BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	1	30
PROJECT FILE NO.	607955		

TITLE SHEET & INDEX
REVISED 6-23-17 jlb

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

CULVERTS REPLACEMENT AND EXTENSION

MASSACHUSETTS AVENUE/ROUTE 111

IN THE TOWN OF

BOXBOROUGH

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

PCN SUBMITTAL

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 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, 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.

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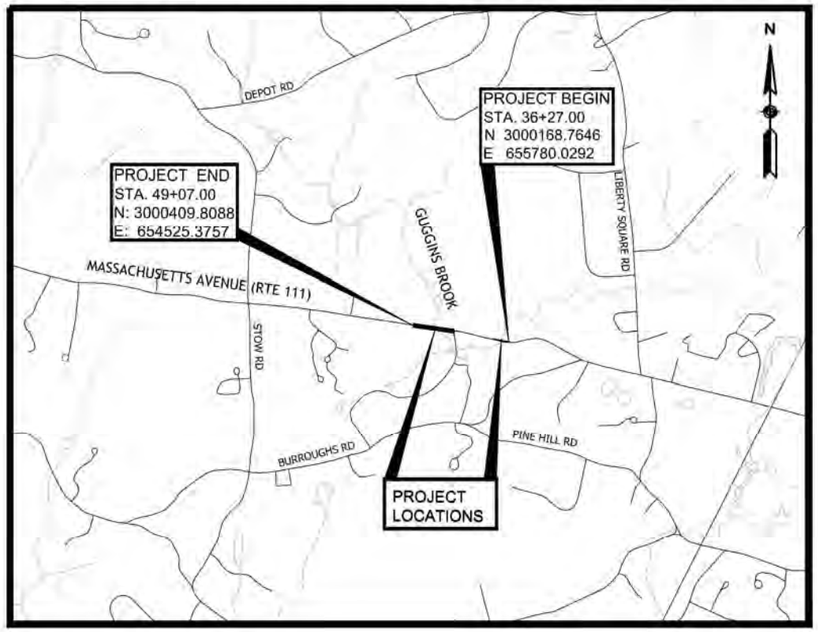


0 500 1000 1500 2000
SCALE: 1" = 1000'

LENGTH OF PROJECT = 1,280.00 FEET = 0.220 MILES

DESIGN DESIGNATION MASSACHUSETTS AVENUE/ROUTE 111

DESIGN SPEED	25 MPH
ADT (1990)	10,672
ADT (2001)	20,200
K	11%
D	61%
T (PEAK HOUR)	UNAVAILABLE
T (AVERAGE DAY)	UNAVAILABLE
DHV	UNAVAILABLE
DDHV	UNAVAILABLE
FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL

DATE	DESCRIPTION	REV #
3/6/2017	PCN PLANS SUBMITTAL	0
2/26/16	REVISED NOI PLANS	1
9/1/15	25% SUBMITTAL	0

massDOT
Massachusetts Department of Transportation
Highway Division

AECOM
AECOM TECHNICAL SERVICES INC.
250 APOLLO DRIVE CHELMSFORD, MA 01824

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
	JB OR BRJB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
	CB	CATCH BASIN
	CI	CURB INLET
	BUOY	BUOY
	FPL	FLAG POLE
		GAS PUMP
	DI	DROP INLET
	MB	MAIL BOX
	GRAN POST	GRANITE POST
	PLANTER	PLANTER
	POST	POST
	TBH	TELEPHONE BOOTH
	VLT	VAULT
	VLV	VALVE
	WELL	WELL
	EHH	ELECTRIC MANHOLE (HANDHOLE)
		GATE POST
	FL	FLOW LINE
		GAS GATE
	BH	BORING HOLE
		MONITORING WELL
	TEP	TEST PIT
	CONC. HDWL	CONCRETE HEADWALL
		HANDHOLE
	STONE DHWL	STONE HEADWALL
	HYD	HYDRANT
	LPL	LIGHT POLE
	CO. BD.	COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		OTHER MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
	MHB	MHD BOUND
	MON	MONUMENT
	SB	STONE BOUND
	TOWN OR CITY BD	TOWN OR CITY BOUND
	TSN	TRAVERSE OR TRIANGULATION STATION
	TPL OR GUY	TROLLEY POLE OR GUY POLE
		TRANS. POLE
	UFB	UP W ITH FIREBOX
	LPDL	POLE WITH DOUBLE LIGHT
	ULT	UP W ITH 1 LIGHT
	UPL	UTILITY POLE
	BUSH	BUSH
	TREE	TREE
		STUMP
		SWAMP / MARSH
	WG	WATER GATE
	FA	FIRE ALARM BOX
	PM	PARKING METER
		ELECTRICAL GROUND
	GV	GATE VALVE
		RIP RAP
		OVERHEAD CABLE
		DIRECT BURIAL CABLE
		CURBING
	185	CONTOURS
		DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		ELECTRIC DUCT " "
		GAS MAIN " "
		SEWER MAIN " "
		TELEPHONE DUCT " "
		WATER MAIN " "
		BALANCE STONE WALL
		CULVERT
		GUARD RAIL
		GUTTER LINE AT DRIVEWAYS
		CHAIN LINK FENCE
		STOCKADE FENCE

GENERAL SYMBOLS (CONT.)

EXISTING	PROPOSED	
		COMPOST FILTER TUBE
		HAY BALES/SILT FENCE
		HAY BALES/SILT FENCE
		RETAINING WALL
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLAN & OVERLAY
		ORDINARY HIGH WATERMARK OF RIVER OR STREAM
		BORDER OF WETLAND
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6'X 6' TYPICAL UNLESS OTHERWISE SPECIFIED)
		VIDEO SURVEILLANCE CAMERA
		MICROWAVE DETECTOR
		MAGNETOMETER (2 SHOWN)
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		OPTICOM CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD (TYPE AS NOTED OR AS SPECIFIED)
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
		PEDESTRIAN SIGNAL POST AND BASE
	RRSG	RAILROAD SIGNAL
		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
		STEEL OR ALUMINUM MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (TWO POSTS)
		SIGNAL AND LIGHTING MAST ARM (OPTICOM)
		EMERGENCY PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL & METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"X12" (AND AS NOTED)
		ELECTRIC HANDHOLE 12" X 24"
		TRAFFIC SIGNAL INTERCONNECT CONDUIT
		TRAFFIC SIGNAL CONDUIT (TYPE AS NOTED)

PAVEMENT MARKINGS AND SIGNING SYSBOLS

EXISTING	PROPOSED	
		PAVEMENT ARROW - WHITE
	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWLL	SOLID WHITE LANE LINE
	BWLL	BROKEN WHITE LANE LINE (10' LINE, 30' SPACE TYP.)
	SWEL	SOLID WHITE EDGE LINE
	YGL	YELLOW GORE LINE - 12"
	DYCL	DOUBLE YELLOW CENTER LINE
	SWCHL	SOLID WHITE CHANNELIZATION LINE - 8"
	WGL	WHITE GORE LINE - 12"
	SYEL	SOLID YELLOW EDGE LINE
	BYCL	BROKEN YELLOW CENTER LINE (10' LINE, 30' SPACE TYP.) - 4"
	SYCL	SOLID YELLOW CENTER LINE
	DWLL	DOTTED WHITE LANE LINE - 4" (2' LINE, 4' SPACE)
		DIRECTION OF TRAFFIC FLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (OR EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (OR EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACHING BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAIL BOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OHW	ORDINARY HIGH WATER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

GENERAL (CONT.)

R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/ TRUCK PERCENTAGE
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEELCHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK - PORTLAND ORANGE
FDW	FLASHING DON'T WALK - PORTLAND ORANGE
FYV	FLASHING AMBER VERTICAL ARROW
FR	FLASHING CIRCULAR RED
FW	FLASHING WALK - LUNAR WHITE
FY	FLASHING CIRCULAR AMBER
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FRV	FLASHING RED VERTICAL ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
OP	OPTICOM
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RV	STEADY RED VERTICAL ARROW
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK - LUNAR WHITE
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW
YR	STEADY AMBER RIGHT ARROW
YV	STEADY AMBER VERTICAL ARROW

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	30
PROJECT FILE NO.	607955		

LEGEND & ABBREVIATIONS
REVISED 6-23-17 jlb

3/6/2017	PCN PLANS SUBMITTAL	0

GENERAL NOTES:

1. LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES ARE FROM SURVEY AND RECORDS OF THE TOWN OR PRIVATE UTILITY COMPANIES AND ARE CONSIDERED APPROXIMATE BOTH AS TO SIZE AND LOCATION, AND ARE INDICATED ON THESE DRAWINGS TO GIVE BIDDERS A GENERAL IDEA OF EXISTING CONDITIONS TO BE INVESTIGATED BY THE BIDDER. IT IS UNDERSTOOD AND AGREED THAT EACH BIDDER WILL NOT RELY UPON THESE DRAWINGS FOR SUCH INFORMATION, BUT THAT EACH BIDDER SHALL MAKE EXAMINATIONS IN THE FIELD BY VARIOUS AVAILABLE RECORDS. UTILITY CORPORATIONS AND INDIVIDUALS AS TO THE LOCATION OF ALL SUBSURFACE STRUCTURES.

2. VEHICLE ACCESS TO ABUTTING PREMISES MUST BE MAINTAINED IN A SAFE CONDITION AT ALL TIMES.

3. EXISTING PAVEMENTS AND/OR SIDEWALKS SHALL BE SAW CUT WHERE THEY MEET PROPOSED SURFACE TREATMENTS. SAW CUTS SHALL BE SMOOTH AND STRAIGHT. WHERE NEW BITUMINOUS CONCRETE MEETS EXISTING BITUMINOUS CONCRETE SURFACES, SAW CUT EDGES ARE TO BE SEALED WITH BITUMEN AND BACKSANDED.

4. AREAS OUTSIDE THE LIMITS OF WORK DISTURBED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE EXPENSE OF THE CONTRACTOR.

5. ALL TOWN OR STATE OWNED UTILITY STRUCTURES INCLUDING MANHOLES, CATCH BASINS, AND GATE BOXES SHALL BE ADJUSTED OR REMODELED TO FINISHED GRADE BY THE CONTRACTOR. ALL PRIVATELY OWNED UTILITY STRUCTURES SHALL BE ADJUSTED OR REMODELED BY THE OWNER.

6. LIMITS OF WORK HAVE BEEN SET ON THE PLANS, HOWEVER, THESE MAY BE EXTENDED OR REDUCED AT THE DISCRETION OF THE ENGINEER TO MEET WITH FIELD CONDITIONS.

7. THE CONTRACTOR SHALL FIELD CHECK ALL DIMENSIONS, AND ELEVATIONS BEFORE PROCEEDING WITH NEW WORK. TEST PITS WILL BE REQUIRED TO VERIFY POTENTIAL UTILITY CONFLICTS AT THE EXPENSE OF THE CONTRACTOR ANY DISCREPANCIES OR CONFLICTS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

8. IF REQUIRED BY THE CONTRACTOR, OVERHEAD LINES SHALL BE RELOCATED BY THE UTILITY COMPANY AT THE CONTRACTOR'S EXPENSE.

9. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NECESSITY OF MAKING HIS OWN INVESTIGATION IN ORDER TO ASSURE THAT NO DAMAGE TO EXISTING UTILITIES, DRAINAGE STRUCTURES, PIPE LINES, TRAFFIC SIGNAL CONDUITS, ETC. WILL OCCUR. THE CONTRACTOR SHALL NOTIFY MASSACHUSETTS DIG SAFE AND PROCURE A DIG SAFE NUMBER FOR EACH LOCATION PRIOR TO DISTURBING EXISTING GROUND IN ANY WAY. TELEPHONE NUMBER OF THE DIG SAFE CENTER IS 811.

10. BEFORE CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED (SEE MASSACHUSETTS GENERAL LAWS, CHAPTER 82 SECTION 40). CALL "DIG SAFE" 811.

11. "DIG SAFE" SHALL BE NOTIFIED AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION FOR THE PROPOSED PROJECT WORK. ALSO CONTACT ANY TOWNSHIP / COUNTY AND MASSDOT WITHIN WHOSE JURISDICTION THE WORK IS TO BE PERFORMED

12. EXISTING BASE MAPPING HAS BEEN COMPILED FROM ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY GCG ASSOCIATES, INC. IN JULY, AUGUST, AND SEPTEMBER OF 2012. SUPPLEMENTAL SURVEY WAS PERFORMED BY PLACES ASSOCIATES USING A TOTAL STATION IN DECEMBER 2012.

13. HORIZONTAL CONTROL IS BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD-83), MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, MAINLAND ZONE. COORDINATES ARE BASED ON CONTROL PROVIDED BY THE MASSDOT SURVEY SECTION FOR GPS STATIONS STA1 AND STA2.

14. VERTICAL CONTROL IS BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS PROVIDED BY MASSDOT FOR GPS STATIONS STA1 AND STA2.

15. PROPERTY LINES SHOWN HEREON ARE APPROXIMATE ONLY AND ARE BASED UPON RECORD DEEDS, PLANS, AND ASSESSORS INFORMATION.

16. FOR TRAVERSE INFORMATION SEE MASSACHUSETTS HIGHWAY FIELD BOOK NO. 21720.

17. THE CONTRACTOR SHALL MAINTAIN EXISTING UTILITY SERVICES TO ABUTTING PROPERTIES DURING CONSTRUCTION.

18. PROVIDE EROSION CONTROL PROTECTION, COMPOST FILTER TUBES AND/OR SEDIMENTATION FENCE TO CONTAIN ANY SEDIMENT RUNOFF FROM THE WORK ZONE. EROSION CONTROL BARRIERS ARE TO BE PLACED 6 FEET OUTSIDE OF THE EDGE OF PAVEMENT OR OUTSIDE THE LIMITS OF GRADING.

19. EQUIPMENT AND MATERIAL SHALL BE STORED AT LEAST 4 FEET BEHIND GUARDRAIL OR AT LEAST 30 FEET FROM THE EDGE OF TRAVEL WAY, OR IN STORAGE AREAS AS APPROVED BY MASSDOT OR APPROPRIATE AUTHORITIES.

20. THE INVERTS SHOWN ARE PROPOSED AND SHOWN FOR BIDDING PURPOSED ONLY. ACTUAL INVERT ELEVATIONS WILL BE CONFIRMED IN THE FIELD.

21. WETLANDS WERE DELINEATED BY EPSILON ASSOCIATES IN SEPTEMBER 2012.

22. REFER TO NO-RISE HYDRAULIC REPORT FOR CULVERT REPLACEMENT ROUTE 111 (MASSACHUSETTS AVENUE) OVER GUGGINS BROOK, BOXBOROUGH, MA. PREPARED BY AECOM, DATED DECEMEBER 2015.

23. FIELD OBSERVATIONS CORRELATED WTH AVAILABLE LOCAL USGS STREAM FLOW DATA INDICATE A GREATER THAN 50% CHANCE THAT THE RESOURCE WILL BE DRY AT SOME POINT BETWEEN JULY AND SEPTEMBER IN A GIVEN YEAR. THIS CORRELATION IS BASED ON 50+ YEARS OF USGS STREAM FLOW DATA. IF WATER IS PRESENT IN THE RESOURCE DURING CONSTRUCTION AND THE USE OF SAND BAGS AND TURBIDITY CURTAINS ARE NECESSARY, THEY SHALL BE INSTALLED AT THE EDGE OF THE PERMANENT FILL AREA ONLY.

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT AT PROP CULVERT LOCATION ONLY

SURFACE: 1.75" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER 2.25" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

BASE: 4.5" SUPERPAVE BASE COURSE 37.5 (SBC-37.5)

SUBBASE: CONTROLLED DENSITY FILL - VARIABLE DEPTH

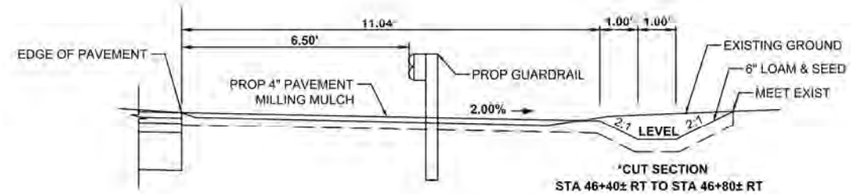
NOTE: TACK COAT SHALL BE APPLIED AT A RATE OF 0.07 GAL/SY ON MILLED SURFACES AND 0.05 GAL/SY ON SMOOTH (UNMILLED) SURFACES

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

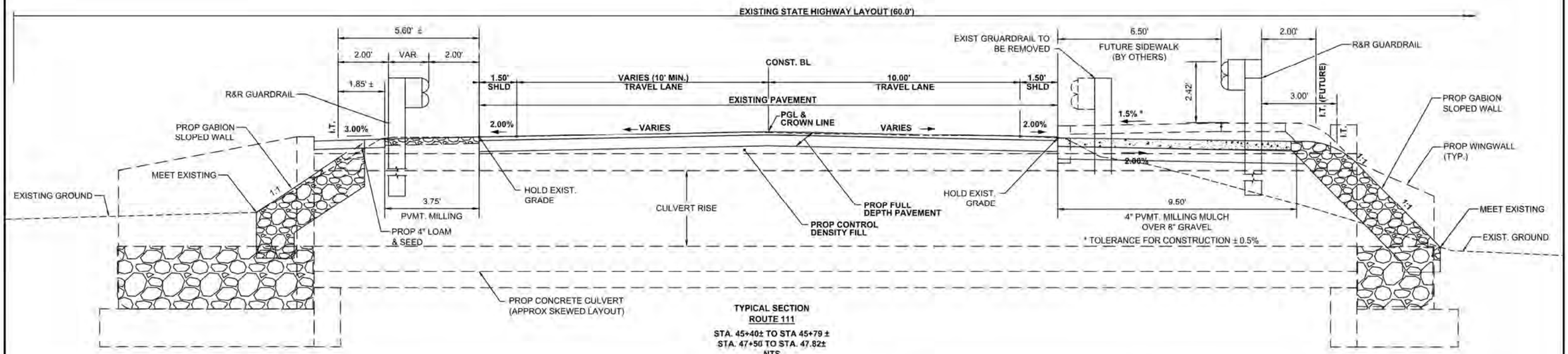
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	30
PROJECT FILE NO.	607955		

TYPICAL SECTIONS

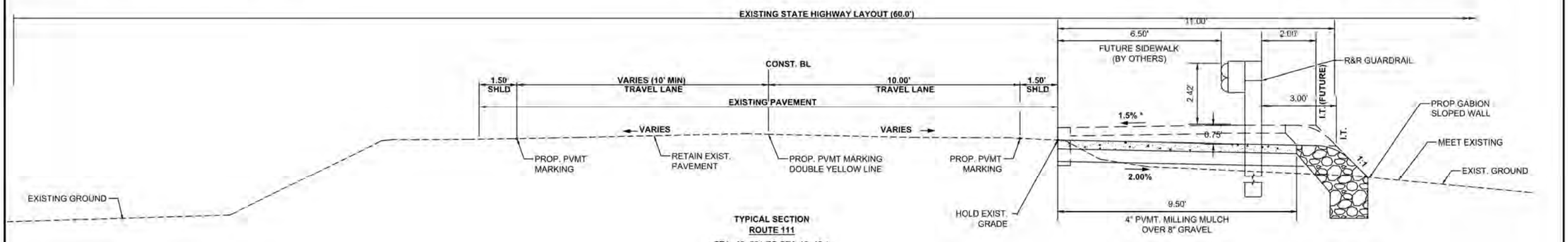
REVISED 6-23-17 jlb



*CUT SECTION
STA 46+40± RT TO STA 46+80± RT



TYPICAL SECTION
ROUTE 111
STA. 45+40± TO STA 45+79 ±
STA. 47+50 TO STA. 47.82±
NTS



TYPICAL SECTION
ROUTE 111
STA. 43+80± TO STA 45+40 ±
STA. 45+79 TO STA. 46.40±
STA. 46+80 TO STA. 47.50±
STA. 47+82 TO STA. 49.00±
NTS

NOTE: 1:1 GABION SLOPED WALL SHALL BE USED ONLY WHERE PROPOSED GRADE DIFFERENCE BETWEEN TOP AND BOTTOM OF SLOPE IS GREATER THAN TWO FEET. WHERE GRADE DIFFERENCE IS TWO FEET OR LESS, A 2:1 LOAM AND SEED SLOPE WITH ORDINARY BORROW SHALL BE CONSTRUCTED.

3/6/2017	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	30
PROJECT FILE NO.	607955		

CONSTRUCTION PLAN
SHEET 1 OF 2

HIGHWAY GUARD DETAILS

STA 36+27 RT TO STA 36+65 RT - STEEL HIGHWAY GUARD TANGENT END TREATMENT
STA 36+65 RT TO STA 36+79 RT - STEEL W BEAM HWY GUARD
STA 36+79 RT TO STA 37+67 RT - STEEL HIGHWAY GUARDRAIL OVER CULVERT
(SEE CONSTRUCTION DETAILS)
STA 37+67 RT TO STA 37+96 RT - STEEL W BEAM HWY GUARD
STA 37+96 RT TO STA 38+24 RT - STEEL HIGHWAY GUARD TANGENT END TREATMENT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

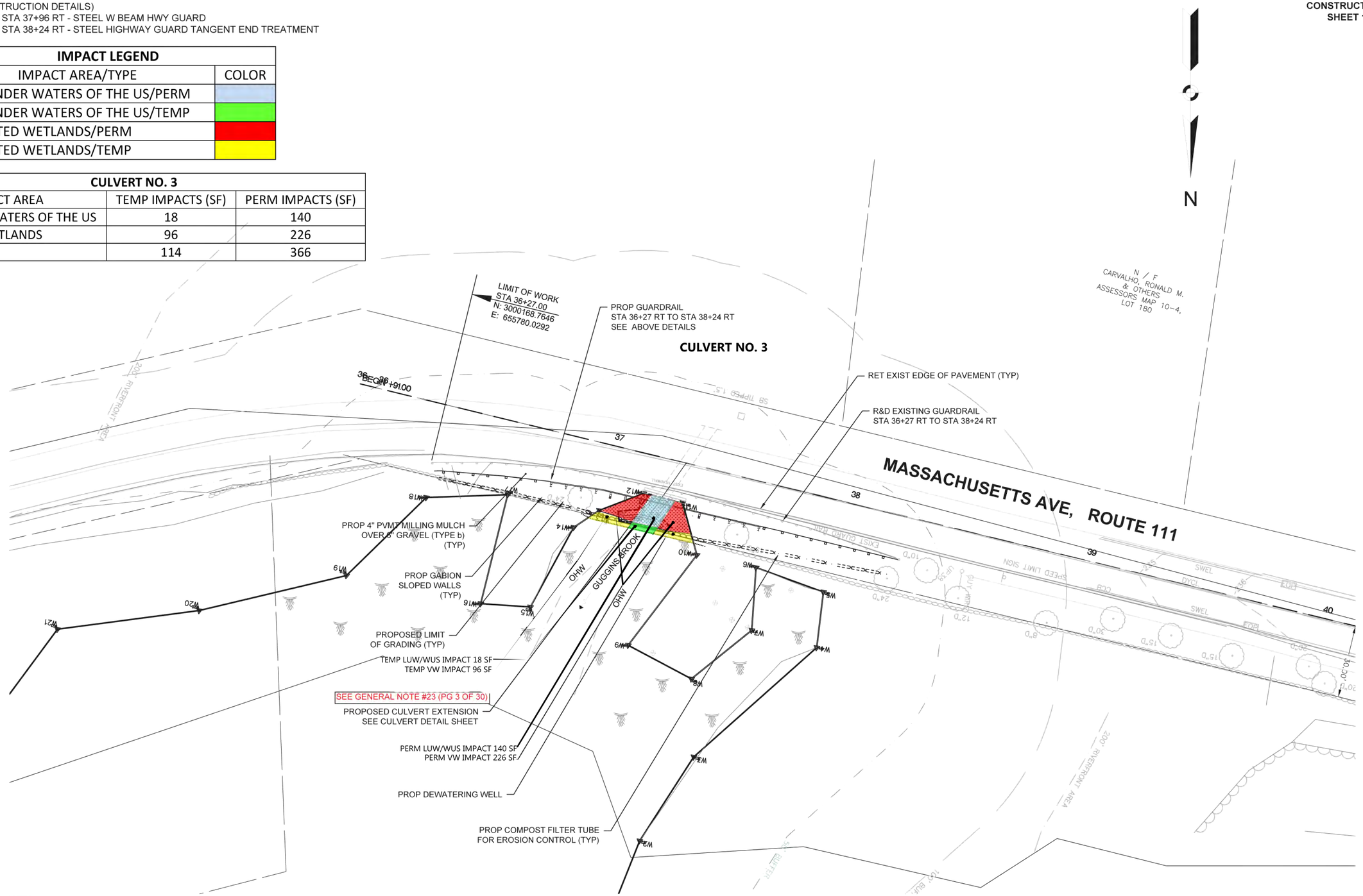
NONE

DRAINAGE DETAILS

NONE

IMPACT LEGEND	
IMPACT AREA/TYPE	COLOR
LAND UNDER WATERS OF THE US/PERM	
LAND UNDER WATERS OF THE US/TEMP	
VEGETATED WETLANDS/PERM	
VEGETATED WETLANDS/TEMP	

CULVERT NO. 3		
IMPACT AREA	TEMP IMPACTS (SF)	PERM IMPACTS (SF)
LAND UNDER WATERS OF THE US	18	140
VEGETATED WETLANDS	96	226
TOTAL	114	366



NOTES:
1. TREES WITHIN THE LIMITS OF GRADING SHALL BE REMOVED UNDER CLEARING AND GRUBBING.
2. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF THE STOCKPILES AND FORWARD THE INFORMATION TO U.S. ARMY CORPS OF ENGINEERS.

40 20 40
SCALE IN FEET
1" = 40'

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	30
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CONSTRUCTION PLAN
SHEET 2 OF 2
REVISED 6-23-17 jlb

HIGHWAY GUARD DETAILS

STA 45+35 LT TO STA 45+70 LT - REMOVE AND RESET
STA 47+54 LT TO STA 47+85 LT - REMOVE AND RESET

HIGHWAY GUARD DETAILS CONT.

STA 43+60 RT TO STA 43+98 RT - STEEL HIGHWAY GUARD TANGENT END TREATMENT
STA 43+98 RT TO STA 48+62 RT - STEEL W BEAM HWY GUARD
STA 48+62 RT TO STA 49+00 RT - STEEL HIGHWAY GUARD TANGENT END TREATMENT

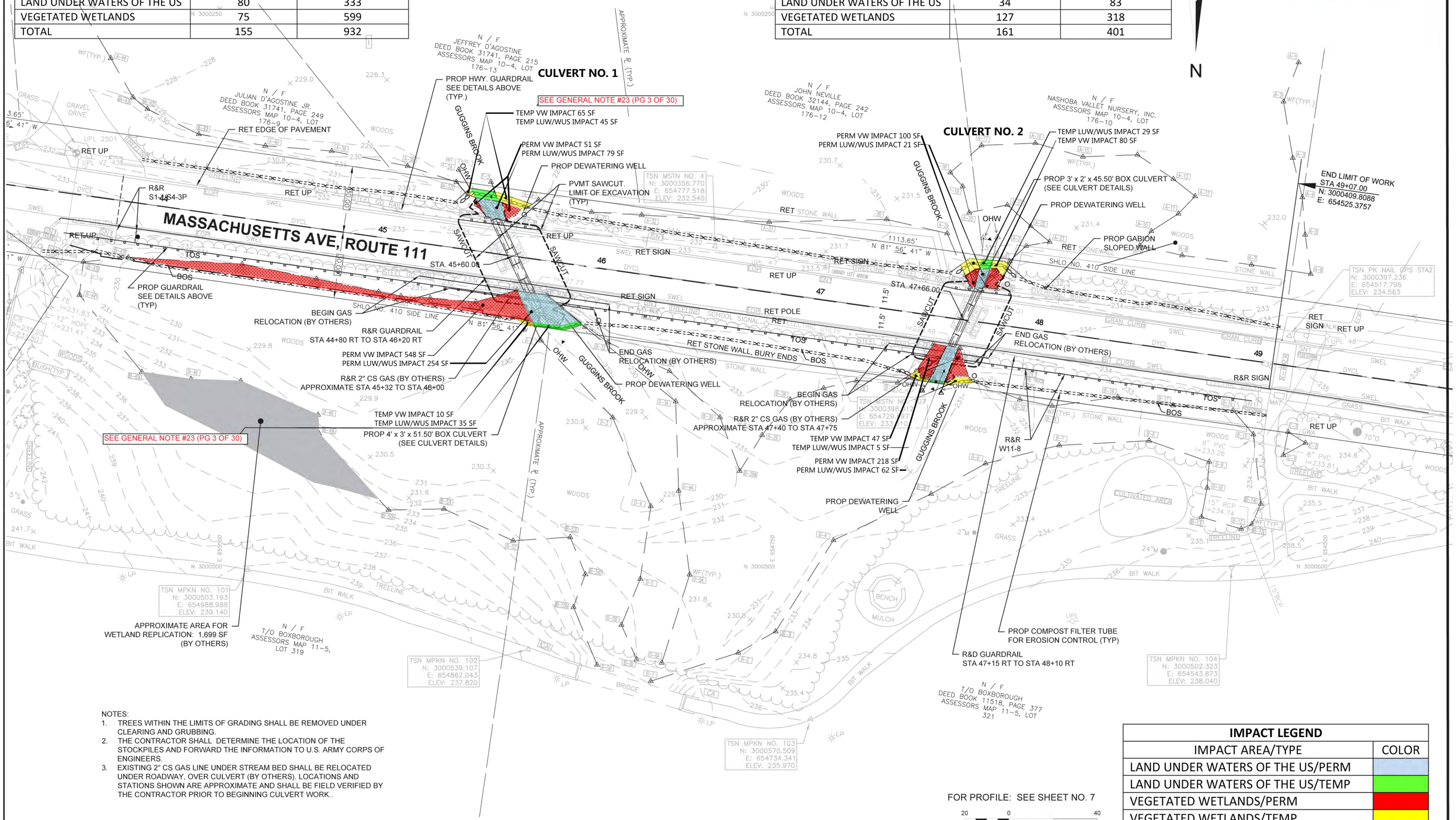
TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
NONE

CULVERT NO. 1		
IMPACT AREA	TEMP IMPACTS (SF)	PERM IMPACTS (SF)
LAND UNDER WATERS OF THE US	80	333
VEGETATED WETLANDS	75	599
TOTAL	155	932

CULVERT NO. 2		
IMPACT AREA	TEMP IMPACTS (SF)	PERM IMPACTS (SF)
LAND UNDER WATERS OF THE US	34	83
VEGETATED WETLANDS	127	318
TOTAL	161	401



NOTES:
1. TREES WITHIN THE LIMITS OF GRADING SHALL BE REMOVED UNDER CLEARING AND GRUBBING.
2. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF THE STOCKPILES AND FORWARD THE INFORMATION TO U.S. ARMY CORPS OF ENGINEERS.
3. EXISTING 2" CS GAS LINE UNDER STREAM BED SHALL BE RELOCATED UNDER ROADWAY, OVER CULVERT (BY OTHERS). LOCATIONS AND STATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING CULVERT WORK..

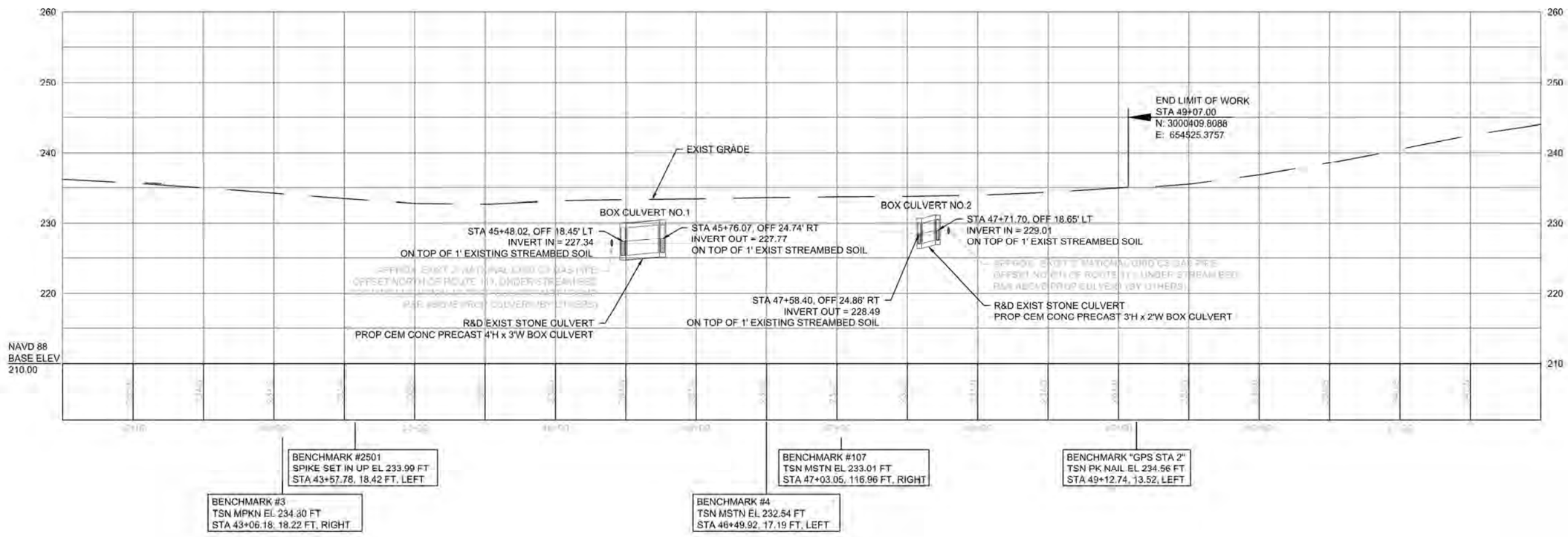
IMPACT LEGEND	
IMPACT AREA/TYPE	COLOR
LAND UNDER WATERS OF THE US/PERM	
LAND UNDER WATERS OF THE US/TEMP	
VEGETATED WETLANDS/PERM	
VEGETATED WETLANDS/TEMP	

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	7	30
PROJECT FILE NO.	607955		

PROFILE
MASSACHUSETTS AVENUE/ROUTE 111

REVISED 6-23-17 jlb



FOR CONSTRUCTION PLANS:
SEE SHEET NO. 6

HORIZONTAL
40 0 40 80
8 0 8 16
VERTICAL
SCALE IN FEET

3/6/2017	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

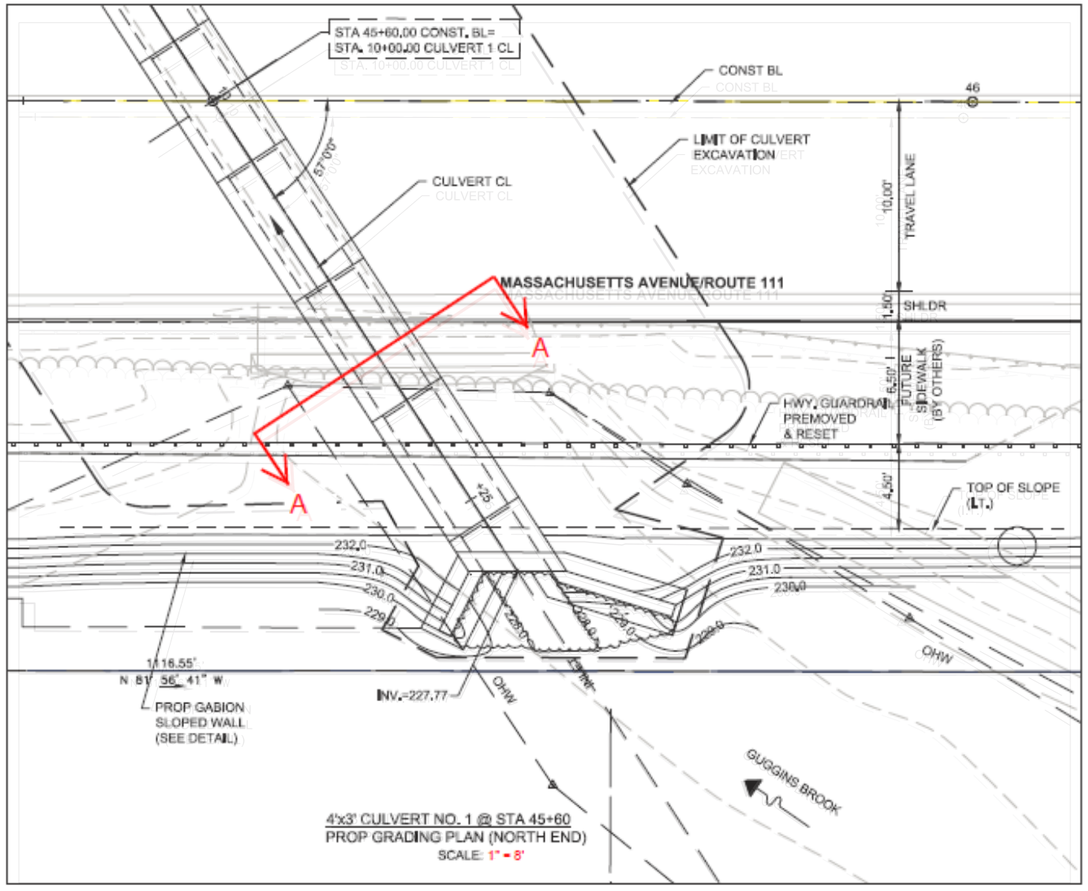
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	30
PROJECT FILE NO.	607955		

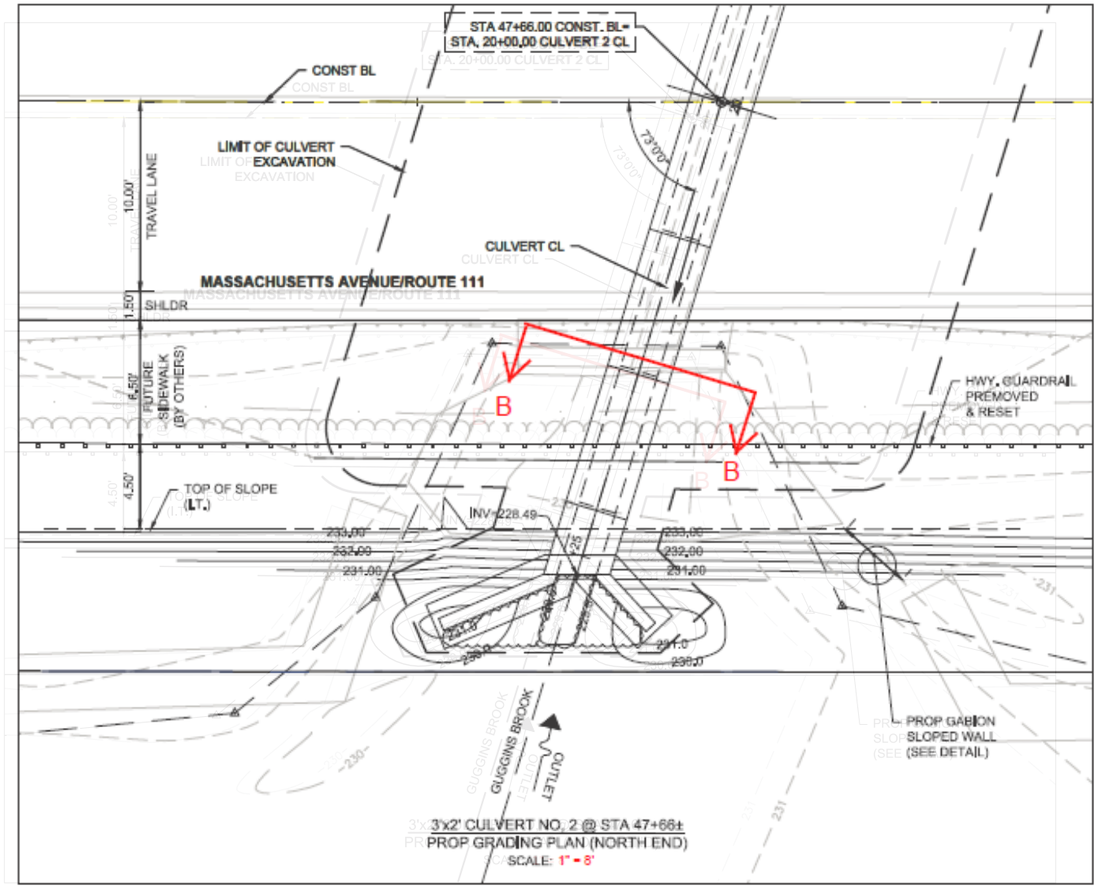
GRADING PLAN
CULVERT NO. 1 & NO. 2

REVISED 6-23-17 jlb

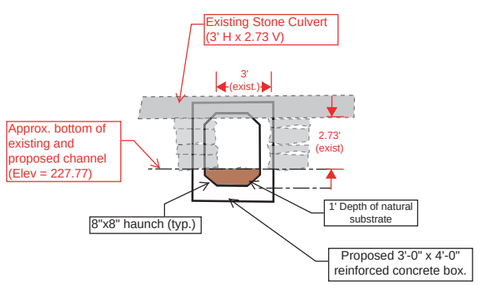
607955_GRADING PLAN.DWG

N



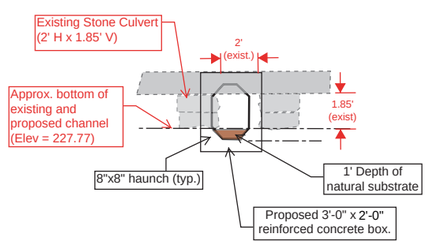


A - A



4' x 3' CULVERT STA 45+60
Note: Replacement culvert approximately 6" to 8" offset
NTS

B - B



3' x 2' CULVERT STA 47+66
Note: Replacement culvert approximately 6" to 8" offset
NTS

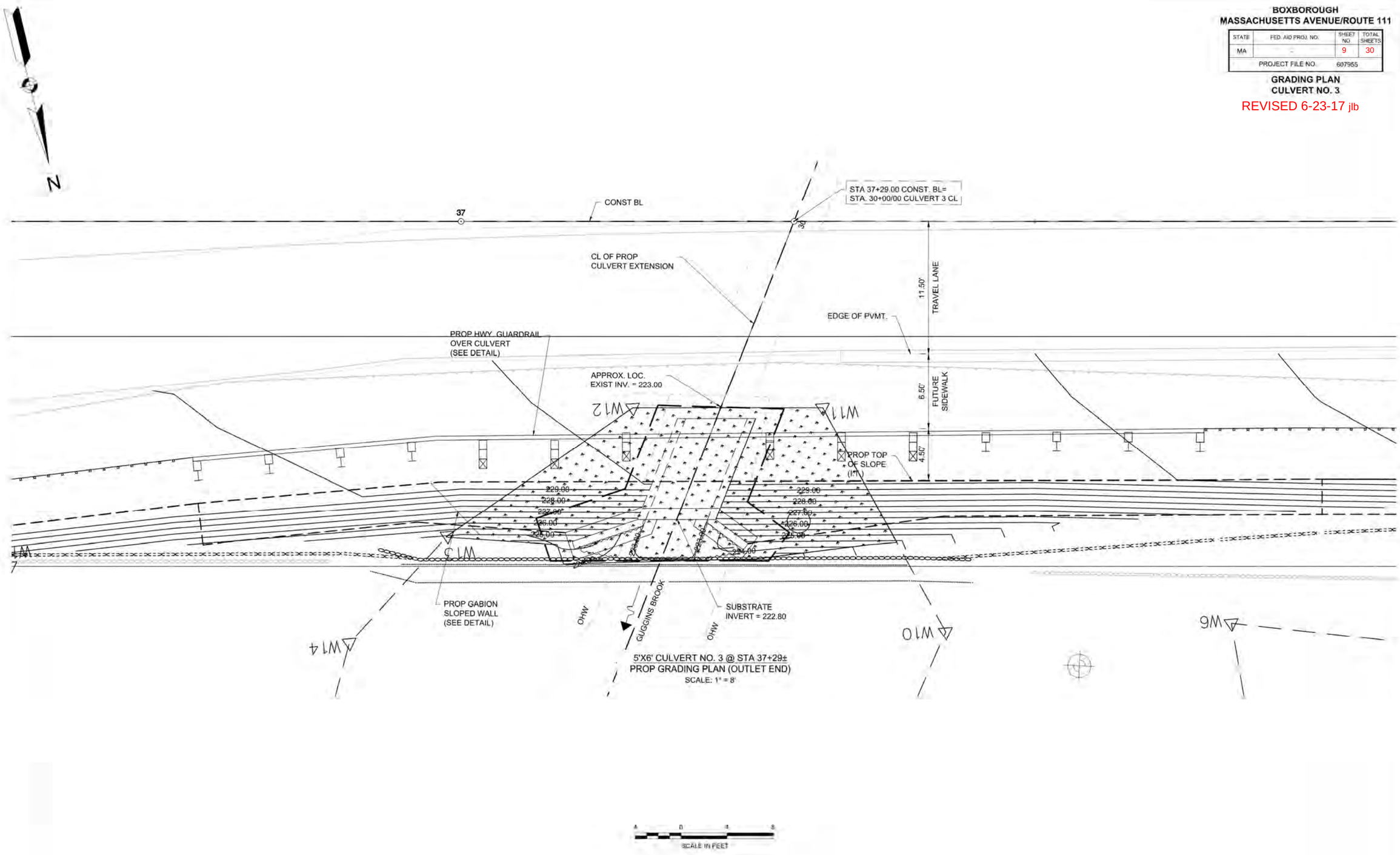
4 0 8
SCALE IN FEET

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	9	30
PROJECT FILE NO.	607955		

GRADING PLAN
CULVERT NO. 3

REVISED 6-23-17 jlb



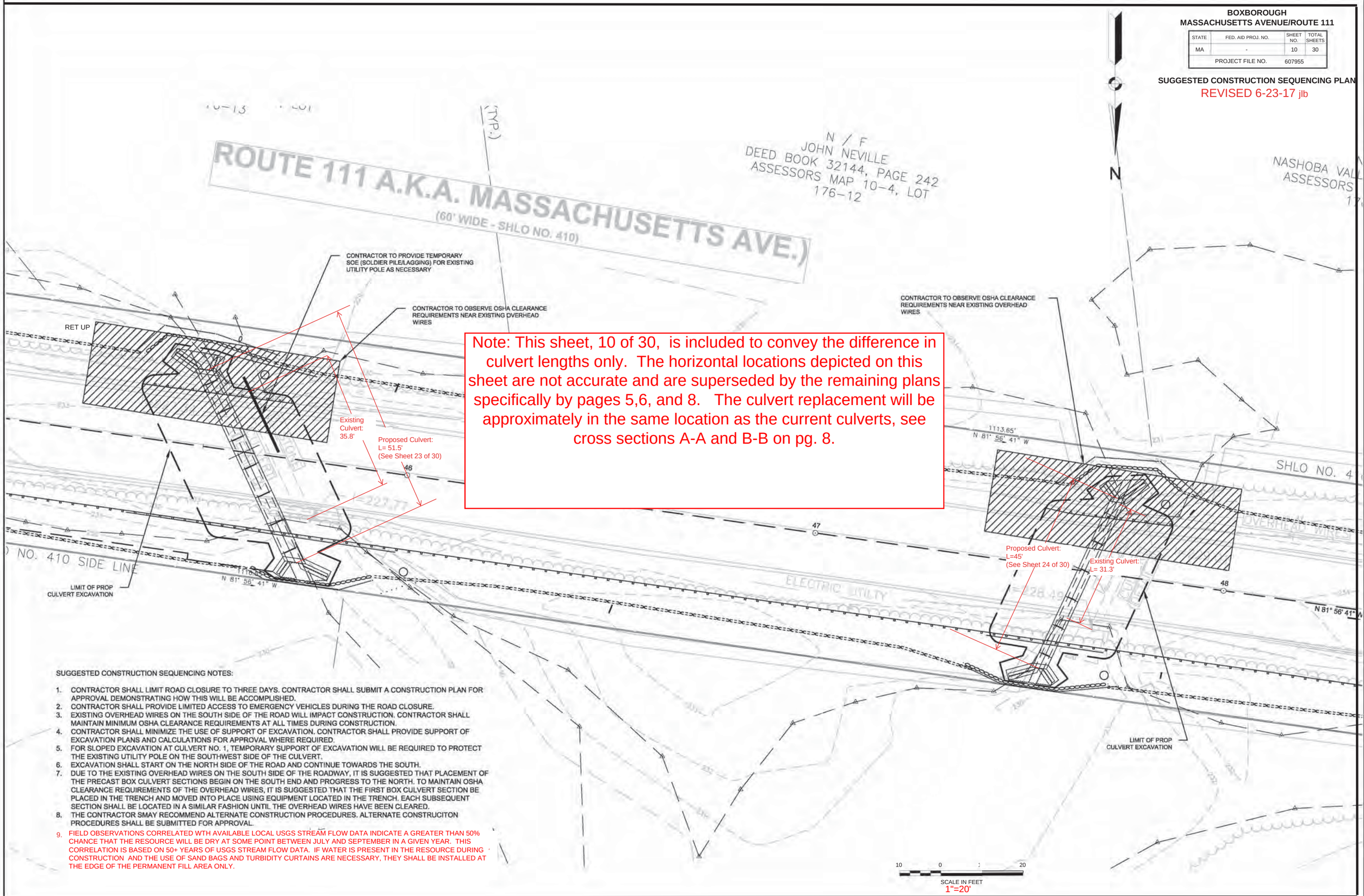
3/6/2017	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	10	30
PROJECT FILE NO.	607955		

SUGGESTED CONSTRUCTION SEQUENCING PLAN

REVISED 6-23-17 jlb



Note: This sheet, 10 of 30, is included to convey the difference in culvert lengths only. The horizontal locations depicted on this sheet are not accurate and are superseded by the remaining plans specifically by pages 5,6, and 8. The culvert replacement will be approximately in the same location as the current culverts, see cross sections A-A and B-B on pg. 8.

SUGGESTED CONSTRUCTION SEQUENCING NOTES:

1. CONTRACTOR SHALL LIMIT ROAD CLOSURE TO THREE DAYS. CONTRACTOR SHALL SUBMIT A CONSTRUCTION PLAN FOR APPROVAL DEMONSTRATING HOW THIS WILL BE ACCOMPLISHED.
2. CONTRACTOR SHALL PROVIDE LIMITED ACCESS TO EMERGENCY VEHICLES DURING THE ROAD CLOSURE.
3. EXISTING OVERHEAD WIRES ON THE SOUTH SIDE OF THE ROAD WILL IMPACT CONSTRUCTION. CONTRACTOR SHALL MAINTAIN MINIMUM OSHA CLEARANCE REQUIREMENTS AT ALL TIMES DURING CONSTRUCTION.
4. CONTRACTOR SHALL MINIMIZE THE USE OF SUPPORT OF EXCAVATION. CONTRACTOR SHALL PROVIDE SUPPORT OF EXCAVATION PLANS AND CALCULATIONS FOR APPROVAL WHERE REQUIRED.
5. FOR SLOPED EXCAVATION AT CULVERT NO. 1, TEMPORARY SUPPORT OF EXCAVATION WILL BE REQUIRED TO PROTECT THE EXISTING UTILITY POLE ON THE SOUTHWEST SIDE OF THE CULVERT.
6. EXCAVATION SHALL START ON THE NORTH SIDE OF THE ROAD AND CONTINUE TOWARDS THE SOUTH.
7. DUE TO THE EXISTING OVERHEAD WIRES ON THE SOUTH SIDE OF THE ROADWAY, IT IS SUGGESTED THAT PLACEMENT OF THE PRECAST BOX CULVERT SECTIONS BEGIN ON THE SOUTH END AND PROGRESS TO THE NORTH. TO MAINTAIN OSHA CLEARANCE REQUIREMENTS OF THE OVERHEAD WIRES, IT IS SUGGESTED THAT THE FIRST BOX CULVERT SECTION BE PLACED IN THE TRENCH AND MOVED INTO PLACE USING EQUIPMENT LOCATED IN THE TRENCH. EACH SUBSEQUENT SECTION SHALL BE LOCATED IN A SIMILAR FASHION UNTIL THE OVERHEAD WIRES HAVE BEEN CLEARED.
8. THE CONTRACTOR SMAY RECOMMEND ALTERNATE CONSTRUCTION PROCEDURES. ALTERNATE CONSTRUCITON PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.
9. FIELD OBSERVATIONS CORRELATED WTH AVAILABLE LOCAL USGS STREAM FLOW DATA INDICATE A GREATER THAN 50% CHANCE THAT THE RESOURCE WILL BE DRY AT SOME POINT BETWEEN JULY AND SEPTEMBER IN A GIVEN YEAR. THIS CORRELATION IS BASED ON 50+ YEARS OF USGS STREAM FLOW DATA. IF WATER IS PRESENT IN THE RESOURCE DURING CONSTRUCTION AND THE USE OF SAND BAGS AND TURBIDITY CURTAINS ARE NECESSARY, THEY SHALL BE INSTALLED AT THE EDGE OF THE PERMANENT FILL AREA ONLY.

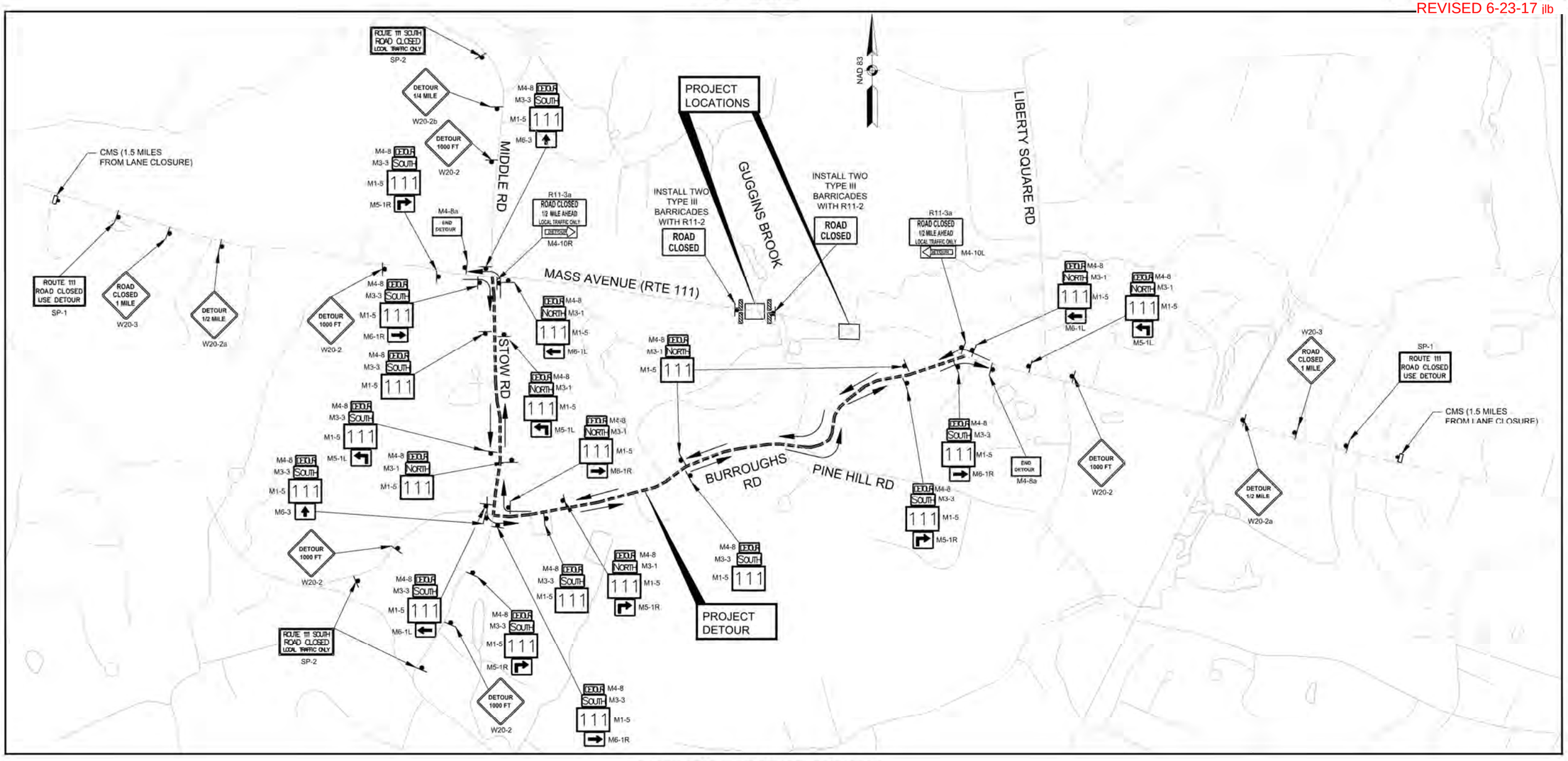
BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	11	30
PROJECT FILE NO.	607955		

TRAFFIC CONTROL AND DETOUR PLAN

REVISED 6-23-17 jlb

DETOUR PLAN



DETOUR LENGTH = 7100.00 FEET = 1.35 MILES

NOT TO SCALE

LEGEND :

- SIGN
- CHANGEABLE MESSAGE SIGN
- TYPE III BARRICADE

GENERAL NOTES:

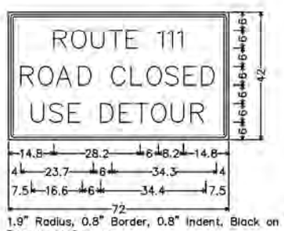
1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), INCLUDING ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. ALL CONFLICTING SIGNAGE SHALL BE REMOVED OR COVERED.
4. ALL CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED.
5. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
6. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE ROADWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
7. THE FIRST FIVE PLASTIC DRUMS OF A TAPER MAY BE MOUNTED WITH TYPE "A" FLASHING LIGHTS.
8. MINIMUM LANE WIDTHS SHALL BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS.
9. SIGN AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVLED WAY, CHANNELIZING DEVICES, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
10. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
11. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
12. THE LOCATION OF ALL SIGNS SHALL BE APPROVED BY THE ENGINEER.
13. THE ADVANCE NOTIFICATION MESSAGE SHALL BE DISPLAYED ON THE CHANGEABLE MESSAGE SIGN 3 WEEKS PRIOR TO CONSTRUCTION.
14. LOCAL TRAFFIC ACCESS SHALL BE MAINTAINED TO THE FIRE STATION, POLICE STATION, SCHOOL AND LIBRARY AT ALL TIMES DURING CONSTRUCTION.

3/6/2017	PCN PLANS SUBMITTAL	0

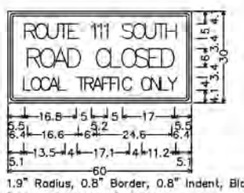
CONSTRUCTION SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	LEGEND	BORDER	NUMBER OF POSTS REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
R11-2	48"	30"	ROAD CLOSED	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			2	WHITE	BLACK	BLACK	2	10.00	20.00
R11-3a	60"	30"	ROAD CLOSED 1/2 MILE AHEAD LOCAL TRAFFIC ONLY				2	WHITE	BLACK	BLACK	4	12.50	25.00
W20-2	36"	36"	DETOUR 6000 FT				5	ORANGE	BLACK	BLACK	2	9.00	45.00
W20-2a	36"	36"	DETOUR 1/2 MILE				2	ORANGE	BLACK	BLACK	2	9.00	18.00
W20-2b	36"	36"	DETOUR 1/4 MILE				1	ORANGE	BLACK	BLACK	1	9.00	9.00
W20-3	36"	36"	ROAD CLOSED 1 MILE				2	ORANGE	BLACK	BLACK	2	9.00	18.00
M1-5	30"	24"	111	SEE MASSDOT* STANDARDS			16 / 6	WHITE	BLACK	BLACK	32 / 6	5.00	110.00
M3-1	24"	12"	NORTH	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			9	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.00	18.00
M3-3	24"	12"	SOUTH				13	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.00	26.00
M4-8	24"	12"	DETOUR				22	ORANGE	BLACK	BLACK	MOUNT WITH M1-5	2.00	44.00
M4-8a	24"	18"	END DETOUR				2	ORANGE	BLACK	BLACK	2	3.00	6.00
M4-10L	24"	12"	DETOUR				1	ORANGE	BLACK	N/A	MOUNT WITH R11-3a	2.00	2.00
M4-10R	24"	12"	DETOUR				1	ORANGE	BLACK	N/A	MOUNT WITH R11-3a	2.00	2.00
M5-1L	21"	15"					3	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.20	6.60
M5-1R	21"	15"					4	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.20	8.80
M6-1L	21"	15"					3	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.20	6.60
M6-1R	21"	15"					4	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.20	8.80

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	LEGEND	BORDER	NUMBER OF POSTS REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
M6-3	21"	15"		SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			2	WHITE	BLACK	BLACK	MOUNT WITH M1-5	2.20	4.40
SP-1	72"	42"	ROUTE 111 ROAD CLOSED USE DETOUR	SEE SP-1 SIGN DETAIL			2	ORANGE	BLACK	BLACK	SEE NOTE 3	21.00	42.00
SP-2	60"	30"	ROUTE 111 SOUTH ROAD CLOSED LOCAL TRAFFIC ONLY	SEE SP-2 SIGN DETAIL			3	ORANGE	BLACK	BLACK	6	12.50	37.50

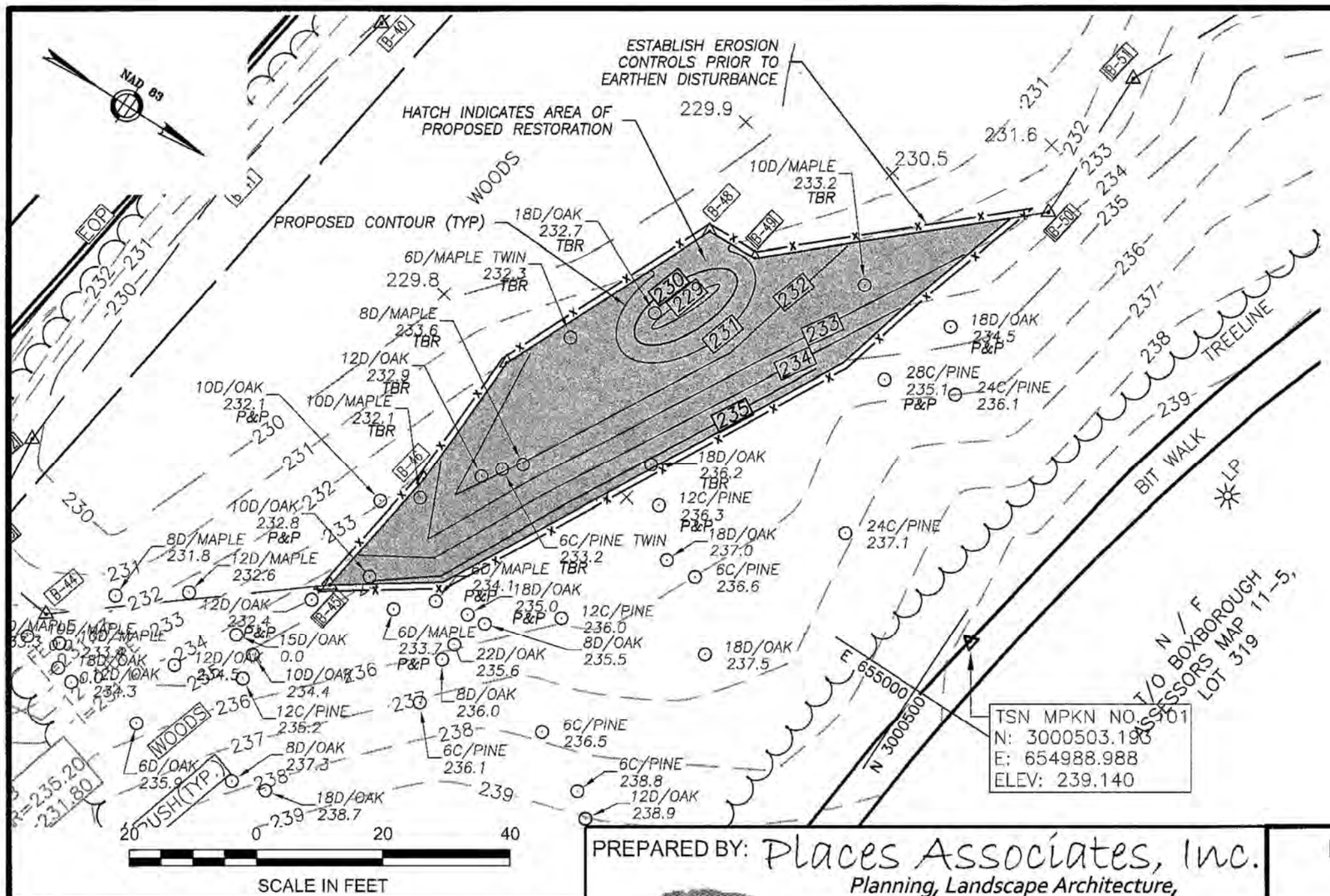


1.9" Radius, 0.8" Border, 0.8" Indent, Black on Orange;
[ROUTE 111] E 2K;
[ROAD CLOSED] E 2K;
[USE DETOUR] E 2K;



1.9" Radius, 0.8" Border, 0.8" Indent, Black on Orange;
[ROUTE 111 SOUTH] C 2K;
[ROAD CLOSED] C 2K;
[LOCAL TRAFFIC ONLY] C 2K;

3/6/2017	PCN PLANS SUBMITTAL	0



BVW IMPACT

RESOURCE AREA	PROPOSED IMPACTS	PROPOSED RESTORATION
BVW	1,699± SF	2,160± SF

BLSF IMPACT

ELEVATION (FT)	FILLED VOLUME (CF)	REPLICATED VOLUME (CF)
231–232	40	552
230–231	42	195
229–230	13	69
228–229	2	10
TOTAL:	97	826

TBR=TO BE REMOVED
P&P=PRESERVE AND PROTECT

MASSACHUSETTS WILLIAM E. MURRAY NO 1107 REGISTERED LANDSCAPE ARCHITECT
12-15-2016

WETLAND IMPACT PLAN

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY: Places Associates, Inc.
Planning, Landscape Architecture, Civil Engineering, Surveying
256 GREAT ROAD, SUITE 4
LITTLETON, MA 01460
978.486.0334 Ph.
978.486.0447 Fax
places@placesassociates.com

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF

ROUTE 111
(A.K.A. MASSACHUSETTS AVENUE)

IN THE TOWN OF

BOXBOROUGH

AS ORDERED BY
BY THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

PROJECT FILE NO. 607955

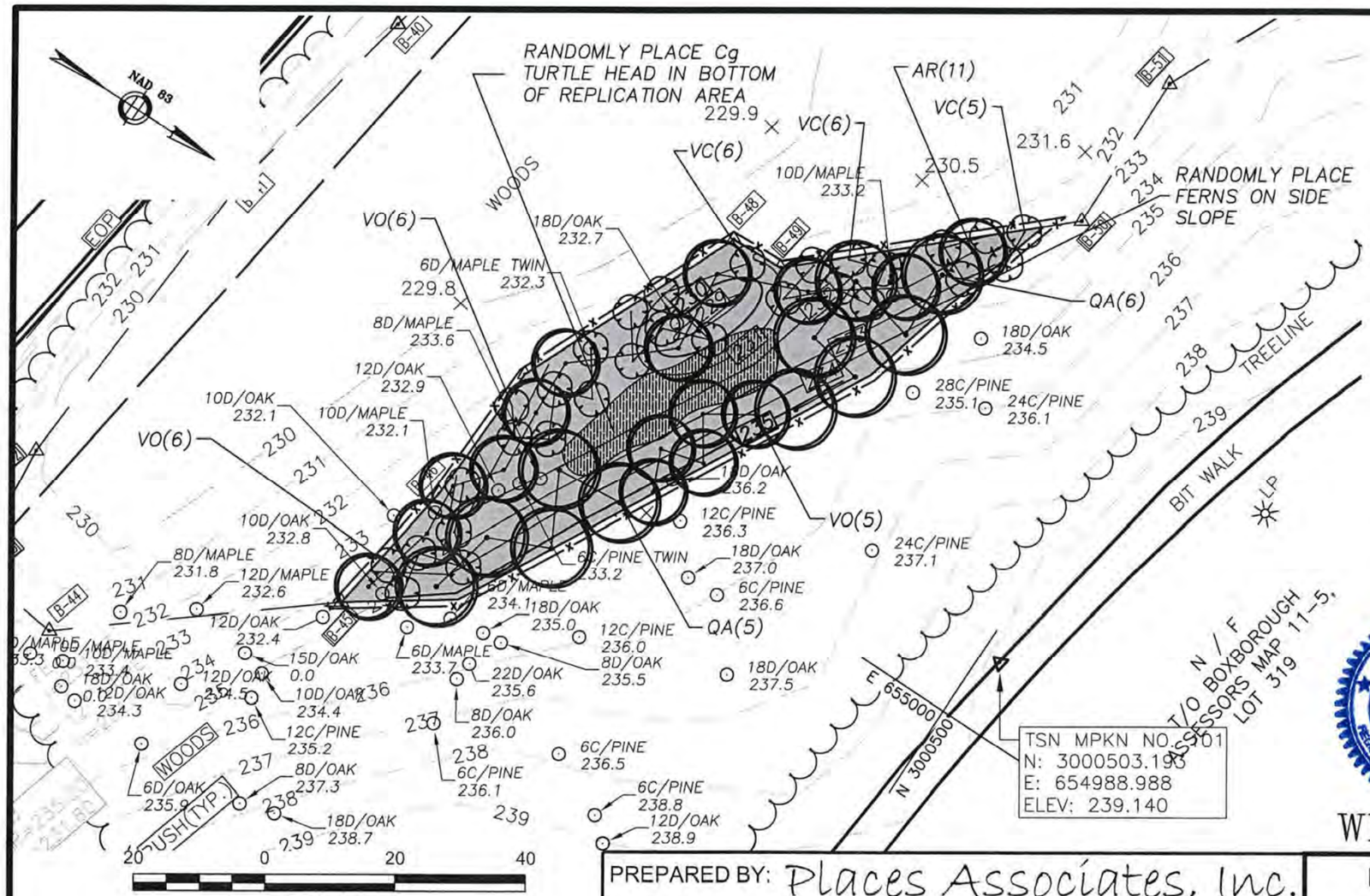
REVISIONS

REV.	COMMENTS	DATE

SCALE: 20 FEET TO THE INCH

FILE NAME: 606328SV.dwg
FIELD BOOK. NO: 21720
DISTRICT 3 SURVEY SUPERVISOR: PP
FIELD CHIEF: RH/MG | PARS. NO: 024-P606-328-C11-1

DATE: JULY 11, 2016 REVISED 6-23-17 jlb



TREES				
abbrev.	qty	sci. name	common name	specifications
AR	11	*Acer rubrum*	Red Maple	1" caliper, b&b, single stem
QA	11	*Quercus bicolor*	White Oak	1" caliper, b&b, single stem

SHRUBS				
abbrev.	qty	sci. name	common name	specifications
VC	17	*Vaccinium coryumbosum*	Highbush Blueberry	2'ht; 2'spr, b&b or >5 gal pot
VO	17	*Viburnum opulus trilobum*	Highbush Cranberry	2'ht; 2'spr, b&b or >5 gal pot

GROUND COVER/FERN				
abbrev.	qty	sci. name	common name	specifications
Oc	24	*Osmunda claytonra*	Interrupted Fern	1 gal pots/plant
Cg	12	*Chelone glabra*	Turtle Head	½ gal pot/plant

Note: Tree, shrub and ground covers to be field located at time of planting, locations shown are diagrammatic.

MASSACHUSETTS WILLIAM E MURRAY NO 1107 REGISTERED LANDSCAPE ARCHITECT

8-3-2016

3/6/2017	PCN PLANS SUBMITTAL	0

WETLANDS REPLICATION PLANTINGS

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY: Places Associates, Inc.
Planning, Landscape Architecture, Civil Engineering, Surveying
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REVISIONS

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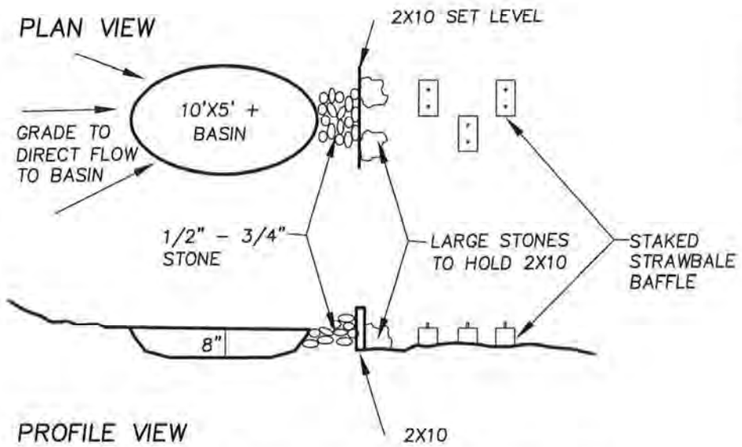
FILE NAME: 606328SV.dwg
FIELD BOOK. NO: 21720
DISTRICT 3 SURVEY SUPERVISOR: PP
FIELD CHIEF: RH/MG
PARS. NO: 024-P606-328-C11-1

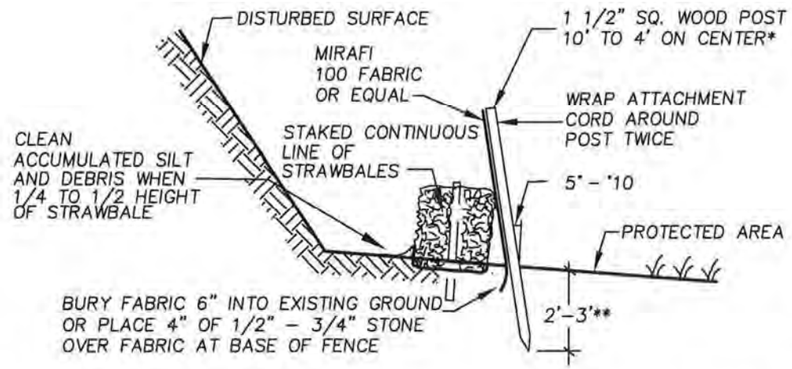
DATE: JULY 11, 2016 (rev 8-3-16) REVISED 6-23-17 jlb

3/6/2017	PCN PLANS SUBMITTAL	0



TEMPORARY DEWATERING AREA

NOT TO SCALE



* STEEL POST MAY BE SUBSTITUTED. DISTANCE BETWEEN POSTS TO VARY AS REQUIRED BY TRIBUTARY AREA: 10' FOR 100 SF/LF FENCE
6' FOR 500 SF/LF FENCE

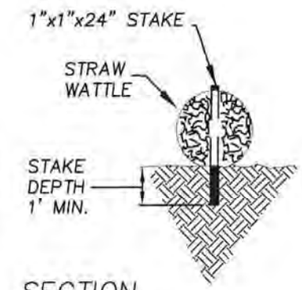
** DEPTH TO VARY WITH TRIBUTARY AREA: 2' FOR 100 SF ETC.
IF POST IS TO BE SET IN PEAT OR UNSTABLE SOILS, THEN 3' OR DEPTH NECESSARY TO PROVIDE A STABLE POST FOR LOADED FENCE CONDITIONS

SILTATION BARRIER

NOT TO SCALE

NOTE : LINES OF WATTLES TO BE PERPENDICULAR TO RUNOFF FLOW DIRECTION

PLAN



SECTION

STRAW WATTLES

NOT TO SCALE

LANDSCAPING DETAILS

20 0 20 40

SCALE IN FEET

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY: Places Associates, Inc.
Planning, Landscape Architecture, Civil Engineering, Surveying
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MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF

ROUTE 111
(A.K.A. MASSACHUSETTS AVENUE)

IN THE TOWN OF

BOXBOROUGH

AS ORDERED BY
BY THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

PROJECT FILE NO. 607955

REVISIONS

REV.	COMMENTS	DATE

SCALE: AS NOTED

FILE NAME: 606328SV.dwg
FIELD BOOK. NO: 21720
DISTRICT 3 SURVEY SUPERVISOR: PP
FIELD CHIEF: RH/MG PARS. NO: 024-P606-328-C11-1

DATE: JUNE 29, 2016 REVISED 6-23-17 jlb SHEET 15 OF 30

GENERAL:

1. THIS PLAN IS INTENDED TO PROVIDE GUIDANCE AND INSTRUCTION TO THE OWNER AND CONTRACTOR(S) IN THE PREVENTION OF EROSION AND SEDIMENTATION ON AND OFF-SITE. THIS PLAN IS INTENDED TO ALLOW ANY PERMIT CONDITIONS OR ORDERS OF CONDITIONS TO BE MORE SPECIFIC IN ADDRESSING ITEMS OF CONCERN. IF, UPON ISSUANCE OF THE ORDER OF CONDITIONS FROM THE BOXBOROUGH CONSERVATION COMMISSION, SAID CONDITIONS SHALL SUPERCEDE THE REQUIREMENTS SPECIFIED ON THIS PLAN.
2. THIS PLAN IS PART OF A SET OF DOCUMENTS THAT ARE TO BE VIEWED AND REVIEWED IN THEIR ENTIRETY, SUCH DOCUMENTS INCLUDE THE CONSTRUCTION SPECIFICATIONS, CONSTRUCTION PLANS AND ANY PERMITS ISSUED BY THE COMMONWEALTH OF MASSACHUSETTS, DEPT OF TRANSPORTATION, NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM, US ARMY CORPS OF ENGINEERS, TOWN OF BOXBOROUGH, AGENTS OF THE TOWN OF BOXBOROUGH OR OTHER REGULATORY AGENCIES.
3. SEE EROSION AND SEDIMENTATION CONTROL PLAN FOR MEASURES TO BE UTILIZED BEFORE, DURING AND AFTER CONSTRUCTION TO PREVENT DUST, SEDIMENT AND RUNOFF FROM AFFECTING SURROUNDING AREAS. THESE MEASURES ARE TO BE CONSIDERED THE MINIMUM MEASURES TO BE UTILIZED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENTATION CONTROL AT ALL TIMES.
4. PRIOR TO CONSTRUCTION OR SITE DISTURBANCE, THE EROSION CONTROL MEASURES (SILT FENCES, STRAW BALE BARRIERS AND FILTERED CATCHBASIN INLETS) SHALL BE IN PLACE AND FUNCTIONING.
5. PRIOR TO ANY DISTURBANCES, THE CONTRACTOR SHALL CONTACT DIG-SAFE TO DELINEATE THE LOCATION OF ADJACENT UTILITIES, AS REQUIRED BY LAW.
6. RUNOFF FROM THE SITE SHALL BE DIRECTED TO TEMPORARY SETTLING BASINS UNTIL SURFACES ARE STABILIZED. NO RUNOFF SHALL BE ALLOWED TO FLOW DIRECTLY TO THE EXISTING OR REPLICATED WETLANDS.
7. ANY LOAM REMOVED FROM AREAS WETLAND AREAS SHALL BE RE-USED AS PART OF THE REPLICATION BACKFILL MATERIAL. LOAM FROM EXCAVATION OF THE UPLANDS AREA SHALL BE RE-USED TO STABILIZE DISTURBED UPLANDS AREAS. EXCESS UPLANDS LOAM SHALL REMAIN THE PROPERTY OF THE TOWN OF BOXBOROUGH.
8. THE LIMITS OF WORK SHALL BE MARKED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR SITE CLEARING.
9. ANY REFUELING OF CONSTRUCTION VEHICLES AND EQUIPMENT SHALL TAKE PLACE OUTSIDE OF THE 100 FOOT BUFFER ZONE TO EXISTING AND PROPOSED WETLANDS AREAS AND SHALL NOT BE CONDUCTED IN PROXIMITY TO SEDIMENTATION BASINS OR DIVERSION SWALES.
10. THE BURIAL OF STUMPS, CONSTRUCTION DEBRIS OR OTHER MATERIALS SHALL NOT BE ALLOWED ANYWHERE ON-SITE.
11. CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL WHICH SHALL INCLUDE STREET SWEEPING OF ALL PAVED SURFACES WITHIN THE SITE AND OFF-SITE AREAS THAT ARE IMPACTED BY SITE CONSTRUCTION ON A REGULAR BASIS, AS NEEDED.

EROSION CONTROL MEASURES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT EROSION AND SEDIMENTATION ARE CONTROLLED. THIS PLAN SHALL BE SHALL BE ADAPTED TO FIT THE CONTRACTOR'S EQUIPMENT, WEATHER CONDITIONS, AND ANY PERMIT CONDITIONS/ORDERS OF CONDITIONS ISSUED BY THE THE CONSERVATION COMMISSION OR ISSUED BY ANY OTHER REGULATORY AGENCY AND ANY SPECIAL CONDITIONS.
2. THE MOST IMPORTANT ASPECTS OF CONTROLLING EROSION AND SEDIMENTATION ARE LIMITING THE EXTENT OF DISTURBANCE AND STABILIZING SURFACES AS SOON AS POSSIBLE.
3. ALL DISTURBED SURFACES SHALL BE STABILIZED A MINIMUM OF 14 DAYS AFTER CONSTRUCTION IN ANY PORTION OF THE SITE HAS CEASED OR IS TEMPORARILY HALTED UNLESS ADDITIONAL CONSTRUCTION IS INTENDED TO BE INITIATED WITHIN 21 DAYS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL EROSION CONTROL DEVICES ON-SITE. ALL EROSION CONTROL DEVICES SHALL BE REGULARLY INSPECTED AND CLEANED WHEN SEDIMENT REACHES 1/4 TO 1/2 THE HEIGHT OF THE BARRIER.
5. AT NO TIME SHALL SILT-LADEN WATER BE ALLOWED TO ENTER SENSITIVE AREAS (WETLANDS, OFF-SITE AREAS AND DRAINAGE SYSTEMS). ANY RUNOFF FROM DISTURBED SURFACES SHALL BE DIRECTED THROUGH SETTLING BASINS AND EROSION CONTROL BARRIERS PRIOR TO ENTERING ANY SENSITIVE AREAS.

PRE-CONSTRUCTION:

1. A SILTATION BARRIER/WATTLES SHALL BE INSTALLED AS DEPICTED ON THE SITE PLAN, BETWEEN THE AREAS TO BE DISTURBED, WETLAND REPLICATION AREAS AND WETLAND AREAS. THIS BARRIER SHALL REMAIN IN PLACE UNTIL ALL TRIBUTARY SURFACES HAVE BEEN FULLY STABILIZED. THE EROSION CONTROL BARRIERS AS SHOWN ON THE SITE PLAN ARE THE MINIMUM REQUIRED TO PROTECT THE ON & OFF SITE DRAINAGE SYSTEMS.
2. PHOTOGRAPHS AND/OR VIDEO IMAGES OF THE PRE-CONSTRUCTION CONDITION OF THE SITE AND SURROUNDING AREAS, ESPECIALLY THE ADJACENT STREETS SHALL BE TAKEN, DEVELOPED AND DATED. THESE PICTURES AND IMAGES SHALL REFERENCE EXISTING SITE CONDITIONS AND PERMANENT REFERENCE MARKS TO ENABLE RECOGNITION OF THE AREA BEING PHOTOGRAPHED, AND SHALL REPRESENT A COMPREHENSIVE VIEW OF THE SITE PRIOR TO DEVELOPMENT.
3. THE CONTRACTOR SHALL ESTABLISH A STAGING AREA ON A PORTION OF THE AREA TO BE DISTURBED FOR THE OVERNIGHT STORAGE OF EQUIPMENT AND STOCKPILING OF MATERIALS.
4. IN THE STAGING AREA, THE CONTRACTOR SHALL HAVE A STOCKPILE OF MATERIALS REQUIRED TO CONTROL EROSION ON-SITE TO BE USED TO SUPPLEMENT OR REPAIR EROSION CONTROL DEVICES. THESE MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO: STRAW BALES, STRAW WADDLES, SILT FENCE AND CRUSHED STONE.
5. A TEMPORARY STONE CONSTRUCTION ENTRANCE IS REQUIRED TO PREVENT TRACKING OF SILT, MUD, ETC. ONTO EXISTING ROADS, DRIVEWAYS AND SIDEWALKS. THE STONE SHALL BE REPLACED REGULARLY AS WELL AS WHEN THE STONE IS SILT LADEN OR EQUIPMENT IS OBSERVED TO BE TRACKING SOIL ONTO THE ROADWAYS. IF SEDIMENT OR MUD IS TRACKED ONTO THE PUBLIC WAYS, THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE SEDIMENT.
6. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL ON SITE AND SHALL UTILIZE EROSION CONTROL MEASURES WHERE NEEDED, REGARDLESS OF WHETHER THE MEASURES ARE SPECIFIED HEREIN, ON THE PLAN OR IN ANY ORDER OF CONDITIONS.

PRELIMINARY SITE WORK:

1. ALL ORGANIC MATERIAL REMOVED FROM UPLANDS AREAS TO BECOME REPLICATED WETLANDS SHOULD BE STOCKPILED PRIOR TO FILLING, SEPARATING THE TOPSOIL FOR FUTURE USE ON THE SITE. EROSION CONTROLS SHALL BE UTILIZED ALONG THE DOWNSLOPE SIDE OF THE PILES IF THE PILES ARE TO REMAIN MORE THAN THREE WEEKS OR SUBJECT TO EROSIVE CONDITIONS SUCH AS INTENSE RAIN, WIND OR OTHER EXPOSURE.
2. STOCKPILES SHALL BE LOCATED AS REQUIRED. SHOULD ADDITIONAL AREAS BE NEEDED THEY SHALL BE LOCATED WITHIN THE LIMITS OF DISTURBANCE, IN AREAS OF MINIMAL IMPACT.
3. IF INTENSE RAINFALL IS ANTICIPATED, THE INSTALLATION OF SUPPLEMENTAL STRAW BALE DIKES, STRAW WADDLES, SILT FENCES, OR ARMORED DIKES SHALL BE UTILIZED.

WETLAND REPLICATION SOILS:

1. ALL ORGANIC MATERIAL REMOVED FROM UPLANDS AREAS TO BECOME REPLICATED WETLANDS SHOULD BE STOCKPILED PRIOR TO FILLING, SEPARATING THE TOPSOIL FOR FUTURE USE ON THE SITE.
2. WETLAND SOILS SHALL CONSIST OF THREE EQUAL PARTS OF THE FOLLOWING:
   - 2.1. EXISTING TOP SOIL RECLAIMED FROM ADJACENT UPLAND AREAS
   - 2.2. NATURAL, ORGANIC PEAT MOSS OR WELL- DECOMPOSED LEAF MULCH
   - 2.3. COARSE TO MEDIUM SAND
3. THE EXISTING WETLANDS SOILS SHALL BE SENT TO THE MASSACHUSETTS AGRICULTURAL TESTING STATION, UMASS SOIL AND PLANT NUTRIENT TESTING LAB, 203 PAIGE LAB, 161 HOLDSWORTH WAY, AMHERST, MA 01003-9286; TEL (413) 545-2311; WEB: SOILTEST.UMASS.EDU WHERE A ROUTINE SOIL ANALYSIS SHALL BE PERFORMED. AN ADDITIONAL TEST SHALL BE REQUIRED FOR SOIL ORGANIC MATTER.
4. PRIOR TO PLACING THE REPLICATION SOILS, THEY SHALL BE MODIFIED TO MATCH THE PROPOSED SOIL'S pH AND ORGANIC CONTENT, BY % OF TOTAL VOLUME. pH SHALL BE FIELD TESTED TO ENSURE THAT THE REPLICATION SOILS MATCH THE ADJACENT EXISTING WETLANDS.

CONSTRUCTION SEQUENCE:

1. PRIOR TO THE INITIATION OF CONSTRUCTION, EROSION CONTROL BARRIERS SHALL BE IN PLACE, SEE STORMWATER POLLUTION PREVENTION PLAN & CONSTRUCTION SEQUENCING. THE LATERAL EXTENT OF BOTH THE AREA OF DISTURBANCE OF UPLANDS AND THE REPLICATION AREAS SHALL BE FIELD STAKED.

2. EXISTING VEGETATION SHALL BE INSPECTED BY THE WETLAND SCIENTIST TO DETERMINE IF ANY VEGETATION CAN BE SAVED BASED ON THE PROPOSED ELEVATIONS IN THE REPLICATION AREA. PLANT CONDITION AND THE AMOUNT OF SILT IN THE ROOT STRUCTURE. PLANTS TO BE SAVED SHALL BE PROTECTED WITH ORANGE CONSTRUCTION FENCING.

3. THE RESTORATION AREA SHALL BE CLEARED, GRUBBED AND STRIPPED. WOODY DEBRIS SHALL BE SET ASIDE TO BE SCATTERED ON THE COMPLETED RESTORATION AREA. THE ROUGH GRADES SHALL BE 12" BELOW FINISHED GRADES SHOWN ON THE SITE PLAN.

4. INSTALLATION OF NEW ORGANIC MUCK SOILS SHALL BE INSTALLED IN THE REPLICATION AREA, SPREAD TO A MINIMUM DEPTH OF 12". WETLANDS SOILS SHALL BE MANUFACTURED PER THE DETAIL. CARE SHALL BE TAKEN IN THE INITIAL PLACEMENT TO ALLOW SUFFICIENT WORK AREA FOR THE REPLICATION AREA PLANTINGS, STOCKPILES OF MUCK SOILS SHALL NOT EXCEED 4' IN HEIGHT FOR NO MORE THAN 1 WEEK.

5. UPON COMPLETION OF THE REPLICATION AREA PLANTINGS, ADDITIONAL TEMPORARY EROSION CONTROL BARRIERS SHALL BE INSTALLED AT THE TOE OF THE SLOPE, AT THE INLET/OUTLET TO THE EXISTING ADJACENT LIBRARY DRIVEWAY CULVERT AND BETWEEN THE EXISTING WETLANDS AND REPLICATION AREA. THESE EROSION CONTROL BARRIERS SHALL REMAIN IN PLACE UNTIL ALL TRIBUTARY AREAS ARE STABILIZED.

WETLAND CROSSING AND REPLICATION NOTES:

1. PROVIDE THE SERVICES OF A WETLAND SCIENTIST, LANDSCAPE ARCHITECT, OR OTHER PROFESSIONAL (REFERRED TO AS WETLAND SPECIALIST, HEREAFTER) TO MONITOR AND REPORT ON THE STATUS AND CONFORMANCE OF THE RESTORATION AREAS TO THE WETLANDS RESTORATION PLAN.

2. THE WETLAND SPECIALIST SHALL PROVIDE OVERSIGHT OF ALL EXCAVATION AND GRADING OF WETLAND AREAS, BROADCAST OF SEED, INSTALLATION OF EROSION CONTROL MAT AND INSTALLATION OF PLANT MATERIALS.

3. ALL WORK DEPICTED BY THE REPLICATION PLAN WILL BE COMPLETED IN A SINGLE, UNINTERRUPTED PROCESS, UNLESS OTHERWISE APPROVED OR DIRECTED BY WETLANDS SPECIALIST.

4. PRIOR TO INITIATION OF THE WORK OF THIS SECTION, ALL REQUIRED MATERIALS WILL BE APPROVED, ON-SITE, AND AVAILABLE FOR INSTALLATION.

5. THE WORK DEPICTED BY THE REPLICATION PLAN SHALL NOT INITIATED PRIOR TO, OR DURING RAIN, SNOW OR OTHER CONDITIONS THAT MAY NEGATIVELY AFFECT THE WORK.

6. THE WORK DEPICTED BY THE WETLANDS CROSSING AND REPLICATION PLAN WILL OCCUR BETWEEN THE FOLLOWING DATES, UNLESS WAIVED BY THE BOXBOROUGH CONSERVATION COMMISSION AND WETLAND SPECIALIST; STARTING NO SOONER THAN APRIL 1ST. ENDING NO LATER THAN OCTOBER 31ST OF ANY YEAR.

7. THE WETLAND SCIENTIST SHALL EVALUATE THE QUALITY OF MUCK SOILS FROM THE CROSSING AND THE DENSITY OF ROOTS/SEEDS FROM INVASIVE SPECIES. IF A HIGH PROPORTION OF INVASIVE SPECIES IS PRESENT, EXISTING MUCK SOILS SHALL BE DISCARDED AND MANUFACTURED WETLANDS SOILS SHALL BE UTILIZED IN THE REPLICATION AREA.

8. WETLAND SOIL MIXTURE SHALL BE APPLIED AT A UNIFORM DEPTH OF 12" MINIMUM TO ALL EXCAVATED WETLAND RESTORATION AREAS. SHAPED AND SMOOTHED TO FINISH GRADE.

9. "NEW ENGLAND WET MIX" SEED AS MANUFACTURED BY NEW ENGLAND ENVIRONMENTAL, INC. 806 MAIN STREET, AMHERST, MA 01002 (413)256-0202, OR APPROVED EQUAL, SHALL BE BROADCAST EVENLY (AT MANUFACTURERS SPECIFIED SEED RATE) OVER ENTIRE WETLAND RESTORATION AREA PRIOR TO INSTALLATION OF EROSION CONTROL MATTING. IF A DIFFERENT SEED MIX IS PROPOSED, THE CONTRACTOR SHALL SUBMIT MANUFACTURERS SEED SPECIFICATIONS FOR APPROVAL BY THE WETLAND SPECIALIST PRIOR TO BROADCAST OF THE SEED.

10. EROSION CONTROL MATTING SUCH AS "BONTERRA S2", OR APPROVED EQUAL, SHALL BE INSTALLED ALONG THE BOTTOM AND BANKS OF THE PROPOSED WETLAND REPLICATION AREAS IMMEDIATELY FOLLOWING APPLICATION OF WETLAND SOIL MIXTURE, FINAL GRADING, AND BROADCAST SEEDING.

11. IF NECESSITATED BY AVAILABILITY, ALTERNATE WETLAND SPECIES MAY BE SELECTED WITH APPROVAL FROM THE BOXBOROUGH CONSERVATION COMMISSION, OR AGENT.

12. THE CONTRACTOR SHALL PROVIDE FOR INSPECTION AND APPROVAL BY THE WETLAND SPECIALIST OF ALL PLANT MATERIALS PRIOR TO PLANTING.

13. A MINIMUM OF TEN CLUSTERS OF SENSITIVE FERN PLANTINGS, EACH WITH A MINIMUM OF TEN - ONE (1) GALLON POTS SHALL BE LOCATED WITHIN THE WETLAND RESTORATION AREA BY THE WETLAND SPECIALIST AT THE TIME OF PLANTING.

14. ALL PLANTINGS SHALL BE WATERED AS NEEDED DURING THE FIRST GROWING SEASON TO ENSURE PLANT SURVIVAL.

15. THE CONTRACTOR SHALL RESTRICT THE ESTABLISHMENT OF INVASIVE PLANT SPECIES WITHIN WETLAND RESTORATION AREAS BY IMPLEMENTING REGULAR EVALUATIONS AND HAND WEEDING THROUGHOUT THE FIRST GROWING SEASON FOLLOWING COMPLETED CONSTRUCTION OF WETLAND RESTORATION. INVASIVE SPECIES SHALL BE THOSE IDENTIFIED ON THE "INVASIVE NON-INDIGENOUS PLANTS IN MASSACHUSETTS" BY THE STATE BOTANIST, MA-NHESP OR OTHER APPROVED LIST.

16. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING AND MAINTAINING ALL WETLAND RESTORATION AREAS AND RELATED EROSION CONTROLS THROUGHOUT ALL PHASES OF CONSTRUCTION. CONTROLS SHALL BE ADJUSTED AS REQUIRED BY VARYING SITE CONDITIONS, CONSTRUCTION METHODS, WEATHER AND MATERIALS TO PREVENT ALL EROSION AND DISTURBANCE OF WETLAND RESTORATION AREAS AND OFF-SITE FEATURES.

3/8/2017	PCN PLANS SUBMITTAL	0

MASSACHUSETTS WILLIAM E. MURRAY NO. 1107 REGISTERED LANDSCAPE ARCHITECT

6-28-2016

LANDSCAPING GENERAL NOTES

20 0 20 40

SCALE IN FEET

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY: Places Associates, Inc.
Planning, Landscape Architecture,
Civil Engineering, Surveying
256 GREAT ROAD, SUITE 4
LITTLETON, MA 01460
978.486.0334 Ph.
978.486.0447 Fax
places@placesassociates.com

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF

ROUTE 111
(A.K.A. MASSACHUSETTS AVENUE)

IN THE TOWN OF

BOXBOROUGH

AS ORDERED BY
BY THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

PROJECT FILE NO. 607955

REVISIONS

REV.	COMMENTS	DATE

SCALE: AS NOTED

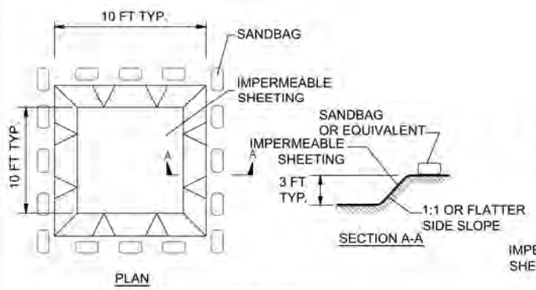
FILE NAME: 606328SV.dwg
FIELD BOOK. NO: 21720
DISTRICT 3 SURVEY SUPERVISOR: PP
FIELD CHIEF: RH/MG PARS. NO: 024-P606-328-C11-1

DATE: JUNE 29, 2016 REVISED 6-23-17 jlb

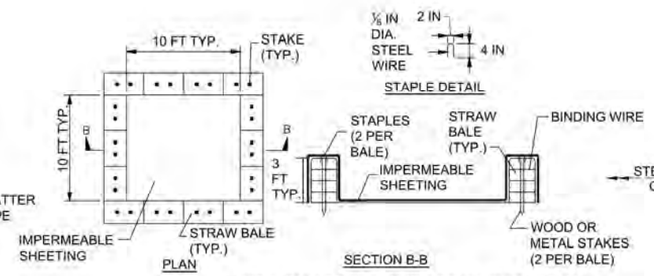
BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	17	30
PROJECT FILE NO.	607955		

CONSTRUCTION DETAILS
SHEET 1 OF 3
REVISED 6-23-17 jlb

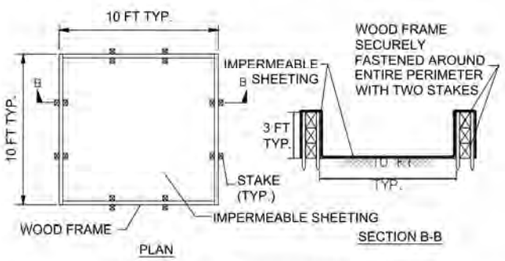


EXCAVATED WASHOUT STRUCTURE



NOTE: CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

WASHOUT STRUCTURE WITH STRAW BALES



WASHOUT STRUCTURE WITH WOOD PLANKS

ONSITE CONCRETE WASHOUT DETAIL

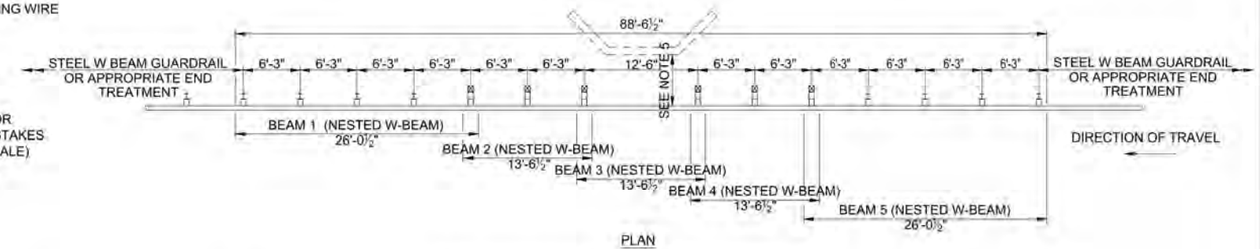
NTS

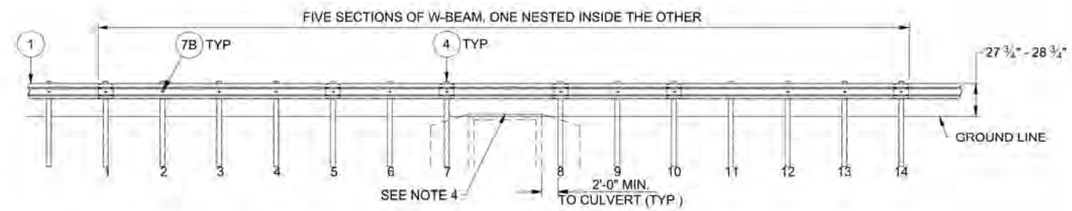
CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, AND OTHER WATERS OF THE U.S. AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

NOTES:

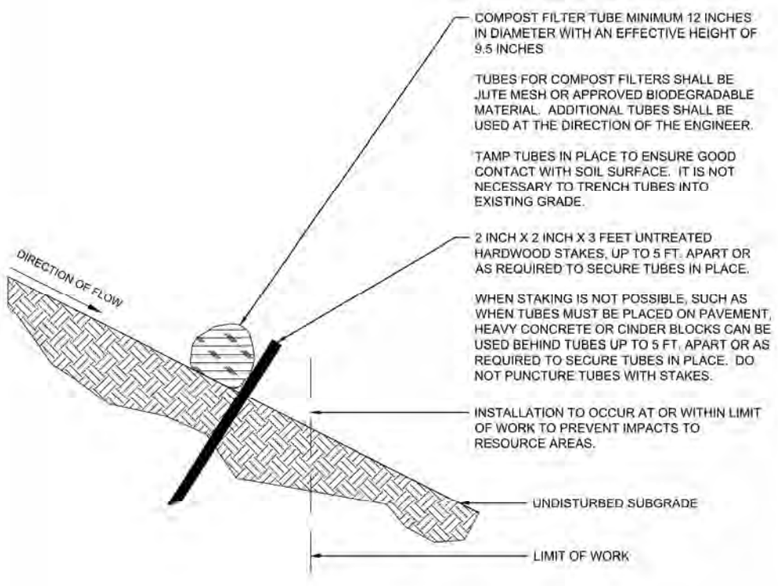
1. PLACE GUARDRAIL DELINEATORS AT THE INTERVALS SPECIFIED IN THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
2. POSTS 1 THRU 4 AND 11 THRU 14 ARE TO BE W6X9 STEEL POSTS. POSTS 5 THRU 10 ARE TO BE 6"x8"x6'-0" BREAKAWAY WOOD POSTS WITH 2 WOOD BLOCKS AT EACH OF THESE 6 POSTS.
3. THE SPLICES AT POSTS 5, 7, 8, & 10 ARE TO USE 5/8" GUARDRAIL BOLT (L=26").

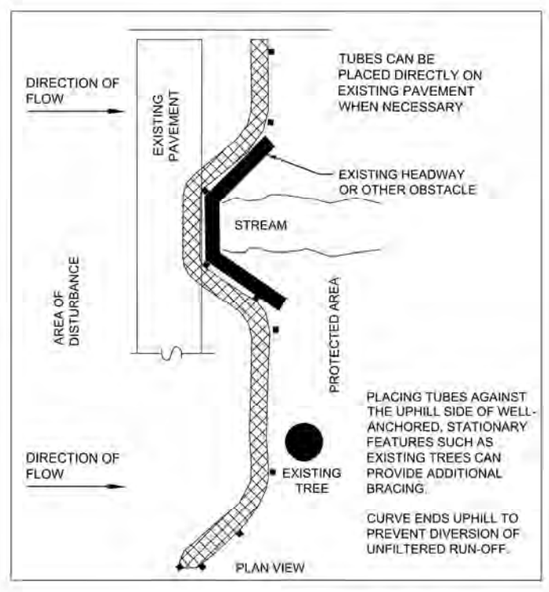




GUARDRAIL OVER CULVERTS

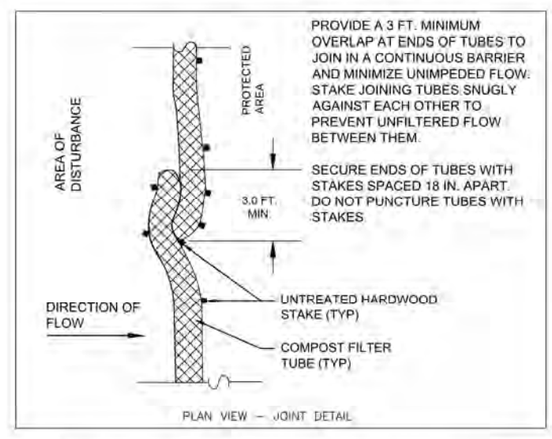
NTS





SINGLE COMPOST FILTER TUBE DETAIL

NTS



NOTES:

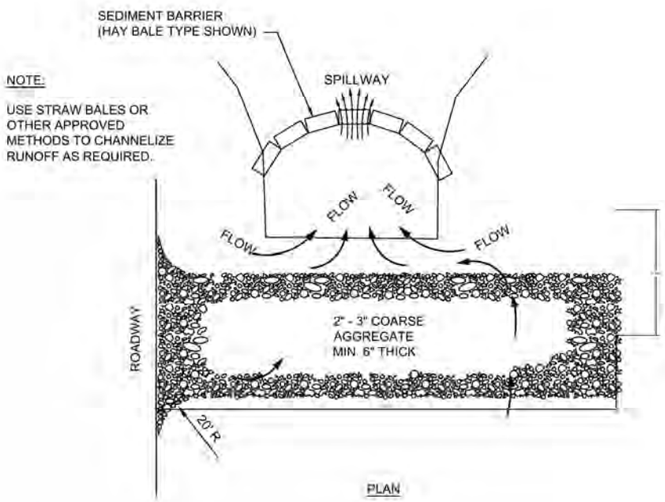
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

~~3/6/2017~~	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	30
PROJECT FILE NO.	607955		

CONSTRUCTION DETAILS
SHEET 2 OF 3
REVISED 6-23-17 jlb



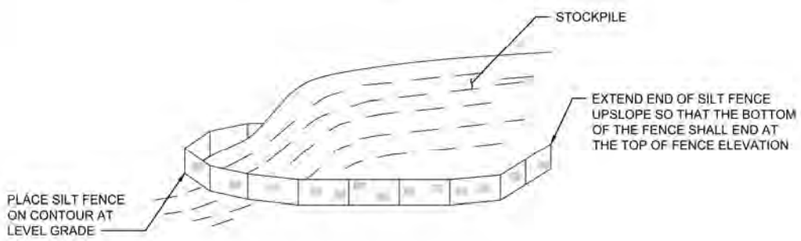
NOTE:
USE STRAW BALES OR OTHER APPROVED METHODS TO CHANNELIZE RUNOFF AS REQUIRED.

PLAN

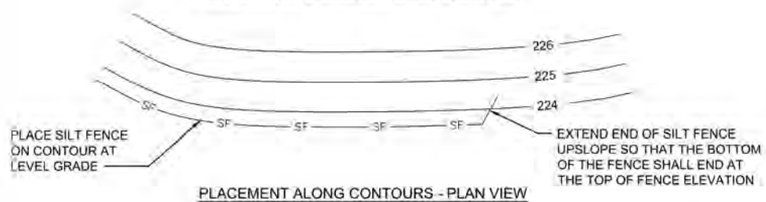
NOTE:
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF THE CONSTRUCTION AREA. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

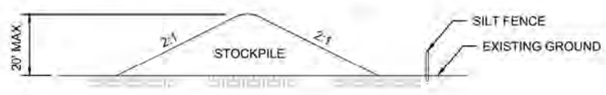
NTS



SCHEMATIC OF SILT FENCE AT STOCKPILE



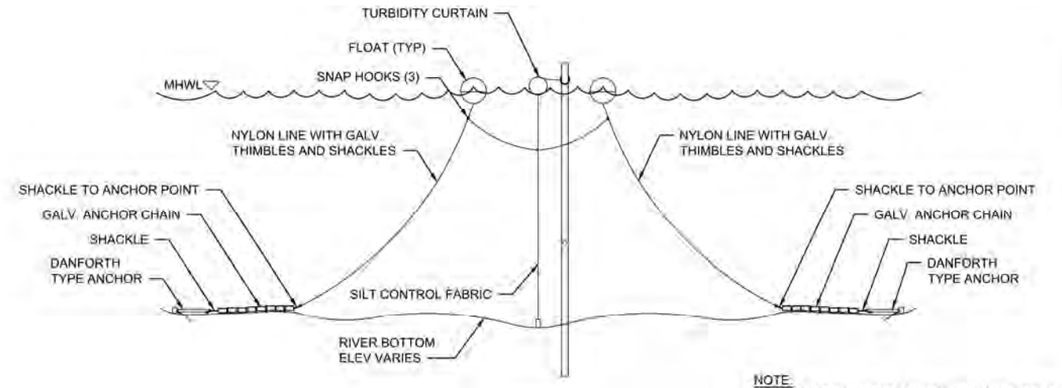
PLACEMENT ALONG CONTOURS - PLAN VIEW



MAINTENANCE:
1. STOCKPILE HEIGHT MUST NOT EXCEED 20 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
2. SILT FENCE SHALL BE INSTALLED AT THE DOWNSLOPE SIDE OF THE STOCK PILE.
3. STOCKPILES SHALL BE TEMPORARILY STABILIZED WITH SEED AND MULCH.
4. TOPSOIL STOCKPILE LOCATIONS SHALL BE PROVIDED WHERE AND WHEN DIRECTED BY THE ENGINEER.

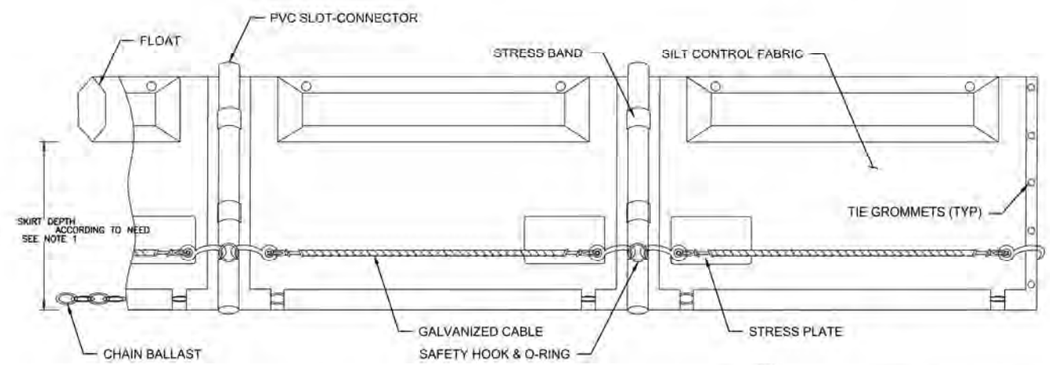
SECTION OF TYPICAL STOCKPILE

NTS



ANCHOR

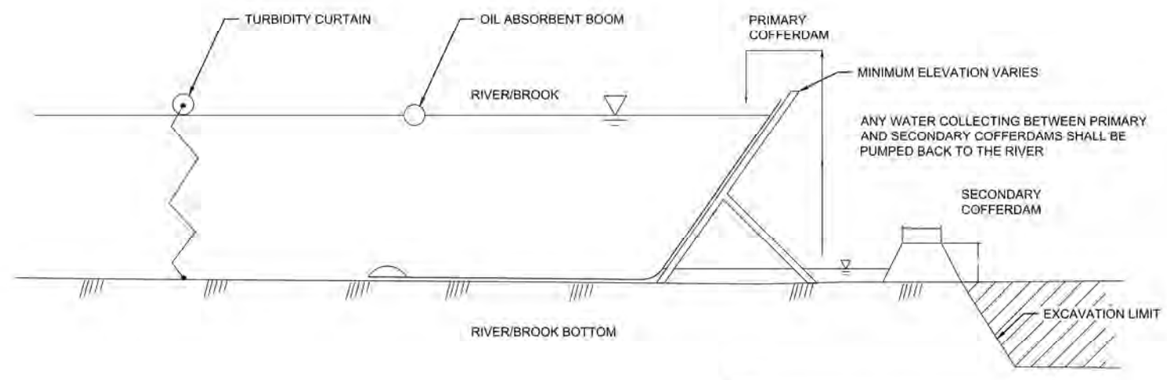
NOTE:
BOTTOM OF TURBIDITY CURTAIN SHALL EXTEND TO RIVER BOTTOM DURING EXCAVATION AND FILLING OPERATIONS



NOTES:
1. TURBIDITY CURTAIN DEPTH VARIES. TURBIDITY CURTAIN SHALL EXTEND FROM RIVER BOTTOM TO WATER SURFACE DURING EXCAVATION AND FILLING OPERATIONS
2. INSTALL PER MANUFACTURER'S RECOMMENDATION

TURBIDITY CURTAIN DETAIL

NTS



NOTE:
DETAIL DEPICTS REQUIRED COMPONENTS OF COFFERDAM SYSTEM. ACTUAL COFFERDAM LAYOUT AND MATERIALS TO BE PROPOSED BY CONTRACTOR AND APPROVED BY ENGINEER.

COFFERDAM DETAIL

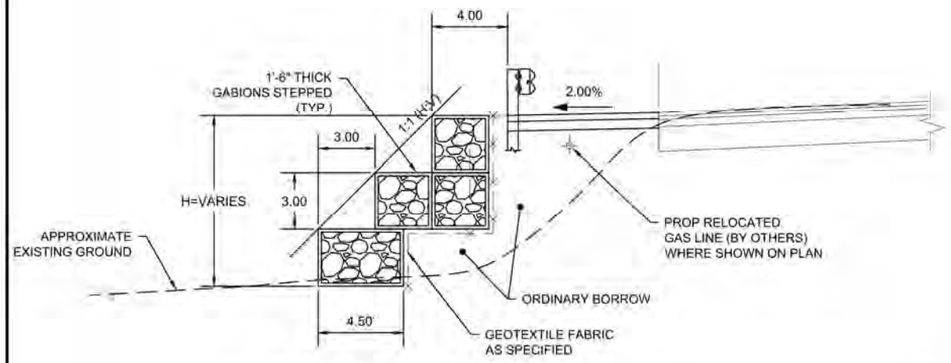
NTS

~~3/6/2017~~	PCN PLANS SUBMITTAL	0

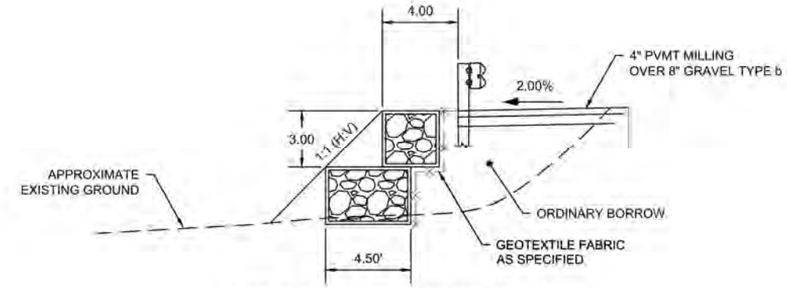
BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	19	30
PROJECT FILE NO.	607955		

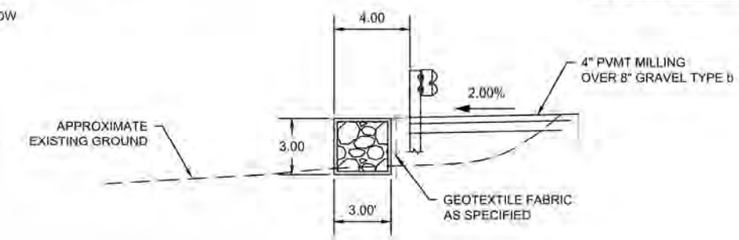
CONSTRUCTION DETAILS
SHEET 3 OF 3
REVISED 6-23-17 jlb



FOR SLOPE HEIGHT: 6' < H < 8'

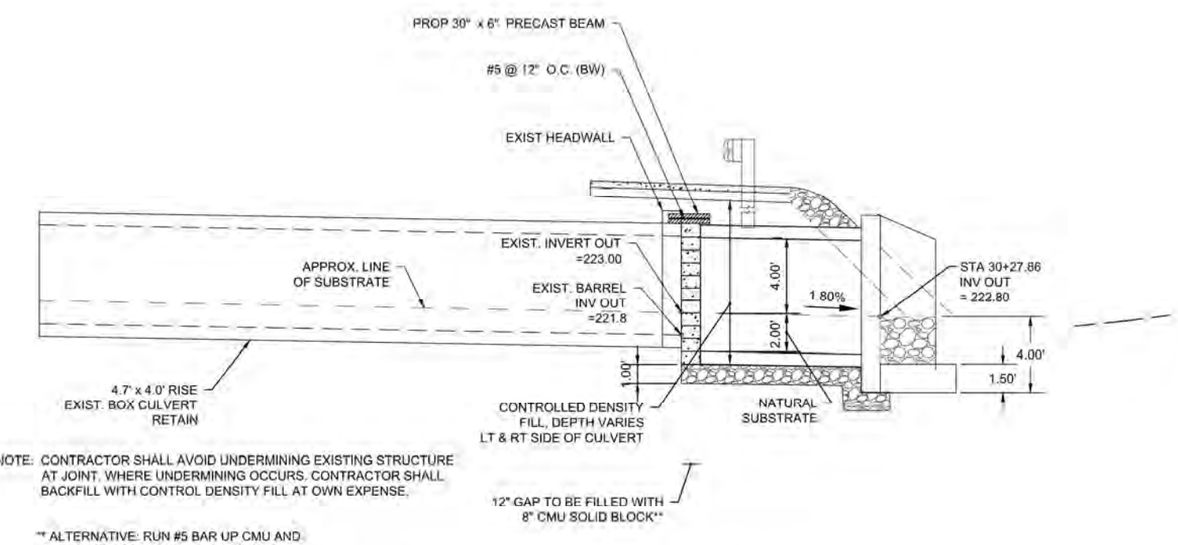


FOR SLOPE HEIGHT: 3' < H < 6'



FOR SLOPE HEIGHT: H < 3'

PROPOSED GABION SLOPED WALL
NTS



NOTE: CONTRACTOR SHALL AVOID UNDERMINING EXISTING STRUCTURE AT JOINT, WHERE UNDERMINING OCCURS. CONTRACTOR SHALL BACKFILL WITH CONTROL DENSITY FILL AT OWN EXPENSE.

** ALTERNATIVE: RUN #5 BAR UP CMU AND TIE-IN PRECAST BEAM, GROUT VOIDS

CULVERT NO. 3 EXTENSION JOINT DETAIL
NTS

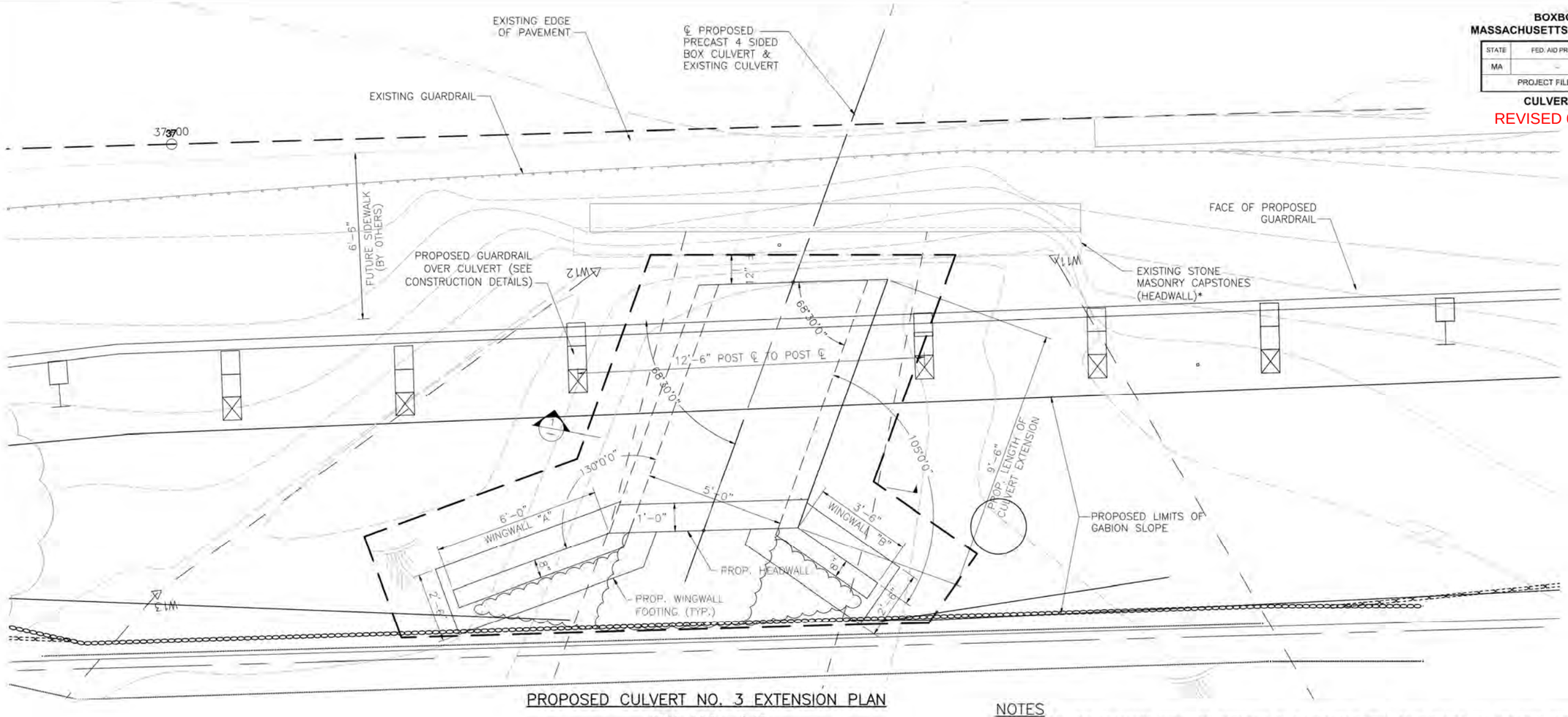
~~3/8/2017~~	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	20	30
PROJECT FILE NO.	607955		

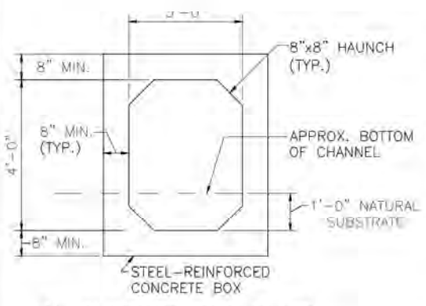
CULVERT DETAILS

REVISED 6-23-17 jlb



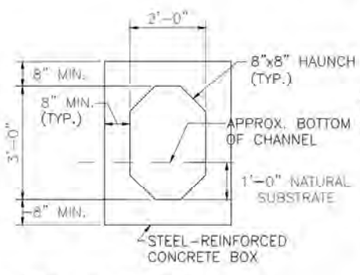
PROPOSED CULVERT NO. 3 EXTENSION PLAN

SCALE: 1/4" = 1'-0"



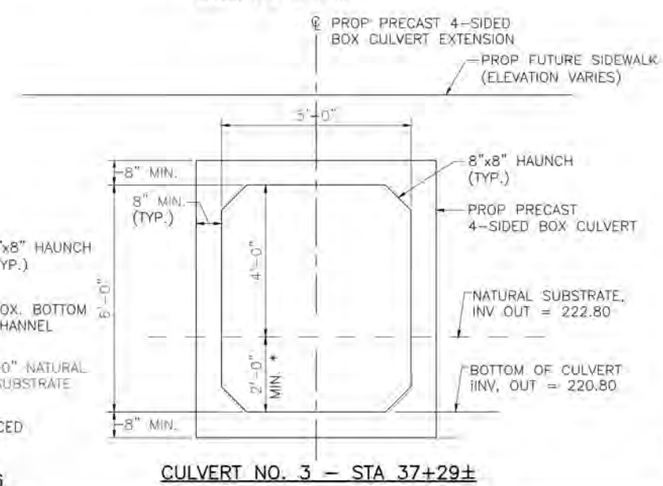
4'x 3' CULVERT STA 45+60

SCALE: 1/4" = 1'-0"



3'x2' CULVERT STA 47+66

SCALE: 1/4" = 1'-0"



CULVERT NO. 3 – STA 37+29±

SCALE: 1/4" = 1'-0"

NOTES

1. PRECAST BOX CULVERTS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM C1577–16, PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS DESIGNED ACCORDING TO AASHTO LRFD.
2. CULVERTS SHALL BE DESIGNED FOR AN AASHTO HL–93 DESIGN TRUCK OF DESIGN TANDEM, WHICHEVER GOVERNS.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF F'c = 5000 PSI
4. REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60. WELDED WIRE REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM A1064, GRADE 65.
5. ALL CONSTRUCTION SHALL BE PERFORMED IN THE DRY. CONTRACTOR TO PROVIDE APPROPRIATE DEWATERING PROVIDING DRY CONDITIONS DURING EXCAVATION, INSTALLATION OF BEDDING AND PRECAST CULVERT SECTIONS, AND BACKFILLING.
6. ALL TRENCHING AND EXCAVATION SHALL BE IN ACCORDANCE WITH MASSDOT SPECIFICATIONS AND OSHA REQUIREMENTS.
7. BEDDING SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS USING GRAVEL BORROW (M1.03.0, TYPE b) COMPACTED TO 95% OF THE MAXIMUM DENSITY DETERMINED IN ACCORDANCE WITH AASHTO T–180.
8. REMOVE BOULDERS AND LARGE STONES ENCOUNTERED WITHIN 6" BELOW THE BOTTOM OF THE BEDDING GRADE.
9. WORK SHALL BE PERFORMED AROUND LIVE, OVERHEAD POWER LINES. CONTRACTOR SHALL MAINTAIN ALL OSHA MINIMUM CLEARANCES DURING CONSTRUCTION ACTIVITIES.
10. CONTRACTOR TO MINIMIZE ROAD CLOSURE. CONTRACTOR SHALL SUBMIT CONSTRUCTION PLAN WHICH MINIMIZES ROAD CLOSURE TO APPROXIMATELY 3 DAYS FOR APPROVAL.
11. CONTRACTOR SHALL PROVIDE ACCESS TO EMERGENCY VEHICLES DURING CONSTRUCTION ACTIVITIES. A LIMITED RESTRICTION TO EMERGENCY VEHICLES DURING ROAD CLOSURE WILL BE ALLOWED UPON APPROVAL OF CONSTRUCTION PLAN BY THE ENGINEER.

DESIGN

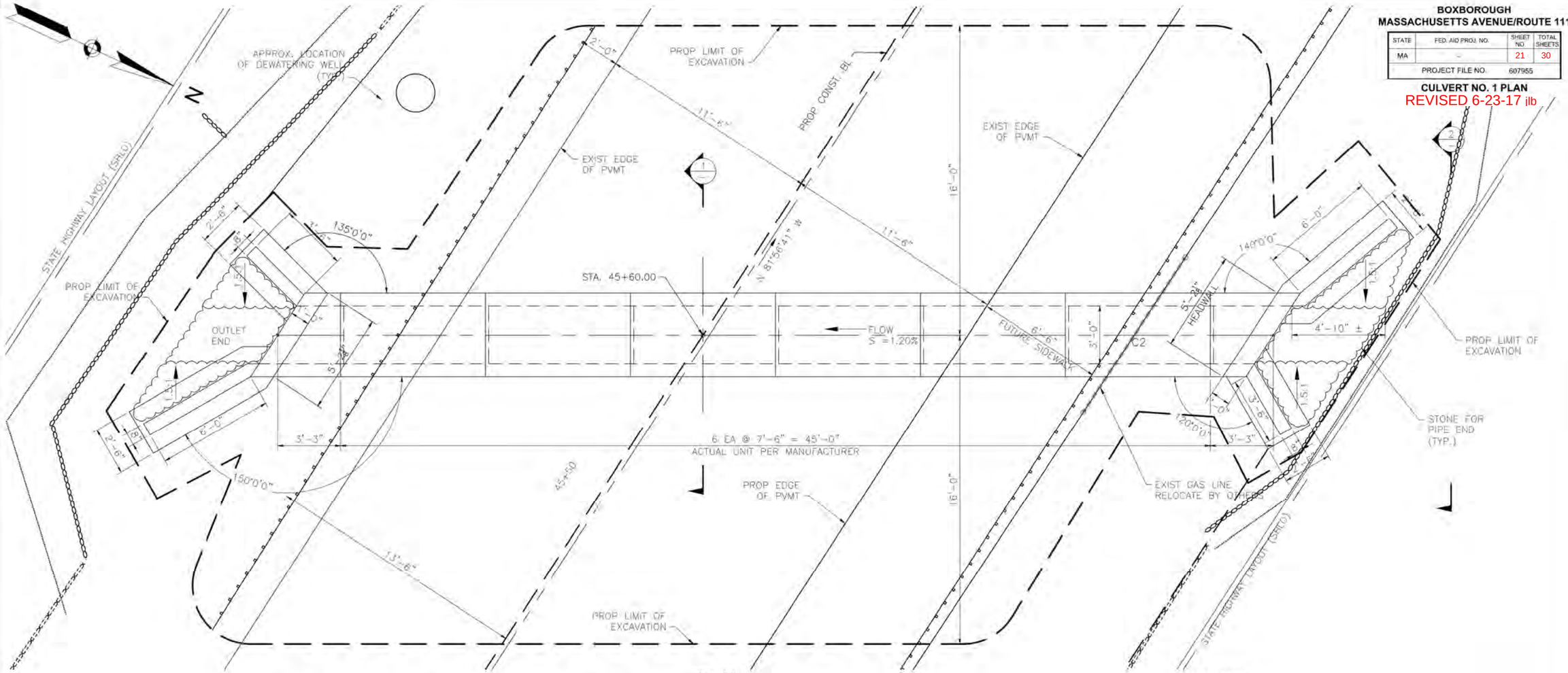
IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED, 2014, FOR HL–93 LOADING.

~~3/6/2017~~	PCN PLANS SUBMITTAL	0

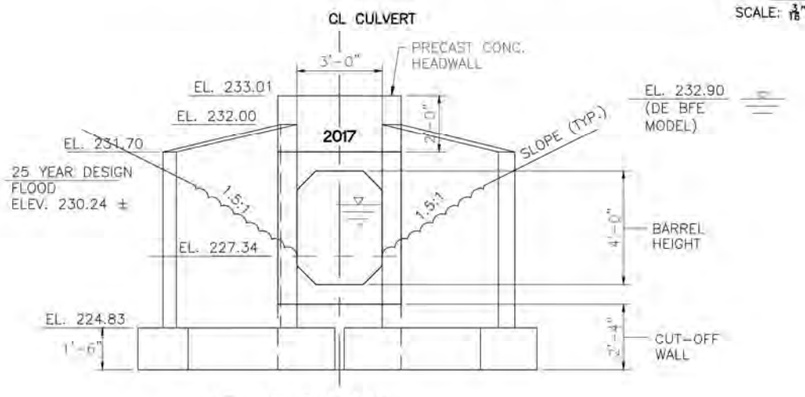
BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	21	30
PROJECT FILE NO.	607955		

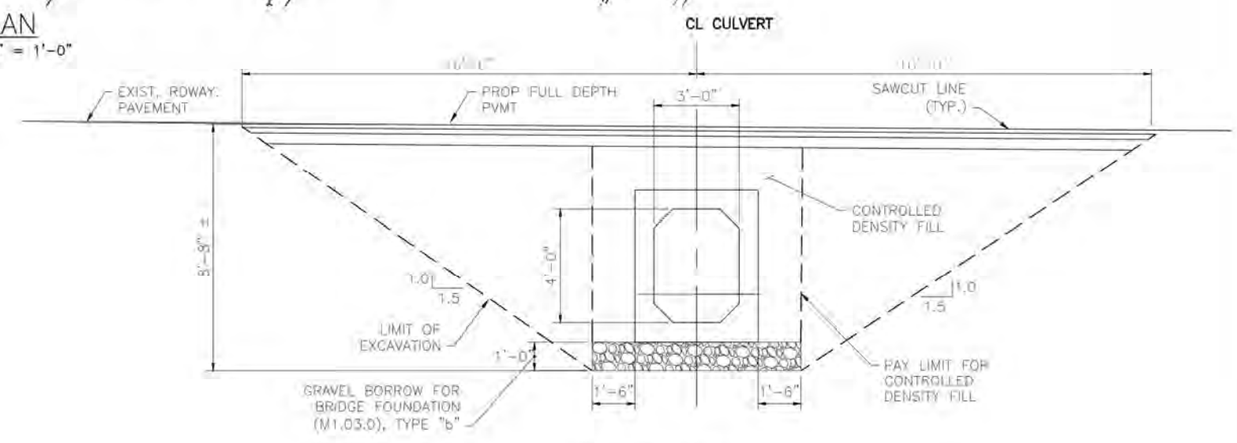
CULVERT NO. 1 PLAN
REVISED 6-23-17 jlb



PLAN
SCALE: 3/16" = 1'-0"



2 ELEVATION
OUTLET END
SCALE: 3/16" = 1'-0"



1 SECTION
SCALE: 3/16" = 1'-0"

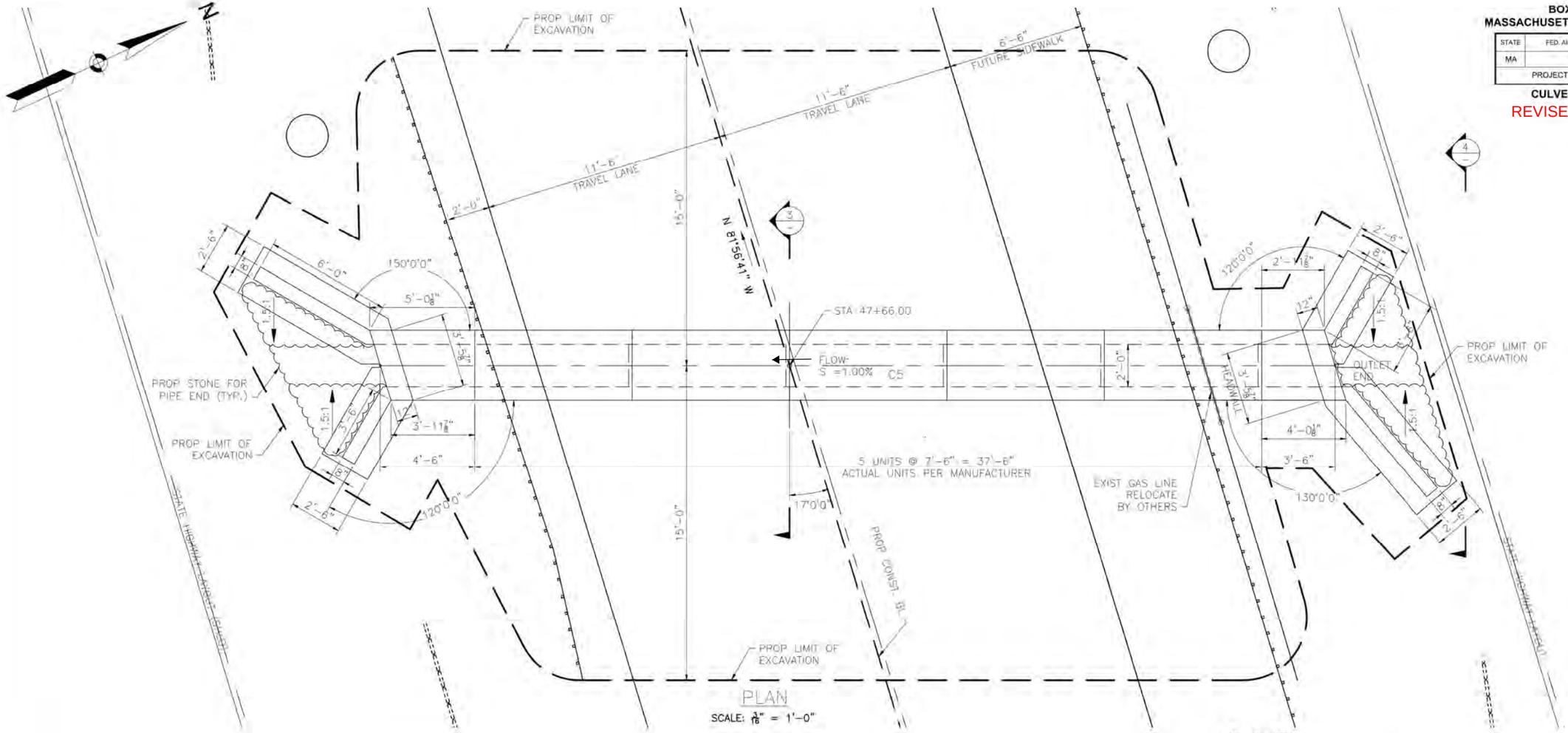
~~3/6/2017~~	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

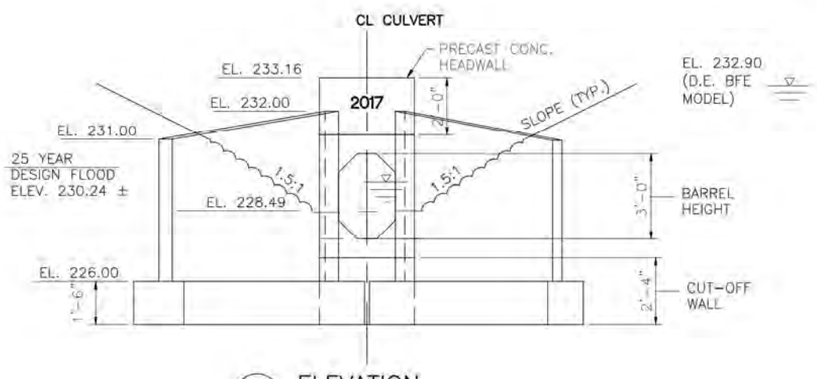
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	22	30
PROJECT FILE NO.	607955		

CULVERT NO. 2 PLAN

REVISED 6-23-17 jlb

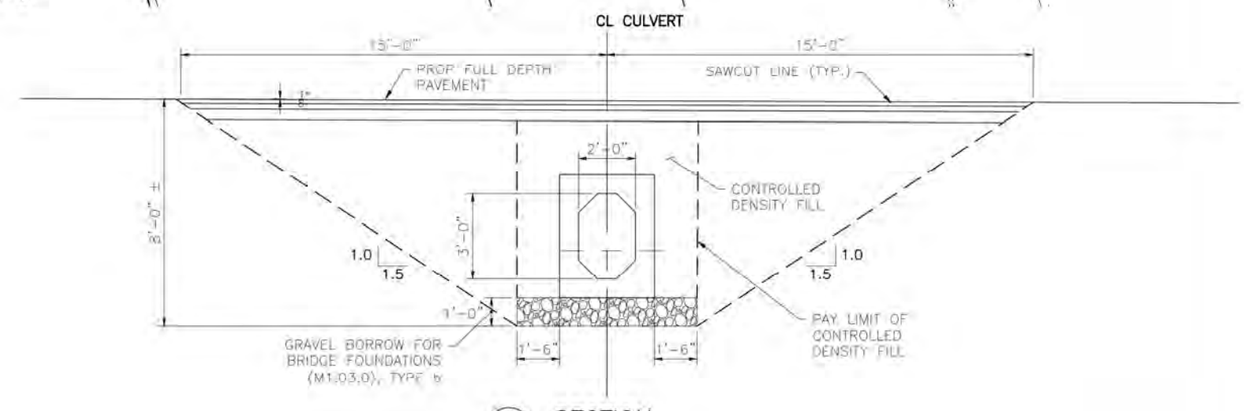


PLAN
SCALE: 1/16" = 1'-0"



4 ELEVATION
OUTLET END
SCALE: 1/16" = 1'-0"

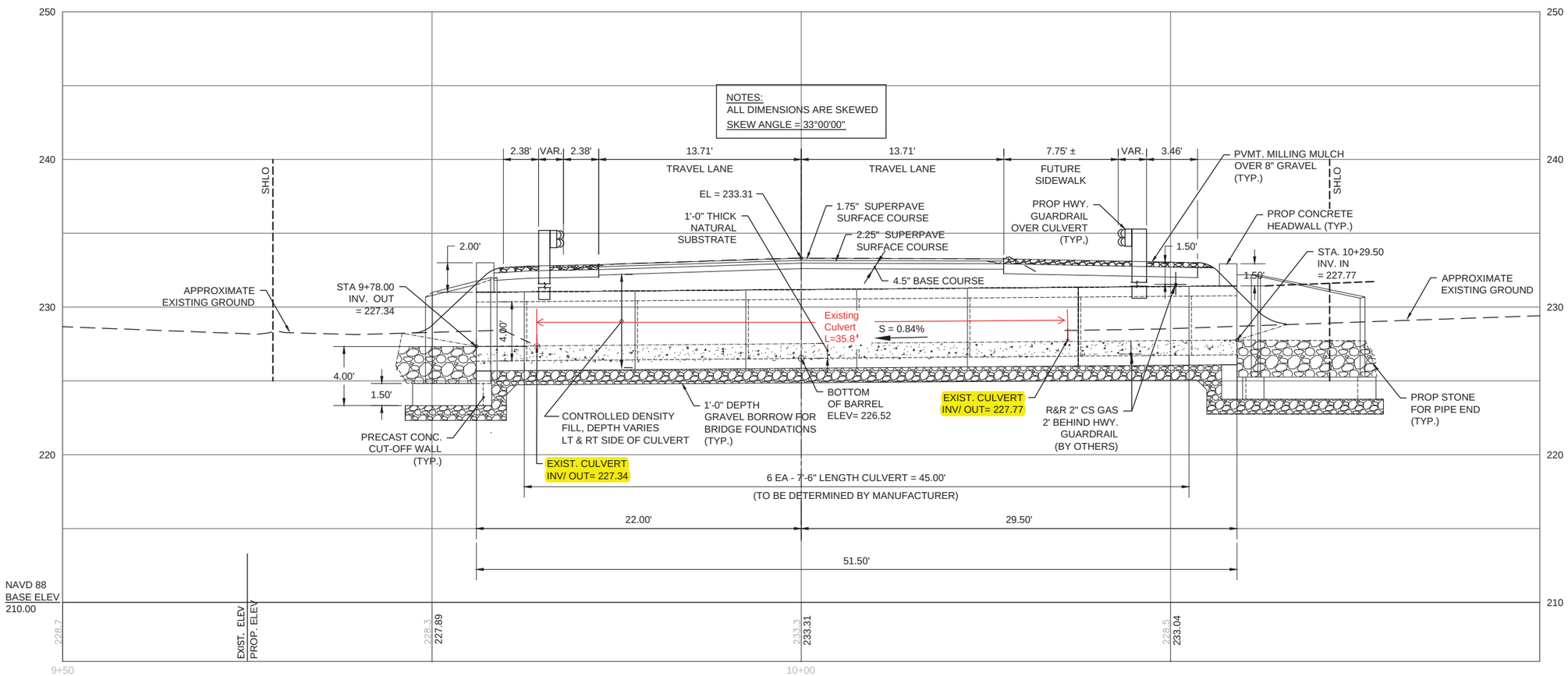
DATUM
ELEV=220.00



3 SECTION
SCALE: 1/16" = 1'-0"

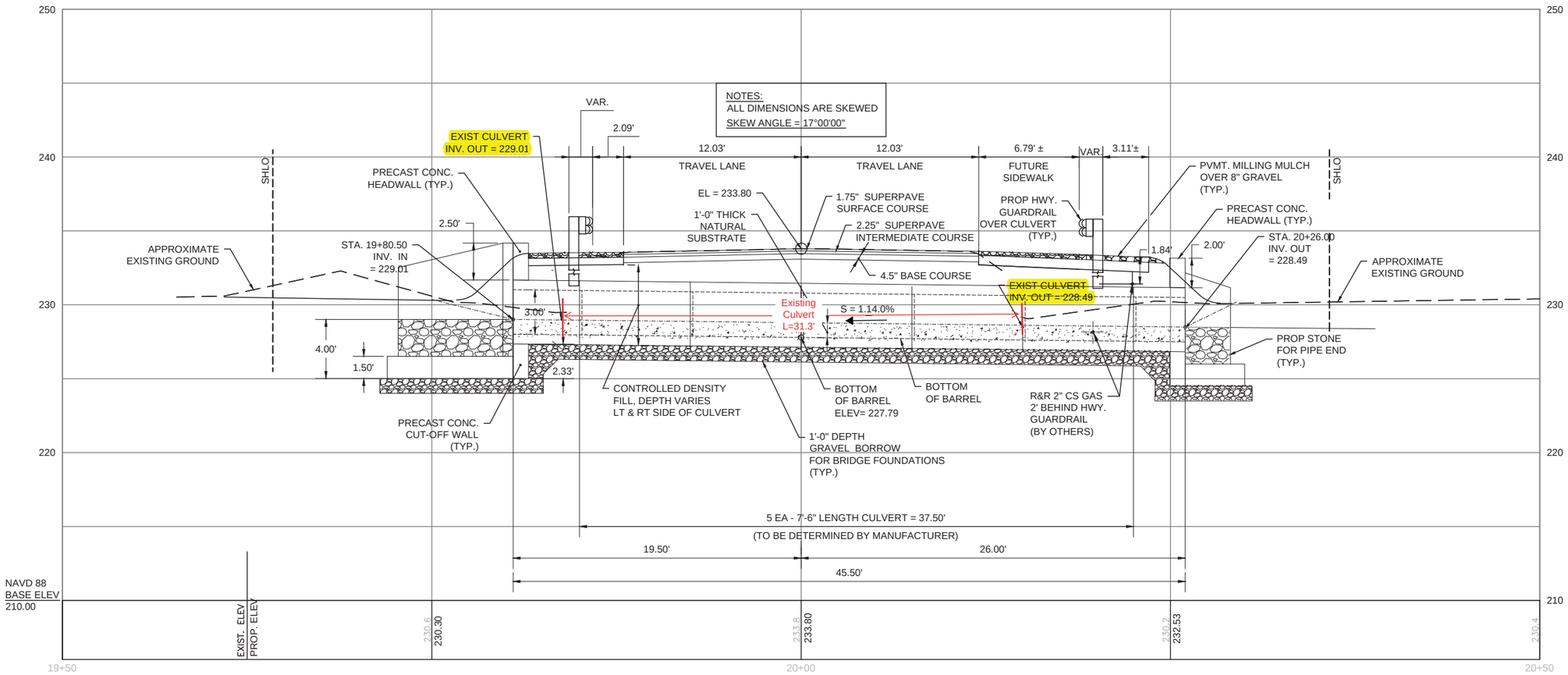
DATUM
ELEV=220.00

~~3/6/2017~~	PCN PLANS SUBMITTAL	0



4'x3' - CULVERT No. 1 @ STA 45+60
LONGITUDINAL SECTION

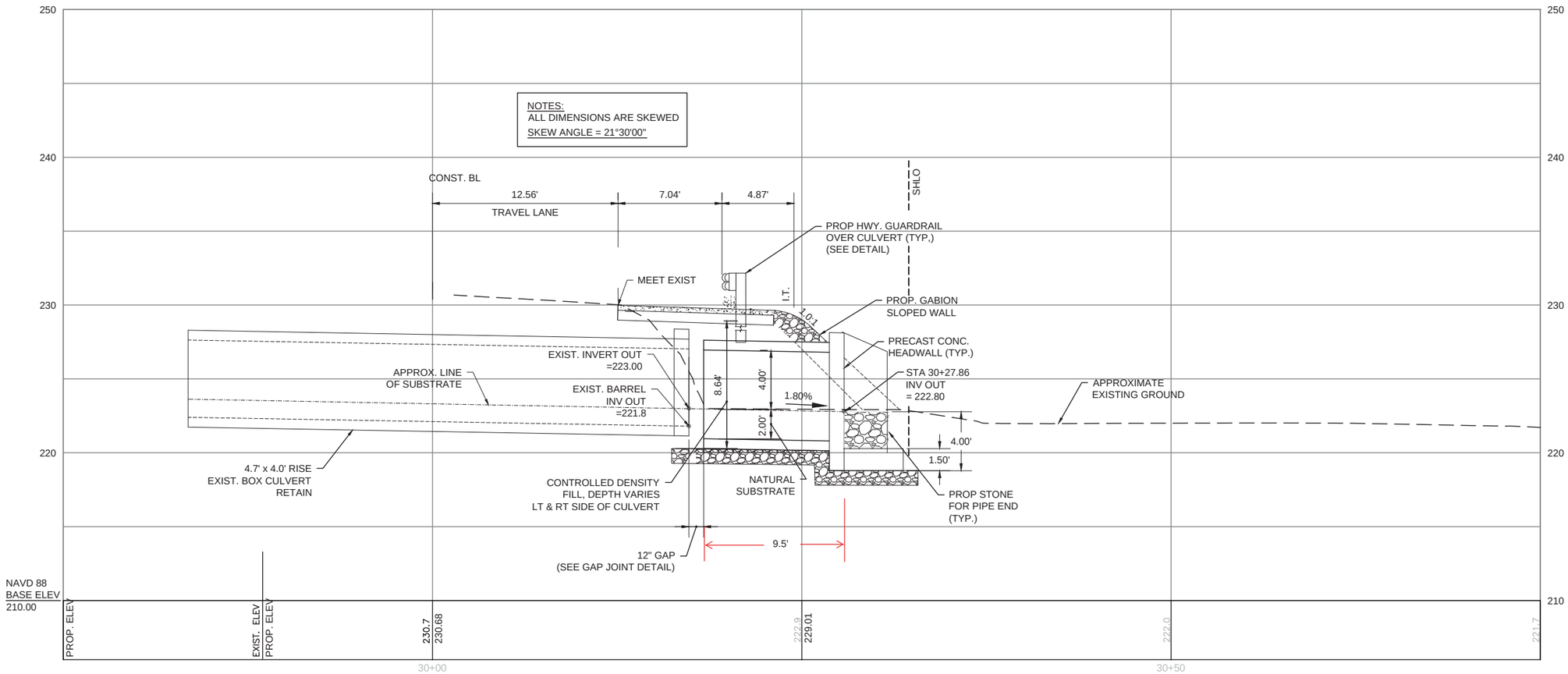
SCALE: 1" = 8'



3'x2' - CULVERT No.2 @ STA 47+66±
LONGITUDINAL SECTION

SCALE: 1" = 8'

CULVERT NO.3 LONGITUDINAL SECTION
REVISED 6/23/17 jlb



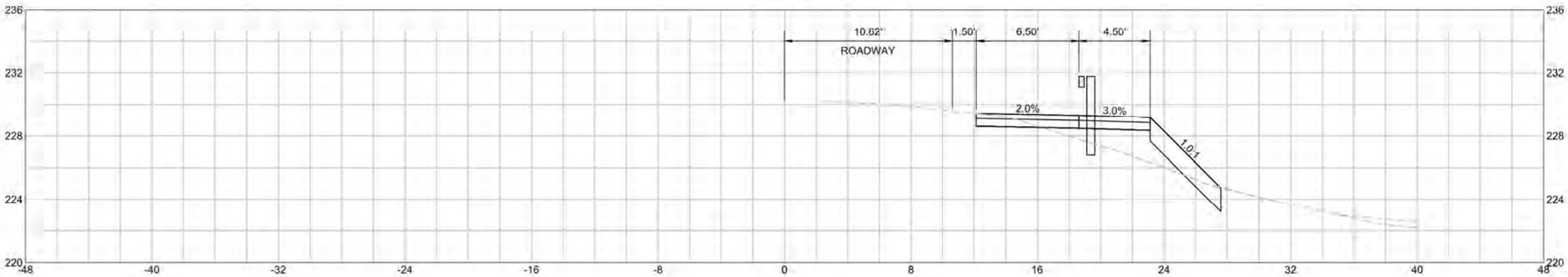
5' x 6' CULVERT NO. 3 @ STA 37+29±
LONGITUDINAL SECTION
SCALE: 1" = 8'

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

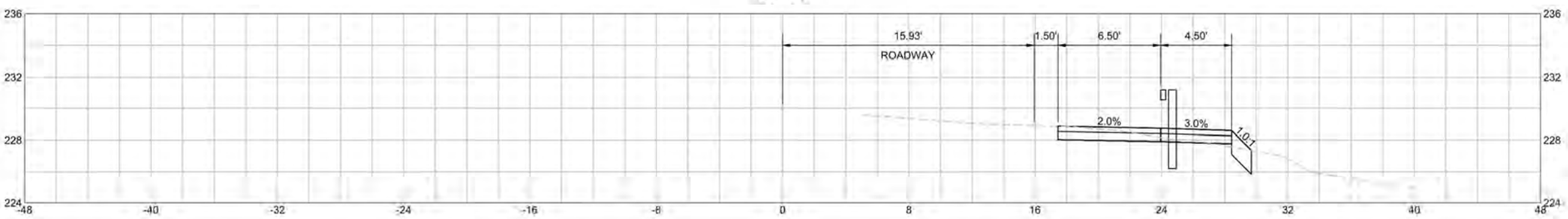
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	26	30
PROJECT FILE NO.	607955		

CROSS SECTIONS
SHEET 1 OF 5
REVISED 6/23/17 jlb

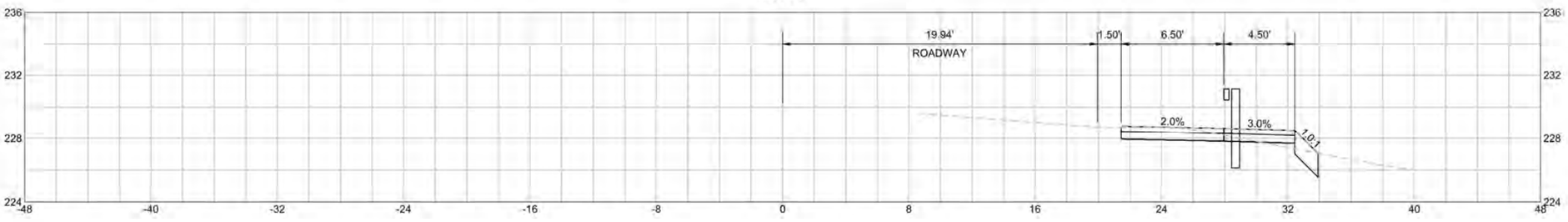
37+00



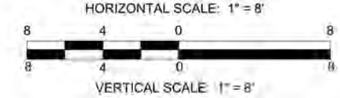
36+50



36+27



HORIZONTAL SCALE: 1" = 8'



VERTICAL SCALE: 1" = 8'

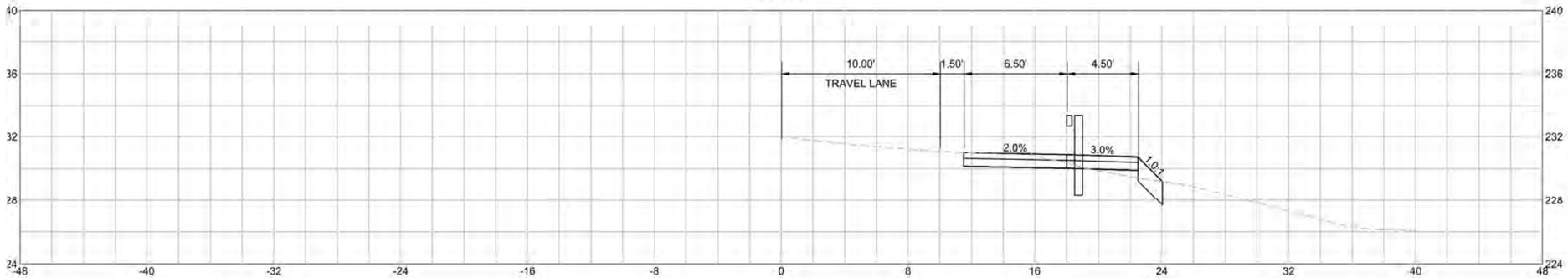
~~3/6/2017~~	PCM PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

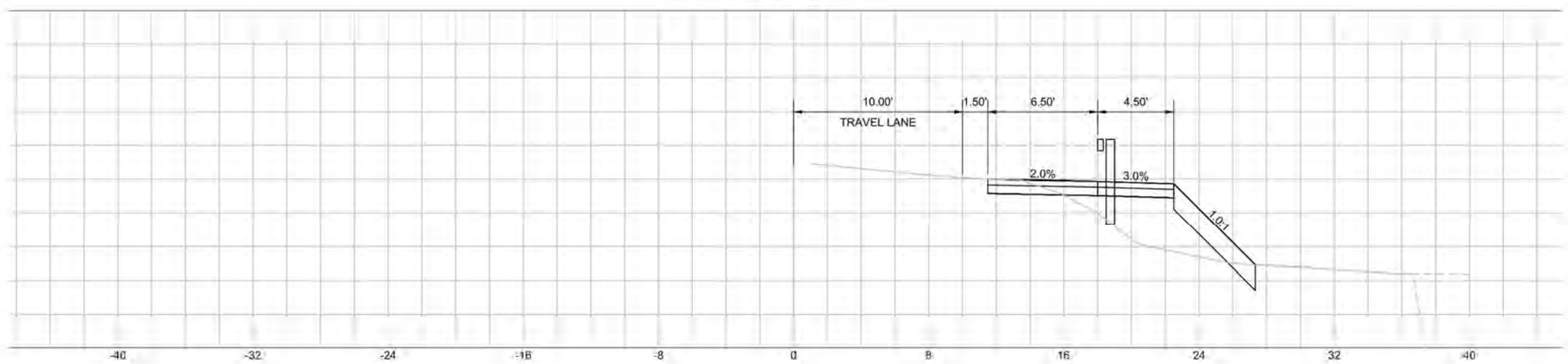
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	27	30
PROJECT FILE NO.	607955		

CROSS SECTIONS
SHEET 2 OF 5
REVISED 6/23/17 jlb

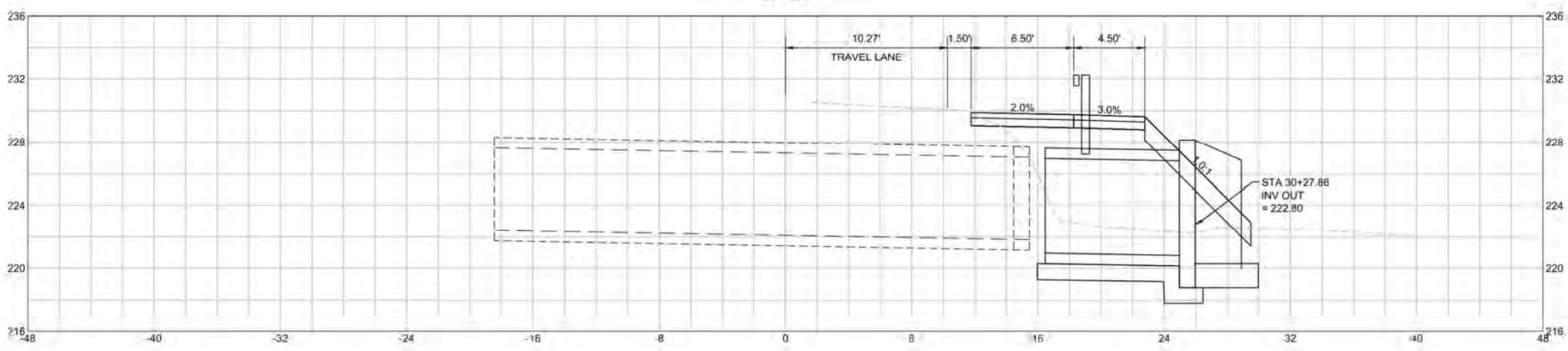
38+00



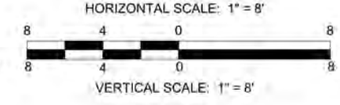
37+42



37+20



HORIZONTAL SCALE: 1" = 8'



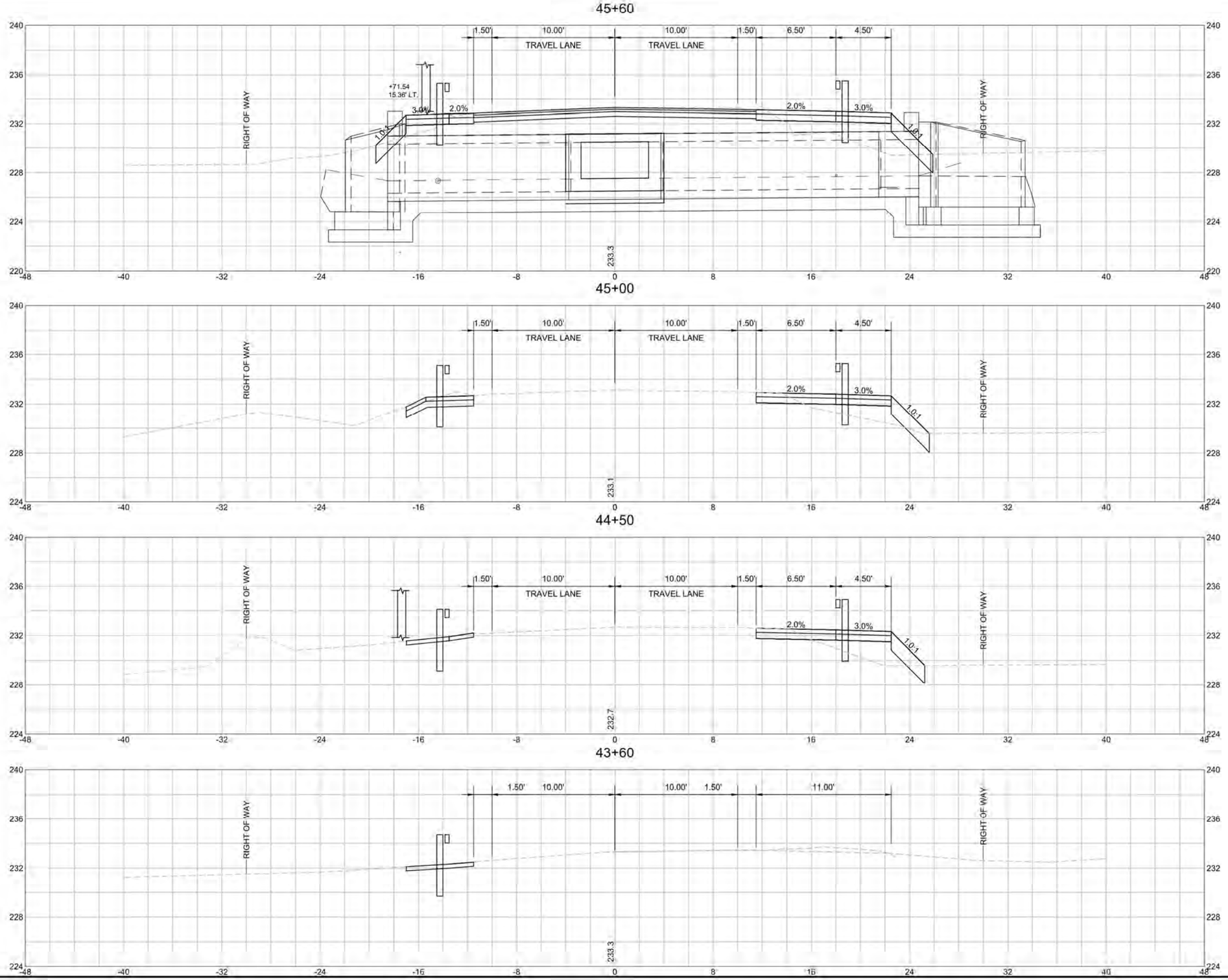
VERTICAL SCALE: 1" = 8'

~~3/02/17~~	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	28	30
PROJECT FILE NO.	607955		

CROSS SECTIONS
SHEET 3 OF 5
REVISED 6/23/17 jlb



HORIZONTAL SCALE: 1" = 8'

VERTICAL SCALE: 1" = 8'

~~3/6/2017~~	PCN PLANS SUBMITTAL	0

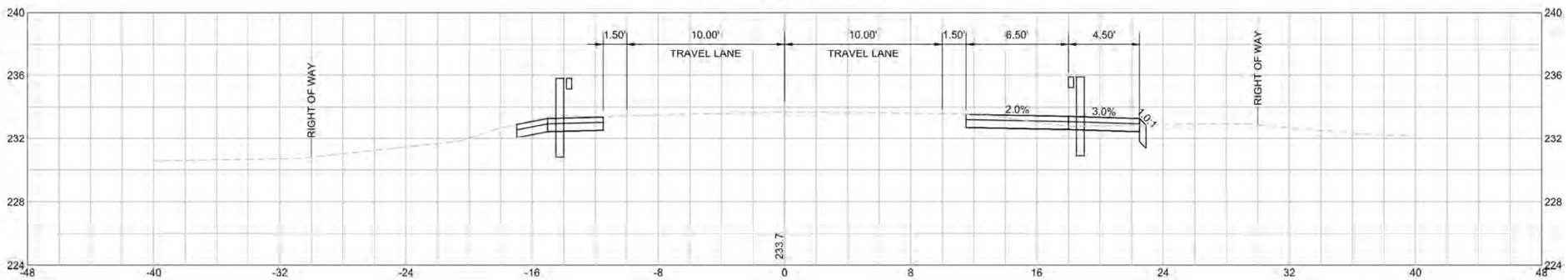
BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	29	30
PROJECT FILE NO.	607955		

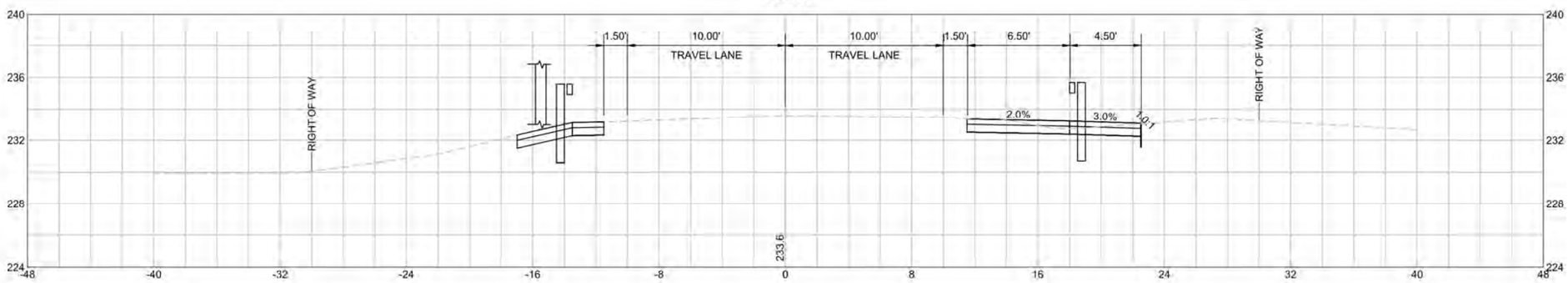
CROSS SECTIONS
SHEET 4 OF 5

REVISED 6/23/17 jlb

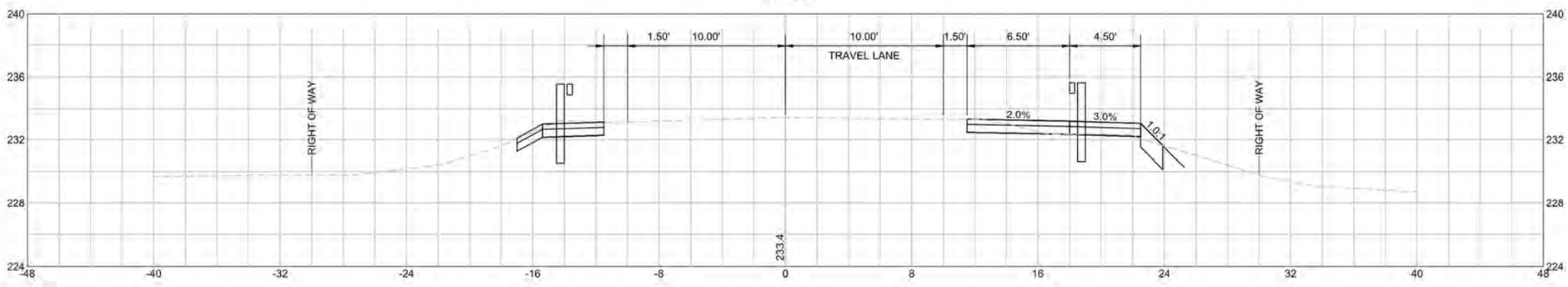
47+00



46+50



46+00



HORIZONTAL SCALE: 1" = 8'

8 4 0 8

8 4 0 8

VERTICAL SCALE: 1" = 8'

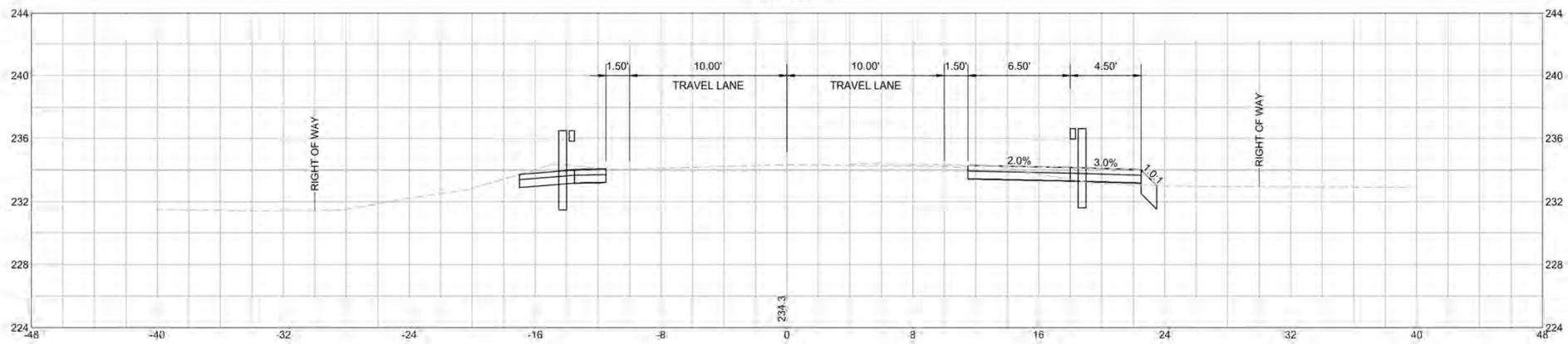
~~3/8/2017~~	PCN PLANS SUBMITTAL	0

BOXBOROUGH
MASSACHUSETTS AVENUE/ROUTE 111

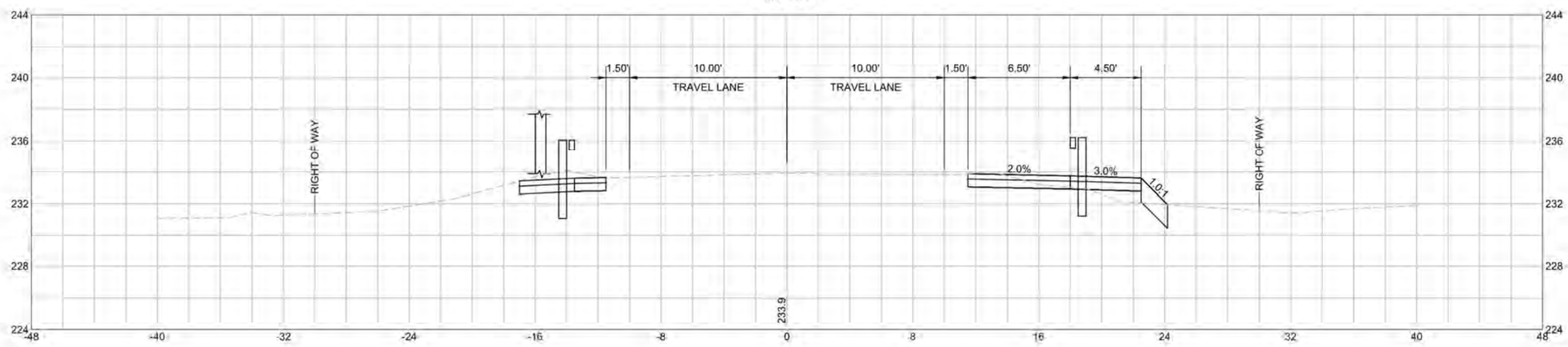
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	30	30
PROJECT FILE NO.	607955		

CROSS SECTIONS
SHEET 5 OF 5
REVISED 6/23/17 jlb

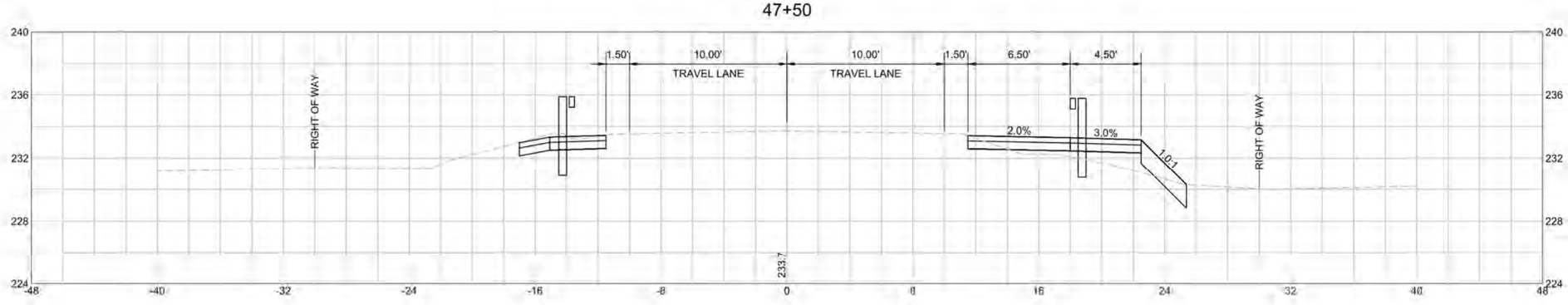
48+50



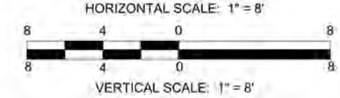
48+00



47+50



HORIZONTAL SCALE: 1" = 8'



VERTICAL SCALE: 1" = 8'

~~3/6/2017~~	PCM PLANS SUBMITTAL	0