

# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

WESTFORD  
ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/STP-0033(193)X	1	73
PROJECT FILE NO.		608037	

TITLE SHEET & INDEX

## PLAN AND PROFILE OF ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

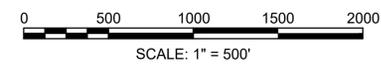
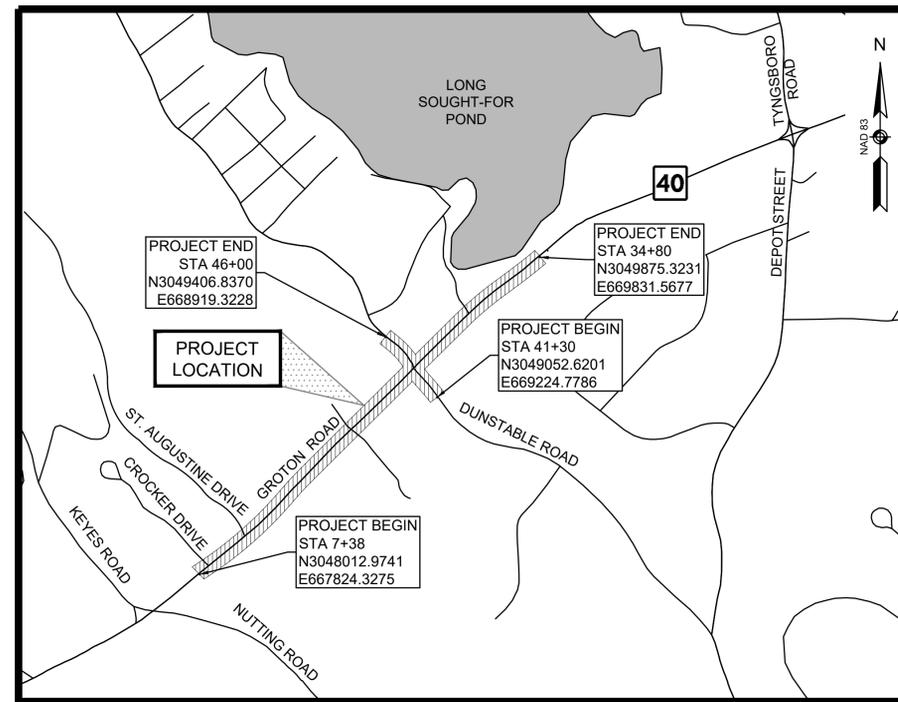
IN THE TOWN OF  
**WESTFORD**  
MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. CMQ/STP-0033(193)X

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, 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, WILL GOVERN.

### INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	KEY PLAN & BORING LOCATIONS
4-5	BORING LOGS
6-8	TYPICAL SECTIONS & PAVEMENT NOTES
9-13	CONSTRUCTION PLANS
14-19	CONSTRUCTION PROFILES
20-24	CURB TIE & GRADING PLANS
25-29	TRAFFIC SIGN & PAVEMENT MARKING PLANS
30	TRAFFIC SIGN SUMMARY
31-32	TRAFFIC SIGNAL PLANS
33-35	TEMPORARY TRAFFIC CONTROL PLANS
36-40	UTILITY PLANS
41-44	CONSTRUCTION DETAILS
45	WHEELCHAIR RAMP & DRIVEWAY DETAILS
46-73	CROSS SECTIONS



LENGTH OF PROJECT = 2,742.00 FEET = 0.519 MILES (GROTON RD)  
470.00 FEET = 0.089 MILES (DUNSTABLE RD)

### DESIGN DESIGNATION

	GROTON ROAD (ROUTE 40)	DUNSTABLE ROAD
DESIGN SPEED	40 MPH	30 MPH
ADT (2017)	10,995 VPD	2,985 VPD
ADT (2037)	13,685 VPD	3,715 VPD
K	9.3%	10.3%
D	54.5% EB	73.6% NB
T (PEAK HOUR)	0.8%	0.6%
T (AVERAGE DAY)	1.4%	1.0%
DHV	1,270 VPH	380 VPH
DDHV	695 VPH	280 VPH
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN MINOR ARTERIAL (NORTH) URBAN COLLECTOR (SOUTH)

DATE	DESCRIPTION	REV #

7/9/18 TEC, Inc.  
 146 Dascomb Road | 169 Ocean Blvd  
 Andover, MA 01810 | Hampton, NH 03842

