

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

CONCORD
BRUCE FREEMAN RAIL TRAIL PHASE 2C

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	1	328
PROJECT FILE NO.		605189	

TITLE SHEET & INDEX

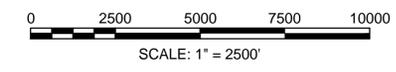
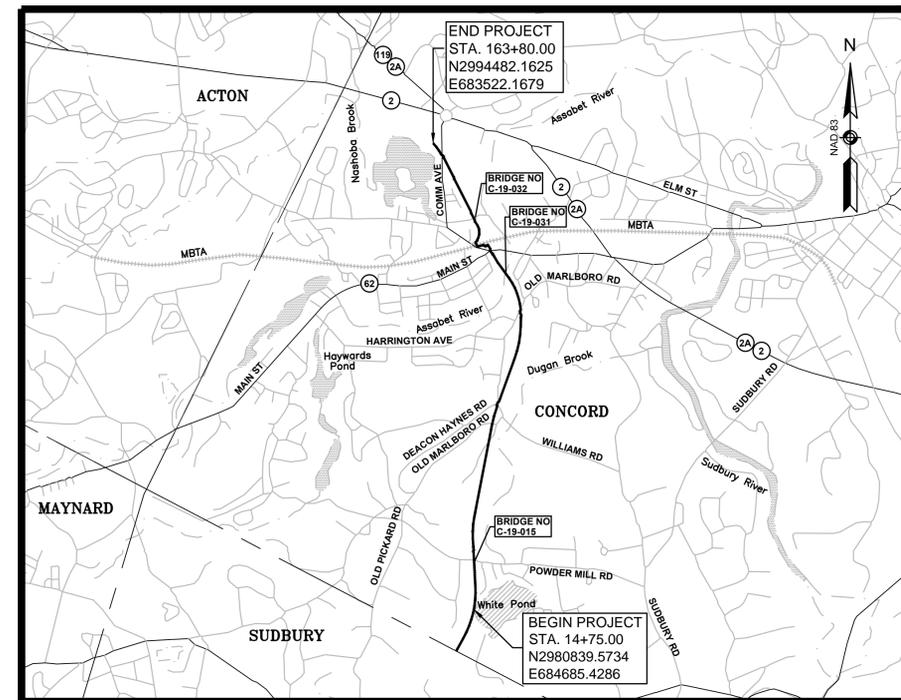
PLAN AND PROFILE OF
BRUCE FREEMAN RAIL TRAIL PHASE 2C
(BRIDGE NOS. C-19-015, C-19-031 & C-19-032)
IN THE TOWN OF
CONCORD
MIDDLESEX COUNTY

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE 2014 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS, (AS RELATED TO TRAFFIC STANDARD DETAILS ONLY), THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

100% SUBMITTAL

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LENGTH OF PROJECT = 14,905 FEET = 2.823 MILES

TRAIL DESIGN DESIGNATION

DESIGN SPEED	18 MPH
MINIMUM HORIZONTAL CURVE RADIUS	60'
MINIMUM LENGTH OF CREST VERTICAL CURVE	100'
MAXIMUM GRADE FOR LEVEL TERRAIN	4.5% (7.5% AT ADA/AAB ACCESSIBLE RAMPS)

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
181 Ballardvale Street, Suite 202, Wilmington, MA 01887
Tel: (978) 570-2999 Fax: (978) 658-3044
http://www.gpinet.com

DATE	DESCRIPTION	REV #



RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

APPROVED:

DIVISION ADMINISTRATOR DATE

HIGHWAY ADMINISTRATOR DATE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	2	328
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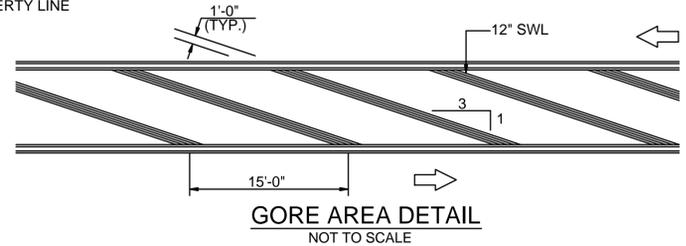
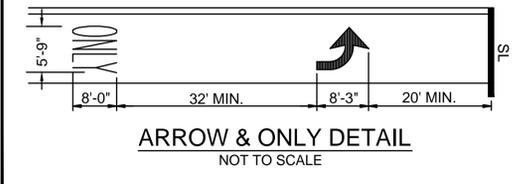
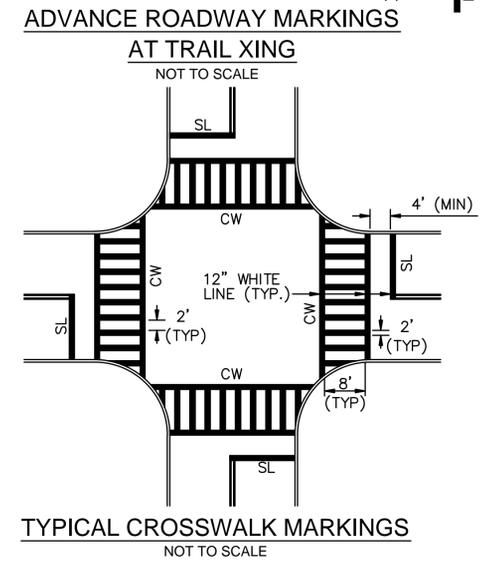
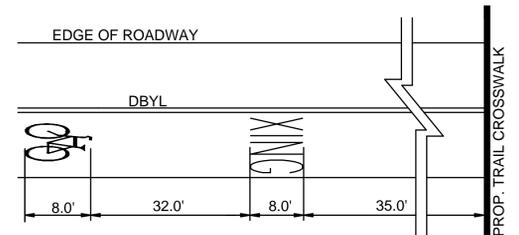
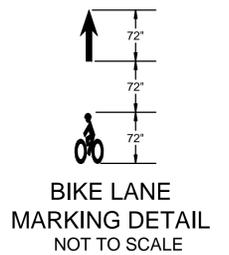
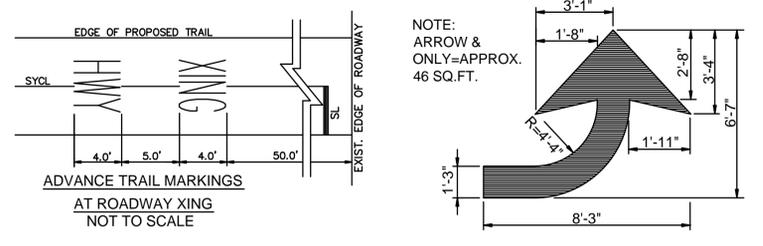
LEGEND & ABBREVIATIONS

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
FP	FP	CATCH BASIN CURB INLET
GP	GP	FLAG POLE
MB	MB	GAS PUMP
FES	FES	MAIL BOX
WELL	WELL	FLARED END STRUCTURE
EHH	EHH	POST SQUARE
GG	GG	POST CIRCULAR
BHL #	BHL #	WELL
MW #	MW #	ELECTRIC HANDHOLE
TP #	TP #	FENCE GATE POST
CO.BD.	*	GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCE STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		COMPOST FILTER TUBES
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		DRAINAGE SWALE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION (ALL THERMOPLASTIC)
ONLY	ONLY	PAVEMENT ARROW - WHITE
	SL	LEGEND "ONLY" - WHITE
	SL	STOP LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE
	BYL	BROKEN YELLOW LINE
	DWL	DOTTED WHITE LINE
	DYL	DOTTED YELLOW LINE
	DWLEx	DOTTED WHITE LINE EXTENSION
	DYLEx	DOTTED YELLOW LINE EXTENSION
	DBWL	DOUBLE WHITE LINE
	DBYL	DOUBLE YELLOW LINE



GENERAL NOTES

- TOPOGRAPHICAL INFORMATION WAS PROVIDED BY GREEN INTERNATIONAL AFFILIATES, INC, MEDFORD, MASSACHUSETTS DURING MAY 2007, CHAPPELL ENGINEERING ASSOCIATES, LLC DURING MAY 2009, AND SUPPLEMENTED BY GREENMAN-PEDERSEN, INC DURING AUGUST 2013. VERTICAL DATUM IS BASED ON NAVD1988. HORIZONTAL DATUM IS BASED ON NAD1983.
- 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 JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT MIX ASPHALT JOINT SEALANT MEETING SPECIAL PROVISION ITEM 453.
- ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE COMPOST TOPSOIL PLACED AND SEEDED. THE COPMPOST TOPSOIL 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 RIGHT OF WAY UNLESS SHOWN OTHERWISE.
- 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 PUBLICLY OWNED GATE BOXES, SERVICE BOXES, 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.
- DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5 FEET SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5 FEET WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
- 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.
- THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY'S RAILROAD OPERATIONS DIRECTORATE "GUIDELINES AND PROCEDURES FOR CONSTRUCTION ON MBTA RAILROAD PROPERTY". SUCH COMPLIANCE SHALL INCLUDE BUT NOT BE LIMITED TO ISSUANCE OF RAILROAD PROTECTIVE INSURANCE, SAFETY TRAINING AND RECEIPT/CONFORMANCE WITH STIPULATION IN PERMITS/LICENSE AGREEMENTS FOR ANY WORK PROPOSED ON MBTA PROPERTY.

GENERAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC	EXC	EXCAVATION	PVC	POINT OF VERTICAL CURVATURE
ABAN	ABANDON	F&C	FRAME AND COVER	PVI	POINT OF VERTICAL INTERSECTION
ADJ	ADJUST	F&G	FRAME AND GRATE	PVT	POINT OF VERTICAL TANGENCY
APPROX.	APPROXIMATE	FDN	FOUNDATION	PVMT	PAVEMENT
A.C.	ASPHALT CONCRETE	FLDSTN	FIELDSTONE	PWW	PAVED WATER WAY
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	GAR	GARAGE	R	RADIUS OF CURVATURE
BIT.	BITUMINOUS	GD	GROUND	R&D	REMOVE AND DISPOSE
BC	BOTTOM OF CURB	GG	GAS GATE	RCP	REINFORCED CONCRETE PIPE
BD.	BOUND	GI	GUTTER INLET	RD	ROAD
BL	BASELINE	GIP	GALVANIZED IRON PIPE	RDWY	ROADWAY
BLDG	BUILDING	GRAN	GRANITE	REM	REMOVE
BM	BENCHMARK	GRAV	GRAVEL	RET	RETAIN
BO	BY OTHERS	GRD	GUARD	RET WALL	RETAINING WALL
BOS	BOTTOM OF SLOPE	HDW	HEADWALL	ROW	RIGHT OF WAY
BR.	BRIDGE	HMA	HOT MIX ASPHALT	RR	RAILROAD
CB	CATCH BASIN	HOR	HORIZONTAL	R&R	REMOVE AND RESET
CBCI	CATCH BASIN WITH CURB INLET	HYD	HYDRANT	R&S	REMOVE AND STACK
CC	CEMENT CONCRETE	INV	INVERT	RT	RIGHT
CCM	CEMENT CONCRETE MASONRY	JCT	JUNCTION	SB	STONE BOUND
CEM	CEMENT	L	LENGTH OF CURVE	SHLD	SHOULDER
CI	CURB INLET	LB	LEACH BASIN	SMH	SEWER MANHOLE
CIP	CAST IRON PIPE	LP	LIGHT POLE	ST	STREET
CLF	CHAIN LINK FENCE	LT	LEFT	STA	STATION
CL	CENTERLINE	MAX	MAXIMUM	SSD	STOPPING SIGHT DISTANCE
CMP	CORRUGATED METAL PIPE	MB	MAILBOX	SHLO	STATE HIGHWAY LAYOUT LINE
CSP	CORRUGATED STEEL PIPE	MH	MANHOLE	SW	SIDEWALK
CO.	COUNTY	MHB	MASSACHUSETTS HIGHWAY BOUND	T	TANGENT DISTANCE OF CURVE/TRUCK %
CONC	CONCRETE	MIN	MINIMUM	TAN	TANGENT
CONT	CONTINUOUS	NIC	NOT IN CONTRACT	TEMP	TEMPORARY
CONST	CONSTRUCTION	NO.	NUMBER	TC	TOP OF CURB
CR GR	CROWN GRADE	PC	POINT OF CURVATURE	TOS	TOP OF SLOPE
DHV	DESIGN HOURLY VOLUME	PCC	POINT OF COMPOUND CURVATURE	TYP	TYPICAL
DI	DROP INLET	P.G.L.	PROFILE GRADE LINE	UP	UTILITY POLE
DIA	DIAMETER	PI	POINT OF INTERSECTION	VAR	VARIES
DIP	DUCTILE IRON PIPE	POC	POINT ON CURVE	VERT	VERTICAL
DW	STEADY DON'T WALK - PORTLAND ORANGE	POT	POINT ON TANGENT	VC	VERTICAL CURVE
DWY	DRIVEWAY	PRC	POINT OF REVERSE CURVATURE	WCR	WHEEL CHAIR RAMP
ELEV (or EL.)	ELEVATION	PROJ	PROJECT	WG	WATER GATE
EMB	EMBANKMENT	PROP	PROPOSED	WIP	WROUGHT IRON PIPE
EOP	EDGE OF PAVEMENT	PSB	PLANTABLE SOIL BORROW	WM	WATER METER/WATER MAIN
EXIST (or EX)	EXISTING	PT	POINT OF TANGENCY	X-SECT	CROSS SECTION