

WESTFORD, CARLISLE & ACTON BRUCE FREEMAN RAIL TRAIL PHASE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	1	151
PROJECT FILE NO.		604532	
TITLE SHEET & INDEX			

IN THE TOWNS OF
WESTFORD, CARLISLE & ACTON
MIDDLESEX COUNTY

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED FEBRUARY 25, 2010, THE 2012 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO TRAFFIC STANDARD DETAILS ONLY), THE 2009 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.

WESTFORD

LITTLETON

ACTON

BEGIN PROJECT
 STA. 12+36.00
 N 3020497.5704
 E 683812.0384

END PROJECT
 STA. 268+00.00
 N 2997505.5722
 E 680386.4136

LENGTH OF PROJECT = 25784.00 FEET = 4.883 MILES

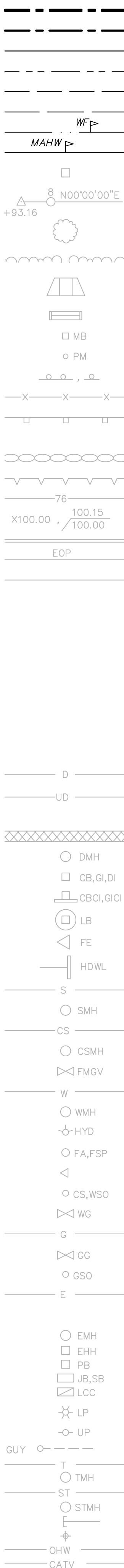
DESIGN SPEED	20 MPH (30 MPH AT APPROACHES TO GREAT ROAD - ROUTE 2A)
MINIMUM HORIZONTAL CURVE RADIUS	100'
MINIMUM LENGTH OF CREST VERTICAL CURVE	100'
MAXIMUM GRADE FOR LEVEL TERRAIN	4.5%



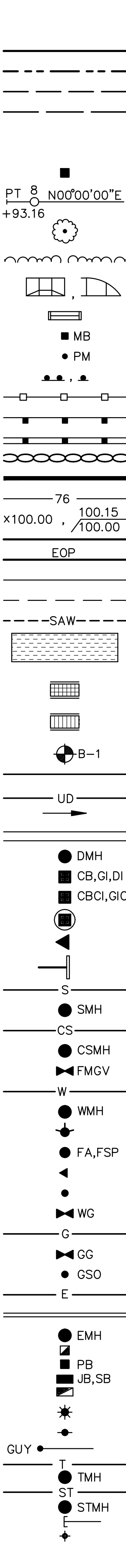
**75%
SUBMISSION**

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED:		APPROVED	
_____ DIVISION ADMINISTRATOR	_____ DATE	_____ HIGHWAY ADMINISTRATOR	_____ DATE

EXISTING



PROPOSED



GENERAL LEGEND

STATE BOUNDARY LINE
CITY, TOWN OR COUNTY BOUNDARY LINE
STATE HIGHWAY LAYOUT LINE
CITY, TOWN OR COUNTY LAYOUT LINE
EASEMENT LINE
PROPERTY LINE
EDGE OF VEGETATED WETLAND/WETLAND FLAG
MEAN ANNUAL HIGH WATER
HIGHWAY/PROPERTY BOUND (TYPE NOTED)
CONSTRUCTION/SURVEY BASELINE
TREE (TYPE & SIZE NOTED)
EDGE OF WOODS/SHRUBS
HANDICAP RAMP
BENCH
MAIL BOX
PARKING METER
SIGN
FENCE (SIZE & TYPE AS NOTED)
HIGHWAY GUARD (TYPE AS NOTED)
HIGHWAY GUARD WITH TIMBER RAIL BACK
BALANCED WALL (SIZE & TYPE AS NOTED)
RETAINING WALL (SIZE & TYPE AS NOTED)
CONTOURS
SPOT ELEVATION, TOP AND BOTTOM CURB
CURB OR BERM (TYPE AS NOTED)
EDGE OF PAVEMENT (NO CURB OR BERM)
BACK OF SIDEWALK
TOP OR BOTTOM OF SLOPE (CUT OR FILL)
SAWCUT LINE
APPROX. COLD PLANING/TRANSITION AREA
GRANITE RUBBLE BLOCK PAVEMENT
SCORED CONCRETE PAVEMENT
BORINGS, PAVEMENT CORES (SEE SPEC. PROV.)
DRAIN LINE
UNDERDRAIN (PERFORATED)
DIRECTION OF FLOW
PAVED WATERWAY
DRAIN MANHOLE
CATCH BASIN, DROP OR GUTTER INLET
CATCH BASIN (OR GUTTER INLET) WITH CURB INLET
LEACHING BASIN
FLARED END
HEADWALL
SEWER LINE
SEWER MANHOLE
COMBINED SEWER LINE
COMBINED SEWER MANHOLE
FORCE MAIN GATE VALVE
WATER MAIN
WATER MANHOLE
HYDRANT
FIRE ALARM BOX, FIRE STAND PIPE
REDUCER
CURB STOP OR WATER SHUT OFF
WATER GATE
GAS MAIN
GAS GATE
GAS SHUT OFF
ELECTRICAL LINE OR DUCT
ELECTRICAL CONDUIT
ELECTRICAL MANHOLE
ELECTRICAL HANDHOLE
PULL BOX (12" x 12")
ELECTRICAL JUNCTION OR SWITCH BOX
ELECTRICAL LOAD CENTER CABINET W/FDN
LIGHT POLE
UTILITY POLE
GUY WIRE & ANCHOR
TELEPHONE LINE OR DUCT
TELEPHONE MANHOLE
STEAM LINE
STEAM MANHOLE/TUNNEL HATCH
PLUG OR CAP
DELINEATOR
OVERHEAD WIRES
CABLE TV

GENERAL ABBREVIATIONS

ABAN ABANDON
ACCOMP ASPHALT COATED CORRUGATED METAL PIPE
ADJ ADJUST
APPROX APPROXIMATE
BC BOTTOM OF CURB
BD BOUND
BIT CONC BITUMINOUS CONCRETE
BO BY OTHERS
BOS BOTTOM OF SLOPE
BM BENCH MARK
BW BOTTOM OF WALL
CEM CONC CEMENT CONCRETE
CC CENTER OF CURVE
CCB CAPE COD BERM
CI CURB INLET
CIP CAST IRON PIPE
CIT CHANGE IN TYPE
CLR CLEARANCE
CLF CHAIN LINK FENCE
CLDI CEMENT LINED DUCTILE IRON
CMP CORRUGATED METAL PIPE
CONST CONSTRUCTION
CP CENTER POINT
CPP CORRUGATED PLASTIC PIPE
COND CONDUIT
DESC DESCRIPTION
DIP DUCTILE IRON PIPE
DR DRIVEWAY
ELEV OR EL ELEVATION
EOP EDGE OF PAVEMENT
ETW EDGE OF TRAVELED WAY
EXIST EXISTING
F&C FRAME AND COVER
F&G FRAME AND GRATE
FDN FOUNDATION
FND FOUNDED
FWD FILLED WITH DEBRIS
GRAN GRANITE
HMA HOT MIX ASPHALT
HOR HORIZONTAL
HP HIGH POINT
HWE HORSLEY WITTEN WEST (OF RAILBED)
HWW HORSLEY WITTEN EAST (OF RAILBED)
HYD HYDRANT
INV INVERT
LB LOAM BORROW
LO LAYOUT
MAHW MEAN ANNUAL HIGH WATER
MAX MAXIMUM
MIN MINIMUM
MHB MASSACHUSETTS HIGHWAY BOUND
MHD MASSACHUSETTS HIGHWAY DEPARTMENT
MLB MODIFIED LOAM BORROW
MON MONUMENT
NIC NOT IN CONTRACT
NGVD NATIONAL GEODETIC VERTICAL DATUM
N/F NOW OR FORMERLY
OHW OVERHEAD WIRE
PC POINT OF CURVE
PCC POINT OF COMPOUND CURVE
PGL PROFILE GRADE LINE
PI POINT OF INTERSECTION
POC POINT ON CURVE
PRC POINT OF REVERSE CURVE
PROPOSED PROPOSED
PT POINT OF TANGENT
PVC POINT OF VERTICAL CURVE
PVCC POINT OF VERTICAL COMPOUND CURVE
PVCP POLYVINYLCHLORIDE PIPE
PVI POINT OF VERTICAL INTERSECTION
PVMT PAVEMENT
PVRC POINT OF VERTICAL REVERSE CURVE
PVT POINT OF VERTICAL TANGENT
PWV PAVED WATERWAY
R RADIUS
R&D REMOVE AND DISPOSE
R&R REMOVE AND RESET
R&S REMOVE AND STACK
REM REMOVE
REMOD REMODEL
RCP REINFORCED CONCRETE PIPE
RET RETAIN
ROW RIGHT OF WAY
RR RAILROAD
SB STONE BOUND
SB/DH STONE BOUND/DRILL HOLE
SHLD SHOULDER
SHLO STATE HIGHWAY LAYOUT
SSD STOPPING SIGHT DISTANCE
STA STATION
STL STEEL
TBM TEMPORARY BENCH MARK
TC TOP OF CURB
TOS TOP OF SLOPE
TS TRAFFIC SIGNAL
TSV & B TAPPING SLEEVE, VALVE AND BOX
TYP TYPICAL
TW TOP OF WALL
UC UNDER CONSTRUCTION
USGS U.S. GEOLOGICAL SURVEY
UP UTILITY POLE
VCP VITRIFIED CLAY PIPE
VERT VERTICAL
WCR WHEELCHAIR RAMP

WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	2	151
PROJECT FILE NO.		604532	

LEGEND & ABBREVIATIONS

GENERAL NOTES

- EXISTING CONDITIONS INFORMATION IS BASED ON SURVEY PROVIDED BY JUDITH NITSCH ENGINEERING, DATED APRIL 2, 2007. ELEVATIONS ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). ALL SURVEY POINTS HAVE BEEN DETERMINED WITH RESPECT TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM AS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83). UNITS ARE ENGLISH.
- 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 AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
- WHERE AN EXISTING UNDERGROUND 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 MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
- 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 CONTRACTOR'S EXPENSE.
- THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
- 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.
- ALL TRANSVERSE JOINTS, AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALANT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION NUMBER SS-S-1401.
- ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
- THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
- ALL PROPERTY LINES BETWEEN ABUTTERS ARE APPROXIMATE ONLY.
- PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
- ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
- ALL GATE BOXES, SERVICE BOXES AND PUBLICLY OWNED MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
- ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
- THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
- CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
- THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS WILL BE CONFIRMED IN THE FIELD.
- CONTRACTOR SHALL REMOVE EXISTING ORGANIC MATERIAL THAT IS UNSUITABLE FOR REUSE AND DISPOSE OF OUTSIDE OF THE PROJECT LIMITS. IT IS ASSUMED THAT ALL OTHER EXCAVATED SUITABLE MATERIAL WILL REMAIN WITHIN THE PROJECT LIMITS. SEE SPECIAL PROVISIONS FOR DETAILS.

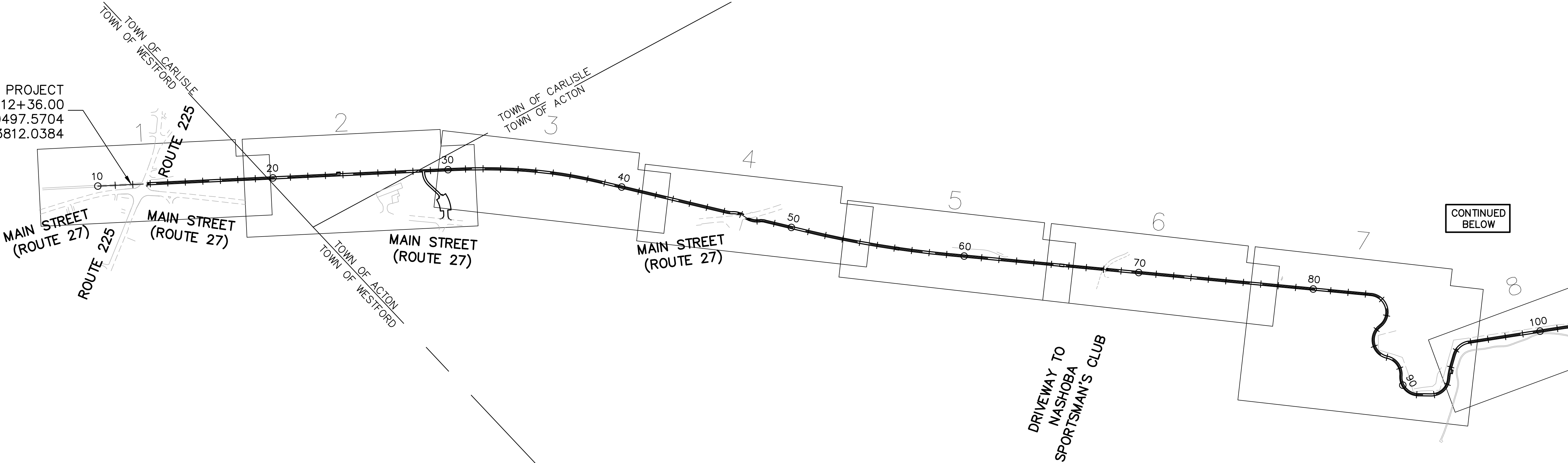
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	3	151
PROJECT FILE NO.		604532	

KEY PLAN & BORING LOCATIONS

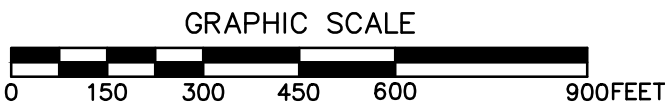
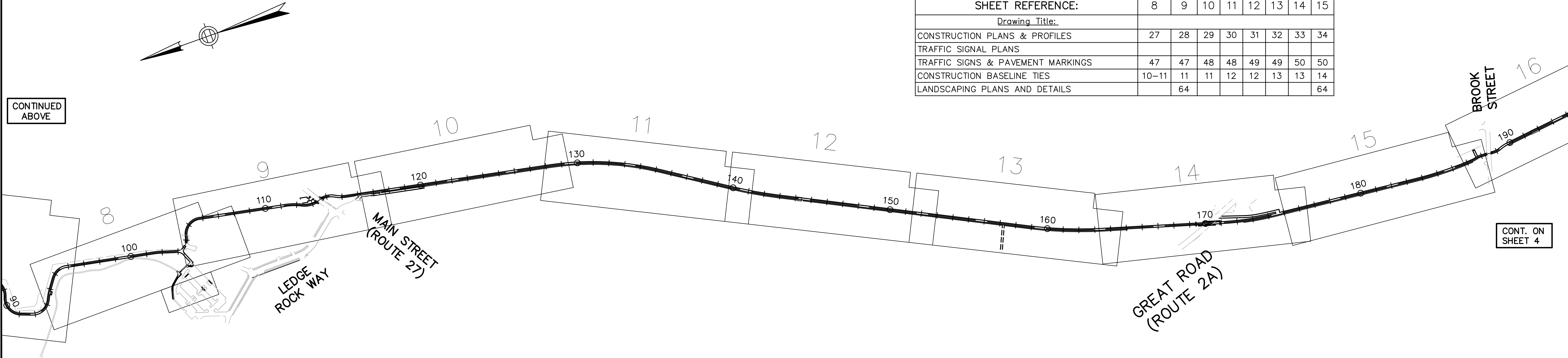
SHEET REFERENCE:	1	2	3	4	5	6	7
Drawing Title:	Drawing Number:						
CONSTRUCTION PLANS & PROFILES	19	20	21	22	23	24	25-26
TRAFFIC SIGNAL PLANS	56						
TRAFFIC SIGNS & PAVEMENT MARKINGS	43	43	44	44	45	45	46
CONSTRUCTION BASELINE TIES	7	7-8	8	8-9	9	9-10	10
LANDSCAPING PLANS AND DETAILS	63			63			

BEGIN PROJECT
STA. 12+36.00
N 3020497.5704
E 683812.0384



SHEET REFERENCE:	8	9	10	11	12	13	14	15
Drawing Title:								
CONSTRUCTION PLANS & PROFILES	27	28	29	30	31	32	33	34
TRAFFIC SIGNAL PLANS								
TRAFFIC SIGNS & PAVEMENT MARKINGS	47	47	48	48	49	49	50	50
CONSTRUCTION BASELINE TIES	10-11	11	11	12	12	13	13	14
LANDSCAPING PLANS AND DETAILS		64						64

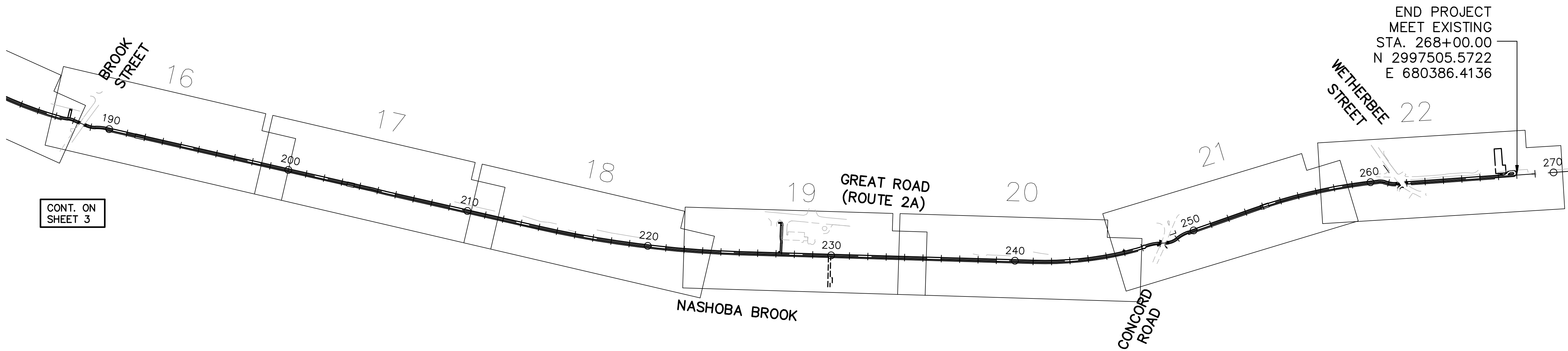
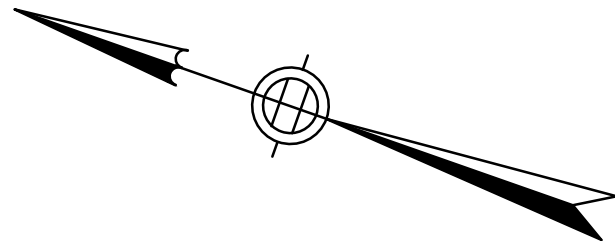
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ABOVE



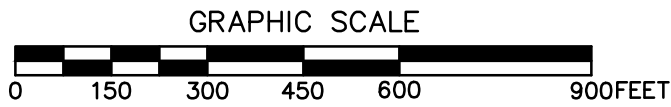
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	4	151
PROJECT FILE NO.		604532	

KEY PLAN & BORING LOCATIONS



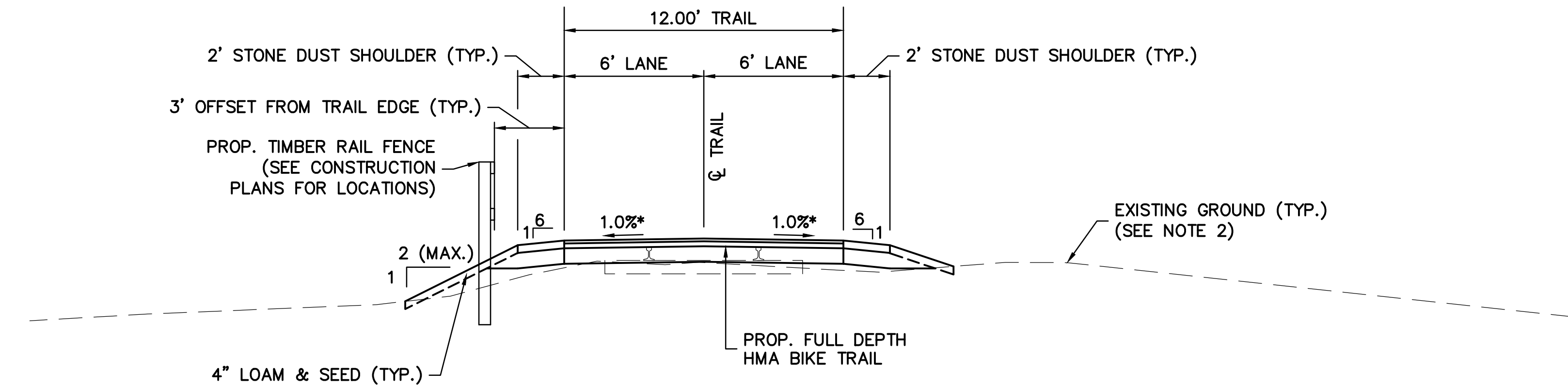
SHEET REFERENCE:	16	17	18	19	20	21	22
Drawing Title							
CONSTRUCTION PLANS & PROFILES	35	36	37	38	39	40	41
TRAFFIC SIGNAL PLANS							
TRAFFIC SIGNS & PAVEMENT MARKINGS	51	51	52	52	53	53	54
CONSTRUCTION BASELINE TIES	14	15	15	16	16	17	17-18
LANDSCAPING PLANS AND DETAILS					65	65	65



