

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PLAN AND PROFILE OF
ROUTE 140 (MILFORD STREET)

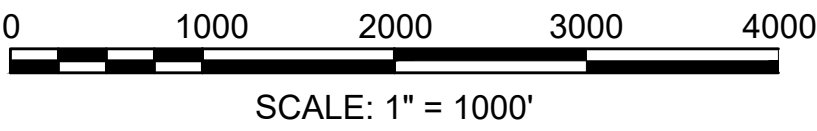
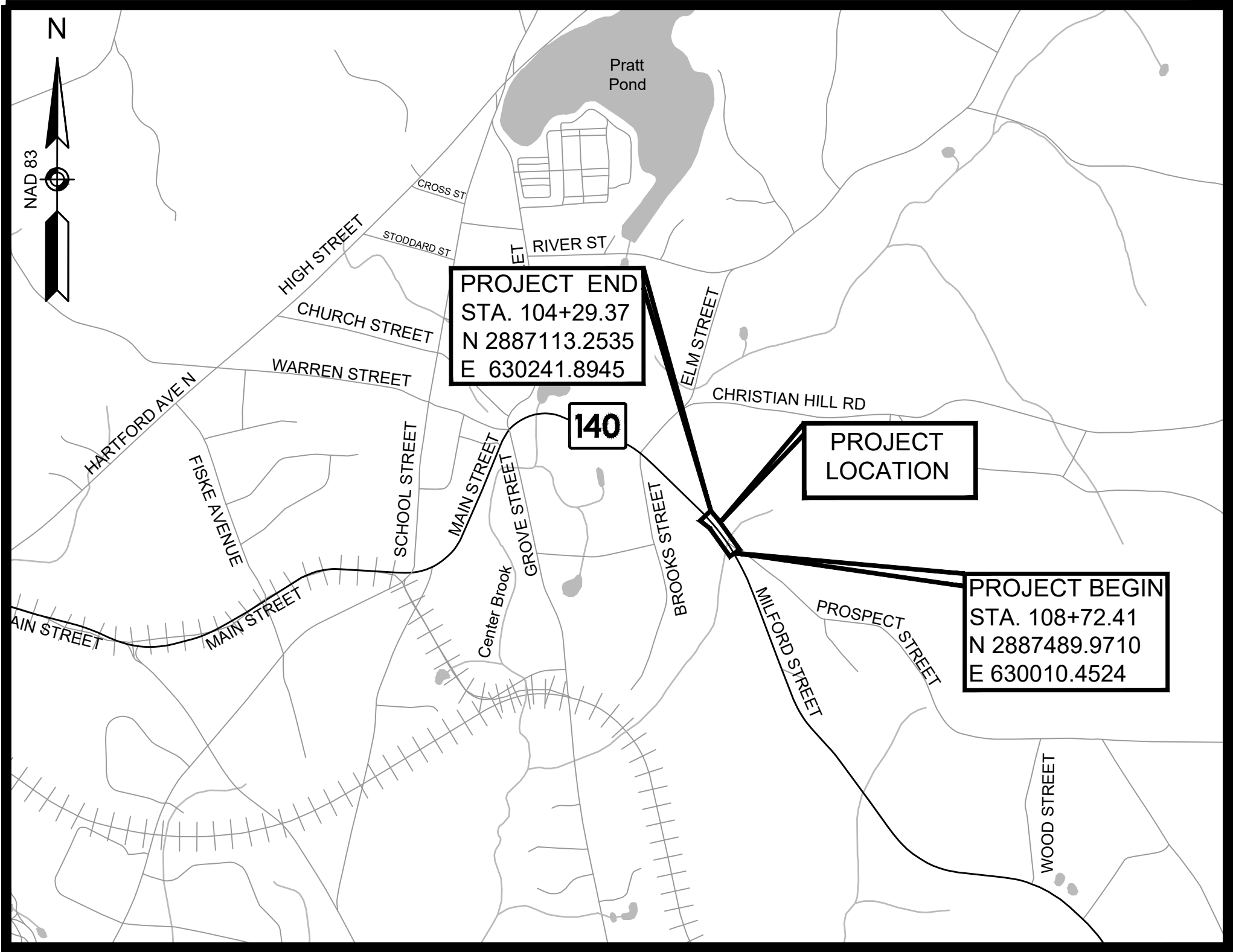
IN THE TOWN OF
UPTON
WORCESTER COUNTY

UPTON ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	22
PROJECT FILE NO.		608456	
TITLE SHEET & INDEX			

THESE PLANS ARE SUPPLEMENTED BY THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2023, AS AMENDED, 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.

25% SUBMITTAL



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LENGTH OF PROJECT = 443.04 FEET = 0.08 MILES

DESIGN DESIGNATION (ROUTE 140 (MILFORD STREET))

DESIGN SPEED	45 MPH
ADT (2022)	7,276
ADT (2029)	7,801
K	10.0%
D	50%
T (PEAK HOUR)	3.2%
T (AVERAGE DAY)	4.1%
DHV	728
DDHV	365
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL

			
	12/11/23	25% DESIGN SUBMISSION	
	DATE	DESCRIPTION	REV #
 Massachusetts Department of Transportation Highway Division			
APPROVED			
CHIEF ENGINEER		DATE	

UPTON
ROUTE 140 (MILFORD STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	22
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GENERAL NOTES

- EXISTING GROUND SURFACES SHOWN ON PLANS, PROFILES AND CROSS SECTIONS ARE BASED UPON DATA OBTAINED BY FIELD SURVEYS.
- THE LOCATIONS OF EXISTING SUBSURFACE STRUCTURES, SUCH AS SEWERS, WATER MAINS, DRAINS AND OTHER UTILITIES ARE APPROXIMATE ONLY AND THE ENGINEER DOES NOT GUARANTEE THEIR NUMBER OR LOCATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES BEFORE EXCAVATING.
- THE CONTRACTOR SHALL DIG TEST PITS AT EXISTING DRAINAGE STRUCTURES TO DETERMINE EXISTING INVERT ELEVATIONS INDICATED ON THE PLANS AS N/A (NOT AVAILABLE). PROPOSED DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE OR UTILITY DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR REQUIRED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED.
- EXISTING WATER BOXES AND CURB STOPS, FIRE ALARM, SEWER AND SURFACE DRAIN MANHOLE FRAMES AND COVERS, CATCH BASIN FRAMES AND GRATES AND OTHER CASTINGS SHALL BE ADJUSTED TO LINE AND/OR GRADE AS SHOWN ON THE PLANS AND/OR AS REQUIRED BY THE ENGINEER.
- ALL EXISTING BROKEN OR DAMAGED SERVICE BOXES AND GATE BOXES WITHIN THE PROJECT SITE SHALL BE REPLACED WITH NEW STRUCTURES IN ACCORDANCE WITH THE MUNICIPAL STANDARDS AND AS REQUIRED BY THE ENGINEER.
- ALL GAS GATES, ELECTRIC MANHOLES AND TELEPHONE MANHOLES WITHIN THE LIMITS OF WORK SHALL BE ADJUSTED BY THE OWNING AGENCY, UNLESS OTHERWISE INDICATED ON THE PLANS. ALL GAS, ELECTRIC, TELEPHONE AND CATV WORK SHALL BE DONE BY THE OWNING AGENCY. THE CONTRACTOR SHALL NOTIFY THE OWNING AGENCIES TO ADJUST AND/OR RELOCATE THESE STRUCTURES TO AVOID IMPACTING THE CONTRACTOR'S SCHEDULE OF OPERATIONS.
- ALL PROPOSED DRAINAGE CONNECTIONS TO EXISTING STRUCTURES WILL BE INCLUDED IN THE COST OF THE NEW PIPE.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA. THE CONTRACTOR SHALL ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO ADJUST AND/OR INSTALL THEIR SYSTEMS WITHIN TOWN/STATE OWNED STREETS AND EASEMENTS.
- NO EXISTING PUBLIC UTILITY STRUCTURES SHALL BE ABANDONED AND/OR DISMANTLED WITHOUT AUTHORIZATION FROM THE ENGINEER.
- THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANIES WHEN THE INSTALLATION OF DRAINAGE LINES AND STRUCTURES ARE IN CLOSE PROXIMITY TO EXISTING UTILITY POLES.
- THE CONTRACTOR SHALL COORDINATE WORK WITH THE OWNERS OF UTILITY POLES AND SHALL BE RESPONSIBLE FOR TRIMMING TREES AS NECESSARY TO ACCOMMODATE NEW UTILITY POLE LOCATIONS.
- THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR TEMPORARY SUPPORT WHILE EXCAVATING IN CLOSE PROXIMITY OF UTILITY POLES, IF REQUIRED BY THE UTILITY, AT NO ADDITIONAL COST.
- CURB SHALL BE FURNISHED AND SET AT LOCATIONS SHOWN ON THE PLANS AND/OR AS REQUIRED BY THE ENGINEER.
- CONSTRUCT DRIVEWAYS AND WALKS AS SHOWN ON THE PLANS AN/OR AS REQUIRED BY THE ENGINEER.
- EXISTING GRANITE CURB AND/OR EDGING SUITABLE FOR REUSE WITHIN THE PROJECT SITE SHALL BE REMOVED AND RESET IN ACCORDANCE WITH THE PLANS AND/OR AS REQUIRED BY THE ENGINEER. EXISTING CURB CORNERS IN THE PROJECT SHOULD BE REMOVED AND DISCARDED.
- SAW CUT EXISTING BITUMINOUS CONCRETE ROADWAYS, CEMENT CONCRETE SIDEWALKS AND BITUMINOUS CONCRETE DRIVEWAYS AS SHOWN ON THE PLANS AND AT THE PROPOSED MATCH LINE.
- WHERE THE NEW CONSTRUCTION COINCIDES WITH PRESENT TRAVELED WAYS.
 - THE CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH THE TEMPORARY TRAFFIC CONTROL PLANS AND THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR WORK ZONES.
 - THE CONTRACTOR SHALL PERFORM THEIR WORK IN A MANNER ACCEPTABLE TO THE ENGINEER SO THAT INTERFERENCE WITH AND INCONVENIENCE TO BUSINESS CONCERNS AND ABUTTERS, ON ACCOUNT OF THE CONSTRUCTION WORK, IS KEPT TO A MINIMUM.
 - THE CONTRACTOR SHALL NOT BE ALLOWED TO PARK EQUIPMENT OR STOCKPILE EQUIPMENT OR MATERIAL ON THE TRAVELED WAYS OVERNIGHT OR WHEN NOT IN USE.
 - THE CONTRACTOR SHALL MAINTAIN SAFE AND RESPONSIBLE ACCESS TO AND FROM ABUTTING PROPERTY PRIVATE WAYS, DRIVEWAYS AND ALL ALLEYS AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
- 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.
- THE CONTRACTOR SHALL DIG TEST PITS AS REQUIRED TO LOCATE EXISTING UTILITIES PRIOR TO TREE/SHRUB PLANTING. ROOT BALLS SHALL BE PLANTED A MINIMUM OF SIX (6) LATERAL FEET AWAY FROM GAS PIPES.
- THE CONTRACTOR SHALL REPORT ANY CONFLICTS BETWEEN TREE PITS AND EXISTING UNDERGROUND UTILITIES TO THE ENGINEER AND THE MUNICIPAL TREE WARDEN FOR RESOLUTION.
- THE CONTRACTOR SHALL DIG TEST PITS TO LOCATE EXISTING UTILITIES PRIOR TO INSTALLING LIGHT POLE FOUNDATIONS. LIGHT POLE FOUNDATIONS SHALL BE INSTALLED A MINIMUM OF THREE (3) LATERAL FEET AWAY FROM GAS PIPES










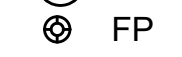



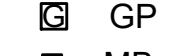



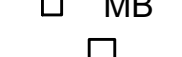











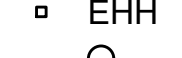



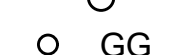



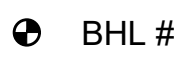







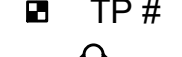































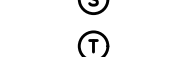































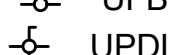























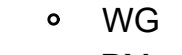







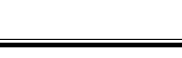



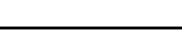



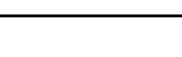







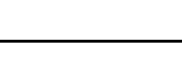



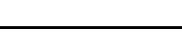



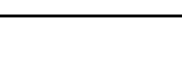







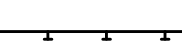
- AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
- THE CONTRACTOR SHALL RESTORE ANY EXISTING SURFACE PAVEMENTS AND TURF WHICH IS TO REMAIN THAT IS DISTURBED BY THE PROPOSED WORK AND SHALL PATCH ALL HOLES RESULTING FROM THE REMOVAL OF FOUNDATIONS WITH MATERIALS SIMILAR TO THE EXISTING.
- ALL ACCESSIBLE ROUTES, WALKWAYS, CURB CUTS, RAMPS, SIDEWALKS, DRIVEWAY OPENINGS, CLEARANCES AND SLOPE TOLERANCES SHALL CONFORM WITH THE ARCHITECTURAL ACCESS BOARD (AAB), 521 CMR AND MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DRAWINGS.
- ALL UTILITY COVERS WITHIN ACCESSIBLE ROUTES SHALL BE REPLACED WITH SLIP-RESISTANT COVERS.
- ITEMS LABELED "REM" SHALL BE REMOVED AND DISCARDED BY CONTRACTOR.
- BEFORE START OF ANY WORK ON THE SITE, PRECEDING THE ARRIVAL OF EQUIPMENT, MATERIALS, OR VEHICLES TO THE SITE, AND PRIOR TO THE COMMENCEMENT OF ANY CLEARING ON THE SITE, THE CONTRACTOR AND ARBORIST SHALL ARRANGE A PRECONSTRUCTION TREE INVENTORY CONFERENCE ON THE SITE WITH THE ENGINEER AND REPRESENTATIVE TOWN TREE WARDENS TO IDENTIFY TREES AND SHRUBS THAT ARE TO BE PROTECTED OR REMOVED AND REVIEW APPROVED PROTECTION MEASURES. NO CLEARING OR PRUNING SHALL BE DONE WITHOUT A CLEAR UNDERSTANDING OF EXISTING CONDITIONS TO BE PRESERVED.
- THE CONTRACTOR SHALL PROTECT EXISTING SURVEY MONUMENTS AND SHALL RESET ANY MONUMENTATION DISTURBED BY HIS OPERATIONS.
- ALL PAVEMENT DEEMED UNSATISFACTORY BENEATH THE PROPOSED MILLING DEPTH SHALL BE REMOVED AND REPLACED TO PROVIDE A SUITABLE BASE CONDITION FOR THE NEW TOP COURSE PAVEMENT.
- WHERE EXISTING SUNKEN TRENCH PAVEMENTS ARE ENCOUNTERED, THE AFFECTED AREA SHALL BE SAWCUT AND REPAIRED FOLLOWING FULL DEPTH PAVEMENT DESIGN AS SHOWN IN THE PAVEMENT NOTES.
- THE MINIMUM MOUNTING HEIGHT FOR ALL POST-MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE CURB OR SIDEWALK, SHALL BE 7 FEET UNLESS SPECIFIED OTHERWISE ON THE PLANS.

SURVEY NOTES

- THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY BSC GROUP, INC. BETWEEN JUNE 25, 2014 AND JULY 24, 2014 AND BETWEEN NOVEMBER 16, 2022 AND NOVEMBER 17, 2022.
- HORIZONTAL DATUM IS NAD 1983. VERTICAL DATUM IS NAVD 1988. BOTH DATUMS ARE ACQUIRED FROM GPS OBSERVATIONS.
- PROPERTY LINES SHOWN ARE APPROXIMATE.
- WETLAND RESOURCE LIMITS AND FLAGS WERE DETERMINED BY BSC GROUP, INC.

