MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

BOSTON ROAD

IN THE TOWN OF

WESTFORD

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. STP/CMQ/TAP-0033(038)X

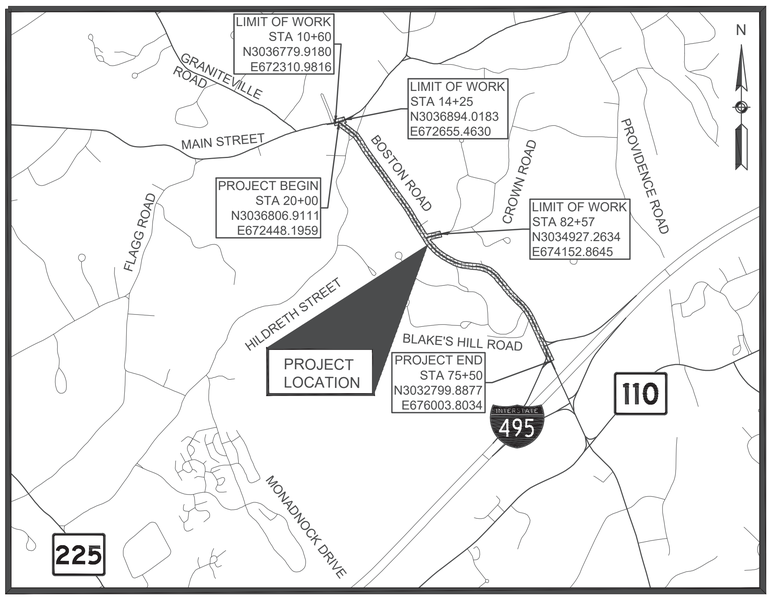
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	1	132
	PROJECT FILE NO.	609035	

TITLE SHEET & INDEX

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

INDEX



0 1,200 2,400 3,600 4,800

SCALE: 1" = 1,200'

LENGTH OF PROJECT = 5,550.00 FEET = 1.051 MILES

	BOSTON ROAD	MAIN STREET	CROWN ROAD
DESIGN SPEED	40 MPH	35 MPH	20 MPH
ADT (2018)	17,679 VPD		
ADT (2028)	20,925 VPD		
K	9.6%		
D	68.5% NB		
T (PEAK HOUR)	1.1%		
T (AVERAGE DAY)	2.4%		
DHV	2,015 VPH		
DDHV	1,379 VPH		
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL	LOCAL

COMMONWEALTH OF MASSACHUSETTS
JONATHAN A. ROCKWELL
CIVIL
No. 45374
REGISTERED PROFESSIONAL ENGINEER

Jonathan A. Rockwell, P.E. Digitally signed by Jonathan A. Rockwell, P.E. Date: 2024.05.21 14:22:00 -04'00'

massDOT
Massachusetts Department of Transportation
Highway Division

TEC The Engineering Corp

282 Merrimack St
2nd Floor
Lawrence, MA 01843
978-794-1792

311 Main Street
2nd Floor
Worcester, MA 01608
508-868-5104

169 Ocean Blvd, Unit 3
PO Box 249
Hampton, NH 03842
603-601-8154

www.TheEngineeringCorp.com

APPROVED

Carrie Lavallee, P.E. Digitally signed by Carrie Lavallee, P.E. Date: 2024.05.28 16:16:24 -04'00'

05/28/2024

CHIEF ENGINEER — DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB/GI	CATCH BASIN OR GUTTER INLET
	CBCI/GICI	CATCH BASIN OR GUTTER INLET W/ CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
C	C	CABLE MANHOLE
D	D	DRAINAGE MANHOLE
E	E	ELECTRIC MANHOLE
G	G	GAS MANHOLE
M	M	MISC MANHOLE
S	S	SEWER MANHOLE
T	T	TELEPHONE MANHOLE
W	W	WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
WSO	WSO	WATER SHUTOFF/CURB STOP
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		SEDIMENT CONTROL BARRIER
		TREE LINE
		EDGE OF PAVEMENT
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CONTROLLER CABINET, FOUNDATION
		CONTROLLER CABINET, FOUNDATION, CONC. PAD
		MAST ARM FOUNDATION (SCALE OF BLOCK = DIAMETER IN INCHES)
		MAST ARM (LENGTH NOTED)
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		PEDESTRIAN SIGNAL HEAD
		MAST ARM OR TS POLE MOUNTED SIGN
		EMERGENCY PRE-EMPTION RECEIVER
		EMERGENCY PRE-EMPTION CONFIRMATION STROBE
		PEDESTRIAN PUSH BUTTON
		YAGI ANTENNA
		BICYCLE WIRE LOOP DETECTOR (SIZE AS NOTED)
		WIRE LOOP DETECTOR (SIZE AND TYPE NOTED)
		TRAFFIC SIGN (1 POST)
		TRAFFIC SIGN (2 POST)
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
		BIKE LANE LEGEND - WHITE
	SL	STOP LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE
	DWL	6" DOTTED WHITE LINE (3' LINE W/ 9' GAP)
	DWLEx	6" DOTTED WHITE LINE EXTENSION (2' LINE W/ 6' GAP)
	DYLEx	6" DOTTED YELLOW LINE EXTENSION (2' LINE W/ 6' GAP)
	DBYL	DOUBLE YELLOW LINE
	YGL	12" YELLOW GORE LINE (3:1, 10' O.C.)

GENERAL NOTES:

1. EXISTING CONDITIONS INFORMATION COMPILED FROM SURVEY BY TEC, INC IN JUNE 2017 AND NOVEMBER 2017 AND SUPPLEMENTED BY HANCOCK SURVEY ASSOCIATES, INC IN MAY 2022.
   HORIZONTAL DATUM = NAD83 (MASSACHUSETTS STATE PLANE COORDINATES)
   VERTICAL DATUM = NAVD88
2. ALL EXISTING STATE, COUNTY, AND TOWN LOCATION LINES HAVE BEEN ESTABLISHED FROM AN ACTUAL ON-THE-GROUND SURVEY. ALL PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL CONTACT DIGSAFE (1-888-DIGSAFE) A MINIMUM OF 72 BUSINESS HOURS PRIOR TO ANY CONSTRUCTION TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
5. ALL PRIVATELY OWNED UTILITY STRUCTURES (GAS GATES, ELECTRIC /TELEPHONE MANHOLES, ETC.) SHALL BE ADJUSTED TO FINISHED GRADE BY THE PRIVATE UTILITY COMPANY, UNLESS DIRECTED OTHERWISE. THE CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES FOR THE ALTERATION AND ADJUSTMENT, AS NECESSARY.
6. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R), AS APPROVED BY THE ENGINEER.
7. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.
8. ALL EXISTING TREES WITHIN THE PROJECT LIMITS SHALL BE RETAINED AND PROTECTED WITH TREE PROTECTION UNLESS INDICATED OTHERWISE ON THE DRAWINGS. ALL PROVIDED DIMENSIONS REFER TO THE DIAMETER AT BREAST HEIGHT.
9. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL PROPOSED PEDESTRIAN CURB RAMPS AND SHALL BE INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARDS.
10. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE.
11. ALL EXISTING GRANITE CURB AND EDGING THAT MEETS SPECIFICATIONS SHALL BE REUSED IN THE PROPOSED WORK, AS APPROVED BY THE ENGINEER.
12. IN AREAS OF EXISTING ROADWAY / SIDEWALK WHERE LOAM AND SEED IS PROPOSED, THE CONTRACTOR SHALL REMOVE EXISTING ROADWAY / SIDEWALK AND SUBBASE AND REPLACE WITH SUITABLE EXCAVATED MATERIAL AND PROPOSED 4" LOAM AND SEED TO MEET FINAL GRADE UNLESS OTHERWISE INDICATED ON THE PLANS.

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
AP	ANGLE POINT
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCB	CAPE COD BERM
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP (or EP)	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GC	GRANITE CURB
GND	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LOG	LIMIT OF GRADING
LP	LIGHT POLE
L&S	LOAM AND SEED
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN
PERP	PERPENDICULAR
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED

ABBREVIATIONS (cont.)

GENERAL

PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PUE	PROPOSED UTILITY EASEMENT
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATERWAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
RRFB	RECTANGULAR RAPID FLASHING BEACON
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	2	132
PROJECT FILE NO.	609035		

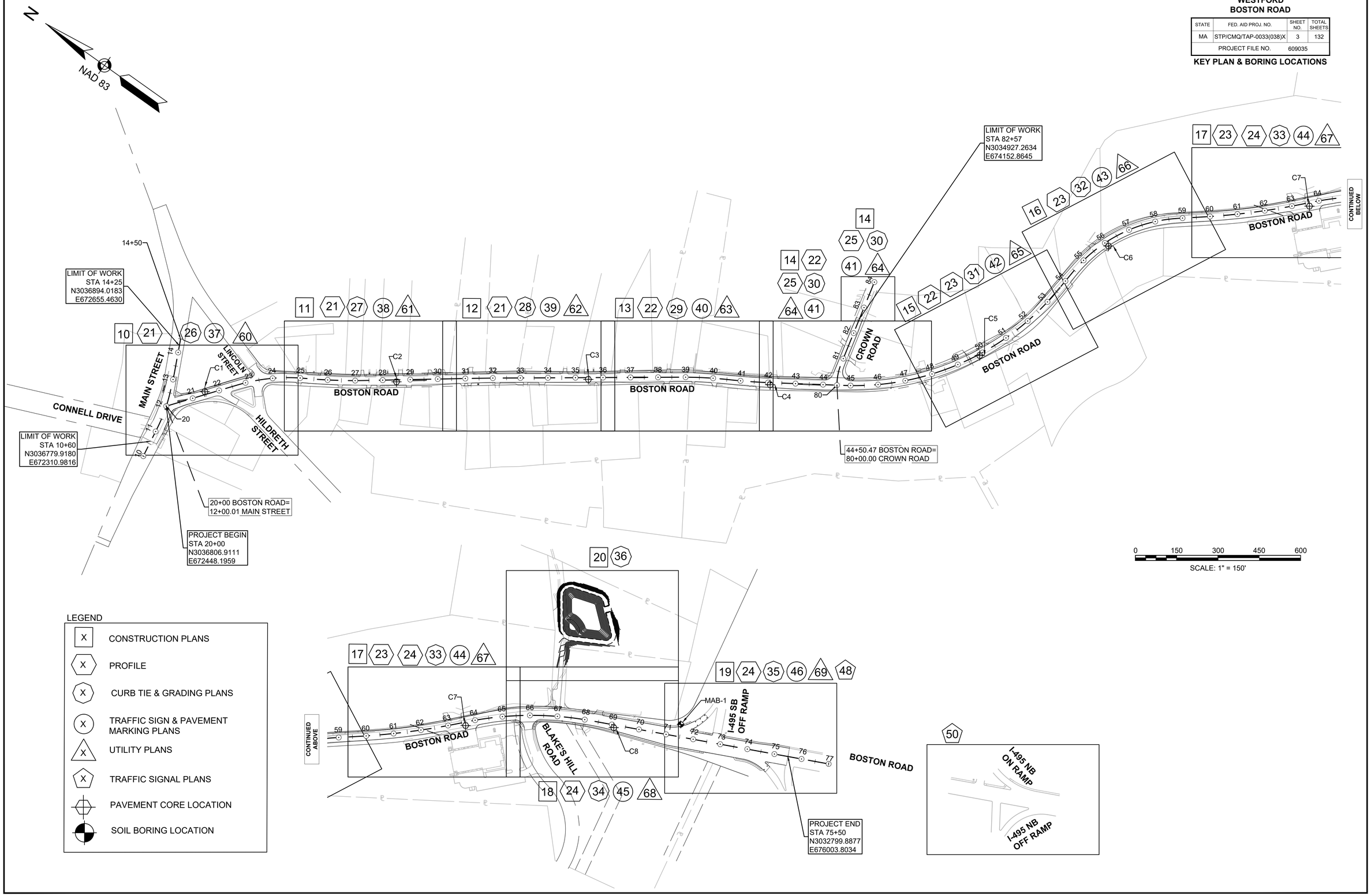
LEGEND, ABBREVIATIONS & GENERAL NOTES

609035_HD2(LEGEND).DWG Plotted on 17-May-2024 8:15 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	3	132
PROJECT FILE NO.	609035		

KEY PLAN & BORING LOCATIONS



LEGEND

- X — CONSTRUCTION PLANS
- X — PROFILE
- X — CURB TIE & GRADING PLANS
- X — TRAFFIC SIGN & PAVEMENT MARKING PLANS
- X — UTILITY PLANS
- X — TRAFFIC SIGNAL PLANS
- PAVEMENT CORE LOCATION
- SOIL BORING LOCATION

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS: ⊕ MAB-XX
2. BORINGS TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NO NECESSARILY SHOW THE NATURE OF THE MATERIALS TO ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORING AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS PRODUCED BY A 30" FALL OF 140 POUND MASS HAMMER REQUIRED TO DRIVE 1 3/8" I.D. SPOON 1 FOOT.
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
6. ALL BORINGS WERE MADE IN SEPTEMBER 2023.
7. BORINGS WERE MADE BY CRAWFORD DRILLING SERVICES, LLC, 555 WHITNEY STREET, GARDNER, MA 01440
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
9. FIGURES TO THE LEFT OF COLUMNS INDICATE DEPTH BELOW SURFACE AT BORING POINT.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	4	132
PROJECT FILE NO.	609035		

BORING LOGS

The Engineering Corp, Inc.

Project: Boston Road
Location: Westford, MA
Project No.: T0713.00

Log of Boring MAB-1

Ground Elevation: 258.5'
Datum: NAVD 1988

Drilling Method: Drive and Wash
Sampling Method: Split Spoon
Drilling Company: Crawford Drilling Services
Foreman: R. Blakeny
Date Started: 9/25/2023 Date Finished: 9/25/2023
Logged By: D. Nader

Groundwater Readings
Date Time Depth to Water Ref. Pt. Depth of Casing Depth of Hole Stab. Time
Not Encountered

N: 3033185.9
E: 675876.0

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	3 10 13 20	24/18			-----0'----- TOPSOIL ---0.75'---	S-1a (0 to 0.8'): Medium dense, brown, fine to coarse SAND, little silt, trace gravel. Moist. Topsoil. S-1b (0.8 to 2'): Medium dense, tan, fine to coarse SAND, little gravel, trace silt. Moist.	
2	S-2	2 - 3.2	22 42 50/2"	14/10				S-2 (2 to 3.2'): V. dense, tan, fine to coarse SAND, little gravel, trace silt. Moist.	
4	S-3	4 - 4.8	35 50/4"	10/8			GLACIAL TILL	S-3 (4 to 4.8'): V. dense, brown, fine to coarse SAND, some gravel, trace silt. Moist.	
6									
8									
9	S-9	9 - 9.1	50/1"	1/0			---9.1'---		
10	C-1	9.1 - 10.5		14/17				C-1 (9.1-10.5'): Hard, moderately weathered, moderately fractured, blue-gray, fine to coarse grained GNEISS, thin bedding with moderate to steep joints and fractures. RQD = 35.7%	Water loss observed between 9.1 and 12 feet. Excess water loss stopped deeper than 12 feet.
12	C-2	10.5 - 15		50/54				C-2a (10.5-12.1'): Hard, slightly weathered, slightly fractured, blue-gray, fine to coarse grained GNEISS, thin bedding with close to moderate joints. RQD = 57.3%	
14							BEDROCK	C-2b (12.1-15'): Very hard, very slightly weathered, sound, light gray, coarse grained GNEISS, close shallow to vertical joins and shears. RQD = 57.5%	
16	C-3	15 - 19		48/48				C-3 (15-19'): Very hard, very slightly weathered, sound, light gray with pink hues, coarse grained GNEISS, close shallow to vertical joins and shears. RQD = 53.1%	
18									
19							-----19'-----	Boring terminated at 19 feet.	
20									
22									
24									
26									
28									
30									
32									

609035_HD3A(PAVEMENT CORES).DWG Plotted on 20-May-2024 9:44 AM

MILLER ENGINEERING & TESTING INC.

100 SHEFFIELD ROAD; MANCHESTER, NH 03103; (603) 668-6016; FAX: (603) 668-8641; Email: marketing@millerengandtesting.com

PROJECT: BOSTON RD. PAVEMENT CORES
WESTFORD, MA
PROJECT NO: 18.268.NH
CONTRACTOR:
CLIENT: THE ENGINEERING CORPORATION
WEATHER:
DATE: 11-02-18

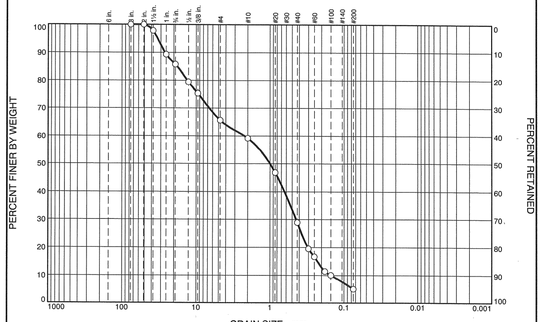
ASPHALT THICKNESS REPORT

Miller Engineering and Testing was on site on this date, at the request of our client, to obtain bituminous asphalt cores. Samples were taken to full depth. Test cores were returned to our laboratory and each pavement layer was measured for depth. The following are the results:

Laboratory Number:

Core #	Core Section 1 (in.)	Core Section 2 (in.)	Total Core Thickness (in.)
C1	9.098	-	9.098
C2	4.075	5.163	9.238
C3	5.756	-	5.756
C4	3.994	2.860	6.854
C5	3.347	2.168	5.514
C6	4.475	-	4.475
C7	5.127	-	5.127
C8	2.245	3.676	5.924

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	14	20	7	30	24	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	100		
1.5"	98		
1"	89		
.75"	86		
.5"	80		
.375"	75		
#4	66		
#10	59		
#20	47		
#40	29		
#50	20		
#60	17		
#80	11		
#100	10		
#200	5.1		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 26.3527 D_{85}= 17.8810 D_{60}= 2.2107
D_{50}= 0.9969 D_{30}= 0.4407 D_{15}= 0.2259
D_{10}= 0.1488 C_u= 14.86 C_c= 0.59

Classification
USCS= AASHTO=

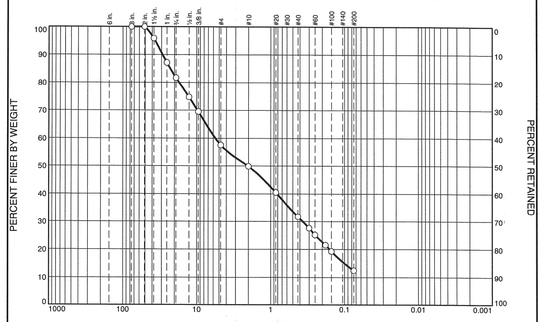
Remarks

Source of Sample: C-1
Sample Number: L180501A
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180501A

Tested By: DM/BM

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	18	24	8	18	20	12	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	100		
1.5"	96		
1"	87		
.75"	82		
.5"	75		
.375"	70		
#4	58		
#10	50		
#20	41		
#40	32		
#50	28		
#60	25		
#80	22		
#100	19		
#200	12		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 28.9522 D_{85}= 22.7755 D_{60}= 5.5951
D_{50}= 2.0332 D_{30}= 0.3641 D_{15}= 0.0997
D_{10}= C_u= C_c=

Classification
USCS= AASHTO=

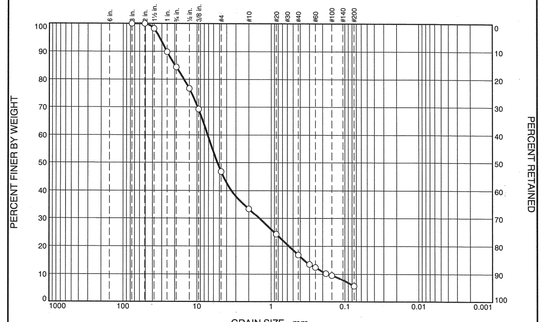
Remarks
SAMPLE CONTAINS ASPHALT.

Source of Sample: C-2
Sample Number: L180501B
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180501B

Tested By: DM/BM

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	16	37	14	16	11	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	100		
1.5"	98		
1"	90		
.75"	84		
.5"	77		
.375"	69		
#4	47		
#10	33		
#20	24		
#40	17		
#50	14		
#60	12		
#80	10		
#100	10		
#200	5.6		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 25.5501 D_{85}= 19.6554 D_{60}= 7.1775
D_{50}= 5.3065 D_{30}= 1.4357 D_{15}= 0.3562
D_{10}= 0.1704 C_u= 42.13 C_c= 1.69

Classification
USCS= AASHTO=

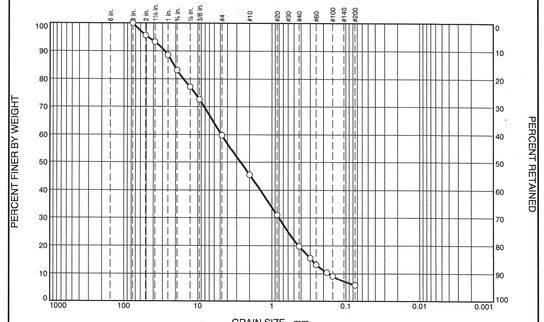
Remarks
SAMPLE CONTAINS ASPHALT.

Source of Sample: C-3
Sample Number: L180501C
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180501C

Tested By: DM/BM

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	17	23	14	26	14	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	96		
1.5"	93		
1"	89		
.75"	83		
.5"	77		
.375"	73		
#4	60		
#10	46		
#20	31		
#40	20		
#50	16		
#60	13		
#80	10		
#100	9		
#200	5.8		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 27.8507 D_{85}= 21.0071 D_{60}= 4.8075
D_{50}= 2.6438 D_{30}= 0.7996 D_{15}= 0.2875
D_{10}= 0.1693 C_u= 28.39 C_c= 0.79

Classification
USCS= AASHTO=

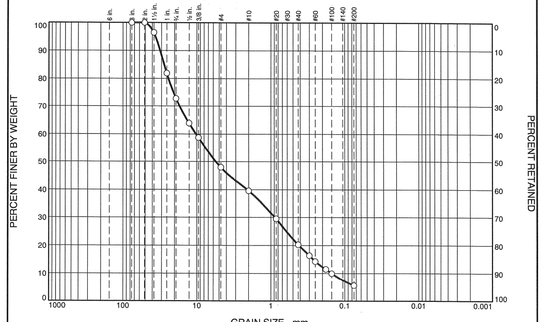
Remarks

Source of Sample: C-4
Sample Number: L180501D
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180501D

Tested By: DM/BM

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	27	25	8	20	14	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	100		
1.5"	96		
1"	82		
.75"	73		
.5"	64		
.375"	59		
#4	48		
#10	40		
#20	30		
#40	20		
#50	16		
#60	14		
#80	11		
#100	10		
#200	5.6		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 31.1914 D_{85}= 27.4852 D_{60}= 10.2311
D_{50}= 5.5285 D_{30}= 0.8788 D_{15}= 0.2664
D_{10}= 0.1509 C_u= 67.82 C_c= 0.50

Classification
USCS= AASHTO=

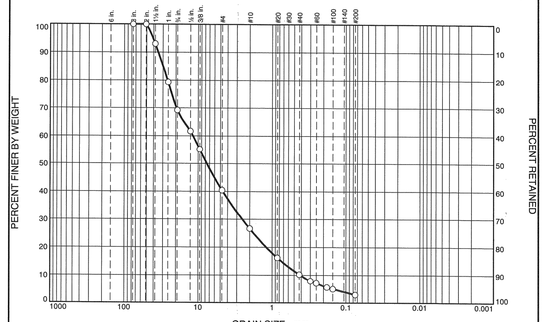
Remarks

Source of Sample: C-6
Sample Number: L180501E
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180501E

Tested By: DM/BM

GRAINSIZE DISTRIBUTION REPORT - AGGREGATE GRADING



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	31	29	13	17	7	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
2"	100		
1.5"	93		
1"	79		
.75"	69		
.5"	62		
.375"	55		
#4	40		
#10	27		
#20	16		
#40	10		
#50	8		
#60	7		
#80	6		
#100	5		
#200	2.9		

* (no specification provided)

Material Description
SAMPLE OBTAINED DIRECTLY BELOW ASPHALT.

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 34.5400 D_{85}= 29.7075 D_{60}= 11.6849
D_{50}= 7.6154 D_{30}= 2.5172 D_{15}= 0.7467
D_{10}= 0.4119 C_u= 28.37 C_c= 1.32

Classification
USCS= GW AASHTO=

Remarks

Source of Sample: C-8
Sample Number: L180501F
Date: 11-7-18

MILLER ENGINEERING & TESTING, INC.
Client:
Project: BOSTON ROAD PAVEMENT CORES
Project No: 18.268.NH **Figure** L180508F

Tested By: DM/BM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	5	132
PROJECT FILE NO.	609035		

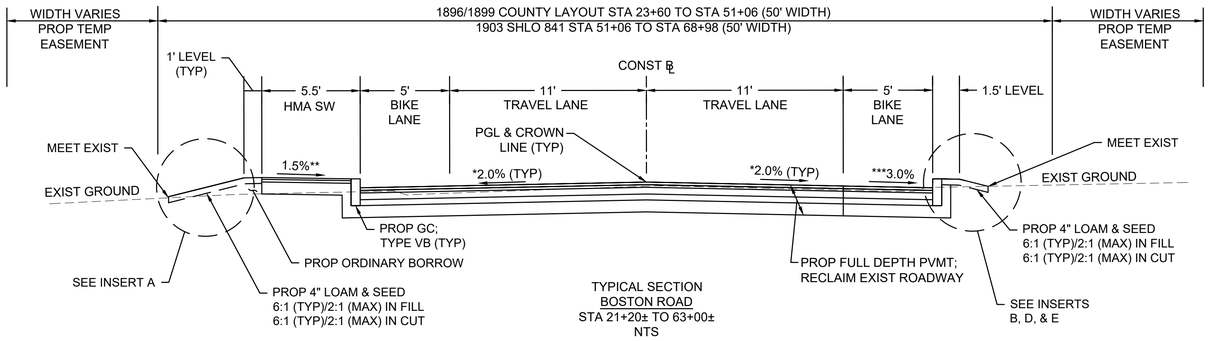
PAVEMENT CORE DATA

609035_HD3A(PAVEMENT CORES).DWG Plotted on 17-May-2024 8:19 AM

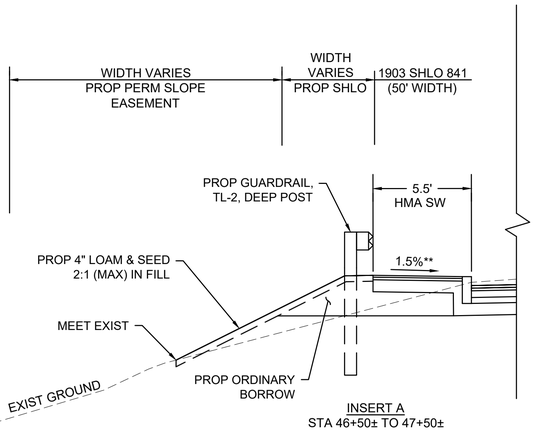
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	6	132
PROJECT FILE NO.	609035		

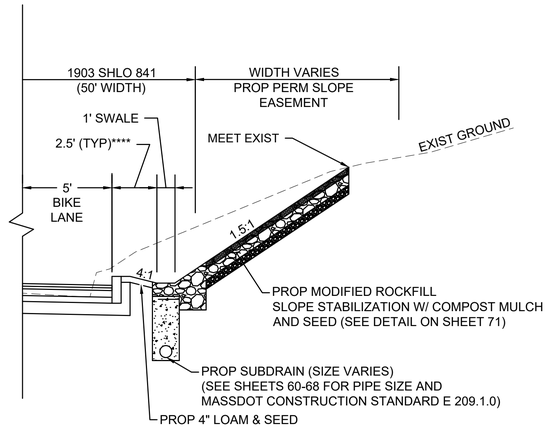
TYPICAL SECTIONS AND PAVEMENT NOTES - 1 OF 4



TYPICAL SECTION
BOSTON ROAD
STA 21+20± TO 63+00±
NTS

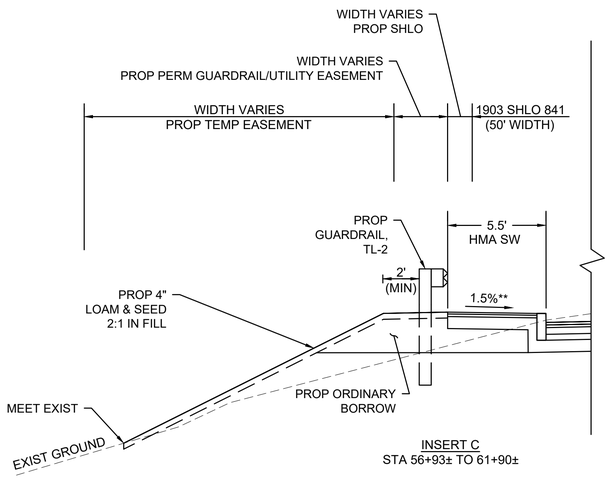


INSERT A
STA 46+50± TO 47+50±

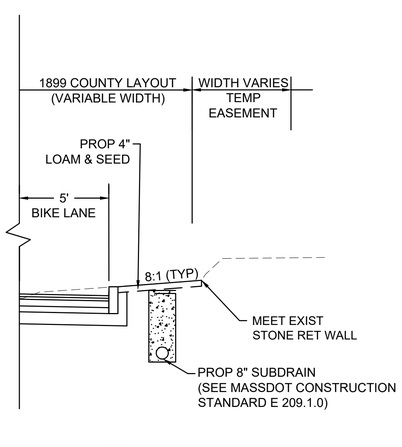


INSERT B
STA 47+67± TO 53+60±
STA 56+00± TO 58+53±

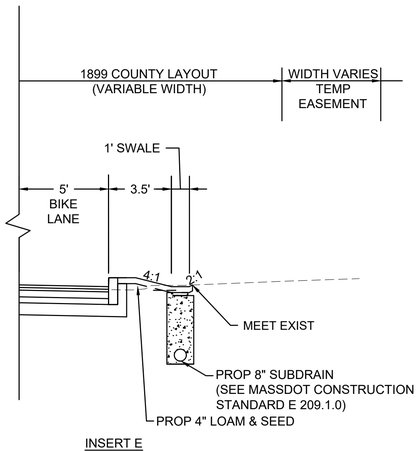
* SEE SHEET 7 FOR LOCATIONS OF SUPERELEVATION / METHOD OF BANKING
** TOLERANCE FOR CONSTRUCTION = ±0.5%
*** 3.0% BETWEEN STA 21+00 TO STA 41+50
**** 1.5' - OMIT 6" LEVEL BEHIND PROPOSED CURB (STA 56+05 TO STA 56+80)



INSERT C
STA 56+93± TO 61+90±



INSERT D
STA 29+40± TO 30+75±



INSERT E
STA 34+00± TO 35+50±

PAVEMENT NOTES

PROPOSED FULL DEPTH RECLAMATION - BOSTON ROAD
SURFACE: 1¾" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) OVER
1¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5)

BASE: 4½" SUPERPAVE BASE COURSE 37.5 (SBC - 37.5) OVER

SUBBASE: 4" RECLAIMED PAVEMENT BORROW FOR SUB-BASE (STABILIZED) OVER
8" RECLAIMED PAVEMENT BORROW FOR SUB-BASE

NOTE: RECLAIM DEPTH SHALL BE 14"±2" OR AS REQUIRED TO MEET LINES AND GRADES.
EXISTING PAVEMENT SHALL BE MILLED 4" FROM STA 20+27 TO STA 31+50 PRIOR TO RECLAIMING.

PROPOSED FULL DEPTH PAVEMENT CONSTRUCTION - CROWN ROAD
SURFACE: 1¾" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) OVER

BASE: 2½" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC - 12.5) OVER

SUBBASE: 12" GRAVEL BORROW, TYPE b OVER
VARIABLE DEPTH SPECIAL BORROW OVER
EXISTING SUBBASE MATERIAL

PROPOSED RESURFACING OVERLAY
SURFACE: 1¾" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) OVER
1¾" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC - 12.5) OVER
3½" MAX DEPTH FINE PAVEMENT MILLING

SUBBASE: EXISTING SUBBASE MATERIAL

NOTES: VARIABLE DEPTH PAVEMENT FINE MILLING AS REQUIRED TO MEET PROPOSED LINES AND GRADES.

PROPOSED FULL DEPTH PAVEMENT (WIDENING LESS THAN 4' WIDE)
SURFACE: 1¾" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) OVER
1¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5)

BASE: 6" HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE OVER

SUBBASE: 8" GRAVEL BORROW, TYPE b

PROPOSED PERMANENT PAVEMENT TRENCH PATCH
SURFACE: VARIABLE DEPTH SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) (ITEM 451.)
(COMPACTED IN 3" MAX. LIFTS TO MATCH EXISTING PAVEMENT THICKNESS)

BASE: 8" GRAVEL BORROW, TYPE b

SUBBASE: EXISTING MATERIAL SUITABLE FOR RE-USE (SEE VARIOUS TRENCH DETAILS)

PROPOSED TEMPORARY PAVEMENT TRENCH PATCH
SURFACE: 3" TEMPORARY ASPHALT PATCHING (ITEM 472.)

SUBBASE: EXISTING MATERIAL SUITABLE FOR RE-USE (SEE VARIOUS TRENCH DETAILS)

PROPOSED HMA SIDEWALK & BIKE PATH
SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER
1¾" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER

NOTE: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE SIDEWALKS & PEDESTRIAN CURB RAMPS
SURFACE: 4" CEMENT CONCRETE (4000 PSI, ¾", 610)

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE SIDEWALK THROUGH DRIVEWAY
SURFACE: 6" CEMENT CONCRETE (4000 PSI, ¾", 610)

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED HMA DRIVEWAY (RESIDENTIAL)
SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER
2½" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER

BASE: 8" SUITABLE EXISTING GRAVEL;
ADD GRAVEL BORROW, TYPE b AS REQUIRED

PROPOSED HMA DRIVEWAY (COMMERCIAL/MUNICIPAL)
SURFACE: 1½" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER
2½" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER

BASE: 8" SUITABLE EXISTING GRAVEL;
ADD GRAVEL BORROW, TYPE b AS REQUIRED

PROPOSED GRAVEL DRIVEWAY
SURFACE: 8" DENSE GRADED CRUSHED STONE (COMPACTED IN 4" (MAX) LIFTS)

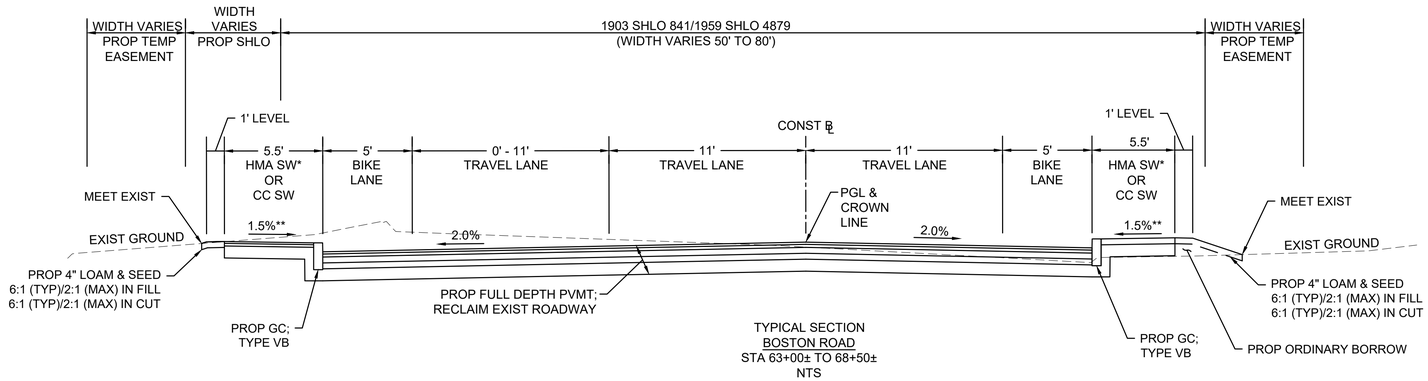
SUBBASE: SUITABLE EXISTING MATERIAL

609035_HDA(TYPICAL SECTIONS).DWG Plotted on 17-May-2024 8:19 AM

WESTFORD
BOSTON ROAD

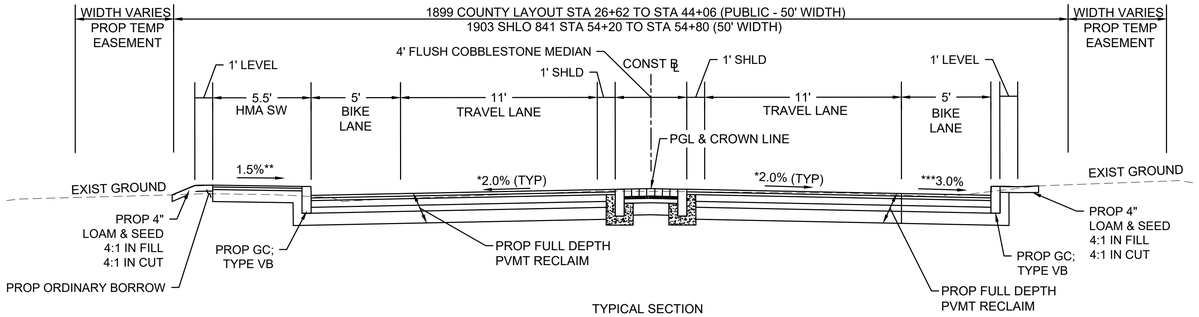
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	7	132
	PROJECT FILE NO. 609035		

TYPICAL SECTIONS AND PAVEMENT NOTES - 2 OF 4



TYPICAL SECTION
BOSTON ROAD
STA 63+00± TO 68+50±
NTS

*HMA SIDEWALK - STA 63+00 TO 65+60 RT AND STA 63+00 TO 67+10 LT
CEMENT CONCRETE SIDEWALK - STA 66+30 TO 68+50 RT AND STA 67+03 TO 68+50 LT
**TOLERANCE FOR CONSTRUCTION = ±0.5%

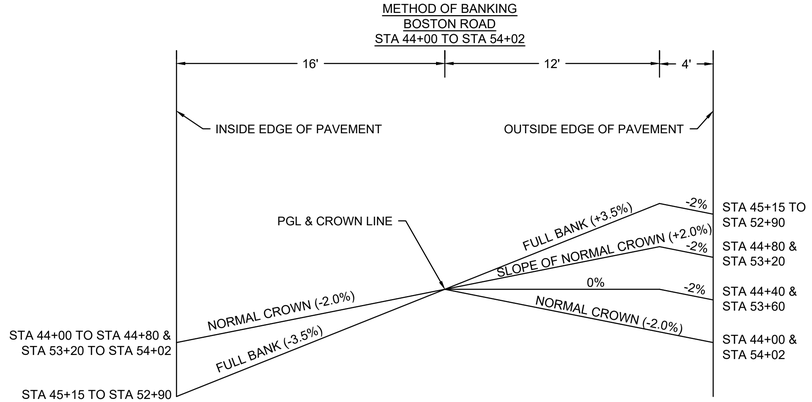


TYPICAL SECTION
BOSTON ROAD
STA 20+46± TO 20+81±
STA 29+11± TO 29+57±
STA 37+05± TO 37+53±
STA 43+06± TO 44+06±
STA 53+10± TO 53+70±
NTS

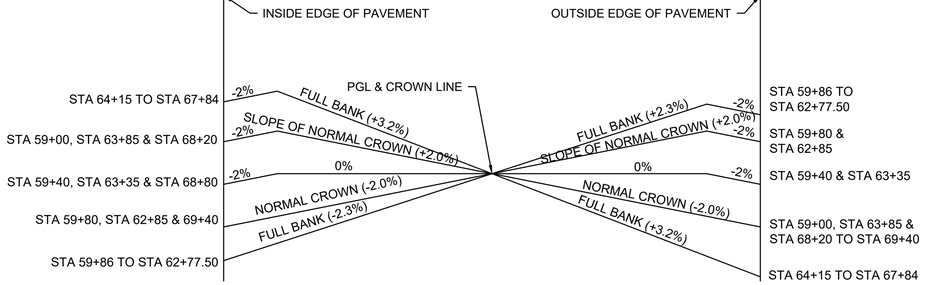
GENERAL PAVEMENT NOTES:

1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND HMA JOINT ADHESIVE SHALL BE APPLIED ON SAWCUT JOINTS BEFORE PAVING. HMA JOINT ADHESIVE SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED IN ACCORDANCE WITH SUBSECTION 450.43. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. HMA FOR WALKS AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH SECTION 702.
3. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED AS REQUIRED.
4. PROPOSED GRAVEL BORROW MAY BE SUBSTITUTED WITH RECLAIMED PAVEMENT BORROW. GRAVEL BORROW SHALL BE IMPORTED AFTER ALL RECLAIMED PAVEMENT BORROW IS EMPLOYED.
5. PROPOSED DENSE GRADED CRUSHED STONE MAY BE SUBSTITUTED WITH ASPHALT STABILIZED RECLAIMED PAVEMENT BORROW.
6. ALL HMA SHALL BE IN ACCORDANCE WITH SECTION 450 HMA PAVEMENT AND SECTION M3 ASPHALTIC MATERIALS.
7. SUB-BASE SHALL BE 12" COMPACTED THICKNESS.
8. ALL ROADWAY EMBANKMENT SHALL BE COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DRY DENSITY.
9. THE ENTIRE SUB-BASE SURFACE SHALL BE STABILIZED WITH EMULSIFIED LIQUID ASPHALT FOR DENSITY AND DUST CONTROL PRIOR TO PAVING HMA BASE COURSE.
10. ALL UTILITY AND DRAINAGE STRUCTURES SHALL BE LOWERED BENEATH RECLAMATION DEPTH PER SECTION 403.
11. AREAS OF WIDENING WITHIN THE RECLAIM AREA (I.E. STA 28+00 TO STA 31+00) SHALL BE EXCAVATED TO A DEPTH OF 20" BELOW FINISH GRADE PRIOR TO ADJACENT RECLAIMING PROCESS. ONCE RECLAMING HAS PROCEEDED, EXCESS MATERIAL WILL NEED TO BE EXCAVATED AND PLACED IN THE WIDENED AREAS FOR BLENDING AND COMPACTION.

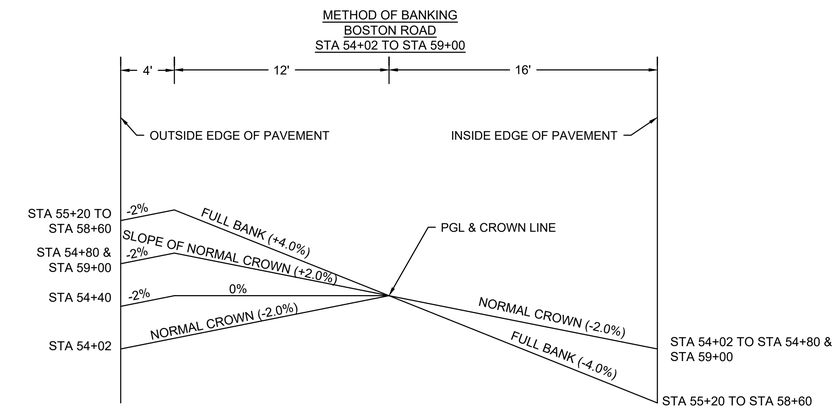
METHOD OF BANKING
BOSTON ROAD
STA 44+00 TO STA 54+02



METHOD OF BANKING
BOSTON ROAD
STA 59+00 TO STA 69+40



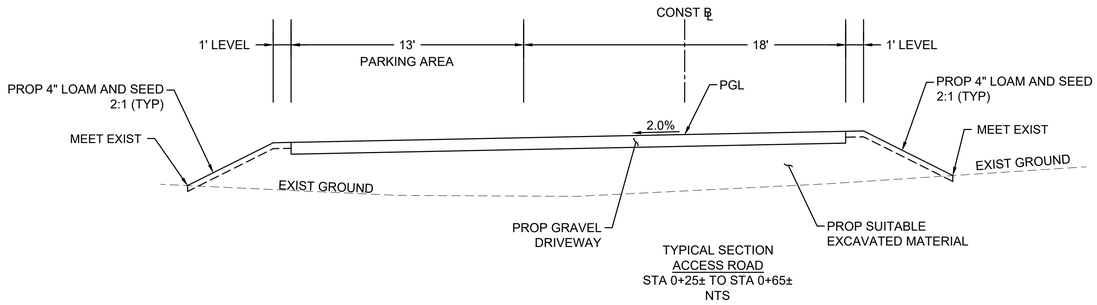
METHOD OF BANKING
BOSTON ROAD
STA 54+02 TO STA 59+00



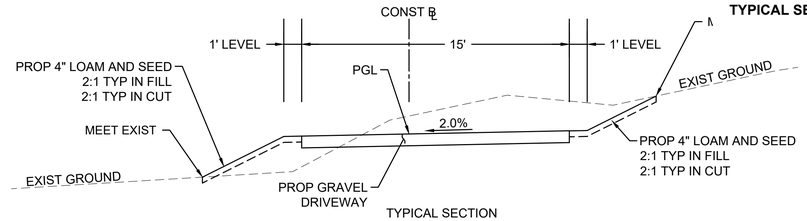
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	8	132
PROJECT FILE NO.	609035		

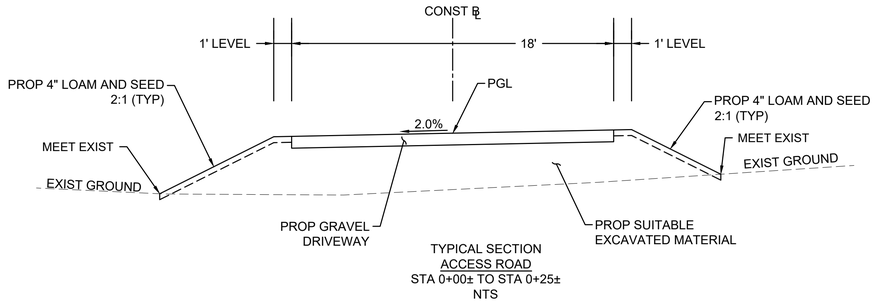
TYPICAL SECTIONS AND PAVEMENT NOTES - 3 OF 4



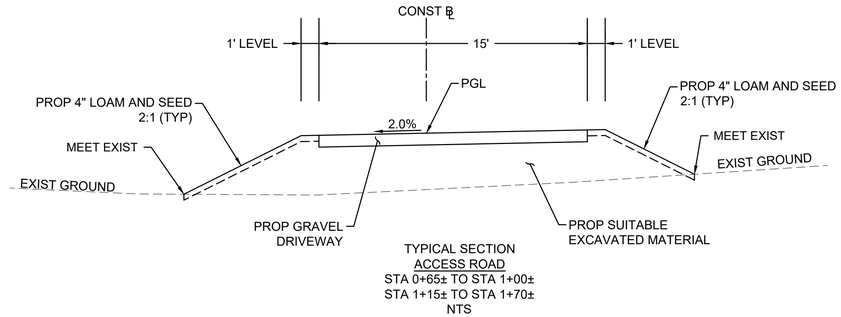
TYPICAL SECTION
ACCESS ROAD
STA 0+25± TO STA 0+65±
NTS



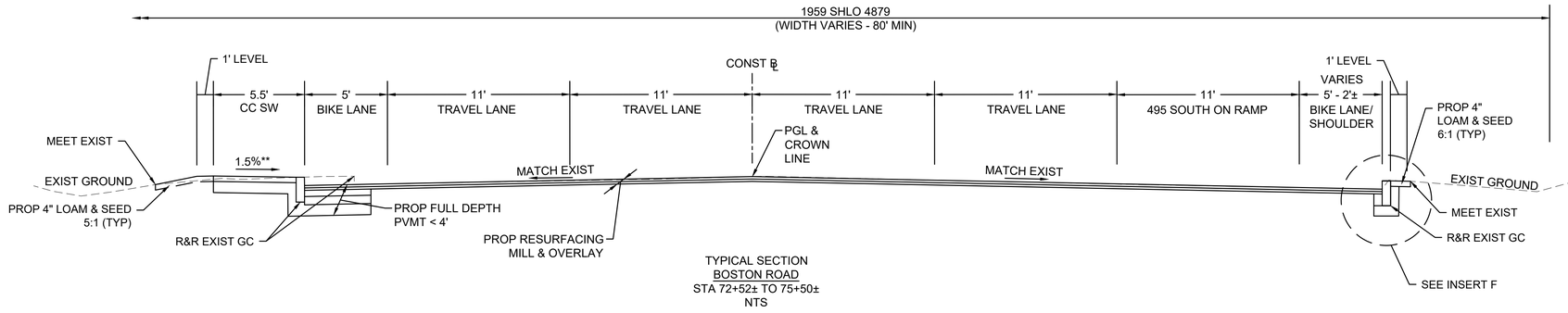
TYPICAL SECTION
ACCESS ROAD
STA 1+00± TO STA 1+15±
STA 1+70± TO STA 2+50±
NTS



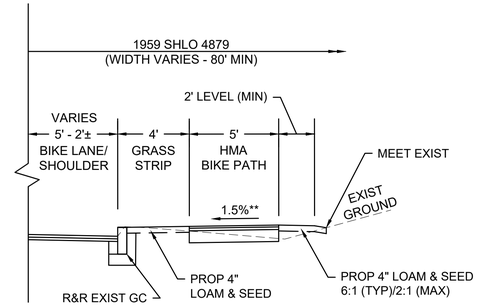
TYPICAL SECTION
ACCESS ROAD
STA 0+00± TO STA 0+25±
NTS



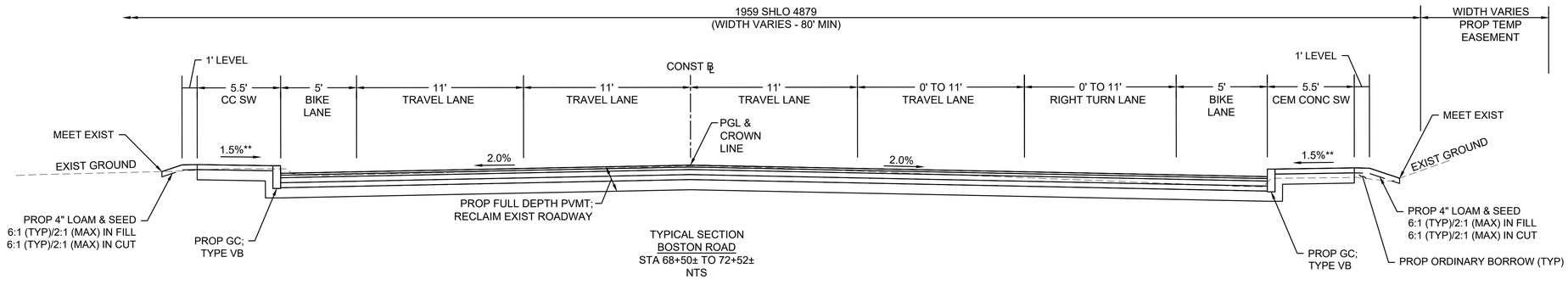
TYPICAL SECTION
ACCESS ROAD
STA 0+65± TO STA 1+00±
STA 1+15± TO STA 1+70±
NTS



TYPICAL SECTION
BOSTON ROAD
STA 72+52± TO 75+50±
NTS



INSERT F
STA 73+68± TO 74+75±

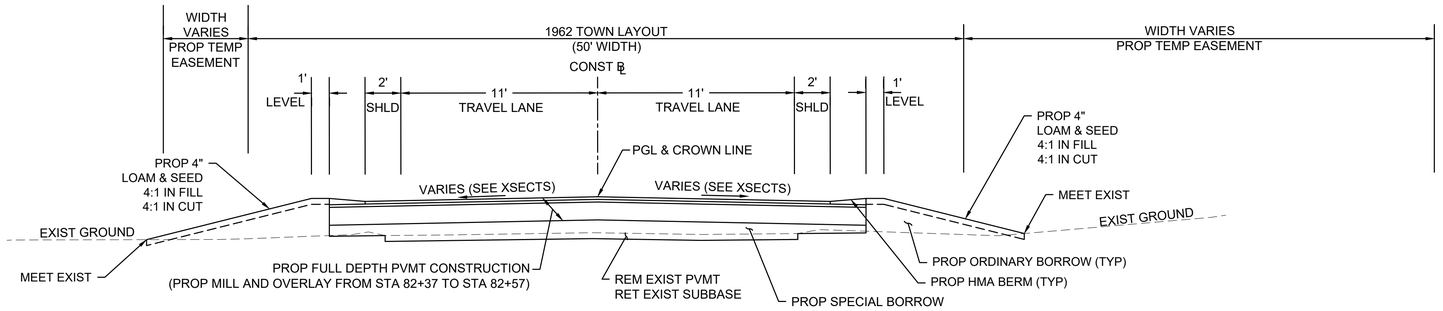


TYPICAL SECTION
BOSTON ROAD
STA 68+50± TO 72+52±
NTS

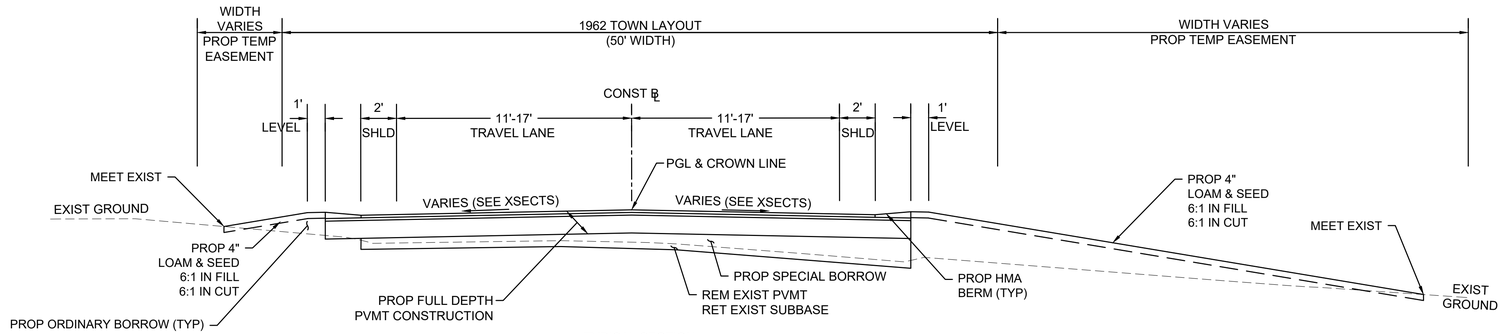
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	9	132
PROJECT FILE NO.	609035		

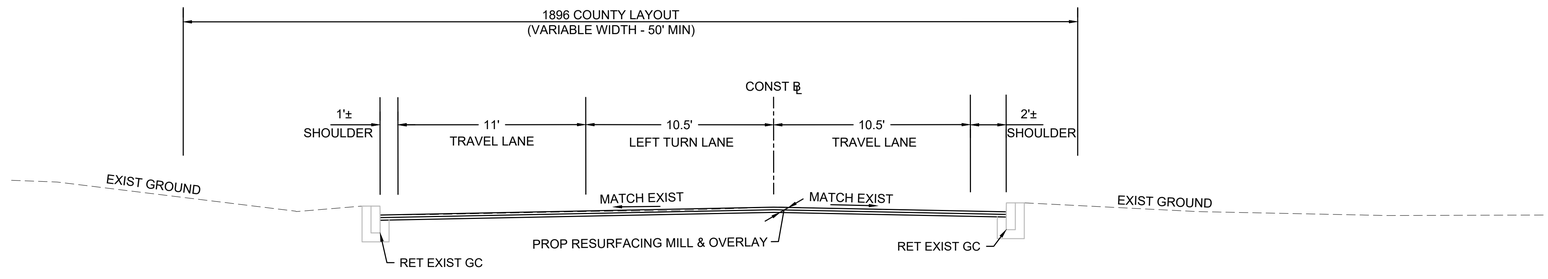
TYPICAL SECTIONS AND PAVEMENT NOTES - 4 OF 4



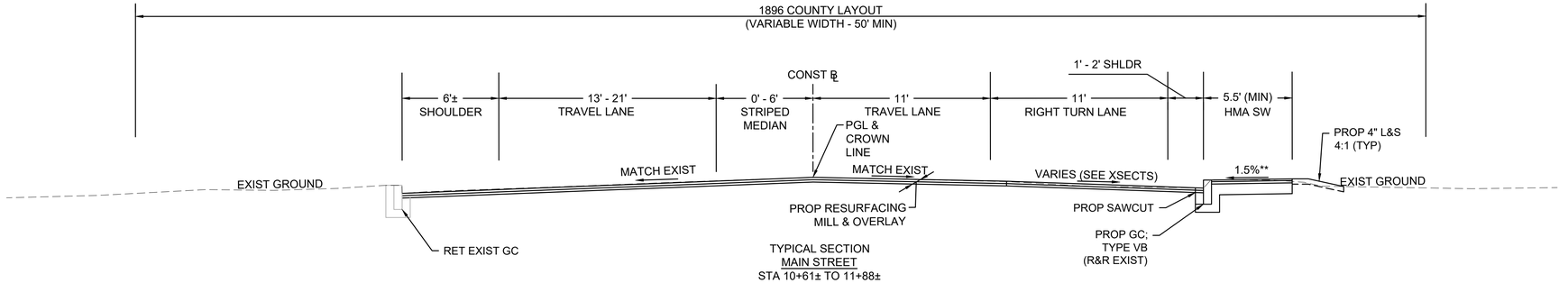
TYPICAL SECTION
CROWN ROAD
STA 80+40± TO 82+57±
NTS



TYPICAL SECTION
CROWN ROAD
STA 80+32± TO 80+40±
NTS



TYPICAL SECTION
MAIN STREET
STA 12+67± TO 13+10±
NTS



TYPICAL SECTION
MAIN STREET
STA 10+61± TO 11+88±
NTS

**TOLERANCE FOR CONSTRUCTION = ±0.5%

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	10	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 1 OF 11

GUARDRAIL DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET 60

DRAINAGE DETAILS
SEE SHEET 60

PLANT LIST					
QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
1	RM	Acer rubrum 'Red Sunset'	Red Sunset Red Maple	2"-2½" cal	776.557
1	YC	Prunus x yedoensis	Yoshino Flowering Cherry	1½"-2" cal	778.393
3	FC	Prunus serrulatea 'Shirotae'	Mt. Fuji Flowering Cherry	1½"-2" cal	778.363

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

LIMIT OF WORK
STA 14+25
N3036894.0183
E672655.4630

N65°20'36"E
126.38'

PROP SAWCUT
LIMIT OF MILL & OVERLAY

PT +23.62

L=16.26' R=400.00'
Δ=2° 19' 44"

RET PVMT & GC

PROP MILL & HMA OVERLAY

PROP PLAIN GRANITE BOUND

MEET EXIST GC

PROP 5.5' (MIN) HMA SW

PROP LAYOUT ALTERATION

PC +07.37

PROP TEMP EASEMENT (TYP, UNLESS OTHERWISE NOTED)

PROP IMPRINTED PREFORMED THERMOPLASTIC CROSSWALK BRICK PATTERN (PAID FOR UNDER ITEM 487.1,TYP)

PROP PLAIN GRANITE BOUND

RET MONUMENT

MEET EX GC & SW

PROP TREE PROTECTION FENCE

N67°40'20"E
51.38'

PT +55.98

LIMIT OF FULL DEPTH RECLAMATION

PROP FULL DEPTH HMA PATCH (SEE SHEET 60)

RET EXIST GC

N/F
FIRST PARISH CHURCH
UNITED OF WESTFORD
48 MAIN STREET
MAP–LOT 059 0017 0000
BK–PG 1585–454

MAIN ST

Δ=19° 50' 18"
L=143.71'
R=595.00'

CONNELL DR

PC+12.28

N81°30'38"E
112.28'

PROP SAWCUT
LIMIT OF MILL & OVERLAY

N/F
CHRISTOPHER CARPENTER &
STACY CARPENTER
44 MAIN STREET
MAP–LOT 059 0011 0000
BK–PG 31321–124

LIMIT OF WORK
STA 10+60
N3036779.9180
E672310.9816

10+00

20+00

PROJECT BEGIN
STA 20+00
N3036806.9111
E672448.1959

REM EXIST
CURB RAMP
20+00 BOSTON ROAD=
12+00.01 MAIN STREET

PROP 4" L&S

PROP 5.5' (MIN) HMA SW

PROP MILL & HMA OVERLAY

PROP HMA DWY

PROP TEMP EASEMENT

MEET EX DWY (SAWCUT)

R&R BRICK DWY TRANSITION

MEET EXIST VGC & BRICK WALK

RET RR TIE

N/F
WESTFORD CENTER TRUST
45 MAIN STREET
MAP–LOT 059 0004 0000
BK–PG 3719–333

N/F
JAMES D. ROBERTS
HILDRETH STREET
MAP–LOT 059 0003 0000
CERT NO. 39045
LCC NO. 17070
BK–PG 198–91

N/F
TOWN OF WESTFORD
MAIN STREET
MAP–LOT 059 0001 0000
BK–PG 0240–127

RET ACCESSIBLE ROUTE; EXERCISE CARE TO NOT DISTURB UNDERLAYMENT

RET FOUNTAIN

PROP 4" L&S (TYP)

PROP 5.5' HMA SW

PROP BOS (TYP)

RET TREE

PROP 25' MILL & OVERLAY TRANSITION RET

MEET EX GC

PROP SAWCUT LIMIT OF MILL & OVERLAY

LINCOLN ST

N/F
WESTFORD HISTORICAL SOCIETY, INC.
10 LINCOLN STREET
MAP–LOT 055 0012 0000
BK–PG 9792–167
BK–PG 19324–138

PROP PERM UTILITY EASEMENT

RET EX CURB RAMP

PROP PLAIN GRANITE BOUND

R&D BUSHES

PROP 4.5' (MIN) HMA SW

RET GRANITE POST & CONC WALK

PROP BOS (TYP)

MEET EXIST SW

R&R (ITEM 874.21)
"WESTFORD MUSEUM"

RET TREE; PROP TREE PROTECTION

L=246.87' R=650.00'
Δ=21° 45' 41"

RET GRAN POST

PROP BARK MULCH

RET LANDSCAPING

PROP BOS (TYP)

RET BALANCE STONE WALL

MEET EX EOP W/ 6' TRANSITION STONE

PROP 25' MILL & OVERLAY TRANSITION

PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY

PROP PERM UTILITY EASEMENT

BOSTON RD

PC +68.96

RET TREE; PROP TREE PROTECTION; PROP AIR SPADE AND ROOT PRUNING

REM EX PVMT & SUBBASE; PROP 6" L&S

PROP TOS (TYP)

RM

FC

YC

RET STATUE

PROP SAWCUT LIMIT OF MILL & OVERLAY

MEET EX GC

PROP 25' MILL & OVERLAY TRANSITION

MEET EX GC

R&R VGC (TYP)

RET

REM EX PVMT & SUBBASE; PROP 6" L&S

PROP BOS (TYP)

PROP 25' MILL & OVERLAY TRANSITION

MEET EX GC

PROP SAWCUT LIMIT OF MILL & OVERLAY

HILDRETH ST

N/F
INEZ CHESHIRE BUCHKO
JUSTIN DANIEL BORICK
2 HILDRETH STREET
MAP–LOT 055 0041 0000
BK–PG 36233–188

N/F
TOWN OF WESTFORD
LOT 4 BOSTON ROAD
MAP–LOT 059 0002 0000
BK–PG 1404–530

N/F
JAMES D. ROBERTS
1 HILDRETH STREET
MAP–LOT 055 0007 0000
CERT NO. 39045
LCC NO. 17070
BK–PG 198–91

CONTINUED ON SHEET NO. 11

FOR PROFILE SEE SHEETS NO. 21 & 25

0 20 50 100

SCALE: 1" = 20'

CONSTRUCTION NOTES:

1. EXISTING CONDITIONS INFORMATION COMPILED FROM AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY TEC, INC. IN JUNE & NOVEMBER, 2017.

   HORIZONTAL DATUM = NAD83 (MASSACHUSETTS STATE PLANE COORDINATES)
   VERTICAL DATUM = NAVD88

2. ALL EXISTING STATE, COUNTY, AND TOWN LOCATION LINES HAVE BEEN ESTABLISHED FROM AN ACTUAL ON-THE-GROUND SURVEY. ALL PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.

3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL CONTACT DIGSAFE (1-888-DIGSAFE) A MINIMUM OF 72 HOURS PRIOR TO ANY CONSTRUCTION TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

5. ALL MUNICIPALLY OWNED UTILITY STRUCTURES (CATCH BASINS, DRAIN MANHOLES, WATER GATES, ETC.) SHALL BE ADJUSTED BY THE CONTRACTOR TO FINISHED GRADE UNLESS DIRECTED OTHERWISE.

6. ALL PRIVATELY OWNED UTILITY STRUCTURES (GAS GATES, ELECTRIC /TELEPHONE MANHOLES, ETC.) SHALL BE ADJUSTED TO FINISHED GRADE BY THE PRIVATE UTILITY COMPANY, UNLESS DIRECTED OTHERWISE. THE CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES FOR THE ALTERATION AND ADJUSTMENT, AS NECESSARY.

7. PROPOSED LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 1.0% (MINIMUM) UNLESS OTHERWISE NOTED.

8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE.

9. ALL DISTURBED AREAS OUTSIDE THE CURBLINE SHALL BE STABILIZED WITH 4" LOAM AND SEED, UNLESS OTHERWISE NOTED.

10. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R), AS APPROVED BY THE ENGINEER.

11. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.

12. ALL EXISTING TREES WITHIN THE PROJECT LIMITS SHALL BE RETAINED AND PROTECTED WITH TREE PROTECTION UNLESS INDICATED OTHERWISE ON THE DRAWINGS. ALL PROVIDED DIMENSIONS REFER TO THE DIAMETER AT BREAST HEIGHT.

13. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 3'-0" (EXCLUDING THE WIDTH OF CURB) SHALL BE MAINTAINED PAST ALL OBSTRUCTIONS (UTILITY POLES, LIGHT POLES, SIGNS, MAILBOXES, ALONG DRIVEWAY OPENINGS, ETC.)

14. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL PROPOSED CURB RAMPS AND SHALL BE INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARDS.

15. CONTRACTOR SHALL COMPENSATE PROPERTY OWNERS FOR ANY ADDITIONAL DAMAGE TO EXISTING PRIVATE SHRUBS AND LANDSCAPE BEDS NOT ALREADY OUTLINED THROUGH THE RIGHT OF WAY PROCESS.

16. ALL AREAS BETWEEN THE BACK OF SIDEWALK OR CURB TO THE LIMIT OF GRADING, OR AREAS DISTURBED BY THE CONTRACTORS OPERATIONS SHALL BE RESTORED WITH 4 INCHES OF LOAM AND SEED, UNLESS OTHERWISE NOTED.

17. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR OTHER "SURFACE" TYPE STRUCTURE THAT CANNOT BE REMOVED OR RESET IS WITHIN THE PROPOSED OR EXISTING (IF RECIPROCAL OR WITHIN PROJECT LIMITS) ACCESSIBLE SURFACE, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACES OR THE STRUCTURE COVER SHALL BE FLUSH WITH THE CURB RAMP SURFACE.

18. FOR SLOTTED PAVEMENT MARKER LOCATIONS, SEE SHEET 46.

609035_HDS(CONSTRUCTION PLANS).DWG Plotted on 17-May-2024 8:22 AM

GUARDRAIL DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 61

DRAINAGE DETAILS

SEE SHEET 61

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	11	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 2 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:22 AM

CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 12

N/F
TOWN OF WESTFORD
2 BOSTON ROAD
MAP–LOT 055 0013 0000
BK–PG 0558–0227

N/F
SCOTT A. BRANDSGAARD &
JULIE R. TENINBAUM BRANDSGAARD
6 BOSTON ROAD
MAP–LOT 055 0014 000
BK–PG 28975–239

N/F
NEWELL F. TILLMAN,
TRUSTEE OF THE NEWELL
FREDERICK TILLMAN LIVING TRUST
8 BOSTON ROAD
MAP–LOT 055 0015 0000
BK–PG 28598–82

N/F
RAFAEL MEIRA ZAGATO
MARIANA SERRANO ZAGATO
10 BOSTON ROAD
MAP–LOT 055 0016 0000
BK–PG 37970–143

N/F
ANDREW J. MACBETH
DEBORAH WOLFE MACBETH
12 BOSTON ROAD
MAP–LOT 055 0017 0000
BK–PG 11720–195

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
14 BOSTON ROAD
MAP–LOT 055 0018 0000
BK–PG 2297–0496

N/F
WESLEY A. OLSON &
KELLY H. OLSON
5 BOSTON ROAD
MAP–LOT 055 0040 0000
BK–PG 21587–244

N/F
7–9 BOSTON ROAD
CONDOMINIUM TRUST
7–9 BOSTON ROAD
MAP–LOT 055 0039 0002
BK–PG 9901–230

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
11 BOSTON ROAD
MAP–LOT 055 0038 0000
BK–PG 6779–0247

N/F
ALLEN T. HORHOTA
AMY E. BAILEY
13 BOSTON ROAD
MAP–LOT 055 0037 0000
LCC NO. 5798
CERT NO. 39942
BK–PG 202–143

N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP–LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK–PG 197–47

N/F
DONNA J. GOODMAN, TRUSTEE
OF THE DONNA J. GOODMAN
FAMILY REALTY TRUST
7A BOSTON ROAD
BK–PG 28558–128

N/F
JAMIE LEE MURRAY
KATIE–LEE MARIE MCLEOD
FAMILY REALTY TRUST
9B BOSTON ROAD
BK–PG 33547–257

BOSTON RD

R&R (ITEM 874.21)
PROP CC WALK TO MEET EX STEPS
PROP HMA DWY (TYP)
MEET EX DWY (SAWCUT)
PROP 5.5' HMA SW
RET BUSHES
R&D PLANTS RET
RET GRANITE STEPS
ROOF OVERHANG RET
PROP TEMP EASEMENT (TYP, UNLESS OTHERWISE NOTED)
PROP HMA DWY (TYP)
MEET EX DWY (SAWCUT)
RET BUSHES
R&R BRICK WALK
R&D PLANTS (8)
PROP BOS (TYP)
RET BUSHES
RET TREE
RET TREE; PROP TREE PROTECTION
PROP BOS (TYP)
TRIM HEDGE
MEET EX DWY (SAWCUT)
RET TREE; PROP TREE PROTECTION
R&R BRICK WALK; PROP GRANITE STEPS LOCATION NO. 1 (SEE DETAIL ON SHEET 76)
PROP BOS (TYP)
PROP CC WALK
PROP GRAN CURB TYPE VB (3' LONG, 8" REVEAL)
MEET EX DWY (SAWCUT)
RET LP
R&R MB
RET TREE; PROP TREE PROTECTION
MEET EX DWY (SAWCUT)
TRIM EX HEDGE
RET TREE; PROP TREE PROTECTION
R&R COBBLESTONE WALK
RET GRANITE STEPS
R&D TREE
PROP BOS (TYP)
RET TREE; PROP TREE PROTECTION
MEET EX DWY
R&R GRANITE WALL
PROP 4" L&S
R&D TREE
MEET EX DWY
PROP GRAVEL DWY
RET TREE; PROP TREE PROTECTION
RET TREE; PROP TREE PROTECTION
RET PLANTS
R&D BUSHES
R&R MB
R&R GRAN THRESHOLD
PT +36.34
CONST ℄
TRIM EX HEDGES
R&R BOUND
R&D EX HEDGE/BUSHES
PROP GRAVEL DWY
R&R MB
R&S STONE WALL (10')
PROP BARK MULCH
PRC +15.83
26 Δ=6° 19' 01" L=220.51' R=2000.00'
S36°07'47"E 398.69'
PROP GC TYPE VB FOR STEP
PROP PLAIN GRANITE BOUND
R&R MB
R&R MB
R&R MB
ER
R&S STEPS
R&R MB
R&D TREE
RET LANDSCAPING
PROP BOS (TYP)
RET BALANCE STONE WALL
MEET EX DWY
RET GRAN POST
RET SHRUBS
PROP TREE TRIMMING STA 24+08 TO STA 25+39
PROP GC; TYPE VB (TYP)
PROP 4" L&S (TYP)
PROP BOS (TYP)
RET TREE; PROP TREE PROTECTION
RET TREE; PROP TREE PROTECTION
RET TREE; PROP TREE PROTECTION; PROP AIR EXCAVATION AND ROOT PRUNING
MEET EXIST DWY (SAWCUT)
MEET EXIST DWY (SAWCUT)
RET GRAN WALL
PROP BOS (TYP)
1899 COUNTY LAYOUT
PROP BARK MULCH
PROP CLEARING & GRUBBING
MEET EX DWY (SAWCUT)
PROP FLUSH COBBLESTONE MEDIAN
PROP CRUSHED STONE
RET TRIM HEDGES
SEE NOTE 11 ON SHEET 7 FOR WIDENING IN RECLAIM (TYP)
PROP BARK MULCH
RET
PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY
PROP TOS (TYP)

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

PLANT LIST					
QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
1	ER	Cercis canadensis	Eastern Redbud	7'-8' height	782.536

0 20 50 100

SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. 21

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	12	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 3 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:23 AM

GUARDRAIL DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 62

DRAINAGE DETAILS

SEE SHEET 62

NOTE:
THE CONTRACTOR SHALL NOTE WELL OF THE EXISTING DOG FENCE WIRE WHICH RUNS BENEATH THE DRIVEWAY AT 18 BOSTON ROAD. DAMAGE TO THE FENCE WIRE DUE TO NEGLIGENCE BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

N/F
DANIEL H. DRINKWATER
MARIA A. MARTIN
16 BOSTON ROAD
MAP-LOT 055 0019 0000
BK-PG 10894-042

N/F
BRIAN G. ALCORN
ANDREA REID GRAHAM
18 BOSTON ROAD
MAP-LOT 055 0020 0000
BK-PG 25798-151

N/F
WILLIAM MORGAN STAIR
CYNTHIA JO. BEELER
20 BOSTON ROAD
MAP-LOT 055 0021 0000
BK-PG 11162-215

N/F
BRIAN C. MCDONALD
NICOLE A. MCDONALD
22 BOSTON ROAD
MAP-LOT 055 0022 0000
BK-PG 30208-17

N/F
ROBERT J WASKIEWICZ
24 BOSTON ROAD
MAP-LOT 055 0023 0000
BK-PG 31571-155

BOSTON RD

RET TREE
TRIM EX HEDGE
PROP GC TYPE VB (4'-4" LONG, 7" REVEAL)
RET TREE; PROP TREE PROTECTION
R&R BRICK WALK
MEET EX DWY (SAWCUT)
TRIM EX HEDGE
PROP BOS (TYP)
R&D TREE
R&R MB
MEET EX DWY (SAWCUT)
PROP BOS (TYP)
PROP 4" L&S (TYP)
RET SHRUBS
R&R MB
PROP TEMP EASEMENT (TYP)
MEET EX DWY (SAWCUT)
RET SHRUB
RET STONE WALL
PROP 5.5' HMA SW (TYP)
PROP BOS (TYP)
RET TREES
RET TREE
R&R COBBLESTONE EDGING TO BACK OF SIDEWALK
RET LP
RET SHRUBS
RET SHRUB
RET SHRUBS
RET STONE WALL
PROP BOS (TYP)
PROP BARK MULCH
MEET EX DWY (SAWCUT)
RET SHRUBS
RET
R&R COBBLESTONE EDGING TO BACK OF SIDEWALK
MEET EX DWY (SAWCUT)
R&R BRICK WALK; PROP GRANITE STEPS LOCATION NO. 2 (SEE DETAIL ON SHEET 76)
R&S STONE WALL (10')
R&R MB
PC +35.02
Δ=0° 51' 15"
L=74.55' R=5000.00'
PT +09.57
R&R BALANCE STONE WALL (90')
CONST ℄
S35°16'32"E
676.00'
R&R MB
R&R MB ASSEMBLY
R&S STONES
PROP 3" REVEAL
PROP GRAVEL DWY
R&R MB
PROP BOS (TYP)
RET TREE
PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY
LM
PROP BOS (TYP)
MEET EX DWY (SAWCUT)
PROP BARK MULCH
RET SHRUBS
RET UP
RET SHRUB
MEET EX DWY (SAWCUT)
R&D SHRUB
DW
R&R MB
R&R LIGHTS
PROP BARK MULCH
RET
RET TREE
R&R MB
MEET EX DWY (SAWCUT)
RET STONES
PROP TOS (TYP)
R&R MB
MEET EX DWY (SAWCUT)
R&S CONC PAVERS
RET STONE WALL
PROP BARK MULCH
REM EXIST CC STEPS; PROP CEM CONC STEPS DESIGN A (MASSDOT STD E 304.1.0)
MEET EX DWY (SAWCUT)
RET STONE WALL
PROP GC TYPE VB (TYP)
MEET EXIST DWY
RET TREE; PROP TREE PROTECTION
RET STONE WALL
MEET EX DWY (SAWCUT)
STONE BOUND DRILL HOLE FOUND RET

#15
2 ST WF BLD

#16
2 ST WF BLD

#17
2 ST WF BLD

#18
1 ST WF BLD

#19
2 ST WF BLD

#20
2 ST WF BLD

#21
2 ST WF BLD

#23
2 ST WF BLD

#25
2 ST WF BLD

N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP-LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK-PG 197-47

N/F
MICHAEL SCHIAVONE
KELLY SCHIAVONE
17 BOSTON ROAD
MAP-LOT 055 0035 0000
LCC NO. 5798
CERT NO. 43857
BK-PG 222-80

N/F
MICHAEL B. CHISHOLM
KATHLEEN L. CHISHOLM
19 BOSTON ROAD
MAP-LOT 055 0034 0000
LCC NO.5798
CERT NO. 32921
BK-PG 167-241

N/F
MYRLANDE EMANUEL
YOURI EMANUEL
21 BOSTON ROAD
MAP-LOT 055 0033 0000
BK-PG 36205-292

N/F
KIMBERLY O. SCHWAB
23 BOSTON ROAD
MAP-LOT 055 0032 0000
BK-PG 28551-267

PASSAGE WAY PLAN BK-PG 28-66

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

PLANT LIST					
QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
1	LM	Cratagus viridis 'Winter King'	Winter King Hawthorne	1½"-2" cal	781.263
1	DW	Malus 'Donald Wyman'	Donald Wyman Crabapple	1½"-2" cal	778.423

0 20 50 100

SCALE: 1" = 20'

CONTINUED ON SHEET NO. 11

CONTINUED ON SHEET NO. 13

FOR PROFILE SEE SHEET NO. 21

Plotted on 17-May-2024 8:23 AM

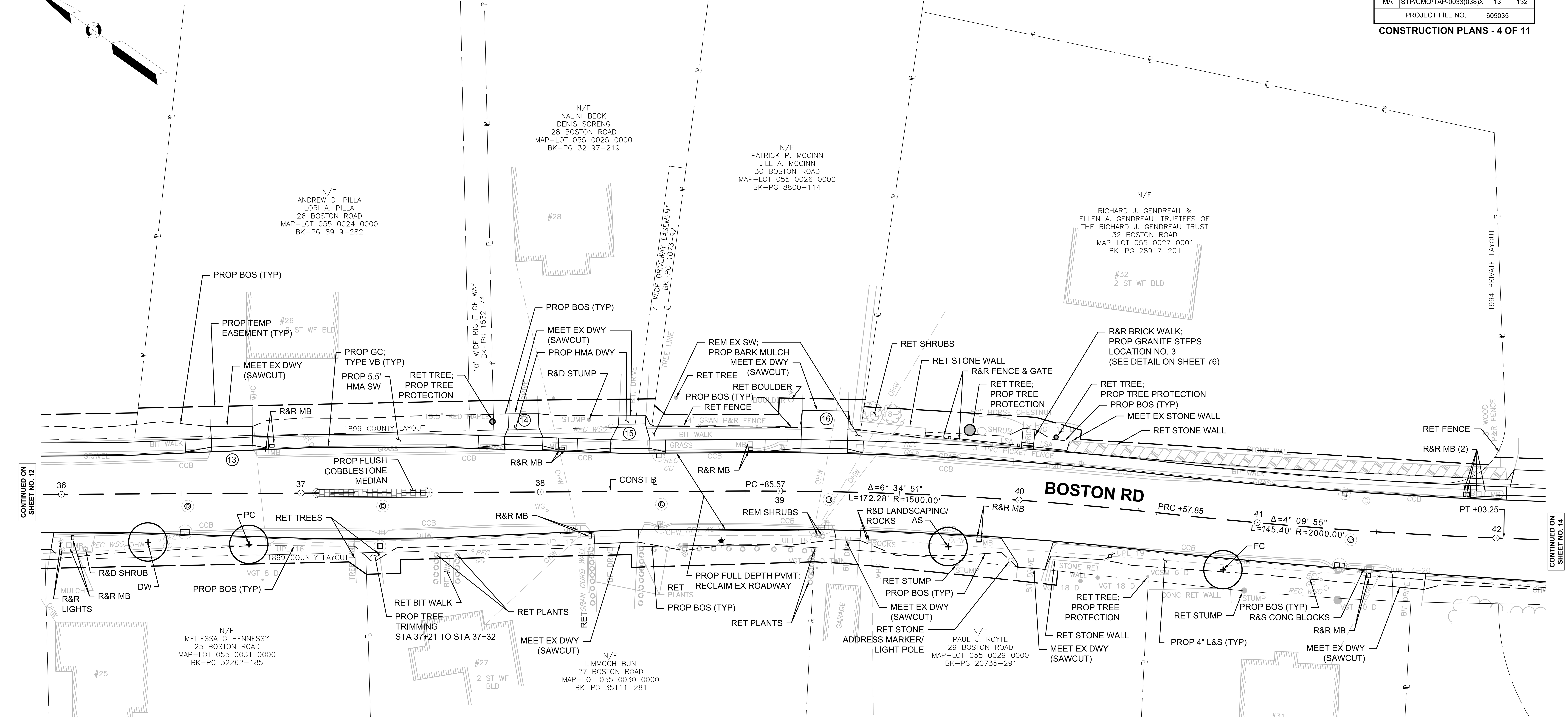
609035_HD5(CONSTRUCTION PLANS).DWG

GUARDRAIL DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET 63

DRAINAGE DETAILS
SEE SHEET 63



N
N/F
NALINI BECK
DENIS SORENG
28 BOSTON ROAD
MAP-LOT 055 0025 0000
BK-PG 32197-219
N/F
PATRICK P. MCGINN
JILL A. MCGINN
30 BOSTON ROAD
MAP-LOT 055 0026 0000
BK-PG 8800-114
N/F
ANDREW D. PILLA
LORI A. PILLA
26 BOSTON ROAD
MAP-LOT 055 0024 0000
BK-PG 8919-282
N/F
RICHARD J. GENDREAU &
ELLEN A. GENDREAU, TRUSTEES OF
THE RICHARD J. GENDREAU TRUST
32 BOSTON ROAD
MAP-LOT 055 0027 0001
BK-PG 28917-201
#32
2 ST WF BLD
#28
#26
1994 PRIVATE LAYOUT
10' WIDE RIGHT OF WAY
BK-PG 1532-74
7' WIDE DRIVEWAY EASEMENT
BK-PG 1073-92
PROP BOS (TYP)
PROP TEMP EASEMENT (TYP)
MEET EX DWY (SAWCUT)
PROP GC; TYPE VB (TYP)
PROP 5.5' HMA SW
RET TREE; PROP TREE PROTECTION
PROP HMA DWY
R&D STUMP
REM EX SW; PROP BARK MULCH
RET TREE
RET BOULDER
RET FENCE
RET SHRUBS
RET STONE WALL
R&R FENCE & GATE
R&R BRICK WALK; PROP GRANITE STEPS LOCATION NO. 3 (SEE DETAIL ON SHEET 76)
MEET EX STONE WALL
RET FENCE
R&R MB (2)
R&R MB
PROP FLUSH COBBLESTONE MEDIAN
CONST ℄
BOSTON RD
PC +85.57
Δ=6° 34' 51"
L=172.28' R=1500.00'
PRC +57.85
Δ=4° 09' 55"
L=145.40' R=2000.00'
PT +03.25
36
37
38
39
40
41
42
1899 COUNTY LAYOUT
CONTINUED ON SHEET NO. 12
CONTINUED ON SHEET NO. 14
13
14
15
16
PC
RET TREES
REM SHRUBS
R&D LANDSCAPING/ ROCKS
AS
FC
R&D SHRUB
DW
R&R LIGHTS
PROP BOS (TYP)
RET BIT WALK
PROP TREE TRIMMING STA 37+21 TO STA 37+32
RET PLANTS
MEET EX DWY (SAWCUT)
PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY
RET STUMP
RET STONE
ADDRESS MARKER/ LIGHT POLE
RET TREE; PROP TREE PROTECTION
RET STONE WALL
PROP 4" L&S (TYP)
R&S CONC BLOCKS
N/F
MELIESSA G HENNESSY
25 BOSTON ROAD
MAP-LOT 055 0031 0000
BK-PG 32262-185
#25
2 ST WF BLD
N/F
LIMMOCH BUN
27 BOSTON ROAD
MAP-LOT 055 0030 0000
BK-PG 35111-281
#27
2 ST WF BLD
N/F
PAUL J. ROYTE
29 BOSTON ROAD
MAP-LOT 055 0029 0000
BK-PG 20735-291
#29
N/F
MICHAEL A. KEMPKES
TAMISON R. ROSE
31 BOSTON ROAD
MAP-LOT 055 0028 0000
BK-PG 37796-92
#31
1 ½ ST WF BLD

PLANT LIST

QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
1	DW	Malus 'Donald Wyman'	Donald Wyman Crabapple	1½"-2" cal	778.423
1	FC	Prunus serrulatea 'Shirotae'	Mt. Fuji Flowering Cherry	1½"-2" cal	778.363
1	AS	Amerlanchier x grandiflora	Autumn Brilliance Serviceberry	4'-5' height	783.043
1	PC	Malus 'Prairiefire'	Prairiefire Crabapple	1½"-2" cal	778.436

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. 22

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	14	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 5 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:23 AM

N

GUARDRAIL DETAILS

STA 45+42 LT TO STA 45+52 LT TRAILING ANCHORAGE
STA 45+52 LT TO STA 47+22 LT DEEP POST GUARDRAIL, TL-2
STA 47+22 LT TO STA 47+40 LT GUARDRAIL, TL-2 (CURVED)
STA 47+40 LT TO STA 47+45 LT TRAILING ANCHORAGE

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 64

DRAINAGE DETAILS

SEE SHEET 64

MAMIE LANE

1994 PRIVATE LAYOUT

CROWN RD

1962 TOWN LAYOUT

1899 COUNTY LAYOUT

BOSTON RD

PROP SAWCUT
LIMIT OF MILL & OVERLAY

MEET EX W/ 6'
TRANSITION STONE

N77°05'40"E
321.67'

LIMIT OF WORK
STA 82+57
N3034927.2634
E674152.8645

MEET EX W/ 6' TRANSITION STONE

PROP FULL DEPTH CONSTRUCTION

PROP 20' MILL &
OVERLAY TRANSITION

LIMIT OF FULL DEPTH CONSTRUCTION
(STA 82+37)

N/F
REECE R. DELONG
AUDREY TURCHICK
3 CROWN ROAD
MAP-LOT 021 0113 0000
BK-PG 37998-161

N/F
DAVID B. ANDERSON & MARY E.
ANDERSON, TRUSTEE OF THE
ANDERSON NOMINEE TRUST
4 CROWN ROAD
MAP-LOT 021 0111 0000
BK-PG 11298-56

SAMPLE LINE USED FOR SECTION AT
81+53, PERPENDICULAR TO CURB LINE
THEN SKEWED AHEAD, SEE SHEET 129

MEET EX DWY
(SAWCUT)

END PROP VGC;
BEGIN HMA BERM;
PROP GRAN CURB TYPE VA4-SPLAYED END

R&R MB

CONST ℄

RET TREE;
PROP TREE
PROTECTION

PROP TEMP EASEMENT
(TYP, UNLESS OTHERWISE NOTED)

100' WETLAND BUFFER

50' WETLAND BUFFER

FOR SEED MIX DETAILS
SEE SHEET 75

PROP SEDIMENT
CONTROL BARRIER

PROP SEDIMENT
FOREBAY PAVING

PROP TRAILING
ANCHORAGE

PROP RIPRAP SPILLWAY

PROP GC; TYPE VB
(7" REVEAL)

PROP STONE FOR
PIPE ENDS

MEET EX DWY
(SAWCUT)

PROP TL-2 GUARDRAIL
WITH 8' DEEP POSTS

PROP CLEARING &
GRUBBING

PROP PERM SIGHT
LINE EASEMENT

PROP CLEARING
& GRUBBING

PROP FULL DEPTH PVMT;
RECLAIM EX ROADWAY

PROP CURVED TL-2
GUARDRAIL (20' RADIUS)

RV

N/F
NAGA VENKATA LAKSHMI
SANDEEP INAMPUDI &
PALLAVI DORADLA
1 CROWN ROAD
MAP-LOT 021 0114 0000
BK-PG 35945-125

N/F
JOHN RUSSELL SCOTT, JR.
36 BOSTON ROAD
MAP-LOT 021 0110 0000
BK-PG 25831-51

PROP BOS (TYP)

PROP 4" L&S (TYP)

R&R MB

LIMIT OF FULL DEPTH RECLAMATION
(STA 80+40)

BEGIN PROP HMA BERM

RET LP

END PROP VGC

MEET EX DWY (SAWCUT)

REM EX WALK;
PROP 4" L&S

R&D
SHRUBS

MEET EX DWY
(SAWCUT)

R&D TREES

PROP GC TYPE VB (TYP)

MEET EX DWY (SAWCUT)

R&R STONE WALL (166')

RET TREE

RET FENCE

R&R MB (2)

PT +03.25

S32°51'36"E
274.87'

PROP FLUSH
COBBLESTONE MEDIAN

PROP 5.5'
HMA SW (TYP)

PROP TREE TRIMMING
FROM STA 42+88 TO STA 47+82

PROP BOS (TYP)

PT +78.13

Δ=19° 57' 17"
R=200.00'
L=69.63'

PC +08.48

N57°08'24"E
8.48'

PC +78.12

Δ=52° 30' 50"
L=879.88' R=960.00'

CONST ℄

R&S STONE WALL (172')

PROP PERM UTILITY
EASEMENT

44+50.47 BOSTON ROAD=
80+00.00 CROWN ROAD

R&D DEAD TREE

R&S BALANCE STONE WALL (11')

R&D STUMP

PROP BOS (TYP)

PROP PERM UTILITY
EASEMENT

MEET EX DWY
(SAWCUT)

100' WETLAND BUFFER

SAMPLE LINE USED FOR CROSS SECTION
47+58, PERPENDICULAR TO CURB LINE
THEN SKEWED AHEAD, SEE SHEET 105

N/F
ROBERT M. HICKS, INC.,
TRUSTEE OF THE
ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318

25' WIDE TRAIL EASEMENT
PLAN BK-PG 187-86

CONTINUED ON SHEET NO. 13

CONTINUED ON SHEET NO. 15

PLANT LIST

QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
		TREES			
1	ER	Cercis canadensis	Eastern Redbud	7'-8' height	782.536
		SHRUBS			
3	RV	Rhododendron viscosim	Swamp Azalea	5' height	788.265

0 20 50 100

SCALE: 1" = 20'

FOR PROFILE SEE SHEETS NO. 22 & 25

GUARDRAIL DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 65

DRAINAGE DETAILS

SEE SHEET 65

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	15	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 6 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:24 AM

N

CONTINUED ON SHEET NO. 14

CONTINUED ON SHEET NO. 16

BOSTON RD

50' WETLAND BUFFER

100' WETLAND BUFFER

R&S COBBLESTONES

MEET EX DWY (SAWCUT)

RET TREE

R&R MB

RET TREE; PROP TREE PROTECTION

RET SHRUBS

PROP BOS (TYP)

PROP TEMP EASEMENT (TYP, UNLESS OTHERWISE NOTED)

RET TREES

MEET EX DWY (SAWCUT)

PROP 4" L&S (TYP)

PROP 5.5' HMA SW

RET GRAN POST

R&D TREE

RET BOULDER

PROP TREE WELL (MASSDOT STD DETAIL E 502.1.0)

Δ=52° 30' 50"
L=879.88' R=960.00'

PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY

PROP BOS

CONST ℄

BEGIN PROP SHLO ALT. NO. 8804 (SECTION 1)

RET PVC FENCE

PROP SHLO ALTERATION

PROP TOS

R&D TREE

R&S BOULDER

R&D TREE

PROP CLEARING & GRUBBING

END PROP SHLO ALT. NO. 8804 (SECTION 1)

PROP BOS

R&S BALANCE STONE WALL (338')

PROP LETTERED GRAN BOUND (TYP)

PROP TOS

PROP FLUSH COBBLESTONE MEDIAN

S85°22'26"E 87.28'

PT +58.00

R&D TREE

R&D TREE

PROP GC; TYPE VB (TYP)

R&S STONE WALL STA 52+50 TO STA 53+81 (131')

PROP PERM SLOPE EASEMENT

RET TREES; PROP TREE PROTECTION

RET STUMP

RET ROADSIDE MEMORIAL

RET STONE WALL STA 51+37 TO STA 52+50

R&R MB

PROP TOS (TYP)

R&D TREE

PROP PERM UTILITY EASEMENT

MEET EX DWY (SAWCUT)

SAMPLE LINE USED FOR CROSS SECTION 47+58, PERPENDICULAR TO CURB LINE THEN SKEWED AHEAD SEE SHEET 105

PROP CLEARING & GRUBBING; PROP TREE TRIMMING ALONG EDGE OF ROCKFILL SLOPE

PROP PERM SLOPE EASEMENT

PROP PERM UTILITY EASEMENT

R&S STONE WALL (178')

PROP GC TYPE VB (TYP)

PROP MODIFIED ROCKFILL W/ COMPOST MULCH & SEED

R&R MB

PROP TOS (TYP)

PROP PERM SLOPE EASEMENT

MEET EX DWY (SAWCUT)

PROP PERM UTILITY EASEMENT

1899 COUNTY LAYOUT

1903 SHLO NO. 841

25' WIDE EMERGENCY ACCESS EASEMENT PLAN BK-PG 187-86

N/F
PETER J POZERSKI
JESSICA L POZERSKI
44 BOSTON ROAD
MAP-LOT 021 0115 0000
BK-PG 31062-275

N/F
RADHIKA SRIRAM AND MANISH GANDHI
46 BOSTON ROAD
MAP-LOT 022 0114 0001
BK-PG 37632-74

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP-LOT 022 0114 0002
BK-PG 31507-70

N/F
SHIRLEY E. MACDOUGALL
47 BOSTON ROAD
MAP-LOT 022 0006 0004
BK-PG 1766-318

N/F
VINU I. PAUL
JUBIE VINU
49 BOSTON ROAD
MAP-LOT 022 0006 0005
BK-PG 30934-168

N/F
DANIEL L. NEWBOWER
VANESSA M. NEWBOWER
45 BOSTON ROAD
MAP-LOT 021 0107 0000
BK-PG 36268-170

N/F
JING LEI ZHANG &
JIAN PING GE
43 BOSTON ROAD
MAP-LOT 021 0108 0000
BK-PG 25112-73

N/F
ROBERT M. HICKS, INC.,
TRUSTEE OF THE
ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318

N/F
ROBERT M. HICKS, INC.,
TRUSTEE OF THE
ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318

#43 2 ST WF BLD

#44 2 ST WF BLD

#45 2 ST WF BLD

#46 1½ ST WF BLD

#48 2 ST WF BLD

1 ST WF GARAGE

GARAGE

RESERV. LEACHING A.

