TOWN OF ACTON
DEPARTMENT OF PUBLIC WORKS

PLAN AND PROFILE OF

ROUTE 27 (MAIN STREET)
ACTON TOWN CENTER

IN THE TOWN OF

ACTON

MIDDLESEX COUNTY

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	62
PROJECT FILE NO.	TOOLE-60143		

TITLE SHEET & INDEX

DRAFT PS&E SUBMITTAL

INDEX

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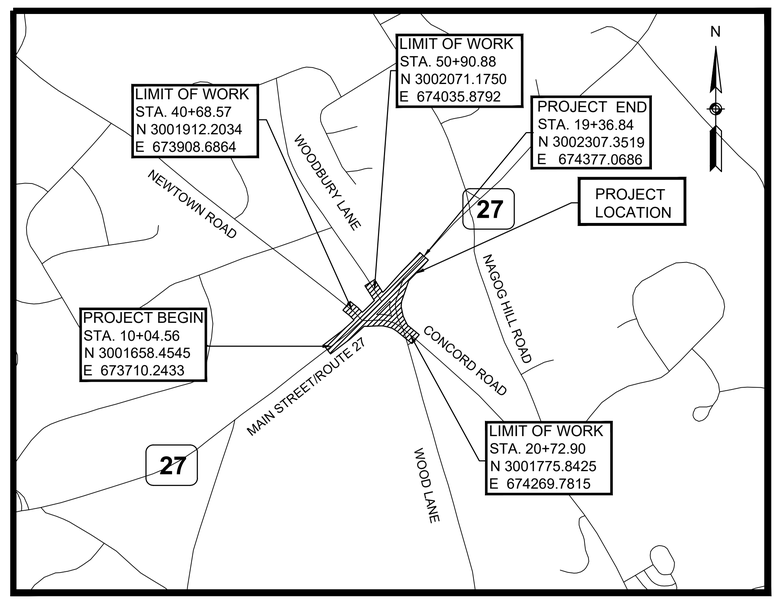

0 500 1000 1500 2000

SCALE: 1" = 500'

LENGTH OF PROJECT = 2014.00 FEET = 0.381 MILES

TOOLE DESIGN
2 OLIVER STREET, SUITE 305
BOSTON, MA 02109
PHONE: 617.619.9910
FAX: 301.927.2800
www.tooledesign.com

DATE	DESCRIPTION	REV #
XX/XX/2021	DRAFT PS&E SUBMISSION	0
9/18/2020	25% SUBMISSION	1
10/8/2019	25% SUBMISSION	0

60143_ROW\(TITLE_SHEET_INDEX).DWG Plotted on 18-Nov-2021 2:32 PM

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN 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
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		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
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		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
		SAWCUT LINE
		LIMIT OF GRADING
		EDGE OF PAVEMENT
		LIMIT 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
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		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
	SL	STOP LINE
	CW	CROSSWALK
	SWL	6" SOLID WHITE LINE
	SYL	6" SOLID YELLOW LINE
	BWL	6" BROKEN WHITE LINE (10' LINE/20' GAP)
	BYL	6" BROKEN YELLOW LINE (10' LINE/20' GAP)
	DWL	6" DOTTED WHITE LINE (2' LINE/4' GAP)
	DYL	6" DOTTED YELLOW LINE (2' LINE/4' GAP)
	DWLEx	6" DOTTED WHITE LINE EXTENSION (2' LINE/6' GAP)
	DYLEx	6" DOTTED YELLOW LINE EXTENSION (2' LINE/6' GAP)
	DBWL	6" DOUBLE WHITE LINE
	DBYL	6" DOUBLE YELLOW LINE
	SYCHL	8" SOLID YELLOW CHANNELIZATION 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
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
DWY	DRIVEWAY
EG	EXISTING GRADE
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
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
LB	LEACH BASIN
LP	LIGHT POLE
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
PED	PEDESTRIAN
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
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY

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MA	-	2	62
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LEGEND AND ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

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
SGC	SLOPED GRANITE CURB
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
SWCB	STRAIGHT-WALLED CATCH BASIN
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
VGC	VERTICAL GRANITE CURB
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

60143_HD2(LEGEND).DWG Plotted on 18-Nov-2021 2:33 PM

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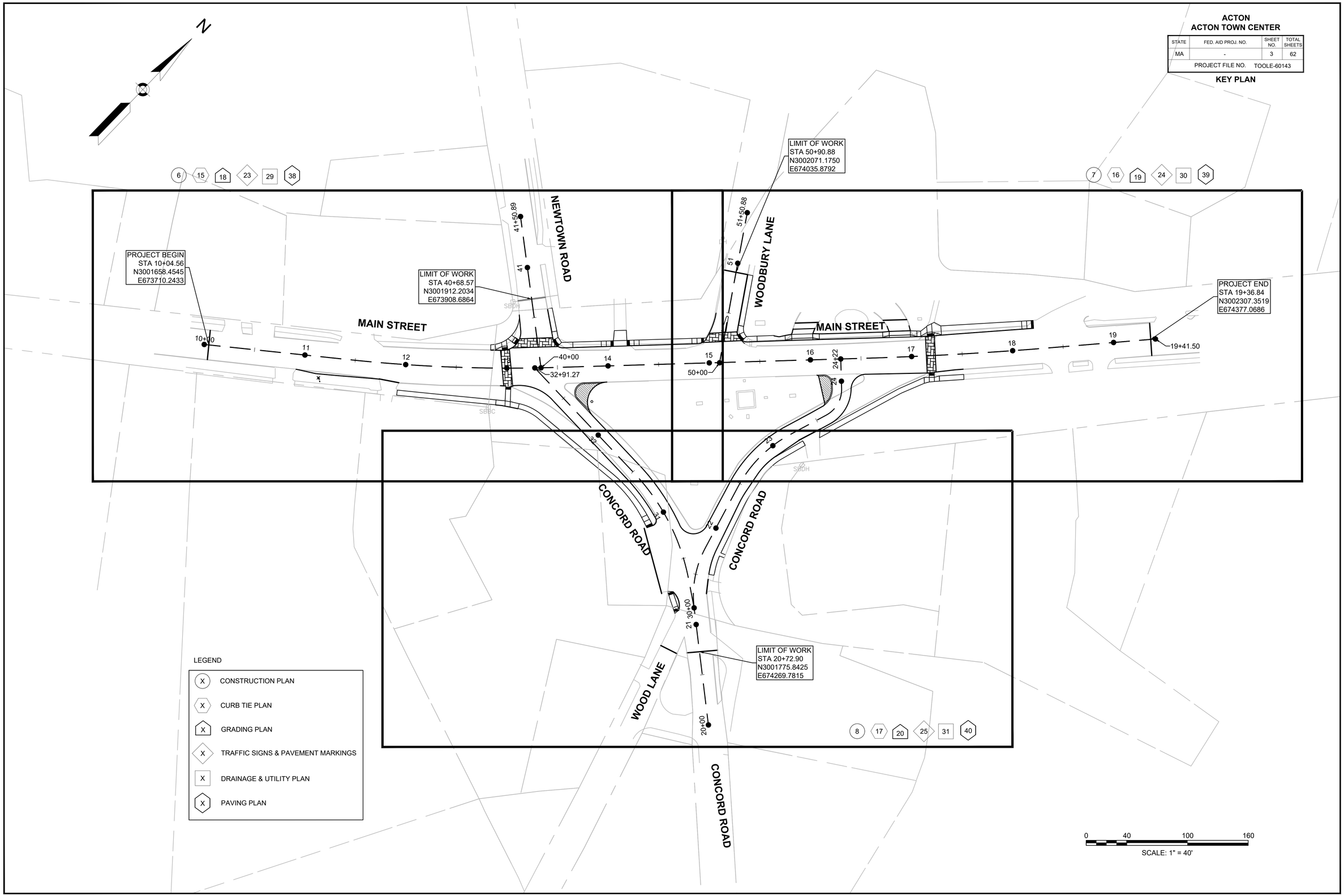
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	62
PROJECT FILE NO.	TOOLE-60143		

KEY PLAN



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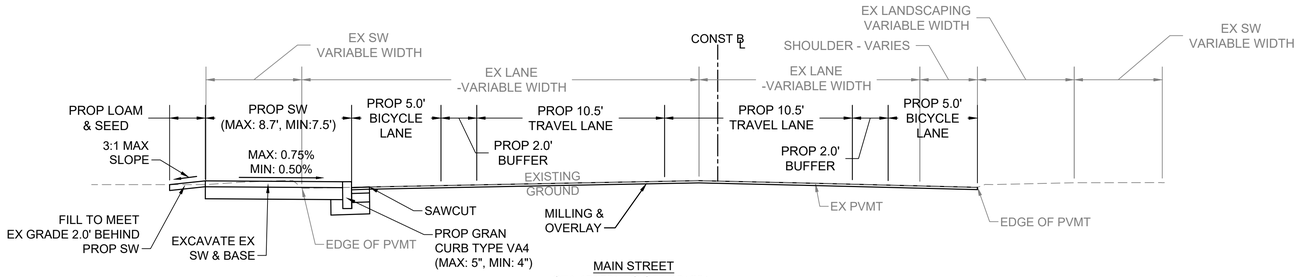
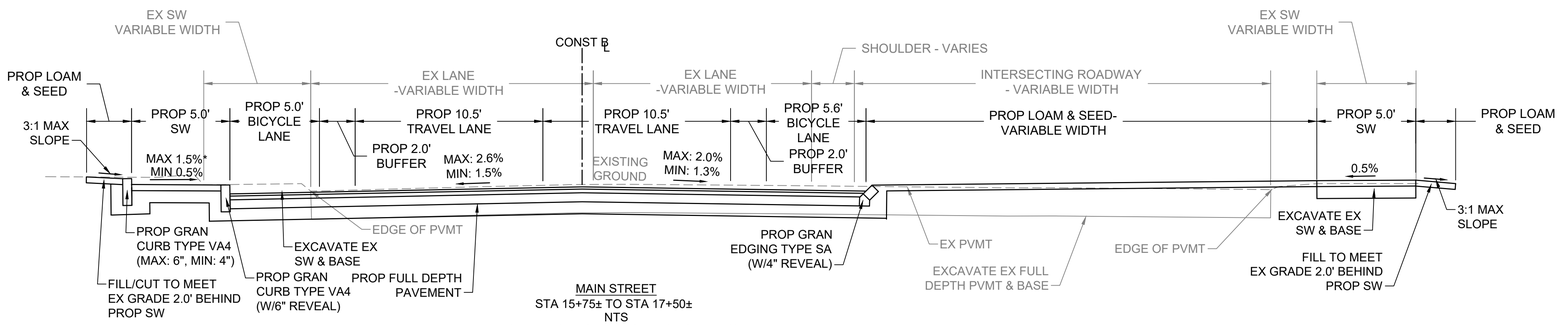
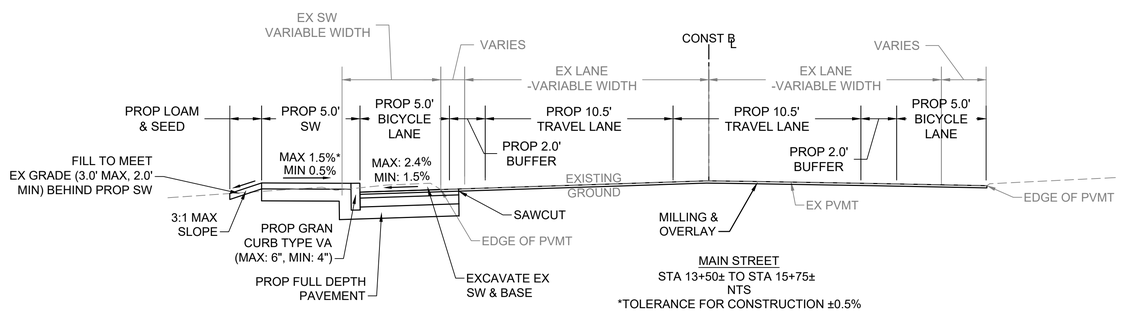


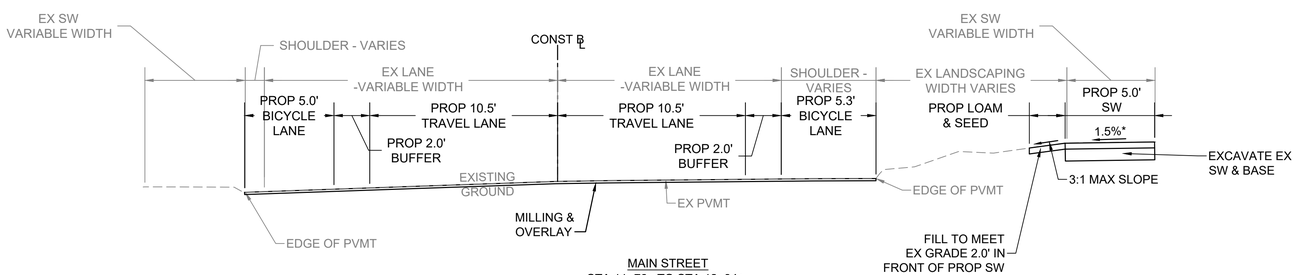
MAIN STREET
STA 17+50± TO STA 18+22±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%



MAIN STREET
STA 15+75± TO STA 17+50±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%



MAIN STREET
STA 13+50± TO STA 15+75±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%



MAIN STREET
STA 11+76± TO STA 12+94±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%

GENERAL PAVEMENT NOTE:

1. ANY EXISTING GRAVEL BASE DEEMED SUITABLE FOR REUSE BY THE RESIDENT ENGINEER SHALL REMAIN AND BE COMPACTED. ADD GRAVEL BORROW TYPE b AS REQUIRED.

2. 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.

3. ASPHALT EMULSION FOR TACK COAT SHALL BE GRADE RS-1H AND SHALL MEET THE REQUIREMENTS OF AASHTO M 140.

4. ALL HMA SUPPLIED SHALL BE MODIFIED USING WARM MIX ADDITIVE IN ACCORDANCE WITH SECTION 450 AND THE SUPERPAVE SPECIAL PROVISIONS.

CEMENT CONCRETE SIDEWALK/WHEELCHAIR RAMP
SURFACE: 4" CEMENT CONCRETE
(4000 PSI, 3/4", 610, AIR-ENTRAINED)

BASE: 8" GRAVEL BORROW TYPE b

CEMENT CONCRETE DRIVEWAY
SURFACE: 6" CEMENT CONCRETE
(4000 PSI, 3/4", 610, AIR-ENTRAINED)

BASE: 8" GRAVEL BORROW TYPE B

MILLING & OVERLAY SURFACE COURSE
MICROMILLING: 1.5" DEPTH

SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5)

CROSSWALK WITH CONCRETE PAVERS
SURFACE: 4" WINTER MARVEL LOCKING PRECAST CONCRETE PAVER
3/4" SAND ASPHALT SETTING BED

BASE: 8" HIGH EARLY STRENGTH
CEMENT CONCRETE BASE

SUB-BASE: 8" GRAVEL BORROW TYPE b
(SEE GENERAL PAVEMENT NOTE 1)

MOUNTABLE TRUCK APRON
SURFACE: 10" JUMBO GRANITE COBBLES LAID ON EDGE
2" SAND OR STONE DUST SETTING BED

BASE: 8" HIGH EARLY STRENGTH
CEMENT CONCRETE BASE

SUB-BASE: 8" COMPACTED GRAVEL BORROW

FULL DEPTH PAVEMENT CONSTRUCTION
SURFACE: 1.5" SUPERPAVE SURFACE COUSE 9.5 (SSC-9.5) OVER

INTERMEDIATE: 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

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

SUB-BASE: 8" GRAVEL BORROW TYPE B
(SEE GENERAL PAVEMENT NOTE 1)

FULL-DEPTH PAVEMENT CONSTRUCTION FOR UTILITY TRENCH
SURFACE: 1" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
5-1/2" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)
PLACED IN TWO LAYERS

BASE: 12" GRAVEL BORROW TYPE B

60143_HD4(TYPICAL_SECTIONS).DWG Plotted on 18-Nov-2021 2:33 PM

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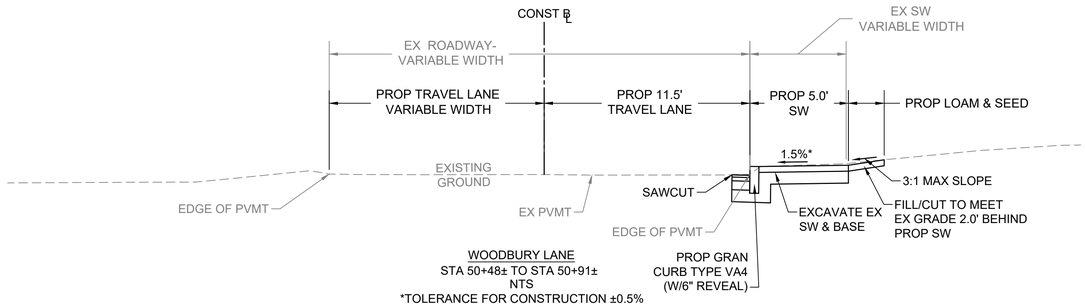
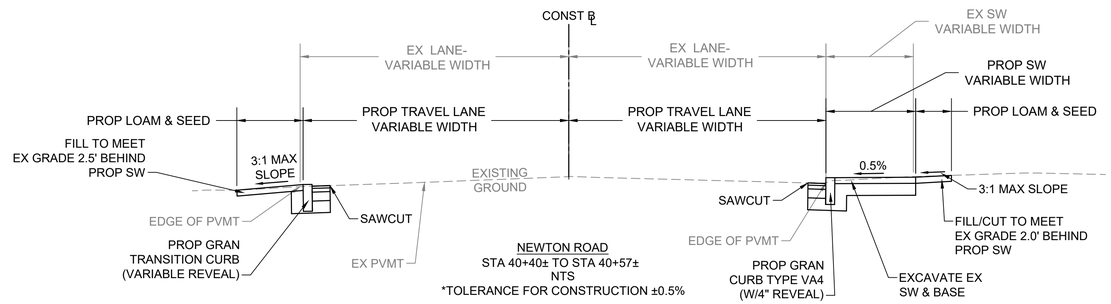
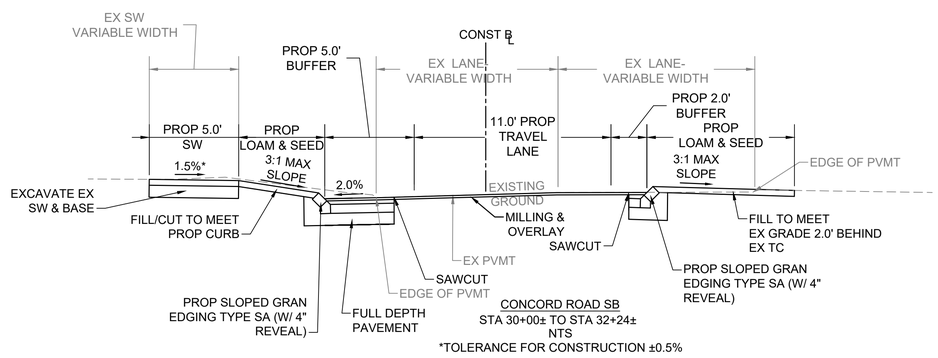
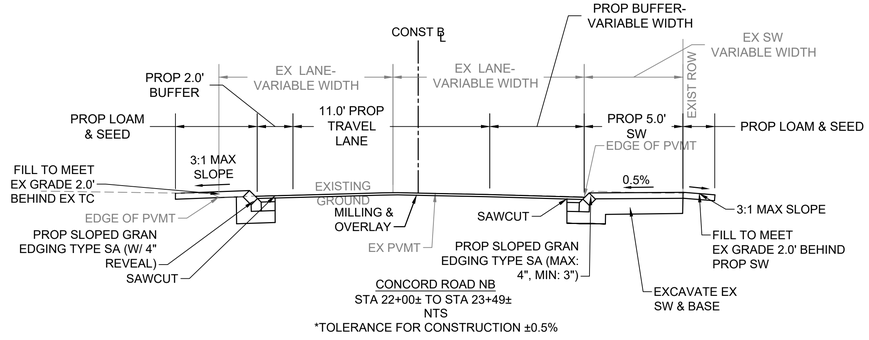
MA	-	5	62
PROJECT FILE NO.	TOOLE-60143		

TYPICAL SECTIONS









60143_HD4(TYPICAL_SECTIONS).DWG Plotted on 18-Nov-2021 2:33 PM

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	62
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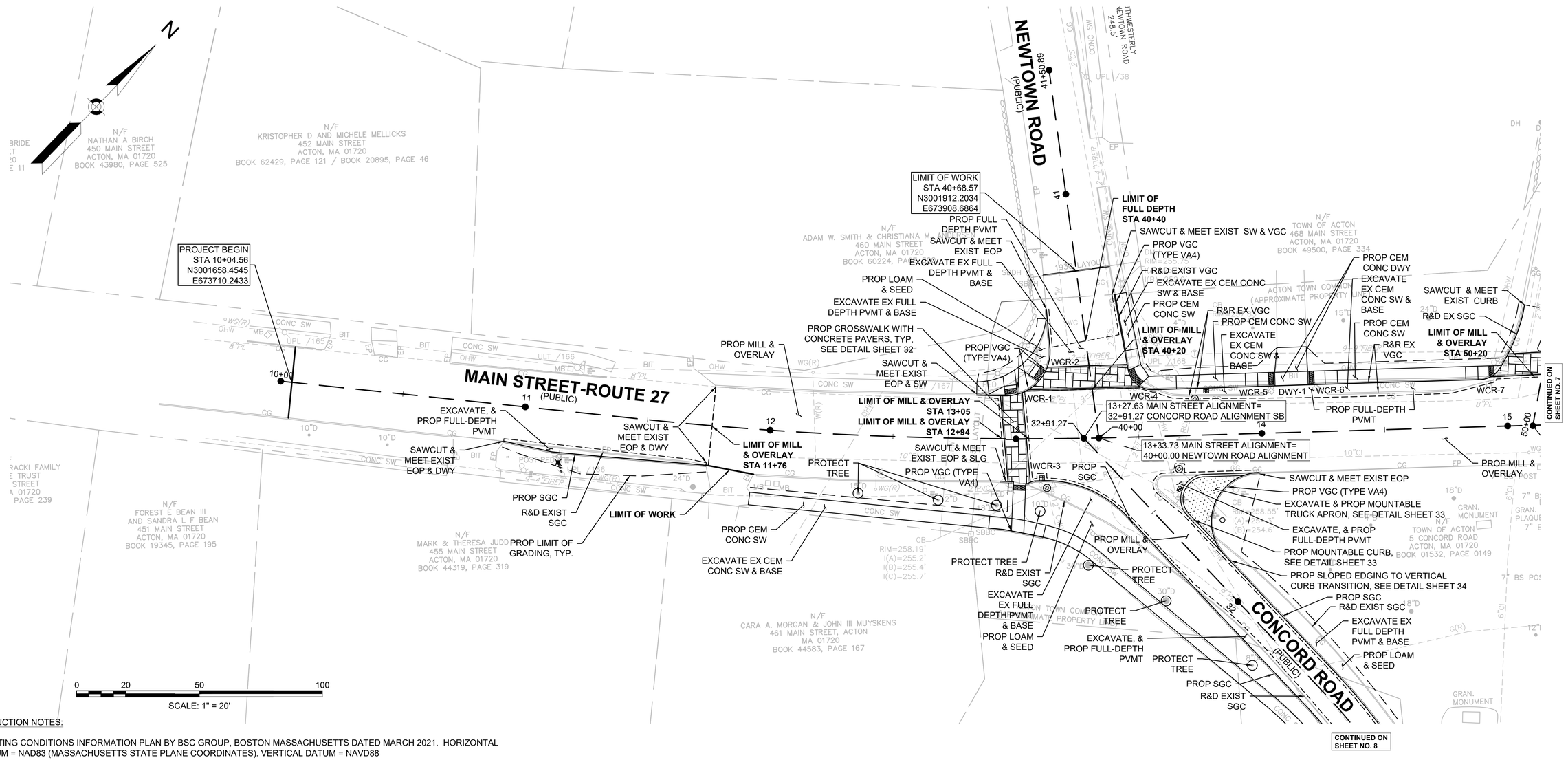
CONSTRUCTION PLANS



CONSTRUCTION NOTES:

1. EXISTING CONDITIONS INFORMATION PLAN BY BSC GROUP, BOSTON MASSACHUSETTS DATED MARCH 2021. HORIZONTAL DATUM = NAD83 (MASSACHUSETTS STATE PLANE COORDINATES). VERTICAL DATUM = NAVD88
2. ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR PRESERVING ALL EXISTING PROPERTY PINS AND HIGHWAY BOUNDS AND WILL REPLACE ANY PROPERTY PINS AND HIGHWAY BOUNDS THAT ARE DISPLACED DURING CONSTRUCTION TO THEIR LOCATION JUST PRIOR TO CONSTRUCTION.
3. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.
4. AN UNOBSTRUCTED PEDESTRIAN PATH OF TRAVEL WITH A MINIMUM WIDTH OF 3'-0" SHALL BE MAINTAINED PAST ALL OBSTRUCTIONS (UTILITY POLES, SIGNS, MAILBOXES, ALONG DRIVEWAY OPENINGS, ETC.)
5. PROPOSED GRANITE TRANSITION CURBING SHALL BE USED AT ALL WHEELCHAIR RAMPS TO MEET EXISTING PAVEMENT WHEN REQUIRED.
6. ADJUST ALL MANHOLES, HANDHOLES, AND OTHER SURFACE STRUCTURES WITHIN THE PROPOSED LIMIT OF WORK.
7. LOAM AND SEED ALL DISTURBED LANDSCAPE AREAS UP TO 10' BACK FROM PROPOSED WORK, AS NECESSARY.

LEGEND:

WCR-#	WHEELCHAIR RAMP IDENTIFIER
DWY-#	DRIVEWAY IDENTIFIER
	PROPOSED MOUNTABLE TRUCK APRON
	PROPOSED CROSSWALK WITH CONCRETE PAVERS
	STAMPED CROSSWALK
— — —	SAWCUT LINE
—— ——	LIMIT OF GRADING

60143_HD5(CONSTRUCTION_PLANS).DWG Plotted on 18-Nov-2021 2:33 PM

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MA	-	7	62
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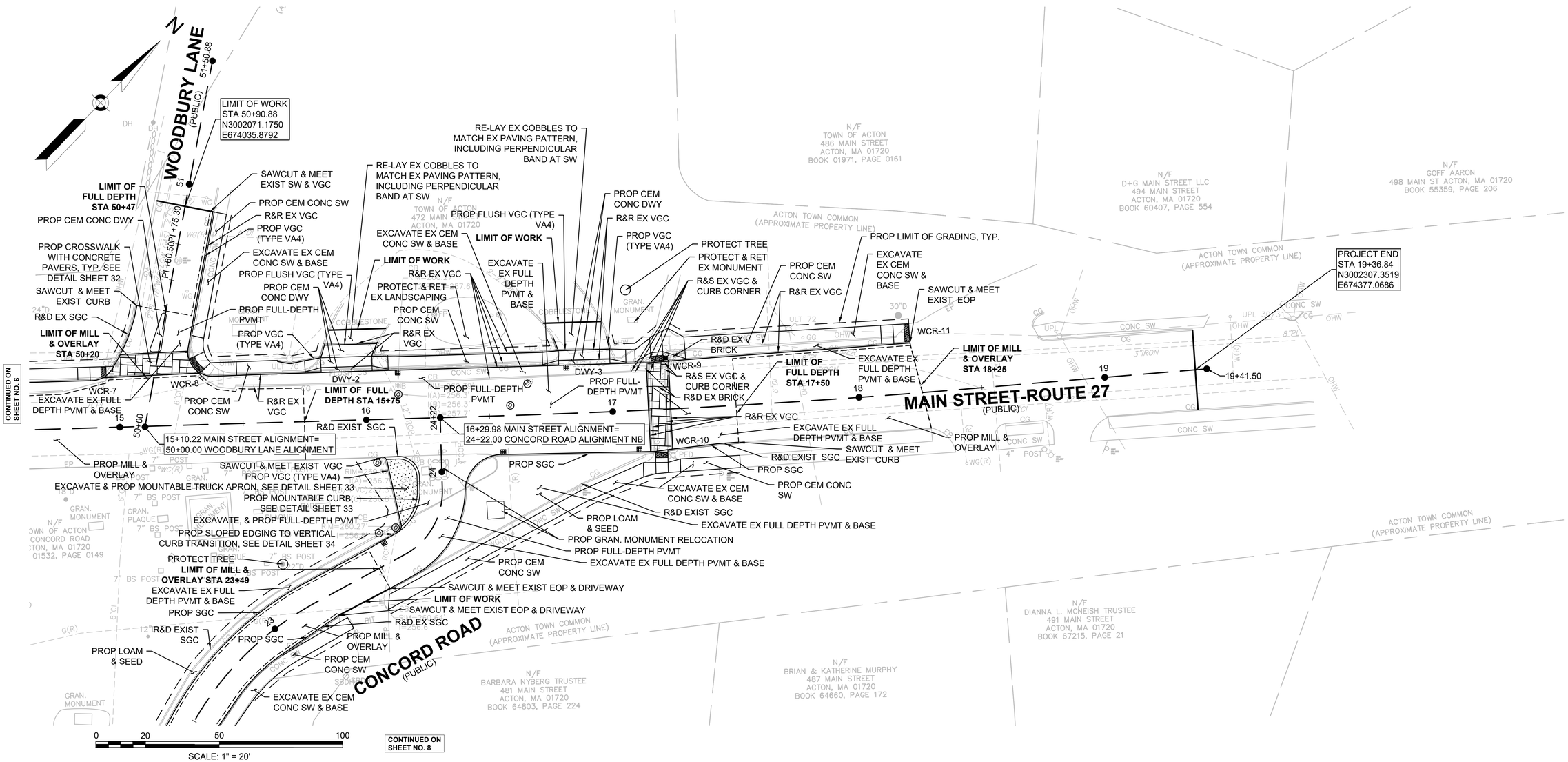
CONSTRUCTION PLANS



LEGEND:

WCR-# WHEELCHAIR RAMP IDENTIFIER

DWY-# DRIVEWAY IDENTIFIER

PROPOSED MOUNTABLE TRUCK APRON

PROPOSED CROSSWALK WITH CONCRETE PAVERS

STAMPED CROSSWALK

SAWCUT LINE

LIMIT OF GRADING

60143_HDS(CONSTRUCTION_PLANS).DWG Plotted on 18-Nov-2021 2:34 PM

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ACTON TOWN CENTER

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MA	-	8	62
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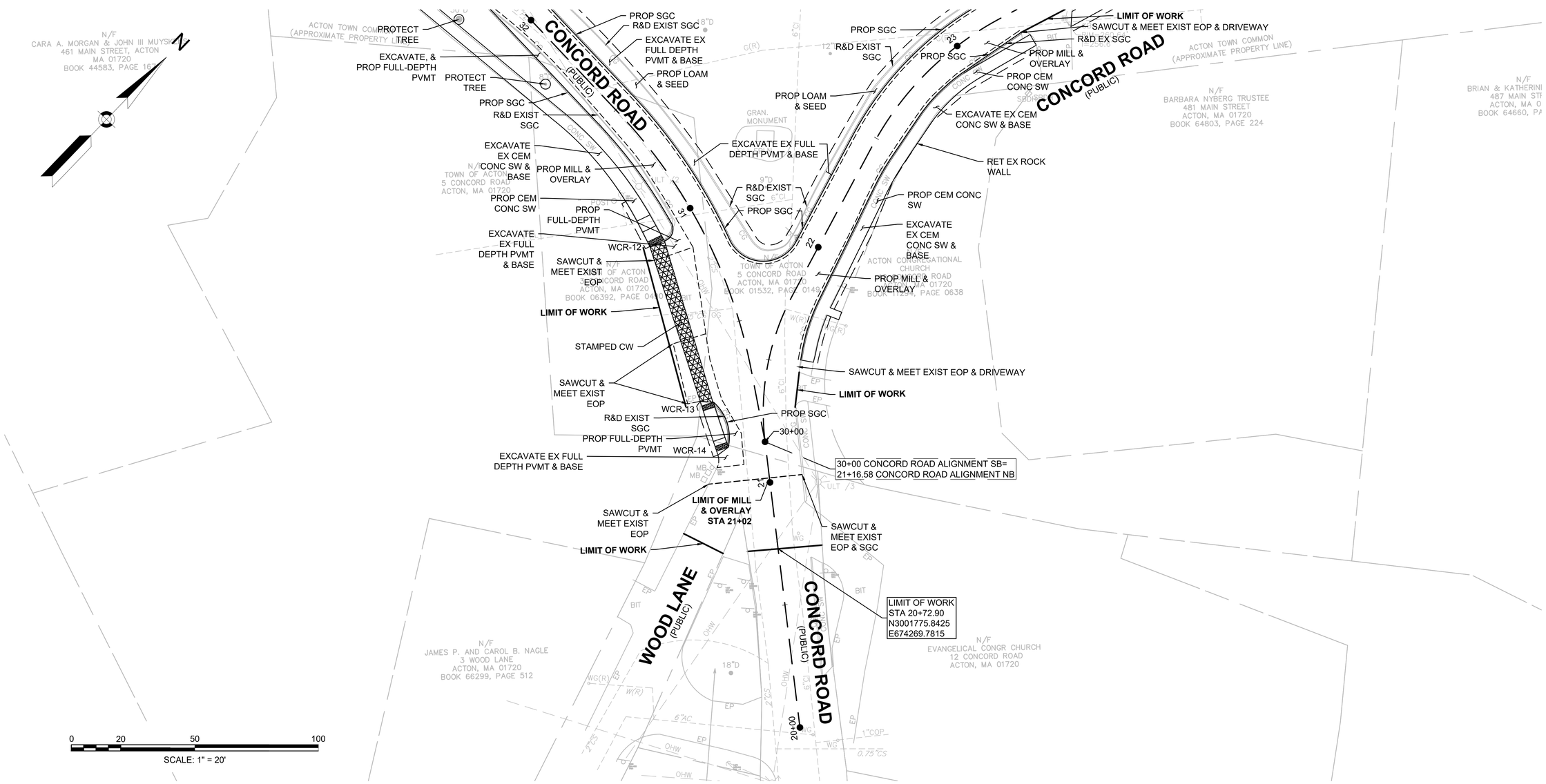
CONSTRUCTION PLANS

CONTINUED ON SHEET NO. 6

CONTINUED ON SHEET NO. 7



LEGEND:

WCR-# WHEELCHAIR RAMP IDENTIFIER

DWY-# DRIVEWAY IDENTIFIER

PROPOSED MOUNTABLE TRUCK APRON

PROPOSED CROSSWALK WITH CONCRETE PAVERS

STAMPED CROSSWALK

SAWCUT LINE

LIMIT OF GRADING

60143_HD5(CONSTRUCTION_PLANS).DWG Plotted on 18-Nov-2021 2:34 PM

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MA	-	9	62
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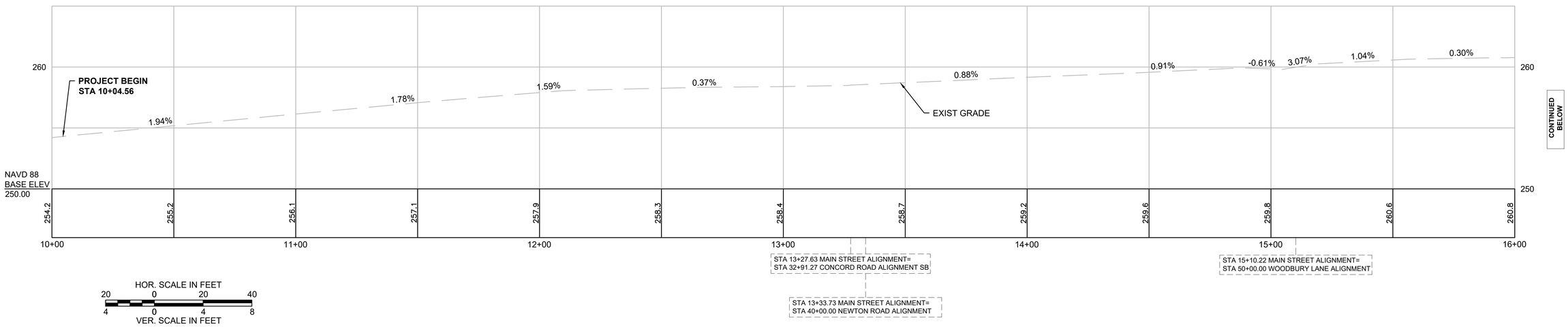
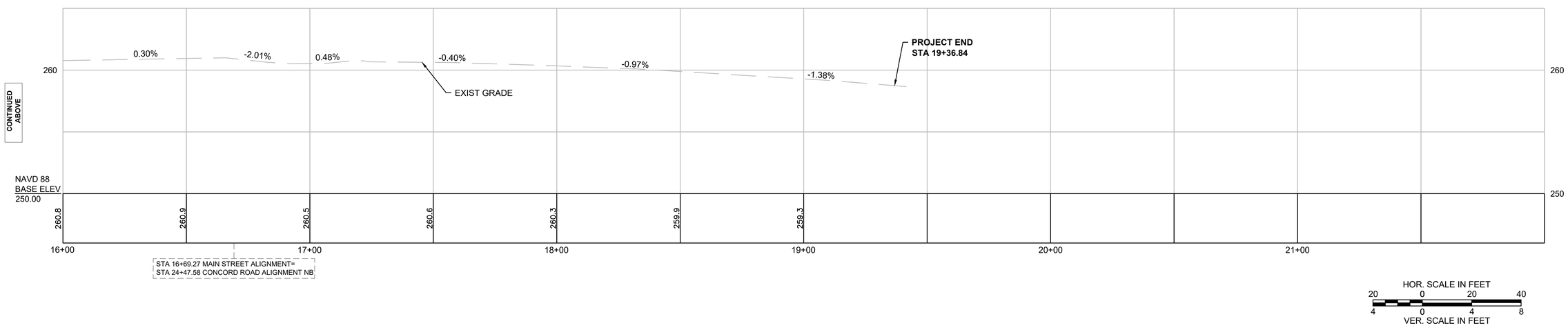
EXISTING PROFILES

MAIN STREET ALIGNMENT - EXISTING



MAIN STREET ALIGNMENT - EXISTING



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

60143_HD6(PROFILES).DWG Plotted on 18-Nov-2021 2:34 PM

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MA	-	10	62
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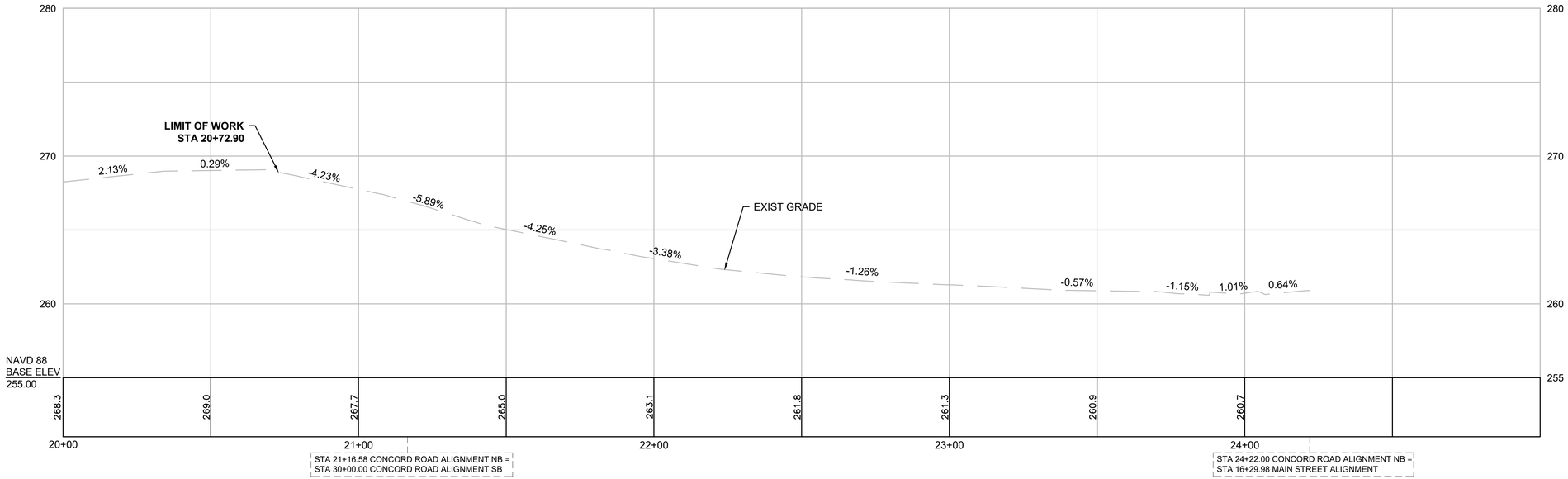
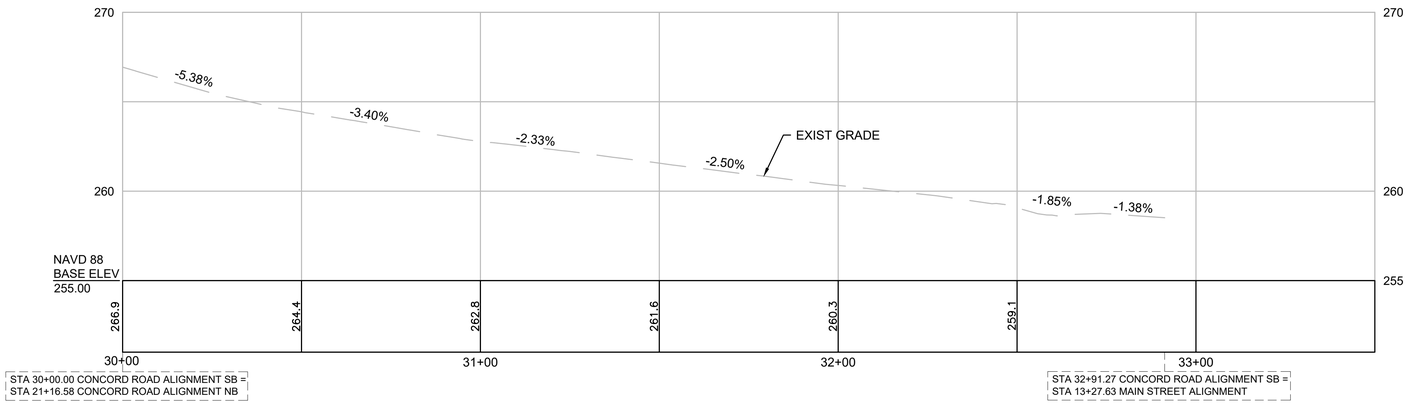
EXISTING PROFILES

CONCORD ROAD ALIGNMENT NB - EXISTING



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

CONCORD ROAD ALIGNMENT SB - EXISTING



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

60143_HD6(PROFILES).DWG Plotted on 18-Nov-2021 2:34 PM

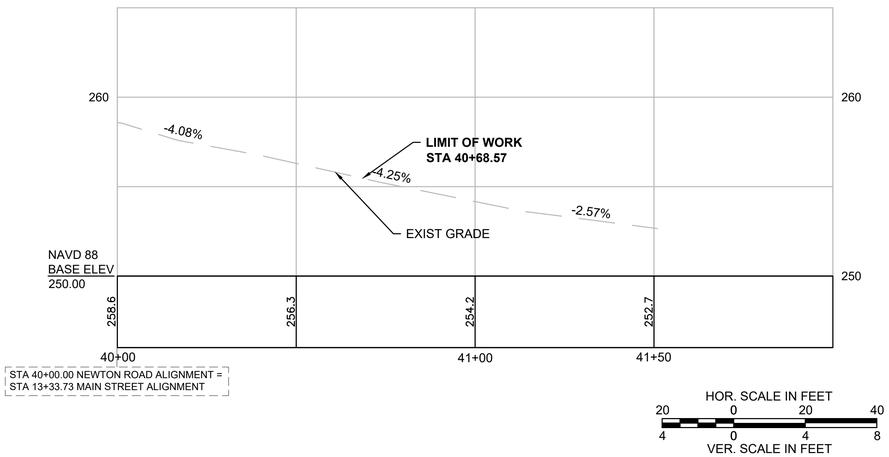
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	62
PROJECT FILE NO.	TOOLE-60143		

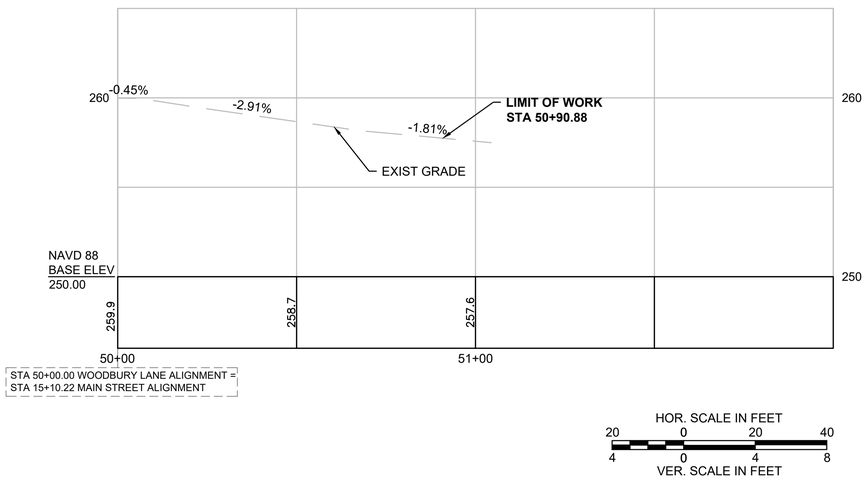
EXISTING PROFILES

60143_HD6(PROFILES).DWG Plotted on 18-Nov-2021 2:34 PM

NEWTON ROAD ALIGNMENT - EXISTING



WOODBURY LANE ALIGNMENT - EXISTING



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

ACTON
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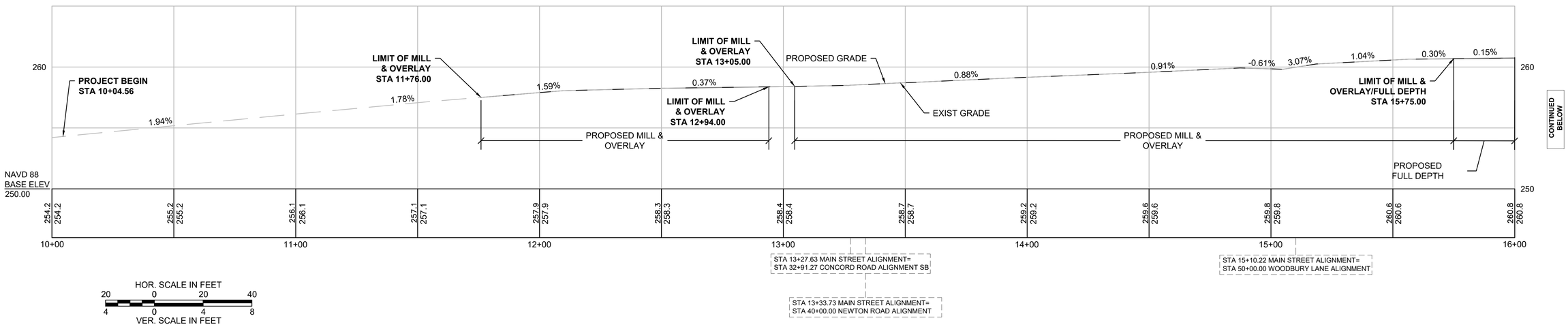
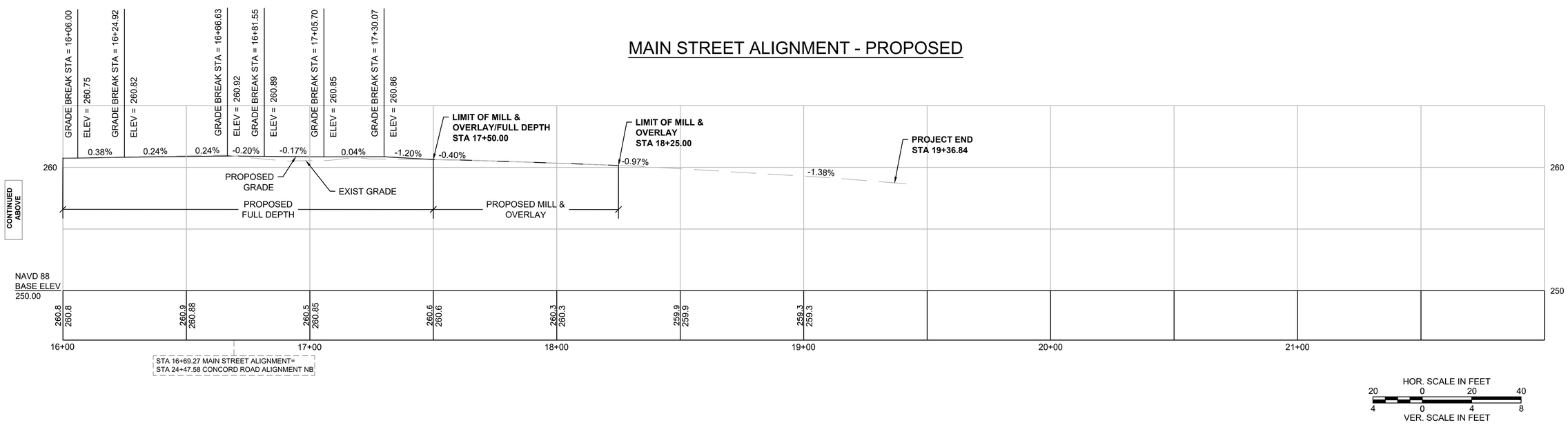
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	12	62
PROJECT FILE NO.	TOOLE-60143		

PROPOSED PROFILES

MAIN STREET ALIGNMENT - PROPOSED



MAIN STREET ALIGNMENT - PROPOSED



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

60143_HD16(PROPOSED_PROFILES).DWG Plotted on 18-Nov-2021 2:34 PM

ACTON
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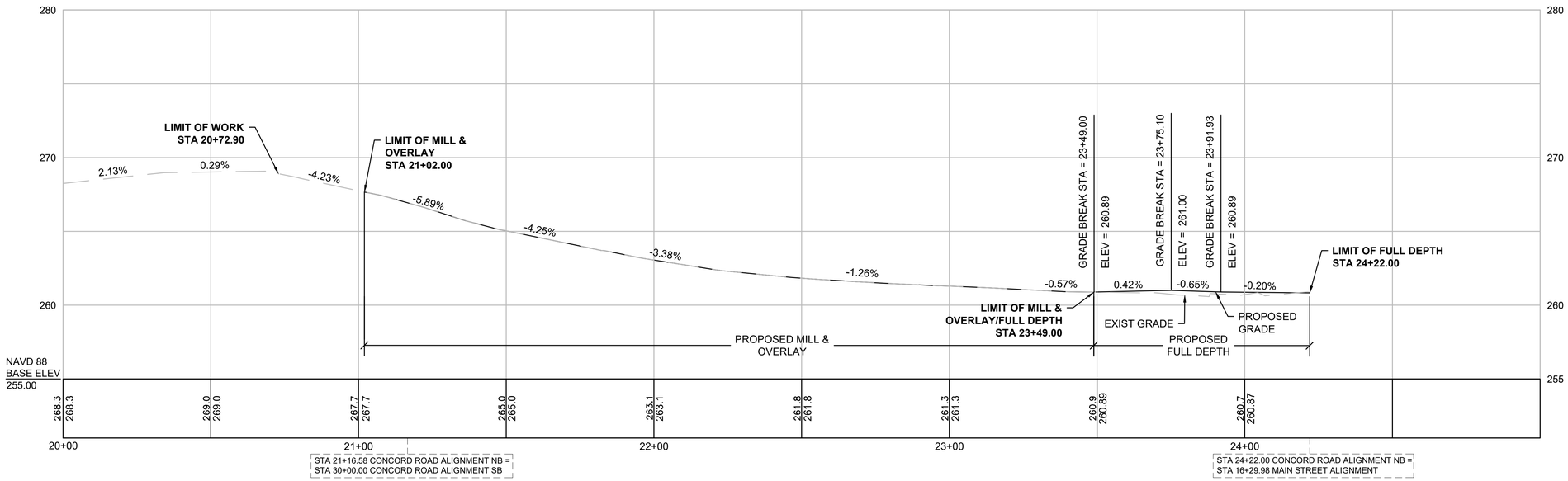
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	62
PROJECT FILE NO.	TOOLE-60143		

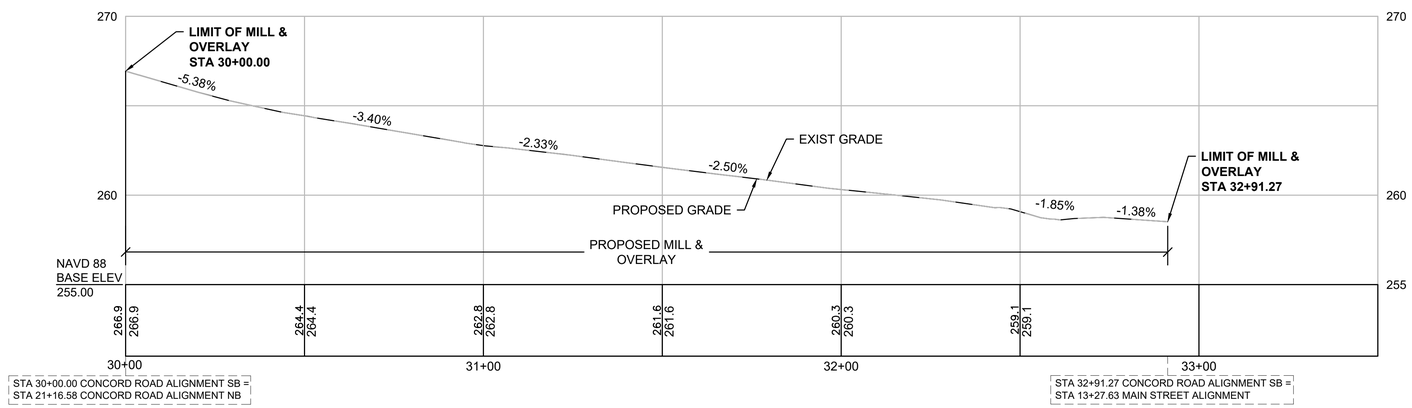
PROPOSED PROFILES

CONCORD ROAD ALIGNMENT NB - PROPOSED



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

CONCORD ROAD ALIGNMENT SB - PROPOSED



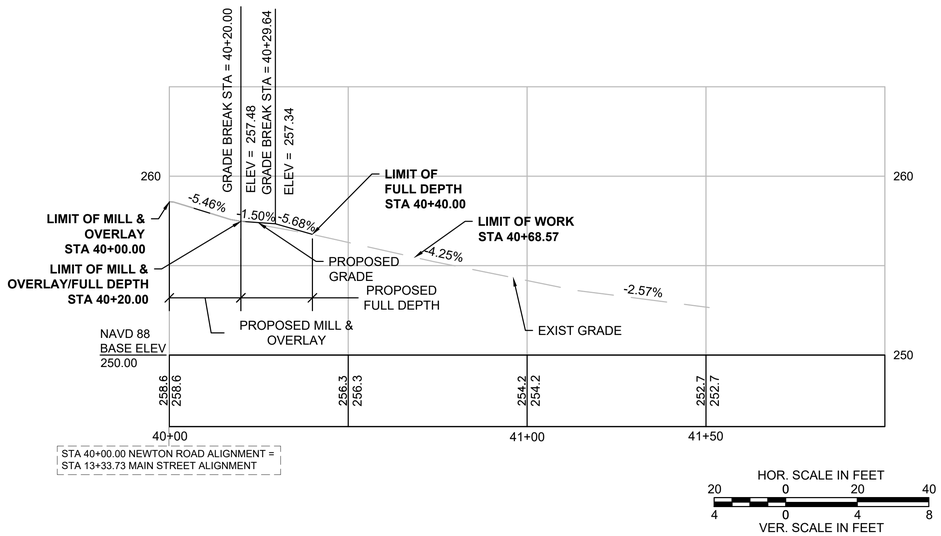
HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

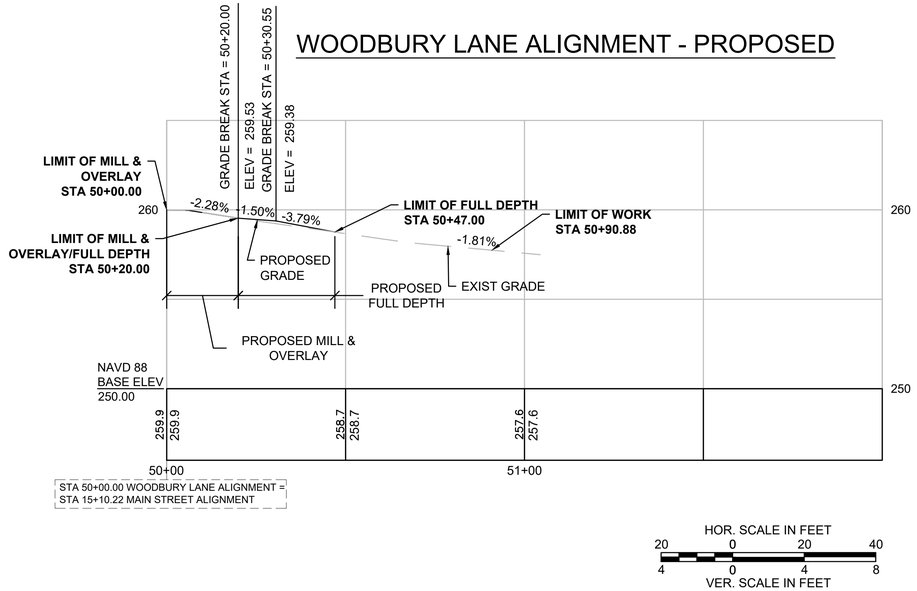
60143_HD16(PROPOSED_PROFILES).DWG Plotted on 18-Nov-2021 2:34 PM

60143_HD16(PROPOSED_PROFILES).DWG Plotted on 18-Nov-2021 2:35 PM

NEWTON ROAD ALIGNMENT - PROPOSED



WOODBURY LANE ALIGNMENT - PROPOSED



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 6-8

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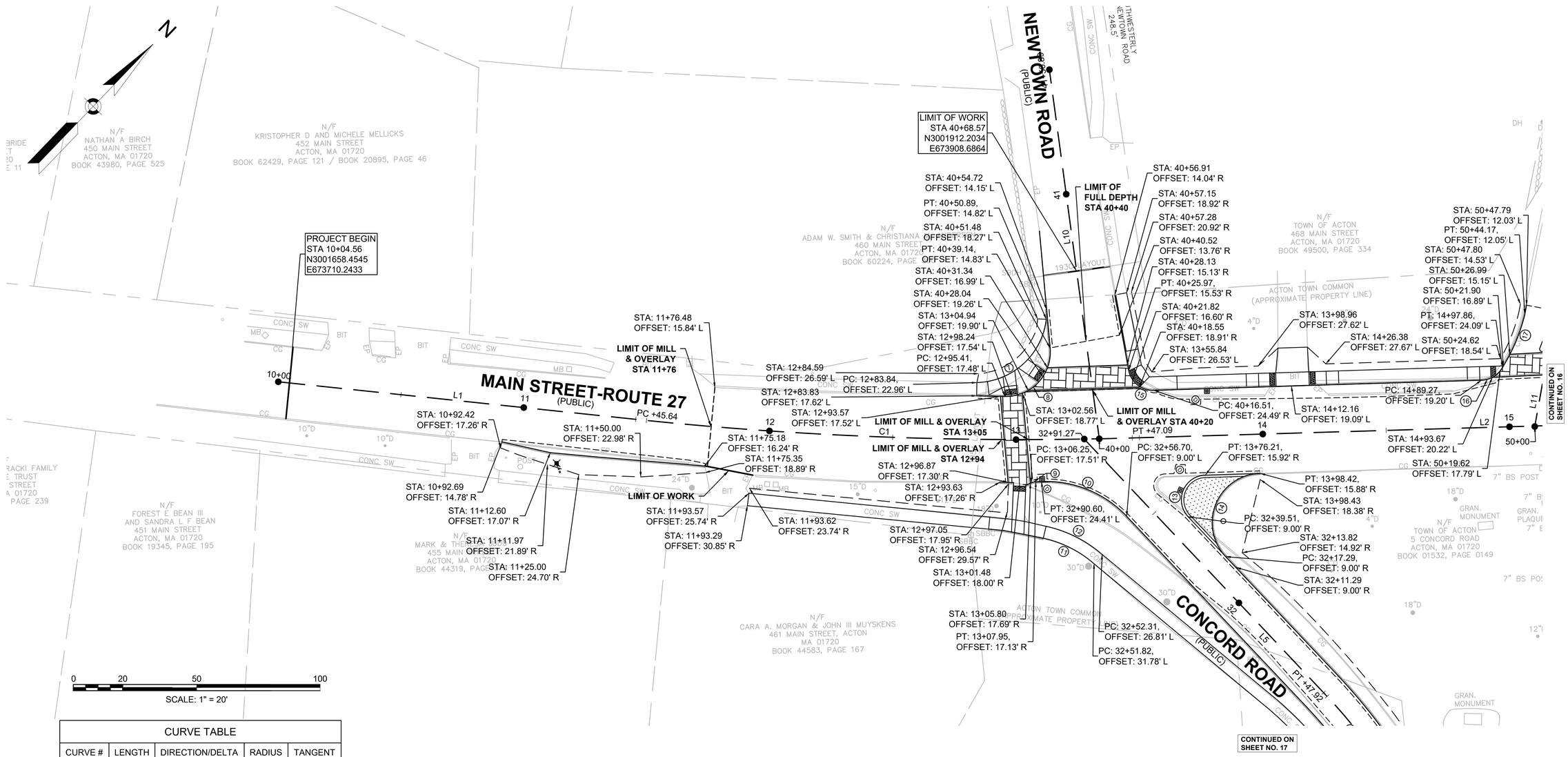
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	62
PROJECT FILE NO.	TOOLE-60143		

CURB TIE PLANS



CURVE TABLE				
CURVE #	LENGTH	DIRECTION/DELTA	RADIUS	TANGENT
7	41.53	82°03'07"	29.00	25.23
8	30.29	96°24'35"	18.00	20.14
9	1.78	20°21'06"	5.00	0.90
10	38.40	48°53'14"	45.00	20.45
11	23.24	28°57'02"	46.00	11.88
12	25.77	28°57'02"	51.00	13.17
13	22.96	131°31'59"	10.00	22.22
14	45.91	131°31'59"	20.00	44.43
15	14.20	81°21'28"	10.00	8.59
16	10.35	59°16'21"	10.00	5.69
17	22.84	17°55'50"	72.99	11.52

CONCORD ROAD ALIGNMENT SB CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L5	31+47.92	3001858.355	674101.281		N87°13'44"W 143.35'	32+91.27	3001865.285	673958.099

NEWTOWN ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L10	40+00.00	3001869.596	673962.417		N51°35'12"W 150.89'	41+50.89	3001963.349	673844.188

MAIN STREET ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	10+00.00	3001655.656	673706.647		N52°06'47"E 145.64'	11+45.64	3001745.096	673821.592
C1	11+45.64	3001745.096	673821.592	R=1500.00' Δ=7°41'40" L=201.44' T=100.87'		13+47.09	3001879.091	673971.804
L2	13+47.09	3001879.091	673971.804		N44°25'07"E 304.33'	16+51.42	3002096.458	674184.804

60143_HD7(CURB TIE).DWG Plotted on 18-Nov-2021 2:35 PM

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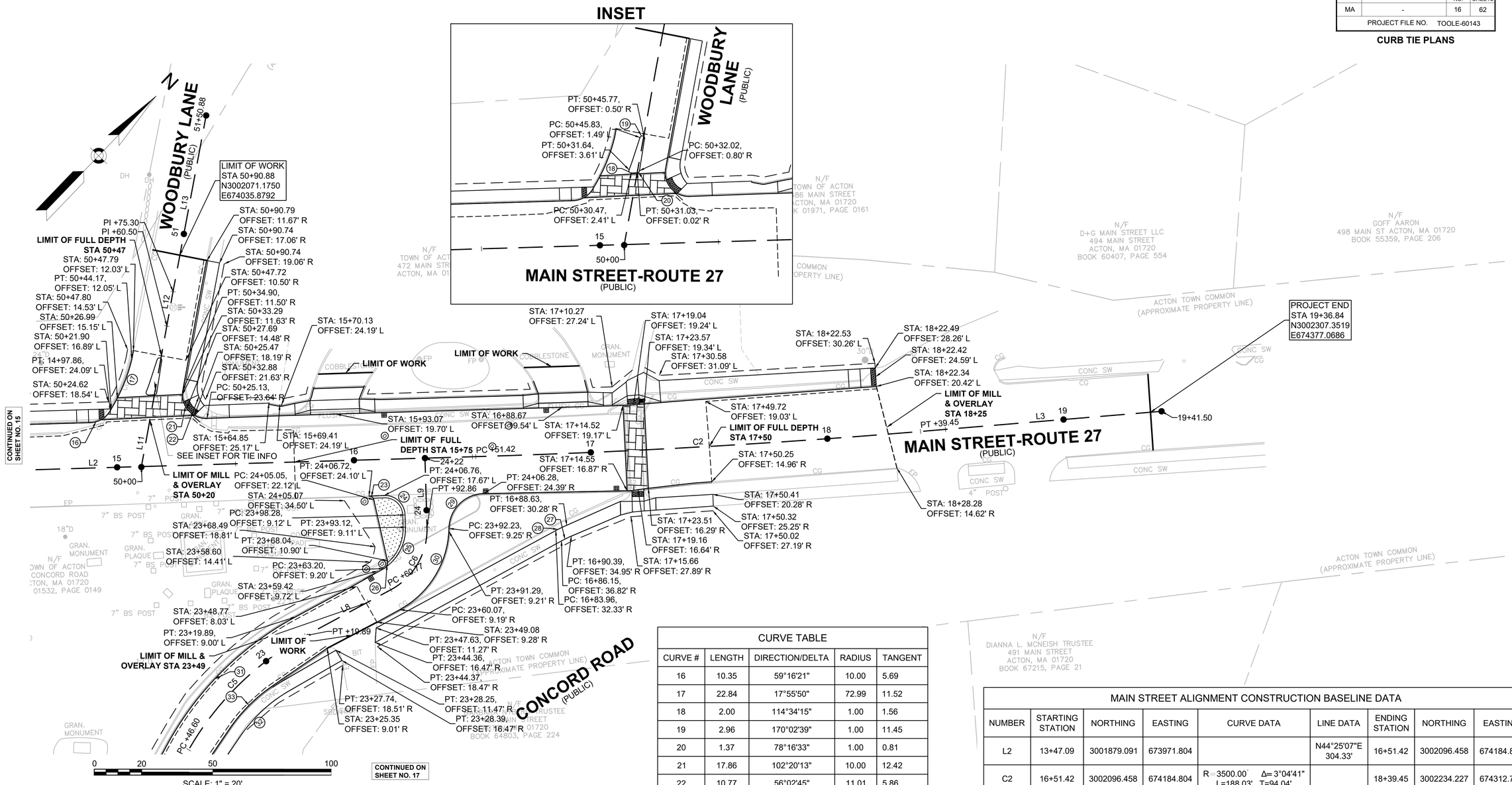
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	62
PROJECT FILE NO.	TOOLE-60143		

CURB TIE PLANS



WOODBURY LANE ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L11	50+00.00	3001995.460	674086.139		N33°38'53"W 60.50'	50+60.50	3002045.825	674052.615
L12	50+60.50	3002045.825	674052.615		N33°38'53"W 14.80'	50+75.30	3002058.144	674044.416
L13	50+75.30	3002058.144	674044.416		N33°13'44"W 75.58'	51+50.88	3002121.366	674002.999

CURVE TABLE				
CURVE #	LENGTH	DIRECTION/DELTA	RADIUS	TANGENT
16	10.35	59°16'21"	10.00	5.69
17	22.84	17°55'50"	72.99	11.52
18	2.00	114°34'15"	1.00	1.56
19	2.96	170°02'39"	1.00	11.45
20	1.37	78°16'33"	1.00	0.81
21	17.86	102°20'13"	10.00	12.42
22	10.77	56°02'45"	11.01	5.86
23	2.82	80°43'28"	2.00	1.70
24	13.39	90°13'50"	8.50	8.53
25	19.70	56°25'43"	20.00	10.73
26	3.84	73°19'10"	3.00	2.23
27	4.68	5°21'27"	50.00	2.34
28	5.14	5°21'27"	55.00	2.57
29	22.99	87°47'47"	15.00	14.43
30	40.72	58°19'25"	40.00	22.32
31	78.57	33°35'40"	134.00	40.45
32	26.40	23°26'52"	64.50	13.39
33	24.32	19°54'27"	70.00	12.28

MAIN STREET ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L2	13+47.09	3001879.091	673971.804		N44°25'07"E 304.33'	16+51.42	3002096.458	674184.804
C2	16+51.42	3002096.458	674184.804	R=3500.00' Δ=3°04'41" L=188.03' T=94.04'		18+39.45	3002234.227	674312.735
L3	18+39.45	3002234.227	674312.735		N41°20'26"E 102.05'	19+41.50	3002310.849	674380.145

CONCORD ROAD ALIGNMENT NB CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C5	22+46.60	3001920.012	674184.124	R=125.00' Δ=33°35'40" L=73.29' T=37.73'		23+19.89	3001992.246	674185.414
L8	23+19.89	3001992.246	674185.414		N17°49'12"E 40.88'	23+60.77	3002031.166	674197.925
C6	23+60.77	3002031.166	674197.925	R=29.00' Δ=63°24'06" L=32.09' T=17.91'		23+92.86	3002060.753	674190.613
L9	23+92.86	3002060.753	674190.613		N45°34'53"W 29.14'	24+22.00	3002081.147	674169.801

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60143_HD7(CURB TIE).DWG

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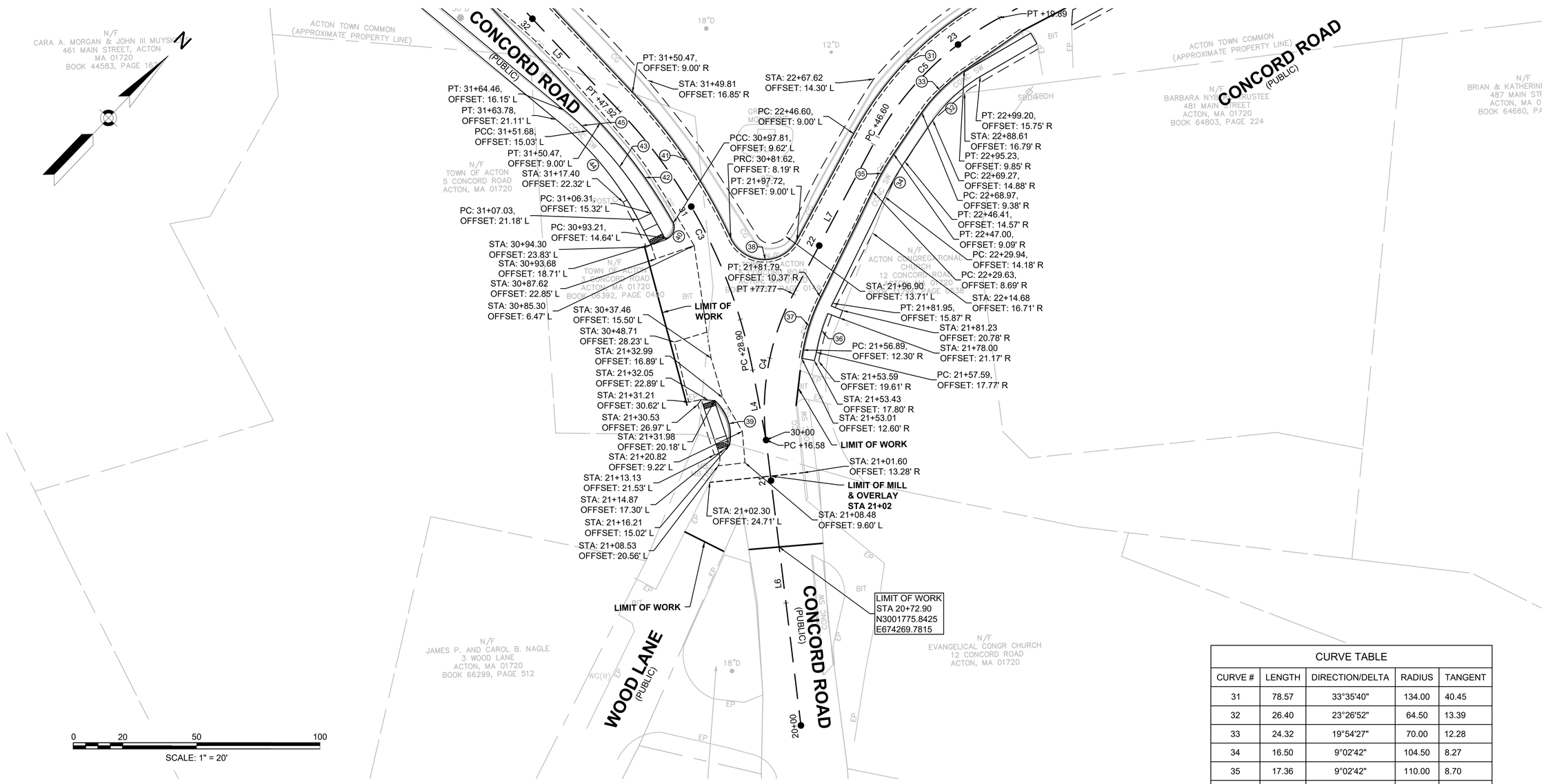
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	62
PROJECT FILE NO.	TOOLE-60143		

CURB TIE PLANS

CONTINUED ON SHEET NO. 15

CONTINUED ON SHEET NO. 16



CONCORD ROAD ALIGNMENT SB CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L4	30+00.00	3001803.430	674235.913		N54°45'18"W 28.90'	30+28.90	3001820.105	674212.314
C3	30+28.90	3001820.105	674212.314	R=210.00' Δ=32°28'26" L=119.02' T=61.16'		31+47.92	3001858.355	674101.281
L5	31+47.92	3001858.355	674101.281		N87°13'44"W 143.35'	32+91.27	3001865.285	673958.099

CONCORD ROAD ALIGNMENT NB CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L6	20+00.00	3001729.805	674326.301		N50°50'07"W 116.58'	21+16.58	3001803.430	674235.913
C4	21+16.58	3001803.430	674235.913	R=100.00' Δ=35°03'40" L=61.19' T=31.59'		21+77.77	3001853.779	674202.834
L7	21+77.77	3001853.779	674202.834		N15°46'27"W 68.82'	22+46.60	3001920.012	674184.124
C5	22+46.60	3001920.012	674184.124	R=125.00' Δ=33°35'40" L=73.29' T=37.73'		23+19.89	3001992.246	674185.414

CURVE TABLE				
CURVE #	LENGTH	DIRECTION/DELTA	RADIUS	TANGENT
31	78.57	33°35'40"	134.00	40.45
32	26.40	23°26'52"	64.50	13.39
33	24.32	19°54'27"	70.00	12.28
34	16.50	9°02'42"	104.50	8.27
35	17.36	9°02'42"	110.00	8.70
36	16.45	12°49'15"	73.50	8.26
37	22.61	16°23'50"	79.00	11.38
38	33.32	127°16'06"	15.00	30.26
39	20.04	60°25'39"	19.00	11.06
40	7.89	90°23'39"	5.00	5.03
41	71.56	18°43'23"	219.00	36.10
42	49.77	14°10'34"	201.16	25.01
43	42.42	15°40'49"	155.00	21.34
44	52.89	23°29'30"	129.00	26.82
45	12.83	5°29'13"	134.00	6.42

60143_HD7(CURB TIE).DWG Plotted on 18-Nov-2021 2:36 PM

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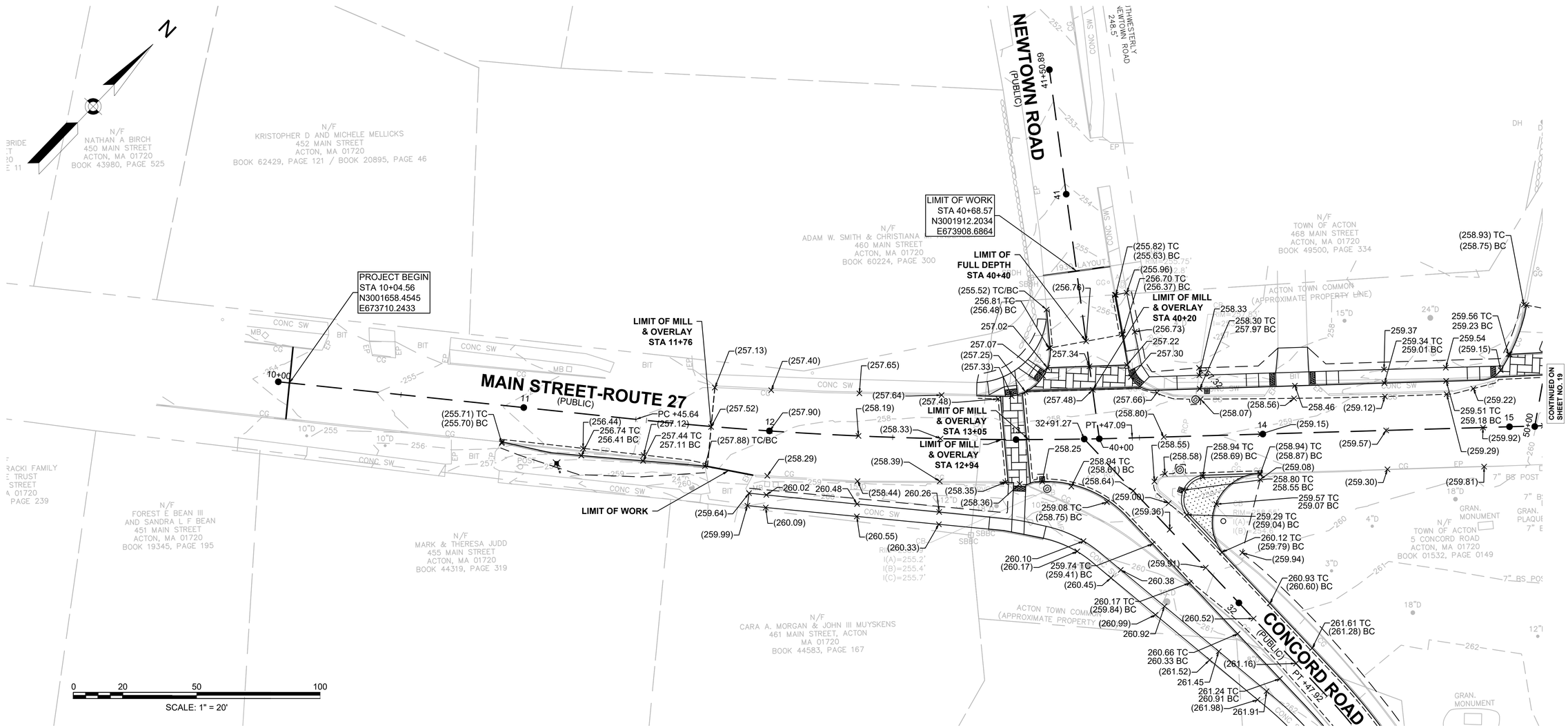
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	62
PROJECT FILE NO.	TOOLE-60143		

GRADING PLANS



LEGEND:

8.45	PROPOSED ELEVATION
(8.45)	EXISTING ELEVATION
8.45 TC (7.88) BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/EXISTING ELEVATION
8.45 TC 7.88 BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/PROPOSED ELEVATION

NOTES:

1. PROPOSED TOP OF CURB ELEVATIONS NOT SHOWN AT WHEELCHAIR RAMP AND DRIVEWAY OPENINGS AND TRANSITIONS. TC = (EG)
2. MAXIMUM CURB REVEAL TO BE 7".
3. PROPOSED ELEVATION AT BOTTOM OF CURB INDICATES CHANGE OF ELEVATION FROM EXISTING ROADWAY IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ADJACENT SAWCUT LINE TO MATCH EXISTING ELEVATION.
4. FOR CURB RAMP SPOT ELEVATIONS, SEE SHEET 21.
5. FOR DRIVEWAY SPOT ELEVATIONS, SEE SHEET 22.

60143_HDS\GRADING\.DWG Plotted on 18-Nov-2021 2:36 PM

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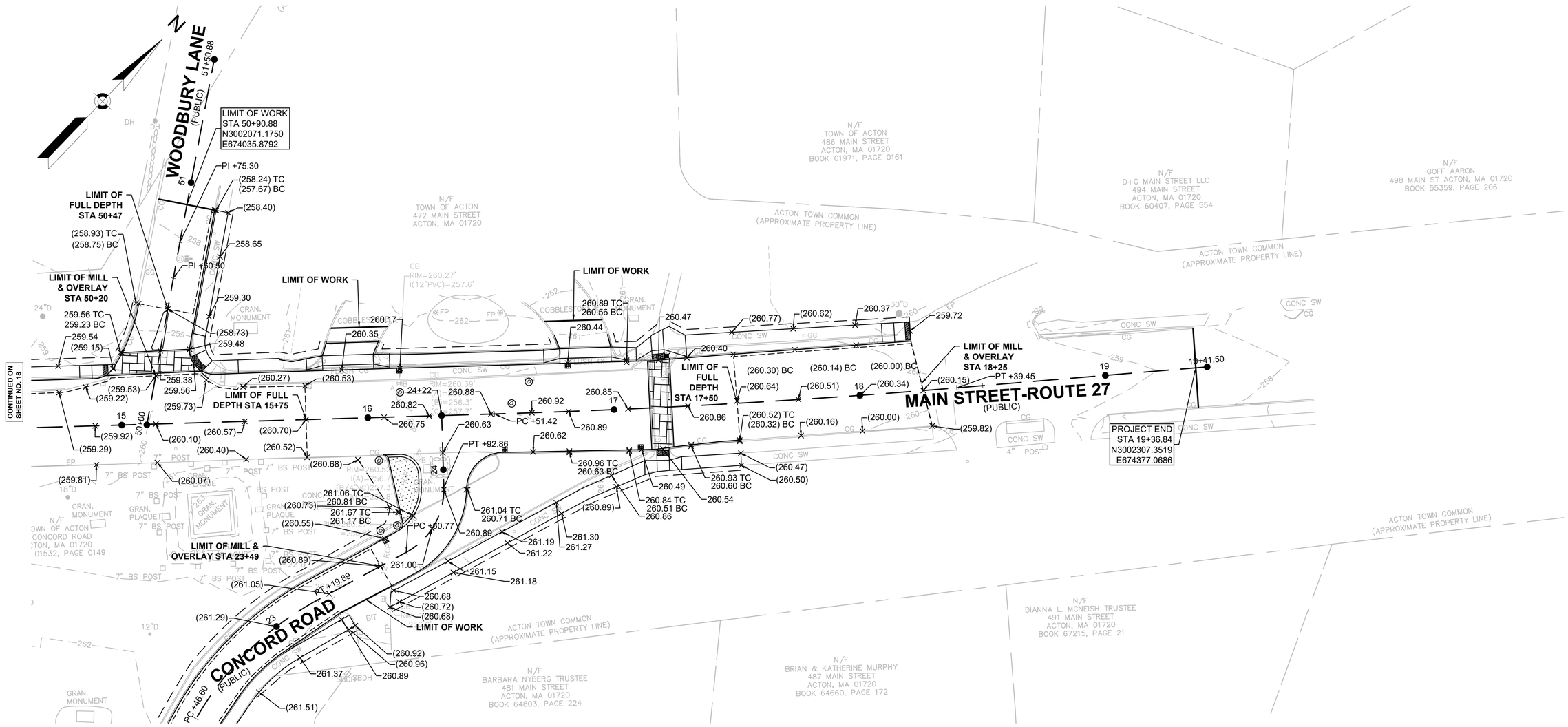
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	62
PROJECT FILE NO.	TOOLE-60143		

GRADING PLANS



0 20 50 100

SCALE: 1" = 20'

LEGEND:

8.45	PROPOSED ELEVATION
(8.45)	EXISTING ELEVATION
8.45 TC (7.88) BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/EXISTING ELEVATION
8.45 TC 7.88 BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/PROPOSED ELEVATION

NOTES:

1. PROPOSED TOP OF CURB ELEVATIONS NOT SHOWN AT WHEELCHAIR RAMP AND DRIVEWAY OPENINGS AND TRANSITIONS. TC = (EG)
2. MAXIMUM CURB REVEAL TO BE 7".
3. PROPOSED ELEVATION AT BOTTOM OF CURB INDICATES CHANGE OF ELEVATION FROM EXISTING ROADWAY IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ADJACENT SAWCUT LINE TO MATCH EXISTING ELEVATION.
4. FOR CURB RAMP SPOT ELEVATIONS, SEE SHEET 21.
5. FOR DRIVEWAY SPOT ELEVATIONS, SEE SHEET 22.

60143_HDS\GRADING\.DWG Plotted on 18-Nov-2021 2:36 PM

ACTON
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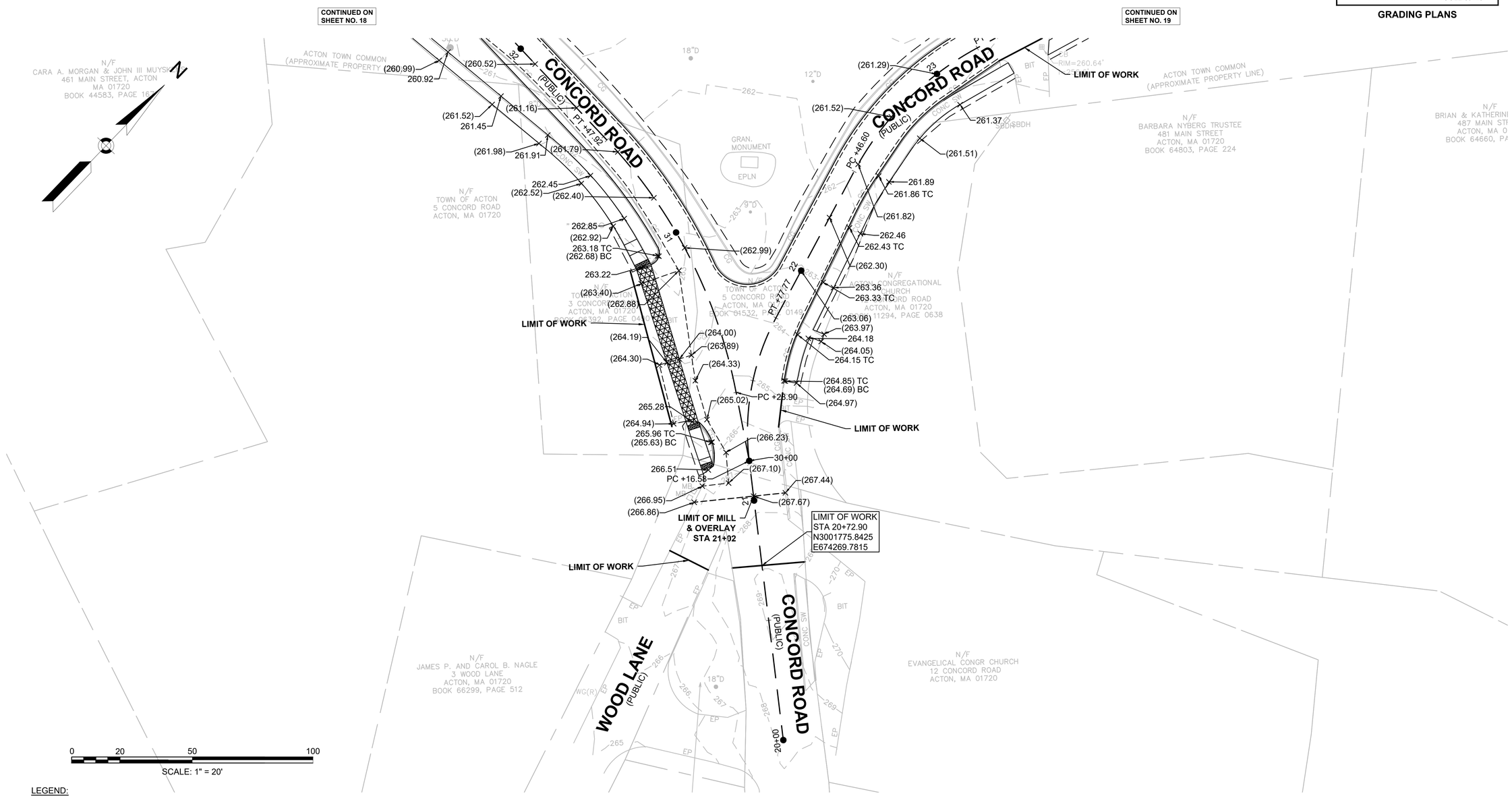
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	62
PROJECT FILE NO.	TOOLE-60143		

GRADING PLANS



LEGEND:

8.45	PROPOSED ELEVATION
(8.45)	EXISTING ELEVATION
8.45 TC (7.88) BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/EXISTING ELEVATION
8.45 TC 7.88 BC	PROPOSED TOP OF CURB ELEVATION BOTTOM OF CURB/PROPOSED ELEVATION

NOTES:

1. PROPOSED TOP OF CURB ELEVATIONS NOT SHOWN AT WHEELCHAIR RAMP AND DRIVEWAY OPENINGS AND TRANSITIONS. TC = (EG)
2. MAXIMUM CURB REVEAL TO BE 7".
3. PROPOSED ELEVATION AT BOTTOM OF CURB INDICATES CHANGE OF ELEVATION FROM EXISTING ROADWAY IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ADJACENT SAWCUT LINE TO MATCH EXISTING ELEVATION.
4. FOR CURB RAMP SPOT ELEVATIONS, SEE SHEET 21.
5. FOR DRIVEWAY SPOT ELEVATIONS, SEE SHEET 22.

60143_HDS\GRADING\.DWG Plotted on 18-Nov-2021 2:37 PM

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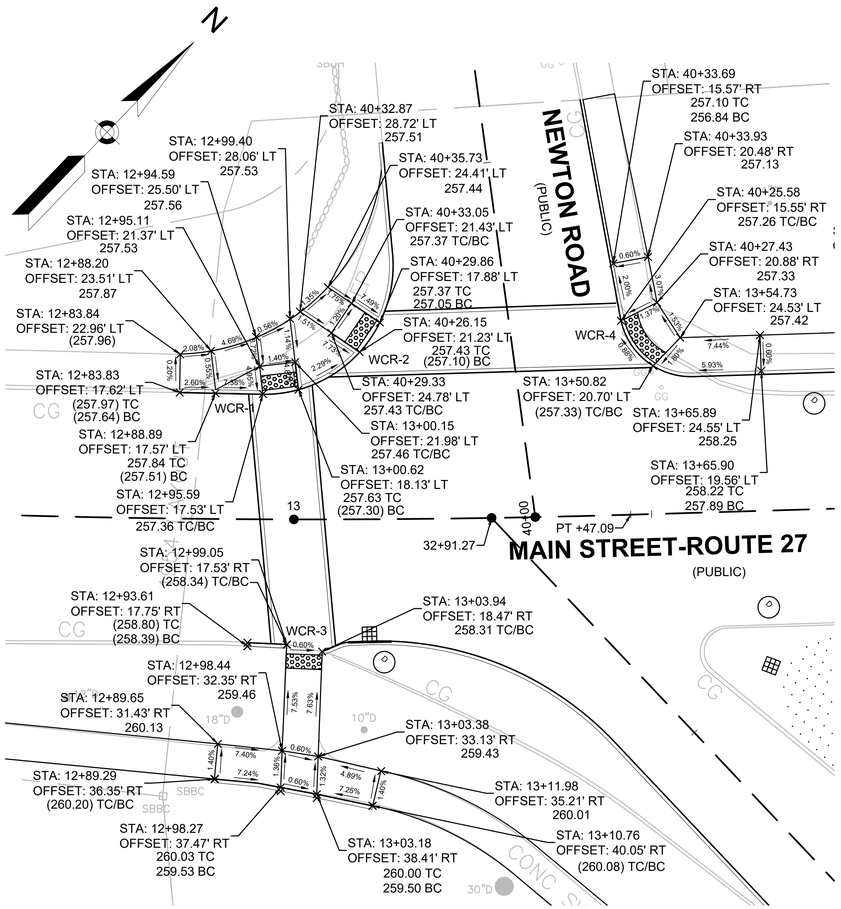
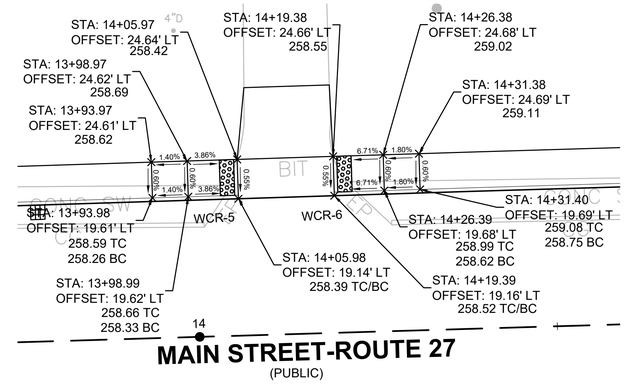
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	62
PROJECT FILE NO.	TOOLE-60143		

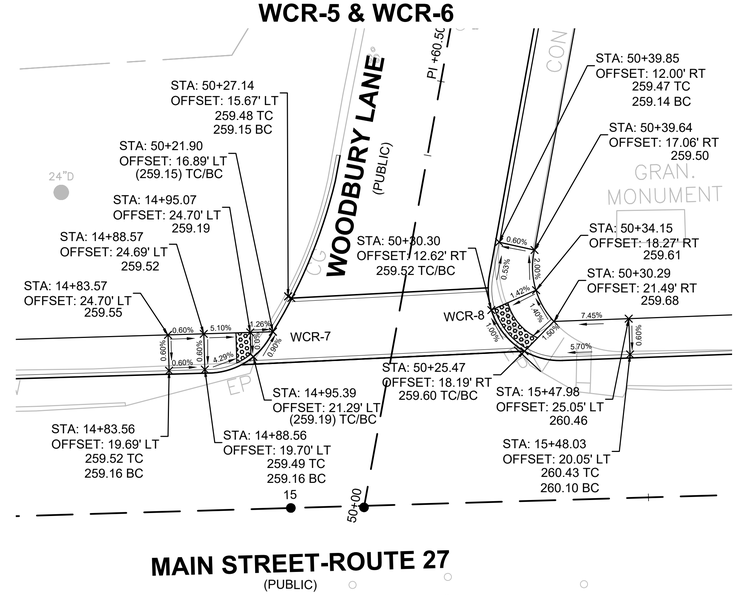
WHEELCHAIR RAMP GRADING DETAILS

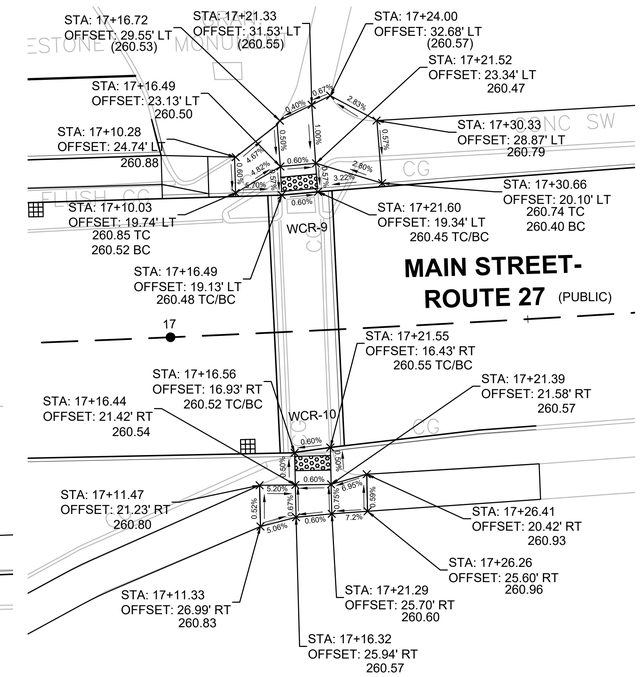


WCR-1 & WCR-2 & WCR-3 & WCR-4

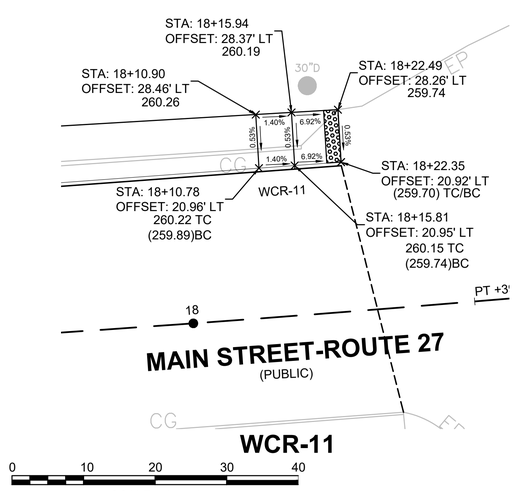


WCR-5 & WCR-6



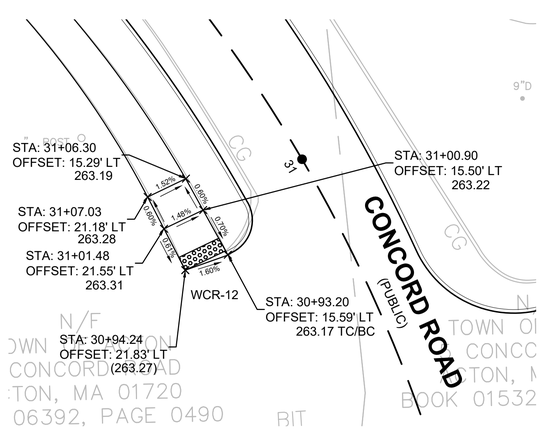


WCR-9 & WCR-10

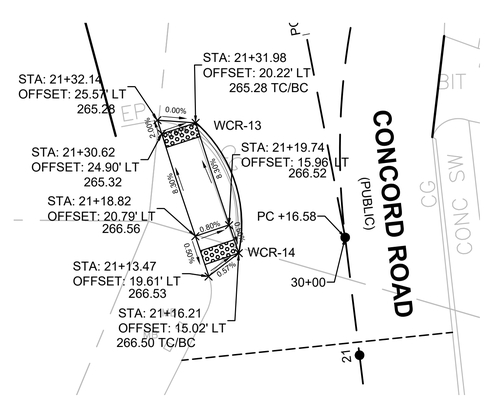


WCR-11

0 10 20 30 40
SCALE: 1" = 10'



WCR-12



WCR-13 & WCR-14

NOTES:

1. MAXIMUM CURB REVEAL TO BE 7".
2. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR OTHER SURFACE STRUCTURES THAT CANNOT BE REMOVED OR RESET IS WITHIN THE PROPOSED OR EXISTING CURB RAMP, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACE/COVER SHALL BE FLUSH WITH THE CURB RAMP SURFACE.
3. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2.0%, INCLUDING, BUT NOT LIMITED TO , TRANSITION RAMP CROSS SLOPE, LEVEL LANDING AND THE PROPOSED RAMP OPENING.
4. A CURB RAMP RUNNING SLOPE SHALL NOT EXCEED 8.3%.
5. PROPOSED ELEVATION AT GUTTER LINE INDICATES CHANGE OF ELEVATION FROM EXISTING ROADWAY IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ADJACENT SAWCUT LINE TO MATCH EXISTING ELEVATION.
6. SEE SHEET 36 FOR CURB RAMP DIMENSIONS AND STATION/OFFSET REFERENCES.

LEGEND:

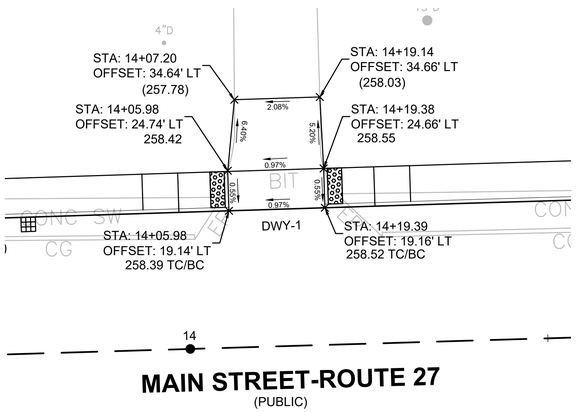
(XX.XX) - EXISTING ELEVATION
XX.XX - PROPOSED ELEVATION
BC - BOTTOM OF CURB
TC - TOP OF CURB
* ±0.5% TOLERANCE FOR CONSTRUCTION
WCR-# - WHEELCHAIR RAMP IDENTIFIER

60143_HD12(WCR-GRADING_PLANS).DWG Plotted on 18-Nov-2021 2:37 PM

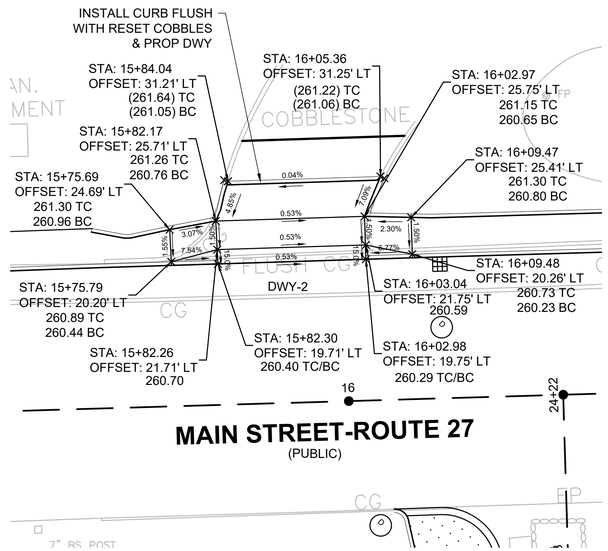
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	62
PROJECT FILE NO.	TOOLE-60143		

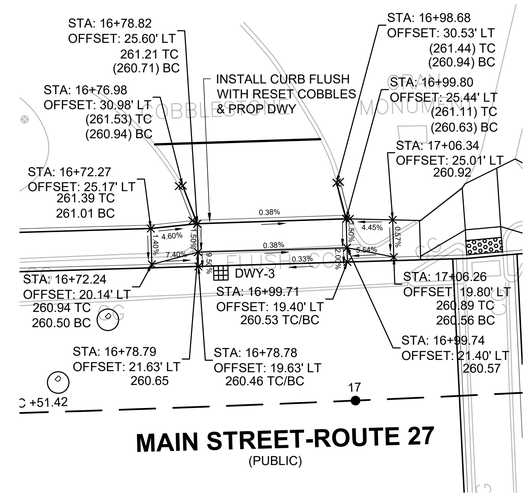
DRIVEWAY GRADING DETAILS



DWY-1



DWY-2



DWY-3

NOTES:

1. MAXIMUM CURB REVEAL TO BE 7".
2. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR OTHER SURFACE STRUCTURES THAT CANNOT BE REMOVED OR RESET IS WITHIN THE PROPOSED OR EXISTING DRIVEWAY, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACE/COVER SHALL BE FLUSH WITH THE DRIVEWAY SURFACE.
3. A DRIVEWAY RUNNING SLOPE SHALL NOT EXCEED 15%*.
4. PROPOSED ELEVATION AT GUTTER LINE INDICATES CHANGE OF ELEVATION FROM EXISTING ROADWAY IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ADJACENT SAWCUT LINE TO MATCH EXISTING ELEVATION.
5. SEE SHEET 37 FOR DRIVEWAY DIMENSIONS AND STATION/OFFSET REFERENCES.

LEGEND:

(XX.XX) - EXISTING ELEVATION
XX.XX - PROPOSED ELEVATION
BC - BOTTOM OF CURB
TC - TOP OF CURB
* - ±0.5% TOLERANCE FOR CONSTRUCTION
DWY-# - DRIVEWAY IDENTIFIER

0 10 20 30 40
SCALE: 1" = 10'

60143_HD12(DWY-GRADING_PLANS).DWG Plotted on 18-Nov-2021 2:38 PM

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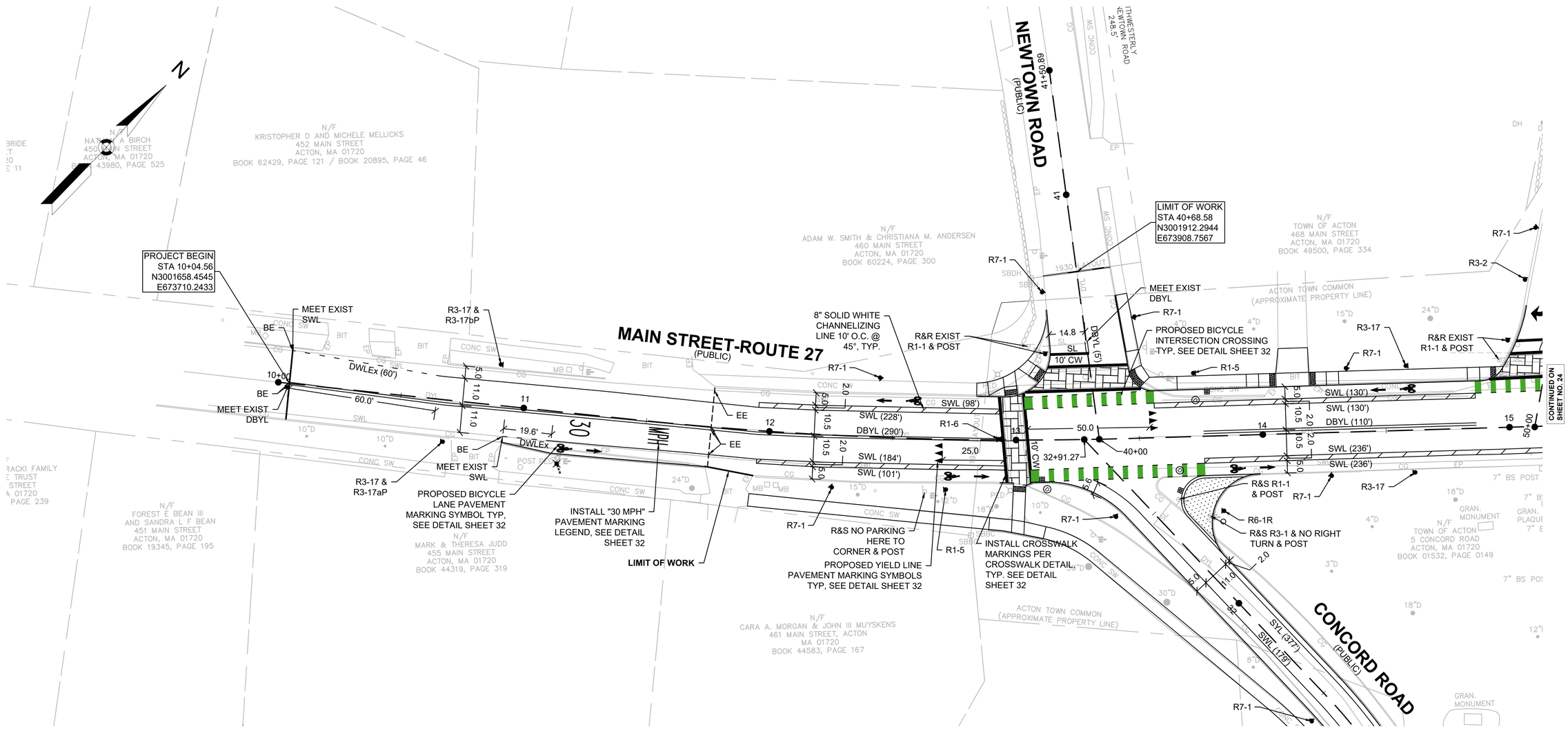
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	62
PROJECT FILE NO.	TOOLE-60143		

TRAFFIC SIGNS & PAVEMENT MARKINGS



0 20 50 100
SCALE: 1" = 20'

NOTES:

1. ALL PAVEMENT MARKINGS WITHIN THE LIMITS OF WORK SHALL BE APPLIED USING MATERIALS LISTED IN ITEM SPECIFICATIONS.
2. ERADICATE ALL CONFLICTING PAVEMENT MARKINGS USING AN APPROVED MASSDOT METHOD.
3. ALL PROP SIGNS OR R&R SIGNS SHALL NOT BE MOUNTED ON UTILITY POLES.
4. SEE SHEET 26 FOR TRAFFIC SIGN SUMMARY.
5. RETAIN ALL EXISTING SIGNS WITHIN THE PROJECT AREA UNLESS OTHERWISE NOTED.

60143_TR1(TRFC_SGN_&_PVMT_MKG).DWG Plotted on 18-Nov-2021 2:38 PM

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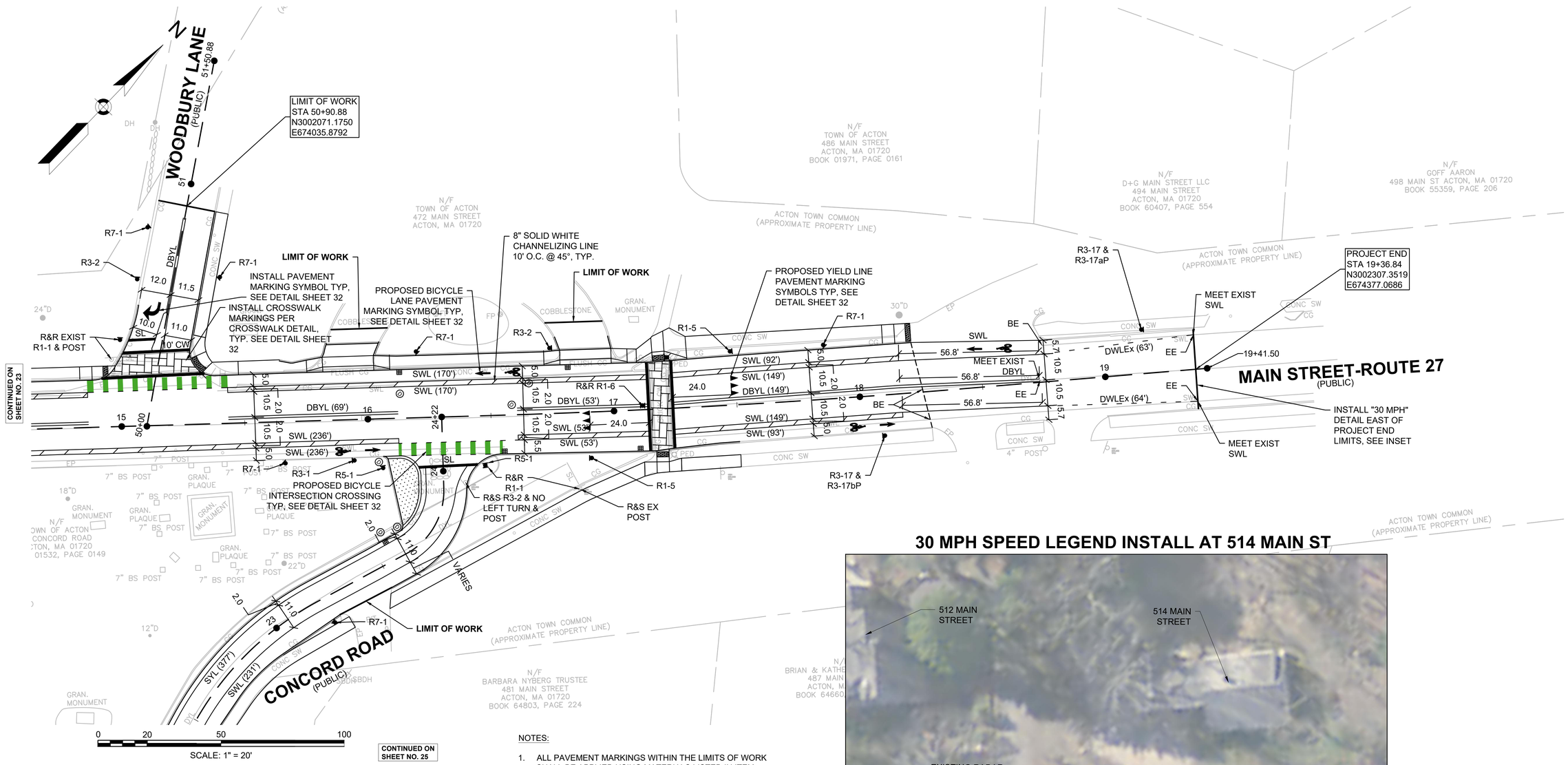
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	62
PROJECT FILE NO.	TOOLE-60143		

TRAFFIC SIGNS & PAVEMENT MARKINGS



NOTES:

1. ALL PAVEMENT MARKINGS WITHIN THE LIMITS OF WORK SHALL BE APPLIED USING MATERIALS LISTED IN ITEM SPECIFICATIONS.
2. ERADICATE ALL CONFLICTING PAVEMENT MARKINGS USING AN APPROVED MASSDOT METHOD.
3. ALL PROP SIGNS OR R&R SIGNS SHALL NOT BE MOUNTED ON UTILITY POLES.
4. SEE SHEET 26 FOR TRAFFIC SIGN SUMMARY.
5. RETAIN ALL EXISTING SIGNS WITHIN THE PROJECT AREA UNLESS OTHERWISE NOTED.

30 MPH SPEED LEGEND INSTALL AT 514 MAIN ST

60143_TR1(TRFC_SGN_&_PVMT_MKG).DWG Plotted on 18-Nov-2021 2:39 PM

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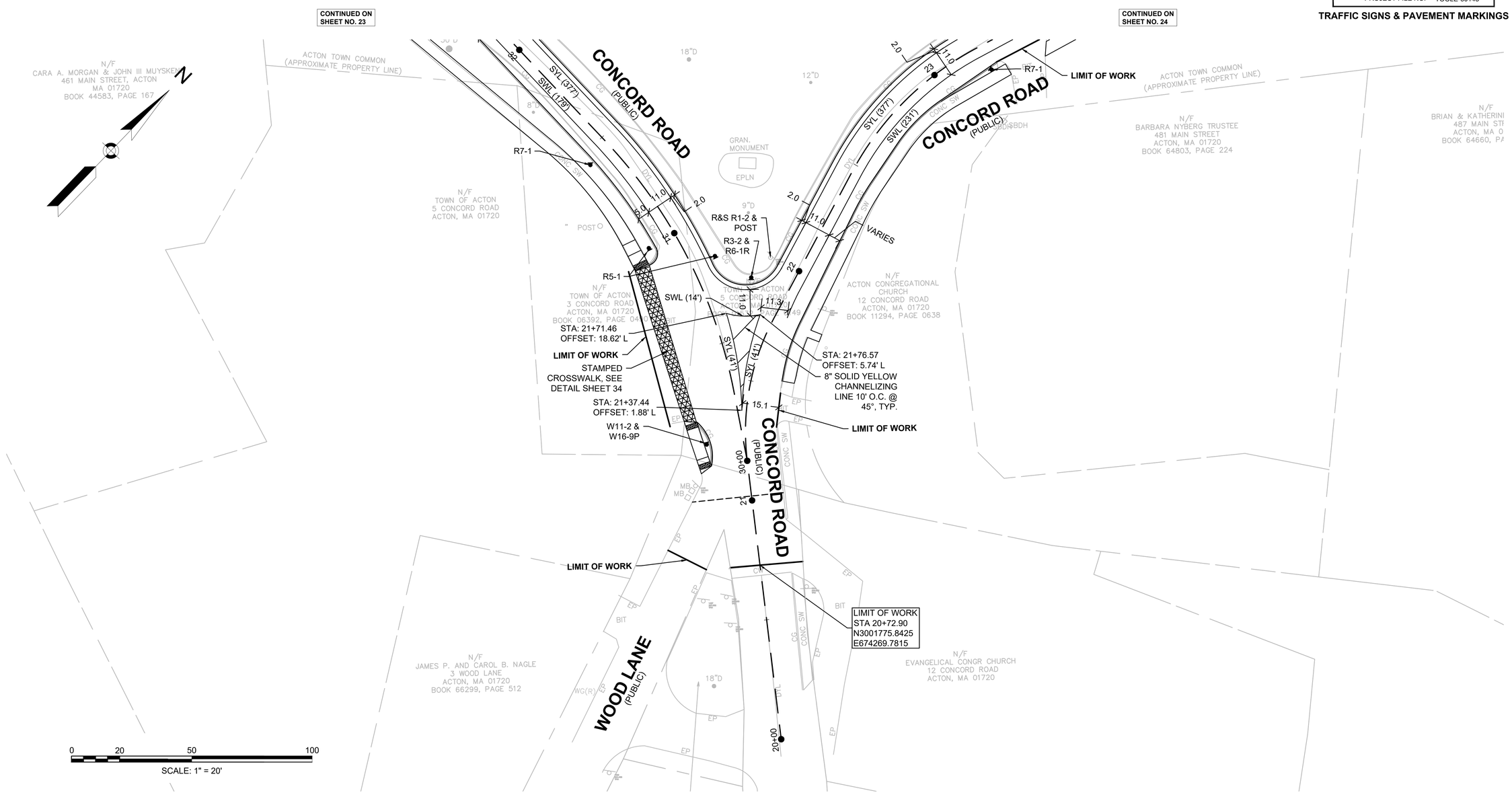
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	62
PROJECT FILE NO.	TOOLE-60143		

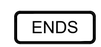
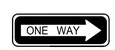
TRAFFIC SIGNS & PAVEMENT MARKINGS



NOTES:

1. ALL PAVEMENT MARKINGS WITHIN THE LIMITS OF WORK SHALL BE APPLIED USING MATERIALS LISTED IN ITEM SPECIFICATIONS.
2. ERADICATE ALL CONFLICTING PAVEMENT MARKINGS USING AN APPROVED MASSDOT METHOD.
3. ALL PROP SIGNS OR R&R SIGNS SHALL NOT BE MOUNTED ON UTILITY POLES.
4. SEE SHEET 26 FOR TRAFFIC SIGN SUMMARY.
5. RETAIN ALL EXISTING SIGNS WITHIN THE PROJECT AREA UNLESS OTHERWISE NOTED.

60143_TR1(TRFC_SGN_&_PVMT_MKG).DWG Plotted on 18-Nov-2021 2:39 PM

ID NUMBER	SIZE OF SIGN (in.)		LEGEND	TEXT DIMENSIONS (in.)			NUMBER OF SIGNS REQUIRED	COLOR*			POST SIZE AND NUMBER REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACKGROUND	LEGEND	BORDER			
R1-5	18	18		SEE MUTCD STANDARD DETAIL			4	WHITE	BLACK	BLACK	P-5 4 REQ'D	2.25	9.00
R1-6	12	36					2	WHITE	BLACK	BLACK	MOUNT ON FLEXPOST	3.00	6.00
R3-1	24	24					1	WHITE	BLACK	BLACK	P-5 1 REQ'D	4.00	4.00
R3-2	24	24					3	WHITE	BLACK	BLACK	P-5 3 REQ'D	4.00	12.00
R3-17	30	24					6	BLACK	BLACK	WHITE	P-5 6 REQ'D	5.00	30.00
R3-17aP	30	12					2	WHITE	BLACK	BLACK	MOUNT W/ R3-17	2.5	5.0
R3-17bP	30	12					2	WHITE	BLACK	BLACK	MOUNT W/ R3-17	2.5	5.0
R5-1	30	30					4	RED	WHITE	WHITE	P-5 4 REQ'D	6.25	25
R6-1R	36	12					2	BLACK	BLACK	WHITE	P-5 1 REQ'D & MOUNT 1 W/ R3-2	3.00	6.00
R7-1	12	18					14	WHITE	RED	RED	P-5 14 REQ'D	1.50	21.00
W11-2	24	24					1	FYG	BLACK	BLACK	P-5 1 REQ'D	4.00	4.00
W16-9P	24	12					1	FYG	BLACK	BLACK	MOUNT W/W11-2	2.00	2.00

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	62
PROJECT FILE NO.	TOOLE-60143		

TRAFFIC SIGN SUMMARY SHEET

60143_TR1(TRFC_SGN_&_PVMT_MKG).DWG Plotted on 18-Nov-2021 2:39 PM

60143_TR5(TTCP).DWG Plotted on 18-Nov-2021 2:39 PM

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN (in) WIDTH	SIZE OF SIGN (in) HEIGHT	LEGEND	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	UNIT AREA (SF)	TOTAL AREA (SF)
MA-R2-10a	48	36	WORK ZONE SPEEDING FINES DOUBLED	MASSDOT STANDARD SIGN			6	FL. ORANGE-WHITE	BLACK BLACK	BLACK BLACK	12.00	72.00
MA-R2-10e	36	48	END ROAD WORK DOUBLE FINES END				6	FL. ORANGE-WHITE	BLACK BLACK	BLACK BLACK	12.00	72.00
R9-9	30	18	SIDEWALK CLOSED	SEE 2009 MUTCD FOR DIMENSIONS			4	WHITE	BLACK	BLACK	3.75	15.00
R9-11aL	24	12	SIDEWALK CLOSED CROSS HERE				2	WHITE	BLACK	BLACK	2.00	4.00
R9-11aR	24	12	SIDEWALK CLOSED CROSS HERE				2	WHITE	BLACK	BLACK	2.00	4.00
W1-4L	36	36					2	FL. ORANGE	BLACK	BLACK	9.00	18.00
W1-4R	36	36					2	FL. ORANGE	BLACK	BLACK	9.00	18.00
W5-1	36	36	ROAD NARROWS				2	FL. ORANGE	BLACK	BLACK	9.00	18.00
W11-2	30	30					4	FYG	BLACK	BLACK	6.25	25.00
W16-7pL	24	12					4	FYG	BLACK	BLACK	2.00	8.00
W20-1	36	36	ROAD WORK				4	FL. ORANGE	BLACK	BLACK	9.00	36.00
W20-4	36	36	ONE LANE ROAD AHEAD				4	FL. ORANGE	BLACK	BLACK	9.00	36.00
W20-7a	36	36					4	FL. ORANGE	BLACK	BLACK	9.00	36.00
W21-5a	36	36	RIGHT SHOULDER CLOSED				4	FL. ORANGE	BLACK	BLACK	9.00	36.00
MA-W20-7b	36	36	POLICE OFFICER AHEAD	MASSDOT STANDARD SIGN			4	FL. ORANGE	BLACK	BLACK	9.00	36.00

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 WITH THE MUTCD.
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 OR TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SE 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 FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A 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.

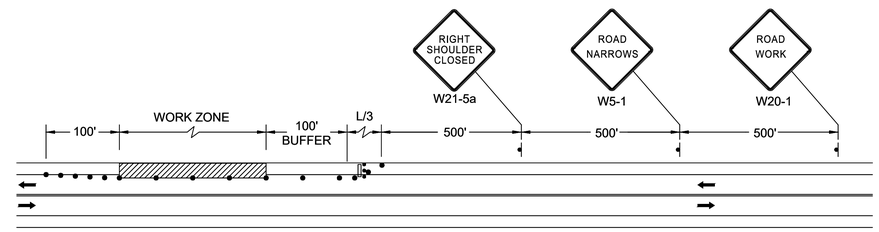
FORMULAS FOR DETERMINING TAPER LENGTHS

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

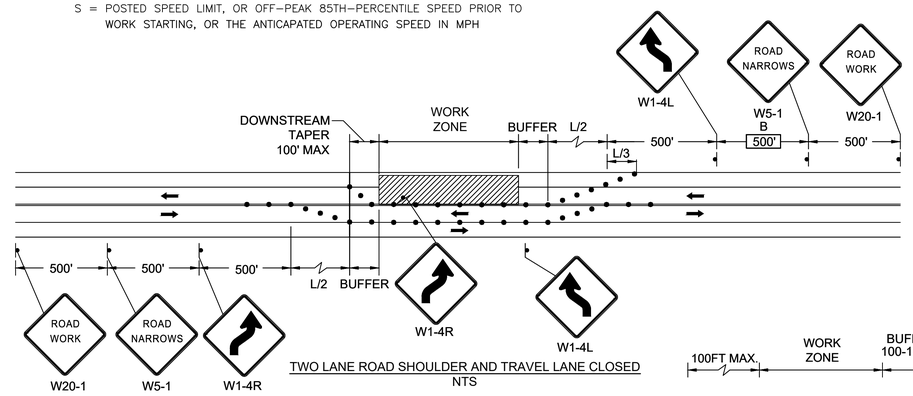
WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

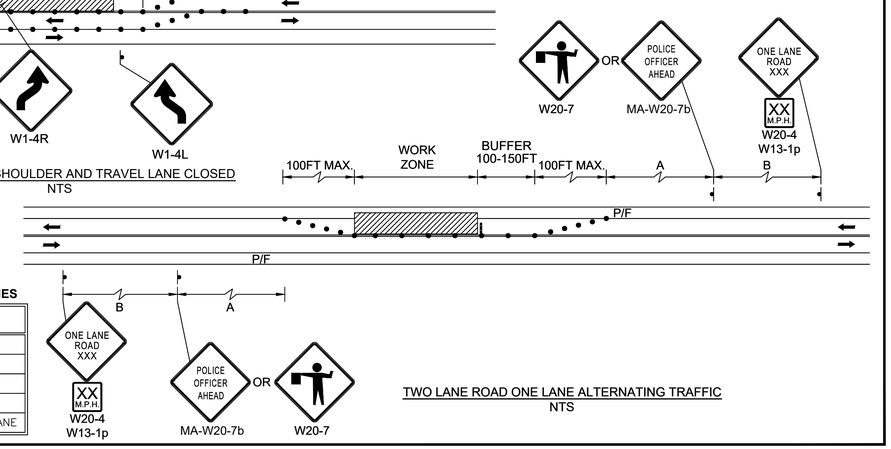
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICAPATED OPERATING SPEED IN MPH



TWO LANE ROAD SHOULDER CLOSED
NTS



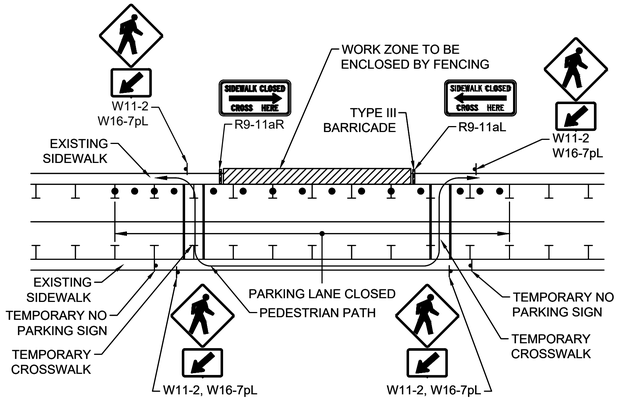
TWO LANE ROAD SHOULDER AND TRAVEL LANE CLOSED
NTS



TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC
NTS

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

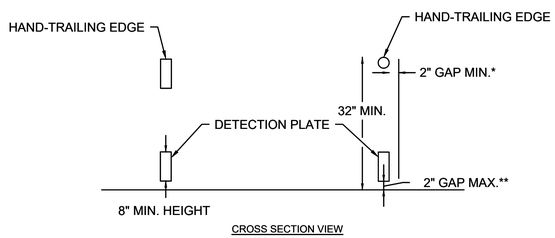
TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE



PEDESTRIAN BYPASS
NTS

PEDESTRIAN BYPASS NOTES:

1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN. VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHOULD BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER. TEMPORARY CURB RAMPS WILL BE REQUIRED AT ALL TEMPORARY CROSSWALK LOCATIONS.
5. BYPASS IS TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DIRECTED BY THE ENGINEER.
6. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THIS WALKWAY EXCEEDS 200 FEET THEN A 5 FOOT X 5 FOOT PASSING ZONE. (FOR SHORT TERM SETUPS < 10 HOURS, THIS CONDITION MAY BE WAIVED. A NOTE WOULD NEED TO BE INCLUDED IN THE TTCP THAT STATES HOW THE CONTRACTOR SHOULD ADDRESS THIS ISSUE.)

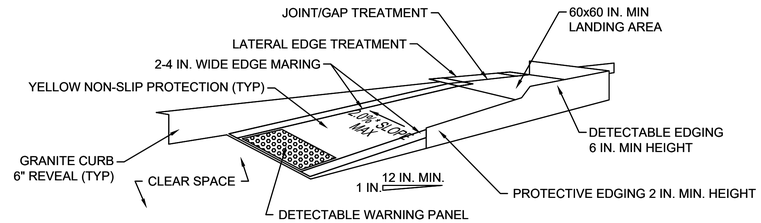


PEDESTRIAN CHANNELIZING DEVICE

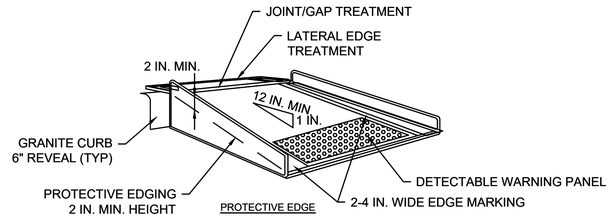
NOTES:

* 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.



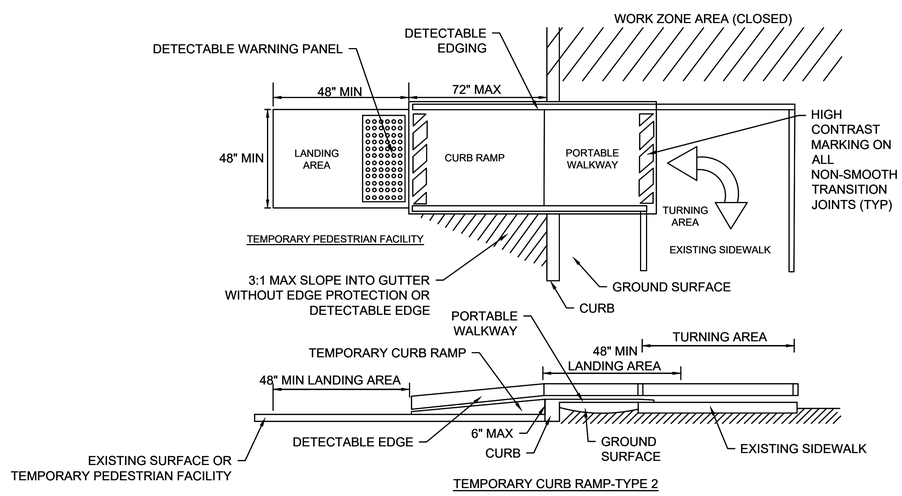
TEMPORARY CURB RAMP-PARALLEL TO CURB
NTS



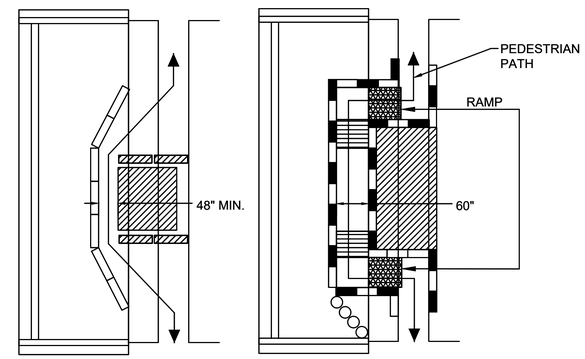
TEMPORARY CURB RAMP-PERPENDICULAR TO CURB
NTS

TEMPORARY CURB RAMP 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. THE CURB RAMP WALKING AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
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.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERE TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED.



TEMPORARY CURB RAMP-TYPE 2



PEDESTRIAN BYPASS
NTS

PEDESTRIAN NOTES:

1. DETAIL I IS CONSIDERED AN EXAMPLE OF A SHORT TERM CLOSURE AND PEDESTRIAN ASSISTANCE (PERSONNEL) TO NAVIGATE AROUND THE CLOSURE/WORK AREA COULD BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES. DETAIL II IS CONSIDERED AN EXAMPLE OF A LONG TERM CLOSURE THAT WOULD REQUIRE ADDITIONAL ADA/AAB COMPLIANT DEVICES. IF A SIDEWALK CLOSURE OR RESTRICTION LASTS FOR ,MORE THAN ONE (1) WORK SHIFT THEN ADA/AAB COMPLIANCE SHALL BE FOLLOWED.
2. WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSE, 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.
3. A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LON CANE SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
4. WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
5. THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
6. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET LONG THEN A 5-FOOT BY 5-FOOT PASSING ZONE SHALL BE PROVIDED.
7. THE PROTECTIVE REQUIREMENT 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.
8. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTION WITH THE PROPOSE LAND CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY AN ENGINEER.
9. 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.
10. EXISTING AUDIBLE DEVICES NO LONGER APPLICABLE DUE TO CONSTRUCTION SHALL BE DISABLED.

AUDIBLE DEVICES:

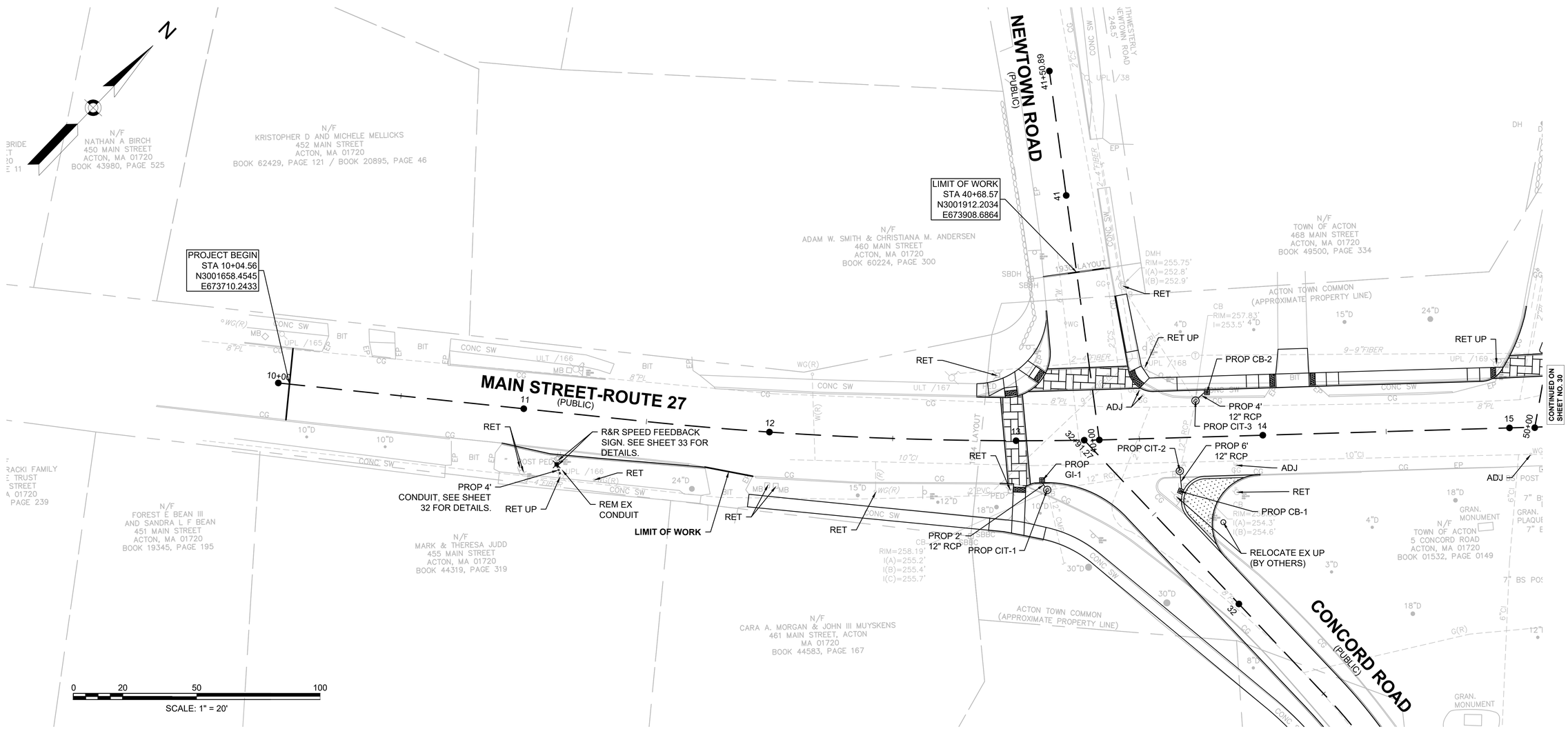
FOR LONG TERM SIDEWALK CLOSURES (AT A MINIMUM OVERNIGHT) A FORM OF SPEECH MESSAGING FOR PEDESTRIANS WITH VISUAL DISABILITIES SHALL BE PROVIDED. AUDIBLE INFORMATION DEVICES SUCH AS DETECTABLE BARRIERS OR BARRICADES AND OTHER PASSIVE PEDESTRIAN ACTIVATION (MOTION ACTIVATED) DEVICES SHOULD BE CONSIDERED FOR THESE CASES. THESE AUDIBLE DEVICES CAN BE MOUNTABLE OR STANDALONE.

60143_TR5(TTCP).DWG Plotted on 18-Nov-2021 2:39 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	29	62
PROJECT FILE NO.	TOOLE-60143		

DRAINAGE & UTILITY PLAN



UTILITY NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL CONTACT DIGSAFE (811 OR 1-888-DIG-SAFE) 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.

2. 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.

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

4. THE CONTRACTOR SHALL CLEAN ALL EXISTING DRAINAGE STRUCTURES AND PIPES THAT ARE BEING REMODELED, ADJUSTED, OR CONNECTED TO ON THE PLANS AND SHALL COORDINATE AND CONTACT THE ACTON DEPARTMENT OF PUBLIC WORKS PRIOR.

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

7. 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.

LEGEND:

SWCB-# STRAIGHT-WALLED CATCH BASIN IDENTIFIER

DRAINAGE DATA TABLE

STR ID	ALIGNMENT	STA & OFFSET	RIM ELEVATION	INV DATA (INV STR)
GI-1	MAIN STREET	13+10.52 16.02' RT	258.25	I(out)=255.75 (CIT-1)
CIT-1	MAIN STREET	13+12.49 19.99' RT	258.53	I(in)=255.53 (GI-1)
CIT-2	MAIN STREET	13+65.97 13.50' RT	258.55	I(in)=254.40 (CB-1)
CB-1	MAIN STREET	13+66.07 21.52' RT	258.55	I(out)=254.48 (CIT-2)
CIT-3	MAIN STREET	13+73.23 14.75' LT	257.91	I(in)=254.02 (CB-2)
CB-2	MAIN STREET	13+78.14 18.26' LT	258.06	I(out)=254.06 (CIT-3)

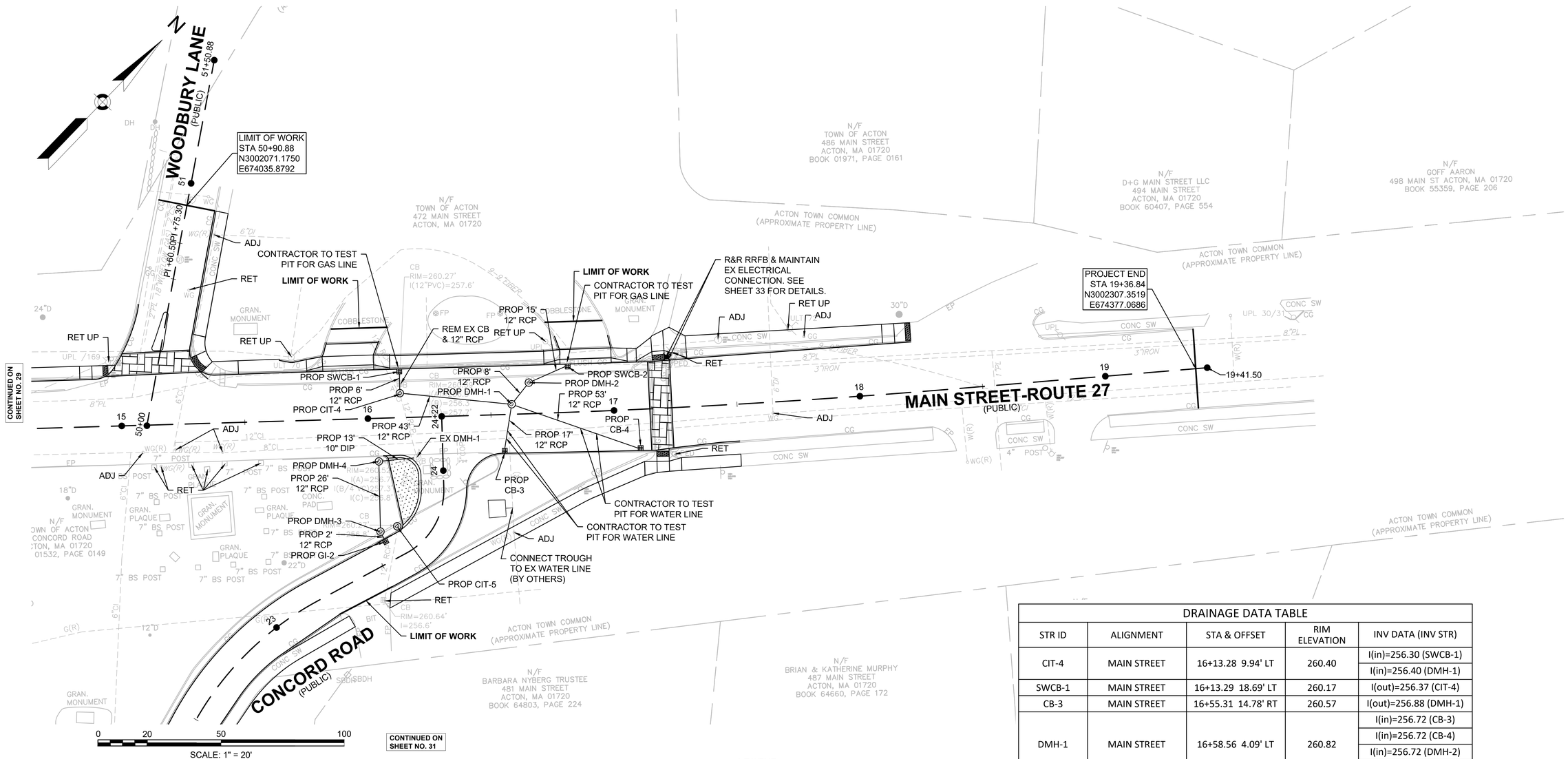
Plotted on 18-Nov-2021 2:40 PM

60143_HD11(DRAINAGE & UTILITY_PLAN).DWG

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	30	62
PROJECT FILE NO.	TOOLE-60143		

DRAINAGE & UTILITY PLAN



LEGEND:

SWCB-# STRAIGHT-WALLED CATCH BASIN IDENTIFIER

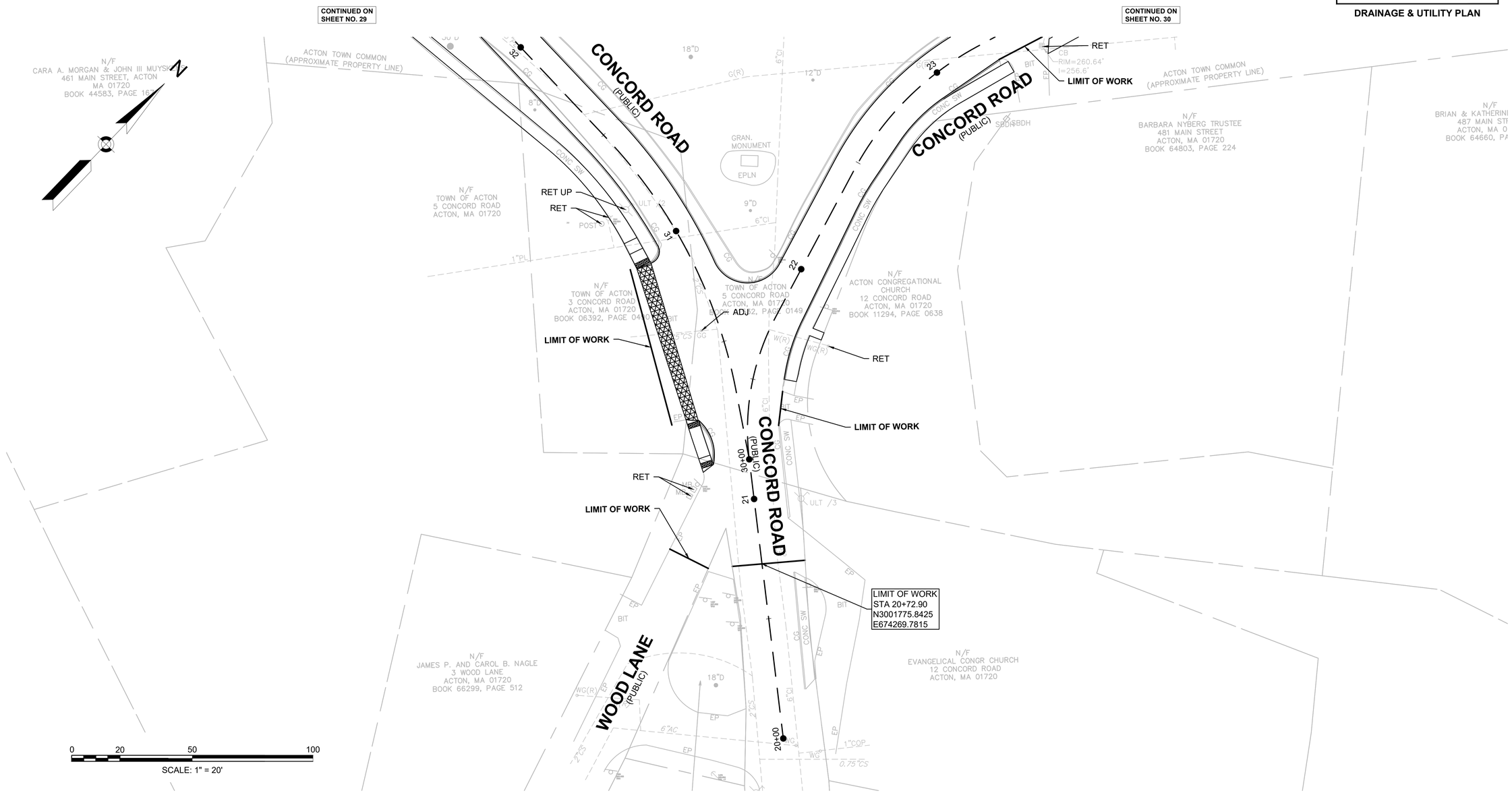
DRAINAGE DATA TABLE				
STR ID	ALIGNMENT	STA & OFFSET	RIM ELEVATION	INV DATA (INV STR)
CIT-4	MAIN STREET	16+13.28 9.94' LT	260.40	I(in)=256.30 (SWCB-1)
				I(in)=256.40 (DMH-1)
SWCB-1	MAIN STREET	16+13.29 18.69' LT	260.17	I(out)=256.37 (CIT-4)
CB-3	MAIN STREET	16+55.31 14.78' RT	260.57	I(out)=256.88 (DMH-1)
DMH-1	MAIN STREET	16+58.56 4.09' LT	260.82	I(in)=256.72 (CB-3)
				I(in)=256.72 (CB-4)
				I(in)=256.72 (DMH-2)
				I(out)=256.62 (CIT-4)
DMH-2	MAIN STREET	16+65.79 12.63' LT	260.67	I(in)=256.86 (SWCB-2)
				I(out)=256.76 (DMH-1)
SWCB-2	MAIN STREET	16+81.89 18.59' LT	260.44	I(out)=256.94 (DMH-2)
CB-4	MAIN STREET	17+10.09 15.73' RT	260.49	I(out)=256.99 (DMH-1)
GI-2	CONCORD ROAD	23+55.53 7.91' LT	260.55	I(out)=258.05 (DMH-3)
DMH-3	CONCORD ROAD	23+55.60 12.66' LT	260.85	I(in)=257.89 (GI-2)
				I(out)=257.35 (DMH-4)
CIT-5	CONCORD ROAD	23+63.82 11.07' LT	261.01	NO NEW INVERTS
DMH-4	CONCORD ROAD	24+04.50 26.04' LT	260.68	I(in)=257.09 (DMH-3)
				I(out)=256.99 (EX DMH-1)
EX DMH-1	CONCORD ROAD	24+05.47 10.31' LT	260.62	I(in)=256.80 (DMH-4)

Plotted on 18-Nov-2021 2:40 PM
60143_HD11(DRAINAGE & UTILITY_PLAN).DWG

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	62
PROJECT FILE NO.	TOOLE-60143		

DRAINAGE & UTILITY PLAN



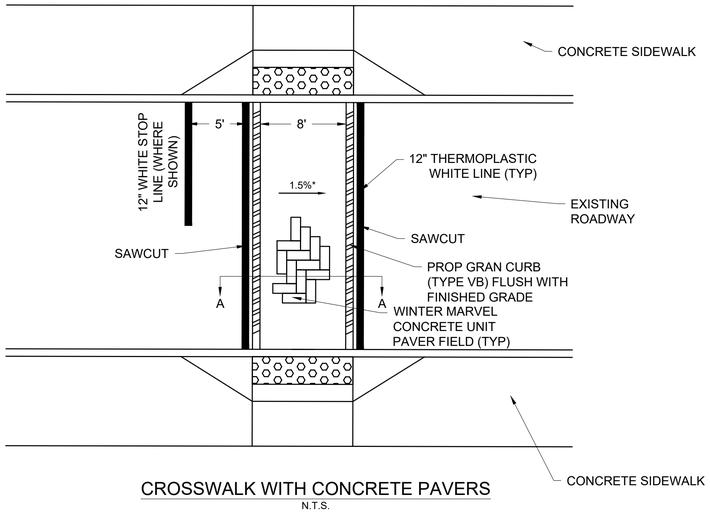
LEGEND:

SWCB-# STRAIGHT-WALLED CATCH BASIN IDENTIFIER

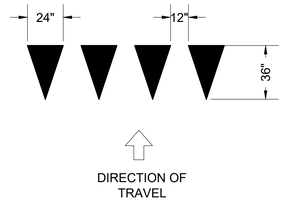
Plotted on 18-Nov-2021 2:40 PM

60143_HD11(DRAINAGE & UTILITY_PLAN).DWG

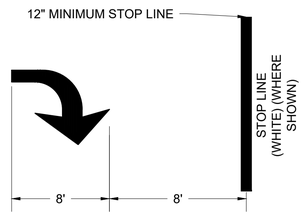
60143_HD9(CONST_DETL).DWG Plotted on 18-Nov-2021 2:40 PM



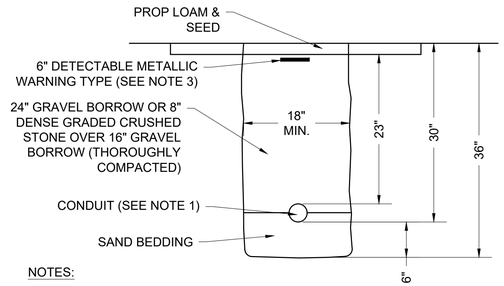
CROSSWALK WITH CONCRETE PAVERS
N.T.S.



YIELD LINE PAVEMENT MARKING SYMBOLS
N.T.S.



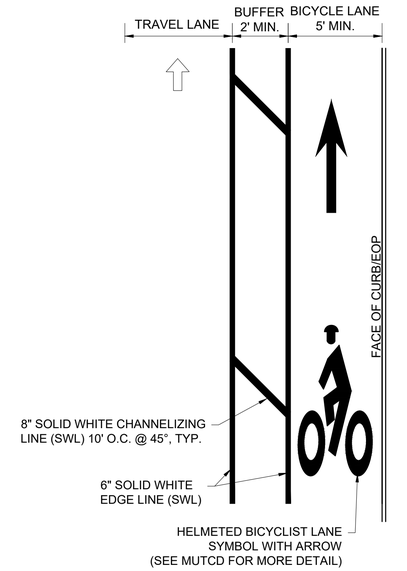
PAVEMENT MARKING ARROW AND STOP LINE PLACEMENT
N.T.S.



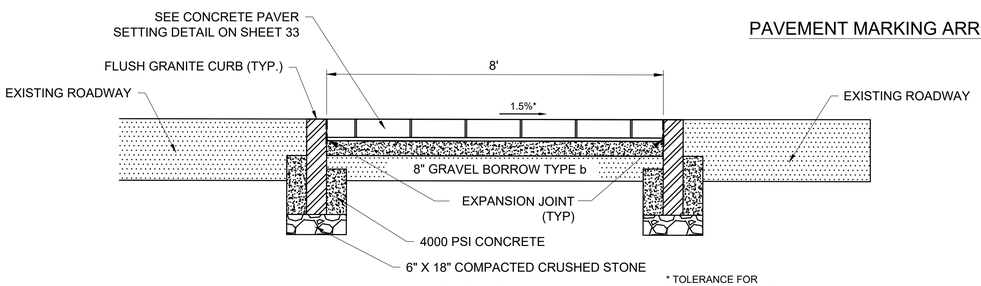
NOTES:

1. SCHEDULE 80 ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL), WITH PULL ROPE, UNLESS OTHERWISE APPROVED BY MASSDOT.
2. WARNING TAPE COLOR SHALL BE PER APWA STANDARDS.
3. LOAM & SEED SHALL BE PAID FOR UNDER ITEM 751 & ITEM 765 .

CONDUIT TRENCH DETAIL
NOT TO SCALE

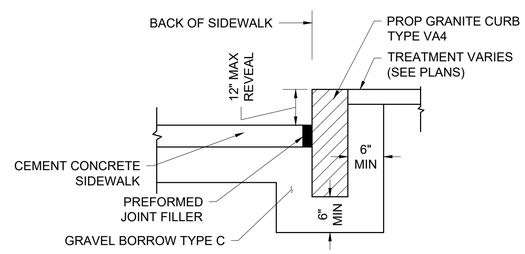


BICYCLE LANE PAVEMENT MARKING SYMBOL
NOT TO SCALE

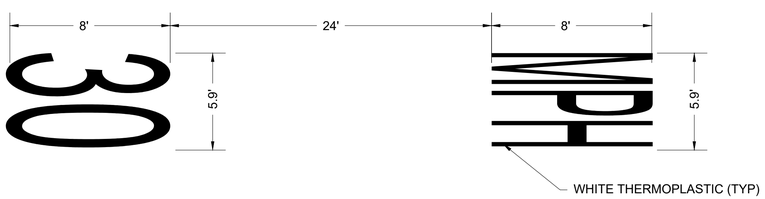


SECTION A-A

* TOLERANCE FOR CONSTRUCTION ±0.5%



GRANITE CURB AT BACK OF SIDEWALK
N.T.S.

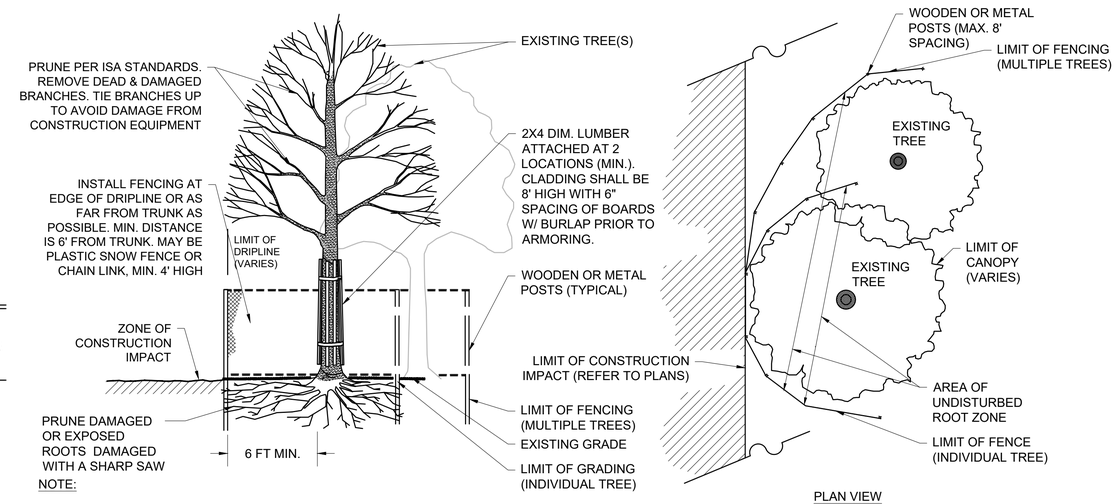


"30 MPH" PAVEMENT MARKING LEGEND
N.T.S.

INTERSECTION TREATMENT NOTES:

1. INSTALL HIGH FRICTION GREEN COLORED PAVEMENT BETWEEN 2' DOTTED WHITE LANE LINES AS SHOWN ON PLANS.
2. INSTALL HIGH FRICTION GREEN COLORED PAVEMENT SO THAT CROSSWALK MARKINGS ARE NOT DISTURBED.
3. TRAVEL LANE WIDTHS ARE AS SHOWN ON PLANS.

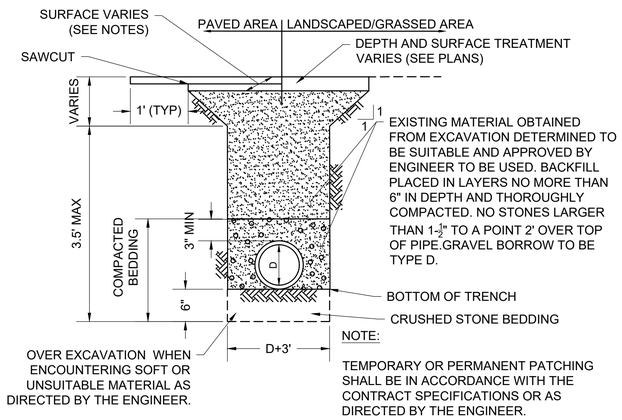
BICYCLE INTERSECTION CROSSING
NOT TO SCALE



NOTE:

NO STORAGE OF EQUIPMENT OR STOCKPILING OF MATERIALS WITHIN DRIPLINE OF THE TREE IS ALLOWED.

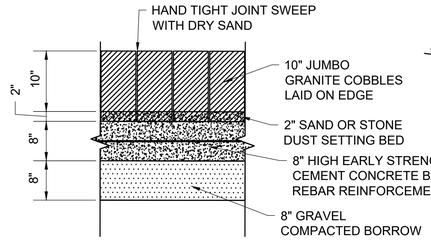
TREE PROTECTION - EXISTING TREE
N.T.S.



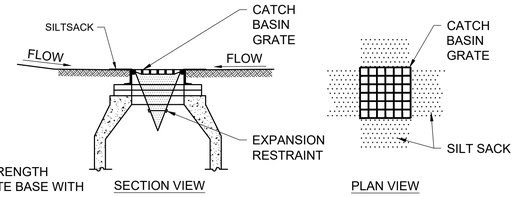
NOTE:

TEMPORARY OR PERMANENT PATCHING SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.

DRAINAGE TRENCH
N.T.S.



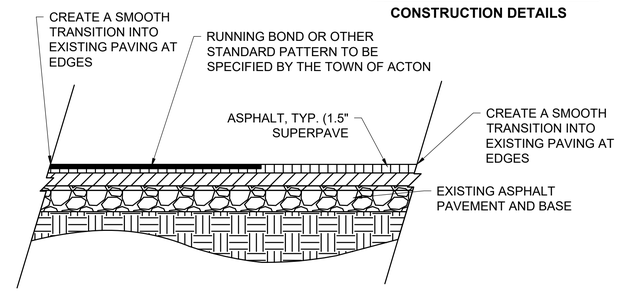
COBBLE SETTING
N.T.S.



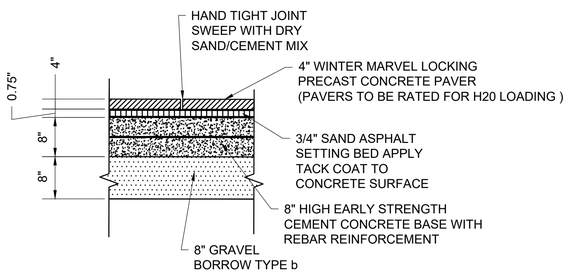
NOTES:

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. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

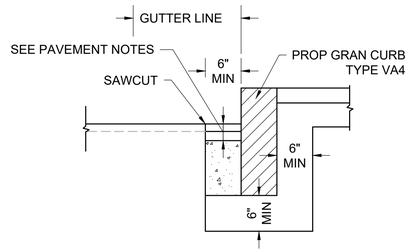
INLET PROTECTION SILT SACK IN CATCH BASIN
N.T.S.



STAMPED CROSSWALK DETAIL
N.T.S.



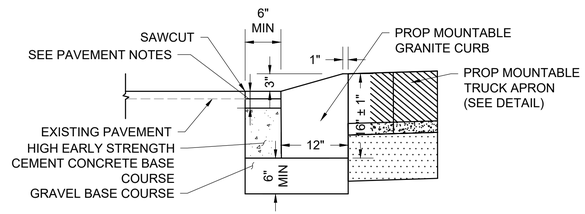
CONCRETE PAVER SETTING DETAIL
N.T.S.



* CONCRETE SHALL BE INCLUDED IN PRICE BID FOR VARIOUS GRANITE CURB ITEMS FOR 6" OFFSET FROM FACE OF CURB.

NOTE: ADDITIONAL CONCRETE SUPPORT SHALL BE PROVIDED FOR STABILITY OF GRANITE CURB.

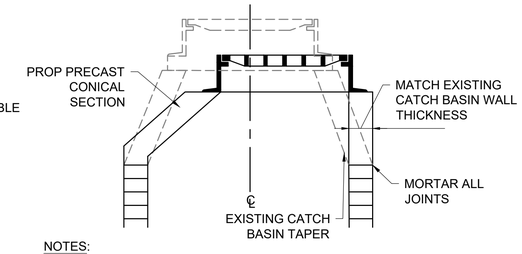
GRANITE CURB IN EXISTING PAVEMENT
N.T.S.



* CONCRETE SHALL BE INCLUDED IN PRICE BID FOR VARIOUS GRANITE CURB ITEMS FOR 6" OFFSET FROM FACE OF CURB.

NOTE: ADDITIONAL CONCRETE SUPPORT SHALL BE PROVIDED FOR STABILITY OF GRANITE CURB.

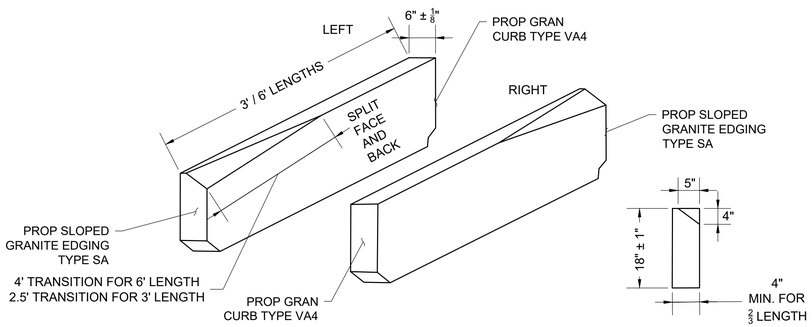
MOUNTABLE GRANITE CURB
N.T.S.



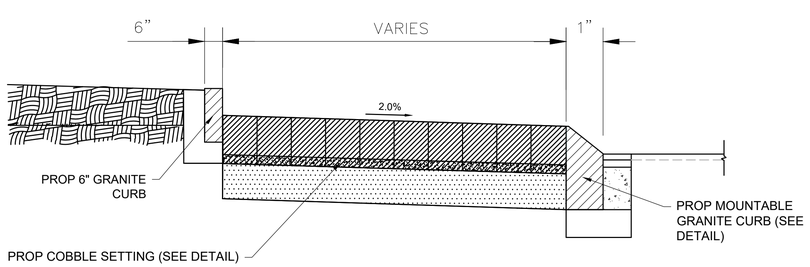
NOTES:

1. FRAME AND GRATE SHALL BE RATED FOR HL-93 LOADING.
2. MIN FRAME WEIGHT:
   4 FLANGE - 295 LB
   3 FLANGE - 264 LB

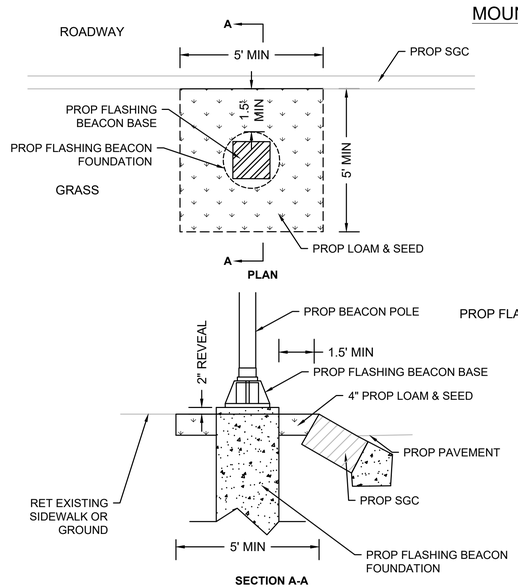
CATCH BASIN REMODEL
N.T.S.



6" X 18" SLOPED EDGING TO VERTICAL CURB TRANSITION STRAIGHT
NOT TO SCALE



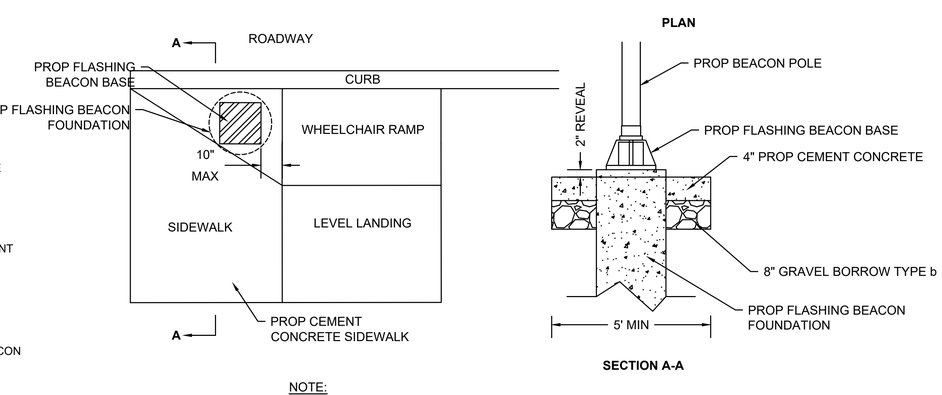
MOUNTABLE TRUCK APRON
N.T.S.



NOTE:

ELECTRICAL WIRING NOT SHOWN FOR CLARITY

RADAR SPEED FEEDBACK SIGN INSTALLATION DETAIL
NOT TO SCALE



NOTE:

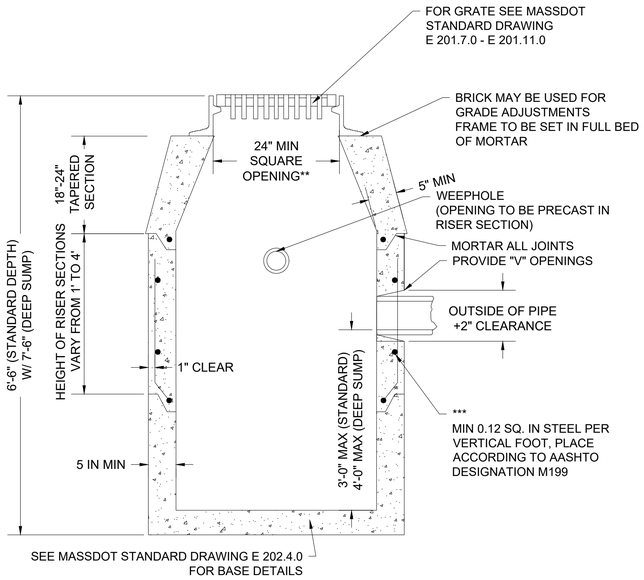
ELECTRICAL WIRING NOT SHOWN FOR CLARITY

FLASHING BEACON INSTALLATION DETAIL
NOT TO SCALE

60143_HD9(CONST_DETL).DWG Plotted on 18-Nov-2021 2:45 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	62
PROJECT FILE NO.	TOOLE-60143		



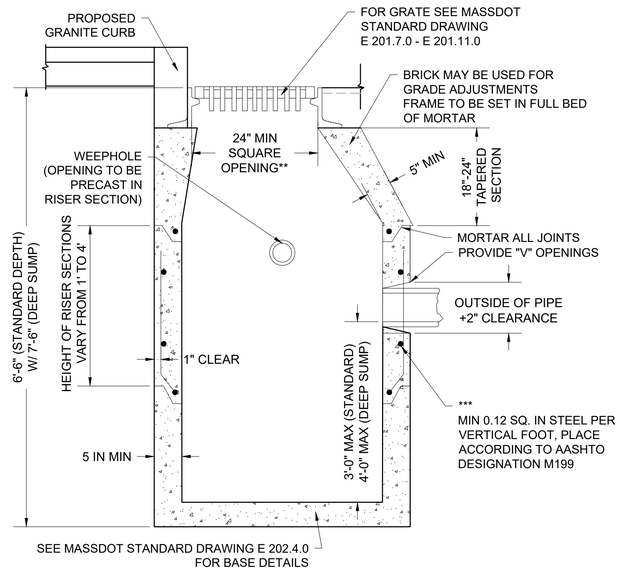
PRECAST CONCRETE CATCH BASIN (MASSDOT STD DWG E 201.4.0)

N.T.S.

* MINIMUM DEPTH OF SUMP TO BE 2 FT
** WHEN A CURB INLET IS INSTALLED, THE OPENING IS TO BE 24"±1"X27"±1"
*** REINFORCING STEEL BASED ON A WALL THICKNESS OF 5"

NOTES:

1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON E 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE
3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD SPECIFICATIONS.
4. ALL CONCRETE TO BE AIR ENTRAINED.



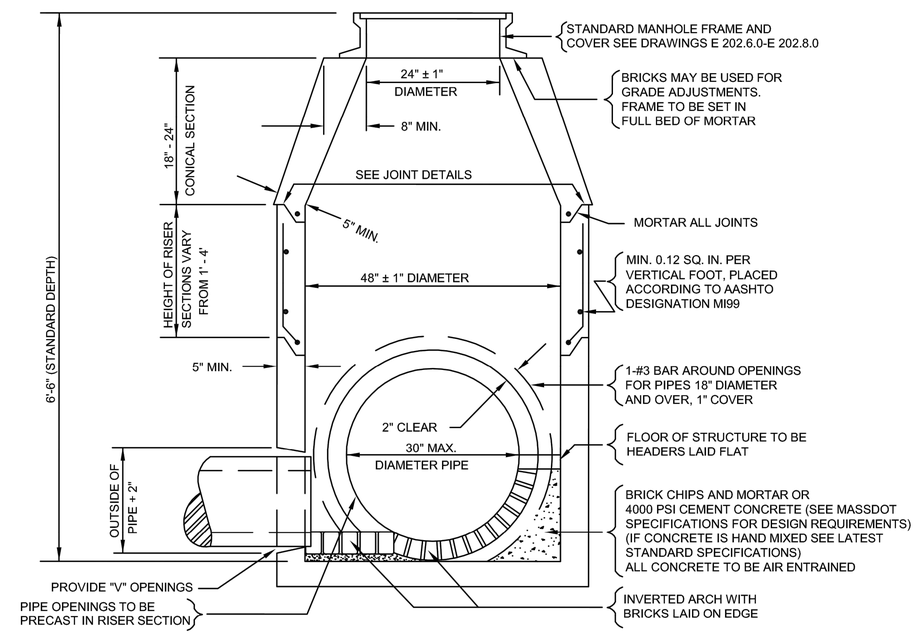
PRECAST STRIAGHT-WALLED CONCRETE CATCH BASIN

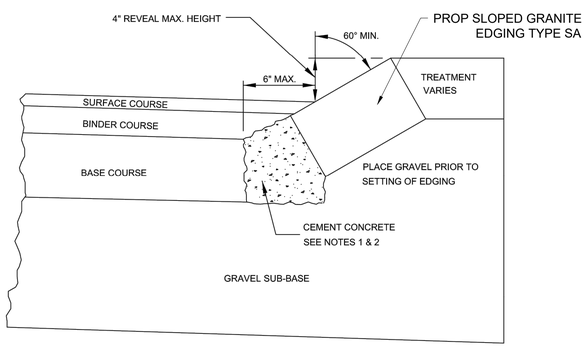
N.T.S.

* MINIMUM DEPTH OF SUMP TO BE 2 FT
** WHEN A CURB INLET IS INSTALLED, THE OPENING IS TO BE 24"±1"X27"±1"
*** REINFORCING STEEL BASED ON A WALL THICKNESS OF 5"

NOTES:

1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON E 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE
3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD SPECIFICATIONS.
4. ALL CONCRETE TO BE AIR ENTRAINED.



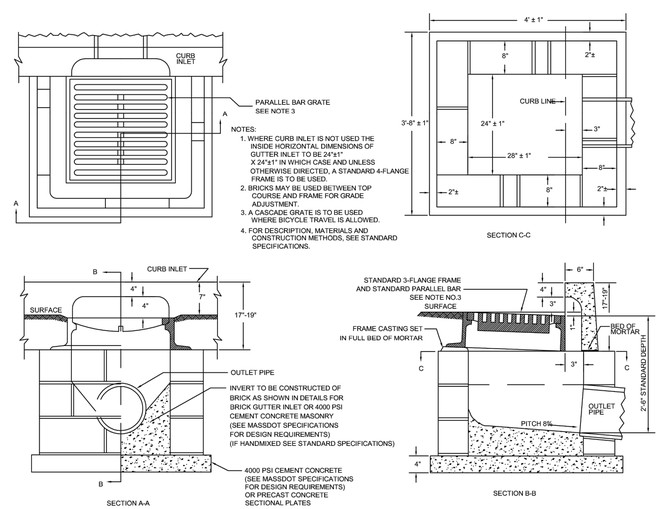


SLOPED GRANITE CURB

N.T.S.

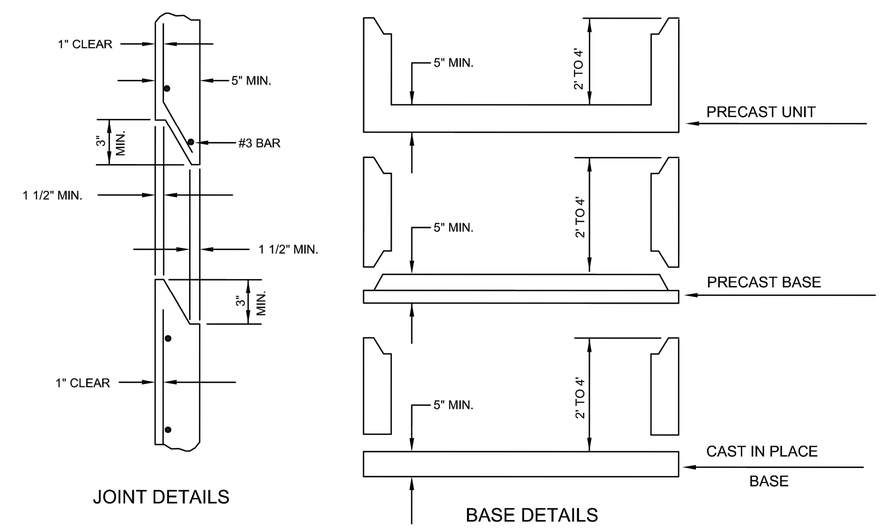
NOTES:

1. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE TO THE DEPARTMENT UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS; ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT TO BE USED AS A SUBSTITUTE.
2. THE REVEAL IS TO BE A MAXIMUM OF 4" UNDER ALL CONDITIONS, THE ANGLE IS TO BE A MINIMUM OF 60° FROM VERTICAL UNDER ALL CONDITIONS.



GUTTER INLET DETAIL

N.T.S.



NOTE:

1. FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHODS, SEE LATEST STANDARD SPECIFICATIONS.

PRECASET CONCETE MANHOLE 9' OR LESS IN DEPTH

MASSDOT STD DWG E 202.4.0

60143_HD9(CONST_DETL).DWG Plotted on 18-Nov-2021 2:41 PM

ACTON
ACTON TOWN CENTER

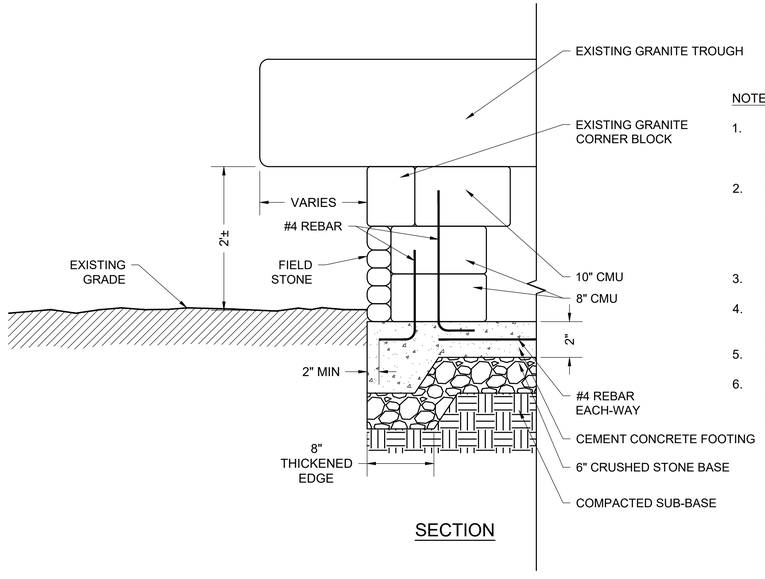
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	62
PROJECT FILE NO.	TOOLE-60143		

GRANITE TROUGH EAST VIEW
NOT TO SCALE

GRANITE TROUGH SOUTH VIEW
NOT TO SCALE

GRANITE TROUGH NORTH VIEW
NOT TO SCALE

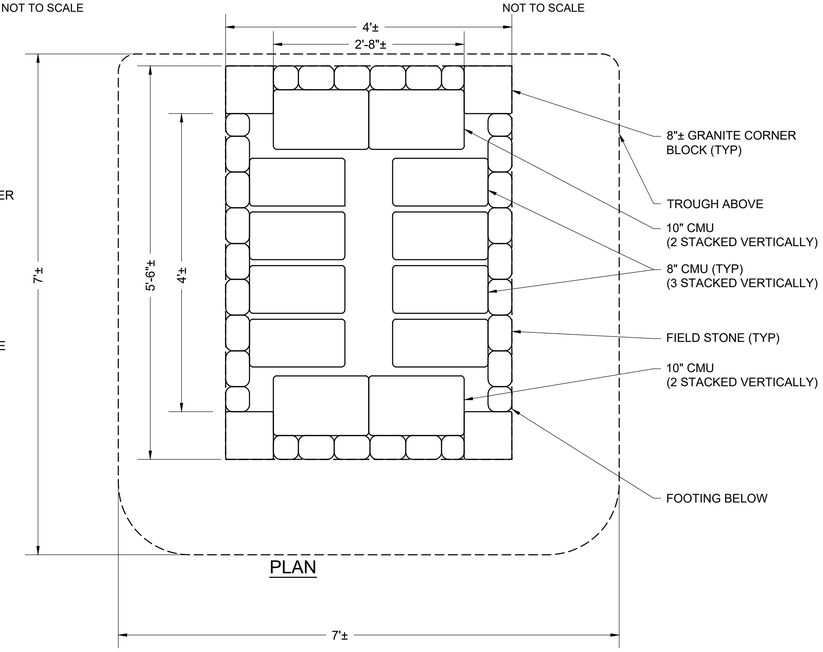
GRANITE TROUGH WEST VIEW
NOT TO SCALE



SECTION

NOTES:

1. CONTRACTOR TO INSPECT GRANITE TROUGH AND GRANITE CORNER BLOCKS PRIOR TO RELOCATION. ANY DEFECTS OR EXISTING DAMAGES SHALL BE COMMUNICATED TO THE ENGINEER PRIOR TO RELOCATION.
2. CONTRACTOR IS RESPONSIBLE FOR ENSURING TROUGH AND GRANITE CORNER BLOCKS MAINTAIN EXISTING AESTHETIC QUALITY AND CHARACTER. CONTRACTOR TO CHOOSE RELOCATION METHOD THAT WILL NOT ALTER OR DEFACE ANY SURFACE OF THE GRANITE TROUGH AND/OR GRANITE CORNER BLOCKS.
3. EXISTING FIELD STONES MAY BE REUSED PER CONTRACTOR'S DISCRETION.
4. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR TO PROVIDE FOOTING DESIGN TO BE APPROVED BY ENGINEER PRIOR TO FOOTING CONSTRUCTION.
5. CONTRACTOR TO PROVIDE ELECTRICAL AND WATER SERVICE CONNECTIONS TO GRANITE TROUGH.
6. WATER CONNECTION, WATER HOSE, AND SHUT OFF TO BE RELOCATED IN HANDHOLE TO BE FIELD LOCATED BY ENGINEER DURING CONSTRUCTION.



PLAN

GRANITE TROUGH RELOCATION DETAIL
NOT TO SCALE

60143_HD9(CONST_DETL).DWG Plotted on 18-Nov-2021 2:47 PM

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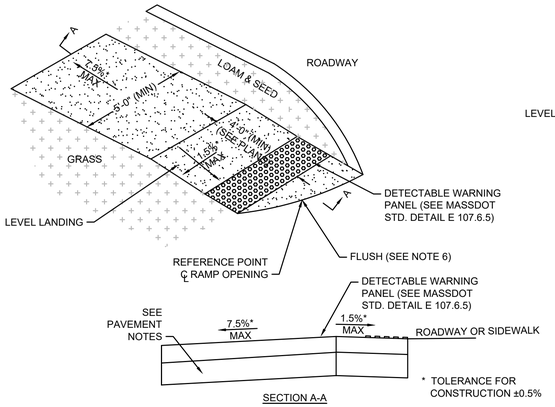
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	62
PROJECT FILE NO.	TOOLE-60143		

WHEELCHAIR RAMP DETAILS



WHEELCHAIR RAMP FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL TYPE A

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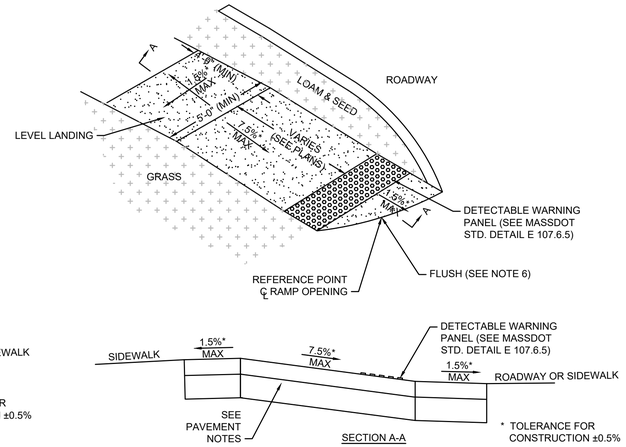

WHEELCHAIR RAMP FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL TYPE B

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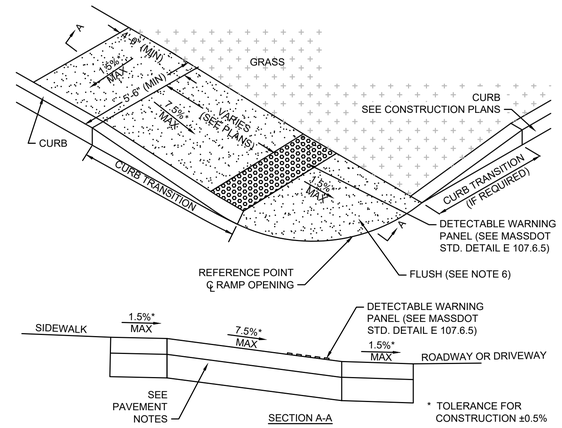
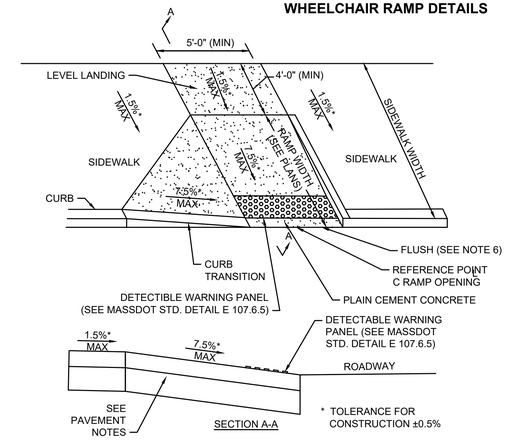


WHEELCHAIR RAMP FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL TYPE C (MASSDOT STD DWG E107.6.0)



WHEELCHAIR RAMPS ON NARROW SIDEWALK TYPE D

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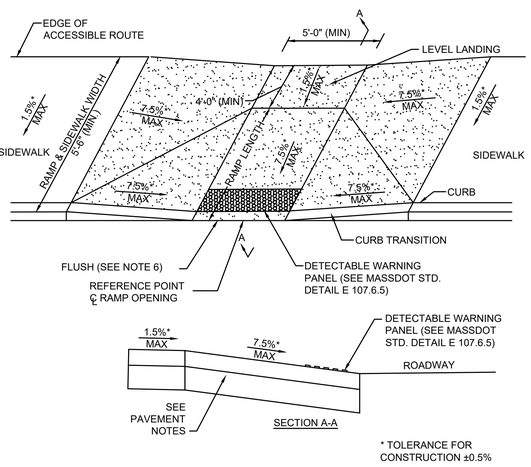

WHEELCHAIR RAMPS ON NARROW SIDEWALK WITH DETECTABLE WARNING PANEL TYPE E (MASSDOT STD DWG E107.2.0)

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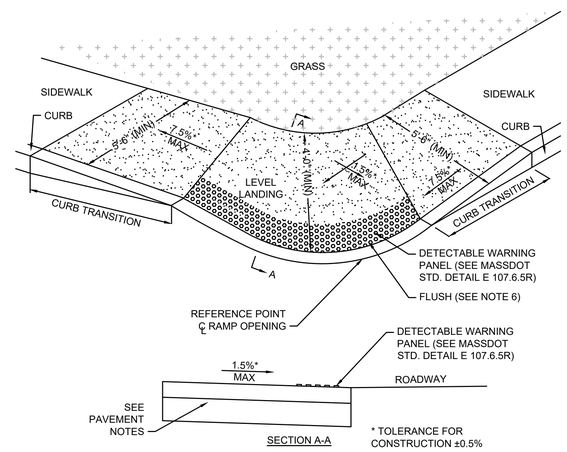
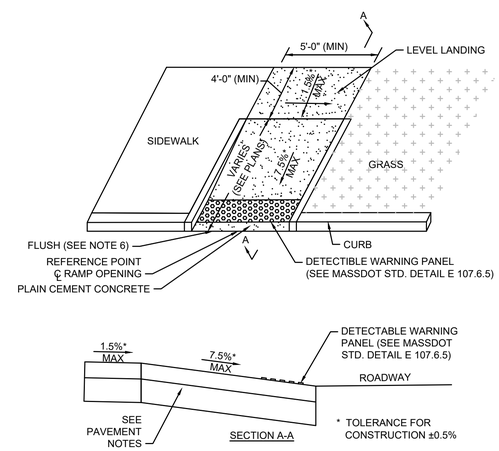


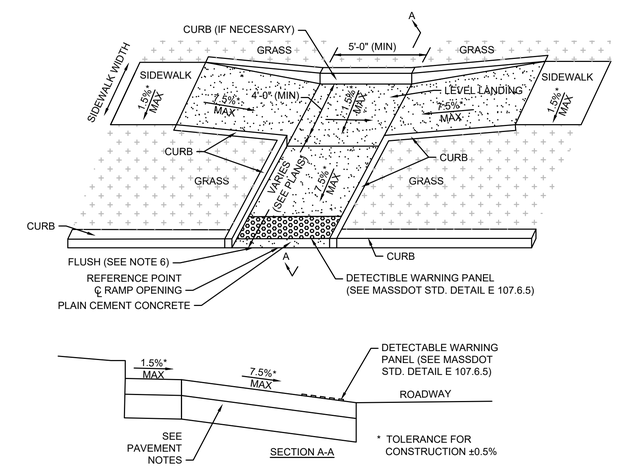
WHEELCHAIR RAMP TYPE F

N.T.S.



WHEELCHAIR RAMPS TYPE G

N.T.S.



WHEELCHAIR RAMP TYPE H

N.T.S.

ROADWAY PROFILE GRADE	HIGH SIDE TRANSITION LENGTH *
=0%	6'-6"
>0% TO 1%	7'-8"
>1% TO 2%	9'-0"
>2% TO 3%	11'-0"
>3% TO 4%	14'-0"
>4% TO 5%	15'-0" MAX

CURB TRANSITION LENGTH FOR WHEELCHAIR RAMPS (E107.9.0)

E107.9.0 NOTE:

* BASED ON A DESIGN SLOPE OF 7.5% AND REVEAL OF 6".

WHEELCHAIR RAMP NOTES:

1. MAXIMUM ALLOWABLE LONGITUDINAL SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE DESIGNED TO 4.5% ±0.5% (7.5% ±0.5% FOR CURB RAMPS) CROSS SLOPES ARE DESIGNED AT 1.5%
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 PROPOSED WHEELCHAIR 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. COLOR SHALL BE YELLOW.
8. SIDEWALK SHALL NOT BE LESS THAN 4' WIDE.

WHEELCHAIR RAMP DATA

NUMBER	TYPE	STREET NAME	WHEELCHAIR RAMP REFERENCE STATION	WHEELCHAIR RAMP REFERENCE OFFSET	OPENING WIDTH (FT)	ROADWAY GUTTER SLOPE	RAMP LENGTH (FT)	SIDEWALK WIDTH (FT)	TRANSITION LEFT LENGTH (FT)	TRANSITION LEFT REVEAL (IN)	TRANSITION RIGHT LENGTH (FT)	TRANSITION RIGHT REVEAL (IN)
1	D	MAIN STREET	12+97.88	17.56' LT	5.00	1.20%	3.41	4.85	6.50	4	-	4
2	G	NEWTON ROAD	40+27.87	19.31' LT	5.00	1.00%	4.27	9.50	-	4	-	4
3	H	MAIN STREET	13+01.50	17.97' RT	5.00	0.50%	15.00	5.00	-	5	-	4
4	F	NEWTON ROAD	40+21.73	16.79' RT	7.88	0.89%	5.75	5.00	8.00	4	15.00	4
5	C	MAIN STREET	14+05.98	21.89' LT	5.00	0.86%	6.50	5.00	6.50	4	-	-
6	C	MAIN STREET	14+19.39	21.91' LT	5.00	2.00%	6.50	5.00	-	-	6.50	4
7	C	WOODBURY LANE	50+19.49	17.48' LT	4.40	0.91%	6.50	5.00	7.31	4	-	-
8	F	WOODBURY LANE	50+27.11	15.23' RT	7.51	1.07%	6.12	5.00	9.78	4	15.00	4
9	E	MAIN STREET	17+19.04	19.24' LT	5.00	0.50%	3.50	5.00/8.77	6.50	4	9.00	4
10	H	MAIN STREET	17+19.16	16.64' RT	5.00	0.50%	4.00	5.00	-	4	-	4
11	C	MAIN STREET	18+22.42	24.59' LT	7.43	0.62%	6.50	7.50	6.50	5	-	-
12	B	CONCORD ROAD	30+93.68	18.71' LT	6.30	1.59%	6.50	5.93	-	-	-	4
13	B	CONCORD ROAD	21+32.05	22.89' LT	5.40	0.00%	15.00	-	-	4	-	-
14	A	CONCORD ROAD	21+14.87	17.30' LT	5.34	0.56%	4.17	-	-	-	-	4

60143_HD14(WCR_DETL).DWG Plotted on 18-Nov-2021 2:41 PM

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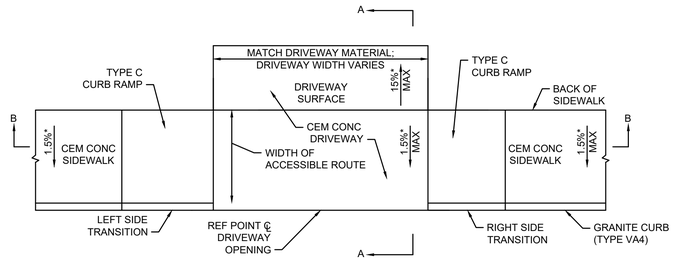
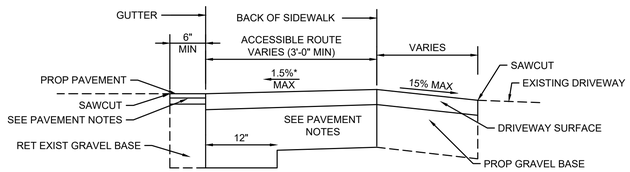
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	62
PROJECT FILE NO.	TOOLE-60143		

DRIVEWAY DETAILS

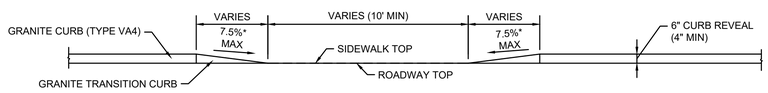


PLAN

*TOLERANCE FOR CONSTRUCTION ±0.5%

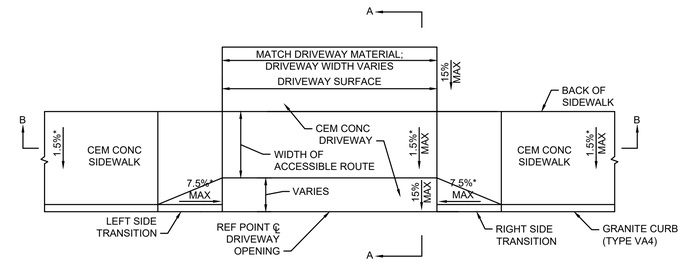


SECTION A-A



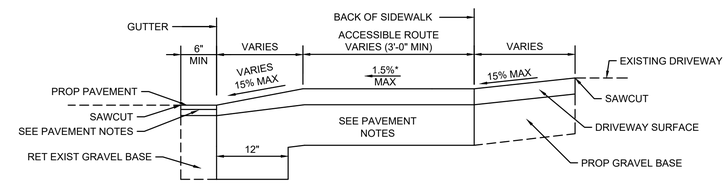
SECTION B-B

PROPOSED SIDEWALK THROUGH DRIVEWAY
N.T.S.



PLAN

*TOLERANCE FOR CONSTRUCTION ±0.5%



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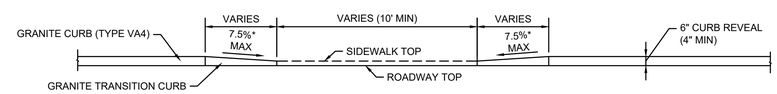

SECTION B-B

PROPOSED SIDEWALK THROUGH DRIVEWAY
N.T.S.

DRIVEWAY DATA

NUMBER	STREET NAME	DRIVEWAY SURFACE	DRIVEWAY REFERENCE		WIDTH (FT)	ROADWAY GUTTER SLOPE	WIDTH OF SW (FT)	WIDTH OF ACESSIBLE ROUTE	TRANSITION LEFT		TRANSITION RIGHT	
			STATION	OFFSET					LENGTH	REVEAL	LENGTH	REVEAL
1	MAIN STREET	CEM CONC	14+12.69	19.15' LT	13.41	0.97%	5.0	5.0	6.5	4"	6.5	4"
2	MAIN STREET	CEM CONC	15+92.62	19.73' LT	20.68	0.53%	5.0	4.0	6.5	5"	6.5	6"
3	MAIN STREET	CEM CONC	16+89.24	19.53' LT	20.82	0.50%	5.0	4.0	6.5	5"	6.5	4"

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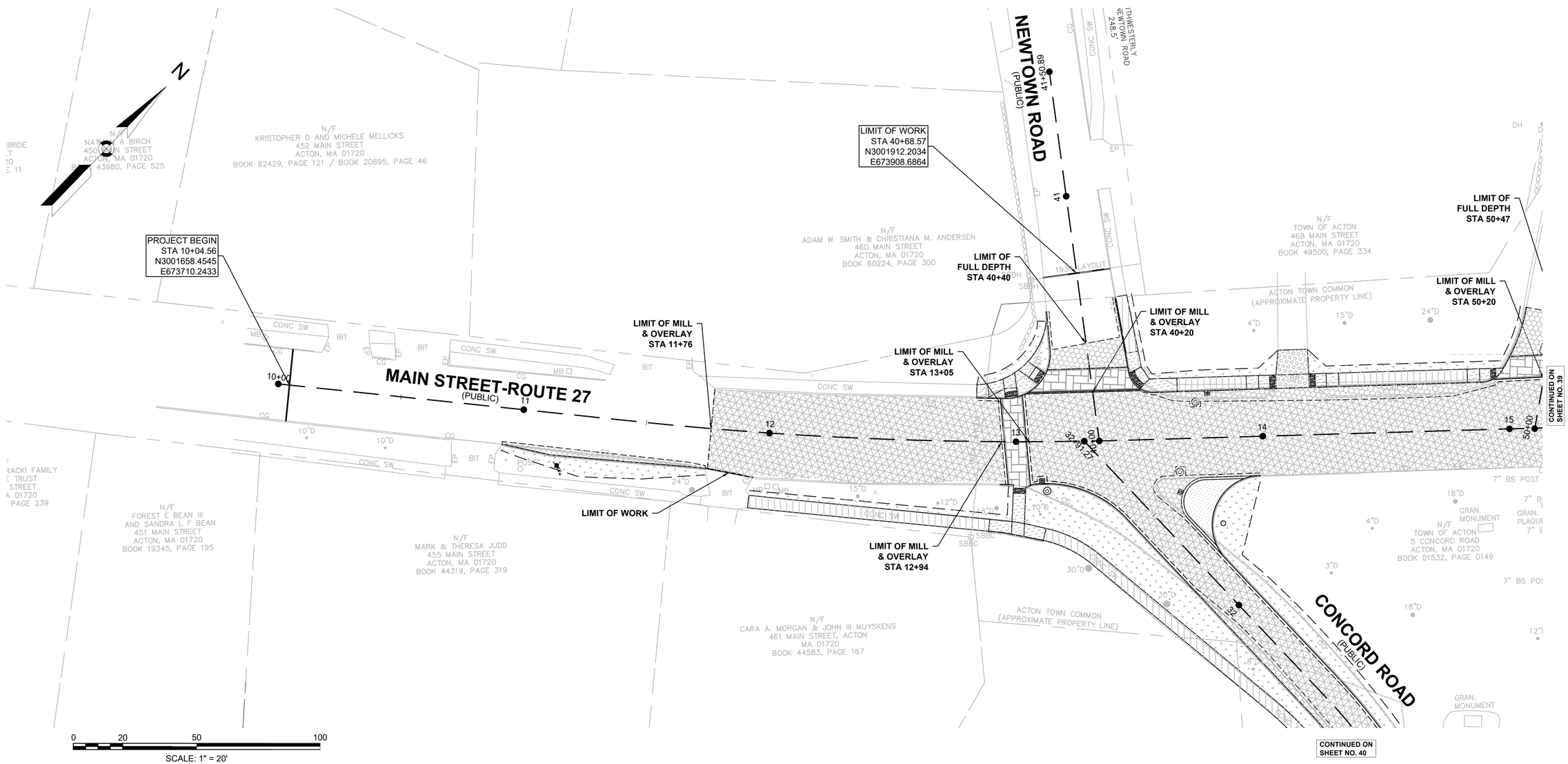
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	62
PROJECT FILE NO.	TOOLE-60143		

PAVING PLANS



LEGEND:

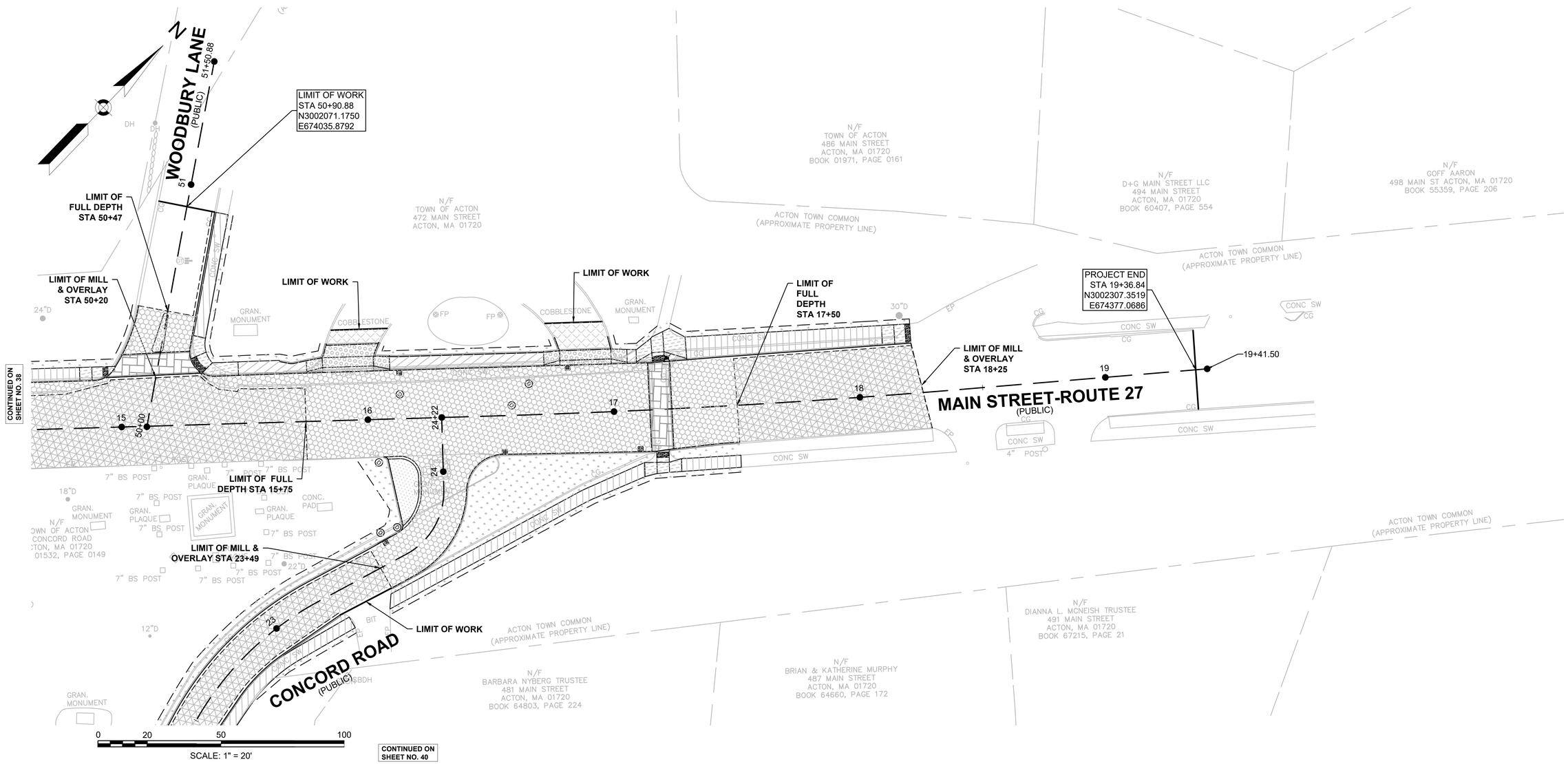
- CEMENT CONCRETE SIDEWALK
- CEMENT CONCRETE WHEELCHAIR RAMP
- CEMENT CONCRETE DRIVEWAY
- MOUNTABLE TRUCK APRON
- MILL & OVERLAY
- CROSSWALK WITH CONCRETE PAVERS
- LOAM & SEED
- HMA FULL DEPTH
- RE-LAY EXISTING COBBLES

60143_HD15(PAVING PLANS).DWG Plotted on 18-Nov-2021 2:41 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	62
PROJECT FILE NO.	TOOLE-60143		

PAVING PLANS



LEGEND:

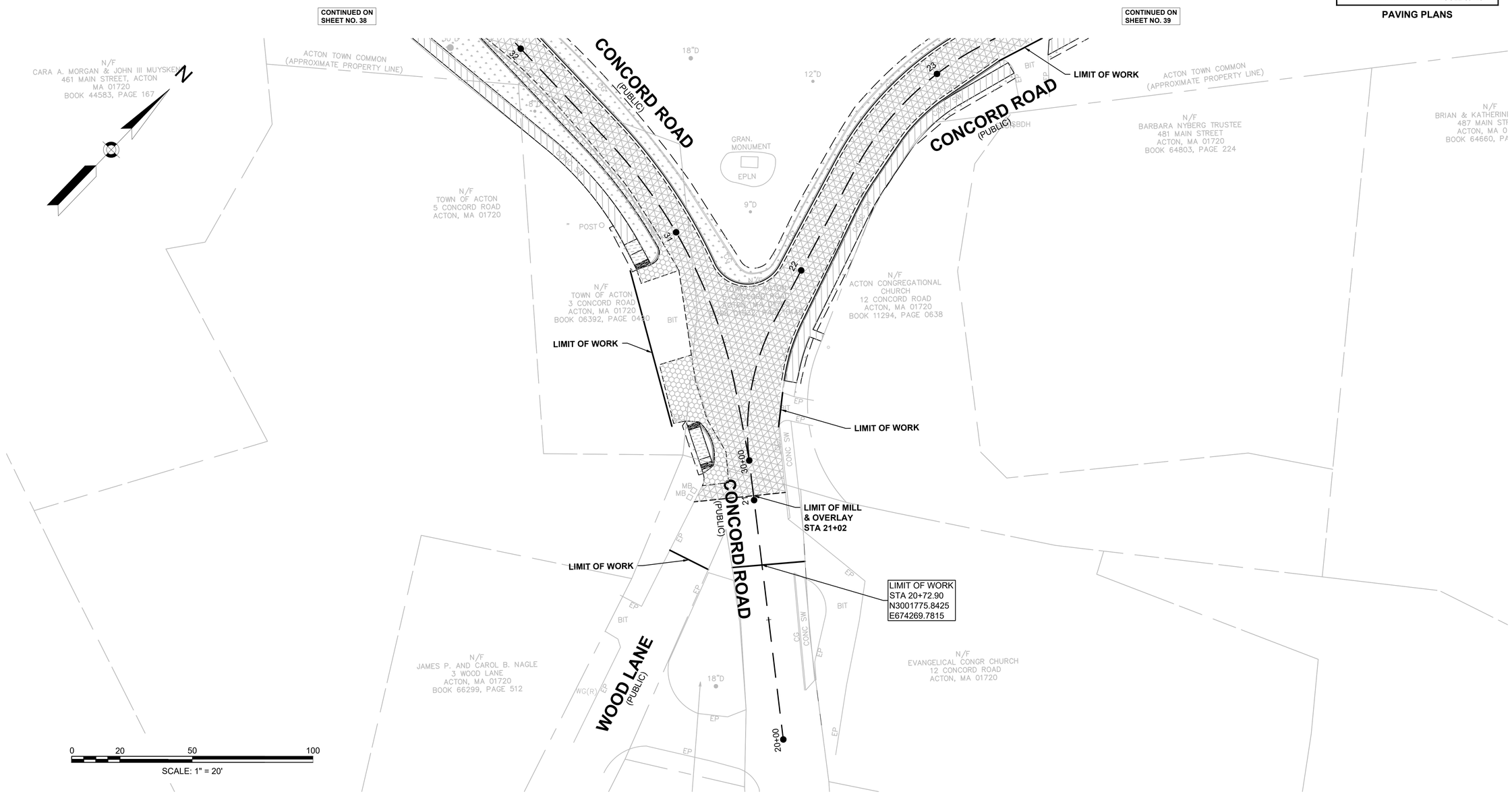
- CEMENT CONCRETE SIDEWALK
- CEMENT CONCRETE WHEELCHAIR RAMP
- CEMENT CONCRETE DRIVEWAY
- MOUNTABLE TRUCK APRON
- MILL & OVERLAY
- CROSSWALK WITH CONCRETE PAVERS
- LOAM & SEED
- HMA FULL DEPTH
- RE-LAY EXISTING COBBLES

60143_HD15(PAVING PLANS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	62
PROJECT FILE NO.	TOOLE-60143		

PAVING PLANS



LEGEND:

- CEMENT CONCRETE SIDEWALK
- CEMENT CONCRETE WHEELCHAIR RAMP
- CEMENT CONCRETE DRIVEWAY
- MOUNTABLE TRUCK APRON
- MILL & OVERLAY
- CROSSWALK WITH CONCRETE PAVERS
- LOAM & SEED
- HMA FULL DEPTH
- RE-LAY EXISTING COBBLES

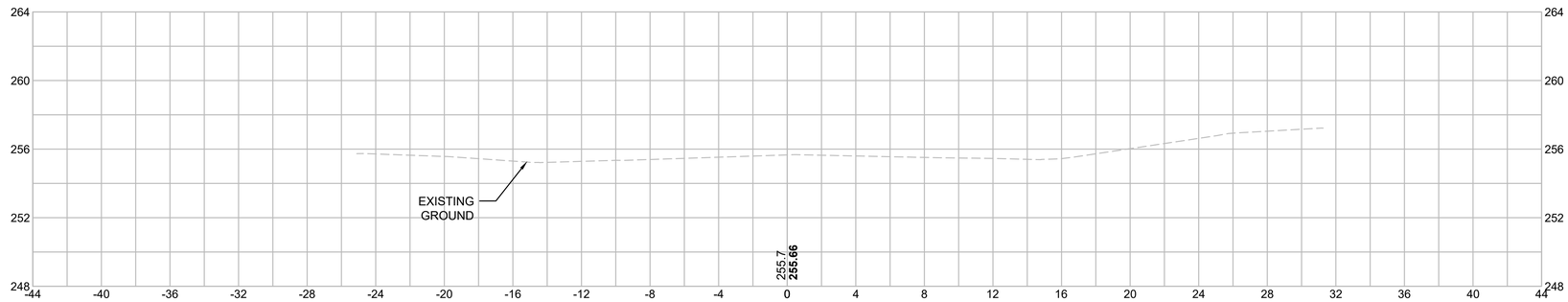
60143_HD15(PAVING PLANS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

10+75



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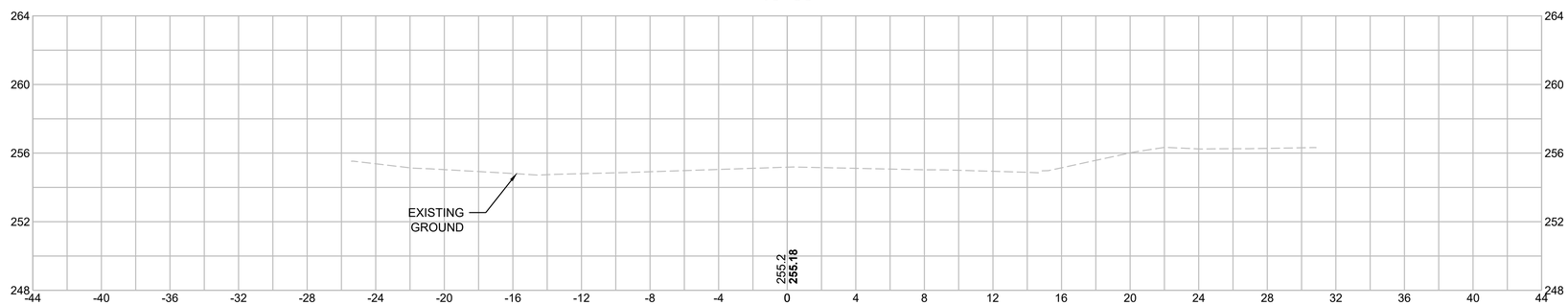

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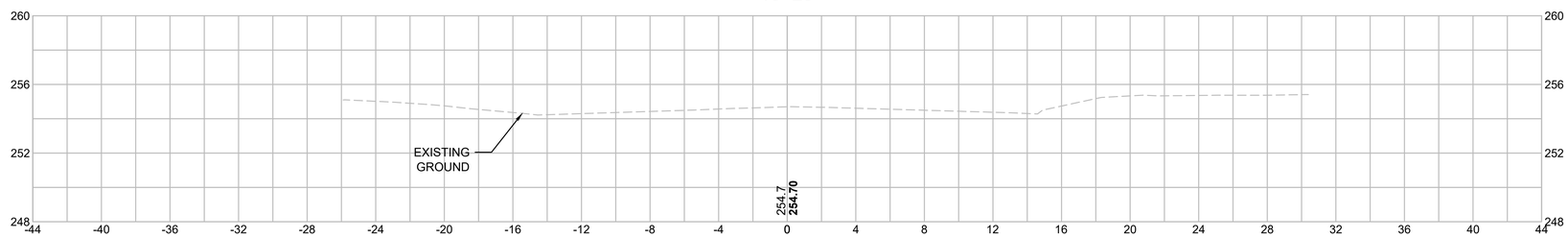

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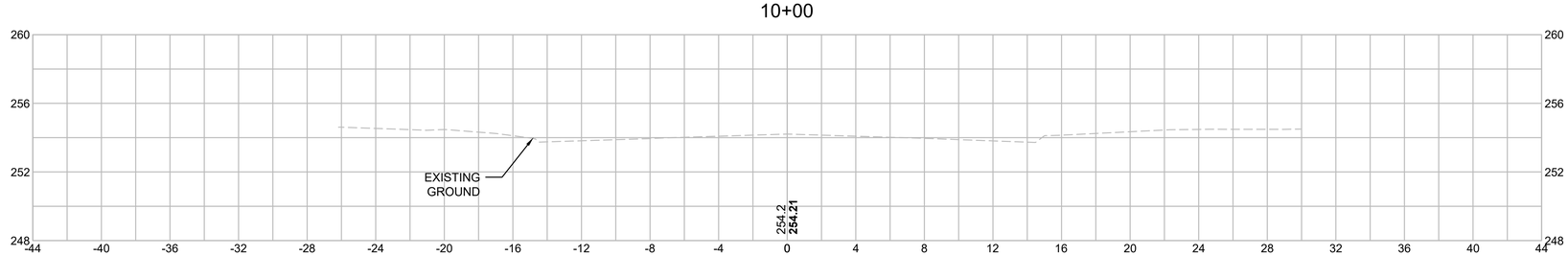

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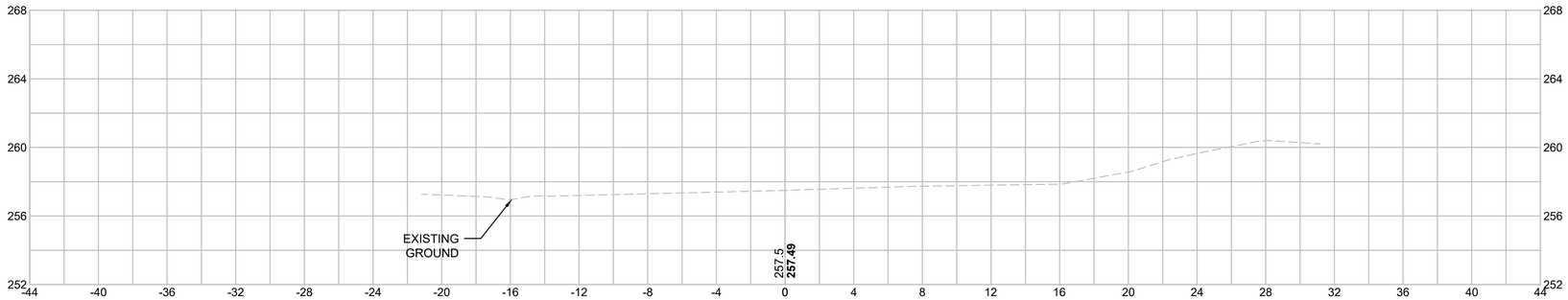
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	42	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

11+75



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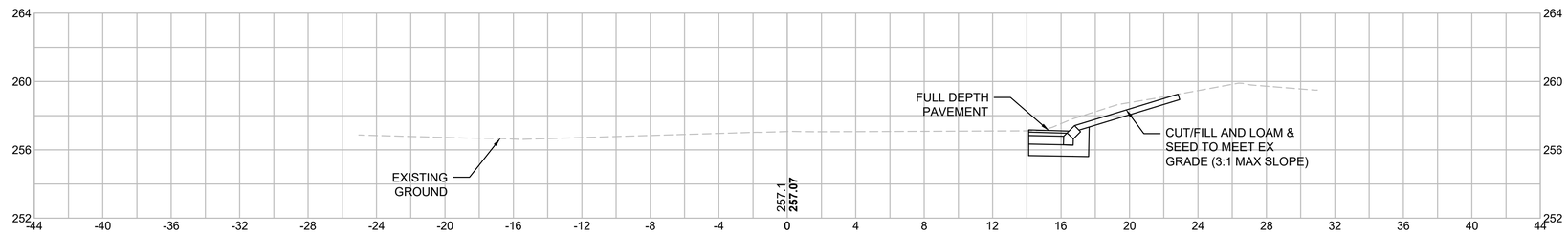

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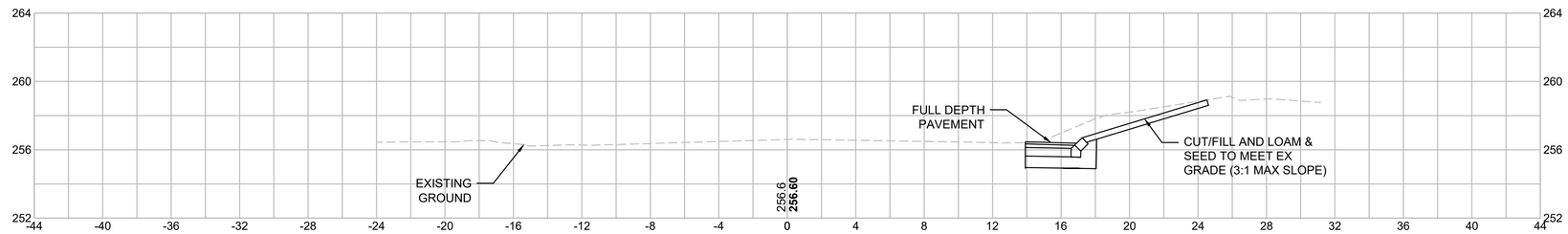

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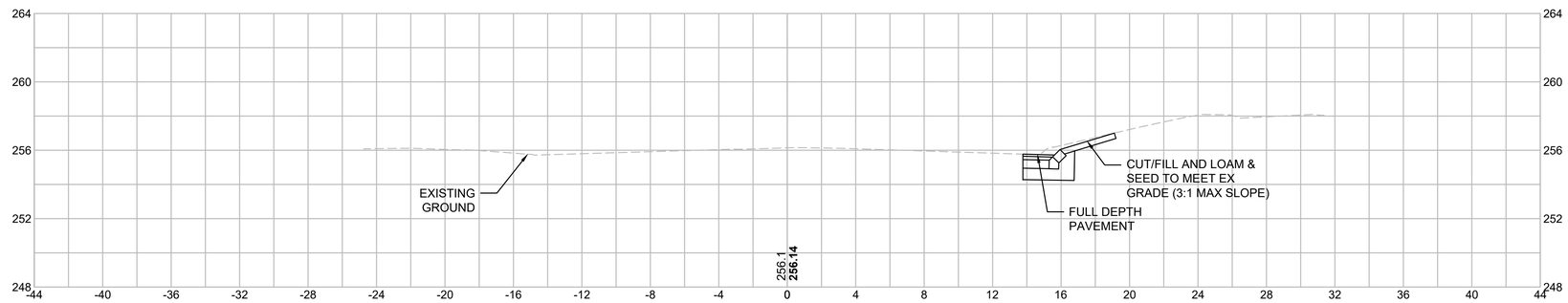

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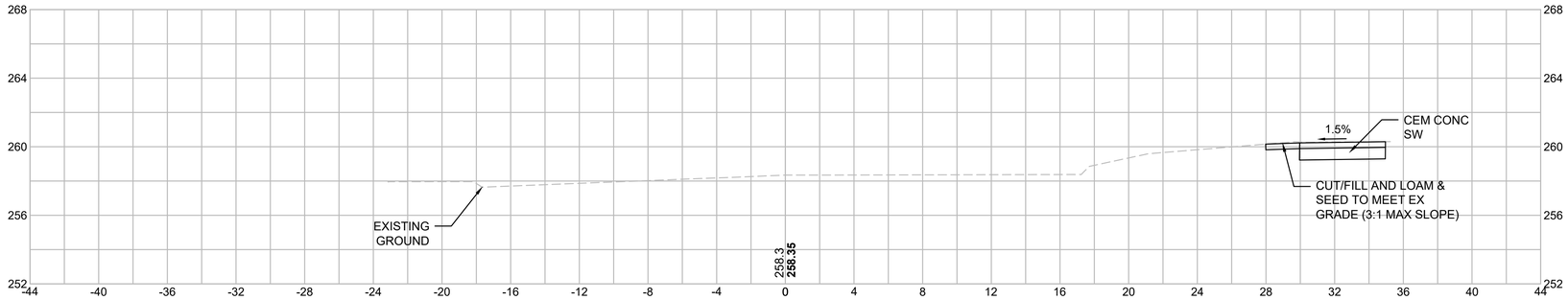
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	43	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

12+75



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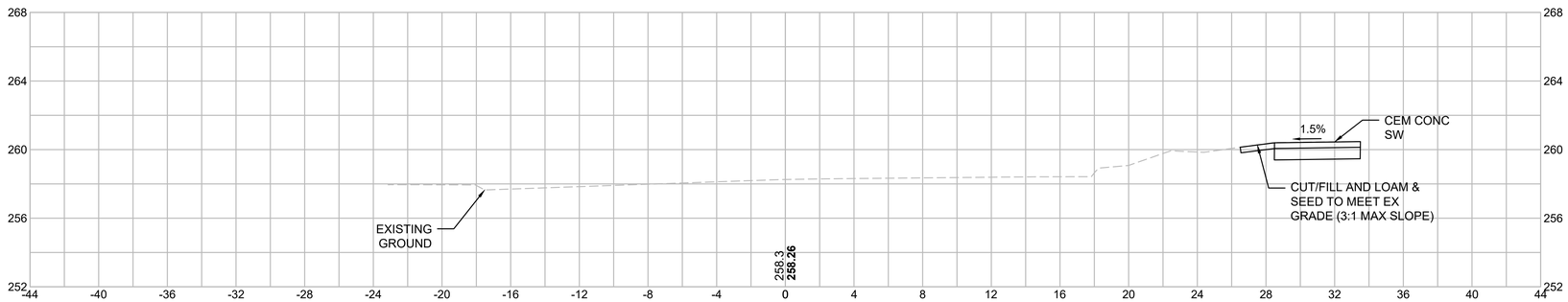

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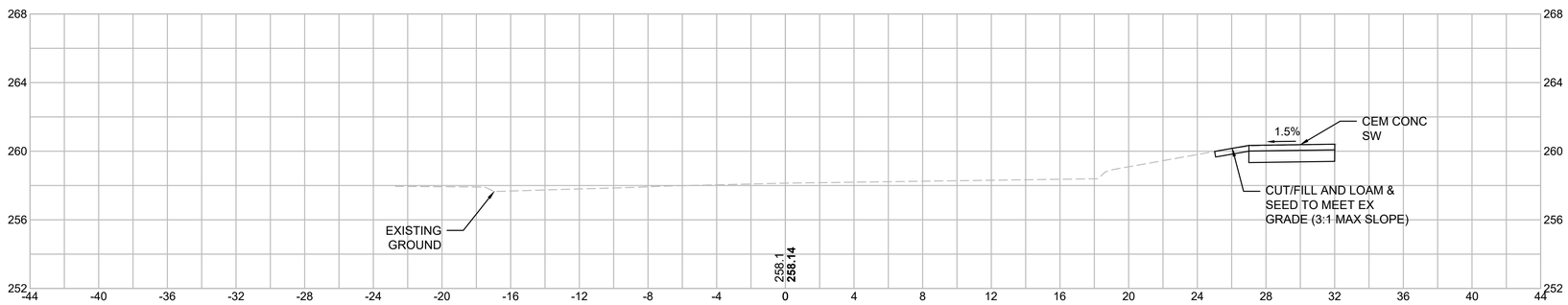

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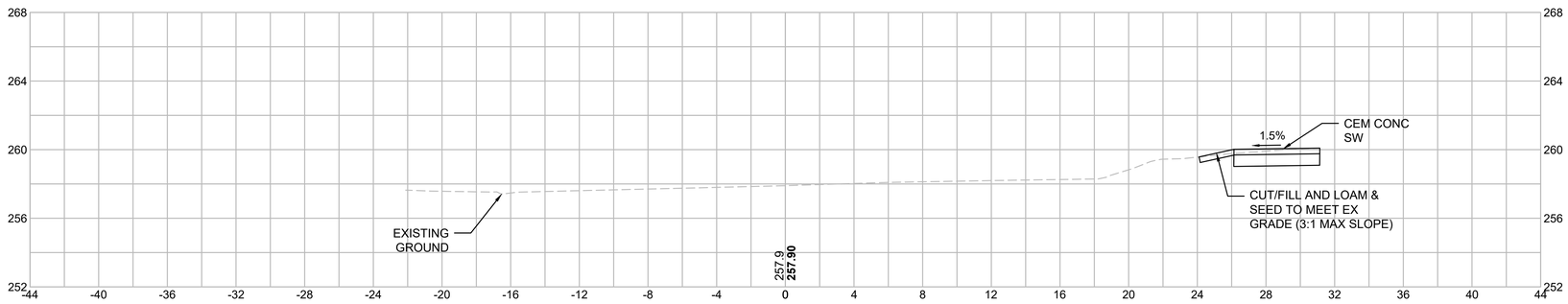


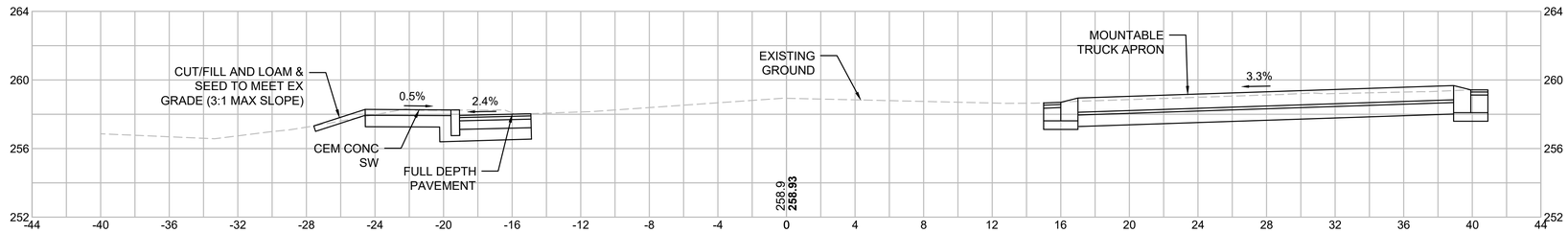
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	44	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

13+75



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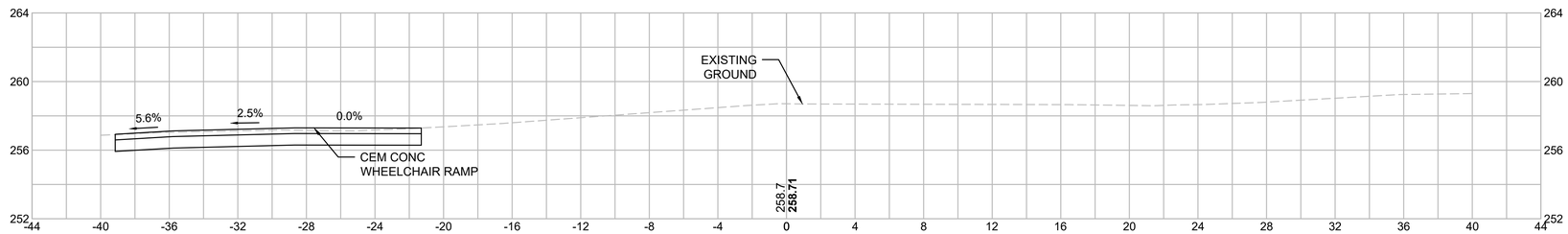

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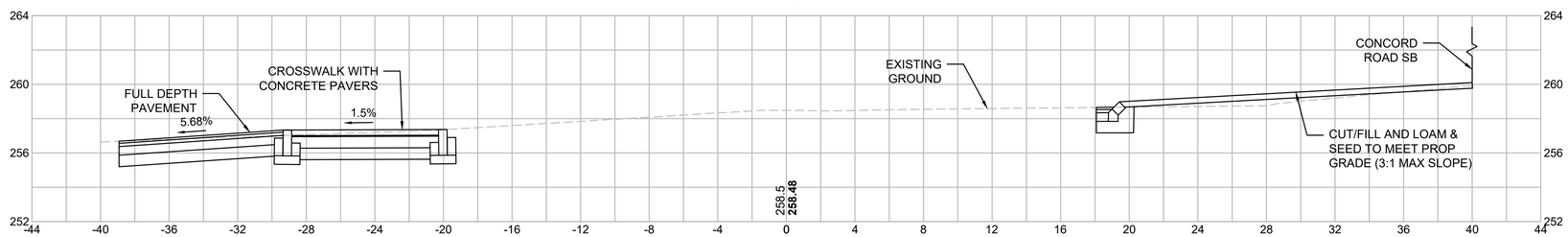

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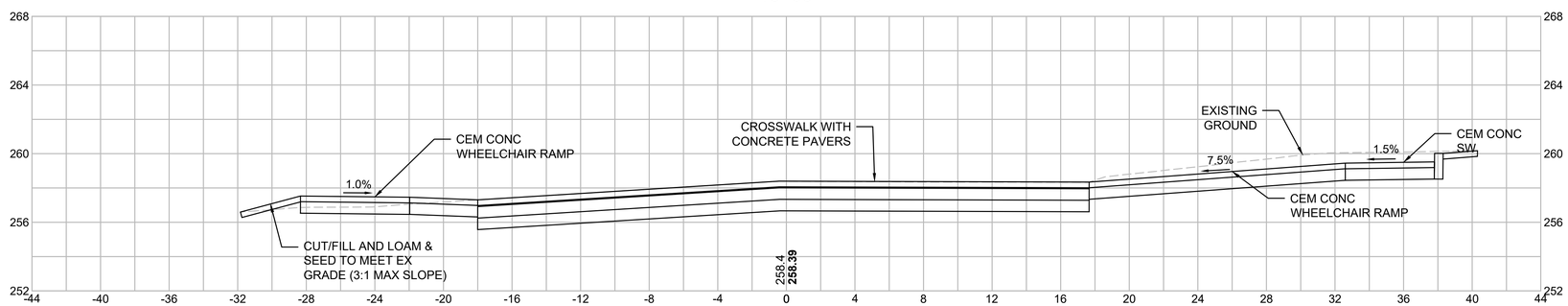

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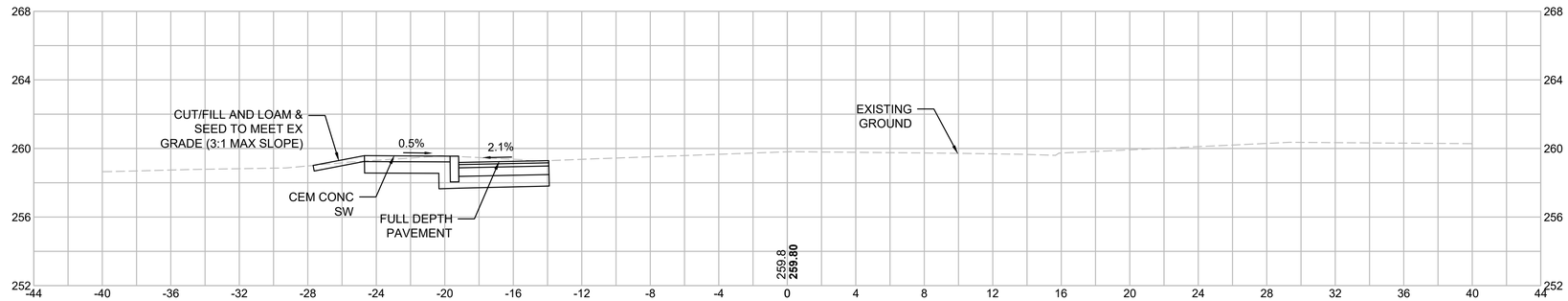
60143_HD10(CROSS_SECTIONS).DWG

ACTON
ACTON TOWN CENTER

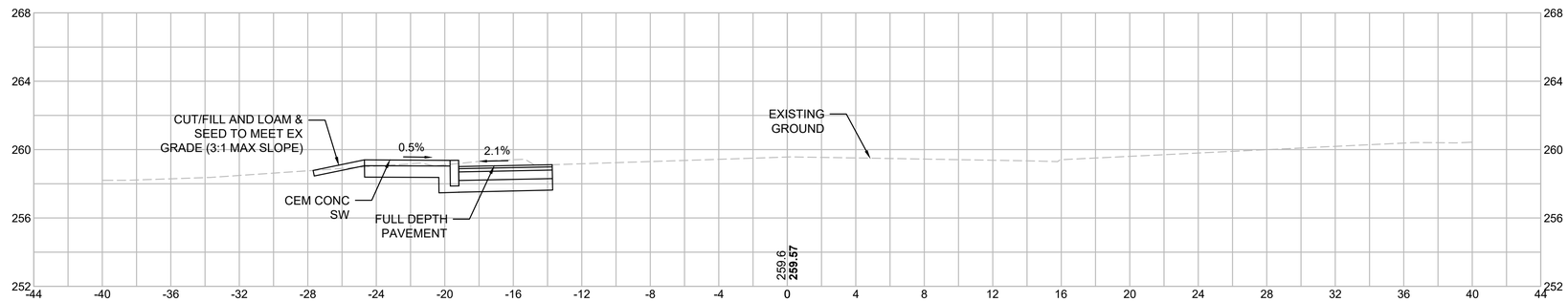
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	45	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

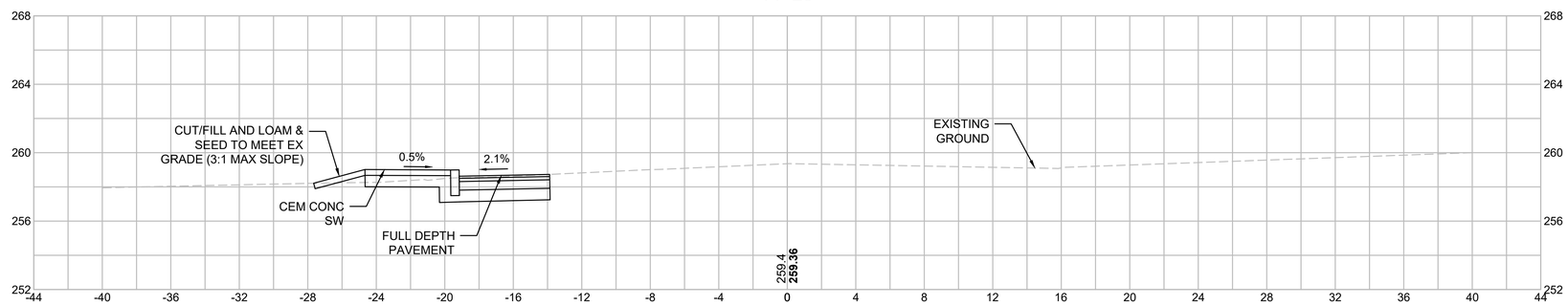
14+75



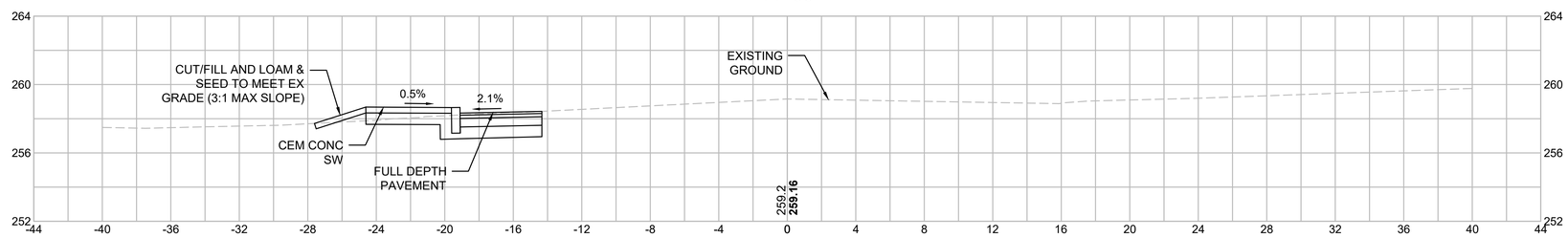
14+50



14+25



14+00



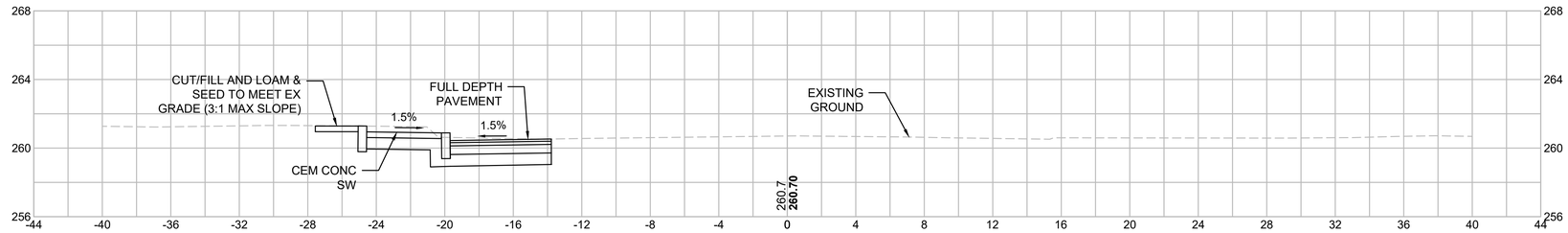
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

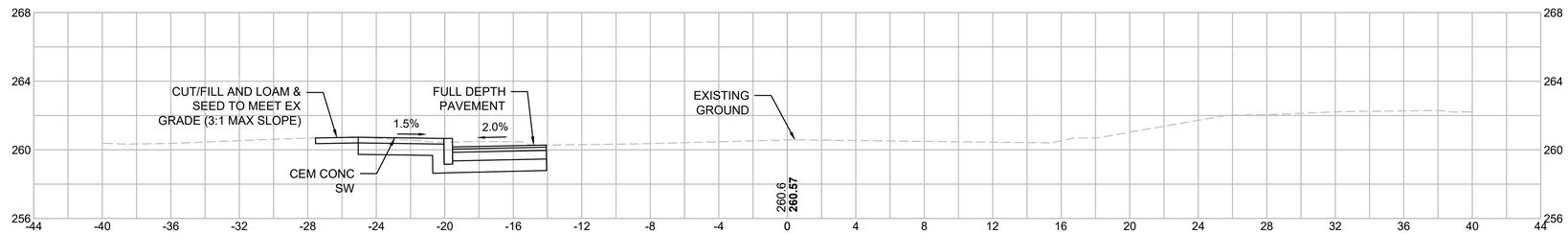
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	46	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

15+75



15+50



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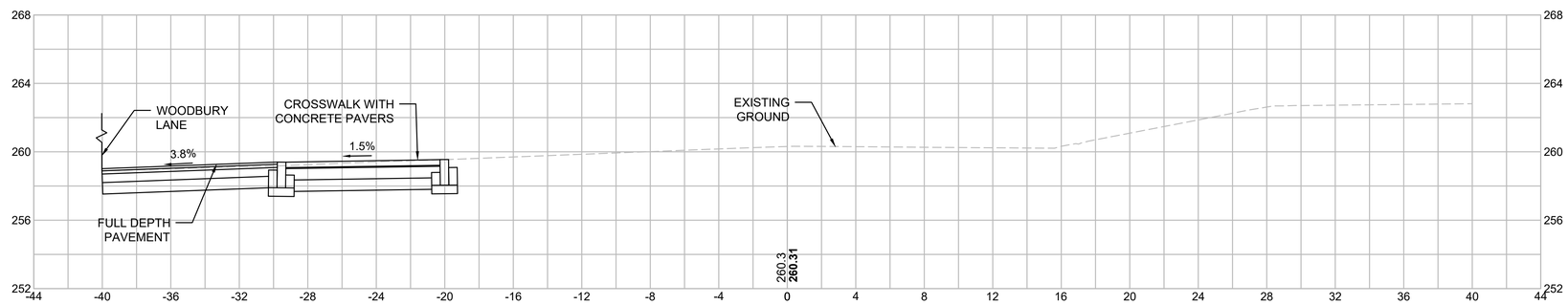
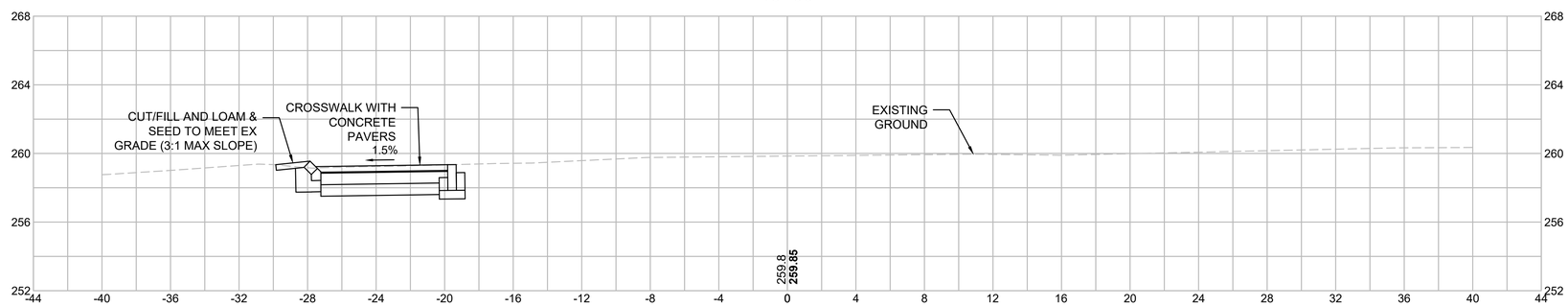


15+00



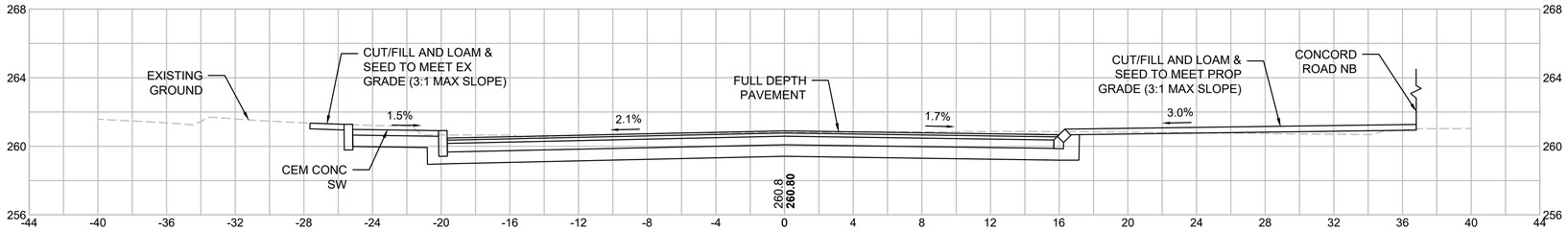
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

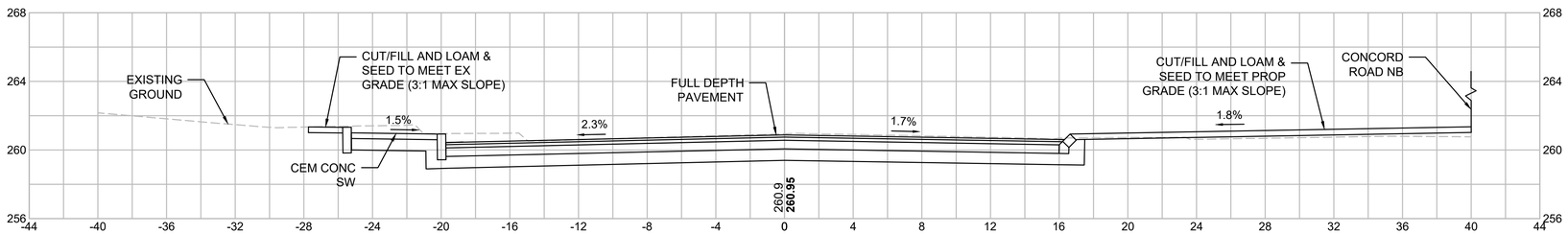
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

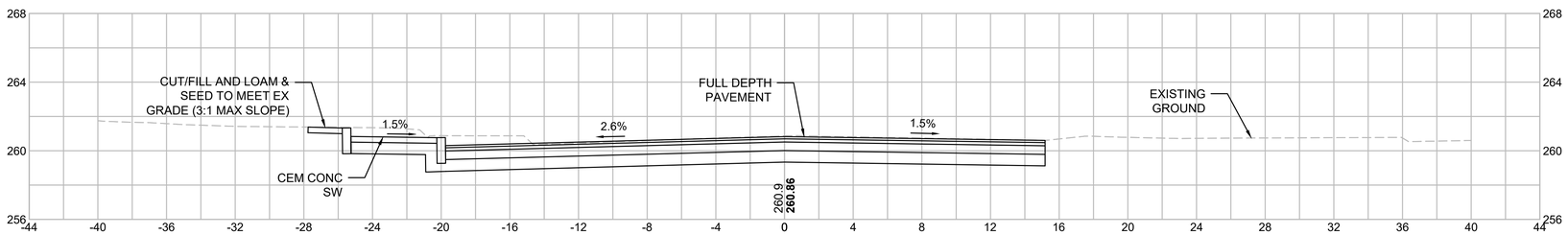
16+75



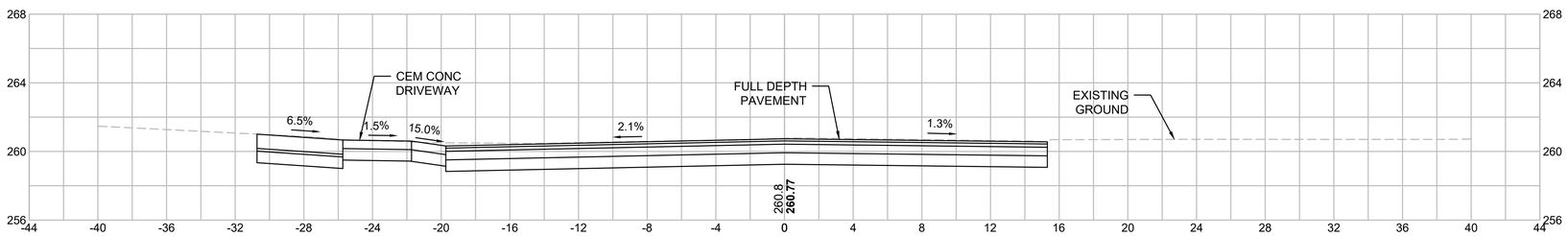
16+50



16+25



16+00



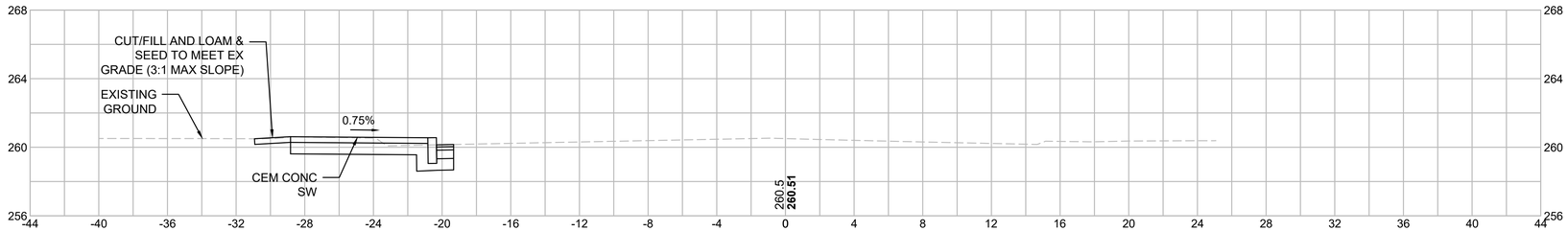
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

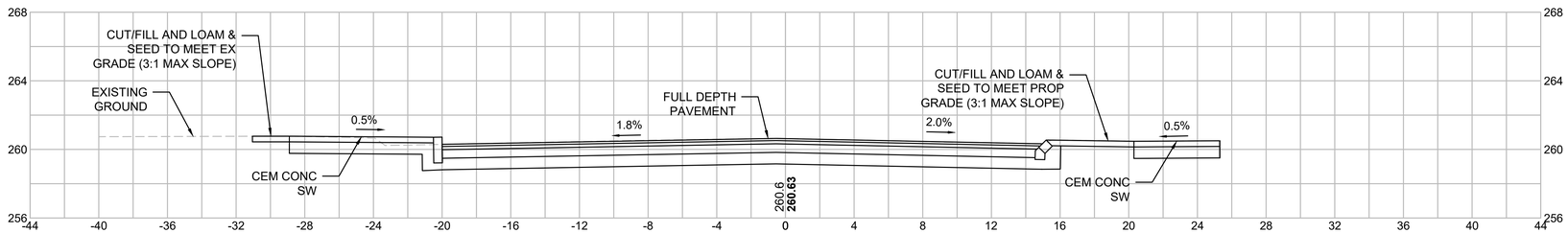
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

17+75



17+50



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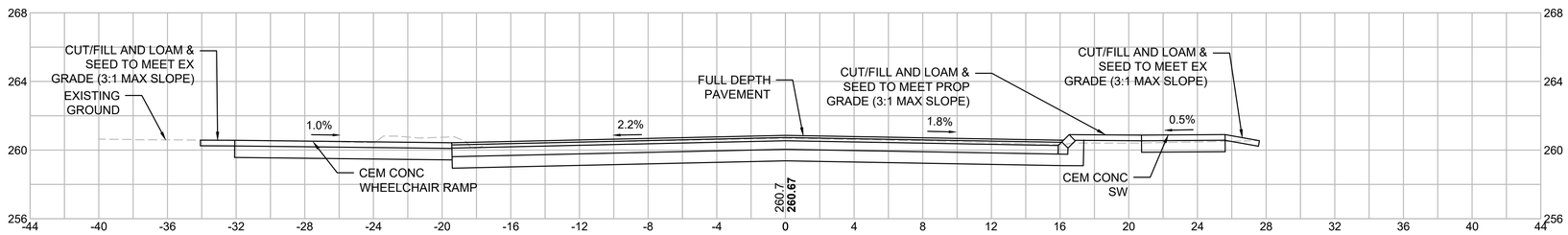
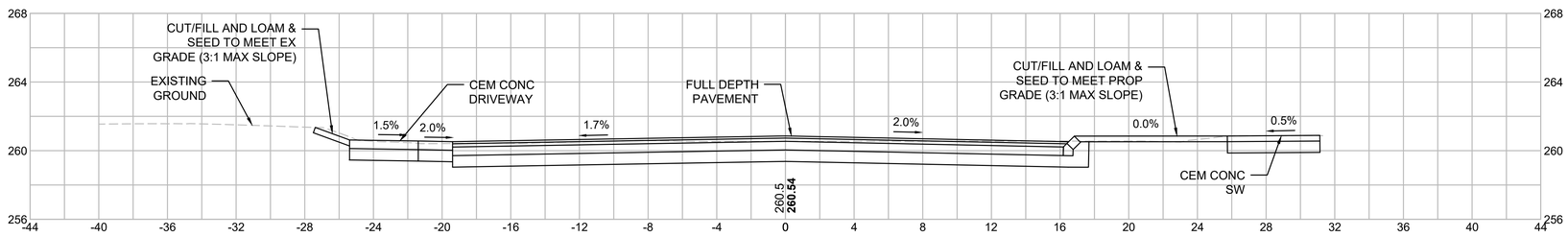


17+00



60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

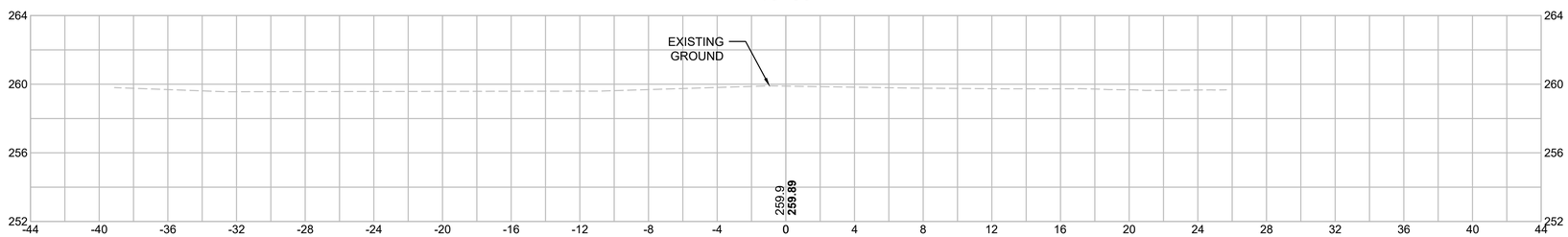
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	62
PROJECT FILE NO.	TOOLE-60143		

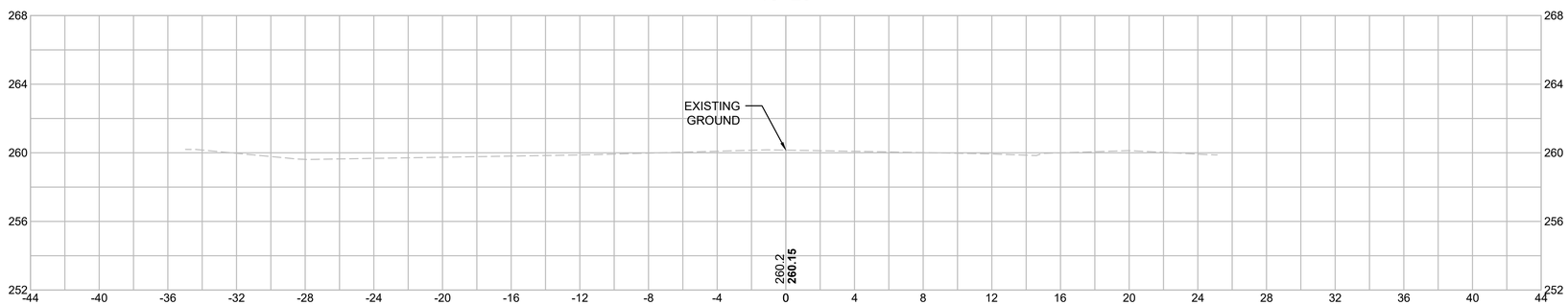
CROSS SECTIONS

18+75

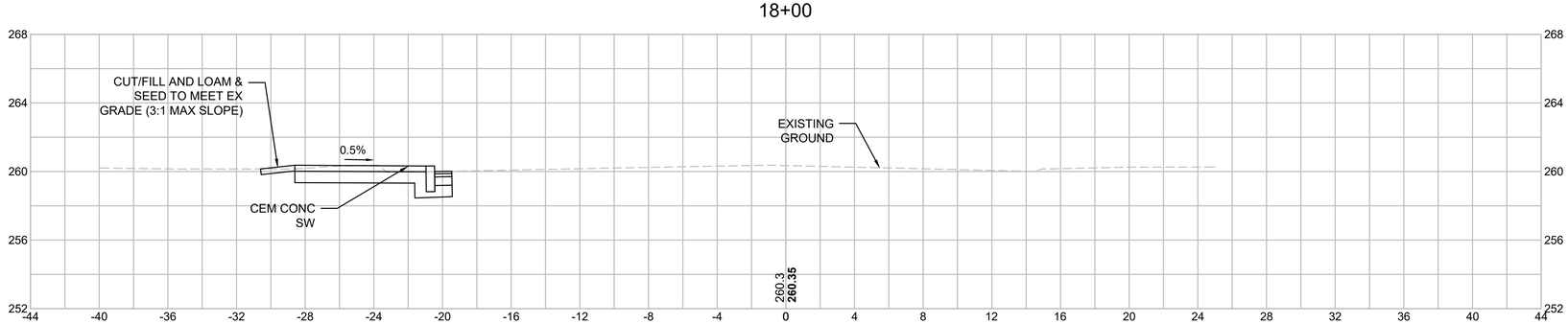
18+50



18+25



18+00



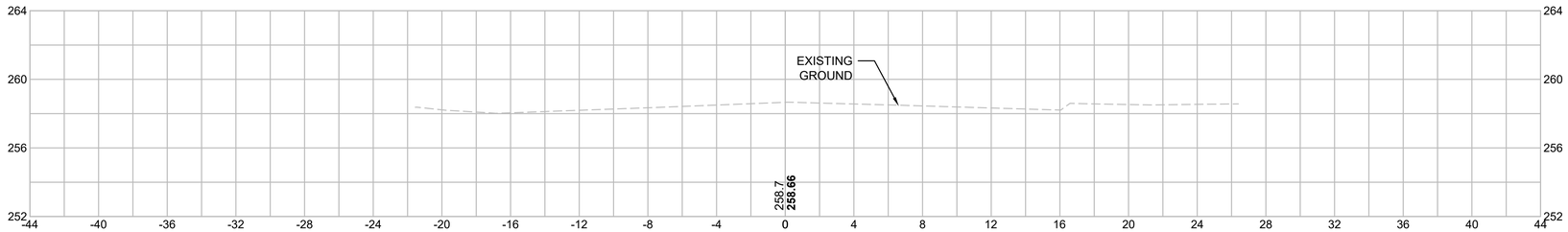
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

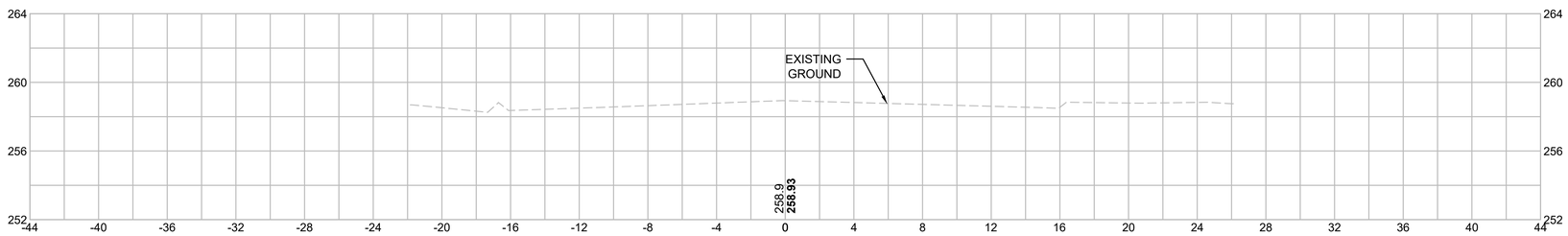
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

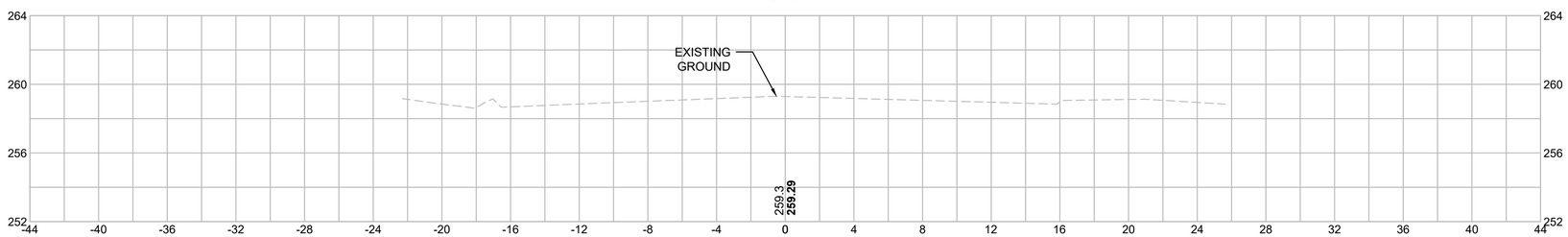
19+41.50



19+25



19+00



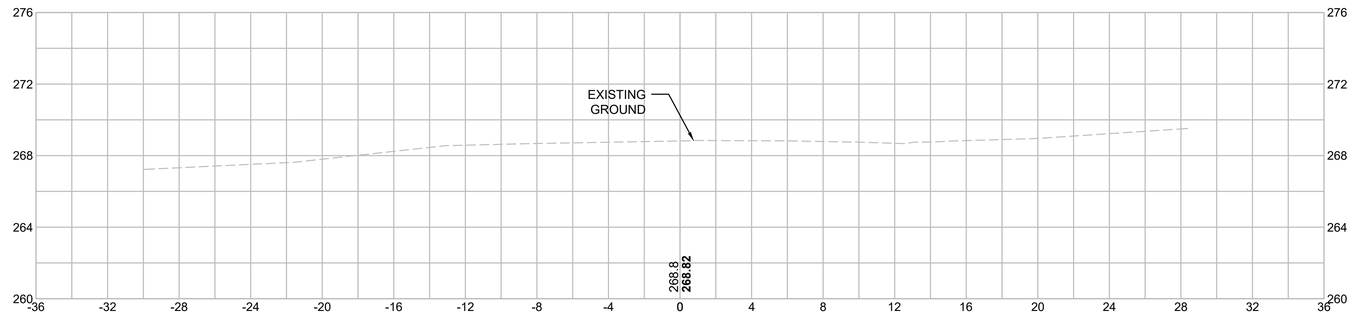
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:42 PM

ACTON
ACTON TOWN CENTER

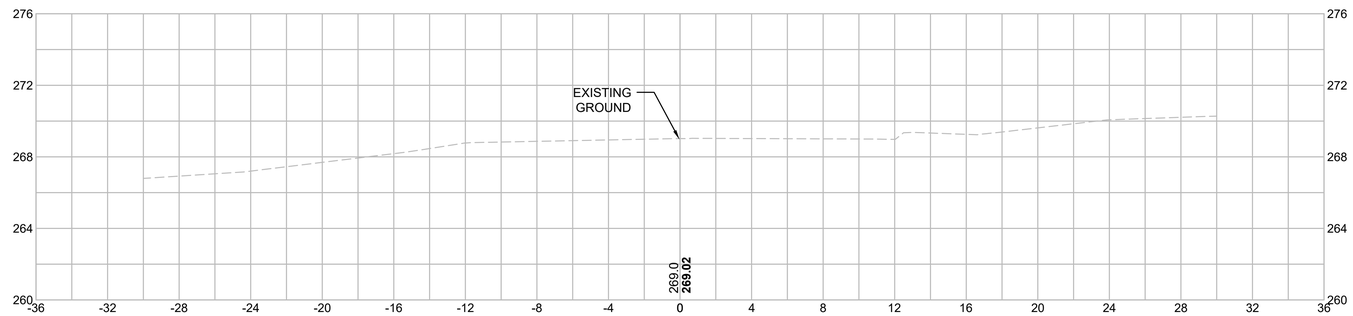
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

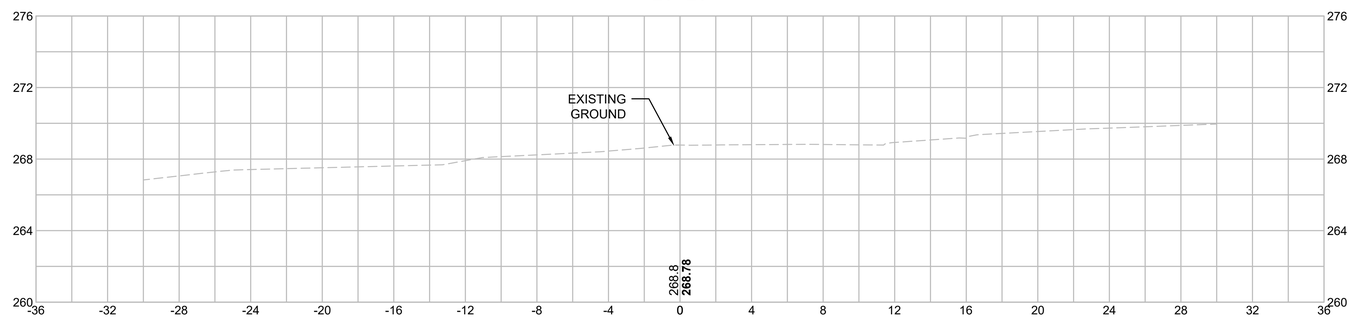
20+75



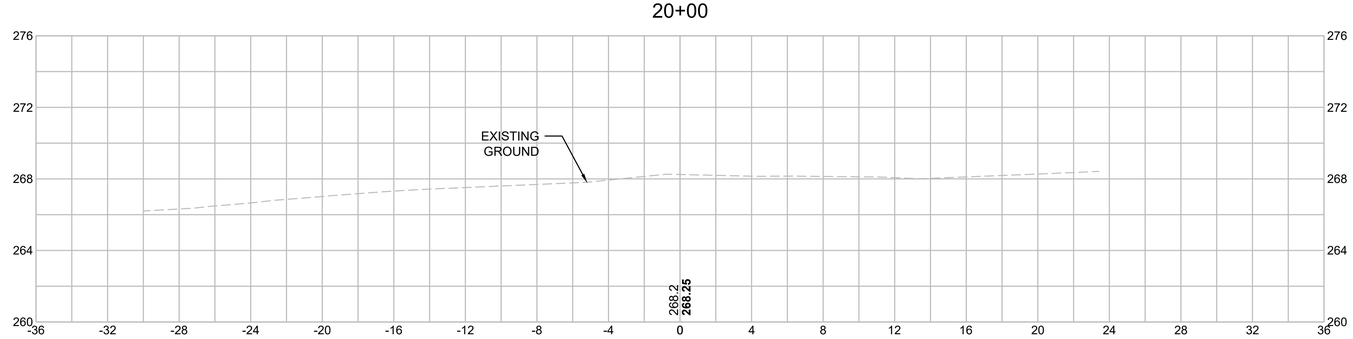
20+50



20+25



20+00



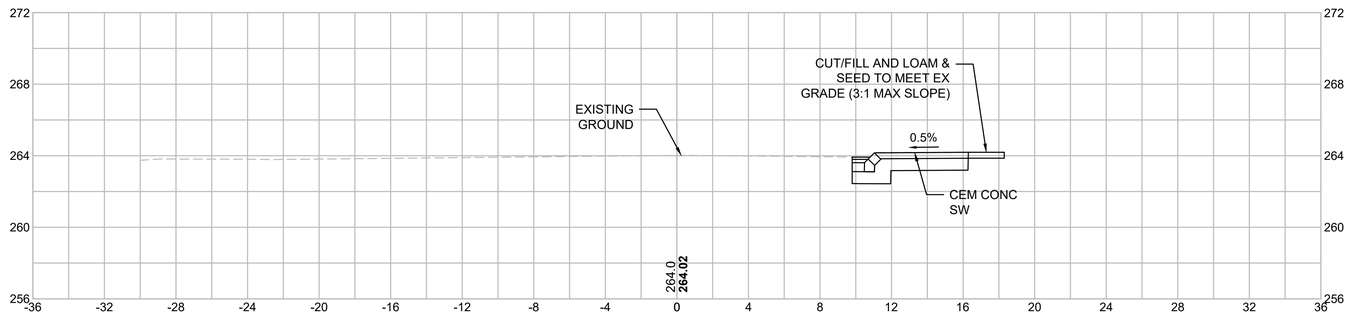
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

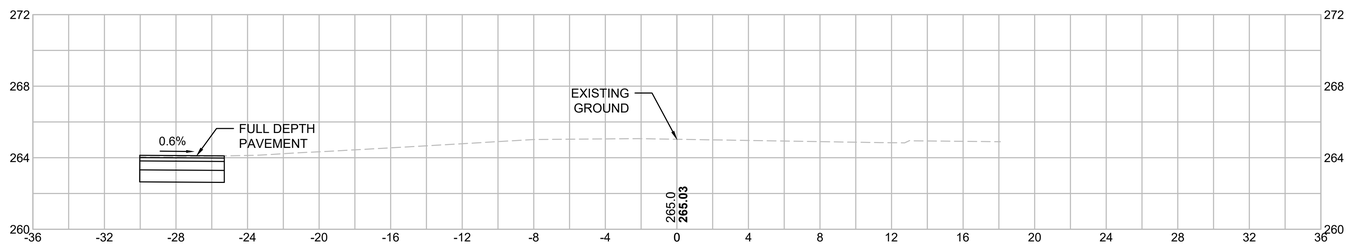
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

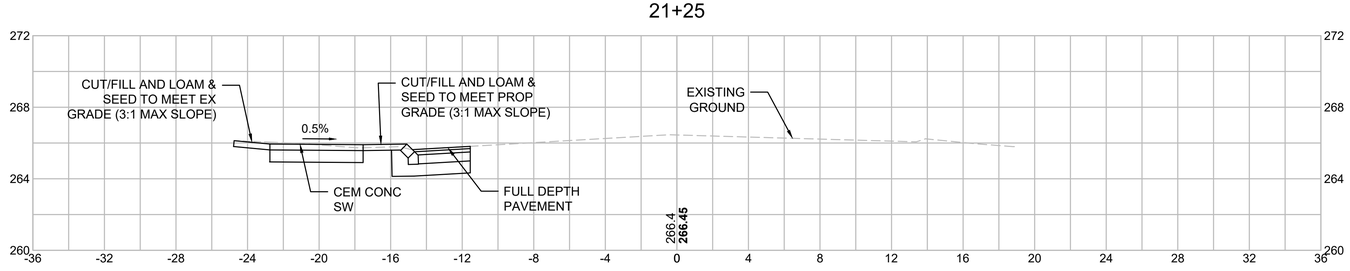
21+75



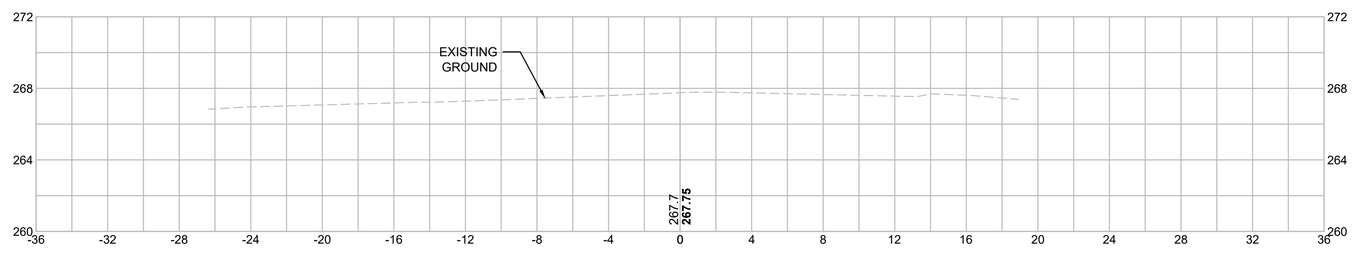
21+50



21+25



21+00



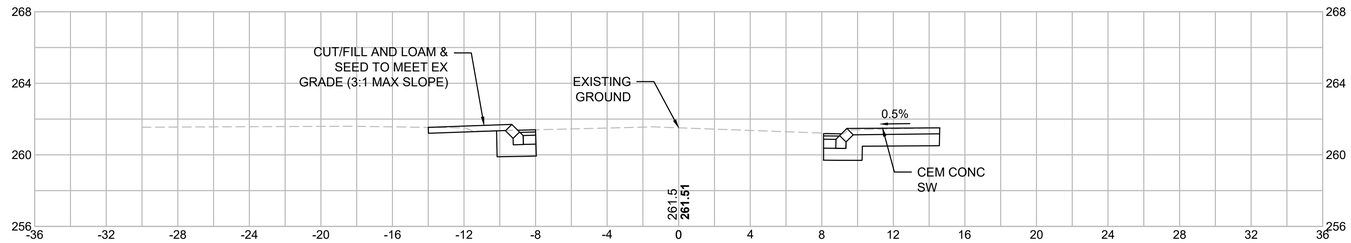
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

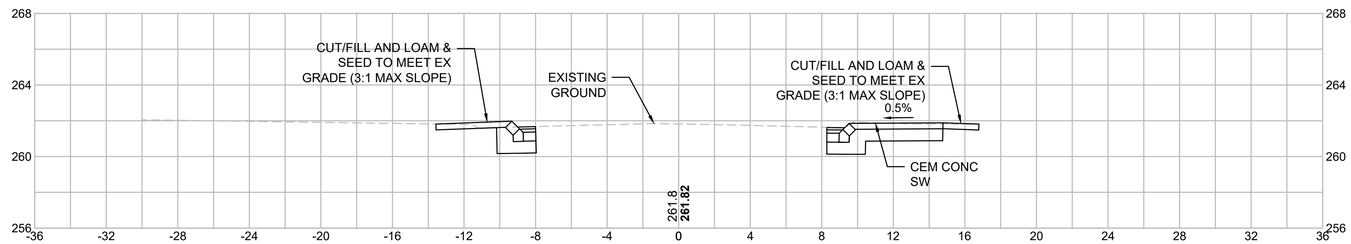
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	53	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

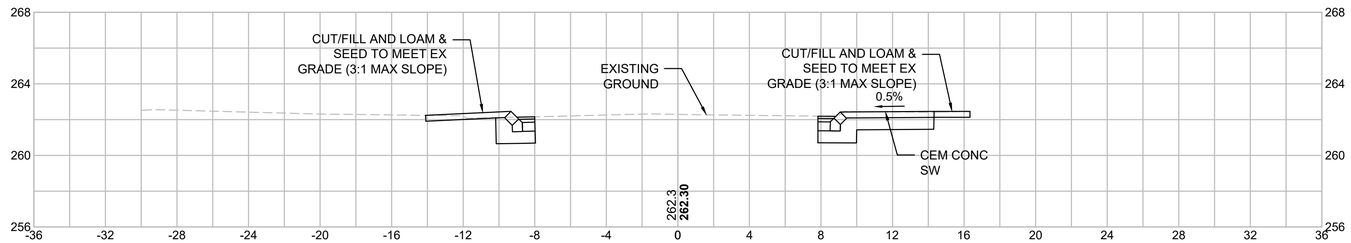
22+75



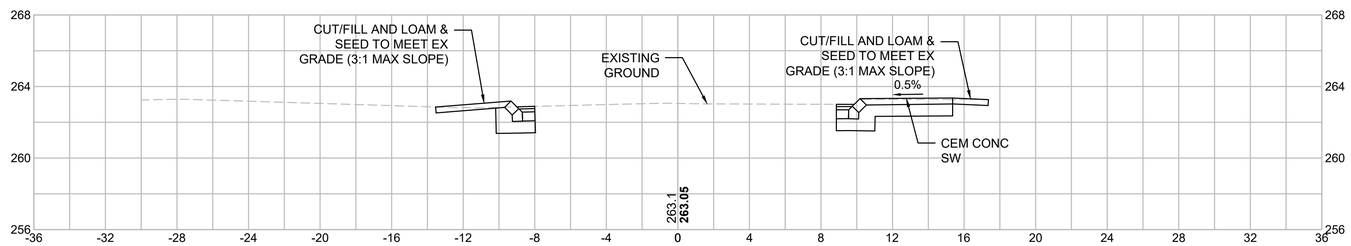
22+50



22+25



22+00



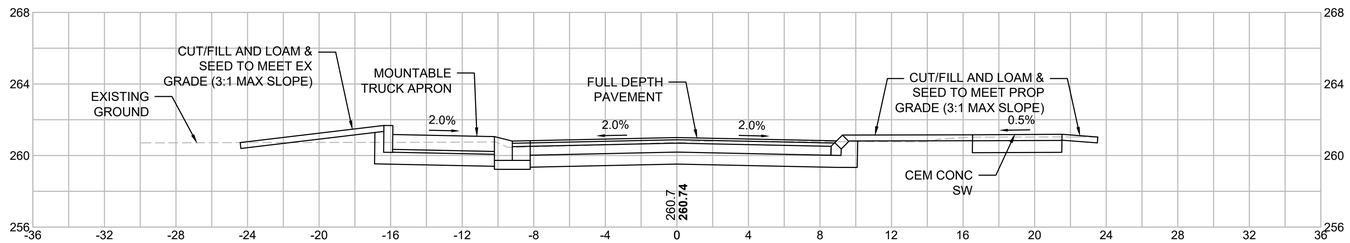
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

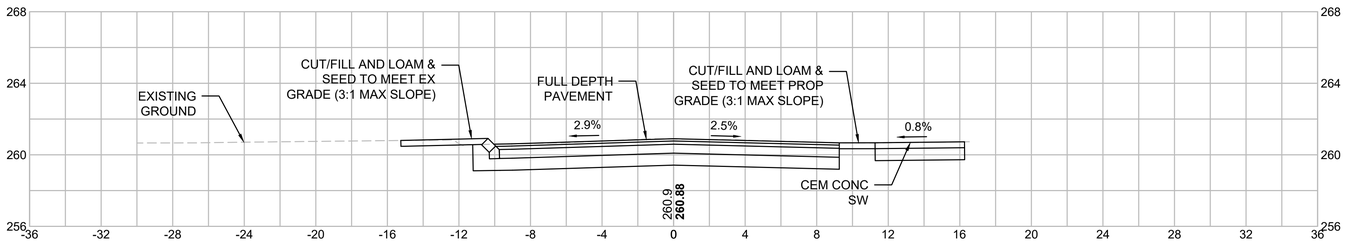
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	54	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

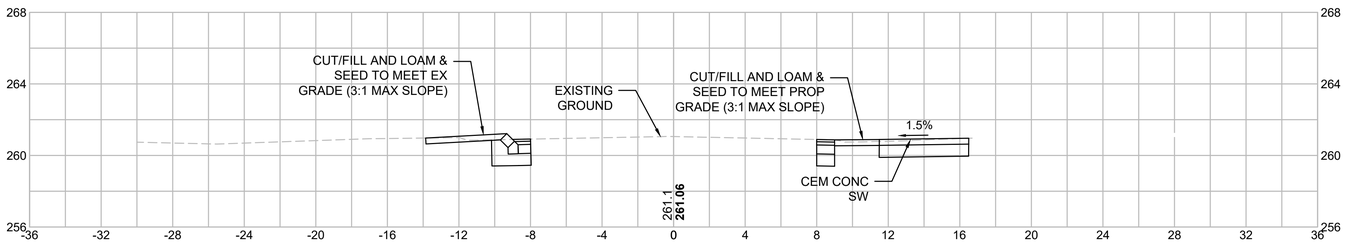
23+75



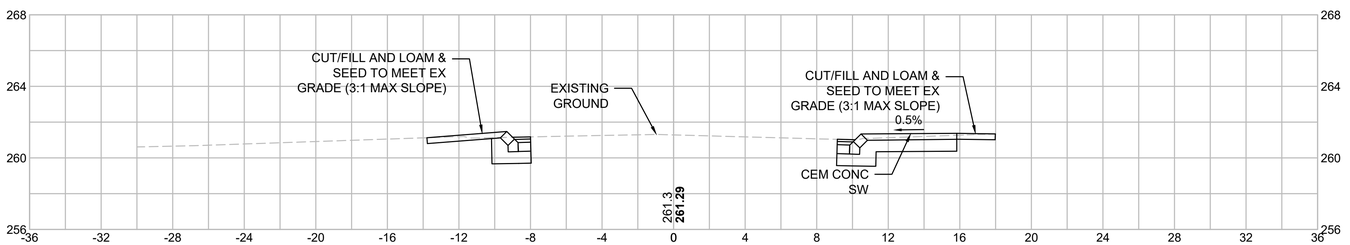
23+50



23+25



23+00



60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

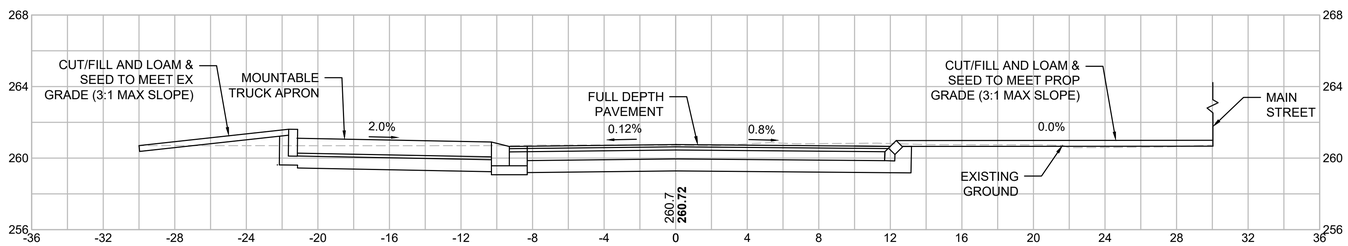
ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	55	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

24+22

24+00



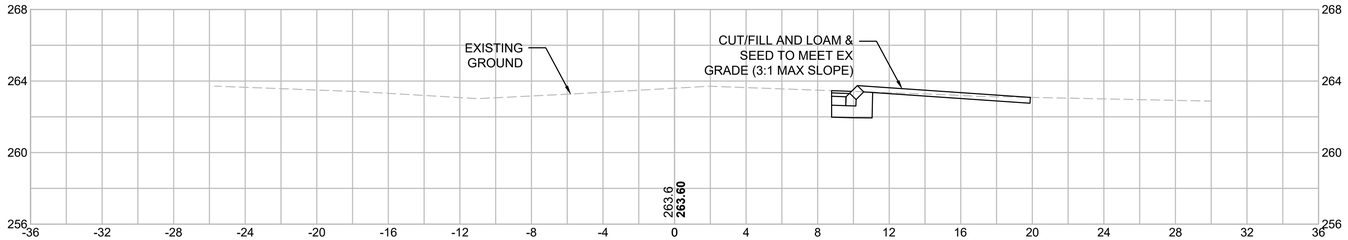
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

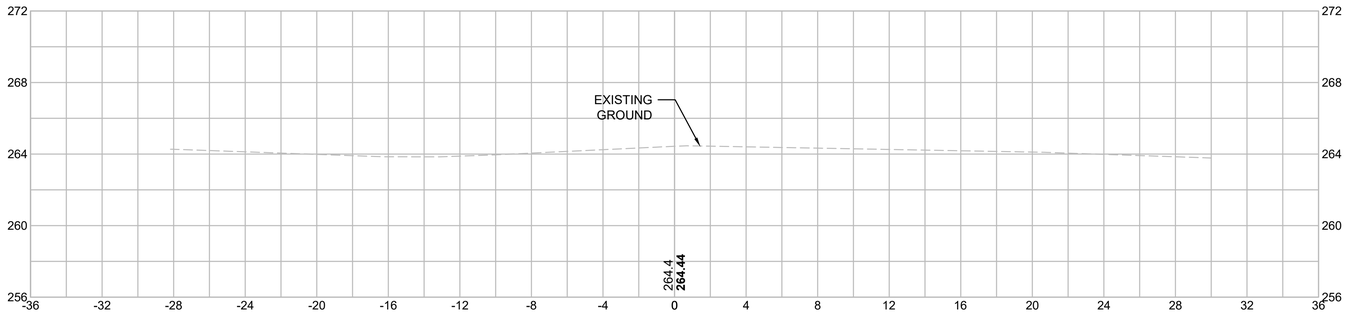
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	56	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

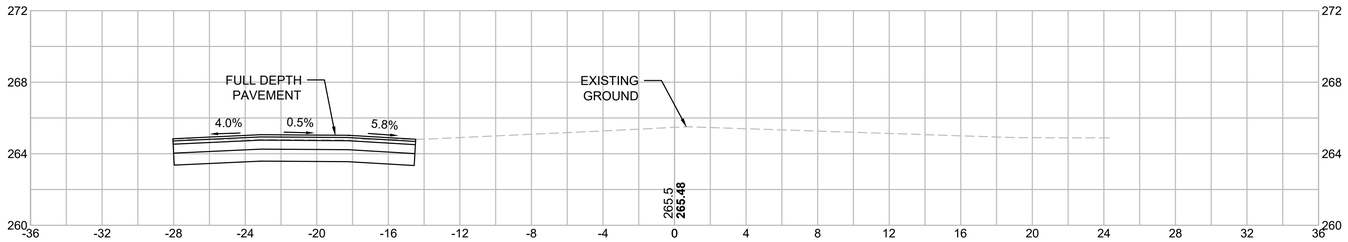
30+75



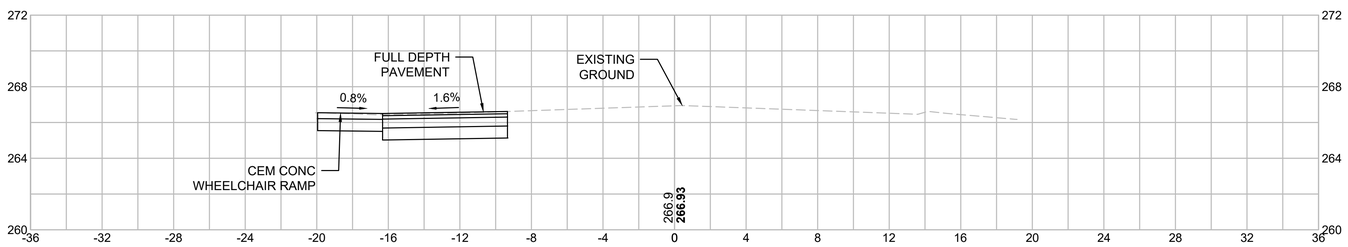
30+50



30+25



30+00



Plotted on 18-Nov-2021 2:43 PM

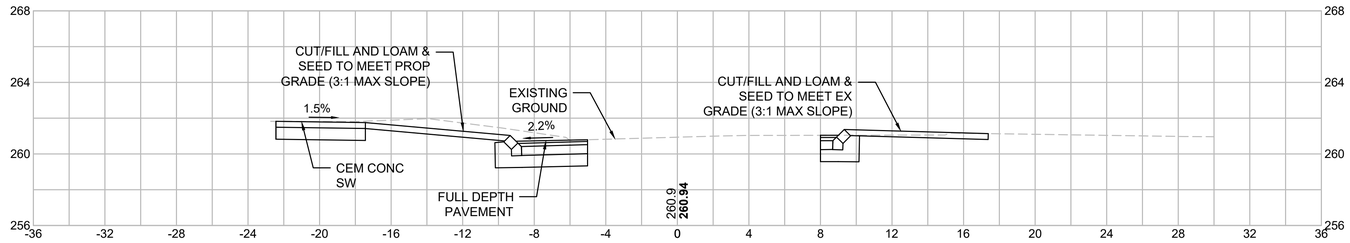
60143_HD10(CROSS_SECTIONS).DWG

ACTON
ACTON TOWN CENTER

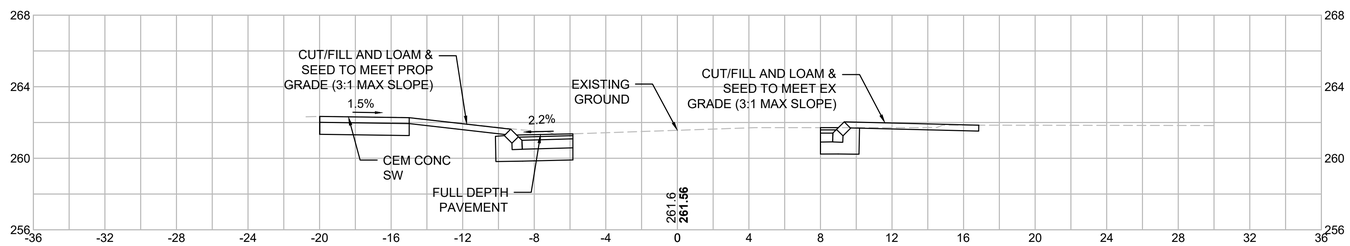
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	57	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

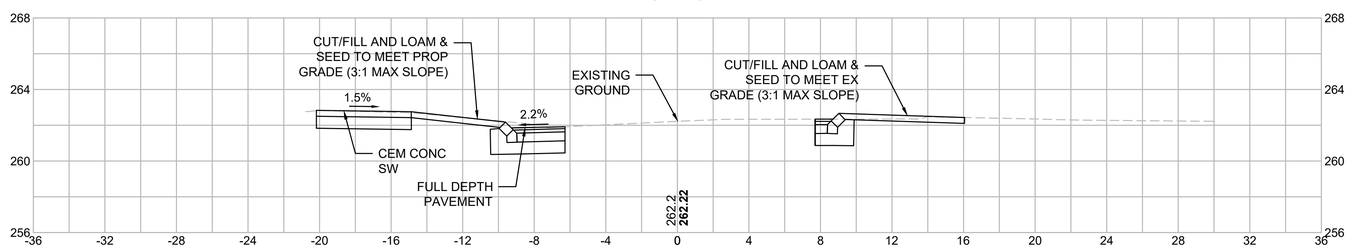
31+75



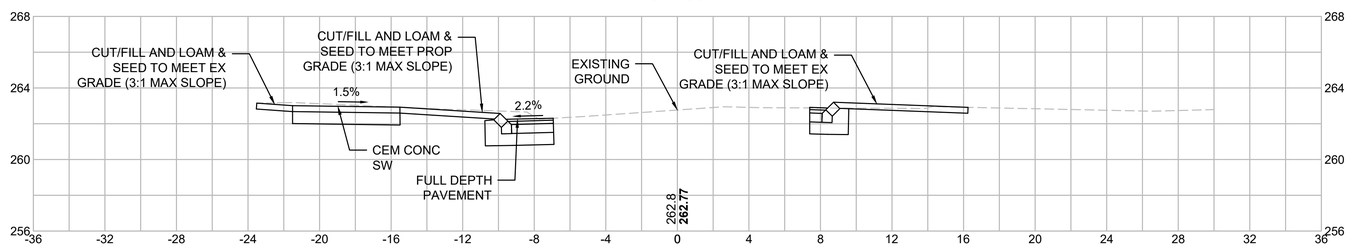
31+50



31+25



31+00



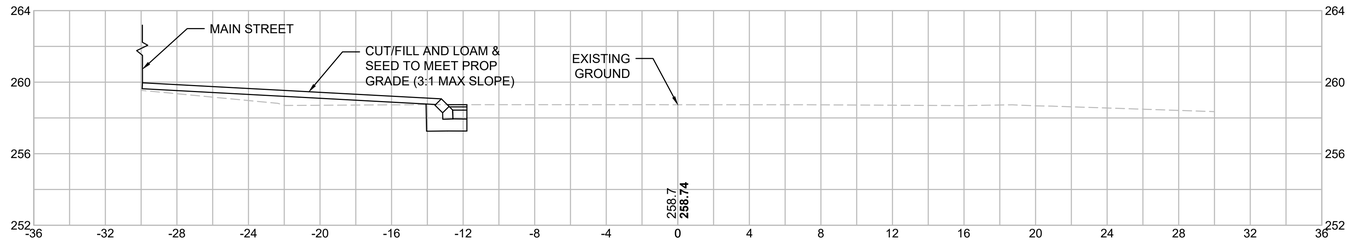
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

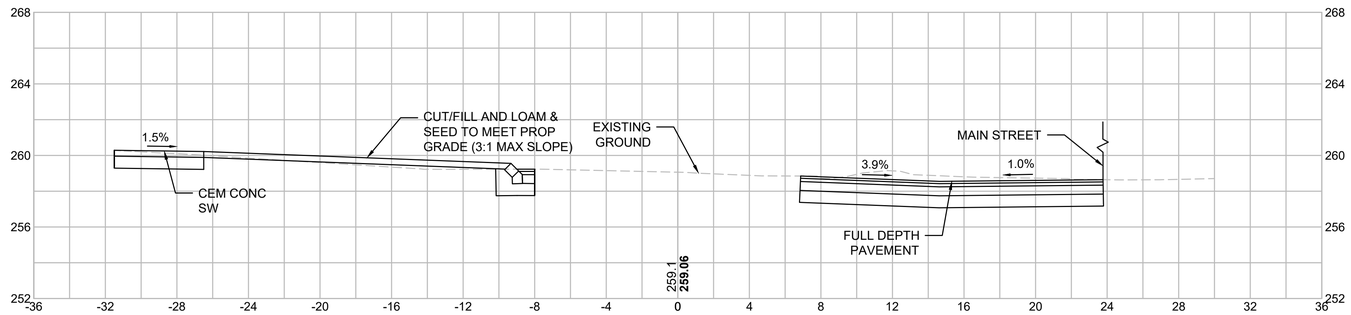
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	58	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

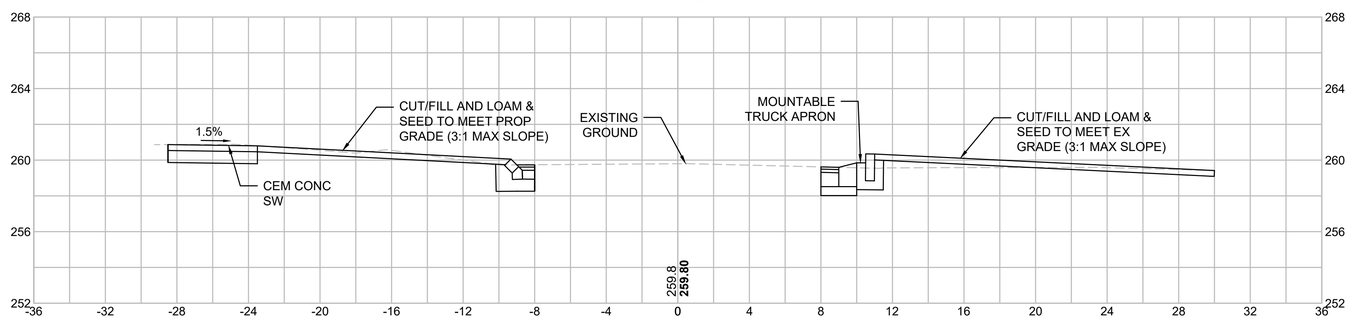
32+75



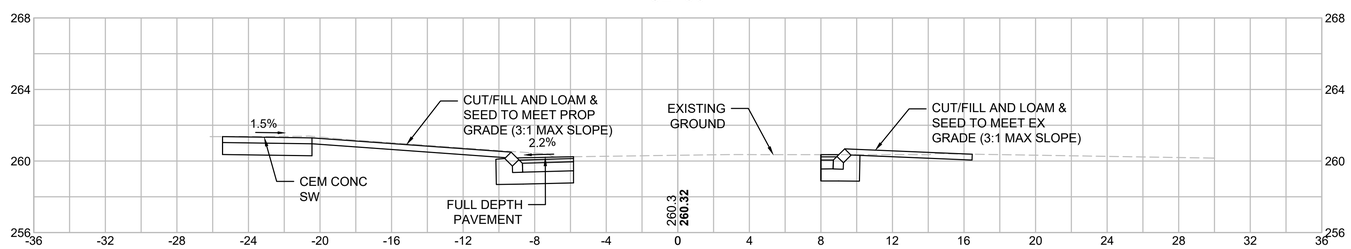
32+50



32+25



32+00



60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	59	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

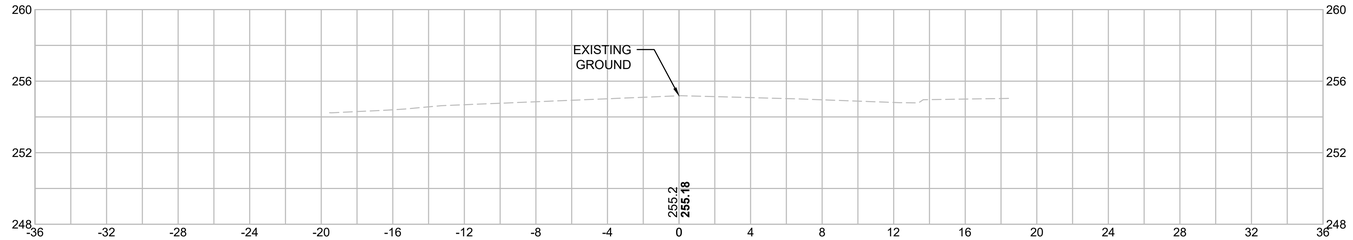
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	60	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

40+75



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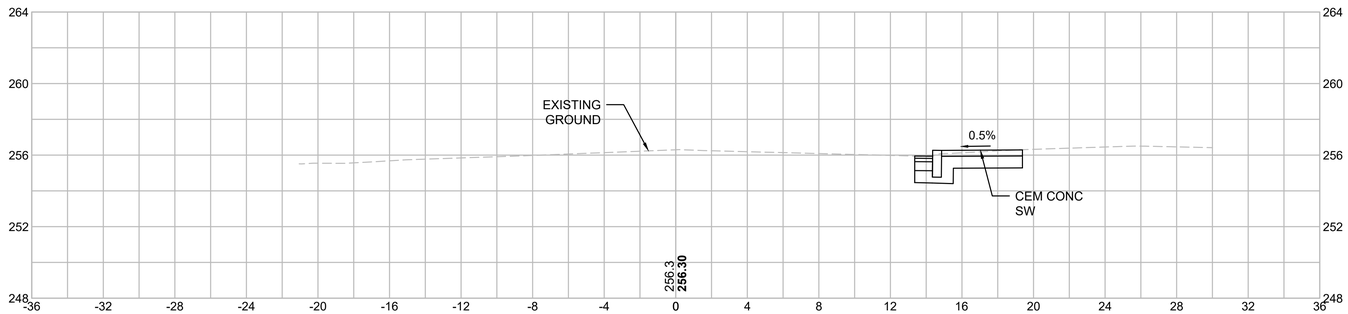

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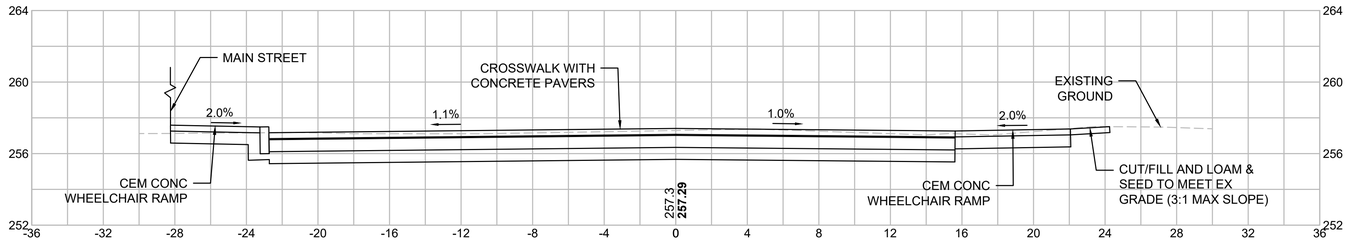

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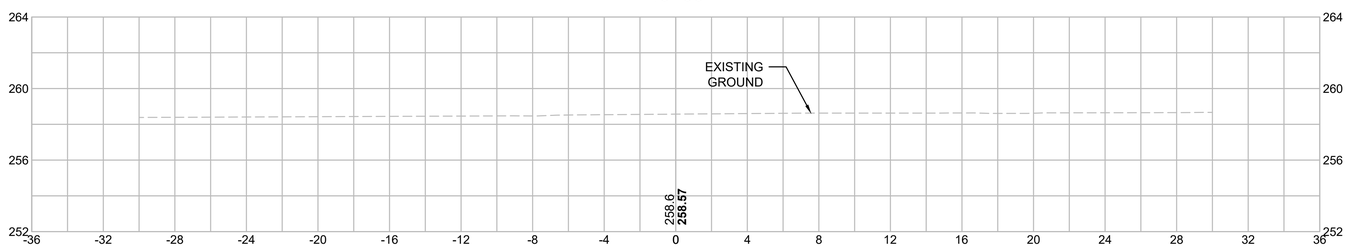

60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
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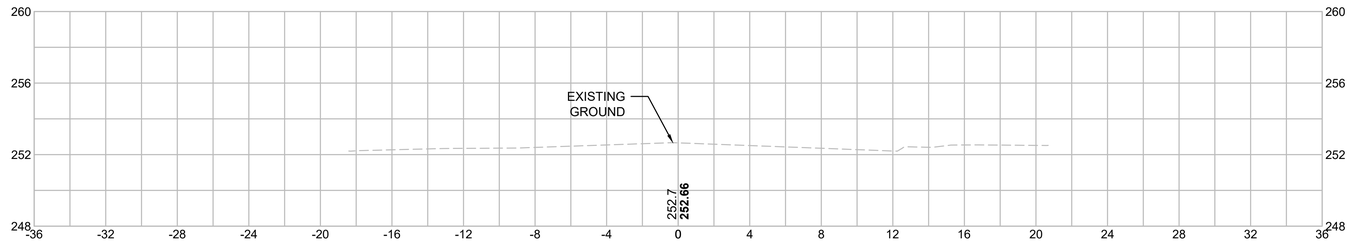
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	61	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

41+50.89



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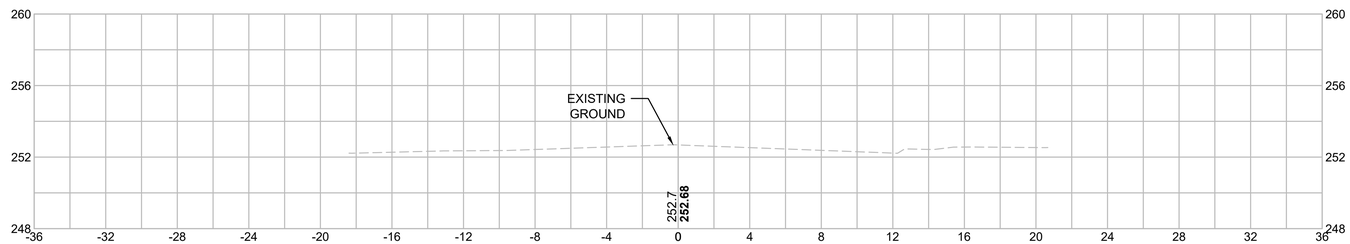

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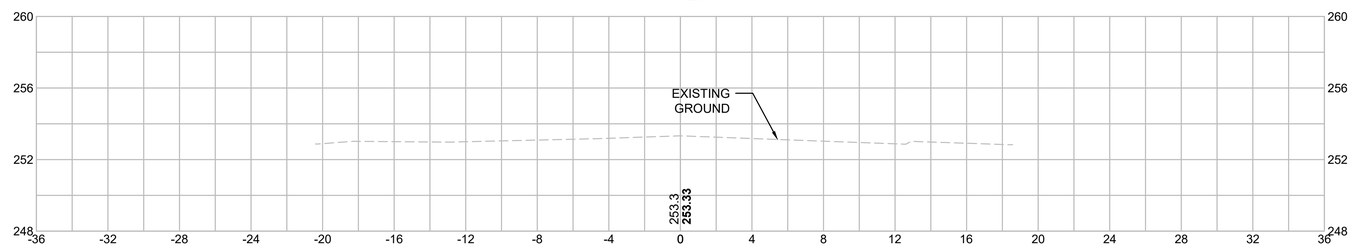
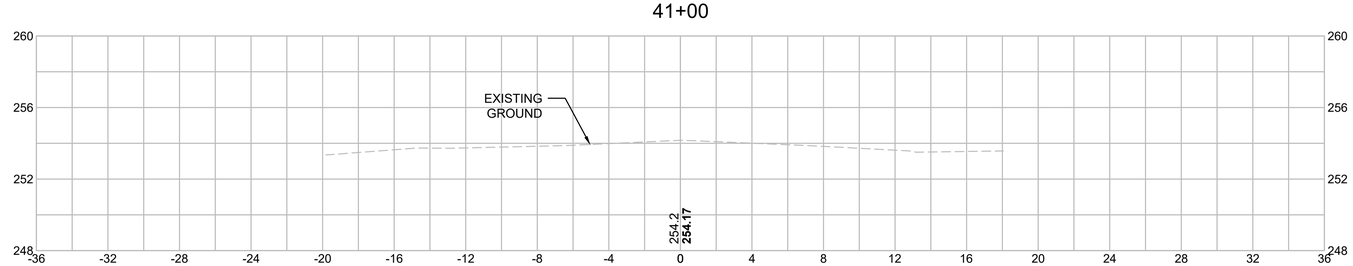


41+00



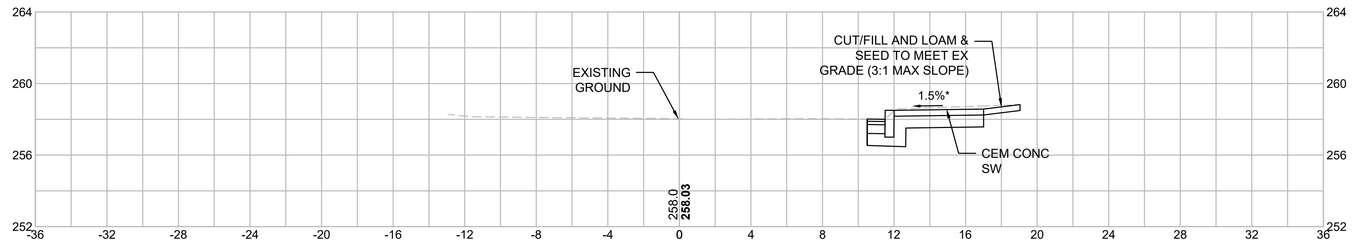
60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

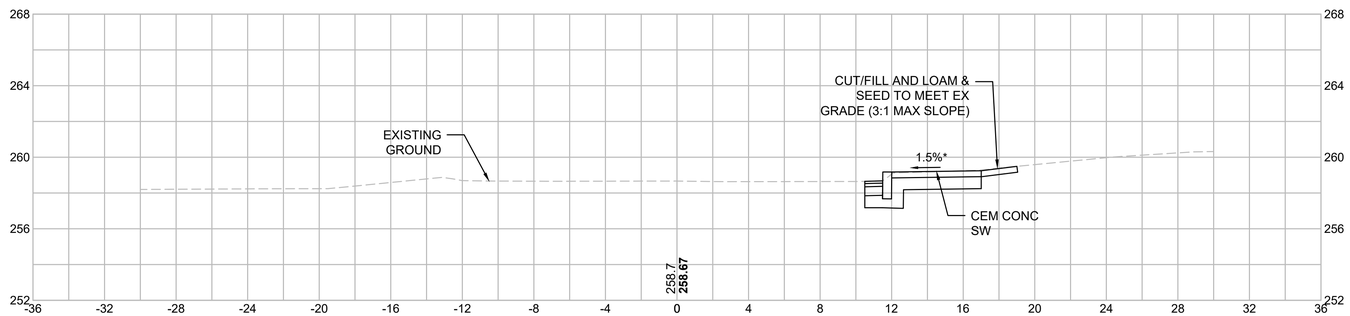
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	62	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS

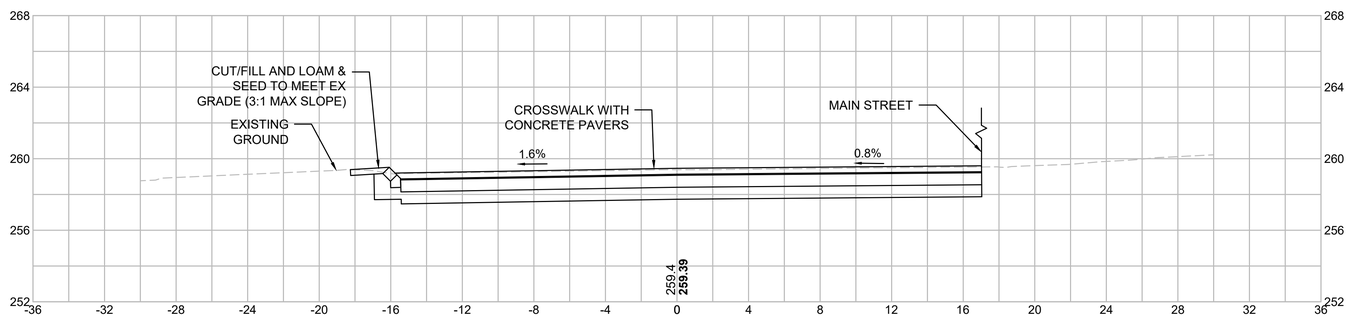
50+75



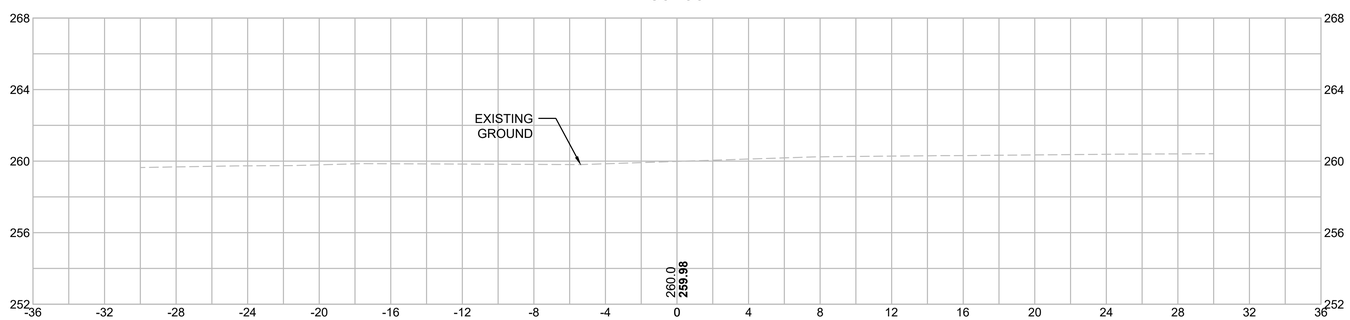
50+50



50+25



50+00

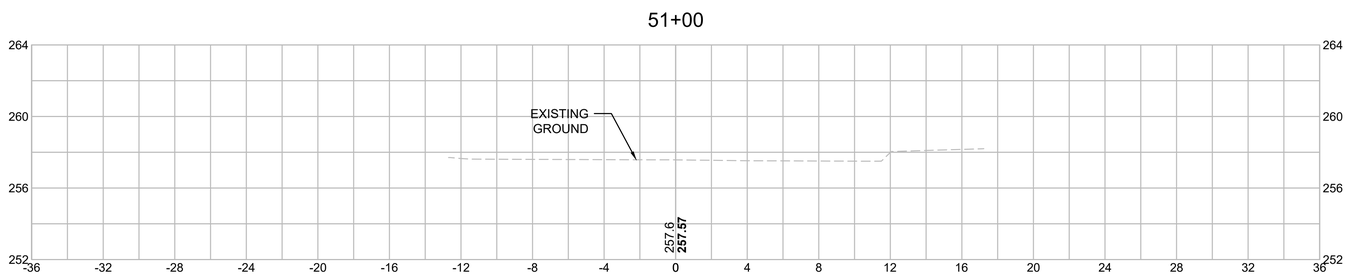


60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:43 PM

ACTON
ACTON TOWN CENTER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	63	62
PROJECT FILE NO.	TOOLE-60143		

CROSS SECTIONS



60143_HD10(CROSS_SECTIONS).DWG Plotted on 18-Nov-2021 2:44 PM