WATER AND SEWER NOTES

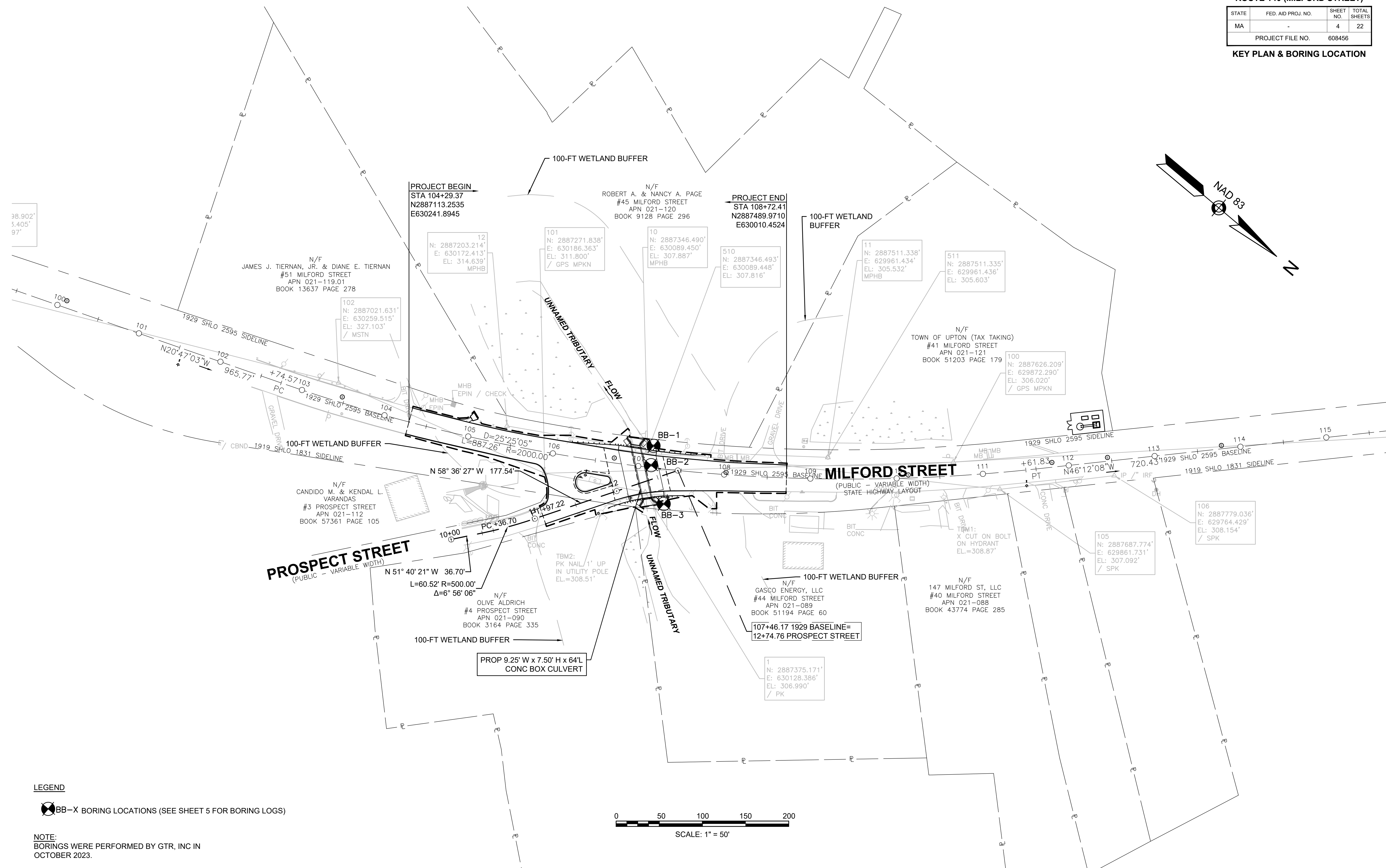
- THE PROPOSED WATER AND SEWER INFRASTRUCTURE SHOWN ON THESE PLAN WAS PROVIDED BY TIGHE & BOND IN DECEMBER 2023. THE WORK IS PROPOSED AS PART OF THE TOWN OF UPTON'S GOVERNOR'S LANDING WATER MAIN, SANITARY SEWER AND PUMP STATION PROJECT
- THE PROPOSED WATER AND SEWER PROJECT IS BE CONSTRUCTED PRIOR TO THE COMPLETION OF THIS PROJECT AND IS NOT PART OF THIS CONTRACT.
- ONCE CONSTRUCTED, WATER AND SEWER INFRASTRUCTURE WILL BE SHOWN AS EXISTING CONDITIONS AND THE APPROPRIATE DISPOSITIONS WILL BE INCLUDED ON THE UTILITY PLAN.


GENERAL SYMBOLS			TRAFFIC SYMBOLS			ABBREVIATIONS														
EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION	GENERAL	UPTON ROUTE 140 (MILFORD STREET)													
 JB	 JB	JERSEY BARRIER	 TS	 TS	CONTROLLER PHASE ACTUATED	AADT	ANNUAL AVERAGE DAILY TRAFFIC	<table><tr><th>STATE</th><th>FED. AID PROJ. NO.</th><th>SHEET NO.</th><th>TOTAL SHEETS</th></tr><tr><td>MA</td><td>-</td><td>3</td><td>22</td></tr><tr><td colspan="2">PROJECT FILE NO.</td><td colspan="2">608456</td></tr></table> LEGEND & ABBREVIATIONS	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	MA	-	3	22	PROJECT FILE NO.		608456	
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS																	
MA	-	3	22																	
PROJECT FILE NO.		608456																		
 CB	 CB	CATCH BASIN	 TSH	 TSH	TRAFFIC SIGNAL HEAD (SIZE AS NOTED)	ABAN	ABANDON													
 FP	 FP	CATCH BASIN CURB INLET	 WLD	 WLD	WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)	ADJ	ADJUST													
 GP	 GP	FLAG POLE	 VDC	 VDC	VIDEO DETECTION CAMERA	APPROX.	APPROXIMATE													
 MB	 MB	GAS PUMP	 MWD	 MWD	MICROWAVE DETECTOR	A.C.	ASPHALT CONCRETE													
 PS	 PS	MAIL BOX	 PPB	 PPB	PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE	ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE													
 PS	 PS	POST SQUARE	 ECS	 ECS	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT	BIT.	BITUMINOUS													
 PC	 PC	POST CIRCULAR	 VSH	 VSH	VEHICULAR SIGNAL HEAD	BC	BOTTOM OF CURB													
 WELL	 WELL	WELL	 FPP	 FPP	VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED	BD.	BOUND													
 EHH	 EHH	ELECTRIC HANDHOLE	 ECS	 ECS	FLASHING BEACON	BL	BASELINE													
 FGP	 FGP	FENCE GATE POST	 RRS	 RRS	RAILROAD SIGNAL	BLDG	BUILDING													
 GG	 GG	GAS GATE	 SPP	 SPP	SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)	BM	BENCHMARK													
 BHL #	 BHL #	BORING HOLE	 MAA	 MAA	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)	BO	BY OTHERS													
 MW #	 MW #	MONITORING WELL	 HMA	 HMA	HIGH MAST POLE OR TOWER	BOS	BOTTOM OF SLOPE													
 TP #	 TP #	TEST PIT	 SPP	 SPP	SIGN AND POST	BR.	BRIDGE													
 HYD	 HYD	HYDRANT	 SPP	 SPP	SIGN AND POST (2 POSTS)	CB	CATCH BASIN													
 LP	 LP	LIGHT POLE	 SPP	 SPP	MAST ARM WITH LUMINAIRE	CBCI	CATCH BASIN WITH CURB INLET													
 CO.BD.	 CO.BD.	COUNTY BOUND	 SPP	 SPP	OPTICAL PRE-EMPTION DETECTOR	CC	CEMENT CONCRETE													
 GPS	 GPS	GPS POINT	 SPP	 SPP	CONTROL CABINET, GROUND MOUNTED	CCM	CEMENT CONCRETE MASONRY													
 CMH	 CMH	CABLE MANHOLE	 SPP	 SPP	CONTROL CABINET, POLE MOUNTED	CEM	CEMENT													
 DMH	 DMH	DRAINAGE MANHOLE	 SPP	 SPP	LOAD CENTER ASSEMBLY	CI	CURB INLET													
 EMH	 EMH	ELECTRIC MANHOLE	 SPP	 SPP	PULL BOX 12"x12" (OR AS NOTED)	CIP	CAST IRON PIPE													
 GMH	 GMH	GAS MANHOLE	 SPP	 SPP	ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)	CLF	CHAIN LINK FENCE													
 MMH	 MMH	MISC MANHOLE	 SPP	 SPP		CL	CENTERLINE													
 SMH	 SMH	SEWER MANHOLE	 SPP	 SPP		CMP	CORRUGATED METAL PIPE													
 TMH	 TMH	TELEPHONE MANHOLE	 SPP	 SPP		CSP	CORRUGATED STEEL PIPE													
 WMH	 WMH	WATER MANHOLE	 SPP	 SPP		CO.	COUNTY													
 MHB	 MHB	MASSACHUSETTS HIGHWAY BOUND	 SPP	 SPP		CONC	CONCRETE													
 MON	 MON	MONUMENT	 SPP	 SPP		CONT	CONTINUOUS													
 SB	 SB	STONE BOUND	 SPP	 SPP		CONST	CONSTRUCTION													
 TB	 TB	TOWN OR CITY BOUND	 SPP	 SPP		CR GR	CROWN GRADE													
 Δ	 Δ	TRAVERSE OR TRIANGULATION STATION	 SPP	 SPP		DHV	DESIGN HOURLY VOLUME													
 TPL or GUY	 TPL or GUY	TROLLEY POLE OR GUY POLE	 SPP	 SPP		DI	DROP INLET													
 HTP	 HTP	TRANSMISSION POLE	 SPP	 SPP		DIA	DIAMETER													
 UFB	 UFB	UTILITY POLE W/ FIREBOX	 SPP	 SPP		DIP	DUCTILE IRON PIPE													
 UPDL	 UPDL	UTILITY POLE WITH DOUBLE LIGHT	 SPP	 SPP		DW	STEADY DON'T WALK - PORTLAND ORANGE													
 ULT	 ULT	UTILITY POLE W / 1 LIGHT	 SPP	 SPP		DWY	DRIVEWAY													
 UPL	 UPL	UTILITY POLE	 SPP	 SPP		ELEV (or EL.)	ELEVATION													
 BUSH	 BUSH	BUSH	 SPP	 SPP		EMB	EMBANKMENT													
 TREE	 TREE	TREE	 SPP	 SPP		EOP	EDGE OF PAVEMENT													
 STUMP	 STUMP	STUMP	 SPP	 SPP		EXIST (or EX)	EXISTING													
 SWAMP	 SWAMP	SWAMP / MARSH	 SPP	 SPP		EXC	EXCAVATION													
 WG	 WG	WATER GATE	 SPP	 SPP		F&C	FRAME AND COVER													
 PM	 PM	PARKING METER																		

UPTON
ROUTE 140 (MILFORD STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	22
PROJECT FILE NO.		608456	

KEY PLAN & BORING LOCATION





GEOSCIENCES TESTING AND RESEARCH, INC.

55 Middlesex Street, Suite 225, North Chelmsford, MA.
Phone: (978) 251-9395 www.gtrinc.net

Boring No. BB-1
Page: 1 of 2
GTR Job #: 22.336
GTR Rep: C. Van Huyneghem
Reviewer: C. George

Project Name: Milford St Culvert Replacement
Location: Upton, MA

Drilling Co. Carr-Dee Corp.
Driller: Joe DeSimone
Start Date: 10/24/2023
Ground Surface Elev (ft): ~+306.5
Boring Location: N 2887345.2033, E 630082.9448
Note: Mobile B56 rig with autohammer

Equipment	Casing	Sampler	Core	Groundwater	Depth (ft)
Type	HW	SS	NX	Date	Time
Size I.D.	4.00"	1.375"	2.16"	10/25	9:30
Hammer Wt.	140 lb	140 lb	-		
Hammer Fall	30"	30"	-		

Depth	Casing BPF	Sample Data						Stratum	Additional Data	Notes	
		No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification				
0		S-1A	24/7	0 - 0.25	2 - 3		S-1A: TOPSOIL	TOPSOIL	3"	1	
		S-1B		0.25 - 2	4 - 4		S-1B: Brown f-c Sand, little Silt				
		S-2	24/3	2 - 4	4 - 3		Loose, brown, f-c SAND, some Gravel, trace Silt				
				4 - 2							
	5		S-3	24/7	4 - 6	2 - 2		Loose, brown, f-c SAND, little Organic/Inorganic Silt			GRANULAR FILL
					2 - 2						
			S-4	24/8	6 - 8	2 - 2		Loose, brown, f-c SAND, little Organic Silt			
					2 - 4						
	10				8 - 10	6 - 13		M. dense, brown, f-c SAND, little Organic Silt			10'
					13 - 13						
		S-6	24/9	10 - 12	12 - 12		M. Dense, gray, GRAVEL and f-c SAND, trace Silt				
				7 - 6							
15				12 - 14	8 - 7		M. Dense brown, GRAVEL and f-c SAND, trace Silt	SAND AND GRAVEL			
				6 - 6							
		S-8	24/10	14 - 16	4 - 4		M. Dense, brown, f-m SAND, trace Silt				
				5 - 7							
20											
		S-9	24/11	20 - 22	25 - 40		V. Dense, gray, f-c SAND and Gravel, trace Silt				
25				29 - 20				24'	2		
		C-1	60/32	24-25	7:00		C-1: Gray with pink/ dark gray, fine to medium grained, fresh, slightly to moderately fractured, very hard, GNEISS				
				25-26	4:00						
				26-27	2:00						
				27-28	4:00						
			28-29	2:00							
	C-2	60/40	29-30	5:00							

NOTES:


1. Topsoil consisted of loose, black fine SAND, little Organic Silt, trace Gravel
2. Rollerbit refusal at 24', broke splitspoon

Order of Sample Description (Modified Burmister)

1. Moisture Content: Dry, Moist, Wet
2. Soil Relative Density or Consistency
3. Color
4. Major Component: Should be capitalized
5. Minor Component: "and" - 35% to 50% minor grain size
"some" - 20% to 35% minor grain size
"little" - 10% to 20% minor grain size
"trace" - < 10% of minor grain size

PENETRATION RESISTANCE (N) GUIDE

Cohesionless Soils (Sands)	Cohesive Soils (Clays)
Relative Density / Blows per Foot	Consistency / Blows per Foot
Very Loose >> 0 - 4	Very Soft >> Below 2
Loose >> 4 - 10	Soft >> 2 - 4
Medium Dense >> 10 - 30	Medium Stiff >> 4 - 8
Dense >> 30 - 50	Stiff >> 8 - 15
Very Dense >> Over 50	Very Stiff >> 15 - 30
	Hard >> Over 30



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Boring No. BB-1
Page: 2 of 2
GTR Job #: 22.336
GTR Rep: C. Van Huyneghem
Reviewer: C. George

Project Name: Milford St Culvert Replacement
Location: Upton, MA

Drilling Co. Carr-Dee Corp.
Driller: Joe DeSimone
Start Date: 10/25/2023
Ground Surface Elev (ft): ~+306.5
Boring Location: N 2887345.2033, E 630082.9448
Note: Mobile B56 rig with autohammer

Equipment	Casing	Sampler	Core	Groundwater	Depth (ft)
Type	HW	SS	NX	Date	Time
Size I.D.	4.00"	1.375"	2.16"	10/25	9:30
Hammer Wt.	140 lb	140 lb	-		
Hammer Fall	30"	30"	-		

Depth	Casing BPF	Sample Data						Stratum	Additional Data	Notes
		No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification			
30				30-31	5:00		C-2: Gray with pink/ dark gray, fine to medium grained, fresh, slightly to moderately fractured, very hard, GNEISS	BEDROCK		
			31-32	11:00						
			32-33	10:00						
			33-34	7:00						
35							Bottom of boring at 34 feet below ground surface with a 10 foot rock core	34'		
40										
45										
50										
55										

NOTES:

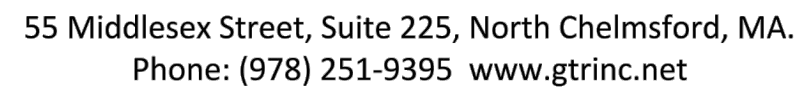
Order of Sample Description (Modified Burmister)

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Very Loose >> 0 - 4	Very Soft >> Below 2
Loose >> 4 - 10	Soft >> 2 - 4
Medium Dense >> 10 - 30	Medium Stiff >> 4 - 8
Dense >> 30 - 50	Stiff >> 8 - 15
Very Dense >> Over 50	Very Stiff >> 15 - 30
	Hard >> Over 30

