DEPARTMENT OF THE ARMY PERMIT

Permittee Massachusetts Department of Transportation – Highway Division

Permit No. NAE-2014-00816

Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

The work includes the discharge of fill material into approximately 0.1 acres (4,627 square feet) of Nashoba Brook and various unnamed waters of the United States, including wetlands, associated with the construction of Phase 2A of the Bruce Freeman Rail Trail, a multi-use recreational trail along the former Lowell Secondary railroad line in Westford, Carlisle, and Acton, Massachusetts. Of the total impacts, 1,845 square feet are permanent and 2,782 square feet are temporary. The proposed work includes construction of a 4.88 mile section of paved, variable width trail, primarily along the abandoned railroad bed, construction of a pedestrian bridge over Route 2A/119, construction of a parking area with trail access ramp, and rehabilitation of existing culverts and associated headwalls. Permanent impacts will result from grading associated with trail construction and the parking area access ramp, and construction of the pedestrian bridge over Route 2A/119. Temporary impacts will result from culvert and headwall rehabilitation activities and temporary access to the work areas.

This work is shown on the attached plans entitled "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" on 32 sheets, and dated "May 29, 2014".

Project Location:

The project is located in Nashoba Brook and various unnamed waters of the U.S., including wetlands, along a 4.88 mile long section of abandoned railroad line in Westford, Carlisle, and Acton, Massachusetts, beginning at the intersection of Routes 27 and 225 in Westford and ending approximately 1,000 feet south of Wetherbee Street in Acton. All of the proposed impacts are located in Acton.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on July 25, 2019**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.**

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure that a copy of this permit is at the work site (and the project office) authorized by this permit whenever work is being performed, and that all personnel with operational control of the site ensure that all appropriate personnel performing work are fully aware of its terms and conditions. The entire permit shall be made a part of any and all contracts and sub-contracts for work that affects areas of Corps jurisdiction at the site of the work authorized by this permit. This shall be achieved by including the entire permit in the specifications for work. The term "entire permit" means this permit (including its drawings, plans, appendices and other attachments) and also includes permit modifications.

(Special conditions continued on Page 4)

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) *(DATE)*

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

7-25-2014.

(DATE)

Frank J. DelGiudice
Chief, Permits and Enforcement Branch
For District Engineer

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

(Special conditions continued from Page 2)

If the permit is issued after the construction specifications, but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps jurisdiction.

2. The permittee shall complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

3. Prior to the commencement of work authorized by this permit, MassDOT shall schedule and hold a pre-construction meeting with at least Daniel Vasconcelos of the Corps [(978) 318-8653] and their contractor.

4. All construction shall be completed in accordance with the limits of construction detailed on the enclosed plan drawings, entitled "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" on 32 sheets, and dated "May 29, 2014". If you increase the scope of construction within waters of the United States, including wetlands, please contact us immediately to discuss modification of this authorization. The Corps must approve any changes before you undertake them.

5. All work associated with the six bridge rehabilitations shall be conducted in a manner that prevents any debris, lumber, or construction materials and/or equipment from falling into the waterway. Any material or equipment that does fall into the waterway shall be removed. Except for the work authorized by this permit, nothing shall be in the waterway post-construction that was not there pre-construction.

6. Wetland areas where permanent disturbance is not authorized shall be restored to their original condition and elevation, which under no circumstances shall be higher than the preconstruction elevation. Original condition means careful protection and/or removal of existing soil and vegetation, and replacement back to the original location such that the original soil layering and vegetation schemes are approximately the same, unless otherwise authorized.

7. In order to document the successful completion of restoration activities within authorized temporary wetland impact areas, photographic documentation of each temporary wetland impact area shall be obtained before construction and after the completion of restoration work. Photographs shall be provided to the Corps in a post-construction report within 60 days of the completion of the restoration work. The report shall identify each temporary impact area by name or number and also include a description of the vegetation, soil, and hydrology characteristics of each temporary impact area, as well as any required remedial actions.

8. If MassDOT or their contractor, during the construction of work authorized by this permit, encounter previously unidentified submerged cultural resources, MassDOT shall take steps to limit adverse effects to this resource and will immediately contact the Massachusetts Board of Underwater Archaeological Resources (BUAR) and the Massachusetts State Historic Preservation Officer (SHPO) in accordance with the BUAR's Policy Guidance for the Discovery of Unanticipated Archaeological Resources (updated 9/28/06).

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMSTP-002S(669)	1	32
PROJECT FILE NO.	604532		

TITLE SHEET & INDEX

PLAN AND PROFILE OF

BRUCE FREEMAN RAIL TRAIL PHASE 2A

IN THE TOWNS OF

WESTFORD, CARLISLE & ACTON

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

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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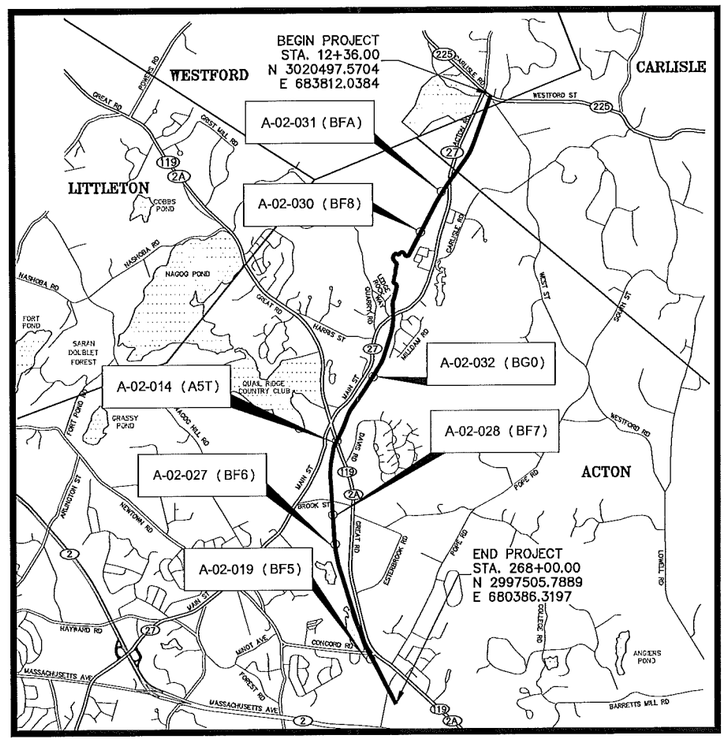
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3-4	KEY PLAN & BORING LOCATIONS
5-28	CONSTRUCTION PLANS & IMPACT DETAILS
29-30	WETLAND REPLICATION PLANS
31-32	CULVERT DETAILS



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

ACOE SUBMISSION

DATE	DESCRIPTION	REV #

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

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	2	32
PROJECT FILE NO. 604532			

LEGEND & ABBREVIATIONS

GENERAL LEGEND

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, MAHW		EDGE OF VEGETATED WETLAND/WETLAND FLAG
		MEAN ANNUAL HIGH WATER
		HIGHWAY/PROPERTY BOUND (TYPE NOTED)
PT 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
		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
×100.00 , 100.15/100.00	×100.00 , 100.15/100.00	SPOT ELEVATION, TOP AND BOTTOM CURB
		CURB OR BERM (TYPE AS NOTED)
EOP	EOP	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
HWL		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 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.

05/29/2014

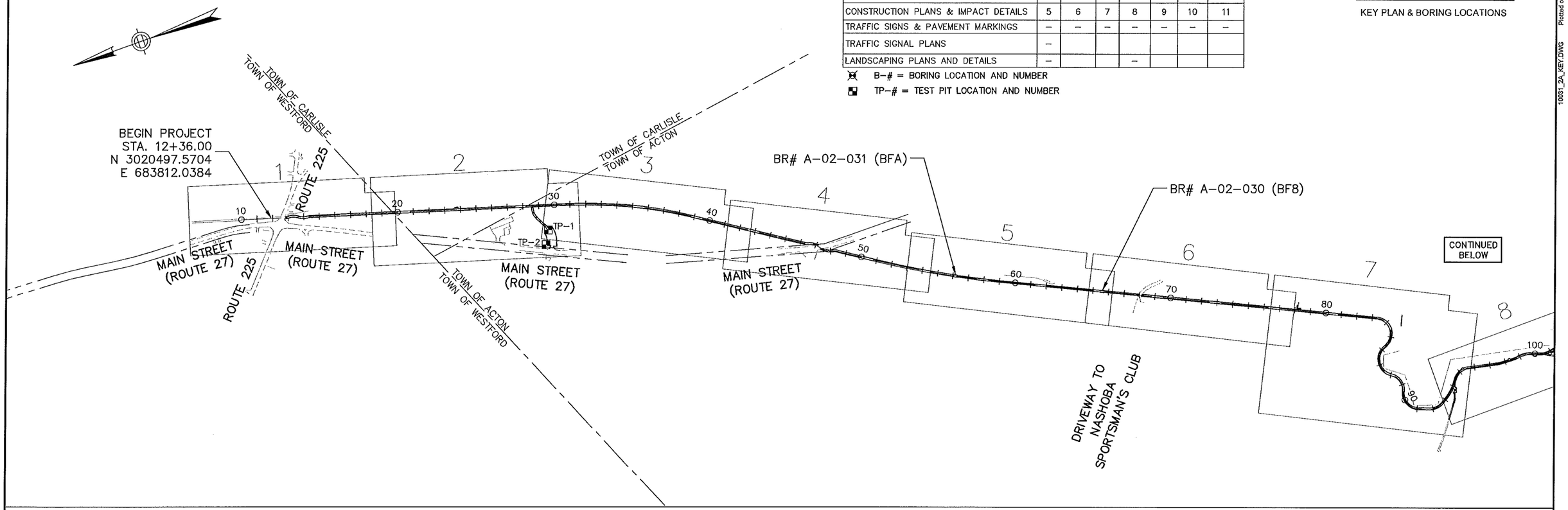
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	3	32
PROJECT FILE NO.	604532		

KEY PLAN & BORING LOCATIONS

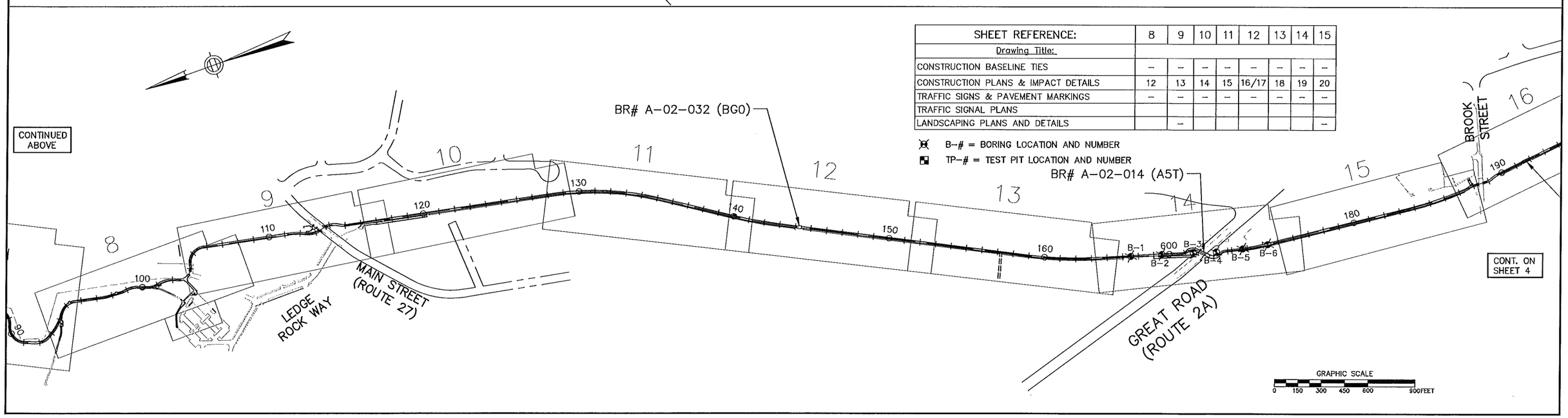
SHEET REFERENCE:	1	2	3	4	5	6	7
Drawing Title:	Drawing Number:						
CONSTRUCTION BASELINE TIES	–	–	–	–	–	–	–
CONSTRUCTION PLANS & IMPACT DETAILS	5	6	7	8	9	10	11
TRAFFIC SIGNS & PAVEMENT MARKINGS	–	–	–	–	–	–	–
TRAFFIC SIGNAL PLANS	–						
LANDSCAPING PLANS AND DETAILS	–			–			

B–# = BORING LOCATION AND NUMBER
TP–# = TEST PIT LOCATION AND NUMBER



SHEET REFERENCE:	8	9	10	11	12	13	14	15
Drawing Title:								
CONSTRUCTION BASELINE TIES	–	–	–	–	–	–	–	–
CONSTRUCTION PLANS & IMPACT DETAILS	12	13	14	15	16/17	18	19	20
TRAFFIC SIGNS & PAVEMENT MARKINGS	–	–	–	–	–	–	–	–
TRAFFIC SIGNAL PLANS								
LANDSCAPING PLANS AND DETAILS		–						–

B–# = BORING LOCATION AND NUMBER
TP–# = TEST PIT LOCATION AND NUMBER



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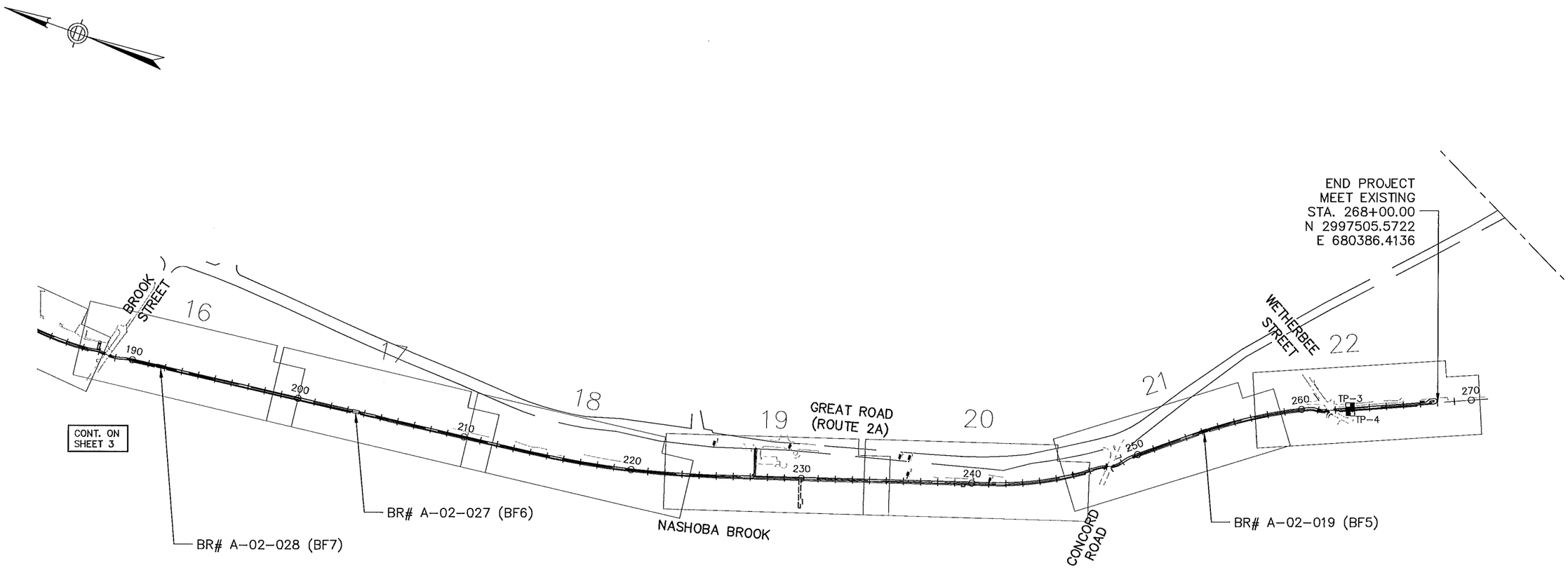
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-0025(669)	4	32
PROJECT FILE NO.	604532		

KEY PLAN & BORING LOCATIONS



SHEET REFERENCE:	16	17	18	19	20	21	22
Drawing Title							
CONSTRUCTION BASELINE TIES	–	–	–	–	–	–	–
CONSTRUCTION PLANS & IMPACT DETAILS	21	22	23/24	25	26	27	28
TRAFFIC SIGNS & PAVEMENT MARKINGS	–	–	–	–	–	–	–
TRAFFIC SIGNAL PLANS							
LANDSCAPING PLANS AND DETAILS					–	–	–

B-# = BORING LOCATION AND NUMBER

TP-# = TEST PIT LOCATION AND NUMBER

GRAPHIC SCALE
0 150 300 450 600 900FEET

10031_2A_KEY.DWG Plotted on 29-May-2014 1:49 PM

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

SEE SHEET 66

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

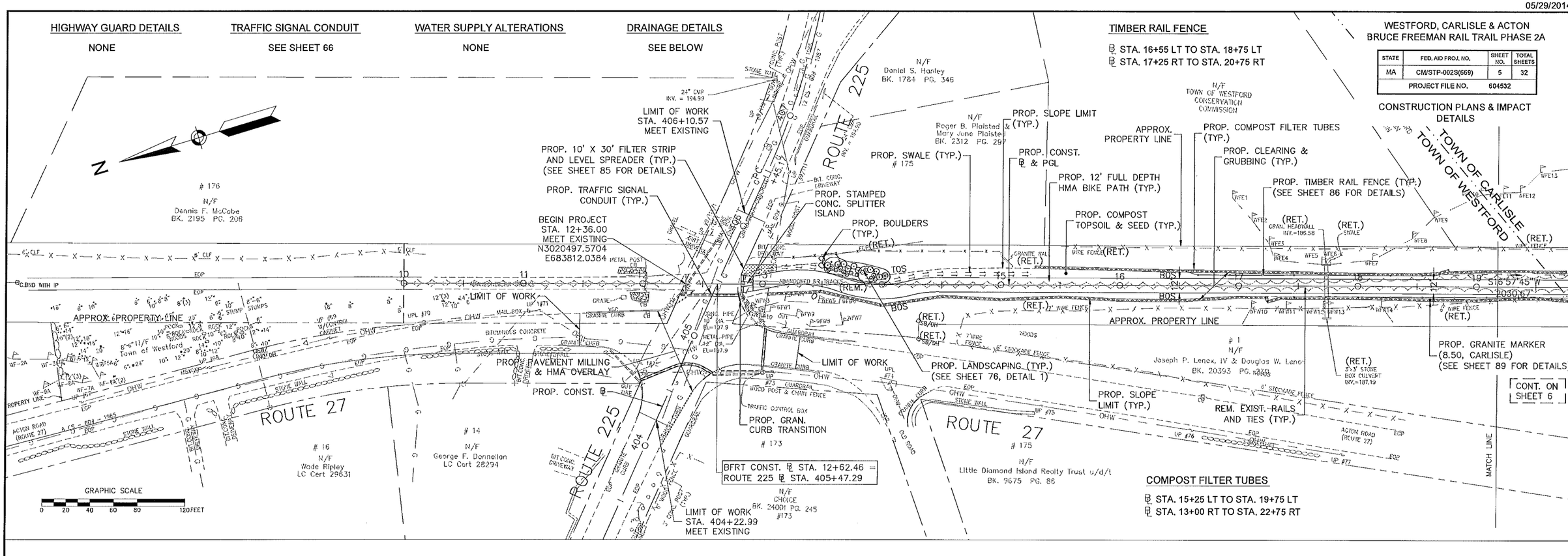
TIMBER RAIL FENCE

℄ 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	CM/STP-002S(669)	5	32
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