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

0 20 50 100

SCALE: 1" = 20'

FOR PROFILE SEE SHEETS NO. 22 & 23

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	16	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 7 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:24 AM

GUARDRAIL DETAILS

STA 55+72 LT TO STA 55+82 LT TRAILING ANCHORAGE
STA 55+82 LT TO STA 62+40 LT GUARDRAIL, TL-2

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 66

DRAINAGE DETAILS

SEE SHEET 66

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

N/F
KRISHNAKUMAR VELMURUGAN
THULASI KRISHNAKUMAR
50 BOSTON ROAD
MAP–LOT 022 0114 0000
BK–PG 27639–51

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP–LOT 022 0114 0002
BK–PG 31507–70

N/F
WESTFORD GATEWAY, LLC
66–68 BOSTON ROAD
MAP–LOT 022 0115 0000
BK–PG 29812–168

#50
2 ST WF
BLD

MEET EX DWY

SAMPLE LINE USED FOR CROSS SECTION 55+56; PERPENDICULAR TO BACK OF PROPOSED SIDEWALK THEN SKEWED BEHIND (SEE NOTE ON SHEET 112)

PROP TRAILING ANCHORAGE

RET CONC WALL

PROP BOS (TYP)

PROP CLEARING & GRUBBING

R&D STONE HEADWALL

PROP 5.5' HMA SW (TYP)

PROP PERM UTILITY EASEMENT

PROP BOS (TYP)

PROP PERM UTILITY EASEMENT

PROP TL-2 GUARDRAIL

BEGIN PROP SHLO ALT. NO. 8804 (SECTION 2)

PROP LETTERED GRAN BOUND

PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY

PROP 4" L&S (TYP)

R&S STONE WALL (338')

30' WIDE DRIVEWAY EASEMENT PLAN BK–PG 200–57

1903 SHLO NO 841

CONST ℄

Δ=47° 05' 44"
L=439.75'
R=535.00'

PROP SHLO ALTERATION

R&D EX GUARDRAIL

PROP PERM GUARDRAIL EASEMENT

PROP CLEARING & GRUBBING

END PROP SHLO ALT. NO. 8804 (SECTION 1)

R&R MB

BOSTON RD

PROP GC; TYPE VB (TYP)

PC +45.28

PROP LETTERED GRAN BOUND

PT +85.03

PROP FLUSH COBBLESTONE MEDIAN

S85°22'26"E
87.26'

PT +58.00

R&R MB

MEET EX DWY (SAWCUT)

R&D TREES

RET PVC FENCE

PROP PERM SLOPE EASEMENT

RET STONE WALL

PROP TEMP EASEMENT (TYP, UNLESS OTHERWISE NOTED)

PROP TREE TRIMMING FROM STA 54+70 TO STA 56+10

RET SHRUBS

PROP BOS (TYP)

RET STONE WALL

RET SHRUBS

MEET EX DWY

RET TREE; PROP TREE PROTECTION

R&S STONE WALL STA 52+50 TO STA 53+81 (131')

PROP PERM SLOPE EASEMENT

N/F
VINU L. PAUL
JUBIE VINU
49 BOSTON ROAD
MAP–LOT 022 0006 0005
BK–PG 30934–168

RIGHT OF WAY PLAN BK–PG 87–143

N/F
JULIETTE T. MOUNT
51 BOSTON ROAD
MAP–LOT 022 0005 0000
BK–PG 7723–0033

#51
1 1/2 ST WF BLD

#49 2 ST WF BLD

R&D TREES

PROP MODIFIED ROCKFILL COMPOST MULCH & SEED

PROP TOS (TYP)

PROP BOS (TYP)

RET STONE WALL

R&R LED FIRE STATION SIGN (SEE SPECIAL PROVISION 824.501)

S38°16'43"E
89.03'

PC +74.06

RET TREE; PROP TREE PROTECTION

R&D TREE

N/F
INHABITANTS OF THE
TOWN OF WESTFORD, MASSACHUSETTS
65 BOSTON ROAD
MAP–LOT 022 0003 0004
BK–PG 7366–211

CONTINUED ON SHEET NO. 15

CONTINUED ON SHEET NO. 17

0 20 50 100

SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. 23

N

GUARDRAIL DETAILS

STA 55+82 LT TO STA 62+40 LT GUARDRAIL, TL-2
STA 62+40 LT TO STA 62+65 LT TANGENT END TREATMENT, TL-2

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 67

DRAINAGE DETAILS

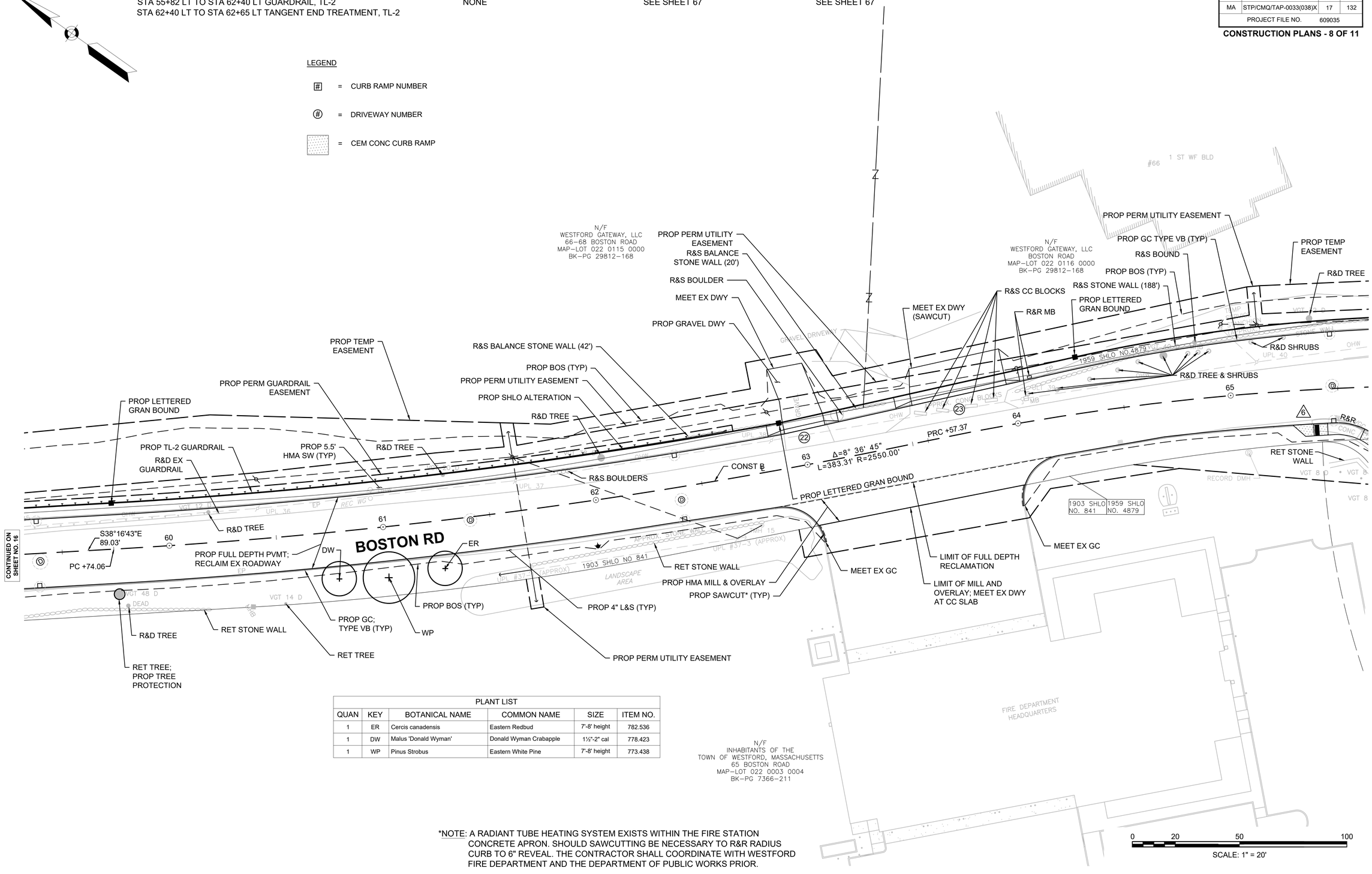
SEE SHEET 67

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP



PLANT LIST					
QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ITEM NO.
1	ER	Cercis canadensis	Eastern Redbud	7'-8' height	782.536
1	DW	Malus 'Donald Wyman'	Donald Wyman Crabapple	1½"-2" cal	778.423
1	WP	Pinus Strobus	Eastern White Pine	7'-8' height	773.438

*NOTE: A RADIANT TUBE HEATING SYSTEM EXISTS WITHIN THE FIRE STATION CONCRETE APRON. SHOULD SAWCUTTING BE NECESSARY TO R&R RADIUS CURB TO 6" REVEAL. THE CONTRACTOR SHALL COORDINATE WITH WESTFORD FIRE DEPARTMENT AND THE DEPARTMENT OF PUBLIC WORKS PRIOR.

FOR PROFILE SEE SHEETS NO. 23 & 24

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	18	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 9 OF 11

609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:25 AM

GUARDRAIL DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 68

DRAINAGE DETAILS

SEE SHEET 68

CONTINUED ON SHEET NO. 20

PROP CLEARING & GRUBBING

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0116 0000
BK–PG 29812–168

PROP BOS (TYP)

PROP 4" L&S (TYP)

PROP ACCESS PATH BASELINE

PROP TEMP EASEMENT

100' WETLAND BUFFER

50' WETLAND BUFFER

N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP–LOT 022 0118 0000
BK–PG 38196–13

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0002
BK–PG 4446–0228

15'

PROP BOS (TYP)

N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0016
BK–PG 5117–0304

RELOCATED PEACE TRAIL PATH

PROP CLEARING & GRUBBING

R&D CONC WALL

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0116 0000
BK–PG 29812–168

PROP GRAVEL DWY PARKING AREA (40'X16')

R&D WOOD POST

PROP ACCESS ROAD BASELINE

APPROX. LOCATION OF PEACE TRAIL PATH

N59°36'01"E 250.00'

PROP HMA DWY

"PEACE TRAIL CUB SCOUT PACK 95"

R&R (ITEM 874.22)

PROP PERM UTILITY EASEMENT

R&D WOOD POST

25' RADIUS ROAD EASEMENT PLAN BK–PG 131–65

PROP PERM UTILITY EASEMENT

PROP TEMP EASEMENT

END PROP SHLO ALT. NO. 8804 (SECTION 2)

R&S CC BLOCK

PROP BOS (TYP)

RET "COLDWELL BANKERS"

PROP 5.5' CC SW

R&D TREE

R&D TREE

PROP 5.5' HMA SW

R&S CC POSTS

25' RADIUS ROAD EASEMENT PLAN BK–PG 131–65

R&R BOUND

END HMA SW
BEGIN CC SW
AT STA 67+10

R&D SHRUBS

R&R

PROP LETTERED GRAN BOUND

66

67

Δ=22° 12' 05"
L=464.98' R=1200.00'

68

PT +22.35

69

70

71

RET LANDSCAPING AROUND SIGN

PROP TEMP EASEMENT

MEET EX DWY

PROP HMA DWY (TYP)

PROP CC SW THROUGH DWY

R&R MB

RET SHRUBS

R&S CLF
STA 68+64 TO
STA 68+74

RET LP

RET FENCE
STA 68+74 TO
STA 70+80

PROP 5.5' CC SW

REM EXIST BRUSH ADJACENT TO EXIST GUY

REM EXIST GUY

PROP TEMP EASEMENT

RET BOUND

R&S CLF
STA 70+80 TO
STA 70+90

N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP–LOT 022 0118 0000
BK–PG 38196–13

CONTINUED ON SHEET NO. 17

LIMIT OF FULL DEPTH RECLAMATION

RET STONE WALL

RET BOUND

MEET EX SGE W/ PROP SPLAYED END

PROP SAWCUT LIMIT OF MILL & OVERLAY

RET TREE

RET STONE WALL

PROP 5' HMA SW

PROP 25' MILL & OVERLAY TRANSITION

PROP SGE TYPE SB (R&R EXIST)

MEET EX SGE W/ PROP SPLAYED END & MEET EX SW

PROP 5.5' CC SW

PROP BOS (TYP)

PROP CC SW THROUGH DWY

PROP HMA DWY (TYP)

PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY

MEET EX DWY

BLAKE'S HILL RD
PUBLIC - 50' WIDE

JOE'S WAY

BOSTON RD

1993 TOWN LAYOUT

GRADING EASEMENT PLAN BK–PG 187–86

1993 TOWN LAYOUT

ACCESS EASEMENT 40' WIDE PLAN BK–PG 112–72

PROP TEMP EASEMENT

PROP 5.5' CC SW

PROP 4" L&S (TYP)

RESIDENTIAL ACCESS 1959 SHLO NO 4879

NO ACCESS 1959 SHLO NO 4879

N/F
COTTAGES IN THE WOODS
CONDOMINIUM TRUST
LOT G–1 BOSTON ROAD
MAP–LOT 022 0003 0100
BK–PG 25988–158

CONTINUED ON SHEET NO. 19

LEGEND

[#] = CURB RAMP NUMBER

(#) = DRIVEWAY NUMBER

= CEM CONC CURB RAMP

0 20 50 100

SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. 24

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	19	132
PROJECT FILE NO.	609035		

CONSTRUCTION PLANS - 10 OF 11

609035_HDS\[CONSTRUCTION PLANS\].DWG Plotted on 17-May-2024 8:25 AM

GUARDRAIL DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET 48

WATER SUPPLY ALTERATIONS
SEE SHEET 69

DRAINAGE DETAILS
SEE SHEET 69

LEGEND
[#] = CURB RAMP NUMBER
(#) = DRIVEWAY NUMBER
= CEM CONC CURB RAMP

CONTINUED ON SHEET NO. 18

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
CONSERVATION COMMISSION
BOSTON ROAD
MAP-LOT 022 0119 0000
BK-PG 5609-0051

NO ACCESS
RET C.L.F.
NO ACCESS
1959 SHLO NO 4879
RET BOUND
BRUSH
PROP TS POST (TYP)
PROP HMA MILL & OVERLAY
MEET EX SGE W/ PROP SPLAYED END
PROP SAWCUT LIMIT OF MILL & OVERLAY
I-495 SB OFF-RAMP
RET
GRASS
SGE
MASSDOT CURB RAMP ID: PED-25101
PROP SAWCUT LIMIT OF MILL & OVERLAY
PROP 10' MILL & OVERLAY TRANSITION
MEET EX SGE W/ PROP SPLAYED END
PROP PB (TYP)
PROP BOS (TYP)
ADJ EXIST PB
PROP TS MAST ARM
R&R VGC
REM CONC SW
UPL 45
OHW
UPL 46
PROP CEM CONC
S24°41'23"E
877.65'
CONST ℄
MASSDOT CURB RAMP ID: PED-12231
PROP FDP < 4'
PROP FULL DEPTH PVMT; RECLAIM EX ROADWAY
LIMIT OF FULL DEPTH RECLAMATION STA 72+52.00
PROP GRAN CURB CORNER TYPE A (TYP)
PROP SAWCUT (TYP)
ADJ EXIST PB
MEET EX CURB & SW
UPL 47
TMH 16
PROP HMA MILL & OVERLAY
BOSTON RD
LIMIT OF WORK
STA 75+50
N3032799.8877
E676003.8034
CONC SW
NO ACCESS
UPL 45-1
PROP 5.5' CC SW (TYP)
R&R VGC; TYPE VB (TYP)
PROP 4" L&S (TYP)
PROP BOS (TYP)
PROP STONE FOR PIPE ENDS AROUND EXIST CB
RET
6" CLF
1959 SHLO NO 4879
PROP HMA BIKE PATH
R&R VGC TRANSITION TO 0" REVEAL AT BIKE PATH (TYP)
PROP SAWCUT LIMIT OF MILL & OVERLAY
UPL 7
UPL 8a
UPL 8
MEET EX SGE W/ PROP SPLAYED END
PROP 20' MILL & OVERLAY TRANSITION
MEET EX SGE W/ PROP SPLAYED END
PROP SAWCUT LIMIT OF MILL & OVERLAY
I-495 SB ON-RAMP

N/F
COTTAGES IN THE WOODS
CONDOMINIUM TRUST
LOT G-1 BOSTON ROAD
MAP-LOT 022 0003 0100
BK-PG 25988-158

50' WIDE ELECTRIC EASEMENT
PLAN BK-PG 103-28A

N/F
TOWN OF WESTFORD
WESTFORD CONSERVATION
LOT G BOSTON ROAD
MAP-LOT 022 0003 0003
BK-PG 7366-211

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. 24

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	20	132
	PROJECT FILE NO. 609035		

CONSTRUCTION PLANS - 11 OF 11

GUARDRAIL DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 70

NATIVE SEEDING NOTES:
1. SEEDING AND SUBMITTALS SHALL BE PER THE SPECIAL PROVISIONS.
2. SUBMITTALS FOR MIXES SHALL BE APPROVED BY THE ENGINEER PRIOR TO SEED APPLICATION.
3. SITE PREPARATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO SEEDING.
4. WHEN SEEDING OUT OF SEASON, APPLICATION RATE SHALL BE INCREASED BY 50%.
5. NATIVE SEEDING SHALL BE BY MANUAL BROADCAST UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

SEED MIX LEGEND

HATCH	TYPE
	= NATIVE SHORT GRASSLAND MIX
	= RIPARIAN MIX

N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0016
BK–PG 5117–0304

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0001
BK–PG 4446–0228

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0115 0000
BK–PG 29812–168

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0116 0000
BK–PG 29812–168

N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP–LOT 022 0118 0000
BK–PG 38196–13

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0002
BK–PG 4446–0228

PROP PERM EASEMENT
CONNECTION TO THE PEACE TRAIL PATH
APPROX. LOCATION OF PEACE TRAIL PATH
LOAM & SEED THROUGHOUT EMBANKMENT
EMBANKMENT
APPROX BVW
50' WETLAND BUFFER
100' WETLAND BUFFER
RELOCATED PEACE TRAIL PATH
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP RIPRAP SPILLWAY
PROP WET DETENTION BASIN EL. 250 - APPROX. 30,000 CF (SEE CONSTRUCTION DETAILS)
PROP 20' WIDE AUXILIARY RIPRAP SPILLWAY TOP EL. = 255.90 (SEE DETAIL ON SHEET 75)
PROP OUTLET CONTROL STRUCTURE (SEE DETAIL ON SHEET 75)
PROP STONE FOR PIPE ENDS
PROP SEDIMENT FOREBAY PAVING
PROP TEMP EASEMENT
15' MAINTENANCE ACCESS PATH
PROP GRAVEL DWY
PROP CLEARING & GRUBBING
PROP BOS (TYP)
PROP 4" L&S (TYP)
PROP ACCESS PATH BASELINE
100-YEAR FLOODPLAIN
BVW
WF#A14 WF#A13 WF#A12 WF#A11 WF#A10 WF#A9 WF#A8 WF#A7 WF#A5 WF#A4 WF#A3 WF#A2 WF#A1
WF#B7 WF#B6 WF#B5 WF#B4

CONTINUED ON SHEET NO. 18

0 20 50 100
SCALE: 1" = 20'

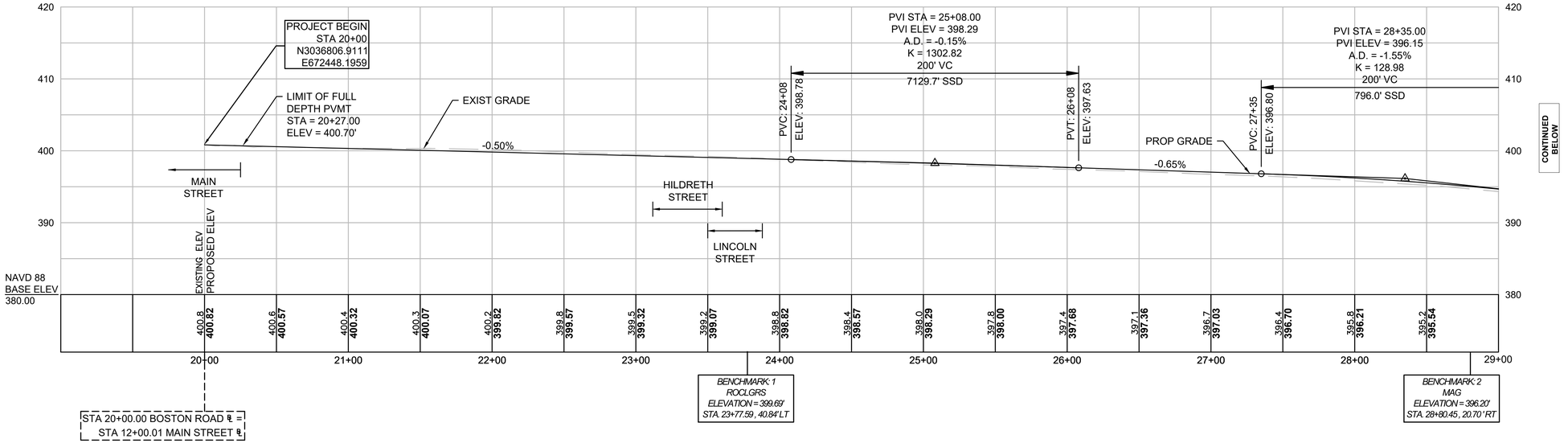
609035_HDS\CONSTRUCTION PLANS\.DWG Plotted on 17-May-2024 8:25 AM

WESTFORD
BOSTON ROAD

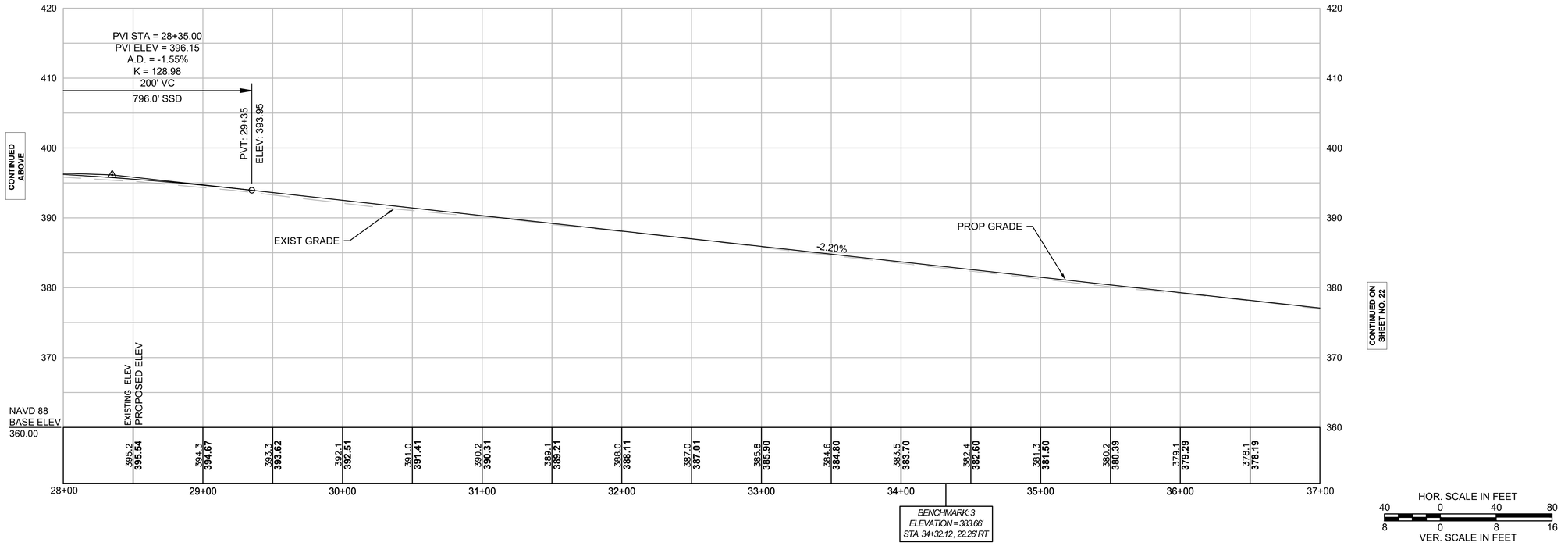
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	21	132
PROJECT FILE NO.	609035		

PROFILES - 1 OF 5

BOSTON ROAD

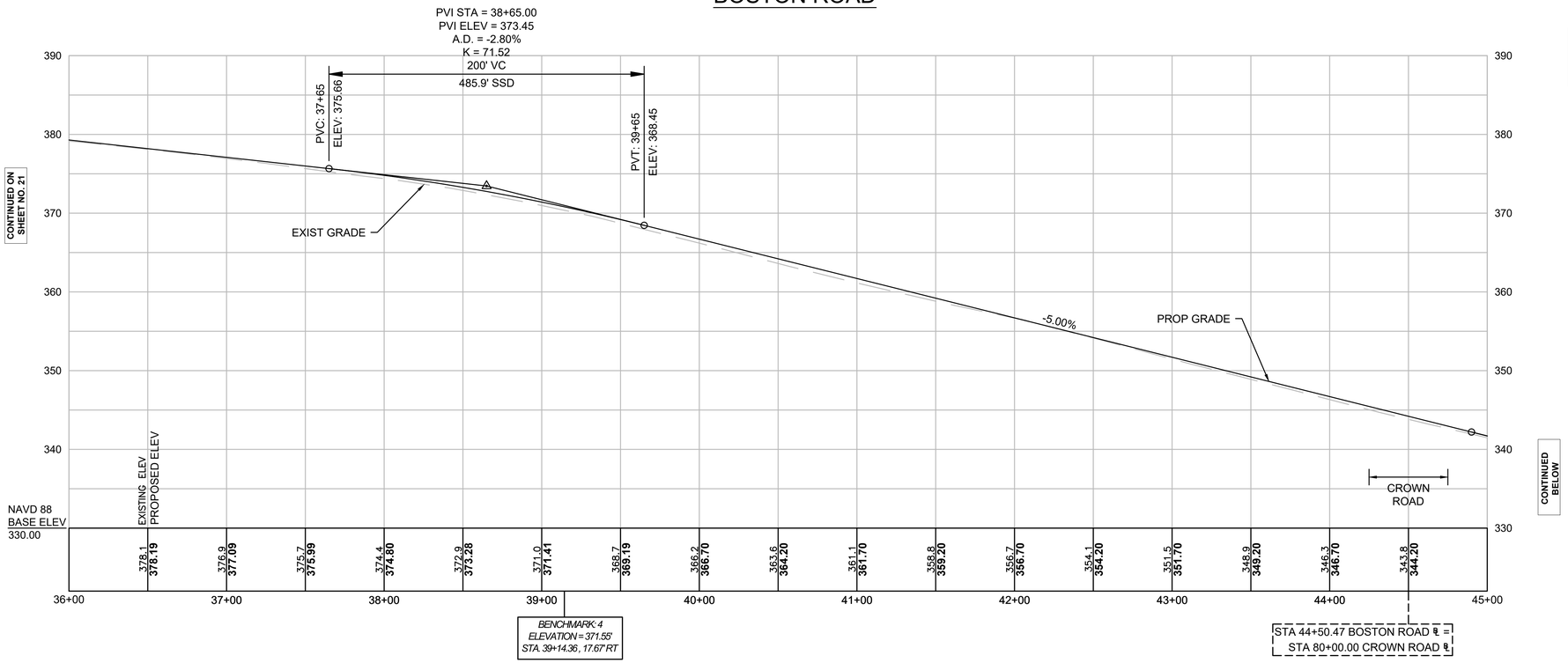


BOSTON ROAD



FOR CONSTRUCTION PLAN: SEE SHEETS 10-13

BOSTON ROAD



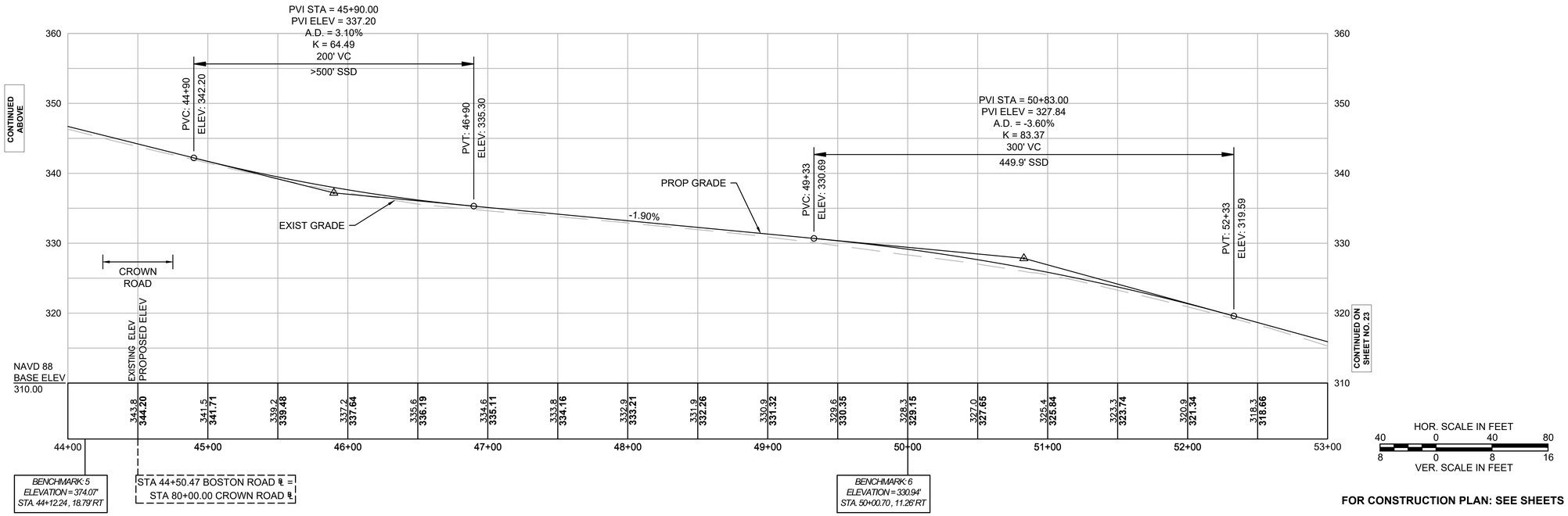
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	22	132
PROJECT FILE NO.	609035		

PROFILES - 2 OF 5

609035_HD6(PROFILE).DWG Plotted on 17-May-2024 8:27 AM

BOSTON ROAD



HOR. SCALE IN FEET
40 0 40 80
VER. SCALE IN FEET
8 0 8 16

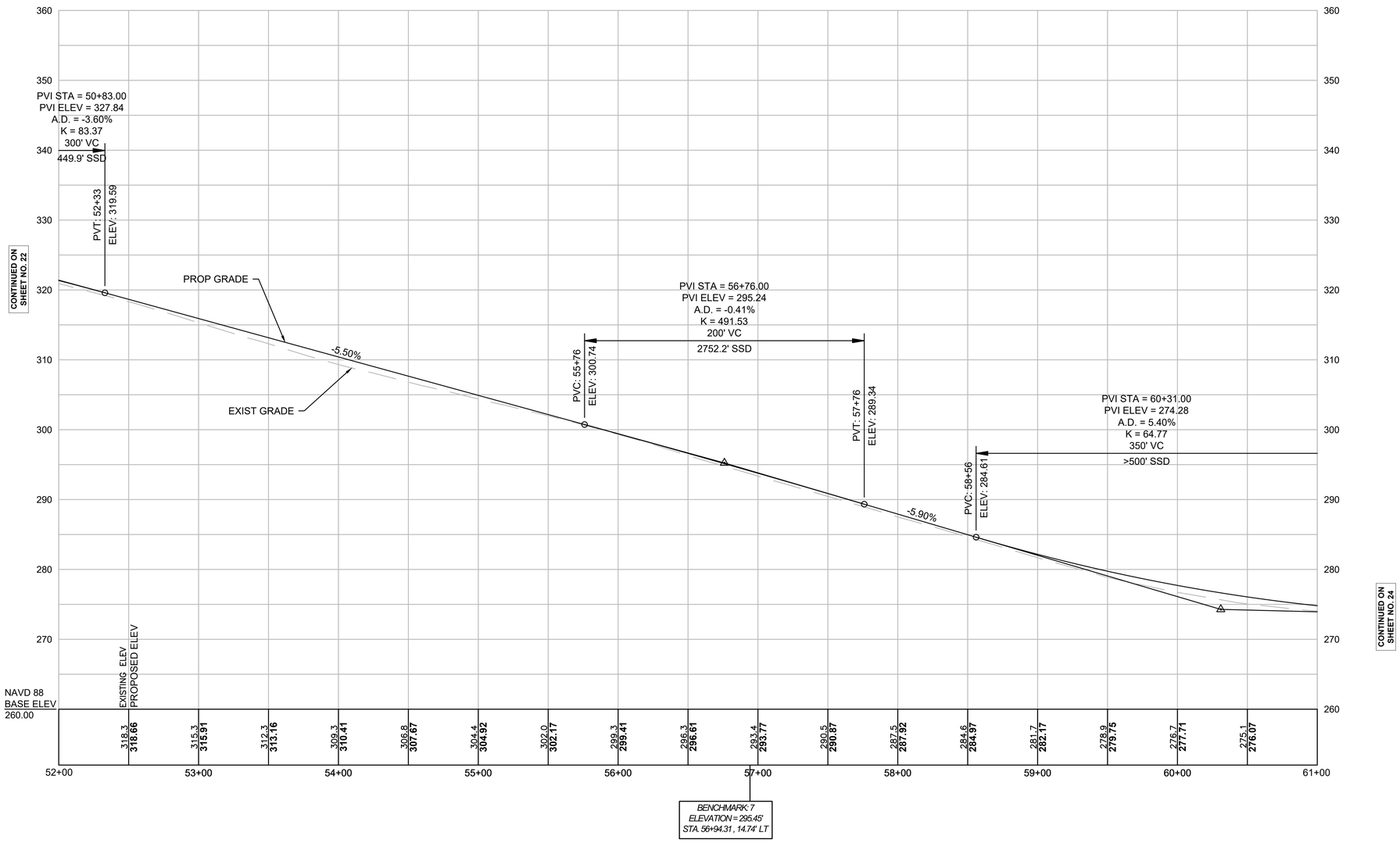
FOR CONSTRUCTION PLAN: SEE SHEETS 12-15

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	23	132
PROJECT FILE NO.	609035		

PROFILES - 3 OF 5

BOSTON ROAD



HOR. SCALE IN FEET
40 0 40 80
8 0 8 16
VER. SCALE IN FEET

FOR CONSTRUCTION PLAN: SEE SHEETS 15-17

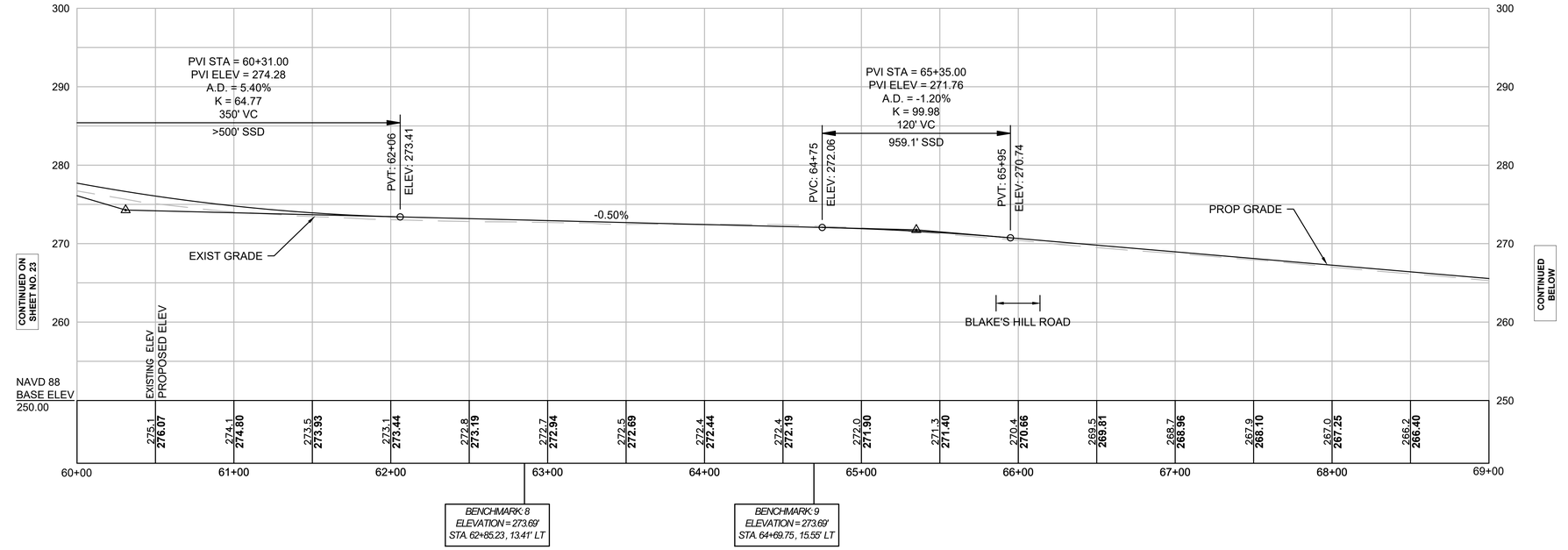
609035_HD6(PROFILE).DWG Plotted on 17-May-2024 8:27 AM

WESTFORD
BOSTON ROAD

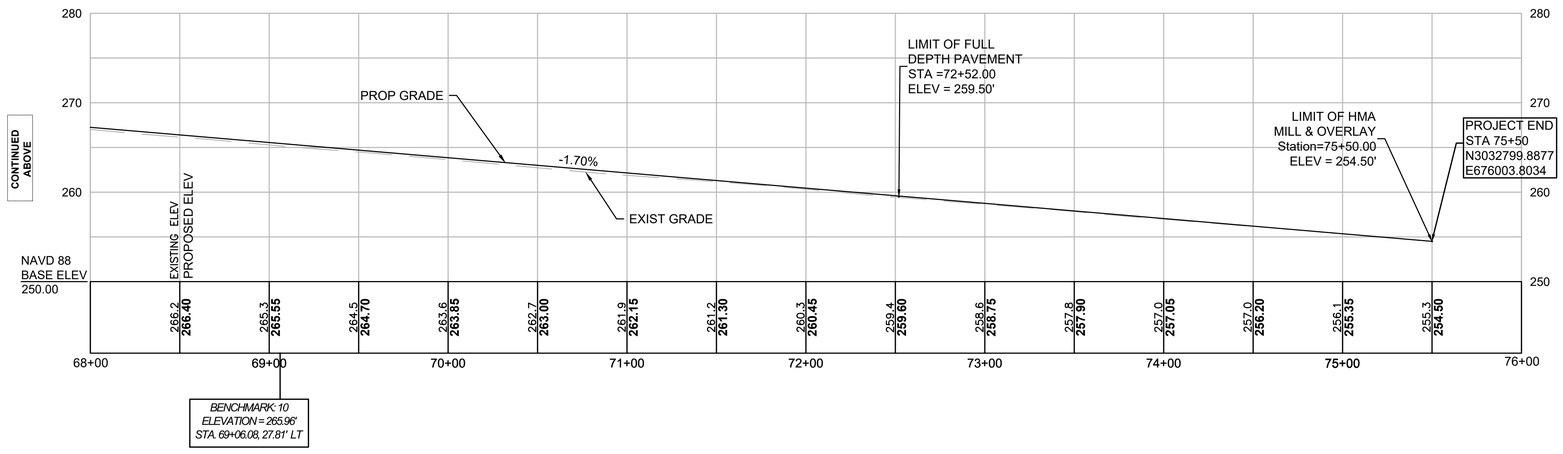
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	24	132
PROJECT FILE NO.	609035		

PROFILES - 4 OF 5

BOSTON ROAD



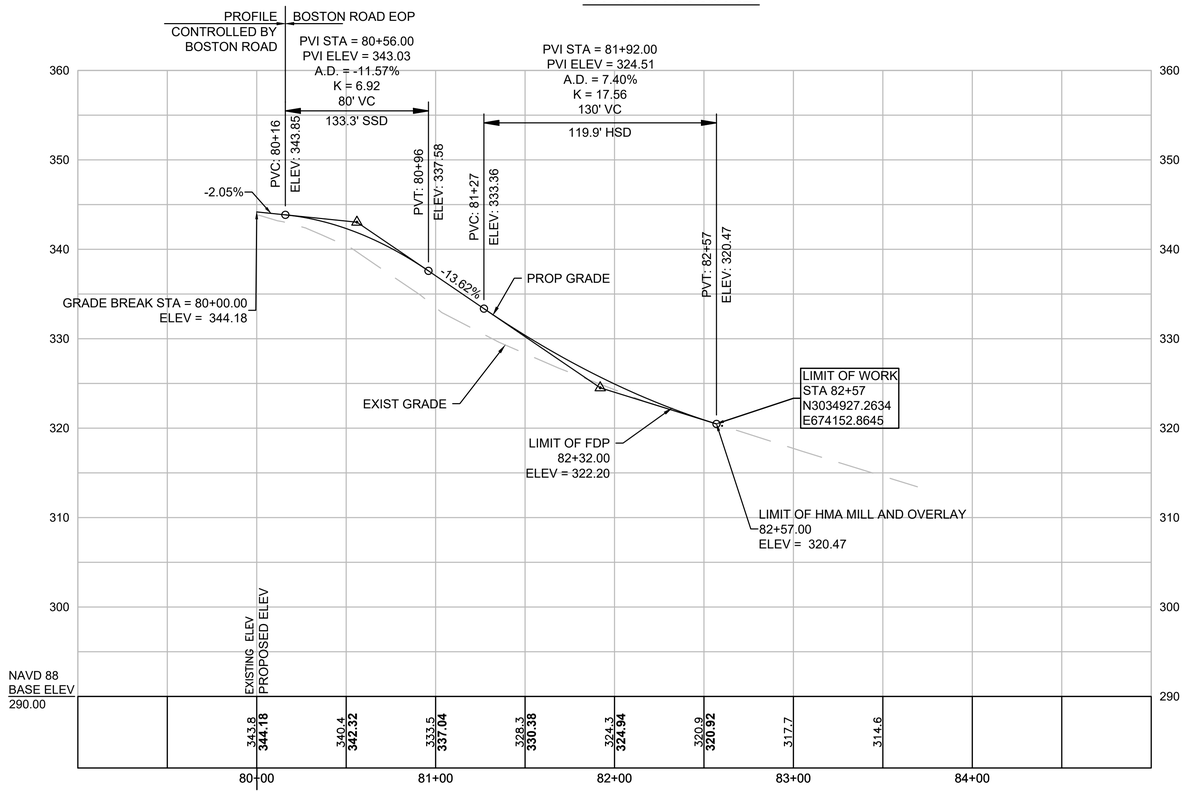
BOSTON ROAD



HOR. SCALE IN FEET
40 0 40 80
8 0 8 16
VER. SCALE IN FEET

FOR CONSTRUCTION PLAN: SEE SHEETS 17-19

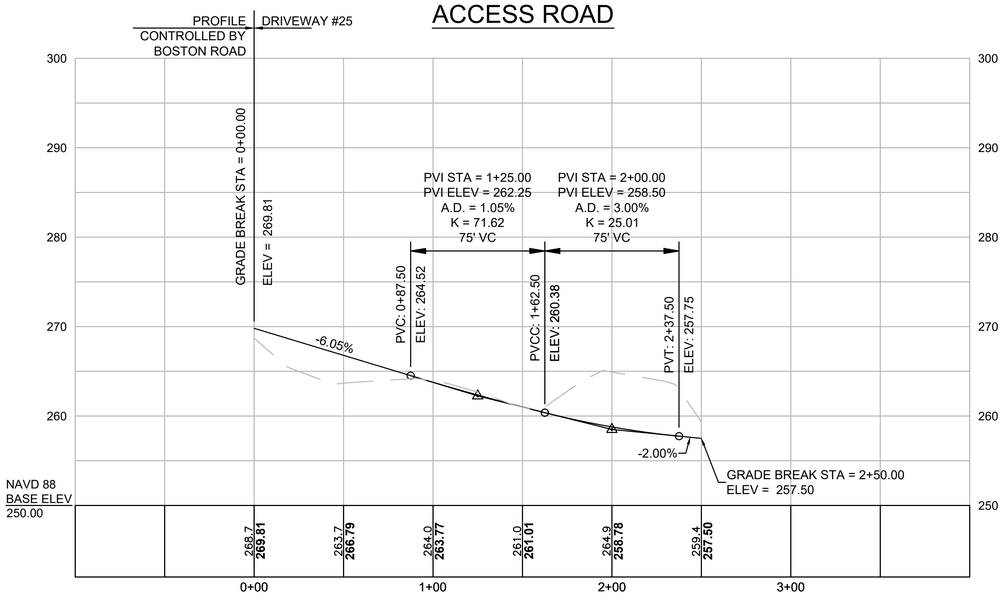
CROWN ROAD



STA 80+00.00 CROWN ROAD ℄ =
STA 44+50.47 BOSTON ROAD ℄

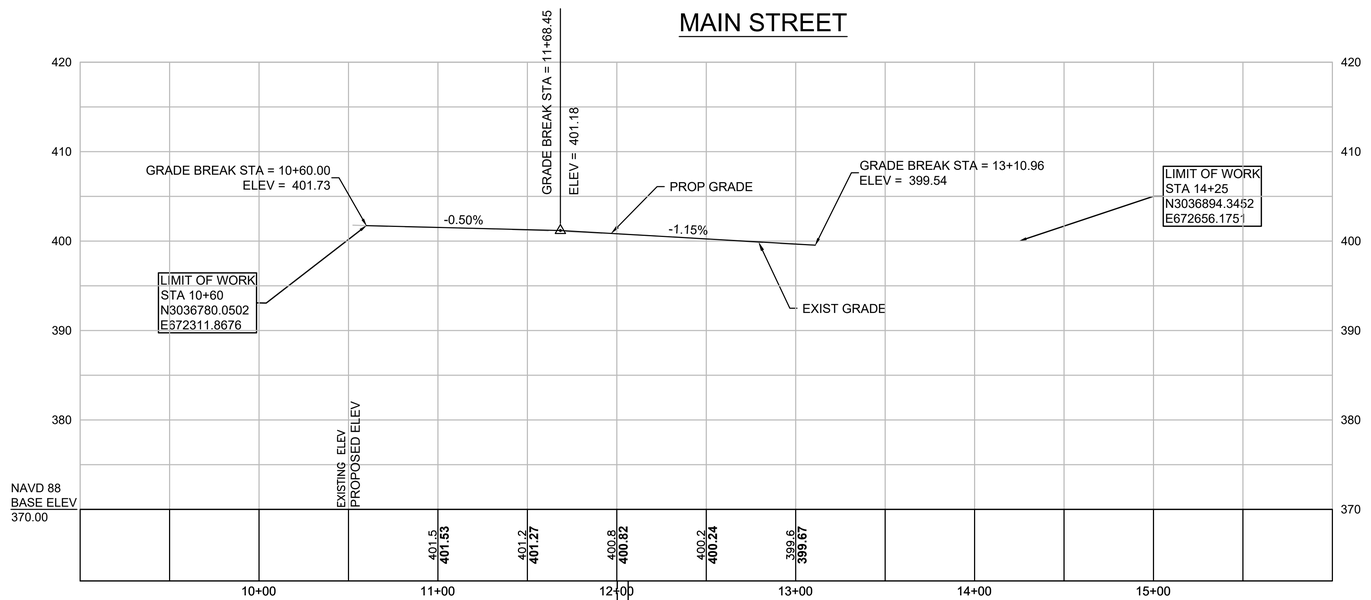
FOR CONSTRUCTION PLAN: SEE SHEET 14

ACCESS ROAD



FOR CONSTRUCTION PLAN: SEE SHEET 18

MAIN STREET



STA 12+00.01 MAIN STREET ℄ =
STA 20+00.00 BOSTON ROAD ℄

BENCHMARK 11
MAG SET
ELEVATION = 401.42'
STA. 12+06.11, 26.52' LT

FOR CONSTRUCTION PLAN: SEE SHEET 10

HOR. SCALE IN FEET
40 0 40 80
8 0 8 16
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	25	132
PROJECT FILE NO.	609035		

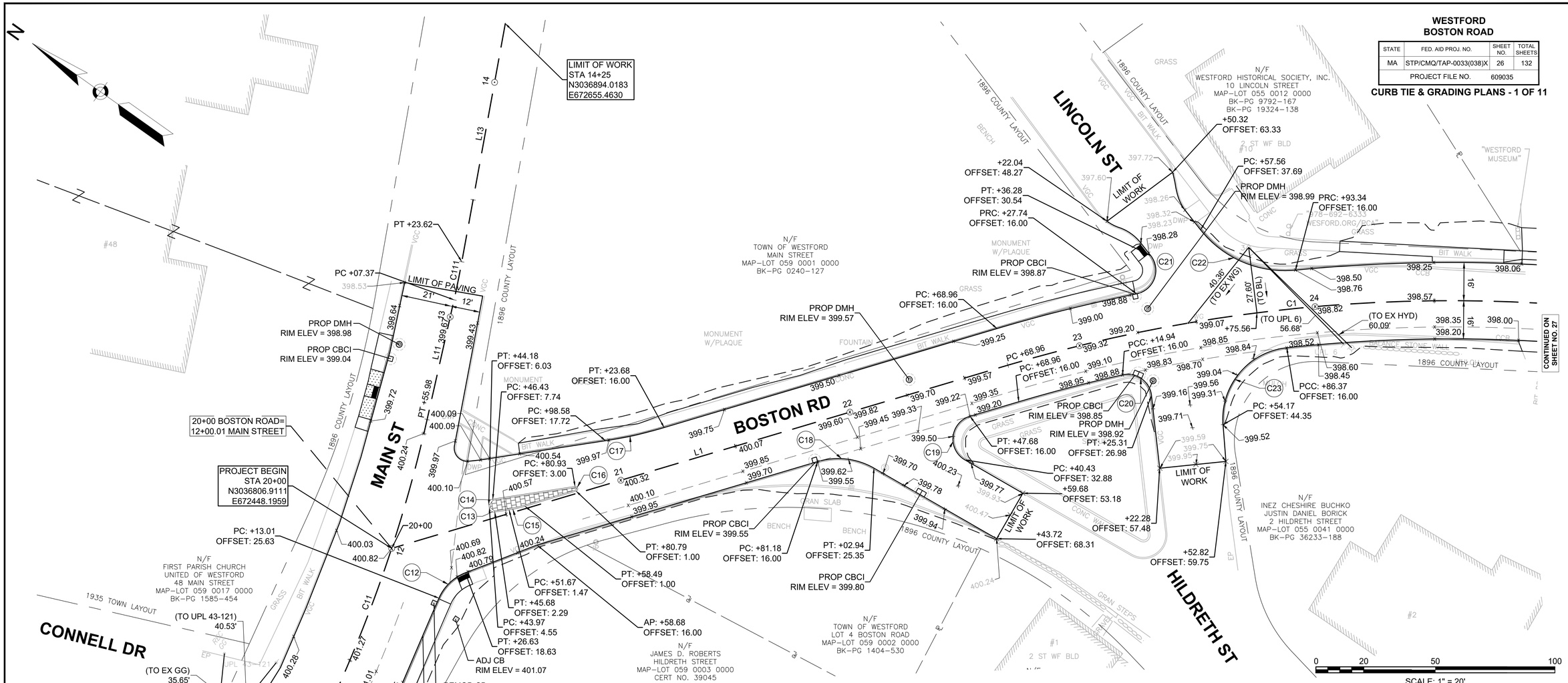
PROFILES - 5 OF 5

609035_HD6(PROFILE).DWG Plotted on 17-May-2024 8:27 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	26	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 1 OF 11



BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	20+00.00	3036806.9111	672448.1959		S51°34'26"E 268.96'	22+68.96	3036639.7533	672658.9003
C1	22+68.96	3036639.7533	672658.9003	R=650.00' Δ=21°45'41" L=246.87' T=124.94'		25+15.83	3036453.6943	672818.8990

MAIN STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L10	10+00.00	3036771.0604	672251.6390		N81°30'38"E 112.28'	11+12.28	3036787.6351	672362.6842
C11	11+12.28	3036787.6351	672362.6842	R=595.00' Δ=13°50'18" L=143.71' T=72.21'		12+55.98	3036825.7257	672500.8904
L11	12+55.98	3036825.7257	672500.8904		N67°40'20"E 51.38'	13+07.37	3036845.2461	672548.4206
C111	13+07.37	3036845.2461	672548.4206	R=400.00' Δ=2°19'44" L=16.26' T=8.13'		13+23.62	3036851.7265	672563.3300
L13	13+23.62	3036851.7265	672563.3300		N65°20'36"E 126.38'	14+50.00	3036904.4478	672678.1836

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C12	45° 00' 56"	20.00'	15.71'	8.29'
C13	90° 00' 00"	2.00'	3.14'	2.00'
C14	90° 00' 04"	2.00'	3.14'	2.00'
C15	7° 50' 25"	50.00'	6.84'	3.43'
C16	172° 09' 35"	1.00'	3.00'	14.59'
C17	7° 50' 25"	184.00'	25.18'	12.61'
C18	46° 29' 46"	30.00'	24.35'	12.89'
C19	133° 28' 48"	10.00'	23.30'	23.26'
C20	96° 06' 13"	10.00'	16.77'	11.13'
C21	116° 36' 16"	10.00'	20.35'	16.19'
C22	57° 13' 51"	45.00'	44.95'	24.55'
C23	88° 16' 16"	30.00'	46.22'	29.11'

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
1	3036821.6150	672340.8410	400.17
3	3036585.4976	672757.0718	398.53

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C24	180° 00' 00"	2.00'	6.28'	INFINITY'
C25	180° 00' 00"	2.00'	6.28'	INFINITY'

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
4	3036244.2904	672975.4762	395.73

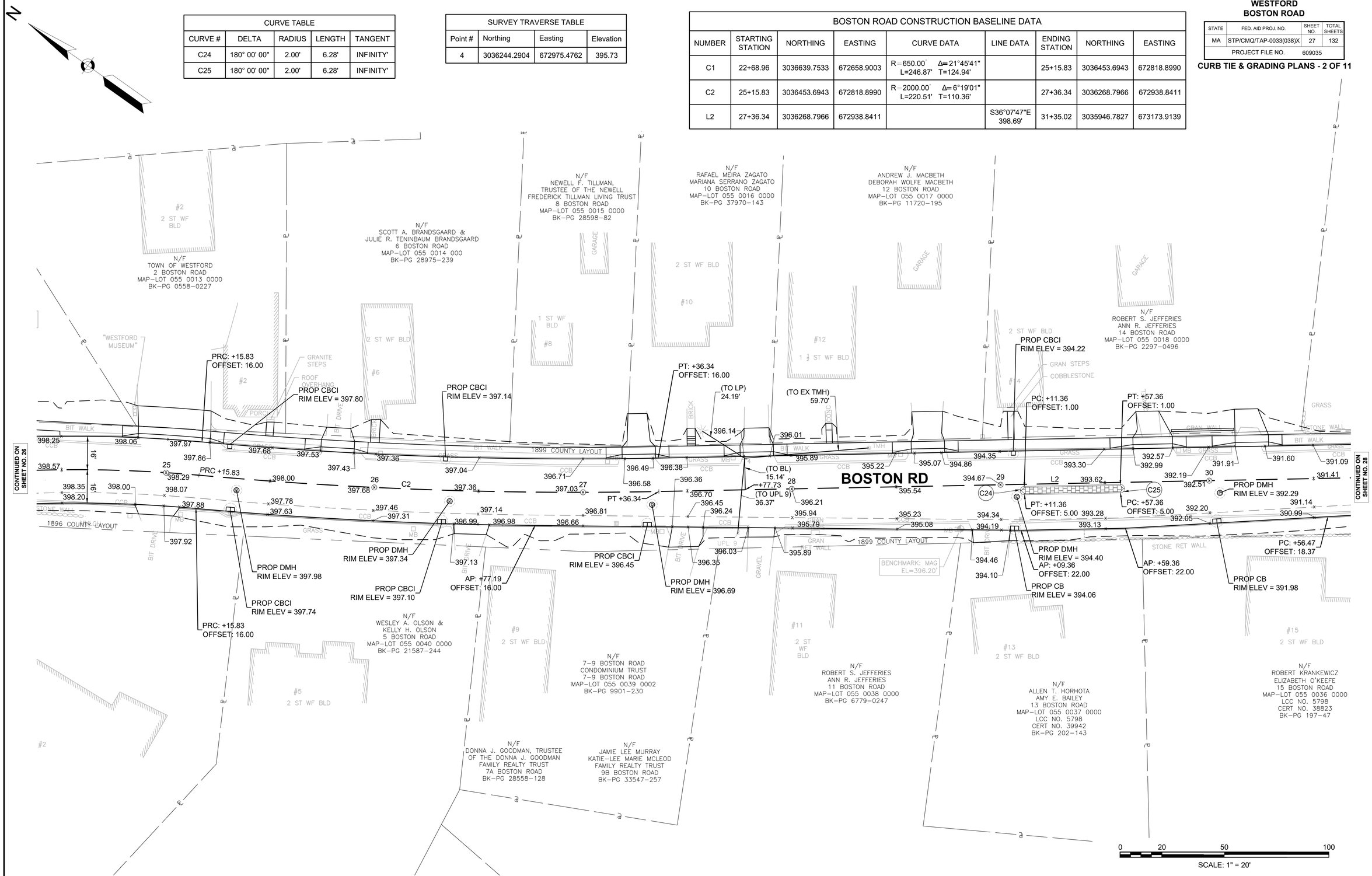
BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C1	22+68.96	3036639.7533	672658.9003	R=650.00' Δ=21°45'41" L=246.87' T=124.94'		25+15.83	3036453.6943	672818.8990
C2	25+15.83	3036453.6943	672818.8990	R=2000.00' Δ=6°19'01" L=220.51' T=110.36'		27+36.34	3036268.7966	672938.8411
L2	27+36.34	3036268.7966	672938.8411		S36°07'47"E 398.69'	31+35.02	3035946.7827	673173.9139

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	27	132
PROJECT FILE NO.	609035		

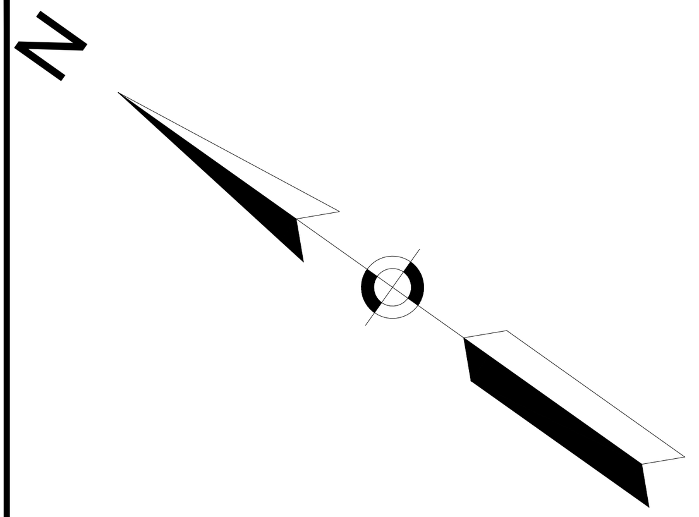
CURB TIE & GRADING PLANS - 2 OF 11

609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:30 AM



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	28	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 3 OF 11



CURVE TABLE

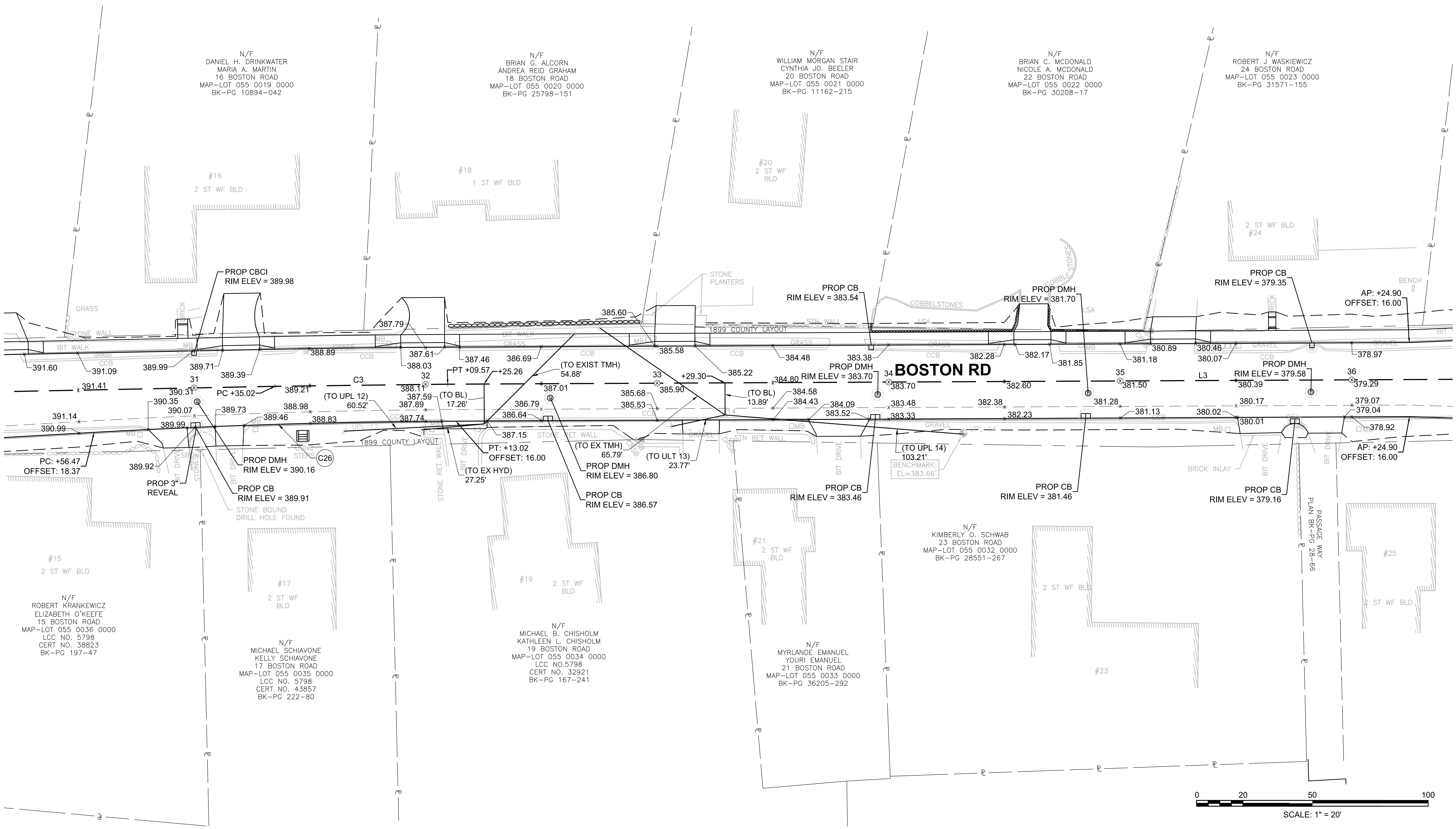
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C26	3° 00' 07"	2984.00'	156.34'	78.19'

SURVEY TRAVERSE TABLE

Point #	Northing	Easting	Elevation
13	3035863.4733	673212.3822	387.29
14	3035780.4857	673275.2222	384.59

BOSTON ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L2	27+36.34	3036268.7966	672938.8411		S36°07'47"E 398.69'	31+35.02	3035946.7827	673173.9139
C3	31+35.02	3035946.7827	673173.9139	R=5000.00' Δ=0°51'15" L=74.55' T=37.27'		32+09.57	3035886.2464	673217.4179
L3	32+09.57	3035886.2464	673217.4179		S35°16'32"E 676.00'	38+85.57	3035334.3717	673607.8128


N/F
DANIEL H. DRINKWATER
MARIA A. MARTIN
16 BOSTON ROAD
MAP-LOT 055 0019 0000
BK-PG 10894-042
N/F
BRIAN G. ALCORN
ANDREA REID GRAHAM
18 BOSTON ROAD
MAP-LOT 055 0020 0000
BK-PG 25798-151
N/F
WILLIAM MORGAN STAIR
CYNTHIA JO. BEELER
20 BOSTON ROAD
MAP-LOT 055 0021 0000
BK-PG 11162-215
N/F
BRIAN C. MCDONALD
NICOLE A. MCDONALD
22 BOSTON ROAD
MAP-LOT 055 0022 0000
BK-PG 30208-17
N/F
ROBERT J WASKIEWICZ
24 BOSTON ROAD
MAP-LOT 055 0023 0000
BK-PG 31571-155
#16
2 ST WF BLD
#18
1 ST WF BLD
#20
2 ST WF BLD
2 ST WF BLD
#24
STONE PLANTERS
COBBLESTONES
PROP CBCI
RIM ELEV = 389.98
PROP CB
RIM ELEV = 383.54
PROP DMH
RIM ELEV = 381.70
PROP CB
RIM ELEV = 379.35
AP: +24.90
OFFSET: 16.00
BENCH
GRASS
STONE WALL
BIT WALK
CCB
1899 COUNTY LAYOUT
STN WALL
BOSTON RD
CONTINUED ON SHEET NO. 27
CONTINUED ON SHEET NO. 29
391.60
391.09
389.99
389.71
389.39
388.89
387.79
387.61
388.03
387.46
386.69
385.60
385.58
385.22
384.48
383.38
382.28
382.17
381.85
381.18
380.89
380.46
380.07
378.97
31
32
33
34
35
36
C3
L3
391.41
390.31
PC +35.02
389.21
PT +09.57
+25.26
(TO EXIST TMH)
54.88'
+29.30
384.80
PROP DMH
RIM ELEV = 383.70
383.70
382.60
381.50
PROP DMH
RIM ELEV = 379.58
380.39
379.29
390.35
390.07
389.73
388.98
388.83
389.46
(TO UPL 12)
60.52'
388.11
387.59
387.89
387.74
(TO BL)
17.26'
387.01
386.79
386.64
385.68
385.53
385.90
(TO BL)
13.89'
384.58
384.43
384.09
383.52
383.48
383.33
382.38
382.23
381.28
381.13
380.17
380.02
380.01
379.07
379.04
378.92
391.14
390.99
389.99
PC: +56.47
OFFSET: 18.37
389.92
PROP 3" REVEAL
PROP DMH
RIM ELEV = 390.16
PROP CB
RIM ELEV = 389.91
C26
STONE BOUND DRILL HOLE FOUND
387.15
PT: +13.02
OFFSET: 16.00
(TO EX HYD)
27.25'
(TO EX TMH)
65.79'
PROP DMH
RIM ELEV = 386.80
PROP CB
RIM ELEV = 386.57
(TO ULT 13)
23.77'
STONE RET WALL
STN RET WALL
(TO UPL 14)
103.21'
BENCHMARK:
EL=383.66'
PROP CB
RIM ELEV = 383.46
PROP CB
RIM ELEV = 381.46
PROP CB
RIM ELEV = 379.16
BRICK INLAY
BIT DRIVE
GRAVEL
PASSAGE WAY
PLAN BK-PG 28-66
AP: +24.90
OFFSET: 16.00
#15
2 ST WF BLD
N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP-LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK-PG 197-47
#17
2 ST WF BLD
N/F
MICHAEL SCHIAVONE
KELLY SCHIAVONE
17 BOSTON ROAD
MAP-LOT 055 0035 0000
LCC NO. 5798
CERT NO. 43857
BK-PG 222-80
#19
2 ST WF BLD
N/F
MICHAEL B. CHISHOLM
KATHLEEN L. CHISHOLM
19 BOSTON ROAD
MAP-LOT 055 0034 0000
LCC NO.5798
CERT NO. 32921
BK-PG 167-241
#21
2 ST WF BLD
N/F
MYRLANDE EMANUEL
YOURI EMANUEL
21 BOSTON ROAD
MAP-LOT 055 0033 0000
BK-PG 36205-292
N/F
KIMBERLY O. SCHWAB
23 BOSTON ROAD
MAP-LOT 055 0032 0000
BK-PG 28551-267
2 ST WF BLD
#23
#25
2 ST WF BLD
0
20
50
100
SCALE: 1" = 20'

Plotted on 17-May-2024 8:31 AM
609035_HD7A(CURB TIE AND GRADING PLAN).DWG

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	29	132
	PROJECT FILE NO.	609035	

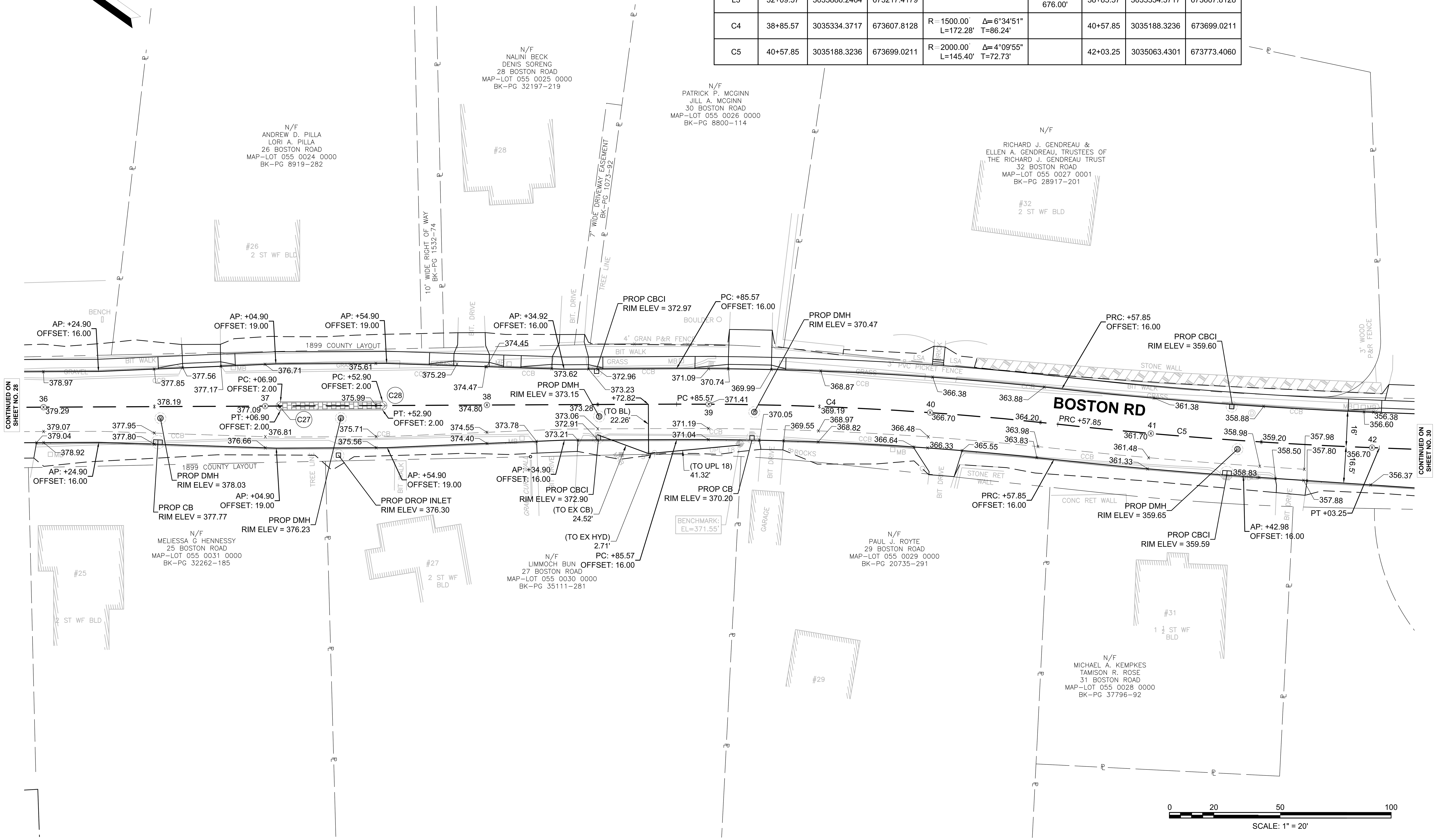
CURB TIE & GRADING PLANS - 4 OF 11

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C27	180° 00' 00"	2.00'	6.28'	INFINITY'
C28	180° 00' 00"	2.00'	6.28'	INFINITY'

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
5	3035331.9295	673582.2791	372.70

BOSTON ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L3	32+09.57	3035886.2464	673217.4179		S35°16'32"E 676.00'	38+85.57	3035334.3717	673607.8128
C4	38+85.57	3035334.3717	673607.8128	R=1500.00' Δ=6°34'51" L=172.28' T=86.24'		40+57.85	3035188.3236	673699.0211
C5	40+57.85	3035188.3236	673699.0211	R=2000.00' Δ=4°09'55" L=145.40' T=72.73'		42+03.25	3035063.4301	673773.4060



N/F
ANDREW D. PILLA
LORI A. PILLA
26 BOSTON ROAD
MAP-LOT 055 0024 0000
BK-PG 8919-282
N/F
NALINI BECK
DENIS SORENG
28 BOSTON ROAD
MAP-LOT 055 0025 0000
BK-PG 32197-219
N/F
PATRICK P. MCGINN
JILL A. MCGINN
30 BOSTON ROAD
MAP-LOT 055 0026 0000
BK-PG 8800-114
N/F
RICHARD J. GENDREAU &
ELLEN A. GENDREAU, TRUSTEES OF
THE RICHARD J. GENDREAU TRUST
32 BOSTON ROAD
MAP-LOT 055 0027 0001
BK-PG 28917-201
#26 2 ST WF BLD
#28
#32 2 ST WF BLD
10' WIDE RIGHT OF WAY BK-PG 1532-74
7' WIDE DRIVEWAY EASEMENT BK-PG 1073-92
BOSTON RD
CONTINUED ON SHEET NO. 28
CONTINUED ON SHEET NO. 30
1899 COUNTY LAYOUT
4' GRAN P&R FENCE
3' PVC PICKET FENCE
3' WOOD P&R FENCE
STONE WALL
PROP CBCI RIM ELEV = 372.97
PROP DMH RIM ELEV = 370.47
PROP CBCI RIM ELEV = 359.60
PROP DMH RIM ELEV = 373.15
PROP DMH RIM ELEV = 378.03
PROP CB RIM ELEV = 377.77
PROP DMH RIM ELEV = 376.23
PROP DROP INLET RIM ELEV = 376.30
PROP CBCI RIM ELEV = 372.90
PROP CB RIM ELEV = 370.20
PROP DMH RIM ELEV = 359.65
PROP CBCI RIM ELEV = 359.59
PC +85.57
PRC +57.85
PT +03.25
BENCHMARK: EL=371.55'
N/F
MELIESSA G HENNESSY
25 BOSTON ROAD
MAP-LOT 055 0031 0000
BK-PG 32262-185
N/F
LIMMOCH BUN
27 BOSTON ROAD
MAP-LOT 055 0030 0000
BK-PG 35111-281
N/F
PAUL J. ROYTE
29 BOSTON ROAD
MAP-LOT 055 0029 0000
BK-PG 20735-291
N/F
MICHAEL A. KEMPKES
TAMISON R. ROSE
31 BOSTON ROAD
MAP-LOT 055 0028 0000
BK-PG 37796-92
#25 2 ST WF BLD
#27 2 ST WF BLD
#29
#31 1 ½ ST WF BLD
SCALE: 1" = 20'

609035_HD7A(CURB TIE AND GRADING PLAN).DWG
Plotted on 17-May-2024 8:31 AM

CURVE TABLE

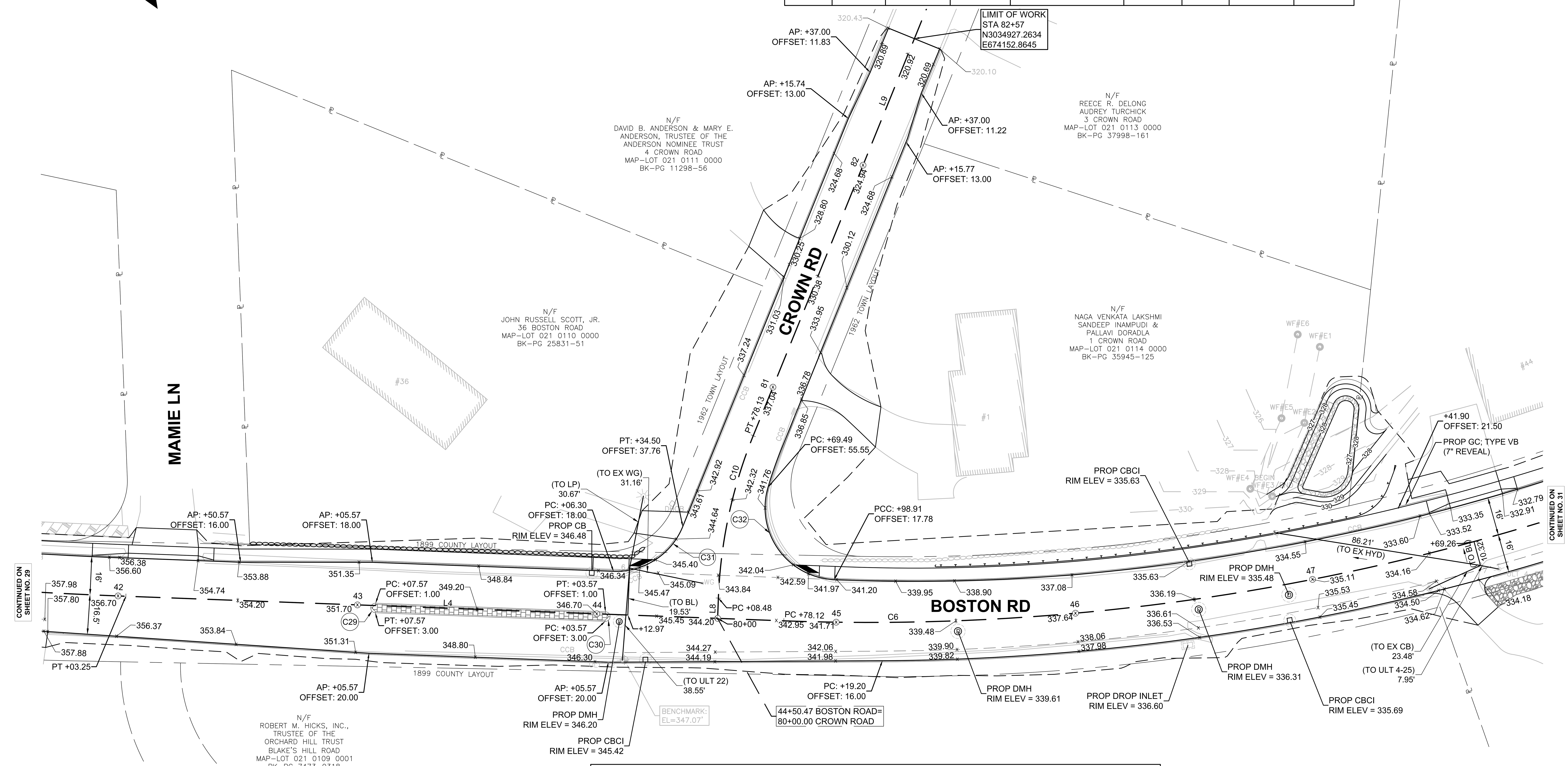
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C29	180° 00' 04"	2.00'	6.28'	224965.60'
C30	180° 00' 00"	2.00'	6.28'	INFINITY'
C31	70° 02' 43"	30.00'	36.68'	21.02'
C32	104° 34' 52"	30.00'	54.76'	38.80'