608456_HD(BORINGLOGS).DWG Plotted on 11-Dec-2023 10:59 AM



Boring No.	BB-2
Page:	1 of 1
GTR Job #:	22.336
GTR Rep:	C. Van Huyneghem
Reviewer:	C. George

Driller:	Joe DeSimone	Helper(s):	Jay Smith	Equipment	Casing	Sampler	CORE	Groundwater			Depth (ft)		
Start Date:	10/24/2023	End Date:	10/24/2023	Type	HW	SS	NX	Date	Time	Water	Casing	Hole	
Ground Surface Elev (ft):	~+307.6			Size I.D.	4.00"	1.375"	2.16"	10/24	2:15	8'	18'	21'	
Boring Location:	N 2887348.6550 E 630140.4202			Hammer Wt.	140 lb	140 lb	-						
Note:	Mobile B56 rig with autohammer			Hammer Fall	30"	30"	-						

NOTES:

1. Rollerbit drilled ahead to 18' before coring
2. Rock core run was terminated due to access of the road.

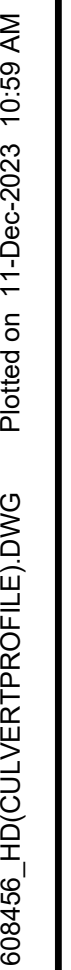
55 Middlesex Street, Suite 225, North Chelmsford, MA.
Phone: (978) 251-9395 www.gtrinc.net

Boring No. BB-3
Page: 1 of 1
GTR Job #: 22.336
GTR Rep: C. Van Huyneghem
Reviewer: C. George

Helper(s):	Jay Smith	Equipment	Casing	Sampler	Core	Groundwater		Depth (ft)		
End Date:	10/24/2023	Type	HW	SS	NX	Date	Time	Water	Casing	Hole
	**306.4	Size I.D.	4.00"	1.375"	2.16"	10/24	11:20	8'	30'	30'
3399.1110, E 630121.7777		Hammer Wt.	140 lb	140 lb	-					
B56 rig with autohammer		Hammer Fall	30"	30"	-					

NOTES:
1. Mudline 6' from grade
2. S-8: No recovery, Drillers readvanced 20-22

Order of Sample Description (Modified Burmister)	PENETRATION RESISTANCE (N) GUIDE	
	Cohesionless Soils (Sands)	Cohesive Soils (Clays)
1. Moisture Content: Dry, Moist, Wet	Relative Density / Blows per Foot	Consistency / Blows per Foot
2. Soil Relative Density or Consistency	Very Loose >> 0 - 4	Very Soft >> Below 2
3. Color	Loose >> 4 - 10	Soft >> 2 - 4
4. Major Component: Should be capitalized	Medium Dense >> 10 - 30	Medium Stiff >> 4 - 8
5. Minor Component: "and" - 35% to 50% minor grain size	Stiff >> 30 - 50	Stiff >> 8 - 15
"some" - 20% to 35% minor grain size	Very Dense >> Over 50	Very Stiff >> 15 - 30
"little" - 10% to 20% minor grain size		Hard >> Over 30
"trace" - < 10% of minor grain size		



HIGHWAY GUARD DETAILS

TL-3 (SINGLE FACE), STA 106+16.66 LT TO STA 106+61.15 LT
 TRANSITION TO BRIDGE RAIL, STA 106+61.15 LT TO STA 106+88.95 LT
 BRIDGE RAIL, STA 106+88.95 LT TO STA 107+01.08 LT
 TRANSITION TO BRIDGE RAIL, STA 107+01.08 TO STA 107+24.81
 TL-3 (SINGLE FACE), STA 107+24.81 LT TO 107+38.49 LT
 TANGENT END (TL-3), STA 107+38.49 LT TO STA 107+76.35
 TRAILING ANCHORAGE, STA 106+72.09 RT TO 106+81.61 RT
 TRANSITION TO BRIDGE RAIL, STA 106+8.61 RT TO STA 107+08.90 RT
 BRIDGE RAIL, STA 107+08.90 RT TO STA 107+19.59 RT
 TRANSITION TO BRIDGE RAIL, STA 107+19.59 RT TO STA 107+45.50 RT
 TRAILING ANCHORAGE, STA 107+45.50 RT TO STA 107+56.47 RT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 21

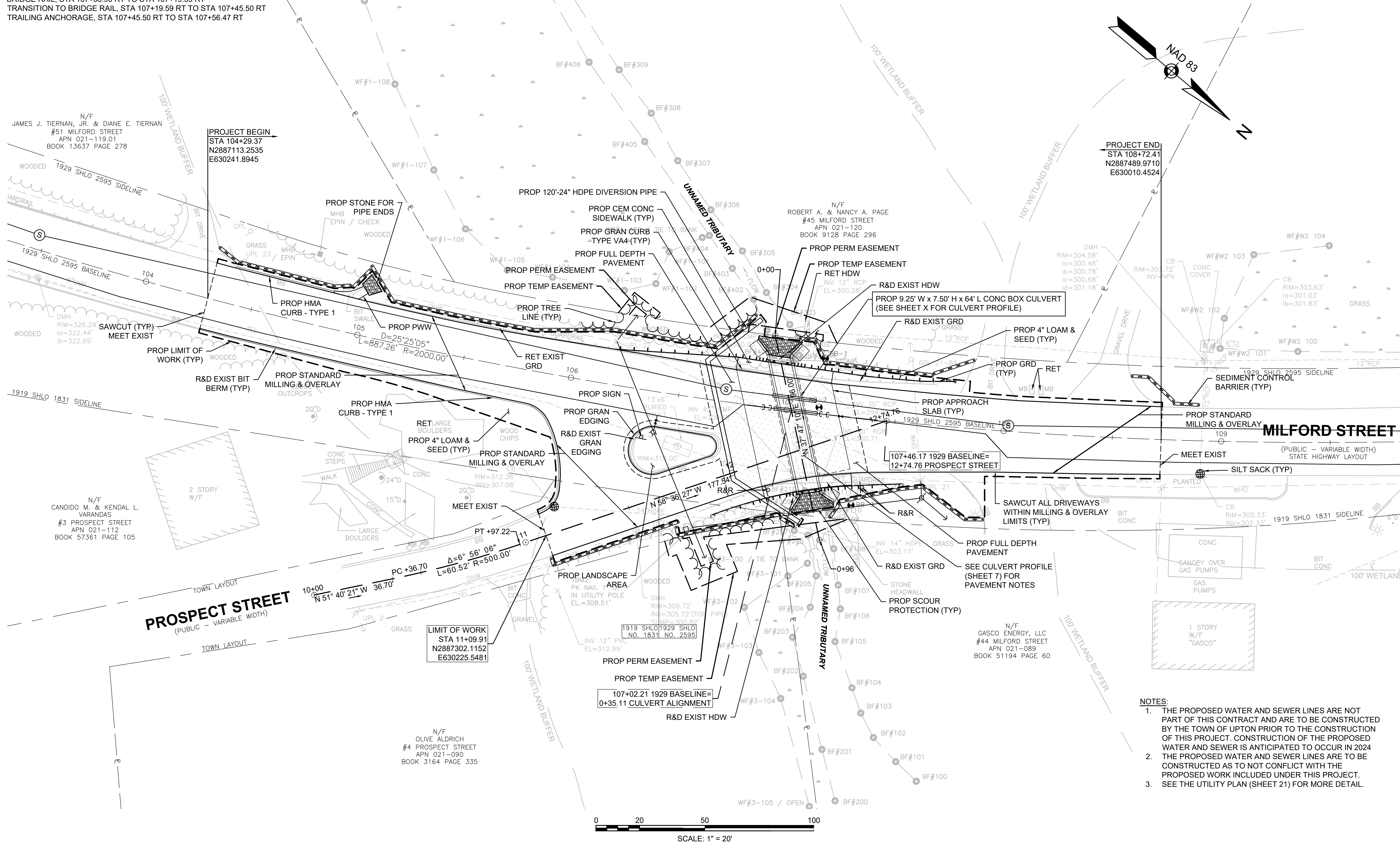
DRAINAGE DETAILS

SEE SHEET 21

UPTON ROUTE 140 (MILFORD STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	22
PROJECT FILE NO.		608456	

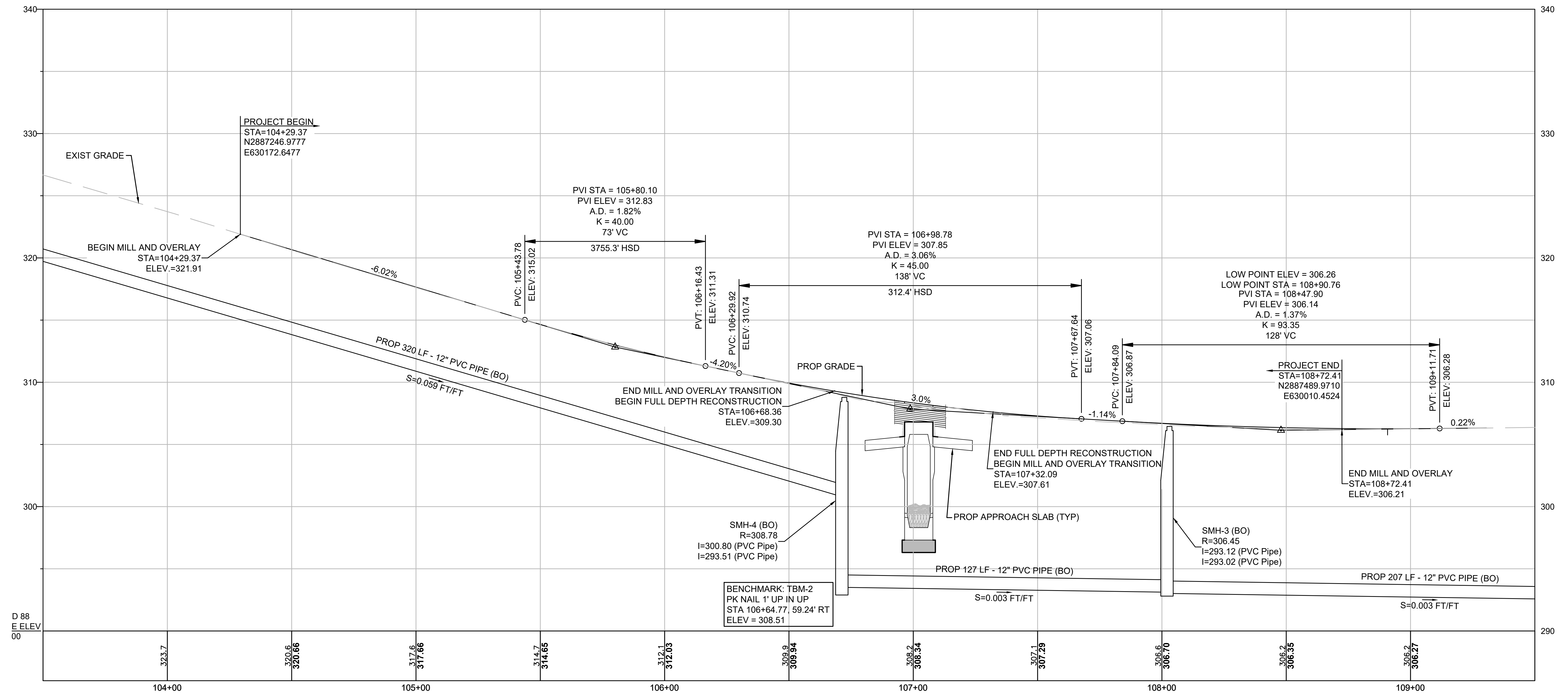
CONSTRUCTION PLAN



UPTON
ROUTE 140 (MILFORD STREET)

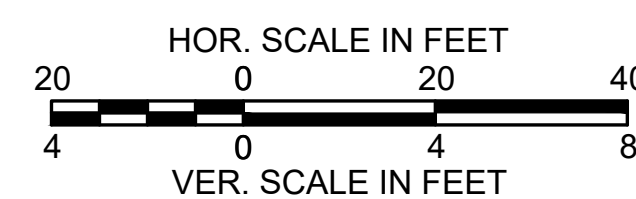
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MA	-	9	22
PROJECT FILE NO.		608456	

PROFILE
MILFORD STREET

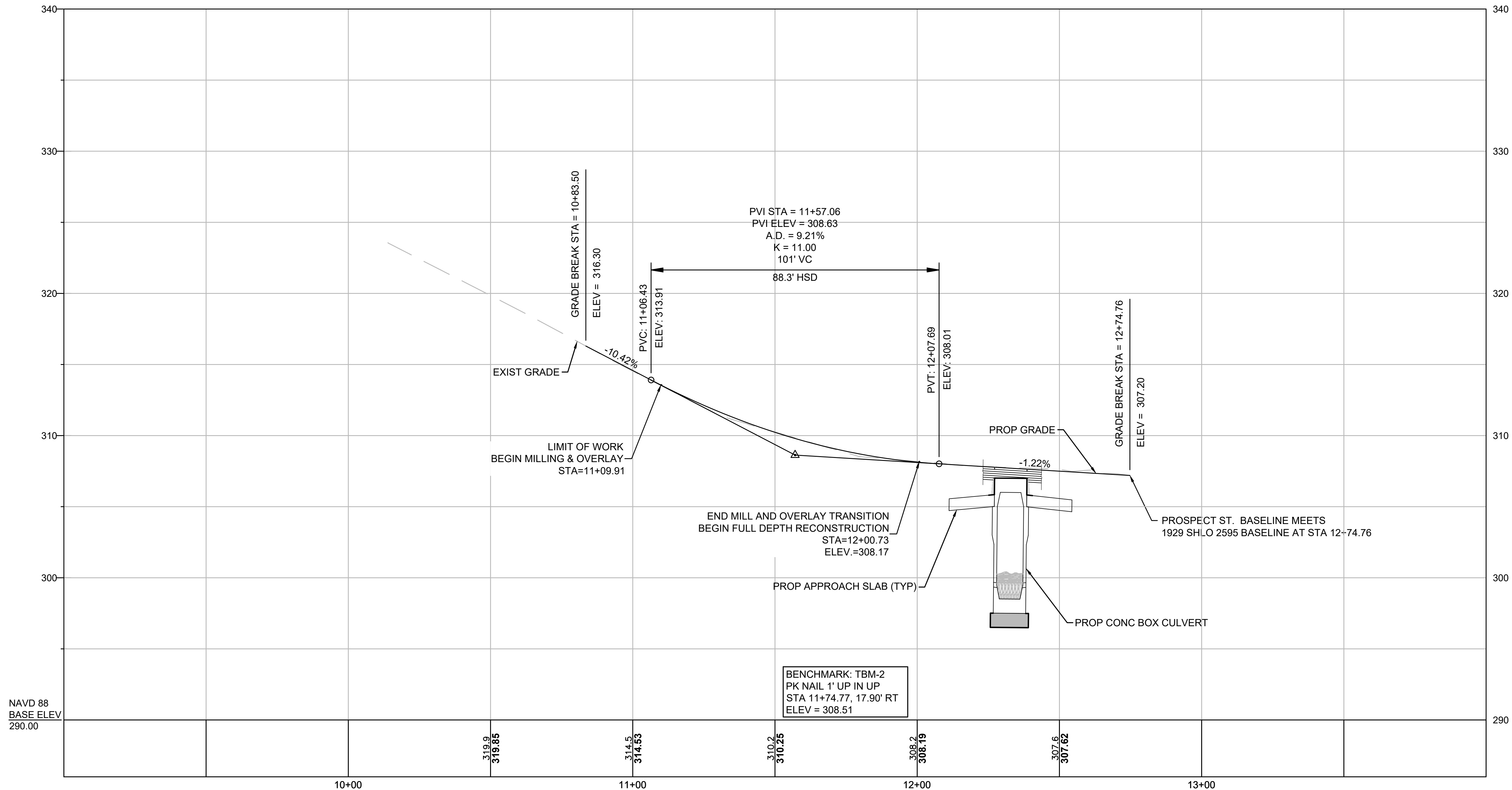


MILFORD STREET PROFILE

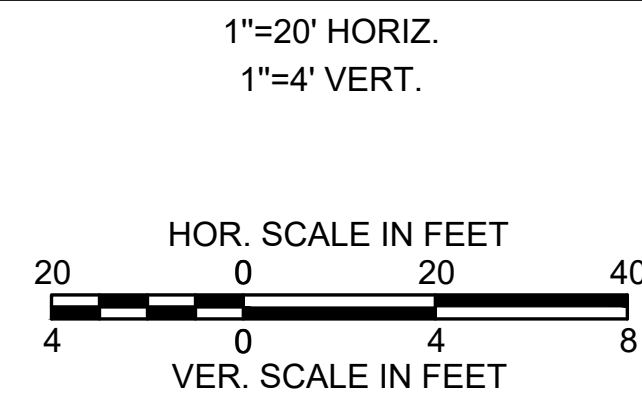
1"=20' HORIZ.
1"=4' VERT.