**RECOMMENDED FOR APPROVAL**

DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 APPROVED:

\_\_\_\_\_  
 CHIEF ENGINEER      DATE

APPROVED  
 \_\_\_\_\_  
 HIGHWAY ADMINISTRATOR      DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		WATER MAIN COUPLING
		WATER MAIN GATE VALVE
		WATER SERVICE W/ CURB STOP
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		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
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		HEDGE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE 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
		LEGEND "ONLY" - WHITE
		STOP LINE
		CROSSWALK
		SOLID WHITE LINE
		SOLID YELLOW LINE
		BROKEN WHITE LINE
		BROKEN YELLOW LINE
		DOTTED WHITE LINE
		DOTTED YELLOW LINE
		DOTTED WHITE LINE EXTENSION
		DOTTED YELLOW LINE EXTENSION
		DOUBLE WHITE LINE
		DOUBLE YELLOW LINE

ABBREVIATIONS

GENERAL	
AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CAB	CABINET
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CGMA	COLUMBIA GAS OF MASSACHUSETTS
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMCT	COMCAST
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	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
GD	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
L&S	LOAM & SEED
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
LSA	LANDSCAPED AREA
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MIN	MINIMUM
NGRID	NATIONAL GRID
NIC	NOT IN CONTRACT
NO.	NUMBER
OVHD	OVERHEAD
PC	POINT OF CURVATURE
PBS	PRINTED BOTH SIDES
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE

WESTFORD  
ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

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LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL	
PROJ	PROJECT
PROP	PROPOSED
PROT	PROTECTION
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
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
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
TELE	TELEPHONE
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TRANS	TRANSITION
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VZ	VERIZON
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

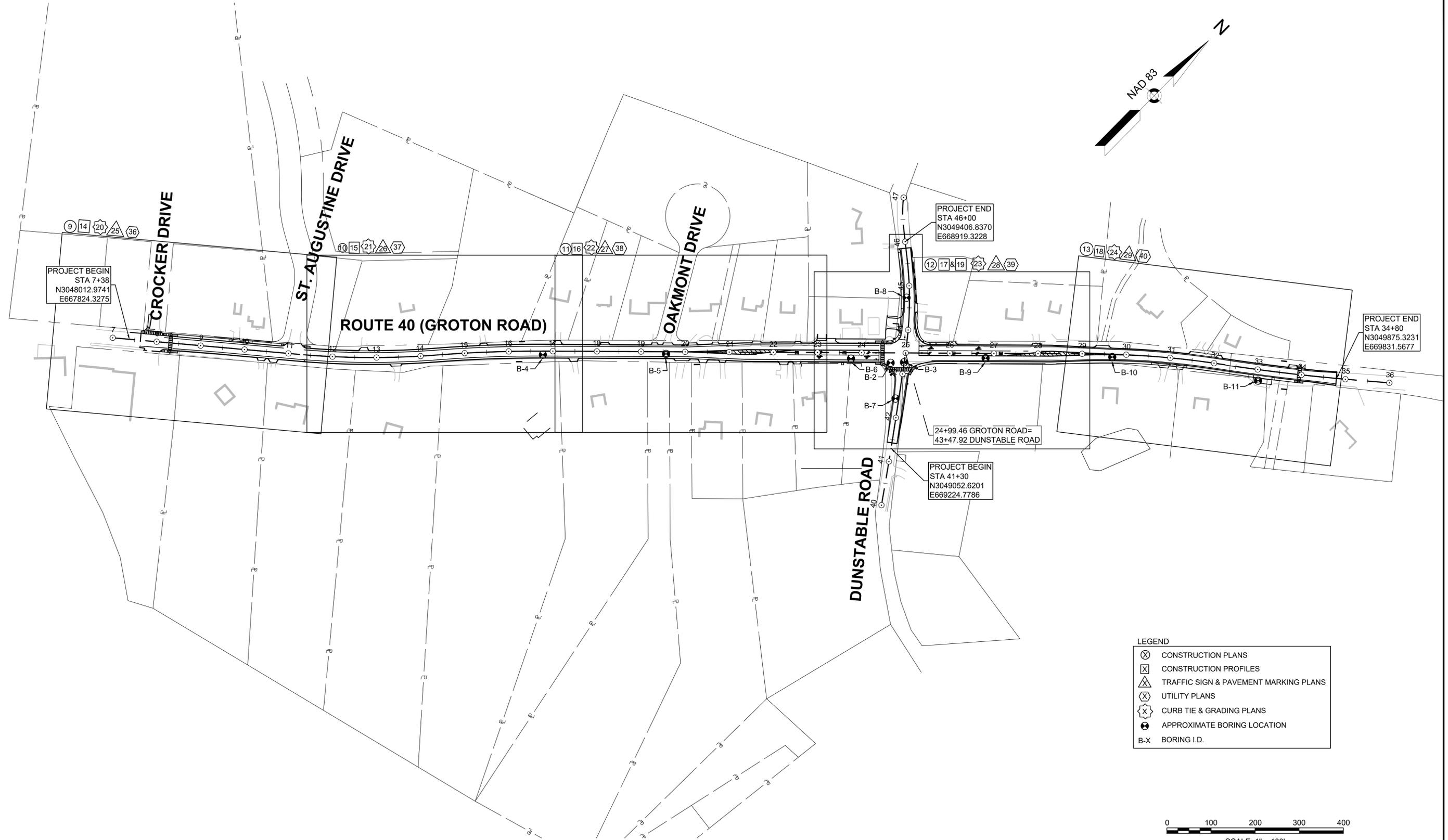
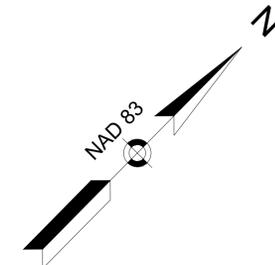
TRAFFIC SIGNAL

