

Billerica, MA

Reconstruction of Boston Road (Route 3A)

MassDOT Highway Division Project File # 605178

August 2021

HORIZONTAL ALIGNMENT REPORT

100% SUBMISSION

08/03/2021



BETA

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Alignment Station and Curve Report

Client: MassDOT

Project Name: Billerica

Boston Road (Route 3A) Project No.
 605718

Project Description: Roadway Improvements - Boston Road
 (Route 3A) in Billerica, MA

Report Date: 8/2/2021 1:47:02 PM

Prepared by: BETA Group, Inc.

Alignment: BOSTON ROAD (ROUTE3A)

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	10+00.000	3033055.85	716346.028
End:	13+95.285	3032685.672	716484.659

Tangent Data

Parameter	Value	Parameter	Value
Length:	395.285	Course:	S 20° 31' 50.9542" E

Curve Point Data

Description	Station	Northing	Easting
PC:	13+95.285	3032685.672	716484.659
RP:		3033106.526	717608.44
PCC:	15+08.395	3032581.772	716529.258

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	05° 24' 02.1368"	Type:	LEFT
Radius:	1200		
Length:	113.11	Tangent:	56.597
Mid-Ord:	1.332	External:	1.334
Chord:	113.068	Course:	S 23° 13' 52.0226" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	15+08.395	3032581.772	716529.258
RP:		3033243.399	717889.926
PCC:	16+62.389	3032446.945	716603.524

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	05° 49' 53.7423"	Type:	LEFT
Radius:		1513	
Length:	153.994	Tangent:	77.064
Mid-Ord:	1.959	External:	1.961
Chord:	153.927	Course:	S 28° 50' 49.9622" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	16+62.389	3032446.945	716603.524
RP:		3033137.332	717741.473
PT:	18+55.973	3032289.311	716715.597

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 19' 59.7388"	Type:	LEFT
Radius:		1331	
Length:	193.584	Tangent:	96.963
Mid-Ord:	3.518	External:	3.527
Chord:	193.414	Course:	S 35° 24' 41.5743" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	18+55.973	3032289.311	716715.597
End:	20+45.048	3032143.581	716836.062

Tangent Data

Parameter	Value	Parameter	Value
Length:	189.074	Course:	S 39° 34' 41.4437" E

Curve Point Data

Description	Station	Northing	Easting
PC:	20+45.048	3032143.581	716836.062
RP:		3031170.495	715667.068
PT:	22+76.613	3031955.038	716970.116

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 43' 22.8948"	Type:	RIGHT
Radius:	1521		
Length:	231.565	Tangent:	116.007
Mid-Ord:	4.405	External:	4.418
Chord:	231.342	Course:	S 35° 24' 46.4872" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	22+76.613	3031955.038	716970.116
End:	25+24.265	3031742.873	717097.857

Tangent Data

Parameter	Value	Parameter	Value
Length:	247.652	Course:	S 31° 03' 05.0397" E

Curve Point Data

Description	Station	Northing	Easting
PC:	25+24.265	3031742.873	717097.857
RP:		3030202.674	714539.736
PT:	26+83.708	3031604.147	717176.414

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	03° 03' 33.9082"	Type:	RIGHT
Radius:	2986		
Length:	159.443	Tangent:	79.741
Mid-Ord:	1.064	External:	1.065
Chord:	159.424	Course:	S 29° 31' 18.0855" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	26+83.708	3031604.147	717176.414
End:	31+49.833	3031192.553	717395.188

Tangent Data

Parameter	Value	Parameter	Value
Length:	466.125	Course:	S 27° 59' 31.1314" E

Curve Point Data

Description	Station	Northing	Easting
PC:	31+49.833	3031192.553	717395.188
RP:		3034947.337	724459.295
PT:	32+44.553	3031109.179	717440.139

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	00° 40' 42.1832"	Type:	LEFT
Radius:	8000		
Length:	94.72	Tangent:	47.361
Mid-Ord:	0.14	External:	0.14
Chord:	94.72	Course:	S 28° 19' 52.2230" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	32+44.553	3031109.179	717440.139
End:	34+79.392	3030903.132	717552.808