BENCHMARK: TBM-1
X CUT ON BOLT
STA 110+53.37, 24.12' RT
ELEV = 308.87



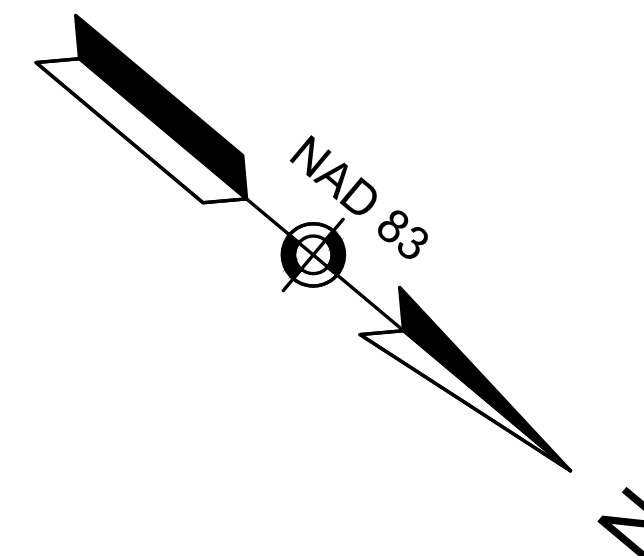
PROSPECT STREET PROFILE



UPTON
ROUTE 140 (MILFORD STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	22
PROJECT FILE NO.		608456	

TRAFFIC SIGN AND
PAVEMENT MARKING PLAN



N/F
JAMES J. TIERNAN, JR. & DIANE E. TIERNAN
#51 MILFORD STREET
APN 021-119.01
BOOK 13637 PAGE 278

PROJECT BEGIN
STA 104+29.37
N2887113.2535
E630241.8945

N/F
ROBERT A. & NANCY A. PAGE
#45 MILFORD STREET
APN 021-120
BOOK 9128 PAGE 296

PROJECT END
STA 108+72.41
N2887489.9710
E630010.4524

LIMIT OF WORK
STA 11+09.91
N2887302.1152
E630225.5481

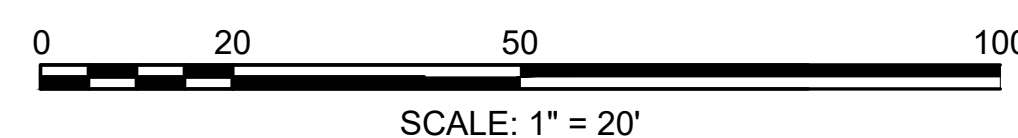
N/F
CANDIDO M. & KENDAL L. VARANDAS
#3 PROSPECT STREET
APN 021-112
BOOK 57361 PAGE 105


N/F
GASCO ENERGY, LLC
#44 MILFORD STREET
APN 021-089
BOOK 51194 PAGE 60

N/F
OLIVE ALDRICH
#4 PROSPECT STREET
APN 021-090
BOOK 3164 PAGE 335

NOTES:

1. PROPOSED PAVEMENT MARKING TO MATCH UP WITH PROPOSED MARKINGS FOR MASSDOT PROJECT NO. 612098, TO BE COMPLETED PRIOR TO CONSTRUCTION OF THIS PROJECT.
2. STOP LINES TO BE 5-FT FROM THE NEAREST EDGE OF THE INTERSECTING TRAVELED WAY.
3. PAVEMENT MARKING SHALL BE THERMOPLASTIC.

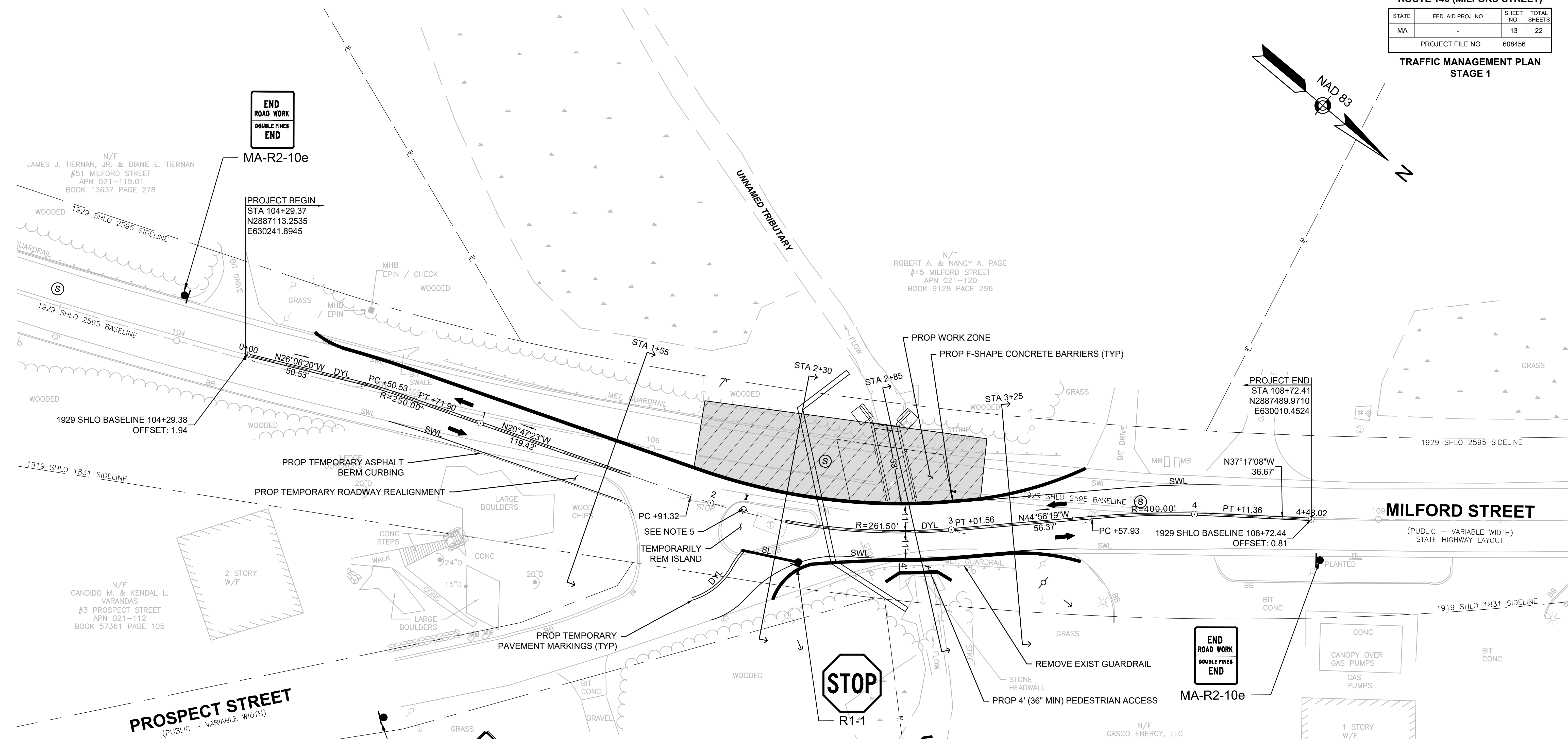


IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (in)	HEIGHT (in)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK- GROUND	LEGEND	BORDER			
R1-1	30	30		SEE 2003 M.U.T.C.D.			1	RED	WHITE	WHITE	P-5 (1)	6.25	6.25


**UPTON
ROUTE 140 (MILFORD STREET)**

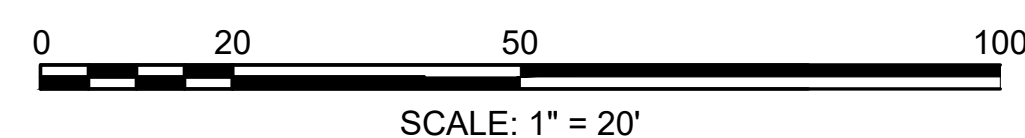
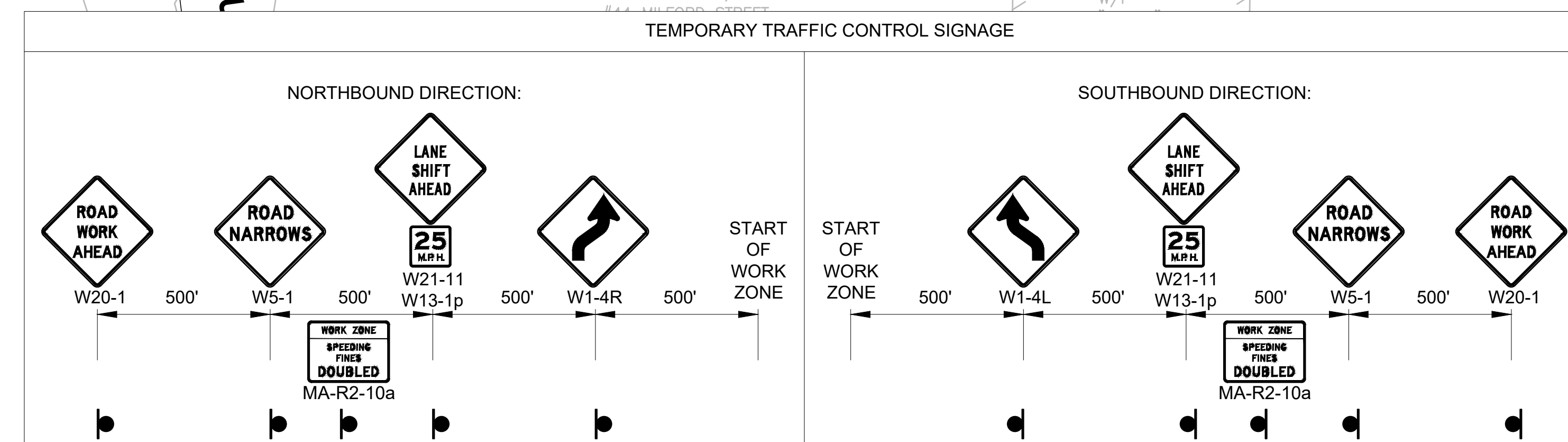
STATE	FED. AID PROJ. NO.	SHEET NO.	TOT. SHEETS
MA	-	13	22

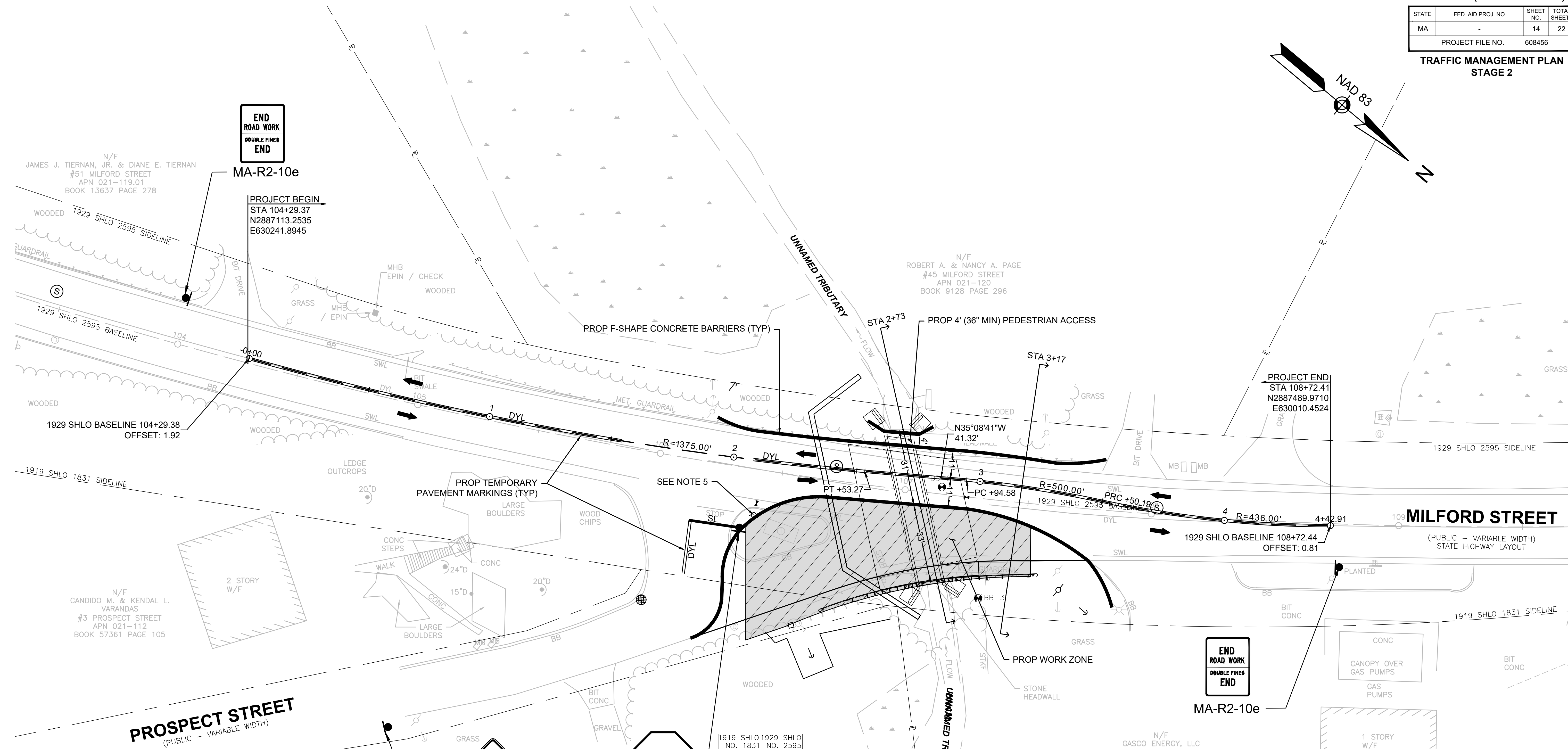
TRAFFIC MANAGEMENT PLAN STAGE 1



- NOTES:**
1. SEE SHEETS 15 - 16 FOR TTCP STAGE 1 TYPICAL SECTIONS.
 2. ACCESS TO RESIDENTIAL AND COMMERCIAL DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.
 3. CONFLICTING SIGNS SHALL BE COVERED OR REMOVED DURING CONSTRUCTION.
 4. PROPOSED WATER AND SEWER LINES TO BE INSTALLED BY THE TOWN OF UPTON PRIOR TO CONSTRUCTION.
 5. TEMPORARY RELOCATION OF THE PROPOSED HYDRANT MAY BE REQUIRED, PENDING FINAL LOCATION OF THE INSTALLED HYDRANT BY THE TOWN OF UPTON.