CAB.	CABINET
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRA	FLASHING RED ARROW
FY	FLASHING CIRCULAR YELLOW
FYA	FLASHING YELLOW ARROW
G	STEADY CIRCULAR GREEN
OL	OVERLAP
PBN	PEDESTRIAN PUSH BUTTON
PED	PEDESTRIAN
PERM	PERMITTED
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
TS	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR YELLOW

WESTFORD  
 ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

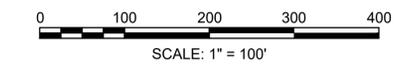
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/STP-0033(193)X	3	73
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KEY PLAN & BORING LOCATIONS



LEGEND

	CONSTRUCTION PLANS
	CONSTRUCTION PROFILES
	TRAFFIC SIGN & PAVEMENT MARKING PLANS
	UTILITY PLANS
	CURB TIE & GRADING PLANS
	APPROXIMATE BORING LOCATION
	BORING I.D.





GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-2 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/29/2017, 11/29/2017, +/- 230, East, Mobile Drill B-47 w/ Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2, S-3, S-4.

NOTES:
1 Petroleum odor was observed in sample S-2 and auger cuttings from approximately 5 feet below ground surface.
2 Cobble encountered at ~ 12 feet below ground surface

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-3 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/29/2017, 11/29/2017, +/- 230, East, Mobile Drill B-47 w/ Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2, S-3, S-4.

NOTES:
1 Drilling action indicates cobbles at 7.5' below ground surface.

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.



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55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-4 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/30/2017, 11/30/2017, +/- 235, East, Mobile Drill B-47 w/ Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2A, S-2B, S-3.

NOTES:
1 Disintegrated rock consisted of bedrock that was broken down into a soil matrix (fine to medium SAND, some Gravel, little Silt).

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.

WESTFORD ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

Table with columns: STATE, FED. AID PROJ. NO., SHEET NO., TOTAL SHEETS. Values include MA, CMQ/STP-0033(193)X, 4, 73.

PROJECT FILE NO. 608037 BORING LOGS - 1 OF 2



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-5 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/30/2017, 11/30/2017, +/- 235, East, Mobile Drill B-47 with Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2.

NOTES:
1 Highly weathered rock consisted of bedrock that was broken down into a gravel matrix (GRAVEL, some fine Sand, trace Silt)

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-6 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/29/2017, 11/29/2017, +/- 230, East, Mobile Drill B-47 with Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2, S-3.

NOTES:
1 Petroleum odor was observed in S-1 and within auger cuttings from 2 to 3 feet below ground surface.
2 Sample S-2 is a highly weathered rock that was likely placed during original road construction

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-7 Contract No: Pg. No.: 1
GTR Project Num: 17-298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, God Surface Elev (ft), Loc. North, Note. Values include Mike Matraro, 11/29/2017, 11/29/2017, +/- 225, East, Mobile Drill B-47 with Automatic Hammer.

Sample Data table with columns: Depth, Case BPF, No., Pen/Rev (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes. Includes samples S-1, S-2, S-3.

NOTES:
1 Cobble encountered at 4 feet below ground surface

Order of Sample Description (Modified Burmister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-8 Contract No: Pg. No.: 1
GTR Project Num: 17,298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, Gnd Surface Elev (ft), Loc. North, Note, Equipment, Casing, Sampler, Core, Groundwater, Depth (ft), Date, Time, Water, Casing, Hole.

Sample Data table with columns: Depth, Case BPF, No., Pen/Revy (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes.

NOTES:
1. Disintegrated rock consisted of bedrock that was broken down into a soil matrix (fine SAND, some Gravel, trace Silt).
2. Highly weathered rock consisted of bedrock that was broken down into a gravel matrix (GRAVEL, some fine Sand, trace Silt)

Order of Sample Description (Modified Burnister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-9 Contract No: Pg. No.: 1
GTR Project Num: 17,298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, Gnd Surface Elev (ft), Loc. North, Note, Equipment, Casing, Sampler, Core, Groundwater, Depth (ft), Date, Time, Water, Casing, Hole.

Sample Data table with columns: Depth, Case BPF, No., Pen/Revy (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes.

NOTES:

Order of Sample Description (Modified Burnister) and PENETRATION RESISTANCE (N) GUIDE tables.

WESTFORD
ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

Table with columns: STATE, FED. AID PROJ. NO., SHEET NO., TOTAL SHEETS. Values: MA, CMQ/STP-0033(193)X, 5, 73.

PROJECT FILE NO. 608037
BORING LOGS - 2 OF 2



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-10 Contract No: Pg. No.: 1
GTR Project Num: 17,298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, Gnd Surface Elev (ft), Loc. North, Note, Equipment, Casing, Sampler, Core, Groundwater, Depth (ft), Date, Time, Water, Casing, Hole.

Sample Data table with columns: Depth, Case BPF, No., Pen/Revy (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes.

NOTES:
1. Possible weathered bedrock in tip of split spoon

Order of Sample Description (Modified Burnister) and PENETRATION RESISTANCE (N) GUIDE tables.



GEOSCIENCE TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, No. Chelmsford, MA 01863
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: B-11 Contract No: Pg. No.: 1
GTR Project Num: 17,298 GTR Rep: S. Hevey
Proj. Name: Rte 40 Westford Drilling Company: New England Boring Co.
Location: Intersection Rte 40 and Dunstable Rd Westford, MA

Table with columns: Driller, Start Date, End Date, Gnd Surface Elev (ft), Loc. North, Note, Equipment, Casing, Sampler, Core, Groundwater, Depth (ft), Date, Time, Water, Casing, Hole.

Sample Data table with columns: Depth, Case BPF, No., Pen/Revy (in), Depth (ft), Blows per 6 inches, Field Test, Description and Classification, Stratum, Additional Data, Notes.

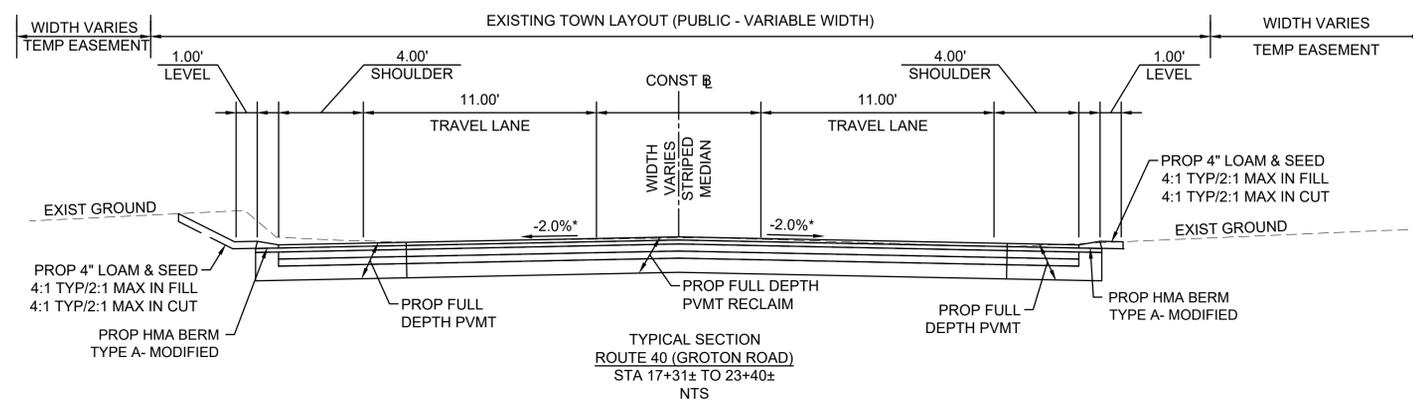
NOTES:
1. Drilling action indicates cobbles at 7 - 8 feet below ground surface.