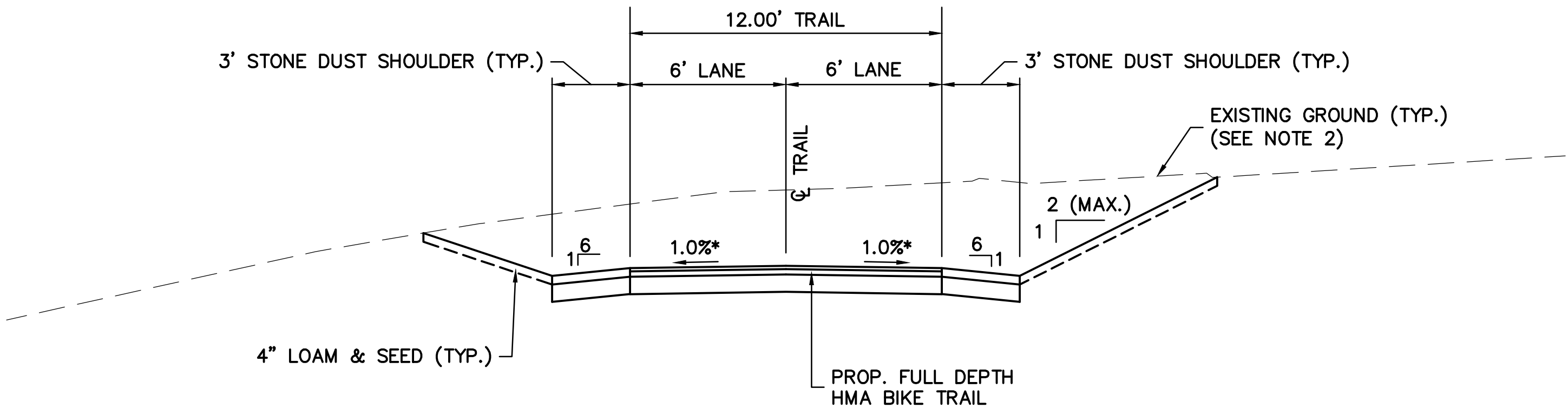
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	5	151
PROJECT FILE NO.		604532	

TYPICAL SECTIONS

10031_2A_TYP.DWG 23-Oct-2012



FILL SECTION



CUT SECTION

TYPICAL SECTION – 12’ WIDE TRAIL

SCALE 1" = 4'
STA. 12+80 – STA. 46+95
STA. 47+50 – STA. 56+05
STA. 56+25 – STA. 65+45
STA. 65+75 – STA. 67+95
STA. 68+15 – STA. 103+55
STA. 103+95 – STA. 113+25
STA. 113+75 – STA. 120+25
(SEE NOTE 1)

* – 0.5% CONSTRUCTION TOLERANCE

PAVEMENT NOTES

FULL DEPTH HOT MIX ASPHALT BIKE TRAIL

SURFACE COURSE: 1 1/2" SUPERPAVE SURFACE COURSE – 12.5 (SSC–12.5) (ITEM 455.23.)
INTERMEDIATE COURSE: 2 1/2" SUPERPAVE INTERMEDIATE COURSE – 19.0 (SIC–19.0) (ITEM 455.32)
FOUNDATION: 2" – 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.) (SEE NOTE BELOW)
24" SPECIAL BORROW (SEE NOTE BELOW)

NOTE: SUBBASE SHALL BE A MINIMUM OF 2" GRAVEL BORROW FOR LEVELING OVER RAILROAD BALLAST. SUBBASE SHALL BE 8" GRAVEL BORROW OVER 24" MINIMUM SPECIAL BORROW AT FILL SECTIONS IN AREAS OF WETLANDS AND OTHER UNSUITABLE MATERIAL IN ACCORDANCE WITH SECTION 150 AND 170 OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

FULL DEPTH HOT MIX ASPHALT CONSTRUCTION
(AT ROADWAY CROSSINGS AS SHOWN ON PLANS)

SURFACE COURSE: 1–3/4" SUPERPAVE SURFACE COURSE – 12.5 (SSC–12.5) (ITEM 455.23)
1–3/4" SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC–12.5) (ITEM 455.32)
BASE COURSE: 3–1/2" SUPERPAVE BASE COURSE – 37.5 (SBC–37.5) (ITEM 455.42)
SUBBASE: 4" DENSE GRADED CRUSHED STONE (ITEM 402.) OVER
8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.) (OR TO DEPTH OF
EXISTING GRAVEL SUBBASE, WHICHEVER IS GREATER)

SOFT TRAIL AND STONE DUST SHOULDER

SURFACE: 4" STONE DUST (ITEM 704.2) OVER WEED CONTROL FABRIC
FOUNDATION: 2" – 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

CEMENT CONCRETE SIDEWALKS, REST AREAS & WHEELCHAIR RAMPS:

SURFACE COURSE: 4" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4", 610)
SUBBASE: 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

CEMENT CONCRETE SPLITTER ISLANDS:

SURFACE COURSE: 4" STAMPED CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4", 610) (ITEM 701.3)
SUBBASE: 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

FULL DEPTH WIDENING LESS THAN 4 FEET

SURFACE: 1–3/4" SUPERPAVE SURFACE COURSE – 12.5 (SSC–12.5) (ITEM 455.23)
1–3/4" SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC–12.5) (ITEM 455.32)
BASE: 6" HIGH–EARLY–STRENGTH CEMENT CONCRETE BASE COURSE (ITEM 431.1)
SUBBASE: 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

HOT MIX ASPHALT WALKS

SURFACE: 1 1/4" SUPERPAVE SURFACE COURSE – 12.5 (SSC–12.5) (ITEM 455.23)
1 1/4" SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC–12.5) (ITEM 455.32)
SUBBASE: 8" GRAVEL BORROW (M1.03.0 TYPE B OR EXISTING GRAVEL BORROW TO REMAIN)
(ITEM 151.)

HOT MIX ASPHALT PARKING LOTS & DRIVEWAYS

SURFACE COURSE: 1 1/2" SUPERPAVE SURFACE COURSE 12.5 (SSC–12.5) (ITEM 703)
INTERMEDIATE COURSE: 2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC–12.5) (ITEM 703.)
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE B OR EXISTING GRAVEL BORROW TO REMAIN)
(ITEM 151.)

GRAVEL PARKING LOTS & DRIVEWAYS

FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

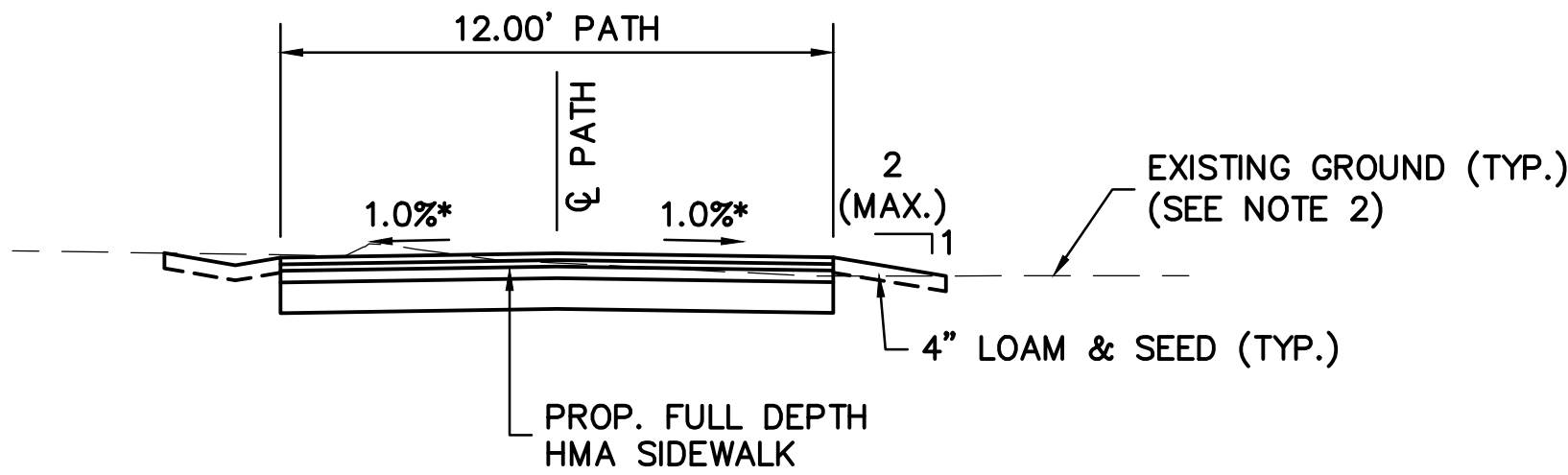
NOTES

1. THE SECTIONS OF PROPOSED ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER IN TRANSITION OR ARE LOCATED AT INTERSECTIONS AND THEREFORE HAVE NOT BEEN SHOWN. REFER TO CROSS SECTION SHEETS FOR MORE DETAILS.

2. CONTRACTOR SHALL REMOVE EXISTING ORGANIC MATERIAL THAT IS UNSUITABLE FOR REUSE AND DISPOSE OF OUTSIDE OF THE PROJECT LIMITS. IT IS ASSUMED THAT ALL OTHER EXCAVATED SUITABLE MATERIAL WILL REMAIN WITHIN THE PROJECT LIMITS. SEE SPECIAL PROVISIONS FOR DETAILS.

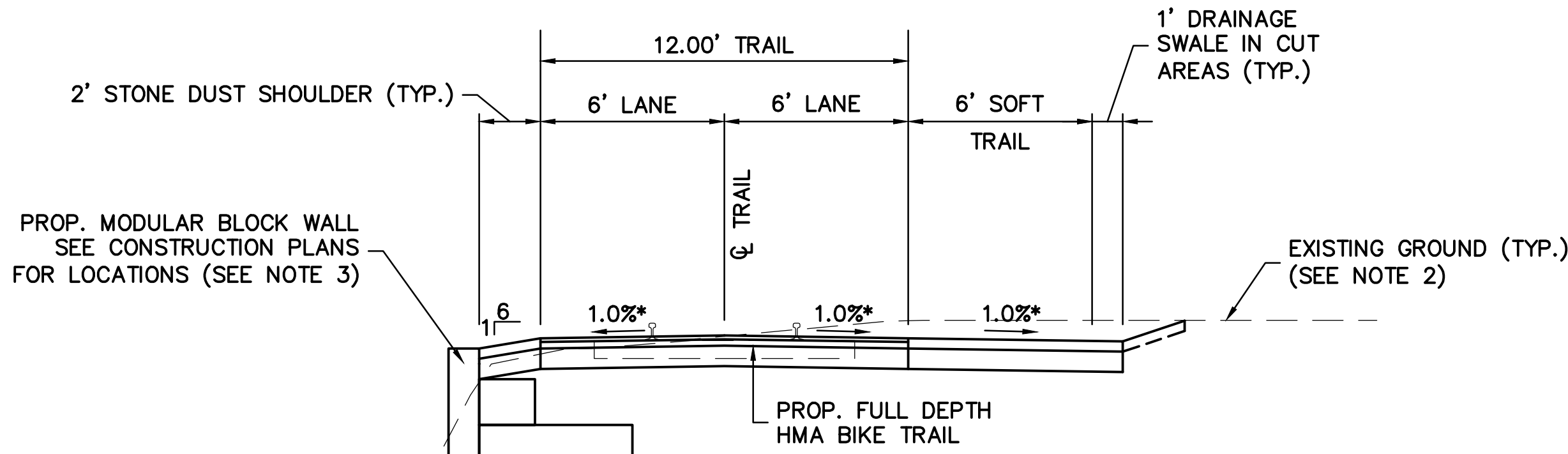
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TYPICAL SECTIONS

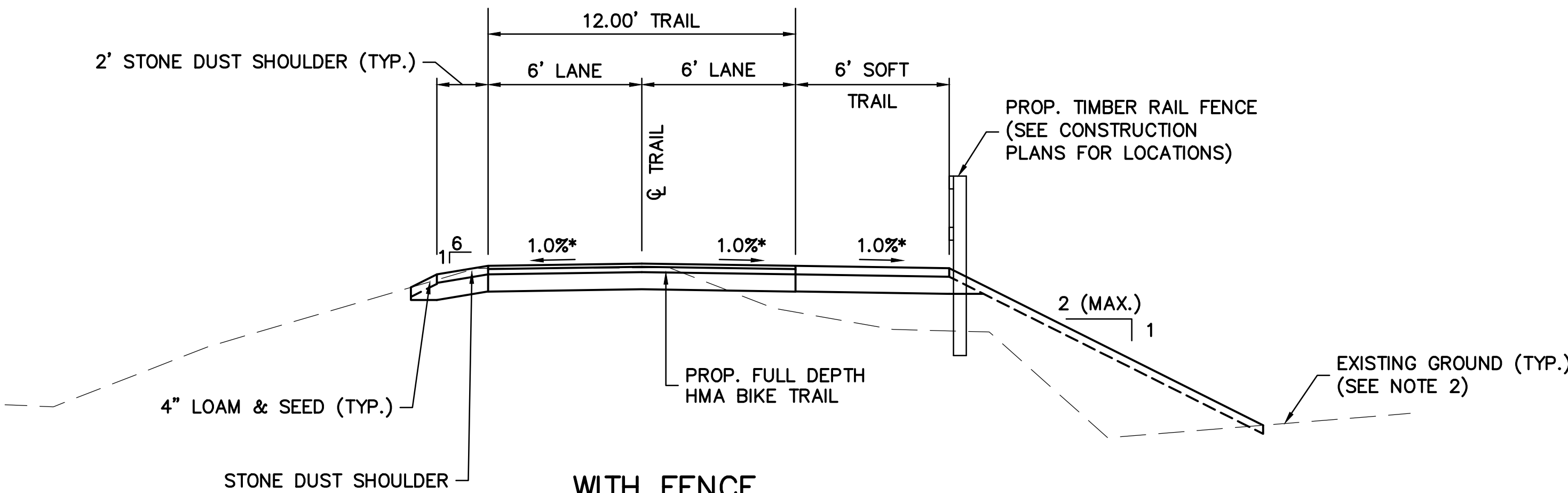


TYPICAL SECTION – ROUTE 2A ACCESS

SCALE 1" = 4'
STA. 310+51 – STA. 311+45



WITHOUT FENCE



WITH FENCE

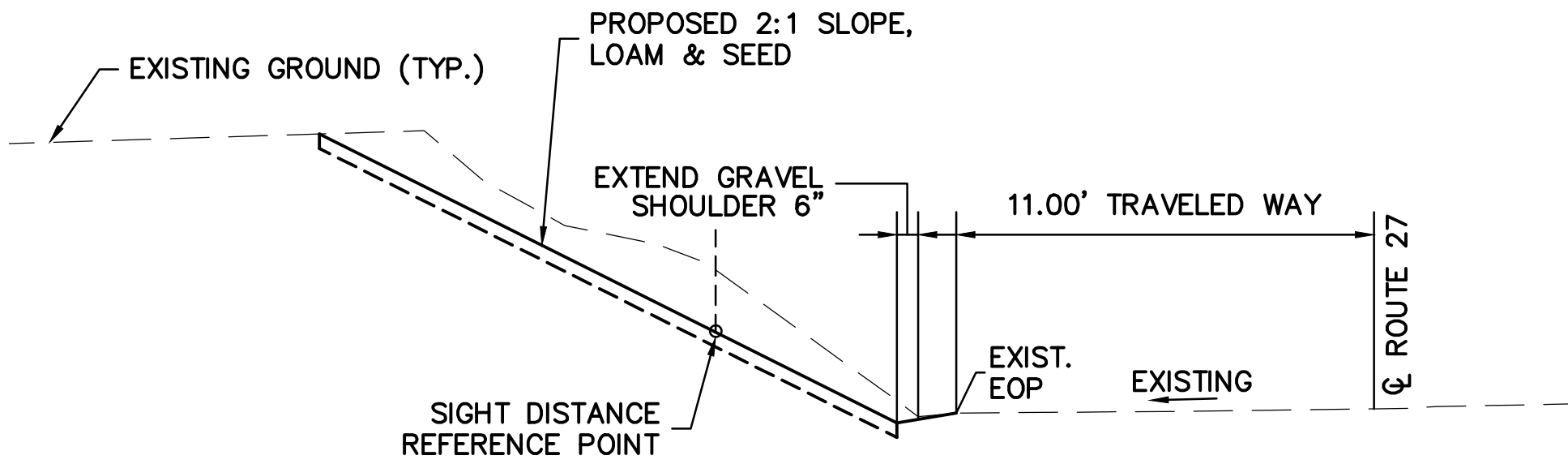
TYPICAL SECTION – 12' WIDE TRAIL WITH SOFT TRAIL

SCALE 1" = 4'
STA. 120+25 – STA. 144+05
STA. 144+45 – STA. 165+20
STA. 172+40 – STA. 188+30
STA. 188+65 – STA. 191+45
STA. 192+10 – STA. 203+25
STA. 203+75 – STA. 248+00
STA. 248+40 – STA. 253+85
STA. 254+35 – STA. 261+45
STA. 261+95 – STA. 267+92
(SEE NOTE 1)

NOTES

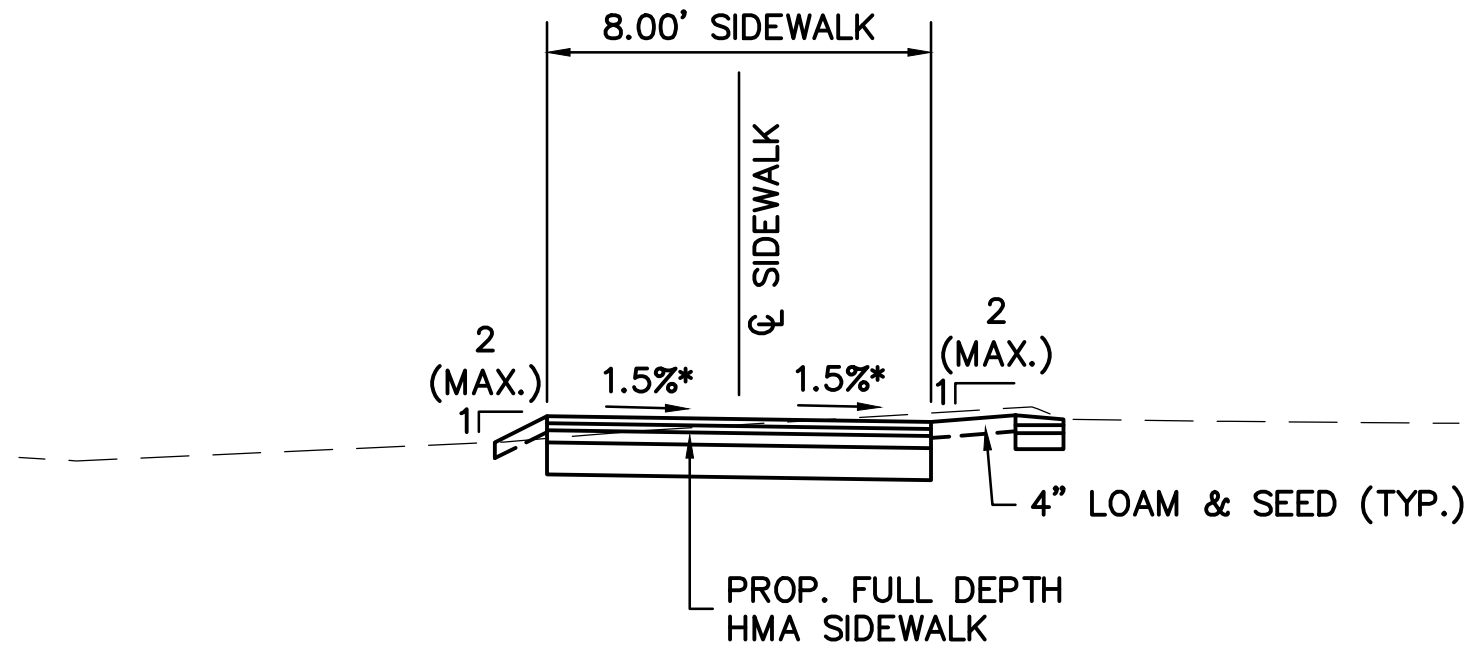
1. THE SECTIONS OF PROPOSED ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER IN TRANSITION OR ARE LOCATED AT INTERSECTIONS AND THEREFORE HAVE NOT BEEN SHOWN. REFER TO CROSS SECTION SHEETS FOR MORE DETAILS.
2. CONTRACTOR SHALL REMOVE EXISTING ORGANIC MATERIAL THAT IS UNSUITABLE FOR REUSE AND DISPOSE OF OUTSIDE OF THE PROJECT LIMITS. IT IS ASSUMED THAT ALL OTHER EXCAVATED SUITABLE MATERIAL WILL REMAIN WITHIN THE PROJECT LIMITS. SEE SPECIAL PROVISIONS FOR DETAILS.
3. WALL IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. ACTUAL DESIGN IS TO BE PROVIDED BY THE CONTRACTOR.

