MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

BRUCE FREEMAN RAIL TRAIL PHASE 2A

IN THE TOWNS OF

WESTFORD, CARLISLE & ACTON

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	1	159
	PROJECT FILE NO. 604532		

TITLE SHEET & INDEX

10031_2A_CS.DWG 17-Mar-2014

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.

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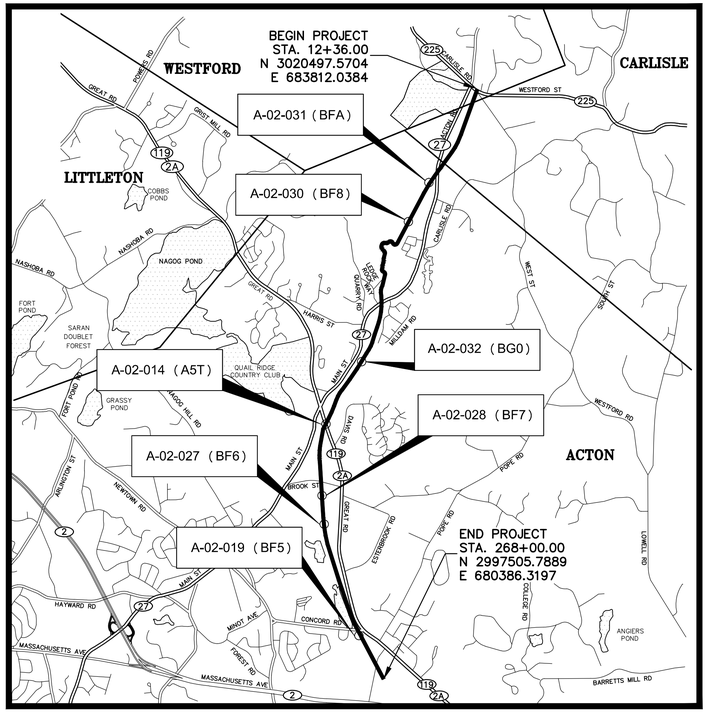


3000 0 3000 6000

SCALE 1" = 3000'

LENGTH OF PROJECT = 25784.00 FEET = 4.883 MILES

TRAIL DESIGN DESIGNATION

DESIGN SPEED	20 MPH (30 MPH AT APPROACHES TO GREAT ROAD - ROUTE 2A)
MINIMUM HORIZONTAL CURVE RADIUS	60'
MINIMUM LENGTH OF CREST VERTICAL CURVE	100'
MAXIMUM GRADE FOR LEVEL TERRAIN	4.5%

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 4100, Stoneham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
http://www.gpinet.com

DATE	DESCRIPTION	REV #

NOI SUBMISSION

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

MassDOT DWT Version:

EXISTING	PROPOSED	
		STATE BOUNDARY LINE
		CITY, TOWN OR COUNTY BOUNDARY LINE
		STATE HIGHWAY LAYOUT LINE
		CITY, TOWN OR COUNTY LAYOUT LINE
		EASEMENT LINE
		PROPERTY LINE
WF		EDGE OF VEGETATED WETLAND/WETLAND FLAG
MAHW		MEAN ANNUAL HIGH WATER
		HIGHWAY/PROPERTY BOUND (TYPE NOTED)
8 N00°00'00"E +93.16	PT 8 N00°00'00"E +93.16	CONSTRUCTION/SURVEY BASELINE
		TREE (TYPE & SIZE NOTED)
		EDGE OF WOODS/SHRUBS
		HANDICAP RAMP
		BENCH
MB	MB	MAIL BOX
PM	PM	PARKING METER
		SIGN
X X X		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)
76	76	CONTOURS
X100.00 , 100.15/100.00	X100.00 , 100.15/100.00	SPOT ELEVATION, TOP AND BOTTOM CURB
EOP	EOP	CURB OR BERM (TYPE AS NOTED)
		EDGE OF PAVEMENT (NO CURB OR BERM)
		BACK OF SIDEWALK
		TOP OR BOTTOM OF SLOPE (CUT OR FILL)
	SAW	SAWCUT LINE
		APPROX. COLD PLANING/TRANSITION AREA
		GRANITE RUBBLE BLOCK PAVEMENT
		SCORED CONCRETE PAVEMENT
	B-1	BORINGS, PAVEMENT CORES (SEE SPEC. PROV.)
D		DRAIN LINE
UD	UD	UNDERDRAIN (PERFORATED)
		DIRECTION OF FLOW
		PAVED WATERWAY
DMH	DMH	DRAIN MANHOLE
CB,GI,DI	CB,GI,DI	CATCH BASIN, DROP OR GUTTER INLET
CBCI,GICI	CBCI,GICI	CATCH BASIN (OR GUTTER INLET) WITH CURB INLET
LB		LEACHING BASIN
FE		FLARED END
HDWL		HEADWALL
S	S	SEWER LINE
SMH	SMH	SEWER MANHOLE
CS	CS	COMBINED SEWER LINE
CSMH	CSMH	COMBINED SEWER MANHOLE
FMGV	FMGV	FORCE MAIN GATE VALVE
W	W	WATER MAIN
WMH	WMH	WATER MANHOLE
HYD		HYDRANT
FA,FSP	FA,FSP	FIRE ALARM BOX, FIRE STAND PIPE
		REDUCER
CS,WSO		CURB STOP OR WATER SHUT OFF
WG	WG	WATER GATE
G	G	GAS MAIN
GG	GG	GAS GATE
GSO	GSO	GAS SHUT OFF
E	E	ELECTRICAL LINE OR DUCT
		ELECTRICAL CONDUIT
EMH	EMH	ELECTRICAL MANHOLE
EHH		ELECTRICAL HANDHOLE
PB	PB	PULL BOX (12" x 12")
JB,SB	JB,SB	ELECTRICAL JUNCTION OR SWITCH BOX
LCC		ELECTRICAL LOAD CENTER CABINET W/FDN
LP		LIGHT POLE
UP		UTILITY POLE
GUY	GUY	GUY WIRE & ANCHOR
T	T	TELEPHONE LINE OR DUCT
TMH	TMH	TELEPHONE MANHOLE
ST	ST	STEAM LINE
STMH	STMH	STEAM MANHOLE/TUNNEL HATCH
		PLUG OR CAP
		DELINEATOR
OHW		OVERHEAD WIRES
CATV		CABLE TV

GENERAL LEGEND

GENERAL ABBREVIATIONS

ABAN	ABANDON
ACCMP	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	FOUND
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
PROP	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
PWW	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

GENERAL NOTES

1. 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.
2. 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.
3. 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.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
5. 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.
6. 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).
7. 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.
8. ALL TRANVERSE 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.
9. 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.
10. THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
11. ALL PROPERTY LINES BETWEEN ABUTTERS ARE APPROXIMATE ONLY.
12. 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.
13. ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
14. ALL GATE BOXES, SERVICE BOXES AND PUBLICLY OWNED MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
15. ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
16. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
17. CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
18. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS WILL BE CONFIRMED IN THE FIELD.
19. 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	2	159
PROJECT FILE NO.	604532		

LEGEND & ABBREVIATIONS

10031_2A_LE.DWG 25-Feb-2014

MassDOT DWT Version:

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

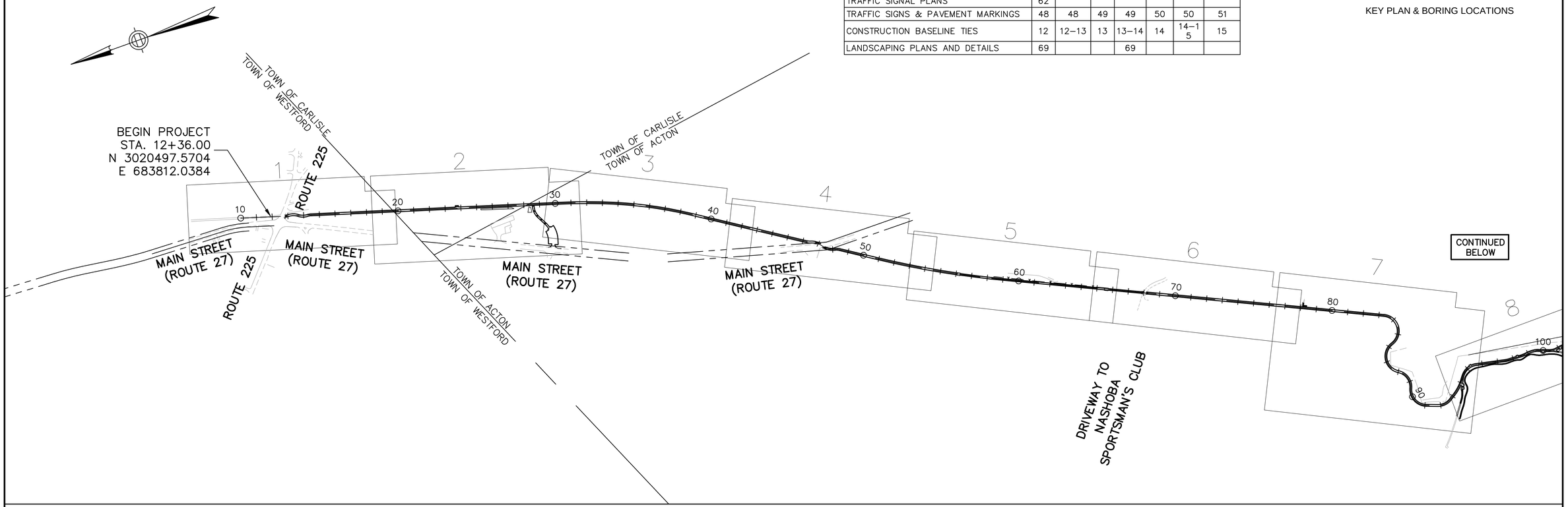
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	3	159
PROJECT FILE NO.	604532		

KEY PLAN & BORING LOCATIONS

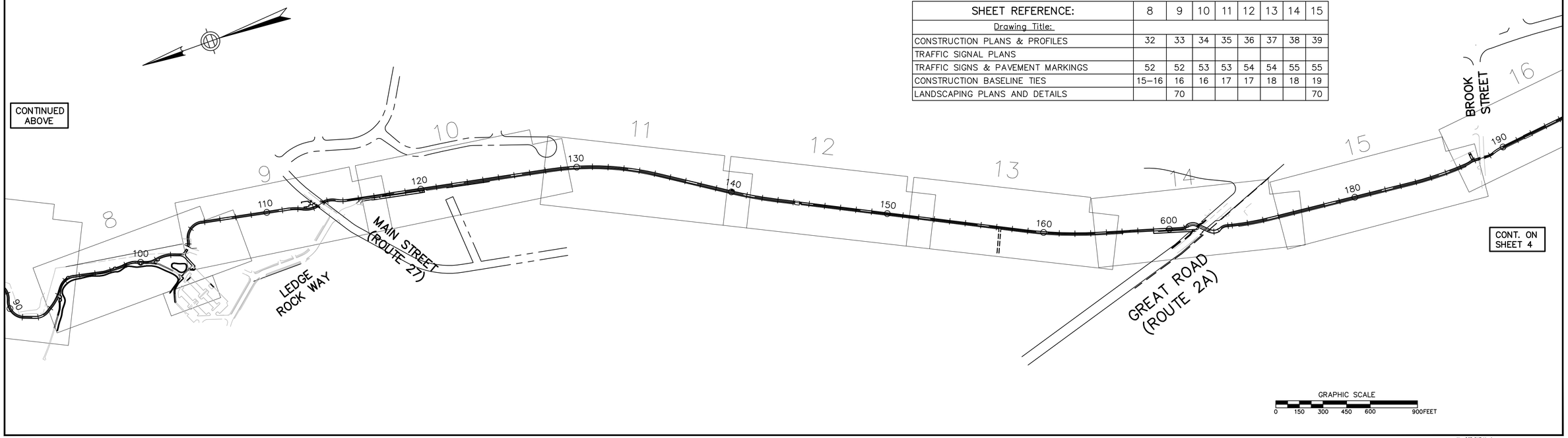
25-Feb-2014

10031_2A_KEY.DWG

SHEET REFERENCE:	1	2	3	4	5	6	7
Drawing Title:	Drawing Number:						
CONSTRUCTION PLANS & PROFILES	24	25	26	27	28	29	30–31
TRAFFIC SIGNAL PLANS	62						
TRAFFIC SIGNS & PAVEMENT MARKINGS	48	48	49	49	50	50	51
CONSTRUCTION BASELINE TIES	12	12–13	13	13–14	14	14–15	15
LANDSCAPING PLANS AND DETAILS	69			69			



SHEET REFERENCE:	8	9	10	11	12	13	14	15
Drawing Title:								
CONSTRUCTION PLANS & PROFILES	32	33	34	35	36	37	38	39
TRAFFIC SIGNAL PLANS								
TRAFFIC SIGNS & PAVEMENT MARKINGS	52	52	53	53	54	54	55	55
CONSTRUCTION BASELINE TIES	15–16	16	16	17	17	18	18	19
LANDSCAPING PLANS AND DETAILS		70						70



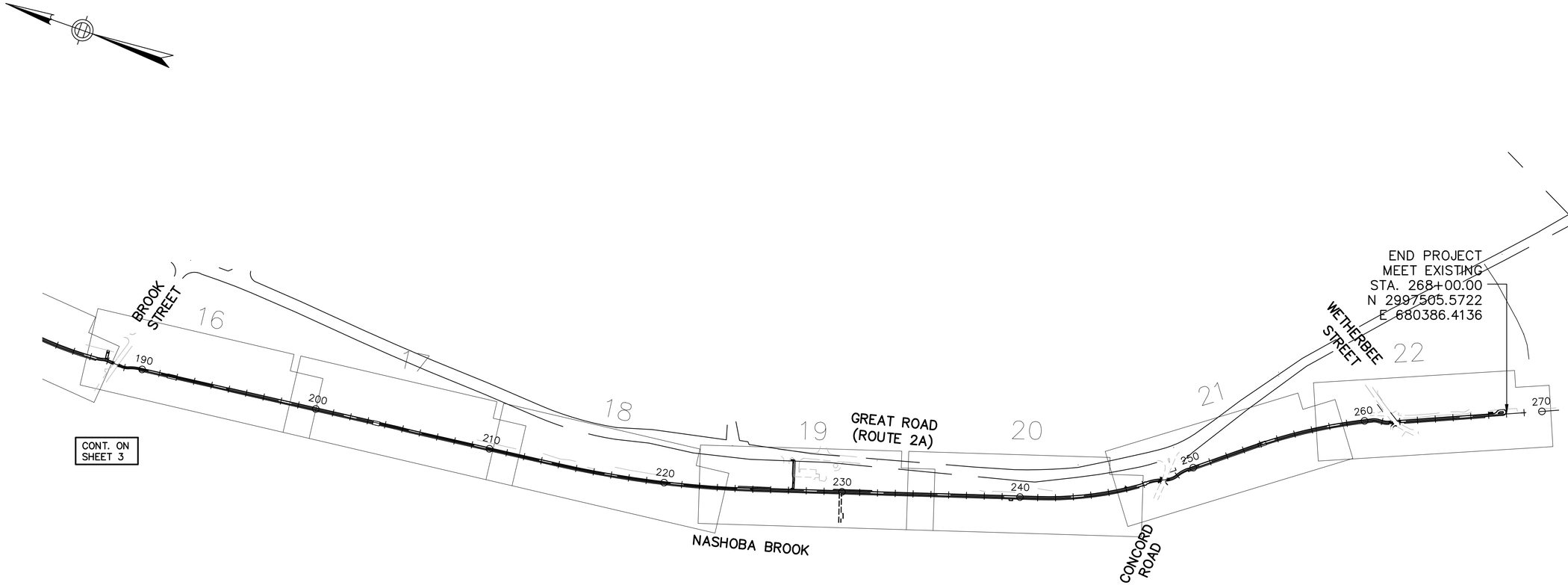
MassDOT DWT Version:

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	4	159
	PROJECT FILE NO. 604532		

KEY PLAN & BORING LOCATIONS

10031_2A_KEY.DWG 25-Feb-2014



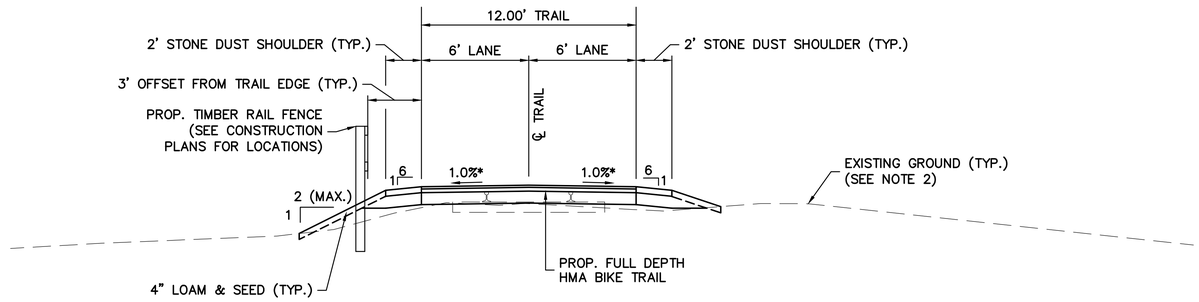
SHEET REFERENCE:	16	17	18	19	20	21	22
Drawing Title							
CONSTRUCTION PLANS & PROFILES	40	41	42	43	44	45	46
TRAFFIC SIGNAL PLANS							
TRAFFIC SIGNS & PAVEMENT MARKINGS	56	56	57	57	58	58	59
CONSTRUCTION BASELINE TIES	19	20	20	21	21	22	22–23
LANDSCAPING PLANS AND DETAILS					71	71	71

GRAPHIC SCALE
0 150 300 450 600 900FEET

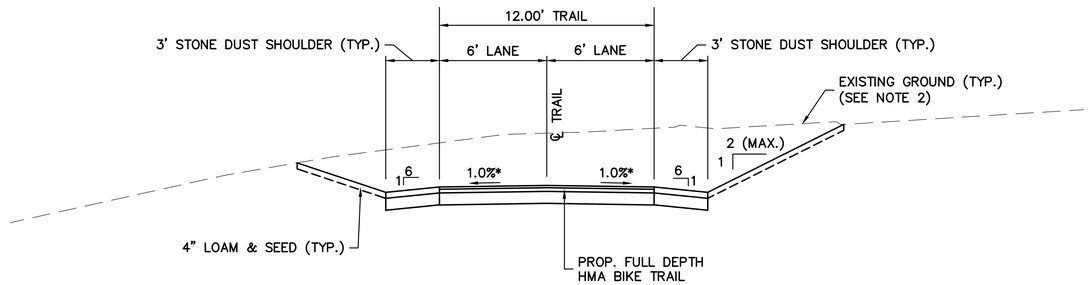
MassDOT DWT Version:

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	10	159
PROJECT FILE NO.	604532		

TYPICAL SECTIONS



FILL SECTION



CUT SECTION

* – 0.5% CONSTRUCTION TOLERANCE

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)

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.

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

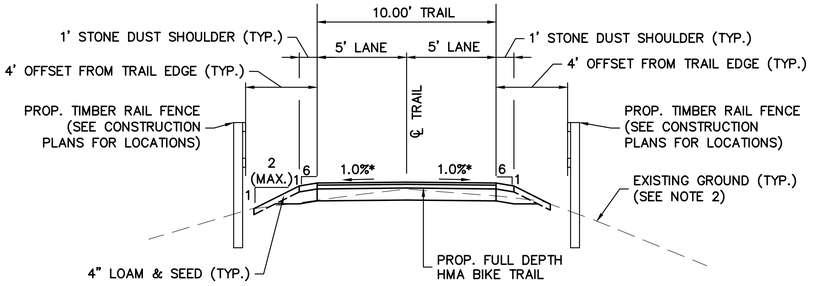
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE B) (ITEM 151.)

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

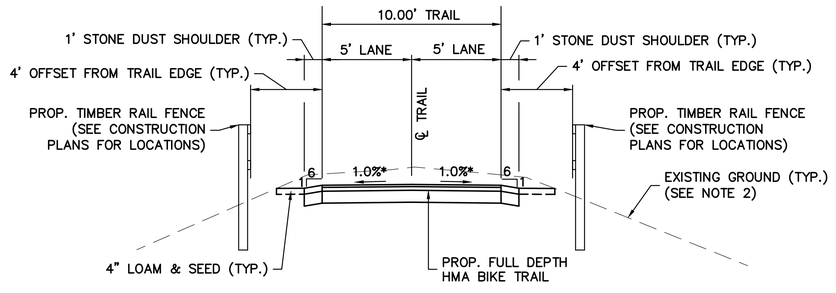
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	10a	159
PROJECT FILE NO.	604532		

TYPICAL SECTIONS

10031_2A_TYP.DWG 27-Feb-2014



FILL SECTION

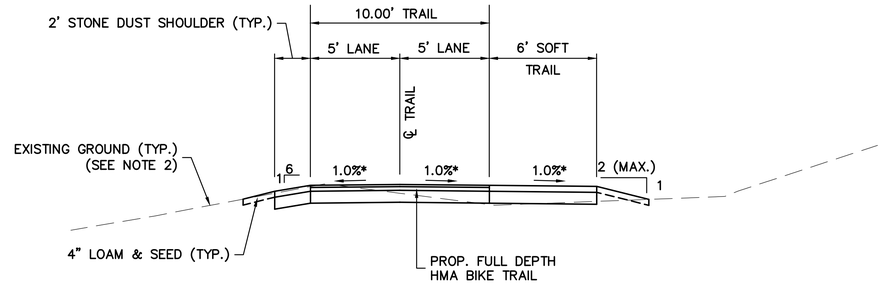


CUT SECTION

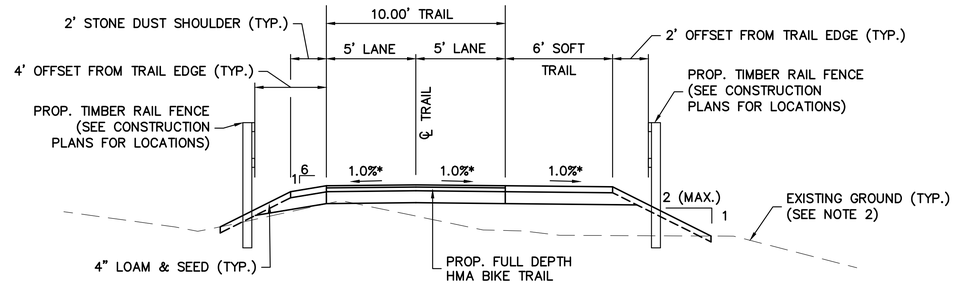
* – 0.5% CONSTRUCTION TOLERANCE

TYPICAL SECTION – 10' WIDE TRAIL

SCALE 1" = 4'
STA. 56+25 – STA. 67+80
(SEE NOTE 1)



WITHOUT FENCE



WITH FENCE

TYPICAL SECTION – 10' WIDE TRAIL WITH SOFT TRAIL

* – 0.5% CONSTRUCTION TOLERANCE

SCALE 1" = 4'
STA. 144+40 – STA. 165+50
STA. 188+85 – STA. 195+00
STA. 203+65 – STA. 225+00
(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 (ABOVE RAILROAD BALLAST) 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.

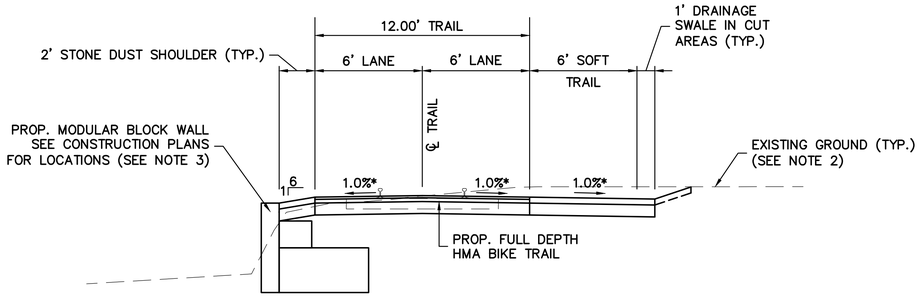
MassDOT DWT Version:

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

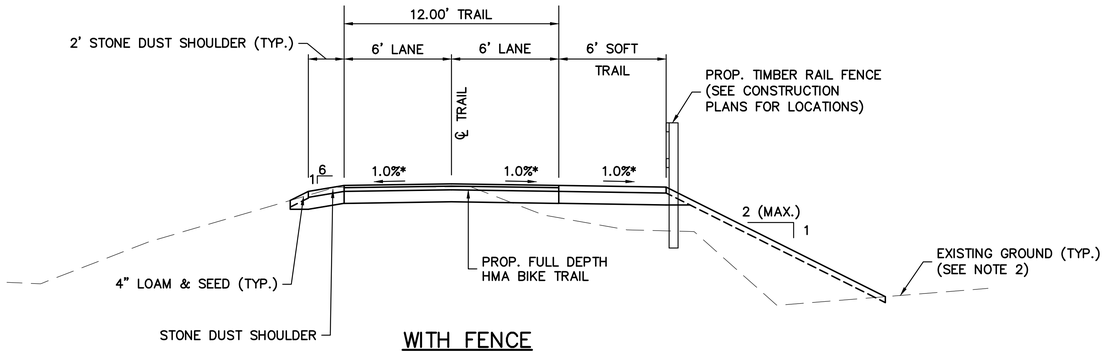
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	11	159
PROJECT FILE NO.	604532		

TYPICAL SECTIONS

10031_2A_TYP.DWG 25-Feb-2014



WITHOUT FENCE

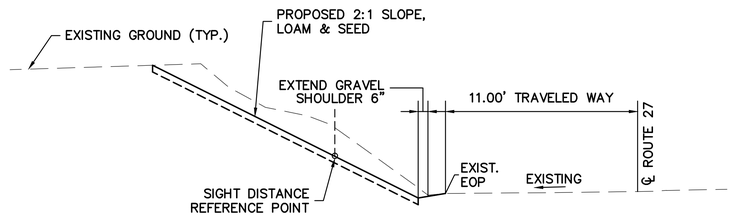


WITH FENCE

TYPICAL SECTION – 12' WIDE TRAIL WITH SOFT TRAIL

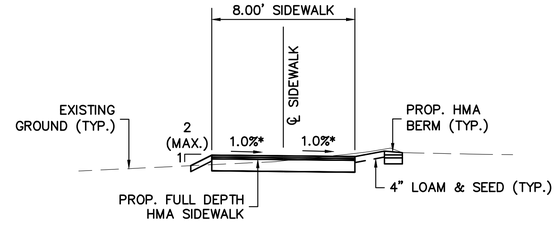
SCALE 1" = 4'
STA. 120+25 – STA. 144+05
STA. 144+45 – STA. 165+20
STA. 172+40 – STA. 188+30
STA. 188+65 – STA. 191+45
STA. 192+10 – STA. 203+25
STA. 203+75 – STA. 248+00
STA. 248+40 – STA. 253+85
STA. 254+35 – STA. 261+45
STA. 261+95 – STA. 267+92
(SEE NOTE 1)

* – 0.5% CONSTRUCTION TOLERANCE



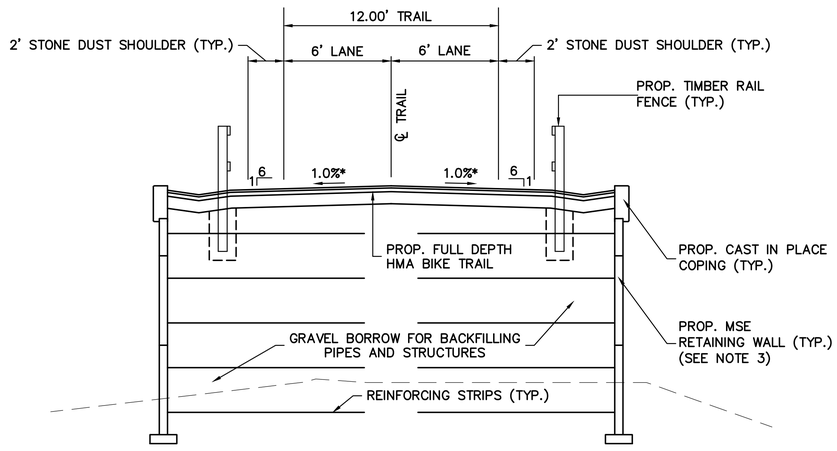
TYPICAL SECTION – ROUTE 27 SLOPE RECONSTRUCTION FOR SIGHT DISTANCE

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



TYPICAL SECTION – SIDEWALK NEAR STATION 227+26.25 (POWERS GALLERY)

SCALE 1" = 4'
STA. 50+77 – STA. 51+67



TYPICAL SECTION – 12' WIDE TRAIL

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

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.

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

SEE SHEET 66

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

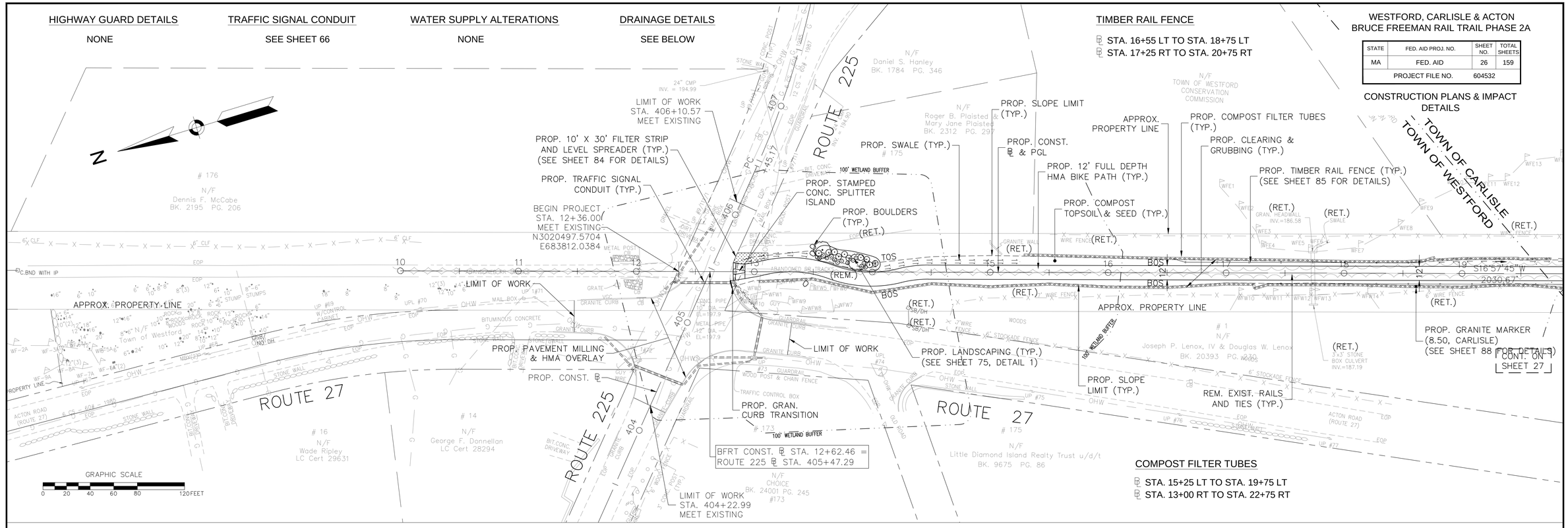
TIMBER RAIL FENCE

- ℄ STA. 16+55 LT TO STA. 18+75 LT
- ℄ STA. 17+25 RT TO STA. 20+75 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	26	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



COMPOST FILTER TUBES

- ℄ STA. 15+25 LT TO STA. 19+75 LT
- ℄ STA. 13+00 RT TO STA. 22+75 RT

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- ℄ STA. 16+55 LT TO STA. 18+75 LT
- ℄ STA. 17+25 RT TO STA. 20+75 RT
- ℄ STA. 17+25 RT TO STA. 20+75 RT
- ℄ STA. 24+00 RT TO STA. 25+25 RT
- ℄ STA. 28+25 LT TO STA. 39+25 LT
- ℄ STA. 28+70 RT TO STA. 39+25 RT

ACTON GARAGE PARKING ℄ STA. 21+45 LT TO STA. 21+80 LT

ACTON GARAGE PARKING ℄ STA. 21+45 RT TO STA. 21+90 RT

COMPOST FILTER TUBES

- ℄ STA. 27+73 LT TO STA. 39+50 LT

~~ACTON GARAGE PARKING ℄ STA. 20+10 LT TO STA. 23+15 LT~~

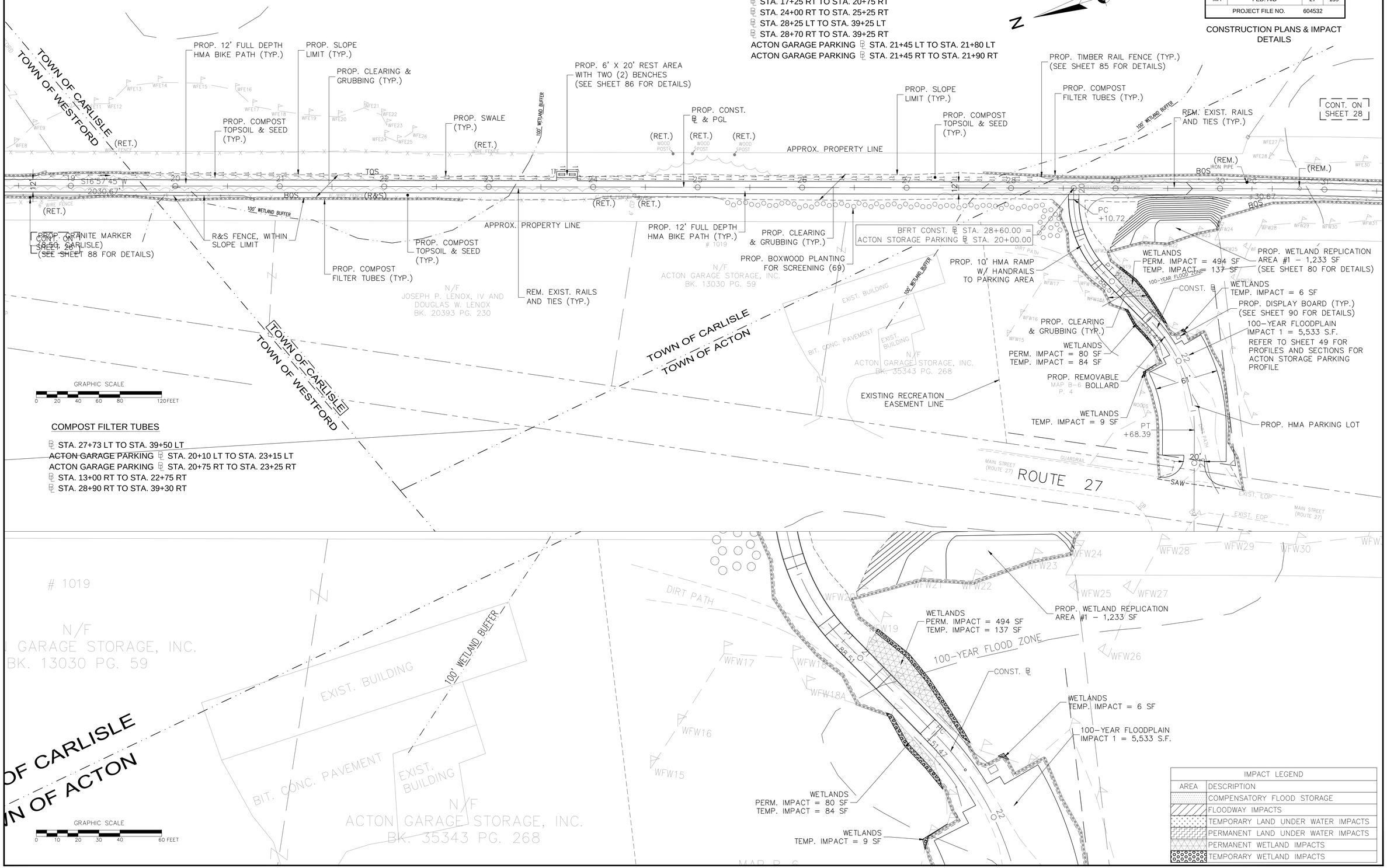
ACTON GARAGE PARKING ℄ STA. 20+75 RT TO STA. 23+25 RT

- ℄ STA. 13+00 RT TO STA. 22+75 RT
- ℄ STA. 28+90 RT TO STA. 39+30 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	27	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 28+25 LT TO STA. 39+25 LT
- 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	28	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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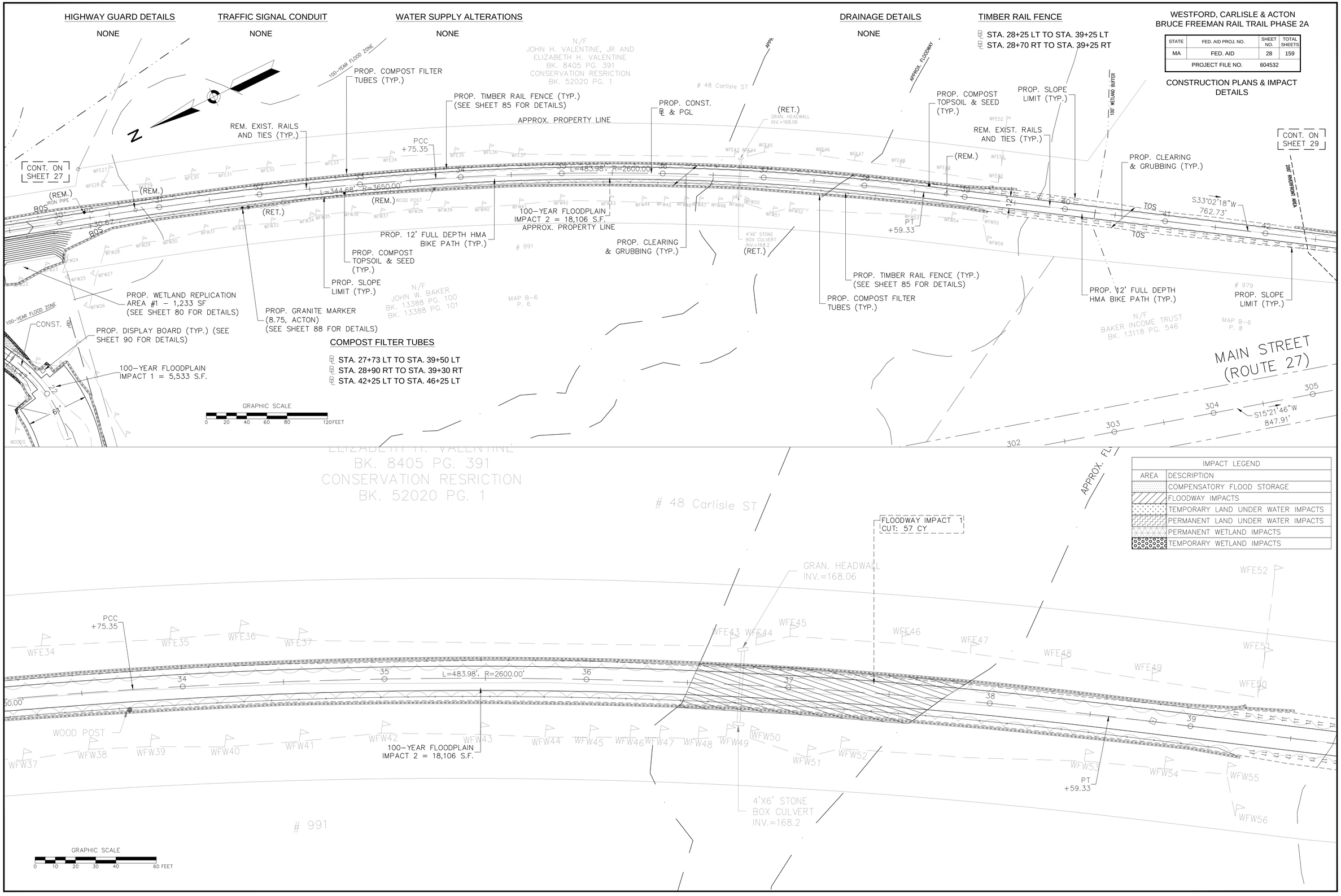

COMPOST FILTER TUBES

- STA. 27+73 LT TO STA. 39+50 LT
- STA. 28+90 RT TO STA. 39+30 RT
- STA. 42+25 LT TO STA. 46+25 LT

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 45+75 LT TO STA. 47+12 LT
- STA. 47+41 RT TO STA. 49+00 RT
- STA. 54+25 LT TO STA. 56+07 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	29	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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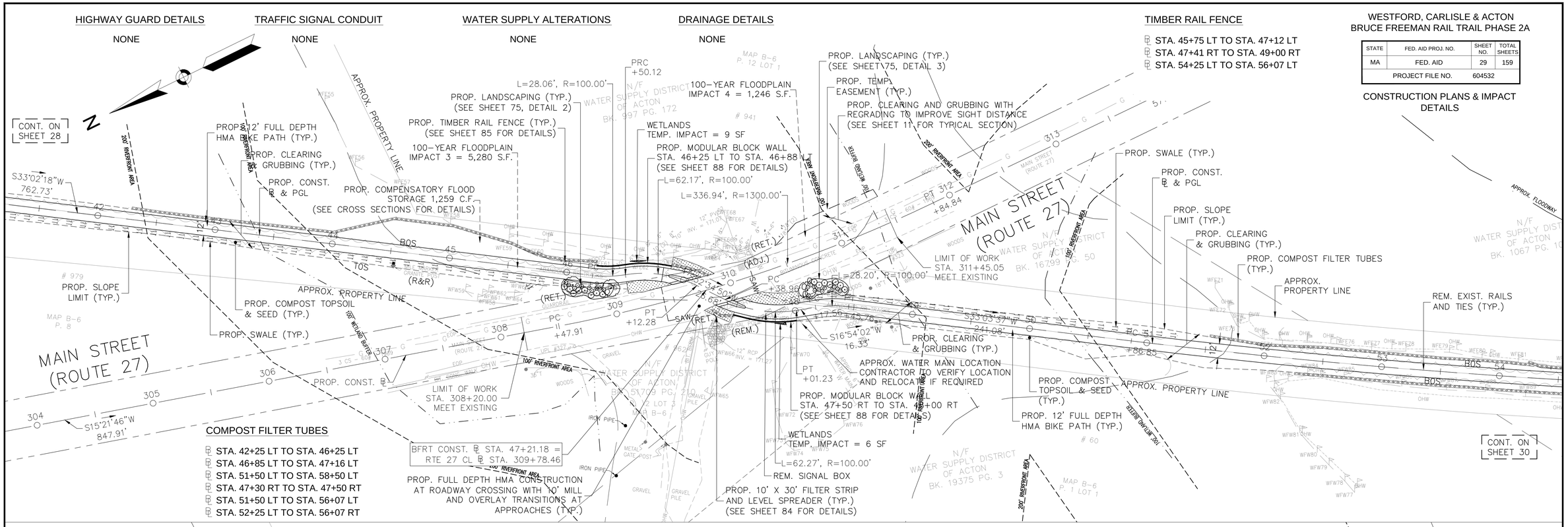
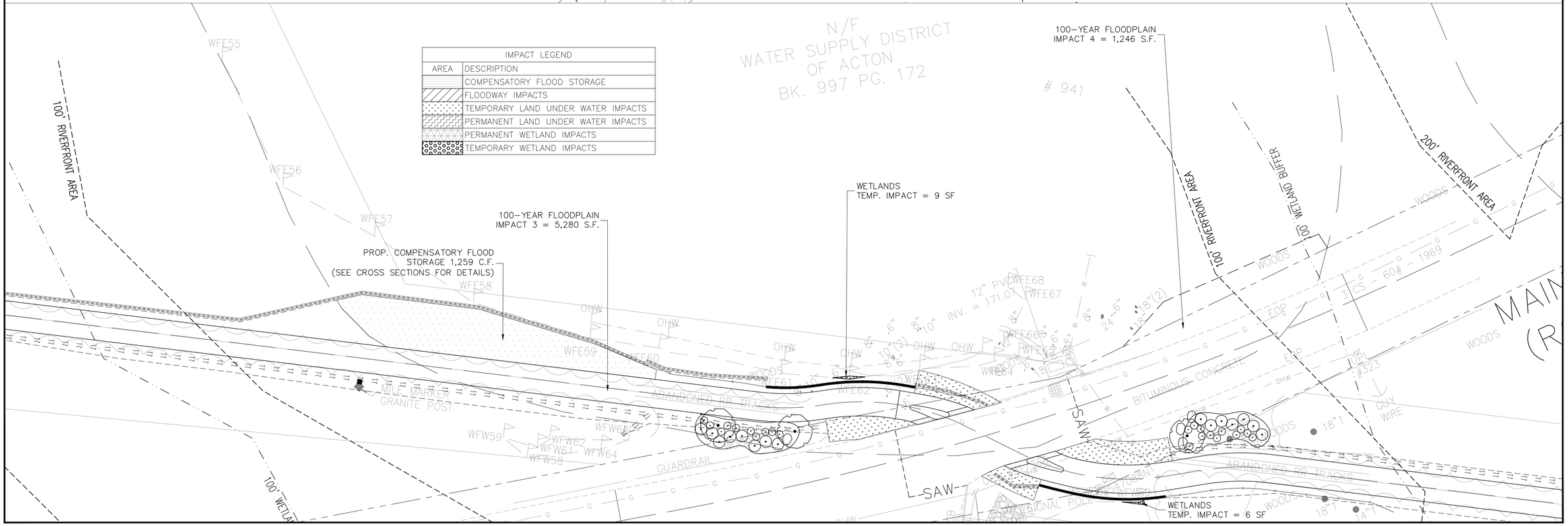


IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS



HIGHWAY GUARD DETAILS

- STA. 62+00 LT - ITEM 627.1
- STA. 62+00 LT TO STA. 63+00 LT - ITEM 603.7
- STA. 63+00 LT - ITEM 627.1

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 54+25 LT TO STA. 56+07 LT
- STA. 55+75 RT TO STA. 56+07 RT
- STA. 56+26 LT TO STA. 58+25 LT
- STA. 56+26 RT TO STA. 58+50 RT
- STA. 63+00 LT TO STA. 65+47 LT
- STA. 62+25 RT TO STA. 65+47 RT

COMPOST FILTER TUBES

- STA. 51+50 LT TO STA. 56+07 LT
- STA. 52+25 RT TO STA. 56+07 RT

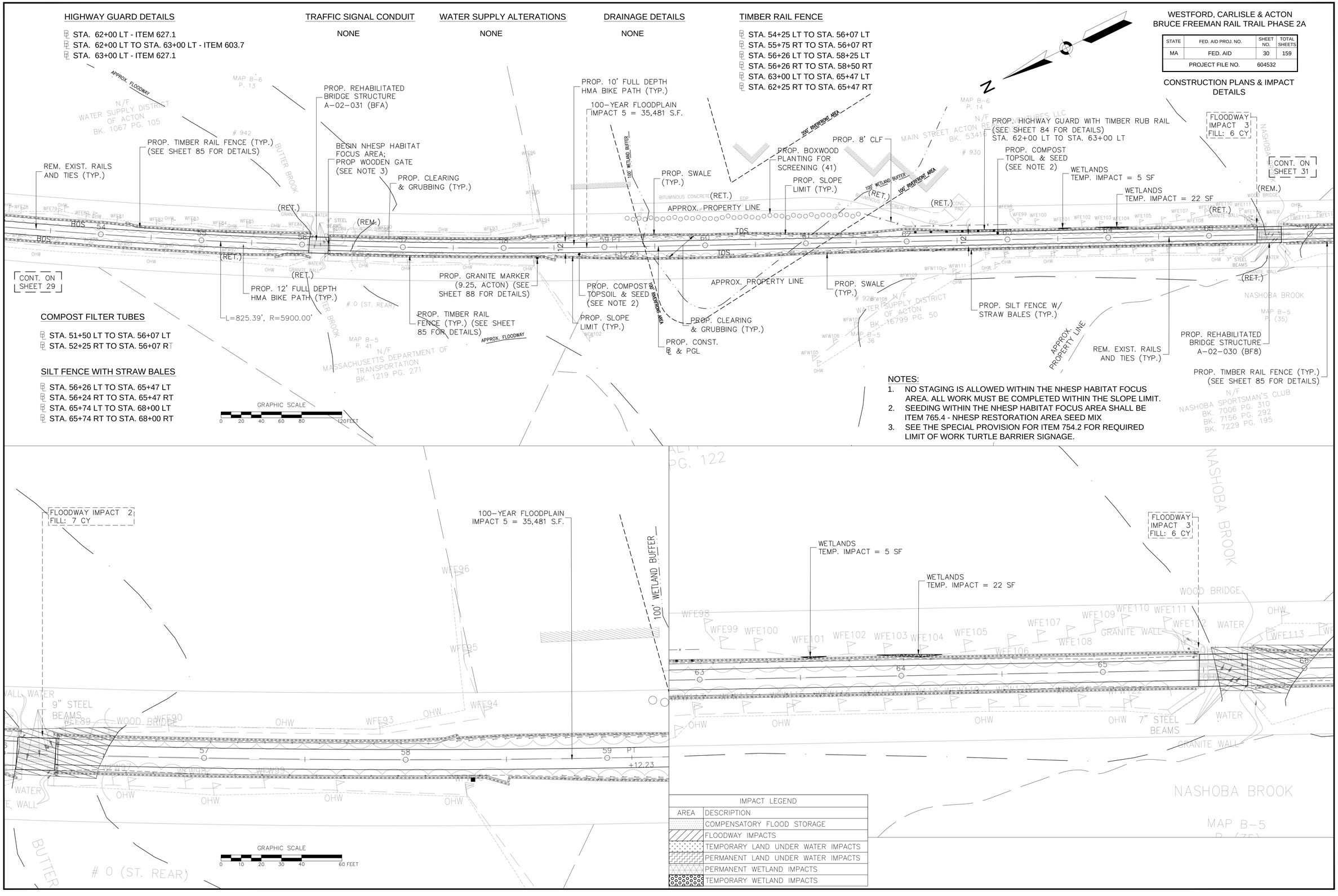
SILT FENCE WITH STRAW BALES

- STA. 56+26 LT TO STA. 65+47 LT
- STA. 56+24 RT TO STA. 65+47 RT
- STA. 65+74 LT TO STA. 68+00 LT
- STA. 65+74 RT TO STA. 68+00 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	30	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

NOTES:

1. NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

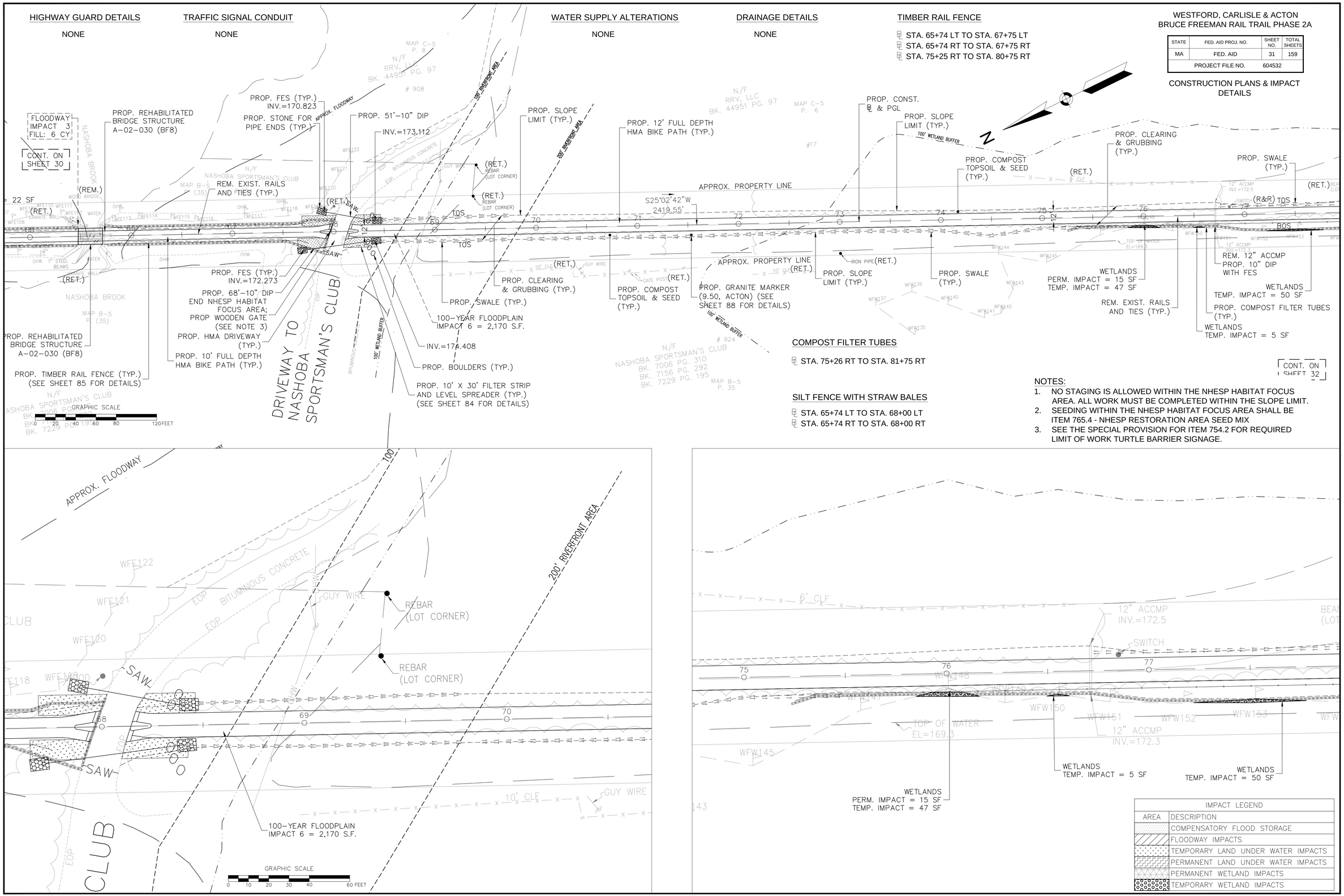
TIMBER RAIL FENCE

- STA. 65+74 LT TO STA. 67+75 LT
- STA. 65+74 RT TO STA. 67+75 RT
- STA. 75+25 RT TO STA. 80+75 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	31	159
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT DETAILS



CONT. ON SHEET 32

COMPOST FILTER TUBES

- STA. 75+26 RT TO STA. 81+75 RT

SILT FENCE WITH STRAW BALES

- STA. 65+74 LT TO STA. 68+00 LT
- STA. 65+74 RT TO STA. 68+00 RT

NOTES:

1. NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

TIMBER RAIL FENCE

- STA. 75+25 RT TO STA. 80+75 RT
- STA. 84+25 LT TO STA. 85+25 LT
- STA. 84+27 RT TO STA. 85+75 RT
- STA. 88+25 LT TO STA. 89+25 LT
- STA. 90+75 LT TO STA. 92+25 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	32	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 1:56 PM

CONT. ON SHEET 31

INV.=174.858

PROP. 5' HMA WALK

PROP. 11'-10" DIP

PROP. FES W/ STONE FOR PIPE ENDS (TYP.) INV.=174.889

ROBBINS BROOK CONDOMINIUM MASTER DEED BK. 34644 PG. 65

100' WETLAND BUFFER

PROP. 6' X 20' REST AREA WITH TWO (2) BENCHES (SEE SHEET 86 FOR DETAILS)

PROP. SWALE (TYP.)