10031_2A_CO_ACOE.DWG Plotted on: 29-May-2014 1:49 PM

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	6	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

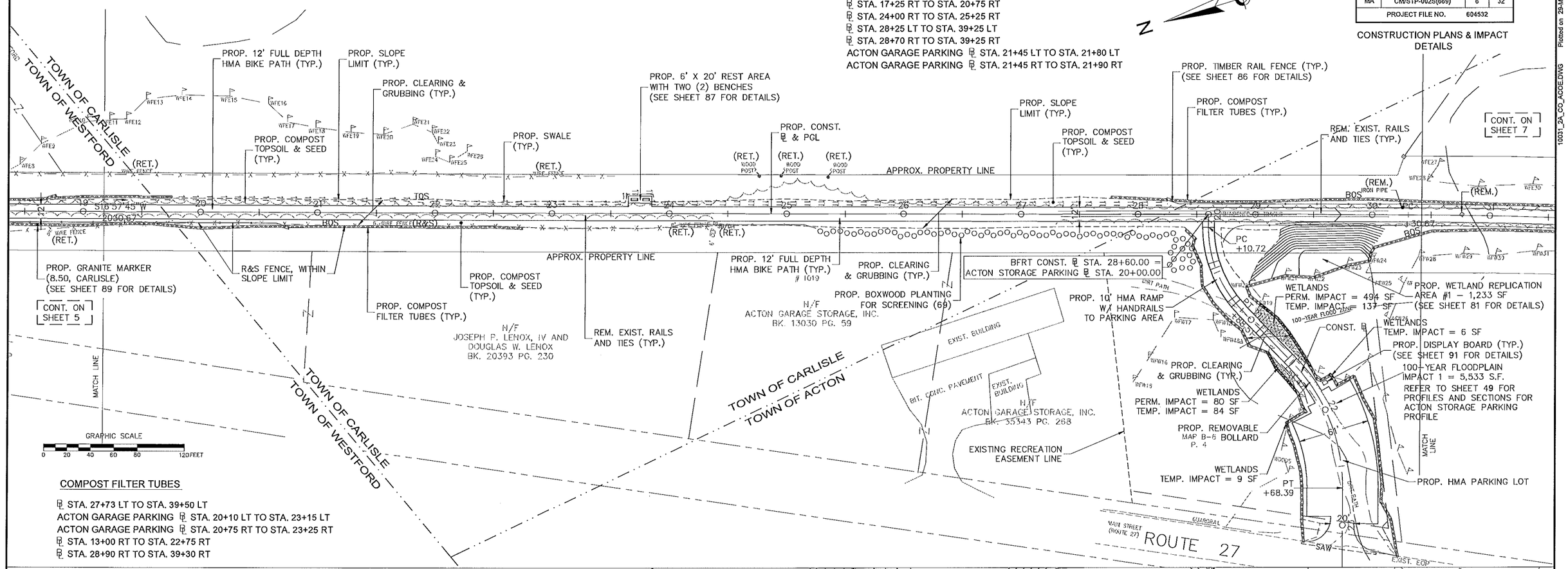
NONE

DRAINAGE DETAILS

NONE

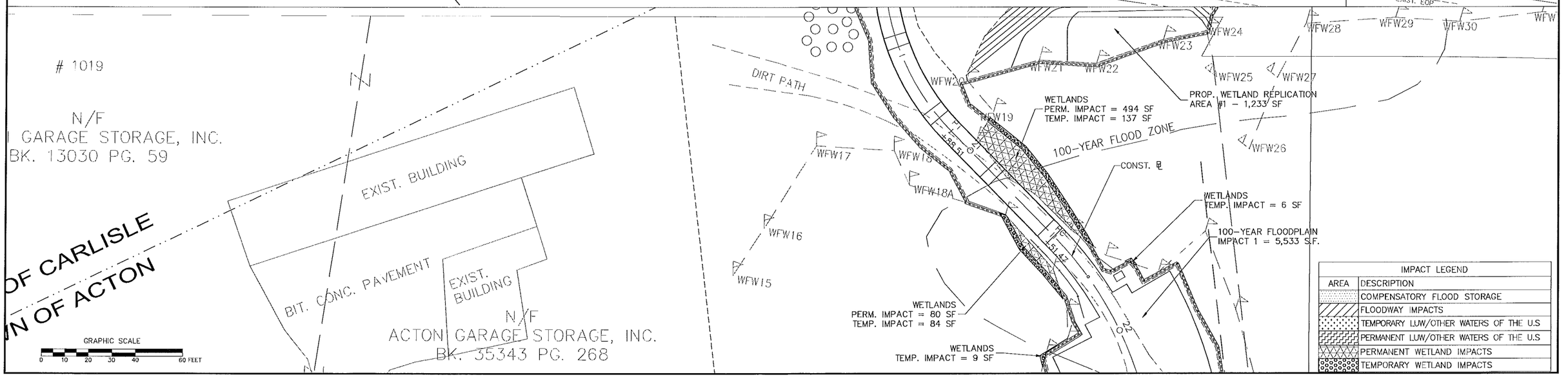
TIMBER RAIL FENCE

℄ 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



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACDE.DWG Plotted on 29-May-2014 1:49 PM

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

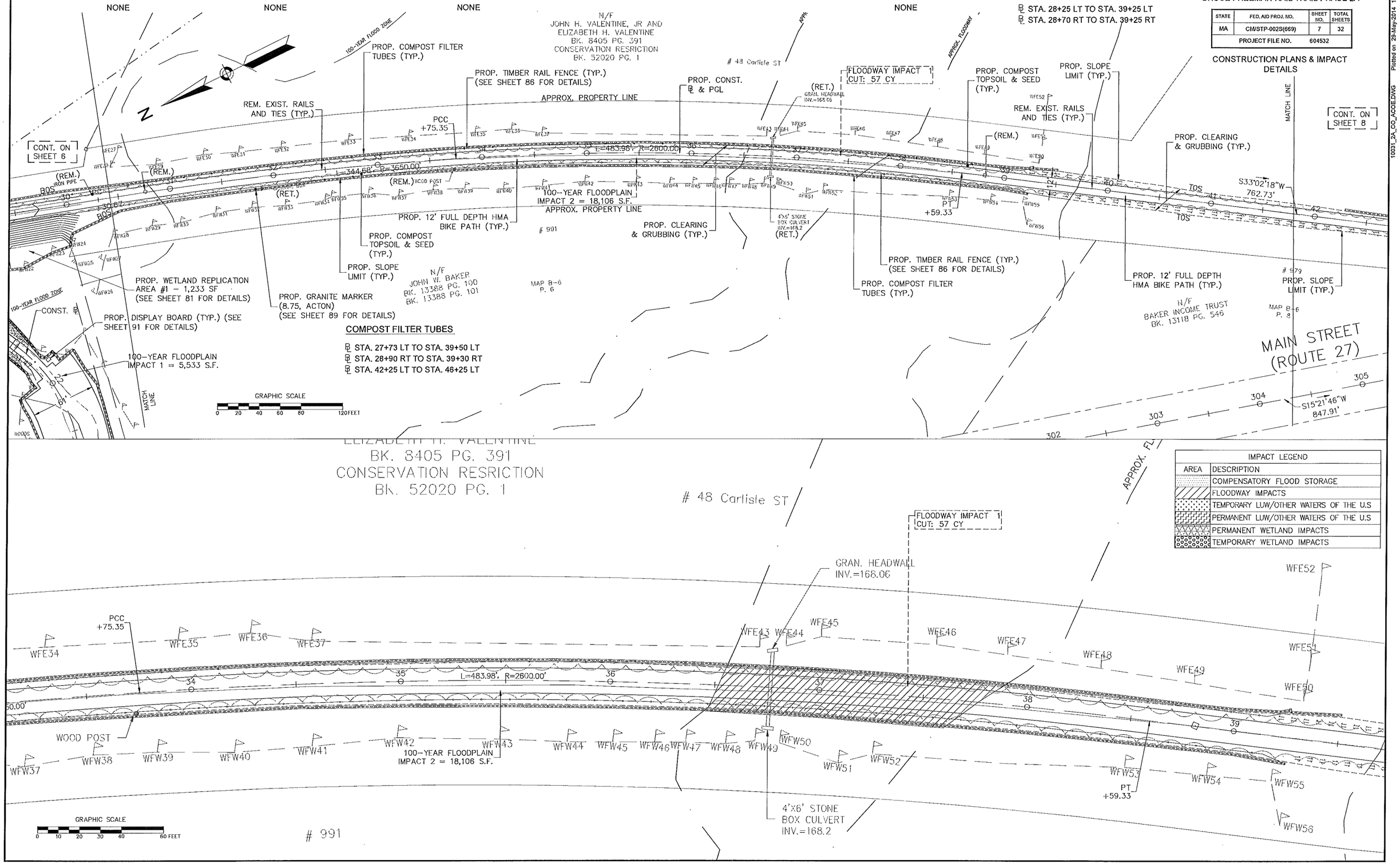
TIMBER RAIL FENCE

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	CM/STP-002S(669)	7	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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 LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	8	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

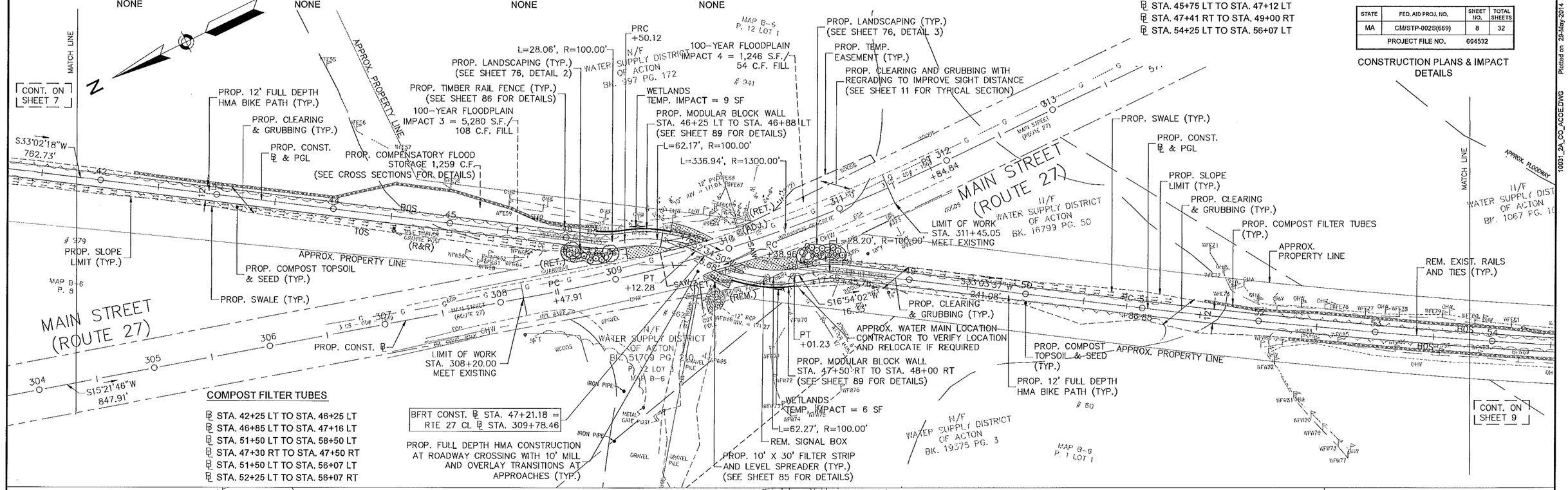
HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE

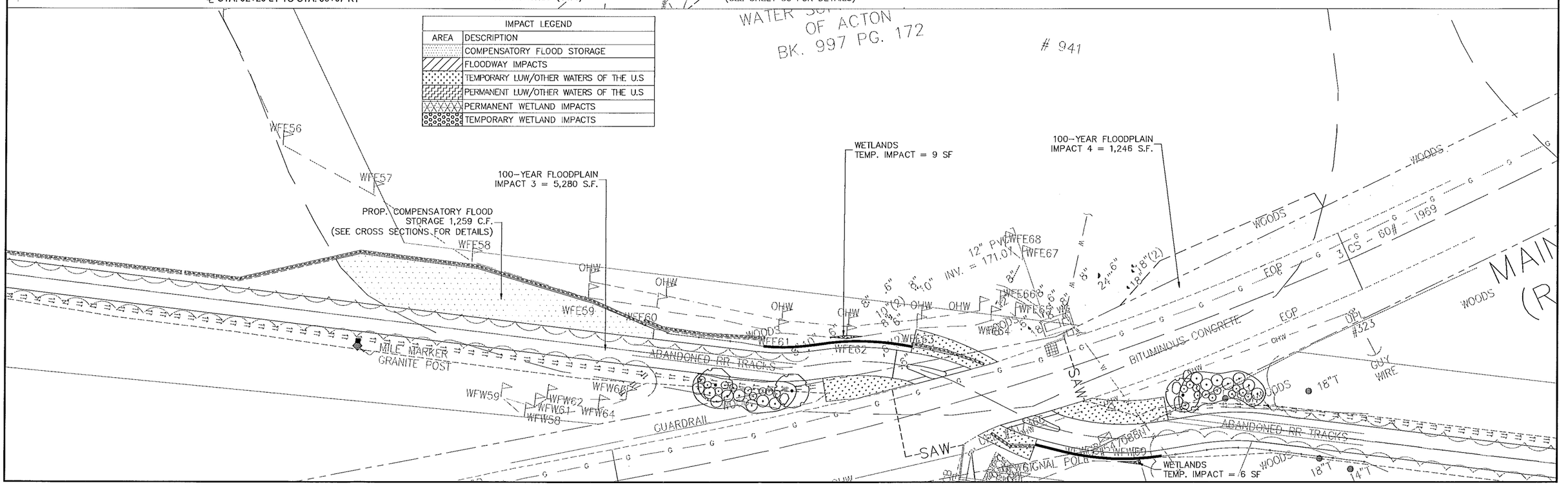
DRAINAGE DETAILS
NONE

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



COMPOST FILTER TUBES
- STA. 42+25 LT TO STA. 46+25 LT
- STA. 46+85 LT TO STA. 47+16 LT
- STA. 51+50 LT TO STA. 58+50 LT
- STA. 47+30 RT TO STA. 47+50 RT
- STA. 51+50 LT TO STA. 56+07 LT
- STA. 52+25 LT TO STA. 56+07 RT

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS



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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	9	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

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

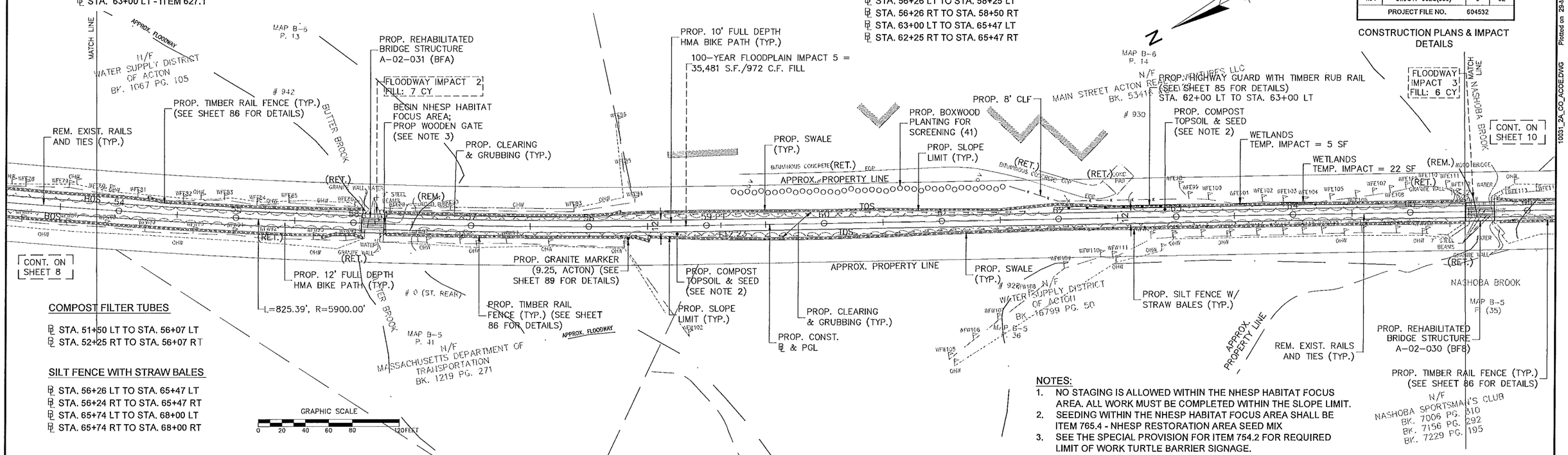
NONE

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

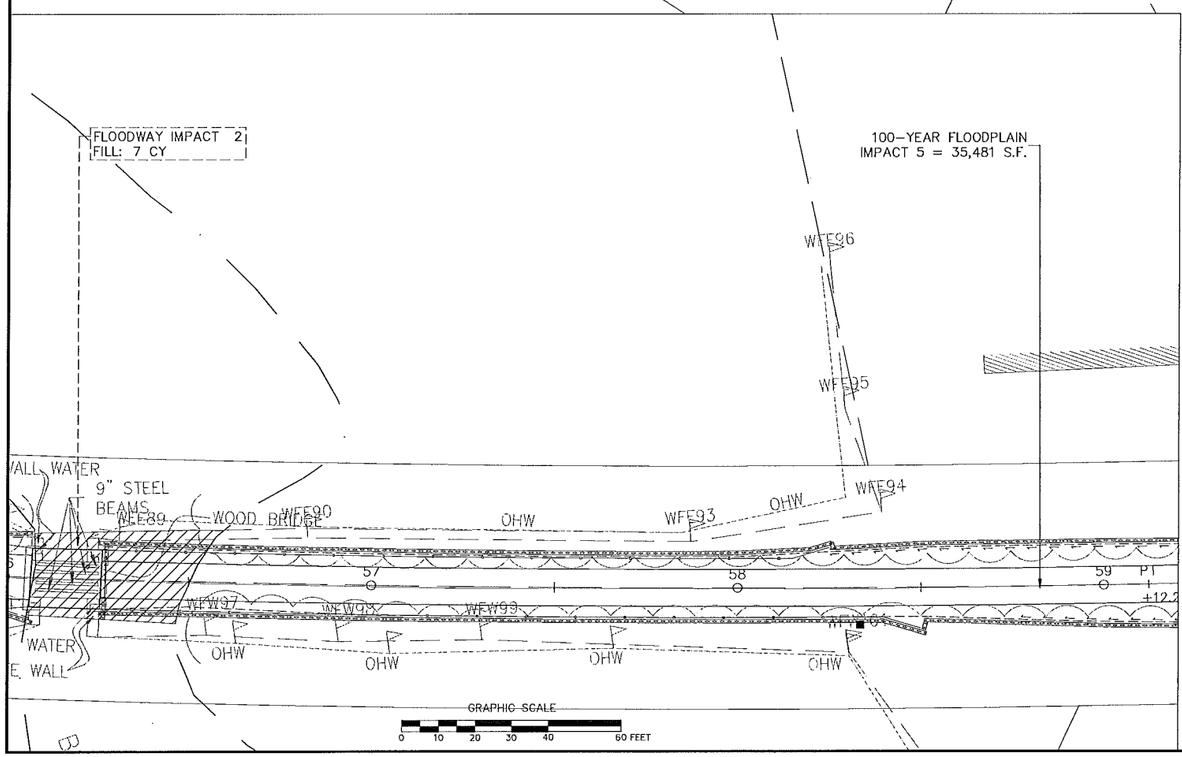
- ℄ STA. 51+50 LT TO STA. 56+07 LT
- ℄ STA. 52+25 RT TO STA. 56+07 RT