* – 0.5% CONSTRUCTION TOLERANCE



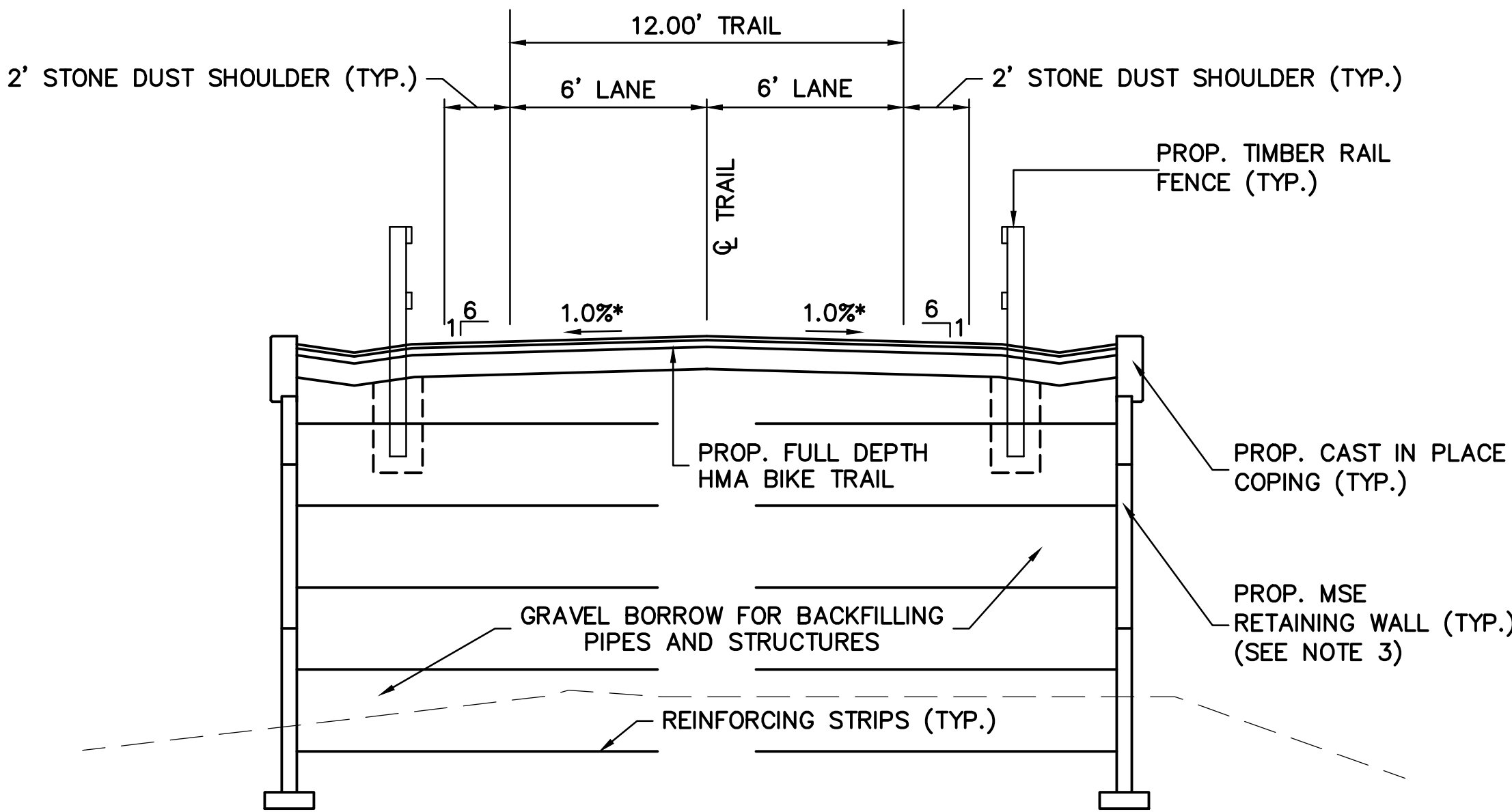
TYPICAL SECTION – ROUTE 27 SLOPE RECONSTRUCTION FOR SIGHT DISTANCE

SCALE 1" = 4'
STA. 310+51 – STA. 311+45



TYPICAL SECTION – SIDEWALK NEAR STATION 172+80 (POWERS GALLERY)

SCALE 1" = 4'
STA. 50+06 – STA. 51+67



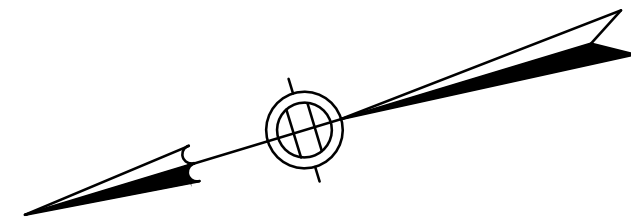
TYPICAL SECTION – 12' WIDE TRAIL

SCALE 1" = 4'
STA. 165+65 – STA. 169+55
STA. 170+91 – STA. 171+90

WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	7	151
PROJECT FILE NO. 604532			

CONSTRUCTION BASELINE TIES



124	NORTHING: 3021147.0568 EASTING: 684029.5900 ELEVATION: 203.23
201	NORTHING: 3021147.7818 EASTING: 684011.2393 ELEVATION: 206.40
125	NORTHING: 3021033.6515 EASTING: 683975.2675 ELEVATION: 203.23

124	125
201	
124 DESC.: USGS 79J	
201 DESC.: PK	
125 DESC.: CBND IP	

200	NORTHING: 3020752.7323 EASTING: 683889.9828 ELEVATION: 203.23
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200	ROUTE 27
200 DESC.: MAG	

100	NORTHING: 3020503.0805 EASTING: 683814.1327 ELEVATION: 201.45
-----	---

100	ROUTE 27
100 DESC.: MAG	

97	97 DESC.: MAG
NORTHING: 3019939.5872 EASTING: 683641.7895 ELEVATION: 196.16	

95	95 DESC.: MAG
NORTHING: 3019613.4268 EASTING: 683542.0171 ELEVATION: 193.35	

96	96 DESC.: MAG
NORTHING: 3019725.9849 EASTING: 683576.7665 ELEVATION: 194.48	

98	98 DESC.: MAG
NORTHING: 3020120.2351 EASTING: 683696.7550 ELEVATION: 197.66	

CONT. ON
SHEET 8

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
1	10+00.14	30+30.67		S16° 57' 45"W 2030.53'	3020723.172	683880.850
2	30+30.67	33+75.35	R=3650.00' Δ=5°24'38" L=344.68' T=172.47'		3018780.978	683288.453

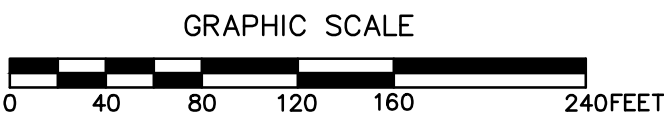
ROUTE 225 CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
100	400+00.00	406+45.17		S49° 09' 03"E 645.17'	3020830.225	683390.327
100	406+45.17	408+72.20	R=724.88' Δ=1°56'40" L=227.03' T=114.45'		3020408.238	683878.355
101	408+72.20	410+50.00		S67° 05' 43"E 177.80'	3020288.836	684070.355

BFRT PGL @ STA. 12+62.46 =
ROUTE 225 @ STA. 405+47.29

99	99 DESC.: MAG
122 DESC.: SB DH	
123 DESC.: SB DH	

99	NORTHING: 3020286.6228 EASTING: 683747.9480 ELEVATION: 199.12
122	NORTHING: 3020320.1840 EASTING: 683726.2397 ELEVATION: 0.00
123	NORTHING: 3020324.1339 EASTING: 683711.7837 ELEVATION: 0.00

94	94 DESC.: MAG
NORTHING: 3019457.9187 EASTING: 683494.9323 ELEVATION: 192.12	



WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	8	151
PROJECT FILE NO. 604532			

CONSTRUCTION BASELINE TIES

310	NORTHING: 3017713.7337 EASTING: 682929.1712 ELEVATION: 171.87
311	NORTHING: 3017645.1116 EASTING: 682989.5675 ELEVATION: 187.12
312	NORTHING: 3017678.1254 EASTING: 683117.5148 ELEVATION: 196.98
313	NORTHING: 3017782.4442 EASTING: 683048.8271 ELEVATION: 187.99

86	NORTHING: 3017582.3310 EASTING: 682662.6707 ELEVATION: 175.41
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86	DESC.: MAG
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CONT. ON SHEET 9

BFRT PGL @ STA. 47+21.18 =
RTE 27 CL @ STA. 309+78.46

7	PT	+12.28
6	PRC	+50.12
5	PC	+22.06
4	PT	+01.23
3	PC	+17.56
2	PT	+38.96
1	PC	+47.91

85	DESC.: HUB/TACK
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85	NORTHING: 3017379.1750 EASTING: 682519.4837 ELEVATION: 173.96
----	---

115	NORTHING: 3018010.0629 EASTING: 682936.1204 ELEVATION: 0.00
116	NORTHING: 3017954.4970 EASTING: 682913.2690 ELEVATION: 178.16
314	NORTHING: 3017903.3105 EASTING: 682973.8747 ELEVATION: 148.23
87	NORTHING: 3017825.8568 EASTING: 682821.3628 ELEVATION: 177.44

115	DESC.: SB IP
116	DESC.: SB USGS 79G
314	DESC.: HUB/TACK
87	DESC.: MAG

ACTON GARAGE PARKING CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
200	20+00.00	20+10.72		N73° 02' 15"W 10.72'	3018944.221	683338.244
201	20+10.72	20+88.51	R=100.00' Δ=44°34'05" L=77.79' T=40.98'		3018947.350	683327.986
202	20+88.51	21+51.47		S62° 23' 40"W 62.96'	3018940.316	683252.473
203	21+51.47	22+68.39	R=150.00' Δ=44°39'45" L=116.93' T=61.62'		3018911.143	683196.684
204	22+68.39	24+00.00		N72° 56' 35"W 131.61'	3018900.665	683083.178

88	DESC.: MAG
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88	NORTHING: 3018181.7581 EASTING: 683043.2202 ELEVATION: 180.57
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90	NORTHING: 3018489.8323 EASTING: 683190.5614 ELEVATION: 183.07
89	NORTHING: 3018336.6424 EASTING: 683122.6085 ELEVATION: 181.85

90	DESC.: MAG
89	DESC.: MAG

Rte 27 CL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
300	308+00.00	308+47.91		S15° 21' 46"W 847.91'	3018253.278	682731.031
301	308+47.91	311+84.84	R=1300.00' Δ=14°51'00" L=336.94' T=169.42'		3017435.670	682506.395
302	311+84.84	315+79.61		S0° 30' 46"W 394.76'	3017102.894	682459.995

92	DESC.: MAG
119	DESC.: SB DH
118	DESC.: IP
117	DESC.: SB IP
91	DESC.: MAG

92	NORTHING: 3018869.1070 EASTING: 683316.1944 ELEVATION: 186.72
119	NORTHING: 3018770.3937 EASTING: 683336.8926 ELEVATION: 0.00
118	NORTHING: 3018783.8725 EASTING: 683295.7589 ELEVATION: 0.00
117	NORTHING: 3018737.2252 EASTING: 683275.5256 ELEVATION: 0.00
91	NORTHING: 3018648.7828 EASTING: 683246.6312 ELEVATION: 184.21

93	NORTHING: 3019167.3878 EASTING: 683410.2883 ELEVATION: 189.52
120	NORTHING: 3019104.3402 EASTING: 683405.1088 ELEVATION: 191.43

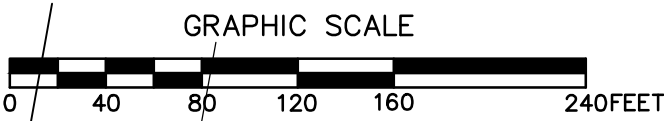
93	DESC.: MAG
120	DESC.: USGS 79H

121	NORTHING: 3019348.7836 EASTING: 683453.1676 ELEVATION: 0.00
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121	DESC.: SB DH
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CONT. ON SHEET 7

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
2	30+30.67	33+75.35	R=3650.00' Δ=5°24'38" L=344.68' T=172.47'		3018780.978	683288.453
3	33+75.35	38+59.33	R=2600.00' Δ=10°39'55" L=483.98' T=242.69'		3018456.524	683172.487
4	38+59.33	46+22.06		S33° 02' 18"W 762.73'	3018028.656	682947.796
5	46+22.06	46+50.12	R=100.00' Δ=16°04'34" L=28.06' T=14.12'		3017389.253	682531.953
6	46+50.12	47+12.28	R=100.00' Δ=35°37'06" L=62.17' T=32.12'		3017363.908	682520.134
7	47+12.28	47+38.96		S52° 34' 50"W 26.68'	3017313.661	682485.249
8	47+38.96	48+01.23	R=100.00' Δ=35°40'48" L=62.27' T=32.18'		3017297.452	682464.063
9	48+01.23	48+17.56		S16° 54' 02"W 16.33'	3017247.102	682429.146
10	48+17.56	48+45.76	R=100.00' Δ=16°09'35" L=28.20' T=14.20'		3017231.480	682424.400
11	48+45.76	50+86.85		S33° 03' 37"W 241.08'	3017205.999	682412.528



WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	9	151
PROJECT FILE NO.			604532

CONSTRUCTION BASELINE TIES

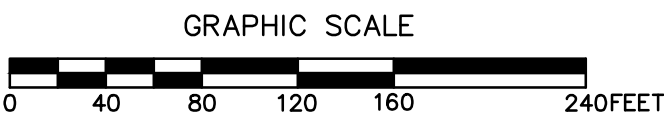
Rte 27 CL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
300	300+00.00	308+47.91		S15° 21' 46"W 847.91'	3018253.278	682731.031
301	308+47.91	311+84.84	R= 1300.00' Δ= 14°51'00" L=336.94' T=169.42'		3017435.670	682506.395
302	311+84.84	315+79.61		S0° 30' 46"W 394.76'	3017102.894	682459.995

CONT. ON
SHEET 8

BFRT PGL @ STA. 47+21.18 =
RTE 27 CL @ STA. 309+78.46

CONT. ON
SHEET 10

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
6	46+50.12	47+12.28	R= 100.00' Δ= 35°37'06" L=62.17' T=32.12'		3017363.908	682520.134
7	47+12.28	47+38.96		S52° 34' 50"W 26.68'	3017313.661	682485.249
8	47+38.96	48+01.23	R= 100.00' Δ= 35°40'48" L=62.27' T=32.18'		3017297.452	682464.063
9	48+01.23	48+17.56		S16° 54' 02"W 16.33'	3017247.102	682429.146
10	48+17.56	48+45.76	R= 100.00' Δ= 16°09'35" L=28.20' T=14.20'		3017231.480	682424.400
11	48+45.76	50+86.85		S33° 03' 37"W 241.08'	3017205.999	682412.528
12	50+86.85	59+12.23	R= 5900.00' Δ= 8°00'56" L=825.39' T=413.37'		3017003.947	682281.011
13	59+12.23	83+31.79		S25° 02' 42"W 2419.55'	3016283.005	681880.520
14	83+31.79	85+62.08	R= 100.00' Δ= 131°56'59" L=230.30' T=224.34'		3014090.946	680856.254



WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	10	151
PROJECT FILE NO.			604532

CONSTRUCTION BASELINE TIES

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
22	94+05.10	94+72.70		S54° 26' 51"E 67.60'	3013799.243	680317.957
23	94+72.70	95+86.62	R = 100.00' Δ = 65° 16' 09" L = 113.92' T = 64.04'		3013759.936	680372.956
24	95+86.62	101+41.48		S10° 49' 18"W 554.86'	3013659.803	680413.033
25	101+41.48	101+96.55	R = 500.00' Δ = 6° 18' 36" L = 55.06' T = 27.56'		3013114.807	680308.857
26	101+96.55	103+21.71		S17° 07' 53"W 125.16'	3013061.399	680295.565
27	103+21.71	103+47.60		S36° 54' 29"E 25.88'	3012941.788	680258.696

TRAV #8
HUB/TACK
N: 3013090.3303
E: 680319.1156
ELEV: 180.66

CONT. ON
SHEET 11

TRAV #7
HUB/TACK
N: 3013531.0978
E: 680403.7539
ELEV: 180.50

TRAV #1
HUB/TACK
N: 3014104.3724
E: 680770.7970
ELEV: 173.33

TRAV #2
HUB/TACK
N: 3014163.3974
E: 680493.9181
ELEV: 194.54

TRAV #6
PK NAIL
N: 3013733.1314
E: 680454.3487
ELEV: 183.98

TRAV #5
BFRT CONST. R
HUB/TACK
N: 680330.1319
E: 3013816.1150
ELEV: 185.24

TRAV #4
HUB/TACK
N: 3013905.4882
E: 680209.9718
ELEV: 187.98

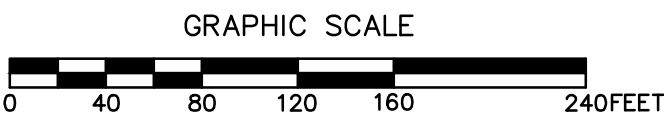
TRAV #3
HUB/TACK
N: 2898283.1420
E: 796099.8810
ELEV: 195.86

62 DESC.: HUB/TACK
61 DESC.: IRON ROD

60 DESC.: HUB/TACK
216 DESC.: HUB/TACK
59 DESC.: HUB/TACK

58 DESC.: MAG
57 DESC.: HUB/TACK
56 DESC.: MAG

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
13	59+12.23	83+31.79		S25° 02' 42"W 2419.55'	3016283.005	681880.520
14	83+31.79	85+62.08	R = 100.00' Δ = 131° 56' 59" L = 230.30' T = 224.34'		3014090.946	680856.254
15	85+62.08	85+81.53		N23° 00' 19"W 19.44'	3014094.197	680673.609
16	85+81.53	88+00.27	R = 100.00' Δ = 125° 19' 50" L = 218.74' T = 193.46'		3014112.096	680666.010
17	88+00.27	89+44.55	R = 100.00' Δ = 82° 40' 04" L = 144.28' T = 87.96'		3014125.508	680488.849
18	89+44.55	91+08.51	R = 100.00' Δ = 93° 56' 29" L = 163.96' T = 107.13'		3014086.884	680362.532
19	91+08.51	91+81.52		S20° 23' 26"W 73.01'	3014030.608	680227.596
20	91+81.52	93+30.73	R = 100.00' Δ = 85° 29' 27" L = 149.21' T = 92.42'		3013962.174	680202.159
21	93+30.73	94+05.10	R = 400.00' Δ = 10° 39' 10" L = 74.37' T = 37.29'		3013836.628	680253.790



BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
24	95+86.62	101+41.48		S10° 49' 18"W 554.86'	3013659.803	680413.033
25	101+41.48	101+96.55	R = 500.00' Δ= 6° 18' 36" L=55.06' T=27.56'		3013114.807	680308.857
26	101+96.55	103+21.71		S17° 07' 53"W 125.16'	3013061.399	680295.565
27	103+21.71	103+47.60		S36° 54' 29"E 25.88'	3012941.788	680258.696
28	103+47.60	104+21.92	R = 100.00' Δ= 42° 35' 00" L=74.32' T=38.97'		3012921.092	680274.239
29	104+21.92	105+79.95	R = 100.00' Δ= 90° 32' 39" L=158.03' T=100.95'		3012882.822	680335.961
30	105+79.95	111+28.14		S11° 03' 10"W 548.19'	3012765.328	680415.868
31	111+28.14	112+32.44	R = 400.00' Δ= 14° 56' 27" L=104.31' T=52.45'		3012227.308	680310.772