PROP. SLOPE LIMIT (TYP.)

PROP. CLEARING & GRUBBING (TYP.)

PROP. COMPOST TOPSOIL & SEED (TYP.)

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

APPROX. PROPERTY LINE

PROP. GRANITE MARKER (9.75, ACTON) (SEE SHEET 88 FOR DETAILS)

WETLANDS TEMP. IMPACT = 15 SF
100-YEAR FLOODPLAIN IMPACT 7 = 3,132 S.F.

PROP. COMPOST TOPSOIL & SEED (TYP.)

LUW/OTHER WATERS OF THE U.S. PERM. IMPACT = 7 SF

PROP. TEMP. EASEMENT (TYP.)

PROP. PERM. EASEMENT (TYP.)

PROP. SLOPE LIMIT (TYP.)

(R&R BOULDERS) (2)

(R&R)

(RET.)

(R&S)

REM. 12" ACCMP
PROP. 10" DIP WITH FES

WETLANDS TEMP. IMPACT = 50 SF

PROP. COMPOST FILTER TUBES (TYP.)

WETLANDS TEMP. IMPACT = 5 SF

REM. EXIST. RAILS AND TIES (TYP.)

WETLANDS PERM. IMPACT = 24 SF TEMP. IMPACT = 61 SF

PROP. TIMBER RAIL FENCE (TYP.) (SEE SHEET 85 FOR DETAILS)

PROP. CONST. ℄ & PGL

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

IRON ROD R&D PORTION OF FENCE WITHIN ROW

APPROX. PROPERTY LINE

WETLANDS PERM. IMPACT = 216 SF TEMP. IMPACT = 123 SF

EXTEND EXIST. 15" PIPE 7' AT EXIST. SLOPE INV.=173.385 R&R FES

PROP. CLEARING & GRUBBING (TYP.)

PROP. SWALE (TYP.)

PC +81.53

N23°00'19"W 49.44'

R=100.00'

L=230.30'

PROP. SWALE (TYP.)

PROP. PERM. EASEMENT (TYP.)

N/F 848 MAIN STREET NOMINEE TRUST, u/d/t BK. 53416 PG. 128

848

MAP C-5 P. 38 LOT 1

N/F REX LUMBER COMPANY BK. 15986 PG. 480

9

CONT. ON SHEET 34

20' WIDE RIGHT OF WAY

RET. EXIST. CLF W/ PROP. SCREENING (TYP.)

BFRT CONST. ℄ STA. 94+47.67 = NARA WALKING PATH ℄ STA. 4+47.67

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

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

PRC +00.27

PROP. 8' CLF W/ SCREENING (TYP.)

PROP. COMPOST FILTER TUBES (TYP.)

PROP. TEMP. EASEMENT (TYP.)

RET. EXIST. CLF W/ PROP. SCREENING (TYP.)

PROP. 8' CLF W/ SCREENING (TYP.)

PROP. COMPOST TOPSOIL & SEED (TYP.)

PROP. CLEARING & GRUBBING (TYP.)

PROP. CONST. ℄ & PGL

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

PROP. SLOPE LIMIT (TYP.)

PROP. PERM EASEMENT (TYP.)

RET. EXIST CLF W/ PROP. SCREENING (TYP.)

PROP. SWALE (TYP.)

PROP ELEC. CONDUIT TO BE INSTALLED IN COORDINATION WITH REX LUMBER CO.

PROP. SLOPE LIMIT (TYP.)

PROP. COMPOST TOPSOIL & SEED (TYP.)

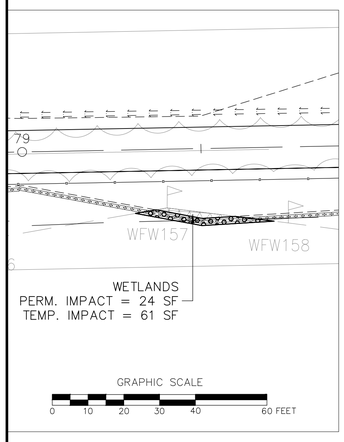
GRAPHIC SCALE
0 20 40 60 80 120 FEET

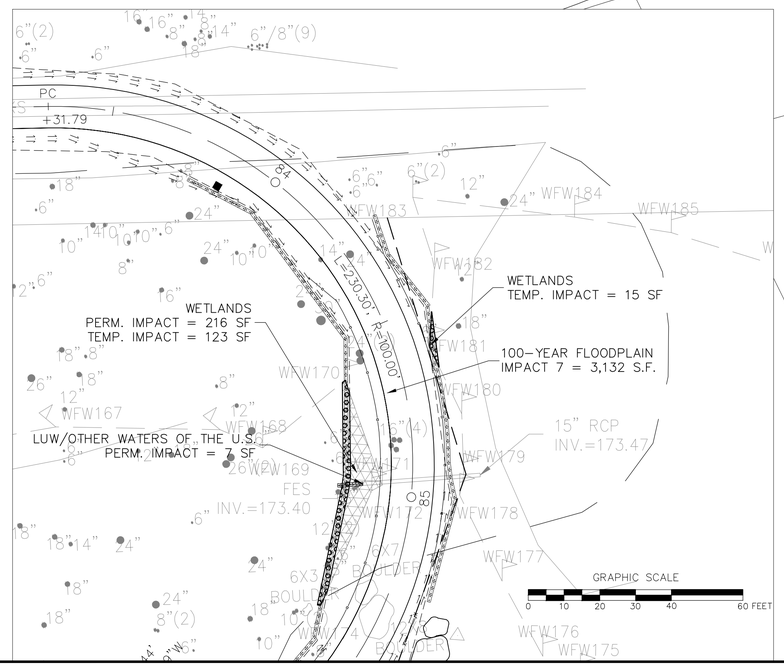
FOR PROFILE: SEE SHEET NO. 33

COMPOST FILTER TUBES

- STA. 75+26 RT TO STA. 81+75 RT
- STA. 83+75 RT TO STA. 85+78 RT
- STA. 84+23 LT TO STA. 85+25 LT
- STA. 87+74 LT TO STA. 92+00 LT

N





HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

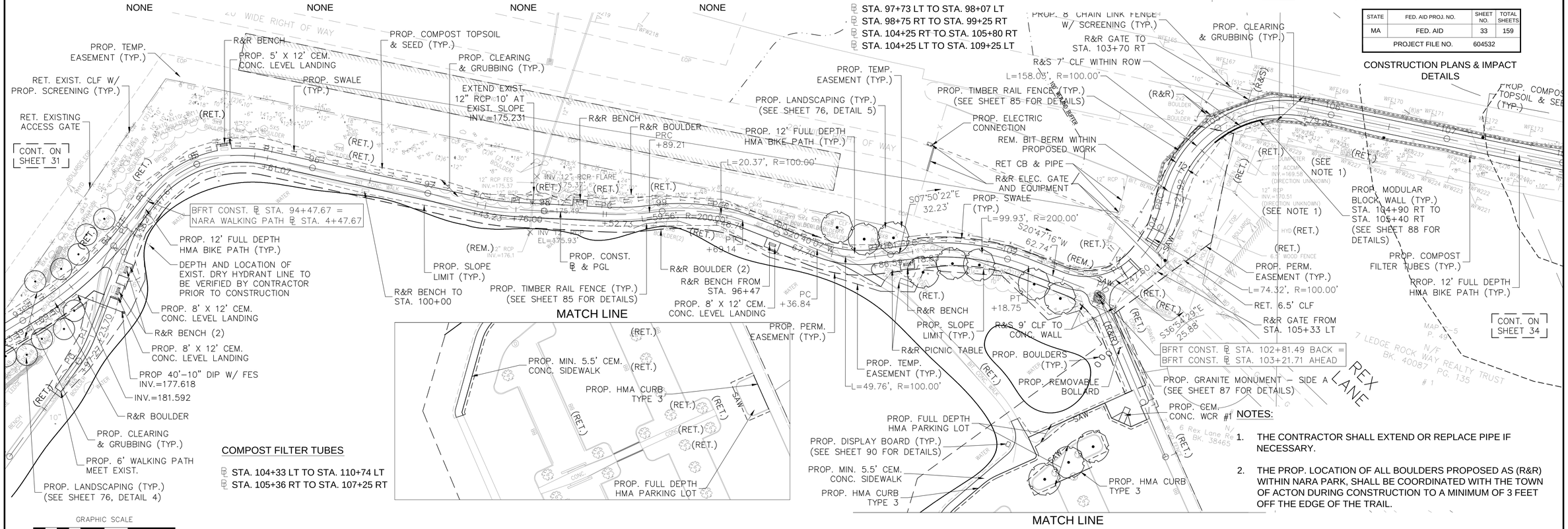
TIMBER RAIL FENCE

- STA. 97+73 LT TO STA. 98+07 LT
- STA. 98+75 RT TO STA. 99+25 RT
- STA. 104+25 RT TO STA. 105+80 RT
- STA. 104+25 LT TO STA. 109+25 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	33	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



COMPOST FILTER TUBES

- STA. 104+33 LT TO STA. 110+74 LT
- STA. 105+36 RT TO STA. 107+25 RT

GRAPHIC SCALE

0 20 40 60 80 120 FEET

NOTES:

1. THE CONTRACTOR SHALL EXTEND OR REPLACE PIPE IF NECESSARY.
2. THE PROP. LOCATION OF ALL BOULDERS PROPOSED AS (R&R) WITHIN NARA PARK, SHALL BE COORDINATED WITH THE TOWN OF ACTON DURING CONSTRUCTION TO A MINIMUM OF 3 FEET OFF THE EDGE OF THE TRAIL.

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 1:56 PM

HIGHWAY GUARD DETAILS

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

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 104+25 LT TO STA. 109+25 LT
- STA. 104+25 RT TO STA. 105+80 RT
- STA. 115+25 LT TO STA. 117+75 LT

COMPOST FILTER TUBES

- STA. 104+33 LT TO STA. 110+74 LT
- STA. 105+36 RT TO STA. 107+25 RT
- STA. 116+42 RT TO STA. 117+39 RT

NOTES:

1. THE CONTRACTOR SHALL EXTEND OR REPLACE PIPE IF NECESSARY.
2. CONTRACTOR TO COORDINATE WORK WITH DRAINAGE IMPROVEMENTS ALONG ROUTE 27 BY THE TOWN OF ACTON.

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	34	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

(IMPACT DETAIL ON SHEET 35)

CONT. ON SHEET 33

CONT. ON SHEET 35

GRAPHIC SCALE 0 20 40 60 80 120 FEET

GRAPHIC SCALE 0 10 20 30 40 60 FEET

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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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. 115+25 LT TO STA. 117+75 LT
- STA. 127+50 RT TO STA. 128+80 RT

COMPOST FILTER TUBES

- STA. 116+42 RT TO STA. 117+39 RT
- STA. 112+74 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	35	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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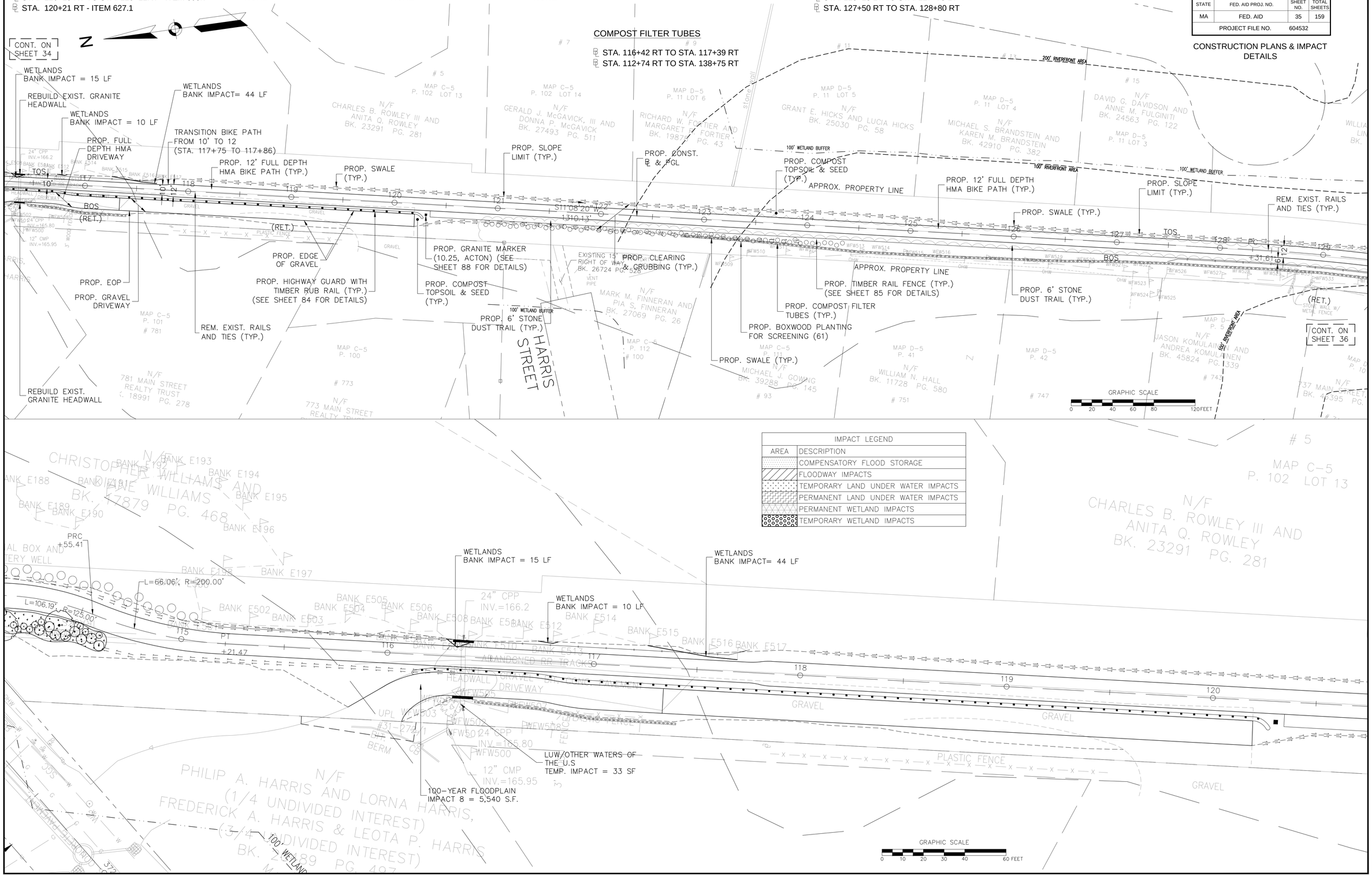

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 127+50 RT TO STA. 128+80 RT
- STA. 128+85 RT TO STA. 130+75 RT
- STA. 129+75 LT TO STA. 132+25 LT
- STA. 135+75 LT TO STA. 144+08 LT
- STA. 138+00 RT TO STA. 140+55 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	36	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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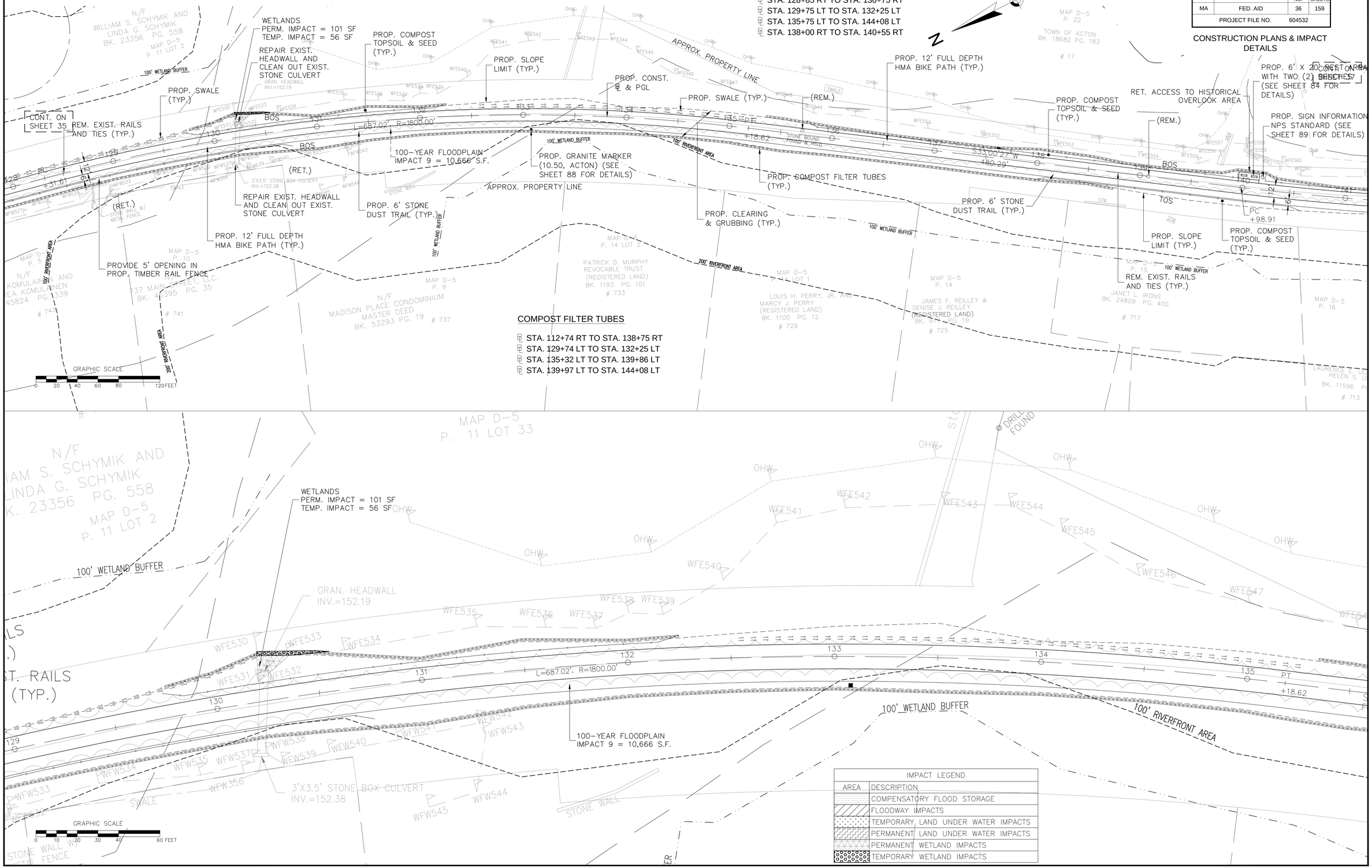


IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

COMPOST FILTER TUBES

- STA. 112+74 RT TO STA. 138+75 RT
- STA. 129+74 LT TO STA. 132+25 LT
- STA. 135+32 LT TO STA. 139+86 LT
- STA. 139+97 LT TO STA. 144+08 LT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

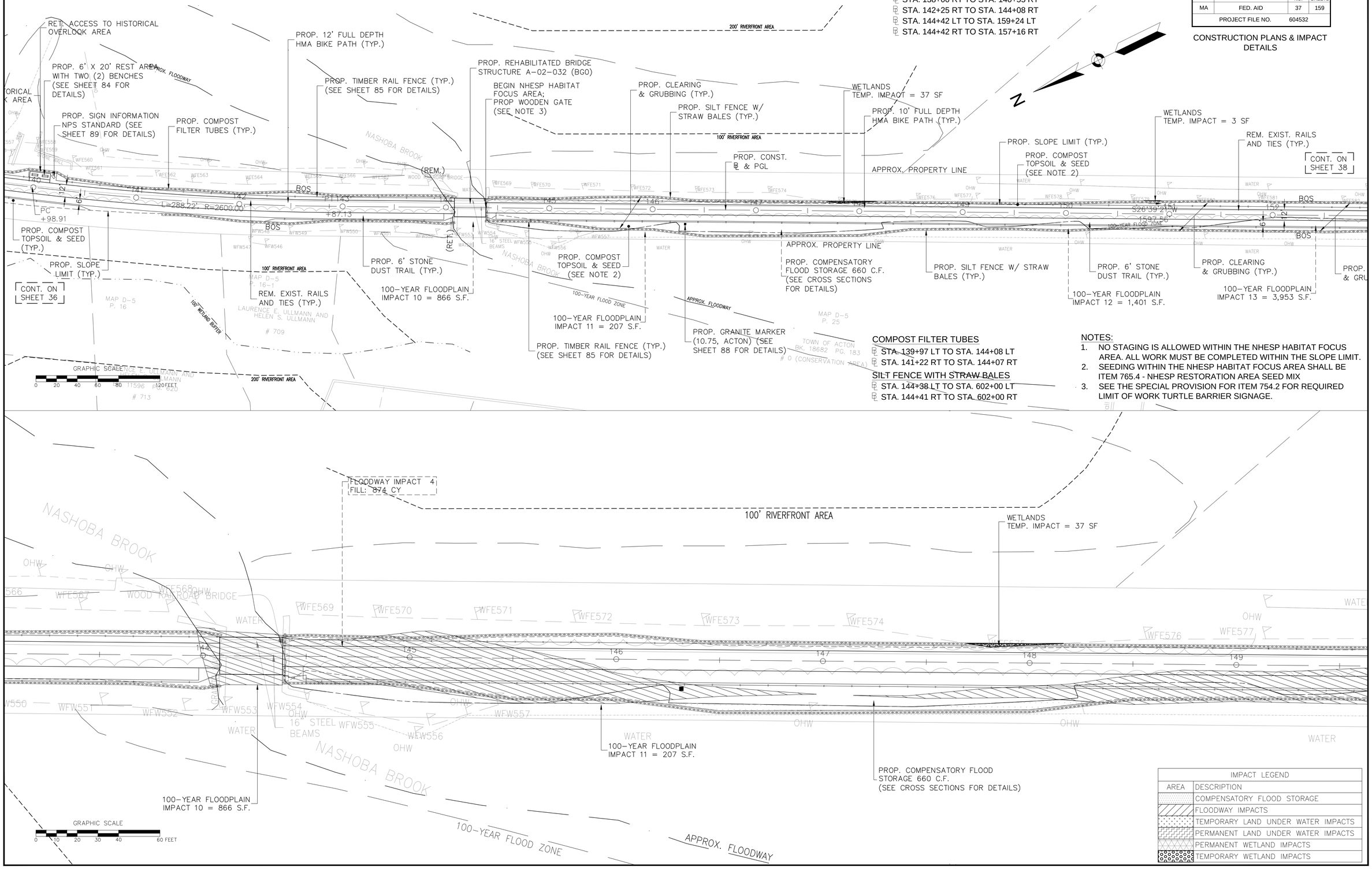
TIMBER RAIL FENCE

- STA. 135+75 LT TO STA. 144+08 LT
- STA. 138+00 RT TO STA. 140+55 RT
- STA. 142+25 RT TO STA. 144+08 RT
- STA. 144+42 LT TO STA. 159+24 LT
- STA. 144+42 RT TO STA. 157+16 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	37	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



COMPOST FILTER TUBES

- STA. 139+97 LT TO STA. 144+08 LT
- STA. 141+22 RT TO STA. 144+07 RT

SILT FENCE WITH STRAW BALES

- STA. 144+38 LT TO STA. 602+00 LT
- STA. 144+41 RT TO STA. 602+00 RT

NOTES:

1. NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 135+75 LT TO STA. 144+08 LT
- STA. 142+25 RT TO STA. 144+08 RT
- STA. 144+42 LT TO STA. 159+24 LT
- STA. 144+42 RT TO STA. 157+16 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	37a	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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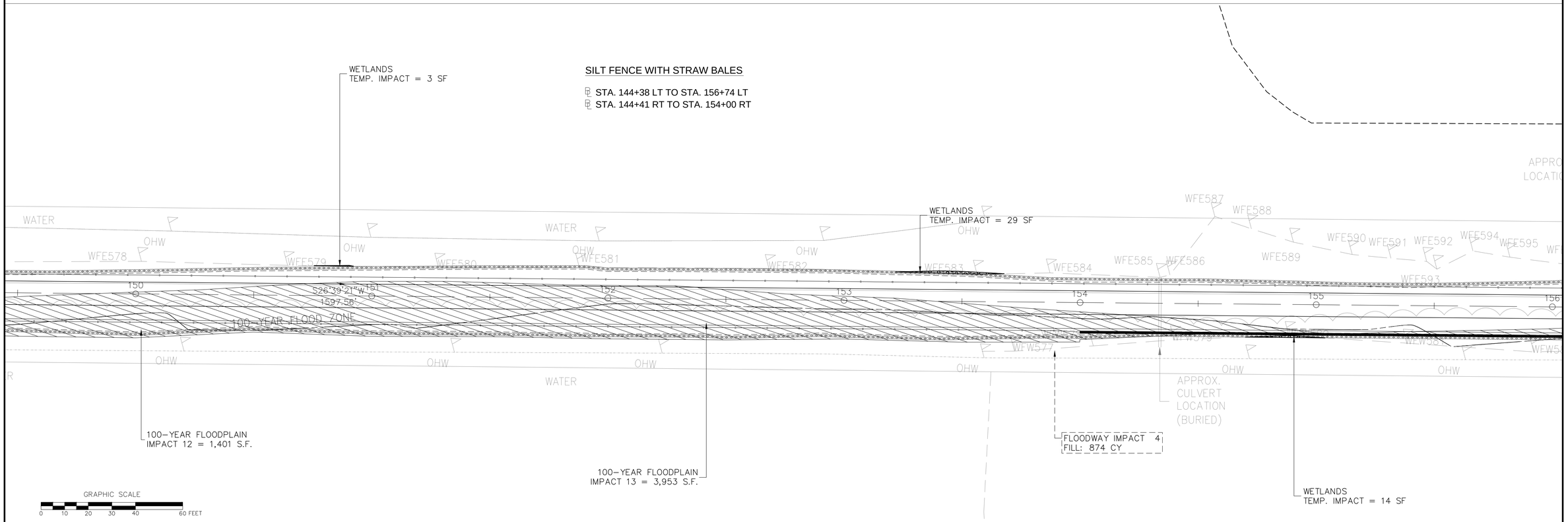
SILT FENCE WITH STRAW BALES

- STA. 144+38 LT TO STA. 156+74 LT
- STA. 144+41 RT TO STA. 154+00 RT



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 144+42 LT TO STA. 159+24 LT
- STA. 144+42 RT TO STA. 157+16 RT
- STA. 157+28 RT TO STA. 159+75 RT

SILT FENCE WITH STRAW BALES

- STA. 144+38 LT TO STA. 602+00 LT
- STA. 144+41 RT TO STA. 602+00 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	38	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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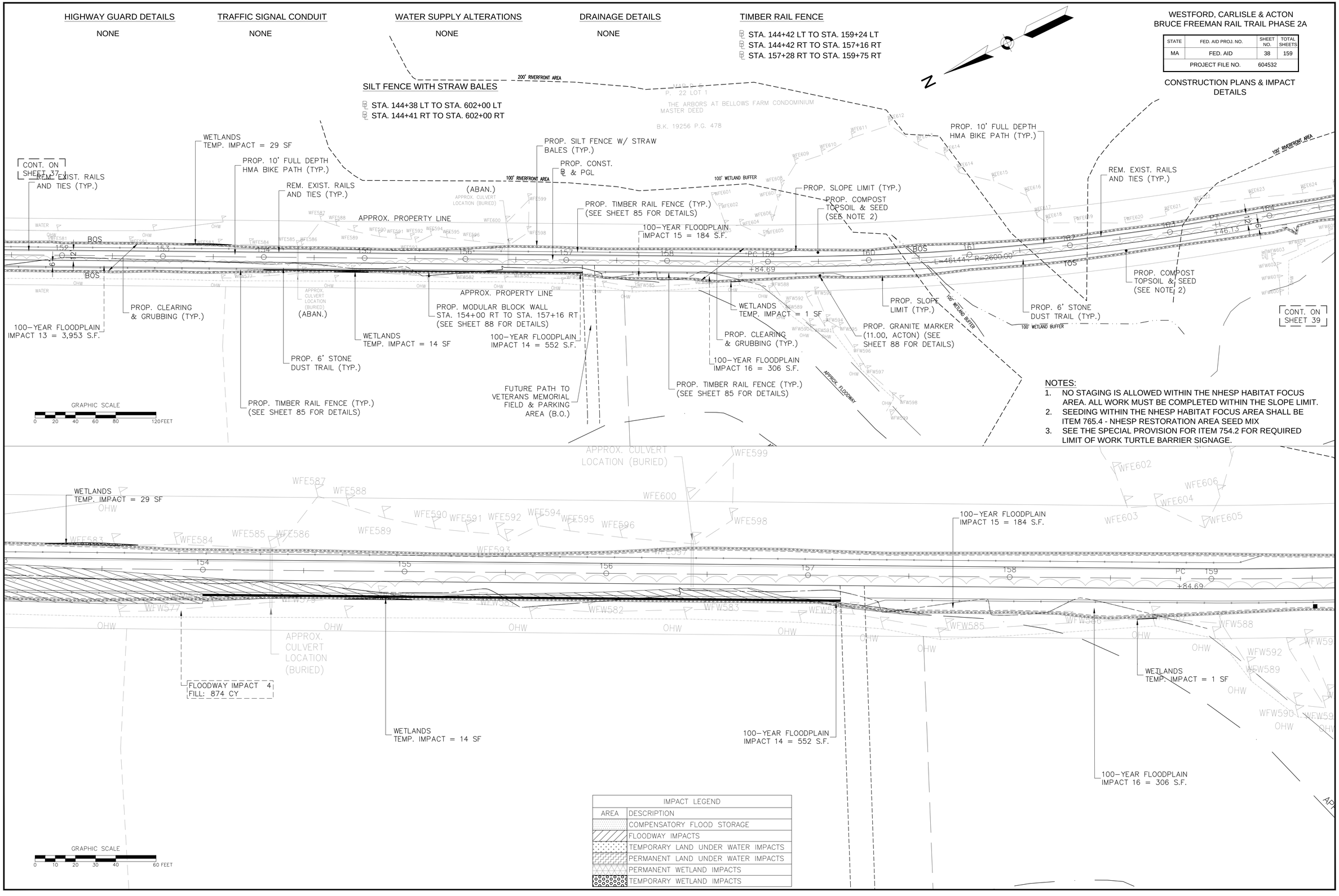

NOTES:

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2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE BELOW

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 164+75 LT TO STA. 601+24 LT
- STA. 164+75 RT TO STA. 167+00 RT
- STA. 167+30 RT TO STA. 601+23 RT
- STA. 603+30 LT TO STA. 175+25 LT
- STA. 603+30 RT TO STA. 175+25 RT

SILT FENCE WITH STRAW BALES

- STA. 144+38 LT TO STA. 602+00 LT
- STA. 144+41 LT TO STA. 602+00 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	39	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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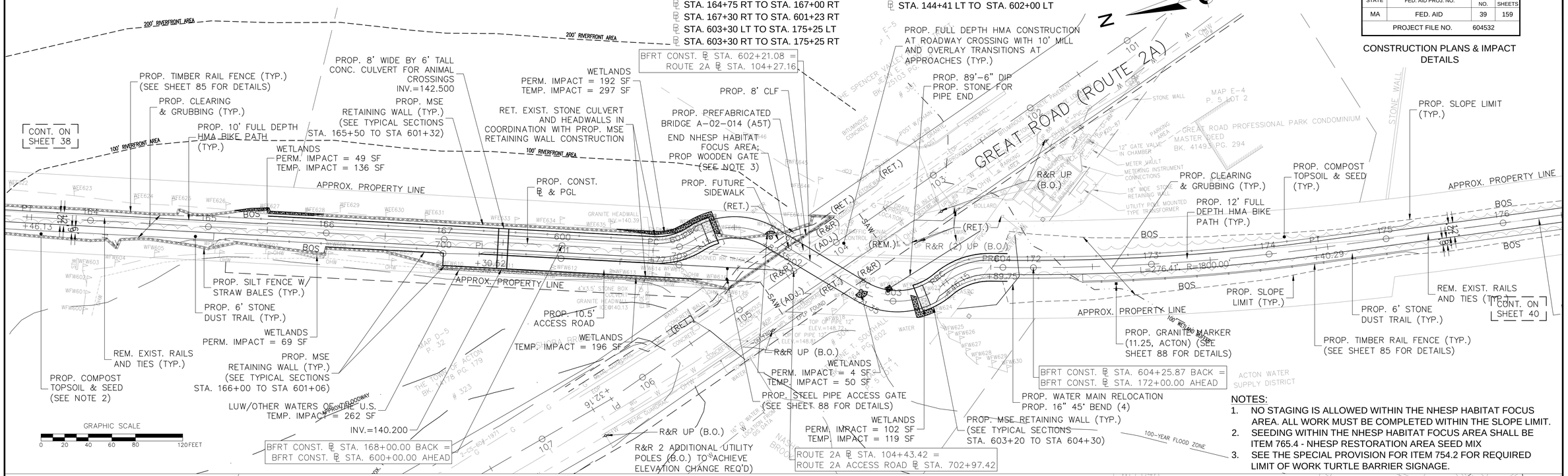

NOTES:

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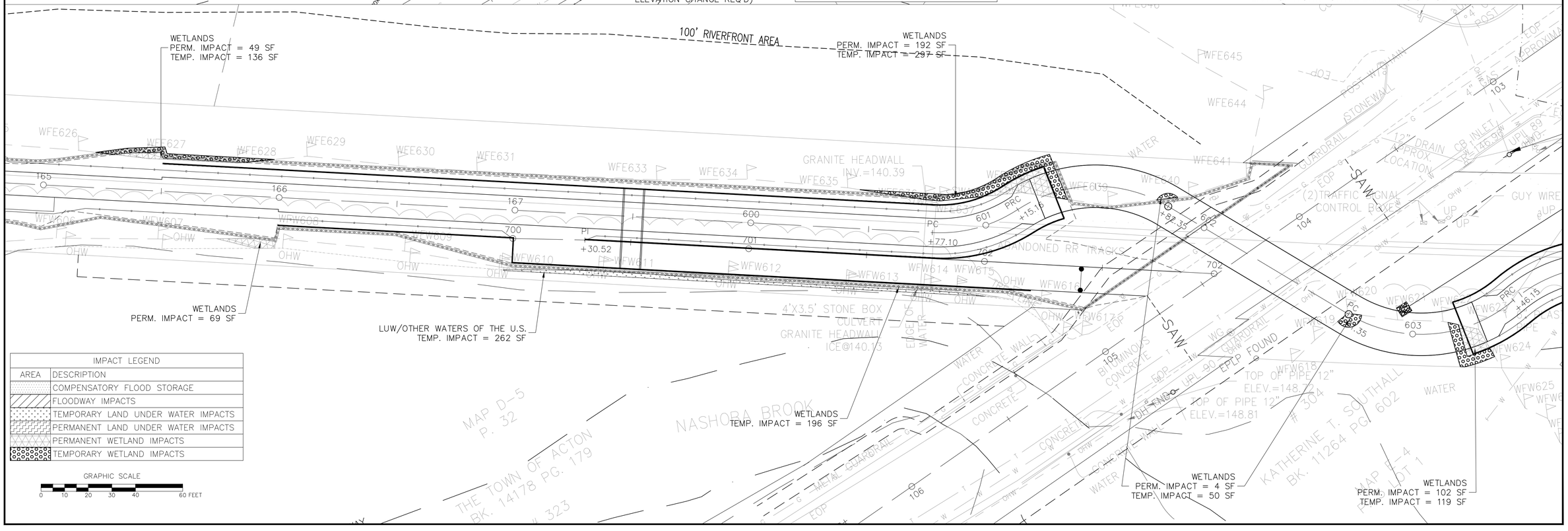
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.



HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 179+25 LT TO STA. 182+25 LT

COMPOST FILTER TUBES

- STA. 179+75 LT TO STA. 182+25 LT
- STA. 180+00 RT TO STA. 181+75 RT
- STA. 183+25 RT TO STA. 184+25 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	40	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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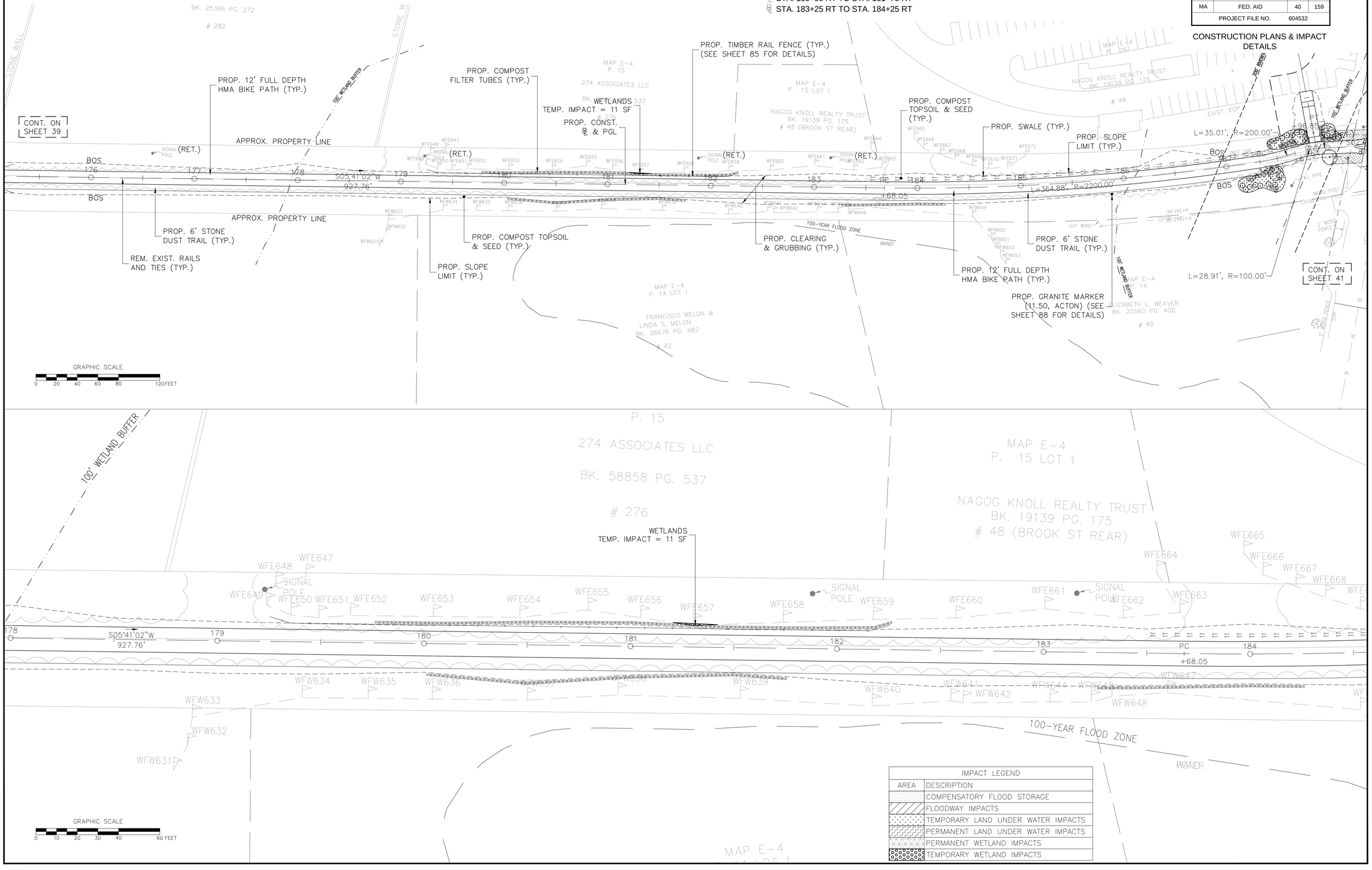

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 188+75 RT TO STA. 191+47 RT
- STA. 190+25 LT TO STA. 191+47 LT
- STA. 192+00 RT TO STA. 192+10 RT
- STA. 192+00 LT TO STA. 194+70 LT
- STA. 194+75 LT TO STA. 203+29 LT

SILT FENCE WITH STRAW BALES

- STA. 188+60 LT TO STA. 191+46 LT
- STA. 188+60 RT TO STA. 191+46 RT
- STA. 191+97 LT TO STA. 203+27 LT
- STA. 192+00 RT TO STA. 203+33 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	41	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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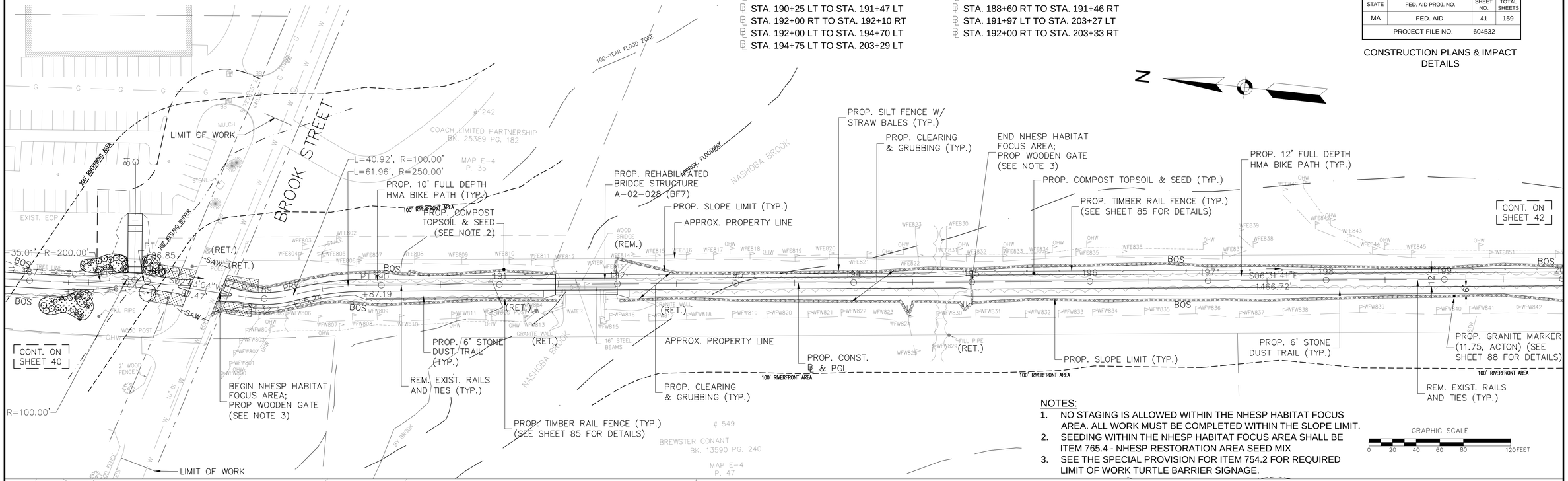

NOTES:

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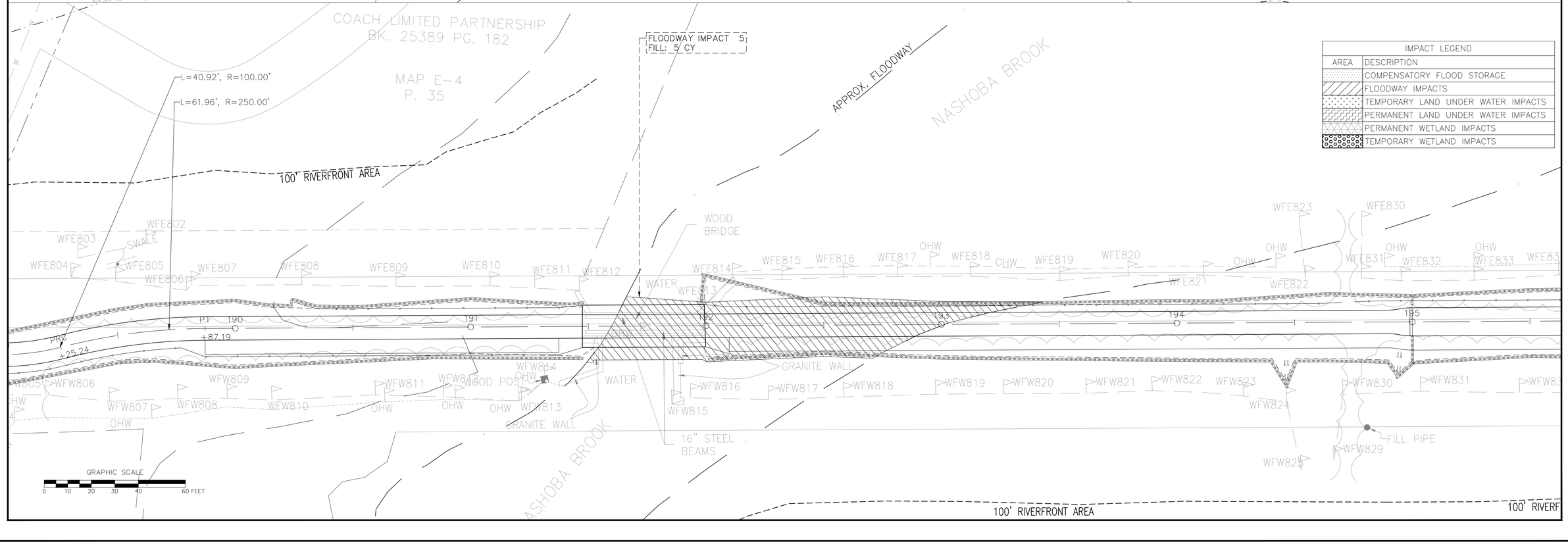
2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.