 - W20-1 PLACED 350
FROM STOP LINE
N/F
OLIVE ALDRICH
#4 PROSPECT STREET
APN 021-090
BOOK 3164 PAGE 335

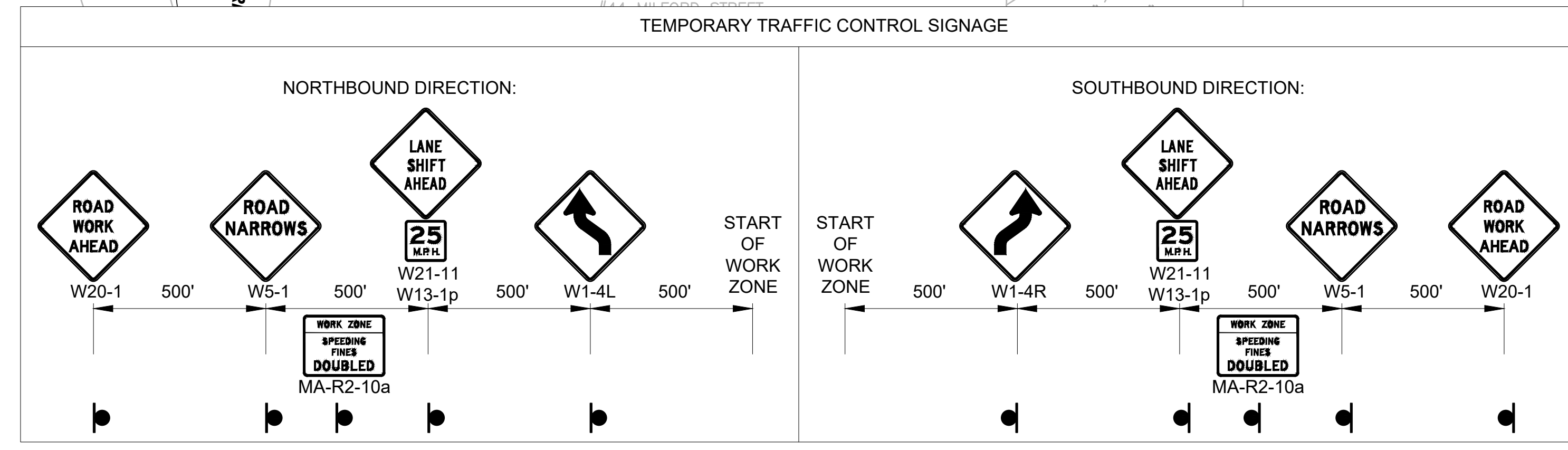
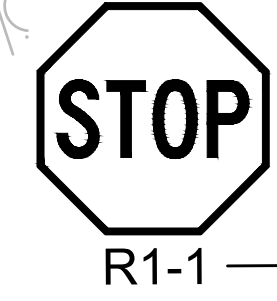




- NOTES:
1. SEE SHEET 17 FOR TTCP STAGE 2 TYPICAL SECTIONS.
 2. ACCESS TO RESIDENTIAL AND COMMERCIAL DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.
 3. CONFLICTING SIGNS SHALL BE COVERED OR REMOVED DURING CONSTRUCTION.
 4. PROPOSED WATER AND SEWER LINES TO BE INSTALLED BY THE TOWN OF UPTON PRIOR TO CONSTRUCTION.
 5. TEMPORARY RELOCATION OF THE PROPOSED HYDRANT MAY BE REQUIRED, PENDING FINAL LOCATION OF THE INSTALLED HYDRANT BY THE TOWN OF UPTON.

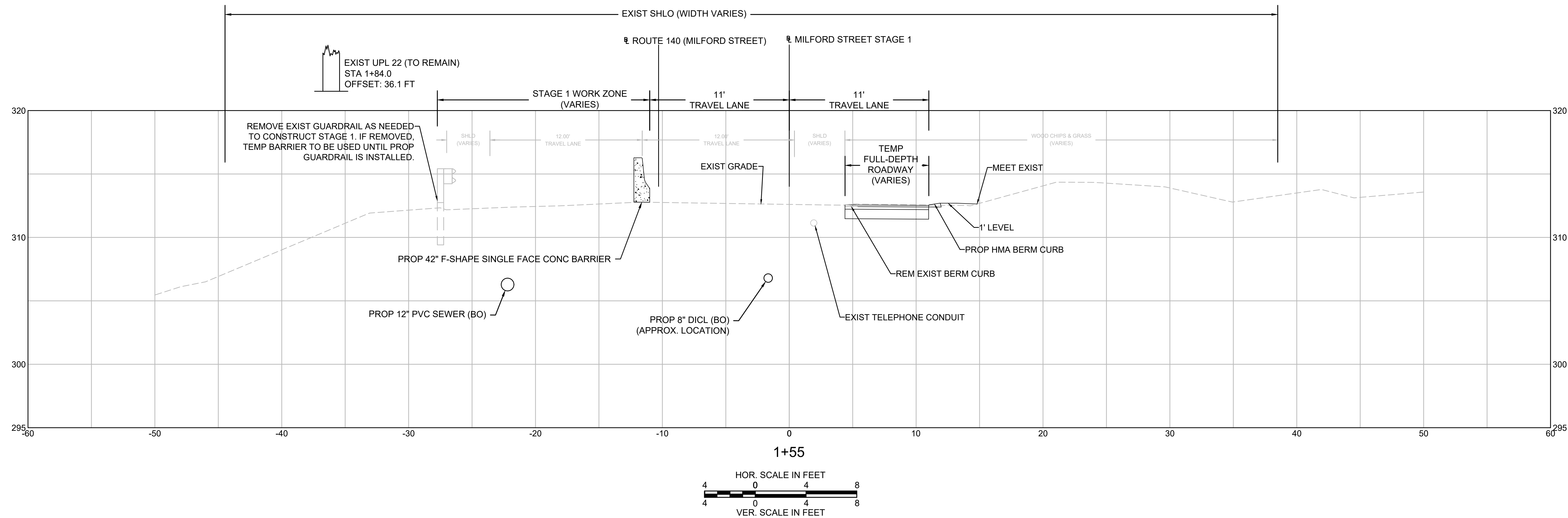
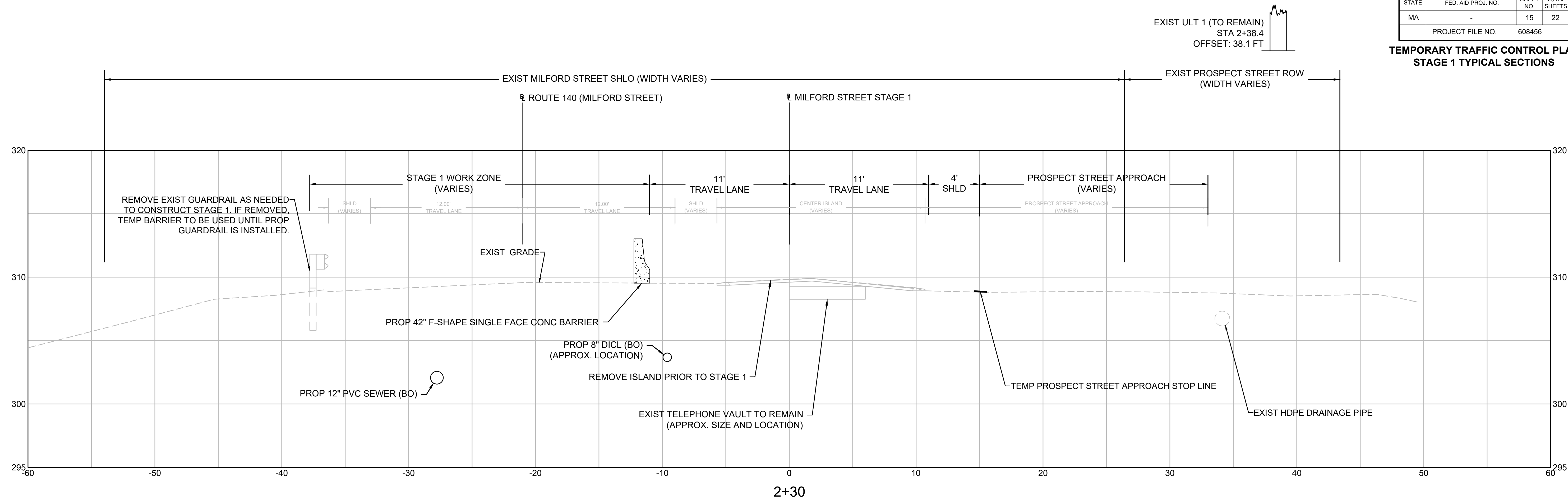
W20-1 PLACED 350'
FROM STOP LINE

N/F
OLIVE ALDRICH
#4 PROSPECT STREET
APN 021-090
BOOK 3164 PAGE 335



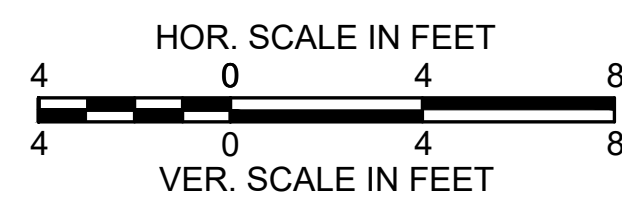
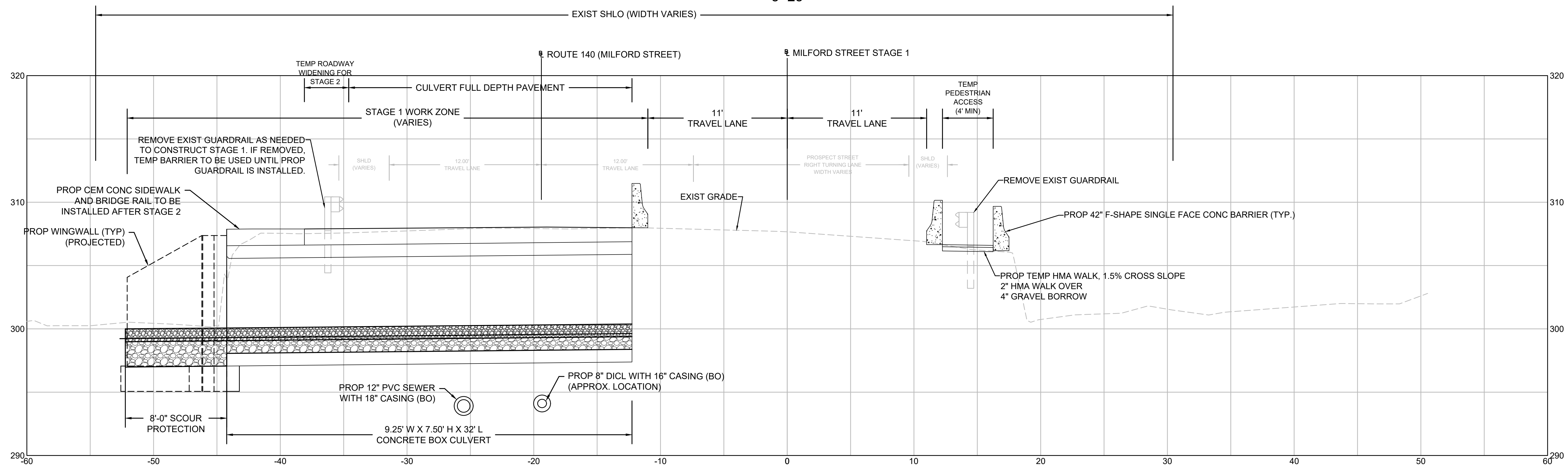
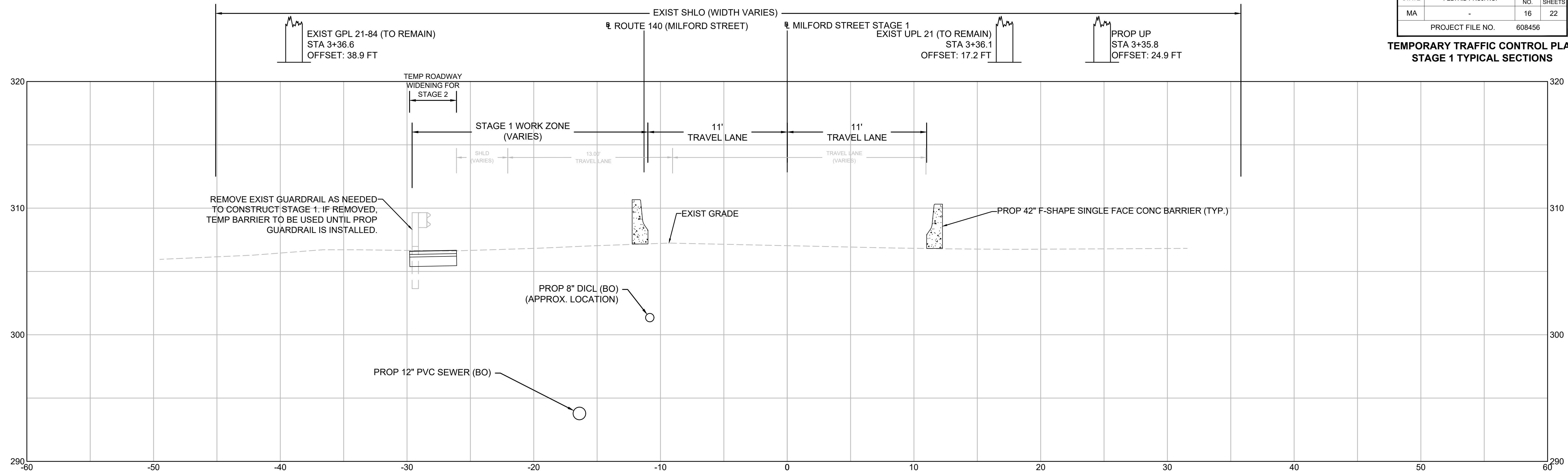
UPTON ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLAN
STAGE 1 TYPICAL SECTIONS



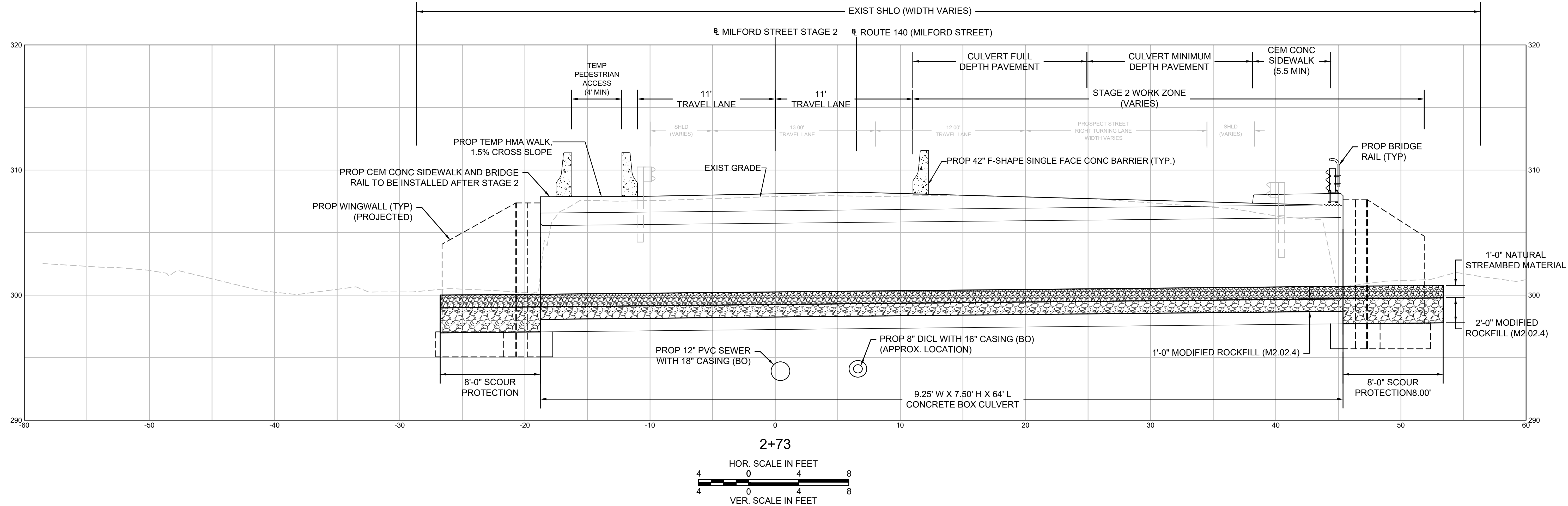
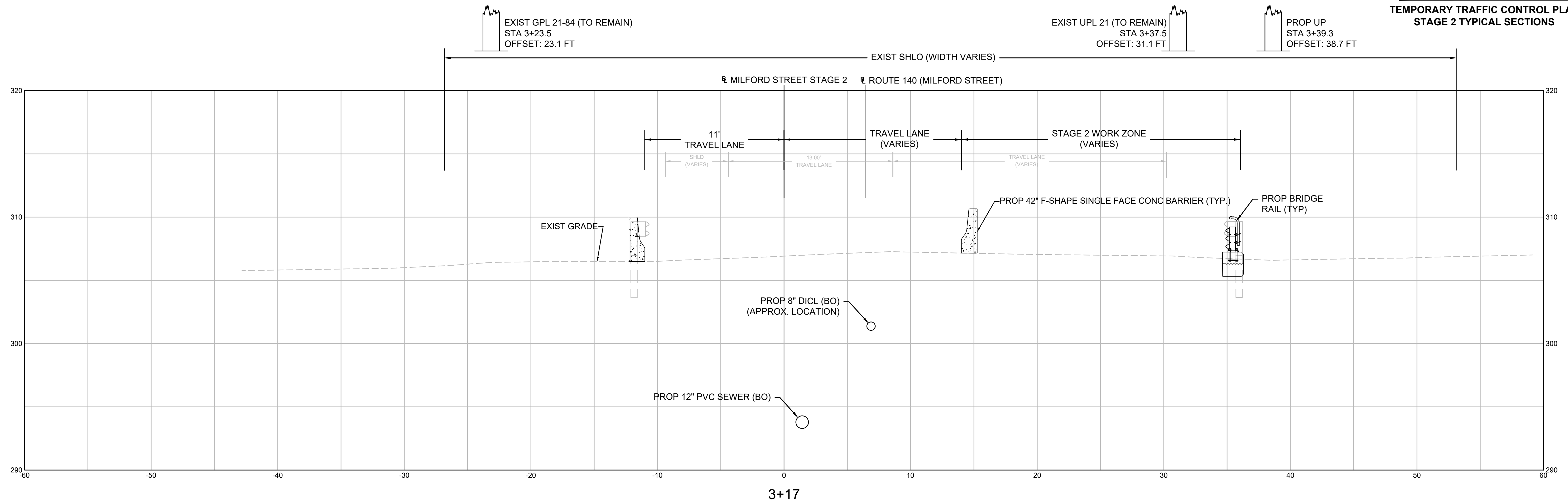
UPTON			
ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLAN
STAGE 1 TYPICAL SECTIONS