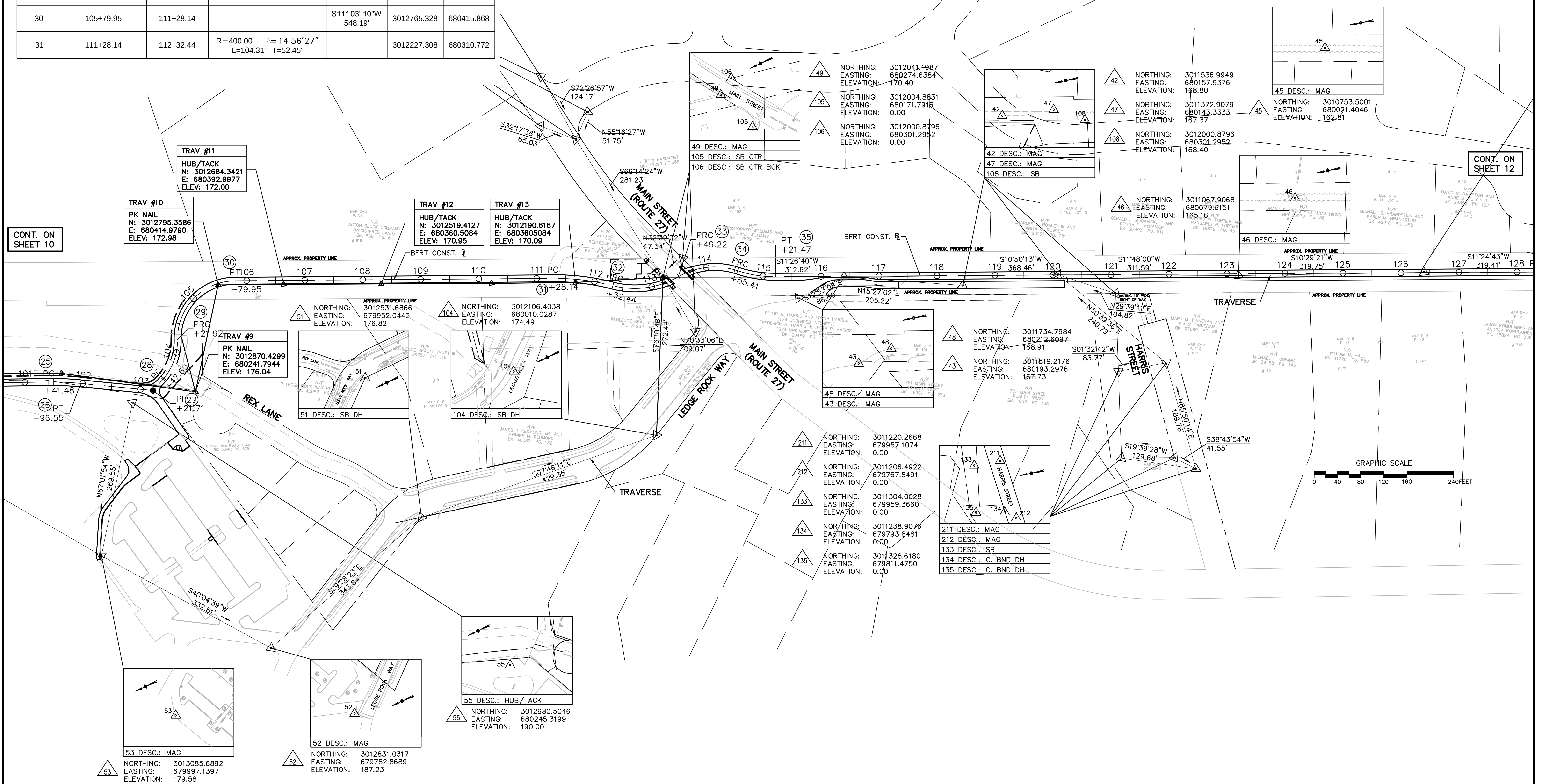
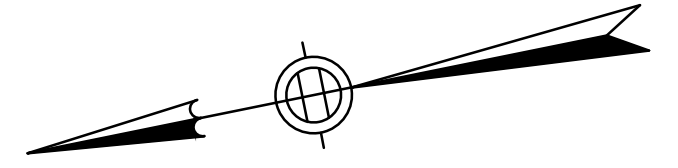
BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
32	112+32.44	113+49.22	R = 150.00' Δ= 44° 36' 16" L=116.77' T=61.53'		3012128.685	680277.729
33	113+49.22	114+55.41	R = 125.00' Δ= 48° 40' 30" L=106.19' T=56.54'		3012015.074	680270.399
34	114+55.41	115+21.47	R = 200.00' Δ= 18° 55' 31" L=66.06' T=33.33'		3011912.561	680260.118
35	115+21.47	128+31.61		S11° 08' 20"W 1310.13'	3011851.004	680236.979
36	128+31.61	135+18.62	R = 1800.00' Δ= 21° 52' 06" L=687.02' T=347.74'		3010565.550	679983.875

WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	11	151
PROJECT FILE NO.		604532	

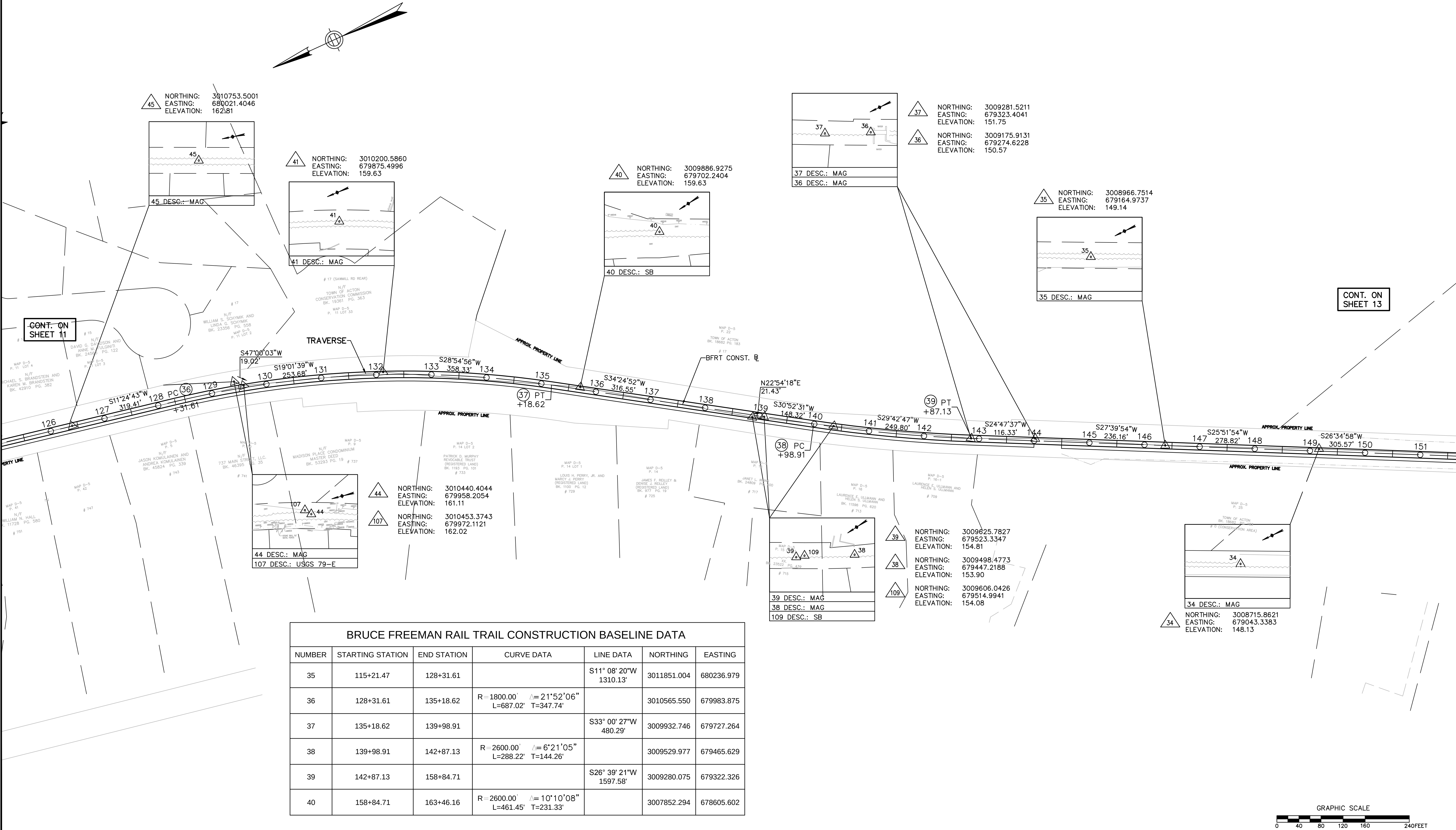
CONSTRUCTION BASELINE TIES



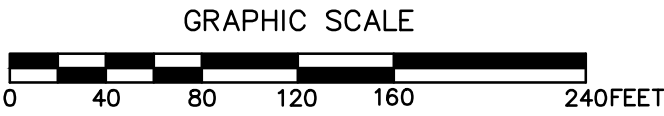
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	12	151
PROJECT FILE NO.		604532	

CONSTRUCTION BASELINE TIES



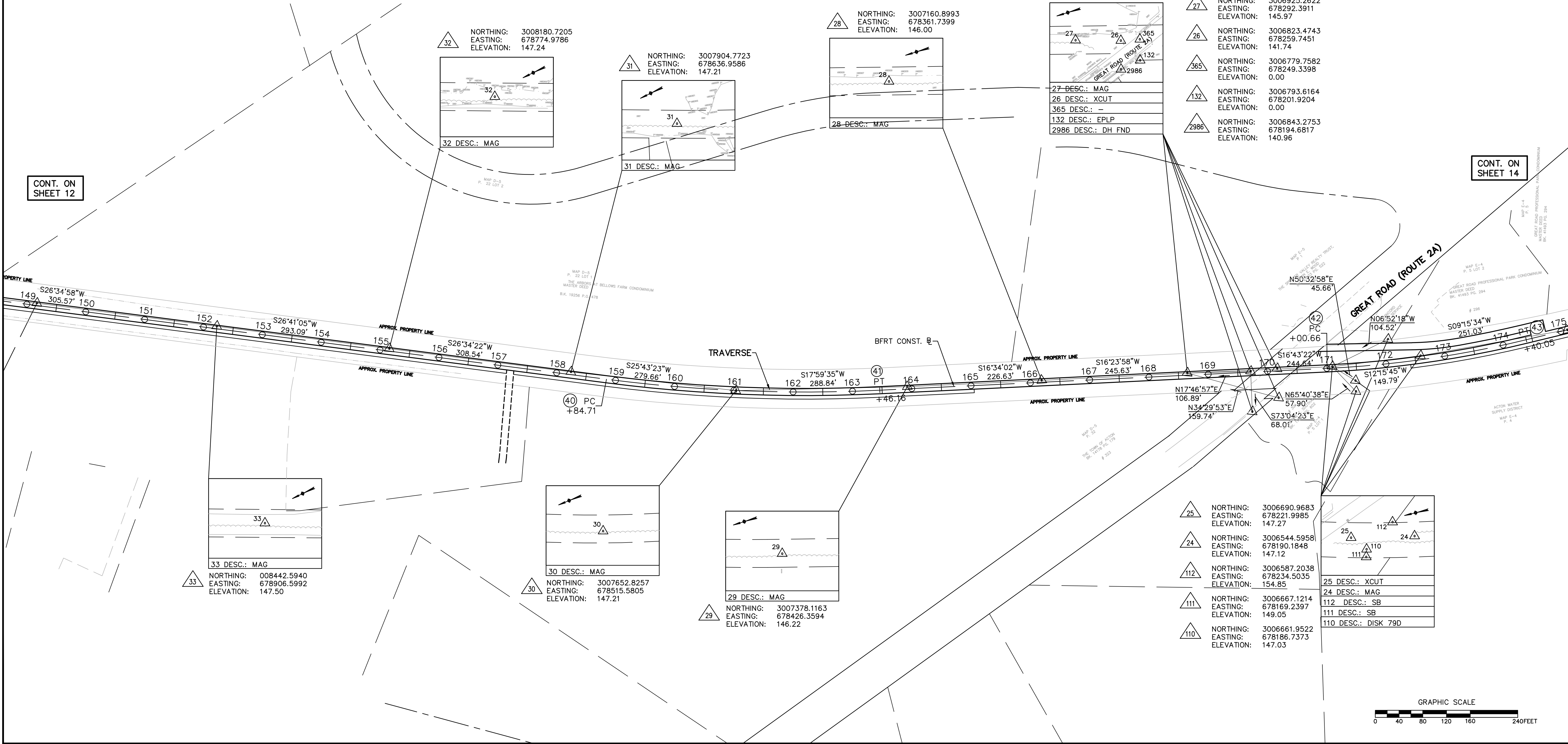
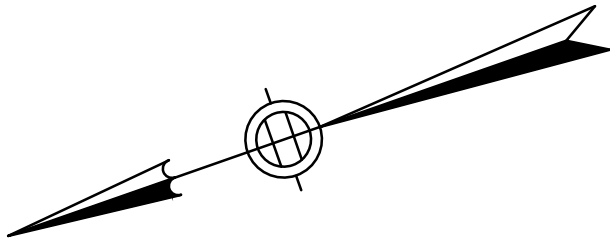
BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
35	115+21.47	128+31.61		S11° 08' 20"W 1310.13'	3011851.004	680236.979
36	128+31.61	135+18.62	R=1800.00' Δ=21°52'06" L=687.02' T=347.74'		3010565.550	679983.875
37	135+18.62	139+98.91		S33° 00' 27"W 480.29'	3009932.746	679727.264
38	139+98.91	142+87.13	R=2600.00' Δ=6°21'05" L=288.22' T=144.26'		3009529.977	679465.629
39	142+87.13	158+84.71		S26° 39' 21"W 1597.58'	3009280.075	679322.326
40	158+84.71	163+46.16	R=2600.00' Δ=10°10'08" L=461.45' T=231.33'		3007852.294	678605.602



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	13	151
PROJECT FILE NO.		604532	

CONSTRUCTION BASELINE TIES

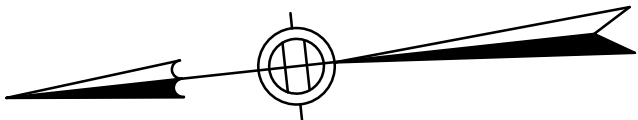
BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
39	142+87.13	158+84.71		S26° 39' 21"W 1597.58'	3009280.075	679322.326
40	158+84.71	163+46.16	R=2600.00' Δ=10°10'08" L=461.45' T=231.33'		3007852.294	678605.602
41	163+46.16	171+00.66		S16° 29' 13"W 754.50'	3007423.728	678436.168
42	171+00.66	174+40.05	R=1800.00' Δ=10°48'11" L=339.39' T=170.20'		3006700.251	678222.042
43	174+40.05	183+67.81		S5° 41' 02"W 927.76'	3006367.686	678156.883
44	183+67.81	187+32.70	R=2200.00' Δ=9°30'11" L=364.89' T=182.86'		3005444.485	678064.997



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	14	151
PROJECT FILE NO.			604532

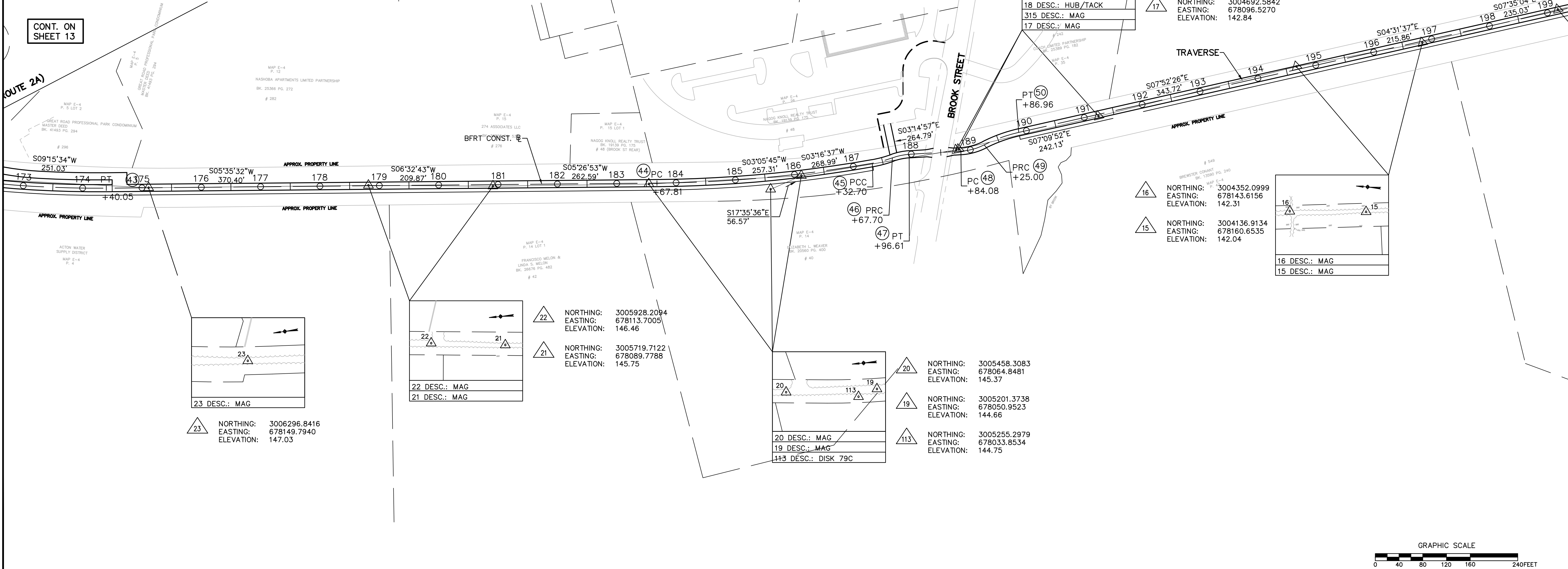
CONSTRUCTION BASELINE TIES

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
42	171+00.66	174+40.05	R=1800.00' Δ=10°48'11" L=339.39' T=170.20'		3006700.251	678222.042
43	174+40.05	183+67.81		S5° 41' 02"W 927.76'	3006367.686	678156.883
44	183+67.81	187+32.70	R=2200.00' Δ=9°30'11" L=364.89' T=182.86'		3005444.485	678064.997
45	187+32.70	187+67.70	R=200.00' Δ=10°01'43" L=35.01' T=17.55'		3005080.065	678059.066
46	187+67.70	187+96.61	R=100.00' Δ=16°33'55" L=28.91' T=14.56'		3005045.518	678064.435
47	187+96.61	188+84.08		S2° 43' 04"W 87.47'	3005016.842	678067.229
48	188+84.08	189+25.00	R=100.00' Δ=23°26'42" L=40.92' T=20.75'		3004929.470	678063.081
49	189+25.00	189+86.96	R=250.00' Δ=14°11'57" L=61.96' T=31.14'		3004889.337	678069.441
50	189+86.96	204+53.68		S6° 31' 41"E 1466.72'	3004829.280	678084.001
51	204+53.68	204+98.40	R=1000.00' Δ=2°33'45" L=44.73' T=22.37'		3003372.069	678250.752