Order of Sample Description (Modified Burnister) and PENETRATION RESISTANCE (N) GUIDE tables.

WESTFORD  
ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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TYPICAL SECTIONS & PAVEMENT NOTES - 1 OF 3



**PROPOSED FULL DEPTH PAVEMENT**  
 SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER  
 2 1/4" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER  
 BASE: 4" SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) OVER  
 SUBBASE: 4" RECLAIMED PAVEMENT BORROW FOR SUBBASE (ASPHALT STABILIZED) OVER  
 8" RECLAIMED PAVEMENT BORROW FOR SUBBASE

**PROPOSED FULL DEPTH PAVEMENT RECLAMATION**  
 SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER  
 2 1/4" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER  
 BASE: 4" SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) OVER  
 SUBBASE: 4" RECLAIMED PAVEMENT BORROW FOR SUBBASE (ASPHALT STABILIZED) OVER  
 8" RECLAIMED PAVEMENT BORROW FOR SUBBASE  
 NOTE: EXISTING PAVEMENT SHALL BE MILLED 3" ± 3/4" FROM ENTIRE PAVEMENT SECTION PRIOR TO RECLAIMING 14" ± 2"

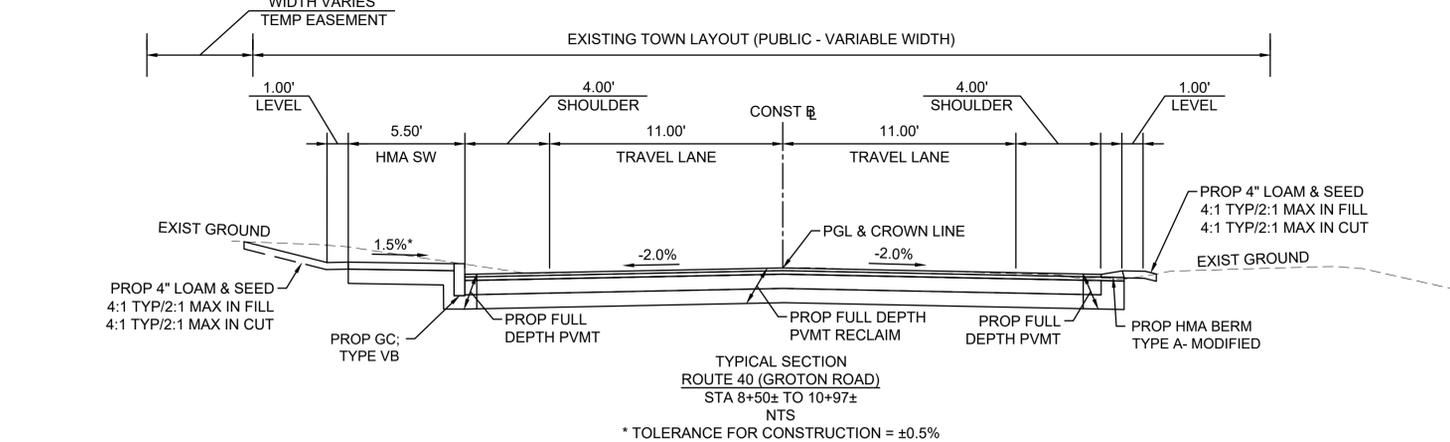
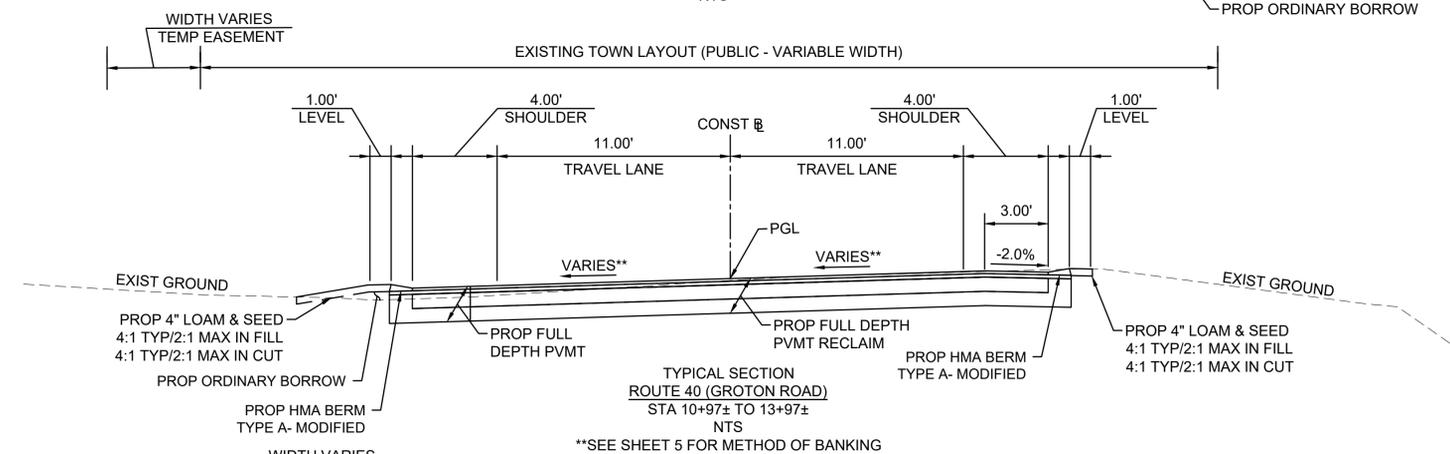
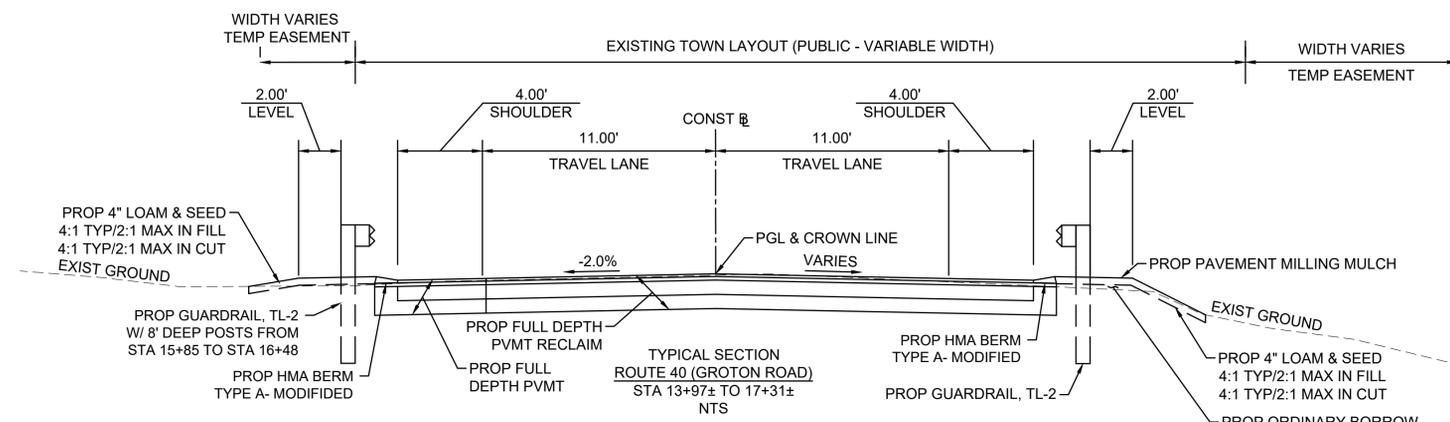
**PROPOSED CEMENT CONCRETE WHEELCHAIR RAMPS**  
 SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED, 4000 PSI, 3/4", 610)  
 BASE: 8" GRAVEL BORROW, TYPE b (COMPACTED)

**PROPOSED HMA DRIVEWAY (TO MATCH EXISTING)**  
 SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
 2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER  
 BASE: 8" SUITABLE EXISTING GRAVEL (COMPACTED);  
 ADD GRAVEL BORROW, TYPE b AS REQUIRED

**PROPOSED HMA SIDEWALK**  
 SURFACE: 1" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
 1 1/2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER  
 BASE: 8" GRAVEL BORROW, TYPE b (COMPACTED)

GENERAL PAVEMENT NOTES:

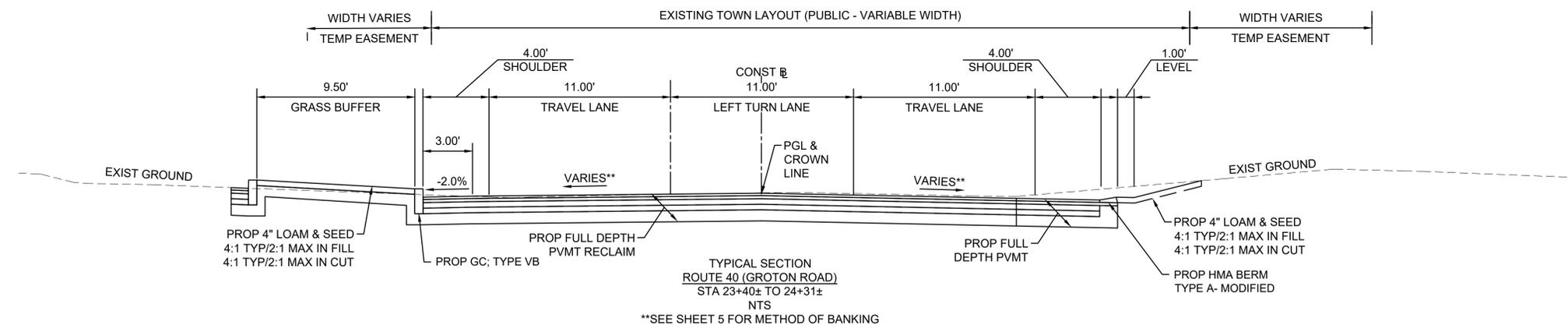
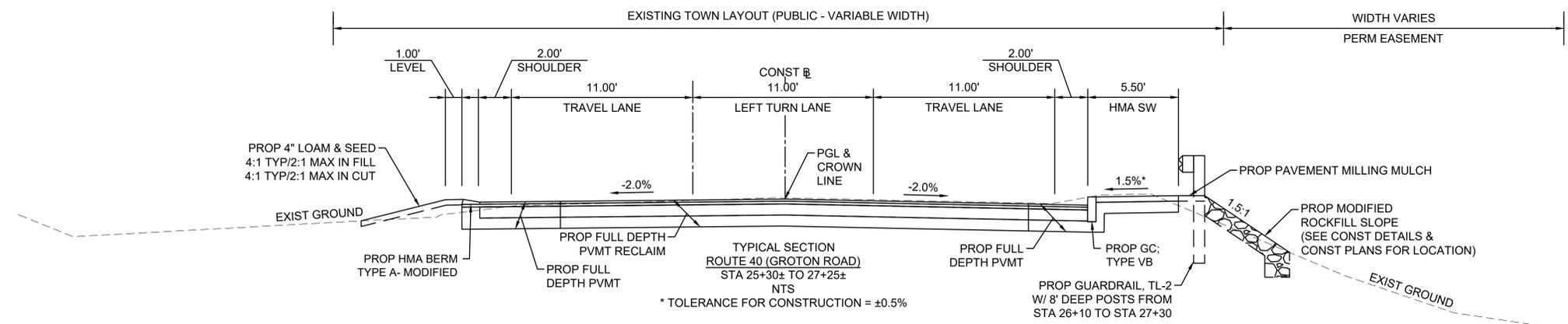
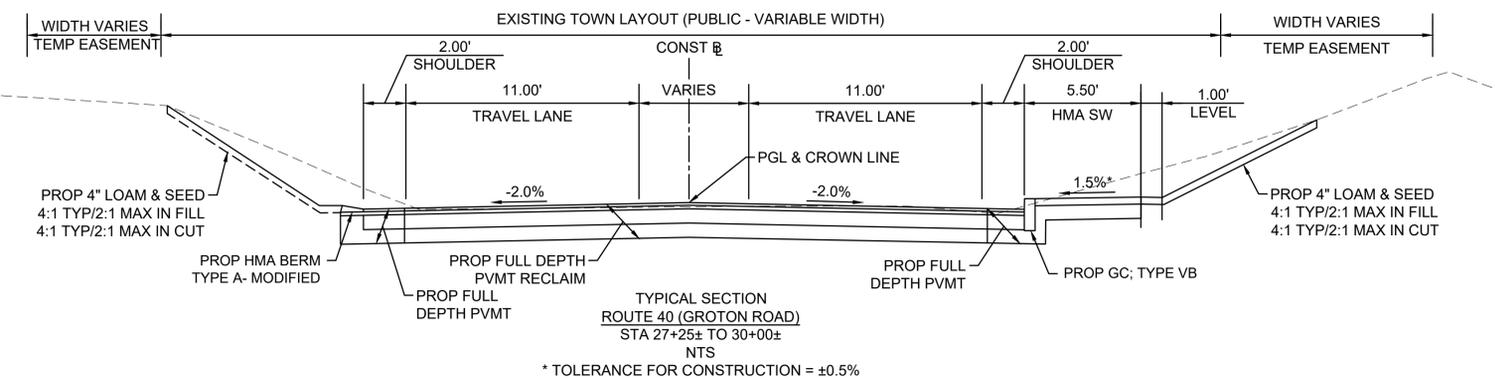
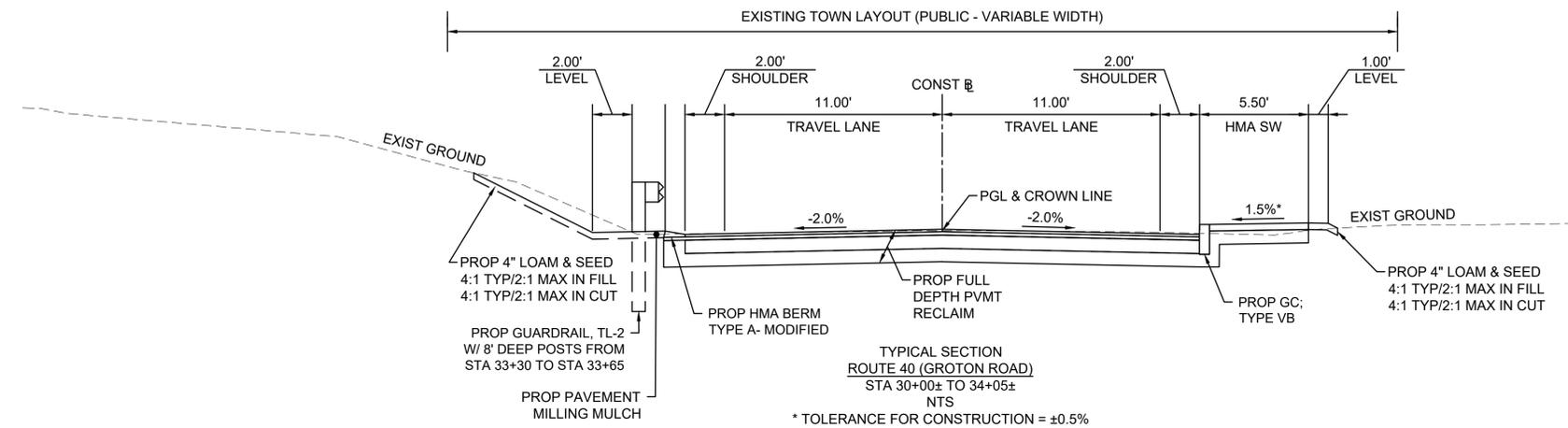
1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND SAWCUT JOINTS BEFORE PAVING. HMA JOINT SEALANT SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED AT A RATE OF 0.05 GAL/SY, EXCEPT OVER MILLED AND CEMENT CONCRETE SURFACES, WHERE THE APPLICATION RATE SHALL BE 0.07 GAL/SY. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. ALL HMA SHALL BE PRODUCED WITH WMA ADDITIVE.
3. ALL HMA SHALL BE IN ACCORDANCE WITH SECTION 450.
4. ASPHALT EMULSION FOR TACK COAT SHALL BE RS-1H TO RESIST TRACKING OF TACK BY HAUL VEHICLES.
5. HMA FOR WALKS AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH SECTION 700.
6. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED WITH DENSE GRADED CRUSHED STONE AS REQUIRED.



WESTFORD  
 ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/STP-0033(193)X	7	73
PROJECT FILE NO. 608037		608037	

TYPICAL SECTIONS & PAVEMENT NOTES - 2 OF 3



608037(PS&E)2(1)4(TYPICAL SECTIONS).DWG Plotted on 7/3/2018 10:31 AM

WESTFORD  
ROUTE 40 (GROTON ROAD) & DUNSTABLE ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/STP-0033(193)X	8	73
PROJECT FILE NO.		608037	

TYPICAL SECTIONS & PAVEMENT NOTES - 3 OF 3