GRAPHIC SCALE
0 20 40 60 80 120 FEET

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS



HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 192+00 LT TO STA. 203+29 LT
- STA. 201+25 RT TO STA. 203+29 RT
- STA. 203+68 RT TO STA. 207+75 RT
- STA. 203+68 LT TO STA. 207+75 LT

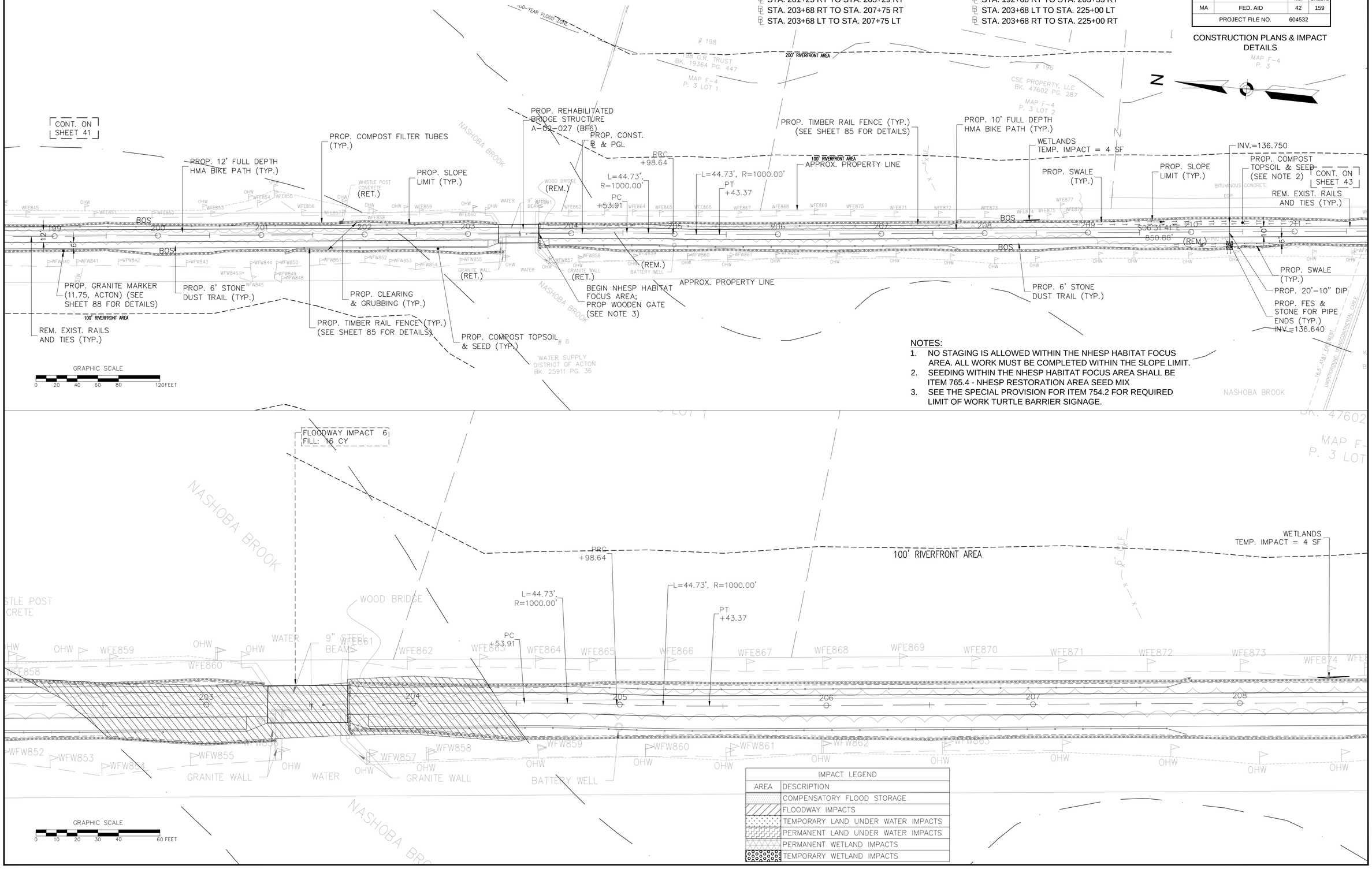
SILT FENCE WITH STRAW BALES

- STA. 191+97 LT TO STA. 203+27 LT
- STA. 192+00 RT TO STA. 203+33 RT
- STA. 203+68 LT TO STA. 225+00 LT
- STA. 203+68 RT TO STA. 225+00 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	42	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

SILT FENCE WITH STRAW BALES

- STA. 203+68 LT TO STA. 225+00 LT
- STA. 203+68 RT TO STA. 225+00 RT

DRAINAGE DETAILS

NONE

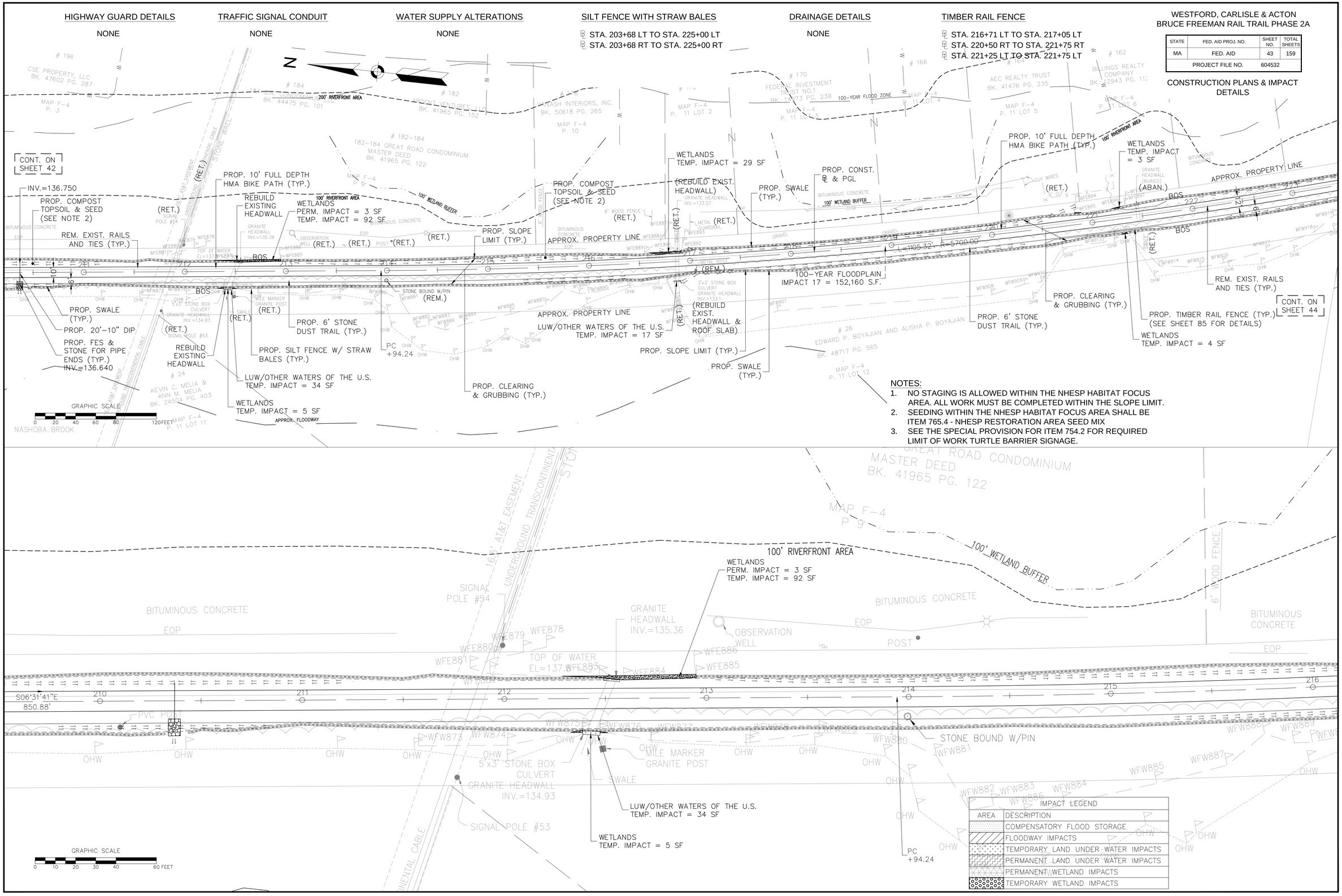
TIMBER RAIL FENCE

- STA. 216+71 LT TO STA. 217+05 LT
- STA. 220+50 RT TO STA. 221+75 RT
- STA. 221+25 LT TO STA. 221+75 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	43	159
	PROJECT FILE NO.	604532	

CONSTRUCTION PLANS & IMPACT DETAILS



NOTES:

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IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 1:59 PM

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 192+00 LT TO STA. 203+29 LT
- STA. 201+25 RT TO STA. 203+29 RT
- STA. 203+68 RT TO STA. 207+75 RT
- STA. 203+68 LT TO STA. 207+75 LT

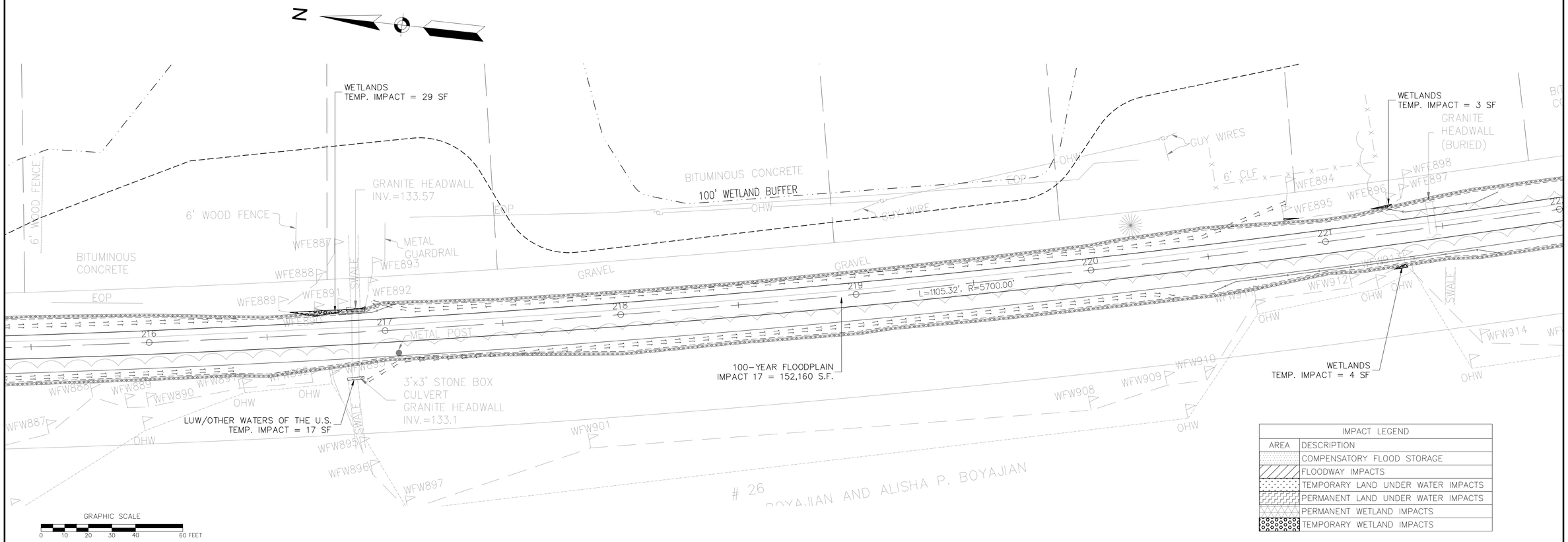
SILT FENCE WITH STRAW BALES

- STA. 203+68 LT TO STA. 225+00 LT
- STA. 203+68 RT TO STA. 225+00 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	43a	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 1:59 PM

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

TIMBER RAIL FENCE

℄ STA. 226+00 LT TO STA. 227+22 LT

SILT FENCE AND STRAW BALES

℄ STA. 203+68 LT TO STA. 225+00 LT
℄ STA. 203+68 RT TO STA. 225+00 RT

COMPOST FILTER TUBES

℄ STA. 225+00 RT TO STA. 239+25 RT
℄ STA. 227+40 LT TO STA. 231+00 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	44	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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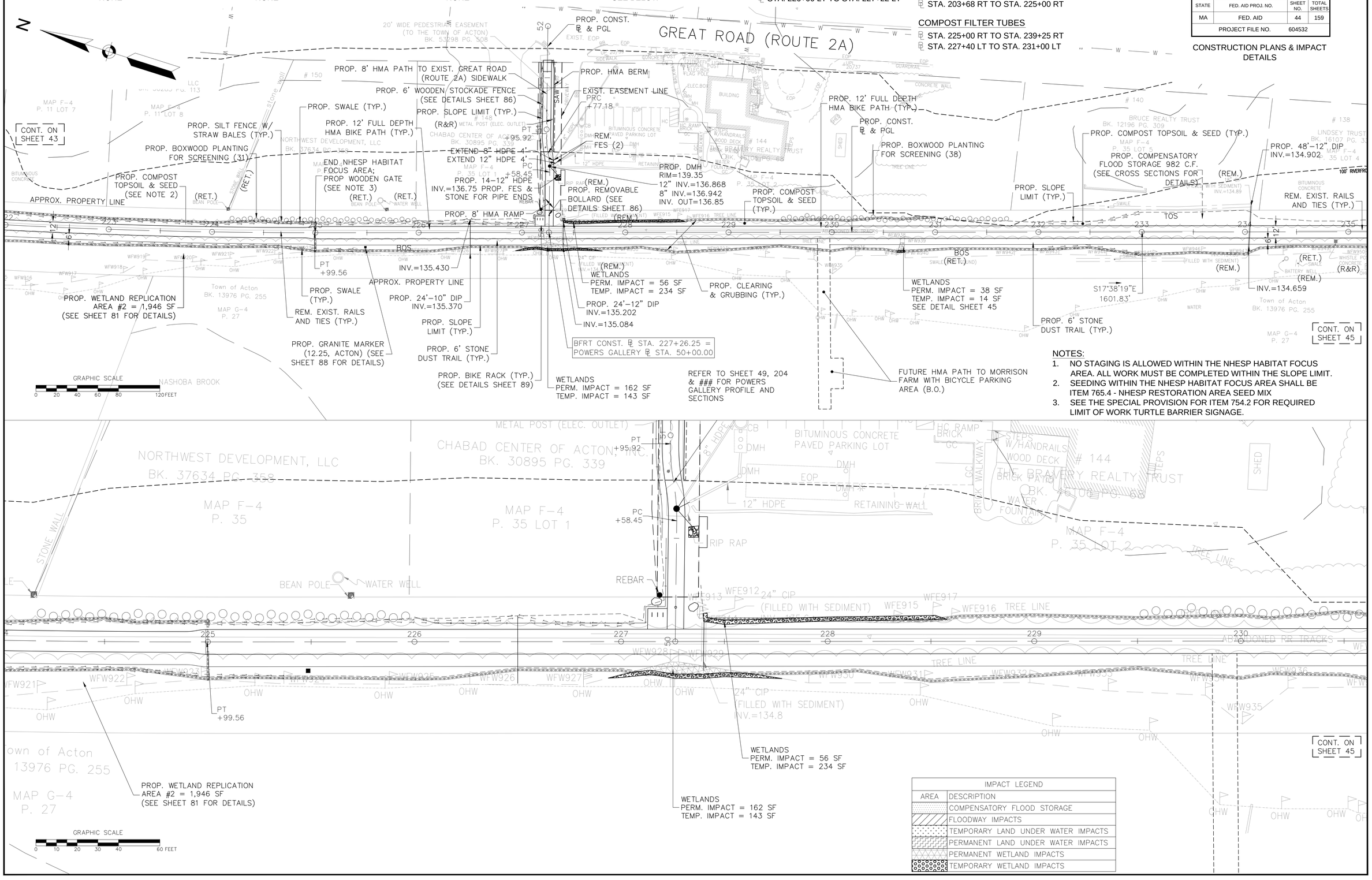

NOTES:

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IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

TIMBER RAIL FENCE

- STA. 236+52 LT TO STA. 236+86 LT
- STA. 237+25 RT TO STA. 238+75 RT
- STA. 243+00 LT TO STA. 244+00 LT
- STA. 244+25 RT TO STA. 244+75 RT
- STA. 244+25 LT TO STA. 244+75 LT

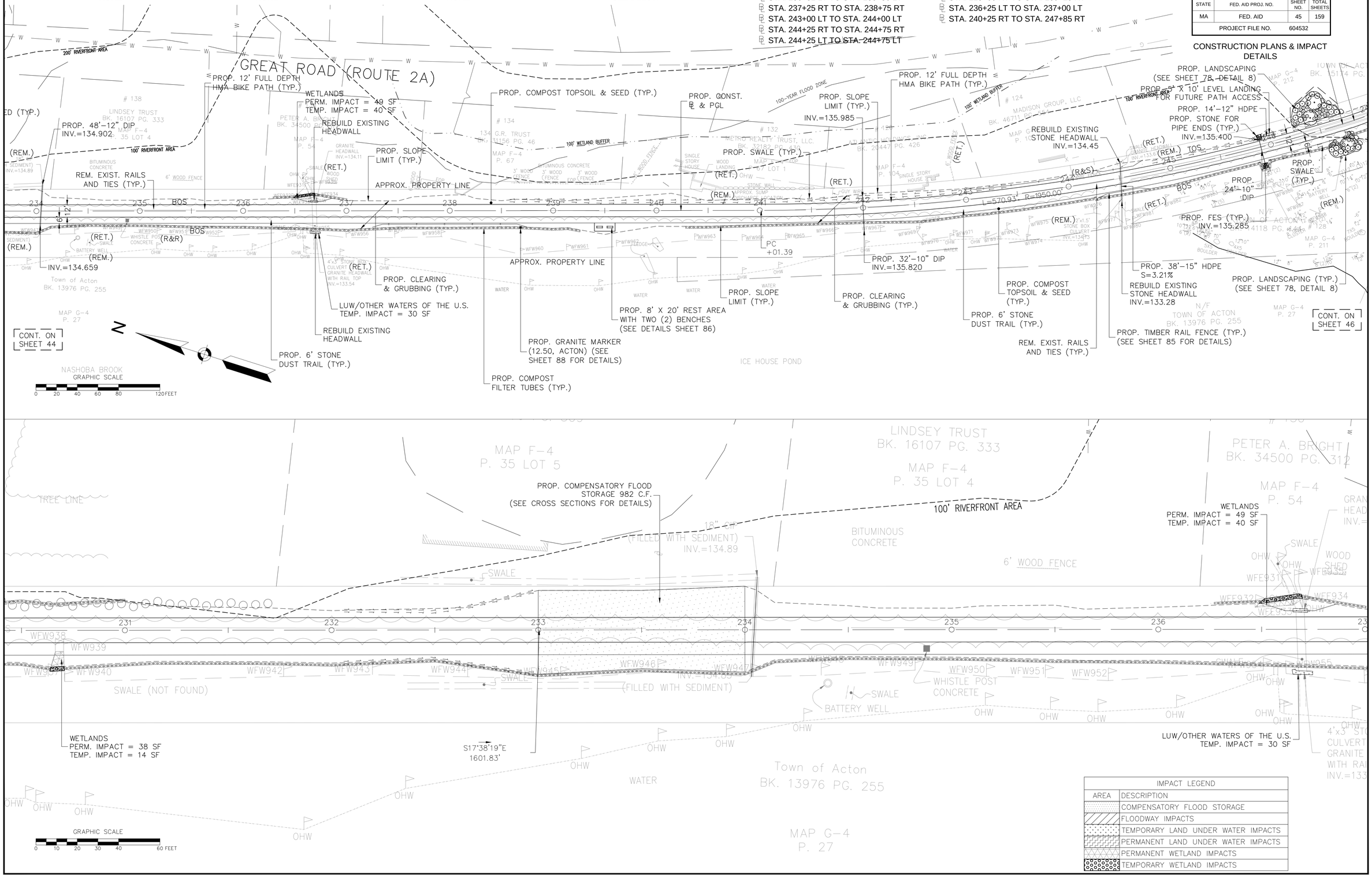
COMPOST FILTER TUBES

- STA. 225+00 RT TO STA. 239+25 RT
- STA. 236+25 LT TO STA. 237+00 LT
- STA. 240+25 RT TO STA. 247+85 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	45	159
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 2:00 PM

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

- STA. 248+36 RT TO STA. 249+25 RT
- STA. 253+78 LT TO STA. 253+88 LT
- STA. 253+78 RT TO STA. 253+88 RT
- STA. 254+31 LT TO STA. 256+75 LT

COMPOST FILTER TUBES

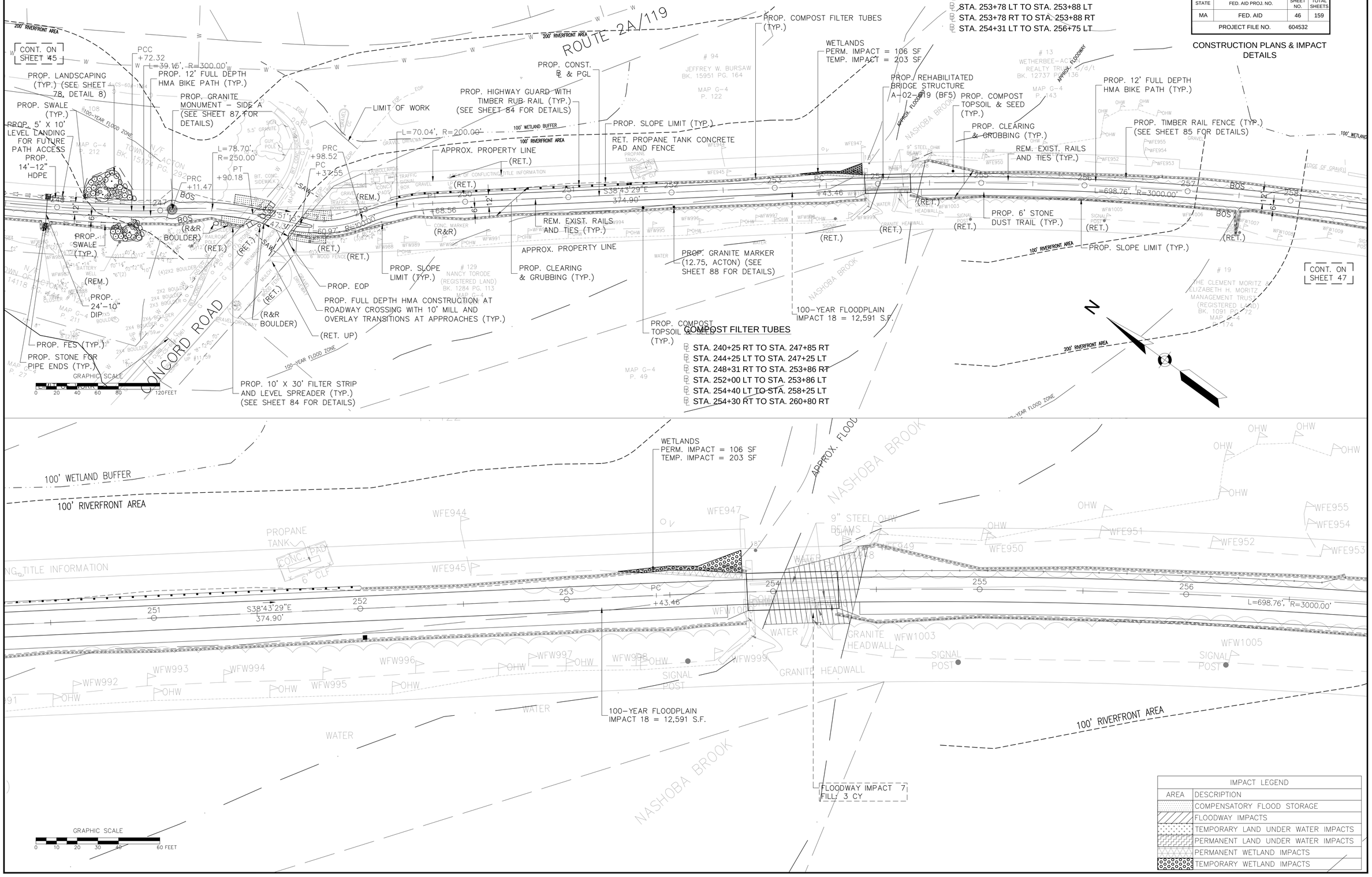
- STA. 240+25 RT TO STA. 247+85 RT
- STA. 244+25 LT TO STA. 247+25 LT
- STA. 248+31 RT TO STA. 253+86 RT
- STA. 252+00 LT TO STA. 253+86 LT
- STA. 254+40 LT TO STA. 258+25 LT
- STA. 254+30 RT TO STA. 260+80 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	46	159
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT DETAILS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 2:00 PM



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

HIGHWAY GUARD DETAILS

- STA. 262+25 LT - ITEM 627.1
- STA. 262+25 LT TO STA. 266+78 LT - ITEM 603.7
- STA. 266+78 LT - ITEM 627.1

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

TIMBER RAIL FENCE

NONE

COMPOST FILTER TUBES

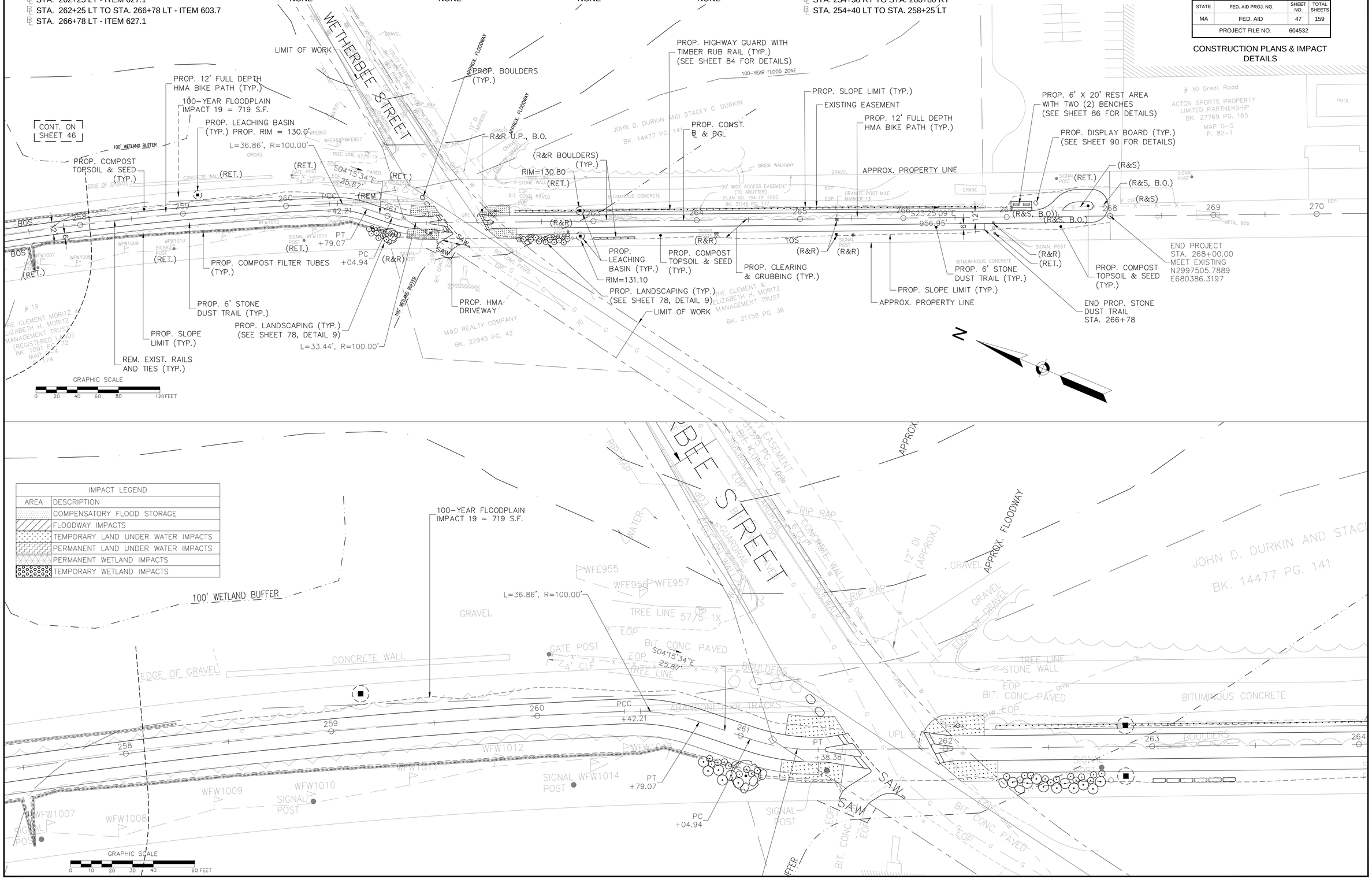
- STA. 254+30 RT TO STA. 260+80 RT
- STA. 254+40 LT TO STA. 258+25 LT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	47	159
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

10031_2A_CO_ENF.DWG Plotted on 18-Mar-2014 2:00 PM



IMPACT LEGEND

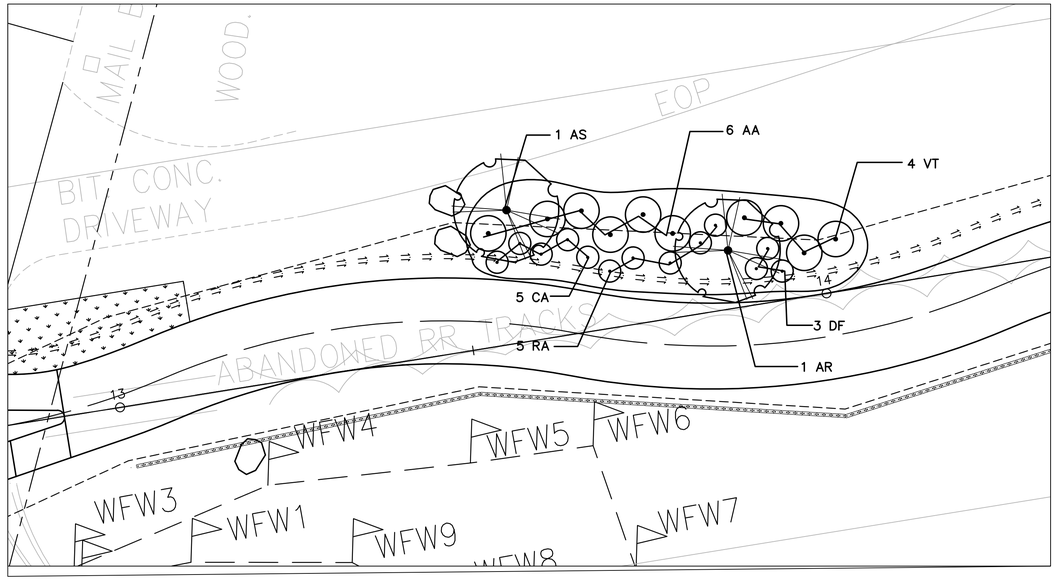
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LAND UNDER WATER IMPACTS
	PERMANENT LAND UNDER WATER IMPACTS
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED: AID	75	158
PROJECT FILE NO.	604532		

LANDSCAPING PLANS AND DETAILS

10031_2A_LS.DWG 11-Mar-2014

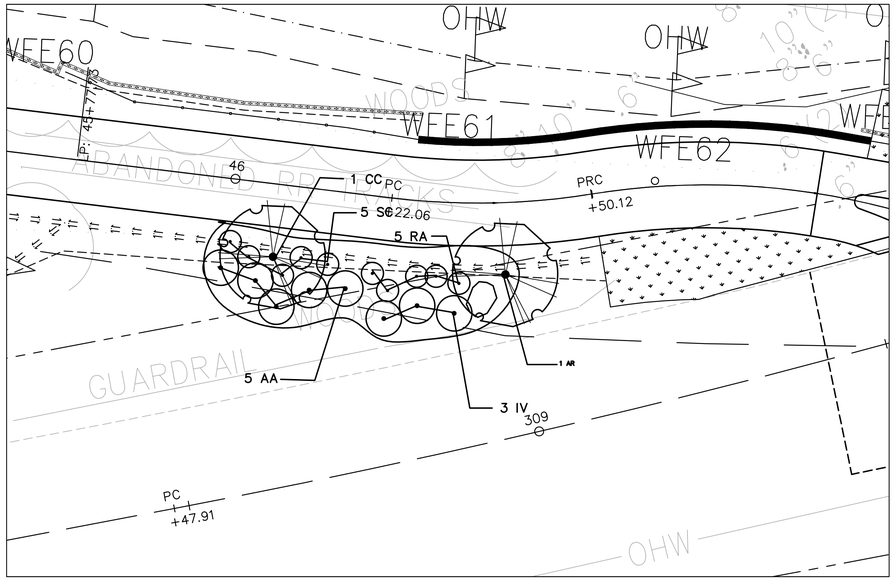


LANDSCAPING DETAIL 1
SCALE: 1" = 10'

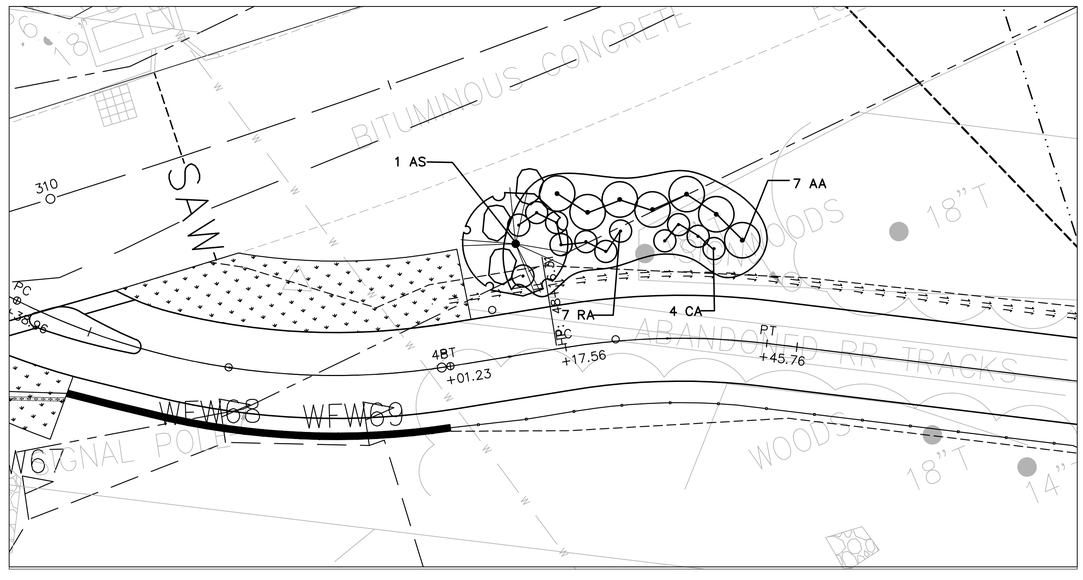
PLANT LIST				
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
SHRUBS				
VT	4	VIBURNUM TRILOBUM	CRANBERRY BUSH – AMERICAN	3' – 4 HT
CA	9	CLETHRA ALNIFOLIA	SUMMERSWEET SHRUB	24"–30" HT
IVM	1	ILEX VERTICILLATA	WINTERBERRY – MALE	24"–30" HT
IVF	2	ILEX VERTICILLATA	WINTERBERRY – FEMALE	24"–30" HT
SC	5	SYMPHORICARPOS XCHENAULTI	CORALBERRY SHRUB – CHENAULT	24"–30" HT
DF	3	FOTHERGILLA GARDENII	FOTHERGILLA – DWARF	18" – 24"
RA	12	RHUS AROMATICA 'GROW LOW'	GROW LOW FRAGRANT SUMAC	18" – 24"
AA	18	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	BRILLIANTISSIMA CHOKEBERRY	18" – 24"
TREES				
CC	1	CERCIS CANADENSIS	EASTERN REDBUD	8'–10' MULTI–STEM
AR	2	ACER RUBRA 'OCTOBER GLORY'	RED MAPLE	3"–3.5" cal
AS	2	AMELANCHIER 'ROBIN HILL'	ROBIN HILL SERVICEBERRY	3"–3.5" cal

NOTES:

1. LOCATIONS FOR PROPOSED TREES ARE APPROXIMATE ONLY. THE TOWN ENGINEER (OR OTHER TOWN REPRESENTATIVE DESIGNATED BY THE TOWN ENGINEER) SHALL APPROVE FINAL LOCATION OF TREES IN THE FIELD IN COORDINATION WITH THE ENGINEER.



LANDSCAPING DETAIL 2
SCALE: 1" = 10'



LANDSCAPING DETAIL 3
SCALE: 1" = 10'

MassDOT DWT Version:

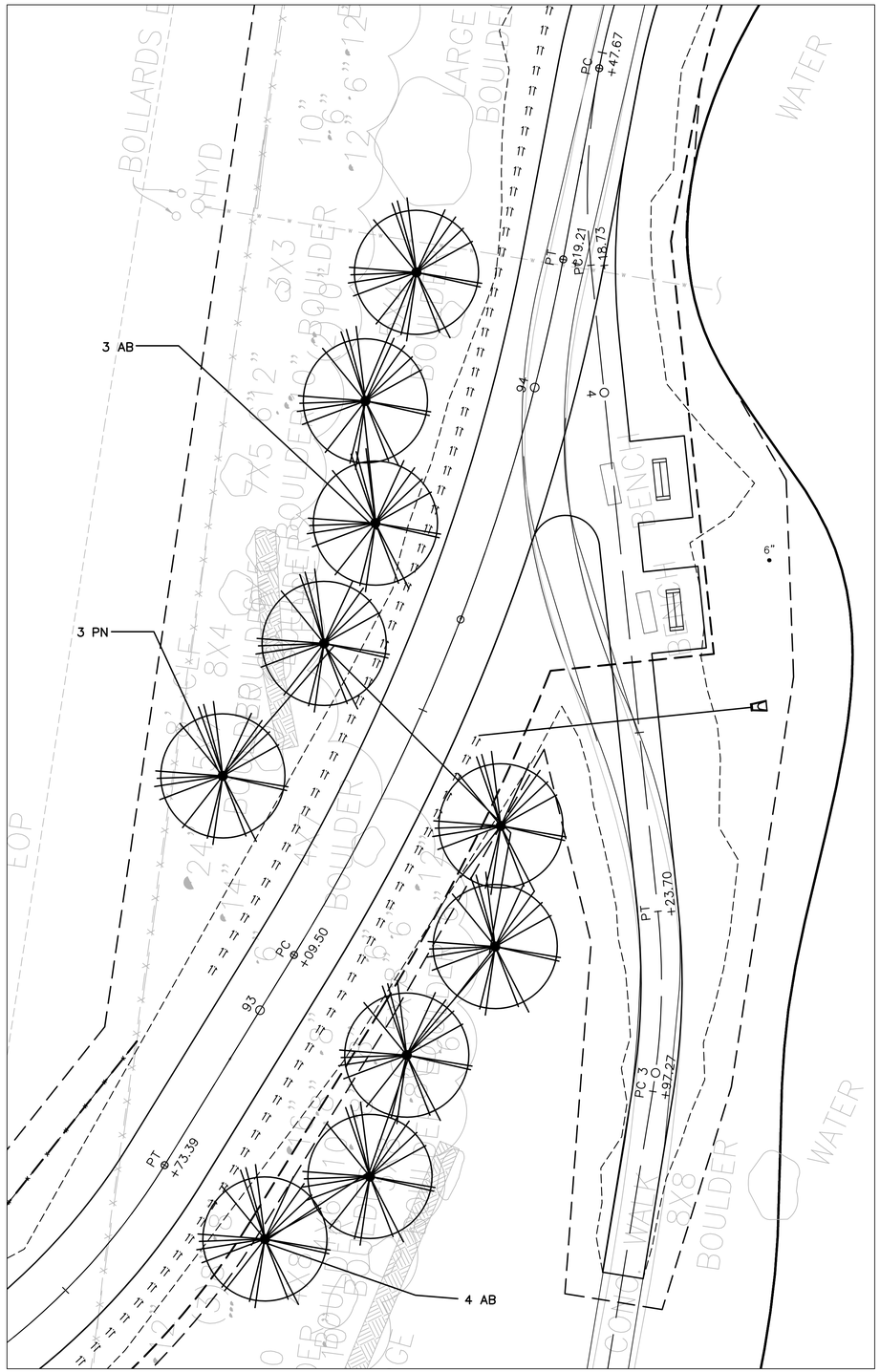
BRUCE FREEMAN RAIL TRAIL PHASE 2A
WESTFORD, CARLISLE & ACTON

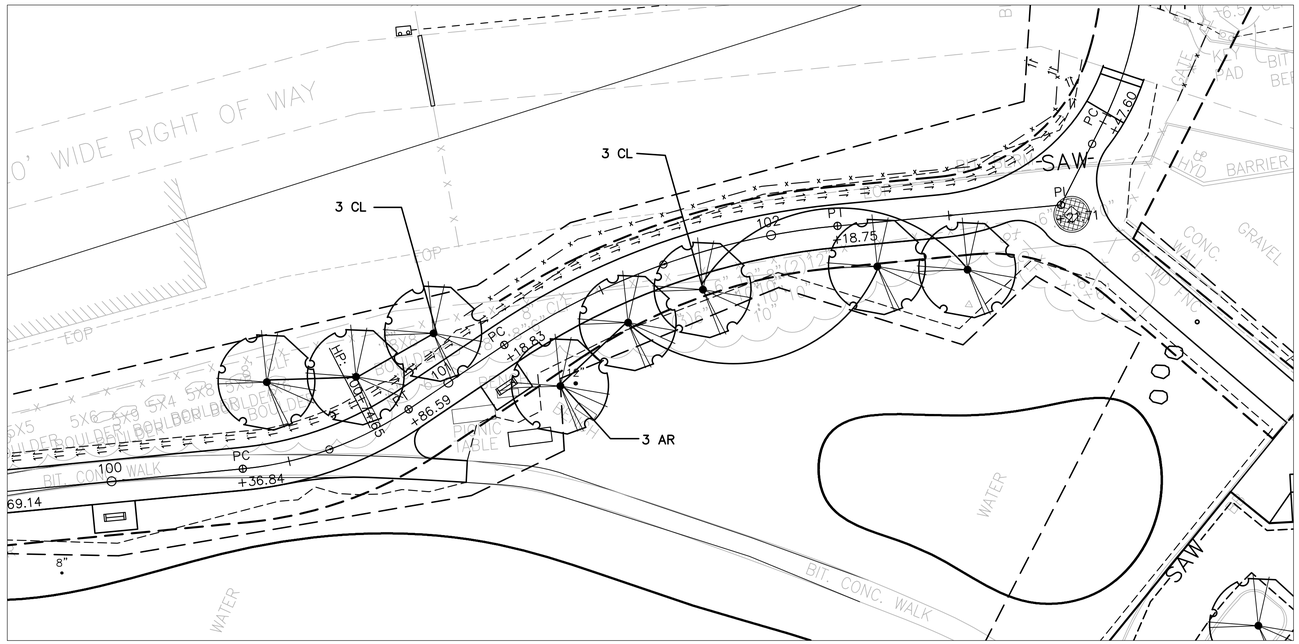
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	76	158
PROJECT FILE NO.	604532		

LANDSCAPING PLANS AND DETAILS

LANDSCAPING DETAIL 4

SCALE: 1" = 10'





LANDSCAPING DETAIL 5

SCALE: 1" = 20'

PLANT LIST				
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
TREES				
CL	6	CLADRASTIS LUTEA	YELLOWWOOD	3"–3.5" cal
AR	3	ACER RUBRA 'OCTOBER GLORY'	RED MAPLE	3"–3.5" cal
PN	3	PINUS STROBUS	EASTERN WHITE PINE	8'–10' HT
AB	7	ABIES BALSAMEA PHANEROLEPIS	CANAAN FIR	8'–10' HT

GRAPHIC SCALE
0 5 10 15 20 30 FEET

MassDOT DWT Version:

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

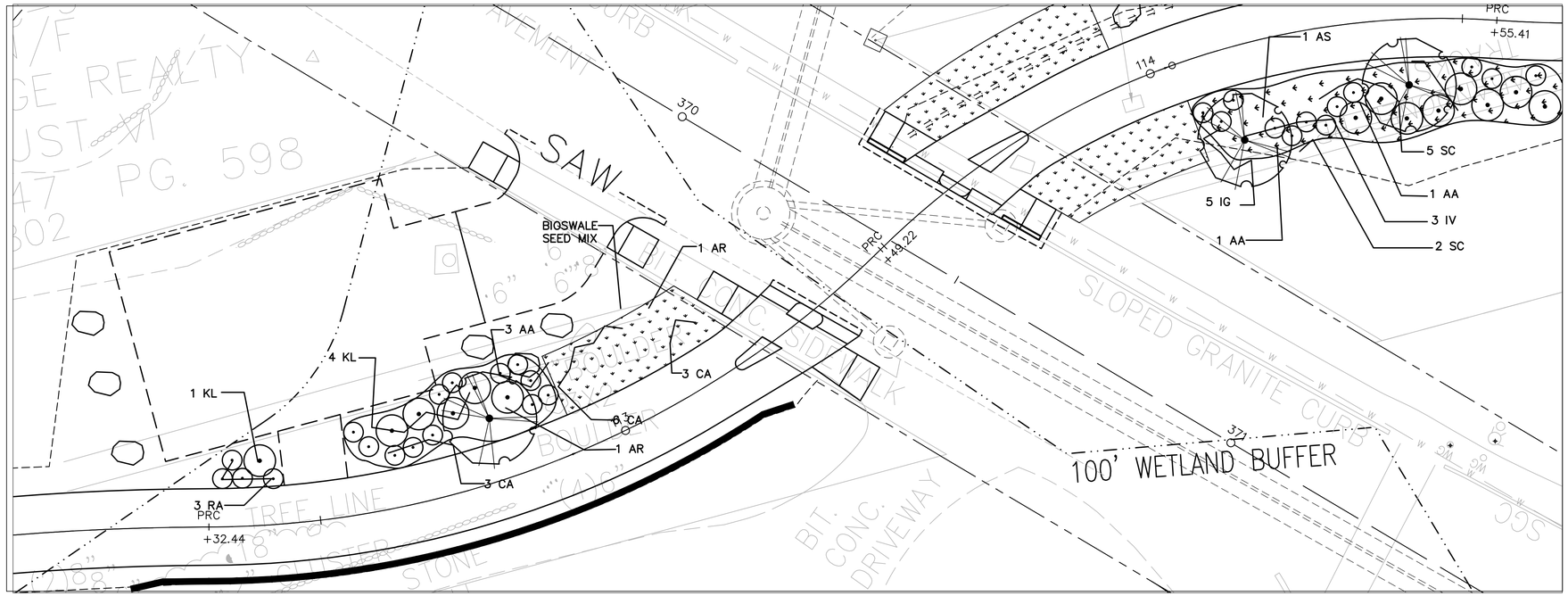
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	77	158
PROJECT FILE NO.	604532		

LANDSCAPING PLANS AND DETAILS

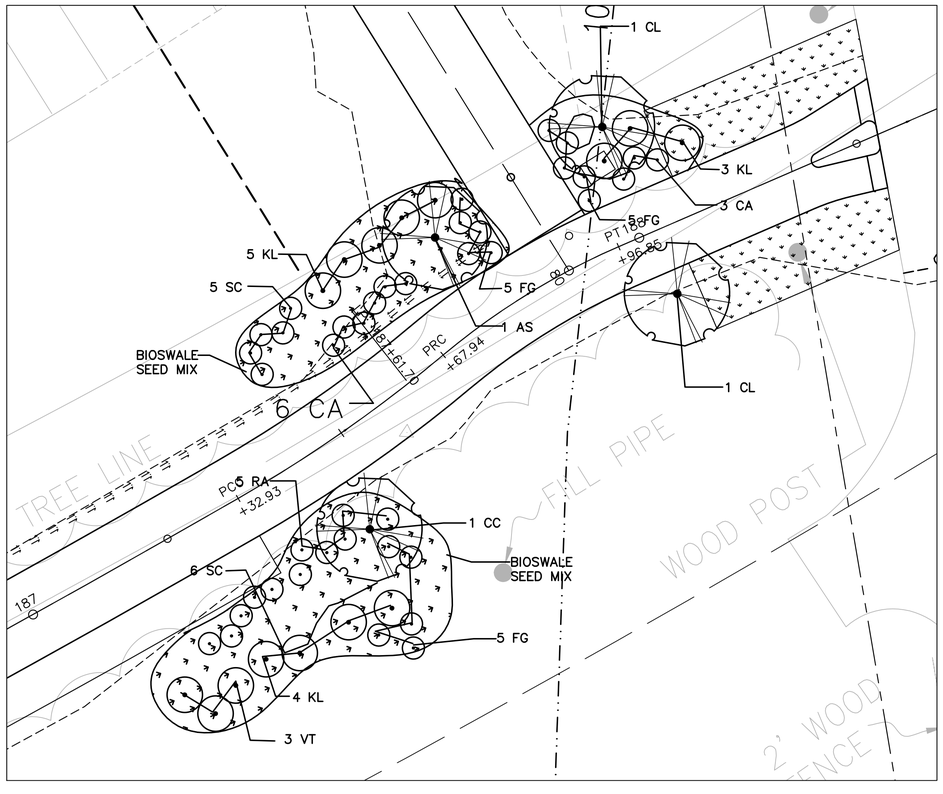
10031_2A_LS.DWG 11-Mar-2014

NOTES:

1. LOCATIONS FOR PROPOSED TREES ARE APPROXIMATE ONLY. THE TOWN ENGINEER (OR OTHER TOWN REPRESENTATIVE DESIGNATED BY THE TOWN ENGINEER) SHALL APPROVE FINAL LOCATION OF TREES IN THE FIELD IN COORDINATION WITH THE ENGINEER.



LANDSCAPING DETAIL 6
SCALE: 1" = 10'



LANDSCAPING DETAIL 7
SCALE: 1" = 10'

BIOSWALE SEED MIX

VIRGINIA WILD RYE, (ELYMUS VIRGINICUS)
CREEPING RED FESCUE, (FESTUCA RUBRA)
LITTLE BLUESTEM,(SCHIZACHYRIUM SCOPARIUM)
BIG BLUESTEM, (ANDROPOGON GERARDII)
FOX SEDGE, (CAREX VULPINOIDEA)
SWITCH GRASS, (PANICUM VIRGATUM)
ROUGH BENTGRASS, (AGROSTIS SCABRA)
NEW ENGLAND ASTER, (ASTER NOVAE–ANGLIAE)
BONESET, (EUPATORIUM PERFOLIATUM)
GRASS LEAVED GOLDENROD, (EUTHAMIA GRAMINIFOLIA)
GREEN BULRUSH, (SCIRPUS ATROVIRENS)
BLUE VERVAIN, (VERBENA HASTATA)
SOFT RUSH, (JUNCUS EFFUSUS)
WOOL GRASS, (SCIRPUS CYPERINUS)

PLANT LIST

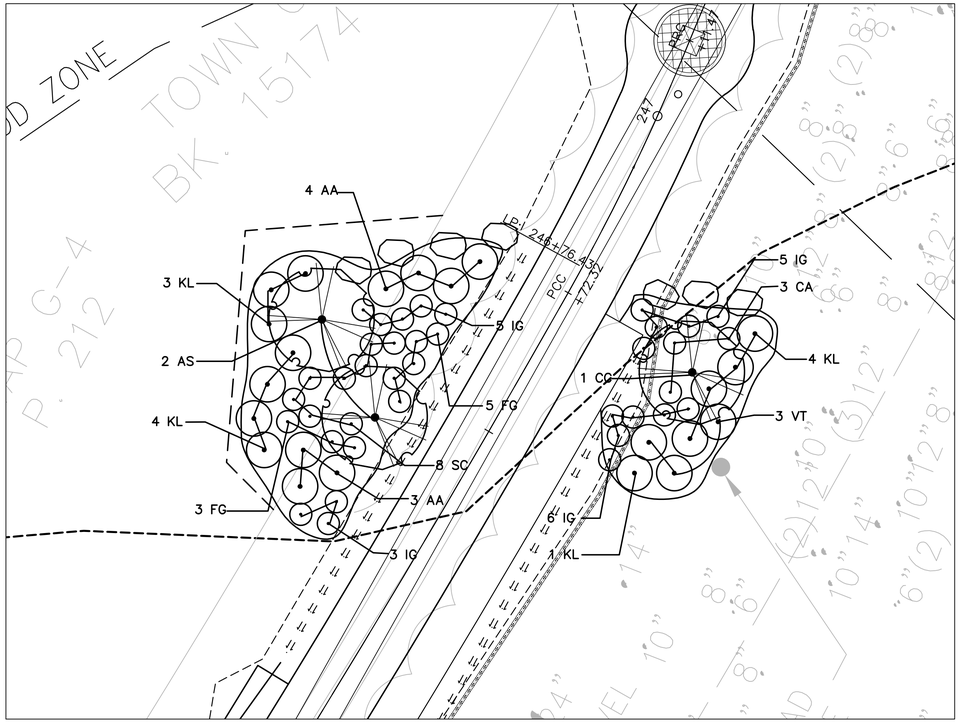
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
SHRUBS				
VT	3	VIBURNUM TRILOBUM	CRANBERRY BUSH – AMERICAN	2 – 3 FEET
CA	15	CLETHRA ALNIFOLIA	SUMMERSWEET SHRUB	2 – 3 FEET
KL	17	KLAMIA LATIFOLIA	MOUNTAIN IAUREL	24 – 30 INCH
IVF	3	ILEX VERTICILLATA	WINTERBERRY – FEMALE	24 – 30 INCH
IG	5	ILEX GLABRA 'COMPACTA'	INKBERRY – COMPACT	24 – 30 INCH
SC	13	SYMPHORICARPOS XCHENAULTI	CORALBERRY SHRUB – CHENAULT	2 – 3 FEET
FG	15	FOTHERGILLA GARDENII	FOTHERGILLA – DWARF	18 – 24 INCH
RA	12	RHUS AROMATICA 'GROW LOW'	GROW LOW FRAGRANT SUMAC	18 – 24 INCH
AA	5	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	BRILLIANTISSIMA CHOKEBERRY	18 – 24 INCH
TREES				
CC	1	CERCIS CANADENSIS	EASTERN REDBUD	8'–10' MULTI–STEM
AR	2	ACER RUBRA 'OCTOBER GLORY'	RED MAPLE	3"–3.5" cal
AS	1	AMELANCHIER 'ROBIN HILL'	ROBIN HILL SERVICEBERRY	3"–3.5" cal
CL	2	CLADRASTIS LUTEA	YELLOWWOOD	3"–3.5" cal

MassDOT DWT Version:

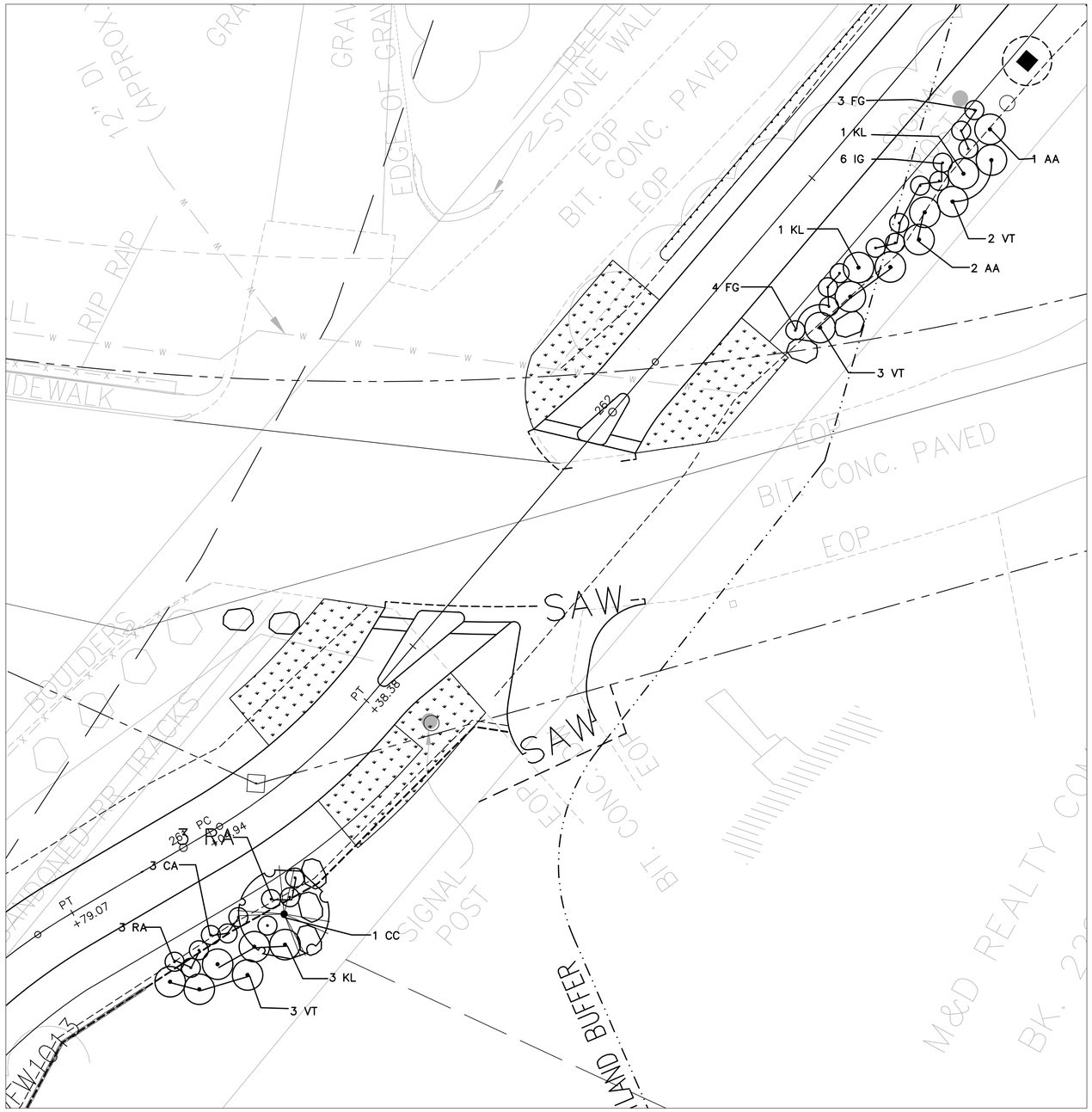
10031_2A_LS.DWG 11-Mar-2014

NOTES:

1. LOCATIONS FOR PROPOSED TREES ARE APPROXIMATE ONLY. THE TOWN ENGINEER (OR OTHER TOWN REPRESENTATIVE DESIGNATED BY THE TOWN ENGINEER) SHALL APPROVE FINAL LOCATION OF TREES IN THE FIELD IN COORDINATION WITH THE ENGINEER.



LANDSCAPING DETAIL 8
SCALE: 1" = 10'



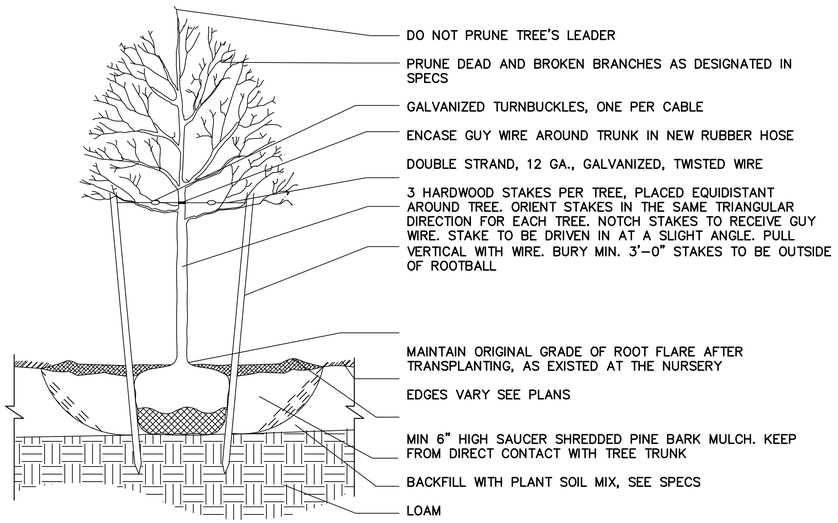
LANDSCAPING DETAIL 9
SCALE: 1" = 10'

PLANT LIST				
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
SHRUBS				
VT	11	VIBURNUM TRILOBUM	CRANBERRY BUSH – AMERICAN	2 – 3 FEET
CA	6	CLETHRA ALNIFOLIA	SUMMERSWEET SHRUB	2 – 3 FEET
KL	17	KLAMIA LATIFOLIA	MOUNTAIN LAUREL	24 – 30 INCH
IG	25	ILEX GLABRA 'COMPACTA'	INKBERRY – COMPACT	24 – 30 INCH
SC	8	SYMPHORICARPOS XCHENAULTI	CORALBERRY SHRUB – CHENAULT	2 – 3 FEET
FG	15	FOTHERGILLA GARDENII	FOTHERGILLA – DWARF	18 – 24 INCH
RA	6	RHUS AROMATICA 'GROW LOW'	GROW LOW FRAGRANT SUMAC	18 – 24 INCH
AA	10	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	BRILLIANTISSIMA CHOKEBERRY	18 – 24 INCH
TREES				
CC	3	CERCIS CANADENSIS	EASTERN REDBUD	8'–10' MULTI–STEM

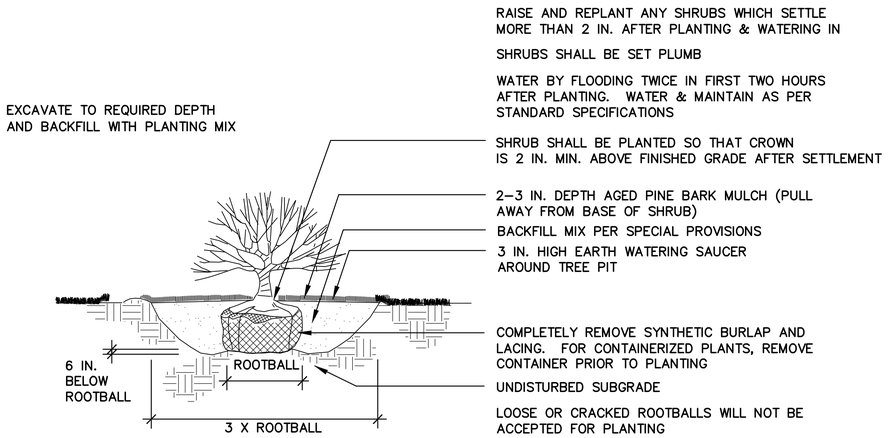
BRUCE FREEMAN RAIL TRAIL PHASE 2A
WESTFORD, CARLISLE & ACTON

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	79	158
PROJECT FILE NO.	604532		

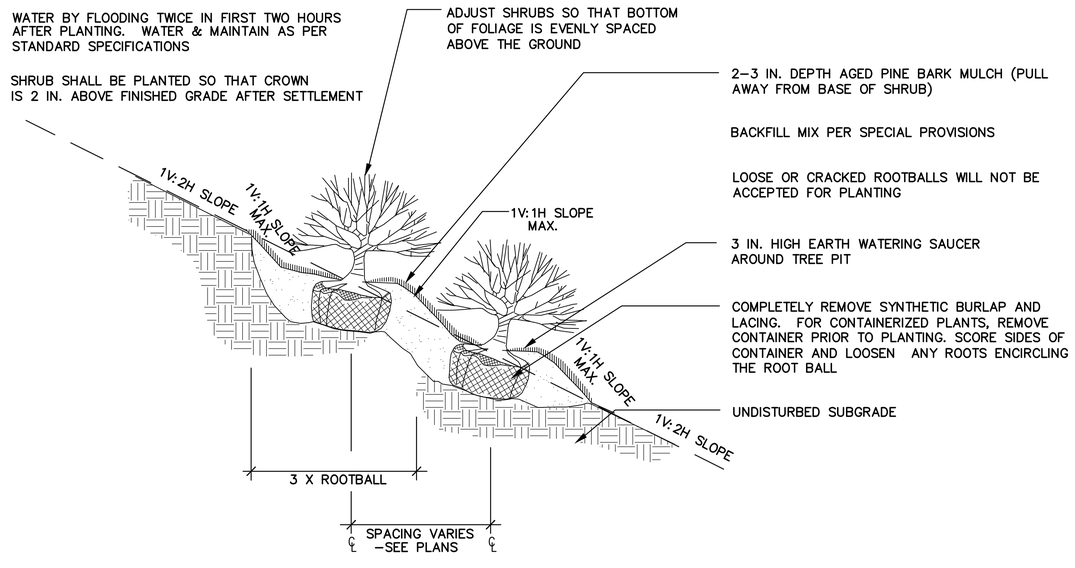
LANDSCAPING PLANS AND DETAILS



TREE
NOT TO SCALE

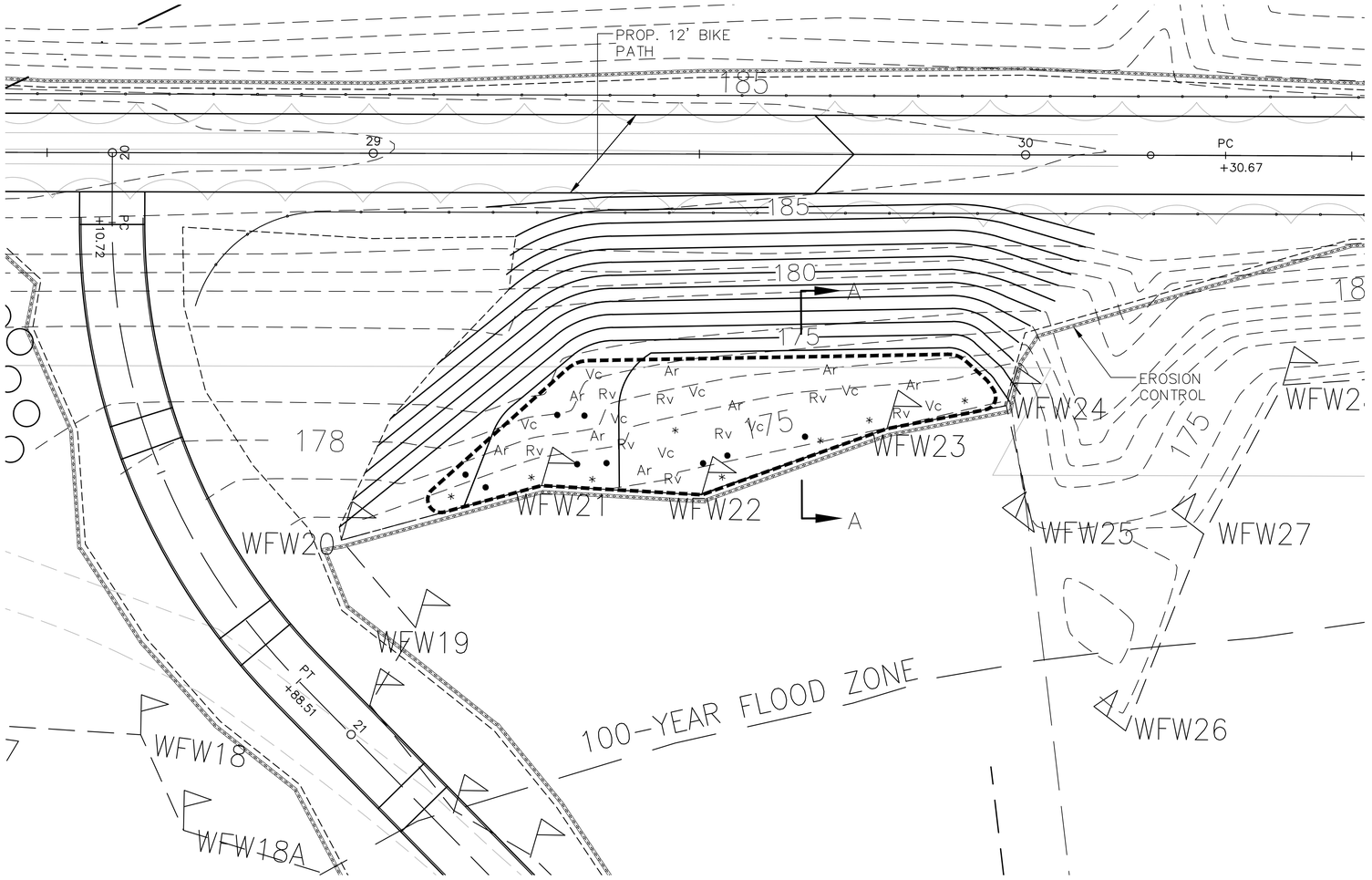


SHRUB PLANTING
NOT TO SCALE



CONTAINERIZED SHRUB PLANTING (SLOPE)
NOT TO SCALE

MassDOT DWT Version:



10 0 10 20

SCALE 1" = 10'

PLANTING PLAN

PLANTING SPECIFICATIONS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY
Ar	ACER RUBRUM	RED MAPLE	8
Vc	VACCCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	8
Rv	RHODODENDRON VISCOSUM	SWAMP AZALEA	8
•	OSMUNDA CINNAMOMEA	CINNAMON FERN	9
*	ONOCLEA SENSIBILIS	SENSITIVE FERN	9

WETLAND SEED MIX

SCIENTIFIC NAME	COMMON NAME	%
CAREX VULPINOIDEA	FOX SEDGE	25
ELYMUS VIRGINICUS	VIRGINIA WILDRYE	25
CAREX LUPULINA	HOP SEDGE	12
CAREX COMOSA	BRISTLY SEDGE	6
VERBENA HASTATA	BLUE VERVAIN	6
JUNCUS EFFUSUS	SOFT RUSH	6
ASTER NOVAE–ANGLIAE	NEW ENGLAND ASTER	4
SCIRPUS ATROVIRENS	GREEN BULRUSH	4
SCIRPUS CYPERINUS	WOOLGRASS	4
EUPATORIUM PERFOLIATUM	BONESET	2
EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED	2
EUTHAMIA GRAMINIFOLIA (SOLIDAGO G)	GRASSLEAF GOLDENROD	2
GLYCERIA GRANDIS	AMERICAN MANNA GRASS	2
	TOTAL	100

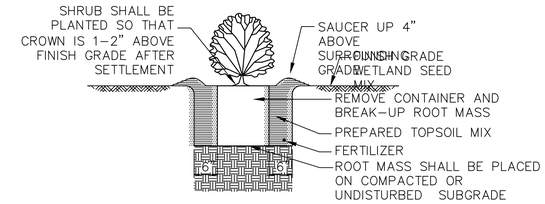
NOTES:

1. FOR LOCATION , SEE CONSTRUCTION PLANS
2. FOR WETLAND SECTIONS A–A, SEE THIS DWG.
3. MITIGATION AREA SHALL BE TREATED WITH TWELVE (12") INCHES OF HIGH ORGANIC GRANULAR TOPSOIL, 2" COMPOST TOPSOIL AND SEEDED WITH A MANUFACTURED WETLAND SEED MIX APPLIED AT A RATE OF 0.5 LB./1,000 S.F.

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	80	158
PROJECT FILE NO. 604532			

WETLAND REPLICATION PLANS



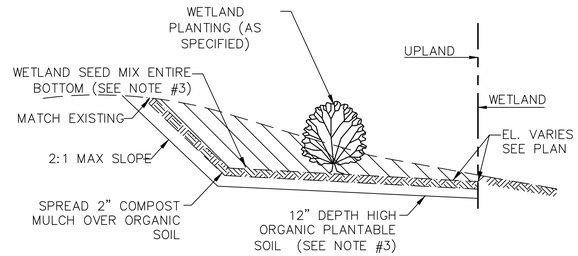
1.) PREPARED TOPSOIL MIX SHALL CONSIST OF HIGH ORGANIC SOIL WITH NO LESS THAN 10% ORGANIC MATTER.

2.) ALL PLANTS SHALL BE FLOODED WITH WATER TWICE WITHIN THE FIRST TWENTY–FOUR HOUR PERIOD AFTER PLANTING.

SHRUB PLANTING DETAIL
NOT TO SCALE

PLANTING NOTES

	DIAMETER	DEPTH
SHRUBS B&B	BALL + 1'–0" MIN	BALL DEPTH
CONTAINER GROWN MATERIAL	CONT. DIA. + 1'–0" MIN	CONT. DEPTH



SECTION A–A OF
WETLAND REPLICATION AREA
N.T.S.

0 20 50 100

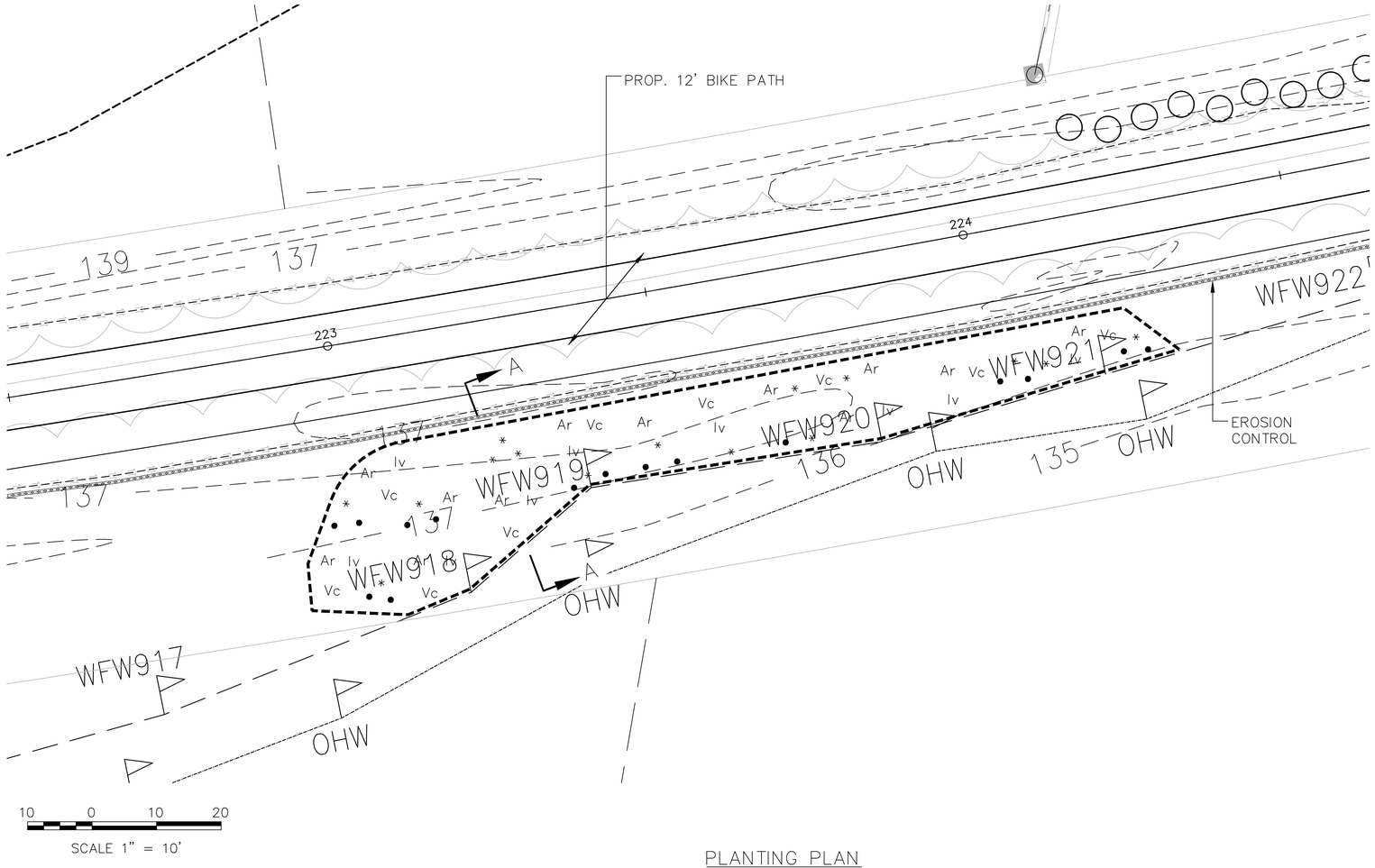
SCALE: 1" = 20'

10031_2A_WET.DWG Plotted on 11–Mar–2014 6:23 PM

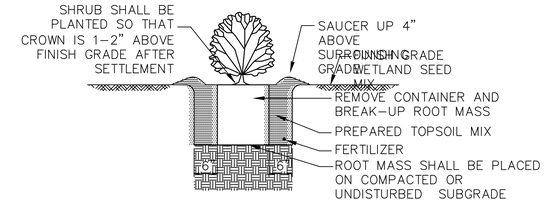
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	81	158
PROJECT FILE NO.	604532		

WETLAND REPLICATION PLANS



PLANTING PLAN



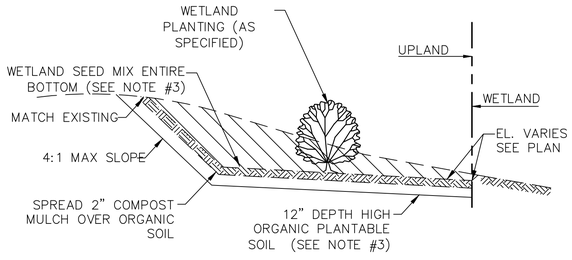
1.) PREPARED TOPSOIL MIX SHALL CONSIST OF HIGH ORGANIC SOIL WITH NO LESS THAN 10% ORGANIC MATTER.

2.) ALL PLANTS SHALL BE FLOODED WITH WATER TWICE WITHIN THE FIRST TWENTY-FOUR HOUR PERIOD AFTER PLANTING.

SHRUB PLANTING DETAIL
NOT TO SCALE

PLANTING NOTES

	DIAMETER	DEPTH
SHRUBS B&B	BALL + 1'-0" MIN	BALL DEPTH
CONTAINER GROWN MATERIAL	CONT. DIA. + 1'-0" MIN	CONT. DEPTH



SECTION A-A OF WETLAND REPLICATION AREA
N.T.S.

PLANTING SPECIFICATIONS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY
Ar	ACER RUBRUM	RED MAPLE	12
Vc	VACCCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	9
Iv	ILEX VERTICILLATA	WINTERBERRY	9
•	OSMUNDA CINNAMOMEA	CINNAMON FERN	15
*	OSMUNDA REGALIS	ROYAL FERN	15

WETLAND SEED MIX

SCIENTIFIC NAME	COMMON NAME	%
CAREX VULPINOIDEA	FOX SEDGE	25
ELYMUS VIRGINICUS	VIRGINIA WILDRYE	25
CAREX LUPULINA	HOP SEDGE	12
CAREX COMOSA	BRISTLY SEDGE	6
VERBENA HASTATA	BLUE VERVAIN	6
JUNCUS EFFUSUS	SOFT RUSH	6
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	4
SCIRPUS ATROVIRENS	GREEN BULRUSH	4
SCIRPUS CYPERINUS	WOOLGRASS	4
EUPATORIUM PERFOLIATUM	BONESET	2
EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED	2
EUTHAMIA GRAMINIFOLIA (SOLIDAGO G)	GRASSLEAF GOLDENROD	2
GLYCERIA GRANDIS	AMERICAN MANNA GRASS	2
	TOTAL	100

NOTES:

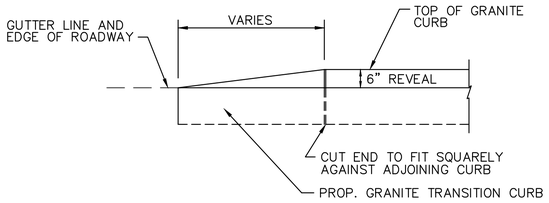
1. FOR LOCATION , SEE CONSTRUCTION PLANS
2. FOR WETLAND SECTIONS A-A, SEE THIS DWG.
3. MITIGATION AREA SHALL BE TREATED WITH TWELVE (12") INCHES OF HIGH ORGANIC GRANULAR TOPSOIL, 2" COMPOST TOPSOIL AND SEEDED WITH A MANUFACTURED WETLAND SEED MIX APPLIED AT A RATE OF 0.5 LB./1,000 S.F.

0 20 50 100
SCALE: 1" = 20'

10031_2A_WET.DWG Plotted on 11-Mar-2014 6:23 PM

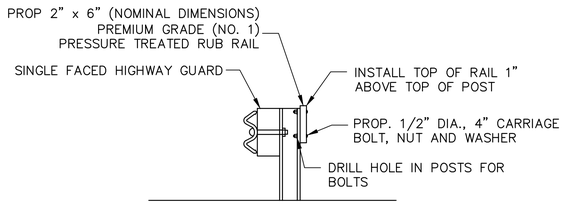
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	74	159
PROJECT FILE NO.	604532		

CONSTRUCTION DETAILS



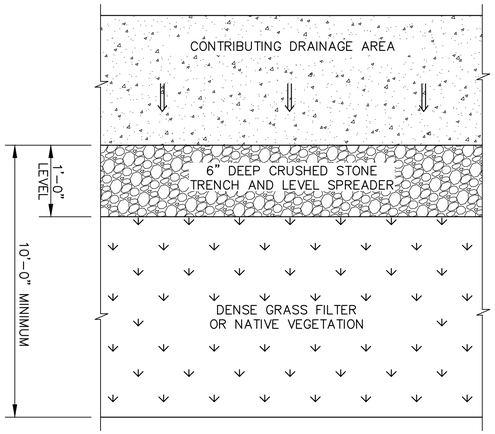
TRANSITION CURB DETAIL

(ITEM 509.)
TO BE USED AT ALL LOCATIONS WHERE VERTICAL GRANITE CURB ENDS

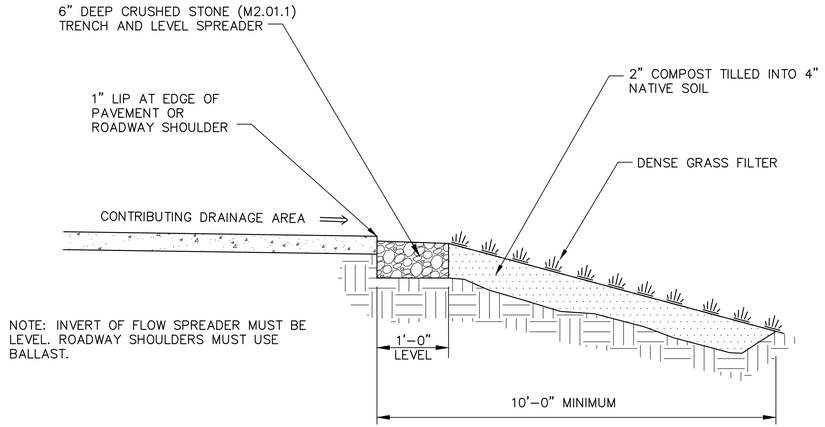


HIGHWAY GUARD W/TIMBER RUB RAIL

N.T.S.



PLAN

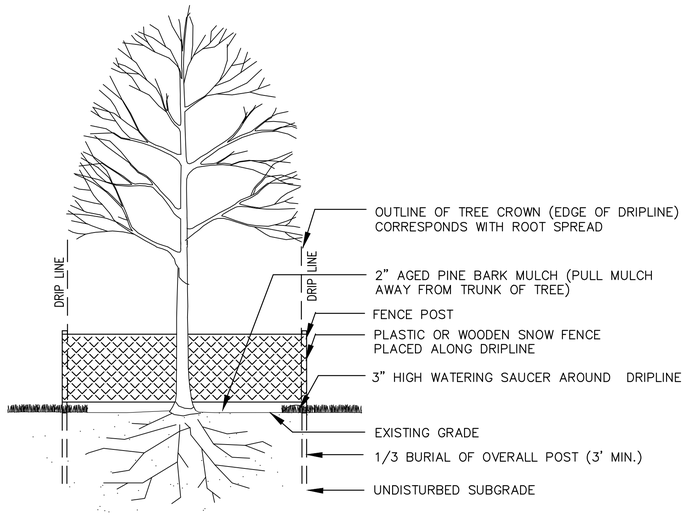


NOTE: INVERT OF FLOW SPREADER MUST BE LEVEL. ROADWAY SHOULDERS MUST USE BALLAST.

SECTION

FILTER STRIP DETAILS

N.T.S.



TREE PROTECTION

N.T.S.

CONSTRUCTION OF FILTER STRIP

SOIL AMENDMENT
1. 2" (MINIMUM) OF STABLE AND MATURE COMPOST SHALL BE PROVIDED FOR THE ENTIRE FILTER STRIP TREATMENT AREA TO AMEND THE TOPSOIL UNLESS THE SOIL ALREADY HAS AN ORGANIC CONTENT OF 5% OR GREATER. THE COMPOST MUST BE TILLED INTO THE UNDERLYING NATIVE SOIL TO A DEPTH OF 4" TO PREVENT WASHING OUT THE COMPOST AND AVOID CREATING A DEFINED LAYER OF DIFFERENT SOIL TYPES THAT CAN PREVENT DOWNWARD PERCOLATION OF WATER.
a. COMPOST SHALL BE PER THE STANDARD SPECIFICATIONS

CONSTRUCTION CONSIDERATIONS
1. PROVIDE EROSION CONTROL BEFORE CONSTRUCTION–PHASE SEDIMENT ENTERS THE FILTER STRIP. COMPOST BERMS MAY BE USED FOR EROSION CONTROL DURING CONSTRUCTION OF THE FILTER STRIPS. FILTER STRIPS ARE DESIGNED TO HANDLE ONLY MODEST SEDIMENT LOADS WITHOUT FREQUENT MAINTENANCE.
2. FILTER STRIP MUST BE PROTECTED DURING CONSTRUCTION. IF CONSTRUCTION SEDIMENTS IMPACT FILTER STRIP, CONTRACTOR SHALL RECONSTRUCT FILTER STRIP AND RE–ESTABLISH VEGETATION OF THE STRIP TO THE SATISFACTION OF THE ENGINEER.
3. RUNOFF SHALL BE DIVERTED AROUND A FILTER STRIP UNTIL THE GRASS IS ESTABLISHED PER SPECIFICATIONS.

MAINTENANCE DURING CONSTRUCTION
1. IRRIGATION SHALL BE PROVIDED AS NECESSARY IN THE MONTHS FOLLOWING INITIAL FILTER STRIP CONSTRUCTION TO PREVENT THE FILTER STRIP GRASS FROM WILTING OR DYING.
2. IF WEEDS GROW TO A HEIGHT OF 12", THE CONTRACTOR SHALL MOW FOR WEED CONTROL.
3. THE CONTRACTOR SHALL MAINTAIN THE FILTER STRIP AT A HEIGHT OF 4" – 6" UNTIL ACCEPTANCE.

PLANTING REQUIREMENTS
1. GRASS SHALL BE ESTABLISHED THROUGHOUT THE ENTIRE TREATMENT AREA OF THE FILTER STRIP AS SPECIFIED IN THE SPECIAL PROVISIONS.
2. THE FOLLOWING PERMANENT EROSION–CONTROL GRASS SEED MIX SHALL BE APPLIED AT A RATE OF 25 LBS/AC IN FILTER STRIPS (PERCENTAGES ARE BY WEIGHT):
- 20% BIG BLUESTEM
- 15% CREEPING RED FESCUE
- 10% LITTLE BLUESTEM
- 10% CANADA WILD RYE
- 10% VIRGINIA WILD RYE
- 7% SWITCH GRASS
- 7% PARTRIDGE PEA
- 7% SHOWY TICK TREFOIL
- 7% FRINGED BROME GRASS
- 7% DEER TONGUE

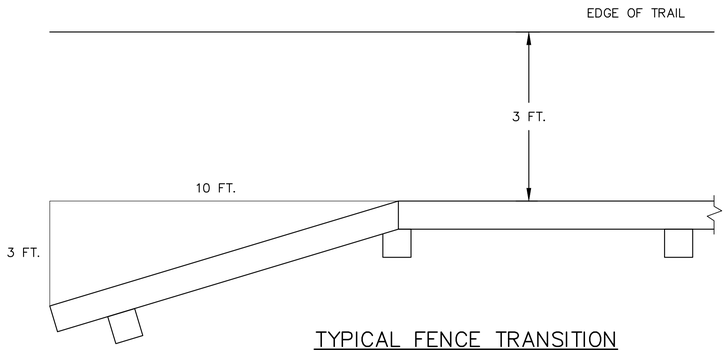
3. ALTERNATE SEED MIX AND EROSION CONTROL MEASURES MAY BE USED IF RECOMMENDED BY THE EROSION CONTROL SPECIALIST AND APPROVED BY THE ENGINEER.
4. SEED MAY BE APPLIED BY HYDROSEEDING OR BROADCAST APPLICATION.
5. SEEDING PERIOD SHALL BE SPRING (MID–MARCH TO JUNE) OR FALL (LATE SEPTEMBER TO OCTOBER). IF SEED IS APPLIED IN THE SPRING OR SUMMER, PROVIDE IRRIGATION AS NECESSARY TO ENSURE GRASS SURVIVAL.

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

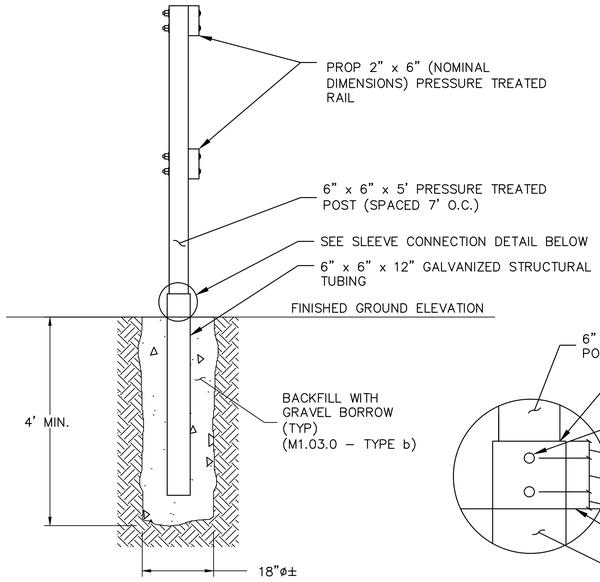
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	75	159
PROJECT FILE NO.	604532		

CONSTRUCTION DETAILS

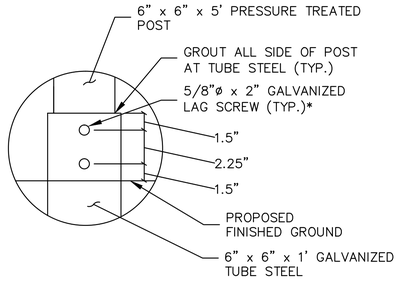
10031_2A_CD.DWG 25-Feb-2014



TYPICAL FENCE TRANSITION
AT FENCE APROACHES
N.T.S.

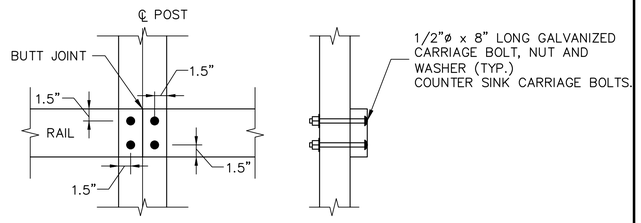


TIMBER RAIL FENCE
TUBE STEEL SLEEVE
N.T.S.
FOR USE IN SATURATED LOCATIONS

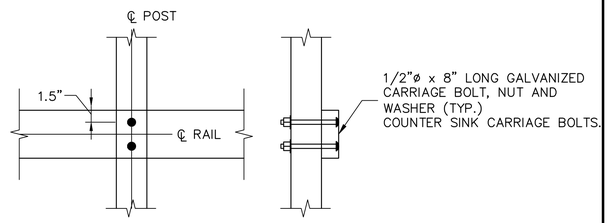


*SAME SCREWS OPPOSITE SIDE.

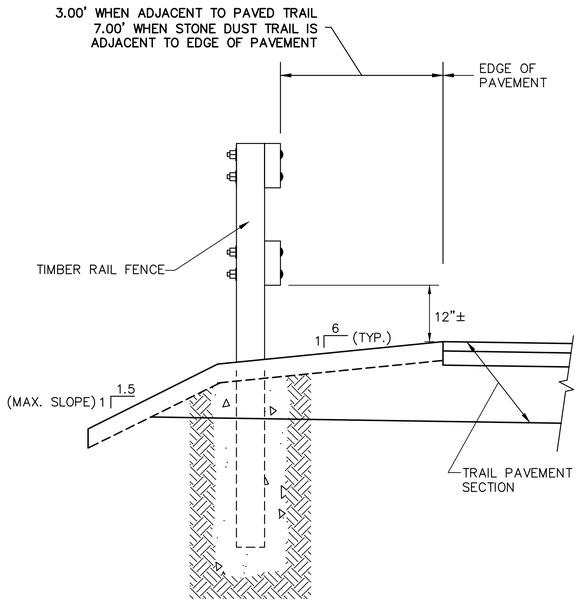
SLEEVE CONNECTION DETAIL
N.T.S.



ELEVATION SECTION
BUTT JOINT CONNECTION
N.T.S.



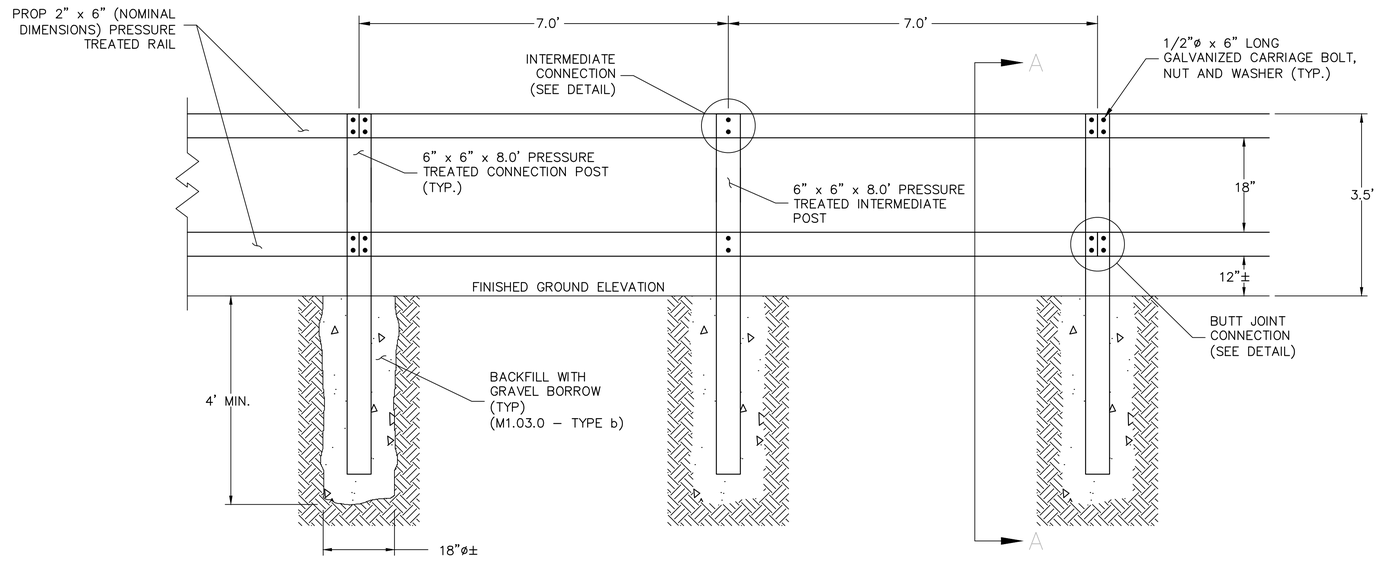
ELEVATION SECTION
INTERMEDIATE CONNECTION
N.T.S.



SECTION A–A

SUGGESTED TIMBER RAIL FENCE CONSTRUCTION SEQUENCE

1. AUGER OR DIG POST HOLE TO REQUIRED DIMENSIONS.
2. IF GROUND IS SATURATED, USE TUBE STEEL SLEEVE. SEE DETAIL ON THIS SHEET.
3. BACKFILL BOTTOM 6"± OF HOLE WITH GRAVEL AND COMPACT THOROUGHLY.
4. SET POST AND HOLD PLUMB DURING BACKFILLING.
5. BACKFILL WITH GRAVEL IN 12" LIFTS. COMPACT EACH LIFT THOROUGHLY.
6. CLAMP RAILS TO POSTS AND FIELD DRILL BOLT HOLES.
7. SET BOLTS, WASHERS AND NUTS.
8. IF CCA PRESSURE TREATED LUMBER IS NOT READILY AVAILABLE AT THE TIME OF CONSTRUCTION OR IT IS DEEMED ENVIRONMENTALLY UNACCEPTABLE FOR COMMERCIAL USES BY THE EPA, USE ACQ PRESSURE TREATED LUMBER.



TIMBER RAIL FENCE ELEVATION
N.T.S.
SEE PLANS FOR LOCATIONS

NOTE:
FOR RADII LESS THAN 165', USE CONNECTION POSTS SET AT 7.0' O.C. AND SHORTEN RAILS ACCORDINGLY.

MassDOT DWT Version:

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	76	159
PROJECT FILE NO.	604532		

CONSTRUCTION DETAILS

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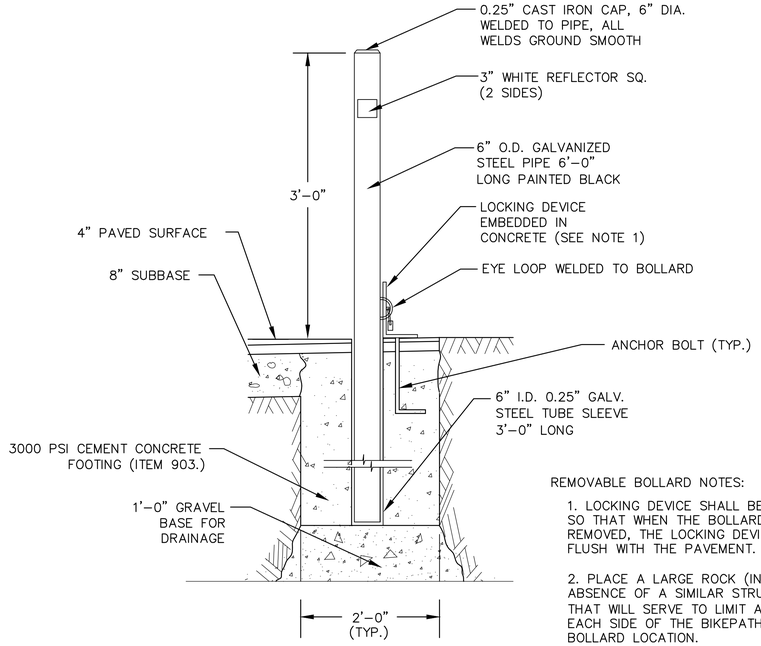


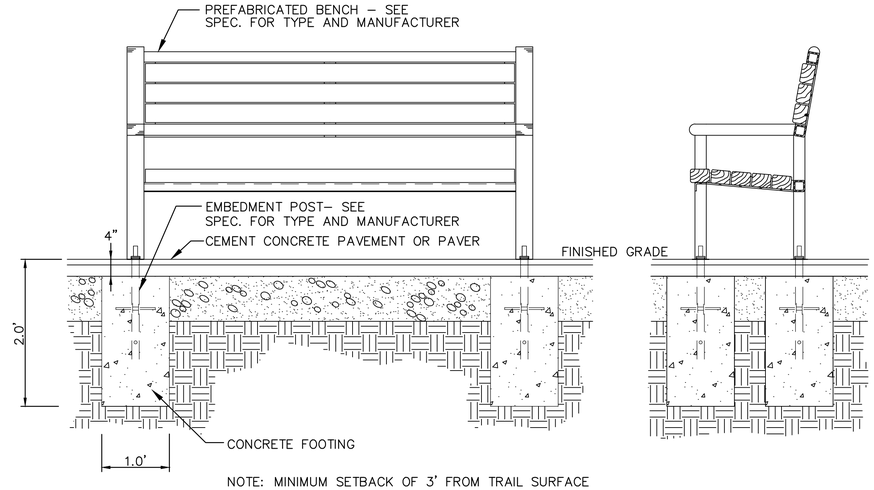
REMOVABLE BOLLARD NOTES:

1. LOCKING DEVICE SHALL BE HINGED SO THAT WHEN THE BOLLARD IS REMOVED, THE LOCKING DEVICE IS FLUSH WITH THE PAVEMENT.

2. PLACE A LARGE ROCK (IN THE ABSENCE OF A SIMILAR STRUCTURE THAT WILL SERVE TO LIMIT ACCESS) ON EACH SIDE OF THE BIKEPATH AT THE BOLLARD LOCATION.

REMOVABLE BOLLARD

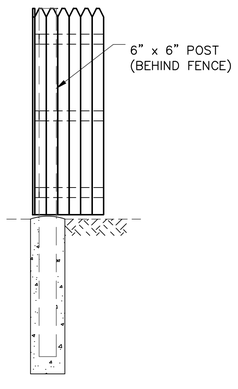
N.T.S.
SEE PLANS FOR LOCATIONS



NOTE: MINIMUM SETBACK OF 3' FROM TRAIL SURFACE

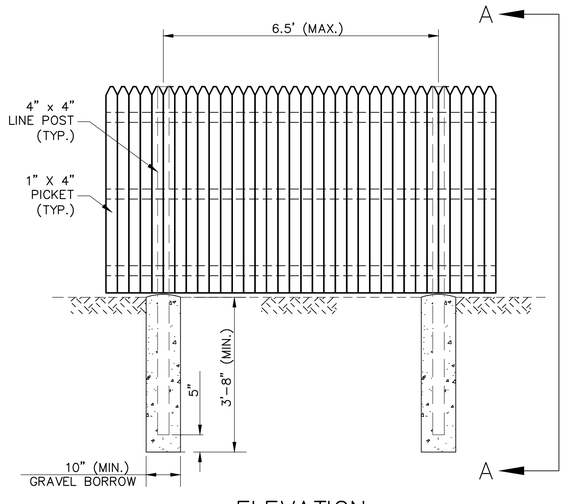
BENCH

N.T.S.



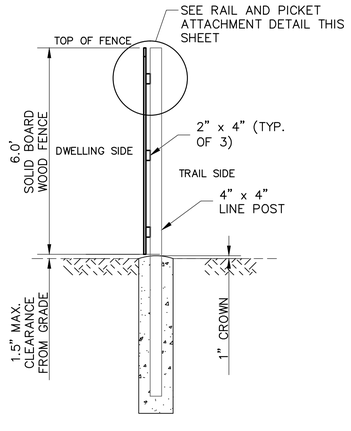
CORNER POST

SCALE: N.T.S.



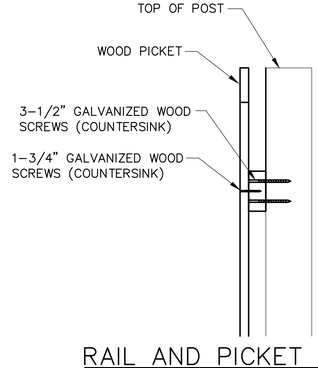
ELEVATION

SCALE: N.T.S.



SECTION A–A

SCALE: N.T.S.



RAIL AND PICKET ATTACHMENT DETAIL

SCALE: N.T.S.

TYPICAL STOCKADE FENCING

1. ALL WOOD FENCE POSTS AND RAILS TO BE NO. 2 PINE PRESSURE TREATED LUMBER.
2. PICKETS TO BE 1" THICK CEDAR. CORNER AND GATE POSTS TO BE 6" X 6" NO. 2 PINE PRESSURE TREATED LUMBER.
3. LINE POSTS TO BE 4" X 4" NO. 2 PINE PRESSURE TREATED LUMBER.
4. ALL HARDWARE TO BE HOT DIP GALVANIZED.
5. PICKETS SHALL ALWAYS FACE DWELLINGS.

MassDOT DWT Version:

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	77	159
PROJECT FILE NO.	604532		

CONSTRUCTION DETAILS

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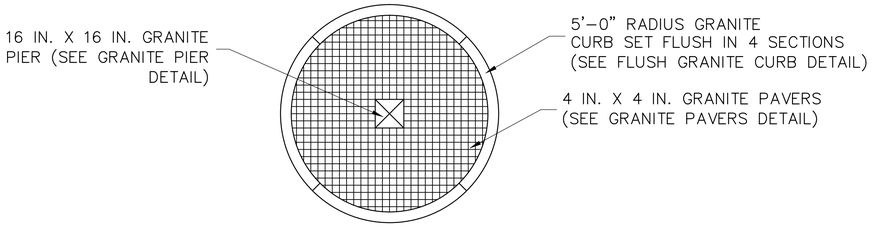
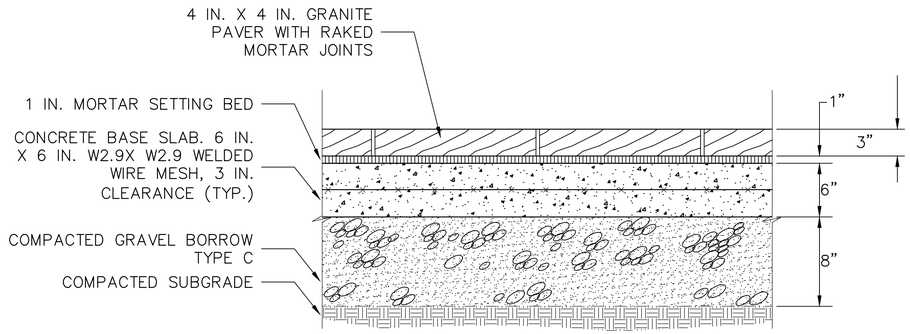


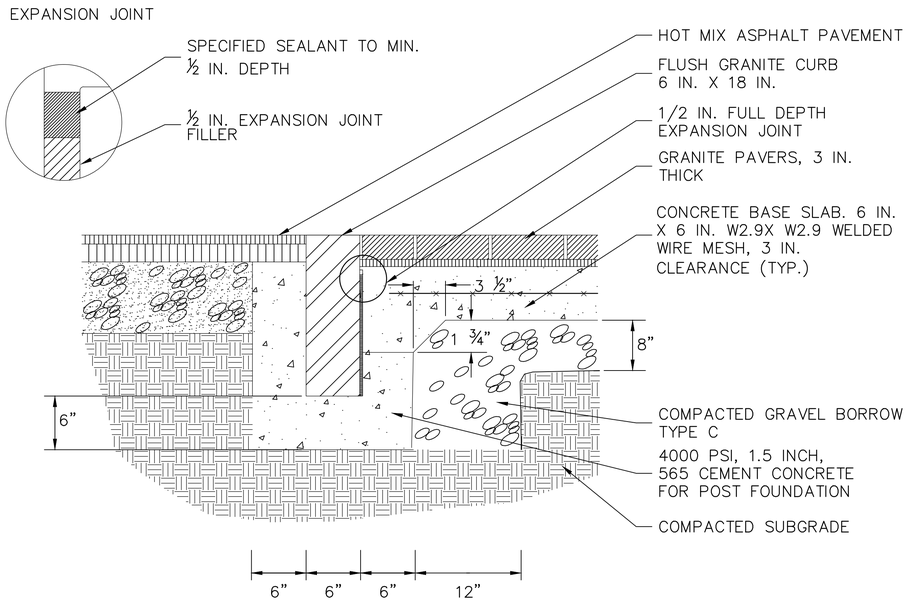
GRANITE PIER IN GRANITE CIRCLE

(PROP. AT STA. 103+21.71 & 247+11.24)
N.T.S.



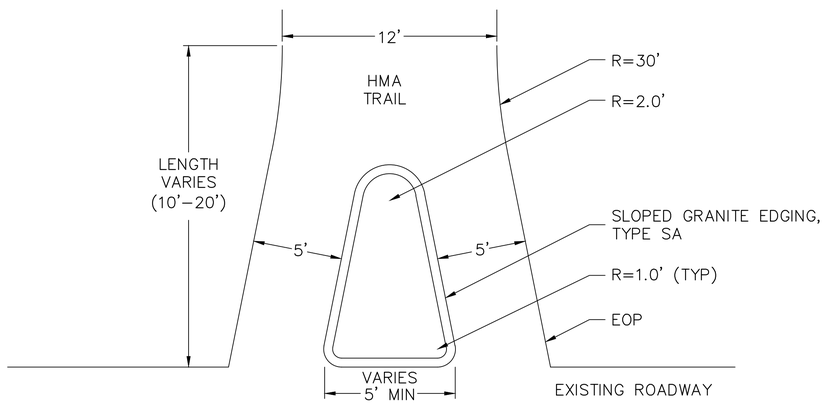
GRANITE PAVERS

N.T.S.



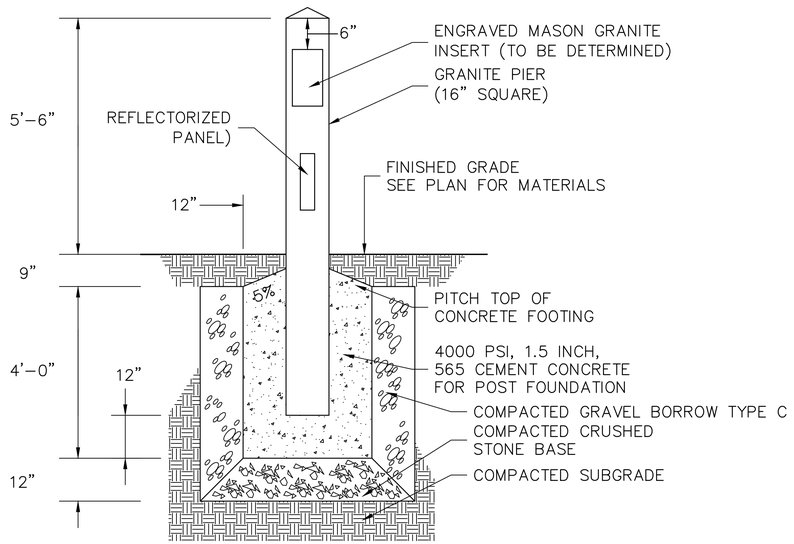
FLUSH GRANITE CURB

N.T.S.



STAMPED CONC. SPLITTER ISLAND

NTS



GRANITE PIER

N.T.S.