CONT. ON
SHEET 13

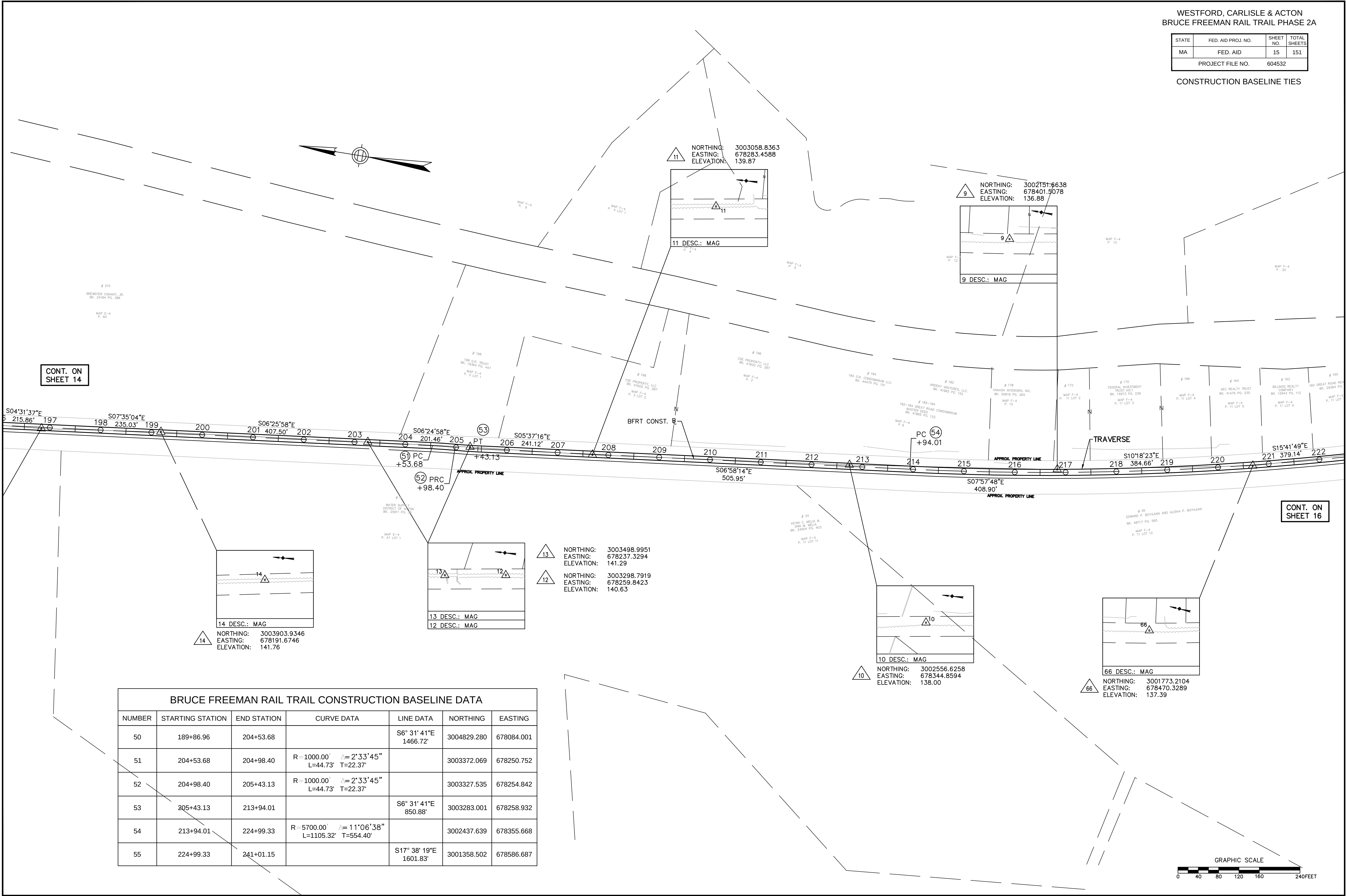
CONT. ON
SHEET 15



WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	15	151
PROJECT FILE NO. 604532			

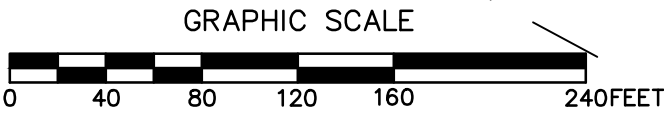
CONSTRUCTION BASELINE TIES



CONT. ON
SHEET 14

CONT. ON
SHEET 16

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
50	189+86.96	204+53.68		S6° 31' 41"E 1466.72'	3004829.280	678084.001
51	204+53.68	204+98.40	R=1000.00' Δ=2°33'45" L=44.73' T=22.37'		3003372.069	678250.752
52	204+98.40	205+43.13	R=1000.00' Δ=2°33'45" L=44.73' T=22.37'		3003327.535	678254.842
53	205+43.13	213+94.01		S6° 31' 41"E 850.88'	3003283.001	678258.932
54	213+94.01	224+99.33	R=5700.00' Δ=11°06'38" L=1105.32' T=554.40'		3002437.639	678355.668
55	224+99.33	241+01.15		S17° 38' 19"E 1601.83'	3001358.502	678586.687

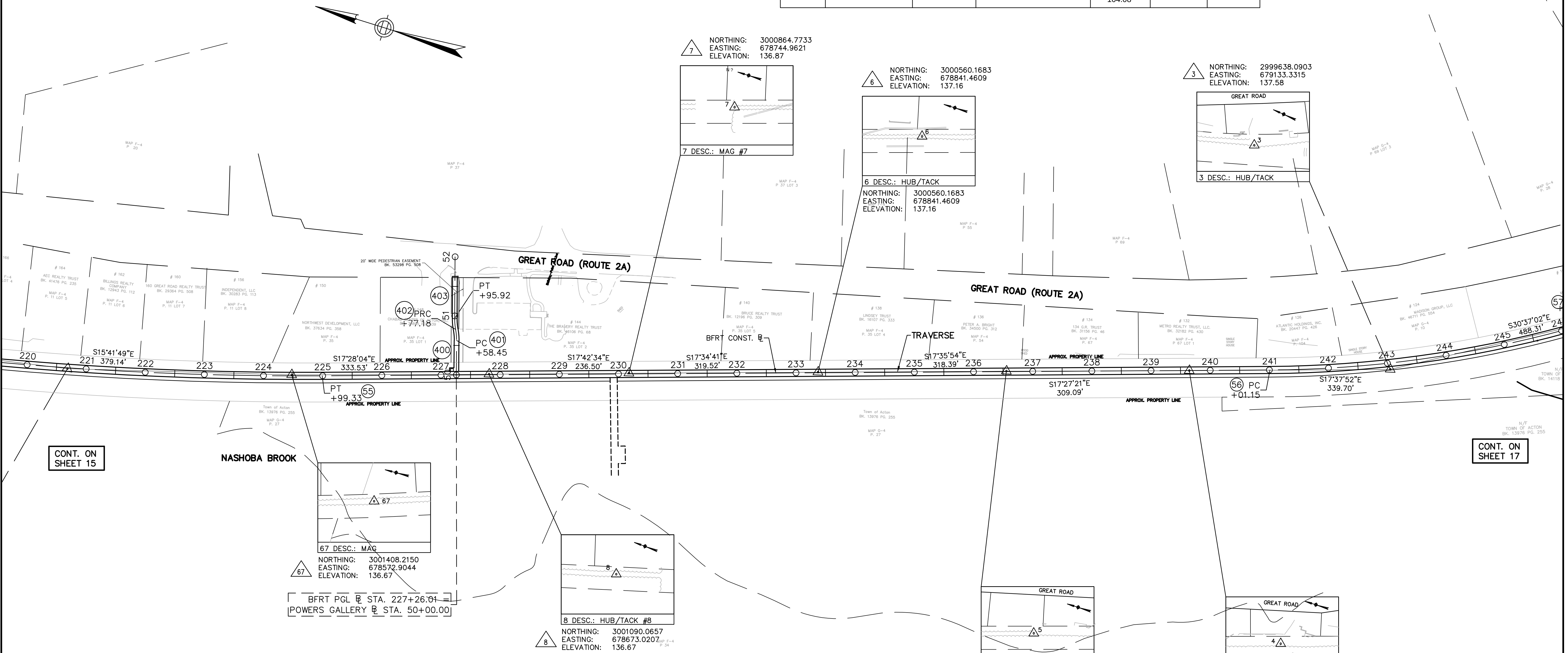


Powers Gallery CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
400	50+00.00	50+58.45		N73° 06' 59"E 58.45'	3001142.474	678655.375
401	50+58.45	50+77.18	R=100.00' Δ= 10°44'05" L=18.74' T=9.40'		3001159.449	678711.304
402	50+77.18	50+95.92	R=100.00' Δ= 10°44'05" L=18.74' T=9.40'		3001166.533	678728.619
403	50+95.92	52+00.00		N73° 06' 59"E 104.08'	3001173.617	678745.934

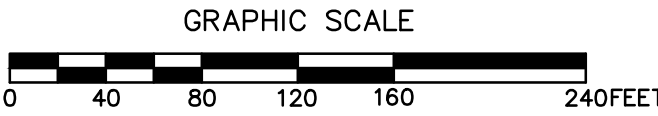
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	16	151
PROJECT FILE NO.		604532	

CONSTRUCTION BASELINE TIES



BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
54	213+94.01	224+99.33	R=5700.00' Δ= 11°06'38" L=1105.32' T=554.40'		3002437.639	678355.668
55	224+99.33	241+01.15		S17° 38' 19"E 1601.83'	3001358.502	678586.687
56	241+01.15	246+72.09	R=1950.00' Δ= 16°46'31" L=570.93' T=287.52'		2999831.983	679072.059
57	246+72.09	247+11.24	R=300.00' Δ= 7°28'39" L=39.15' T=19.60'		2999320.777	679321.681



WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	17	151
PROJECT FILE NO.			604532

CONSTRUCTION BASELINE TIES

207	NORTHING: 2997566.5193 EASTING: 680432.5052 ELEVATION: 131.66
213	NORTHING: 2997630.1402 EASTING: 680327.1853 ELEVATION: 132.55
214	NORTHING: 2997464.1039 EASTING: 680416.4326 ELEVATION: 130.84

207	DESC.: MAG
213	DESC.: MAG
214	DESC.: MAG

206	NORTHING: 2997832.1792 EASTING: 680265.9567 ELEVATION: 131.50
-----	---

206	DESC.: MAG
-----	------------

205	NORTHING: 2998142.5020 EASTING: 680150.5427 ELEVATION: 131.44
127	NORTHING: 2998134.9612 EASTING: 680118.9142 ELEVATION: 0.00

205	DESC.: MAG
127	DESC.: SB DH

END PROJECT
STA. 268+00.00
MEET EXISTING
N 2997505.5722
E 680386.4136

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA

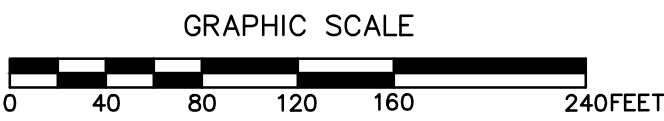
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
56	241+01.15	246+72.09	R=1950.00' Δ=16°46'31" L=570.93' T=287.52'		2999831.983	679072.059
57	246+72.09	247+11.24	R=300.00' Δ=7°28'39" L=39.15' T=19.60'		2999320.777	679321.681
58	247+11.24	247+89.94	R=250.00' Δ=18°02'14" L=78.70' T=39.68'		2999290.011	679345.851
59	247+89.94	248+37.31		S23° 51' 15"E 47.37'	2999224.183	679388.393
60	248+37.31	248+98.28	R=100.00' Δ=34°56'05" L=60.97' T=31.47'		2999180.860	679407.550
61	248+98.28	249+68.32	R=200.00' Δ=20°03'51" L=70.04' T=35.38'		2999135.775	679447.188
62	249+68.32	253+43.22		S38° 43' 29"E 374.90'	2999089.838	679499.582

BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
63	253+43.22	260+41.97	R=3000.00' Δ=13°20'43" L=698.76' T=350.97'		2998797.357	679734.111
64	260+41.97	260+78.84	R=100.00' Δ=21°07'12" L=36.86' T=18.64'		2998206.453	680104.096
65	260+78.84	261+04.70		S4° 15' 34"E 25.87'	2998171.019	680113.471
66	261+04.70	261+38.14	R=100.00' Δ=19°09'36" L=33.44' T=16.88'		2998145.225	680115.392
67	261+38.14	270+95.09		S23° 25' 09"E 956.95'	2998112.907	680123.354

138	NORTHING: 2997604.1374 EASTING: 680020.5991 ELEVATION: 131.44
139	NORTHING: 2997529.5542 EASTING: 680007.3340 ELEVATION: 131.44
140	NORTHING: 2997446.3641 EASTING: 679991.7048 ELEVATION: 131.44
141	NORTHING: 2997438.8678 EASTING: 680029.3349 ELEVATION: 131.44
220	NORTHING: 2997434.7326 EASTING: 680019.2714 ELEVATION: 131.44

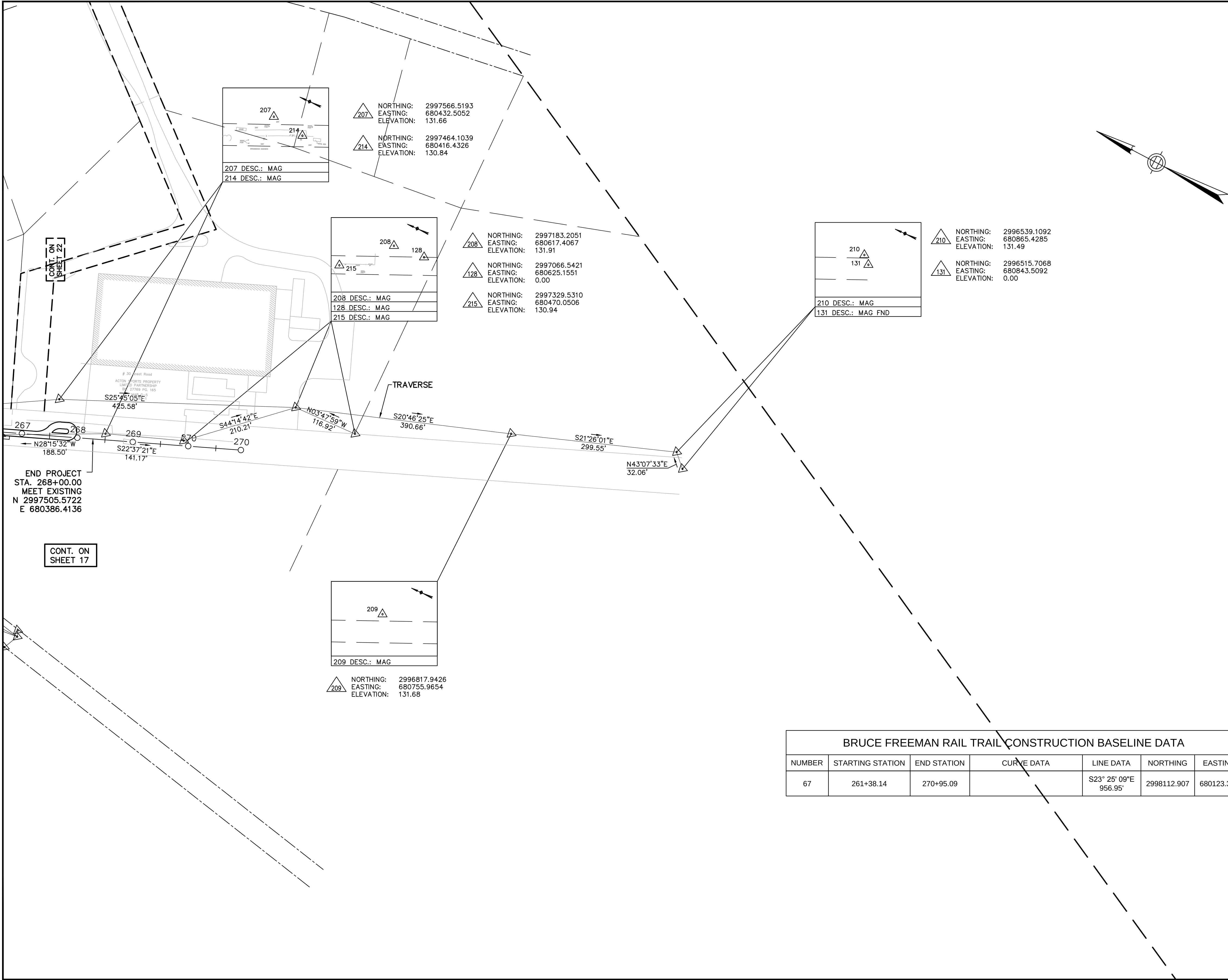
138	DESC.: IP
139	DESC.: DH
140	DESC.: IP
141	DESC.: SB DH
220	DESC.: MAG



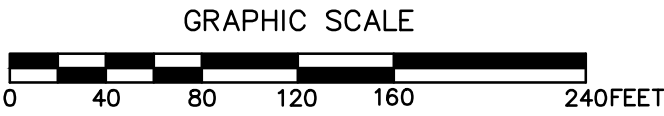
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

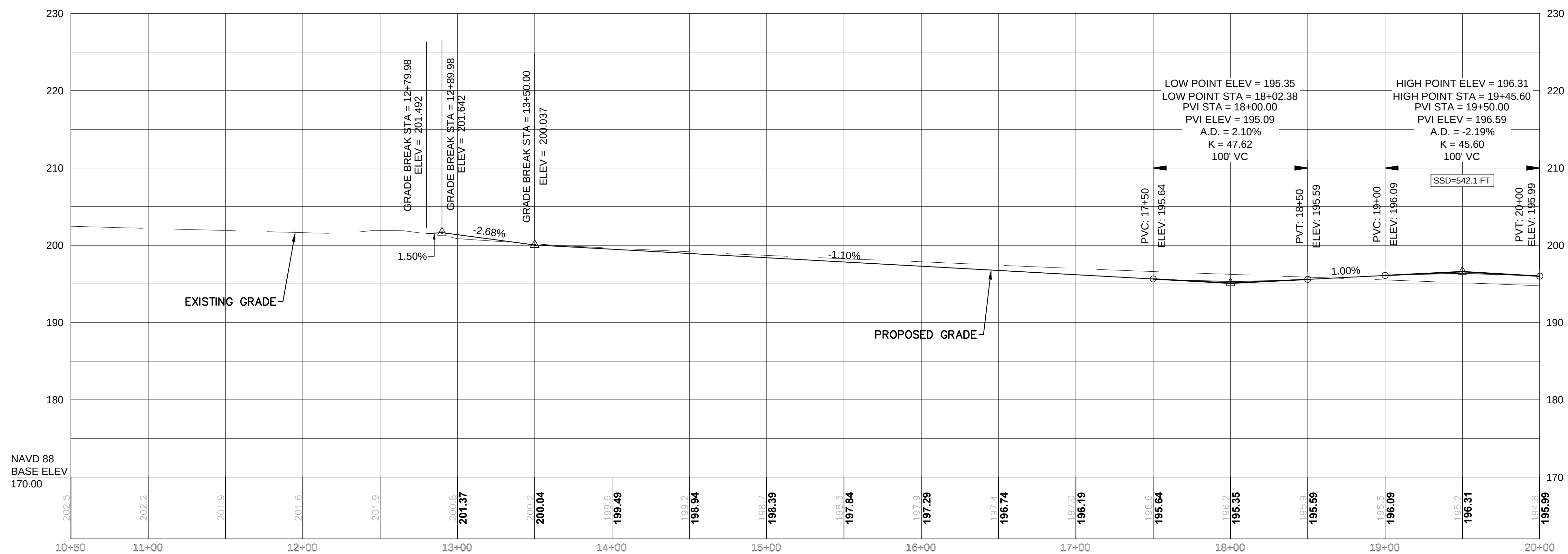
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	18	151
PROJECT FILE NO.		604532	

CONSTRUCTION BASELINE TIES



BRUCE FREEMAN RAIL TRAIL CONSTRUCTION BASELINE DATA						
NUMBER	STARTING STATION	END STATION	CURVE DATA	LINE DATA	NORTHING	EASTING
67	261+38.14	270+95.09		S23° 25' 09"E 956.95'	2998112.907	680123.354





HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

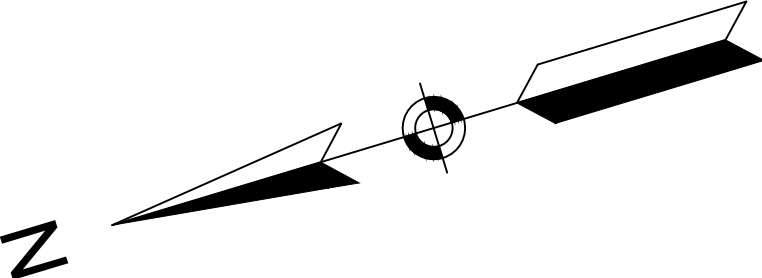
STA. 27+25 RT TO STA. 28+52 RT
 STA. 27+75 LT TO STA. 39+25 RT
 STA. 28+68 RT TO STA. 39+25 RT
 ACTON GARAGE PARKING STA. 20+12 LT TO STA. 23+13 LT
 ACTON GARAGE PARKING STA. 20+12 RT TO STA. 23+13 RT

N/F
 ERIC DARLING AND
 MARGARET E. BALTZ
 BK. 2273 PG. 250

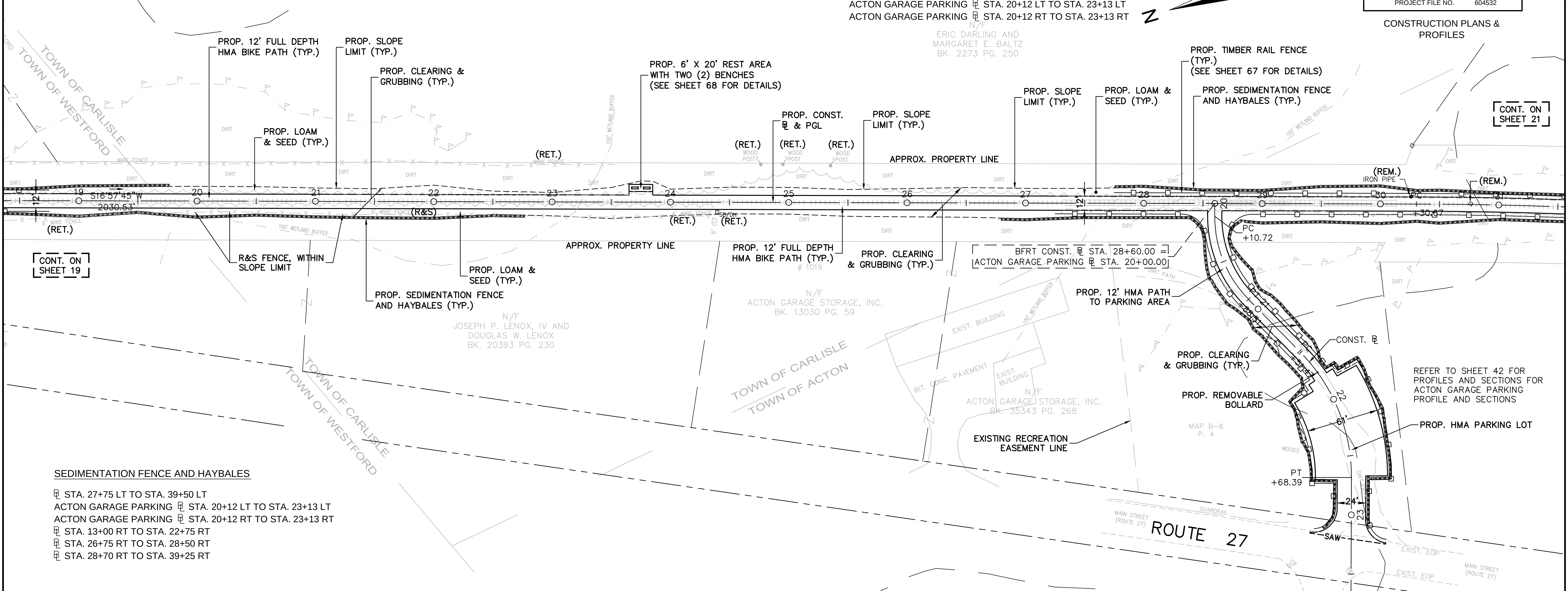
WESTFORD, CARLISLE & ACTON BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	20	151
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & PROFILES

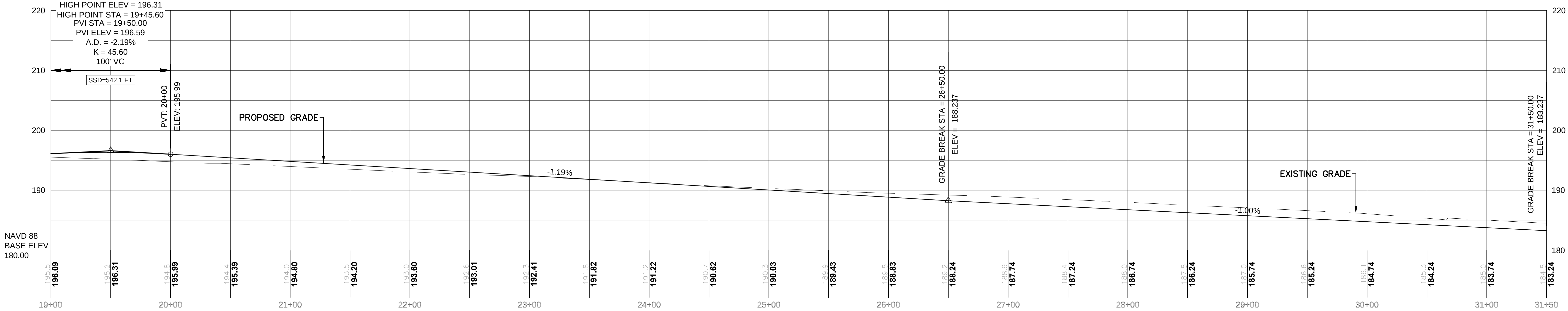
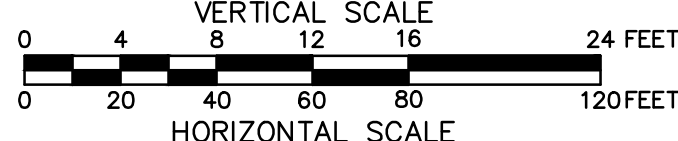


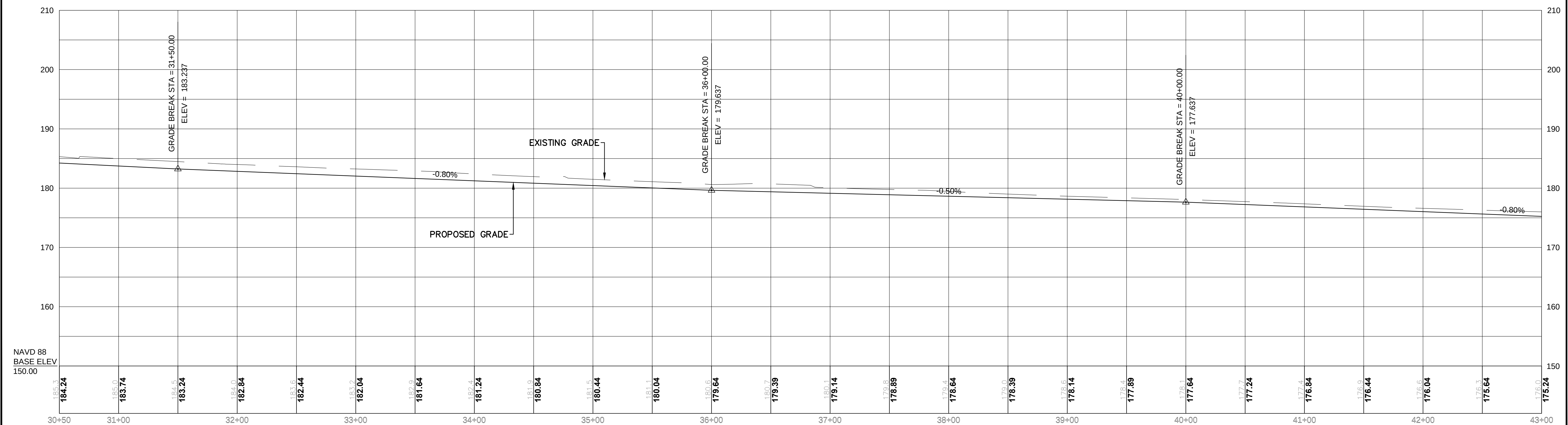
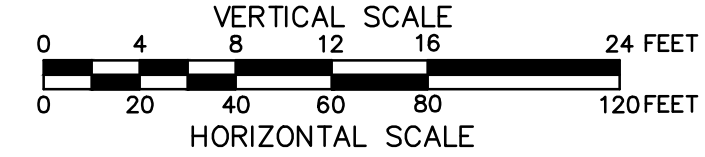
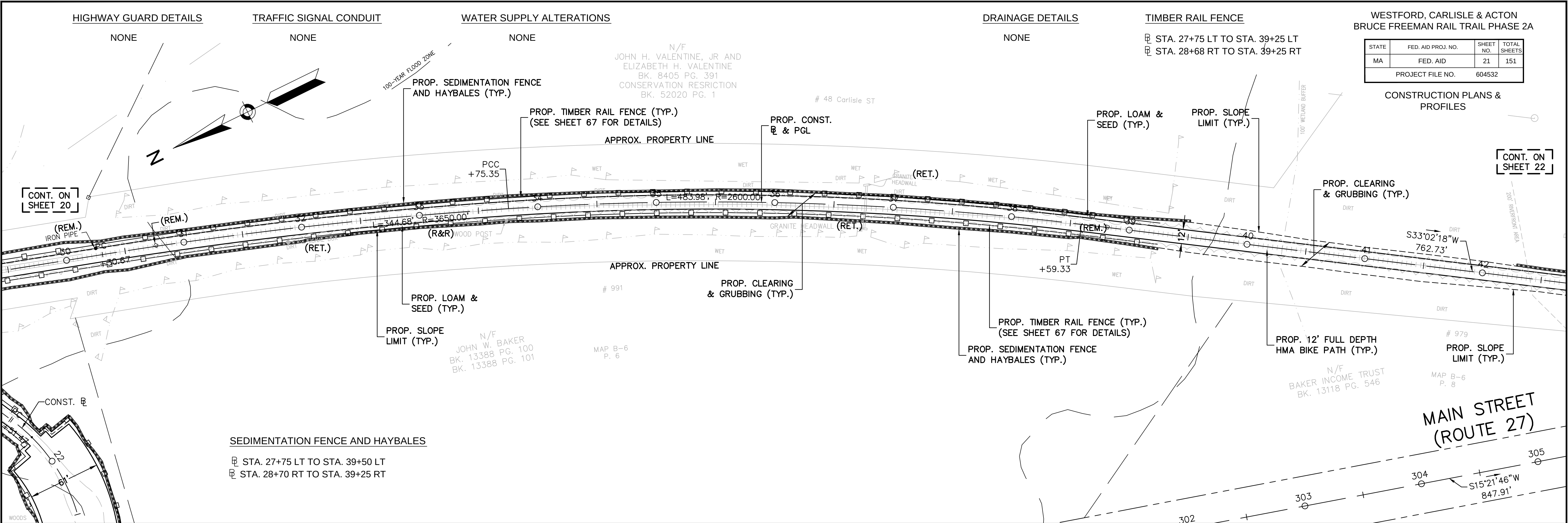
[CONT. ON
 SHEET 21]



SEDIMENTATION FENCE AND HAYBALES

STA. 27+75 LT TO STA. 39+50 LT
 ACTON GARAGE PARKING STA. 20+12 LT TO STA. 23+13 LT
 ACTON GARAGE PARKING STA. 20+12 RT TO STA. 23+13 RT
 STA. 13+00 RT TO STA. 22+75 RT
 STA. 26+75 RT TO STA. 28+50 RT
 STA. 28+70 RT TO STA. 39+25 RT

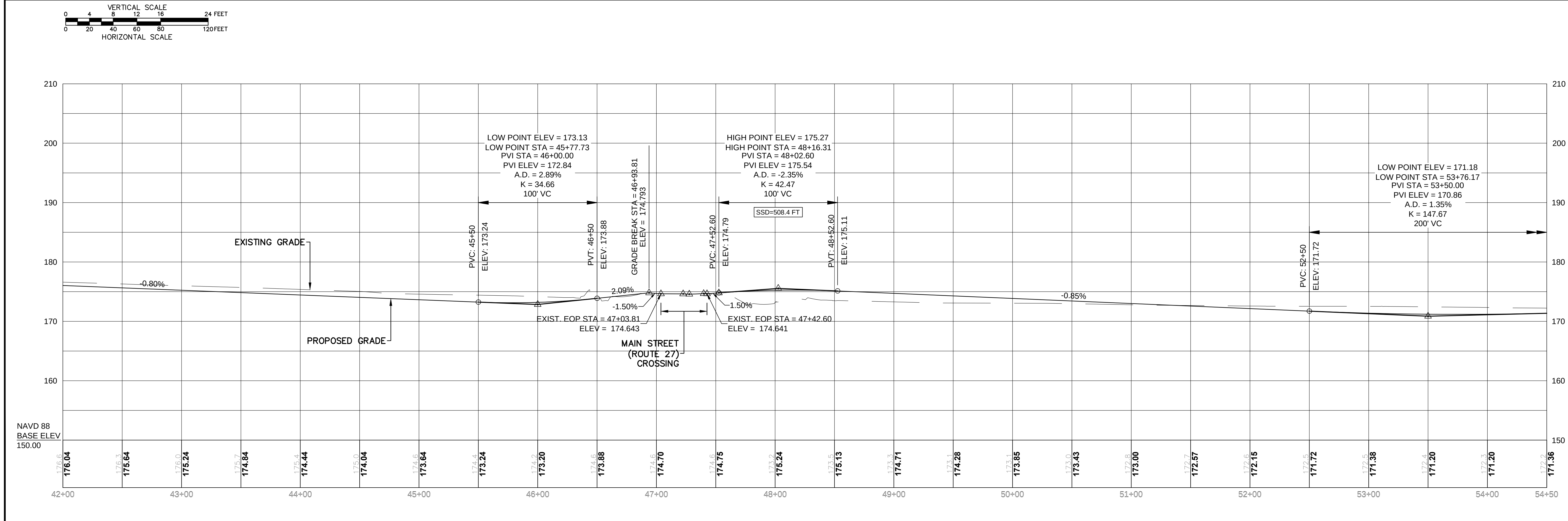




WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	21	151
PROJECT FILE NO. 604532			

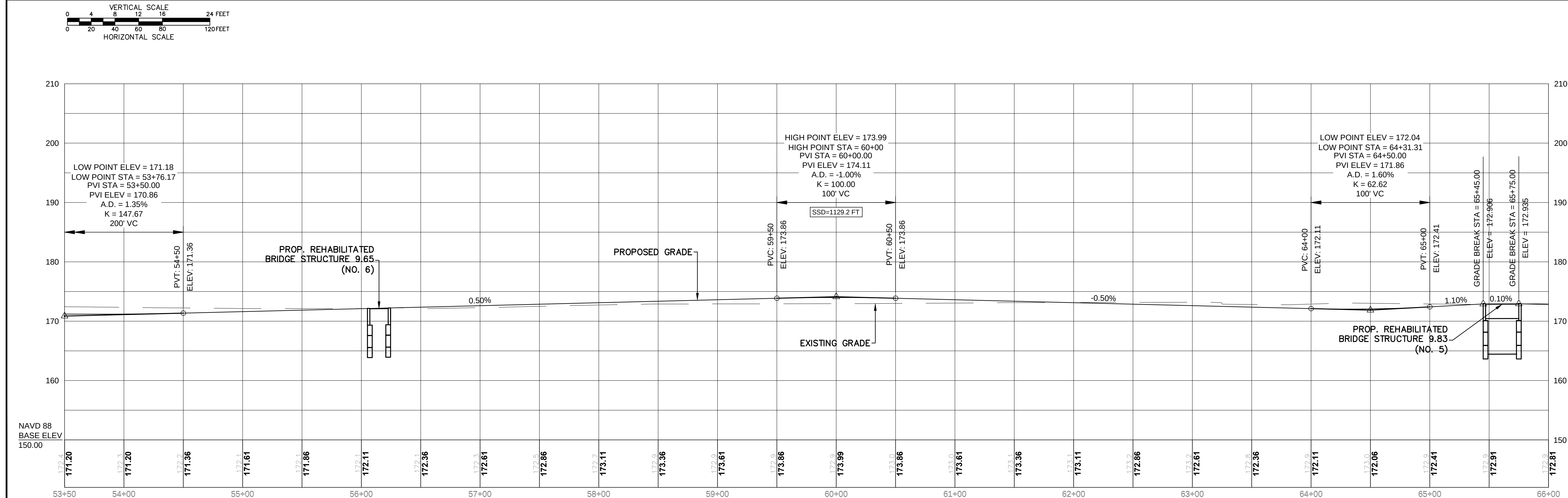
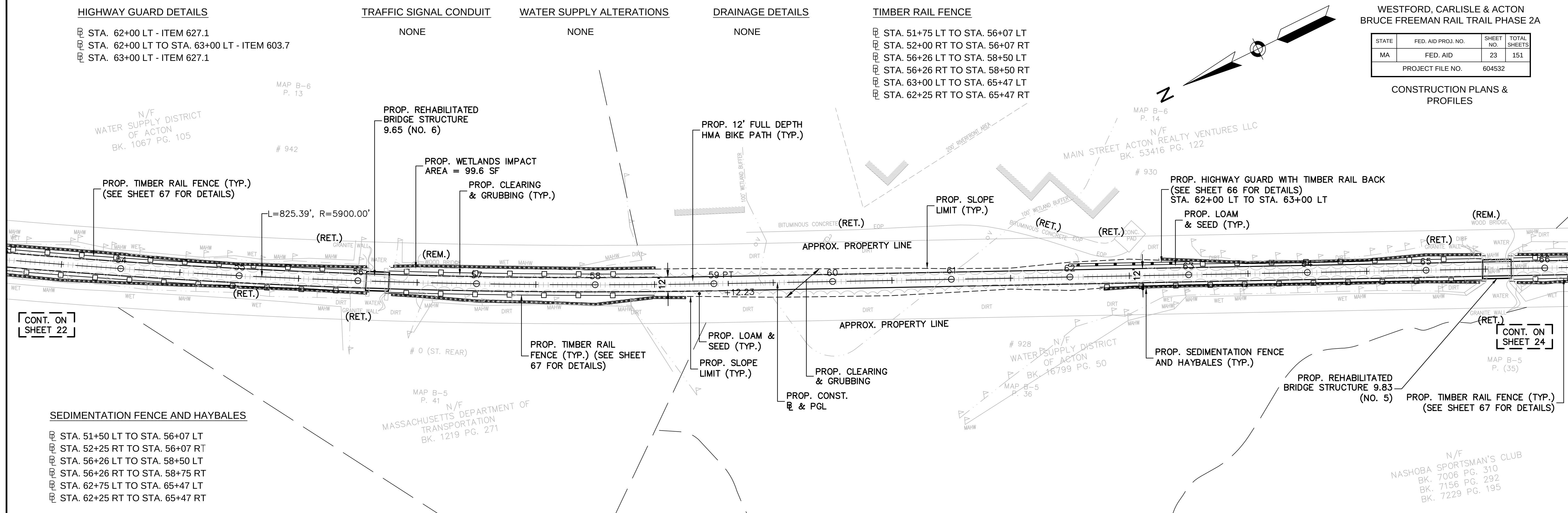
CONSTRUCTION PLANS & PROFILES

