



**US Army Corps
of Engineers®**
New England District
696 Virginia Road
Concord, MA 01742-2751

PUBLIC NOTICE

Comment Period Begins: June 10, 2014
Comment Period Ends: July 10, 2014
File Number: NAE-2014-00816
In Reply Refer To: Dan Vasconcelos
Phone: (978) 318-8653
E-mail: daniel.b.vasconcelos@usace.army.mil

The District Engineer has received a permit application to conduct work in waters of the United States from the Massachusetts Department of Transportation – Highway Division (MassDOT), 10 Park Plaza, Boston, Massachusetts 02116. This work is proposed in Nashoba Brook and various unnamed waters of the United States, 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 to waters of the United States are located in Acton.

The site coordinates are:

Begin: Latitude 42.536083°, Longitude -71.397478°
End: Latitude 42.471884°, Longitude -71.409353°

Although this project may have only minimal impacts and may be eligible for authorization under the current Massachusetts General Permit, the work is not expected to begin until after the General Permit expires on January 20, 2015. The applicant is seeking an individual permit to allow for a full five years in which to complete the work.

The work involves the discharge of 4,627 square feet of fill material into 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. The purpose of the work is to provide a public recreational amenity by extending the Bruce Freeman Rail Trail from the terminus of the completed Phase 1 in Westford through Carlisle and into Acton. Section 404 fills would result from the following project components:

- Construction of a 4.88 mile section of paved, variable width, multi-use 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
- Repair and rehabilitation of existing culverts and associated headwalls
- Construction of a wildlife crossing structure

The proposed work also includes the rehabilitation of six existing railroad trestle bridges and the construction of a six-foot wide stone dust trail adjacent to the paved trail where feasible.

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Of the total 4,627 square feet of impact, 1,845 square feet would be permanent and 2,782 square feet would be temporary. Permanent impacts would result primarily from grading associated with trail construction, grading for the parking area access ramp, and construction of the pedestrian bridge over Route 2A/119. Temporary impacts would result primarily from culvert and headwall repair and rehabilitation activities and temporary access to the work areas. This work would also occur within the 100-foot envelope of one potential vernal pool (PVP) and the 750-foot critical terrestrial habitat of six additional PVPs and four certified vernal pools (CVPs).

The 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".

In developing plans for the construction of Phase 2A of the Bruce Freeman Rail Trail, MassDOT considered ways to avoid and minimize impacts to waters of the United States, including wetlands. Steps to avoid and minimize impacts to wetlands and waterways include constructing the majority of the trail on the existing rail ballast, installing erosion and sedimentation controls at the work limits, installing netting or shielding under the railroad trestle bridges to prevent debris from falling into the water, conducting bridge rehabilitation work from uplands or boats to avoid impacting the stream channels, and restoring all temporary impact areas following construction. No compensatory mitigation pursuant to the Corps New England District Compensatory Mitigation Guidance is proposed due to the limited nature of the impacts. However, onsite compensatory mitigation is proposed to satisfy the requirements of the Massachusetts Department of Environmental Protection.

AUTHORITY

Permits are required pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899
- Section 404 of the Clean Water Act
- Section 103 of the Marine Protection, Research and Sanctuaries Act.

The decision whether to issue a permit will be based on an evaluation of the probable impact of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which may reasonably accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are: conservation, economics, aesthetics, general environmental concerns, wetlands, cultural value, fish and wildlife values, flood hazards, flood plain value, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are

also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Where the activity involves the discharge of dredged or fill material into waters of the United States or the transportation of dredged material for the purpose of disposing it in ocean waters, the evaluation of the impact of the activity in the public interest will also include application of the guidelines promulgated by the Administrator, U.S Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act, and/or Section 103 of the Marine Protection Research and Sanctuaries Act of 1972, as amended.

NATIONAL HISTORIC PRESERVATION ACT

Based on his initial review, the District Engineer has determined that little likelihood exists for the proposed work to impinge upon properties with cultural or Native American significance, or listed in, or eligible for listing in, the National Register of Historic Places. Therefore, no further consideration of the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, is necessary. This determination is based upon one or more of the following:

- a. The permit area has been extensively modified by previous work.
- b. The permit area has been recently created.
- c. The proposed activity is of limited nature and scope.
- d. Review of the latest published version of the National Register shows that no presence of registered properties listed as being eligible for inclusion therein are in the permit area or general vicinity.
- e. Coordination with the State Historic Preservation Officer and/or Tribal Historic Preservation Officer(s)

ENDANGERED SPECIES CONSULTATION

The New England District, Army Corps of Engineers has reviewed the list of species protected under the Endangered Species Act of 1973, as amended, which might occur at the project site. It is our preliminary determination that the proposed activity for which authorization is being sought is designed, situated or will be operated/used in such a manner that it is not likely to adversely affect any Federally listed endangered or threatened species or their designated critical habitat. By this Public Notice, we are requesting that the appropriate Federal Agency concur with our determination.

The following authorizations have been applied for, or have been, or will be obtained:

- Permit, License or Assent from State.
- Permit from Local Wetland Agency or Conservation Commission.
- Water Quality Certification in accordance with Section 401 of the Clean Water Act.

In order to properly evaluate the proposal, we are seeking public comment. Anyone wishing to comment is encouraged to do so. Comments should be submitted in writing by the above date. If you have any questions, please contact Dan Vasconcelos at (978) 318-8653, (800) 343-4789 or (800) 362-4367, if calling from within Massachusetts.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for a public hearing shall specifically state the reasons for holding a

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public hearing. The Corps holds public hearings for the purpose of obtaining public comments when that is the best means for understanding a wide variety of concerns from a diverse segment of the public.

The initial determinations made herein will be reviewed in light of facts submitted in response to this notice. All comments will be considered a matter of public record. Copies of letters of objection will be forwarded to the applicant who will normally be requested to contact objectors directly in an effort to reach an understanding.

THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK.



Karen K. Adams
Chief, Permits and Enforcement Branch
Regulatory Division

If you would prefer not to continue receiving Public Notices by email, please contact Ms. Tina Chaisson at (978) 318-8058 or e-mail her at bettina.m.chaisson@usace.army.mil. You may also check here () and return this portion of the Public Notice to: Bettina Chaisson, Regulatory Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751.

NAME: _____
ADDRESS: _____
PHONE: _____

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	CM/STP-002S(669)	1	32
PROJECT FILE NO.		604532	

TITLE SHEET & INDEX

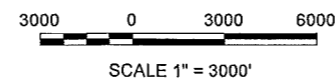
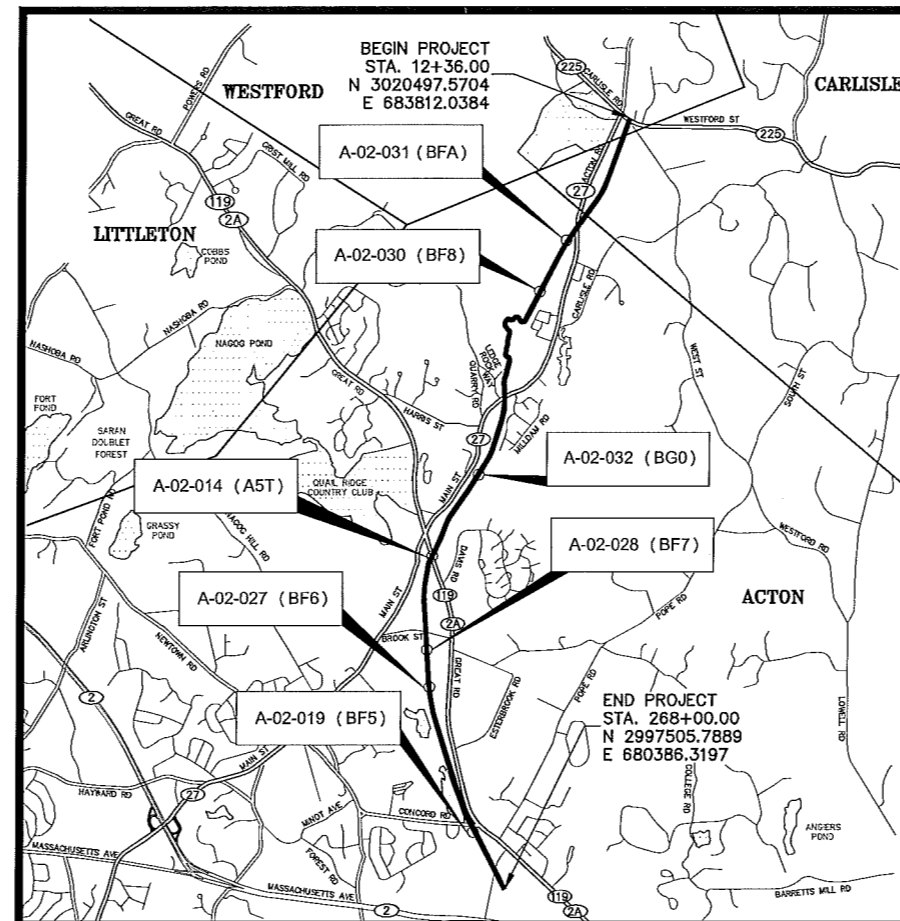
PLAN AND PROFILE OF BRUCE FREEMAN RAIL TRAIL PHASE 2A

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.

INDEX	
SHEET NO.	DESCRIPTION
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



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 #



RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED:

APPROVED

DIVISION ADMINISTRATOR DATE

HIGHWAY ADMINISTRATOR DATE

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

EXISTING **PROPOSED**

GENERAL LEGEND

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

GENERAL ABBREVIATIONS

ABAN	ABANDON
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)
HWY	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

- EXISTING CONDITIONS INFORMATION IS BASED ON SURVEY PROVIDED BY JUDITH NITSCH ENGINEERING, DATED APRIL 2, 2007. ELEVATIONS ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). ALL SURVEY POINTS HAVE BEEN DETERMINED WITH RESPECT TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM AS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83). UNITS ARE ENGLISH.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
- WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
- THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
- AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
- THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
- ALL EXISTING STATE, COUNTY, CITY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
- ALL TRANSVERSE JOINTS, AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALANT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION NUMBER SS-5-1401.
- ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
- THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
- ALL PROPERTY LINES BETWEEN ABUTTERS ARE APPROXIMATE ONLY.
- PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
- ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
- ALL GATE BOXES, SERVICE BOXES AND PUBLICLY OWNED MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
- ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
- THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
- CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
- THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS WILL BE CONFIRMED IN THE FIELD.
- CONTRACTOR SHALL REMOVE EXISTING ORGANIC MATERIAL THAT IS UNSUITABLE FOR REUSE AND DISPOSE OF OUTSIDE OF THE PROJECT LIMITS. IT IS ASSUMED THAT ALL OTHER EXCAVATED SUITABLE MATERIAL WILL REMAIN WITHIN THE PROJECT LIMITS. SEE SPECIAL PROVISIONS FOR DETAILS.

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

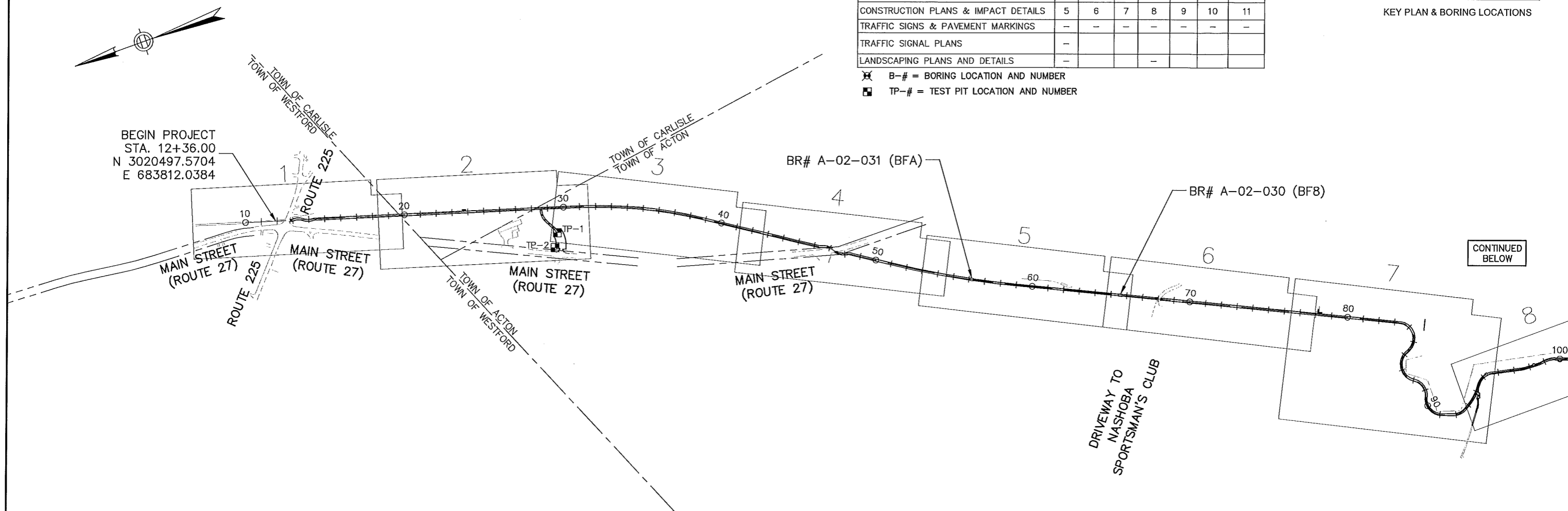
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	3	32
PROJECT FILE NO.		604532	

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

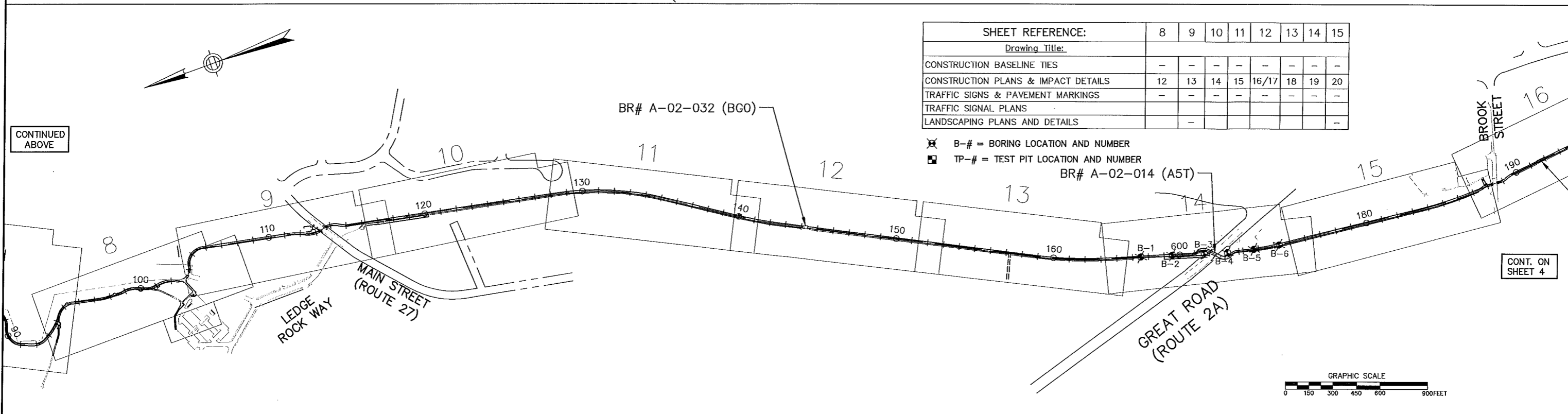
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E 683812.0384



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BELOW

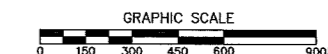
SHEET REFERENCE:	8	9	10	11	12	13	14	15
Drawing Title:	Drawing Number:							
CONSTRUCTION BASELINE TIES	-	-	-	-	-	-	-	-
CONSTRUCTION PLANS & IMPACT DETAILS	12	13	14	15	16/17	18	19	20
TRAFFIC SIGNS & PAVEMENT MARKINGS	-	-	-	-	-	-	-	-
TRAFFIC SIGNAL PLANS	-	-	-	-	-	-	-	-
LANDSCAPING PLANS AND DETAILS	-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

- ⊗ B-# = BORING LOCATION AND NUMBER
- ⊠ TP-# = TEST PIT LOCATION AND NUMBER



CONTINUED
ABOVE

CONT. ON
SHEET 4

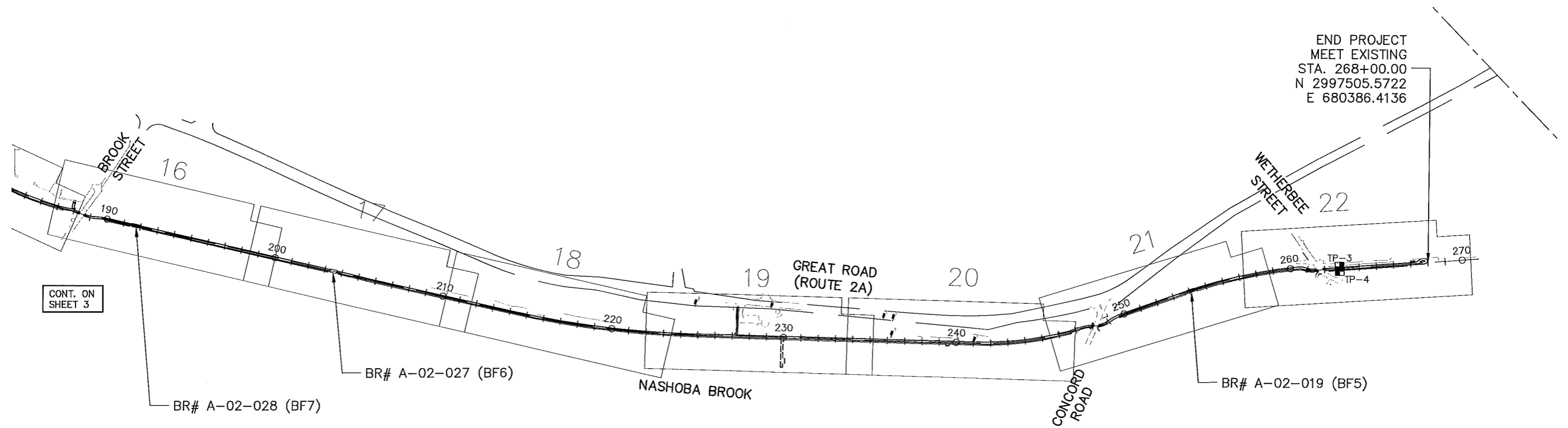
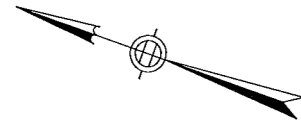


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WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

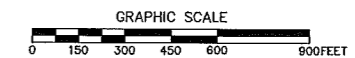
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	4	32
PROJECT FILE NO.		604532	

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					-	-	-

- X B-# = BORING LOCATION AND NUMBER
- TP-# = TEST PIT LOCATION AND NUMBER



HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

SEE SHEET 66

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE BELOW

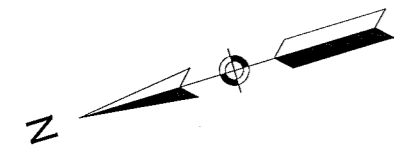
TIMBER RAIL FENCE

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/S/TP-002S(669)	5	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT
DETAILS



176
N/F
Dennis F. McCabe
BK. 2195 PG. 206

PROP. 10' X 30' FILTER STRIP
AND LEVEL SPREADER (TYP.)
(SEE SHEET 85 FOR DETAILS)

PROP. TRAFFIC SIGNAL
CONDUIT (TYP.)

BEGIN PROJECT
STA. 12+36.00
MEET EXISTING
N3020497.5704
E683812.0384

24" CMP
INV. = 194.99
LIMIT OF WORK
STA. 406+10.57
MEET EXISTING

N/F
Daniel S. Hanley
BK. 1724 PG. 346

N/F
Roger B. Plalsted
Mary June Plalsted
BK. 2312 PG. 297

PROP. SWALE (TYP.)
175

PROP. SLOPE LIMIT
& (TYP.)

PROP. CONST.
E & PGL

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

PROP. COMPOST
TOPSOIL & SEED (TYP.)

PROP. COMPOST FILTER TUBES
(TYP.)

PROP. CLEARING &
GRUBBING (TYP.)