MassDOT DWT Version:

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	78	159
	PROJECT FILE NO.	604532	

CONSTRUCTION DETAILS

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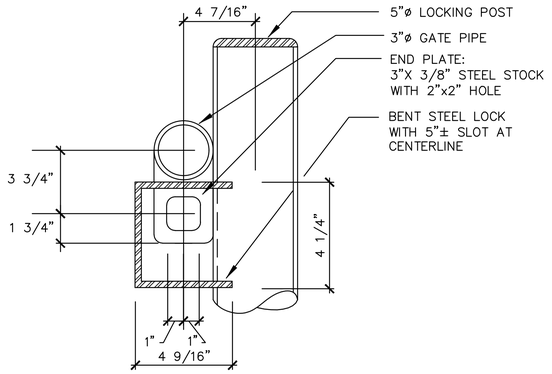
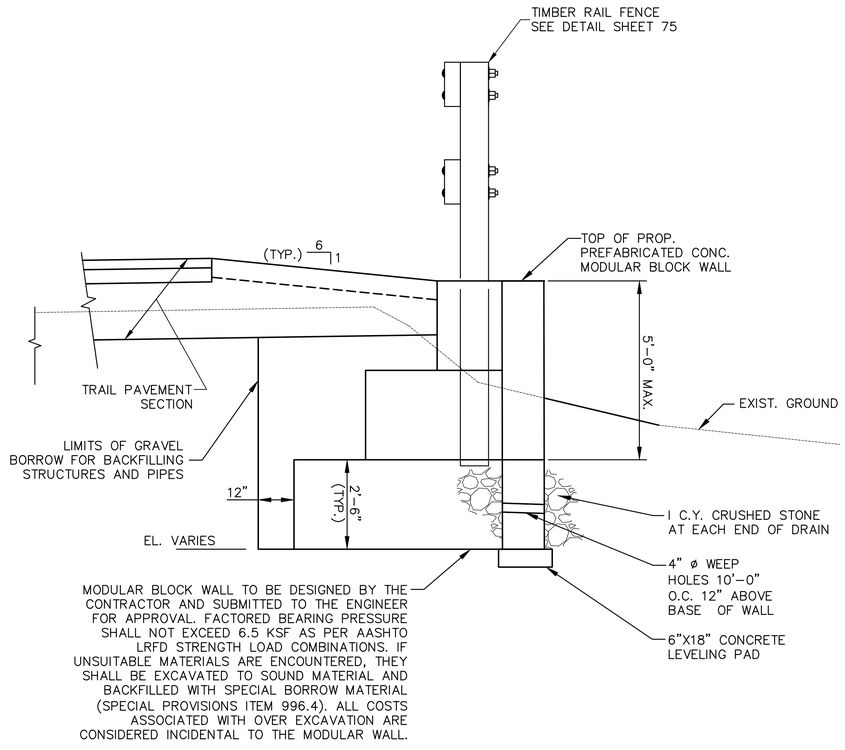


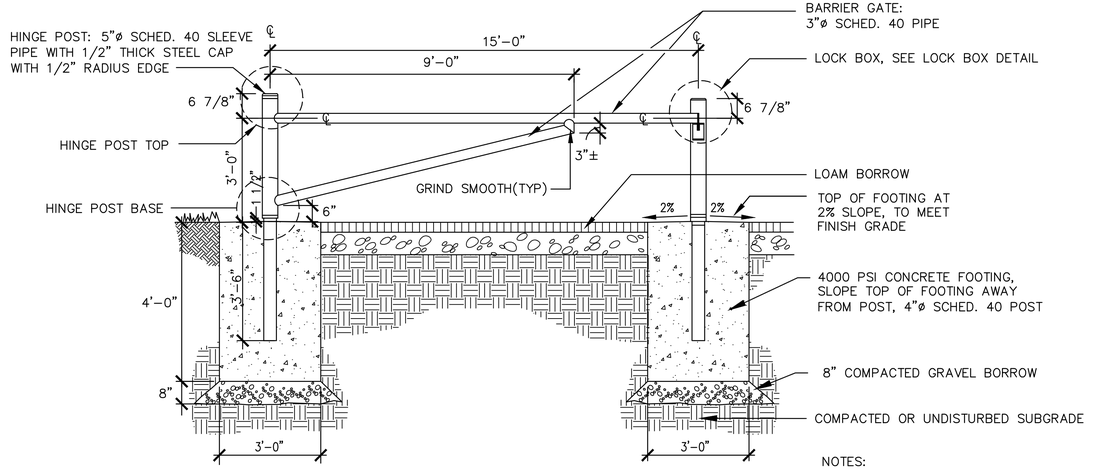
LOCK BOX DETAIL

N.T.S.



MODULAR BLOCK WALL SECTION

NOT TO SCALE



STEEL PIPE ACCESS GATE

N.T.S.

NOTES:

1. ALL STEEL SHALL BE GALVANIZED INSIDE AND OUT.
2. PROVIDE 1/2"ø WEEP HOLES AT WELDED CONNECTIONS (3 PLACES).
3. INSTALL BRASS BUSHINGS AFTER GALVANIZING.

MassDOT CWT Version:

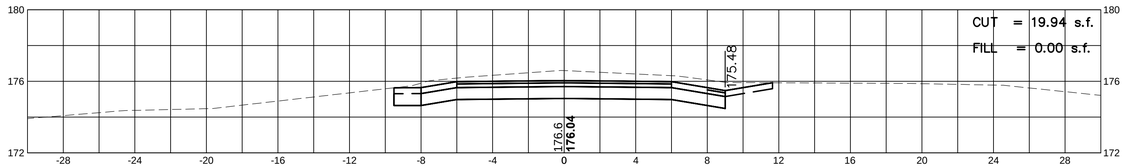
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	89	158
PROJECT FILE NO.	604532		

CROSS SECTIONS

10031_2A_XS.DWG 11-Mar-2014

42+00



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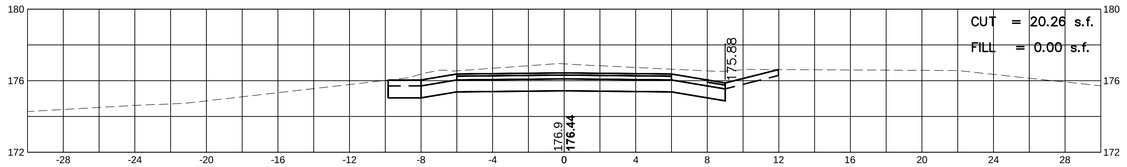

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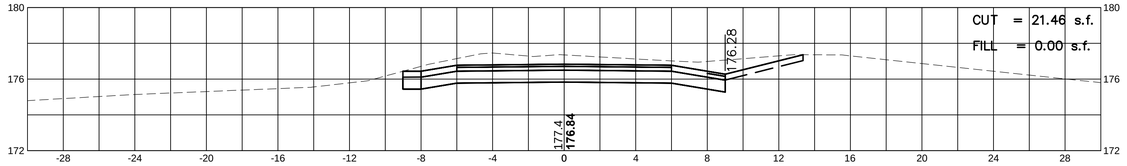

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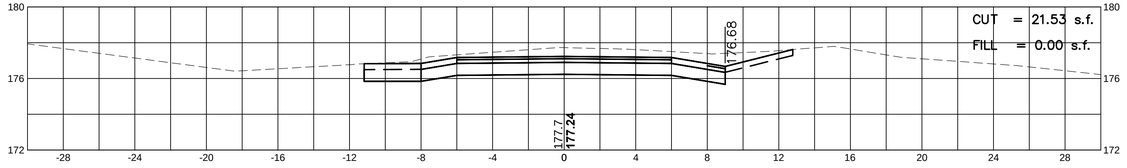

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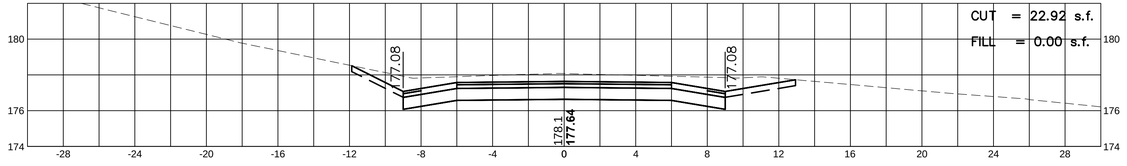

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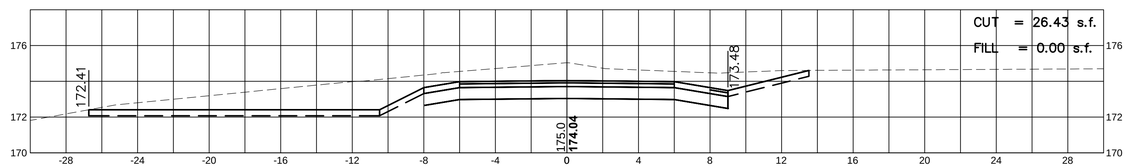

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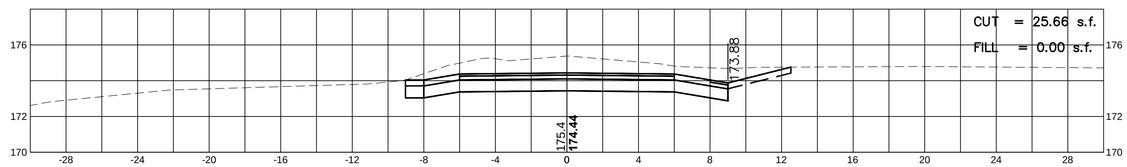

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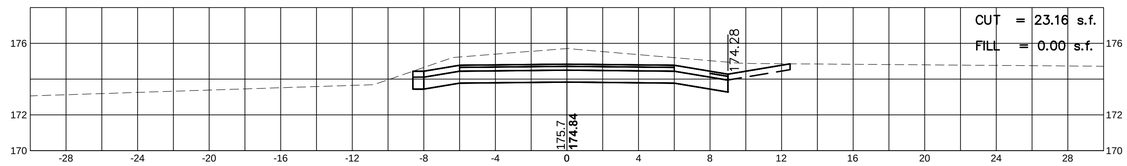

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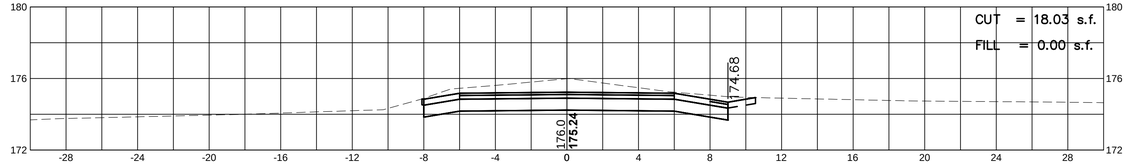

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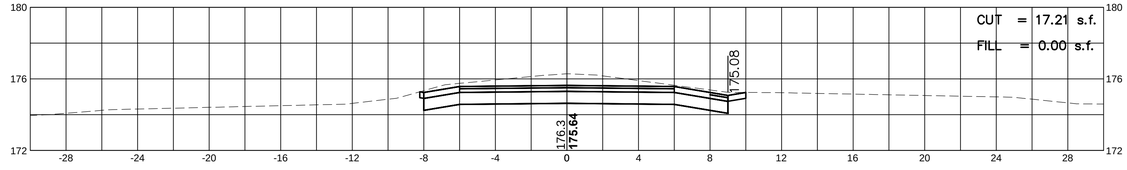
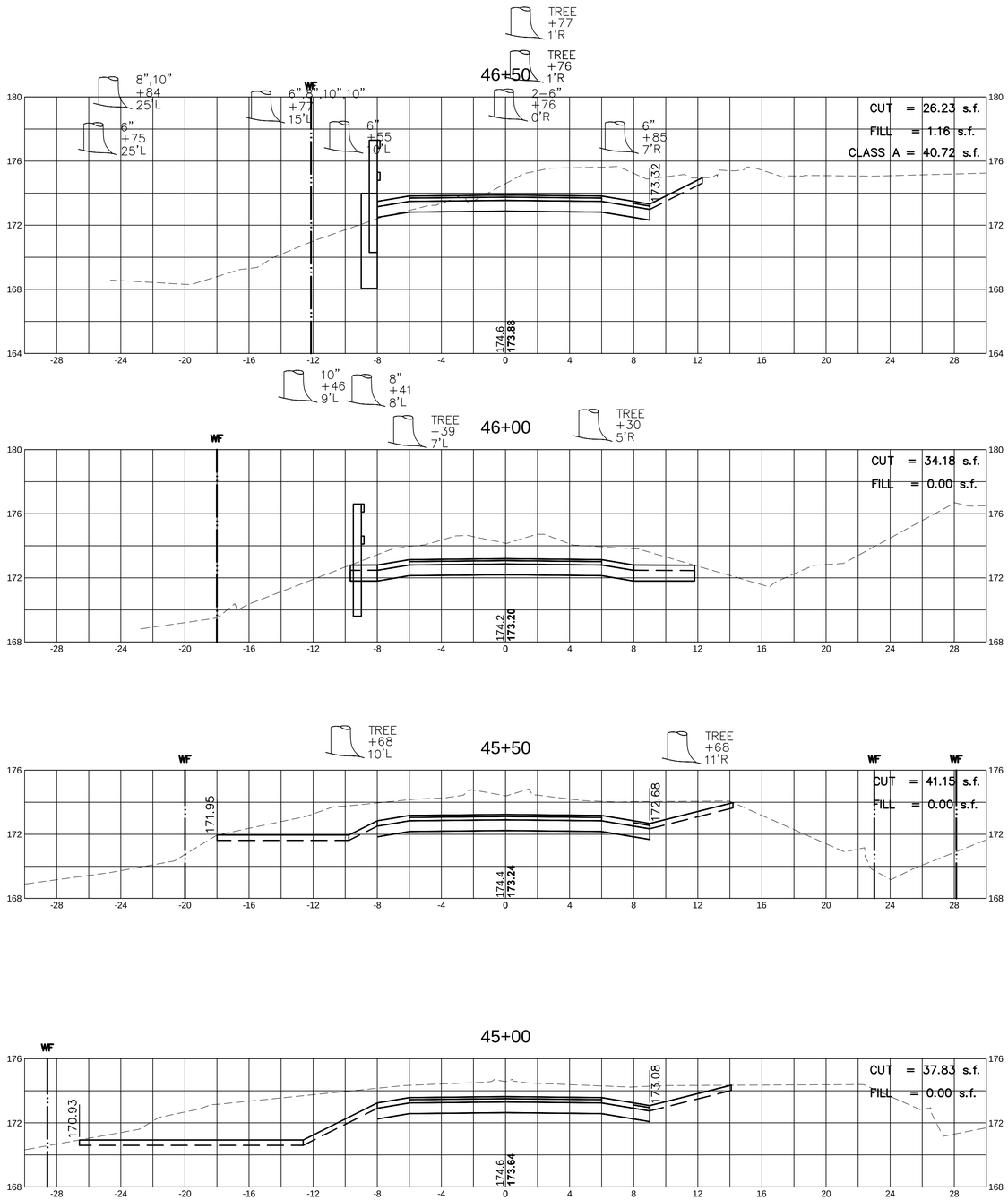


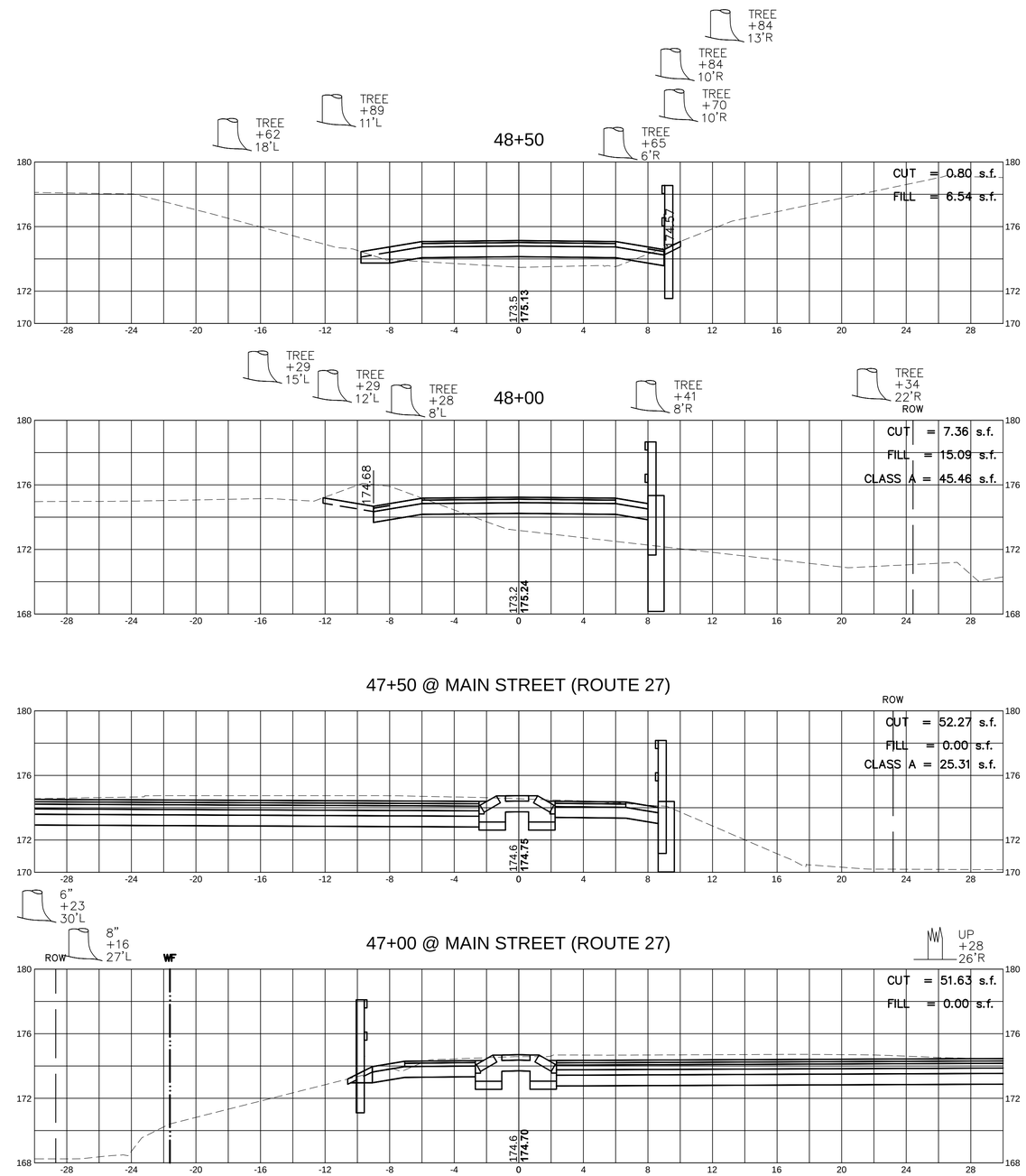
MassDOT DWT Version:

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	90	158
	PROJECT FILE NO.	604532	

CROSS SECTIONS





10031_2A_XS.DWG 11-Mar-2014

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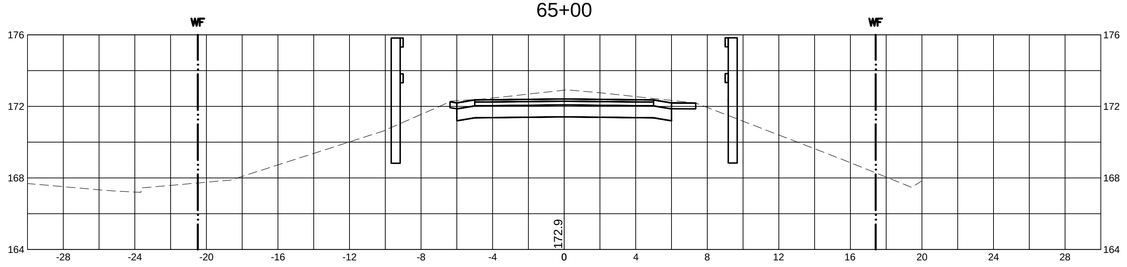
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	96	159
PROJECT FILE NO.	604532		

CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

65+00



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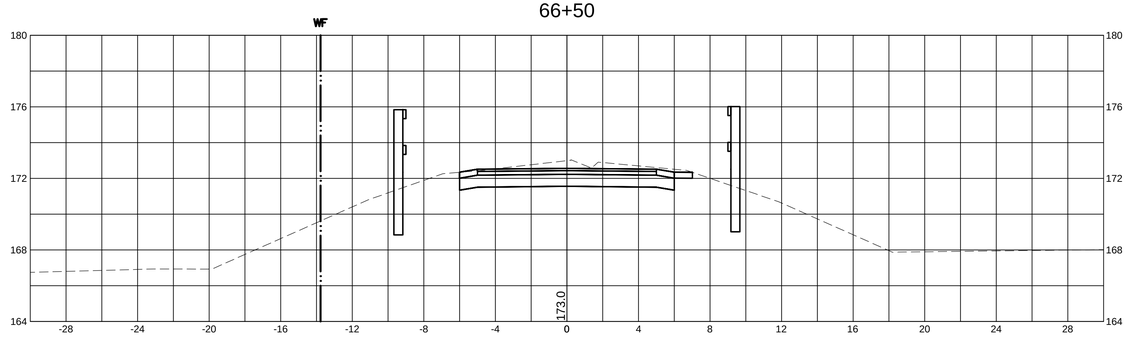

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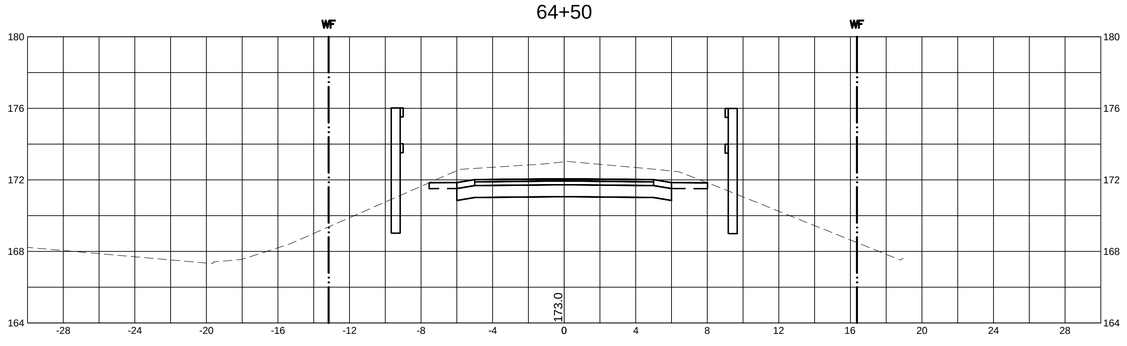
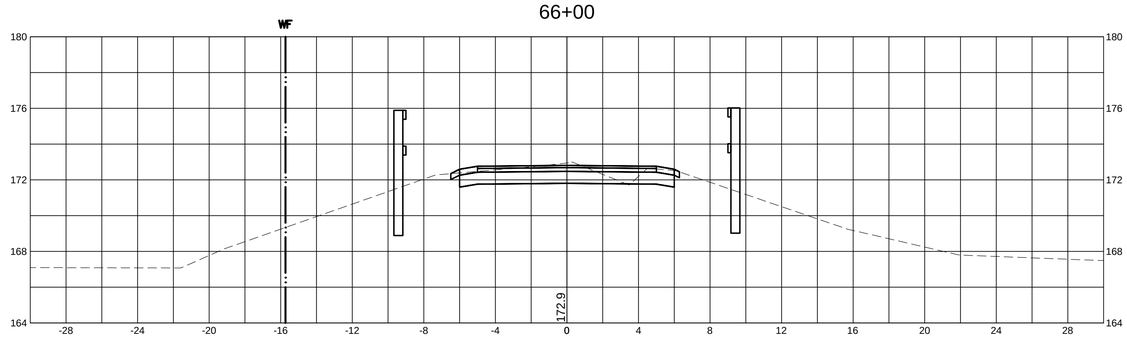
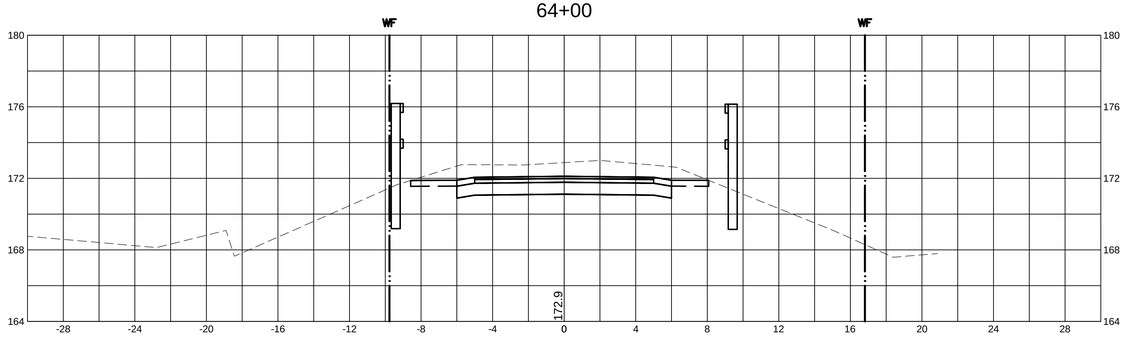


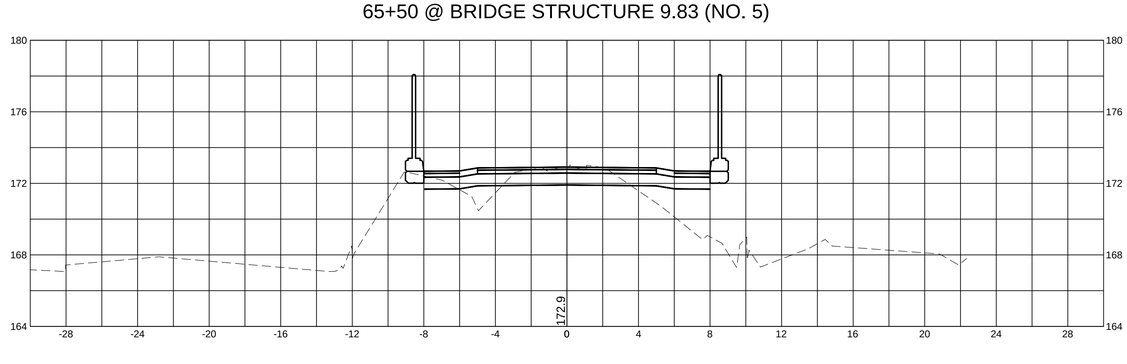
66+00



64+00



65+50 @ BRIDGE STRUCTURE 9.83 (NO. 5)



MassDOT DWT Version:

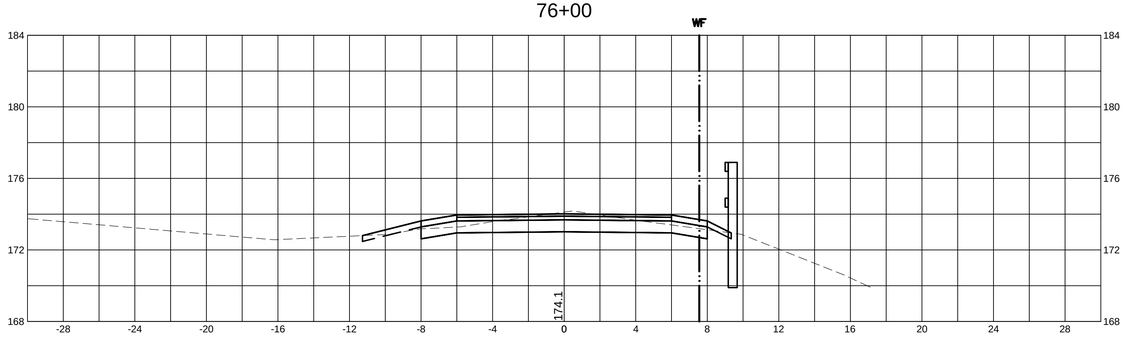
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	99	159
PROJECT FILE NO.	604532		

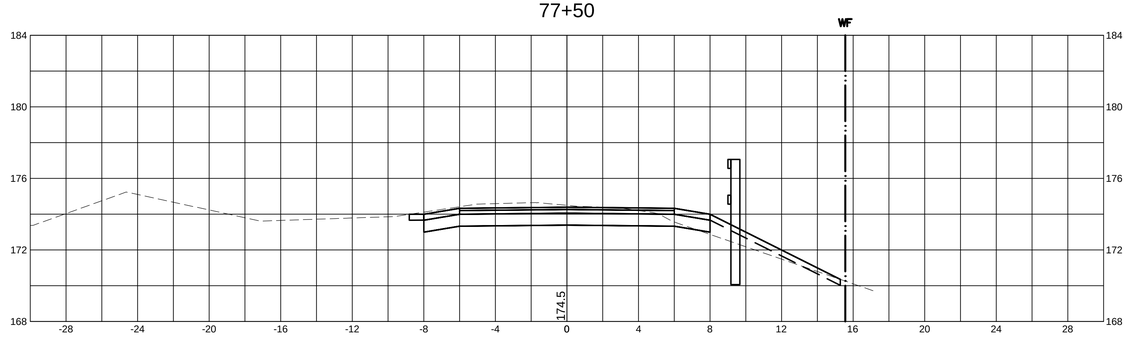
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

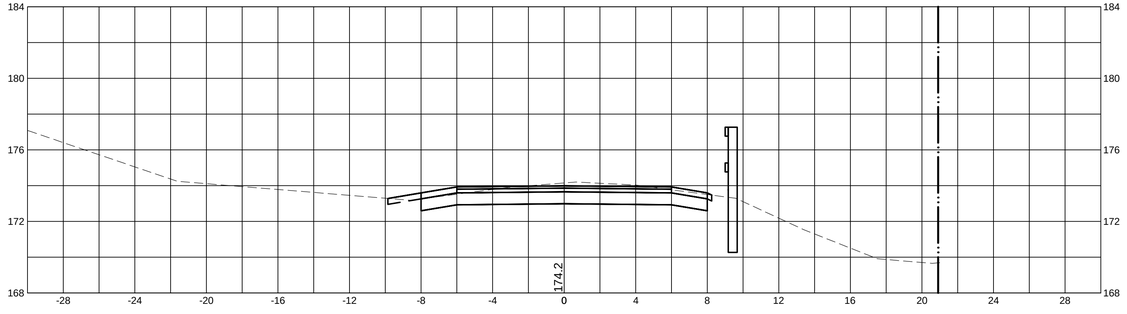
76+00



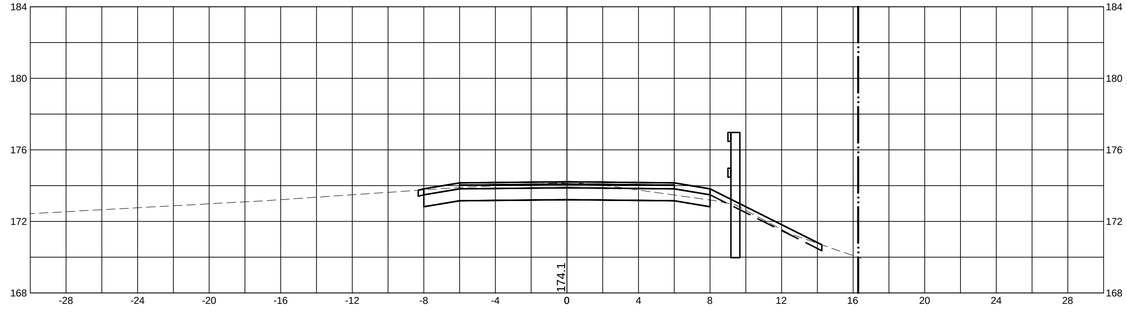
77+50



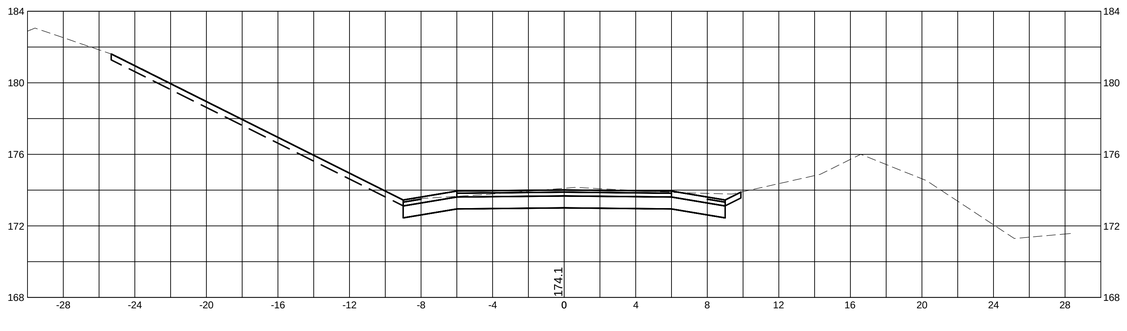
75+50



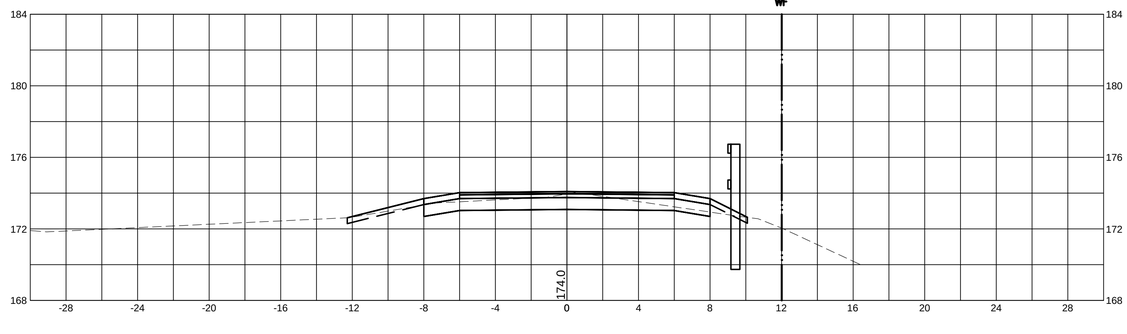
77+00



75+00



76+50



MassDOT DWT Version:

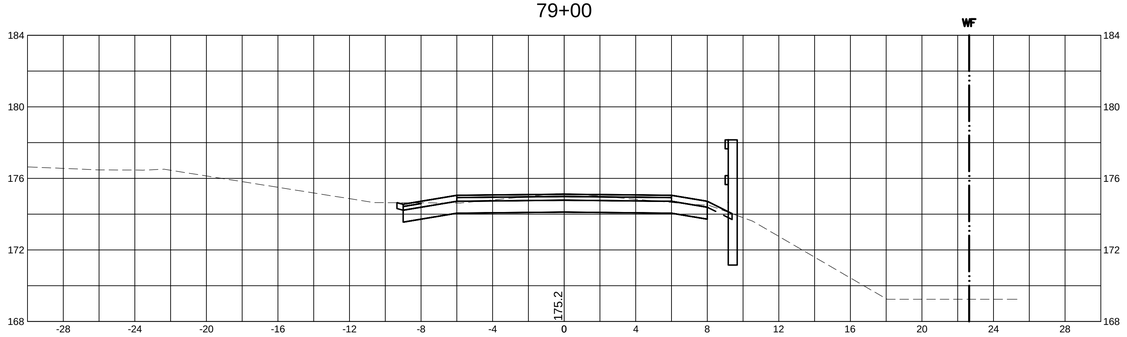
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	100	159
	PROJECT FILE NO.	604532	

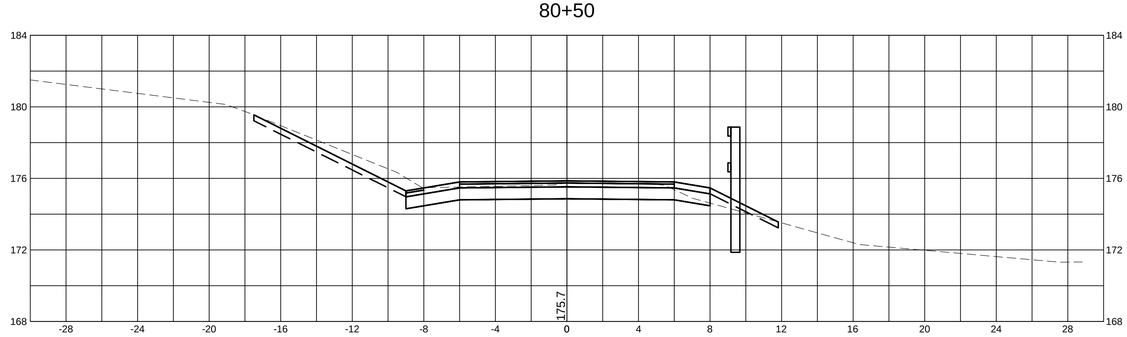
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

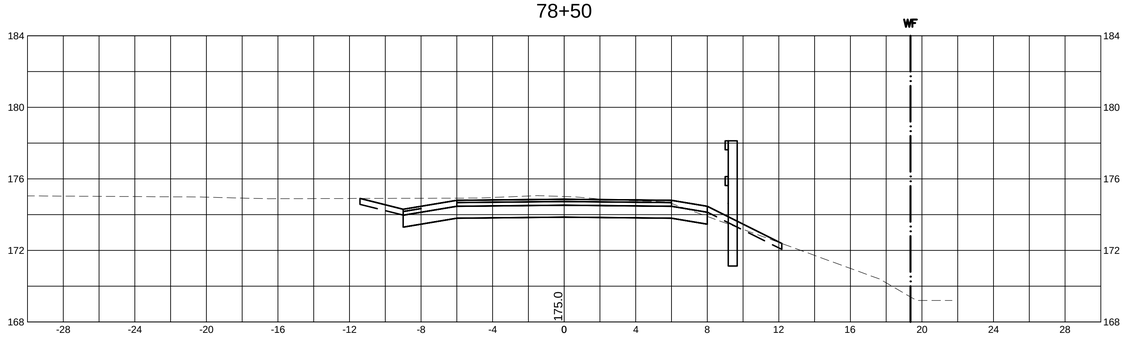
79+00



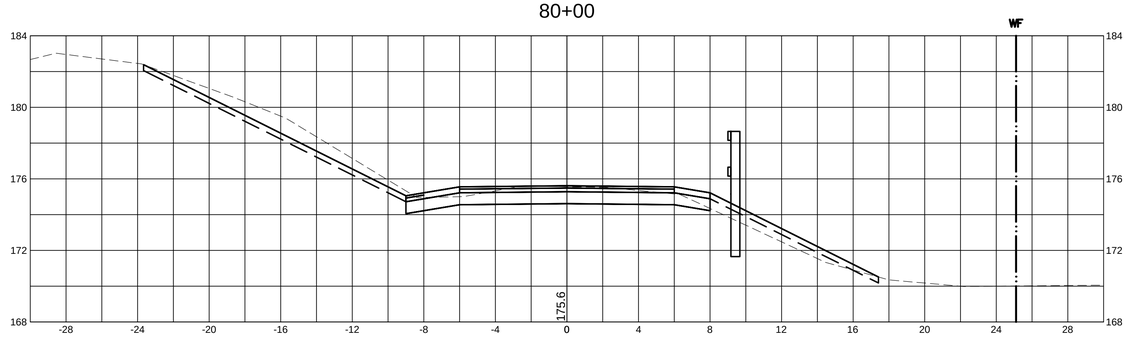
80+50



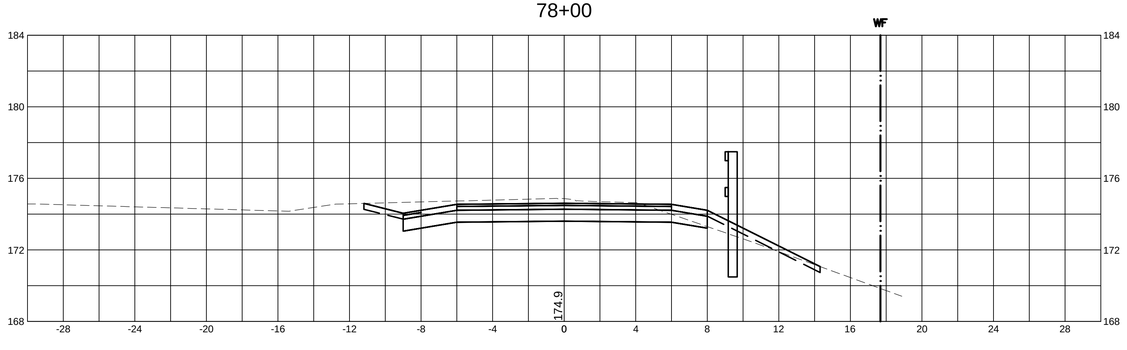
78+50



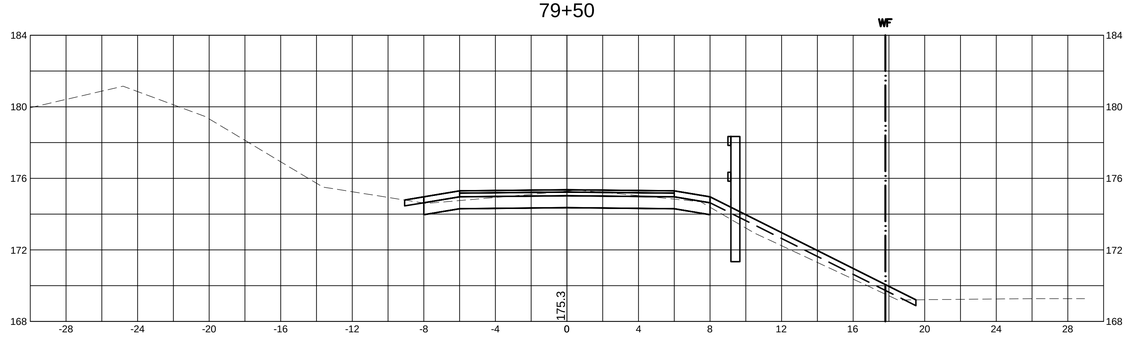
80+00



78+00



79+50



MassDOT DWT Version:

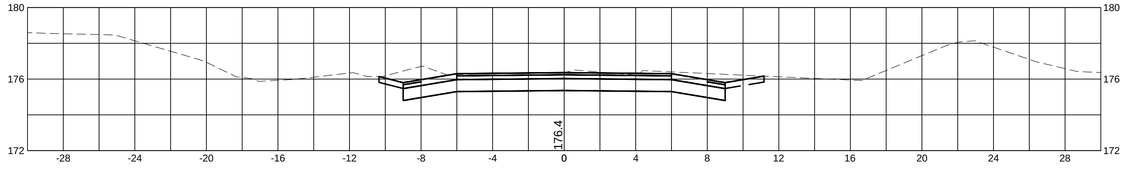
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	101	159
PROJECT FILE NO.	604532		

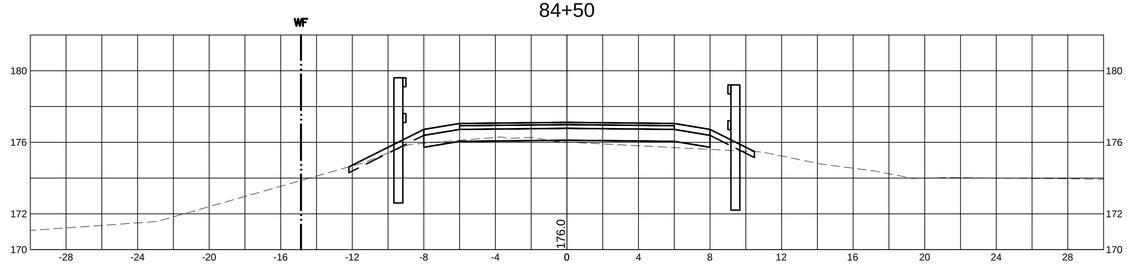
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

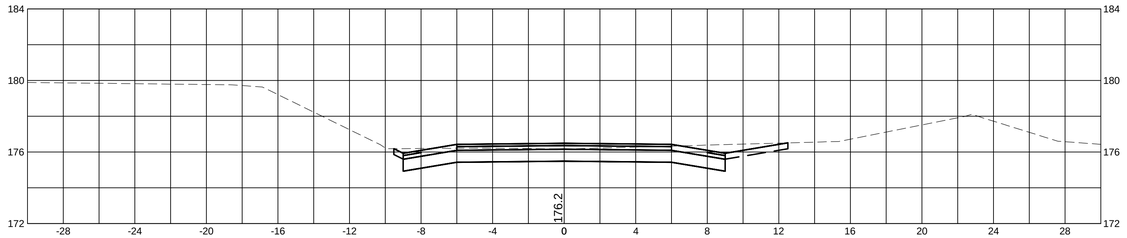
82+50



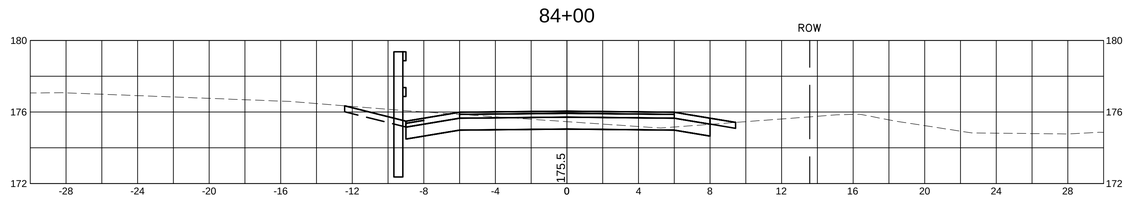
84+50



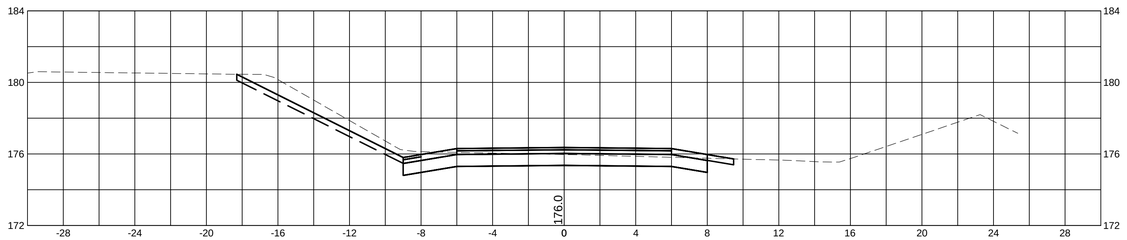
82+00



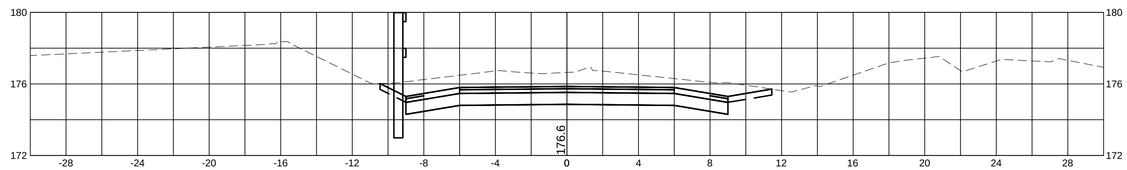
84+00



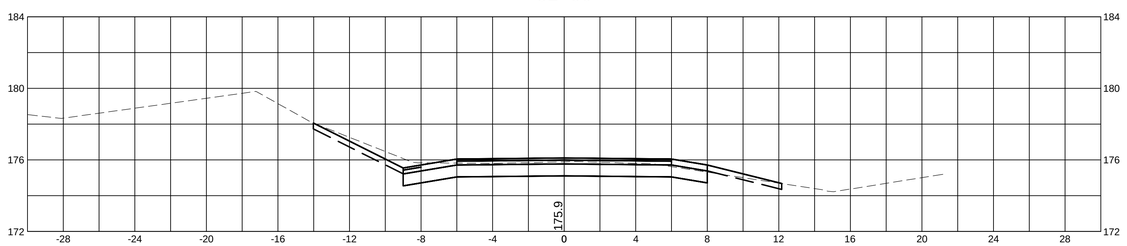
81+50



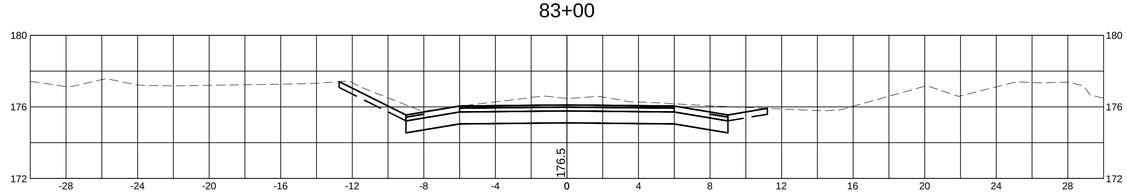
83+50



81+00



83+00



MassDOT DWT Version:

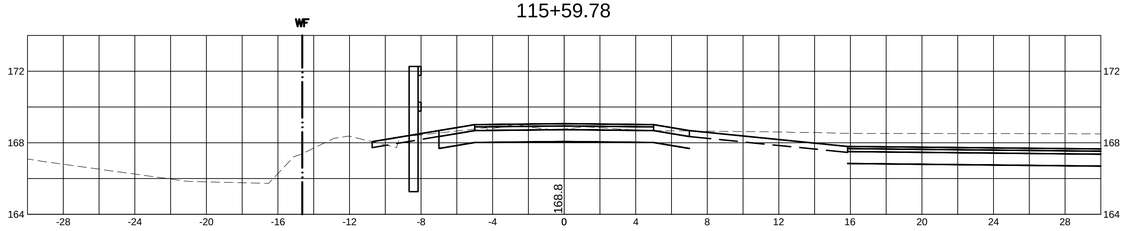
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	110	159
PROJECT FILE NO.	604532		

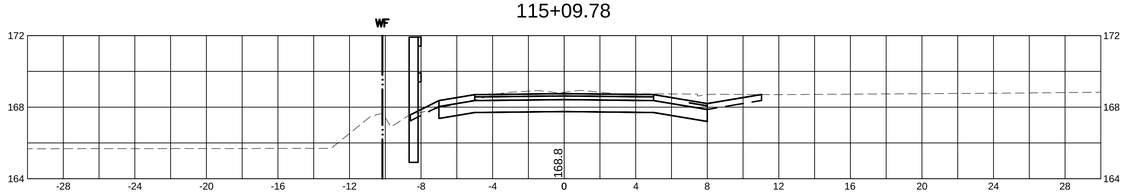
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

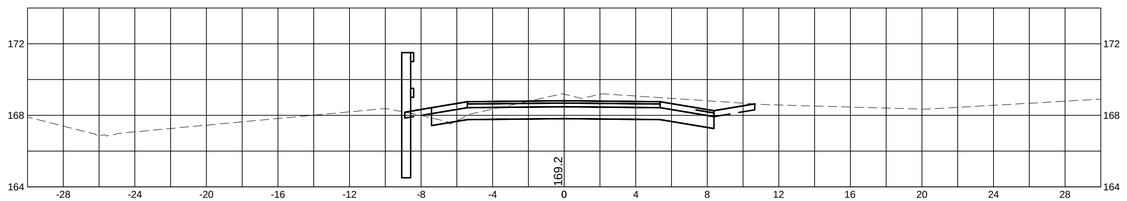
115+59.78



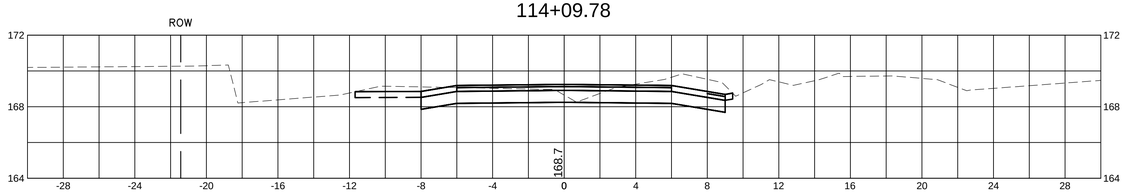
115+09.78



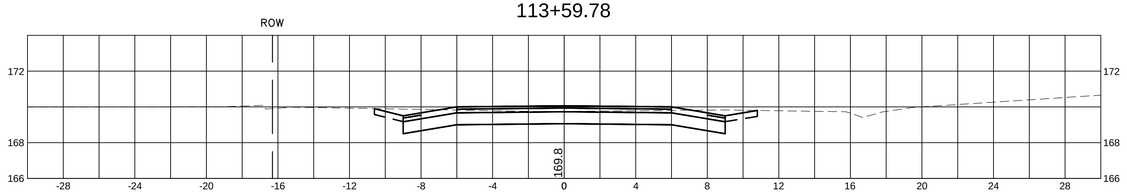
114+59.78



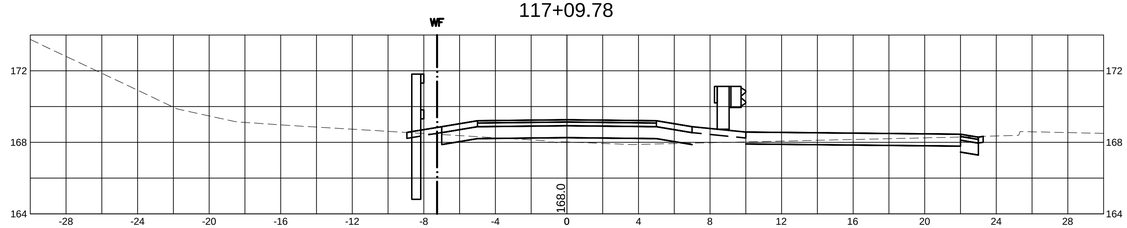
114+09.78



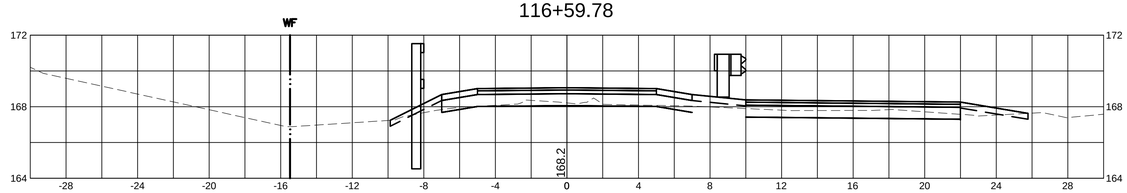
113+59.78



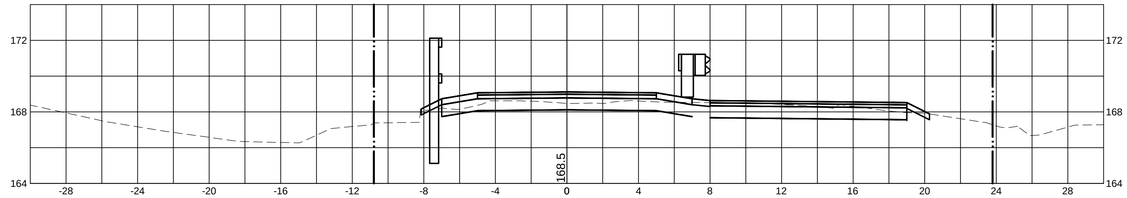
117+09.78



116+59.78



116+09.78



MassDOT DWT Version:

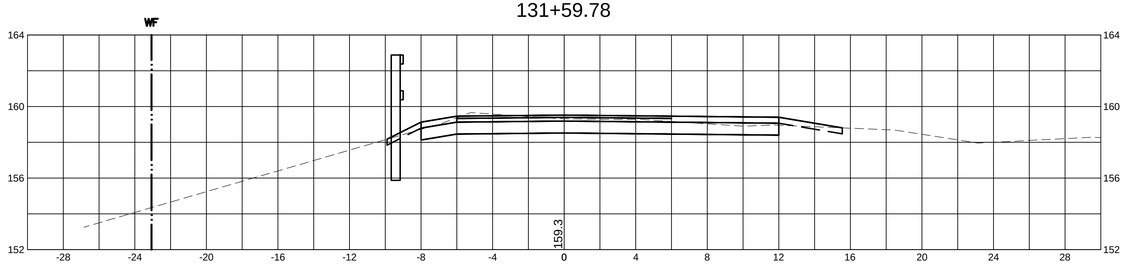
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	115	159
	PROJECT FILE NO. 604532		

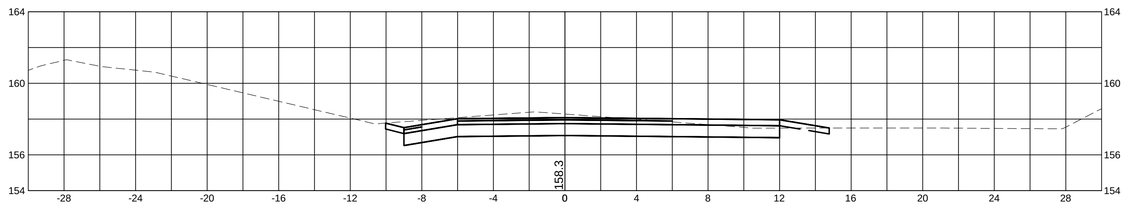
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

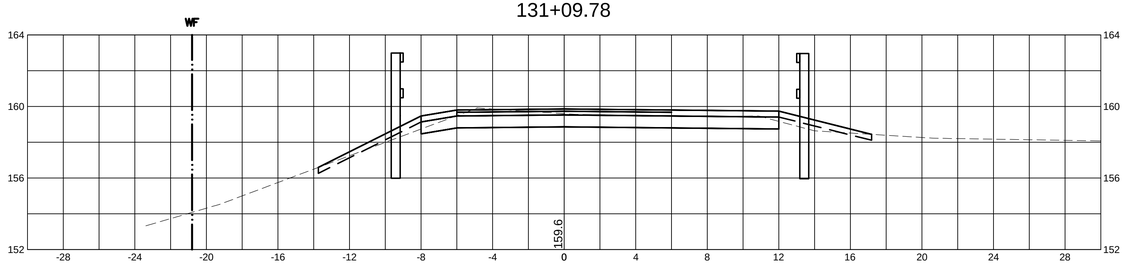
131+59.78



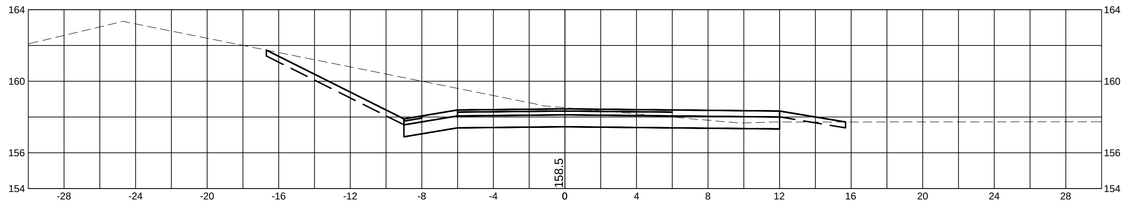
133+59.78



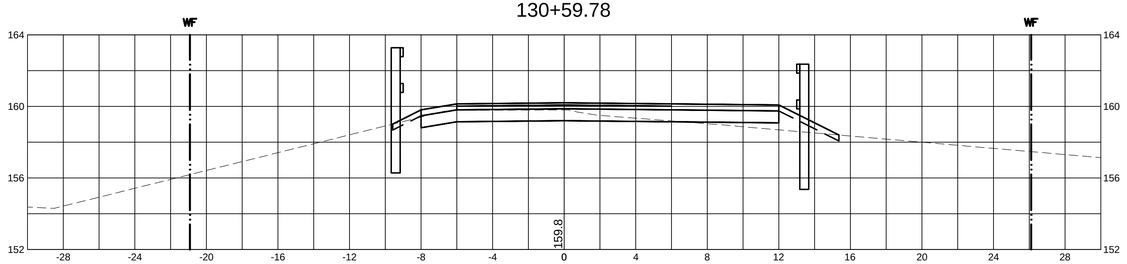
131+09.78



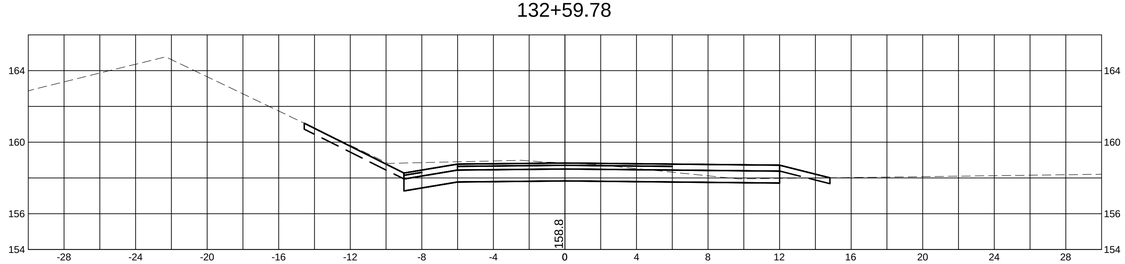
133+09.78



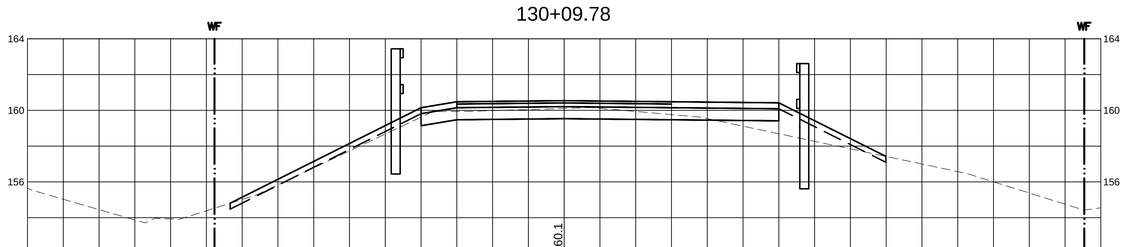
130+59.78



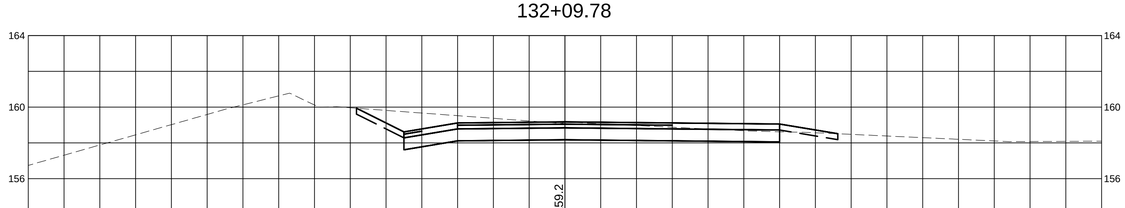
132+59.78



130+09.78



132+09.78



MassDOT DWT Version:

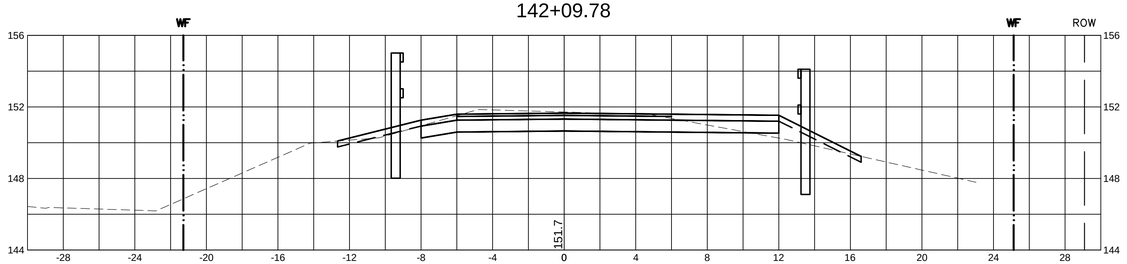
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	118	159
PROJECT FILE NO.	604532		

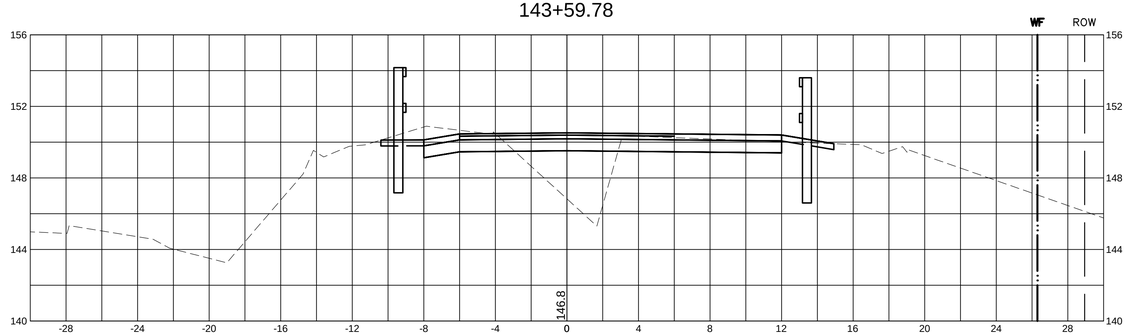
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

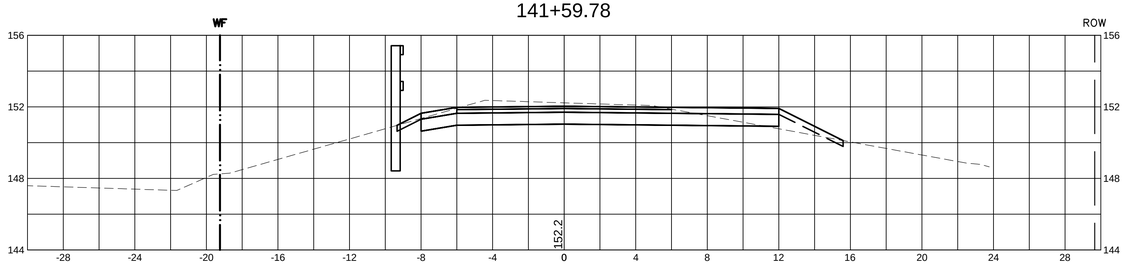
142+09.78



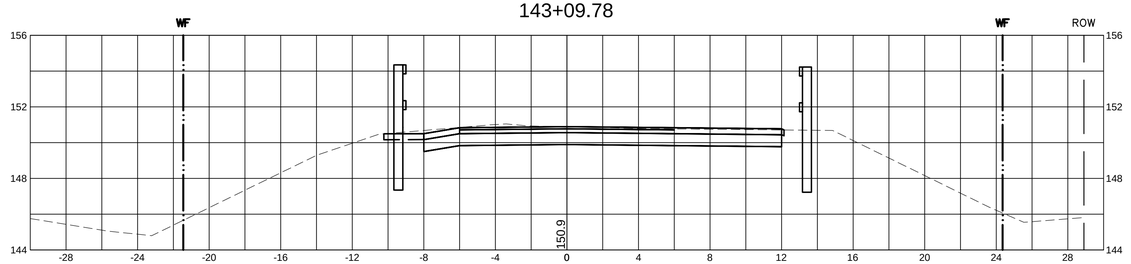
143+59.78



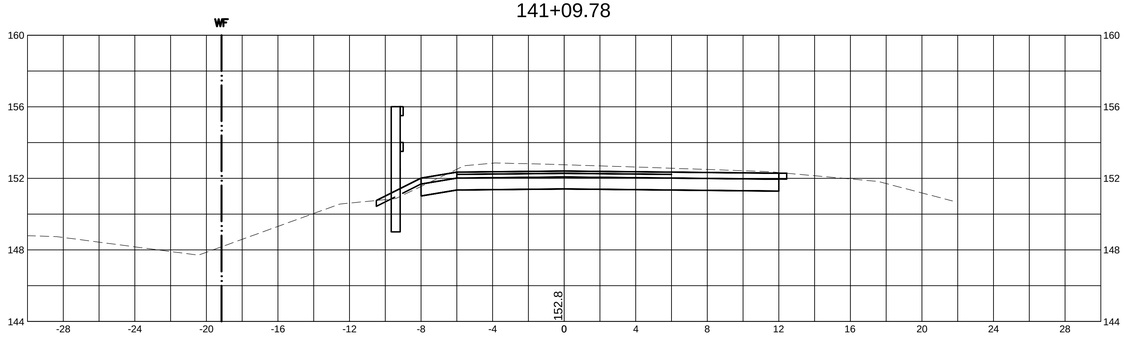
141+59.78



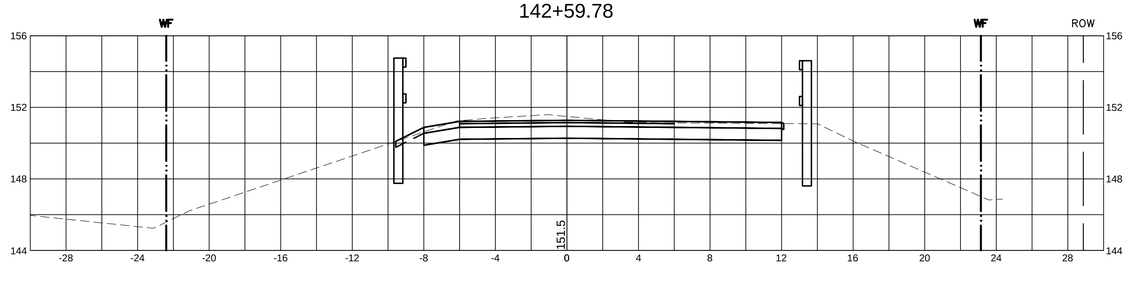
143+09.78



141+09.78



142+59.78



MassDOT DWT Version:

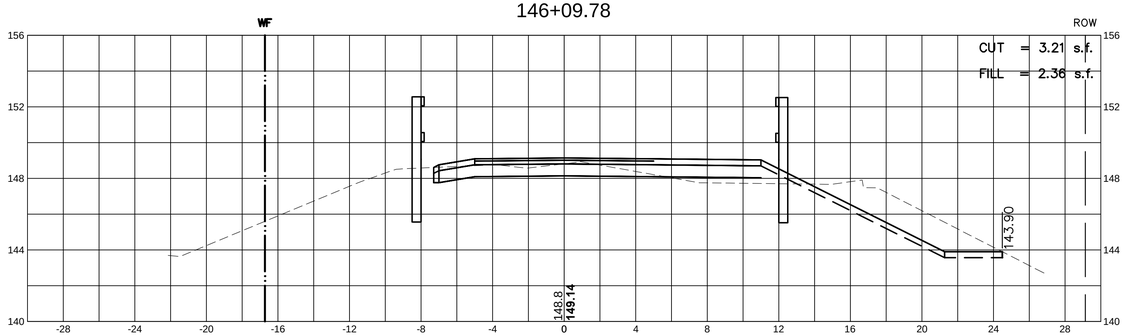
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	118	158
PROJECT FILE NO.	604532		

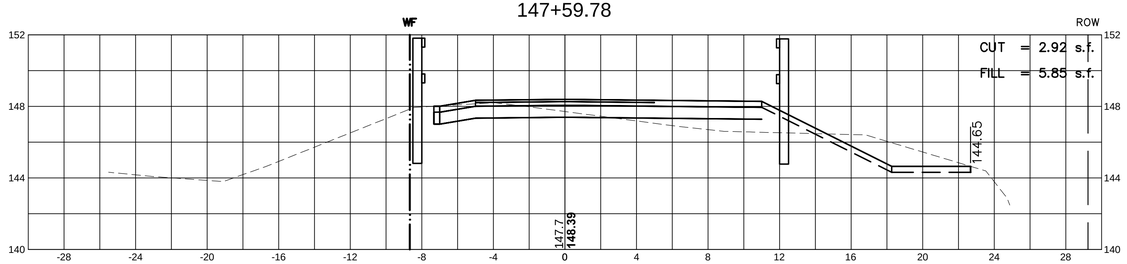
CROSS SECTIONS

10031_2A_XS.DWG 11-Mar-2014

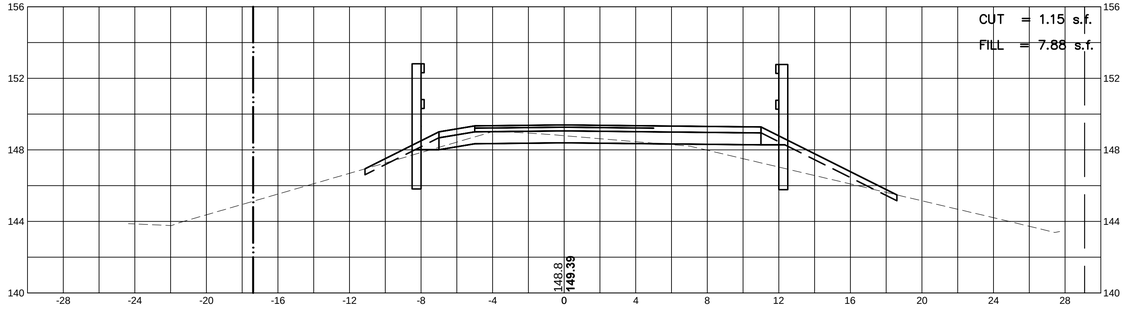
146+09.78



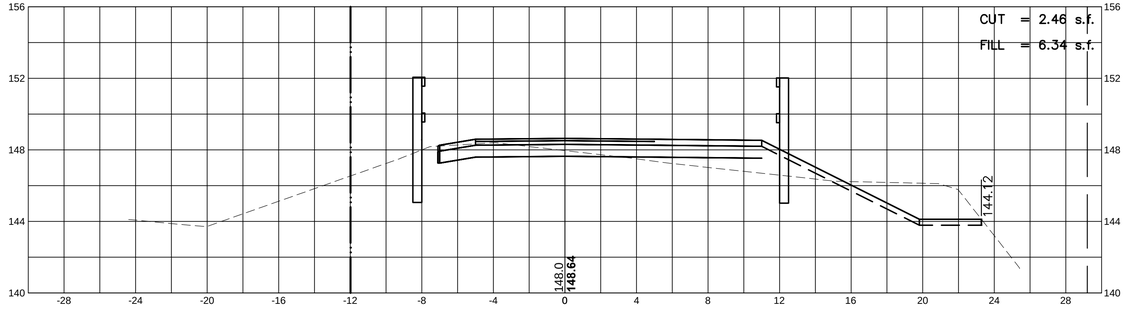
147+59.78



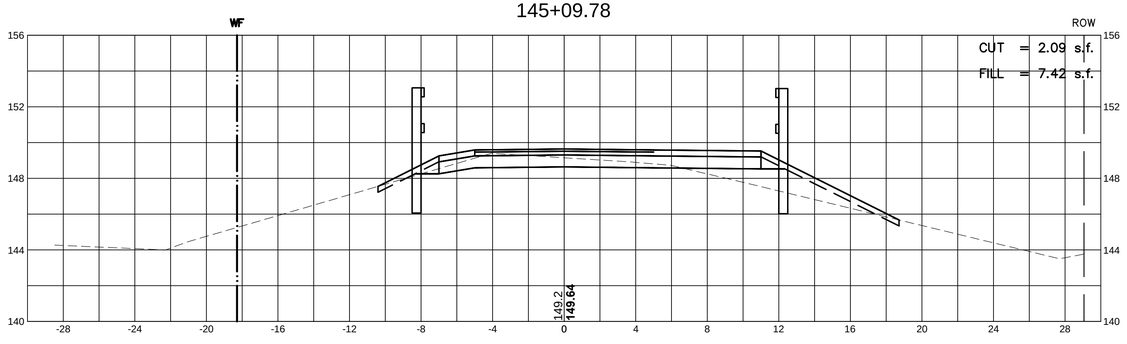
145+59.78



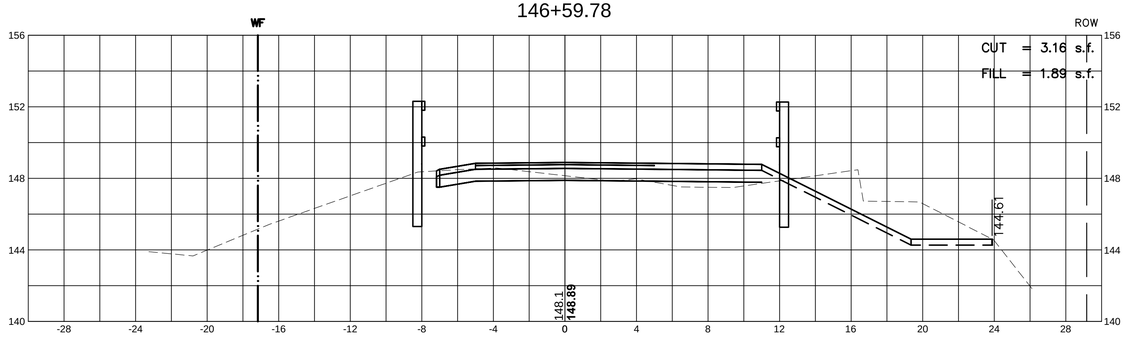
147+09.78



145+09.78



146+59.78



MassDOT DWT Version:

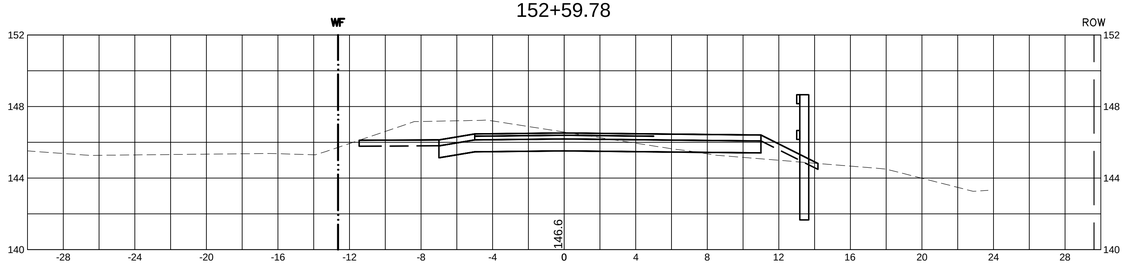
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	121	159
PROJECT FILE NO.	604532		

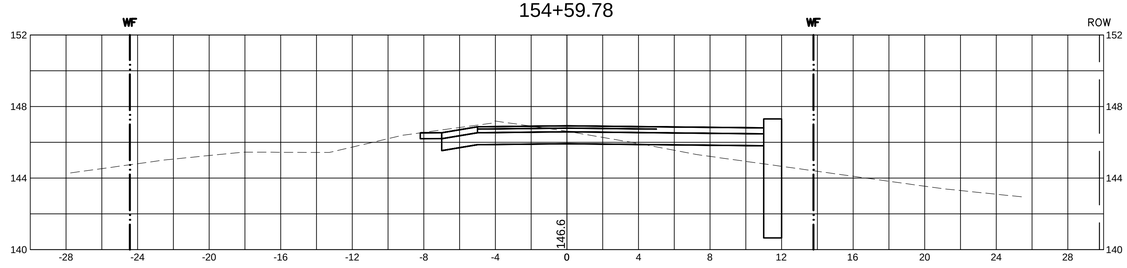
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

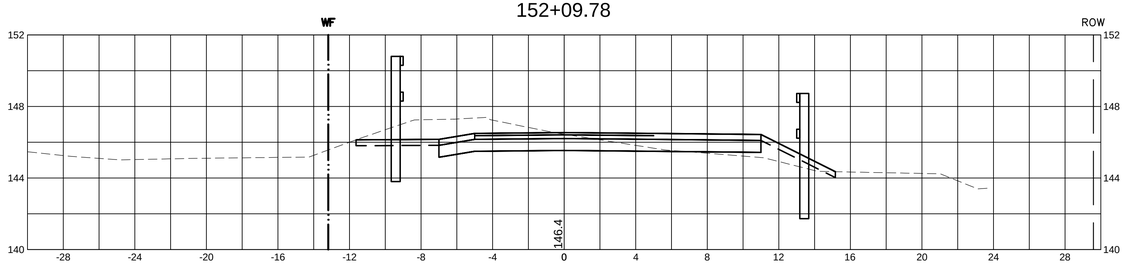
152+59.78



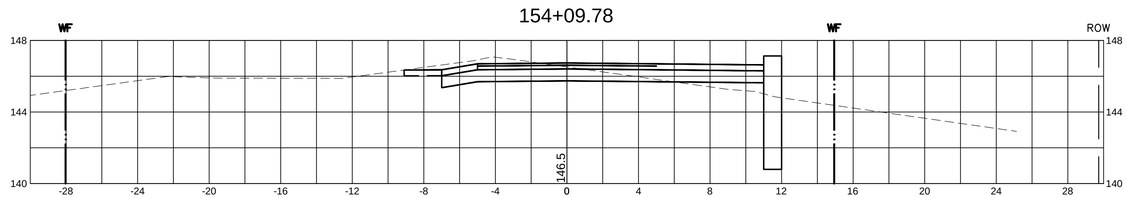
154+59.78



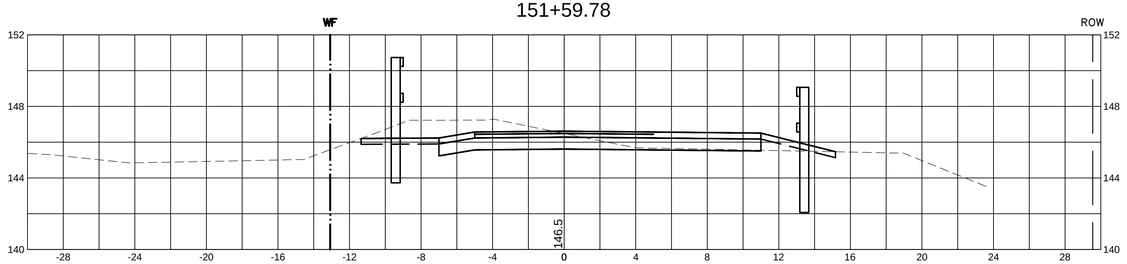
152+09.78



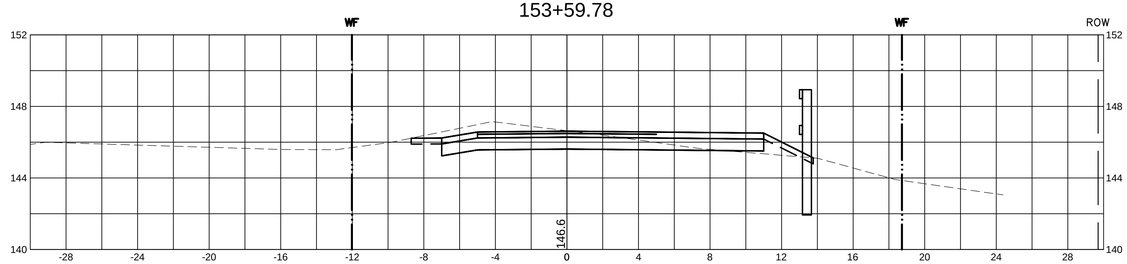
154+09.78



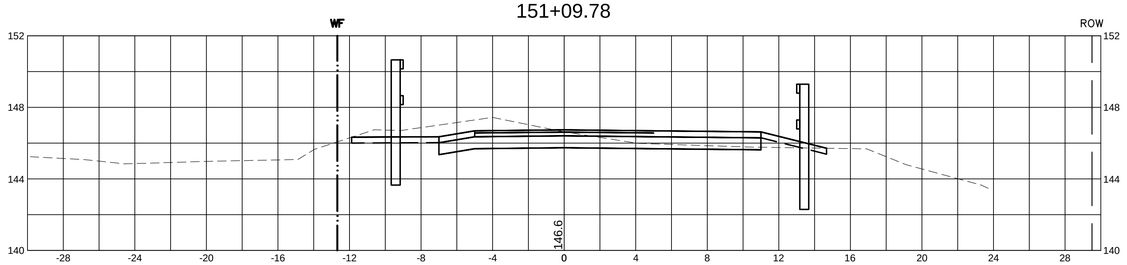
151+59.78



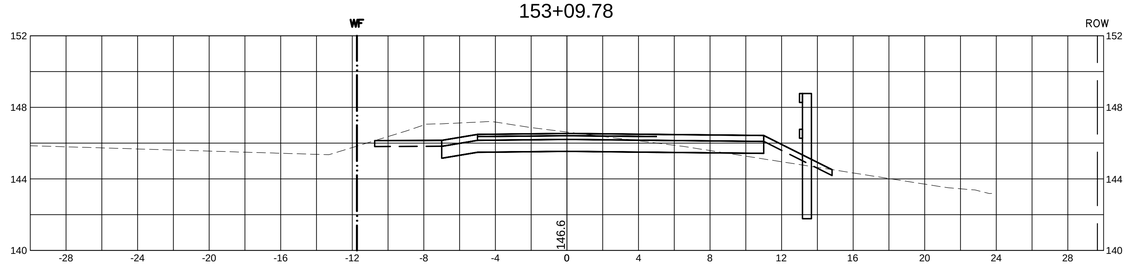
153+59.78



151+09.78



153+09.78



MassDOT DWT Version:

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

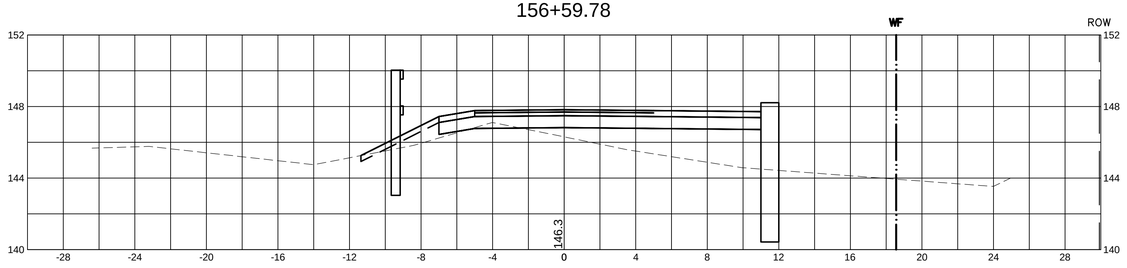
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	122	159
PROJECT FILE NO.	604532		

CROSS SECTIONS

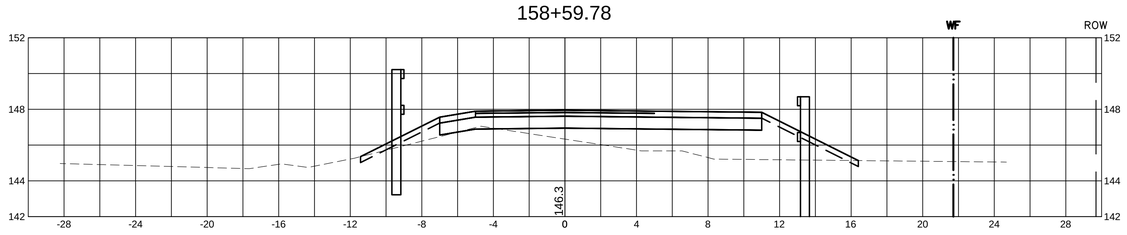
25-Feb-2014

10031_2A_XS.DWG

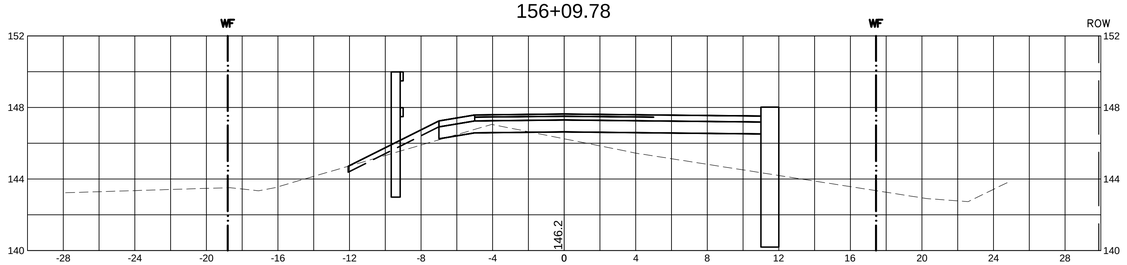
156+59.78



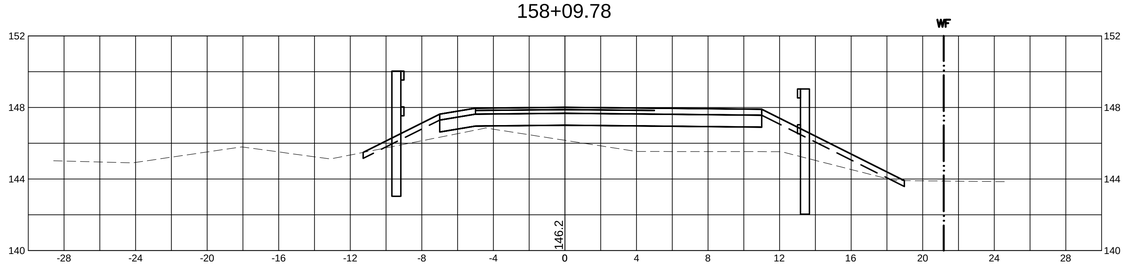
158+59.78



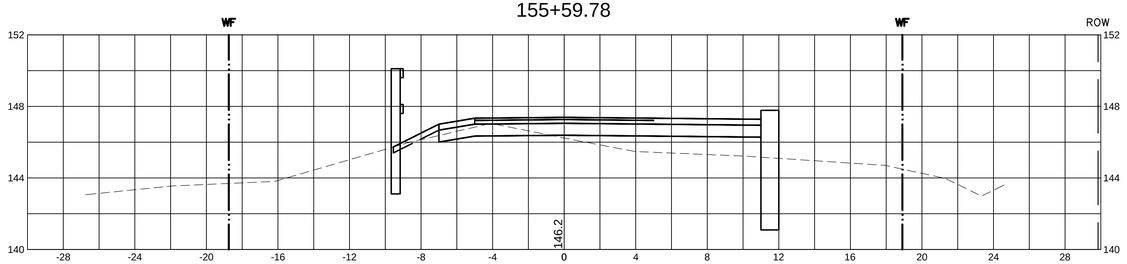
156+09.78



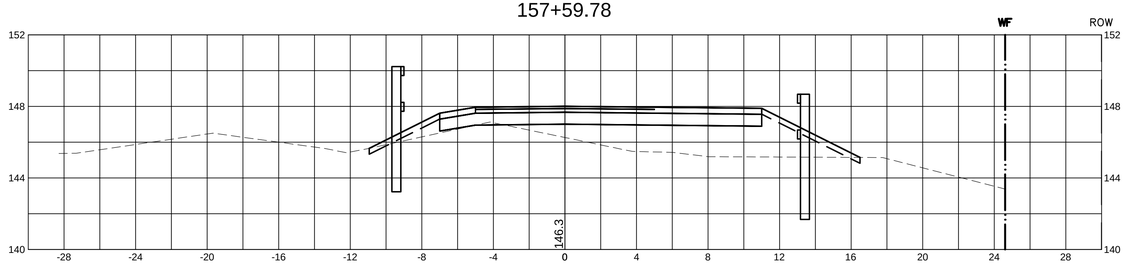
158+09.78



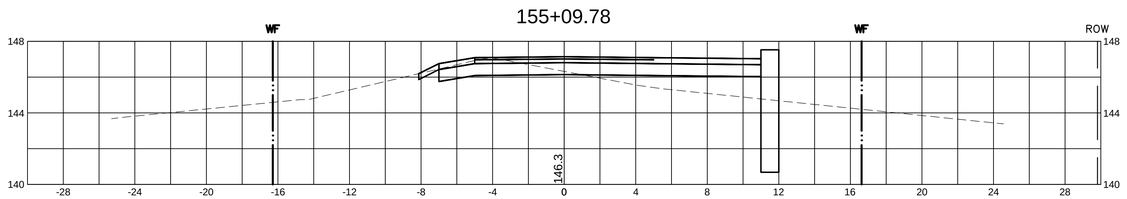
155+59.78



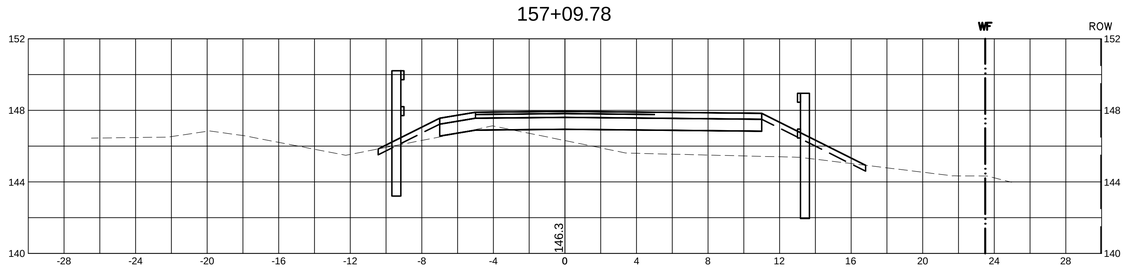
157+59.78



155+09.78



157+09.78



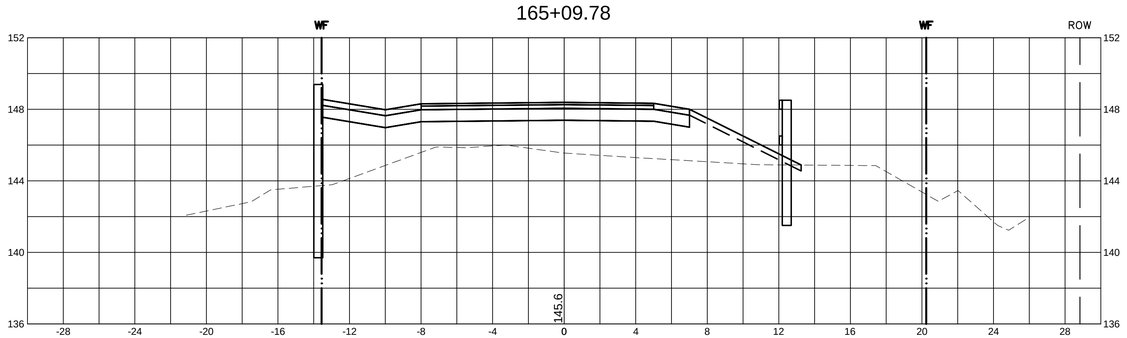
MassDOT DWT Version:

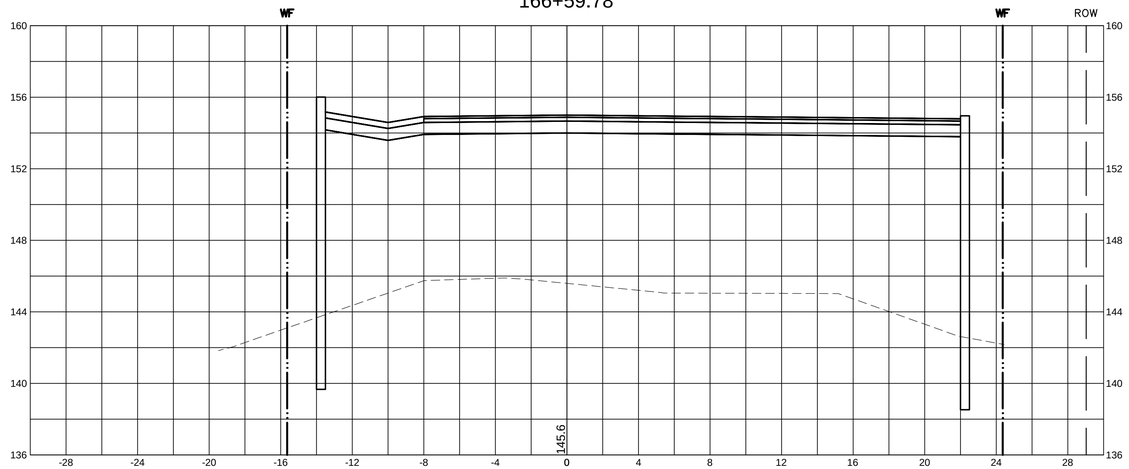
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

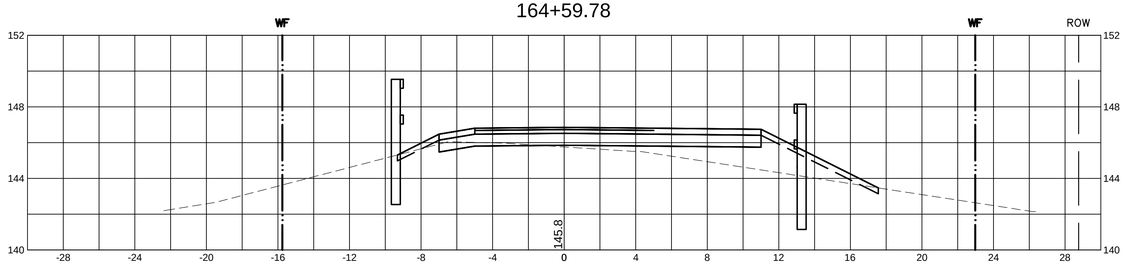
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	124	159
PROJECT FILE NO.	604532		

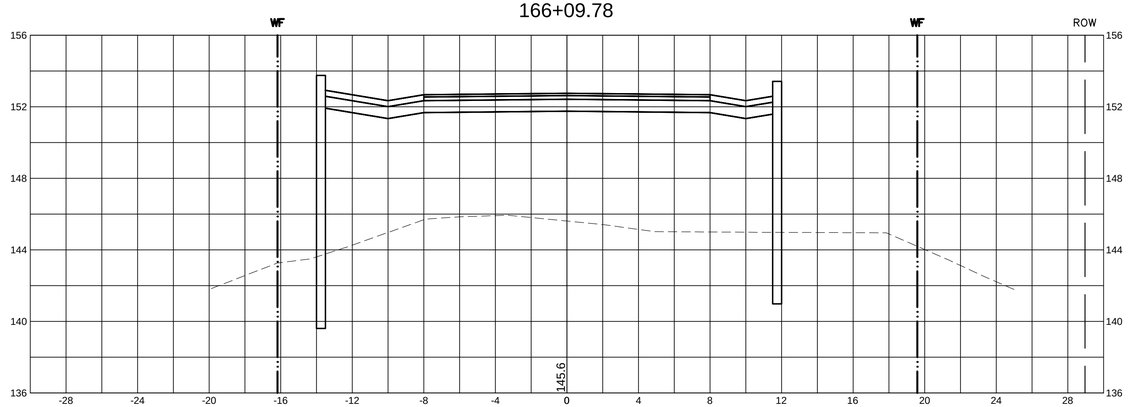
CROSS SECTIONS

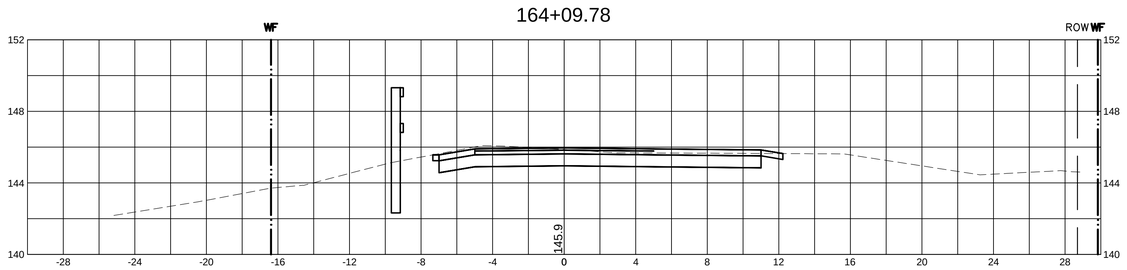
10031_2A_XS.DWG 25-Feb-2014

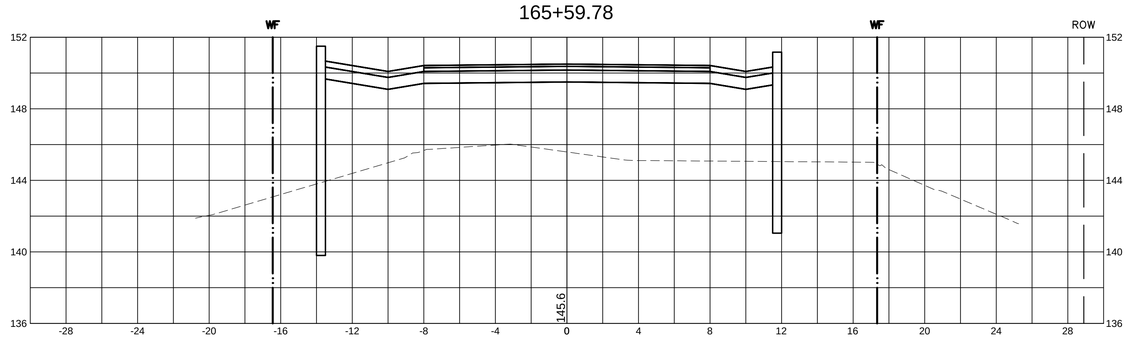












MassDOT DWT Version:

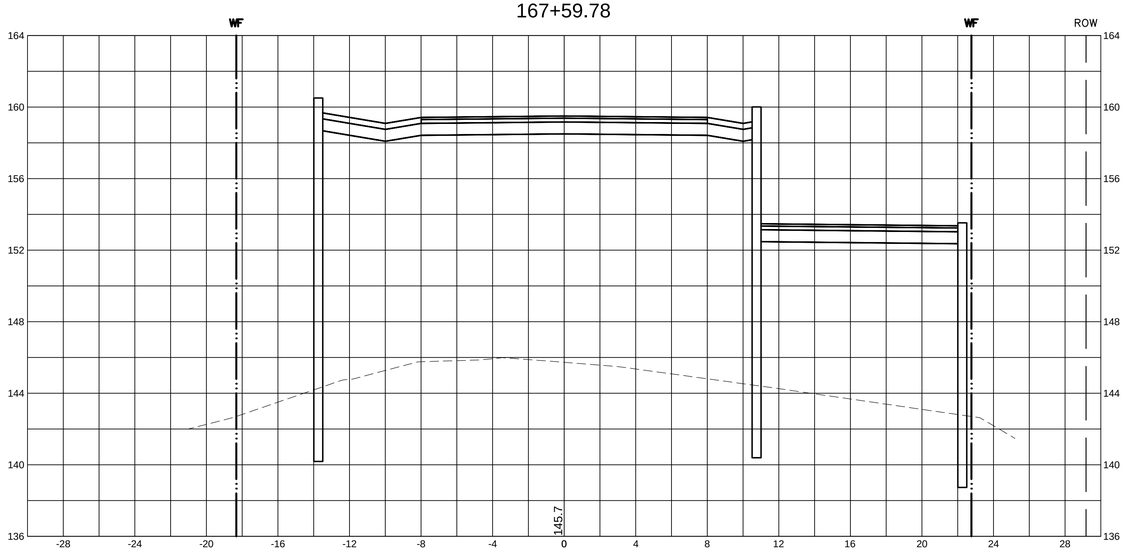
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	125	159
PROJECT FILE NO.	604532		

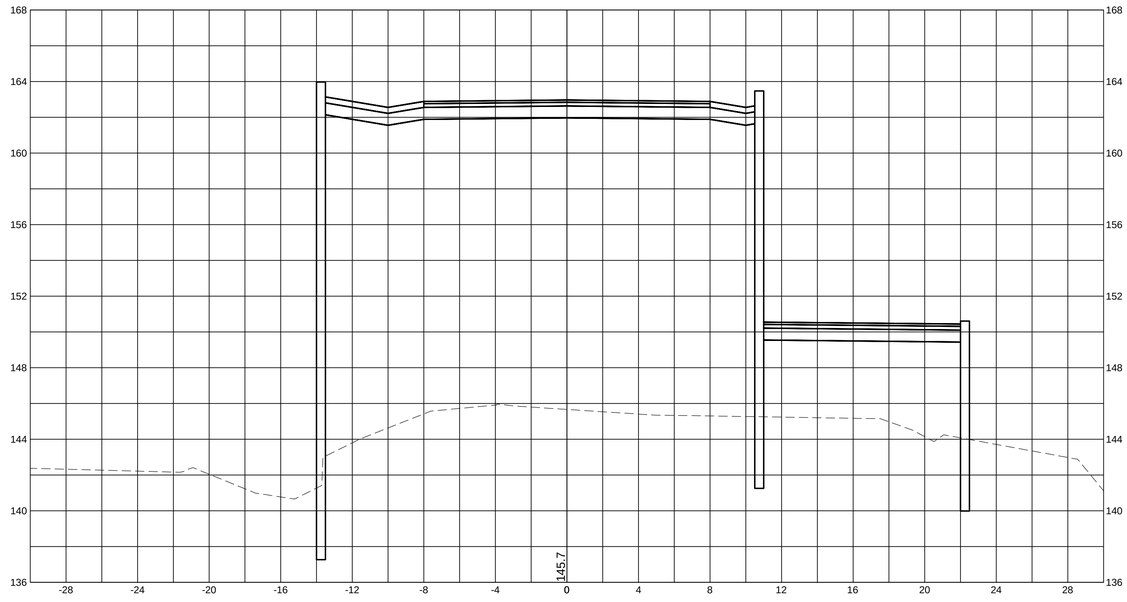
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