SURVEY TRAVERSE TABLE

Point #	Northing	Easting	Elevation
6	3034897.8646	673903.5969	345.34
7	3034607.5517	674108.3037	333.74

BOSTON ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C5	40+57.85	3035188.3236	673699.0211	R=2000.00' Δ=4°09'55" L=145.40' T=72.73'		42+03.25	3035063.4301	673773.4060
L4	42+03.25	3035063.4301	673773.4060		S32°51'36"E 274.87'	44+78.12	3034832.5420	673922.5464
C6	44+78.12	3034832.5420	673922.5464	R=960.00' Δ=52°30'50" L=879.88' T=473.56'		53+58.00	3034396.5558	674651.5181


LIMIT OF WORK
STA 82+57
N3034927.2634
E674152.8645
CROWN RD
BOSTON RD
MAMIE LN
N/F
DAVID B. ANDERSON & MARY E. ANDERSON, TRUSTEE OF THE ANDERSON NOMINEE TRUST
4 CROWN ROAD
MAP-LOT 021 0111 0000
BK-PG 11298-56
N/F
REECE R. DELONG
AUDREY TURCHICK
3 CROWN ROAD
MAP-LOT 021 0113 0000
BK-PG 37998-161
N/F
JOHN RUSSELL SCOTT, JR.
36 BOSTON ROAD
MAP-LOT 021 0110 0000
BK-PG 25831-51
N/F
NAGA VENKATA LAKSHMI
SANDEEP INAMPUDI &
PALLAVI DORADLA
1 CROWN ROAD
MAP-LOT 021 0114 0000
BK-PG 35945-125
N/F
ROBERT M. HICKS, INC., TRUSTEE OF THE ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318
1962 TOWN LAYOUT
1899 COUNTY LAYOUT
AP: +37.00 OFFSET: 11.83
AP: +15.74 OFFSET: 13.00
AP: +37.00 OFFSET: 11.22
AP: +15.77 OFFSET: 13.00
PT: +34.50 OFFSET: 37.76
PC: +69.49 OFFSET: 55.55
PCC: +98.91 OFFSET: 17.78
(TO EX WG) 31.16'
(TO LP) 30.67'
PC: +06.30 OFFSET: 18.00
PROP CB RIM ELEV = 346.48
AP: +50.57 OFFSET: 16.00
AP: +05.57 OFFSET: 18.00
PC: +07.57 OFFSET: 1.00
PT: +07.57 OFFSET: 3.00
PT: +03.57 OFFSET: 1.00
PC: +03.57 OFFSET: 3.00
(TO BL) 19.53'
PC +08.48
PC +78.12
PT +78.13
PT +03.25
AP: +05.57 OFFSET: 20.00
AP: +05.57 OFFSET: 20.00
PROP DMH RIM ELEV = 346.20
PROP CBCI RIM ELEV = 345.42
BENCHMARK: EL=347.07'
(TO ULT 22) 38.55'
PC: +19.20 OFFSET: 16.00
44+50.47 BOSTON ROAD= 80+00.00 CROWN ROAD
PROP DMH RIM ELEV = 339.61
PROP DROP INLET RIM ELEV = 336.60
PROP DMH RIM ELEV = 336.31
PROP CBCI RIM ELEV = 335.69
PROP DMH RIM ELEV = 335.48
PROP CBCI RIM ELEV = 335.63
+41.90 OFFSET: 21.50
PROP GC; TYPE VB (7" REVEAL)
86.21' (TO EX HYD)
(TO EX CB) 23.48'
(TO ULT 4-25) 7.95'
+69.26
CONTINUED ON SHEET NO. 29
CONTINUED ON SHEET NO. 31

CROWN ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L8	80+00.00	3034855.7670	673907.5444		N57°08'24"E 8.48'	80+08.48	3034860.3657	673914.6637
C10	80+08.48	3034860.3657	673914.6637	R=200.00' Δ=19°57'17" L=69.65' T=35.18'		80+78.13	3034887.3142	673978.5132
L9	80+78.13	3034887.3142	673978.5132		N77°05'40"E 321.87'	84+00.00	3034959.2014	674292.2523

0 20 50 100
SCALE: 1" = 20'

Plotted on 17-May-2024 8:32 AM
609035_HD7A(CURB TIE AND GRADING PLAN).DWG

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C33	1° 44' 35"	1000.00'	30.42'	15.21'
C34	6° 40' 49"	500.00'	58.30'	29.18'
C35	7° 28' 42"	516.00'	67.35'	33.72'
C36	179° 08' 49"	2.00'	6.25'	268.41'
C37	2° 44' 04"	965.00'	46.05'	23.03'
C38	2° 44' 04"	961.00'	45.86'	22.94'
C39	2° 44' 00"	944.00'	45.04'	22.52'
C40	2° 54' 57"	982.00'	49.97'	24.99'
C41	179° 02' 55"	2.00'	6.25'	240.93'

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
7	3034607.5517	674108.3037	333.74
8	3034432.1542	674410.2287	325.26

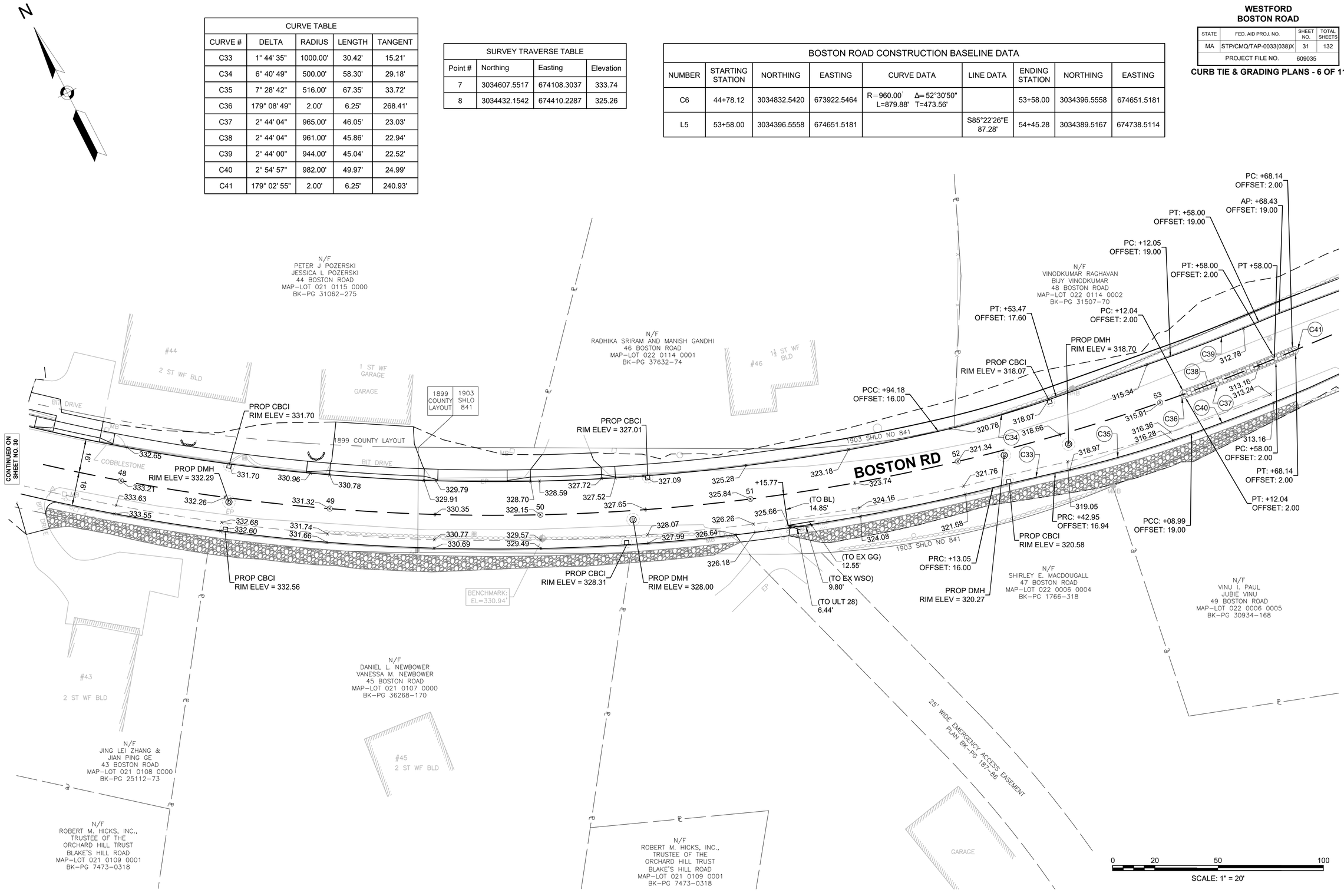
BOSTON ROAD CONSTRUCTION BASELINE DATA							
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C6	44+78.12	3034832.5420	673922.5464	R=960.00' Δ=52°30'50" L=879.88' T=473.56'		53+58.00	3034396.5558	674651.5181
L5	53+58.00	3034396.5558	674651.5181		S85°22'26"E 87.28'	54+45.28	3034389.5167	674738.5114

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	31	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 6 OF 11

609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:32 AM



WESTFORD
BOSTON ROAD

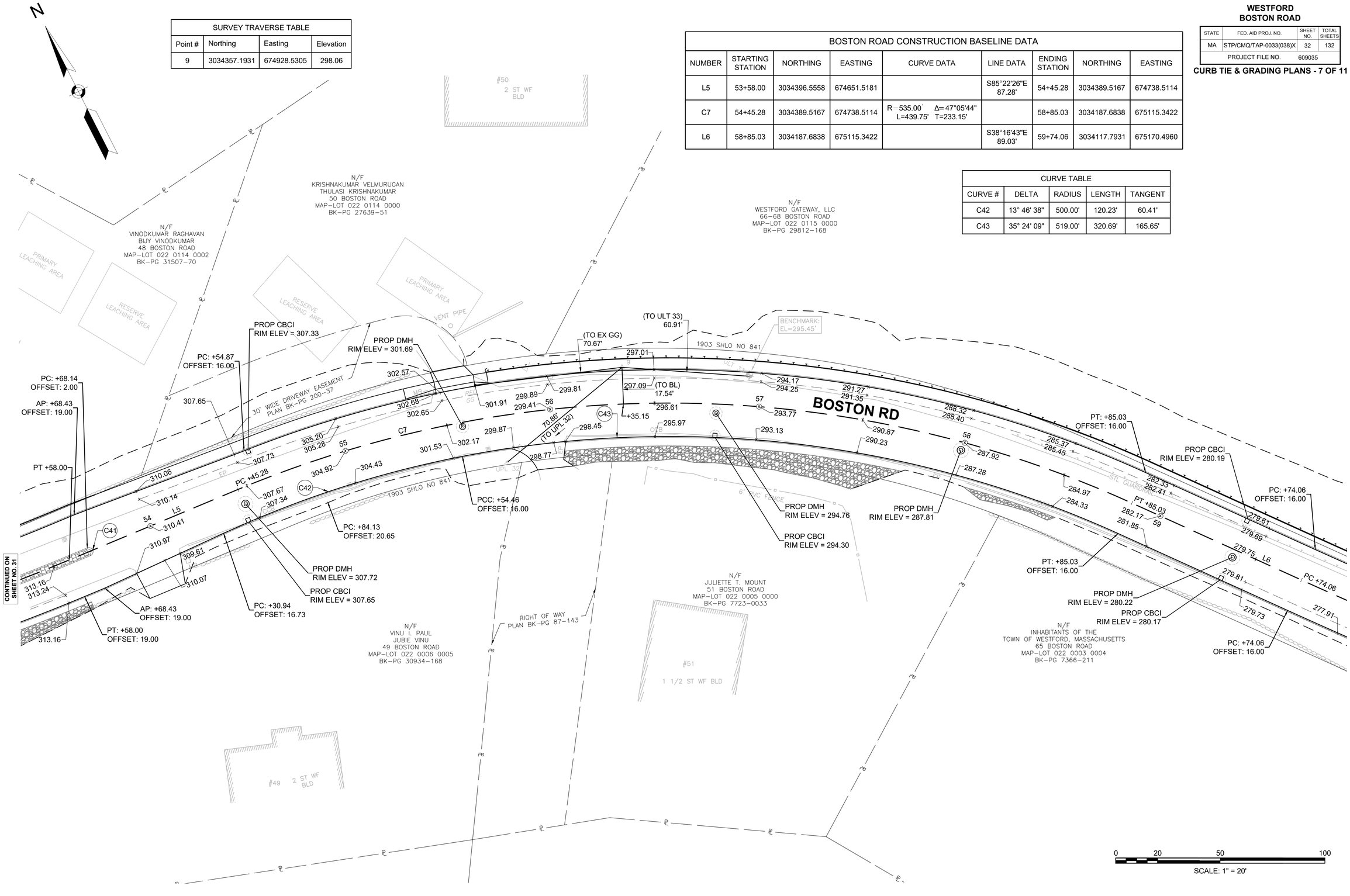
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	32	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 7 OF 11

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
9	3034357.1931	674928.5305	298.06

BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L5	53+58.00	3034396.5558	674651.5181		S85°22'26"E 87.28'	54+45.28	3034389.5167	674738.5114
C7	54+45.28	3034389.5167	674738.5114	R=535.00' Δ=47°05'44" L=439.75' T=233.15'		58+85.03	3034187.6838	675115.3422
L6	58+85.03	3034187.6838	675115.3422		S38°16'43"E 89.03'	59+74.06	3034117.7931	675170.4960

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C42	13° 46' 38"	500.00'	120.23'	60.41'
C43	35° 24' 09"	519.00'	320.69'	165.65'



609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:33 AM

WESTFORD
BOSTON ROAD

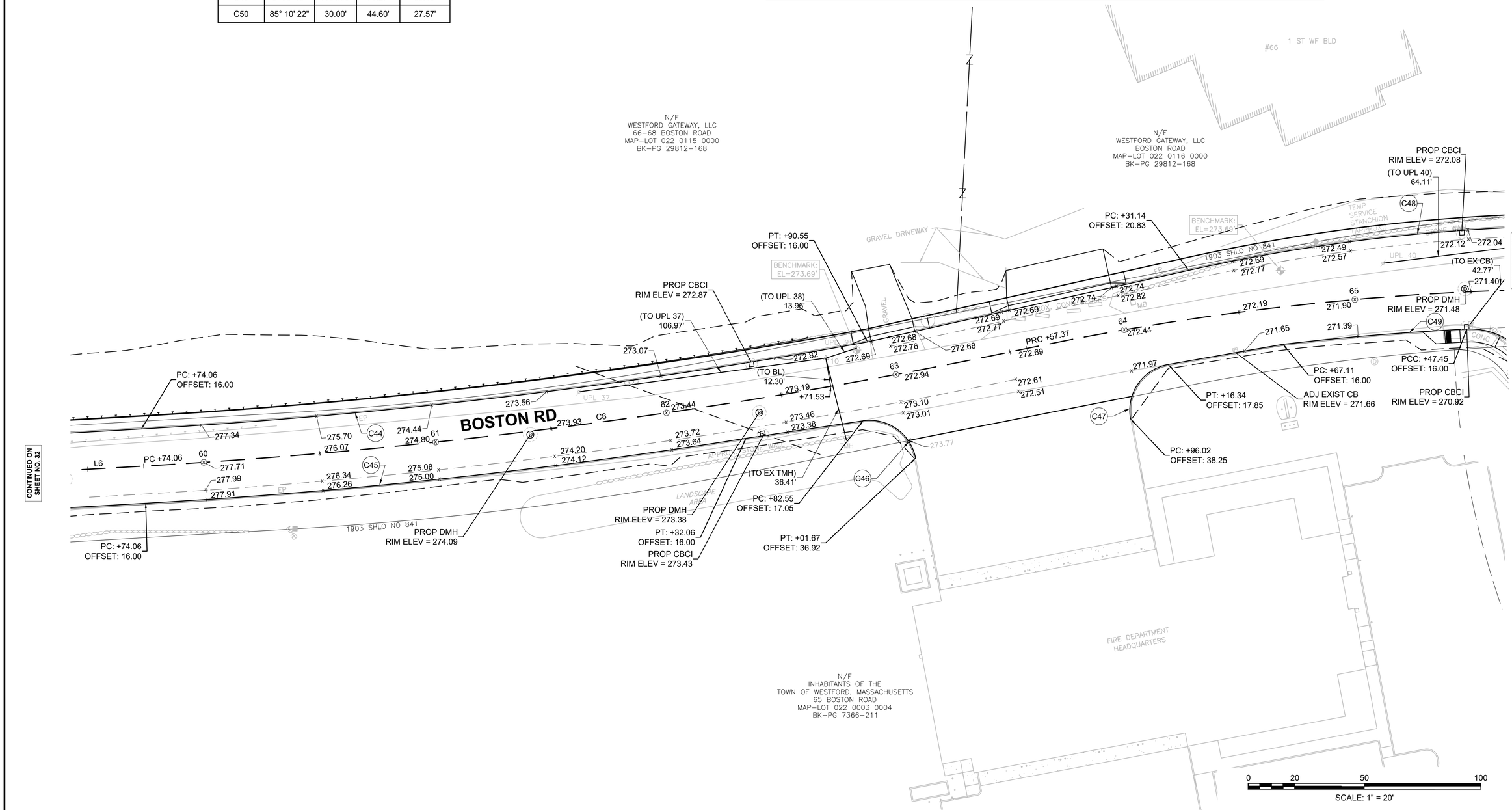
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	33	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 8 OF 11

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C44	7° 06' 40"	2534.00'	314.50'	157.45'
C45	5° 47' 49"	2566.00'	259.62'	129.92'
C46	87° 40' 57"	20.00'	30.61'	19.21'
C47	90° 44' 20"	20.00'	31.67'	20.26'
C48	12° 04' 04"	800.00'	168.50'	84.56'
C49	3° 50' 10"	1184.00'	79.27'	39.65'
C50	85° 10' 22"	30.00'	44.60'	27.57'

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
10	3033904.2304	675376.6615	272.36

BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L6	58+85.03	3034187.6838	675115.3422		S38°16'43"E 89.03'	59+74.06	3034117.7931	675170.4960
C8	59+74.06	3034117.7931	675170.4960	R=2550.00' Δ=8°36'45" L=383.31' T=192.02'		63+57.37	3033835.8381	675429.6286
C9	63+57.37	3033835.8381	675429.6286	R=1200.00' Δ=22°12'05" L=464.98' T=235.45'		68+22.35	3033461.0155	675699.8631



609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:33 AM

WESTFORD
BOSTON ROAD

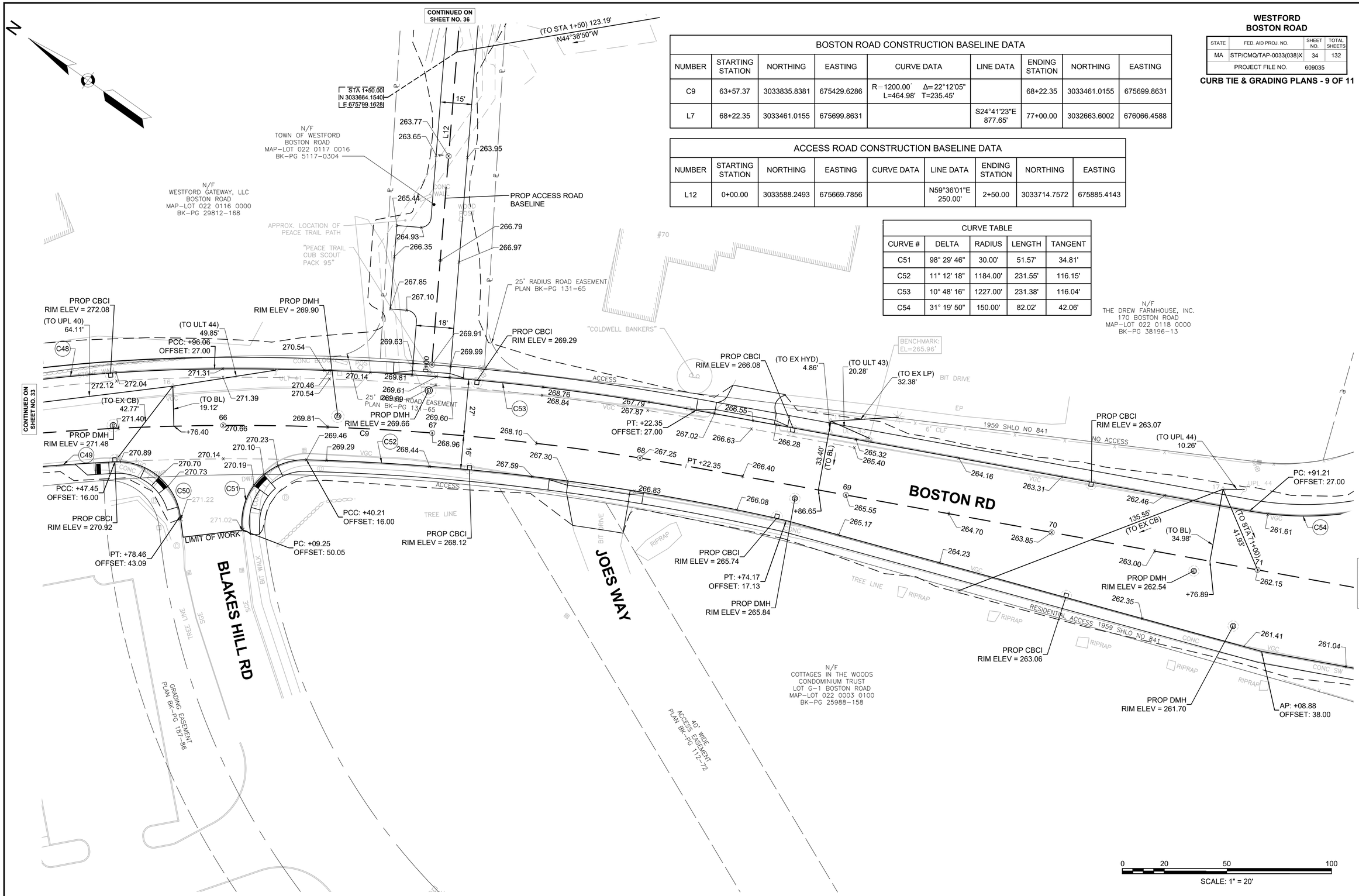
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	34	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 9 OF 11

BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C9	63+57.37	3033835.8381	675429.6286	R=1200.00' Δ=22°12'05" L=464.98' T=235.45'		68+22.35	3033461.0155	675699.8631
L7	68+22.35	3033461.0155	675699.8631		S24°41'23"E 877.65'	77+00.00	3032663.6002	676066.4588

ACCESS ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L12	0+00.00	3033588.2493	675669.7856		N59°36'01"E 250.00'	2+50.00	3033714.7572	675885.4143

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C51	98° 29' 46"	30.00'	51.57'	34.81'
C52	11° 12' 18"	1184.00'	231.55'	116.15'
C53	10° 48' 16"	1227.00'	231.38'	116.04'
C54	31° 19' 50"	150.00'	82.02'	42.06'



609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:34 AM

WESTFORD
BOSTON ROAD

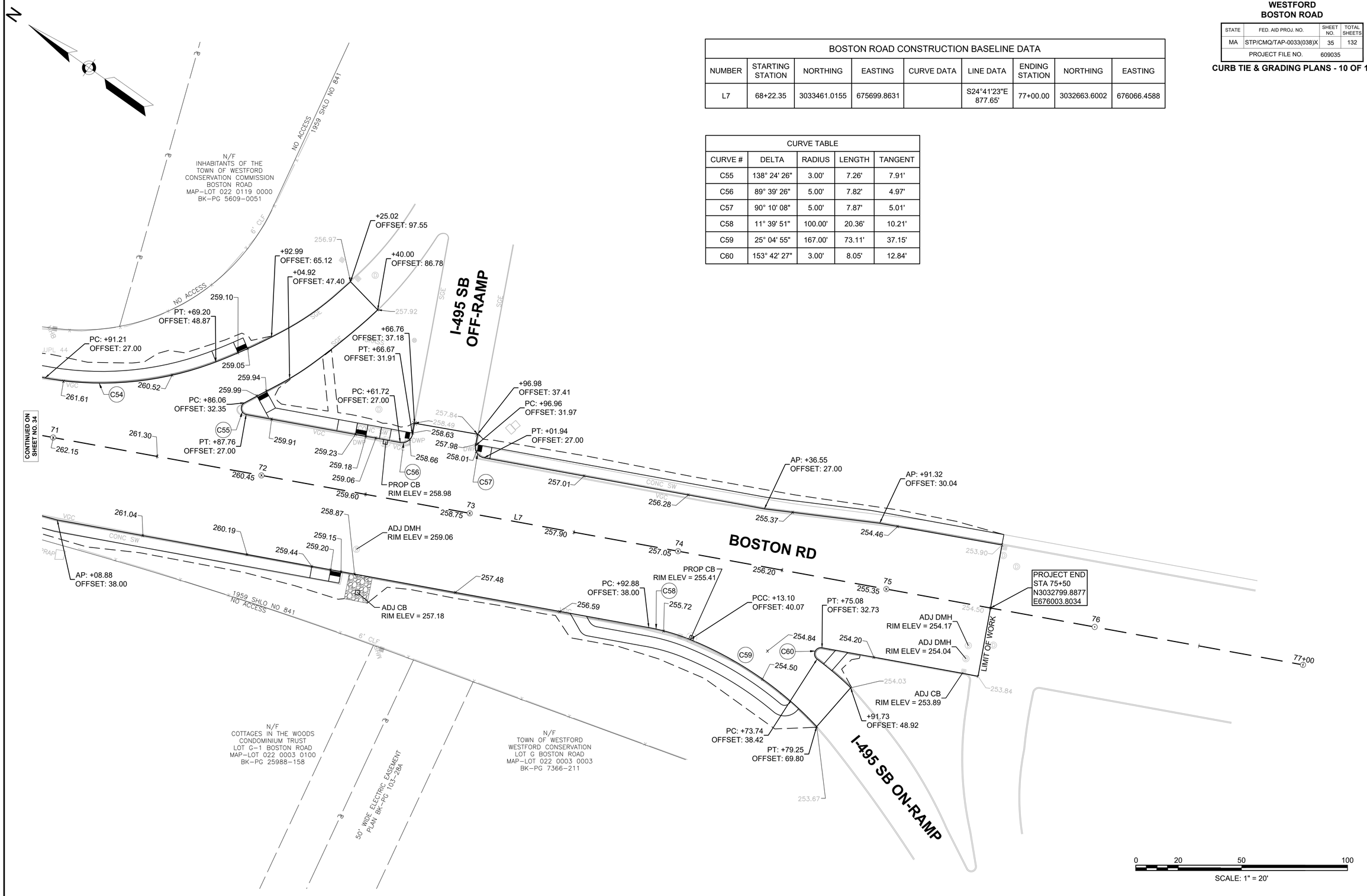
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	35	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 10 OF 11

609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:34 AM

BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L7	68+22.35	3033461.0155	675699.8631		S24°41'23"E 877.65'	77+00.00	3032663.6002	676066.4588

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C55	138° 24' 26"	3.00'	7.26'	7.91'
C56	89° 39' 26"	5.00'	7.82'	4.97'
C57	90° 10' 08"	5.00'	7.87'	5.01'
C58	11° 39' 51"	100.00'	20.36'	10.21'
C59	25° 04' 55"	167.00'	73.11'	37.15'
C60	153° 42' 27"	3.00'	8.05'	12.84'



WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	36	132
PROJECT FILE NO.	609035		

CURB TIE & GRADING PLANS - 11 OF 11

SURVEY TRAVERSE TABLE			
Point #	Northing	Easting	Elevation
20	3033691.7470	675871.5034	265.11
21	3033576.5111	675885.7331	265.14
22	3033709.1980	676021.6993	265.92

609035_HD7A(CURB TIE AND GRADING PLAN).DWG Plotted on 17-May-2024 8:34 AM

N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0016
BK–PG 5117–0304

APPROX. LOCATION OF
PEACE TRAIL PATH

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0001
BK–PG 4446–0228

PROP WET
DETENTION BASIN
EL. 250

N87°39'51"W
(TO STA 2+50) 136.40'

N63°22'21"E
51.21'

S45°41'58"W
189.98'

STA 2+50.00
N 3033714.7572
E 675885.4143

2+50

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0115 0000
BK–PG 29812–168

(TO STA 2+00) S85°30'55"W
29.30'

S21°02'22"E
121.01'

N7°02'22"W
116.11'

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0116 0000
BK–PG 29812–168

STA 2+00.00
N 3033689.4556
E 675842.2886

PROP ACCESS ROAD
BASELINE

(TO STA 1+50) 123.19'
N44°38'50"W

N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP–LOT 022 0118 0000
BK–PG 38196–13

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0002
BK–PG 4446–0228

STA 1+50.00
N 3033664.1540
E 675799.1628

15'

L12

N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0016
BK–PG 5117–0304

CONTINUED ON
SHEET NO. 34

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	37	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 1 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:35 AM

N

14+50

W11-2
W16-9P

LIMIT OF WORK
STA 14+25
N3036894.0183
E672655.4630

PROP YIELD MARKINGS
R1-5

W11-2 (2)
W16-7PL
W16-7PR

W11-2 (2)
W16-7PL
W16-7PR

R3-17
R3-17bP

"BOSTON RD"
(R1-1) RET

RET
"MAIN ST"

MAIN ST

BOSTON RD

LINCOLN ST
ONE WAY

W11-2
W16-7PL

W11-2
W16-7PR

R&R W/ "LINCOLN ST"
NEW POST

PROP BICYCLE LANE
MARKINGS (TYP)

R&R
(PAID FOR UNDER
ITEM 874.21)
"WESTFORD
MUSEUM"

R&D
"NABNASSET →"
"NO. CHELMSFORD →"
"TYNGSBORO →"

R&D
"978-692-6333
WESFORD.ORG/PCA"

GRANITE POST

D1-3

CONTINUED ON
SHEET NO. 38

"PLEASE SLOW DOWN
HIDDEN DRIVE" R&D

(R1-1) R&R W/
NEW POST

R&R W/ NEW POST "HILDRETH ST"

R8-3a

(R1-1) R&R W/ NEW POST

"NO TRUCKS" R&D
(R5-2) R&R STA.
21+97 RT

(R5-2) R&R
"NO TRUCKS" R&D

"NO PARKING R&D
THIS SIDE"

PROP GREEN
COLORIZED PAVEMENT
MARKINGS (TYP)

PROP THERMOPLASTIC
PVMT MARKINGS (TYP)

R5-2
R&R FROM
STA. 22+52 RT
W/ NEW POST

R3-17

PROP IMPRINTED PREFORMED
THERMOPLASTIC CROSSWALK
BRICK PATTERN (PAID FOR UNDER
ITEM 487.1,TYP)

W11-2
W16-7PL

PROJECT BEGIN
STA 20+00
N3036806.9111
E672448.1959

CONNELL DR

W14-1

R&R (2) W/ NEW POST "CONNELL DR
R&D DEAD END"

W11-2
W16-9P

RET
"EXIT ONLY
DO NOT ENTER"

RET
"EXIT ONLY
DO NOT ENTER"

R3-7R

LIMIT OF WORK
STA 10+60
N3036779.9180
E672310.9816

HILDRETH ST

EXISTING SIGN LEGEND

STOP
R1-1

R5-2

N/F
WESTFORD HISTORICAL SOCIETY, INC.
10 LINCOLN STREET
MAP-LOT 055 0012 0000
BK-PG 9792-167
BK-PG 19324-138

N/F
TOWN OF WESTFORD
MAIN STREET
MAP-LOT 059 0001 0000
BK-PG 0240-127

N/F
FIRST PARISH
UNITED OF WESTFORD
48 MAIN STREET
MAP-LOT 059 0017 0000
BK-PG 1585-454

N/F
CHRISTOPHER CARPENTER &
STACY CARPENTER
44 MAIN STREET
MAP-LOT 059 0011 0000
BK-PG 31321-124

N/F
WESTFORD CENTER TRUST
45 MAIN STREET
MAP-LOT 059 0004 0000
BK-PG 3719-333

N/F
JAMES D. ROBERTS
HILDRETH STREET
MAP-LOT 059 0003 0000
CERT NO. 39045
LCC NO. 17070
BK-PG 198-91

N/F
TOWN OF WESTFORD
LOT 4 BOSTON ROAD
MAP-LOT 059 0002 0000
BK-PG 1404-530

N/F
JAMES D. ROBERTS
1 HILDRETH STREET
MAP-LOT 055 0007 0000
CERT NO. 39045
LCC NO. 17070
BK-PG 198-91

N/F
INEZ CHESHIRE BUCHKO
JUSTIN DANIEL BORICK
2 HILDRETH STREET
MAP-LOT 055 0041 0000
BK-PG 36233-188

1896 COUNTY LAYOUT
1899 COUNTY LAYOUT
1935 TOWN LAYOUT

NOTE:
SEE DETAIL ON SHEET 74 FOR TREATMENT AT INTERSECTIONS.

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	38	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 2 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:35 AM

N

N/F
TOWN OF WESTFORD
2 BOSTON ROAD
MAP–LOT 055 0013 0000
BK–PG 0558–0227

N/F
SCOTT A. BRANDSGAARD &
JULIE R. TENINBAUM BRANDSGAARD
6 BOSTON ROAD
MAP–LOT 055 0014 000
BK–PG 28975–239

N/F
NEWELL F. TILLMAN,
TRUSTEE OF THE NEWELL
FREDERICK TILLMAN LIVING TRUST
8 BOSTON ROAD
MAP–LOT 055 0015 0000
BK–PG 28598–82

N/F
RAFAEL MEIRA ZAGATO
MARIANA SERRANO ZAGATO
10 BOSTON ROAD
MAP–LOT 055 0016 0000
BK–PG 37970–143

N/F
ANDREW J. MACBETH
DEBORAH WOLFE MACBETH
12 BOSTON ROAD
MAP–LOT 055 0017 0000
BK–PG 11720–195

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
14 BOSTON ROAD
MAP–LOT 055 0018 0000
BK–PG 2297–0496

#2 #6 #8 #10 #12 #14

GARAGE

R&R
(PAID FOR UNDER
ITEM 874.21)
"WESTFORD
MUSEUM"

R&D
"NABNASSET →"
CHELMSFORD→"
"TYNGSBORO →"

R&D
R&D(W11–2)
(W13–1P)

12" SYL @ 1:1,
20' O.C. (TYP)

GRAN WALL

1899 COUNTY LAYOUT

SWEL

CONTINUED ON SHEET NO. 37

CONTINUED ON SHEET NO. 39

25 26 27 28 29 30

5' 11' 5'

6" SWL
6" DBYL
6" SWL

+41 **BOSTON RD**

6" SWL
6" DBYL
+09
6" SYL
1' 1' 4'
+59
6" SYL
+09
6" DBYL
6" SWL

PROP BICYCLE LANE
MARKINGS (TYP)

PROP THERMOPLASTIC
PVMT MARKINGS (TYP)

R&D(R2–1)(30)
R&D(R21–2P)
BICYCLE
R&D"SHARE THE ROAD"

N/F
WESLEY A. OLSON &
KELLY H. OLSON
5 BOSTON ROAD
MAP–LOT 055 0040 0000
BK–PG 21587–244

N/F
7–9 BOSTON ROAD
CONDOMINIUM TRUST
7–9 BOSTON ROAD
MAP–LOT 055 0039 0002
BK–PG 9901–230

N/F
DONNA J. GOODMAN, TRUSTEE
OF THE DONNA J. GOODMAN
FAMILY REALTY TRUST
7A BOSTON ROAD
BK–PG 28558–128

N/F
JAMIE LEE MURRAY
KATIE–LEE MARIE MCLEOD
FAMILY REALTY TRUST
9B BOSTON ROAD
BK–PG 33547–257

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
11 BOSTON ROAD
MAP–LOT 055 0038 0000
BK–PG 6779–0247

N/F
ALLEN T. HORHOTA
AMY E. BAILEY
13 BOSTON ROAD
MAP–LOT 055 0037 0000
LCC NO. 5798
CERT NO. 39942
BK–PG 202–143

N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP–LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK–PG 197–47

#5 #9 #11 #13 #15

EXISTING SIGN LEGEND

SPEED LIMIT 30
R2–1(30)

STRICTLY ENFORCED
R21–2P

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	39	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 3 OF 10

N
N/F
DANIEL H. DRINKWATER
MARIA A. MARTIN
16 BOSTON ROAD
MAP-LOT 055 0019 0000
BK-PG 10894-042
N/F
BRIAN G. ALCORN
ANDREA REID GRAHAM
18 BOSTON ROAD
MAP-LOT 055 0020 0000
BK-PG 25798-151
N/F
WILLIAM MORGAN STAIR
CYNTHIA JO. BEELER
20 BOSTON ROAD
MAP-LOT 055 0021 0000
BK-PG 11162-215
N/F
BRIAN C. MCDONALD
NICOLE A. MCDONALD
22 BOSTON ROAD
MAP-LOT 055 0022 0000
BK-PG 30208-17
N/F
ROBERT J. WASKIEWICZ
24 BOSTON ROAD
MAP-LOT 055 0023 0000
BK-PG 31571-155
#16
#18
#20
#24
STONE PLANTERS
PROP RADAR SPEED FEEDBACK SIGN ASSEMBLY W/ MA-W13-4 (30) R21-2p
PROP THERMOPLASTIC PVMT MARKINGS (TYP)
R&R W/ NEW POST "WESTFORD CENTER HISTORIC DISTRICT"
1899 COUNTY LAYOUT
CONTINUED ON SHEET NO. 38
CONTINUED ON SHEET NO. 40
BOSTON RD
6" SWL
6" DBYL
DBYL
SWEL
31
32
33
34
35
36
+02
+38
5'
11'
PROP RADAR SPEED FEEDBACK SIGN ASSEMBLY W/ MA-W13-4 (30) R21-2p
PROP BICYCLE LANE MARKINGS (TYP)
STONE BOUND DRILL HOLE FOUND
PASSAGE WAY PLAN BK-PG 28-66
#15
#17
#19
#21
#23
#25
N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP-LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK-PG 197-47
N/F
MICHAEL SCHIAVONE
KELLY SCHIAVONE
17 BOSTON ROAD
MAP-LOT 055 0035 0000
LCC NO. 5798
CERT NO. 43857
BK-PG 222-80
N/F
MICHAEL B. CHISHOLM
KATHLEEN L. CHISHOLM
19 BOSTON ROAD
MAP-LOT 055 0034 0000
LCC NO.5798
CERT NO. 32921
BK-PG 167-241
N/F
MYRLANDE EMANUEL
YOURI EMANUEL
21 BOSTON ROAD
MAP-LOT 055 0033 0000
BK-PG 36205-292
N/F
KIMBERLY O. SCHWAB
23 BOSTON ROAD
MAP-LOT 055 0032 0000
BK-PG 28551-267
0
20
50
100
SCALE: 1" = 20'

Plotted on 17-May-2024 8:36 AM

609035_HD7(TSPM).DWG

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	40	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 4 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:36 AM

N

N/F
ANDREW D. PILLA
LORI A. PILLA
26 BOSTON ROAD
MAP–LOT 055 0024 0000
BK–PG 8919–282

#26

N/F
NALINI BECK
DENIS SORENG
28 BOSTON ROAD
MAP–LOT 055 0025 0000
BK–PG 32197–219

#28

N/F
PATRICK P. MCGINN
JILL A. MCGINN
30 BOSTON ROAD
MAP–LOT 055 0026 0000
BK–PG 8800–114

N/F
RICHARD J. GENDREAU &
ELLEN A. GENDREAU, TRUSTEES OF
THE RICHARD J. GENDREAU TRUST
32 BOSTON ROAD
MAP–LOT 055 0027 0001
BK–PG 28917–201

#32

10' WIDE RIGHT OF WAY
BK–PG 1532–74

7' WIDE DRIVEWAY EASEMENT
BK–PG 1073–92

1994 PRIVATE LAYOUT

R&R W/
NEW POST
"WESTFORD
CENTER
HISTORIC
DISTRICT"

12" SYL @ 1:1,
20' O.C. (TYP)

1899 COUNTY LAYOUT

PROP BICYCLE LANE
MARKINGS (TYP)

STONE WALL

CONTINUED ON
SHEET NO. 39

BOSTON RD

36 37 38 39 40 41 42

5' 11' 11' 5'

6" SWL
6" DBYL
6" SYL
6" DBYL
6" SWL

+38 +05 +55 +22 +05 +55 +06

SWEL 1' 4' SWEL

PROP THERMOPLASTIC
PVMT MARKINGS (TYP)

1896 COUNTY LAYOUT

W2-2L
W16-8P

CONTINUED ON
SHEET NO. 41

GRAN CURB WALL

GARAGE

N/F
MELIESSA G HENNESSY
25 BOSTON ROAD
MAP–LOT 055 0031 0000
BK–PG 32262–185

#25

#27

N/F
LIMMOCH BUN
27 BOSTON ROAD
MAP–LOT 055 0030 0000
BK–PG 35111–281

N/F
PAUL J. ROYTE
29 BOSTON ROAD
MAP–LOT 055 0029 0000
BK–PG 20735–291

#29

#31

N/F
MICHAEL A. KEMPKES
TAMISON R. ROSE
31 BOSTON ROAD
MAP–LOT 055 0028 0000
BK–PG 37796–92

EXISTING SIGN LEGEND

SPEED LIMIT 30

R2–1(30)

0 20 50 100

SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	41	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 5 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:36 AM

NOTE:
BICYCLE LANES SHALL BE GREEN COLORIZED PAVEMENT MARKINGS. SEE DETAIL SHEET 74 FOR TREATMENT AT INTERSECTIONS.

APPROXIMATE 20' DRAIN EASEMENT (SEE DEED PLAN 96-43)

LIMIT OF WORK
STA 82+57
N3034927.2634
E674152.8645

N/F
DAVID B. ANDERSON & MARY E. ANDERSON, TRUSTEE OF THE ANDERSON NOMINEE TRUST
4 CROWN ROAD
MAP-LOT 021 0111 0000
BK-PG 11298-56

N/F
REECE R. DELONG
AUDREY TURCHICK
3 CROWN ROAD
MAP-LOT 021 0113 0000
BK-PG 37998-161

N/F
JOHN RUSSELL SCOTT, JR.
36 BOSTON ROAD
MAP-LOT 021 0110 0000
BK-PG 25831-51

N/F
NAGA VENKATA LAKSHMI SANDEEP INAMPUDI & PALLAVI DORADLA
1 CROWN ROAD
MAP-LOT 021 0114 0000
BK-PG 35945-125

N/F
ROBERT M. HICKS, INC., TRUSTEE OF THE ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318

MAMIE LN
1994 PRIVATE LAYOUT
CROWN RD
1962 TOWN LAYOUT
BOSTON RD
1899 COUNTY LAYOUT

#36 #1

R&D(R1-1)
MA-D3-1a (2)
MA-D3-1b (2)
R&D (D3-1)
R1-1
(R2-1)(30) R&D
12" SYL @ 1:1, 20' O.C. (TYP)
12" SL
8' CW
6" DWLEx
6" SWL
6" DBYL
6" SYL
PROP BICYCLE LANE MARKINGS (TYP)
PROP GREEN COLORIZED PAVEMENT MARKINGS
PROP THERMOPLASTIC PVMT MARKINGS (TYP)
R&R TO RELOCATED UPL 26 AT STA 48+95 (SEE SHEET 42)
SOLAR POWERED RADAR FEEDBACK SIGN
PROP RADAR SPEED FEEDBACK SIGN ASSEMBLY W/ MA-W13-4 (30) R21-2P
R&D(W2-2R)
W2-2R
W16-8P
W1-4L
W13-1P(30)
(W1-4L) R&D
(W13-1P)(30) R&D

CONTINUED ON SHEET NO. 40

CONTINUED ON SHEET NO. 42

EXISTING SIGN LEGEND

W2-2R | R1-1 | R2-1(30) | W1-4L | W13-1P(30)

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	42	132
	PROJECT FILE NO. 609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 6 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:36 AM

N

N/F
PETER J POZERSKI
JESSICA L POZERSKI
44 BOSTON ROAD
MAP–LOT 021 0115 0000
BK–PG 31062–275

N/F
RADHIKA SRIRAM AND MANISH GANDHI
46 BOSTON ROAD
MAP–LOT 022 0114 0001
BK–PG 37632–74

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP–LOT 022 0114 0002
BK–PG 31507–70

#44 #46 #48 GARAGE

1899 COUNTY LAYOUT 1903 SHLO 841

CONTINUED ON SHEET NO. 41

BOSTON RD

48 49 50 51 52 53

5' 11' 11' 5'

SWEL DBYL

6" SWL 6" DBYL 6" SWL 6" DBYL 6" SWL

PROP BICYCLE LANE MARKINGS (TYP)

MA-I-13

R&D"STATE HIGHWAY BEGINS HERE"

PROP THERMOPLASTIC PVMT MARKINGS (TYP)

R&R SOLAR POWERED RADAR SPEED FEEDBACK SIGN FROM STA 44+10 ON RELOCATED UPL 26 (SEE SHEET 41)
MA-W13-4 (30)
R21-2p

R&D(R2-1)(30)
R&D(R21-2P)
R&D BICYCLE "SHARE THE ROAD"

12" SYL @ 1:1, 20' O.C. (TYP)

6" SYL 6" DBYL SWEL

+12 +37 +68

5' 11' 11' 5'

CONTINUED ON SHEET NO. 43

N/F
JING LEI ZHANG &
JIAN PING GE
43 BOSTON ROAD
MAP–LOT 021 0108 0000
BK–PG 25112–73

#43

N/F
ROBERT M. HICKS, INC.,
TRUSTEE OF THE
ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP–LOT 021 0109 0001
BK–PG 7473–0318

N/F
DANIEL L. NEWBOWER
VANESSA M. NEWBOWER
45 BOSTON ROAD
MAP–LOT 021 0107 0000
BK–PG 36268–170

#45

EXISTING SIGN LEGEND

SPEED LIMIT 30 R2–1(30)

STRICTLY ENFORCED R21–2P

25' WIDE EMERGENCY ACCESS EASEMENT PLAN BK–PG 187–86

N/F
SHIRLEY E. MACDOUGALL
47 BOSTON ROAD
MAP–LOT 022 0006 0004
BK–PG 1766–318

N/F
VINU I. PAUL
JUBIE VINU
49 BOSTON ROAD
MAP–LOT 022 0006 0005
BK–PG 30934–168

GARAGE

0 20 50 100

SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	43	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 7 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:36 AM

N

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP-LOT 022 0114 0002
BK-PG 31507-70

N/F
KRISHNAKUMAR VELMURUGAN
THULASI KRISHNAKUMAR
50 BOSTON ROAD
MAP-LOT 022 0114 0000
BK-PG 27639-51

#50

N/F
WESTFORD GATEWAY, LLC
66-68 BOSTON ROAD
MAP-LOT 022 0115 0000
BK-PG 29812-168

RET "NO TRESSPASSING"
"PRIVATE PROPERTY"

VENT PIPE

R&D "HEART SAFE COMMUNITY"

PROP THERMOPLASTIC
PVMT MARKINGS (TYP)

30' WIDE DRIVEWAY EASEMENT
PLAN BK-PG 200-57

1903 SHLO 841

BOSTON RD

6" SWL
6" DBYL
56
57
SWEL
DBYL
6" SWL
55
58
SWEL
1903 SHLO 841

+42

W11-8
R&D

6' PVC FENCE

SOLAR LED
W11-8

5
11'
11'
5

6" SWL
59
6" DBYL
6" SWL

+68
54
6" DBYL
6" SYL
6" DBYL
+68
6" SYL
5
11'
4'
11'
5

PROP BICYCLE LANE
MARKINGS (TYP)

R&R LED FIRE STATION SIGN
(PAID UNDER ITEM 824.501)

CONTINUED ON
SHEET NO. 42

CONTINUED ON
SHEET NO. 44

N/F
VINU I. PAUL
JUBIE VINU
49 BOSTON ROAD
MAP-LOT 022 0006 0005
BK-PG 30934-168

RIGHT OF WAY
PLAN BK-PG 87-143

N/F
JULIETTE T. MOUNT
51 BOSTON ROAD
MAP-LOT 022 0005 0000
BK-PG 7723-0033

#51

#49

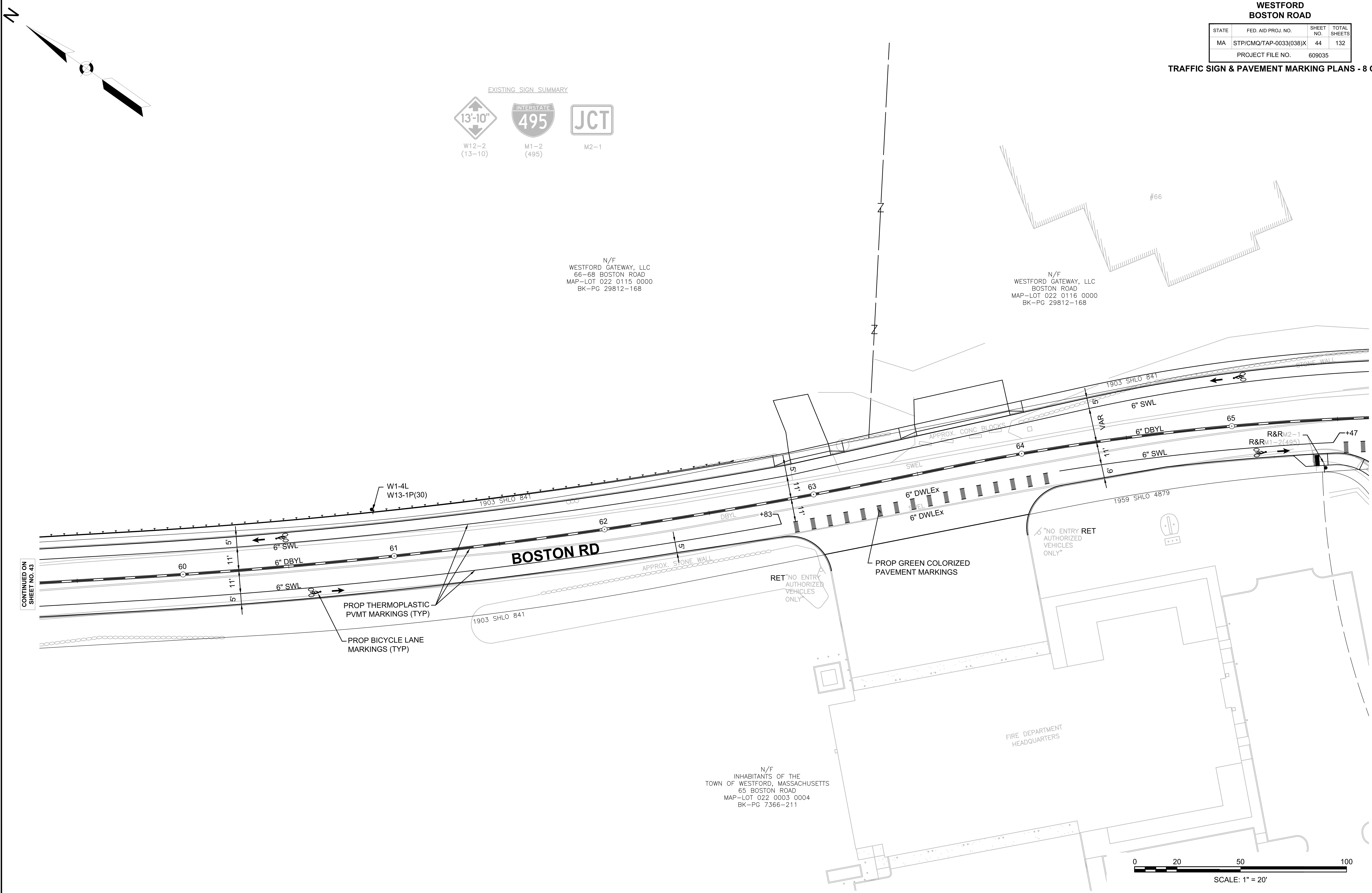
N/F
INHABITANTS OF THE
TOWN OF WESTFORD, MASSACHUSETTS
65 BOSTON ROAD
MAP-LOT 022 0003 0004
BK-PG 7366-211

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	44	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 8 OF 10



EXISTING SIGN SUMMARY
13'-10"
INTERSTATE
495
JCT
W12-2
(13-10)
M1-2
(495)
M2-1
N/F
WESTFORD GATEWAY, LLC
66-68 BOSTON ROAD
MAP-LOT 022 0115 0000
BK-PG 29812-168
N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP-LOT 022 0116 0000
BK-PG 29812-168
#66
CONTINUED ON SHEET NO. 45
CONTINUED ON SHEET NO. 43
1903 SHLO 841
6" SWL
6" DBYL
VAR
R&R M2-1
R&R M1-2(495)
+47
APPROX. CONC BLOCKS
SWEL
6" DWLEx
DBYL
+83
W1-4L
W13-1P(30)
BOSTON RD
APPROX. STONE WALL
PROP THERMOPLASTIC
PVMT MARKINGS (TYP)
PROP BICYCLE LANE
MARKINGS (TYP)
PROP GREEN COLORIZED
PAVEMENT MARKINGS
RET "NO ENTRY AUTHORIZED VEHICLES ONLY"
1959 SHLO 4879
FIRE DEPARTMENT
HEADQUARTERS
N/F
INHABITANTS OF THE
TOWN OF WESTFORD, MASSACHUSETTS
65 BOSTON ROAD
MAP-LOT 022 0003 0004
BK-PG 7366-211
60
61
62
63
64
65
5'
11'
6'
0
20
50
100
SCALE: 1" = 20'

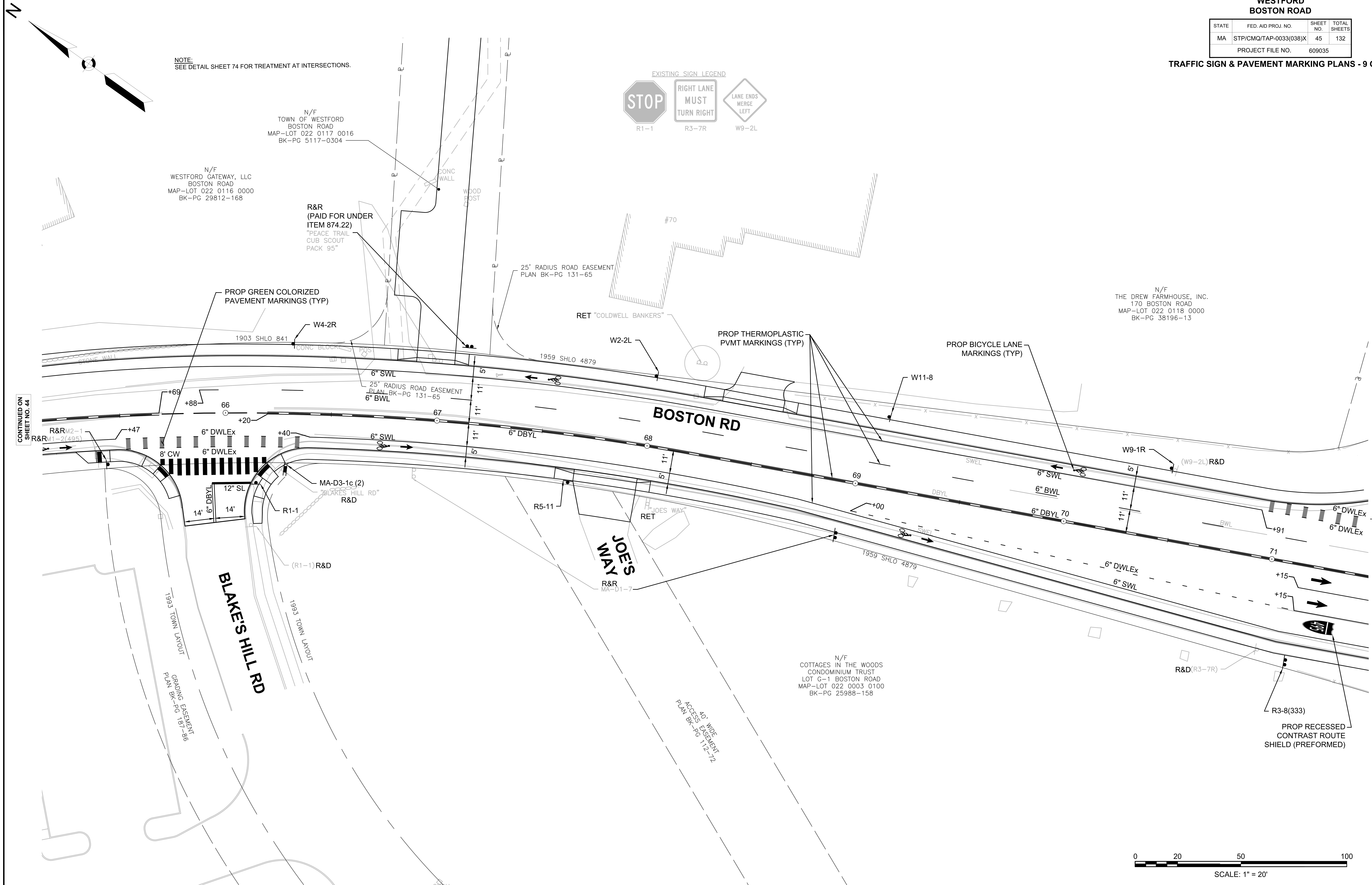
Plotted on 17-May-2024 8:36 AM

609035_HD7(TSPM).DWG

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	45	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 9 OF 10

NOTE:
SEE DETAIL SHEET 74 FOR TREATMENT AT INTERSECTIONS.


N
EXISTING SIGN LEGEND
STOP
RIGHT LANE MUST TURN RIGHT
LANE ENDS MERGE LEFT
R1-1
R3-7R
W9-2L
N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP-LOT 022 0117 0016
BK-PG 5117-0304
N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP-LOT 022 0116 0000
BK-PG 29812-168
R&R
(PAID FOR UNDER
ITEM 874.22)
"PEACE TRAIL
CUB SCOUT
PACK 95"
CONC WALL
WOOD POST
#70
25' RADIUS ROAD EASEMENT
PLAN BK-PG 131-65
N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP-LOT 022 0118 0000
BK-PG 38196-13
PROP GREEN COLORIZED
PAVEMENT MARKINGS (TYP)
W4-2R
1903 SHLO 841
CONC BLOCK
STONE WALL
RET "COLDWELL BANKERS"
W2-2L
1959 SHLO 4879
PROP THERMOPLASTIC
PVMT MARKINGS (TYP)
PROP BICYCLE LANE
MARKINGS (TYP)
W11-8
6" SWL
25' RADIUS ROAD EASEMENT
PLAN BK-PG 131-65
6" BWL
BOSTON RD
CONTINUED ON SHEET NO. 44
+69
+88
66
+20
67
R&R M2-1
R&R M1-2(495)
+47
6" DWLEx
+40
6" SWL
6" DBYL
68
8' CW
6" DWLEx
5'
11'
11'
11'
5'
MA-D3-1c (2)
"BLAKES HILL RD"
R&D
12" SL
6" DBYL
14'
14'
R1-1
R5-11
RET
"JOES WAY"
69
+00
DBYL
SWEL
W9-1R
(W9-2L) R&D
6" SWL
6" BWL
6" DBYL 70
BWL
+91
6" DWLEx
6" DWLEx
(R1-1) R&D
JOE'S WAY
R&R
MA-D1-7
1959 SHLO 4879
71
6" DWLEx
6" SWL
+15
+15
CONTINUED ON SHEET NO. 46
BLAKE'S HILL RD
1993 TOWN LAYOUT
1993 TOWN LAYOUT
GRADING EASEMENT
PLAN BK-PG 187-86
40' WIDE
ACCESS EASEMENT
PLAN BK-PG 112-72
N/F
COTTAGES IN THE WOODS
CONDOMINIUM TRUST
LOT G-1 BOSTON ROAD
MAP-LOT 022 0003 0100
BK-PG 25988-158
R&D (R3-7R)
R3-8(333)
PROP RECESSED
CONTRAST ROUTE
SHIELD (PREFORMED)
0
20
50
100
SCALE: 1" = 20'

609035_HD7(TSPM).DWG   Plotted on 17-May-2024 8:37 AM

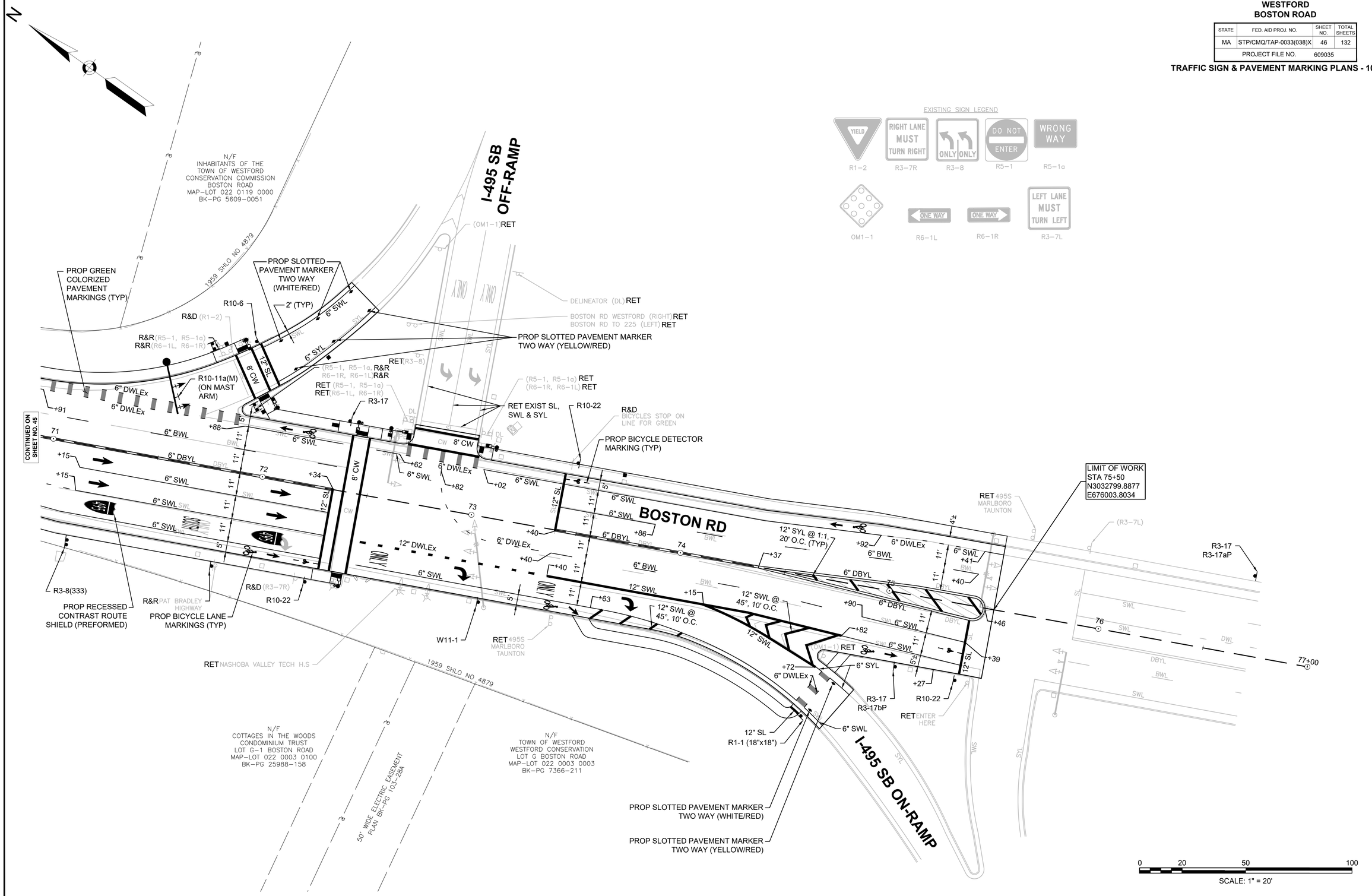
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	46	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN & PAVEMENT MARKING PLANS - 10 OF 10

609035_HD7(TSPM).DWG Plotted on 17-May-2024 8:37 AM

EXISTING SIGN LEGEND



TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN (in)			TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			SIZE AND NUMBER OF POSTS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT	LEGEND	LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK-GROUND	LEGEND	BORDER			
R1-1	30	30	STOP		①		2	RED	WHITE	WHITE	P5 2	6.25	12.50
	18	18					1				P5 1	2.25	2.25
R1-5	36	36	ONLY HERE TO				1	WHITE	RED/ BLACK	BLACK	4" WOOD 1 (PAID UNDER ITEM 849.1)	9.00	9.00
R3-7R	30	30	RIGHT LANE MUST TURN RIGHT				1	WHITE	BLACK	BLACK	4" WOOD 1 (PAID UNDER ITEM 849.1)	6.25	6.25
R3-8(333)	48	30	ONLY ONLY ONLY				1	WHITE	BLACK	BLACK	1 DOUBLE P5 POST ASSEMBLY	10.00	10.00
R3-17	24	18	BIKE LANE				5	BLACK/ WHITE	WHITE/ BLACK	BLACK	P5 3 4" WOOD 2 (PAID UNDER ITEM 849.1)	3.00	15.00
R3-17aP	24	8	AHEAD				1	WHITE	BLACK	BLACK	MOUNT W/ R3-17	1.33	1.33
R3-17bP	24	8	ENDS				2	WHITE	BLACK	BLACK	MOUNT W/ R3-17	1.33	2.67
R5-11	30	24	AUTHORIZED VEHICLES ONLY				1	WHITE	BLACK	BLACK	P5 1	5.00	5.00
R8-3a	24	30	NO PARKING				2	WHITE	RED	RED	4" WOOD 2 (PAID UNDER ITEM 849.1)	5.00	10.00
R10-6	24	36	STOP HERE ON RED				1	WHITE	BLACK	BLACK	P5 1	6.00	6.00
R10-11a(M)	24	30	NO TURN ON RED ARROW				1	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	5.00	5.00
R10-22	12	18	TO REQUEST GREEN WAIT ON				3	WHITE	BLACK	BLACK	P5 3	1.50	4.50
R21-2p	24	18	STRICTLY ENFORCED	4C 4C	3.5 3 3.5	N/A	4	WHITE	BLACK	BLACK	MOUNT W/ SPEED FEEDBACK SIGN	PAID UNDER ITEMS 824.62 & 824.621	
W1-4L	30	30			①		2	YELLOW	BLACK	BLACK	P5 2	6.25	12.50
W2-2L	30	30					2	YELLOW	BLACK	BLACK	P5 2	6.25	12.50
W2-2R	30	30					1	YELLOW	BLACK	BLACK	P5 1	6.25	6.25
W4-2R	36	36					1	YELLOW	BLACK	BLACK	P5 1	9.00	9.00
W9-1R	36	36	RIGHT LANE ENDS				1	YELLOW	BLACK	BLACK	P5 1	9.00	9.00
W11-1	30	30					1	YELLOW	BLACK	BLACK	P5 1	6.25	6.25

NOTES:

1. SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS FOR TEXT AND LEGEND DIMENSIONS.
2. THE MINIMUM MOUNTING HEIGHT OF POST-MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF CURB OR SIDEWALK, OR THE ELEVATION OF THE NEAR EDGE OF TRAVEL WAY, SHALL BE 7 FEET UNLESS OTHERWISE SPECIFIED.
3. A MINIMUM OF 3'-0" PATH OF TRAVEL CLEARANCE, EXCLUDING CURB, IS REQUIRED WHEN PLACING SIGNS.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	47	132
PROJECT FILE NO.	609035		

TRAFFIC SIGN SUMMARY

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN (in)			TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			SIZE AND NUMBER OF POSTS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT	LEGEND	LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK-GROUND	LEGEND	BORDER			
W11-2	30	30			①		9	FLUORES CENT YELLOW-GREEN	BLACK	BLACK	4" WOOD 9 (PAID UNDER ITEM 849.1)	6.25	56.25
W11-8	36	36					1	YELLOW	BLACK	BLACK	P5 1	9.00	9.00
W13-1P(30)	18	18	30 MPH				2	YELLOW	BLACK	BLACK	MOUNT W/ W1-4L	2.25	4.50
W14-1	30	30	DEAD END				1	YELLOW	BLACK	BLACK	4" WOOD 1 (PAID UNDER ITEM 849.1)	6.25	6.25
W16-7PR	24	12					3	FLUORES CENT YELLOW-GREEN	BLACK	BLACK	MOUNT W/ W11-2	2.00	6.00
W16-7PL	24	12					4	FLUORES CENT YELLOW-GREEN	BLACK	BLACK	MOUNT W/ W11-2	2.00	8.00
W16-8P	24	8	Crown Rd	4B	2 2	N/A	2	YELLOW	BLACK	BLACK	MOUNT W/ W2-2L W2-2R	1.33	2.67
W16-9P	24	12	AHEAD		①		2	FLUORES CENT YELLOW-GREEN	BLACK	BLACK	MOUNT W/ W11-2	2.00	4.00
D1-3	78	42	SEE BELOW	6D	6 6 6 6	9" x 6.1" ARROW	1	GREEN	WHITE	WHITE	S5 x 10 2 (PAID UNDER ITEM 841.81)	22.75	22.75
MA-W13-4 (30)	24	36	THICKLY SETTLED DISTRICT 30 MPH	4C 4C 4C 8E 3E	2.5 2 2 2 2 2.5	N/A	4	YELLOW	BLACK	BLACK	MOUNT W/ SPEED FEEDBACK SIGN	PAID UNDER ITEMS 824.62 & 824.621	
MA-D3-1a	42	12	SEE BELOW	6D / 4D	3 3	N/A	2	GREEN	WHITE	WHITE	1 DOUBLE P5 POST ASSEMBLY	PAID UNDER ITEM 874.	
MA-D3-1b	48	12	SEE BELOW	6D / 4D	3 3	N/A	2	GREEN	WHITE	WHITE	MOUNT W/ MA-D3-1a	PAID UNDER ITEM 874.	
MA-D3-1c	57	12	SEE BELOW	6D / 4D	3 3	N/A	2	GREEN	WHITE	WHITE	1 DOUBLE P5 POST ASSEMBLY	PAID UNDER ITEM 874.	
MA-I-13	24	30	STATE HIGHWAY BEGINS	4C 4C 5C	4.5 4 4 4.5	N/A	1	GREEN	WHITE	WHITE	P5 1	5.00	5.00
												PAID UNDER ITEM 829.	

Crown Rd
MA-D3-1a

Boston Rd
MA-D3-1b

Blakes Hill Rd
MA-D3-1c

Nabnasset →
N Chelmsford →
Tyngsboro →
D1-3

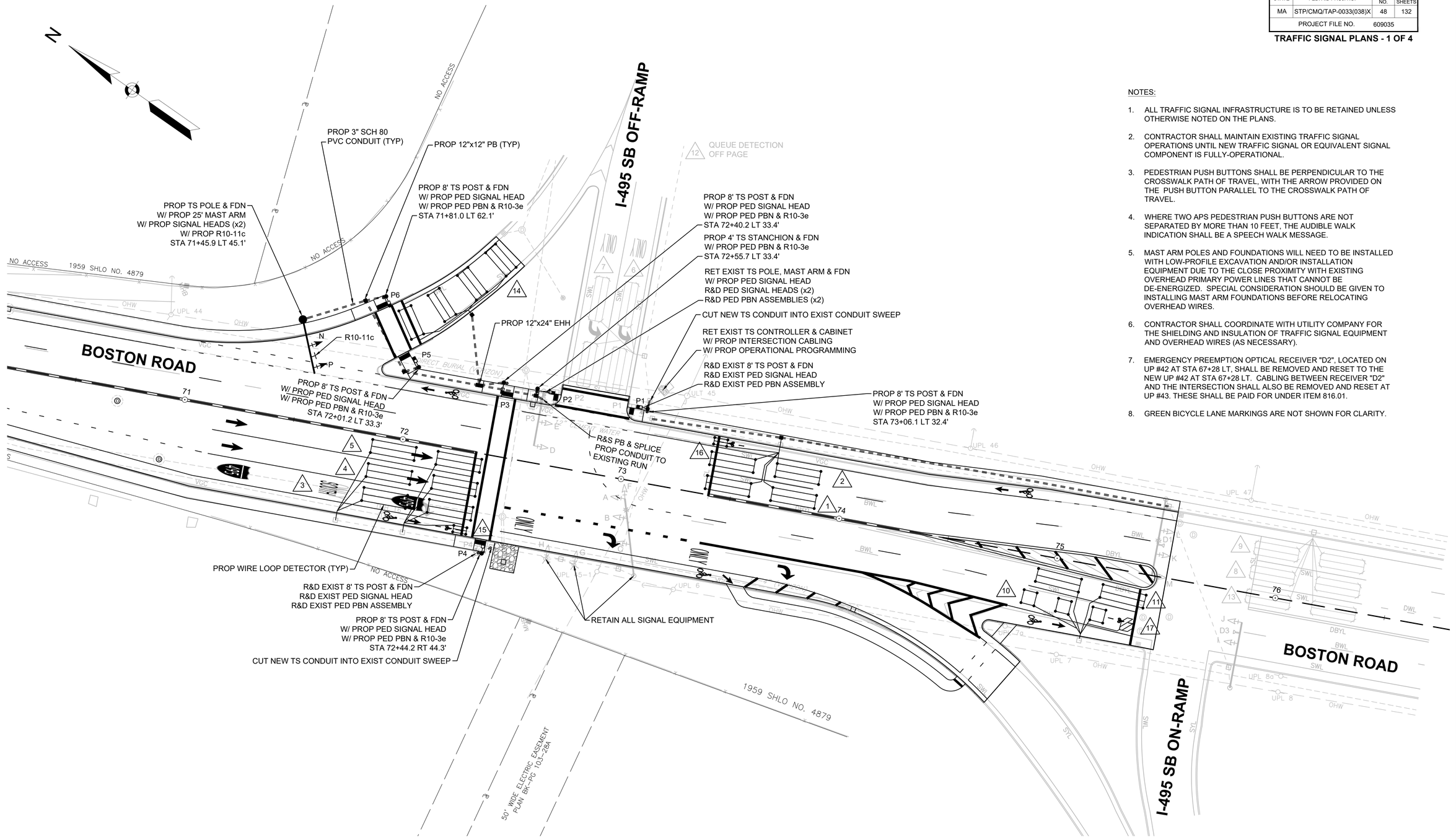
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	48	132
	PROJECT FILE NO. 609035		

TRAFFIC SIGNAL PLANS - 1 OF 4

NOTES:

1. ALL TRAFFIC SIGNAL INFRASTRUCTURE IS TO BE RETAINED UNLESS OTHERWISE NOTED ON THE PLANS.
2. CONTRACTOR SHALL MAINTAIN EXISTING TRAFFIC SIGNAL OPERATIONS UNTIL NEW TRAFFIC SIGNAL OR EQUIVALENT SIGNAL COMPONENT IS FULLY-OPERATIONAL.
3. PEDESTRIAN PUSH BUTTONS SHALL BE PERPENDICULAR TO THE CROSSWALK PATH OF TRAVEL, WITH THE ARROW PROVIDED ON THE PUSH BUTTON PARALLEL TO THE CROSSWALK PATH OF TRAVEL.
4. WHERE TWO APS PEDESTRIAN PUSH BUTTONS ARE NOT SEPARATED BY MORE THAN 10 FEET, THE AUDIBLE WALK INDICATION SHALL BE A SPEECH WALK MESSAGE.
5. MAST ARM POLES AND FOUNDATIONS WILL NEED TO BE INSTALLED WITH LOW-PROFILE EXCAVATION AND/OR INSTALLATION EQUIPMENT DUE TO THE CLOSE PROXIMITY WITH EXISTING OVERHEAD PRIMARY POWER LINES THAT CANNOT BE DE-ENERGIZED. SPECIAL CONSIDERATION SHOULD BE GIVEN TO INSTALLING MAST ARM FOUNDATIONS BEFORE RELOCATING OVERHEAD WIRES.
6. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR THE SHIELDING AND INSULATION OF TRAFFIC SIGNAL EQUIPMENT AND OVERHEAD WIRES (AS NECESSARY).
7. EMERGENCY PREEMPTION OPTICAL RECEIVER "D2", LOCATED ON UP #42 AT STA 67+28 LT, SHALL BE REMOVED AND RESET TO THE NEW UP #42 AT STA 67+28 LT. CABLING BETWEEN RECEIVER "D2" AND THE INTERSECTION SHALL ALSO BE REMOVED AND RESET AT UP #43. THESE SHALL BE PAID FOR UNDER ITEM 816.01.
8. GREEN BICYCLE LANE MARKINGS ARE NOT SHOWN FOR CLARITY.



WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	49	132
PROJECT FILE NO.	609035		

TRAFFIC SIGNAL PLANS - 2 OF 4

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL (COORDINATED)

BOSTON ROAD AT INTERSTATE 495 SB RAMPS (WESTFORD, MASSACHUSETTS)

Ø1 NOT USED; Ø2 FYA; Ø3 NOT USED; Ø4; Ø5; Ø6; Ø7 NOT USED; Ø8 NOT USED

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
BOSTON ROAD	SB - T	A,B				R	R	R				R	R	R	R	(G)	Y	R	(G)	Y	R	R						
BOSTON ROAD	SB - R	C				R	R	R				R	R	R	R	G	Y	R	G	Y	R	R						
BOSTON ROAD	SB - T	I,J				R	R	R				G	G	Y	R	R	R	R	G	G	Y	R						
BOSTON ROAD	NB - L	M				←FY→	←Y→	←R→				←R→	←R→	←R→	←R→	←G→	←Y→	←R→	←R→	←R→	←R→	←R→						
BOSTON ROAD	NB - T	D,E				(G)	Y	R				R	R	R	R	(G)	Y	R	R	R	R	R						
BOSTON ROAD	NB - T	K,L				G	Y	R				R	R	R	R	G	Y	R	R	R	R	R						
I-495 SB OFF-RAMP	WB - L	F,G,H				←R→	←R→	←R→				←G→	←Y→	←R→	←R→	←R→	←R→	←R→	←R→	←R→	←R→	←R→						
I-495 SB OFF-RAMP	WB - R	N,P				→R←	→R←	→R←				→G←	→Y←	→R←	→R←	→R←	→R←	→R←	→R←	→R←	→R←	→R←						
PEDESTRIAN	N-S	P1-P2				W/FDW	FDW	DW				DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW						
PEDESTRIAN	E-W	P3-P4				DW	DW	DW				W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW						
PEDESTRIAN	N-S	P5-P6				W/FDW	FDW	DW				DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW						
MINIMUM INTERVAL						7						7				7			7									
VEHICLE EXTENSION						3						2				2			3									
MAXIMUM 1						31						26				10			31									
MAXIMUM 2						31						30				30			31									
YELLOW CLEARANCE							4.0						4.0	4.0			4.0			4.0	4.0							
RED CLEARANCE								1.0							1.0			1.0				1.0						
WALK						7.0						7.0																
PEDESTRIAN CLEARANCE						5.0	4.0	1.0				15.0	4.0	4.0	1.0													
RECALL						MIN						OFF				OFF			MIN									
DETECTOR						NON-LOCK						NON-LOCK				NON-LOCK			NON-LOCK									

EMERGENCY ONLY

COORDINATION DATA			COORDINATION PHASE TIMINGS								
TIMING PLAN (D/S/O)	CYCLE	OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
(1/1/1): M-F (0630-1000)	75	0		26		30	19	26		
(2/1/1): M-F (1400-1900)	75	0		20		25	30	20		
(3/1/1): S-S (0900-1500)	75	0		18		33	24	18		

PREEMPT PHASING & PRIORITY

PREEMPT NB - D1; PREEMPT SB - D2/D3 (FYA)

	30	31	32	33	34	35	36
FLASHING OPERATION	FY	R	R	R	(G)	Y	R	R
	FY	R	R	R	G	Y	R	R
	FY	R	R	R	G	G	Y	R
	←FY→	←FY→	←Y→	←R→	←R→	←R→	←R→	←R→
	FY	(G)	Y	R	R	R	R	R
	FY	G	Y	R	R	R	R	R
	←FR→	←R→	←R→	←R→	←R→	←R→	←R→	←R→
	→FR←	→R←	→R←	→R←	→R←	→R←	→R←	→R←
	OUT	DW	DW	DW	DW	DW	DW	DW
	OUT	DW	DW	DW	DW	DW	DW	DW
	OUT	DW	DW	DW	DW	DW	DW	DW
EMERGENCY ONLY		*			*			
			4.0			4.0	4.0	
				1.0				1.0
			-			-		
			-			-		
			Ø2			Ø6		

* SEE EMERGENCY VEHICLE PRE-EMPTION NOTES.

SEQUENCE & TIMING NOTES:

1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.12.
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. FYA = FLASHING YELLOW ARROW
4. PERM = PERMITTED LEFT-TURN
5. MAXIMUM 1 = FREE OPERATION
6. MAXIMUM 2 = DURING COORDINATION
7. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
8. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
9. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
10. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

COORDINATION NOTES:

1. OFFSET: BEGINNING OF Ø2&Ø6 YELLOW.
2. Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
3. SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
4. OFFSET REFERENCE LOCATION.
5. CONTRACTOR AND VENDOR SHALL ADJUST SIGNAL TIMINGS AND COORDINATION IN THE FIELD AS NECESSARY IN THE PRESENCE OF THE ENGINEER AND MASSDOT.

EMERGENCY VEHICLE PRE-EMPTION NOTES:

1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. EMERGENCY PRE-EMPTION SHALL OVERRIDE COORDINATION.
4. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE ØA (OR ØB, ØC) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (AS NOTED IN CHART) AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
5. NORMAL CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
6. CONFIRMATION STROBE (WHITE) SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

BOSTON ROAD AT INTERSTATE 495 SB RAMPS

LIST OF MAJOR ITEMS REQUIRED

ITEM #	QUANTITY	DESCRIPTION
816.01	1	TS POLE W/ 25' MAST ARM, TYPE 2, W/ FOUNDATION
	5	8' TS POST, BASE W/ FOUNDATION
	1	4' TS STANCHION, BASE W/ FOUNDATION
	2	SIGNAL HEAD, 3-SECTION, 12" L.E.D. MODULES, REFLECTIVE BACKPLATES, VISORS
	3	12" BALL L.E.D. MODULE (REPLACING 12" ARROW L.E.D. MODULE)
	6	PEDESTRIAN SIGNAL HEAD, 16" L.E.D. MODULE, COUNTDOWN INDICATOR & AUDIBLE WARNING DEVICES
	6	APS PEDESTRIAN PUSH BUTTON W/ R10-3e AND SIGN SADDLE
	4	WIRE LOOP DETECTORS (6'X14' QUADRUPOLE)
	6	WIRE LOOP DETECTORS (6'X20' QUADRUPOLE)
	2	WIRE LOOP DETECTORS - BICYCLE (3'X6' QUADRUPOLE-BL)
	4	TYPE C, 2-CHANNEL CARD RACK LOOP DETECTOR AMPLIFIER
	1	R&R EMERGENCY PREEMPTION OPTICAL RECEIVER (STA 67+28 LT)
	2	R&D 8' TS POST & DEMO FOUNDATION
	4	R&D PEDESTRIAN SIGNAL HEAD
	4	R&D PEDESTRIAN PUSH BUTTON ASSEMBLY
	1	CONTROLLER PROGRAMMING & FINE TUNING
	1	INTERSECTION CABLING FOR NEW SIGNAL HEADS / LOOPS / PRE-EMPTION
804.3	±205 FT	3" SCH. 80 PVC CONDUIT
811.22	1	12"X24" ELECTRIC HANDHOLE
811.31	4	12"X12" PULL BOX
811.351	2	PULL BOX REMOVED AND STACKED

PLUS NECESSARY CONDUIT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING SIGNAL HOUSINGS						PROPOSED SIGNAL HOUSINGS	
A,B,D,E	C	F,G,H	I,J,K,L	M	P1-P4	N,P	P1-P6
	REPLACE 12" MODULES				REMOVE & DISCARD	ALL 12" LENSES W/ 5" BACKPLATES, 3" RR STRIP, & TUNNEL VISORS	ALL 16" L.E.D. W/ COUNTDOWN INDICATION
ALL 12" LENSES W/ 5" BACKPLATES, 3" RETRO-REFLECTIVE STRIP ("M" ONLY), & TUNNEL VISORS					ALL 8" INDICATIONS		

LOOP DETECTOR DATA

DETECTOR NO.	AMPLIFIER NO.	CHANNEL NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY/ EXT.	PHASE CALLED	PHASE EXT.	LOOP CONNECTION
1	1	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
2	1	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
3	5	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
4	5	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
5	6	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
6	3	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	Ø4	SERIES
7	3	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	Ø4	SERIES
8	2	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
9	2	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
10	4	1	3-6'X6' TYPE A	3	PRESENCE	0	Ø6	Ø6	SERIES
11	4	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
12	6	2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Q1 - Ø4	Q1 - Ø4	SERIES
13	7	1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø5	Ø5	SERIES
14	7	2	4-6'X14' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	Ø4	SERIES
15	8	1	3'X6' TYPE Q-BL	1-2-1	PRESENCE	0	Ø6	Ø6	SINGLE
16	8	2	3'X6' TYPE Q-BL	1-2-1	PRESENCE	0	Ø2	Ø2	SINGLE
17	9	1	6'X6' TYPE D-1	3-3-3-3	PRESENCE	0	Ø6	Ø6	SINGLE

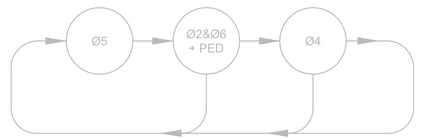
LOOP DETECTOR NOTES:

1. THE CONSTRUCTION SHALL CONFORM WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION SPECIFICATIONS UNLESS OTHERWISE NOTED.
2. DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
3. EACH LOOP GROUP SHALL BE SPLICED IN SINGLE PULL BOX AND WIRED TO SEPARATE CONTROLLER INPUT.
4. ALL BICYCLE LOOPS SHALL BE CONNECTED TO SEPARATE LOOP DETECTOR AMPLIFIERS CAPABLE OF HIGHER LEVELS OF SENSITIVITY.
5. UNLESS OTHERWISE NOTED, ALL LOOP DETECTORS SHALL BE PLACED IN THE CENTER OF THE LANE.

CONSTRUCTION NOTES:

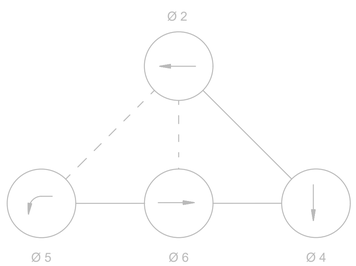
1. PULL BOXES SHALL NOT BE LOCATED WITHIN CURB RAMPS.
2. THE CONSTRUCTION SHALL CONFORM WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION SPECIFICATIONS UNLESS OTHERWISE NOTED.
3. ALL MAST ARM FOUNDATIONS SHALL CONFORM WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION "OVERHEAD SIGNAL STRUCTURES & FOUNDATION STANDARDS", DATED DECEMBER 2015.
4. ALL SIGNAL HEADS AND SIGNS SHALL BE RIGIDLY MOUNTED.
5. CONTRACTOR SHALL FINE-TUNE THE TIMING AND COORDINATION PARAMETERS IN THE PRESENCE OF THE ENGINEER AND MASSDOT REPRESENTATIVES FOLLOWING INSTALLATION.

PREFERENTIAL PHASE SEQUENCE



* PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.

NEMA DUAL RING PHASING



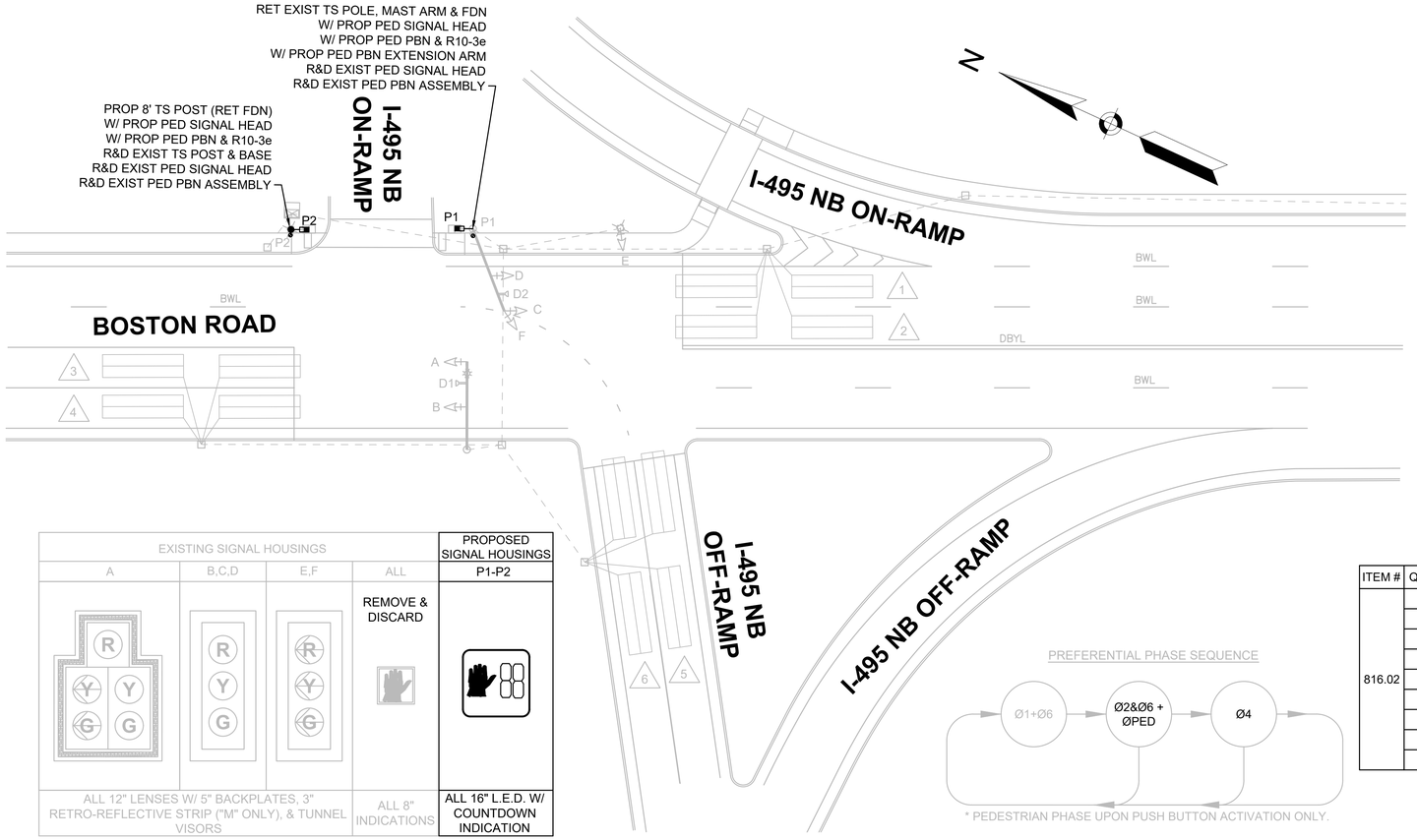
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	50	132
PROJECT FILE NO.	609035		

TRAFFIC SIGNAL PLANS - 3 OF 4



SEQUENCE & TIMING NOTES:

1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.12.
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. FYA = FLASHING YELLOW ARROW
4. PERM = PERMITTED LEFT-TURN
5. MAXIMUM 1 = FREE OPERATION
6. MAXIMUM 2 = DURING COORDINATION
7. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
8. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
9. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
10. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

COORDINATION NOTES:

1. OFFSET: BEGINNING OF Ø2&Ø6 YELLOW.
2. Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
3. SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
4. OFFSET REFERENCE LOCATION AT INTERSTATE 495 SB RAMPS.
5. CONTRACTOR AND VENDOR SHALL ADJUST SIGNAL TIMINGS AND COORDINATION IN THE FIELD AS NECESSARY IN THE PRESENCE OF THE ENGINEER AND MASSDOT.

EMERGENCY VEHICLE PRE-EMPTION NOTES:

1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. EMERGENCY PRE-EMPTION SHALL OVERRIDE COORDINATION.
4. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 OR D2 THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE ØA OR ØB GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (AS NOTED IN CHART) AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
5. NORMAL CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
6. CONFIRMATION STROBE (WHITE) SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

EXISTING SIGNAL HOUSINGS				PROPOSED SIGNAL HOUSINGS
A	B,C,D	E,F	ALL	P1-P2
			REMOVE & DISCARD	
ALL 12" LENSES W/ 5" BACKPLATES, 3" RETRO-REFLECTIVE STRIP ("M" ONLY), & TUNNEL VISORS			ALL 8" INDICATIONS	ALL 16" L.E.D. W/ COUNTDOWN INDICATION

BOSTON ROAD AT INTERSTATE 495 NB RAMPS

LIST OF MAJOR ITEMS REQUIRED

ITEM #	QUANTITY	DESCRIPTION
816.02	1	8' TS POST & BASE (RET FDN)
	2	PEDESTRIAN SIGNAL HEAD, 16" LED MODULE COUNTDOWN INDICATOR & VISORS
	2	APS PEDESTRIAN PUSH BUTTON W/ R10-3e AND SIGN SADDLE
	1	PEDESTRIAN PUSH BUTTON EXTENSION ARM
	1	CONTROLLER PROGRAMMING & FINE TUNING
	1	INTERSECTION CABLING FOR NEW SIGNAL HEADS / LOOPS / PRE-EMPTION
	1	R&D 8' TS POST & BASE
	2	R&D PEDESTRIAN SIGNAL HEAD
	2	R&D PEDESTRIAN PUSH BUTTON ASSEMBLY

PLUS NECESSARY CONDUIT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL (COORDINATED)

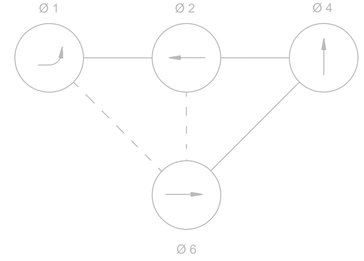
BOSTON ROAD AT INTERSTATE 495 SB - EXIT 32 RAMPS (WESTFORD, MASSACHUSETTS)			Ø1			Ø2			Ø3			Ø4			Ø5			Ø6			Ø7			Ø8			Ø9				PREEMPT PHASING & PRIORITY					
									NOT USED						NOT USED			PERM			NOT USED			NOT USED			NOT USED				PREEMPT ØA - D1			PREEMPT ØB - D2		
APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	FLASHING OPERATION	30	31	32	33	34	35
BOSTON ROAD	SB	A	G	Y	R	R	R	R				R	R	R				G	Y	R										FY	G	Y	R	R	R	R
BOSTON ROAD	SB	B	G	Y	R	R	R	R				R	R	R				G	Y	R										FY	G	Y	R	R	R	R
BOSTON ROAD	NB	C,D	R	R	R	G	Y	R				R	R	R				R	R	R										FY	R	R	R	G	Y	R
I-495 NB OFF-RAMP	EB	E,F	R	R	R	R	R	R				G	Y	R				R	R	R										FR	R	R	R	R	R	R
PEDESTRIAN	ALL	P1-P2	DW	DW	DW	W/FDW	FDW	DW				DW	DW	DW				DW	DW	DW										OUT	DW	DW	DW	DW	DW	DW
MINIMUM INTERVAL			7			7						7						7												EMERGENCY ONLY						
VEHICLE EXTENSION			2			3						2						3													*			*		
MAXIMUM 1			10			30						15						30																		
MAXIMUM 2			10			45						20						60																		
YELLOW CLEARANCE				4.0			4.0						3.5						4.0													4.0			4.0	
RED CLEARANCE					1.0			1.0						1.0						1.0													1.0			1.0
WALK						5.0																														
PEDESTRIAN CLEARANCE						6.0	4.0	1.0																												
RECALL			MIN			OFF						OFF						MIN													-			-		
DETECTOR			NON-LOCK			NON-LOCK						LOCK						NON-LOCK													-			-		
																															Ø1&Ø6			Ø2		

COORDINATION DATA			COORDINATION PHASE TIMINGS									
TIMING PLAN (D/S/O)	CYCLE	OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	
(1/1/1): M-F (0630-1000)	75	37	12	47		16		59				
(2/1/1): M-F (1400-1900)	75	38	12	42		21		54				
(3/1/1): S-S (0900-1500)	75	47	12	49		16		61				

LOOP DETECTOR DATA

DETECTOR NO.	AMPLIFIER NO.	CHANNEL NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY/ EXT.	PHASE CALLED	PHASE EXT.	LOOP CONNECTION
1	EXIST.	EXIST.	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
2	EXIST.	EXIST.	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	Ø2	SERIES
3	EXIST.	EXIST.	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
4	EXIST.	EXIST.	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	Ø6	SERIES
5	EXIST.	EXIST.	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	Ø4	SERIES
6	EXIST.	EXIST.	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	Ø4	SERIES

NEMA DUAL RING PHASING



NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.

0 20 50 100

SCALE: 1" = 20'

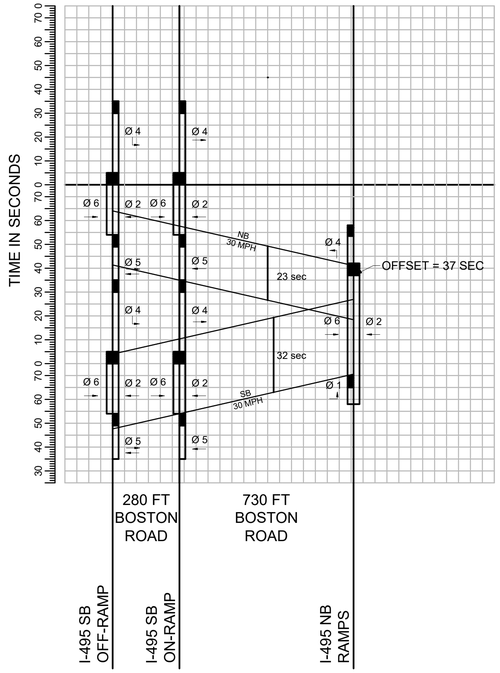
609035_HDB\TRAFFIC SIGNAL PLANS\.DWG Plotted on 17-May-2024 8:38 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	51	132
	PROJECT FILE NO. 609035		

TRAFFIC SIGNAL PLANS - 4 OF 4

PLAN 1/1/1
WEEKDAY MORNING PEAK HOURS
BOSTON ROAD
75 SECOND CYCLE



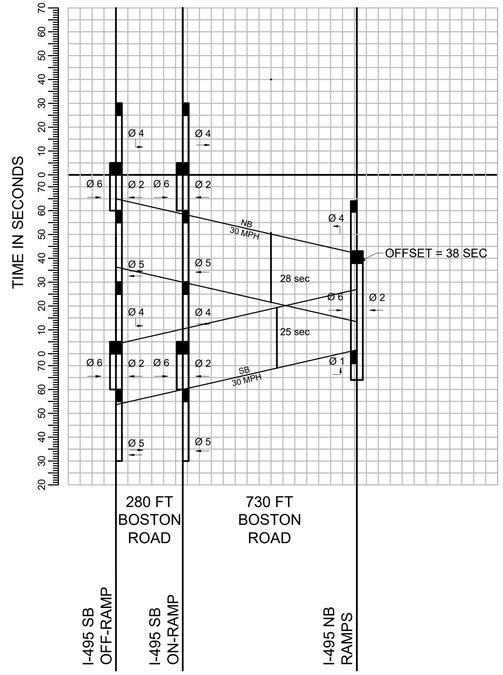
BOSTON ROAD / I-495 SB RAMPS
COORDINATION DATA
(ALL ENTRIES IN SECONDS)

	1/1/1	2/1/1	3/1/1
CYCLE LENGTH	75	75	75
OFFSET	0	0	0
SPLIT Ø2	26	20	18
SPLIT Ø4	30	25	33
SPLIT Ø5	19	30	24
SPLIT Ø6	26	20	18
COORDINATED PHASE	Ø2&Ø6	Ø2&Ø6	Ø2&Ø6

LEGEND:

- GREEN TIME
- CLEARANCE TIME (YELLOW + ALL RED)
- Ø 2 — PHASE MOVEMENT
- WB 30 MPH — INTERSECTION-INTERSECTION COORDINATION BAND

PLAN 2/1/1
WEEKDAY EVENING PEAK HOURS
BOSTON ROAD
75 SECOND CYCLE



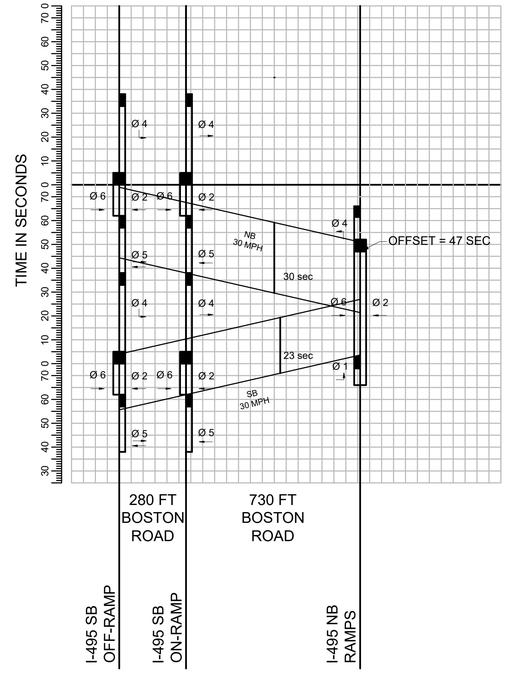
BOSTON ROAD / 1-495 NB RAMPS
COORDINATION DATA
(ALL ENTRIES IN SECONDS)

	1/1/1	2/1/1	3/1/1
CYCLE LENGTH	75	75	75
OFFSET	37	38	47
SPLIT Ø1	12	12	12
SPLIT Ø2	47	42	49
SPLIT Ø4	16	21	16
SPLIT Ø6	59	54	61
COORDINATED PHASE	Ø2&Ø6	Ø2&Ø6	Ø2&Ø6

NOTES:

1. OFFSET: BEGINNING OF YELLOW FOR COORDINATED PHASE.
2. COORDINATED PHASE "CALL NOT ACTUATED" DURING COORDINATION.
3. SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
4. MASTER CONTROLLER LOCATED AT I-495 SB RAMPS.
6. CONTRACTOR AND VENDOR SHALL ADJUST SIGNAL TIMINGS AND COORDINATION IN THE FIELD AS NECESSARY ONLY AFTER MASSDOT APPROVAL.
7. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND REFINING TIMINGS & COORDINATION PARAMETERS AT SIGNALIZED INTERSECTIONS AS PART OF THIS CONTRACT.

PLAN 3/1/1
WEEKEND MIDDAY PEAK HOURS
BOSTON ROAD
75 SECOND CYCLE



DAILY & WEEKLY COORDINATION PROGRAM

	MONDAY THRU FRIDAY	SATURDAY	SUNDAY
PLAN 1/1/1 60"/120" CYCLE	0630-1000	-	-
PLAN 2/1/1 70"/140" CYCLE	1400-1900	-	-
PLAN 3/1/1 60"/120" CYCLE	-	0900-1500	-
FREE OPERATION	0000-0630 1000-1400 1900-2400	0000-0900 1500-2400	0000-2400
FLASH OPERATION	NO PROGRAMMED FLASH MODE CONFLICT FLASH ONLY		

300 0 300 600
SCALE IN FEET

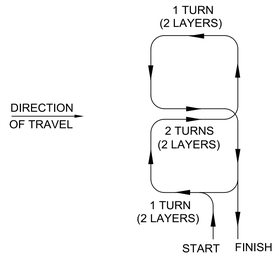
609035_HDB(TRAFFIC SIGNAL PLANS).DWG Plotted on 17-May-2024 8:38 AM

WESTFORD
BOSTON ROAD

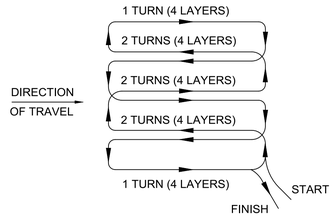
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	52	132
	PROJECT FILE NO. 609035		

TRAFFIC SIGNAL DETAILS
BICYCLE LOOP DETECTOR

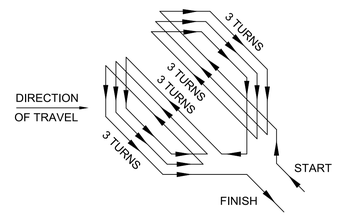
WINDING DETAILS



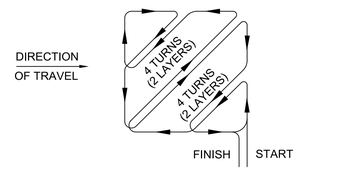
TYPE Q DETECTOR



TYPE D-Q DETECTOR

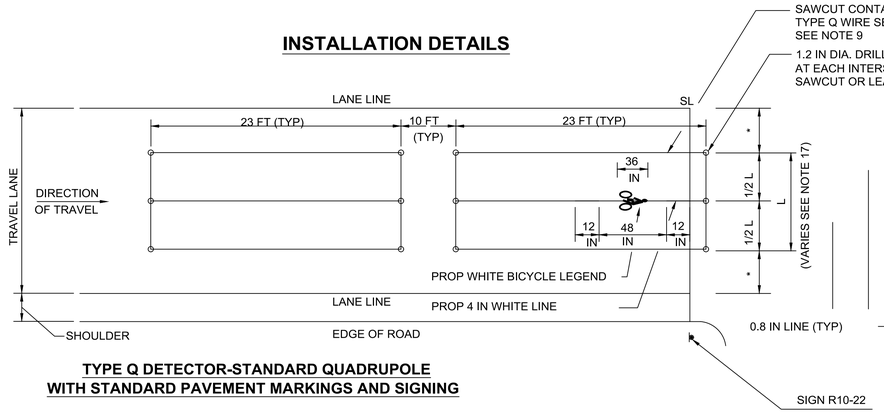


TYPE D-1 DETECTOR



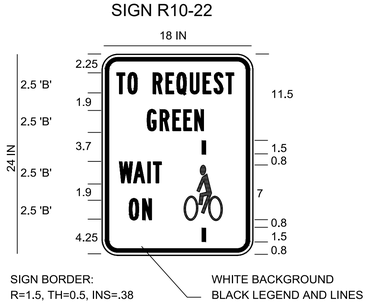
TYPE D-2 DETECTOR

INSTALLATION DETAILS



TYPE Q DETECTOR-STANDARD QUADRUPOLE
WITH STANDARD PAVEMENT MARKINGS AND SIGNING

SIGN R10-22

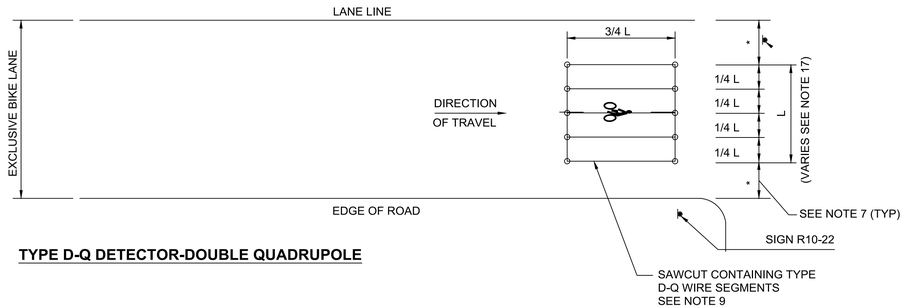


SIGN BORDER:
R=1.5, TH=0.5, INS=.38

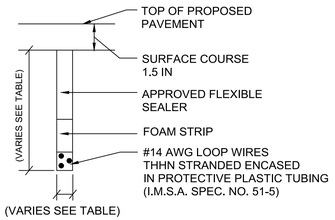
WHITE BACKGROUND
BLACK LEGEND AND LINES

NOTE: ALL SIGN DIMENSIONS IN INCHES

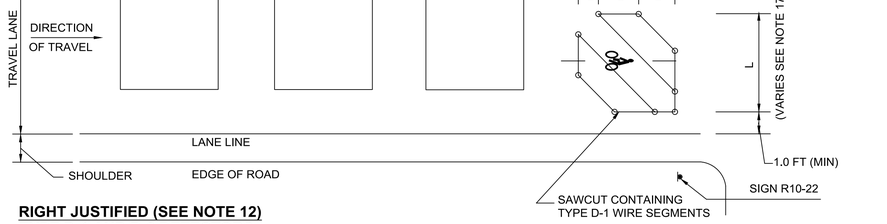
NOTE: SIGN PANEL NOT SHOWN TO SCALE



TYPE D-Q DETECTOR-DOUBLE QUADRUPOLE

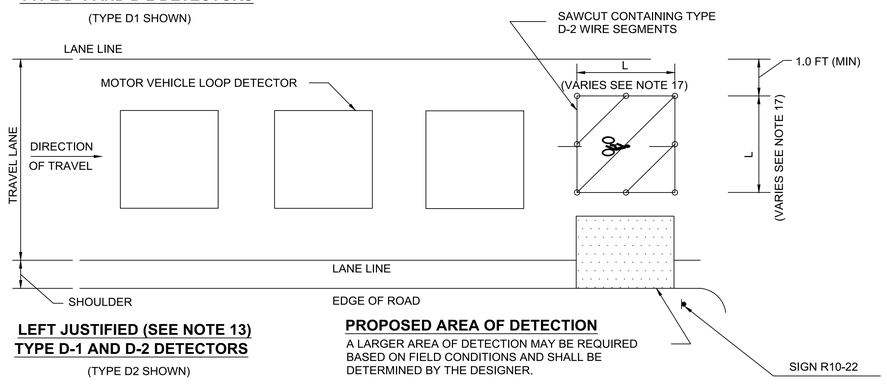


SECTION THRU LOOP DETECTOR



RIGHT JUSTIFIED (SEE NOTE 12)
TYPE D-1 AND D-2 DETECTORS

(TYPE D1 SHOWN)



LEFT JUSTIFIED (SEE NOTE 13)
TYPE D-1 AND D-2 DETECTORS

(TYPE D2 SHOWN)

PROPOSED AREA OF DETECTION

A LARGER AREA OF DETECTION MAY BE REQUIRED BASED ON FIELD CONDITIONS AND SHALL BE DETERMINED BY THE DESIGNER.

SAWCUT SLOT DEPTH GUIDE

TURNS OF WIRE	SLOT SIZE	
	DEPTH (IN)	WIDTH (IN)
1	1.5	0.5
2	1.5	0.5
3	1.5	0.5
4	2.0	0.5
5	2.0	0.5
6	2.0	0.5
7	2.0	0.5
8	2.0	0.5

BICYCLE LOOP DETECTOR DETAILS

NOTES:

1. REFER TO VEHICLE LOOP DETECTOR DETAIL SHEET FOR ADDITIONAL NOTES AND CONSTRUCTION DETAILS.
2. ALL DETAILS ARE GRAPHICAL WITH NO SCALE.
3. THE NUMBER, SIZE, LOCATION AND LENGTH OF DETECTION AREA VARIES AND SHALL BE DETERMINED BY THE DESIGNER REFER TO TRAFFIC SIGNAL PLAN.
4. BICYCLE LOOPS SHALL BE CONNECTED TO SEPARATE LOOP DETECTOR AMPLIFIERS CAPABLE OF HIGHER LEVELS OF SENSITIVITY.
5. BICYCLE LOOPS SHALL BE INSTALLED IN THE BASE COURSE OF EXISTING PAVEMENT. THE EXISTING PAVEMENT SHALL BE COLD PLANED TO THE BASE COURSE AND SAWCUT FOR LOOP INSTALLATION.
6. SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED FOR ALL BICYCLE DETECTORS TO INFORM CYCLISTS OF THE DETECTION AREA.

*7. OFFSETS FROM LANE LINE EQUAL UNLESS OTHERWISE NOTED. SEE PLANS.

8. TYPE Q DETECTORS SHALL BE WIRED IN A FIGURE EIGHT PATTERN WITH A DOUBLE LAYER DESIGN ("2-4-2") WITH 2 TURNS IN THE PERIMETER SLOTS AND 4 TURNS IN THE CENTER SLOT AS SHOWN IN THE WINDING DETAIL.
9. BICYCLES WILL BE DETECTED WITHIN 4 IN. OF THE INTERIOR LONGITUDINAL LOOP WIRES FOR TYPE Q AND D-Q DETECTORS.
10. PROVIDE 3 TURNS FOR TYPE D-1 DETECTORS.
11. INSTALL 2 LAYERS OF WIRE WOUND IN THE SAME DIRECTION IN BOTH LAYERS FOR TYPE D-2 DETECTORS. THE RESULT IS 4 TURNS IN EACH DIAGONAL.
12. RIGHT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    - 12.a. BICYCLE STOPPING ON THE RIGHT SIDE OF A THRU TRAVEL LANE.
    - 12.b. BICYCLE STOPPING ON THE RIGHT SIDE OF AN EXCLUSIVE LEFT TURN LANE.
13. LEFT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    - 13.a. BICYCLE STOPPING ON THE LEFT SIDE OF A SHARED LEFT/THRU LANE.
    - 13.b. BICYCLE STOPPING JUST TO THE RIGHT OF THE CENTERLINE WHEN TURNING LEFT ON A TWO-LANE ROADWAY.
14. RECTANGULAR LOOP DETECTORS SHALL BE CONSIDERED FOR BICYCLES STOPPING 0N EITHER THE LEFT OR RIGHT SIDE OF A TWO-LANE ROADWAY. THE MINIMUM OFFSET FROM LANE LINE OR CURB LINE SHALL BE 1.0 FT.
15. PAVEMENT CORES OR TEST PITS MAY BE REQUIRED TO DETERMINE THE DEPTH OF EXISTING PAVEMENT AND CONFIRM THAT THE DETECTION OPTION CHOSEN AND CORRESPONDING WINDING PATTERN CAN BE ACCOMMODATED.
16. THESE DETAILS APPLY TO BICYCLE LOOPS INSTALLED IN ROADWAYS. PUSH BUTTON ACTUATION SHALL BE CONSIDERED FOR RECREATIONAL BIKE PATHS.
17. THE MINIMUM DIMENSION FOR L SHALL BE 6 FT MIN. FOR DETECTORS TYPE D-Q, D-1 & D-2. FINAL DIMENSIONS SHALL BE DETERMINED BY THE DESIGN ENGINEER.

TEMPORARY TRAFFIC CONTROL NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. CONTRACTOR SHALL MAINTAIN ACCESS FOR BICYCLES THROUGH THE CONSTRUCTION ZONE AT ALL TIMES. WHERE REDUCED LANE/SHOULDER WIDTHS ARE PROVIDED TO FACILITATE CONSTRUCTION, TEMPORARY W11-1/MA-W16-19P SIGNS SHALL BE INSTALLED, AS REQUIRED BY THE ENGINEER.

LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

TYPICAL PEDESTRIAN DETAILS:

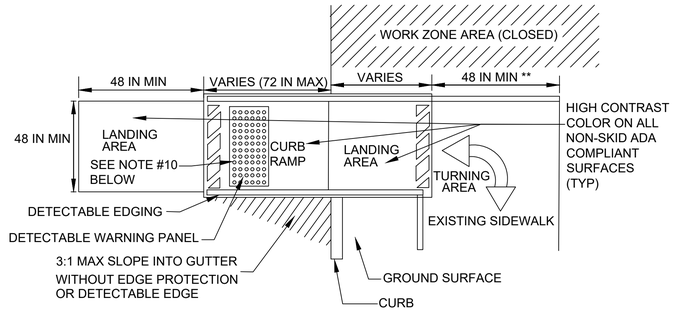
NOTES:
1. WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
2. A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
3. WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
4. THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
5. THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGEMENT.
6. AUDIBLE INFORMATION DEVICES SHOULD BE CONSIDERED WHERE MIDBLOCK CLOSINGS AND CHANGED CROSSWALK AREAS CAUSE INADEQUATE COMMUNICATION TO BE PROVIDED TO PEDESTRIANS WHO HAVE VISUAL DISABILITIES.
7. ADA COMPLIANT ACCESS SHALL BE MAINTAINED AT ALL TIMES INCLUDING PEDESTRIAN GUIDANCE SYSTEMS AT WORK ZONES. ANY PEDESTRIAN DETOURS OR BYPASSES SHALL INCLUDE AN ADA COMPLIANT ROUTE WITH PROPER BARRICADES, RAILING, RAMPS, AND SIGNAGE.

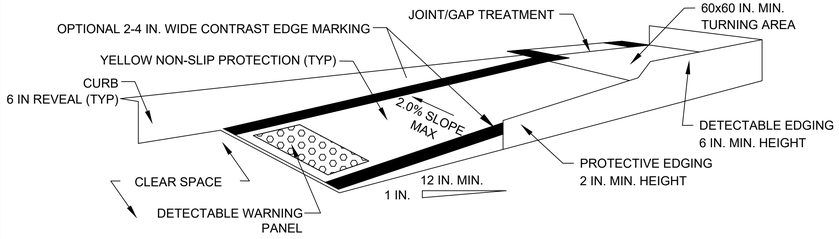
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	53	132
PROJECT FILE NO.	609035		

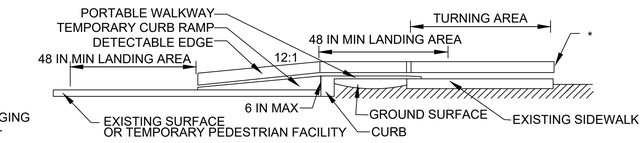
TEMPORARY TRAFFIC CONTROL PLANS - 1 OF 7

TYPICAL PEDESTRIAN DEVICES:





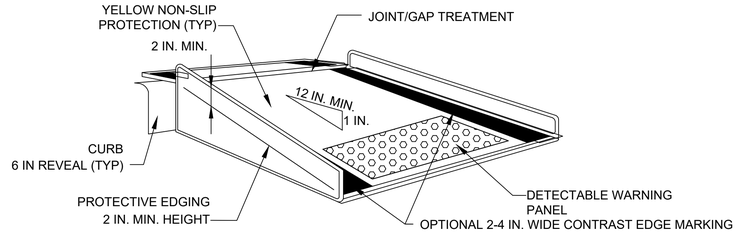
TEMPORARY CURB RAMP-PARALLEL TO CURB
NTS



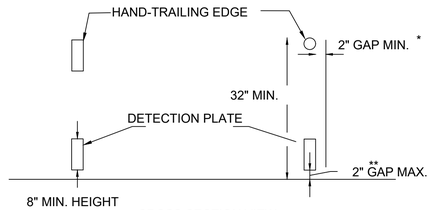
* -DETECTABLE EDGE REMOVED IF A CONTINUOUS SIDEWALK.

** -60 IN. IF AN OBSTRUCTION IS AT BACK OF SIDEWALK

TEMPORARY CURB RAMP-TYPE 2



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB
NTS

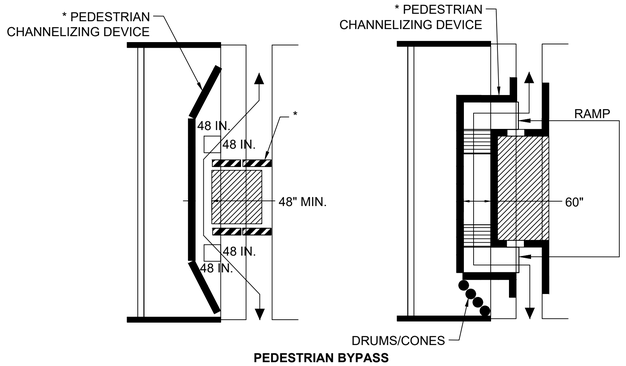


CROSS SECTION VIEW

NOTES:
* THERE SHALL BE A 2 INCH GAP BETWEEN THE HAND-TRAILING EDGE AND ITS SUPPORT.

** A MAXIMUM 2 INCH GAP BETWEEN THE BOTTOM OF THE BOTTOM RAIL AND THE SURFACE MAY BE USED TO PROVIDE DRAINAGE.

PEDESTRIAN CHANNELIZING DEVICE



PEDESTRIAN BYPASS

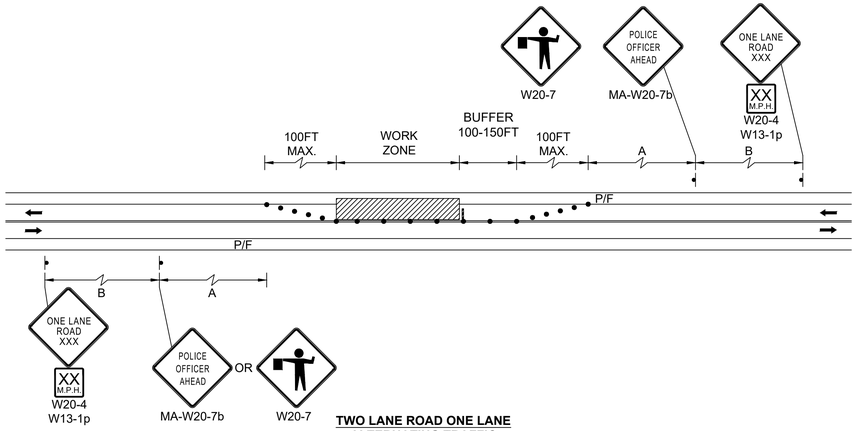
TYPICAL PEDESTRIAN DEVICE NOTES:

1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
5. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
6. THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE MARKING. MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.

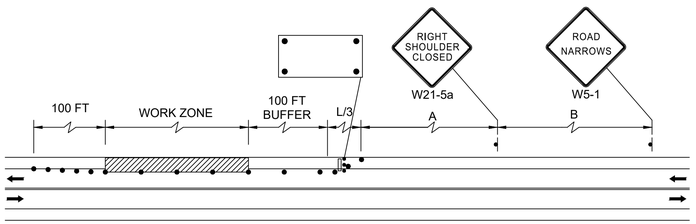
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	54	132
PROJECT FILE NO.	609035		

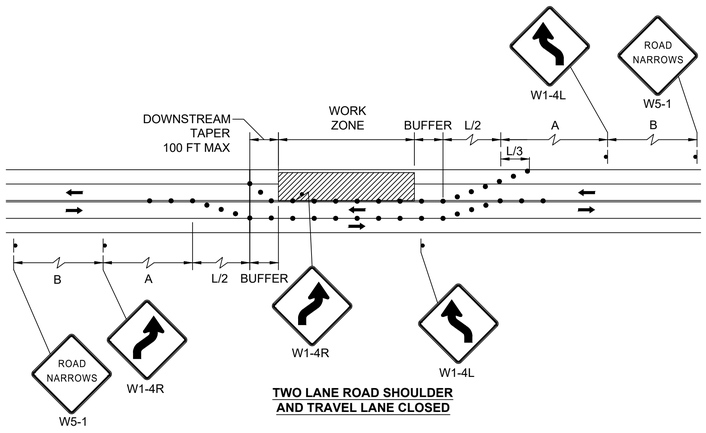
TEMPORARY TRAFFIC CONTROL PLANS - 2 OF 7



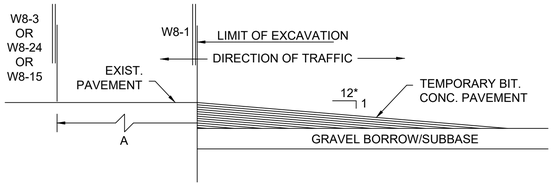
TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC



TWO LANE ROAD SHOULDER CLOSED

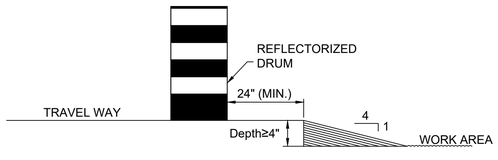


TWO LANE ROAD SHOULDER AND TRAVEL LANE CLOSED



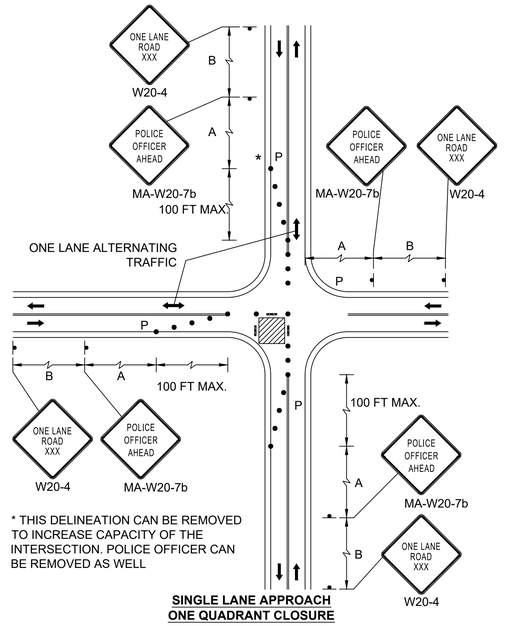
LONGITUDINAL DROP-OFF DETAIL

NOT TO SCALE
* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS



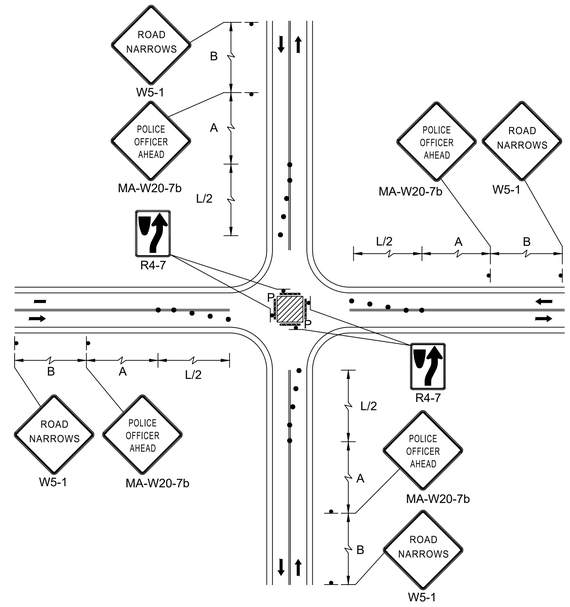
LATERAL DROP-OFF DETAIL

NOT TO SCALE



* THIS DELINEATION CAN BE REMOVED TO INCREASE CAPACITY OF THE INTERSECTION. POLICE OFFICER CAN BE REMOVED AS WELL

SINGLE LANE APPROACH ONE QUADRANT CLOSURE



SINGLE LANE APPROACH CENTER CLOSURE

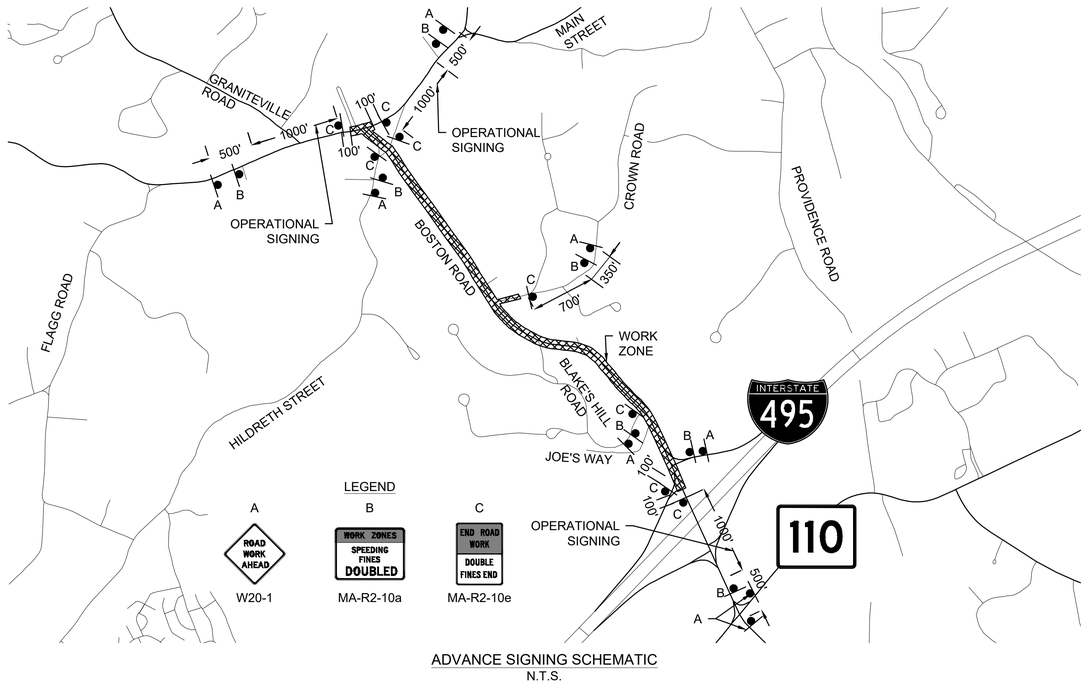
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	55	132
PROJECT FILE NO.	609035		

TEMPORARY TRAFFIC CONTROL PLANS - 3 OF 7

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN (in)			TEXT DIMENSIONS (in)			COLOR			NUMBER OF SIGNS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT	LEGEND	LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR	BACK-GROUND	LEGEND	BORDER			
W16-8P	36	8	Boston Rd	SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			FL. ORANGE	BLACK	BLACK	28	2.00	56.00
M4-8a	24	18	END DETOUR				FL. ORANGE	BLACK	BLACK	2	3.00	6.00
M4-9aL	30	24	DETOUR				FL. ORANGE	BLACK	BLACK	3	5.00	15.00
M4-9aR	30	24	DETOUR				FL. ORANGE	BLACK	BLACK	2	5.00	10.00
M4-9L	30	24	DETOUR				FL. ORANGE	BLACK	BLACK	6	5.00	30.00
M4-9R	30	24	DETOUR				FL. ORANGE	BLACK	BLACK	7	5.00	35.00
M4-9T	30	24	DETOUR				FL. ORANGE	BLACK	BLACK	8	5.00	40.00
M4-10L	48	18	DETOUR				FL. ORANGE	BLACK	BLACK	1	6.00	6.00
MA-R2-10a	48	36	WORK ZONES SPEEDING FINES DOUBLED	MASSDOT STANDARD SIGN			FL. ORANGE WHITE	BLACK BLACK	BLACK BLACK	7	12.00	84.00
MA-R2-10e	36	48	END ROAD WORK DOUBLE FINES END				FL. ORANGE WHITE	BLACK BLACK	BLACK BLACK	8	12.00	96.00
MA-W16-19P	24	18	ON ROADWAY				FL. ORANGE	BLACK	BLACK	4	3.00	12.00



ADVANCE SIGNING SCHEMATIC
N.T.S.

NOTES:
1. ON SIDE STREETS, "A" SIGNS SHALL BE LOCATED 1050' FROM LIMIT OF WORK, "B" SIGNS SHALL BE LOCATED 875' FROM THE LIMIT OF WORK.
2. THE DISTANCE BETWEEN "A" AND "B" SIGNS ON BOSTON ROAD, MAIN STREET & I-495 SB RAMP SHALL BE APPROXIMATELY 250'.
3. "C" SIGNS SHALL BE PLACED BETWEEN 100' TO 500' BEYOND THE LIMIT OF WORK.
4. FOR LOCATIONS OF SIGNS FOR DETOUR PLAN AND TEMPORARY TRAFFIC SIGNALS, SEE SHEETS 56 AND 57.

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN (in)			TEXT DIMENSIONS (in)			COLOR			NUMBER OF SIGNS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT	LEGEND	LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR	BACK-GROUND	LEGEND	BORDER			
MA-W20-7b	36	36	POLICE OFFICER AHEAD	MASSDOT STANDARD SIGN			FL. ORANGE	BLACK	BLACK	4	9.00	36.00
R4-7	24	30		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			WHITE	BLACK	BLACK	4	5.00	20.00
R4-11	30	30	MAY USE FULL LANE				WHITE	BLACK	BLACK	2	6.25	12.50
R10-6	24	36	STOP HERE ON RED				WHITE	BLACK	BLACK	5	6.00	30.00
R11-4	60	30	ROAD CLOSED TO THRU TRAFFIC				WHITE	BLACK	BLACK	3	12.50	37.50
W1-4L	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W1-4R	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W3-3	36	36					FL. ORANGE	RED YELLOW GREEN BLACK	BLACK	6	9.00	54.00
W5-1	36	36	ROAD NARROWS				FL. ORANGE	BLACK	BLACK	4	9.00	36.00
W8-1	36	36	BUMP				FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-3	36	36	PAVEMENT ENDS				FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-15	36	36	GROOVED PAVEMENT				FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-24	36	36	STEEL PLATE AHEAD				FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W11-1	36	36					FL. YELLOW	BLACK	BLACK	4	9.00	36.00
W13-1p	24	24	XX MPH				FL. ORANGE	BLACK	BLACK	2	4.00	8.00
W16-9p	24	12	AHEAD				YELLOW	BLACK	BLACK	6	2.00	12.00
W20-1	36	36	ROAD WORK AHEAD				FL. ORANGE	BLACK	BLACK	8	9.00	72.00
W20-2	36	36	DETOUR AHEAD				ORANGE	BLACK	BLACK	10	9.00	90.00
W20-4	36	36	ONE LANE ROAD AHEAD				FL. ORANGE	BLACK	BLACK	4	9.00	36.00
W21-5a	36	36	RIGHT SHOULDER CLOSED				FL. ORANGE	BLACK	BLACK	1	9.00	9.00

CHELMSFORD

WESTFORD

N

GRANITEVILLE ROAD
DEPOT STREET
KIRSI CIRCLE
MAIN STREET
MAIN STREET
MAIN STREET
PROVIDENCE ROAD
CROWN ROAD
TADMUCK ROAD
LITTLETON ROAD
ST. MARY'S DRIVE
FLAGG ROAD
BOSTON ROAD
HILDRETH STREET
JOE'S WAY
LITTLETON ROAD
S. CHELMSFORD ROAD
CARLISLE ROAD
LITTLETON ROAD

INTERSTATE 495
110
225

PROP. PROJECT LOCATION

PCMS #1
PCMS #2
PCMS #3
PCMS #4

W20-2 W16-8P
M4-9aL W16-8P
M4-9L W16-8P
M4-8a
M4-9R
R11-4
M4-10L (MOUNT ON TYPE III BARRICADE)
M4-9T W16-8P
M4-9aR W16-8P

DETOUR PLAN & ADVANCED SIGNAGE SCHEMATIC PLAN
BOSTON ROAD
SCALE: 1" = 600'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	56	132
	PROJECT FILE NO. 609035		

TEMPORARY TRAFFIC CONTROL PLANS - 4 OF 7

GENERAL NOTES:

1. ALL DETOURS ARE ESTABLISHED ON A DAY-TO-DAY BASIS BY NEED; HOWEVER, TEMPORARY TRAFFIC SIGNALS WILL BE IN OPERATION 24-HOURS A DAY. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
2. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL (M.U.T.C.D.) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
3. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE M.U.T.C.D.
4. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
7. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS AT THE DISCRETION OF THE CONTRACTOR.
8. ALL DRUMS AND/OR CONES SHALL BE SET @ 20' O.C. MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
9. ALL TRAFFIC SIGNAL TIMINGS AT BOTH EXISTING AND TEMPORARY TRAFFIC SIGNALS SHALL BE EVALUATED POST-INSTALLATION OF THE DETOUR. ALL SIGNAL TIMINGS SHALL BE MODIFIED AS NECESSARY.

TEMPORARY TRAFFIC CONTROL LEGEND

- WORK ZONE
- DIRECTION OF TRAVEL
- SIGN
- POLICE DETAIL
- TRAFFIC SIGNAL
- ARROW BOARD
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- REFLECTORIZED DRUM W/ SEQUENTIAL FLASHING LIGHTS
- CONSTRUCTION BARRIER
- CONSTRUCTION BARRIER W/ REFLECTORS OR WARNING LIGHTS
- TYPE III BARRICADES
- IMPACT ATTENUATOR
- WORK VEHICLE

STARTING 14 DAYS PRIOR TO DETOUR

BOSTON ROAD CLOSURE	XX/XX/XX TO XX/XX/XX	FOLLOW DETOUR

DURING ACTIVE DETOUR

PORTABLE CHANGEABLE MESSAGE SIGNS TEXT
(DIMENSIONS ARE APPROX.)

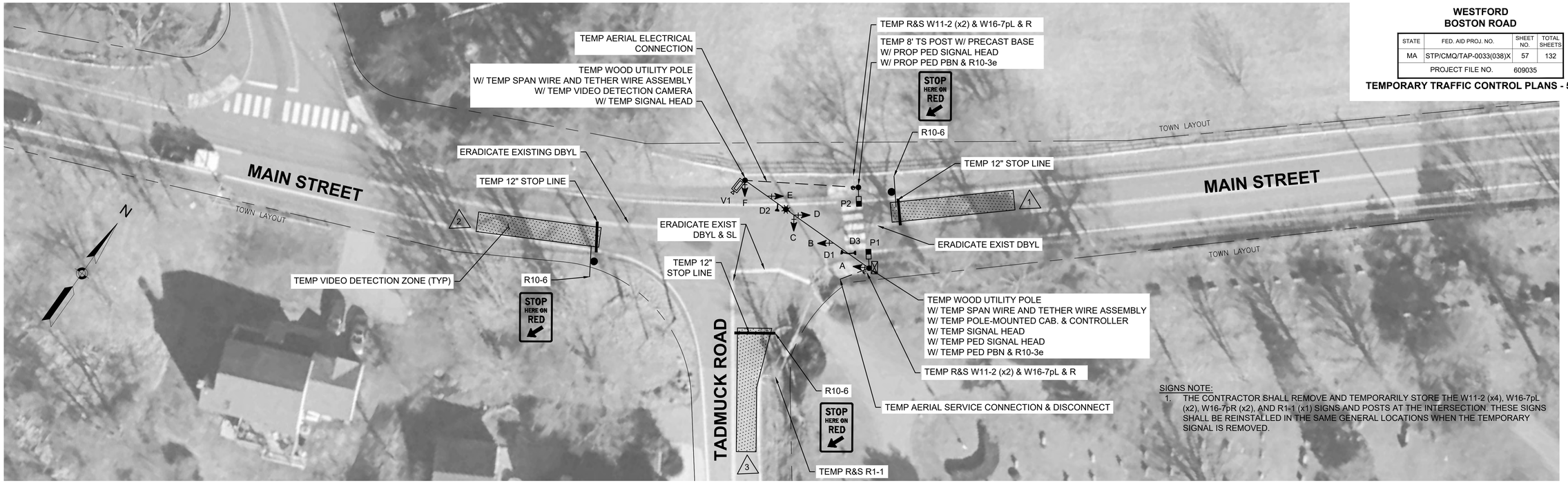
609035_HDT3(DETOUR).DWG Plotted on 17-May-2024 8:39 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	57	132
PROJECT FILE NO.	609035		

TEMPORARY TRAFFIC CONTROL PLANS - 5 OF 7

609035_HD13(DETOUR).DWG Plotted on 20-May-2024 1:09 PM



MAIN STREET AT TADMUCK ROAD
TEMPORARY TRAFFIC SIGNAL-SHORT TERM STATIONARY (24 HOURS A DAY)
SCALE: 1" = 20'

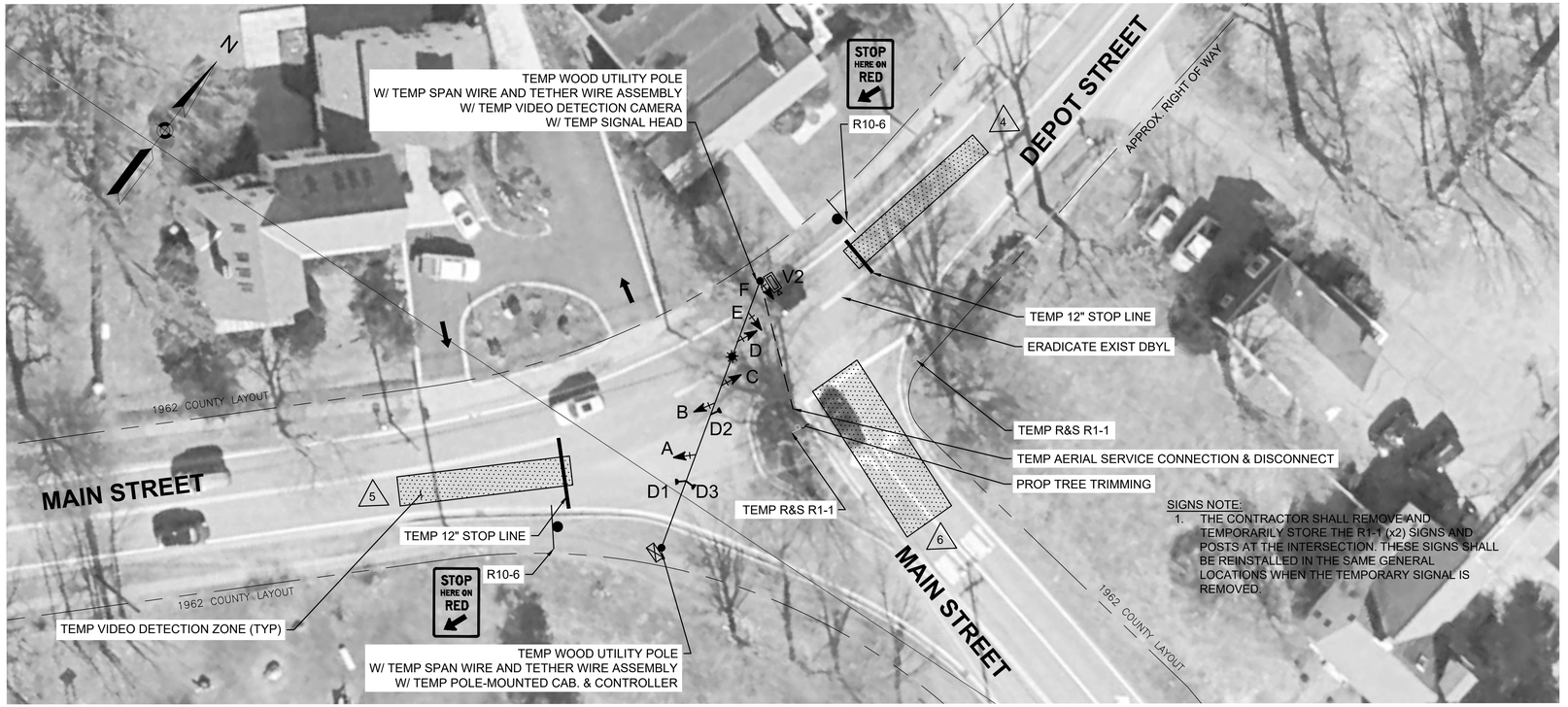
SIGNS NOTE:
1. THE CONTRACTOR SHALL REMOVE AND TEMPORARILY STORE THE W11-2 (x4), W16-7pL (x2), W16-7pR (x2), AND R1-1 (x1) SIGNS AND POSTS AT THE INTERSECTION. THESE SIGNS SHALL BE REINSTALLED IN THE SAME GENERAL LOCATIONS WHEN THE TEMPORARY SIGNAL IS REMOVED.

TEMPORARY SIGNAL NOTES:
1. TEMPORARY PEDESTRIAN PUSH BUTTONS SHALL BE PERPENDICULAR TO THE CROSSWALK PATH OF TRAVEL, WITH THE ARROW PROVIDED ON THE PUSH BUTTON PARALLEL TO THE CROSSWALK PATH OF TRAVEL.
2. TEMPORARY SIGNAL UTILITY POLE AND FOUNDATIONS MAY NEED TO BE INSTALLED WITH LOW-PROFILE INSTALLATION AND/OR EXCAVATION EQUIPMENT DUE TO CLOSE PROXIMITY WITH EXISTING OVERHEAD PRIMARY POWER LINES.
3. CONTRACTOR IS RESPONSIBLE FOR AND SHALL COORDINATE WITH UTILITY COMPANY FOR THE SHIELDING AND INSULATION OF TRAFFIC SIGNAL EQUIPMENT AND OVERHEAD HEAD WIRES (AS NECESSARY).
4. ALL THE EXISTING DOUBLE YELLOW LINES AT THE INTERSECTION, BETWEEN THE TEMPORARY STOP LINES, SHALL BE ERADICATED AND REPLACED WITH OTHER MARKINGS AS INDICATED.
5. CONTRACTOR MAY PROPOSE AN ALTERNATIVE ARRANGEMENT OF THE TRAFFIC SIGNAL EQUIPMENT OF THE USE OF TRAILER MOUNTED SIGNAL. ANY PROPOSED CHANGE IN THE EQUIPMENT LAYOUT SHALL BE APPROVED BY MASDOT, THE TOWN OF WESTFORD, AND THE ENGINEER PRIOR TO IMPLEMENTATION.
6. TEMPORARY WOOD POLES SHALL BE CLASS IV, WITH A FIBER BENDING STRESS OF 8,000 PSI AND OF SUFFICIENT LENGTH TO ALLOW FOR DEPTH OF EMBEDMENT TO PREVENT OVERTURNING. THE POLES SHALL CONFORM TO THE RURAL ELECTRIFICATION ADMINISTRATION (REA) SPECIFICATION DT-5C.

TEMPORARY TRAFFIC CONTROL LEGEND

- TEMPORARY WOOD POLE
- TEMPORARY TRAFFIC SIGNAL POST
- SIGNAL HOUSING
- PEDESTRIAN SIGNAL HOUSING
- PEDESTRIAN PUSH BUTTON
- PREEMPT RECIEVER
- PREEMPT STROBE
- VIDEO DETECTION CAMERA
- SIGN

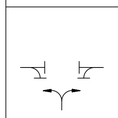
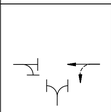
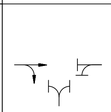
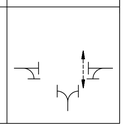
0 20 50 100
SCALE: 1" = 20'



MAIN STREET AT DEPOT ROAD
TEMPORARY TRAFFIC SIGNAL-SHORT TERM STATIONARY (24 HOURS A DAY)
SCALE: 1" = 20'

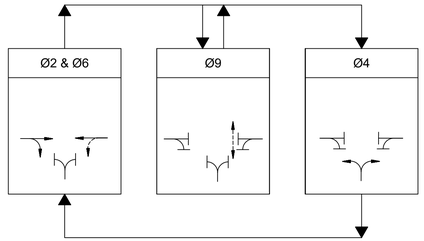
SIGNS NOTE:
1. THE CONTRACTOR SHALL REMOVE AND TEMPORARILY STORE THE R1-1 (x2) SIGNS AND POSTS AT THE INTERSECTION. THESE SIGNS SHALL BE REINSTALLED IN THE SAME GENERAL LOCATIONS WHEN THE TEMPORARY SIGNAL IS REMOVED.

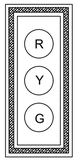
TEMPORARY TRAFFIC SIGNAL CONTROL - MAIN STREET AT TADMUCK ROAD

TEMPORARY TRAFFIC SIGNAL TIMING AND PHASING														
APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12
MINIMUM INTERVAL			4			10			10					
VEHICLE EXTENSION			-			2			2					
MAXIMUM 1			25			55			55					
MAXIMUM 2			55			25			25					
YELLOW CLEARANCE				4.0			4.0			4.0				
RED CLEARANCE					1.0			1.0			1.0			
WALK												7.0		
PEDESTRIAN CLEARANCE													7.0	4.0
MAIN STREET	EB	A,B	R	R	R	R	R	R	G	Y	R	R	R	R
MAIN STREET	WB	D,E	R	R	R	G	Y	R	R	R	R	R	R	R
TADMUCK ROAD	NB	C,F	G	Y	R	R	R	R	R	R	R	R	R	R
PEDESTRIAN	ALL	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW
DETECTOR			NON-LOCK			NON-LOCK			NON-LOCK			LOCK		
RECALL			OFF			MIN			MIN			OFF		
			Ø4			Ø6			Ø2			Ø9		
														

NOTES:
1. MAXIMUM 1 = FREE OPERATION
2. MAXIMUM 2 = 3:00 PM - 7:00 PM
3. SIGNAL "X" MAY BE ALTERED BASED ON EXISTING SET-UP.

PREFERENTIAL PHASE SEQUENCE



SIGNAL HOUSING DATA	
A-F	P1-P6
	
ALL 12" L.E.D. LENSES, 5" BACKPLATES W/ 3" RETROREFLECTIVE STRIP, & TUNNEL VISORS	ALL 16" L.E.D. W/ COUNTDOWN INDICATIONS, & VISORS

PREEMPTION PHASING & PRIORITY			
DETECTOR	PREEMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø4
D3	3		Ø6

VIDEO DETECTION DATA						
CAMERA #	DETECTOR #	SIZE	Ø CALLED	Ø EXTEND	DELAY/EXT	OPERATION
V1	1	±8'x50'	Ø6	Ø6	0 SEC	PRESENCE
V1	2	±8'x50'	Ø2	Ø2	0 SEC	PRESENCE
V1	3	±12'x50'	Ø4	Ø4	0 SEC	PRESENCE

MAIN STREET AT TADMUCK ROAD

LIST OF MAJOR ITEMS REQUIRED - TEMPORARY TRAFFIC SIGNAL INSTALLATION

ITEM #	QUANTITY	DESCRIPTION
816.81	1	NEMA TS 2 - TYPE 1 POLE-MOUNTED CONTROLLER & CABINET W/ GROUNDING ARRAY
	2	CLASS IV WOOD UTILITY POLE WITH SPAN WIRE & TETHER WIRE ASSEMBLIES W/ GUY
	1	8' TS POST, BASE W/ PRECAST FDN WITH WEATHERHEAD FOR AERIAL CONNECTION TO WOOD POLE
	6	SIGNAL HEAD, 3-SECTION, 12" LED MODULES, REFLECTIVE BACKPLATES, & TUNNEL VISORS
	2	PEDESTRIAN SIGNAL HEAD, 16" LED MODULE COUNTDOWN INDICATOR & VISORS
	2	PEDESTRIAN PUSH BUTTON W/ R10-3e AND SIGN SADDLE
	1	COMPLETE VIDEO DETECTION SYSTEM [CAMERA(S), PROCESSOR(S), CHASSIS, & CABLING]
	3	EMERGENCY PRE-EMPTION DETECTORS AND DETECTOR CABLING
	2	EMERGENCY PRE-EMPTION 2-CHANNEL PHASE SELECTORS
	1	EMERGENCY PRE-EMPTION SYSTEM CHASSIS
	1	EMERGENCY PRE-EMPTION STROBE (WHITE LENS)
	1	CONTROLLER PROGRAMMING & FINE TUNING
	1	INTERSECTION CABLING FOR SIGNAL HEADS, VIDEO DETECTION, & PRE-EMPTION (AERIAL)
	1	SERVICE CONNECTION & DISCONNECT (AERIAL)

PLUS NECESSARY CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.
ALL EQUIPMENT SHALL REMAIN OWNED BY THE CONTRACTOR OR UNDER LEASE AGREEMENTS WITH ITS VENDORS FOR THE TERM OF THE TEMPORARY TRAFFIC SIGNAL INSTALLATION. UPON NOTIFICATION THAT THE NEED FOR THE TEMPORARY TRAFFIC SIGNAL IS NO LONGER REQUIRED, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EQUIPMENT AND RESTORE THE INTERSECTION BACK TO THE EXISTING CONFIGURATION OF SIGNS AND STRIPING UNLESS OTHERWISE APPROVED BY THE TOWN OF WESTFORD AND MASSDOT.

SEQUENCE & TIMING NOTES:
1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.28 TO 4D.31
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. MAXIMUM 1 = FREE OPERATION
4. MAXIMUM 2 = 3:00 PM - 7:00 PM
5. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
6. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.
7. THE RIGHT-OF-WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
8. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.

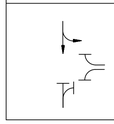
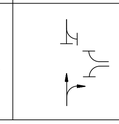
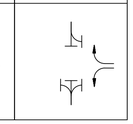
MAIN STREET AT DEPOT STREET

LIST OF MAJOR ITEMS REQUIRED - TEMPORARY TRAFFIC SIGNAL INSTALLATION

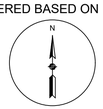
ITEM #	QUANTITY	DESCRIPTION
816.82	1	NEMA TS 2 - TYPE 1 POLE-MOUNTED CONTROLLER & CABINET W/ GROUNDING ARRAY
	2	CLASS IV WOOD UTILITY POLE WITH SPAN WIRE & TETHER WIRE ASSEMBLIES W/ GUY
	6	SIGNAL HEAD, 3-SECTION, 12" LED MODULES, REFLECTIVE BACKPLATES, & TUNNEL VISORS
	1	COMPLETE VIDEO DETECTION SYSTEM [CAMERA(S), PROCESSOR(S), CHASSIS, & CABLING]
	3	EMERGENCY PRE-EMPTION DETECTORS AND DETECTOR CABLING
	2	EMERGENCY PRE-EMPTION 2-CHANNEL PHASE SELECTORS
	1	EMERGENCY PRE-EMPTION SYSTEM CHASSIS
	1	EMERGENCY PRE-EMPTION STROBE (WHITE LENS)
	1	CONTROLLER PROGRAMMING & FINE TUNING
	1	INTERSECTION CABLING FOR SIGNAL HEADS, VIDEO DETECTION, & PRE-EMPTION (AERIAL)
	1	SERVICE CONNECTION & DISCONNECT (AERIAL)

PLUS NECESSARY CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.
ALL EQUIPMENT SHALL REMAIN OWNED BY THE CONTRACTOR OR UNDER LEASE AGREEMENTS WITH ITS VENDORS FOR THE TERM OF THE TEMPORARY TRAFFIC SIGNAL INSTALLATION. UPON NOTIFICATION THAT THE NEED FOR THE TEMPORARY TRAFFIC SIGNAL IS NO LONGER REQUIRED, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EQUIPMENT AND RESTORE THE INTERSECTION BACK TO THE EXISTING CONFIGURATION OF SIGNS AND STRIPING UNLESS OTHERWISE APPROVED BY THE TOWN OF WESTFORD AND MASSDOT.

TEMPORARY TRAFFIC SIGNAL CONTROL - MAIN STREET AT DEPOT ROAD

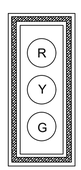
TEMPORARY TRAFFIC SIGNAL TIMING AND PHASING											
APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9
MINIMUM INTERVAL			4			6			10		
VEHICLE EXTENSION			-			2			2		
MAXIMUM 1			60			60			20		
MAXIMUM 2			55			55			25		
YELLOW CLEARANCE				4.0			4.0			4.0	
RED CLEARANCE					1.5			1.0			1.0
WALK											
PEDESTRIAN CLEARANCE											
MAIN STREET	WB	C,D	R	R	R	R	R	R	R	R	R
MAIN STREET	NB	E,F	R	R	R	R	R	R	G	Y	R
DEPOT ROAD	SB	A,B	G	Y	R	R	R	R	R	R	R
DETECTOR			NON-LOCK			NON-LOCK			NON-LOCK		
RECALL			MIN			MIN			OFF		
			Ø2			Ø6			Ø4		
											

NOTES:
1. MAXIMUM 1 = FREE OPERATION
2. MAXIMUM 2 = 3:00 PM - 7:00 PM
3. SIGNAL "X" MAY BE ALTERED BASED ON EXISTING SET-UP.

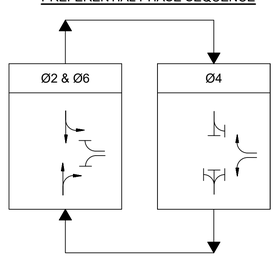


VIDEO DETECTION DATA						
CAMERA #	DETECTOR #	SIZE	Ø CALLED	Ø EXTEND	DELAY/EXT	OPERATION
V2	4	±8'x50'	Ø2	Ø2	0 SEC	PRESENCE
V2	5	±8'x50'	Ø6	Ø6	0 SEC	PRESENCE
V2	6	±15'x50'	Ø4	Ø4	0 SEC	PRESENCE

PREEMPTION PHASING & PRIORITY			
DETECTOR	PREEMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø6
D2	2		Ø2
D3	3		Ø4

SIGNAL HOUSING DATA
A-F

ALL 12" L.E.D. LENSES, 5" BACKPLATES W/ 3" RETROREFLECTIVE STRIP, & TUNNEL VISORS

PREFERENTIAL PHASE SEQUENCE



EMERGENCY VEHICLE PRE-EMPTION NOTES:

1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVE BASIS.
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2 & D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2 OR #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (3 SECONDS: YELLOW AND 8 SECONDS: ALL RED) AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
4. NORMAL CLEARANCE INTERVALS SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. ONCE PRE-EMPTION PHASING HAS CLEARED, THE SYSTEM SHALL RESTART NORMAL OPERATIONS ACCORDING TO THE PREFERENTIAL PHASE SEQUENCE.
6. CONFIRMATION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	59	132
PROJECT FILE NO.	609035		

TEMPORARY TRAFFIC CONTROL PLANS - 7 OF 7

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL

LITTLETON ROAD (ROUTE 110) AT TADMUCK ROAD (WESTFORD, MASSACHUSETTS)

APPROACH	DIRECTION	HOUSING	Ø1			Ø2			Ø3			Ø4			Ø5			Ø6			Ø7			Ø8			Ø9			FLASHING OPERATION
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
LITTLETON ROAD	EB	A	G	Y	R	R	R	R				R	R	R	R	R	R	FY	Y	R				R	R	R	R	R	R	FR
LITTLETON ROAD	EB	B,C	R	R	R	R	R	R				R	R	R	R	R	R	G	Y	R				R	R	R	R	R	R	FY
LITTLETON ROAD	WB	D	R	R	R	R	R	R				R	R	R	G	Y	R	R	R	R				R	R	R	R	R	R	FY
LITTLETON ROAD	WB	E,F	R	R	R	G	Y	R				R	R	R	R	R	R	R	R	R				R	R	R	R	R	R	FY
TADMUCK ROAD	NB	G,H,J	R	R	R	R	R	R				R	R	R	R	R	R	R	R	R				G	Y	R	R	R	R	FR
TADMUCK ROAD	SB	K,L	R	R	R	R	R	R				G	Y	R	R	R	R	R	R	R				R	R	R	R	R	R	FR
TADMUCK ROAD	SB	M	R G	R Y	R	R	R	R				G	Y	R	R	R	R	R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P8	DW	DW	DW	DW	DW	DW				DW	DW	DW	DW	DW	DW	DW	DW	DW				DW	DW	DW	W/FDW	DW	DW	OUT
MINIMUM INTERVAL			6			10						6			6			10						6						EMERGENCY ONLY
VEHICLE EXTENSION			2			3						2			2			2						2						
MAXIMUM 1			10			45						15			10			45						15						
MAXIMUM 2			42			35						25			20			60						25						
YELLOW CLEARANCE				5.0			5.0						4.0			5.0			5.0						4.0			3.0		
RED CLEARANCE					3.0			2.0						3.0			3.0			2.0						3.0			1.0	
WALK																											7			
PEDESTRIAN CLEARANCE																											17			
RECALL			OFF			MIN						OFF			OFF			MIN						OFF			-			
DETECTOR			NON-LOCK			NON-LOCK						NON-LOCK			NON-LOCK			NON-LOCK						NON-LOCK			-			

PRE-EMPTION PHASING AND PRIORITY

PREEMPT ØA - D1			PREEMPT ØB - D2			PREEMPT ØC - D3			PREEMPT ØD - D4		
28	29	30	31	32	33	34	35	36	34	35	36
G	Y	R	R	R	R	R	R	R	R	R	R
R	R	R	G	Y	R	R	R	R	R	R	R
R	R	R	R	R	R	G	Y	R	R	R	R
R	R	R	R	R	R	R	R	R	G	Y	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
*			*			*			*		
	5.0			5.0			4.0			4.0	
		2.0			2.0			3.0			3.0
-			-			-			-		
-			-			-			-		
Ø1&Ø6			Ø2&Ø5			Ø4			Ø8		

SEQUENCE & TIMING NOTES:

1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.28 - 4D.31.
2. MAXIMUM 1 = FREE OPERATION
3. MAXIMUM 2 = 2:00 PM - 7:00 PM, MONDAY-FRIDAY
4. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
5. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE EXISTING PHASE SEQUENCE.
6. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
7. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.
8. CONCURRENT PEDESTRIAN PHASES WILL ONLY BE CALLED UPON PUSH BUTTON ACTIVATION.

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL

LITTLETON ROAD (ROUTE 110) / BOSTON ROAD / CARLISLE ROAD (WESTFORD, MASSACHUSETTS)

APPROACH	DIRECTION	HOUSING	Ø1			Ø2			Ø3			Ø4			Ø5			Ø6			Ø7			Ø8			Ø9			FLASHING OPERATION
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
ROUTE 110	EB	A,B	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FR
ROUTE 110	EB	C,D	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	Y
ROUTE 110	WB	E	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
ROUTE 110	WB	F,G	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
ROUTE 110	WB	H	R	R	R	G G	Y Y	R	R G	R	R	R G	R Y	R	R G	R Y	R	R G	R Y	R	R G	R Y	R	R G	R Y	R	R G	R Y	R	-Y/Y
ROUTE 110	WB	J,K	R	R	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	- Y
BOSTON ROAD	SB	L,M	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FR
BOSTON ROAD	SB	N,P	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R
BOSTON ROAD	SB	Q	- G	- Y	- R	- R	- R	- R	- R	- R	- R	- G	- Y	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R
CARLISLE ROAD	NB	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
CARLISLE ROAD	NB	S,T	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R
PEDESTRIAN		P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
PEDESTRIAN		P3-P4	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
PEDESTRIAN		P5-P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW
PEDESTRIAN		P7-P8	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW
PEDESTRIAN		P9-P10	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
PEDESTRIAN		P11-P12	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
MINIMUM INTERVAL			6			10*			6			6			6			10*			10**			6			33			EMERGENCY ONLY
VEHICLE EXTENSION			3			3			3			3			3			3			3			2			3			
MAXIMUM 1			20			40			15			20			20			40			20			15			10			
MAXIMUM 2			32			36			16			35			17			33			18			25			35			
YELLOW CLEARANCE				4			4			4			4			4			4			4			4			4		
RED CLEARANCE					3			3			3			3			3			3			3			3			3	
WALK			7			7									7			7									7			
PEDESTRIAN CLEARANCE			8			30									26			11									26			
RECALL			OFF			OFF			OFF			OFF			OFF			OFF			OFF			OFF			OFF			
DETECTOR			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			

PRE-EMPTION PHASING AND PRIORITY

PREEMPT ØA - D1			PREEMPT ØB - D2			PREEMPT ØC - D3			PREEMPT ØD - D4		
28	29	30	31	32	33	34	35	36	34	35	36
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R
DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
*			*			*			*		
	4			4			4			4	
		3			3			3			3
-			-			-			-		
-			-			-			-		
Ø1&Ø6			Ø2&Ø5			Ø4&Ø7			Ø3&Ø8		

SEQUENCE & TIMING NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGED IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. THE RIGHT-OF-WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES. IF CALLS EXIST ON ALL PHASES, THE RIGHT-OF-WAY SHALL BE ASSIGNED IN ACCORDANCE WITH THE PREFERENTIAL SEQUENCE.
3. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.28 - 4D.31.
4. MAXIMUM 1 = MON-FRI 6:00 AM -9:00 AM.

* UPON PEDESTRIAN PUSH BUTTON ACTIVATION, THE MINIMUM GREEN SHALL BE 36 SECONDS.
**UPON PEDESTRIAN PUSH BUTTON ACTIVATION, THE MINIMUM GREEN SHALL BE 19 SECONDS.

609035_HDT3(DETOUR).DWG Plotted on 17-May-2024 8:39 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	60	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 1 OF 11

609035_HD10\UTILITY PLANS\ (COLOR).DWG Plotted on 17-May-2024 8:41 AM

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
78	DMH	23+31.0	9.0' LT	398.99	394.40 (82) 394.40 (80) 394.90 (79)	393.90	5' DIAMETER
79	CB	23+27.0	16.0' RT	398.87	-	394.98	4' SUMP W/ HOOD
80	DMH	23+27.3	21.0' LT	398.92	395.00 (EXIST) 395.90 (81)	394.90	CIT EXIST CB TO DMH CONTRACTOR TO VERIFY ELEV
81	CBCI	23+20.0	17.3' RT	398.85	-	396.00	DOUBLE CB 4' SUMP W/ HOOD
82	DMH	22+27.7	6.0' LT	399.57	395.25 (83) 395.25 (84)	395.15	
83	CBCI	21+80.2	16.0' RT	399.55	-	395.55	4' SUMP W/ HOOD
84	CBCI	22+19.0	40.7' RT	399.80	-	395.80	DOUBLE CB 4' SUMP W/ HOOD
85	DMH	12+84.2	17.7' LT	398.98	395.20 (86)	395.20 (EXIST)	REM EXIST CB CONTRACTOR TO VERIFY ELEV
86	CBCI	12+77.6	20.0' LT	399.04	-	395.26	4' SUMP W/ HOOD
87	REMOD CB	11+84.4	24.2' RT	400.89	-	397.33	
88	EXIST CB	11+80.4	34.5' RT	401.07	397.25 (87)	397.10 (EXIST)	ADJ CONTRACTOR TO VERIFY ELEV

N

LIMIT OF WORK
STA 14+25
N3036894.0183
E672655.4630

MAIN ST

LINCOLN ST

BOSTON RD

CONNELL DR

HILDRETH ST

1896 COUNTY LAYOUT

1899 COUNTY LAYOUT

1935 TOWN LAYOUT

N/F
WESTFORD HISTORICAL SOCIETY, INC.
10 LINCOLN STREET
MAP–LOT 055 0012 0000
BK–PG 9792–167
BK–PG 19324–138

N/F
TOWN OF WESTFORD
MAIN STREET
MAP–LOT 059 0001 0000
BK–PG 0240–127

N/F
FIRST PARISH CHURCH
UNITED OF WESTFORD
48 MAIN STREET
MAP–LOT 059 0017 0000
BK–PG 1585–454

N/F
CHRISTOPHER CARPENTER &
STACY CARPENTER
44 MAIN STREET
MAP–LOT 059 0011 0000
BK–PG 31321–124

N/F
JAMES D. ROBERTS
HILDRETH STREET
MAP–LOT 059 0003 0000
CERT NO. 39045
LCC NO. 17070
BK–PG 198–91

N/F
TOWN OF WESTFORD
LOT 4 BOSTON ROAD
MAP–LOT 059 0002 0000
BK–PG 1404–530

N/F
JAMES D. ROBERTS
1 HILDRETH STREET
MAP–LOT 055 0007 0000
CERT NO. 39045
LCC NO. 17070
BK–PG 198–91

N/F
INEZ CHESHIRE BUCHKO
JUSTIN DANIEL BORICK
2 HILDRETH STREET
MAP–LOT 055 0041 0000
BK–PG 36233–188

ADJ WG
REM CB
PROP 3' - 12" HDPE @ 2.0%
ADJ WG
RET HYD
PROP 12" X 12" TEE
PROP 2 - 12" GATE VALVE
PROP 12" COUPLING
RET ULT #43-120
REM EX TEE
PROP 8' - 12" DI WATER LINE
PROP 2 - 12" COUPLINGS
R&D 2 - 8" WG
PROP 8" CI PLUG
20+00
RET UPL #43-121
RET GG
LIMIT OF WORK
STA 10+60
N3036779.9180
E672310.9816
RET ULT #122
ADJ TMH (BO)
PROP TEMP EASEMENT
RET UPL #2
ADJ TMH (BO)
PROP 50' - 12" HDPE @ 0.6%
REM EX 4" CI WATER LINE
PROP 4" CI PLUG
PROP 12" DI WATER MAIN (TYP)
ABAN 4" CI WATER LINE CLOSE VALVE, R&D BOX
PROP 12" 11.25° BEND
PROP 12" 22.5° BEND
ADJ CB
PROP 8' - 12" HDPE @ 1.0%
RET UPL #31-121 & UPL #30-121
PROJECT BEGIN
STA 20+00
N3036806.9111
E672448.1959
ADJ GG (BO)
ADJ CB
PROP 4' - 12" HDPE @ 2.0%
R&S HYD
R&D WG
RET ULT #5
PROP HYD ASSEMBLY
PROP 31' - 6" DI
PROP 100' - 12" HDPE @ 0.8%
RET FOUNTAIN
PROP METER BOX
R&S METER BOX
RET UPL #3
REM CB
REM EXIST 12" CPP
PROP 44' - 12" HDPE @ 1.3%
ABAN & PLUG
PROP 12" X 6" TEE
6" GATE VALVE
PROP 1" PLASTIC WATER PIPE
W/ CURB STOP
& CORPORATION (TYP)
ABAN CB & PIPE
REM DMH
PROP 3' - 12" HDPE @ 3.3%
REM EX PIPE
PROP 25' - 15" HDPE @2.0%
EXIST FIBER
TO BE RELOCATED
(BO-VZ BUSINESS)
(SEE NOTE 4)
PROP 8" COUPLING
PROP 201' - 18" HDPE @ 0.6%
PROP TEMP EASEMENT
PROP PUE
PROP 8" 22.5° BEND
ADJ GG (BO)
R&S HYD
RELOC UPL #6 (BO)
PROP 15' GUY (BO)
PROP GND EL = 398.7
PROP PUE
R&S WG
PROP TEMP EASEMENT
PROP 12" X 8" ANCHOR CROSS
PROP 2 - 12" GATE VALVE
PROP 2 - 8" GATE VALVE
R&S WG
PROP 8"X4" REDUCER
PROP 4" COUPLING
ADJ GG (BO)
PROP TREE TRIMMING
STA 24+08 TO
STA 25+39

CONTINUED ON SHEET NO. 61

EXISTING INVERT TABLE

CB1 RIM=400.37' I=397.6(A)12"CPP I=397.5(B)12"CPP	CB5 RIM=398.31' I=395.2(12"CPP) SUMP=394.3	DMH1 RIM=399.76' I=397.2(A)8"DI I=396.0(B)8"DI SUMP=395.6
CB3 RIM=399.24' I=397.5(8"DI) SUMP=394.8	CB6 RIM=398.92' I=395.0(A)12"CPP I=394.9(B)12"CPP SUMP=393.8	
CB4 RIM=398.89' I=395.9(A)12"CPP I=395.2(B)12"CPP SUMP=392.9	CB3J RIM=399.97' I=397.1(12"DI) SUMP=396.5	

UTILITY NOTES:

1. THE EXIST 12" WATER LINE TO BE ABANDONED SHALL BE FILLED WITH CONTROLLED DENSITY FILL.
2. ALL EXISTING WATER SERVICES SHALL BE ABANDONED AND ALL EXISTING CURB STOPS SHALL BE REMOVED.
3. THE EXISTING VERIZON-OWNED DIRECT BURIED COPPER CABLE ALONG THE NORTHEAST SIDE OF BOSTON ROAD BETWEEN CROWN ROAD TO THE LIMIT OF WORK (STA 75+50) HAS BEEN CONFIRMED ABANDONED BY VERIZON. IF THE CABLE INTERFERES WITH CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS ALLOWED TO REMOVE THE CABLE AS NECESSARY.
4. THE EXISTING UNDERGROUND VERIZON BUSINESS-OWNED FIBER-OPTIC CABLE ALONG THE WEST SIDE OF BOSTON ROAD BETWEEN WESTFORD TOWN COMMON TO UPL 41 WILL BE RELOCATED BY VERIZON BUSINESS TO THE EXISTING VERIZON-OWNED 4" BFD/PVC TELEPHONE DUCTS. THE EXISTING FIBER CONDUIT IS ENCASED IN CONCRETE WITH A DEPTH TYPICALLY BETWEEN 9" AND 14" BELOW EXISTING ROADWAY GRADE. THE EXISTING CONCRETE DUCT SHALL BE REMOVED AFTER THE FIBER-OPTIC CABLE HAS BEEN RELOCATED AND PRIOR TO COMMENCING RECLAMATION OPERATIONS OR AS DIRECTED BY THE ENGINEER.