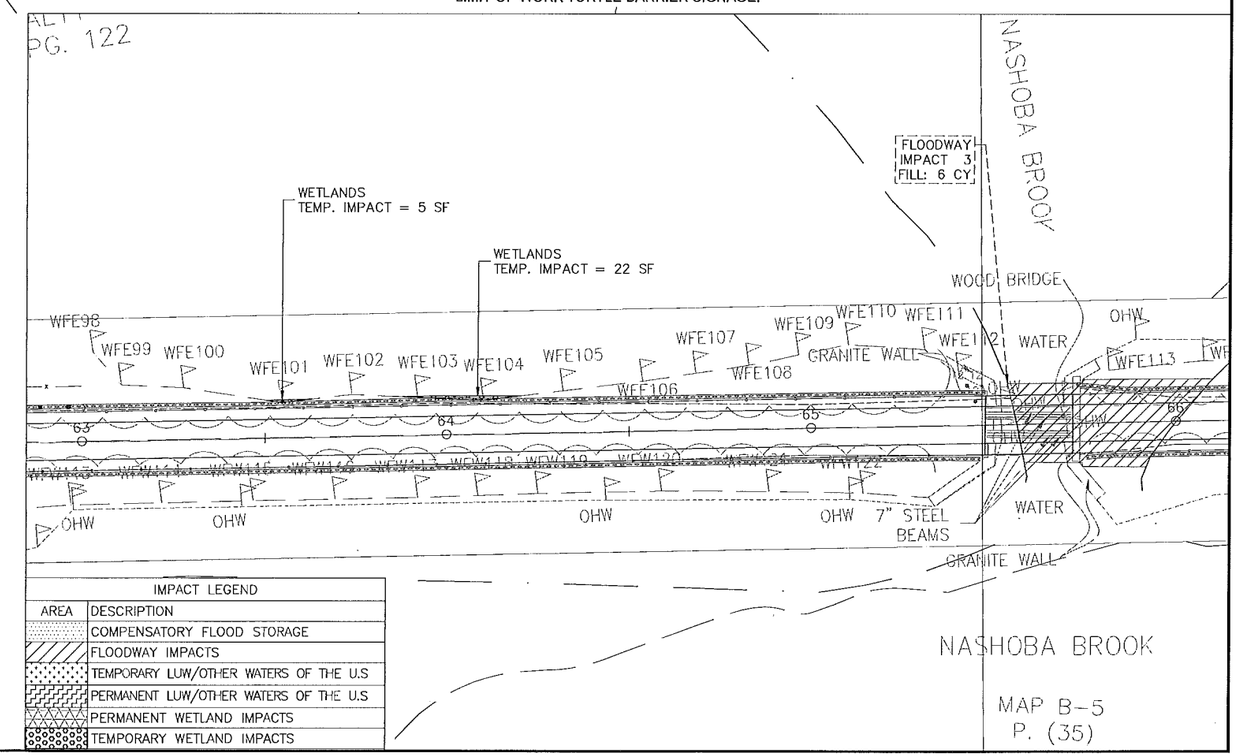
SILT FENCE WITH STRAW BALES

- ℄ 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

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 LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	10	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

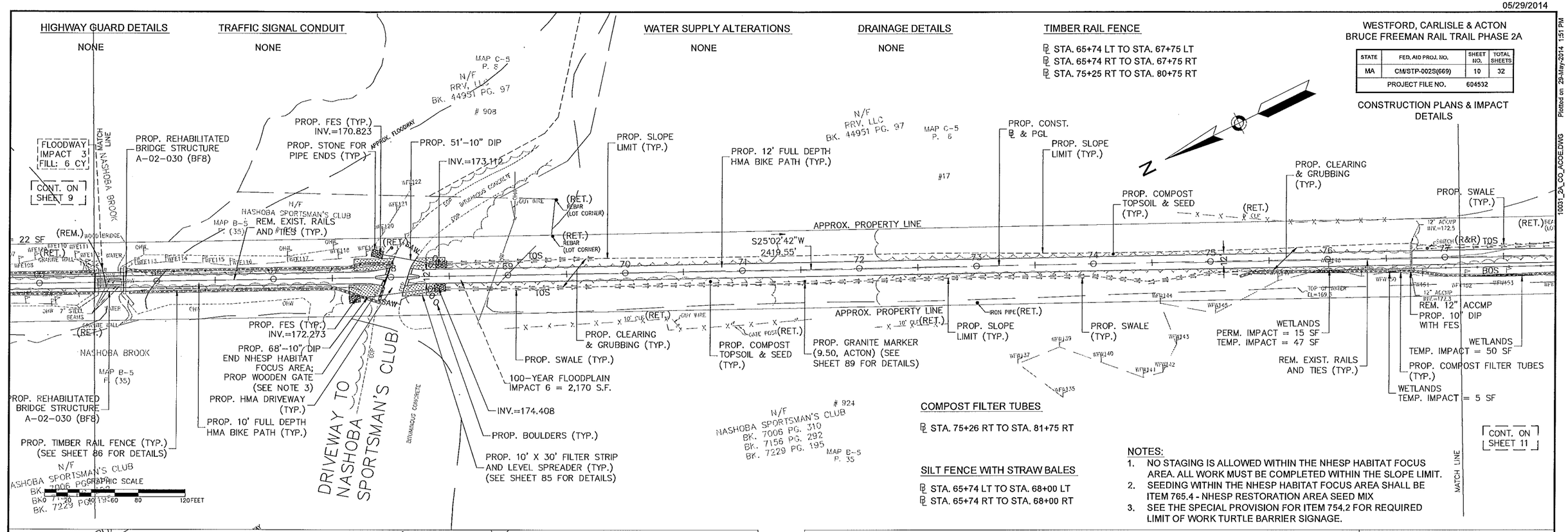
NONE

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



COMPOST FILTER TUBES

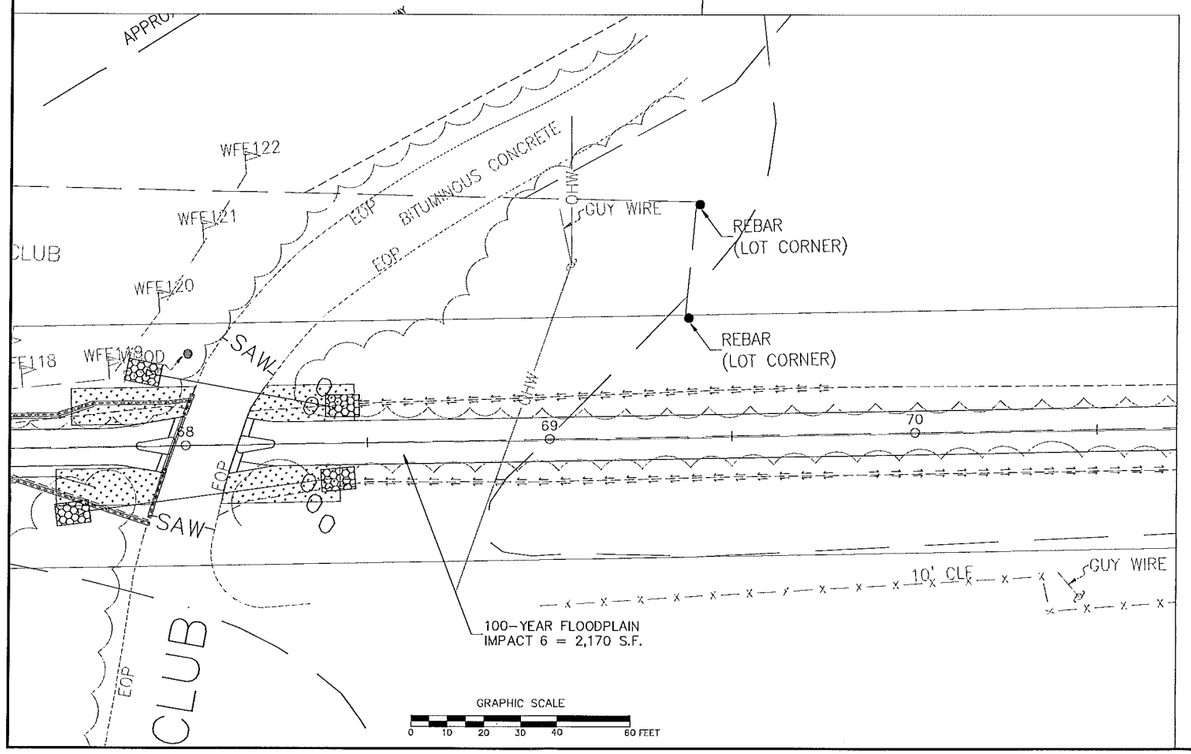
℄ STA. 75+26 RT TO STA. 81+75 RT

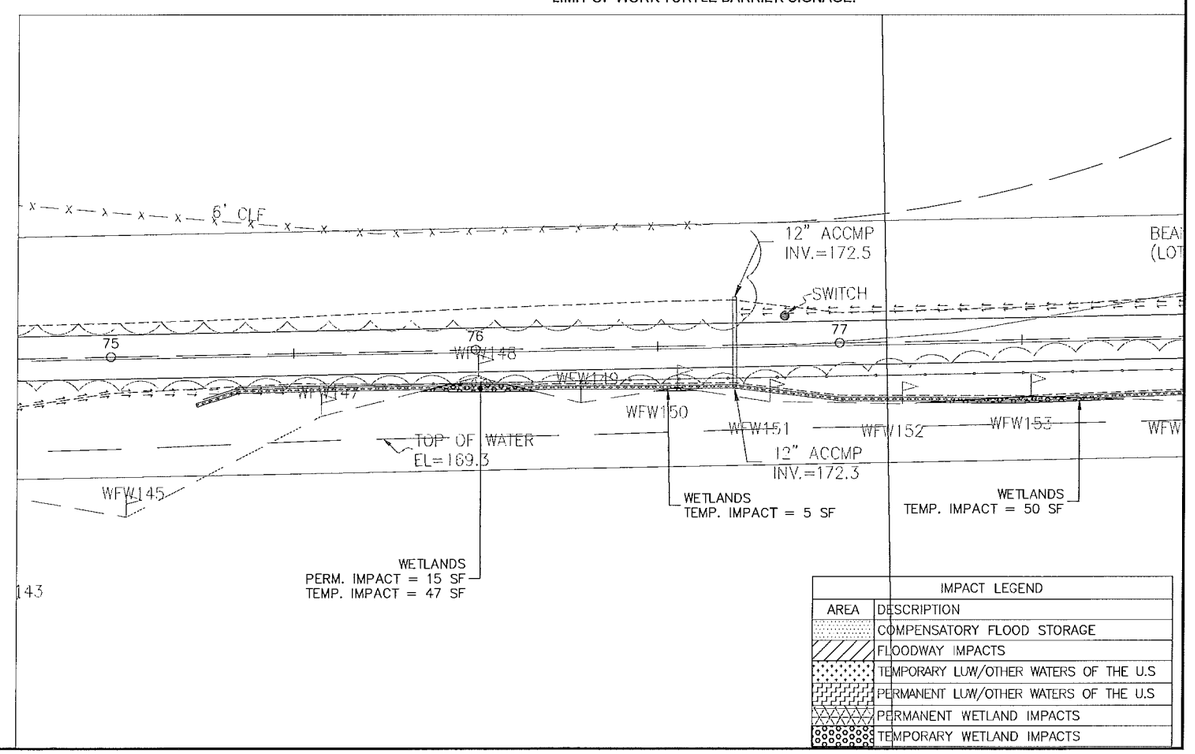
SILT FENCE WITH STRAW BALES

℄ 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 LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACCE.DWG Plotted on: 29-May-2014 1:51 PM

05/29/2014

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

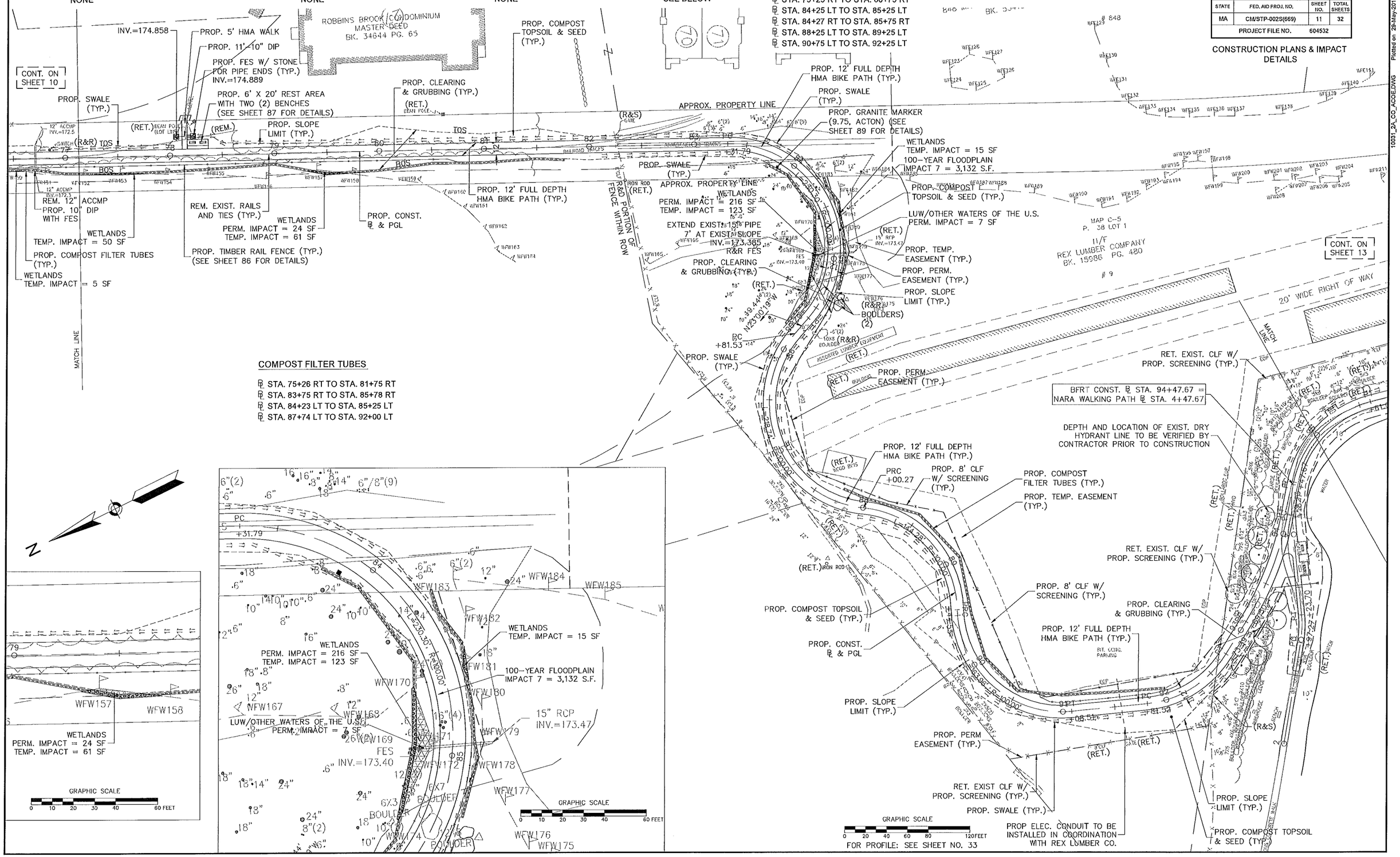
TIMBER RAIL FENCE

℄ 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	CM/STP-002S(669)	11	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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

10031_2A_CO_ACOE.DWG Plotted on: 29-May-2014 1:51 PM

05/29/2014

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

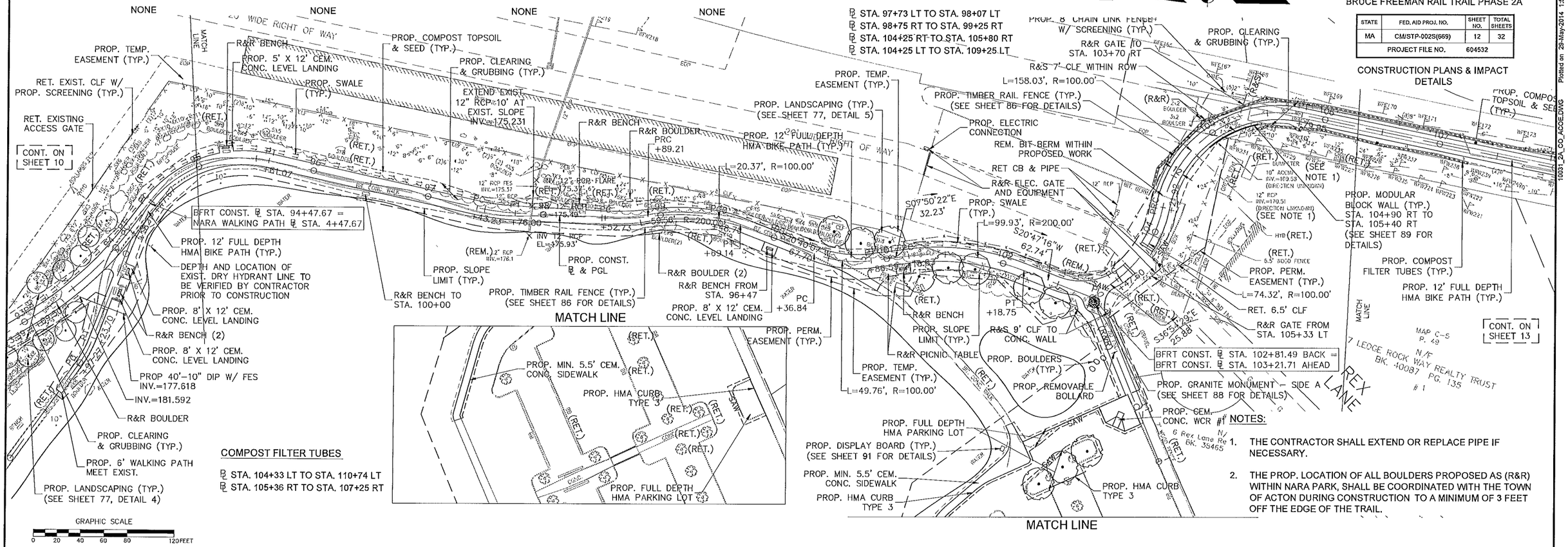
TIMBER RAIL FENCE

℄ 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	CM/STP-002S(669)	12	32
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