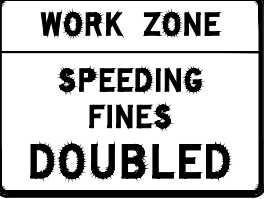

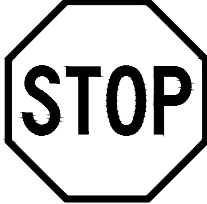
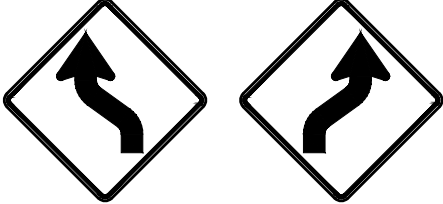




UPTON ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLAN
STAGE 2 TYPICAL SECTIONS



UPTON ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLANS
NOTES & SIGN SUMMARY

IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (IN.)			NUMBER OF SIGNS REQ.	COLOR			UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (IN.)	HEIGHT (IN.)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK- GROUND	LEGEND	BORDER		
MA-R2-10a	48	36		SEE MASSDOT STANDARDS			2	FLUORE- SCENT ORANGE	BLACK	BLACK	12.00	24.00
MA-R2-10e	36	48		SEE MASSDOT STANDARDS			2	FLUORE- SCENT ORANGE	BLACK	BLACK	12.00	24.00
R1-1	30	30		SEE 2009 M.U.T.C.D.			1	RED	WHITE	WHITE	6.25	6.25
W1-4L/R	36	36		SEE 2009 M.U.T.C.D.			2	FLUORE- SCENT ORANGE	BLACK	BLACK	9.00	18.00
W5-1	36	36		SEE 2009 M.U.T.C.D.			2	FLUORE- SCENT ORANGE	BLACK	BLACK	9.00	18.00
W13-1p	18	18		SEE 2009 M.U.T.C.D.			2	FLUORE- SCENT ORANGE	BLACK	BLACK	2.25	4.50
W20-1	36	36		SEE 2009 M.U.T.C.D.			3	FLUORE- SCENT ORANGE	BLACK	BLACK	9.00	27.00
W21-11	36	36		SEE 2009 M.U.T.C.D.			2	FLUORE- SCENT ORANGE	BLACK	BLACK	9.00	18.00

TRAFFIC MANAGEMENT NOTES

GENERAL:

- ALL CONSTRUCTION SIGNING, DRUMS, BARRICADES AND OTHER DEVICES SHALL BE FURNISHED AND INSTALLED IN CONFORMANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES - 2009 EDITION (M.U.T.C.D.); MASSDOT'S STANDARD SPECIFICATIONS; NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP #350); THE FHWA MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) 2009 EDITION; MASSDOT'S STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS, THE LATEST EDITION; THEIR LATEST REVISIONS; AND THE FOLLOWING:
- UNLESS WRITTEN PERMISSION FROM MASSDOT IS OBTAINED, ALL TRAVEL WAYS WITHIN MASSDOT'S RIGHT OF WAY CAN ONLY BE OCCUPIED BETWEEN THE HOURS OF 09:00 AM AND 03:00 PM, MONDAY THROUGH FRIDAY.
- WARNING SIGNS SHALL HAVE AN ORANGE BACKGROUND, AND REGULATORY SIGNS SHALL BE BLACK TEXT ON A WHITE BACKGROUND.

CONSTRUCTION SIGNING:

- FINAL LOCATION OF SIGNS, DRUMS, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE DETERMINED IN THE FIELD BY MASSDOT'S REPRESENTATIVE.
- SEVEN DAYS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION , THE CONTRACTOR SHALL PROVIDE ONE PCMS AT DESIGNATED LOCATIONS, WITH THE FOLLOWING MESSAGE: "ROADWAY / WORK / _ _ _ _ _" AND "CONST / BEGINS / MONTH DAY".
- ADVISORY SPEED PLATES (W13-1(XX)) SHALL BE USED IF APPROPRIATE AND AS REQUIRED BY MASSDOT. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE MASSDOT REPRESENTATIVE.
- AT THE END OF EACH WORKDAY/SHIFT, THE CONTRACTOR SHALL COVER TEMPORARY TRENCHES WITH STEEL PLATES. TEMPORARY TRAFFIC CONTROL DEVICES, I.E., DRUMS AND CONSTRUCTION FENCES, SHALL BE REMOVED FROM THE TRAVELWAY.
- NON-ESSENTIAL TEMPORARY CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED FROM THE HIGHWAY WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
- DISTANCES LISTED BETWEEN TRAFFIC DEVICES ARE PROVIDED AS A GUIDE, AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.

MISCELLANEOUS:

- THE WORKSITE SHALL BE ADEQUATELY PROTECTED (DURING BOTH WORKING AND NON-WORKING HOURS) TO ENSURE THE SAFETY OF VEHICULAR AND PEDESTRIAN TRAFFIC.
- AT ALL TIMES, MAINTAIN INGRESS AND EGRESS TO ALL STREETS AND DRIVES.
- UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL REMOVE THE TEMPORARY MARKINGS AND RESTORE THE PAVEMENT MARKINGS TO THEIR ORIGINAL LOCATION.

NOTES:

- 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.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- 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.
- 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).
- 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.
- THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- MINIMUM LANE WIDTH IS TO BE 11 FEET (3.3m) UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND:

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

THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

NUMBER OF LANES		NUMBER OF STUDIES	AVERAGE CAPACITY	
NORMAL (EXISTING)	OPEN (TO TRAFFIC)		VPH	VPHPL
3	1	7	1,170	1,170
2	1	8	1,340	1,340
5	2	8	2,740	1,370
4	2	4	2,960	1,480
3	2	9	2,980	1,490
4	3	4	4,560	1,520

Source: Dudek, C., Notes on Work Zone Capacity and Level of Service, Texas Transportation Institute, Texas A&M University, College Station, Texas (1994)

BY OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT), THIS WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.



Notes for Traffic Management

FIGURE Gen-1
GENERAL GUIDELINES

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350 (100)	350 (100)	350 (100)
MOST OTHER ROADWAYS*	500 (150)	500 (150)	500 (150)
FREEWAYS AND EXPRESSWAYS*	1,000 (300)	1,500 (450)	2,640 (800)

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

** DISTANCES ARE SHOWN IN FEET (METERS). 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 TTC SETUP. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK AHEAD) 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.

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

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

Based on: Table 6C-1 MUTCD LATEST EDITION

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

SPEED* (km/h)	DISTANCE (m)	SPEED* (mph)	DISTANCE (ft)
30	35	20	115
40	50	25	155
50	65	30	200
60	85	35	250
70	105	40	305
80	130	45	360
90	160	50	425
100	185	55	495
110	220	60	570
120	250	65	645
		70	730
		75	820

*POSTED SPEED, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 MUTCD LATEST EDITION



Notes for Traffic Management

FIGURE Gen-2
NOTES ON WORK ZONE DISTANCES

CONVENTIONAL ROADWAY- A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

EXPRESSWAY- A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

FREEWAY- A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

LOW-VOLUME ROAD- A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 AADT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: MUTCD LATEST EDITION

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.(15 m) 100 FT(30 m) MAX.
DOWNSTREAM TAPER	50 FT MIN.(15 m) 100 FT MAX.(30 m) PER LANE

Source: Table 6C-3 MUTCD LATEST EDITION

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET	SPEED LIMIT (S)	TAPER LENGTH (L) Meters
40 MPH OR LESS	$L = \frac{WS^2}{60}$	60 KMH OR LESS	$L = \frac{WS^2}{156}$
45 MPH OR MORE	$L = WS$	70 KMH OR MORE	$L = \frac{WS}{1.6}$

WHERE: L = TAPER LENGTH IN FEET (METERS)

W = WIDTH OF OFFSET IN FEET (METERS)

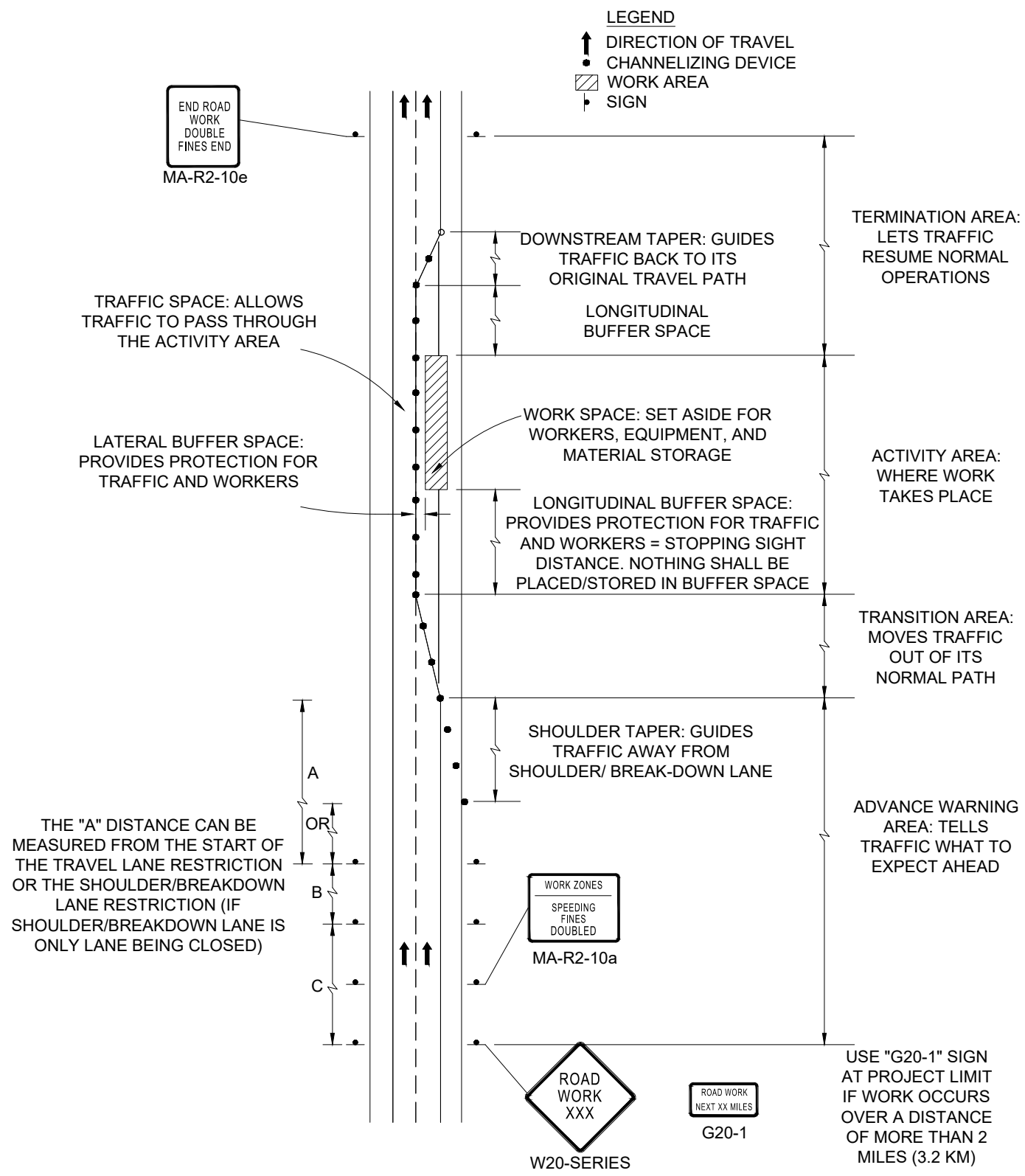
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH (KM/H)

Source: Table 6C-4 MUTCD LATEST EDITION



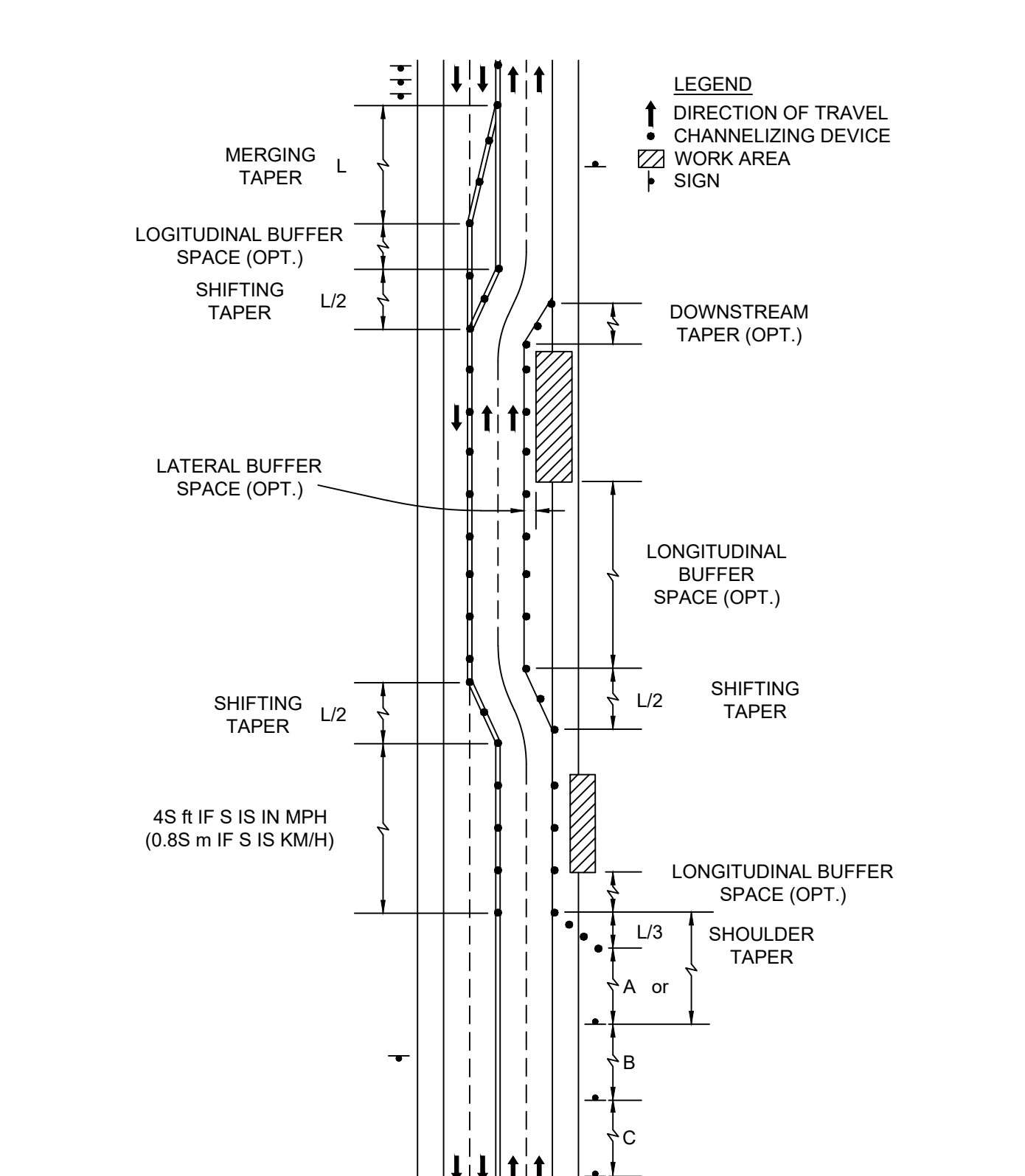
Notes for Traffic Management

FIGURE Gen-3
NOTES ON WORK ZONE DISTANCES



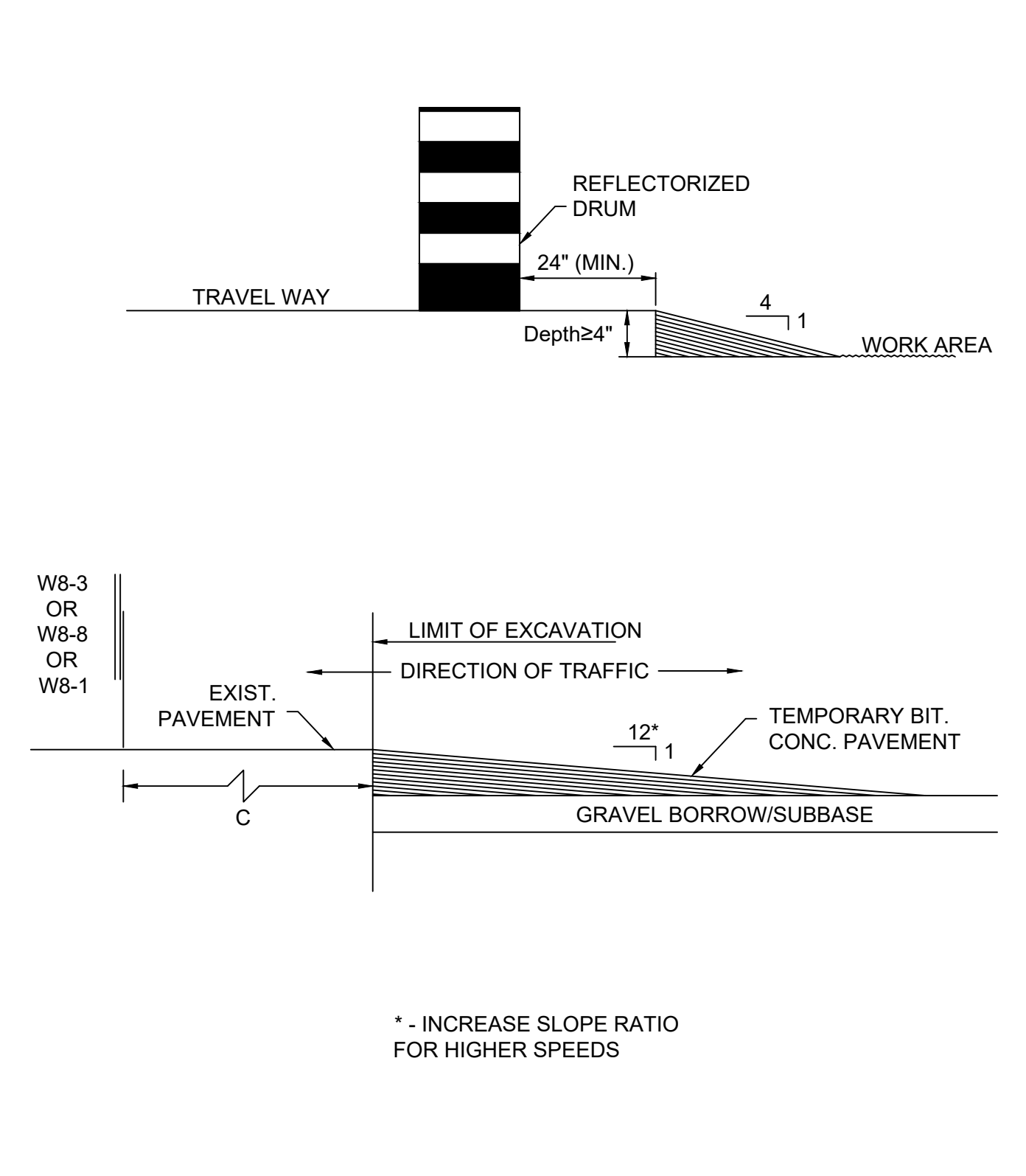
Standard Details and Drawings for the Development of Temporary Traffic Control Plans

FIGURE Gen-4
COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL (TTC) ZONE
NOT TO SCALE



Standard Details and Drawings for the Development of Temporary Traffic Control Plans

FIGURE Gen-5
TYPES OF TAPERS AND BUFFER SPACES
NOT TO SCALE



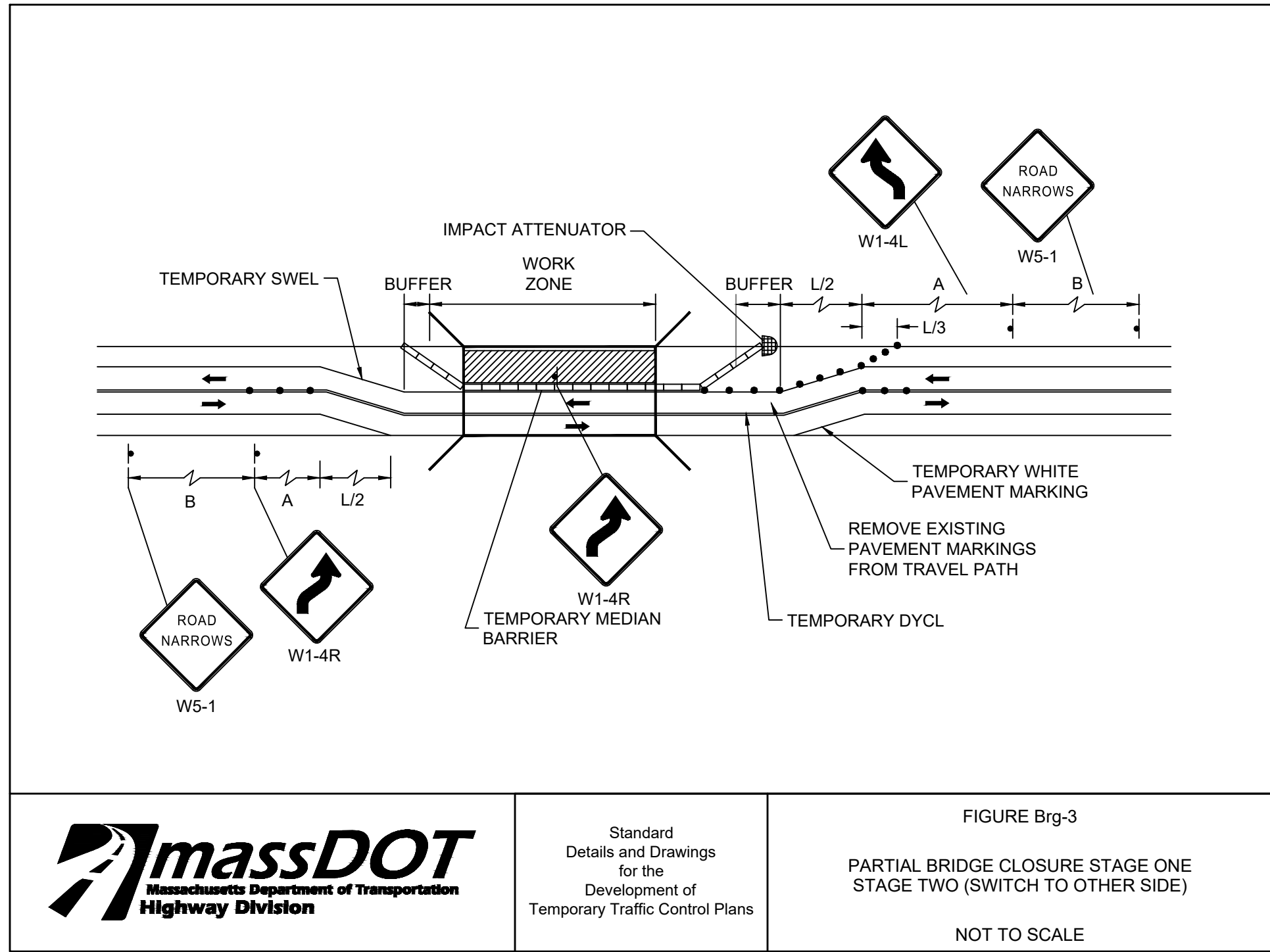
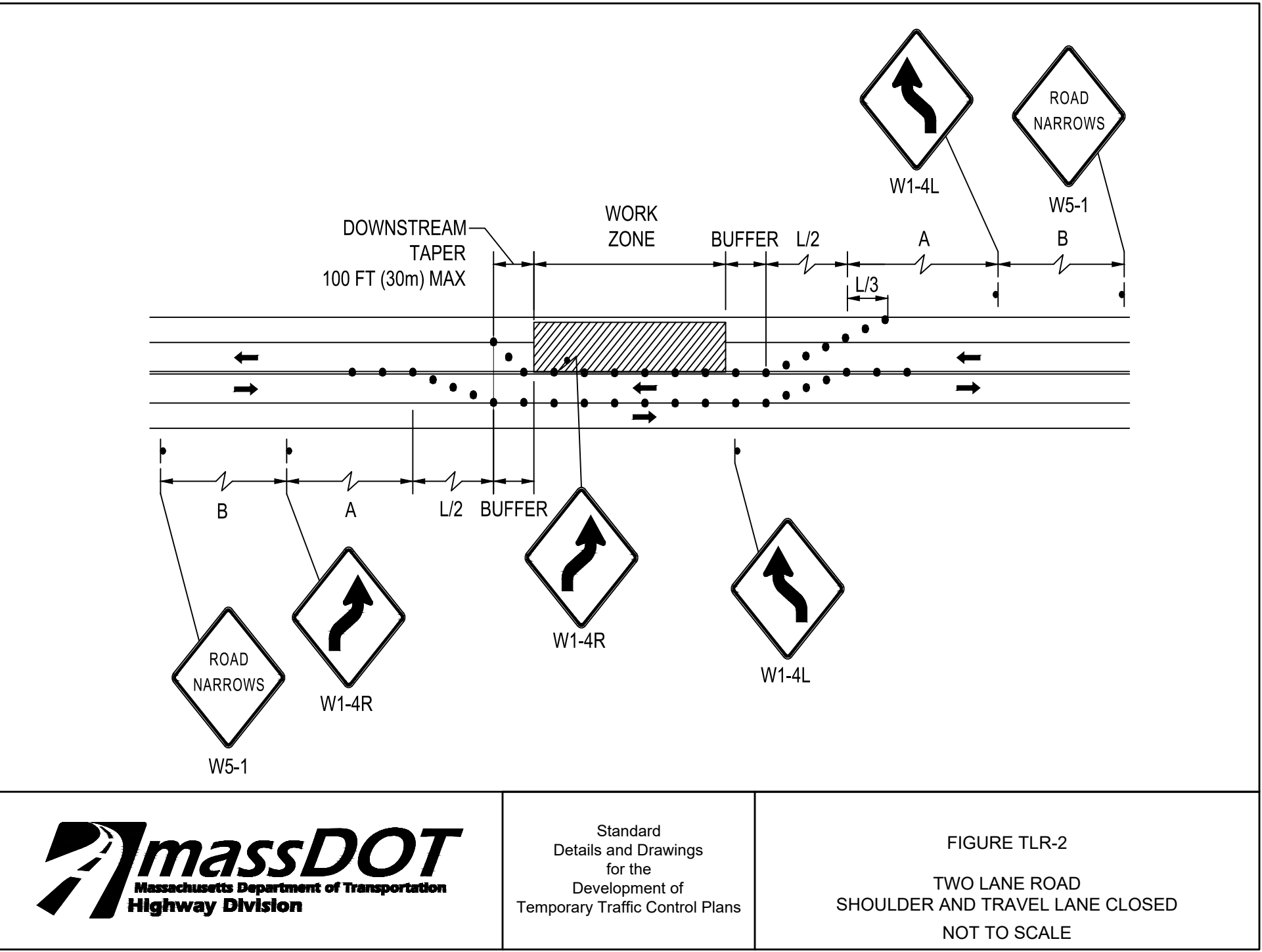
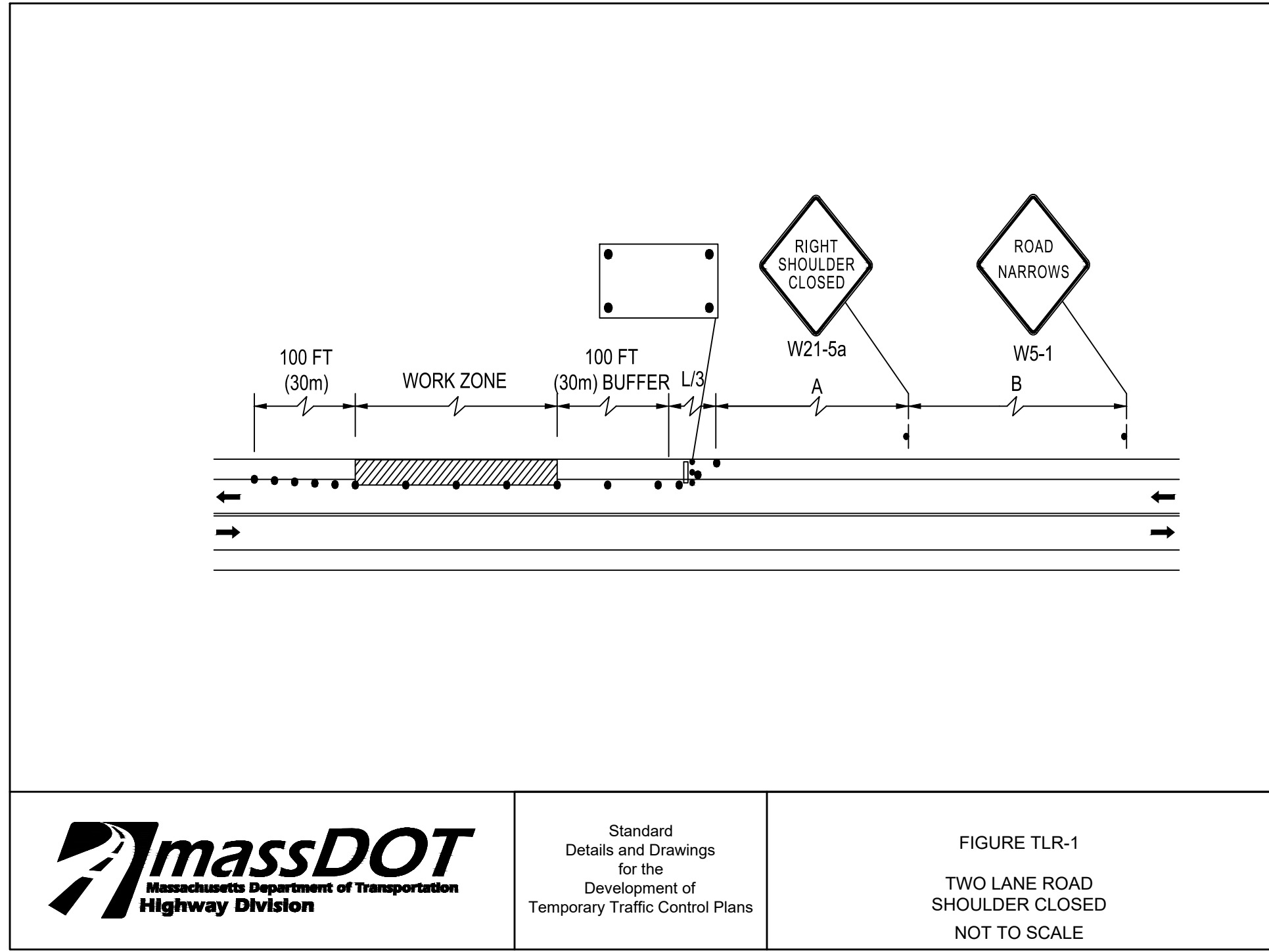
Standard Details and Drawings for the Development of Temporary Traffic Control Plans