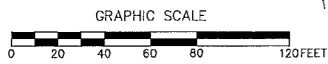
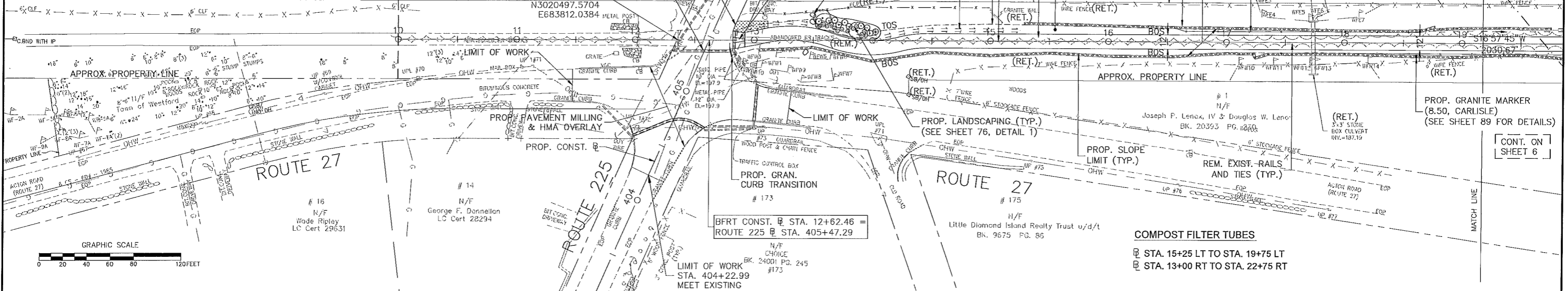
PROP. TIMBER RAIL FENCE (TYP.)
(SEE SHEET 86 FOR DETAILS)

(RET.)
GRAN. HEADWALL
INV. = 186.58

(RET.)
SWALE

PROP. GRANITE MARKER
(8.50, CARLISLE)
(SEE SHEET 89 FOR DETAILS)

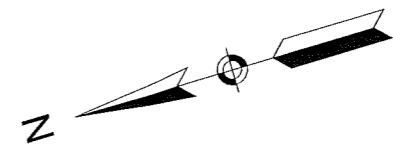
CONT. ON
SHEET 6



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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CW/SFP-0025(669)	6	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT
DETAILS



HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

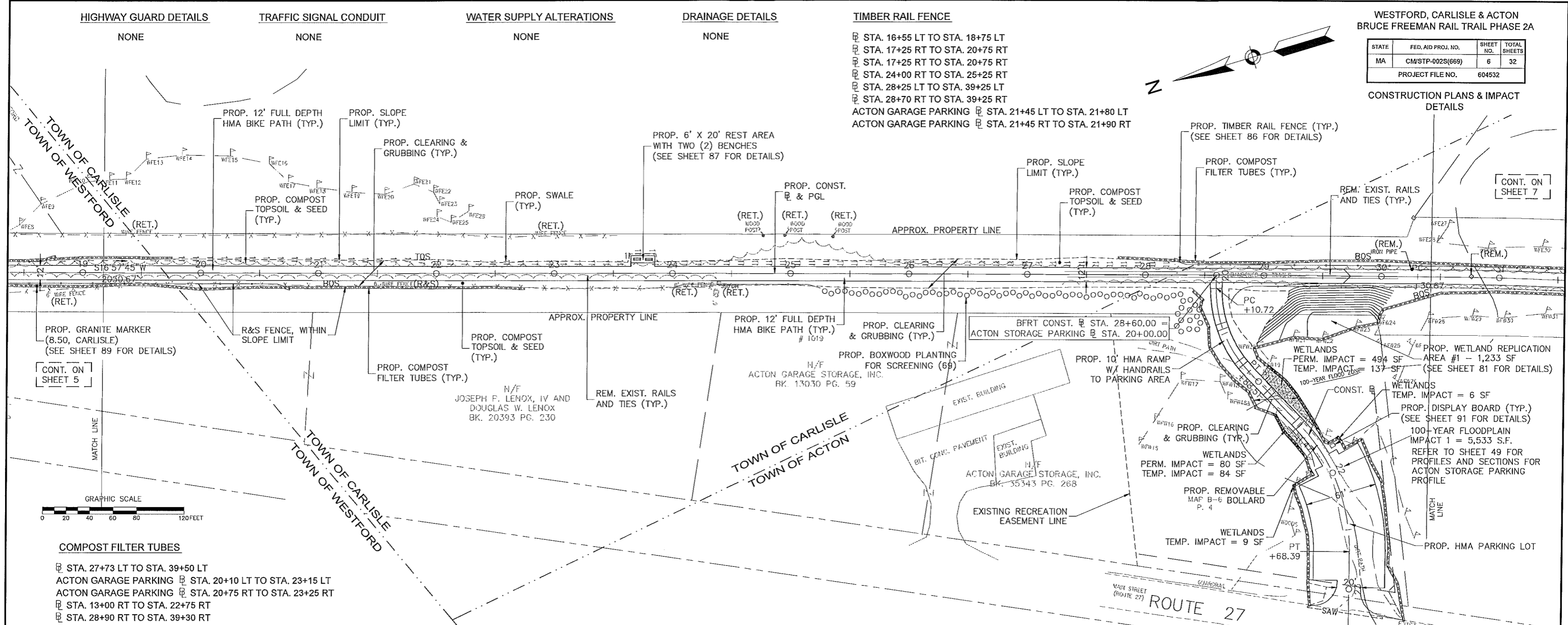
NONE

DRAINAGE DETAILS

NONE

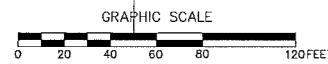
TIMBER RAIL FENCE

- ☐ 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



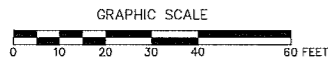
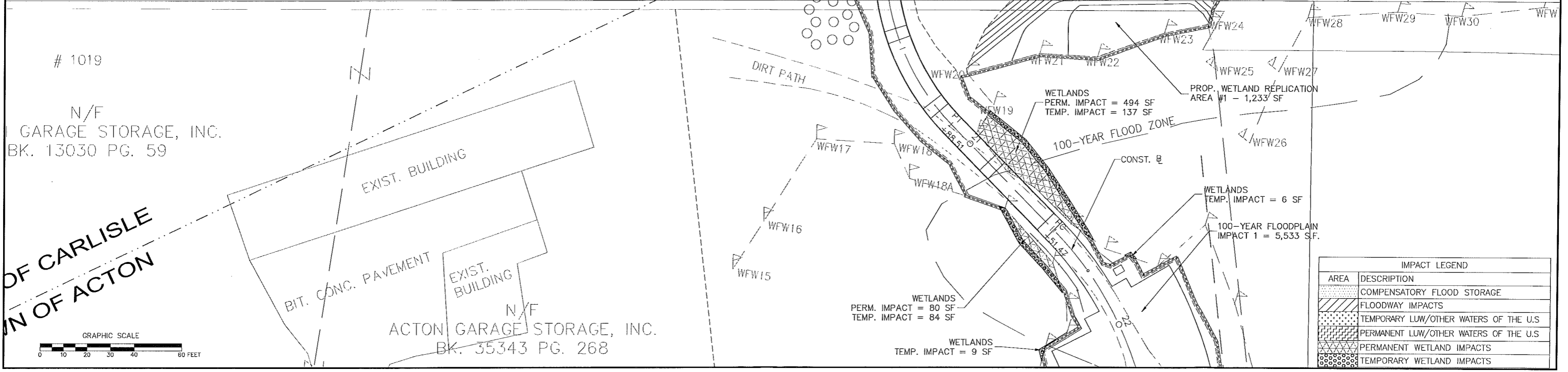
CONT. ON SHEET 5

CONT. ON SHEET 7



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
[Hatched pattern]	COMPENSATORY FLOOD STORAGE
[Diagonal lines]	FLOODWAY IMPACTS
[Dotted pattern]	TEMPORARY LUW/OTHER WATERS OF THE U.S.
[Cross-hatched pattern]	PERMANENT LUW/OTHER WATERS OF THE U.S.
[Stippled pattern]	PERMANENT WETLAND IMPACTS
[Grid pattern]	TEMPORARY WETLAND IMPACTS

10031_2A_CO_ACC01.DWG Plotted on 25-May-2014 1:49 PM

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

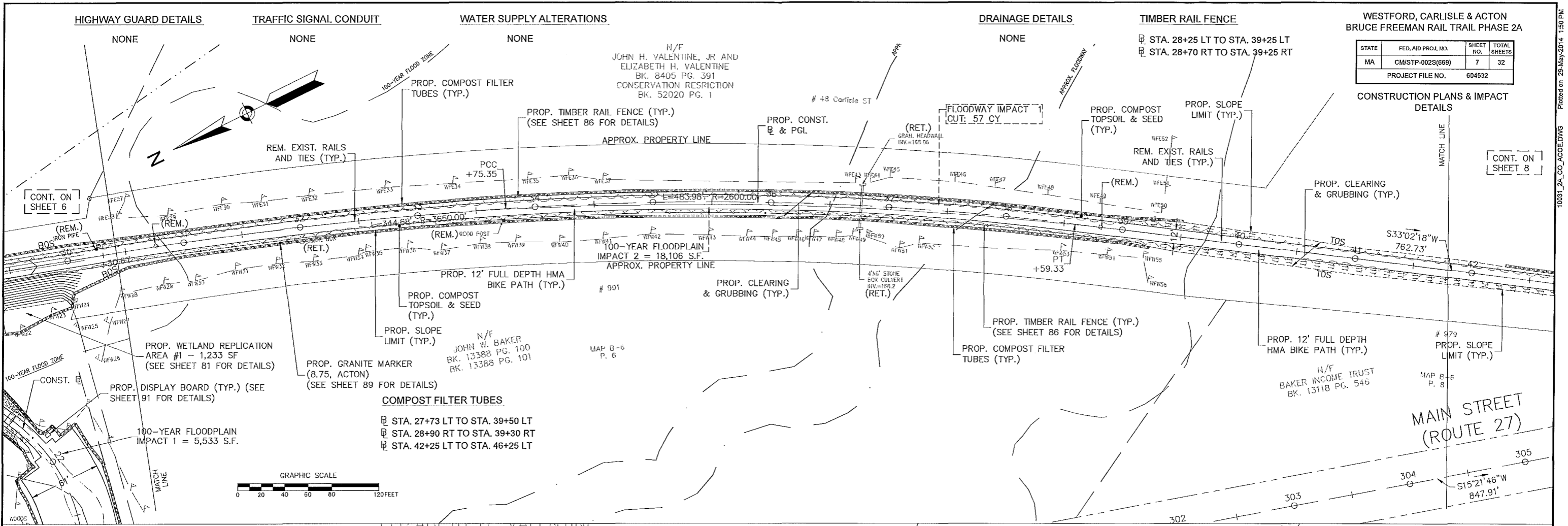
DRAINAGE DETAILS

TIMBER RAIL FENCE

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

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/MSTP-002S(669)	7	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT DETAILS

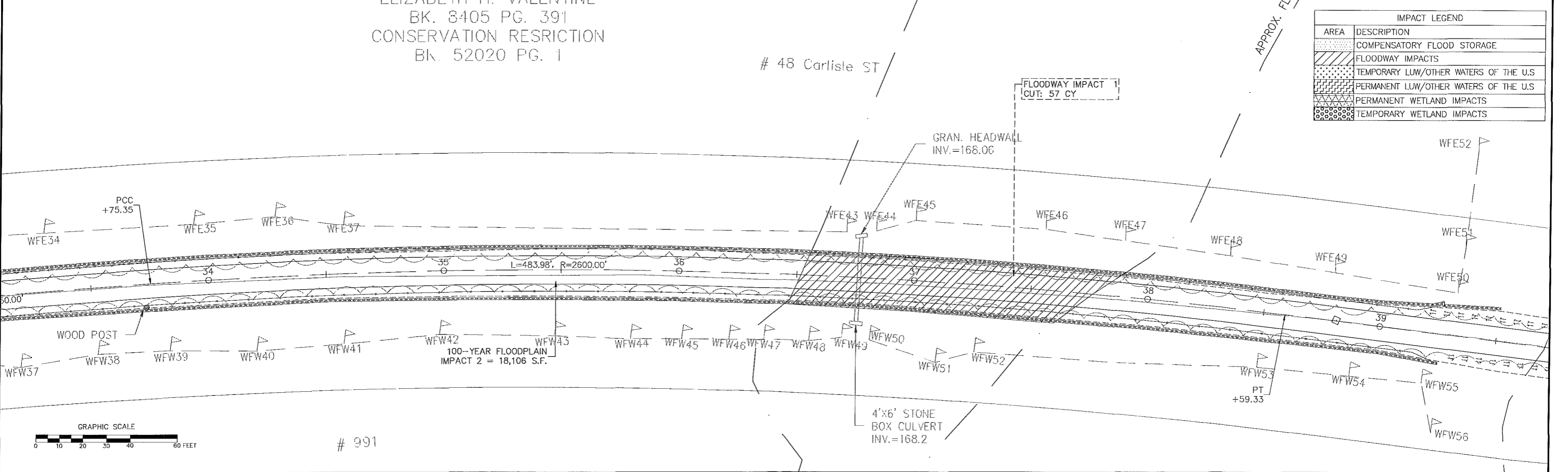


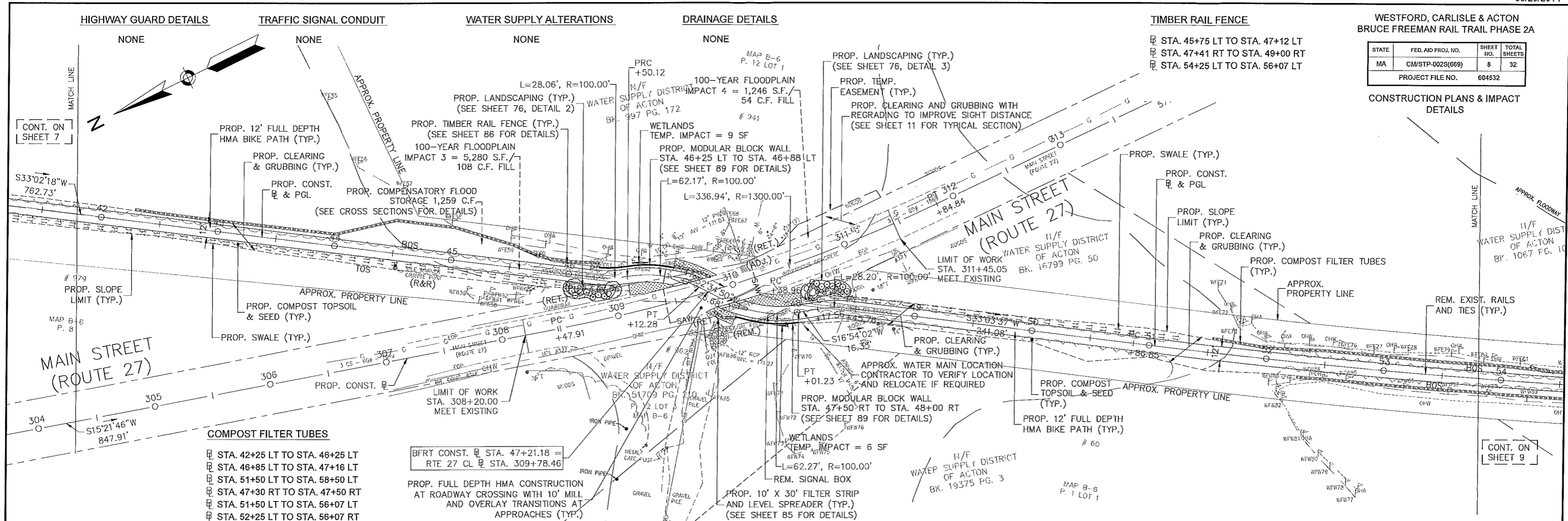
ELIZABETH H. VALENTINE
BK. 8405 PG. 391
CONSERVATION RESTRICTION
BK. 52020 PG. 1

48 Carlisle ST

991

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





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

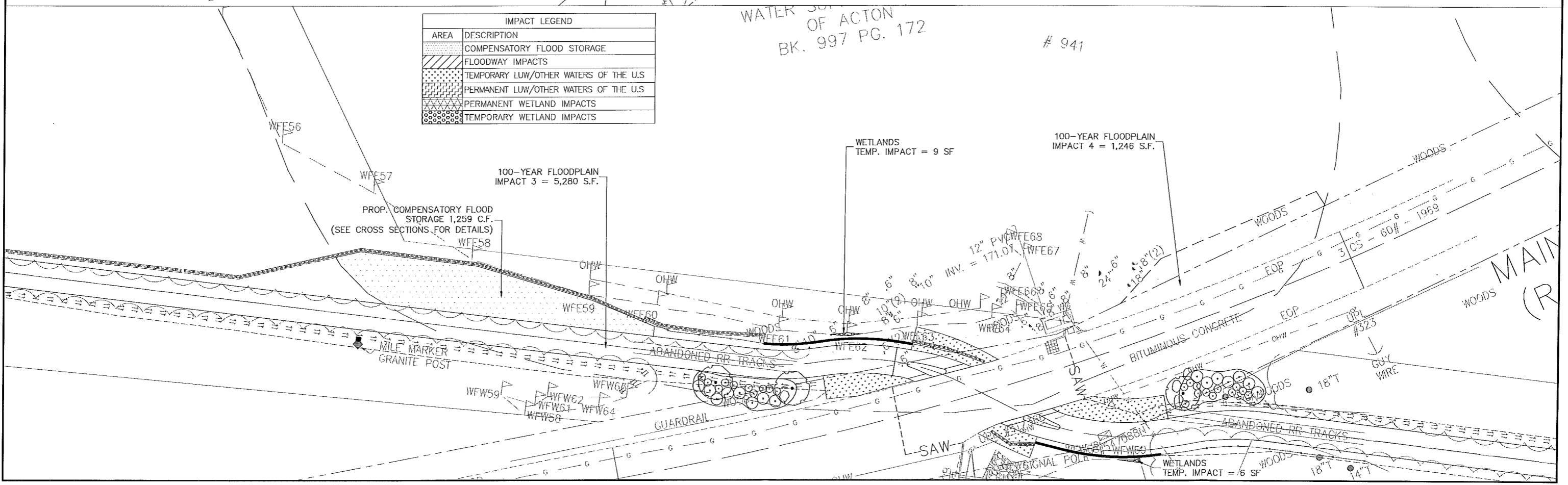
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	8	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS

- 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

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

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



10031_2A_CO_ACC02DWS Plotted on 28-May-2014 1:50 PM

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

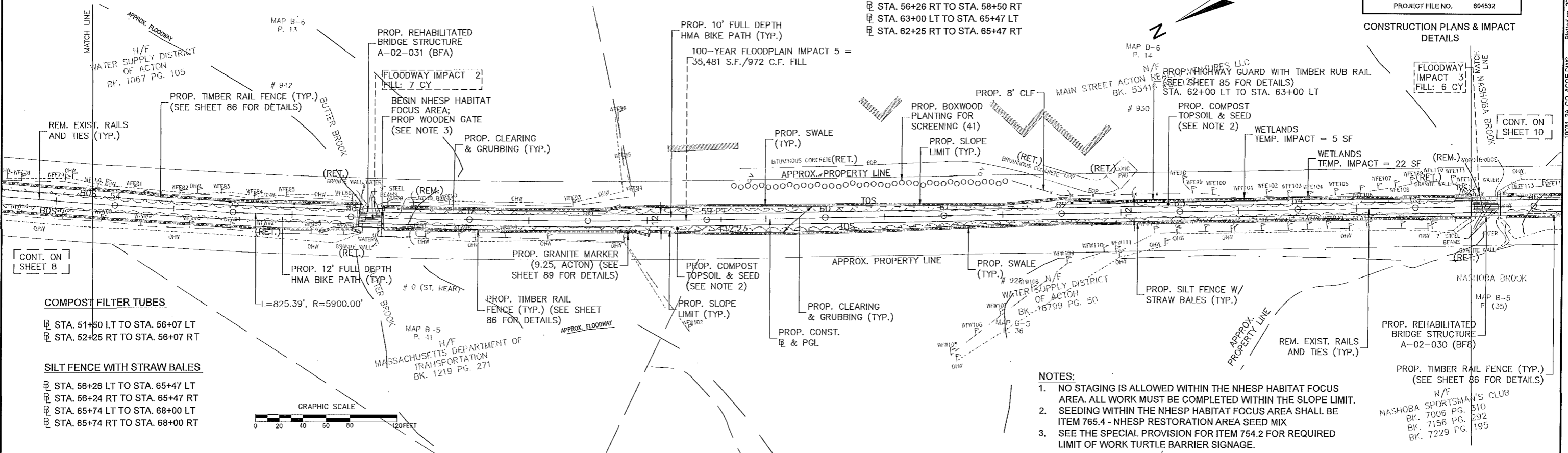
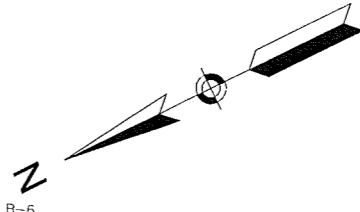
TIMBER RAIL FENCE