0 20 50 100

SCALE: 1" = 20'

N

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
65	DMH	30+05.0	6.0' RT	392.29	388.10 (67) 388.38 (66)	388.10	5' DIAMETER 1' FLAT TOP
66	CB	30+03.3	20.4' RT	391.98	388.75 (SUB)	388.48 388.75 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
67	DMH	29+07.7	5.9' RT	394.40	390.10 (70) 390.60 (69) 390.60 (68)	390.10	5' DIAMETER 1' FLAT TOP
68	CB	29+06.4	16.0' LT	394.22	-	390.70	4' SUMP W/ HOOD
69	CB	29+05.7	21.9' RT	394.06	391.00 (SUB)	390.70 391.00 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
70	DMH	27+33.0	6.3' RT	396.69	391.20 (72) 392.24 (71)	391.20	
71	CBCI	27+30.5	16.7' RT	396.45	392.65 (SUB)	392.45 392.65 (SUB)	DOUBLE CB - 4' SUMP W/ HOOD
72	DMH	26+36.3	5.2' RT	397.34	392.20 (75) 392.90 (74) 392.68 (73)	391.70	5' DIAMETER
73	CBCI	26+33.7	16.0' LT	397.14	-	393.04	4' SUMP W/ HOOD
74	CB	26+31.0	21.6' RT	397.10	393.30 (SUB)	393.10 393.30 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
75	DMH	25+34.3	5.6' RT	397.98	392.70 (78) 393.13 (77) 393.70 (76)	392.70	
76	CBCI	25+32.1	16.3' RT	397.74	-	393.74 394.00 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
77	CBCI	25+29.4	16.0' LT	397.80	-	393.30	4' SUMP W/ HOOD

CONTINUED ON SHEET NO. 60

CONTINUED ON SHEET NO. 62

N/F
TOWN OF WESTFORD
2 BOSTON ROAD
MAP–LOT 055 0013 0000
BK–PG 0558–0227

N/F
SCOTT A. BRANDSGAARD &
JULIE R. TENINBAUM BRANDSGAARD
6 BOSTON ROAD
MAP–LOT 055 0014 000
BK–PG 28975–239

N/F
NEWELL F. TILLMAN,
TRUSTEE OF THE NEWELL
FREDERICK TILLMAN LIVING TRUST
8 BOSTON ROAD
MAP–LOT 055 0015 0000
BK–PG 28598–82

N/F
DAVID ALLAN KEELE
KRISTEN L. KEELE
10 BOSTON ROAD
MAP–LOT 055 0016 0000
BK–PG 8375–0213

N/F
ANDREW J. MACBETH
DEBORAH WOLFE MACBETH
12 BOSTON ROAD
MAP–LOT 055 0017 0000
BK–PG 11720–195

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
14 BOSTON ROAD
MAP–LOT 055 0018 0000
BK–PG 2297–0496

BOSTON RD

PROP TEMP EASEMENT
PROP PUE
RELOC UPL #6-1 (BO)
PROP GND EL = 398.4
PROP 17' - 12" HDPE @ 1.0%
PROP TEMP EASEMENT
PROP 1" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION (TYP)
ADJ GG (BO)
PROP 18' - 12" HDPE @ 2.0%
PROP 95' - 24" HDPE @ 0.5%
ADJ GG (BO)
ADJ GG (BO)
RET LP
PROP 17' -12" HDPE @ 0.6%
ADJ GG (BO)
PROP 93' - 24" HDPE @ 2.1%
ADJ TMH (BO)
PROP 170' - 24" HDPE @ 0.6%
ADJ GG (BO)
RET LP
REM CB
ABAN & PLUG
PROP 6' - 12" HDPE @ 0.7%
PROP 7' - 12" HDPE @ 2.9%
ADJ GG (BO)
PROP 99' - 8" SUBDRAIN @ 0.9%
REM EX CPP
PROP 99' - 18" HDPE @ 0.5%
PROP 8' - 6" DI
REM CB
PROP 8' - 12" HDPE @ 2.6%
ABAN EX 12" CLDI WATER LINE
REM EX 4" CI WATER LINE
PROP HYD ASSEMBLY
PROP 12" X 6" TEE
6" GATE VALVE
PROP 78' - 8" SUBDRAIN @ 1.8%
EXIST FIBER TO BE RELOCATED (BO-VZ BUSINESS, SEE NOTE 4 ON SHEET 60)
UPGRADE IN PLACE UPL #9
PROP TEMP EASEMENT
1899 COUNTY LAYOUT
PROP 12" DI WATER MAIN (TYP)
PROP 199' - 8" SUBDRAIN @ 1.2%
ADJ GG (BO)
RELOC UPL #4-10 (BO)
PROP 15' GUY (BO)
PROP 4" CI PLUG
REM CB
PROP 11' - 12" HDPE @ 0.9%
PROP PUE
PROP 10' - 12" HDPE @ 1.0%
RET ULT #11
CAP AND ABAN EX 4" CI WATER LINE (STA 29+25 TO 35+00)
PROP 93' - 24" HDPE @ 2.1%
ADJ GG (BO)
PROP 193' - 8" SUBDRAIN @ 2.3%
PROP TREE TRIMMING STA 24+08 TO STA 25+39
UPGRADE IN PLACE UPL #7 (BO)
PROP TEMP SUPPORT (BO)
UPGRADE IN PLACE ULT #8 (BO)
PROP TEMP SUPPORT (BO)
R&R STREET LIGHT

N/F
WESLEY A. OLSON &
KELLY H. OLSON
5 BOSTON ROAD
MAP–LOT 055 0040 0000
BK–PG 21587–244

N/F
7–9 BOSTON ROAD
CONDOMINIUM TRUST
7–9 BOSTON ROAD
MAP–LOT 055 0039 0002
BK–PG 9901–230

N/F
ROBERT S. JEFFERIES
ANN R. JEFFERIES
11 BOSTON ROAD
MAP–LOT 055 0038 0000
BK–PG 6779–0247

N/F
ALLEN T. HORHOTA
AMY E. BAILEY
13 BOSTON ROAD
MAP–LOT 055 0037 0000
LCC NO. 5798
CERT NO. 39942
BK–PG 202–143

N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP–LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK–PG 197–47

N/F
DONNA J. GOODMAN, TRUSTEE
OF THE DONNA J. GOODMAN
FAMILY REALTY TRUST
7A BOSTON ROAD
BK–PG 28558–128

N/F
JAMIE LEE MURRAY
KATIE–LEE MARIE MCLEOD
FAMILY REALTY TRUST
9B BOSTON ROAD
BK–PG 33547–257

EXISTING INVERT TABLE

CB7
RIM=397.14'
i=394.2(12"CPP)
SUMP=393.3

CB10
RIM=393.46'
i=390.4(12"CPP)
SUMP=390.4

CB8
RIM=396.62'
(NO VISIBLE PIPES)
SUMP=393.8

CB9
RIM=396.20'
(NO VISIBLE PIPES)
SUMP=392.9

0 20 50 100

SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	62	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 3 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:41 AM

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
52	DMH	35+82.4	5.1' RT	379.58	374.40 (55) 374.40 (54) 374.40 (53)	374.40	5' DIAMETER
53	CBCI	35+82.9	16.0' LT	379.35	-	374.65	4' SUMP W/ HOOD OFFSET TOP
54	CB	35+75.3	17.6' RT	379.16	374.95 (SUB)	374.68 374.95 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
55	DMH	34+86.2	5.2' RT	381.70	376.77 (57) 377.40 (56)	376.70	5' DIAMETER
56	CB	34+85.0	16.0' RT	381.46	377.75 (SUB)	377.46 377.75 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
57	DMH	33+95.3	5.4' RT	383.70	379.15 (60) 379.17 (59) 379.17 (58)	379.05	5' DIAMETER 1' FLAT TOP
58	CB	33+94.1	16.0' RT	383.46	379.55 (SUB)	379.29 379.55 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
59	CBCI	33+92.5	16'.0 LT	383.54	-	379.54	4' SUMP W/ HOOD
60	DMH	32+53.7	6.1' RT	386.80	382.50 (61) 382.40 (62)	382.35	5' DIAMETER 1' FLAT TOP
61	CB	32+52.8	16.0' RT	386.57	382.80 (SUB)	382.57 382.80 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
62	DMH	31+01.6	6.2' RT	390.16	386.10 (66) 386.10 (64) 386.10 (63)	386.00	5' DIAMETER 1' FLAT TOP
63	CB	31+00.3	16.0' LT	389.98	-	386.20	4' SUMP W/ HOOD
64	CB	31+00.3	16.0' RT	389.91	386.30 (SUB)	386.15 386.30 (SUB)	DOUBLE CB 4' SUMP W/ HOOD

N/F
DANIEL H. DRINKWATER
MARIA A. MARTIN
16 BOSTON ROAD
MAP–LOT 055 0019 0000
BK–PG 10894–042
#16

N/F
WILLIAM MORGAN STAIR
CYNTHIA JO. BEELER
20 BOSTON ROAD
MAP–LOT 055 0021 0000
BK–PG 11162–215
#20

N/F
BRIAN C. MCDONALD
NICOLE A. MCDONALD
22 BOSTON ROAD
MAP–LOT 055 0022 0000
BK–PG 30208–17

N/F
ROBERT J WASKIEWICZ
24 BOSTON ROAD
MAP–LOT 055 0023 0000
BK–PG 31571–155
#24

N/F
BRIAN G. ALCORN
ANDREA REID GRAHAM
18 BOSTON ROAD
MAP–LOT 055 0020 0000
BK–PG 25798–151

ADJ GG (BO)
PROP 17' - 12" HDPE @ 0.6%
ABAN & PLUG EX 12" DI
REM CB
PROP 12" GATE VALVE
PROP 150' - 24" HDPE @ 2.4%
PROP 140' - 24" HDPE @ 2.3%
PROP 1" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION (TYP)
ADJ TMH (BO)
RET GG
PROP 18' - 12" HDPE @ 2.0%
REM EX 12" CMP
RET LP
ADJ GG (BO)
PROP 15' - 12" HDPE @ 1.7%
REM CB
REM EX 12" DI
ADJ GG (BO)
REM EX 12" CMP
PROP 12" X 4" TEE
TIE INTO EXIST 4" SERVICE
PROP 67' - 24" HDPE @ 2.5%
PROP 95' - 24" HDPE @ 2.4%
PROP 95' - 24" HDPE @ 2.4%

BOSTON RD

PROP 93' - 24" HDPE @ 2.1%
ADJ GG (BO)
PROP 193' - 8" SUBDRAIN @ 2.3%
REM CB
ADJ GG (BO)
REM EX 12" PVC
PROP 6' - 12" HDPE @ 0.8%
RET UPL #12 PROP TEMP SUPPORT (BO)
PROP 6' - 6" DI
PROP HYD ASSEMBLY R&S EX HYD
PROP 12" X 6" TEE 6" GATE VALVE
RET GG
REM EX 12" CLDI WATER LINE (STA 30+50 TO STA 34+00)
CAP AND ABAN EX 4" CI WATER LINE (STA 29+00 TO STA 35+00)
RET ULT #13 PROP TEMP SUPPORT (BO)
PROP 6' - 12" HDPE @ 1.2%
PROP 291' - 8" SUBDRAIN @ 2.2%
PROP 6' - 15" HDPE @ 2.0%
EXIST FIBER TO BE RELOCATED (BO-VZ BUSINESS, SEE NOTE 4 ON SHEET 60)
PROP 178' - 8" SUBDRAIN @ 2.6%
PROP 12" DI WATER MAIN (TYP)
RET UPL #14 PROP TEMP SUPPORT (BO)
ADJ GG (BO)
PROP 4" DI CAP
PROP 6' - 12" HDPE @ 1.0%
ABAN EX 12" CLDI WATER LINE
REM EX 4" CI WATER LINE
REM CB
RET ULT #4-15 PROP TEMP SUPPORT (BO)
ADJ GG (BO)
PROP 11' - 15" HDPE @ 2.6%

N/F
ROBERT KRANKEWICZ
ELIZABETH O'KEEFE
15 BOSTON ROAD
MAP–LOT 055 0036 0000
LCC NO. 5798
CERT NO. 38823
BK–PG 197–47
#15

N/F
MICHAEL SCHIAVONE
KELLY SCHIAVONE
17 BOSTON ROAD
MAP–LOT 055 0035 0000
LCC NO. 5798
CERT NO. 43857
BK–PG 222–80
#17

N/F
MICHAEL B. CHISHOLM
KATHLEEN L. CHISHOLM
19 BOSTON ROAD
MAP–LOT 055 0034 0000
LCC NO.5798
CERT NO. 32921
BK–PG 167–241
#19

N/F
MYRLANDE EMANUEL
YOURI EMANUEL
21 BOSTON ROAD
MAP–LOT 055 0033 0000
BK–PG 36205–292
#21

N/F
KIMBERLY O. SCHWAB
23 BOSTON ROAD
MAP–LOT 055 0032 0000
BK–PG 28551–267
#23

N/F
MELISSA G HENNESSY
25 BOSTON ROAD
MAP–LOT 055 0031 0000
BK–PG 32262–185
#25

PASSAGE WAY
PLAN BK–PG 28–66

EXISTING INVERT TABLE

CB11
RIM=389.50'
I=386.0(A)12"CPP
I=385.9(B)12"PVC
SUMP=384.7

CB12
RIM=388.11'
I=384.6(A)12"DI
I=384.2(B)12"DI
SUMP=381.4

CB13
RIM=378.92'
NO VISIBLE PIPES
SUMP=376.4

CB14
RIM=378.76'
I=374.7(A)12"CMP
I=374.4(B)12"CMP
I=374.4(C)12"CMP
SUMP=373.9

CONTINUED ON SHEET NO. 61
CONTINUED ON SHEET NO. 63

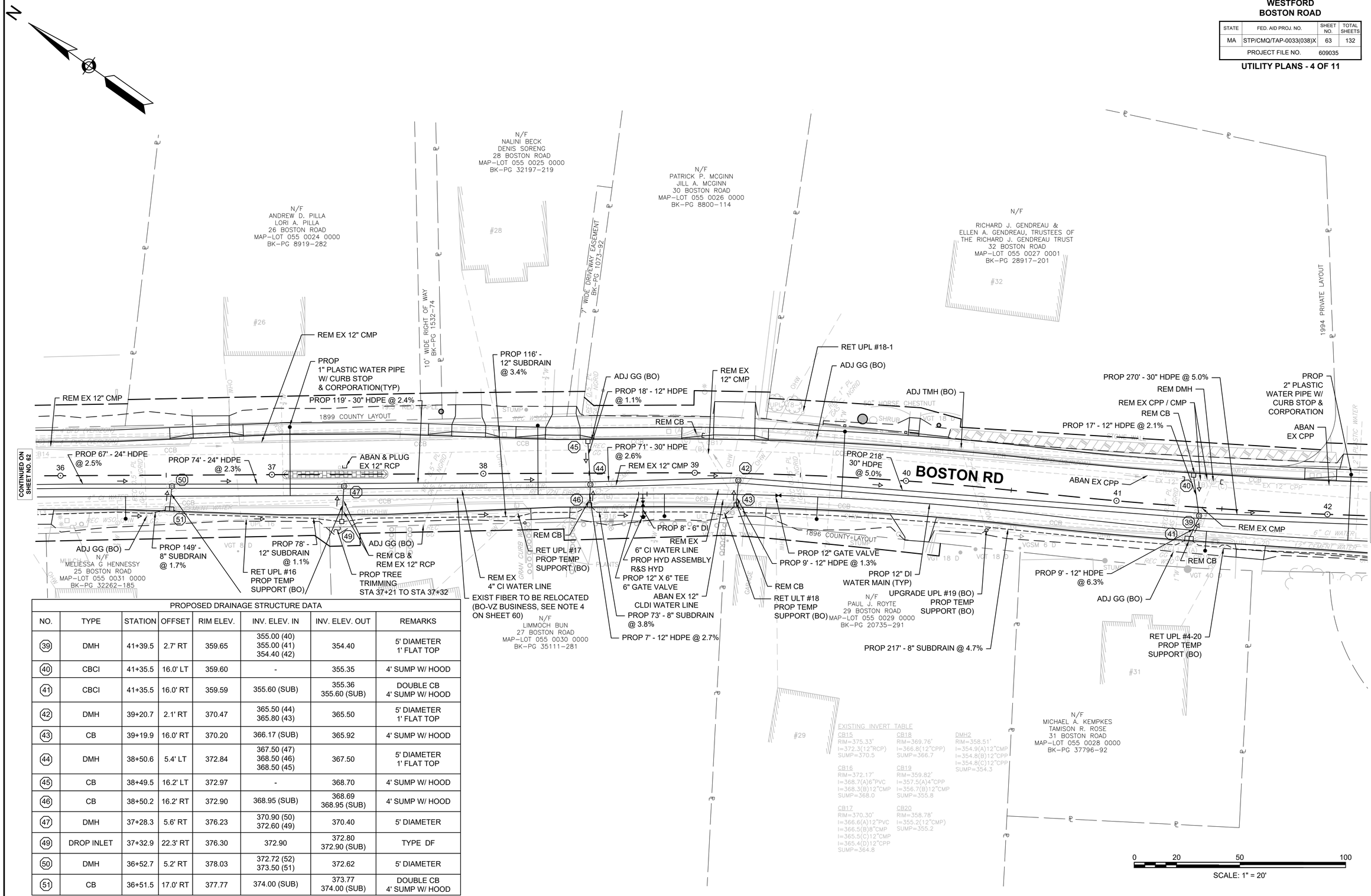
0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	63	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 4 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:41 AM



PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
39	DMH	41+39.5	2.7' RT	359.65	355.00 (40) 355.00 (41) 354.40 (42)	354.40	5' DIAMETER 1' FLAT TOP
40	CBCI	41+35.5	16.0' LT	359.60	-	355.35	4' SUMP W/ HOOD
41	CBCI	41+35.5	16.0' RT	359.59	355.60 (SUB)	355.36 355.60 (SUB)	DOUBLE CB 4' SUMP W/ HOOD
42	DMH	39+20.7	2.1' RT	370.47	365.50 (44) 365.80 (43)	365.50	5' DIAMETER 1' FLAT TOP
43	CB	39+19.9	16.0' RT	370.20	366.17 (SUB)	365.92	4' SUMP W/ HOOD
44	DMH	38+50.6	5.4' LT	372.84	367.50 (47) 368.50 (46) 368.50 (45)	367.50	5' DIAMETER 1' FLAT TOP
45	CB	38+49.5	16.2' LT	372.97	-	368.70	4' SUMP W/ HOOD
46	CB	38+50.2	16.2' RT	372.90	368.95 (SUB)	368.69 368.95 (SUB)	4' SUMP W/ HOOD
47	DMH	37+28.3	5.6' RT	376.23	370.90 (50) 372.60 (49)	370.40	5' DIAMETER
49	DROP INLET	37+32.9	22.3' RT	376.30	372.90	372.80 372.90 (SUB)	TYPE DF
50	DMH	36+52.7	5.2' RT	378.03	372.72 (52) 373.50 (51)	372.62	5' DIAMETER
51	CB	36+51.5	17.0' RT	377.77	374.00 (SUB)	373.77 374.00 (SUB)	DOUBLE CB 4' SUMP W/ HOOD

NOTE:
THERE IS NO DRAINAGE STRUCTURE NUMBER 48.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	64	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 5 OF 11

609035_HD10\UTILITY PLANS\ (COLOR).DWG Plotted on 17-May-2024 8:42 AM

N

APPROXIMATE 20' DRAIN EASEMENT (SEE DEED PLAN 96-43)

LIMIT OF WORK
STA 82+57
N3034927.2634
E674152.8645

N/F
DAVID B. ANDERSON & MARY E. ANDERSON, TRUSTEE OF THE ANDERSON NOMINEE TRUST
4 CROWN ROAD
MAP-LOT 021 0111 0000
BK-PG 11298-56

UPGRADE UPL #194-2 TO 40' POLE IN PLACE (BO)

ADJ HYD

PROP TEMP EASEMENT

N/F
JOHN RUSSELL SCOTT, JR.
36 BOSTON ROAD
MAP-LOT 021 0110 0000
BK-PG 25831-51

UPGRADE UPL #194-1 TO 45' POLE IN PLACE (BO)
R&R RISER & SWEEPS DUE TO ±2' GRADE RISE (BO-VZ)

SEE NOTE 3 ON SHEET 60

PROP 18' - 12" HDPE @ 4.4%

PROP 2" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION

ABAN EX CPP

PROP 1" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION (TYP)

ADJ GG (BO)

CAP AND ABAN 6" WATER MAIN

R&D WG

PROP 266' - 30" HDPE @ 3.7%

ADJ GG (BO)

ADJ GG (BO)

R&D WG

PROP 138' - 30" HDPE @ 4.1%

PROP 96' - 30" HDPE @ 4.3%

PROP 12' - 6" DI

PROP HYD ASSEMBLY

N/F
ROBERT M. HICKS, INC., TRUSTEE OF THE ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP-LOT 021 0109 0001
BK-PG 7473-0318

RELOC UPL #21 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT (BO)

PROP PUE

PROP 12" X 6" TEE
6" GATE VALVE

PROP TEMP EASEMENT

PROP 284' - 12" SUBDRAIN @ 5.0%

PROP TREE TRIMMING FROM STA 42+88 TO STA 47+82

PROP 16' - 15" HDPE @ 1.3%

RELOC ULT #22 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT (BO)
R&R STREET LIGHT

PROP 12" DI WATER MAIN (TYP)

PROP
1 - 12" X 6" TEE
1 - 6" GATE VALVE
2 - 12" GATE VALVES
1 - 6" COUPLING

PROP PUE

PROP 224' - 12" SUBDRAIN @ 4.0%

RELOC UP #4-23 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT (BO)
RELOCATE RISER (BO-VZ)
PROP GND EL = 340.9

EXISTING INVERT TABLE
CB21
RIM=333.30'
I=330.3(12"CPP)
SUMP=328.5

EXIST FIBER TO BE RELOCATED (BO-VZ BUSINESS, SEE NOTE 4 ON SHEET 60)

ADJ TMH (BO)

REM EX 6" CI WATER LINE

ABANDON EX 12" CLDI WATER LINE

SLOPE CONSTRUCTION BETWEEN STA 45+00 LT TO STA 47+50 LT SHALL BE COMPLETED PRIOR TO INSTALLATION OF PROPOSED DRAINAGE

SLOPE CUT BETWEEN STA 46+00 TO STA 51+00 RT SHALL BE COMPLETED PRIOR TO RELOCATING UTILITY POLES

RELOC UPL #24 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT ON EXIST UPL #24 (BO)
PROP GND EL = 336.5

PROP PUE

PROP 8' - 12" HDPE @ 10.0%

PROP 12" X 6" TEE
PROP 6" GATE VALVE

PROP 8' - 6" DI
PROP HYD ASSEMBLY

PROP 12" 45° BEND

PROP 24" HDPE FLARED END

PROP 42' - 24" HDPE @ 0.6%

R&S HYD

REM PIPE

PROP 34' - 36" HDPE @ 2.1%

PROP 15' - 12" HDPE @ 0.7%

PROP SIGHT LINE EASEMENT

PROP 12' - 30" HDPE @ 1.3%

REM CB

PLUG EXIST 12" CPP

PROP 160' - 30" HDPE @ 0.7%

ABAN EX 12" CPP

RELOC UPL #4-25 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT ON EXIST UPL#4-25 (BO)
R&R STREET LIGHT
PROP GND EL = 334.1

PROP PUE

PROP 168' - 12" SUBDRAIN @ 2.8%

N/F
NAGA VENKATA LAKSHMI SANDEEP INAMPUDI & PALLAVI DORADLA
1 CROWN ROAD
MAP-LOT 021 0114 0000
BK-PG 35945-125

PROP TEMP EASEMENT

PROP SEDIMENT FOREBAY PAVING (SEE SHEET 75)

PROP SEDIMENT CONTROL BARRIER (TYP)

PROP RIPRAP SPILLWAY

PROP PERM DRAINAGE EASEMENT

ADJ WG

PROP: 12" x 8" TEE 1' - 8" DI 1 - 8" COUPLING

25' WIDE TRAIL EASEMENT PLAN BK-PG 187-86

MAMIE LN

CROWN RD

BOSTON RD

1899 COUNTY LAYOUT

1962 TOWN LAYOUT

1994 PRIVATE LAYOUT

CONTINUED ON SHEET NO. 63

CONTINUED ON SHEET NO. 65

0 20 50 100

SCALE: 1" = 20'

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
31	DMH	46+89.2	4.5' RT	335.48	329.89 (33) 329.00 (34)	327.70 (32) 327.90 (29)	7' DIAMETER
32	OUTLET	47+00.8	34.4' LT	-	-	327.45	24" FES
33	CBCI	46+87.6	16.0' RT	335.69	-	330.69 331.94 (SUB)	4' SUMP W/ HOOD
34	DMH	46+51.3	4.4' RT	336.31	330.82 (34A) 332.40 (35) 329.70 (35A)	329.70	7' DIAMETER
34A	DMH	45+50.8	4.4' RT	339.61	334.94 (36)	334.94	6' DIAMETER
35	CBCI	46+50.0	16.0' LT	335.63	-	332.50	4' SUMP W/ HOOD
35A	DROP INLET	46+44.7	18.6' RT	336.60	332.60 (SUB)	329.85	TYPE A
36	DMH	44+09.5	2.9' RT	346.20	341.10 (39) 341.10 (38) 341.10 (37)	340.60	6' DIAMETER
37	CB	43+97.3	18.0' LT	346.48	-	341.90	4' SUMP W/ HOOD
38	CBCI	44+21.0	19.4' RT	345.42	341.55 (SUB)	341.30 341.55 (SUB)	4' SUMP W/ HOOD

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	65	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 6 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:42 AM

PROPOSED DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
24	DMH	52+52.8	5.5' RT	318.70	313.50 (24B) 313.50 (25)	313.50	5' DIAMETER 1' FLAT TOP
24A	CBCI	52+21.0	16.1' RT	320.58	316.83 (SUB)	316.58 316.83 (SUB)	4' SUMP W/ HOOD
24B	DMH	52+22.1	2.5' RT	320.27	316.00 (24A) 315.00 (26)	315.00	6' DIAMETER 1' FLAT TOP
25	CBCI	52+50.0	16.0' LT	318.07	-	314.00	4' SUMP W/ HOOD OFFSET TOP
26	DMH	50+43.7	4.3' RT	328.00	322.80 (29) 323.00 (28) 323.00 (27)	322.80	6' DIAMETER 1' FLAT TOP
27	CB	50+40.0	16.0' LT	327.01	-	323.50	4' SUMP W/ HOOD
28	CBCI	50+40.0	16.0' RT	328.31	323.75 (SUB)	323.50 323.75 (SUB)	4' SUMP W/ HOOD
29	DMH	48+52.2	1.9' RT	332.29	326.81 (31) 327.40 (30) 326.75 (30A)	326.75	5' DIAMETER 1' FLAT TOP
30	CBCI	48+50.0	16.0' LT	331.70	-	327.75	4' SUMP W/ HOOD
30A	CBCI	48+52.2	16.0' RT	332.56	327.15 (SUB)	326.90 327.15 (SUB)	4' SUMP W/ HOOD

N/F
PETER J POZERSKI
JESSICA L POZERSKI
44 BOSTON ROAD
MAP–LOT 021 0115 0000
BK–PG 31062–275

N/F
RADHIKA SRIRAM AND MANISH GANDHI
46 BOSTON ROAD
MAP–LOT 022 0114 0001
BK–PG 37632–74

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP–LOT 022 0114 0002
BK–PG 31507–70

N/F
SHIRLEY E. MACDOUGALL
47 BOSTON ROAD
MAP–LOT 022 0006 0004
BK–PG 1766–318

N/F
VINU L PAUL
JUBIE VINU
49 BOSTON ROAD
MAP–LOT 022 0006 0005
BK–PG 30934–168

N/F
DANIEL L. NEWBOWER
VANESSA M. NEWBOWER
45 BOSTON ROAD
MAP–LOT 021 0107 0000
BK–PG 36268–170

N/F
JING LEI ZHANG &
JIAN PING GE
43 BOSTON ROAD
MAP–LOT 021 0108 0000
BK–PG 25112–73

N/F
ROBERT M. HICKS, INC.,
TRUSTEE OF THE
ORCHARD HILL TRUST
BLAKE'S HILL ROAD
MAP–LOT 021 0109 0001
BK–PG 7473–0318

#43 #44 #45 #46 #48

BOSTON RD

PROP 14' - 12" HDPE @ 2.5%
REM EX 6" CI WATER LINE
SEE NOTE 3 ON SHEET 60
PROP 188' - 30" HDPE @ 2.1%
PROP ¾" GAS SERVICE (BO-NGRID, SEE NOTE)
REM CB
REM EX 12" CMP/RCP
PROP 9' - 12" HDPE @ 1.7%
PROP 160' - 30" HDPE @ 0.7%
RELOC ULT #4-25 (BO)
PROP 15' GUY (BO)
R&R STREET LIGHT
PROP TEMP SUPPORT ON EXIST UPL#4-25 (BO)
PROP GND EL = 334.1
PROP PUE
PROP 168' - 12" SUBDRAIN @ 2.8%
RELOC UPL #26 (BO)
PROP 15' GUY (BO)
PROP GND EL = 331.8
PROP PUE
SLOPE CUT BETWEEN STA 46+00 TO STA 51+00 RT SHALL BE COMPLETED PRIOR TO RELOCATING UTILITY POLES
PROP 190' - 12" SUBDRAIN @1.8%
RELOC UPL #27 (BO)
PROP GUY 15' (BO)
PROP TEMP SUPPORT ON EXIST UPL #27 (BO)
PROP GND EL = 329.6
ABAN EX 12" RCP
ABAN EX 12" CLDI WATER LINE
PROP 16' - 12" HDPE @ 3.1%
PROP ¾" GAS SERVICE (BO-NGRID, SEE NOTE)
ADJ GG (BO)
PROP 12" 45° BEND
PROP 8' - 12" HDPE @ 6.3%
EXIST 6" PVC FROM #47 BOSTON ROAD TO TIE INTO PROP 8" SUBDRAIN CONTRACTOR SHALL TEST PIT TO VERIFY LOCATION OF EXIST 6" PVC
RELOC ULT #28 (BO)
PROP 15' GUY (BO)
PROP TEMP SUPPORT (BO)
R&R STREET LIGHT
EXIST FIBER TO BE RELOCATED (BO-VZ BUSINESS, SEE NOTE 4 ON SHEET 60)
REM EX 12" RCP STA 51+50 TO STA 52+30
PROP MASONRY PLUG (TYP)
PROP 28' - 30" HDPE @ 4.5%
PROP 17' - 12" HDPE @ 2.9%
ABAN EX 12" RCP
PROP 192' - 30" HDPE @ 5.9%
PROP 175' - 30" HDPE @ 4.5%
PROP 10' - 12" HDPE @ 5.8%
PROP 186' - 12" SUBDRAIN @ 3.7%
PROP 228' - 12" SUBDRAIN @ 5.7%
PROP 12" DI WATER MAIN (TYP)
UPGRADE IN PLACE TO 45' POLE UPL #29 (BO)
PROP TEMP SUPPORT (BO)
PROP 12" GATE VALVE
PROP 1" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION (TYP)
PROP 12" X 6" TEE
6" GATE VALVE
PROP 6' - 6" DI
PROP HYD ASSEMBLY
RELOC ULT #4-30 (BO)
PROP TEMP SUPPORT (BO)
R&R STREET LIGHT
PROP GND EL = 313.5
ADJ TMH (BO)

EXISTING INVERT TABLE

CB22	CB24
RIM=330.74'	RIM=325.59'
I=327.7(12"CMP)	I=322.1(A)6"PVC
SUMP=326.9	I=320.2(B)12"RCP
	I=320.1(C)12"RCP
CB23	SUMP=320.1
RIM=328.70'	
I=324.5(A)12"RCP	CB25
I=323.9(B)12"RCP	RIM=311.32'
SUMP=322.3	I=306.0(12"RCP)
	SUMP=306.0

25' WIDE EMERGENCY ACCESS EASEMENT PLAN BK–PG 197–96

NOTE:
DUE TO PROPOSED GRADING FOR SLOPE CUT, GAS SERVICE TO 45 AND 47 BOSTON ROAD SHALL BE RELAID TO OBTAIN PROPER COVER WITHIN THE LIMITS OF GRADING.

CONTINUED ON SHEET NO. 64
CONTINUED ON SHEET NO. 66

0 20 50 100
SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	66	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 7 OF 11

609035_HD10\UTILITY PLANS\ (COLOR).DWG Plotted on 17-May-2024 8:42 AM

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
14	DMH	59+35.3	3.9' RT	280.22	274.50 (17) 274.60 (16) 275.90 (15)	274.00	5' DIAMETER
15	CBCI	59+35.0	16.0' LT	280.19	-	276.00	4' SUMP W/ HOOD
16	CBCI	59+35.0	16.0' RT	280.17	275.10 (SUB)	275.00	4' SUMP W/ HOOD OFFSET TOP
17	DMH	57+99.1	3.9' RT	287.81	282.40 (18)	282.30	5' DIAMETER
18	DMH	56+79.5	4.3' RT	294.76	289.30 (20) 289.30 (19)	289.30	
19	CBCI	56+80.0	16.0' RT	294.30	290.00 (SUB)	289.75 290.00 (SUB)	4' SUMP W/ HOOD
20	DMH	55+57.3	1.9' RT	301.69	296.40 (21)	296.30	5' DIAMETER 1' FLAT TOP
21	DMH	54+47.2	6.5' RT	307.72	302.10 (24) 303.35 (23) 302.10 (22)	302.10	6' DIAMETER
22	CBCI	54+56.5	16.0' LT	307.33	-	304.00	4' SUMP W/ HOOD OFFSET TOP
23	CBCI	54+44.3	16.4' RT	307.65	303.75 (SUB)	303.50 303.75 (SUB)	4' SUMP W/ HOOD

N/F
KRISHNAKUMAR VELMURUGAN
THULASI KRISHNAKUMAR
50 BOSTON ROAD
MAP–LOT 022 0114 0000
BK–PG 27639–51

N/F
VINODKUMAR RAGHAVAN
BIJY VINODKUMAR
48 BOSTON ROAD
MAP–LOT 022 0114 0002
BK–PG 31507–70

N/F
WESTFORD GATE VALVEWAY LLC
BOSTON ROAD
MAP–LOT 022 0115 0000
BK–PG 29812–168

SEE NOTE 3 ON SHEET 60

EXIST FIBER
TO BE RELOCATED
(BO-VZ BUSINESS, SEE NOTE 4
ON SHEET 60)

ADJ GG (BO)

PROP 19' - 12" HDPE @ 10.0%

PROP
1" PLASTIC WATER PIPE
W/ CURB STOP &
CORPORATION (TYP)

REM EXIST
GUY WIRE (BO)

PROP HYD ASSEMBLY

PROP 27' - 6" DI

PROP 118' - 30" HDPE
@ 5.8%

RELOC ULT #33 (BO)
PROP 20' GUY (BO)
R&R STREET LIGHT
PROP GND EL = 294.4

RELOC UPL #34 (BO)
PROP 10' GUY (BO)
PROP 2-15' GUY (BO)
PROP GND EL = 288.3

SLOPE CONSTRUCTION BETWEEN
STA 51+00 TO STA 63+00 LT
SHALL BE COMPLETED PRIOR TO
RELOCATING UTILITY POLES AND
INSTALLATION OF PROPOSED
DRAINAGE

PROP
GUARDRAIL
EASEMENT

PROP PUE

PROP TEMP
EASEMENT

ABAN EX 12" CLDI
WATER LINE

RELOC UPL #35 (BO)
PROP GND
EL = 281.4

PROP 15' -
15" HDPE
@ 0.7%

BOSTON RD

ABAN 12" PIPE

ADJ GG (BO)

REM EX 12" RCP

REM CB

PROP 12"
22.5° BEND

R&S HYD

R&D WG

PROP 12"
22.5° BEND

ABAN 12" RCP

PROP 106' - 30" HDPE @ 5.4%

REM CB

PROP 12" 22.5° BEND

ABAN 12" RCP

PROP TREE TRIMMING
FROM STA 54+70 TO STA 56+10

UPGRADE AND
RELOC UPL #31 (BO)

PROP 4' -
12" HDPE
@ 3.8%

REM EX 12" RCP
(STA 54+18 TO 54+70)

ABAN 12" RCP

PROP 192' - 30" HDPE
@ 5.9%

PROP 12"
22.5° BEND

ADJ GG (BO)

RELOC ULT #4-30 (BO)
PROP TEMP SUPPORT (BO)
R&R STREET LIGHT
PROP GND EL = 313.5

ADJ TMH (BO)

PROP 12" X 6" TEE
6" GATE VALVE

PROP 7' - 15" HDPE @ 6.4%

PROP 224' - 10" SUBDRAIN @ 5.7%

UPGRADE UPL #32 (BO)
PROP 20' GUY (BO)

PROP PUE

PROP TEMP
EASEMENT

PROP 115' - 30" HDPE @ 6.0%

PROP 12" DI
WATER MAIN (TYP)

PROP 250' - 10" SUBDRAIN @
6.0%

PROP SLOPE EASEMENT

PROP 133' - 30" HDPE @ 5.9%

PROP 7' - 12" HDPE @ 5.7%

N/F
VINU L. PAUL
JUBIE VINU
49 BOSTON ROAD
MAP–LOT 022 0006 0005
BK–PG 30934–168

N/F
JULIETTE T. MOUNT
51 BOSTON ROAD
MAP–LOT 022 0005 0000
BK–PG 7723–0033

N/F
INHABITANTS OF THE
TOWN OF WESTFORD, MASSACHUSETTS
65 BOSTON ROAD
MAP–LOT 022 0003 0004
BK–PG 7366–211

RIGHT OF WAY
PLAN BK–PG 87–143

30' WIDE DRIVEWAY EASEMENT
PLAN BK–PG 200–37
1903 SHLO 841

EXISTING INVERT TABLE

CB25
RIM=311.32'
I=306.0(12"RCP)
SUMP=306.0

CB26
RIM=303.57'
I=299.1(A)12"RCP
I=298.9(B)12"RCP
SUMP=298.8

CB27
RIM=300.38'
I=295.6(12"RCP)
I=295.5(NVP)
SUMP=295.5

#49

#51

CONTINUED ON SHEET NO. 65

CONTINUED ON SHEET NO. 67

0 20 50 100

SCALE: 1" = 20'

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	67	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 8 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:42 AM

N

PROPOSED DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
(7)	DMH	65+47.6	1.3' LT	271.48	262.00 (10) 265.50 (9) 265.50 (8)	262.00	6' DIAMETER
(8)	CBCI	65+48.0	26.5' LT	272.08	-	265.91	4' SUMP W/ HOOD
(9)	CBCI	65+48.0	16.0' RT	270.92	-	265.99	4' SUMP W/ HOOD REM EX CB OFFSET TOP
(10)	DMH	62+39.4	6.0' RT	273.38	267.50 (13) 268.50 (12) 268.50 (11)	267.50	5' DIAMETER 1' FLAT TOP
(11)	CBCI	62+40.0	16.0' LT	272.87	-	269.00	4' SUMP W/ HOOD
(12)	CBCI	62+40.0	16.1' RT	273.43	-	268.70	4' SUMP W/ HOOD OFFSET TOP
(13)	DMH	61+40.8	1.4' RT	274.09	269.10 (14) 269.63 (EXIST)	269.10	5' DIAMETER CONTRACTOR TO VERIFY EXIST INVERT 1' FLAT TOP

NOTE:
OVERHEAD FIBER WILL RELOCATED BY VZ-BUSINESS AND SPAN UTILITY POLES BETWEEN UPL #37 TO UPL #48.

N/F
WESTFORD GATEWAY, LLC
66-68 BOSTON ROAD
MAP-LOT 022 0115 0000
BK-PG 29812-168

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP-LOT 022 0116 0000
BK-PG 29812-168

SLOPE CONSTRUCTION BETWEEN STA 51+00 TO STA 63+00 LT SHALL BE COMPLETED PRIOR TO RELOCATING UTILITY POLES AND INSTALLATION OF PROPOSED DRAINAGE

PROP TEMP EASEMENT
PROP PUE
RELOC UPL #36 (BO)
PROP GND EL = 275.1
PROP GUARDRAIL EASEMENT
R&S HYD
R&D WG
PROP 195' - 36" HDPE @ 2.5%
PROP 12" GATE VALVE
REMOVE 18" RCP CULVERT NORTH OF PROPOSED MANHOLE
RET EXIST 18" RCP
PROP 93' - 36" HDPE @ 1.6%
RELOC UPL #37 (BO)
PROP 12' GUY (BO)
R&R SOLAR PANEL & TRANSMITTER
PROP GND EL = 273.9
PROP 17' - 12" HDPE @ 2.9%
PROP OHW FOR FIBER RELOCATION (BO-VZ BUSINESS)
PROP 12" X 6" TEE
6" GATE VALVE
PROP 15' GUY (BO)
PROP PUE
RET UPL #37-1
PROP 15' GUY (BO)
RELOC UPL #38 (BO)
EXIST FIBER TO BE RELOCATED (BO-VZ BUSINESS, SEE NOTE 4 ON SHEET 60)
PROP HYD ASSEMBLY
PROP 3' - 6" DI
PROP 12" DI WATER MAIN (TYP)
RET UPL #37-3
PROP 5' - 12" HDPE @ 4.0%
RET TMH
PROP CONDUIT FOR FIBER RELOCATION (BO-VZ BUSINESS)
PROP TEMP EASEMENT (TYP, UNLESS OTHERWISE NOTED)
ABAN EX 12" CLDI WATER LINE
RELOC ULT #39 (BO)
R&R STREET LIGHT
PROP GND EL = 272.5
RELOCATE TEMP SERVICE STANCHION (PAID UNDER ITEM 813.812)
RELOC UPL #40 (BO)
PROP 15' GUY (BO)
PROP GND EL = 271.8
PROP 1" PLASTIC WATER PIPE W/ CURB STOP & CORPORATION (TYP)
PROP PUE
PROP 22' - 12" HDPE @ 1.8%
SEE NOTE 3 ON SHEET 60
PROP 308' - 36" HDPE @ 1.8%
ADJ CB
RET DMH
PROP 14' - 12" HDPE @3.5%
REM CB

CONTINUED ON SHEET NO. 66

CONTINUED ON SHEET NO. 68

BOSTON RD

EXISTING INVERT TABLE
RCP1
270.7

CB28
RIM=270.47'
FULL OF DEBRIS=269.8

DMH8(FIRE STATION AS-BUILT)
RIM=272.8'
INV IN= 268.8'
INV OUT=269.1'

N/F
INHABITANTS OF THE
TOWN OF WESTFORD, MASSACHUSETTS
65 BOSTON ROAD
MAP-LOT 022 0003 0004
BK-PG 7366-211

FIRE DEPARTMENT HEADQUARTERS

0 20 50 100
SCALE: 1" = 20'

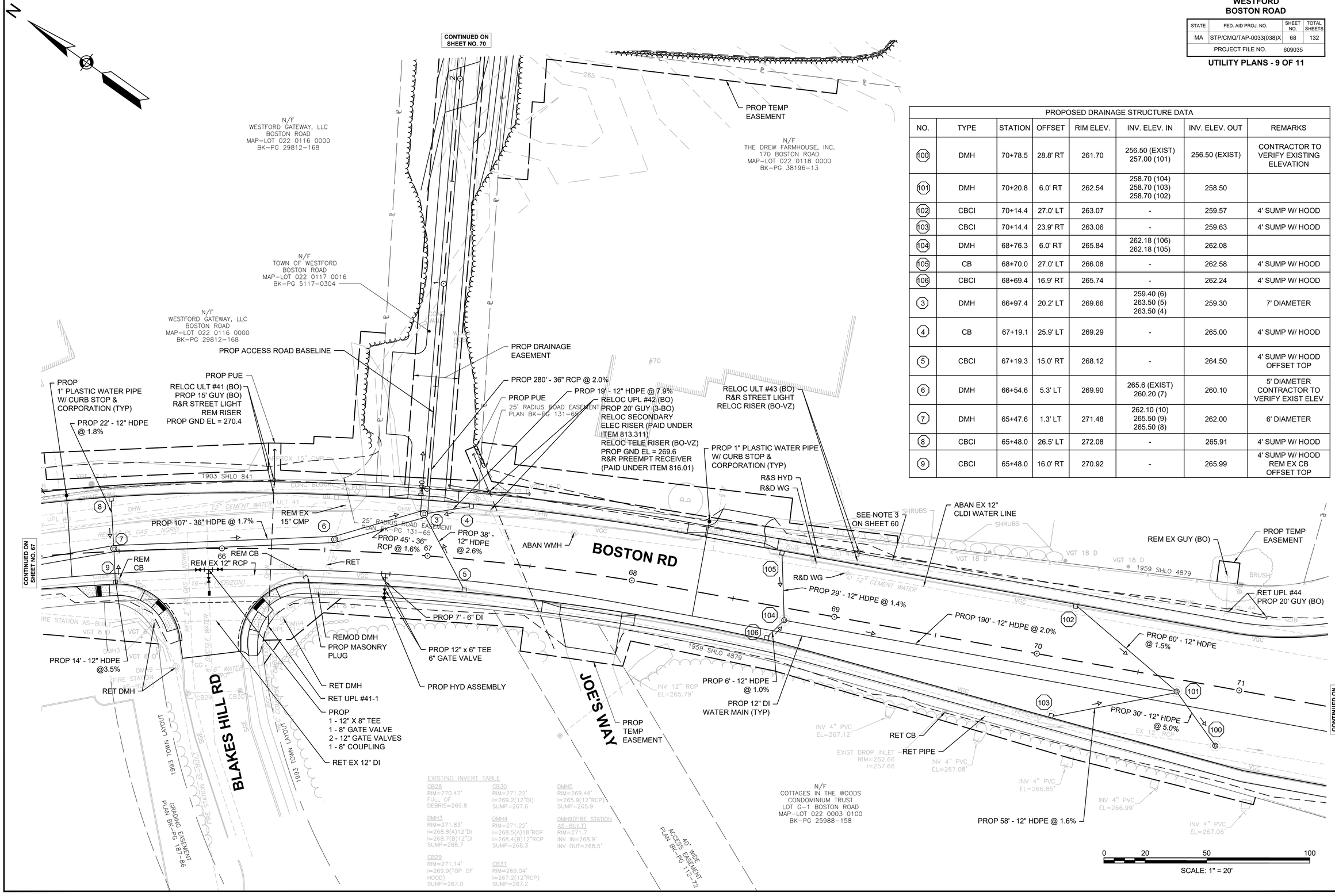
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	68	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 9 OF 11

609035_HD10(UTILITY PLANS) (COLOR).DWG Plotted on 17-May-2024 8:42 AM

PROPOSED DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
100	DMH	70+78.5	28.8' RT	261.70	256.50 (EXIST) 257.00 (101)	256.50 (EXIST)	CONTRACTOR TO VERIFY EXISTING ELEVATION
101	DMH	70+20.8	6.0' RT	262.54	258.70 (104) 258.70 (103) 258.70 (102)	258.50	
102	CBCI	70+14.4	27.0' LT	263.07	-	259.57	4' SUMP W/ HOOD
103	CBCI	70+14.4	23.9' RT	263.06	-	259.63	4' SUMP W/ HOOD
104	DMH	68+76.3	6.0' RT	265.84	262.18 (106) 262.18 (105)	262.08	
105	CB	68+70.0	27.0' LT	266.08	-	262.58	4' SUMP W/ HOOD
106	CBCI	68+69.4	16.9' RT	265.74	-	262.24	4' SUMP W/ HOOD
3	DMH	66+97.4	20.2' LT	269.66	259.40 (6) 263.50 (5) 263.50 (4)	259.30	7' DIAMETER
4	CB	67+19.1	25.9' LT	269.29	-	265.00	4' SUMP W/ HOOD
5	CBCI	67+19.3	15.0' RT	268.12	-	264.50	4' SUMP W/ HOOD OFFSET TOP
6	DMH	66+54.6	5.3' LT	269.90	265.6 (EXIST) 260.20 (7)	260.10	5' DIAMETER CONTRACTOR TO VERIFY EXIST ELEV
7	DMH	65+47.6	1.3' LT	271.48	262.10 (10) 265.50 (9) 265.50 (8)	262.00	6' DIAMETER
8	CBCI	65+48.0	26.5' LT	272.08	-	265.91	4' SUMP W/ HOOD
9	CBCI	65+48.0	16.0' RT	270.92	-	265.99	4' SUMP W/ HOOD REM EX CB OFFSET TOP

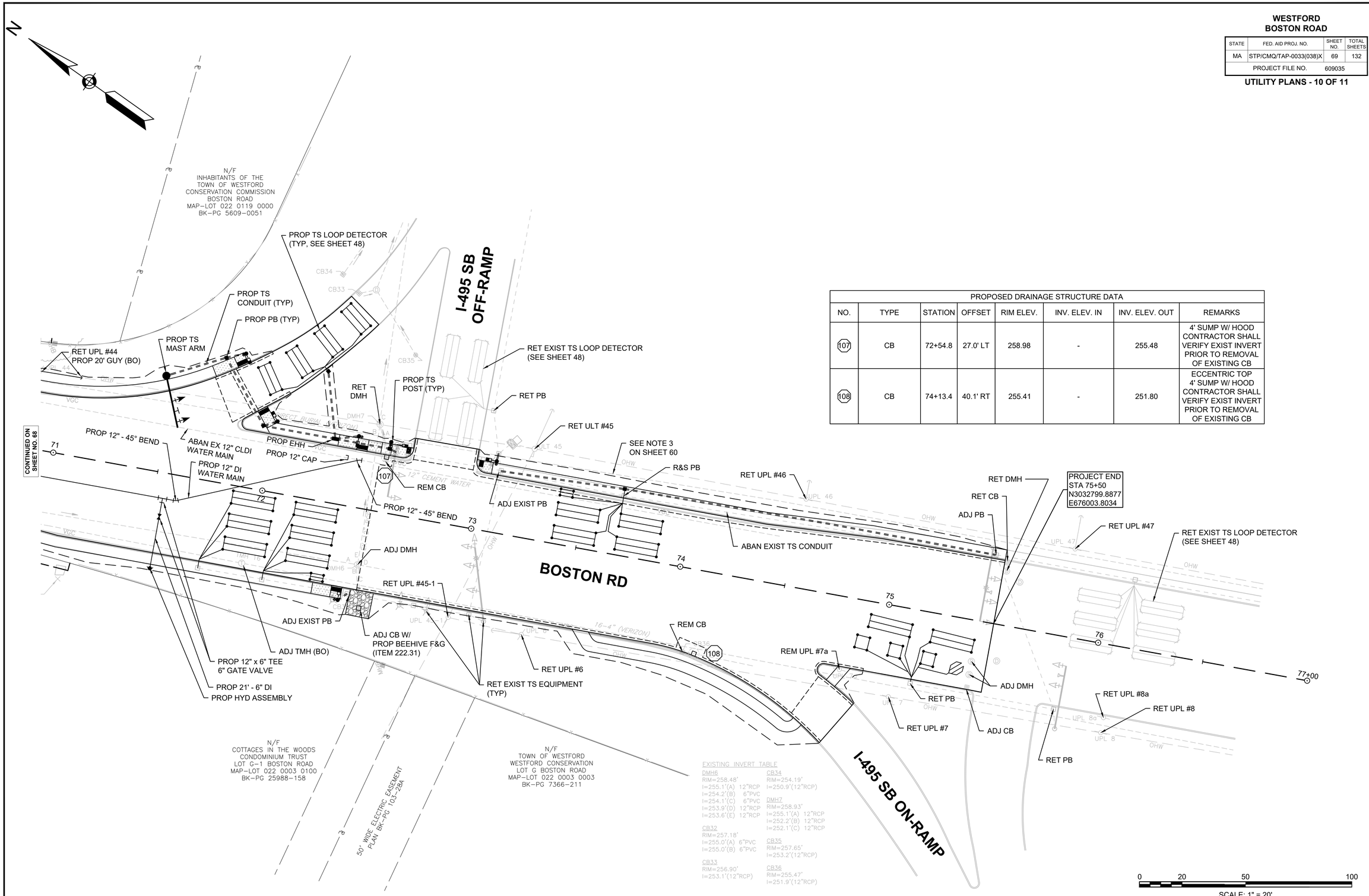


WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	69	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 10 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:43 AM



PROPOSED DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
107	CB	72+54.8	27.0' LT	258.98	-	255.48	4' SUMP W/ HOOD CONTRACTOR SHALL VERIFY EXIST INVERT PRIOR TO REMOVAL OF EXISTING CB
108	CB	74+13.4	40.1' RT	255.41	-	251.80	ECCENTRIC TOP 4' SUMP W/ HOOD CONTRACTOR SHALL VERIFY EXIST INVERT PRIOR TO REMOVAL OF EXISTING CB

EXISTING INVERT TABLE

DMH6
RIM=258.48'
I=255.1'(A) 12"RCP
I=254.2'(B) 6"PVC
I=254.1'(C) 6"PVC
I=253.9'(D) 12"RCP
I=253.6'(E) 12"RCP

CB32
RIM=257.18'
I=255.0'(A) 6"PVC
I=255.0'(B) 6"PVC

CB33
RIM=256.90'
I=253.1'(12"RCP)

CB34
RIM=254.19'
I=250.9'(12"RCP)

DMH7
RIM=258.93'
I=255.1'(A) 12"RCP
I=252.2'(B) 12"RCP
I=252.1'(C) 12"RCP

CB35
RIM=257.65'
I=253.2'(12"RCP)

CB36
RIM=255.47'
I=251.9'(12"RCP)

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	70	132
PROJECT FILE NO.	609035		

UTILITY PLANS - 11 OF 11

609035_HD10(UTILITY PLANS)(COLOR).DWG Plotted on 17-May-2024 8:43 AM

N/F
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0016
BK–PG 5117–0304

N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0001
BK–PG 4446–0228

PROP PERM EASEMENT

PROP RIPRAP SPILLWAY (SEE DETAIL ON SHEET 75)

PROP SEDIMENT FOREBAY PAVING (SEE DETAIL ON SHEET 75)

PROP STONE FOR PIPE ENDS

PROP 36" RCP FLARED END

PROP WET DETENTION BASIN EL. 250

PROP 30' - 36" RCP @ 1.3%

PROP ACCESS ROAD BASELINE

15' MAINTENANCE ACCESS PATH

PROP OUTLET CONTROL STRUCTURE (SEE DETAIL ON SHEET 75)

PROP PERM EASEMENT

PROP 20' WIDE AUXILIARY RIPRAP SPILLWAY (TOP EL. 255.90)

PROP SEDIMENT CONTROL BARRIER (TYP)

PROP 30" RCP FLARED END INV EL = 249.00

PROP STONE FOR PIPE ENDS

PROP 50' - 30" RCP @ 1.0%

LIMIT OF GRADING (TYP)

LIMIT OF CLEARING AND GRUBBING

PROP TEMP EASEMENT

APPROX BVW

BVW

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0115 0000
BK–PG 29812–168

N/F
WESTFORD GATEWAY, LLC
BOSTON ROAD
MAP–LOT 022 0116 0000
BK–PG 29812–168

N/F
THE DREW FARMHOUSE, INC.
170 BOSTON ROAD
MAP–LOT 022 0118 0000
BK–PG 38196–13

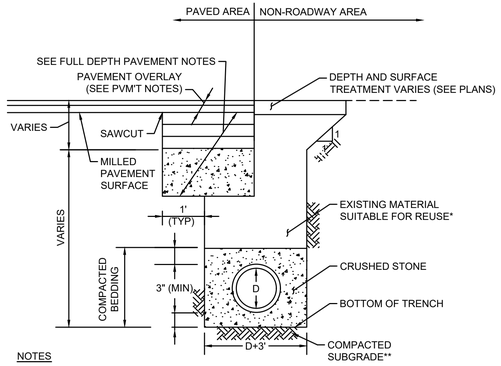
N/F
INHABITANTS OF THE
TOWN OF WESTFORD
BOSTON ROAD
MAP–LOT 022 0117 0002
BK–PG 4446–0228

CONTINUED ON SHEET NO. 68

0 20 50 100
SCALE: 1" = 20'

PROPOSED DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
1	OUTLET	67+12.8	301.9' LT	-	-	253.20	36" FES
2	DMH	66+98.3	283.2' LT	258.00	253.70 (3)	253.60	6' DIAMETER 1' FLAT TOP



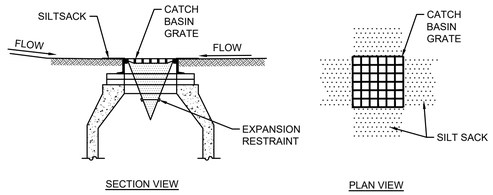
NOTES

* EXISTING MATERIAL OBTAINED FROM EXCAVATION THAT IS DETERMINED TO BE SUITABLE, AND APPROVED BY THE ENGINEER SHALL BE USED. BACKFILL SHALL BE PLACED IN LAYERS NO MORE THAN 6" IN DEPTH AND THOROUGHLY COMPACTED. BACKFILLING TO A POINT 2' OVER THE PIPE SHALL CONTAIN NO STONES LARGER THAN 3".

**SOFT OR UNSUITABLE MATERIAL EXISTING BELOW THE REQUIRED BEDDING GRADE SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SAND, GRAVEL, CRUSHED STONE OR OTHER SUITABLE MATERIAL AND THOROUGHLY COMPACTED.

DRAINAGE TRENCH

N.T.S.

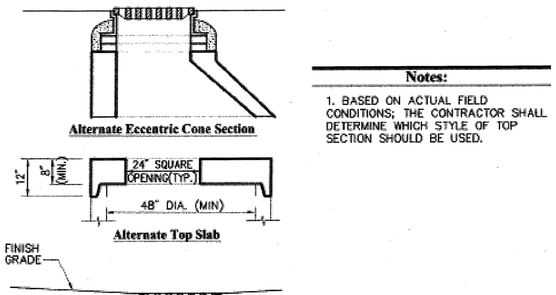


NOTES:

1. INSTALL SILT SACK IN EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
2. GRATE TO BE PLACED OVER SILT SACK.
3. SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

INLET PROTECTION SILT SACK IN CATCH BASIN

N.T.S.



Notes:

1. BASED ON ACTUAL FIELD CONDITIONS; THE CONTRACTOR SHALL DETERMINE WHICH STYLE OF TOP SECTION SHOULD BE USED.

OFFSET CATCH BASIN

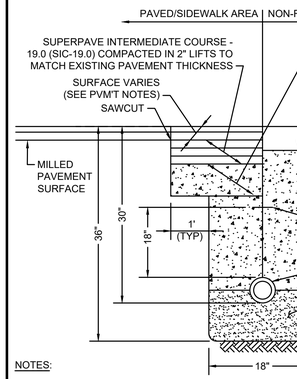
N.T.S.

NOTE:

ALL CATCH BASINS SHALL CONFORM TO MASSDOT CONSTRUCTION STANDARD E 201.4.0 EXCEPT FOR 4' SUMP DEPTH AND HOOD AS SHOWN

DEEP SUMP CATCH BASIN WITH HOOD

N.T.S.

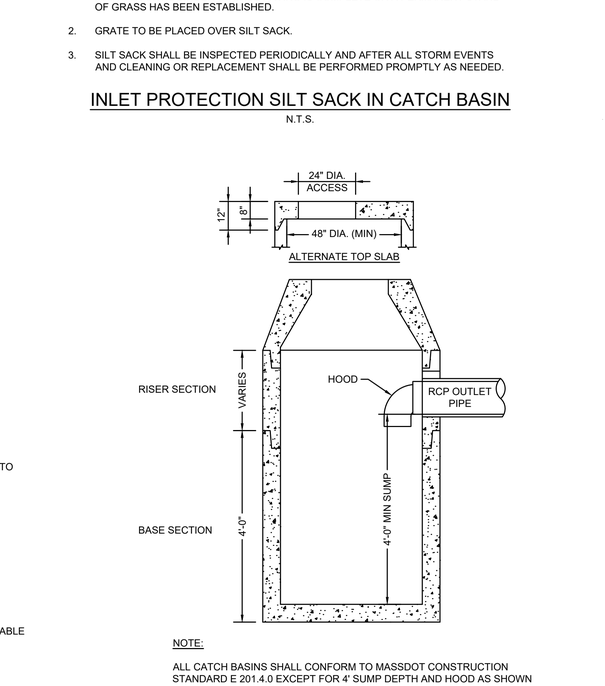


NOTES:

* SOFT OR UNSUITABLE MATERIAL EXISTING BELOW THE REQUIRED BEDDING GRADE SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SAND, GRAVEL, CRUSHED STONE OR OTHER SUITABLE MATERIAL AND THOROUGHLY COMPACTED.

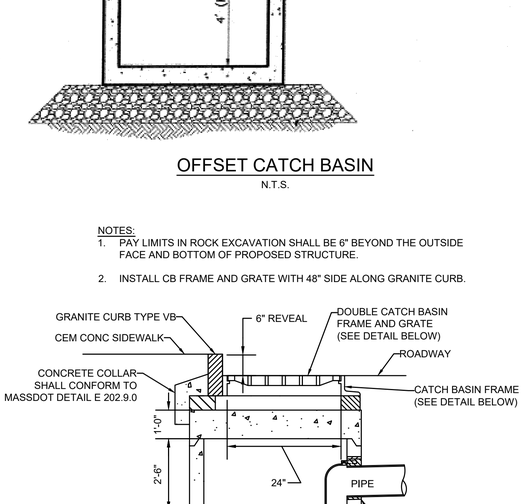
CONDUIT TRENCH

N.T.S.



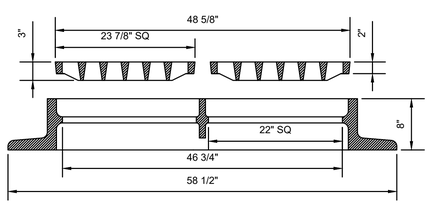
MODIFIED ROCKFILL SLOPE STABILIZATION

N.T.S.



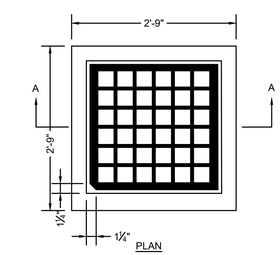
DOUBLE CATCH BASIN (ITEM 201.1)

N.T.S.



DOUBLE CATCH BASIN FRAME AND GRATE

N.T.S.



NOTES:

1. FRAME AND COVER SHALL BE RATED FOR HL-93 LOADING.
2. MATERIAL - CAST IRON.
3. MINIMUM FRAME WEIGHT:
   4 FLANGE - 295 LB
   3 FLANGE - 264 LB
4. CATCH BASIN GRATES WITHIN SHLO SHALL COMPLY WITH CONSTRUCTION STANDARDS E201.7.0 / E201.7.1 AND SHALL HAVE LOCK DOWN GRATES.

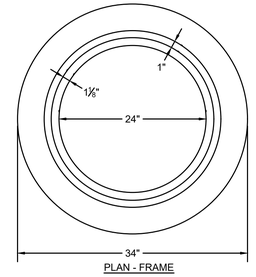
CATCH BASIN FRAME & GRATE (MUNICIPAL STANDARD)

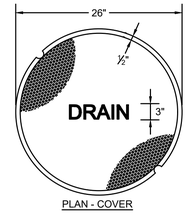
N.T.S.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	71	132
PROJECT FILE NO.	609035		

CONSTRUCTION DETAILS - 1 OF 6



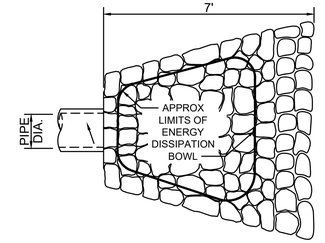


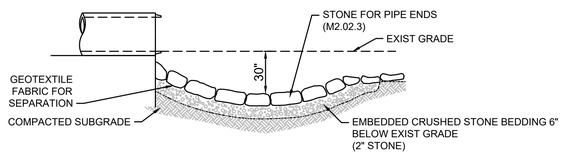
NOTES:

1. FRAME AND COVER SHALL BE RATED FOR HL-93 LOADING.
2. MATERIAL - CAST IRON.
3. MINIMUM MASS - 265 LBS.
4. ALL MH FRAMES AND COVERS SHALL BE ADA AND AAB COMPLIANT.
5. MANHOLE COVERS SHALL HAVE A DIAMOND PATTERN, PICK HOLES, AND THE WORD "DRAIN" OR "SEWER" CAST IN 3-INCH LETTERS.
6. MANHOLE COVERS WITHIN SHLO SHALL COMPLY WITH CONSTRUCTION STANDARD E202.6.0.

MANHOLE FRAME & COVER (MUNICIPAL STANDARD)

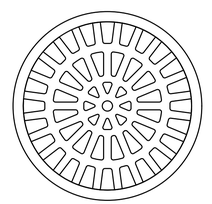
N.T.S.





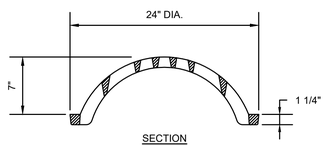
STONE FOR PIPE ENDS

N.T.S.



PLAN

NOTES:
1. FRAME AND GRATE SHALL BE RATED FOR HL-93 LOADING.
2. GRATE SHALL BE INSTALLED IN SUITABLE MANHOLE FRAME.



FRAME AND GRATE (BEEHIVE)

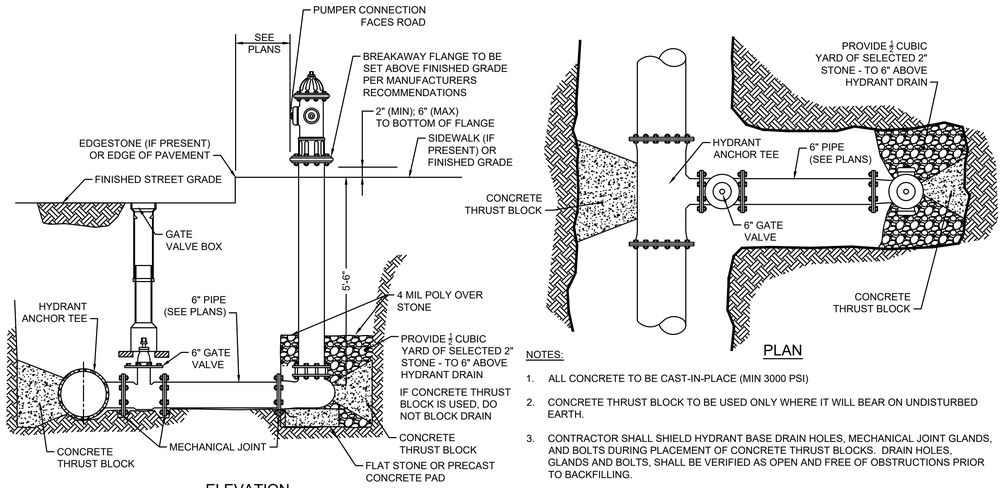
N.T.S.

609035_HD11(CONSTRUCTION DETAILS).DWG Plotted on 17-May-2024 8:45 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	72	132
PROJECT FILE NO.	609035		

CONSTRUCTION DETAILS - 2 OF 6

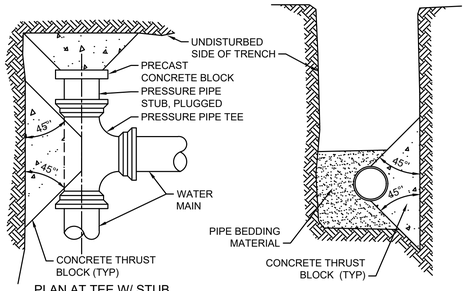


NOTES:

1. ALL CONCRETE TO BE CAST-IN-PLACE (MIN 3000 PSI)
2. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
3. CONTRACTOR SHALL SHIELD HYDRANT BASE DRAIN HOLES, MECHANICAL JOINT GLANDS, AND BOLTS DURING PLACEMENT OF CONCRETE THRUST BLOCKS. DRAIN HOLES, GLANDS AND BOLTS, SHALL BE VERIFIED AS OPEN AND FREE OF OBSTRUCTIONS PRIOR TO BACKFILLING.

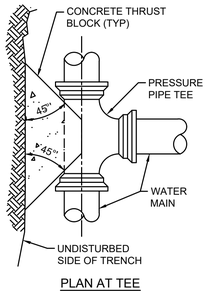
HYDRANT ASSEMBLY

N.T.S.

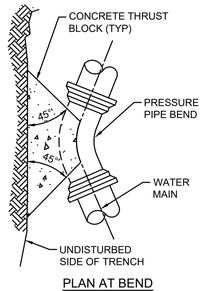


PLAN AT TEE W/ STUB FOR FUTURE USE

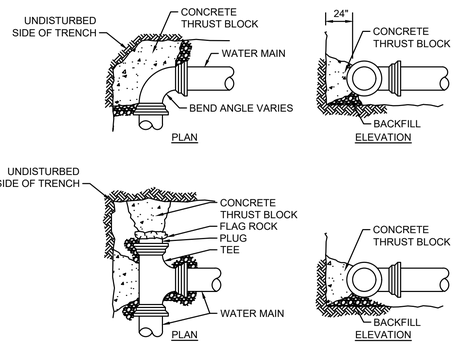
SECTION



PLAN AT TEE



PLAN AT BEND



MINIMUM THRUST BLOCK BEARING AREAS (IN SQ. FT.)*				
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES, PLUGS, CAPS & HYDRANTS
4", 6", 8"	6.0	2.9	2.3	4.5
10"	9.6	5.2	2.3	6.7
12"	13.3	6.7	3.7	9.6
* BASED ON 250 P.S.I. & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY				

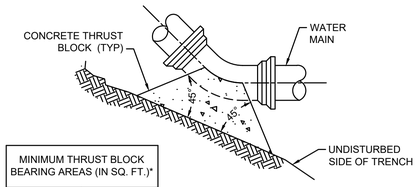
MINIMUM PIPE RESTRAINT LENGTH (IN FEET)*					
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES	PLUG/CAP
8"	21.0	9.0	4.0	29.0	38.0
10"	26.0	11.0	5.0	38.0	46.0
12"	33.0	14.0	6.0	48.0	69.0
* BASED ON DUCTILE IRON PIPE WITH A 150 P.S.I. TEST PRESSURE WITH 5.0 FEET OF BURY IN UNIFIED SOIL CLASSIFICATION SM.					
**NOTE: LONGER LENGTHS REQUIRED FOR PIPES WITH PLASTIC SLEEVES					

NOTES:

1. ALL WATER MAIN FITTINGS, BENDS, TEES, PLUGS ETC. SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
4. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
5. MINIMUM BEARING AREAS ARE BASED ON 250 P.S.I INTERNAL PIPE PRESSURE & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.
6. MINIMUM PIPE RESTRAINT LENGTH IS BASED ON DUCTILE IRON PIPE WITH A 150 P.S.I INTERNAL PIPE PRESSURE WITH 5.0' OF BURY IN UNIFIED SOIL CLASSIFICATION SM.

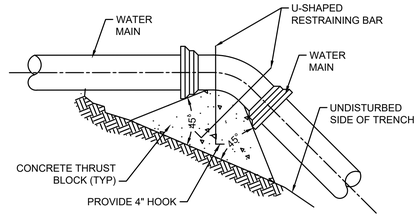
THRUST BLOCK - HORIZONTAL BENDS & PIPE RESTRAINT DETAILS

N.T.S.



MINIMUM THRUST BLOCK BEARING AREAS (IN SQ. FT.)*	
PIPE Ø	45° BEND
4", 6"	3.6
8"	6.5
12"	8.4

PLAN AT UPWARD VERTICAL BEND



MINIMUM THRUST BLOCK BEARING AREAS (IN SQ. FT.)*	
PIPE Ø	45° BEND
4", 6"	.9
8"	1.6
12"	3.3

RESTRAINING BAR DIMENSIONS		
PIPE Ø	BAR SIZE	EMBEDMENT LENGTH
4", 6"	#4	15"
8"	#4	15"
12"	#6	2'-0"

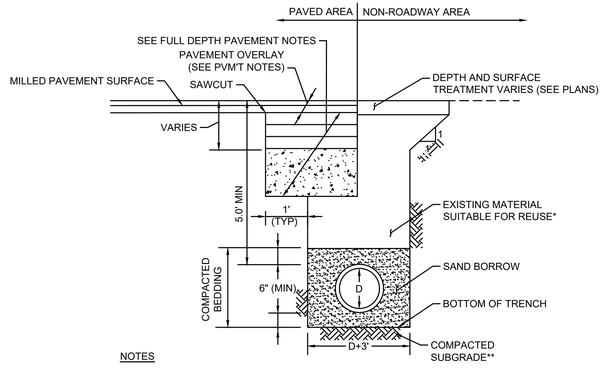
PLAN AT DOWNWARD VERTICAL BEND

NOTES:

1. ALL WATER MAIN BENDS SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
4. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
5. MINIMUM BEARING AREAS ARE BASED ON 250 P.S.I INTERNAL PIPE PRESSURE & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.

THRUST BLOCK DETAILS - VERTICAL BENDS

N.T.S.



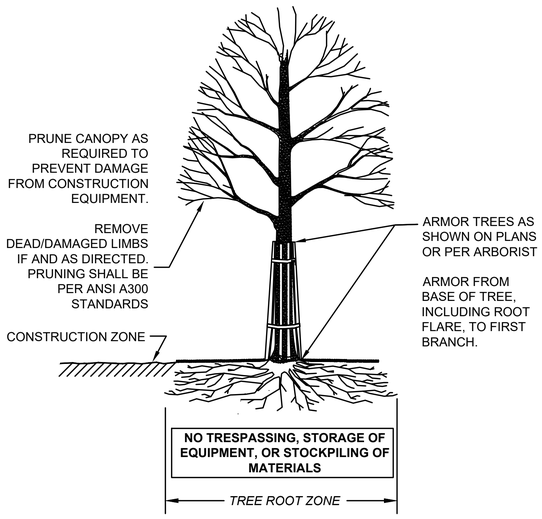
NOTES

* EXISTING MATERIAL OBTAINED FROM EXCAVATION THAT IS DETERMINED TO BE SUITABLE, AND APPROVED BY THE ENGINEER SHALL BE USED. BACKFILL SHALL BE PLACED IN LAYERS NO MORE THAN 6" IN DEPTH AND THOROUGHLY COMPACTED. BACKFILLING TO A POINT 2' OVER THE PIPE SHALL CONTAIN NO STONES LARGER THAN 3".

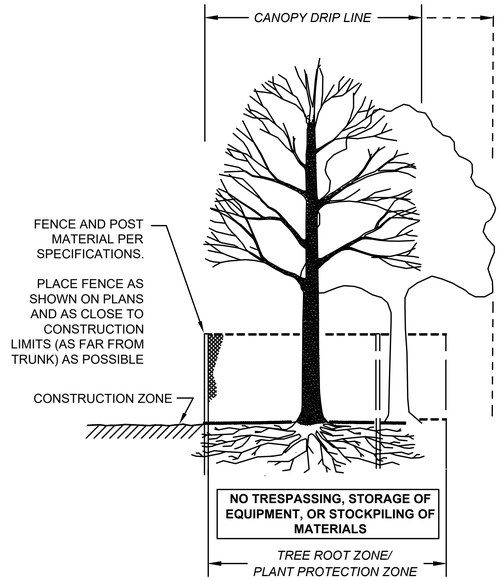
**SOFT OR UNSUITABLE MATERIAL EXISTING BELOW THE REQUIRED BEDDING GRADE SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SAND, GRAVEL, CRUSHED STONE OR OTHER SUITABLE MATERIAL AND THOROUGHLY COMPACTED.

WATER TRENCH

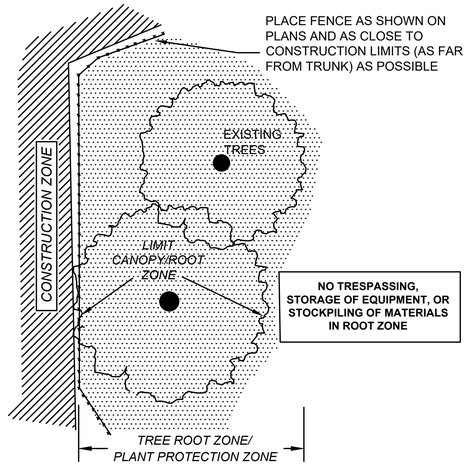
N.T.S.



SECTION - TRUNK ARMORING & PRUNING



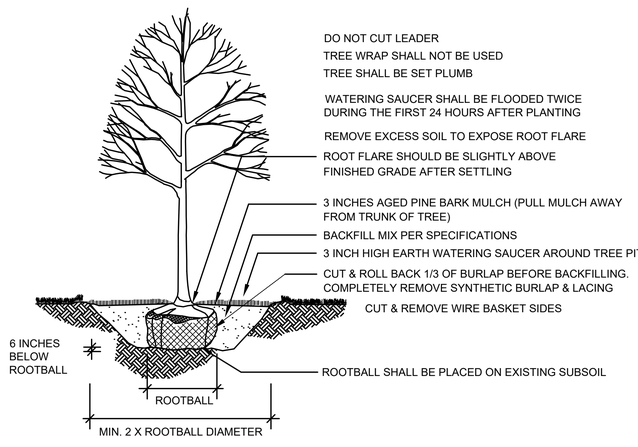
SECTION - FENCE PROTECTION OF ROOT ZONE



PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

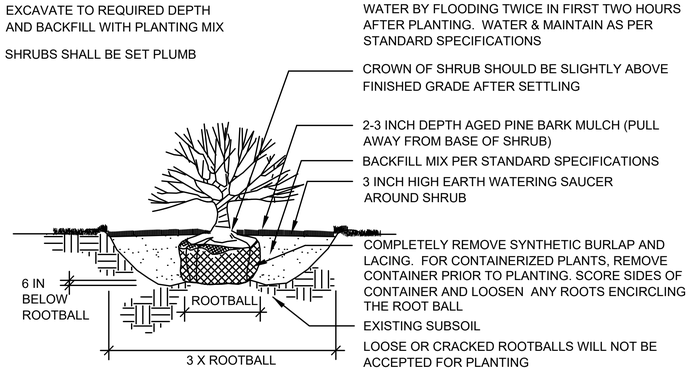
TREE PROTECTION - TRUNK & ROOT ZONE

N.T.S.



DECIDUOUS TREE PLANTING

N.T.S.



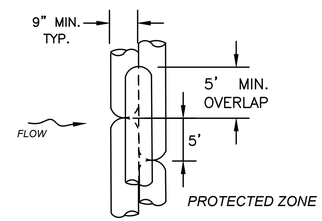
SHRUB PLANTING

N.T.S.

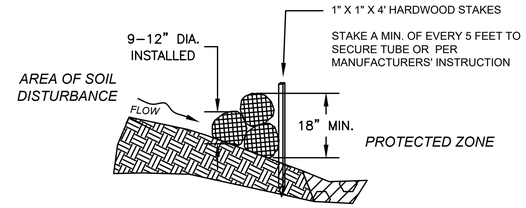
PLANT LIST				
QUAN	KEY	BOTANICAL NAME	COMMON NAME	SIZE
1	RM	Acer rubrum 'Red Sunset'	Red Sunset Red Maple	2"-2½" cal
1	YC	Prunus x yedoensis	Yoshino Flowering Cherry	1½"-2" cal
3	FC	Prunus serrulatea 'Shirotae'	Mt. Fuji Flowering Cherry	1½"-2" cal
2	ER	Cercis canadensis	Eastern Redbud	7'-8' height
2	DW	Malus 'Donald Wyman'	Donald Wyman Crabapple	1½"-2" cal
1	AS	Amerlanchier x grandiflora	Autumn Brilliance Serviceberry	4'-5' height
1	LM	Cratagus viridis 'Winter King'	Winter King Hawthorne	1½"-2" cal
1	TT	Liriodendron tulipifera	Tulip Tree	2"-2½" cal
1	PC	Malus 'Prairiefire'	Prairiefire Crabapple	1½"-2" cal
1	WP	Pinus Strobus	Eastern White Pine	7'-8' height
		SHRUBS		
3	RV	Rhododendron viscosim	Swamp Azalea	2'-3' height

NOTE:
PROPOSED TREE LOCATIONS MAY BE FIELD ADJUSTED AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLANTING.

WHERE SPECIFIED ON CONSTRUCTION PLANS OR AS REQUIRED



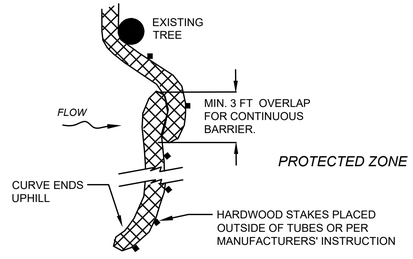
PLAN VIEW



SECTION

COMPOST FILTER TUBES STACKED

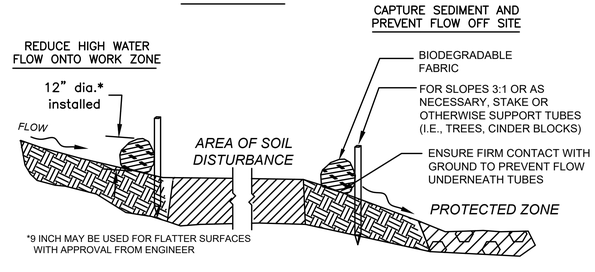
N.T.S.



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLAN VIEW



SECTION

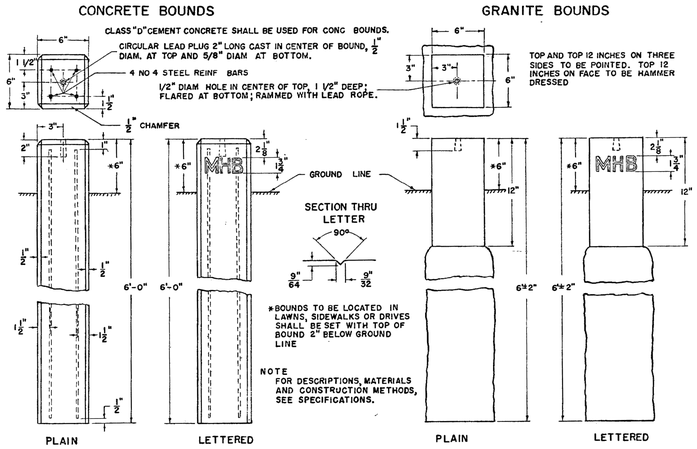
SEDIMENT BARRIER - COMPOST FILTER TUBE

N.T.S.

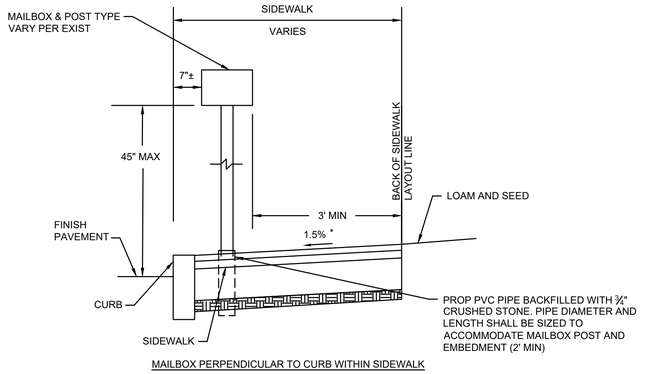
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	74	132
PROJECT FILE NO.	609035		

CONSTRUCTION DETAILS - 4 OF 6

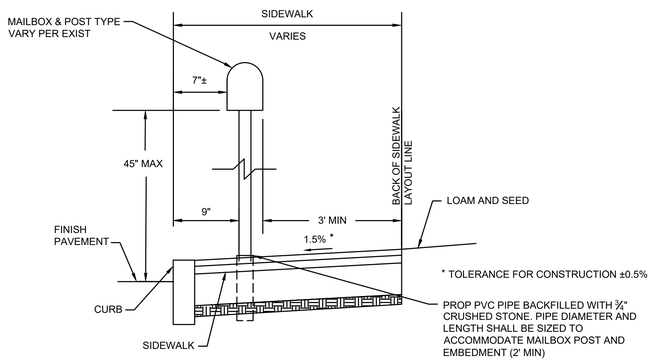
BOUNDS



STONE BOUND
N.T.S.



MAILBOX PERPENDICULAR TO CURB WITHIN SIDEWALK

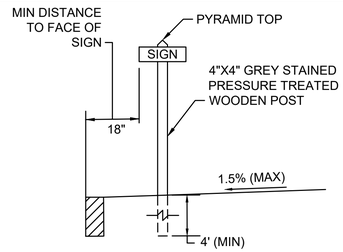


MAILBOX PARALLEL TO CURB WITHIN SIDEWALK

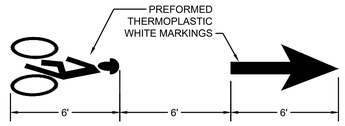
NOTES:

1. MINIMUM CLEAR PATH ON ALL SIDEWALK SHALL BE 36" EXCLUDING THE CURB. THE CLEAR PATH SHALL BE MEASURED TO FIRST VERTICAL FACE ENCOUNTERED ON THE MAILBOX OR PAPER TUBE (INCLUDING ALL PROTRUSIONS LESS THAN 6'-8" IN HEIGHT).
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL MAILBOXES AND PAPER TUBES TO BE SET WITHIN THE SIDEWALK PRIOR TO FINAL PLACEMENT TO PROVIDE A MINIMUM CLEAR PATH OF 36". CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY LOCATION THAT CANNOT MEET THE CLEARANCE REQUIREMENTS.
3. REFER TO MASSDOT STANDARD DETAIL E504.1.0 FOR ADDITIONAL INFORMATION.

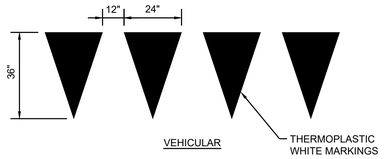
MAILBOX REMOVED AND RESET
N.T.S.



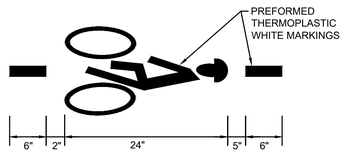
HISTORIC DISTRICT SIGN POST
N.T.S.



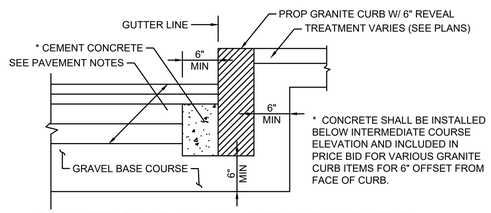
BICYCLE LANE PAVEMENT MARKING
N.T.S.



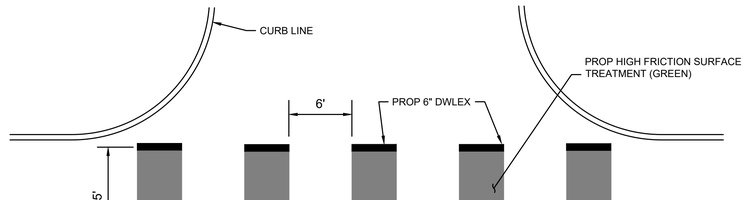
YIELD LINE PAVEMENT MARKING
N.T.S.



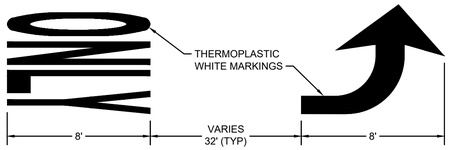
BICYCLE DETECTOR PAVEMENT MARKING
N.T.S.



GRANITE CURB IN FULL DEPTH PAVEMENT
N.T.S.

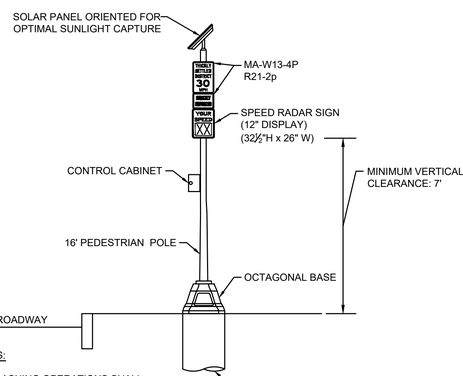


BIKE LANE THROUGH INTERSECTION
N.T.S.



NOTE: SPACING SHALL BE SAME FOR RIGHT TURN LANE AND THRU ONLY PAVEMENT MARKING (REFER TO MASSDOT STANDARD DRAWING TR.6.1)

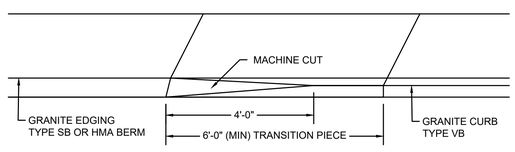
LEFT TURN LANE PAVEMENT MARKING
N.T.S.



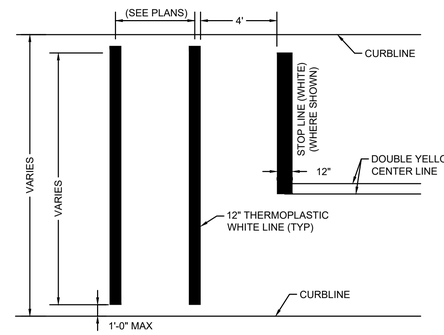
NOTES:

1. FLASHING OPERATIONS SHALL COMPLY WITH SECTION 4L OF THE 2009 MUTCD.
2. SEE SIGN SUMMARY SHEET FOR SIZE AND LEGEND DETAILS.

RADAR SPEED FEEDBACK SIGN ASSEMBLY
N.T.S.