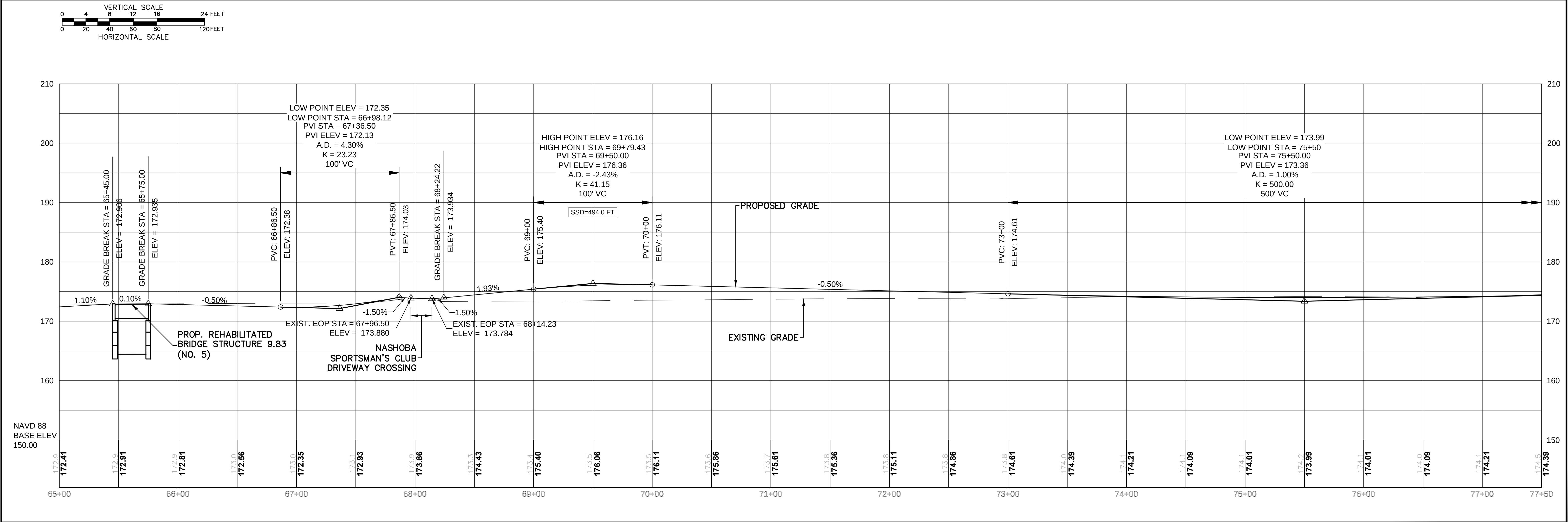
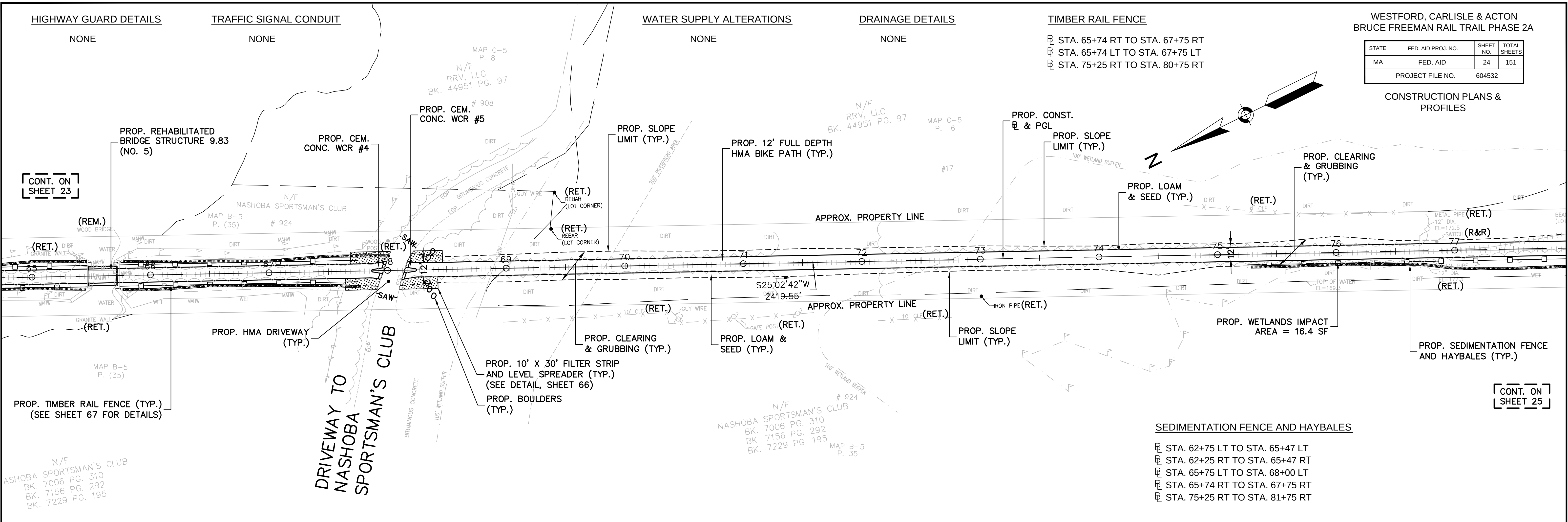


WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	23	151
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & PROFILES





STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	25	151
PROJECT FILE NO.		604532	

1

STA. 95+50 LT - ITEM 627.1
STA. 95+50 LT TO STA. 101+10 LT - ITEM 603.7

NONE

NONE

SEE BELOW

- ④ STA. 75+25 RT TO STA. 80+75 RT
- ④ STA. 83+25 LT TO STA. 85+25 LT
- ④ STA. 84+25 RT TO STA. 85+75 RT
- ④ STA. 88+25 LT TO STA. 89+25 LT
- ④ STA. 90+75 LT TO STA. 92+75 LT

CONT. ON
SHEET 24

PROP. 12' FULL DEPTH
HMA BIKE PATH (TYP.)

PROP. SLOPE
LIMIT (TYP.)

PROP. CLEARING
& GRUBBING (TYP.)
(RET.) DIRT

PROP. LOAM
& SEED (TYP.)

APPROX. PROPERTY LINE

PROP. 12' FULL DEPTH
HMA BIKE PATH (TYP.)

PROP. WETLANDS IMPACT
AREA = 5.6 SF

PROP. SEDIMENTATION FENCE
AND HAYBALES (TYP.)

PROP. WETLANDS IMPACT
AREA = 29.8 SF

PROP. TIMBER RAIL FENCE (TYP.
(SEE SHEET 67 FOR DETAILS)

PROP. CONST.
B & PGL

DIRT
R&D PORTION
FENCE WITHIN

APPROX. PROPERTY LINE
PROP. WETLANDS IMPACT
AREA = 227.5 SF

PROP. CLEARING
& GRUBBING (TYP.)

PROP. TEMP.
EASEMENT (TYP.)

☐ PROP. LOAM
 & SEED (TYP.)
☐ PROP. TEMP.
 EASEMENT (TYP.)
☒ PROP. PERM.
 EASEMENT (TYP.)
☐ PROP. SLOPE
 LIMIT (TYP.)

PROP. HIGHWAY GUARD WITH TIMBER RAIL BACK (TYP.)
(SEE SHEET 66 FOR DETAILS)

CONT. ON
SHEET 27

SEDIMENTATION FENCE AND HAYBALES

- ④ STA. 75+25 RT TO STA. 81+75 RT
- ④ STA. 84+25 LT TO STA. 85+25 LT
- ④ STA. 83+75 RT TO STA. 85+75 RT
- ④ STA. 87+75 LT TO STA. 93+25 LT
- ④ STA. 92+25 RT TO STA. 94+25 RT

PROJ.	PROP.	PERM.	EASEMENT (TYP.)
1	2	3	4

PROP. 12' FULL DEPTH
HMA BIKE PATH (TYP.)

PRC
+00.27

PROP. 6'
CLF (TYP.)

DEPTH AND LOCATION OF EXIST. DRY
HYDRANT LINE TO BE VERIFIED BY
CONTRACTOR PRIOR TO CONSTRUCTION

PROP. SEDIMENTATION
AND HAYBALES (TYP.)

PROP. TEMP. EASEMEN
(TYP.)

PROP. LOAM
& SEED (TYP.)

R&R EXISTING
ACCESS GATE

PT
+05.10

PROP. 8' X 20'
REST AREA WITH
FOUR (4) BENCHES

R&R BOULDERS
(SEE NOTE 1)

ET. 7

PROP. 12' FULL DEPTH
HMA BIKE PATH (TYP.)

PROP. CONST.
B & PGL

PROP. SLOPE
LIMIT (TYP.)

PROP. PERM
EASEMENT (TYP.)

PROP. LOAM
& SEED
(TYP.)

PROP. SLOPE
LIMIT (TYP.)

NOTE 1: THE PROP. LOCATION OF ALL BOULDERS PROPOSED AS (R&R) WITHIN NARA PARK, SHALL BE COORDINATED WITH THE TOWN OF ACTON DURING CONSTRUCTION

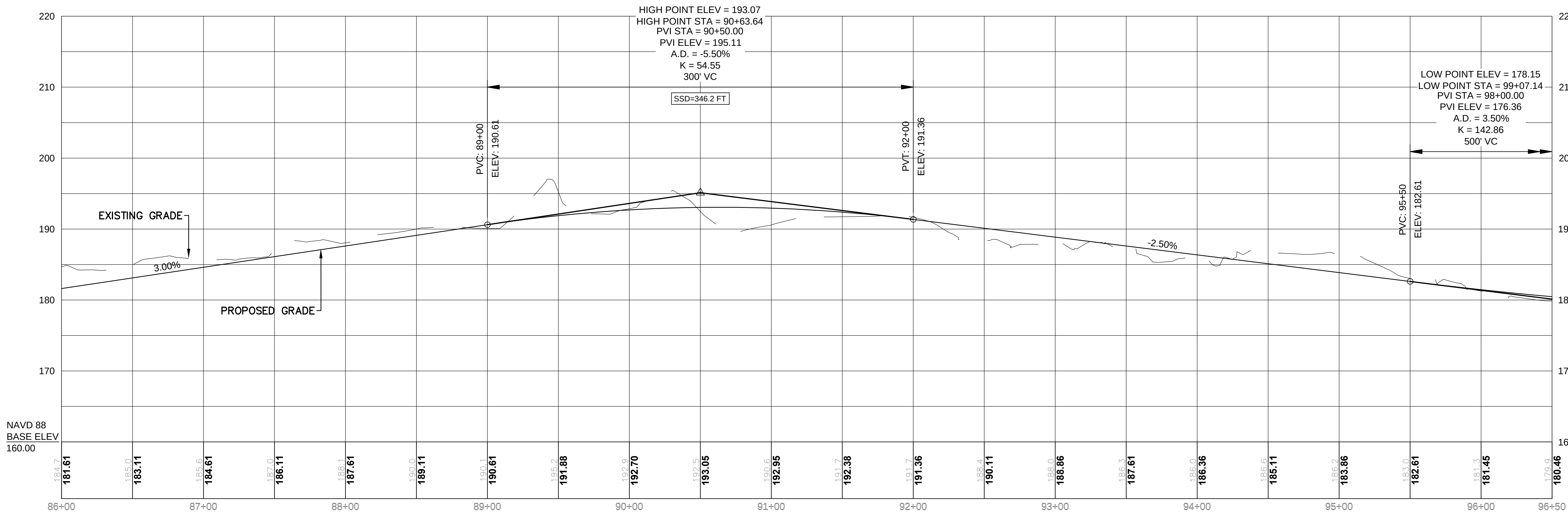
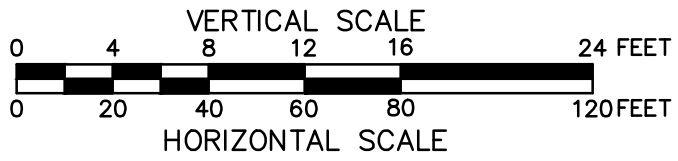
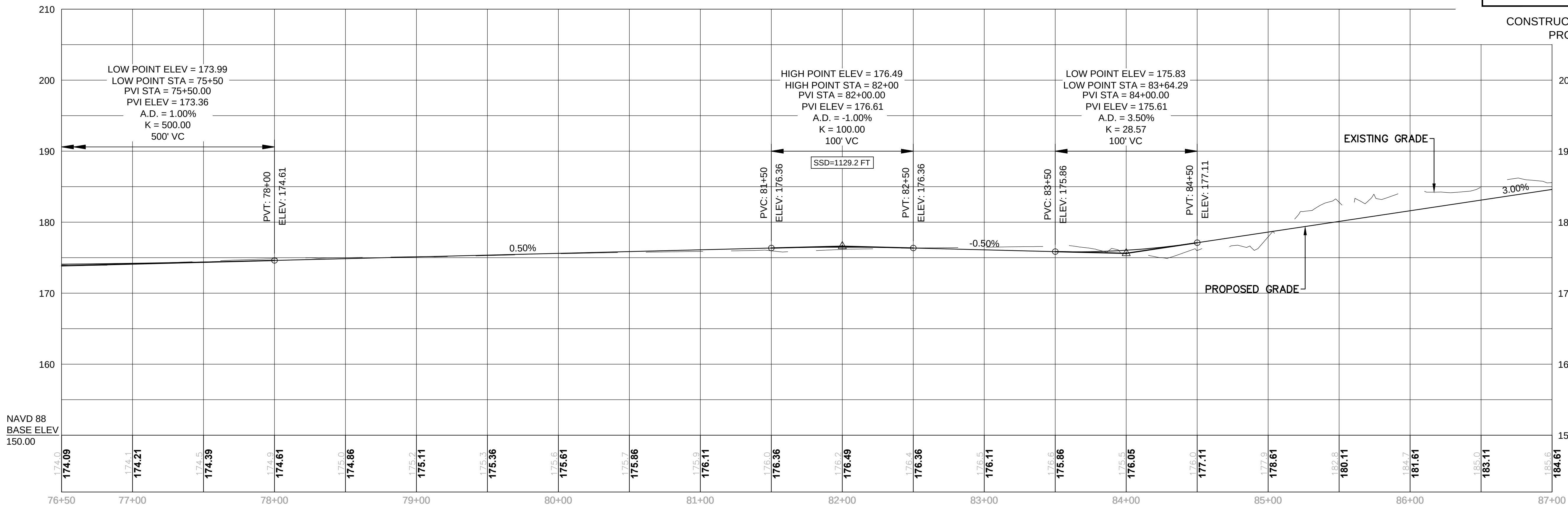
FOR PROFILE: SEE SHEET NO. 26

MassDOT DWT Version:

WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

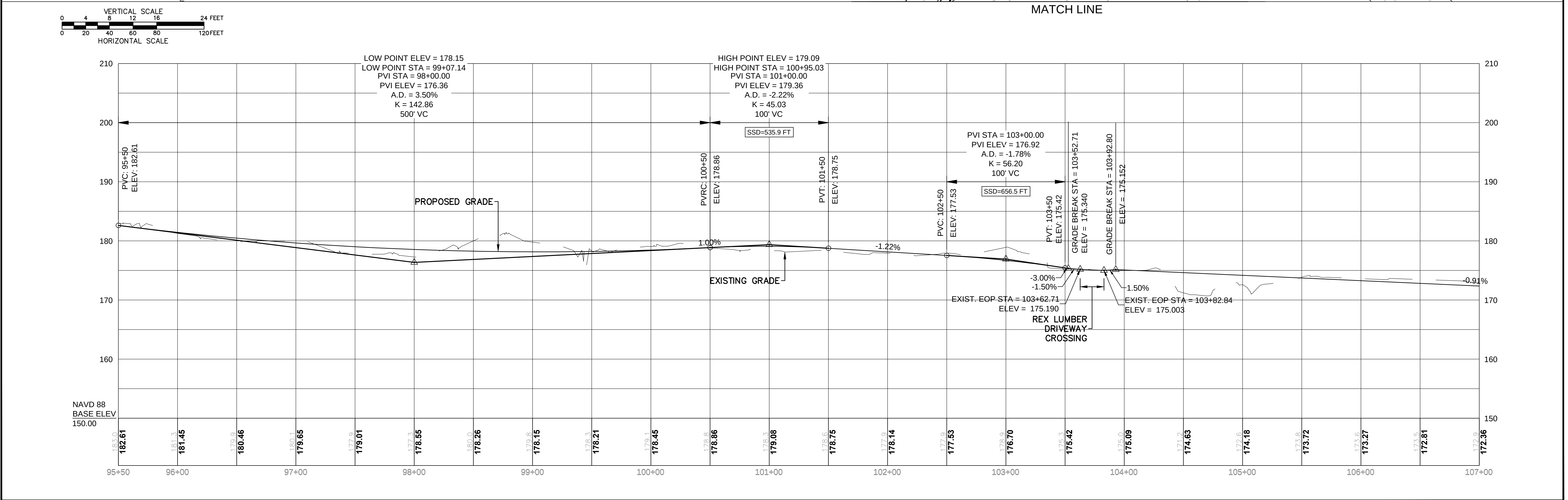
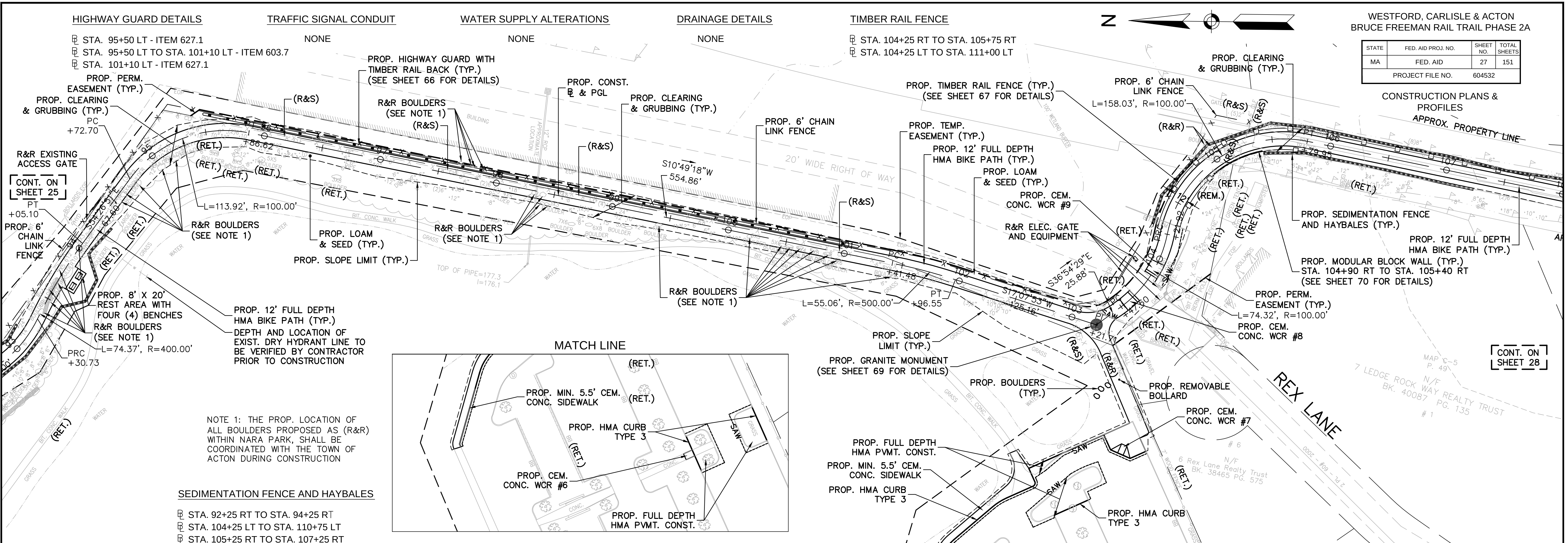
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	26	151
PROJECT FILE NO.		604532	

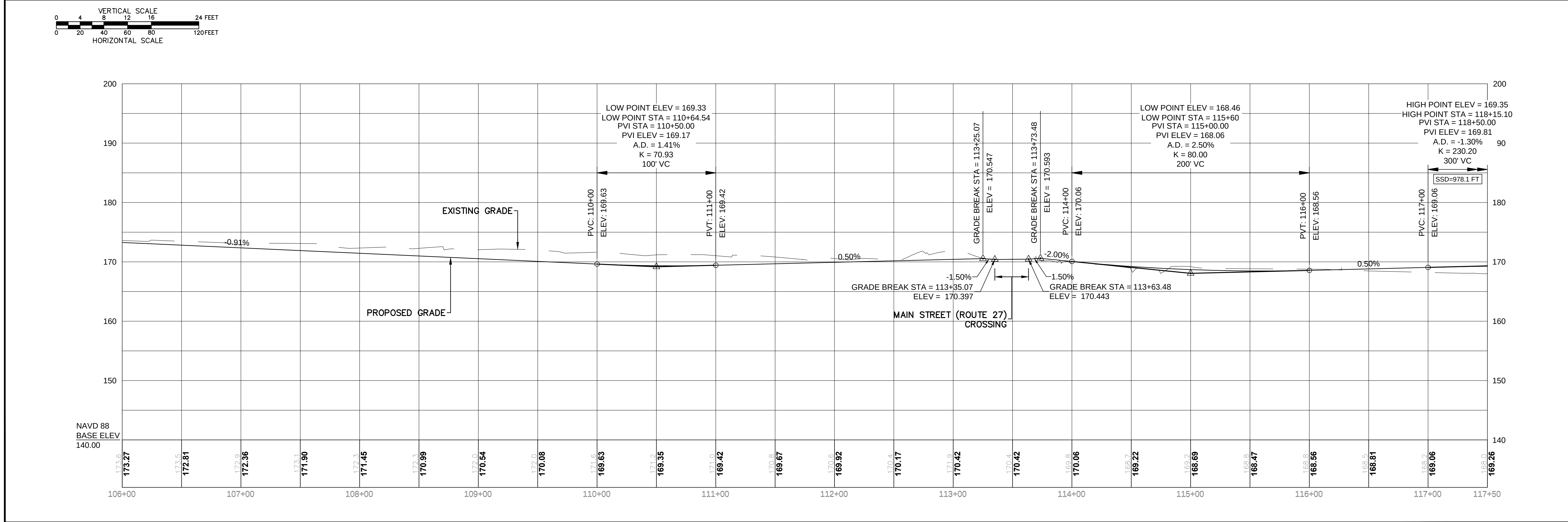
CONSTRUCTION PLANS &
PROFILES



FOR CONSTRUCTION PLANS: SEE SHEET NO. 25

MassDOT DWF Version:





HIGHWAY GUARD DETAILS

STA. 116+29 RT TO STA. 120+21RT - ITEM 603.7
 STA. 120+21 RT - ITEM 627.1

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

HIGHWAY GUARD WITH TIMBER RAIL BACK

STA. 116+30 RT TO STA. 120+20 RT

TIMBER RAIL FENCE

STA. 114+85 LT TO STA. 116+75 LT
 STA. 123+75 RT TO STA. 131+75 RT

SEDIMENTATION FENCE AND HAYBALES

STA. 116+75 LT TO STA. 117+25 LT
 STA. 116+37 RT TO STA. 117+35 RT
 STA. 122+75 RT TO STA. 138+75 RT

WESTFORD, CARLISLE & ACTON
 BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	29	151
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS &
 PROFILES

CONT. ON
 SHEET 28

(REM.) TRANSITION BIKE PATH
 FROM 8' TO 12'
 (STA. 116+67 TO 117+08)

PROP. WETLANDS IMPACT
 AREA = 5.2 SF

PROP. WETLANDS IMPACT
 AREA = 1906.0 SF

PROP. 12' FULL DEPTH
 HMA BIKE PATH (TYP.)