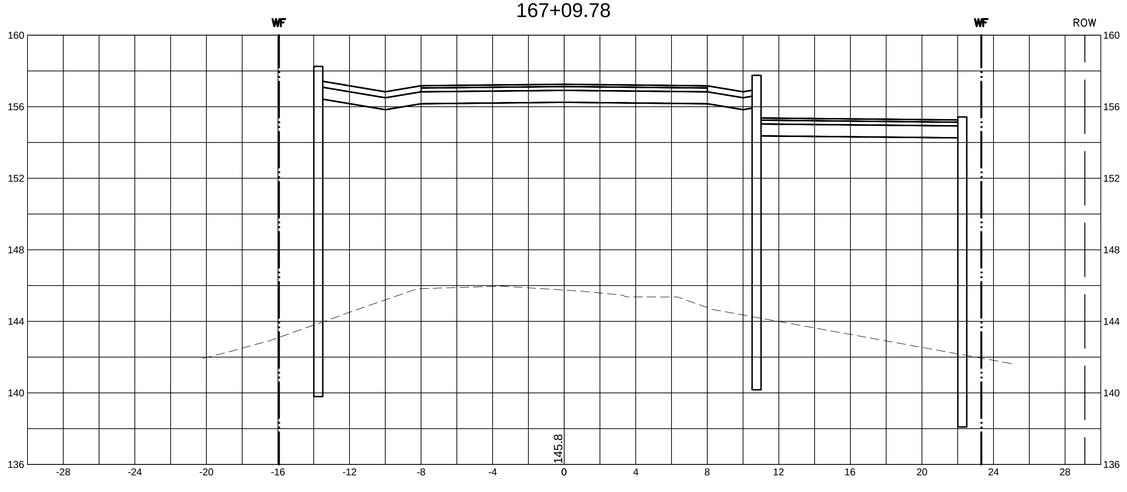
167+59.78



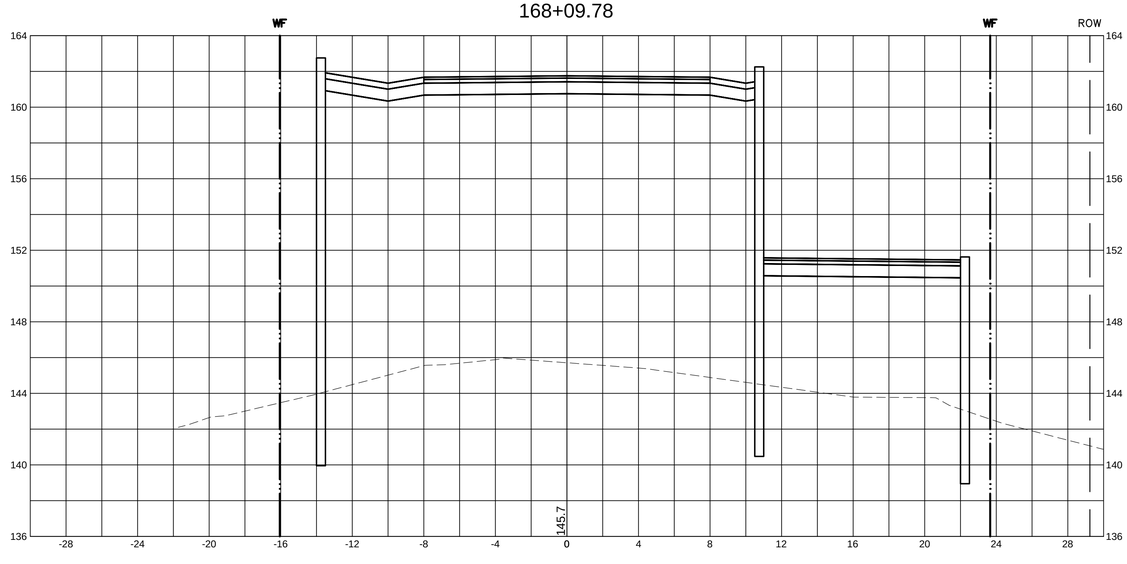
168+36.78



167+09.78



168+09.78



MassDOT DWT Version:

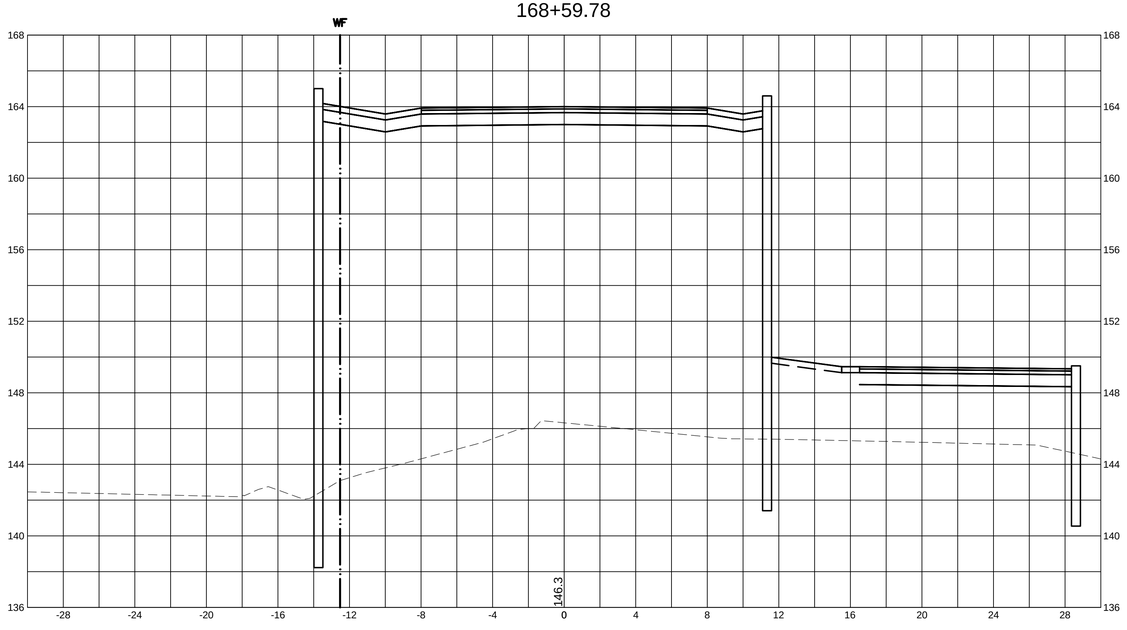
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	126	159
PROJECT FILE NO.	604532		

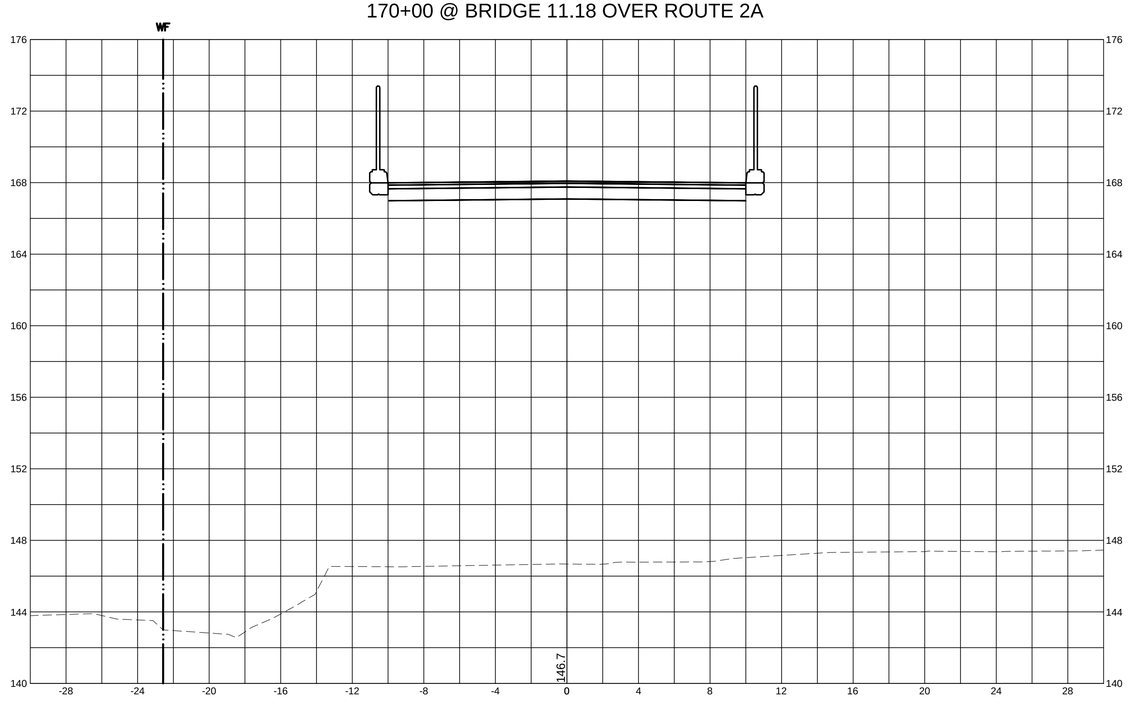
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

168+59.78



170+00 @ BRIDGE 11.18 OVER ROUTE 2A



MassDOT DWT Version:

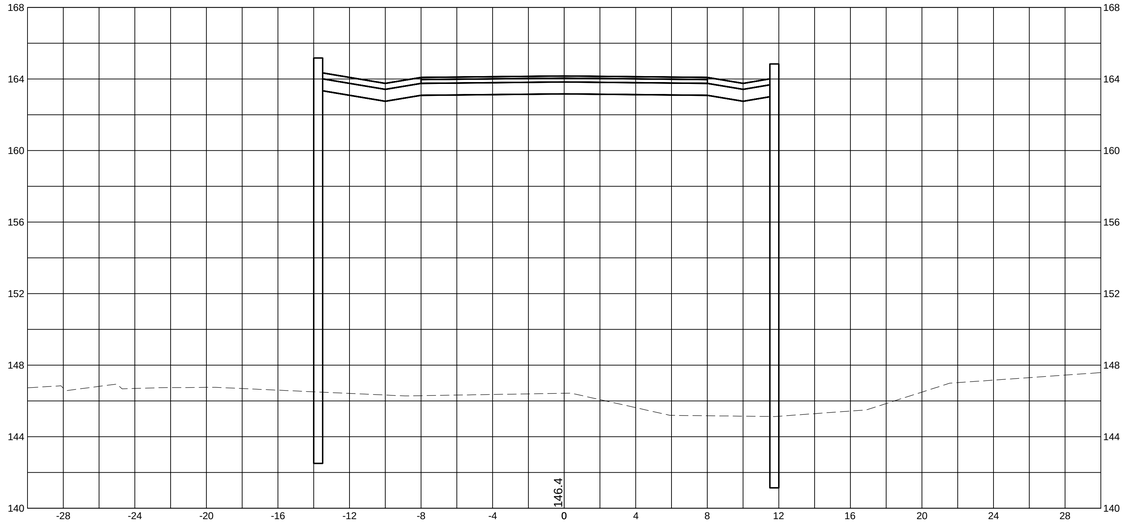
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	127	159
PROJECT FILE NO.	604532		

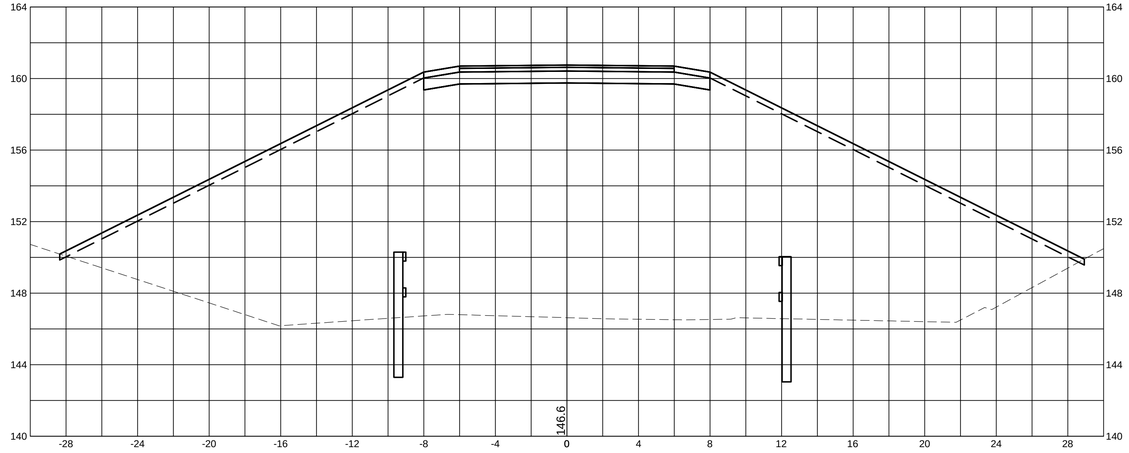
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

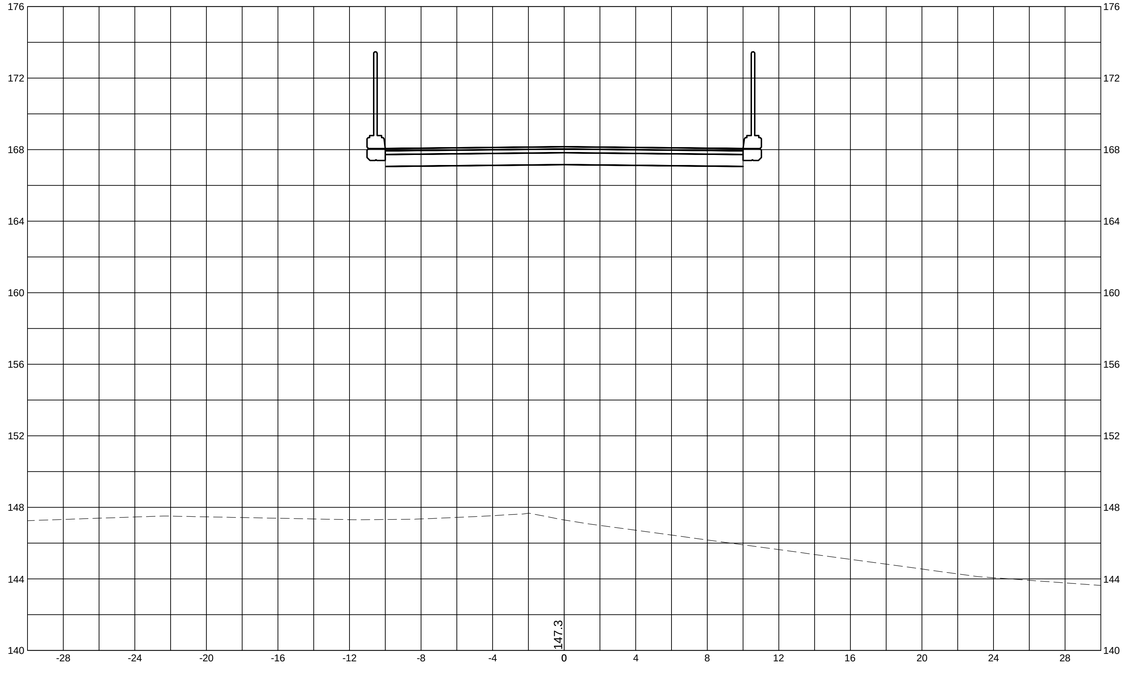
171+09.78



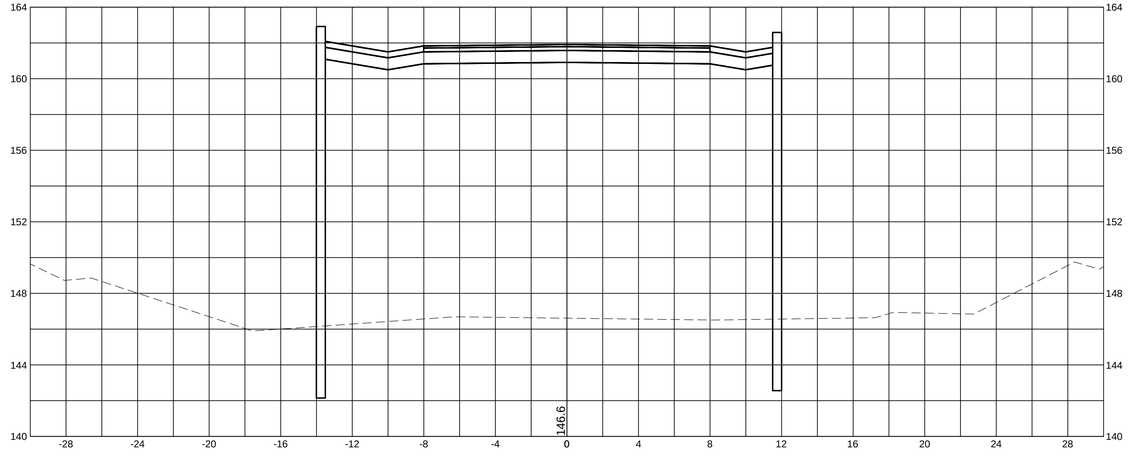
172+00



170+50 @ BRIDGE 11.18 OVER ROUTE 2A



171+59.78



MassDOT DWT Version:

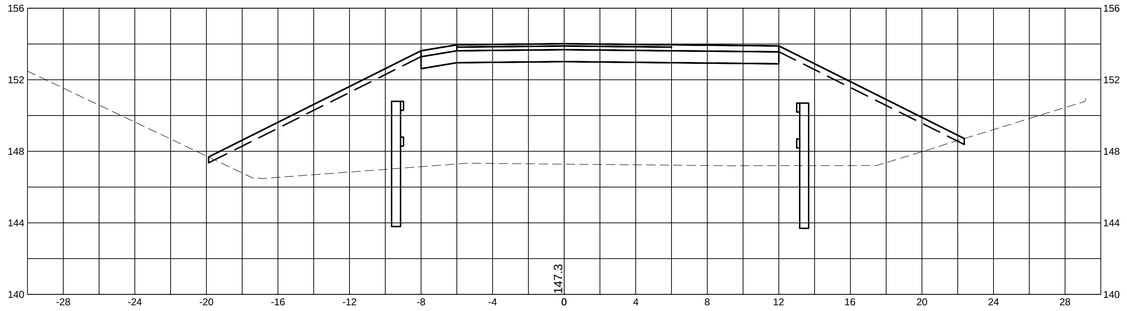
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	128	159
PROJECT FILE NO.	604532		

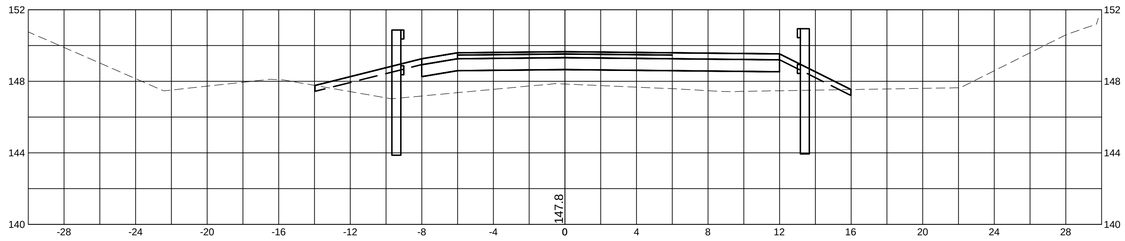
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

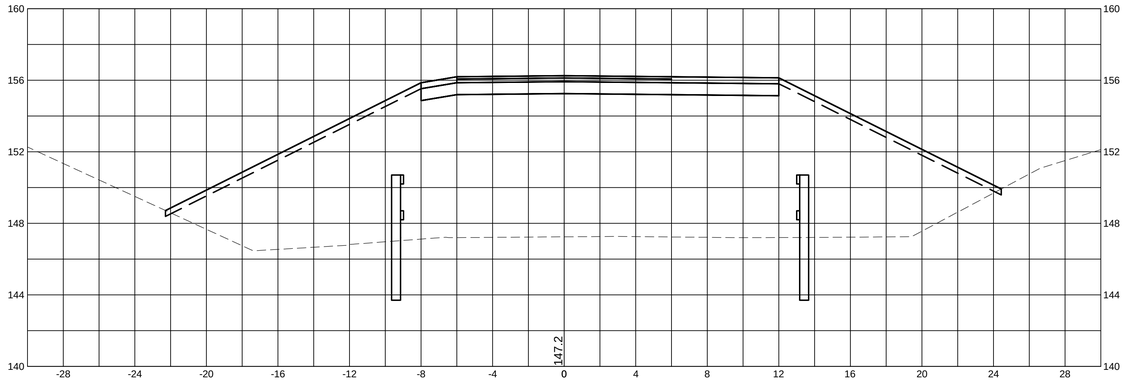
173+50



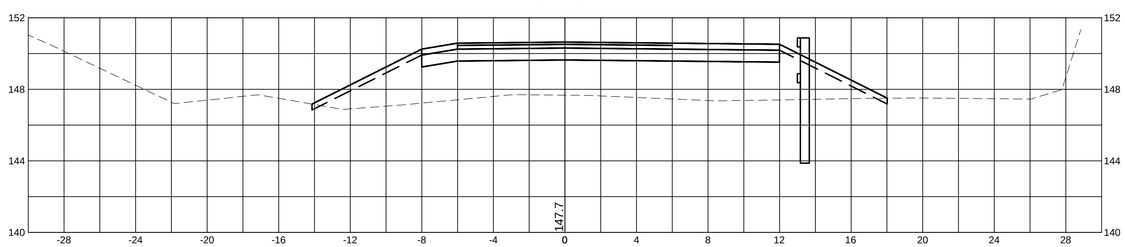
175+00



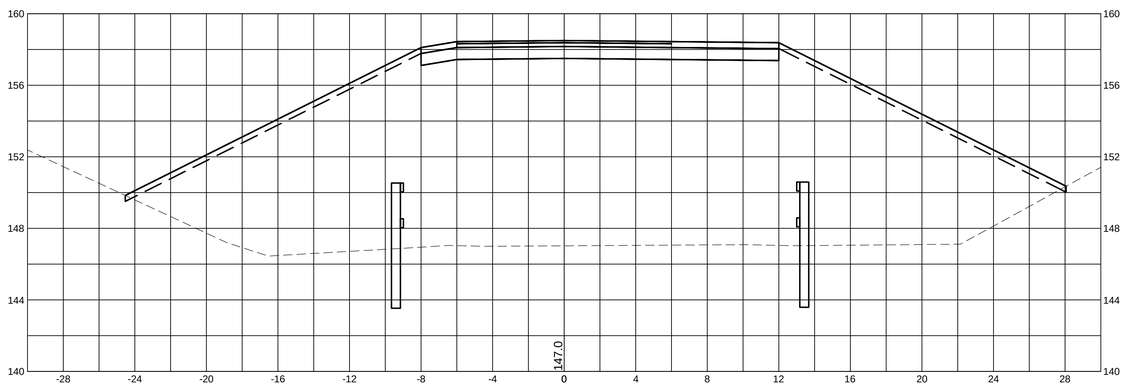
173+00



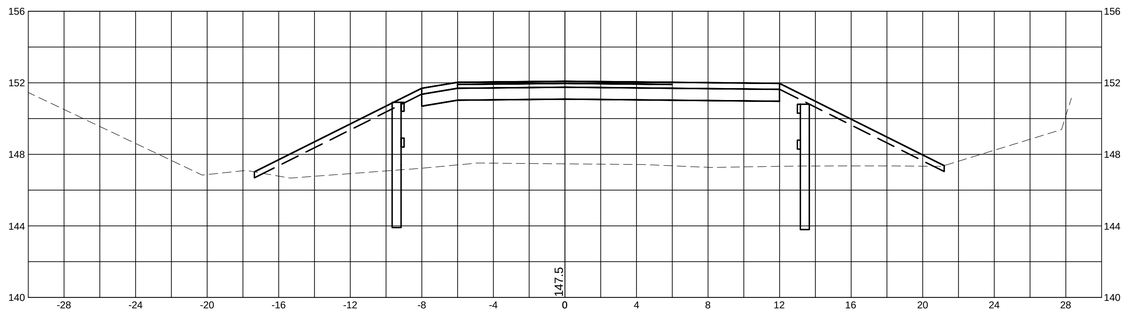
174+50



172+50



174+00



MassDOT DWT Version:

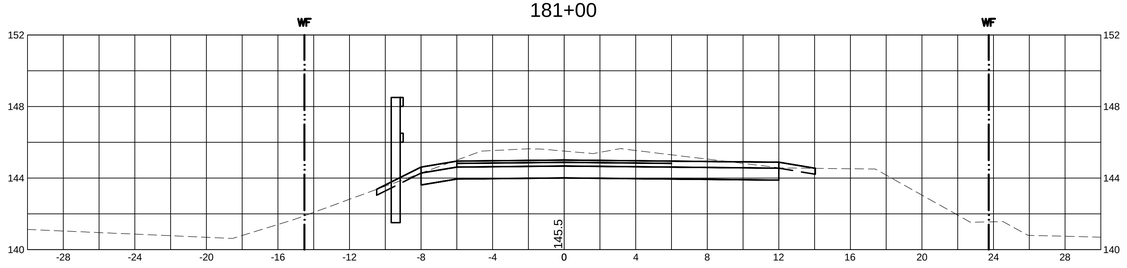
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	130	159
PROJECT FILE NO.	604532		

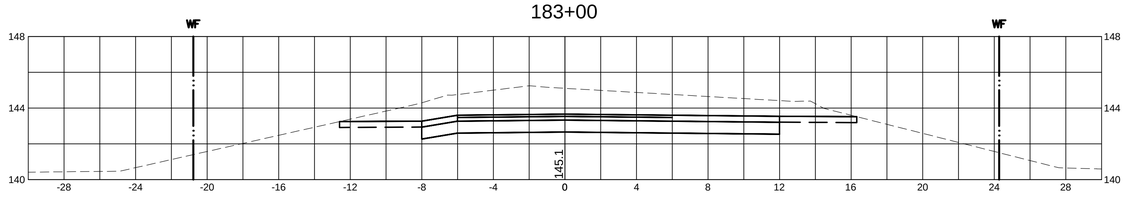
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

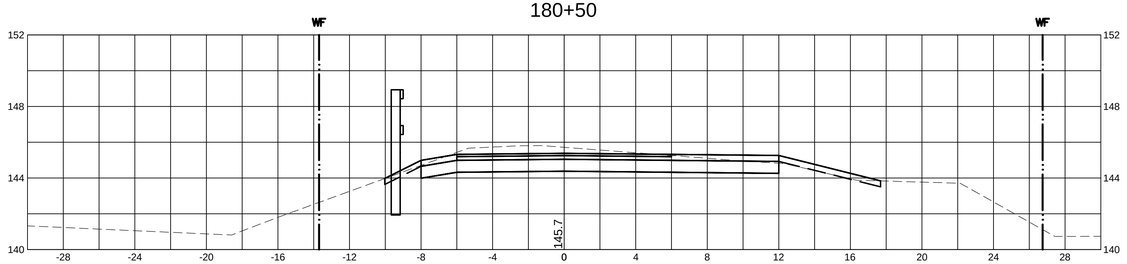
181+00



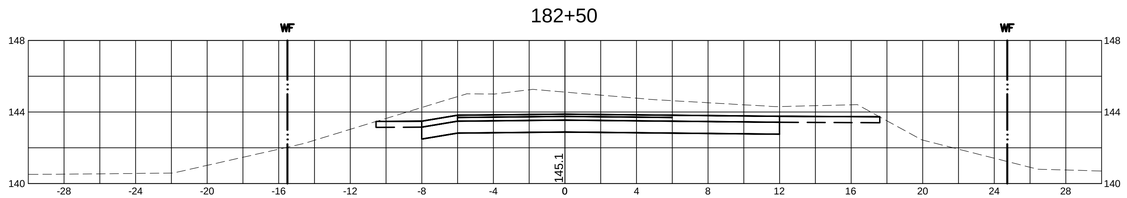
183+00



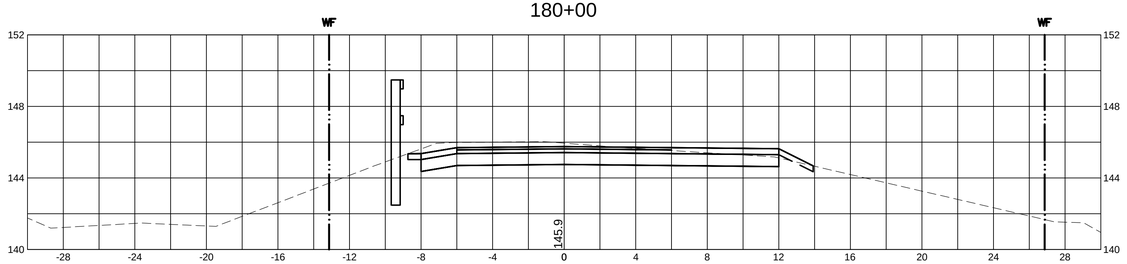
180+50



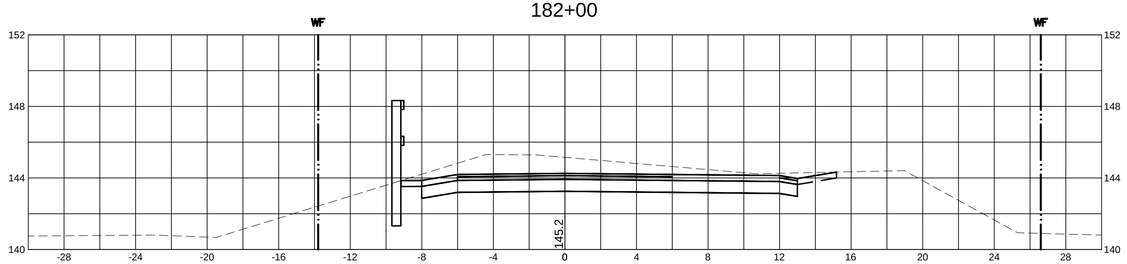
182+50



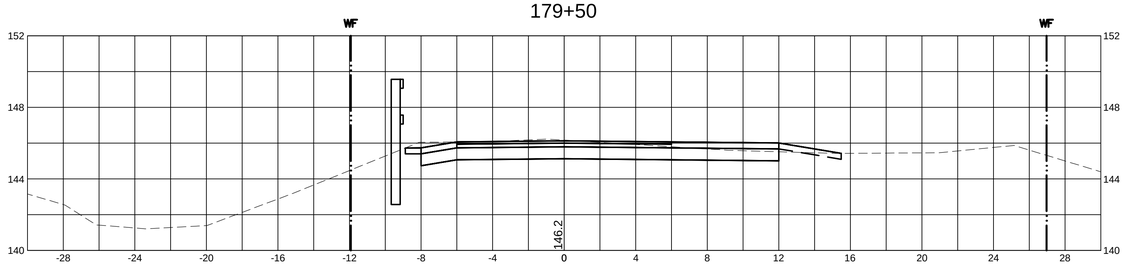
180+00



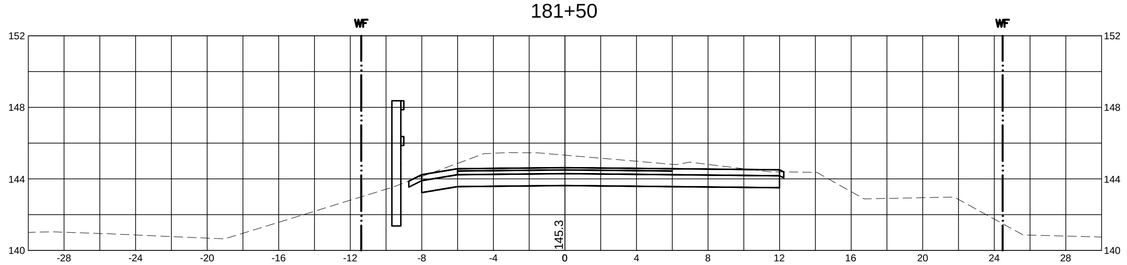
182+00



179+50



181+50



MassDOT DWT Version:

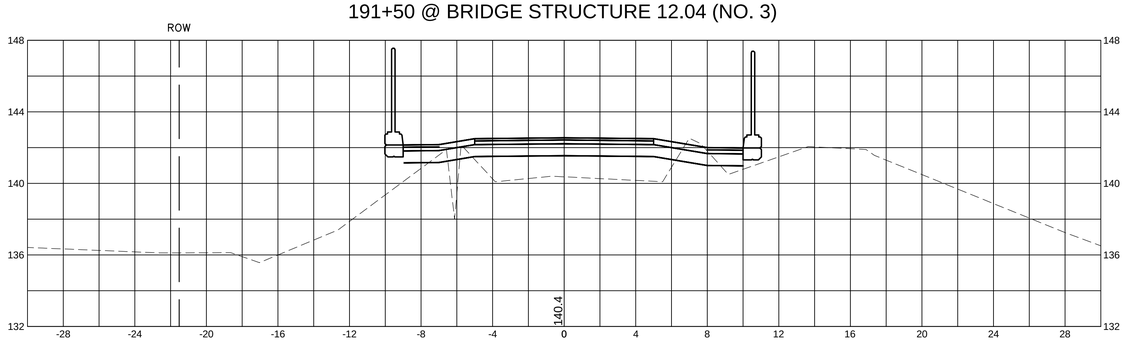
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	133	159
PROJECT FILE NO.	604532		

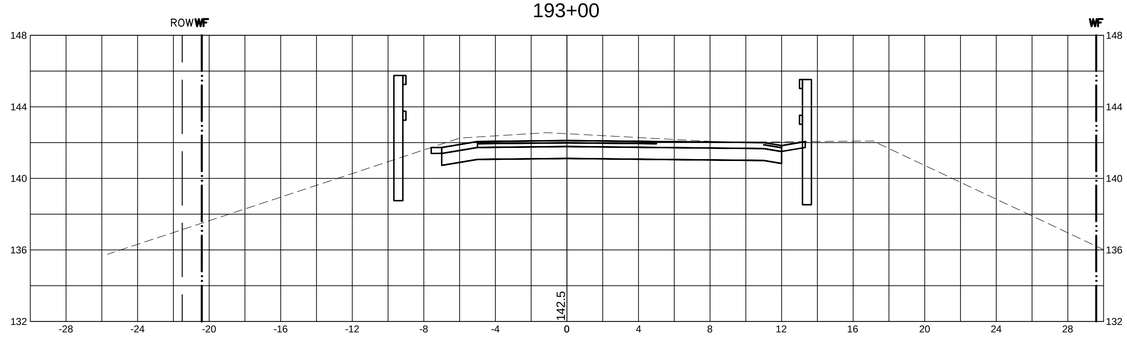
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

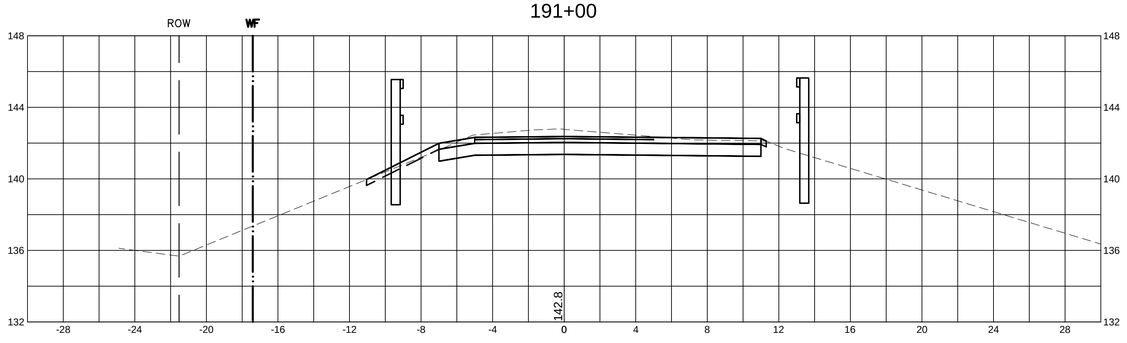
191+50 @ BRIDGE STRUCTURE 12.04 (NO. 3)



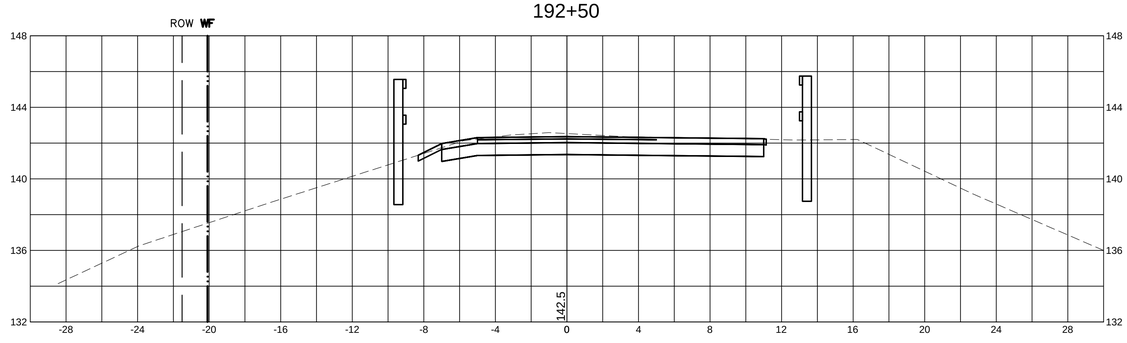
193+00



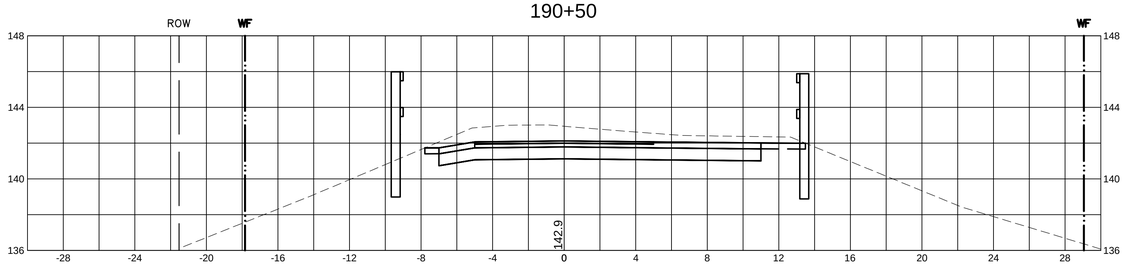
191+00



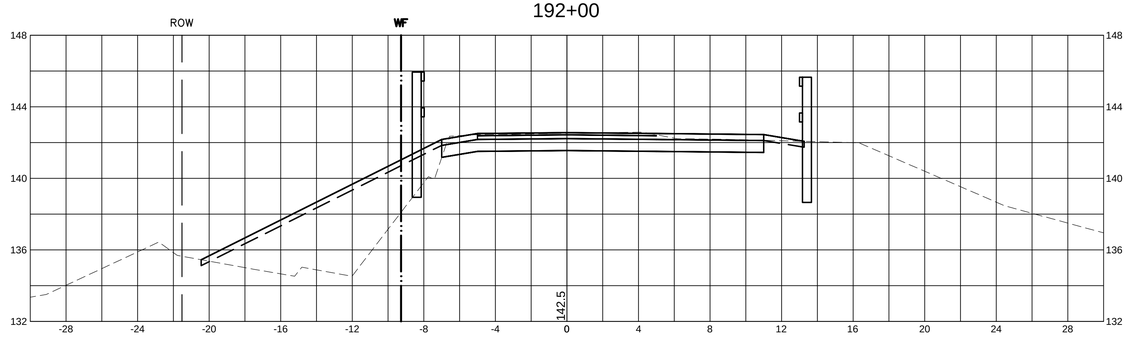
192+50



190+50



192+00



MassDOT DWT Version:

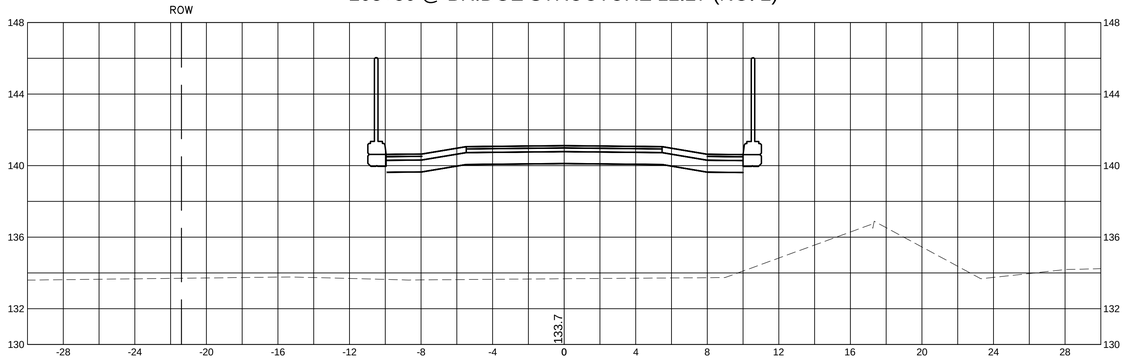
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	137	159
PROJECT FILE NO.	604532		

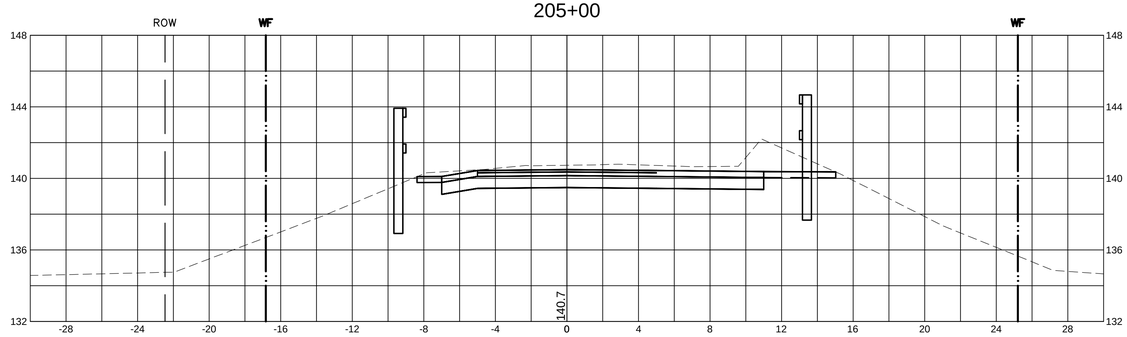
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

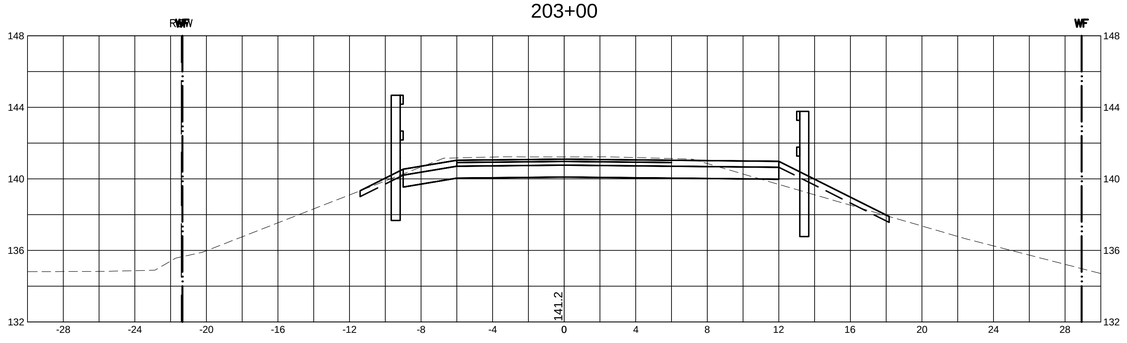
203+50 @ BRIDGE STRUCTURE 12.27 (NO. 2)



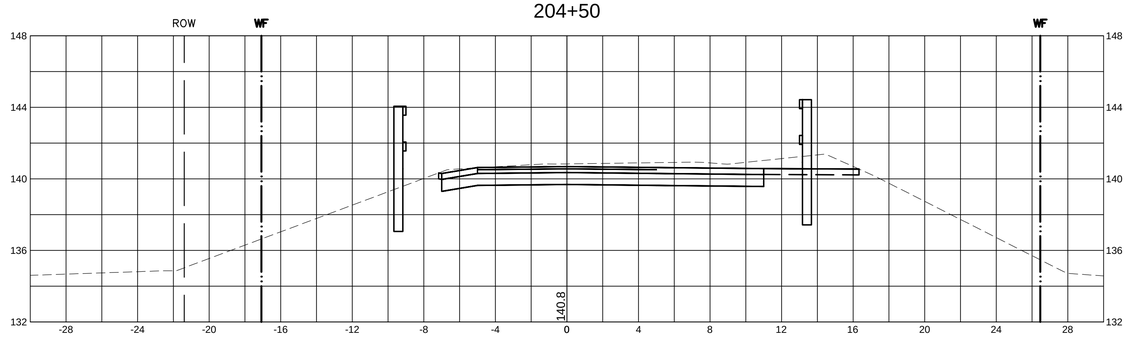
205+00



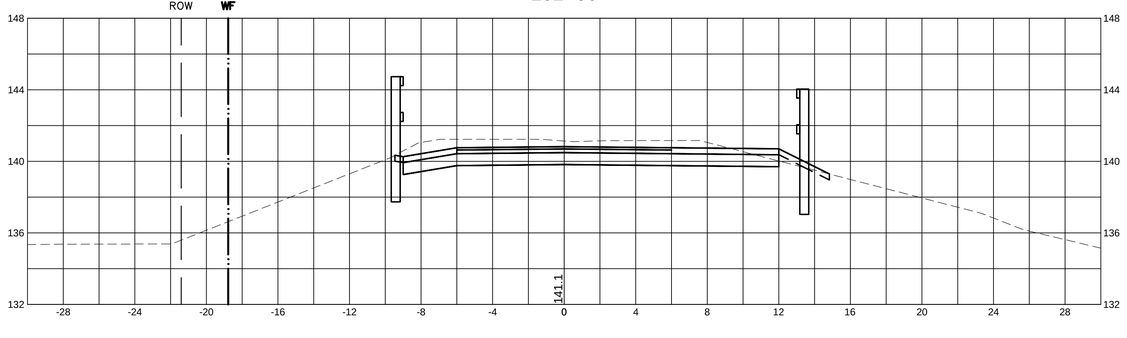
203+00



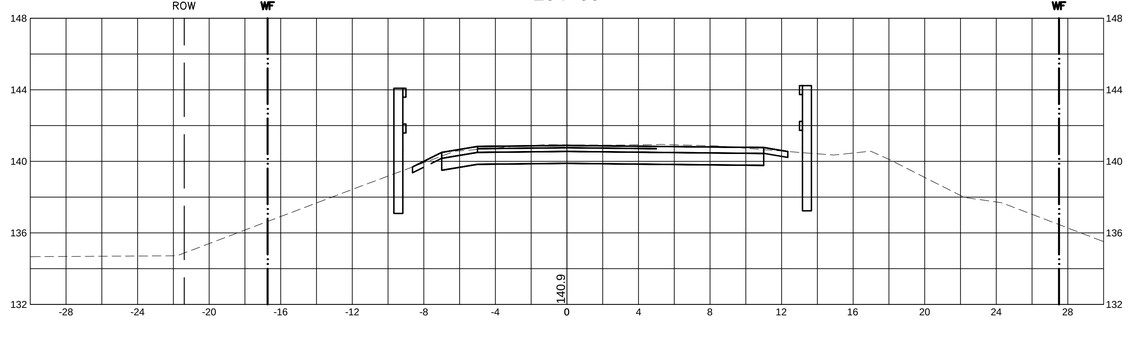
204+50



202+50



204+00



MassDOT DWT Version:

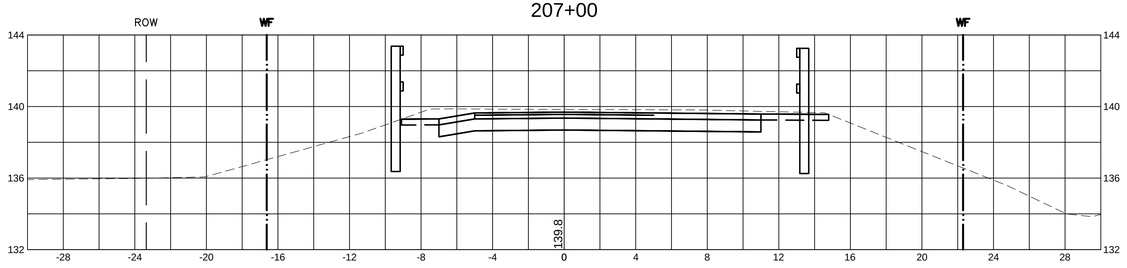
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	138	159
PROJECT FILE NO.	604532		

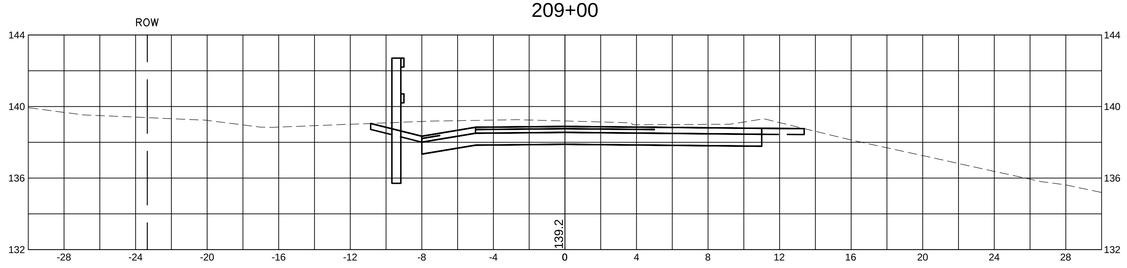
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

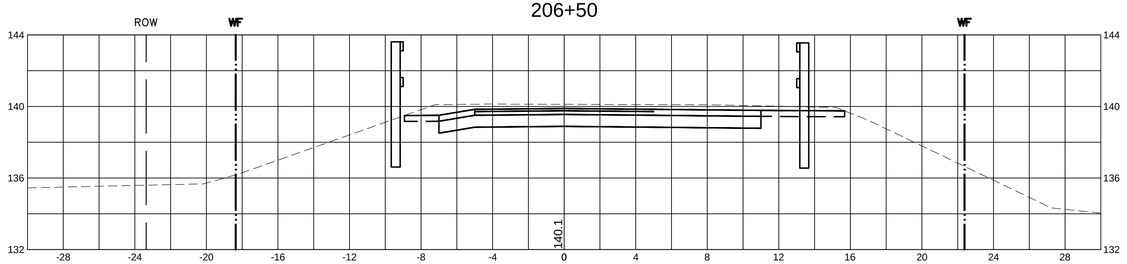
207+00



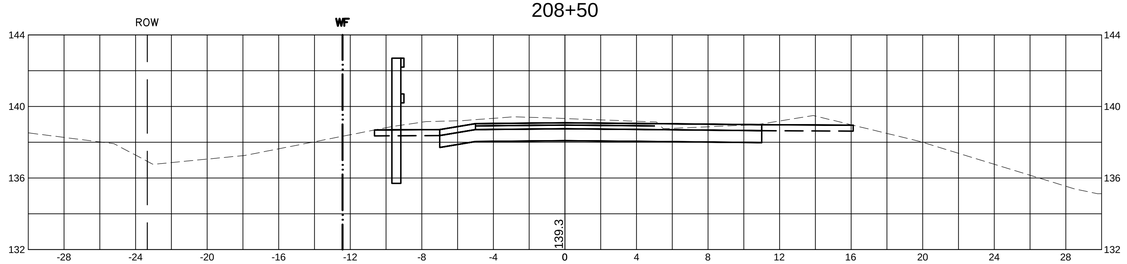
209+00



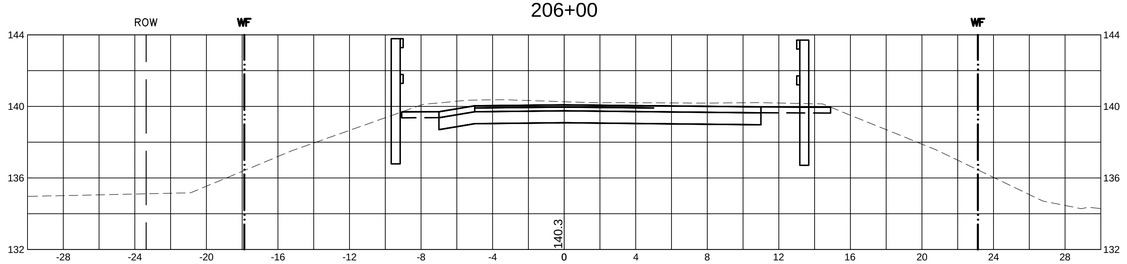
206+50



208+50



206+00



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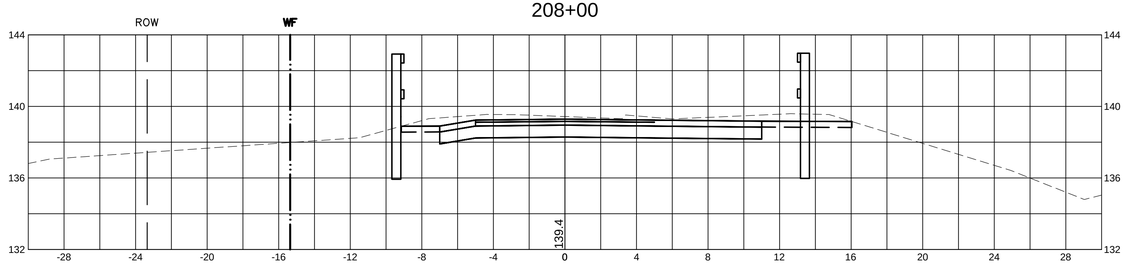
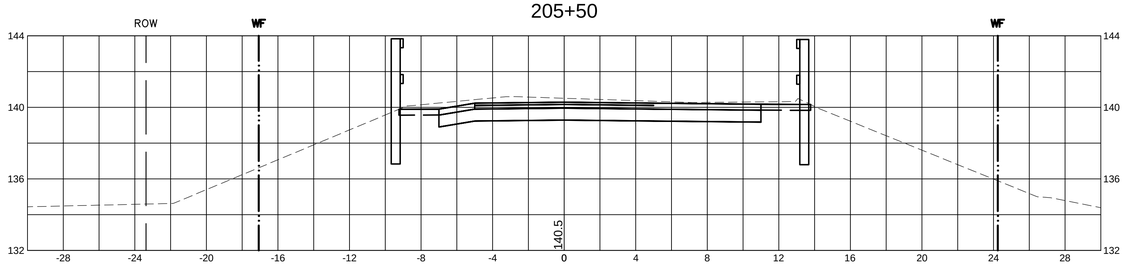


205+50



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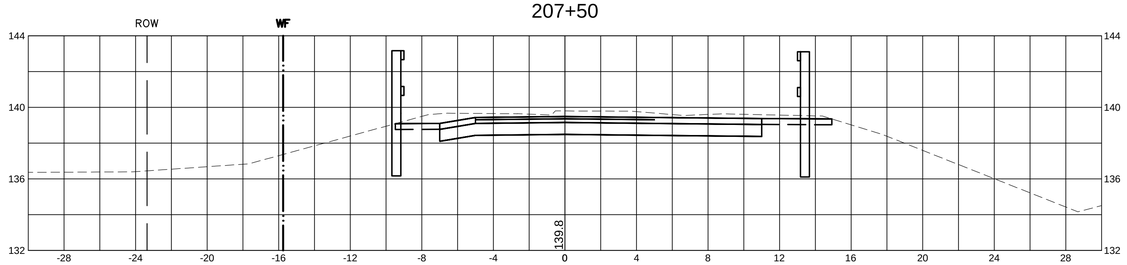


MassDOT DWT Version:

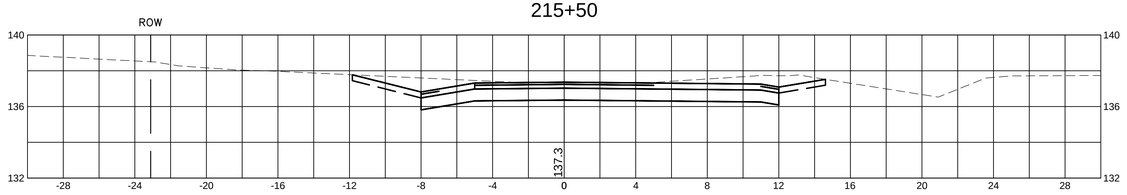
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	140	159
	PROJECT FILE NO.	604532	

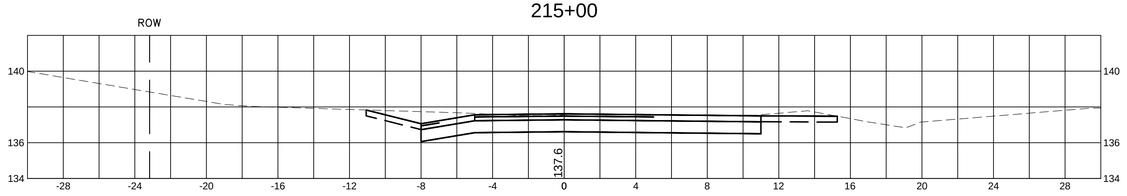
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

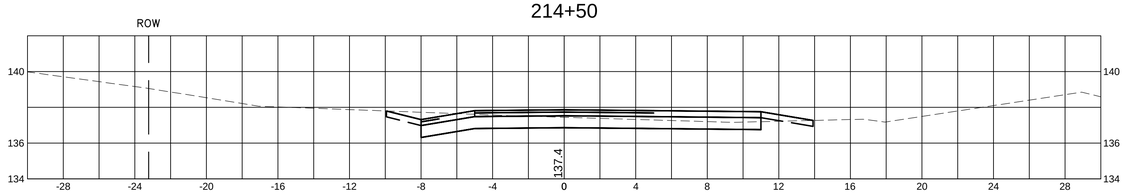
215+50



215+00



214+50



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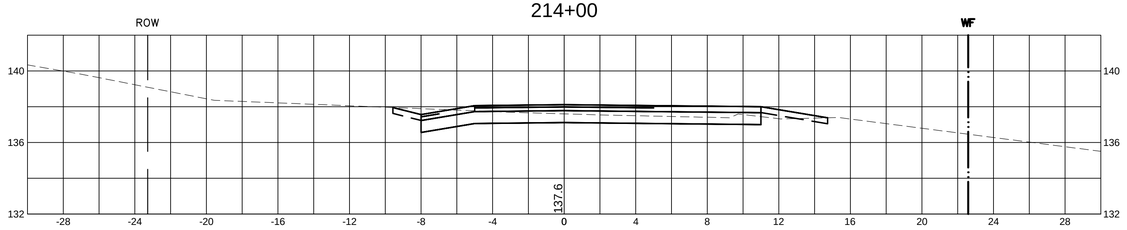
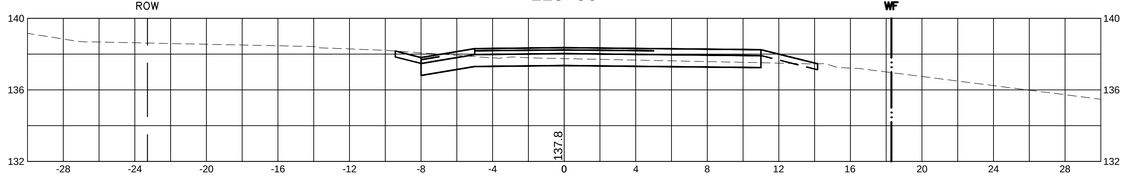
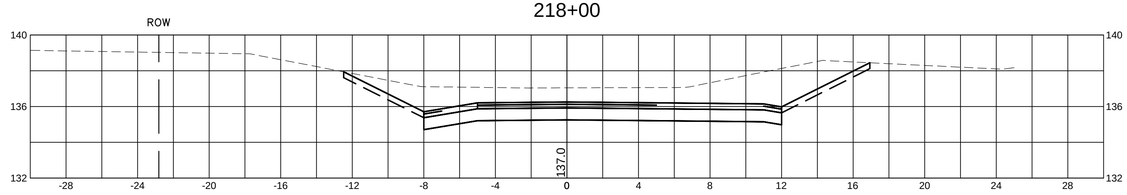


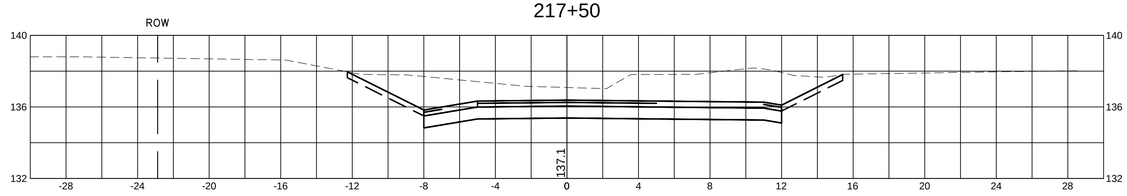
213+50



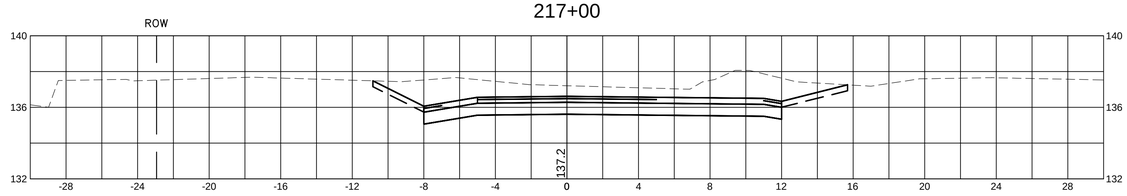
218+00



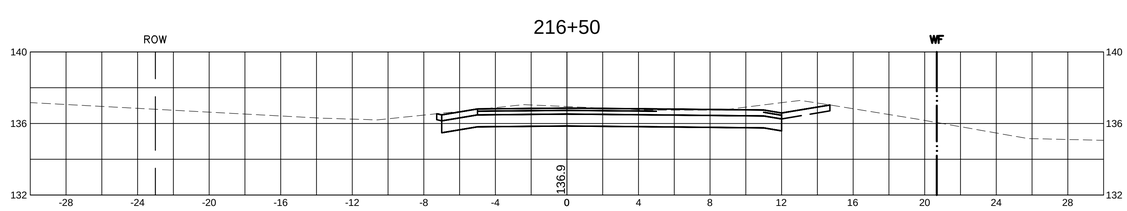
217+50



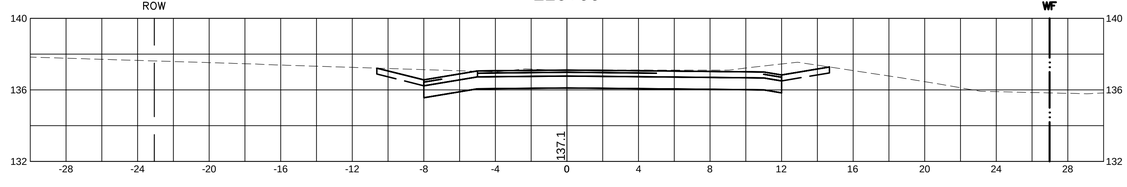
217+00



216+50



216+00



MassDOT DWT Version:

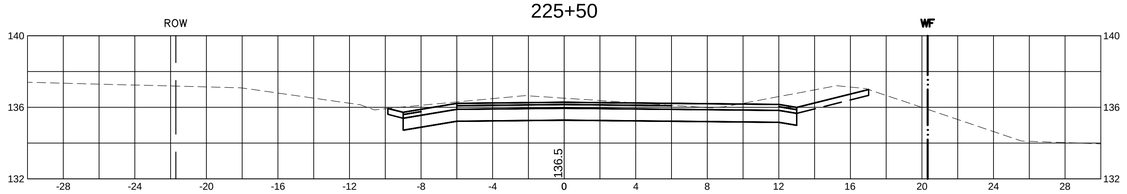
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	142	159
PROJECT FILE NO.	604532		

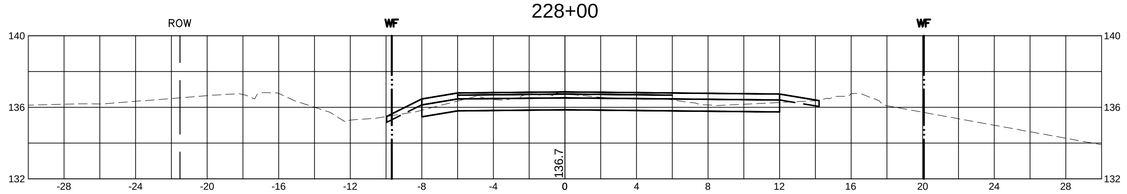
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

225+50



228+00



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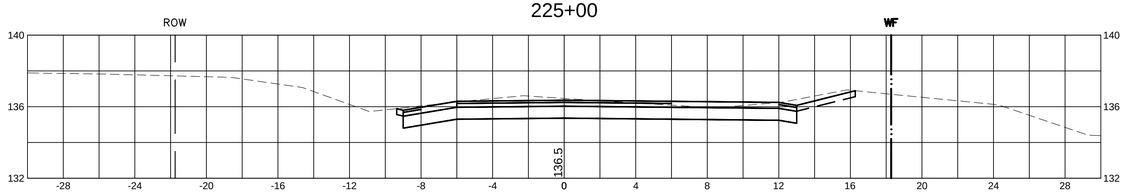

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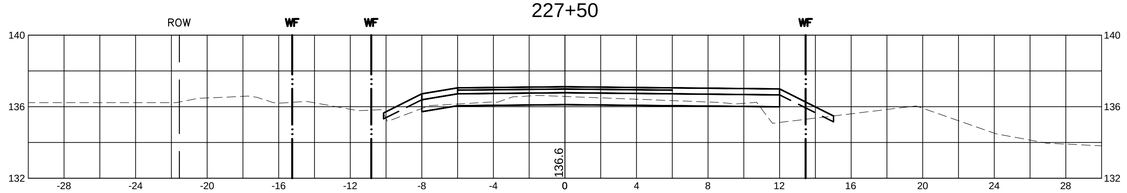
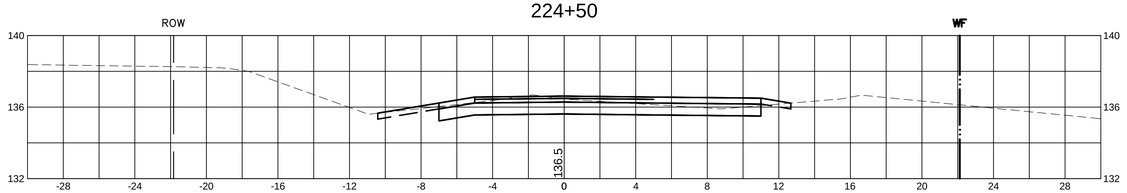
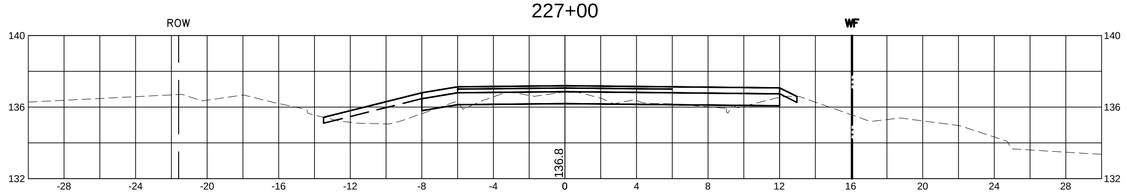


224+50



227+00



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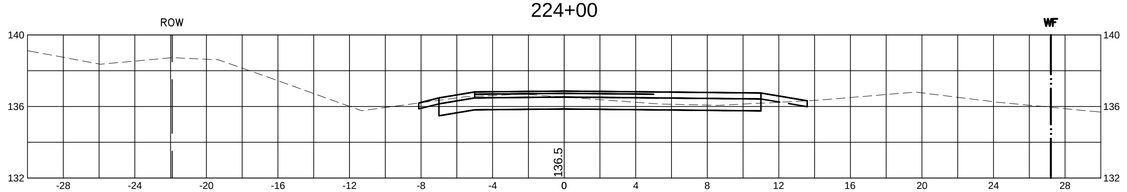
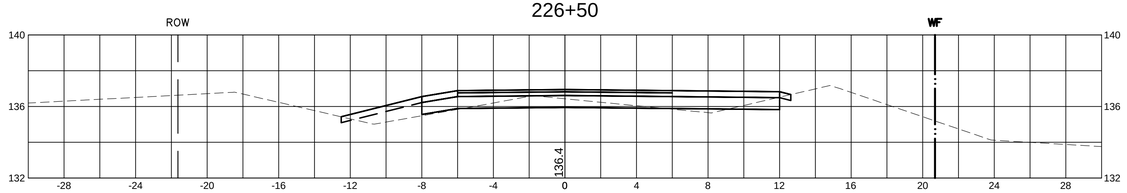
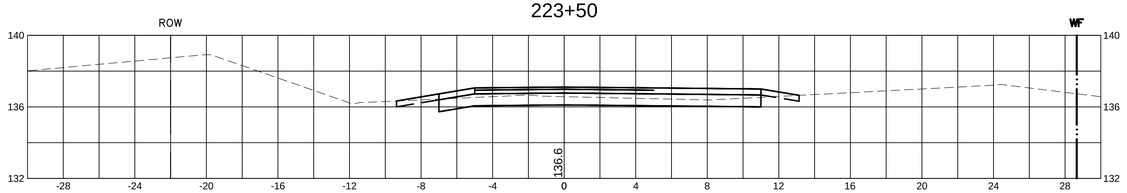


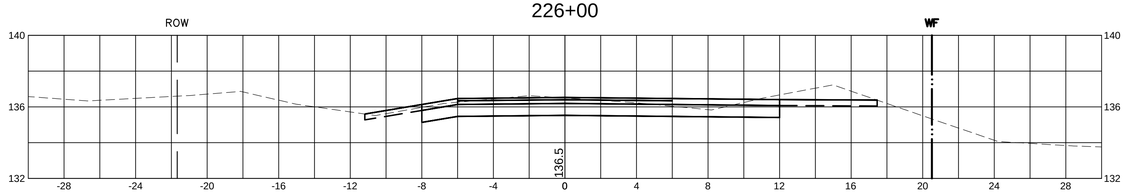
226+50



223+50



226+00



MassDOT DWT Version:

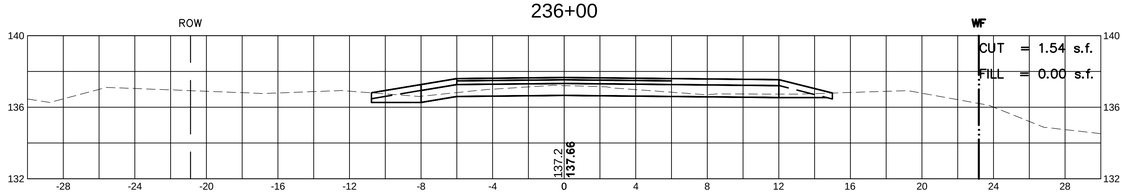
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	144	158
PROJECT FILE NO.	604532		

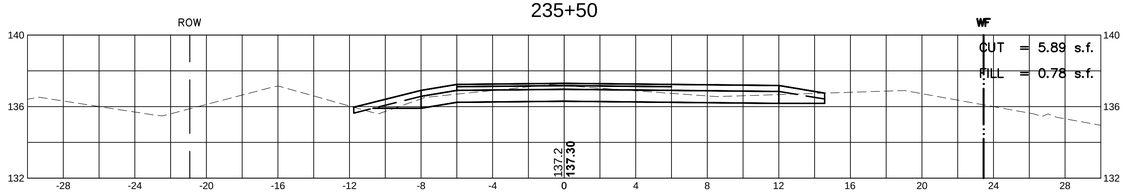
CROSS SECTIONS

10031_2A_XS.DWG 11-Mar-2014

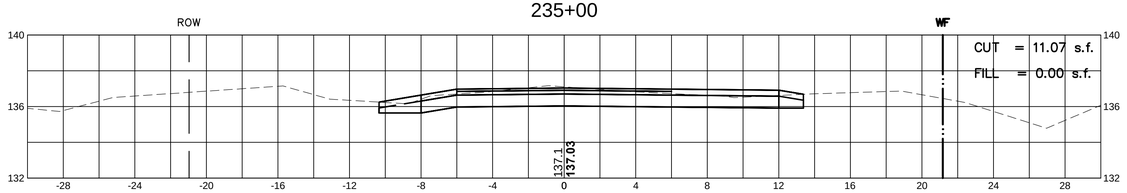
236+00



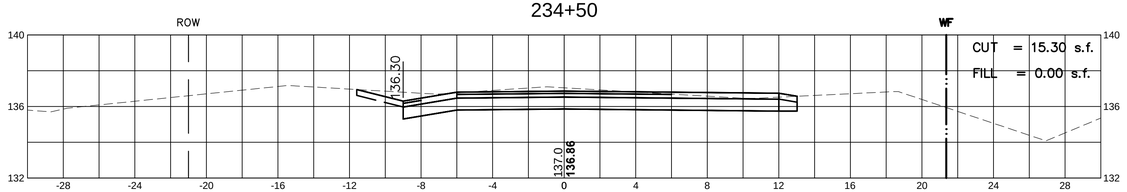
235+50



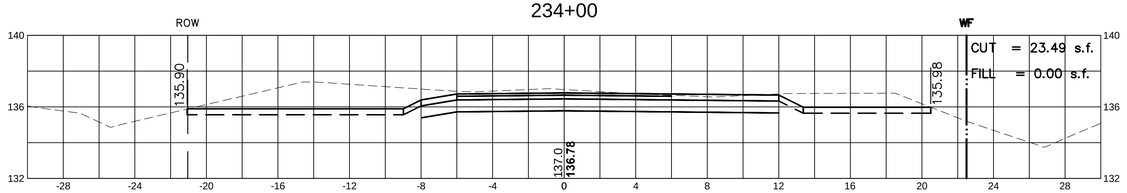
235+00



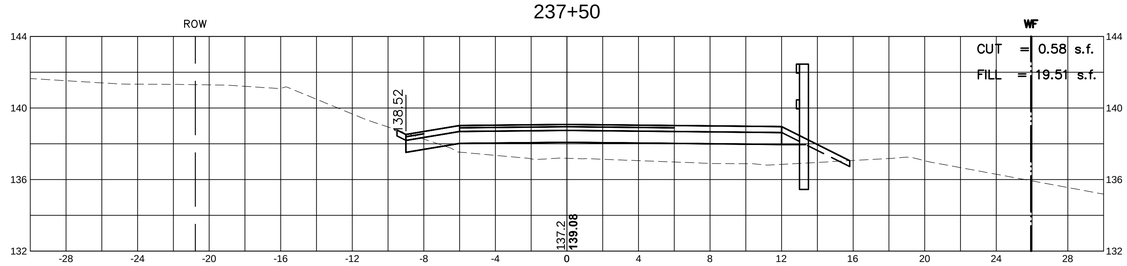
234+50



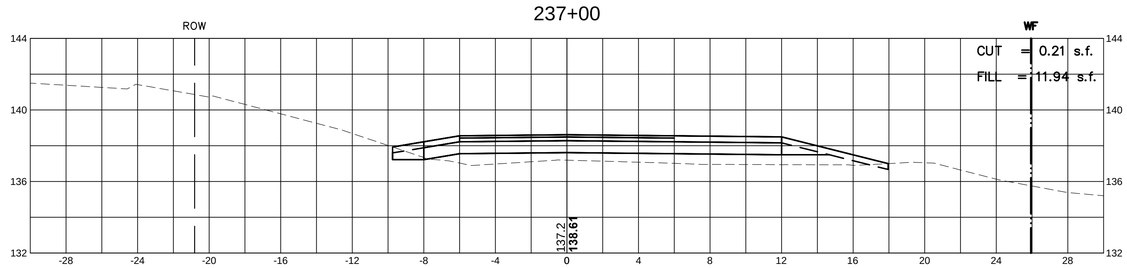
234+00



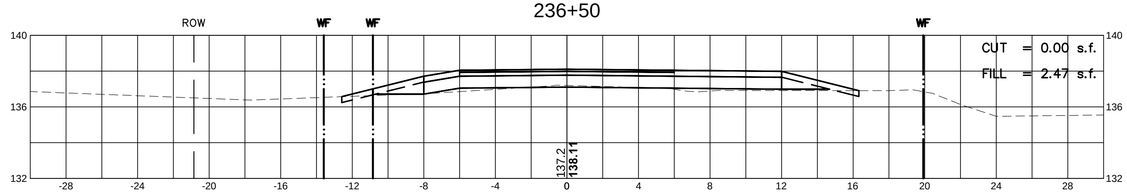
237+50



237+00



236+50



MassDOT DWT Version:

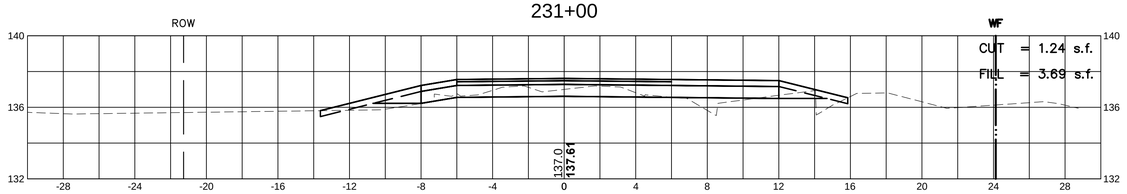
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	143	158
PROJECT FILE NO.	604532		

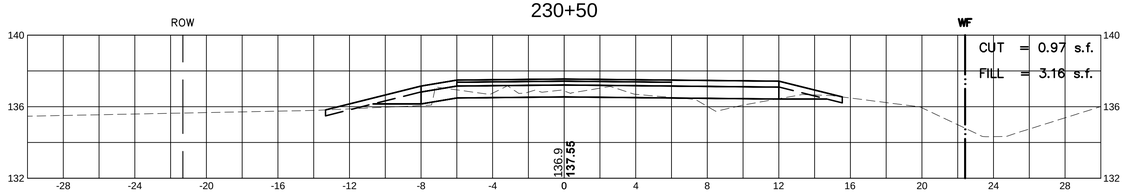
CROSS SECTIONS

10031_2A_XS.DWG 11-Mar-2014

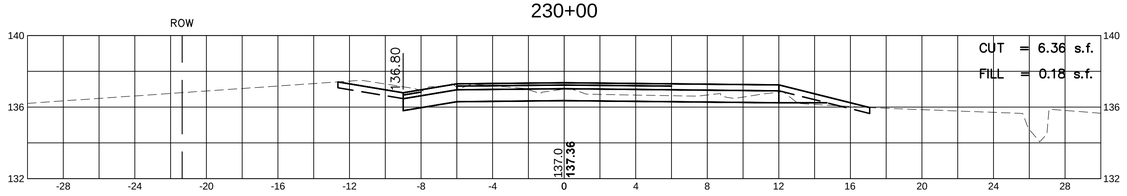
231+00



230+50



230+00



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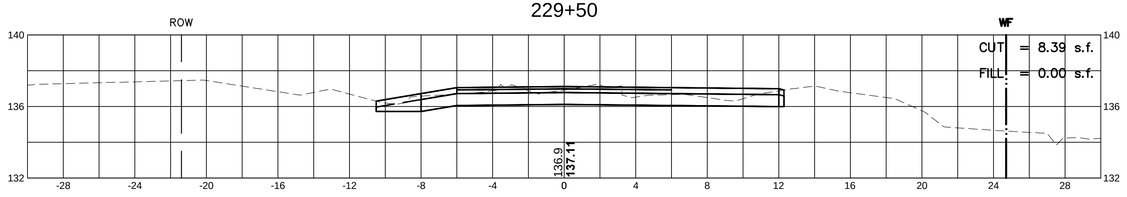
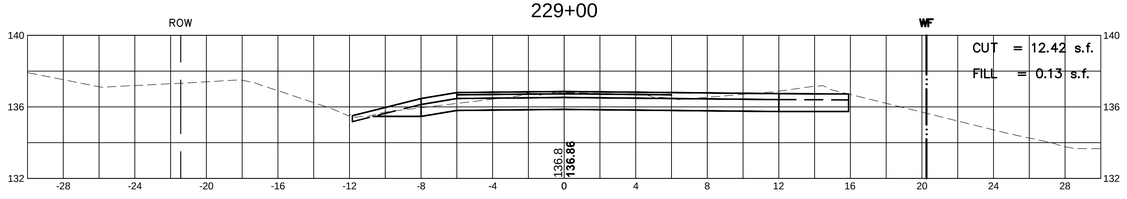
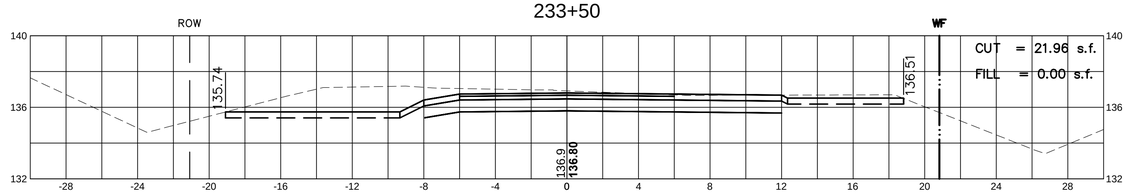


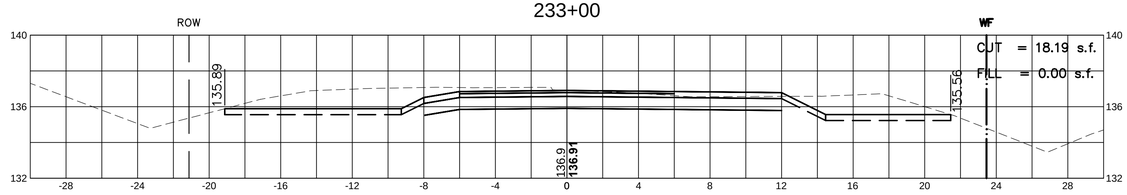
229+00



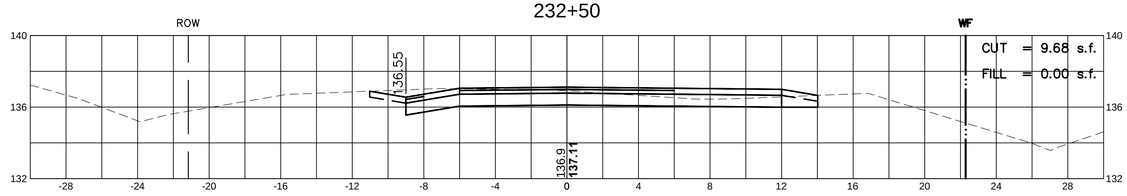
233+50



233+00



232+50



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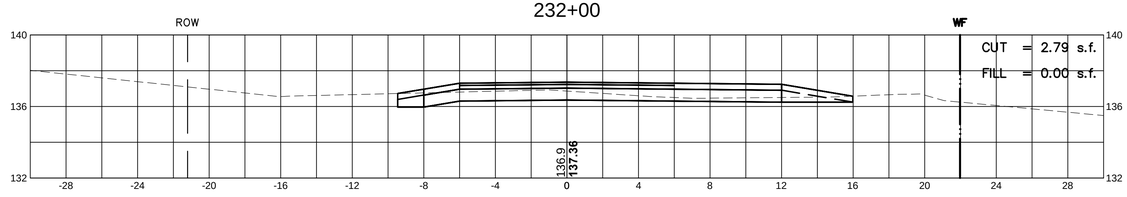
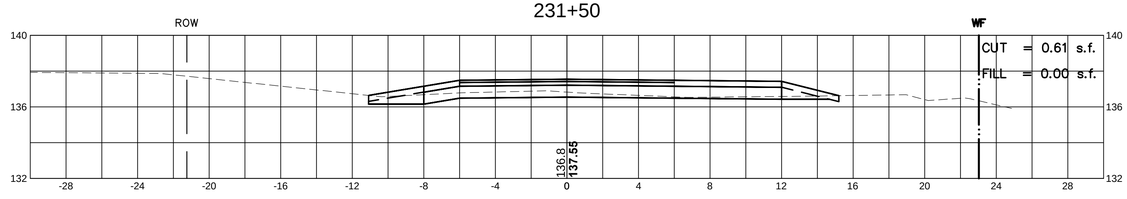


231+50



MassDOT DWT Version:

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

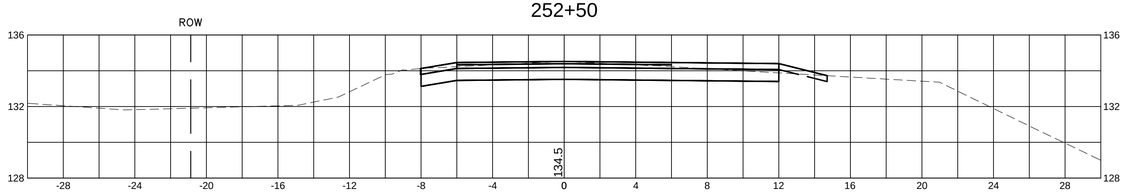
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	148	159
PROJECT FILE NO.	604532		

CROSS SECTIONS

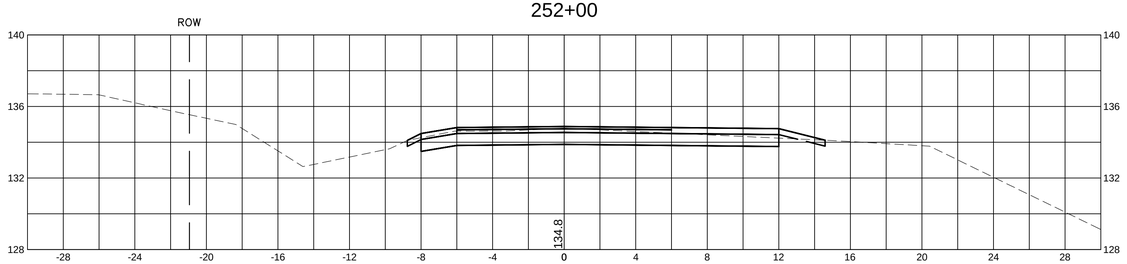
25-Feb-2014

10031_2A_XS.DWG

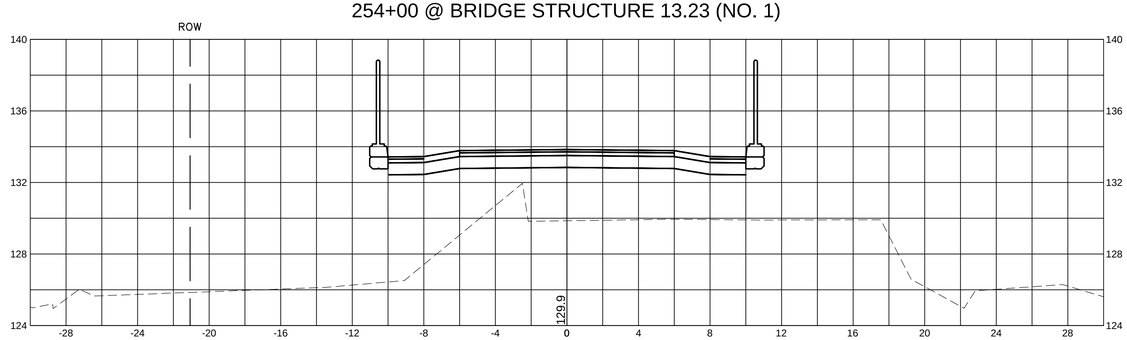
252+50



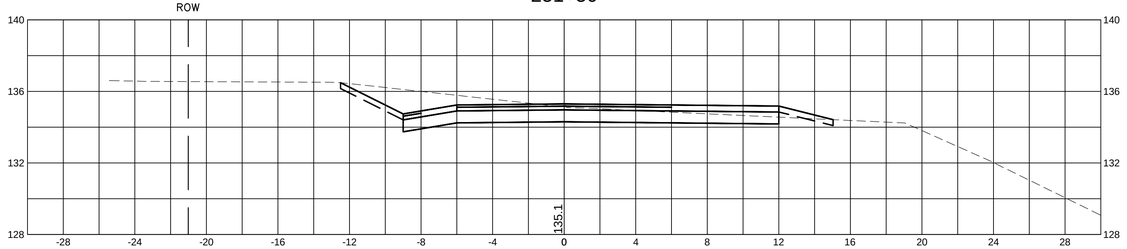
252+00



254+00 @ BRIDGE STRUCTURE 13.23 (NO. 1)



251+50



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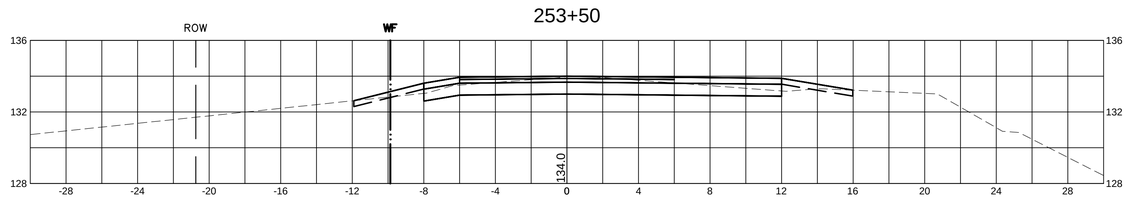
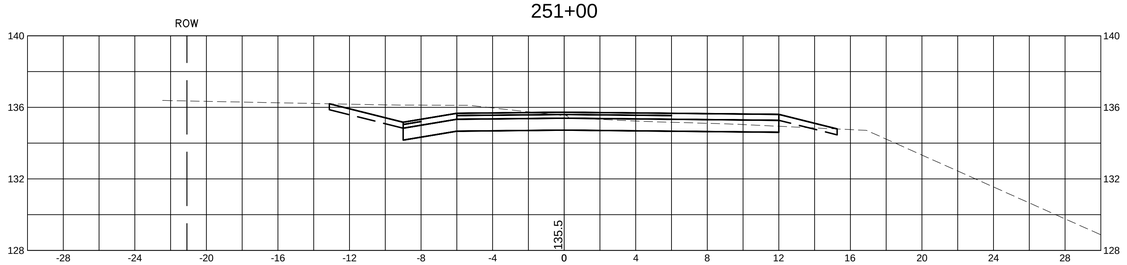
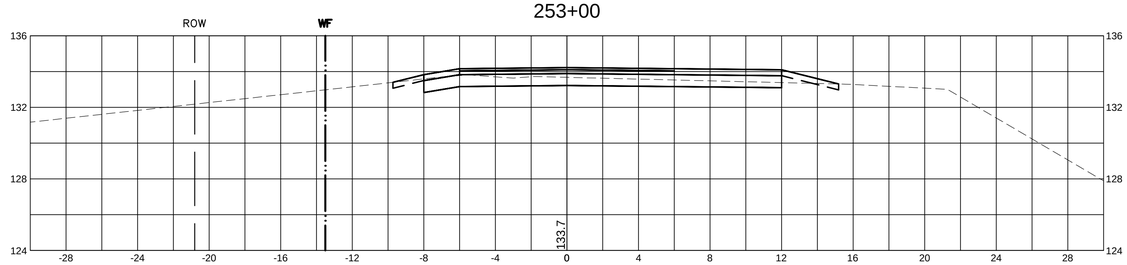


251+00



253+00



MassDOT DWT Version:

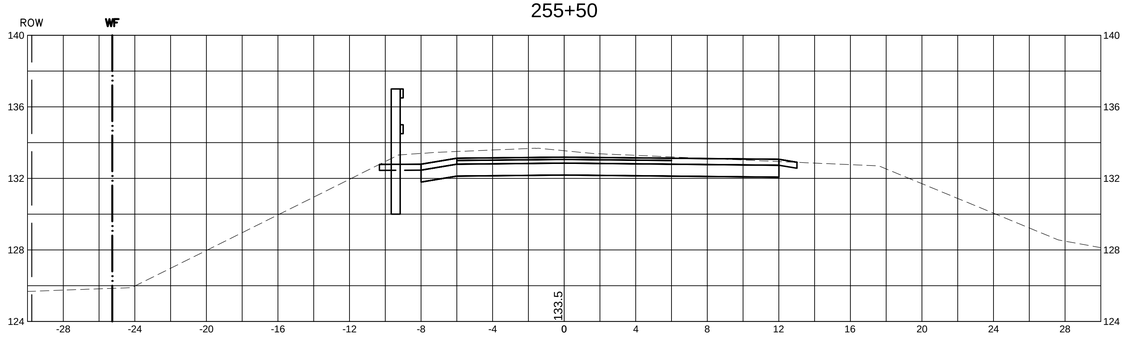
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	149	159
PROJECT FILE NO.	604532		

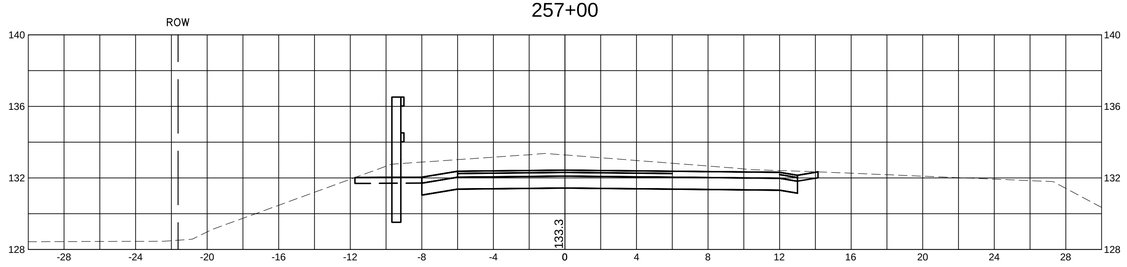
CROSS SECTIONS

10031_2A_XS.DWG 25-Feb-2014

255+50



257+00



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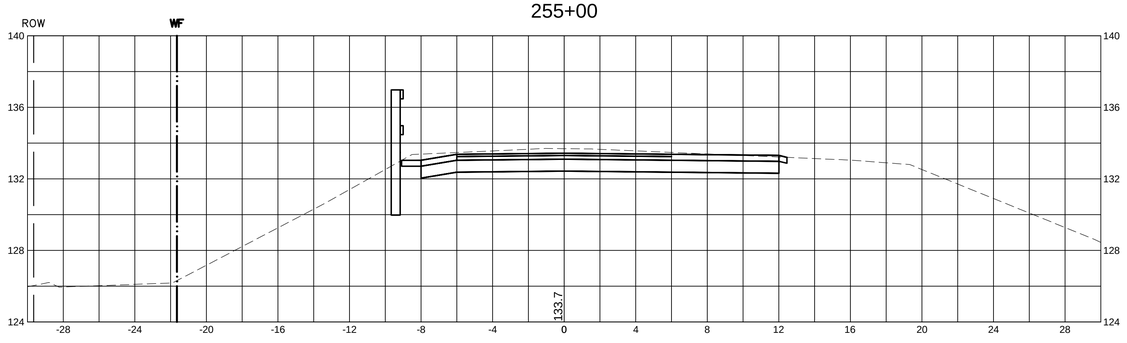
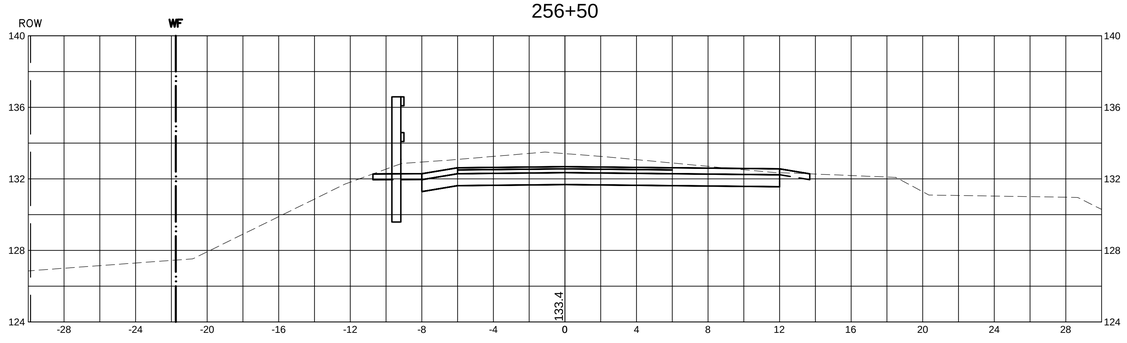


256+50



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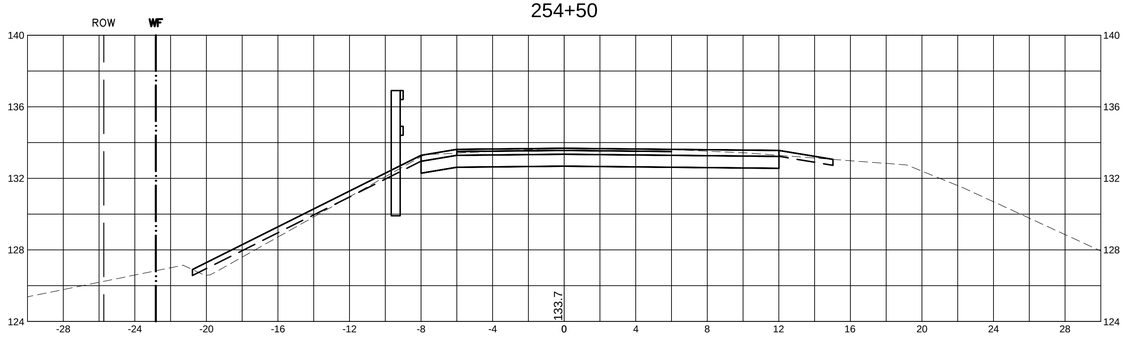
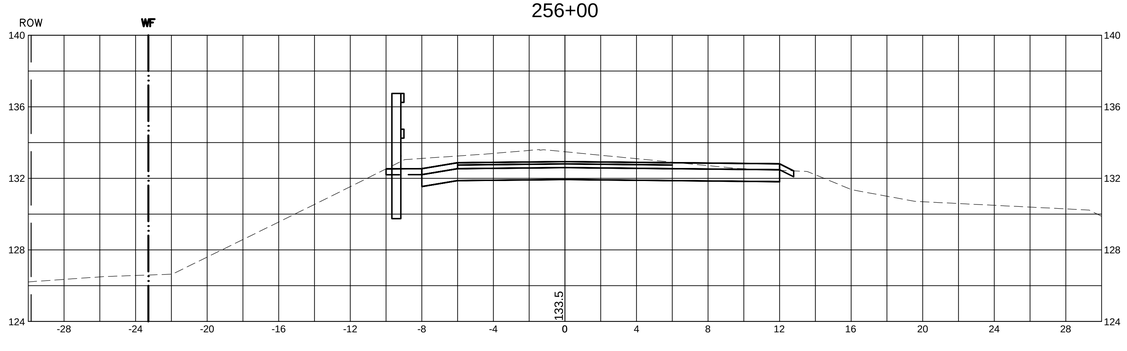


256+00



MassDOT DWT Version:

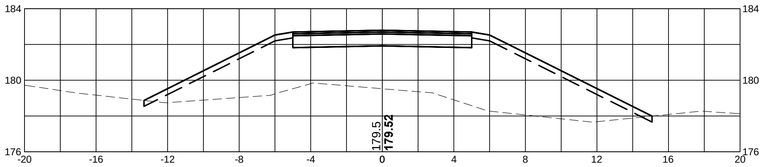
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	155	159
PROJECT FILE NO.	604532		

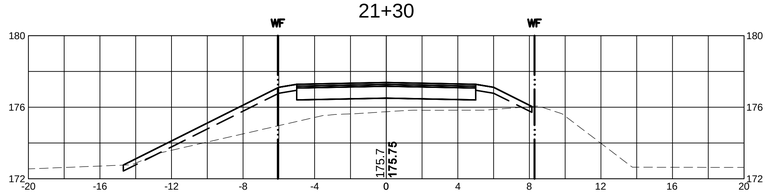
CROSS SECTIONS
ACTON GARAGE PARKING LOT

10031_2A_XS.DWG 25-Feb-2014

20+55



21+30



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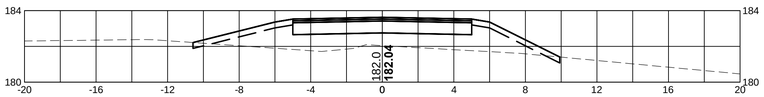

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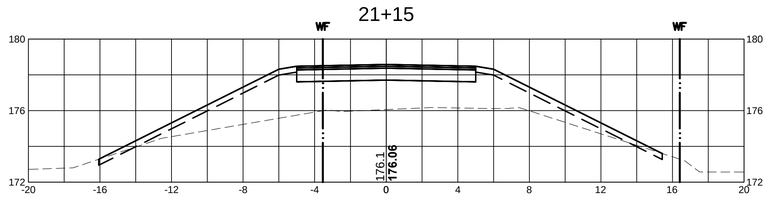
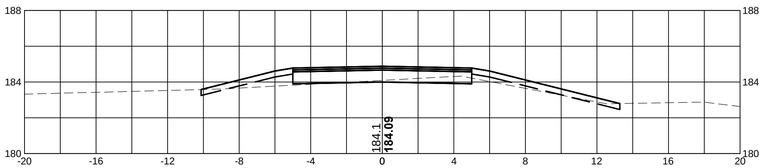
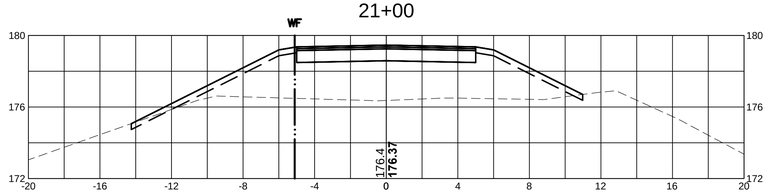


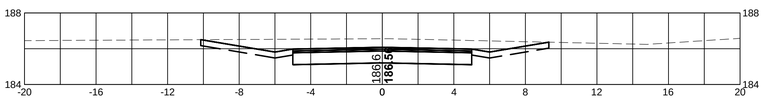
20+25



21+00



20+10



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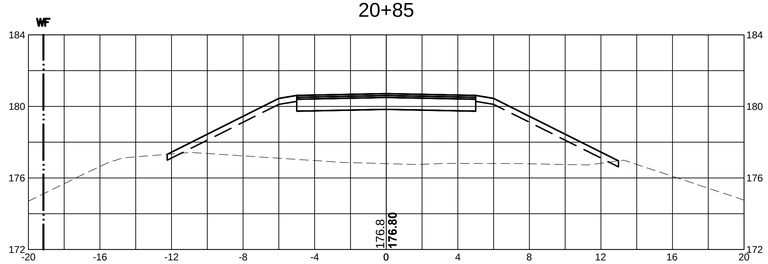
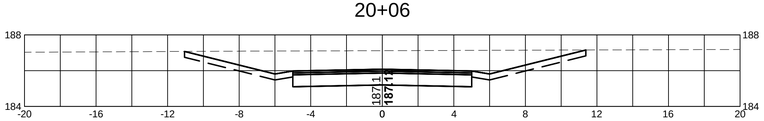
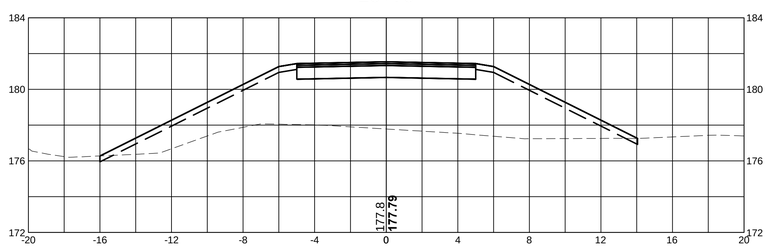


20+06



20+70



MassDOT DWT Version:

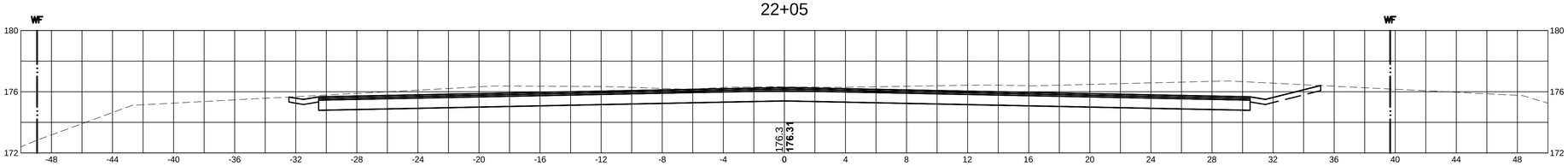
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	FED. AID	156	159
PROJECT FILE NO.	604532		

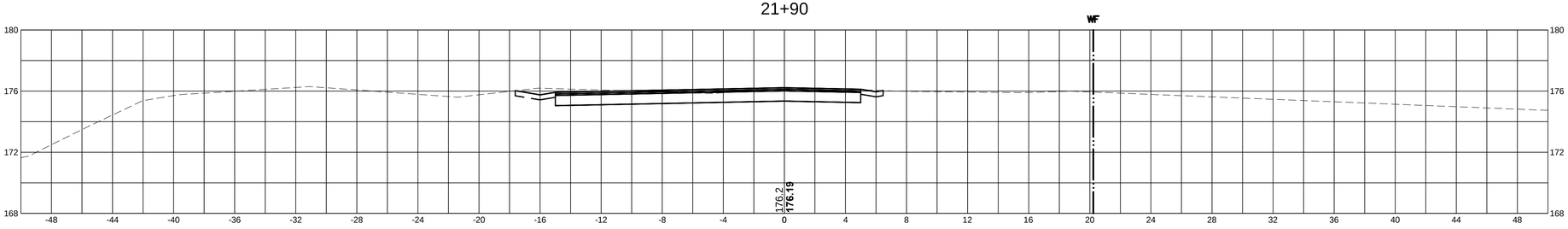
CROSS SECTIONS
ACTON GARAGE PARKING LOT

10031_2A_XS.DWG 25-Feb-2014

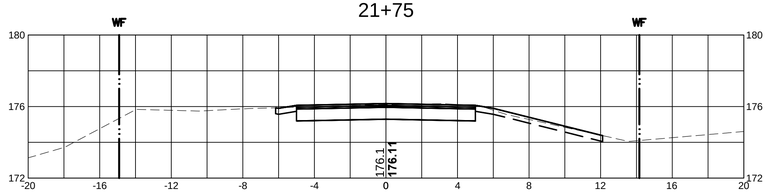
22+05



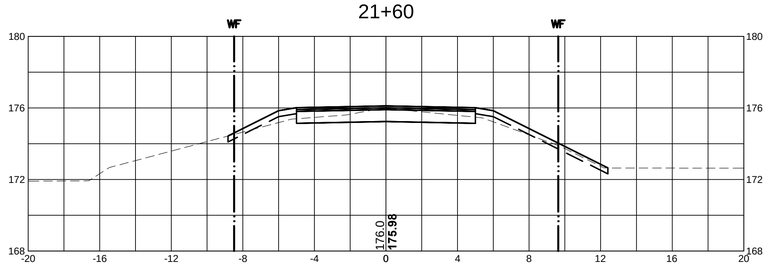
21+90



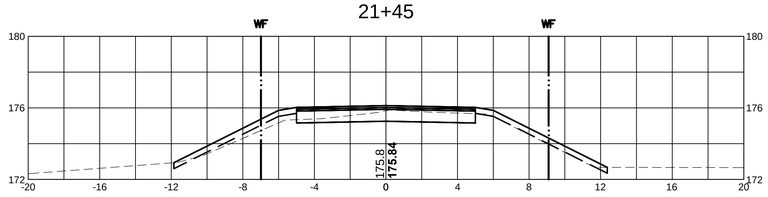
21+75



21+60



21+45



MassDOT DWT Version: