

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PLAN AND PROFILE OF MINUTEMAN BIKEWAY EXTENSION

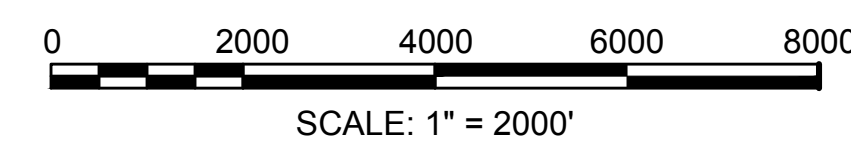
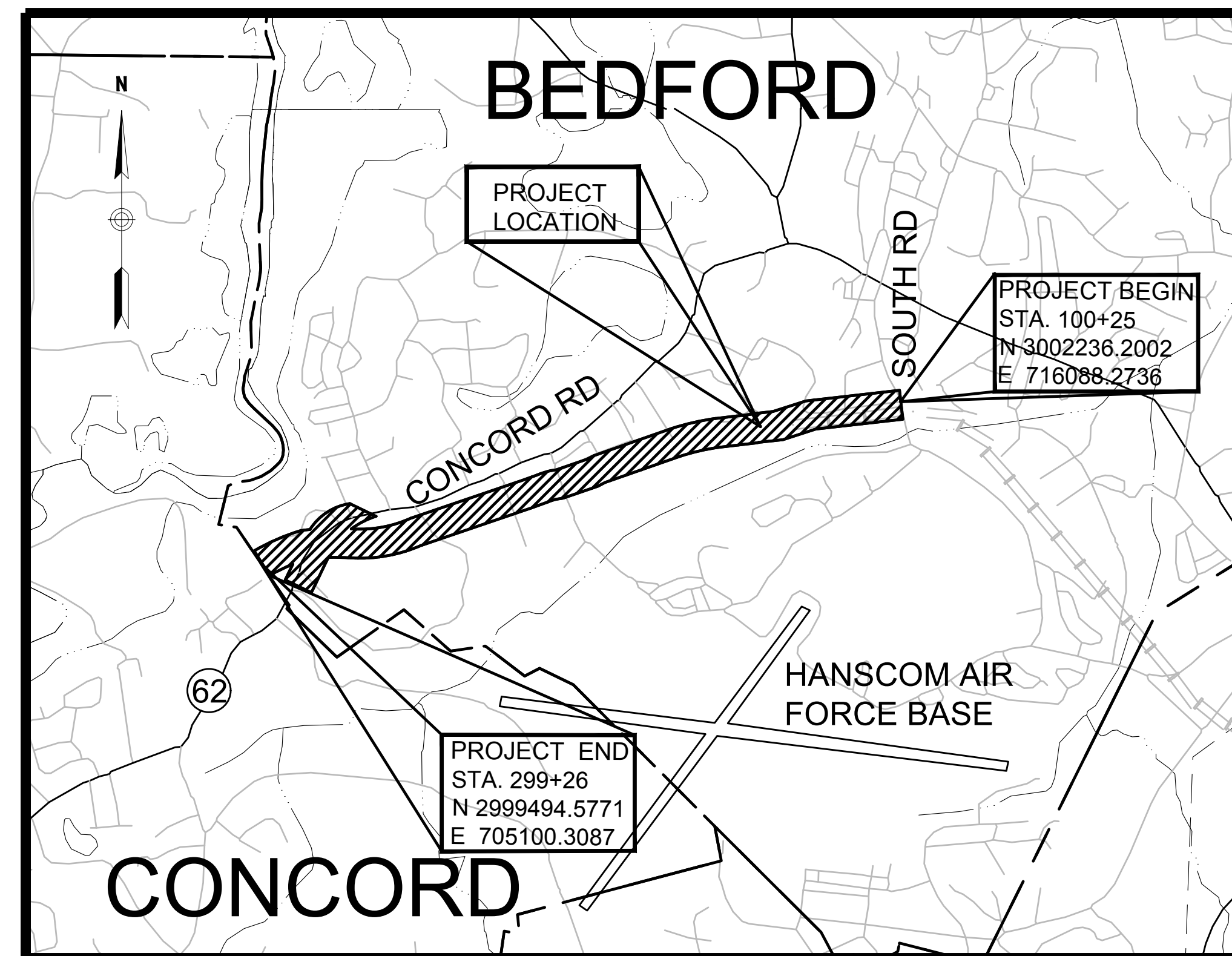
IN THE TOWN OF
BEDFORD
MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. TBD

25% SUBMITTAL

INDEX

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LENGTH OF PROJECT = 13,216 FEET = 2.50 MILES

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	01	54
PROJECT FILE NO. 54			
TITLE SHEET & INDEX			

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1 2015, THE INTERIM SUPPLEMENTAL SPECIFICATIONS DATED SEPTEMBER 16 2016, THE 2016 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

DESIGN DESIGNATION (MINUTEMAN BIKEWAY)

DESIGN SPEED 20 MPH

DESIGN DESIGNATION (RAILROAD AVENUE)

DESIGN SPEED 30 MPH

ADT (2017) 2,445 VPD

ADT (2037) 2,700 VPD

K 16%

D 57% EB

T (PEAK HOUR) 5.7%

T (AVERAGE DAY) 2.4%

DHV 445 VPH

DDHV 250 VPH

FUNCTIONAL CLASSIFICATION LOCAL ROAD

DESIGN DESIGNATION (CONCORD ROAD)

DESIGN SPEED 40 MPH

ADT (2017) 9,905 VPD

ADT (2037) 10,945 VPD

K 11%

D 54% EB

T (PEAK HOUR) 0.9%

T (AVERAGE DAY) 1.0%

DHV 1,190 VPH

DDHV 645 VPH

FUNCTIONAL CLASSIFICATION URBAN MINOR ARTERIAL

DATE	INITIAL SUBMISSION	REV #
		1
DATE	DESCRIPTION	REV #

PLAN PREPARED BY:

101 WALNUT STREET
WATERTOWN, MA 02471



RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

APPROVED:

DIVISION ADMINISTRATOR DATE

HIGHWAY ADMINISTRATOR DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		MAIL BOX
		ELECTRIC HANDHOLE
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		EROSION CONTROL BARRIER
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
BIT.	BITUMINOUS
BM	BENCHMARK
BOS	BOTTOM OF SLOPE
(BO)	BY OTHERS
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CBSC	CATCH BASIN SHALLOW COVER
CEM	CEMENT
CLF	CHAIN LINK FENCE
CONC	CONCRETE
ELEV (or EL.)	ELEVATION
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING

F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GRAN	GRANITE
HMA	HOT MIX ASPHALT
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NTS	NOT TO SCALE
P.G.L.	PROFILE GRADE LINE
PROP	PROPOSED
PVMT	PAVEMENT
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET

R&S	REMOVE AND STACK
RT	RIGHT
STA	STATION
TEMP	TEMPORARY
TOS	TOP OF SLOPE
TYP	TYPICAL
UTILITIES	
ACCOMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HW	HEADWALL

HYD	HYDRANT
INV	INVERT
PVC	POLYVINYLCHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
TSV&B	TAPPING SLEEVE VALVE AND BOX
UP	UTILITY POLE
ALIGNMENT/GRADING	
CC	CENTER OF CURVE
HP	HIGH POINT
LP	LOW POINT
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
PNT	POINT
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENT

GENERAL NOTES:

- TOPOGRAPHICAL INFORMATION FROM A SURVEY PERFORMED BY VHB IN 2011, SUPPLEMENTED BY HANCOCK ASSOCIATES, CHELMSFORD, MASSACHUSETTS IN 2011, AND UPDATED BY VHB IN 2016. THE HORIZONTAL DATUM FOR THIS SURVEY IS THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE. THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
- WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
- THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK CONFORMING TO M4.05.2.
- THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
- TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON APPROVAL OF THE ENGINEER.
- AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
- THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
- AFTER MICRO MILLING OPERATIONS AND PRIOR TO PAVING OF THE INTERMEDIATE (BINDER) COURSE THE MILLED SURFACE SHALL BE CRACK SEALED.
- JOINTS BETWEEN NEW ASPHALT CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.
- ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- ALL LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF .01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- EXISTING GRANITE CURB SUITABLE FOR RE-USE SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED STONES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
- ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED. PROPERTY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN VERIFIED.
- DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.

TRAFFIC SIGNAL

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

BEDFORD MINUTEMAN BIKEWAY EXTENSION

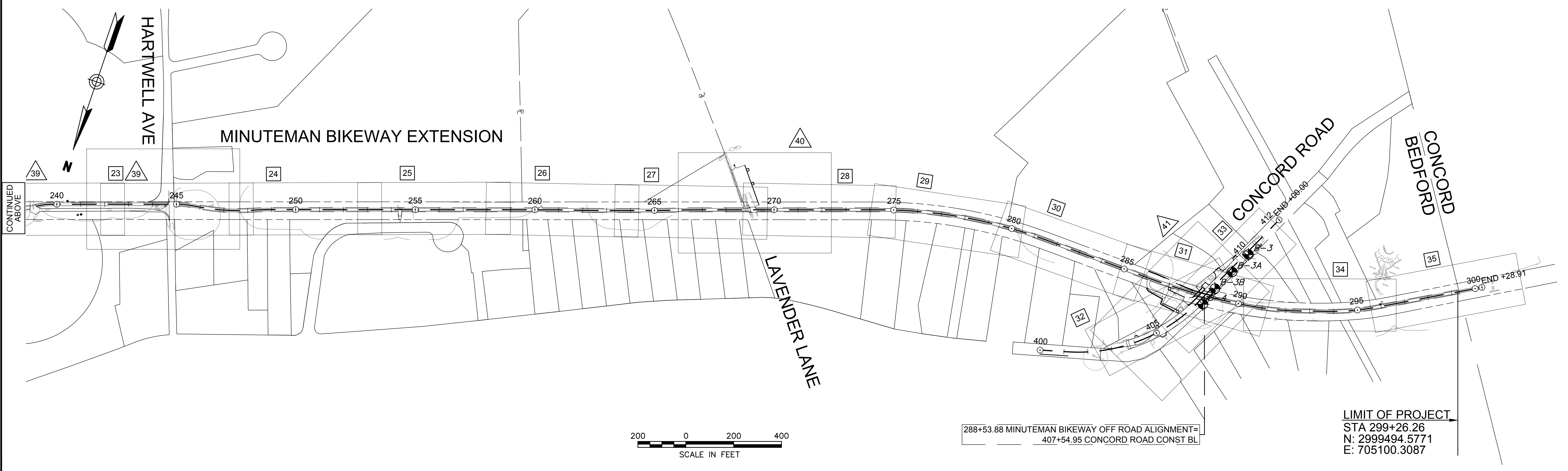
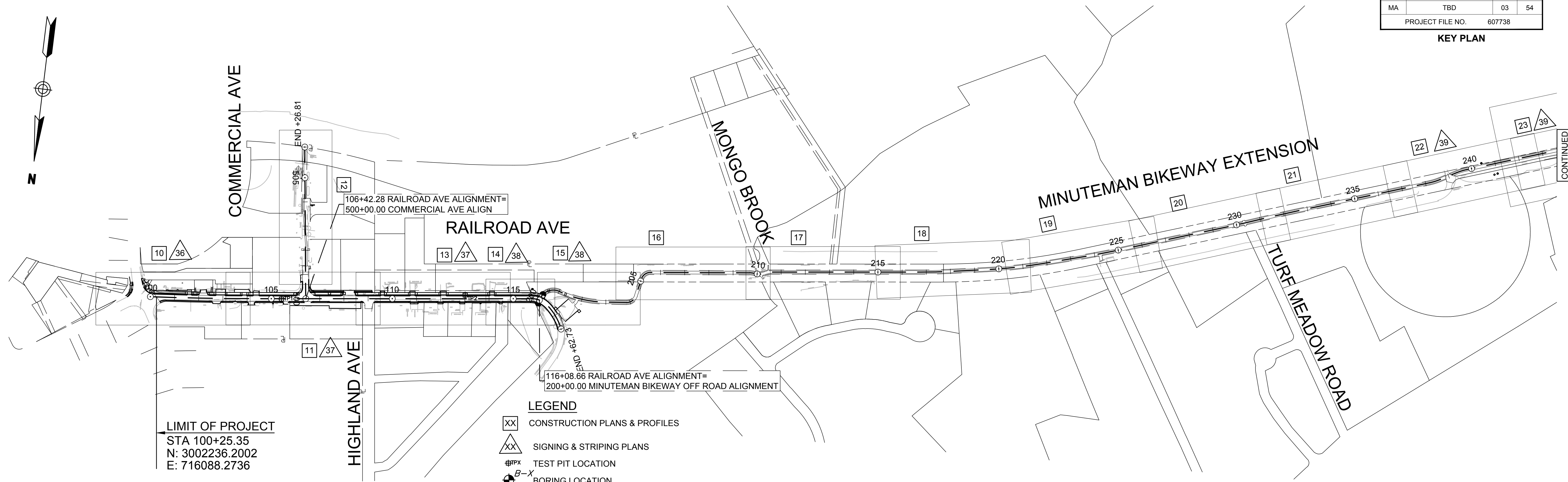
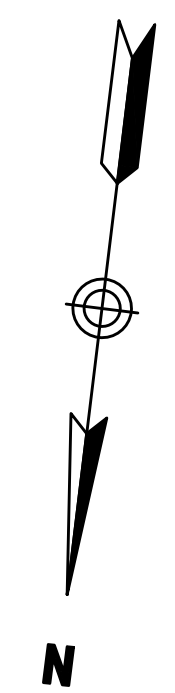
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	02	54
PROJECT FILE NO.		607738	

LEGEND & ABBREVIATIONS

BEDFORD
MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	03	54
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KEY PLAN



607738_HD(KEY).DWG Plotted on 17-Mar-2017 3:11 PM

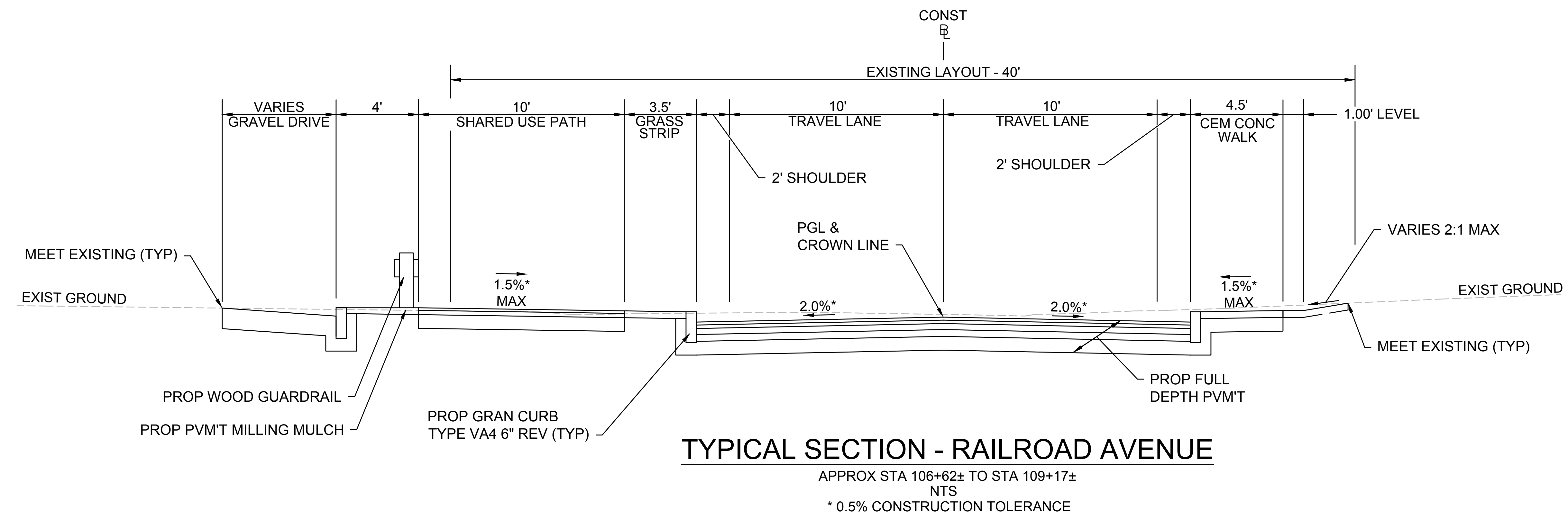
BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	04	54
PROJECT FILE NO.		607738	

TYPICAL SECTIONS

PAVEMENT NOTES

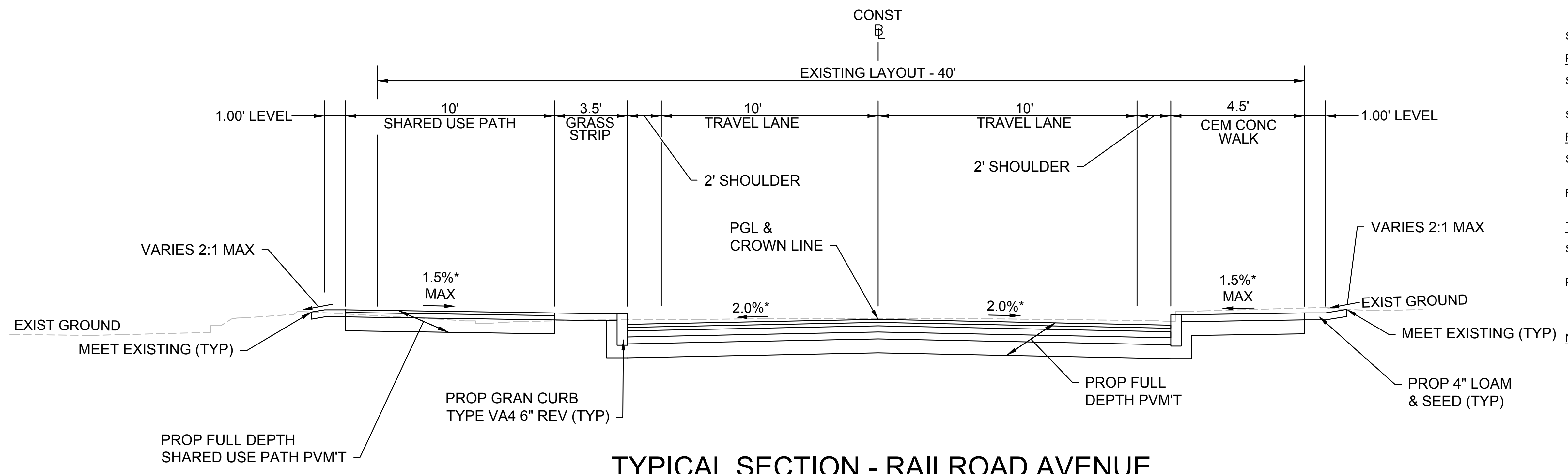
- PROPOSED FULL DEPTH PAVEMENT**
 SURFACE: 1.75" SUPERPAVE SURFACE COURSE
 9.5 (SSC-9.5) OVER
 BASE: 4" SUPERPAVE INTERMEDIATE COURSE
 12.5 (SIC-12.5) OVER
 SUBBASE: 4" DENSE GRADED STONE FOR SUBBASE OVER
 8" GRAVEL BORROW, TYPE b
- PROPOSED FULL DEPTH SHARED USE PATH (SUP) PAVEMENT**
 SURFACE: 1.5" SUPERPAVE SURFACE COURSE
 9.5 (SSC-9.5) OVER
 BASE: 2.5" SUPERPAVE INTERMEDIATE COURSE
 19.0 (SIC-19.0) OVER
 SUBBASE: 8" GRAVEL BORROW, TYPE b
- PROPOSED PAVEMENT MILLING & OVERLAY**
 SURFACE: 1.75" SUPERPAVE SURFACE COURSE
 9.5 (SSC-9.5) OVER
 TACK COAT: BITUMEN FOR TACK COAT (RS-1) AT
 0.07 GAL/SY OVER EXISTING PAVEMENT
 PAVEMENT MILLING VARIABLE DEPTH
 1.75" MIN.
- PROPOSED HOT MIX ASPHALT DRIVEWAY**
 SURFACE: 1.5" SUPERPAVE SURFACE COURSE
 9.5 (SSC-9.5) OVER
 2.0" SUPERPAVE INTERMEDIATE COURSE
 12.5 (SIC-12.5) OVER
 SUBBASE: 8" GRAVEL BORROW, TYPE b
- PROPOSED HOT MIX ASPHALT WALK**
 SURFACE: 1.0" SUPERPAVE SURFACE COURSE
 9.5 (SSC-9.5) OVER
 1.5" SUPERPAVE INTERMEDIATE COURSE
 12.5 (SIC-12.5) OVER
 SUBBASE: 8" GRAVEL BORROW, TYPE b
- PROPOSED CEMENT CONCRETE WALK/WHEELCHAIR RAMP**
 SURFACE: 4" CEMENT CONCRETE
 AIR ENTRAINED 4000 PSI, ¾", 610
 SUBBASE: 8" GRAVEL BORROW, TYPE b
- PROPOSED CEMENT CONCRETE WALK/WHEELCHAIR RAMP**
 SURFACE: 6" CEMENT CONCRETE
 AIR ENTRAINED 4000 PSI, ¾", 610
 FOUNDATION: 8" GRAVEL BORROW, TYPE b
- TEMPORARY PAVEMENT**
 SURFACE: 4" HOT MIX ASPHALT
 PLACED IN 2 LIFTS
 FOUNDATION: 8" GRAVEL BORROW, TYPE b

- NOTES:**
- ALL SUPERPAVE HOT MIX ASPHALT SHALL BE PRODUCED WITH A WARM MIX ASPHALT TECHNOLOGY.
 - ALL HOT MIX ASPHALT PAVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 450 QUALITY ASSURANCE FOR HMA AND SHALL BE PRODUCED IN ACCORDANCE WITH SECTION 455 SUPERPAVE HMA SPECIFICATIONS.
 - ASPHALT EMULSION FOR TACK COAT (ITEM 452.) SHALL BE SPRAY APPLIED FOR DOUBLE OVERLAP COVERAGE AT 0.07 GALLONS PER SQUARE YARD OVER MILLED SURFACES AND 0.05 GALLONS PER SQUARE YARD OVER SMOOTH SURFACES.
 - HMA JOINT SEALANT (ITEM 453.) SHALL BE APPLIED IN SURFACE COURSE AT ALL VERTICAL COLD JOINTS PRIOR TO HMA PAVING.
 - LATEX MODIFICATION OF HMA (ITEM 454.5) SHALL BE USED FOR ALL SUPERPAVE HOT MIX ASPHALT PROPOSED WITHIN ROADWAYS.
 - ALL HOT MIX ASPHALT WALKS AND TEMPORARY PAVEMENT SHALL BE ESTIMATED AND PAID FOR UNDER ITEM 472. OF STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
 - ALL HOT MIX ASPHALT DRIVEWAYS SHALL BE ESTIMATED AND PAID FOR UNDER ITEM 703. OF STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES.
 - EXISTING SUBBASE MATERIAL AT SIDEWALKS AND DRIVEWAYS THAT MEETS THE REQUIREMENTS FOR GRAVEL BORROW TYPE b SHALL REMAIN IN PLACE.



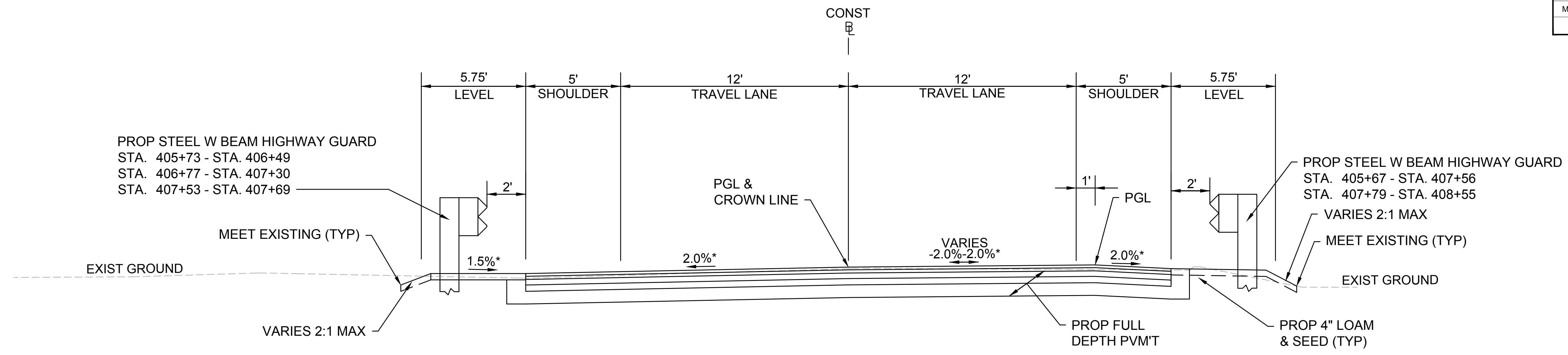
TYPICAL SECTION - RAILROAD AVENUE

APPROX STA 106+62± TO STA 109+17±
 NTS
 * 0.5% CONSTRUCTION TOLERANCE



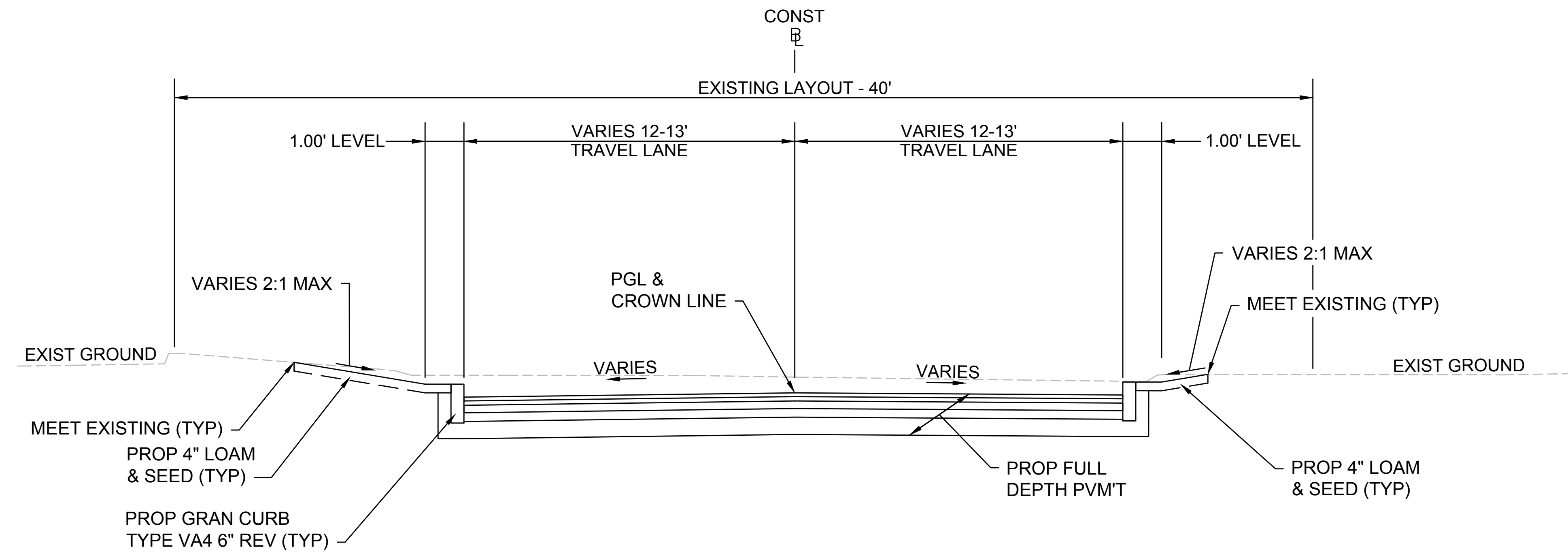
TYPICAL SECTION - RAILROAD AVENUE

APPROX STA 100+25± TO STA 105+99±
 STA 109+17± TO STA 116+00±
 NTS
 * 0.5% CONSTRUCTION TOLERANCE



TYPICAL SECTION - CONCORD ROAD

APPROX STA 403+67± TO STA 407+31±
 STA 407+78± TO STA 410+65±
 NTS
 * 0.5% CONSTRUCTION TOLERANCE



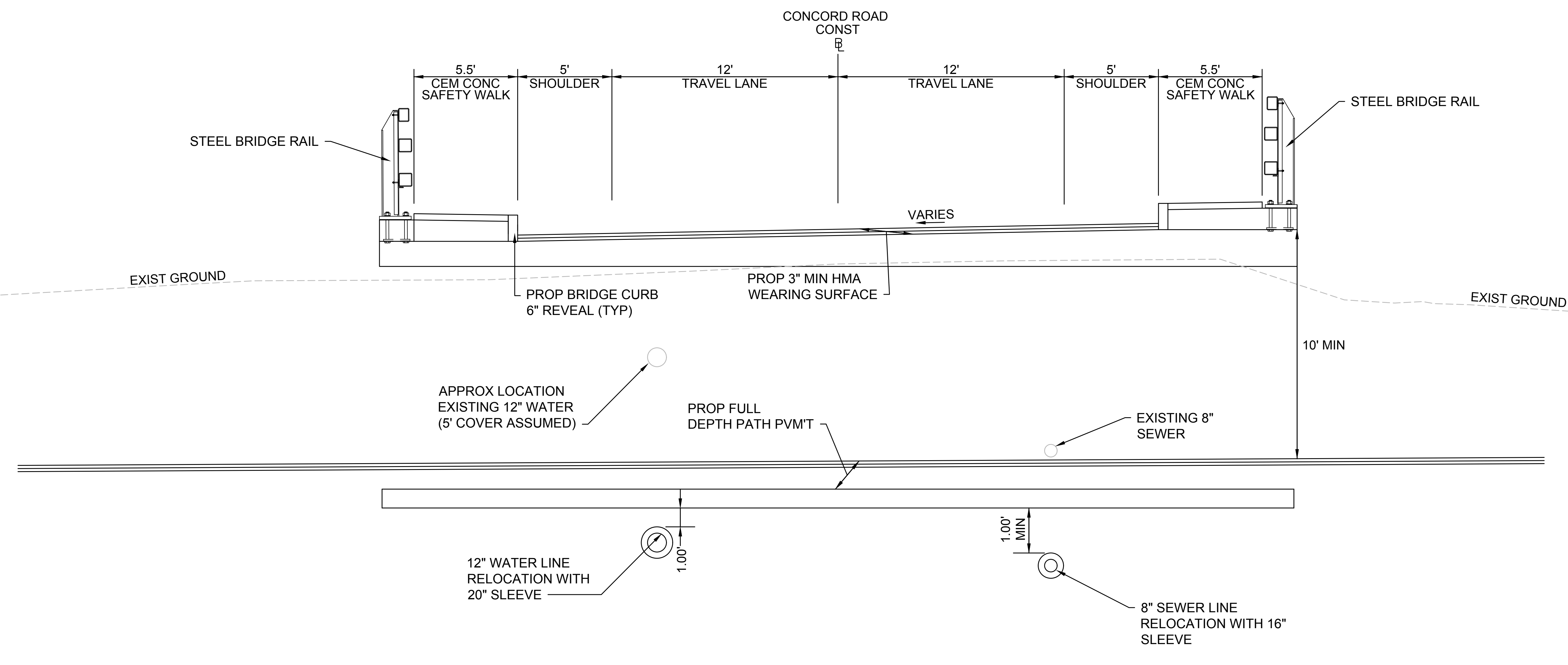
TYPICAL SECTION - COMMERCIAL AVENUE

APPROX STA 500+50± TO STA 501+35±
 NTS
 * 0.5% CONSTRUCTION TOLERANCE

**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

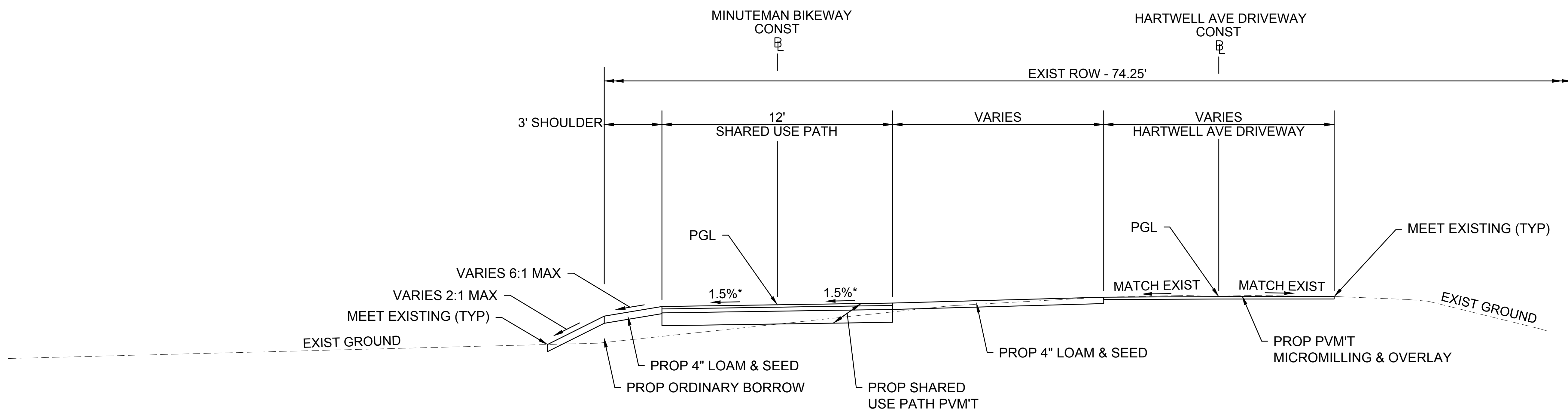
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	06	54
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TYPICAL SECTIONS



TYPICAL SECTION - CONCORD ROAD CULVERT

APPROX STA 407+31± TO STA 407+78±
NTS
* 0.5% CONSTRUCTION TOLERANCE

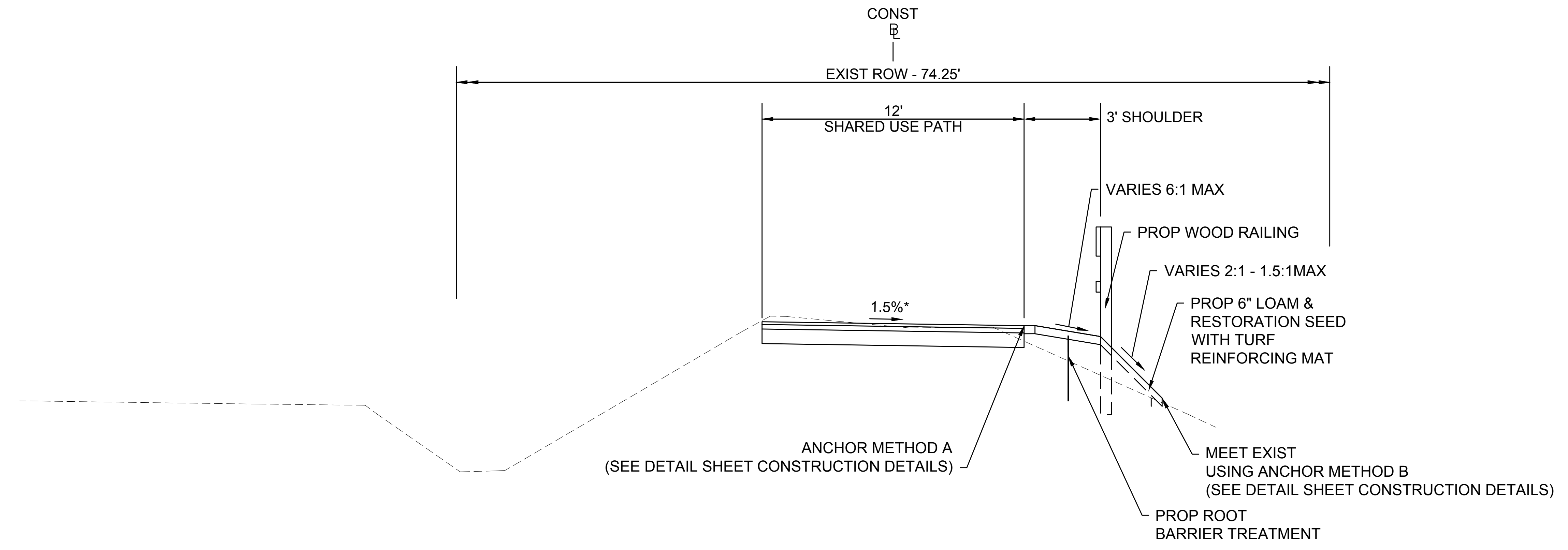


TYPICAL SECTION - MINUTEMAN BIKEWAY EXTENSION

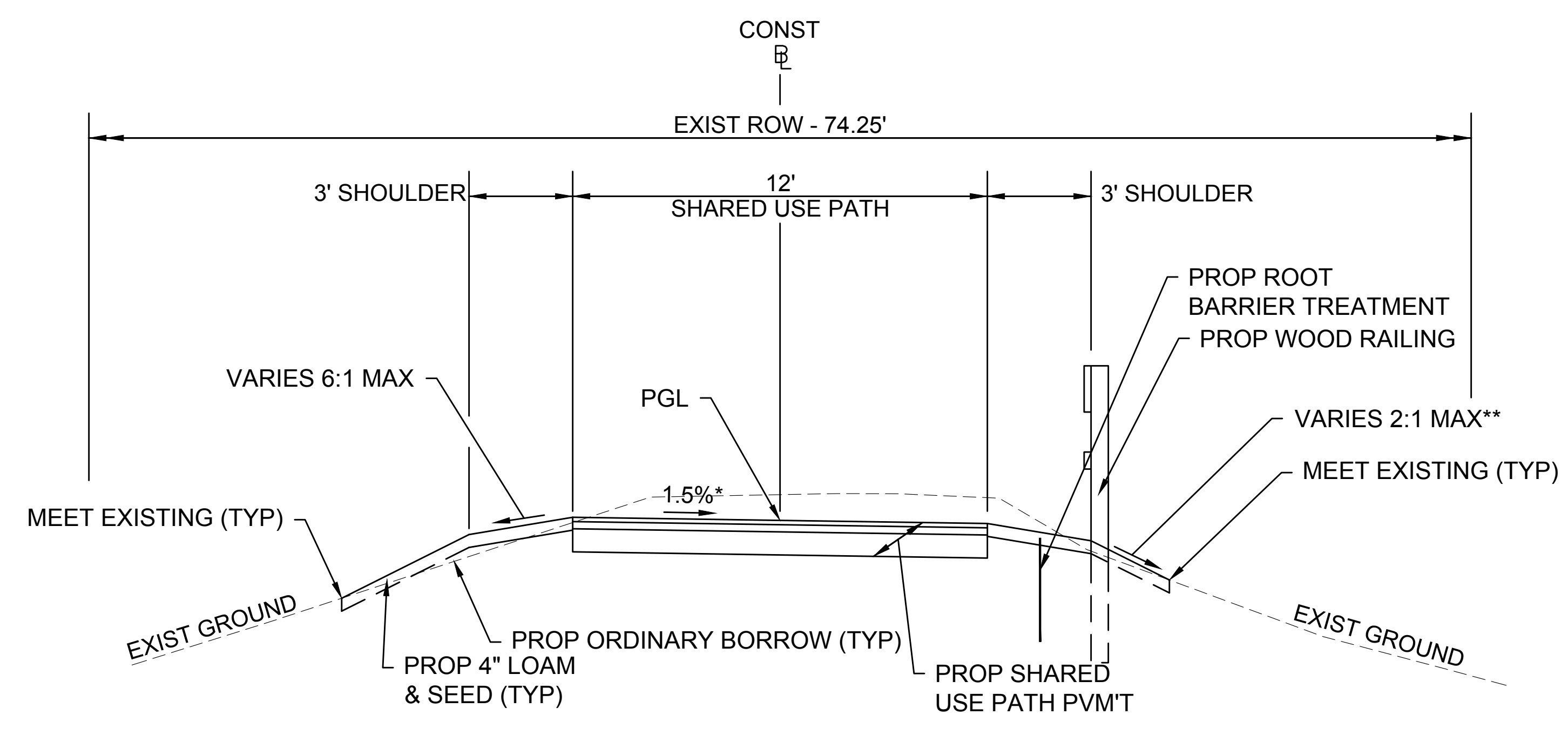
APPROX STA 239+10± TO STA 244+70±
 NTS
 * 0.5% CONSTRUCTION TOLERANCE

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	08	54
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TYPICAL SECTIONS



TYPICAL SECTION - MINUTEMAN BIKEWAY EXTENSION (STEEP SLOPE)

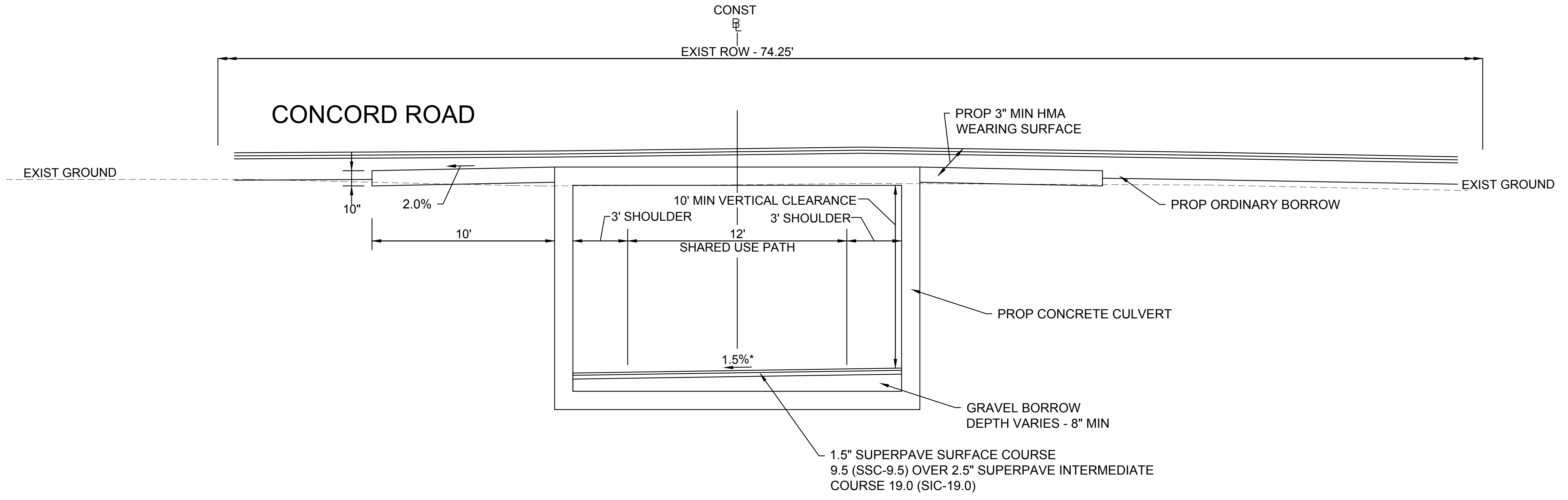


TYPICAL SECTION - MINUTEMAN BIKEWAY EXTENSION

APPROX STA 200+42± TO STA 238+90±
 STA 244+93± TO STA 287+50±
 STA 289+00± TO STA 299+26±
 NTS

* 0.5% CONSTRUCTION TOLERANCE

** SEE TYPICAL SECTION - MINUTEMAN BIKEWAY EXTENSION (STEEP SLOPE)
 FOR SLOPE TREATMENTS STEEPER THAN 2:1

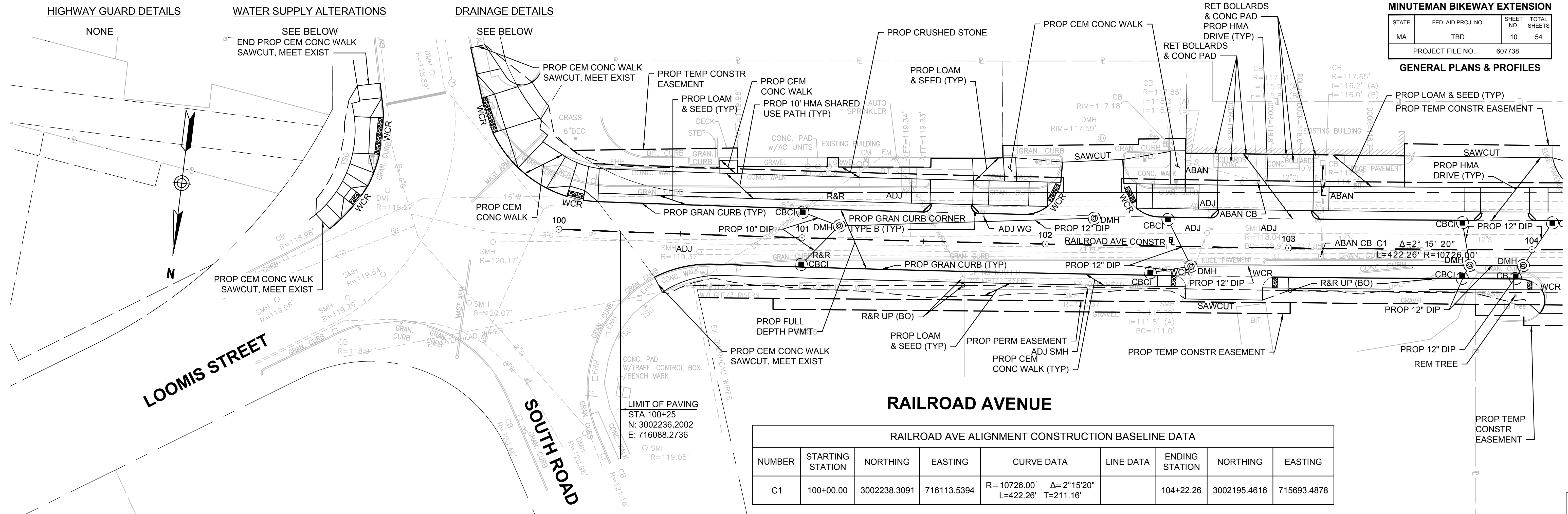


TYPICAL SECTION - MINUTEMAN BIKEWAY EXTENSION AT CONCORD ROAD CULVERT

APPROX STA 288+28± TO STA 288+80±
NTS

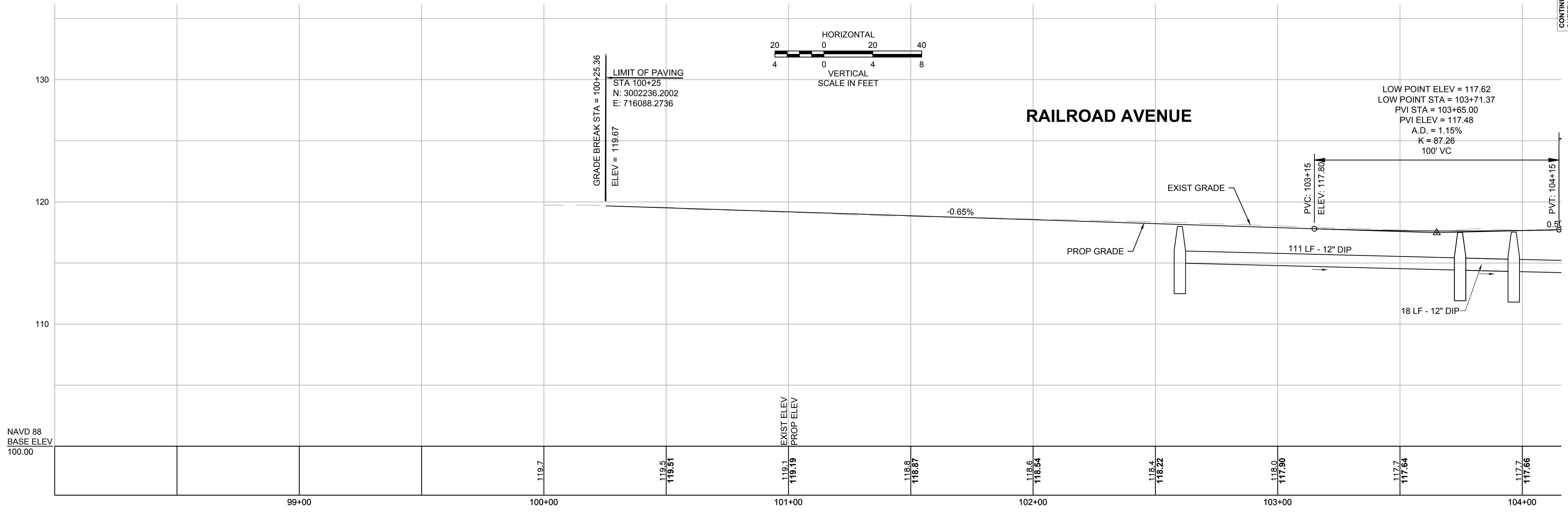
* 0.5% CONSTRUCTION TOLERANCE

GENERAL PLANS & PROFILES



RAILROAD AVE ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C1	100+00.00	3002238.3091	716113.5394	R=10726.00 L=422.26' Δ=2°15'20" T=211.16'		104+22.26	3002195.4616	715693.4878



CONTINUED ON SHEET NO. 11

HIGHWAY GUARD DETAILS
 DOUBLE FACED WOOD GUARDRAIL:
 STA. 406+74.58 LT TO STA. 107+97.76 LT
 STA. 108+44.22 LT TO STA. 108+53.18 LT
 STA. 108+56.40 LT TO STA. 109+14.96 LT

WATER SUPPLY ALTERATIONS
 SEE BELOW

DRAINAGE DETAILS
 SEE BELOW

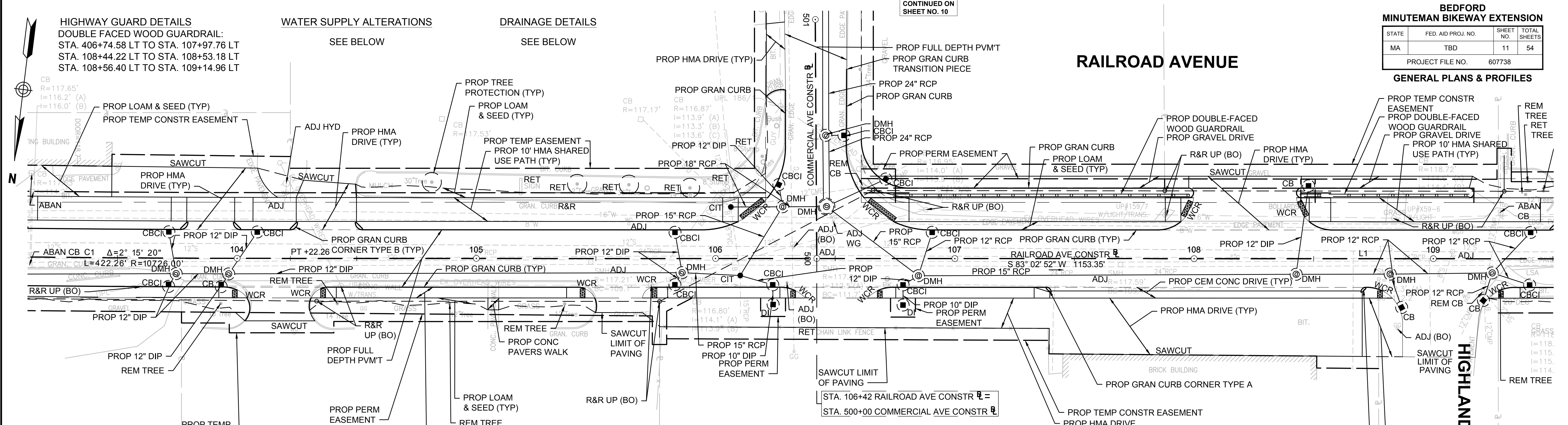
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BEDFORD MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	11	54

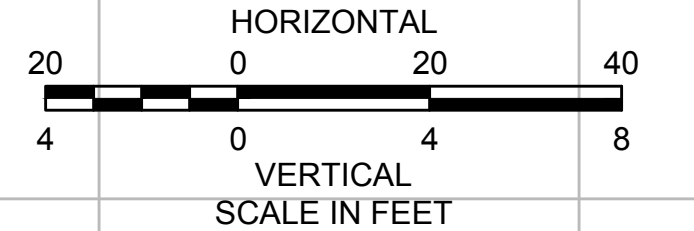
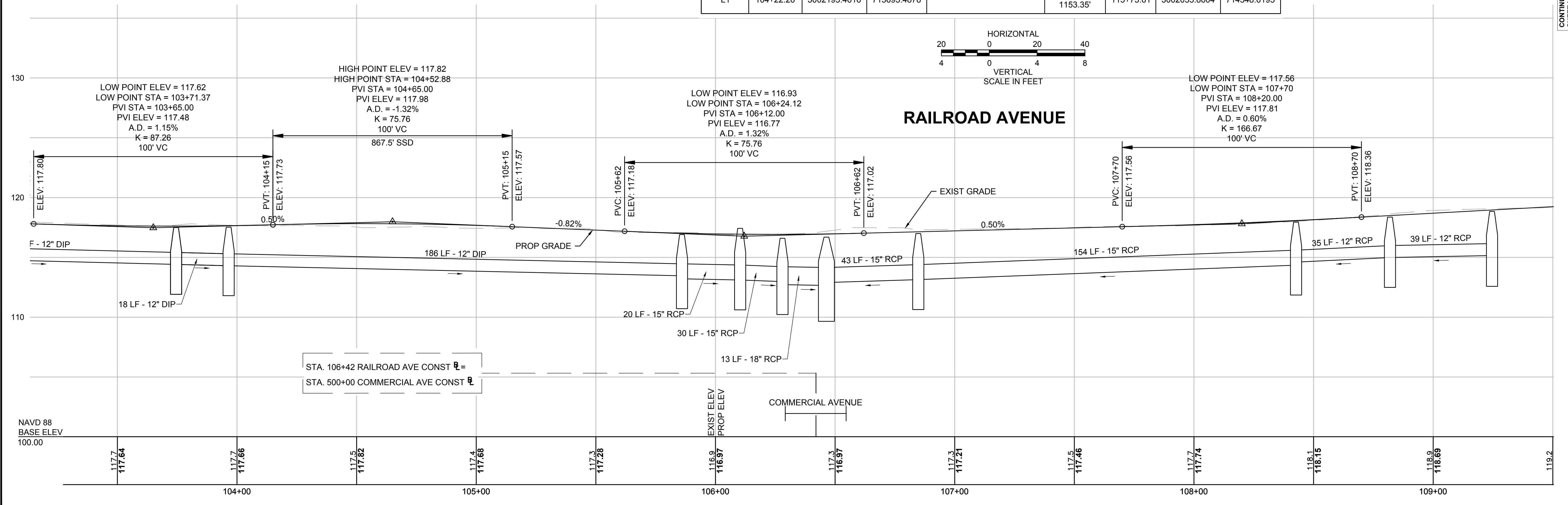
PROJECT FILE NO. 607738

GENERAL PLANS & PROFILES



RAILROAD AVE ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C1	100+00.00	3002238.3091	716113.5394	R=10726.00 Δ=2°15'20" L=422.26' T=211.16'		104+22.26	3002195.4616	715693.4878
L1	104+22.26	3002195.4616	715693.4878		S83°02'52"W 1153.35'	115+75.61	3002055.8604	714548.6195



CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 13

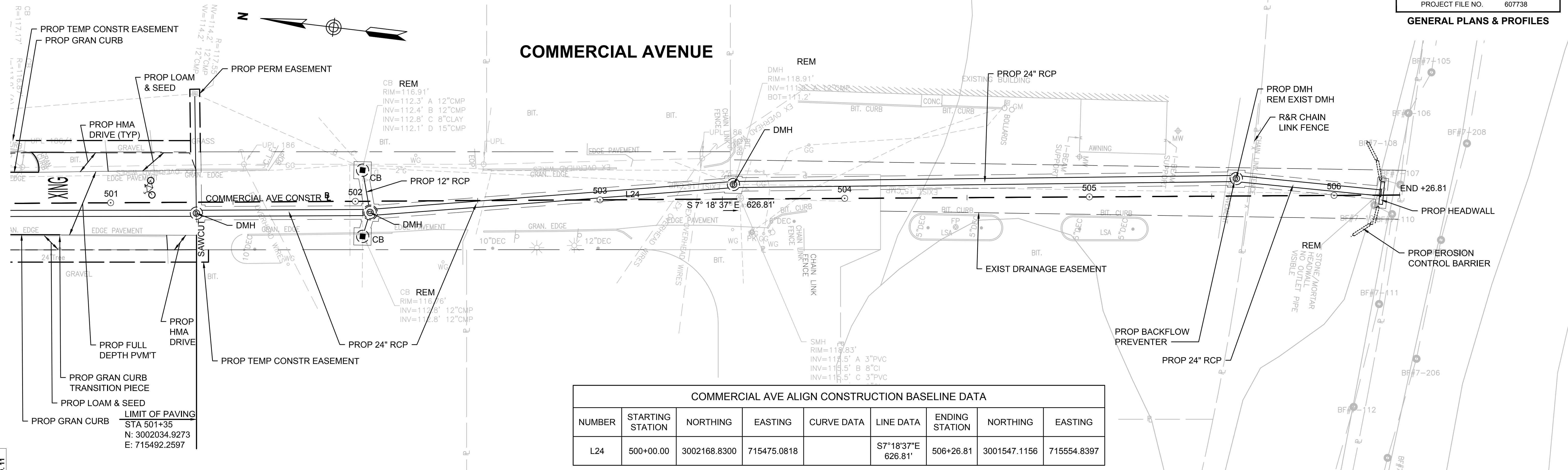
08993.01-GENDWG Ploited on 17-Mar-2017 3:11 PM

HIGHWAY GUARD DETAILS
 NONE

WATER SUPPLY ALTERATIONS
 SEE BELOW

DRAINAGE DETAILS
 SEE BELOW

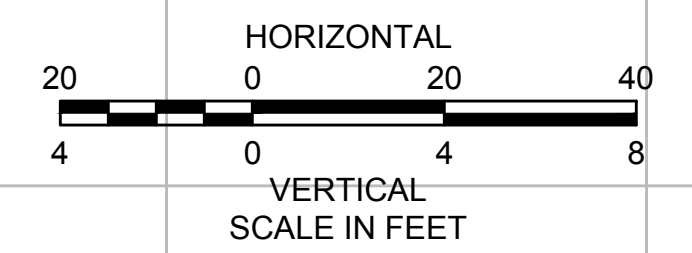
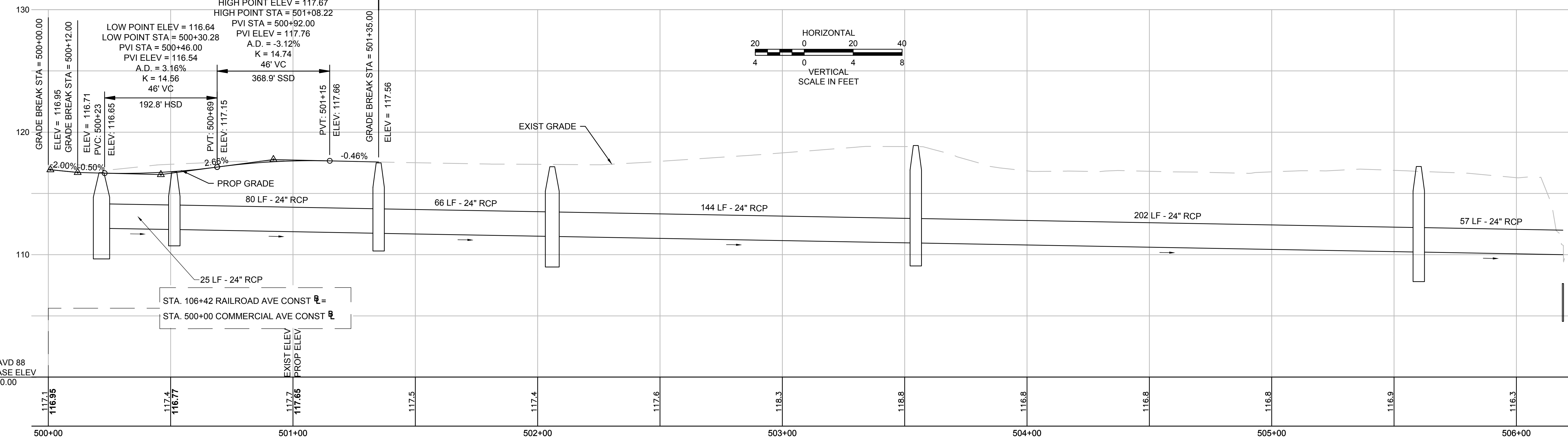
COMMERCIAL AVENUE



COMMERCIAL AVE ALIGN CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L24	500+00.00	3002168.8300	715475.0818		S 7° 18' 37" E 626.81'	506+26.81	3001547.1156	715554.8397

COMMERCIAL AVENUE



CONTINUED ON SHEET NO. 11

HIGHWAY GUARD DETAILS
DOUBLE FACED WOOD GUARDRAIL:
STA. 108+56.40 LT TO STA 109+14.96 LT

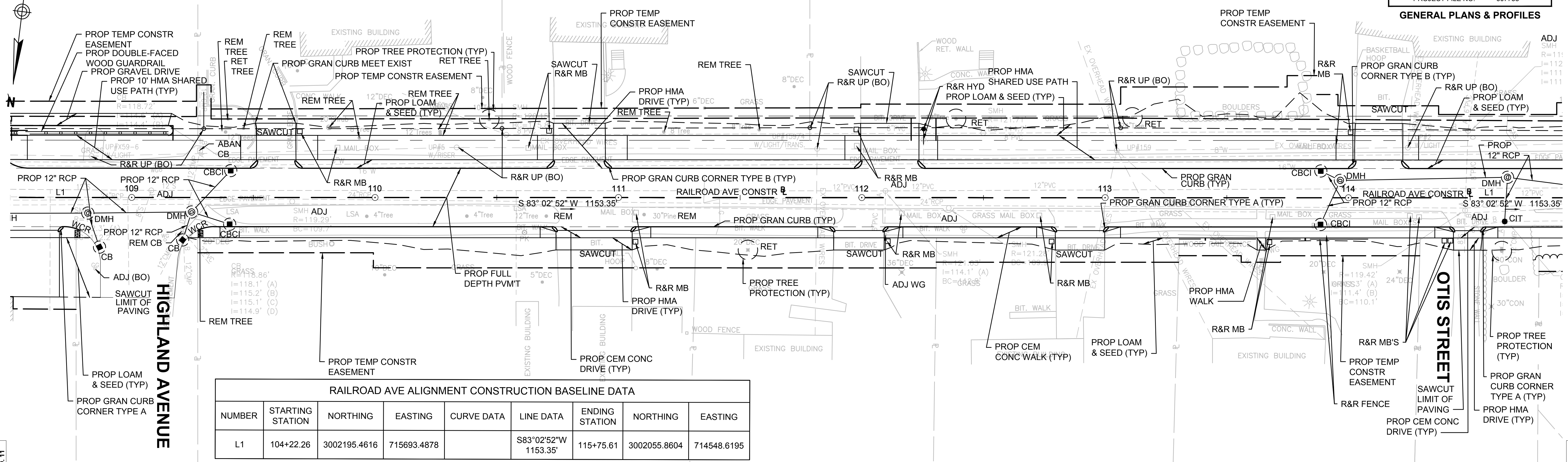
WATER SUPPLY ALTERATIONS
SEE BELOW

DRAINAGE DETAILS
SEE BELOW

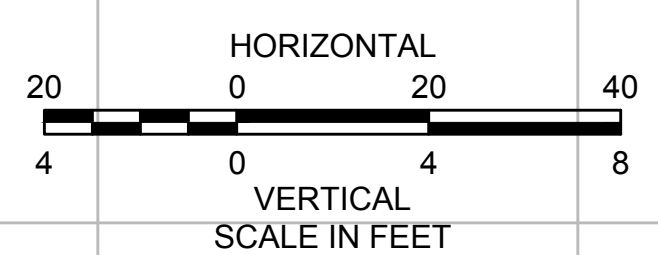
RAILROAD AVENUE

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	607738	13	54
PROJECT FILE NO.		607738	

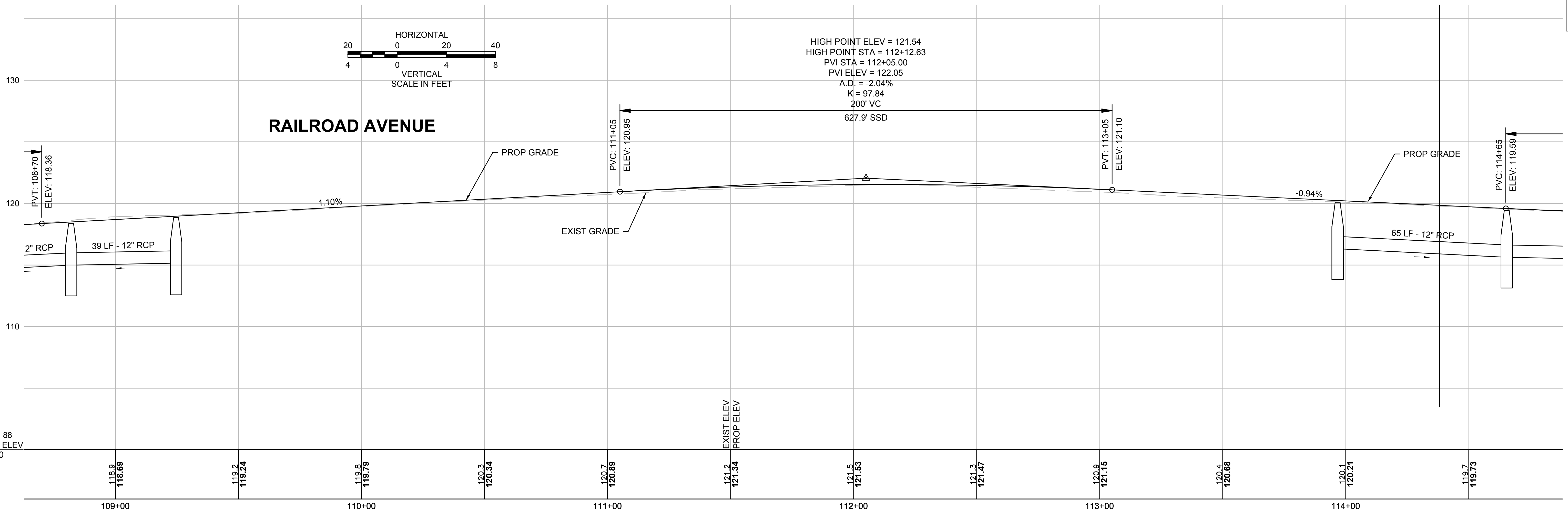
GENERAL PLANS & PROFILES



RAILROAD AVE ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	104+22.26	3002195.4616	715693.4878		S83°02'52"W 1153.35'	115+75.61	3002055.8604	714548.6195



HIGH POINT ELEV = 121.54
HIGH POINT STA = 112+12.63
PVI STA = 112+05.00
PVI ELEV = 122.05
A.D. = -2.04%
K = 97.84
200' VC
627.9' SSD



CONTINUED ON SHEET NO. 11

CONTINUED ON SHEET NO. 14

NAVD 88
BASE ELEV
100.00

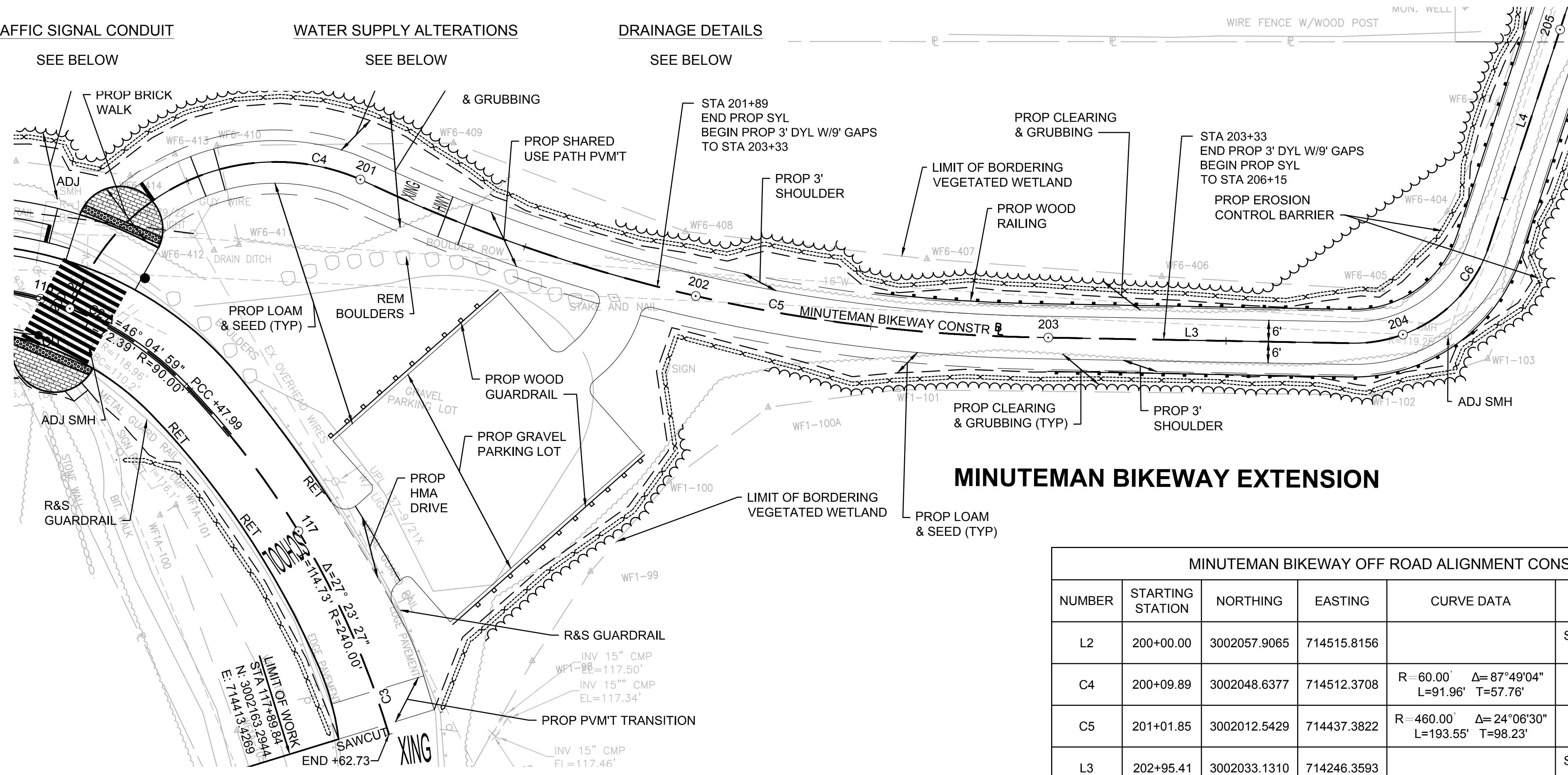
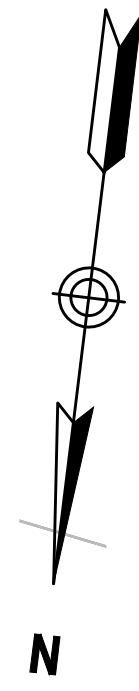
HIGHWAY GUARD DETAILS
WOOD GUARDRAIL:
STA. 201+20.53 RT TO STA. 201+47.27 RT
STA. 201+62.75 RT TO STA. 201+96.35 RT

TRAFFIC SIGNAL CONDUIT
SEE BELOW

WATER SUPPLY ALTERATIONS
SEE BELOW

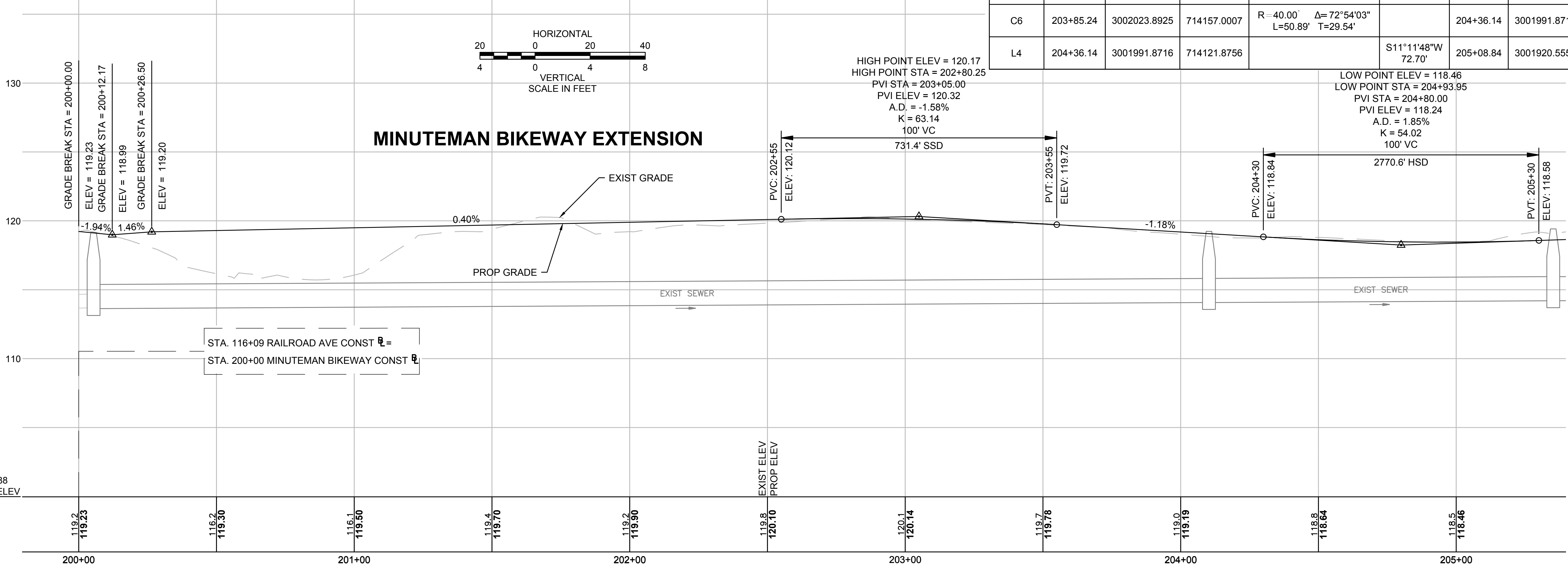
DRAINAGE DETAILS
SEE BELOW

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	15	54
PROJECT FILE NO.		607738	
GENERAL PLANS & PROFILES			



MINUTEMAN BIKEWAY EXTENSION

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L2	200+00.00	3002057.9065	714515.8156		S20°23'16"W 9.89'	200+09.89	3002048.6377	714512.3708
C4	200+09.89	3002048.6377	714512.3708	R=60.00' Δ=87°49'04" L=91.96' T=57.76'		201+01.85	3002012.5429	714437.3822
C5	201+01.85	3002012.5429	714437.3822	R=460.00' Δ=24°06'30" L=193.55' T=98.23'		202+95.41	3002033.1310	714246.3593
L3	202+95.41	3002033.1310	714246.3593		S84°05'50"W 89.83'	203+85.24	3002023.8925	714157.0007
C6	203+85.24	3002023.8925	714157.0007	R=40.00' Δ=72°54'03" L=50.89' T=29.54'		204+36.14	3001991.8716	714121.8756
L4	204+36.14	3001991.8716	714121.8756		S11°11'48"W 72.70'	205+08.84	3001920.5555	714107.7590



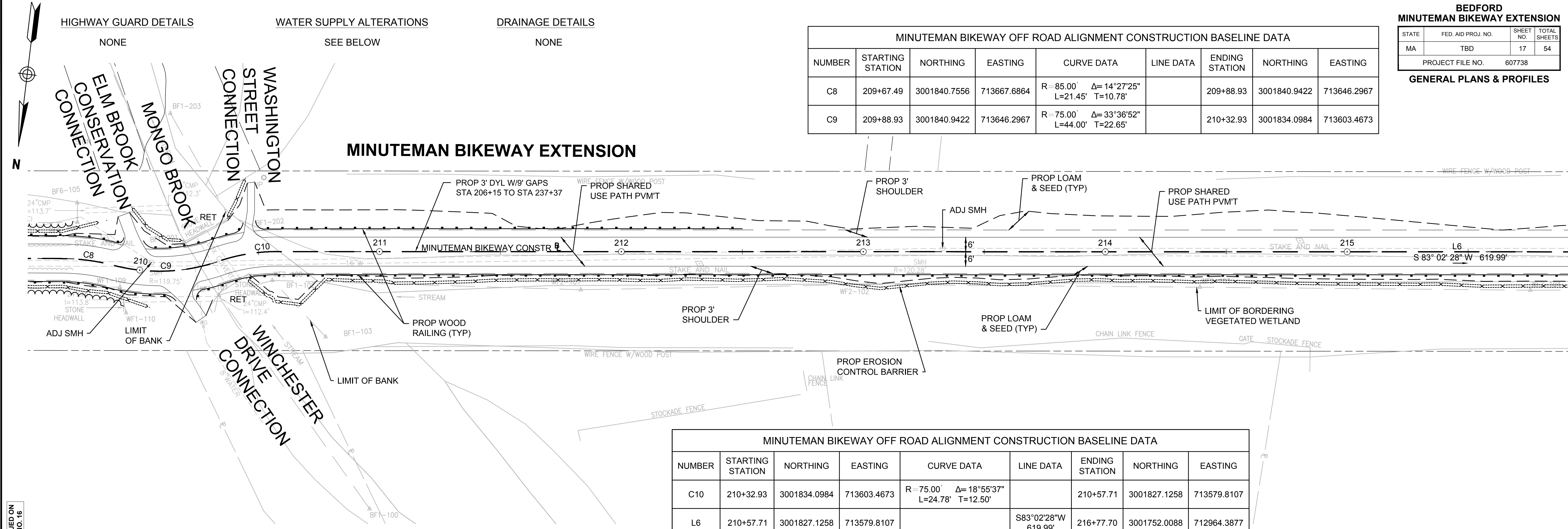
CONTINUED ON
SHEET NO. 14

CONTINUED ON
SHEET NO. 16

08993.01-GENDWIG Plotted on 17-Mar-2017 3:13 PM

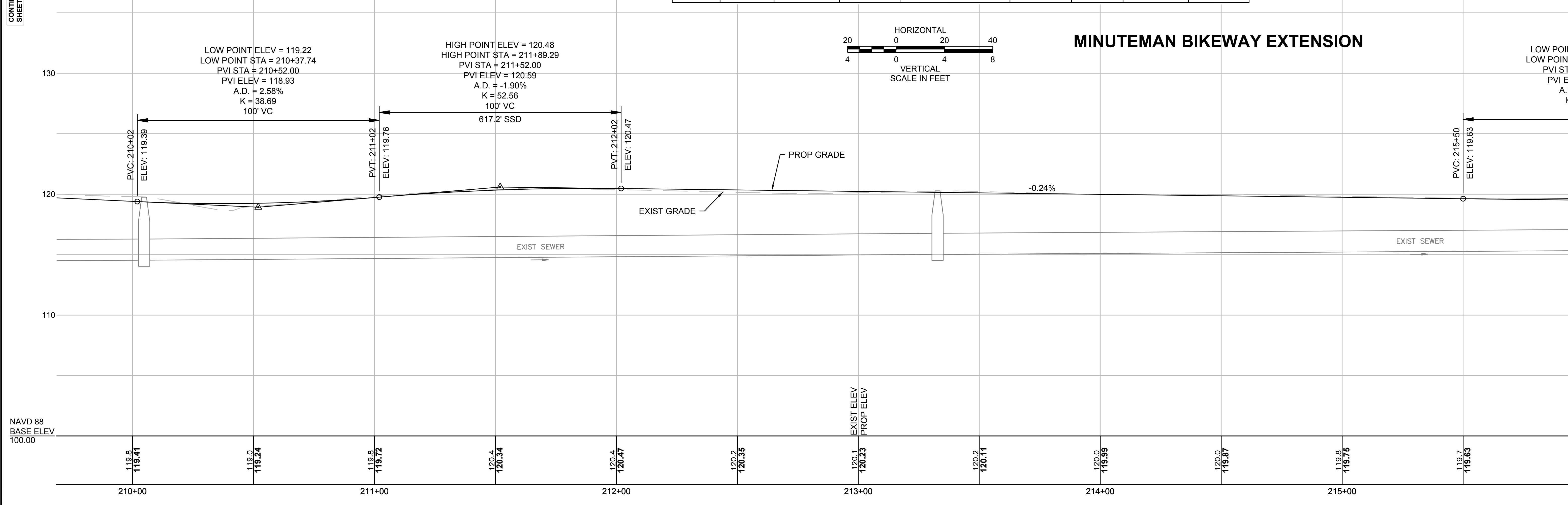
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C8	209+67.49	3001840.7556	713667.6864	R = 85.00' Δ = 14°27'25" L = 21.45' T = 10.78'		209+88.93	3001840.9422	713646.2967
C9	209+88.93	3001840.9422	713646.2967	R = 75.00' Δ = 33°36'52" L = 44.00' T = 22.65'		210+32.93	3001834.0984	713603.4673

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C10	210+32.93	3001834.0984	713603.4673	R = 75.00' Δ = 18°55'37" L = 24.78' T = 12.50'		210+57.71	3001827.1258	713579.8107
L6	210+57.71	3001827.1258	713579.8107		S 83° 02' 28" W 619.99'	216+77.70	3001752.0088	712964.3877



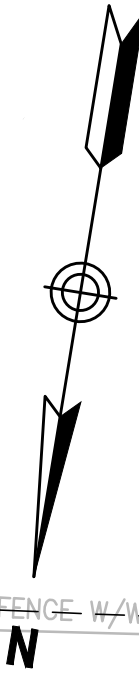
CONTINUED ON SHEET NO. 16

CONTINUED ON SHEET NO. 18



HIGHWAY GUARD DETAILS

NONE



WATER SUPPLY ALTERATIONS

SEE BELOW

DRAINAGE DETAILS

NONE

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

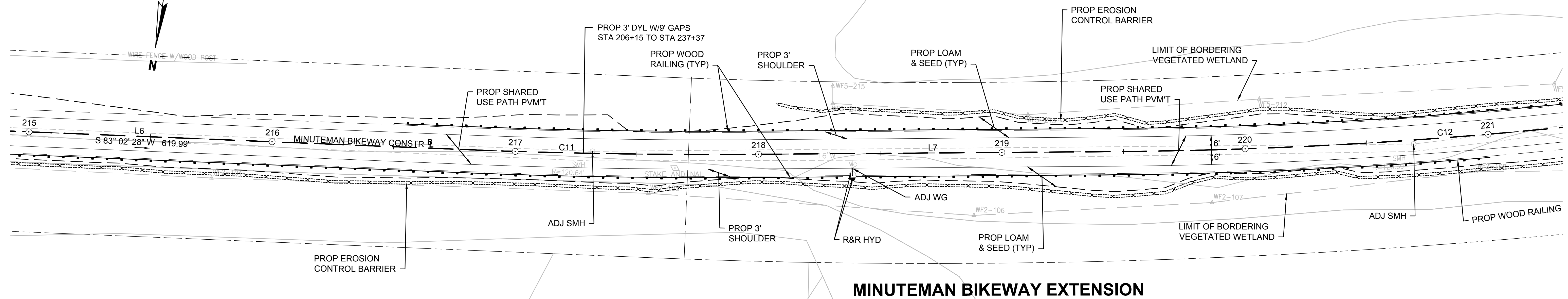
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L6	210+57.71	3001827.1258	713579.8107		S83°02'28"W 619.99'	216+77.70	3001752.0088	712964.3877
C11	216+77.70	3001752.0088	712964.3877	R=2500.00' Δ=2°45'26" L=120.30' T=60.16'		217+98.01	3001734.5657	712845.3658

BEDFORD
MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	18	54

PROJECT FILE NO. 607738

GENERAL PLANS & PROFILES



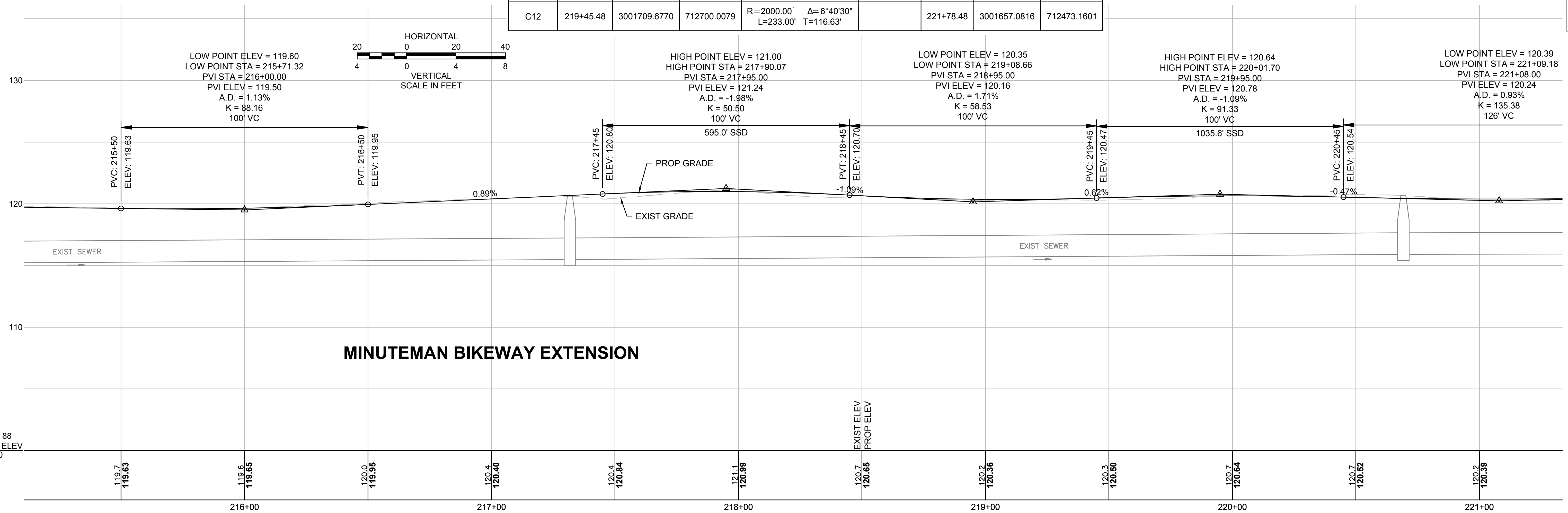
MINUTEMAN BIKEWAY EXTENSION

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L7	217+98.01	3001734.5657	712845.3658		S80°17'02"W 147.47'	219+45.48	3001709.6770	712700.0079
C12	219+45.48	3001709.6770	712700.0079	R=2000.00' Δ=6°40'30" L=233.00' T=116.63'		221+78.48	3001657.0816	712473.1601

CONTINUED ON SHEET NO. 17

CONTINUED ON SHEET NO. 19



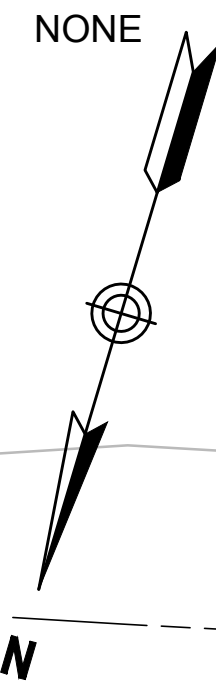
MINUTEMAN BIKEWAY EXTENSION

NAVD 88
BASE ELEV
100.00

HIGHWAY GUARD DETAILS

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS



SEE BELOW

NONE

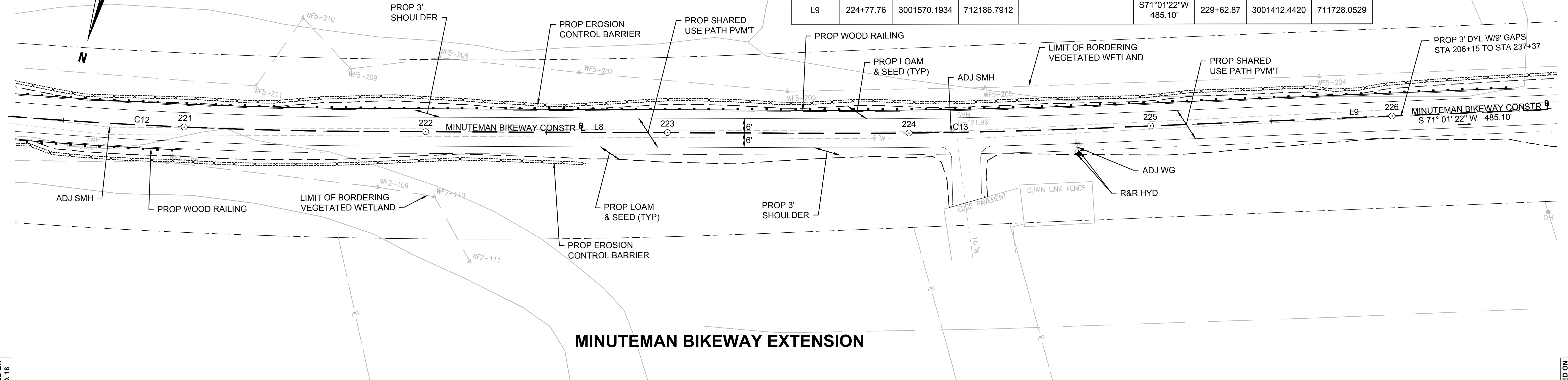
MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C12	219+45.48	3001709.6770	712700.0079	R=2000.00' Δ=6°40'30" L=233.00' T=116.63'		221+78.48	3001657.0816	712473.1601
L8	221+78.48	3001657.0816	712473.1601		S73°36'32"W 186.45'	223+64.92	3001604.4677	712294.2900
C13	223+64.92	3001604.4677	712294.2900	R=2500.00' Δ=2°35'10" L=112.84' T=56.43'		224+77.76	3001570.1934	712186.7912
L9	224+77.76	3001570.1934	712186.7912		S71°01'22"W 485.10'	229+62.87	3001412.4420	711728.0529

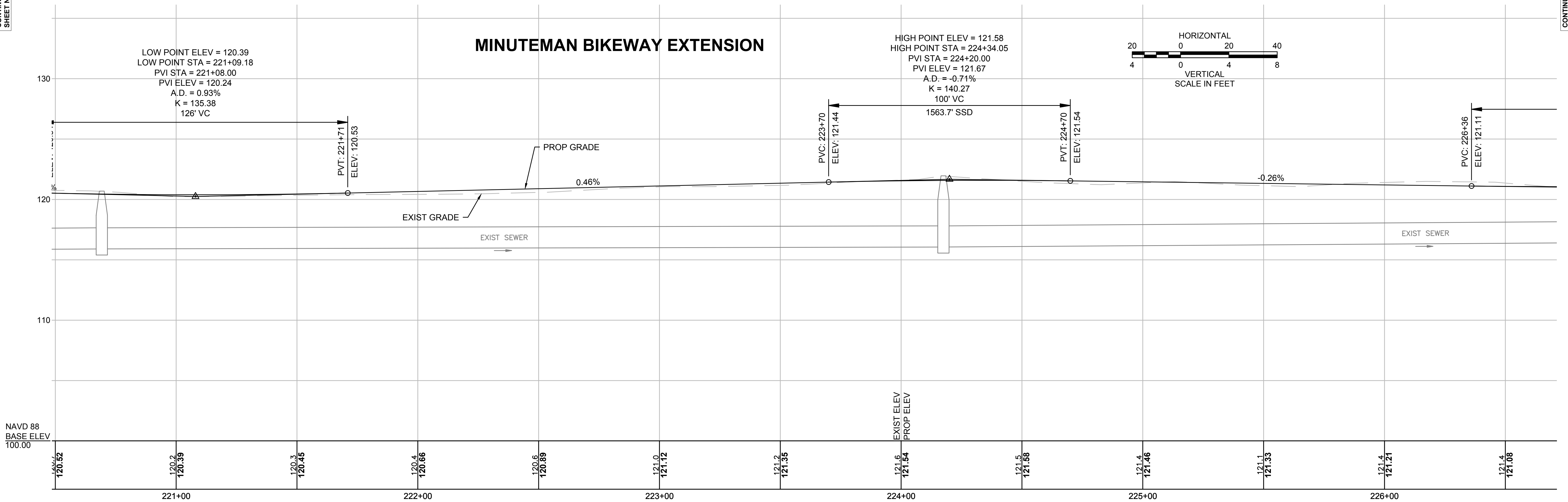
BEDFORD
MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	19	54
PROJECT FILE NO.		607738	

GENERAL PLANS & PROFILES



MINUTEMAN BIKEWAY EXTENSION



CONTINUED ON SHEET NO. 18

CONTINUED ON SHEET NO. 20

NAVD 88
BASE ELEV
100.00

HIGHWAY GUARD DETAILS

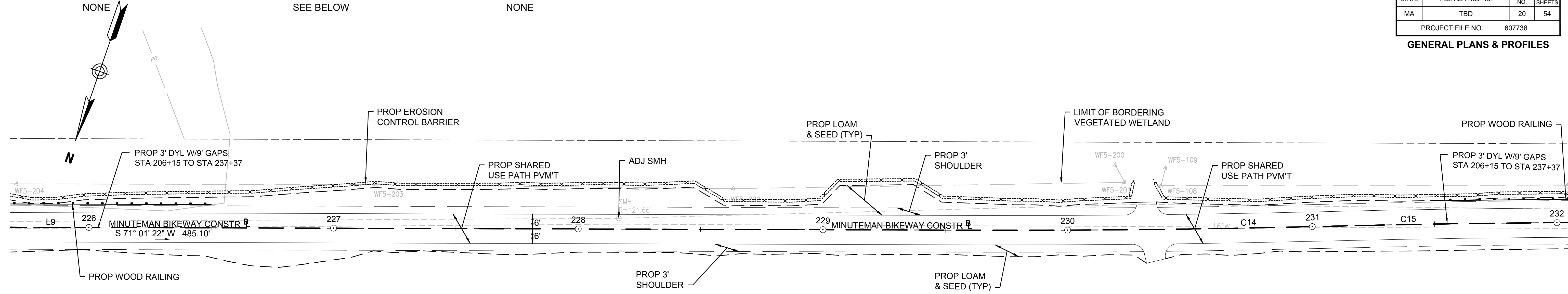
WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

NONE

SEE BELOW

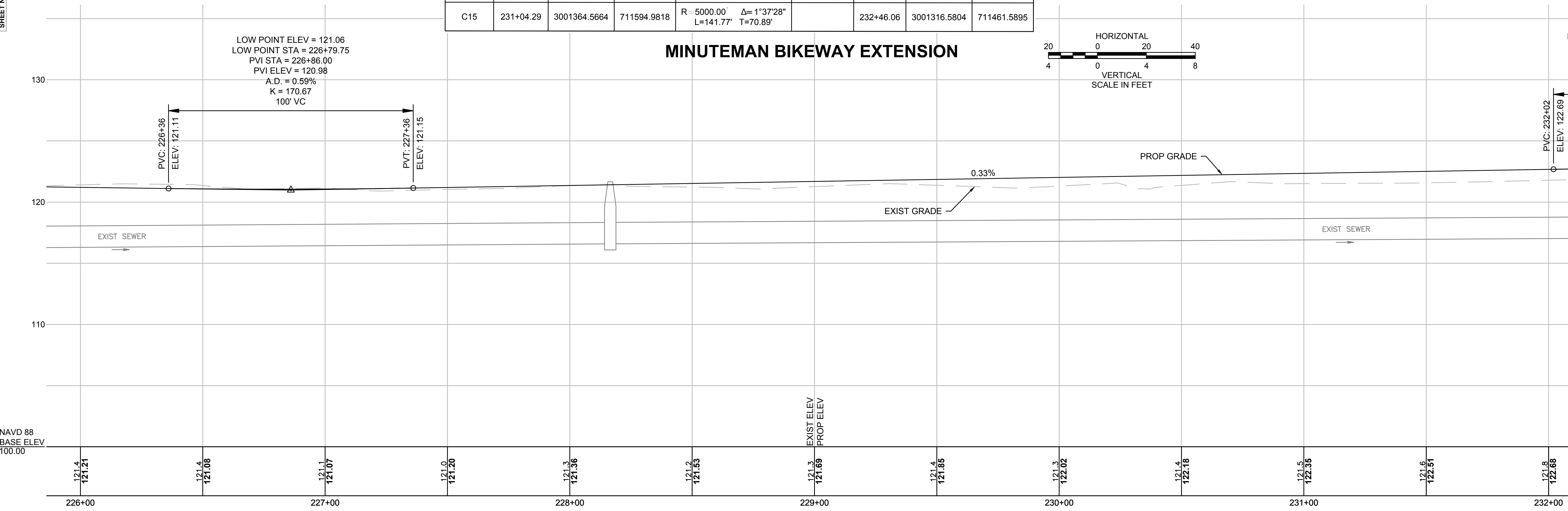
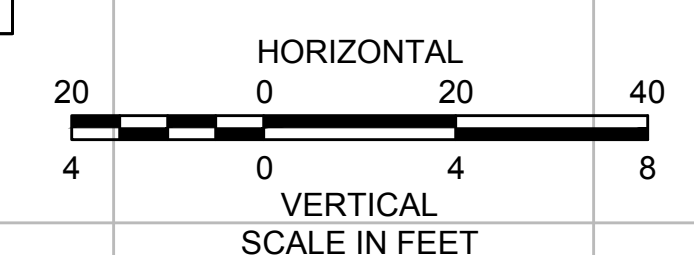
NONE



MINUTEMAN BIKEWAY EXTENSION

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L9	224+77.76	3001570.1934	712186.7912		S71°01'22"W 485.10'	229+62.87	3001412.4420	711728.0529
C14	229+62.87	3001412.4420	711728.0529	R=5000.00' Δ=1°37'14" L=141.43' T=70.72'		231+04.29	3001364.5664	711594.9818
C15	231+04.29	3001364.5664	711594.9818	R=5000.00' Δ=1°37'28" L=141.77' T=70.89'		232+46.06	3001316.5804	711461.5895

MINUTEMAN BIKEWAY EXTENSION



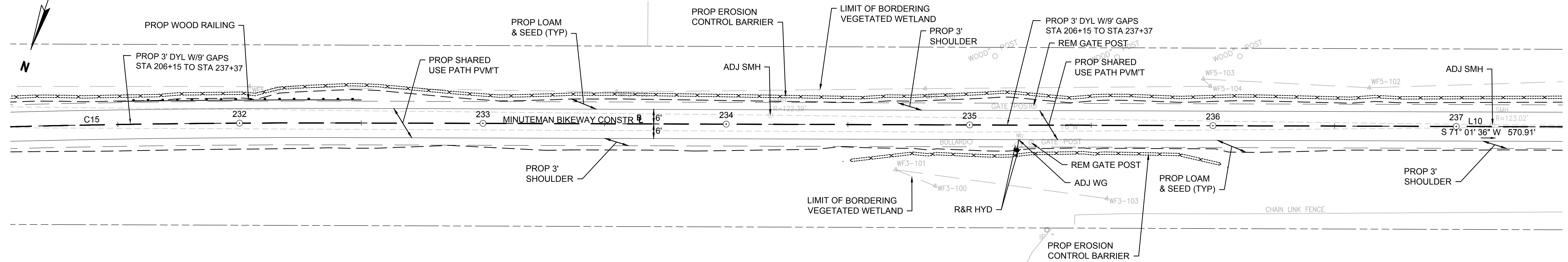
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CONTINUED ON SHEET NO. 21

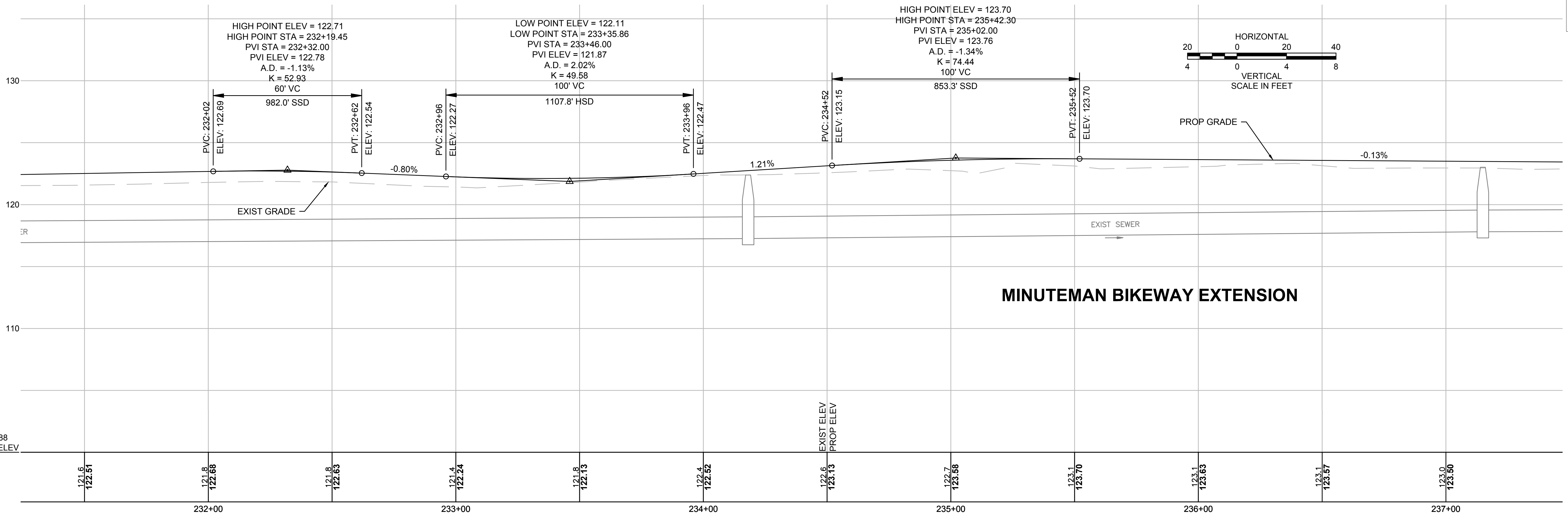
NAVD 88
BASE ELEV.
100.00

HIGHWAY GUARD DETAILS NONE
 WATER SUPPLY ALTERATIONS SEE BELOW
 DRAINAGE DETAILS NONE

MINUTEMAN BIKEWAY EXTENSION



NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C15	231+04.29	3001364.5664	711594.9818	R = 5000.00' Δ = 1°37'28" L = 141.77' T = 70.89'		232+46.06	3001316.5804	711461.5895
L10	232+46.06	3001316.5804	711461.5895		S 71° 01' 36" W 570.91'	238+16.97	3001130.9612	710921.6930



CONTINUED ON SHEET NO. 20

CONTINUED ON SHEET NO. 22

HIGHWAY GUARD DETAILS

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

HARTWELL AVE DRIVEWAY ALIGN CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L13	600+00.00	3001111.0518	710854.9579		S70°48'05"W 393.23'	603+93.23	3000981.7408	710483.5999

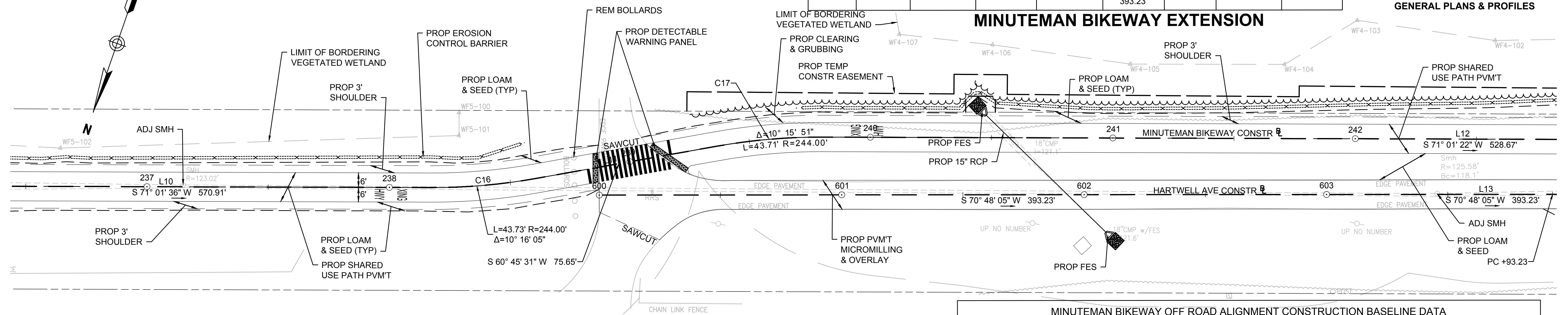
**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	22	54

PROJECT FILE NO. 607738

GENERAL PLANS & PROFILES

MINUTEMAN BIKEWAY EXTENSION



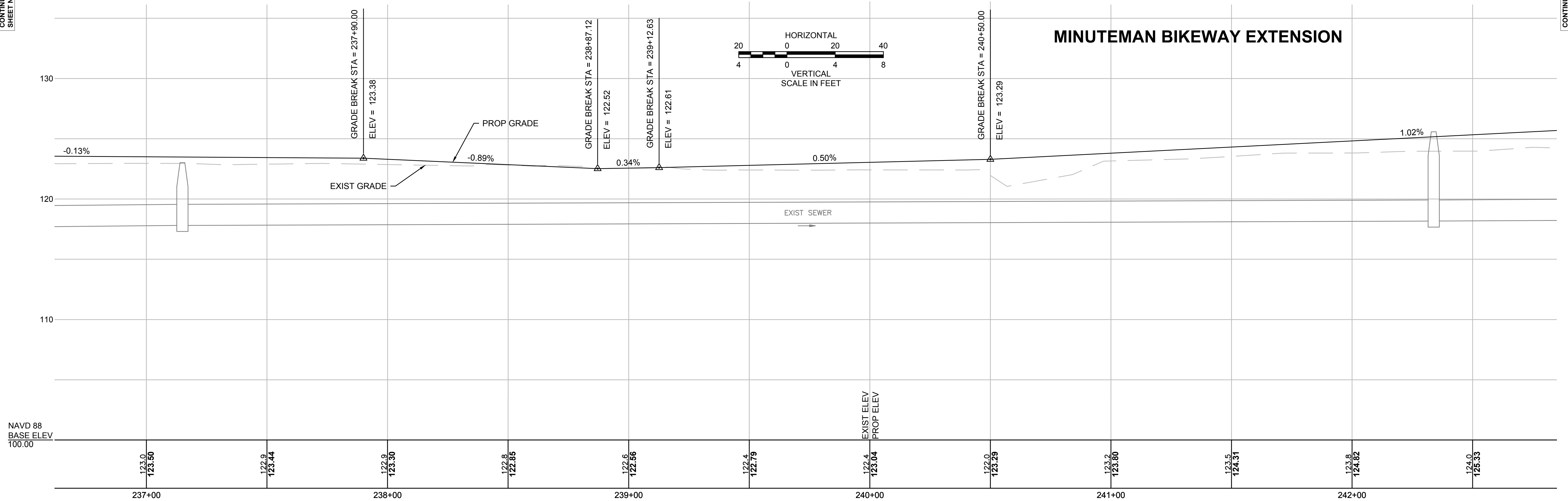
MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L10	232+46.06	3001316.5804	711461.5895		S71°01'36"W 570.91'	238+16.97	3001130.9612	710921.6930
C16	238+16.97	3001130.9612	710921.6930	R=244.00' Δ=10°16'05" L=43.73' T=21.92'		238+60.70	3001113.1246	710881.8324

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

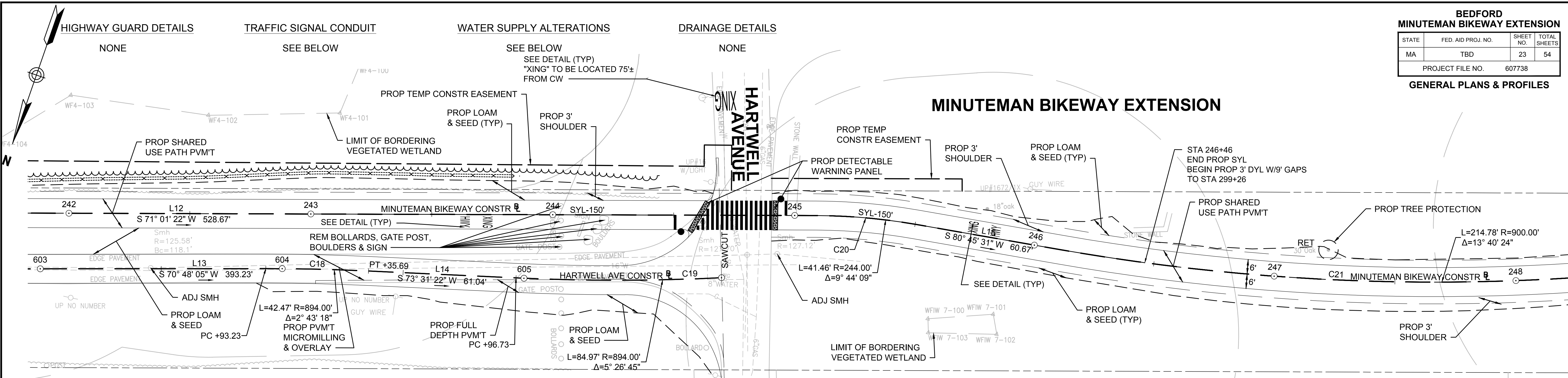
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L11	238+60.70	3001113.1246	710881.8324		S60°45'31"W 75.65'	239+36.35	3001076.1725	710815.8263
C17	239+36.35	3001076.1725	710815.8263	R=244.00' Δ=10°15'51" L=43.71' T=21.91'		239+80.06	3001058.3413	710775.9814
L12	239+80.06	3001058.3413	710775.9814		S71°01'22"W 528.67'	245+08.73	3000886.4216	710276.0418

MINUTEMAN BIKEWAY EXTENSION



CONTINUED ON SHEET NO. 21

CONTINUED ON SHEET NO. 23



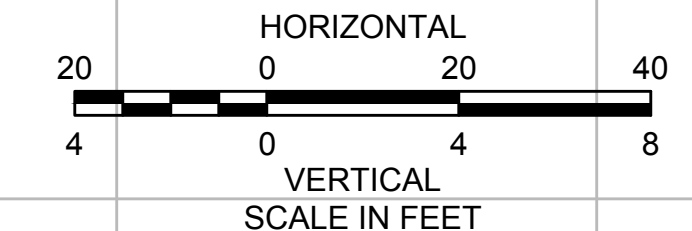
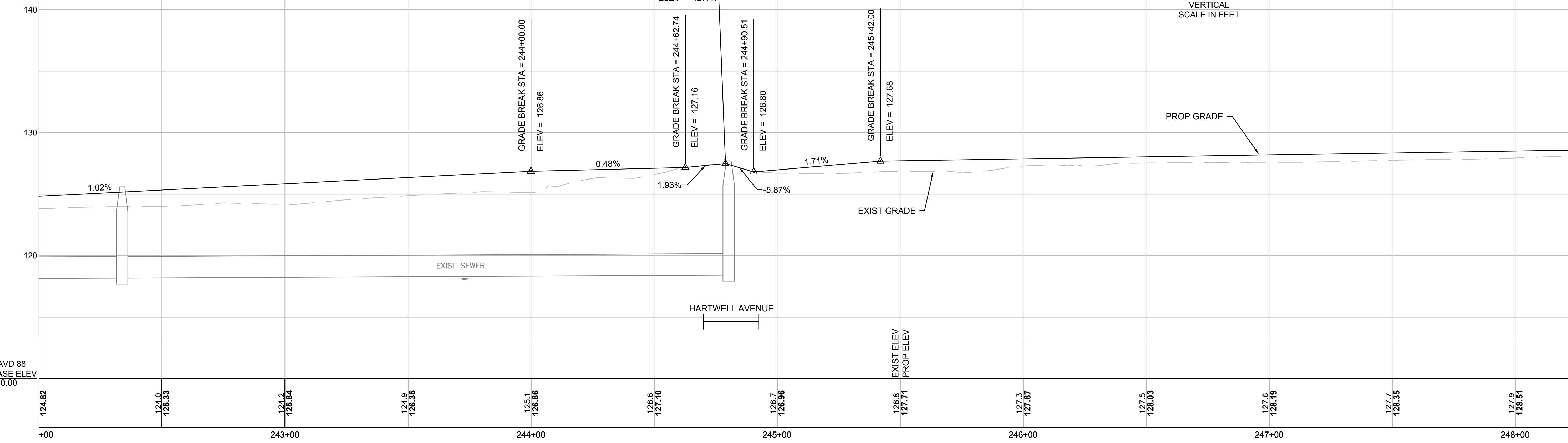
HARTWELL AVE DRIVEWAY ALIGN CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L13	600+00.00	3001111.0518	710854.9579		S70°48'05"W 393.23'	603+93.23	3000981.7408	710483.5999
C18	603+93.23	3000981.7408	710483.5999	R=894.00' Δ=2°43'18" L=42.47' T=21.24'		604+35.69	3000968.7338	710443.1798
L14	604+35.69	3000968.7338	710443.1798		S73°31'22"W 61.04'	604+96.73	3000951.4217	710384.6493
C19	604+96.73	3000951.4217	710384.6493	R=894.00' Δ=5°26'45" L=84.97' T=42.52'		605+81.70	3000923.4876	710304.4338

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L12	239+80.66	3001058.3413	710775.9814		S71°01'22"W 528.67'	245+08.73	3000886.4216	710276.0418
C20	245+08.73	3000886.4216	710276.0418	R=244.00' Δ=9°44'09" L=41.46' T=20.78'		245+50.19	3000876.3268	710235.8801
L15	245+50.19	3000876.3268	710235.8801		S80°45'31"W 60.67'	246+10.86	3000866.5836	710175.9981
C21	246+10.86	3000866.5836	710175.9981	R=900.00' Δ=13°40'24" L=214.78' T=107.90'		248+25.64	3000807.2420	709970.1080

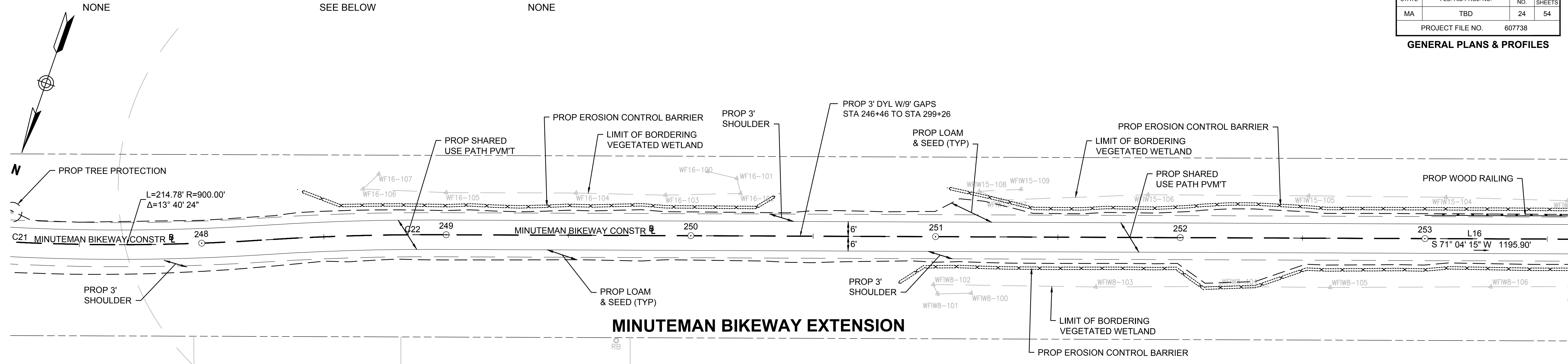
MINUTEMAN BIKEWAY EXTENSION



CONTINUED ON SHEET NO. 22

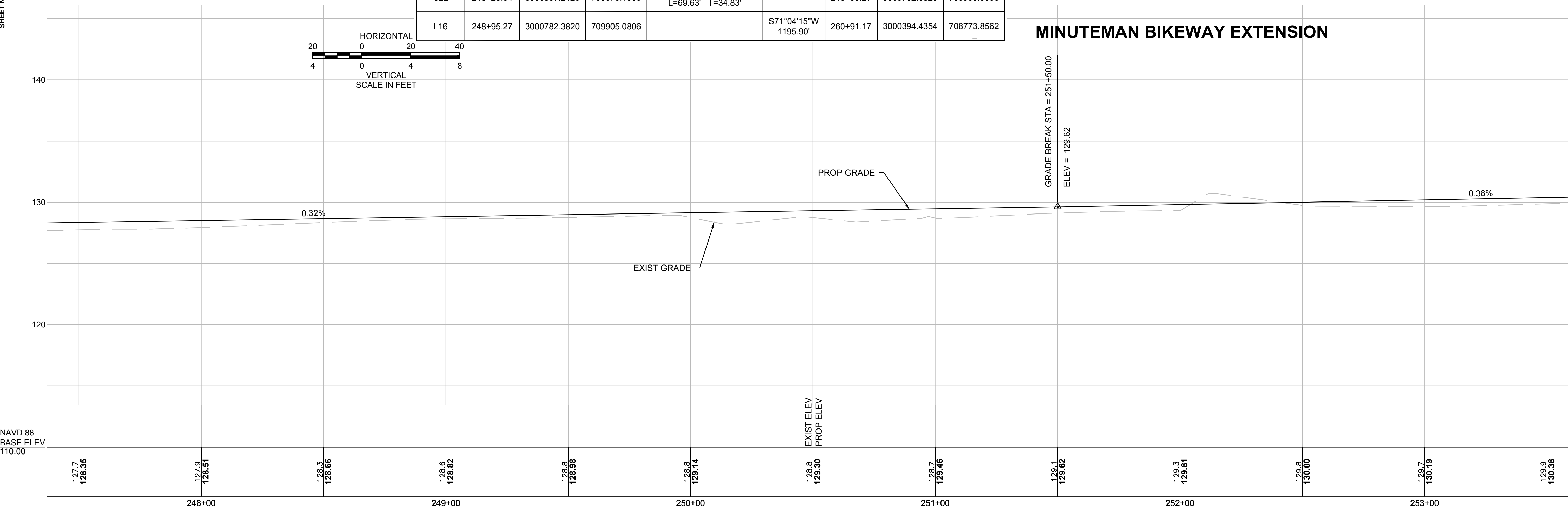
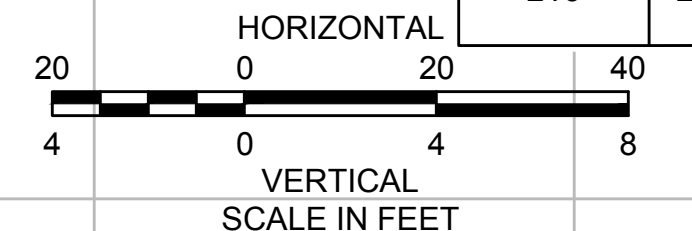
CONTINUED ON SHEET NO. 24

HIGHWAY GUARD DETAILS NONE
 WATER SUPPLY ALTERATIONS SEE BELOW
 DRAINAGE DETAILS NONE



MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C21	246+10.86	3000866.5836	710175.9981	R=900.00' L=214.78' $\Delta=13^{\circ}40'24''$ T=107.90'		248+25.64	3000807.2420	709970.1080
C22	248+25.64	3000807.2420	709970.1080	R=1001.00' L=69.63' $\Delta=3^{\circ}59'08''$ T=34.83'		248+95.27	3000782.3820	709905.0806
L16	248+95.27	3000782.3820	709905.0806		S71°04'15"W 1195.90'	260+91.17	3000394.4354	708773.8562

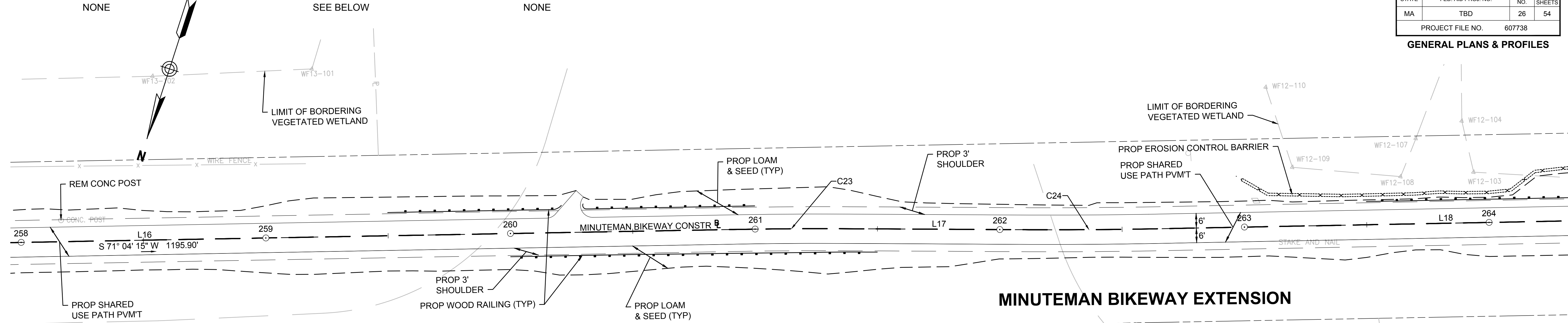


NAVD 88 BASE ELEV 110.00	127.7 128.35	127.9 128.51	128.3 128.66	128.6 128.82	128.8 128.96	128.8 129.14	128.8 129.30	128.7 129.46	129.1 129.62	129.3 129.81	129.6 130.00	129.7 130.19	129.9 130.38
	248+00		249+00		250+00		251+00		252+00		253+00		

CONTINUED ON SHEET NO. 23

CONTINUED ON SHEET NO. 25

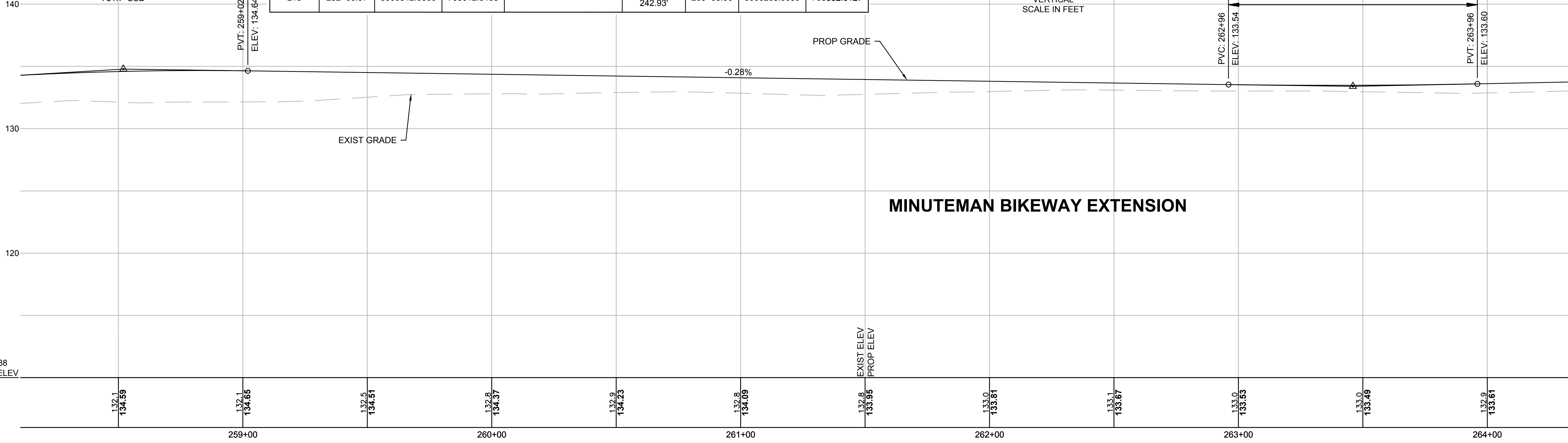
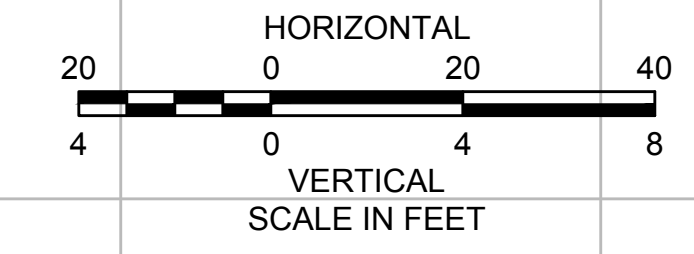
HIGHWAY GUARD DETAILS: NONE
 WATER SUPPLY ALTERATIONS: SEE BELOW
 DRAINAGE DETAILS: NONE



NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L16	248+95.27	3000782.3820	709905.0806		S71°04'15"W 1195.90'	260+91.17	3000394.4354	708773.8562
C23	260+91.17	3000394.4354	708773.8562	R=2000.00' Δ=1°21'20" L=47.31' T=23.66'		261+38.49	3000379.6175	708728.9230
L17	261+38.49	3000379.6175	708728.9230		S72°25'35"W 73.49'	262+11.98	3000357.4285	708658.8626
C24	262+11.98	3000357.4285	708658.8626	R=2000.00' Δ=1°24'13" L=48.99' T=24.50'		262+60.97	3000342.0660	708612.3438
L18	262+60.97	3000342.0660	708612.3438		S71°01'22"W 242.93'	265+03.90	3000263.0659	708382.6127

HIGH POINT ELEV = 134.67
 HIGH POINT STA = 258+83.02
 PVI STA = 258+52.00
 PVI ELEV = 134.78
 A.D. = -1.47%
 K = 67.80
 100' VC

LOW POINT ELEV = 133.48
 LOW POINT STA = 263+37.12
 PVI STA = 263+46.00
 PVI ELEV = 133.40
 A.D. = 0.68%
 K = 146.90
 100' VC



CONTINUED ON SHEET NO. 25

CONTINUED ON SHEET NO. 27

HIGHWAY GUARD DETAILS

NONE

WATER SUPPLY ALTERATIONS

SEE BELOW

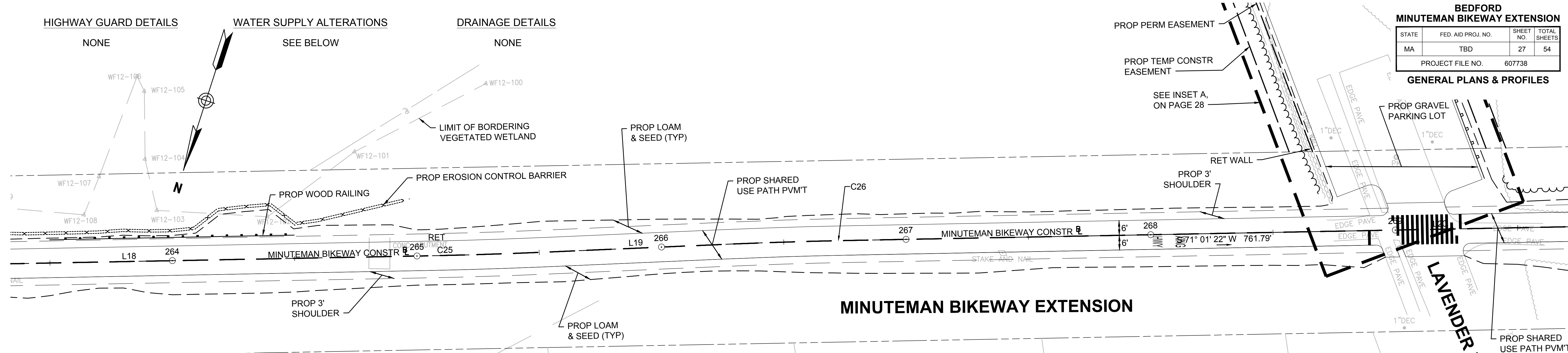
DRAINAGE DETAILS

NONE

MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	27	54
PROJECT FILE NO.		607738	

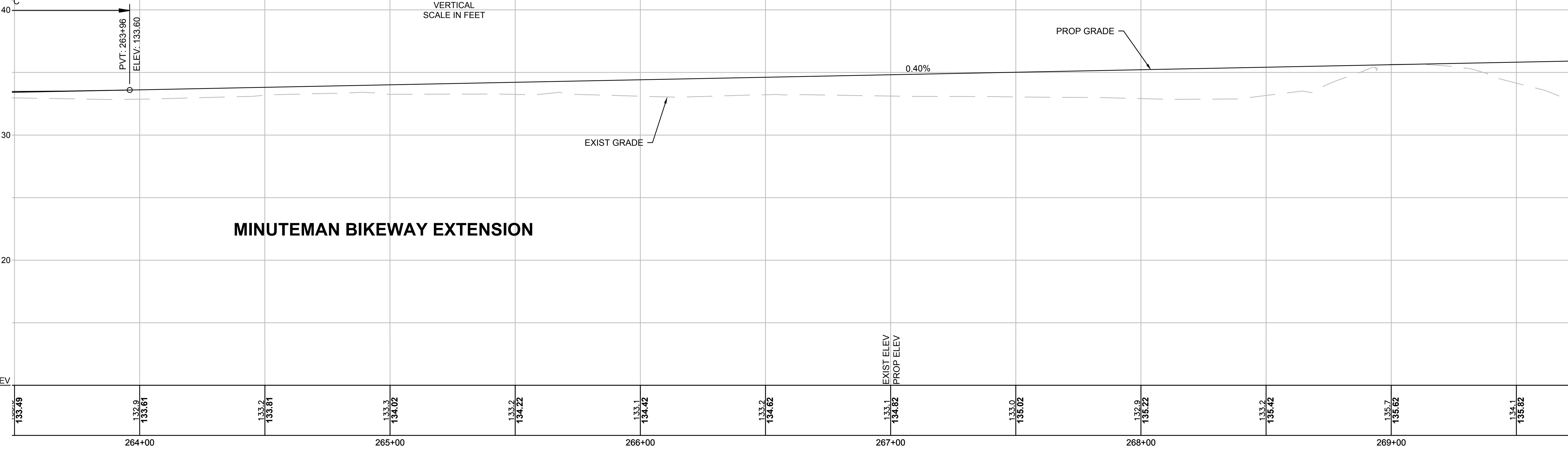
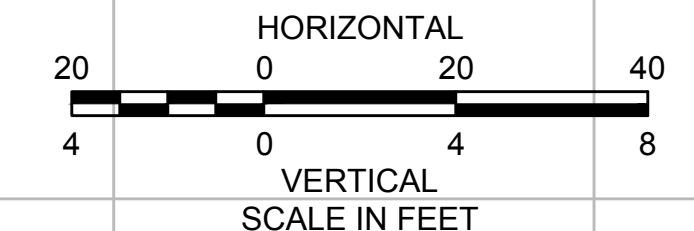
GENERAL PLANS & PROFILES



MINUTEMAN BIKEWAY EXTENSION

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L18	262+60.97	3000342.0660	708612.3438		S71°01'22"W 242.93'	265+03.90	3000263.0659	708382.6127
C25	265+03.90	3000263.0659	708382.6127	R=2000.00 Δ=1°24'13" L=48.99' T=24.50'		265+52.89	3000246.5686	708336.4842
L19	265+52.89	3000246.5686	708336.4842		S69°37'10"W 73.49'	266+26.38	3000220.9753	708267.5945
C26	266+26.38	3000220.9753	708267.5945	R=2000.00 Δ=1°24'13" L=48.99' T=24.50'		266+75.37	3000204.4781	708221.4659
L20	266+75.37	3000204.4781	708221.4659		S71°01'22"W 761.79'	274+37.16	2999956.7518	707501.0824

EV = 133.48
 I = 263+37.12
 33+46.00
 133.40
 68%
 1.90
 C



MINUTEMAN BIKEWAY EXTENSION

CONTINUED ON SHEET NO. 26

CONTINUED ON SHEET NO. 28

HIGHWAY GUARD DETAILS

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

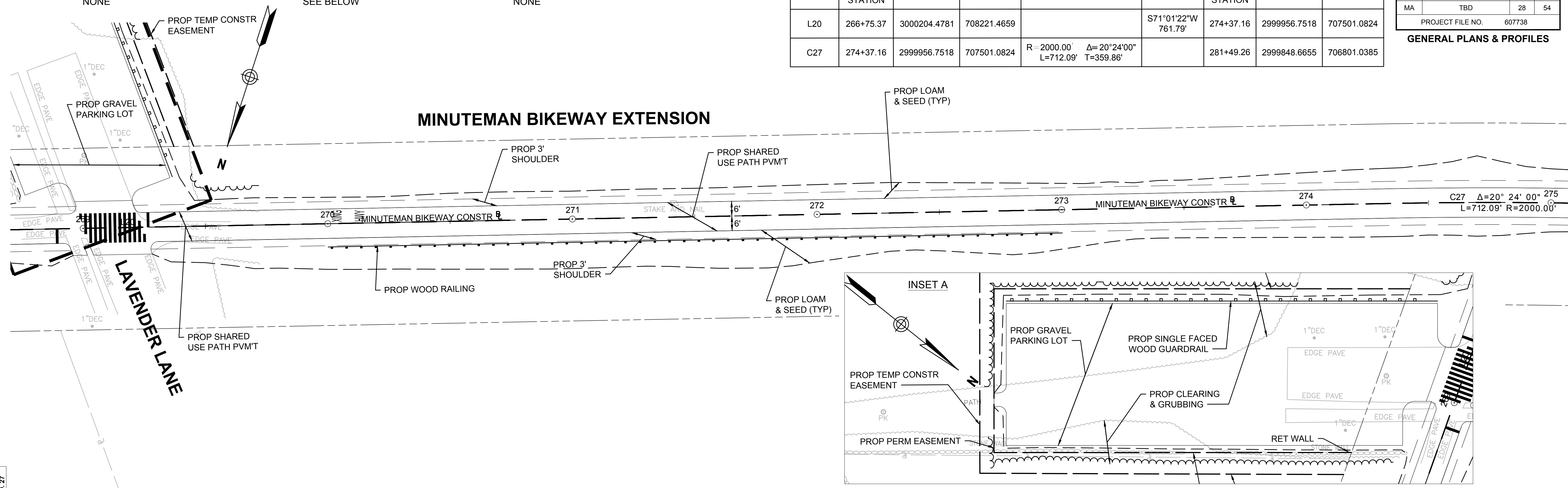
NONE

SEE BELOW

NONE

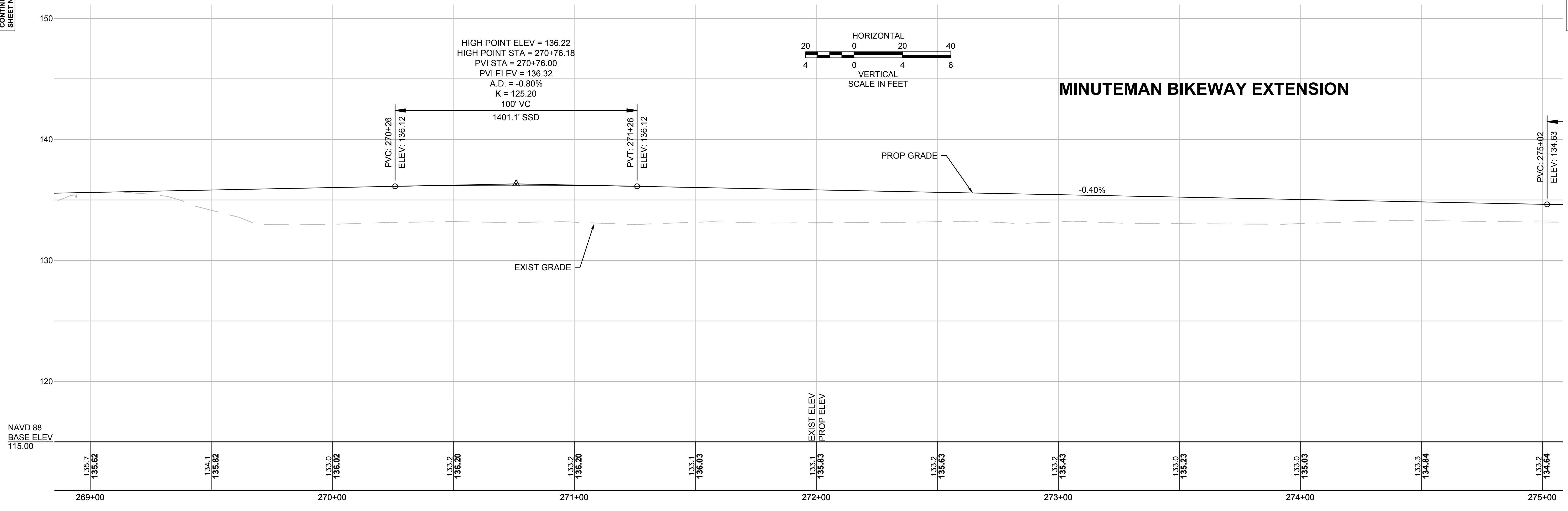
MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L20	266+75.37	3000204.4781	708221.4659		S71°01'22"W 761.79'	274+37.16	2999956.7518	707501.0824
C27	274+37.16	2999956.7518	707501.0824	R = 2000.00' L = 712.09' Δ = 20°24'00" T = 359.86'		281+49.26	2999848.6655	706801.0385

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	28	54
PROJECT FILE NO.		607738	
GENERAL PLANS & PROFILES			



CONTINUED ON SHEET NO. 27

CONTINUED ON SHEET NO. 29



HIGHWAY GUARD DETAILS
NONE

WATER SUPPLY ALTERATIONS
SEE BELOW

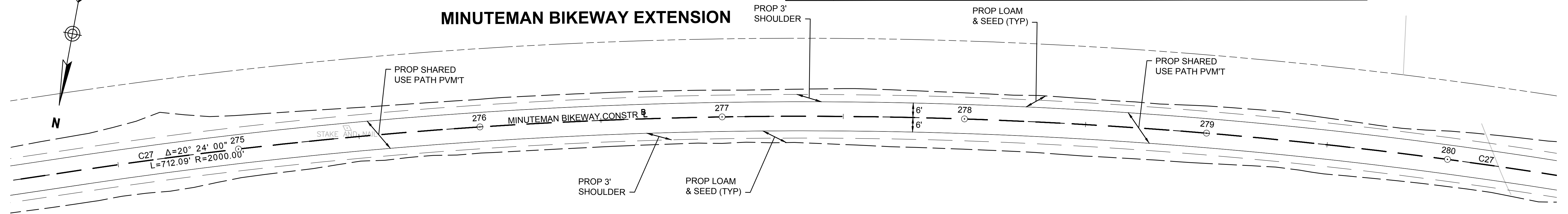
DRAINAGE DETAILS
NONE

MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C27	274+37.16	2999956.7518	707501.0824	R=2000.00' L=712.09' $\Delta=20^{\circ}24'00''$ T=359.86'		281+49.26	2999848.6655	706801.0385

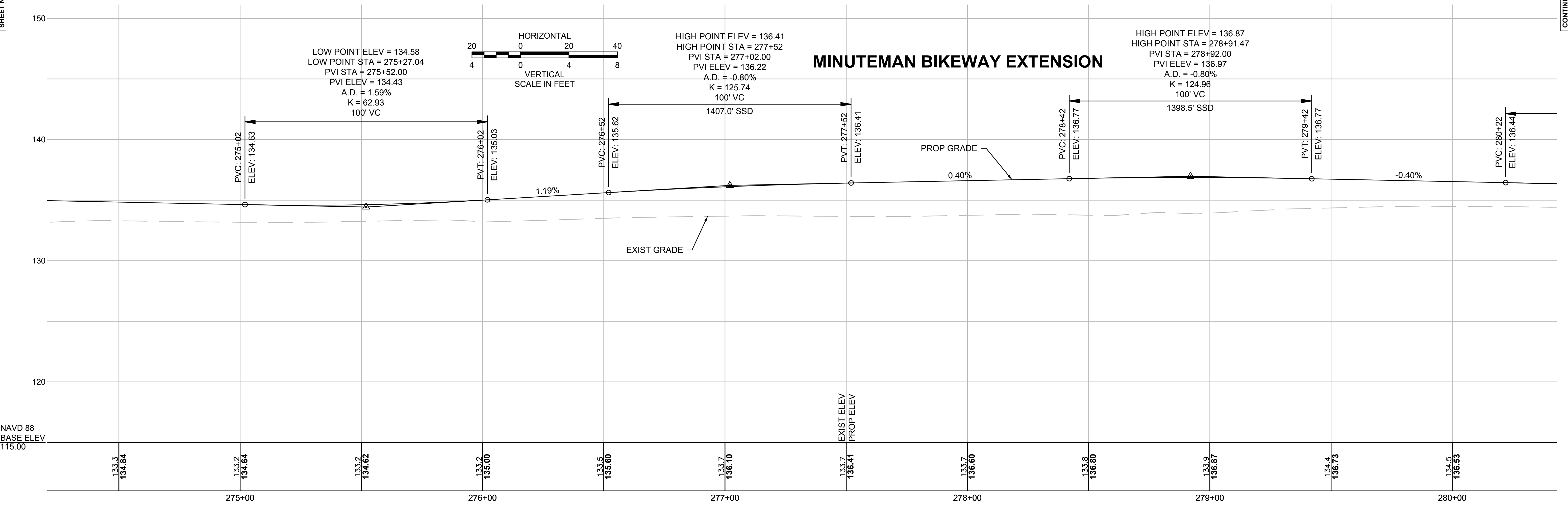
BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	29	54
PROJECT FILE NO.		607738	

GENERAL PLANS & PROFILES

MINUTEMAN BIKEWAY EXTENSION



MINUTEMAN BIKEWAY EXTENSION

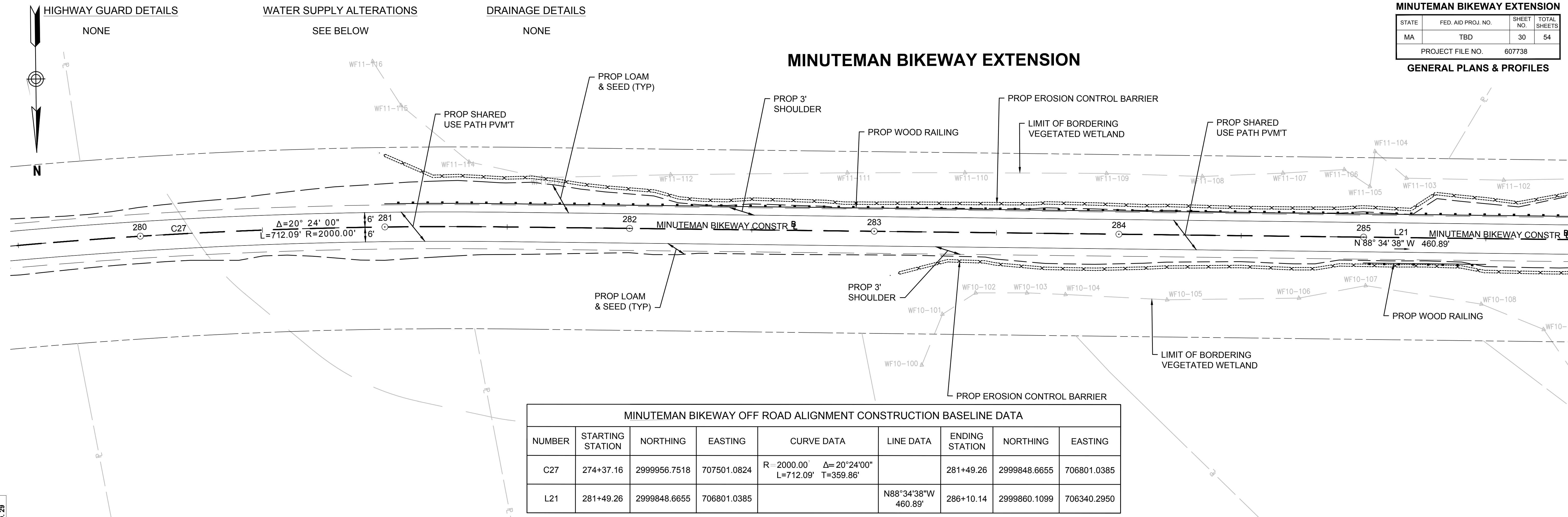


CONTINUED ON SHEET NO. 28

CONTINUED ON SHEET NO. 30

NAVD 88
BASE ELEV
115.00

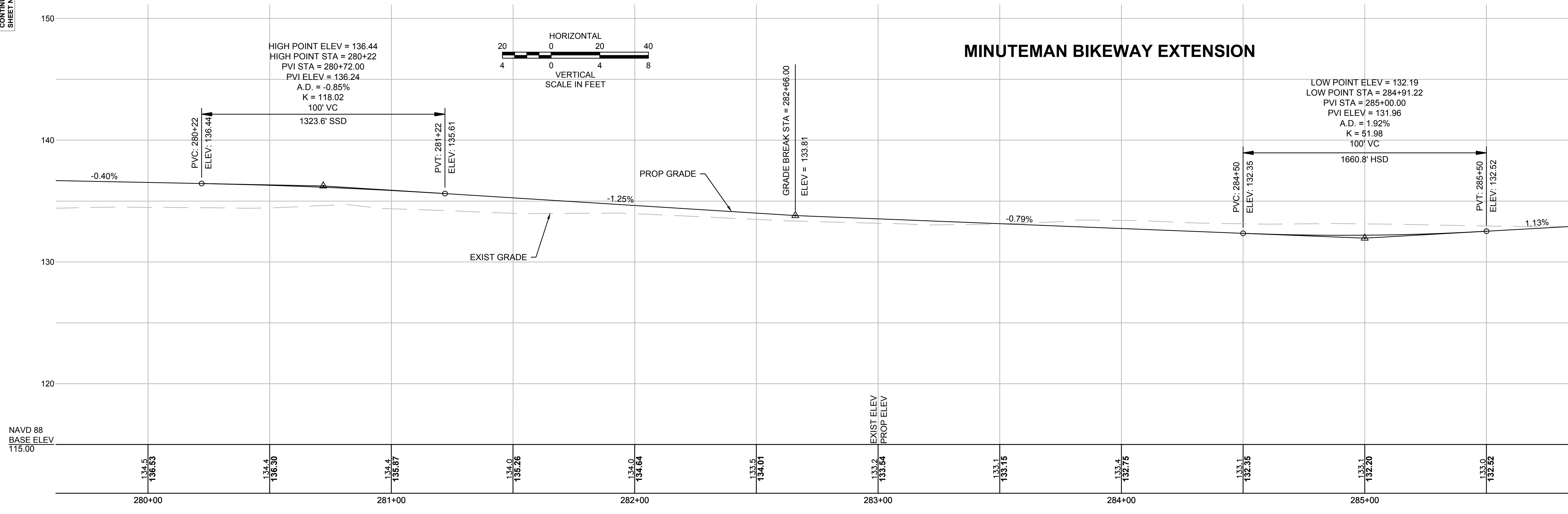
MINUTEMAN BIKEWAY EXTENSION



NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C27	274+37.16	2999956.7518	707501.0824	$R=2000.00'$ $\Delta=20^\circ 24' 00''$ $L=712.09'$ $T=359.86'$		281+49.26	2999848.6655	706801.0385
L21	281+49.26	2999848.6655	706801.0385		$N88^\circ 34' 38'' W$ $460.89'$	286+10.14	2999860.1099	706340.2950

CONTINUED ON SHEET NO. 29

CONTINUED ON SHEET NO. 31



NAVD 88
 BASE ELEV
 115.00

HIGHWAY GUARD DETAILS
WOOD GUARDRAIL:
STA. 286+97.79 RT TO STA. 287+66.86 RT
STA. 287+04.85 RT TO STA. 287+75.57 RT

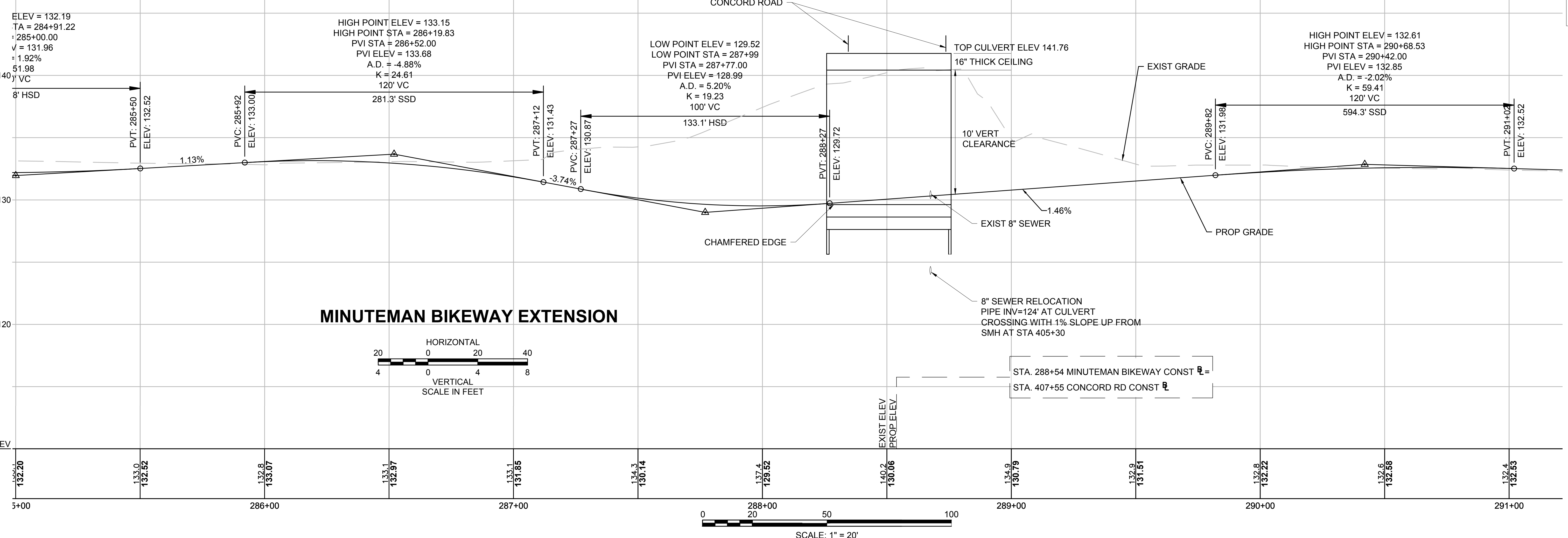
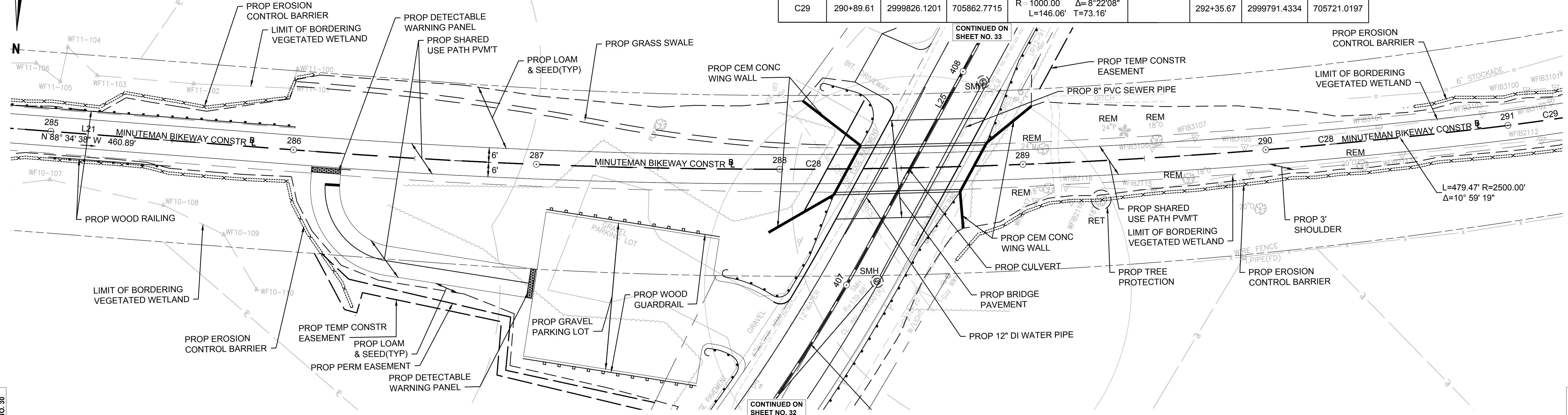
WATER SUPPLY ALTERATIONS
SEE BELOW

DRAINAGE DETAILS
SEE BELOW

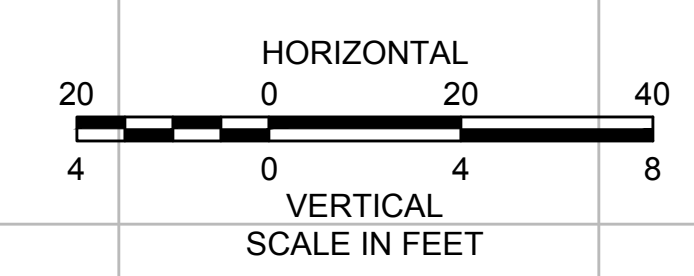
MINUTEMAN BIKEWAY OFF ROAD ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L21	281+49.26	2999848.6655	706801.0385		N88°34'38"W 460.89'	286+10.14	2999860.1099	706340.2950
C28	286+10.14	2999860.1099	706340.2950	R = 2500.00' Δ = 10°59'19" L = 479.47' T = 240.47'		290+89.61	2999826.1201	705862.7715
C29	290+89.61	2999826.1201	705862.7715	R = 1000.00' Δ = 8°22'08" L = 146.06' T = 73.16'		292+35.67	2999791.4334	705721.0197

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	31	54
PROJECT FILE NO.		607738	
GENERAL PLANS & PROFILES			

MINUTEMAN BIKEWAY EXTENSION



MINUTEMAN BIKEWAY EXTENSION



STA. 288+54 MINUTEMAN BIKEWAY CONST \square =
STA. 407+55 CONCORD RD CONST \square =

CONTINUED ON SHEET NO. 30

CONTINUED ON SHEET NO. 34

HIGHWAY GUARD DETAILS
 STEEL HIGHWAY GUARD:
 STA. 405+67.22 RT TO STA. 407+55.97 RT
 STA. 405+75.00 LT TO STA. 406+46.71 LT
 STA. 406+76.66 LT TO STA. 407+30.10 LT
 STA. 407+53.17 LT TO STA. 407+68.59 LT
 STA. 407+79.04 RT TO STA. 408+53.11 RT

WOOD GUARDRAIL:
 STA. 405+92.95 LT TO STA. 406+30.27 LT
 STA. 406+58.16 LT TO STA. 406+90.47 LT

WATER SUPPLY ALTERATIONS
 SEE BELOW

DRAINAGE DETAILS
 SEE BELOW

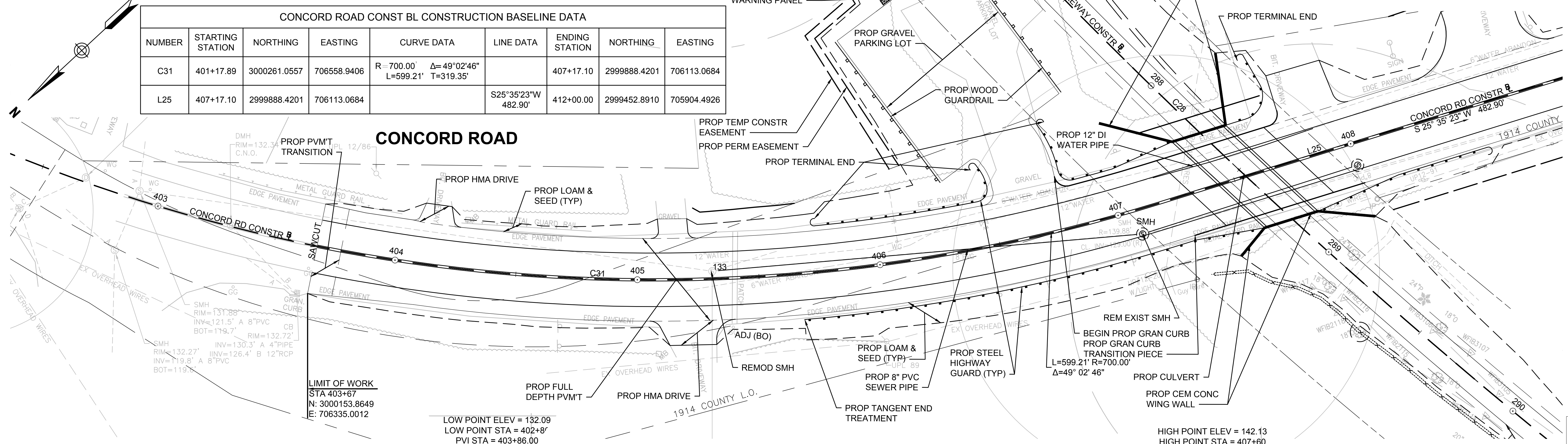
**BEDFORD
 MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	32	54
PROJECT FILE NO. 607738			

GENERAL PLANS & PROFILES

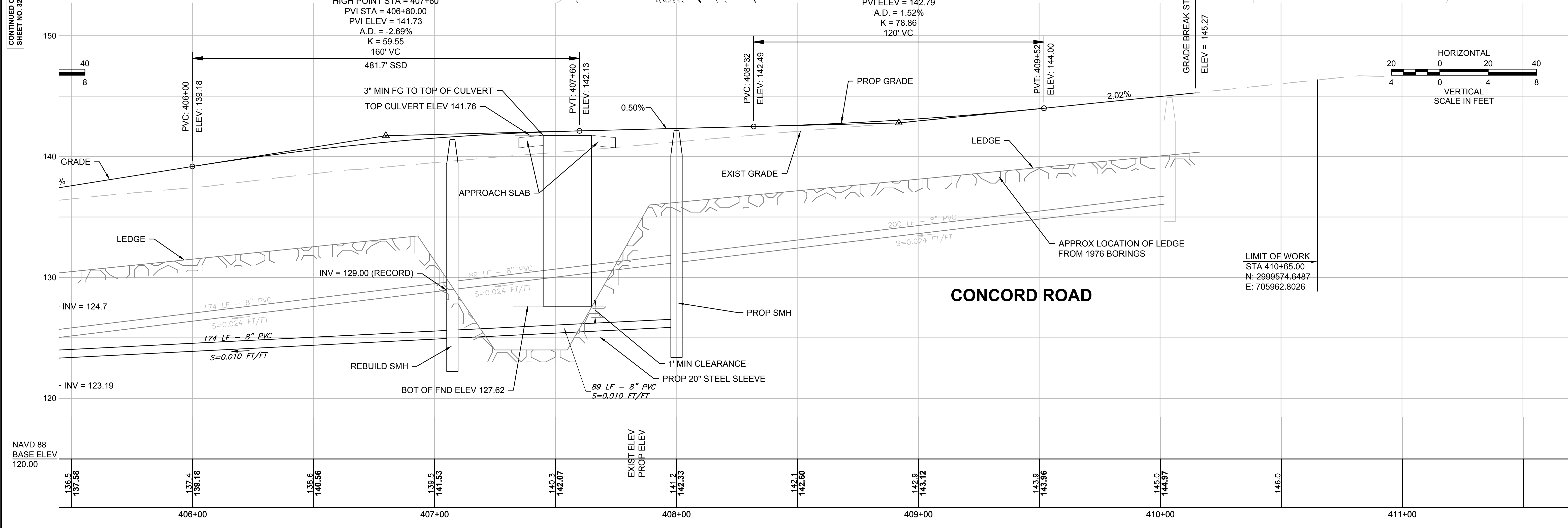
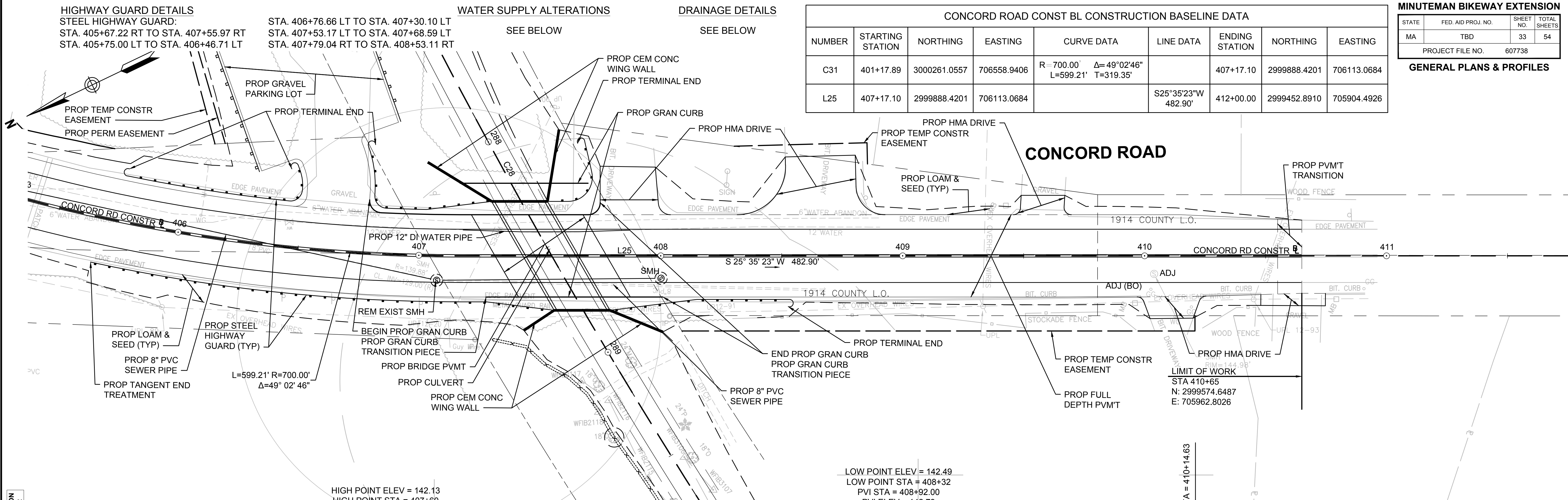
CONCORD ROAD CONST BL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C31	401+17.89	3000261.0557	706558.9406	R = 700.00' Δ = 49°02'46" L = 599.21' T = 319.35'		407+17.10	2999888.4201	706113.0684
L25	407+17.10	2999888.4201	706113.0684		S25°35'23"W 482.90'	412+00.00	2999452.8910	705904.4926



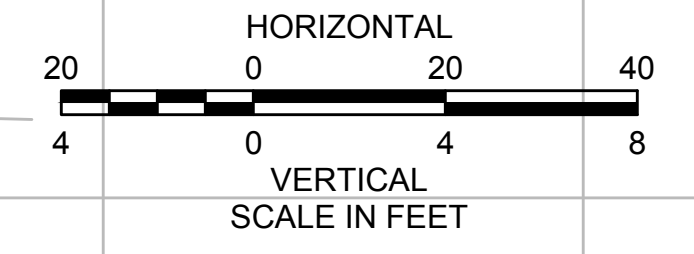
CONCORD ROAD CONST BL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C31	401+17.89	3000261.0557	706558.9406	R = 700.00' Δ = 49°02'46" L = 599.21' T = 319.35'		407+17.10	2999888.4201	706113.0684
L25	407+17.10	2999888.4201	706113.0684		S25°35'23"W 482.90'	412+00.00	2999452.8910	705904.4926



CONTINUED ON
SHEET NO. 32

NAVD 88
BASE ELEV
120.00



HIGHWAY GUARD DETAILS

NONE

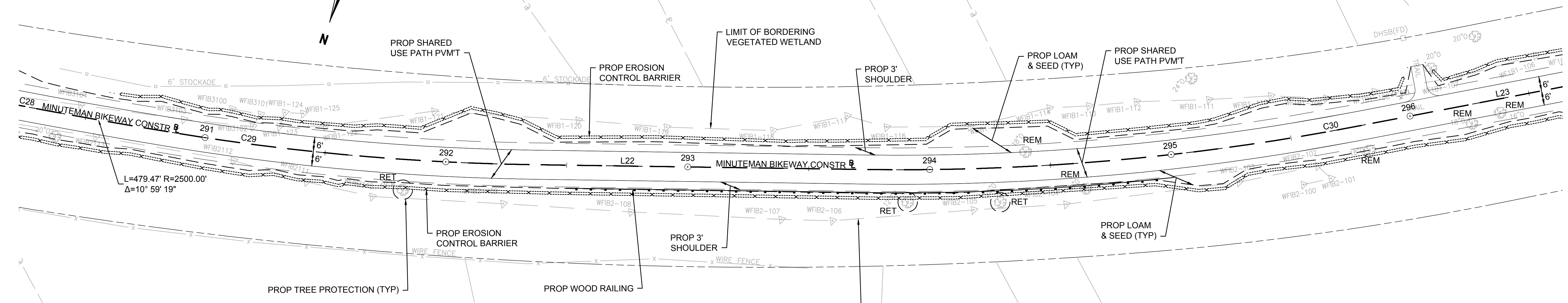
WATER SUPPLY ALTERATIONS

SEE BELOW

DRAINAGE DETAILS

NONE

MINUTEMAN BIKEWAY EXTENSION

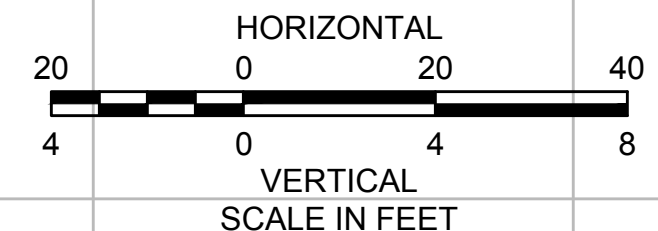


NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C28	286+10.14	2999860.1099	706340.2950	R=2500.00' Δ=10°59'19" L=479.47' T=240.47'		290+89.61	2999826.1201	705862.7715
C29	290+89.61	2999826.1201	705862.7715	R=1000.00' Δ=8°22'08" L=146.06' T=73.16'		292+35.67	2999791.4334	705721.0197
L22	292+35.67	2999791.4334	705721.0197		S72°03'56"W 137.86'	293+73.53	2999748.9834	705589.8621
C30	293+73.53	2999748.9834	705589.8621	R=1000.00' Δ=11°40'25" L=203.74' T=102.22'		295+77.27	2999666.9996	705403.7274

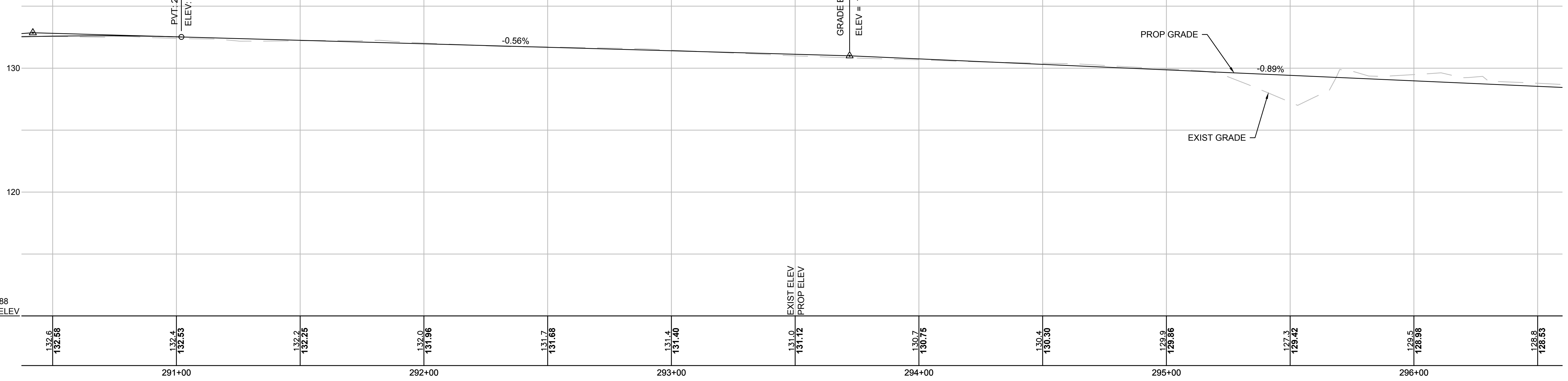
CONTINUED ON SHEET NO. 31

CONTINUED ON SHEET NO. 35

IT ELEV = 132.61
 STA = 290+68.53
 V = 290+42.00
 EV = 132.85
 140. = -2.02%
 = 59.41
 20' VC
 4.3' SSD



MINUTEMAN BIKEWAY EXTENSION

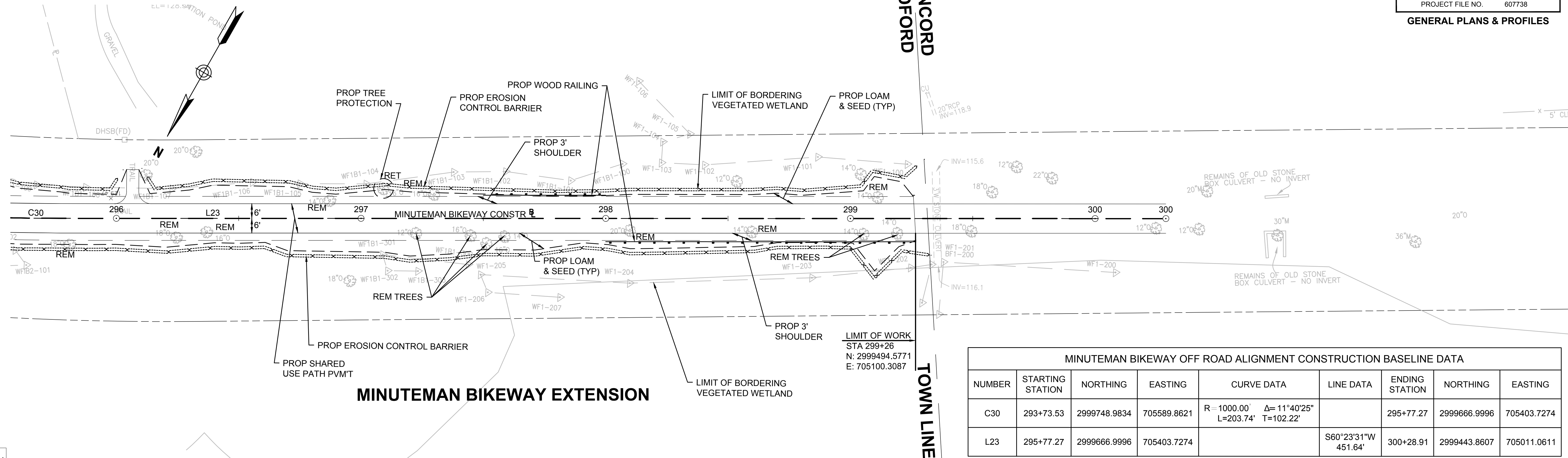


NAVD 88
 BASE ELEV
 110.00

HIGHWAY GUARD DETAILS NONE
 WATER SUPPLY ALTERATIONS SEE BELOW
 DRAINAGE DETAILS SEE BELOW

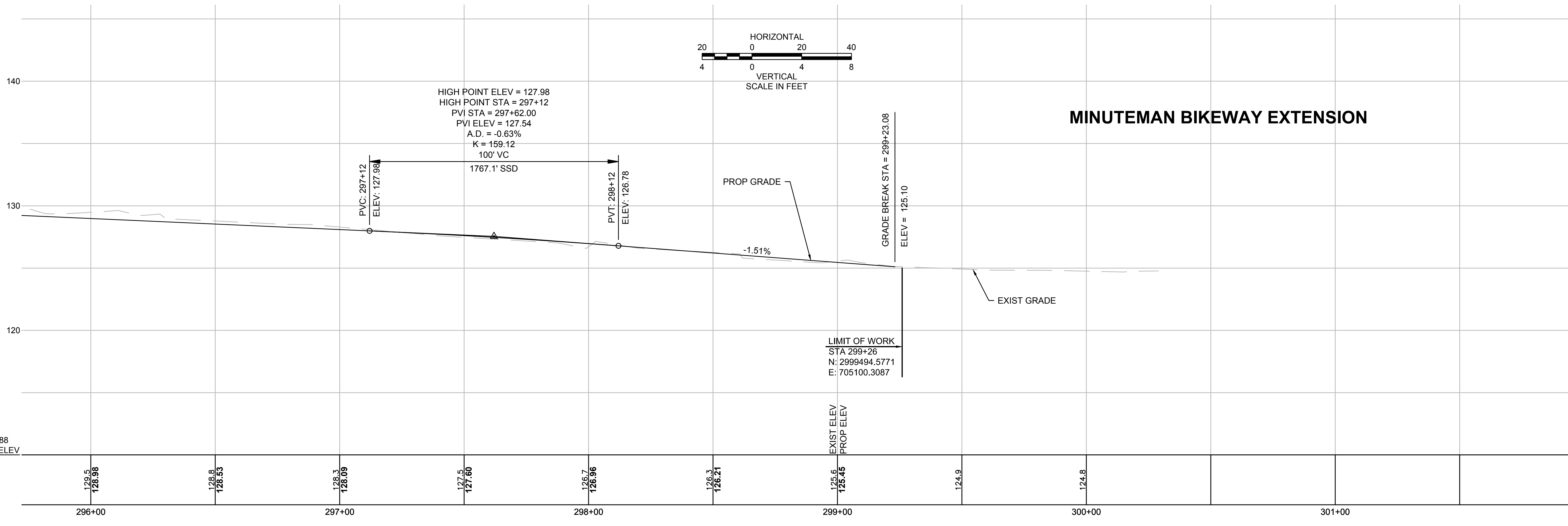
CONCORD
BEDFORD

TOWN LINE



NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C30	293+73.53	2999748.9834	705589.8621	R=1000.00' Δ=11°40'25" L=203.74' T=102.22'		295+77.27	2999666.9996	705403.7274
L23	295+77.27	2999666.9996	705403.7274		S60°23'31"W 451.64'	300+28.91	2999443.8607	705011.0611

CONTINUED ON SHEET NO. 34



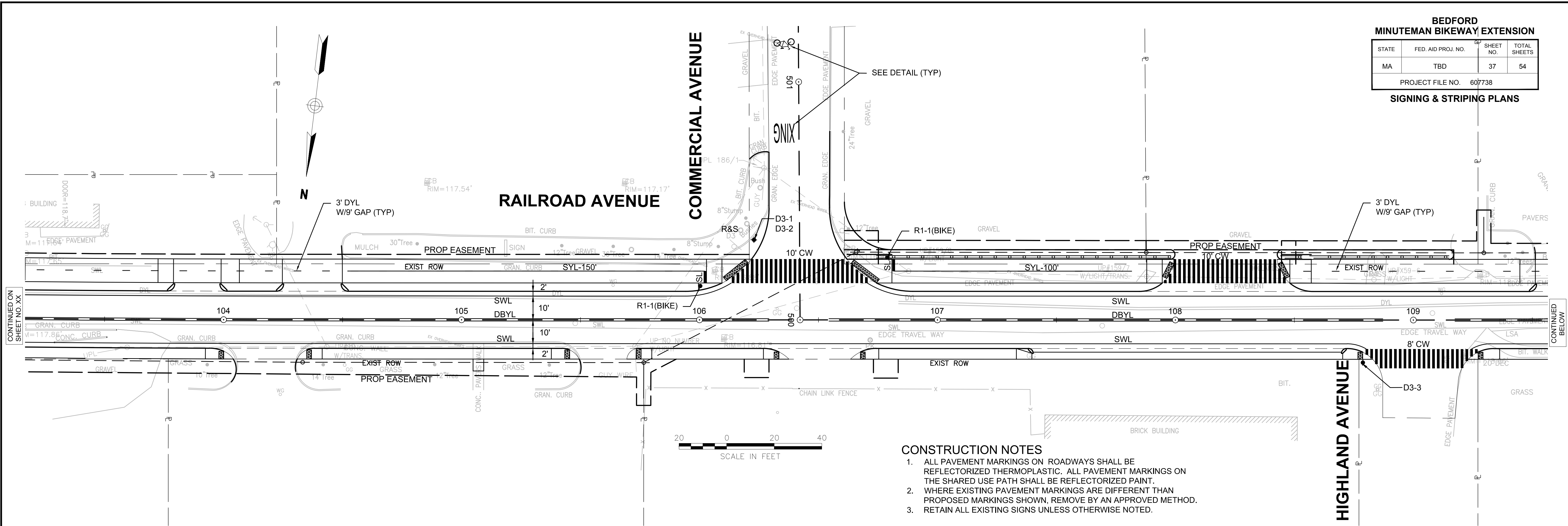
NAVD 88
 BASE ELEV
 110.00

**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

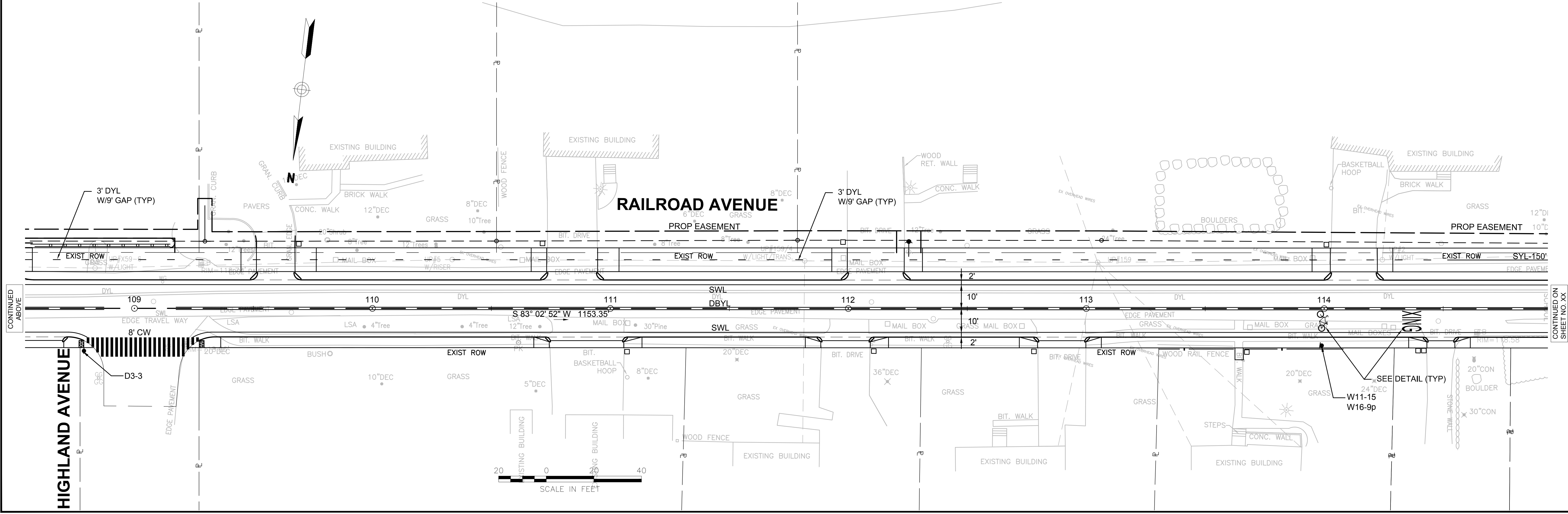
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	37	54

PROJECT FILE NO. 607738

SIGNING & STRIPING PLANS



- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE SHARED USE PATH SHALL BE REFLECTORIZED PAINT.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.



CONTINUED ON SHEET NO. XX

CONTINUED BELOW

CONTINUED ABOVE

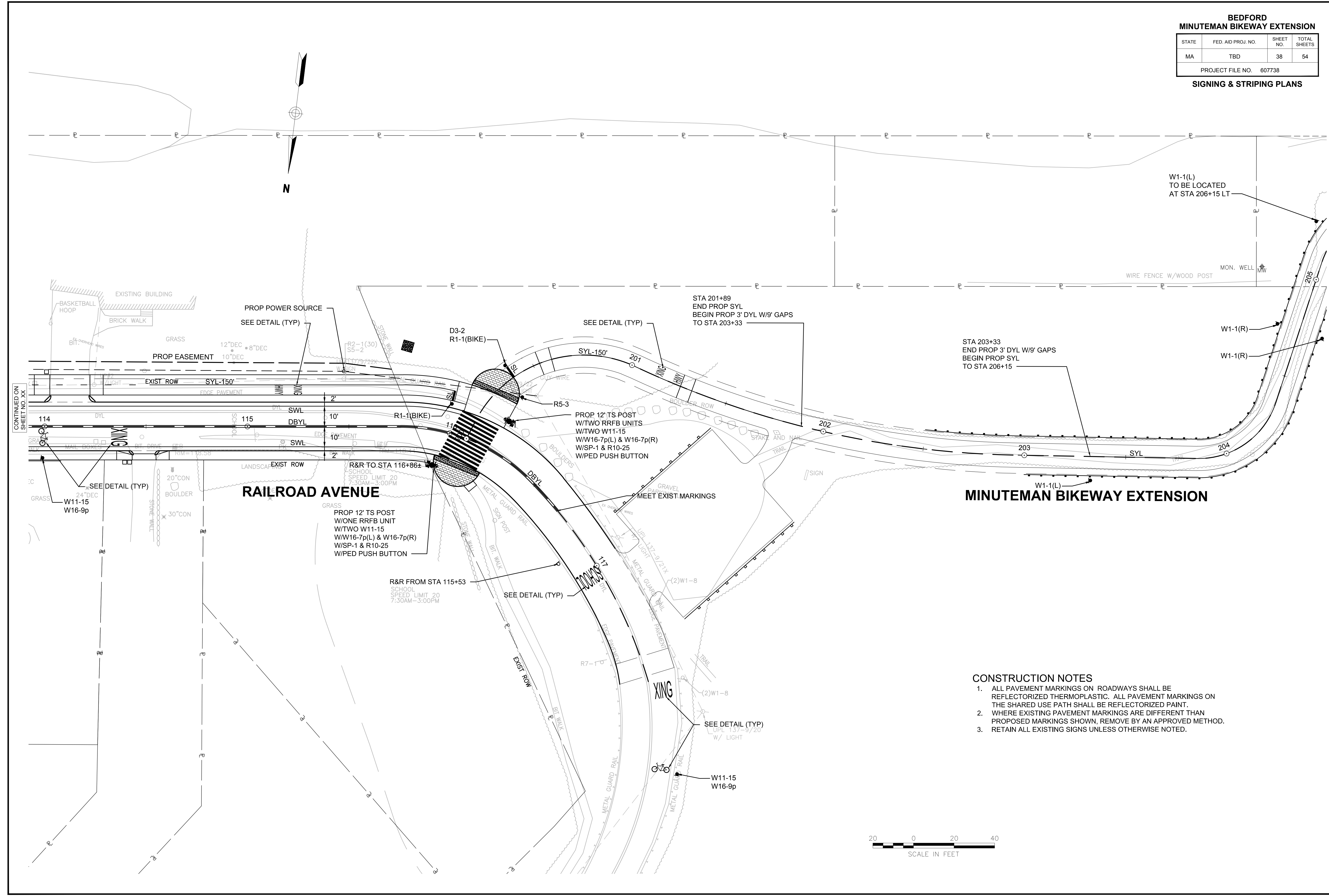
CONTINUED ON SHEET NO. XX

**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	38	54

PROJECT FILE NO. 607738

SIGNING & STRIPING PLANS



- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE SHARED USE PATH SHALL BE REFLECTORIZED PAINT.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

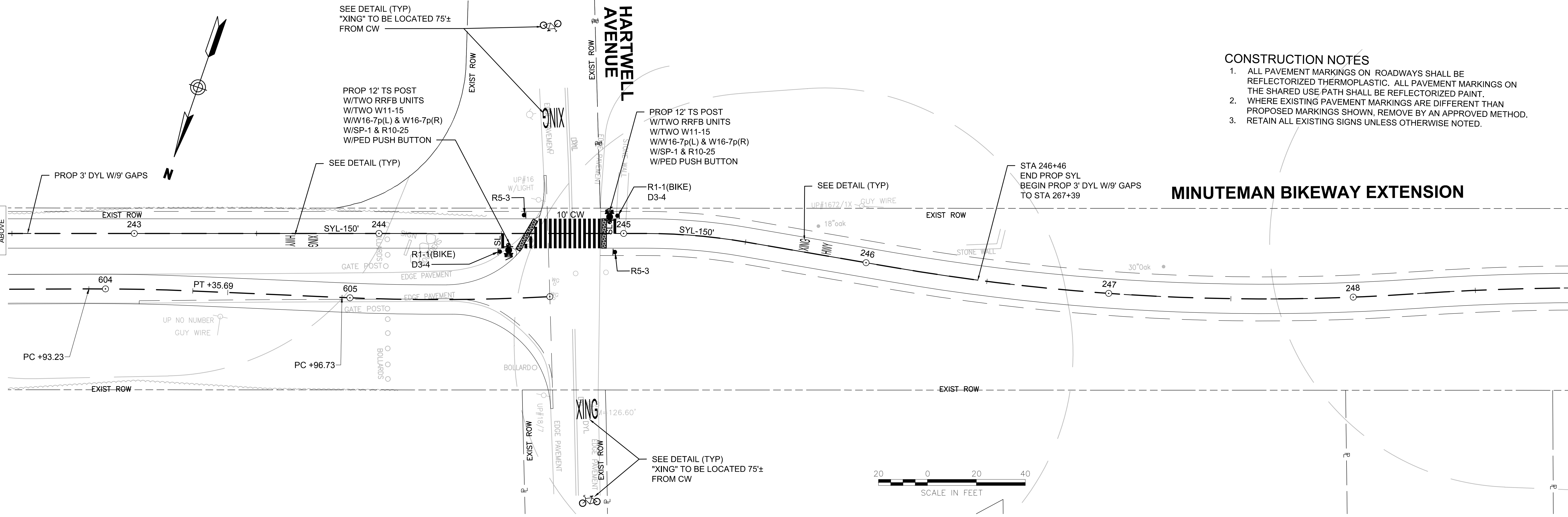
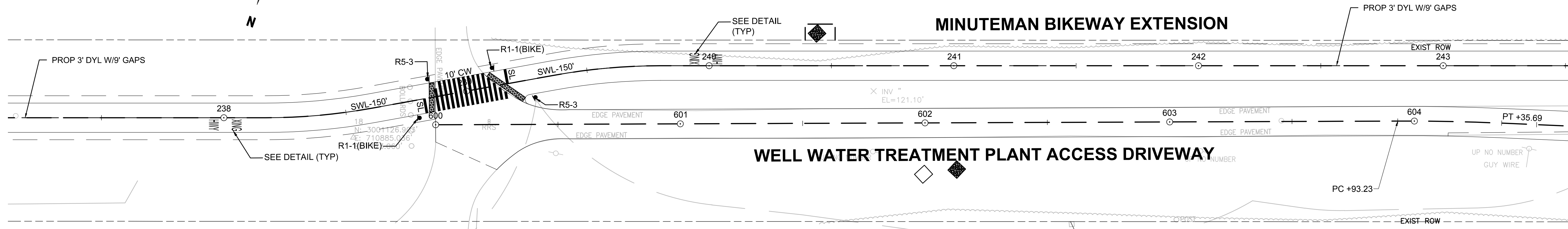


**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	39	54

PROJECT FILE NO. 607738
SIGNING & STRIPING PLANS

09393.01-STRIP.DWG Picked on 17-Mar-2017 3:19 PM



- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE SHARED USE PATH SHALL BE REFLECTORIZED PAINT.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

CONTINUED ABOVE

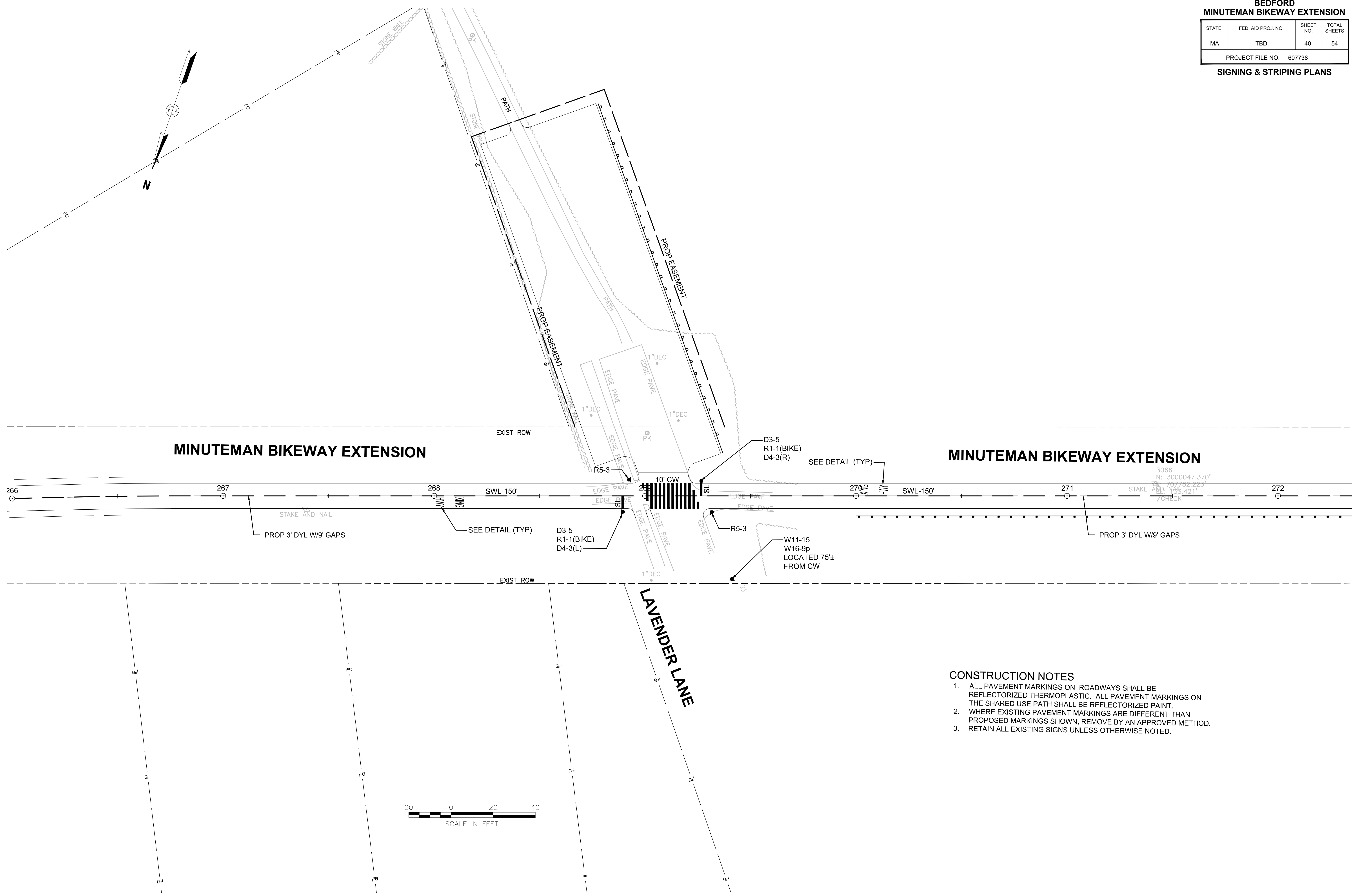
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**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	40	54

PROJECT FILE NO. 607738

SIGNING & STRIPING PLANS



CONSTRUCTION NOTES

1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE SHARED USE PATH SHALL BE REFLECTORIZED PAINT.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

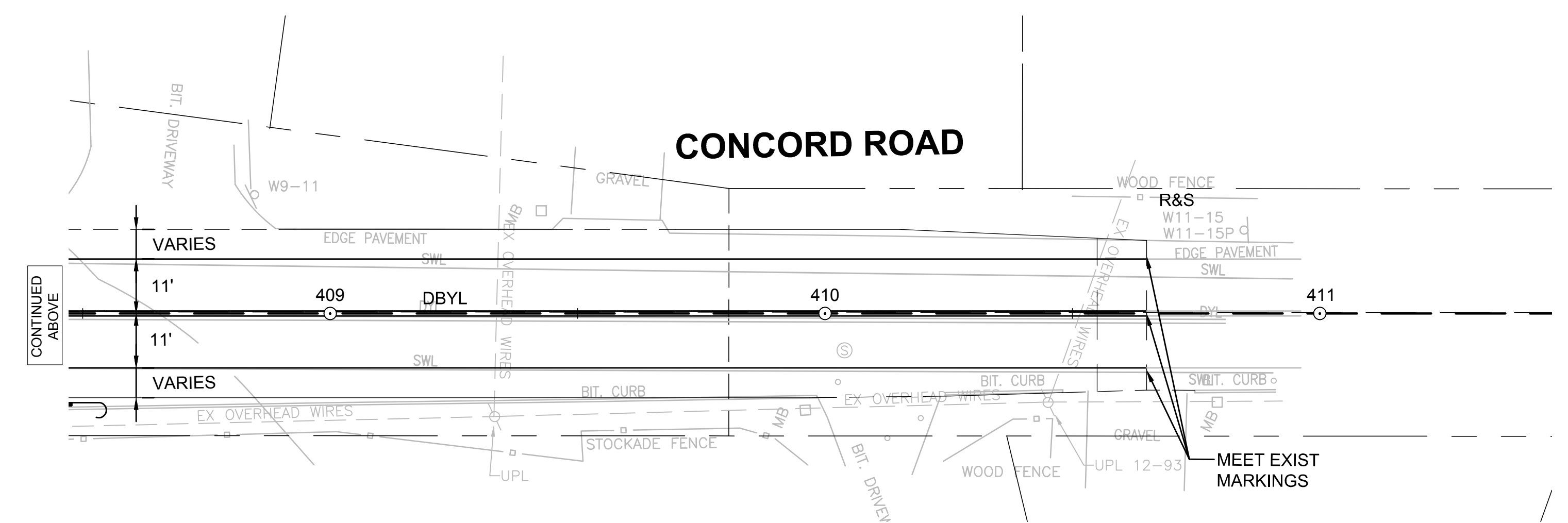
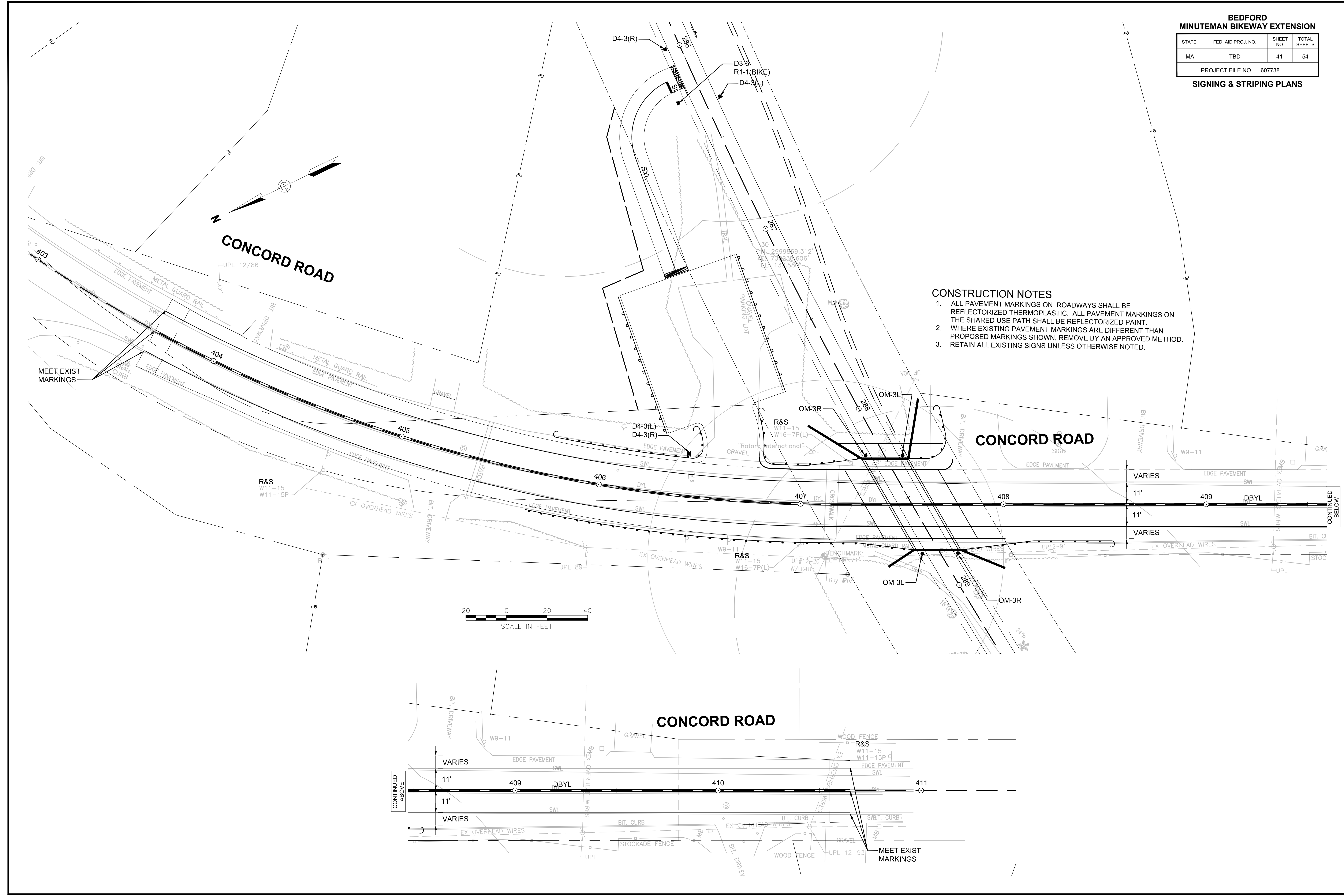
**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**


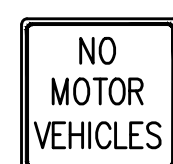





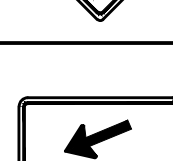


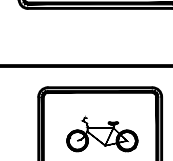


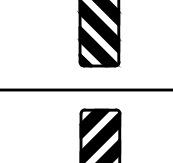
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	TBD	41	54





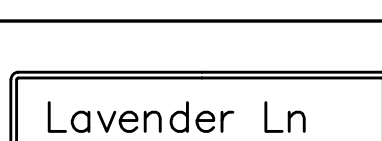
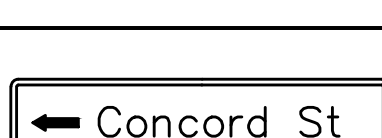
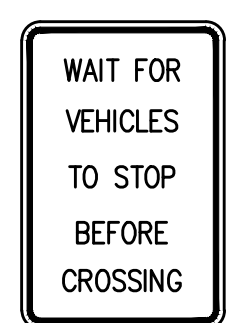
PROJECT FILE NO. 607738
SIGNING & STRIPING PLANS

CONSTRUCTION NOTES

1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE SHARED USE PATH SHALL BE REFLECTORIZED PAINT.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.



IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
R1-1(BIKE)	18"	18"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED				RED	WHITE	WHITE		1.86	
R5-3	24"	24"						WHITE	BLACK	BLACK		4.00	
R9-5	12"	18"						WHITE	BLACK	BLACK		1.50	
R10-25	9"	12"						WHITE	BLACK	BLACK		0.75	
W1-1(L)(1)	18"	18"						YELLOW	BLACK	BLACK		2.25	
W1-1(R)	18"	18"						YELLOW	BLACK	BLACK		2.25	
W11-15	24"	24"						YELLOW	BLACK	BLACK		4.00	
W16-7p(L)	24"	12"						YELLOW	BLACK	BLACK		2.00	
W16-7p(R)	24"	12"						YELLOW	BLACK	BLACK		2.00	
W16-9p	24"	12"						YELLOW	BLACK	BLACK		2.00	
D4-3(L)	12"	18"						WHITE	GREEN	GREEN		1.50	
D4-3(R)	12"	18"						WHITE	GREEN	GREEN		1.50	
OM-3L	12"	36"						YELLOW	BLACK	--		3.00	
OM-3R	12"	36"						YELLOW	BLACK	--		3.00	

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D3-1	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
D3-2	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
D3-3	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
D3-4	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
D3-5	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
D3-6	X"	12"		6	3	N/A		GREEN	WHITE	WHITE			INCLUDED UNDER ITEM 874
SP-1	9"	12"		1"C	1.5"	N/A		YELLOW	BLACK	BLACK		0.75	

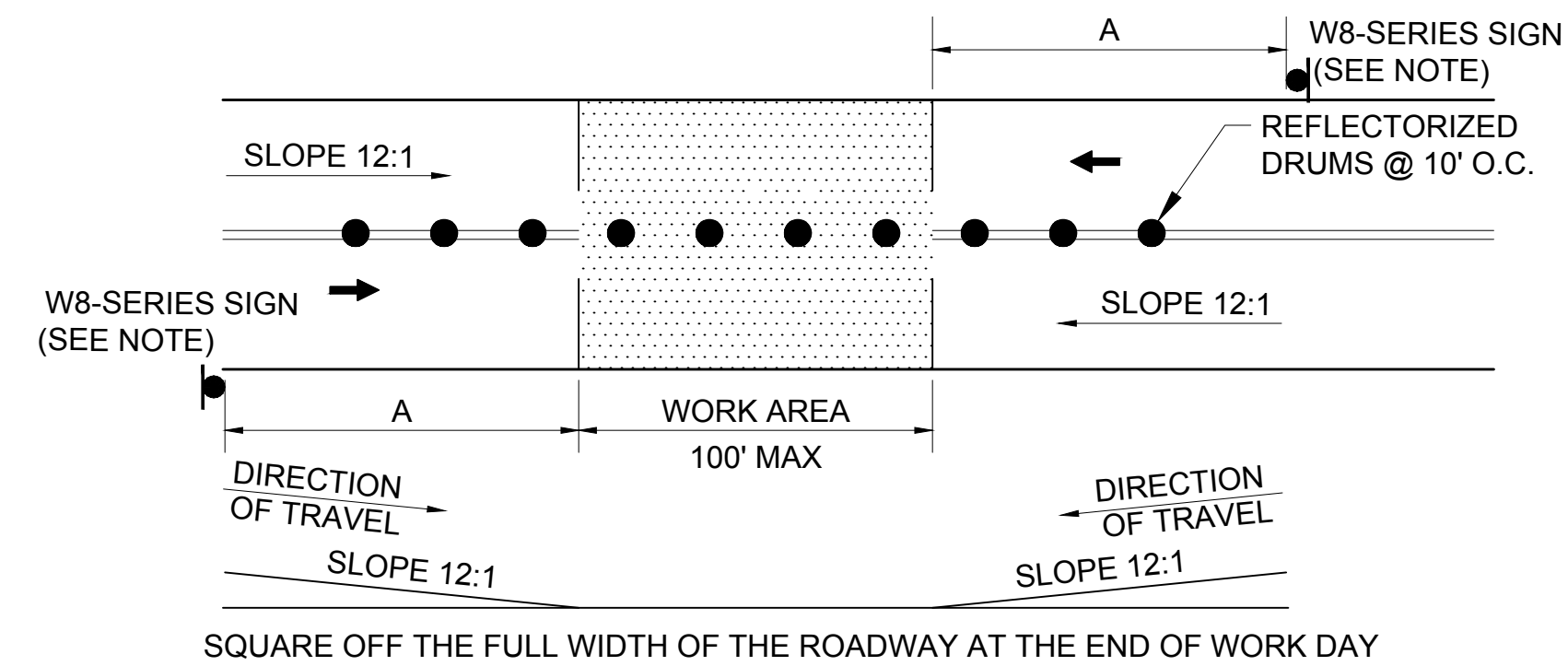
NOTE: HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, FOR VERTICAL & LATERAL CLEARANCES.

TEMPORARY TRAFFIC CONTROL GENERAL NOTES

- ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- WORK HOURS SHALL BE 9:00AM TO 3:00PM MONDAY THROUGH FRIDAY UNLESS OTHERWISE APPROVED BY THE ENGINEER. WORK SHALL NOT AFFECT TRAFFIC PATTERNS DURING PEAK TRAFFIC PERIODS. PEAK TRAFFIC PERIODS ARE DEFINED AS MONDAY THROUGH FRIDAY 7:00AM-9:00AM AND 3:00PM-6:00PM.
- ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) REQUIREMENTS.
- ALL DRUMS OUTSIDE TAPERS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
- ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
- THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OR RESTRICTION OF ACCESS.
- FOR RESTORATIVE WORK ON LOCAL ROADWAYS, A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION ON TWO WAY STREETS SHALL BE MAINTAINED AT ALL TIMES, EXCEPT THAT DURING WORKING HOURS, TRAFFIC MAY BE REDUCED TO ONE LANE UNDER POLICE CONTROL FOR SHORT TIME PERIODS WHEN REQUIRED FOR THE WORK, AS SHOWN UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- FOR DROP-OFFS 4" OR LESS WITHIN THE CLEAR ZONE: CONDITION MAY BE MITIGATED WITH W8-9 (LOW SHOULDER) SIGN OR TEMPORARY CHANNELIZATION DEVICES. FOR DROP-OFFS GREATER THAN 4" BUT NO MORE THAN 12", DETERMINE WHETHER IT IS MORE COST EFFECTIVE TO INSTALL BOTH TEMPORARY CHANNELIZATION DEVICES AND A 1V:4H (MIN) TO 1V:6H (DESIRED) WEDGE OR TO SHIELD IT. FOR DROP-OFFS GREATER THAN 12" BUT NO MORE THAN 24", DETERMINE WHETHER IT IS MORE COST EFFECTIVE TO MAINTAIN AN ADDITIONAL 5' OF SHOULDER WIDTH AND INSTALL BOTH TEMPORARY CHANNELIZATION DEVICES AND A 1V:6H (DESIRE) WEDGE OR TO SHIELD IT. FOR DROP-OFFS 24" OR GREATER USE BARRIER IN ACCORDANCE WITH MASSDOT WORK ZONE POSITIVE PROTECTION GUIDELINES.
- THE CONTRACTOR SHALL PROVIDE TEMPORARY IMPACT ATTENUATORS TO PROTECT ALL BLUNT-ENDS OF TEMPORARY BARRIER OR AS REQUIRED BY THE ENGINEER. TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF WORK. ALL TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED MEET OR EXCEED MASH TEST LEVEL 2 (TL-2).
- 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
- NON-ESSENTIAL TRAFFIC CONTROL DEVICES AND SIGNS SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS WHEN NOT IN USE.
- SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
- SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
- SIGNS MOUNTED ON P5 POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN.
- THE FIRST 5 DRUMS ON TAPERS SHALL BE REFLECTORIZED DRUMS WITH TYPE A LIGHTS.
- REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.
- CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.
- ADVISORY SPEED PLAQUES (W13-1p(XX)) SHALL BE USED AS SHOWN AND AS REQUESTED BY THE ENGINEER. POSTED ADVISORY SPEED SHALL BE AS APPROVED BY THE APPROPRIATE AGENCY WITH JURISDICTION OVER THE ROADWAY ON WHICH THE SIGN WILL BE MOUNTED.
- MA-W20-7b SIGNS SHALL BE REPLACED BY W20-7 SIGNS WHEN FLAGGERS ARE USED IN LIEU OF POLICE OFFICER DETAILS.
- NO WORK SHALL OCCUR WITHIN THE PUBLIC WAY ON STATE RECOGNIZED HOLIDAYS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- CONTRACTOR SHALL SECURE WORK AREAS TO PREVENT UNAUTHORIZED ACCESS AT ALL TIMES.
- THERE IS NO DESIGNATED BICYCLE LANE ON THE ROADWAY WITHIN THE PROJECT LIMITS. BICYCLES ARE EXPECTED TO SHARE THE ROAD WITH GENERAL VEHICULAR TRAFFIC.
- W21-7 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF AREAS WHERE UTILITY CASTINGS HAVE BEEN RAISED IN ADVANCE OF PAVING OPERATIONS OR AS REQUESTED BY THE ENGINEER.
- W8-15 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF PAVEMENT MILLING AREAS OR AS REQUESTED BY THE ENGINEER.
- TEMPORARY MARKINGS SHALL BE WATER-BORNE PAINT OR SURFACE-APPLIED REMOVABLE TAPE, AS APPROVED BY THE ENGINEER.
- ALL TEMPORARY CROSSWALKS AND STOP LINES SHALL BE 12 INCHES WIDE.
- ALL TEMPORARY DOUBLE YELLOW LINES (DBYL) SHALL BE 6 INCHES WIDE.
- CLEAR ZONE IS 8 FEET AT 35 MPH BASED ON MASSDOT GUIDANCE.
- ALL TEMP BARRIER SHALL MEET OR EXCEED MASH TL-2 REQUIREMENTS WITH A MAXIMUM DYNAMIC DEFLECTION OF 3 FEET.

CONSTRUCTION STAGING NOTES

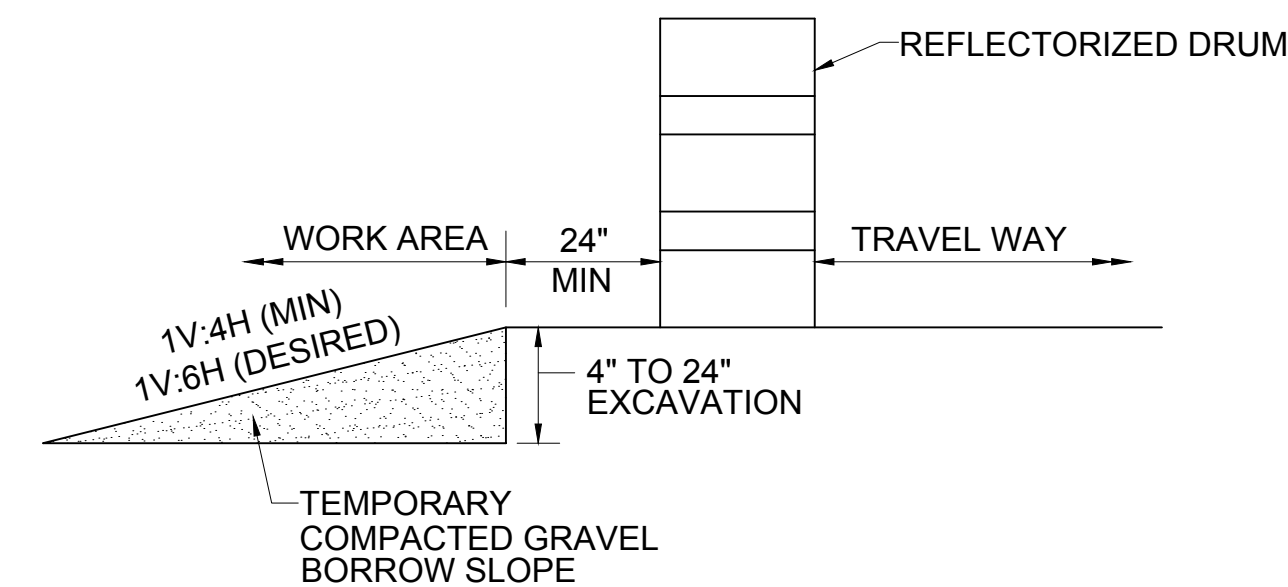
- STAGE 1:
1. CONTRACTOR TO CONSTRUCT TEMPORARY HMA ROADWAY TO BE UTILIZED IN STAGE 2.
- STAGE 2:
2. CONTRACTOR TO CONSTRUCT WEST SIDE OF CONCORD RD/CULVERT.
- STAGE 3:
3. CONTRACTOR TO CONSTRUCT REMAINING EAST SIDE OF CONCORD RD/CULVERT.



NOTE:
CONTRACTOR SHALL INSTALL W8-1, W8-3, OR W8-8 SIGN, AS APPROPRIATE, ON ALL ROADWAYS IN ADVANCE OF THE TRANSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TEMPORARY PAVEMENT TRANSITION DETAIL

SCALE: NTS



NOTE:
CONTRACTOR SHALL INSTALL W8-9 SIGN ON ALL ROADWAYS 350 FT IN ADVANCE OF THE START OF DROP-OFF CONDITION.

TYPICAL ROADWAY DROP-OFF PROTECTION

SCALE: NTS

BEDFORD MINUTEMAN BIKEWAY EXTENSION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	43	54

PROJECT FILE NO. TBD

TEMPORARY TRAFFIC CONTROL PLANS GENERAL NOTES & LEGEND

LEGEND

	FLAGGER
	POLICE OFFICER
	TRAFFIC SIGNAL
	REFLECTORIZED DRUM
	REFLECTORIZED DRUM WITH TYPE A FLASHER (SEE NOTE 15)
	TEMPORARY CONSTRUCTION SIGN
	TRAFFIC CONE
	TYPE III BARRICADE
	WORK AREA (PUBLIC ACCESS RESTRICTED)
	TRAFFIC FLOW
	PEDESTRIAN ROUTE
	CONSTRUCTION FENCE
	PEDESTRIAN CHANNELIZATION DEVICE
NTS	NOT TO SCALE

ADVANCE SIGN SPACING

ROAD	DISTANCE BETWEEN SIGNS (FEET)			
	A	B	C	D
CONCORD RD	350	150	350	350
ALL OTHER ROADWAYS	100	50	100	100

LANE TAPER LENGTH FORMULAS

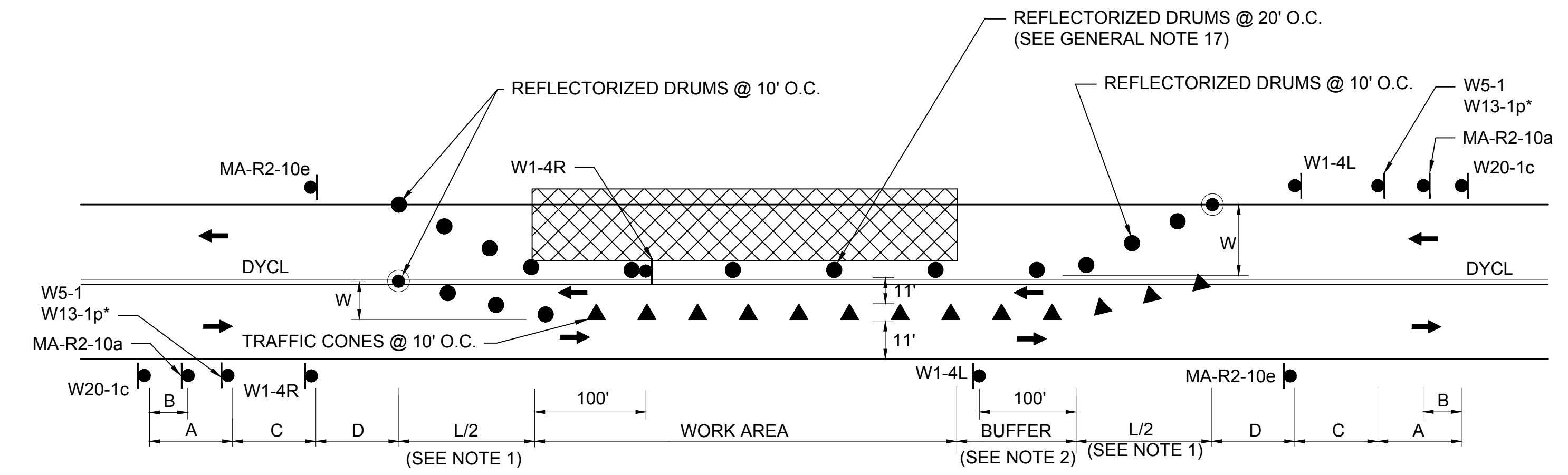
L= TAPER LENGTH IN FEET
W= WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED IN FEET
S= POSTED SPEED LIMIT IN MPH
POSTED SPEED 40 MPH OR LESS
$L = \frac{WS^2}{60}$

BUFFER SPACING

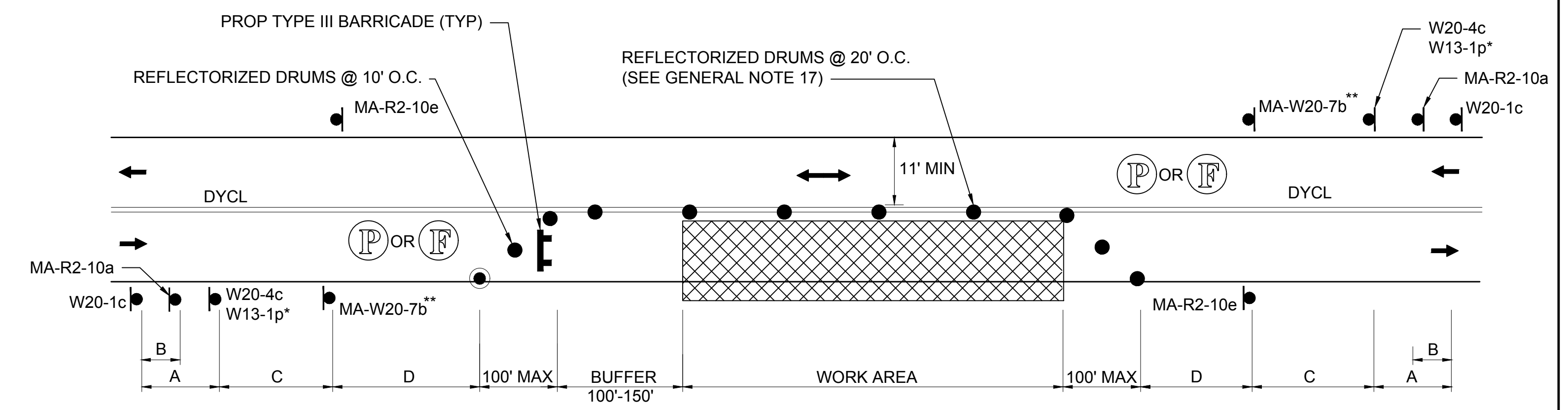
SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200
35	250
40	305

BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	44	54
PROJECT FILE NO. TBD			

**TEMPORARY TRAFFIC CONTROL PLANS
TYPICAL DETAILS**



- NOTES:**
1. SEE TAPER LENGTH FORMULA ON SHEET 43.
 2. SEE BUFFER SPACING CHART ON SHEET 43.
 3. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 43.
 4. *SEE GENERAL NOTE 18 ON SHEET 43.

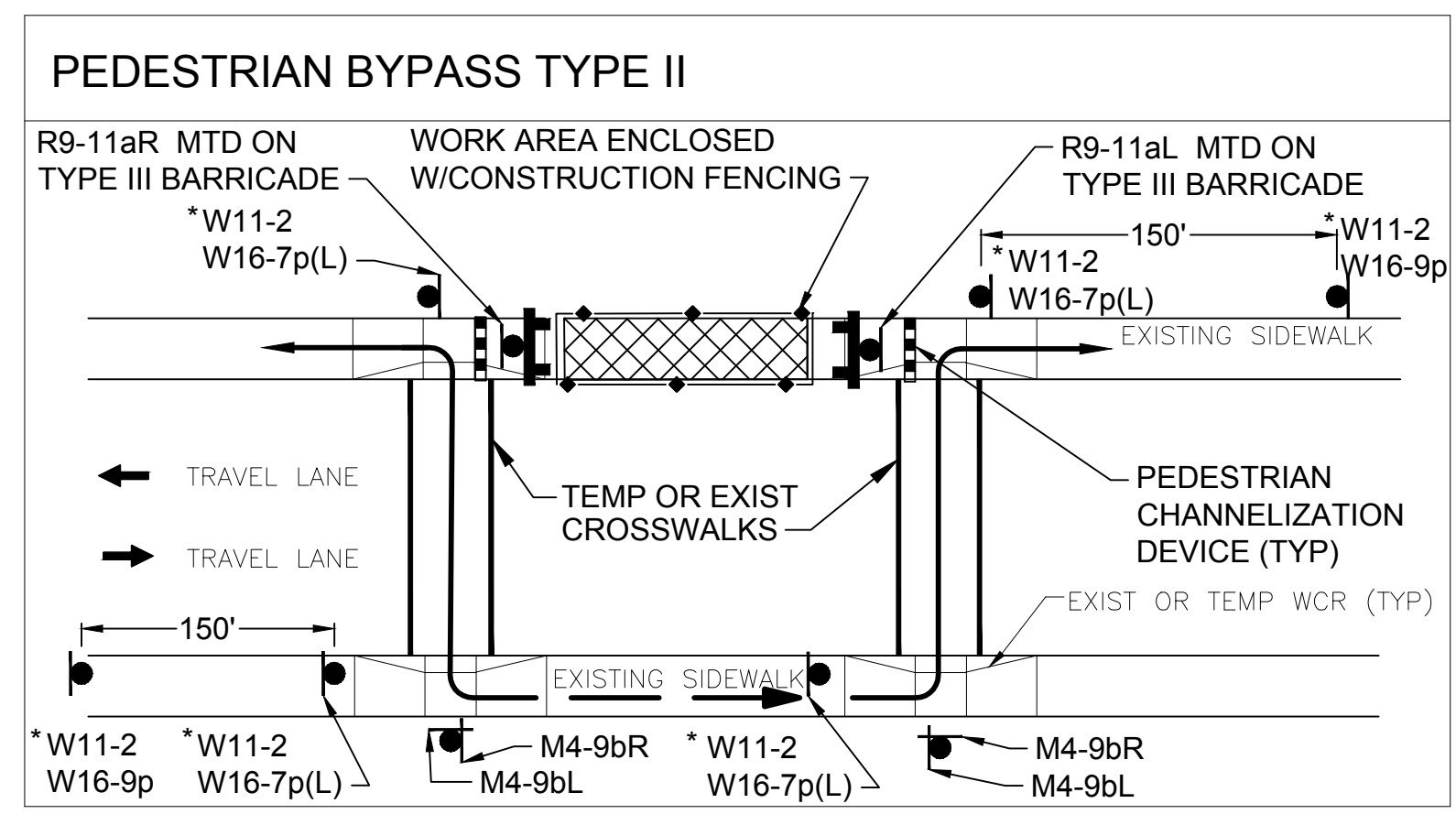
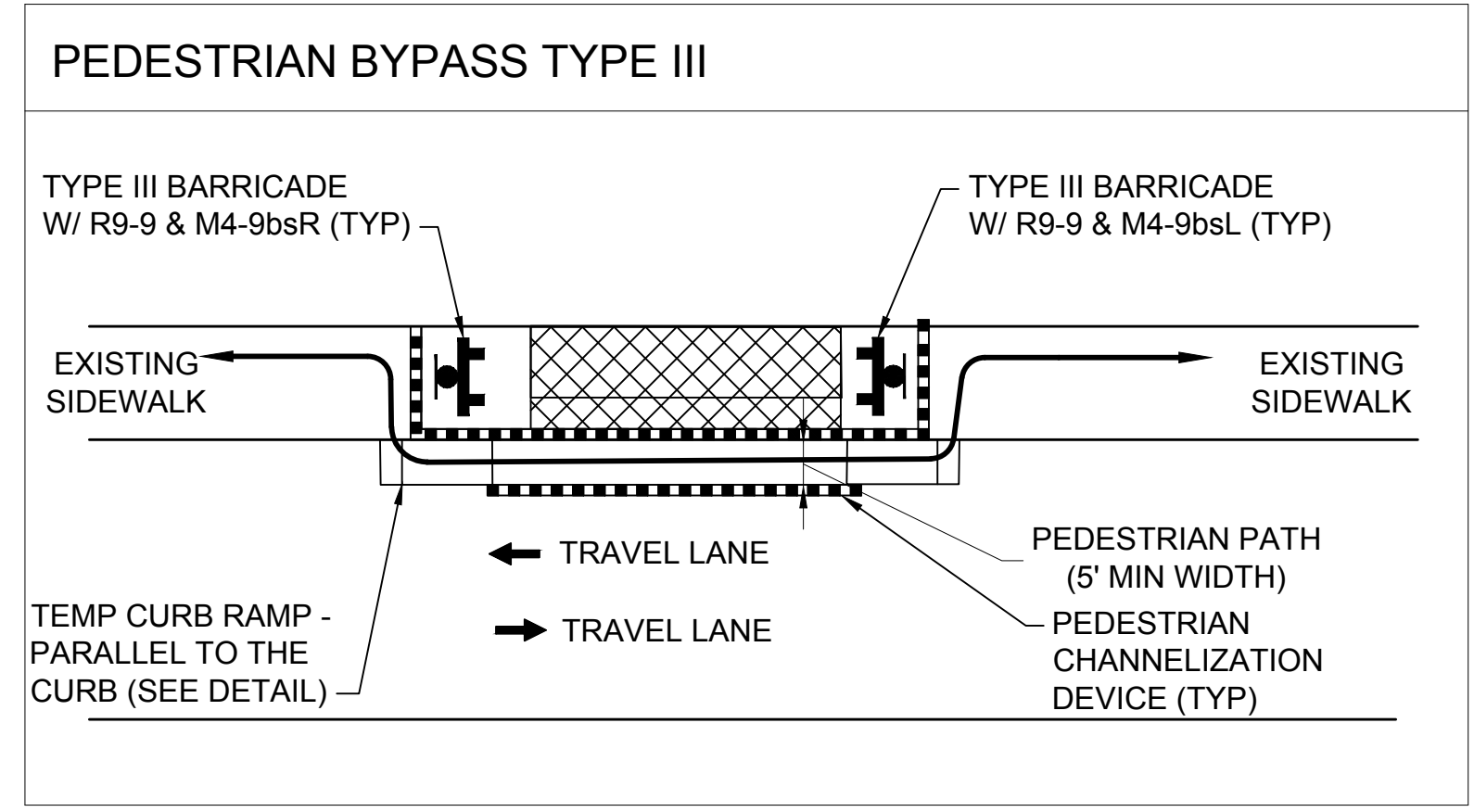


- NOTES:**
1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 43.
 2. *SEE GENERAL NOTE 18 ON SHEET 43.
 3. ** SEE GENERAL NOTE 19 ON SHEET 43.

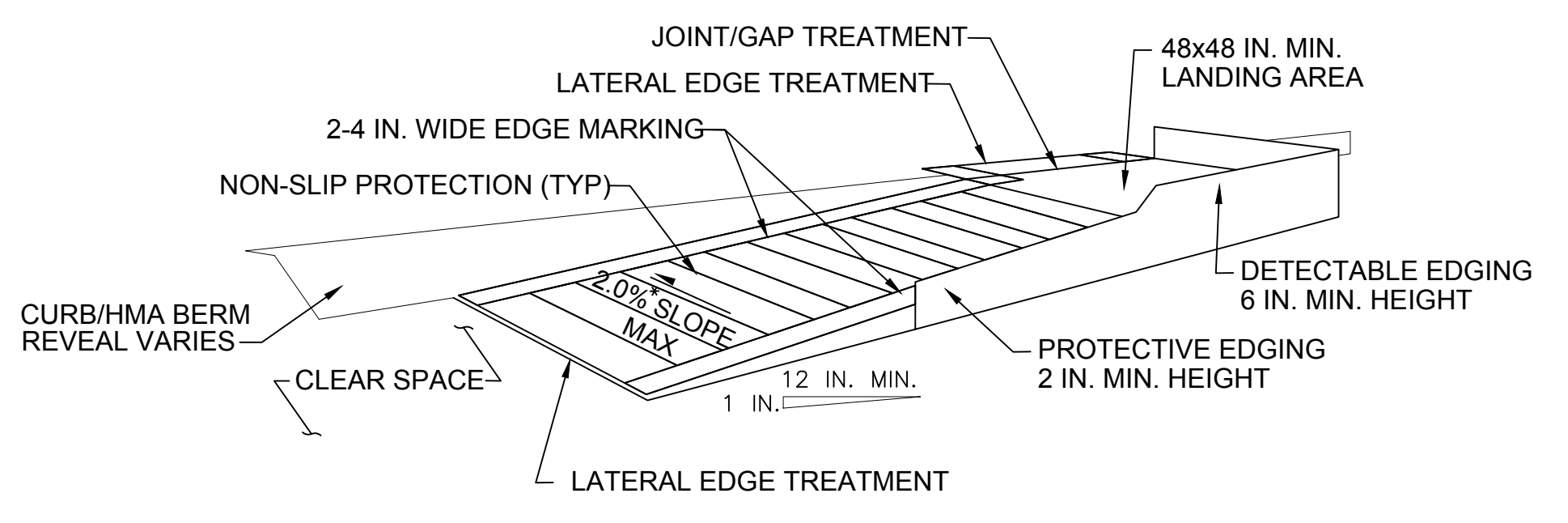
TYPICAL TWO-WAY STREET LANE SHIFT
SCALE: NTS

TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC
SCALE: NTS

- NOTES:**
1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
 2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
 3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
 4. ← → INDICATES DIRECTION OF PEDESTRIAN TRAVEL.
 5. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, THE APPROPRIATE SIGNS SHALL BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AT EXISTING OR TEMPORARY CROSSWALKS AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.
 6. PROPOSED TEMPORARY CROSSWALKS SHALL BE 12" WIDE SURFACE APPLIED TAPE OR REFLECTORIZED PAINT AS DIRECTED BY THE ENGINEER.
 7. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MAAB AND ADAAG REQUIREMENTS.
 8. CONTRACTOR SHALL MAINTAIN AS WIDE OF A PEDESTRIAN ACCESS AS POSSIBLE AT ALL TIMES. EXCEPT WHERE NECESSARY, THE CONTRACTOR MAY TEMPORARILY REDUCE PEDESTRIAN PATHWAYS TO 4 FEET IN WIDTH (EXCLUDING CURB) FOR NO MORE THAN 200 LINEAR FEET AT A TIME IN ACCORDANCE WITH ALL STANDARDS.
 9. TEMPORARY WHEELCHAIR RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MASSDOT, MAAB, AND ADAAG REQUIREMENTS.
 10. * INDICATES SIGNS ARE NOT REQUIRED IF EXISTING CROSSWALKS ARE USED.



PEDESTRIAN BYPASS DETAIL
SCALE: NTS

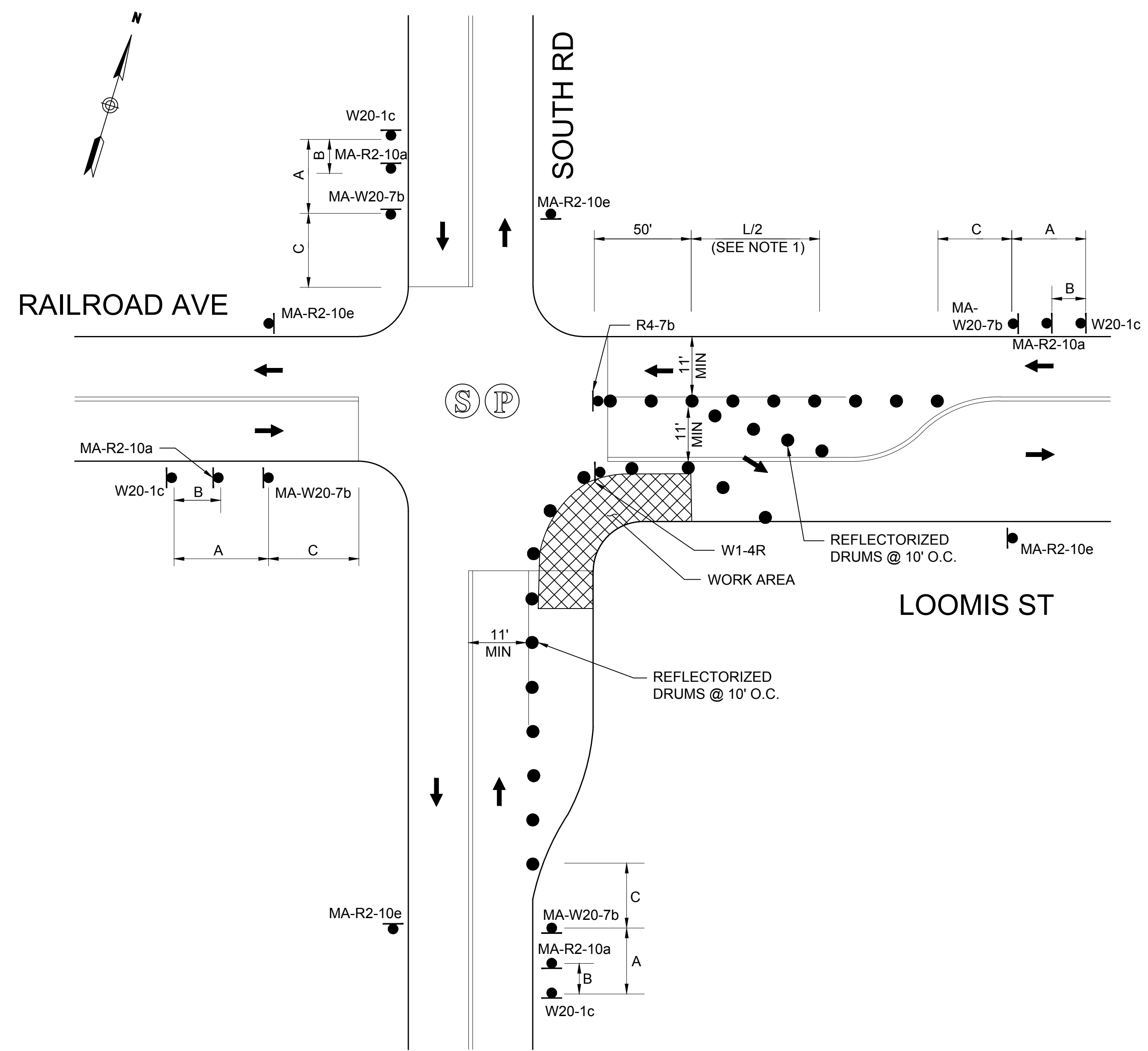


- NOTES:**
1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
 2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
 3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
 4. *CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
 5. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
 6. THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
 7. THE CURB RAMP SHOULD BE CONSTRUCTED SO AS NOT TO INTERRUPT THE FLOW OF WATER ALONG THE GUTTER.
 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.

TEMPORARY CURB RAMP-PARALLEL TO CURB
SCALE: NTS

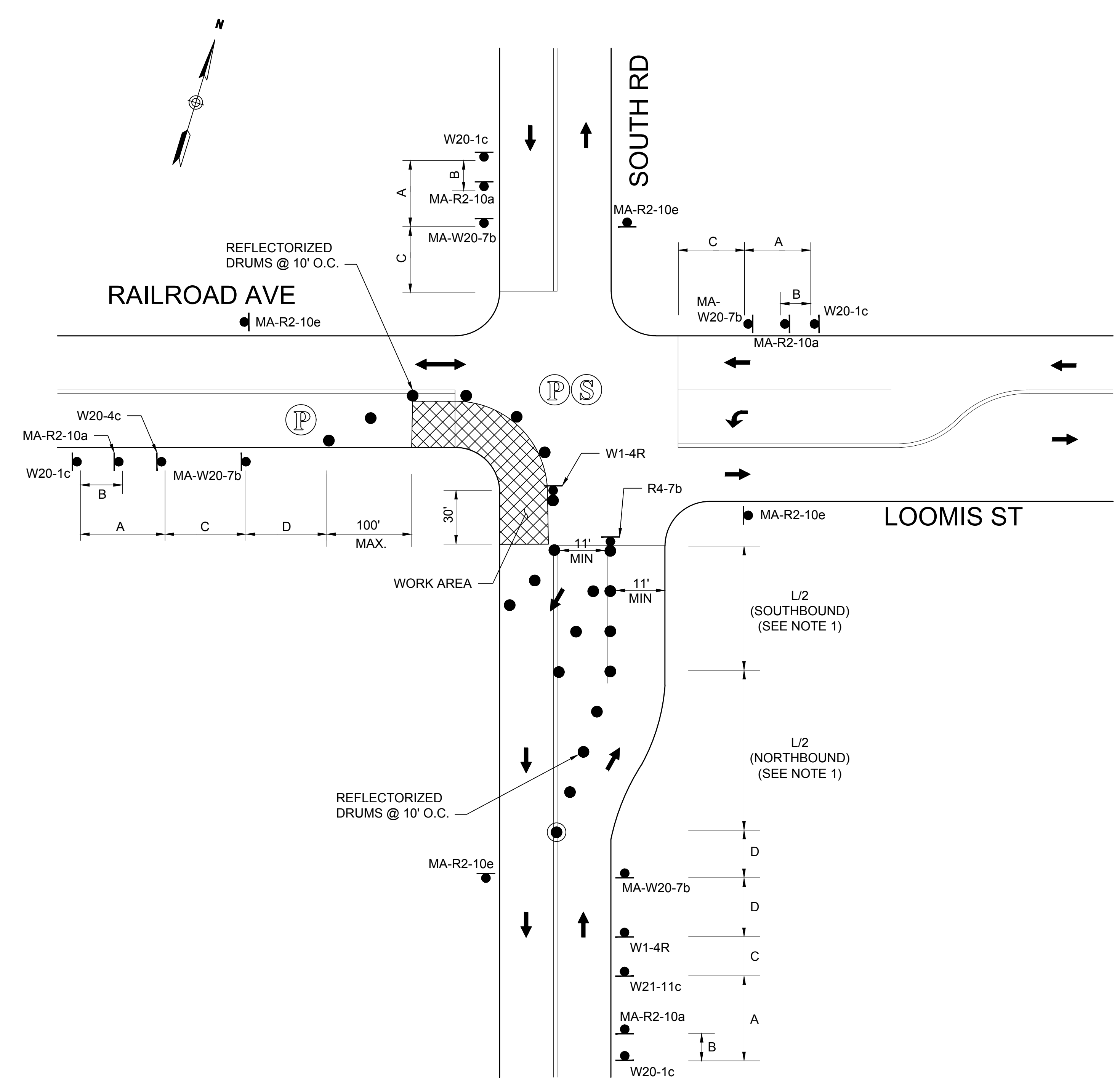
BEDFORD MINUTEMAN BIKEWAY EXTENSION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	45	54
PROJECT FILE NO. TBD			

TEMPORARY TRAFFIC CONTROL PLANS
TYPICAL DETAILS



- NOTES:
 1. SEE TAPER LENGTH FORMULA ON SHEET 43.
 2. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 43.

WORK ON NEAR SIDE OF INTERSECTION - LOOMIS/RAILROAD AT SOUTH RD
 SCALE: NTS



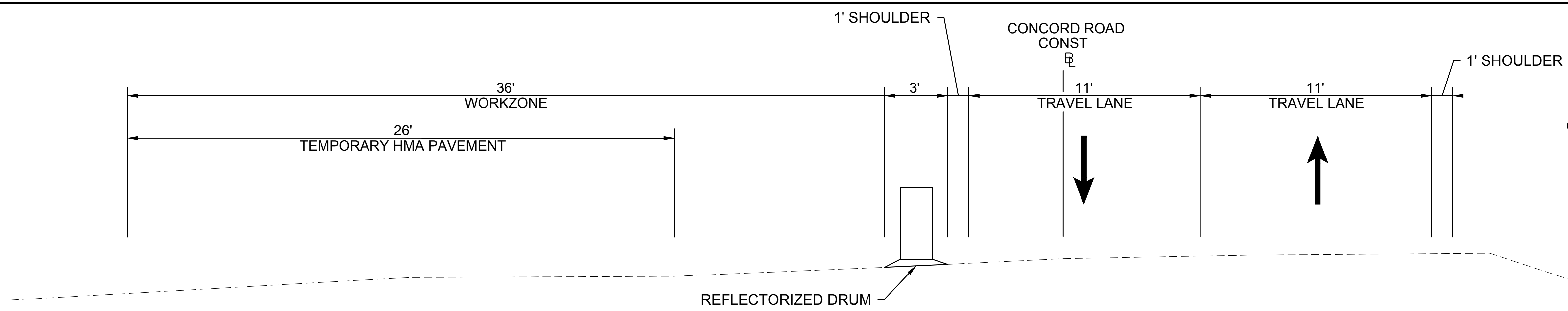
- NOTES:
 1. SEE TAPER LENGTH FORMULA ON SHEET 43.
 2. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 43.

ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTION - LOOMIS/RAILROAD AT SOUTH RD
 SCALE: NTS

BEDFORD
MINUTEMAN BIKEWAY EXTENSION

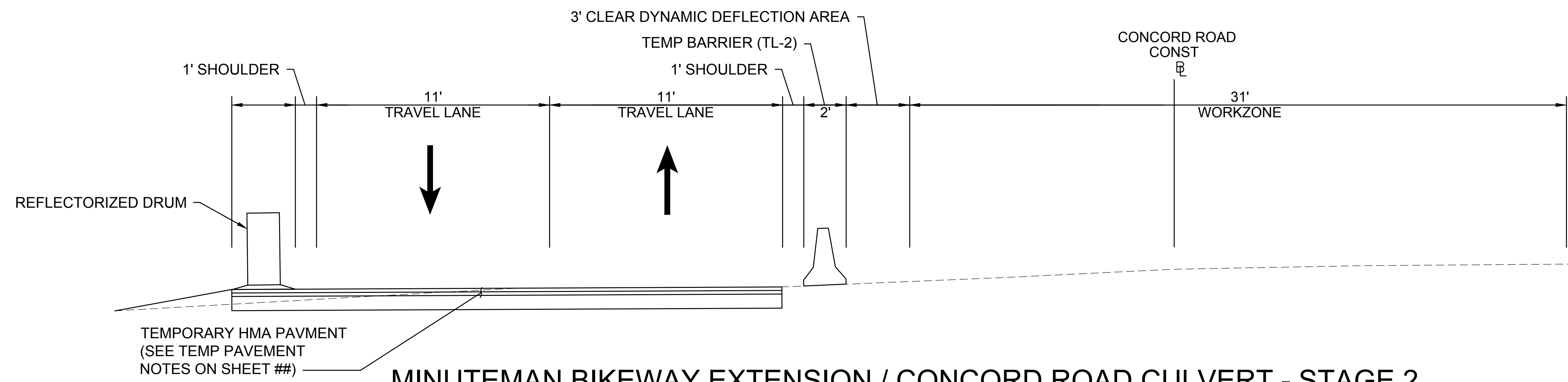
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	46	54
PROJECT FILE NO.		TBD	

TEMPORARY TRAFFIC CONTROL PLANS
CULVERT STAGING - TYPICAL SECTIONS



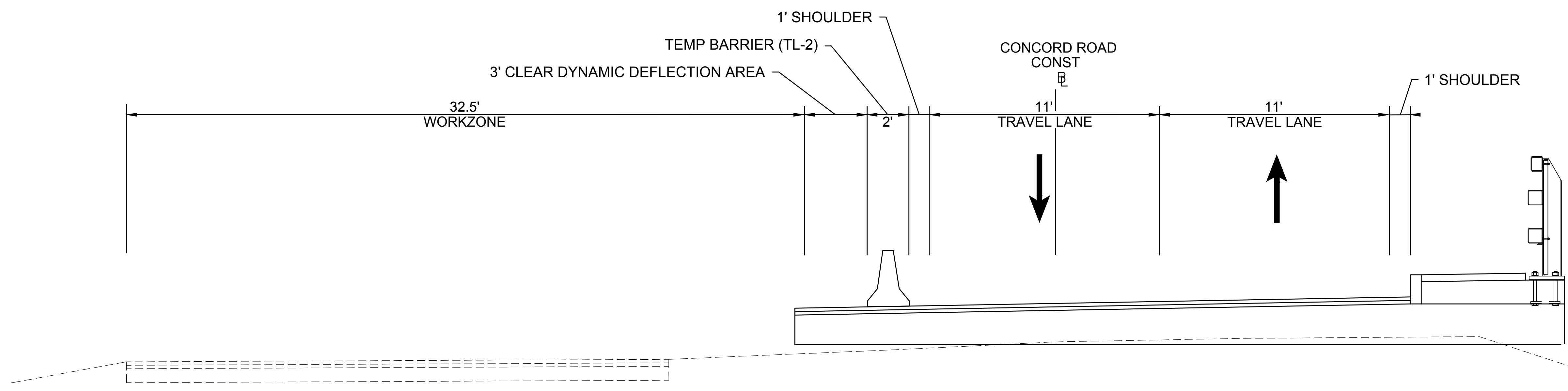
MINUTEMAN BIKEWAY EXTENSION / CONCORD ROAD CULVERT - STAGE 1

APPROX STA 288+28± TO STA 288+79±
NTS
* 0.5% CONSTRUCTION TOLERANCE



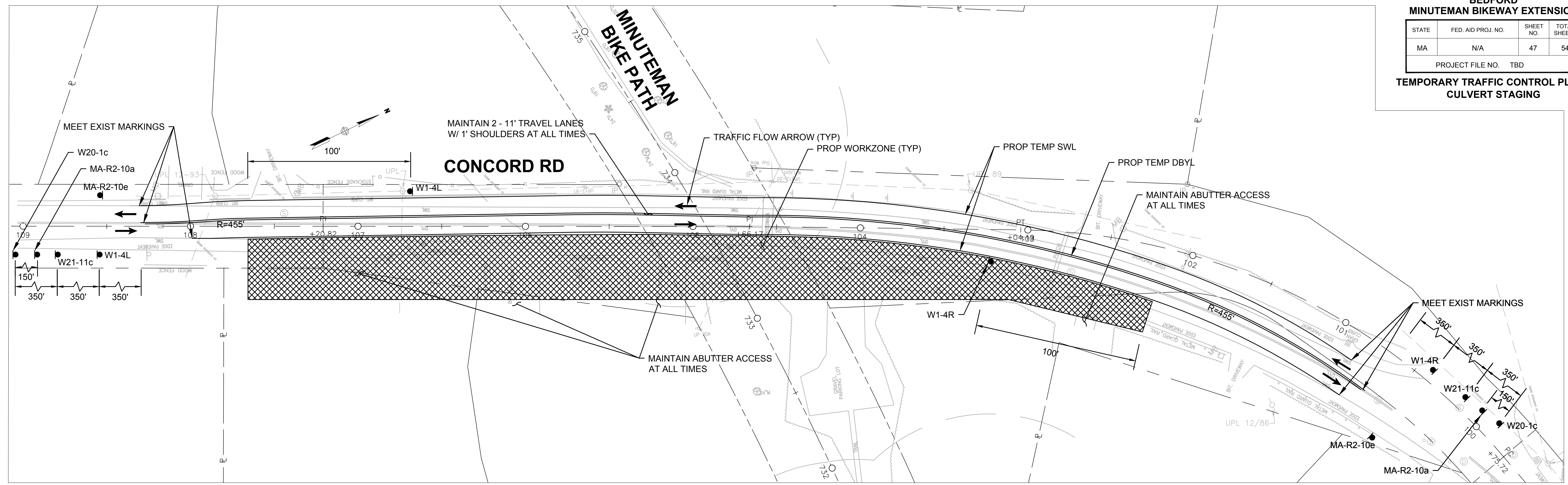
MINUTEMAN BIKEWAY EXTENSION / CONCORD ROAD CULVERT - STAGE 2

APPROX STA 288+28± TO STA 288+79±
NTS
* 0.5% CONSTRUCTION TOLERANCE

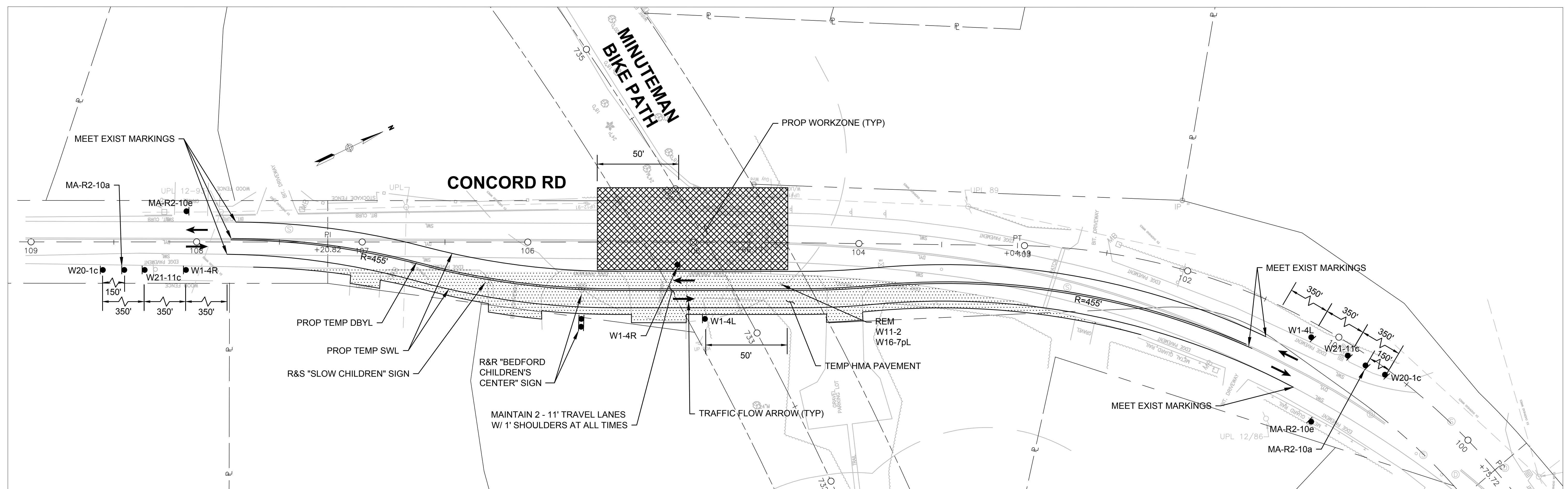


MINUTEMAN BIKEWAY EXTENSION / CONCORD ROAD CULVERT - STAGE 3

APPROX STA 288+28± TO STA 288+79±
NTS
* 0.5% CONSTRUCTION TOLERANCE



STAGE 1
SCALE: 1" = 30'



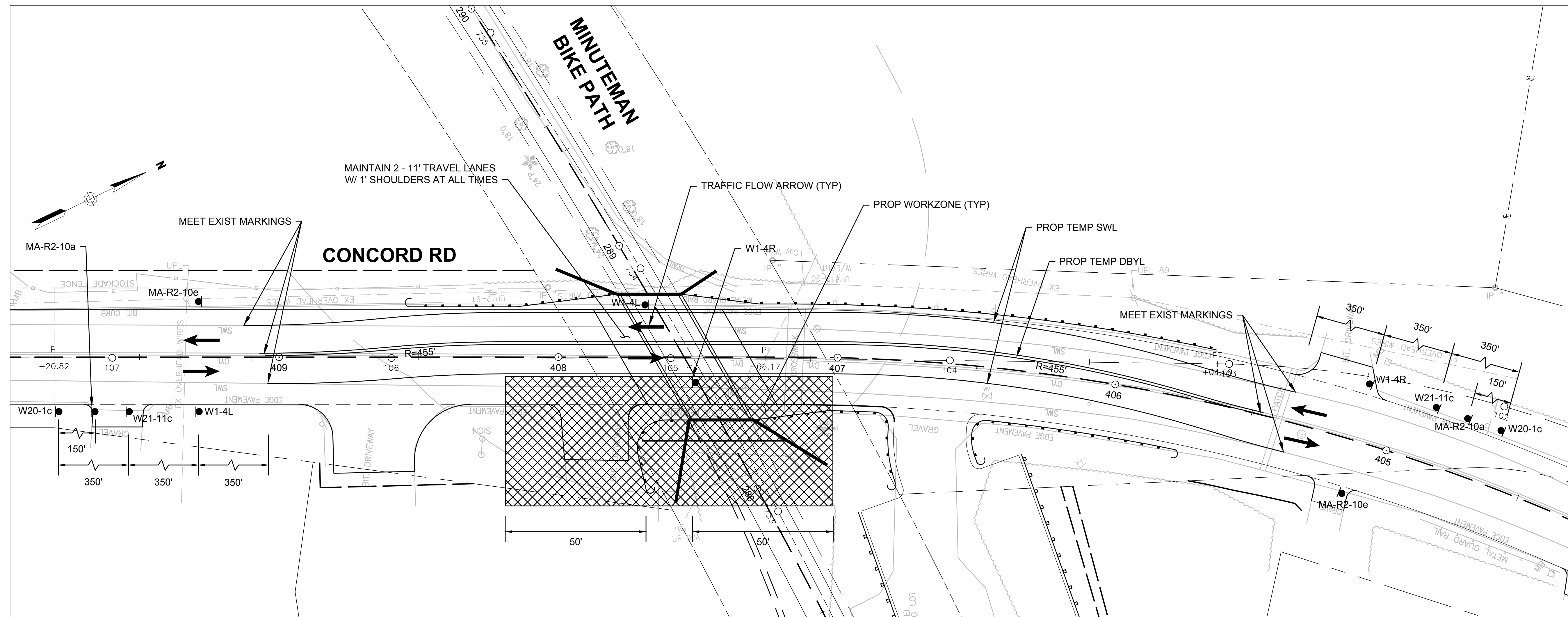
STAGE 2
SCALE: 1" = 30'

NOTE:
1. SEE CULVERT STAGING TYPICAL SECTIONS ON SHEET 46 FOR ADDITIONAL INFORMATION.

**BEDFORD
MINUTEMAN BIKEWAY EXTENSION**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	48	54
PROJECT FILE NO. TBD			

**TEMPORARY TRAFFIC CONTROL PLANS
CULVERT STAGING**



STAGE 3
SCALE: 1" = 20'

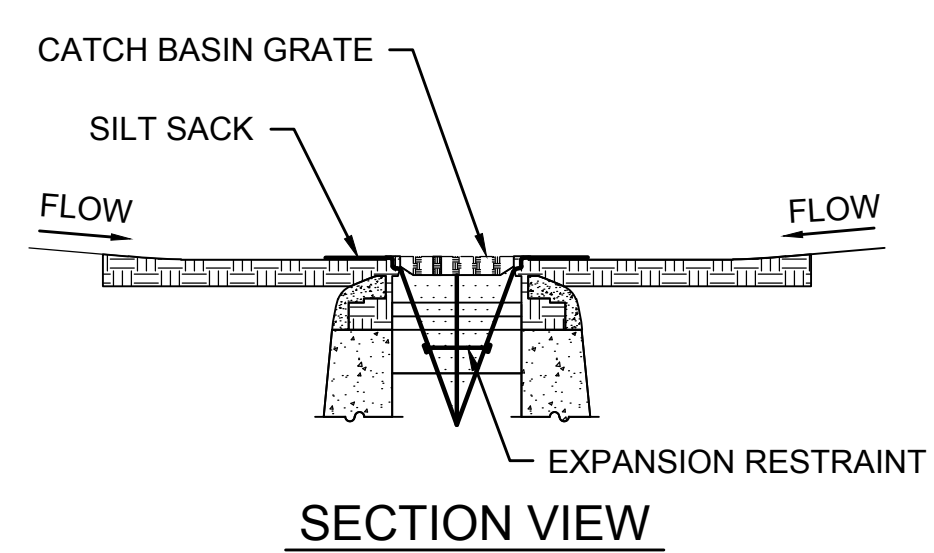
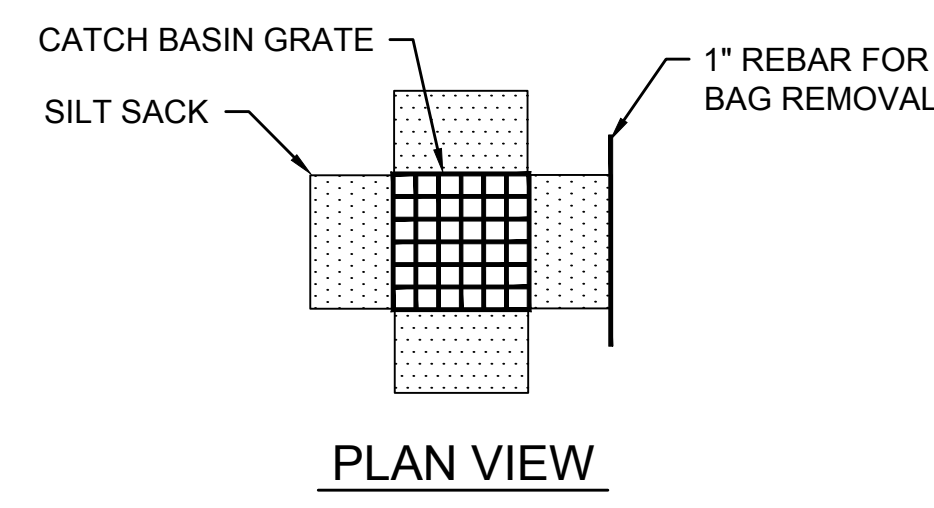
NOTE:
1. SEE CULVERT STAGING TYPICAL SECTIONS ON SHEET 46 FOR ADDITIONAL INFORMATION.

**TEMPORARY TRAFFIC CONTROL PLANS
SIGN SUMMARY**

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY									
IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK- GROUND	LEGEND	BORDER
MA-R2-10a	48"	36"		AS PER MASSDOT STANDARD			FLUOR- ESCENT ORANGE	BLACK	BLACK
MA-R2-10e	36"	48"		↓			WHITE FLUOR- ESCENT ORANGE	BLACK	BLACK
R4-7b	24"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK	BLACK
R9-9	24"	12"					WHITE	BLACK	BLACK
R9-11aL	24"	12"					WHITE	BLACK	BLACK
R9-11aR	24"	12"					WHITE	BLACK	BLACK
W1-4L	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W1-4R	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W5-1	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W8-1	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W8-3	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W8-8	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W8-9	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W8-15	36"	36"		↓			FLUOR- ESCENT ORANGE	BLACK	BLACK

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)									
IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK- GROUND	LEGEND	BORDER
W11-2	30"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			YELLOW	BLACK	BLACK
W13-1p(XX)	24"	24"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W16-7p(L)	24"	12"					YELLOW	BLACK	BLACK
W16-9p	24"	12"					YELLOW	BLACK	BLACK
W20-1c	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W20-4c	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
W20-7	36"	36"		↓			FLUOR- ESCENT ORANGE	BLACK	BLACK
MA-W20-7b	36"	36"		AS PER MASSDOT STANDARD			FLUOR- ESCENT ORANGE	BLACK	BLACK
W21-7	36"	36"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUOR- ESCENT ORANGE	BLACK	BLACK
W21-11c	36"	36"					FLUOR- ESCENT ORANGE	BLACK	BLACK
M4-9bL	30"	24"					FLUOR- ESCENT ORANGE	BLACK	BLACK
M4-9bR	30"	24"					FLUOR- ESCENT ORANGE	BLACK	BLACK
M4-9bsL	30"	24"					FLUOR- ESCENT ORANGE	BLACK	BLACK
M4-9bsR	30"	24"		↓			FLUOR- ESCENT ORANGE	BLACK	BLACK

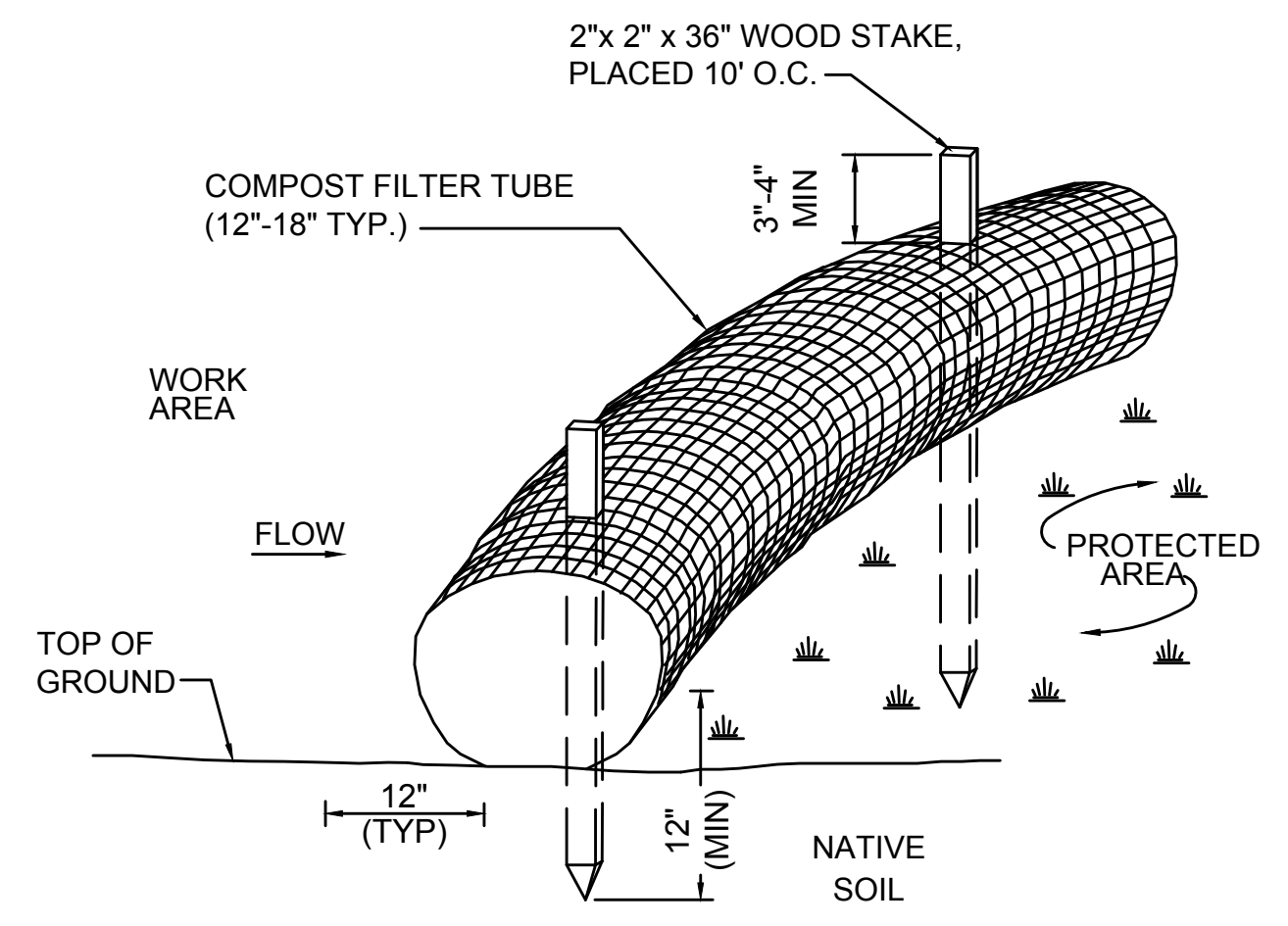
NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; AND THE 2017 MASSDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.



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

**INLET PROTECTION - SILT SACK
IN CATCH BASIN**

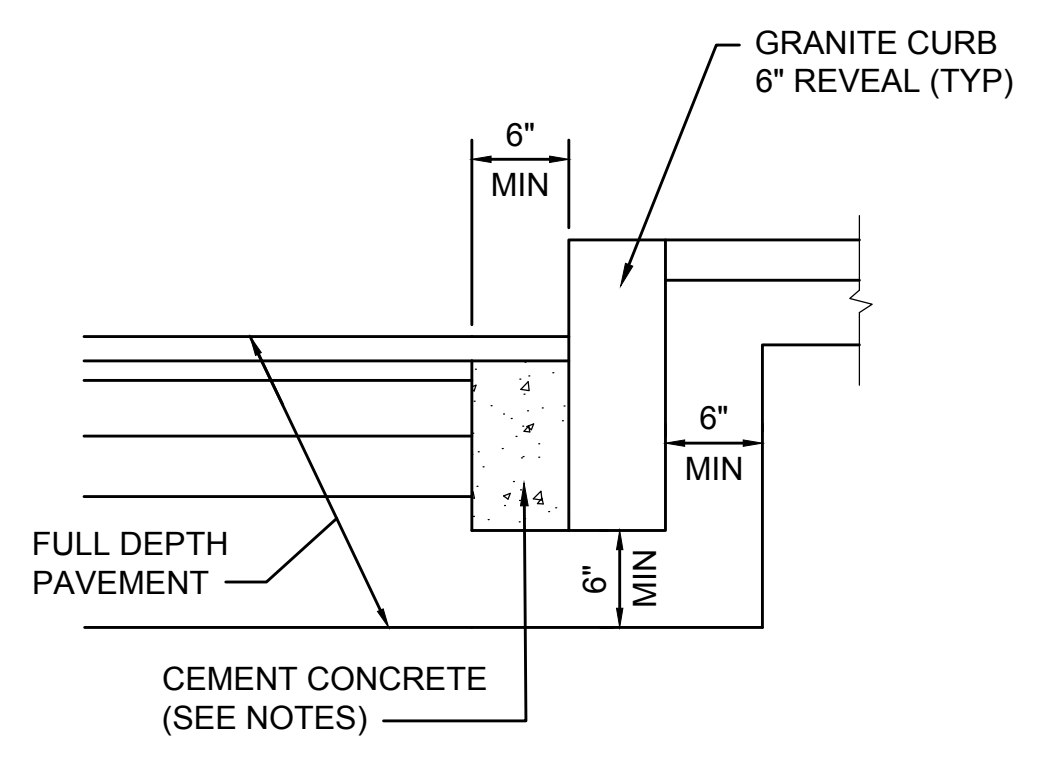
SCALE: N.T.S.



- NOTES:**
1. FILTER TUBE SHALL BE FILLED BY BLOWN IN ORGANIC COMPOST AND PLACED AS ILLUSTRATED ON THE PROJECT PLANS.
 2. COMPOST FILTER TUBES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIRED OR REPLACED AS NEEDED.
 3. AT COMPLETION OF PROJECT, COMPOST FILTER TUBES SHALL BE CUT OPEN AND COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
 4. THE EMPTY FILTER TUBE FABRIC SHALL BE COLLECTED AND DISPOSED OF PROPERLY.

COMPOST FILTER TUBES

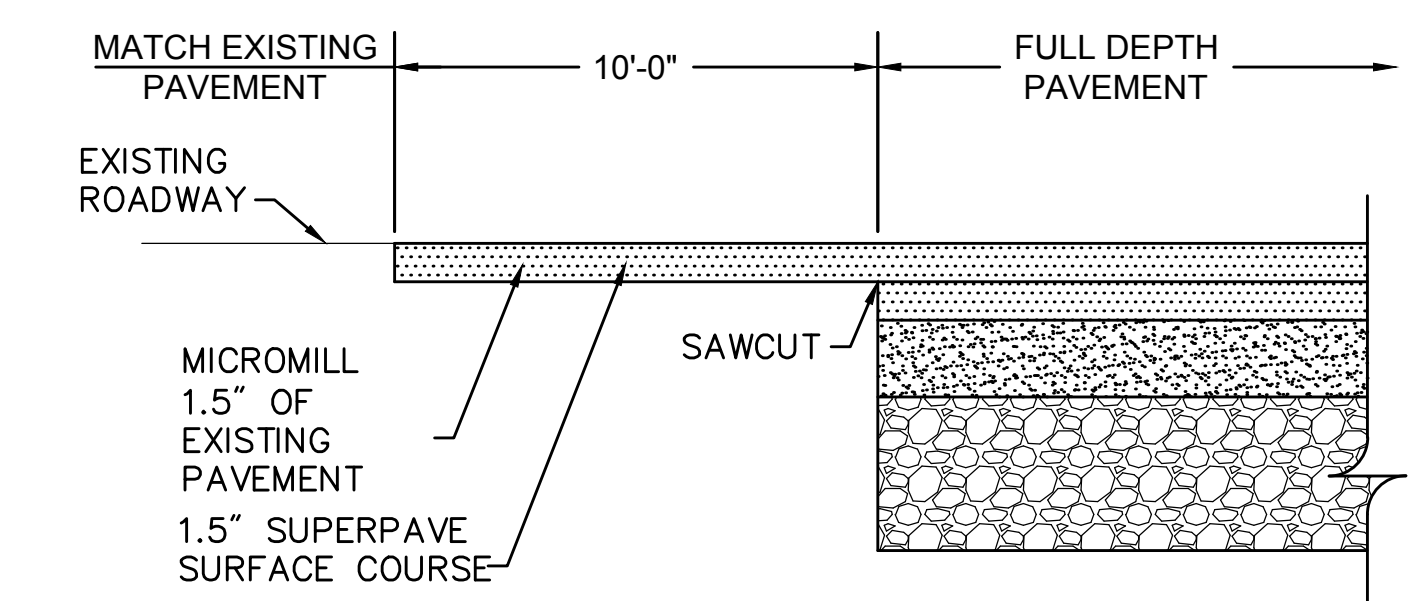
SCALE: N.T.S.



- NOTES:**
1. TO BE PLACED IF CURB IS INSTALLED AFTER HOT MIX ASPHALT
 2. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB
 3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

GRANITE CURB IN FULL DEPTH PAVEMENT

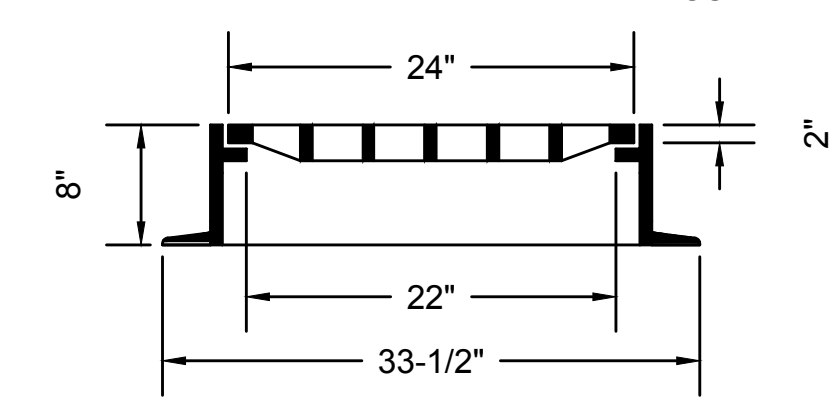
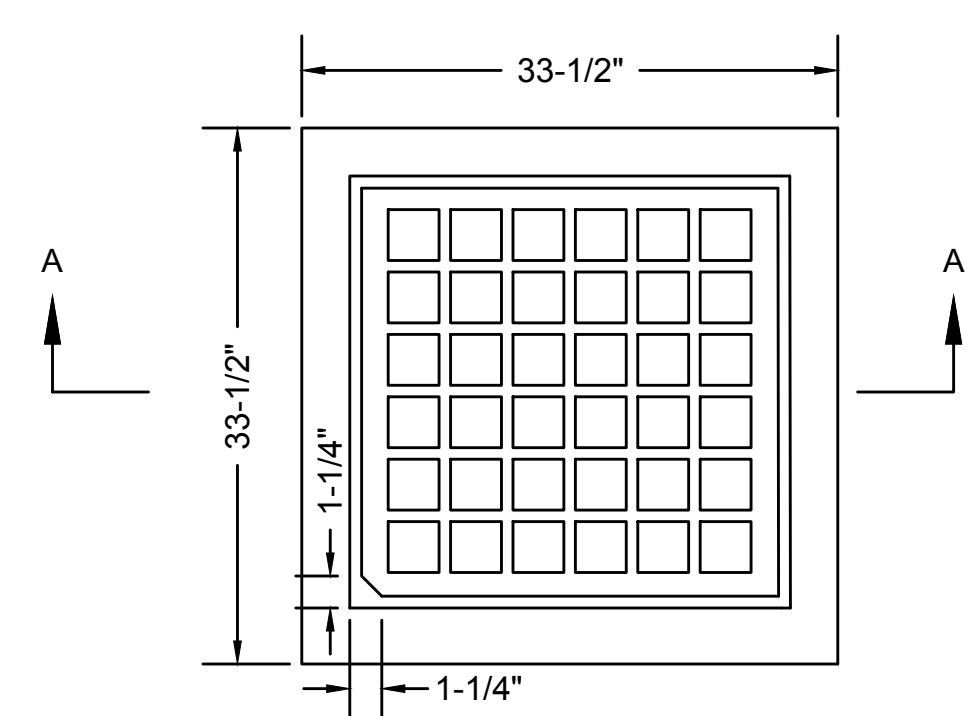
SCALE: N.T.S.



LONGITUDINAL SECTION

FULL DEPTH PAVEMENT TRANSITION

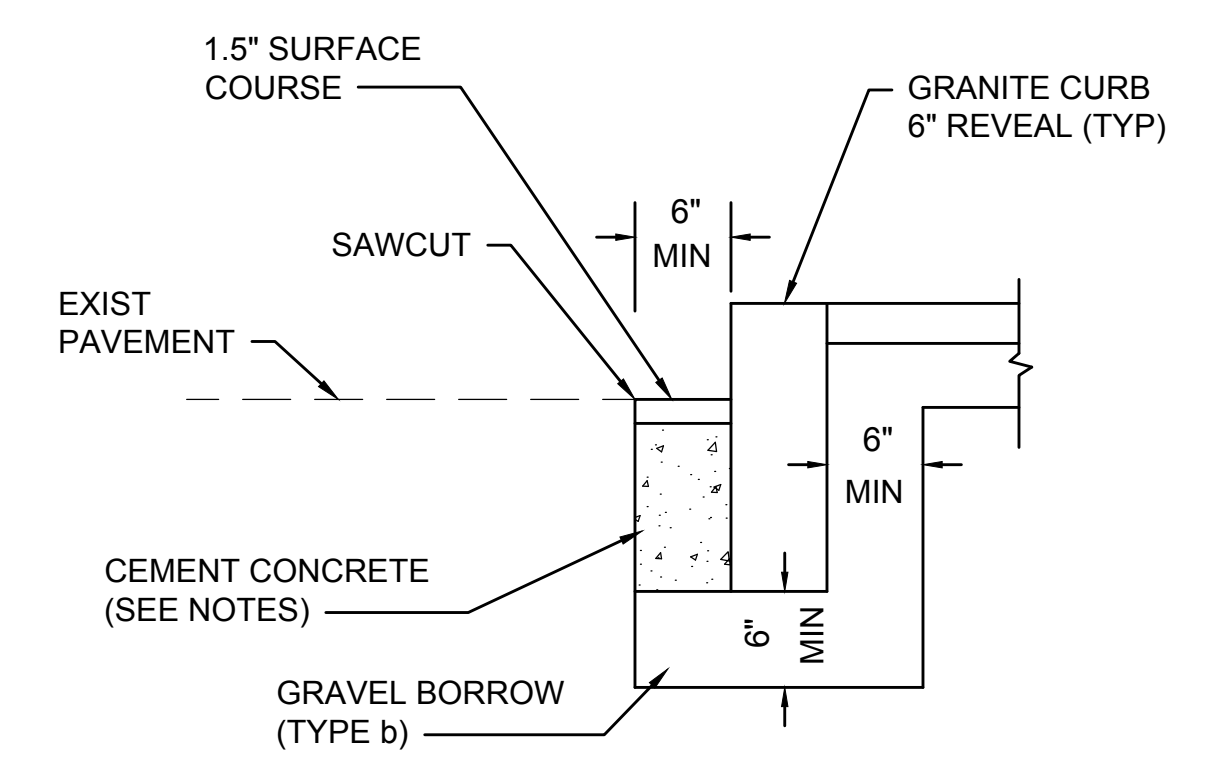
SCALE: N.T.S.



- NOTES:**
1. FRAME AND GRATE SHALL BE RATED FOR HS-20 LOADING.
 2. MIN FRAME WEIGHT:
4 FLANGE 295 LBS.
3 FLANGE 265 LBS.
 3. USE 3 FLANGE FRAMES AT CURB INLETS.

**MUNICIPAL STANDARD
CATCH BASIN FRAME & GRATE**

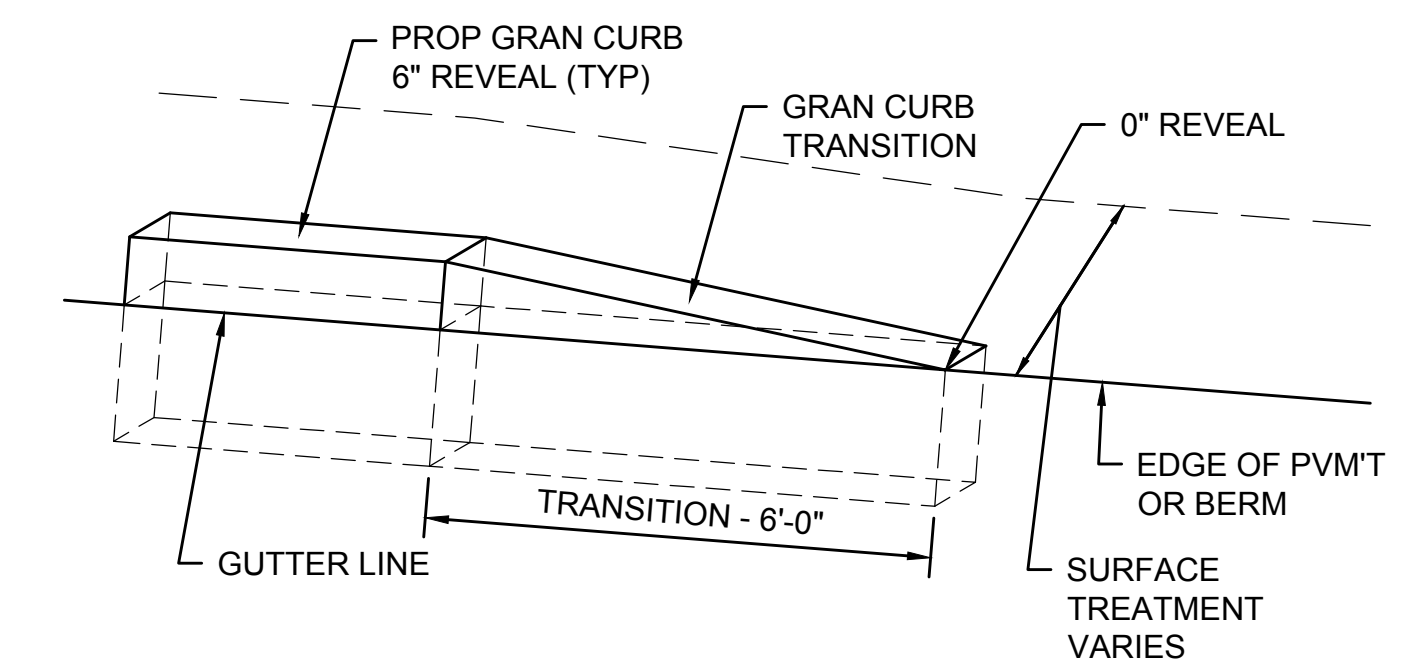
SCALE: N.T.S.



- NOTES:**
1. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB.
 2. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

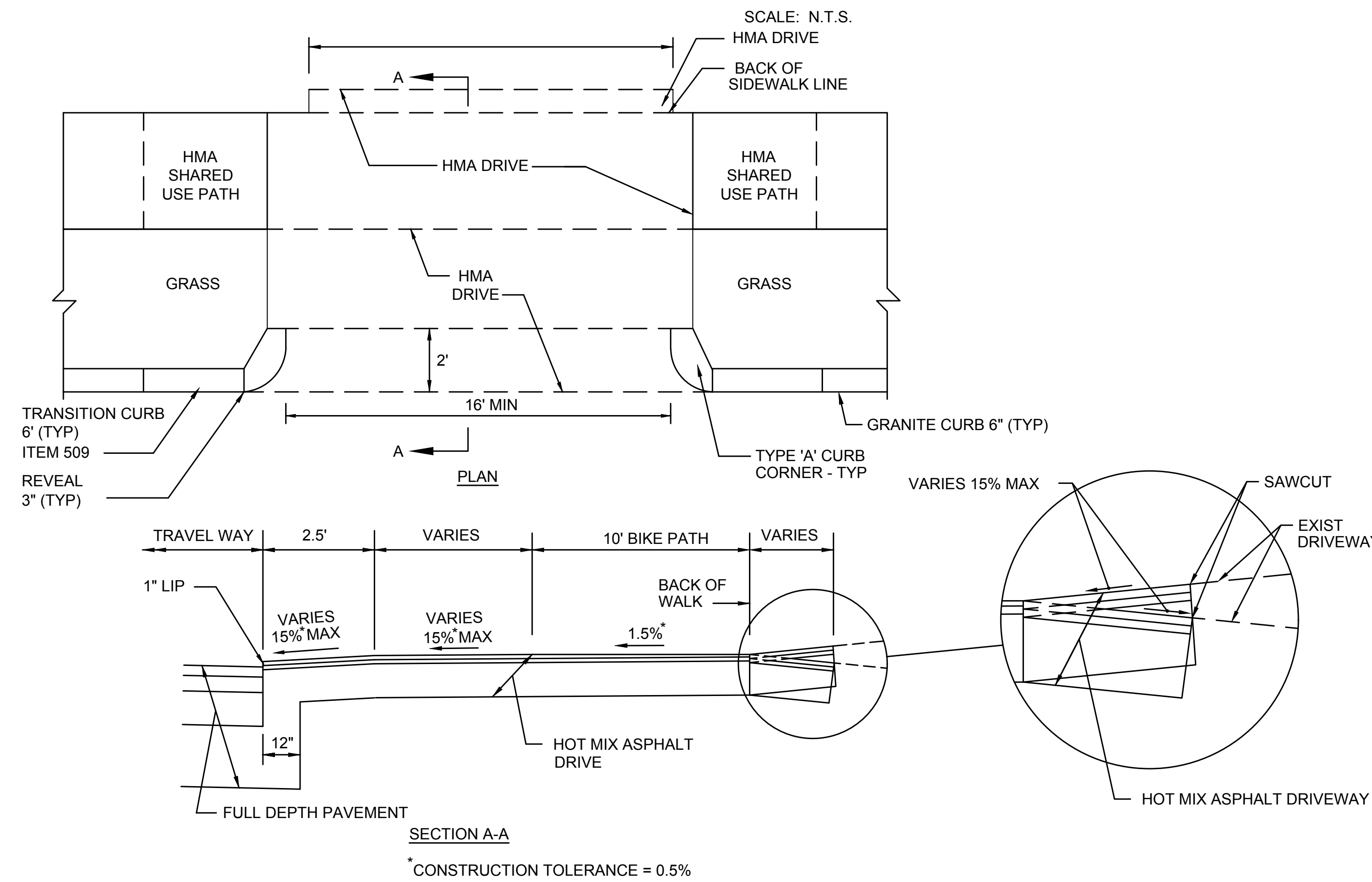
GRANITE CURB IN EXISTING PAVEMENT

SCALE: N.T.S.

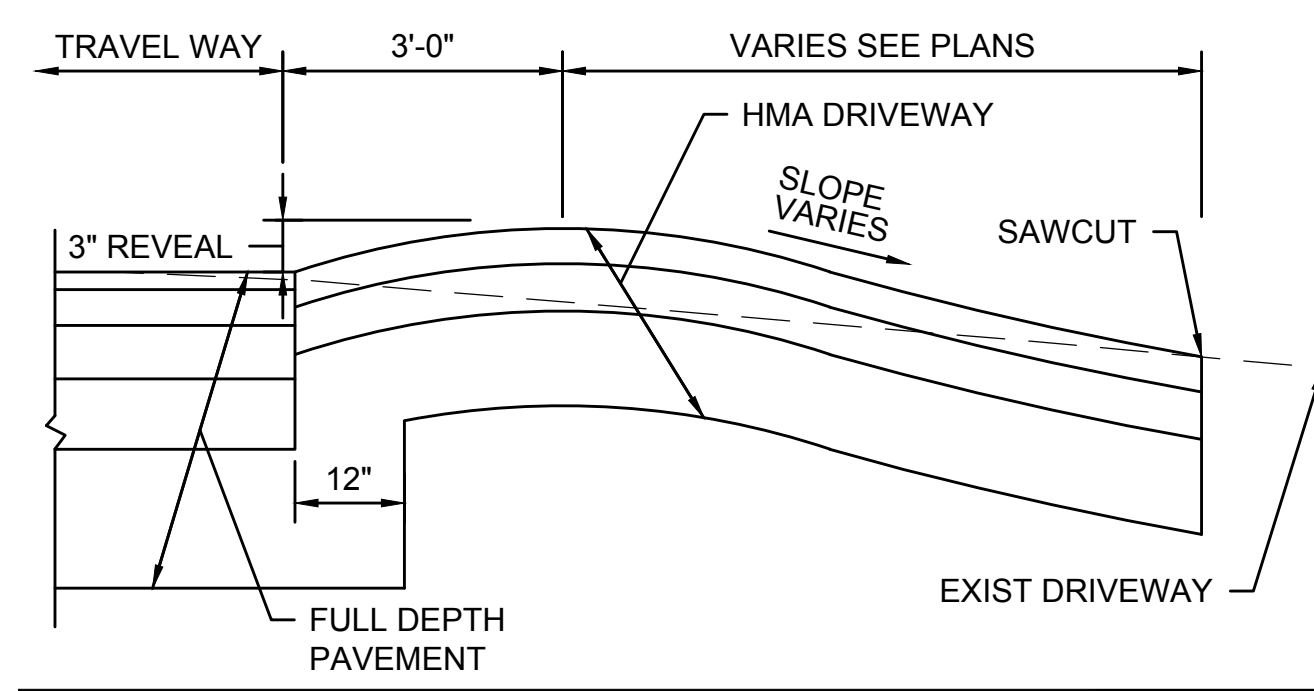


GRANITE CURB TRANSITION PIECE

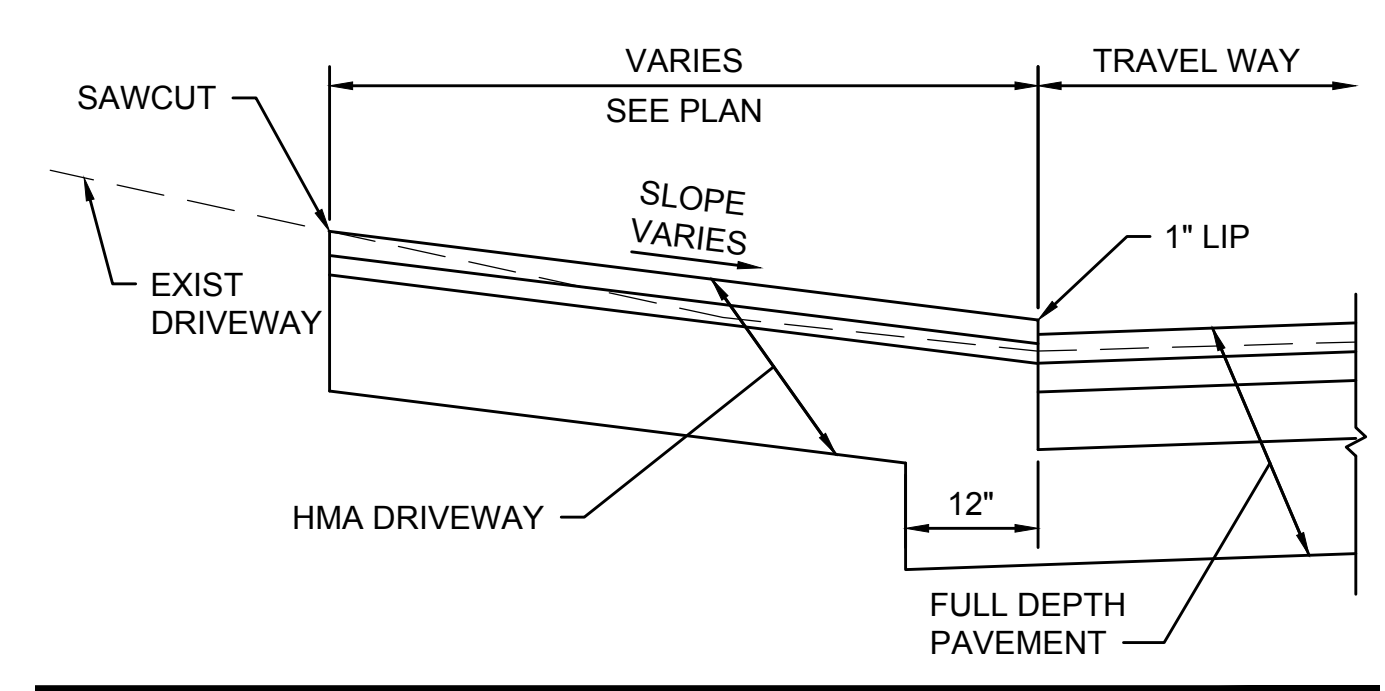
SCALE: N.T.S.



TYPICAL DRIVEWAY WITH SIDEWALK, GRASS STRIP AND GRAN CURB CORNER
SCALE: N.T.S.

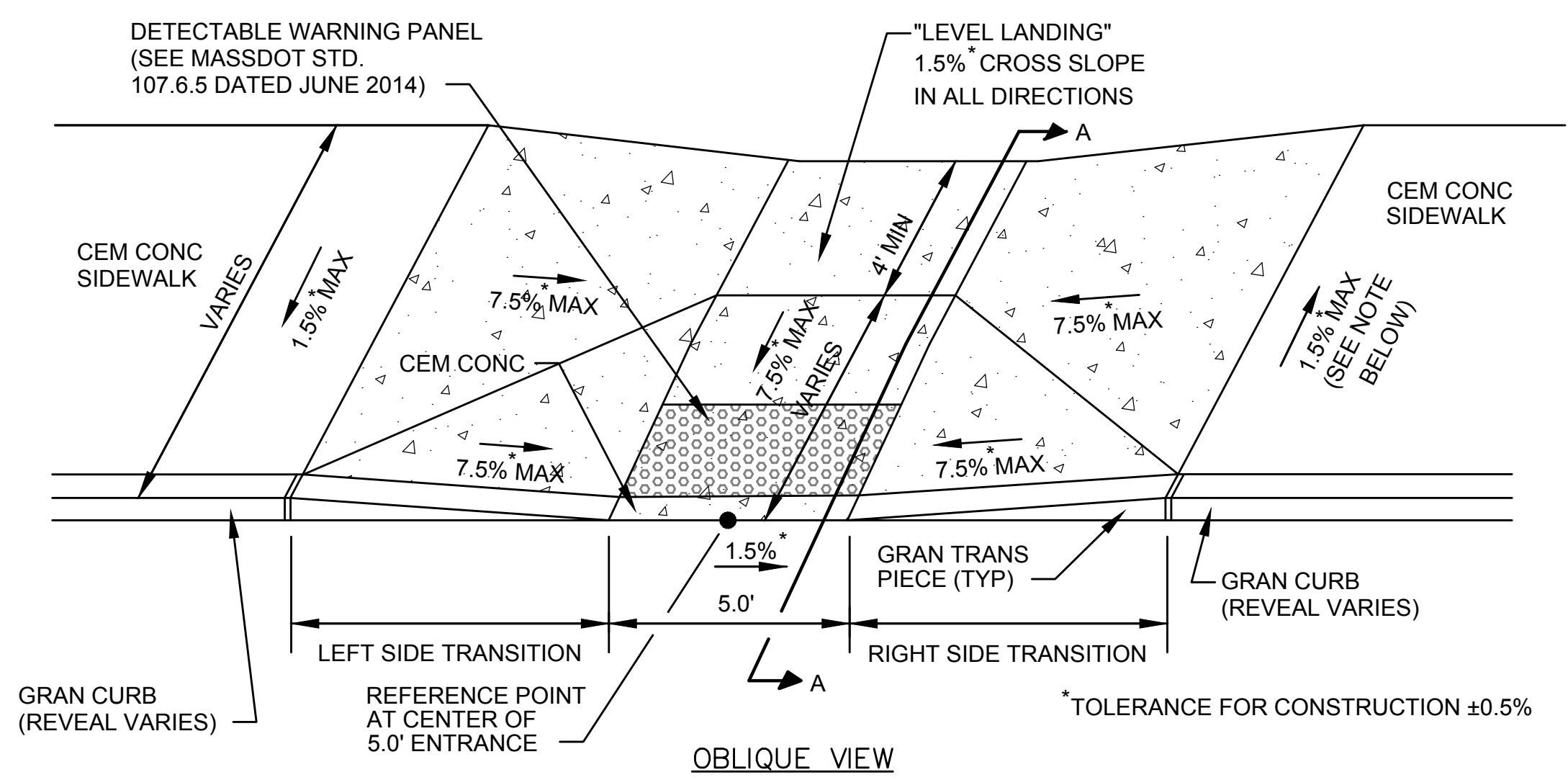


TYPICAL DRIVEWAY SECTION WITHOUT SIDEWALK TYPE I
SCALE: N.T.S.

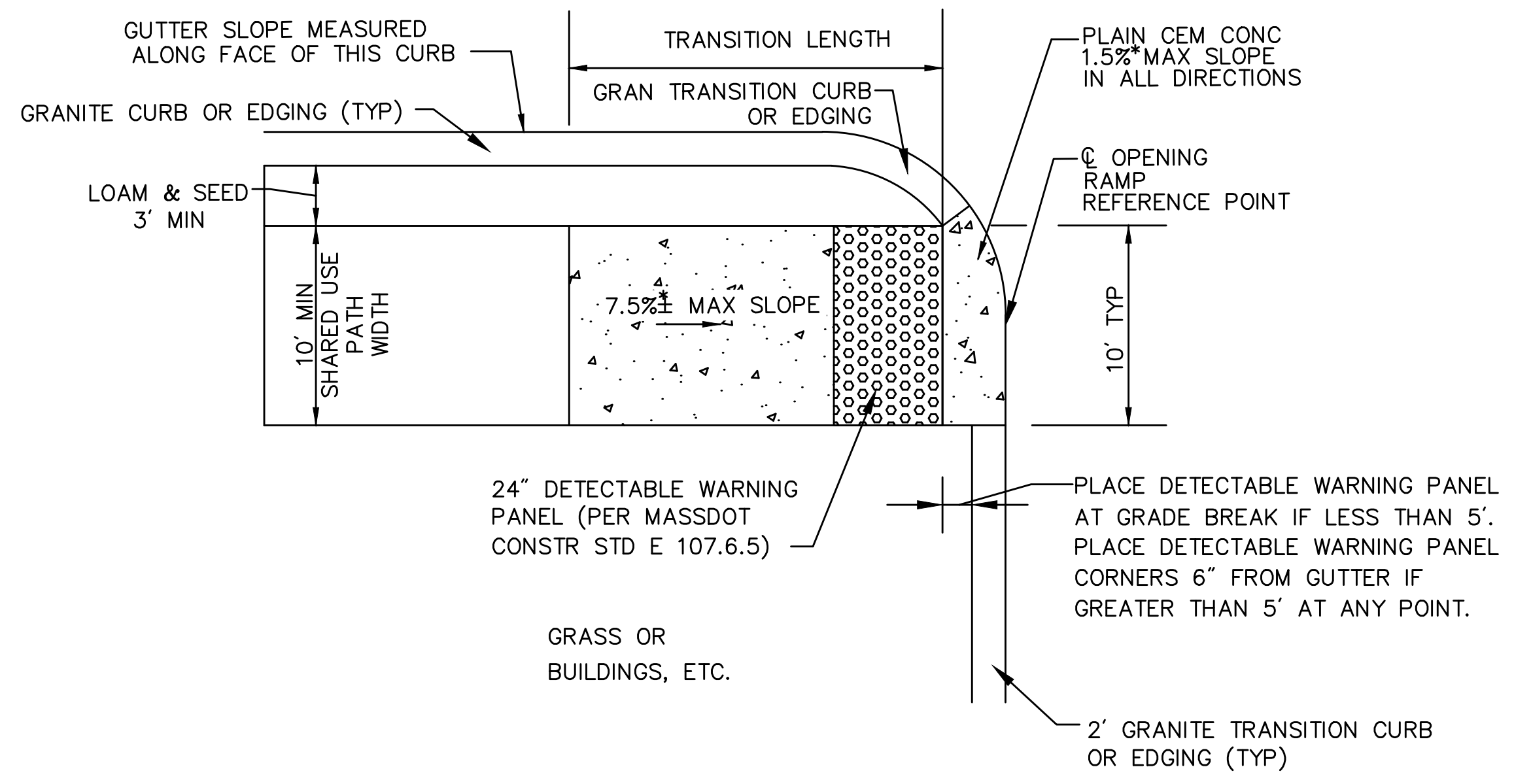


TYPICAL DRIVEWAY SECTION WITHOUT SIDEWALK TYPE II
SCALE: N.T.S.

- LEGEND**
- = LIMITS OF CEM CONC RAMP
 - = DETECTABLE WARNING PANEL (COLOR: BRICK RED)



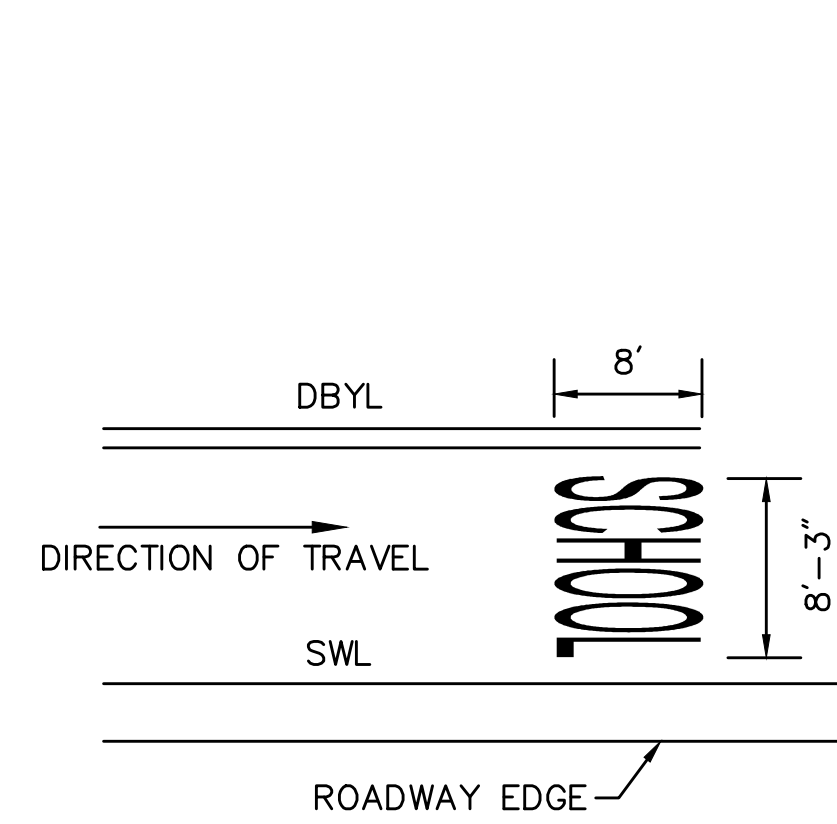
**WHEELCHAIR RAMP
12.0' OR LESS - STRAIGHT**
SCALE: N.T.S.



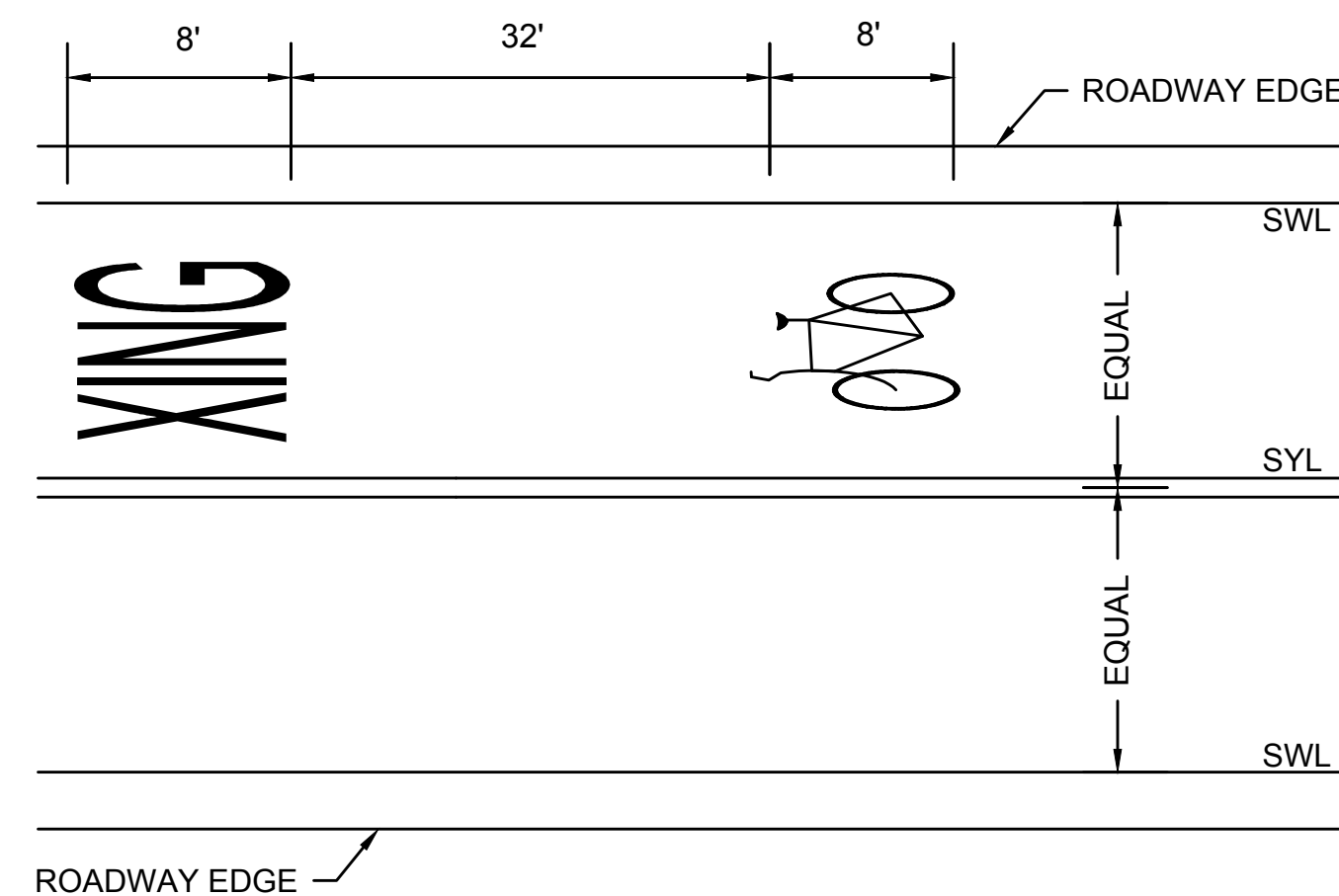
**WHEELCHAIR RAMP
SINGLE DIRECTION**
SCALE: N.T.S.

DWG: WCR-04

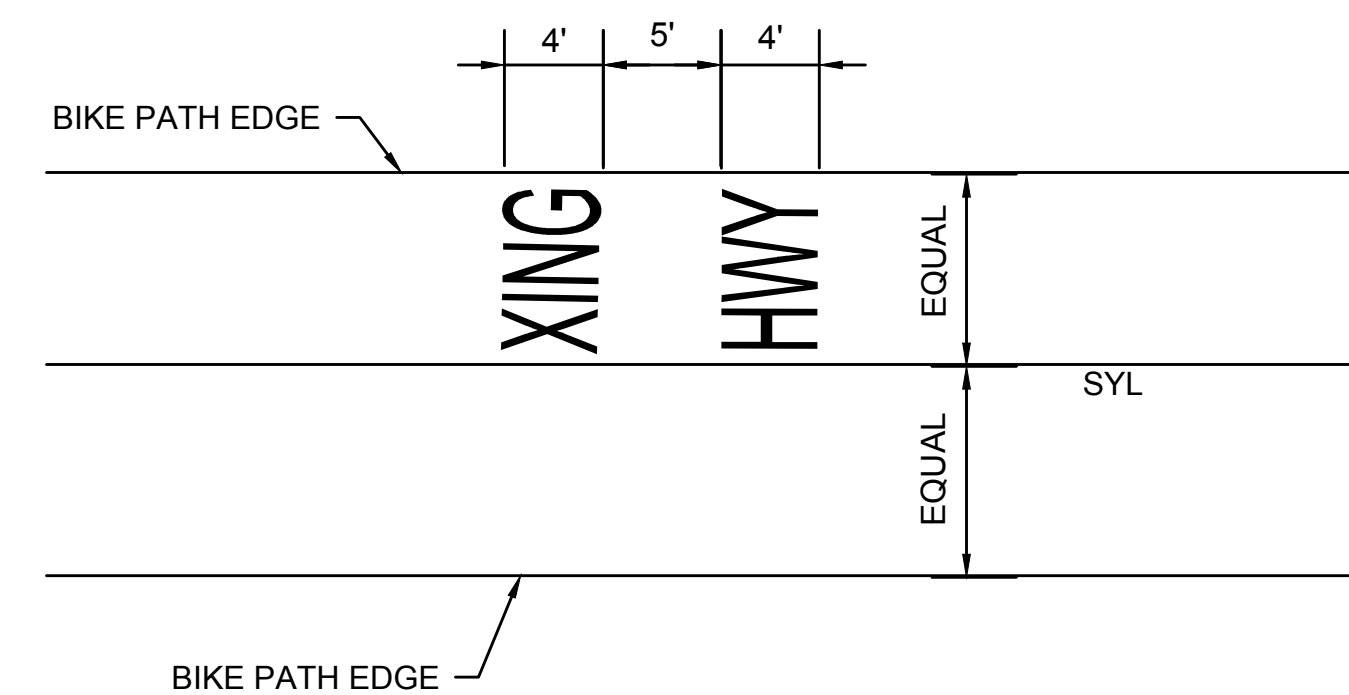
DATE: OCT 2008



- NOTES:
- PAVEMENT MARKINGS AS PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
 - PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.



- NOTES:
- PAVEMENT MARKINGS AS PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
 - PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.

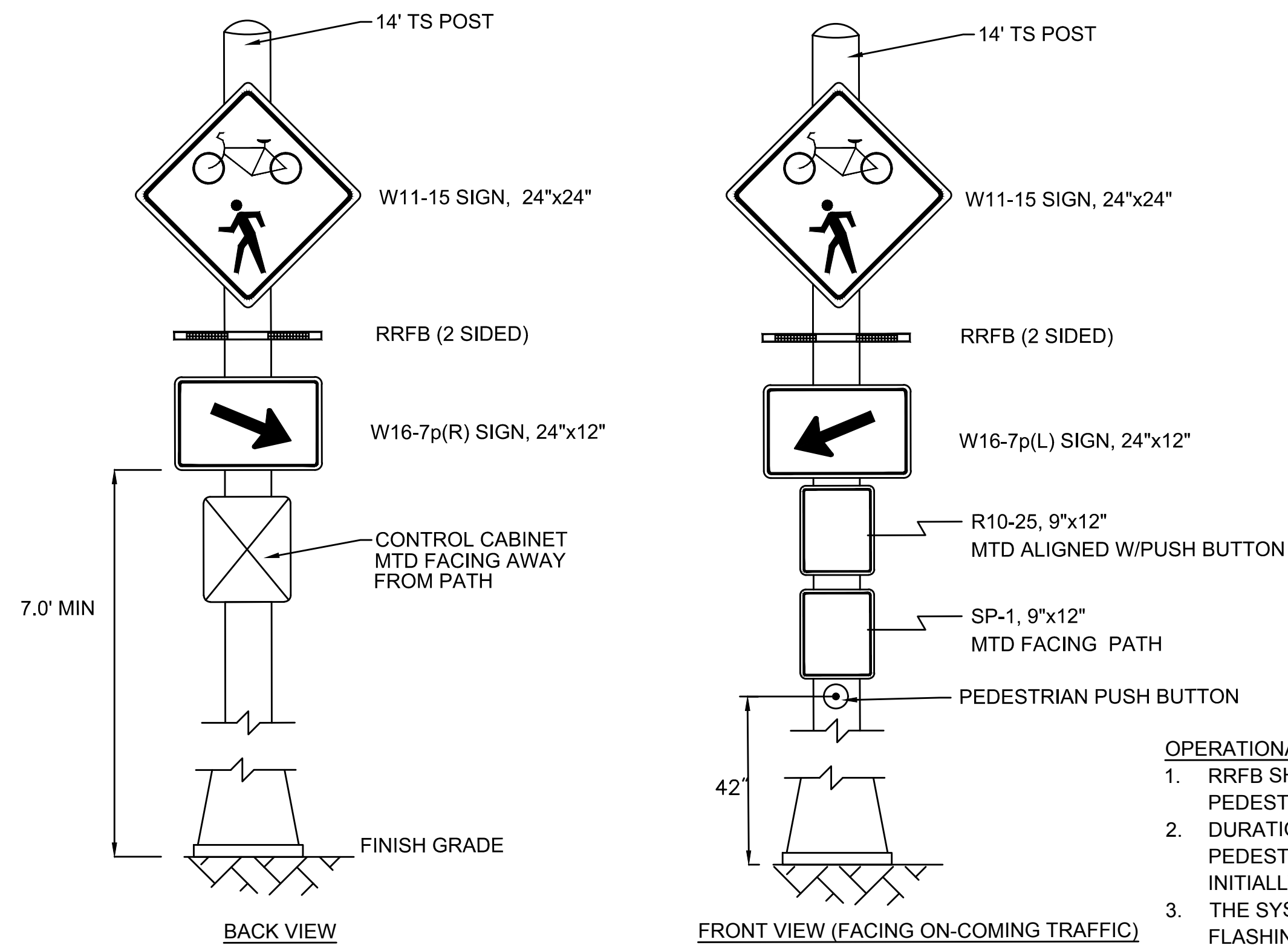


- NOTES:
- PAVEMENT MARKINGS AS PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
 - PAVEMENT MARKINGS SHALL BE REFLECTIVE PAINT.

SCHOOL ZONE PAVEMENT MARKING DETAIL
SCALE: N.T.S. DWG: PM-08 DATE: APRIL 2013

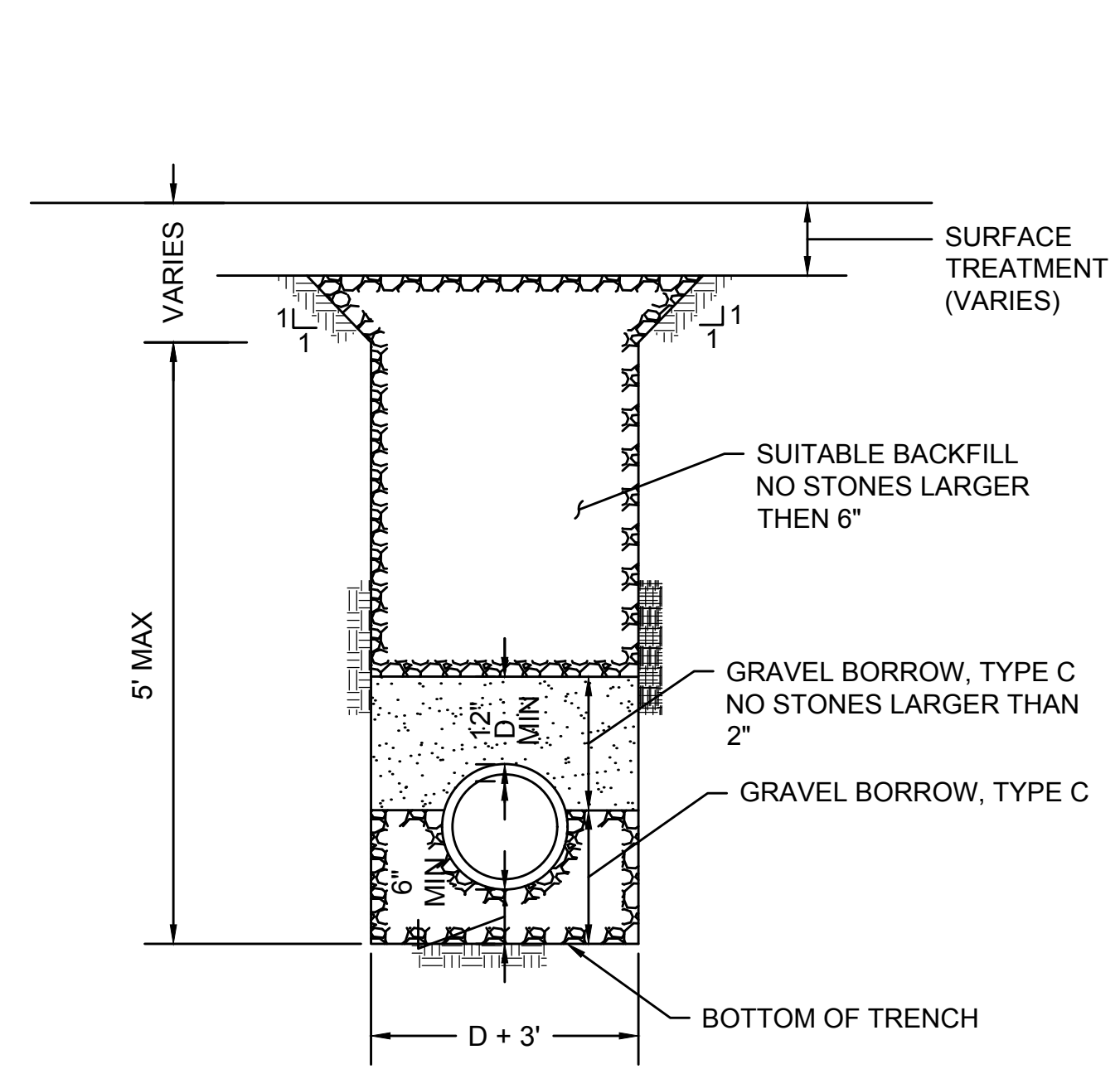
ROADWAY MARKINGS

BIKE PATH MARKINGS
SCALE: N.T.S.



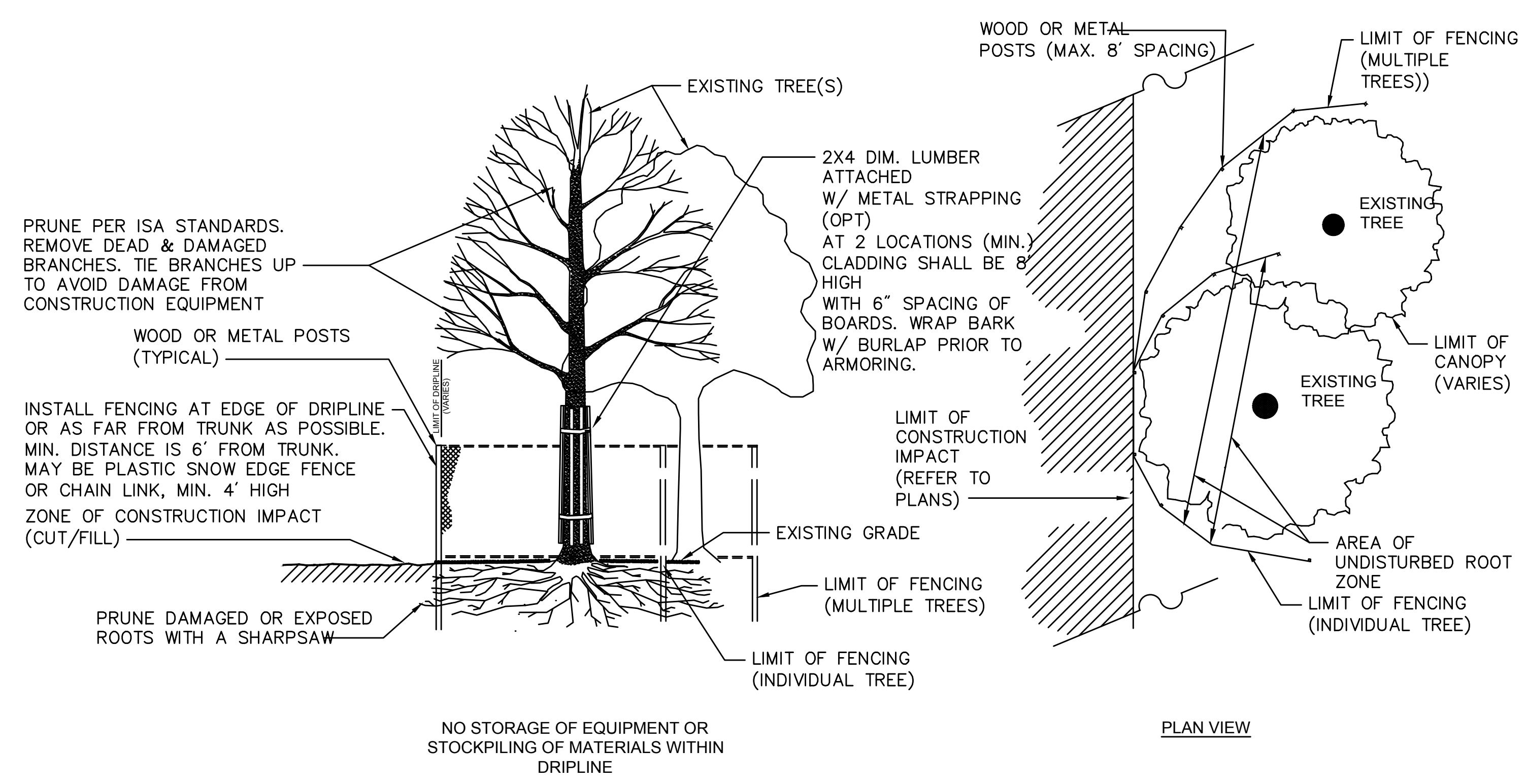
- OPERATIONAL NOTES:**
- RRFB SHALL WIG-WAG FLASH WHEN ACTIVATED BY PEDESTRIAN PUSHBUTTON.
 - DURATION OF RRFB UPON RECEIPT OF VALID PEDESTRIAN PUSHBUTTON ACTUATION SHALL BE INITIALLY SET FOR 15 SECONDS.
 - THE SYSTEM SHALL BE CAPABLE OF PROVIDING A FLASHING RATE OF 70 TO 80 CYCLES PER MINUTE.
 - SEE SPECIAL PROVISIONS ITEM 824.401 FOR MORE DETAILS.

RECTANGULAR RAPID FLASHING BEACON DETAIL
SCALE: N.T.S.



TRENCH DETAIL

SCALE: NOT TO SCALE
TRENCH-05
MARCH 2013

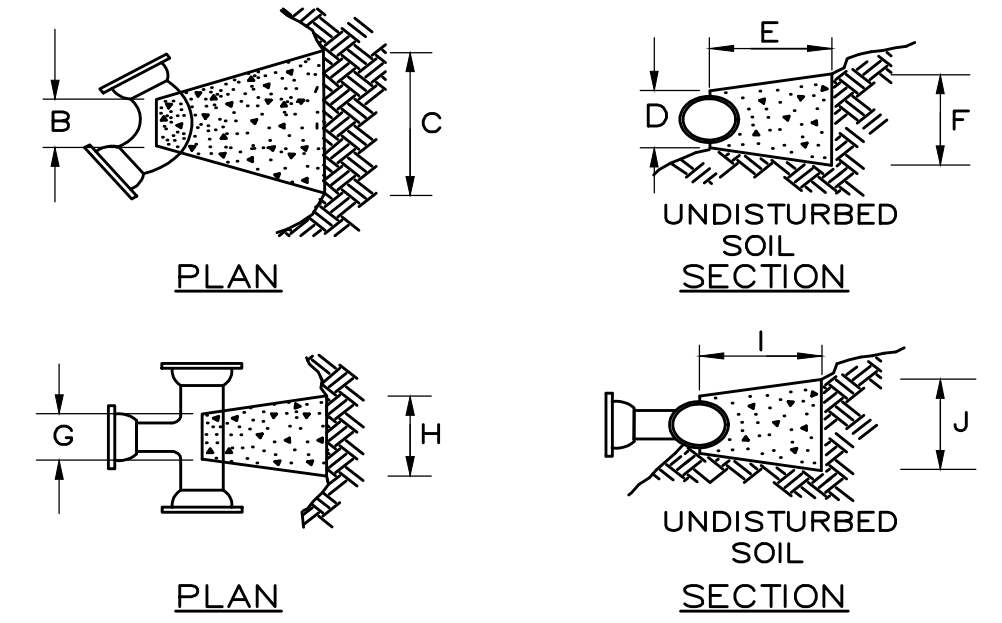


TREE PROTECTION OF EXISTING TREE(S)

SCALE: N.T.S.

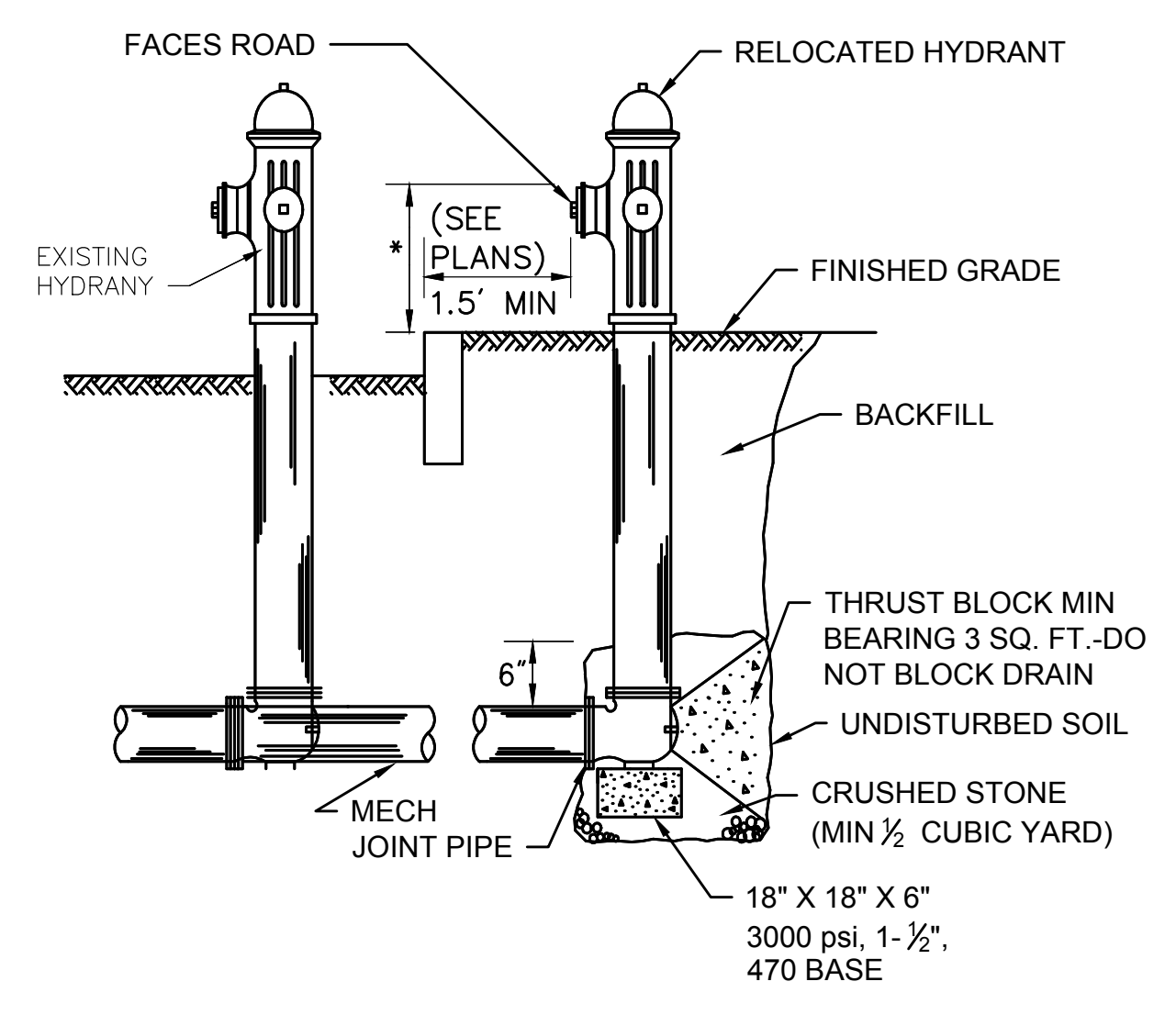
BENDS						BENDS						
	B	C	D	E	F		B	C	D	E	F	
6"	11-1/4"	8"	15"	12"	24"	12"	45°	8"	30"	12"	24"	14"
6"	22-1/2"	"	19"	"	13"	13"	90°	"	30"	"	24"	27"
8"	11-1/4"	"	20"	"	12"	12"	45°	"	30"	"	"	24"
8"	22-1/2"	"	22"	"	17"	17"	90°	"	36"	"	"	36"
12"	11-1/4"	"	30"	"	15"	15"	45°	"	40"	"	"	40"
12"	22-1/2"	"	35"	"	25"	25"	90°	"	60"	"	"	52"

TEES						TEES								
	G	H	I	J		G	H	I	J		G	H	I	J
6" x 6" x 6"	12"	24"	24"	18"		12" x 12" x 6"	12"	24"	24"	12"				
8" x 8" x 6"	"	"	"	"		12" x 12" x 8"	"	"	"	24"				
8" x 8" x 8"	"	"	"	24"		12" x 12" x 12"	"	36"	"	36"				

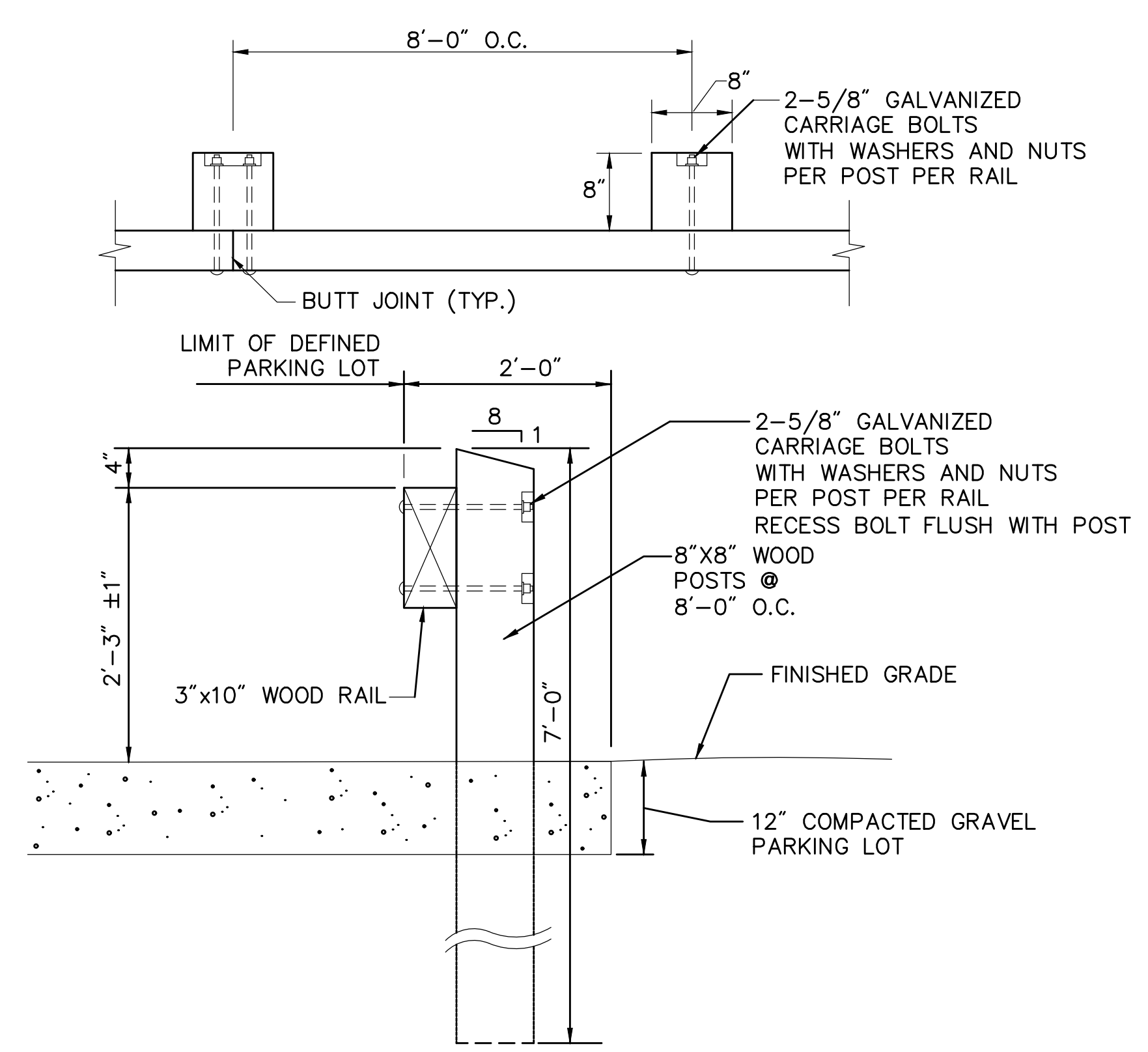


- NOTES:**
1. PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES AND VERTICAL BENDS, SAME SIZE AS REQUIRED FOR TEES.
 2. PROVIDE ANCHOR RODS AT VERTICAL BENDS AND GATE VALVES
 3. CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.

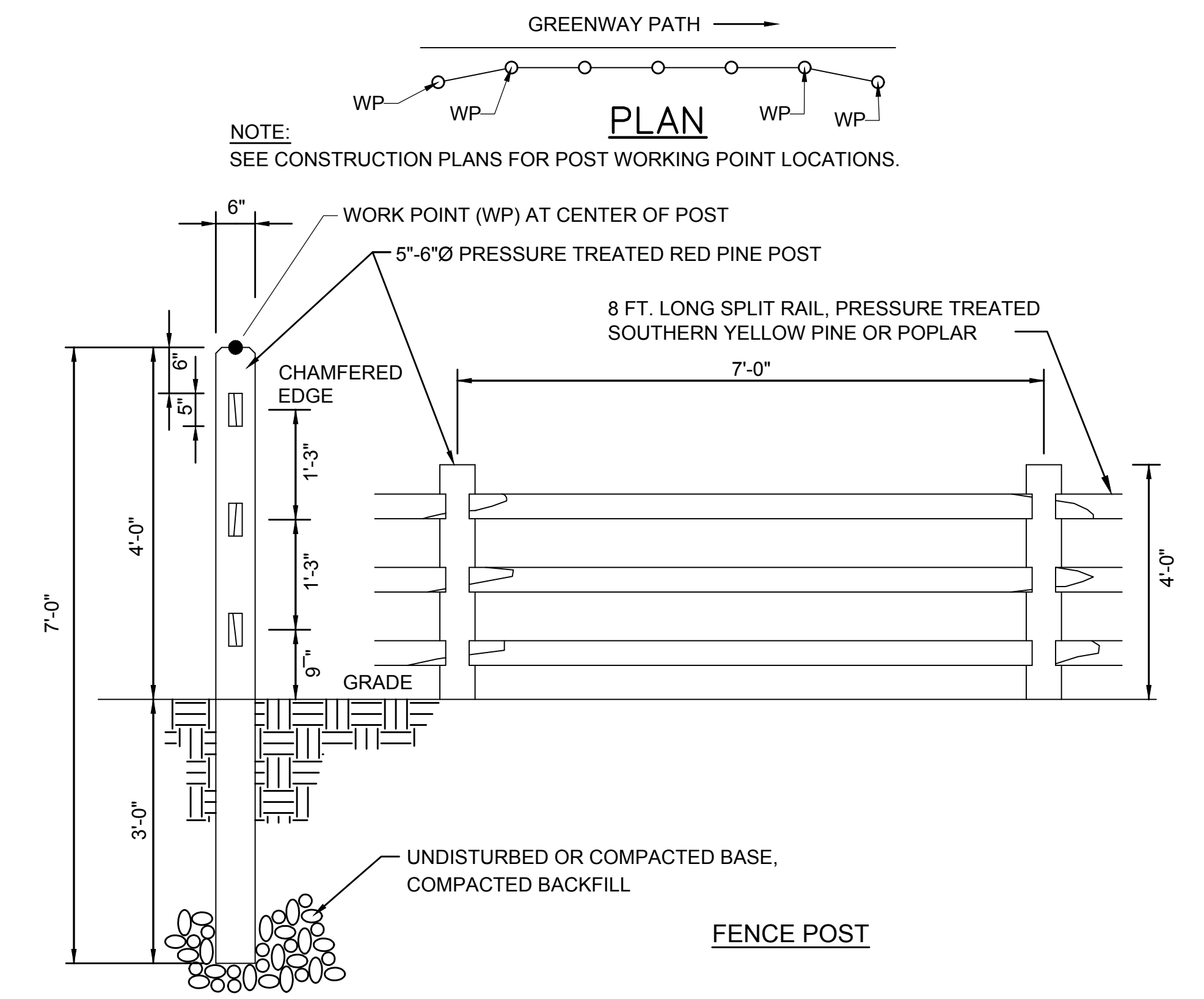
CONCRETE THRUST BLOCK
SCALE: NTS



HYDRANT RELOCATION
SCALE: NTS



WOOD GUARDRAIL
SCALE: NOT TO SCALE



WOOD RAILING
SCALE: NOT TO SCALE