PROP. CLEARING
 & GRUBBING

PROP. SLOPE
 LIMIT (TYP.)

PROP. CONST.
 E & PGL

PROP. 12' FULL DEPTH
 HMA BIKE PATH (TYP.)

PROP. SLOPE
 LIMIT (TYP.)

(RET.)

PROP. FULL
 DEPTH HMA
 DRIVEWAY

PROP. EOP
 PROP. GRAVEL
 DRIVEWAY

REBUILD EXIST.
 GRANITE HEADWALL
 (SEE NOTE 1)

NOTE 1:
 PROP. DRAINAGE IN THE AREA OF
 STA. 114+00 TO 118+00 IS TO BE
 COORDINATED WITH THE PROPOSED
 DRAINAGE PLANS BEING PREPARED
 FOR THE TOWN OF ACTON.

PROP. EDGE
 OF GRAVEL

PROP. HIGHWAY GUARD WITH
 TIMBER RAIL BACK (TYP.)
 (SEE SHEET 67 FOR DETAILS)

PROP. LOAM
 & SEED (TYP.)

PROP. 6' STONE
 DUST TRAIL (TYP.)

EXISTING 15' WIDE
 RIGHT OF WAY

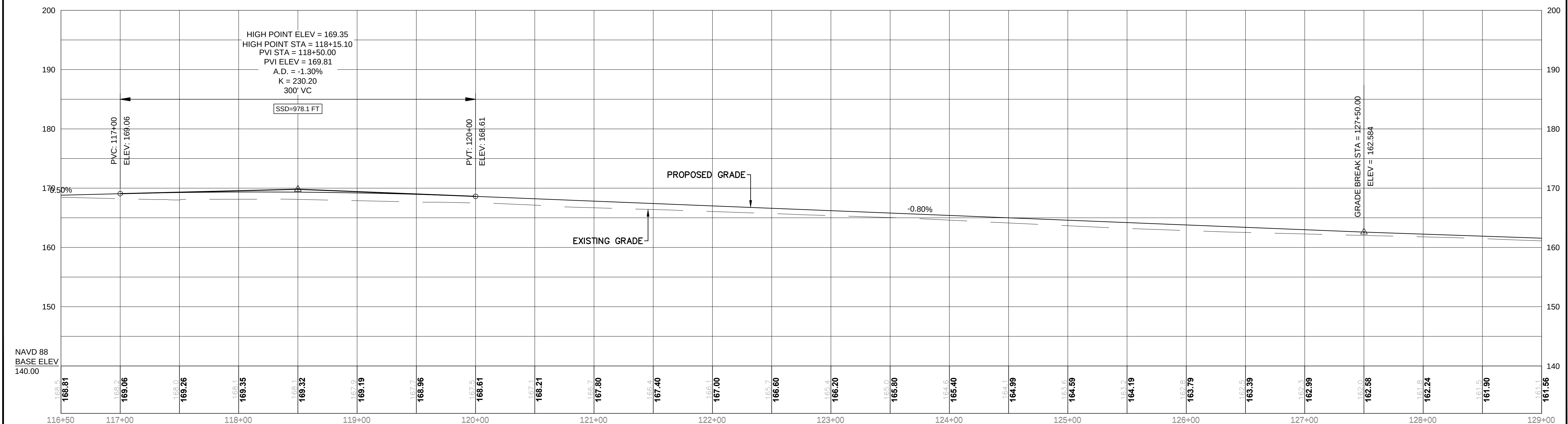
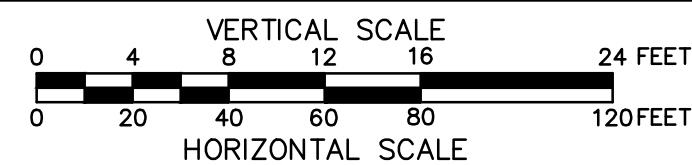
PROP. CLEARING
 & GRUBBING (TYP.)

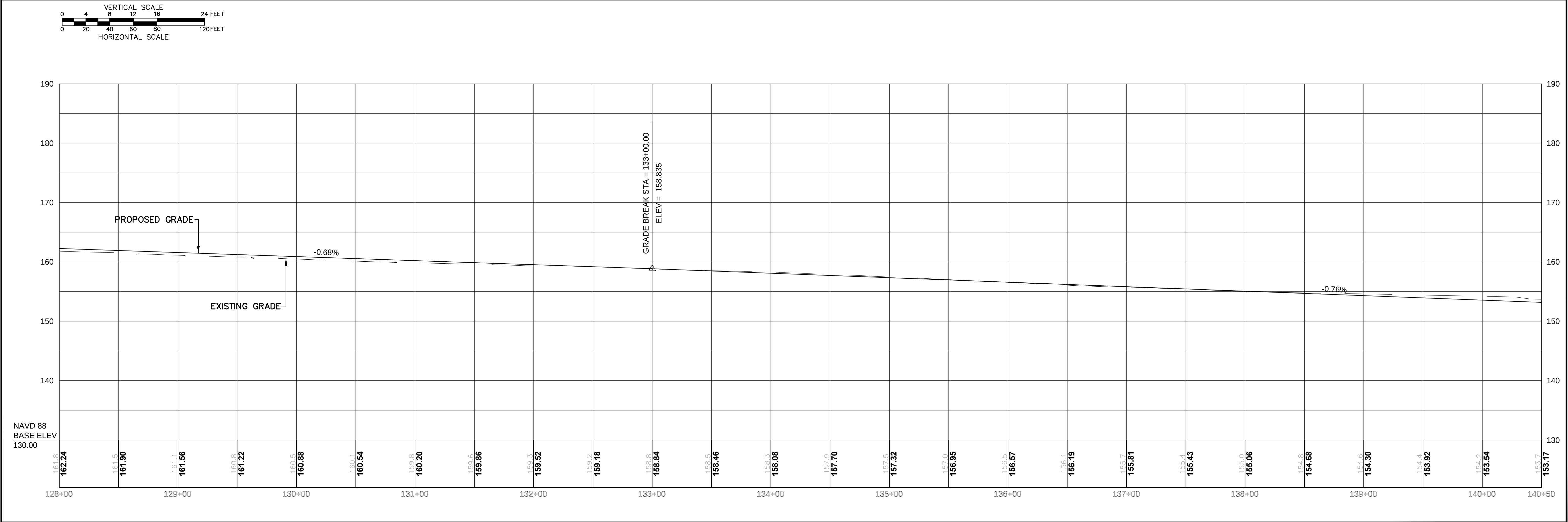
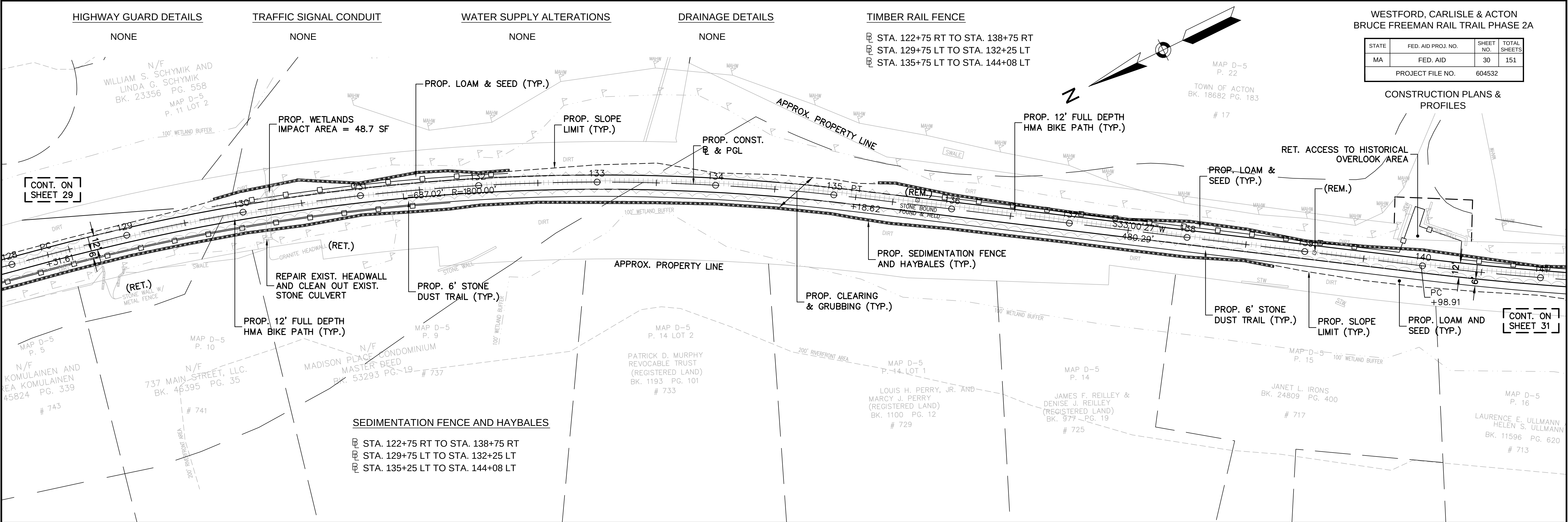
APPROX. PROPERTY LINE
 PROP. TIMBER RAIL FENCE (TYP.)
 (SEE SHEET 67 FOR DETAILS)

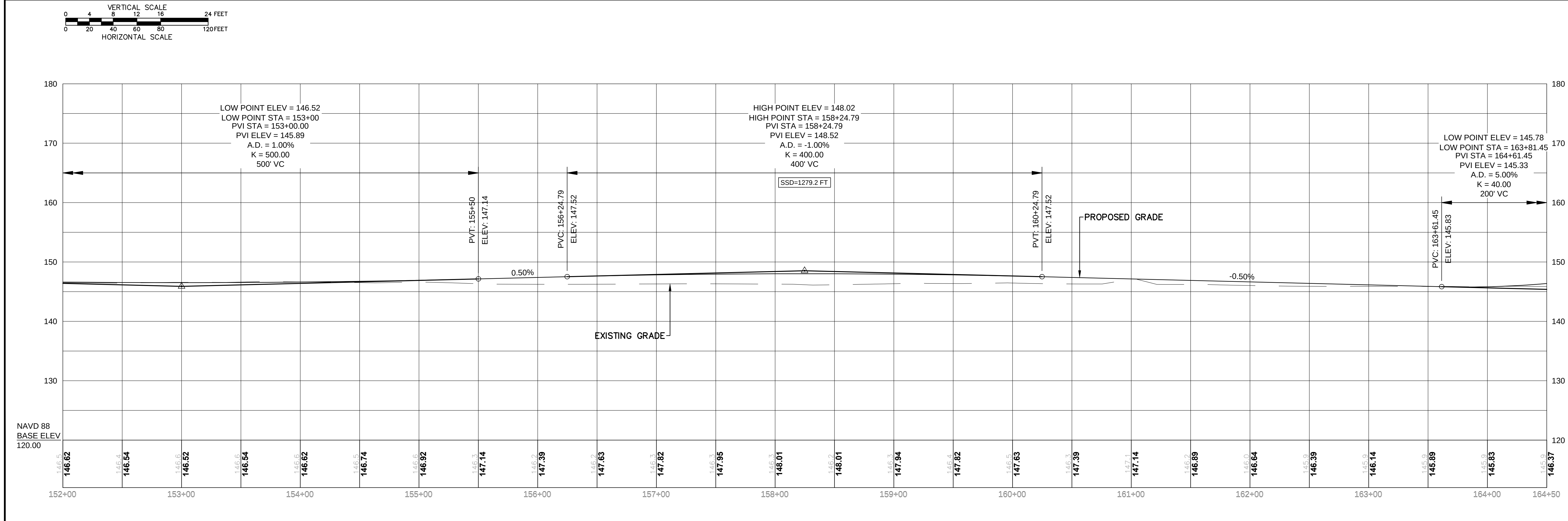
PROP. SEDIMENTATION FENCE
 AND HAYBALES (TYP.)

PROP. 6' STONE
 DUST TRAIL (TYP.)

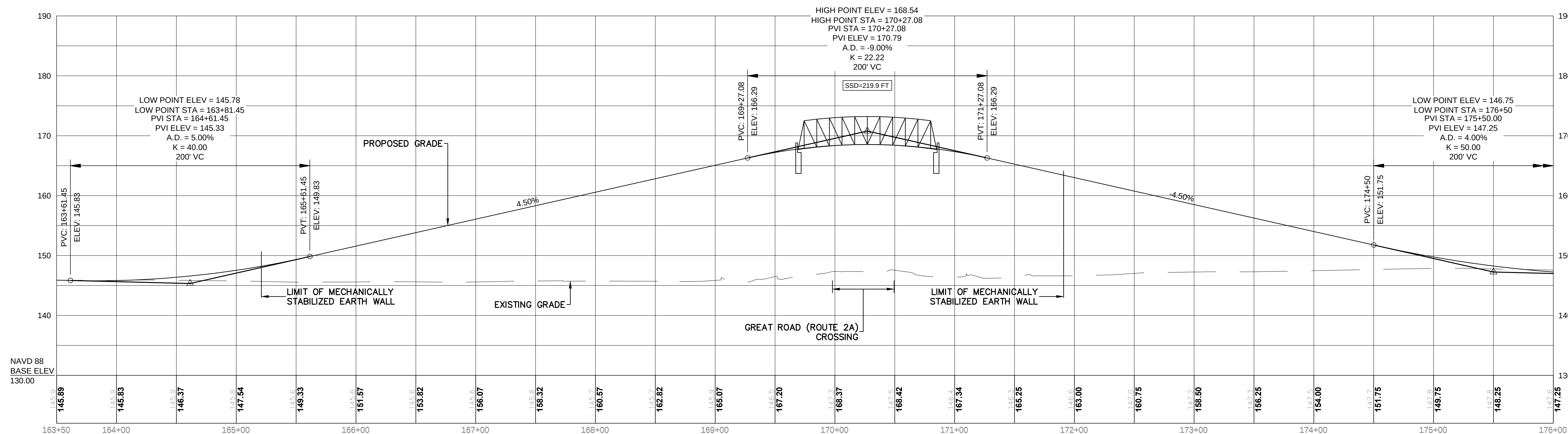
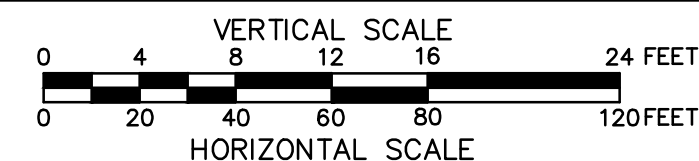
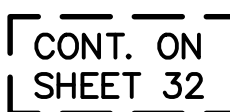
CONT. ON
 SHEET 30

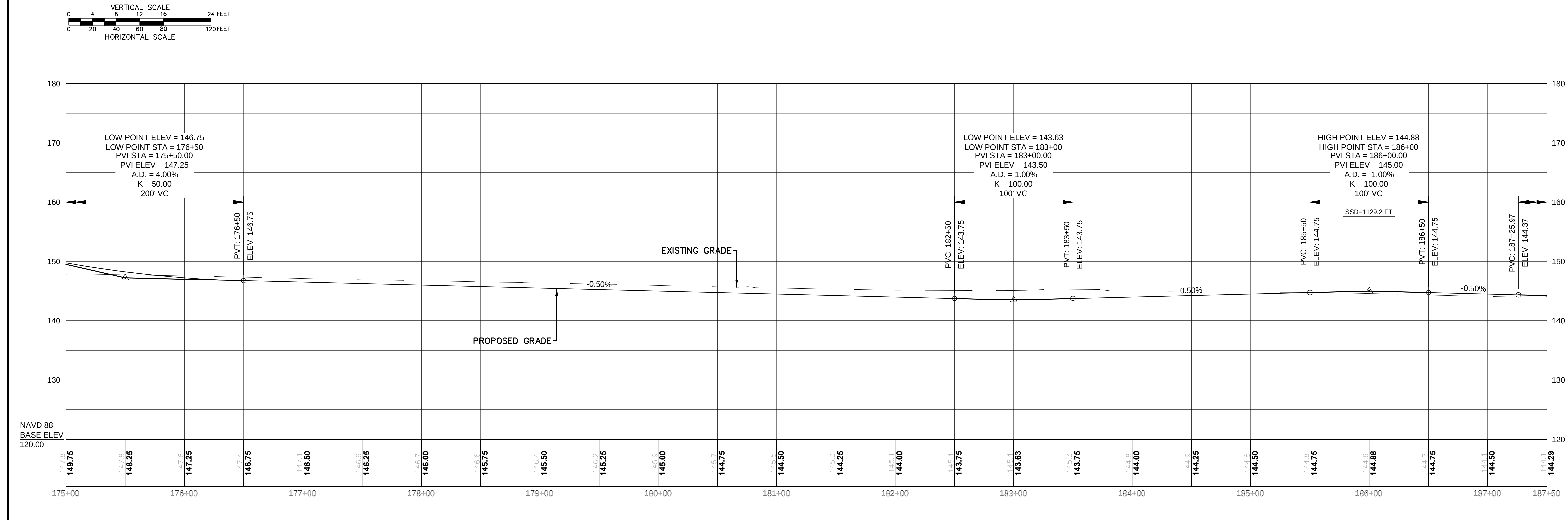
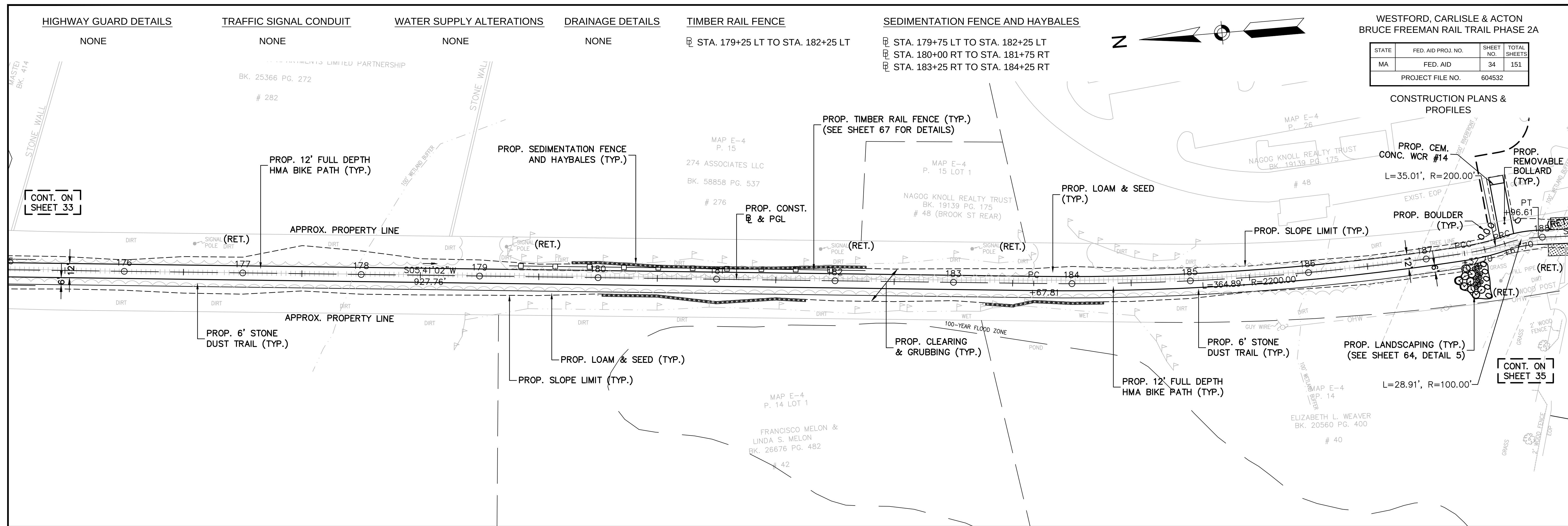






STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	33	152
PROJECT FILE NO.		604532	





STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	35	151
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS &
PROFILES