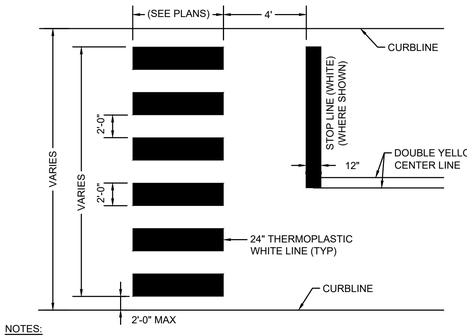
GRANITE CURB SPLAYED END
N.T.S.



NOTES:

1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.

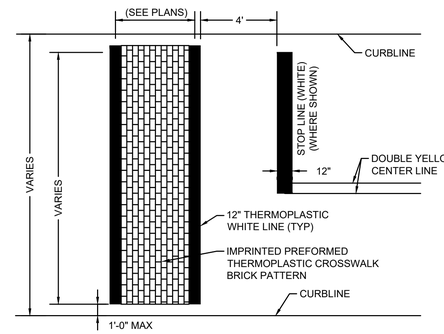
CROSSWALK PAVEMENT MARKING (SIGNALIZED APPROACH)
N.T.S.



NOTES:

1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED. ALL 24" LINES MAY BE EITHER ONE 24" LINE OR A COMBINATION OF TWO - 12" LINES.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.

CROSSWALK PAVEMENT MARKING (UNSIGNALIZED APPROACH)
N.T.S.



NOTES:

1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
3. IMPRINTED PREFORMED THERMOPLASTIC CROSSWALK SHALL BE PAID FOR UNDER ITEM 487.1.

CROSSWALK PAVEMENT MARKING (HISTORIC DISTRICT)
N.T.S.

NOTE:
THE CONTRACTOR SHALL ENSURE 24" HDPE PIPE FROM DMH #31 TO OUTLET SEDIMENT TRAP IS LOCATED BETWEEN GUARDRAIL POSTS.

1 CROWN ROAD
MAP–LOT 021 0114 0000
BK–PG 35945–125

44 BOSTON ROAD
MAP–LOT 021 0115 0000
BK–PG 31062–275

EXIST WETLAND
PROP PERM DRAINAGE EASEMENT
EXIST PROPERTY LINE
PROP TEMP EASEMENT
PROP 4" LOAM & SEED
LIMIT OF GRADING
PROP RIPRAP SPILLWAY
PROP PERM SIGHT LINE EASEMENT
PROP SEDIMENT FOREBAY PAVING
PROP COMPOST FILTER TUBE
PROP PERM GUARDRAIL EASEMENT
PROP 24" FES (#32)
(I=327.45)
PROP GUARDRAIL, DEEP POST
PROP 24" HDPE
REM EXIST PIPE
PROP CB #35
RIM=335.63
I=332.50
PROP DMH #34
RIM=336.31
I(OUT)=330.32
PROP DMH #31
R=335.48
I(#32-TRAP)=327.70
I(#29)=327.90
CONST ℄

PLAN (OUTLET SEDIMENT TRAP)
SCALE: 1" = 10'

PROP GUARDRAIL, DEEP POST
PROP. SDWK
INV OUT 24" FES = 327.45
PROP LOAM AND SEED
STONE FOR PIPE ENDS (ITEM 258.)
SEDIMENT FOREBAY PAVING (ITEM 988.01)
BOTTOM FOREBAY = 327.00
GEOTEXTILE FABRIC FOR SEPARATION (ITEM 698.3)
8" GRAVEL BOROW, TYPE b (COMPACTED)
COMPACTED SUBGRADE

SECTION A-A (OUTLET SEDIMENT TRAP)
N.T.S

SEDIMENT CONTROL BARRIER
3' WIDE SPILLWAY EL. = 328.00
12" RIPRAP (ITEM 983.1)
APPROX. LIMITS OF BORDERING VEGETATED WETLANDS
SEDIMENT FOREBAY PAVING (ITEM 988.01)
BOTTOM FOREBAY = 327.00
GEOTEXTILE FABRIC FOR SEPARATION (ITEM 698.3)
8" GRAVEL BOROW, TYPE b (COMPACTED)
COMPACTED SUBGRADE

SECTION B-B (OUTLET SEDIMENT TRAP)
N.T.S

SEEDING LEGEND

- LAWN AREA SEED MIX (ITEM 765.) WITH LOAM FOR LAWNS
- UPLAND SEED NATIVE SHORT GRASSLAND MIX (ITEM 765.415)
- WETLAND SEED RIPARIAN MIX (ITEM 765.553)

JUTE MESH ON ALL SLOPES 3:1 OR GREATER AT WET DETENTION POND AND OUTLET SEDIMENT TRAP
INSTALL STAKES PER MANUFACTURER'S SPECIFICATIONS

JUTE MESH DETAIL
N.T.S

EXIST PROPERTY LINE
EMBANKMENT
PROP 20' AUXILIARY RIPRAP SPILLWAY
TOP OF WATER
ELEVATION 250
BOTTOM OF WET DETENTION BASIN
ELEVATION 247
PROP RIPRAP SPILLWAY
PROP SEDIMENT FOREBAY PAVING
PROP STONE FOR PIPE ENDS
PROP OUTLET CONTROL STRUCTURE (SEE DETAIL BELOW)
PROP 36" FES
(I=253.20)
PROP 50' - 30' RCP
15' MAINTENANCE ACCESS PATH
PROP PERM EASEMENT
LIMIT OF GRADING
100-YEAR FLOODPLAIN
PROP STONE FOR PIPE ENDS
PROP 30" FES
(I=249.00)
PROP SEDIMENT CONTROL BARRIER
LIMIT OF CLEARING AND GRUBBING

PLAN (WET DETENTION BASIN)
SCALE: 1" = 20'

1 3/16"
2"
4"
48"
5/16" ROUND
3/4" X 3/16" BAR

SECTION C-C

SECTION C-C NOTES:
1. GRATE SHALL BE 48"x48" (INNER DIMENSIONS) WITH A 2" WIDE X 3/16" THICK (MIN) LIP ON TWO SIDES THAT ARE BOLTED TO THE PRECAST CONCRETE BOX STRUCTURE USING BOLTS THAT ARE 0.5" THICK X 2" LONG (MIN).
2. GRATE SHALL BE MADE OF ASTM-A36 MATERIAL WITH A GALVANIZED COATING.
3. GRATE SHALL HAVE A PEDESTRIAN LOAD RATING

48" WIDTH
48"x48"x0.5" RIM
ELEV. 255.90
17" TALL x 12" WIDE ORIFICE
18" TALL x 18" WIDE ORIFICE
INV ELEV 252.65
INV ELEV 250.00
OUTLET
30" DIA RCP
INV ELEV 249.50

GENERAL NOTES:
1. STRUCTURE SHALL BE 48"x48" (INNER DIMENSIONS) PRECAST CONCRETE BOX STRUCTURE
2. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
3. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

OUTLET CONTROL STRUCTURE DETAIL
N.T.S

12" RIPRAP (ITEM 983.1)
1' WIDE SPILLWAY EL. = 254.00
WET DETENTION BASIN
TOP OF WATER = 250.00
SEDIMENT FOREBAY PAVING (ITEM 988.01)
BOTTOM FOREBAY = 250.00
BOTTOM OF BASIN = 247.00
COMPACTED SUBGRADE
GEOTEXTILE FABRIC FOR SEPARATION (ITEM 698.3)
8" GRAVEL BORROW, TYPE b (COMPACTED)
6" IMPERVIOUS SOIL BORROW

SECTION D-D (RIPRAP SPILLWAY)
N.T.S

20' WIDE EMERGENCY SPILLWAY
EL. = 257.50
EL. = 255.90
4" LOAM AND SEED
12" RIPRAP (ITEM 983.1)
COMPACTED SUBGRADE

SECTION E-E (AUXILIARY SPILLWAY)
N.T.S

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	75	132
PROJECT FILE NO.	609035		

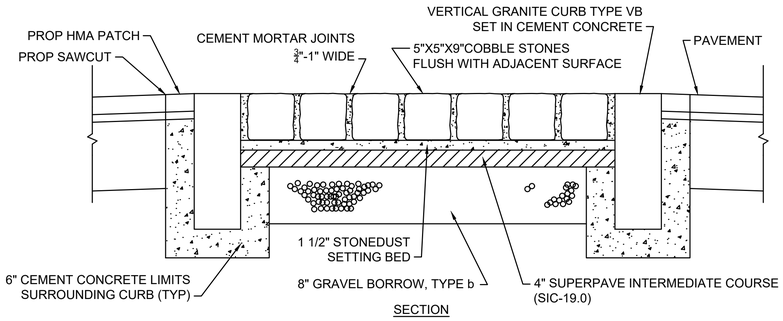
CONSTRUCTION DETAILS - 5 OF 6

609035_HD11(CONSTRUCTION DETAILS).DWG Plotted on 17-May-2024 8:46 AM

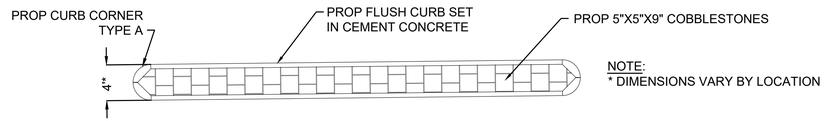
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	76	132
	PROJECT FILE NO. 609035		

CONSTRUCTION DETAILS - 6 OF 6

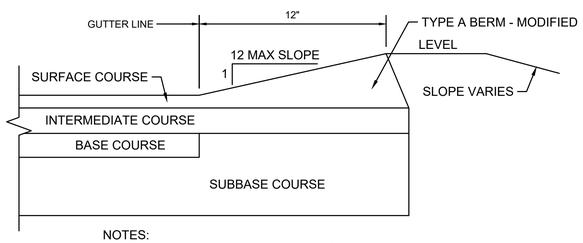


SECTION



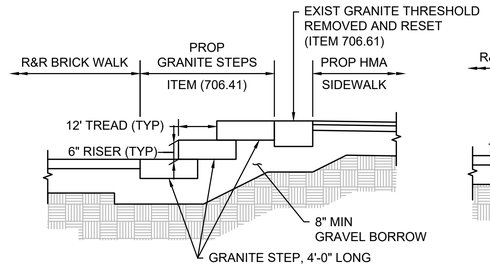
NOTE:
* DIMENSIONS VARY BY LOCATION

COBBLESTONE ISLAND DETAIL
N.T.S

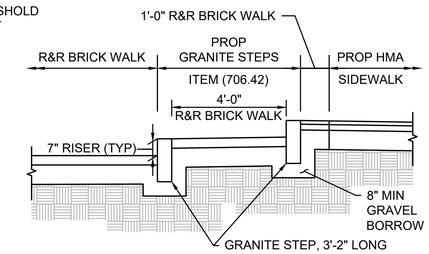


NOTES:
1. FOR ALL OTHER DIMENSIONS, SEE MASSDOT E 106.1.0
2. HMA BERM SHALL BE INSTALLED MONOLITHICALLY WITH ROADWAY HMA SURFACE COURSE AND SHALL BE PAID FOR UNDER ITEM 450.231

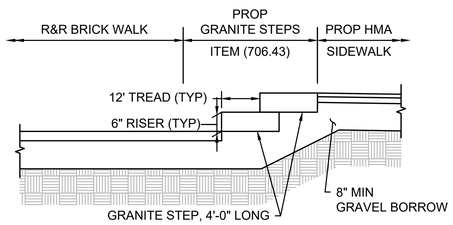
HMA BERM
N.T.S.



GRANITE STEPS - LOCATION NO. 1
N.T.S.



GRANITE STEPS - LOCATION NO. 2
N.T.S.

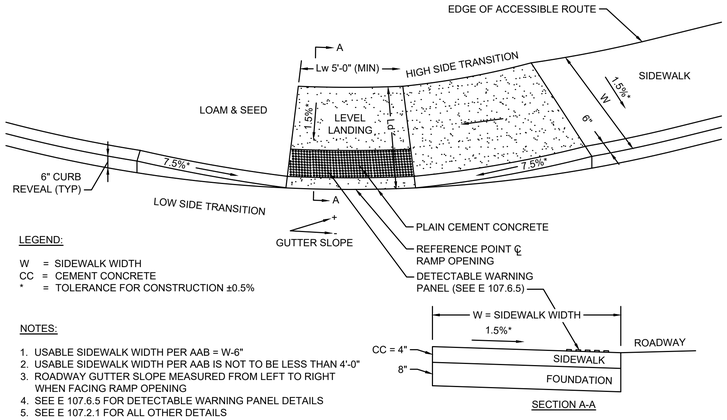


GRANITE STEPS - LOCATION NO. 3
N.T.S.

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	77	132
PROJECT FILE NO.	609035		

CURB RAMP & DRIVEWAY DETAILS - 1 OF 3



LEGEND:

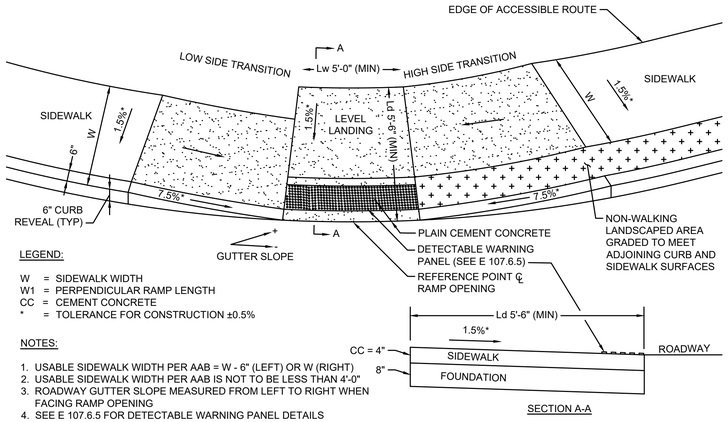
W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT WHEN FACING RAMP OPENING
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

CURB RAMP TYPE A

N.T.S.



LEGEND:

W = SIDEWALK WIDTH
W1 = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W - 6" (LEFT) OR W (RIGHT)
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT WHEN FACING RAMP OPENING
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS

CURB RAMP TYPE B

N.T.S.

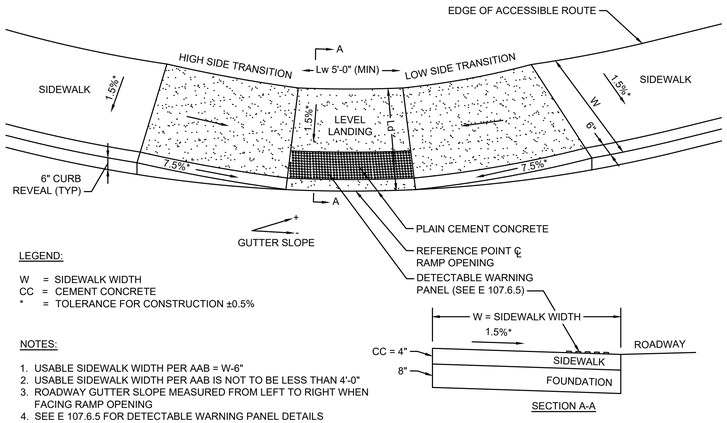
CURB RAMP DATA												
RAMP #	MASSDOT ID	BASELINE REFERENCE	STATION	OFFSET	LEVEL LANDING		ROADWAY GUTTER SLOPE	HIGH SIDE TRANSITION			LOW SIDE TRANSITION		
					WIDTH (Lw)	DEPTH (Ld)		TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH	TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH
2	-	BOSTON ROAD	20+25.2	19.3' RT	5'-0"	5'-6"	+0.8%	7'-8"	6"	5'-6	6'-6"	6"	N/A
3	-	BOSTON ROAD	23+34.3	33.5' LT	5'-0"	5'-6"	-2.9%	11'-0"	6"	5'-6"	6'-6"	6"	N/A
9	-	BOSTON ROAD	71+81.1	56.5' LT	5'-0"	5'-6"	-2.6%	11'-0"	6"	5'-6"	6'-6"	6"	N/A
12	-	BOSTON ROAD	72+42.9	38.1' RT	5'-0"	5'-6"	+1.8%	9'-0"	6"	5'-6"	6'-6"	6"	N/A

CURB RAMP DATA												
RAMP #	BASELINE REFERENCE	STATION	OFFSET	LEVEL LANDING		ROADWAY GUTTER SLOPE	HIGH SIDE TRANSITION			LOW SIDE TRANSITION		
				WIDTH (Lw)	DEPTH (Ld)		TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH	TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH
8	BOSTON ROAD	66+17.0	26.2' RT	5'-0"	8'-6"	+0.4%	7'-8"	6"	5'-0"	6'-6"	6"	5'-6"

1. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE DESIGNED TO 4.5% ±0.5% (7.5% ±0.5% FOR CURB RAMPS)
2. A MINIMUM OF 3'-0" CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
3. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
4. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
5. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5'x5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FT.
6. ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY.
7. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL OF THE PROPOSED CURB RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STANDARD E 107.6.5 (OCTOBER 2017). CONTRACTOR SHALL PROVIDE 6" BETWEEN DETECTABLE WARNING PANEL AND EDGE OF CONCRETE WHERE IT ABUTS LOAM & SEED.
8. CURB RAMP SLOPES AND CROSS SLOPES SHALL HAVE A CONSTRUCTION TOLERANCE OF ±0.5%.
9. DETECTABLE WARNING PANELS SHALL BE BRICK RED IN COLOR AS APPROVED BY THE ENGINEER.

CURB RAMP NOTES

N.T.S.



LEGEND:

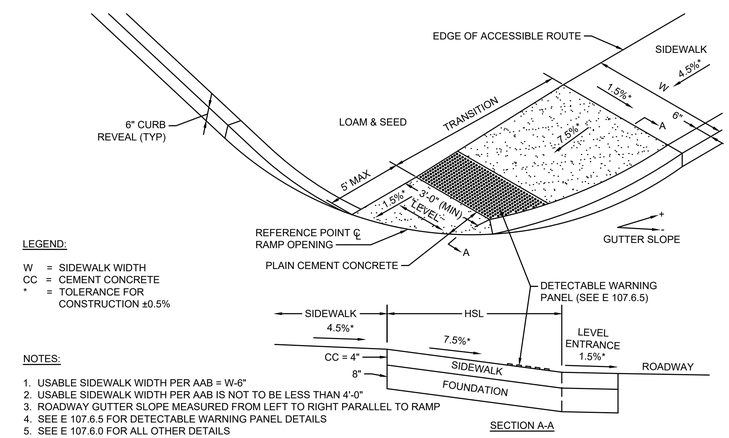
W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT WHEN FACING RAMP OPENING
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

CURB RAMP TYPE C

N.T.S.



LEGEND:

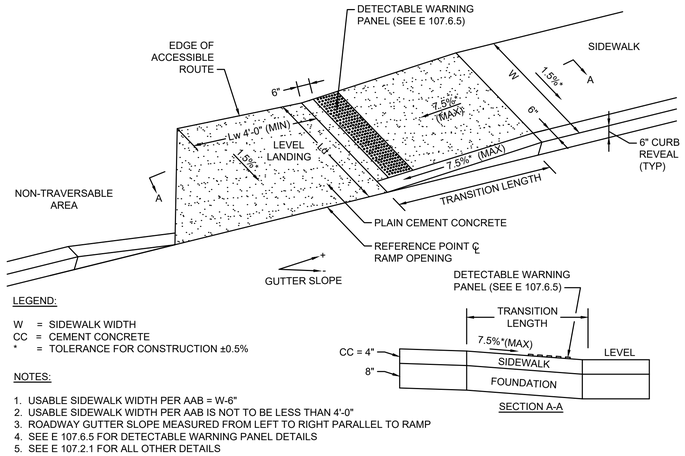
W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT PARALLEL TO RAMP
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.6.0 FOR ALL OTHER DETAILS

CURB RAMP TYPE D

N.T.S.



LEGEND:

W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT PARALLEL TO RAMP
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

CURB RAMP TYPE E

N.T.S.

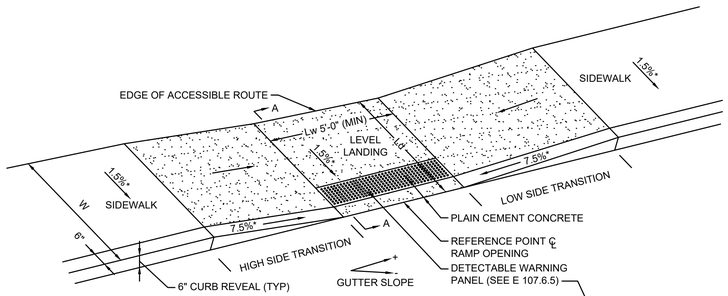
CURB RAMP DATA									
RAMP #	MASSDOT ID	BASELINE REFERENCE	STATION	OFFSET	ROADWAY GUTTER SLOPE	WIDTH OF RAMP OPENING (3' MIN.)	TRANSITION LENGTH		
							TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH
4	-	BOSTON ROAD	44+20.6	21.7' LT	5.0%	3'-0"	15'-0"	6"	5'-6"
5	-	BOSTON ROAD	44+84.6	21.4' LT	-5.0%	3'-0"	6'-6"	6"	5'-6"
13	PED-25101	BOSTON ROAD	72+66.6	31.1' LT	1.8%	3'-0"	9'-0"	6"	5'-6"
14	PED-12231	BOSTON ROAD	72+97.0	29.7' LT	-1.8%	3'-0"	6'-6"	6"	5'-6"

CURB RAMP DATA									
RAMP #	BASELINE REFERENCE	STATION	OFFSET	ROADWAY GUTTER SLOPE	LEVEL LANDING WIDTH (Lw)	LEVEL LANDING DEPTH (Ld)	TRANSITION		
							TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH (W)
6	BOSTON ROAD	65+37	16' RT	-0.49%	6'-6"	5'-6"	6'-6"	6"	5'-6"

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	78	132
	PROJECT FILE NO. 609035		

CURB RAMP & DRIVEWAY DETAILS - 2 OF 3

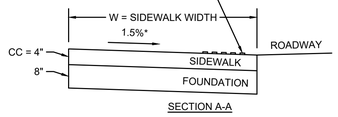


LEGEND:

W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT WHEN FACING RAMP OPENING
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

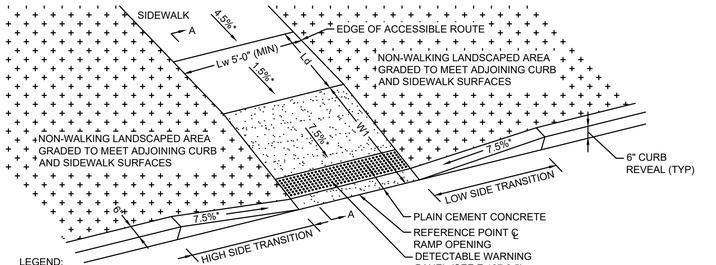


SECTION A-A

CURB RAMP TYPE F

N.T.S.

CURB RAMP DATA													
RAMP #	MASSDOT ID	BASELINE REFERENCE	STATION	OFFSET	LEVEL LANDING		ROADWAY GUTTER SLOPE	HIGH SIDE TRANSITION			LOW SIDE TRANSITION		
					WIDTH (Lw)	DEPTH (Ld)		TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH	TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH
1	-	MAIN STREET	12+62	22.3' LT	5'-0"	5'-6"	-1.7%	9'-0"	6"	5'-6"	6'-6"	6"	5'-6" (MIN)
11	-	BOSTON ROAD	72+42.8	27.0' LT	5'-0"	5'-6"	-1.8%	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"

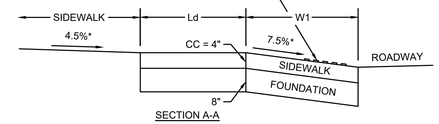


LEGEND:

HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
W1 = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS



SECTION A-A

CURB RAMP TYPE G

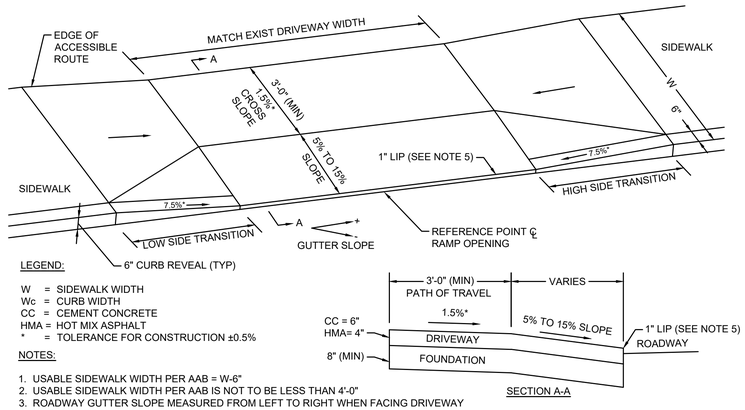
N.T.S.

CURB RAMP DATA														
RAMP #	MASSDOT ID	BASELINE REFERENCE	STATION	OFFSET	LEVEL LANDING		ROADWAY GUTTER SLOPE	PRIMARY RAMP (W1)	HIGH SIDE TRANSITION		LOW SIDE TRANSITION		SIDEWALK WIDTH (W)
					WIDTH (Lw)	DEPTH (Ld)			TRANSITION LENGTH	CURB REVEAL	TRANSITION LENGTH	CURB REVEAL	
10	-	BOSTON ROAD	71+93.2	38.2' LT	5'-0"	5'-0"	1.7%	9'-3"	9'-0"	6"	6'-6"	6"	5'-6" (MIN)

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	79	132
PROJECT FILE NO.	609035		

CURB RAMP & DRIVEWAY DETAILS - 3 OF 3



LEGEND:

W = SIDEWALK WIDTH
Wc = CURB WIDTH
CC = CEMENT CONCRETE
HMA = HOT MIX ASPHALT
* = TOLERANCE FOR CONSTRUCTION ±0.5%

SECTION A-A

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT WHEN FACING DRIVEWAY
4. SURFACE TREATMENT VARIES; SEE PLANS
5. OMIT LIP ON HMA DRIVEWAYS

SIDEWALK THROUGH DRIVEWAY TYPE A

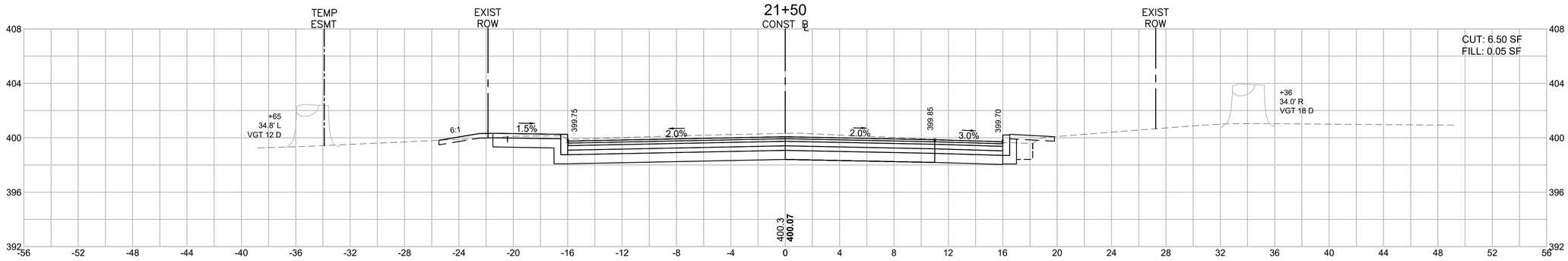
N.T.S.

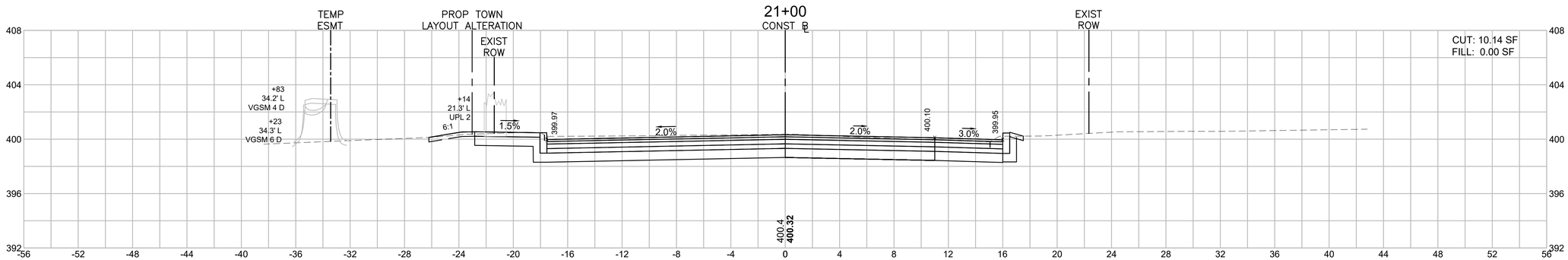
DRIVEWAY DATA													
DWY #	BASELINE REFERENCE	STATION	OFFSET	DRIVEWAY SURFACE	DWY WIDTH @ GUTTER	ROADWAY GUTTER SLOPE	WIDTH OF ACCESSIBLE ROUTE	HIGH SIDE TRANSITION			LOW SIDE TRANSITION		
								LENGTH	CURB REVEAL	SW WIDTH (W)	LENGTH	CURB REVEAL	SW WIDTH (W)
①	BOSTON ROAD	25+02.7	16.0' LT	HMA	44'-5"	-0.6%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
②	BOSTON ROAD	25+81.4	16.0' LT	HMA	16'-0"	-0.7%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
③	BOSTON ROAD	27+27.0	16.0' LT	HMA	16'-0"	-0.7%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
④	BOSTON ROAD	27+83.6	16.0' LT	HMA	16'-0"	-0.9%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
⑤	BOSTON ROAD	28+65.6	16.0' LT	HMA	16'-0"	-1.5%	3'-6"	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑥	BOSTON ROAD	29+73.3	16.0' LT	HMA	19'-0"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑦	BOSTON ROAD	30+19.9	16.0' LT	HMA	16'-0"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑧	BOSTON ROAD	31+20.6	16.0' LT	HMA	16'-0"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑨	BOSTON ROAD	31+98.9	16.0' LT	HMA	18'-11"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑩	BOSTON ROAD	33+07.7	16.0' LT	HMA	17'-4"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑪	BOSTON ROAD	34+62.2	16.0' LT	HMA	16'-0"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑫	BOSTON ROAD	35+22.9	16.0' LT	HMA	19'-6"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑬	BOSTON ROAD	36+71.5	17.8' LT	HMA	17'-3"	-2.2%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑭	BOSTON ROAD	37+93.1	18.3' LT	HMA	16'-0"	-2.5%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑮	BOSTON ROAD	38+37.8	16.7' LT	HMA	16'-0"	-3.1%	3'-6"	14'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑯	BOSTON ROAD	39+18.3	16.0' LT	HMA	19'-9"	-4.0%	3'-6"	15'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑰	BOSTON ROAD	42+18.2	16.0' LT	HMA	29'-2"	-5.0%	3'-6"	15'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑱	BOSTON ROAD	47+74.8	16.1' LT	HMA	22'-6"	-1.9%	3'-6"	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑲	BOSTON ROAD	49+21.4	16.0' LT	HMA	44'-10"	-2.0%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
⑳	BOSTON ROAD	50+12.8	16.0' LT	HMA	33'-9"	-2.7%	3'-6"	11'-0"	6"	5'-6"	6'-6"	6"	5'-6"
㉑	BOSTON ROAD	55+57.3	15.9' LT	HMA	18'-11"	-5.5%	3'-6"	15'-0"	6"	5'-6"	6'-6"	6"	5'-6"
㉒	BOSTON ROAD	63+01.8	16.4' LT	HMA	19'-2"	-0.5%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
㉓	BOSTON ROAD	63+75.6	18.1' LT	HMA	45'-0"	-0.5%	3'-6"	7'-8"	6"	5'-6"	6'-6"	6"	5'-6"
㉔	BOSTON ROAD	66+97.3	27.0' LT	HMA	18'-0"	-1.7%	3'-6"	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"
㉕	BOSTON ROAD	67+82.7	16.0' RT	CC	30'-0"	+1.8%	3'-6"	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"
㉖	BOSTON ROAD	68+45.8	27.0' LT	CC	29'-0"	-1.8%	3'-6"	9'-0"	6"	5'-6"	6'-6"	6"	5'-6"
㉗	MAIN STREET	11+14.8	24.3' RT	HMA/BRICK	13'-2"	-0.4%	3'-6"	6'-6"	6"	5'-6"	6'-6"	6"	6'-0"

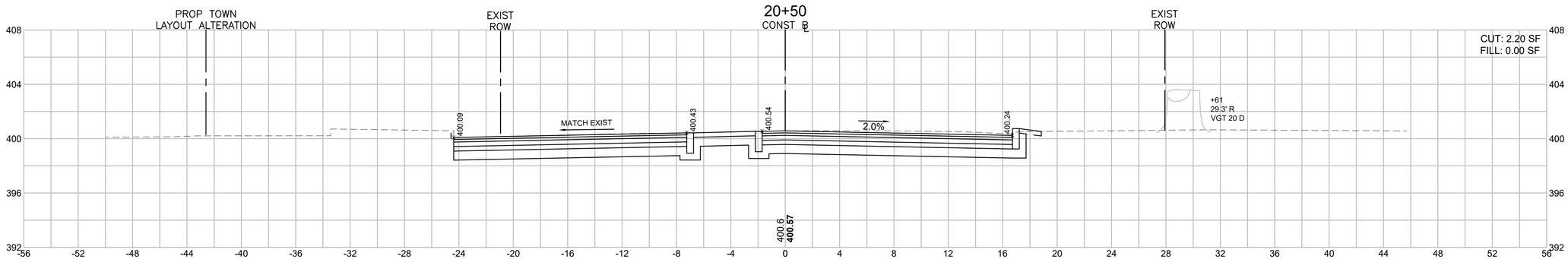
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	80	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 1 OF 53
BOSTON ROAD





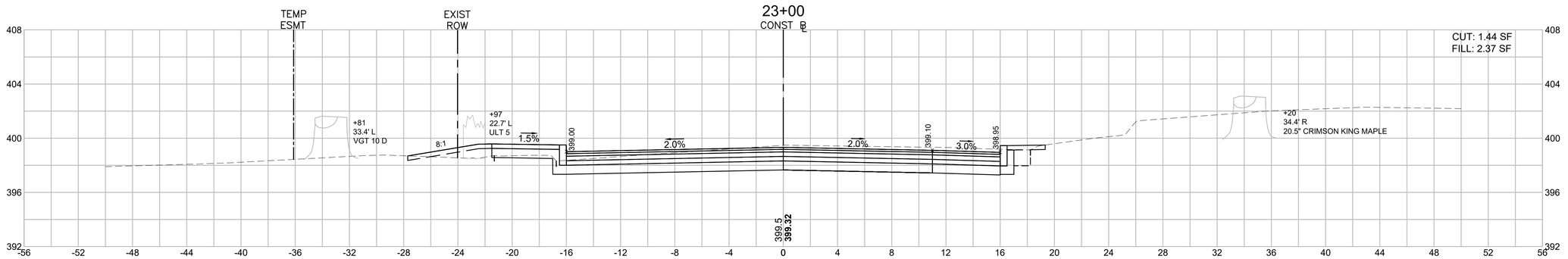


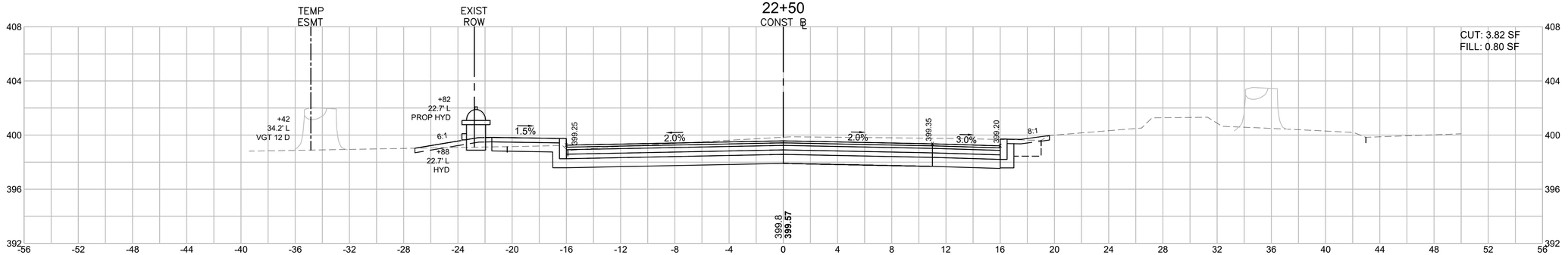
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

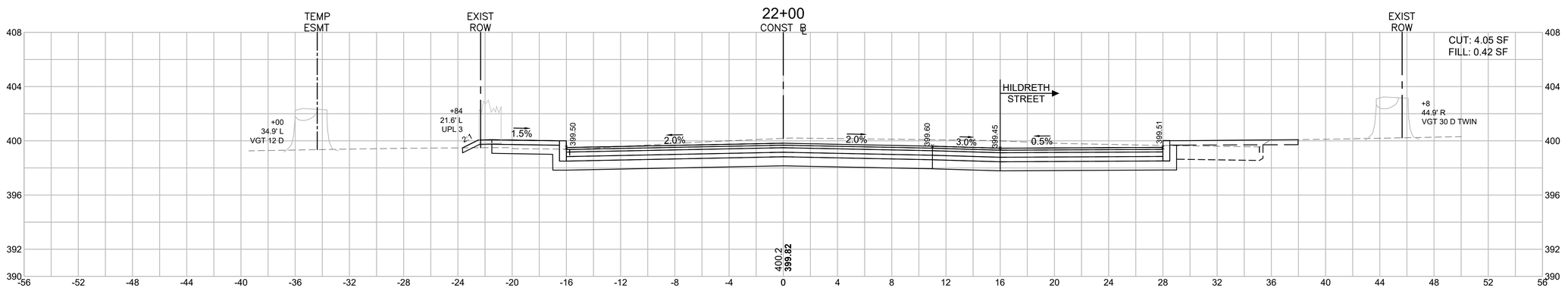
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	81	132
PROJECT FILE NO.	609035		

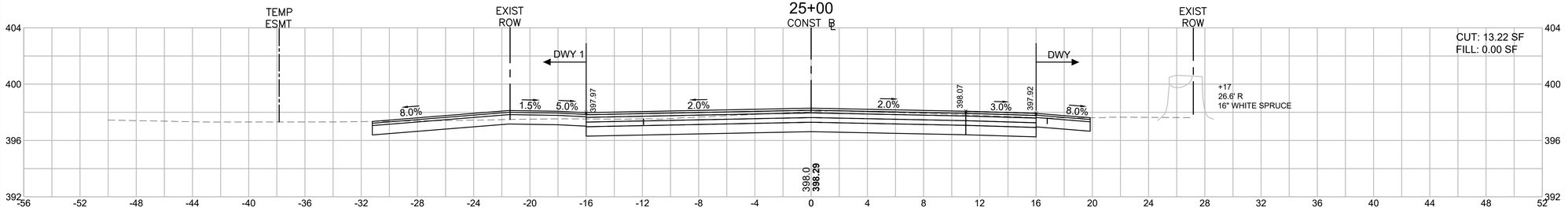
CROSS SECTIONS - 2 OF 53
BOSTON ROAD

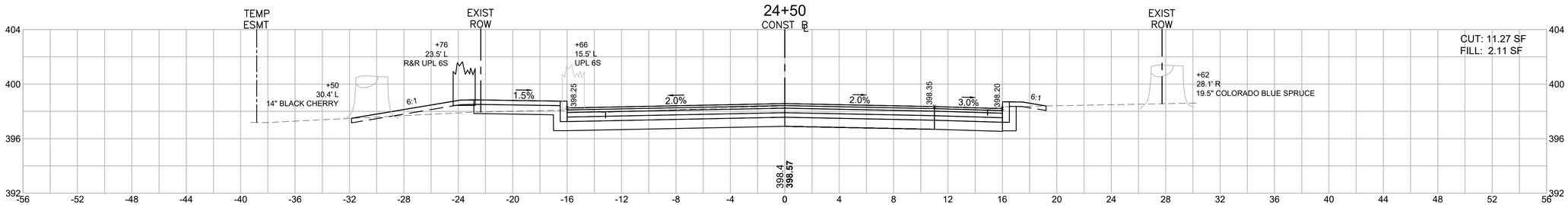


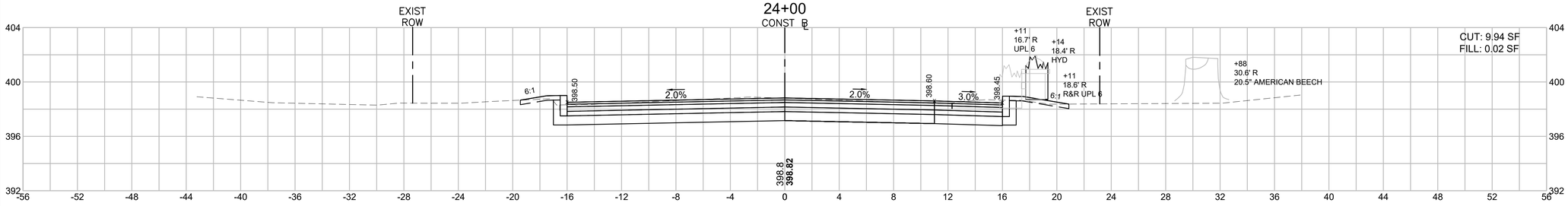


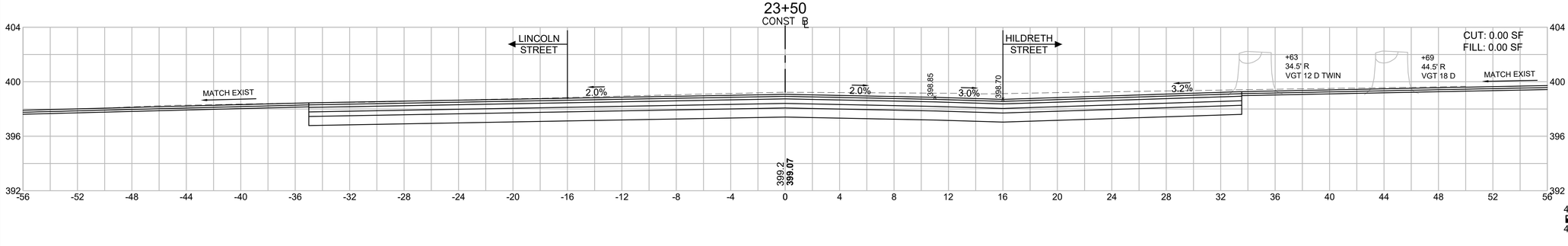


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8









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

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	82	132
PROJECT FILE NO.	609035		

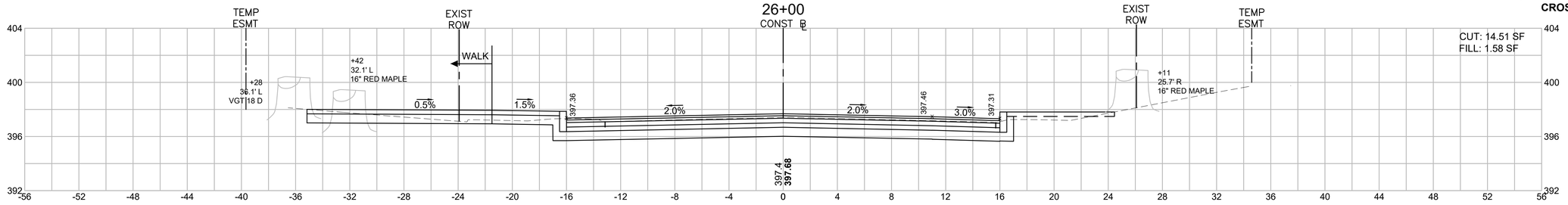
CROSS SECTIONS - 3 OF 53
BOSTON ROAD

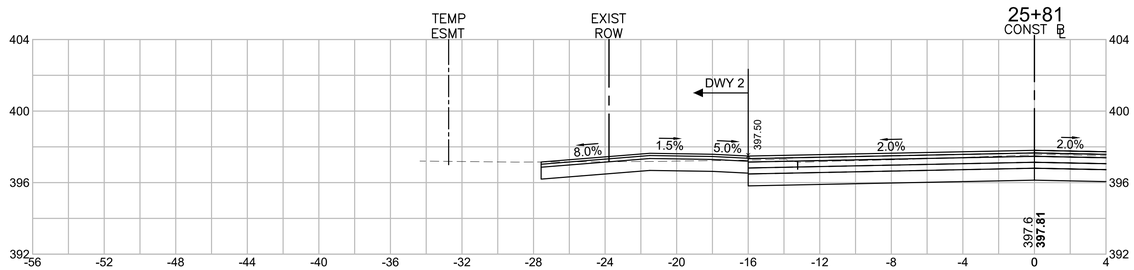
609035_HD12\CROSS SECTIONS\.DWG Plotted on 17-May-2024 8:48 AM

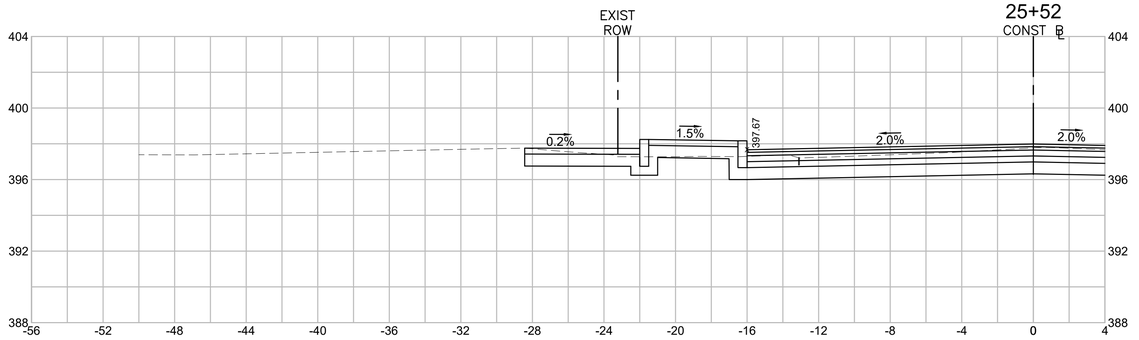
WESTFORD
BOSTON ROAD

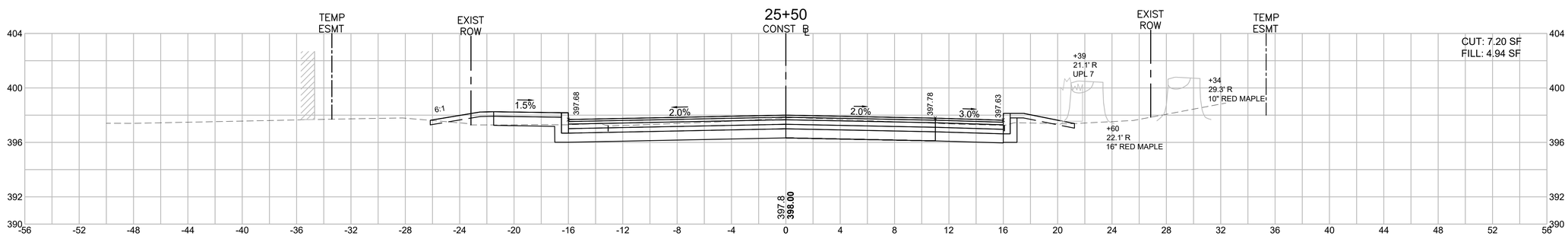
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	83	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 4 OF 53
BOSTON ROAD







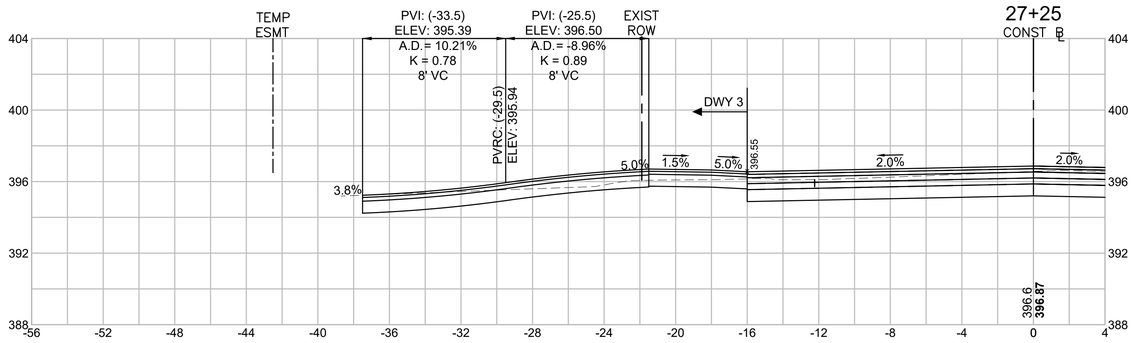


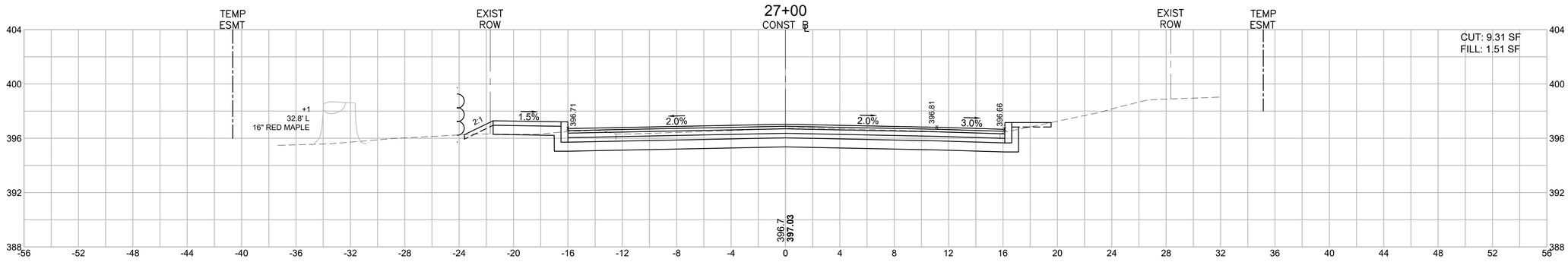
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

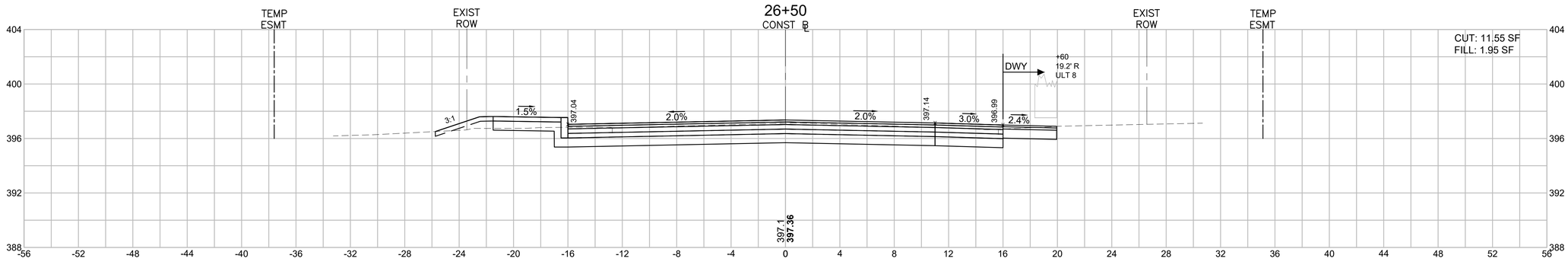
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	84	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 5 OF 53
BOSTON ROAD





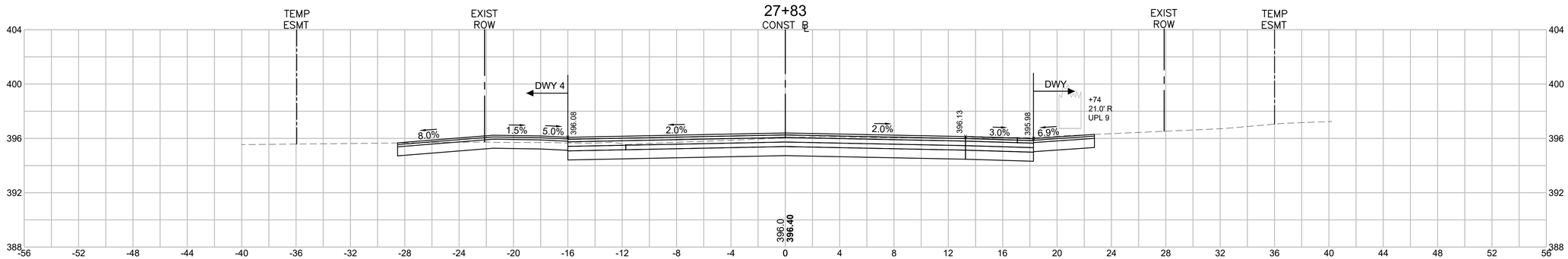


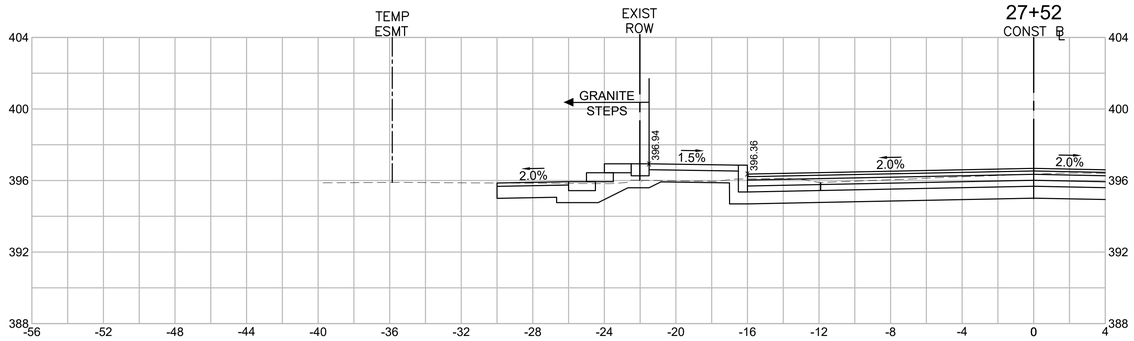
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

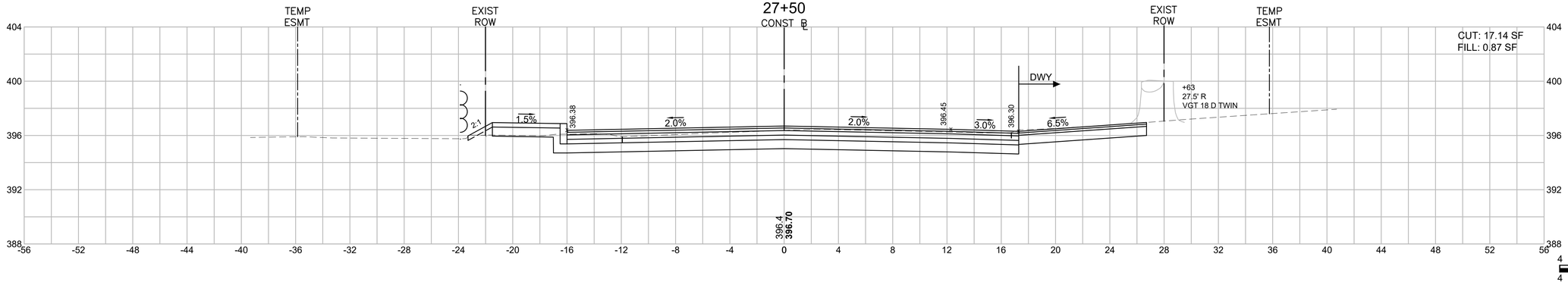
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	85	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 6 OF 53
BOSTON ROAD







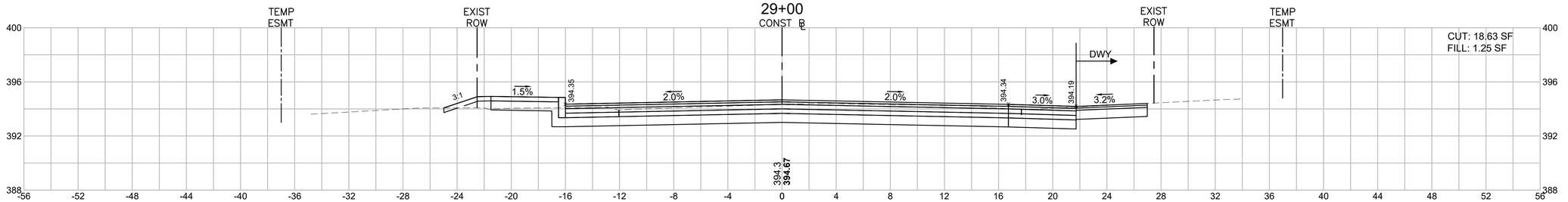
HOR. SCALE IN FEET
4 0 4 8

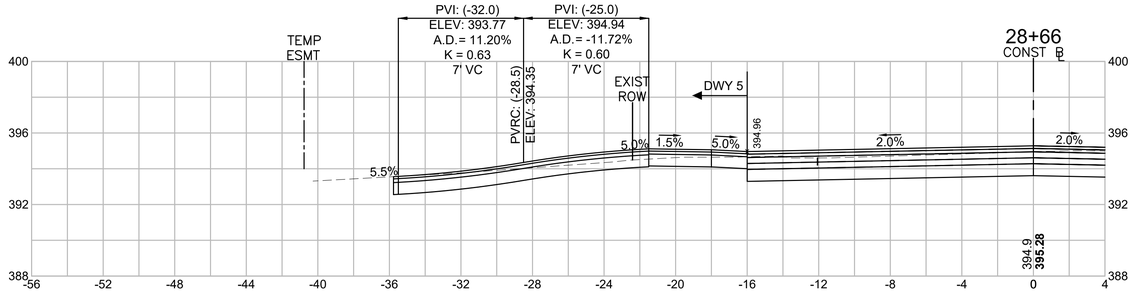
VER. SCALE IN FEET
4 0 4 8

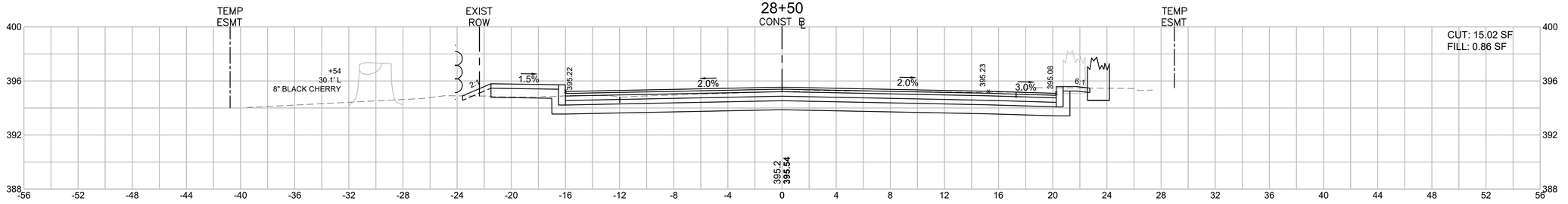
WESTFORD
BOSTON ROAD

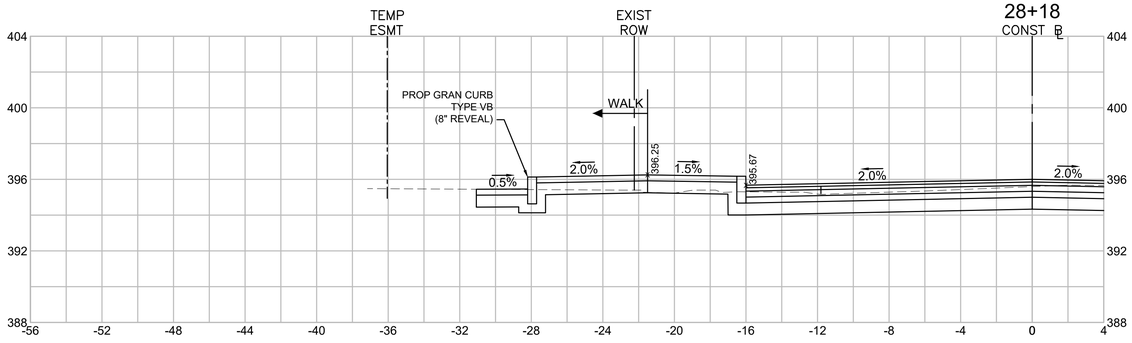
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	86	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 7 OF 53
BOSTON ROAD







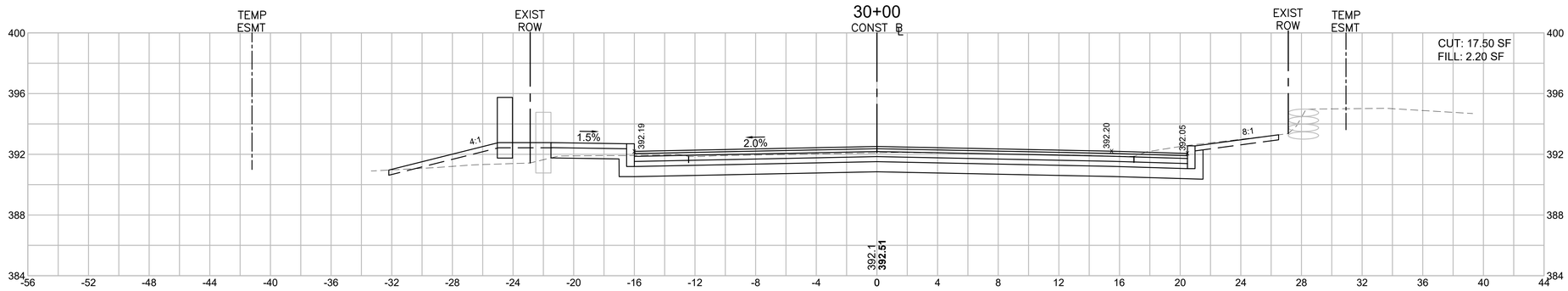


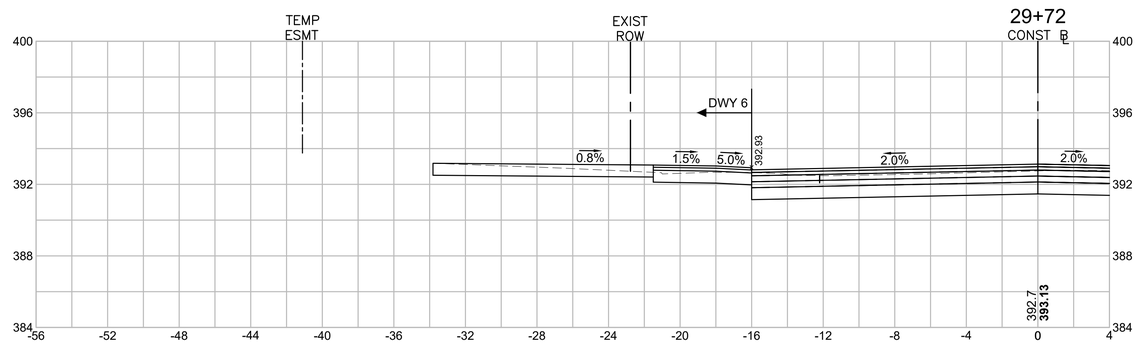
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

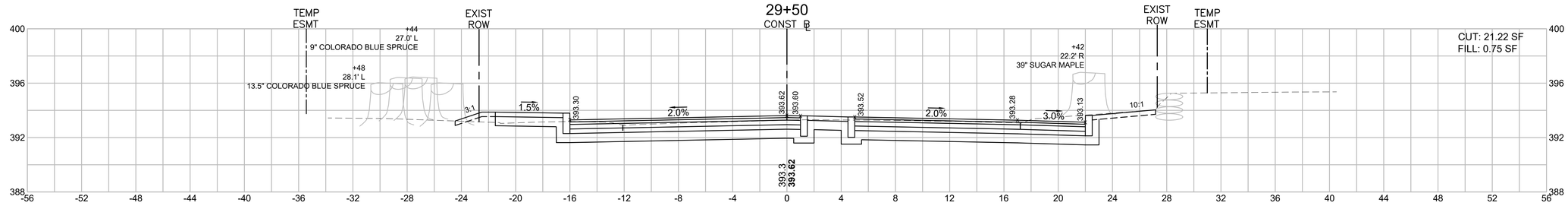
WESTFORD
BOSTON ROAD

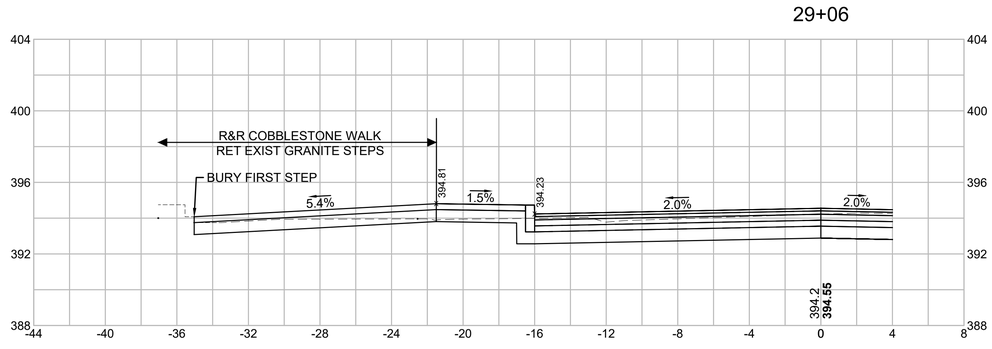
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	87	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 8 OF 53
BOSTON ROAD







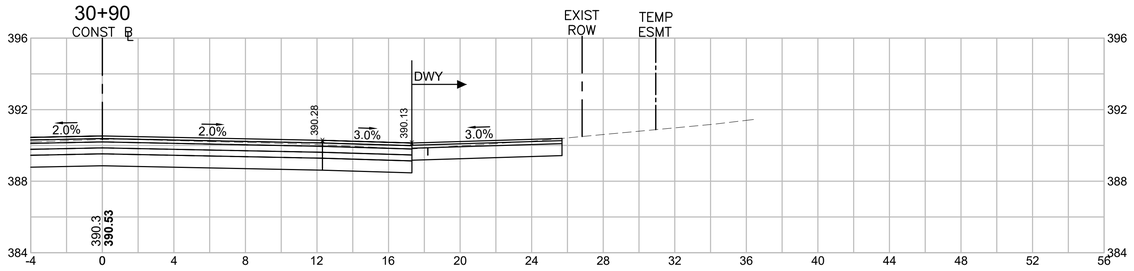


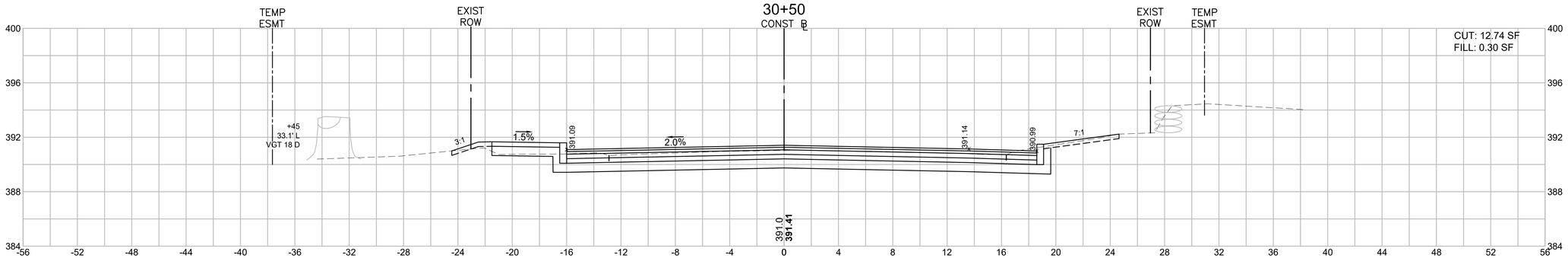
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

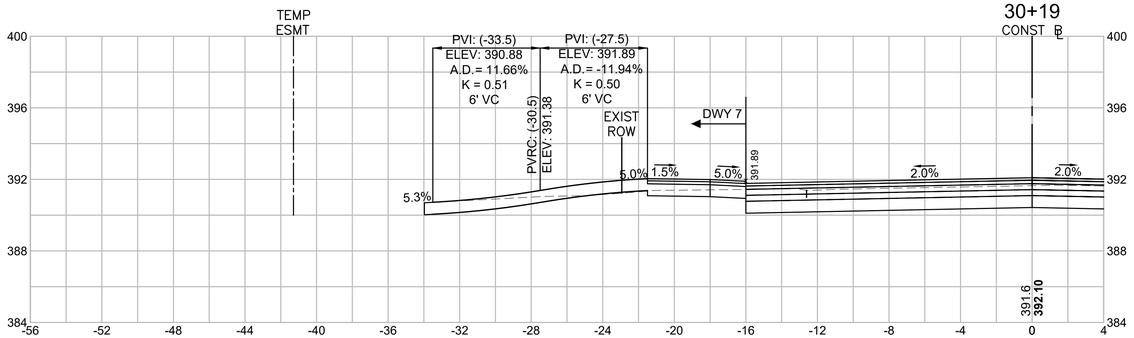
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	88	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 9 OF 53
BOSTON ROAD





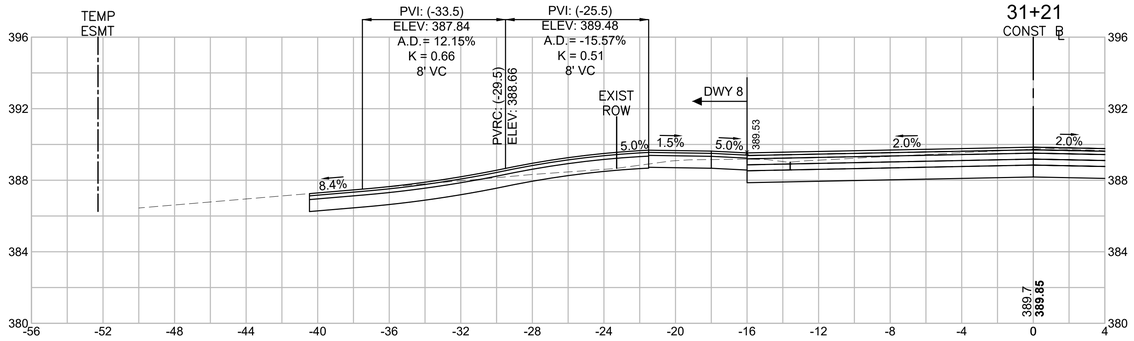


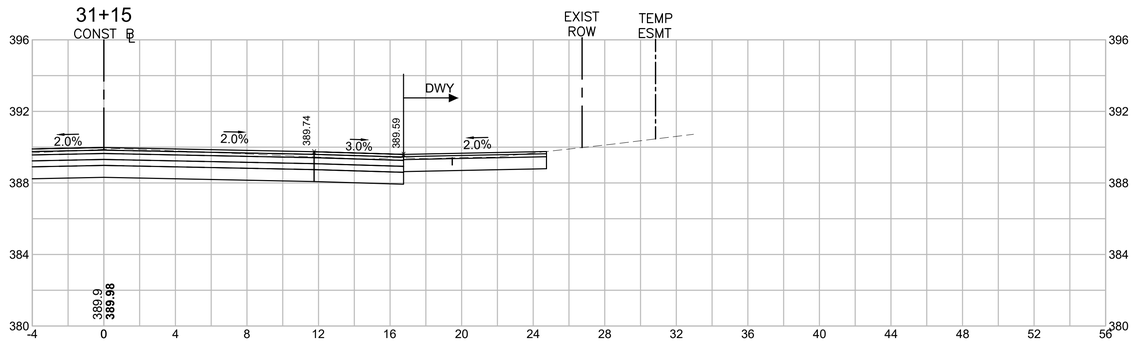
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

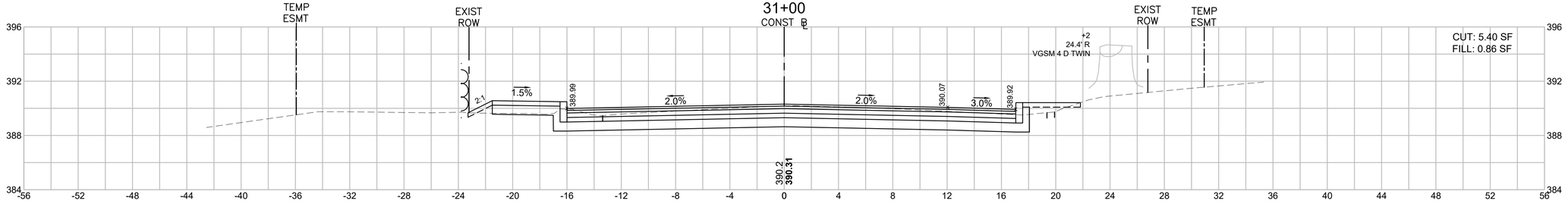
WESTFORD
BOSTON ROAD

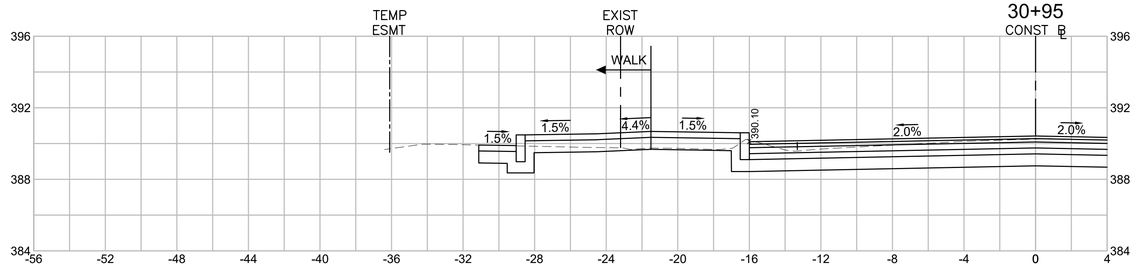
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	89	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 10 OF 53
BOSTON ROAD









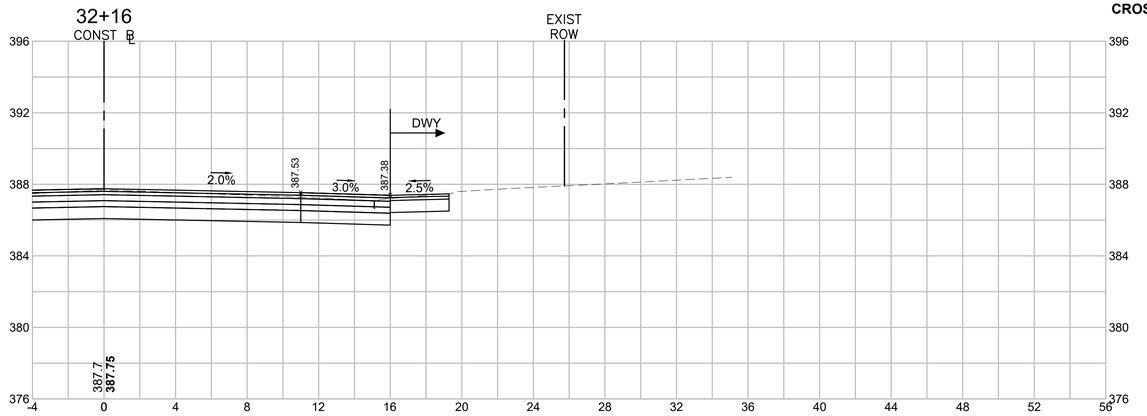
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

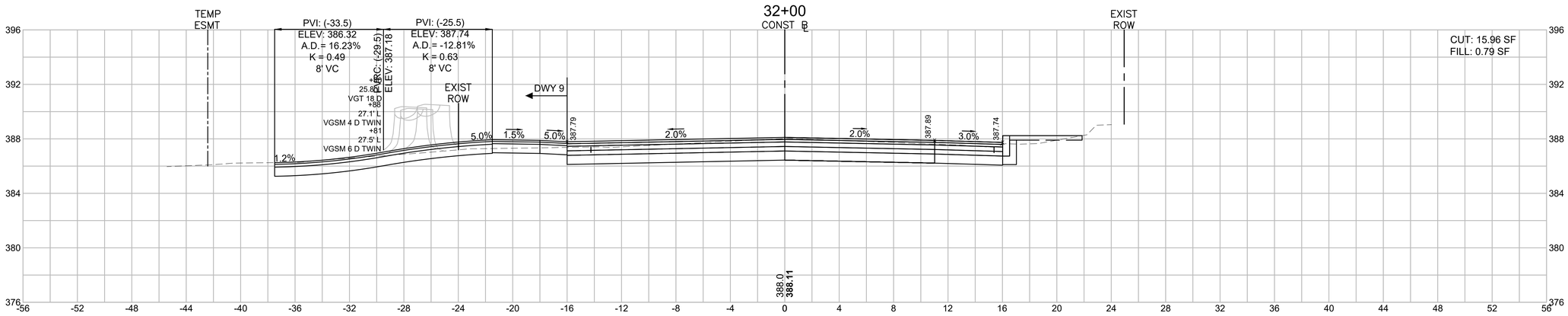
WESTFORD
BOSTON ROAD

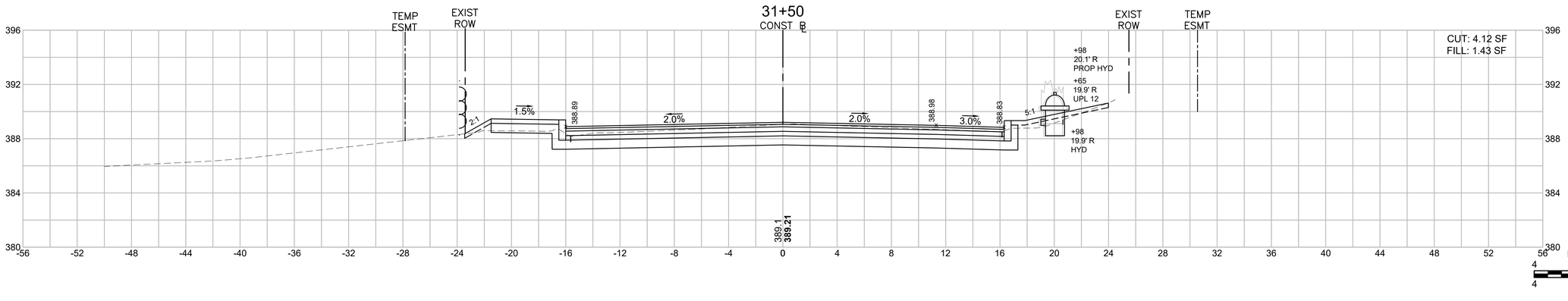
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	90	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 11 OF 53
BOSTON ROAD

609035_HD12(CROSS SECTIONS).DWG Plotted on 17-May-2024 8:49 AM



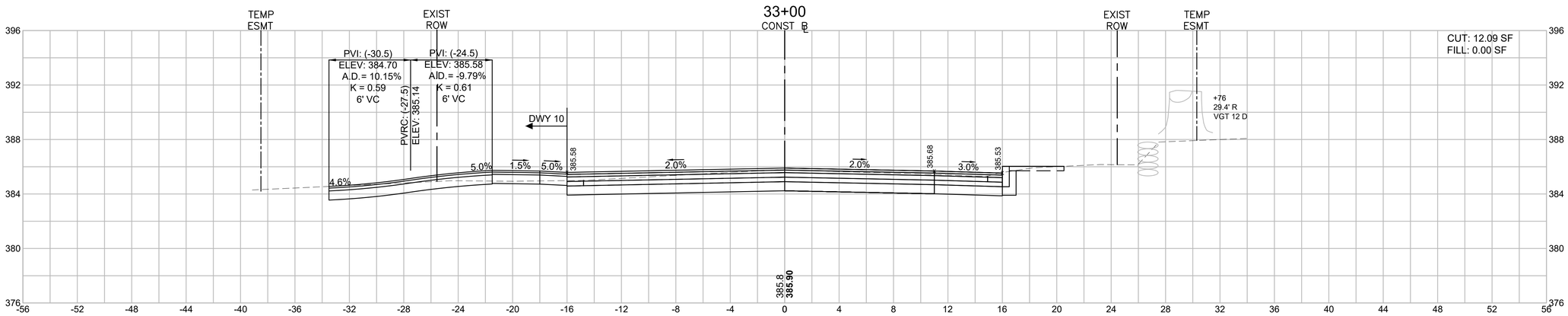


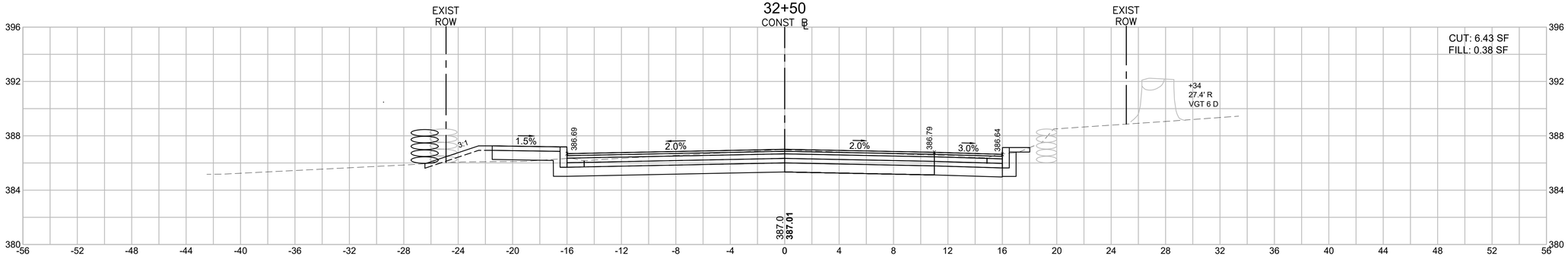


WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	91	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 12 OF 53
BOSTON ROAD



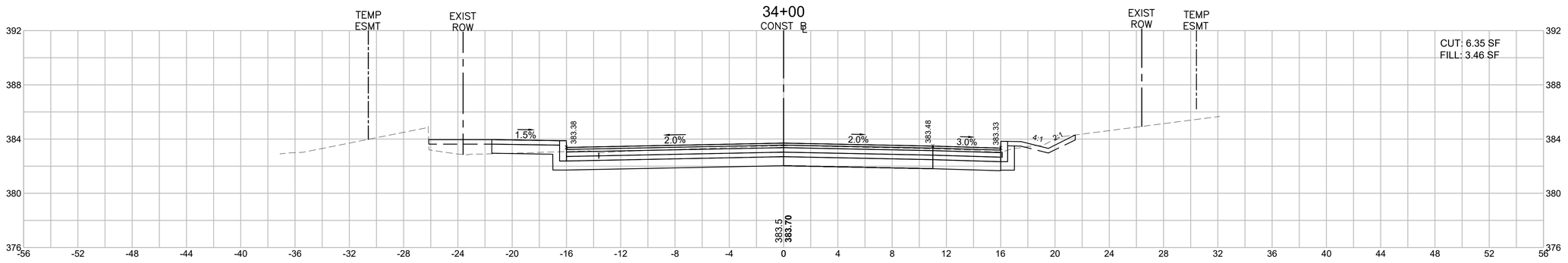


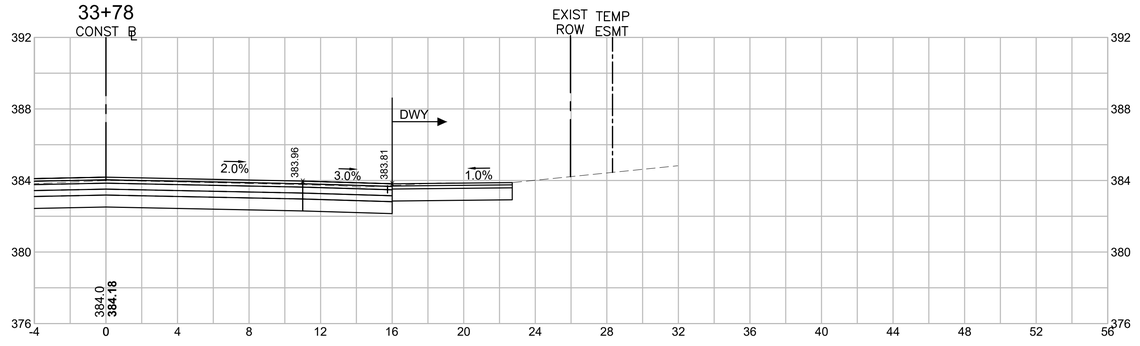
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

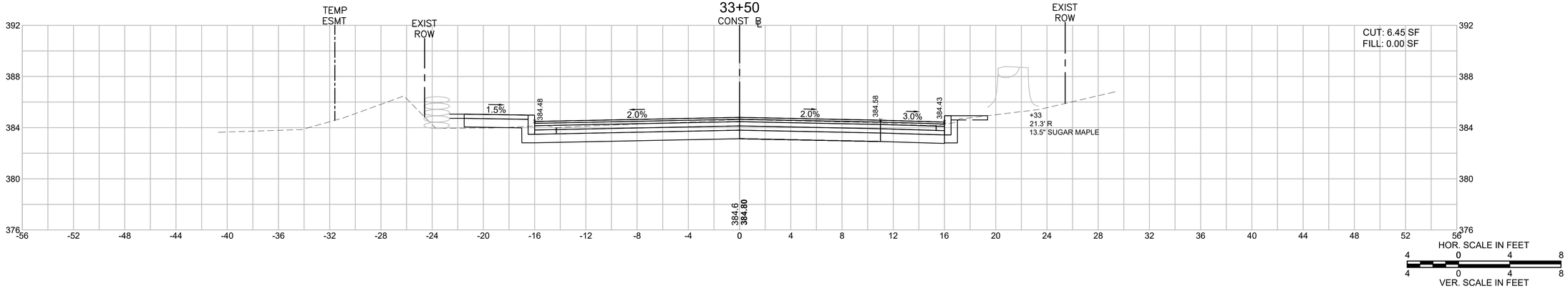
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	92	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 13 OF 53
BOSTON ROAD



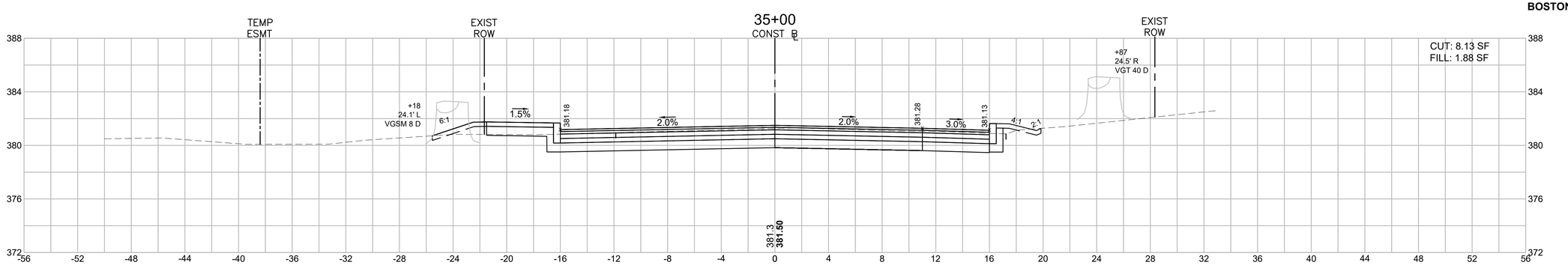


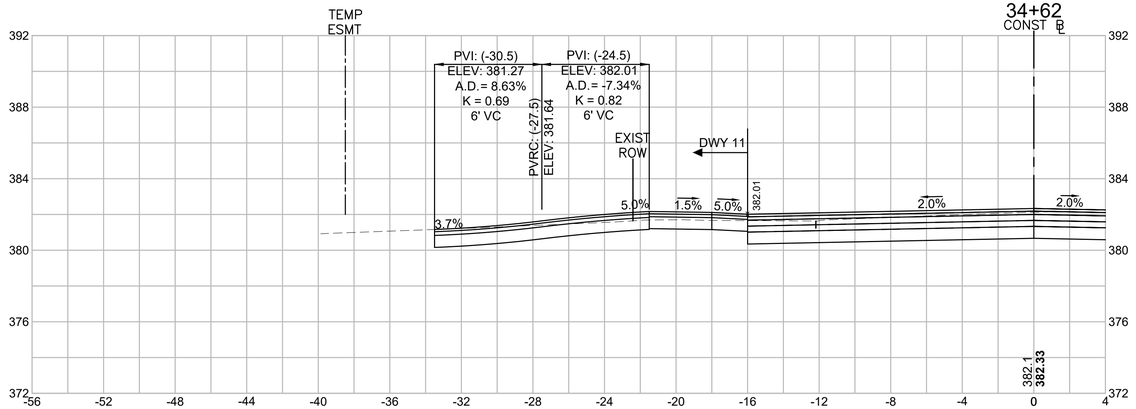


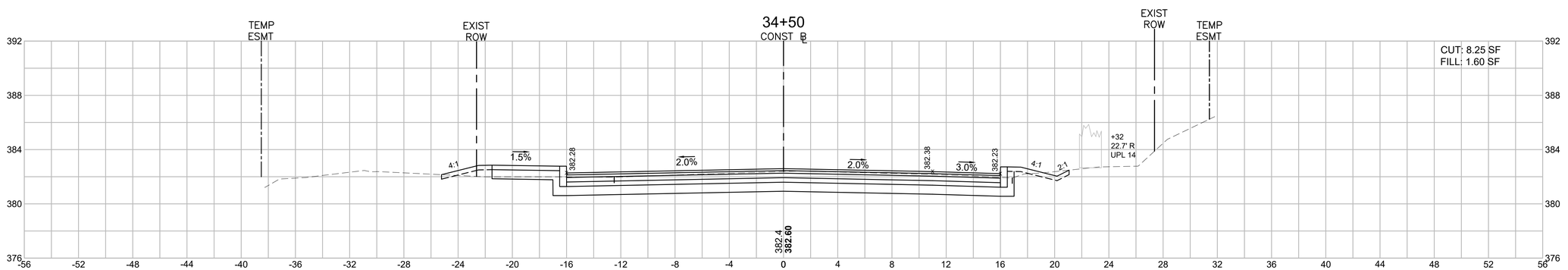
WESTFORD
BOSTON ROAD

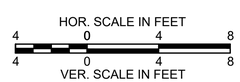
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	93	132
PROJECT FILE NO.	609035		

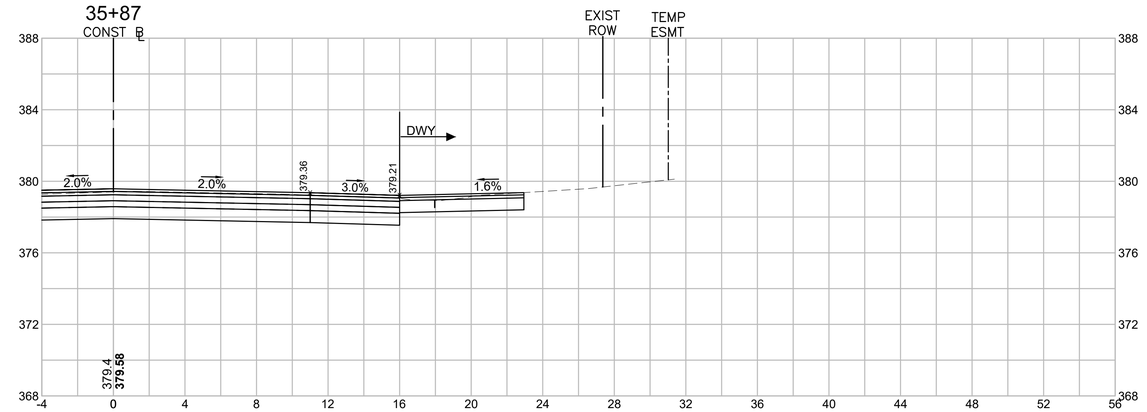
CROSS SECTIONS - 14 OF 53
BOSTON ROAD

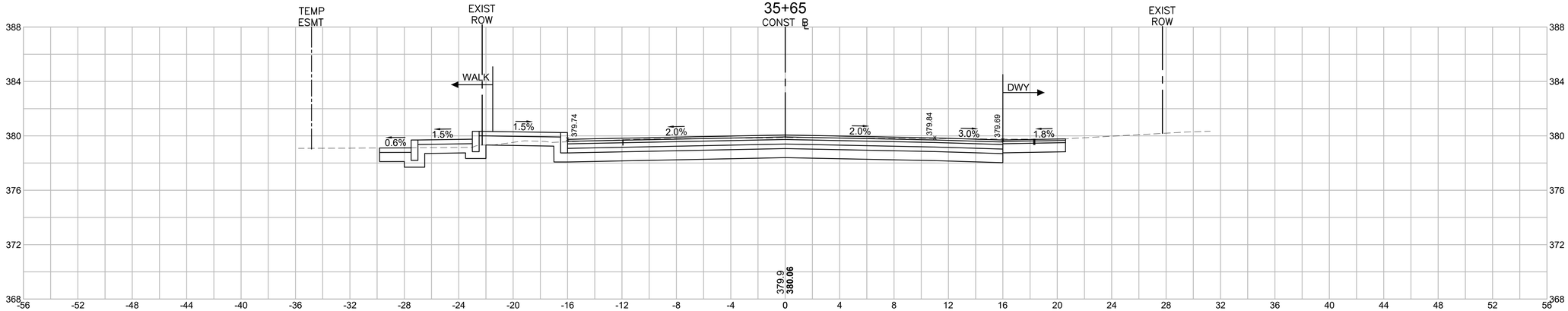


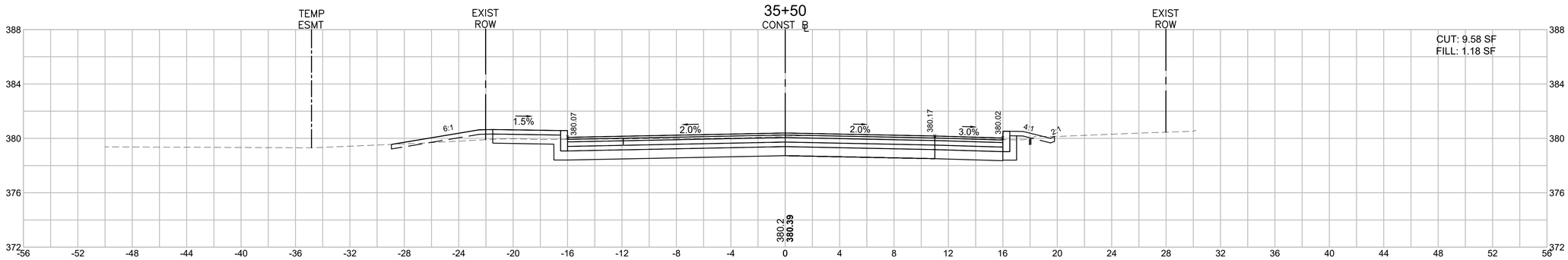


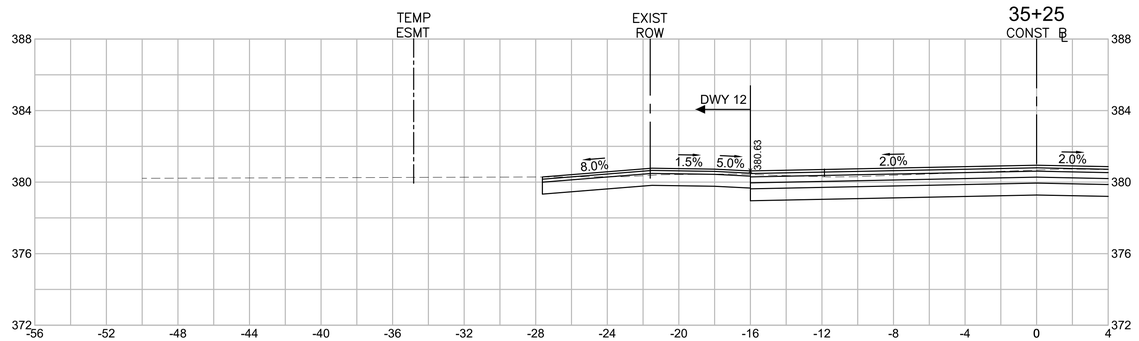












HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	94	132
PROJECT FILE NO.	609035		

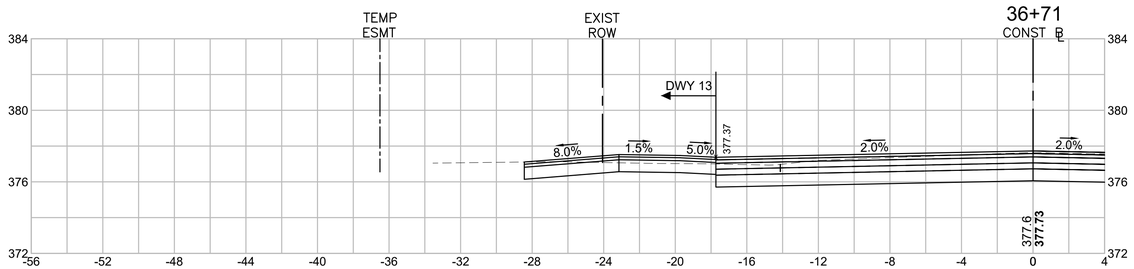
CROSS SECTIONS - 15 OF 53
BOSTON ROAD

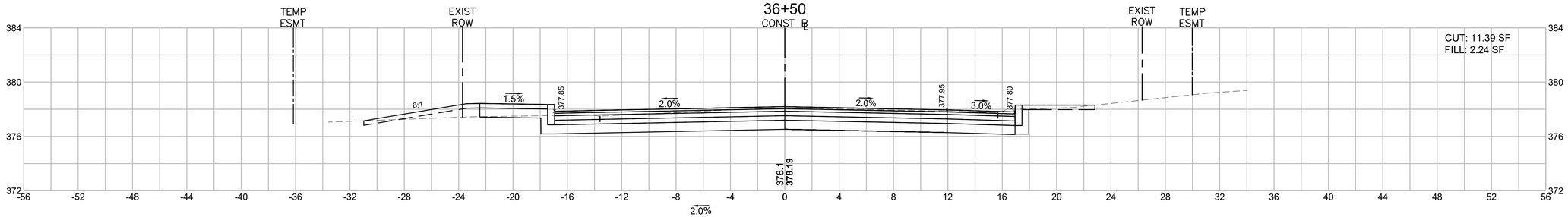
609035_HD12\CROSS SECTIONS\.DWG Plotted on 17-May-2024 8:50 AM

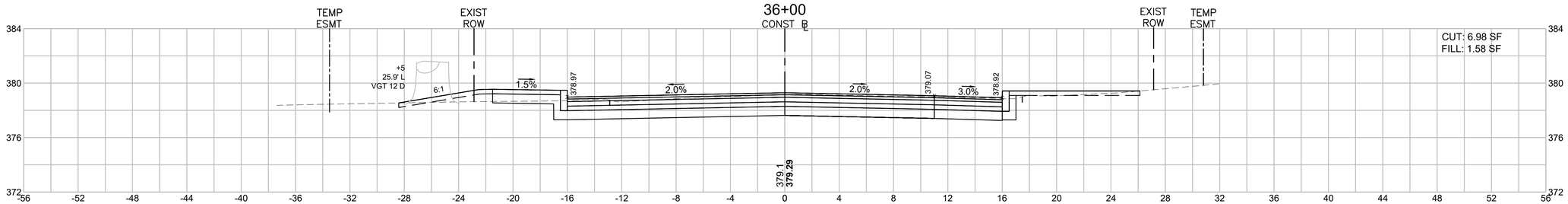
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	95	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 16 OF 53
BOSTON ROAD





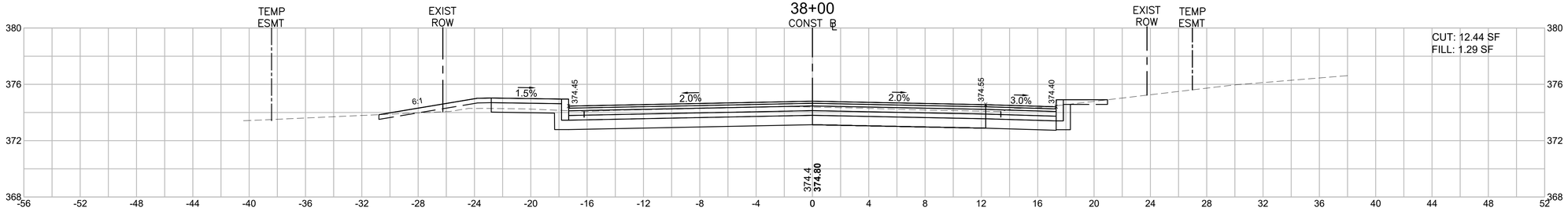


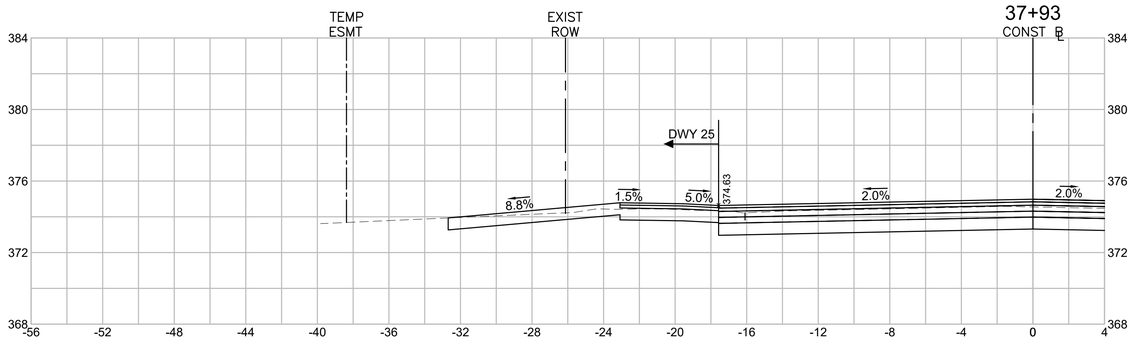
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

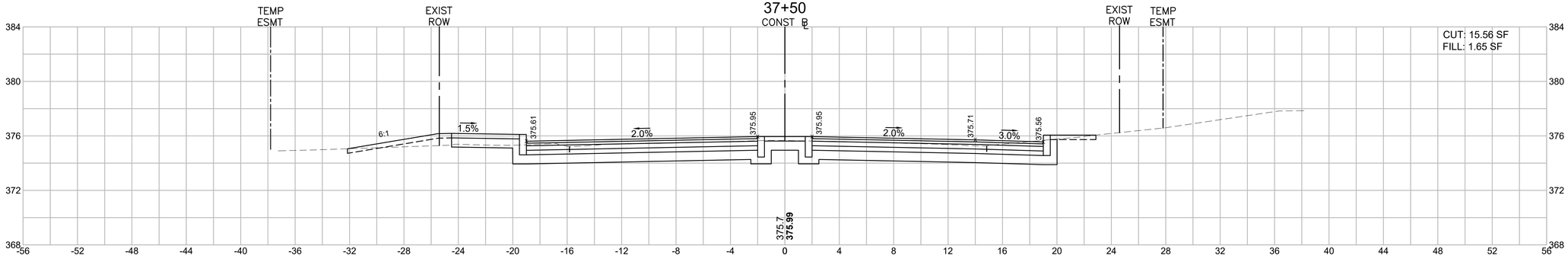
WESTFORD
BOSTON ROAD

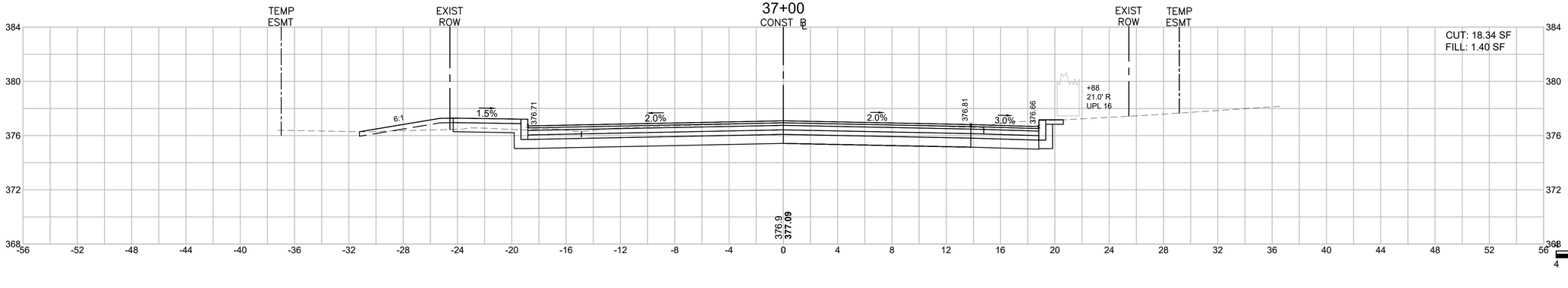
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	96	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 17 OF 53
BOSTON ROAD





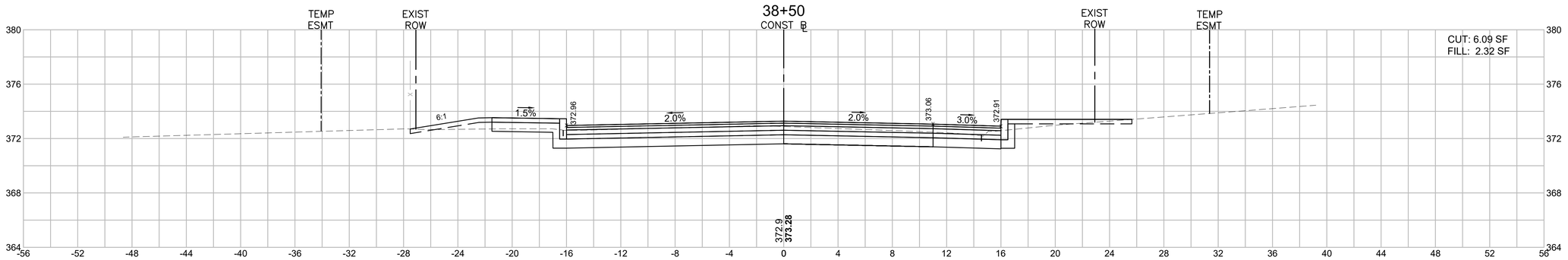


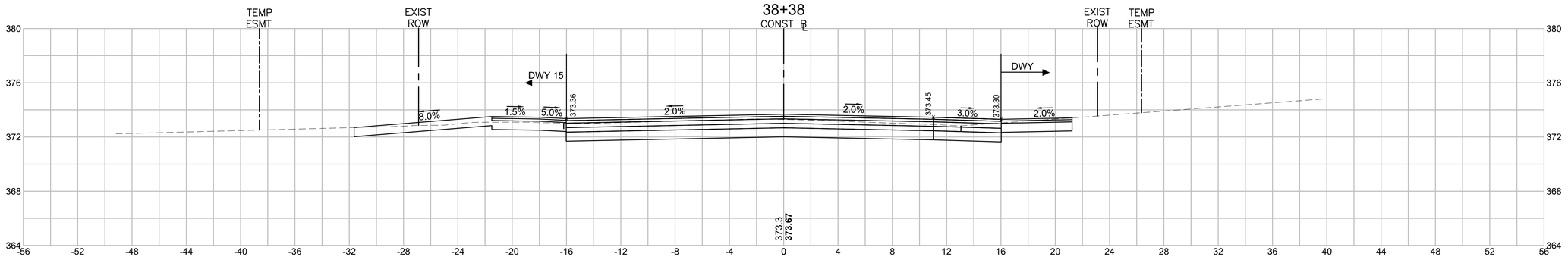


WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	97	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 18 OF 53
BOSTON ROAD



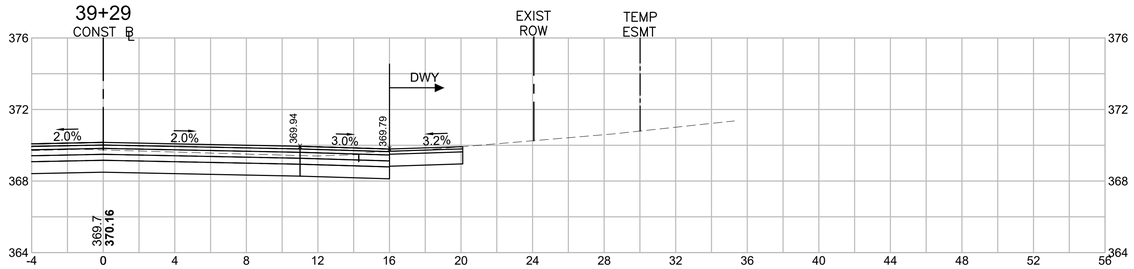


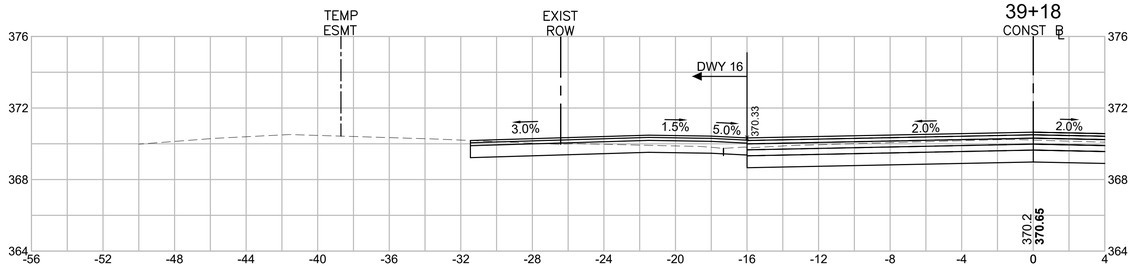
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

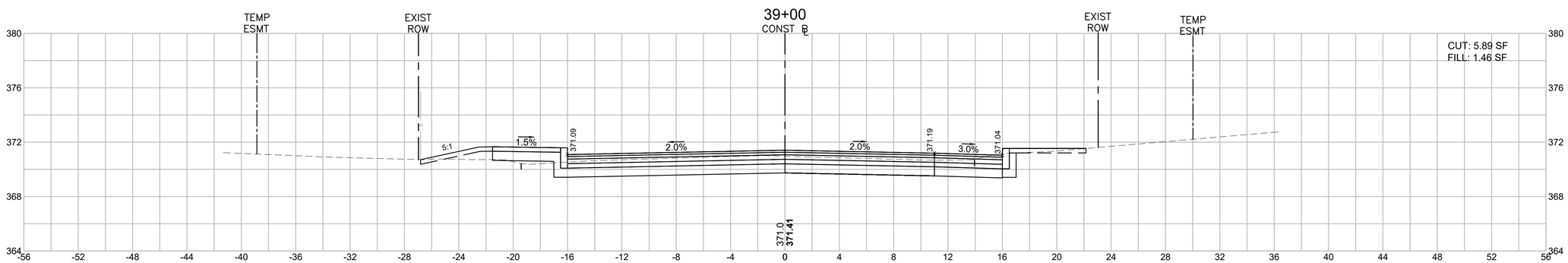
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	98	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 19 OF 53
BOSTON ROAD





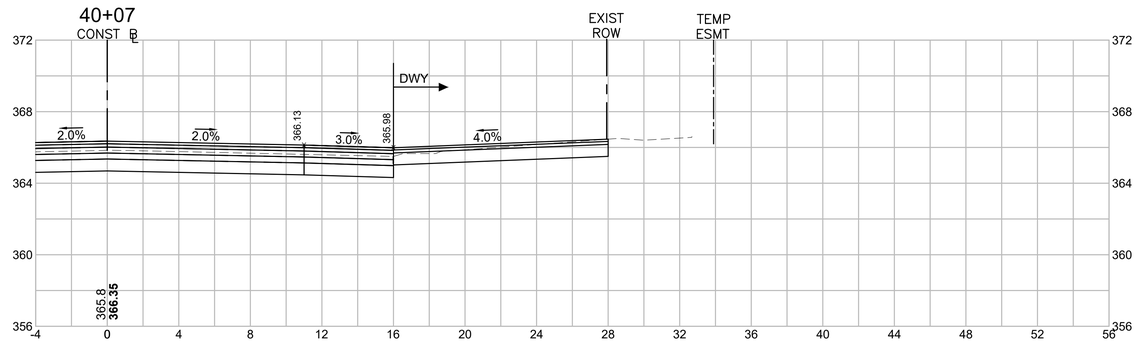


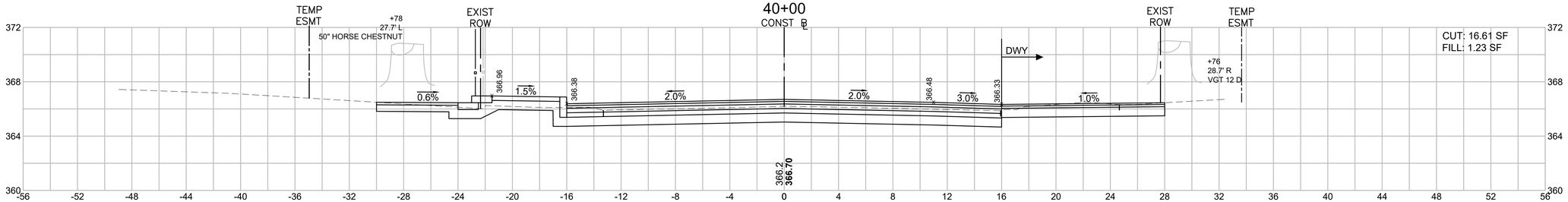
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

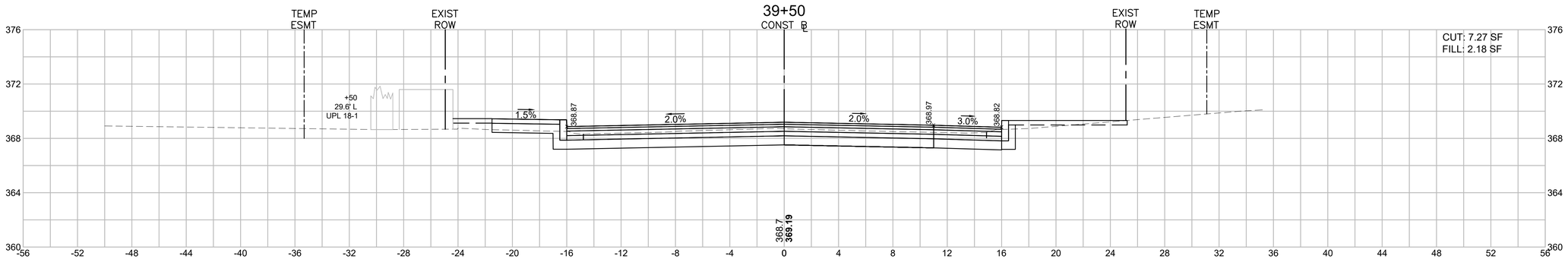
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	99	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 20 OF 53
BOSTON ROAD





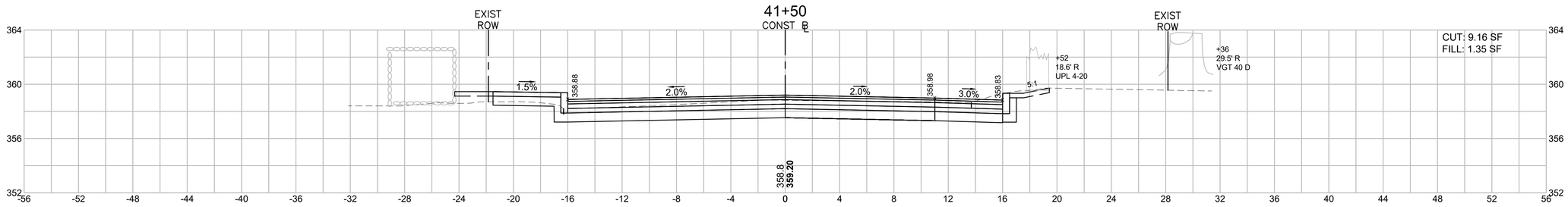


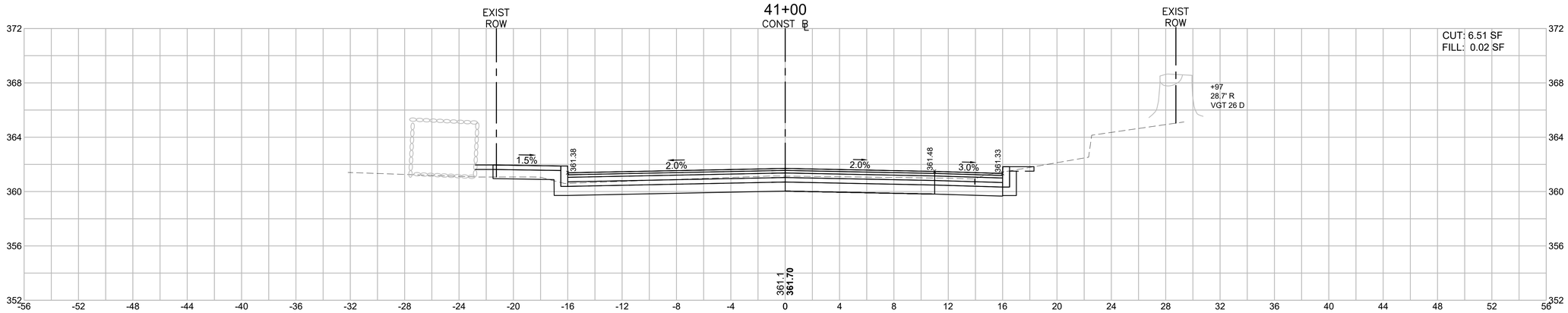
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

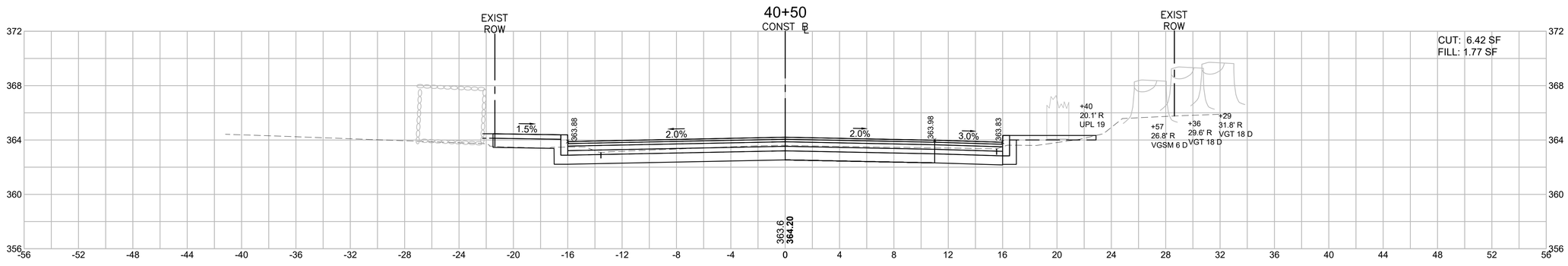
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	100	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 21 OF 53
BOSTON ROAD





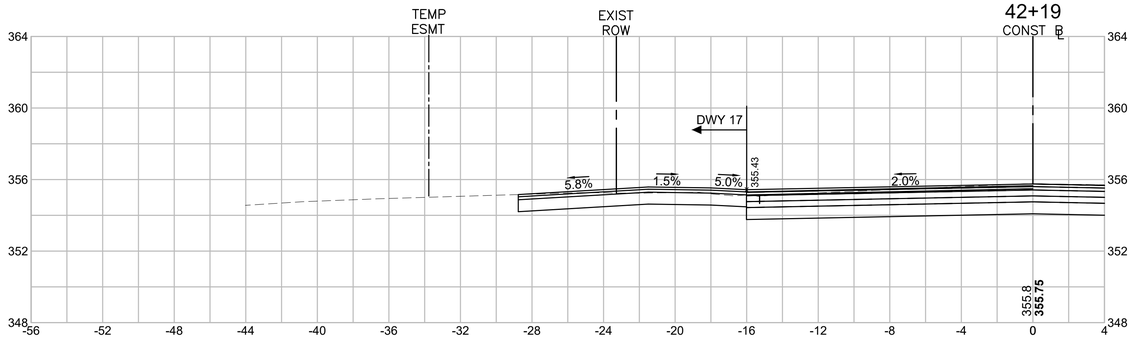


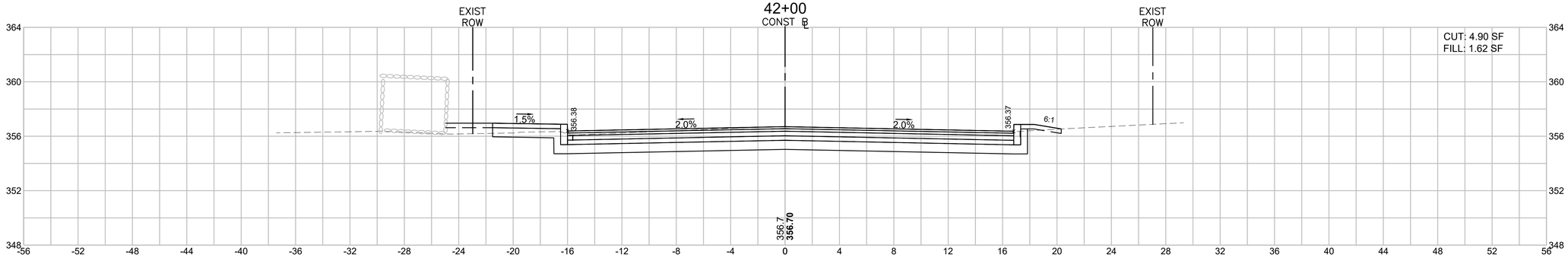
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

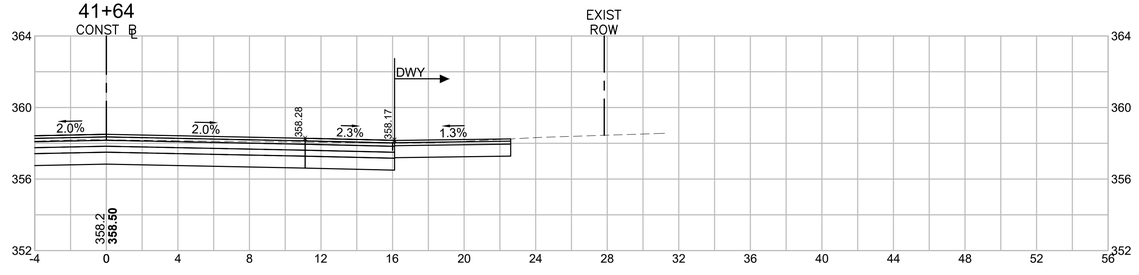
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	101	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 22 OF 53
BOSTON ROAD





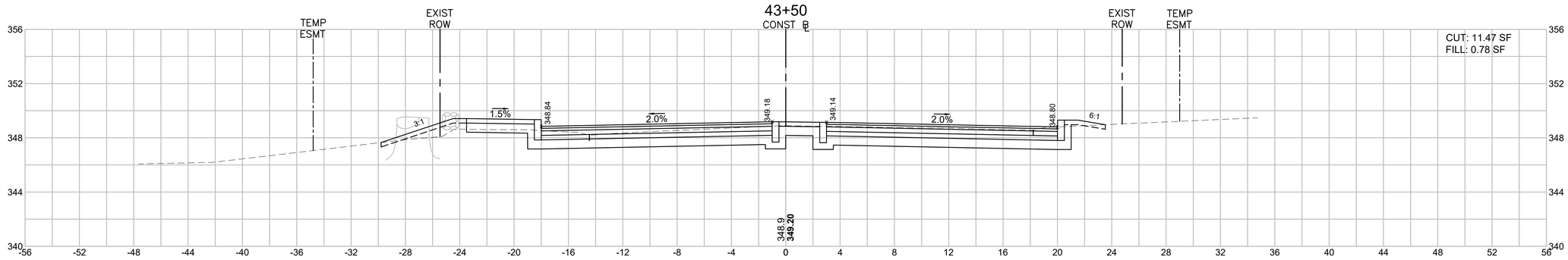


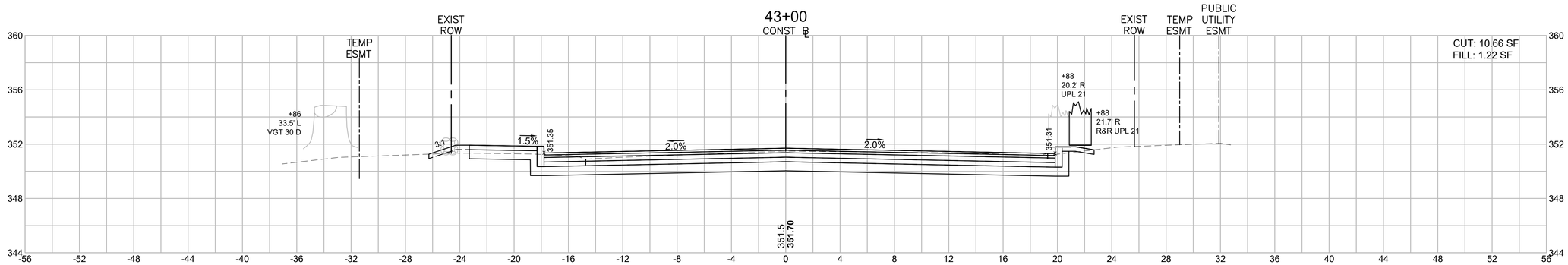
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

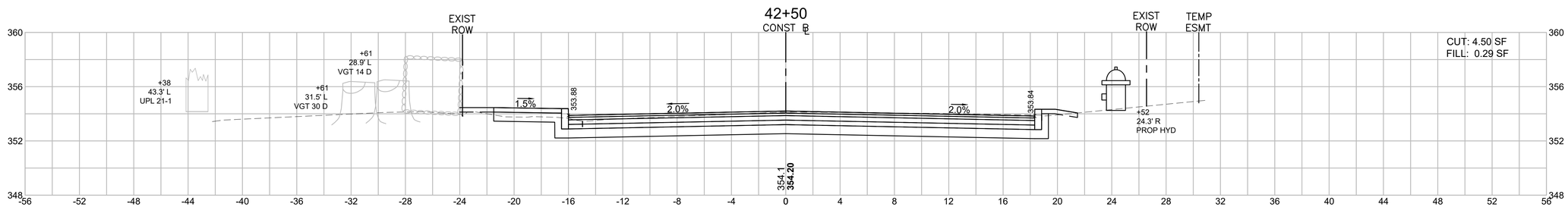
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	102	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 23 OF 53
BOSTON ROAD





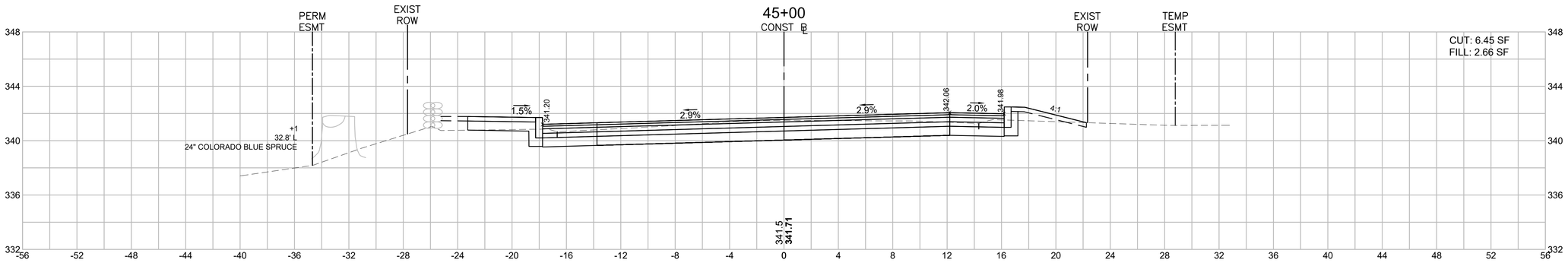


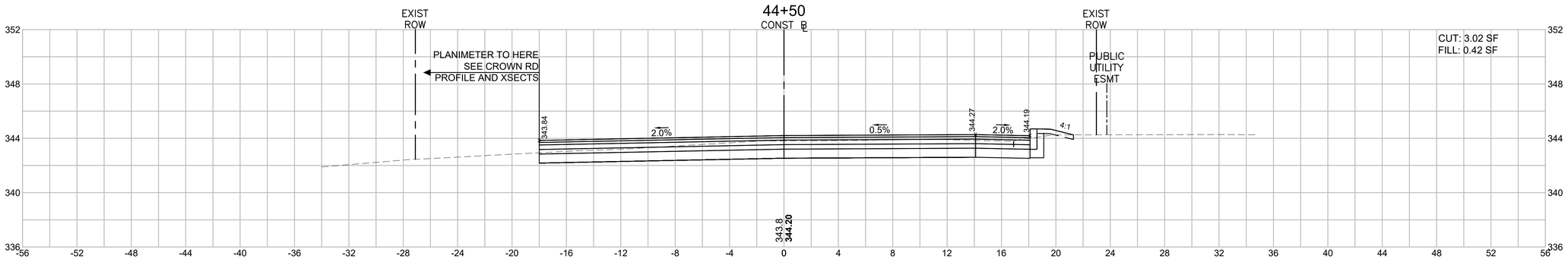
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

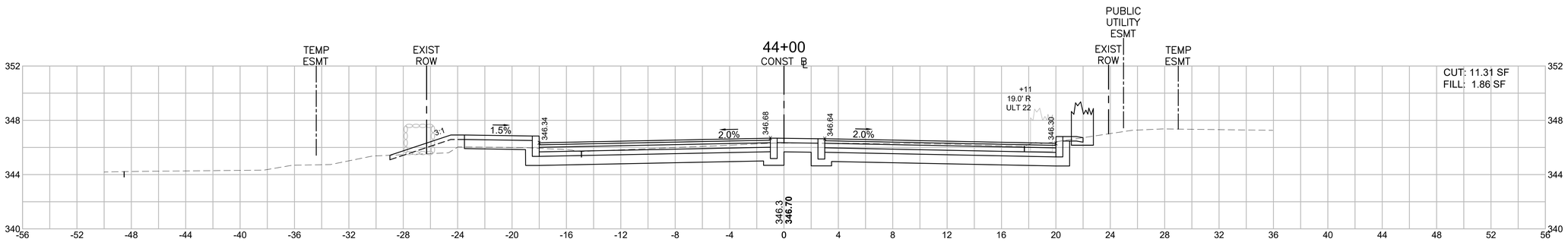
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	103	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 24 OF 53
BOSTON ROAD





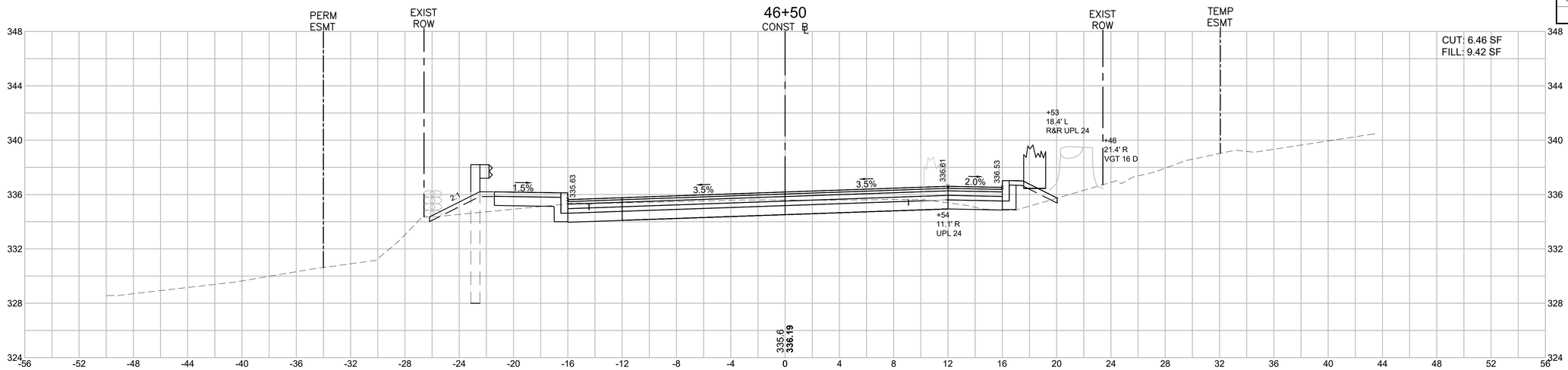


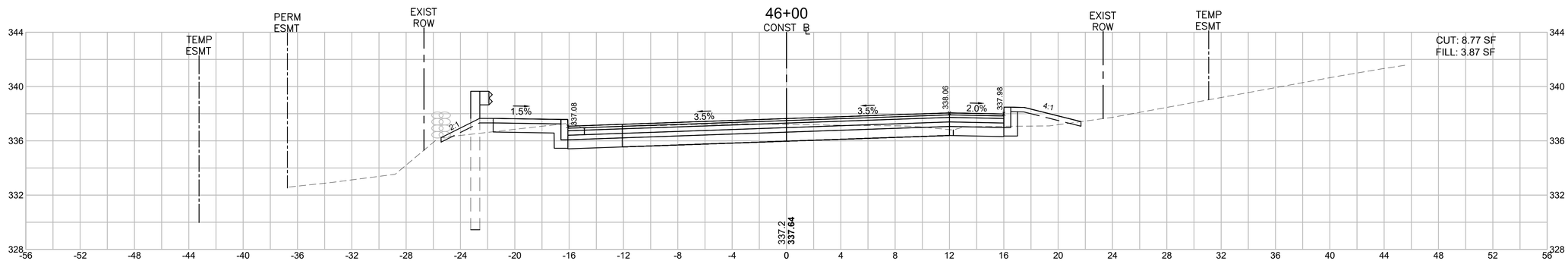
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

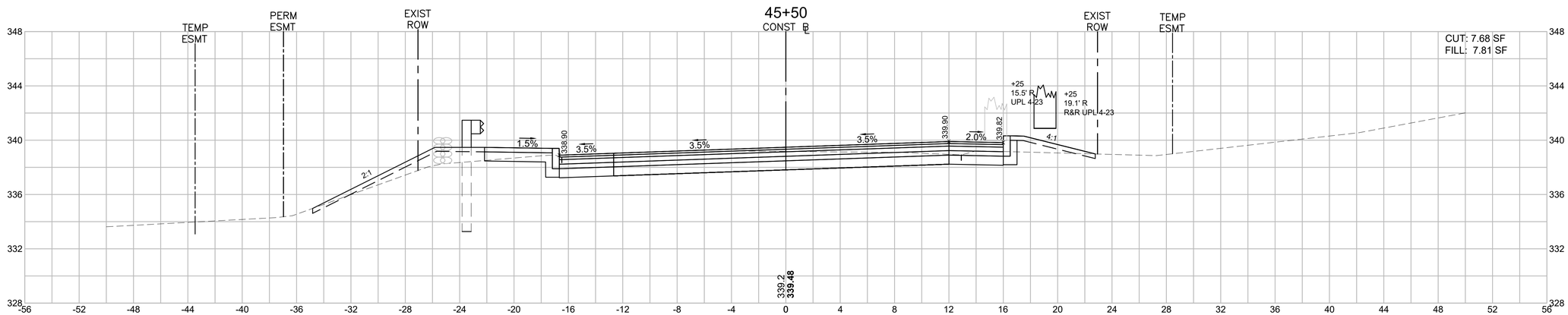
WESTFORD
BOSTON ROAD

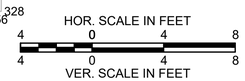
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	104	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 25 OF 53
BOSTON ROAD





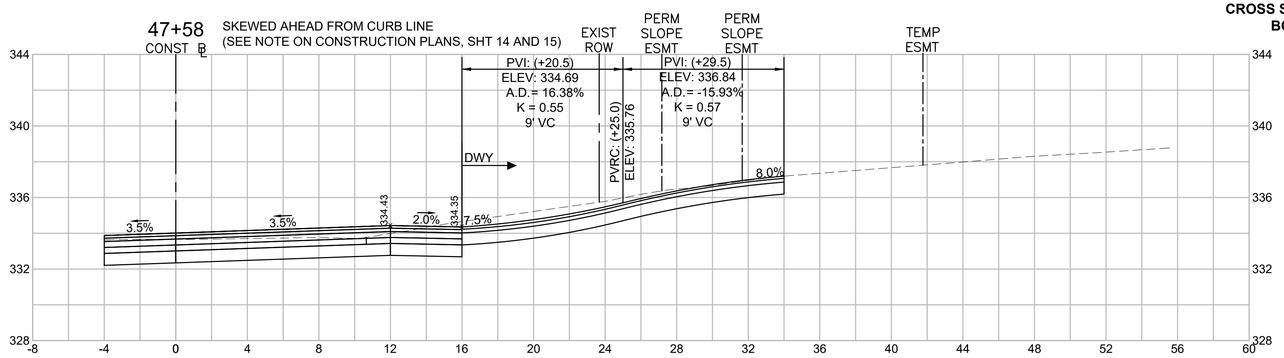


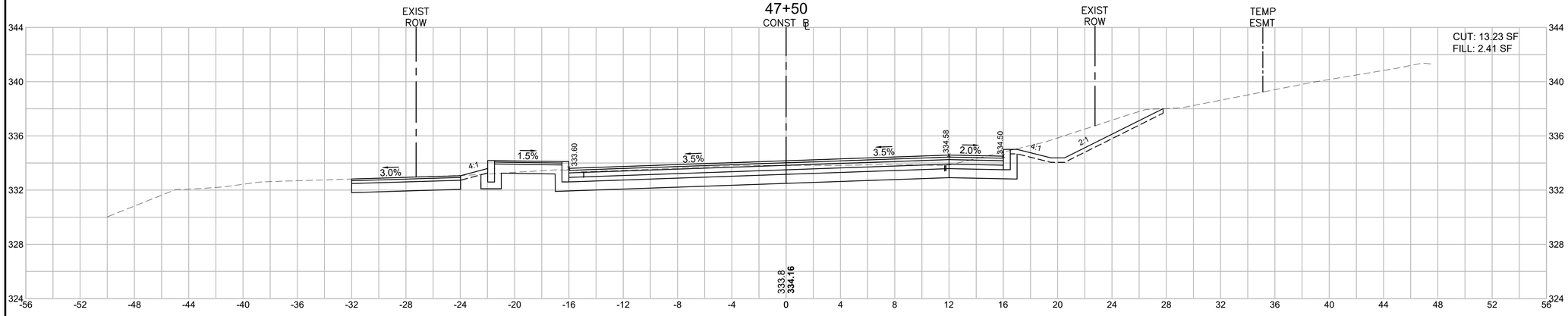


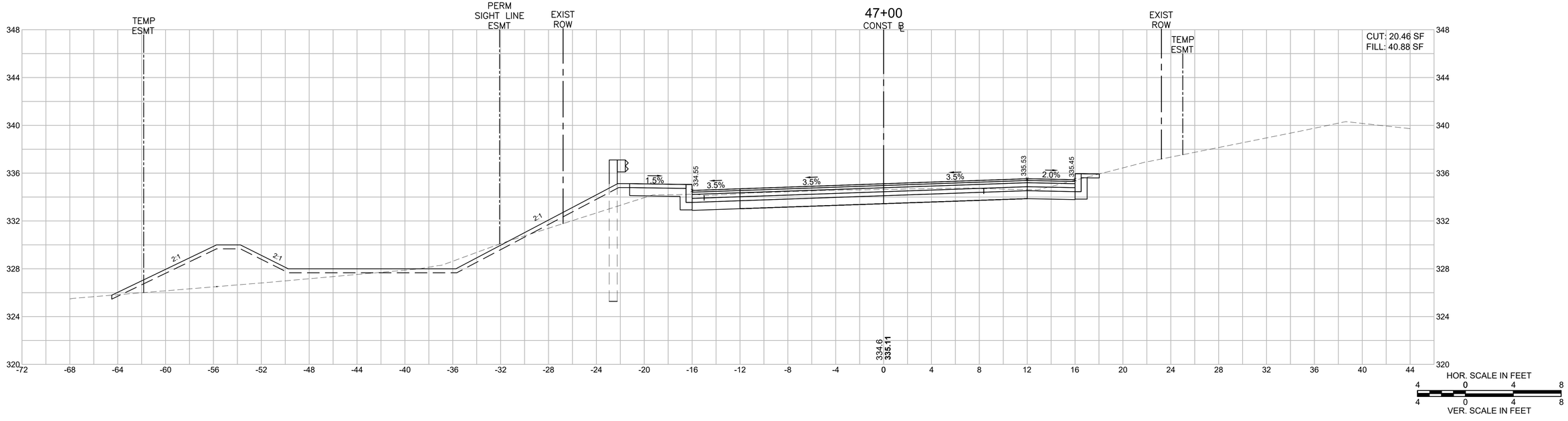
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	105	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 26 OF 53
BOSTON ROAD



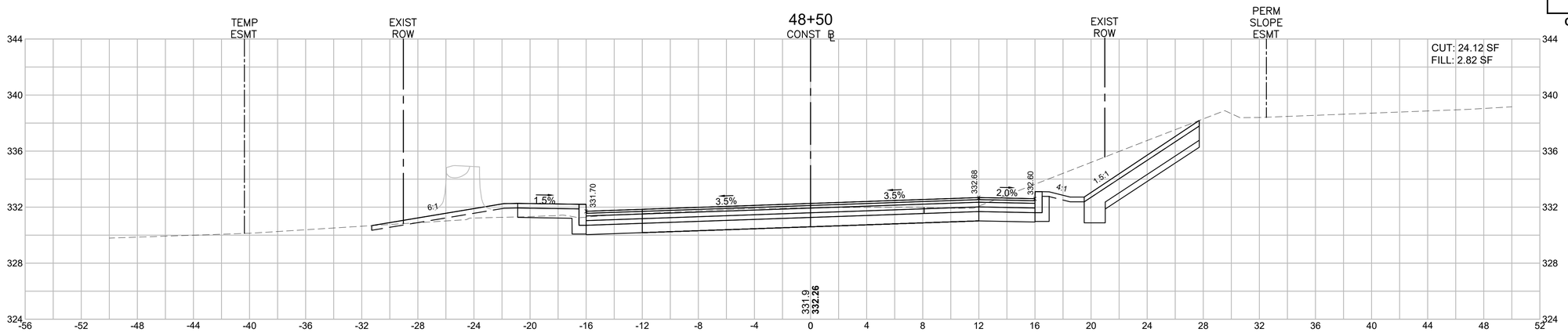


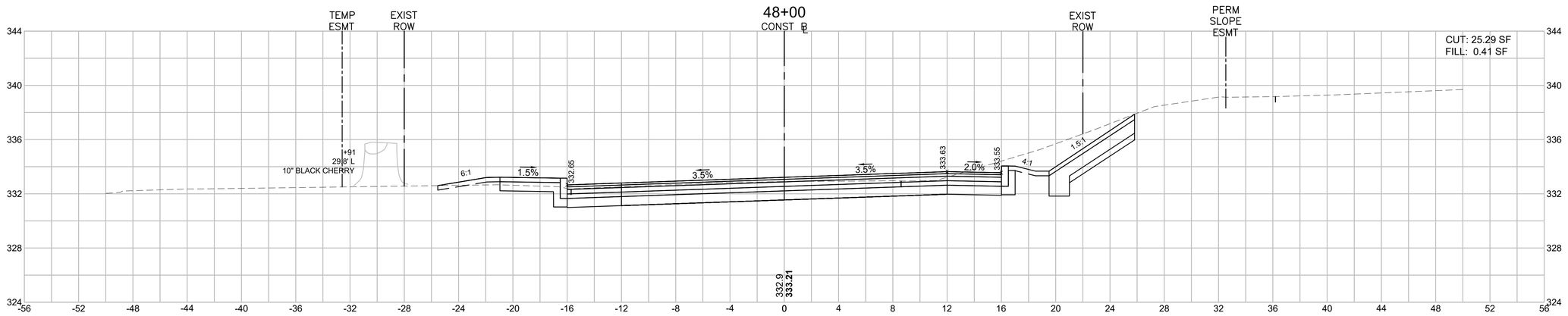


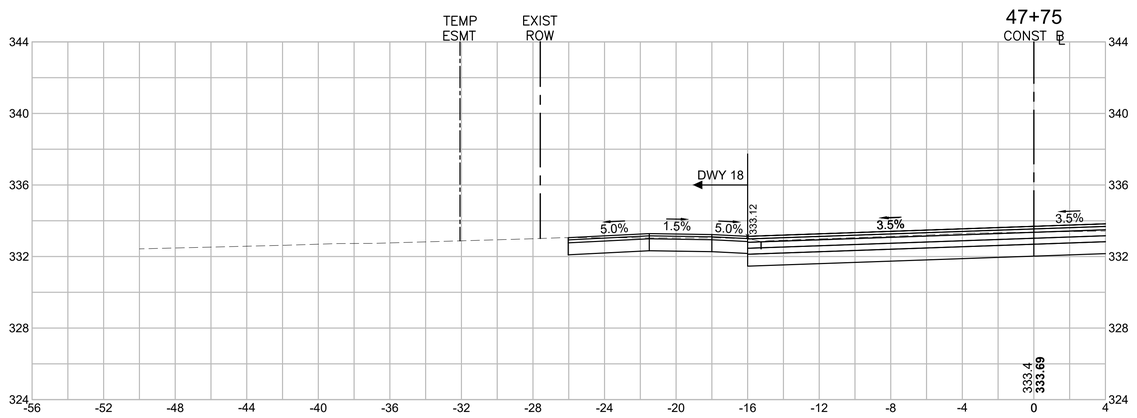
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	106	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 27 OF 53
BOSTON ROAD





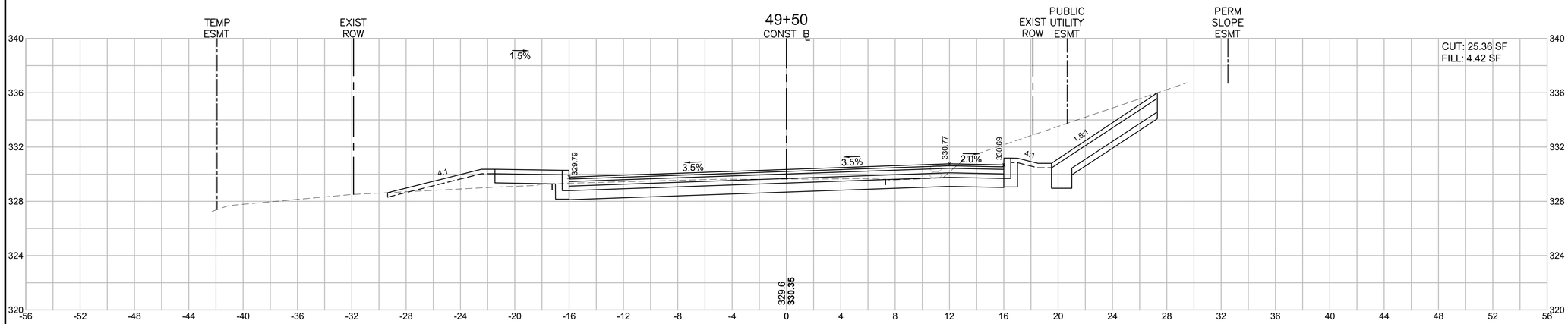


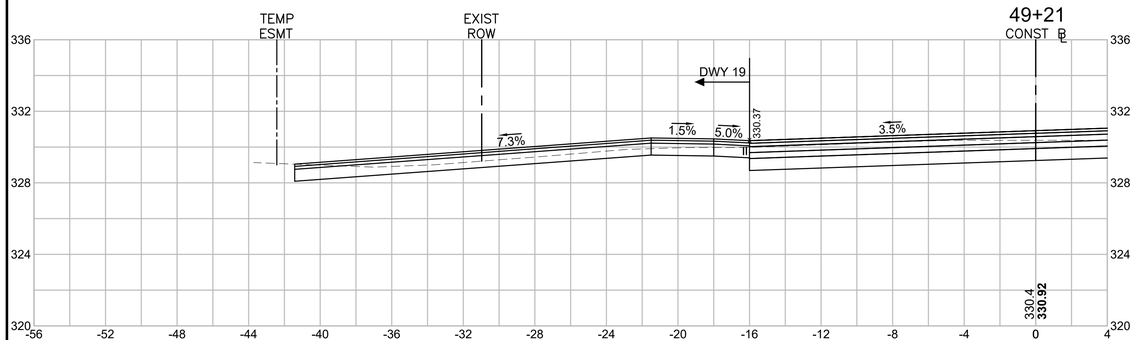
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

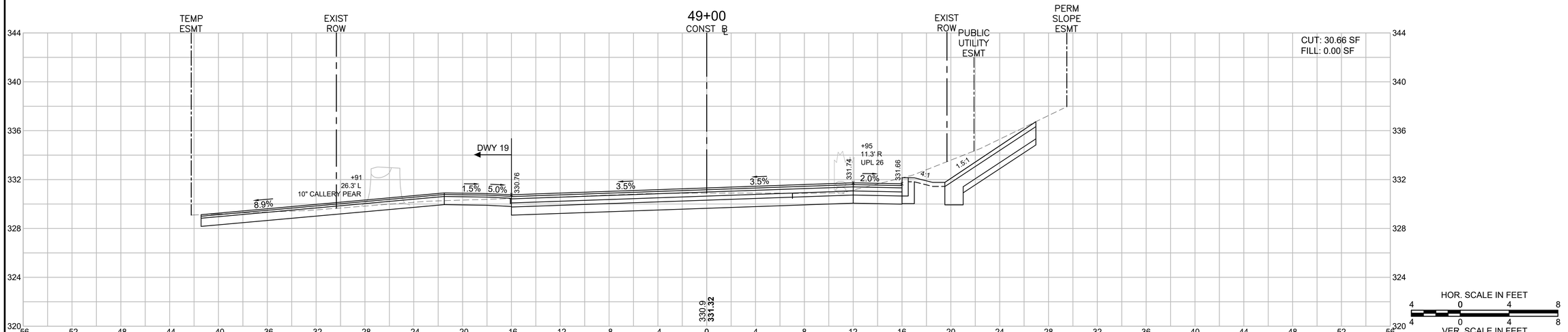
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	107	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 28 OF 53
BOSTON ROAD



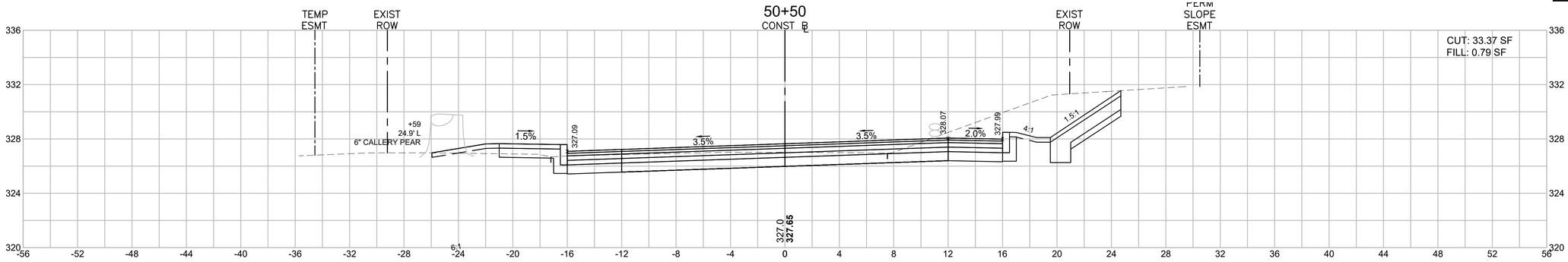


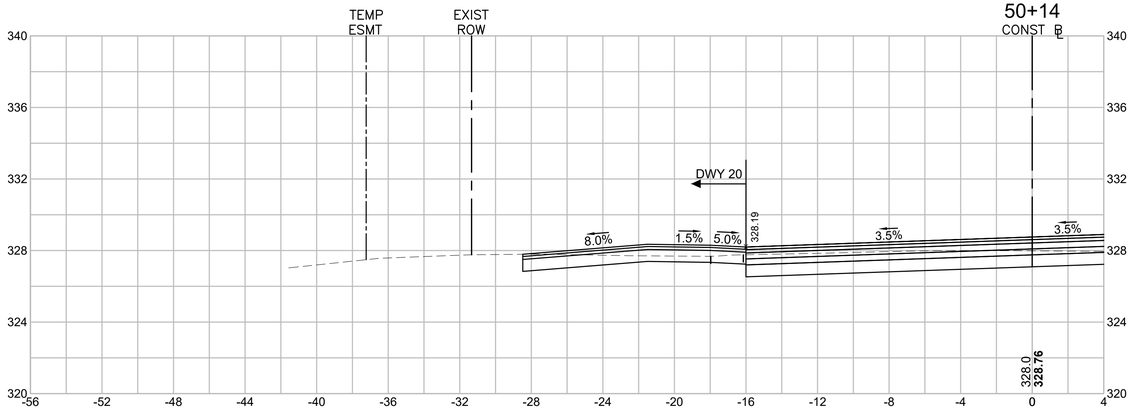


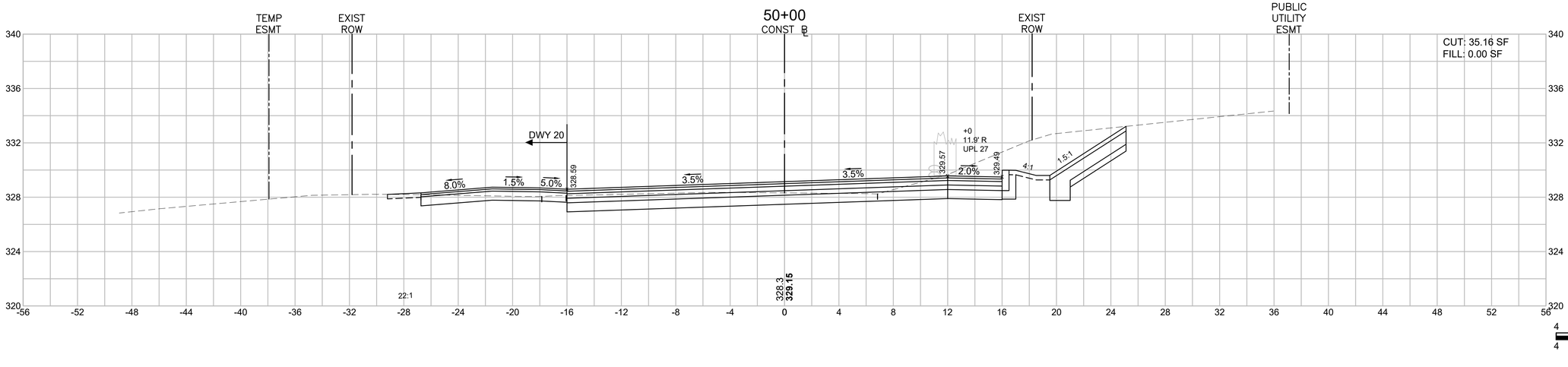
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	108	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 29 OF 53
BOSTON ROAD







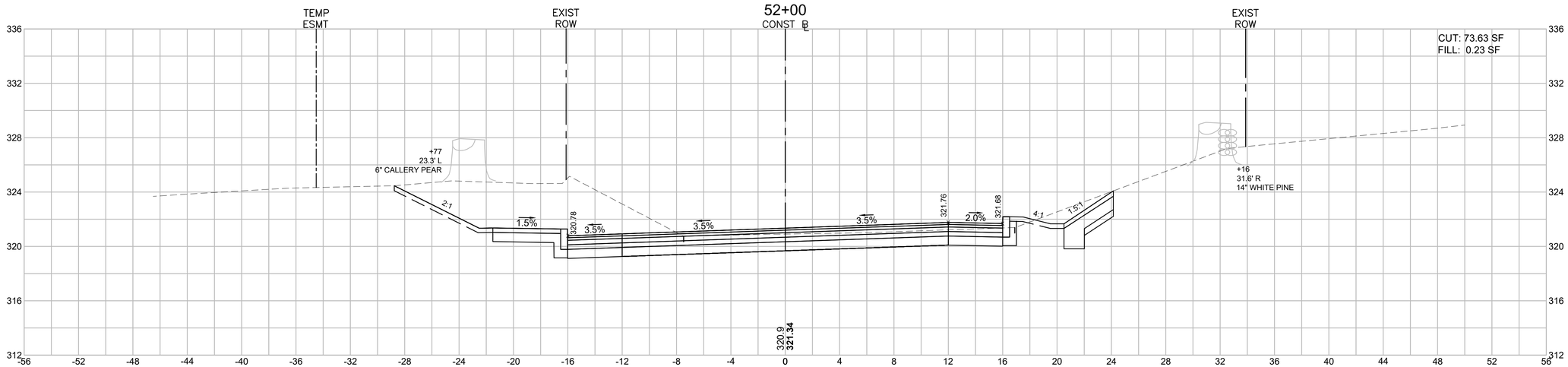
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

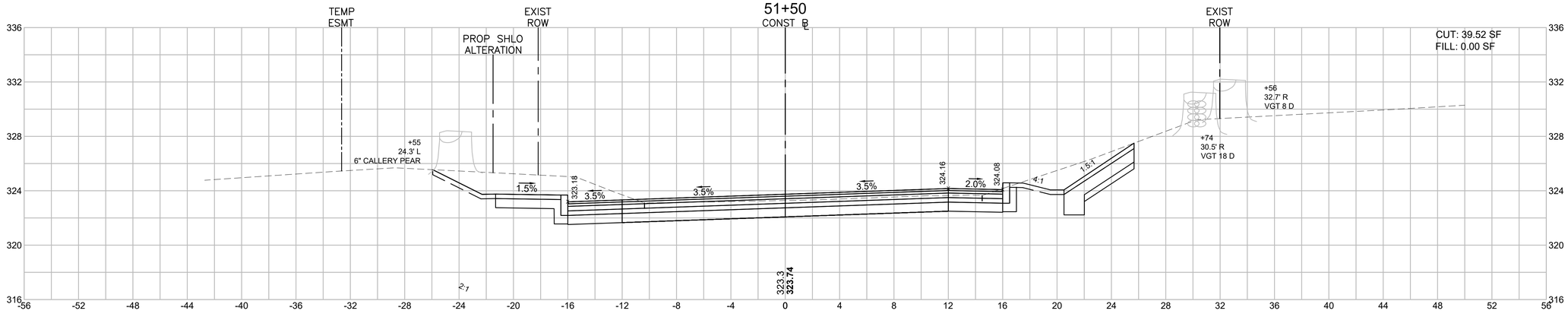
609035_HD12(CROSS SECTIONS).DWG Plotted on 17-May-2024 8:52 AM

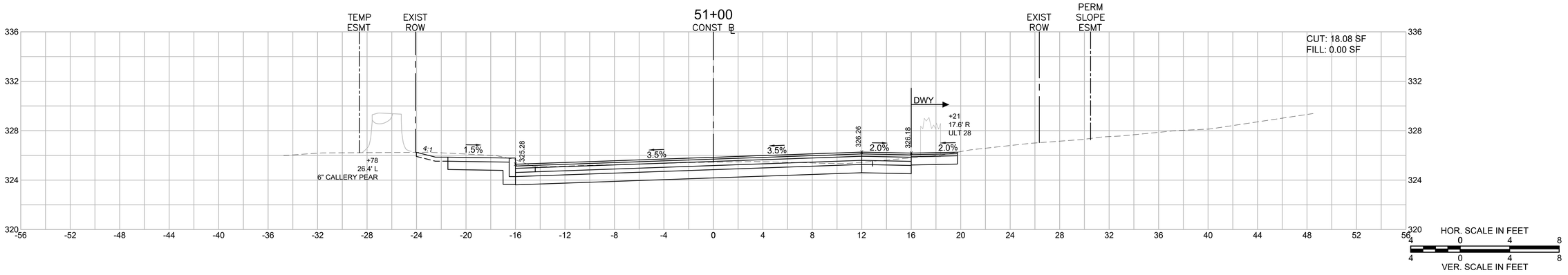
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	109	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 30 OF 53
BOSTON ROAD



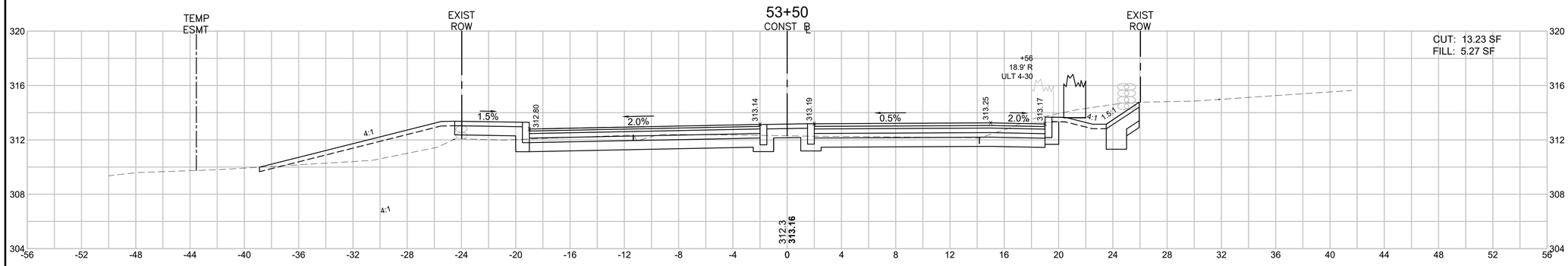


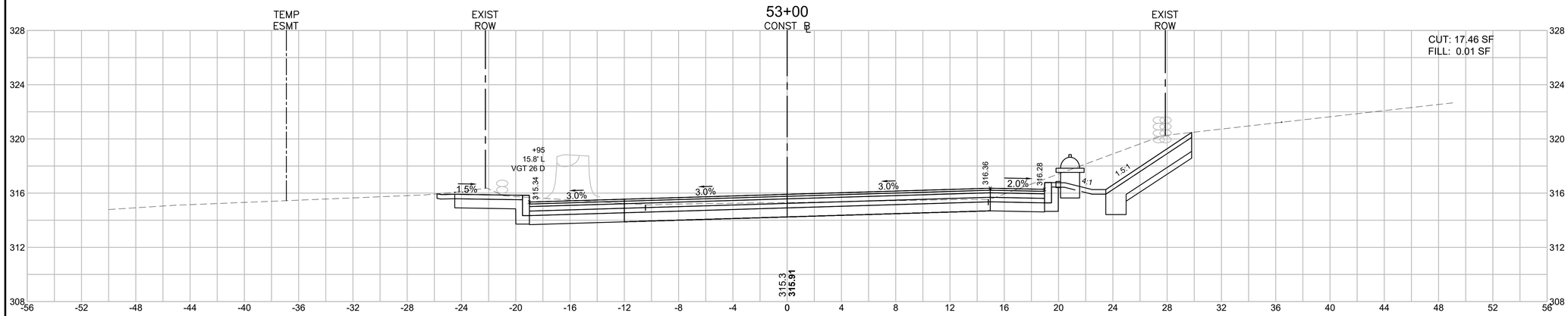


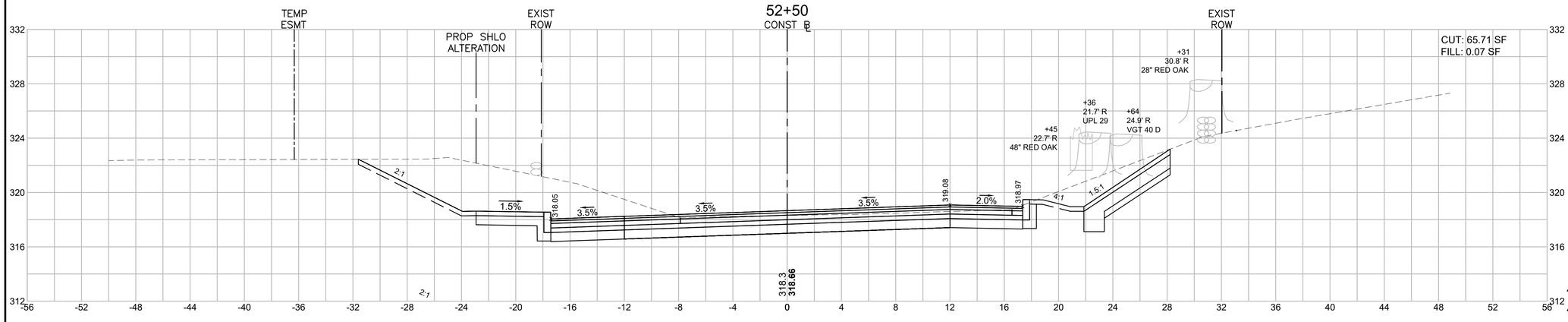
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	110	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 31 OF 53
BOSTON ROAD





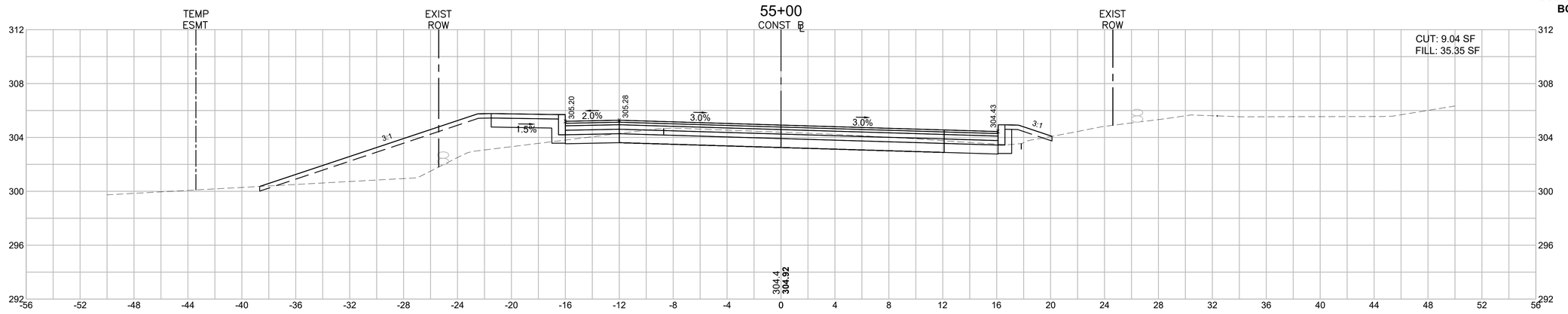


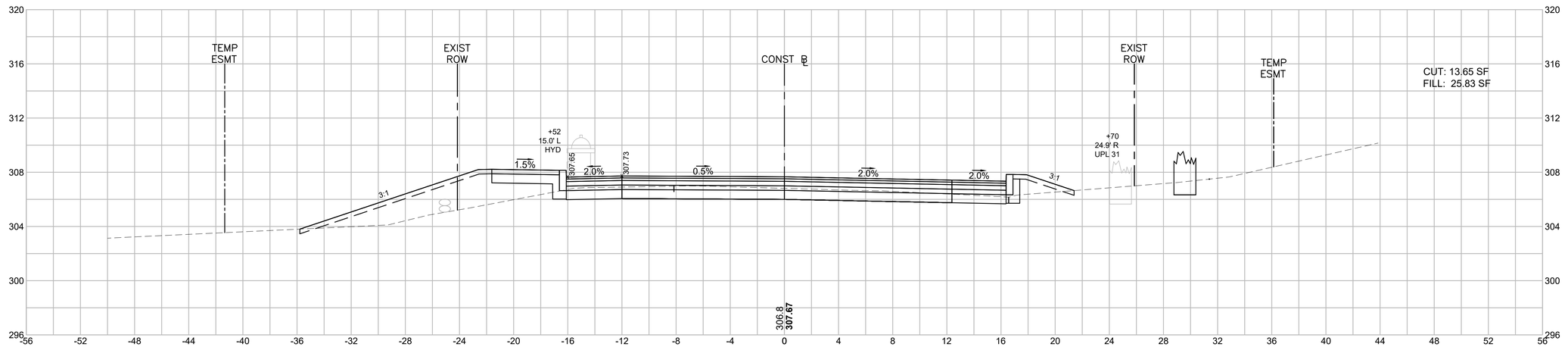
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

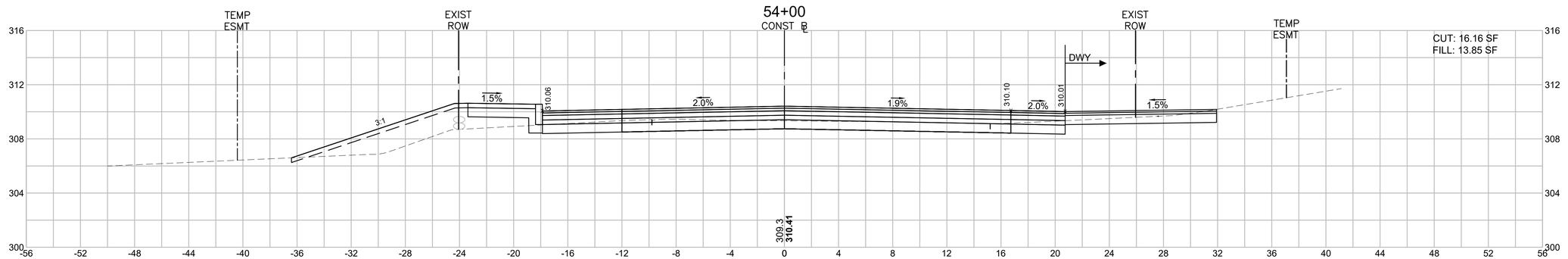
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	111	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 32 OF 53
BOSTON ROAD





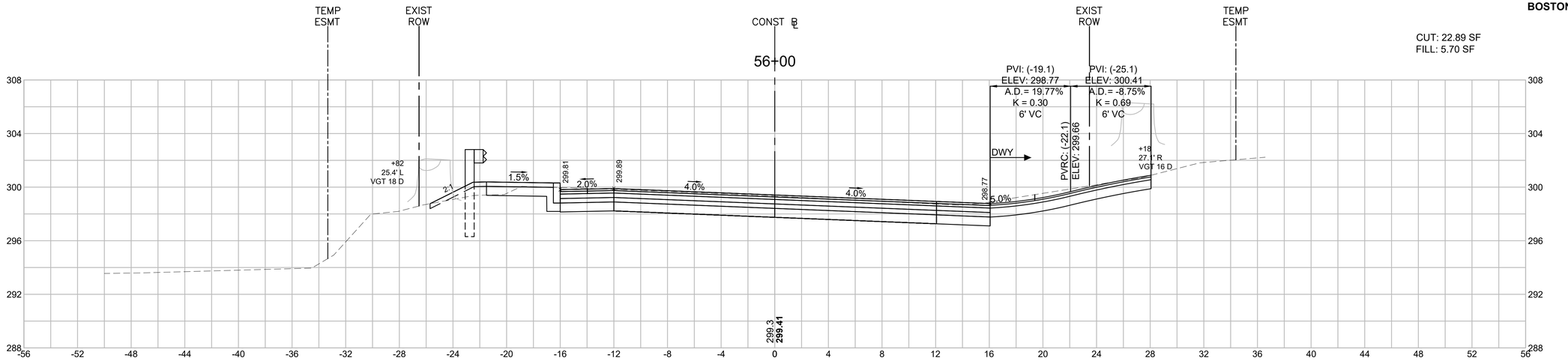


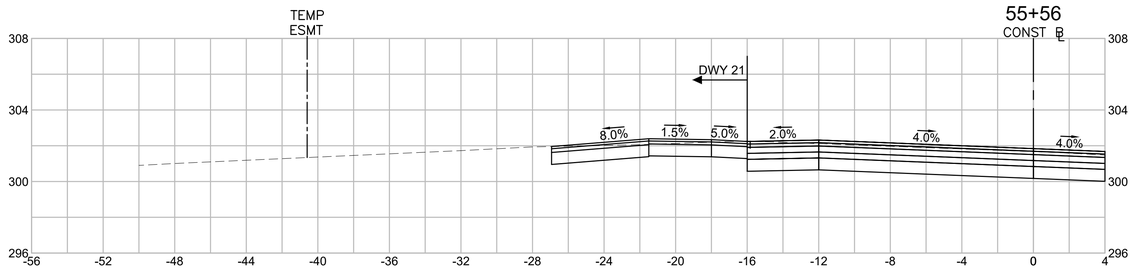
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

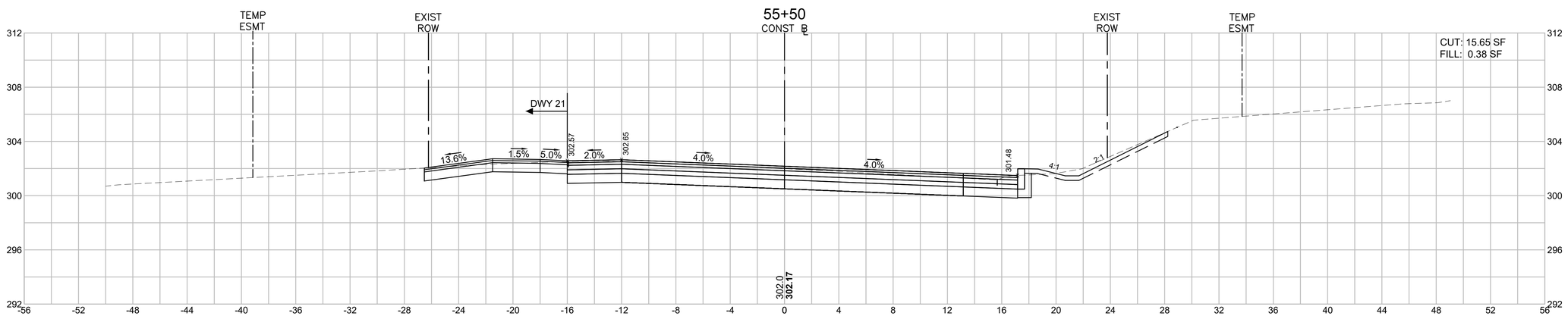
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	112	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 33 OF 53
BOSTON ROAD





SKEWED BEHIND FROM BACK OF PROPOSED SIDEWALK
(SEE NOTE ON CONSTRUCTION PLANS, SHT 16)



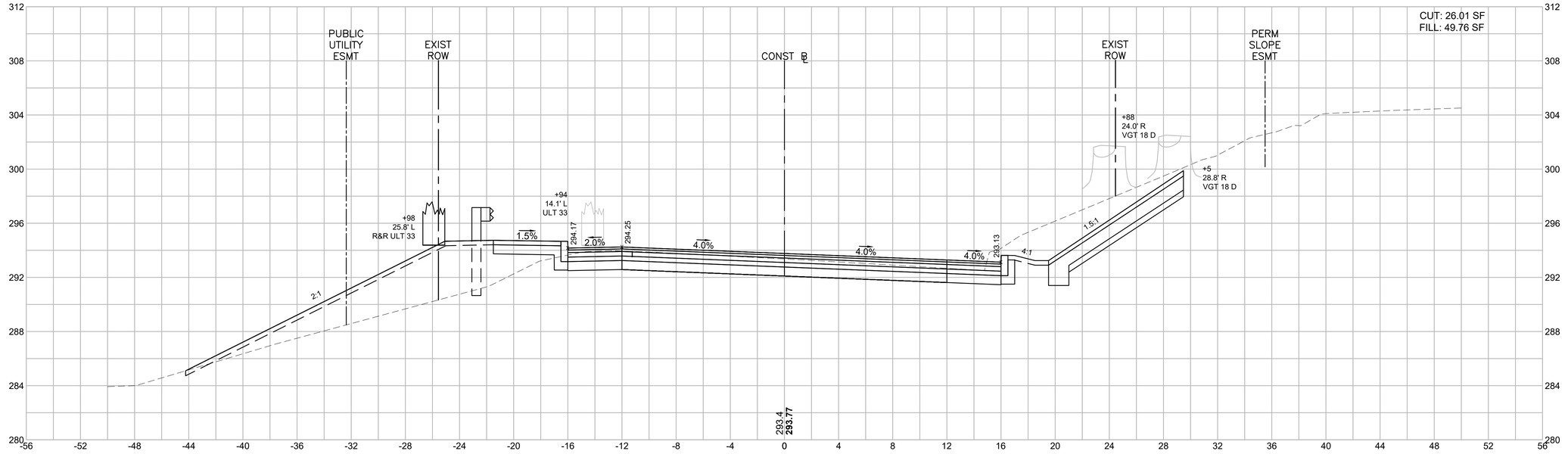
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

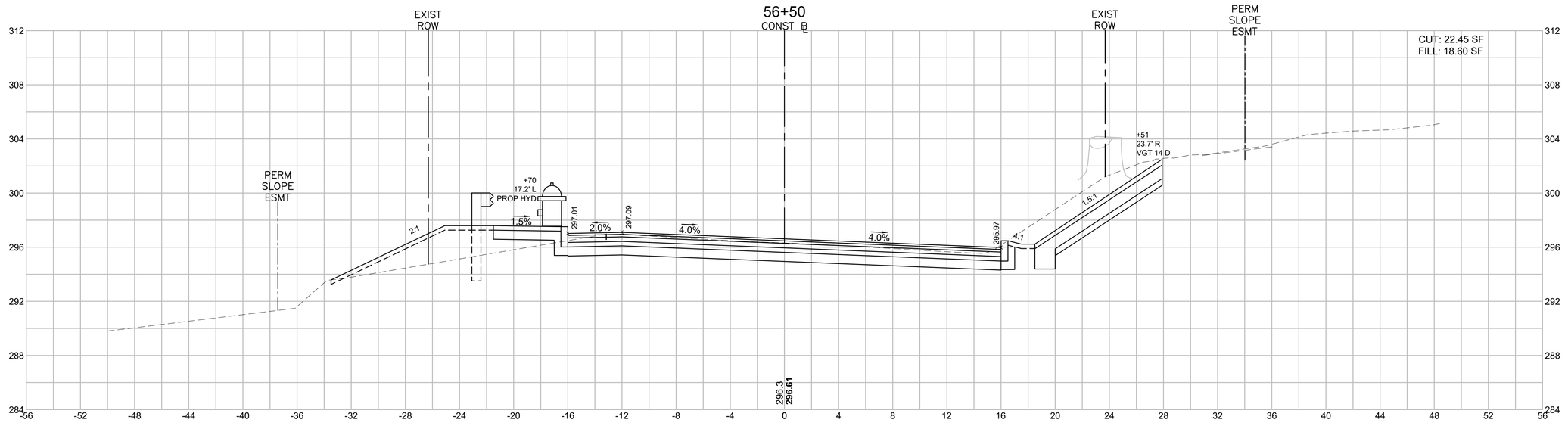
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	113	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 34 OF 53
BOSTON ROAD

57+00



56+50

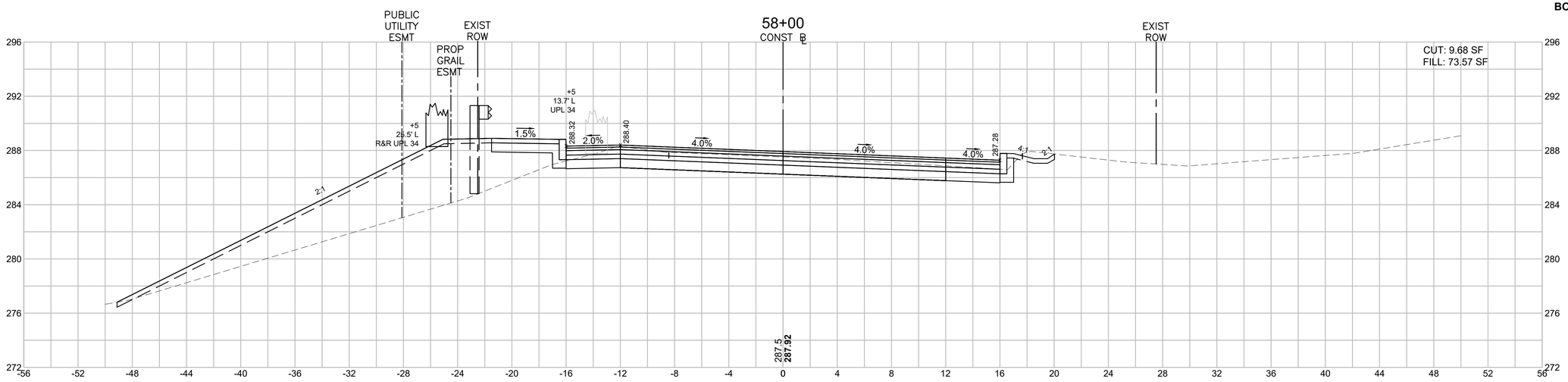


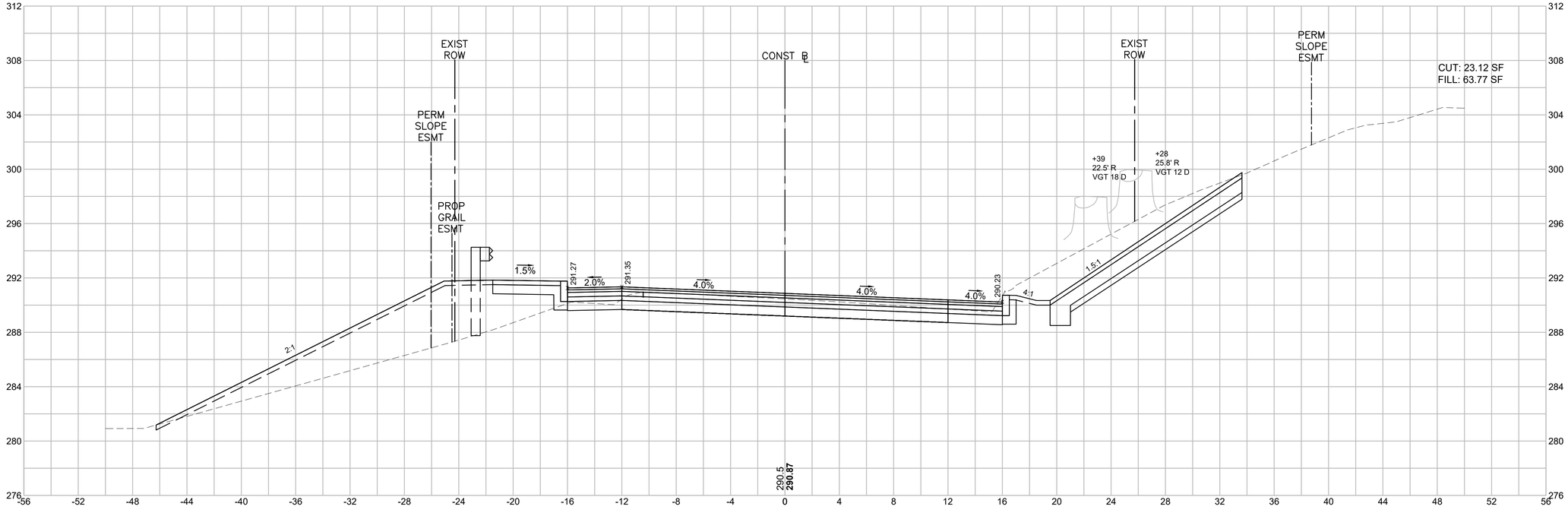
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	114	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 35 OF 53
BOSTON ROAD



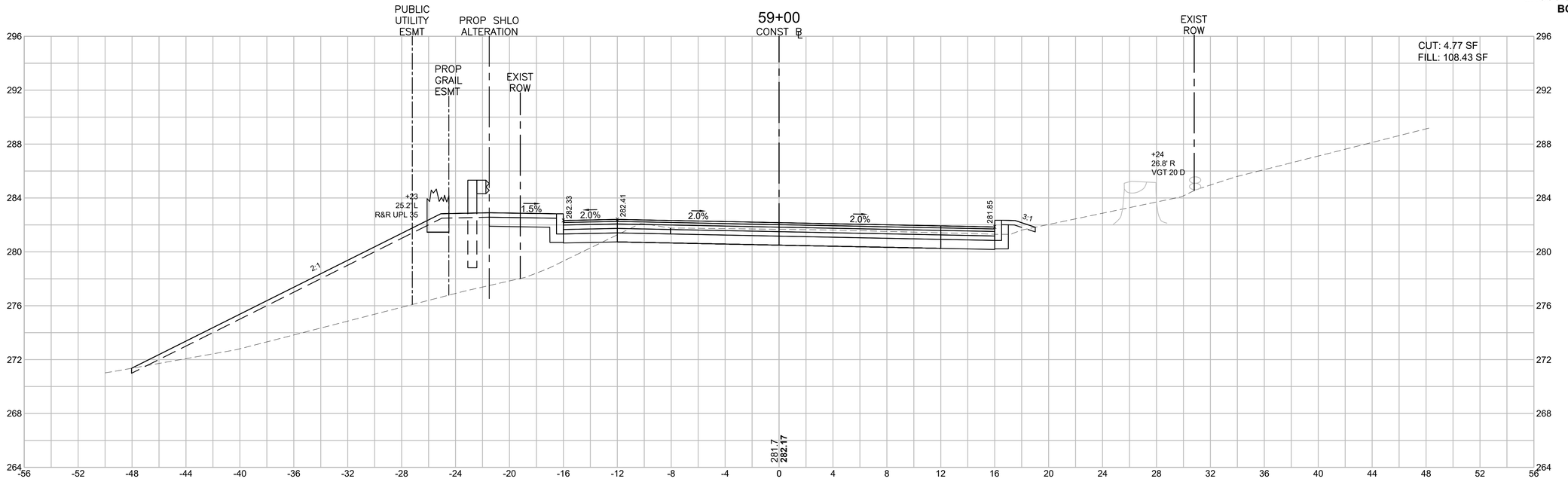


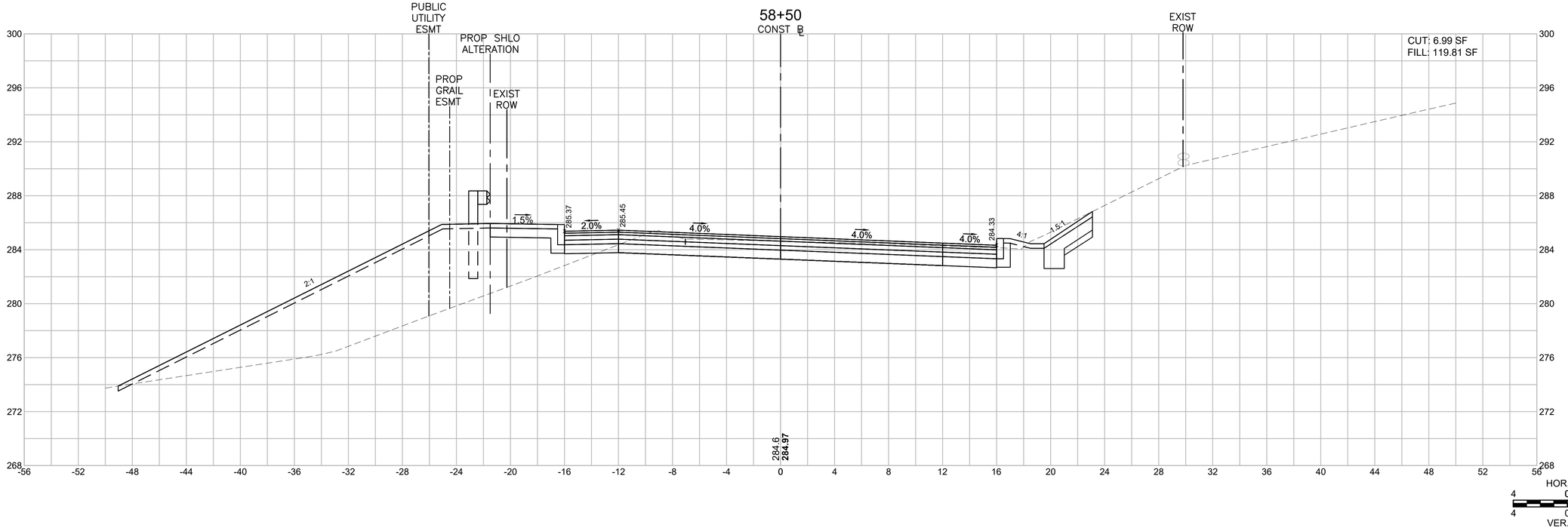
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	115	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 36 OF 53
BOSTON ROAD

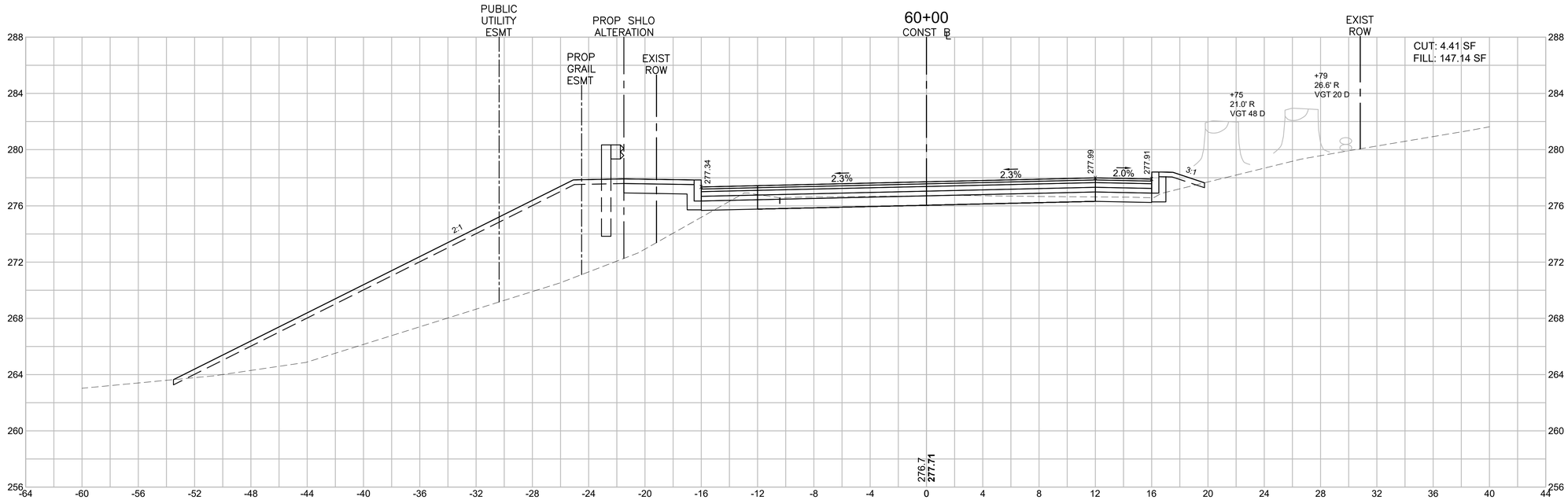


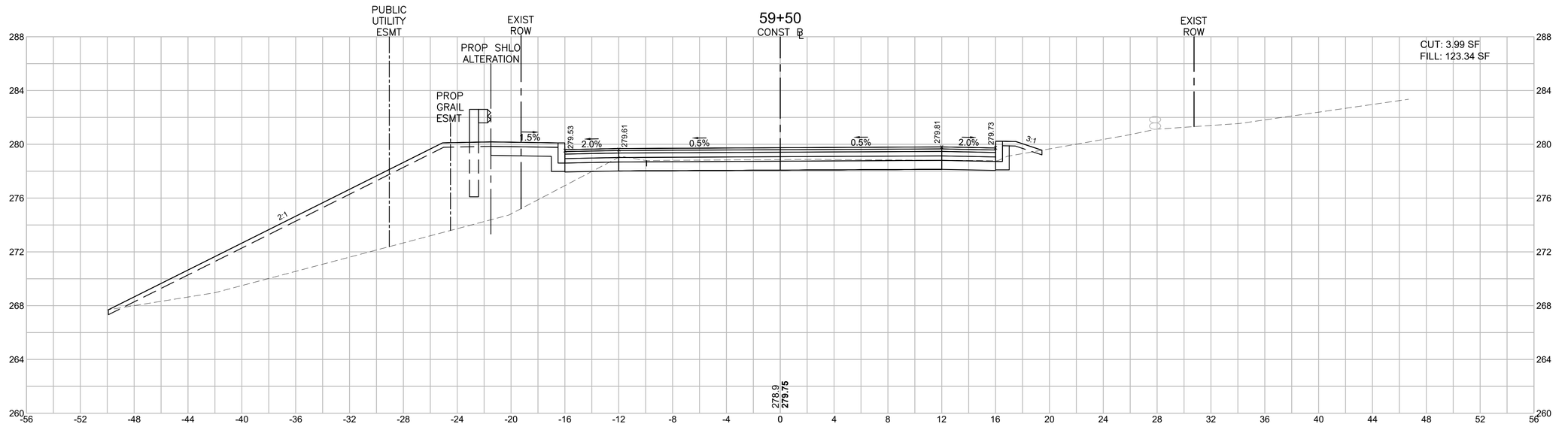


WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	116	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 37 OF 53
BOSTON ROAD





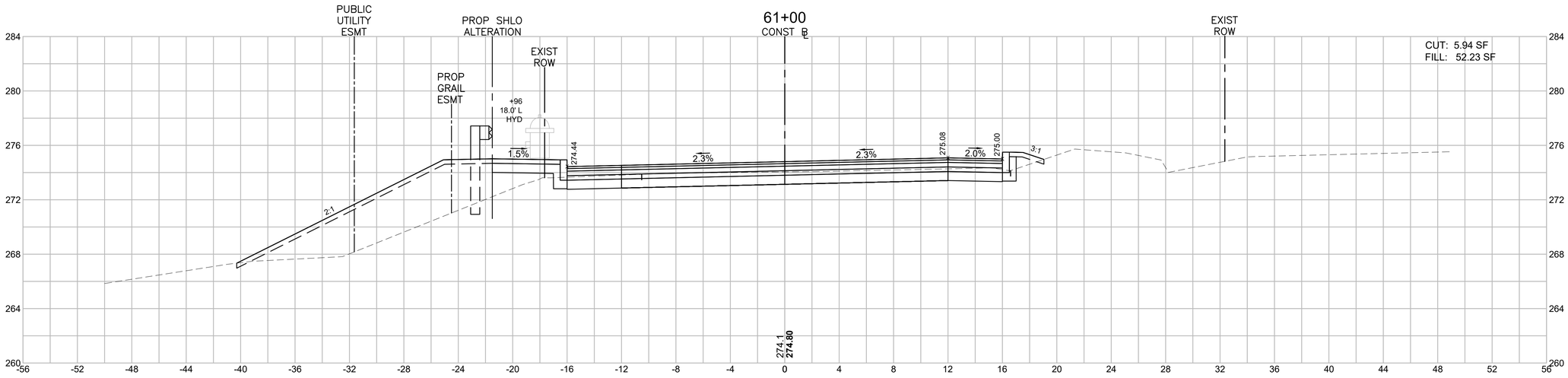
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

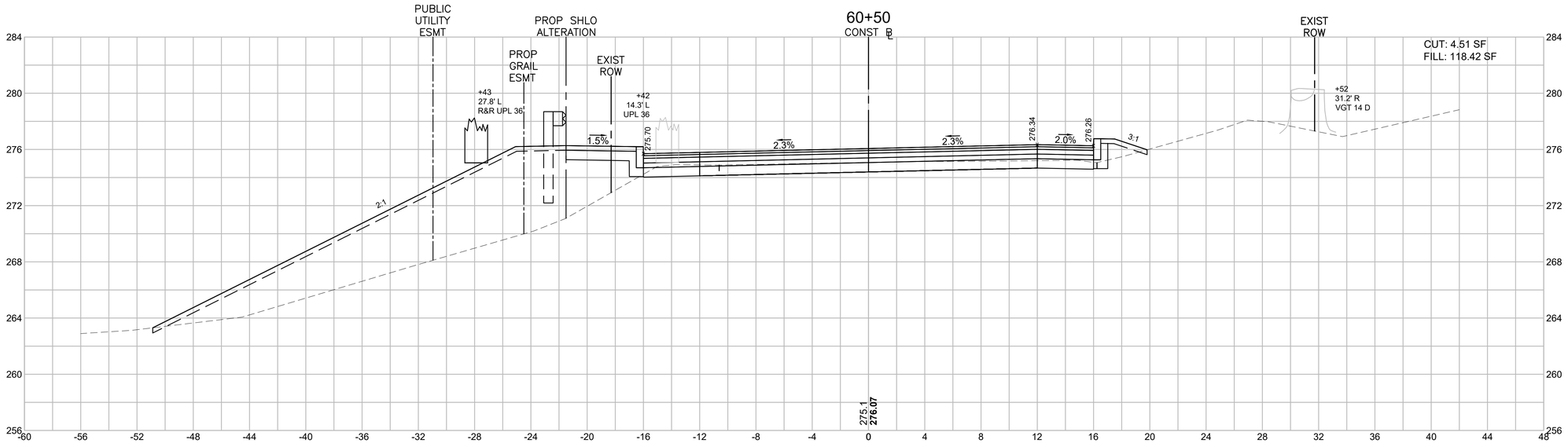
609035_HD12(CROSS SECTIONS).DWG Plotted on 17-May-2024 8:53 AM

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	117	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 38 OF 53
BOSTON ROAD





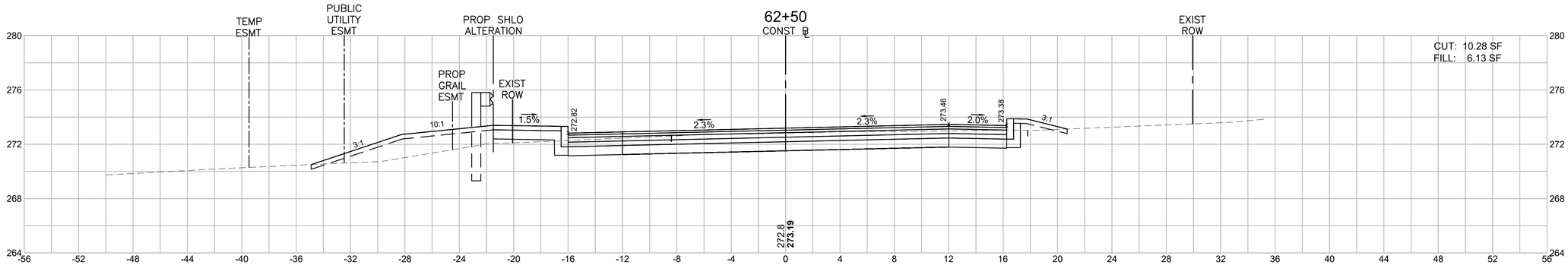
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

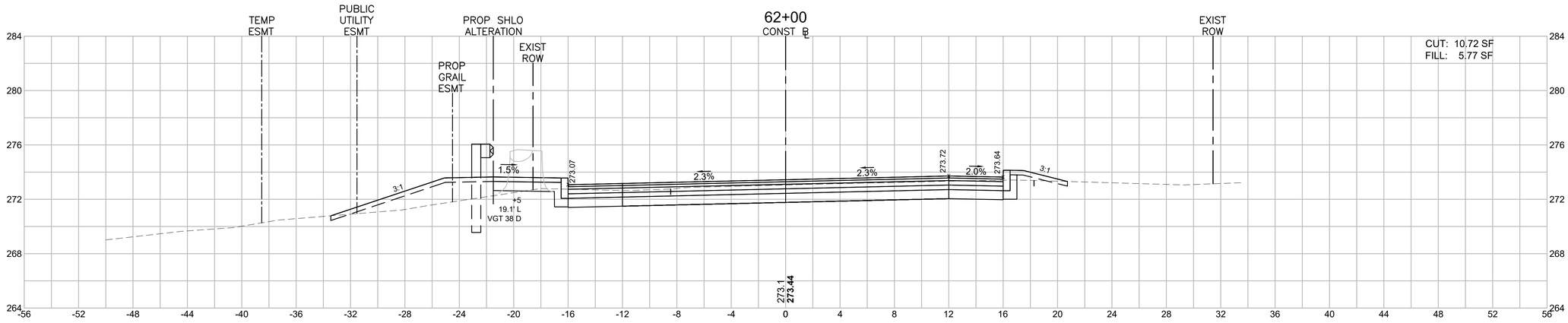
609035_HD12(CROSS SECTIONS).DWG Plotted on 17-May-2024 8:53 AM

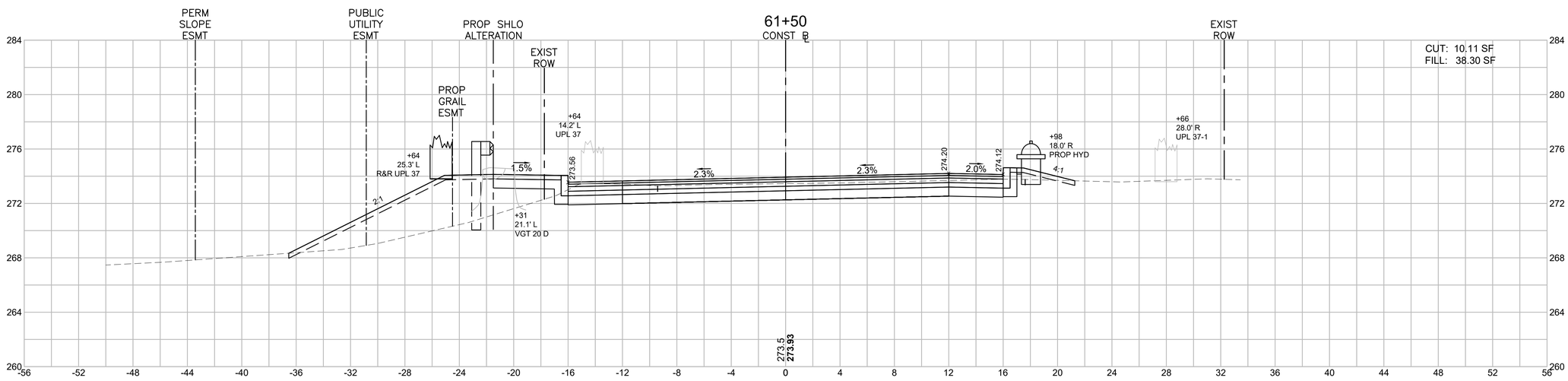
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	118	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 39 OF 53
BOSTON ROAD





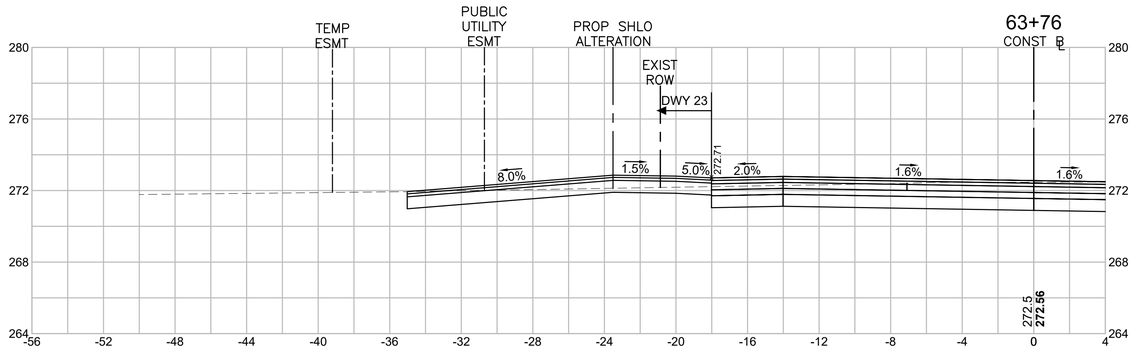


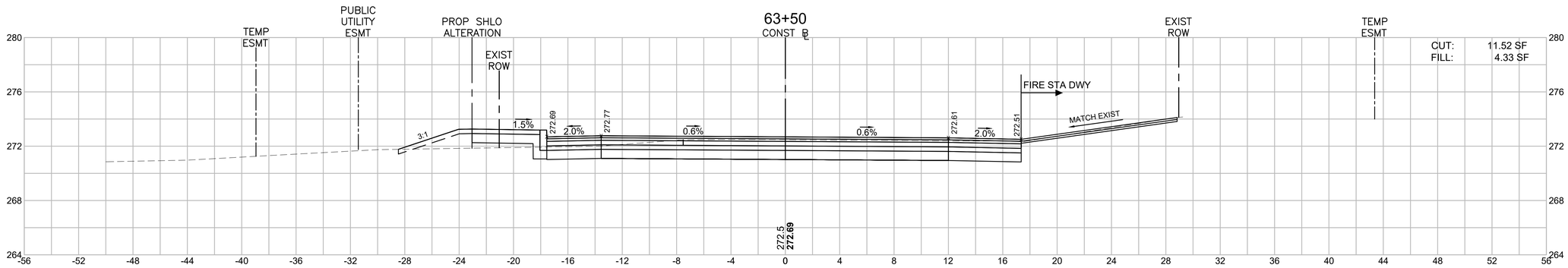
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

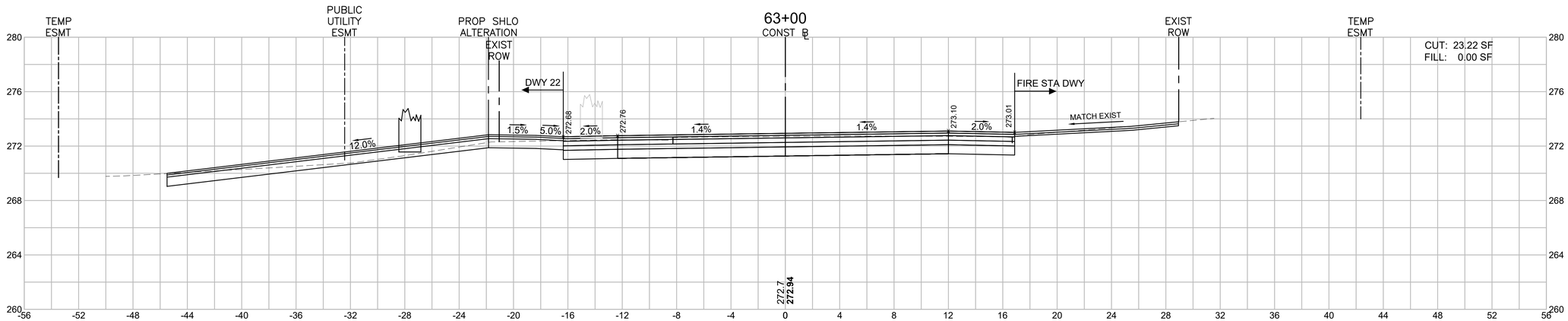
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	119	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 40 OF 53
BOSTON ROAD





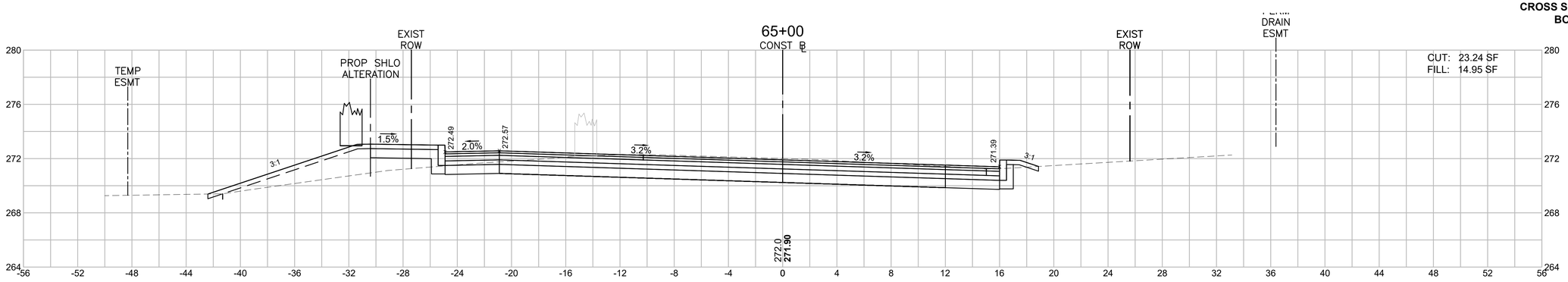


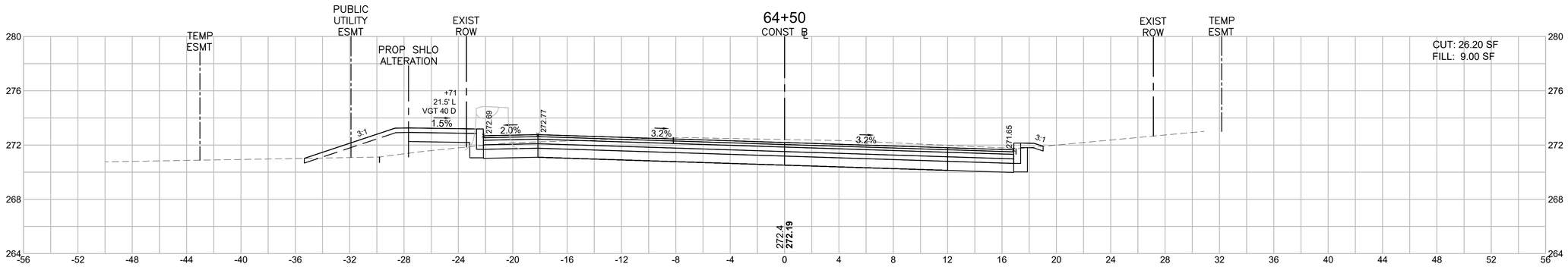
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

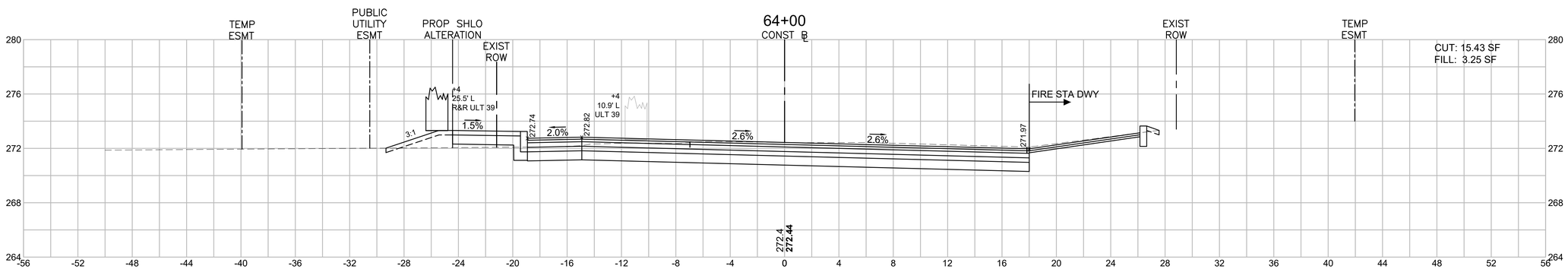
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	120	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 41 OF 53
BOSTON ROAD





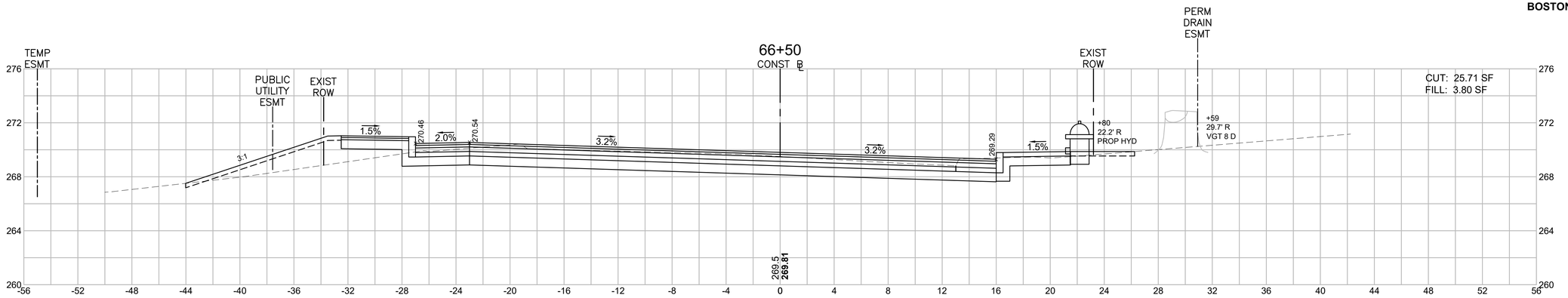


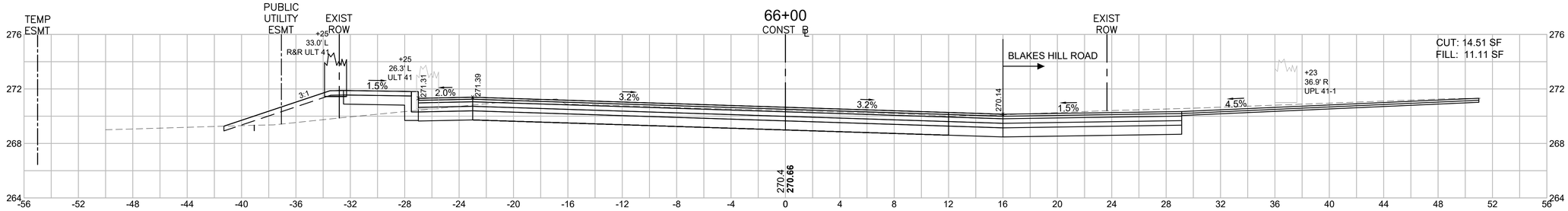
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

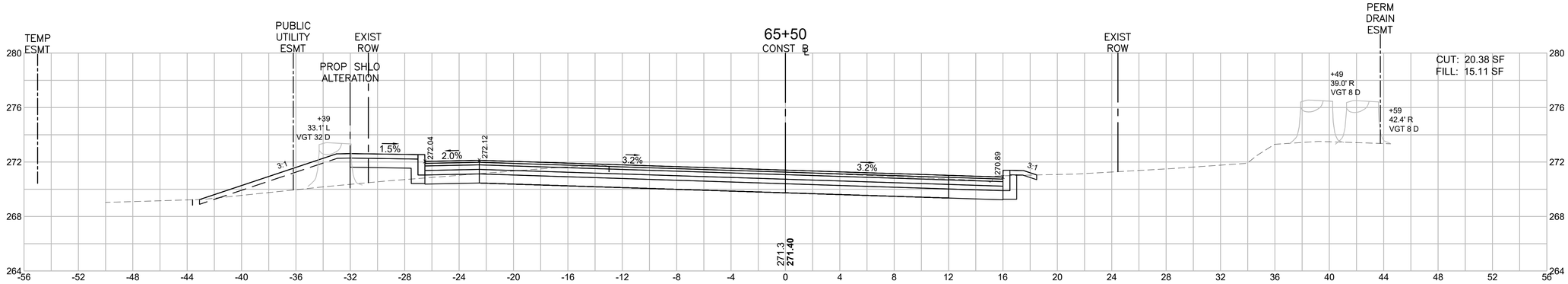
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	121	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 42 OF 53
BOSTON ROAD





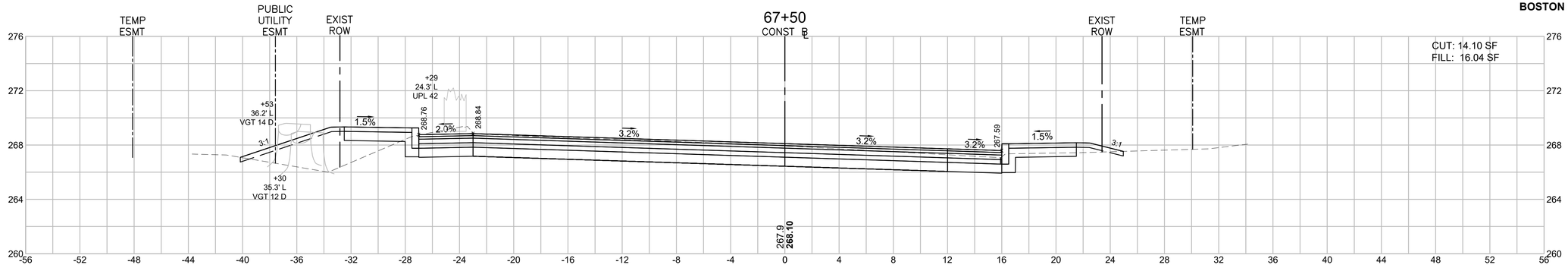


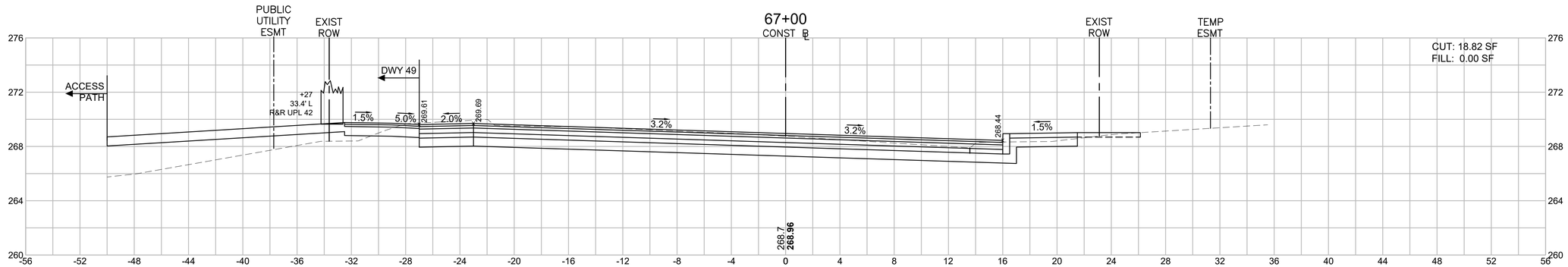
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	122	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 43 OF 53
BOSTON ROAD





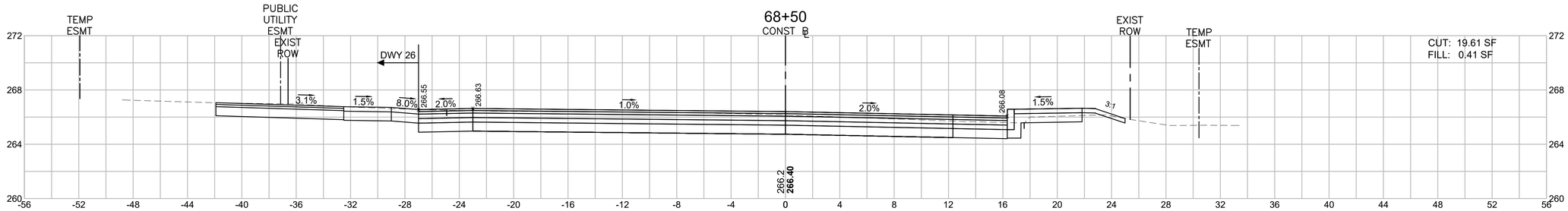
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

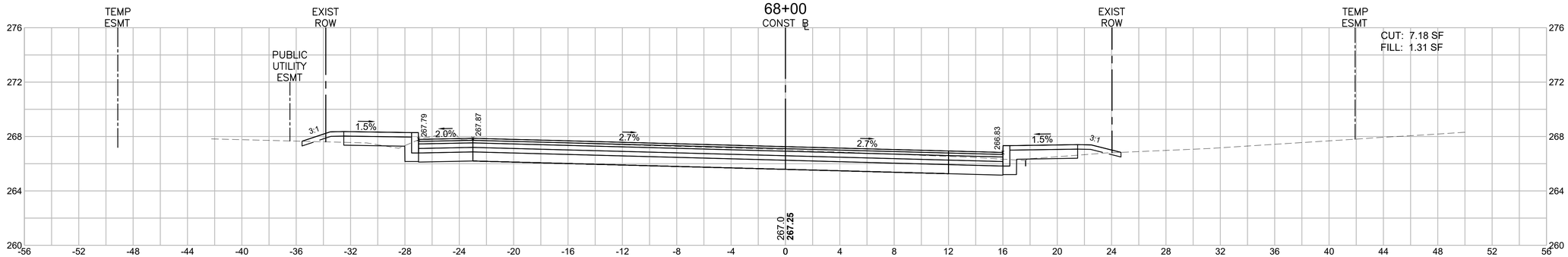
609035_HD12\CROSS SECTIONS\.DWG Plotted on 17-May-2024 8:54 AM

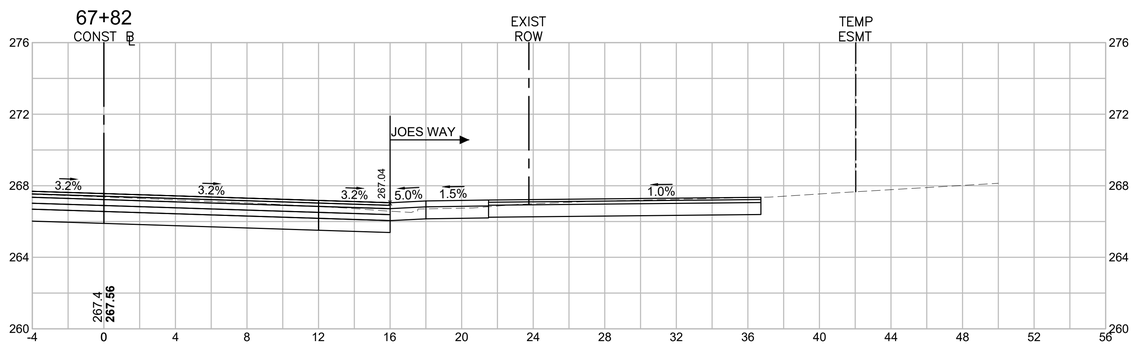
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	123	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 44 OF 53
BOSTON ROAD





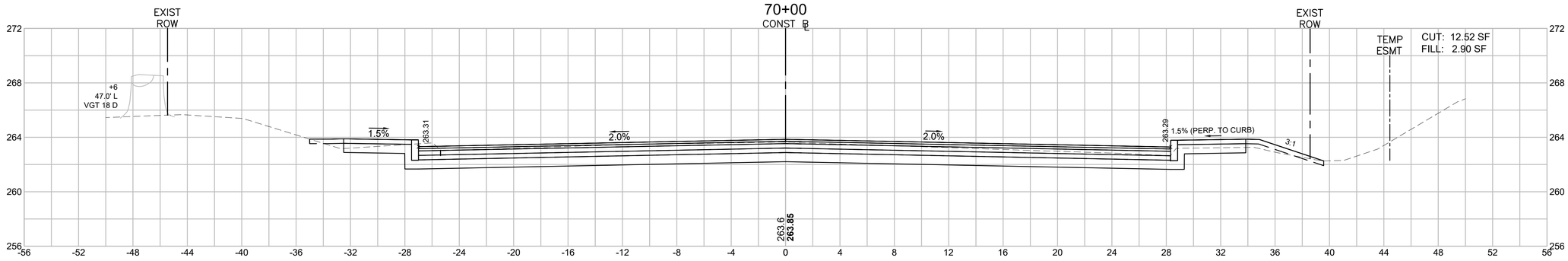


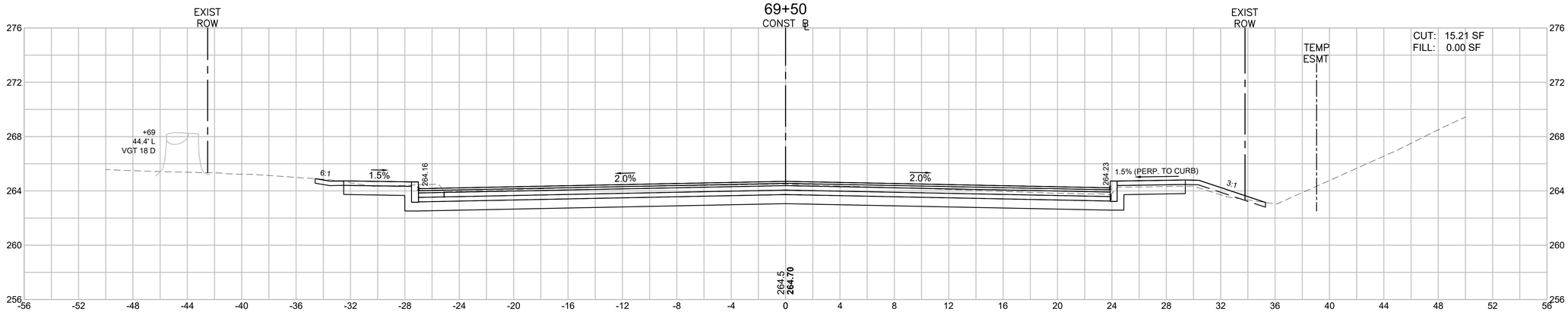
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

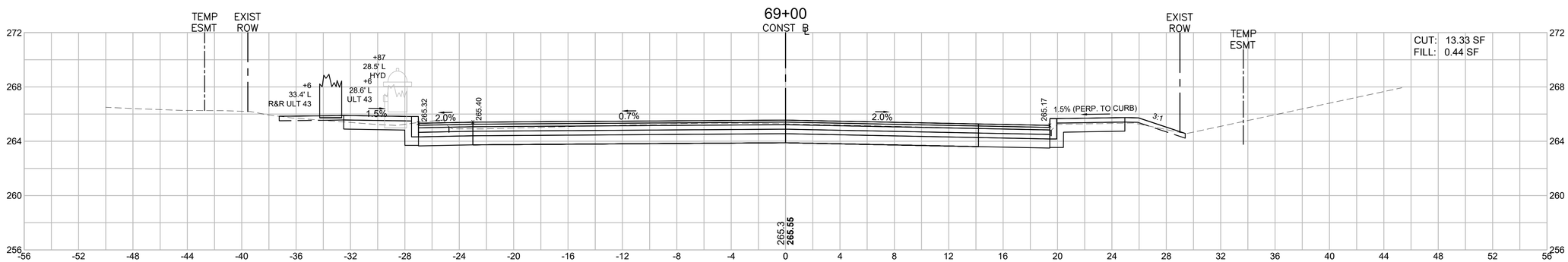
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	124	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 45 OF 53
BOSTON ROAD





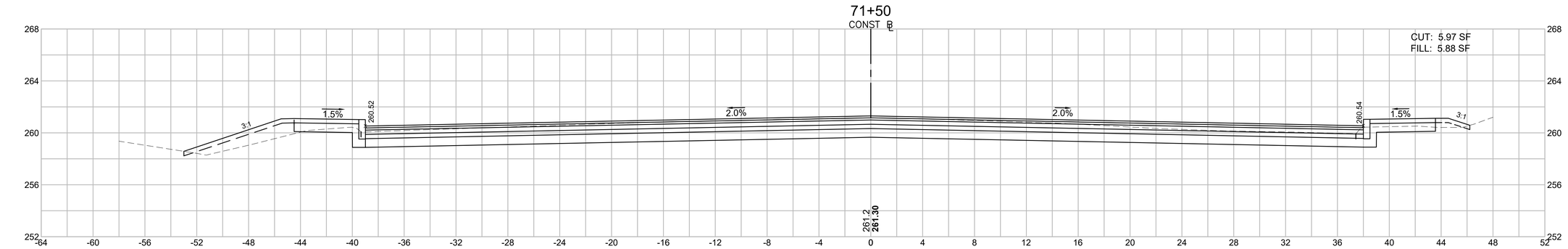


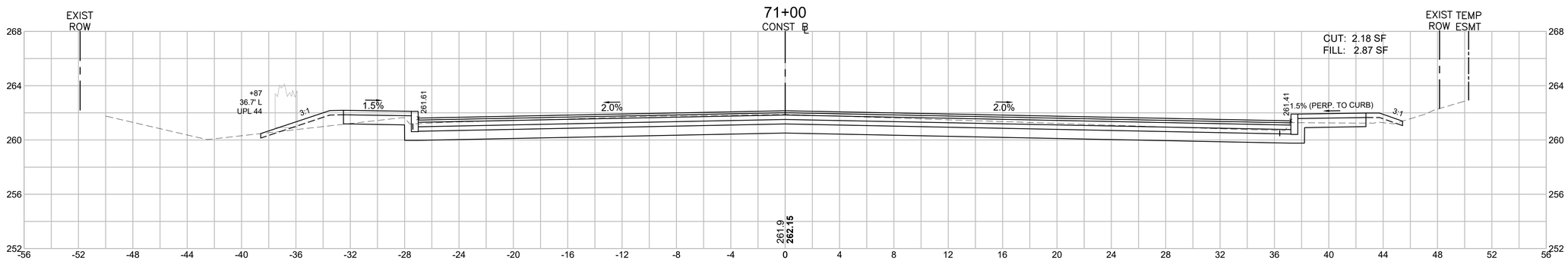
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

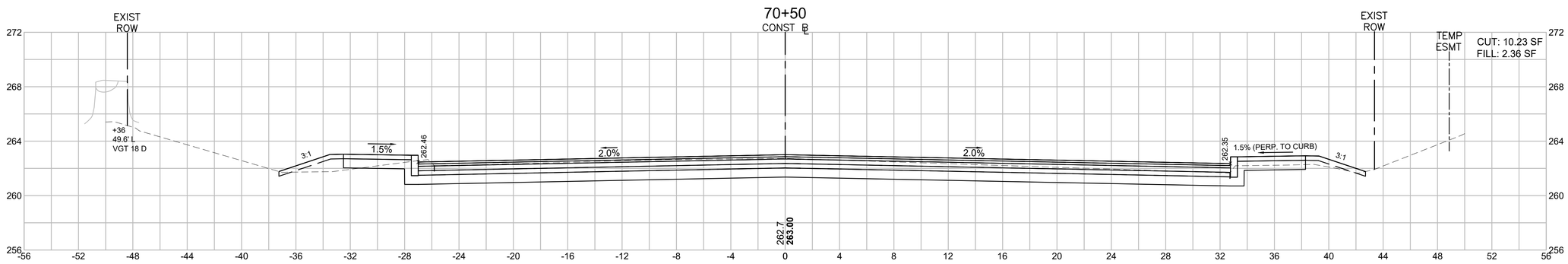
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	125	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 46 OF 53
BOSTON ROAD





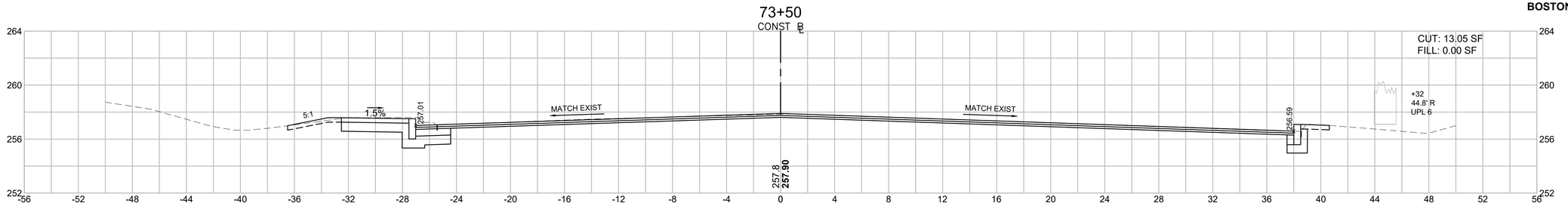


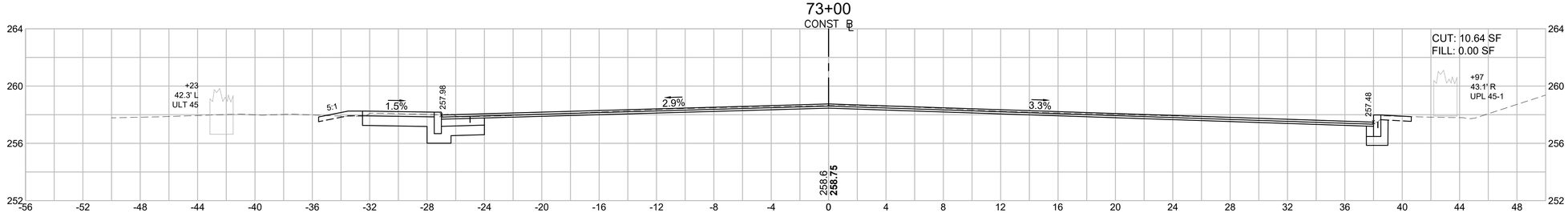
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

WESTFORD
BOSTON ROAD

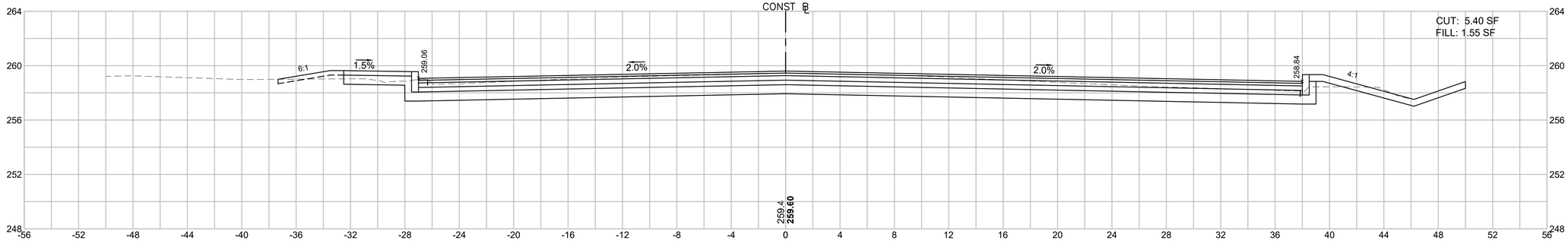
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	126	132
PROJECT FILE NO.	609035		

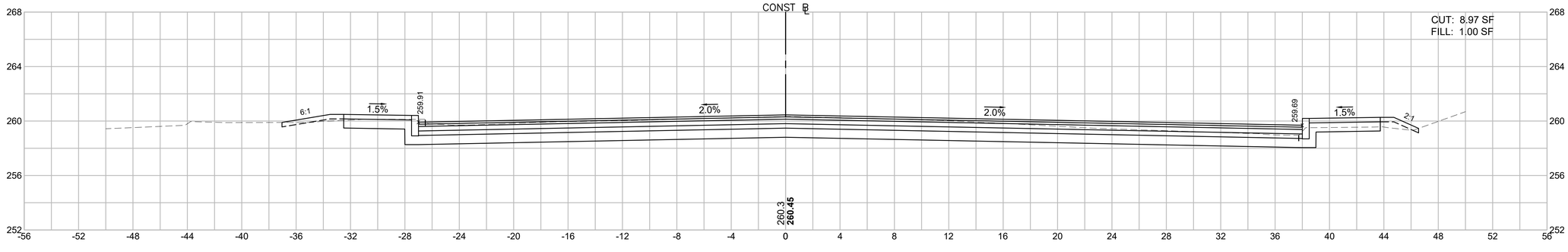
CROSS SECTIONS - 47 OF 53
BOSTON ROAD





END FULL DEPTH RECLAMATION / BEGIN HMA MILL & OVERLAY



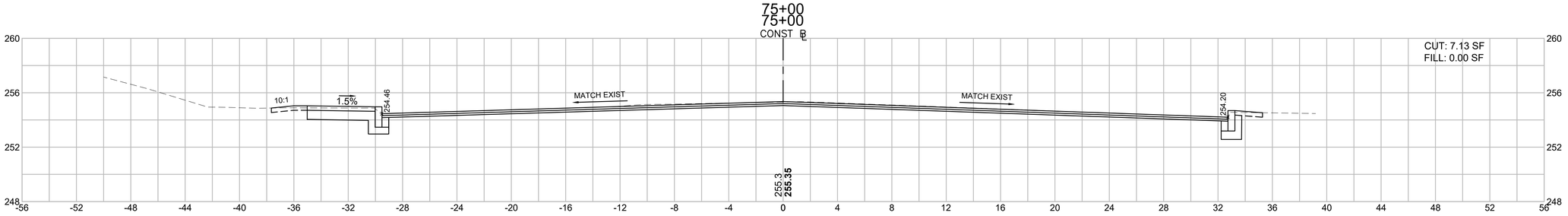


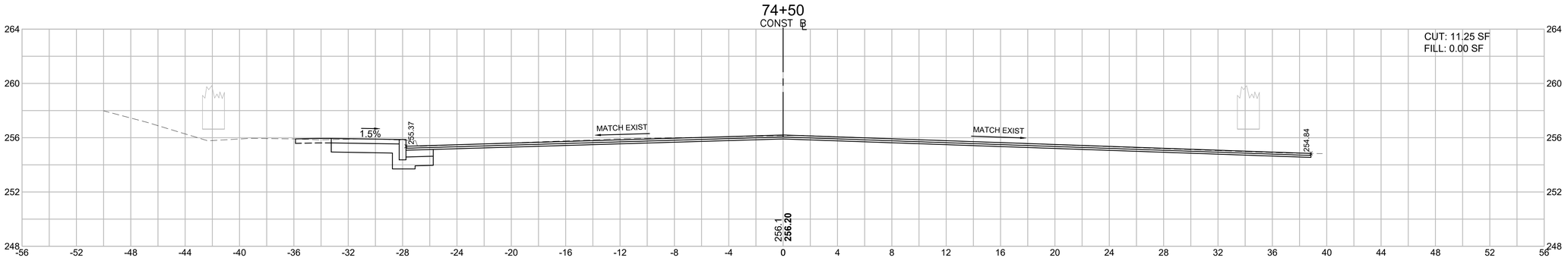
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

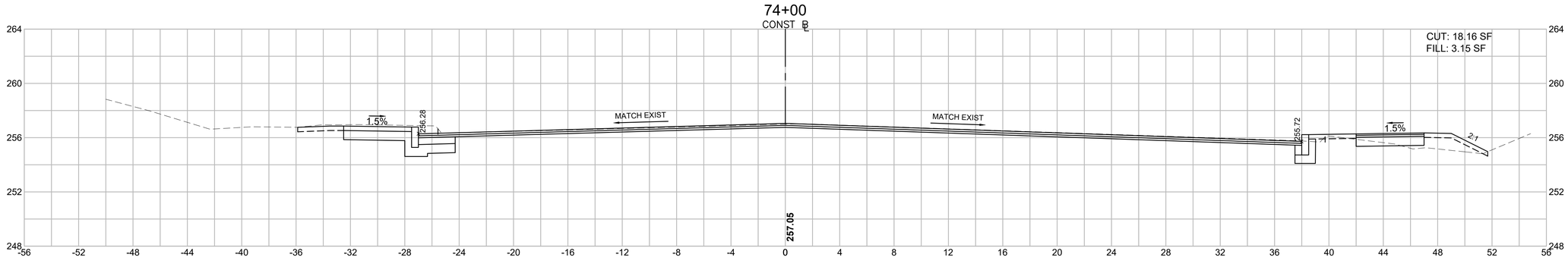
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	127	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 48 OF 53
BOSTON ROAD





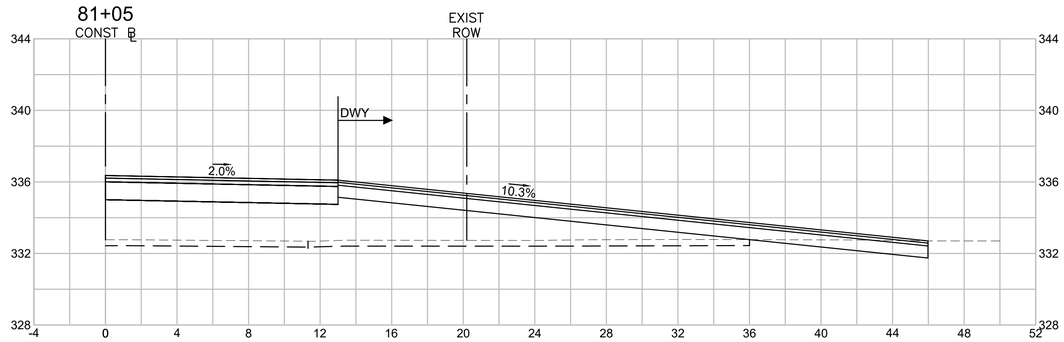


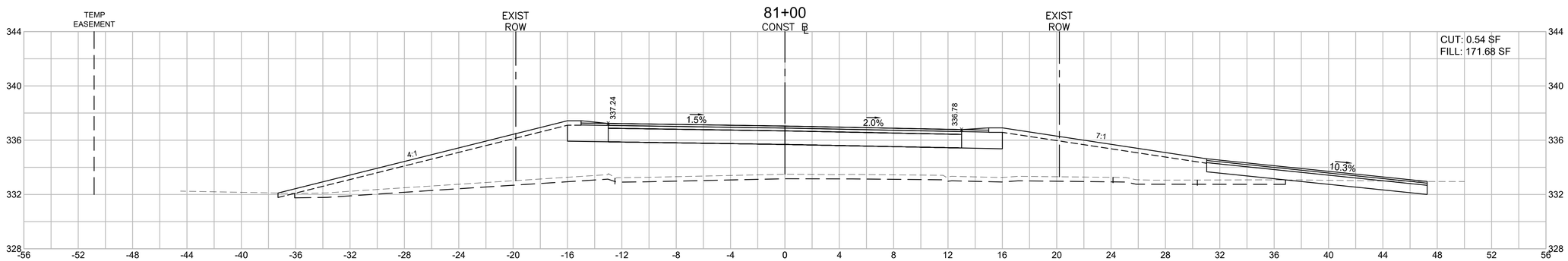
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

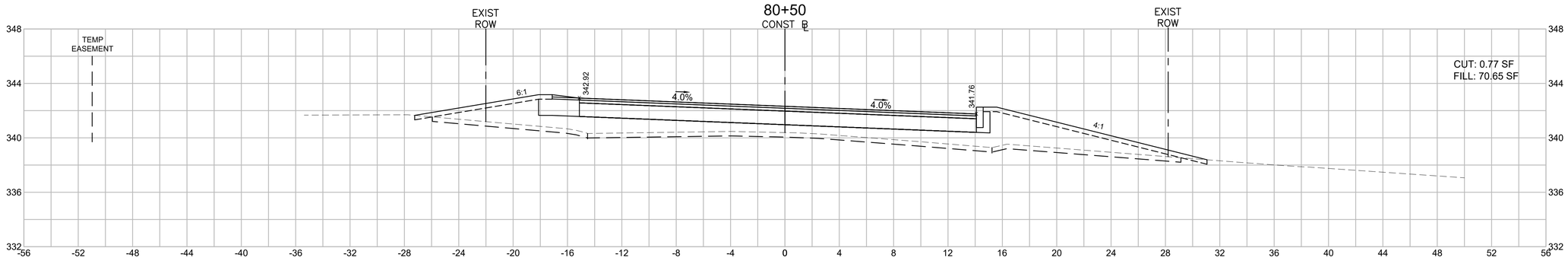
WESTFORD
BOSTON ROAD

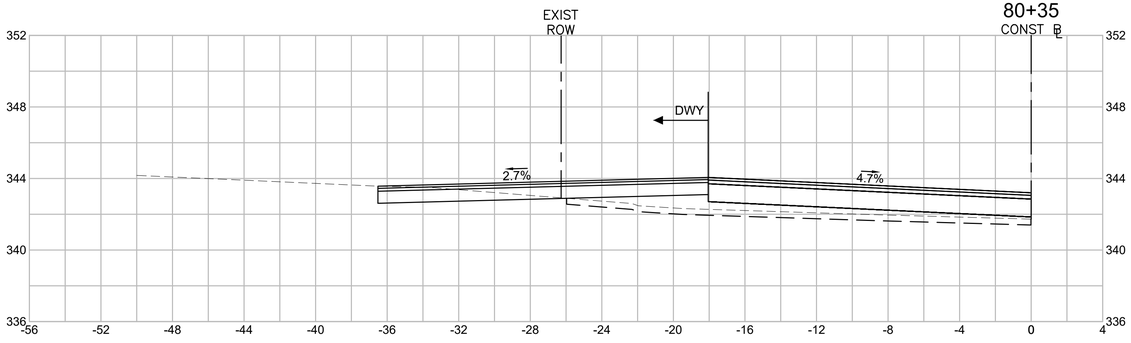
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	128	132
PROJECT FILE NO.	609035		

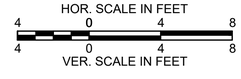
CROSS SECTIONS - 49 OF 53
CROWN ROAD







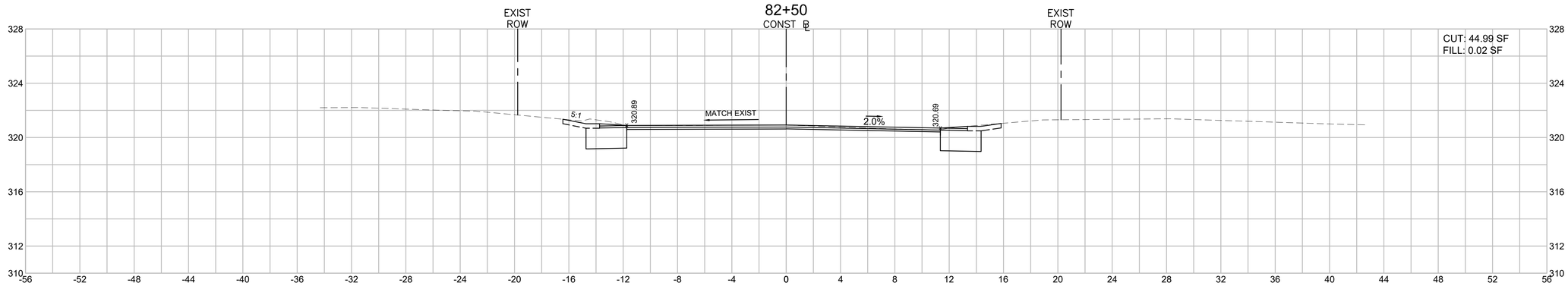


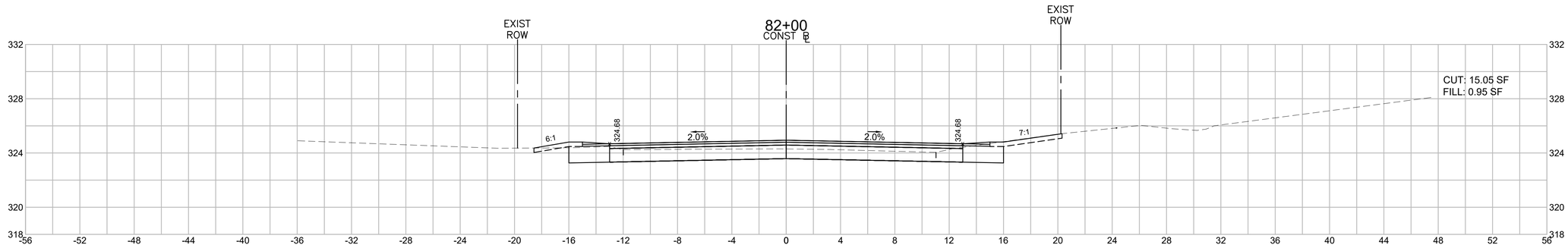


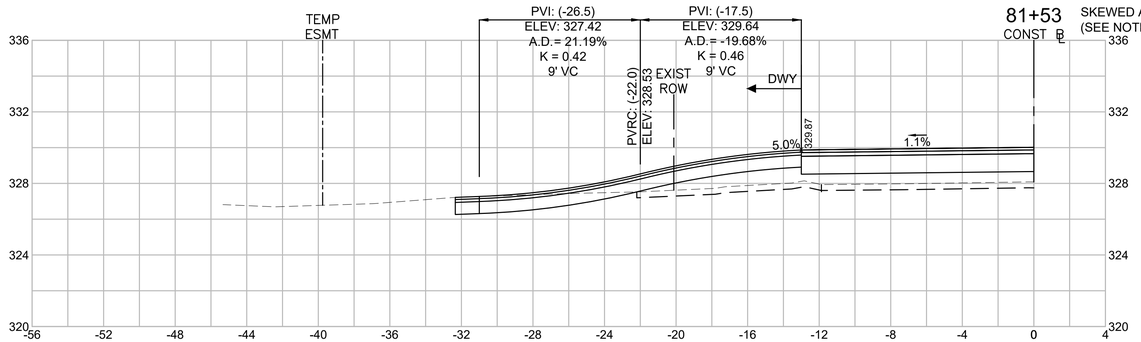
WESTFORD
BOSTON ROAD

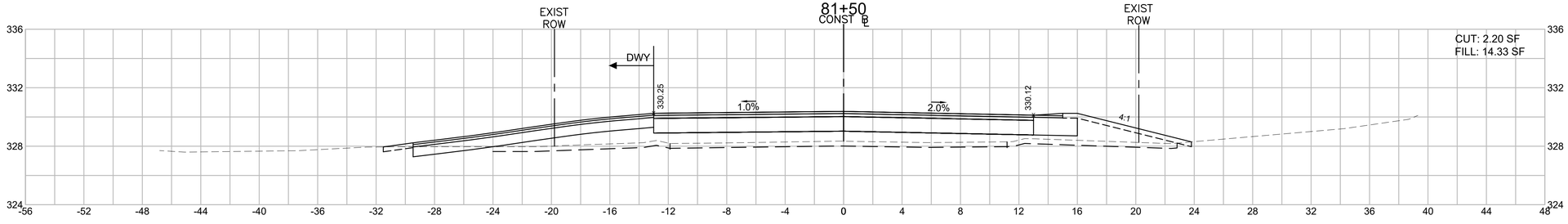
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	129	132
	PROJECT FILE NO. 609035		

CROSS SECTIONS - 50 OF 53
CROWN ROAD







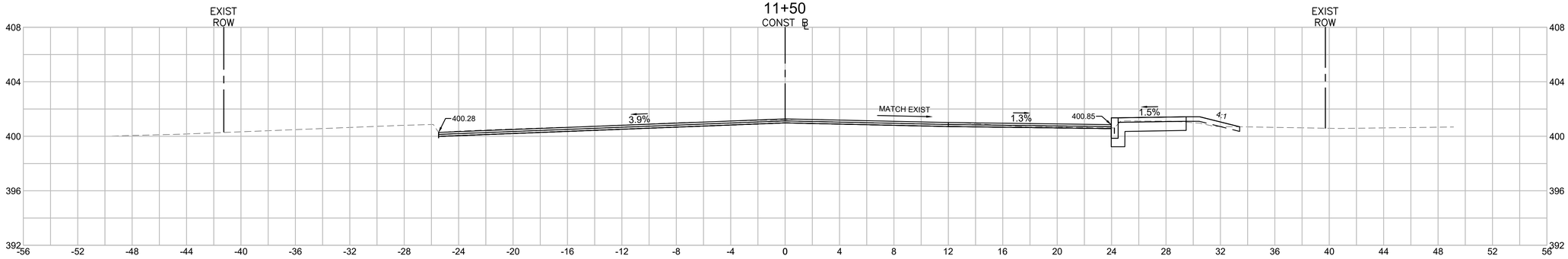


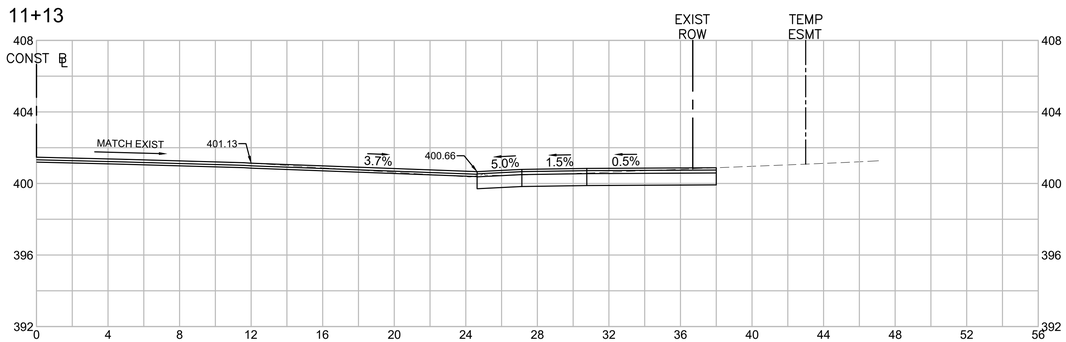
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

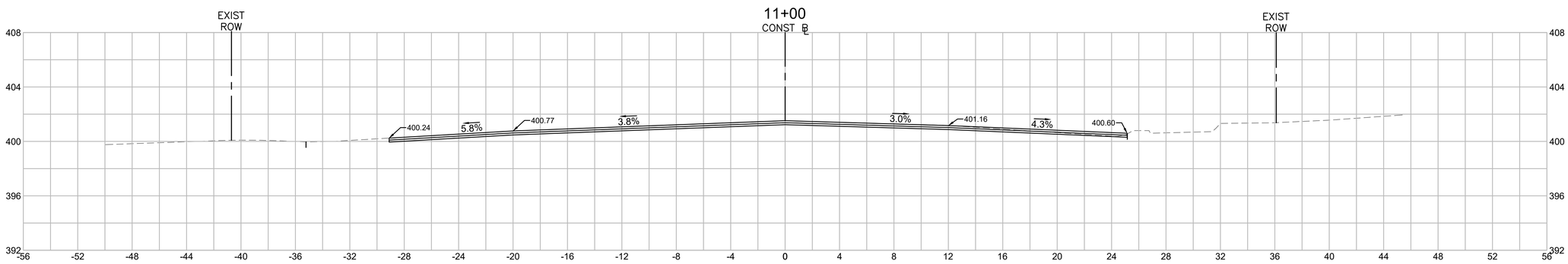
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	130	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 51 OF 53
MAIN STREET





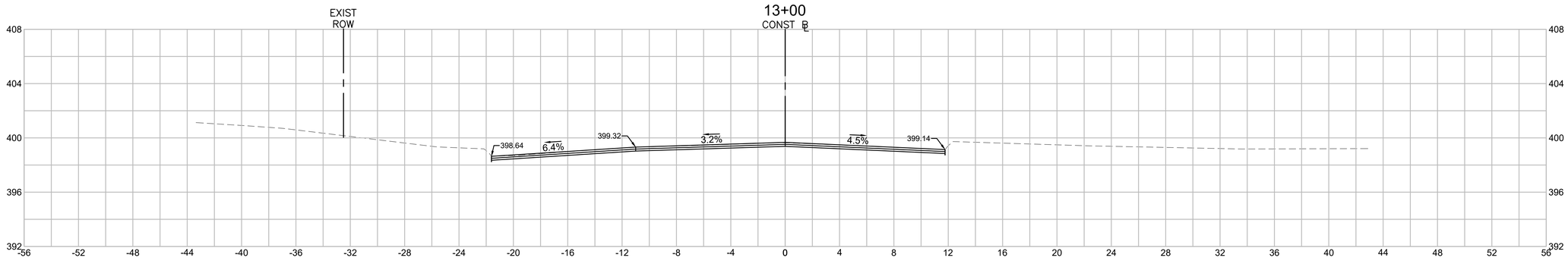


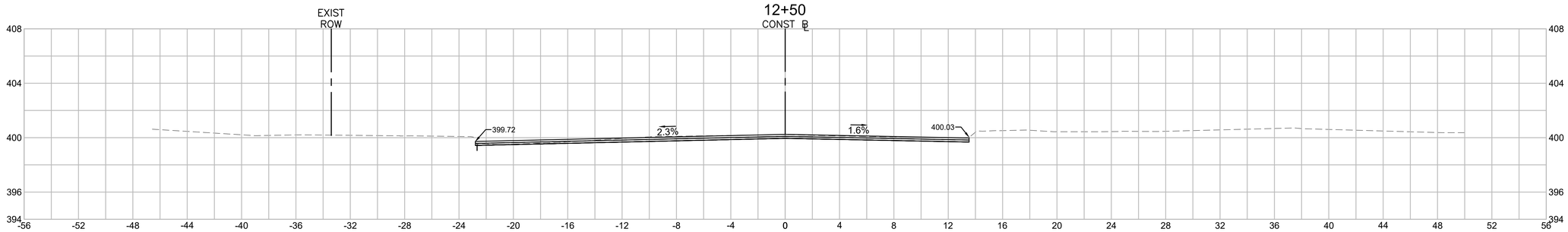
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

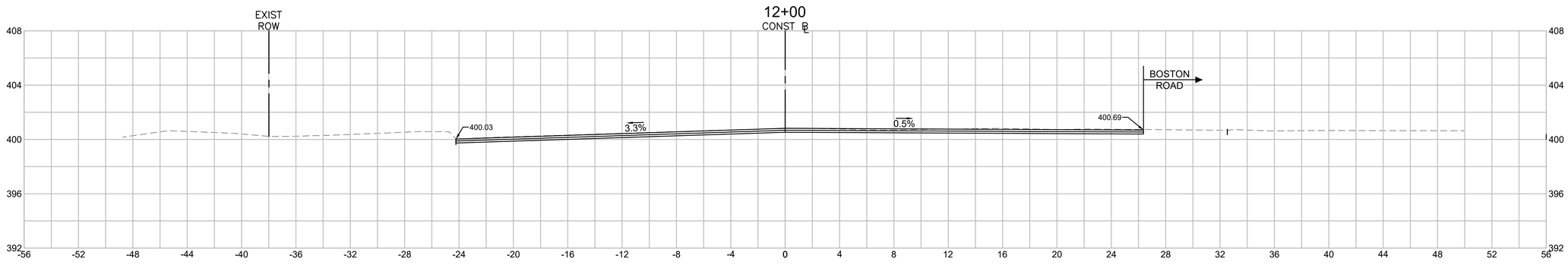
WESTFORD
BOSTON ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	131	132
PROJECT FILE NO.	609035		

CROSS SECTIONS -52 OF 53
MAIN STREET





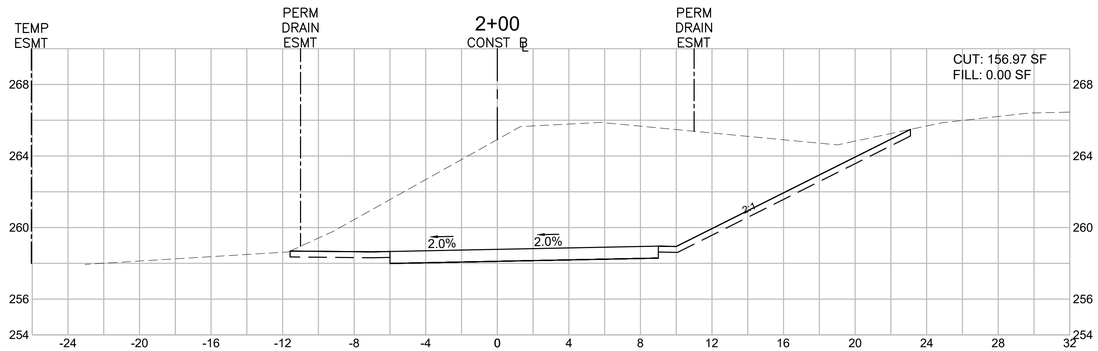


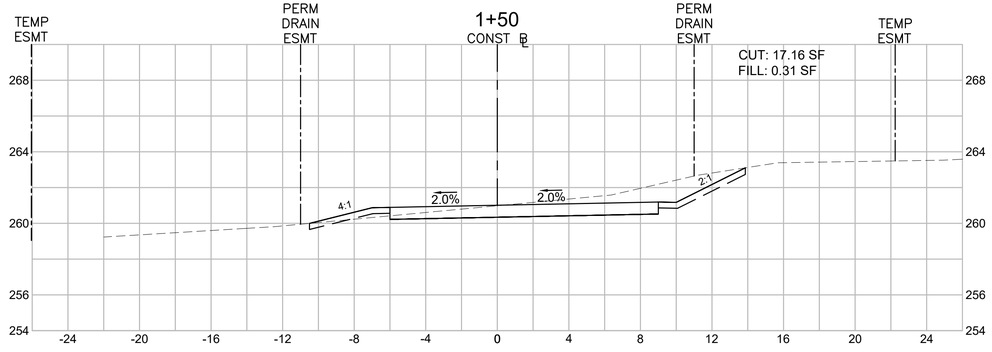
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

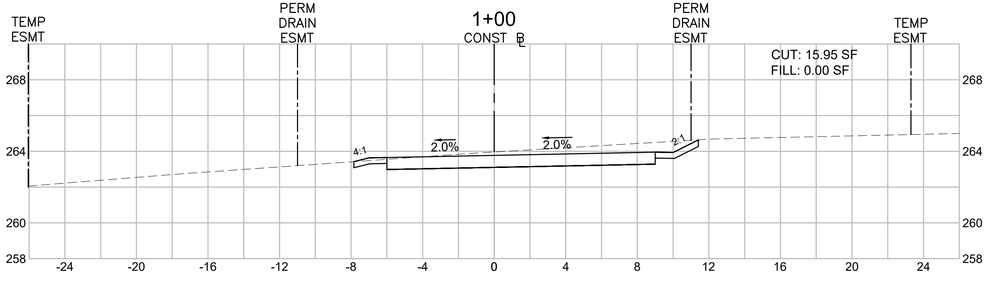
WESTFORD
BOSTON ROAD

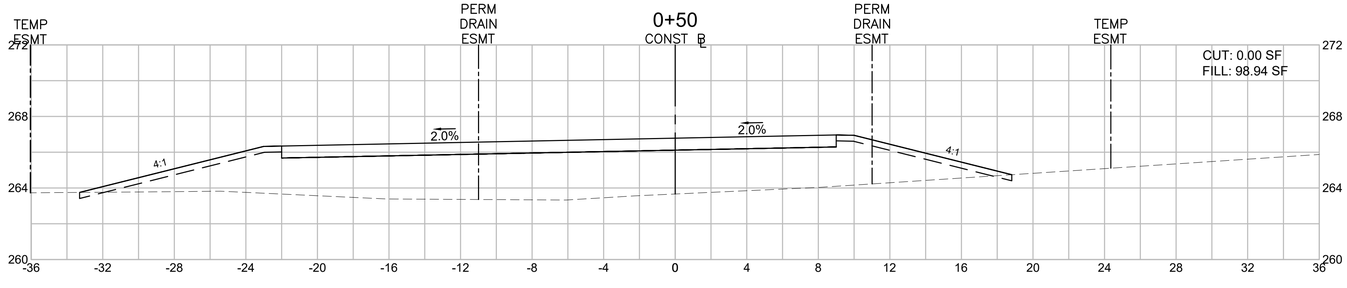
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP-0033(038)X	132	132
PROJECT FILE NO.	609035		

CROSS SECTIONS - 53 OF 53
ACCESS ROAD









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