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_ACCELDWG Plotted on 29-May-2014 1:51 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

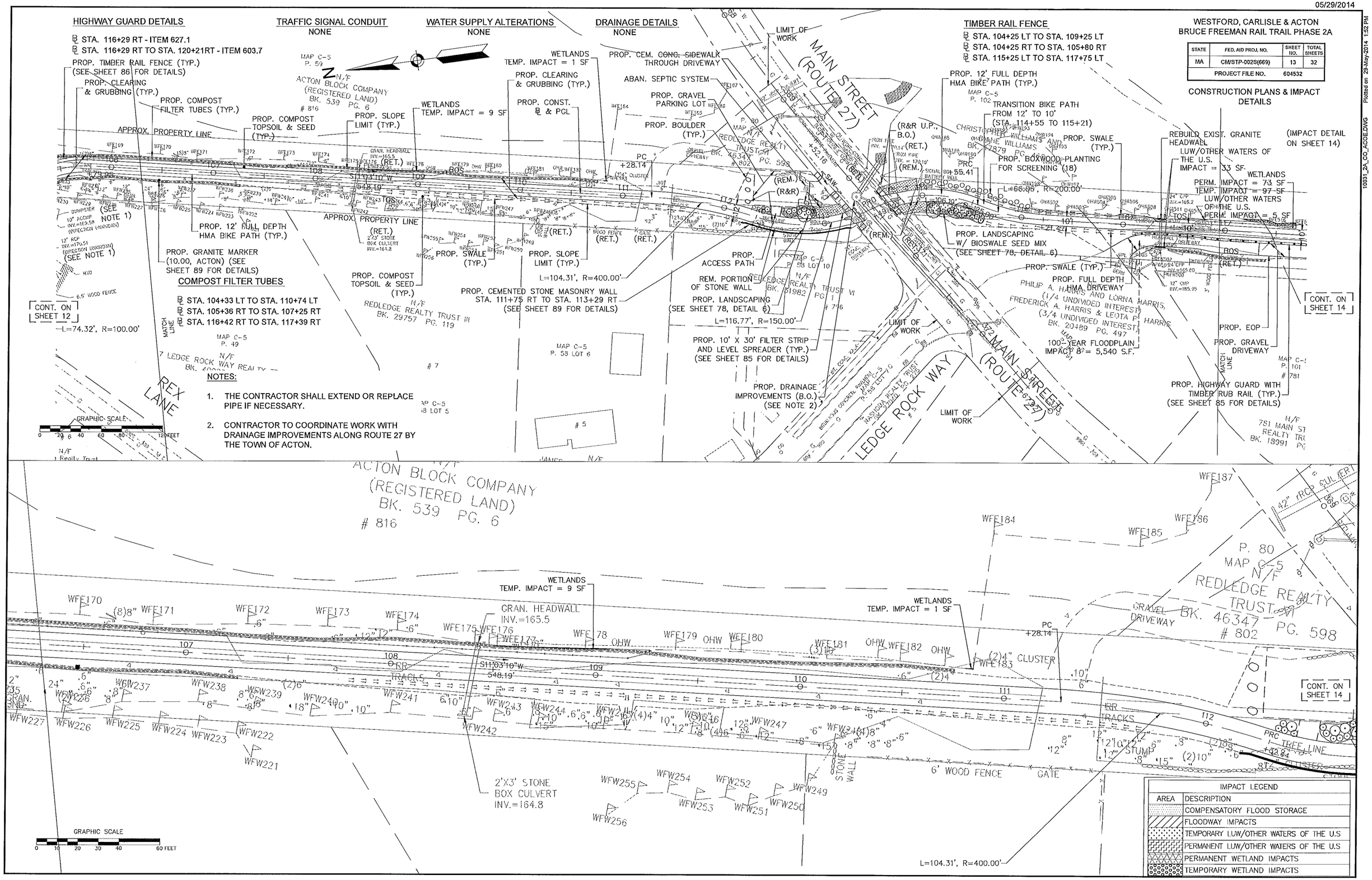
TIMBER RAIL FENCE

- 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

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	13	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS



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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	14	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT DETAILS

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

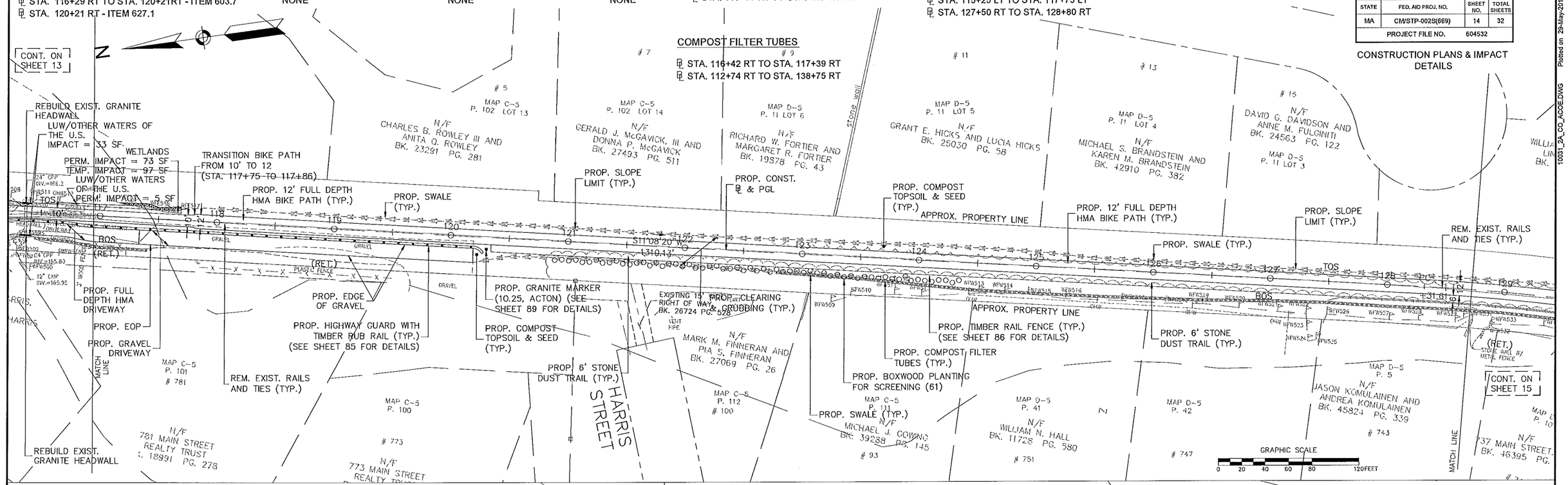
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
NONE

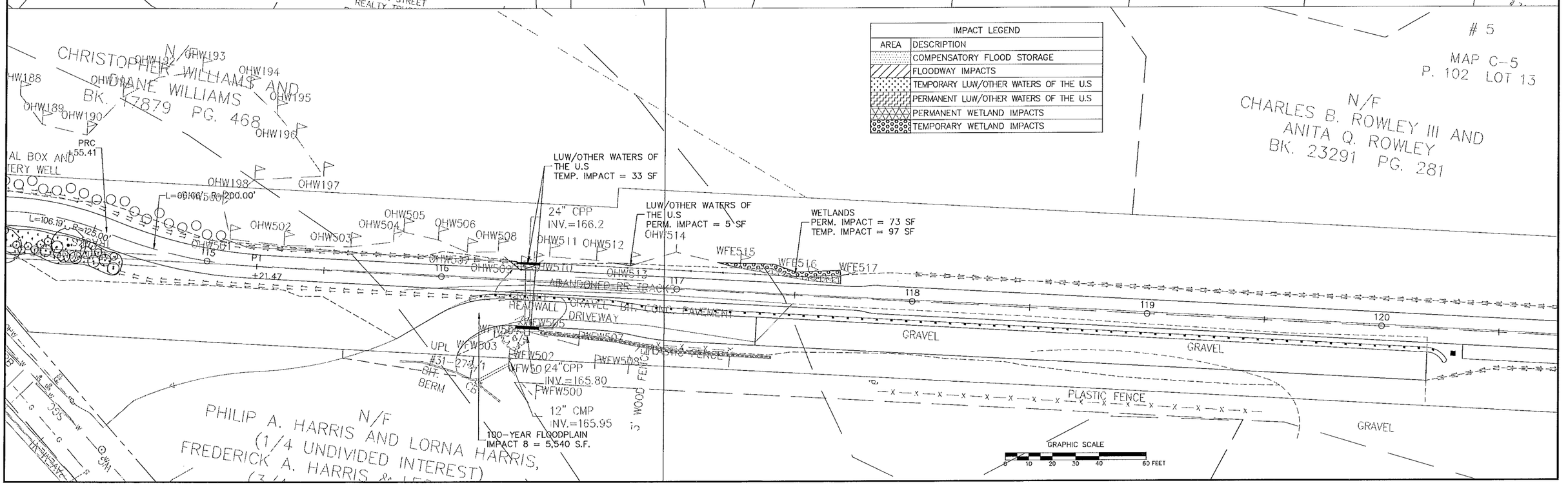
HIGHWAY GUARD WITH TIMBER RAIL BACK
- STA. 116+30 RT TO STA. 120+20 RT

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



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS



10031_2A_CO_ACDE.DWG Plotted on 29-May-2014 1:32 PM

05/29/2014

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

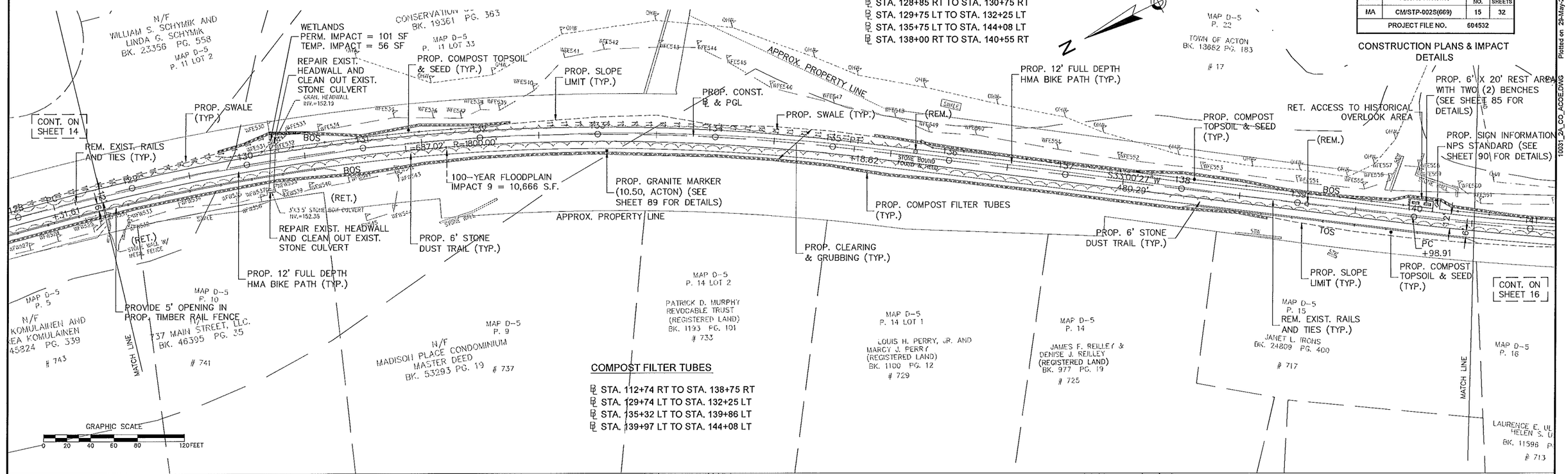
TIMBER RAIL FENCE

- 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

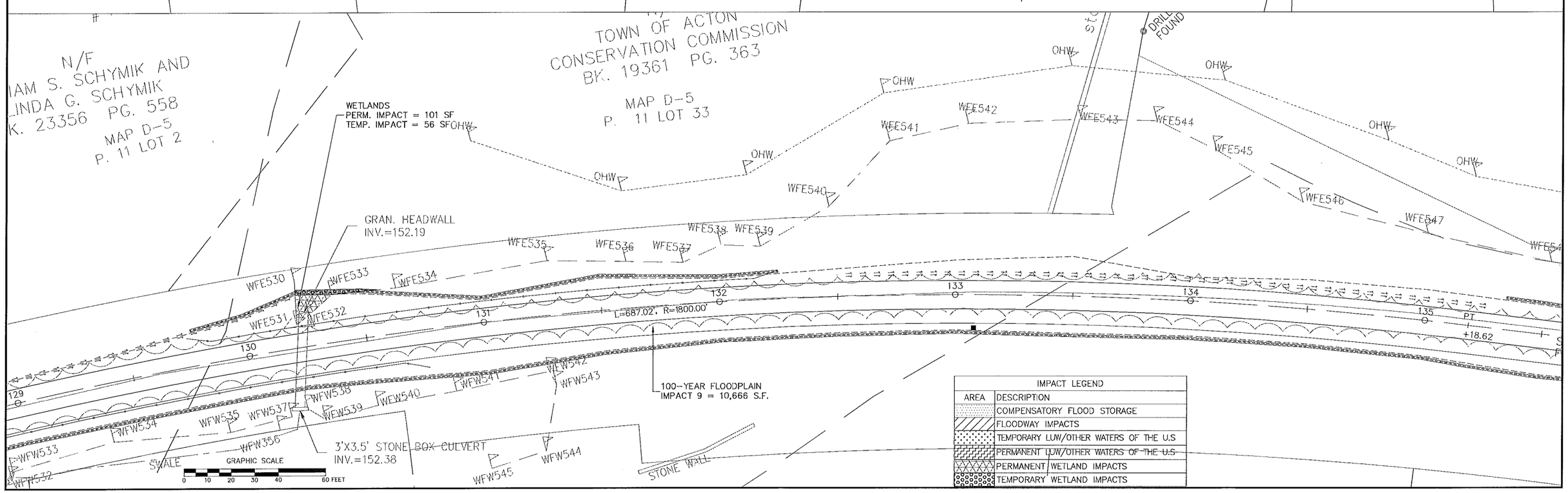
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	15	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACOE.DWG Plotted on 29-May-2014 1:52 PM

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	16	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS

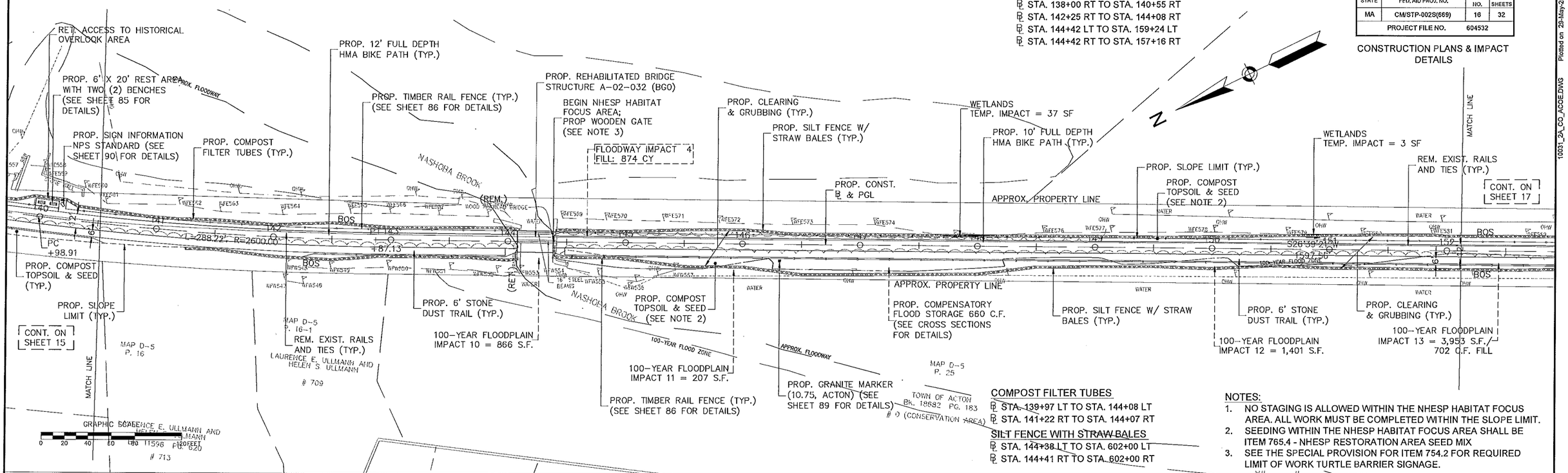
HIGHWAY GUARD DETAILS
NONE

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



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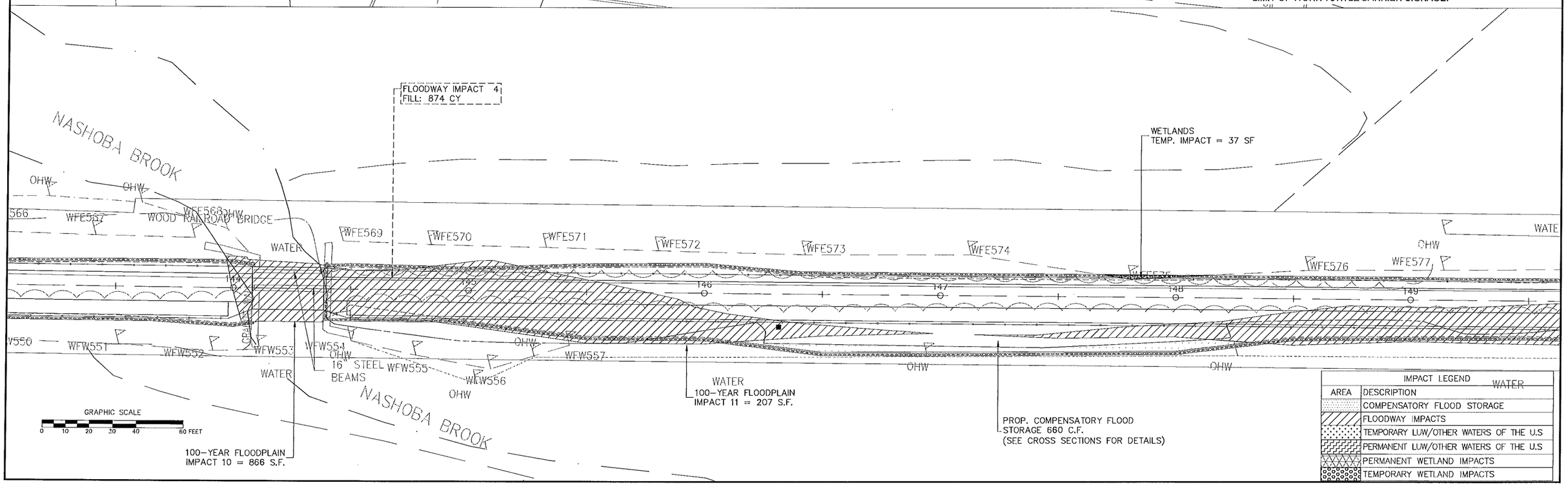
2. SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
3. SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	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

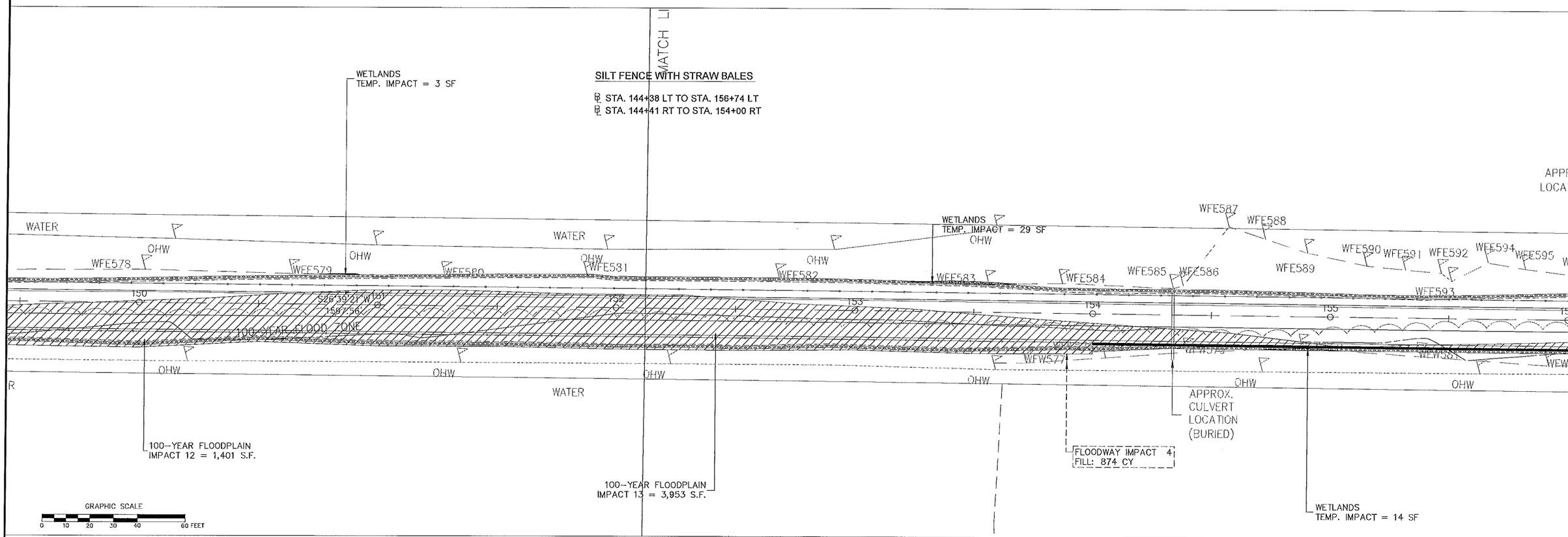
TIMBER RAIL FENCE

- 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	CM/STP-002S(669)	17	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	18	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS

HIGHWAY GUARD DETAILS
NONE

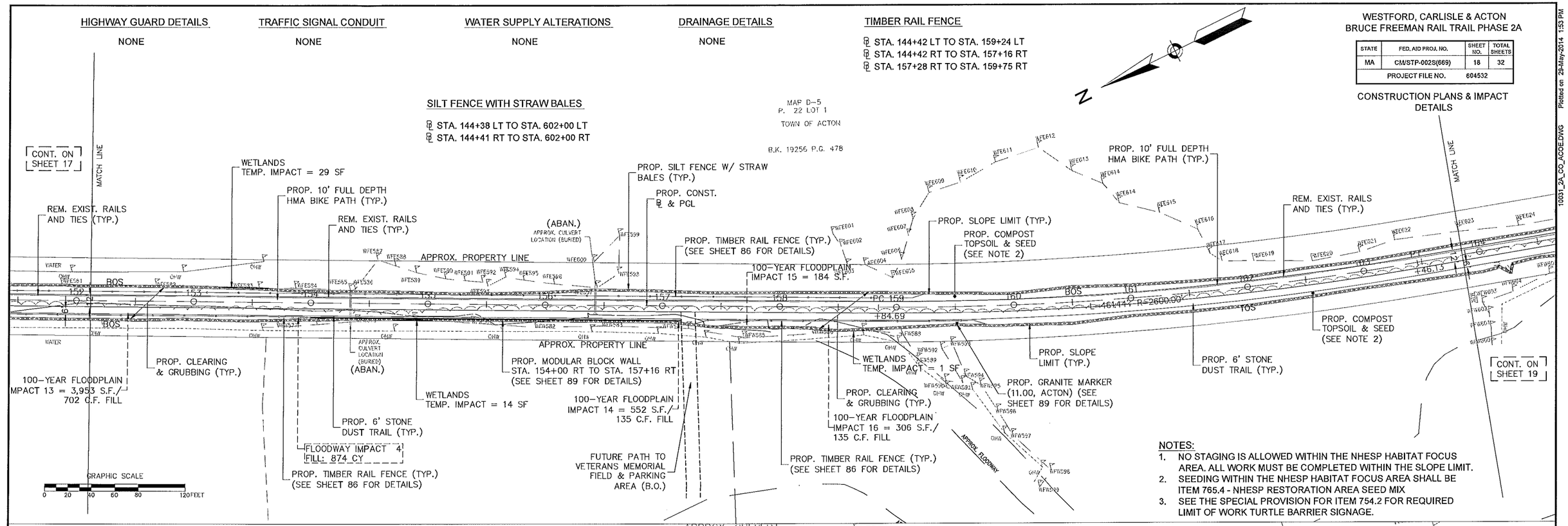
TRAFFIC SIGNAL CONDUIT
NONE

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



NOTES:
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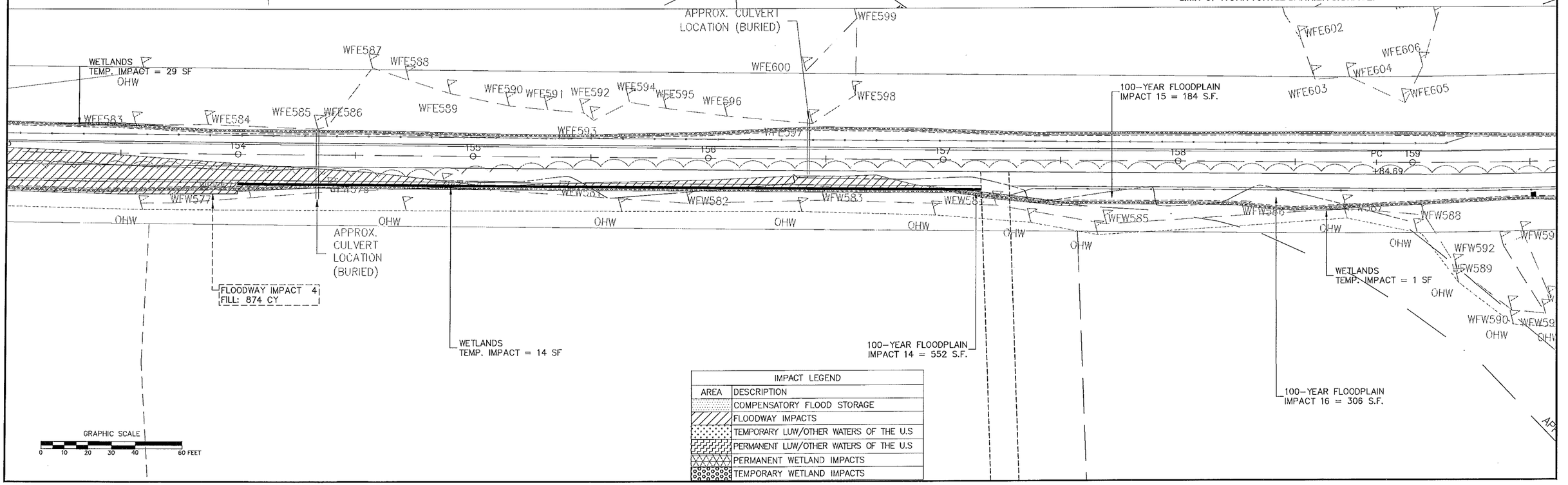

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	19	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS

HIGHWAY GUARD DETAILS
NONE

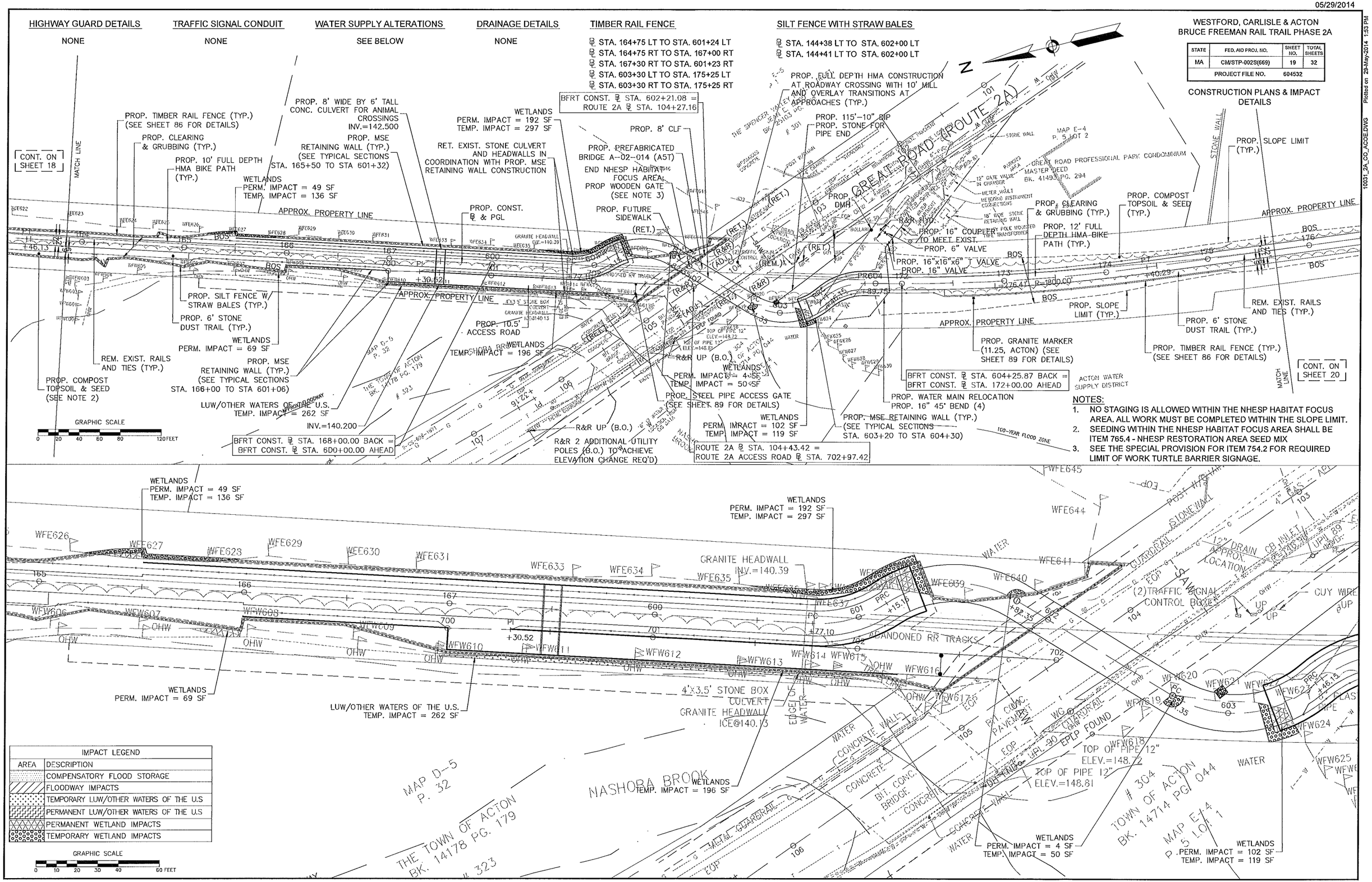
TRAFFIC SIGNAL CONDUIT
NONE

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



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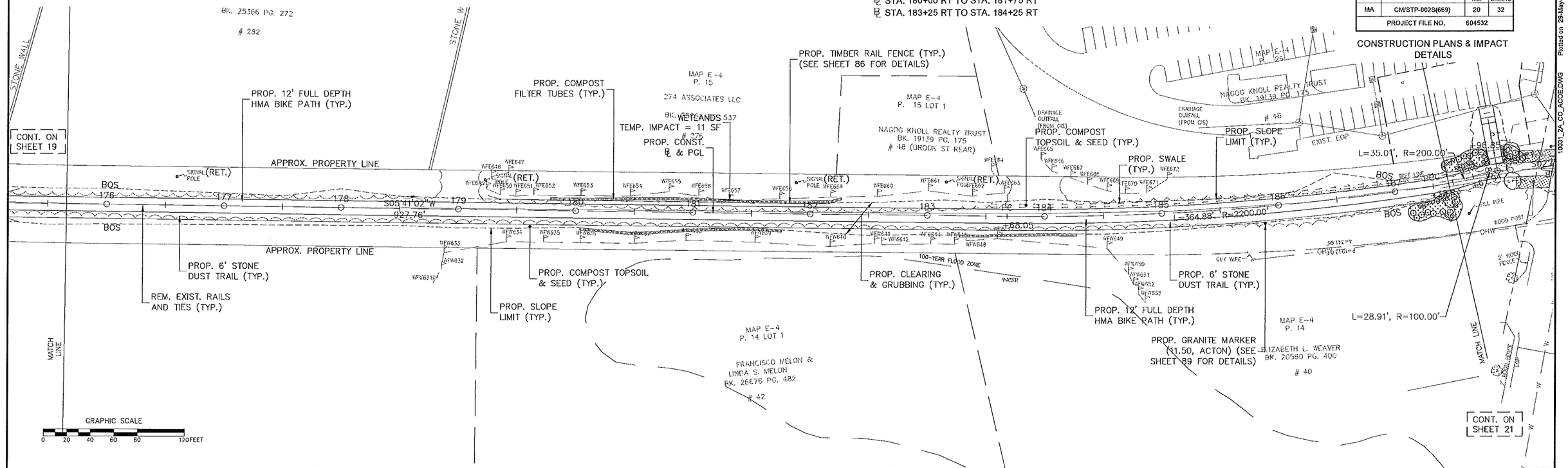
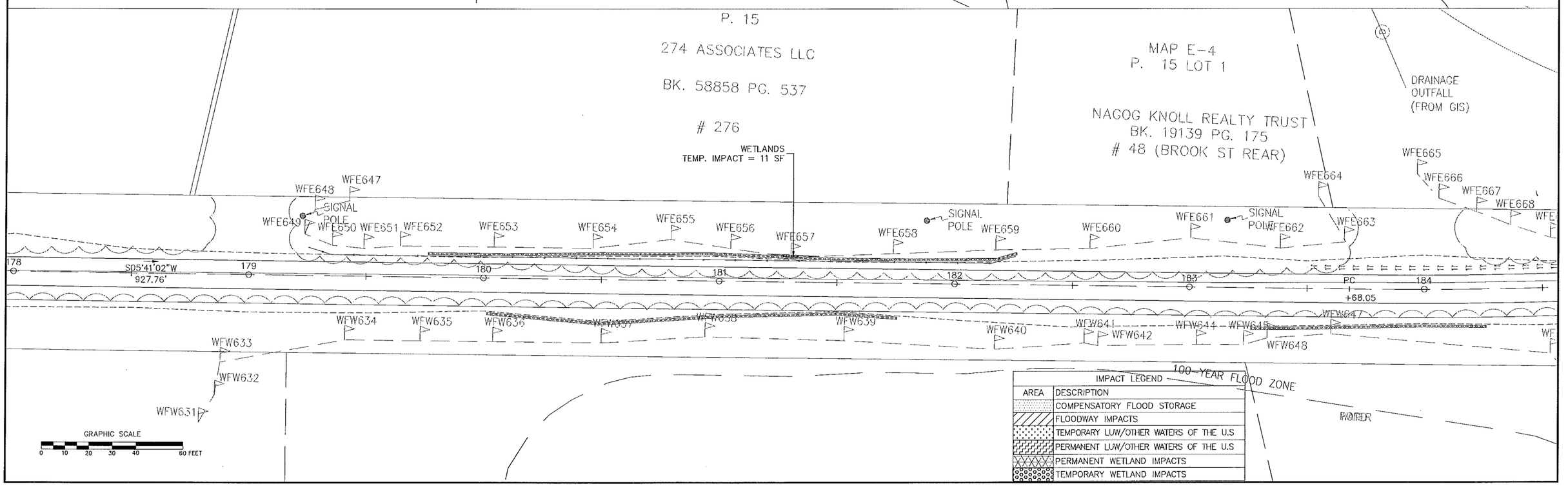
HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS	TIMBER RAIL FENCE	COMPOST FILTER TUBES
NONE	NONE	NONE	NONE	STA. 179+25 LT TO STA. 182+25 LT	STA. 179+75 LT TO STA. 182+25 LT STA. 180+00 RT TO STA. 181+75 RT STA. 183+25 RT TO STA. 184+25 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	20	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS





IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACOE.DWG Plotted on 29-May-2014 1:53 PM

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HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	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

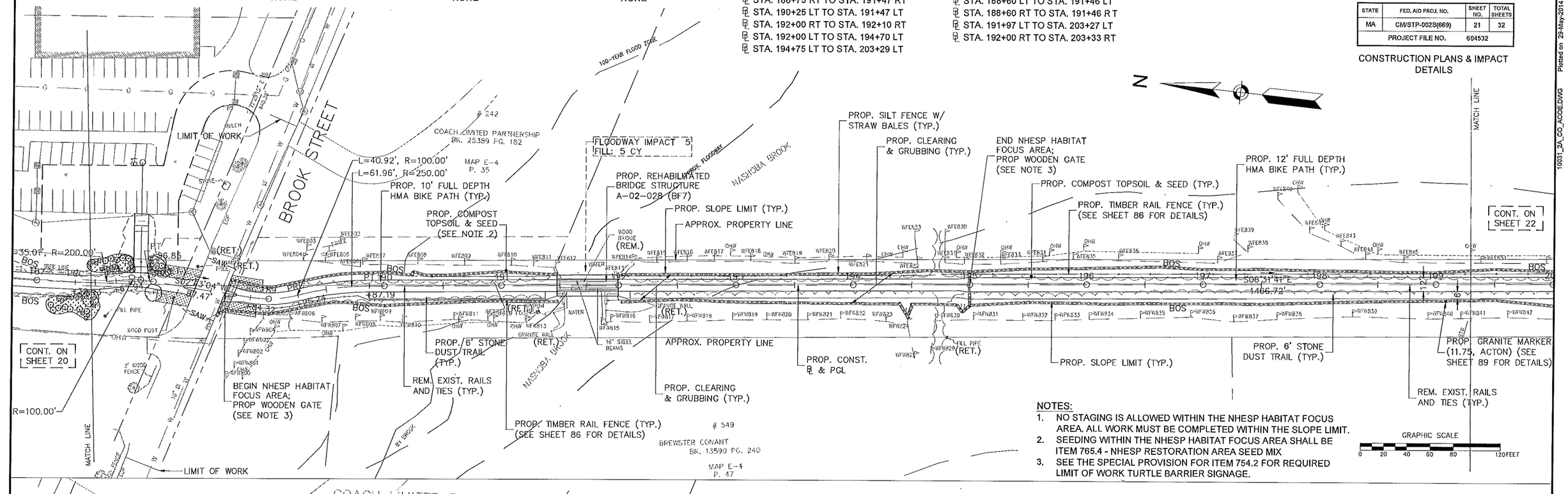
SILT FENCE WITH STRAW BALES

- 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 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	21	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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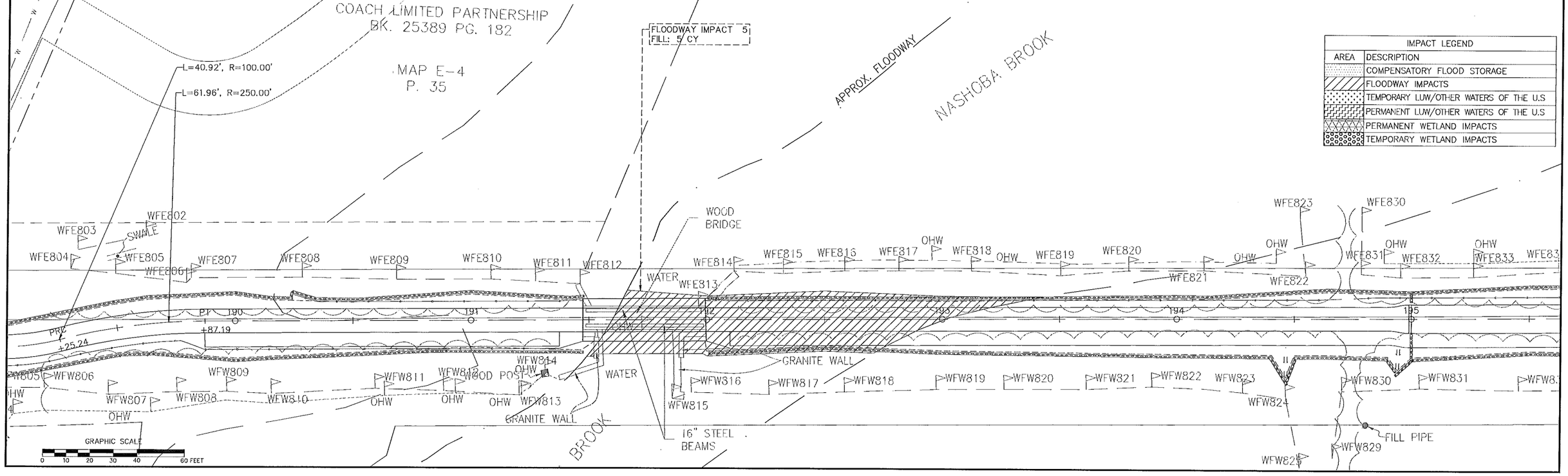

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	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

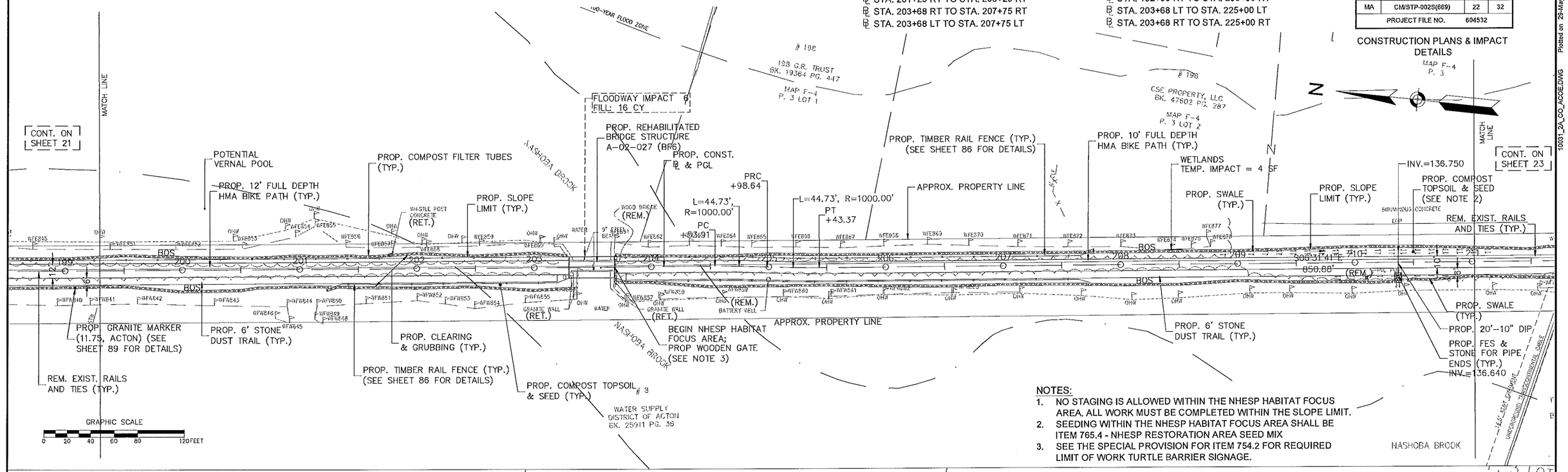
SILT FENCE WITH STRAW BALES

- 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	CM/STP-002S(669)	22	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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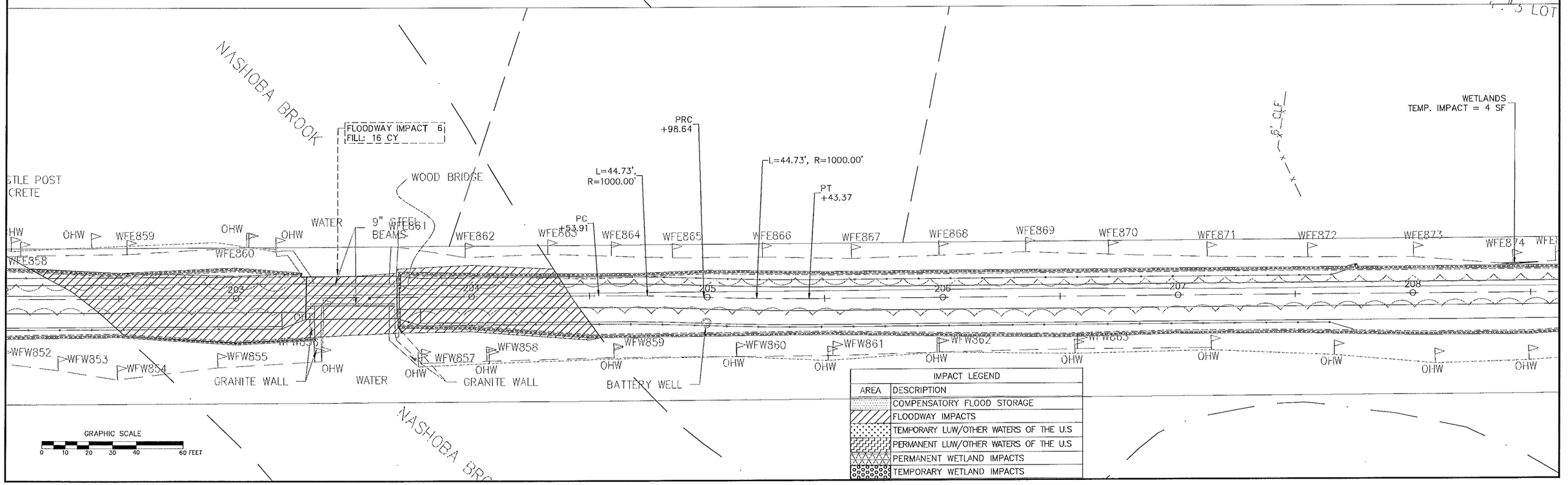

IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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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

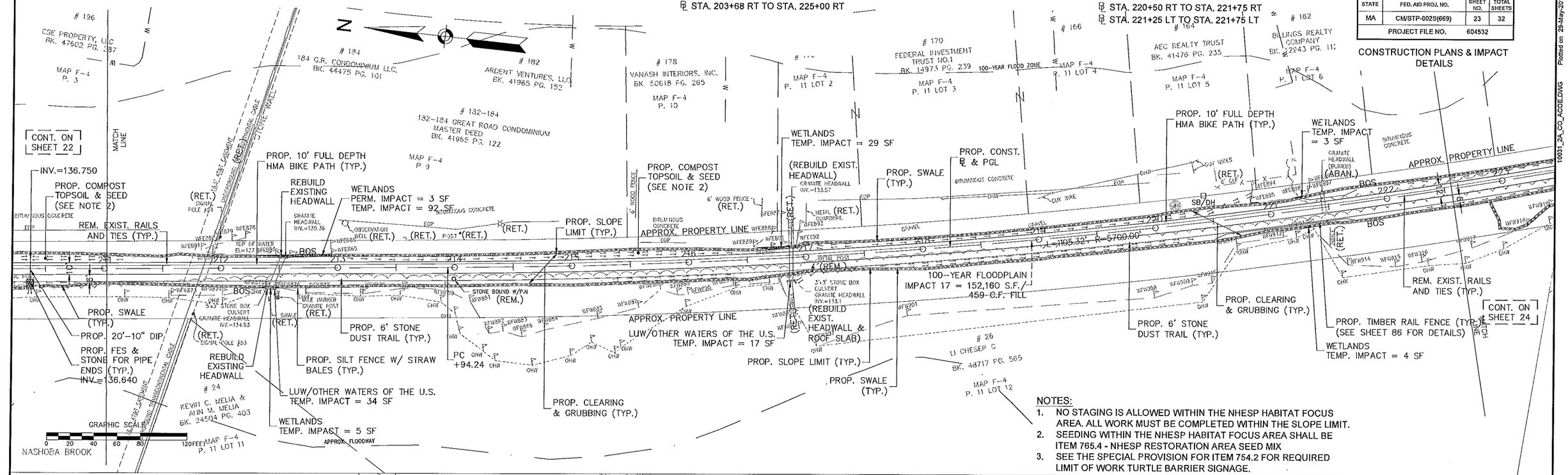
TIMBER RAIL FENCE

℄ 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	CM/STP-002S(669)	23	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



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IMPACT LEGEND

AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	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. 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

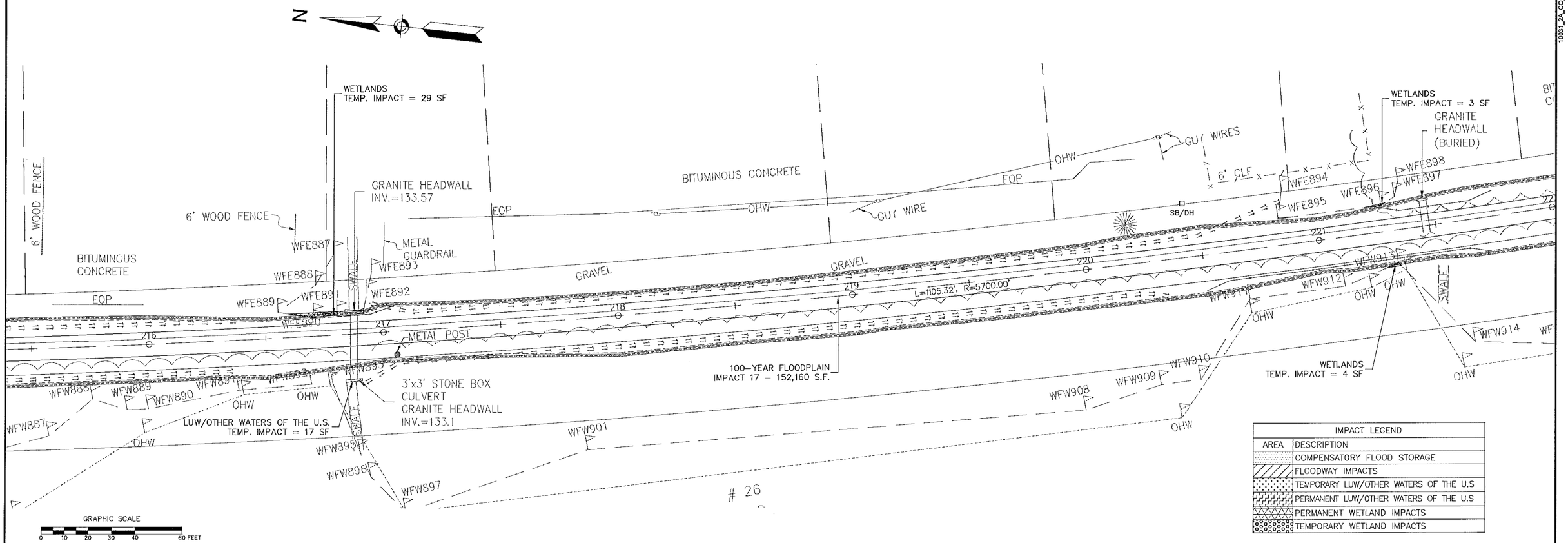
SILT FENCE WITH STRAW BALES

- 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	CM/STP-002S(669)	24	32
PROJECT FILE NO.	604532		

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACOE.DWG Plotted on 29-May-2014, 1:54 PM

HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS	TIMBER RAIL FENCE
NONE	NONE	NONE	SEE BELOW	STA. 226+00 LT TO STA. 227+22 LT

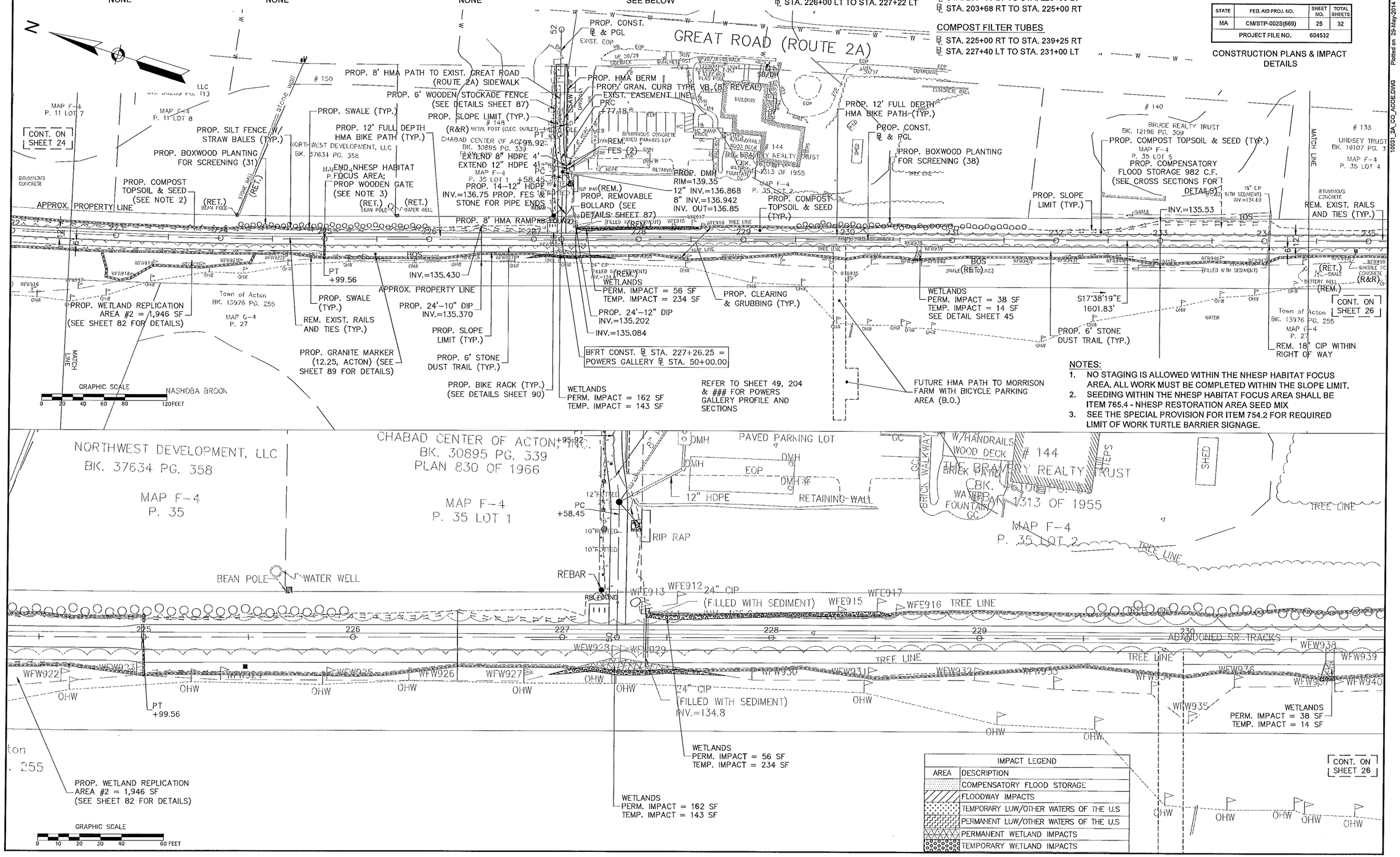
SILT FENCE AND STRAW BALES
- STA. 203+68 LT TO STA. 225+00 LT
- STA. 203+68 RT TO STA. 225+00 RT

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	CM/STP-002S(669)	25	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	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

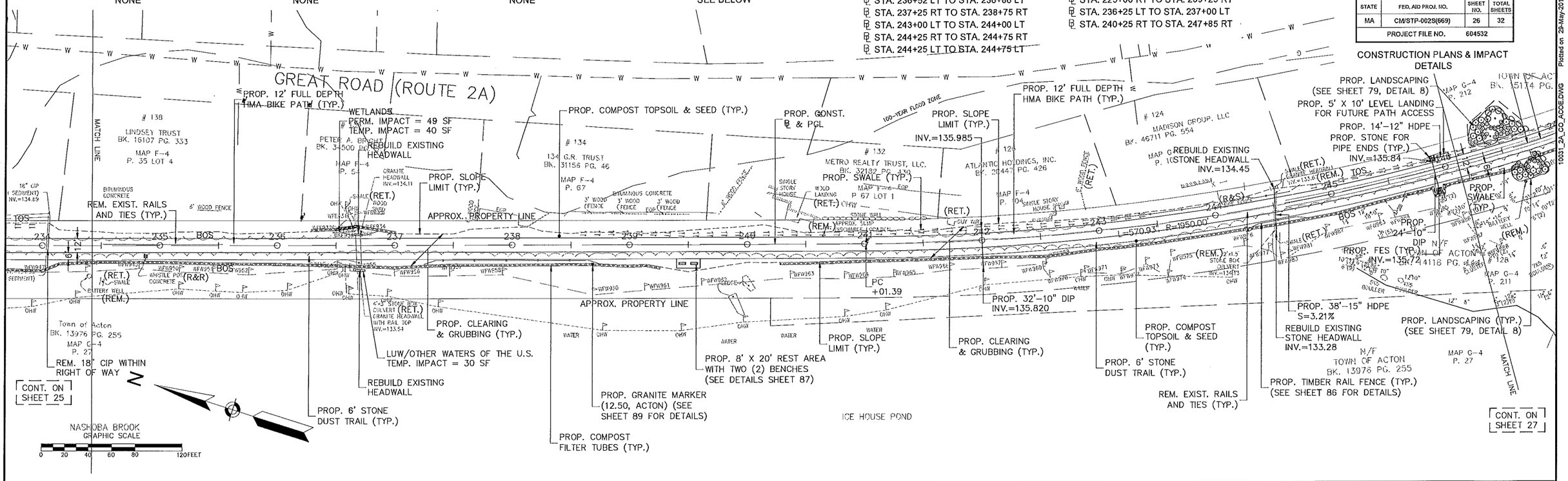
COMPOST FILTER TUBES

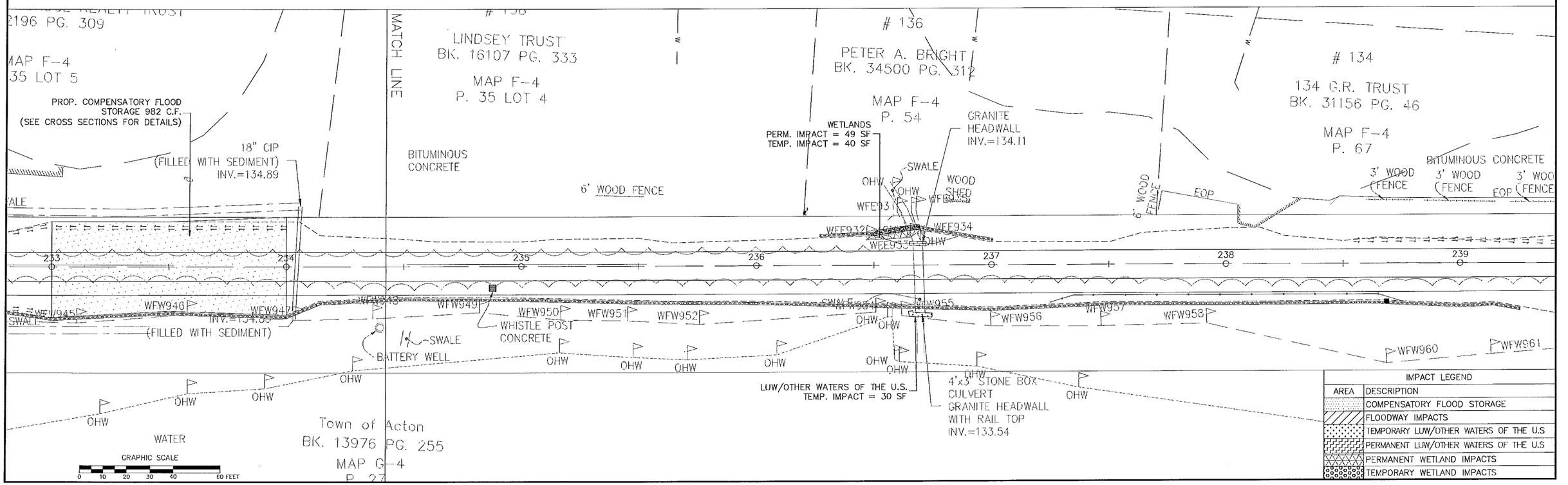
- STA. 225+00 RT TO STA. 239+25 RT
- STA. 236+25 LT TO STA. 237+00 LT
- STA. 240+25 RT TO STA. 247+85 RT

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-0029(669)	26	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS





IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	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

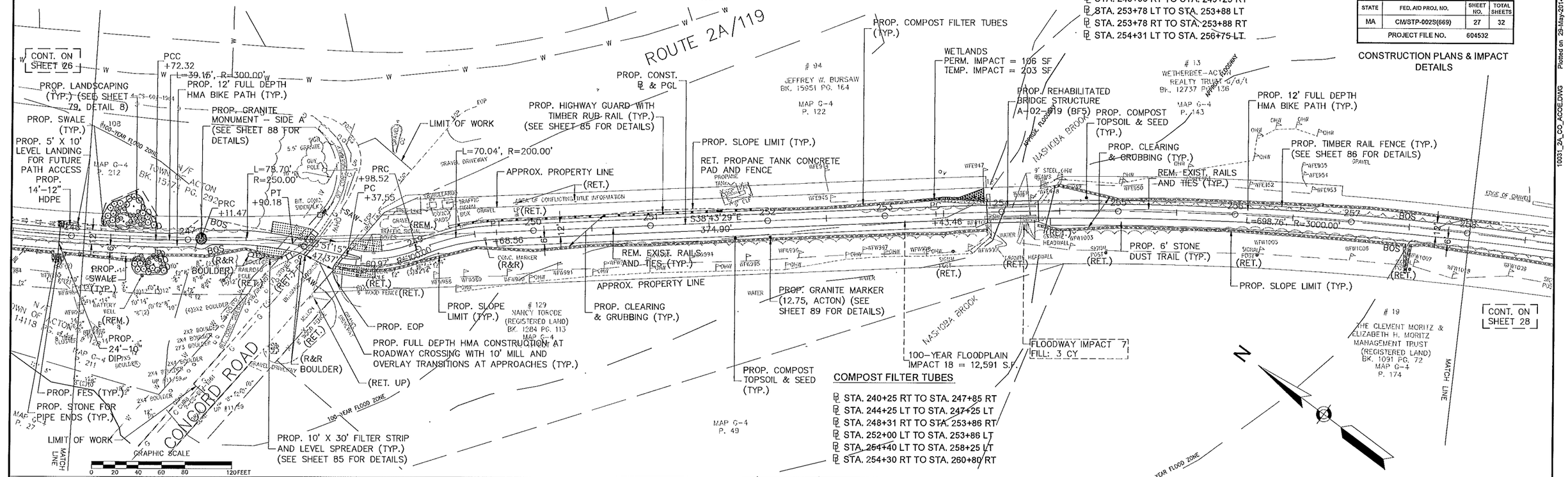
TIMBER RAIL FENCE

- STA. 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

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

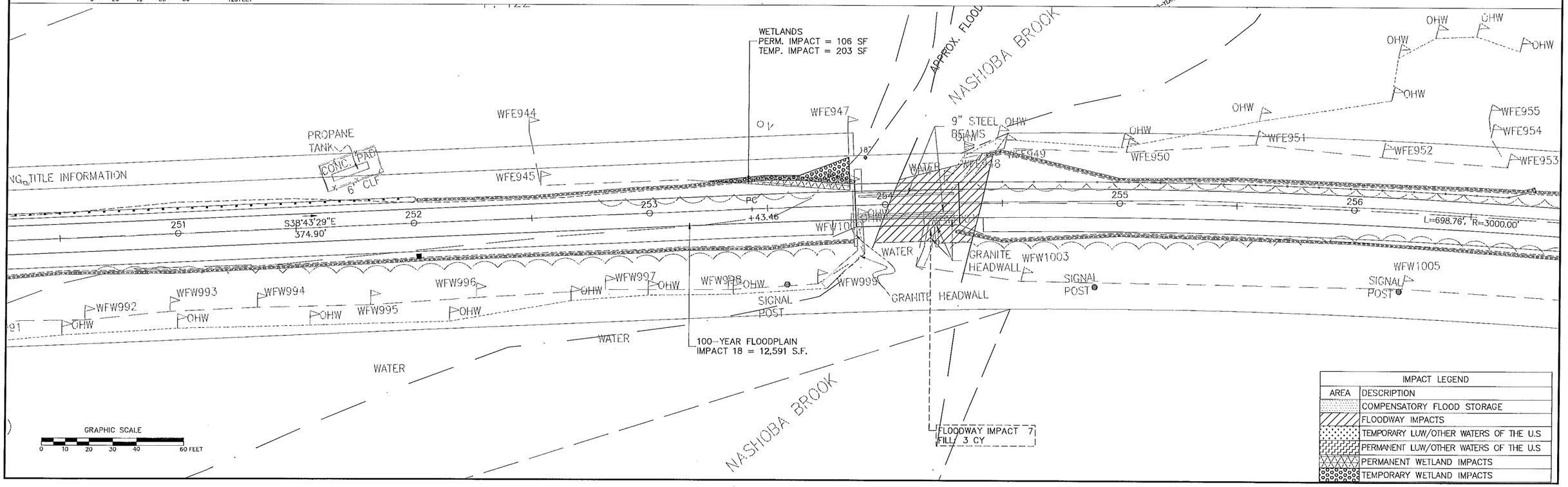
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	27	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS



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



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LUW/OTHER WATERS OF THE U.S
	PERMANENT LUW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

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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

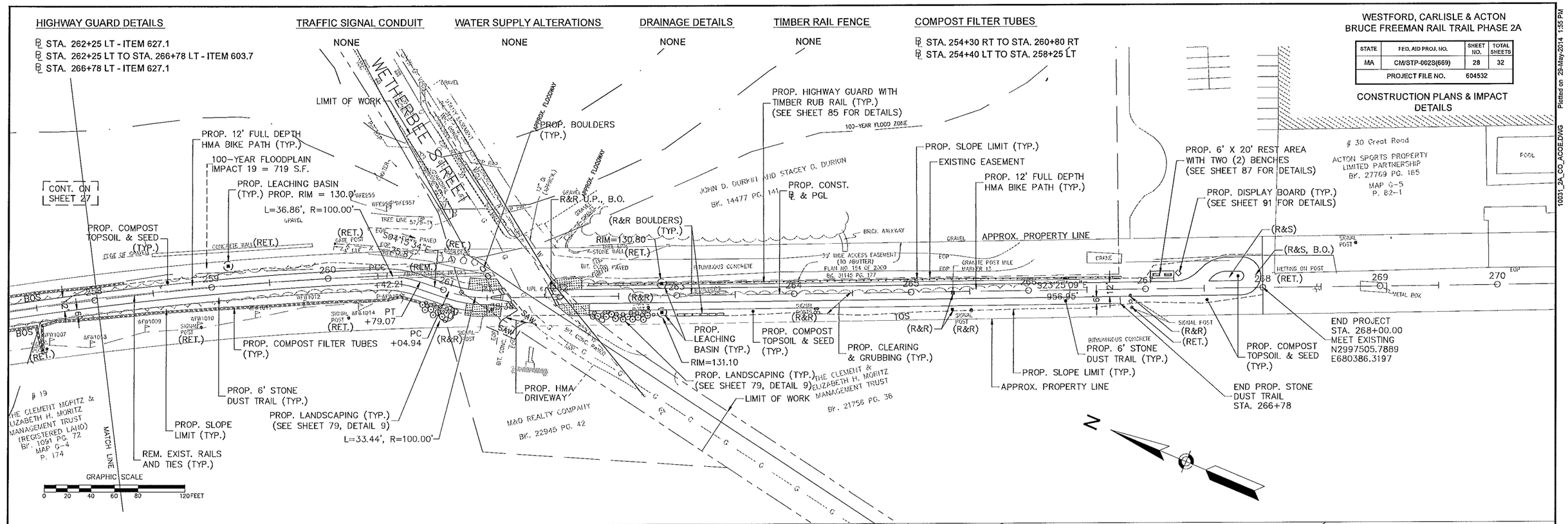
COMPOST FILTER TUBES

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

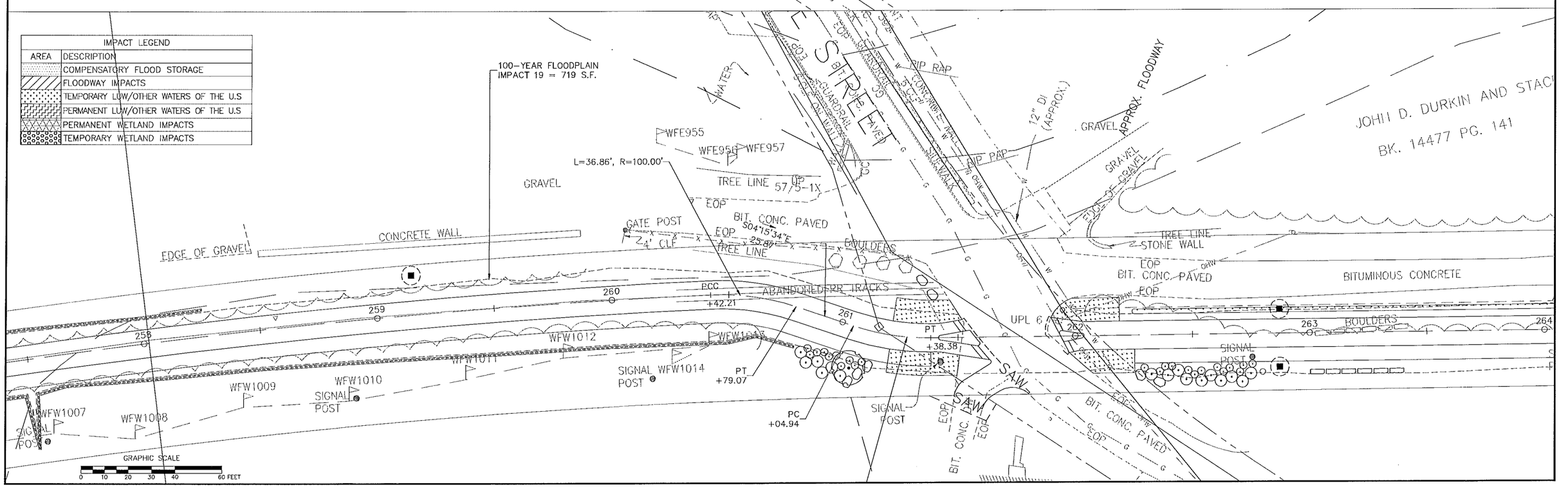
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-0023(669)	28	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS



IMPACT LEGEND	
AREA	DESCRIPTION
	COMPENSATORY FLOOD STORAGE
	FLOODWAY IMPACTS
	TEMPORARY LOW/OTHER WATERS OF THE U.S
	PERMANENT LOW/OTHER WATERS OF THE U.S
	PERMANENT WETLAND IMPACTS
	TEMPORARY WETLAND IMPACTS

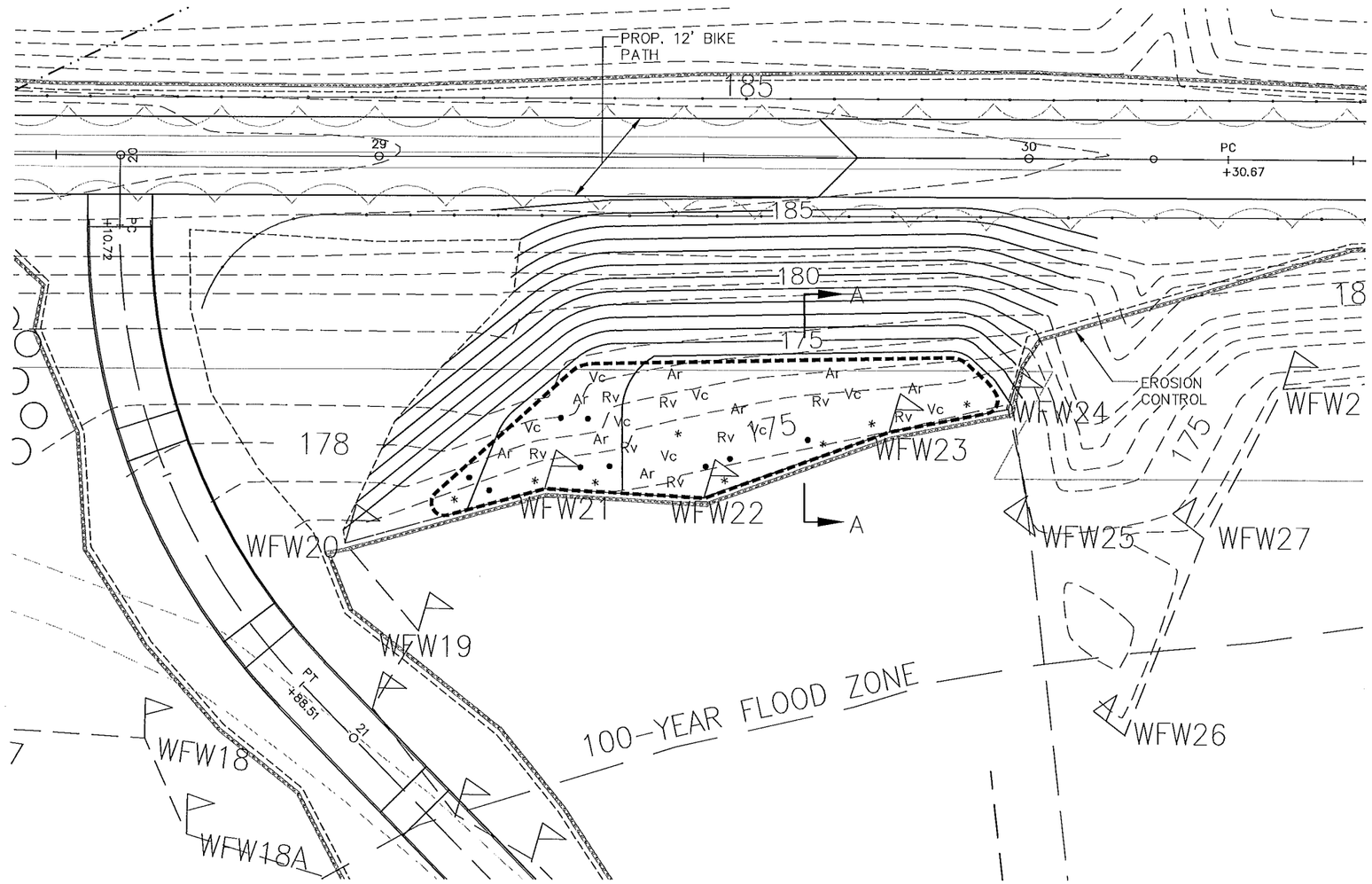


10031_2A_CO_ACCE.DWG Plotted on 29-May-2014 1:55 PM

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

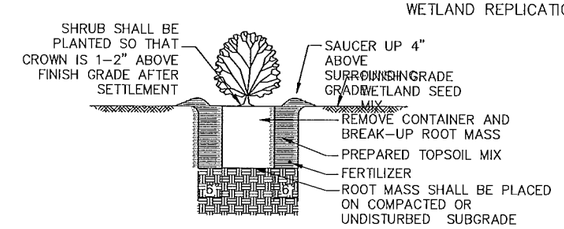
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	29	32
PROJECT FILE NO. 604532			

WETLAND REPLICATION PLANS



PLANTING PLAN

0 20 50 100



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

PLANTING SPECIFICATIONS

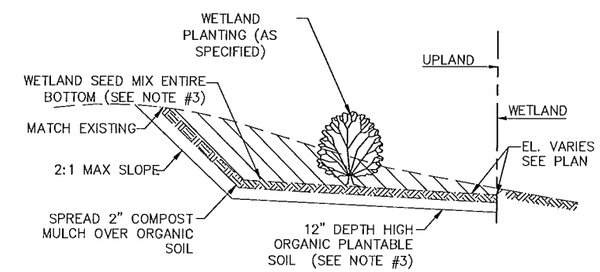
SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY
Ar	ACER RUBRUM	RED MAPLE	8
Vc	VACCCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	8
Rv	RHODODENDRON VISCOSUM	SWAMP AZALEA	8
•	OSMUNDA CINNAMOMEA	CINNAMON FERN	9
*	ONOCLEA SENSIBILIS	SENSITIVE FERN	9

WETLAND SEED MIX

SCIENTIFIC NAME	COMMON NAME	%
Carex vulpinoidea	Fox Sedge	25%
Elymus virginicus	Virginia Wildrye	25%
Carex lurida	Lurid (Shallow) Sedge	12%
Carex lupulina	Hop Sedge	6%
Verbena hastote	Blue Vervain	4%
Juncus effuses	Soft Rush	3%
Carex comoso	Cosmos (Bristly) Sedge	3%
Aster umbellatus (Doellingeria umbellate)	Flot Topped White Aster	3%
Aster prenanthoides (Symphyotrichum p.)	Zigzag Aster	3%
Scirpus atrovirens	Green Bulrush	3%
Helenium autumnole	Common sneezeweed	2%
Zizia aurea	Golden Alexanders	2%
Ludwigia alternifolia	Seedbox	2%
Lobelia siphilitica	Great Blue Lobelio	1%
Aster puniceus (Symphyotrichum puniceum)	Purplestem Aster	1%
Vernonia gigantea (V. altissima)	Giant Ironweed	1%
Scirpus cyperinus	Woolgrass	1%
Eupatorium perfoliatum	Boneset	1%
Euthamia graminifolia (Solidago g.)	Grassleaf Goldenrod	1%
Asclepias incarnata	Swamp Milkweed	1%
	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.

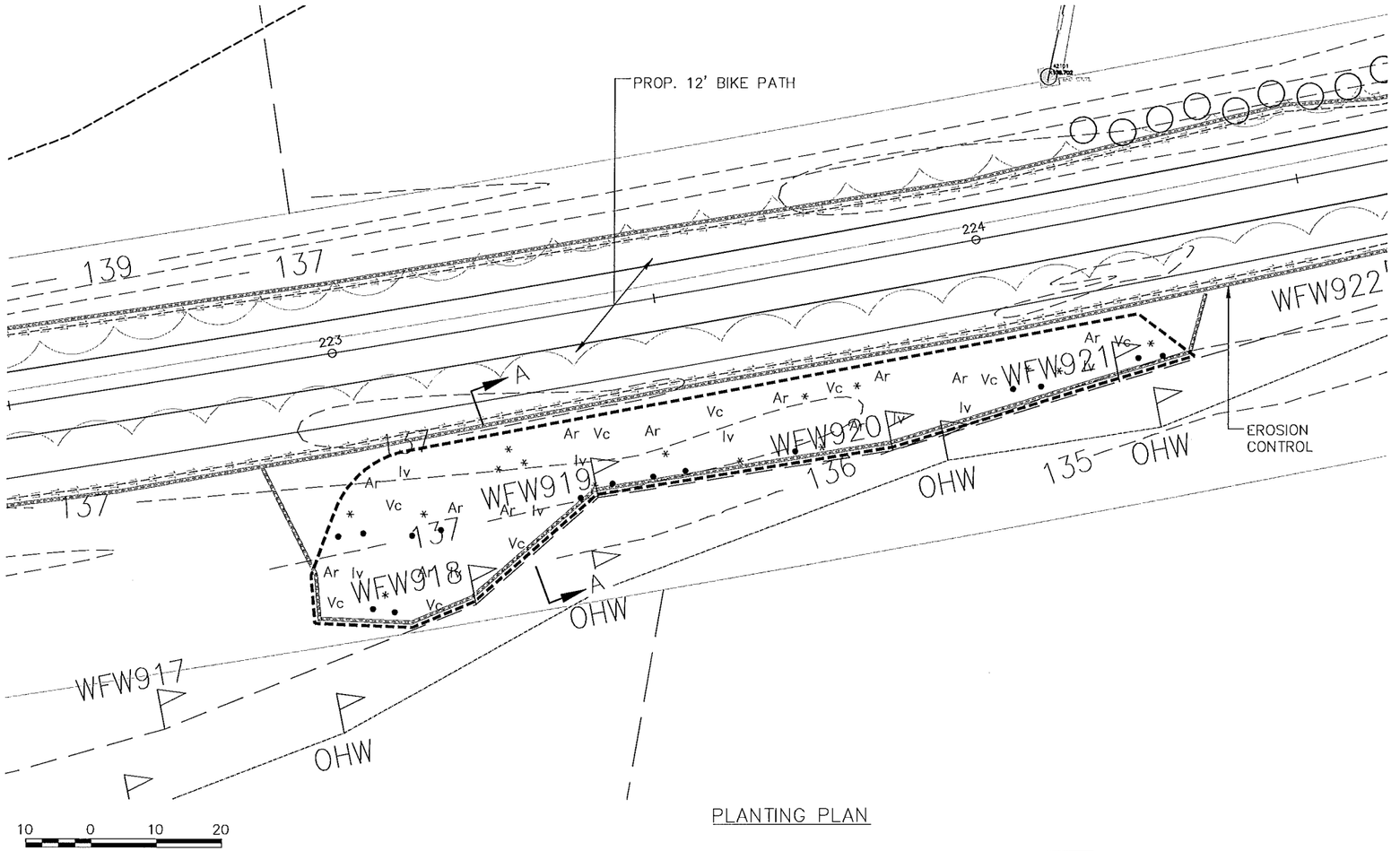


SECTION A-A OF WETLAND REPLICATION AREA
N.T.S.

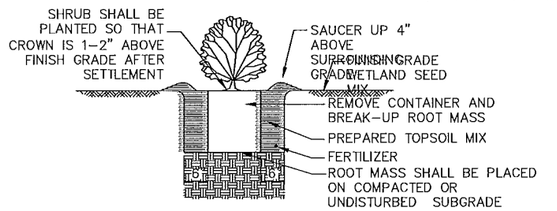
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE
2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-0025(669)	30	32
PROJECT FILE NO.	604532		

WETLAND REPLICATION PLANS



PLANTING PLAN



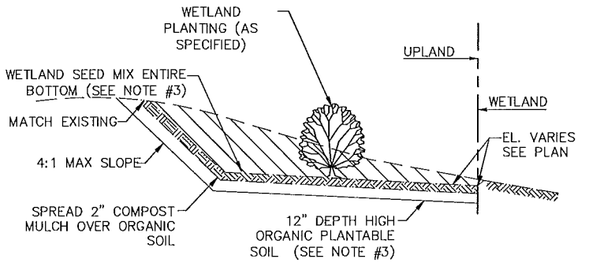
1.) PREPARED TOPSOIL MIX SHALL CONSIST OF HIGH ORGANIC SOIL WITH NO LESS THAN 10% ORGANIC MATTER.

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 lurida	Lurid (Shollow) Sedge	12%
Carex lupulina	Hop Sedge	6%
Verbena hastate	Blue Vervain	4%
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Carex comosa	Cosmos (Bristly) Sedge	3%
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Aster prenanthoides (Symphyotrichum p.)	Zigzag Aster	3%
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Helenium autumnale	Common sneezeweed	2%
Zizia aurea	Golden Alexanders	2%
Ludwigia alternifolia	Seedbox	2%
Lobelia siphilitica	Great Blue Lobelia	1%
Aster puniceus (Symphyotrichum puniceum)	Purplestem Aster	1%
Vernonia gigantea (V. altissima)	Giant Ironweed	1%
Scirpus cyperinus	Woolgrass	1%
Eupatorium perfoliatum	Boneset	1%
Euthamia graminifolia (Solidago g.)	Grassleaf Goldenrod	1%
Asclepias incarnata	Swamp Milkweed	1%
	TOTAL	100%

NOTES:

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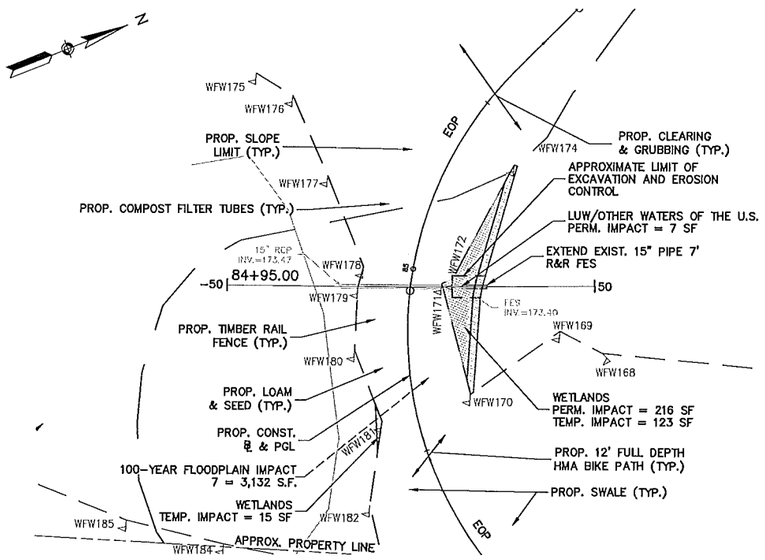
3. MITIGATION AREA SHALL BE TREATED WITH TWELVE (12") INCHES OF HIGH ORGANIC GRANULAR TOPSOIL, 2" COMPOST TOPSOIL AND SEEDED WITH A MANUFACTURED WETLAND SEED MIX APPLIED AT A RATE OF 0.5 LB./1,000 S.F.

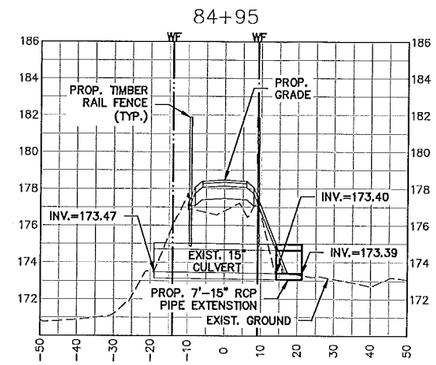
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	31	32
PROJECT FILE NO.	604532		

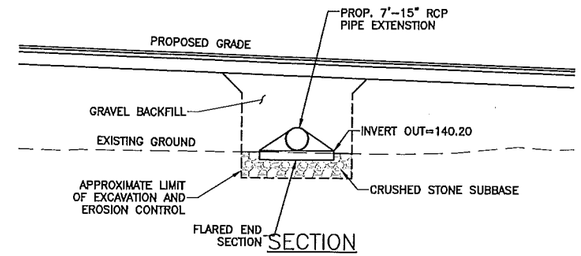
CULVERT DETAILS



PLAN
SCALE: 1" = 20'

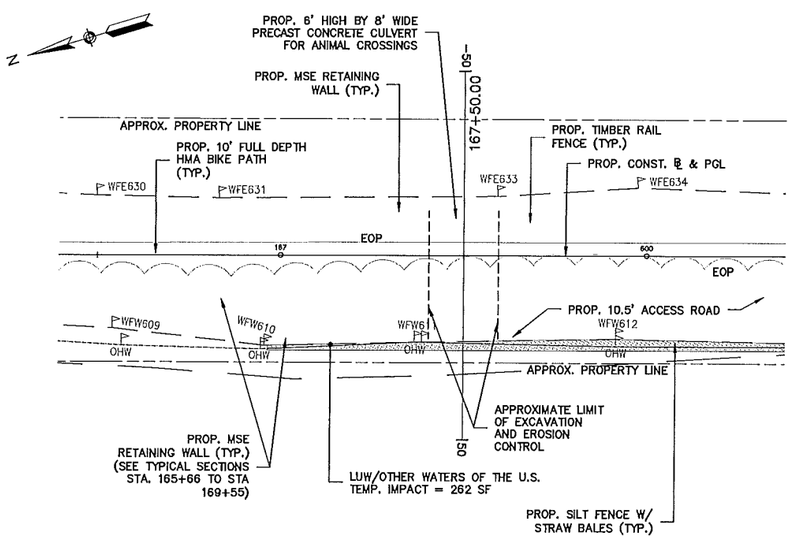


PROFILE
SCALE: 1" = 20' (HORIZONAL)
1" = 4' (VERTICAL)

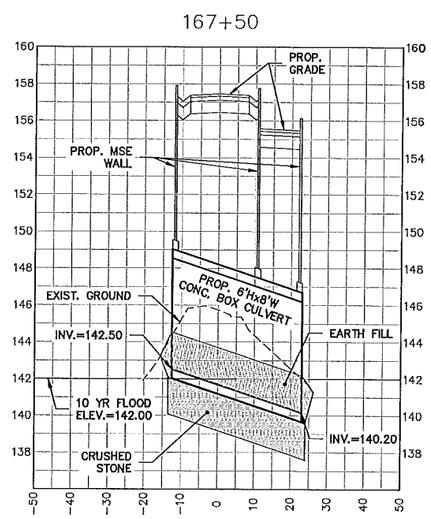


SECTION
SCALE: 1" = 4'

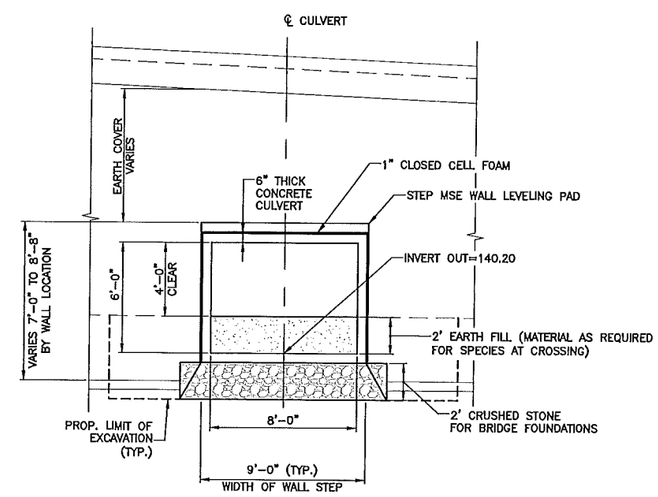
15" CULVERT EXTENSION
STA 84+95
SCALE: AS NOTED



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' (HORIZONAL)
1" = 4' (VERTICAL)



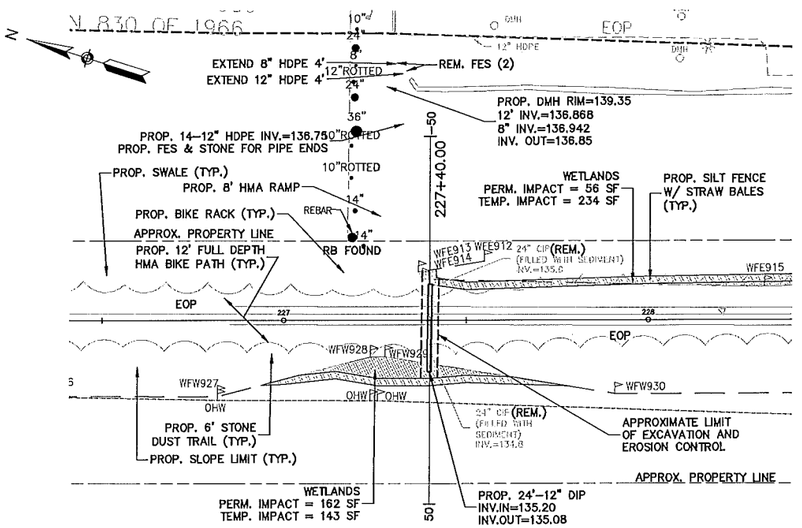
SECTION
SCALE: 1" = 4'

CONCRETE CULVERT FOR WILDLIFE CROSSING
STA 167+50
SCALE: AS NOTED

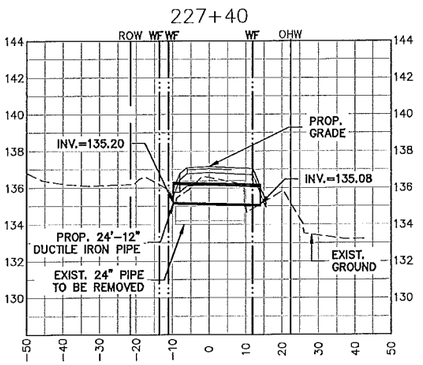
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	32	32
PROJECT FILE NO.	604532		

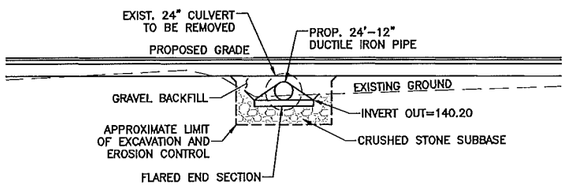
CULVERT DETAILS



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' (HORIZONAL)
1" = 4' (VERTICAL)



SECTION
SCALE: 1" = 4'

CULVERT REPLACEMENT
STA 227+40
SCALE: AS NOTED