- Ⓜ 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

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



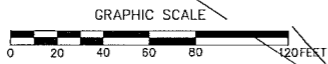
CONT. ON SHEET 8

COMPOST FILTER TUBES

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

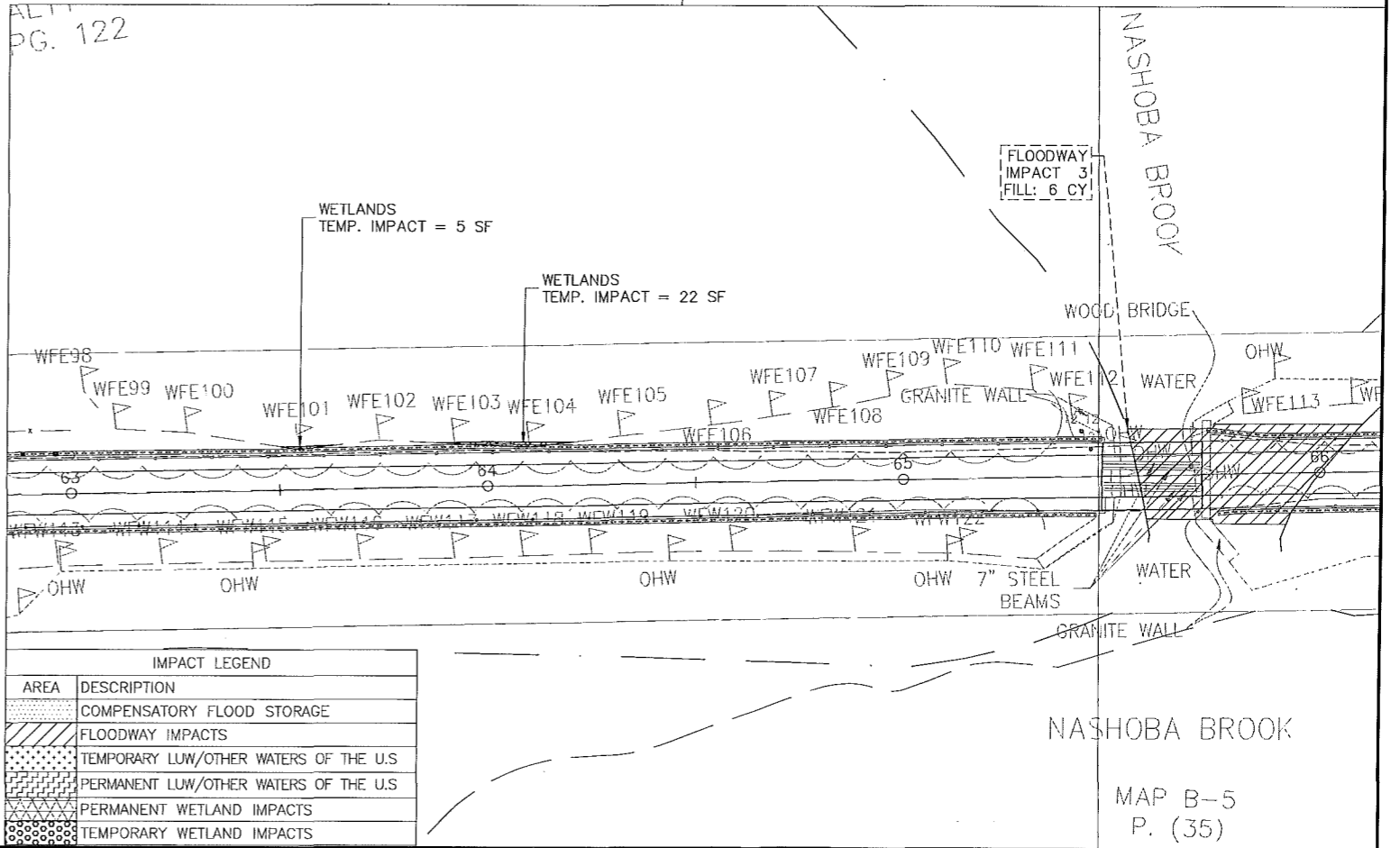
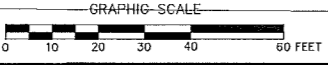
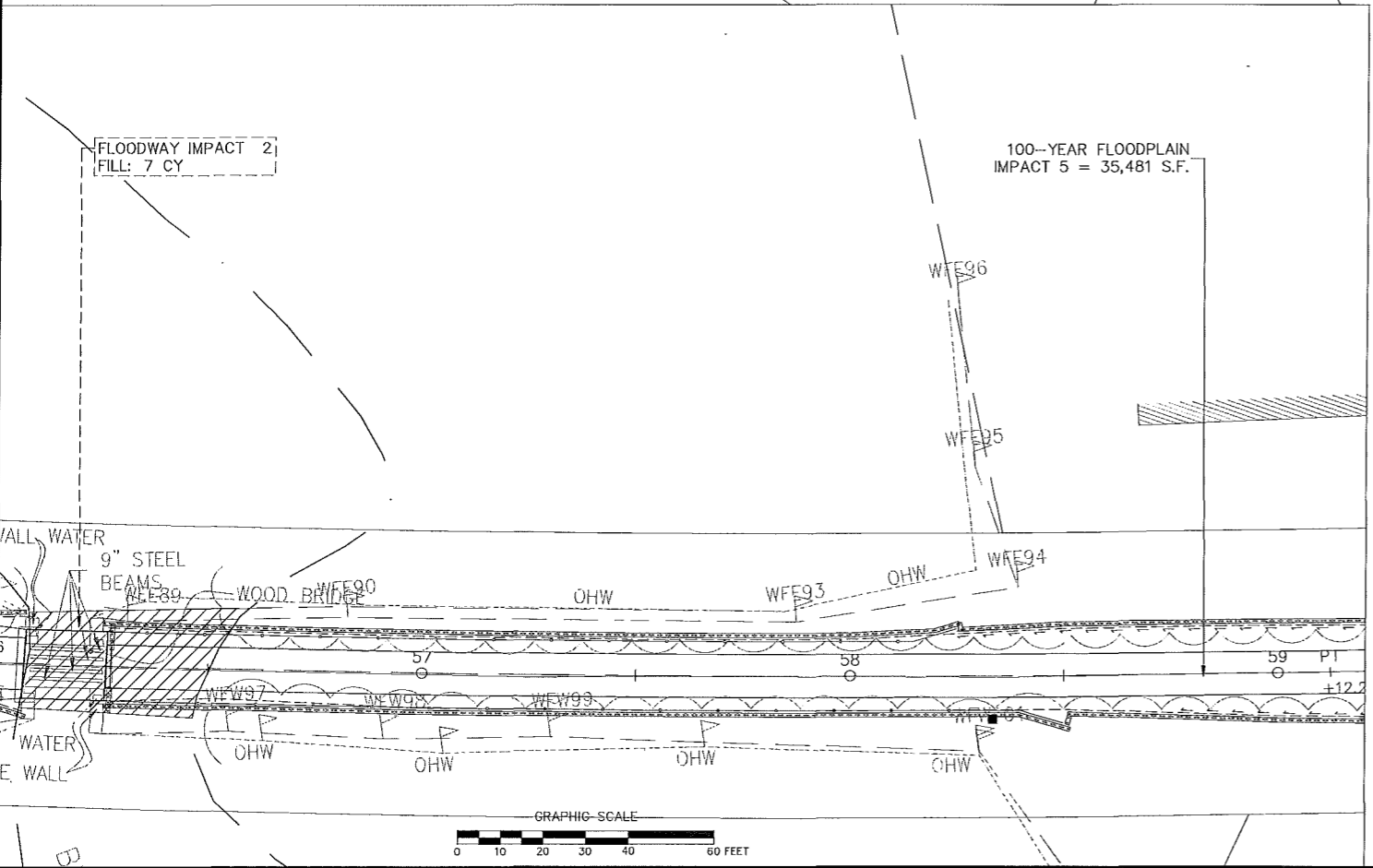
SILT FENCE WITH STRAW BALES

- Ⓜ 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:

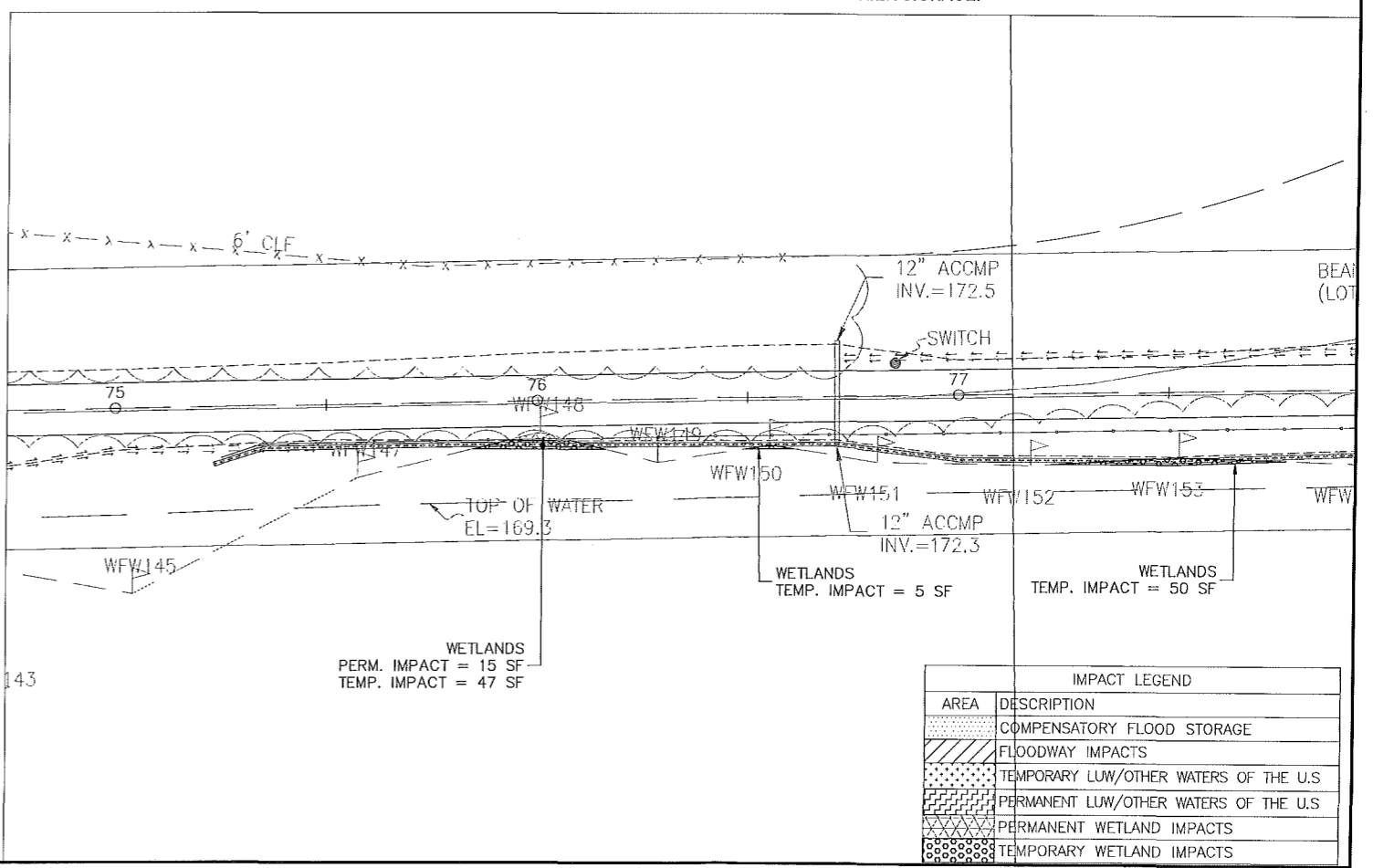
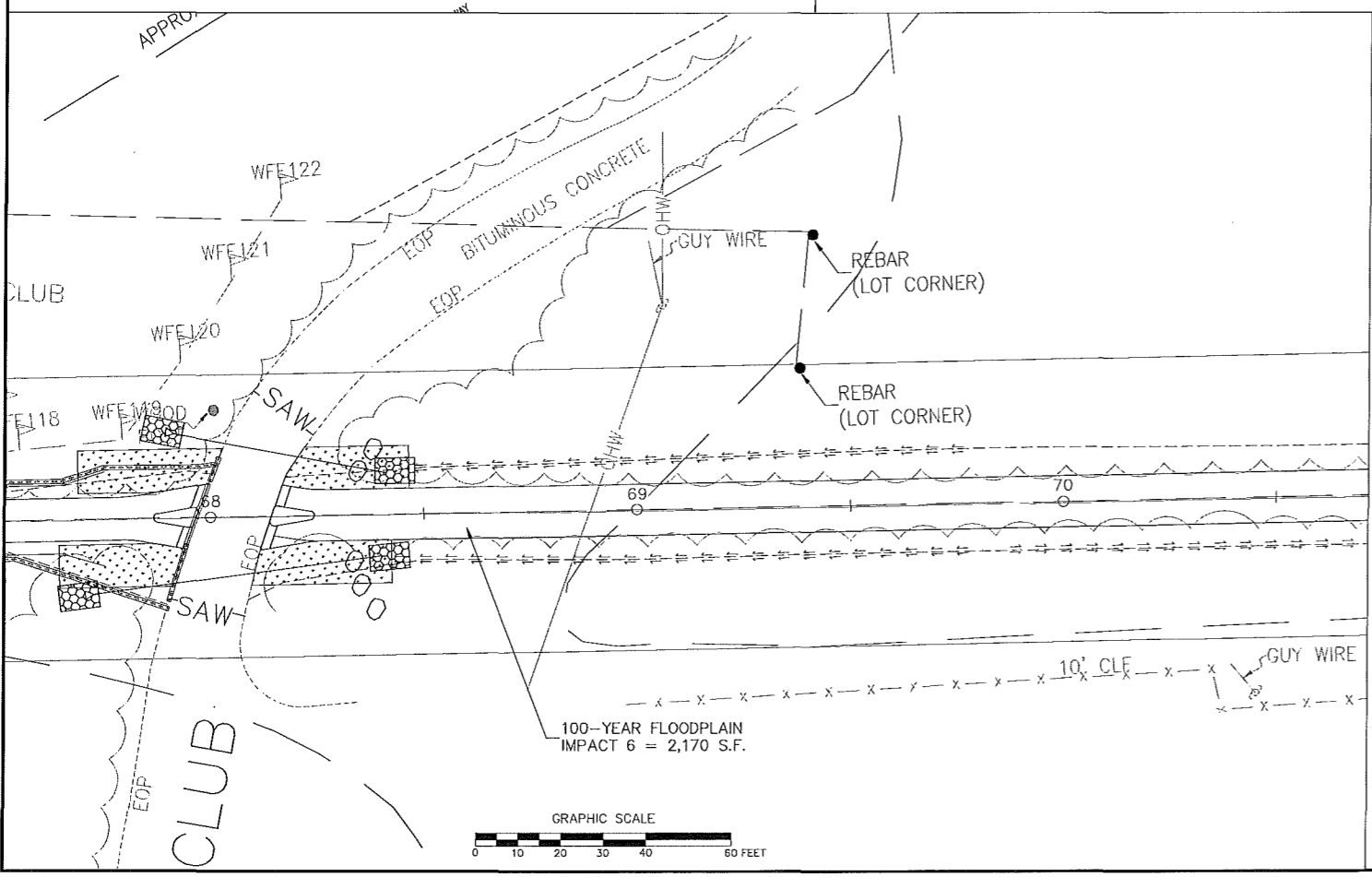
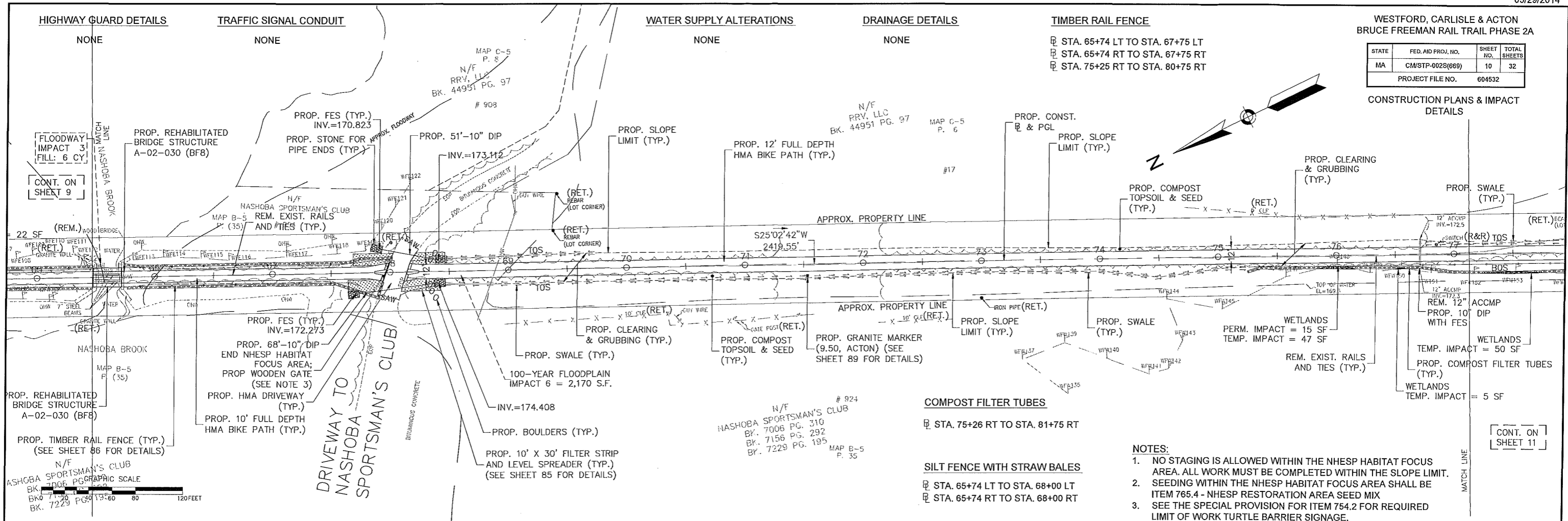
- NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
- SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
- SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER SIGNAGE.



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

NASHOBA BROOK

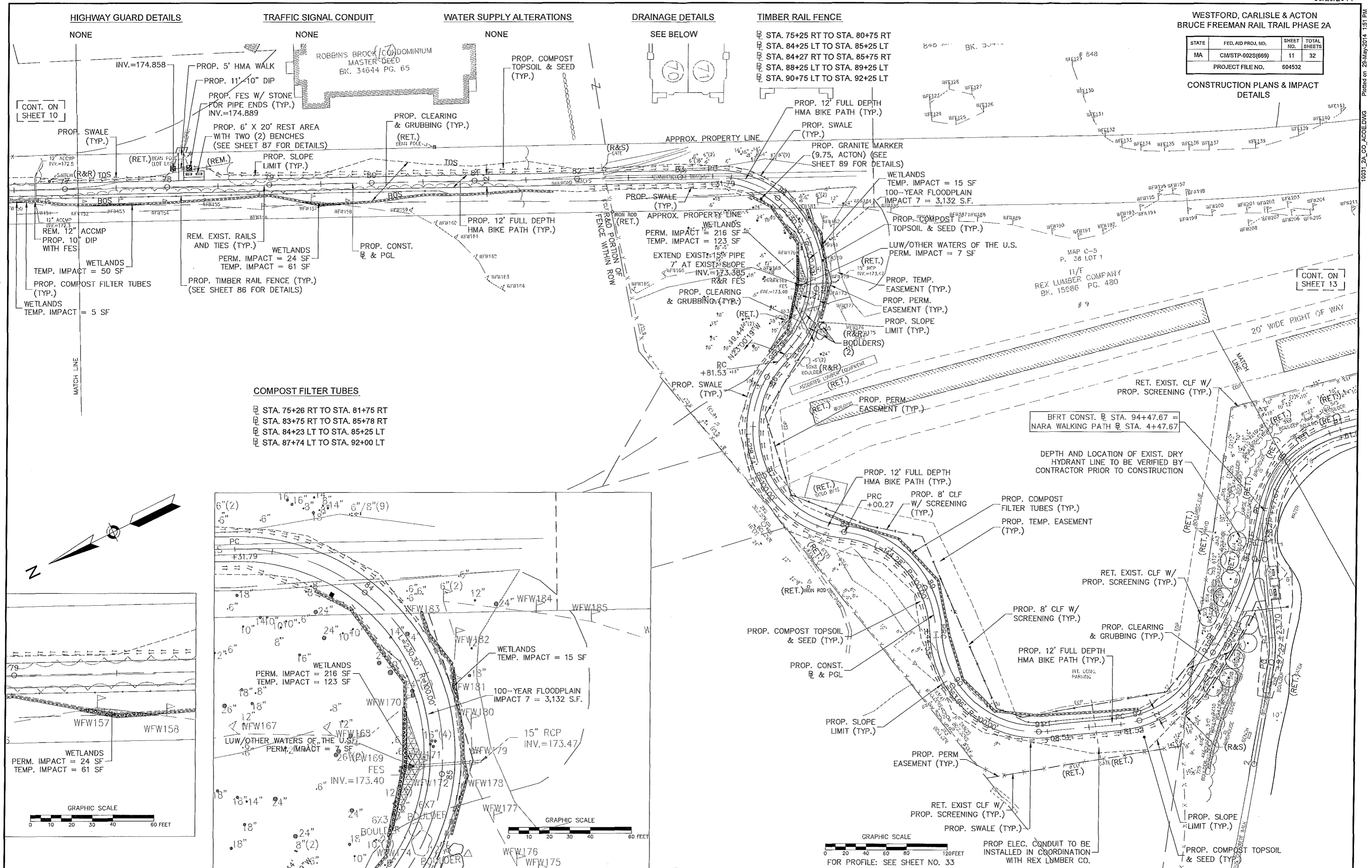
MAP B-5
P. (35)



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



HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

TIMBER RAIL FENCE

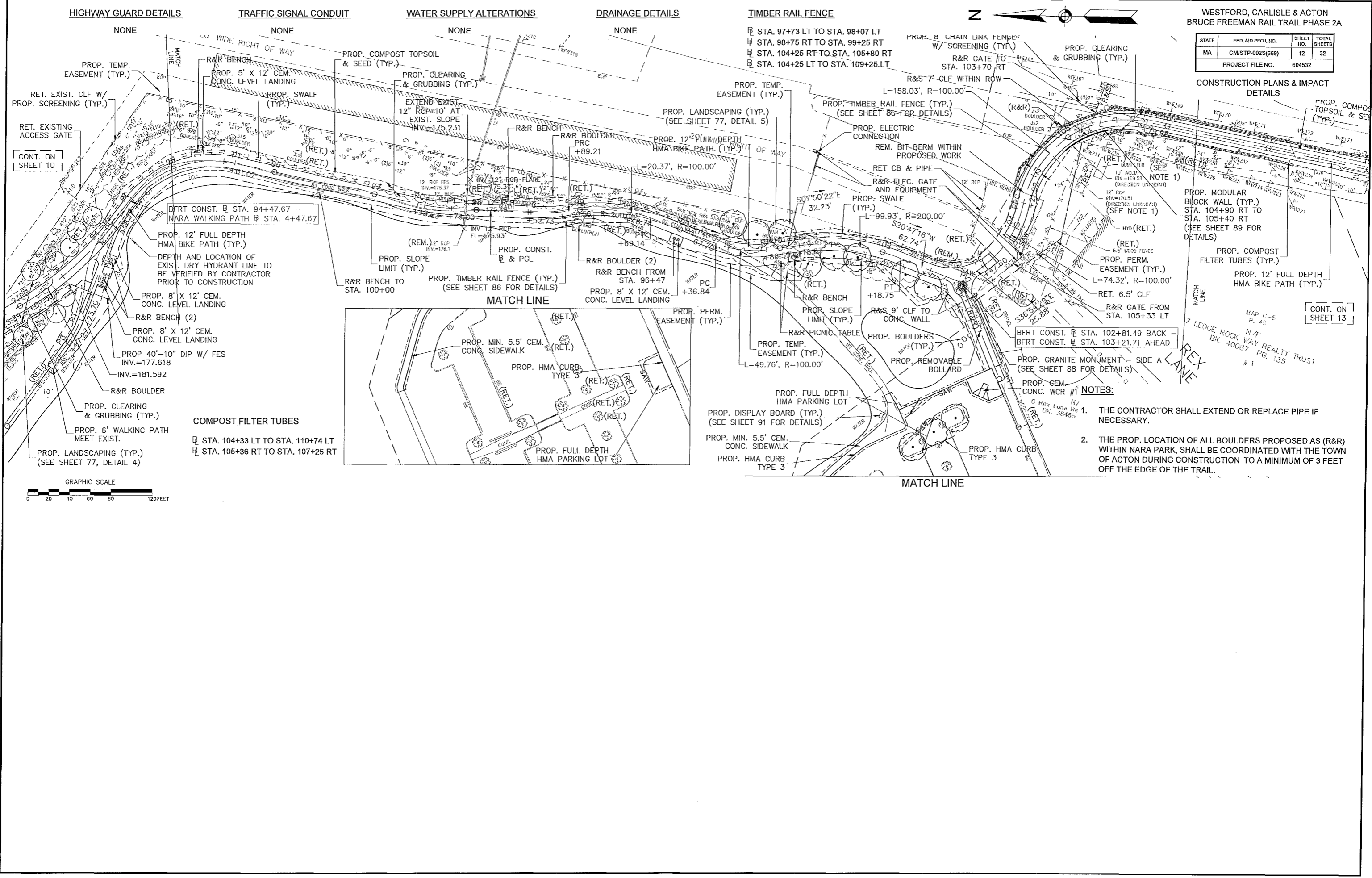
COMPOST FILTER TUBES

- 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

CONT. ON SHEET 10

CONT. ON SHEET 13

10031_2A_CO_ACCOMP.DWG Plotted on 29-May-2014 1:51 PM



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

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



HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

PROP. MODULAR
BLOCK WALL (TYP.)
STA. 104+90 RT TO
STA. 105+40 RT
(SEE SHEET 89 FOR
DETAILS)

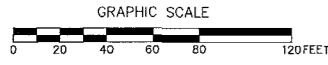
PROP. COMPOST
FILTER TUBES (TYP.)

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

- 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.

CONT. ON
SHEET 10

CONT. ON
SHEET 13



COMPOST FILTER TUBES

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

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

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MATCH LINE

MATCH LINE

MATCH LINE

HIGHWAY GUARD DETAILS

STA. 116+29 RT - ITEM 627.1
STA. 116+29 RT TO STA. 120+21RT - ITEM 603.7
PROP. TIMBER RAIL FENCE (TYP.)
(SEE SHEET 86 FOR DETAILS)
PROP. CLEARING & GRUBBING (TYP.)

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

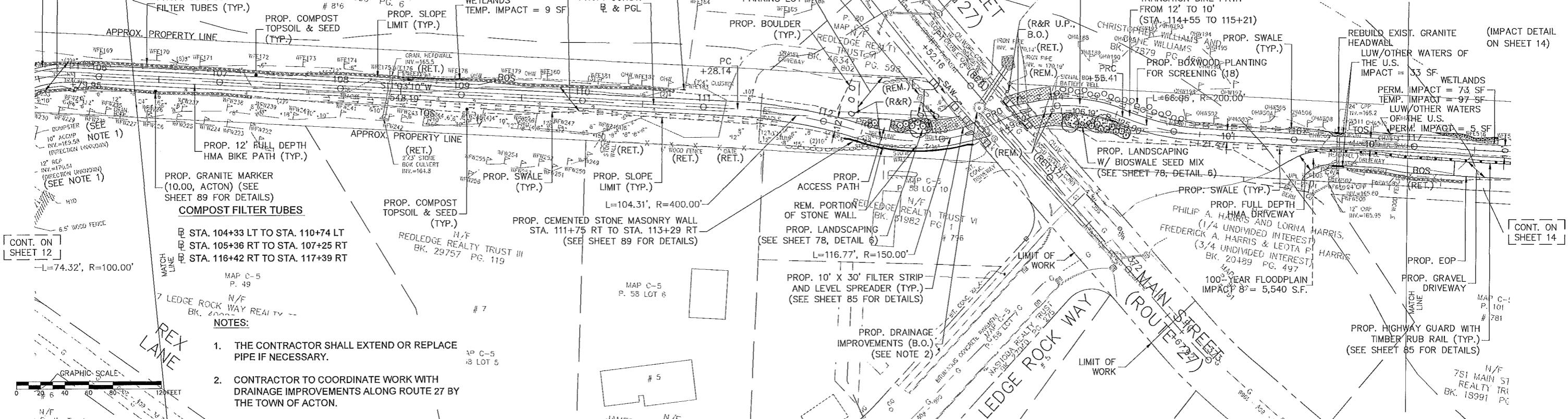
TIMBER RAIL FENCE

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	

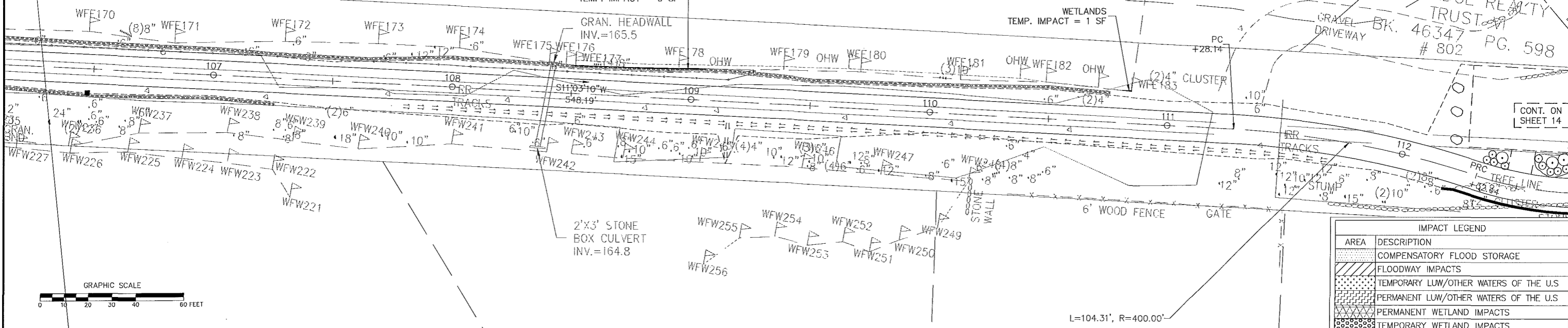
CONSTRUCTION PLANS & IMPACT DETAILS



ACTON BLOCK COMPANY (REGISTERED LAND) BK. 539 PG. 6 # 816

WETLANDS TEMP. IMPACT = 9 SF

WETLANDS TEMP. IMPACT = 1 SF



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

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

HIGHWAY GUARD WITH TIMBER RAIL BACK

TIMBER RAIL FENCE

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

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

CONSTRUCTION PLANS & IMPACT DETAILS

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

NONE

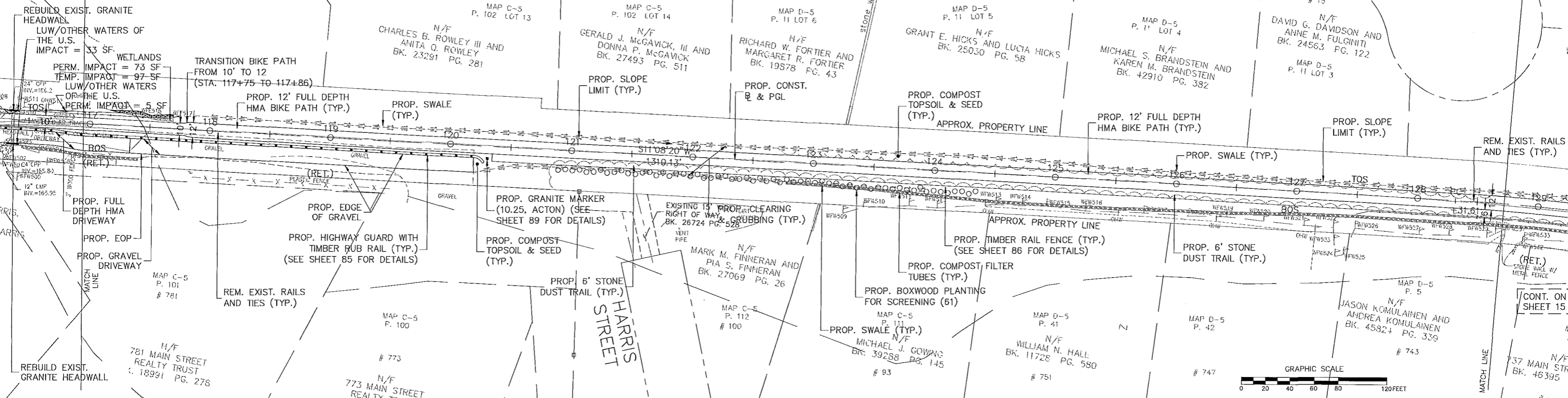
NONE

NONE

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

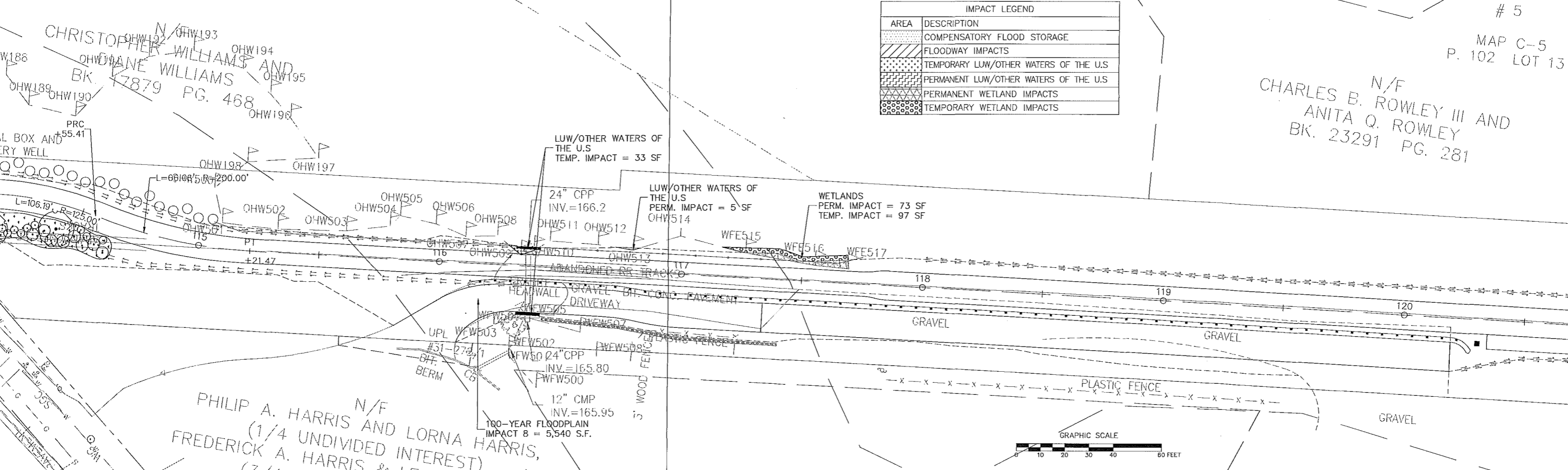
STA. 115+25 LT TO STA. 117+75 LT
STA. 127+50 RT TO STA. 128+80 RT

CONT. ON SHEET 13



CONT. ON SHEET 15

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



HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

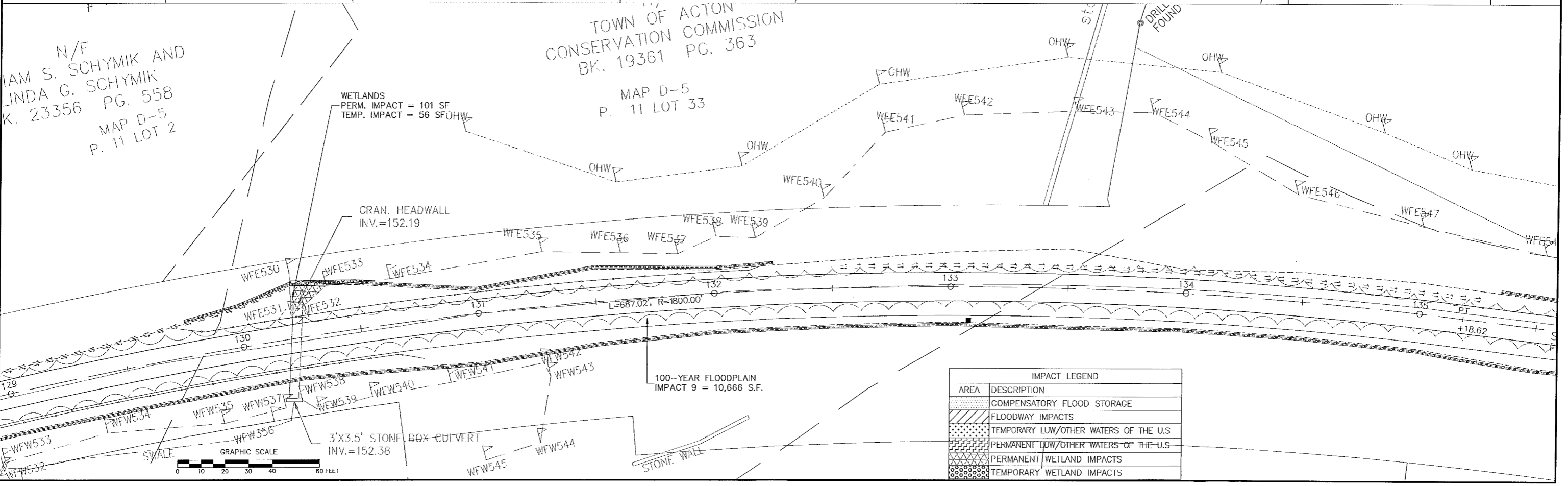
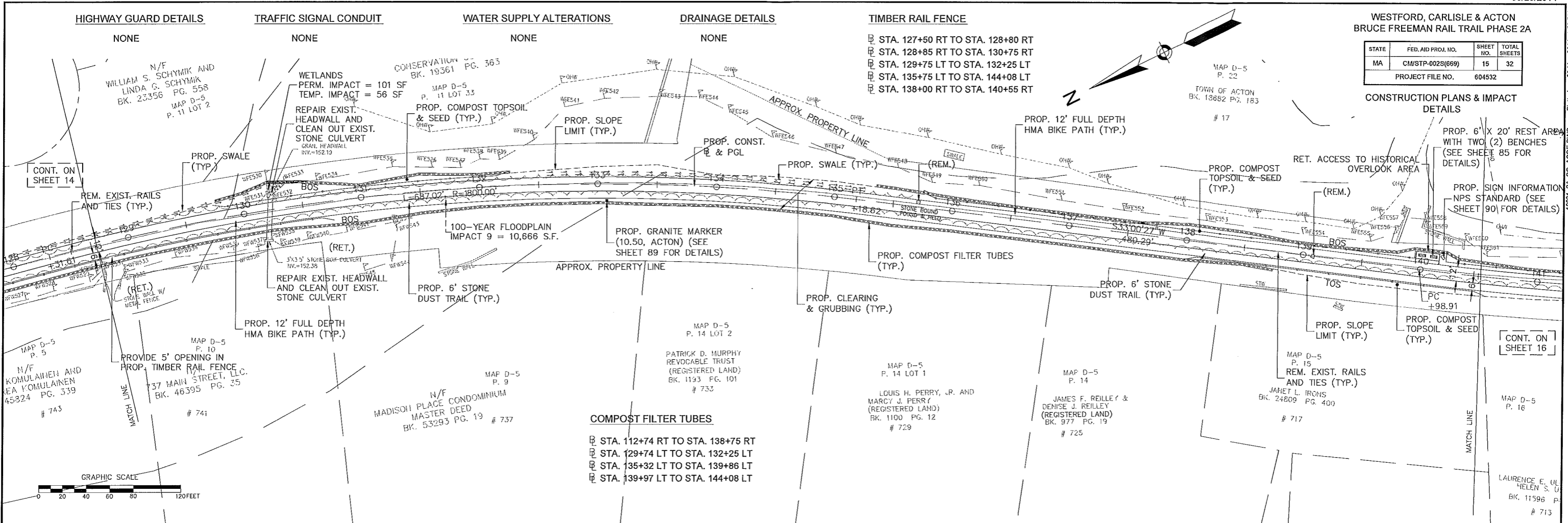
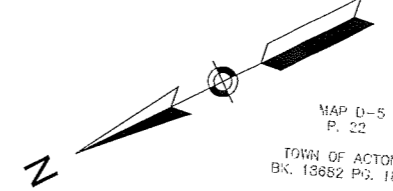
TIMBER RAIL FENCE

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	

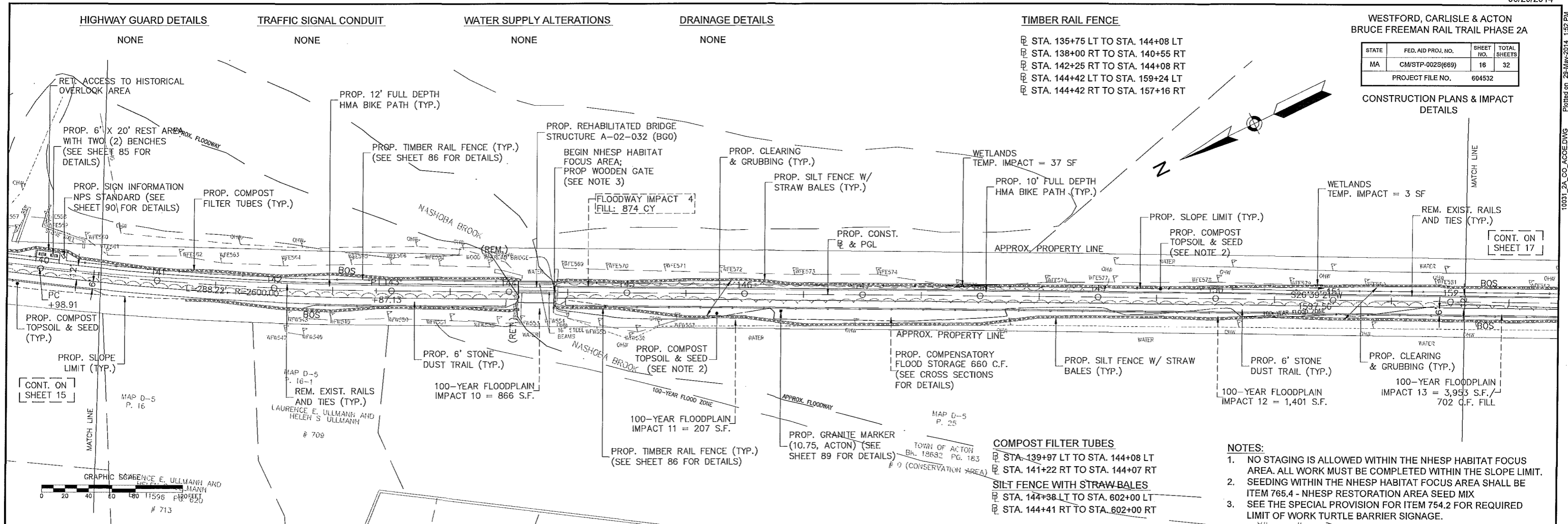
CONSTRUCTION PLANS & IMPACT DETAILS

- 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



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

Plotted on 29-May-2014 1:52 PM T0031_2A_CO_ACCO.DWG

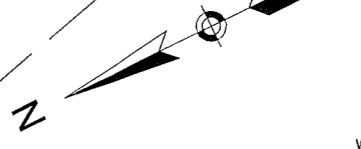


WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

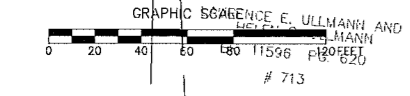
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	16	32
PROJECT FILE NO.			604532

CONSTRUCTION PLANS & IMPACT DETAILS

- 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

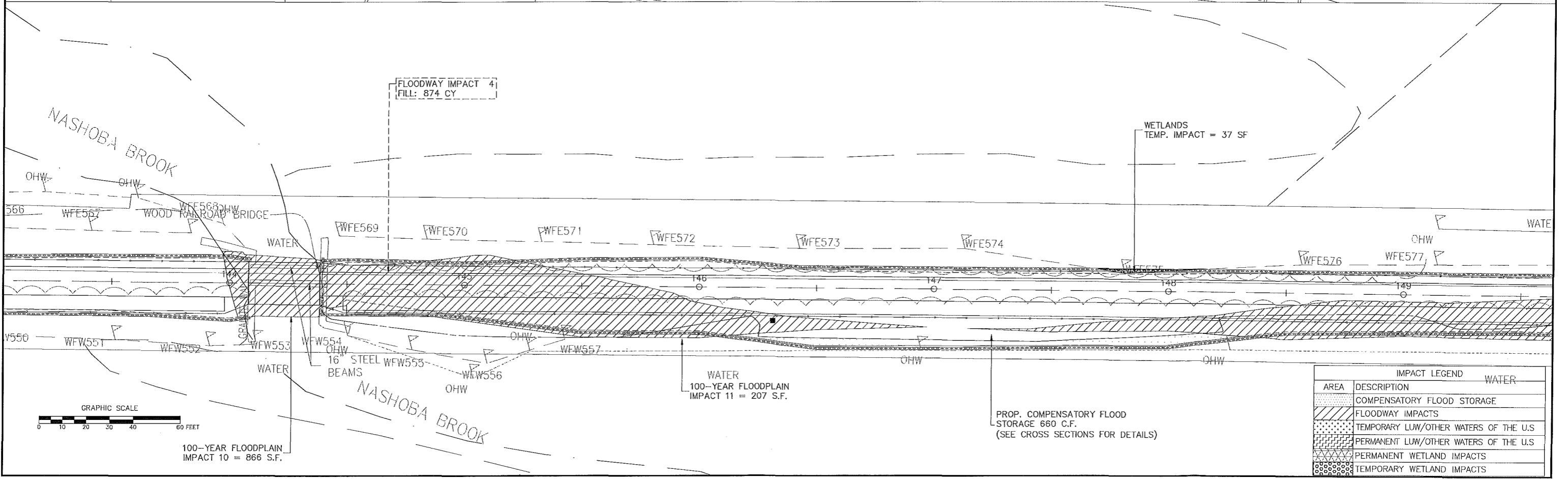


CONT. ON SHEET 17

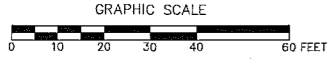


- NOTES:**
- NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
 - SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
 - SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE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

- 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



IMPACT LEGEND		WATER
AREA	DESCRIPTION	
[Hatched pattern]	COMPENSATORY FLOOD STORAGE	
[Dotted pattern]	FLOODWAY IMPACTS	
[Cross-hatched pattern]	TEMPORARY LUW/OTHER WATERS OF THE U.S.	
[Diagonal lines]	PERMANENT LUW/OTHER WATERS OF THE U.S.	
[Wavy lines]	PERMANENT WETLAND IMPACTS	
[Stippled pattern]	TEMPORARY WETLAND IMPACTS	



100-YEAR FLOODPLAIN
IMPACT 10 = 866 S.F.

PROP. COMPENSATORY FLOOD STORAGE 660 C.F.
(SEE CROSS SECTIONS FOR DETAILS)

WATER
100-YEAR FLOODPLAIN
IMPACT 11 = 207 S.F.

WETLANDS
TEMP. IMPACT = 37 SF

FLOODWAY IMPACT 4
FILL: 874 CY

100-YEAR FLOODPLAIN
IMPACT 10 = 866 S.F.

100-YEAR FLOODPLAIN
IMPACT 11 = 207 S.F.

PROP. TIMBER RAIL FENCE (TYP.)
(SEE SHEET 86 FOR DETAILS)

PROP. COMPOST TOPSOIL & SEED
(SEE NOTE 2)

PROP. 6' STONE DUST TRAIL (TYP.)

MAP D-5
P. 16-1
REM. EXIST. RAILS AND TIES (TYP.)
LAURENCE E. ULLMANN AND HELEN S. ULLMANN
709

PROP. COMPOST TOPSOIL & SEED (TYP.)

PROP. SLOPE LIMIT (TYP.)

CONT. ON SHEET 15

PROP. SIGN INFORMATION NPS STANDARD (SEE SHEET 90 FOR DETAILS)

PROP. 6' X 20' REST AREA WITH TWO (2) BENCHES (SEE SHEET 85 FOR DETAILS)

RET. ACCESS TO HISTORICAL OVERLOOK AREA

PROP. COMPOST FILTER TUBES (TYP.)

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

PROP. TIMBER RAIL FENCE (TYP.) (SEE SHEET 86 FOR DETAILS)

PROP. REHABILITATED BRIDGE STRUCTURE A-02-032 (BGO)

BEGIN NHESP HABITAT FOCUS AREA; PROP WOODEN GATE (SEE NOTE 3)

PROP. CLEARING & GRUBBING (TYP.)

PROP. SILT FENCE W/ STRAW BALES (TYP.)

PROP. CONST. R & PGL

PROP. 10' FULL DEPTH HMA BIKE PATH (TYP.)

WETLANDS TEMP. IMPACT = 37 SF

PROP. SLOPE LIMIT (TYP.)

PROP. COMPOST TOPSOIL & SEED (SEE NOTE 2)

WETLANDS TEMP. IMPACT = 3 SF

REM. EXIST. RAILS AND TIES (TYP.)

PROP. CLEARING & GRUBBING (TYP.)

100-YEAR FLOODPLAIN IMPACT 13 = 3,953 S.F./702 C.F. FILL

100-YEAR FLOODPLAIN IMPACT 12 = 1,401 S.F.

PROP. SILT FENCE W/ STRAW BALES (TYP.)

PROP. COMPENSATORY FLOOD STORAGE 660 C.F. (SEE CROSS SECTIONS FOR DETAILS)

PROP. GRANITE MARKER (10.75, ACTON) (SEE SHEET 89 FOR DETAILS)

MAP D-5
P. 25
TOWN OF ACTON
BK. 18632 PG. 183
0 (CONSERVATION AREA)

APPROX. PROPERTY LINE

APPROX. PROPERTY LINE

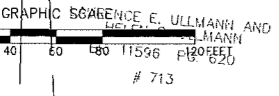
APPROX. FLOODWAY

100-YEAR FLOODPLAIN IMPACT 11 = 207 S.F.

100-YEAR FLOODPLAIN IMPACT 10 = 866 S.F.

MAP D-5
P. 16-1
REM. EXIST. RAILS AND TIES (TYP.)
LAURENCE E. ULLMANN AND HELEN S. ULLMANN
709

MAP D-5
P. 16



GRAPHIC SCALE
LAURENCE E. ULLMANN AND HELEN S. ULLMANN
713

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

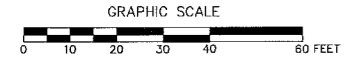
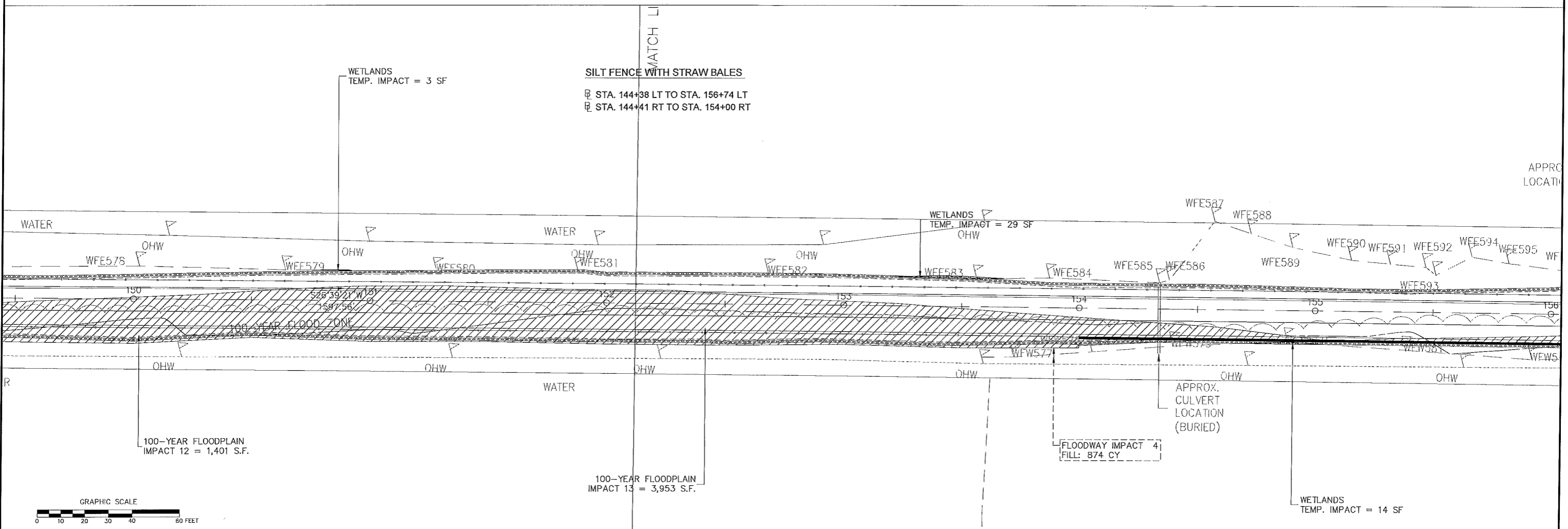
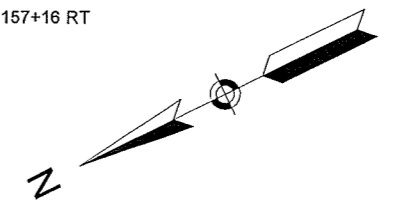
TIMBER RAIL FENCE

- ☐ 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

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

TIMBER RAIL FENCE

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

NONE

NONE

NONE

NONE

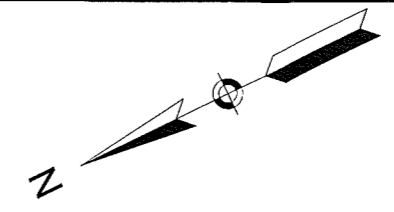
STA. 144+42 LT TO STA. 159+24 LT
STA. 144+42 RT TO STA. 157+16 RT
STA. 157+28 RT TO STA. 159+75 RT

SILT FENCE WITH STRAW BALES

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

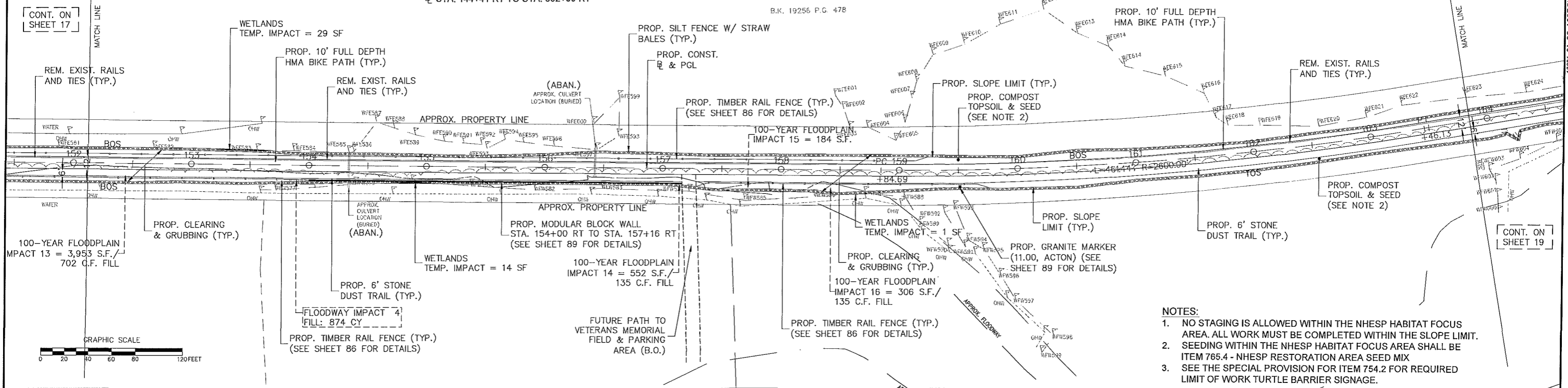
MAP D-5
P. 22 LOT 1
TOWN OF ACTON

B.K. 19256 P.G. 478

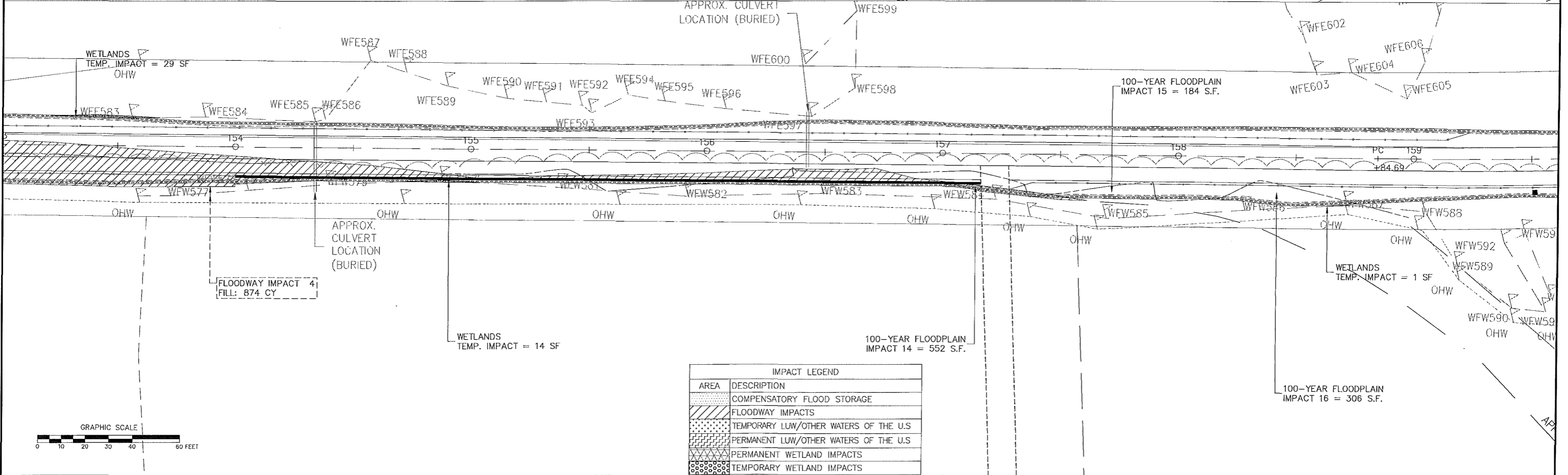


CONT. ON SHEET 17

CONT. ON SHEET 19



- 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
[Hatched Pattern]	COMPENSATORY FLOOD STORAGE
[Diagonal Lines]	FLOODWAY IMPACTS
[Dotted Pattern]	TEMPORARY LUW/OTHER WATERS OF THE U.S.
[Cross-hatched Pattern]	PERMANENT LUW/OTHER WATERS OF THE U.S.
[Stippled Pattern]	PERMANENT WETLAND IMPACTS
[Grid Pattern]	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

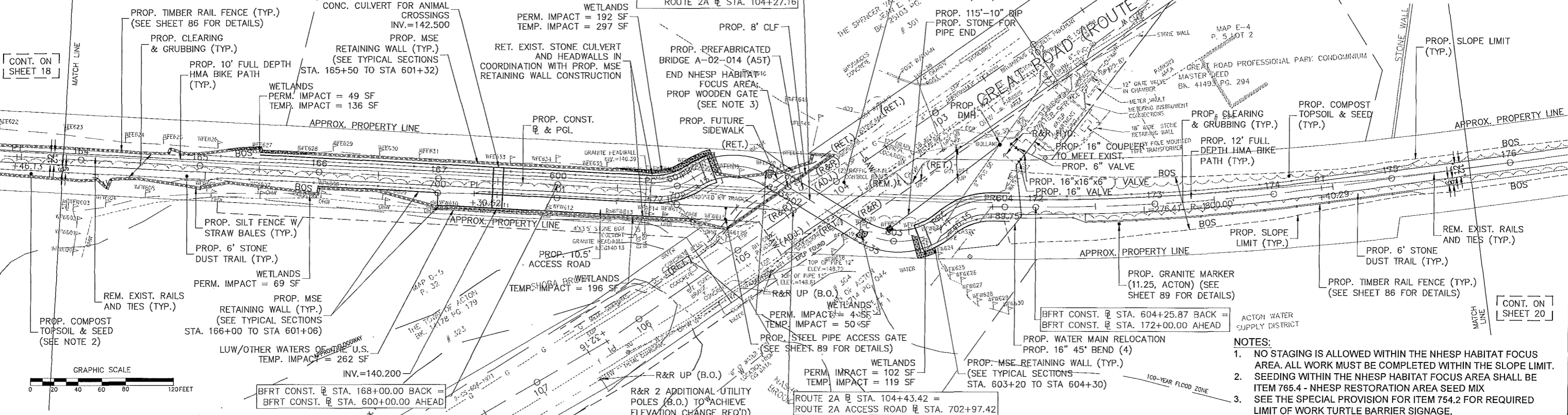
SILT FENCE WITH STRAW BALES

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

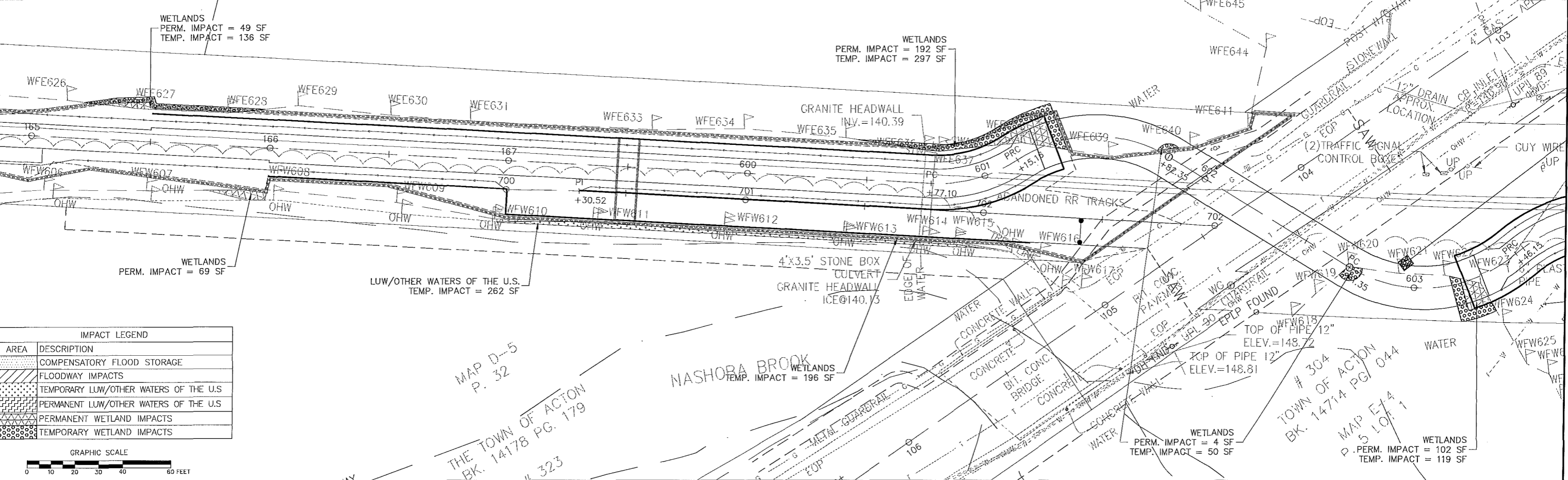
WESTFORD, CARLISLE & ACTON BRUCE FREEMAN RAIL TRAIL PHASE 2A

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

CONSTRUCTION PLANS & IMPACT DETAILS



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



IMPACT LEGEND

AREA	DESCRIPTION
[Hatched pattern]	COMPENSATORY FLOOD STORAGE
[Dotted pattern]	FLOODWAY IMPACTS
[Cross-hatched pattern]	TEMPORARY LUW/OTHER WATERS OF THE U.S.
[Diagonal lines]	PERMANENT LUW/OTHER WATERS OF THE U.S.
[Wavy lines]	PERMANENT WETLAND IMPACTS
[Stippled pattern]	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)	20	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT
DETAILS

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

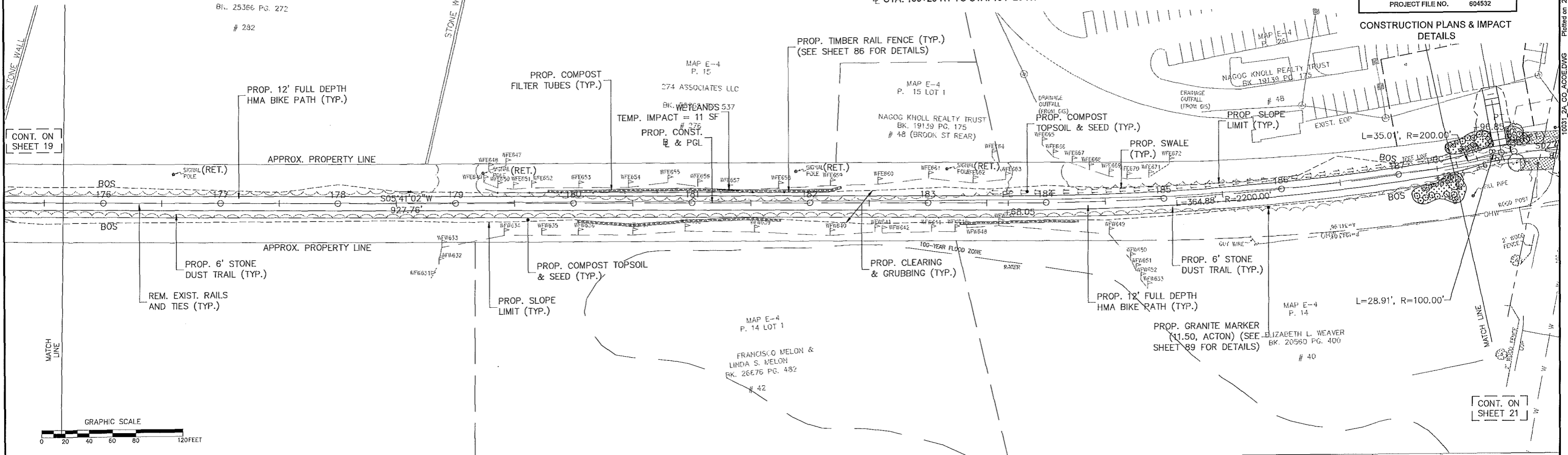
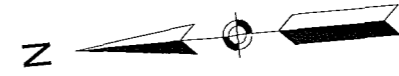
NONE

TIMBER RAIL FENCE

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

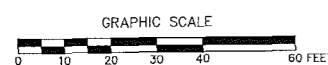
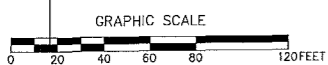
COMPOST FILTER TUBES

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



CONT. ON SHEET 19

CONT. ON SHEET 21

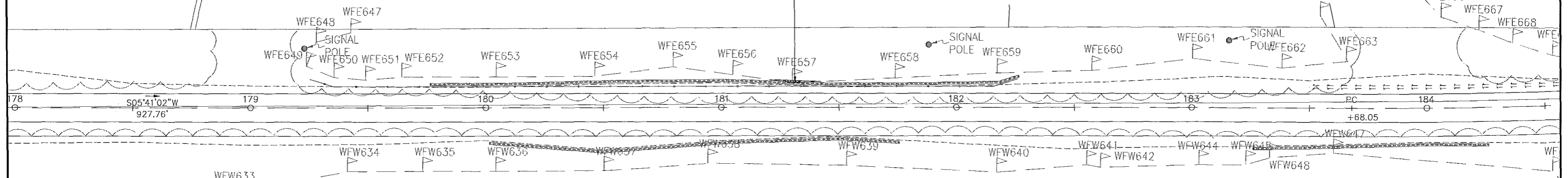


P. 15
274 ASSOCIATES LLC
BK. 58858 PG. 537
276
WETLANDS
TEMP. IMPACT = 11 SF

MAP E-4
P. 15 LOT 1
NAGOG KNOLL REALTY TRUST
BK. 19139 PG. 175
48 (BROOK ST REAR)

MAP E-4
P. 14
FRANCISCO MELON &
LINDA S. MELON
BK. 26E76 PG. 482
42

WFE665
WFE666
WFE667
WFE668



IMPACT LEGEND

AREA	DESCRIPTION
[Pattern]	COMPENSATORY FLOOD STORAGE
[Pattern]	FLOODWAY IMPACTS
[Pattern]	TEMPORARY LW/OTHER WATERS OF THE U.S.
[Pattern]	PERMANENT LW/OTHER WATERS OF THE U.S.
[Pattern]	PERMANENT WETLAND IMPACTS
[Pattern]	TEMPORARY WETLAND IMPACTS

100-YEAR FLOOD ZONE

ROWNER

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

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

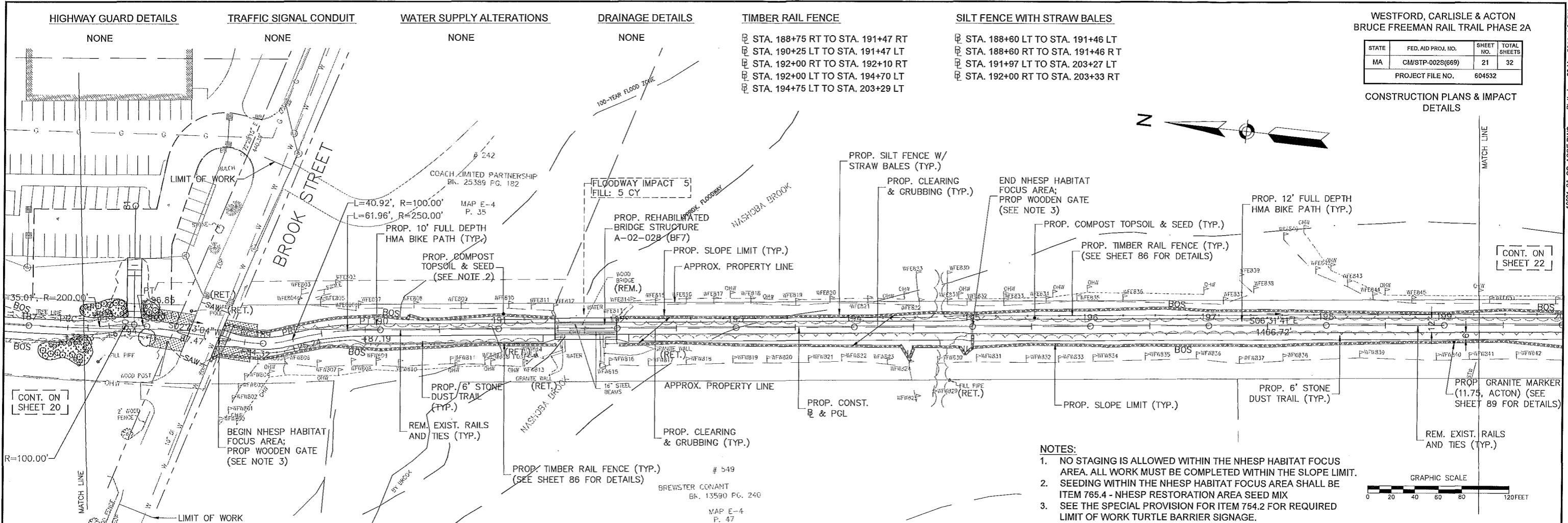
SILT FENCE WITH STRAW BALES

- 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 RT

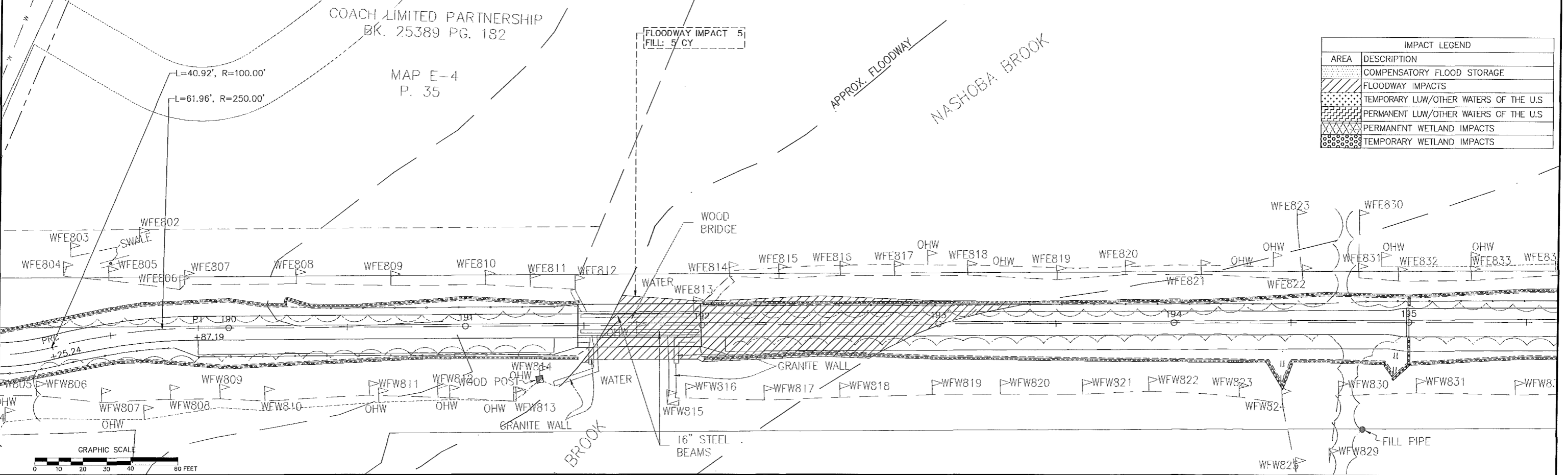
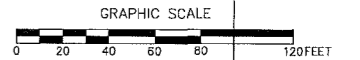
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

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

CONSTRUCTION PLANS & IMPACT
DETAILS



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

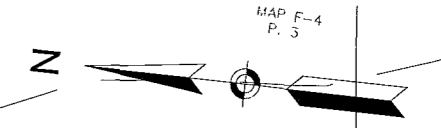


IMPACT LEGEND	
AREA	DESCRIPTION
[Symbol]	COMPENSATORY FLOOD STORAGE
[Symbol]	FLOODWAY IMPACTS
[Symbol]	TEMPORARY LUW/OTHER WATERS OF THE U.S
[Symbol]	PERMANENT LUW/OTHER WATERS OF THE U.S
[Symbol]	PERMANENT WETLAND IMPACTS
[Symbol]	TEMPORARY WETLAND IMPACTS

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



HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

TIMBER RAIL FENCE

SILT FENCE WITH STRAW BALES

NONE

NONE

NONE

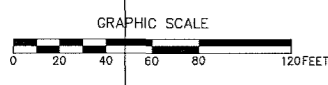
NONE

- 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

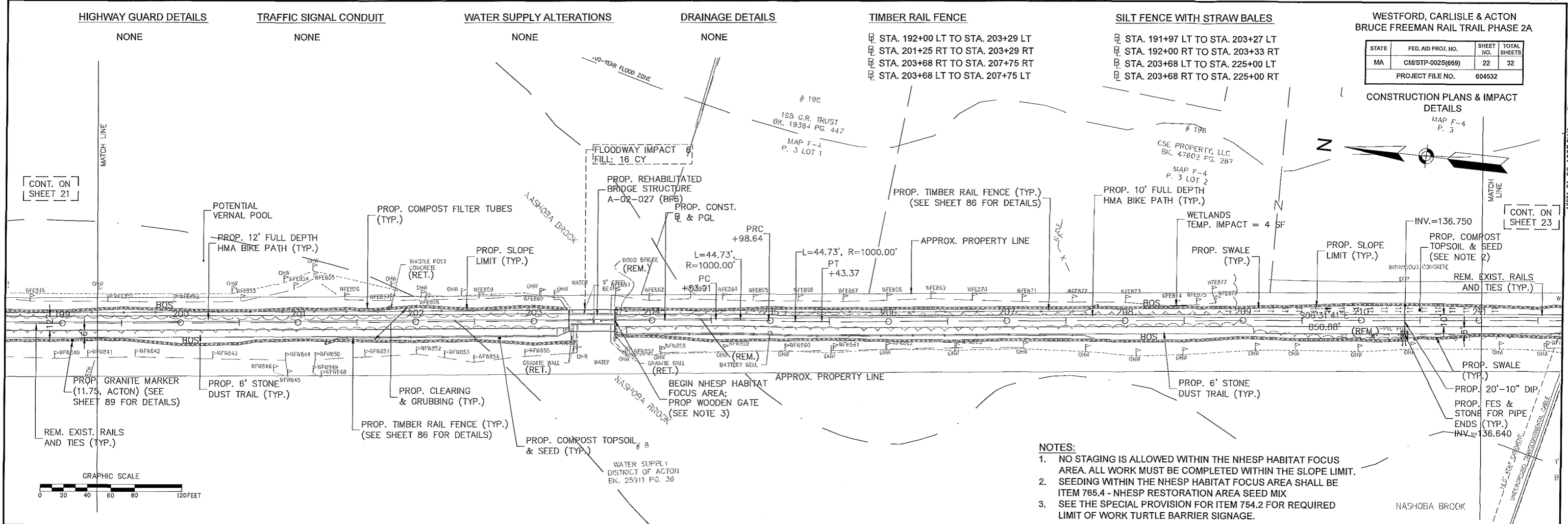
- STA. 191+97 LT TO STA. 203+27 LT
- STA. 192+00 RT TO STA. 203+33 RT
- STA. 203+68 LT TO STA. 225+00 LT
- STA. 203+68 RT TO STA. 225+00 RT

CONT. ON SHEET 21

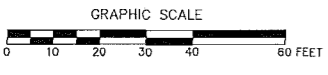
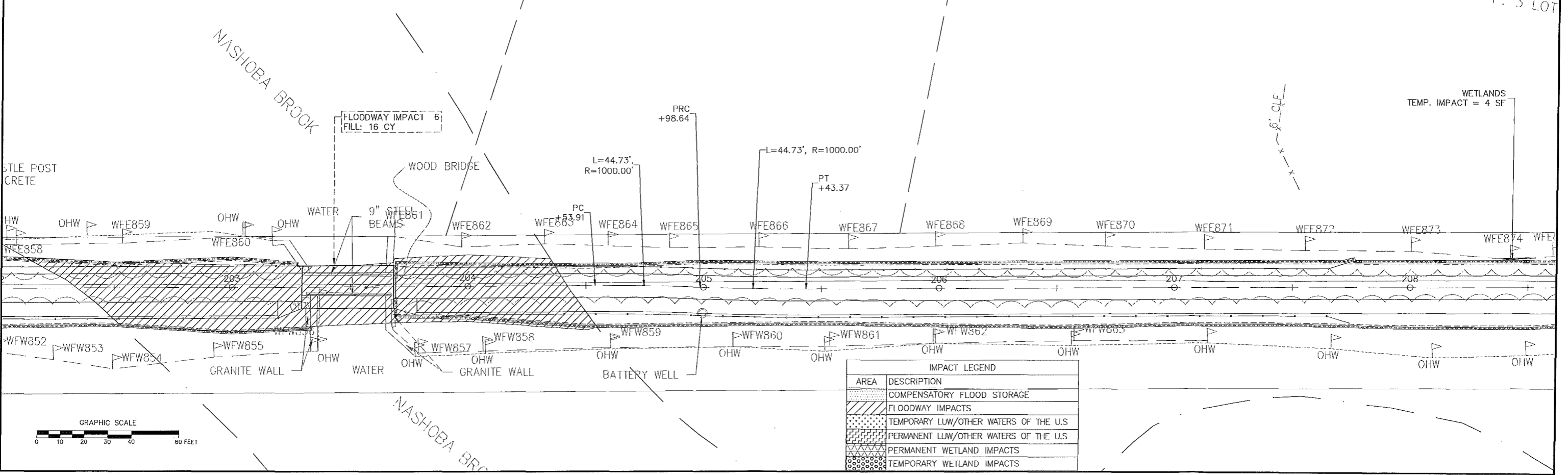
CONT. ON SHEET 23



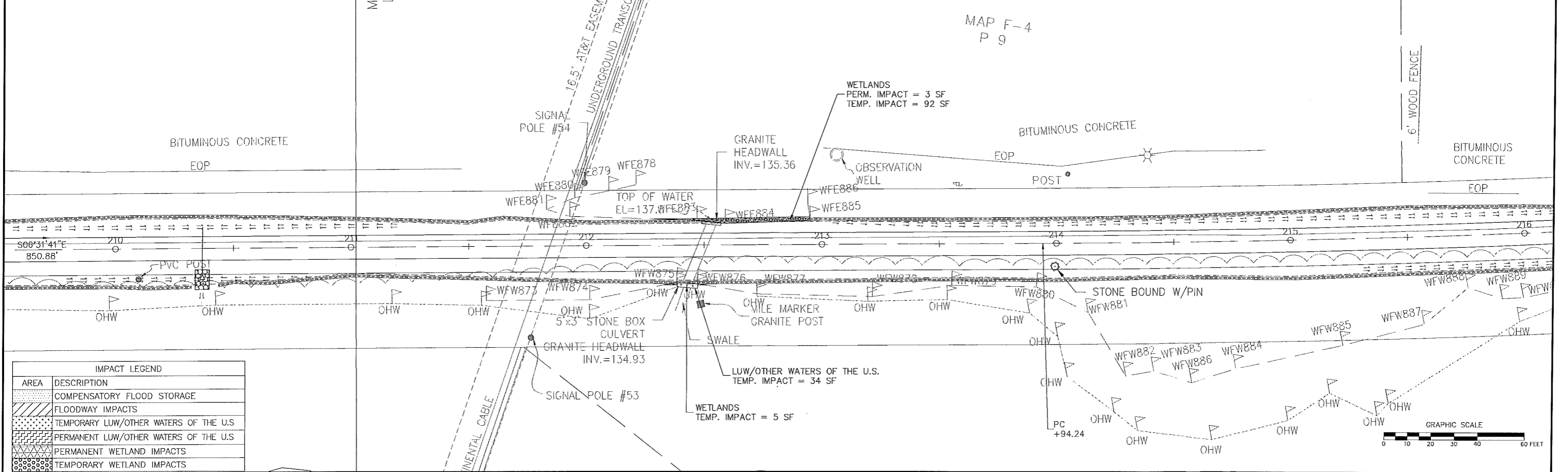
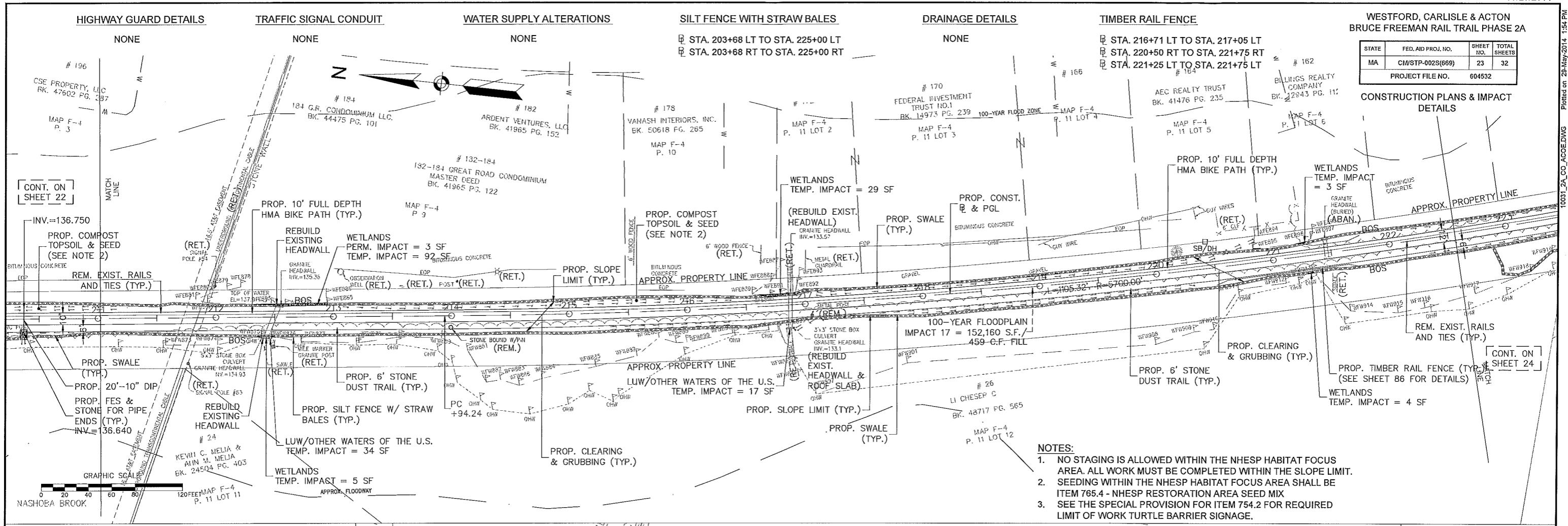
- NOTES:
- NO STAGING IS ALLOWED WITHIN THE NHESP HABITAT FOCUS AREA. ALL WORK MUST BE COMPLETED WITHIN THE SLOPE LIMIT.
 - SEEDING WITHIN THE NHESP HABITAT FOCUS AREA SHALL BE ITEM 765.4 - NHESP RESTORATION AREA SEED MIX
 - SEE THE SPECIAL PROVISION FOR ITEM 754.2 FOR REQUIRED LIMIT OF WORK TURTLE BARRIER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



NASHOBA BROOK



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

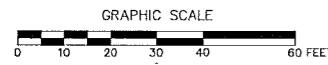
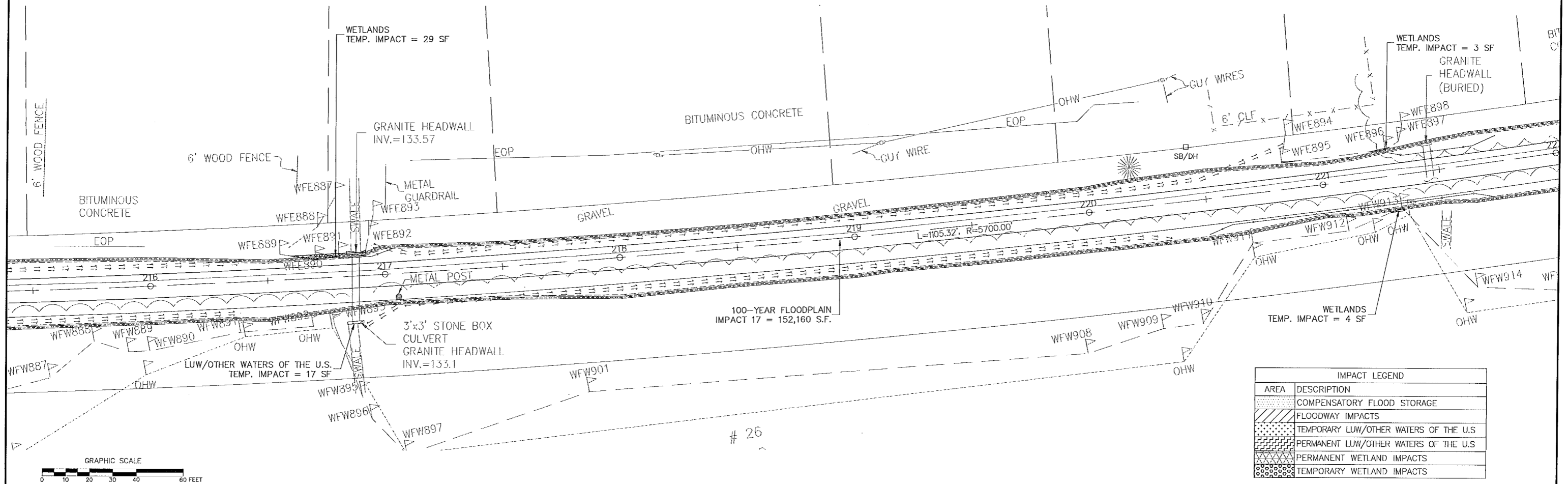
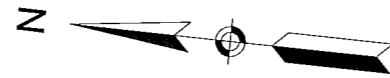
SILT FENCE WITH STRAW BALES

☒ STA. 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	CW/STP-0025(669)	24	32
PROJECT FILE NO.		604532	

CONSTRUCTION PLANS & IMPACT
 DETAILS



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

100-YEAR FLOODPLAIN
 IMPACT 17 = 152,160 S.F.

3'x3' STONE BOX
 CULVERT
 GRANITE HEADWALL
 INV.=133.1

LW/OTHER WATERS OF THE U.S.
 TEMP. IMPACT = 17 SF

WETLANDS
 TEMP. IMPACT = 29 SF

WETLANDS
 TEMP. IMPACT = 3 SF
 GRANITE
 HEADWALL
 (BURIED)

WETLANDS
 TEMP. IMPACT = 4 SF

26

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

TIMBER RAIL FENCE

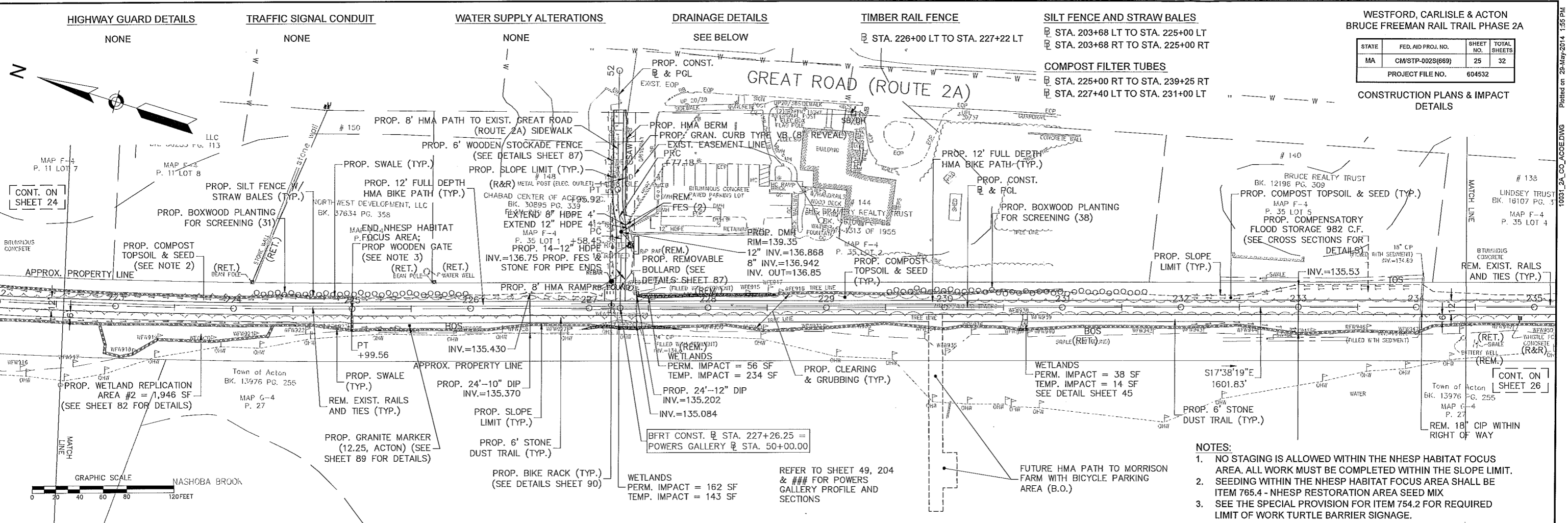
SILT FENCE AND STRAW BALES

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

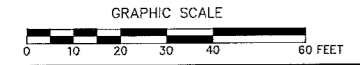
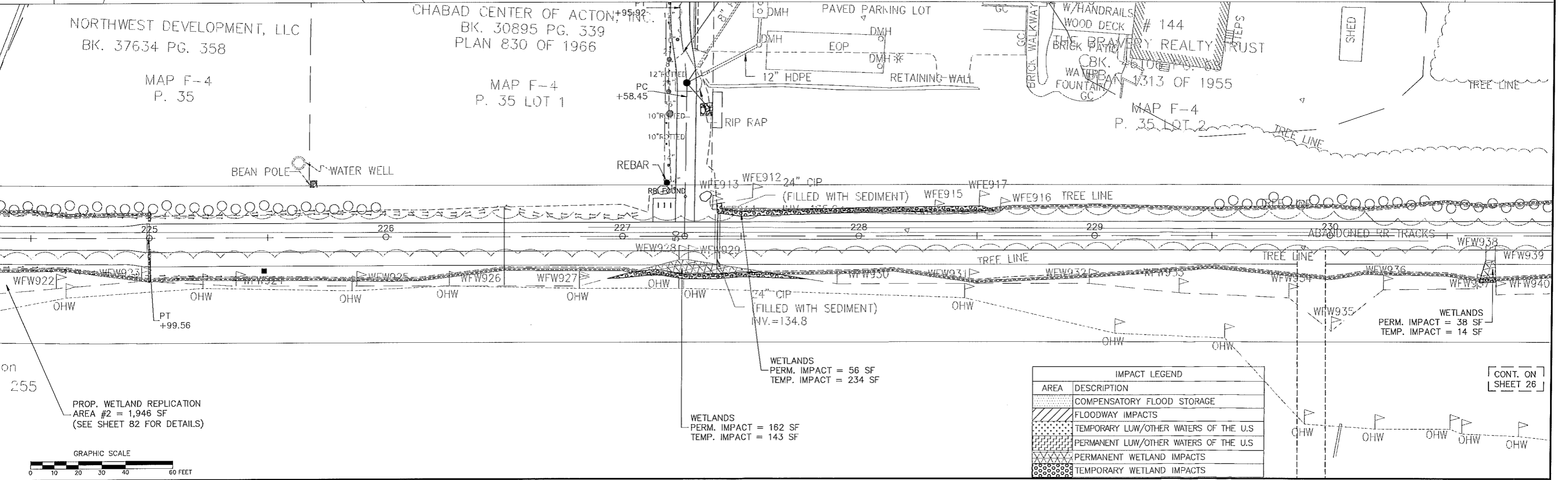
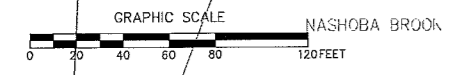
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	25	32

PROJECT FILE NO. 604532

CONSTRUCTION PLANS & IMPACT
DETAILS



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



IMPACT LEGEND

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

CONT. ON SHEET 26

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

DRAINAGE DETAILS

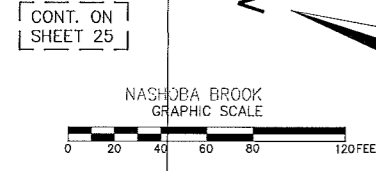
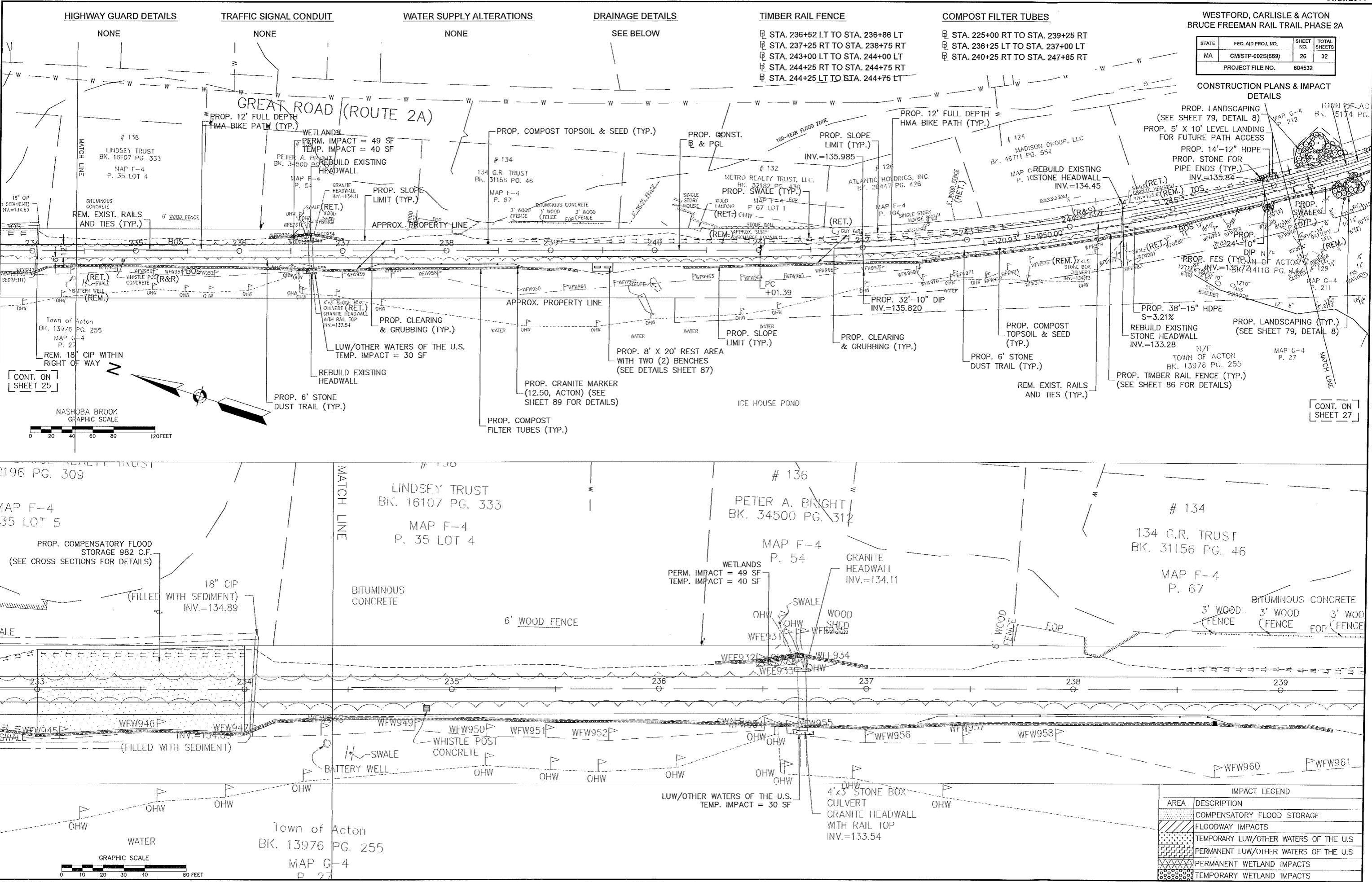
TIMBER RAIL FENCE

COMPOST FILTER TUBES

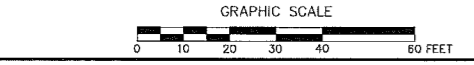
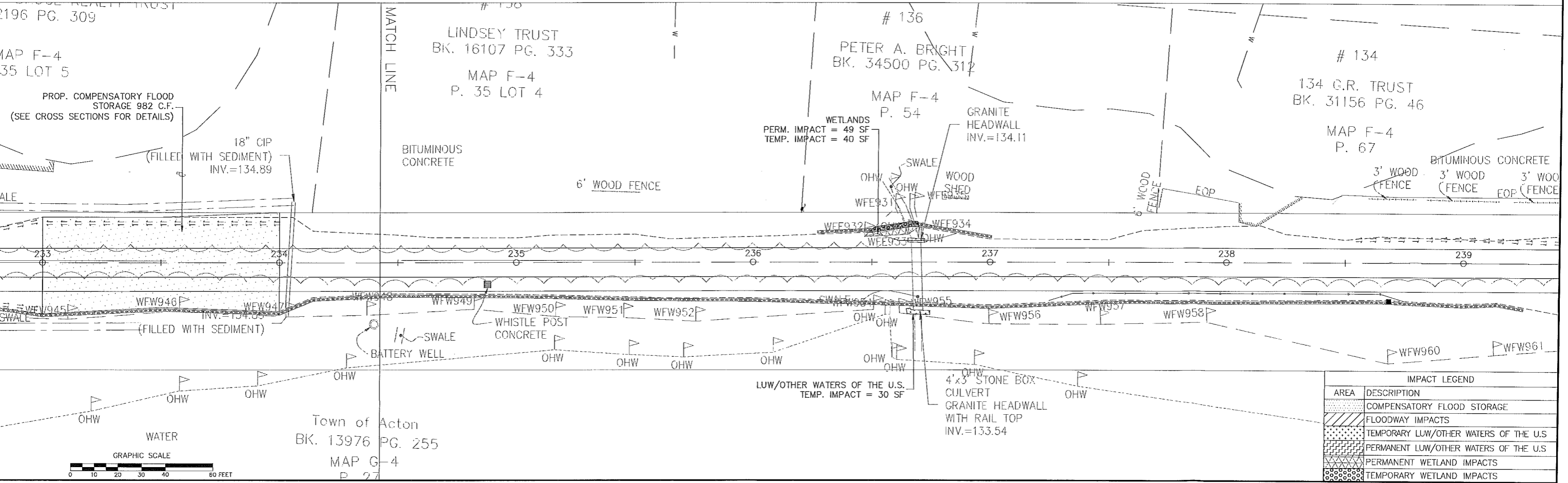
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	26	32
PROJECT FILE NO.			604532

CONSTRUCTION PLANS & IMPACT DETAILS



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



CONT. ON SHEET 27

CONT. ON SHEET 25

HIGHWAY GUARD DETAILS

TRAFFIC SIGNAL CONDUIT

WATER SUPPLY ALTERATIONS

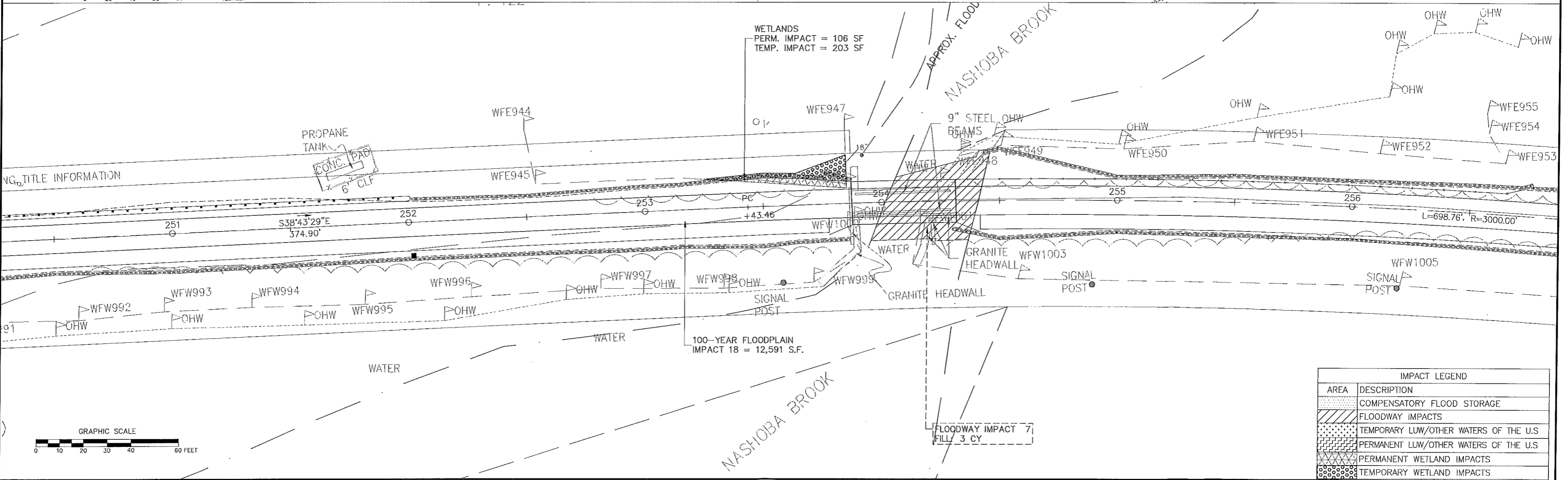
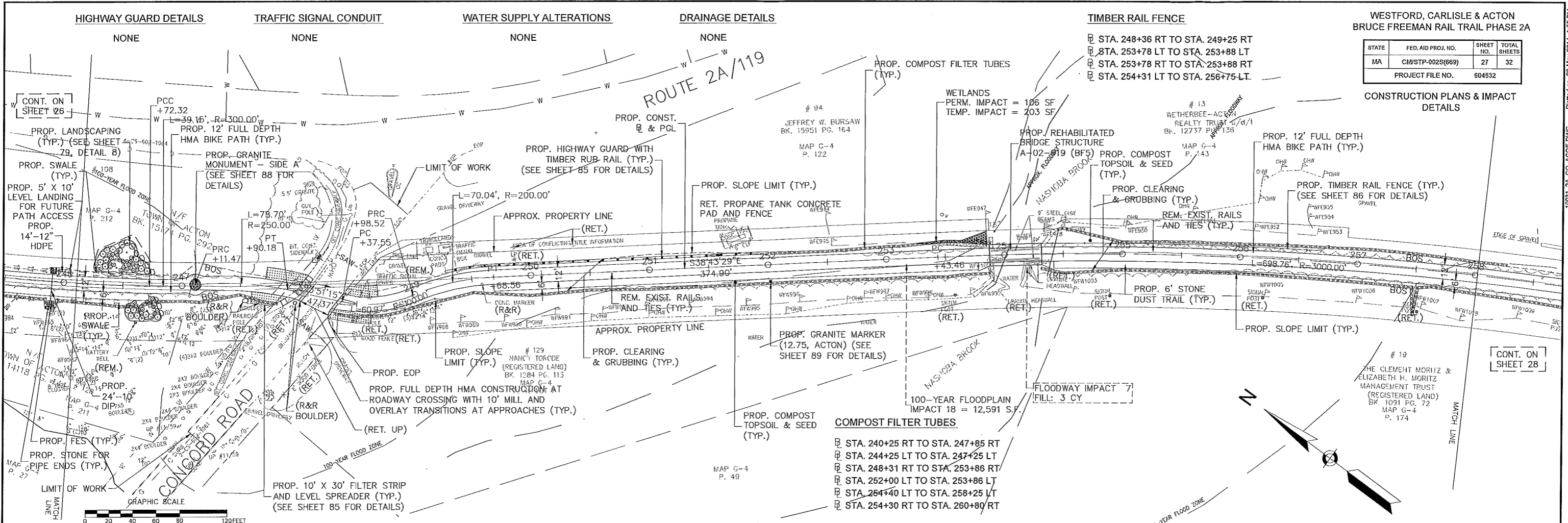
DRAINAGE DETAILS

TIMBER RAIL FENCE

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



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

Plotted on 29-May-2014 1:56 PM 10031_2A_COI_AC0E.DWG

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

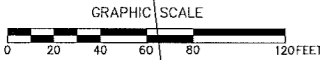
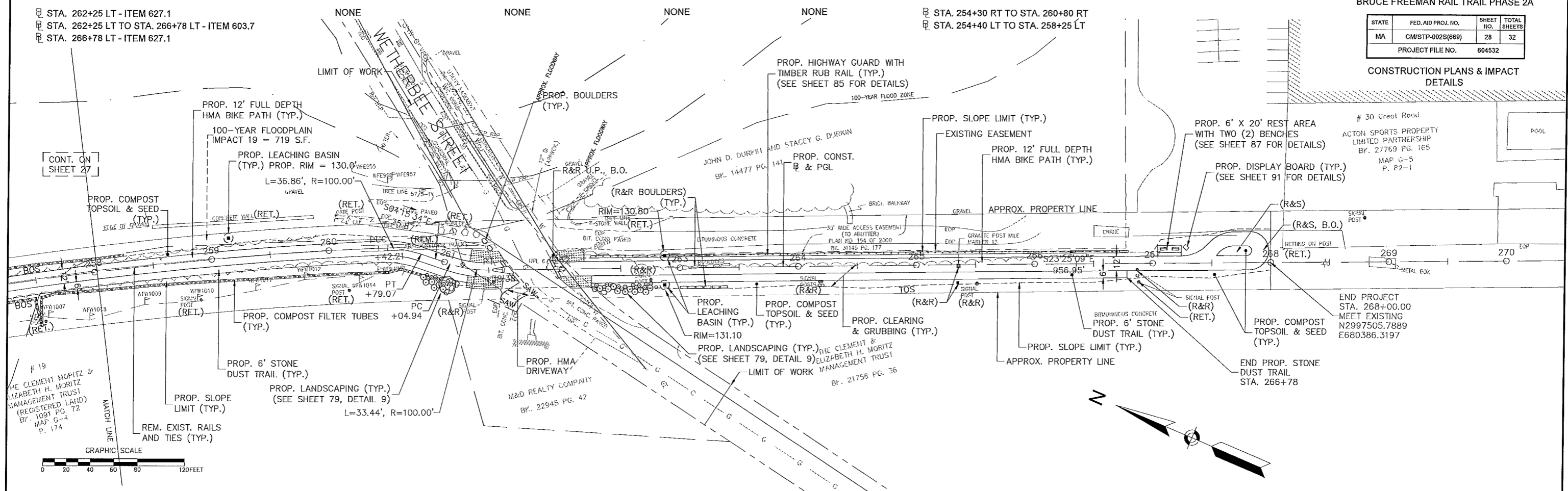
COMPOST FILTER TUBES

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

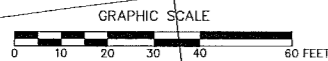
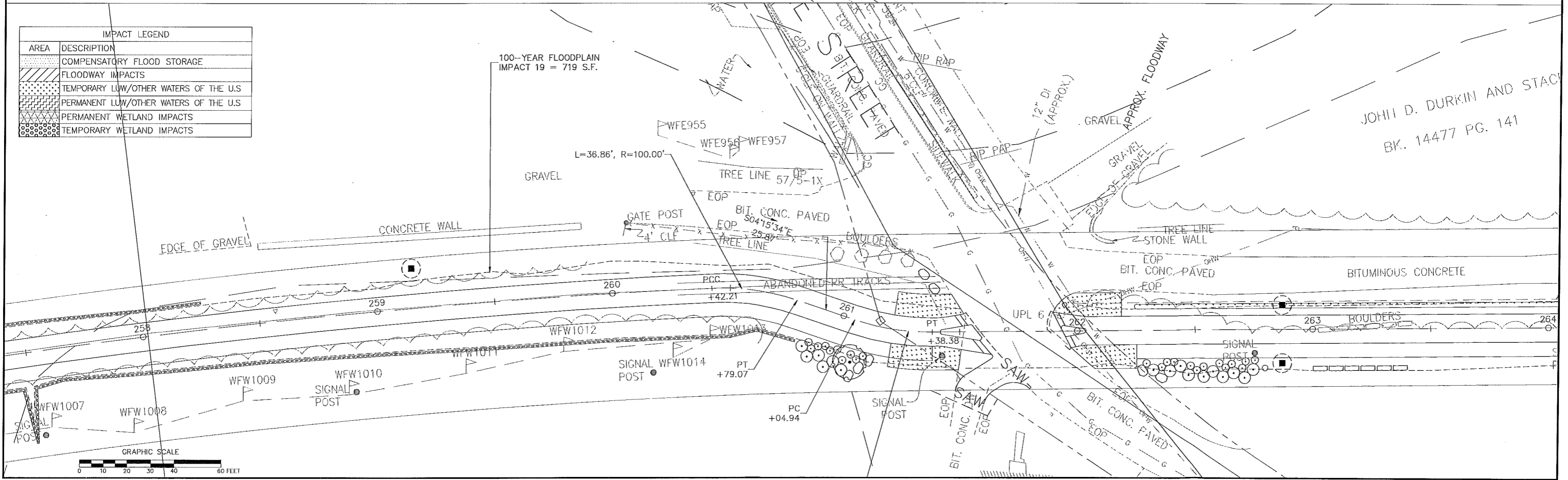
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-0025(669)	28	32
PROJECT FILE NO. 604532			

CONSTRUCTION PLANS & IMPACT DETAILS



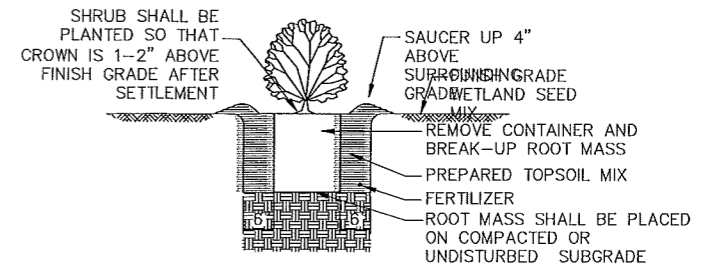
IMPACT LEGEND	
AREA	DESCRIPTION
[Pattern]	COMPENSATORY FLOOD STORAGE
[Pattern]	FLOODWAY IMPACTS
[Pattern]	TEMPORARY LW/OTHER WATERS OF THE U.S.
[Pattern]	PERMANENT LW/OTHER WATERS OF THE U.S.
[Pattern]	PERMANENT WETLAND IMPACTS
[Pattern]	TEMPORARY WETLAND IMPACTS



Plotted on 29-May-2014 1:55 PM

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

WETLAND REPLICATION PLANS

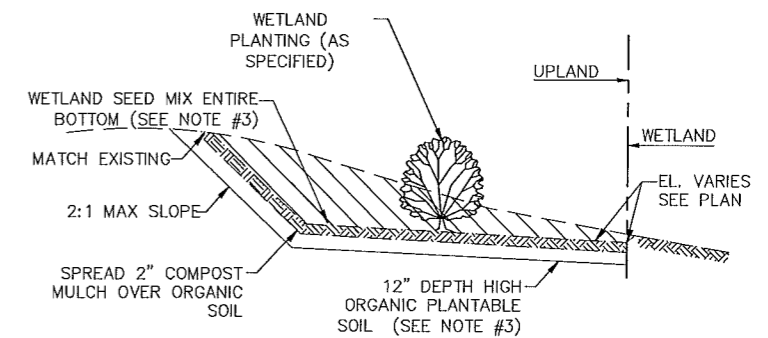


- 1.) PREPARED TOPSOIL MIX SHALL CONSIST OF HIGH ORGANIC SOIL WITH NO LESS THAN 10% ORGANIC MATTER.
- 2.) ALL PLANTS SHALL BE FLOODED WITH WATER TWICE WITHIN THE FIRST TWENTY-FOUR HOUR PERIOD AFTER PLANTING.

SHRUB PLANTING DETAIL
NOT TO SCALE

PLANTING NOTES

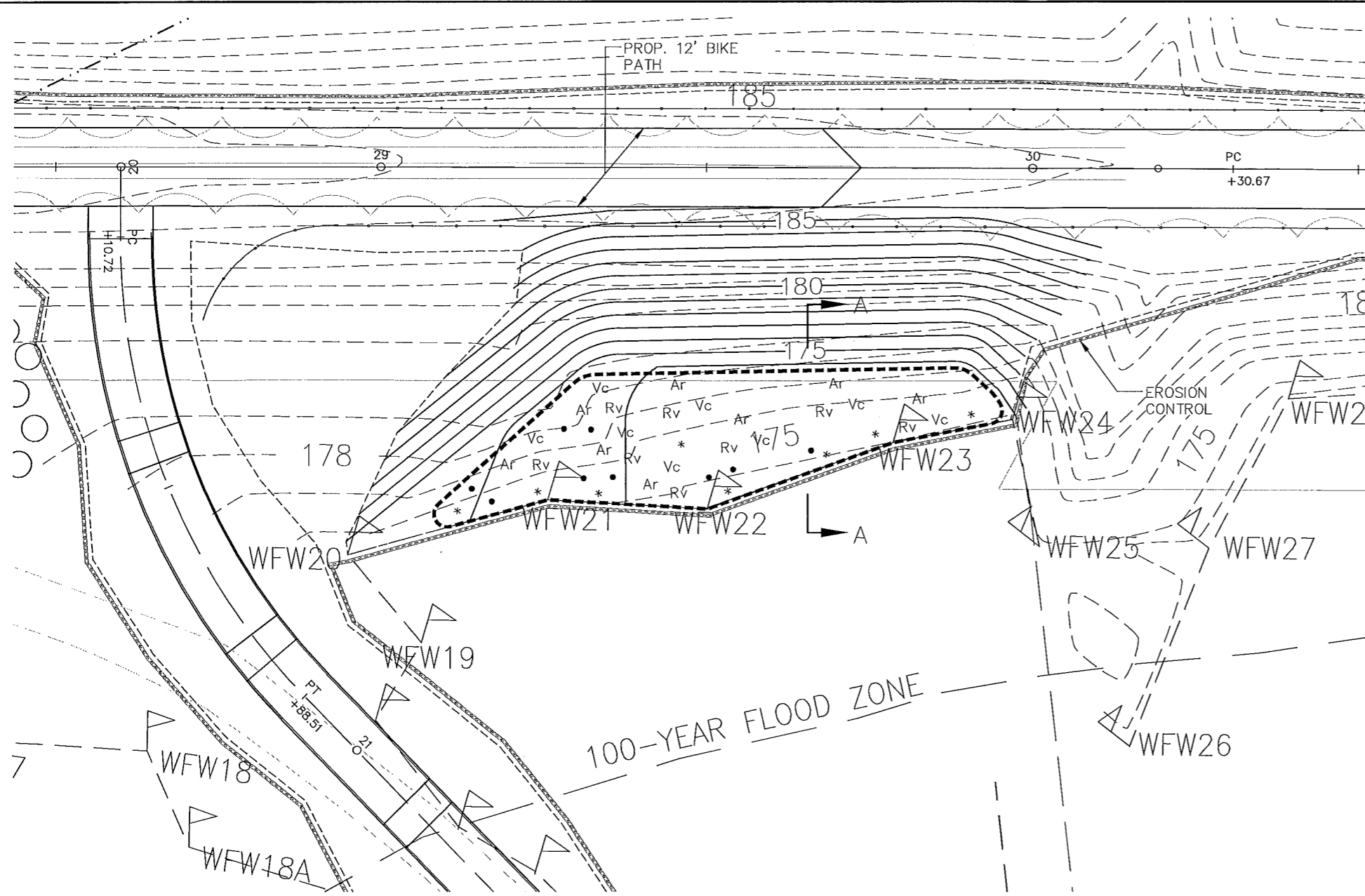
	DIAMETER	DEPTH
SHRUBS B&B	BALL + 1'-0" MIN	BALL DEPTH
CONTAINER GROWN MATERIAL	CONT. DIA. + 1'-0" MIN	CONT. DEPTH



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

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.



PLANTING PLAN



PLANTING SPECIFICATIONS

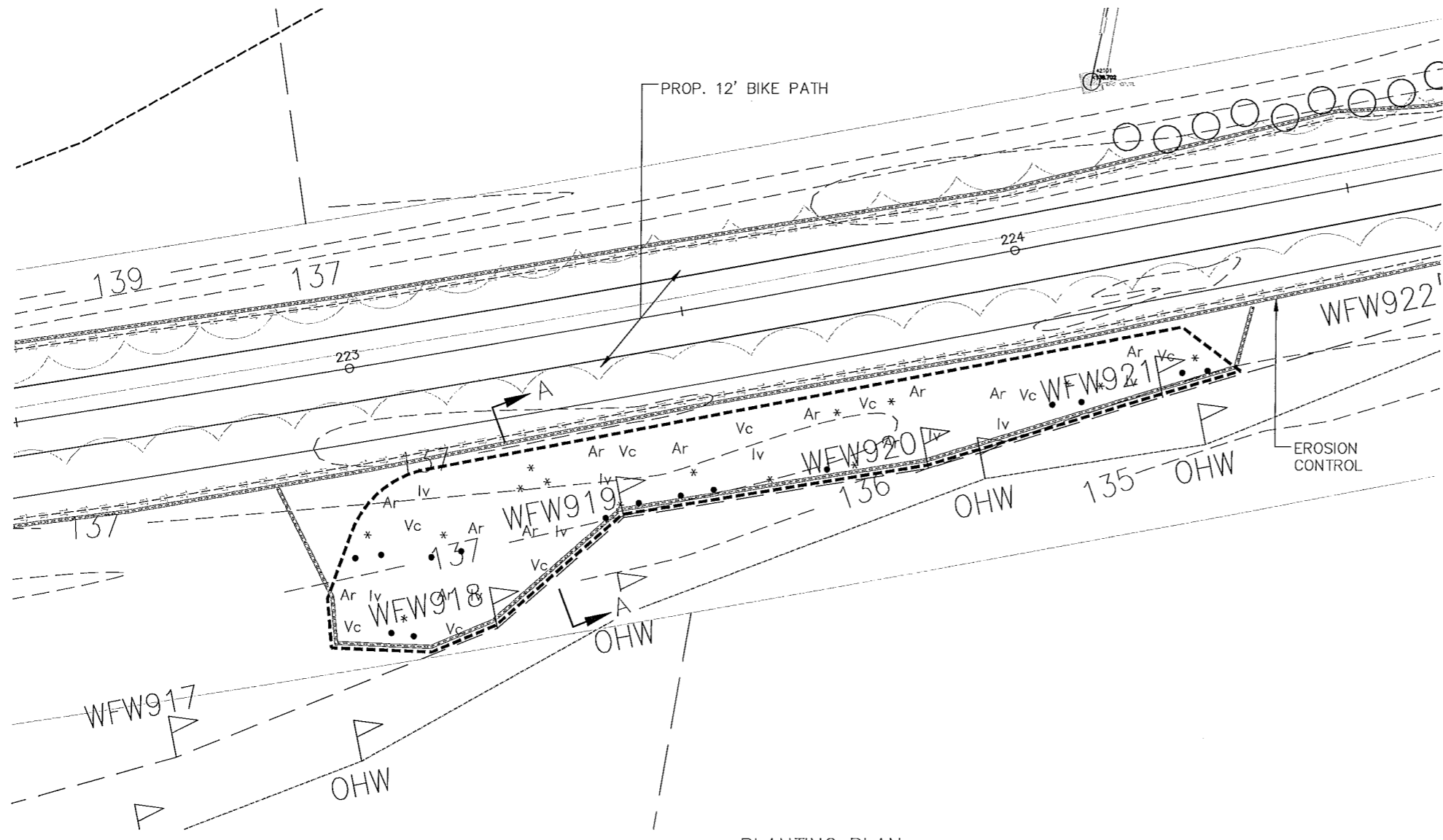
SYMBOL	SCIENTIFIC NAME	COMMON NAME	QTY
Ar	ACER RUBRUM	RED MAPLE	8
Vc	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	8
Rv	RHODODENDRON VISCOSUM	SWAMP AZALEA	8
*	OSMUNDA CINNAMOMEA	CINNAMON FERN	9
*	ONOCLEA SENSIBILIS	SENSITIVE FERN	9

WETLAND SEED MIX

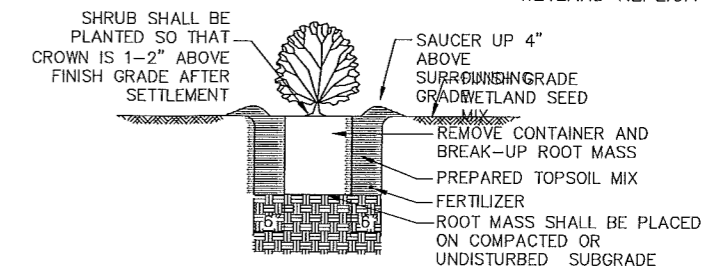
SCIENTIFIC NAME	COMMON NAME	%
Carex vulpinoidea	Fox Sedge	25%
Elymus virginicus	Virginia Wildrye	25%
Carex lurida	Lurid (Shallow) Sedge	12%
Carex lupulina	Hop Sedge	6%
Verbena hastate	Blue Vervain	4%
Juncus effuses	Soft Rush	3%
Carex comosa	Cosmos (Bristly) Sedge	3%
Aster umbellatus (Doellingeria umbellata)	Flat Topped White Aster	3%
Aster prenanthoides (Symphyotrichum p.)	Zigzag Aster	3%
Scirpus atrovirens	Green Bulrush	3%
Helienium 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%

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(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.

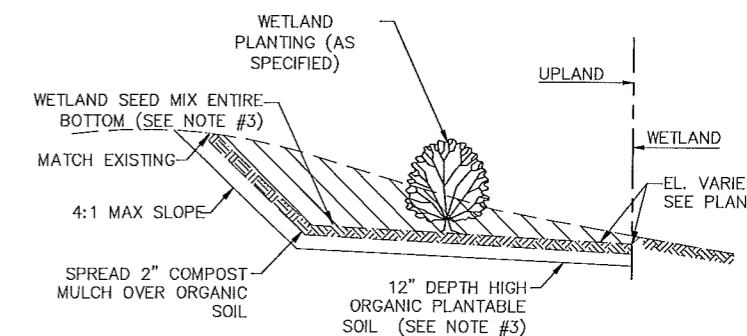
SHRUB PLANTING DETAIL
NOT TO SCALE

PLANTING NOTES

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

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

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 hastata	Blue Vervain	4%
Juncus effuses	Soft Rush	3%
Carex comosa	Cosmos (Bristly) Sedge	3%
Aster umbellatus (Doellingeria umbellate)	Flat Topped White Aster	3%
Aster prenanthoides (Symphyotrichum p.)	Zigzag Aster	3%
Scirpus atrovirens	Green Bulrush	3%
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%



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

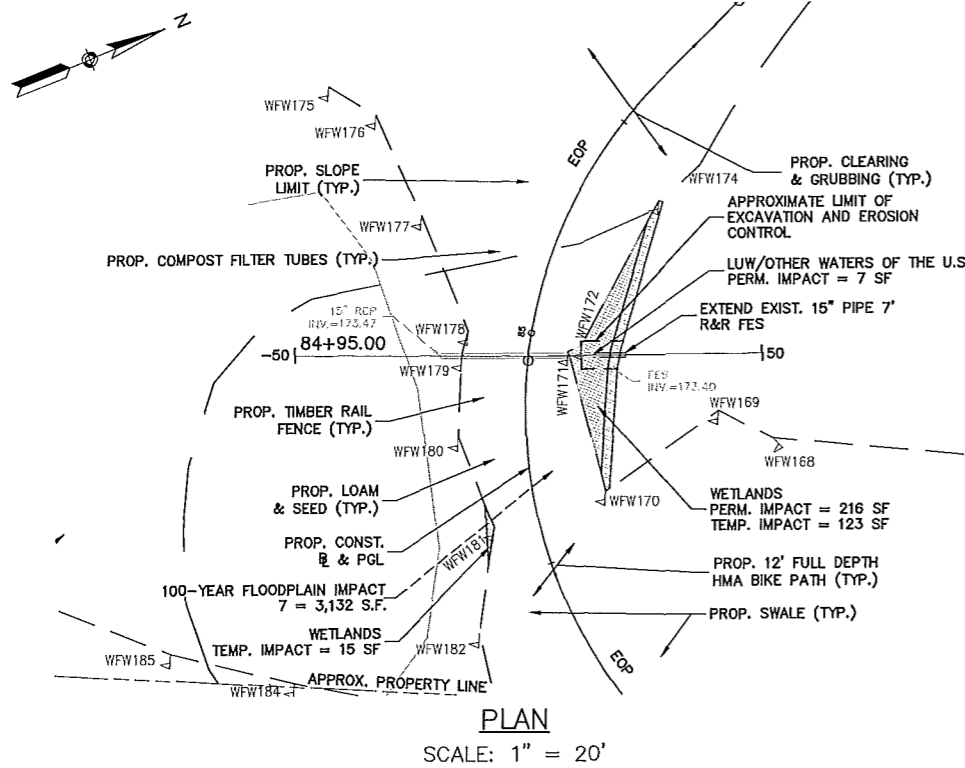
NOTES:

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

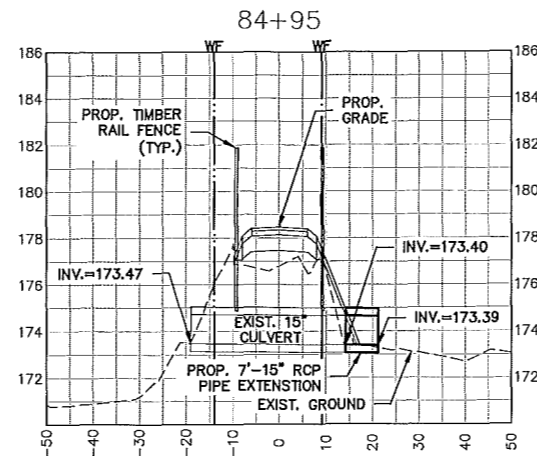
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CM/STP-002S(669)	31	32
PROJECT FILE NO.		604532	

CULVERT DETAILS



PLAN

SCALE: 1" = 20'

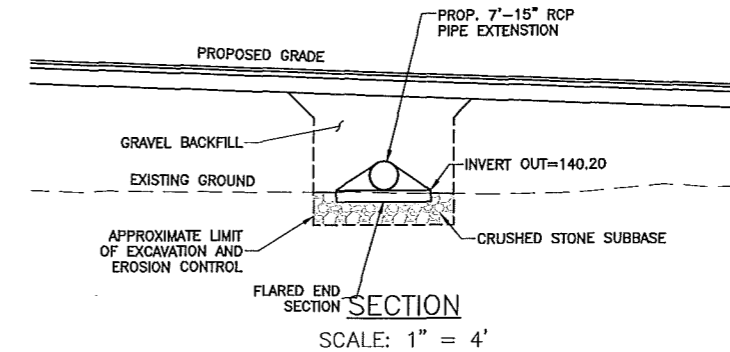


PROFILE

SCALE: 1" = 20' (HORIZONTAL)
1" = 4' (VERTICAL)

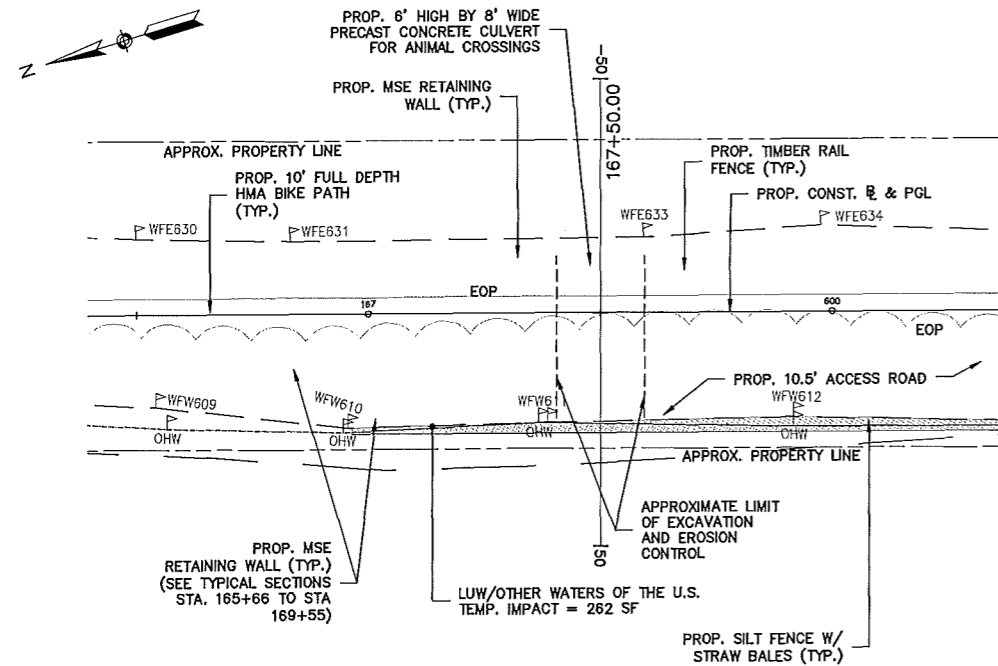
15" CULVERT EXTENSION
STA 84+95

SCALE: AS NOTED



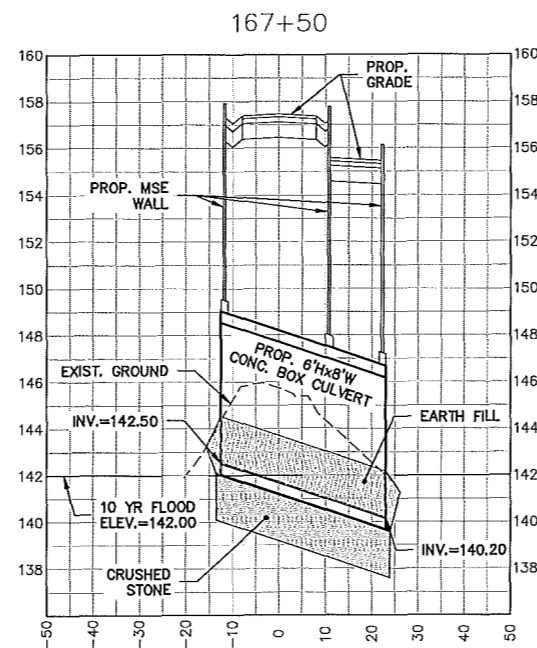
SECTION

SCALE: 1" = 4'



PLAN

SCALE: 1" = 20'

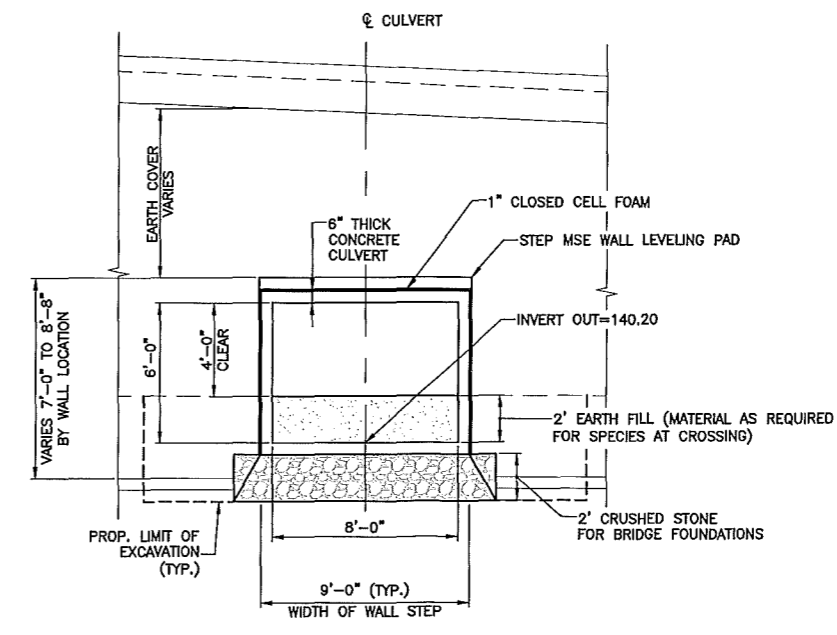


PROFILE

SCALE: 1" = 20' (HORIZONTAL)
1" = 4' (VERTICAL)

CONCRETE CULVERT FOR WILDLIFE CROSSING
STA 167+50

SCALE: AS NOTED



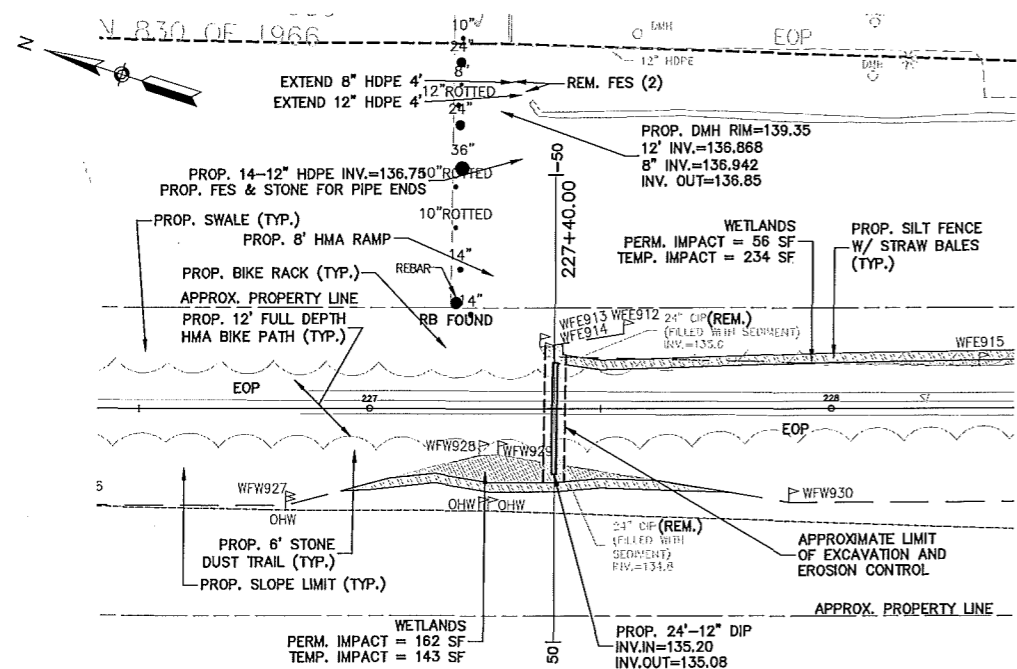
SECTION

SCALE: 1" = 4'

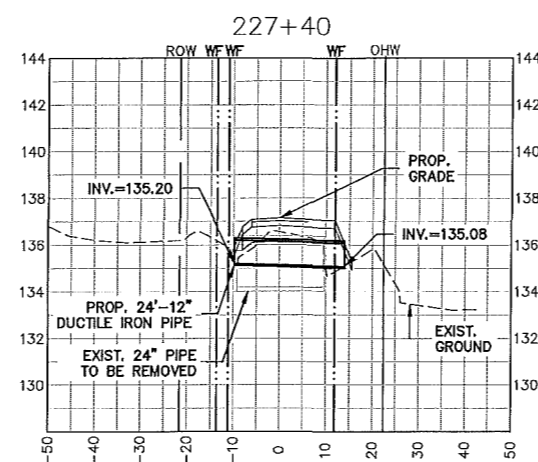
WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

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

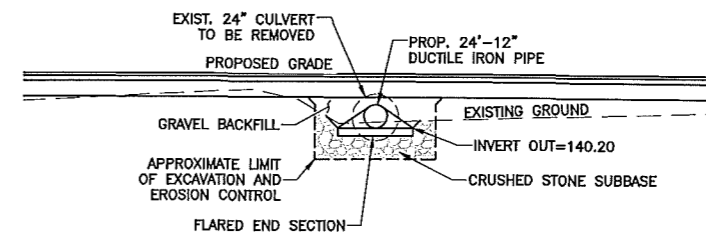
CULVERT DETAILS



PLAN
SCALE: 1" = 20'



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



SECTION
SCALE: 1" = 4'

CULVERT REPLACEMENT
STA 227+40
SCALE: AS NOTED