FIGURE Gen-6
LATERAL AND LONGITUDINAL DROP-OFF DETAILS
NOT TO SCALE

UPTON
ROUTE 140 (MILFORD STREET)

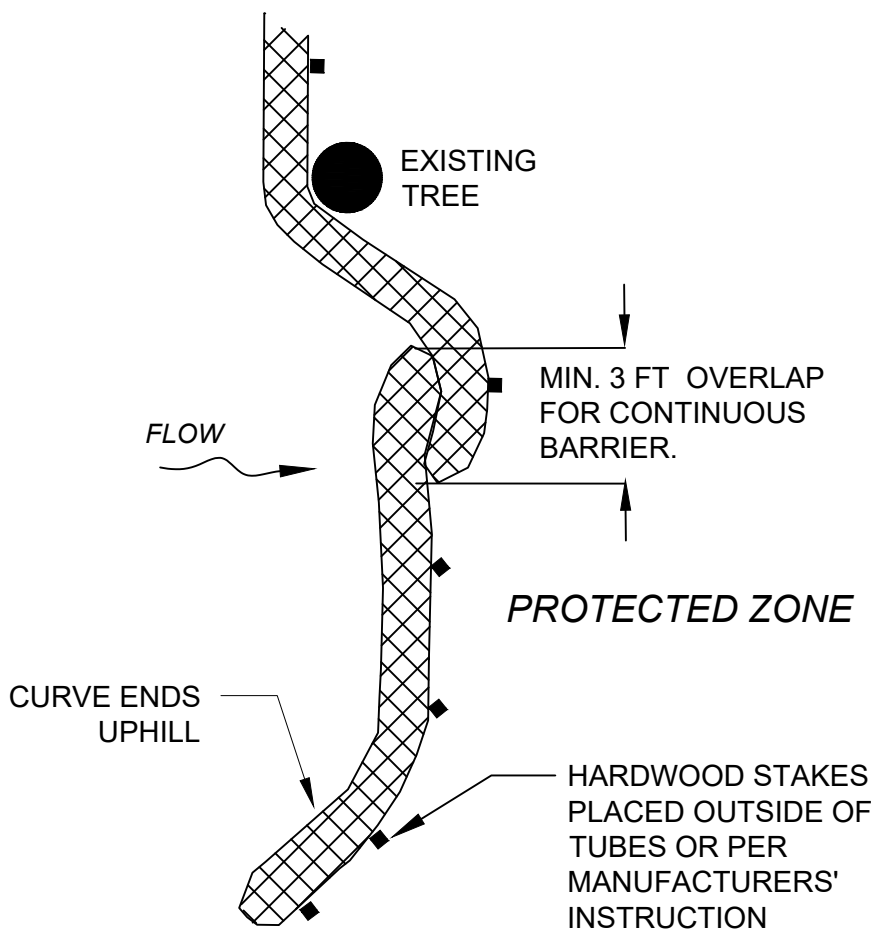
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLANS
DETAILS



UPTON			
ROUTE 140 (MILFORD STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	22
PROJECT FILE NO.		608456	

TEMPORARY TRAFFIC CONTROL PLANS
DETAILS



PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

PLACE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE

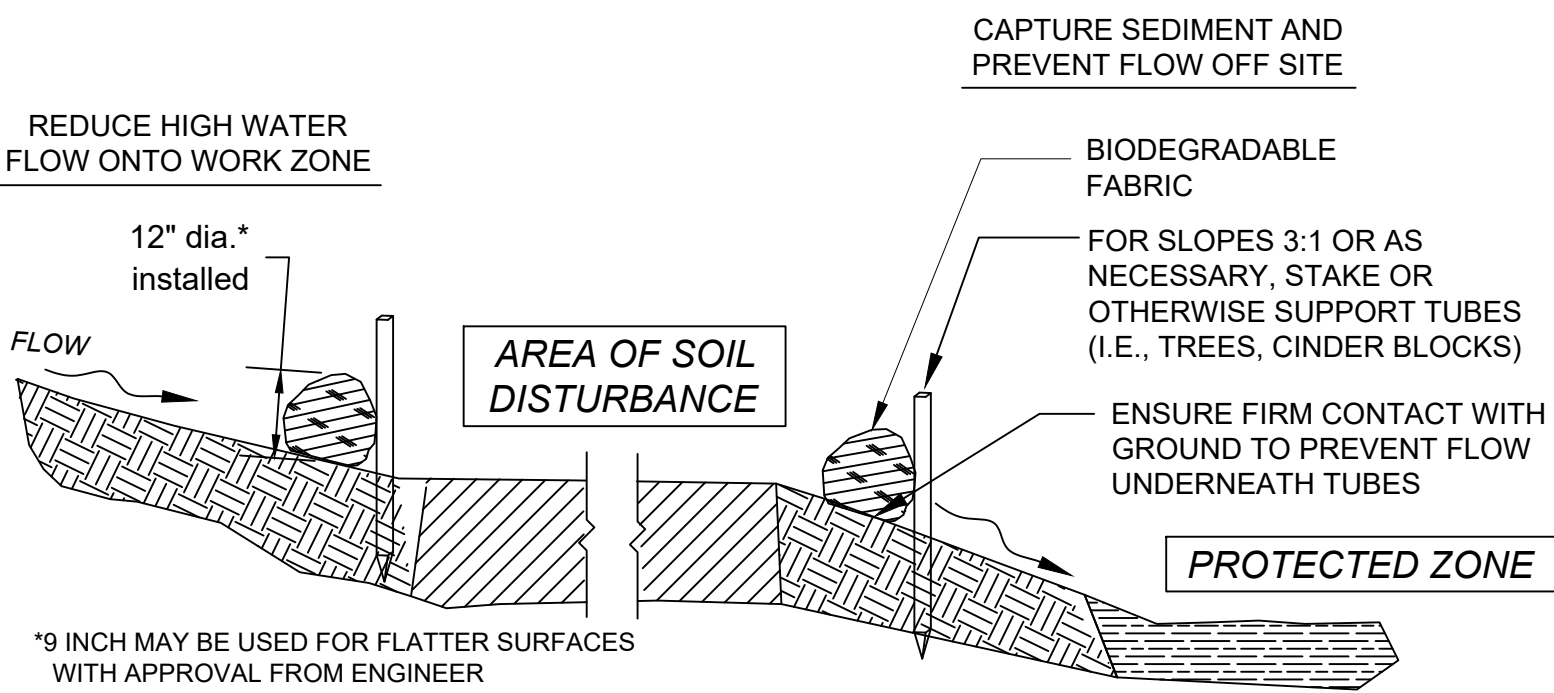
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

PLAN VIEW

COMPOST FILTER TUBE

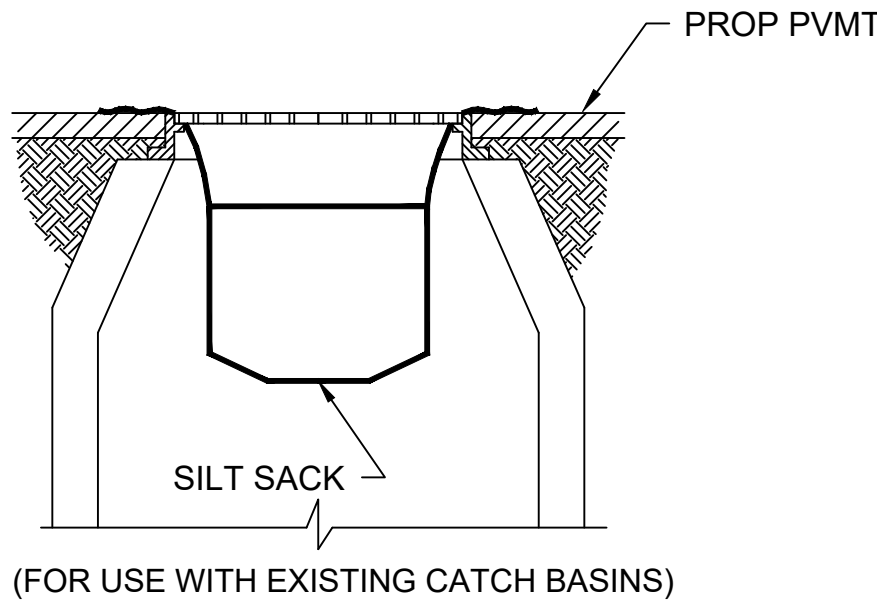
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SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE

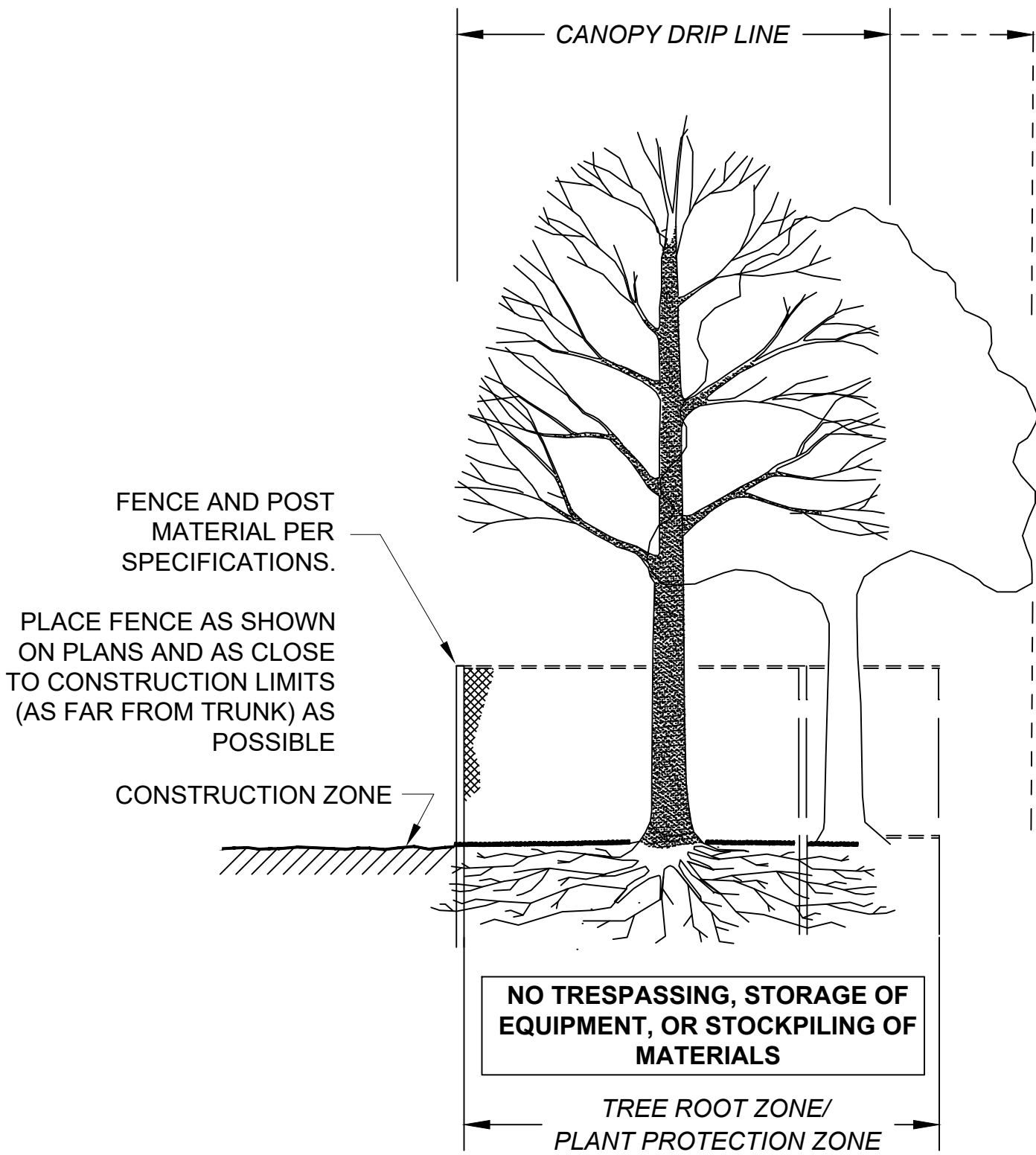


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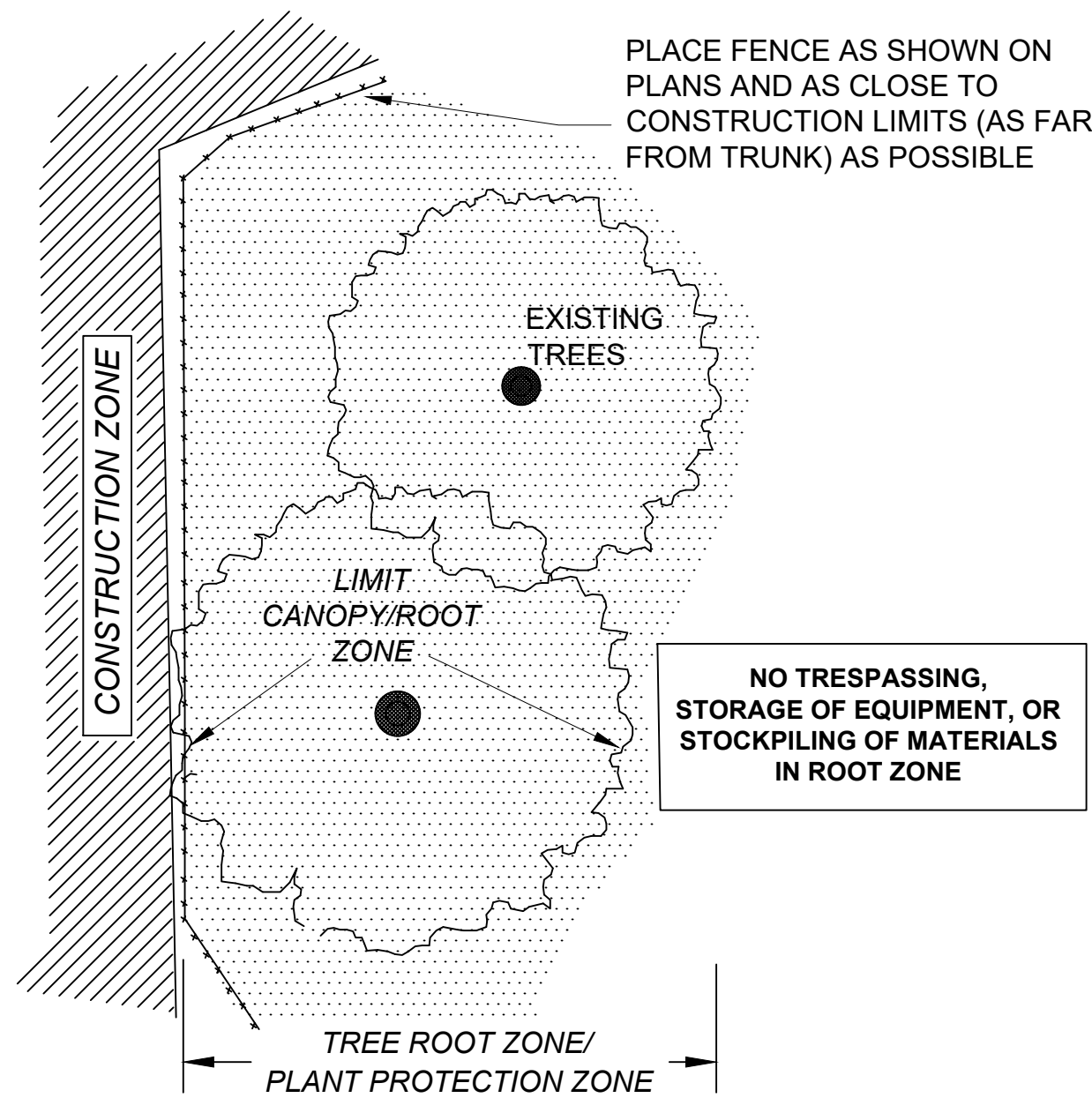
SILT SACKS SHALL BE PLACED IN ALL CATCH BASINS IN THE VICINITY OF NEW CONSTRUCTION. CATCH BASINS SHALL BE PROTECTED AS SHOWN, WITH MINIMUM WEEKLY MAINTENANCE, OR AS REQUIRED, AND REPLACED IF NECESSARY.

SILT SACK INLET PROTECTION

NOT TO SCALE



SECTION - FENCE PROTECTION OF ROOT ZONE



PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION - ROOT ZONE

NOT TO SCALE