Tangent Data

Parameter	Value	Parameter	Value
Length:	234.839	Course:	S 28° 40' 13.3146" E

Curve Point Data

Description	Station	Northing	Easting
PC:	34+79.392	3030903.132	717552.808
RP:		3031628.064	718878.551
PT:	36+34.126	3030771.404	717633.86

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	05° 52' 02.5587"	Type:	LEFT
Radius:	1511		
Length:	154.734	Tangent:	77.435
Mid-Ord:	1.98	External:	1.983
Chord:	154.666	Course:	S 31° 36' 14.5940" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	36+34.126	3030771.404	717633.86
End:	37+57.377	3030669.876	717703.737

Tangent Data

Parameter	Value	Parameter	Value
Length:	123.251	Course:	S 34° 32' 15.8733" E

Curve Point Data

Description	Station	Northing	Easting
PC:	37+57.377	3030669.876	717703.737
RP:		3026707.469	711946.528
PT:	38+44.448	3030597.845	717752.654

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	00° 42' 49.7019"	Type:	RIGHT
Radius:		6989	
Length:	87.071	Tangent:	43.536
Mid-Ord:	0.136	External:	0.136
Chord:	87.07	Course:	S 34° 10' 51.0223" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	38+44.448	3030597.845	717752.654
End:	39+97.604	3030470.611	717837.907

Tangent Data

Parameter	Value	Parameter	Value
Length:	153.156	Course:	S 33° 49' 26.1714" E

Curve Point Data

Description	Station	Northing	Easting
PC:	39+97.604	3030470.611	717837.907
RP:		3029571.076	716495.412
PT:	42+09.755	3030287.131	717944.108

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	07° 31' 18.7961"	Type:	RIGHT
Radius:	1616		
Length:	212.151	Tangent:	106.228
Mid-Ord:	3.48	External:	3.488
Chord:	211.999	Course:	S 30° 03' 46.7734" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	42+09.755	3030287.131	717944.108
End:	45+17.949	3030010.844	718080.67

Tangent Data

Parameter	Value	Parameter	Value
Length:	308.194	Course:	S 26° 18' 07.3753" E

Curve Point Data

Description	Station	Northing	Easting
PC:	45+17.949	3030010.844	718080.67
RP:		3029351.95	716747.618
PT:	48+06.680	3029741.247	718182.755

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	11° 07' 30.5263"	Type:	RIGHT
Radius:	1487		
Length:	288.731	Tangent:	144.821
Mid-Ord:	7.002	External:	7.036
Chord:	288.278	Course:	S 20° 44' 22.1122" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	48+06.680	3029741.247	718182.755
End:	52+97.543	3029267.504	718311.263

Tangent Data

Parameter	Value	Parameter	Value
Length:	490.863	Course:	S 15° 10' 36.8491" E

Alignment: FARMERS LANE

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+00.000	3030914.605	717546.534
End:	3+19.012	3031030.114	717732.609

Tangent Data

Parameter	Value	Parameter	Value
Length:	219.012	Course:	N 58° 10' 10.1317" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+19.012	3031030.114	717732.609
End:	4+00.003	3031070.292	717802.932

Tangent Data

Parameter	Value	Parameter	Value
Length:	80.992	Course:	N 60° 15' 30.8752" E

Alignment: GOOD STREET

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	70+00.000	3030496.835	717820.336
End:	71+39.012	3030457.832	717686.908

Tangent Data

Parameter	Value	Parameter	Value
Length:	139.012	Course:	S 73° 42' 20.0386" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	71+39.012	3030457.832	717686.908
End:	73+73.098	3030395.635	717461.236

Tangent Data

Parameter	Value	Parameter	Value
Length:	234.086	Course:	S 74° 35' 28.2921" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	73+73.098	3030395.635	717461.236
End:	82+99.610	3030134.546	716572.272

Tangent Data

Parameter	Value	Parameter	Value
Length:	926.512	Course:	S 73° 37' 57.0158" W

Curve Point Data

Description	Station	Northing	Easting
PC:	82+99.610	3030134.546	716572.272
RP:		3030139.343	716570.863
PT:	83+04.610	3030135.566	716567.587

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	57° 17' 44.8062"	Type:	RIGHT
Radius:			5
Length:		5 Tangent:	2.732
Mid-Ord:	0.612	External:	0.697
Chord:	4.794	Course:	N 77° 43' 10.5810" W

Alignment: HERITAGE ROAD

Description:

<u>Curve Point Data</u>			
Description	Station	Northing	Easting
PC:	50+00.000	3031699.274	717123.606
RP:		3031805.622	717065.89
PCC:	50+83.708	3031760.542	717178.179

<u>Circular Curve Data</u>			
Parameter	Value	Parameter	Value
Delta:	39° 38' 14.4611"	Type:	LEFT
Radius:		121	
Length:	83.708	Tangent:	43.607
Mid-Ord:	7.167	External:	7.618
Chord:	82.049	Course:	N 41° 41' 31.5154" E

<u>Curve Point Data</u>			
Description	Station	Northing	Easting
PCC:	50+83.708	3031760.542	717178.179
RP:		3032125.648	716268.73
PT:	52+47.583	3031917.005	717226.262

<u>Circular Curve Data</u>			
Parameter	Value	Parameter	Value
Delta:	09° 34' 51.4690"	Type:	LEFT
Radius:		980	
Length:	163.875	Tangent:	82.129
Mid-Ord:	3.423	External:	3.435
Chord:	163.684	Course:	N 17° 04' 58.5503" E

<u>Tangent Data</u>			
Description	PT Station	Northing	Easting
Start:	52+47.583	3031917.005	717226.262
End:	53+45.817	3032012.987	717247.176

<u>Tangent Data</u>			
Parameter	Value	Parameter	Value
Length:	98.234	Course:	N 12° 17' 32.8158" E

Curve Point Data

Description	Station	Northing	Easting
PC:	53+45.817	3032012.987	717247.176
RP:		3031981.051	717393.737
PT:	55+18.914	3032127.993	717363.603

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	66° 07' 05.9281"	Type:	RIGHT
Radius:			150
Length:	173.097	Tangent:	97.631
Mid-Ord:	24.284	External:	28.975
Chord:	163.651	Course:	N 45° 21' 05.7799" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	55+18.914	3032127.993	717363.603
End:	57+68.278	3032178.089	717607.883

Tangent Data

Parameter	Value	Parameter	Value
Length:	249.364	Course:	N 78° 24' 38.7439" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	57+68.278	3032178.089	717607.883
End:	58+56.906	3032193.217	717695.211

Tangent Data

Parameter	Value	Parameter	Value
Length:	88.628	Course:	N 80° 10' 19.1805" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	58+56.906	3032193.217	717695.211
End:	59+19.374	3032205.87	717756.384

Tangent Data

Parameter	Value	Parameter	Value
Length:	62.468	Course:	N 78° 18' 50.6288" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	59+19.374	3032205.87	717756.384
End:	59+65.793	3032214.018	717802.082

Tangent Data

Parameter	Value	Parameter	Value
Length:	46.419	Course:	N 79° 53' 22.7684" E

Curve Point Data

Description	Station	Northing	Easting
PC:	59+65.793	3032214.018	717802.082
RP:		3032391.223	717770.484
PT:	59+98.032	3032222.482	717833.145

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	10° 15' 42.5268"	Type:	LEFT
Radius:	180		
Length:	32.238	Tangent:	16.162
Mid-Ord:	0.721	External:	0.724
Chord:	32.195	Course:	N 74° 45' 31.5050" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	59+98.032	3032222.482	717833.145
End:	61+43.017	3032272.954	717969.062

Tangent Data

Parameter	Value	Parameter	Value
Length:	144.985	Course:	N 69° 37' 40.2416" E

Alignment: LASALLETTE RD

Description:

<u>Tangent Data</u>			
Description	PT Station	Northing	Easting
Start:	4+00.000	3030784.872	717624.697
End:	5+33.415	3030746.061	717497.053

<u>Tangent Data</u>			
Parameter	Value	Parameter	Value
Length:	133.415	Course:	S 73° 05' 15.6348" W

Alignment: MULBERRY LANE

Description:

<u>Tangent Data</u>			
Description	PT Station	Northing	Easting
Start:	6+00.000	3030041.464	718065.535
End:	7+50.000	3030086.733	718208.542

<u>Tangent Data</u>			
Parameter	Value	Parameter	Value
Length:	150	Course:	N 72° 26' 05.8788" E

Alignment: SIMMONS LANE

Description:

<u>Tangent Data</u>			
Description	PT Station	Northing	Easting
Start:	0+00.000	3032785.42	716447.304
End:	1+00.002	3032775.143	716347.832

<u>Tangent Data</u>			
Parameter	Value	Parameter	Value
Length:	100.002	Course:	S 84° 06' 05.1161" W

Alignment: TOM GLAVINE WAY

Description:

<u>Tangent Data</u>			
Description	PT Station	Northing	Easting
Start:	92+00.000	3030125.632	718023.933
End:	93+21.857	3030083.086	717909.745

<u>Tangent Data</u>			
Parameter	Value	Parameter	Value
Length:	121.857	Course:	S 69° 33' 53.6288" W

<u>Curve Point Data</u>			
Description	Station	Northing	Easting
PC:	93+21.857	3030083.086	717909.745
RP:		3029708.259	718049.404
PT:	93+75.121	3030061.226	717861.217

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	07° 37' 46.3886"	Type:	LEFT
Radius:	400		
Length:	53.264	Tangent:	26.672
Mid-Ord:	0.886	External:	0.888
Chord:	53.225	Course:	S 65° 45' 00.4345" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	93+75.121	3030061.226	717861.217
End:	94+50.000	3030025.998	717795.142

Tangent Data

Parameter	Value	Parameter	Value
Length:	74.879	Course:	S 61° 56' 07.2402" W

Alignment: TOWN HALL DRIVE

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	90+00.000	3030301.055	717937.142
End:	91+54.996	3030235.349	717796.762

Tangent Data

Parameter	Value	Parameter	Value
Length:	154.996	Course:	S 64° 55' 03.6208" W

Alignment PI Station Report

Client:

MassDOT Highway Division
 Ten Park Plaza
 Boston, MA 02116
 Date: 8/2/2021 1:46:04 PM

Prepared by:

BETA Group - Inc.
 315 Norwood Park South
 Norwood, MA 02062

Alignment Name: BOSTON ROAD (ROUTE3A)

Description:

Station Range: Start: 10+00.00, End: 52+97.54

PI Station	Northing	Easting	Distance	Direction
10+00.00	3,033,055.850'	716,346.028'		
			451.882'	S20° 31' 51"E
14+51.88	3,032,632.670'	716,504.508'		
			133.660'	S25° 55' 53"E
15+85.46	3,032,512.467'	716,562.957'		
			174.025'	S31° 28' 28"E
17+59.35	3,032,364.046'	716,653.819'		
			402.044'	S39° 38' 05"E
21+61.05	3,032,054.421'	716,910.279'		
			443.399'	S31° 03' 05"E
26+04.01	3,031,674.559'	717,138.988'		
			593.226'	S27° 59' 31"E
31+97.19	3,031,150.733'	717,417.417'		
			359.635'	S28° 40' 13"E
35+56.83	3,030,835.191'	717,589.959'		
			244.221'	S34° 32' 16"E
38+00.91	3,030,634.013'	717,728.420'		
			302.920'	S33° 49' 26"E
41+03.83	3,030,382.362'	717,897.038'		
			559.243'	S26° 18' 07"E
46+62.77	3,029,881.017'	718,144.841'		
			635.684'	S15° 10' 37"E
52+97.54	3,029,267.504'	718,311.263'		

Alignment Name: FARMERS LANE

Description:

Station Range: Start: 1+00.00, End: 4+00.00

PI Station	Northing	Easting	Distance	Direction
1+00.00	3,030,914.605'	717,546.534'		
			219.012'	N58° 10' 10"E
3+19.01	3,031,030.114'	717,732.609'		
			80.992'	N60° 15' 31"E
4+00.00	3,031,070.292'	717,802.932'		

Alignment Name: GOOD STREET

Description:

Station Range: Start: 70+00.00, End: 83+04.61

PI Station	Northing	Easting	Distance	Direction
70+00.00	3,030,496.835'	717,820.336'		
			139.012'	S73° 42' 20"W
71+39.01	3,030,457.832'	717,686.908'		
			234.086'	S74° 35' 28"W
73+73.10	3,030,395.635'	717,461.236'		
			929.243'	S73° 37' 57"W
83+02.34	3,030,133.776'	716,569.651'		
			2.732'	N49° 04' 18"W
83+04.61	3,030,135.566'	716,567.587'		

Alignment Name: HERITAGE ROAD

Description:

Station Range: Start: 50+00.00, End: 61+43.02

PI Station	Northing	Easting	Distance	Direction
50+00.00	3,031,699.274'	717,123.606'		
			43.607'	N61° 30' 39"E
50+43.61	3,031,720.074'	717,161.933'		
			125.736'	N21° 52' 24"E
51+65.84	3,031,836.759'	717,208.777'		
			277.994'	N12° 17' 33"E
54+43.45	3,032,108.380'	717,267.962'		
			346.995'	N78° 24' 39"E
57+68.28	3,032,178.089'	717,607.883'		
			88.628'	N80° 10' 19"E
58+56.91	3,032,193.217'	717,695.211'		
			62.468'	N78° 18' 51"E
59+19.37	3,032,205.870'	717,756.384'		
			62.582'	N79° 53' 23"E
59+81.96	3,032,216.855'	717,817.994'		
			161.148'	N69° 37' 40"E
61+43.02	3,032,272.954'	717,969.062'		

Alignment Name: LASALLETTE RD

Description:

Station Range: Start: 4+00.00, End: 5+33.42

PI Station	Northing	Easting	Distance	Direction
4+00.00	3,030,784.872'	717,624.697'		
			133.415'	S73° 05' 16"W
5+33.42	3,030,746.061'	717,497.053'		

Alignment Name: MULBERRY LANE

Description:

Station Range: Start: 6+00.00, End: 7+50.00

PI Station	Northing	Easting	Distance	Direction
6+00.00	3,030,041.464'	718,065.535'		
			150.000'	N72° 26' 06"E
7+50.00	3,030,086.733'	718,208.542'		

Alignment Name: SIMMONS LANE

Description:

Station Range: Start: 0+00.00, End: 1+00.00

PI Station	Northing	Easting	Distance	Direction
0+00.00	3,032,785.420'	716,447.304'		
			100.002'	S84° 06' 05"W
1+00.00	3,032,775.143'	716,347.832'		

Alignment Name: TOM GLAVINE WAY

Description:

Station Range: Start: 92+00.00, End: 94+50.00

PI Station	Northing	Easting	Distance	Direction
92+00.00	3,030,125.632'	718,023.933'		
			148.529'	S69° 33' 54"W
93+48.53	3,030,073.774'	717,884.752'		
			101.550'	S61° 56' 07"W
94+50.00	3,030,025.998'	717,795.142'		

Alignment Name: TOWN HALL DRIVE

Description:

Station Range: Start: 90+00.00, End: 91+55.00

PI Station	Northing	Easting	Distance	Direction
90+00.00	3,030,301.055'	717,937.142'		
			154.996'	S64° 55' 04"W
91+55.00	3,030,235.349'	717,796.762'		