13

JORDAN S. MCCATHERIN
BK/PG 62917/52
PARCEL #R10 1 0
277 FOSTER STREET

FOSTER STREET
(PUBLIC)

BULKELEY ROAD
(PUBLIC)

Δ=35° 26' 20"
L=316.45' R=510.00'

N 35° 28' 10" E 184.96'

PT +95.95

PC +80.91

Δ=9° 16' 42"
L=348.16' R=2150.00'

2018 TOWN LAYOUT

1950 TOWN LAYOUT SEE SHLO NO. 3786

1950 TOWN LAYOUT SEE

50' BUFFER TO RESOURCE AREA (LITTLETON)

100' BUFFER TO RESOURCE AREA

ANTHONY J. RIZZOLO, JR. & JOSEPHINE RIZZOLO
BK/PG 17691/108
PLAN NO 831 OF 1973
PARCEL #R09 5 G
290 FOSTER STREET

BROCKTON KENYON & AINE COLLINS
BK/PG 72894/208
PLAN NO 831 OF 1973
PARCEL #R09 5 F
286 FOSTER STREET

GREGORY & SHERI BALZOTTI
BK/PG 50902/470
PLAN NO 831 OF 1973
PARCEL #R09 5 E
284 FOSTER ST

JOSEPH W. & AMANDA LENNON,
LIVING TRUSTEES OF THE
AMANDA+JOSEPH LENNON LIVING TRUST
BK/PG 64219/262
PLAN NO 1628 OF 1972
PARCEL #R09 5 A
3 BULKELEY ROAD

FOR PROFILE: SEE SHEET NO. 20

0 20 50 100

SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E5	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

TEST PIT-24
ESTIMATED SEASONAL
HIGH GROUNDWATER= 34"

LEACHING 04 CATCH BASIN WAS PROPOSED HERE. GROUNDWATER TOO HIGH.

NAD 83

CONTINUED ON SHEET NO. 12

CONTINUED ON SHEET NO. 14

JORDAN S. MCCATHERIN
BK/PG 62917/52
PARCEL #R10 1 0
277 FOSTER STREET

HIGHWAY LAYOUT NO. 3675
BK. 7515 PG. 424

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1949 STATE HIGHWAY LAYOUT NO. 3675
BK/PG 7515/424

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1950 STATE HIGHWAY LAYOUT NO. 3711
BK/PG 7553/391

TOWN OF LITTLETON
BK/PG 7551/414

MASSACHUSETTS DEPART
1950 STATE HIGHW
BK/PG

JOSEPH W. & AMANDA LENNON,
LIVING TRUSTEES OF THE
+JOSEPH LENNON LIVING TRUST
BK/PG 64219/262
PLAN NO 1628 OF 1972
PARCEL #R09 5 A
3 BULKELEY ROAD

BONNIE COOPER & GINNY M. MAHER-COOPER
BK/PG 32345/306
PLAN NO 1018 OF 1972
PARCEL #R09 1 0
2 BULKELEY ROAD

FOSTER STREET
(PUBLIC)

BULKELEY ROAD
(PUBLIC)

BRIDGE NO. L-13-017

ROUTE 2
OVERPASS
MASS. BRIDGE
NO. L-13-017

1950 TOWN LAYOUT SEE SHLO NO. 3786

1950 STATE HIGHWAY LAYOUT NO. 3711

100' BUFFER TO RESOURCE AREA

50' BUFFER RESOURCE AREA (LITTLETON)

Δ=9° 16' 42"
L=348.16' R=2150.00'

PT +29.08

PT +46.88

PC +04.83

MHB FD TOP

MHB FD BRKN

MHB FD

MHB FD W/LP

T.B.M.
SPIKE IN U.P. #91
ELEV.=246.01

CB 20
RIM=233.72

CB 19
RIM=233.67

INV 48" RCP
EL=227.66'

INV 48" RCP
EL=227.80'

INV 15" CMP
EL=242.48'

INV 15" CMP
EL=229.47'

12" RCP D

15" CMP D

G700 START

G701

G702

G703

F600 3'0/C

F601 4'0/C

F602 4'0/C
INTERMITTENT STREAM

F603 1'0/C

F604 END 1'

FOR PROFILE: SEE SHEET NO. 21

0 20 50 100

SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E6	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

TEST PIT-22
ESTIMATED SEASONAL HIGH GROUNDWATER= 36"

LEACHING 05 CATCH BASIN WAS PROPOSED HERE. GROUNDWATER TOO HIGH.

NAD 83

VAF I 265 FOSTER LLC
BK/PG 80433/278
PLAN NO 266 OF 1987
PARCEL #R11 1 0
265 FOSTER STREET

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
(PARCEL FBL 3-A)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

(MBTA)
BK/PG 13117/113
PARCEL #R11 2 0

JUNE 30, 1914 RAILROAD SIDELINE

1948 STATE HIGHWAY LAYOUT NO. 3675
BK/PG 7515/424

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1950 STATE HIGHWAY LAYOUT NO. 3711
BK/PG 7553/391

TOWN OF LITTLETON
BK/PG 7551/414

(MBTA)
BK/PG 13117/113
PARCEL #R08 37 0

LITTLETON AFFORDABLE HOUSING TRUST FUND
BK/PG 82357/132
PARCEL #R08 15 0
260 FOSTER STREET

FOSTER STREET
(PUBLIC)

GRIMES LANE
(PUBLIC)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
(f/ BOSTON & MAINE RAILROAD)

1951 SHLO NO. 3535

1950 SHLO NO. 3711

2018 TOWN LAYOUT

100' BUFFER TO RESOURCE AREA

50' BUFFER RESOURCE AREA (LITTLETON)

PC +04.83
PT +46.88
PC +87.53
PT +57.06
PT +65.58
301+95.23

INV 48" RCP EL=227.66'
INV 48" RCP EL=227.80'
INV 15" CMP EL=242.48'
INV 15" CMP EL=229.47'
INV 12" HDPE EL=246.66'
INV 12" RCP EL=246.59'
INV 4X2" STONE EL=236.38'

DMH 37 RIM=248.31'
CB 21B RIM=247.62'
CB 21A RIM=251.60'
DMH 39 RIM=251.10'
CB 21 RIM=250.63'
CB 22 RIM=255.13'
CB 23 RIM=255.13'

T.B.M.
SPIKE IN U.P. #87
ELEV.=243.99

MHB FD W/LP
MHB FD
PK
DH

CONTINUED ON SHEET NO. 13

CONTINUED ON SHEET NO. 15

FOR PROFILE: SEE SHEET NO. 21, 22 & 24

0 20 50 100
SCALE: 1" = 20'

20170044A21_HPN01 NOI SET TEST PITS.DWG Plotted on 5-Jun-2025 4:17 PM

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E7	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET TEST PITS.DWG Plotted on 5-Jun-2025 4:17 PM

NAD 83 N

NEW TEST PIT JUNE 2025, LOCATON #2
Ledge encountered at 18" no groundwater measurement possible

TEST PIT-12 GROUND WATER ENCOUNTERED 60" DEEP

CONTINUED ON SHEET NO. 14

CONTINUED ON SHEET NO. 16

MASSACHUSETTS BAY TRANSORTATION AUTHORITY
(PARCEL FBL 3-A)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

MASSACHUSETTS BAY TRANSORTATION AUTHORITY
(PARCEL FBL 3-B)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

SNS FOSTER, LLC & C/O ROBERT LONG
BK/PG 72045/170
PLAN NO 435 OF 2011
PARCEL #R11 3 0
245 FOSTER STREET

LITTLETON AFFORDABLE HOUSING TRUST FUND
BK/PG 82357/132
PARCEL #R08 15 0
260 FOSTER STREET

RICHARD B. VIGNON
BK/PG 13250/70
PLAN NO 847 OF 1969
PARCEL #R08 13
242 FOSTER STREET

FOSTER STREET (PUBLIC)

T.B.M.
SPIKE IN U.P. #83
ELEV.=266.98

CB 21A RIM=251.60
DMH 39 RIM=251.10'
CB 21 RIM=250.63'
CB 22 RIM=255.13'
CB 23 RIM=255.13'
CB 24 RIM=260.31'
CB 25 RIM=262.28'
CB 26 RIM=260.68'
DMH 28 RIM=260.06'
DMH 29 RIM=270.50'

INV 12" PVC FE EL=251.64'
INV 12" RCP EL=247.05'
INV 12" RCP EL=246.59'

2018 TOWN LAYOUT

100' BUFFER TO RESOURCE AREA

50' BUFFER RESOURCE AREA (LITTLETON)

NOTE:
NO RECORD OF WATER LINE NORTHEAST OF THIS HYDRANT. WATER LINE IS BELIEVED TO CONTINUE AND IS SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE:
GAS LINE RECORDS NORTHEAST OF THIS VICINITY ARE SCHEMATIC AND ARE SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

PC +86.16

FOR PROFILE: SEE SHEET NO. 22 & 23

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E8	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

CONTINUED ON SHEET NO. 19

NAD 83

N

SNS FOSTER, LLC & C/O ROBERT LONG
BK/PG 72045/170
PLAN NO 435 OF 2011
PARCEL #R11 3 0
245 FOSTER STREET

PATRICIA A. NARGIZIAN
BK/PG 70735/467
PARCEL #R11 5 4
237 FOSTER STREET

END OF PROJECT
PROJ. NO. 609054
STA. 39+36.15
N 3015278.1762
E 656130.7752

NEW TEST PIT JUNE 2025, LOCATON #3
Ledge encountered at 36" no groundwater measurement possible

TEST PIT-33
ESTIMATED
SEASONAL HIGH
GROUNDWATER= 108"

NEW FULL-SIZE
LEACHING CATCH BASIN
INSTALLED HERE

LIMIT OF GRADING

2018 TOWN LAYOUT

FOSTER STREET (PUBLIC)

BALSAM LANE (PUBLIC)

2020 TOWN LAYOUT

Δ=3° 56' 00"
L=204.20' R=2974.57'

PC +86.16
PT +90.37

Δ=9° 19' 15"
L=105.74' R=650.00'

PC +06.15
PT +11.89
N 37° 31' 19" E 86.75'

39+98.64

N 28° 12' 04" E

RICHARD B. VIGNONI
BK/PG 13250/70
PLAN NO 847 OF 1969
PARCEL #R08 13 E
242 FOSTER STREET

QUINN E. & JENNIFER A. CANFIELD
BK/PG 55588/290
PLAN NO 188 OF 1971
PARCEL #R08 13 D
238 FOSTER STREET

NOTE:
NO RECORD OF WATER LINE CONFIGURATION IN THIS AREA. WATER LINE IS SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE:
GAS LINE RECORDS IN THIS AREA ARE SCHEMATIC AND ARE SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE:
C.B. #34 IS A DOUBLE-SIZED STRUCTURE.

C.B. #32 IS A DOUBLE-SIZED STRUCTURE.

C.B. #32
RIM=276.46

C.B. #34
RIM=299.74

CB 30
RIM=276.44'
DMH 31
RIM=276.52'

CB 36
RIM=299.76'
DMH 33
RIM=299.20'

DMH 35
RIM=291.85'

GARDEN
WOODS
LEDGE/ROCK OUTCROP
TREE
STONE WALL
BIT. CONC. BERM
BIT. CONC. DRIVE
LANDSCAPED AREA
GRANITE CURB
BIT. CURB
CONC. WALL
GUARDRAIL
BIT. CONC. SIDEWALK
GRASS
CATV (COMCAST)
8" G TRANSMISSION (NG)
8" AC W
12" RCP D
15" RCP D
2" G (NG)
8" G (NG)
14"PINE
26"PINE
SPIKE IN U.P. #78
ELEV.=289.65
100' BUFFER TO RESOURCE AREA

FOR PROFILE: SEE SHEET NO. 23

0 20 50 100
SCALE: 1" = 20'

ALTERNATIVES ANALYSIS FOR REPLACEMENT OF 4 LEACHING CATCH BASINS

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Alternatives Analysis for Replacement of Leaching Catch Basins
Request for Amendment to Order of Conditions for DEP#204-0991
The Reconstruction of Foster Street, MassDOT Project # 609054
July 2, 2025

The following narrative describes the stormwater infiltration measures that have been evaluated to replace the stormwater infiltration storage volume of the 4 MassDOT Standard leaching catch basins that could not be installed in within the project limits due to high estimated seasonal groundwater throughout the project corridor.

The project corridor along Foster Street, where the 0.6 acres of impervious area are proposed to construct a 10ft wide shared-use path along the roadside, is constrained by the following factors.

- Right of Way: The town owned public road layout of Foster Street is varies between 40 feet and 70 feet wide. The cross section of Foster Street has been minimized for lane width and shared-use path width totaling 40ft wide. This means that in some areas in the corridor, there is no available right of way outside of the road and path cross section limits. There is approx. 15 feet of width at each roadside in areas where the road layout is 70 feet wide. However, there are often other physical constraints that prohibit the use of this area.
- Trees: Foster Street is lined with trees and forest on each side of the road shoulder. Incurring additional tree takings are a constraint when considering widening the project limits to include stormwater control measures such as swales or basins.
- Groundwater Depth: The project has performed 10 test pits by a soil evaluator throughout the corridor. The results show groundwater shallower than 4feet in most locations tested. Only one location had the required groundwater depth, greater than 8.5' to install a MassDOT standard leaching catch basin. See attached test pit results.
- Constructability: The road corridor has existing shoulder slopes in many locations that have steep, 4:1, slopes or greater pitched toward or away from the edge of road. This means that significant cut and/or fill would be required to install stormwater infiltration measures by the roadside that require significant width and mildly sloped grading. Significant cut and fill increase the likelihood of adjacent private property impacts as the project limits must be tied back into existing ground.
- Ledge: The project has significant areas of shallow ledge approx. 4'-5' from the surface. This constraint makes the constructability of deep infiltration systems impractical where the ledge exists.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

The alternatives analysis considered the following six stormwater infiltration countermeasures, mostly from MassDOT's stormwater design guide[1], to offset the 4 leaching catch basins that could not be installed.

- Permeable pavement
- Pavement disconnection
- Infiltration basin
- Linear infiltration or swale
- Subsurface infiltration system
- Crushed stone diaphragm trench

The following graphic summarizes the results of the alternative analysis by displaying a plus sign where an alternative provided an advantage and a negative sign where an alternative presented a drawback.

	Permeable Pavement	Pavement Disconnection	Infiltration Basin	Linear Infiltration or Swale	Subsurface Infiltration System	Crushed Stone Diaphragm Trench
Right-of-Way	+	-	-	+	+	+
Groundwater Elev. Requirement	-	+	-	-	-	+
Maintenance	-	+	-	+	-	-
Tree Impacts	+	-	-	-	+	+
Constructability	-	-	-	-	-	+

The crushed stone diaphragm trench is the proposed alternative to offset the stormwater infiltration storage that could not be installed via the 4 leaching MassDOT standard catch basins. Calculations and plans are included detailing the proposed crushed stone diaphragm trench. Next, each alternative is described in more detail with respect to their respective strengths and weaknesses.

[1] Stormwater Design Guide. MassDOT. 2023 Edition. <https://www.mass.gov/doc/stormwater-design-guide/download>

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

1. Permeable Pavement

Porous pavement is a pavement system designed to allow stormwater to infiltrate through a permeable surface, base, and sub-base. Porous pavement systems provide water quality treatment through filtration and infiltration mechanisms. MassDOT's preferred design for porous pavement is as an exfiltrating system with an underdrain within the reservoir layer to prevent surcharge conditions. F&O considered the possibility of converting an equivalent volume of some portion of the shared-use path to permeable pavement to offset the reduction in leaching catch basins. However, factors such as groundwater depth requirements, maintenance, and constructability resulted in the infeasibility of this alternative.

Table 1: Permeable Pavement Alternative Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• The project ROW would accommodate this alternative if, for example, the 10ft shared-use path was constructed from permeable pavement in the proposed alignment. • The road surfaces within the project limit cannot be constructed from permeable pavement per MassDOT standards due to sand treatment during winter and past MassDOT experience with freeze-thaw cycle damage to permeable road pavement.	• The minimum depth equals: 4" Choker course 8" Filter course 3" Filter blanket 4" Reservoir Course Total Depth= 19" • The minimum depth of est. seasonal high groundwater must be 2ft below the bottom of reservoir course of crushed stone. Using the minimum depth above of 19", the minimum depth of groundwater must be 43". This required minimum depth limits the locations in the project area where permeable pavement is feasible for the shared-use path.	• Not for use in areas that receive sand treatment during winter • Periodic cleaning or vacuuming of the surface is required to remove particulates.	• No Tree impacts anticipated if the shared-use path were constructed from permeable pavement within the project limits.	• Not well suited for use where underground utilities are beneath the pavement. This limits the locations in the project area where permeable pavement is feasible for the shared-use path. • Due to the depth of construction required, may prove challenging to construct given ledge in project area at 4ft depth.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

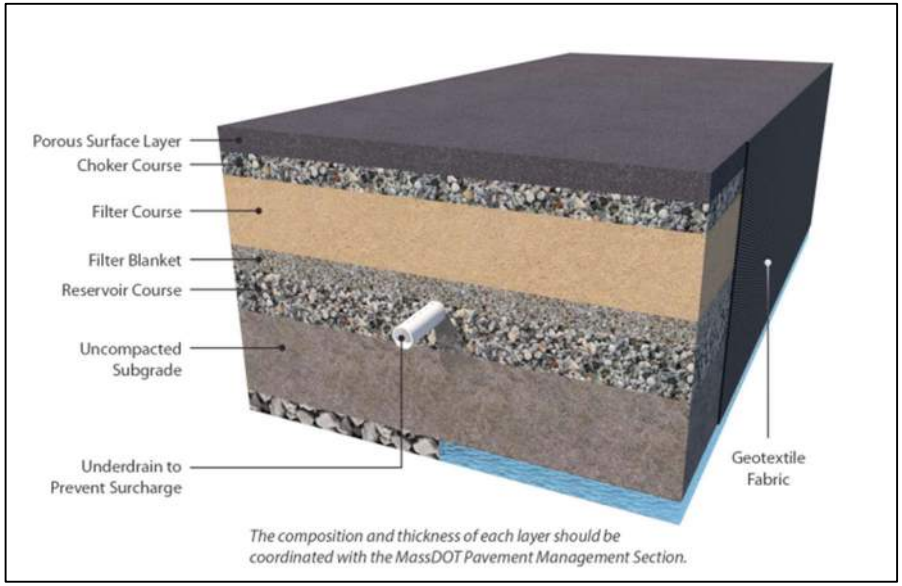


Figure 1: Example of Permeable Pavement Cross Section. Source: MassDOT Stormwater Design Guide (2023 Ed.)

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

2 Pavement Disconnection

Pavement disconnection is a low impact development measure that is also considered an infiltration SCM. This design approach involves directing runoff from impervious areas to vegetated upland areas, which may be intentional or incidental, engineered or natural. Approximately 30 percent of the length of the proposed 10ft wide shared-use path is already designed to be sloped away from the road, Foster Street. The sections of shared-use path that are sloped away from the road drain by sheet flow to vegetated areas. F&O considered the possibility of converting additional sections of the shared-use path to slope toward vegetated areas. However, factors such as ROW constraints, tree impacts, and constructability resulted in the infeasibility of this alternative.

Table 2: Pavement Disconnection Alternative Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• A width of vegetative filter strip equal in width to the contributing impervious area is needed. For the 10ft wide shared-use path, a 10ft wide vegetative filter strip with a slope less than or equal to 5% downgradient from the shared-use path is required. • The project ROW limits and gradients at adjacent private properties limit the locations where pavement disconnection is feasible.	• No minimum est. high seasonal high groundwater is given for this alternative. Although 24-inch minimum separation from groundwater is generally recommended for groundwater recharge.	• General maintenance of vegetative area to maintain sheet flow path of storm runoff.	• In some areas of the project limits, creation of a 10ft wide vegetative strip adjacent to the share-use path would impact existing trees. This would occur where cutting of filling of earth would be required to meet the 5% slope requirement.	• This alternative would result in the resetting of additional stone wall adjacent to the road side. • The 5% maximum gradient requirement for the 10ft wide vegetative strip adjacent to the shared-use path would result in additional cut/fill where the slope limits of the project must meet existing ground elevation. In various locations, the amount of cut/fill required is impractical due to steep embankment slopes at the roadside.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

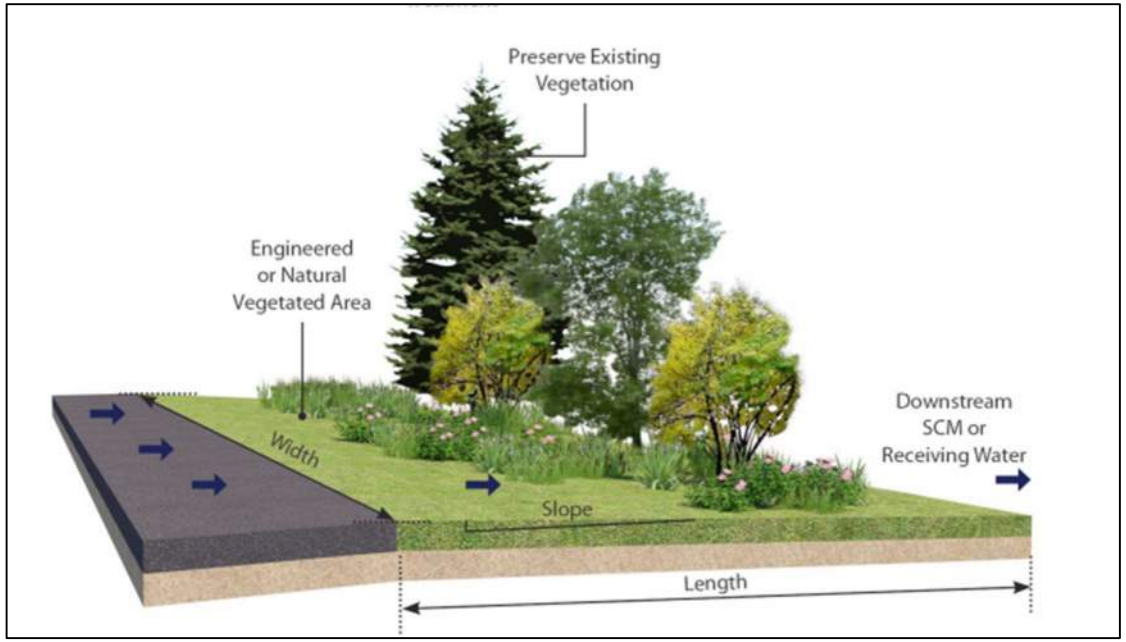


Figure 2: Example of Pavement Disconnection Source: MassDOT Stormwater Design Guide (2023 Ed.)

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

3 Infiltration Basin

Infiltration basins are designed to provide water quality treatment through storage using outlet control and/or behind check dams and infiltrate runoff to groundwater. The project included a conceptual infiltration basin at 25% design stage in 2019. The basin was proposed on MBTA property at 263 Foster Street, the only publicly owned and relatively flat lawn area adjacent to the project corridor. ROW easement complexities and insurance requirements on MBTA property prohibited this infiltration basin from moving forward past 25% design. Given the constrained width of the project ROW, potential tree impacts at the roadside, and groundwater depth requirements, this alternative has been found to be infeasible.

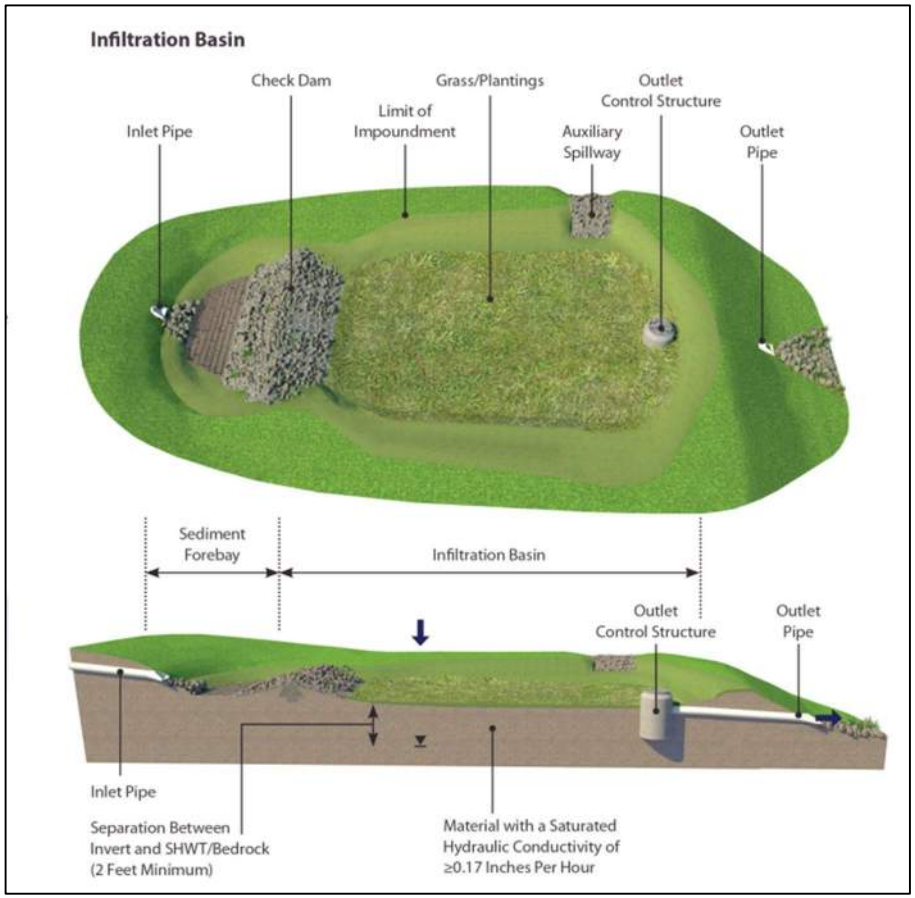


Figure 3: Example of an Infiltration Basin. Source MassDOT Stormwater Guide (2023)

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Table 3: Infiltration Basin Alternative Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• The project ROW limits and gradients at adjacent private properties render the construction of an infiltration basin impractical. Basins are recommended to have a ground slope of 1% maximum.	• An infiltration basin is typically set at a ground elevation to receive flow from an outlet pipe of a closed drainage system. The minimum depth of burial of closed drainage system pipe is typically 2'-3' from elevation of ground cover to bottom of pipe invert. • 24-inch minimum separation from ground surface of the infiltration basin to groundwater is required for groundwater recharge. • Pipe invert depth for inlet pipe plus required separation results in min. ground water depths of 4'-5'. This limits the locations in the project are where this alternative is feasible.	• Maintenance of infiltration basins generally consists of removing the build up of particulates and debris in the basin and maintaining clearance of inlet and outlet pipes.	• Existing trees lining Foster Street and the proposed shared-use path would result in more tree takings if an infiltration basin could be implemented.	• This alternative would result in removal of stone wall adjacent to the roadside. • An infiltration basin would require significant regrading of earth adjacent to the roadside to maintain a 1% ground slope within the infiltration basin. Tying the constructed basin back to existing ground at adjacent private property adjacent to the road is impractical in many locations. • Due to the depth of construction required, may prove challenging to construct given ledge in project area at 4ft depth.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

4 Linear Infiltration or Swale

Infiltration linear practices or swales are essentially a series of infiltration basins in a linear configuration that use the same treatment mechanisms as basins to improve water quality and infiltration. F&O considered the possibility of converting additional areas at the edge of road or edge of shared-use path to infiltrative swales. However, factors such as ROW constraints, tree impacts, and required depth of groundwater resulted in this alternative to be less feasible than alternative 6, crushed stone diaphragm trench.

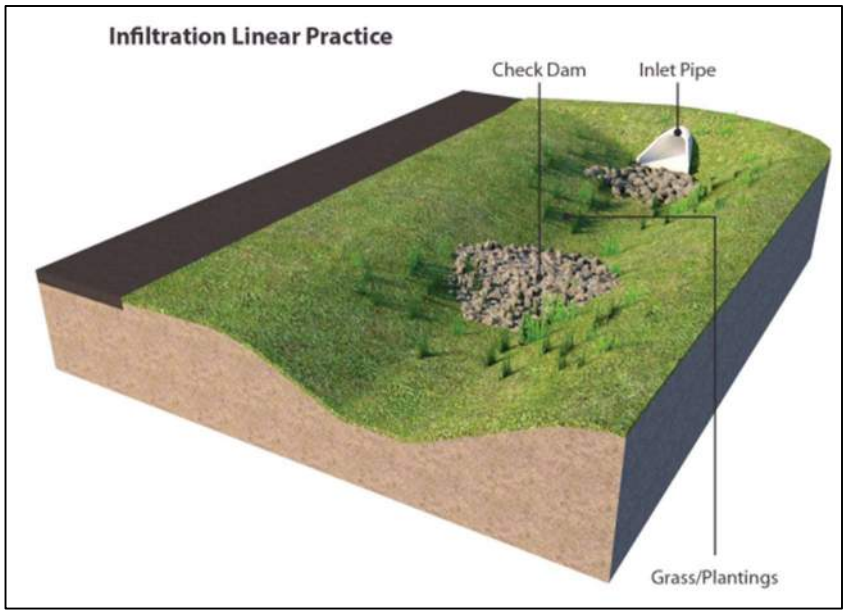


Figure 4: Example of Linear Infiltration Practice. Source: MassDOT Stormwater Guide (2023)

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Table 4: Linear Infiltration or Swale Alternative Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• The project ROW limits at adjacent private properties limit the locations where linear swales are constructable in the project limits at the roadside or at the edge of the share-use path.	• A linear swale is typically set at a ground elevation to receive flow from an outlet pipe of a closed drainage system. The minimum depth of burial of closed drainage system pipe is typically 2'-3' from elevation of ground cover to bottom of pipe invert. • 24-inch minimum separation from the bottom of the swale to groundwater is required for groundwater recharge. • Pipe invert depth for inlet pipe plus required separation results in min. ground water depths of 4'-5'. This limits the locations in the project are where this alternative is feasible.	• Low maintenance. • Maintenance of infiltration swales generally consists of removing the buildup of particulates and debris in the swale and maintaining clearance of inlet and outlet pipes.	• Existing trees lining Foster Street and the proposed shared-use path would result in more tree takings if slope limits are increased to construct swales.	• This alternative would result in additional relocating of stone wall adjacent to the roadside. • The required width of linear swales at the roadside or the back of the shared-use path would be at least 3'-4". In various locations this width is not available due to existing obstructions, trees, or existing embankments. • Linear infiltration swales are not recommended where underground utilizes exist. • Due to the depth of construction required, may prove challenging to construct given ledge in project area at 4ft depth.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

5 Subsurface Infiltration System

Subsurface infiltration systems are underground systems designed to detain stormwater and release it to groundwater through infiltration. F&O considered the possibility of converting segments underneath the proposed shared-use path to a subsurface infiltration system. However, the required depth of groundwater, approx. 4.5ft, resulted in this alternative to be infeasible. The one location where estimated seasonal high groundwater was found to be deep enough to support a subsurface infiltration system was on the opposite side of the road from the shared-use path at STA 35+84. The shared-use path near this location is located on a side of the road with extremely shallow ledge. Two test pits in this area struck shallow ledge at less than 24 inches from the proposed surface to the shared use path. The shared-use path cannot be moved to the opposite side of the road at this location.

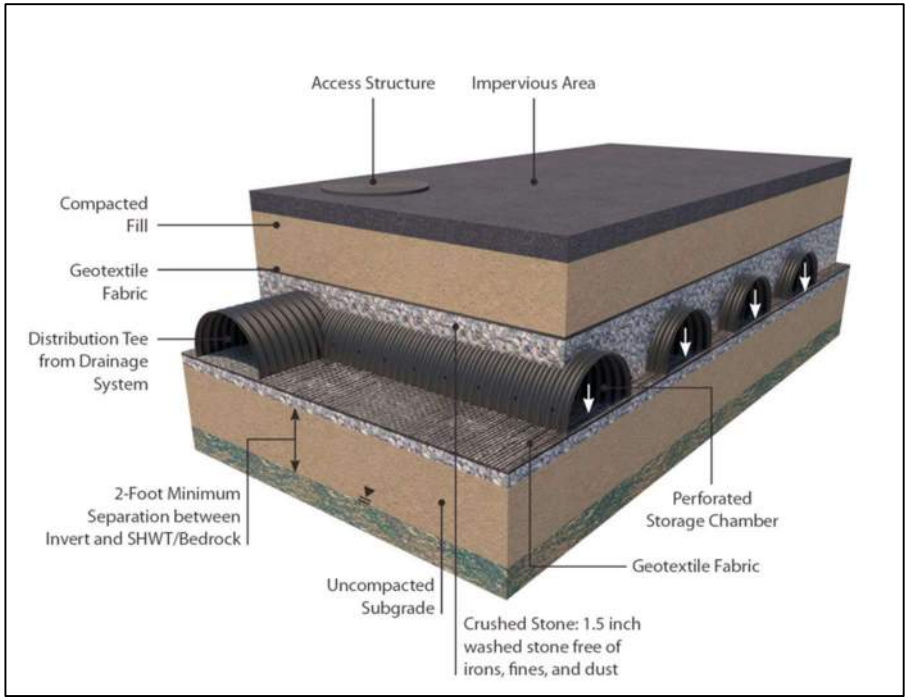


Figure 5: Example of Subsurface Infiltration System. Source: MassDOT Stormwater Guide (2023)

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Table 5: Subsurface Infiltration Systems Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• The narrow project corridor would require any subsurface infiltration system to be linear in form underneath the shared-use path. • Subsurface infiltration systems are not recommended by MassDOT directly beneath public roads.	• The pavement structure and subbase of the shared use path has a depth of 1ft. • The smallest subsurface infiltration systems typically have a 1ft tall plastic structure with required crushed stone cover of at least 6in. • Ground water depths are typically recommended to be 2ft below the infiltration system. • The sum of the shared-use path pavement depth (1ft), the subsurface infiltration system (1.5ft), and separation from groundwater (2ft) total 4.5ft or 54in. This is a practical minimum for seasonal high groundwater elevation for this alternative.	• Subsurface infiltration systems include one or more cleanout ports at ground level. Owners must inspect and clean the systems through the port periodically.	• N/A if located beneath the propose shared-use path.	• This alternative is not feasible where underground utilities, such as gas mains, are located beneath the shared-use path. • Due to the depth of construction required, may prove challenging to construct given ledge in project area at 4ft depth.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

6 Crushed Stone Diaphragm Trench

A stone diaphragm trench is a shallow trench filled with crushed stone that can act as either a pretreatment device and/or to promote infiltration. The trench is wrapped in geotextile fabric for separation and to prevent particulates from entering the trench. The trench includes a 3" top layer of crushed stone outside of the geotextile fabric to provide treatment. The 3-inch layer requires periodic replacement or replenishment for maintenance. Because the stone diaphragm sits at surface level, it does not require as much excavation or require as deep an elevation of groundwater depth compared to other alternatives. When the crushed stone diaphragm becomes saturated, stormwater runoff will either sheet flow over the trench to a down sloped vegetated area or return to the closed drainage system on Foster Street.

This alternative has been found to be the most feasible option to replace the stormwater storage volume of the 4 leaching catch basins that could not be installed. Calculations are attached to this submittal showing an equivalency between the storage volume of a proposed 100ft crushed stone diaphragm and the 4 leaching catch basins that could not be installed in the project limits. The location of the proposed crushed stone diaphragm is between STA 34+21 and STA 35+70 on the right-side edge of pavement of Foster Street.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

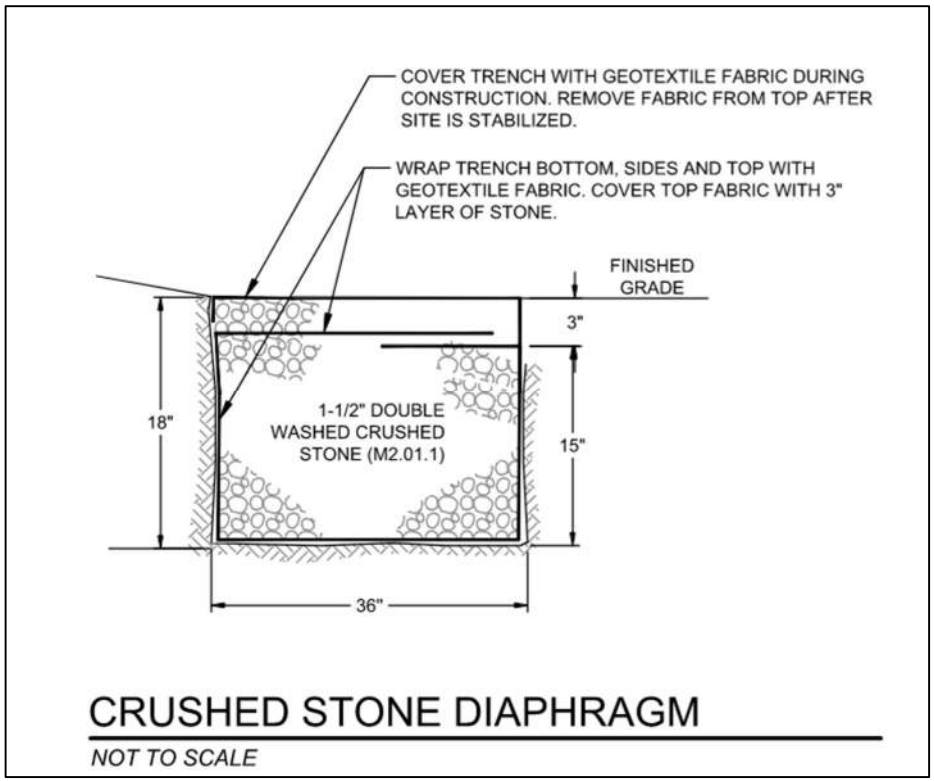


Figure 6: Example of a Crushed Stone Diaphragm.

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Table 6: Crushed Stone Diaphragm Trench Evaluation for the Foster Street Project

Right-of-Way	Groundwater Elev.	Maintenance	Tree Impacts	Constructability
• This alternative is feasible within the project ROW due the narrow 3ft wide linear footprint.	• This alternative sits at the ground surface and has a proposed depth of 1.5ft. • It is recommended that seasonal high groundwater is located at least 2ft below the bottom of trench. • The sum of the depth of trench (1.5ft) and the required separation (2ft) from ground water results in a minimum groundwater depth of 3.5ft or 42in.	• The top 3" of crushed stone must be replenished and replaced periodically with cleaned crushed stone to maintain depth and remove debris and particulates.	• N/A or minor due the narrow 3ft width from the edge of pavement.	• Low complexity/ Low conflict to construct. • This alternative is not feasible where underground utilities, such as gas mains, are located at the roadside.

PLAN SET MARKUP AND DETAIL OF CRUSHED STONE DIAPHRAGM TRENCH

NOTES:
1. SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
2. * - CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

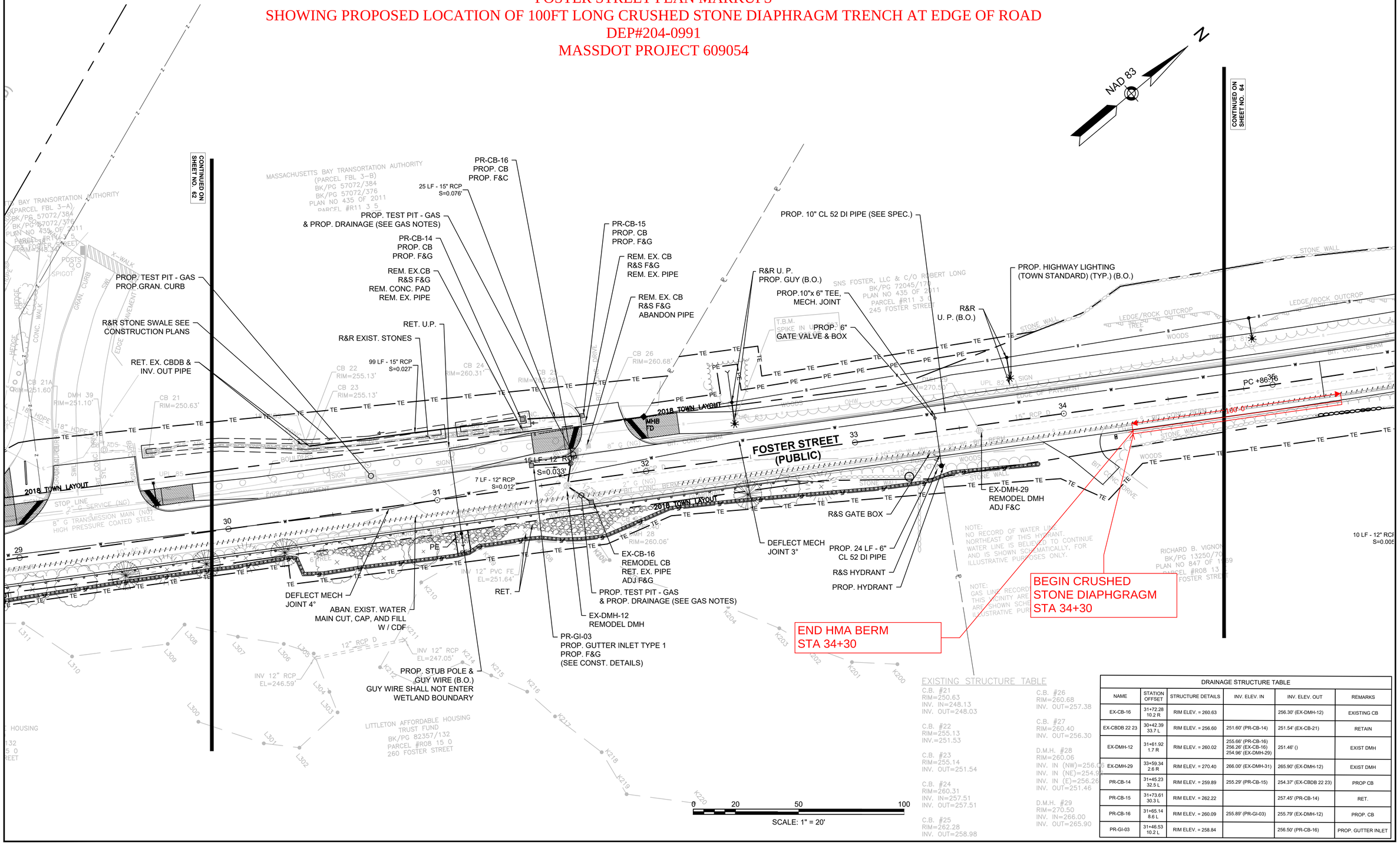
GAS NOTES:
1.NOTIFY NATIONAL GRID DAMAGE PREVENTION, MEGHAN KELLEY, AT(339) 203-0490 TWO WEEKS PRIOR TO EXCAVATING NEAR REGULATOR STATION OR GAS MAIN. HIGH PRESSURE GAS MAINS ARE PRESENT IN PROJECT AREA.
2.TO REPORT ANY DAMAGE TO A GAS LINE CALL NATIONAL GRID'S EMERGENCY GAS LEAKS NUMBER AT 1-800-233-5325 IMMEDIATELY.
3. ALL TEST PITS PERFORMED NEAR GAS MAIN SHALL BE PERFORMED WITH A VACUUM TRUCK SEE SPECIAL PROVISION FOR ITEM 141.101

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	63	128
PROJECT FILE NO.	609054		

DRAINAGE & UTILITY PLANS

FOSTER STREET PLAN MARKUPS
SHOWING PROPOSED LOCATION OF 100FT LONG CRUSHED STONE DIAPHRAGM TRENCH AT EDGE OF ROAD
DEP#204-0991
MASSDOT PROJECT 609054



EXISTING STRUCTURE TABLE

C.B. #21
RIM=250.63
INV. IN=248.13
INV. OUT=248.03

C.B. #22
RIM=255.13
INV.=251.53

C.B. #23
RIM=255.14
INV. OUT=251.54

C.B. #24
RIM=260.31
INV. IN=257.51
INV. OUT=257.51

C.B. #25
RIM=262.28
INV. OUT=258.98

C.B. #26
RIM=260.68
INV. OUT=257.38

C.B. #27
RIM=260.40
INV. OUT=256.30

D.M.H. #28
RIM=260.06
INV. IN (NW)=256.06
INV. IN (NE)=254.96
INV. IN (E)=256.26
INV. OUT=251.46

D.M.H. #29
RIM=270.50
INV. IN=266.00
INV. OUT=265.90

DRAINAGE STRUCTURE TABLE

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
EX-CB-16	31+72.28 10.2 R	RIM ELEV. = 260.63		256.30' (EX-DMH-12)	EXISTING CB
EX-CBDB 22 23	30+42.39 33.7 L	RIM ELEV. = 256.60	251.60' (PR-CB-14)	251.54' (EX-CB-21)	RETAIN
EX-DMH-12	31+61.92 1.7 R	RIM ELEV. = 260.02	255.66' (PR-CB-16) 256.26' (EX-CB-16) 254.96' (EX-DMH-29)	251.46' ()	EXIST DMH
EX-DMH-29	33+59.34 2.6 R	RIM ELEV. = 270.40	266.00' (EX-DMH-31)	265.90' (EX-DMH-12)	EXIST DMH
PR-CB-14	31+45.23 32.5 L	RIM ELEV. = 259.89	255.29' (PR-CB-15)	254.37' (EX-CBDB 22 23)	PROP CB
PR-CB-15	31+73.61 30.3 L	RIM ELEV. = 262.22		257.45' (PR-CB-14)	RET.
PR-CB-16	31+65.14 8.6 L	RIM ELEV. = 260.09	255.89' (PR-GI-03)	255.79' (EX-DMH-12)	PROP. CB
PR-GI-03	31+46.53 10.2 L	RIM ELEV. = 258.84		256.50' (PR-CB-16)	PROP. GUTTER INLET

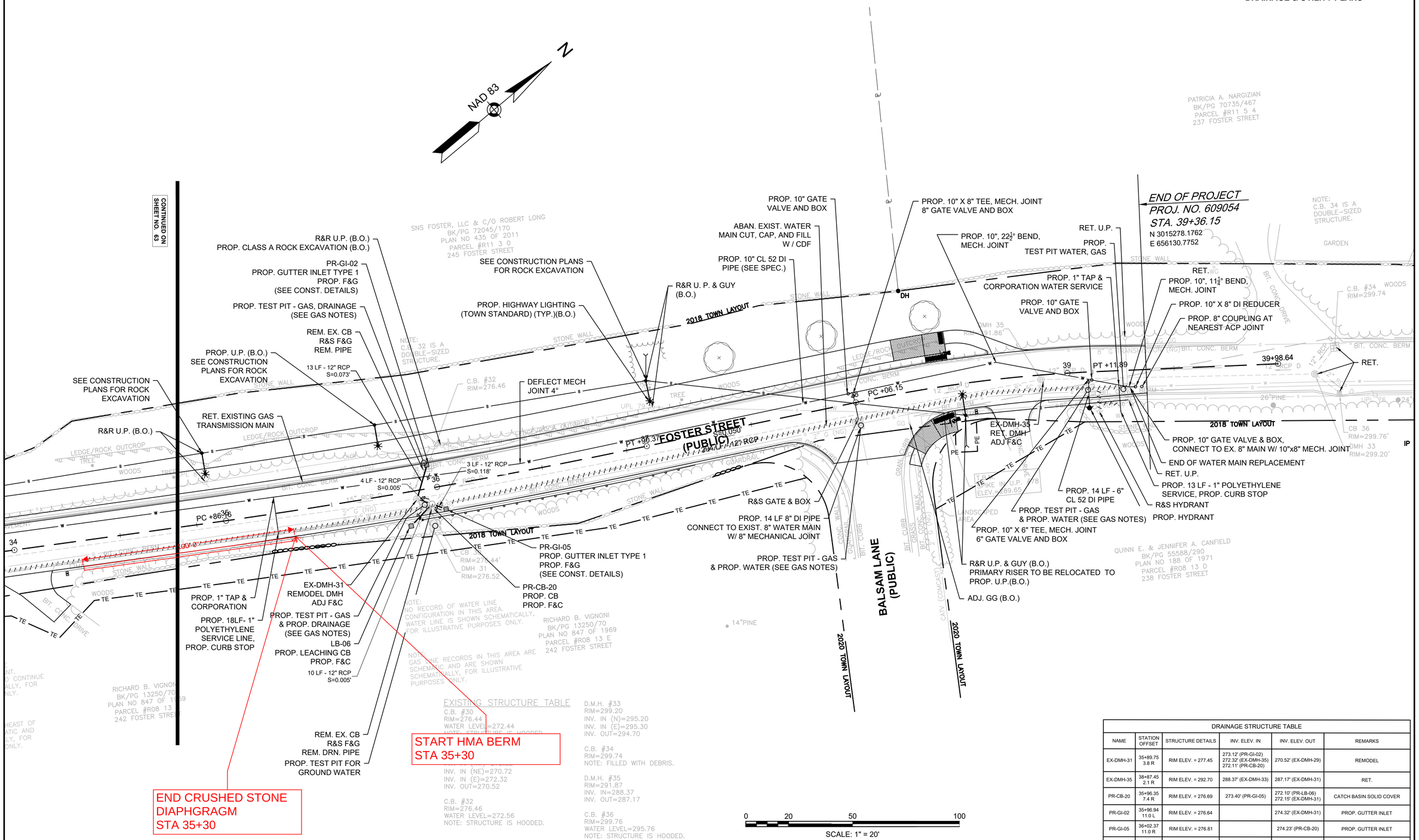
NOTES:
1. SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
2. * - CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

GAS NOTES:
1.NOTIFY NATIONAL GRID DAMAGE PREVENTION, MEGHAN KELLEY, AT(339) 203-0490 TWO WEEKS PRIOR TO EXCAVATING NEAR REGULATOR STATION OR GAS MAIN. HIGH PRESSURE GAS MAINS ARE PRESENT IN PROJECT AREA.
2.TO REPORT ANY DAMAGE TO A GAS LINE CALL NATIONAL GRID'S EMERGENCY GAS LEAKS NUMBER AT 1-800-233-5325 IMMEDIATELY.
3. ALL TEST PITS PERFORMED NEAR GAS MAIN SHALL BE PERFORMED WITH A VACUUM TRUCK SEE SPECIAL PROVISION FOR ITEM 141.101

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	64	128
PROJECT FILE NO.	609054		

DRAINAGE & UTILITY PLANS



DRAINAGE STRUCTURE TABLE

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
EX-DMH-31	35+89.75 3.8 R	RIM ELEV. = 277.45	273.12' (PR-GI-02) 272.32' (EX-DMH-35) 272.11' (PR-CB-20)	270.52' (EX-DMH-29)	REMODEL
EX-DMH-35	38+87.45 2.1 R	RIM ELEV. = 292.70	288.37' (EX-DMH-33)	287.17' (EX-DMH-31)	RET.
PR-CB-20	35+96.35 7.4 R	RIM ELEV. = 276.69	273.40' (PR-GI-05)	272.10' (PR-LB-06) 272.15' (EX-DMH-31)	CATCH BASIN SOLID COVER
PR-GI-02	35+96.94 11.0 L	RIM ELEV. = 276.64		274.32' (EX-DMH-31)	PROP. GUTTER INLET
PR-GI-05	36+02.37 11.0 R	RIM ELEV. = 276.81		274.23' (PR-CB-20)	PROP. GUTTER INLET
PR-LB-06	35+84.98 15.9 R	RIM ELEV. = 277.18	272.03' (PR-CB-20)		LEACHING BASIN W/SOLID COVER

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E1	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

Plotted on 29-Apr-2025 3:20 PM

20170044A21_HPN01 NOI SET.DWG

DANIEL SWEENEY (CLASS A TRUSTEE)
ARTURO J. GUTIEREEZ, JOHN A. CATALDO (CLASS B TRUSTEES)
TAYLOR STREET, LITTLETON TRUST
BK/PG 32096/213
PARCEL #R10 6 0
TAYLOR STREET

LIMIT OF WORK
STA 205+00.00
N3012961.1405
E653254.4720

MHB FD NOEL

MHB SB FD W/DH

TAYLOR STREET (PUBLIC)

PT +57.68
N 12° 51' 04" W 96.62'

205

204

Δ=4° 01' 39"
L=249.54' R=3550.00'

1959 SHLO NO. 4853

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

2641–2651 SANTA ANNA AVENUE, LLC
BK/PG 68756/572
PLAN NO 1425 OF 1981
PARCEL #R10 2 1
305 FOSTER STREET

CONTINUED ON SHEET NO. 10

NAD 83

BEGINNING OF PROJECT
PROJ. NO. 609054
STA 0+00.00
N3012786.8847
E653296.9381

STA 203+20.63 ALIGN_TAYLOR =
STA 0+00.00 ALIGN_FOSTER
N 3012786.8847 E 653296.9381

0+00

FOSTER STREET (PUBLIC)
N 70° 36' 10" E 403.30'

2018 TOWN LAYOUT

T.B.M.
SPIKE IN U.P. #104
ELEV.=305.59

PC +03.30

Δ=7° 27' 10"
L=130.08' R=1000.00'

N 63

TAYLOR STREET (PUBLIC)
N 16° 52' 43" W 208.14'

202

PC +08.14

203

DANIEL SWEENEY (CLASS A TRUSTEE)
ARTURO J. GUTIEREEZ, JOHN A. CATALDO (CLASS B TRUSTEES)
TAYLOR STREET, LITTLETON TRUST
BK/PG 32096/215
PLAN 1268 OF 1957
PARCEL #R10 7 0
225 TAYLOR STREET

JOHN K. GRADY, TRUSTEE OF THE
FOSTER/TAYLOR REALTY TRUST
BK/PG 25198/143
PLAN NO 228 OF 1992
PARCEL #R09 32 0
230 TAYLOR STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF
CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

FOR PROFILE: SEE SHEET NO. 17

0 20 50 100
SCALE: 1" = 20'

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	HT.	QTY.	SIZE
	TREES				
AC	ACER RUBRUM	MAPLE–RED–'OCTOBER GLORY'	50	5	2"–2.5" CAL.

PLANTING LEGEND

- PROPOSED TREE PLANTING
- X / XX — PLANT QUANTITY AND SPECIES

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E2	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET.DWG Plotted on 29-Apr-2025 3:20 PM

CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 11

N

NAD 83

2641–2651 SANTA ANNA AVENUE, LLC
BK/PG 68756/572
PLAN NO 1425 OF 1981
PARCEL #R10 2 1
305 FOSTER STREET

ASIJA PROPERTIES, LLC & SANDEEP ASIJA
BK/PG 70488/365
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF
CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

FOSTER STREET (PUBLIC)

3571 SF TEMP IMPACT TO BUFFER ZONE

7317 SF PERM IMPACT TO BUFFER ZONE

1202 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

537 SF REMOVED IMPERVIOUS BUFFER ZONE TO BE REVEGETATED

863 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

3332 SF TEMP IMPACT TO BUFFER ZONE

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 7+62

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 7+53

LIMIT OF GRADING

BVW

INTERMITTENT STREAM

UNAMED OPEN BODY OF WATER

BANK

100' BUFFER TO RESOURCE AREA

50' BUFFER TO RESOURCE AREA (LITTLETON)

T.B.M. SPIKE IN U.P. #104 ELEV.=305.59

2018 TOWN LAYOUT

PT +33.38 PC +48.87

Δ=7° 27' 10" L=130.08' R=1000.00'

N 63° 09' 00" E 15.49'

L=104.10' R=650.00' Δ=9° 10' 33"

PT +52.96

N 72° 19' 32" E 376.71'

PC +29.68

Δ= L=98.9

C +03.30

FOR PROFILE: SEE SHEET NO. 18

0 20 50 100

SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E3	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET.DWG Plotted on 29-Apr-2025 3:20 PM

N

NAD 83

CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 12

EP ASIJA

B200 START

B201

B202

B203

B204

BVW

INTERMITTENT STREAM

3571 SF TEMP IMPACT TO BUFFER ZONE

1202 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

C300

C301

BVW

INV 60" RCP EL=245.64'

NOTE: C.B. 10 IS A DOUBLE-SIZED STRUCTURE.

END PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 10+95

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 11+77

CATV (COMCAST)

50' BUFFER TO RESOURCE AREA (LITTLETON)

100' BUFFER TO RESOURCE AREA

T.B.M. SPIKE ELEV.=254.68'

7317 SF PERM IMPACT TO BUFFER ZONE

2018 TOWN LAYOUT

C2

D2

537 SF REMOVED IMPERVIOUS BUFFER ZONE TO BE REVEGETATED

Δ=1° 25' 01" L=98.93' R=4000.00'

11

PT +28.61

863 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

CULVERT 8"HW

CB 12 RIM=266.18'

CB 11 RIM=265.34'

DMH 9 RIM=265.69'

3332 SF TEMP IMPACT TO BUFFER ZONE

END PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 11+53

8157 SF TEMP IMPACT TO BUFFER ZONE

INV 60" RCP EL=244.91'

D400 START

D401

D402

D403

D404

D405

D406

D407

D408

D409

D410

BVW

6269 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

333 SF PERM IMPACT TO 50FT NO DISTURB ZONE

7317 SF PERM IMPACT TO BUFFER ZONE

3648 SF TEMP IMPACT TO BUFFER ZONE

LIMIT OF GRADING

FOSTER STREET (PUBLIC)

PC +80.50

N 70° 54' 31" E 151.90'

13

611 SF REMOVED IMPERVIOUS BUFFER ZONE TO BE REVEGETATED

356 SF REMOVED IMPERVIOUS 50FT NO DISTURB ZONE TO BE REVEGETATED

1769 SF PERM IMPACT TO 50FT NO DISTURB ZONE

INV 12" PVC EL=250.24'

LIMIT OF GRADING

2018 TOWN LAYOUT

Δ=35° 26' 20" L=315.49' R=510.00'

DR1-1

15

44

EDGE OF PAVEMENT

STONE WALL

WOODS

DH

26 OAK

T.B.M. SPIKE IN U.P. #93 ELEV.=254.44'

100' BUFFER TO RESOURCE AREA

CONC. DRIVE

DMH 15 RIM=254.68'

CB 14 RIM=254.44'

ASIJA PROPERTIES, LLC
BK/PG 70688/3[illegible]
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF CONCORD ASSOCIATES FOSTER STREET TRUST
BK/PG 14680/362
PLAN NO 1314 OF 1981
PARCEL #R09 33 0
300 FOSTER STREET

ANTHONY J. RIZZOLO, JR. & JOSEPHINE RIZZO
BK/PG 17691/108
PLAN NO 831 OF 1973
PARCEL #R09 3 G
290 FOSTER STREET

UNAMED OPEN BODY OF WATER

BANK

A100 START

A101

A102

A103

A104

A105

BVW

E501

E500 START

WF#E502

50' BUFFER TO RESOURCE AREA (LITTLETON)

100' BUFFER TO RESOURCE AREA

FOR PROFILE: SEE SHEET NO. 19

0 20 50 100

SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E4	128
	PROJECT FILE NO. 609054		

ENVIRONMENTAL PLANS

ASIJA PROPERTIES, LLC & SANDEEP ASIJA
BK/PG 70688/365
PLAN NO 1425 OF 1981
PARCEL #R10 2 2
295 FOSTER STREET

CONTINUED ON SHEET NO. 11

6269 SF TEMP IMPACT TO 50FT NO DISTURB ZONE

1769 SF PERM IMPACT TO 50FT NO DISTURB ZONE

356 SF REMOVED IMPERVIOUS 50FT NO DISTURB ZONE TO BE REVEGETATED

8157 SF REMOVED IMPERVIOUS BUFFER ZONE TO BE REVEGETATED

8157 SF TEMP IMPACT TO BUFFER ZONE

END PROP. EROSION & SEDIMENT CONTROL BARRIER STA 17+47

1005 SF TEMP IMPACT TO BUFFER ZONE

D405 D406 D407 D408 D409 D410 D411 END BVW

50' BUFFER TO RESOURCE AREA (LITTLETON)

100' BUFFER TO RESOURCE AREA

Δ=35° 26' 20" L=316.45' R=510.00

PT +95.95

PC +80.91

N 35° 28' 10" E 184.96'

Δ=9° 16' 42" L=348.16' R=2150.00'

2018 TOWN LAYOUT

FOSTER STREET (PUBLIC)

BULKELEY ROAD (PUBLIC)

1950 TOWN LAYOUT SEE SHLO NO. 3786

JORDAN S. MCCATHERIN
BK/PG 62917/52
PARCEL #R10 1 0
277 FOSTER STREET

CONTINUED ON SHEET NO. 13

ANTHONY J. RIZZOLO, JR. & JOSEPHINE RIZZOLO
BK/PG 17691/108
PLAN NO 831 OF 1973
PARCEL #R09 5 G
290 FOSTER STREET

BROCKTON KENYON & AINE COLLINS
BK/PG 72894/208
PLAN NO 831 OF 1973
PARCEL #R09 5 F
286 FOSTER STREET

GREGORY & SHERI BALZOTTI
BK/PG 50902/470
PLAN NO 831 OF 1973
PARCEL #R09 5 E
284 FOSTER ST

JOSEPH W. & AMANDA LENNON, LIVING TRUSTEES OF THE AMANDA+JOSEPH LENNON LIVING TRUST
BK/PG 64219/262
PLAN NO 1628 OF 1972
PARCEL #R09 5 A
3 BULKELEY ROAD

FOR PROFILE: SEE SHEET NO. 20

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK

- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E5	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET.DWG Plotted on 29-Apr-2025 3:20 PM

CONTINUED ON SHEET NO. 12

NAD 83

JORDAN S. MCCATHERIN
BK/PG 62917/52
PARCEL #R10 1 0
277 FOSTER STREET

HIGHWAY LAYOUT NO. 3675
BK. 7515 PG. 424

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1949 STATE HIGHWAY LAYOUT NO. 3675
BK/PG 7515/424

LIMIT OF GRADING

MHB FD TOP

Δ=9° 16' 42"
L=348.16' R=2150.00'

PT +29.08

FOSTER STREET
(PUBLIC)

MHB FD BRKN

MHB FD

MHB FD W/LP

J1

T.B.M.
SPIKE IN U.P. #91
ELEV.=246.01

LIMIT OF GRADING

BULKELEY ROAD
(PUBLIC)

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1950 STATE HIGHWAY LAYOUT NO. 3711
BK/PG 7553/391

1950 TOWN LAYOUT SEE SHLO NO. 3786

1950 TOWN LAYOUT SEE SHLO NO. 3786

1950 STATE HIGHWAY LAYOUT NO. 3711

EPH W. & AMANDA LENNON,
LIVING TRUSTEES OF THE
+JOSEPH LENNON LIVING TRUST
BK/PG 64219/262
PLAN NO 1628 OF 1972
PARCEL #R09 5 A
3 BULKELEY ROAD

BONNIE COOPER & GINNY M. MAHER-COOPER
BK/PG 32345/306
PLAN NO 1018 OF 1972
PARCEL #R09 1 0
2 BULKELEY ROAD

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 24+13

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
1949 STATE HIGHWAY LAYOUT NO. 3675
BK/PG 7515/424

2156SF TEMP IMPACT TO BUFFER ZONE

2288SF PERM IMPACT TO BUFFER ZONE

151SF REMOVED IMPERVIOUS BUFFER ZONE TO BE REVEGETATED

1378SF PERM IMPACT TO BUFFER ZONE

398SF REMOVED IMPERVIOUS 50FT NO DISTURB ZONE TO BE REVEGETATED

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 24+25

401SF TEMP IMPACT TO 50FT NO DISTURB ZONE

1199SF PERM IMPACT TO 50FT NO DISTURB ZONE

780SF PERM IMPACT TO 50FT NO DISTURB ZONE

1293SF TEMP IMPACT TO 50FT NO DISTURB ZONE

BRIDGE NO. L-13-017

PT +46.88

PC +04.83

BANK

BANK

TOWN OF LITTLETON
BK/PG 7551/414

CONTINUED ON SHEET NO. 14

FOR PROFILE: SEE SHEET NO. 21

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E6	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET.DWG Plotted on 29-Apr-2025 3:20 PM

N
NAD 83

1949 STATE HIGHWAY LAYOUT NO. 3675 BK. 7515 PG. 424

JUNE 30, 1914 RAILROAD SIDELINE

VAF I 265 FOSTER LLC
BK/PG 80433/278
PLAN NO 266 OF 1987
PARCEL #R11 1 0
265 FOSTER STREET

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (f/ BOSTON & MAINE RAILROAD)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
(PARCEL FBL 3-A)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

(MBTA)
BK/PG 13117/113
PARCEL #R11 2 0

(MBTA)
BK/PG 13117/113
PARCEL #R08 37 0

LITTLETON AFFORDABLE HOUSING TRUST FUND
BK/PG 82357/132
PARCEL #R08 15 0
260 FOSTER STREET

FOSTER STREET (PUBLIC)

GRIMES LANE (PUBLIC)

CONTINUED ON SHEET NO. 13

CONTINUED ON SHEET NO. 15

2156SF TEMP IMPACT TO BUFFER ZONE

401SF TEMP IMPACT TO 50FT NO DISTURB ZONE

1199SF PERM IMPACT TO 50FT NO DISTURB ZONE

2288SF PERM IMPACT TO BUFFER ZONE

END PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 26+14

LIMIT OF GRADING

1293SF TEMP IMPACT TO 50FT NO DISTURB ZONE

780SF PERM IMPACT TO 50FT NO DISTURB ZONE

1378SF PERM IMPACT TO BUFFER ZONE

END PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 26+23

2031SF PERM IMPACT TO BUFFER ZONE

LIMIT OF GRADING

375SF TEMP IMPACT TO BUFFER ZONE

588SF PERM IMPACT TO BUFFER ZONE

220SF PERM IMPACT TO 50FT NO DISTURB ZONE

72SF REMOVED IMPERVIOUS 50FT NO DISTURB ZONE

94SF REMOVED IMPERVIOUS BUFFER ZONE

LIMIT OF GRADING

3057SF PERM IMPACT TO 50FT NO DISTURB ZONE / BUFFER ZONE

PC +87.53

5694SF TEMP IMPACT TO 50FT NO DISTURB ZONE / BUFFER ZONE

BEGIN PROP. EROSION & SEDIMENT CONTROL BARRIER STA. 301+65

PC +04.83

PT +46.88

PT +57.06

PT +65.58

301+95.23

2018 TOWN LAYOUT

1950 SHLO NO. 3711

1951 SHLO NO. 3836

50' BUFFER RESOURCE AREA (LITTLETON)

100' BUFFER TO RESOURCE AREA

BVW

FOR PROFILE: SEE SHEET NO. 21, 22 & 24

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E7	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

NAD 83 N

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
(PARCEL FBL 3-B)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
(PARCEL FBL 3-A)
BK/PG 57072/384
BK/PG 57072/376
PLAN NO 435 OF 2011
PARCEL #R11 3 5
263 FOSTER STREET

SNS FOSTER, LLC & C/O ROBERT LONG
BK/PG 72045/170
PLAN NO 435 OF 2011
PARCEL #R11 3 0
245 FOSTER STREET

RICHARD B. VIGNON
BK/PG 13250/70
PLAN NO 847 OF 1969
PARCEL #R08 13
FOSTER STREET

LITTLETON AFFORDABLE HOUSING TRUST FUND
BK/PG 82357/132
PARCEL #R08 15 0
260 FOSTER STREET

FOSTER STREET (PUBLIC)

CONTINUED ON SHEET NO. 14

CONTINUED ON SHEET NO. 16

90SF REMOVED IMPERVIOUS 50 FT NO DISTURB ZONE

562SF PERM IMPACT TO 50FT NO DISTURB ZONE

84SF REMOVED IMPERVIOUS BUFFER ZONE

614 SF TEMP IMPACT TO BUFFER ZONE

841 SF PERM IMPACT TO BUFFER ZONE

3497SF TEMP IMPACT TO BUFFER ZONE

1991SF PERM IMPACT TO BUFFER ZONE

100' BUFFER TO RESOURCE AREA

LIMIT OF GRADING

473SF PERM IMPACT TO 50FT NO DISTURB ZONE / BUFFER ZONE

425 SF TEMP IMPACT TO BUFFER ZONE

839 SF PERM IMPACT TO BUFFER ZONE

3057SF PERM IMPACT TO 50FT NO DISTURB ZONE / BUFFER ZONE

5694SF TEMP IMPACT TO 50FT NO DISTURB ZONE / BUFFER ZONE

BVW

END HMA BERM
STA 34+30

BEGIN CRUSHED STONE DIAPHGRAGM
STA 34+30

END PROP. EROSION & SEDIMENT CONTROL BARRIER
STA. 33+84

50' BUFFER RESOURCE AREA (LITTLETON)

NOTE:
NO RECORD OF WATER LINE NORTHEAST OF THIS HYDRANT. WATER LINE IS BELIEVED TO CONTINUE AND IS SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE:
GAS LINE RECORDS IN THIS VICINITY ARE ARE SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

PC +86.16

200'-0"

FOR PROFILE: SEE SHEET NO. 22 & 23

0 20 50 100
SCALE: 1" = 20'

ENVIRONMENTAL PLANS LEGEND

- EXISTING TREE LINE
- PROPOSED TREE LINE
- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100FT BUFFER from BVW or BANK
- 50FT NO DISTURB LIMIT from BVW or BANK
- EROSION CONTROLS
- LIMIT OF WORK
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	E8	128
PROJECT FILE NO.	609054		

ENVIRONMENTAL PLANS

20170044A21_HPN01 NOI SET.DWG Plotted on 29-Apr-2025 3:21 PM

CONTINUED ON SHEET NO. 19

NAD 83

SNS FOSTER, LLC & C/O ROBERT LONG
BK/PG 72045/170
PLAN NO 435 OF 2011
PARCEL #R11 3 0
245 FOSTER STREET

PATRICIA A. NARGIZIAN
BK/PG 70735/467
PARCEL #R11 5 4
237 FOSTER STREET

END OF PROJECT
PROJ. NO. 609054
STA. 39+36.15
N 3015278.1762
E 656130.7752

2018 TOWN LAYOUT

STONE WALL

NOTE: C.B. 32 IS A DOUBLE-SIZED STRUCTURE.

NOTE: C.B. 34 IS A DOUBLE-SIZED STRUCTURE.

LIMIT OF GRADING

C.B. #32
RIM=276.46

C.B. #34
RIM=299.74

GARDEN

WOODS

TREE

LEDGE/ROCK OUTCROP

BIT. CONC. BERM

BIT. CONC. DRIVE

DH

DMH 35
RIM=291.85'

8" G TRANSMISSION (NG)

39+98.64

PT +11.89
N 37° 31' 19" E 86.75'

Δ=9° 19' 15"
L=105.74' R=650.00'

PC +06.15

H1

G2

DR2-2

DR3-2

36

Δ=3° 56' 00"
L=204.20' R=2974.57'

37

PT +90.37

N 28° 12' 04" E

FOSTER STREET
(PUBLIC)

38

35

PC +86.16

34

100'-0"

CB 30
RIM=276.44'
DMH 31
RIM=276.52'

CB 36
RIM=299.76'
DMH 33
RIM=299.20'

26" PINE

14" PINE

LANDSCAPED AREA

GRANITE CURB

BIT. CURB

BIT. CONC. SIDEWALK

CONC. WALL

GUARDRAIL

BALSAM LANE
(PUBLIC)

2020 TOWN LAYOUT

CATV (COMCAST)

QUINN E. & JENNIFER A. CANFIELD
BK/PG 55588/290
PLAN NO 188 OF 1971
PARCEL #R08 13 D
238 FOSTER STREET

RICHARD B. VIGNONI
BK/PG 13250/70
PLAN NO 847 OF 1969
PARCEL #R08 13 E
242 FOSTER STREET

NOTE: NO RECORD OF WATER LINE CONFIGURATION IN THIS AREA. WATER LINE IS SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE: GAS LINE RECORDS IN THIS AREA ARE SCHEMATIC AND ARE SHOWN SCHEMATIC AND APPROXIMATE

100' BUFFER TO RESOURCE AREA

START HMA BERM
STA 35+30

END CRUSHED STONE DIAPHGRAGM
STA 35+30

FOR PROFILE: SEE SHEET NO. 23

0 20 50 100

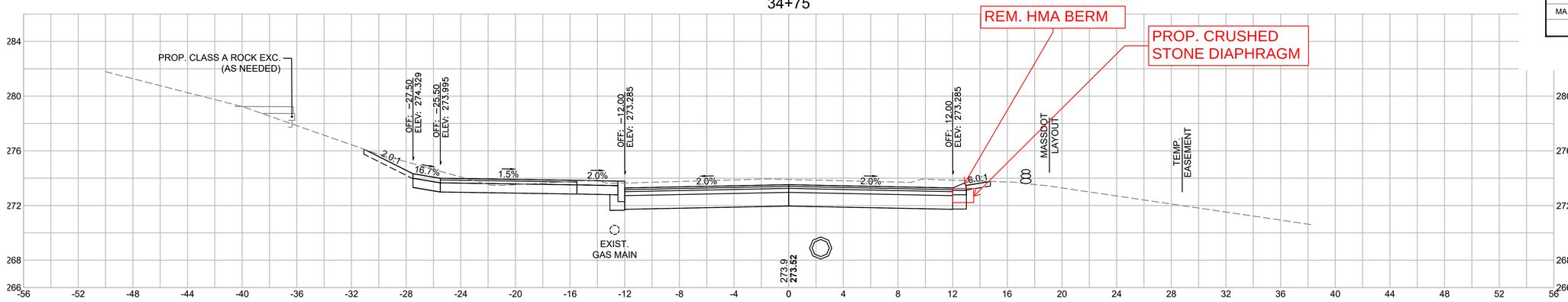
SCALE: 1" = 20'

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	121	128
	PROJECT FILE NO. 609054		

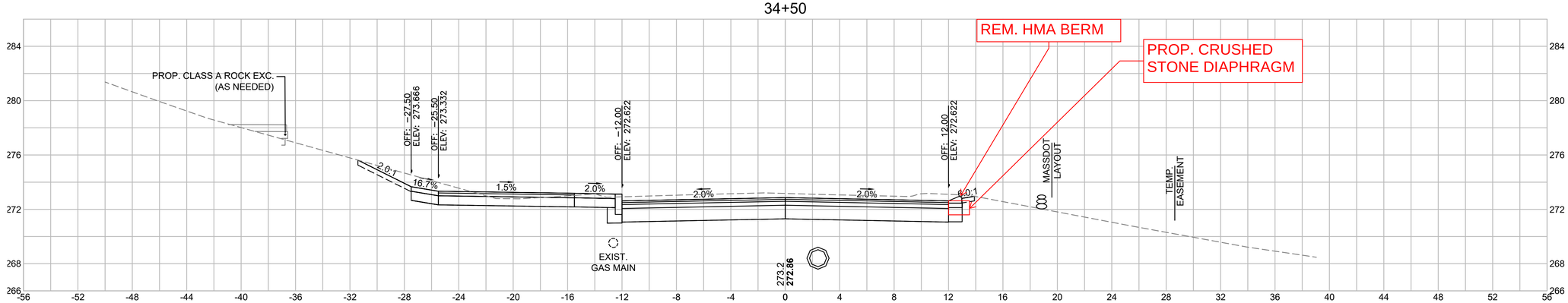
CROSS SECTIONS

34+75



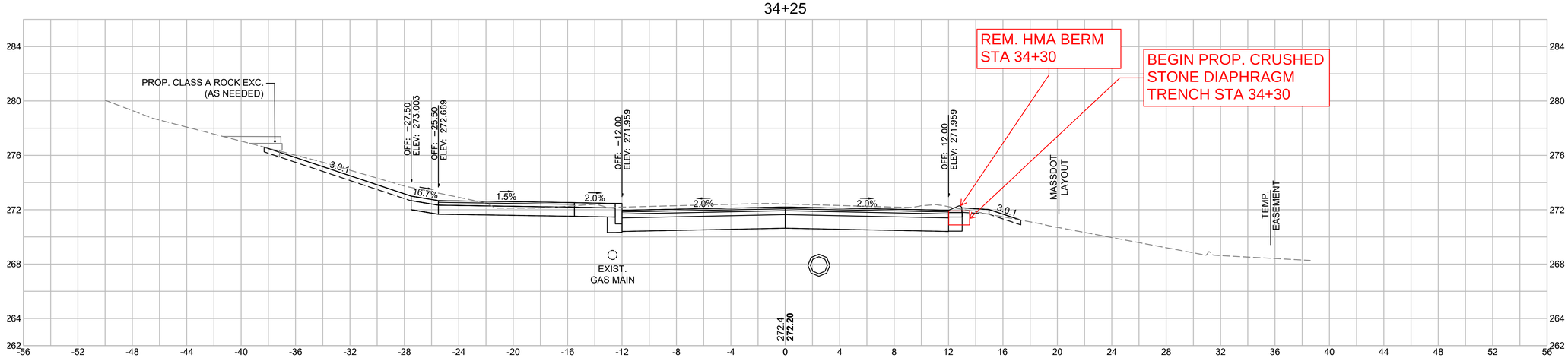
Total Volume at Station 34+75.00	
Cut Area	68.933
Fill Area	0.000
Cut Vol	63.0
Fill Vol	0.0
Cum Cut Vol	6935.3
Cum Fill Vol	337.3
Net Vol	6598.0

34+50



Total Volume at Station 34+50.00	
Cut Area	67.132
Fill Area	0.000
Cut Vol	62.1
Fill Vol	0.0
Cum Cut Vol	6872.3
Cum Fill Vol	337.3
Net Vol	6535.0

34+25



Total Volume at Station 34+25.00	
Cut Area	66.905
Fill Area	0.001
Cut Vol	40.6
Fill Vol	0.0
Cum Cut Vol	6810.3
Cum Fill Vol	337.3
Net Vol	6472.9

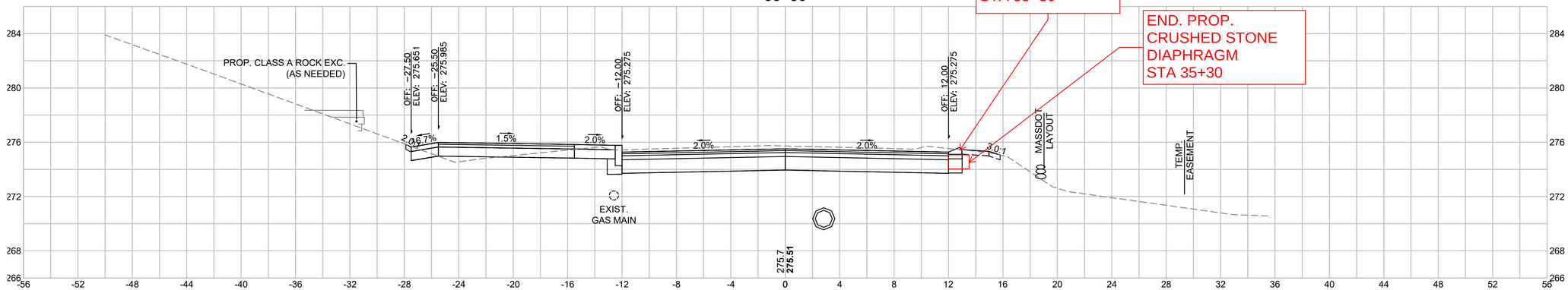
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

LITTLETON
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(037)X	122	128
PROJECT FILE NO.	609054		

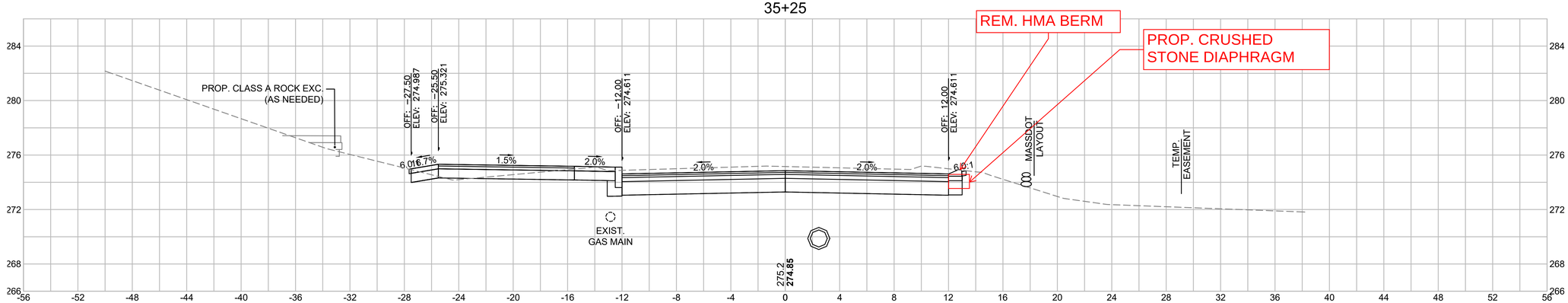
CROSS SECTIONS

35+50



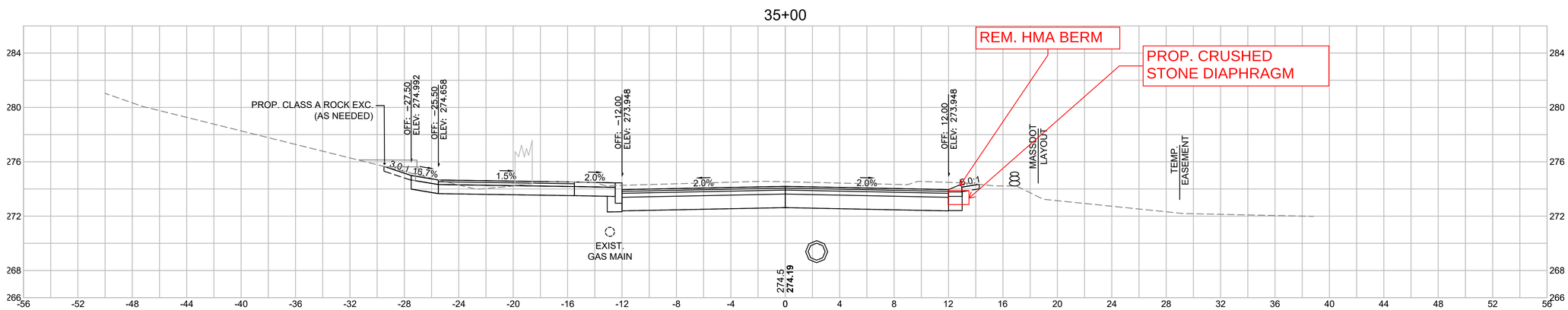
Total Volume at Station 35+50.00	
Cut Area	52.062
Fill Area	0.952
Cut Vol	49.8
Fill Vol	0.5
Cum Cut Vol	7101.8
Cum Fill Vol	337.9
Net Vol	6763.9

35+25



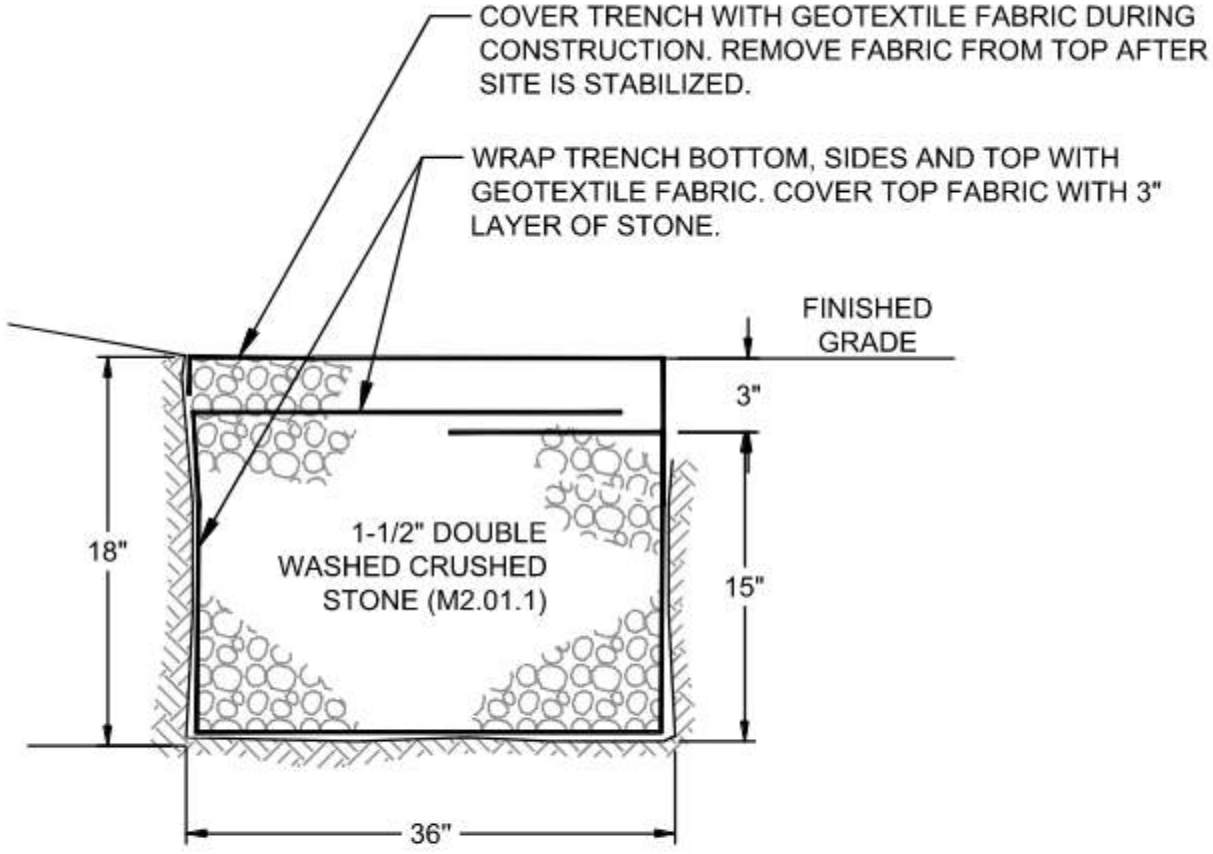
Total Volume at Station 35+25.00	
Cut Area	55.495
Fill Area	0.142
Cut Vol	55.2
Fill Vol	0.1
Cum Cut Vol	7052.0
Cum Fill Vol	337.4
Net Vol	6714.6

35+00



Total Volume at Station 35+00.00	
Cut Area	63.835
Fill Area	0.000
Cut Vol	61.5
Fill Vol	0.0
Cum Cut Vol	6996.8
Cum Fill Vol	337.3
Net Vol	6659.4

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8



CRUSHED STONE DIAPHRAGM

NOT TO SCALE

STORMWATER STORAGE VOLUME CALCULATIONS
EQUIVALENCY BETWEEN 4 LEACHING CATCH BASINS AND A 100FT LONG CRUSHED STONE DIAPHRAGM TRENCH

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Calculated by: AK

Storage Volume Calculation for Stone Diaphram (using 18" height)	
H= Height (ft)	1.5
W =Width (ft)	3
L= Length (ft)	100
e=Void Ratio	0.40
Storage Volume formula	=H*W*L*e
Storage Volume of Stone Diaphram (CF)	180

FUSS & O'NEILL
1550 Main Street, Suite 400
Springfield, MA 01103
413.452.0445
www.fando.com

Calculated by: AK

Storage Volume Calculation for MassDOT Standard Leaching Catch Basin	
H= Height from invert out pipe to bottom of sump(ft)	3
R =Radius (ft)	2
Volume of a cylinder formula	$=\prod * R^2 * H$
Storage Volume of Each Leaching Basin (CF)	37.7
Number of Leaching Basisns Not Installed	4
Total Cumulative Storage Volume of Leaching Basisns Not Installed (CF)	150.7