MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	1	85
PROJECT FILE NO.	608460		

TITLE SHEET & INDEX

608460_HD01 (TITLE).DWG Plotted on 18-Jul-2025 2:53 PM

PLAN AND PROFILE OF

BAY ROAD (ROUTE 47) OVER FORT RIVER

(BRIDGE NO. H-01-005 (C1H))

IN THE TOWN OF

HADLEY

HAMPSHIRE COUNTY

FEDERAL AID PROJECT NO. NHP(BRR-ON)-003S(813)X

THESE PLANS ARE SUPPLEMENTED BY THE LATEST EDITIONS OF THE FOLLOWING PUBLICATIONS, AS IDENTIFIED IN THE CONTRACT SPECIAL PROVISIONS: THE MASSDOT CONSTRUCTION STANDARD DETAILS, THE MASSDOT STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE MASSDOT STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, THE MASSDOT OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, AND THE ANSI AMERICAN STANDARD FOR NURSERY STOCK.

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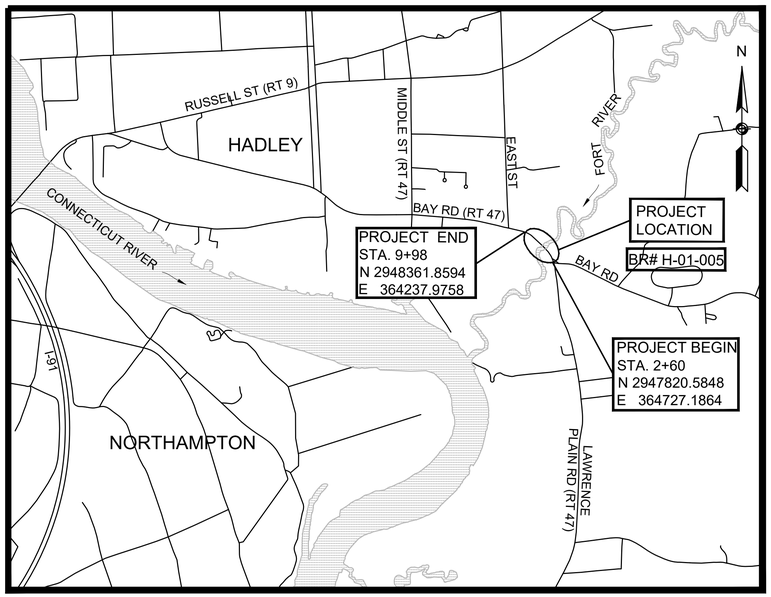

0 1500 3000 4500 6000

SCALE: 1" = 1500'

LENGTH OF PROJECT = 730.00 FEET = 0.138 MILES

DESIGN DESIGNATION (BAY ROAD - ROUTE 47)

DESIGN SPEED	35 MPH
ADT (2017)	11,732
ADT (2037)	14,350
K	9.4%
D	62%
T (PEAK HOUR)	1.2%
T (AVERAGE DAY)	4.1%
DHV	1,350
DDHV	837
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL (MAP-21 NHS)

COMMONWEALTH OF MASSACHUSETTS
ASHLEY D. BOMELY
CIVIL
No. 55329
REGISTERED PROFESSIONAL ENGINEER

Ashley Bomely Digitally signed by Ashley Bomely Date: 2025.07.29 10:52:12 -04'00'

benesch

DATE	DESCRIPTION	REV #

massDOT Massachusetts Department of Transportation Highway Division

APPROVED

Carrie Lavallee, P.E. — Carrie Lavallee, P.E. 2025.07.30 12:31:08 -04'00' — 07/30/2025

CHIEF ENGINEER — **DATE**

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		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)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING 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

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE (12" WIDE)
	CW	CROSSWALK (12" WIDE LINES)
	SWL	SOLID WHITE LINE (6" WIDE)
	SYL	SOLID YELLOW LINE (6" WIDE)
	BWL	BROKEN WHITE LINE (6" WIDE, 10' LINE, 30' GAP)
	BYL	BROKEN YELLOW LINE (6" WIDE, 10' LINE, 30' GAP)
	DWL	DOTTED WHITE LINE (6" WIDE, 3' LINE, 9' GAP)
	DYL	DOTTED YELLOW LINE (6" WIDE, 3' LINE, 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION (6" WIDE, 2' LINE, 6' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION (6" WIDE, 2' LINE, 6' GAP)
	DBWL	DOUBLE WHITE LINE (6" WIDE LINES)
	DBYL	DOUBLE YELLOW LINE (6" WIDE LINES)

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	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
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	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OHW	OVERHEAD WIRE
OHWL	ORDINARY HIGH WATER LINE
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

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	2	85
PROJECT FILE NO.	608460		

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

PVMT	PAVEMENT
PWW	PAVED WATER WAY
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 %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VW	VEGETATED WETLANDS
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT 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
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

608460_HD02-03 (LEGEND).DWG Plotted on 30-May-2025 11:33 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	3	85
PROJECT FILE NO.	608460		

GENERAL NOTES

608460_HD02-03 (LEGEND).DWG Plotted on 30-May-2025 11:33 AM

GENERAL NOTES

1. THIS BASE MAP IS COMPILED FROM AN ACTUAL-ON-THE-GROUND INSTUMENT SURVEY PERFORMED BY GREEN INTERNATIONAL AFFILIATES, INC. PERFORMED BETWEEN JUNE 19, 2017 AND SEPTEMBER 15, 2017.

2. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED BY MASSDOT SURVEY, IN MASSDOT DISTRICT 2 FIELD BOOK 41273, PAGE 86, ON JULY 6, 2017. HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD83 (2011) EPOCH 2010.000, VERTICAL DATUM IS NAVD88 (COMPUTED USING GEOID12B) USING THE FOLLOWING CONTROL POINTS:

POINT	GRID NORTHING	GRID EASTING	ELEVATION	COMBINED GROUND TO GRID SCALE FACTOR
9 YC	2937327.18	358584.75	118.11	1.000035007344
448 H	2959132.00	348529.15	154.41	1.000034373289

MASSDOT ESTABLISHED THE FOLLOWING POINTS FOR THIS PROJECT:

POINT	GRID NORTHING	GRID EASTING	ELEVATION	DESCRIPTION
1933	2947789.42	364780.56	139.35	HUB AND TACK FOUND
1934	2947702.87	365166.90	155.65	IRON ROD FOUND

THE UNIT OF MEASUREMENTS IS US FEET. THE PROJECT COMBINED SCALE FACTOR IS 1.000035399383.

3. THE RIGHT OF WAY LINES SHOWN ON THIS BASE MAP ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES HAVE NOT BEEN SURVEYED, THEY ARE COMPILED FROM GIS & RECORD PLAN INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE.

4. 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).

5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE PROVIDED FOR UNDER CONTRACT ITEMS.

6. ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED OR AS PAVEMENT MILLING MULCH 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

7. CATCH BASINS DAMAGED OR FILLED WITH SEDIMENTATION DURING THE CONSTRUCTION PROCESS SHALL BE CLEANED, FLUSHED AND/OR REPLACED AT CONTRACTOR'S EXPENSE.

8. JOINTS IN HOT MIX ASPHALT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR SECTION 450.

9. TOP OF CURB SHALL BE 6 INCHES ABOVE GUTTER GRADE UNLESS OTHERWISE NOTED.

10. BEFORE ANY DRAINAGE STRUCTURES ARE CONSTRUCTED OR CONNECTIONS ARE MADE THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF SUBSURFACE STRUCTURES AND DRAINAGE INVERTS TO AVOID CONFLICTS WITH UTILITIES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION PLANS OR DIRECTED BY THE ENGINEER.

11. ANY ADJUSTMENTS MADE TO MUNICIPALLY OWNED SANITARY AND WATER MANHOLES, HYDRANTS, GATE BOXES, ETC... SHALL MEET APPLICABLE MUNICIPAL STANDARDS AND CRITERIA.

12. TREES AND SHRUBS NOT NOTED TO BE REMOVED, AND TREE AND SHRUBS NOTED "RET" ON THE DRAWINGS, SHALL BE PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION OPERATIONS. TREES OR SHRUBS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN-KIND BY THE CONTRACTOR AT HIS OR HER OWN EXPENSE.

13. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.

PLAN REFERENCES

1. JULY 7, 1931 PLAN OR ROAD IN THE TOWN OF HADLEY, HAMPSHIRE COUNTY, LAID OUT BY THE COUNTY COMMISSIONERS, RECORDED IN PLAN BOOK 14, PAGE 44 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

2. AUGUST 28, 1935 PLAN OF ROAD IN THE TOWN OF HADLEY, HAMPSHIRE COUNTY, LAID OUT BY THE COUNTY COMMISSIONERS, RECORDED IN PLAN BOOK 19, PAGE 78 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

3. AUGUST 1967 PLAN OF BAY ROAD-HADLEY AS ALTERED & RELOCATED BY THE COUNTY COMMISSIONERS, RECORDED IN PLAN BOOK 71, PAGE 88 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

4. JUNE 28, 1977 LAND OF NELLIE H. FYDENKEVEZ, TOWN OF HADLEY, COUNTY OF HAMPSHIRE, RECORDED IN PLAN BOOK 105, PAGE 39 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

5. SEPTEMBER 19, 1988 PLAN OF LAND IN HADLEY, MASSACHUSETTS PREPARED FOR JOHN M. CALLAHAN, RECORDED IN PLAN BOOK 157, PAGE 29 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

6. DECEMBER 10, 1990 PLAN OF LAND IN HADLEY, MASSACHUSETTS PREPARED FOR SETH ISMAN & ERIKA HOLLISTER, RECORDED IN PLAN BOOK 169, PAGE 88 AT HAMPSHIRE COUNTY REGISTRY OF DEEDS.

UTILITY NOTES:

1. ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION.

2. RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.

3. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING OR REPAVING.

4. THE LOCATION OF EXISTING PIPES OR OTHER UNDERGROUND STRUCTURES OR PROPERTY LINES ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO ANY EXCAVATION TO OBTAIN ACCURATE UTILITY LOCATIONS.

5. SUBSURFACE UTILITY LOCATIONS HAVE BEEN PLOTTED TO MEET UTILITY QUALITY LEVEL "C" AS DESCRIBED IN ASCE STANDARD 38-02. THE UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON ABOVE-GROUND FIELD OBSERVATION AND EXISTING RECORD INFORMATION RECEIVED FROM UTILITY STAKE-HOLDERS. UTILITY RECORD PLANS WERE REQUESTED AND RECEIVED FROM THE FOLLOWING UTILITY COMPANIES/AGENCIES/MUNICIPALITIES:

6. INVERTS SHOWN ON PLAN ARE NOT GUARANTEED TO BE ACCURATE. DUE TO THE LIMITATIONS OF FIELD OBSERVATION AND SURVEY TECHNIQUES THE INVERTS ARE SHOWN AS APPROXIMATE ONLY AND SHALL NOT BE WARRANTED TO BE CORRECT. ADDITIONAL FIELD INVESTIGATION IS NECESSARY WHERE ACCURATE MEASUREMENTS ARE REQUIRED FOR DESIGN OF CRITICAL AREAS.

7. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

8. ALL PIPES LABELED AS (REC) ARE BASED ON RECORD INFORMATION ONLY AND NOT OBSERVED IN THE FIELD.

9. 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.

10. ALL EXISTING UTILITY GATE BOXES, MANHOLE FRAMES AND COVERS, CATCH BASIN FRAMES AND GRATES AND OTHER CASTINGS TO BE RETAINED SHALL BE ADJUSTED TO LINE AND/OR GRADE.

11. WORK REQUIRED ON ELECTRIC, GAS, CABLE T.V. OR TELEPHONE STRUCTURES AND LINES SHALL BE CARRIED OUT BY THE OWNER OF THAT UTILITY. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS TO COORDINATE THE ALTERATION AND ADJUSTMENT OF THESE AND ANY OTHER PRIVATE UTILITIES WITH THE UTILITY COMPANIES.

12. PRIOR NOTICE OF AT LEAST 48 HOURS SHALL BE GIVEN BY THE CONTRACTOR TO AFFECTED MUNICIPAL WATER AND FIRE DEPARTMENTS, WITH A COPY OF SUCH NOTICE SUBMITTED TO THE ENGINEER, BEFORE ANY WATER MAIN IS SHUT OFF AND IN NO CASE SHALL A GATE OR HYDRANT BE OPENED OR SHUT WITHOUT PROPER AUTHORIZATION FROM THE TOWN OF HADLEY WATER DIVISION AND HADLEY WATER TREATMENT PLANT. WATER SHUTDOWNS SHALL BE SCHEDULED TO MINIMIZE IMPACTS TO CUSTOMERS AND SHALL NOT OCCUR WITHOUT PROPER AUTHORIZATION FROM THE TOWN OF HADLEY DPW AND HADLEY WATER TREATMENT PLANT.

13. NOTICE OF AT LEAST 48 HOURS SHALL BE GIVEN BY THE CONTRACTOR TO THE HADLEY WATER DIVISION PRIOR TO BACKFILLING ANY WATER MAIN TRENCHES. BACKFILLING SHALL NOT OCCUR PRIOR TO RECEIVING RESPONSE FROM THE HADLEY WATER DIVISION, WHO MAY ELECT TO OBSERVE THE WATER MAIN INSTALLATION.

14. NOTICE OF AT LEAST 48 HOURS SHALL BE GIVEN BY THE CONTRACTOR TO THE HADLEY WATER DIVISION PRIOR TO PRESSURE AND DISINFECTION TESTING. THE TOWN OF HADLEY SHALL BE ALLOWED TO COLLECT AND TEST THEIR OWN SAMPLE TO CONFIRM TESTING RESULTS.

15. THE CONTRACTOR SHALL COORDINATE ALL ARRANGEMENTS FOR THE ALTERATION AND/OR ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITY THROUGH THE MASSDOT HIGHWAY DIVISION UTILITY SECTION.

16. WITHIN AREAS OF RESURFACING OR RECONSTRUCTION, ALL EXISTING DRAINAGE MANHOLES, CATCH BASINS, SEWER MANHOLES, AND WATER GATES SHALL BE ADJUSTED TO PROPOSED LINE AND GRADE UNLESS OTHERWISE NOTED ON THE PLANS.

17. SHOP DRAWINGS OF ALL CASTINGS, PRECAST CONCRETE STRUCTURES, PIPE AND OTHER MANUFACTURED ITEMS SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER, IN CONFORMANCE WITH CONTRACT SPECIFICATIONS, AND SAID APPROVAL SHALL BE REQUIRED PRIOR TO INITIATING PROCUREMENT OF MATERIALS.

18. ALL DRAINAGE STRUCTURES TO BE ABANDONED SHALL BE FILLED WITH GRAVEL AND ALL CONNECTIONS SHALL BE PLUGGED AT THE PIPE LOCATIONS WITH A CEMENT CONCRETE MASONRY PLUG.

19. THE CONTRACTOR PERFORMING ANY WATER, SANITARY SEWER OR STORM DRAIN WORK WITHIN THE TOWN OF HADLEY MUST BE LICENSED WITH THE TOWN AND HAVE A PERMIT FROM THE TOWN TO PERFORM THE WORK ON THE UTILITIES AS WELL AS ALL OTHER WORK IN THE TOWN RELATED TO THIS PROJECT. THE CONTRACTOR IS REQUIRED TO OBTAIN A STREET OCCUPANCY PERMIT FROM THE TOWN FOR THE DURATION OF THE PROJECT.

20. FINAL LOCATION OF TRAFFIC SIGNS AND SUPPORTS AS SHOWN IN THE PLANS SHALL BE FIELD-CONFIRMED BY THE ENGINEER PRIOR TO INSTALLATION.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	4	85
PROJECT FILE NO.	608460		

KEY PLAN

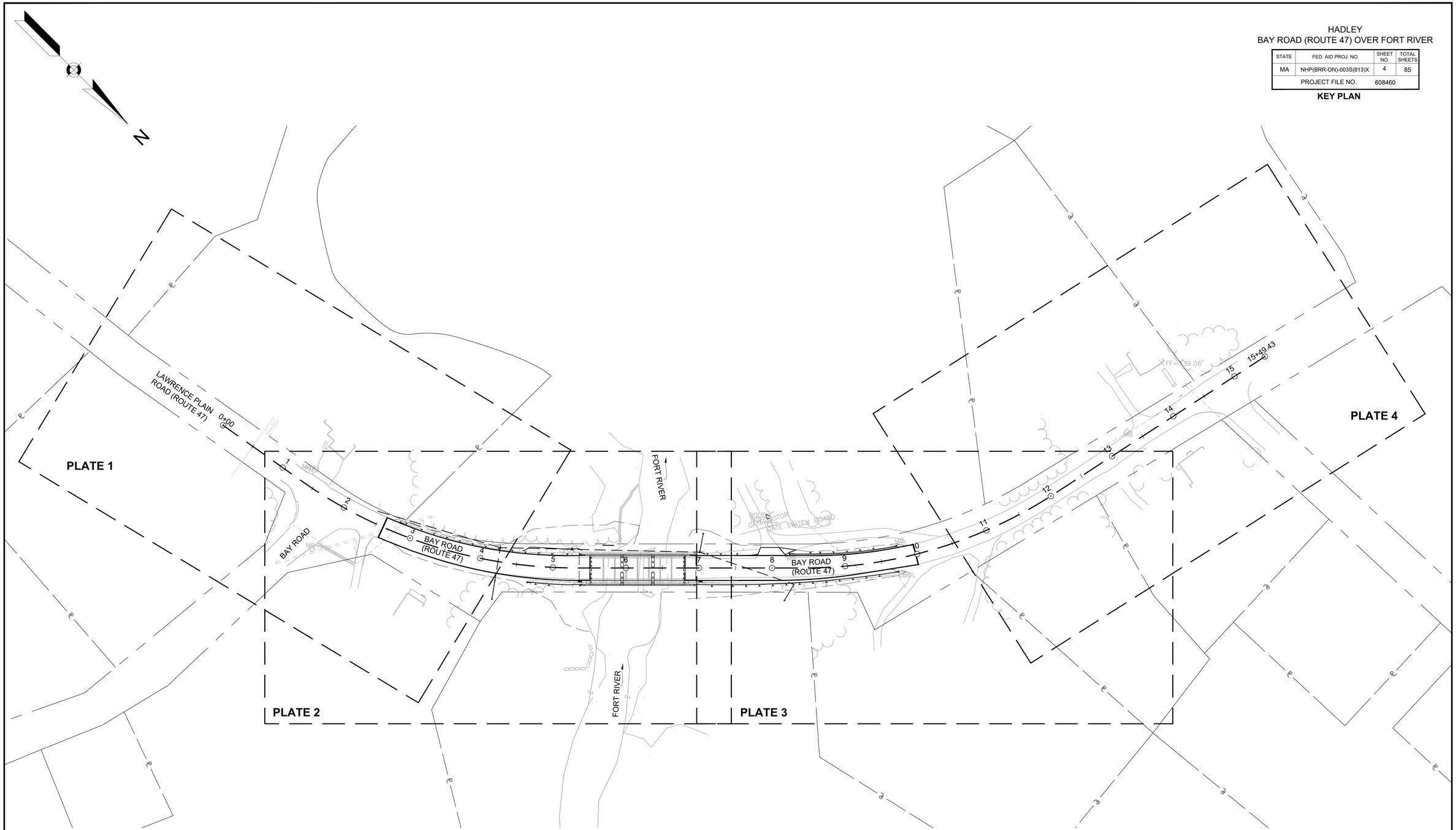

	PLATE 1	PLATE 2	PLATE 3	PLATE 4
SURVEY CONTROL	5	6	7	8
CONSTRUCTION PLANS	-	10	11	-
PROFILES	-	12	13	-
CURB TIE PLANS	-	14	15	-
UTILITY PLANS	-	16	17	-
TRAFFIC SIGN AND PAVEMENT MARKING PLANS	-	24	25	-

608460_HD04 (KEY PLAN).DWG Plotted on 30-May-2025 11:34 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	5	85
PROJECT FILE NO.	608460		

SURVEY CONTROL

608460_HD05-08 (SURVEY CONTROL).DWG Plotted on 30-May-2025 11:35 AM

N

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LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION

LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION

6
N: 2947531.811'
E: 364754.872'
EL: 150.014'
MSTN

18
N: 2947682.198'
E: 364545.245'
EL: 107.557'
MSTN

S38°53'05"W 45.59'

DP-1

164.30'
S21°18'57"W

1

DP-2

PC +30.54

2

N11°37'07"E 95.37'

DP-3

N59°43'11"W 61.80'

3

N34°17'11"W 207.17'

LAWRENCE PLAIN ROAD

BAY ROAD

LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301
3 LAWRENCE PLAIN ROAD

N/F
DAVID J. & REBECCA A. CHMURA
PARCEL 04B-0065-0000
BOOK 6140 PAGE 0228
4 LAWRENCE PLAIN ROAD

5
N: 2947789.424'
E: 364780.554'
EL: 139.350'
MSTN

CONTINUED ON SHEET NO. 6

BAY ROAD CONSTRUCTION BASELINE DATA							
STARTING STATION (DATA POINTS)	NORTHING	EASTING	CURVE DATA	LINE DATA	STARTING STATION (DATA POINTS)	NORTHING	EASTING
STA 0+00.00 (DP-1)	2947567.3000	364783.4924		N9°41'40W 130.54'	STA 1+30.54 (DP-2)	2947695.9735	364761.5110
STA 1+30.54 (DP-2)	2947695.9735	364761.5110	R=650.00' Δ=11°24'44" l=129.47' T=64.95		STA 2+60.00 (DP-3)	2947820.5853	364727.1862
STA 2+60.00 (DP-3)	2947820.5853	364727.1862	R=650.00' Δ=23°54'55" L=271.13' T=137.66		STA 5+31.31 (DP-4)	2948046.3128	364580.2376

FOR DP-4, SEE SHEET 6.

0 20 50 100
SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	6	85
PROJECT FILE NO.	608460		

SURVEY CONTROL

CONTINUED ON SHEET NO. 5

CONTINUED ON SHEET NO. 7

608460_HD05-08 (SURVEY CONTROL).DWG Plotted on 30-May-2025 11:35 AM

N

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

164.30'
S27°19'57"W

1

DP-2

PC +30.54

LAWRENCE PLAIN ROAD

N11°37'03"E
95.37'

2

DP-3

N34°17'11"W
207.17'

3

BAY ROAD

N59°43'11"W
61.80'

41.78'

5.18'

6.47'

4

BAY ROAD

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

75.07'

39.19'

62.39'
S29°00'05"E

73.46'

DP-4

PT +31.31

N45°01'18"W
313.35'

32.5'

N31°05'01"W
75.61'

69.41'

7

N55°24'38"W
230.04'

79.12'

LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

5
N: 2947789.424'
E: 364780.554'
EL: 139.350'
MSTN

LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301

3 LAWRENCE PLAIN ROAD

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119

129 BAY ROAD

AUDREY R. WILGA LIFE ESTATE
PARCEL 04B-0054-0000
BOOK 12246 PAGE 0198

132 BAY ROAD

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044

130 BAY ROAD

JOAN L. WANCZYAK LIF
PARCEL 04B-0053-
BOOK 10910 PAGE

130 BAY ROA

BENCHMARK:
MAG NAIL SET 1'
ABOVE GRADE
EL=130.61'

9
N: 2947991.757'
E: 364610.480'
EL: 125.742'
MMAG

17
N: 2947929.645'
E: 364449.074'
EL: 110.101'
MSTN

11
N: 2948055.416'
E: 364511.176'
EL: 107.701'
MSTN

4
N: 2948111.065'
E: 364541.202'
EL: 126.233'
MELP

7
N: 2948143.913'
E: 364668.650'
EL: 124.040'
MSTN

10
N: 2948189.228'
E: 364612.943'
EL: 107.087'
MSTN

100' BANK RESOURCE BUFFER
100' BVW BUFFER ZONE
200' RIVERFRONT AREA
100' BVW BUFF

0 20 50 100
SCALE: 1" = 20'

BAY ROAD CONSTRUCTION BASELINE DATA

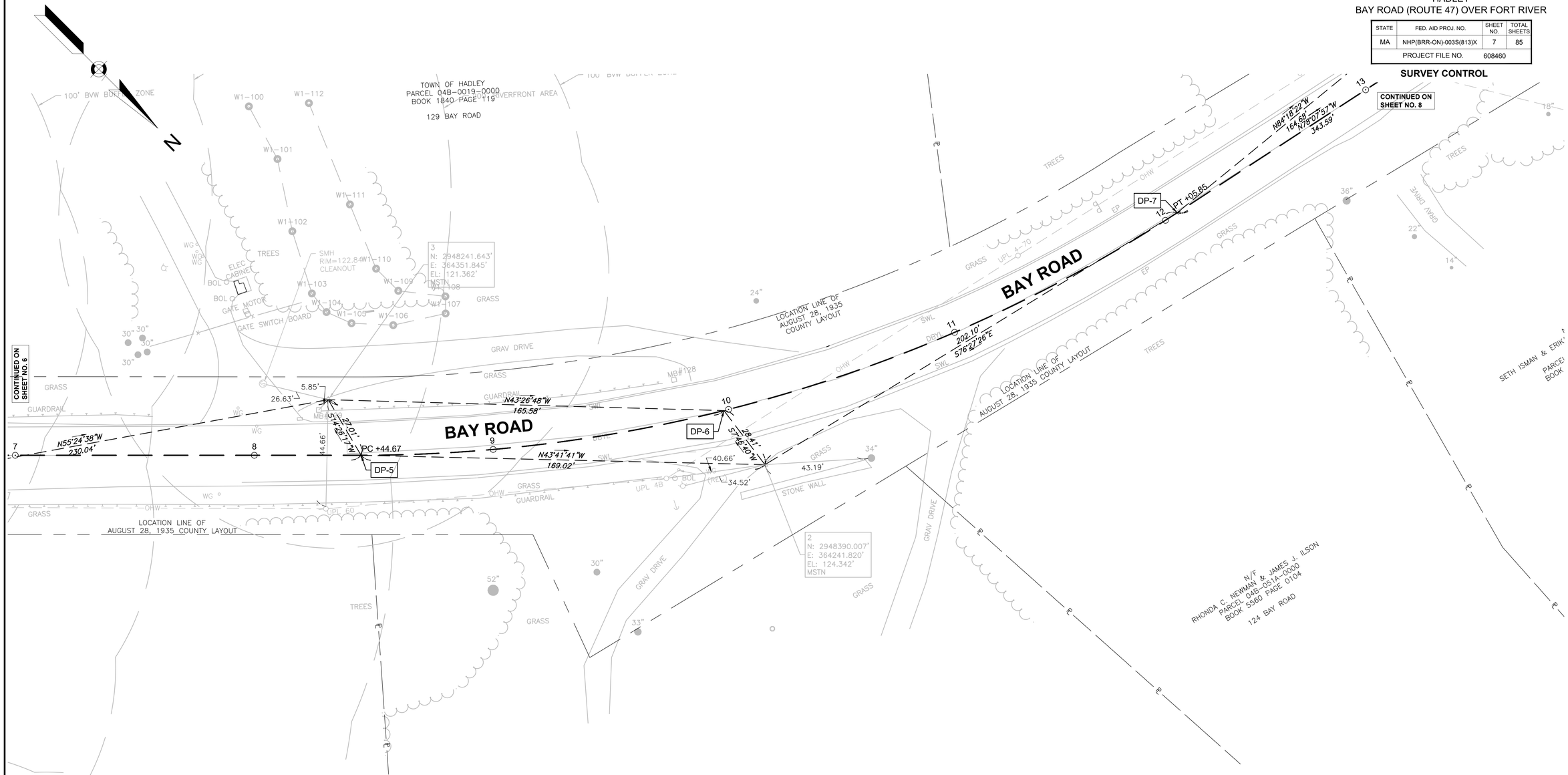
STARTING STATION (DATA POINTS)	NORTHING	EASTING	CURVE DATA	LINE DATA	STARTING STATION (DATA POINTS)	NORTHING	EASTING
STA 1+30.54 (DP-2)	2947695.9735	364761.5110	R=650.00' Δ=11°24'44" L=129.47' T=64.95		STA 2+60.00 (DP-3)	2947820.5853	364727.1862
STA 2+60.00 (DP-3)	2947820.5853	364727.1862	R=650.00' Δ=23°54'55" L=271.13' T=137.66		STA 5+31.31 (DP-4)	2948046.3128	364580.2376
STA 5+31.31 (DP-4)	2948046.3128	364580.2376		N45°01'18"W 130.54'	STA 8+44.67 (DP-5)	2948267.8020	364358.5801

FOR DP-5, SEE SHEET 7.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	7	85
PROJECT FILE NO.	608460		

SURVEY CONTROL



FOR DP-4, SEE SHEET 6.

BAY ROAD CONSTRUCTION BASELINE DATA

STARTING STATION (DATA POINTS)	NORTHING	EASTING	CURVE DATA	LINE DATA	STARTING STATION (DATA POINTS)	NORTHING	EASTING
STA 5+31.31 (DP-4)	2948046.3128	364580.2376		N45°01'18"W 130.54'	STA 8+44.67 (DP-5)	2948267.8020	364358.5801
STA 8+44.67 (DP-5)	2948267.8020	364358.5801	R=624.91' Δ=14°03'30" L=153.33' T=77.05		STA 9+98.00 (DP-6)	2948361.8594	364237.9758
STA 9+98.00 (DP-6)	2948361.8594	364237.9758	R=624.94' Δ=19°03'24" L=207.65' T=104.90		STA 12+05.85 (DP-7)	2948437.3337	364045.3360
STA 12+05.85 (DP-7)	2948437.3337	364045.3360		N78°07'57"W 343.59'	STA 15+49.53 (DP-8)	2948507.9911	363709.0947

FOR DP-8, SEE SHEET 8.

0 20 50 100
SCALE: 1" = 20'

608460_HD05-08 (SURVEY CONTROL).DWG Plotted on 30-May-2025 11:35 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

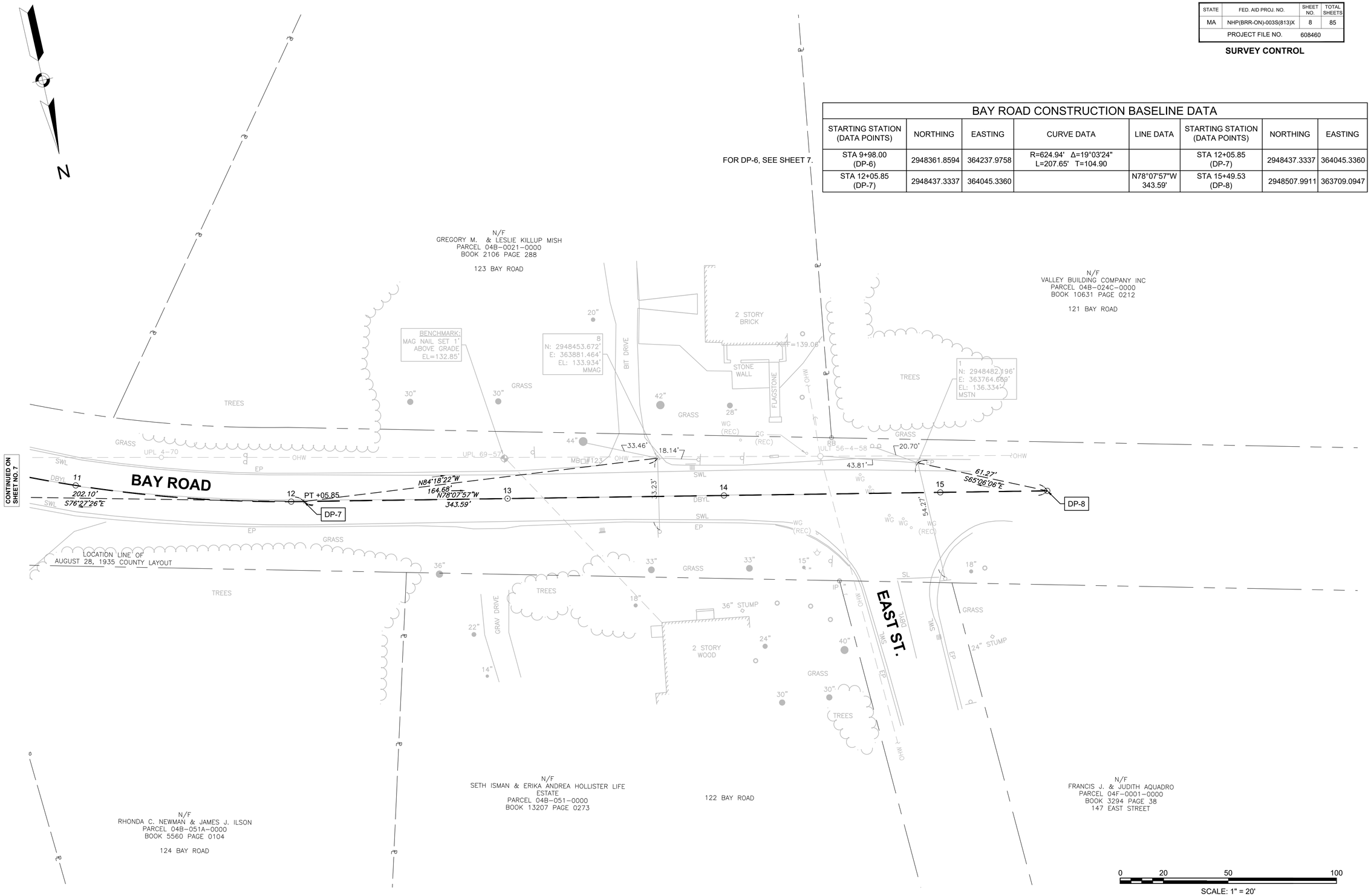
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	8	85
PROJECT FILE NO. 608460			

SURVEY CONTROL

608460_HD05-08 (SURVEY CONTROL).DWG Plotted on 30-May-2025 11:35 AM

BAY ROAD CONSTRUCTION BASELINE DATA

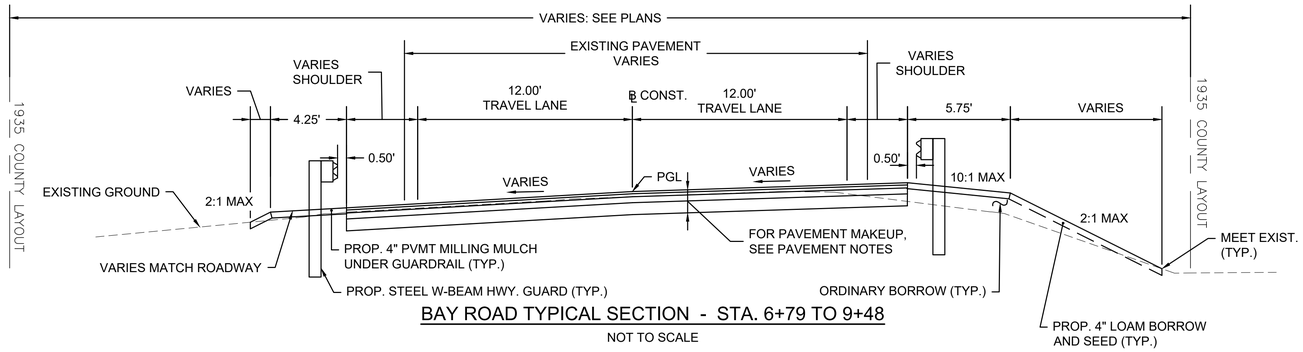
STARTING STATION (DATA POINTS)	NORTHING	EASTING	CURVE DATA	LINE DATA	STARTING STATION (DATA POINTS)	NORTHING	EASTING
STA 9+98.00 (DP-6)	2948361.8594	364237.9758	R=624.94' Δ=19°03'24" L=207.65' T=104.90		STA 12+05.85 (DP-7)	2948437.3337	364045.3360
STA 12+05.85 (DP-7)	2948437.3337	364045.3360		N78°07'57"W 343.59'	STA 15+49.53 (DP-8)	2948507.9911	363709.0947



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

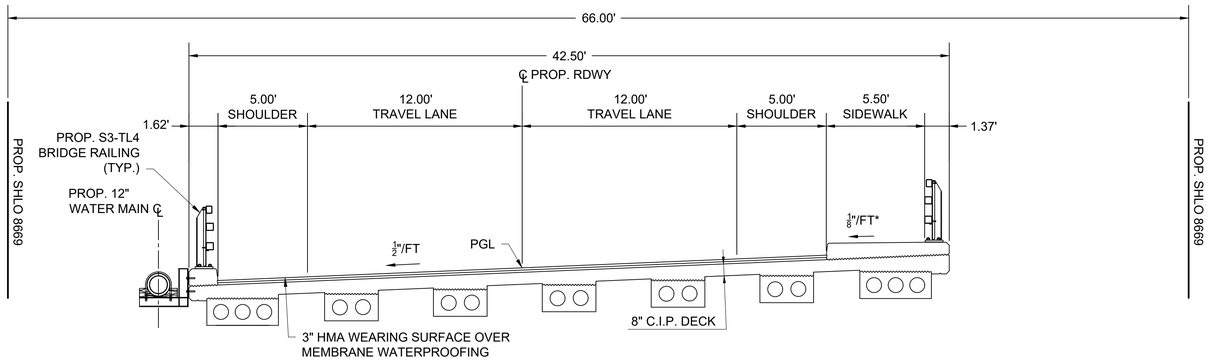
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	9	85
PROJECT FILE NO.	608460		

TYPICAL SECTIONS



BAY ROAD TYPICAL SECTION - STA. 6+79 TO 9+48

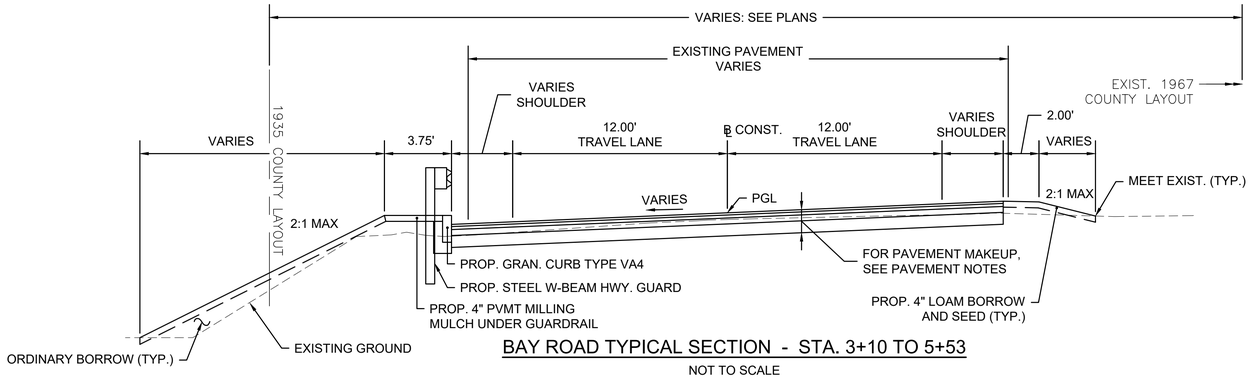
NOT TO SCALE



BRIDGE TYPICAL SECTION - STA. 5+53 TO 6+79

NOT TO SCALE

*CONSTRUCTION TOLERANCE +/- 0.5%



BAY ROAD TYPICAL SECTION - STA. 3+10 TO 5+53

NOT TO SCALE

PAVEMENT NOTES

GENERAL PAVEMENT NOTES:

1. ALL HMA FOR PATCHING, ASPHALT EMULSION FOR TACK COAT AND HMA JOINT SEALANT SHALL BE IN ACCORDANCE WITH SECTION 450. ALL PERMANENT PAVEMENT REPAIRS TO THE MILLED SURFACE SHALL BE MADE PRIOR TO RESURFACING. ASPHALT EMULSION SHALL BE APPLIED AT THE RATE OF 0.06-0.08 GALLONS PER SQUARE YARD OVER SMOOTH PAVEMENTS AND 0.07-0.09 GALLONS PER SQUARE YARD OVER MILLED SURFACES PRIOR TO PAVING. ALL JOINTS IN THE SURFACE COURSE SHALL BE SEALED WITH HMA JOINT SEALANT.
2. ALL SUPERPAVE HMA SHALL BE PRODUCED WITH A WARM MIX ASPHALT ADDITIVE.
3. PROVIDE TEMPORARY HMA TRANSITIONS IF TRAFFIC IS EXPECTED TO BE WITHIN BOX WIDENED AREAS OR IF BOX WIDENING IS TO LAST OVER THE WINTER MONTHS.

PROPOSED FULL DEPTH CONSTRUCTION WITH RECLAIMED BASE

1 1/2"	SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B-9.5) OVER
2"	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
4.5"	SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
VARIES (8" MIN.)	RECLAIMED PAVEMENT SUPPLEMENTED WITH GRAVEL BORROW (TYPE b) AS REQUIRED

PROPOSED FINE MILLING AND OVERLAY

1 1/2"	SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B-9.5) OVER
1 1/2"	PAVEMENT FINE MILLING

PROPOSED HMA WEARING SURFACE FOR BRIDGES

1 1/2"	SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B-9.5) OVER
	RS-1H ASPHALT EMULSION FOR TACK COAT OVER
1 1/2"	SUPERPAVE BRIDGE PROTECTIVE COURSE - 9.5 (SPC-B-9.5) OVER
	POLYMER MODIFIED TACK COAT OVER
	SPRAY APPLIED MEMBRANE WATERPROOFING

PROPOSED HMA FOR DRIVEWAYS

1 1/2"	SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
2 1/2"	SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
8"	GRAVEL BORROW - SUBBASE (TYPE b)

PROPOSED CEMENT CONC. SIDEWALKS AND WHEELCHAIR RAMPS

4"	(AIR-ENTRAINED, 4000 PSI, 3/4", 610) CEMENT CONC. POURED IN ONE COURSE
8"	GRAVEL BORROW (TYPE b)

PROPOSED HMA FOR PATCHING PERMANENT TRENCH PAVEMENT

(PRIOR TO FINE MILLING OPERATIONS)

NOTE: THE 1 1/2" SURFACE COURSE SHALL BE TEMPORARY UNTIL FINE MILLING OPERATIONS ARE PERFORMED.

1 1/2"	TEMPORARY HMA (PAID UNDER ITEM 451.) OVER
2"	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
4.5"	SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
	TRENCH BACKFILL AS REQUIRED (SEE PLAN DETAILS AND CONTRACT SPECIAL PROVISIONS)
VARIES	GRAVEL BORROW (TYPE b) TO SUPPLEMENT SUITABLE BACKFILL
	(REFER TO UTILITY TRENCH DETAILS)

608460_HD09 (TYP SECTIONS).DWG Plotted on: 30-May-2025 11:35 AM

HIGHWAY GUARD DETAILS

RIGHT SIDE:
STA. 4+69 TO STA. 5+06 GUARDRAIL TANGENT END TREATMENT, TL-3 TO GUARDRAIL, TL-3 (SINGLE FACED)
STA. 5+06 TO STA. 5+40 TRANSITION TO BRIDGE RAIL

LEFT SIDE:
STA. 2+80 TO STA. 5+06 GUARDRAIL TANGENT END TREATMENT, TL-3 TO GUARDRAIL, TL-3 (SINGLE FACED)
STA. 5+06 TO STA. 5+40 TRANSITION TO BRIDGE RAIL

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE UTILITY SHEETS 16-17

DRAINAGE DETAILS

SEE UTILITY SHEET 16

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	10	85
PROJECT FILE NO.	608460		

CONSTRUCTION PLANS

608460_HD10-11 (CONST).DWG Plotted on 30-May-2025 11:36 AM

LAWRENCE PLAIN ROAD
LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2
N8°41'40"W 130.54'
PC +30.54
BAY ROAD
LORI J. & BRYAN K. HARPER PARCEL 04B-0018-0000 BOOK 8321 PAGE 0301
3 LAWRENCE PLAIN ROAD
TOWN OF HADLEY PARCEL 04B-0019-0000 BOOK 1840 PAGE 119
129 BAY ROAD
AUDREY R. WILGA LIFE ESTATE PARCEL 04B-0054-0000 BOOK 12246 PAGE 0198
132 BAY ROAD
JOAN L. WANCZYAK LIFE ESTATE PARCEL 04B-0053-0000 BOOK 10910 PAGE 0044
130 BAY ROAD
FORT RIVER
LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT
LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION
PROJECT BEGIN STA 2+60 N2947820.5853 E364727.1862
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (0" TO 6") STA. 2+80 LT
50' FINE MILLING TRANSITION
PROP. PERM. UTILITY EASEMENT
BEGIN PROP. GRANITE CURB TYPE VA4 (6" REVEAL) STA. 2+90 LT
PROP. FULL DEPTH CONSTRUCTION WITH RECLAIMED BASE
LINE OF TEMP. EASEMENT
PROP. GUARDRAIL, TL-3 (SINGLE FACED) (TYP.)
Δ=35°19'39" R=650.00' L=400.78' T=206.99'
PROP. UP (B.O.) (TYP.)
PROP. BOS
CONST. ℄
PROP. SEDIMENT CONTROL BARRIER. SEE NOTE 1. (TYP.)
RET. 22" STUMP
PROP. UP SUPPORT (B.O.)
PROP. AREA OF LOAM & SEED (TYP.)
PROP. CLEARING & GRUBBING TO SLOPE LIMIT
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (0" TO 6") STA. 5+00 RT
BEGIN PROP. GRAN. CURB TYPE VA4 (6" REVEAL) STA. 5+10 RT
PROP. AREA OF PART SHADE ROADSIDE MIX (TYP.)
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (6" TO 0") STA. 5+28 RT
PROP. CEM. CONC. HEADWALL AND STONE FOR PIPE ENDS
PROP. LIMIT OF CLEARING
PROP LINE OF PERM. EASEMENT
BEGIN PROP. CEM. CONC. SIDEWALK STA. 5+46 RT
PROP. STREAMBED MATERIAL FOR DRAINAGE CHANNEL. FOR GRADING, SEE SHEET 20.
BEGIN PROP. GRAN. CURB TYPE VA4 TRANSITION (0" TO 6") STA. 5+39.5 RT
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (6" TO 8") STA. 5+46 RT
END PROP. GRANITE CURB TYPE VA4 (8" REVEAL) STA. 5+39 LT
PROP. AREA OF PART SHADE ROADSIDE MIX (TYP.)
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (6" TO 8") STA. 5+33 LT
PROP. LEVEL SHELF WITH PART SHADE ROADSIDE MIX
PROP. LIMIT OF CLEARING
TOURIST ORIENTATION SIGN (R&R)
PROP. BRIDGE APPROACH SLAB (TYP.)
PROP. BOS
PROP. CBCI
PT +31.31
PROP. CEM. CONC. WCR #1
PROP. DMH
PROP. BRIDGE H-01-005
N45°01'18"W 313.35'
S.H.L.O. NO. 8669
PROP. 5-6" CEM. CONC. SIDEWALK (TYP.)
END PROP. GRANITE CURB TYPE VA4 (8" REVEAL) STA. 5+51 RT
PROP. LINE OF PERM. EASEMENT
PROP. RIPRAP SEE DETAIL SHEET 40
PROP. TERRESTRIAL WILDLIFE PASSAGE, SEE BRIDGE PLANS.
LINE OF TEMP. EASEMENT
PROP. CLEARING & GRUBBING TO SLOPE LIMIT
PROP. WETLAND RESTORATION AREA. SEE SHEETS 21-23.
PROP. TERRESTRIAL WILDLIFE PASSAGE, SEE BRIDGE PLANS.
PROP. LINE OF PERM. EASEMENT
PROP. RIPRAP SEE DETAIL SHEET 40
PROP. 12" LAYER OF NATURAL STREAMBED MATERIAL
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (8" TO 6") STA. 6+93 LT
PROP. AREA OF LOAM & SEED (TYP.)
PROP. WATER MAIN. FOR DETAILS, SEE SHEET [16]
BEGIN PROP. GRANITE CURB TYPE VA4 (6" REVEAL) STA. 6+99 LT
PROP. PERM. UTILITY EASEMENT
PROP. GUY (B.O.) (RET)
PROP. LINE OF PERM. EASEMENT
END PROP. CEM. CONC. SIDEWALK STA. 6+86 RT
PROP. CEM. CONC. WCR #2
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (8" TO 6") STA. 6+81 RT
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (6" TO 0") STA. 6+86 RT
LINE OF TEMP EASEMENT
BEGIN PROP. GRANITE CURB TYPE VA4 TRANSITION (0" TO 6") STA. 7+05 RT
BEGIN PROP. GRANITE CURB TYPE VA4 (6" REVEAL) STA. 7+11 RT
JOAN L. WANCZYAK LIFE ESTATE PARCEL 04B-0053-0000 BOOK 10910 PAGE 0044
130 BAY ROAD
CONTINUED ON SHEET NO. 11

NOTES:

1. SEDIMENT CONTROL BARRIER SHALL INCLUDE PROTECTION FOR WOOD TURTLES. FOR DETAILS REFER TO THE WOOD TURTLE PROTECTION PLAN ATTACHED TO THE SPECIAL PROVISIONS.

FOR PROFILE: SEE SHEET NO. 12

0 20 50 100
SCALE: 1" = 20'

HIGHWAY GUARD DETAILS

RIGHT SIDE:

STA. 6+91 TO STA. 7+25	TRANSITION TO BRIDGE RAIL
STA. 7+25 TO STA. 9+72	GUARDRAIL, TL-3 (SINGLE FACED) TO GUARDRAIL TANGENT END TREATMENT, TL-3

LEFT SIDE:

STA. 6+91 TO STA. 7+25	TRANSITION TO BRIDGE RAIL
STA. 7+25 TO STA. 7+79	GUARDRAIL, TL-3 (SINGLE FACED) TO GUARDRAIL TANGENT END TREATMENT, TL-3
STA. 8+26 TO STA. 9+76	GUARDRAIL TANGENT END TREATMENT, TL-3 TO GUARDRAIL, TL-3 (SINGLE FACED) TO GUARDRAIL TANGENT END TREATMENT, TL-3

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE UTILITY SHEETS 16-17

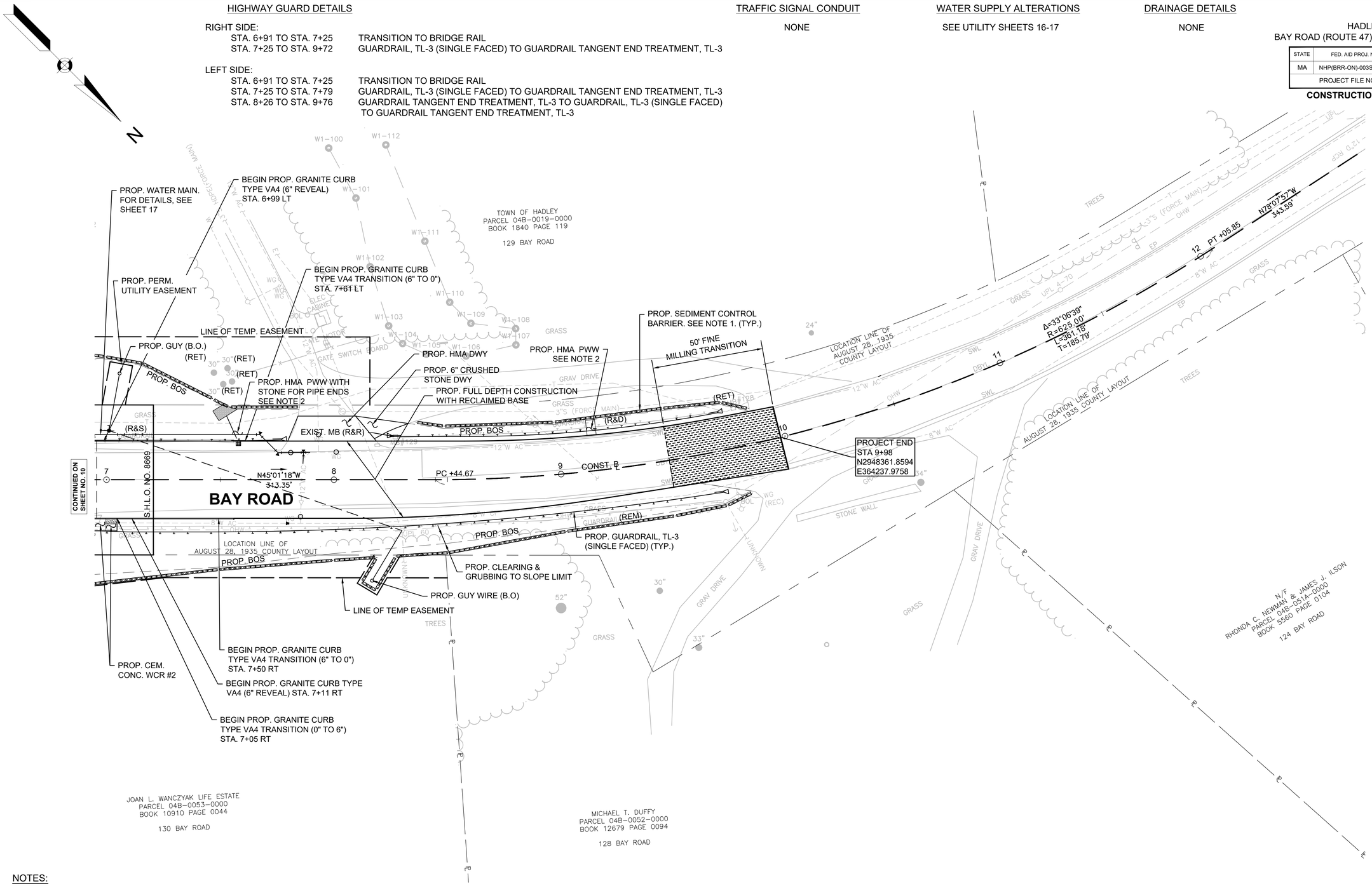
DRAINAGE DETAILS

NONE

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	11	85
PROJECT FILE NO.	608460		

CONSTRUCTION PLANS



NOTES:

1. SEDIMENT CONTROL BARRIER SHALL INCLUDE PROTECTION FOR WOOD TURTLES. FOR DETAILS REFER TO THE WOOD TURTLE PROTECTION PLAN ATTACHED TO THE SPECIAL PROVISIONS.
2. PWW SHALL BE CONSTRUCTED IN SHAPE IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARD 280.0.2 AND SHALL BE GRADED TO ENSURE POSITIVE FLOW AWAY FROM ROADWAY EDGE. PWW SHALL EXTEND TO THE LIMIT OF PAVEMENT MILLING MULCH. PWW AT STA. 7+58 LT SHALL INCLUDE 4'X4' AREA OF STONE FOR PIPE ENDS. PWW, INCLUDING GRAVEL BASE, SHALL BE PAID FOR UNDER ITEM 280.

FOR PROFILE: SEE SHEET NO. 13

0 20 50 100

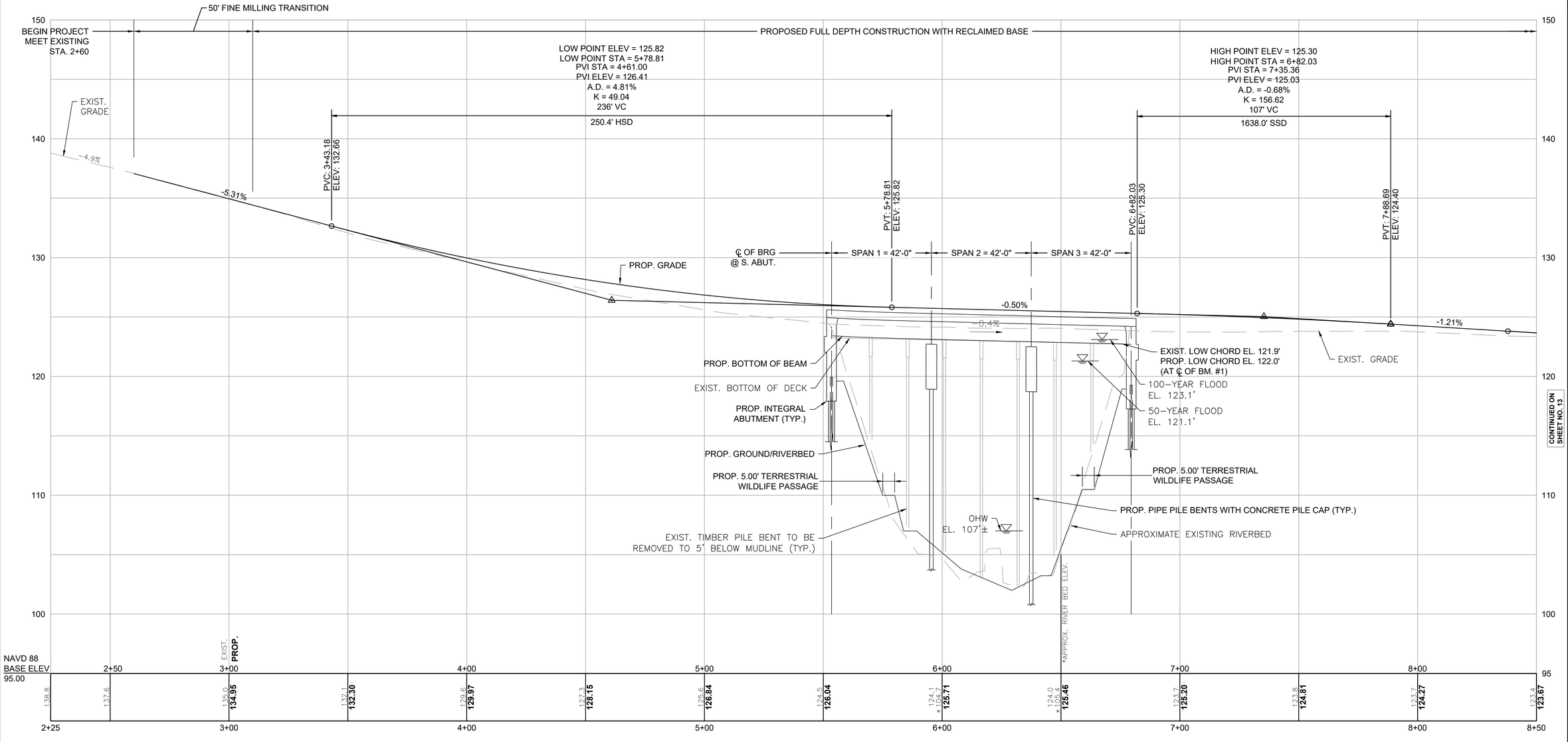
SCALE: 1" = 20'

608460_HD10-11 (CONST).DWG Plotted on 30-May-2025 11:36 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	12	85
PROJECT FILE NO.	608460		

PROFILE



PROFILE - BAY RD

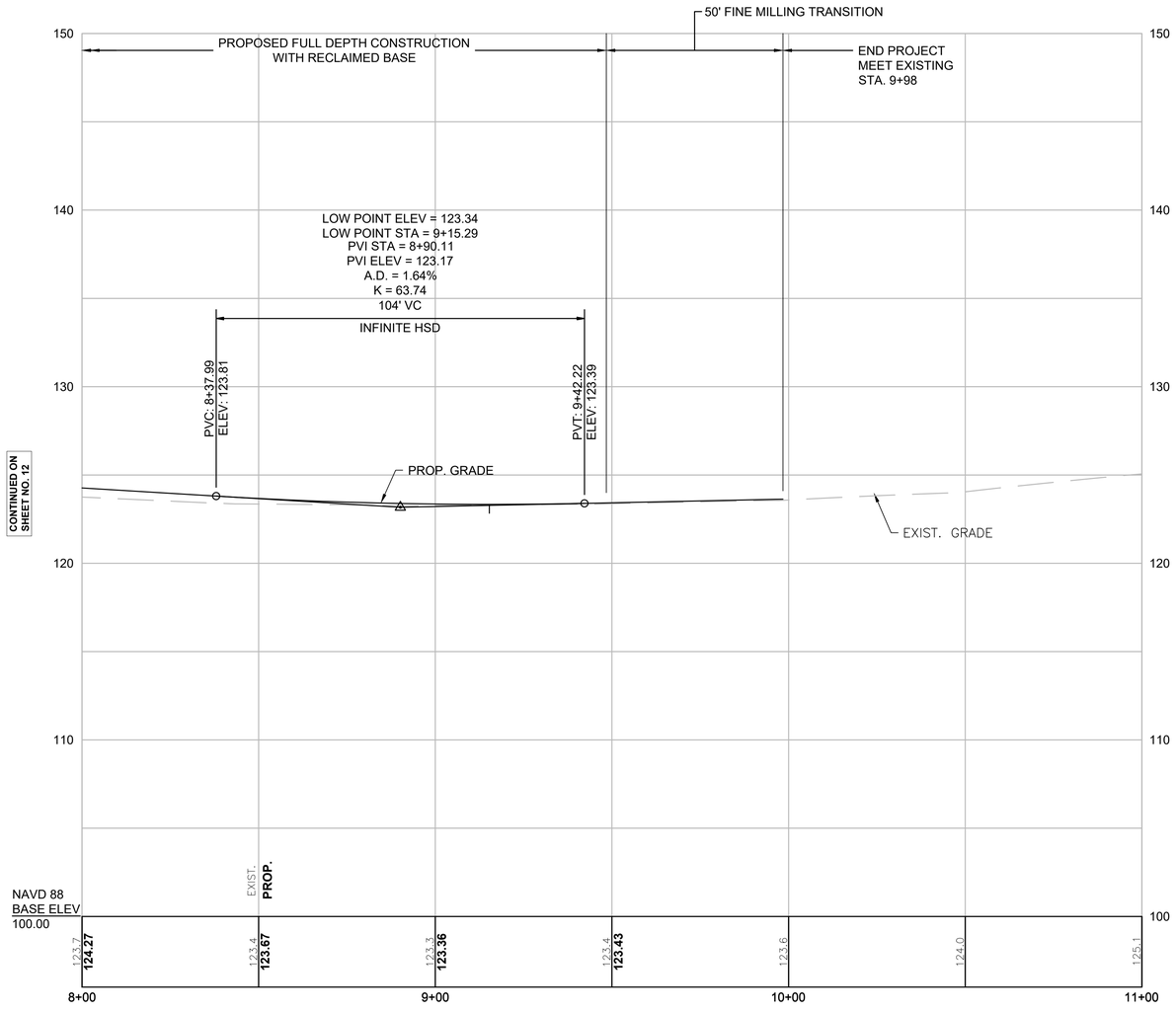
HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

608460_HD12-13_PROFILE.DWG Plotted on 30-May-2025 11:37 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	13	85
PROJECT FILE NO.	608460		

PROFILE



PROFILE - BAY RD

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

608460_HD12-13_PROFILE.DWG Plotted on 30-May-2025 11:37 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	14	85
PROJECT FILE NO.	608460		

CURB TIE & GRADING PLANS

608460_HD14-15 (CURB TIE).DWG Plotted on 30-May-2025 11:38 AM

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

N

LAWRENCE PLAIN ROAD

N8°41'40"W 130.54'

PC +30.54

LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301

3 LAWRENCE PLAIN ROAD

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119

129 BAY ROAD

FORT RIVER

BAY ROAD

PROJECT BEGIN
STA 2+60
N2947820.5853
E364727.1862

MEET EXISTING

+59.86 15.30 RT

+69.11 15.38 RT

EOP 136.47'

EOP 135.28' +00.00 15.22 RT

+08.25 15.44 RT

EOP 134.08'

PC +30.24 15.32 RT

EOP 132.92' +50.00 15.56 RT

EOP 131.70'

EOP 130.65' +00.00 16.08 RT

EOP 129.69'

EOP 128.84' +50.00 16.51 RT

EOP 128.13'

+72.09 14.32 LT

+60.01 14.25 LT

EOP 135.84'

+80.00 14.42 LT

+90.00 14.40 LT

TC134.96'
BC134.46'
+00.00
14.46 LT

PC +13.25
14.42 LT

TC133.58'
BC133.08'

TC132.22'
BC131.72'
+50.00
14.59 LT

TC130.95'
BC130.45'

TC129.84'
BC129.34'
+00.00
15.01 LT

TC128.86'
BC128.36'

Δ=19°02'49"
R=600.00'
L=199.46'
T=100.66'

TC127.99'
BC127.49'
+50.00
15.65 LT

TC127.26'
BC126.76'

TC126.65'
BC126.15'
+00.00
16.51 LT

TC126.20'
BC125.70'

RIM 126.02'

+33.09 17.00 LT

+39.09 17.00 LT

+06.14 16.63 LT

PT +17.51 16.86 LT

PT +31.31

PT +34.58 17.00 RT

+00.00 16.84 RT

+28.17 16.99 RT

+10.00 16.89 RT

+39.58 17.00 RT

+46.11 17.00 RT

+51.11 17.00 RT

NO REVEAL
TC127.55'
+00.00
16.84 RT

Δ=3°04'14"
R=650.00'
L=34.84'
T=17.42'
TC127.62'
BC127.12'

Δ=35°19'39"
R=650.00'
L=400.78'
T=206.99'

Δ=15°20'12"
R=650.00'
L=173.99'
T=87.52'

N45°01'18"W
313.35'

+92.75 17.00 LT

TC124.99'
BC124.49'
+00.00
16.99 LT

+98.75 17.00 LT

+99.61 17.00 RT

+11.11 17.00 RT

+04.61 17.00 RT

+80.61 17.00 RT

+85.61 17.00 RT

GUTTER (WCR)
125.91'
+00.00
17.00 RT

CONTINUED ON SHEET NO. 15

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

AUDREY R. WILGA LIFE ESTATE
PARCEL 04B-0054-0000
BOOK 12246 PAGE 0198

132 BAY ROAD

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044

130 BAY ROAD

JOAN L. WANCZYAK LIF
PARCEL 04B-0053-
BOOK 10910 PAGE

130 BAY ROAI

STONE WALL

CONC DRIVE

WALK CONC

1.5 STORY VINYL

BIT DRIVE

BIT CURB

BIT BERM

BIT SWALE

GRASS

STAKE AND NAIL

20" STUMP

22" STUMP

14"

18"

22"

SB CTR

SB GRLP

GUARDRAIL

CONC SW

NO BARRIER

5.50'

17.00'

0 20 50 100

SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	15	85
PROJECT FILE NO.	608460		

CURB TIE & GRADING PLANS

608460_HD14-15 (CURB TIE).DWG Plotted on 30-May-2025 11:38 AM

N

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119

129 BAY ROAD

BAY ROAD

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

TC124.99'
BC124.49'
+00.00
16.99 LT

TC124.60'
BC124.10'
+50.00
17.00 LT

EOP 123.77'

GUTTER (DRIVEWAY) 123.44'
+00.00
16.96 LT

EOP 122.70'
+50.00
16.98 LT

EOP 122.34'
+00.00
16.02 LT

Δ=10°48'06"
R=600.00'
L=113.12'
T=56.73'

EOP 122.64'
+50.00
15.07 LT

PT +73.84
14.64 LT

+89.27
14.18 LT

MEET EXISTING

PROJECT END
STA 9+98
N2948361.8594
E364237.9758

+98.75
17.00 LT

+56.00
17.00 LT

+50.00
17.00 LT

RIM 123.99'

+79.69
17.00 LT

+18.68
17.00 LT

PC +57.83
16.87 LT

PC +44.67

+36.94
+0.00 LT

15.31'

12.04

28.27'

+90.54
13.97 RT

MEET EXISTING

PT +16.81
12.53 RT

N45°01'18"W
313.35'

+99.61
17.00 RT

+11.11
17.00 RT

+50.00
17.00 RT

+56.00
17.00 RT

PC +06.00
17.00 RT

EOP 123.79'
+50.00
12.08 RT

EOP 123.74'
+00.00
13.24 RT

+04.61
17.00 RT

LOCATION LINE OF
AUGUST 28, 1935 COUNTY LAYOUT

EOP 124.90'
+00.00
17.04 RT

EOP 124.17'
+50.00
15.68 RT

Δ=8°53'38"
R=725.00'
L=112.54'
T=56.38'

GUTTER (WCR)
125.91'
+00.00
17.00 RT

TC126.02'
BC125.52'
+50.00
17.00 RT

CONTINUED ON SHEET NO. 14

GRASS
GUARDRAIL
GRAV DRIVE
EP
STONE WALL
30"
24"
34"
52"
33"

Δ=33°06'39"
R=625.00'
L=361.18'
T=185.79'

PT +05.85

N78°07'57"W
345.59'

LOCATION LINE OF
AUGUST 28, 1935 COUNTY LAYOUT

N/F
RHONDA C. NEWMAN & JAMES J. ILSON
PARCEL 04B-051A-0000
BOOK 5560 PAGE 0104

124 BAY ROAD

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044

130 BAY ROAD

MICHAEL T. DUFFY
PARCEL 04B-0052-0000
BOOK 12679 PAGE 0094

128 BAY ROAD

0 20 50 100

SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	16	85
PROJECT FILE NO.	608460		

UTILITY PLANS

608460_HD16-17 (UTILITY).DWG Plotted on 30-May-2025 11:38 AM

LAWRENCE PLAIN ROAD
LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2
N6°41'40"W 130.54'
PC +30.54
BAY ROAD
PROJECT BEGIN
STA 2+60
N2947820.5853
E364727.1862
50' FINE MILLING TRANSITION
PROP. LINE OF PERM. UTILITY EASEMENT
PROP. OHW (TYP.)
PROP. RELOCATED UP WITH LIGHT (B.O.) (TYP.)
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
PROP. RELOCATED UP WITH LIGHT (B.O.) (TYP.)
SEE NOTE 1
PROP. DEEP SUMP CBCI-1
STA 5+06.14 OFF 16.63' LT
RIM = 126.02'
INV OUT = 122.52'
PROP. 45°-12" BEND & THRUST BLOCK
PROP. 3/4" AIR RELEASE VALVE
PROP. BOS
PROP. LINE OF PERM. UTILITY EASEMENT
PROP. RELOCATED UP WITH LIGHT (B.O.)
PROP. GUY (B.O.)
LINE OF TEMP. EASEMENT
PROP. LINE OF PERM. EASEMENT
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
(R&S) FRAME & GRATE (R&D) CI (REM) CB
PROP. 12" DI WATER MAIN SEE NOTES 2 & 3 S.H.L.O. NO. 8669
CONTINUED ON SHEET NO. 17
Δ=35°19'39"
R=650.00'
L=400.78'
T=206.99'
PROP. 8" TO 12" REDUCER
PROP. 12" DI WATER MAIN
PROP. 45°-12" BEND & THRUST BLOCK
PROP. BRIDGE H-01-005
PT +31.31
40' - 12" RCP
(REM)
(R&R B.O.)
(R&R B.O.)
S.H.L.O. NO. 8669
N45°01'18"W 313.35'
LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT
LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION
PROP. UP SUPPORT (B.O.)
PROP. GUY (B.O.)
PROP. DMH-1
STA 5+08.80 OFF 29.5' RT
RIM = 127.00'
INV IN = 122.00'
INV OUT= 121.50'
34' - 12" CMP
PROP. CHECK VALVE AT PIPE END ON HEADWALL
FOR GRADING OF DRAINAGE CHANNEL, SEE UTILITY SHEET 20
PROP. CEM. CONC. HEADWALL WITH STONE FOR PIPE ENDS (STANDARD E 230.0.1)
STA 5+21.53' OFF 60.8' RT
INV OUT = 110.50'
(REM) EXISTING GUY WIRE (B.O.)
PROP. LINE OF PERM. EASEMENT
PROP. 12" WATER GATE & GATE BOX
REM. EXISTING REDUCER MEET INTO EXIST 12" WATER MAIN
PROP. 12"x12"x12" TEE & THRUST BLOCK
PROP. 12" WATER GATE & GATE BOX
PROP. 8" CAP & THRUST BLOCK
LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301
3 LAWRENCE PLAIN ROAD
TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119
129 BAY ROAD
LINE OF TEMP. EASEMENT
FORT RIVER
AUDREY R. WILGA LIFE ESTATE
PARCEL 04B-0054-0000
BOOK 12246 PAGE 0198
132 BAY ROAD
JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044
130 BAY ROAD
JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044
130 BAY ROAD
STONE WALL
0 20 50 100
SCALE: 1" = 20'

NOTES:

1. CONTRACTOR TO VERIFY LOCATION OF EXISTING TELEPHONE CONDUIT BEFORE CONSTRUCTING PROPOSED WATER MAIN.
2. FOR WATER MAIN INSULATION ON BRIDGE, SEE MASSDOT STANDARD SPECIFICATIONS FOR ITEM 373.12.
3. MECHANICAL JOINTS SHALL BE USED ON BRIDGE.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	17	85
PROJECT FILE NO.	608460		

UTILITY PLANS

608460_HD16-17 (UTILITY).DWG Plotted on 30-May-2025 11:38 AM

N

PROP. LINE OF PERM. UTILITY EASEMENT
LINE OF TEMP. EASEMENT
PROP. GUY (B.O.)
PROP. RELOCATED UP WITH LIGHT (B.O.)
PROP. 12" DI WATER MAIN
PROP. PIPE END WITH STONE FOR PIPE ENDS
STA 7+52.45' OFF 28.9' LT
INV OUT = 120.43'
PROP. 45°-12" BEND & THRUST BLOCK
PROP. 12" WATER GATE & GATE BOX (RET)
PROP. 12" GATE BOX
50' FINE MILLING TRANSITION
LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT
Δ=33°06'39"
R=625.00'
L=361.18'
T=185.79'
PT 405.85
N78°07'57"W
343.59'
PROJECT END
STA 9+98
N2948361.8594
E364237.9758
12' - 12" RCP
SEE NOTE 1
MEET INTO EXIST. 12" WATER MAIN
PC +44.67
BAY ROAD
PROP. OHW (TYP.)
PROP. 12" x 12" x 12" TEE & THRUST BLOCK (REM)
PROP. 8" GATE BOX
(RET)
(REC)
S.H.L.O. NO. 8669
N45°01'18"W
313.35'
CONTINUED ON SHEET NO. 16
LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT
LINE OF TEMP. EASEMENT
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
PROP. VERTICAL 45°-12" BEND & THRUST BLOCK
PROP. 8" CAP & THRUST BLOCK
PROP. GUY (B.O.)

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119
129 BAY ROAD

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044
130 BAY ROAD

MICHAEL T. DUFFY
PARCEL 04B-0052-0000
BOOK 12679 PAGE 0094
128 BAY ROAD

N/F
RHONDA C. NEWMAN & JAMES J. ILSON
PARCEL 04B-051A-0000
BOOK 5560 PAGE 0104
124 BAY ROAD

NOTES:

1. PROP. DEEP SUMP CBCI-2
   STA 7+58 OFF 17.00' LT
   RIM = 123.99'
   INV OUT = 120.49'

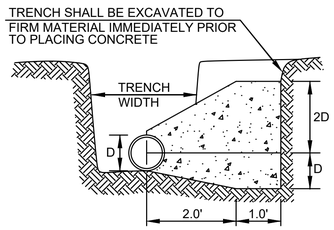
0 20 50 100
SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	18	85
PROJECT FILE NO.	608460		

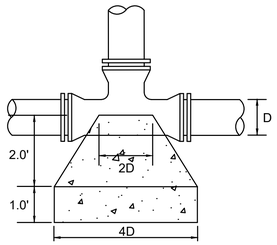
DRAINAGE AND UTILITY DETAILS

608460_HD18-19 (UTILITY DETAILS).DWG Plotted on 30-May-2025 11:39 AM



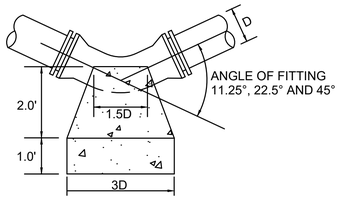
HORIZONTAL TEE & BEND

SECTION



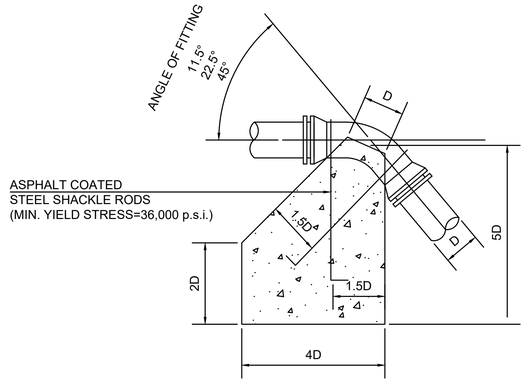
HORIZONTAL TEE

PLAN VIEW



HORIZONTAL BEND

PLAN VIEW



VERTICAL 45° BEND

ELEVATION

CONCRETE THRUST BLOCKS
FOR HORIZONTAL, VERTICAL BENDS AND TEES

NOT TO SCALE

NOTES:

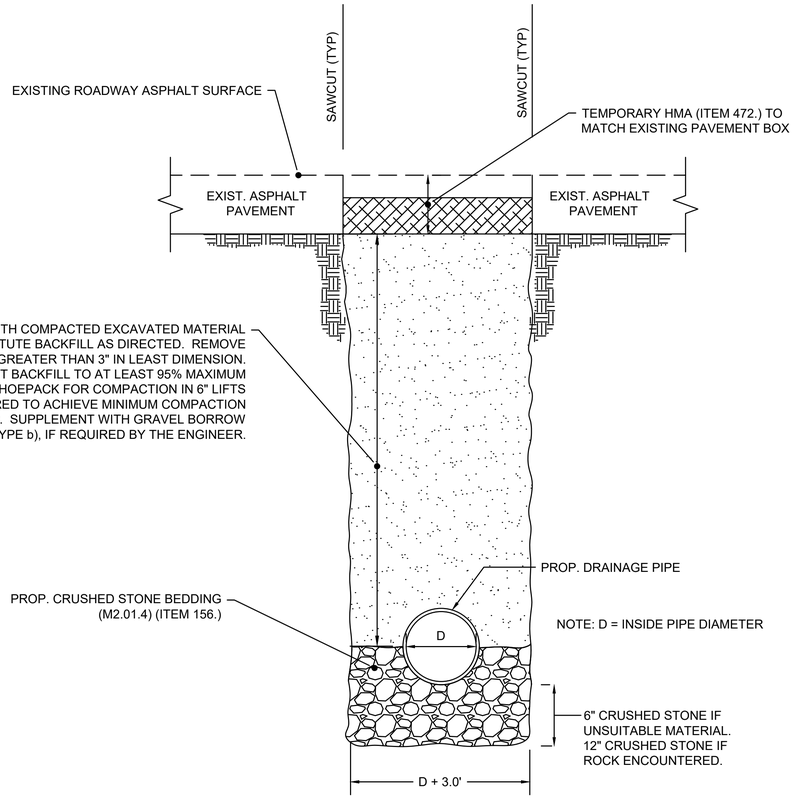
1. THE DIMENSIONS SHOWN ARE MINIMUM.
2. CONCRETE SHALL BE 4000 PSI - 1 $\frac{1}{2}$ IN. 565 CEMENT CONCRETE.
3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF CONCRETE POURED AGAINST COMPACTED SOIL.
4. THE WIDTH OF THE THRUST BLOCK , WHERE APPLICABLE, SHALL BE EQUAL TO THE WIDTH OF THE TRENCH.
5. THE HEIGHT OF THE THRUST BLOCK SHOULD BEEN LESS THAN OR EQUAL TO HALF THE DEPTH OF THE TRENCH.
6. POLYETHYLENE SHEETING SHALL BE PLACED OVER MJ FITTINGS TO PREVENT DIRECT CONTACT BETWEEN CONCRETE AND THE FITTING.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	19	85
PROJECT FILE NO.	608460		

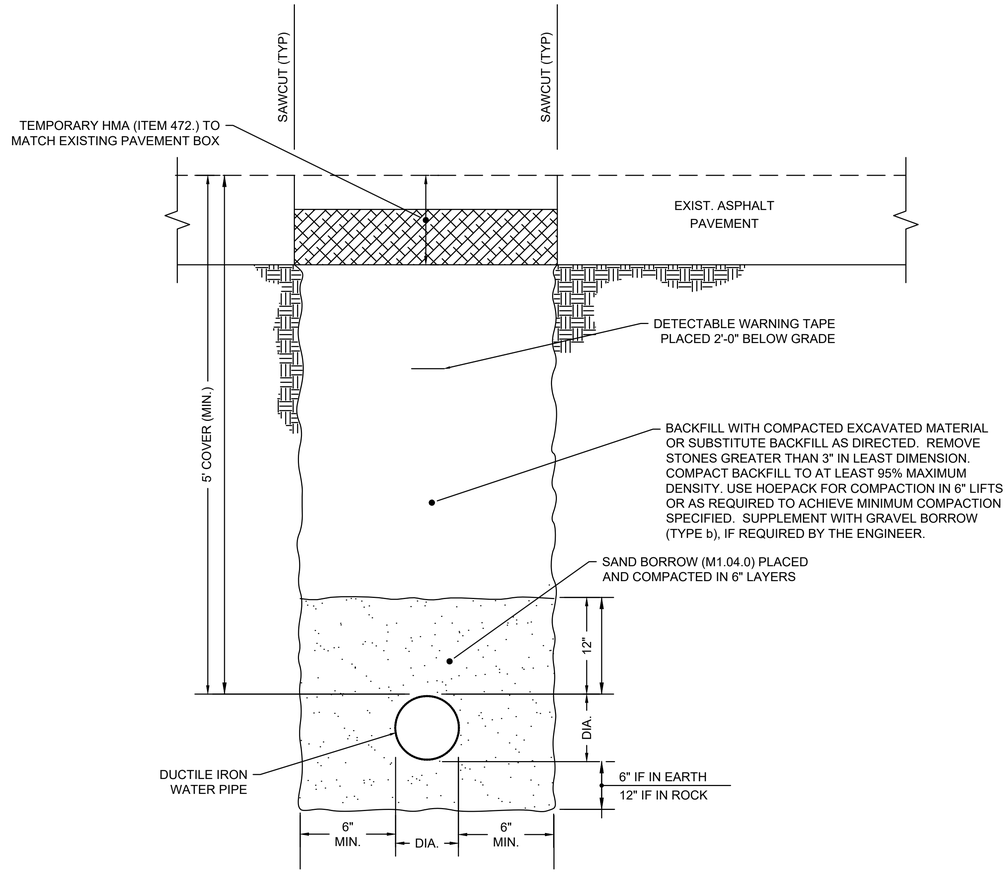
DRAINAGE AND UTILITY DETAILS

608460_HD18-19 (UTILITY DETAILS).DWG Plotted on 30-May-2025 11:39 AM



DRAINAGE TRENCH DETAIL IN EXISTING ROADWAY AREAS

NOT TO SCALE



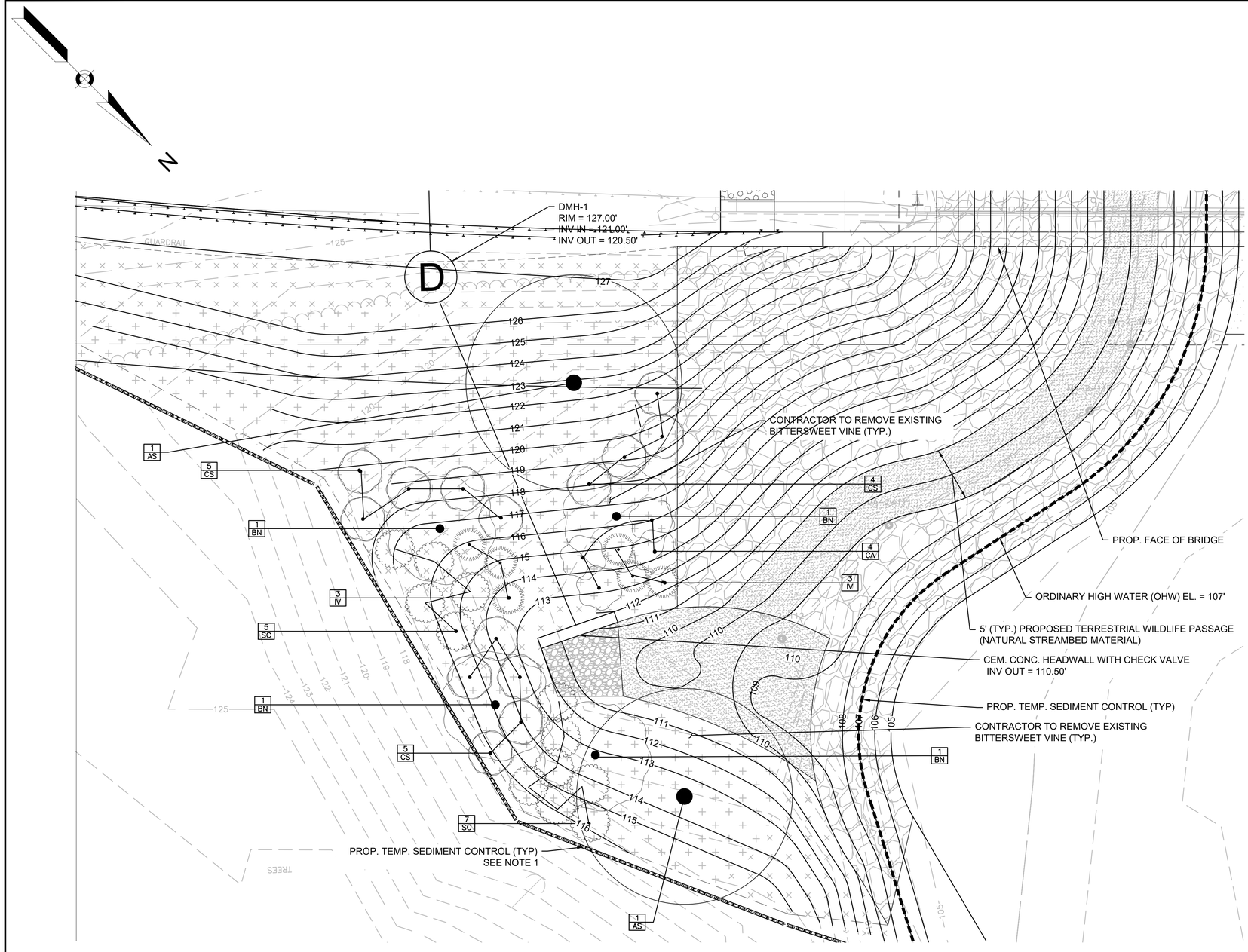
WATER SUPPLY TRENCH DETAIL IN EXISTING ROADWAY AREAS

NOT TO SCALE

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	20	85
PROJECT FILE NO.	608460		

DRAINAGE CHANNEL GRADING & PLANTING



DRAINAGE CHANNEL GRADING AND PLANTING PLAN

0 5 10 15 20
SCALE: 1" = 5'

LEGEND

- RIPRAP AREA
- WILDLIFE PASSAGE AREA (FILTER FABRIC W/ NATIVE WOOD CHIPS)
- STONE FOR PIPE ENDS
- STREAMBED MATERIAL DRAINAGE CHANNEL AREA
- PART SHADE ROADSIDE MIX
- SEDIMENT CONTROL BARRIER WITHOUT SILT FENCE
- SEDIMENT CONTROL BARRIER WITH SILT FENCE

NOTES:

1. SEDIMENT CONTROL BARRIER SHALL INCLUDE SILT FENCE TO SERVE AS WOOD TURTLE BARRIER. REFER TO THE APPLICABLE SPECIAL PROVISION.
2. ORDINARY HIGH WATER IS AT EL. 107'.

PLANTING NOTES

1. CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
2. PLANT LOCATIONS ARE APPROXIMATE. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT.
3. ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME, CULTIVAR, & SIZE.
4. IMMEDIATELY AFTER ACCEPTANCE OF PLANTING, TAGS AND RIBBONS SHALL BE REMOVED.
5. ALL PLANTS WILL BE MULCHED PER PLANS AND SPECIFICATIONS.
6. ALL SHRUB AND PERENNIAL BEDS WILL BE WEEDED AND OTHERWISE NEATLY MAINTAINED FOR THE DURATION OF THE CONTRACT.
7. PLANTS AND PLANTING BEDS SHALL BE THOROUGHLY WATERED AS NECESSARY AND PER SPECIFICATIONS.

PLANT LIST (THIS PAGE)

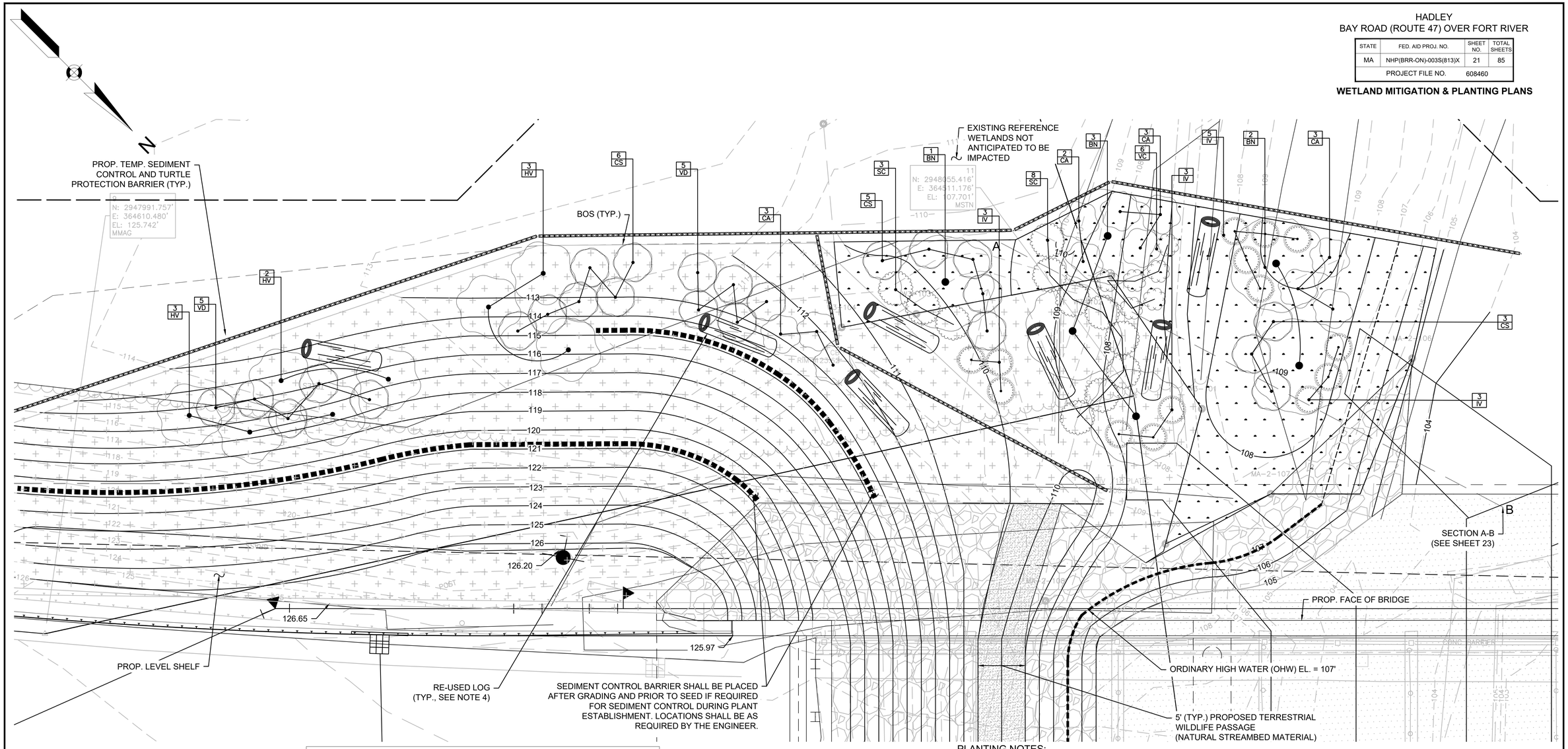
PLANT TYPE	LABEL	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
SHURBS						
	CA	4	CORNUS AMOMUM	SILKY DOGWOOD	2'-2.5'	3'-5' TYP.
	CS	14	CORNUS SERICEA	REEDOSIER DOGWOOD	2'-2.5'	3'-5' TYP.
	IV	6	ILEX VERTICILLATA	WINTERBERRY	2'-2.5'	3'-5' TYP.
	SC	12	SAMBUCUS CANADENSIS	ELDERBERRY	2'-2.5'	3'-5' TYP.
TREES						
	AS	2	ACER SACCHARINUM	SILVER MAPLE	2'-2.5'	
	BN	4	BETULA NIGRA	RIVER BIRCH	2'-2.5'	

608460_HD20-22 (CHANNEL DET.).DWG Plotted on 30-May-2025 11:39 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	21	85
PROJECT FILE NO.	608460		

WETLAND MITIGATION & PLANTING PLANS



LEGEND

- EXISTING WETLANDS TO BE RESTORED
- WILDLIFE PASSAGE AREA (NATURAL STREAMBED MATERIAL)
- PART SHADE ROADSIDE MIX
- SEDIMENT CONTROL BARRIER WITHOUT SILT FENCE
- SEDIMENT CONTROL BARRIER WITH SILT FENCE

PLANT LIST (THIS PAGE)

PLANT TYPE	LABEL	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
SHURBS						
	CA	3 + 8*	CORNUS AMOMUM	SILKY DOGWOOD	2'-2.5'	3'-5' TYP.
	CS	7 + 7*	CORNUS SERICEA	REEDOSIER DOGWOOD	2'-2.5'	3'-5' TYP.
	IV	6 + 8*	ILEX VERTICILLATA	WINTERBERRY	2'-2.5'	3'-5' TYP.
	SC	7 + 4*	SAMBUCUS CANADENSIS	ELDERBERRY	2'-2.5'	3'-5' TYP.
	HV	8	HAMAMELIS VIRGINIANA	WITCH HAZEL	2'-2.5'	5' TYP.
	VD	10	VIBURNUM DENTATUM	NORTHERN ARROWWOOD	2'-2.5'	5' TYP.
	VC	6*	VACCINIUM CORYMBOSOM	HIGHBUSH BLUEBERRY	2'-3'	
TREES						
	BN	6	BETULA NIGRA	RIVER BIRCH	2'-2.5'	

* THE QUANTITIES MARKED WITH AN ASTERISK ARE LOCATED WITHIN THE AREA OF WETLAND RESTORATION. ALL OTHER QUANTITIES ARE LOCATED WITHIN UPLAND AREAS.

WETLAND MITIGATION AND GRADING

0 5 10 15 20
SCALE: 1" = 5'

PLANTING NOTES:

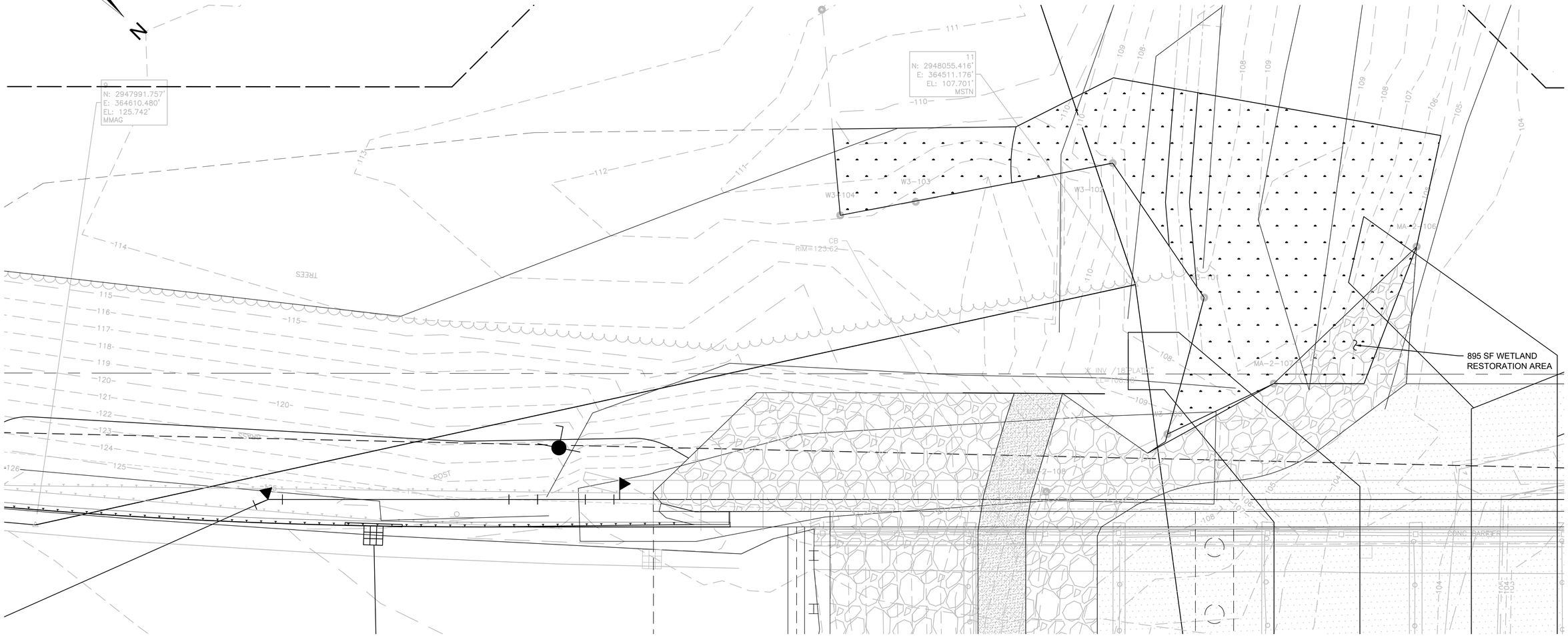
1. FOR WETLAND REPLICATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.35.
2. FOR WETLAND RESTORATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.45.
3. RESTORATION AND REPLICATION WORK SHALL NOT COMMENCE UNTIL ALL WORK IN WATER AND SLOPE RECONSTRUCTION HAS BEEN COMPLETED TO AVOID DAMAGE TO MITIGATED AREA.
4. REFER TO CONSTRUCTION PLANS FOR LIMIT OF CLEARING AND GRUBBING. RETAINING TREES TO RESTORE WOODY DEBRIS (SEE SPECIFICATION). LOGS CAN BE CUT AND LEFT ON-SITE OR ADJACENT TO THE SITE. THE WETLAND SPECIALIST WILL SELECT A MINIMUM OF 3 LARGE TREES TO BE RE-USED ON-SITE TO CREATE HABITAT LOGS PER THE WETLAND SPECIAL PROVISIONS. PLACEMENT OF LOGS AT TIME OF WETLAND CONSTRUCTION SHALL BE PER THE WETLAND SPECIALIST (PLAN LOCATIONS ARE SYMBOLIC ONLY.)
5. SEDIMENT CONTROL BARRIER SHALL INCLUDE SILT FENCE TO SERVE AS WOOD TURTLE BARRIER, UNLESS OTHERWISE NOTED ON THE PLAN. REFER TO THE APPLICABLE SPECIAL PROVISION ORDINARY HIGH WATER IS AT EL. 107'.
6. CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
7. PLANT LOCATIONS ARE APPROXIMATE. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT.
8. ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME, CULTIVAR, & SIZE.
9. IMMEDIATELY AFTER ACCEPTANCE OF PLANTING, TAGS AND RIBBONS SHALL BE REMOVED.
10. ALL PLANTS WILL BE MULCHED PER PLANS AND SPECIFICATIONS.
11. ALL SHRUB AND PERENNIAL BEDS WILL BE WEEDED AND OTHERWISE NEATLY MAINTAINED FOR THE DURATION OF THE CONTRACT.
12. PLANTS AND PLANTING BEDS SHALL BE THOROUGHLY WATERED AS NECESSARY AND PER SPECIFICATIONS.

608460_HD20-22 (CHANNEL DET.).DWG Plotted on 30-May-2025 11:40 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	22	85
PROJECT FILE NO.	608460		

WETLAND IMPACT & MITIGATION AREA PLAN



WETLAND IMPACT DIAGRAM

LEGEND

EXISTING WETLANDS TO BE RESTORED

0 5 10 15 20

SCALE: 1" = 5'

PLANTING NOTES:

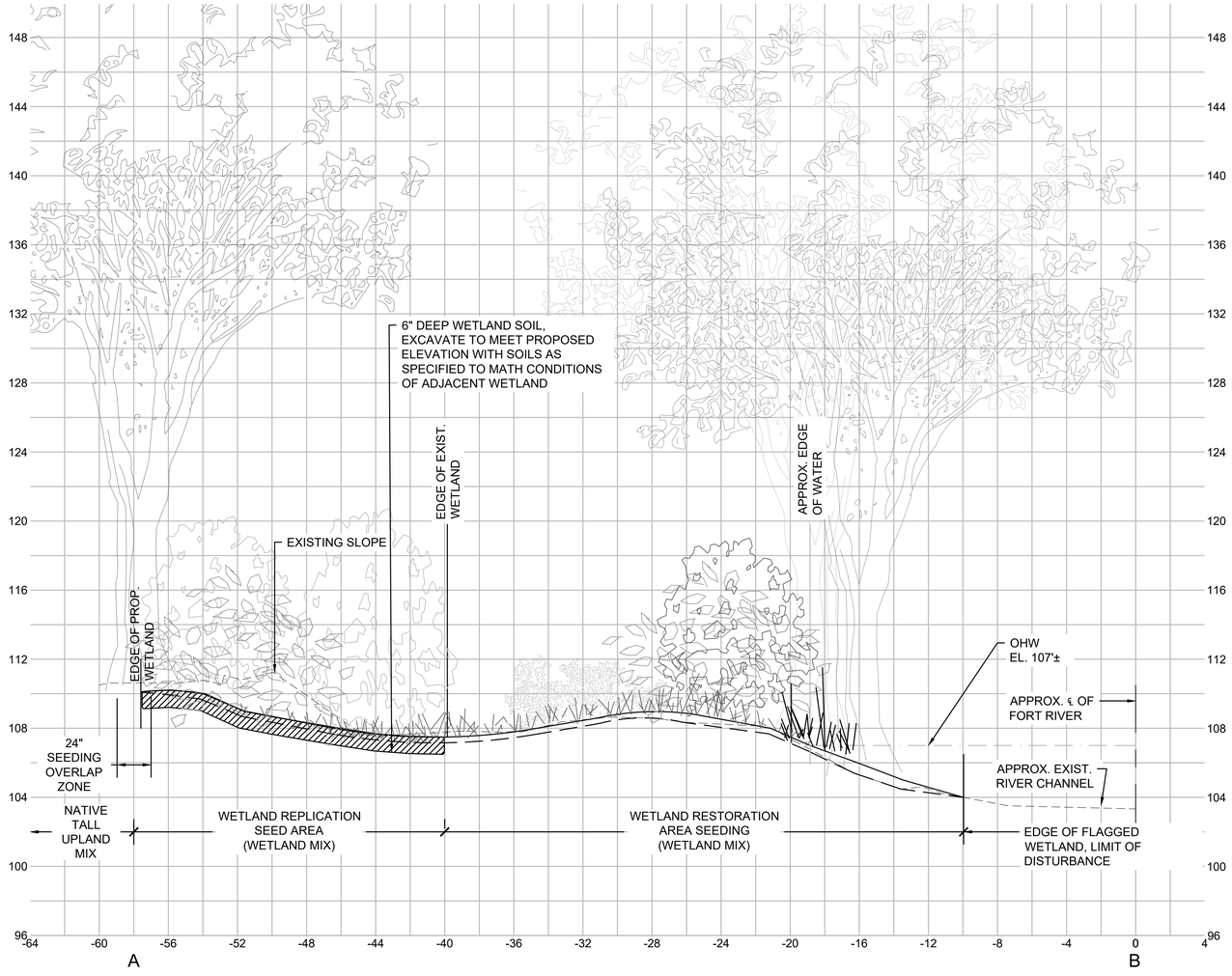
1. FOR WETLAND REPLICATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.35.
2. FOR WETLAND RESTORATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.45.
3. RESTORATION AND REPLICATION WORK SHALL NOT COMMENCE UNTIL ALL WORK IN WATER AND SLOPE RECONSTRUCTION HAS BEEN COMPLETED TO AVOID DAMAGE TO MITIGATED AREA.
4. REFER TO CONSTRUCTION PLANS FOR LIMIT OF CLEARING AND GRUBBING. ALL TREES WITHIN LIMIT OF CLEARING AND GRUBBING SHALL BE REMOVED.
5. SEDIMENT CONTROL BARRIER SHALL INCLUDE SILT FENCE TO SERVE AS WOOD TURTLE BARRIER. REFER TO THE APPLICABLE SPECIAL PROVISION.
6. ORDINARY HIGH WATER IS AT EL. 107'.

608460_HD20-22 (CHANNEL DET.).DWG Plotted on 30-May-2025 11:40 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	23	85
PROJECT FILE NO.	608460		

WETLAND MITIGATION SECTION



WETLAND MITIGATION SECTION A-B
(LOOKING WEST)

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

608460_HD23 (LAND XSECT).DWG Plotted on: 23-Mar-2018 11:21 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	24	85
PROJECT FILE NO.	608460		

TRAFFIC SIGN AND PAVEMENT MARKINGS

608460_HD24-25 (PM & SIGNS).DWG Plotted on 30-May-2025 11:41 AM

LOCATION LINE OF 1931 COUNTY LAYOUT SECTION 2

LAWRENCE PLAIN ROAD

LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301

3 LAWRENCE PLAIN ROAD

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119

129 BAY ROAD

MEET EXIST. PAVEMENT MARKINGS STA. 2+60

2.9'±

12.51'±

12.6'±

1.6'±

SWL

DBYL

12.00'

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

TOURIST ORIENTATION SIGN(R&R)

BAY ROAD

5.00'

12.00'

SWL

DBYL

SWL

5.00'

CONTINUED ON SHEET NO. 25

LOCATION LINE OF AUGUST 1967 COUNTY ALTERATION & RELOCATION

AUDREY R. WILGA LIFE ESTATE
PARCEL 04B-0054-0000
BOOK 12246 PAGE 0198

132 BAY ROAD

SB CPLP

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

FORT RIVER

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044

130 BAY ROAD

JOAN L. WANCZYAK LIFE E
PARCEL 04B-0053-00
BOOK 10910 PAGE 00

130 BAY ROAD

100' BANK RESOURCE BUFFER

100' BVW BUFFER ZONE

200' RIVERFRONT AREA

0 20 50 100

SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	25	85
PROJECT FILE NO.	608460		

TRAFFIC SIGN AND PAVEMENT MARKINGS

608460_HD24-25 (PM & SIGNS).DWG Plotted on 30-May-2025 11:41 AM

N

100' BUFFER ZONE

100' BANK RESOURCE

100' BVW BUFFER ZONE

200' RIVERFRONT AREA

TOWN OF HADLEY
PARCEL 04B-0019-0000
BOOK 1840 PAGE 119

129 BAY ROAD

W1-100 W1-112 W1-101 W1-111 W1-102 W1-110 W1-103 W1-109 W1-108 W1-104 W1-107 W1-105 W1-106

TREES

ELEC CABINET

BOL

GATE MOTOR

GATE SWITCH BOARD

GRASS

GRAV DRIVE

MB#128

MB#129

GUARDRAIL

3"S (FORCE MAIN)

MEET EXIST. PAVEMENT MARKINGS STA. 9+98

LOCATION LINE OF AUGUST 28, 1935 COUNTY LAYOUT

5.00'

SWL

DBYL

12.00'

7 8 9 10 11

BAY ROAD

0.7'±

13.3'±

12.0'±

2.3'±

CONTINUED ON SHEET NO. 24

UPL 60

UPL 48

WG (REC)

STONE WALL

UNKNOWN

24" 30" 34" 52" 33" 36"

12

EP

JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044

130 BAY ROAD

MICHAEL T. DUFFY
PARCEL 04B-0052-0000
BOOK 12679 PAGE 0094

128 BAY ROAD

N/F
RHONDA C. NEWMAN & JAMES J. ILSON
PARCEL 04B-051A-0000
BOOK 5560 PAGE 0104

124 BAY ROAD

0 20 50 100

SCALE: 1" = 20'

NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC DRUMS OF A MERGING TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN

THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

NUMBER OF LANES		NUMBER OF STUDIES	AVERAGE CAPACITY	
NORMAL (EXISTING)	OPEN (TO TRAFFIC)		VPH	VPHPL
3	1	7	1,170	1,170
2	1	8	1,340	1,340
5	2	8	2,740	1,370
4	2	4	2,960	1,480
3	2	9	2,980	1,490
4	3	4	4,560	1,520

Source: Dudek, C., Notes on Work Zone Capacity and Level of Service. Texas Transportation Institute, Texas A&M University, College Station, Texas (1984)

BY OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT), THIS WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350 (100)	350 (100)	350 (100)
MOST OTHER ROADWAYS*	500 (150)	500 (150)	500 (150)
FREEWAYS AND EXPRESSWAYS*	1,000 (300)	1,500 (450)	2,640 (800)

* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

** DISTANCES ARE SHOWN IN FEET (METERS). THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

R2-10a, R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

Based on: Table 6C-1 MUTCD LATEST EDITION

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

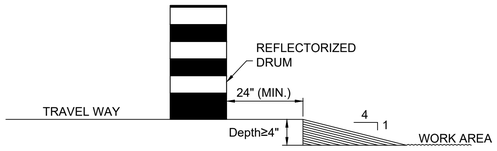
SPEED* (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

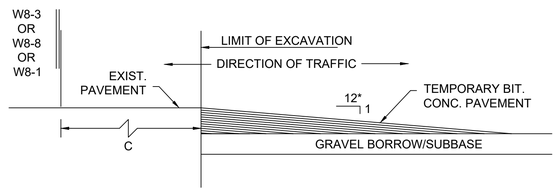
*POSTED SPEED, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 MUTCD LATEST EDITION





* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	26	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS DETAILS

CONVENTIONAL ROADWAY- A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

EXPRESSWAY- A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

FREEWAY- A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

LOW-VOLUME ROAD- A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 AADT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: MUTCD LATEST EDITION

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

Source: Table 6C-3 MUTCD LATEST EDITION

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L= WS

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICAPATED OPERATING SPEED IN MPH

Source: Table 6C-4 MUTCD LATEST EDITION

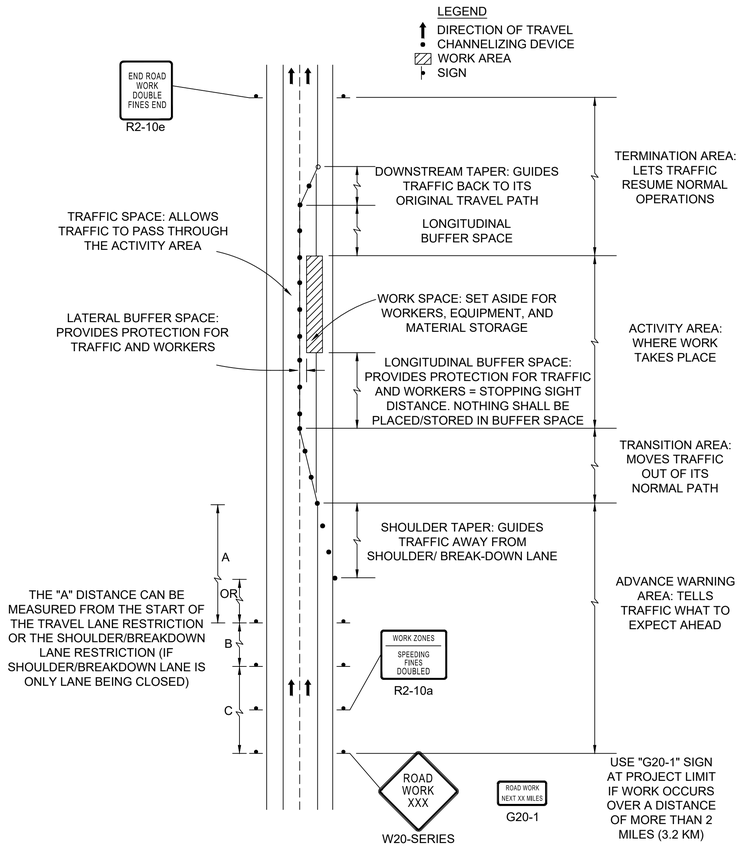
608460_HD26-27 (TTCP DET).DWG Plotted on 30-May-2025 11:41 AM

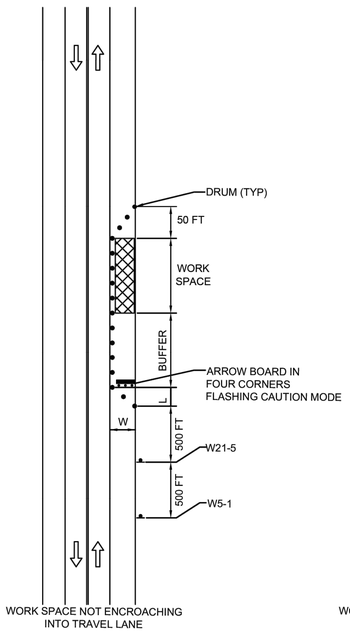
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

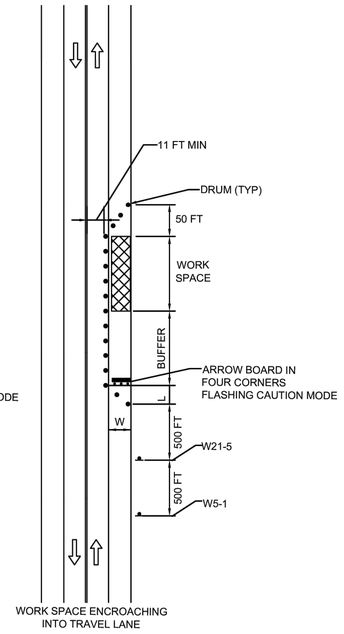
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	27	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS DETAILS

608460_HD26-27 (TTCP DET).DWG Plotted on 30-May-2025 11:41 AM







TWO LANE ROAD
SHOULDER CLOSURE
NOT TO SCALE

TYPICAL TAPER LENGTHS (L) IN FEET

SPEED LIMIT (S) IN MPH	WIDTH OF OFFSET (W_L OR W_S) IN FEET		
	10	11	12
25	104	115	125
30	150	165	180
35	204	225	245
40	267	293	320

NOTE: FOR SHOULDER WIDTHS NOT LISTED IN TABLE, USE $L=\frac{WS^2}{60}{3}$

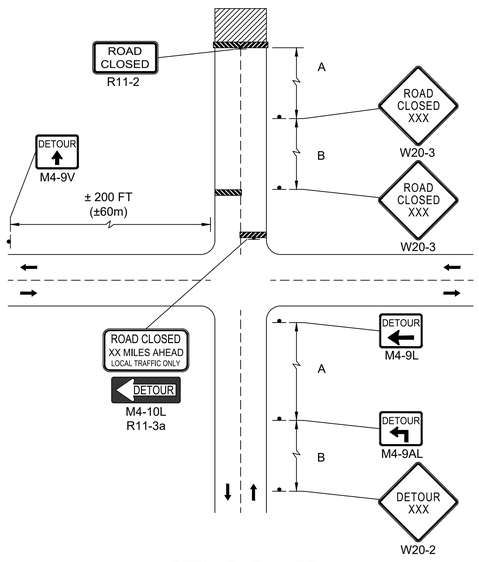
MINIMUM LENGTH OF LONGITUDINAL BUFFER IS EQUAL TO THE STOPPING SIGHT DISTANCE AT THE POSTED SPEED LIMIT AND CAN BE DETERMINED FROM THE FOLLOWING TABLE:

STOPPING SIGHT DISTANCE	
SPEED (MPH)	DISTANCE (FT)
25	155
30	200
35	250
40	305

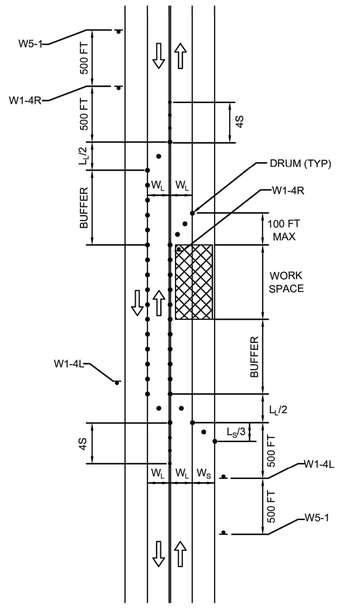
NOTES:

1. MAXIMUM DRUM SPACING IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
2. MINIMUM LANE WIDTH IS TO BE 11 FEET MEASURED FROM THE EDGE OF DRUMS.

COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL (TTC) ZONE
NOT TO SCALE



DETOUR ADVANCE SIGNING
NOT TO SCALE



TWO LANE ROAD
HALF ROAD CLOSURE
NOT TO SCALE

TYPICAL TAPER LENGTHS (L_L OR L_S) IN FEET

SPEED LIMIT (S) IN MPH	WIDTH OF OFFSET (W_L OR W_S) IN FEET		
	10	11	12
25	104	115	125
30	150	165	180
35	204	225	245
40	267	293	320

NOTE: FOR SHOULDER WIDTHS NOT LISTED IN TABLE, USE $L_S=WS^2/60$

MINIMUM LENGTH OF LONGITUDINAL BUFFER IS EQUAL TO THE STOPPING SIGHT DISTANCE AT THE POSTED SPEED LIMIT AND CAN BE DETERMINED FROM THE FOLLOWING TABLE:

STOPPING SIGHT DISTANCE	
SPEED (MPH)	DISTANCE (FT)
25	155
30	200
35	250
40	305

NOTES:

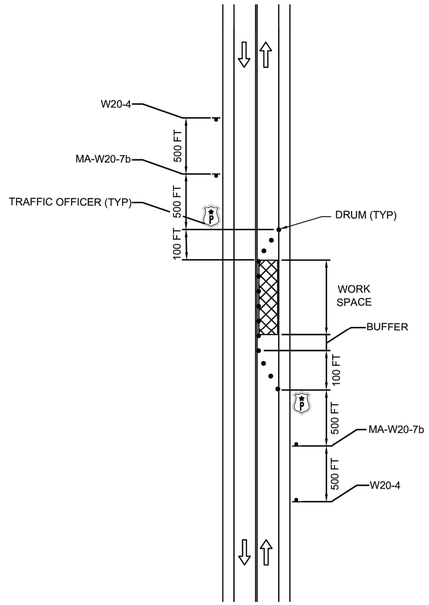
1. MAXIMUM DRUM SPACING IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
2. MINIMUM LANE WIDTH IS TO BE 11 FEET MEASURED FROM THE EDGE OF DRUMS.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	28	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS
DETAILS

608460_HD26-27 (TTCP DET).DWG Plotted on 30-May-2025 11:41 AM



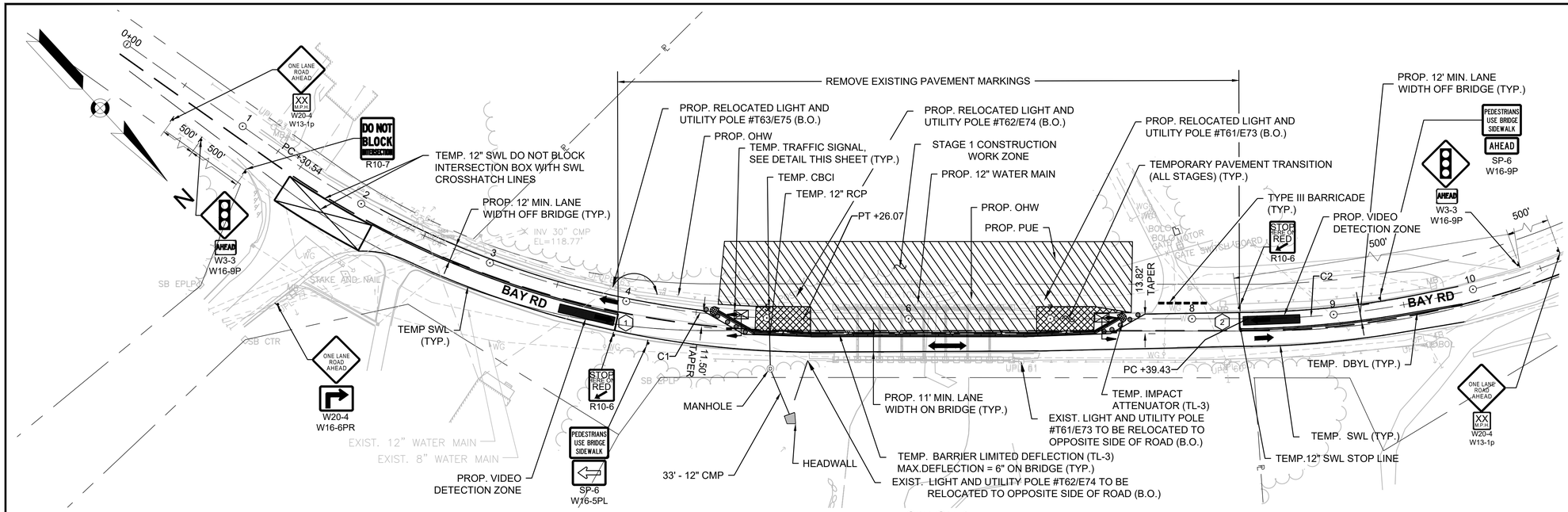
ALTERNATING ONE-WAY
(TRAFFIC OFFICER)
NOT TO SCALE

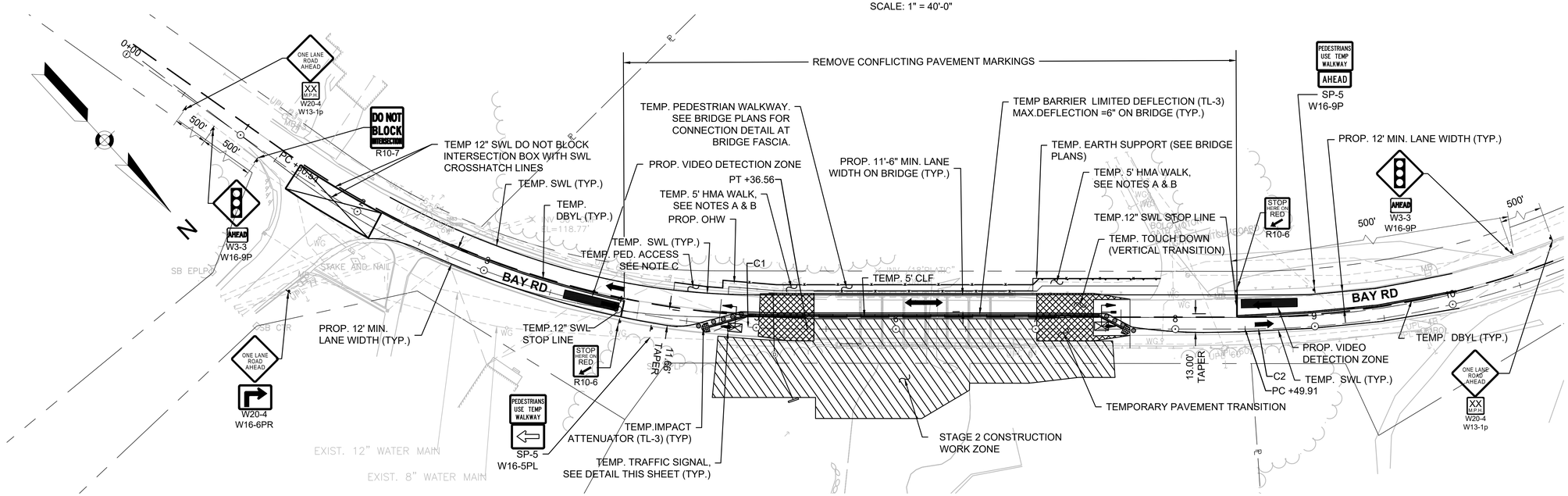
MINIMUM LENGTH OF LONGITUDINAL BUFFER IS EQUAL TO THE STOPPING SIGHT DISTANCE AT THE POSTED SPEED LIMIT AND CAN BE DETERMINED FROM THE FOLLOWING TABLE:

STOPPING SIGHT DISTANCE	
SPEED (MPH)	DISTANCE (FT)
25	155
30	200
35	250
40	305

NOTE:

1. MAXIMUM DRUM SPACING IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.





LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- SHARED LANE MARKING
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN
- (S) SIGNALIZED INTERSECTION
- DIRECTION OF TRAVEL
- WORK ZONE
- TEMPORARY PAVEMENT TRANSITION
- TEMP. TOUCH DOWN (CONSTRUCTED)
- FULL DEPTH PAVEMENT EXCLUDING SURFACE COURSE
- IMPACT ATTENUATOR
- TEMPORARY BARRIER (TL-3) WITH 2' LIMITED DEFLECTION

0 40 100 160
SCALE: 1" = 40'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	29	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS

WORK TO OCCUR THIS STAGE

1. DEMOLISH AND CONSTRUCT SOUTH HALF OF BRIDGE.
2. CONSTRUCT TEMPORARY PEDESTRIAN BRIDGE ON SOUTH SIDE OF BRIDGE.
3. CONSTRUCT TEMPORARY PAVEMENT TRANSITION BETWEEN NEW BRIDGE AND EXISTING ROADWAY ON EAST AND WEST ENDS OF PROPOSED BRIDGE.
4. CONSTRUCT PERMANENT DRAINAGE MANHOLES, DRAINAGE PIPE AND HEADWALL ON SW END OF BRIDGE
5. CONSTRUCT TEMPORARY DRAINAGE ON SOUTH ROADWAY APPROACH.

ADDITIONAL STAGE NOTES

1. MAINTAIN PEDESTRIAN WALKWAY ON EXISTING BRIDGE
2. CONTRACTOR SHALL PROVIDE ACCESS/EGRESS TO ALL ABBUTTERS AT ALL TIMES THROUGHOUT CONSTRUCTION.
3. ALL TRAVEL LANES SHALL BE A MINIMUM OF 11' CLEAR AT ALL TIMES
4. ADA/AAB PEDESTRIAN ACCOMODATION SHALL BE MAINTAINED AT ALL TIMES THROUGH THE PROJECT LIMITS. PEDESTRIANS TO USE EXISTING BRIDGE WALK.
5. AN ALTERNATE ROUTE FOR WIDE LOADS WILL BE UTILIZED DURING THIS STAGE

ANTICIPATED TYPICAL SETUP DETAILS

TYPICAL SETUP DETAILS THAT MAY BE REQUIRED FOR THIS STAGE INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:

TTCP 2

WORK TO OCCUR THIS STAGE

1. REMOVE AND RESET TEMPORARY BARRIER TO STAGE 2 LOCATION. PLACE BITUMINOUS WEDGE IN STAGE 2 WORK AREA TO SUPPORT TEMPORARY PAVEMENT TRANSITION SECTION.
2. DEMOLISH AND CONSTRUCT NORTH HALF OF BRIDGE AND SIDEWALK.
3. CONSTRUCT TEMPORARY PAVEMENT TRANSITION ON NORTH BETWEEN NEW BRIDGE AND EXISTING ROADWAY ON EAST AND WEST ENDS OF PROPOSED BRIDGE.

ADDITIONAL STAGE NOTES

1. MAINTAIN PEDESTRIAN WALKWAY ON TEMPORARY PEDESTRIAN BRIDGE.
2. CONTRACTOR SHALL PROVIDE ACCESS/EGRESS TO ALL ABBUTTERS AT ALL TIMES THROUGHOUT CONSTRUCTION.
3. ALL TRAVEL LANES SHALL BE A MINIMUM OF 11' CLEAR AT ALL TIMES
4. ADA/AAB PEDESTRIAN ACCOMODATION SHALL BE MAINTAINED AT ALL TIMES THROUGH THE PROJECT LIMITS. PEDESTRIANS TO USE TEMP. WALKWAY.
5. AN ALTERNATE ROUTE FOR WIDE LOADS WILL BE UTILIZED DURING THIS STAGE

ANTICIPATED TYPICAL SETUP DETAILS

TYPICAL SETUP DETAILS THAT MAY BE REQUIRED FOR THIS STAGE INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:

TTCP 2

GENERAL NOTES:

A. TEMP. 5' HMA WALK CONSISTS OF 1.5" SUPERPAVE SURFACE COURSE (PAID FOR UNDER ITEM 702.) OVER 6" (MIN.) GRAVEL BORROW (PAID FOR UNDER ITEM 151.)

B. INSTALL TEMP. FENCE ALONG OUTSIDE EDGE OF WALK (PAID FOR UNDER ITEM 657.)

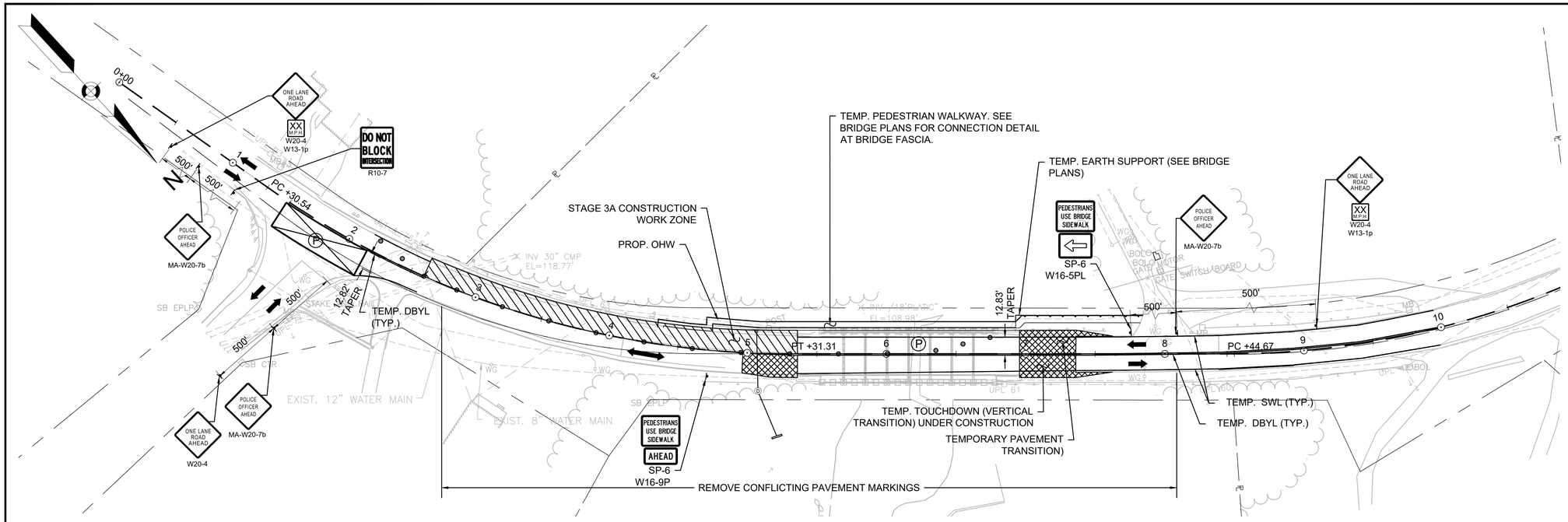
C. 4' MIN. PED. ACCESS SHALL BE PROVIDED IN SHOULDER OF ROADWAY. SEE DETAIL, SHEET 36. HMA USED TO BE PAID UNDER ITEM 702.

608460_HD28-30 (TTCP STAGES).DWG Plotted on 30-May-2025 11:42 AM

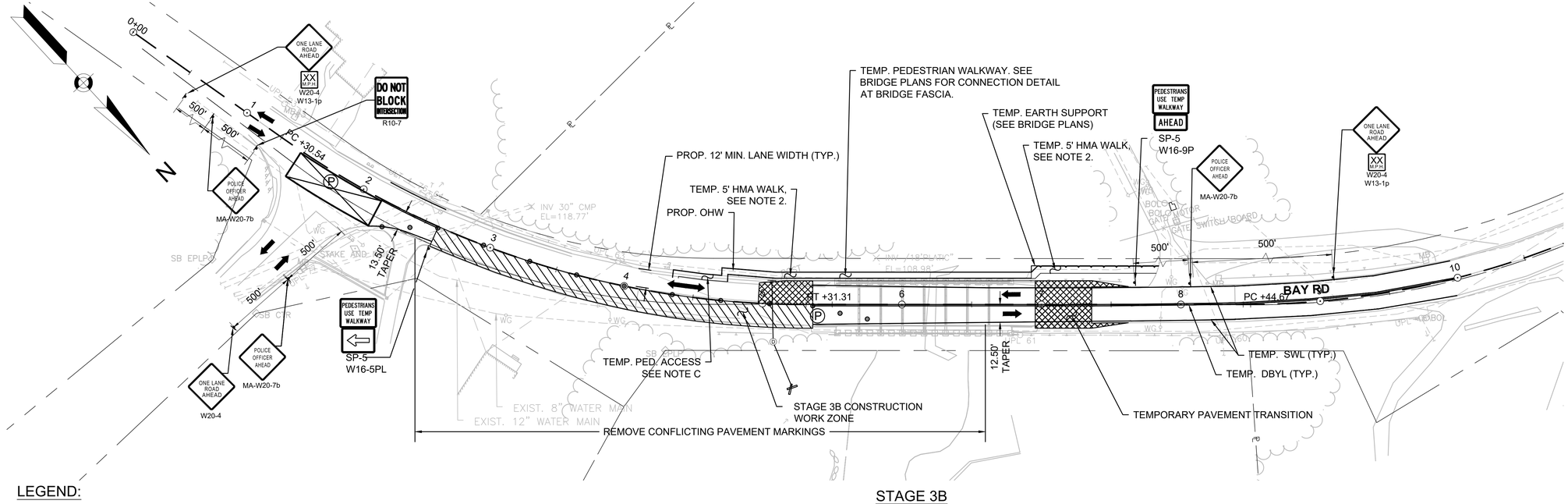
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	30	85
	PROJECT FILE NO. 608460		

TEMPORARY TRAFFIC CONTROL PLANS



STAGE 3A
SCALE: 1" = 40'-0"



STAGE 3B
SCALE: 1" = 40'-0"

WORK TO OCCUR THESE STAGES

1. CONSTRUCT SOUTH PORTION OF PROPOSED FULL DEPTH PAVEMENT EXCLUDING SURFACE COURSE ROADWAY INCLUDING REMOVAL OF TEMPORARY PAVEMENT TRANSITION AND FINAL ROADWAY DRAINAGE WEST OF BRIDGE.
2. CONSTRUCTION SHALL ALTERNATE BETWEEN STAGES 3A AND 3B, MAINTAINING TRAFFIC IN A MINIMUM OF ONE LANE AT ALL TIMES.
3. FULL DEPTH PAVING OPERATIONS FOR ROADWAY APPROACHES AND SETTING FINAL PAVING ELEVATIONS VIA POLICE CONTROL AND MULTIPLE ALTERNATING PAVING LIFT OPERATIONS DURING DAYTIME CONSTRUCTION SHALL BE UTILIZED. TRAFFIC SHALL BE MAINTAINED VIA BI-DIRECTIONAL TRAVEL WITHIN ONE TRAVEL LANE DURING CONSTRUCTION VIA POLICE CONTROL DURING DAYTIME PAVING OPERATIONS AND TWO-WAY TRAFFIC OPENED ALONG BOTH TRAVEL LANES FOR NIGHT TRAVEL.

   FULL DEPTH PAVEMENT SHALL CONSIST OF A MINIMUM 8" RECLAIMED BASE (VARIABLE EXCAVATION DEPTH) AND MULTIPLE PAVING LIFTS NOT TO EXCEED 4" BETWEEN WESTBOUND TRAVEL AND EASTBOUND AND EASTBOUND TRAVEL.

ADDITIONAL STAGE NOTES

4. MAINTAIN TEMPORARY PEDESTRIAN WALKWAY ON NEW BRIDGE CONSTRUCTED IN STAGE 2.
5. CONTRACTOR SHALL PROVIDE ACCESS/EGRESS TO ALL ABBUTTERS AT ALL TIMES THROUGHOUT CONSTRUCTION.
6. ALL TRAVEL LANES SHALL BE A MINIMUM OF 11' CLEAR AT ALL TIMES.
7. ADA/AAB PEDESTRIAN ACCOMODATION SHALL BE MAINTAINED AT ALL TIMES THROUGH THE PROJECT LIMITS. PEDESTRIANS TO USE NEW BRIDGE SIDEWALK.
8. AN ALTERNATE ROUTE FOR WIDE LOADS WILL BE UTILIZED DURING THIS STAGE
9. WHEN POLICE ARE NOT PRESENT, THE LANES SHALL BE DELINEATED, SUCH THAT SAFE TRAVEL CAN BE MAINTAINED AT ALL TIMES.

ANTICIPATED TYPICAL SETUP DETAILS

TYPICAL SETUP DETAILS THAT MAY BE REQUIRED FOR THESE STAGES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:

TTCP 1

LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- SHARED LANE MARKING
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN
- SIGNALIZED INTERSECTION
- DIRECTION OF TRAVEL
- WORK ZONE
- TEMPORARY PAVEMENT TRANSITION
- FULL DEPTH PAVEMENT EXCLUDING SURFACE COURSE
- IMPACT ATTENUATOR
- TEMPORARY BARRIER (TL-3) WITH 2' LIMITED DEFLECTION

0 40 100 160
SCALE: 1" = 40'

GENERAL NOTES:

A. TEMP. 5' HMA WALK CONSISTS OF 1.5" SUPERPAVE SURFACE COURSE (PAID FOR UNDER ITEM 702.) OVER 6" (MIN.) GRAVEL BORROW (PAID FOR UNDER ITEM 151.)

B. INSTALL TEMP. FENCE ALONG OUTSIDE EDGE OF WALK (PAID FOR UNDER ITEM 657.)

C. 4' MIN. PED. ACCESS SHALL BE PROVIDED IN SHOULDER OF ROADWAY. SEE DETAIL, SHEET 36. HMA USED TO BE PAID UNDER ITEM 702.

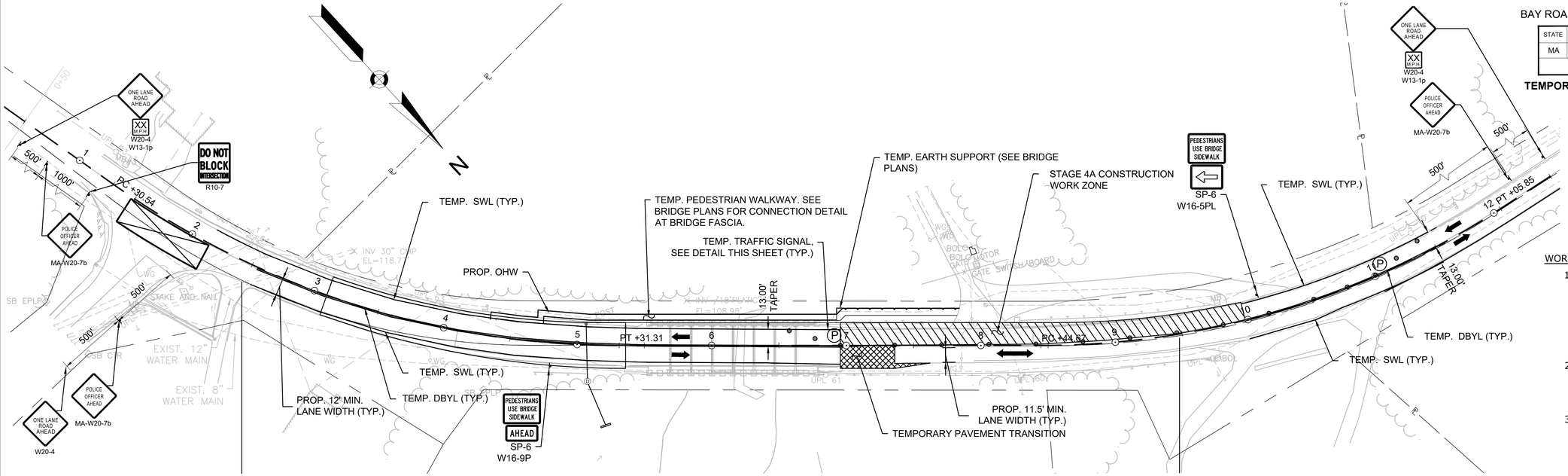
608460_HD28-30 (TTCP STAGES).DWG Plotted on 30-May-2025 11:42 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

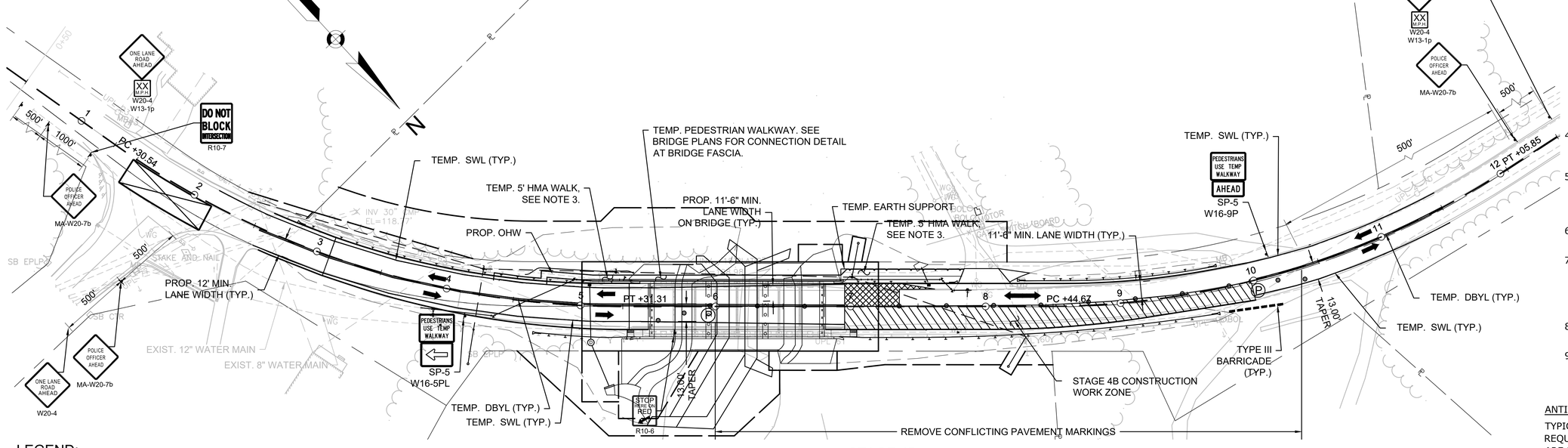
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	31	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS

608460_H028-30 (TTCP STAGES).DWG Plotted on 30-May-2025 11:42 AM



STAGE 4A
SCALE: 1" = 40'-0"



STAGE 4B
SCALE: 1" = 40'-0"

LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- SHARED LANE MARKING
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN
- SIGNALIZED INTERSECTION
- DIRECTION OF TRAVEL
- WORK ZONE
- TEMPORARY PAVEMNT TRANSITION
- FULL DEPTH PAVEMENT EXCLUDING SURFACE COURSE
- IMPACT ATTENUATOR
- TEMPORARY BARRIER (TL-3) WITH 2' LIMITED DEFLECTION

0 40 100 160
SCALE: 1" = 40'

WORK TO OCCUR THESE STAGES

1. CONSTRUCT SOUTH PORTION OF PROPOSED FULL DEPTH PAVEMENT EXCLUDING SURFACE COURSE ROADWAY INCLUDING REMOVAL OF TEMPORARY PAVEMENT TRANSITION AND FINAL ROADWAY DRAINAGE WEST OF BRIDGE.
2. CONSTRUCTION SHALL ALTERNATE BETWEEN STAGES 4A AND 4B, MAINTAINING TRAFFIC IN A MINIMUM OF ONE LANE AT ALL TIMES.
3. FULL DEPTH PAVING OPERATIONS FOR ROADWAY APPROACHES AND SETTING FINAL PAVING ELEVATIONS VIA POLICE CONTROL AND MULTIPLE ALTERNATING PAVING LIFT OPERATIONS DURING DAYTIME CONSTRUCTION SHALL BE UTILIZED. TRAFFIC SHALL BE MAINTAINED VIA BI-DIRECTIONAL TRAVEL WITHIN ONE TRAVEL LANE DURING CONSTRUCTION VIA POLICE CONTROL DURING DAYTIME PAVING OPERATIONS AND TWO-WAY TRAFFIC OPENED ALONG BOTH TRAVEL LANES FOR NIGHT TRAVEL.

FULL DEPTH PAVEMENT SHALL CONSIST OF A MINIMUM 8" RECLAIMED BASE (VARIABLE EXCAVATION DEPTH) AND MULTIPLE PAVING LIFTS NOT TO EXCEED 4" BETWEEN WESTBOUND TRAVEL AND EASTBOUND AND EASTBOUND TRAVEL.

ADDITIONAL STAGE NOTES

4. MAINTAIN TEMPORARY PEDESTRIAN WALKWAY ON NEW BRIDGE CONSTRUCTED IN STAGE 2.
5. CONTRACTOR SHALL PROVIDE ACCESS/EGRESS TO ALL ABBUTTERS AT ALL TIMES THROUGHOUT CONSTRUCTION.
6. ALL TRAVEL LANES SHALL BE A MINIMUM OF 11' CLEAR AT ALL TIMES.
7. ADA/AAB PEDESTRIAN ACCOMODATION SHALL BE MAINTAINED AT ALL TIMES THROUGH THE PROJECT LIMITS. PEDESTRIANS TO USE NEW BRIDGE SIDEWALK.
8. AN ALTERNATE ROUTE FOR WIDE LOADS WILL BE UTILIZED DURING THIS STAGE
9. WHEN POLICE ARE NOT PRESENT, THE LANES SHALL BE DELINEATED, SUCH THAT SAFE TRAVEL CAN BE MAINTAINED AT ALL TIMES.

ANTICIPATED TYPICAL SETUP DETAILS

TYPICAL SETUP DETAILS THAT MAY BE REQUIRED FOR THESE STAGES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:

TTCP 1

GENERAL NOTES:

A. TEMP. 5' HMA WALK CONSISTS OF 1.5" SUPERPAVE SURFACE COURSE (PAID FOR UNDER ITEM 450.22) OVER 6" (MIN.) GRAVEL BORROW (PAID FOR UNDER ITEM 151.)

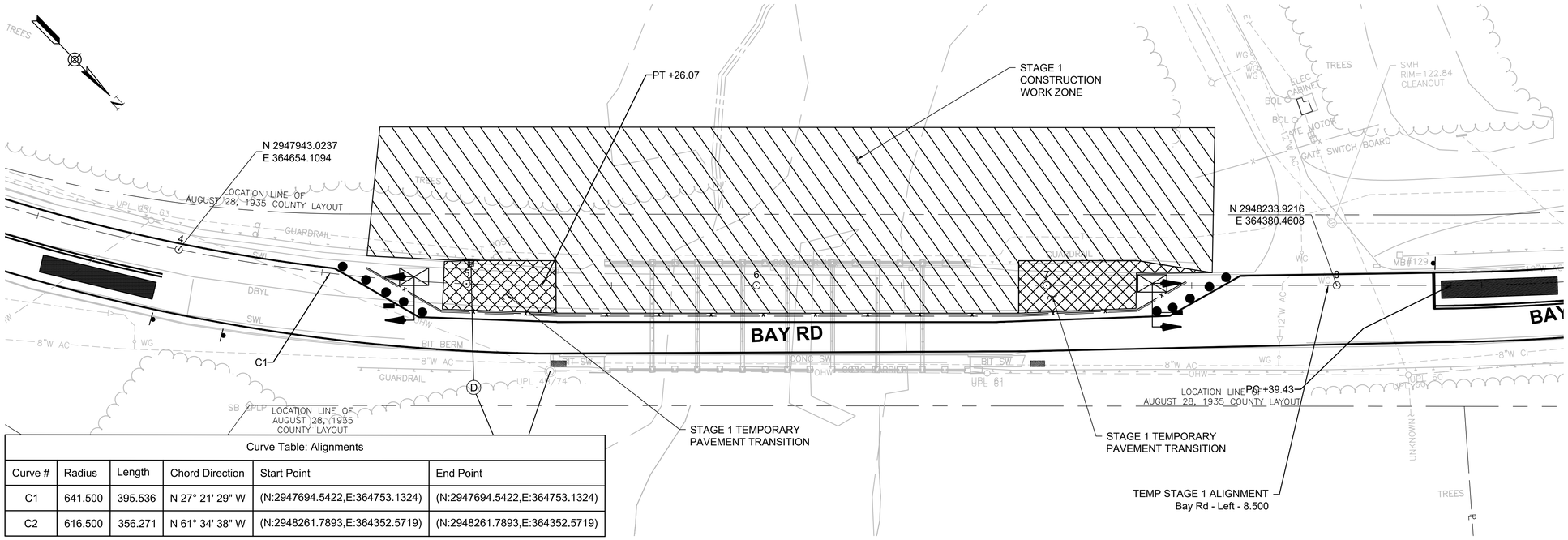
B. INSTALL TEMP. FENCE ALONG OUTSIDE EDGE OF WALK (PAID FOR UNDER ITEM 657.)

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	32	85
PROJECT FILE NO.	608460		

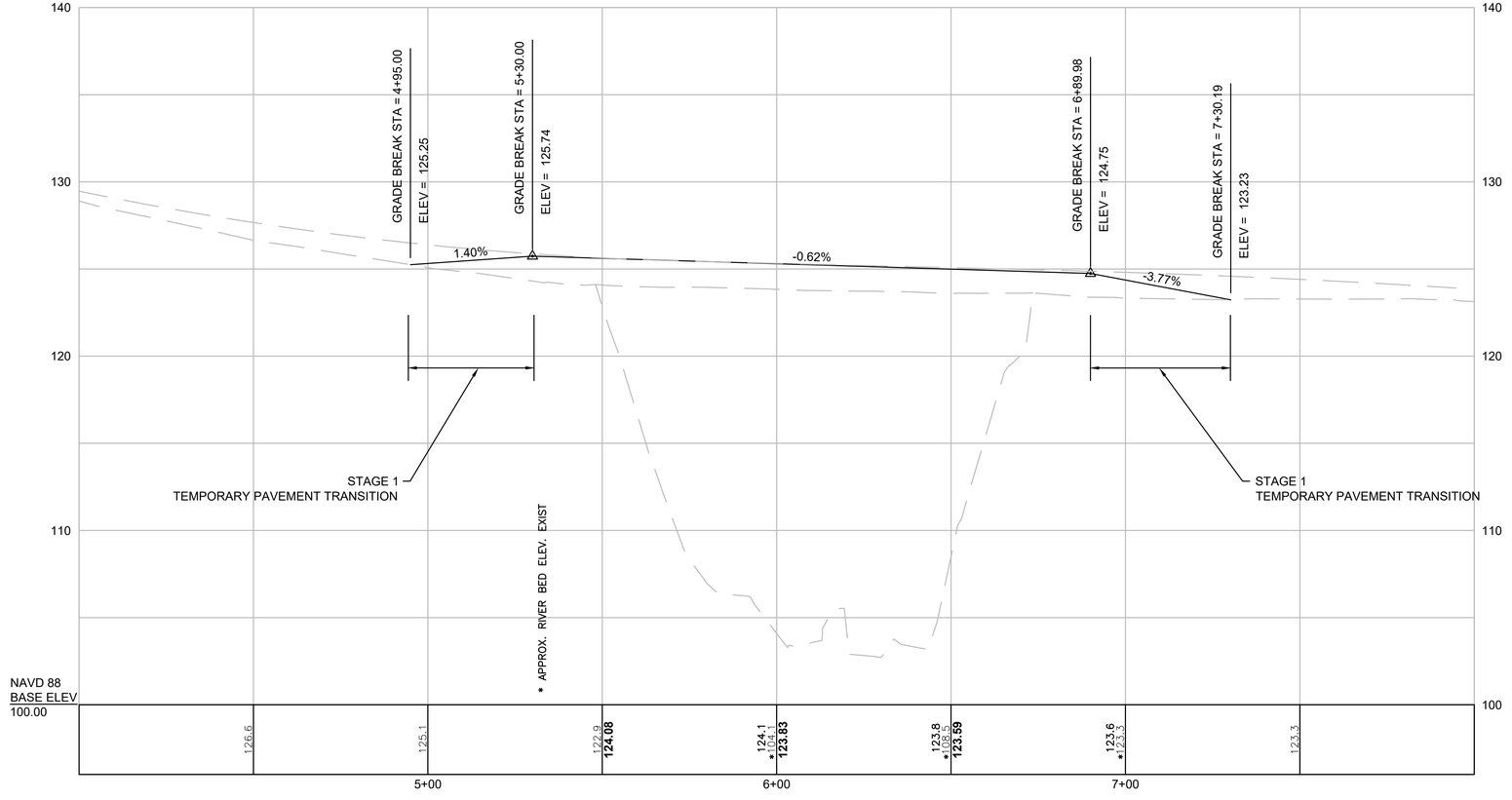
TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY PAVEMENT TRANSITION DETAILS

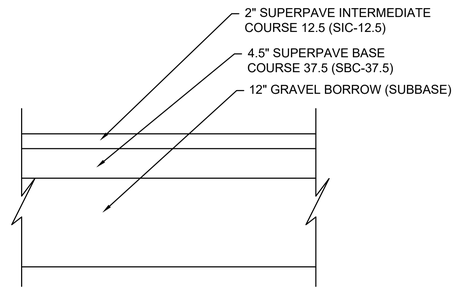
608460_HD37-38 (MISC DETAILS).DWG Plotted on 30-May-2025 11:43 AM



Curve Table: Alignments

Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	641.500	395.536	N 27° 21' 29" W	(N:2947694.5422,E:364753.1324)	(N:2947694.5422,E:364753.1324)
C2	616.500	356.271	N 61° 34' 38" W	(N:2948261.7893,E:364352.5719)	(N:2948261.7893,E:364352.5719)





TEMPORARY PAVEMENT TRANSITION

NOT TO SCALE

STAGE 1
SCALE: 1" = 20'-0"

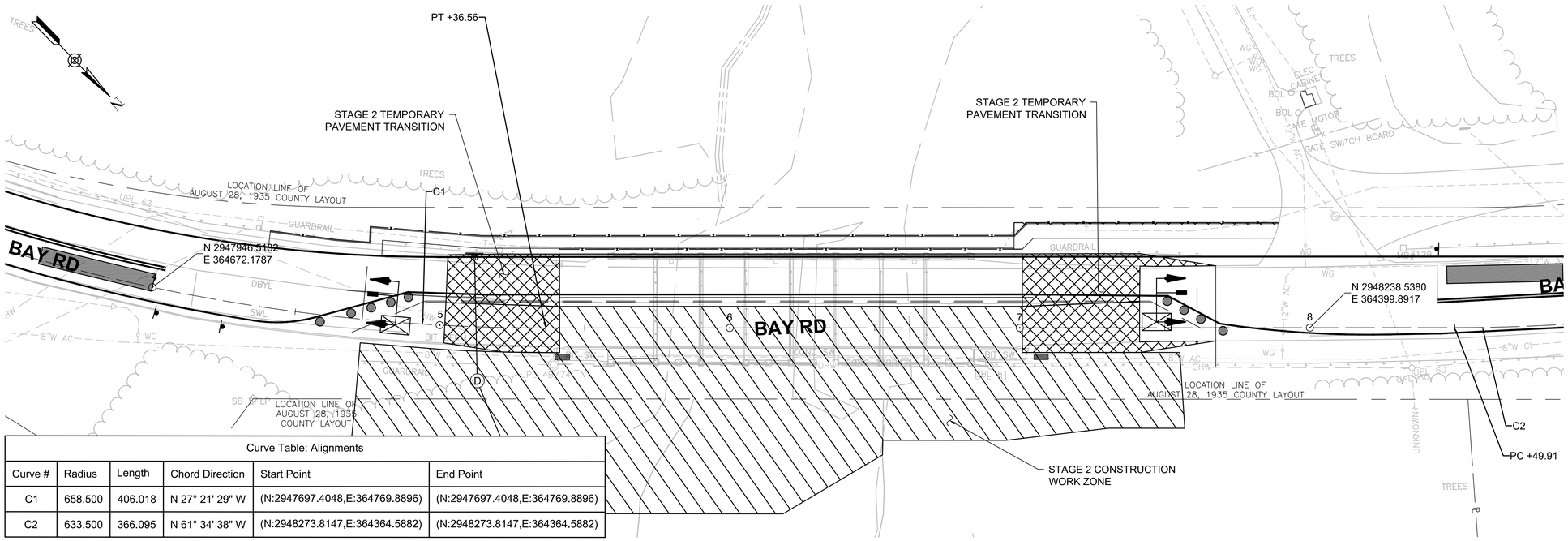
0 20 50 100
SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

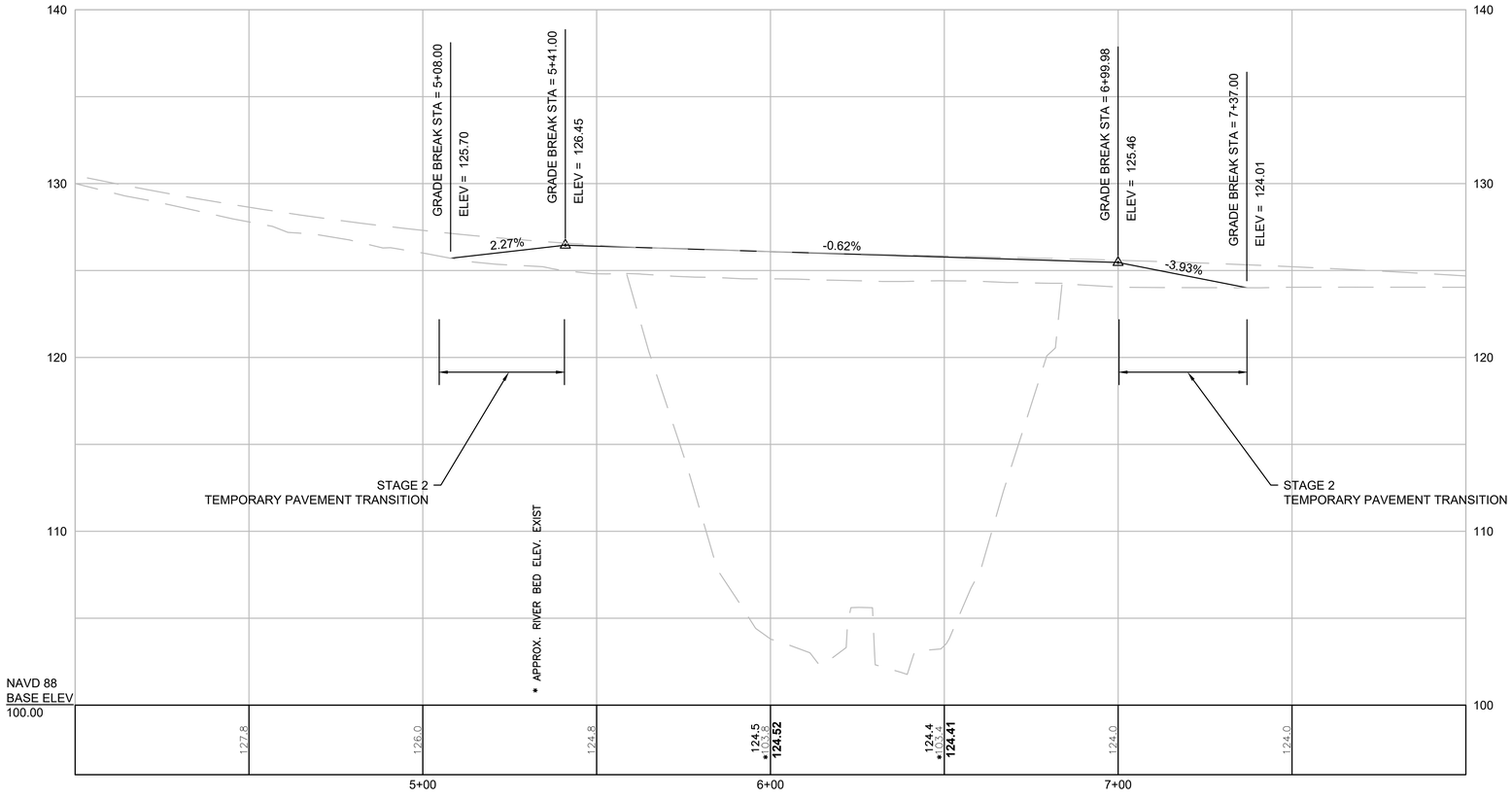
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	33	85
PROJECT FILE NO.	608460		

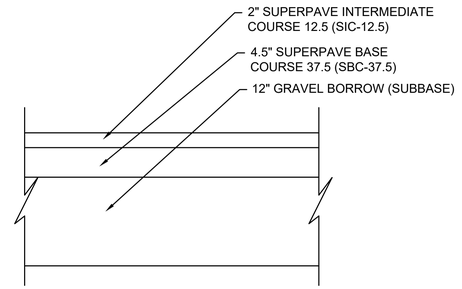
TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY PAVEMENT TRANSITION DETAILS

608460_HD37-38 (MISC DETAILS).DWG Plotted on 30-May-2025 11:43 AM



Curve Table: Alignments					
Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	658.500	406.018	N 27° 21' 29" W	(N:2947697.4048,E:364769.8896)	(N:2947697.4048,E:364769.8896)
C2	633.500	366.095	N 61° 34' 38" W	(N:2948273.8147,E:364364.5882)	(N:2948273.8147,E:364364.5882)





TEMPORARY PAVEMENT TRANSITION

NOT TO SCALE

STAGE 2
SCALE: 1" = 20'-0"

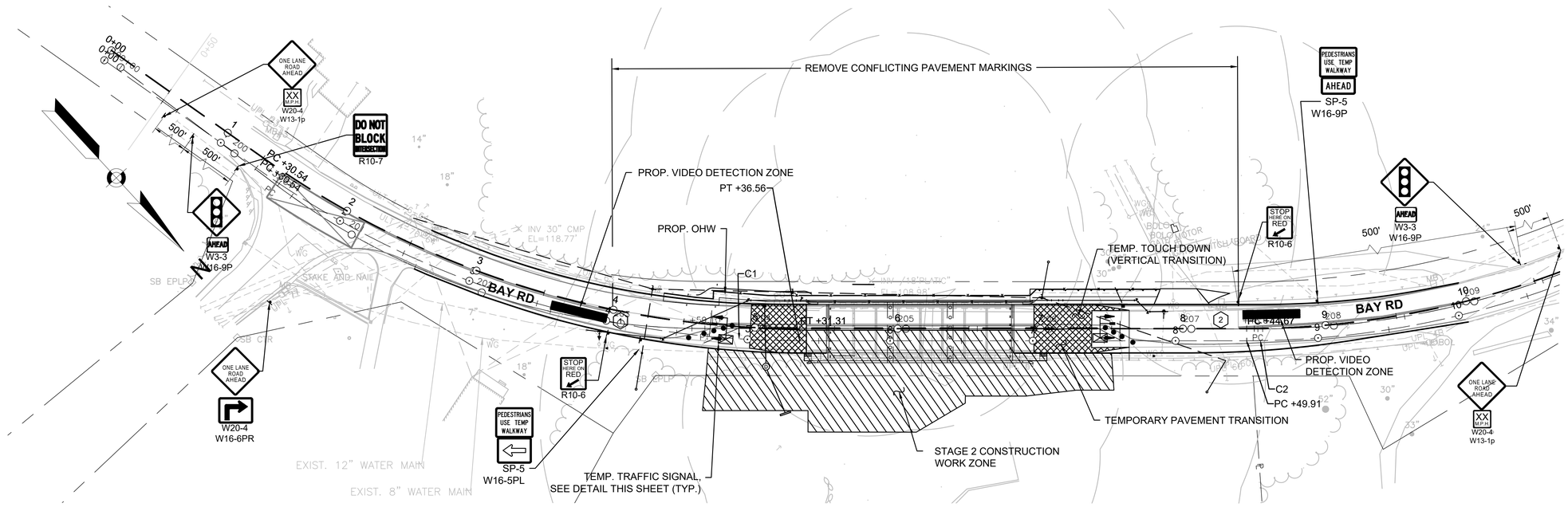
0 20 50 100
SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	34	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY SIGNAL TIMING
STAGE 1

608460_HD33 (TTCP SIGNAL).DWG Plotted on 30-May-2025 11:44 AM



STAGE 1
SCALE: 1" = 40'-0"

			PHASE 1			PHASE 2			PHASE 3			PHASE 4			EMERGENCY FLASH OPERATION
STREET	DIR.	FACE	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
BAY ROAD	SB	A,B	G	Y	R				R	R	R				FR
BAY ROAD	NB	C,D	R	R	R				G	Y	R				FR
TIMING IN SECONDS															
MINIMUM GREEN			7						7						
VEHICLE INTERVAL			2						2						
MAXIMUM GREEN I			40						40						
MAXIMUM GREEN II			40						40						
YELLOW CLEAR				3.0						3.0					
ALL RED CLEAR					16						16				
DETECTOR			NON-LOCK			OFF			NON-LOCK			OFF			
RECALL TO MINIMUM			OFF			OFF			OFF			OFF			

TEMPORARY SIGNAL PHASING - STAGE 1

SIGNAL DISPLAY

A, B, C, D

NOTES:
1. ALL VEHICLE INDICATIONS TO BE EQUIPPED WITH TUNNEL VISORS.

EMERGENCY VEHICLE PRE-EMPTION OPERATION

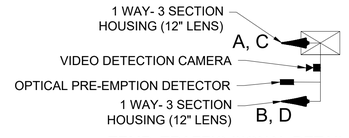
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN THE EVENT OF MULTIPLE PRE-EMPTION CALLS, PRE-EMPTION CALLS SHALL BE SERVICED ON A FIRST CALL RECEIVED FIRST CALL SERVICED BASIS.
3. IN RESPONSE TO A PRE-EMPTION SIGNAL THE CONTROLLER SHALL HOLD OR ADVANCE TO, AND HOLD IN THE EMERGENCY PRE-EMPTION PHASE GREEN FOR A MINIMUM OF 10 SECONDS OR UNTIL THE PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN RESUME THE NORMAL PHASE SEQUENCING, OR SERVICE SUBSEQUENT PRE-EMPTION SIGNALS AS NECESSARY.
4. AT NO TIME DURING PRE-EMPTION OPERATION ARE THE CONTROLLER TIMES FOR MINIMUM GREEN, YELLOW CLEARANCE, AND RED CLEARANCE TO BE CHANGED
5. THE STROBE BEACON IS TO BE ILLUMINATED WHENEVER ANY VEHICLE PRE-EMPTION GREEN IS ON.

CONSTRUCTION NOTES:

1. ALL SIGNAL EQUIPMENT IS NEW EXCEPT AS NOTED.
2. EACH FOUNDATION SHOWN CONTIGUOUS WITH THE STREET LINES SHALL BE PLACED NO CLOSER THAN 6" TO THE STREET LINE.
3. VIDEO DETECTION ZONES ARE TO BE FIELD ADJUSTED AND ARE SUBJECT TO APPROVAL BY THE ENGINEER.
4. IN EMERGENCY SITUATIONS, FLASHING RED LIGHT SHOULD BE UTILIZED.
5. FOR CONSTRUCTION SIGN SUMMARY, SEE SHEET 39.

GENERAL NOTES:

1. PORTABLE SOLAR POWERED TRAFFIC SIGNALS SHALL MEET THE SPECIFICATIONS PROVIDED FOR ITEM NO.816.71
2. TRAFFIC SIGNAL TO REST IN RED AND FLASH RED DURING MALFUNCTION.
3. DETECTION ZONES TO EXTEND FROM 5 FEET IN FRONT OF THE STOP LINES TO 15 FEET BEHIND THE STOP LINES.
4. TRAFFIC SIGNAL NOT TO BE PLACED IN PROGRAMMED FLASH.



TEMP. TRAFFIC SIGNAL DETAIL
NOT TO SCALE

VIDEO DETECTION ZONE DATA

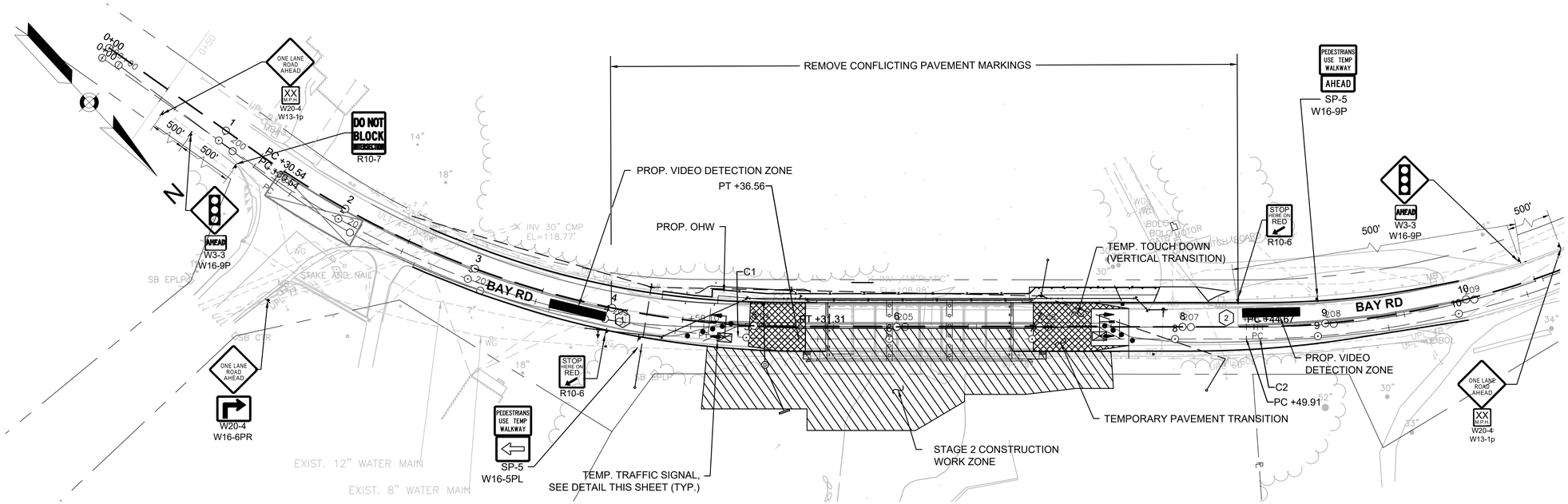
DETECTOR NUMBER	VIDEO CAMERA	SIZE*	OPERATION	Ø CALLED	DELAY TIME	Ø EXTENDED
1	V1	6' X 40'	PRESENCE	1	0	1
2	V2	6' X 40'	PRESENCE	3	0	3

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	35	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY SIGNAL TIMING
STAGE 2

608460_HD33 (TTCP SIGNAL).DWG Plotted on 30-May-2025 11:44 AM



STAGE 2
SCALE: 1" = 40'-0"

STREET	DIR.	FACE	PHASE 1 R/W	PHASE 1 CL1	PHASE 1 CL2	PHASE 2 R/W	PHASE 2 CL1	PHASE 2 CL2	PHASE 3 R/W	PHASE 3 CL1	PHASE 3 CL2	PHASE 4 R/W	PHASE 4 CL1	PHASE 4 CL2	EMERGENCY FLASH OPERATION
BAY ROAD	SB	A,B	G	Y	R				R	R	R				FR
BAY ROAD	NB	C,D	R	R	R				G	Y	R				FR
TIMING IN SECONDS															
MINIMUM GREEN			7						7						
VEHICLE INTERVAL			2						2						
MAXIMUM GREEN I			40						40						
MAXIMUM GREEN II			40						40						
YELLOW CLEAR				3.0						3.0					
ALL RED CLEAR					16						16				
DETECTOR			NON-LOCK			OFF			NON-LOCK			OFF			
RECALL TO MINIMUM			OFF			OFF			OFF			OFF			

TEMPORARY SIGNAL PHASING - STAGE 2

SIGNAL DISPLAY

A, B, C, D

NOTES:
1. ALL VEHICLE INDICATIONS TO BE EQUIPPED WITH TUNNEL VISORS.

EMERGENCY VEHICLE PRE-EMPTION OPERATION

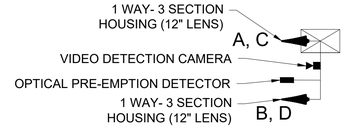
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN THE EVENT OF MULTIPLE PRE-EMPTION CALLS, PRE-EMPTION CALLS SHALL BE SERVICED ON A FIRST CALL RECEIVED FIRST CALL SERVICED BASIS.
3. IN RESPONSE TO A PRE-EMPTION SIGNAL THE CONTROLLER SHALL HOLD OR ADVANCE TO, AND HOLD IN THE EMERGENCY PRE-EMPTION PHASE GREEN FOR A MINIMUM OF 10 SECONDS OR UNTIL THE PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN RESUME THE NORMAL PHASE SEQUENCING, OR SERVICE SUBSEQUENT PRE-EMPTION SIGNALS AS NECESSARY.
4. AT NO TIME DURING PRE-EMPTION OPERATION ARE THE CONTROLLER TIMES FOR MINIMUM GREEN, YELLOW CLEARANCE, AND RED CLEARANCE TO BE CHANGED
5. THE STROBE BEACON IS TO BE ILLUMINATED WHENEVER ANY VEHICLE PRE-EMPTION GREEN IS ON.

CONSTRUCTION NOTES:

1. ALL SIGNAL EQUIPMENT IS NEW EXCEPT AS NOTED.
2. EACH FOUNDATION SHOWN CONTIGUOUS WITH THE STREET LINES SHALL BE PLACED NO CLOSER THAN 6" TO THE STREET LINE.
3. VIDEO DETECTION ZONES ARE TO BE FIELD ADJUSTED AND ARE SUBJECT TO APPROVAL BY THE ENGINEER.
4. IN EMERGENCY SITUATIONS, FLASHING RED LIGHT SHOULD BE UTILIZED.
5. FOR CONSTRUCTION SIGN SUMMARY, SEE SHEET 39.

GENERAL NOTES:

1. PORTABLE SOLAR POWERED TRAFFIC SIGNALS SHALL MEET THE SPECIFICATIONS PROVIDED FOR ITEM NO.816.71
2. TRAFFIC SIGNAL TO REST IN RED AND FLASH RED DURING MALFUNCTION.
3. DETECTION ZONES TO EXTEND FROM 5 FEET IN FRONT OF THE STOP LINES TO 15 FEET BEHIND THE STOP LINES.
4. TRAFFIC SIGNAL NOT TO BE PLACED IN PROGRAMMED FLASH.



TEMP. TRAFFIC SIGNAL DETAIL
NOT TO SCALE

VIDEO DETECTION ZONE DATA

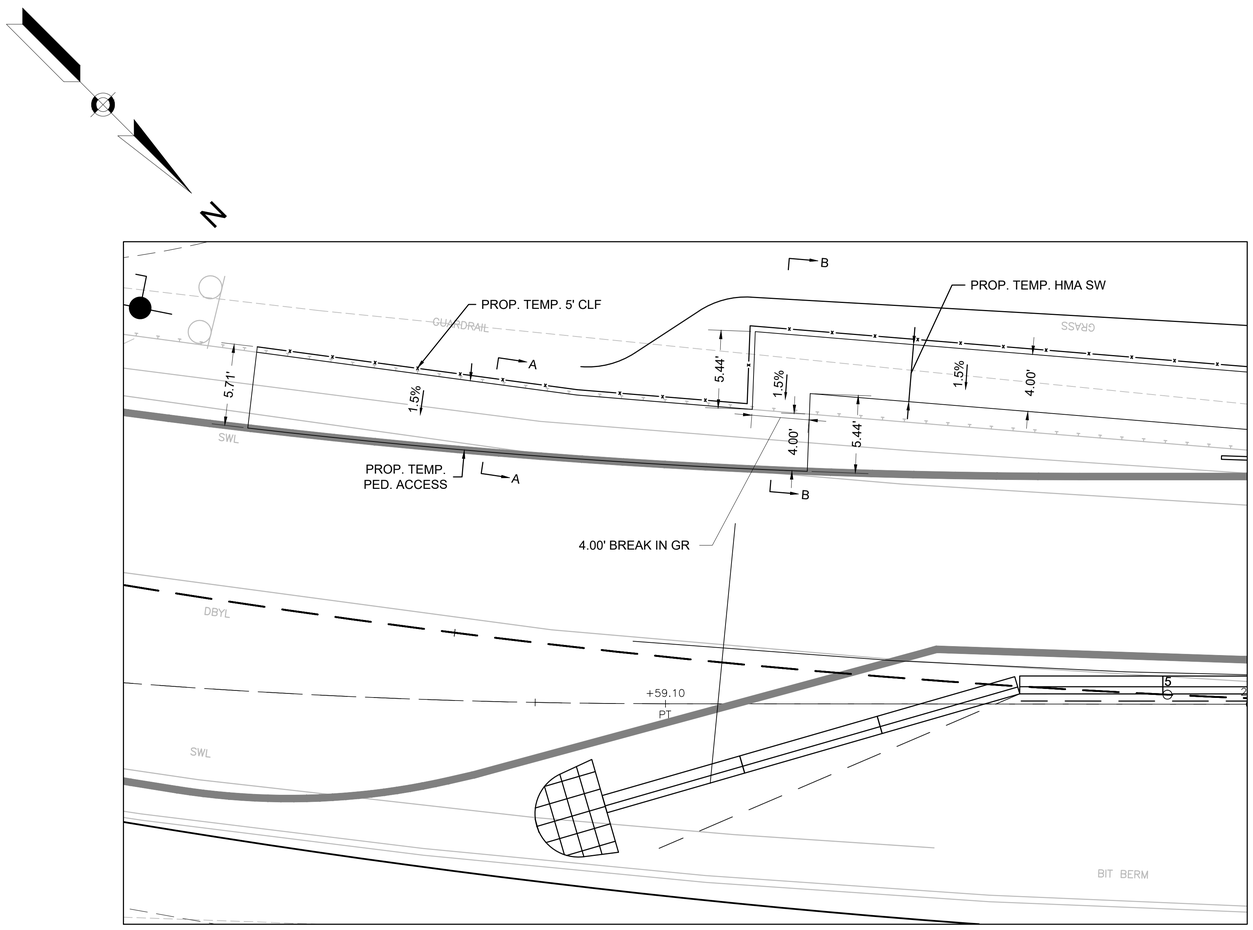
DETECTOR NUMBER	VIDEO CAMERA	SIZE*	OPERATION	Ø CALLED	DELAY TIME	Ø EXTENDED
1	V1	6' X 40'	PRESENCE	1	0	1
2	V2	6' X 40'	PRESENCE	3	0	3

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

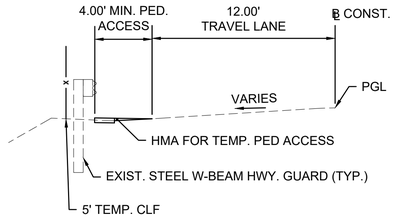
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	36	85
	PROJECT FILE NO. 608460		

TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY SIDEWALK DETAIL

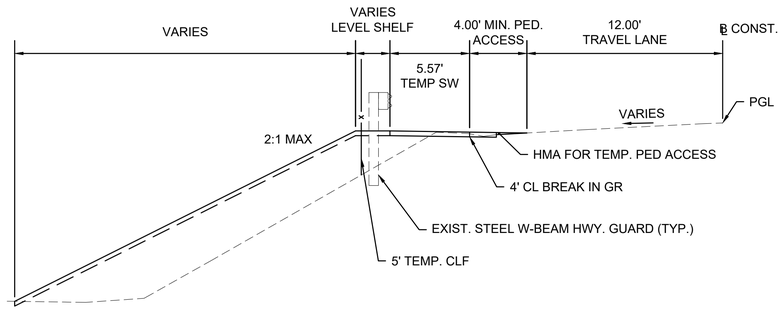
608460_HD33 (TTCP SIGNAL).DWG Plotted on 30-May-2025 11:44 AM



TEMPORARY SIDEWALK DETAIL
SCALE: 1" = 5'



SECTION AA
NOT TO SCALE



SECTION BB
NOT TO SCALE

0 5 10 15 20
SCALE: 1" = 5'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	37	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS
ADVANCED WARNING SIGN PLAN

608460_HD34-35 (TTCP SIGNING).DWG Plotted on 30-May-2025 11:44 AM

ADVANCED WARNING SIGN PLACEMENT
SCALE: 1" = 1000'

0 1000 2000 3000 4000
SCALE: 1" = 1000'

NOTE:

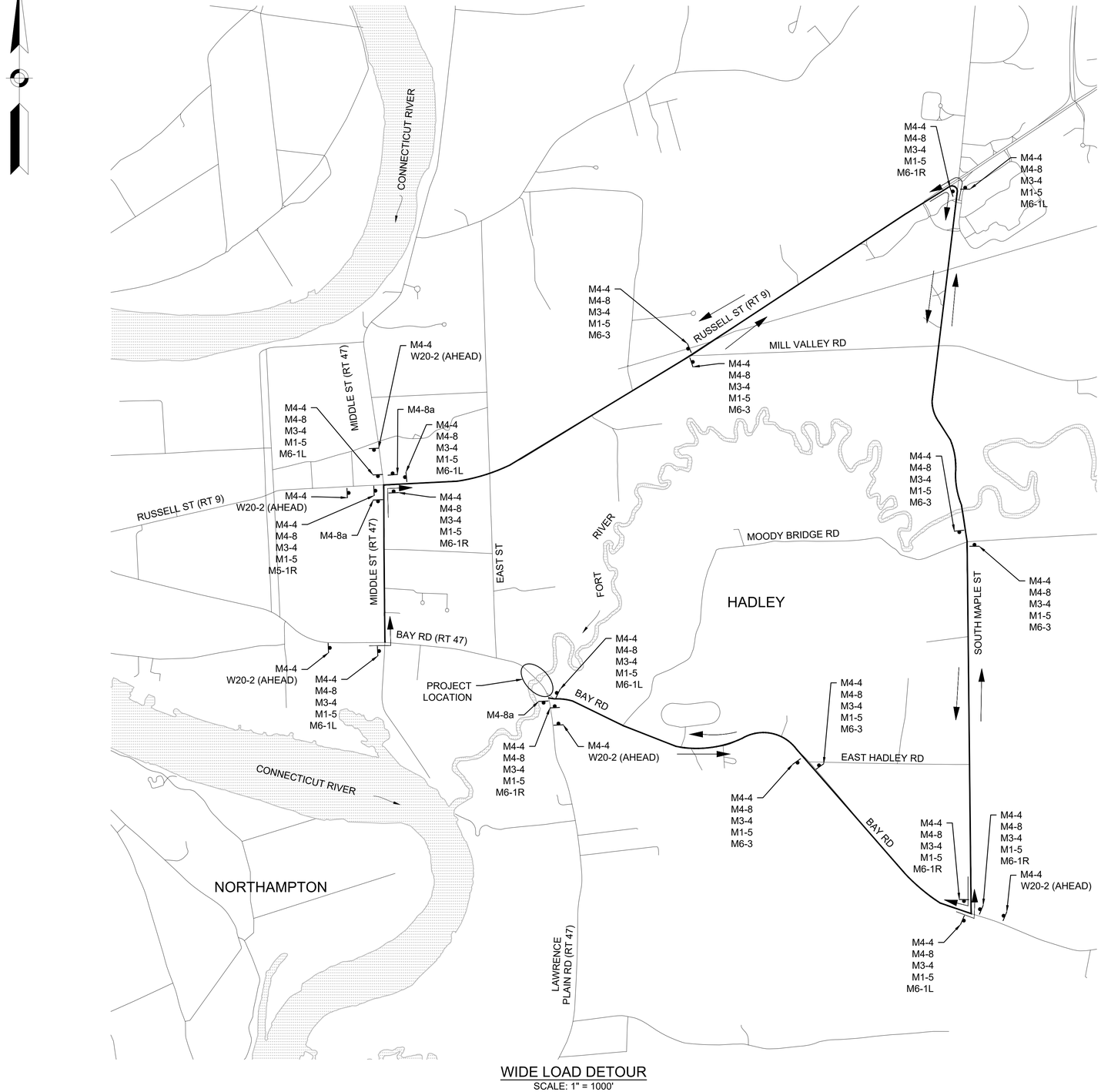
1. ALL ADVANCED WARNING SIGNS SHALL BE SPACED AS SHOWN IN TABLE 6C-1 ON SHEET [26].

0 20 50 100
SCALE: 1" = 20'

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	38	85
PROJECT FILE NO.	608460		

TEMPORARY TRAFFIC CONTROL PLANS
WIDE LOAD DETOUR



WIDE LOAD DETOUR
SCALE: 1" = 1000'

WIDE LOAD DETOUR NOTES:

1. ANY OVERSIZE CARGO VEHICLE SHALL COORDINATE WITH MASSDOT TO DETERMINE APPROPRIATE ROUTE.
2. THIS PLAN IS SHOWN AS A POSSIBLE OVERSIZE CARGO ROUTE FOR INFORMATIONAL PURPOSES ONLY.
3. THIS ROUTE IS APPROXIMATELY 7 MILES LONG.

0 20 50 100
SCALE: 1" = 20'

608460_HD34-35 (TTCP SIGNING).DWG Plotted on 30-May-2025 11:45 AM

DETOUR & CONSTRUCTION SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	UNIT AREA (S.F.)	AREA IN SQUARE FEET
SP-5	30"	24"	PEDESTRIANS USE TEMP WALKWAY				2	ORANGE H/I			5.00	10.00
SP-6	30"	24"	PEDESTRIANS USE BRIDGE SIDEWALK				2				5.00	10.00
M1-5	24"	24"	47				18				4.00	72.00
M3-4	24"	12"	WEST				18	WHITE H/I			2.00	36.00
M4-4	24"	12"	TRUCK				23				2.00	46.00
M4-8	24"	12"	DETOUR				18				2.00	36.00
M4-8a	24"	18"	END DETOUR				3	ORANGE H/I			3.00	9.00
M6-1L	21"	15"					6				2.19	13.13
M6-1R	21"	15"					6	WHITE H/I			2.19	13.13
M6-3	21"	15"					6				2.19	13.13
W1-4L	36"	36"					2				9.00	18.00
W1-4R	36"	36"					2				9.00	18.00
W3-3	36"	36"					2				9.00	18.00
W5-1	36"	36"	ROAD NARROWS				2				9.00	18.00
W13-1p (SEE NOTE 1)	18"	18"	35 M.P.H.				2	ORANGE H/I			2.25	4.50
W16-5PL	24"	18"					1				3.00	3.00
W20-1 W16-6PR	12"	15"					1				2.20	2.20
W16-9P	24"	12"	AHEAD				3				2.00	6.00
(AHEAD)	36"	36"	ROAD WORK AHEAD				4				9.00	36.00

MUTCD — BLACK H/I — BLACK H/I

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	UNIT AREA (S.F.)	AREA IN SQUARE FEET
W20-2 (AHEAD)	36"	36"	DETOUR AHEAD				5	ORANGE H/I	BLACK H/I	BLACK H/I	9.00	45.00
W20-4	36"	36"	ONE LANE ROAD XXX				3				9.00	27.00
W21-5	36"	36"	SHOULDER WORK				1				9.00	9.00
MA-W20-7b	36"	36"	POLICE OFFICER AHEAD				3				9.00	27.00
MA-R2-10a	48"	36"	WORK ZONE SPEEDING FINES DOUBLED				4	FLUOR. ORANGE/ WHITE H/I			12.00	48.00
MA-R2-10e	36"	48"	END ROAD WORK DOUBLE FINES END				3				12.00	36.00
R10-6	24"	36"	STOP HERE ON RED				2	WHITE H/I			6.00	12.00
R10-7	24"	36"	DO NOT BLOCK INTERSECTON				1				6.00	6.00

MUTCD — MASSDOT STANDARD — MUTCD

TOTAL AREA = 529.09 SF

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	39	85
PROJECT FILE NO.	608460		

CONSTRUCTION SIGN SUMMARY

SIGN SP-5
SCALE = NOT TO SCALE
QUANTITY REQUIRED: 2

SIGN SP-6
SCALE = NOT TO SCALE
QUANTITY REQUIRED: 2

NOTE:

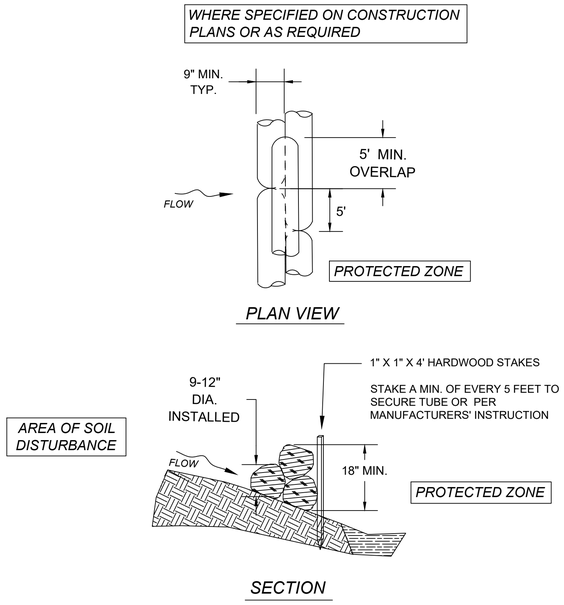
1. THE ENGINEER SHALL DETERMINE THE POSTED SPEED LIMIT FOR THE W13-1P SIGNS.

608460_HD36 (CSS).DWG Plotted on 30-May-2025 11:45 AM

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	40	85
PROJECT FILE NO.	608460		

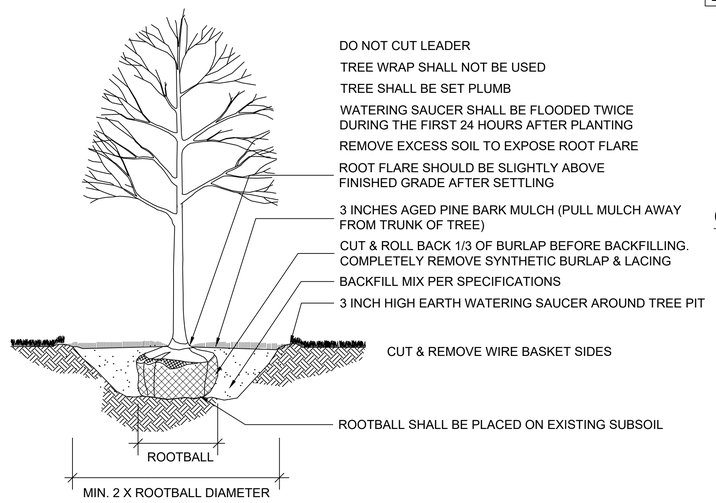
LANDSCAPING DETAILS

608460_HD37-38 (MISC DETAILS).DWG Plotted on 30-May-2025 11:46 AM



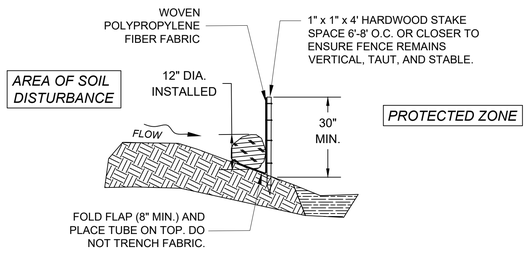
COMPOST FILTER TUBE STACKED

NOT TO SCALE



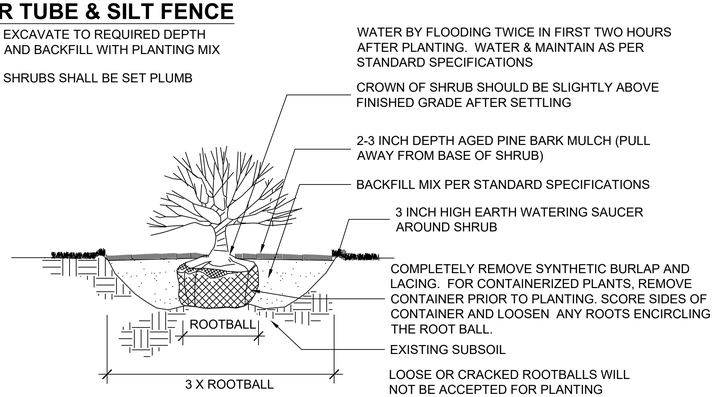
DECIDUOUS TREE PLANTING

NOT TO SCALE



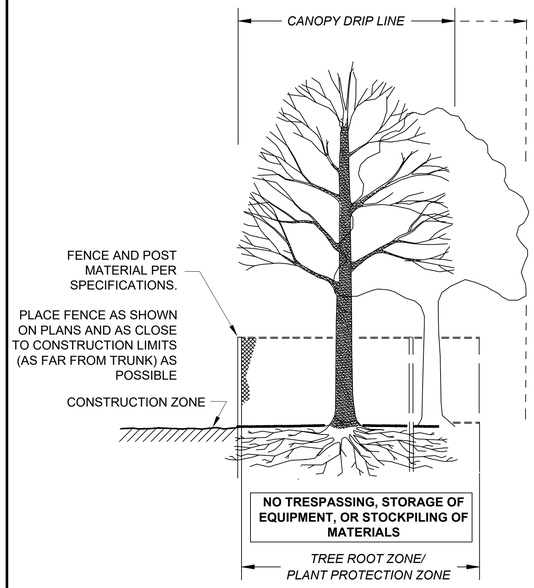
COMPOST FILTER TUBE & SILT FENCE

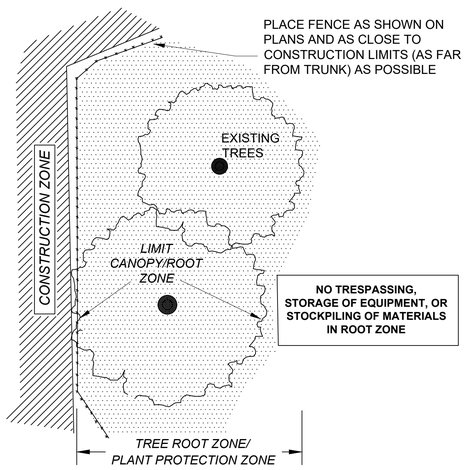
NOT TO SCALE



SHRUB PLANTING

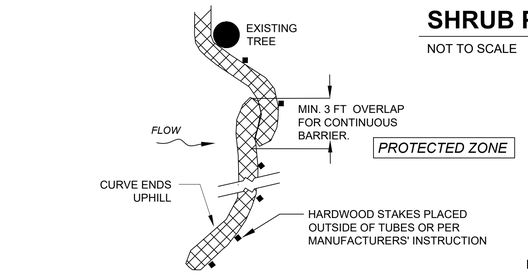
NOT TO SCALE

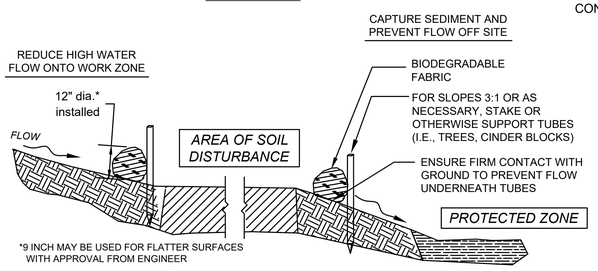




TREE PROTECTION - ROOT ZONE

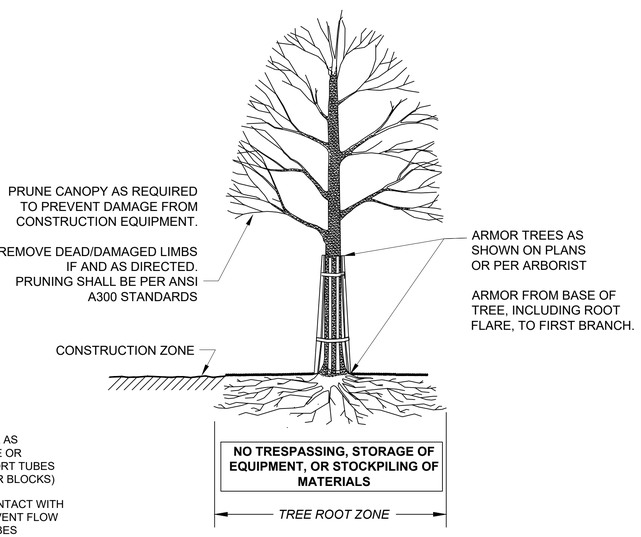
NOT TO SCALE





SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE



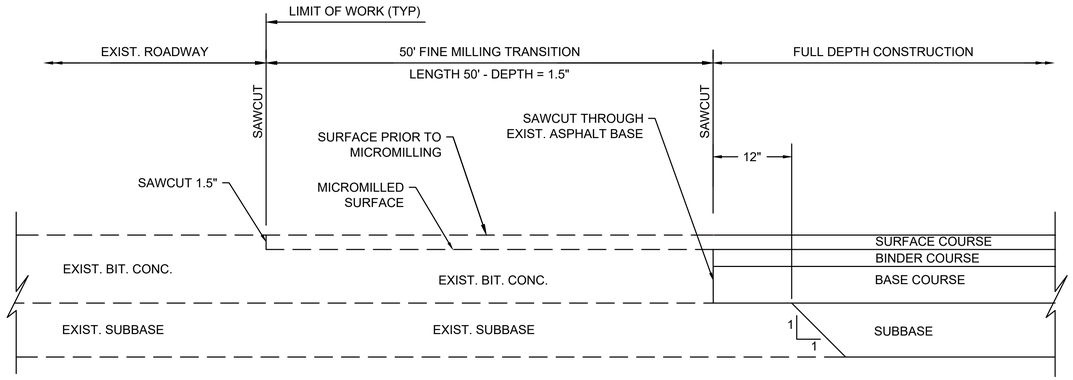
TREE PROTECTION - TRUNK

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

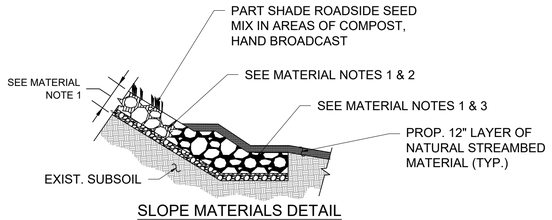
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	41	85
PROJECT FILE NO.	608460		

MISCELLANEOUS DETAILS

608460_HD37-38 (MISC DETAILS).DWG Plotted on 30-May-2025 11:46 AM



PAVEMENT TRANSITION DETAIL
NOT TO SCALE



SLOPE MATERIALS DETAIL
NOT TO SCALE

MATERIAL NOTES:

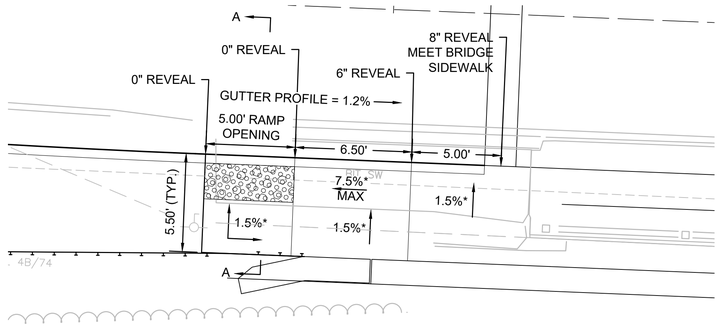
1. PROP. 3'-0" LAYER OF RIPRAP (M2.02.0) OVER 12" LAYER OF CRUSHED STONE OVER GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL
2. AT ELEVATIONS HIGHER THAN THE OHW/BANK LINE, OR TERRESTRIAL WILDLIFE PASSAGE (WHERE PRESENT), MODIFIED ROCKFILL SHALL BE APPLIED OVER RIPRAP SUCH THAT MODIFIED ROCKFILL FILLS THE VOIDS AND IS 4" BELOW THE SURFACE OF THE STONES. COMPOST SHALL THEN BE PLACED OVER MODIFIED ROCKFILL TO AN ELEVATION AT OR SLIGHTLY BELOW THE TOP OF RIPRAP STONES. NOT ALL RIPRAP STONES WILL BE COMPLETELY COVERED. COMPOST IS NOT TO BE USED BELOW THE OHW/BANK LINE. PART SHADE ROADSIDE MIX SHALL BE HAND BROADCAST IN AREAS OF COMPOST.
3. AT ELEVATIONS LOWER THAN THE OHW/BANK LINE, OR AT TERRESTRIAL WILDLIFE PASSAGE (WHERE PRESENT), NATURAL STREAMBED MATERIAL SHALL BE PLACED TO FILL IN VOIDS IN THE RIPRAP TO CREATE A SMOOTH SURFACE PRIOR TO PLACEMENT OF 12" LAYER OF NATURAL STREAMBED MATERIAL OVER RIPRAP.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	42	85
PROJECT FILE NO.	608460		

MISCELLANEOUS DETAILS

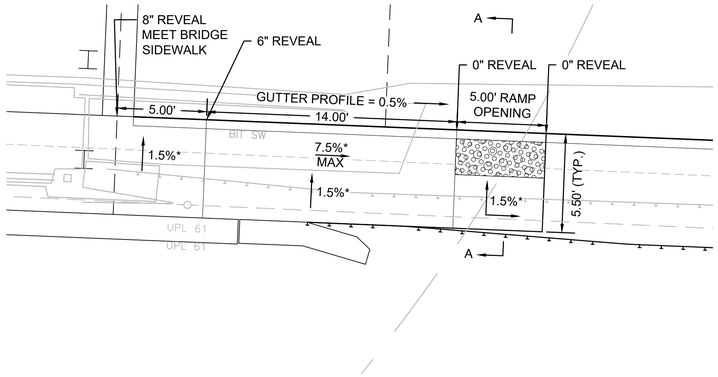
608460_HD37-38 (MISC DETAILS).DWG Plotted on 30-May-2025 11:46 AM



WHEELCHAIR RAMP 1

SCALE: 1" = 4'

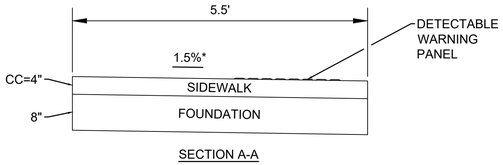
WCR REFERENCE POINT: STA 5+37.08 - OFFSET 17.00' RT
WIDTH OF CURB = 0.5'
* CONSTRUCTION TOLERANCE +/- 0.5%



WHEELCHAIR RAMP 2

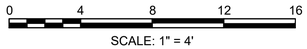
SCALE: 1" = 4'

WCR REFERENCE POINT: STA 7+02.11 - OFFSET 17.00' RT
WIDTH OF CURB = 0.5'
* CONSTRUCTION TOLERANCE +/- 0.5%

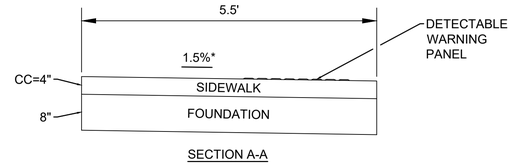


SECTION A-A

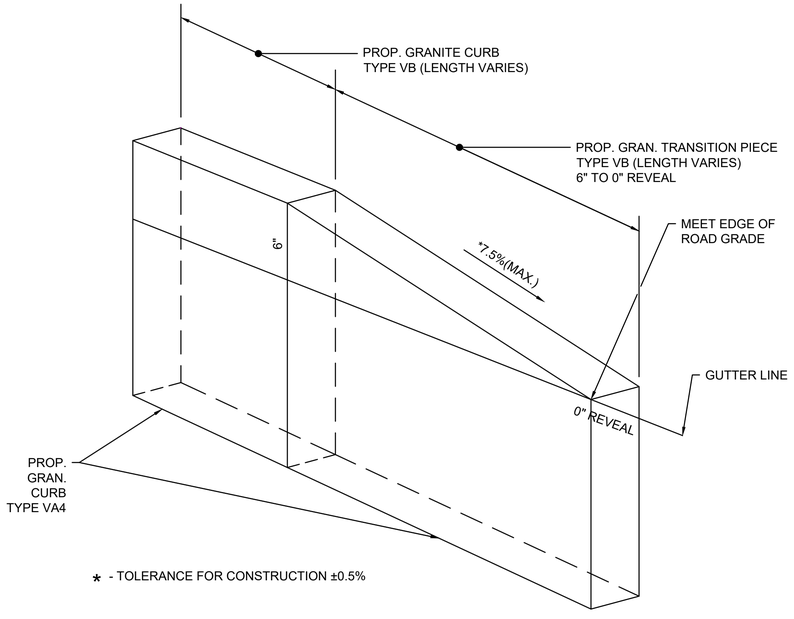
NOTE:
1. THE PERPENDICULAR DIMENSIONS TO THE CURB ALONG THE SIDEWALK INCLUDE 0.5' FOR THE WIDTH OF THE CURB.
2. WHEELCHAIR RAMP REFERENCE POINTS ARE TAKEN FROM THE BAY ROAD BASELINE TO THE GUTTER LINE AT THE CENTER OF RAMP OPENING.
3. DETECTABLE WARNING PANELS ARE REQUIRED ON ON ALL THE PROPOSED WHEELCHAIR RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARDS.



SCALE: 1" = 4'

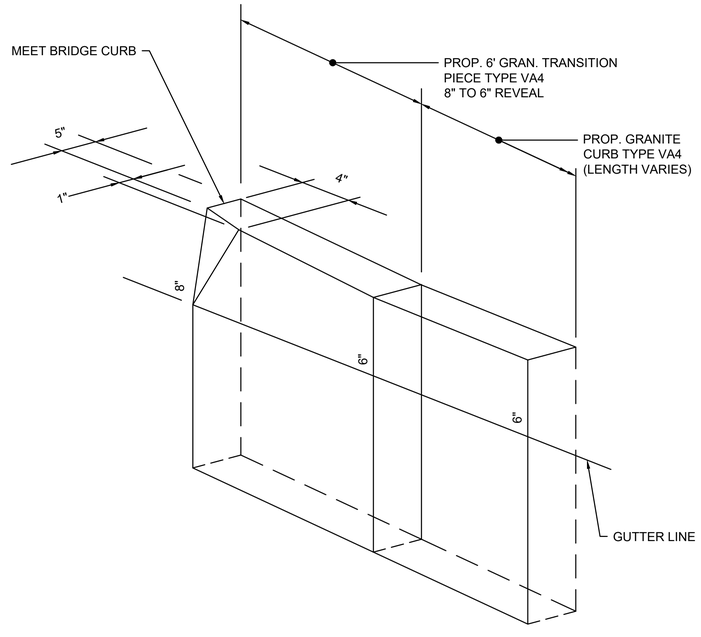


SECTION A-A



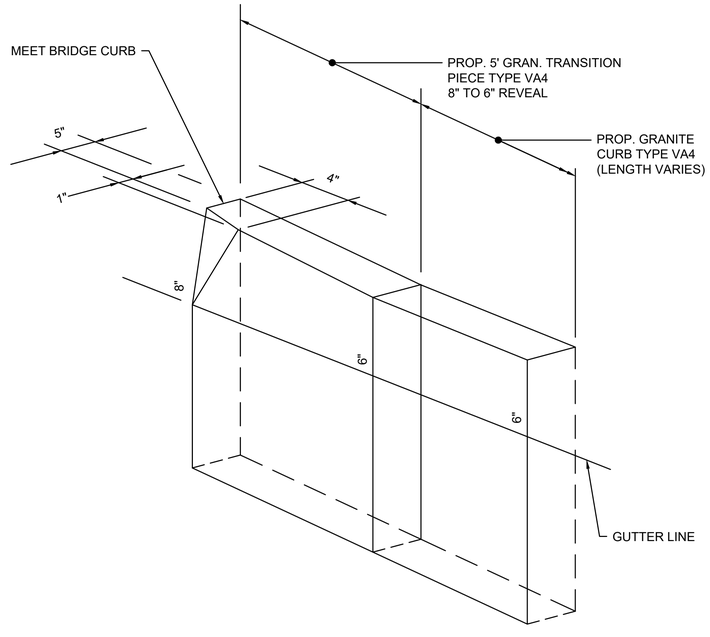
GRANITE CURB TRANSITION (6" TO 0" REVEAL)

NOT TO SCALE



6' GRANITE CURB TRANSITION (8" TO 6" REVEAL)

NOT TO SCALE



5' GRANITE CURB TRANSITION (8" TO 6" REVEAL)

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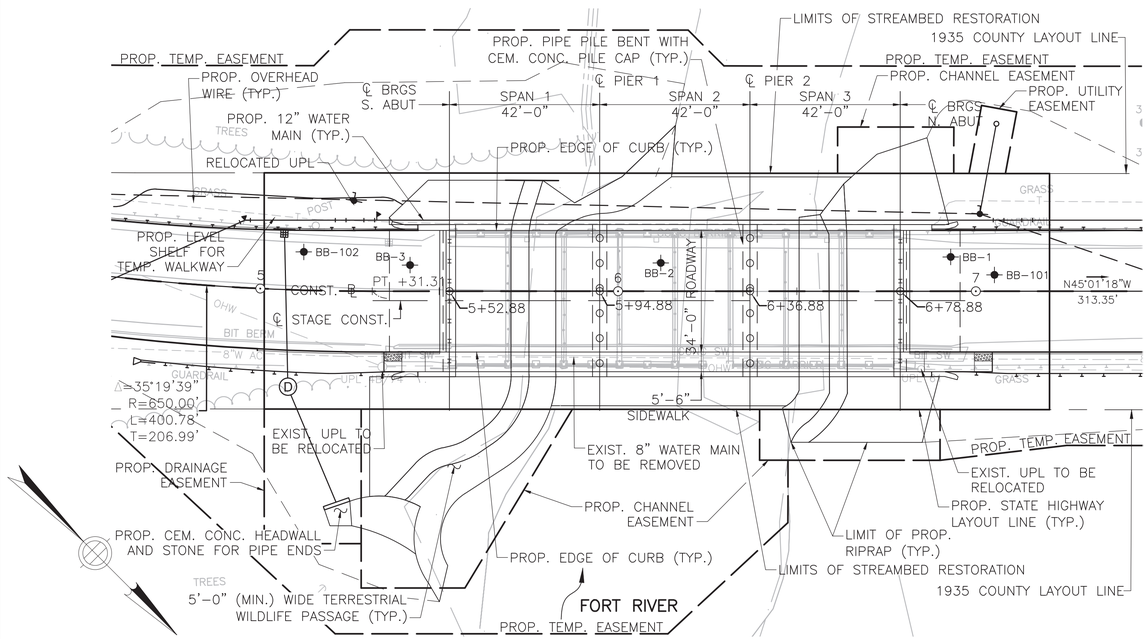
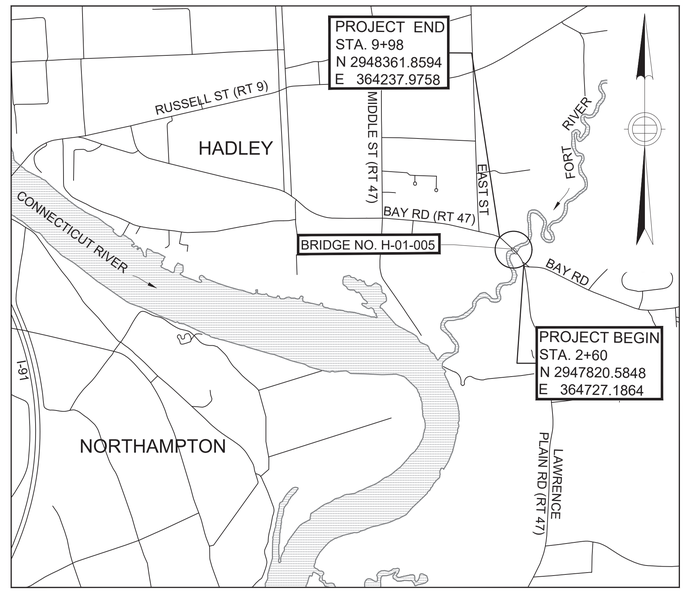


KEY PLAN

SCALE: 1"=20'



LOCUS MAP

SCALE: 1"=1500'

HADLEY
BAY RD (ROUTE 47)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	43	78
PROJECT FILE NO. 608460			

KEY PLAN, PROFILE & INDEX

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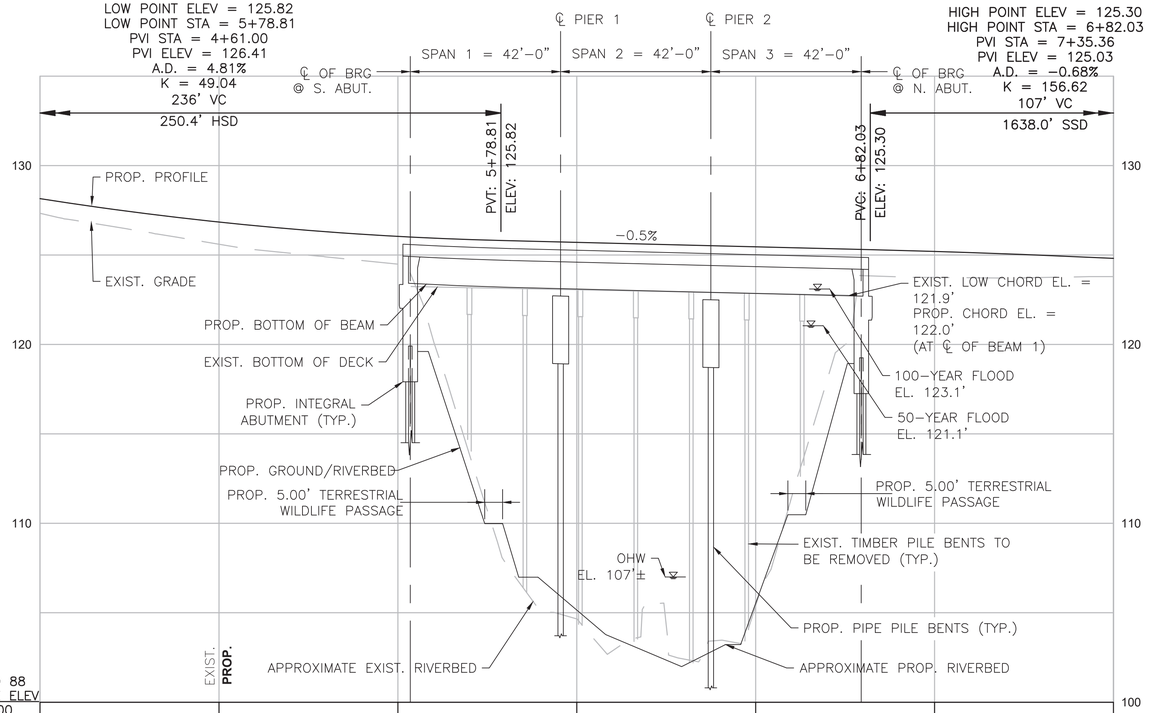
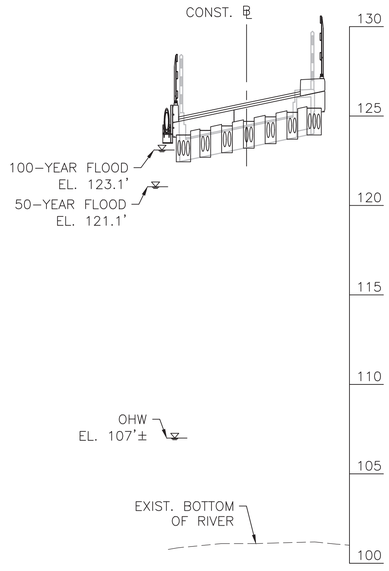


PROFILE – BAY ROAD (ROUTE 47)

HORIZONTAL: 1"=20'
VERTICAL: 1"=4'-0"



PROFILE – FORT RIVER

UNDER RTE 47 (BAY ROAD)
HORIZONTAL: 1"=20'
VERTICAL: 1"=4'-0"

COMMONWEALTH OF MASSACHUSETTS
FREDERICK CASSELLIUS
STRUCTURAL
No. 46877
REGISTERED PROFESSIONAL ENGINEER

Frederick Cassellius — Digitally signed by Frederick Cassellius Date: 2025.08.04 09:36:46 -04'00'

benesch
engineers • scientists • planners
50 REDFIELD STREET
BOSTON, MA 02122

APRIL 26, 2025 | ISSUED FOR CONSTRUCTION

MassDOT Massachusetts Department of Transportation Highway Division

PROPOSED BRIDGE
HADLEY
BAY ROAD (ROUTE 47)
OVER FORT RIVER
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

Alexander K. Bardow, P.E. — Digitally signed by Alexander K. Bardow, P.E. Date: 2025.08.04 11:43:04 -04'00'
STATE BRIDGE ENGINEER

Carrie Lavallee, P.E. — 2025.08.04 16:12:55 -04'00'
CHIEF ENGINEER

SHEET 1 OF 38 SHEETS BRIDGE NO. H-01-005 (C1H)

608406_KEY PLAN PROFILE & INDEX.DWG Plotted on 18-Jul-2025 2:56 PM

MassDOT DWT Name: MassDOT_Bridge Sheets
MassDOT DWT Version: v2023
MassDOT CAD Standard Release: r5.1
Release Date: September 2023

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	44	85
PROJECT FILE NO.	608460		

GENERAL NOTES
& QUANTITIES

GENERAL NOTES:

DESIGN:
IN ACCORDANCE WITH THE 2017 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION FOR HL–93 LOADING.

EXISTING BRIDGE PLANS:
PLANS FOR EXISTING BRIDGE MAY BE SEEN AT THE OFFICE OF THE BRIDGE ENGINEER, MASSDOT, 10 PARK PLAZA, BOSTON, MASSACHUSSETTS.

EXISTING CONDITIONS:
DIMENSIONS SHOWN ON EXISTING DETAILS ARE TAKEN FROM ORIGINAL DESIGN DRAWINGS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENTS AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY, THEREOF.

MASSDOT BENCH MARK AND ELEVATIONS:
HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED BY MASSDOT SURVEY, IN MASSDOT DISTRICT 2 FIELD BOOK 41273, PAGE 86, ON JULY 6, 2017. HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD83 (2011) EPOCH 2010.0000, VERTICAL DATUM IS NAVD 88 (COMPUTED USING GEOID12B) USING THE FOLLOWING CONTROL POINTS:

POINT	GRID NORTHING	GRID EASTING	ELEVATION	COMBINED GROUND TO GRID SCALE FACTOR
9 YC	2937327.18	358584.75	118.11	1.000035007344
448 H	2959132.00	348529.15	154.41	1.000034373289

MASSDOT ESTABLISHED THE FOLLOWING POINTS FOR THIS PROJECT:

POINT	GRID NORTHING	GRID EASTING	ELEVATION	DESCRIPTION
1933	2947789.42	364780.56	139.35	HUB AND TACK FOUND
1934	2947702.87	365166.90	155.65	IRON ROD FOUND

DATE:
TO BE PLACED ON THE INSIDE FACE OF THE NORTHWEST AND SOUTHEAST HIGHWAY GUARDRAIL TRANSITIONS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED. ALL HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

SURVEY:
FIELD SURVEY WAS PERFORMED BY GREEN INTERNATIONAL AFFILIATES, INC. AND WAS ELECTRONICALLY RECORDED. SEE FIELD NOTES IN MASSDOT DISTRICT 2 FIELD BOOKS 26994 AND 41263.

THE BASE MAP WAS COMPILED FROM AN ACTUAL–ON–THE–GROUND TOPOGRAPHIC SURVEY PERFORMED BETWEEN JUNE 19, 2017 AND SEPTEMBER 15, 2017.

SCALES:
SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF–SIZED PRINTS (A3).

FOUNDATIONS:
FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.

UNSUITABLE MATERIAL:
ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

SEISMIC GROUND SHAKING HAZARD:
DESIGN RETURN PERIOD: 1,000–YEAR
DESIGN SPECTRA: A_S = 0.094
S_{DS} = 0.209
S_{D1} = 0.093
SITE CLASS = D
SEISMIC DESIGN CATEGORY (SDC) = A

GEOTECHNICAL REPORT
REFER TO GEOTECHNICAL REPORT, DATED JULY 28, 2020, PREPARED BY GZA GEOENVIRONMENTAL, INC.

CONFIRMATORY BORING LOGS BB–101 AND BB–102 DATED 04/03/2025 – 04/16/2025 PROVIDED FOR SUPPLEMENTAL INFORMATION.

REINFORCEMENT:
REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31, GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS
1. NONE	21"	26"
2. 12" OF CONCRETE BELOW BAR	29"	36"
3. COATED BARS, COVER < $3d_b$, OR CLEAR SPACING <$6d_b$	31"	39"
4. COATED BARS, ALL OTHER CASES	25"	31"
5. CONDITION 2. AND 3.	35"	44"
6. CONDITION 2. AND 4.	34"	43"

IF THE ABOVE BARS ARE SPACED 6" OR MORE ON CENTER, THE LAP LENGTH SHALL BE 80% OF THE LAP LENGTH GIVEN ABOVE. ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

EPOXY COATED BARS:
ALL REINFORCING BARS AND SUPPORTING DEVICES SHALL BE EPOXY COATED UNLESS NOTED OTHERWISE.

WELDING:
ALL WELDING AND THE PREPARATION AND ASSEMBLY OF MATERIAL FOR WELDING SHALL CONFORM TO THE STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES, THE BRIDGE WELDING CODE (ANSI/AASHTO/AWS D1.5) AND ALL INTERIM REVISIONS PUBLISHED BY AASHTO AS OF BID OPENING DATE.

UTILITIES:
ALL EXISTING UTILITIES SHALL BE LOCATED AND PROTECTED BY THE CONTRACTOR.

TRAFFIC:
ONE LANE OF ALTERNATING TRAFFIC IS TO BE MAINTAINED DURING CONSTRUCTION OF BRIDGE NO. H–01–005 (C1H) AS SHOWN ON HIGHWAY TEMPORARY TRAFFIC CONTROL PLANS.

TEMPORARY OVERNIGHT CLOSURES OF THE BRIDGE FOR BEAM ERECTION AND OTHER CONSTRUCTION ACTIVITIES MAY BE PERMITTED BY THE ENGINEER. CONTRACTOR SHALL REFER TO DETOUR PLAN IN HIGHWAY DRAWINGS.

CONSTRUCTION NOTES:
NO DEBRIS OR CONSTRUCTION MATERIAL SHALL BE SPILLED OR DUMPED INTO THE FORT RIVER DURING CONSTRUCTION.

CONCRETE MIXES:
UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 5000 HP CONCRETE.

ALL CIP AND PRECAST CONCRETE POURS SHOWN ON THESE CONSTRUCTION DRAWINGS WHERE ALL VOLUMETRIC DIMENSIONS ARE 4 FEET OR GREATER SHALL BE CONSIDERED TO BE MASS CONCRETE PLACEMENTS AND SHALL REQUIRE A HEAT OF HYDRATION ANALYSIS AND THERMAL CONTROL PLAN, AS SPECIFIED IN THE MASSDOT STANDARD SPECIFICATIONS.

HYDRAULIC DESIGN DATA
DRAINAGE AREA: 54.6 SQUARE MILES
DESIGN FLOOD DISCHARGE: 3,460 CUBIC FEET PER SECOND
DESIGN FLOOD FREQUENCY: 50 YEARS
DESIGN FLOOD VELOCITY: 2.27 FEET PER SECOND
DESIGN FLOOD ELEVATION: 121.11 FEET, NAVD

BASE (100–YEAR) FLOOD DATA
BASE FLOOD DISCHARGE: 4,080 CUBIC FEET PER SECOND
BASE FLOOD ELEVATION: 123.10 FEET, NAVD

DESIGN AND CHECK SCOUR DATA
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY: 100–YEAR
DESIGN FLOOD ABUTMENT SCOUR DEPTH: 11.9FEET
DESIGN FLOOD PIER SCOUR DEPTH: 2.6 FEET
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY: 200–YEAR
CHECK FLOOD ABUTMENT SCOUR DEPTH: 13.2 FEET
CHECK FLOOD PIER SCOUR DEPTH: 2.6 FEET

FLOOD OF RECORD
DISCHARGE: NOT AVAILABLE
FREQUENCY (IF KNOWN): NOT AVAILABLE
MAXIMUM ELEVATION: NOT AVAILABLE
DATE: MARCH 1936
HISTORY OF ICE FLOES: NONE DOCUMENTED IN NBIS DATABASE.
EVIDENCE OF SCOUR AND EROSION: AT THE UPSTREAM ENDS OF BENTS 3, 4 & 5 SHOWN IN UNDERWATER INSPECTION REPORT, MINOR SCOUR HAS EXPOSED THE TIMBER PILES BELOW THE STEEL JACKET.

ESTIMATE OF BRIDGE QUANTITIES
(NOT GUARANTEED)

DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. H–01–005	1	LS
REINFORCED CONCRETE EXCAVATION	15	CY
TIMBER PILE REMOVE AND DISCARD	81	EA
BRIDGE EXCAVATION	515	CY
CHANNEL EXCAVATION	1,500	CY
CLASS B ROCK EXCAVATION	150	CY
GRAVEL BORROW FOR BRIDGE FOUNDATION	235	CY
CRUSHED STONE	450	TON
SUPERPAVE BRIDGE SURFACE COURSE–9.5(SSC–B–9.5)	45	TON
SUPERPAVE BRIDGE PROTECTIVE COURSE–9.5(SPC–B–9.5)	45	TON
STEEL PILE HP 12 X 84	900	FT
STEEL PIPE PILE 24 INCH OUTSIDE DIAMETER	730	FT
SHORT DURATION LOAD TEST	1	EA
DYNAMIC LOAD TEST PREPARATION	5	EA
DYNAMIC LOAD TEST BY CONTRACTOR	5	EA
PILE SHOES	27	EA
TEMPORARY EARTH SUPPORT SYSTEMS	800	SF
RIPRAP	750	CY
STREAMBED RESTORATION	175	CY
CONTROL OF WATER – STRUCTURE NO. H–01–005	1	LS
TEMPORARY WALKWAY STRUCTURE	1	LS
BRIDGE STRUCTURE, BRIDGE NO. H–01–005	1	LS

DATE	DESCRIPTION
APRIL 26, 2025	ISSUED FOR CONSTRUCTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR02 (H-01-005)_GENERAL NOTES.DWG Plotted on 21-Jul-2025 12:04 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

BB–1

TEST BORING LOG

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MassDOT/Benesch
Bay Road (Route 47) over Fort River
Hadley, Massachusetts

BORING NO.: BB-1
SHEET: 1 of 2
PROJECT NO: 01.0173284.00
REVIEWED BY: STS

Drilling Co.: Seaboard Drilling
Foreman: Jeff Nitsch
Logged By: Max Rolandi

Type of Rig: Truck Mounted
Rig Model: Mobile B-47
Drilling Method: Drive & Wash

Boring Location: N: 2948153.8, E: 364459.1
Ground Surface Elev. (ft.): 125
Final Boring Depth (ft.): 66
Date Start - Finish: 10/31/2017 - 11/1/2017

H. Datum: NAD 88
V. Datum: NAVD 88

Auger/Casing Type: HW
I.D/O.D. (in): 4.25/4.5
Hammer Weight (lb.): 300
Hammer Fall (in.): 30
Other:

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Automatic Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
11/1/17	0844	16.5	41	18 hrs.

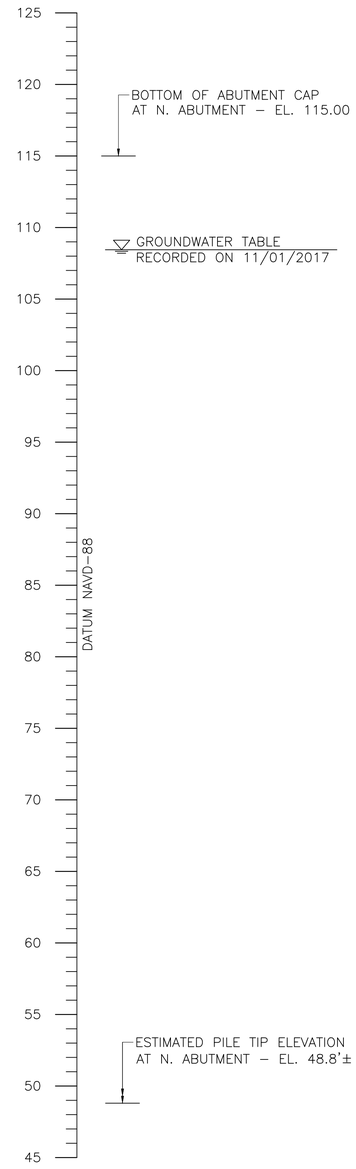
Depth (ft)	Casing Blows/ Core Rate (min/ft)	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.75'	PAVEMENT	124.3'
		S-1	0.8-2.8	24	12	10 11 8 8	19	S-1: Medium dense, brown, fine SAND, little Silt.	1				
		S-2	2.8-4.8	24	12	6 4 4 3	8	S-2: Loose, light brown, fine to medium SAND, some Silt, trace fine Gravel.	2				
5		S-3	5-7	24	7	6 5 9 9	14	S-3: Medium dense, brown, fine to medium SAND, little Silt, trace Gravel.					
		S-4	7-9	24	6	8 9 9 11	18	S-4: Medium dense, brown/gray, fine SAND, little Silt.				FILL	
10		S-5	9-11	24	6	6 3 2 3	5	S-5: Loose, light brown, fine SAND, some Silt.					
		S-6	11-13	24	5	4 4 3 5	7	S-6: Loose, light brown/gray, fine SAND, some Silt.					
15		S-7	14-16	24	9	3 1 1 3	2	S-7: Very loose, gray/brown, fine to medium SAND and SILT.			16'		109.0'
		S-8	16-18	24	11	4 5 11 12	16	S-8: Medium dense, gray, fine to medium SAND, little fine Gravel, trace Silt.			18'	SAND	107.0'
20									3			GRAVEL	
											22.5'		102.5'
25		S-9	24-26	24	10	7 8 7 7	15	S-9: Medium dense, reddish brown, fine to coarse SAND, little fine Gravel, trace Silt.				SAND	
											26'		97.0'
									4		29'	GRAVEL	96.0'
30		S-10	29-31	24	10	10 9 10 11	19	S-10: Medium dense, gray/red, fine to medium SAND, trace Silt, trace Gravel.				SAND	
35		S-11	34-36	24	9	9 9 9 11	18	S-11: Medium dense, gray/red, fine to medium SAND, trace Silt.				SAND	
											36'		87.0'
									5		39'	GRAVEL	86.0'
40		S-12	39-41	24	6	10 8 8 5	16	S-12: Medium dense, light brown/gray, fine to medium SAND, someSilt, trace fine Gravel.					
45		S-13	44-46	24	6	6 10 13 12	23	S-13: Medium dense, gray, fine to coarse SAND and GRAVEL, trace Silt.				SAND	
50		S-14	49-51	24	10	13 11 14 16	25	S-14: Medium dense, gray, fine to coarse SAND, little Silt.	6				
											53'		72.0'
55		S-15	54-56	24	10	30 21 19 25	40	S-15: Dense, gray, fine to coarse SAND and GRAVEL, little Silt.	7				
60		S-16	59-61	24	9	21 21 20 23	41	S-16: Dense, gray, fine to coarse SAND, some fine Gravel, little Silt.				SAND AND GRAVEL	
65		S-17	64-66	24	9	24 21 29 20	50	S-17: Very dense, gray, fine to coarse SAND and GRAVEL, trace Silt.			66'		59.0'
								Bottom of boring at 66 feet.	8				
70													

REMARKS

1. Ground surface elevation estimated based on available GIS data from a drawing entitled " Exploration Location Plan for Proposed Bridge Replacement in Hadley, MA" dated August 24, 2017.
2. Boring offsets: 6.5 feet northeast and 14 feet north of the northeast bridge guard rail inside edge.
3. Rig bouncing/chattering at 18 to 22.5 ft bgs during borehole washout indicating probable gravel layer.
4. Rig bouncing/grinding at 28 to 29 ft bgs during borehole washout indicating a probable gravel layer.
5. Rig bouncing/grinding at 38 to 39 ft bgs during borehole washout indicating a probable gravel layer.
6. Two inches of silt and sand in spoon tip of sample S-14.
7. Rig bouncing/grinding at 53 ft bgs during borehole washout indicating probable gravel layer.
8. Upon completion, borehole backfilled with cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-1



BB–2

TEST BORING LOG

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MassDOT/Benesch
Bay Road (Route 47) over Fort River
Hadley, Massachusetts

BORING NO.: BB-2
SHEET: 1 of 2
PROJECT NO: 01.0173284.00
REVIEWED BY: STS

Drilling Co.: Seaboard Drilling
Foreman: Doug Feeley
Logged By: Max Rolandi

Type of Rig: Truck Mounted
Rig Model: Mobile B-47
Drilling Method: Drive & Wash

Boring Location: N: 2948097.7, E: 364517.6
Ground Surface Elev. (ft.): 105.2
Final Boring Depth (ft.): 46
Date Start - Finish: 11/8/2017 - 11/8/2017

H. Datum: NAD 88
V. Datum: NAVD 88

Auger/Casing Type: HW
I.D/O.D.(in): 4.25/4.5
Hammer Weight (lb.): 300
Hammer Fall (in.): 30
Other:

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Automatic Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
	See	Note	7	

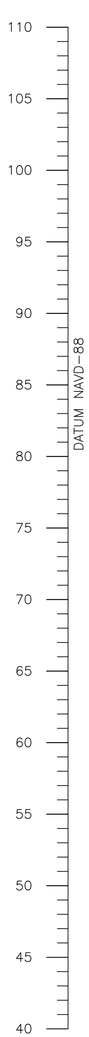
Depth (ft)	Casing Blows/ Core Rate (min/ft)	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	8	6 1 1 2	2	S-1: Very loose, brown, fine to coarse SAND, some fine Gravel, little Silt.	1				
									2				
									3			SAND	
5		S-2	4-6	24	4	3 4 5 6	9	S-2: Loose, red/brown, fine to coarse SAND, little fine Gravel, trace Silt.			7'		98.2'
									4		8'	GRAVEL	97.2'
10		S-3	8-10	24	5	3 6 5 7	11	S-3: Medium dense, brown, fine to coarse SAND, little fine Gravel, trace Silt.					
15		S-4	14-16	24	4	3 3 4 4	7	S-4: Loose, brown, fine to coarse SAND, little Silt, trace fine Gravel.					
20		S-5	19-21	24	10	3 6 7 9	13	S-5: Medium dense, reddish brown, fine to medium SAND, little Silt.				SAND	
25		S-6	24-26	24	12	5 6 10 10	16	S-6: Top 4" gray, fine to coarse SAND, little Silt. Middle 3" gray, fine SAND and SILT. Bottom 5" gray, fine to coarse SAND, little Silt.	5				
30		S-7	29-31	24	10	7 7 16 20	23	S-7: Medium dense, gray, fine SAND and SILT.			30'		75.2'
												SAND AND SILT	
											33'		72.2'
35		S-8	34-36	24	7	14 16 20 16	36	S-8: Dense, brown, fine to coarse SAND and fine to GRAVEL, trace Silt.	6			SAND AND GRAVEL	
									7				
40		S-9	39-41	24	7	10 16 13 17	29	S-9: Medium dense, gray, fine to coarse SAND and GRAVEL, little Silt.				SAND AND GRAVEL	
45		S-10	44-46	24	2	61 44 29 10	73	S-10: Very dense, red, fine GRAVEL and fine to coarse SAND, trace Silt.			46'		59.2'
								Bottom of boring at 46 feet.	8				
50													

REMARKS

1. Ground surface elevation estimated based on available GIS data from a drawing entitled " Exploration Location Plan for Proposed Bridge Replacement in Hadley, MA," dated August 24, 2017.
2. Driller cored through bridge deck prior to starting. Cored deck included 2 inches of asphalt plus 15 inches of reinforced concrete. Mudline was measured 20.3 feet below top of bridge deck. Sample depths are intended to be below the mudline.
3. Boring offsets: 70.5 feet north and 7 feet east of the south west bridge guard rail inside edge.
4. Rig bouncing from 7 to 8 feet below mudline indicating probable gravel layer.
5. 3-inch thick silt layer interbedded in S-6 between approximately 25.5 and 25.75 feet below mudline.
6. Rig bouncing/grinding at 33 feet below mudline. Fine sand and silt in wash water from 25 to 33 feet below mudline.
7. Boring drilled through the bridge deck, water in casing was approximately at the river level at the end of drilling.
8. Upon completion, borehole backfilled with cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-2



NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLANS THUS: BB–1
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A $1\frac{3}{8}$" I.D. SPLIT SPOON SAMPLER 6" WITH A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
6. BORINGS BB–1 THROUGH BB–3 WERE MADE IN OCTOBER AND NOVEMBER 2017. BORINGS BB–101 AND BB–102 WERE MADE IN APRIL 2025.
7. BORINGS BB–1 THROUGH BB–3 WERE MADE BY SEABOARD DRILLING, INC., P.O. BOX 3026, SPRINGFIELD, MA 01101. BORINGS BB–101 AND BB–102 WERE MADE BY NEW ENGLAND BORING CONTRACTORS, 40 FORDWAY STREET, DERRY, NH 03038.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

BORING DATA

SCALE: 1" = 5'–0"

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	45	85
PROJECT FILE NO.	608460		

BORING DATA I

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:04 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

BB–3

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

MassDOT/Benesch
Bay Road (Route 47) over Fort River
Hadley, Massachusetts

BORING NO.: BB-3
SHEET: 1 of 2
PROJECT NO: 01.0173284.00
REVIEWED BY: STS

Drilling Co.: Seaboard Drilling
Foreman: Jeff Nitsch
Logged By: Max Rolandi

Type of Rig: Truck Mounted
Rig Model: Mobile B-47
Drilling Method: Drive & Wash

Boring Location: N: 2948048.6, E: 364567.6
Ground Surface Elev. (ft.): 126
Final Boring Depth (ft.): 60
Date Start - Finish: 10/30/2017 - 10/31/2017

H. Datum: NAD 88
V. Datum: NAVD 88

Auger/Casing Type: HW
I.D/O.D.(in): 4.25/4.5
Hammer Weight (lb.): 300
Hammer Fall (in.): 30
Other:

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Automatic Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
11/1/17	0830	15	50	20 hrs.

Depth (ft)	Casing Blows/ Core Rate (min/ft)	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											1'	ASPHALT AND BASE	125.0'
		S-1	1-3	24	3	37 77 38 30	R	S-1: Very dense, brown, fine to medium SAND, some Gravel, trace Silt.	1				
		S-2	3-5	24	4	22 20 18 14	38	S-2: Dense, fine to medium SAND, little Silt, trace fine Gravel.	2				
5													
		S-3	7-9	24	0	3 3 2 2	5	S-3: No recovery. (Gravel in tip of splitspoon)	3				
		S-4	9-11	24	6	3 2 3 3	5	S-4: Loose, brown, fine SAND, little Silt, trace fine Gravel.				FILL	
10		S-5	11-13	24	6	3 4 4 4	8	S-5: Loose, brown, fine SAND, little Silt, trace fine Gravel.					
		S-6	13-15	24	8	4 4 5 6	9	S-6: Loose, brown, fine SAND, little Silt, trace fine Gravel.					
15		S-7	15-17	24	8	5 8 12 20	20	S-7: Medium dense, brown, fine SAND, little Silt, little fine Gravel.	5		16.9'		109.1'
		S-8	17-19	24	6	12 11 17 30	28	S-8: Medium dense, brown/gray, fine to coarse SAND and GRAVEL, trace Sit.					
20									6				
25		S-9	24-26	24	2	19 15 15 12	30	S-9: Dense, brown/gray, fine to coarse GRAVEL, some fine to coarse Sand, trace Silt.	7			SAND AND GRAVEL	
		S-10	28-30	24	8	37 10 9 9	19	S-10: Medium dense, gray/brown, fine to coarse SAND and fine GRAVEL, trace Silt.					
30											33'		93.0'
		S-11	33-35	24	2	5 4 7 8	11	S-11: Medium dense, gray, fine to medium SAND, some Silt.				SAND	
35													
		S-12	38-40	24	11	14 11 13 14	24	S-12: Medium dense, reddish gray, fine to medium SAND, trace Silt.				SAND	
40											43'		83.0'
		S-13	43-45	24	13	21 25 27 24	52	S-13: Top 6": reddish gray, fine SAND and SILT. Bottom 7": reddish gray, fine to coarse SAND and GRAVEL, little Silt.				SAND AND GRAVEL	
45											47'		79.0'
									8		48'	GRAVEL	78.0'
		S-14	48-50	24	10	51 24 22 21	46	S-14: Dense, reddish gray, fine to coarse SAND and GRAVEL, little Silt.					
50									9				
		S-15	53-55	24	3	39 19 19 20	38	S-15: Dense, brown/gray, fine to coarse GRAVEL and SAND, trace Silt.				SAND AND GRAVEL	
55													
		S-16	58-60	24	7	32 30 18 10	48	S-16: Dense, red, fine to medium SAND, some fine Gravel, little Silt.					
60											60'		66.0'
								Bottom of boring at 60 feet.	10				
65													

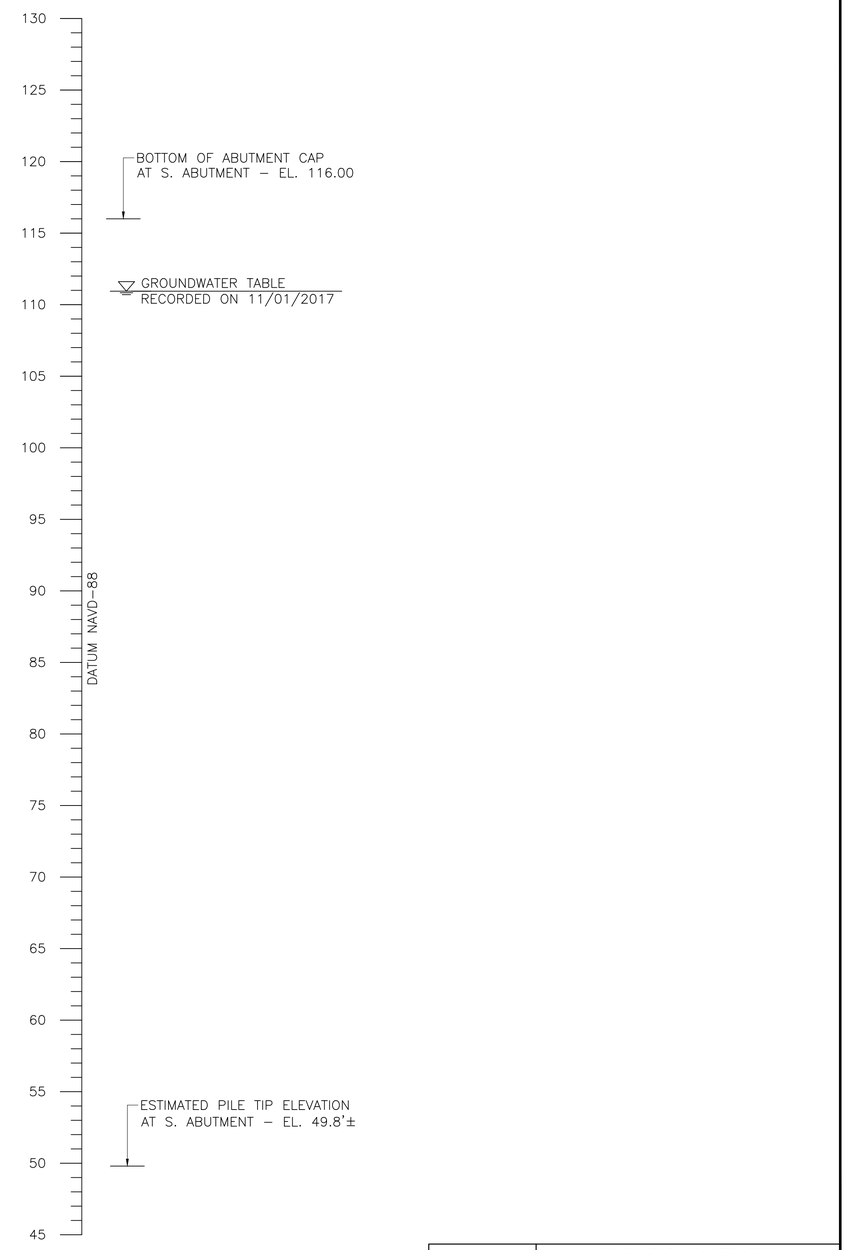
REMARKS

1. Ground surface elevation estimated based on available GIS data from a drawing entitled " Exploration Location Plan for Proposed Bridge Replacement in Hadley, MA" dated August 24, 2017.
2. Boring offsets: 7.9 feet east and 10.5 feet southeast of the south west bridge guardrail inside edge.
3. Piece of gravel caught between casing and rollerbit. Casing spinning during boring cleanout. Driller cleaned borehole down to 7 feet below ground surface (ft bgs) to clear the stuck gravel particles.
5. Bottom two inches of S-7 was sand and gravel.
6. Rig bouncing/grinding during wash from 20 to 24 ft bgs indicating a probable gravel layer.
7. Rig bouncing/grinding during wash from 24 to 28 ft bgs indicating a probable gravel layer.
8. Rig bouncing/grinding during wash from 47 to 48 ft bgs indicating a probable gravel layer.
9. Driller stopped on 10/30/17 at 50 ft bgs. Casing driving flush with ground surface. Drilling resumed on 10/31/17.
10. Upon completion, borehole backfilled with cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-3

BORING DATA
SCALE: 1" = 5'–0"



NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	46	85
PROJECT FILE NO.	608460		

BORING DATA II

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:04 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	47	85
PROJECT FILE NO.	608460		

BORING DATA III

NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

BB–101

TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. — Engineers and Scientists

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-101
SHEET: 1 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

Drilling Co.: New England Boring Contractors
Foreman: Mihn Pham
Logged By: Josh Hyslip

Type of Rig: Truck-Mounted
Rig Model: Mobile B-53
Drilling Method: Drive & Wash

Boring Location: North Abutment
Ground Surface Elev. (ft.): 125
Final Boring Depth (ft.): 139.5
Date Start - Finish: 4/3/2025 - 4/9/2025

H. Datum: NAD 83
V. Datum: NAVD 88
Northing: 2948166
Easting: 364454

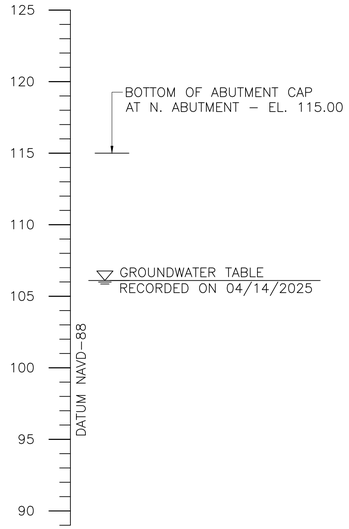
Auger/Casing Type: HW & PW
I.D./O.D.(in): 4/4.5 & 5/5.5
Hmr Weight (lb.): 140 & 300
Hmr Fall (in.): 30 & 24
Other: See Notes 8 and 12

Sampler Type: Split Spoon
I.D./O.D (in.): 1.375/2
Sampler Hmr Wt (lb.): 140
Sampler Hmr Fall (in): 30
Other: Automatic Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
		SEE NOTE 5		

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft)	Stratum Description	Stratum Elev. (ft)	Equipment Installed
0	42							SEE NOTE 2	1		0.4'	ASPHALT	124.6'	No Equipment Installed
	41								2					
	20							SEE NOTE 3	3					
5	31													
	48													
	54													
	52													
	50													
	49											FILL		
10	33													
	31													
	35													
	44													
	48													
15	59													
	31										16'		109.0'	
	33								4					
	40													
	68													
20	98								5					
	87													
	95													
	106													
	98													
25	84								6					
	40											SAND AND GRAVEL		
	44													
	52													
	57													
30	69													
	48													
	60													
	74													
	74													
35	97													



REMARKS

1. Ground surface elevation and coordinates estimated from an AutoCAD file entitled "608460_BR1-2(H01005)", provided by Alfred Benesch & Company, dated August 24, 2017.
2. Used 5-inch roller-cone bit to advance borehole through approximately 5-inch thick bituminous asphalt layer.
3. Used cased drive and wash drilling methods to advance borehole from the roadway to approximately 49 feet below ground surface (bgs) without collecting soil samples or performing Standard Penetration Tests (SPT). Stratum descriptions are interpreted from observing the drilling spoils in the wash, wash color and rate of casing advancement.
4. Observed organic fibers in the wash and the wash color changed from light brown to gray at approximately 16 feet bgs, indicating borehole advancement through probable historic ground surface.
5. Groundwater level was measured at Fort River from the top of the existing bridge on April 14, 2025 at 9:20am. The groundwater level at the river was at elevation 106.1 feet corresponding to approximately 18.9 feet bgs at the bridge boring BB-101 location. Groundwater level in the borehole is anticipated to be at or slightly higher than the river groundwater level due to use of wash water to advance the borehole but if given enough time to stabilize would probably stabilize at (or close to) the same elevation as the river.
6. The wash color changed from gray to brown at approximately 24 feet bgs.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-101

BB–101 (CONT'D)

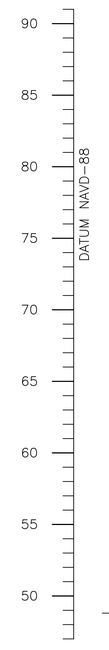
TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. — Engineers and Scientists

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-101
SHEET: 2 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft)	Stratum Description	Stratum Elev. (ft)	Equipment Installed
40	53													
	69													
	84													
	90													
	132													
	90													
	125													
	148													
45	150													
	170													
	77									7		SAND AND GRAVEL		
	69													
	65													
	69													
50	115	S-1	49-51	24	11	7 13 15 19	28	S-1: Medium dense, red to gray, fine to medium SAND, trace Silt.						
	65													
	82													
55	93	S-2	54-56	24	13	23 27 28 27	55	S-2: Very dense, red to gray, fine to coarse SAND and GRAVEL, trace Silt.		8 9 10	55'		70.0'	
		S-3	59-61	24	11	11 29 64 81	93	S-3A: (Top 3") Gray, fine to coarse SAND and GRAVEL, trace Silt. S-3B: (Bottom 8") Red to gray, fine to coarse SAND, little Gravel, trace Silt.						
60	48													
	61									11				
65	82	S-4	64-66	24	10	15 19 16 17	35	S-4: Dense, red to gray, fine to coarse SAND, little Gravel, trace Silt.				DENSE TO VERY DENSE SAND AND GRAVEL		
	76													
	70													
	75													
	85													
70	91	S-5	69-71	24	7	20 20 24 26	44	S-5: Dense, red to gray, fine to coarse SAND, some Gravel, trace Silt.						
75		S-6	74-76	24	9	21 21 33 34	54	S-6: Very dense, red to gray, fine to medium SAND, trace Gravel, trace Silt.		12				
	97													
	85													



REMARKS

7. Used polymer drilling slurry to advance the borehole before driving casing to sample depths from approximately 45 to 74 feet bgs. The borehole was washed again after driving casing to each sample depth and prior to performing SPT.
8. Used 140-lb auto-hammer to advance casing from the roadway surface to approximately 55 feet bgs and 300-lb safety driver thereafter.
9. Observed increased driving resistance to advance casing and the wash color changed from brown to grayish brown at approximately 55 feet bgs, indicating possible transition from sand and gravel to dense to very dense sand and gravel.
10. Observed significant drilling fluid loss to the formation at approximately 56 feet bgs.
11. The wash color changed from grayish brown to brown at approximately 63 feet bgs.
12. Drove PW casing to sample depths to approximately 75 feet bgs then telescoped HW casing through PW casing to sample depths from approximately 75 to 129 feet bgs.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-101

BORING DATA
SCALE: 1" = 5'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

BB–101 (CONT'D)

TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-101
SHEET: 3 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

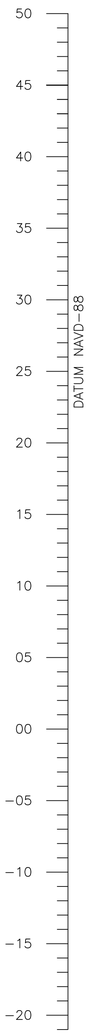
Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description	Depth (ft)	Elev. (ft)	Equipment Installed
80	126 96	S-7	79-81	24	12	25 35 23 23	58	S-7: Very dense, red to gray, GRAVEL, some fine to coarse Sand, trace Silt.			DENSE TO VERY DENSE SAND AND GRAVEL	82'	43.0'	
									13		POSSIBLE BOULDER	84'	41.0'	
85	39 60 53 58 52	S-8	84-86	24	9	8 10 13 16	23	S-8: Medium dense, red to gray, GRAVEL, some fine to coarse Sand, trace Silt.						
90	50	S-9	89-91	24	10	9 9 15 19	24	S-9: Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt.			SAND AND GRAVEL			
95														
												99'	26.0'	
100	72 48 87 75 81	S-10	99-101	24	9	16 34 26 31	60	S-10: Very dense, red to gray, GRAVEL, some fine to coarse Sand, trace Silt.						
105	80 89 77 90 82													
110	85	S-11	109-111	24	11	29 18 26 13	44	S-11: Dense, red to gray, Gravel, some fine to coarse Sand, trace Silt.	14		DENSE TO VERY DENSE SAND AND GRAVEL			
115	75 79 92 85													
120	70	S-12	119-121	24	11	26 29 24 25	53	S-12: Very dense, red to gray, GRAVEL, some fine to coarse Sand, trace Silt.						
125											DENSE TO VERY DENSE SAND AND GRAVEL	127'	-2.0'	
									15		WEATHERED BEDROCK	129.2'	-4.2'	
130	min:sec /ft 4:05 2:40 3:04 3:13	S-13 C-1	129-129.2 129.5-134.5	2 60	2 35	50/2"	R	S-13: Very dense, red to gray, fine to coarse SAND and Gravel, little Silt. (Severely Weathered Bedrock) C-1: Medium hard, moderately to severely weathered, coarse grained, gray/red/brown, SANDSTONE with very closely to closely spaced, horizontal to sub-horizontal, joints/fractures. REC.=58%, REQ=8%	16					
135	4:20 2:42 2:56 3:10 3:55 3:13	C-2	134.5-139.5	60	37			C-2: Soft to medium hard, moderately to moderately severely weathered, coarse grained, gray/red/brown, SANDSTONE with very closely to closely spaced, horizontal to sub-horizontal, joints/fractures. REC.=62%, RQD=50%.			BEDROCK			
									17			139.5'	-14.5'	
140									18					
145								Bottom of boring at 139.5 feet.						

REMARKS

13. Used roller-cone bit to advance the borehole through an approximately 2-foot boulder at approximately 82 feet bgs.
14. Used polymer drilling slurry to advance the borehole before driving casing to sample depths from approximately 109 to 129 feet bgs. The borehole was washed again after driving casing to each sample depth and prior to performing SPT.
15. Observed apparent roller-cone bit resistance to advance the borehole from approximately 127 to 129.5 feet bgs, indicating possible bedrock surface at approximately 127 feet bgs.
16. Used NX-sized core barrel to core from approximately 129.5 to 139.5 feet bgs with approximately 250 psi down pressure. Core rates are presented in minutes:seconds per foot cored.
17. Upon completion, the borehole was backfilled with drilling soils and the roadway surface was repaired with concrete and cold-patch asphalt.
18. Bridge Boring BB-101 was performed to supplement Bridge Boring BB-1 subsurface data.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-101



BORING DATA
SCALE: 1" = 5'–0"

NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	49	85
PROJECT FILE NO.	608460		

BORING DATA V

NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

BB–102

TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-102
SHEET: 1 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

Drilling Co.: New England Boring Contractors
Foreman: Minh Pham
Logged By: Josh Hyslip

Type of Rig: Truck-Mounted
Rig Model: Mobile B-53
Drilling Method: Drive & Wash

Boring Location: South Abutment
Ground Surface Elev. (ft.): 127
Final Boring Depth (ft.): 136
Date Start - Finish: 4/10/2025 - 4/16/2025

H. Datum: NAD 83
V. Datum: NAVD 88
Northing: 2948025
Easting: 364586

Auger/Casing Type: HW & PW
I.D./O.D (in): 4/4.5 & 5/5.5
Hmr Weight (lb.): 140 & 300
Hmr Fall (in.): 30 & 24
Other: See Notes 5 and 10

Sampler Type: Split Spoon
I.D./O.D (in.): 1.375/2
Sampler Hmr Wt (lb.): 140
Sampler Hmr Fall (in): 30
Other: Automatic Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
		SEE NOTE 6		

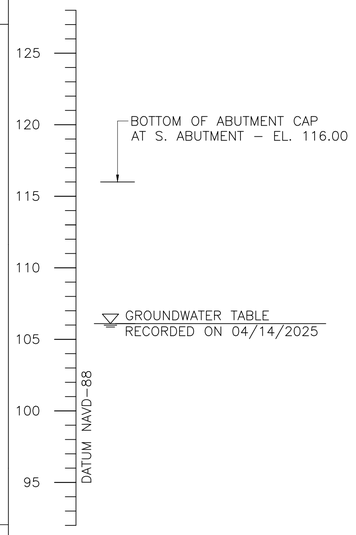
Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft)	Stratum Description	Stratum Elev. (ft)	Equipment Installed
								SEE NOTE 2	1		0.4'	ASPHALT	126.6'	No Equipment Installed
	105							SEE NOTE 3	2					
	37								3					
	25													
5	38													
	48													
	45													
	39											FILL		
	49													
10	25													
	58													
	45													
	44													
	56										14'		113.0'	
15	13								4					
	18								5					
	29													
	26													
	42													
20	47													
	42													
	34								6					
	45													
	53													
25	35											SAND AND GRAVEL		
	41													
	42													
	42													
	37													
30	34													
	47													
	40													
	44													
	51								7					
35	45													

REMARKS

1. Ground surface elevation and coordinates estimated from an AutoCAD file entitled "608460_BR1-2(H01005)", provided by Alfred Benesch & Company, dated August 24, 2017.
2. Used 5-inch roller-cone bit to advance borehole through approximately 5-inch thick bituminous asphalt layer.
3. Used cased drive and wash drilling methods to advance borehole from the roadway to approximately 49 feet below ground surface (bgs) without collecting soil samples or performing Standard Penetration Tests (SPT). Stratum descriptions are interpreted from observing the drilling spoils in the wash, wash color and rate of casing advancement.
4. Observed increased driving resistance to advance casing and the wash color changed from grayish brown to brown at approximately 14 feet bgs, indicating borehole advancement through probable historic ground surface.
5. Used 140-lb auto-hammer to advance casing from the roadway surface to approximately 14 feet bgs and 300-lb safety driver thereafter.
6. Groundwater level was measured at Fort River from the top of the existing bridge on April 14, 2025 at 9:20am. The groundwater level at the river was at elevation 106.1 feet corresponding to approximately 20.9 feet bgs at the bridge boring BB-102 location. Groundwater level in the borehole is anticipated to be at or slightly higher than the river groundwater level due to use of wash water to advance the borehole,but if given enough time to stabilize would probably stabilize at (or close to) the same elevation as the river.
7. Observed increased driving resistance to advance casing at approximately 33 feet bgs, indicating possible transition from sand and gravel to dense to very dense sand and gravel.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-102



BB–102 (CONT'D)

TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-102
SHEET: 2 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

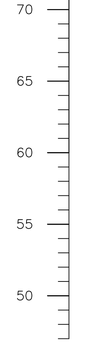
Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft)	Stratum Description	Stratum Elev. (ft)	Equipment Installed
	51													
	61													
	69													
	86													
40	37								8					
	36													
	39													
	60											SAND AND GRAVEL		
	87													
45	33													
	28													
	33													
	47													
	78										49'		78.0'	
50	26	S-1	49-51	24	13	21 23	46	S-1: Dense, red to gray, fine to coarse SAND and GRAVEL, trace Silt.						
	16					23 25								
	20													
	40													
	67													
55		S-2	54-56	24	8	12 17	44	S-2: Dense, red to gray, fine to coarse SAND, little Gravel, trace Silt.						
						27 36								
	49													
	55													
	77	S-3	59-61	24	5	14 42	R	S-3: Very dense, red to gray, fine to coarse SAND, little Gravel, trace Silt.	9					
60	42					59 72								
	98													
	121													
	125											DENSE TO VERY DENSE SAND AND GRAVEL		
65	117	S-4	64-66	24	0	6 6	11	S-4: No Recovery.						
						5 8								
70		S-5	69-71	24	12	8 14	31	S-5: Dense, red to gray, fine to coarse SAND, trace Silt.						
						17 23								
75		S-6	74-76	24	11	7 15	33	S-6: Dense, red to gray, fine to coarse SAND, trace Silt.	10					
						18 25								

REMARKS

8. Used polymer drilling slurry to advance the borehole before driving casing to sample depths from approximately 39 to 119 feet bgs. The borehole was washed again after driving casing to sample depth and prior to performing SPT.
9. Piece of gravel lodged in sample S-3 split spoon tip, possibly causing blows counts to be high.
10. Drove PW casing to sample depth to approximately 75 feet bgs then telescoped HW casing through PW casing to sample depth from approximately 75 to 119 feet bgs.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-102



BORING DATA
SCALE: 1" = 5'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:05 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

BB–102 (CONT'D)

TEST BORING LOG — MassDOT Project No.: 608460

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

Bay Road (Route 47) over Fort River
Bridge No. H-01-005 BIN 12J
Hadley, Massachusetts

BORING NO.: BB-102
SHEET: 3 of 4
PROJECT FILE NO: 01.0173284.00
REVIEWED BY: SKB

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description	Depth (ft)	Elev (ft)	Equipment Installed
80		S-7	79-81	24	10	16 18 33 41	51	S-7: Very dense, red to gray, fine to coarse SAND, little Gravel, trace Silt.						
85		S-8	84-86	24	8	24 30 21 18	51	S-8: Very dense, red to gray, GRAVEL, little fine to coarse Sand, trace Silt.						
90		S-9	89-91	24	11	17 23 23 21	46	S-9: Dense, red to gray, GRAVEL, some fine to coarse Sand, trace Silt.						
95	76 70 65 52 45													
100		S-10	99-100.4	17	7	16 24 82/5"	R	S-10: Very dense, red to gray, GRAVEL, little fine to coarse Sand, trace Silt.			DENSE TO VERY DENSE SAND AND GRAVEL			
105														
110		S-11	109-111	24	4	16 18 27 29	45	S-11: Dense, red to gray, Gravel, some fine to coarse Sand, trace Silt.						
115														
120		S-12	119-121	24	12	28 34 24 27	58	S-12: Very dense, red to gray, fine to coarse SAND and GRAVEL, trace Silt.			DENSE TO VERY DENSE SAND AND GRAVEL	124'	3.0'	
125	min:sec /ft								11		WEATHERED BEDROCK	126'	1.0'	
	3:19	C-1	126-131	60	52			C-1: Medium hard, moderately weathered, coarse grained, gray, SANDSTONE with closely spaced, horizontal, joints/fractures. REC.= 87%, RQD=48%	12					
	3:50													
	3:21													
130	4:05													
	3:13													
	3:25	C-2	131-136	60	55			C-2: Medium hard, moderately weathered, coarse grained, gray, SANDSTONE with moderately close to closely spaced, horizontal, joints/fractures. REC.= 92%, RQD=76%			BEDROCK			
	3:55													
	2:39													
135	3:02													
	3:17								13			136'	-9.0'	
								Bottom of boring at 136 feet.						
140									14					

REMARKS

11. Observed significant increase in roller-cone bit resistance to advance the borehole from approximately 124 to 126 feet bgs, indicating possible bedrock surface at approximately 124 feet bgs.
12. Used NX-sized core barrel to core from approximately 126 to 136 feet bgs with approximately 250 psi down pressure. Core rates are presented in minutes:seconds per foot cored.
13. Upon completion, the borehole was backfilled with drilling soils and filter sand and the roadway surface was repaired with concrete and cold-patch asphalt.
14. Bridge Boring BB-102 was performed to supplement Bridge Boring BB-3 subsurface data.

See log key for explanation of sample descriptions and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: BB-102

ESTIMATED PILE TIP ELEVATION AT S. ABUTMENT – EL. 49.8'±

50 45 40 35 30 25 20 15 10 05 00 −05 −10 −15

NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

BORING DATA
SCALE: 1" = 5'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

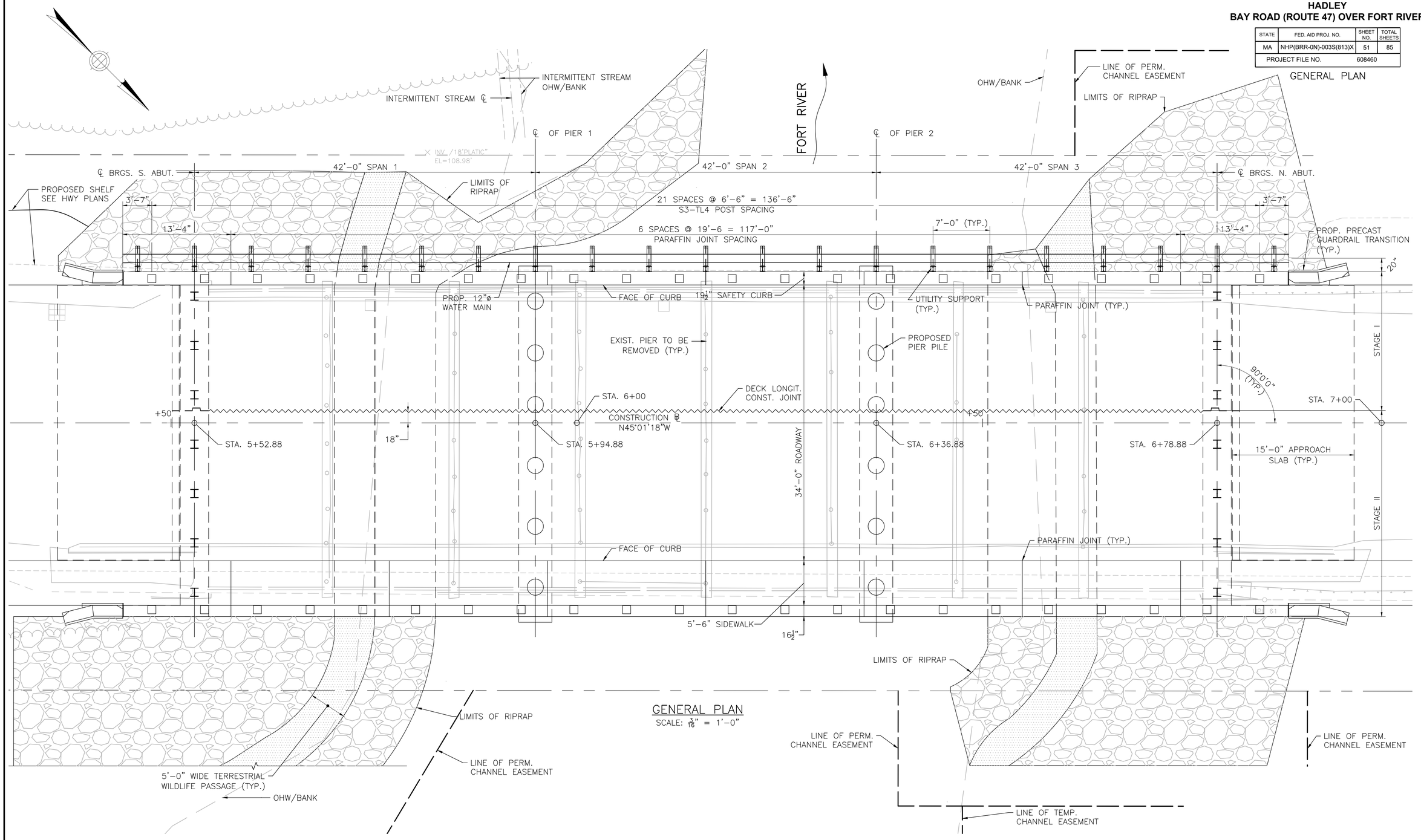
USE ONLY PRINTS OF LATEST DATE

608460_BR03-04 (H-01-005)_BORINGS.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	51	85
PROJECT FILE NO.	608460		

GENERAL PLAN



GENERAL PLAN
SCALE: $\frac{3}{16}$" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

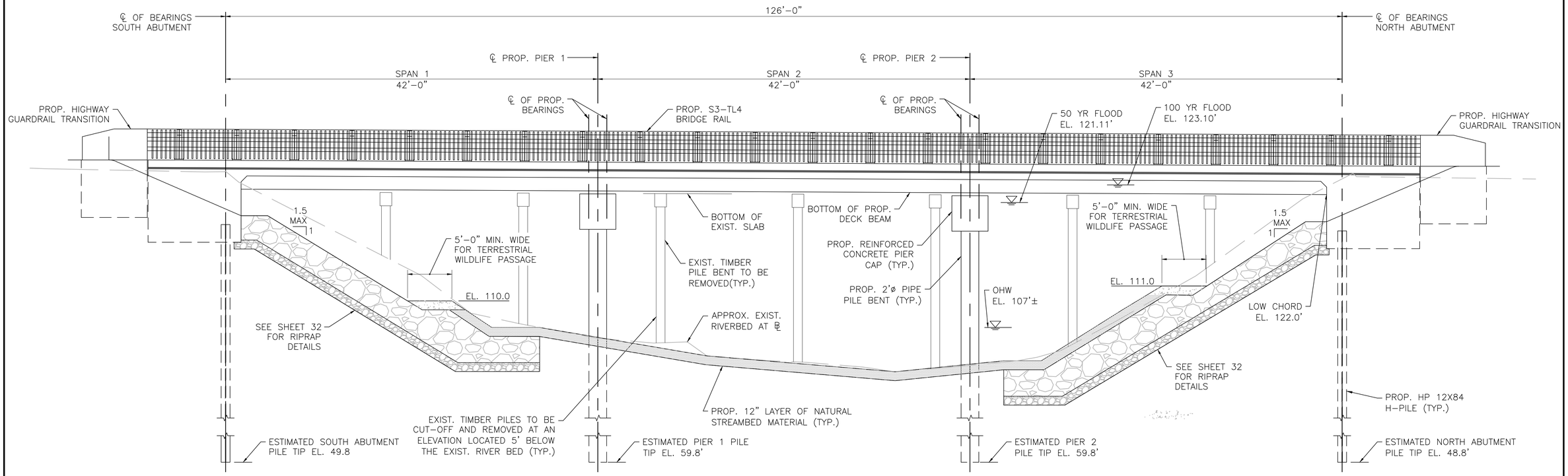
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR05 (H-01-005)_GENERAL PLAN.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	52	85
PROJECT FILE NO.	608460		

GENERAL ELEVATION



EAST ELEVATION
SCALE: $\frac{3}{16}$" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

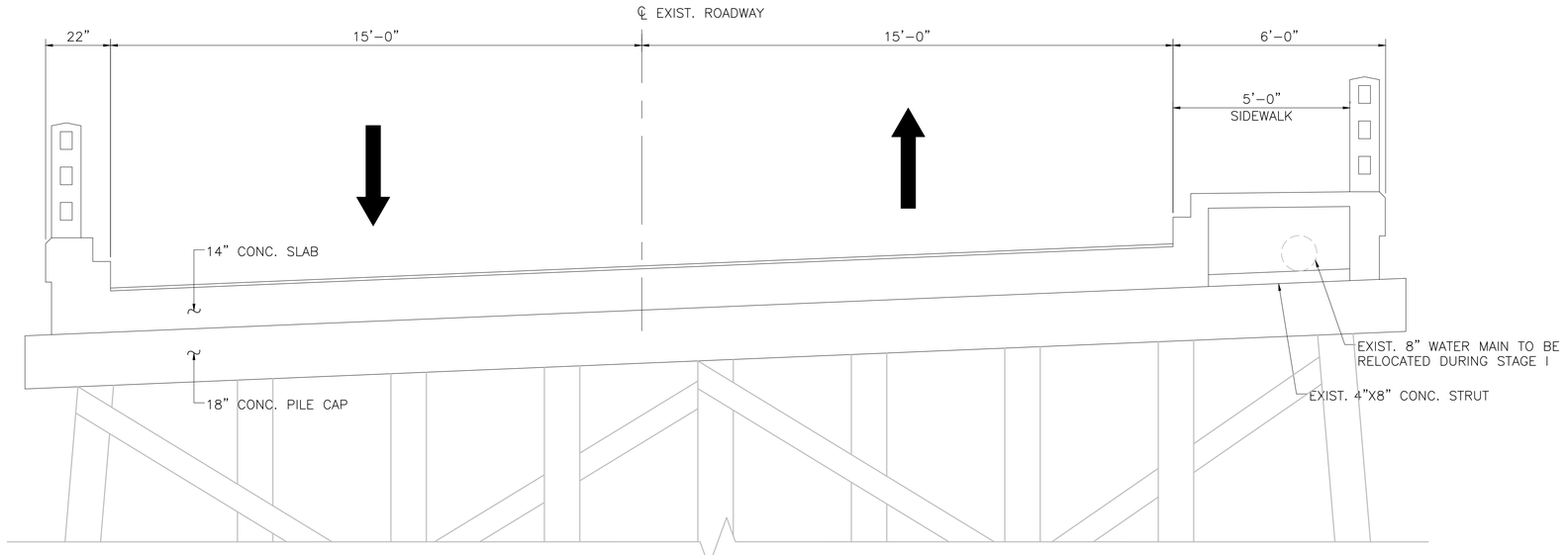
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR06 (H-01-005)_GENERAL ELEVATION.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

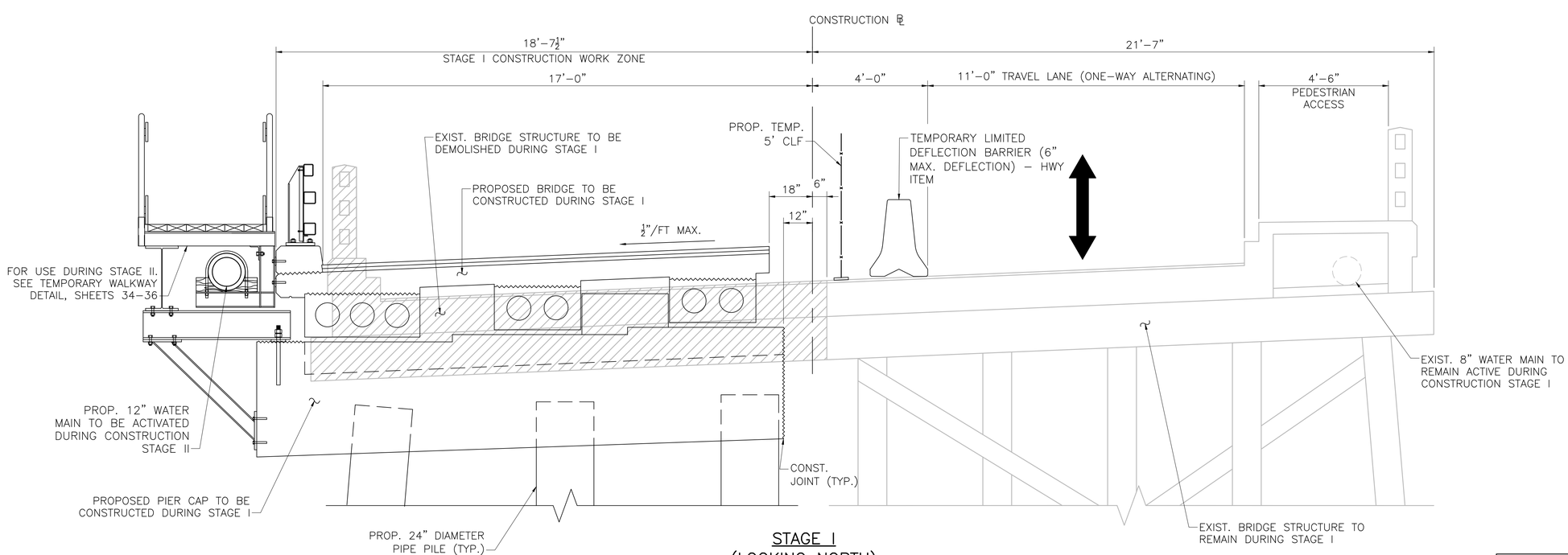
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	53	85
PROJECT FILE NO.	608460		

SEQUENCE OF BRIDGE CONSTRUCTION I



EXISTING BRIDGE CROSS SECTION
(LOOKING NORTH)

SCALE: ½" = 1'–0"



STAGE I
(LOOKING NORTH)

SCALE: ½" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

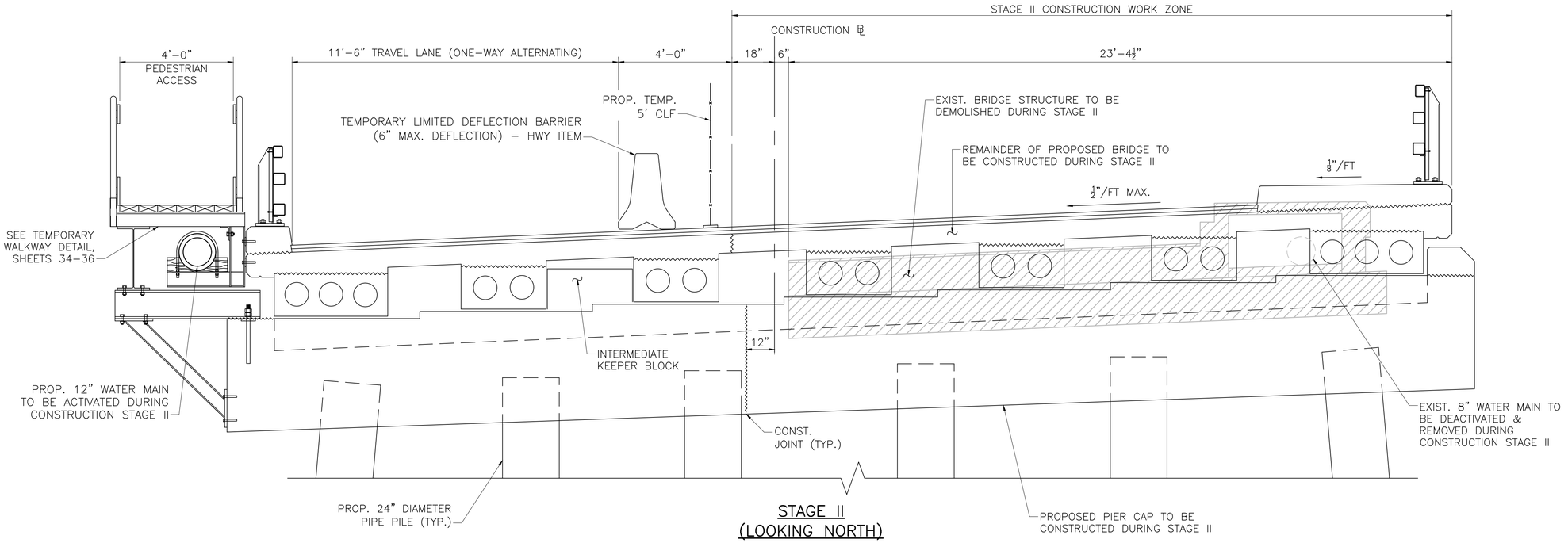
USE ONLY PRINTS OF LATEST DATE

608460_SEQUENCE OF BRIDGE CONSTRUCTION II.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

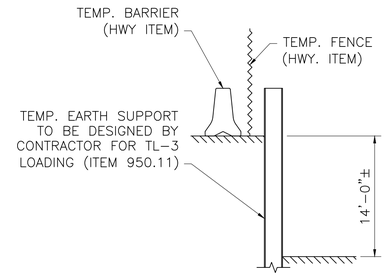
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	54	85
PROJECT FILE NO.	608460		

SEQUENCE OF BRIDGE CONSTRUCTION II



STAGE II
(LOOKING NORTH)

SCALE: ½" = 1'–0"



TEMP. EARTH SUPPORT DETAIL AT ABUTMENTS

NOT TO SCALE

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

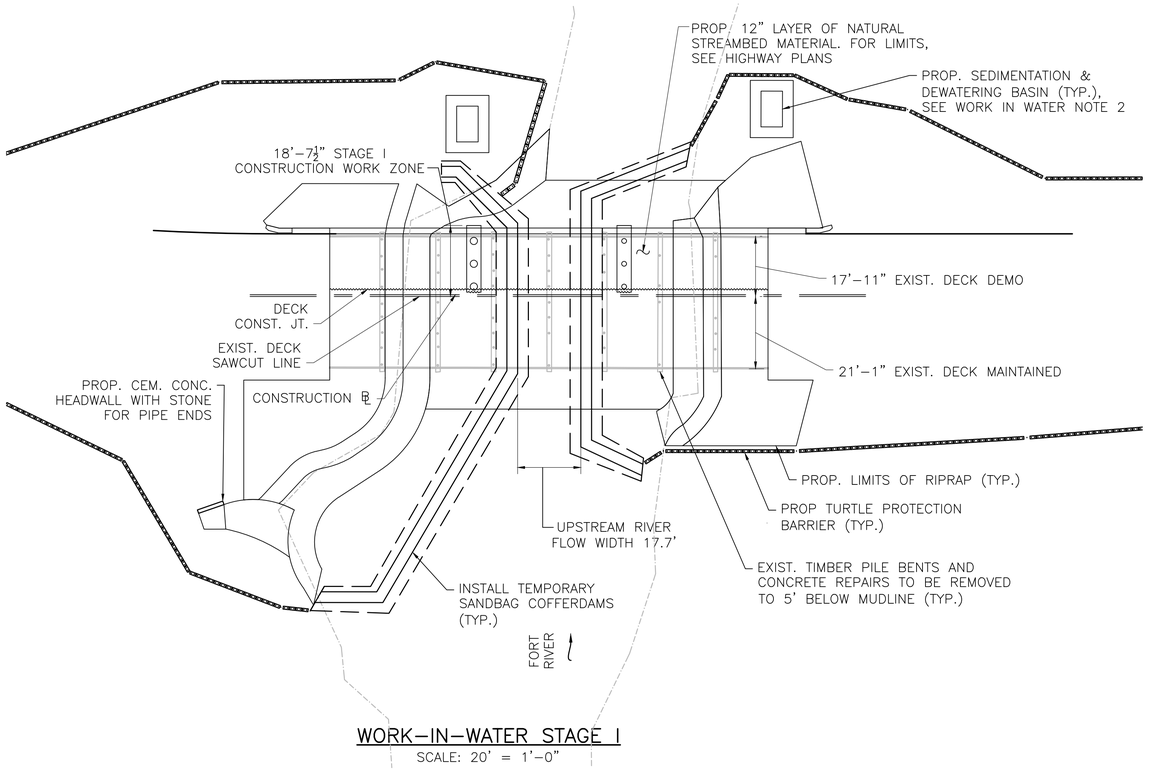
USE ONLY PRINTS OF LATEST DATE

608460_SEQUENCE OF BRIDGE CONSTRUCTION II.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

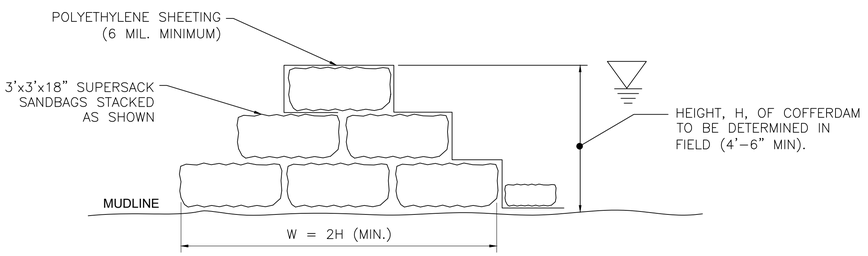
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	55	85
PROJECT FILE NO.	608460		

WORK–IN–WATER STAGE I



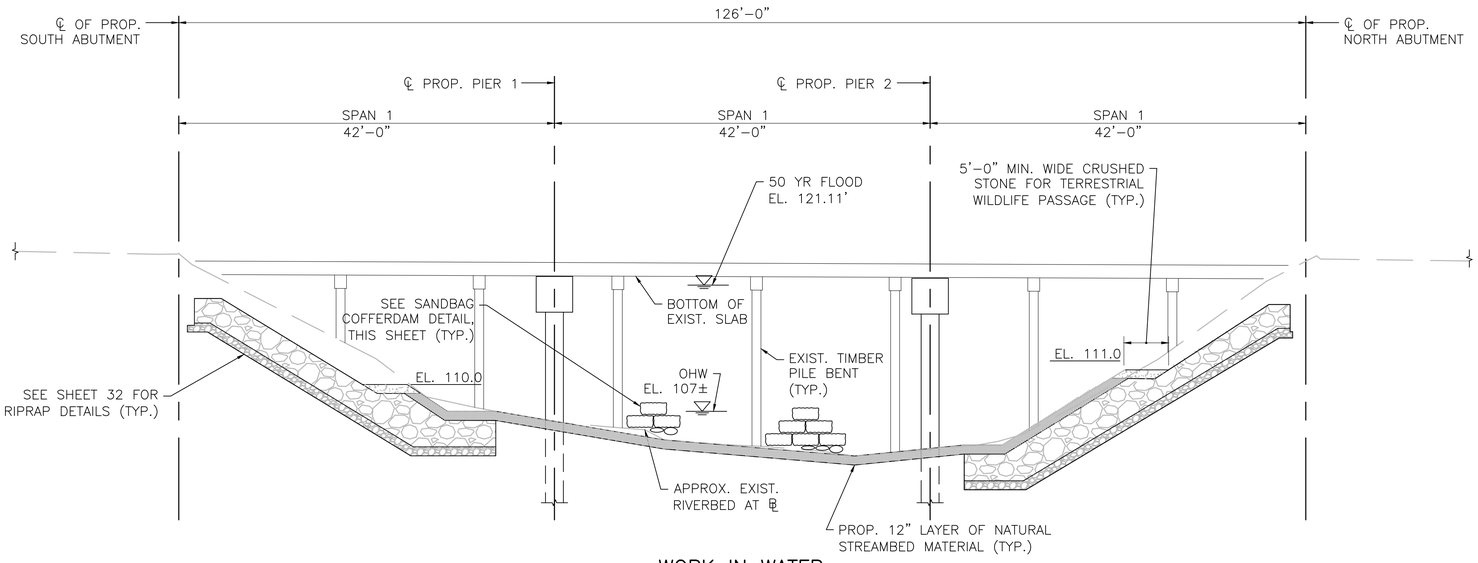
WORK–IN–WATER STAGE I
SCALE: 20' = 1'–0"



SANDBAG NOTES:

1. SANDBAG COFFERDAM IS TO BE CONSTRUCTED IN A PYRAMID SHAPE BASED ON THE REQUIRED HEIGHT AND NUMBER OF BAGS REQUIRED.
2. THE SANDBAGS ARE TO BE PLACED OVERLAPPING ALONG THE LENGTH OF THE COFFERDAM.

SANDBAG COFFERDAM DETAIL
NOT TO SCALE



WORK IN WATER
LONGITUDINAL SECTION – STAGE I
SCALE: ⅛" = 1'–0"

WORK-IN-WATER - STAGE I NOTES:

1. THIS WORK IN WATER PLAN IS TO BE IN PLACE DURING THE STAGE I AND STAGE II SEQUENCES OF CONSTRUCTION OF THE BRIDGE.
2. COFFERDAMS SHOWN AND LOCATIONS OF SEDIMENTATION & DEWATERING BASINS ARE CONCEPTUAL ONLY. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF WATER CONTROL METHODS FOR THE CONSTRUCTION OF THE PROPOSED PIERS AND THE REMOVAL OF THE EXISTING PIERS THAT ARE IN ACCORDANCE WITH THE PERMITTING REQUIREMENTS.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

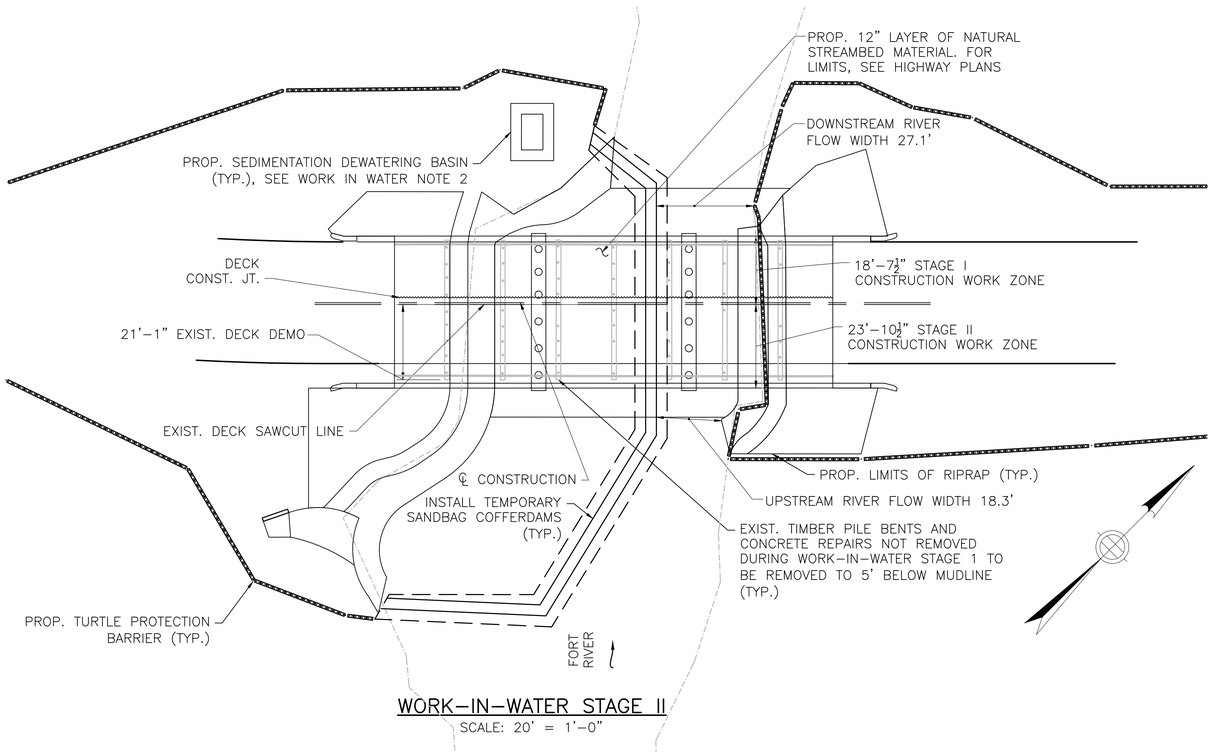
608460_WORK-IN-WATER STAGE II.DWG Plotted on 21-Jul-2025 12:05 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	56	85
PROJECT FILE NO.	608460		

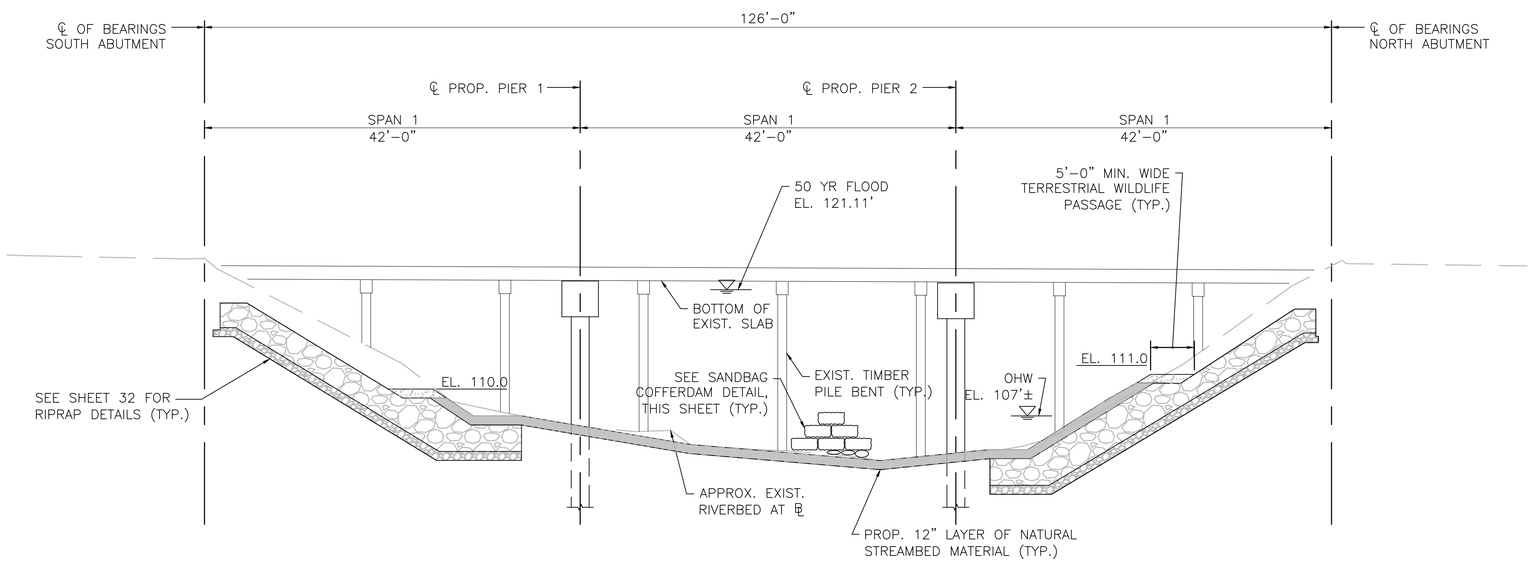
WORK–IN–WATER STAGE II



WORK–IN–WATER STAGE II
SCALE: 20' = 1'–0"

WORK-IN-WATER - STAGE II NOTES:

1. THIS WORK IN WATER PLAN IS TO BE IN PLACE DURING THE COMPLETION OF STREAMBED RESTORATION NOT COMPLETED DURING WORK–IN–WATER STAGE I.
2. COFFERDAMS SHOWN AND LOCATIONS OF SEDIMENTATION & DEWATERING BASINS ARE CONCEPTUAL ONLY. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF WATER CONTROL METHODS FOR THE CONSTRUCTION OF THE PROPOSED PIERS AND THE REMOVAL OF THE EXISTING PIERS THAT ARE IN ACCORDANCE WITH THE PERMITTING REQUIREMENTS.



WORK IN WATER
ELEVATION – STAGE II
SCALE: ⅛" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

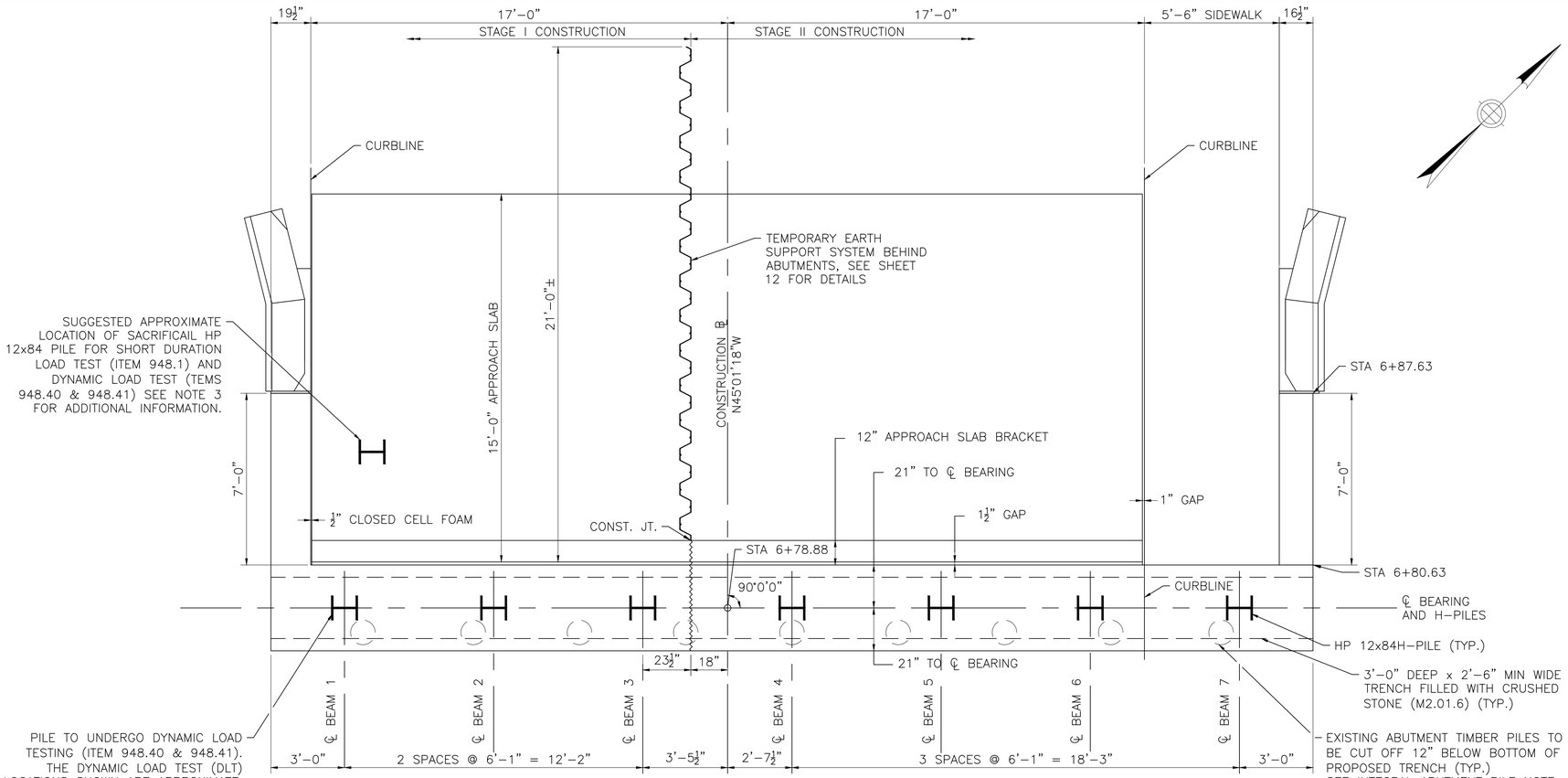
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_WORK-IN-WATER STAGE II.DWG Plotted on 21-Jul-2025 12:05 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

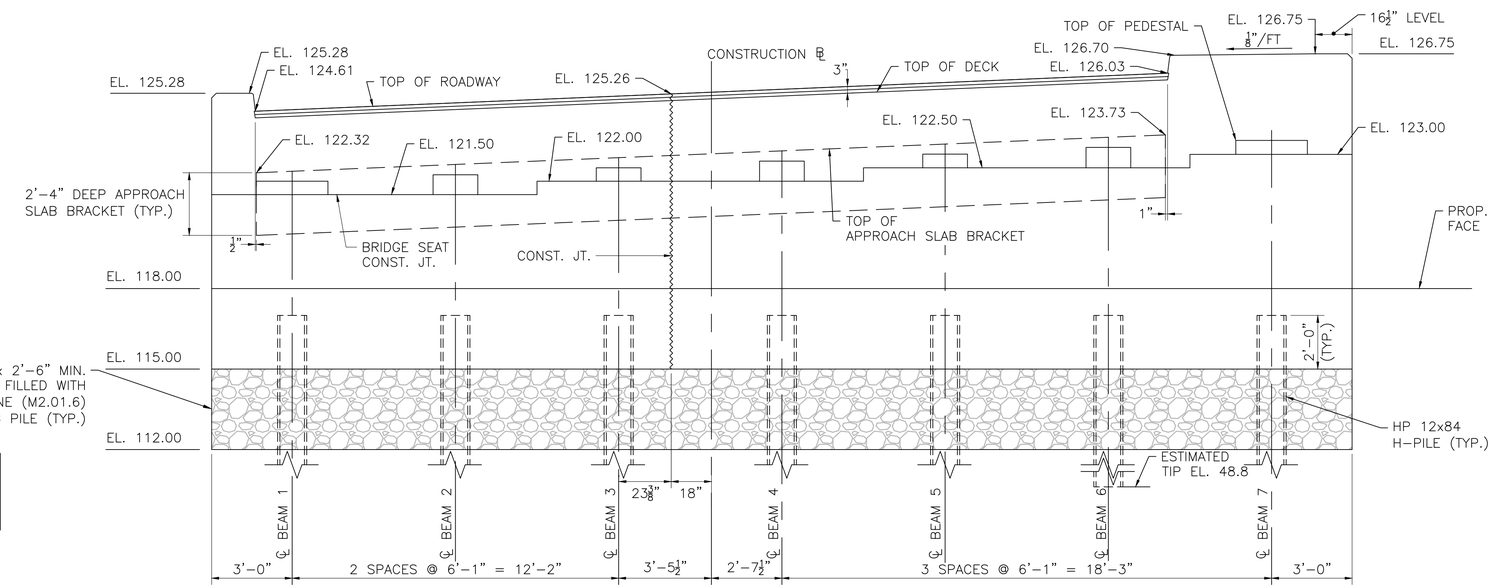
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	57	85
PROJECT FILE NO.	608460		

NORTH ABUTMENT PLAN AND ELEVATION



NORTH ABUTMENT PLAN
SCALE: ⅜" = 1'–0"



NORTH ABUTMENT ELEVATION
SCALE: ⅜" = 1'–0"

TOP OF PEDESTAL ELEVATIONS			
BM. #1	122.00	BM. #5	123.01
BM. #2	122.24	BM. #6	123.26
BM. #3	122.50	BM. #7	123.52
BM. #4	122.75		

NOTE:

ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

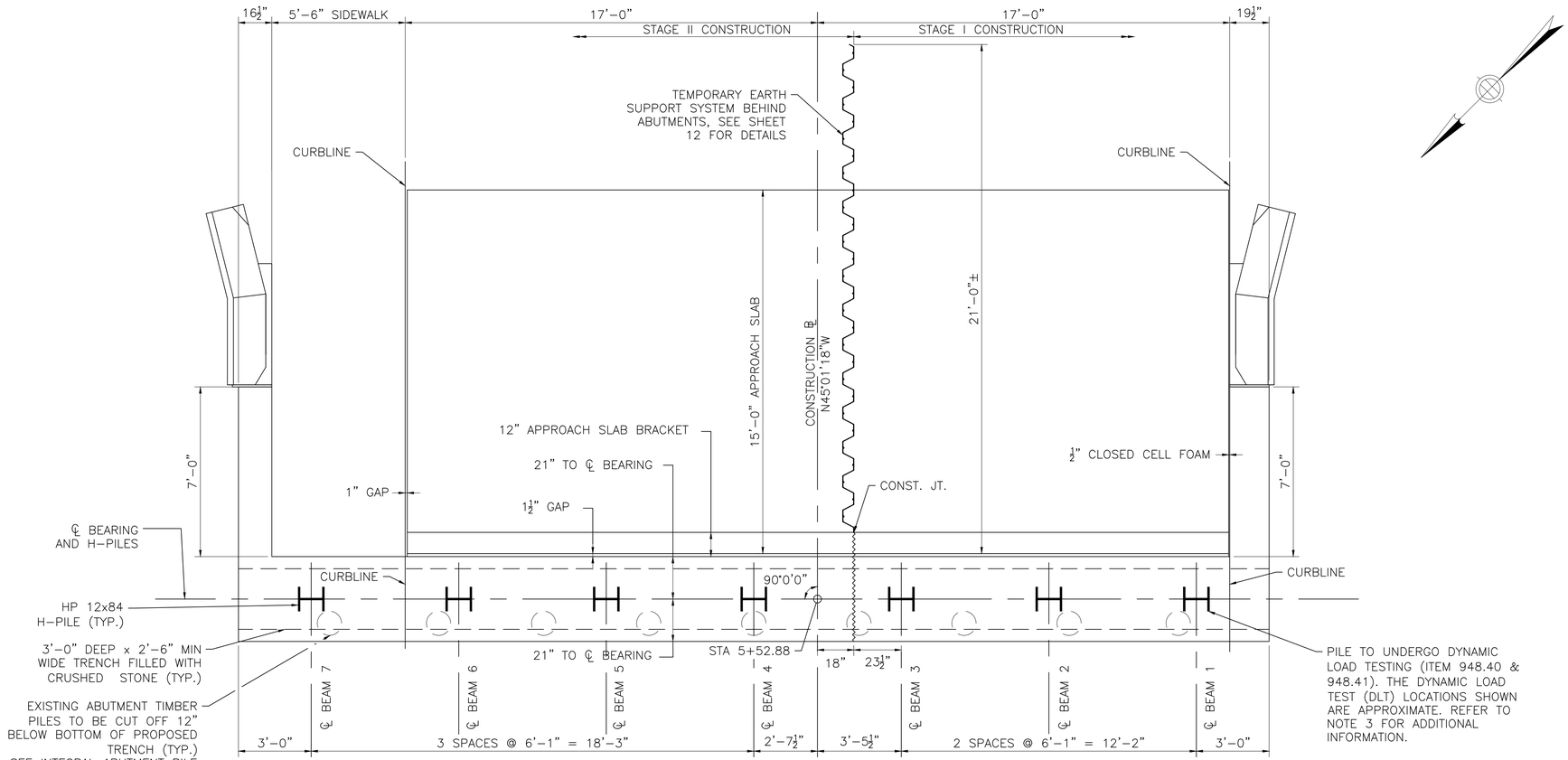
NOTES:

1. ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE
2. DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY
3. CONTRACTOR TO SELECT EXACT LOCATION OF SACRIFICIAL PILE WITH APPROVAL OF THE ENGINEER.
4. CONTRACTOR TO SELECT THE EXACT LOCATION(S) OF THE DLT'S WITH APPROVAL BY THE ENGINEER

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

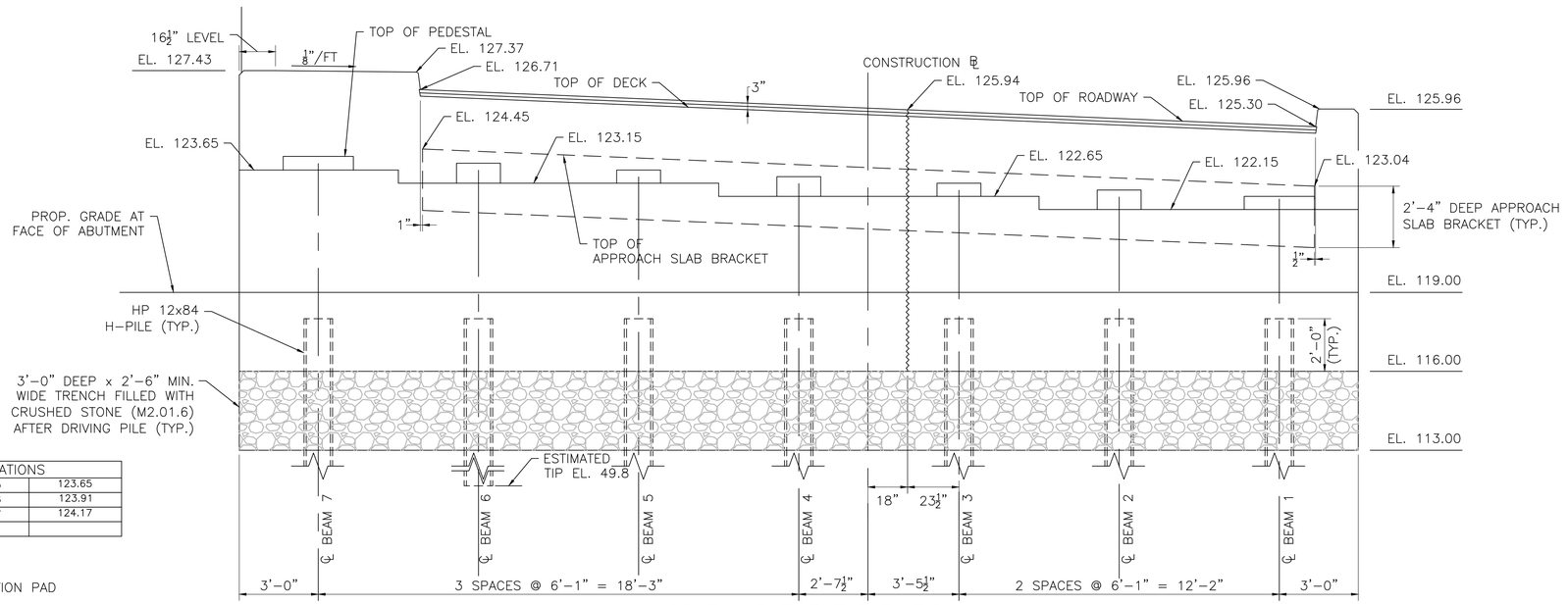
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_ABUTMENT SECTIONS II.DWG Plotted on 21-Jul-2025 12:06 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



SOUTH ABUTMENT PLAN

SCALE: ⅜" = 1'–0"



SOUTH ABUTMENT ELEVATION

SCALE: ⅜" = 1'–0"

TOP OF PEDESTAL ELEVATIONS			
BM. #1	122.65	BM. #5	123.65
BM. #2	122.89	BM. #6	123.91
BM. #3	123.15	BM. #7	124.17
BM. #4	123.40		

NOTE:

ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

NOTES:

1. ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE
2. DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY
3. CONTRACTOR TO SELECT THE EXACT LOCATION(S) OF THE DLT'S WITH APPROVAL BY THE ENGINEER

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	58	85
PROJECT FILE NO.	608460		

SOUTH ABUTMENT PLAN AND ELEVATION

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

USE ONLY PRINTS OF LATEST DATE

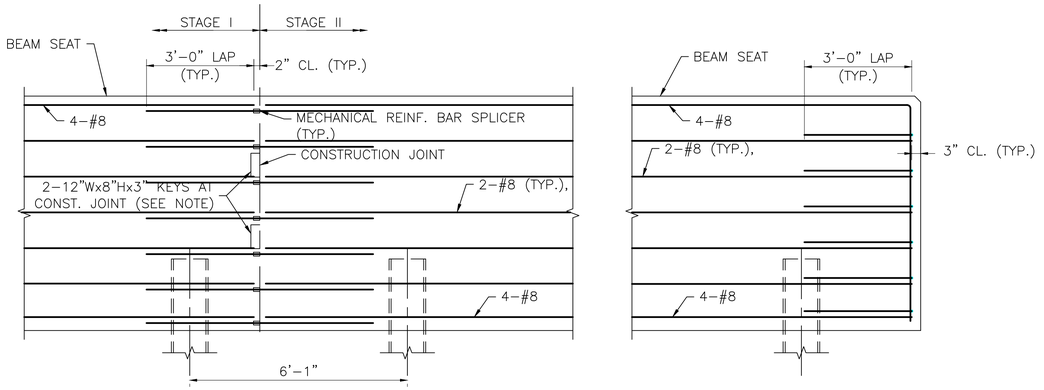
608460_ABUTMENT SECTIONS II.DWG Plotted on 21-Jul-2025 12:06 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	59	85
PROJECT FILE NO.	608460		

ABUTMENT SECTIONS AND DETAILS I



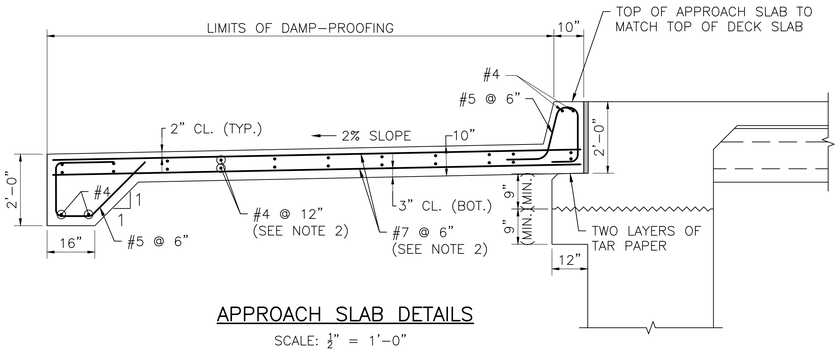
ELEVATION – ABUTMENT REINFORCING DETAIL AT CONSTRUCTION JOINT

SCALE: ½" = 1'–0"

ELEVATION – END OF ABUTMENT REINFORCING DETAIL

SCALE: ½" = 1'–0"

NOTES:
KEY TO BE SLIGHTLY TAPERED.

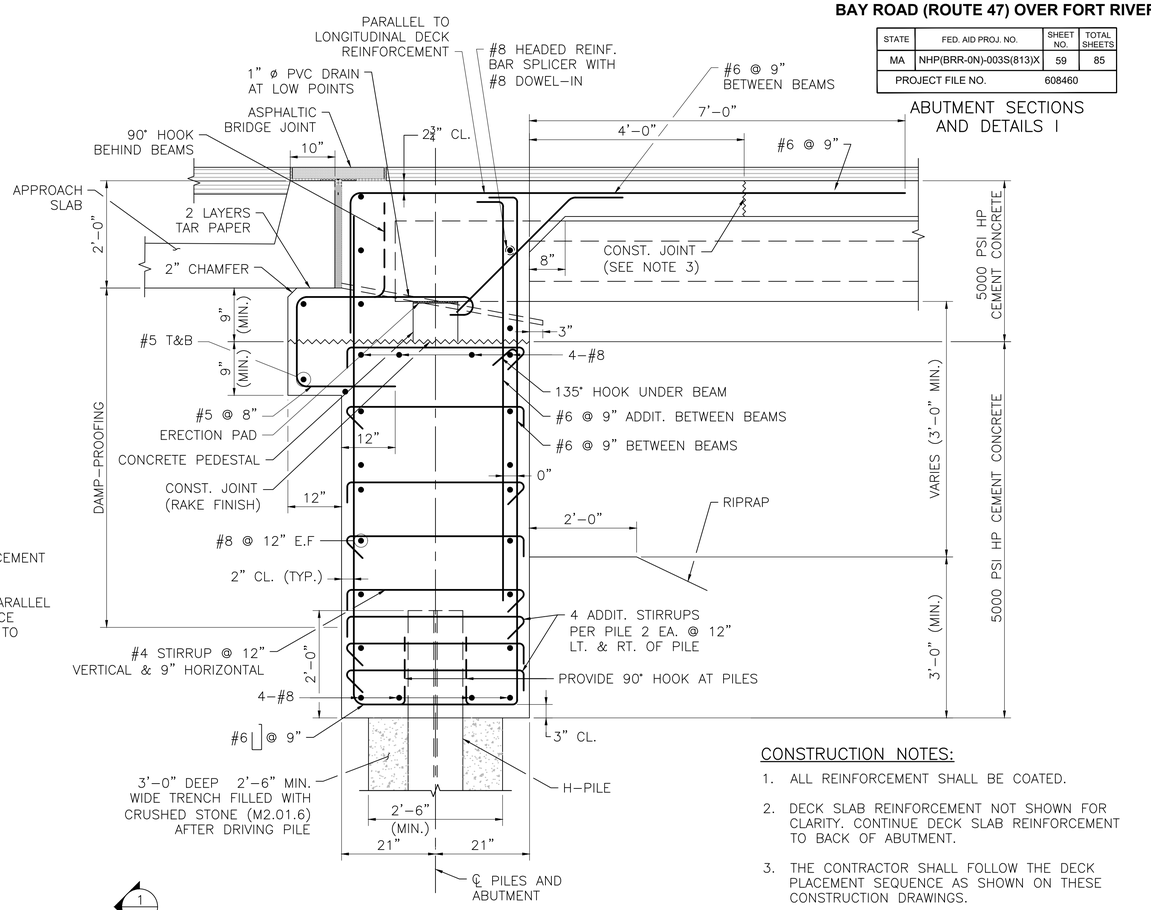


APPROACH SLAB DETAILS

SCALE: ½" = 1'–0"

NOTES:

1. APPROACH SLAB TO BE 5000 PSI HP CEMENT CONCRETE.
2. PLACE LONGITUDINAL REINFORCEMENT PARALLEL TO CENTERLINE OF CONSTRUCTION. PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT.



TYPICAL ABUTMENT SECTION

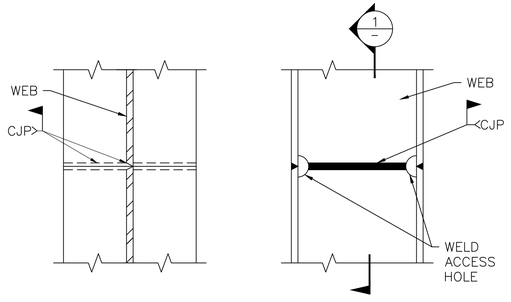
SCALE: ¾" = 1'–0"

CONSTRUCTION NOTES:

1. ALL REINFORCEMENT SHALL BE COATED.
2. DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY. CONTINUE DECK SLAB REINFORCEMENT TO BACK OF ABUTMENT.
3. THE CONTRACTOR SHALL FOLLOW THE DECK PLACEMENT SEQUENCE AS SHOWN ON THESE CONSTRUCTION DRAWINGS.
4. ALL CONCRETE SHALL CONTAIN SUPERPLASTICIZER TO ENSURE ADEQUATE CONSOLIDATION.
5. BOTH ABUTMENTS SHALL BE BACKFILLED SIMULTANEOUSLY. NO MORE THAN TWO (2) FEET OF DIFFERENTIAL BACKFILL HEIGHT SHALL BE PERMITTED. BACKFILLING SHALL NOT BEGIN UNTIL THE ABUTMENT AND DECK CONSTRUCTION IS COMPLETE.
6. THE CONTRACTOR MAY USE MECHANICAL REINFORCING BAR SPLICERS IN LIEU OF TENSION LAP SPLICES TO FACILITATE CONSTRUCTION. HOWEVER, NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THE USE OF MECHANICAL REINFORCING BAR SPLICERS.
7. MECHANICAL REINFORCING BAR SPLICERS SHALL BE INSTALLED AT STAGE CONSTRUCTION JOINTS FOR ALL TRANSVERSE REINFORCEMENT.
8. THE TOP OF THE APPROACH SLAB SHALL MATCH THE TOP OF THE CONCRETE DECK SLAB.

INTEGRAL ABUTMENT PILE NOTES:

1. A TRENCH WITH A DEPTH OF 3'–0" AND A MINIMUM WIDTH OF 2'–6" SHALL BE CONSTRUCTED DIRECTLY BELOW THE BOTTOM OF THE PILE CAP ELEVATION. AFTER THE PILES ARE DRIVEN. THE TRENCH SHALL BE FILLED WITH CRUSHED STONE (M2.01.6).
2. ALL SPLICES SHALL HAVE COMPLETE PENETRATION BUTT WELDS. THERE SHALL BE NO SPLICES WITHIN THE TOP 20 FEET OF PILE. SPLICE WELDS SHALL BE 100% UT.
3. THE FACTORED AXIAL DESIGN LOAD PER PILE IS 153 KIPS AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.
4. THE FACTORED STRUCTURAL RESISTANCE PER PILE IS 704 KIPS AND IS THE PRODUCT OF THE NOMINAL STRUCTURAL RESISTANCE OF 1006 KIPS AND A RESISTANCE FACTOR OF 0.70
5. THE FACTORED GEOTECHNICAL PILE RESISTANCE IS 154 KIPS AND IS THE PRODUCT OF THE NOMINAL GEOTECHNICAL RESISTANCE OF 192 KIPS AND A RESISTANCE FACTOR OF 0.80. THE ESTIMATED TIP ELEVATION IS EL. 48.8 AT THE NORTH ABUTMENT AND EL. 49.8 AT THE SOUTH ABUTMENT.
6. DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA, AND THE PILE INTEGRITY SHALL BE BASED ON SUCCESSFUL STATIC PILE LOAD TESTING ON ONE SACRIFICIAL PILE AND DYNAMIC TESTING USING THE PILE DRIVING ANALYZER (PDA) TESTING METHOD WITH A RESISTANCE FACTOR OF 0.80. DYNAMIC TESTING SHALL BE PERFORMED ON THE SACRIFICIAL TEST PILE AND ONE PRODUCTION PILE PER ABUTMENT (THREE PDA TESTS TOTAL). PILES SHALL BE INSTALLED TO ACHIEVE A FACTORED GEOTECHNICAL RESISTANCE EQUAL TO OR GREATER THAN THE FACTORED AXIAL DESIGN LOAD. THE SACRIFICIAL LOAD TEST PILE SHALL BE LOCATED AT THE NORTH ABUTMENT AT A LOCATION AS AGREED TO BY THE CONTRACTOR AND ENGINEER. PILES SHALL BE INSTALLED TO ACHIEVE A FACTORED DRIVEN RESISTANCE EQUAL TO OR GREATER THAN THE FACTORED AXIAL DESIGN LOAD NEGLECTING AN ESTIMATED 28 KIPS OF SIDE RESISTANCE THAT WILL BE LOST DUE TO 13.2 FEET OF DESIGN SCOUR.
7. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING/TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER.
8. PILES SHALL CONFORM TO AASHTO M270 GRADE 50.
9. HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
10. UPON EXCAVATION AND DEMOLITION OF THE EXISTING ABUTMENT, CONTRACTOR SHALL CONFIRM LOCATION OF EXISTING TIMBER PILES. EXISTING TIMBER PILES IN CONFLICT SHALL BE EXTRACTED BY THE CONTRACTOR. ANY VOID LEFT IN THE GROUND AFTER EXTRACTING THE PILE SHALL BE FILLED WITH ¾" CRUSHED STONE (M2.01.6). EXISTING PILES NOT IN CONFLICT WITH THE NEW ABUTMENT PILES SHALL BE CUT OFF.
11. AFTER PILE DRIVING IS COMPLETE THE CONTRACTOR SHALL SUBMIT PILE DRIVING LOGS INCLUDING THE FINAL TIP ELEVATIONS AND THE RESULTS OF DYNAMIC OR STATIC LOAD TESTING. SIGNIFICANT DEVIATIONS SHALL BE NOTED AS REVISIONS ON THE CONSTRUCTION DRAWINGS.



REQUIRED PILE LOCATION TOLERANCES:

1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRIVING, EACH ABUTMENT PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH ABUTMENT PILE IS DRIVEN, THE TOP OF THE PILE SHALL BE WITHIN 3" OF PLAN LOCATION.

NOTES:

1. ALL WELDS SHALL BE COMPLETE PENETRATION AND SHALL CONFORM TO THE ANSI/AASHTO/AWS BRIDGE WELDING CODE, D1.5.
2. WELDING PROCEDURE SPECIFICATIONS MUST BE APPROVED BY THE ENGINEER PRIOR TO WELDING.
3. WHENEVER POSSIBLE ALL PILES SHALL BE SPLICED ON THE GROUND IN THE FLAT POSITION.
4. WEB SHALL BE COPED TO ALLOW FOR COMPLETE PENETRATION WELDING OF FLANGES.
5. WELDING MECHANICAL PILE SPLICERS MAY BE USED PROVIDED THAT COMPLETE DETAILS AND WELDING PROCEDURES HAVE BEEN REVIEWED AND APPROVED BY THE ENGINEER.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

USE ONLY PRINTS OF LATEST DATE

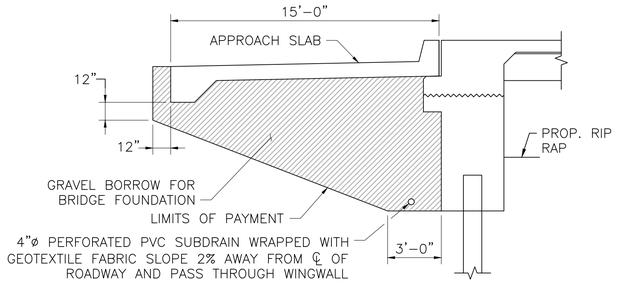
608460_ABUTMENT SECTIONS II.DWG Plotted on 21-Jul-2025 12:06 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

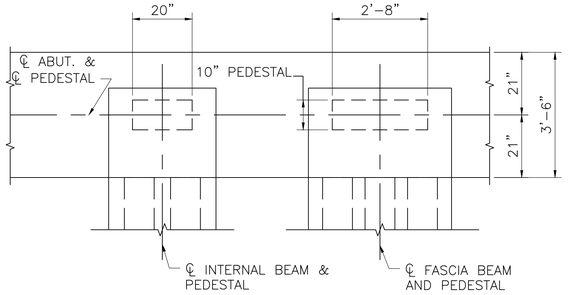
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	60	85
PROJECT FILE NO.	608460		

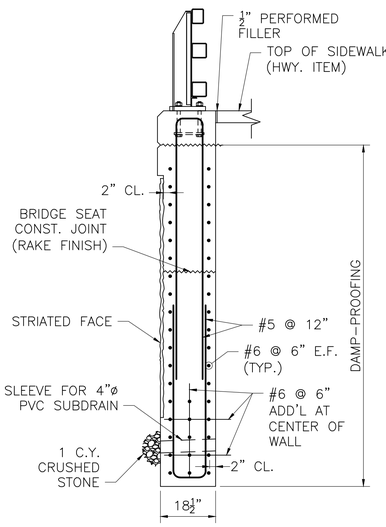
ABUTMENT SECTIONS AND DETAILS II



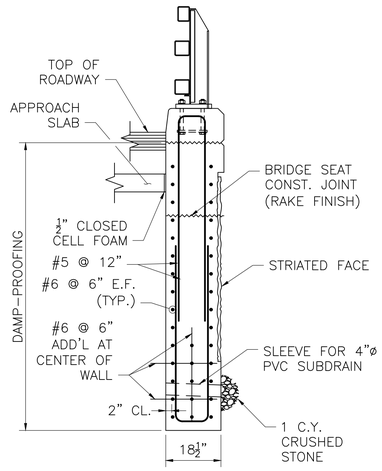
INTEGRAL ABUTMENT BACKFILL
SCALE: ¼" = 1'–0"



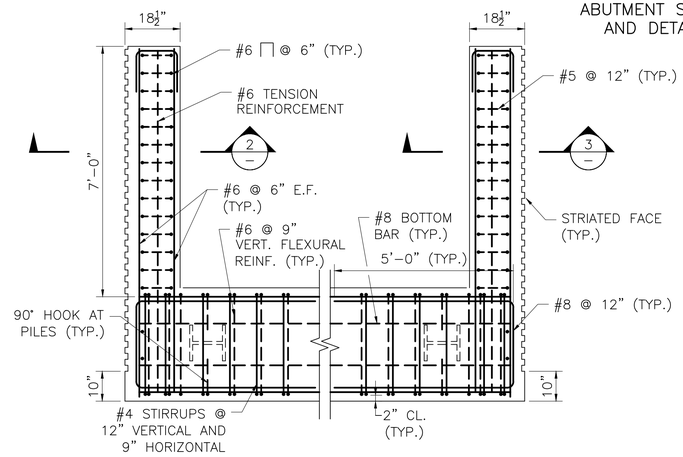
ABUTMENT PEDESTAL PLAN
SCALE: ½" = 1'–0"



WINGWALL WITH SIDEWALK
SECTION 2
SCALE: ½" = 1'–0"

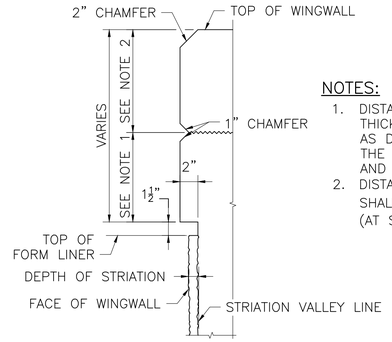


WINGWALL WITH SAFETY CURB
SECTION 3
SCALE: ½" = 1'–0"



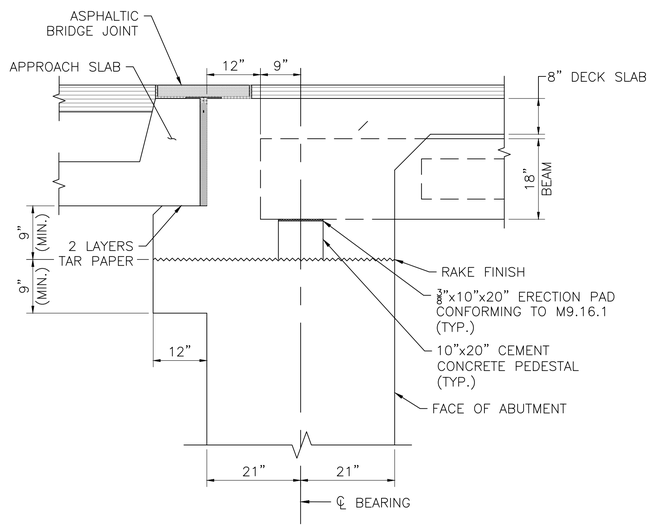
NOTE:
1. SECTION IS TAKEN BELOW CAP TOP LONGITUDINAL REINFORCEMENT AT BRIDGE SEAT CONSTRUCTION JOINT.

TYPICAL ABUTMENT HORIZONTAL SECTION
(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR, OPPOSITE HAND)
SCALE: ½" = 1'–0"

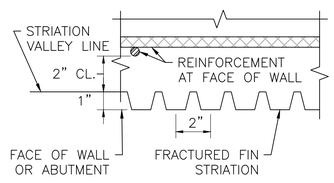


NOTES:
1. DISTANCE TO BE THE SUM OF THE DECK THICKNESS AND THE ACTUAL HAUNCH DEPTH AS DETERMINED BY THE DIFFERENCE BETWEEN THE TOP OF FORM ELEVATIONS ON SHEET 31 AND TOP OF FASCIA BEAM.
2. DISTANCE ON WEST FASCIA (AT SAFETYWALK) SHALL BE $11\frac{13}{16}$", DISTANCE ON EAST FASCIA (AT SIDEWALK) SHALL BE $8\frac{1}{4}$".

DETAIL AT TOP OF WINGWALL
SCALE: 1½" = 1'–0"

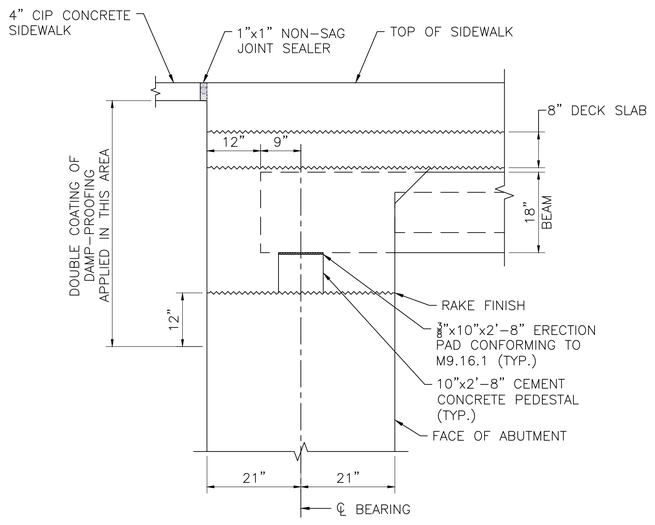


INTEGRAL DETAILS AT ABUTMENT
(AT INTERIOR BEAMS)
SCALE: ¾" = 1'–0"



TYPICAL STRIATION DETAIL
SCALE: 3" = 1'–0"

NOTES:
1. THE CONTRACTOR SHALL MAKE SURE THAT THE STRIATION FINS ARE PLUMB AND LINED UP VERTICALLY FROM PANEL TO PANEL FOR THE FULL HEIGHT OF THE WALL.
2. THE HORIZONTAL JOINT MAY BE OMITTED IF THE CONTRACTOR CAN DEMONSTRATE THAT THE FORM LINER PANELS CAN BE INSTALLED END TO END WITHOUT CREATING A VISIBLE SEAM IN THE FINAL CAST CONCRETE.



INTEGRAL DETAILS AT ABUTMENT
(BEAM 7)
SCALE: ¾" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

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AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
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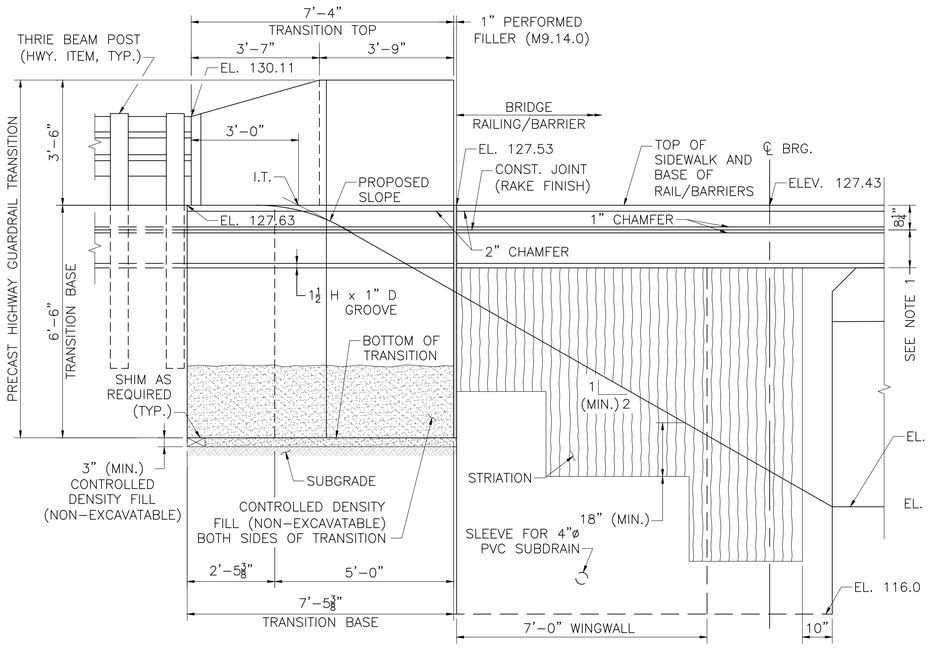
608460_ABUTMENT SECTIONS II.DWG Plotted on 21-Jul-2025 12:06 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

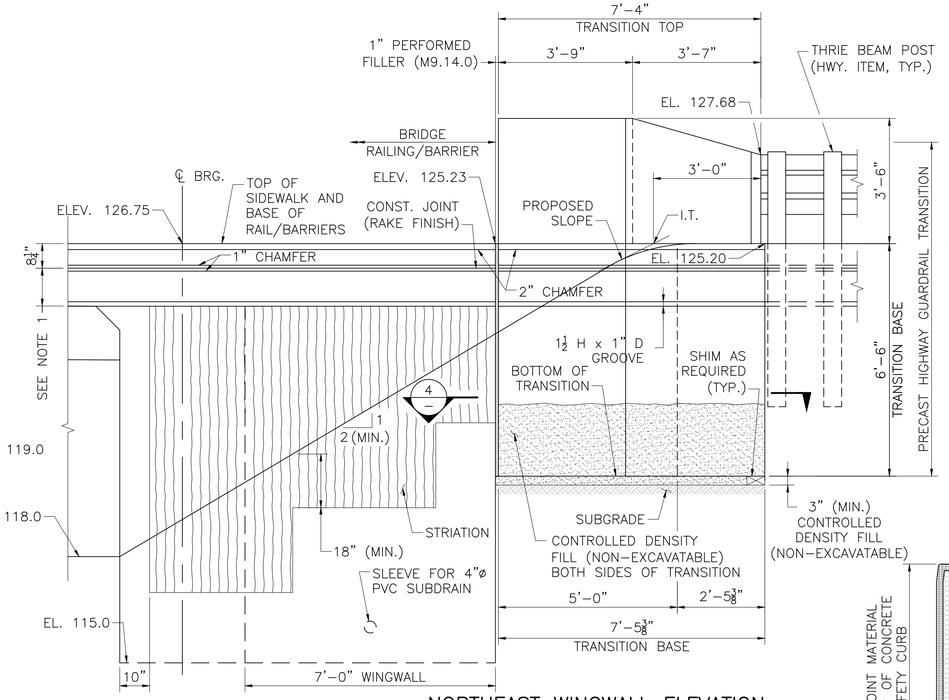
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	61	85
PROJECT FILE NO.	608460		



SOUTHEAST WINGWALL ELEVATION

SCALE: ½" = 1'-0"

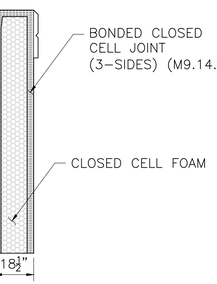


NORTHEAST WINGWALL ELEVATION

SCALE: ½" = 1'-0"

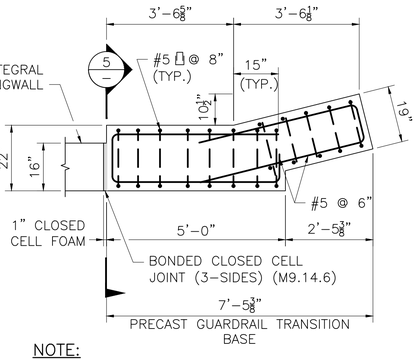
NOTES:

1. DISTANCE TO BE THE SUM OF THE DECK THICKNESS AND THE ACTUAL HAUNCH DEPTH AS DETERMINED BY THE DIFFERENCE BETWEEN THE TOP OF FORM ELEVATIONS ON SHEET 31 AND TOP OF FASCIA BEAM.
2. PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.
3. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO THE GRADE OF 3" (MIN.) BELOW THE INTENDED BOTTOM OF THE PRECAST GUARDRAIL TRANSITION BASE AND TO A HEIGHT OF 2'-0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE TO FORM A TRENCH IN WHICH TO SET THE TRANSITION. WHERE NO GRAVEL BORROW IS REQUIRED BELOW THE BASE, IT SHALL BE PLACED ON UNDISTURBED SOIL.
4. CONTRACTOR SHALL SET THE PRECAST GUARDRAIL TRANSITION TO THE REQUIRED ELEVATION AND ALIGNMENT, AND BACKFILL PRECAST GUARDRAIL TRANSITION WITH CONTROLLED DENSITY FILL (NON-EXCAVATABLE) TO THE ELEVATION SHOWN.



SECTION 5

SCALE: ½" = 1'-0"

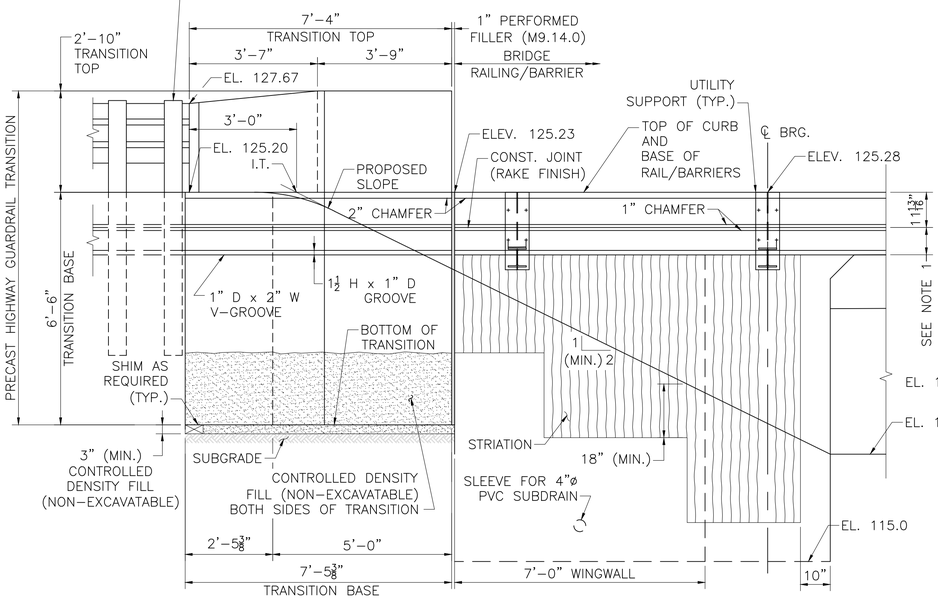


NOTE:

WINGWALL REINFORCEMENT AND STRIATIONS NOT SHOWN FOR CLARITY.

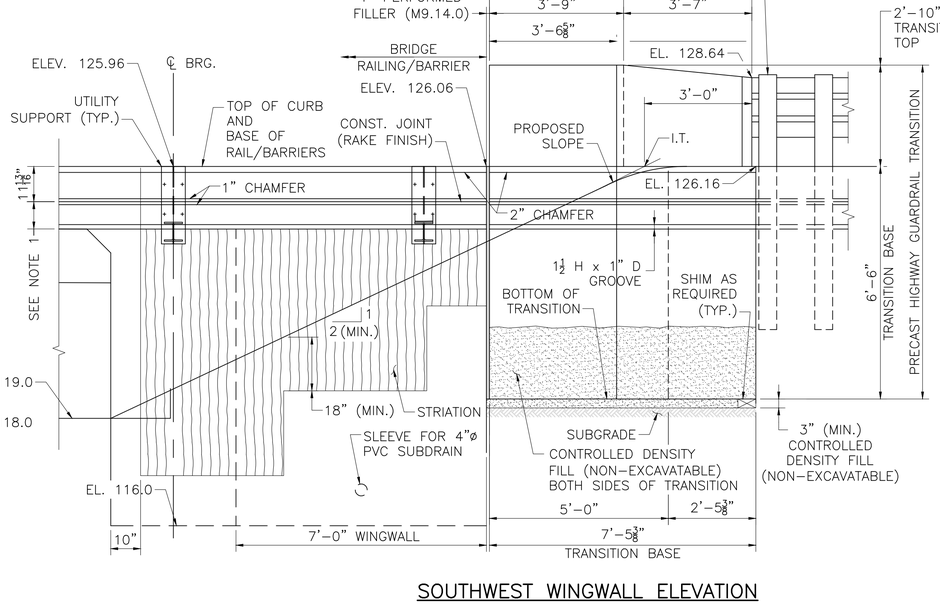
SECTION 4

SCALE: ½" = 1'-0"



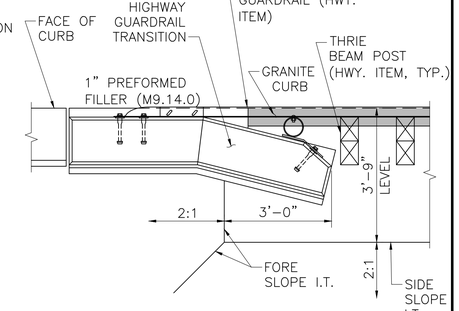
NORTHWEST WINGWALL ELEVATION

SCALE: ½" = 1'-0"



SOUTHWEST WINGWALL ELEVATION

SCALE: ½" = 1'-0"



GRADING REQUIREMENTS PLAN

SCALE: ½" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

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AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

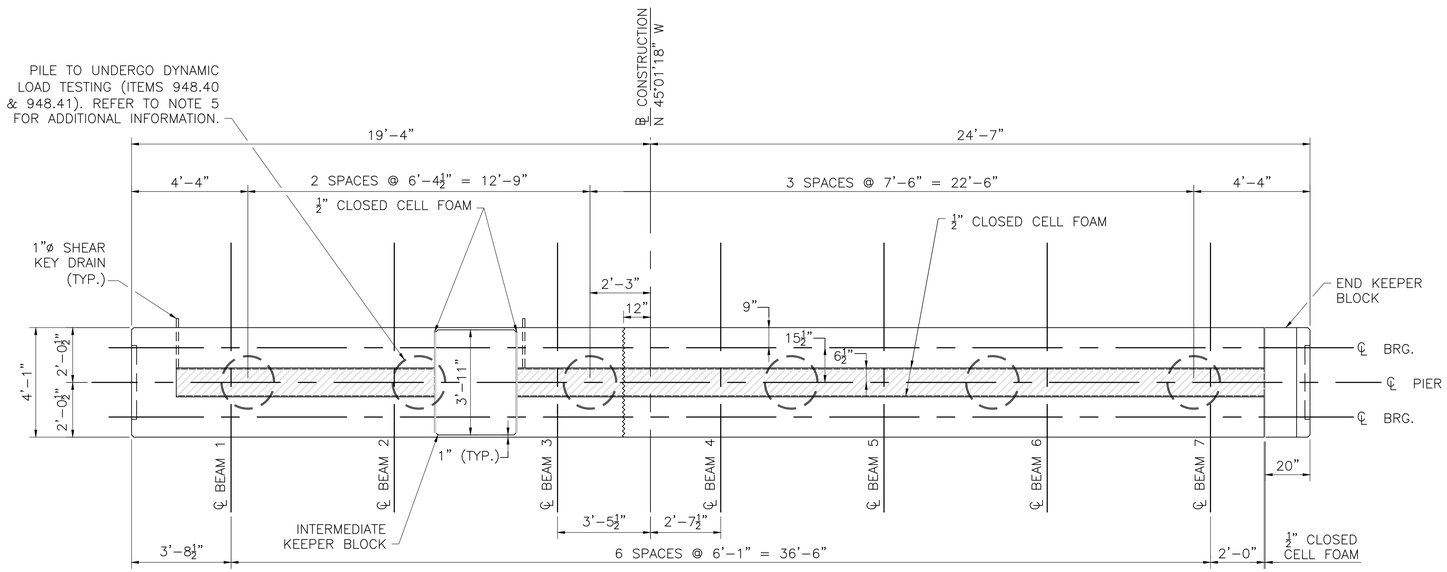
608460_WINGWALL DETAILS.DWG Plotted on 21-Jul-2025 12:07 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

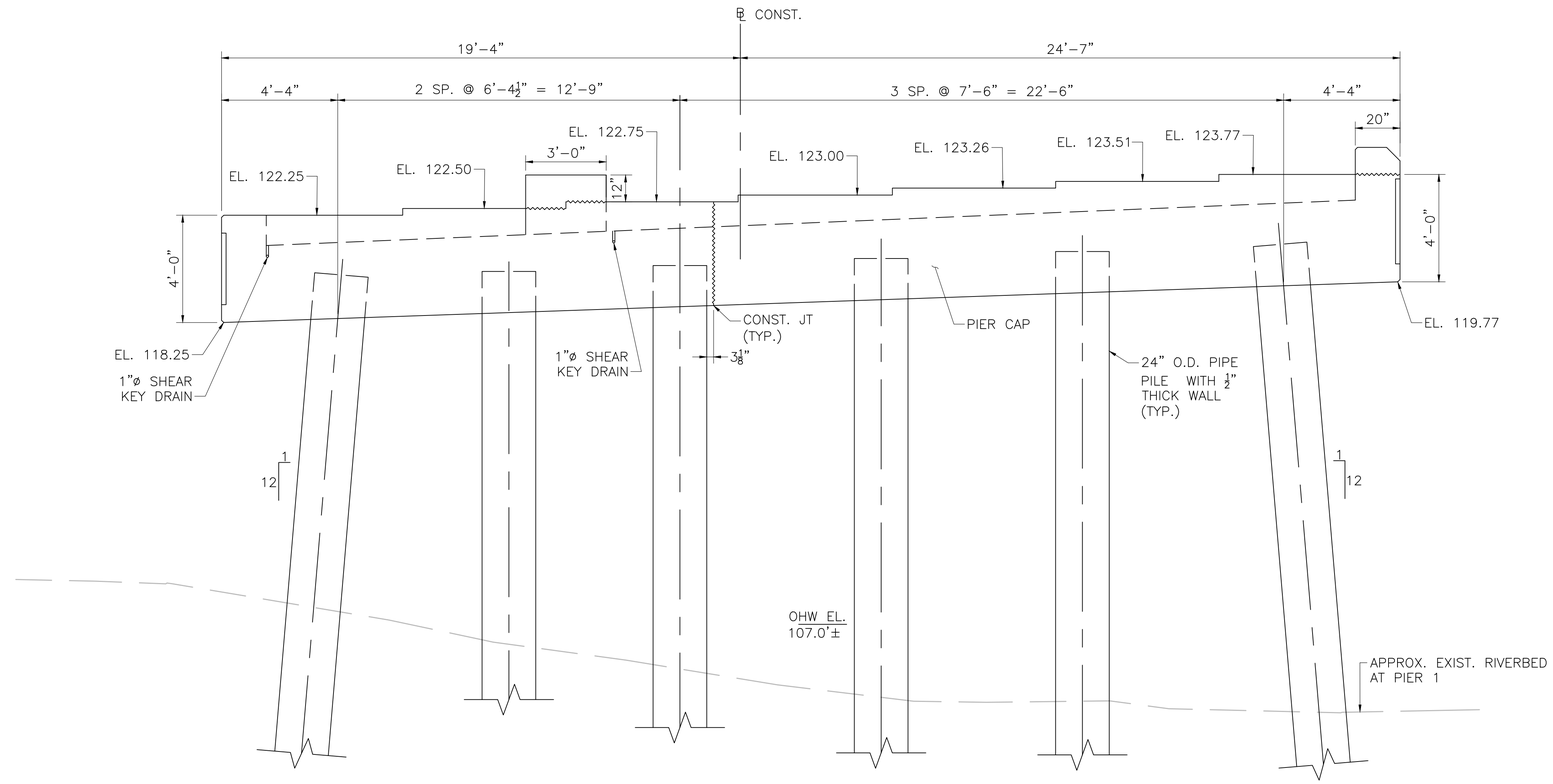
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	62	85
PROJECT FILE NO.	608460		

PIER I PLAN AND ELEVATION



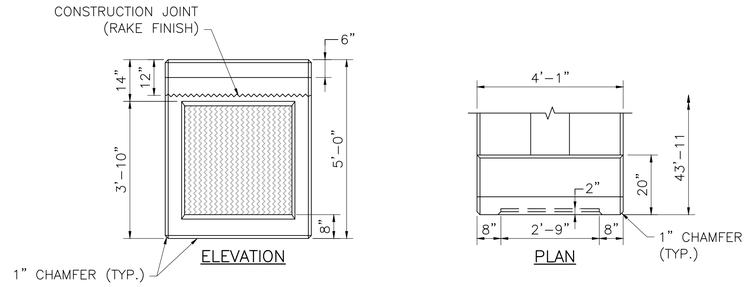
PIER 1 PLAN
SCALE: ⅜" = 1'–0"



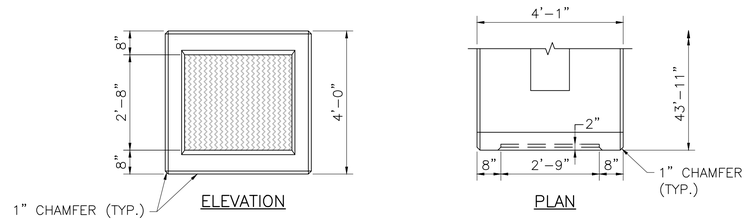
PROPOSED PIER 1 ELEVATION
(LOOKING NORTH)
SCALE: ⅜" = 1'–0"

NOTES:

1. ▨ DENOTES LIMITS OF 13" BY 12" MIN. DEEP SHEAR KEY.
2. ALL SURFACES OF THE SHEAR KEY SHALL BE LINED WITH ½" THICK CLOSED CELL FOAM.
3. FOR PIER CAP DETAILS, SEE SHEET 22. FOR PILE DETAILS, SEE SHEET 23.
4. CONCRETE PIER CAP SHALL BE 5000 PSI HP CEMENT CONCRETE
5. CONTRACTOR TO SELECT THE EXACT LOCATION OF THE DLT'S WITH APPROVAL BY THE ENGINEER.



PIER CAP END WITH END KEEPER BLOCK
SCALE: ½" = 1'–0"



PIER CAP END WITHOUT END KEEPER BLOCK
SCALE: ½" = 1'–0"

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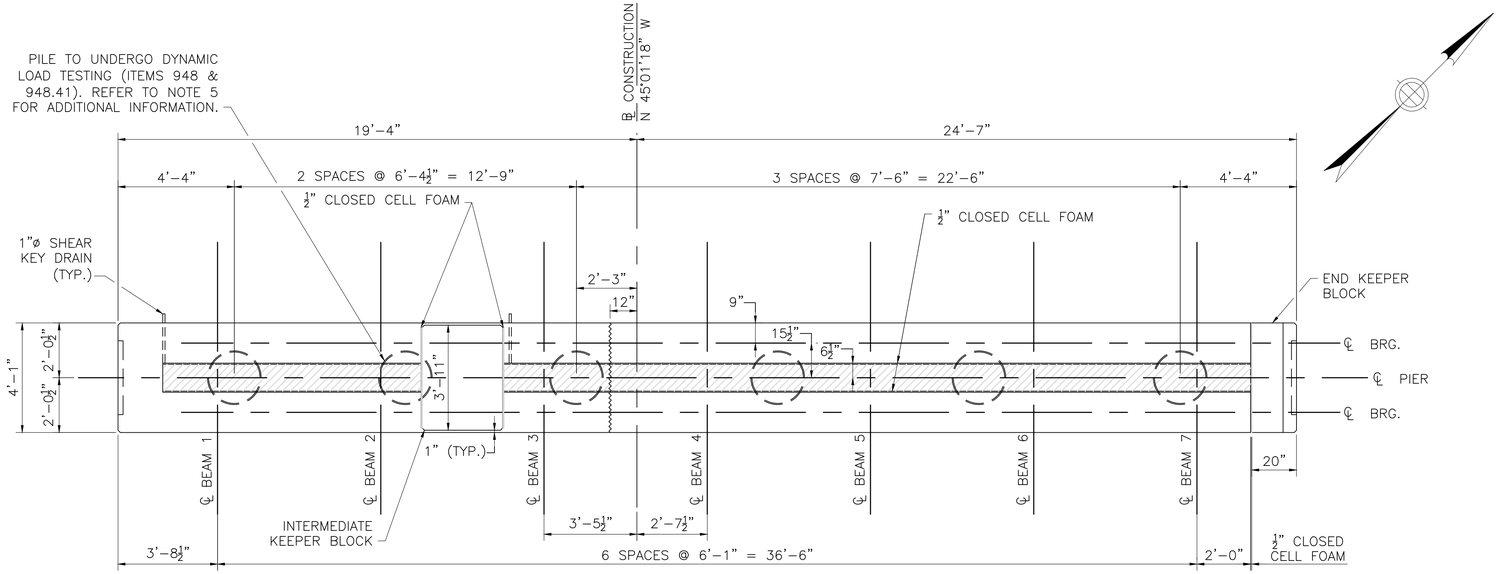
608460_BR22 (H-01-005)_PIERS PLAN.DWG Plotted on 21-Jul-2025 12:07 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

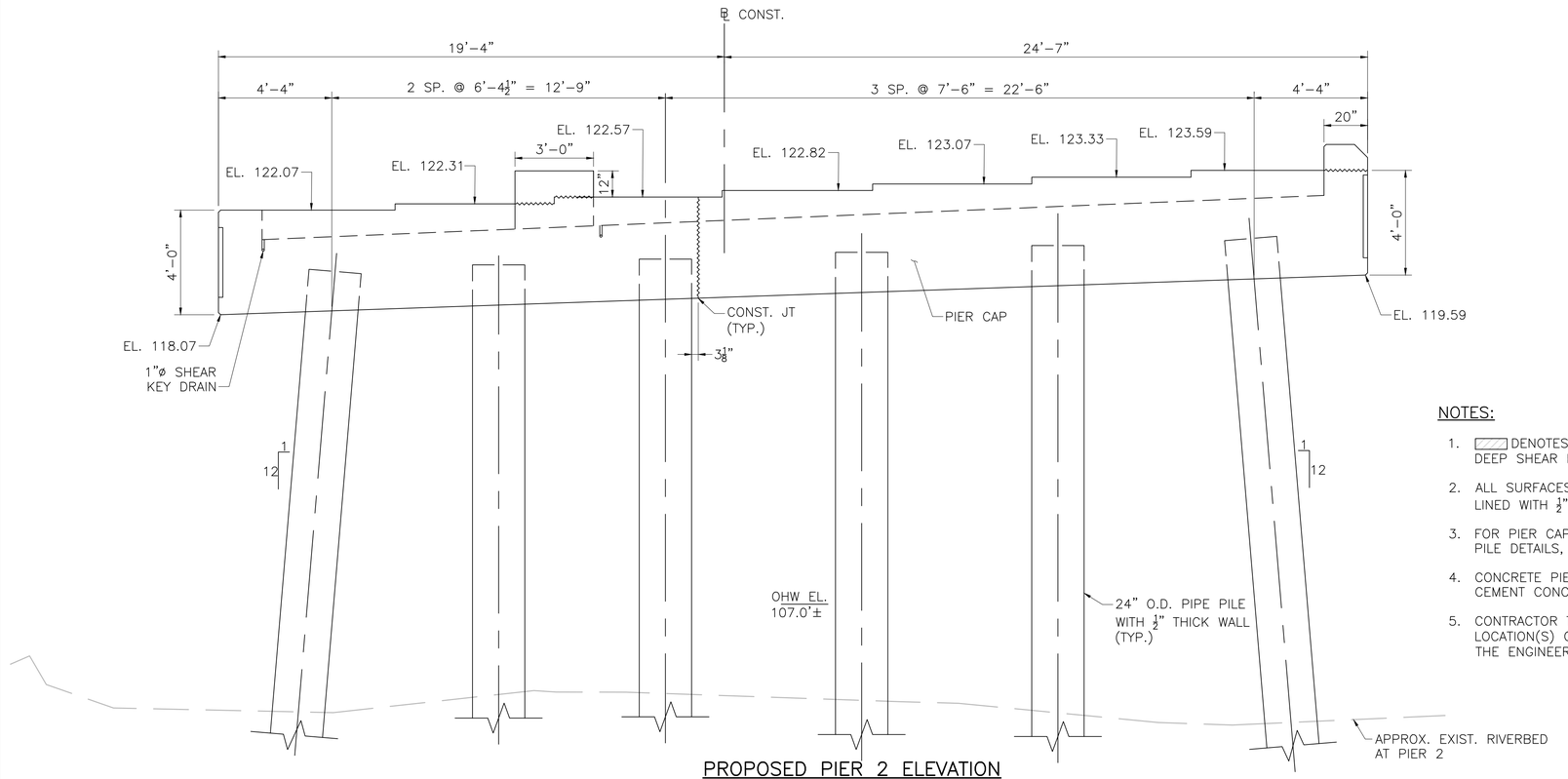
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	63	85
PROJECT FILE NO.	608460		

PIER II PLAN AND ELEVATION



PIER 2 PLAN
SCALE: ⅜" = 1'-0"



PROPOSED PIER 2 ELEVATION
(LOOKING NORTH)
SCALE: ⅜" = 1'-0"

NOTES:

1. ▨ DENOTES LIMITS OF 13" BY 12" MIN. DEEP SHEAR KEY.
2. ALL SURFACES OF THE SHEAR KEY SHALL BE LINED WITH ½" THICK CLOSED CELL FOAM.
3. FOR PIER CAP DETAILS, SEE SHEET 22. FOR PILE DETAILS, SEE SHEET 23.
4. CONCRETE PIER CAP SHALL BE 5000 PSI HP CEMENT CONCRETE
5. CONTRACTOR TO SELECT THE EXACT LOCATION(S) OF THE DLT'S WITH APPROVAL BY THE ENGINEER.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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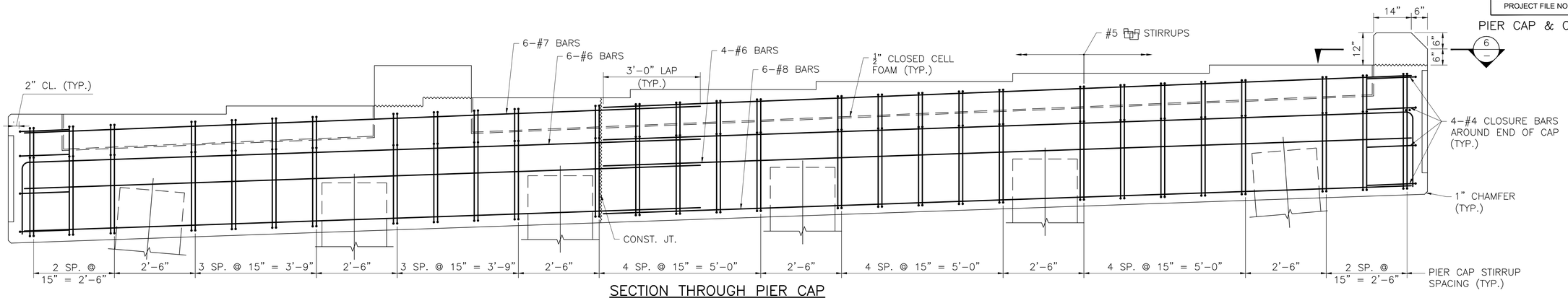
608460_BR22 (H-01-005)_PIERS PLAN.DWG Plotted on 21-Jul-2025 12:07 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

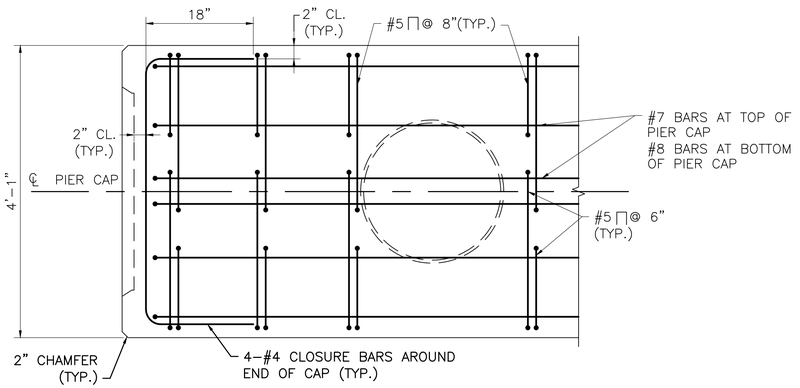
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	64	85
PROJECT FILE NO.	608460		

PIER CAP & COLUMN DETAILS I



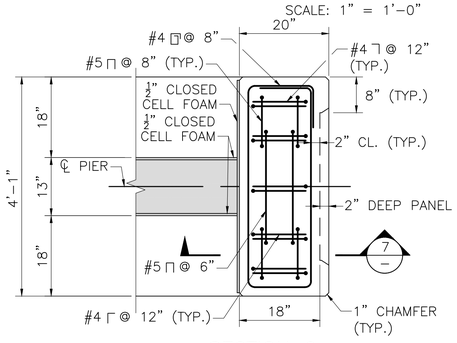
SECTION THROUGH PIER CAP

SCALE: ⅝" = 1'-0"



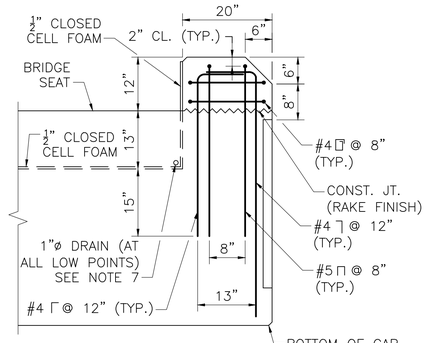
PLAN–END OF PIER CAP

SCALE: 1" = 1'-0"



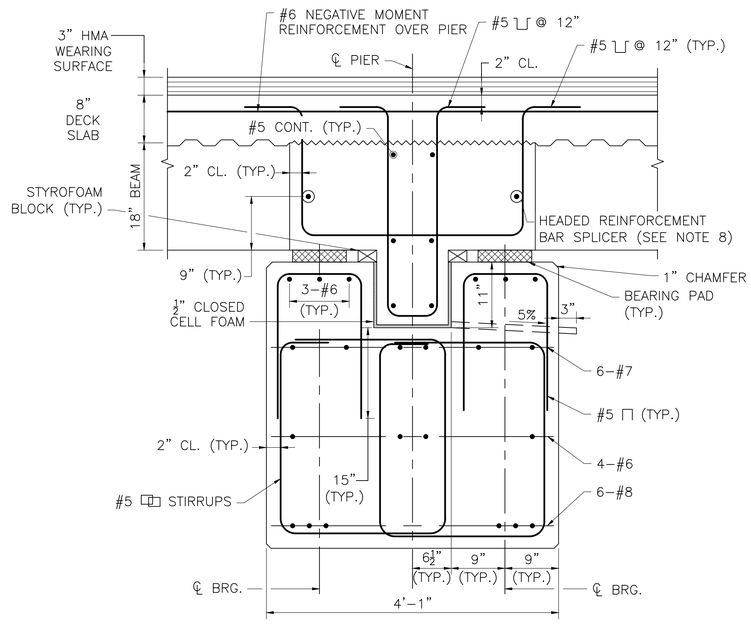
SECTION 6

SCALE: ¾" = 1'-0"



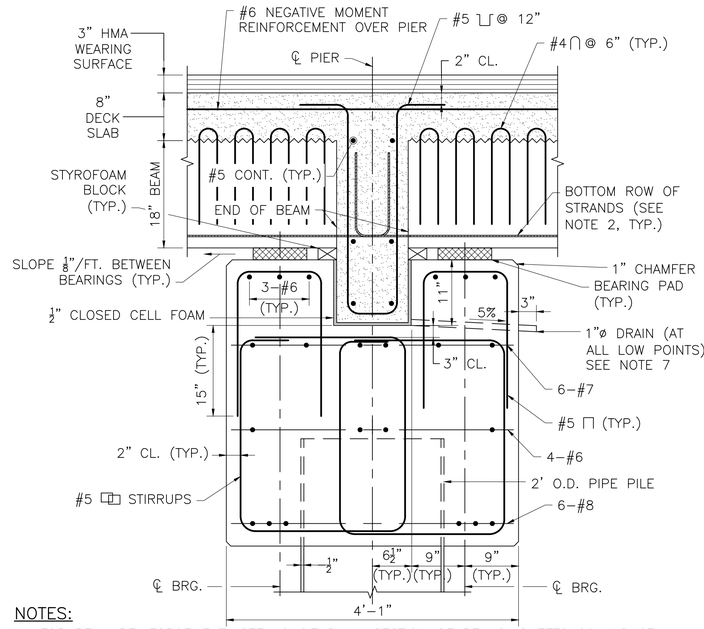
SECTION 7

SCALE: ¾" = 1'-0"



DETAILS OVER PIER AT DIAPHRAGM

SCALE: 1" = 1'-0"



DETAILS OVER PIER AT BEAM

SCALE: 1" = 1'-0"

DETAILS OVER PIER NOTES:

1. ALL REINFORCEMENT SHOWN IN THESE DETAILS SHALL BE COATED.
2. ALL PIER DIAPHRAGM CONCRETE SHALL BE 5000 PSI HP CEMENT CONCRETE.
3. END KEEPER BLOCKS SHALL BE CAST AFTER THE BEAMS ARE ERECTED AND THE PIER DIAPHRAGM HAS BEEN CAST. ATTACH CLOSED CELL FOAM TO THE BEAMS AND DIAPHRAGM PRIOR TO PLACING END KEEPER BLOCK CONCRETE.
4. CONTRACTOR MAY USE EXPANDED POLYSTYRENE FILLER OR A REMOVABLE FORM TO FORM THE BOTTOM OF THE PIER DIAPHRAGM.
5. PLACE EXPANDED POLYSTYRENE FILLER UNDER THE BOTTOM FLANGE AT THE EDGE OF THE SHEAR KEY.
6. PRIOR TO PLACING PIER DIAPHRAGM CONCRETE, LINE ALL SURFACES OF THE SHEAR KEY WITH CLOSED CELL FOAM AS SHOWN. PIER DIAPHRAGM CONCRETE MAY NOT COME IN DIRECT CONTACT WITH THE PIER CAP CONCRETE MASONRY.
7. SLOPE SHEAR KEY DRAIN 5% MIN. TOWARDS FACE OF PIER CAP.
8. ¾"ø THREADED DOWEL BAR SPLICERS SHALL BE CAST–IN–PLACE BY THE FABRICATOR AND SHALL BE EMBEDDED AS REQUIRED TO PROVIDE A MINIMUM ULTIMATE TENSILE CAPACITY OF 17 KIPS AS SPECIFIED BY THE MANUFACTURER.

NOTES:

1. FOR BEAM REINFORCEMENT, SEE LONGITUDINAL SECTION OF BEAMS, SHEETS 26 AND 27.
2. DECK SLAB AND THE REMAINDER OF STRANDS IN BEAMS NOT SHOWN FOR CLARITY.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

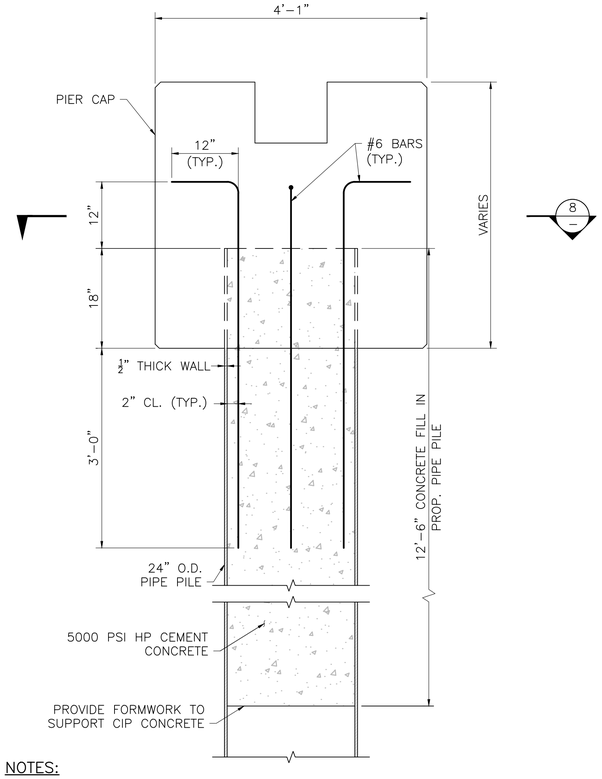
608460_BR22 (H-01-005)_PIERS DETAILS.DWG Plotted on 21-Jul-2025 12:07 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

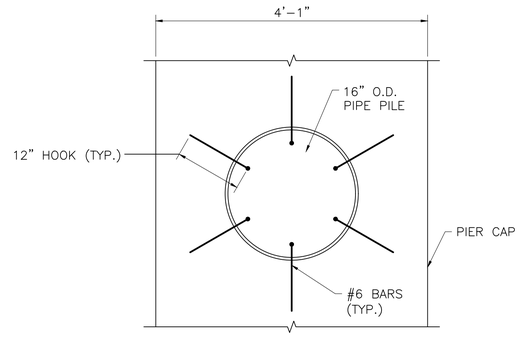
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	65	85
PROJECT FILE NO.	608460		

PIER CAP & COLUMN DETAILS II



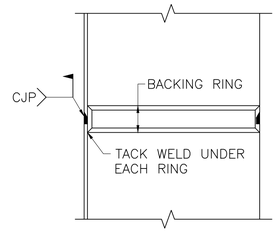
NOTES:
1. PIER CAP REINFORCEMENT NOT SHOWN FOR CLARITY, SEE SHEET 22 FOR DETAILS

PIER COLUMN EMBEDMENT DETAIL
SCALE: 1" = 1'–0"



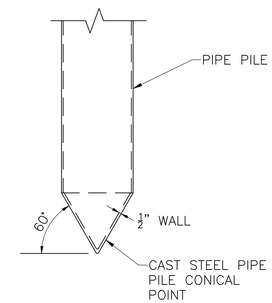
SECTION 8
SCALE: 1" = 1'–0"

PIER PILE NOTES:
1. ALL PIPE PILES SHALL BE 24" DIAMETER X ½" THICK AND SHALL CONFORM TO ASTM A252 GRADE 3 WITH A COAL TAR EPOXY COATING THAT EXTENDS TO A DEPTH OF AT LEAST 10 FEET BELOW MUD LINE. PILES SHALL BE DRIVEN CLOSE–ENDED. REFER TO THE SPECIAL PROVISIONS FOR COAL TAR EPOXY COATING SPECIFICATIONS. FILL PILES WITH SAME CONCRETE USED FOR PIER CAP AS SHOWN ON THESE PLANS.
2. THE FACTORED AXIAL DESIGN LOAD PER PILE IS 305 KIPS AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.
3. THE FACTORED STRUCTURAL RESISTANCE PER PILE IS 981 KIPS AND IS THE PRODUCT OF THE NOMINAL STRUCTURAL RESISTANCE OF 1402 KIPS AND A RESISTANCE FACTOR OF 0.7.
4. THE FACTORED GEOTECHNICAL PILE RESISTANCE IS 306 KIPS AND IS THE PRODUCT OF THE NOMINAL GEOTECHNICAL RESISTANCE OF 471 KIPS AND A RESISTANCE FACTOR OF 0.65. 10. PILES SHALL BE DRIVEN TO AN ESTIMATED TIP ELEVATION OF 59.8' AT PIER 1 AND ELEVATION 59.8' AT PIER 2.
5. DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA AND THE PILE INTEGRITY SHALL BE PERFORMED USING THE PILE DRIVING ANALYZER (PDA) TESTING METHOD WITH A RESISTANCE FACTOR OF 0.65. DYNAMIC TESTING SHALL BE PERFORMED ON THE FIRST PRODUCTION PILE AT EACH PIER LOCATION (TWO PDA TESTS). PILES SHALL BE INSTALLED TO ACHIEVE A FACTORED GEOTECHNICAL RESISTANCE EQUAL TO OR GREATER THAN THE FACTORED AXIAL DESIGN LOAD.
6. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING AND TESTING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
7. HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
8. REFER TO SPECIAL PROVISIONS FOR ADDITIONAL PILE INFORMATION.
9. ALL SPLICES SHALL HAVE COMPLETE PENETRATION BUTT WELDS. THERE SHALL BE NO SPLICES WITHIN THE TOP 20 FEET OF PILE. SPLICE WELDS SHALL BE 100% UT.
10. AFTER PILE DRIVING IS COMPLETE THE CONTRACTOR SHALL SUBMIT PILE DRIVING LOGS INCLUDING THE FINAL TIP ELEVATIONS AR THE RESULTS OF ANY DYNAMIC OR STATIC LOAD TESTING. SIGNIFICANT DEVIATIONS SHALL BE NOTES ON THE CONSTRUCTION DRAWINGS.



NOTES:
1. BACKING RING DETAILS SHALL BE CONSISTENT WITH APPROVED WELDING PROCEDURE SPECIFICATIONS.
2. ROOT BASE SHALL BE DEPOSITED TO WITHIN 1" OF BACKING RING SPACER PINS. SPACER PINS SHALL THEN BE REMOVED AND PASS COMPLETED.
3. ALL WELDS SHALL BE SMOOTH. REINFORCEMENT SHALL NOT EXCEED ⅛".
4. WELDING SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE – STEEL.
5. ALL WELDS SHALL BE INSPECTED USING ULTRASONIC TESTING IN ACCORDANCE WITH THE BRIDGE WELDING CODE, ANSI/AASHTO/AWS D1.1. WELDS SHALL BE CONSIDERED TO BE IN TENSION.

PILE SPLICE DETAIL
SCALE: 1" = 1'–0"



PILE POINT DETAIL
SCALE: ¾" = 1'–0"

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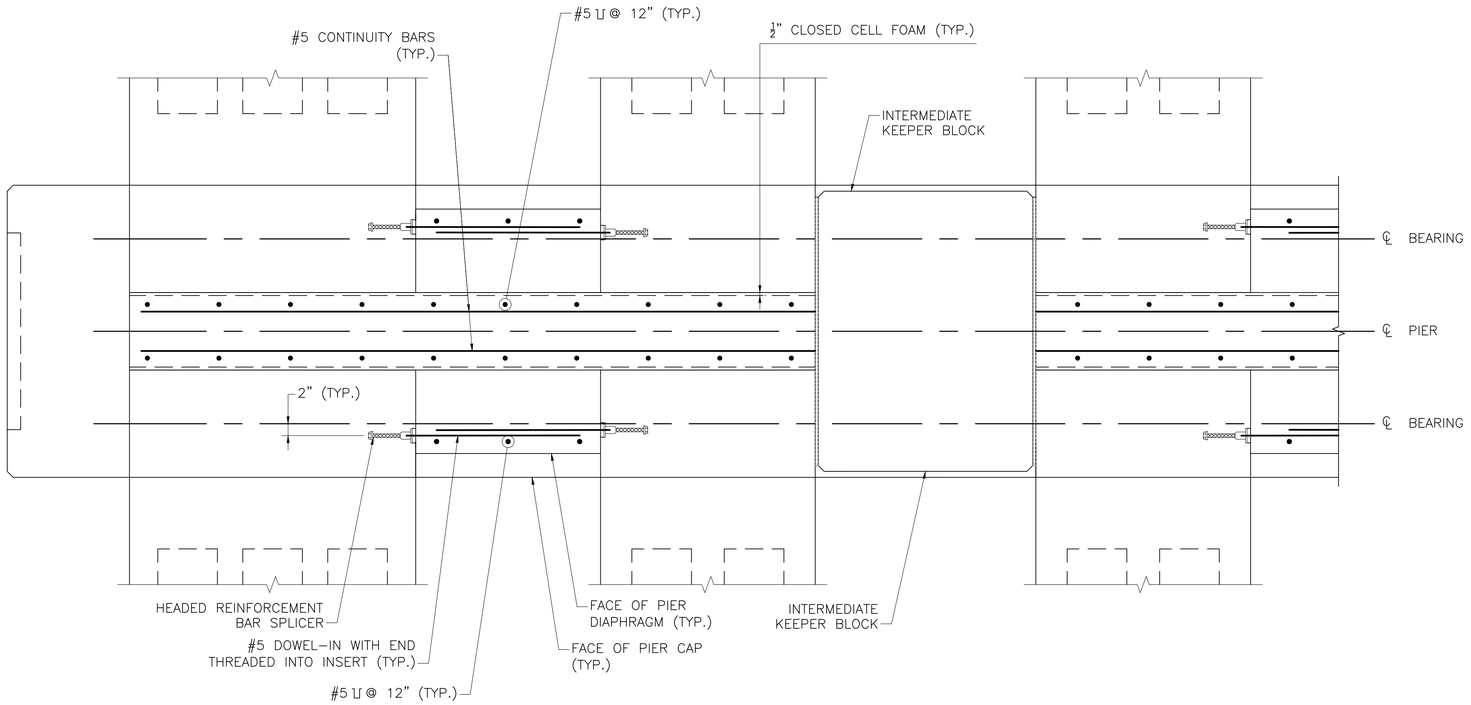
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

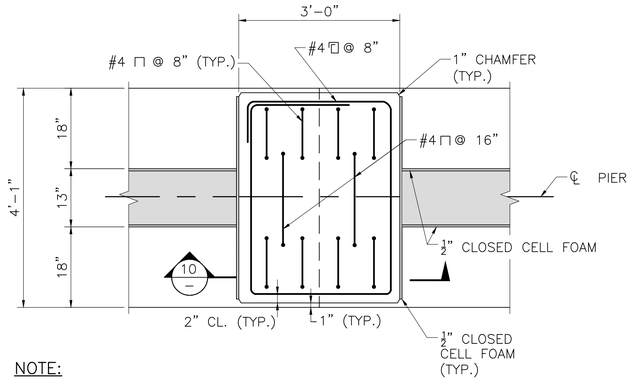
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	66	85
PROJECT FILE NO.	608460		

PIER DIAPHRAGM DETAILS



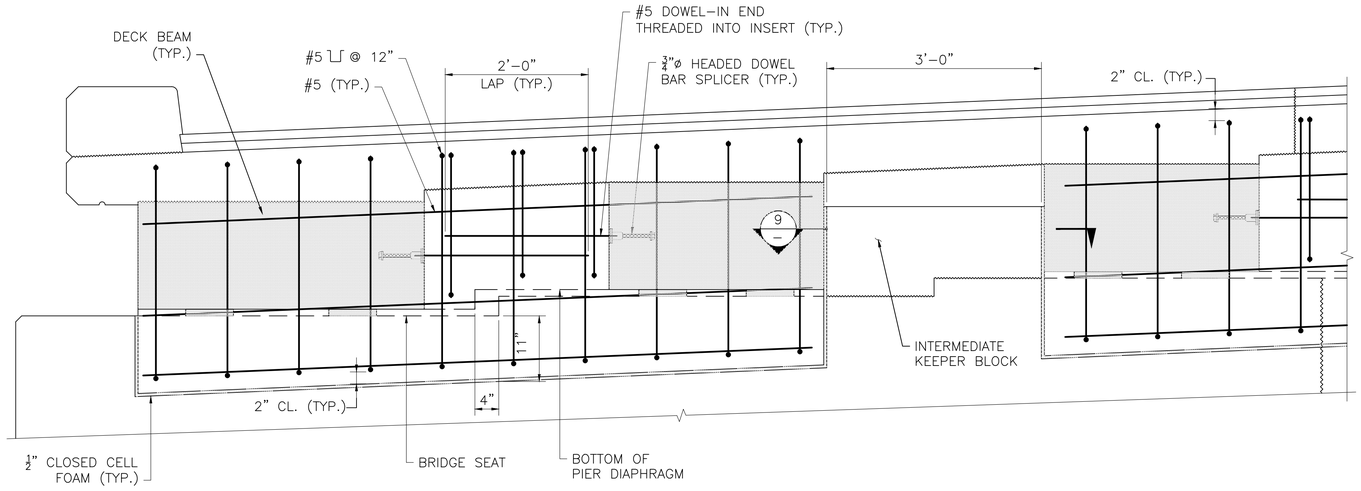
PIER DIAPHRAGM PLAN

SCALE: 1" = 1'–0"



NOTE:

INTERMEDIATE KEEPER BLOCKS SHALL BE CAST BEFORE BEAMS ARE SET AND THE PIER DIAPHRAGM CONCRETE IS PLACED.

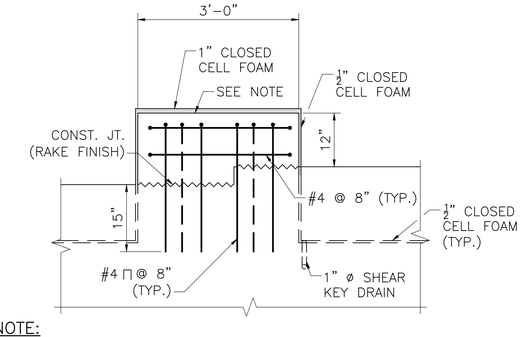


PIER DIAPHRAGM SECTION

SCALE: 1" = 1'–0"

SECTION 9

SCALE: ¾" = 1'–0"



NOTE:

TOP OF INTERMEDIATE KEEPER BLOCK SHALL BE TROWELED SMOOTH PARALLEL TO PROFILE GRADE.

SECTION 10

SCALE: ¾" = 1'–0"

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HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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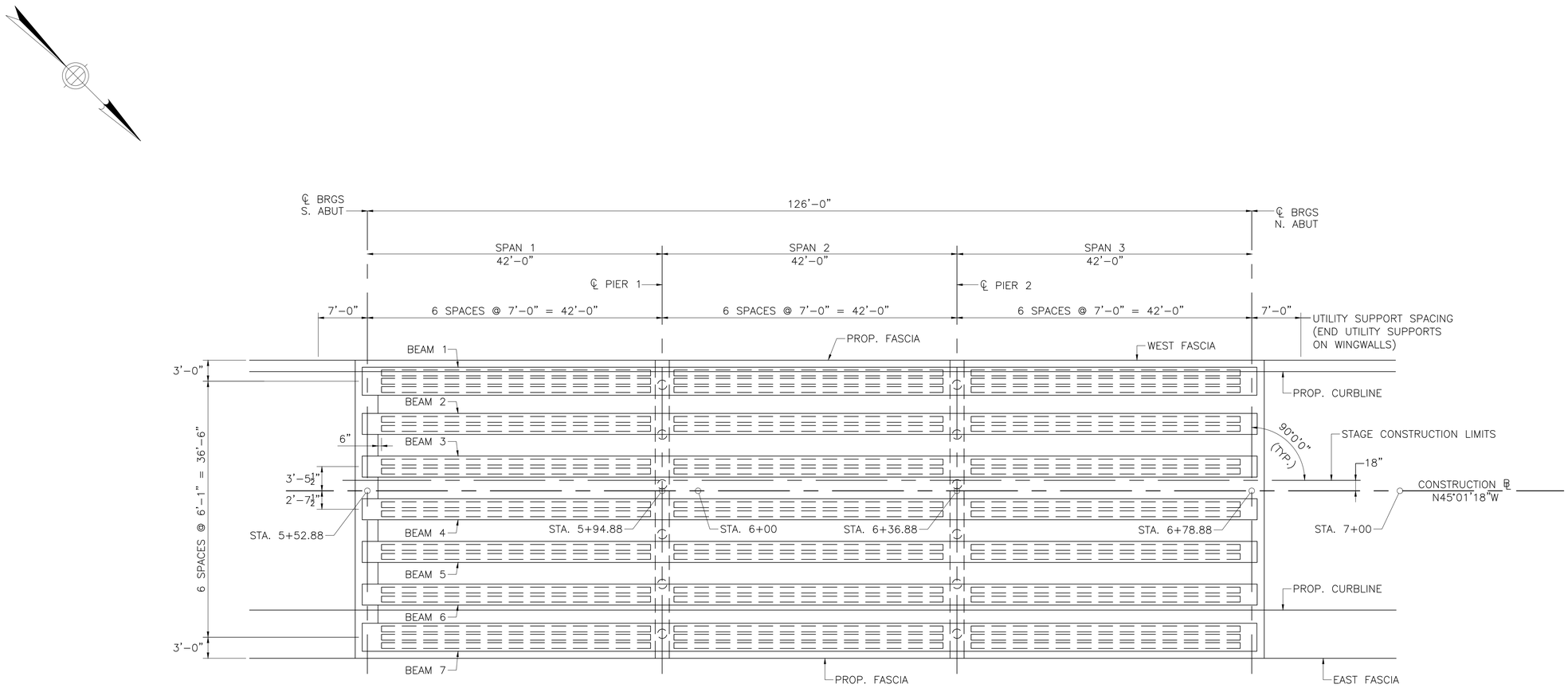
MA	NHP(BRR-0N)-003S(813)X	67	85
PROJECT FILE NO.	608460		

FRAMING PLAN



FRAMING PLAN
SCALE: ⅛" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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608460_BR020 (H-01-005)_FRAMING.DWG Plotted on 21-Jul-2025 12:07 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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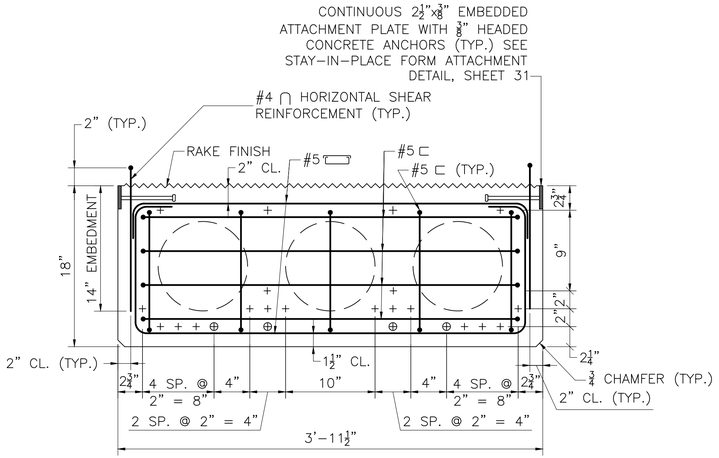
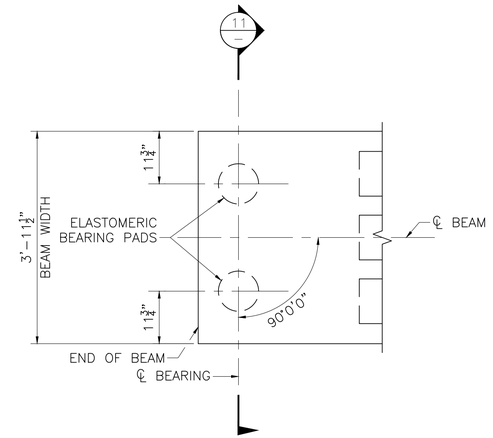
MA	NHP(BRR-0N)-003S(813)X	68	85
PROJECT FILE NO.	608460		

BEAM DETAILS I



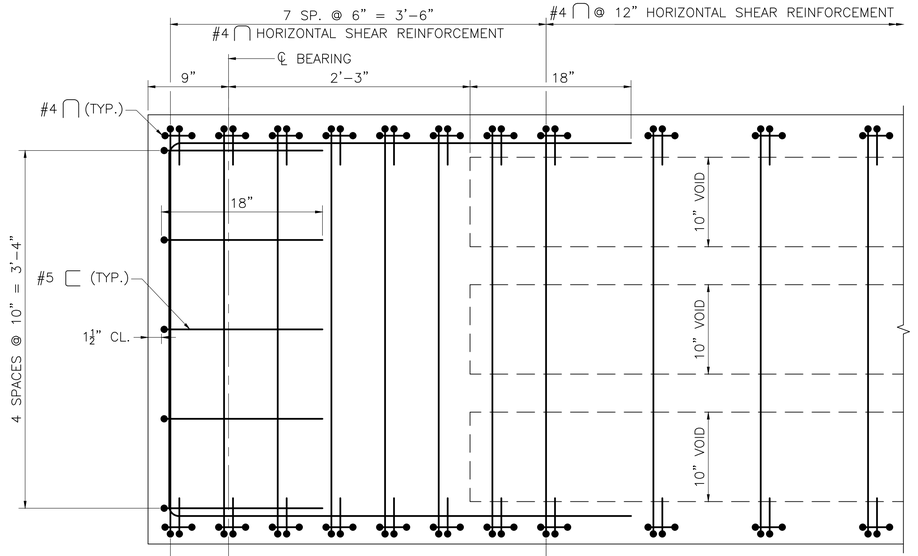
BEAMS 1 AND 7 – TYPICAL END SECTION

SCALE: 1½" = 1'-0"



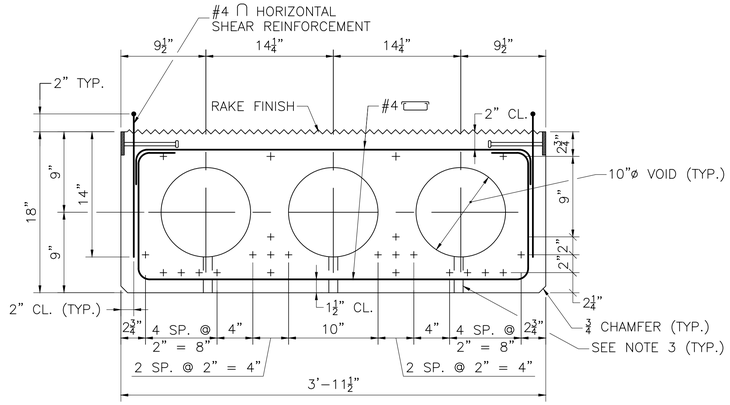
BEAMS 1 AND 7 BEARING PLAN

SCALE: ¾"= 1'-0"



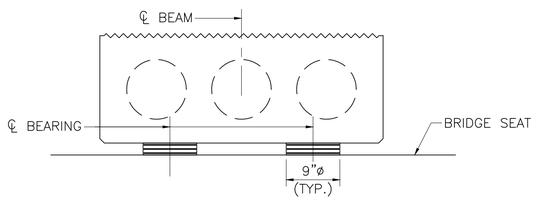
BEAMS 1 AND 7 END OF BEAM PLAN

SCALE: 1½"= 1'-0"



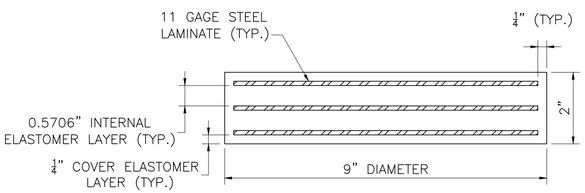
BEAMS 1 AND 7 – TYPICAL MIDSPAN SECTION

SCALE: 1½" = 1'-0"



SECTION 11

SCALE: 1"= 1'-0"

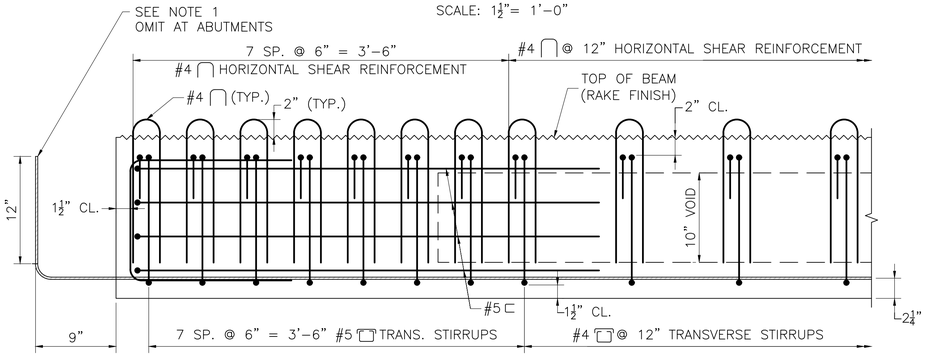


NOTES:

1. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
2. STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
3. THE STRENGTH I COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 67 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 1.05 KSI.

ELASTOMERIC BEARING PADS

SCALE: 6"= 1'-0"



NOTE:

1. ONLY FULLY BONDED STRANDS IN THE BOTTOM ROW SHALL BE EXTENDED INTO THE CONTINUITY DIAPHRAGM

BEAMS 1 AND 7 LONGITUDINAL SECTION AT BEAM END

SCALE: 1½"= 1'-0"

BEAM SECTION NOTES:

1. + DENOTES STRAIGHT STRANDS.
2. ⊕ DENOTES DEBONDED STRANDS.
3. 1" ø DRAIN, PLACED AT BOTH ENDS OF VOIDS.
4. SEE END OF BEAM PLAN FOR STIRRUP SPACING.
5. THE DEBONDED STRANDS SHALL BE DEBONDED OVER THE BEGINNING AND END 6'-0" OF THE BEAM.

PRESTRESS NOTE:

SEE SHEET 27 FOR ADDITIONAL NOTES

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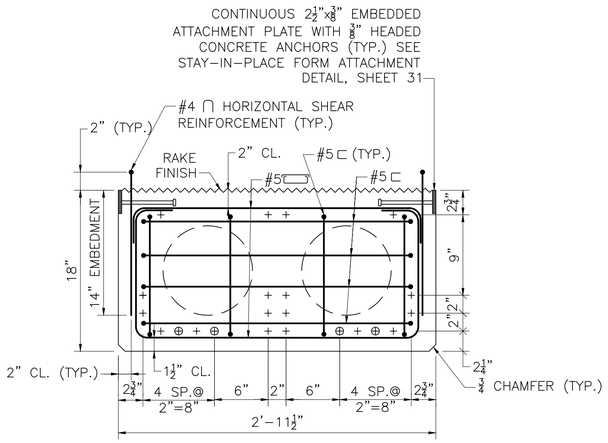
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

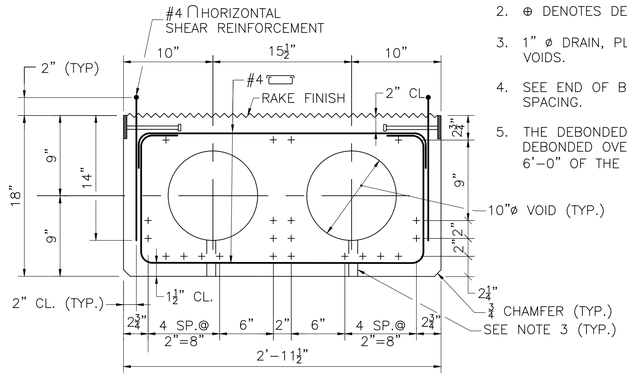
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	69	85
PROJECT FILE NO.	608460		

BEAM DETAILS II



INTERIOR BEAMS 2 THROUGH 6 TYPICAL END SECTION

SCALE: 1½" = 1'-0"

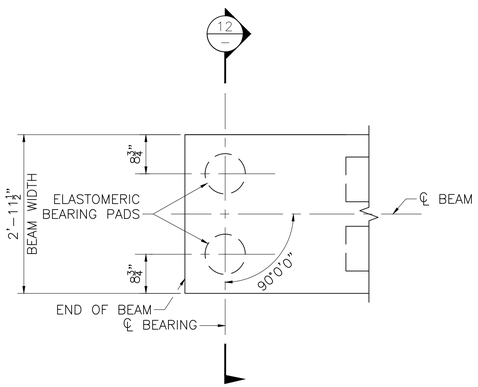


INTERIOR BEAMS 2 THROUGH 6 TYPICAL MIDSPAN SECTION

SCALE: 1½" = 1'-0"

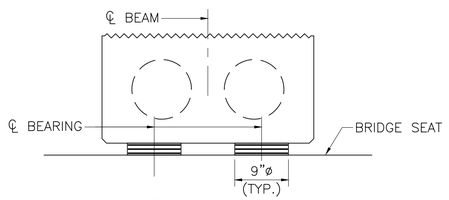
BEAM SECTION NOTES:

1. + DENOTES STRAIGHT STRANDS.
2. ⊕ DENOTES DEBONDED STRANDS.
3. 1" ø DRAIN, PLACED AT BOTH ENDS OF VOIDS.
4. SEE END OF BEAM PLAN FOR STIRRUP SPACING.
5. THE DEBONDED STRANDS SHALL BE DEBONDED OVER THE BEGINNING AND END 6'-0" OF THE BEAM.



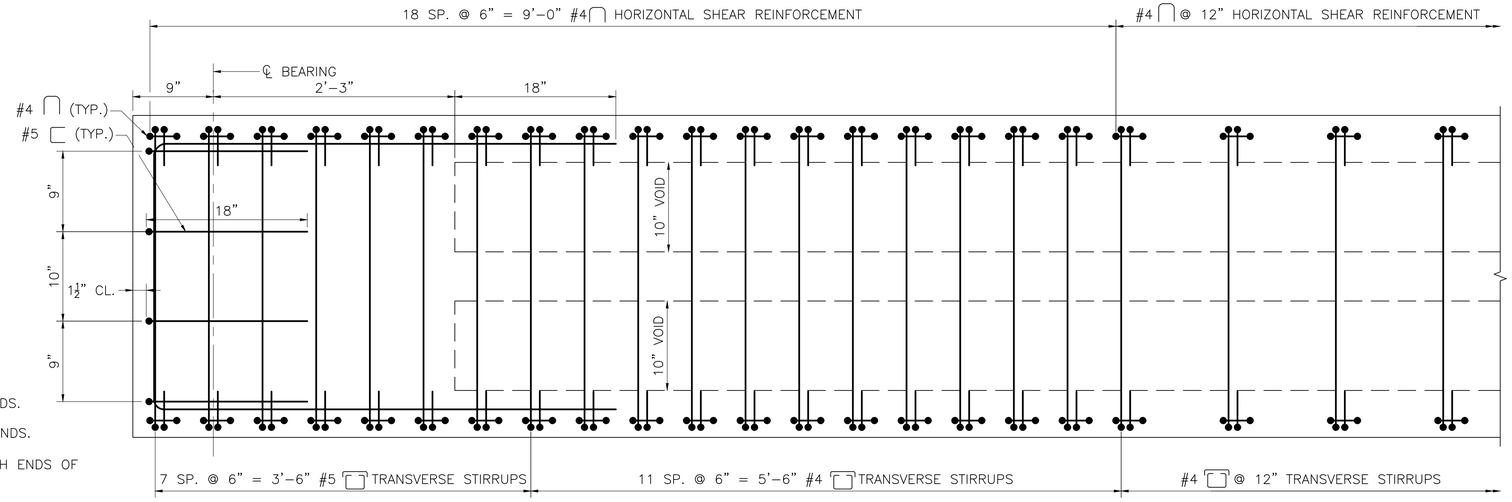
BEAMS 2 THROUGH 6 BEARING PLAN

SCALE: ¾"= 1'-0"



SECTION 12

SCALE: 1"= 1'-0"

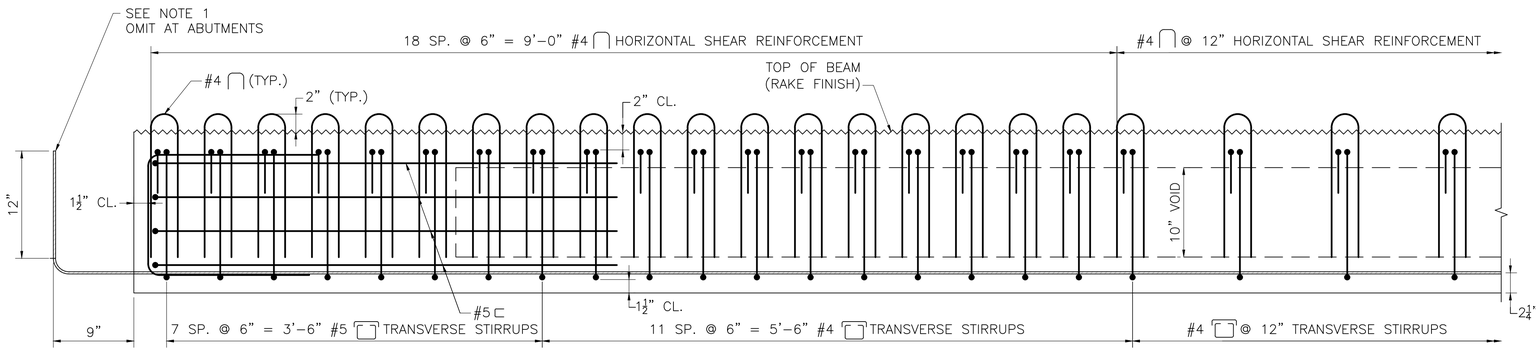


INTERIOR BEAMS 2 THROUGH 6 END OF BEAM PLAN

SCALE: 1½"= 1'-0"

PRESTRESS NOTES:

1. ALL PRETENSIONING ELEMENTS SHALL BE 0.6"ø, UNCOATED, SEVEN-WIRE, LOW RELAXATION STEEL STRANDS AND SHALL CONFORM TO AASHTO M 203.
2. THE NOMINAL TENSILE STRENGTH OF THE PRETENSIONING STRANDS SHALL BE 270 KSI.
3. THE INITIAL TENSION PER 0.6"ø STRAND SHALL BE 44 KIPS.
4. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 6500 PSI.
5. NO PRESTRESS SHALL BE TRANSFERRED TO THE CONCRETE UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH, AS SHOWN BY A CYLINDER TEST, OF AT LEAST 5200 PSI.
6. THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
7. THE FABRICATOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE LIFTING DEVICES WHICH SHALL BE ADEQUATE FOR THE SAFETY FACTORS REQUIRED BY THE ERECTION PROCEDURE.



NOTE:

1. ONLY FULLY BONDED STRANS IN THE BOTTOM ROW SHALL BE EXTENDED INTO THE CONTINUITY DIAPHRAGM

INTERIOR BEAMS 2 THROUGH 6 LONGITUDINAL SECTION

SCALE: 1½"= 1'-0"

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HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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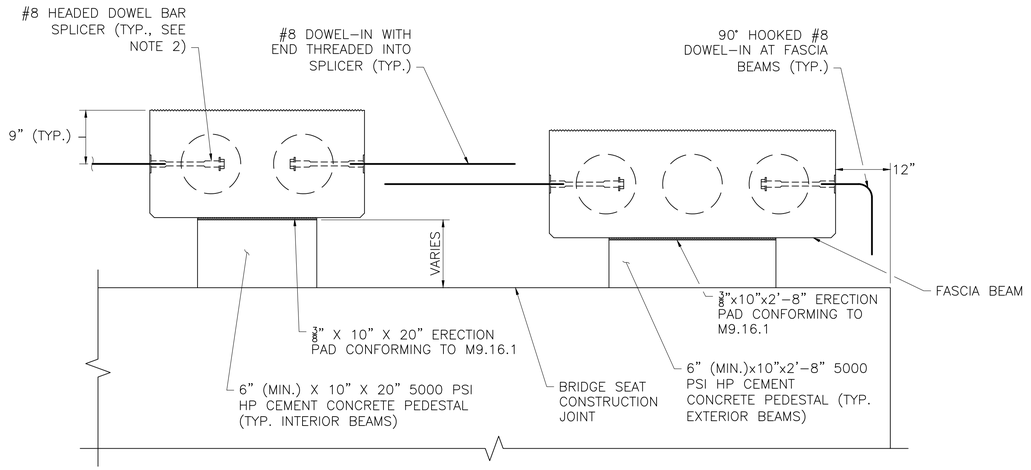
MA	NHP(BRR-0N)-003S(813)X	70	85
PROJECT FILE NO.	608460		

BEAM DETAILS III



BEAM END DETAILS AT ABUTMENTS

SCALE: 1" = 1'–0"

NOTES:

1. THE LATERAL STABILITY OF THE BEAMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR DURING ERECTION AND CONSTRUCTION. A LATERAL SUPPORT SYSTEM SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN AND BRIDGE CONSTRUCTION SPECIFICATIONS.

2. #8 HEADED DOWEL BAR SPLICERS SHALL BE CAST–IN–PLACE IN THE PRECAST BEAMS BY THE FABRICATOR AND SHALL BE EMBEDDED AS REQUIRED TO PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE OF 71.0 KIPS AS SPECIFIED BY THE MANUFACTURER.

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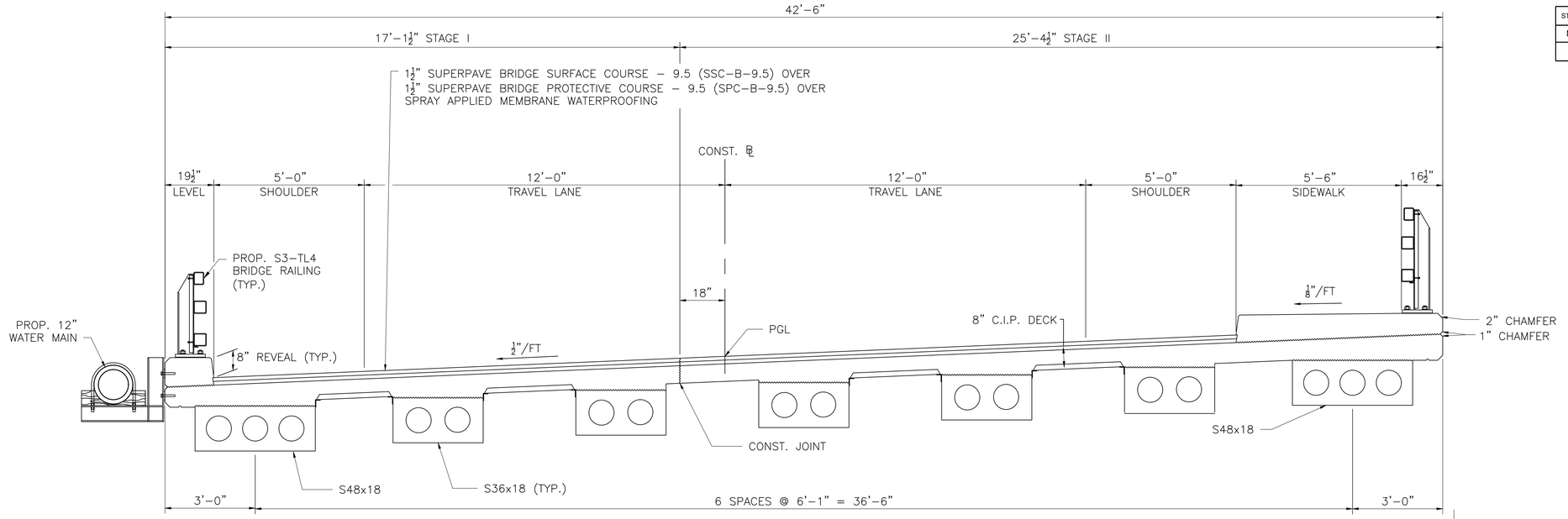
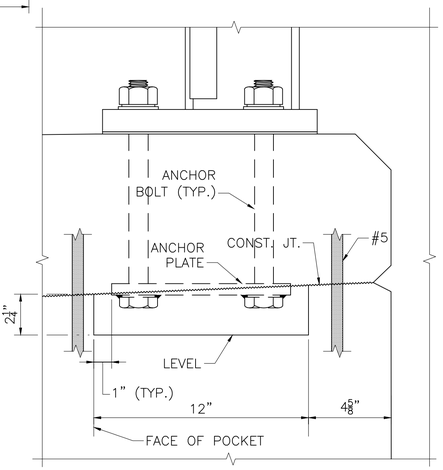
TYPICAL SECTIONS



TRANSVERSE SECTION

SCALE: ½" = 1'-0"

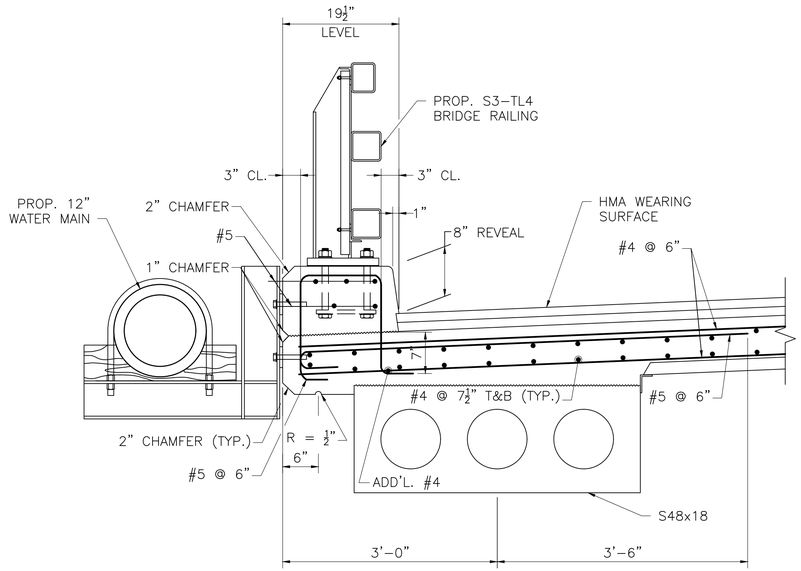


NOTE:

PROVIDE 15¾" LONG, 11¼" WIDE, 2¼" DEEP POCKET IN THE DECK SLAB AT THE LOCATION OF EACH RAIL POST.

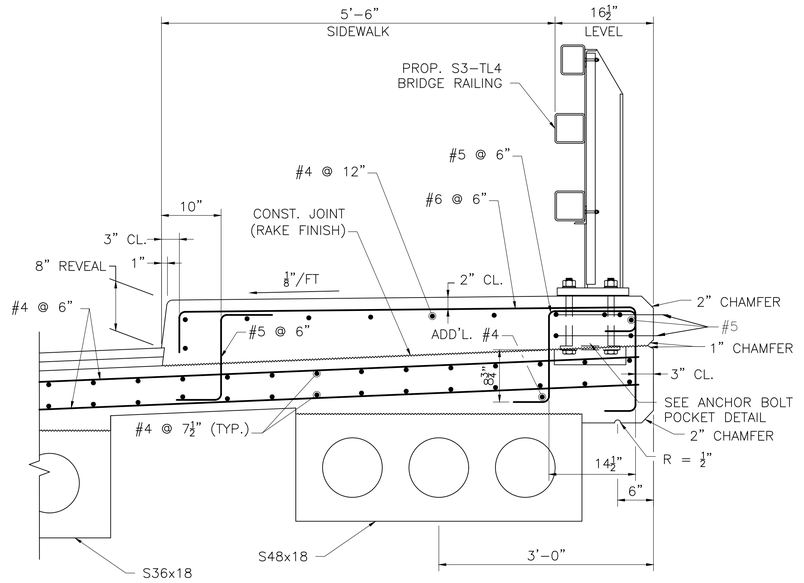
ANCHOR BOLT POCKET AT SIDEWALK

SCALE: 3" = 1'-0"



WEST SAFETY CURB SECTION

SCALE: 1" = 1'-0"



EAST SIDEWALK SECTION

SCALE: 1" = 1'-0"

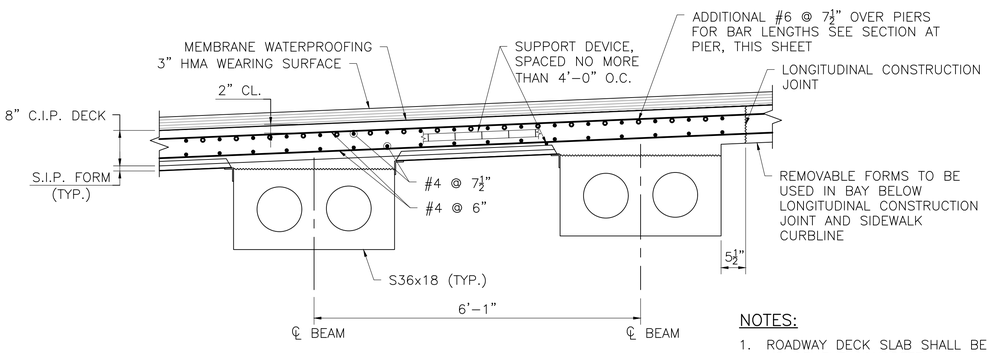
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

USE ONLY PRINTS OF LATEST DATE

608460_TYPICAL SECTIONS.DWG Plotted on 21-Jul-2025 12:08 PM

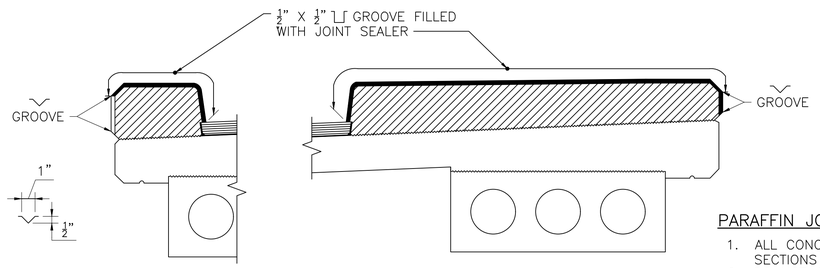
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



TYPICAL DECK REINFORCEMENT
SCALE: ¾" = 1'-0"

NOTES:

1. ROADWAY DECK SLAB SHALL BE 5000 PSI HP CEMENT CONCRETE.
2. LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE ℄ OF CONSTRUCTION. TRANSVERSE (PRIMARY) REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE ℄ OF CONSTRUCTION.
3. ALL REINFORCEMENT AND SUPPORT DEVICES SHALL BE COATED.
4. THE FINISHED SURFACE OF BRIDGE DECK SHALL BE SMOOTH AND WITHOUT ANY PROJECTIONS THAT COULD PUNCTURE THE MEMBRANE WATERPROOFING OR DEPRESSIONS THAT COULD RETAIN WATER.

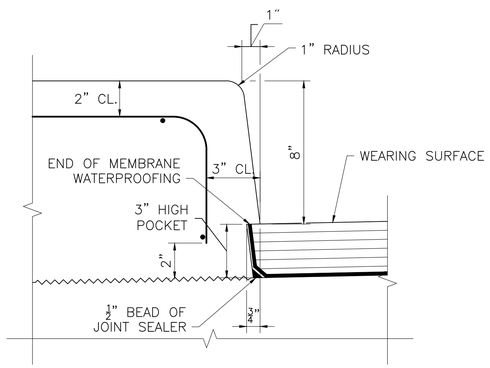


SAFETY CURB SIDEWALK

PARAFFIN JOINT DETAILS
SCALE: ¾" = 1'-0"

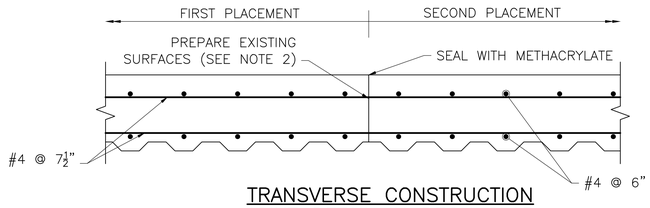
PARAFFIN JOINT NOTES:

1. ALL CONCRETE ABOVE SLAB SHALL BE POURED IN ALTERNATING SECTIONS WITH NOT LESS THAN 3 DAYS BETWEEN POURS.
2. DO NOT CARRY LONGITUDINAL BARS THROUGH THE PARAFFIN JOINTS. END THE REINFORCEMENT 2" CLEAR OF JOINT.
3. JOINT SHALL BE SQUARE TO FACE OF CURB.

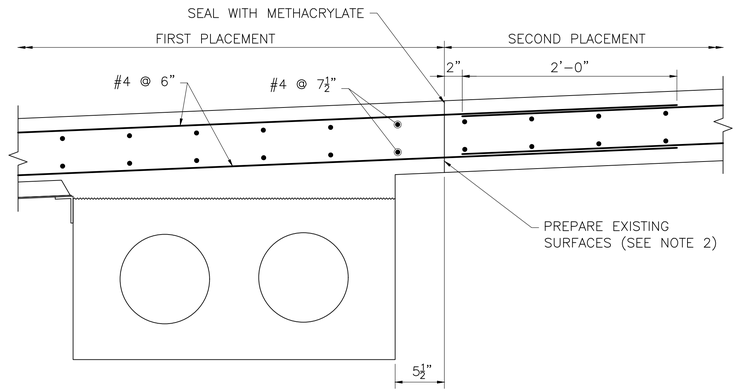


NOTES:
TURN MEMBRANE UP INTO 3" HIGH POCKET.

FACE OF CURB DETAILS
SCALE: 3" = 1'-0"



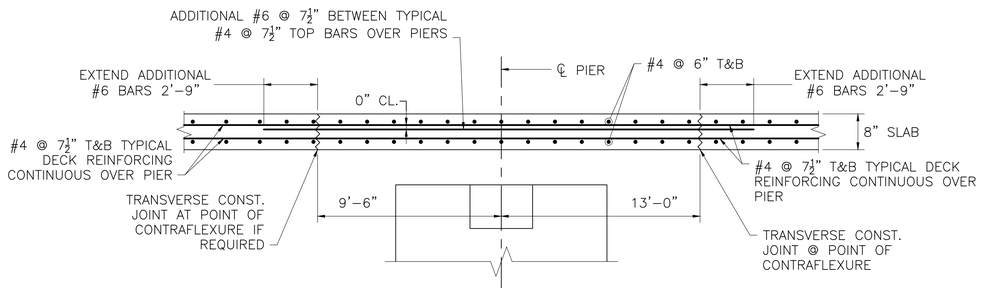
TRANSVERSE CONSTRUCTION JOINT DETAIL IN DECK SLAB
SCALE: 1½" = 1'-0"



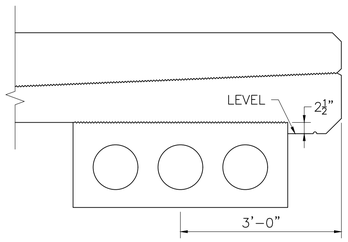
LONGITUDINAL CONSTRUCTION JOINT DETAIL IN DECK SLAB
SCALE: 1½" = 1'-0"

CONSTRUCTION JOINT NOTES

1. BRIDGE DECK SLAB SHALL BE PLACED IN ACCORDANCE WITH THE PLACEMENT SEQUENCE SHOWN ON THE PLANS.
2. THE SURFACE OF THE PREVIOUSLY CAST CONCRETE SHALL BE BLAST CLEANED, ROUGHENED, WETTED WITH CLEAN WATER, AND THEN FLUSHED WITH A MORTAR COMPOSED OF EQUAL PARTS OF THE CEMENT AND SAND SPECIFIED FOR THE NEW CONCRETE, BEFORE NEW CONCRETE IS PLACED ADJACENT THERETO. NEW CONCRETE SHALL BE PLACED BEFORE MORTAR HAS TAKEN INITIAL SET.
3. IN LIEU OF THE MORTAR, AN EPOXY ADHESIVE SUITABLE FOR BONDING FRESH CONCRETE TO HARDENED CONCRETE FOR LOAD BEARING APPLICATIONS MAY BE USED. THE EPOXY ADHESIVE SHALL CONFORM TO AASHTO M 235 TYPE V AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. DOWEL BAR SPLICERS SHALL BE USED WHERE USE OF LAP SPLICES IS NOT FEASIBLE.



DECK SECTION AT PIER
(PIER 1 SHOWN, PIER 2 MIRRORED)
NOT TO SCALE

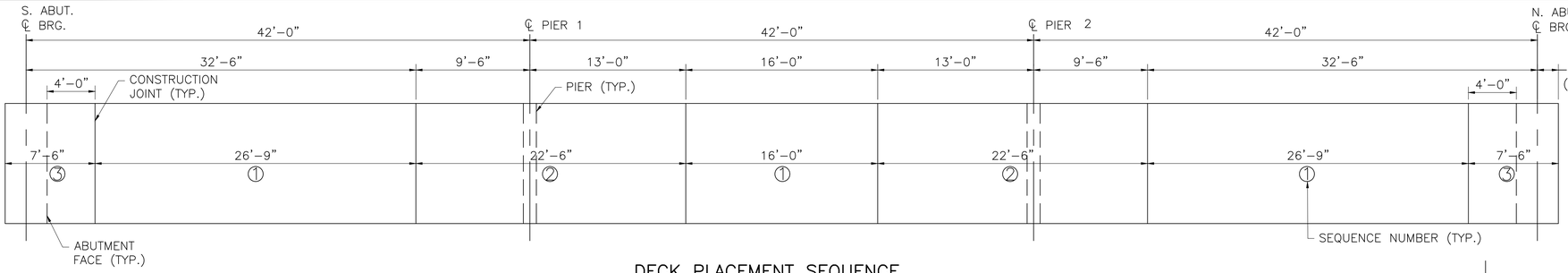


SLAB OVERHANG AT FASCIA BEAM
SCALE: ¾" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_BR28 (H-01-005)_DECK DETAILS.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



DECK PLACEMENT SEQUENCE

SCALE: $\frac{3}{16}$" = 1'–0"

TOP OF FORM ELEVATIONS FOR DECK SLAB PRIOR TO PLACEMENT OF CONCRETE

BEAM NO.	INCREASING STATIONS →														
	SPAN 1					SPAN 2					SPAN 3				
	℄ BRG. S. ABUT.	¼ PT.	½ PT.	¾ PT.	℄ BRG. PIER 1	℄ BRG. PIER 1	¼ PT.	½ PT.	¾ PT.	℄ BRG. PIER 2	℄ BRG. PIER 2	¼ PT.	½ PT.	¾ PT.	℄ BRG. N. ABUT.
1	124.44	124.37	124.31	124.26	124.18	124.17	124.14	124.10	124.04	123.97	123.96	123.93	123.90	123.83	123.75
2	124.69	124.63	124.57	124.51	124.43	124.42	124.40	124.36	124.30	124.22	124.21	124.19	124.15	124.09	124.01
3	124.95	124.88	124.82	124.77	124.69	124.67	124.65	124.61	124.55	124.48	124.46	124.44	124.41	124.34	124.26
4	125.20	125.14	125.08	125.02	124.94	124.93	124.90	124.87	124.80	124.73	124.72	124.70	124.66	124.60	124.51
5	125.45	125.39	125.33	125.28	125.19	125.18	125.16	125.12	125.06	124.98	124.97	124.95	124.92	124.85	124.77
6	125.71	125.64	125.58	125.53	125.45	125.43	125.41	125.37	125.31	125.24	125.22	125.20	125.17	125.10	125.02
7	125.96	125.89	125.83	125.78	125.70	125.69	125.66	125.62	125.56	125.49	125.48	125.45	125.42	125.35	125.27

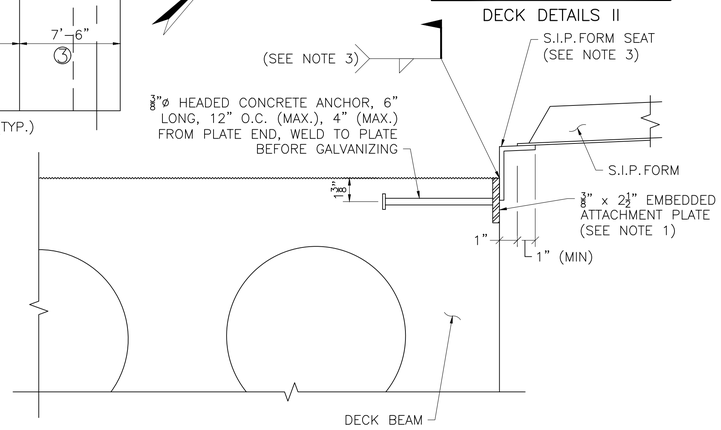
NOTE:

AFTER THE BEAMS ARE ERECTED BUT BEFORE THE FORMS ARE BUILT, ELEVATIONS ON TOP OF THE BEAMS ARE TO BE OBTAINED AT THE POINTS INDICATED IN THE TABLE. THE DIFFERENCE BETWEEN THE ELEVATIONS OBTAINED AND THOSE SHOWN IN THE TABLE GIVES THE THEORETICAL BLOCKING DISTANCE FROM THE TOP OF BEAM TO THE BOTTOM OF THE SLAB AT CENTER LINE OF BEAM.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	73	85
PROJECT FILE NO.	608460		

DECK DETAILS II

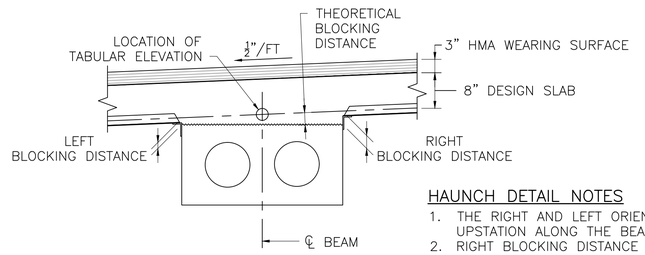


NOTE:

1. EMBEDDED ATTACHMENT PLATES SHALL BE HOT–DIP GALVANIZED AASHTO M 270 GRADE 36 STEEL. THE PLATES SHALL BE IN LENGTHS FROM 3' TO 12' WITH PIECES BUTTED TOGETHER WITHOUT END CONNECTIONS FOR FULL LENGTH OF BEAM. THE HEADED ANCHORS SHALL BE ATTACHED TO THE PLATES PRIOR GALVANIZING.
2. HEADED ANCHORS SHALL CONFORM TO M8.04.1 FOR MATERIAL REQUIREMENTS ONLY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE S.I.P. FORM SEAT AND WELD.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING THE CONCRETE LAITANCE FROM THE ATTACHMENT PLATE BEFORE INSTALLING THE S.I.P. FORMS.

STAY–IN–PLACE FORM ATTACHMENT DETAIL

SCALE: 3" = 1'–0"



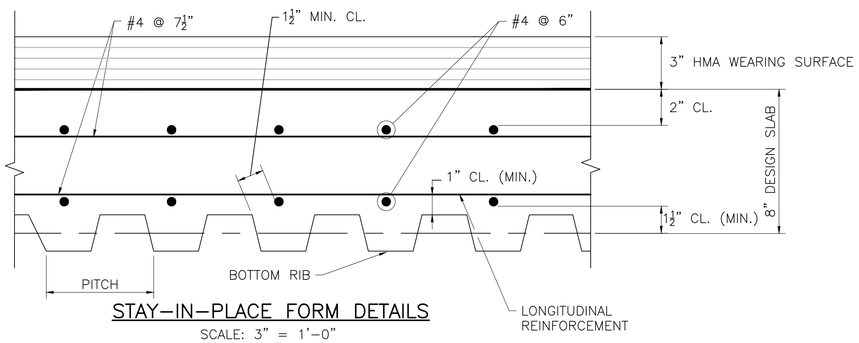
HAUNCH DETAIL

SCALE: ¾" = 1'–0"

HAUNCH DETAIL NOTES

1. THE RIGHT AND LEFT ORIENTATION IS TAKEN LOOKING UPSTATION ALONG THE BEAM.
2. RIGHT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "R"
3. LEFT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "L"

"R" AND "L"			
BEAMS 1 AND 7		BEAMS 2–6	
"R"	"L"	"R"	"L"
0'–1"	–0'–1"	0'–0 3/4"	–0'–0 3/4"



STAY–IN–PLACE FORM DETAILS

SCALE: 3" = 1'–0"

S.I.P. FORM DETAILS NOTES :

1. FOR 2" S.I.P. FORM, SET BOTTOM OF FORM 1" BELOW ELEVATION GIVEN IN TABLE. FOR 3" S.I.P. FORM, SET BOTTOM OF FORM 1½" BELOW TABLE ELEVATIONS.
2. FORM ENDS SHALL BE CRIMPED CLOSED IN A TAPERED MANNER. SEPARATE END CLOSURE PIECES WILL NOT BE ALLOWED.
3. SUPPORT ANGLES SHALL BE PLACED IN THE "LEG DOWN" POSITION WHERE POSSIBLE. WHERE "LEG UP" POSITION IS NECESSARY, THE UPPER MOST PORTION OF THE ANGLE SHALL NOT PROJECT MORE THAN 1" ABOVE THE TOP FLANGE OR COVER PLATE. THE CONTRACTOR SHALL HAVE AN ASSORTMENT OF ANGLES OF VARIOUS SIZES AVAILABLE ON THE SITE TO CONFORM TO THIS REQUIREMENT.
4. ALL MAIN STEEL REINFORCEMENT IN THE LOWER MAT SHALL BE CENTERED OVER THE VALLEY OF THE S.I.P. FORM.
5. CONTRACTOR SHALL DESIGN AND DETAIL ALL ELEMENTS OF THE FORMING SYSTEM AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.
6. IN CASES WHERE STANDARD 2" OR 3" DEEP S.I.P. FORMS DO NOT SATISFY DESIGN REQUIREMENTS AN ALTERNATIVE FORMING SYSTEM CONSISTING OF DEEPER S.I.P. FORMS OR REMOVABLE FORMS SHALL BE DESIGNED AND DETAILED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. THE DESIGN THICKNESS OF THE SLAB SHALL NOT BE REDUCED.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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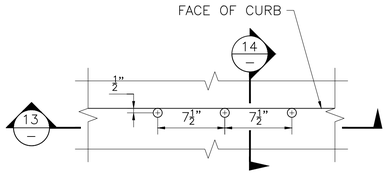
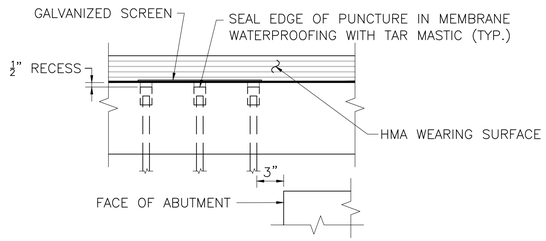
608460_BR28 (H-01-005)_DECK DETAILS.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



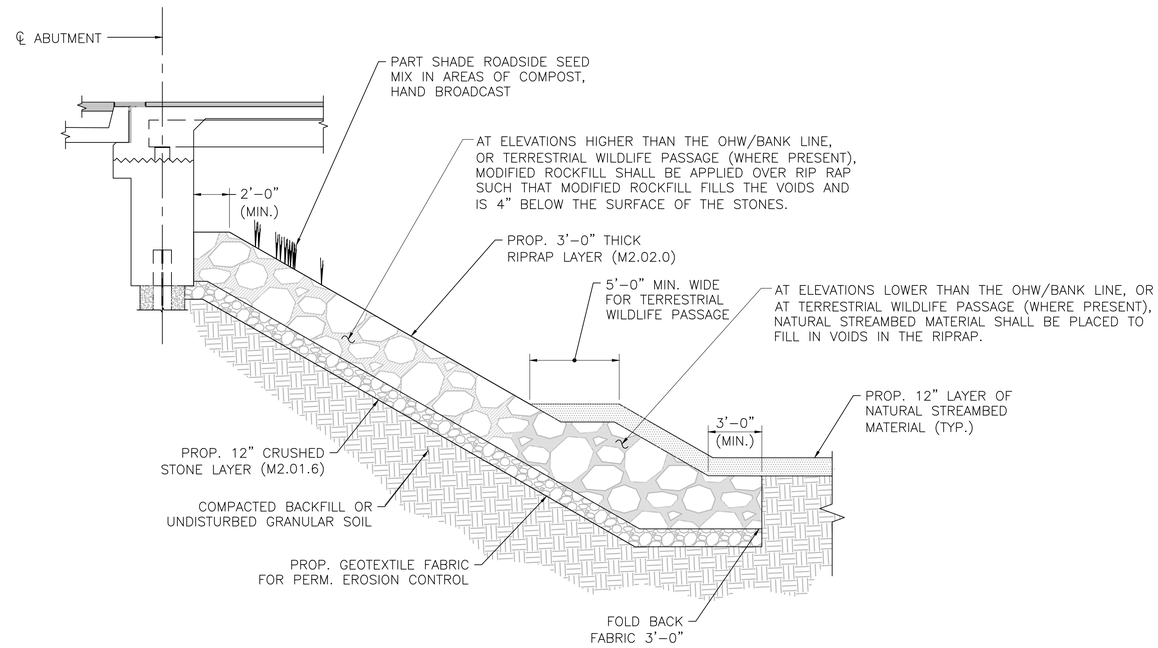
DECK PLAN

SCALE: 1½" = 1'–0"



SECTION 13

SCALE: 1½" = 1'–0"



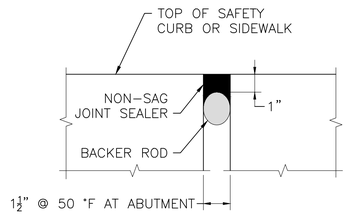
RIPRAP DETAIL

SCALE: ¼" = 1'–0"

NOTES:
1. DRAINS SHALL BE LOCATED AT ALL ROADWAY JOINTS AND/OR LOW POINT OF VERTICAL CURVE

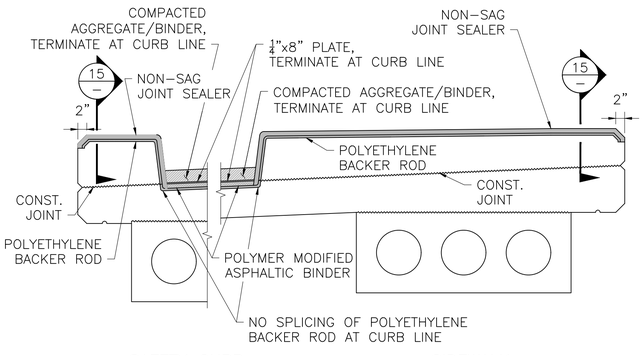
SECTION 14
DECK DRAIN PIPES AT SAFETY CURB

SCALE: ¾" = 1'–0"



SECTION 15

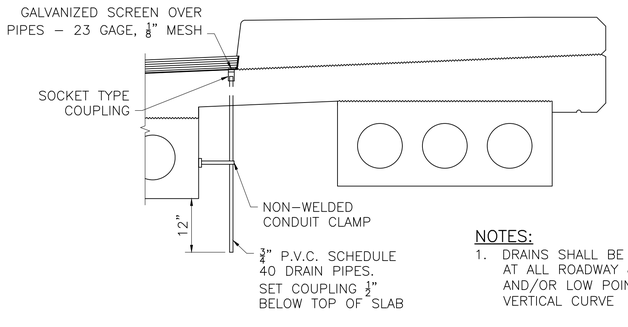
SCALE: 3" = 1'–0"



SAFETY CURB SIDEWALK

JOINT DETAIL AT S3–TL4 RAILING

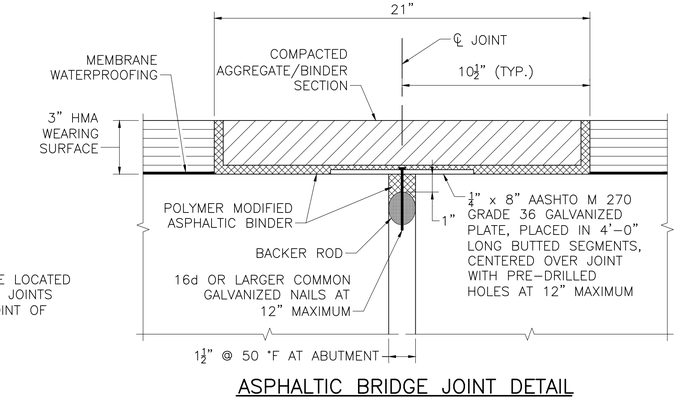
SCALE: ¾" = 1'–0"



NOTES:
1. DRAINS SHALL BE LOCATED AT ALL ROADWAY JOINTS AND/OR LOW POINT OF VERTICAL CURVE

SECTION 14
DECK DRAIN PIPES AT SIDEWALK

SCALE: ¾" = 1'–0"



ASPHALTIC BRIDGE JOINT DETAIL

SCALE: 3" = 1'–0"

JOINT CONSTRUCTION NOTES:
1. CENTER 19" WIDE STRIP OF ROOFING FELT OVER THE JOINT LOCATION.
2. PLACE WATERPROOFING MEMBRANE AND HMA WEARING SURFACE UNIFORMLY ACROSS THE DECK AND JOINT LOCATIONS.
3. SAW CUT AND REMOVE THE HMA WEARING SURFACE AND MEMBRANE WATERPROOFING TO THE LIMITS REQUIRED.
4. PLACE BACKER ROD, POLYMER MODIFIED BINDER AND STEEL PLATE SECURED IN PLACE WITH GALVANIZED NAILS.
5. COAT THE SURFACES OF THE BLOCK–OUT WITH THE POLYMER MODIFIED ASPHALTIC BINDER.
6. PLACE COMPACTED AGGREGATE/BINDER TO FILL ALL VOIDS AND OBTAIN A FINAL AND EVEN SURFACE WITH THE ADJACENT WEARING SURFACE.
7. IT IS NOT NECESSARY TO CONSTRUCT THE JOINT AT MEAN TEMPERATURE, HOWEVER, THE MANUFACTURER SHOULD BE CONSULTED FOR INSTALLATION GUIDELINES FOR EXTREME CLIMATE CONDITIONS.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER

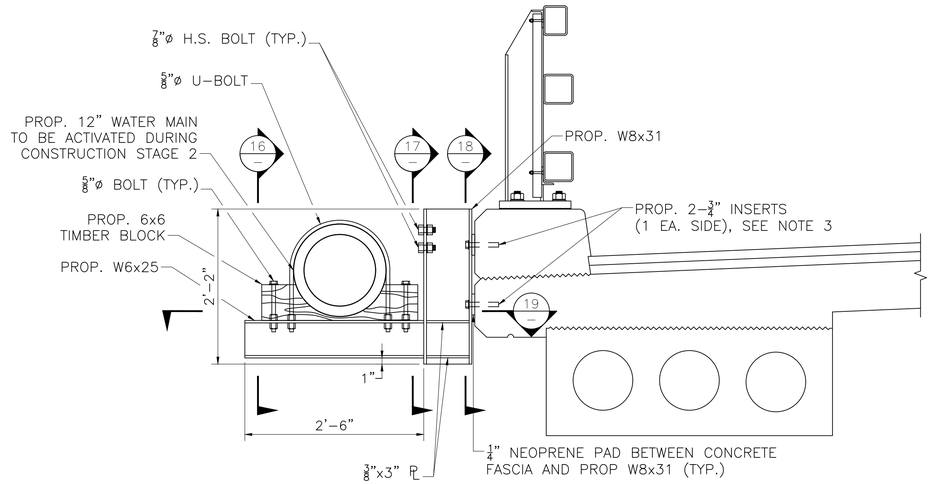
USE ONLY PRINTS OF LATEST DATE

608460_BR29 (H-01-005)_MISCELLANEOUS DETAILS.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

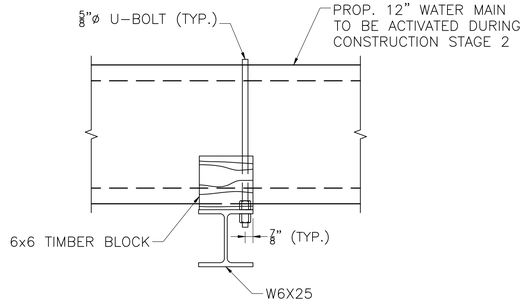
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	75	85
PROJECT FILE NO.	608460		

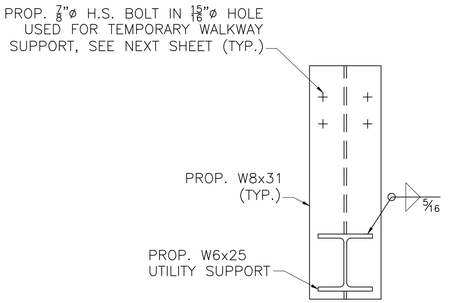
UTILITY SUPPORT DETAILS



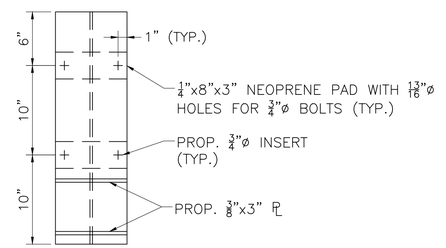
UTILITY SUPPORT DETAIL
SCALE: 1" = 1'-0"



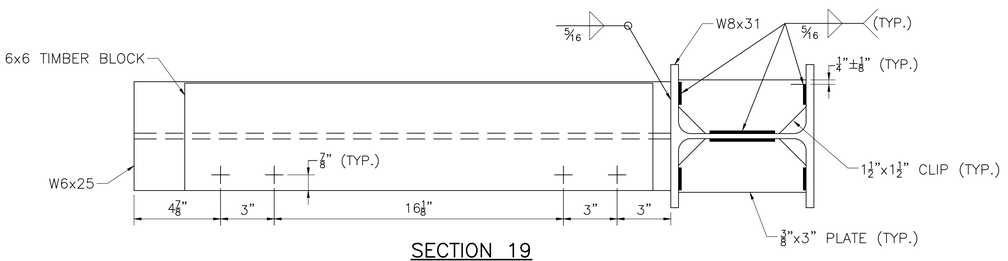
SECTION 16
SCALE: 1½" = 1'-0"



SECTION 17
SCALE: 1½" = 1'-0"



SECTION 18
SCALE: 1½" = 1'-0"



SECTION 19
SCALE: 3" = 1'-0"

UTILITY SUPPORT NOTES:

1. ALL STRUCTURAL STEEL SHALL USED IN UTILITY SUPPORT DETAILS CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M270 (ASTM A709) GRADE 50 AND SHALL REQUIRE CHARPY V NOTCH TESTING.
2. ALL UTILITY SUPPORTS SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STANDARD 595B, COLOR NO. 10045).
3. PROPOSED UTILITY SUPPORT INSERTS SHALL BE DESIGNED TO SUPPORT MINIMUM LOAD OF 5 KIPS IN TENSION AND 2 KIPS IN SHEAR.
4. 5/8"ø U-BOLT TO BE INSTALLED LOOSE TO ALLOW FOR INDEPENDENT THERMAL MOVEMENT BETWEEN BRIDGE AND DUCTILE IRON WATER MAIN.
5. THE DUCTILE IRON PIPE AND SADDLE ARE TO BE INSTALLED IN ACCORDANCE WITH MASSDOT STANDARDS.

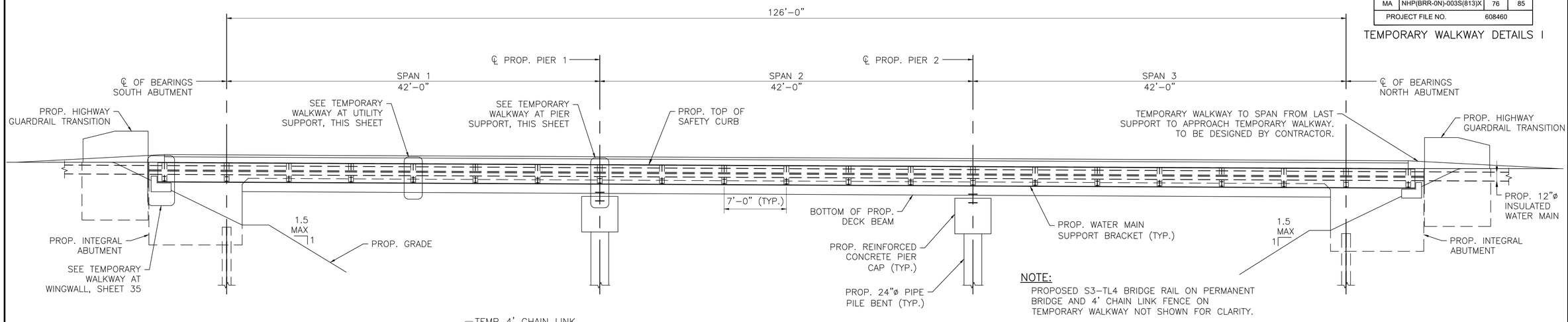
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_UTILITY SUPPORT DETAILS.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	76	85
PROJECT FILE NO.	608460		

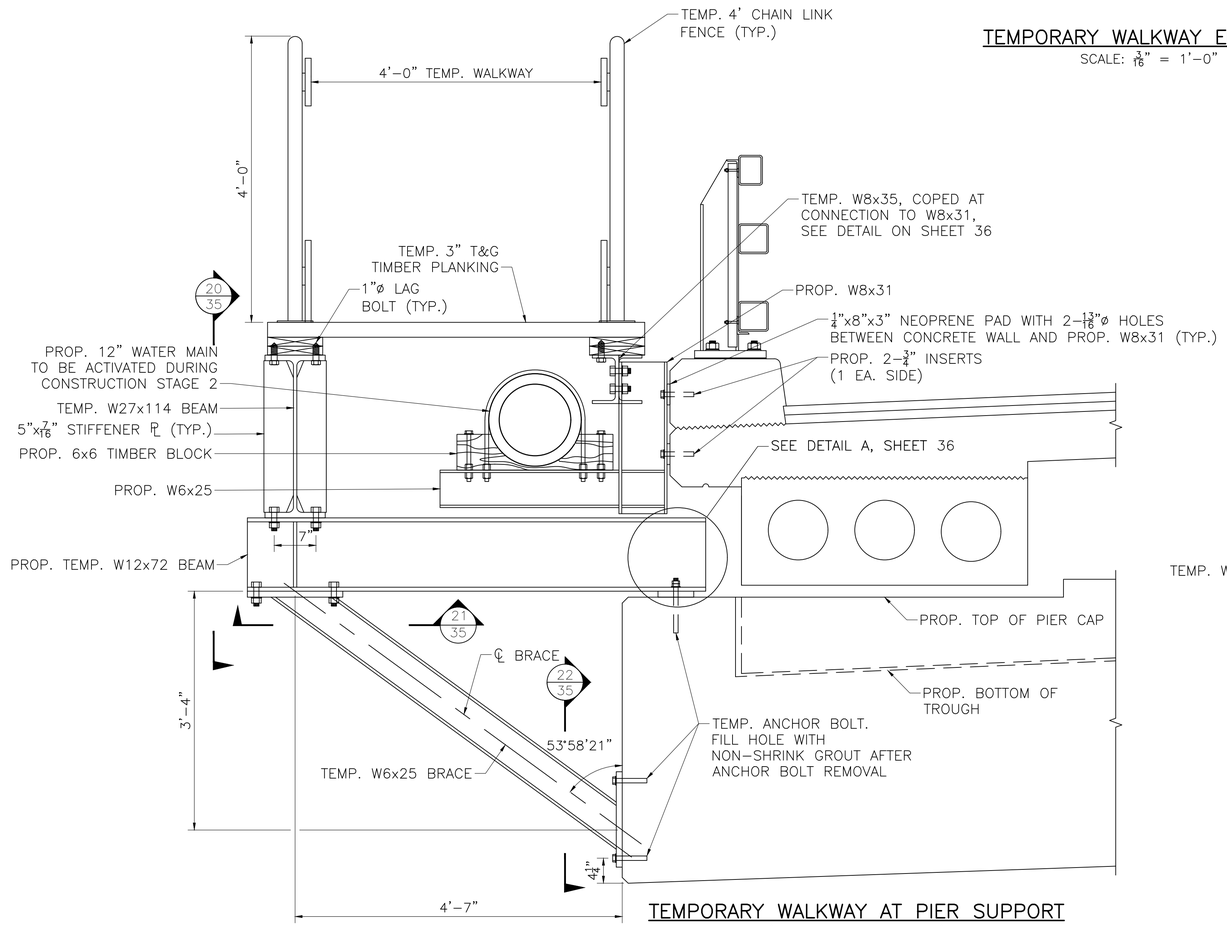
TEMPORARY WALKWAY DETAILS I



NOTE:
PROPOSED S3-TL4 BRIDGE RAIL ON PERMANENT BRIDGE AND 4' CHAIN LINK FENCE ON TEMPORARY WALKWAY NOT SHOWN FOR CLARITY.

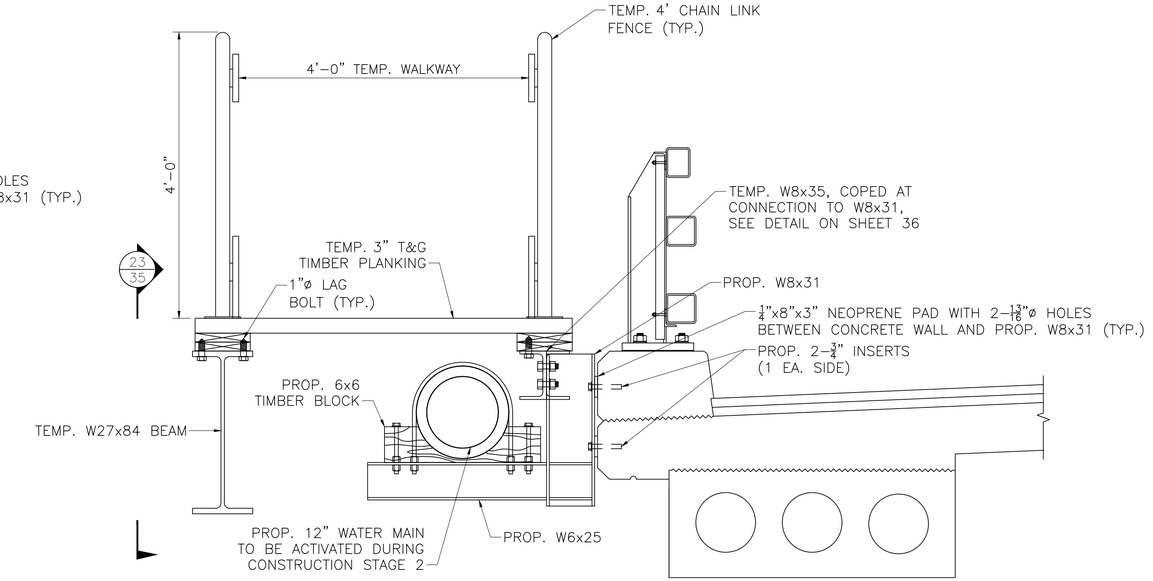
TEMPORARY WALKWAY ELEVATION

SCALE: $\frac{3}{16}$" = 1'-0"



TEMPORARY WALKWAY AT PIER SUPPORT (LOOKING NORTH)

SCALE: 1" = 1'-0"



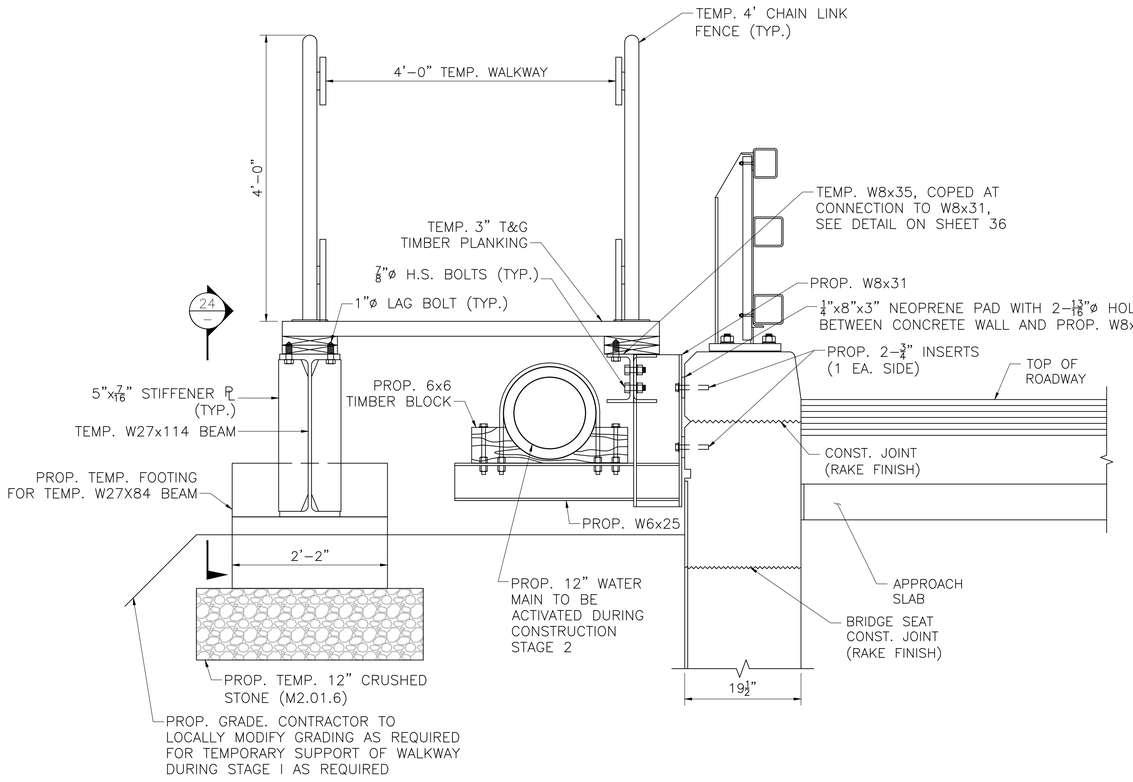
TEMPORARY WALKWAY AT UTILITY SUPPORT (LOOKING NORTH)

SCALE: 1" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

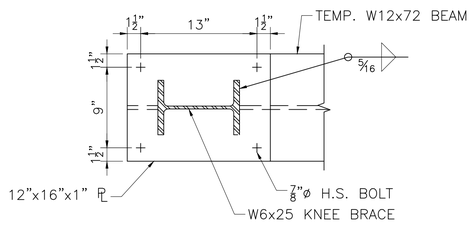
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_TEMPORARY WALKWAY DETAILS III.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



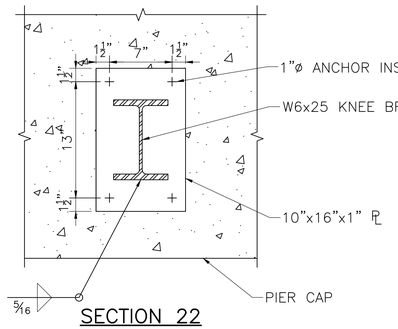
TEMPORARY WALKWAY AT WINGWALL (LOOKING NORTH)

SCALE: 1" = 1'-0"



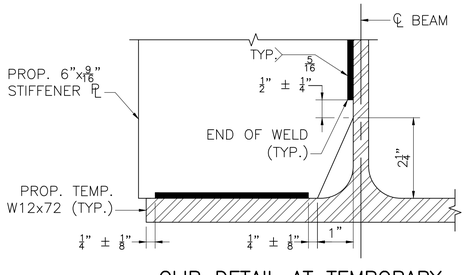
SECTION 21

SCALE: 1 1/2" = 1'-0"



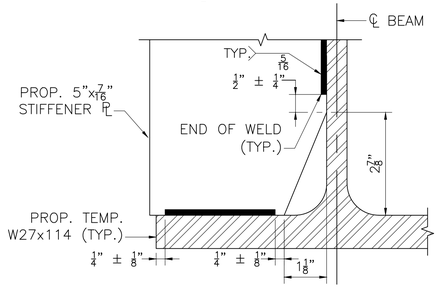
SECTION 22

SCALE: 1 1/2" = 1'-0"



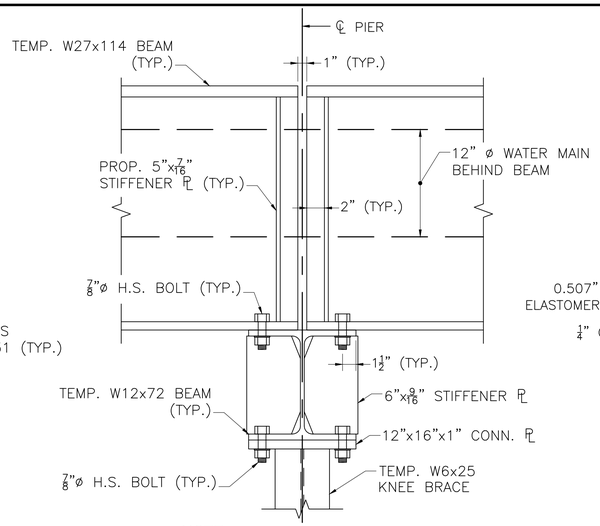
CLIP DETAIL AT TEMPORARY W12x72 BEAM STIFFENER PLATES

SCALE: 6" = 1'-0"



CLIP DETAIL AT TEMPORARY W27x114 BEAM STIFFENER PLATES

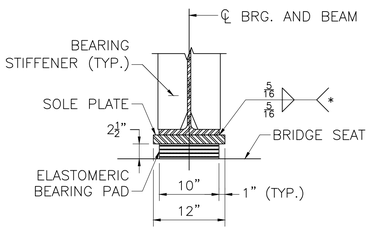
SCALE: 6" = 1'-0"



NOTE:
UTILITY SUPPORT NOT SHOWN FOR CLARITY, SEE SHEET 33 FOR DETAILS.

SECTION 20

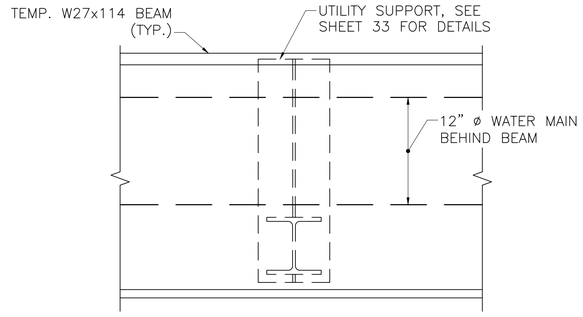
SCALE: 1 1/2" = 1'-0"



(*) - WELDS SHALL TERMINATE 1/4" FROM EDGE OF PLATE.

TEMPORARY W27x114 SECTION AT BEARING

SCALE: 1" = 1'-0"



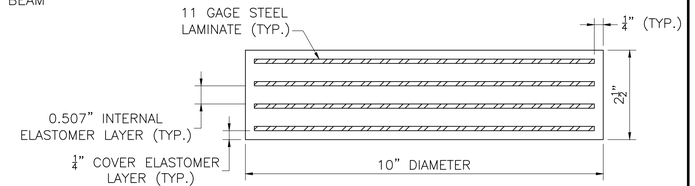
SECTION 23

SCALE: 1 1/2" = 1'-0"

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	77	85
PROJECT FILE NO.	608460		

TEMPORARY WALKWAY DETAILS II

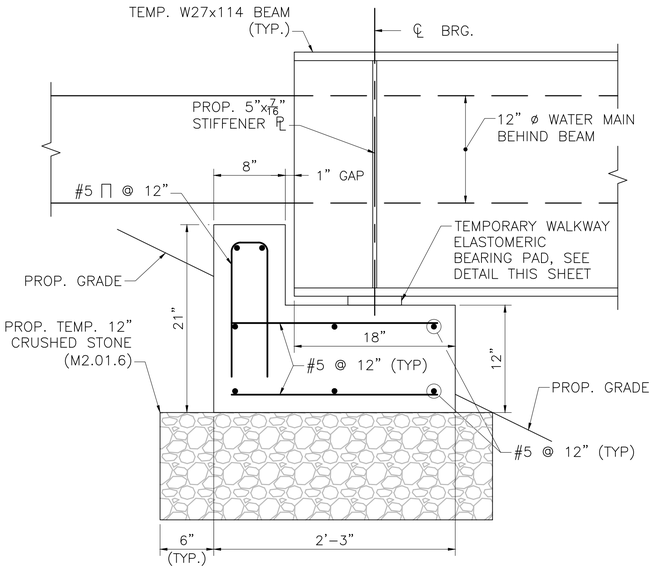


NOTES:

1. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
2. STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
3. THE STRENGTH I COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 12.7 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 0.16 KSI.
4. ELASTOMERIC BEARING PAD SHALL NOT BE VULCANIZED TO THE TEMPORARY BEAM.

TEMPORARY WALKWAY ELASTOMERIC BEARING PADS

SCALE: 6"= 1'-0"



NOTE:
UTILITY SUPPORT NOT SHOWN FOR CLARITY, SEE SHEET 33 FOR DETAILS.

SECTION 24

SCALE: 1 1/2" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

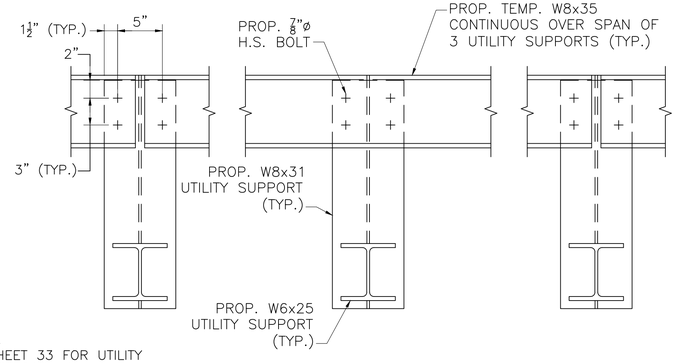
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_TEMPORARY WALKWAY DETAILS III.DWG Plotted on 21-Jul-2025 12:08 PM

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

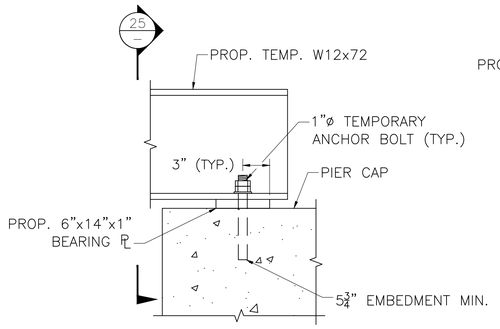
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	78	85
PROJECT FILE NO.	608460		

TEMPORARY WALKWAY DETAILS III

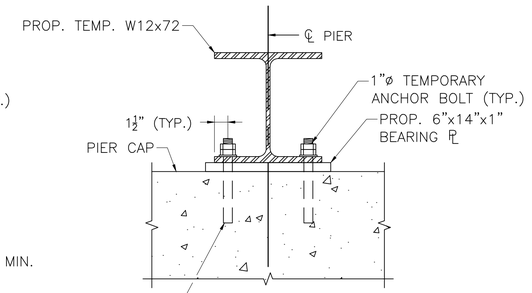


NOTE:
SEE SHEET 33 FOR UTILITY SUPPORT DETAILS

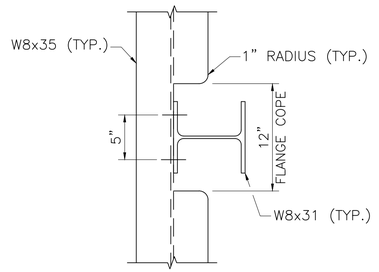
TEMPORARY CONTINUOUS W8X35
SCALE: 1½" = 1'–0"



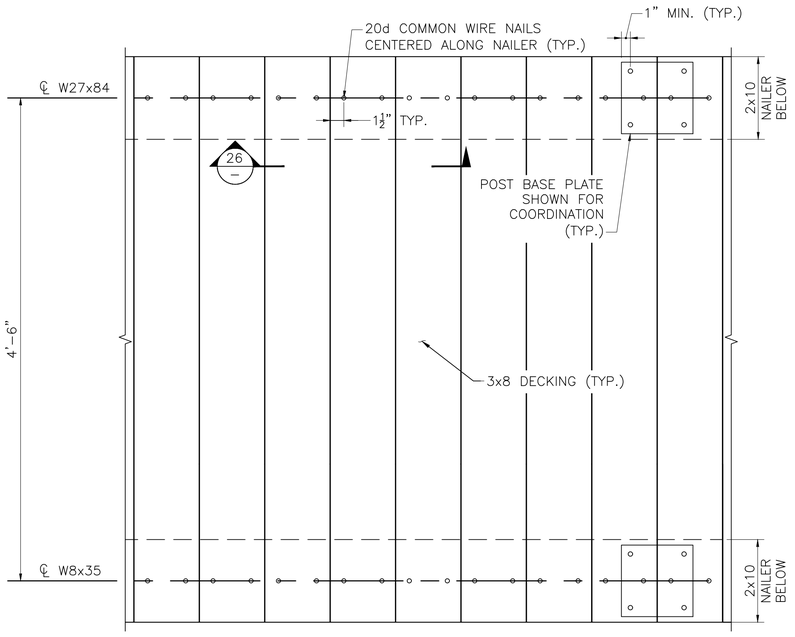
DETAIL A
SCALE: 1½" = 1'–0"



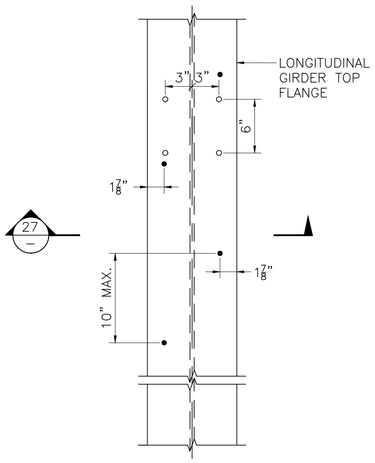
SECTION 25
SCALE: 1½" = 1'–0"



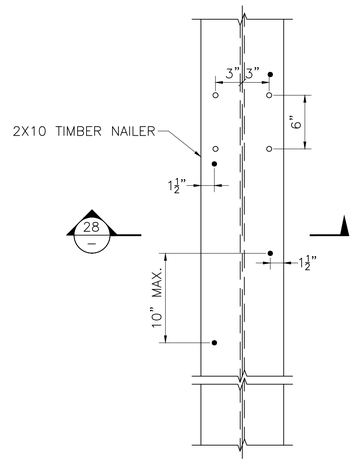
W8X35 FLANGE COPE DETAIL
SCALE: 1½" = 1'–0"



DECK NAILING SCHEDULE
SCALE: 1½" = 1'–0"



GIRDER TOP FLANGE PLAN

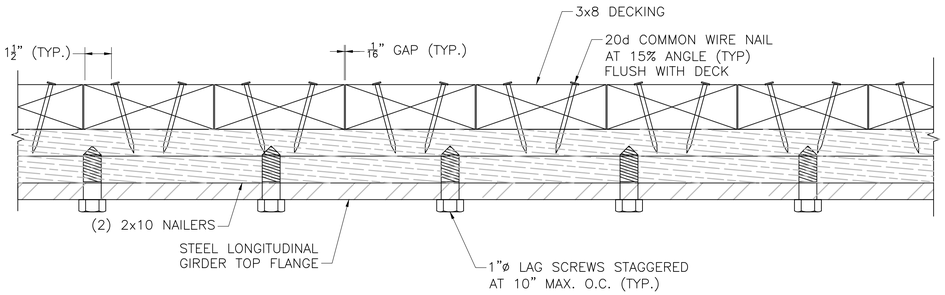


NAILER PLAN

NOTE:
1. FABRICATOR SHALL COORDINATE THE LOCATIONS OF THE LAG SCREWS FOR THE TOP FLANGE NAILERS WITH THE LOCATIONS OF THE TOP FLANGE BOLTS FOR THE LATERAL BRACING GUSSET PLATE CONNECTION AND THE BOLTS FOR THE RAILING CONNECTION. IF CONFLICTS OCCUR THE FABRICATOR MAY ADJUST THE NAILER HOLE SPACING, WHILE MAINTAINING THE MAXIMUM SPACING.
2. RAILING POST THROUGH BOLTS MAY BE INCLUDED FOR LAG SCREW MAXIMUM SPACING. LAG SCREWS MAY BE SKIPPED IN AREAS WHERE THERE ARE RAILING POSTS IF THE DISTANCE BETWEEN THE LAG SCREWS ON EITHER SIDE OF THE RAIL POST AND THE RAIL POST IS NOT GREATER THAN THE MAXIMUM LAG BOLT SPACING.

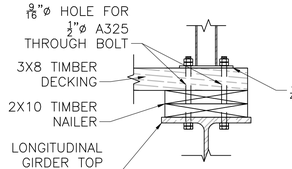
LEGEND:
- ● 1 1/16"ø HOLE FOR 1"ø LAG SCREW
- ○ 9/16"ø HOLES FOR ½"ø A325 RAILING POST BOLTS

NAILER TO BEAM CONNECTION
SCALE: 1½" = 1'–0"



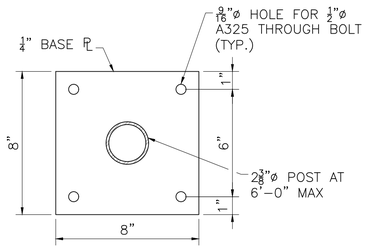
SECTION 26
SCALE: 3" = 1'–0"

NOTE: STEEL BEAM WEB AND BOTTOM FLANGE NOT SHOWN FOR CLARITY

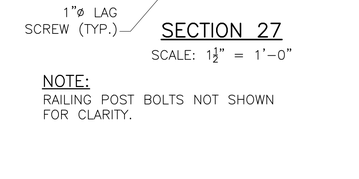


SECTION 28
SCALE: 1½" = 1'–0"

NOTES:
1. A325 BOLTS SHALL HAVE TWO NUTS EACH END.
2. POST BASE PLATE SHALL BE ASTM A36.



CHAIN LINK FENCE DETAIL
SCALE: 3" = 1'–0"



SECTION 27
SCALE: 1½" = 1'–0"

NOTE:
RAILING POST BOLTS NOT SHOWN FOR CLARITY.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

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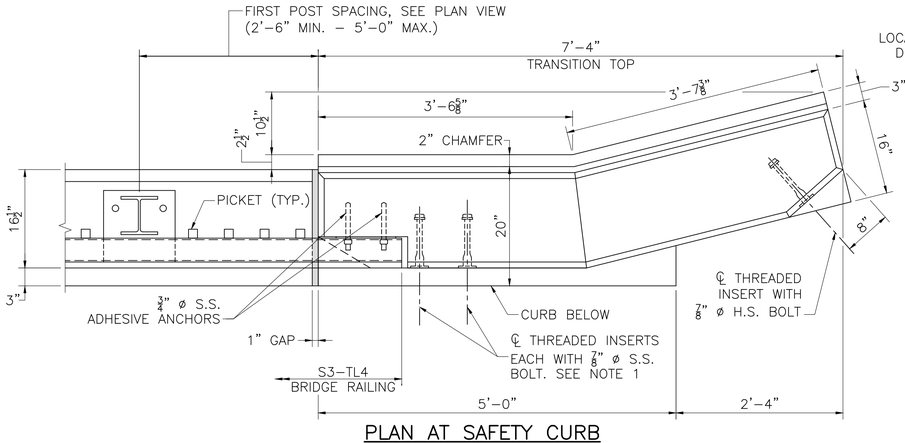
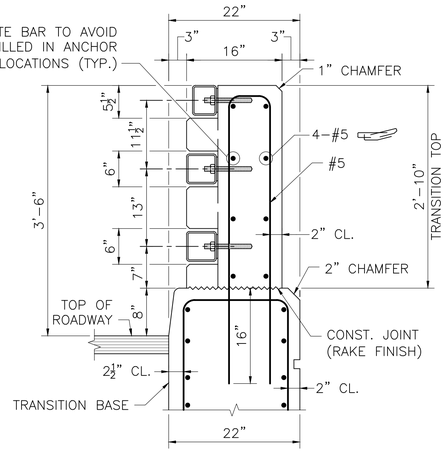
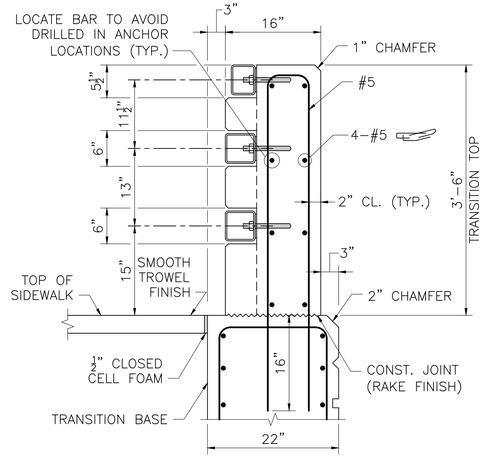
608460_TEMPORARY WALKWAY DETAILS III.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024



PLAN AT SAFETY CURB
SCALE: 1" = 1'-0"



SECTION 30 AT SAFETY CURB
SCALE: 1" = 1'-0"

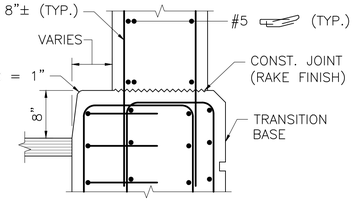


SECTION 30 AT SIDEWALK
SCALE: 1" = 1'-0"

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	79	85
PROJECT FILE NO.	608460		

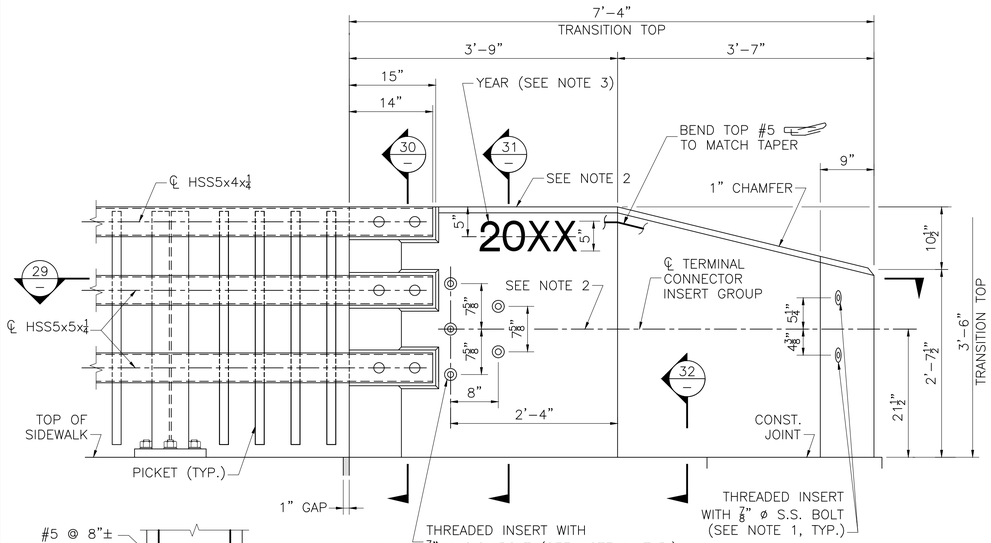
HIGHWAY GUARDRAIL
TRANSITION DETAILS



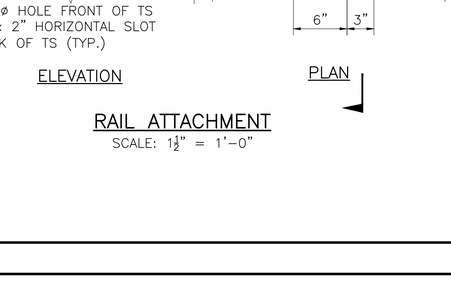
SECTION 32 AT SAFETY CURB
SCALE: 1" = 1'-0"

NOTES:

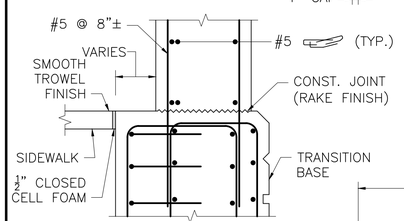
1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER ⅞" ø S.S. BOLT. S.S. BOLTS SHALL BE ⅞" ø x 1½" LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR ⅞" S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO THE TRANSITION.
2. FOR AN APPROACH GRADE UP TO 3%, THE TRANSITION MAY BE CAST SQUARE AND SET PLUMB WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SQUARE TO THE POST.
3. FOR AN APPROACH GRADE IN EXCESS OF 3%, THE TRANSITION TOP AND THE TOP OF CURB SHALL FOLLOW THE APPROACH GRADE. THE HEIGHT OF THE TRANSITION TOP SHALL VARY PROVIDED THAT THE MINIMUM DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE MET. THE BOTTOM OF THE TRANSITION BASE SHALL BE SET LEVEL WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SLOPED TO FOLLOW THE APPROACH GRADE.
4. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST GUARDRAIL TRANSITION IS CAST. USE THIS YEAR FOR ALL GUARDRAIL TRANSITIONS.
5. ALL CONCRETE FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI HP CEMENT CONCRETE.
6. LIFTING DEVICES (NOT SHOWN), INCLUDING THEIR NUMBER AND LOCATION, SHALL BE DESIGNED AND DETAILED BY THE PRECASTER. THEY SHALL BE GALVANIZED AND SHALL BE PLACED AND RECESSED IN POCKETS TO PROVIDE 1½" CLEAR COVER TO THE FACE OF THE TRANSITION CONCRETE. THESE DEVICES SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS ALONG WITH ALL SUPPORTING CALCULATIONS AND/OR CATALOG CUTS. ONCE THE PRECAST TRANSITION IS SET IN PLACE, THE LIFTING DEVICE POCKETS SHALL BE FILLED WITH A NON-SHRINK GROUT THAT MATCHES THE COLOR OF THE TRANSITION CONCRETE WHEN CURED AND THE FILLED POCKETS SHALL BE RUBBED WITH A CORUNDUM STONE TO BLEND OUT THE JOINTS.



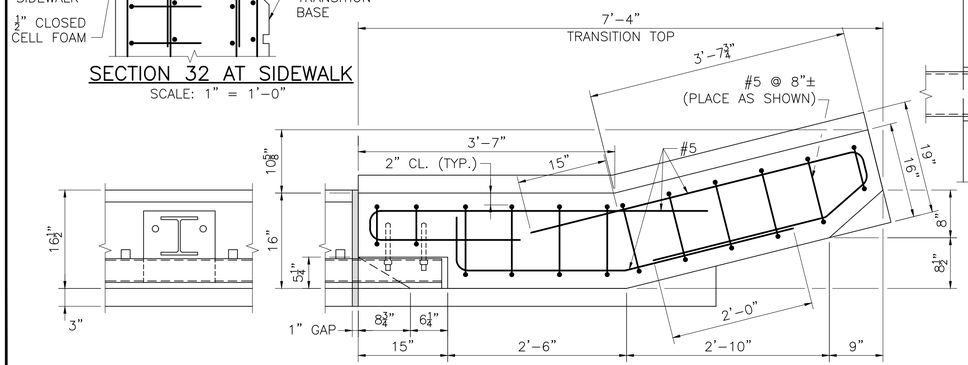
ELEVATION AT SIDEWALK
SCALE: 1" = 1'-0"



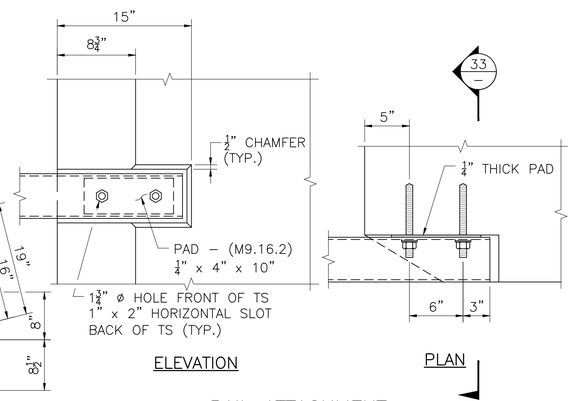
SECTION 31 AT SAFETY CURB
SCALE: 1" = 1'-0"



SECTION 32 AT SIDEWALK
SCALE: 1" = 1'-0"

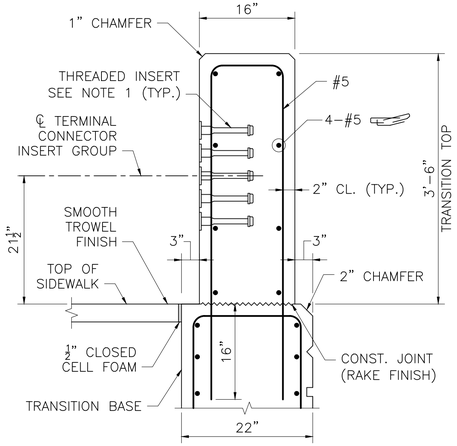


SECTION 29
SCALE: 1" = 1'-0"

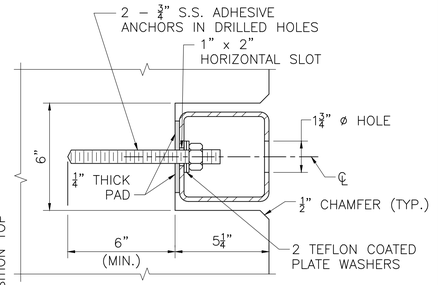


ELEVATION PLAN

RAIL ATTACHMENT
SCALE: 1½" = 1'-0"



SECTION 31 AT SIDEWALK
SCALE: 1" = 1'-0"



SECTION 33
SCALE: 3" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

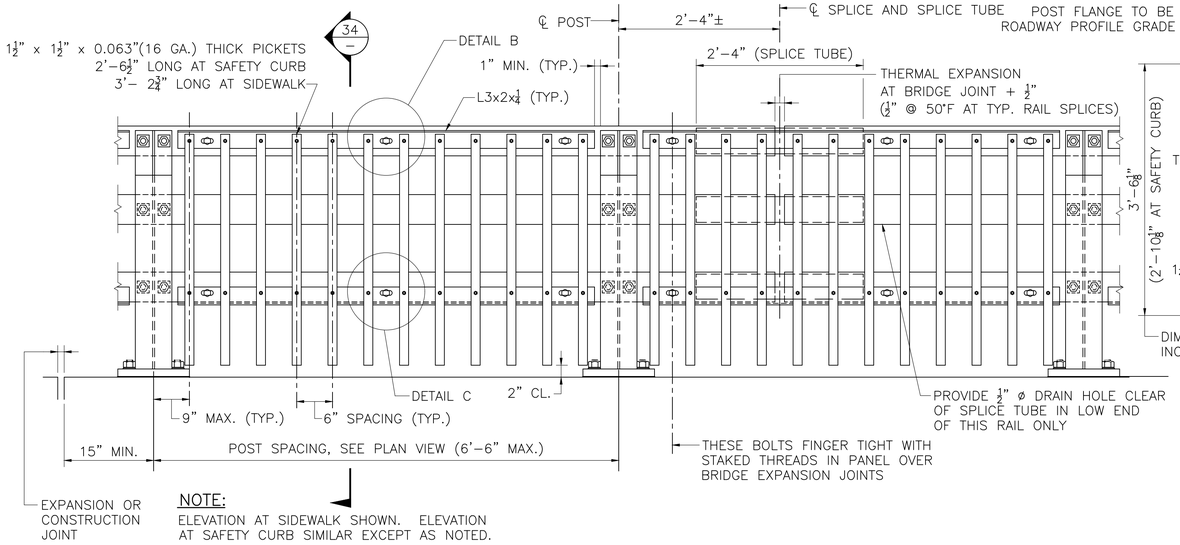
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_S3-TL4 RAIL DETAILS.DWG Plotted on 21-Jul-2025 12:08 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

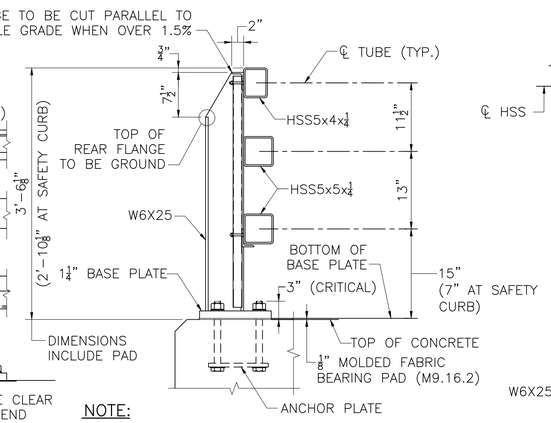
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	80	85
PROJECT FILE NO.	608460		

S3–TL4 RAIL DETAILS



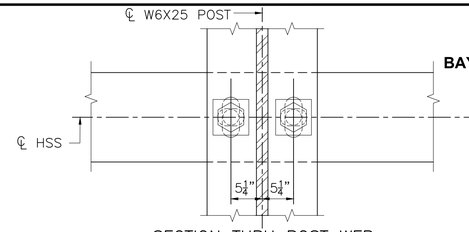
NOTE:
ELEVATION AT SIDEWALK SHOWN. ELEVATION AT SAFETY CURB SIMILAR EXCEPT AS NOTED.

BRIDGE RAILING ELEVATION
SCALE: 1" = 1'–0"

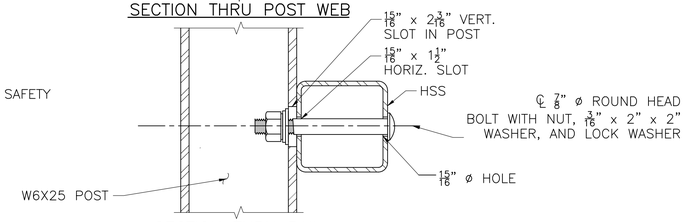


NOTE:
SECTION AT SIDEWALK SHOWN. SECTION AT SAFETY CURB SIMILAR, EXCEPT AS NOTED.

SECTION 34
SCALE: 1" = 1'–0"



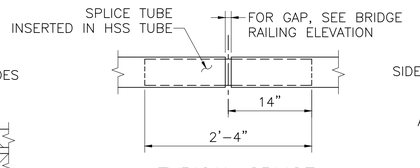
SECTION THRU POST WEB



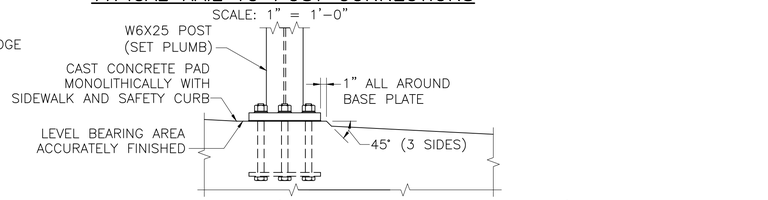
SECTION THRU RAIL

NOTE:
CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

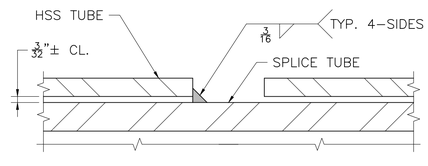
TYPICAL RAIL TO POST CONNECTIONS
SCALE: 1" = 1'–0"



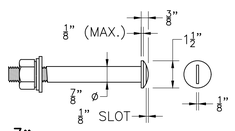
TYPICAL SPLICE
SCALE: 1" = 1'–0"



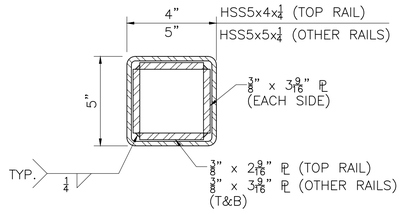
SETTING OF POSTS (PROFILE GRADE OVER 1.5%)
SCALE: 1" = 1'–0"



SPLICE DETAIL
FULL SIZE



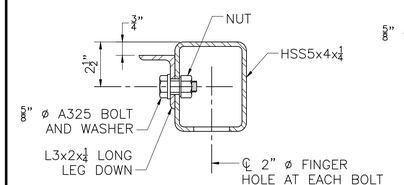
⅞" ø ROUND HEAD BOLT
SCALE: 3" = 1'–0"



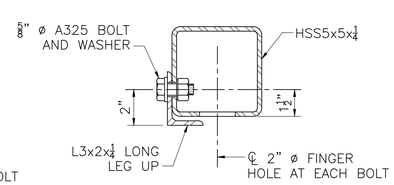
SPLICE TUBE DETAILS
SCALE: 3" = 1'–0"

RAILING NOTES:

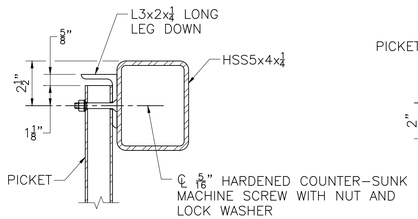
1. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING (HSS) SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 WITH A CERTIFIED Fy = 50 KSI MINIMUM. THE MINIMUM HORIZONTAL BENDING RADII OF THE HSS TUBING SHALL BE 8 FEET. PICKET CARRIER ANGLES, ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 36. PICKET TUBING SHALL CONFORM TO ASTM A 513 WITH Fy = 36 KSI MIN. OR A 500 GRADE B.
2. ALL STEEL (EXCEPT THE ⅝" ANCHOR PLATE AND FASTENERS) SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STD. 595B COLOR NO. 10045). ANCHOR PLATE SHALL BE GALVANIZED ONLY. HEADS OF ⅞" ø ROUND HEAD BOLTS SHALL BE PAINTED TO MATCH RAIL.
3. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR (4) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN THE PANELS OVER EXPANSION JOINT.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. ALL POSTS TO BE PLUMB WHEN PROFILE GRADE EXCEEDS 1.5%. FOR PROFILE GRADES LESS THAN 1.5%, POSTS SHALL BE SET PERPENDICULAR TO GRADE.
7. POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK–GOUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
8. ⅞" ø ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF AASHTO M 164.



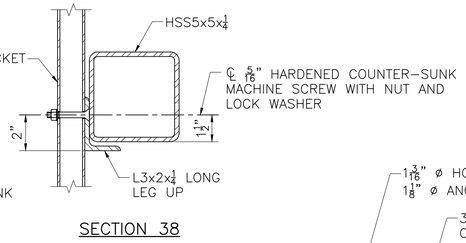
SECTION 35



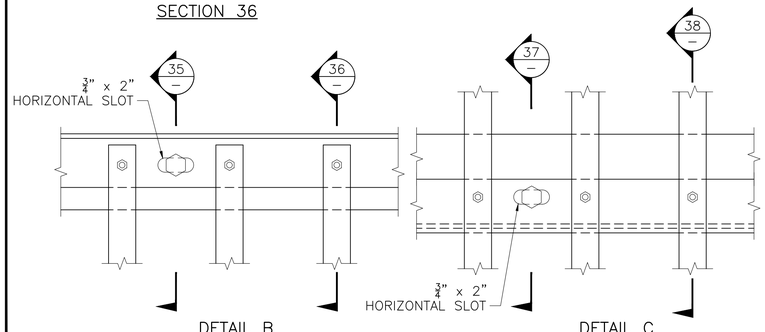
SECTION 37



SECTION 36

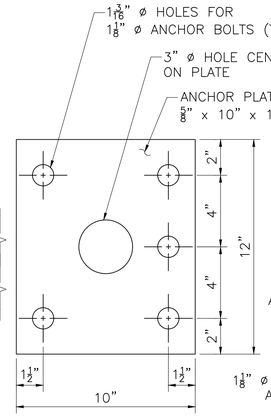


SECTION 38

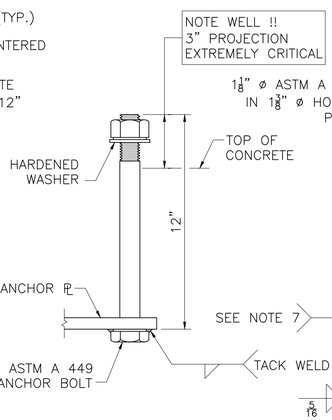


DETAIL B
DETAIL C

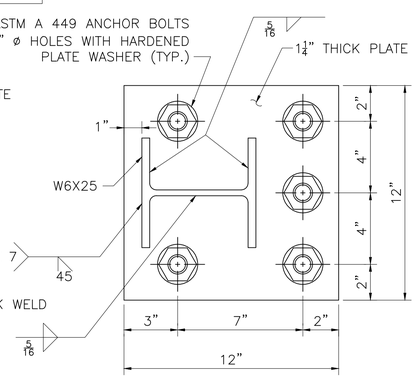
TYPICAL PICKET TO RAIL DETAILS
SCALE: 3" = 1'–0"



ANCHOR PLATE
SCALE: 3" = 1'–0"



ANCHOR BOLT
SCALE: 3" = 1'–0"



BASE PLATE
SCALE: 3" = 1'–0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION

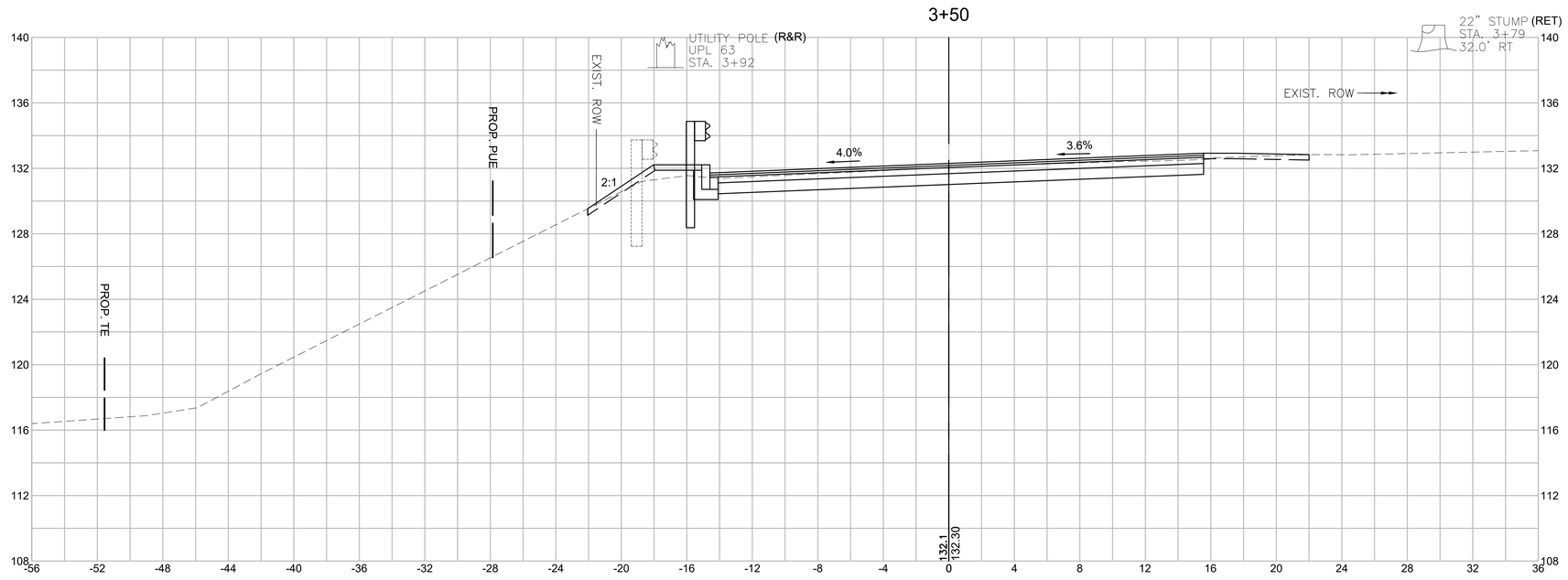
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE

608460_S3-TL4 RAIL DETAILS.DWG Plotted on 21-Jul-2025 12:09 PM
608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

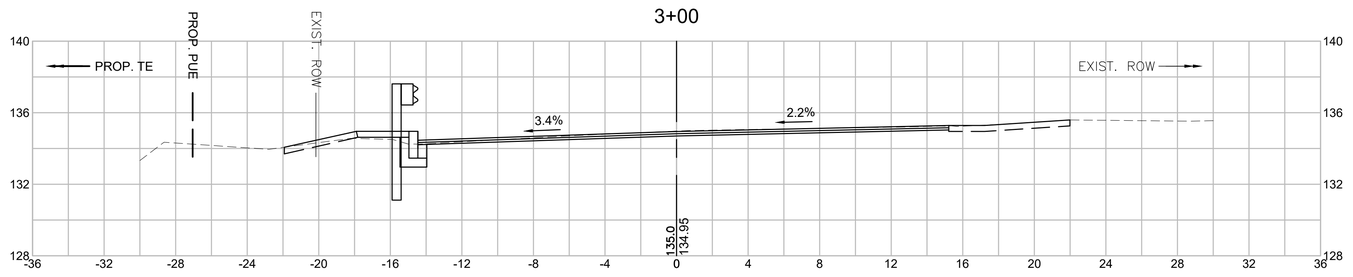
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	81	85
PROJECT FILE NO.	608460		

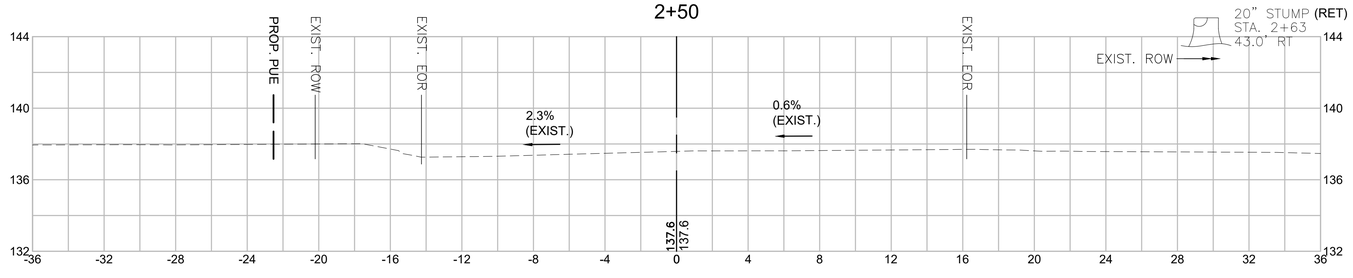
CROSS SECTIONS



CUT = 13.35 SF
FILL = 1.39 SF



CUT = 11.22 SF
FILL = 0.27 SF



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

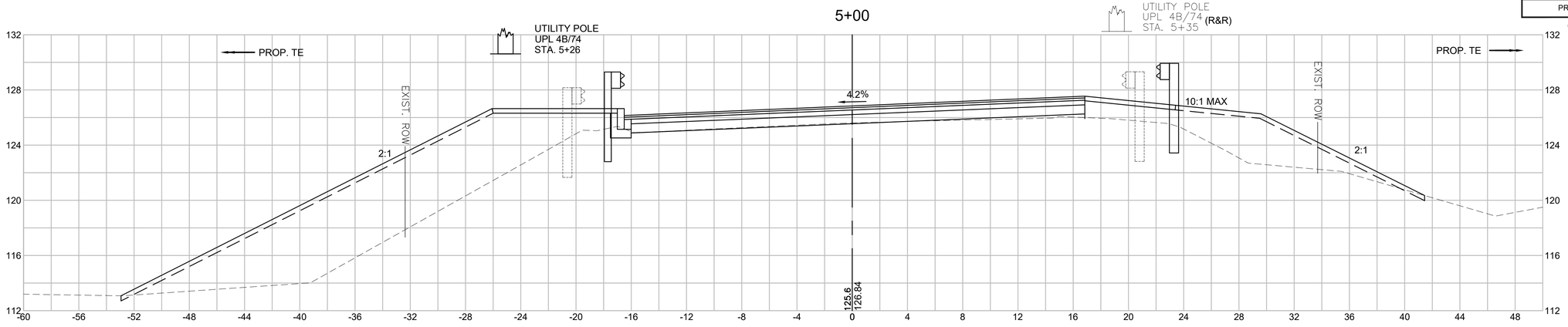
608460_XSECT 5.DWG Plotted on: 23-Mar-2018 11:21 AM

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

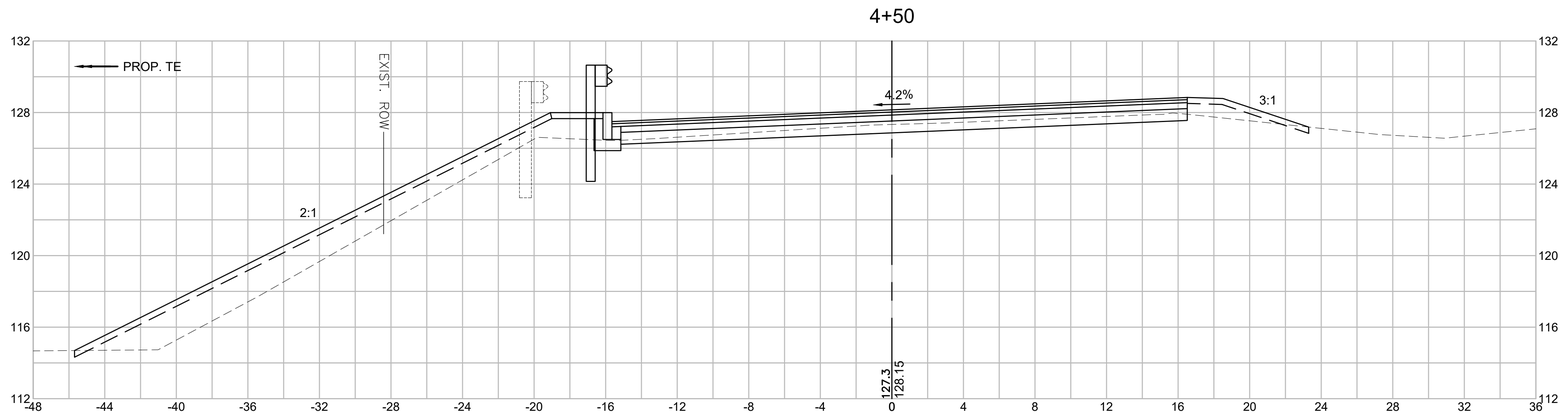
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	82	85
PROJECT FILE NO.	608460		

CROSS SECTIONS

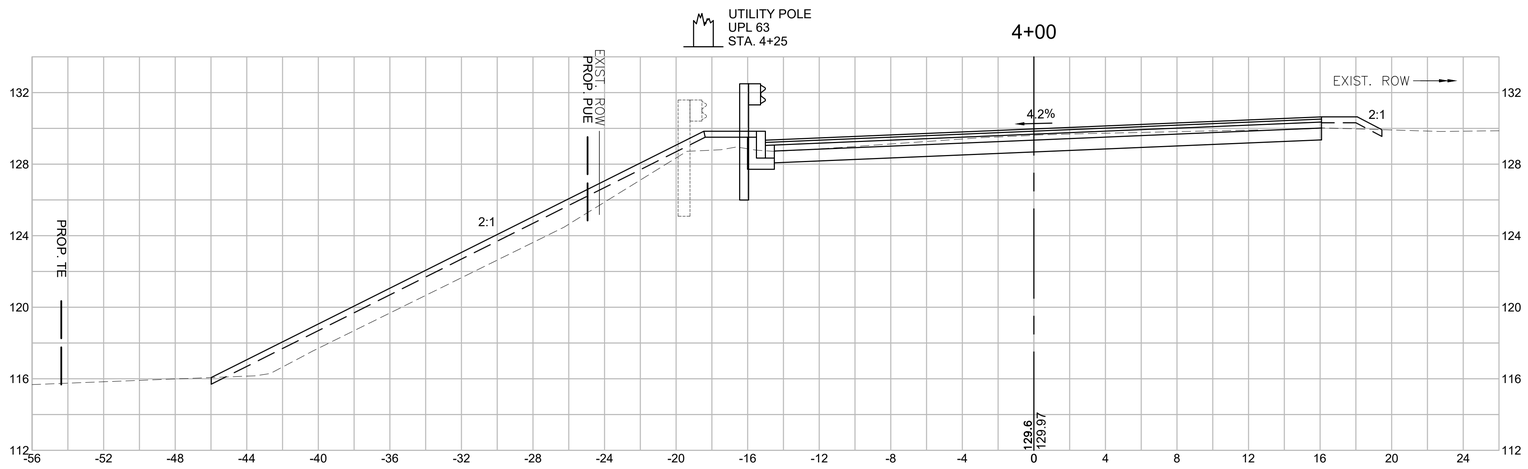
608460_XSECT 5.DWG Plotted on: 23-Mar-2018 11:21 AM



CUT = 1.52 SF
FILL = 165.00 SF



CUT = 1.28 SF
FILL = 38.44 SF



CUT = 1.72 SF
FILL = 25.87 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

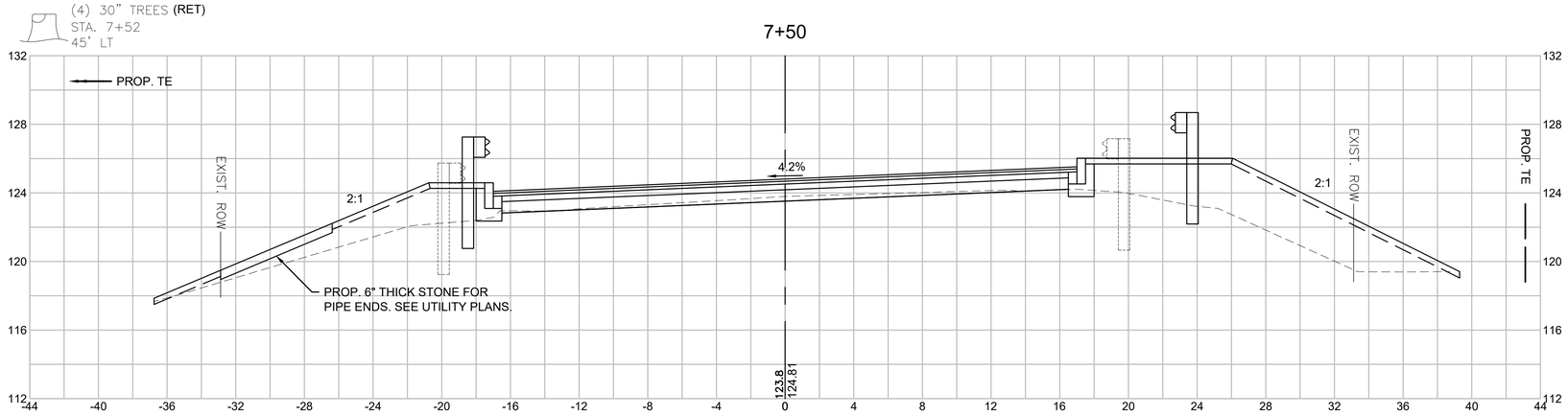
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	83	85
PROJECT FILE NO.	608460		

CROSS SECTIONS

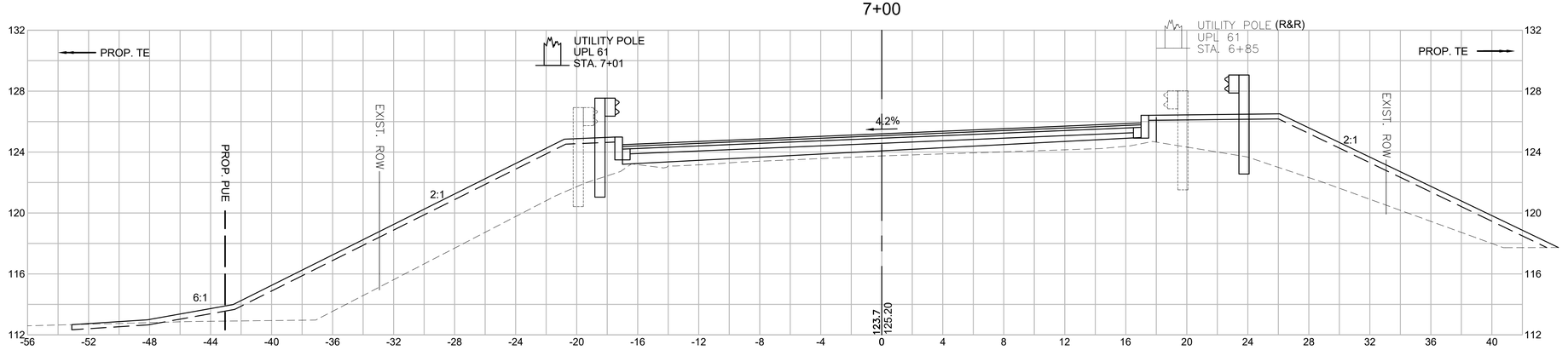
608460_XSECT 5.DWG Plotted on: 23-Mar-2018 11:21 AM

7+50



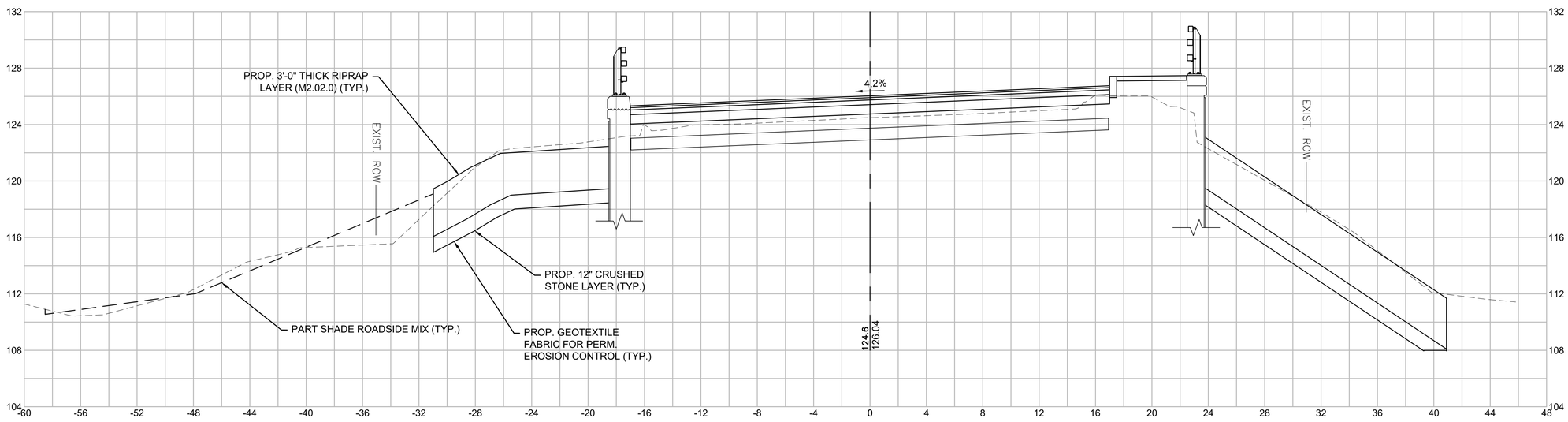
CUT = 1.19 SF
FILL = 63.23 SF

7+00



CUT = 1.27 SF
FILL = 72.23 SF

5+50



CUT = 5.98 SF
FILL = 8.02 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

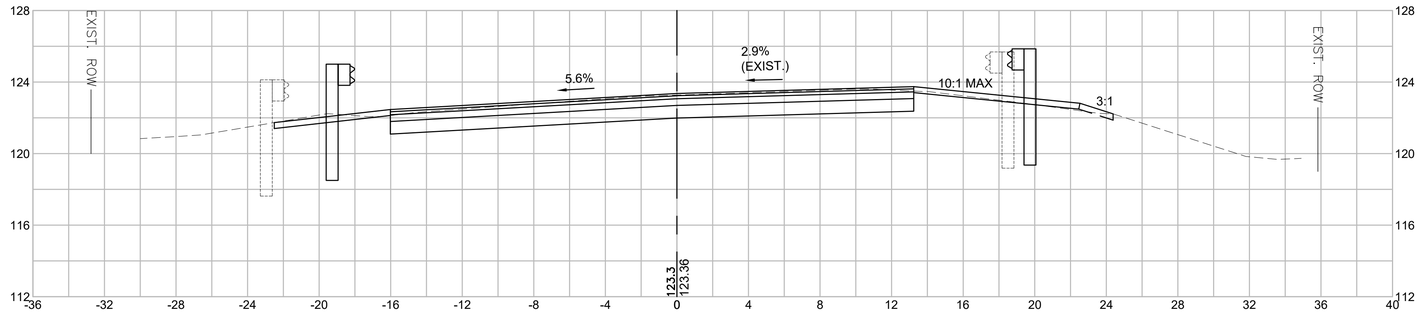
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	84	85
PROJECT FILE NO.	608460		

CROSS SECTIONS

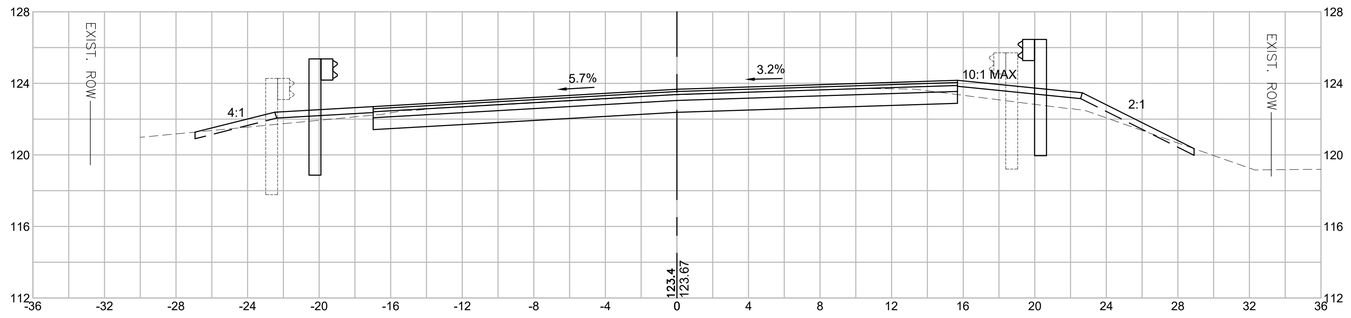
608460_XSECT 5.DWG Plotted on: 23-Mar-2018 11:21 AM

9+00



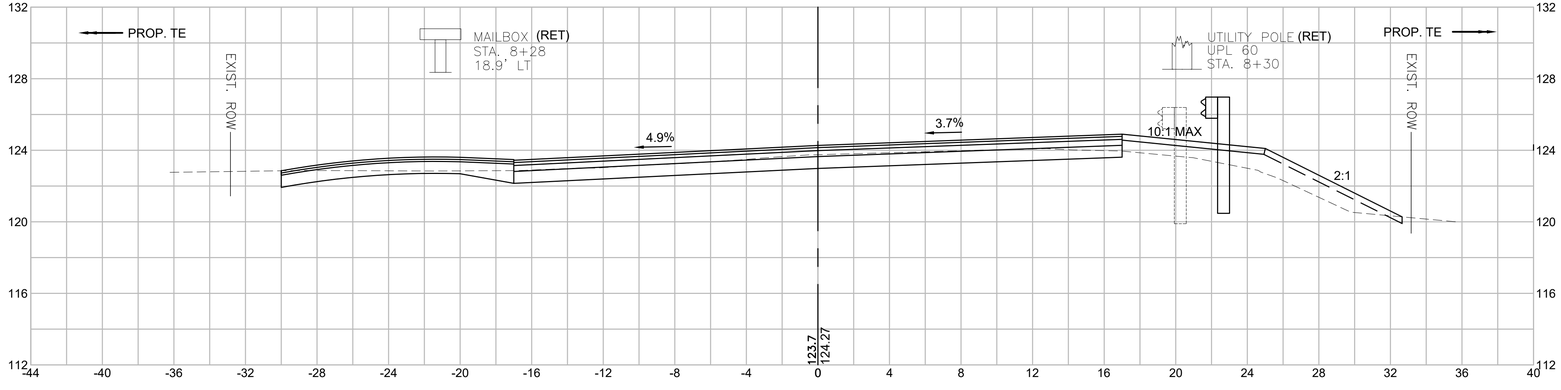
CUT = 18.83 SF
FILL = 0.12 SF

8+50



CUT = 13.40 SF
FILL = 6.34 SF

8+00



CUT = 5.73 SF
FILL = 10.56 SF

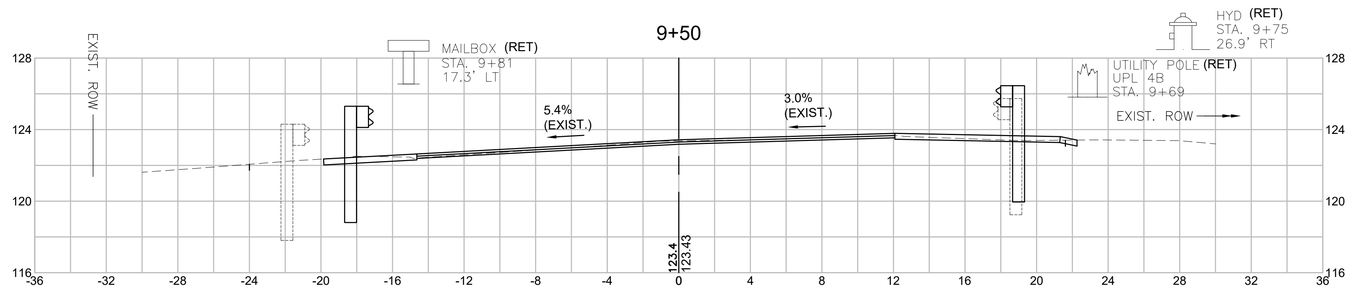
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	85	85
	PROJECT FILE NO.	608460	

CROSS SECTIONS

608460_XSECT 5.DWG Plotted on: 23-Mar-2018 11:21 AM



CUT = 6.13 SF
FILL = 0 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET