

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

PLAN AND PROFILE OF
BAY ROAD (ROUTE 47) OVER FORT RIVER
(BRIDGE NO. H-01-005 (C1H))

IN THE TOWN OF

HADLEY

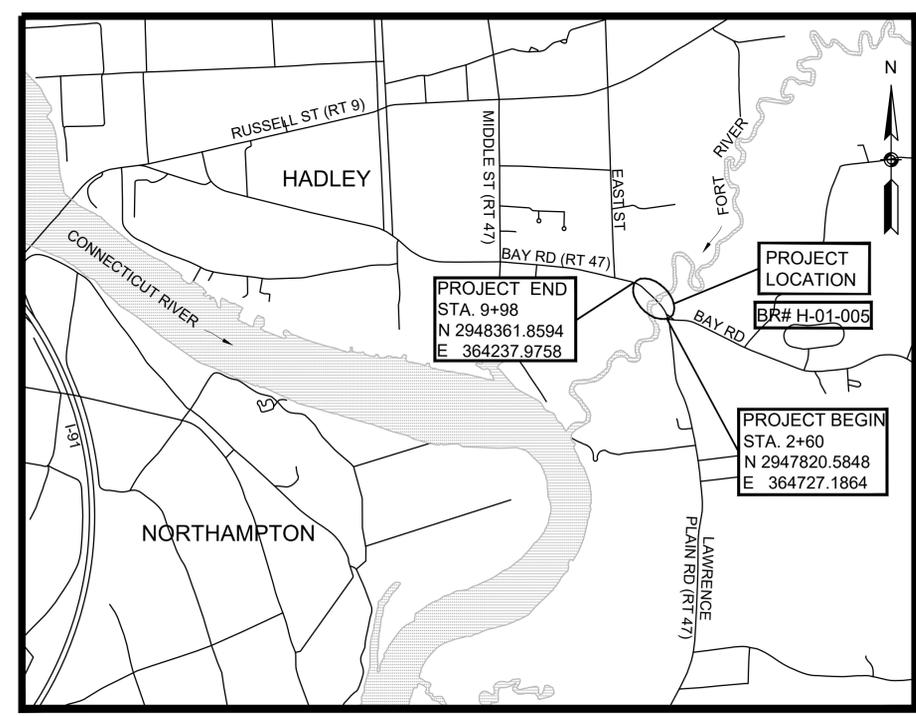
HAMPSHIRE COUNTY

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.

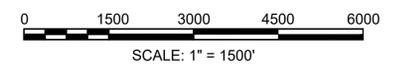
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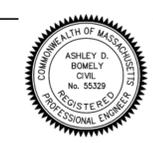


DESIGN DESIGNATION (BAY ROAD - ROUTE 47)

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)



LENGTH OF PROJECT = 730.00 FEET = 0.138 MILES



Ashley Bomej, Digitally signed by Ashley Bomej, DN: cn=Ashley Bomej, o=Massachusetts Department of Transportation, email=ashley.bomej@state.ma.us



DATE	DESCRIPTION	REV #

massDOT Massachusetts Department of Transportation Highway Division	
APPROVED	DATE
Carrie Lavallee, P.E. 2025.07.30 12:31:08 -04'00'	07/30/2025
CHIEF ENGINEER	DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		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
		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
		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)
		RAILROAD SIGNAL
		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		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
		LEGEND "ONLY" - WHITE
		STOP LINE (12" WIDE)
		CROSSWALK (12" WIDE LINES)
		SOLID WHITE LINE (6" WIDE)
		SOLID YELLOW LINE (6" WIDE)
		BROKEN WHITE LINE (6" WIDE, 10' LINE, 30' GAP)
		BROKEN YELLOW LINE (6" WIDE, 10' LINE, 30' GAP)
		DOTTED WHITE LINE (6" WIDE, 3' LINE, 9' GAP)
		DOTTED YELLOW LINE (6" WIDE, 3' LINE, 9' GAP)
		DOTTED WHITE LINE EXTENSION (6" WIDE, 2' LINE, 6' GAP)
		DOTTED YELLOW LINE EXTENSION (6" WIDE, 2' LINE, 6' GAP)
		DOUBLE WHITE LINE (6" WIDE LINES)
		DOUBLE YELLOW LINE (6" WIDE LINES)

ABBREVIATIONS

GENERAL	DESCRIPTION
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

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LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL	DESCRIPTION
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

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MA	NHP(BRR-ON)-003S(813)X	3	85
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GENERAL NOTES

GENERAL NOTES

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

- 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.
- 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).
- 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.
- 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
- CATCH BASINS DAMAGED OR FILLED WITH SEDIMENTATION DURING THE CONSTRUCTION PROCESS SHALL BE CLEANED, FLUSHED AND/OR REPLACED AT CONTRACTOR'S EXPENSE.
- JOINTS IN HOT MIX ASPHALT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR SECTION 450.
- TOP OF CURB SHALL BE 6 INCHES ABOVE GUTTER GRADE UNLESS OTHERWISE NOTED.
- 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.
- ANY ADJUSTMENTS MADE TO MUNICIPALLY OWNED SANITARY AND WATER MANHOLES, HYDRANTS, GATE BOXES, ETC... SHALL MEET APPLICABLE MUNICIPAL STANDARDS AND CRITERIA.
- 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.
- ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.

PLAN REFERENCES

- 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.
- 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.
- 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.
- 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.
- 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.
- 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:

- ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION.
- RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
- 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.
- 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.
- 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:
- 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.
- 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.
- ALL PIPES LABELED AS (REC) ARE BASED ON RECORD INFORMATION ONLY AND NOT OBSERVED IN THE FIELD.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- FINAL LOCATION OF TRAFFIC SIGNS AND SUPPORTS AS SHOWN IN THE PLANS SHALL BE FIELD-CONFIRMED BY THE ENGINEER PRIOR TO INSTALLATION.

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

KEY PLAN

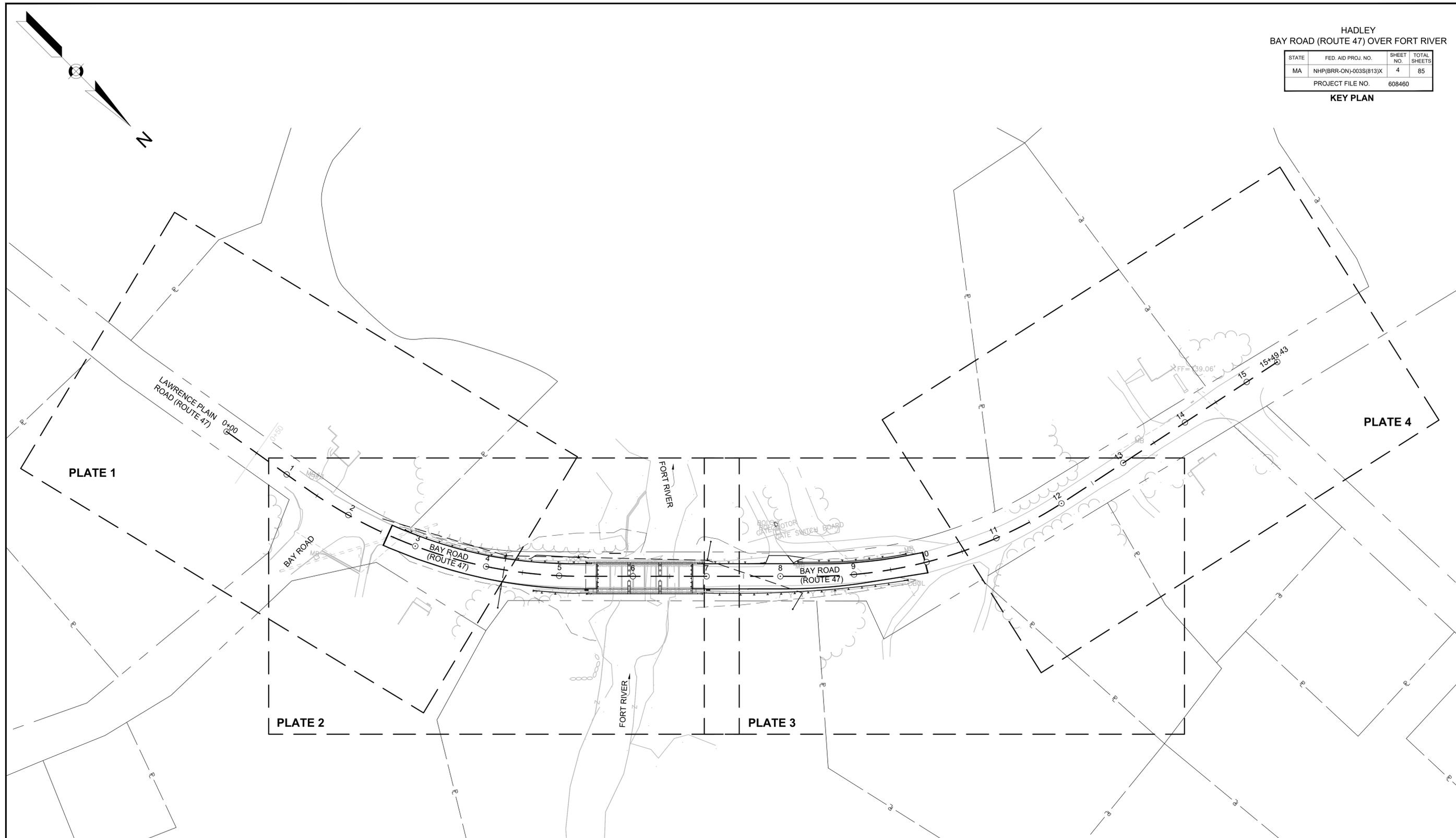


PLATE 4

PLATE 1

PLATE 2

PLATE 3

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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

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

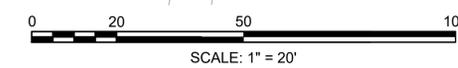
LORI J. & BRYAN K. HARPER
PARCEL 04B-0018-0000
BOOK 8321 PAGE 0301
3 LAWRENCE PLAIN ROAD

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

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°41'40"W 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" I=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.

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



CONTINUED ON
SHEET NO. 6

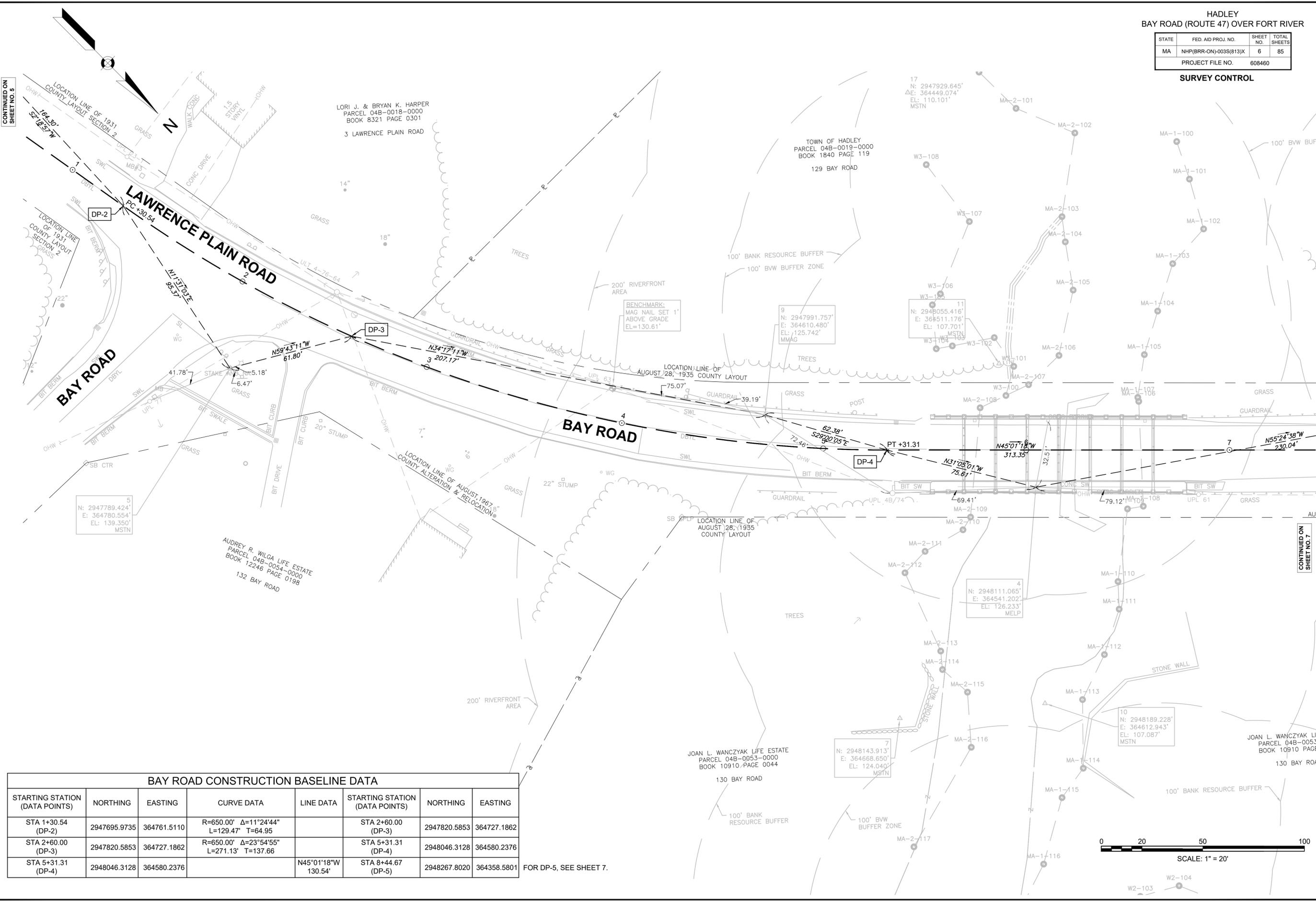
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

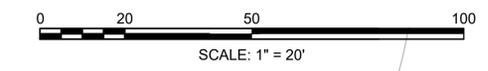
CONTINUED ON SHEET NO. 7



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.

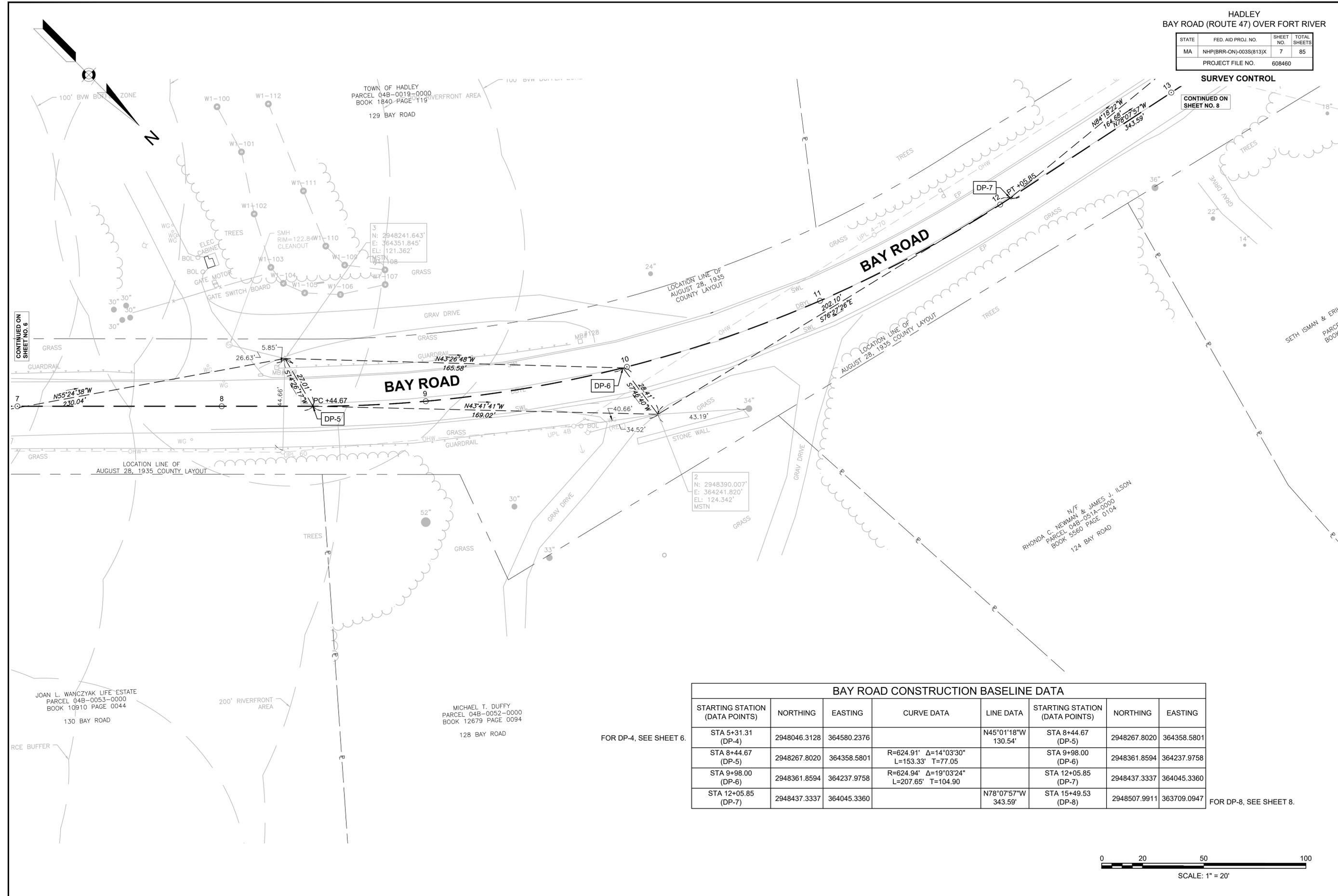


HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

SURVEY CONTROL

CONTINUED ON SHEET NO. 8



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-4, SEE SHEET 6.

FOR DP-8, SEE SHEET 8.



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

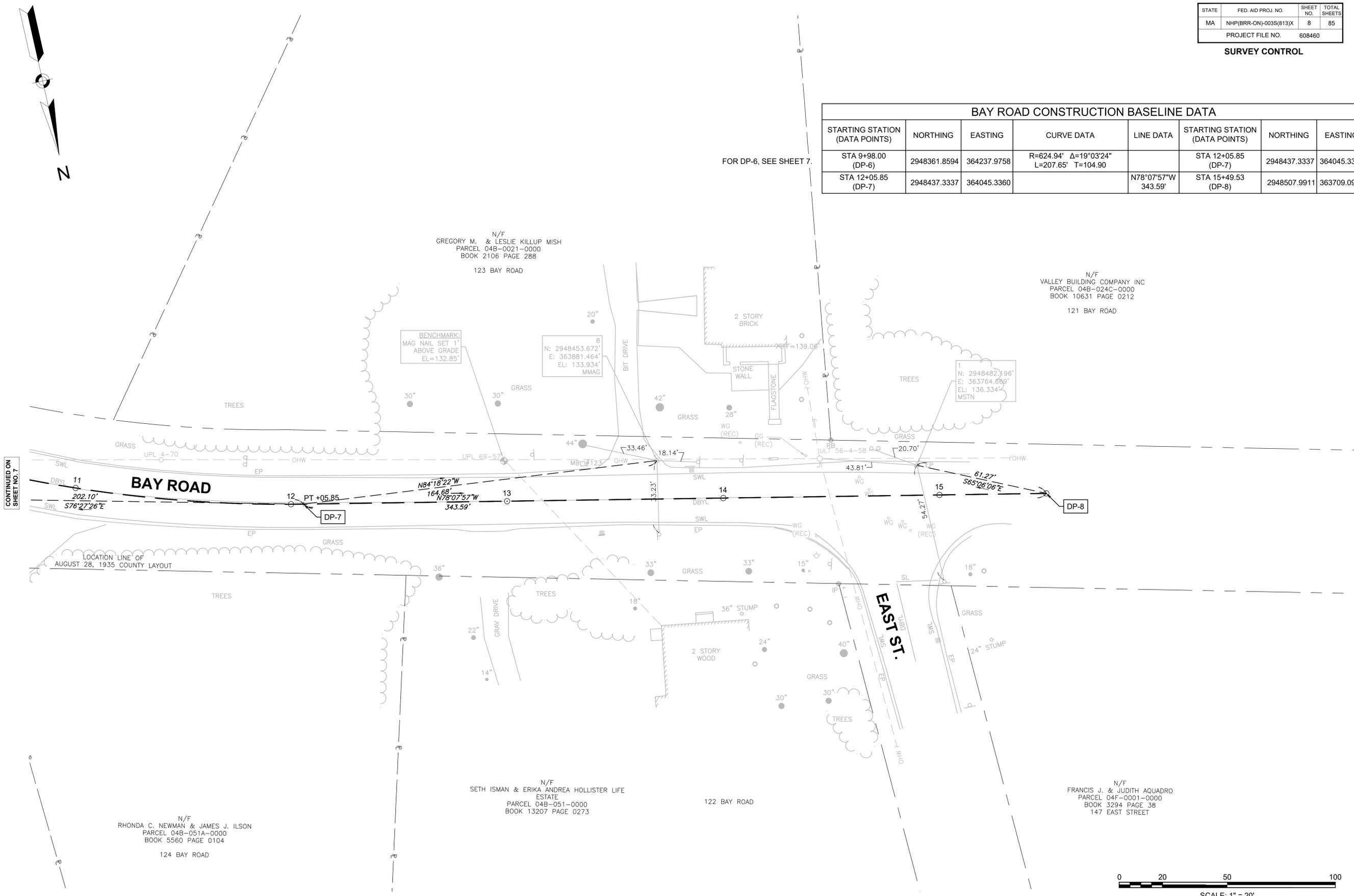
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	8	85
PROJECT FILE NO.		608460	

SURVEY CONTROL

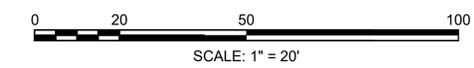
BAY ROAD CONSTRUCTION BASELINE DATA

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

FOR DP-6, SEE SHEET 7.



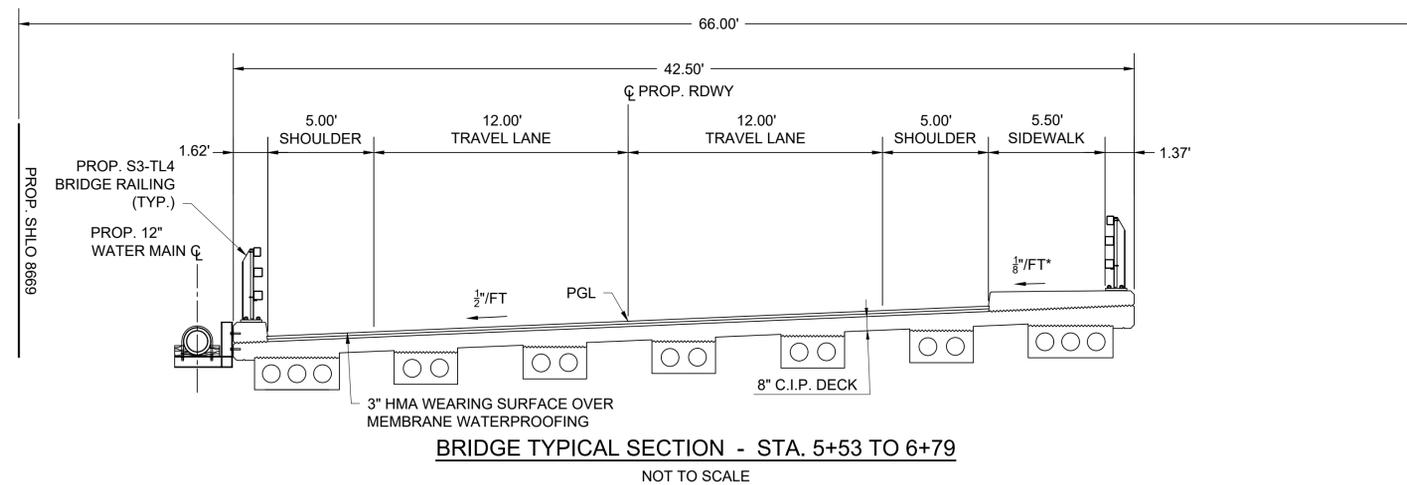
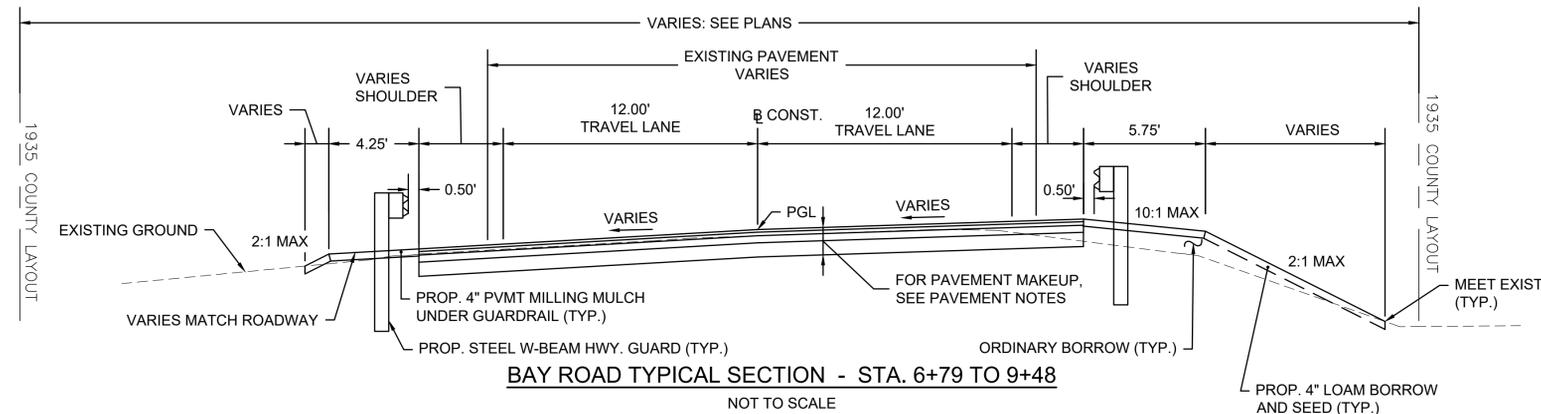
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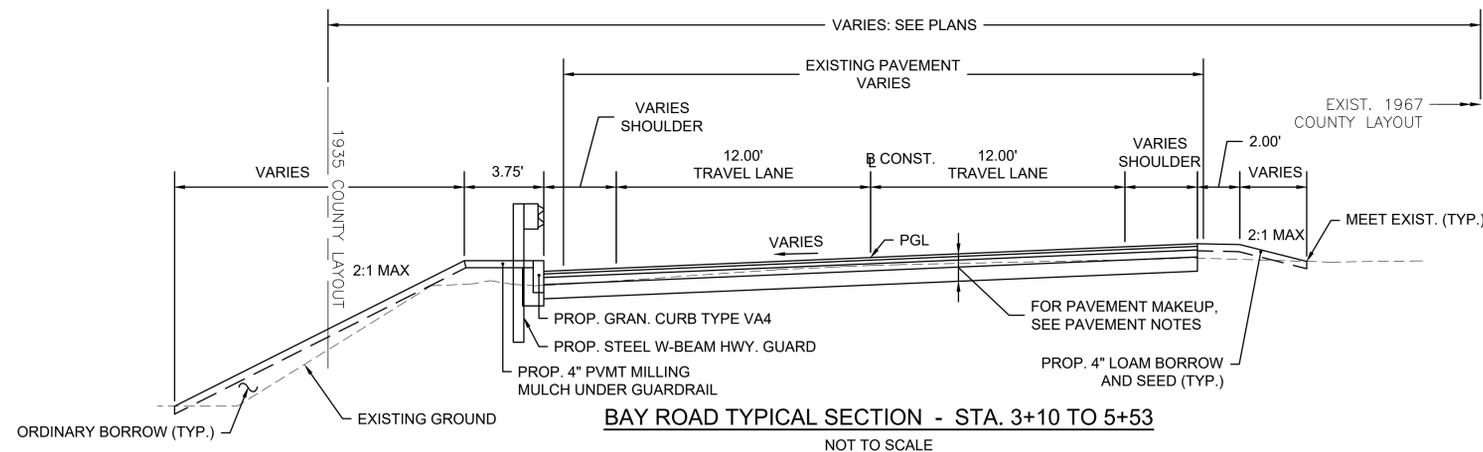
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-0035(813)X	9	85
PROJECT FILE NO.		608460	

TYPICAL SECTIONS



*CONSTRUCTION TOLERANCE +/- 0.5%



PAVEMENT NOTES

GENERAL PAVEMENT NOTES:

- 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.
- ALL SUPERPAVE HMA SHALL BE PRODUCED WITH A WARM MIX ASPHALT ADDITIVE.
- 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)

HIGHWAY GUARD DETAILS

RIGHT SIDE:
STA. 4+69 TO STA. 5+06
STA. 5+06 TO STA. 5+40

LEFT SIDE:
STA. 2+80 TO STA. 5+06
STA. 5+06 TO STA. 5+40

GUARDRAIL TANGENT END TREATMENT, TL-3 TO GUARDRAIL, TL-3 (SINGLE FACED)
TRANSITION TO BRIDGE RAIL

GUARDRAIL TANGENT END TREATMENT, TL-3 TO GUARDRAIL, TL-3 (SINGLE FACED)
TRANSITION TO BRIDGE RAIL

LORI J. & BRYAN K. HARPER
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BOOK 8321 PAGE 0301
3 LAWRENCE PLAIN ROAD

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (0" TO 6")
STA. 2+80 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (0" TO 6")
STA. 2+90 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (6" TO 8")
STA. 5+33 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (6" TO 8")
STA. 6+99 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

BEGIN PROP. GRANITE CURB
TYPE VA4 TRANSITION (8" TO 6")
STA. 6+93 LT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE UTILITY SHEETS 16-17

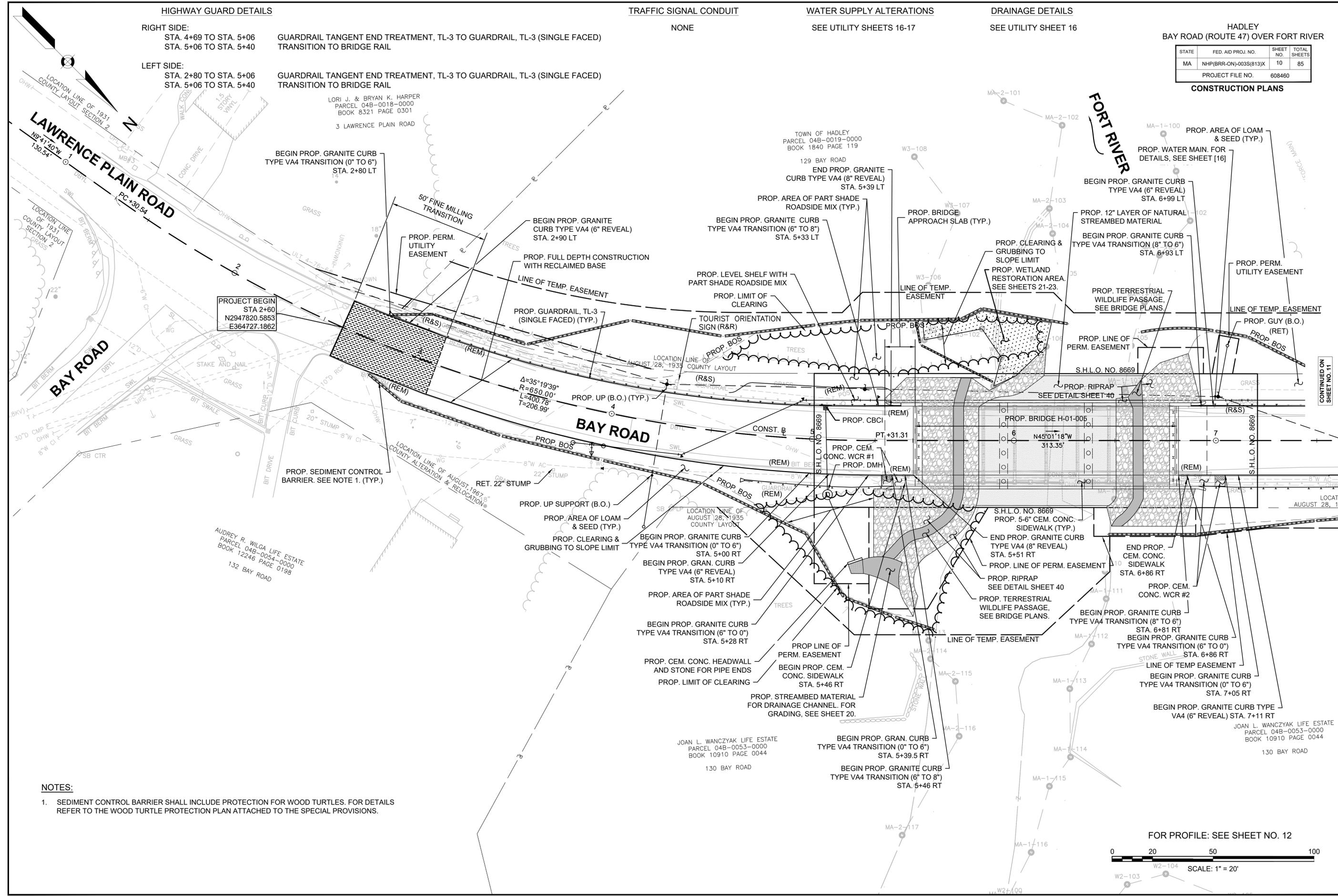
DRAINAGE DETAILS

SEE UTILITY SHEET 16

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

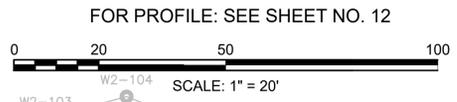
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	10	85
PROJECT FILE NO.		608460	

CONSTRUCTION PLANS



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.

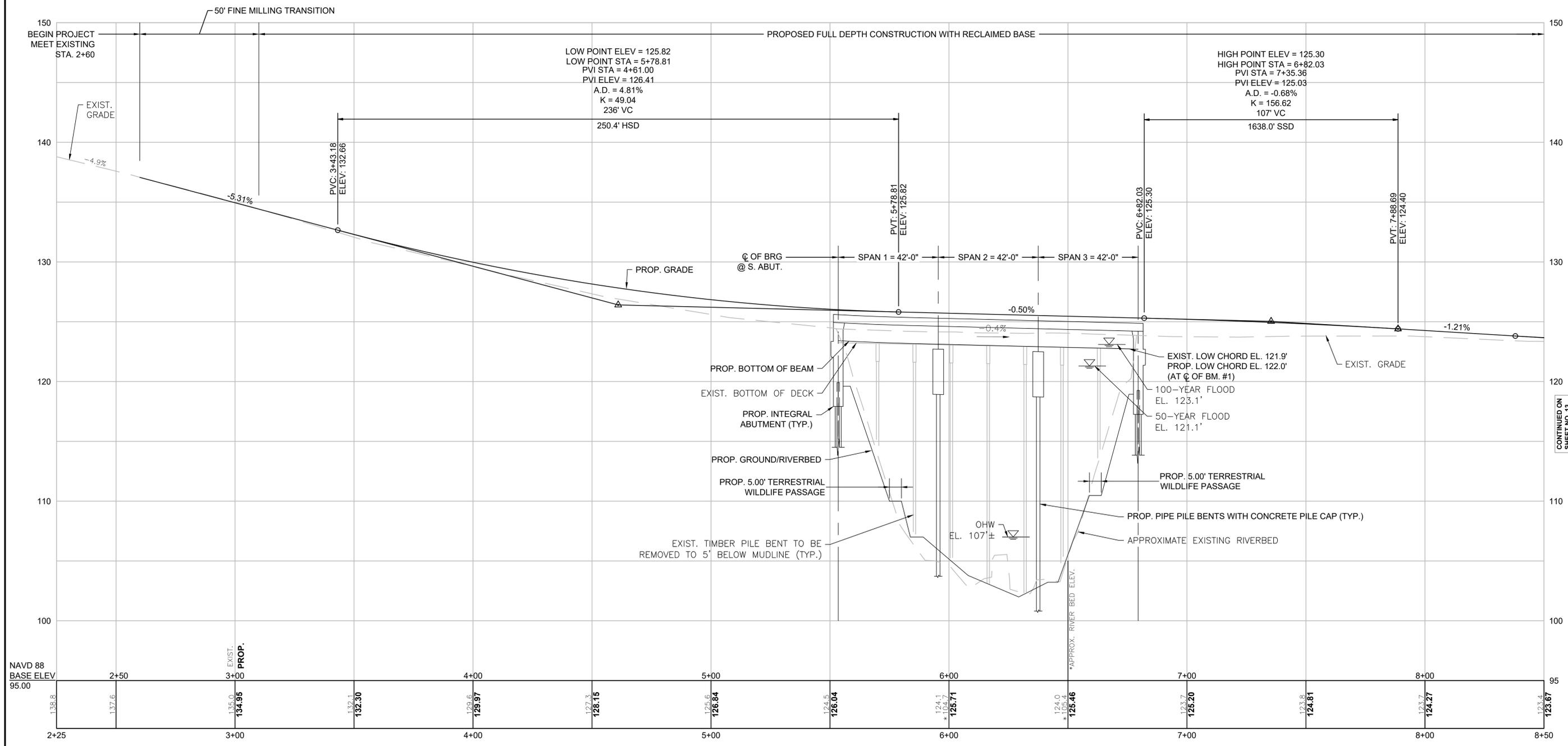


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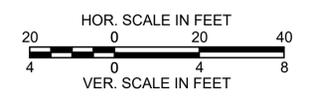
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

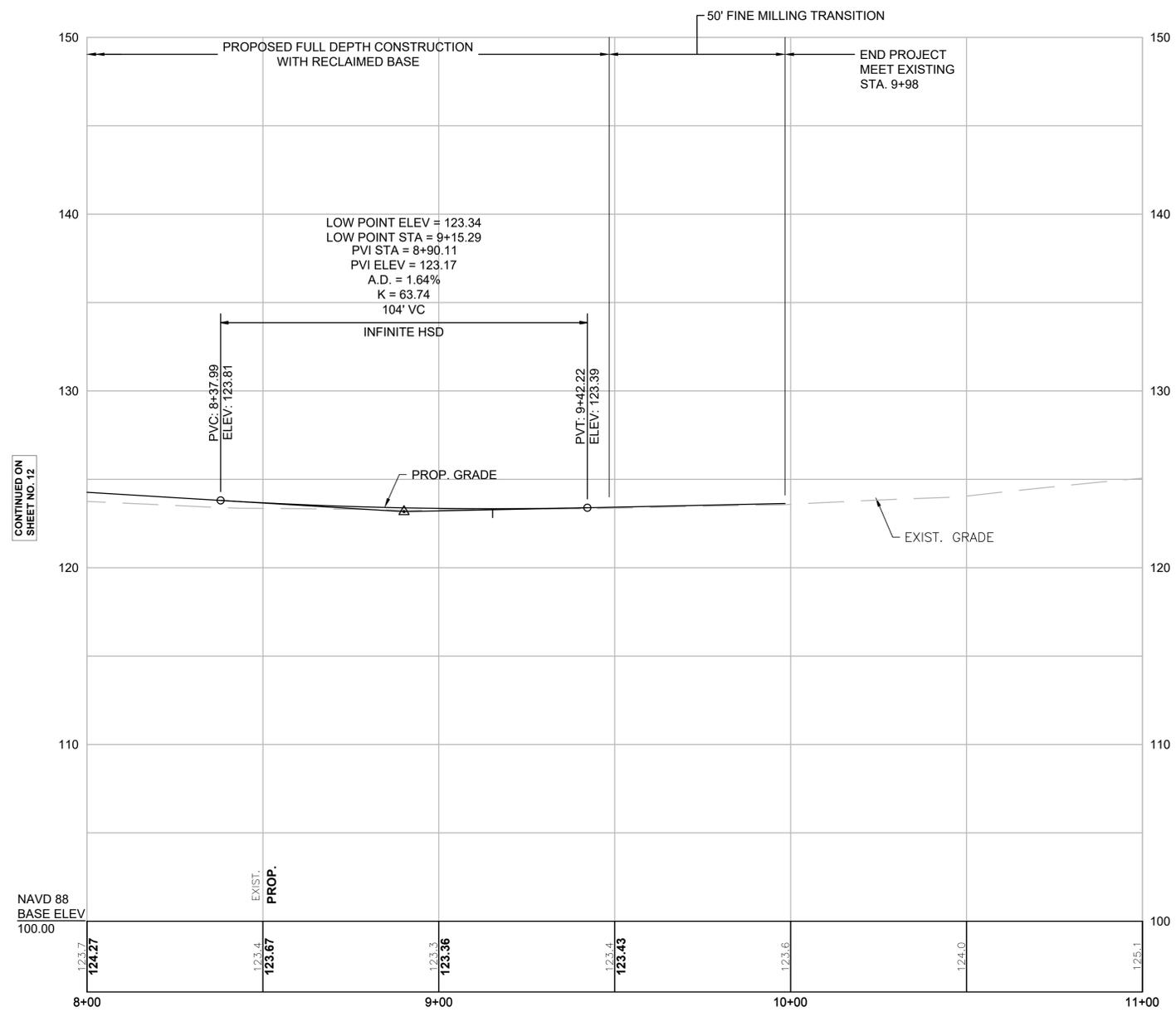


CONTINUED ON
SHEET NO. 13

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

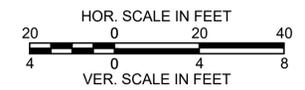
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	13	85
PROJECT FILE NO.		608460	

PROFILE



CONTINUED ON
SHEET NO. 12

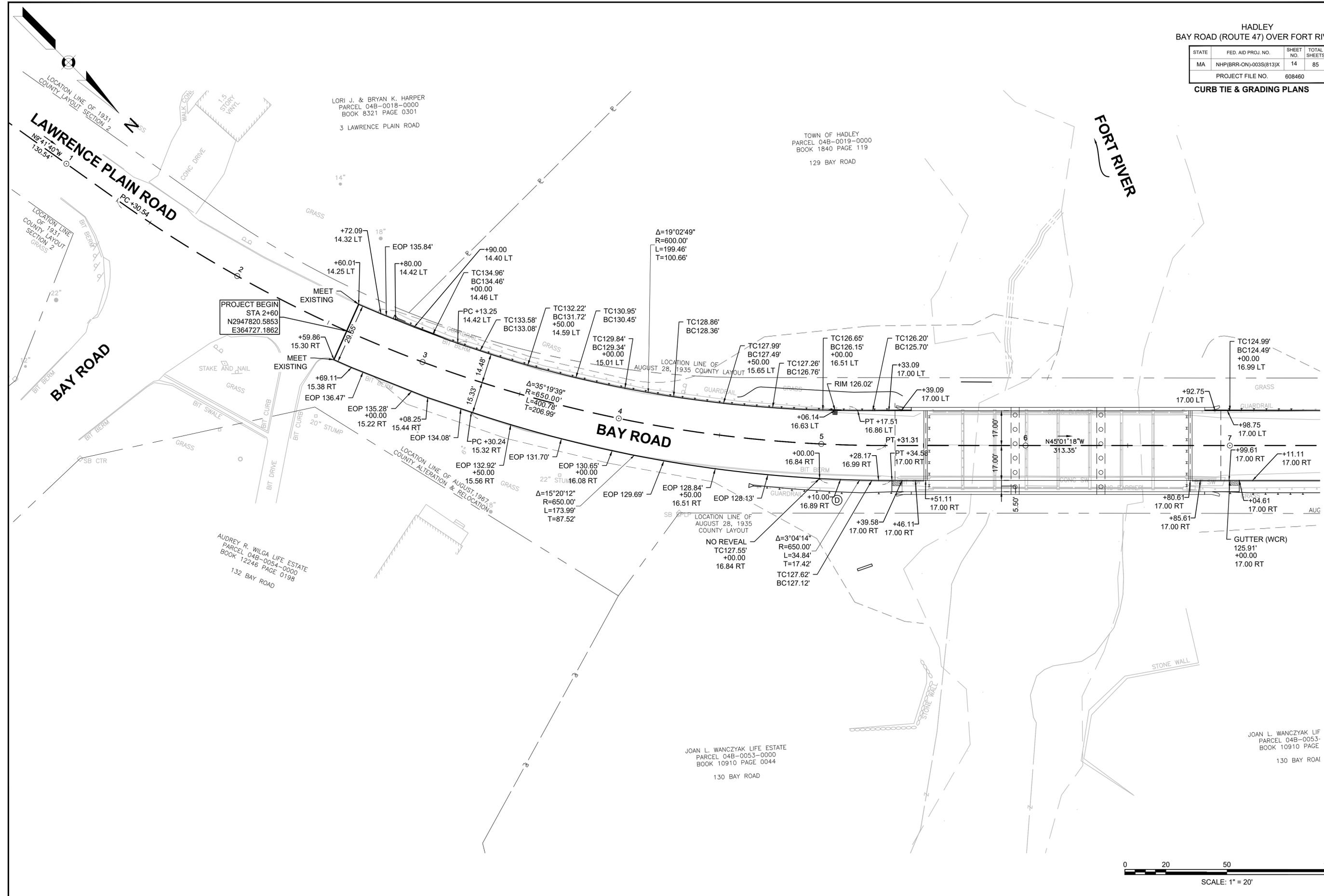
PROFILE - BAY RD



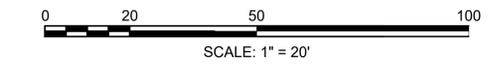
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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



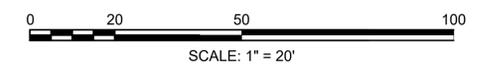
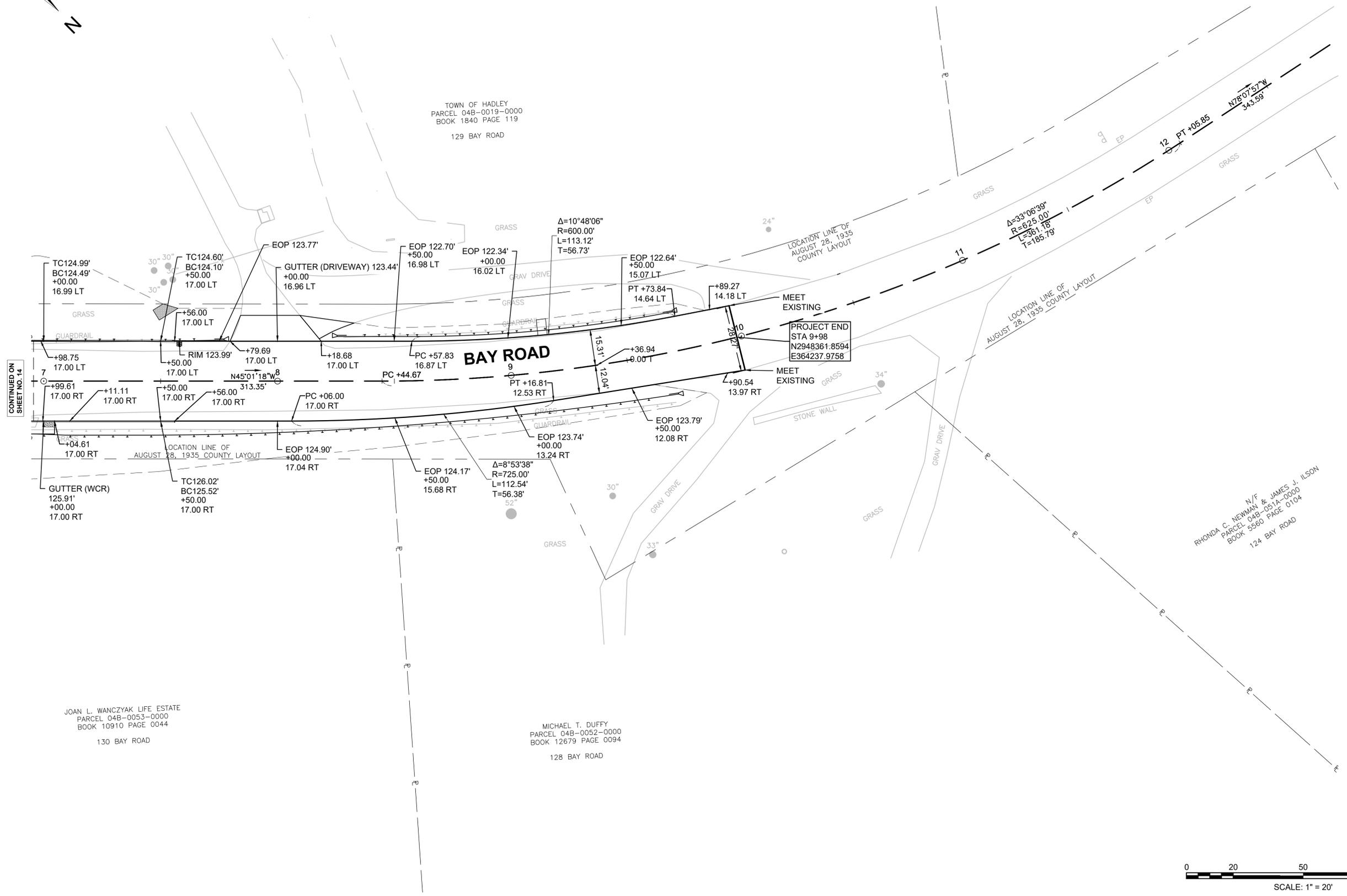
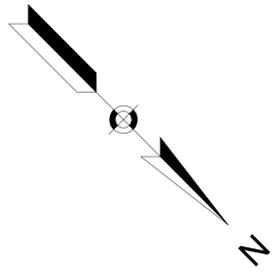
CONTINUED ON
SHEET NO. 15



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	

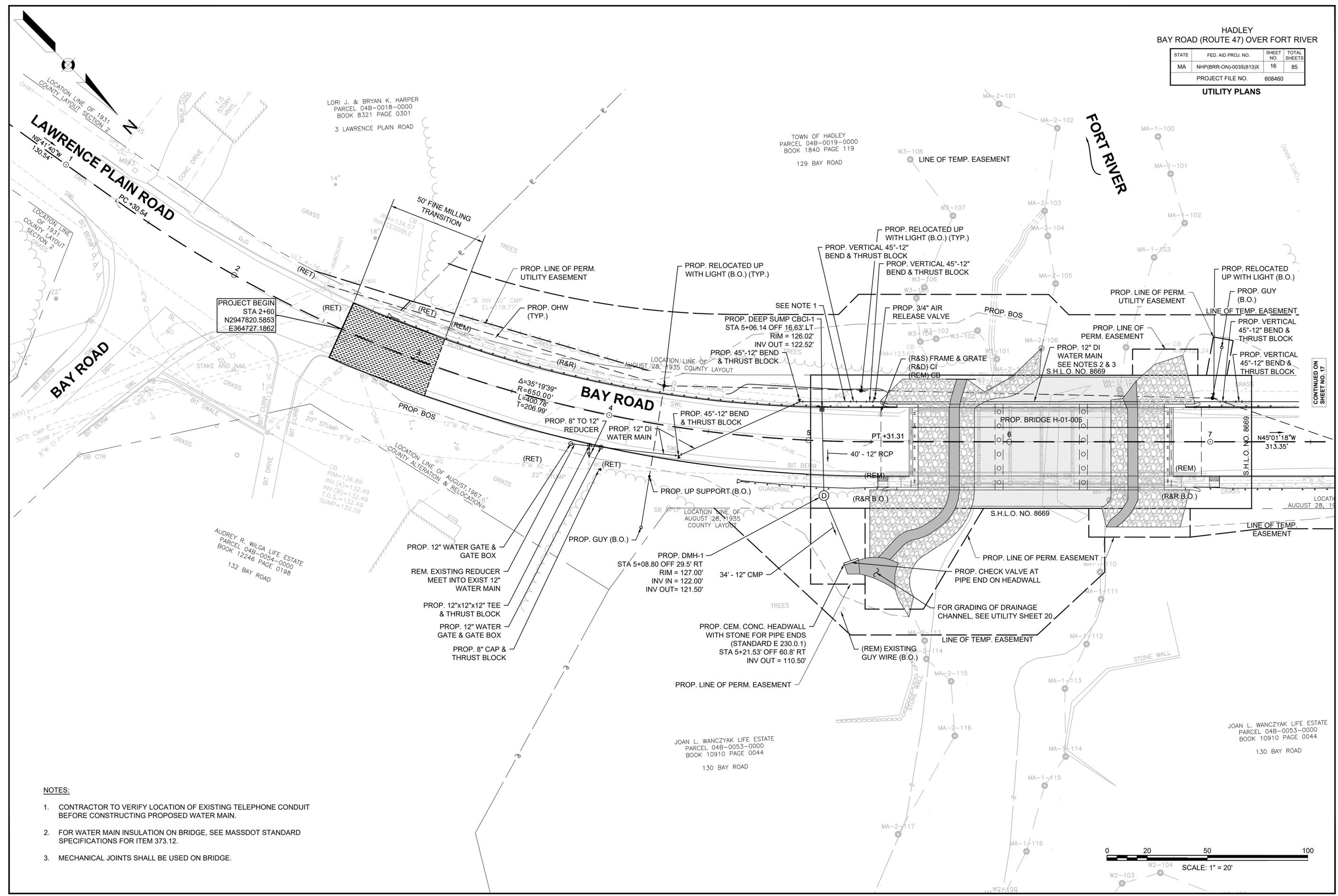
CURB TIE & GRADING PLANS



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

UTILITY PLANS

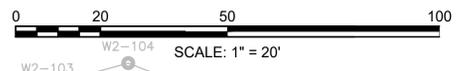


PROJECT BEGIN
STA 2+60
N2947820.5853
E364727.1862

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

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

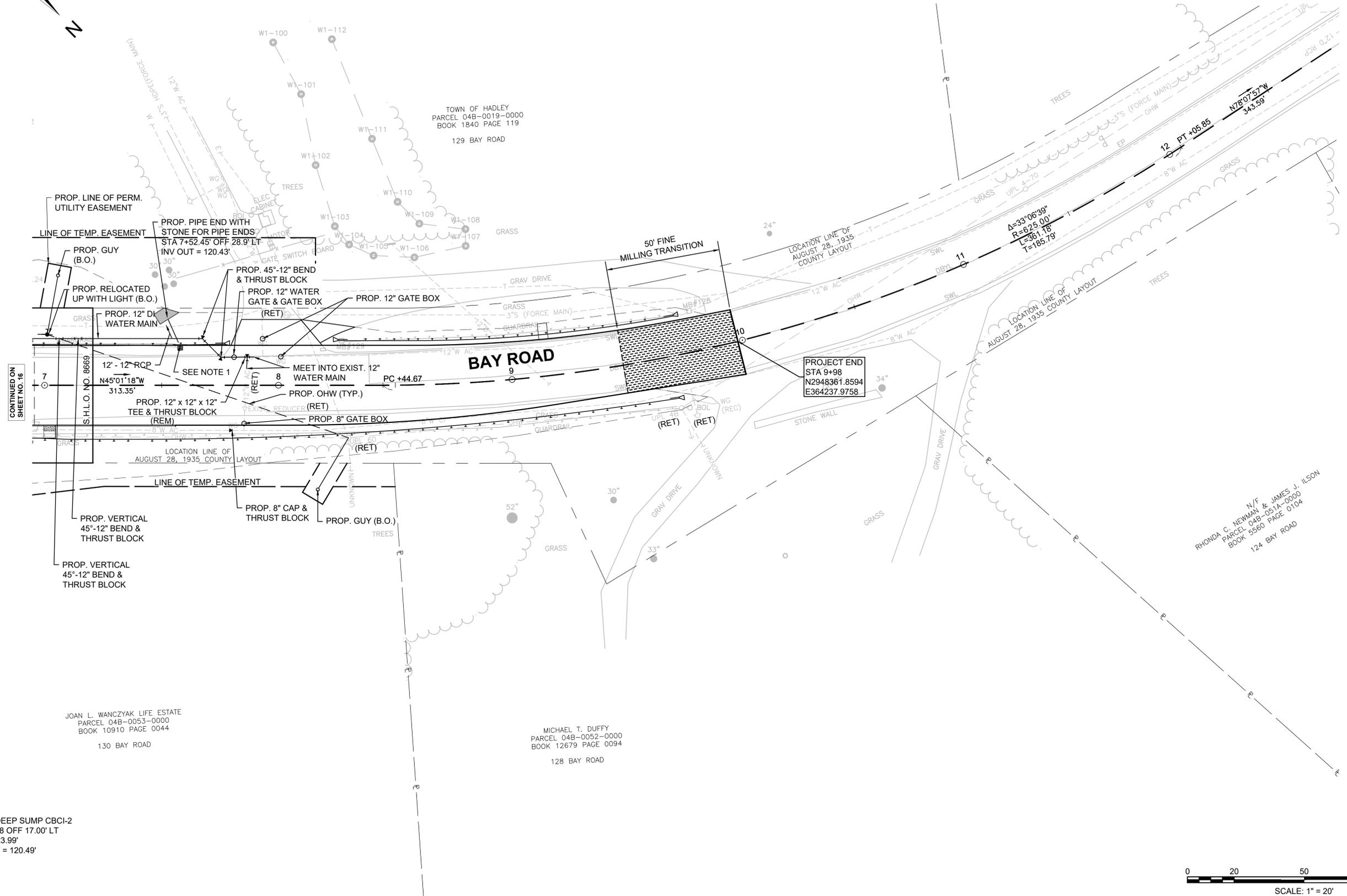


CONTINUED ON
SHEET NO. 17

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



CONTINUED ON
SHEET NO. 16

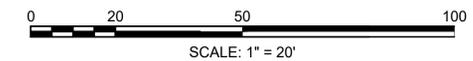
JOAN L. WANCZYAK LIFE ESTATE
PARCEL 04B-0053-0000
BOOK 10910 PAGE 0044
130 BAY ROAD

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

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

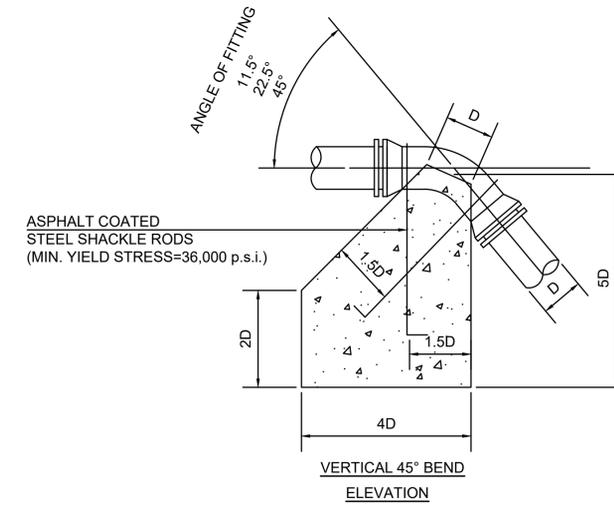
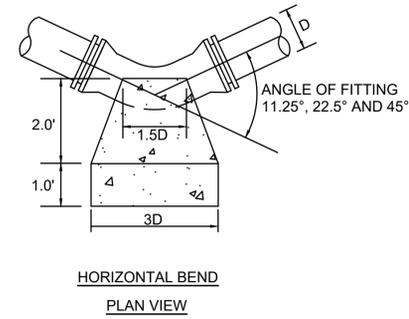
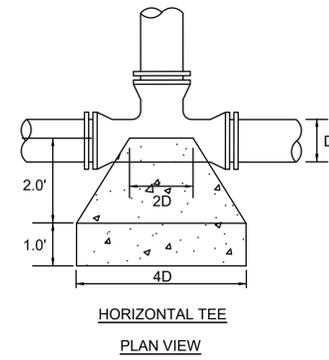
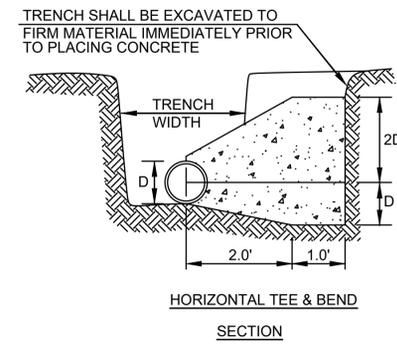
NOTES:

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



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

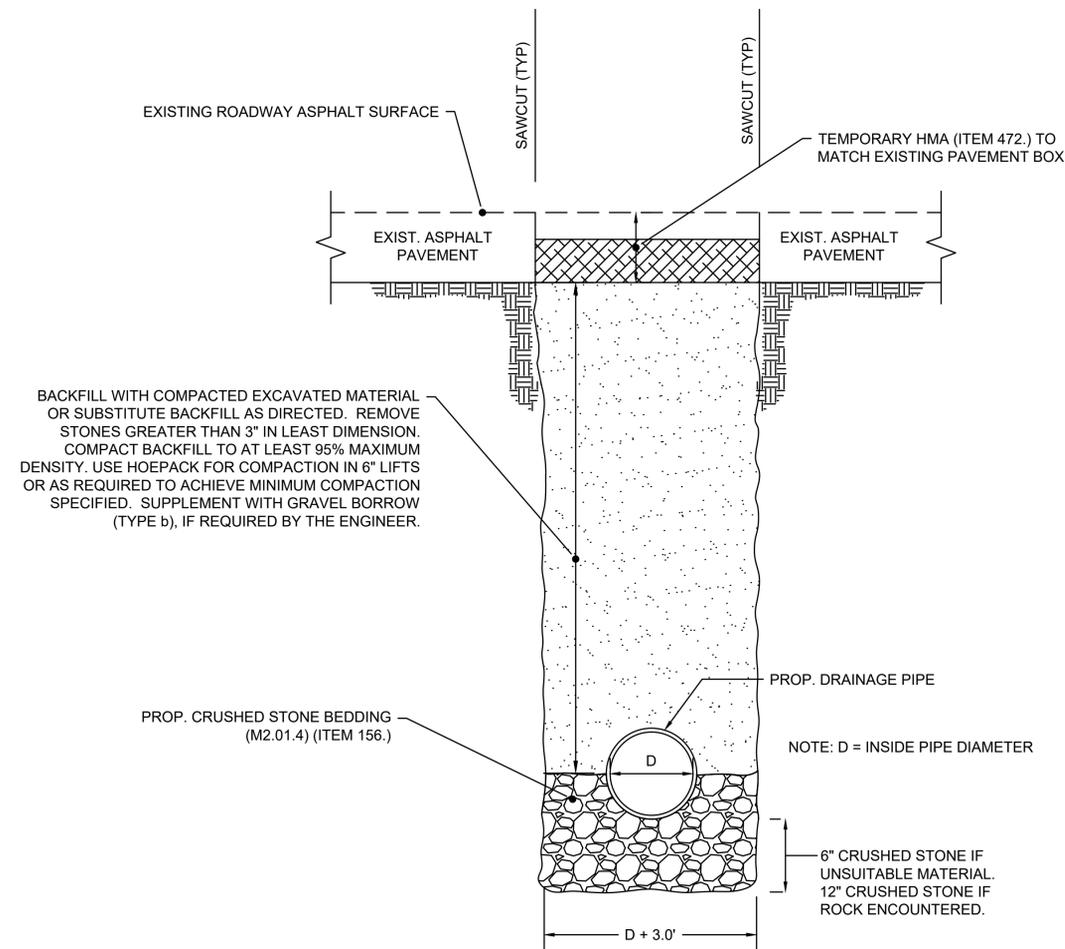


**CONCRETE THRUST BLOCKS
FOR HORIZONTAL, VERTICAL BENDS AND TEES**
NOT TO SCALE

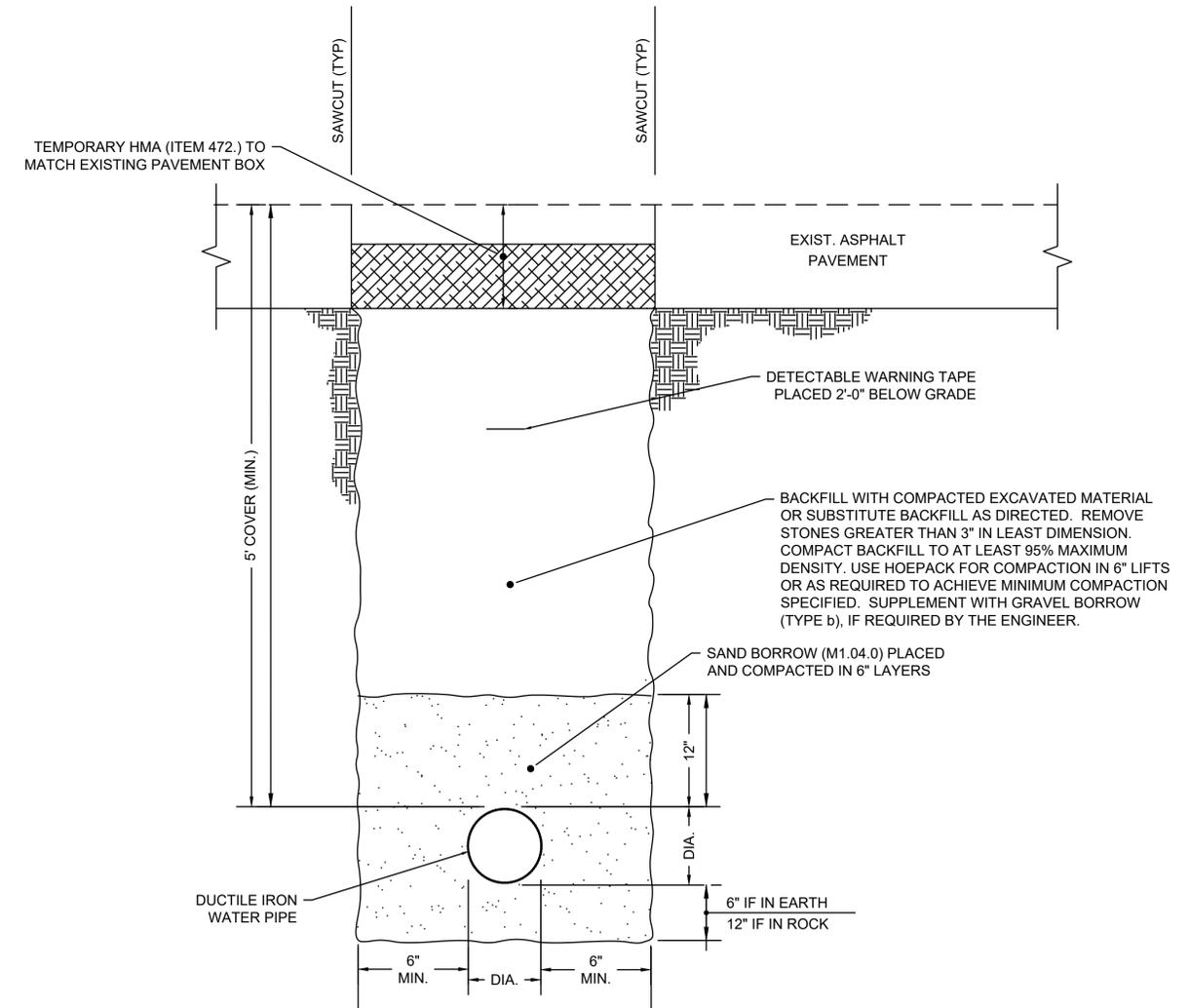
- NOTES:
1. THE DIMENSIONS SHOWN ARE MINIMUM.
 2. CONCRETE SHALL BE 4000 PSI - 1 1/2 IN. 565 CEMENT CONCRETE.
 3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF CONCRETE POURED AGAINST COMPACTED SOIL.
 4. THE WIDTH OF THE THRUST BLOCK, WHERE APPLICABLE, SHALL BE EQUAL TO THE WIDTH OF THE TRENCH.
 5. 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.

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



DRAINAGE TRENCH DETAIL IN EXISTING ROADWAY AREAS
NOT TO SCALE

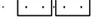


WATER SUPPLY TRENCH DETAIL IN EXISTING ROADWAY AREAS
NOT TO SCALE

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

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:

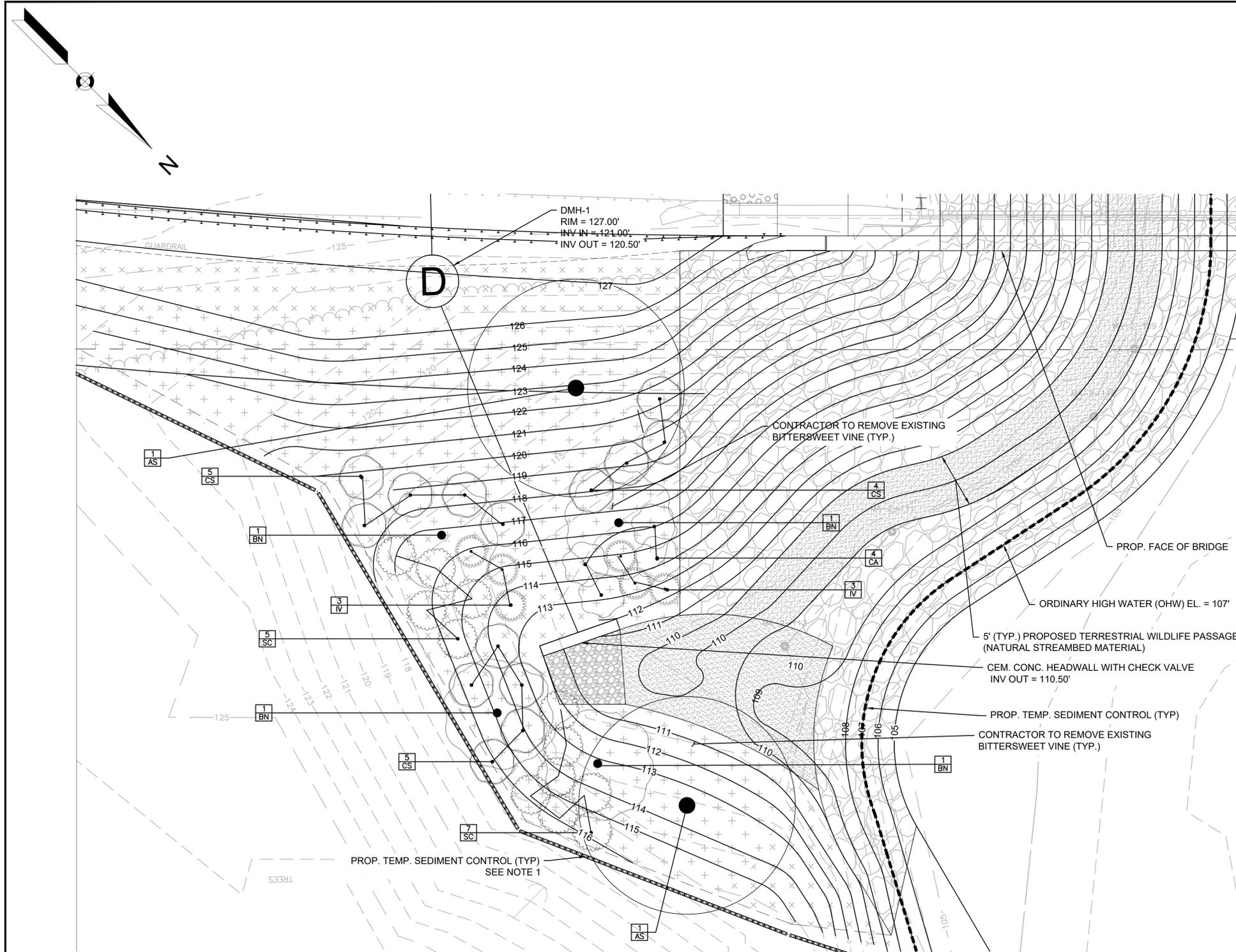
- SEDIMENT CONTROL BARRIER SHALL INCLUDE SILT FENCE TO SERVE AS WOOD TURTLE BARRIER. REFER TO THE APPLICABLE SPECIAL PROVISION.
- ORDINARY HIGH WATER IS AT EL. 107'.

PLANTING NOTES

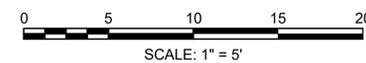
- CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
- PLANT LOCATIONS ARE APPROXIMATE. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT.
- ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL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

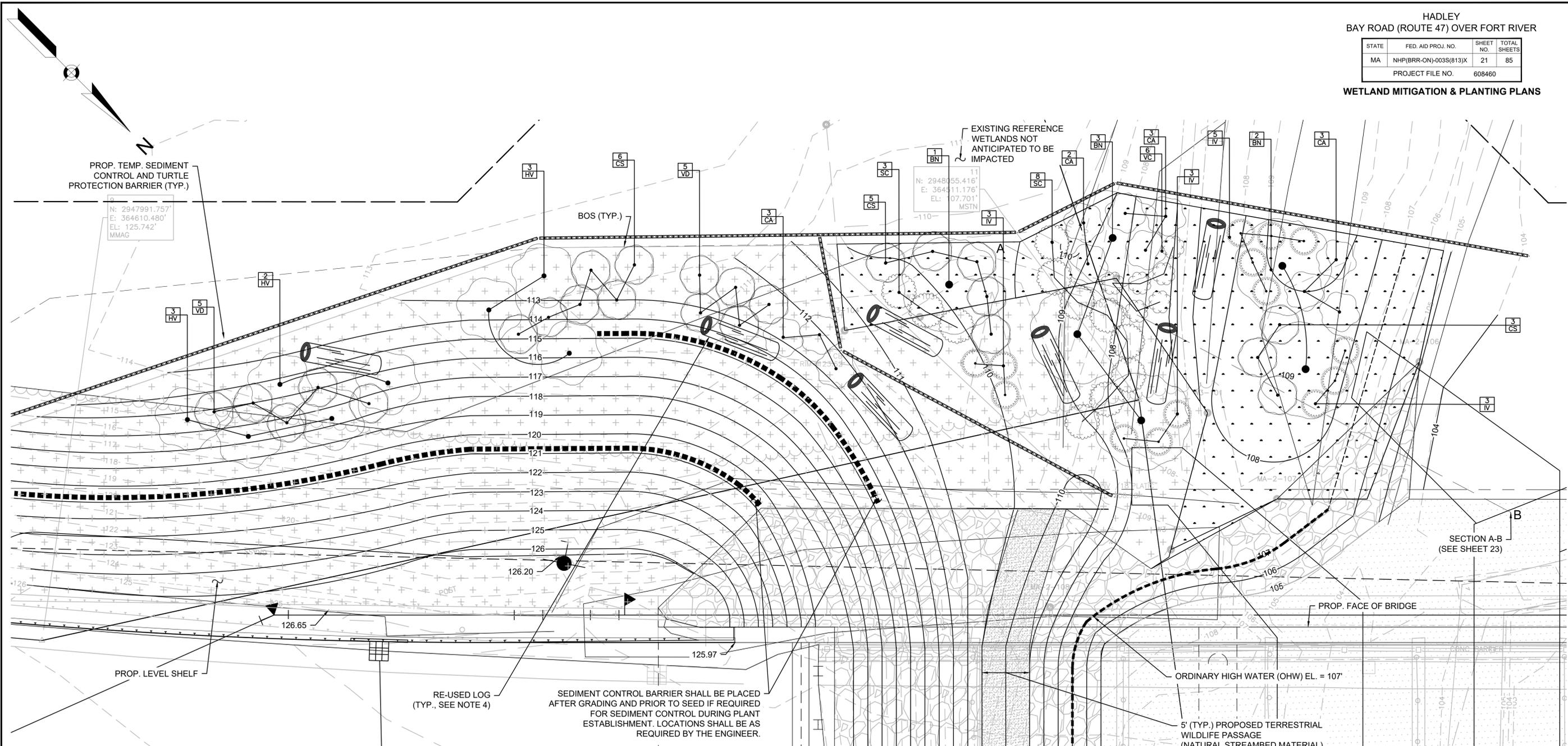


DRAINAGE CHANNEL GRADING AND PLANTING PLAN



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



PROP. TEMP. SEDIMENT CONTROL AND TURTLE PROTECTION BARRIER (TYP.)

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

BOS (TYP.)

EXISTING REFERENCE WETLANDS NOT ANTICIPATED TO BE IMPACTED

SECTION A-B
(SEE SHEET 23)

PROP. LEVEL SHELF

RE-USED LOG (TYP., SEE NOTE 4)

SEDIMENT CONTROL BARRIER SHALL BE PLACED AFTER GRADING AND PRIOR TO SEED IF REQUIRED FOR SEDIMENT CONTROL DURING PLANT ESTABLISHMENT. LOCATIONS SHALL BE AS REQUIRED BY THE ENGINEER.

PROP. FACE OF BRIDGE

ORDINARY HIGH WATER (OHW) EL. = 107'

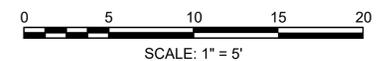
5' (TYP.) PROPOSED TERRESTRIAL WILDLIFE PASSAGE (NATURAL STREAMBED MATERIAL)

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 CORYMBOSUM	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



PLANTING NOTES:

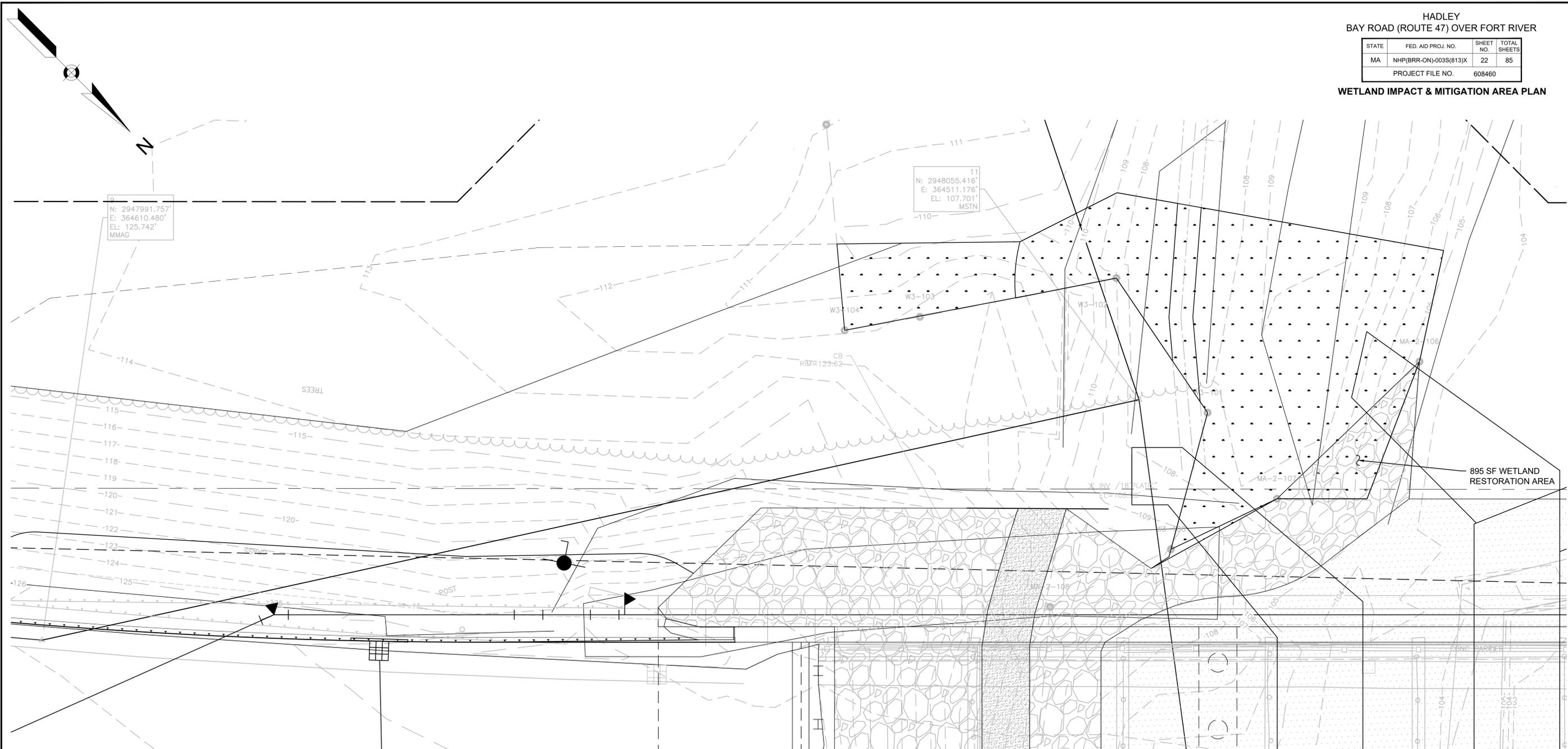
- FOR WETLAND REPLICATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.35.
- FOR WETLAND RESTORATION INSTRUCTIONS, REFER TO SPECIAL PROVISION ITEM 755.45.
- RESTORATION AND REPLICATION WORK SHALL NOT COMMENCE UNTIL ALL WORK IN WATER AND SLOPE RECONSTRUCTION HAS BEEN COMPLETED TO AVOID DAMAGE TO MITIGATED AREA.
- 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.)
- 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'.
- CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
- PLANT LOCATIONS ARE APPROXIMATE. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT.
- ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME, CULTIVAR, & SIZE.
- IMMEDIATELY AFTER ACCEPTANCE OF PLANTING, TAGS AND RIBBONS SHALL BE REMOVED.
- ALL PLANTS WILL BE MULCHED PER PLANS AND SPECIFICATIONS.
- ALL SHRUB AND PERENNIAL BEDS WILL BE WEEDED AND OTHERWISE NEATLY MAINTAINED FOR THE DURATION OF THE CONTRACT.
- PLANTS AND PLANTING BEDS SHALL BE THOROUGHLY WATERED AS NECESSARY AND PER SPECIFICATIONS.

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

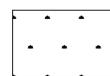
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	22	85
PROJECT FILE NO.		608460	

WETLAND IMPACT & MITIGATION AREA PLAN

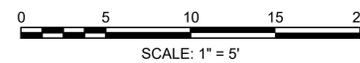


WETLAND IMPACT DIAGRAM

LEGEND

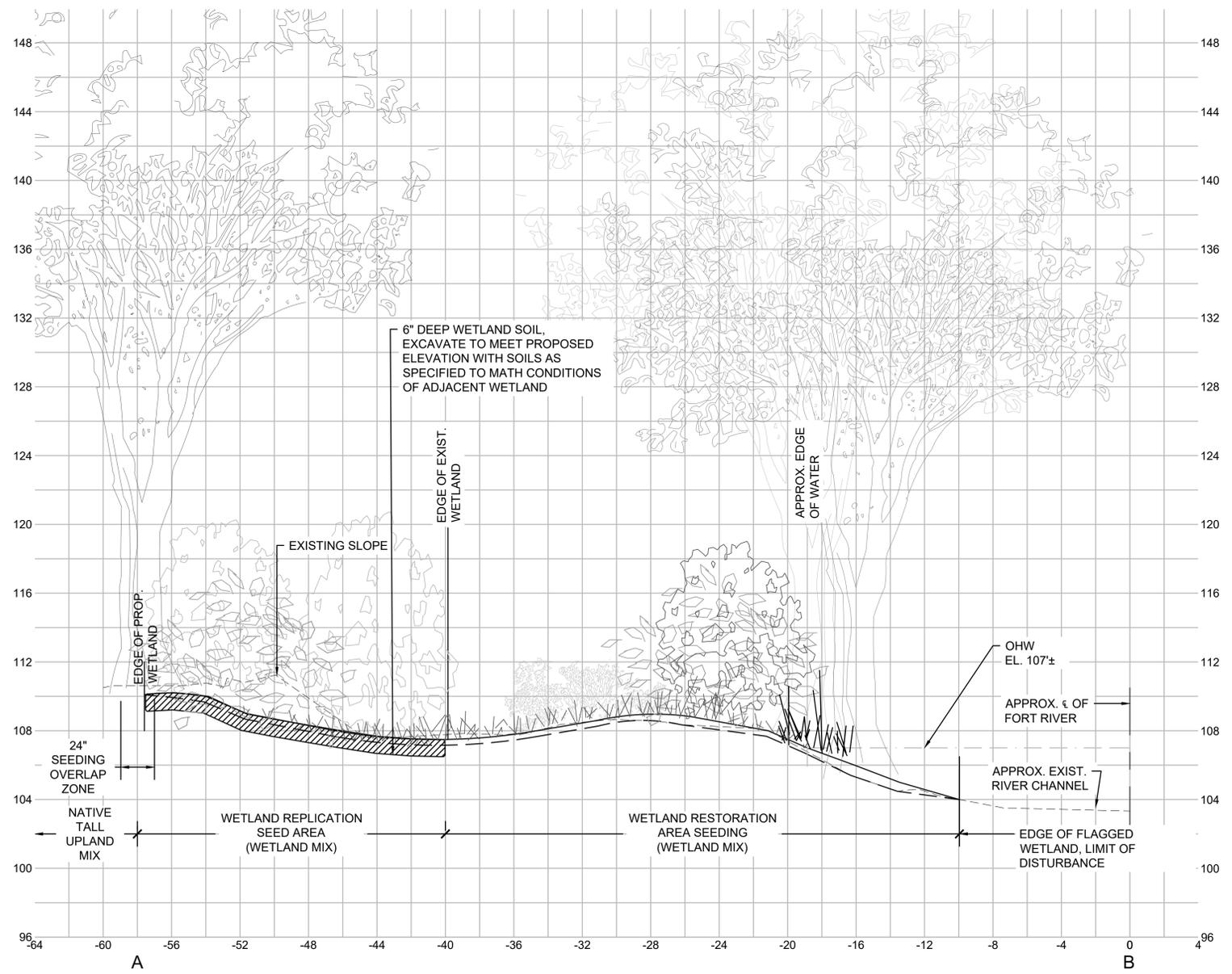


EXISTING WETLANDS TO BE RESTORED

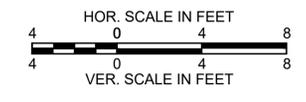


PLANTING NOTES:

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'.



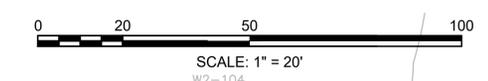
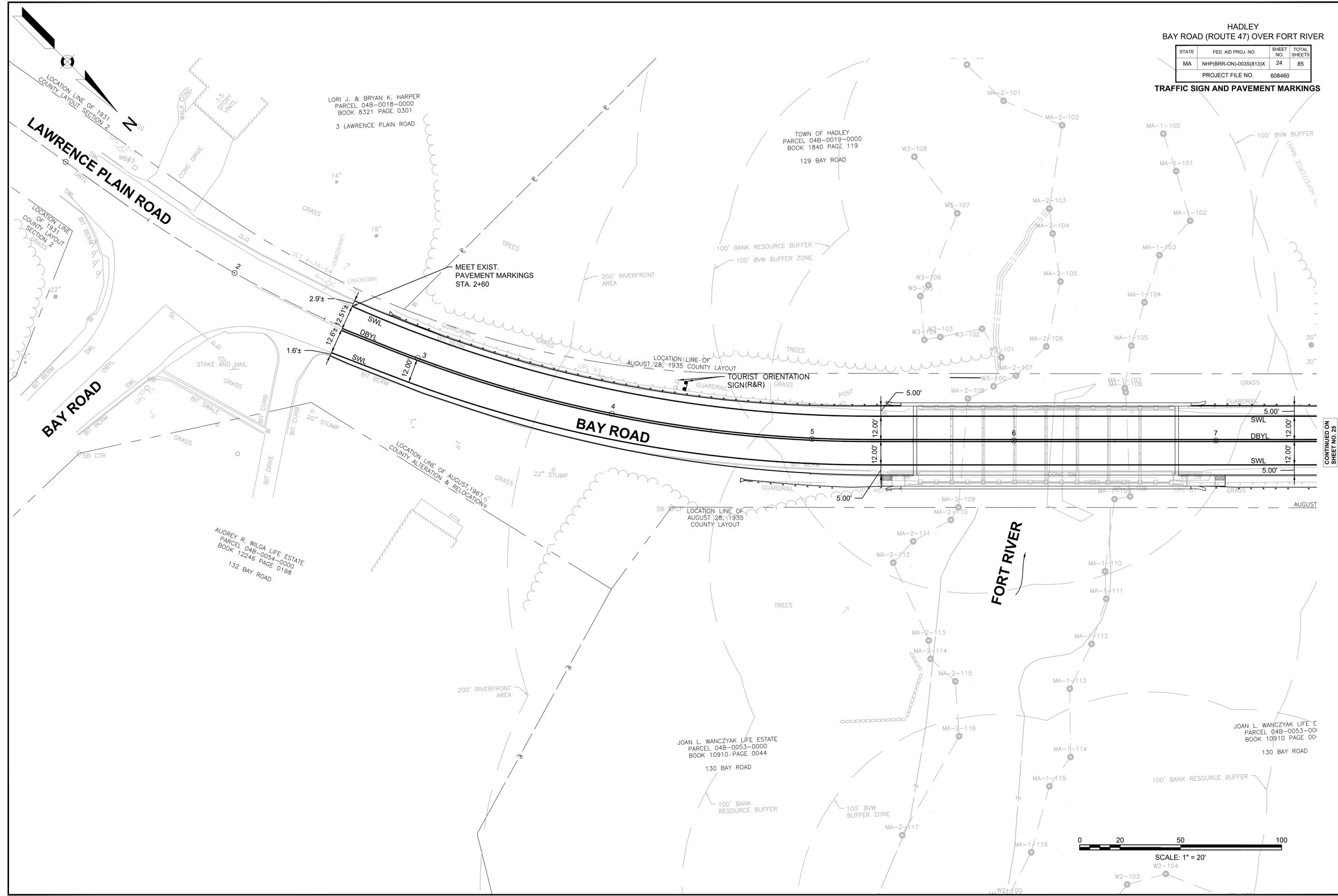
**WETLAND MITIGATION SECTION A-B
 (LOOKING WEST)**



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

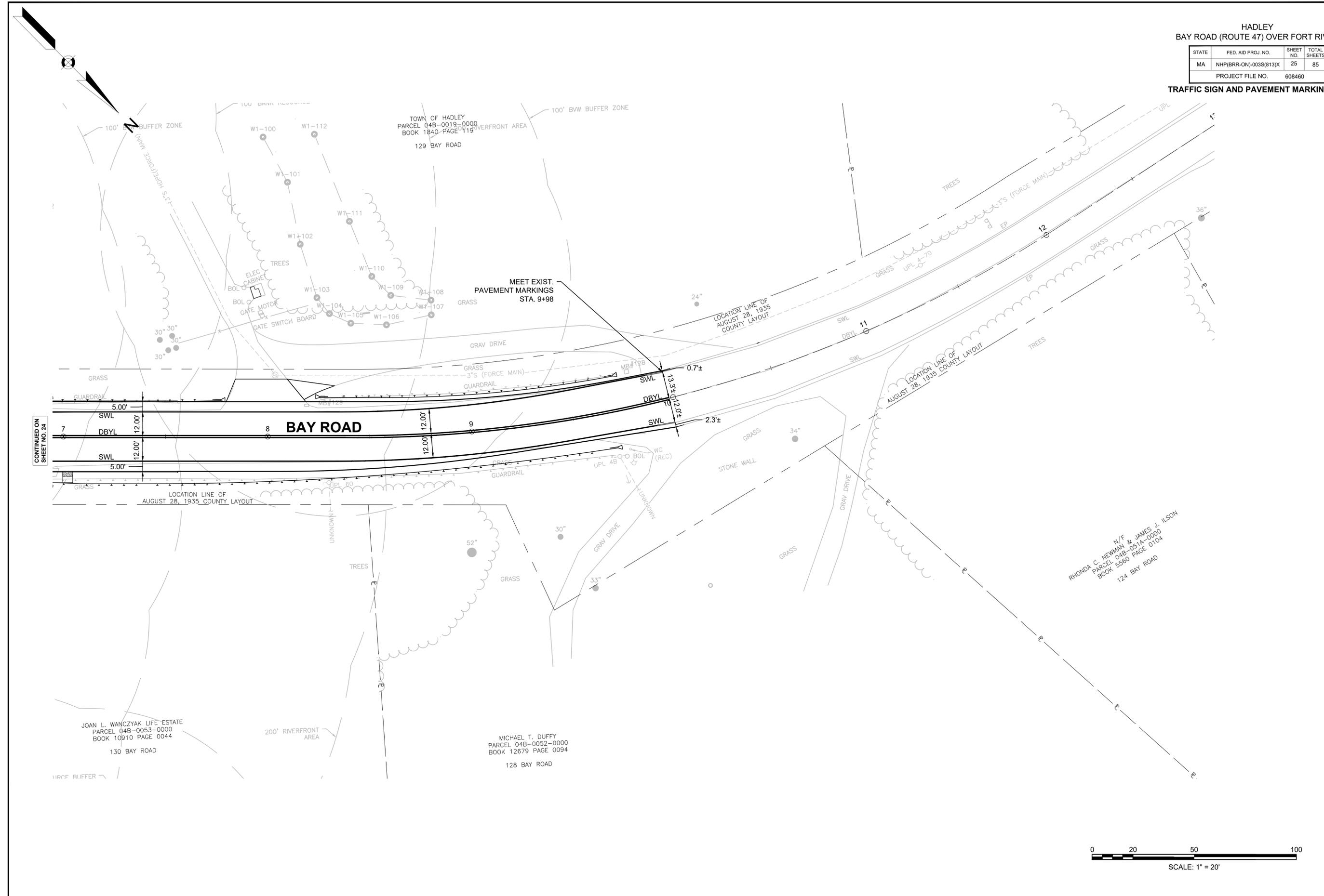


CONTINUED ON
SHEET NO. 25

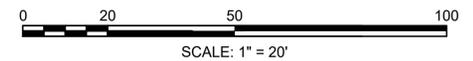
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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



CONTINUED ON
SHEET NO. 24



NOTES:

- 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.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- 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.
- 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).
- 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.
- THE FIRST TEN PLASTIC DRUMS OF A MERGING TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- 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.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND:

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

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 TTC 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

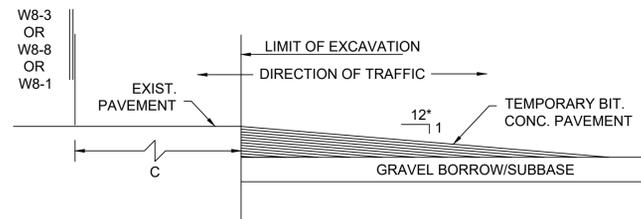
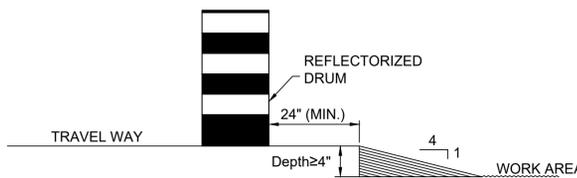
SPEED* (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

*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

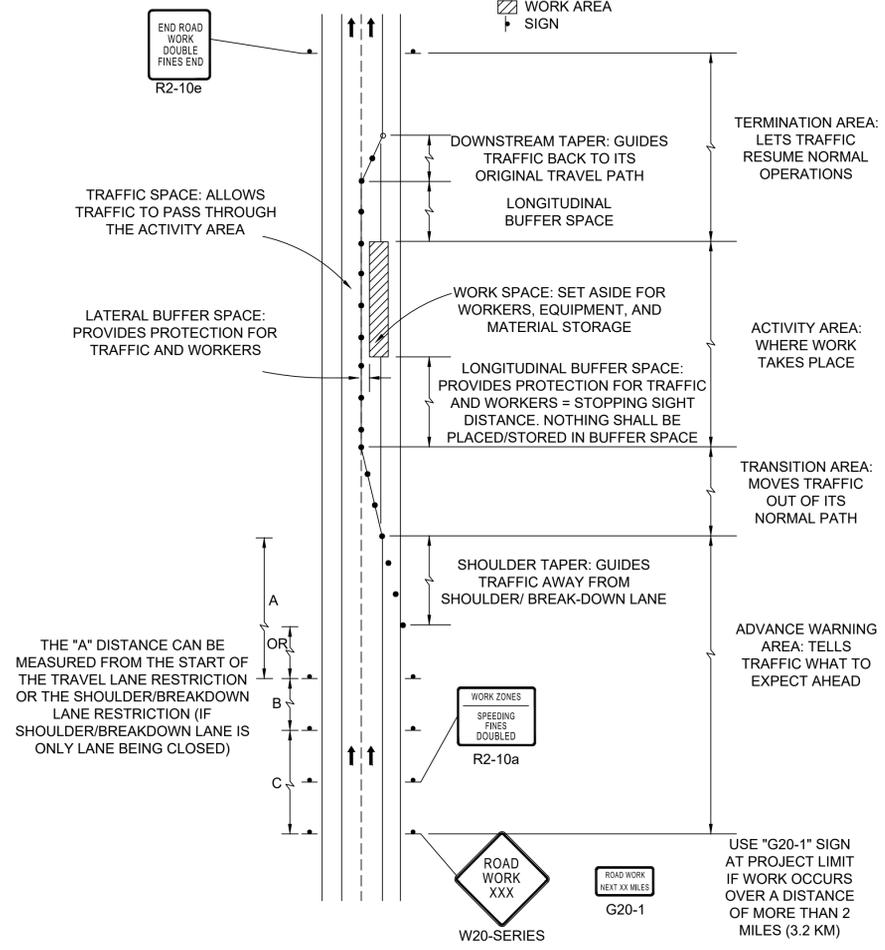
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

Source: Table 6C-4 MUTCD LATEST EDITION

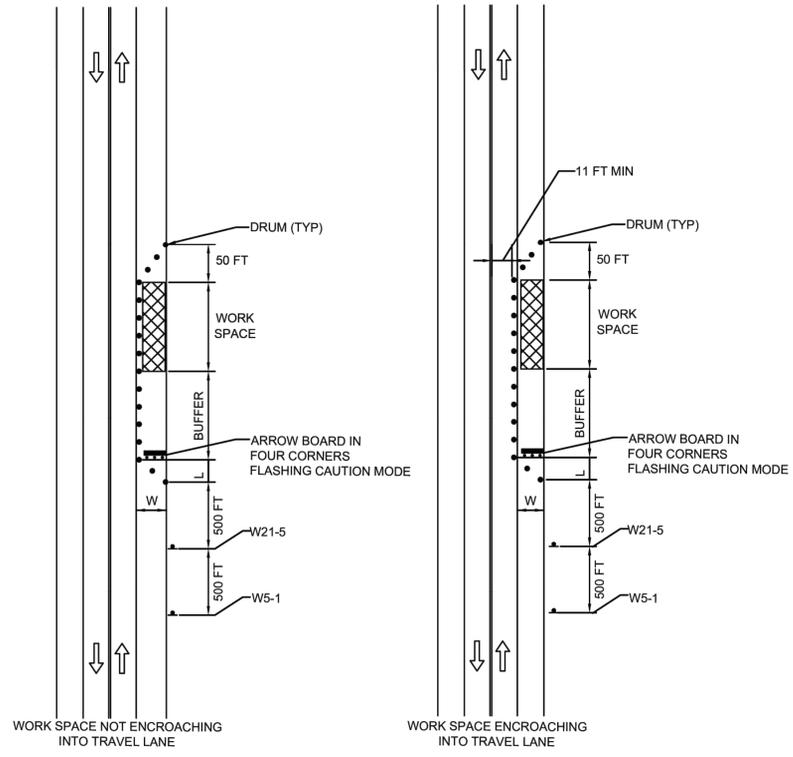
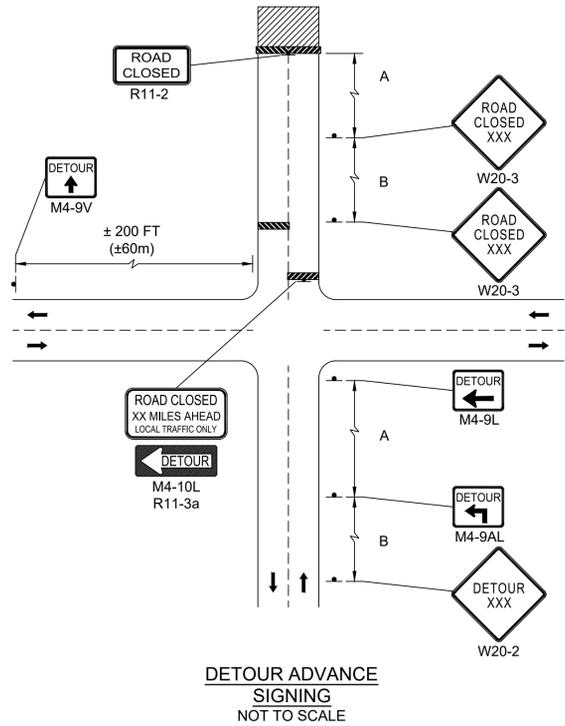
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	27	85
PROJECT FILE NO.		608460	

TEMPORARY TRAFFIC CONTROL PLANS
DETAILS

LEGEND
 ↑ DIRECTION OF TRAVEL
 ● CHANNELIZING DEVICE
 ▨ WORK AREA
 ▽ SIGN



COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL (TTC) ZONE
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 $L = WS^2/60$

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.

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

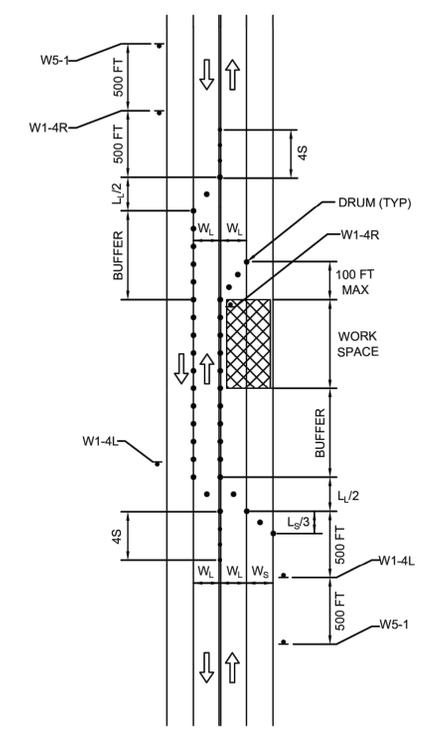
NOTE: FOR SHOULDER WIDTHS NOT LISTED IN TABLE, USE $L_s = WS^2/60$

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.

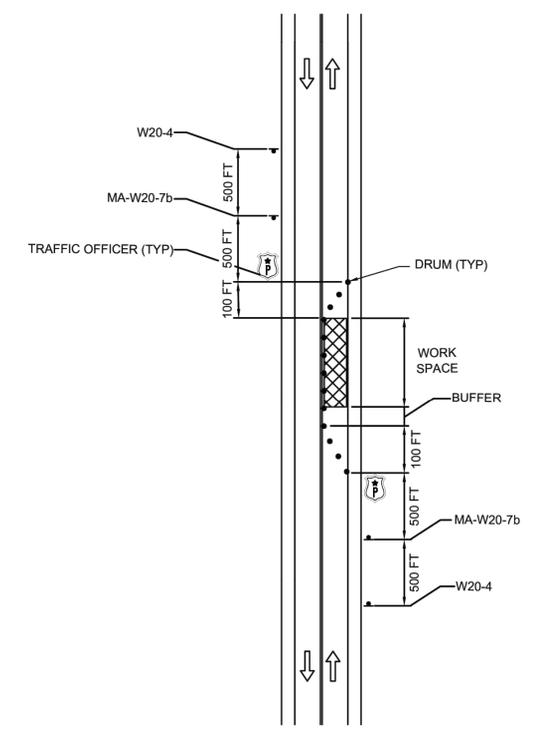


TWO LANE ROAD HALF ROAD CLOSURE
NOT TO SCALE

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

TEMPORARY TRAFFIC CONTROL PLANS
DETAILS



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.

ALTERNATING ONE-WAY
(TRAFFIC OFFICER)
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	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 ABUTTERS 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 ABUTTERS 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

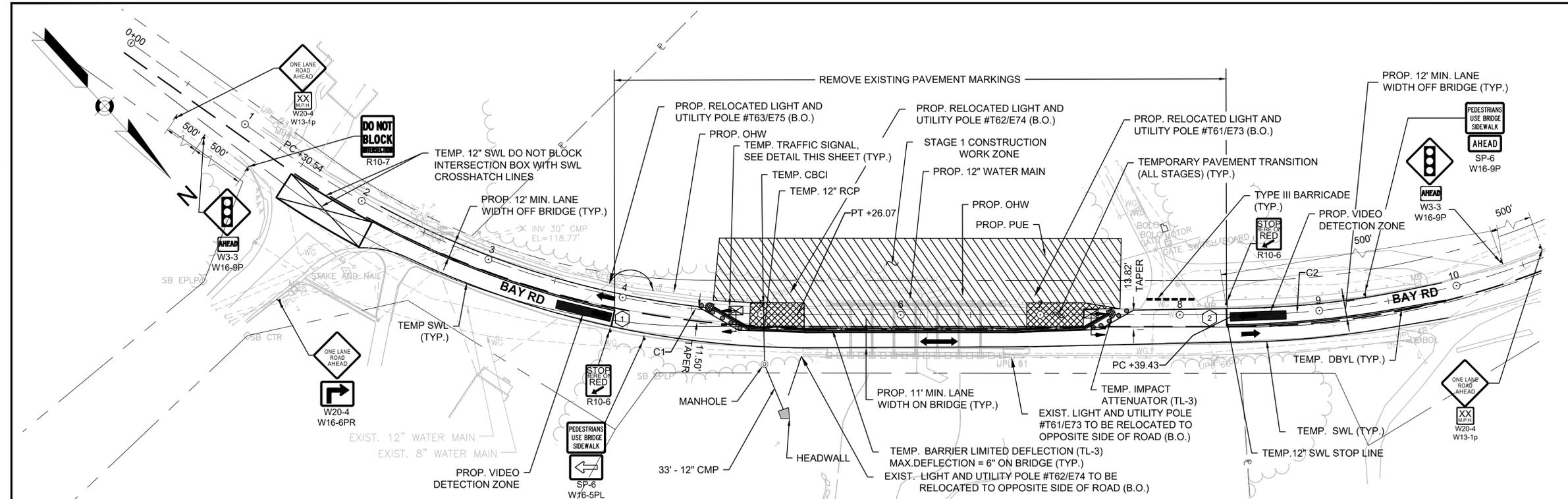
ANTICIPATED TYPICAL SETUP DETAILS

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

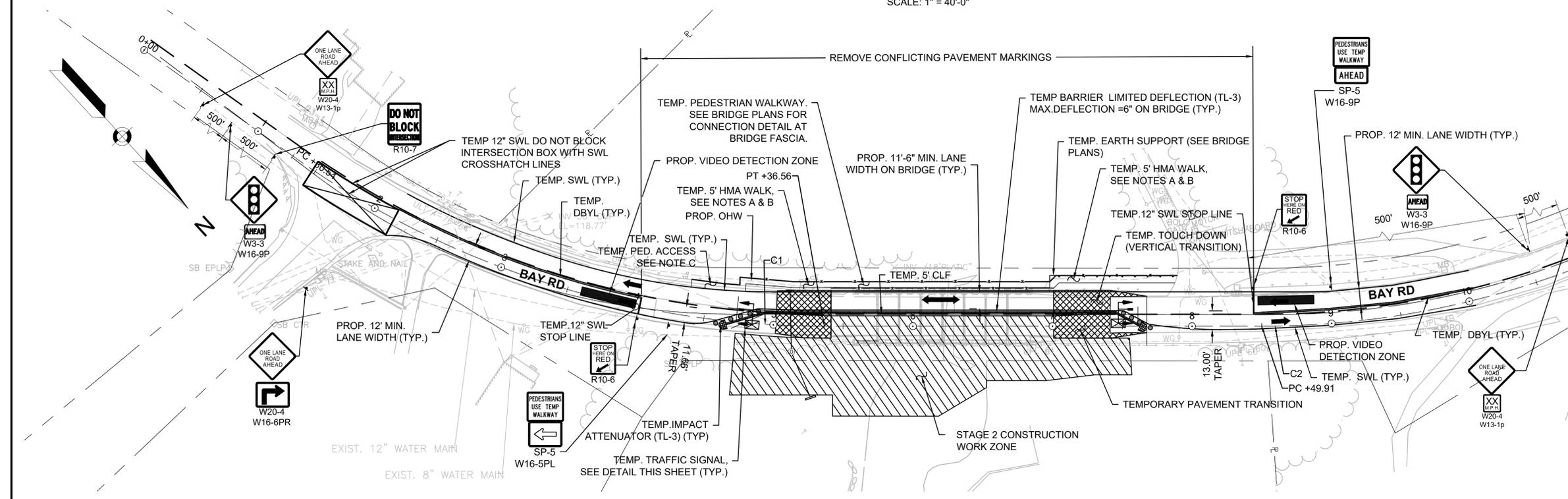
TTCP 2

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.



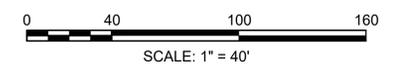
STAGE 1
SCALE: 1" = 40'-0"



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

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
- Ⓢ 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



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

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

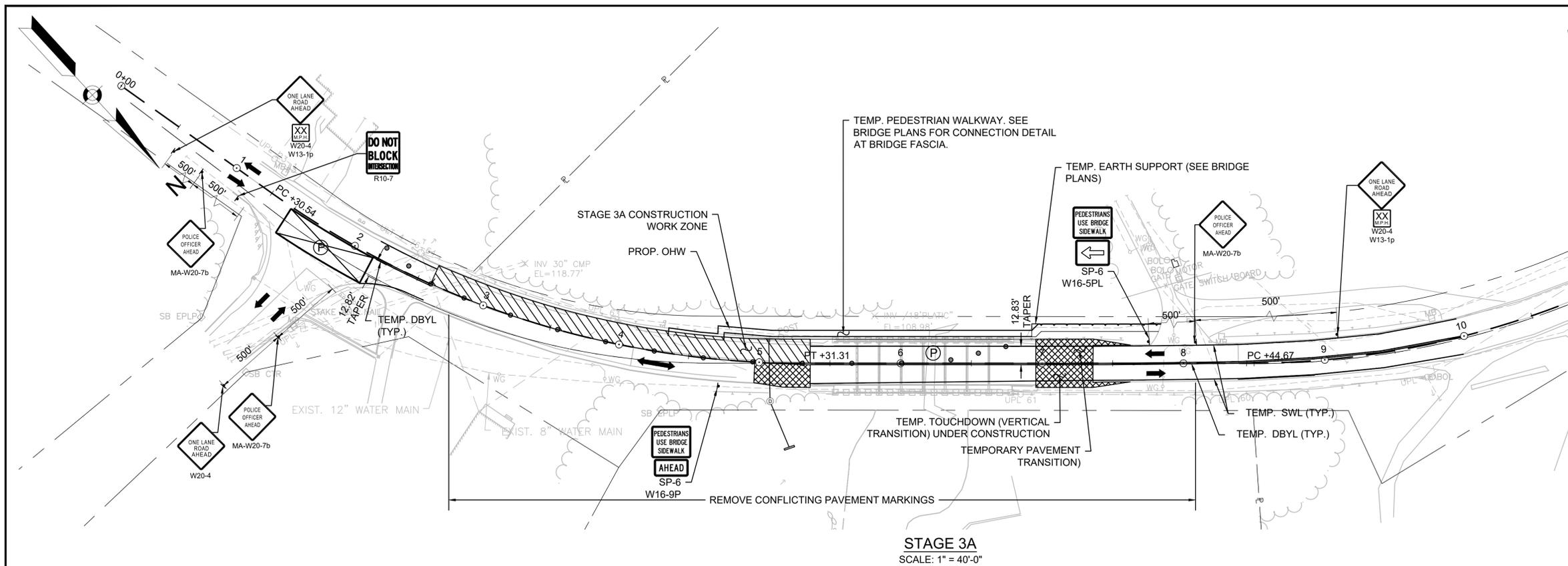
4. MAINTAIN TEMPORARY PEDESTRIAN WALKWAY ON NEW BRIDGE CONSTRUCTED IN STAGE 2.
5. CONTRACTOR SHALL PROVIDE ACCESS/EGRESS TO ALL ABBUTTERS AT ALL TIMES THROUGHOUT CONSTRUCTION.
6. ALL TRAVEL LANES SHALL BE A MINIMUM OF 11' CLEAR AT ALL TIMES.
7. ADA/AAB PEDESTRIAN ACCOMMODATION SHALL BE MAINTAINED AT 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:

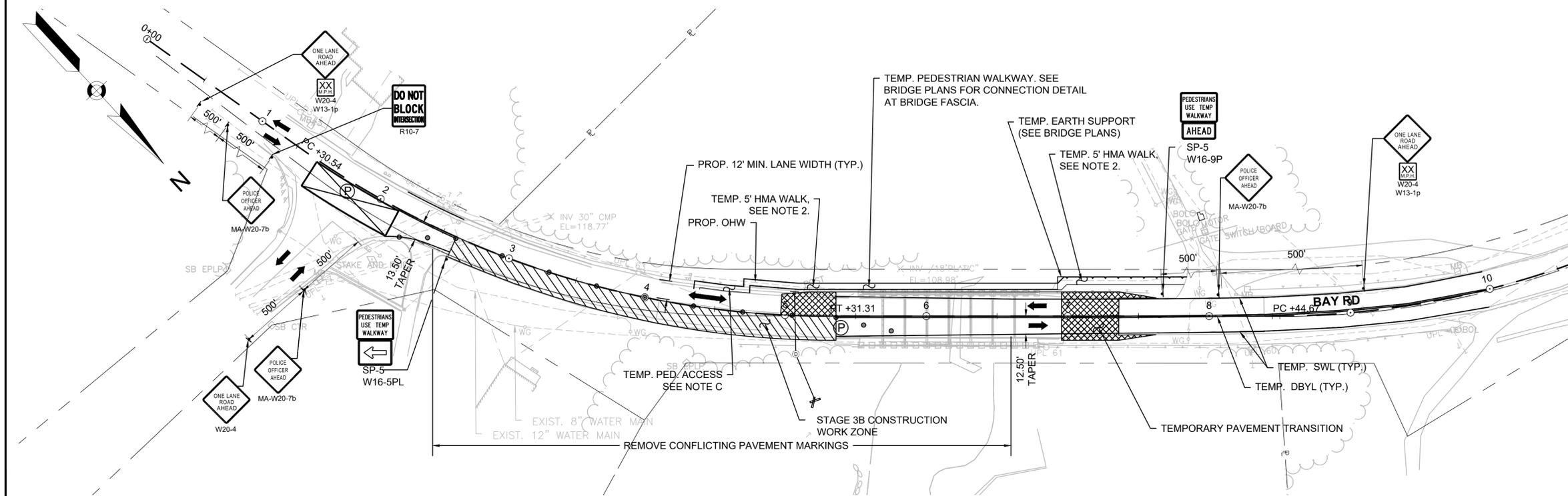
TTCP 1

GENERAL NOTES:

- A. TEMP. 5' HMA WALK CONSISTS OF 1.5" SUPERPAVE SURFACE COURSE (PAID FOR UNDER ITEM 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.



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



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

LEGEND:

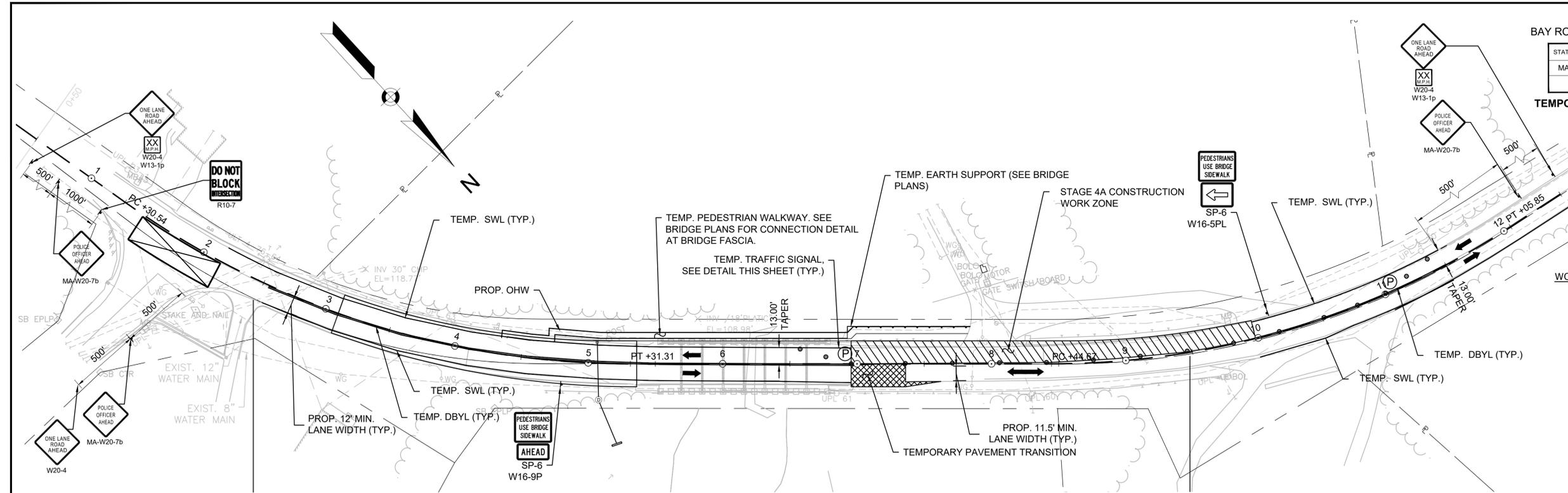
- | | | |
|--|------------------------------|---|
| ● REFLECTORIZED PLASTIC DRUM OR 36" CONE | WORK VEHICLE | WORK ZONE |
| (P/F) POLICE/FLAGGER DETAIL | TRUCK MOUNTED ATTENUATOR | TEMPORARY PAVEMENT TRANSITION |
| ▨ TYPE III BARRICADE | TRAFFIC OR PEDESTRIAN SIGNAL | FULL DEPTH PAVEMENT EXCLUDING SURFACE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



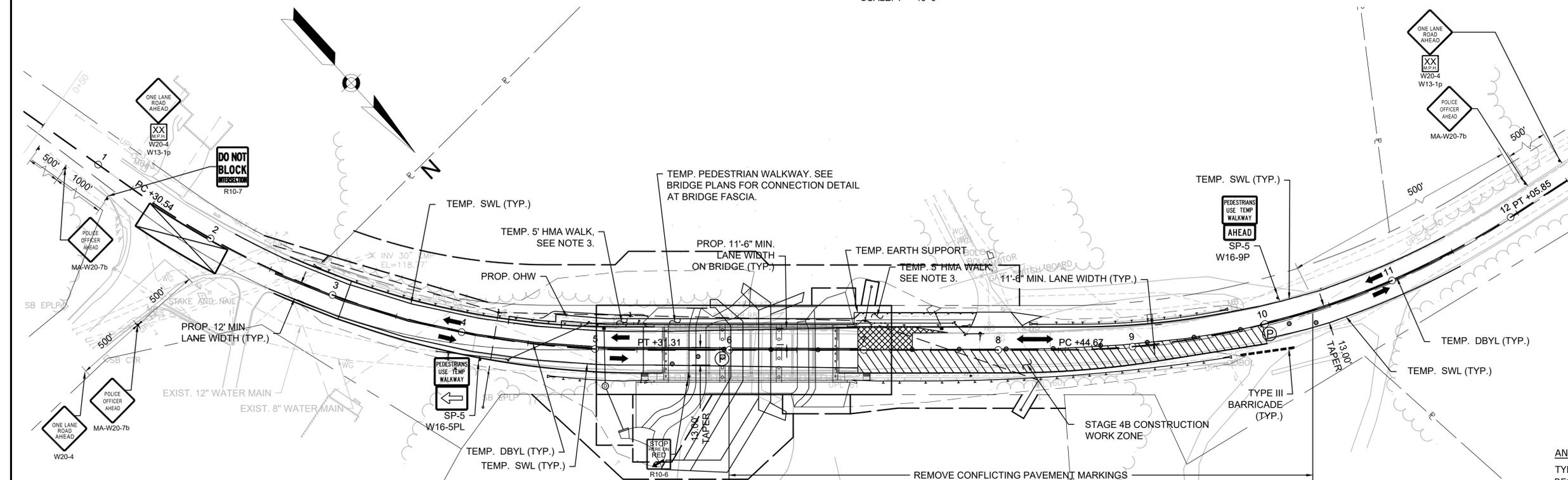
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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



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



STAGE 4B
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 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 ACCOMMODATION 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.)

LEGEND:

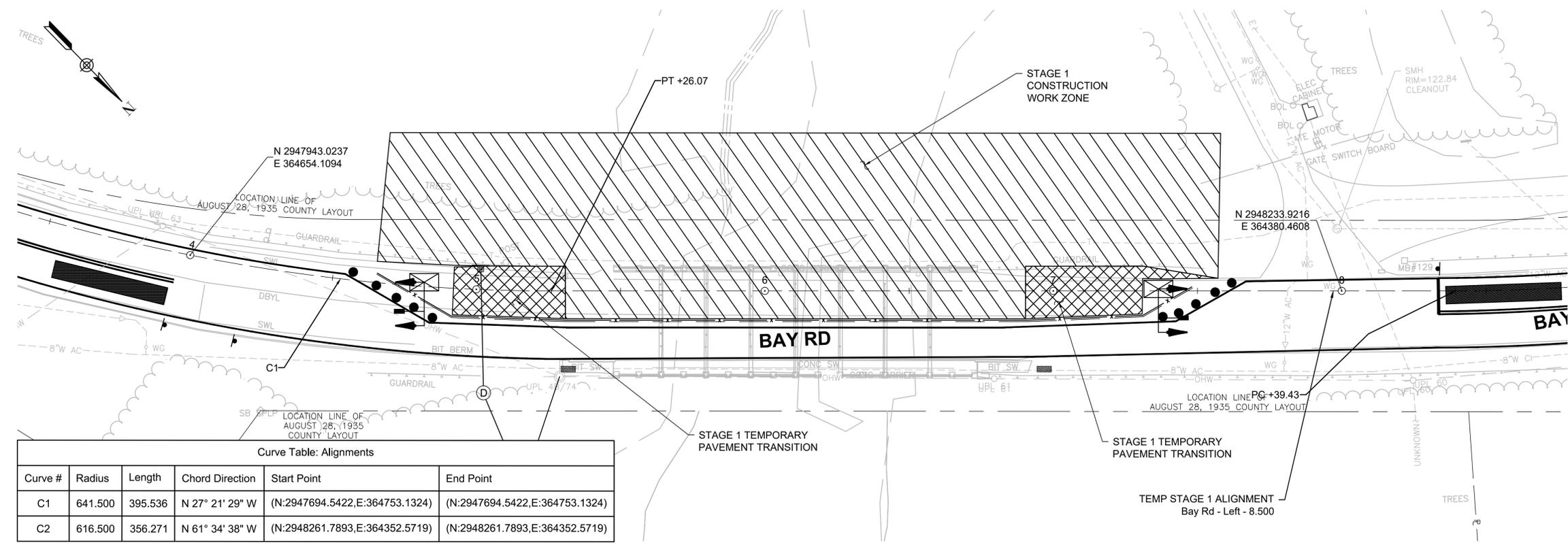
- | | | |
|--|------------------------------|---|
| ● REFLECTORIZED PLASTIC DRUM OR 36" CONE | WORK VEHICLE | WORK ZONE |
| (P/F) POLICE/FLAGGER DETAIL | TRUCK MOUNTED ATTENUATOR | TEMPORARY PAVEMENT TRANSITION |
| TYPE III BARRICADE | TRAFFIC OR PEDESTRIAN SIGNAL | FULL DEPTH PAVEMENT EXCLUDING SURFACE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



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

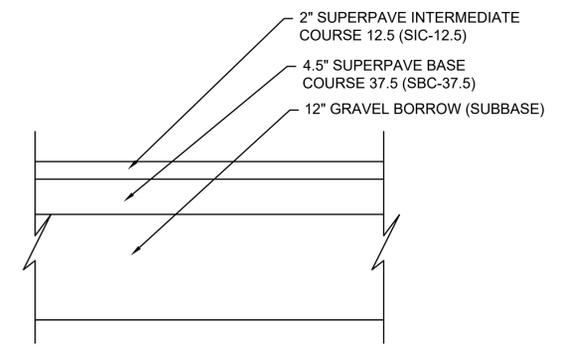
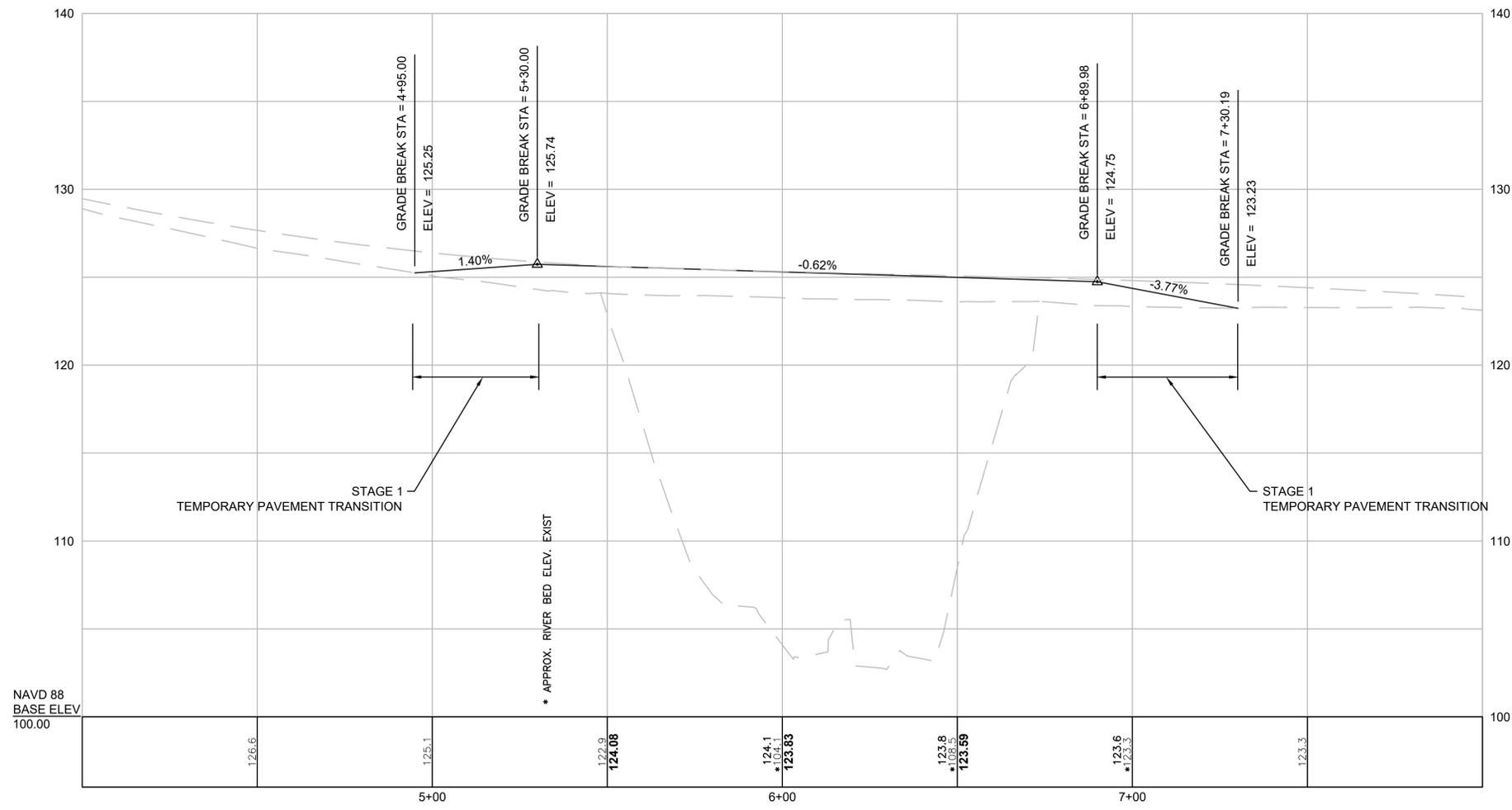
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	32	85
PROJECT FILE NO.		608460	

TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY PAVEMENT TRANSITION DETAILS



Curve Table: Alignments

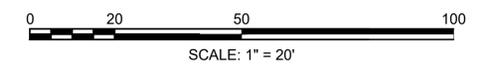
Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	641.500	395.536	N 27° 21' 29" W	(N:2947694.5422,E:364753.1324)	(N:2947694.5422,E:364753.1324)
C2	616.500	356.271	N 61° 34' 38" W	(N:2948261.7893,E:364352.5719)	(N:2948261.7893,E:364352.5719)



TEMPORARY PAVEMENT TRANSITION

NOT TO SCALE

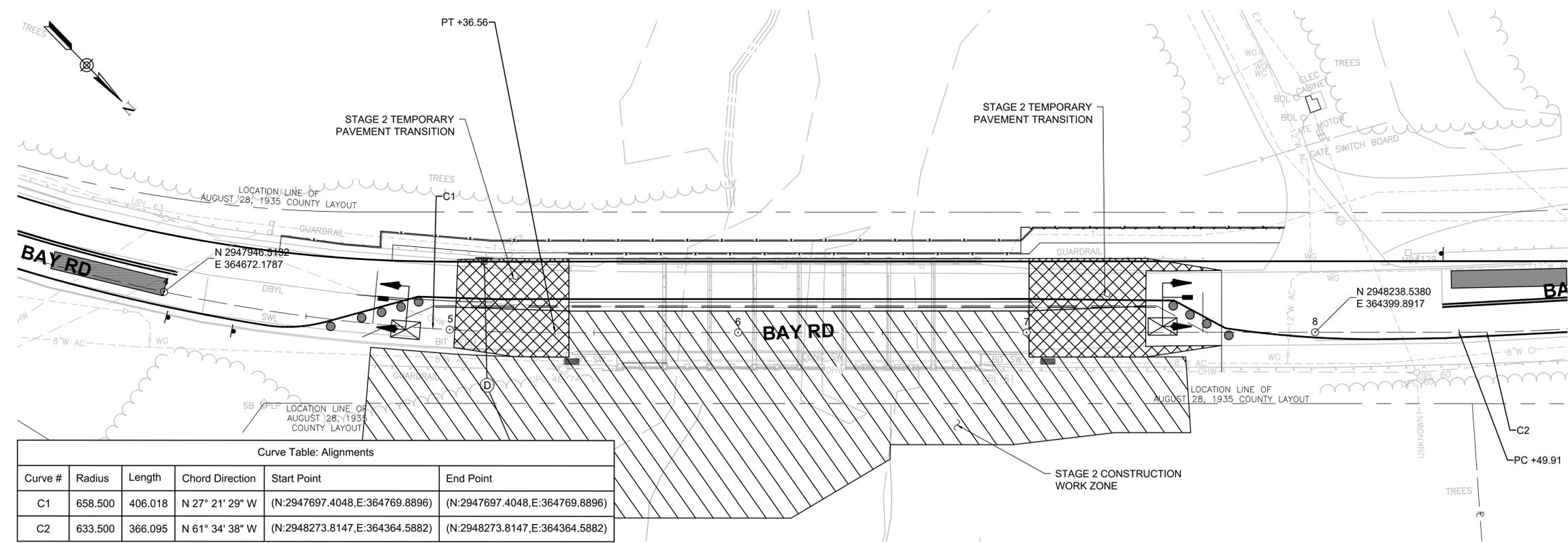
STAGE 1
SCALE: 1" = 20'-0"



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

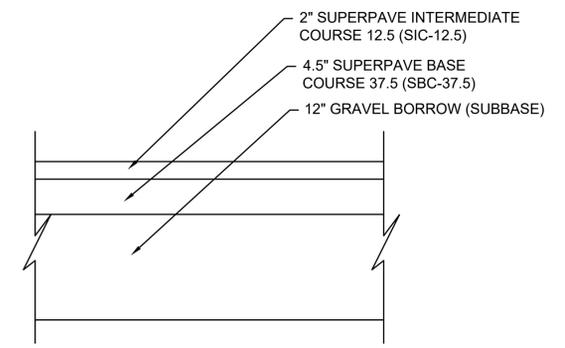
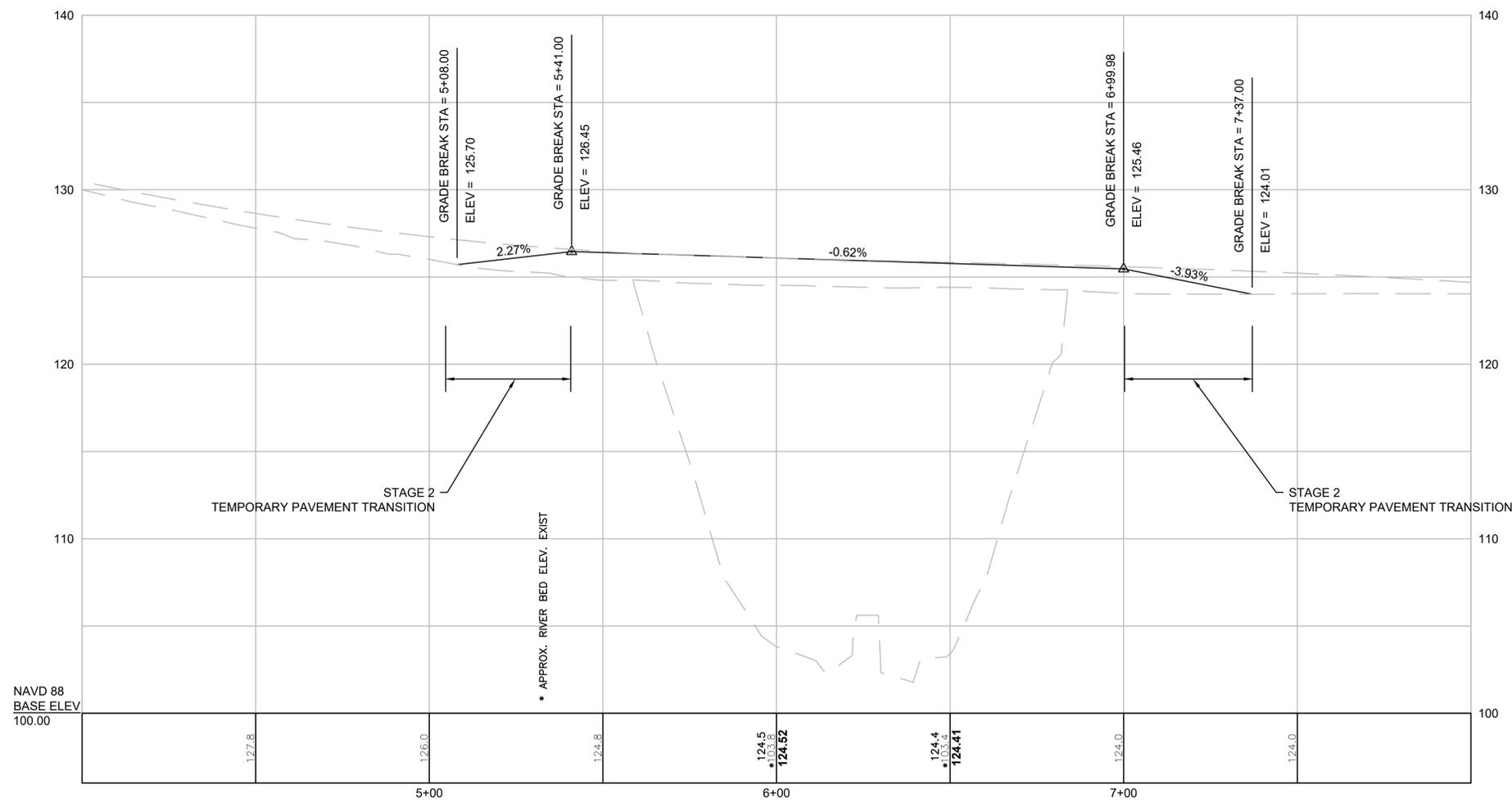
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	33	85
PROJECT FILE NO.		608460	

TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY PAVEMENT TRANSITION DETAILS



Curve Table: Alignments

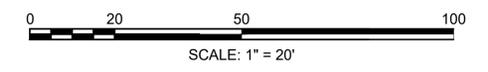
Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	658.500	406.018	N 27° 21' 29" W	(N:2947697.4048,E:364769.8896)	(N:2947697.4048,E:364769.8896)
C2	633.500	366.095	N 61° 34' 38" W	(N:2948273.8147,E:364364.5882)	(N:2948273.8147,E:364364.5882)



TEMPORARY PAVEMENT TRANSITION

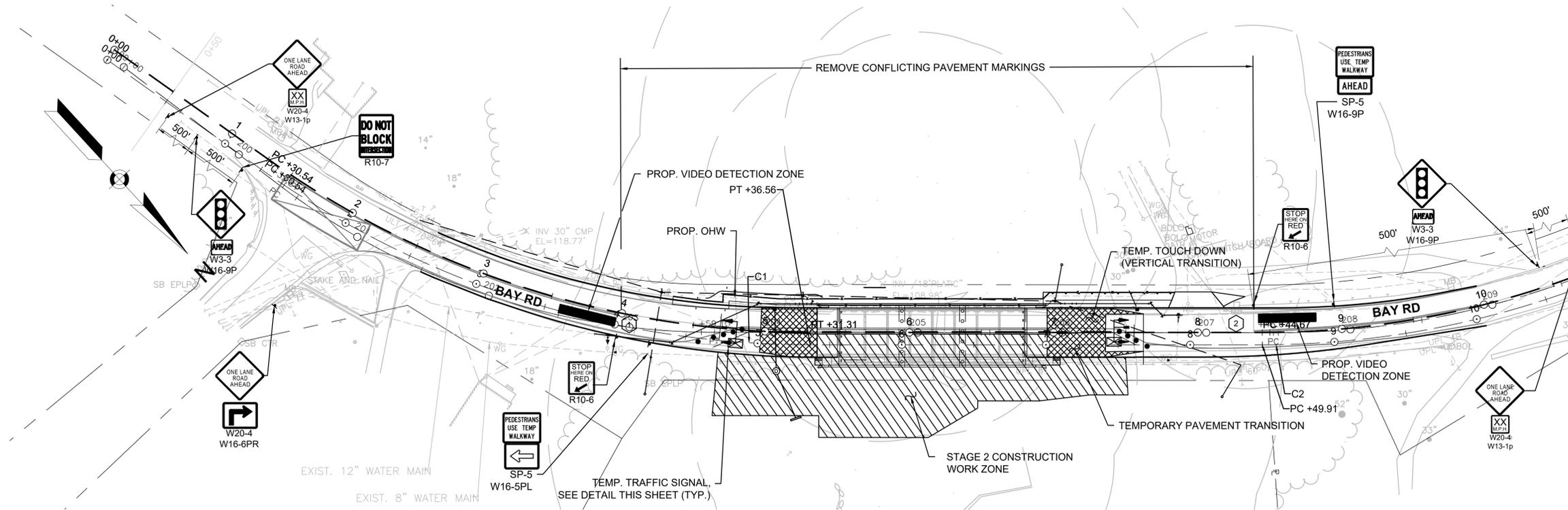
NOT TO SCALE

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



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



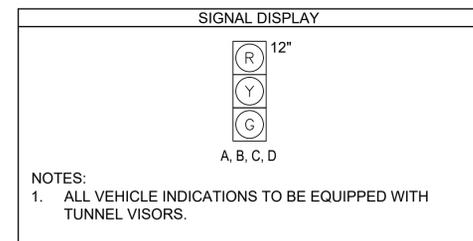
STAGE 1
SCALE: 1" = 40'-0"

STREET	DIR.	FACE	PHASE				EMERGENCY FLASH OPERATION	
			R/W	CL1	CL2	CL2		
BAY ROAD	SB	A,B	G	Y	R		FR	
BAY ROAD	NB	C,D	R	R	R	G	Y	R
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			NON-LOCK	OFF	
RECALL TO MINIMUM			OFF			OFF	OFF	

TEMPORARY SIGNAL PHASING - STAGE 1

GENERAL NOTES:

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



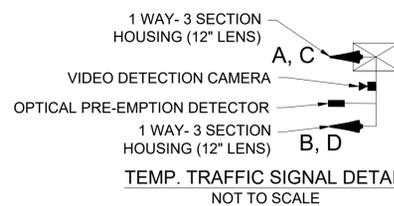
- NOTES:
1. ALL VEHICLE INDICATIONS TO BE EQUIPPED WITH TUNNEL VISORS.

EMERGENCY VEHICLE PRE-EMPTION OPERATION

- 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.
- IN THE EVENT OF MULTIPLE PRE-EMPTION CALLS, PRE-EMPTION CALLS SHALL BE SERVICED ON A FIRST CALL RECEIVED FIRST CALL SERVICED BASIS.
- 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.
- AT NO TIME DURING PRE-EMPTION OPERATION ARE THE CONTROLLER TIMES FOR MINIMUM GREEN, YELLOW CLEARANCE, AND RED CLEARANCE TO BE CHANGED
- THE STROBE BEACON IS TO BE ILLUMINATED WHENEVER ANY VEHICLE PRE-EMPTION GREEN IS ON.

CONSTRUCTION NOTES:

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



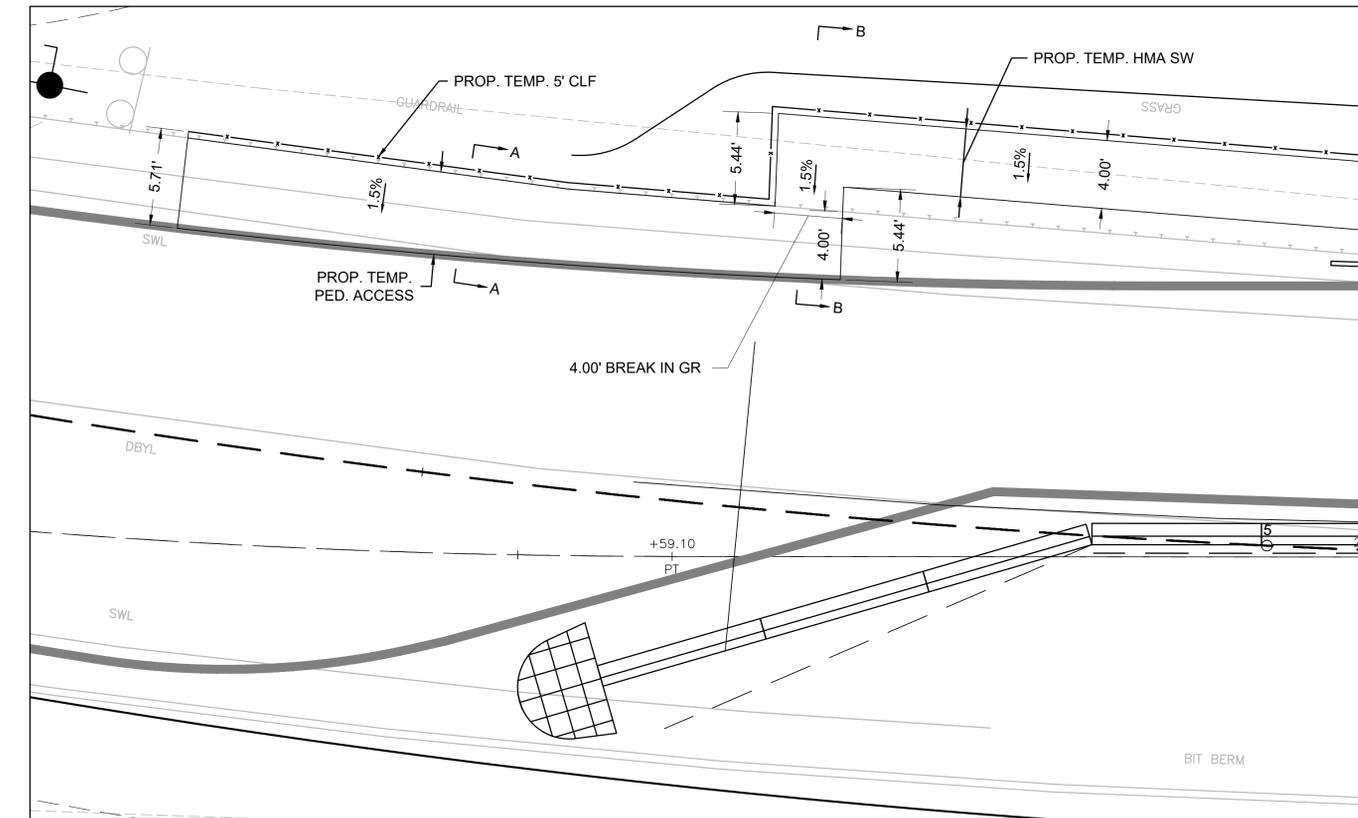
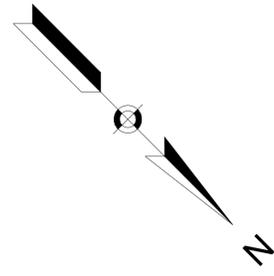
VIDEO DETECTION ZONE DATA

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

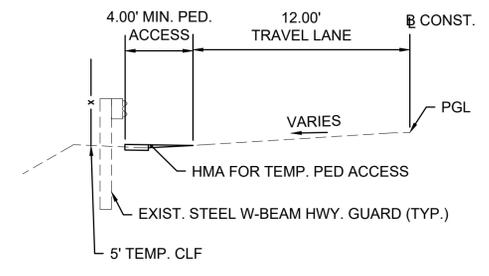
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

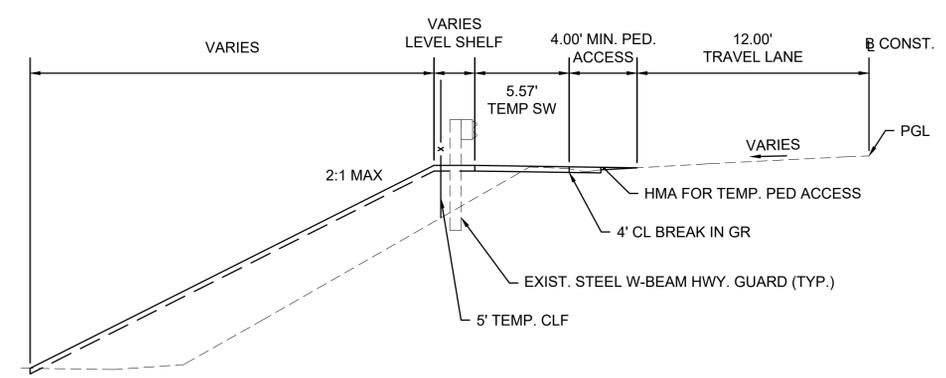
TEMPORARY TRAFFIC CONTROL PLANS
TEMPORARY SIDEWALK DETAIL



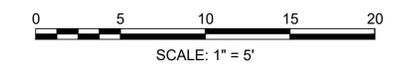
TEMPORARY SIDEWALK DETAIL
SCALE: 1" = 5'



SECTION AA
NOT TO SCALE



SECTION BB
NOT TO SCALE



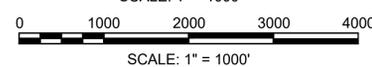
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

TEMPORARY TRAFFIC CONTROL PLANS
ADVANCED WARNING SIGN PLAN

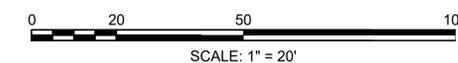


ADVANCED WARNING SIGN PLACEMENT
SCALE: 1" = 1000'



NOTE:

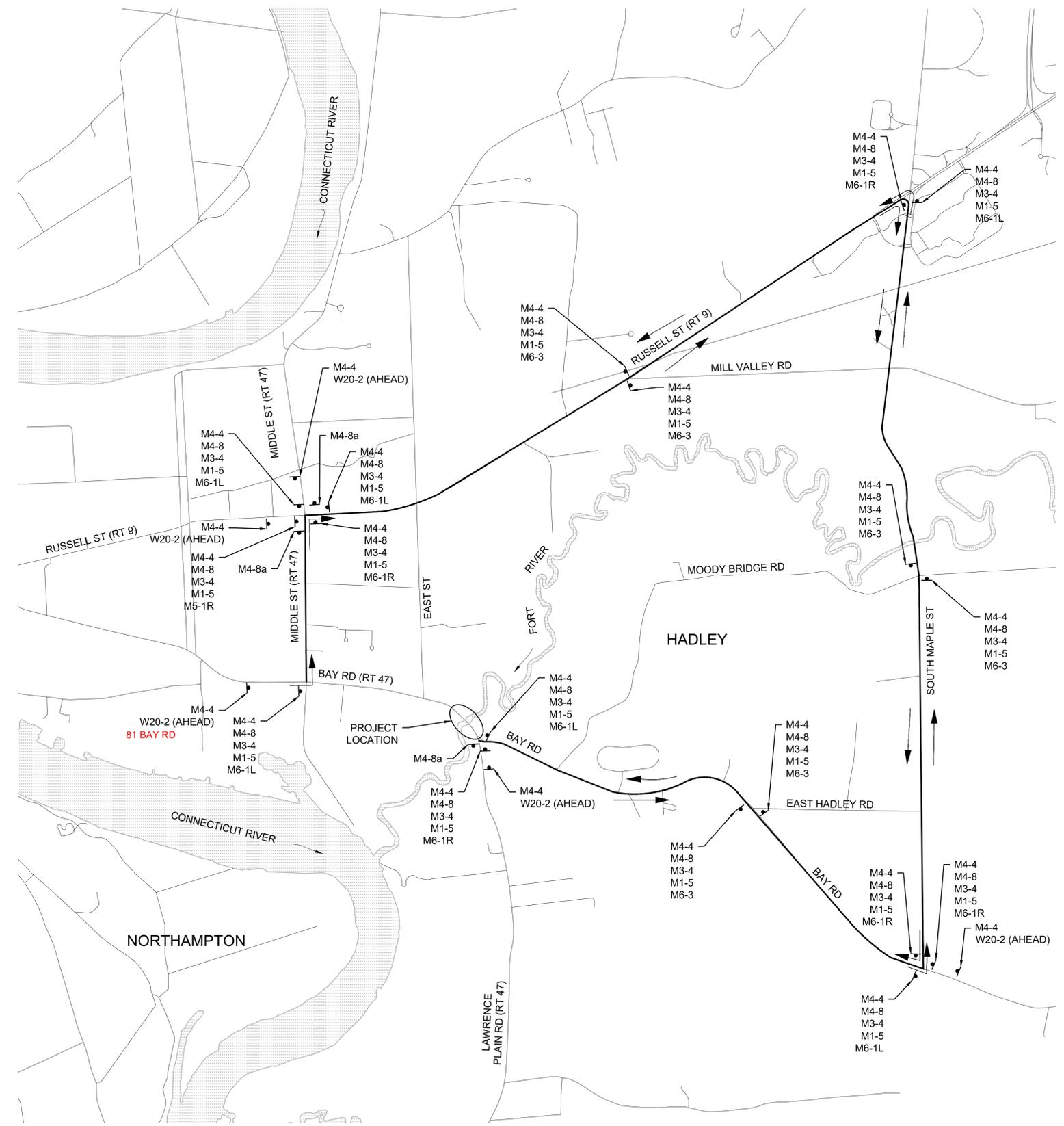
1. ALL ADVANCED WARNING SIGNS SHALL BE SPACED AS SHOWN IN TABLE 6C-1 ON SHEET [26].



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



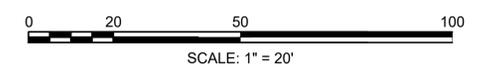
WIDE LOAD DETOUR NOTES:

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.

NORTHAMPTON

HADLEY

WIDE LOAD DETOUR
SCALE: 1" = 100'



DETOUR & CONSTRUCTION SIGN SUMMARY

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

MUTCD

BLACK H/I

BLACK H/I

ORANGE H/I

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER		
W20-2 (AHEAD)	36"	36"					5	ORANGE			9.00	45.00
W20-4	36"	36"					3	ORANGE			9.00	27.00
W21-5	36"	36"					1	ORANGE			9.00	9.00
MA-W20-7b	36"	36"					3	ORANGE	BLACK	BLACK	9.00	27.00
MA-R2-10a	48"	36"					4	FLUOR. ORANGE/WHITE			12.00	48.00
MA-R2-10e	36"	48"					3	FLUOR. ORANGE/WHITE			12.00	36.00
R10-6	24"	36"					2	WHITE			6.00	12.00
R10-7	24"	36"					1	WHITE			6.00	6.00

TOTAL AREA = 529.09 SF



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.

HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

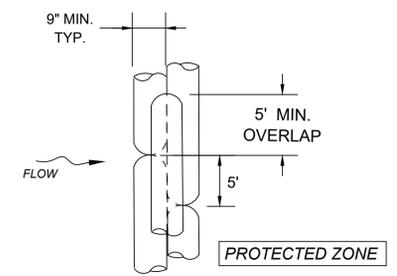
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	39	85

PROJECT FILE NO. 608460
CONSTRUCTION SIGN SUMMARY

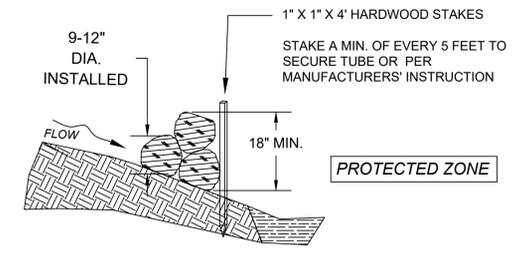
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	40	85
PROJECT FILE NO.		608460	

LANDSCAPING DETAILS

WHERE SPECIFIED ON CONSTRUCTION PLANS OR AS REQUIRED



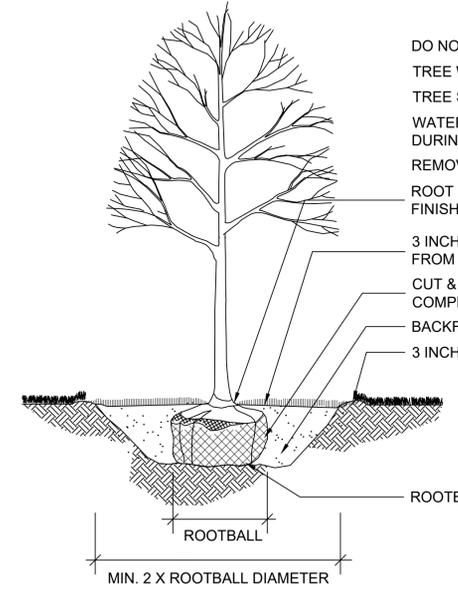
PLAN VIEW



SECTION

COMPOST FILTER TUBE STACKED

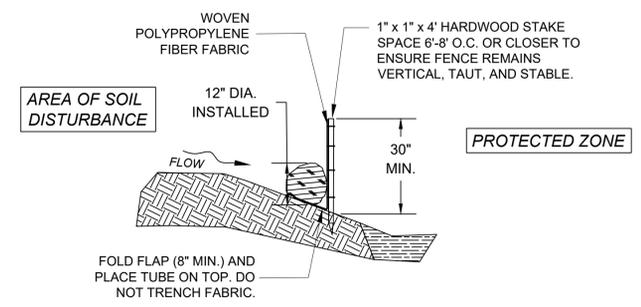
NOT TO SCALE



- DO NOT CUT LEADER
- TREE WRAP SHALL NOT BE USED
- TREE SHALL BE SET PLUMB
- WATERING SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING
- REMOVE EXCESS SOIL TO EXPOSE ROOT FLARE
- ROOT FLARE SHOULD BE SLIGHTLY ABOVE FINISHED GRADE AFTER SETTLING
- 3 INCHES AGED PINE BARK MULCH (PULL MULCH AWAY FROM TRUNK OF TREE)
- CUT & ROLL BACK 1/3 OF BURLAP BEFORE BACKFILLING. COMPLETELY REMOVE SYNTHETIC BURLAP & LACING
- BACKFILL MIX PER SPECIFICATIONS
- 3 INCH HIGH EARTH WATERING SAUCER AROUND TREE PIT
- CUT & REMOVE WIRE BASKET SIDES
- ROOTBALL SHALL BE PLACED ON EXISTING SUBSOIL

DECIDUOUS TREE PLANTING

NOT TO SCALE



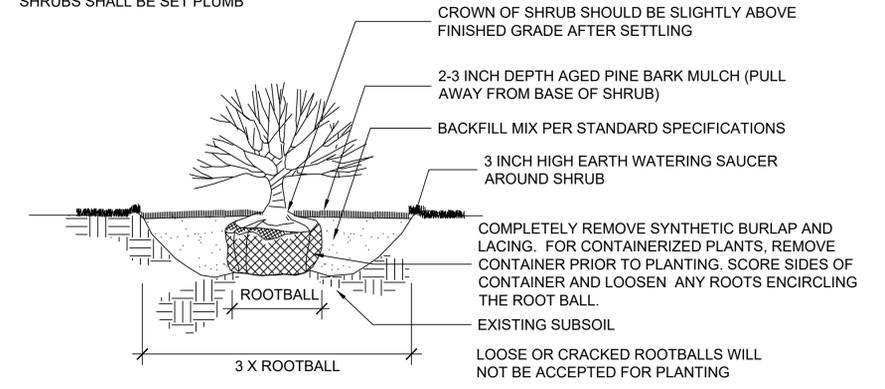
SECTION

COMPOST FILTER TUBE & SILT FENCE

NOT TO SCALE

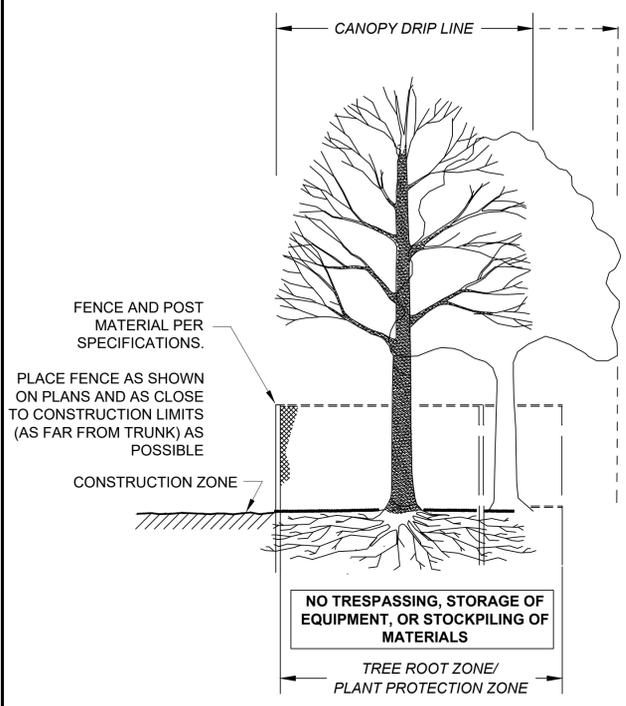
- EXCAVATE TO REQUIRED DEPTH AND BACKFILL WITH PLANTING MIX
- SHRUBS SHALL BE SET PLUMB

WATER BY FLOODING TWICE IN FIRST TWO HOURS AFTER PLANTING. WATER & MAINTAIN AS PER STANDARD SPECIFICATIONS

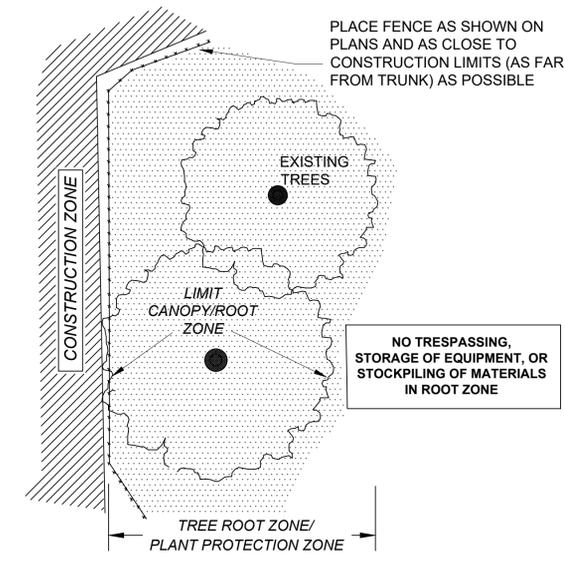


SHRUB PLANTING

NOT TO SCALE



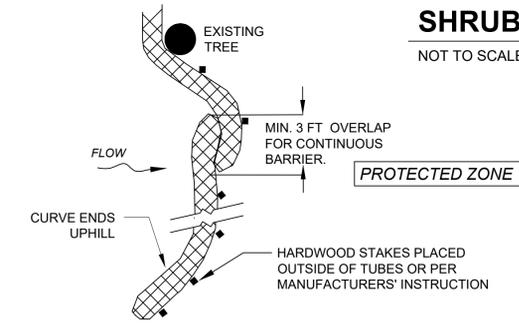
SECTION - FENCE PROTECTION OF ROOT ZONE



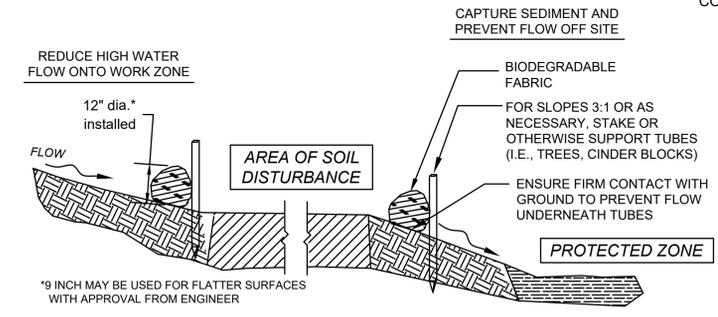
PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION - ROOT ZONE

NOT TO SCALE



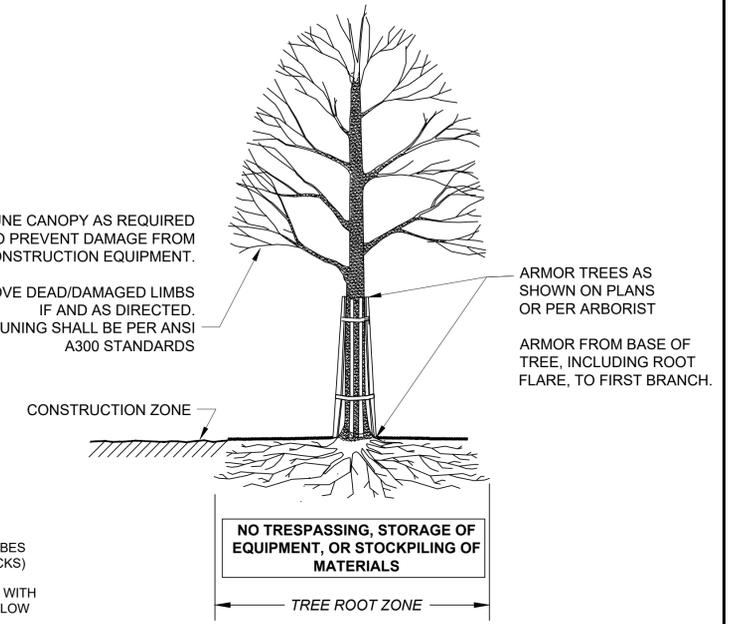
PLAN VIEW



SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE

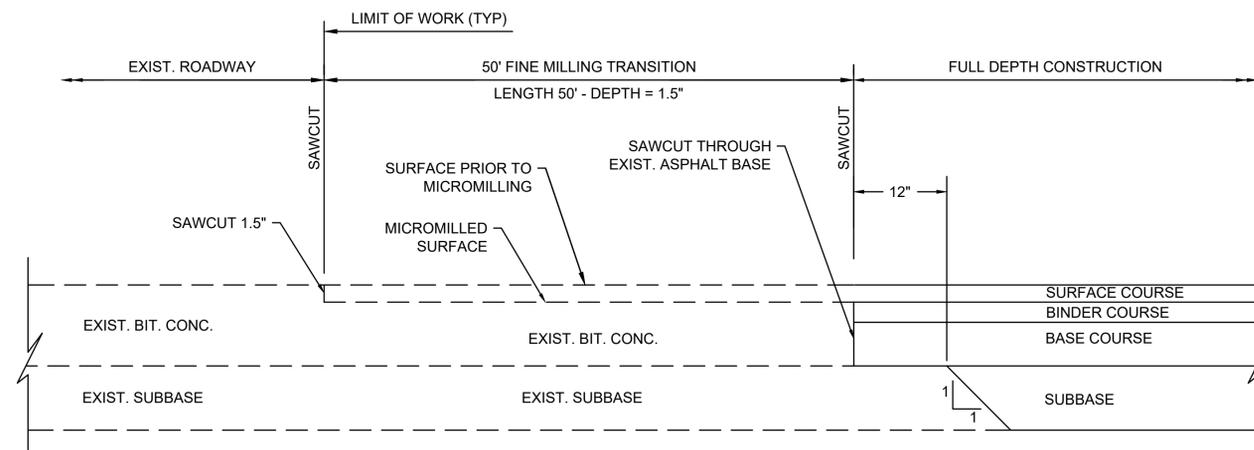


SECTION - TRUNK ARMORING & PRUNING

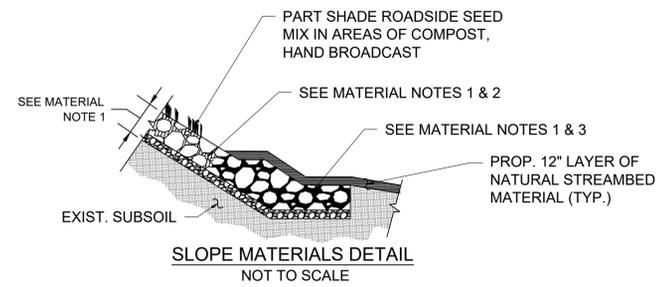
TREE PROTECTION - TRUNK

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

MISCELLANEOUS DETAILS



PAVEMENT TRANSITION DETAIL
NOT TO SCALE



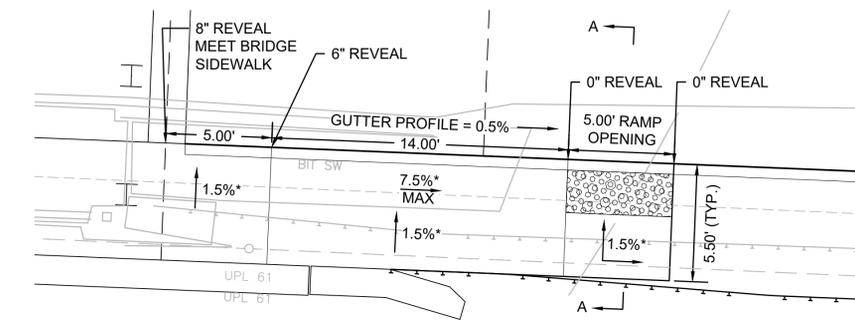
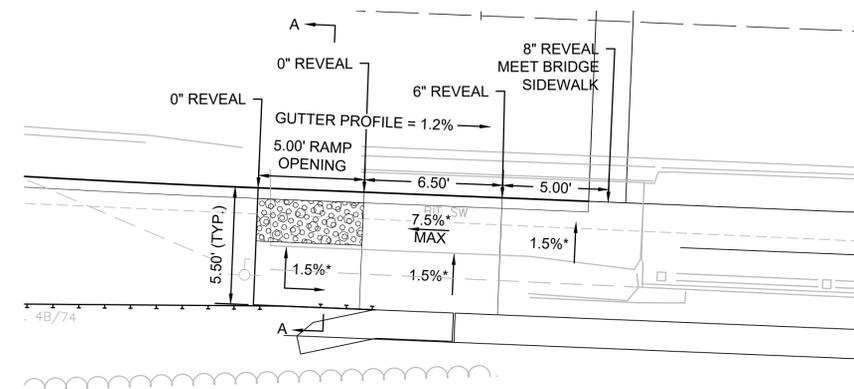
SLOPE MATERIALS DETAIL
NOT TO SCALE

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.

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

MISCELLANEOUS DETAILS

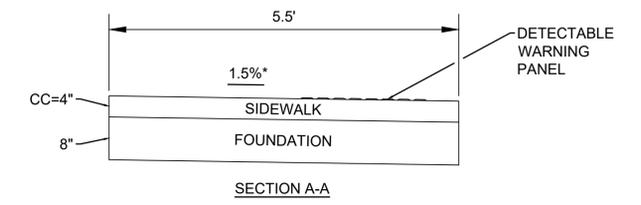
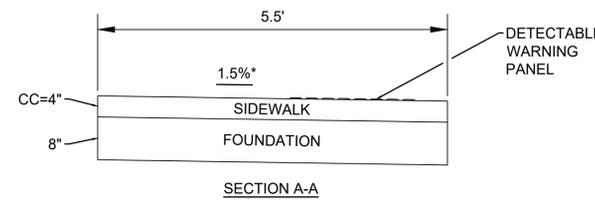


WHEELCHAIR RAMP 1
SCALE: 1" = 4'

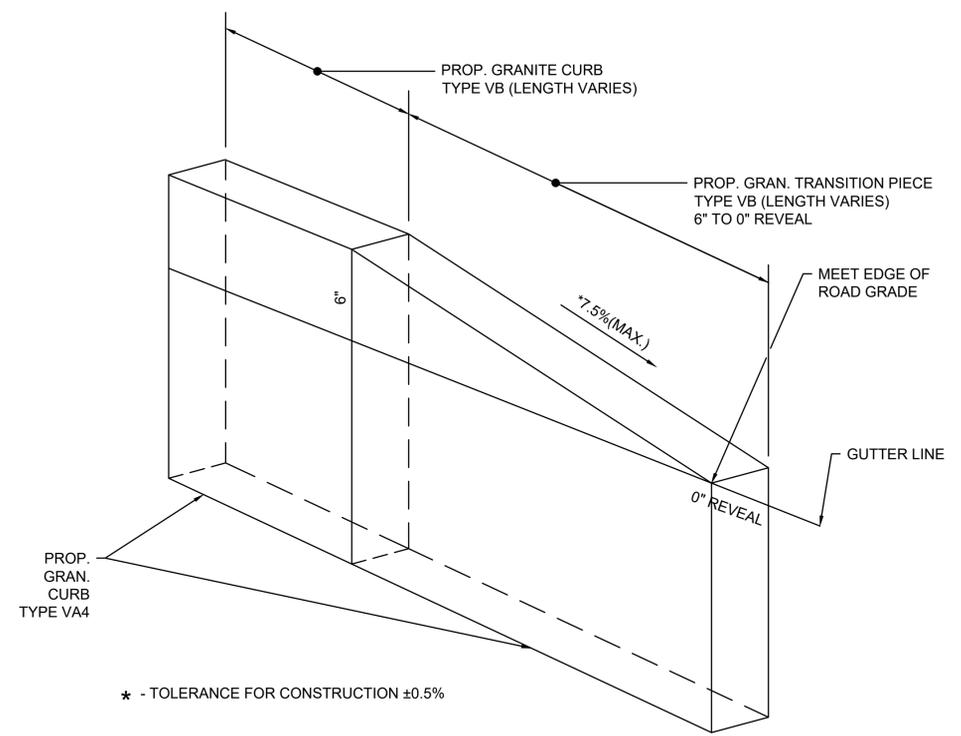
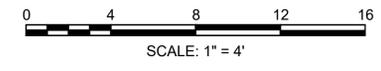
WCR REFERENCE POINT: STA 5+37.08 - OFFSET 17.00' RT
WIDTH OF CURB = 0.5'
* CONSTRUCTION TOLERANCE +/- 0.5%

WHEELCHAIR RAMP 2
SCALE: 1" = 4'

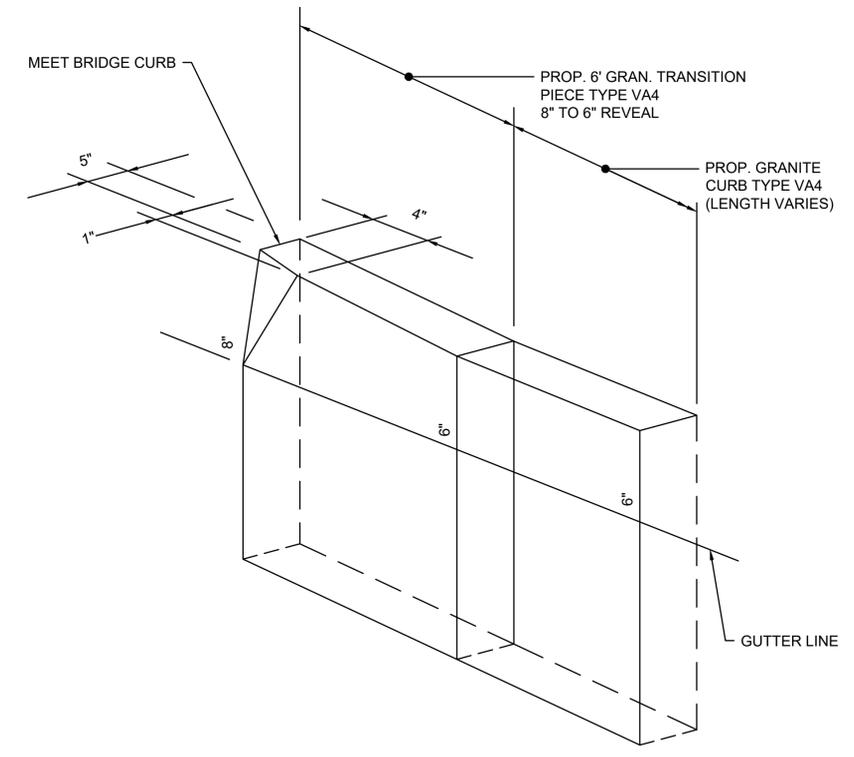
WCR REFERENCE POINT: STA 7+02.11 - OFFSET 17.00' RT
WIDTH OF CURB = 0.5'
* CONSTRUCTION TOLERANCE +/- 0.5%



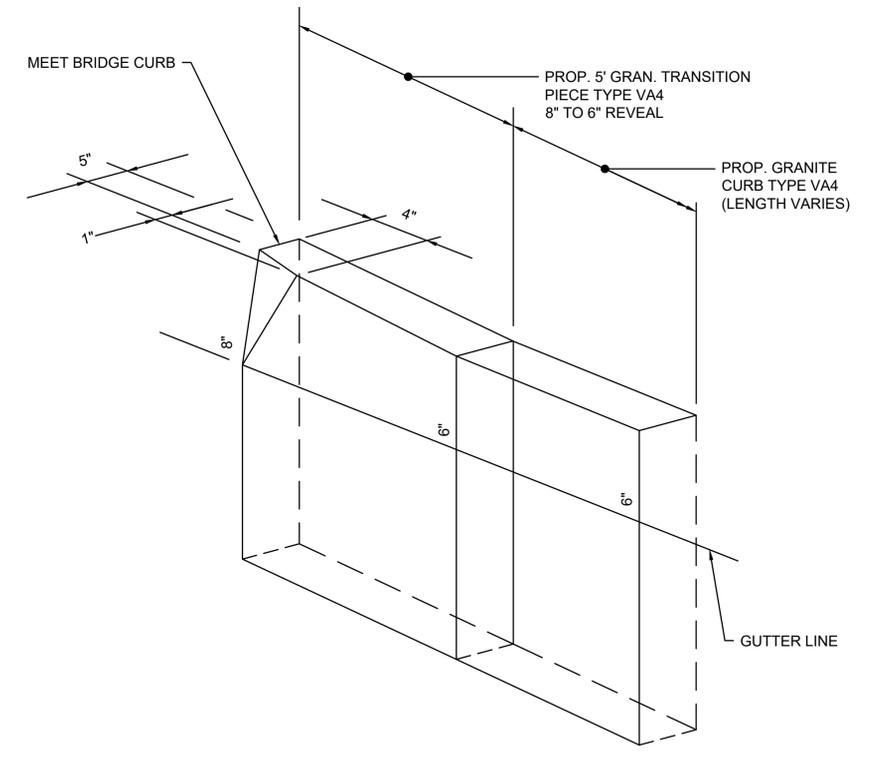
- NOTE:
1. THE PERPENDICULAR DIMENSIONS TO THE CURB ALONG THE SIDEWALK INCLUDE 0.5' FOR THE WIDTH OF THE CURB.
 2. WHEELCHAIR RAMP REFERENCE POINTS ARE TAKEN FROM THE BAY ROAD BASELINE TO THE GUTTER LINE AT THE CENTER OF RAMP OPENING.
 3. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL THE PROPOSED WHEELCHAIR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



GRANITE CURB TRANSITION (6" TO 0" REVEAL)
NOT TO SCALE

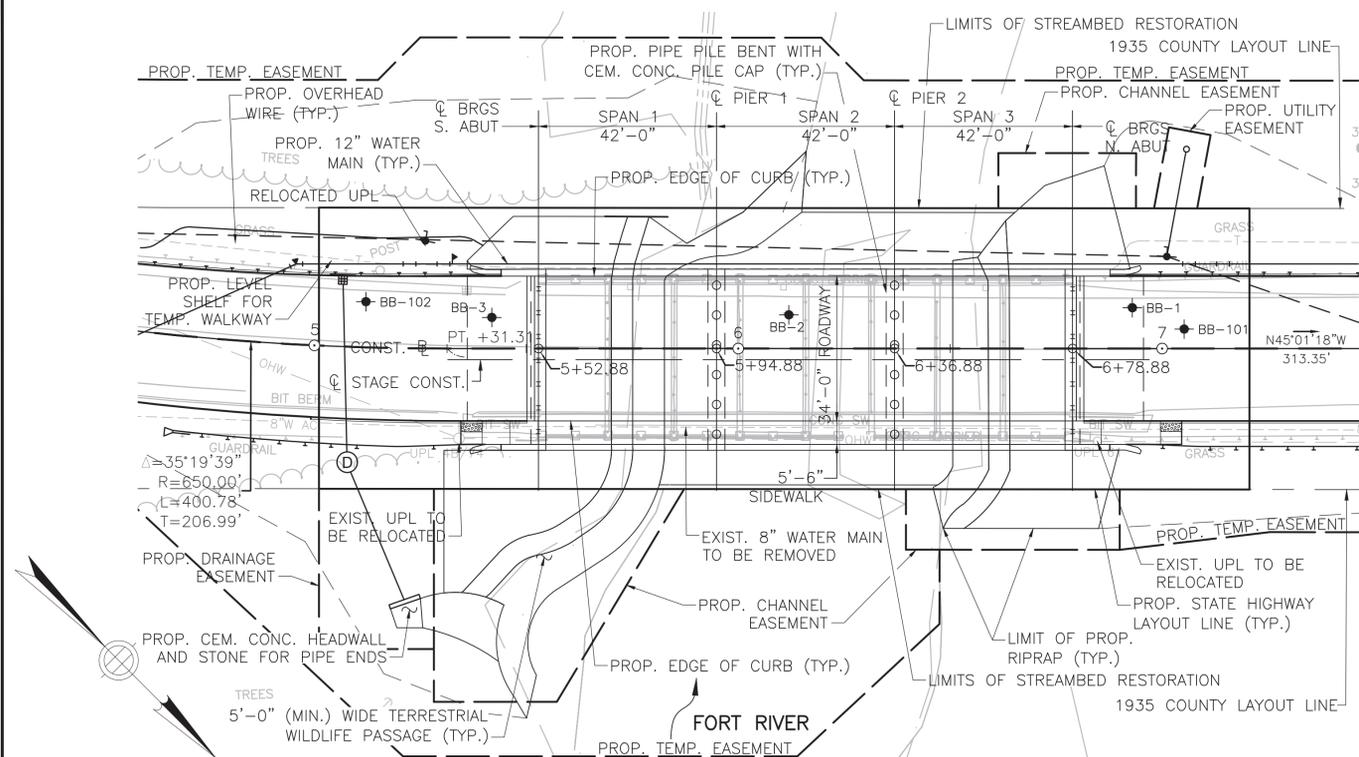


6" GRANITE CURB TRANSITION (8" TO 6" REVEAL)
NOT TO SCALE

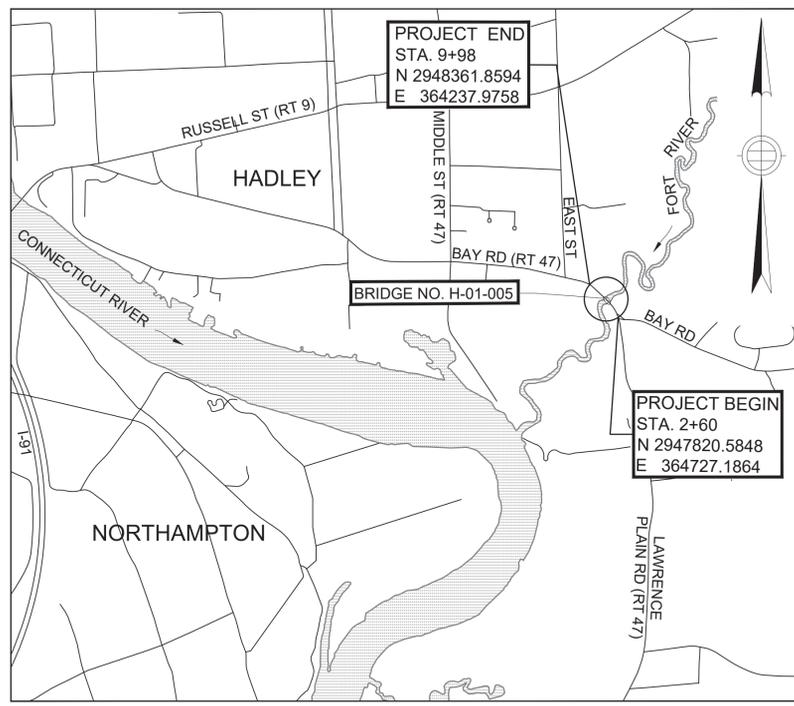


5" GRANITE CURB TRANSITION (8" TO 6" REVEAL)
NOT TO SCALE

* - TOLERANCE FOR CONSTRUCTION ±0.5%



KEY PLAN
SCALE: 1"=20'



LOCUS MAP
SCALE: 1"=1500'

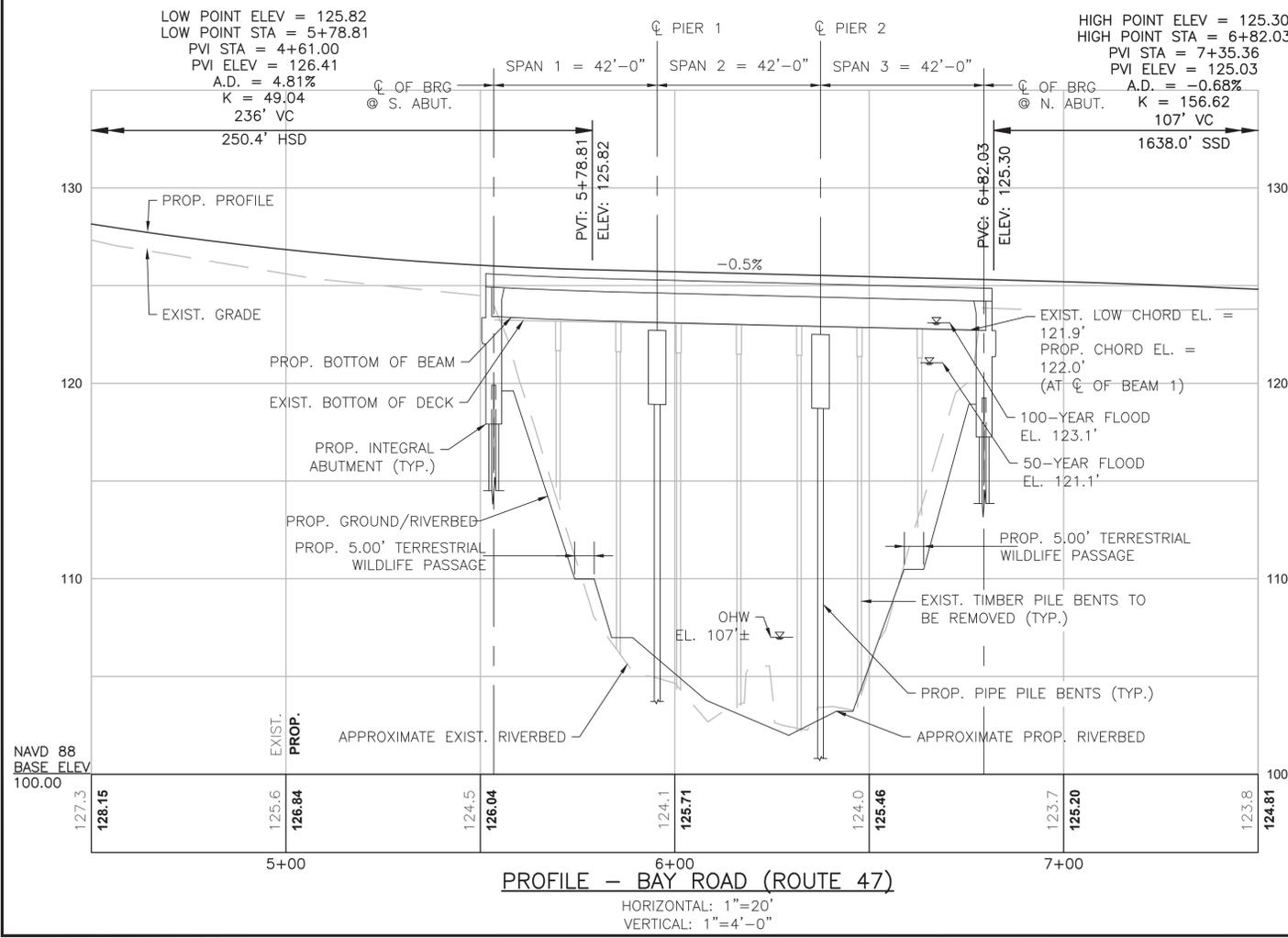
**HADLEY
BAY RD (ROUTE 47)**

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

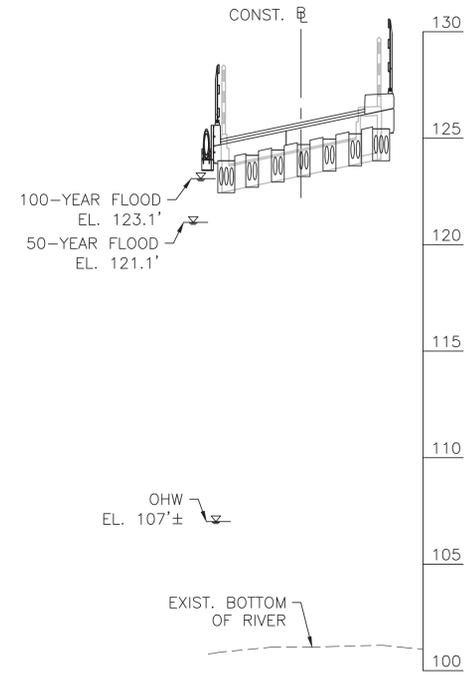
PROJECT FILE NO. 608460
KEY PLAN, PROFILE & INDEX

INDEX OF DRAWINGS

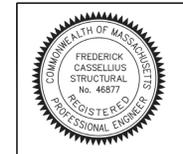
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PROFILE - BAY ROAD (ROUTE 47)
HORIZONTAL: 1"=20'
VERTICAL: 1"=4'-0"



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



Frederick Casseilus
50 REDFIELD STREET
BOSTON, MA 02122

APRIL 26, 2025 ISSUED FOR CONSTRUCTION

massDOT
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. STATE BRIDGE ENGINEER
Carrie Lavallee, P.E. CHIEF ENGINEER

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-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, MASSACHUSETTS.

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: $A_s = 0.094$
 $S_{ps} = 0.209$
 $S_{p1} = 0.093$

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: 11.9 FEET
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
EVIDENCE OF SCOUR: DATABASE.
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

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	

BB-1

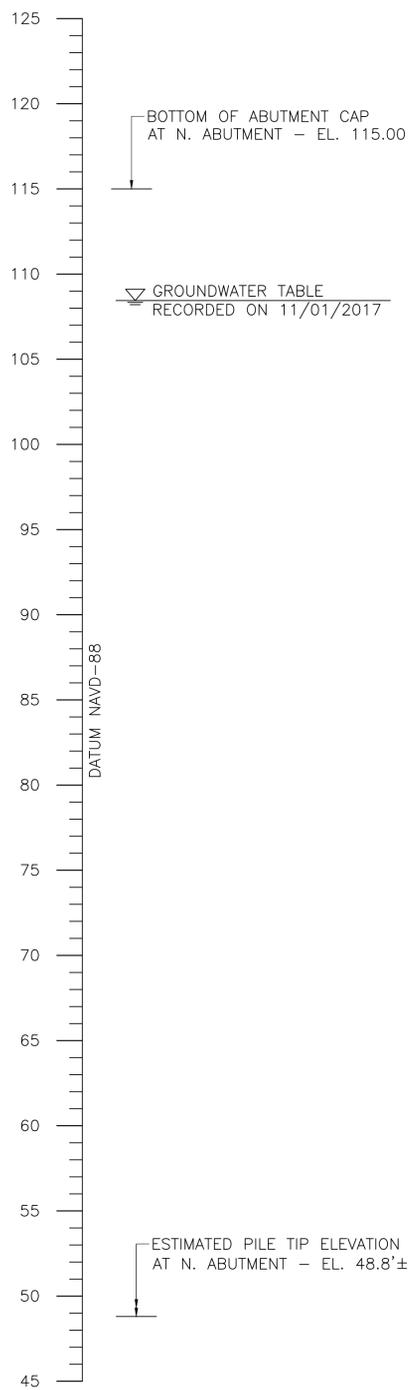
TEST BORING LOG																	
GZA GeoEnvironmental, Inc. Engineers and Scientists		MassDOT/Benesch Bay Road (Route 47) over Fort River Hadley, Massachusetts			BORING NO.: BB-1 SHEET: 1 of 2 PROJECT NO.: 01.0173284.00 REVIEWED BY: STS												
Drilling Co.: Seaboard Drilling Foreman: Jeff Nitsch 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		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									
Depth (ft)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remarks	Field Test Data	Stratum Description	Elev. (ft.)	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		
								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	
								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.			
								S-7	14-16	24	9	3 1 1 3	2	S-7: Very loose, gray/brown, fine to medium SAND and SILT.			
								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.		16'	109.0'
																16'	107.0'
																22.5'	102.6'
								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.			
								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.		26'	97.0'
																29'	96.0'
								S-11	34-36	24	9	9 9 9 11	18	S-11: Medium dense, gray/red, fine to medium SAND, trace Silt.			
								S-12	39-41	24	6	10 8 8 5	16	S-12: Medium dense, light brown/gray, fine to medium SAND, some Silt, trace fine Gravel.		36'	87.0'
																39'	86.0'
S-13	44-46	24	6	6 10 13 12	23	S-13: Medium dense, gray, fine to coarse SAND and GRAVEL, trace Silt.											
S-14	49-51	24	10	13 11 14 16	25	S-14: Medium dense, gray, fine to coarse SAND, little Silt.											
S-15	54-56	24	10	30 21 19 25	40	S-15: Dense, gray, fine to coarse SAND and GRAVEL, little Silt.											
S-16	59-61	24	9	21 21 20 23	41	S-16: Dense, gray, fine to coarse SAND, some fine Gravel, little Silt.											
S-17	64-66	24	9	24 21 29 20	50	S-17: Very dense, gray, fine to coarse SAND and GRAVEL, trace Silt.		55'	72.0'								
Bottom of boring at 66 feet.																	

REMARKS

- 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.
- Boring offsets: 5.5 feet northeast and 14 feet north of the northeast bridge guard rail inside edge.
- Rig bouncing/chattering at 18 to 22.5 ft bgs during borehole washout indicating probable gravel layer.
- Rig bouncing/grinding at 28 to 29 ft bgs during borehole washout indicating a probable gravel layer.
- Rig bouncing/grinding at 38 to 39 ft bgs during borehole washout indicating a probable gravel layer.
- Two inches of silt and sand in spoon top of sample S-14.
- Rig bouncing/grinding at 53 ft bgs during borehole washout indicating probable gravel layer.
- 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



BORING DATA
SCALE: 1" = 5'-0"

BB-2

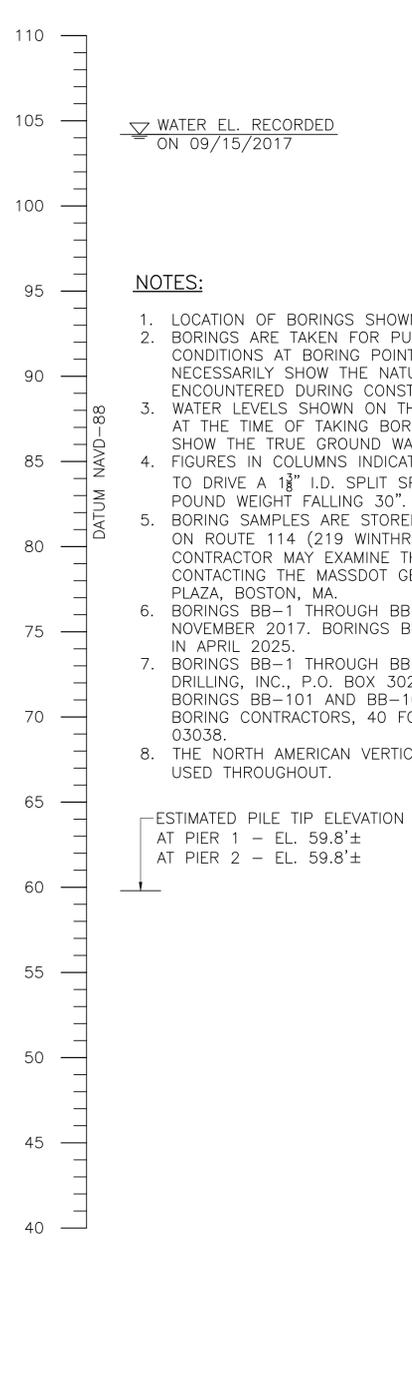
TEST BORING LOG																	
GZA GeoEnvironmental, Inc. Engineers and Scientists		MassDOT/Benesch Bay Road (Route 47) over Fort River Hadley, Massachusetts			BORING NO.: BB-2 SHEET: 1 of 2 PROJECT NO.: 01.0173284.00 REVIEWED BY: STS												
Drilling Co.: Seaboard Drilling Foreman: Doug Feeley 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		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									
Depth (ft)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remarks	Field Test Data	Stratum Description	Elev. (ft.)	PAVEMENT		124.3							
								S-1	0-2	24	8	6 1 2	2	S-1: Very loose, brown, fine to coarse SAND, some fine Gravel, little Silt.	1		
								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.	2		
								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.	3		
								S-4	14-16	24	4	3 3 4 4	7	S-4: Loose, brown, fine to coarse SAND, little Silt, trace fine Gravel.	4		
								S-5	19-21	24	10	3 6 7 9	13	S-5: Medium dense, reddish brown, fine to medium SAND, little Silt.	5		
								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.	6		
								S-7	29-31	24	10	7 7 16 20	23	S-7: Medium dense, gray, fine SAND and SILT.	7		
								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.	8		
								S-9	39-41	24	7	10 16 13 17	29	S-9: Medium dense, gray, fine to coarse SAND and GRAVEL, little Silt.	9		
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.	10										
Bottom of boring at 46 feet.																	

REMARKS

- 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.
- 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.
- Boring offsets: 70.5 feet north and 7 feet east of the south west bridge guard rail inside edge.
- Rig bouncing from 7 to 9 feet below mudline indicating probable gravel layer.
- 3-inch thick silt layer interbedded in S-6 between approximately 25.5 and 25.75 feet below mudline.
- Rig bouncing/grinding at 33 feet below mudline. Fine sand and silt in wash water from 25 to 33 feet below mudline.
- Boring drilled through the bridge deck, water in casing was approximately at the river level at the end of drilling.
- 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:

- LOCATION OF BORINGS SHOWN ON THE PLANS THUS: BB-1
- 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.
- 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.
- FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 1/8" I.D. SPLIT SPOON SAMPLER 6" WITH A 140 POUND WEIGHT FALLING 30".
- 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.
- BORINGS BB-1 THROUGH BB-3 WERE MADE IN OCTOBER AND NOVEMBER 2017. BORINGS BB-101 AND BB-102 WERE MADE IN APRIL 2025.
- 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.
- THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

ESTIMATED PILE TIP ELEVATION
AT PIER 1 - EL. 59.8±
AT PIER 2 - EL. 59.8±

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_BRR-0N (H-01-005)_BORINGS.DWG 14-MARCH 2024 Printed on 21-Jul-2025 12:04 PM

BB-3

TEST BORING LOG										
			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: NAVD 88 V. Datum: NAVD 88				
Auger/Casing Type: HW I.D.O.D. (in): 4.254.5 Hammer Weight (lb.): 300 Hammer Fall (in.): 30		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 Core (ft)	Sample			Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Field Test Data	Stratum Description	Elev. (ft.)
		No.	Depth (ft)	Pen. (in)						
		S-1	1-3	24	3	37 77	R		1	ASPHALT AND BASE
		S-2	3-5	24	4	38 30			2	
5		S-2	3-5	24	4	22 20				
		S-3	7-9	24	0	3 3			3	
		S-4	9-11	24	6	3 2				FILL
10		S-5	11-13	24	6	3 4				
		S-6	13-15	24	8	4 4				
		S-7	15-17	24	8	5 8				
15		S-8	17-19	24	6	12 11				
		S-9	24-26	24	2	19 15				
		S-10	28-30	24	8	37 10				
20		S-11	33-35	24	2	5 4				
		S-12	38-40	24	11	14 11				
		S-13	43-45	24	13	21 25				
25		S-14	48-50	24	10	51 24				
		S-15	53-55	24	3	39 19				
		S-16	58-60	24	7	32 30				
30										
35										
40										
45										
50										
55										
60										
65										

REMARKS

- 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.
- Soring offsets: 7.9 feet east and 10.5 feet southeast of the south west bridge guardrail inside edge.
- 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.
- Bottom two inches of S-7 was sand and gravel.
- Rig bouncing/grinding during wash from 20 to 24 ft bgs indicating a probable gravel layer.
- Rig bouncing/grinding during wash from 24 to 28 ft bgs indicating a probable gravel layer.
- Rig bouncing/grinding during wash from 47 to 48 ft bgs indicating a probable gravel layer.
- Driller stopped on 10/30/17 at 50 ft bgs. Casing driving flush with ground surface. Drilling resumed on 10/31/17.
- 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

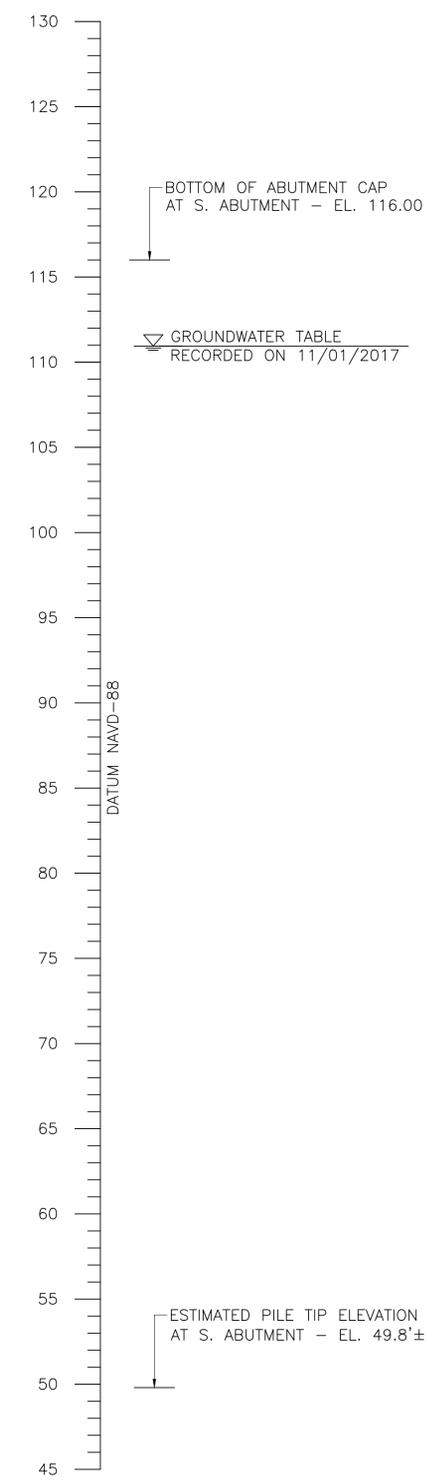
BORING DATA
 SCALE: 1" = 5'-0"

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-ON)-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_BROG-04 (H-01-005)_BORINGS.DWG 14-MARCH-2024 Printed on 21-Jul-2025 12:04 PM

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

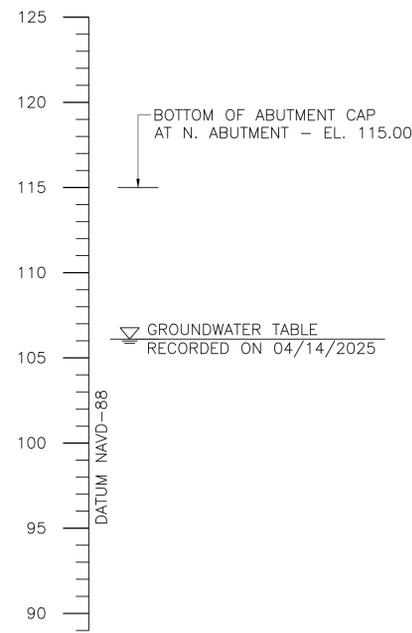
NOTES:

1. FOR BORING NOTES, SEE SHEET 3.

BORING DATA III

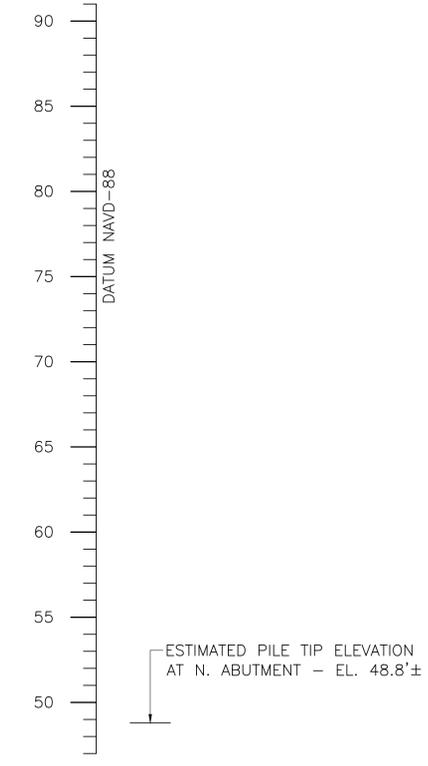
BB-101

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			H. Datum: NAD 83 V. Datum: NAVD 88 Northing: 2948166 Easting: 364454			
Drilling Co.: New England Boring Contractors Foreman: Mihn Pham Logged By: Josh Hyslop		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		Sampler Type: Split Spoon ID/O.D. (in.): 1.375/2 Sampler Hmr Wt (lb.): 140 Sampler Hmr Fall (in.): 30 Other: Automatic Hammer		Groundwater Depth (ft.)			
Auger/Casing Type: HW & PW ID/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 ID/O.D. (in.): 1.375/2 Sampler Hmr Wt (lb.): 140 Sampler Hmr Fall (in.): 30 Other: Automatic Hammer		Date		Time		Water Depth		Casing	
Depth (ft.)		Blows Core Rate		No.		Depth (ft.)		Pen. (in.)		Rec. (in.)	
42										SEE NOTE 2	
41										SEE NOTE 3	
20										FILL	
31										16' - - - - - 109.0'	
48										SAND AND GRAVEL	
54											
52											
50											
49											
33											
31											
35											
44											
48											
59											
31											
33											
40											
68											
98											
87											
95											
106											
98											
84											
40											
44											
57											
69											
48											
60											
74											
74											
35											



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			H. Datum: NAD 83 V. Datum: NAVD 88 Northing: 2948166 Easting: 364454			
Drilling Co.: New England Boring Contractors Foreman: Mihn Pham Logged By: Josh Hyslop		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		Sampler Type: Split Spoon ID/O.D. (in.): 1.375/2 Sampler Hmr Wt (lb.): 140 Sampler Hmr Fall (in.): 30 Other: Automatic Hammer		Groundwater Depth (ft.)			
Auger/Casing Type: HW & PW ID/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 ID/O.D. (in.): 1.375/2 Sampler Hmr Wt (lb.): 140 Sampler Hmr Fall (in.): 30 Other: Automatic Hammer		Date		Time		Water Depth		Casing	
Depth (ft.)		Blows Core Rate		No.		Depth (ft.)		Pen. (in.)		Rec. (in.)	
53											
69											
84											
90											
40											
132											
90											
125											
148											
150											
170											
45											
77											
69											
65											
69											
50		S-1		49-51		24		11		7 13 15 19	
65											
82											
55		S-2		54-56		24		13		23 27 28 27	
93											
60											
48											
61											
82		S-4		64-66		24		10		15 19 16 17	
76											
70											
75											
85											
70		S-5		69-71		24		7		20 20 24 26	
91											
75											
97											
85											



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_BRR05-04 (H-01-005)_BORINGS.DWG 14-MARCH-2024

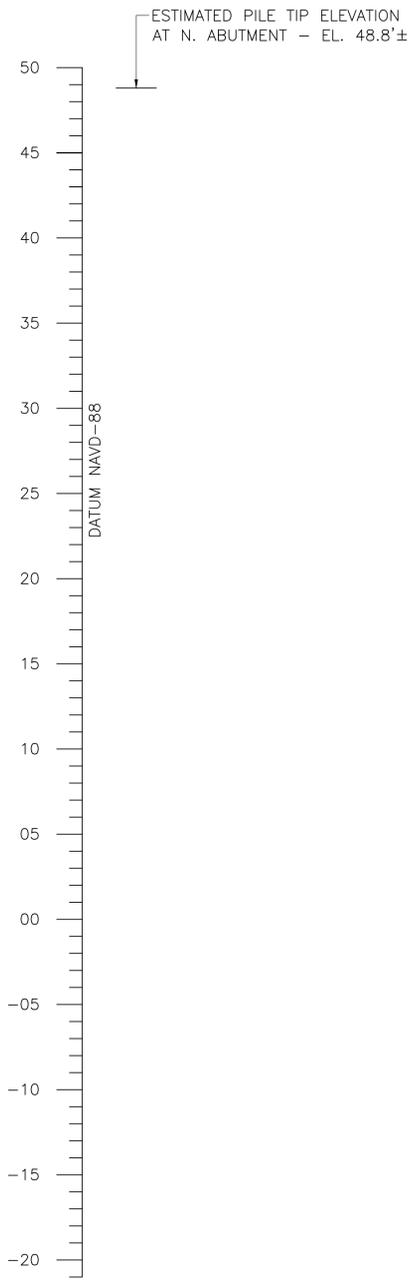
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	48	85
PROJECT FILE NO.		608460	

BORING DATA IV

BB-101 (CONT'D)

Casing		Sample				Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remarks	Field Test Data	Stratum Description	Equipment Installed
Depth (ft)	Core Rate (ft)	No.	Depth (ft)	Pen. (in)	Rec. (in)							
80	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		
85	39	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.		POSSIBLE BOULDER		
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		
100	72	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.				
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.		DENSE TO VERY DENSE SAND AND GRAVEL		
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.		DENSE TO VERY DENSE SAND AND GRAVEL		
130	4:05	S-13	129- 129.2	2	2	50/2"	R	S-13: Very dense, red to gray, fine to coarse SAND and Gravel, little Silt. (Severely Weathered Bedrock)		WEATHERED BEDROCK		
135	2:42	C-2	134.5- 139.5	60	37			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%, RQD=8% 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		
140	3:13							Bottom of boring at 139.5 feet.				



NOTES:
1. FOR BORING NOTES, SEE SHEET 3.

REMARKS:
13. Used water-core bit to advance the borehole through an approximately 2-foot boulder at approximately 82 feet bgs. The borehole was washed again after driving casing to each sample depth and prior to performing SPT.
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"

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_BRR03-04 (H-01-005)_BORINGS.DWG 14-MARCH-2024 Printed on 21-Jul-2025 12:05 PM

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

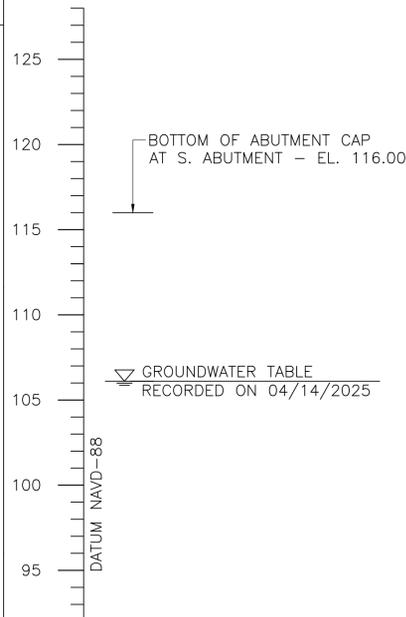
BORING DATA V

NOTES:

- FOR BORING NOTES, SEE SHEET 3.

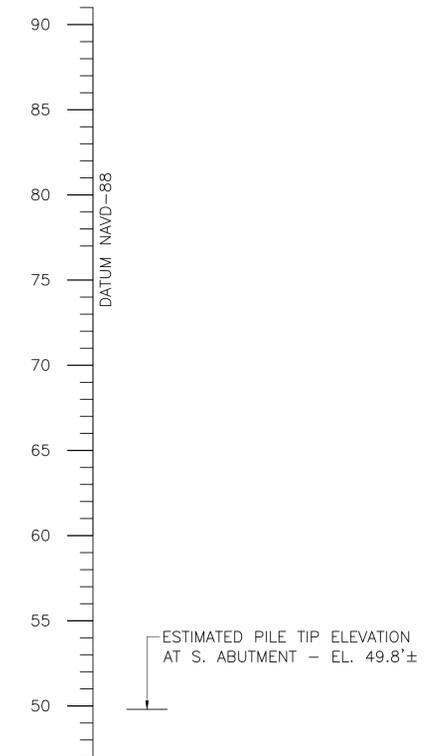
BB-102

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	
Drilling Co.: New England Boring Contractors Foreman: Mihn Pham Logged By: Josh Hyslip		Boring Location: South Abutment Ground Surface Elev. (ft.): 127 Final Boring Depth (ft.): 136 Date Start - Finish: 4/10/2025 - 4/16/2025	
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	
H. Datum: NAD 83 V. Datum: NAVD 88 Northing: 2948025 Easting: 364586			
Groundwater Depth (ft.)			
Date	Time	Water Depth	Casing Stab. Time
SEE NOTE 6			
Depth (ft)	Casing No.	Sample No.	Blows (per 6 in.)
105			
37			
25			
38			
45			
48			
39			
49			
25			
58			
45			
44			
56			
13			
18			
29			
26			
42			
47			
42			
34			
45			
53			
35			
41			
42			
37			
34			
47			
40			
44			
51			
45			
REMARKS: 1. Ground surface elevation and coordinates estimated from an AutoCAD file entitled "608460_BR1-2(HI1005)", 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 48 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 9:22am. 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	
Drilling Co.: New England Boring Contractors Foreman: Mihn Pham Logged By: Josh Hyslip		Boring Location: South Abutment Ground Surface Elev. (ft.): 127 Final Boring Depth (ft.): 136 Date Start - Finish: 4/10/2025 - 4/16/2025	
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	
H. Datum: NAD 83 V. Datum: NAVD 88 Northing: 2948025 Easting: 364586			
Groundwater Depth (ft.)			
Date	Time	Water Depth	Casing Stab. Time
SEE NOTE 6			
Depth (ft)	Casing No.	Sample No.	Blows (per 6 in.)
51			
61			
69			
86			
37			
36			
39			
60			
87			
33			
28			
33			
47			
78			
26	S-1	49-51	24 13 21 23 23 25 46
16			
20			
40			
67			
55	S-2	54-56	24 8 12 17 27 36 44
49			
55			
77	S-3	59-61	24 5 14 42 59 72 R
42			
98			
121			
125			
65	S-4	64-66	24 0 6 6 5 8 11
55			
70	S-5	69-71	24 12 8 14 17 23 31
75	S-6	74-76	24 11 7 15 18 25 33
REMARKS: 8. Used polymer drilling slurry to advance the borehole before driving casing to sample depths from approximately 30 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_BROG-04 (H-01-005)_BORINGS.DWG 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	50	85
PROJECT FILE NO.		608460	

BORING DATA VI

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 Blow Rate	Sample No.	Sample		Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remarks	Field Test Data	Stratum Description	Equipment Installed
			Depth (ft.)	Pen. (in)							
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										
100	70	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	65										
110	52	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	45										
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	
125											
130	min:sec /ft	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%		WEATHERED BEDROCK	
135		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	
140								Bottom of boring at 136 feet.			
145											

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



NOTES:
1. FOR BORING NOTES, SEE SHEET 3.

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

BORING DATA

SCALE: 1" = 5'-0"

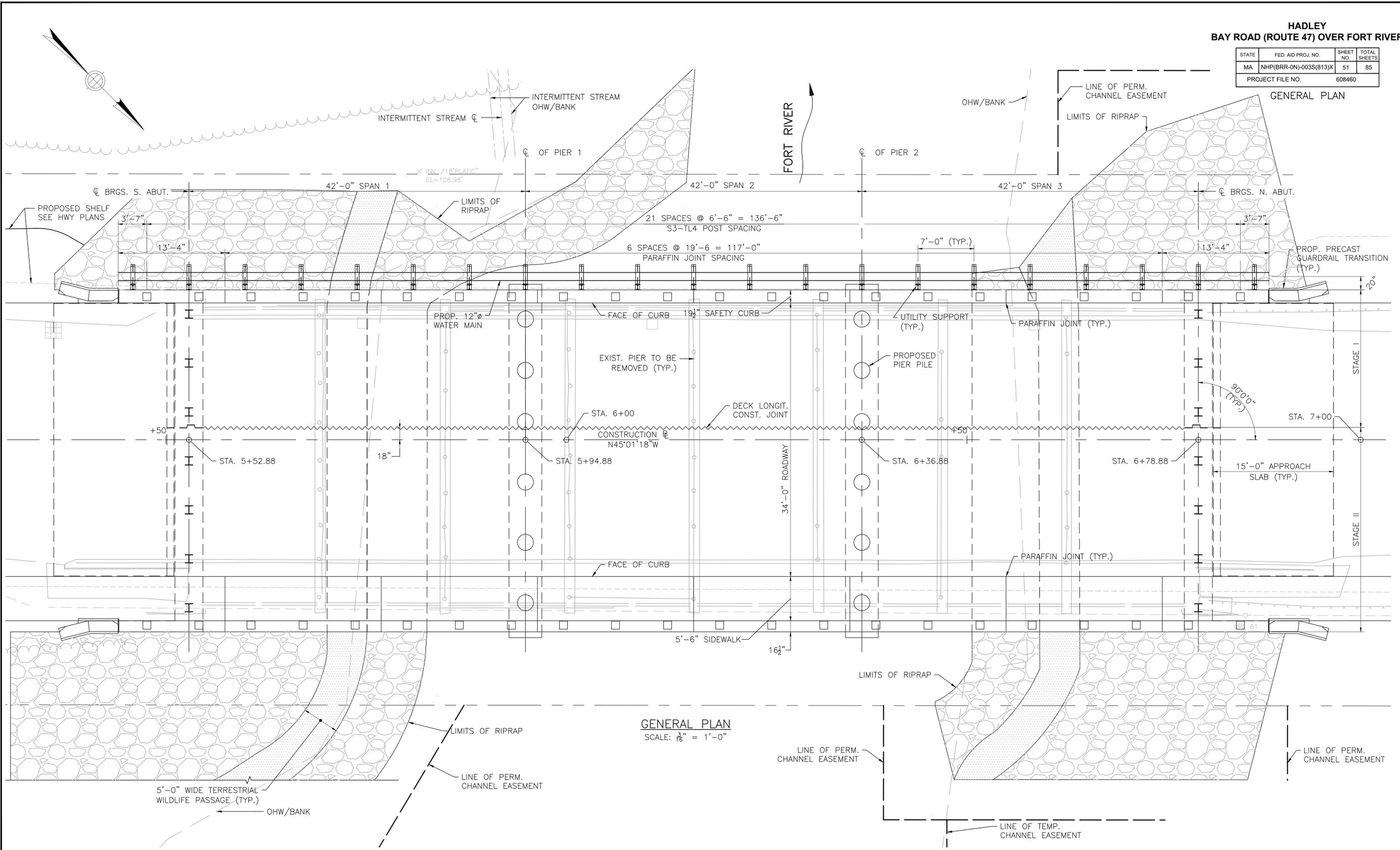
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_BORING-04 (H-01-005)_BORINGS.DWG Printed 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-ON)-003S(813)X	51	85
PROJECT FILE NO.		608460	

GENERAL PLAN



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

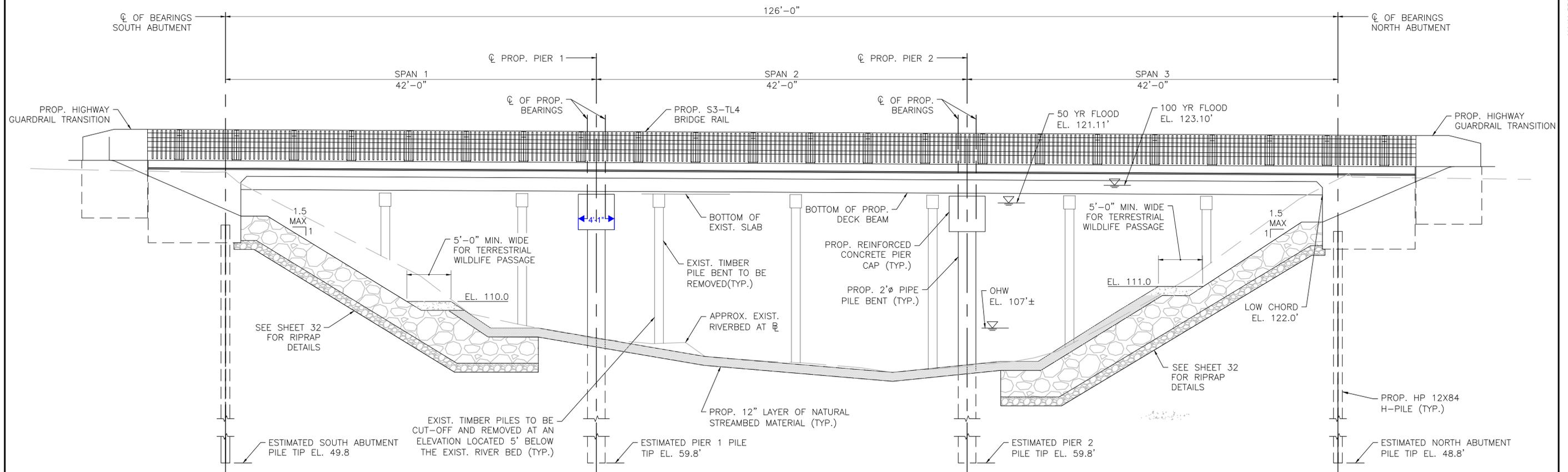
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_BRR05 (H-01-005)_GENERAL PLAN.DWG 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	52	85
PROJECT FILE NO.		608460	

GENERAL ELEVATION



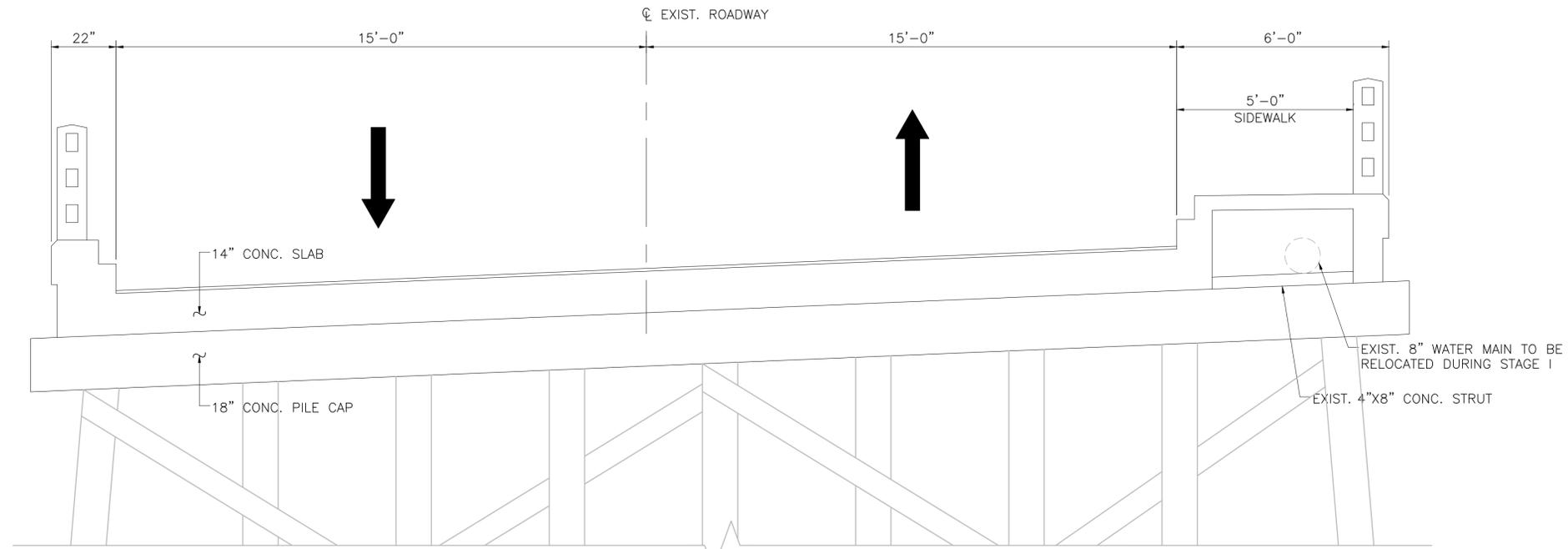
EAST ELEVATION
SCALE: $\frac{3}{16}'' = 1'-0''$

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	

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

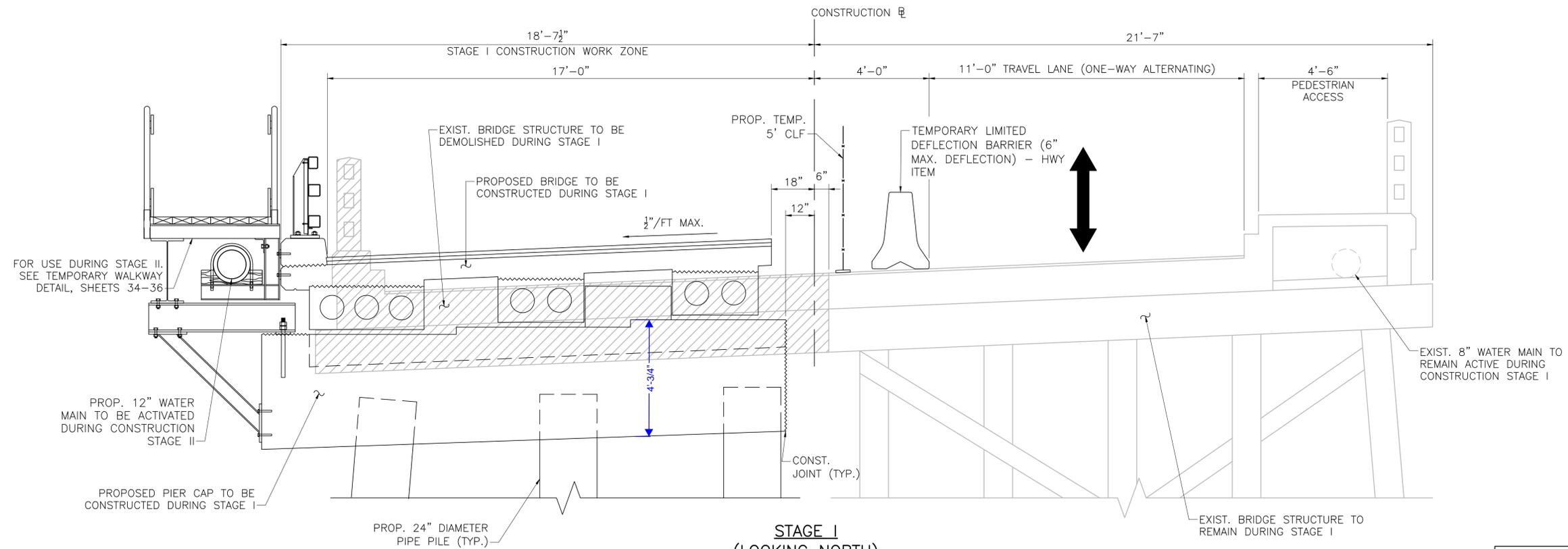
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	53	85
PROJECT FILE NO.		608460	

**SEQUENCE OF BRIDGE
CONSTRUCTION I**



**EXISTING BRIDGE CROSS SECTION
(LOOKING NORTH)**

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



**STAGE I
(LOOKING NORTH)**

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

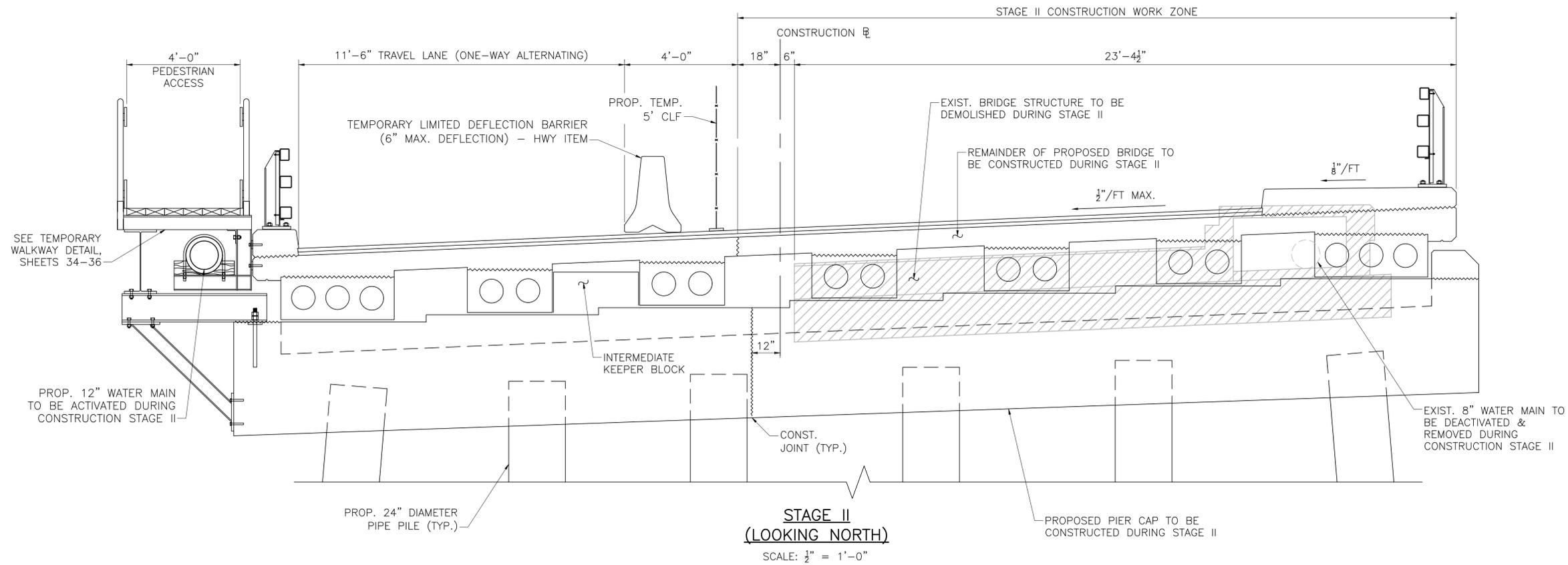
DATE	DESCRIPTION
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

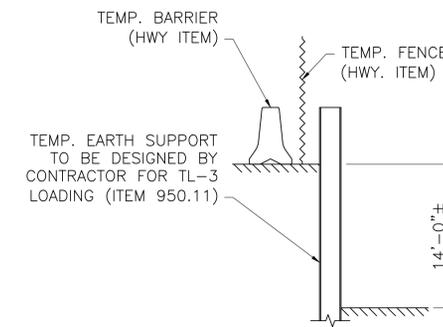
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

**SEQUENCE OF BRIDGE
CONSTRUCTION II**



**STAGE II
(LOOKING NORTH)**
SCALE: 1/2" = 1'-0"



**TEMP. EARTH SUPPORT DETAIL
AT ABUTMENTS**
NOT TO SCALE

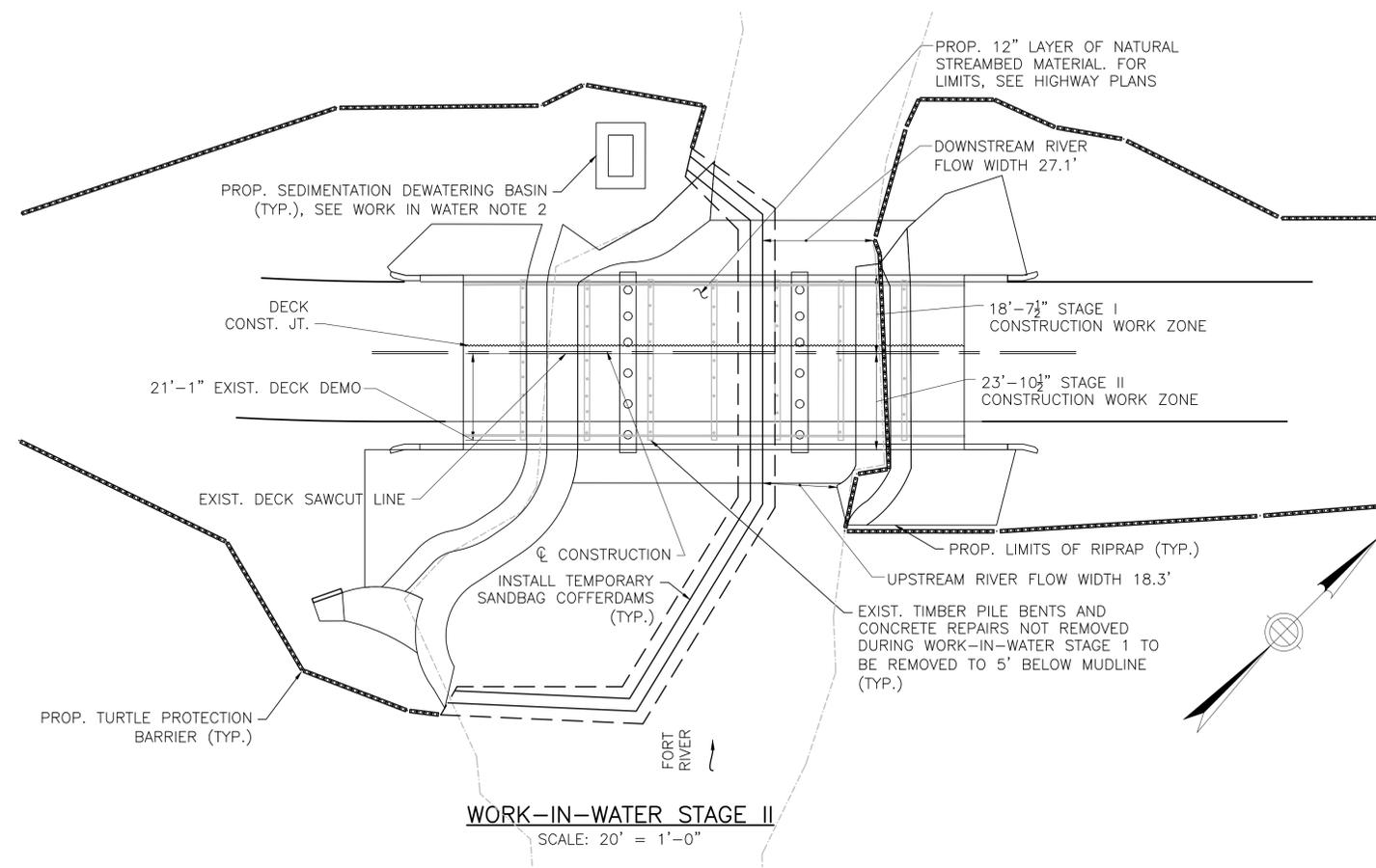
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR	
CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH 2024

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

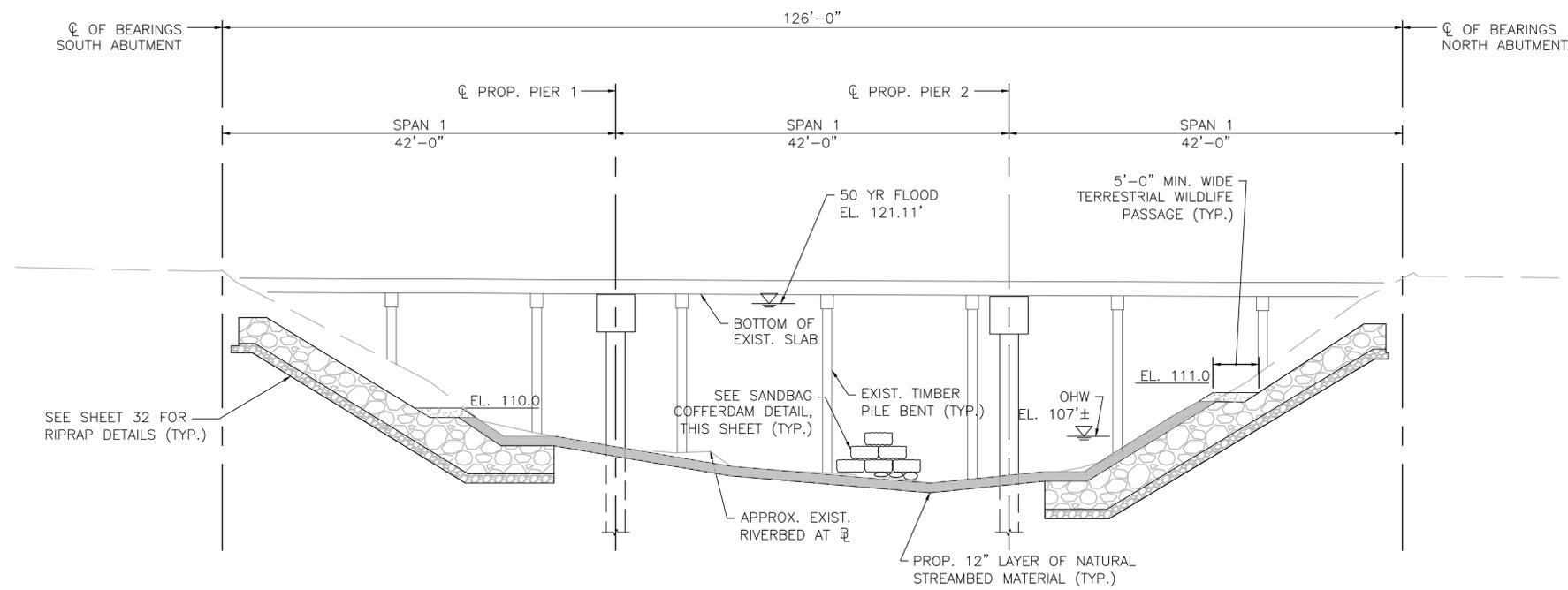
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	56	85
PROJECT FILE NO.		608460	

WORK-IN-WATER STAGE II



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.



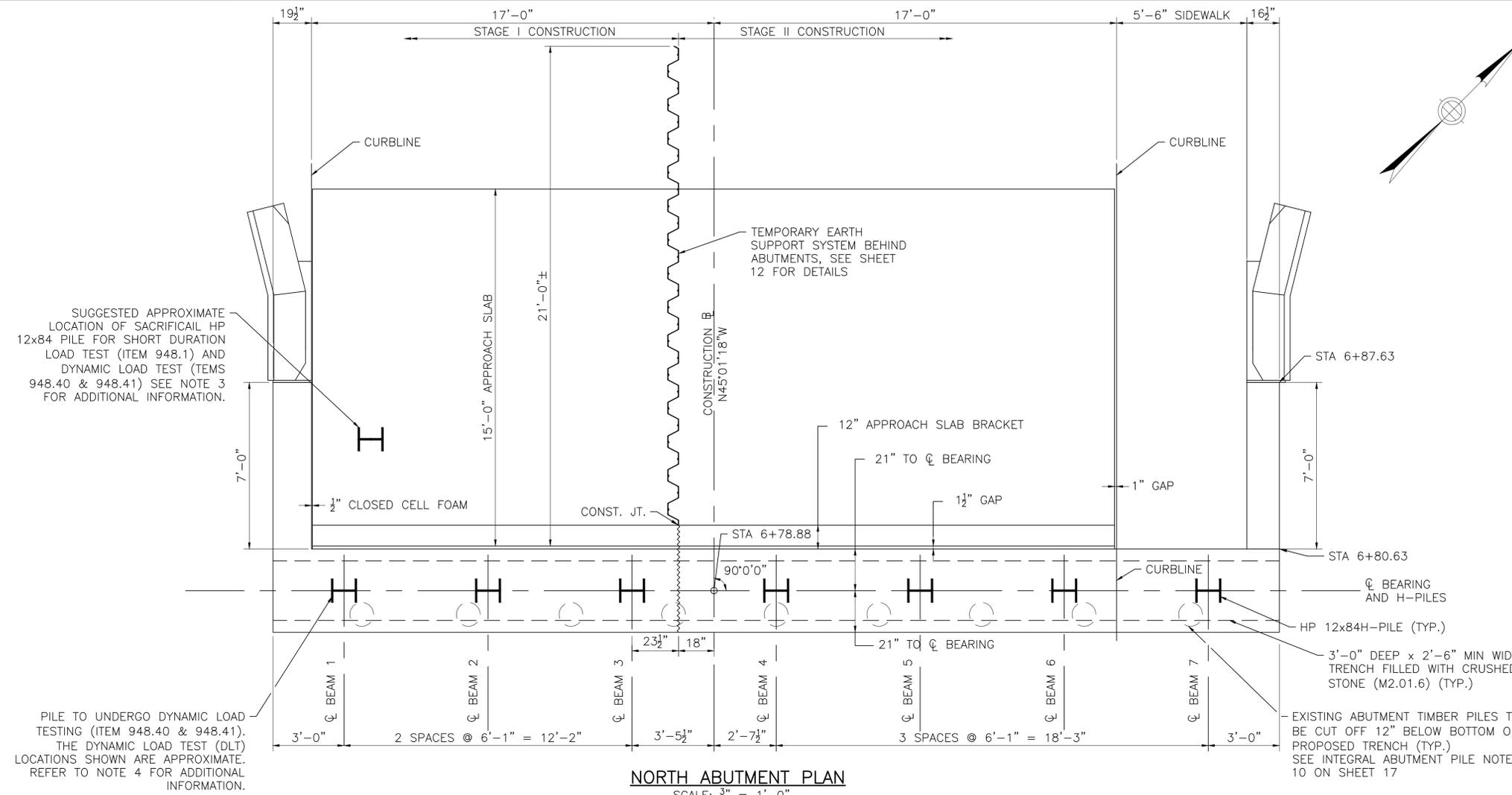
**WORK IN WATER
ELEVATION - STAGE II**
SCALE: 3/8" = 1'-0"

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	

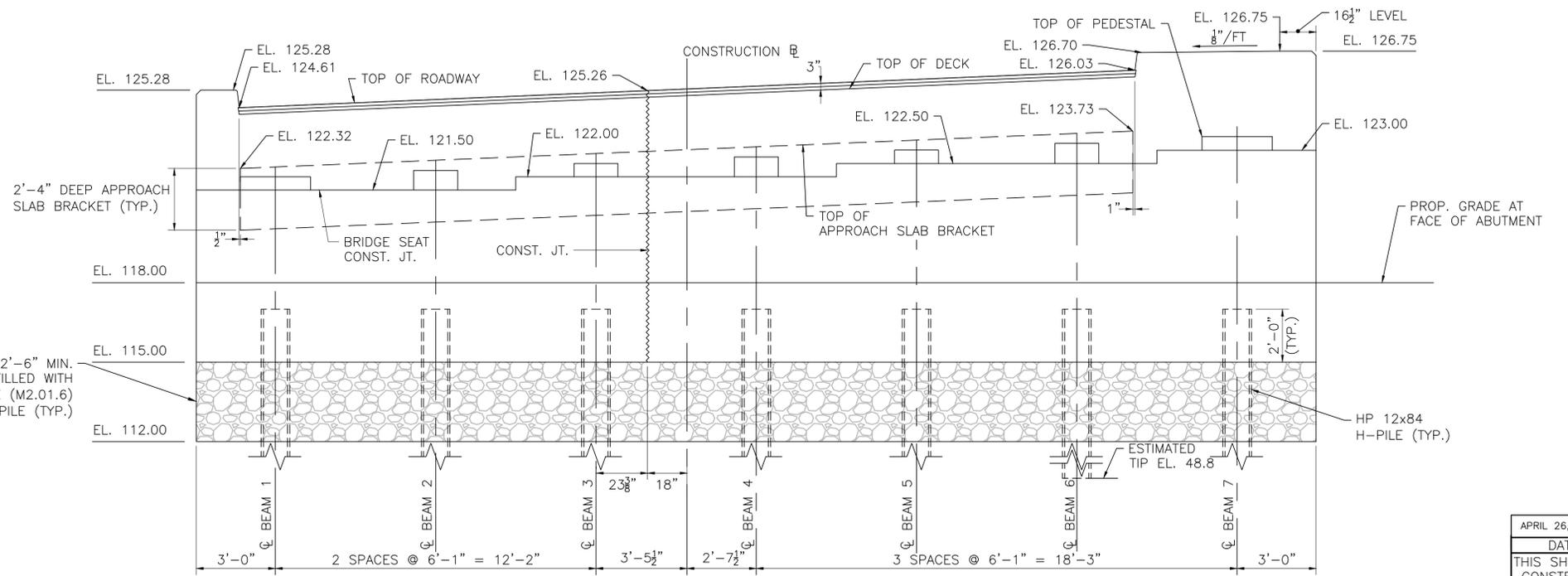
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

**NORTH ABUTMENT
PLAN AND ELEVATION**



NORTH ABUTMENT PLAN
SCALE: 3/8" = 1'-0"



NORTH ABUTMENT ELEVATION
SCALE: 3/8" = 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:**
- ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE
 - DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY
 - CONTRACTOR TO SELECT EXACT LOCATION OF SACRIFICIAL PILE WITH APPROVAL OF THE ENGINEER.
 - CONTRACTOR TO SELECT THE EXACT LOCATION(S) OF THE DLT'S WITH APPROVAL BY THE ENGINEER

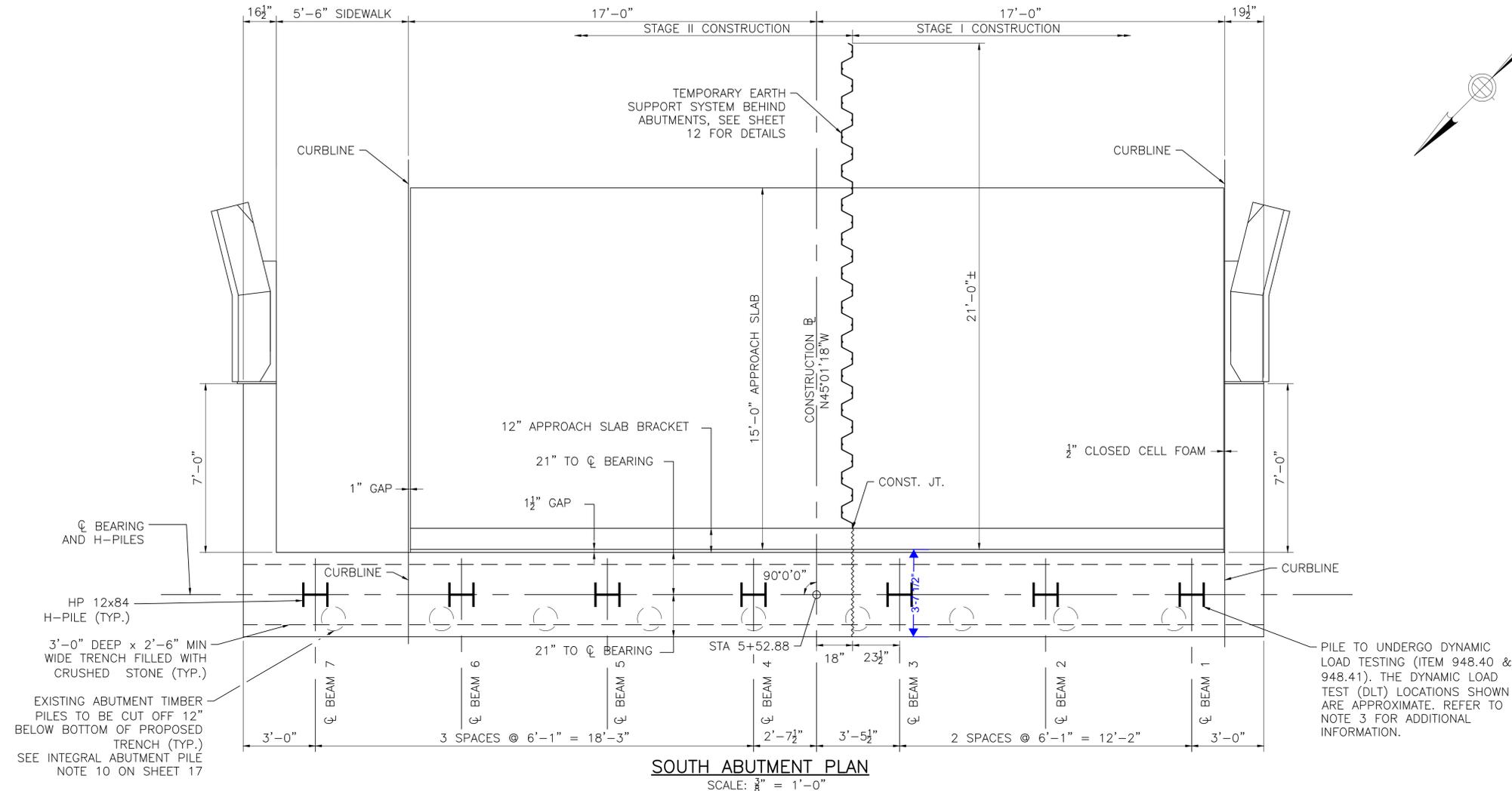
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024

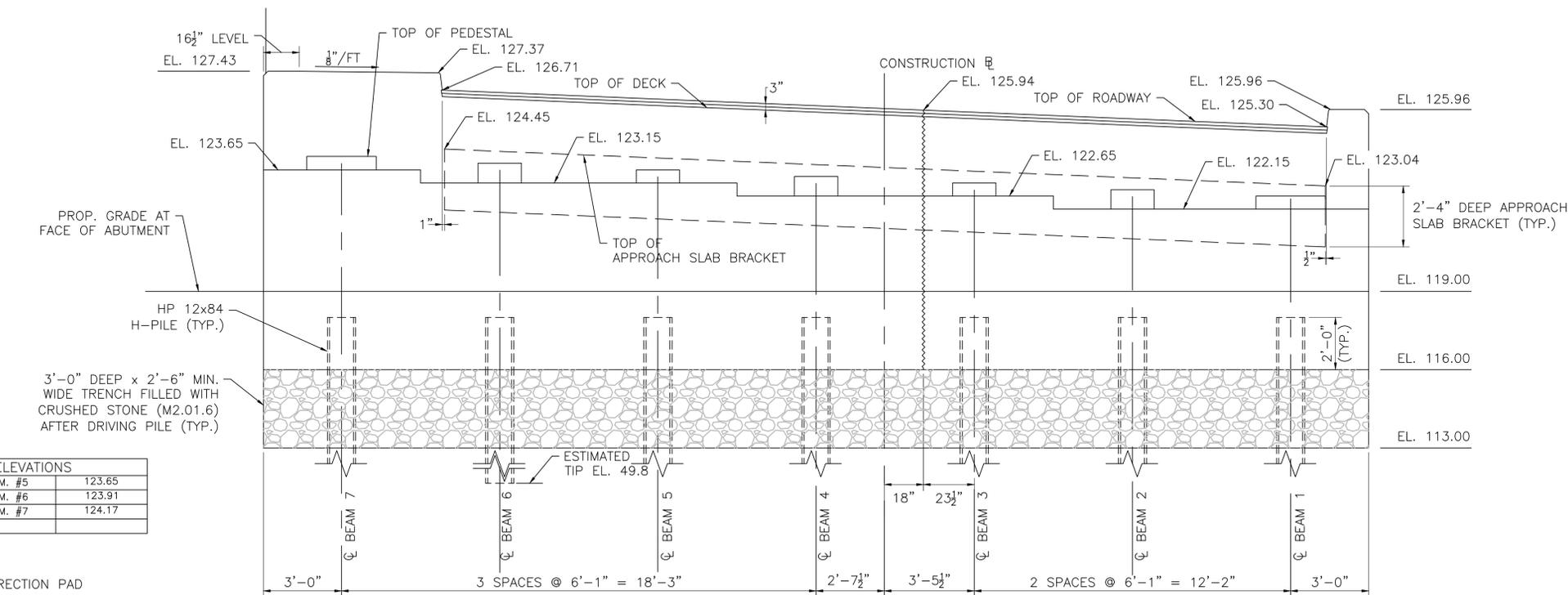
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

**SOUTH ABUTMENT
PLAN AND ELEVATION**



SOUTH ABUTMENT PLAN
SCALE: 3/8" = 1'-0"



SOUTH ABUTMENT ELEVATION
SCALE: 3/8" = 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.

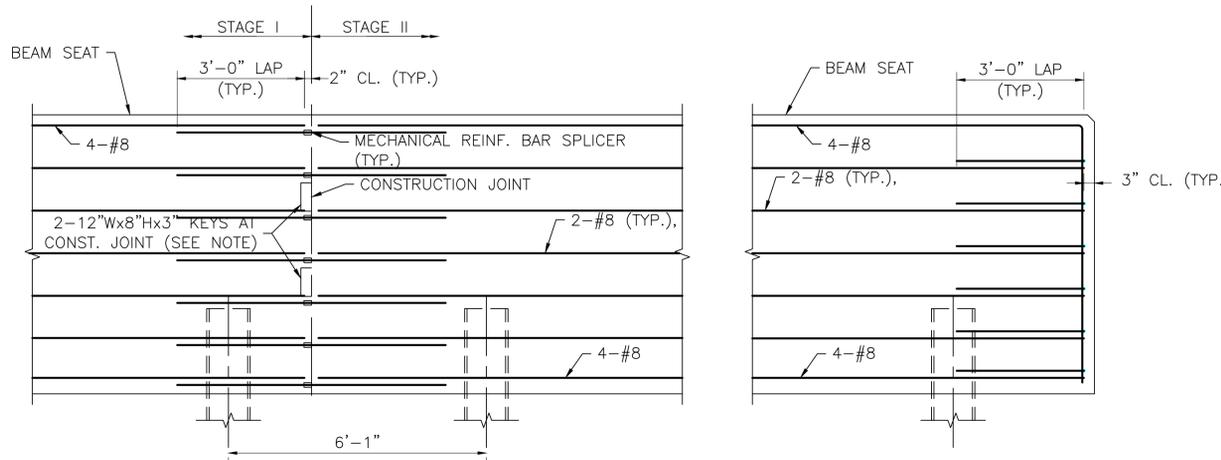
NOTES:

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

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	

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

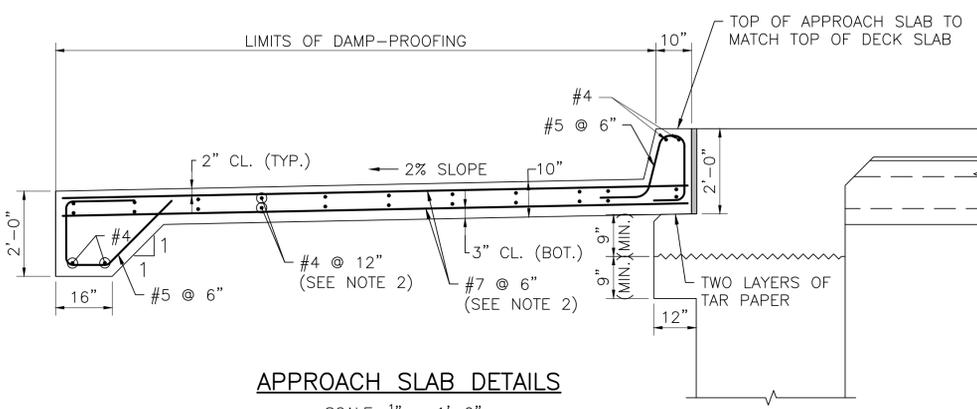
ABUTMENT SECTIONS AND DETAILS I



ELEVATION - ABUTMENT REINFORCING DETAIL AT CONSTRUCTION JOINT
SCALE: 1/2" = 1'-0"

ELEVATION - END OF ABUTMENT REINFORCING DETAIL
SCALE: 1/2" = 1'-0"

NOTES:
KEY TO BE SLIGHTLY TAPERED.



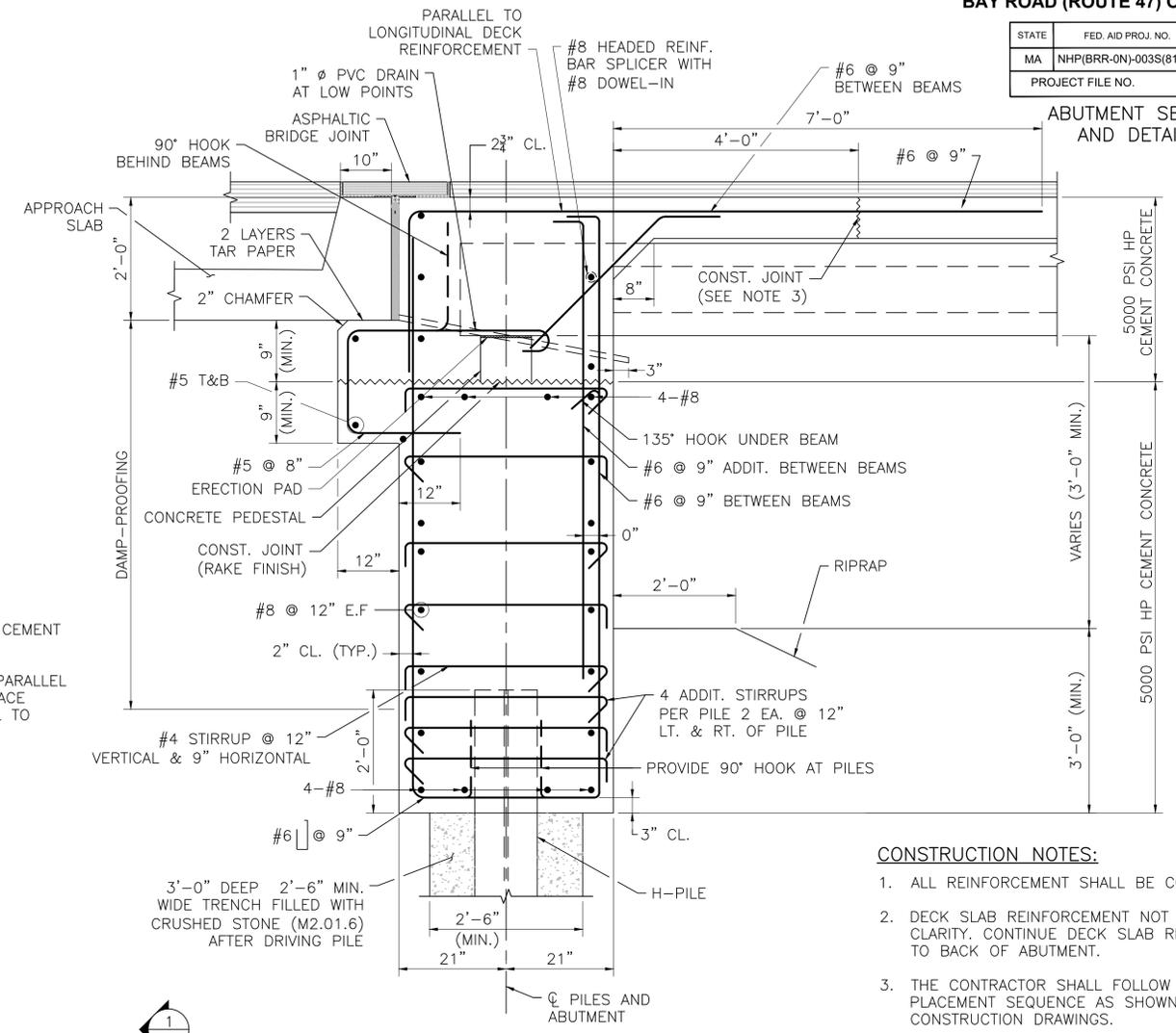
APPROACH SLAB DETAILS
SCALE: 1/2" = 1'-0"

INTEGRAL ABUTMENT PILE NOTES:

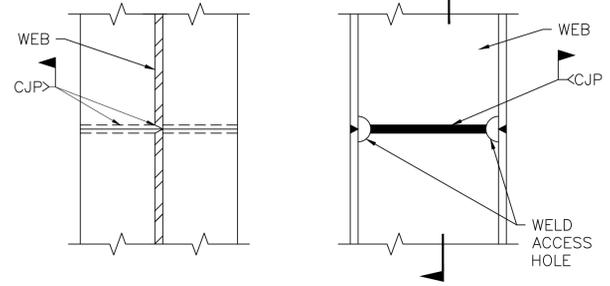
1. A TRENCH WITH A DEPTH OF 3'-0" AND A MINIMUM WIDTH OF 2'-6" SHALL BE CONSTRUCTED DIRECTLY BELOW THE BOTTOM OF THE PILE CAP ELEVATION. AFTER THE PILES ARE DRIVEN, THE TRENCH SHALL BE FILLED WITH CRUSHED STONE (M2.01.6).
2. ALL SPLICES SHALL HAVE COMPLETE PENETRATION BUTT WELDS. THERE SHALL BE NO SPLICES 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 3/4" 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.

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: 3/4" = 1'-0"



SECTION 1

ELEVATION

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.

CONSTRUCTION NOTES:

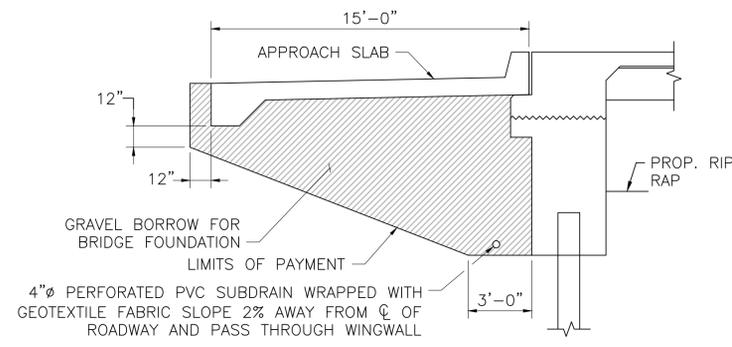
1. ALL REINFORCEMENT SHALL BE COATED.
2. DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY. CONTINUE DECK SLAB REINFORCEMENT TO BACK OF ABUTMENT.
3. THE CONTRACTOR SHALL FOLLOW THE DECK PLACEMENT SEQUENCE AS SHOWN ON THESE CONSTRUCTION DRAWINGS.
4. ALL CONCRETE SHALL CONTAIN SUPERPLASTICIZER TO ENSURE ADEQUATE 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.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
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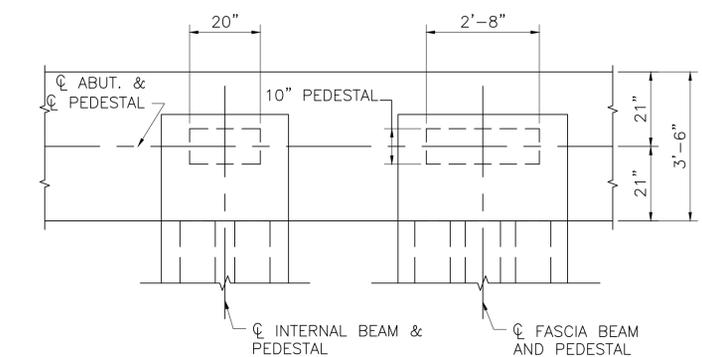
608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024

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

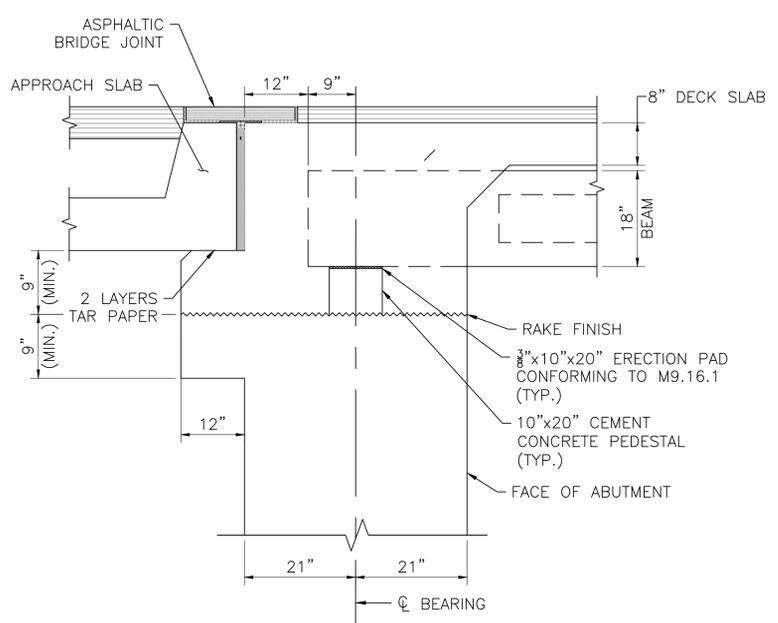
ABUTMENT SECTIONS AND DETAILS II



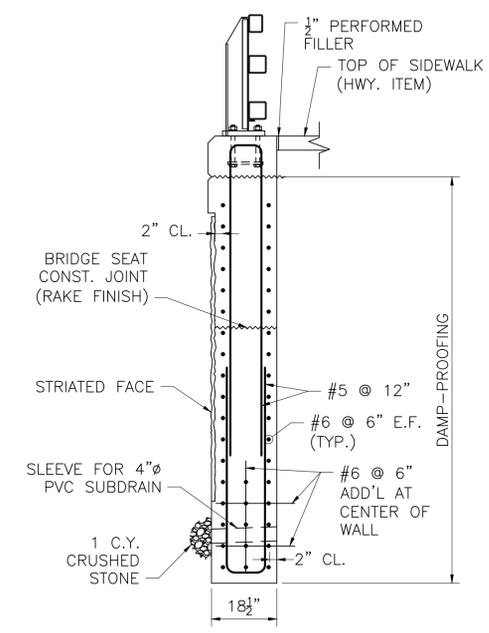
INTEGRAL ABUTMENT BACKFILL
SCALE: 1/4" = 1'-0"



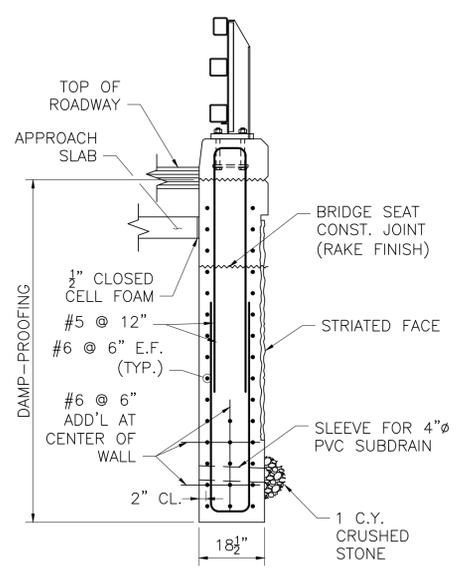
ABUTMENT PEDESTAL PLAN
SCALE: 1/2" = 1'-0"



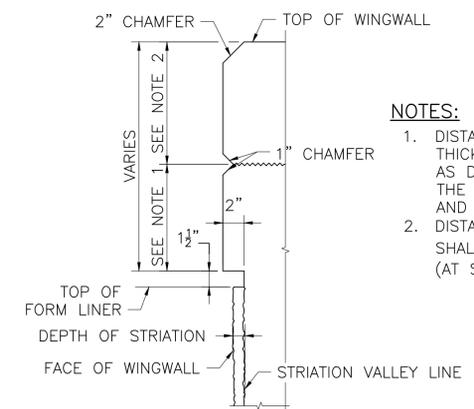
INTEGRAL DETAILS AT ABUTMENT
(AT INTERIOR BEAMS)
SCALE: 3/4" = 1'-0"



WINGWALL WITH SIDEWALK
SECTION 2
SCALE: 1/2" = 1'-0"

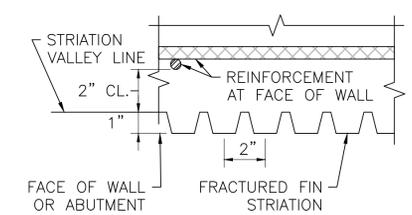


WINGWALL WITH SAFETY CURB
SECTION 3
SCALE: 1/2" = 1'-0"



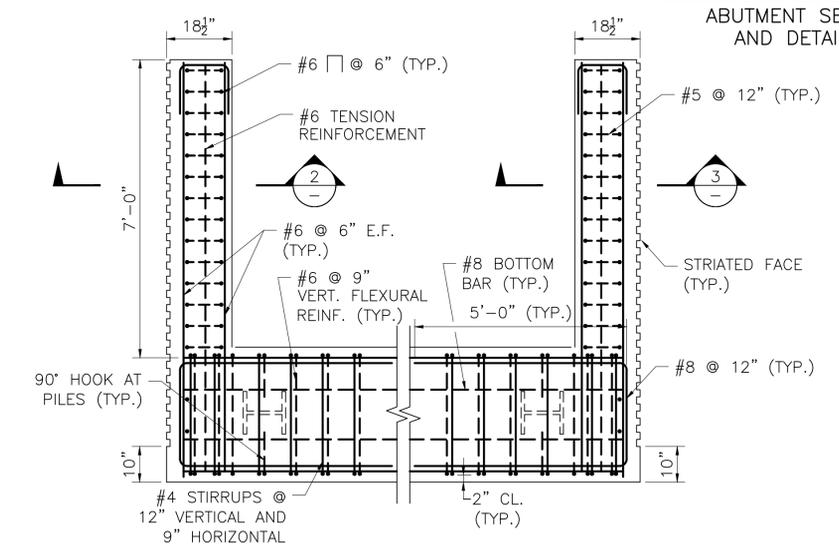
DETAIL AT TOP OF WINGWALL
SCALE: 1 1/2" = 1'-0"

- NOTES:
- 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.
 - DISTANCE ON WEST FASCIA (AT SAFETYWALK) SHALL BE 11 1/8", DISTANCE ON EAST FASCIA (AT SIDEWALK) SHALL BE 8 1/4".



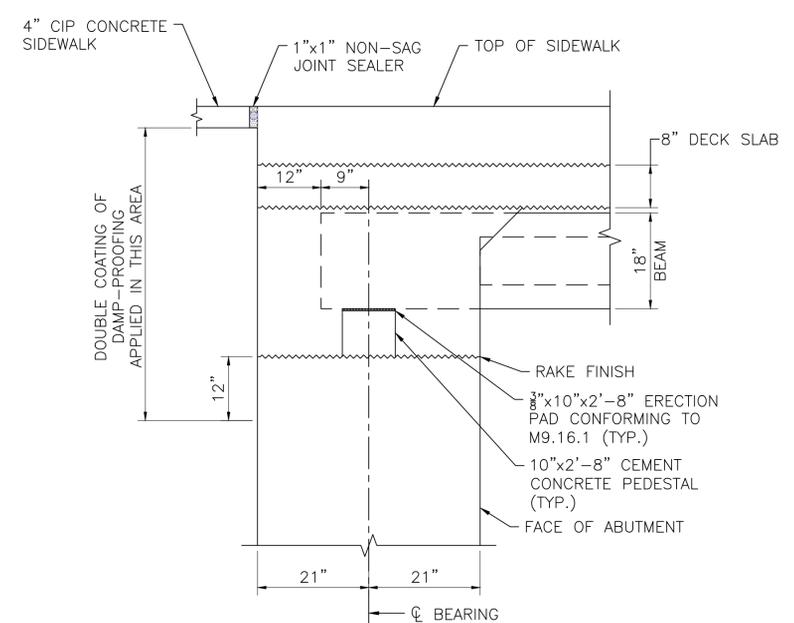
TYPICAL STRIATION DETAIL
SCALE: 3" = 1'-0"

- NOTES:
- THE CONTRACTOR SHALL MAKE SURE THAT THE STRIATION FINNS ARE PLUMB AND LINED UP VERTICALLY FROM PANEL TO PANEL FOR THE FULL HEIGHT OF THE WALL.
 - 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.



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



INTEGRAL DETAILS AT ABUTMENT
(BEAM 7)
SCALE: 3/4" = 1'-0"

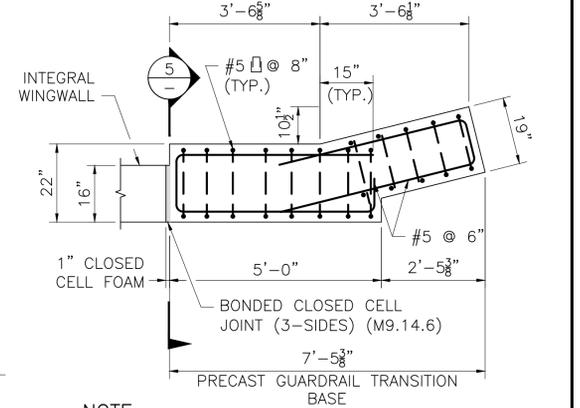
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
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608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024 PLOTTED ON 21-JUL-2025 12:06 PM

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

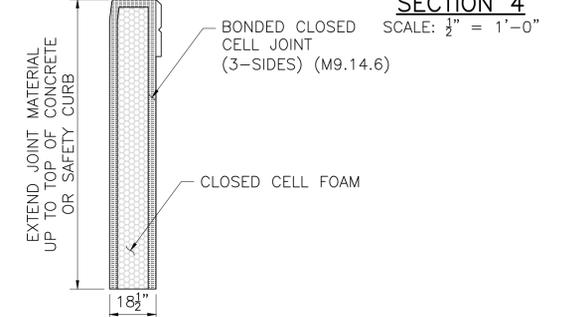
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	61	85
PROJECT FILE NO.		608460	

WINGWALL ELEVATIONS AND DETAILS

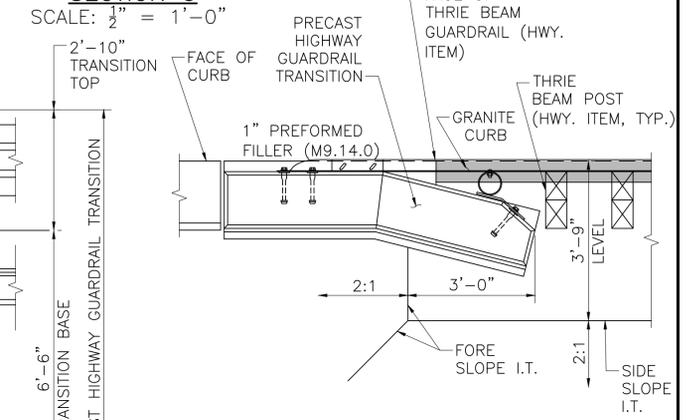


NOTE:
WINGWALL REINFORCEMENT AND STRIATIONS NOT SHOWN FOR CLARITY.

SECTION 4

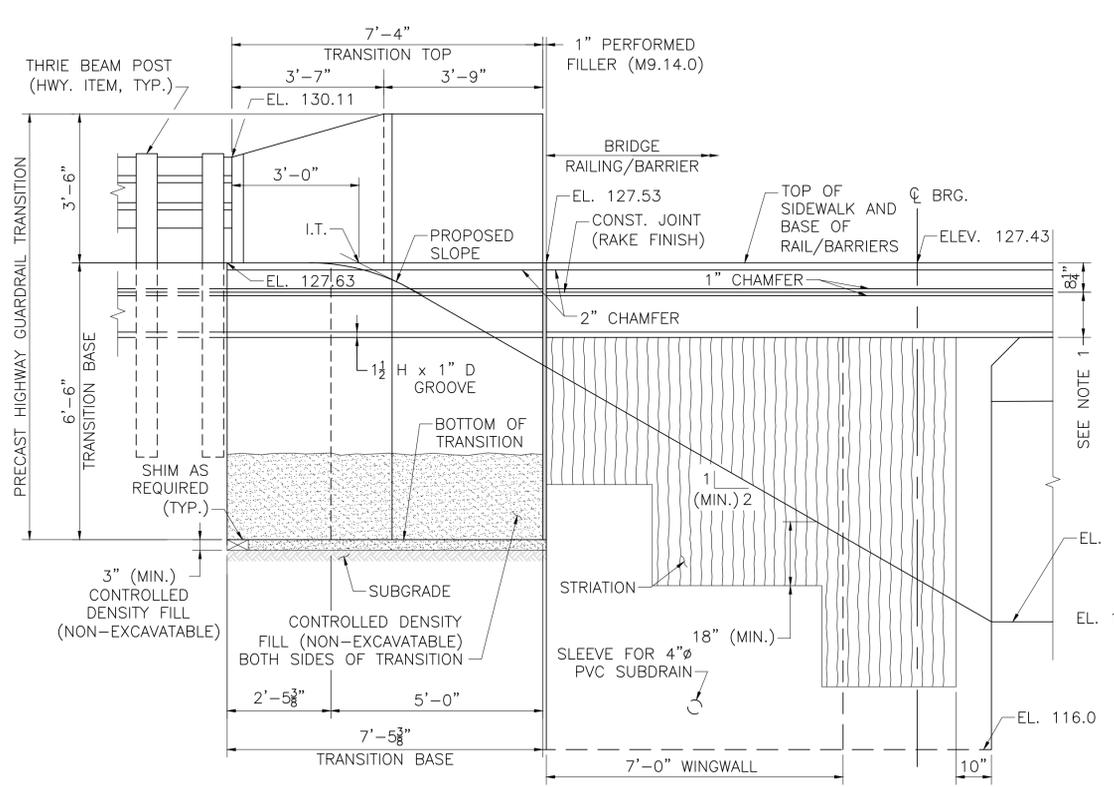


SECTION 5



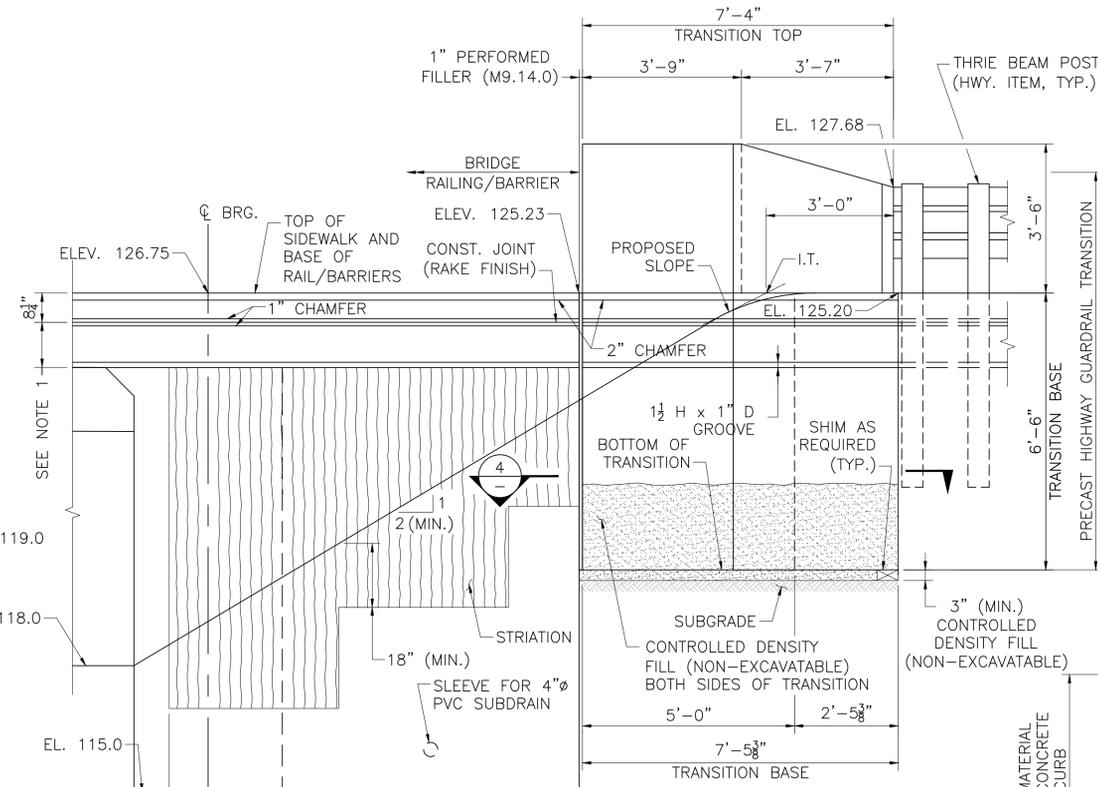
GRADING REQUIREMENTS PLAN

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



SOUTHEAST WINGWALL ELEVATION

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

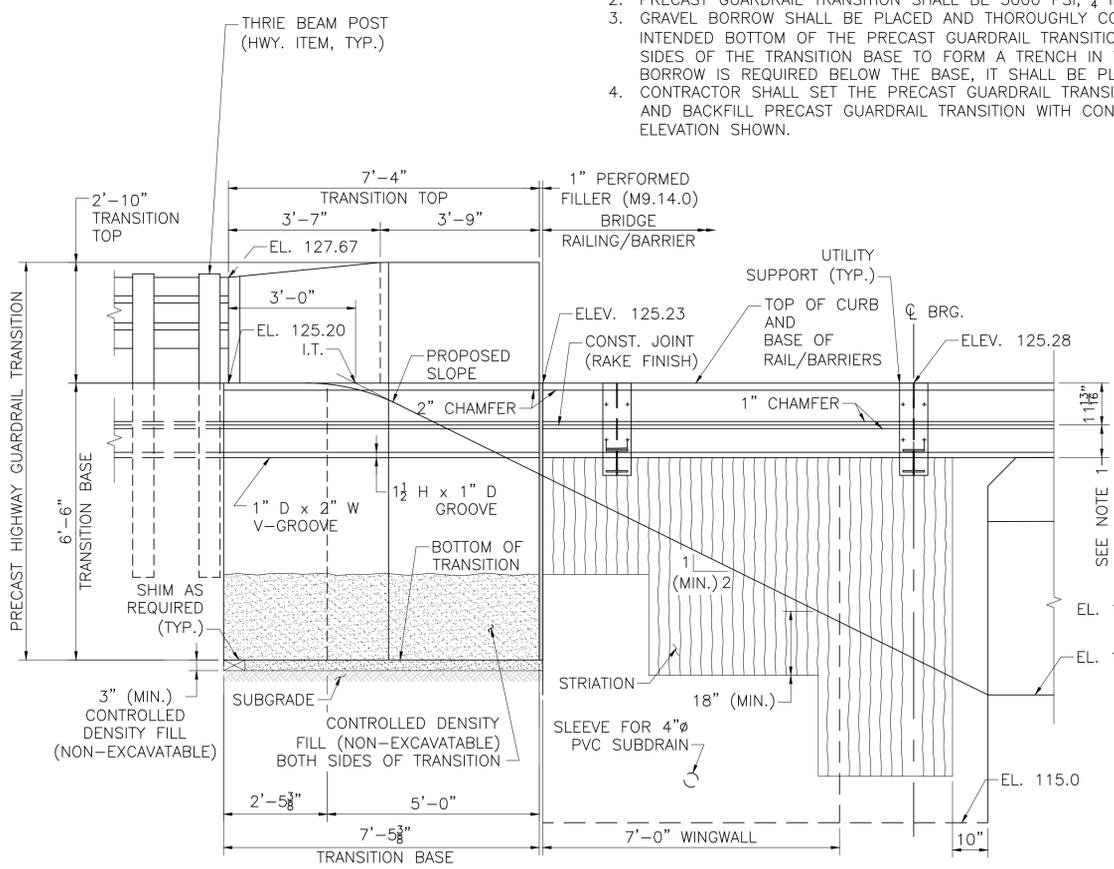


NORTHEAST WINGWALL ELEVATION

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

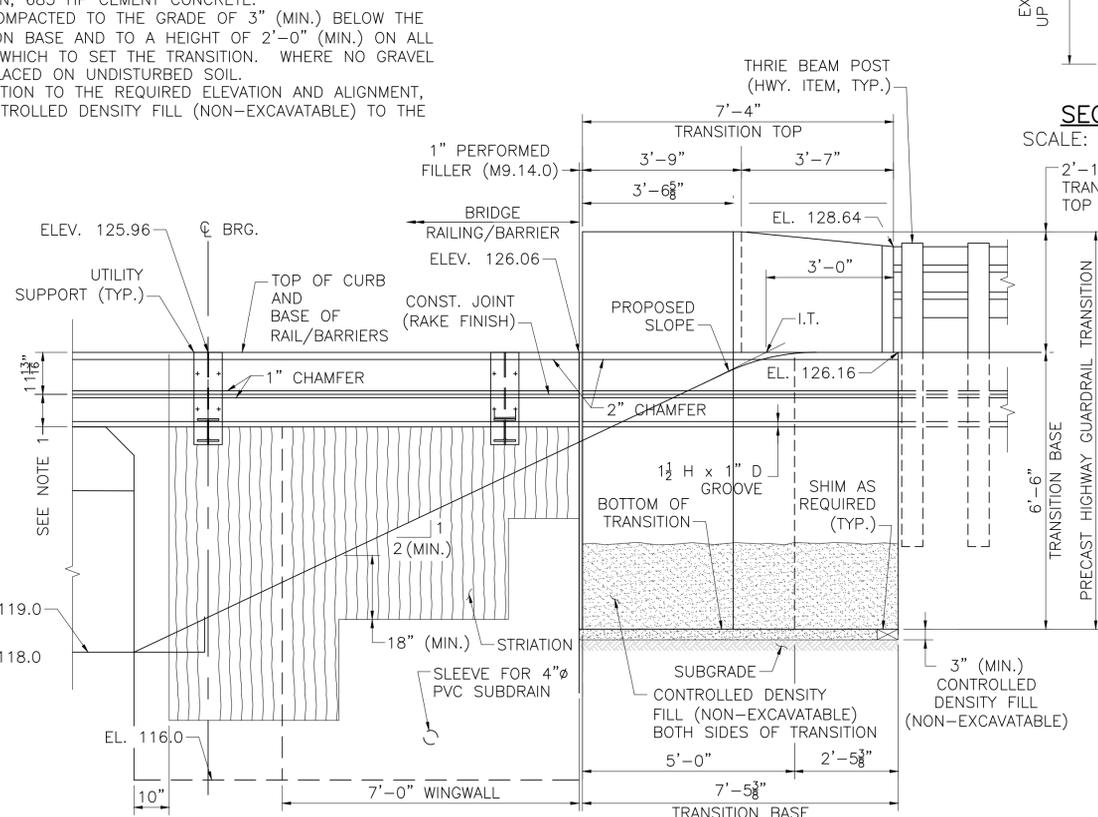
NOTES:

- 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.
- PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE.
- 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.
- 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.



NORTHWEST WINGWALL ELEVATION

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



SOUTHWEST WINGWALL ELEVATION

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

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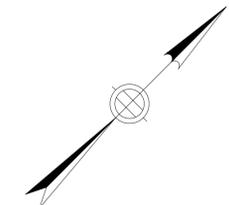
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

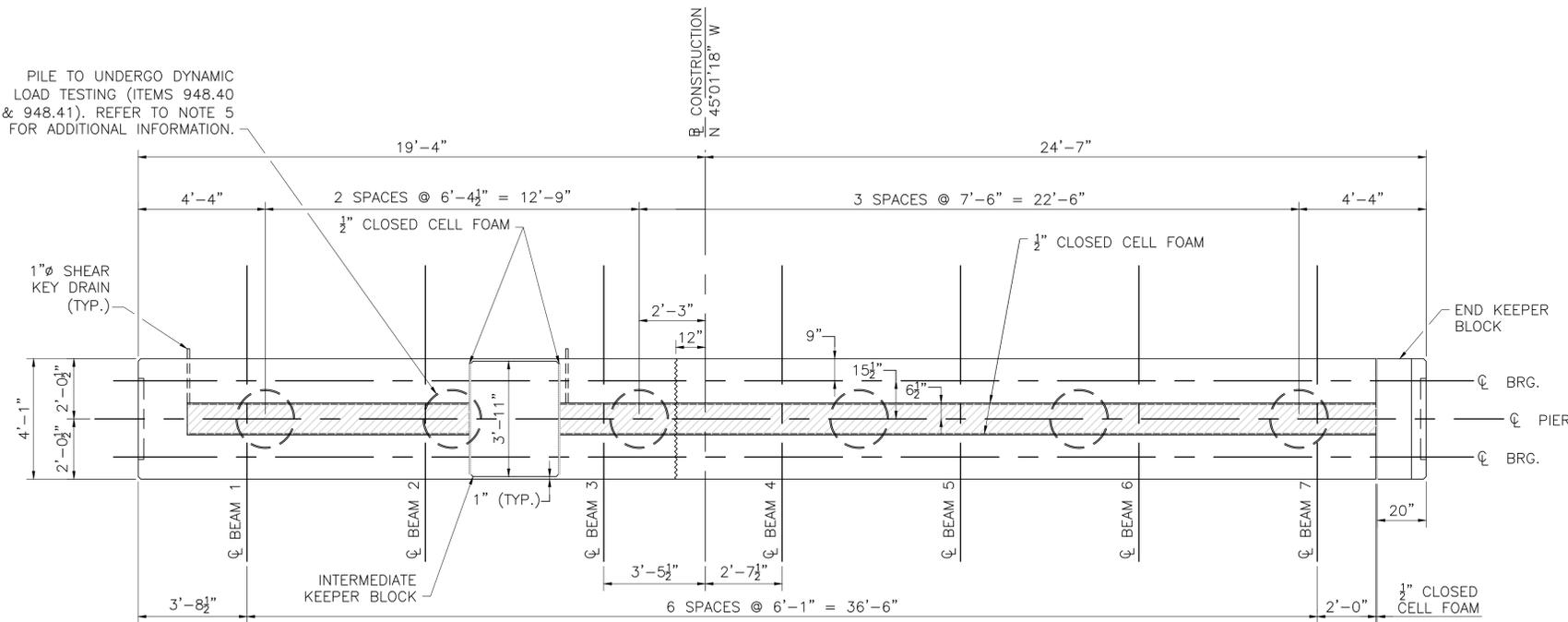
PIER 1 PLAN AND ELEVATION

608460_BR22 (H-01-005)_PIERS PLANDWG

608460 FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024



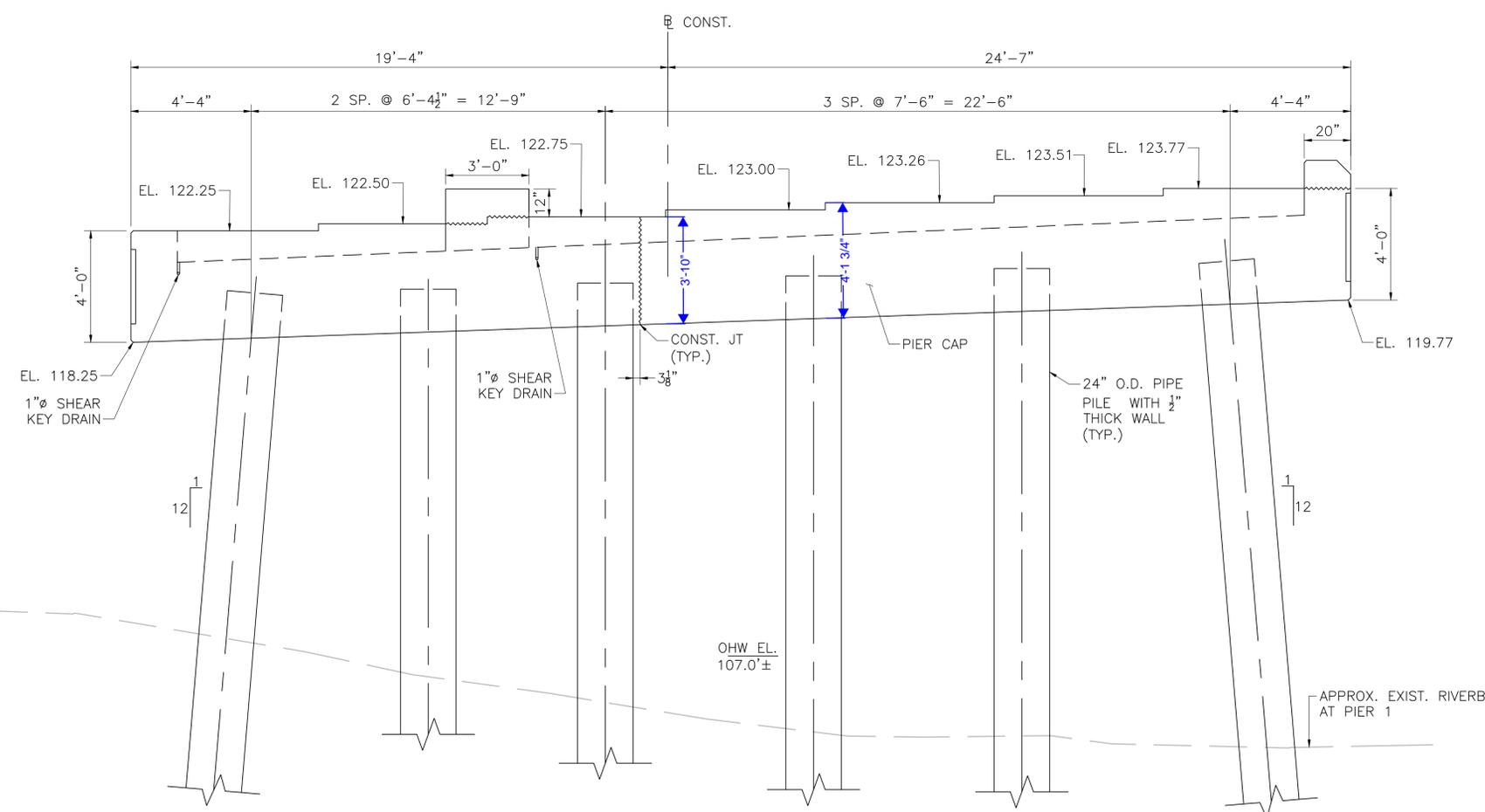
PILE TO UNDERGO DYNAMIC LOAD TESTING (ITEMS 948.40 & 948.41). REFER TO NOTE 5 FOR ADDITIONAL INFORMATION.



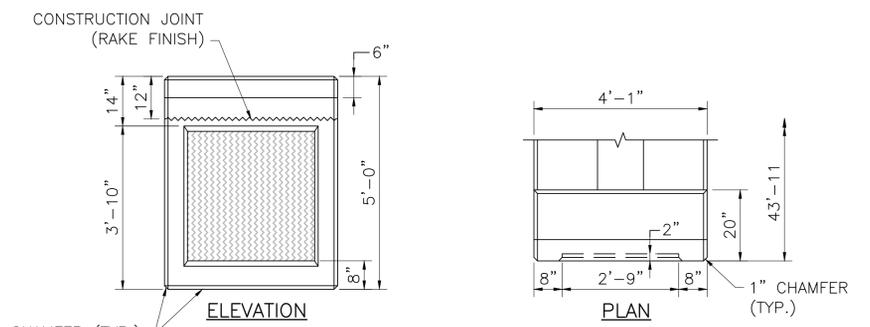
PIER 1 PLAN
SCALE: 3/8" = 1'-0"

NOTES:

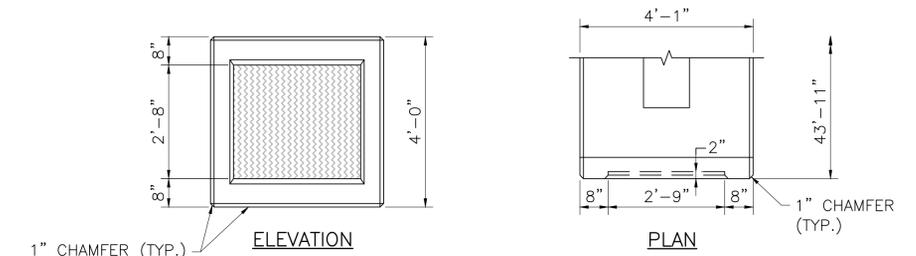
1. [Hatched box symbol] DENOTES LIMITS OF 13" BY 12" MIN. DEEP SHEAR KEY.
2. ALL SURFACES OF THE SHEAR KEY SHALL BE LINED WITH 1/2" THICK CLOSED CELL FOAM.
3. FOR PIER CAP DETAILS, SEE SHEET 22. FOR PILE DETAILS, SEE SHEET 23.
4. CONCRETE PIER CAP SHALL BE 5000 PSI HP CEMENT CONCRETE
5. CONTRACTOR TO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



**PROPOSED PIER 1 ELEVATION
(LOOKING NORTH)**
SCALE: 3/8" = 1'-0"



PIER CAP END WITH END KEEPER BLOCK
SCALE: 1/2" = 1'-0"



PIER CAP END WITHOUT END KEEPER BLOCK
SCALE: 1/2" = 1'-0"

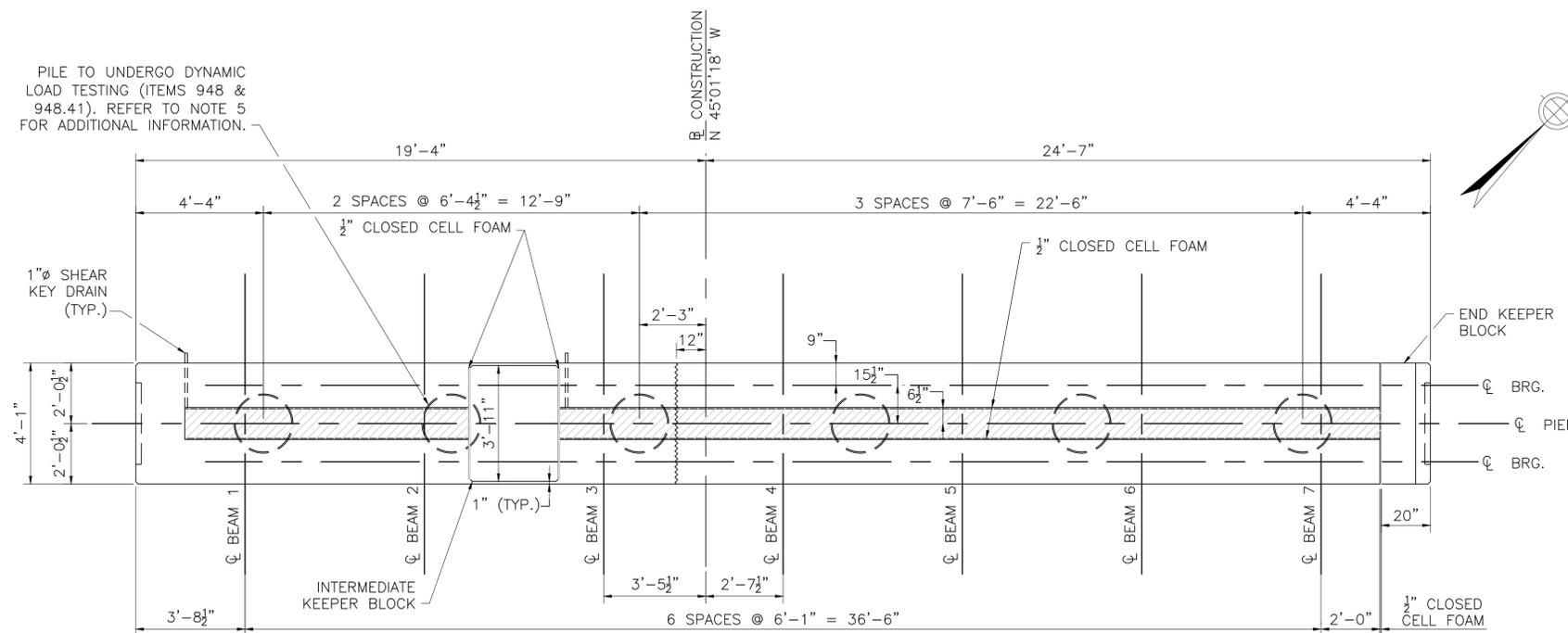
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

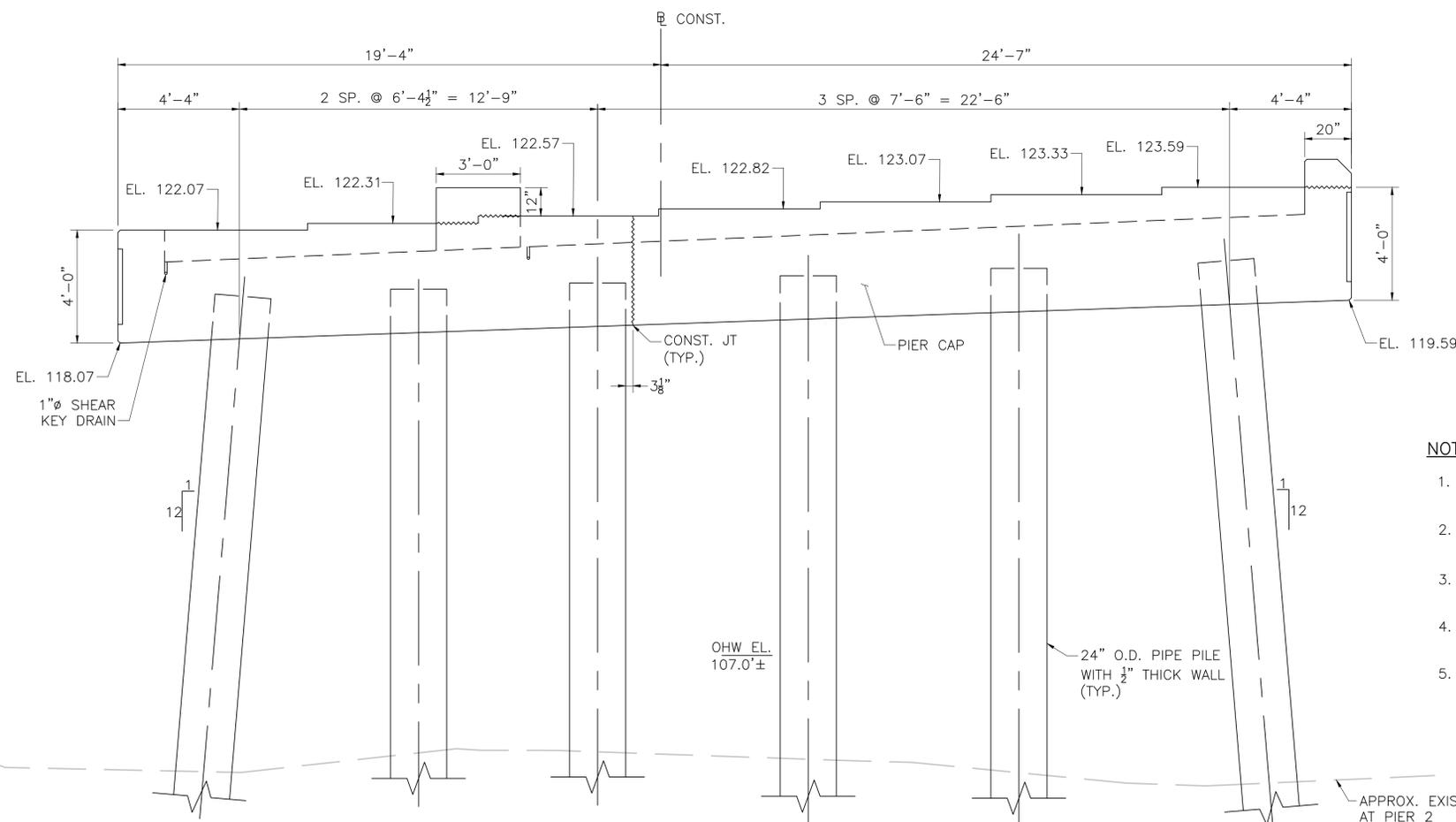
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	63	85
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PIER II PLAN AND ELEVATION

PILE TO UNDERGO DYNAMIC LOAD TESTING (ITEMS 948 & 948.41). REFER TO NOTE 5 FOR ADDITIONAL INFORMATION.



PIER 2 PLAN
SCALE: 3/8" = 1'-0"



**PROPOSED PIER 2 ELEVATION
(LOOKING NORTH)**
SCALE: 3/8" = 1'-0"

NOTES:

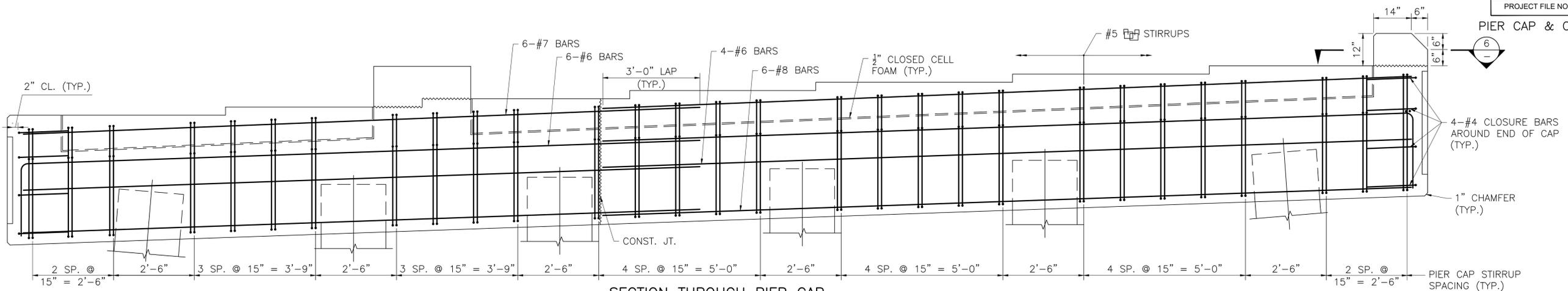
1. [Hatched area symbol] DENOTES LIMITS OF 13" BY 12" MIN. DEEP SHEAR KEY.
2. ALL SURFACES OF THE SHEAR KEY SHALL BE LINED WITH 1/2" THICK CLOSED CELL FOAM.
3. FOR PIER CAP DETAILS, SEE SHEET 22. FOR PILE DETAILS, SEE SHEET 23.
4. CONCRETE PIER CAP SHALL BE 5000 PSI HP CEMENT CONCRETE
5. CONTRACTOR TO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

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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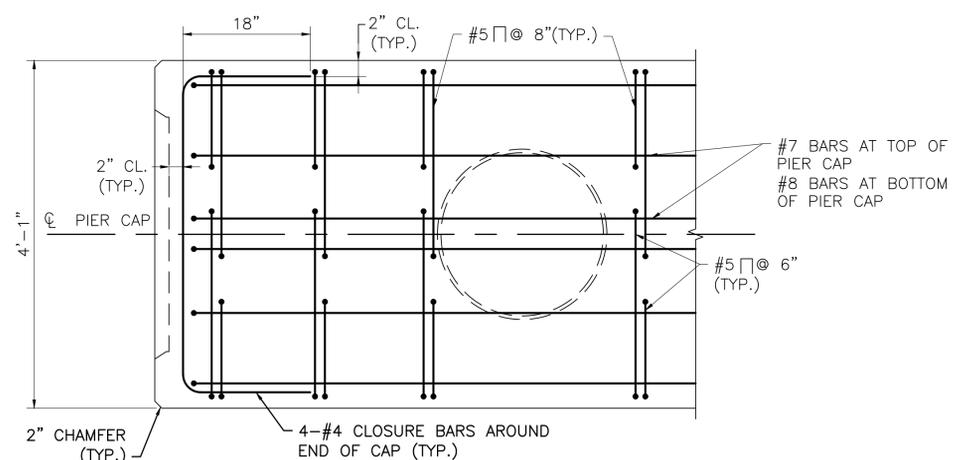
608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024

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

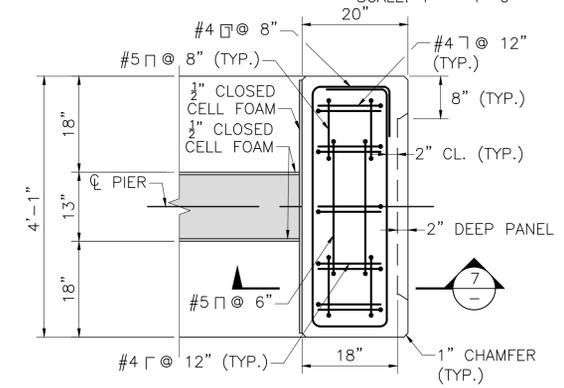
PIER CAP & COLUMN DETAILS I



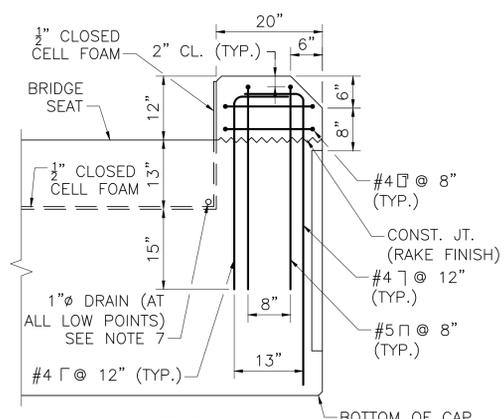
SECTION THROUGH PIER CAP
SCALE: 5/8" = 1'-0"



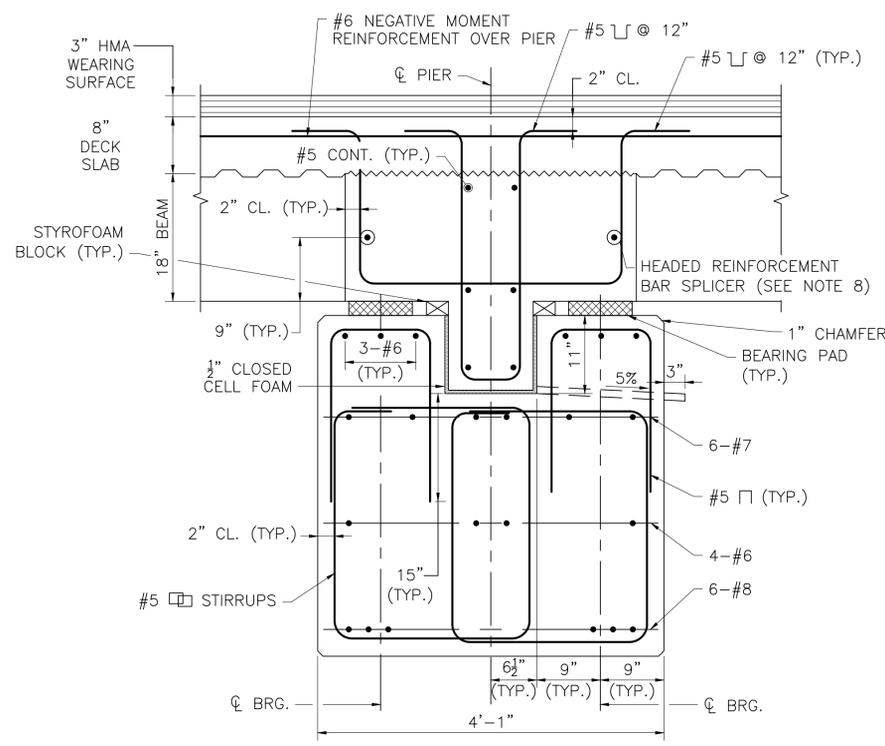
PLAN-END OF PIER CAP
SCALE: 1" = 1'-0"



SECTION 6
SCALE: 3/4" = 1'-0"



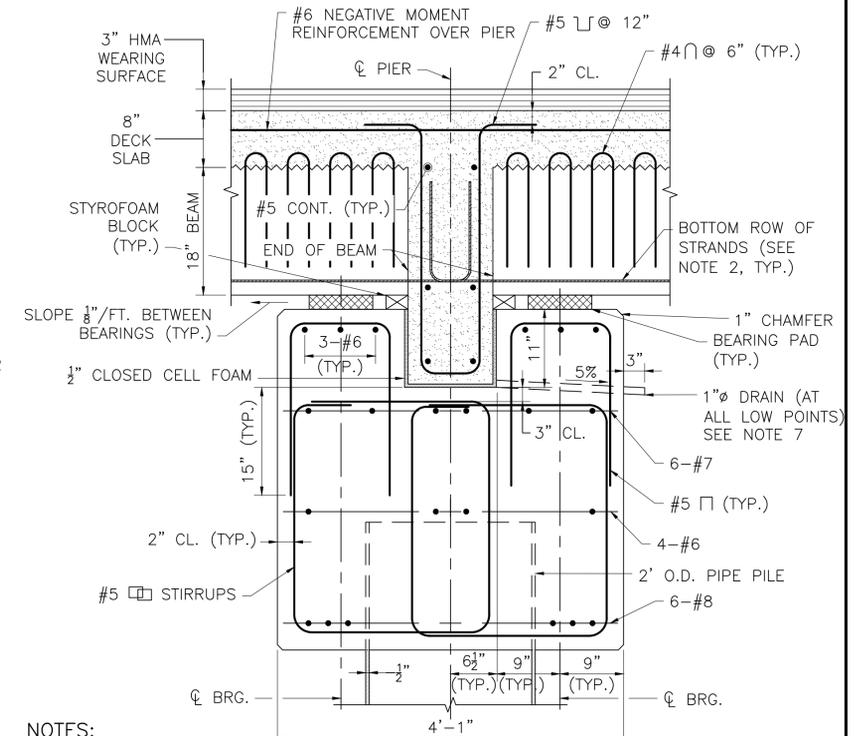
SECTION 7
SCALE: 3/4" = 1'-0"



DETAILS OVER PIER AT DIAPHRAGM
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. 3/4" THREADED DOWEL BAR SPICERS 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.



DETAILS OVER PIER AT BEAM
SCALE: 1" = 1'-0"

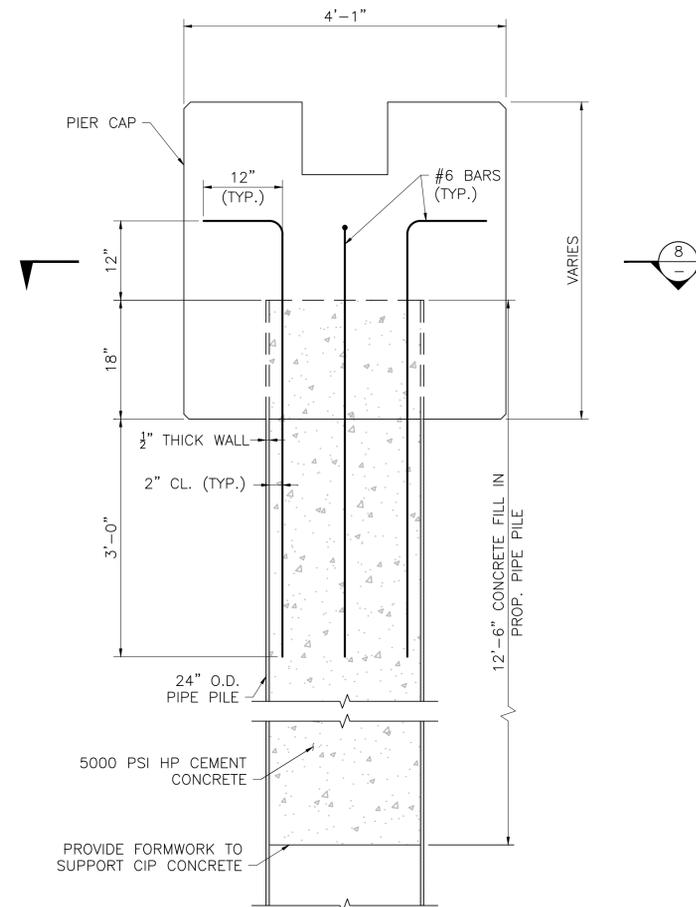
NOTES:

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.

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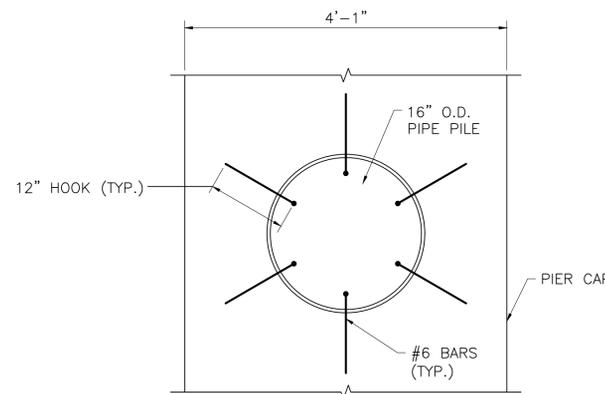
608460_BR22 (H-01-005)_PIERS DETAILS.DWG Plotted on 21-Jul-2025 12:07 PM 608460_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024

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- NOTES:**
- PIER CAP REINFORCEMENT NOT SHOWN FOR CLARITY, SEE SHEET 22 FOR DETAILS

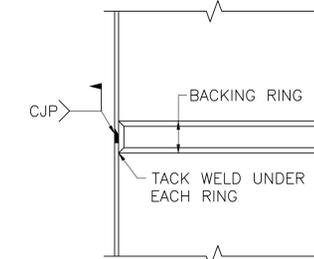
PIER COLUMN EMBEDMENT DETAIL
SCALE: 1" = 1'-0"



SECTION 8
SCALE: 1" = 1'-0"

PIER PILE NOTES:

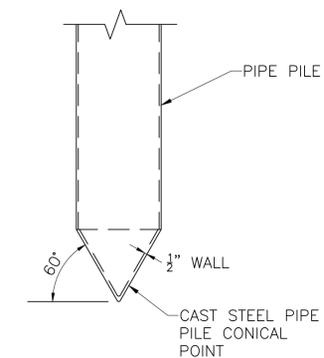
- ALL PIPE PILES SHALL BE 24" DIAMETER X 1/2" THICK AND SHALL CONFORM TO ASTM A252 GRADE 3 WITH A COAL TAR EPOXY COATING THAT EXTENDS TO A DEPTH OF AT LEAST 10 FEET BELOW MUD LINE. PILES SHALL BE DRIVEN CLOSE-ENDED. REFER TO THE SPECIAL PROVISIONS FOR COAL TAR EPOXY COATING SPECIFICATIONS. FILL PILES WITH SAME CONCRETE USED FOR PIER CAP AS SHOWN ON THESE PLANS.
- THE FACTORED AXIAL DESIGN LOAD PER PILE IS 305 KIPS AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING AND TESTING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
- HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
- REFER TO SPECIAL PROVISIONS FOR ADDITIONAL PILE INFORMATION.
- 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.
- AFTER PILE DRIVING IS COMPLETE THE CONTRACTOR SHALL SUBMIT PILE DRIVING LOGS INCLUDING THE FINAL TIP ELEVATIONS AND THE RESULTS OF ANY DYNAMIC OR STATIC LOAD TESTING. SIGNIFICANT DEVIATIONS SHALL BE NOTED ON THE CONSTRUCTION DRAWINGS.



NOTES:

- BACKING RING DETAILS SHALL BE CONSISTENT WITH APPROVED WELDING PROCEDURE SPECIFICATIONS.
- ROOT BASE SHALL BE DEPOSITED TO WITHIN 1" OF BACKING RING SPACER PINS. SPACER PINS SHALL THEN BE REMOVED AND PASS COMPLETED.
- ALL WELDS SHALL BE SMOOTH. REINFORCEMENT SHALL NOT EXCEED 1/8".
- WELDING SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE - STEEL.
- 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"



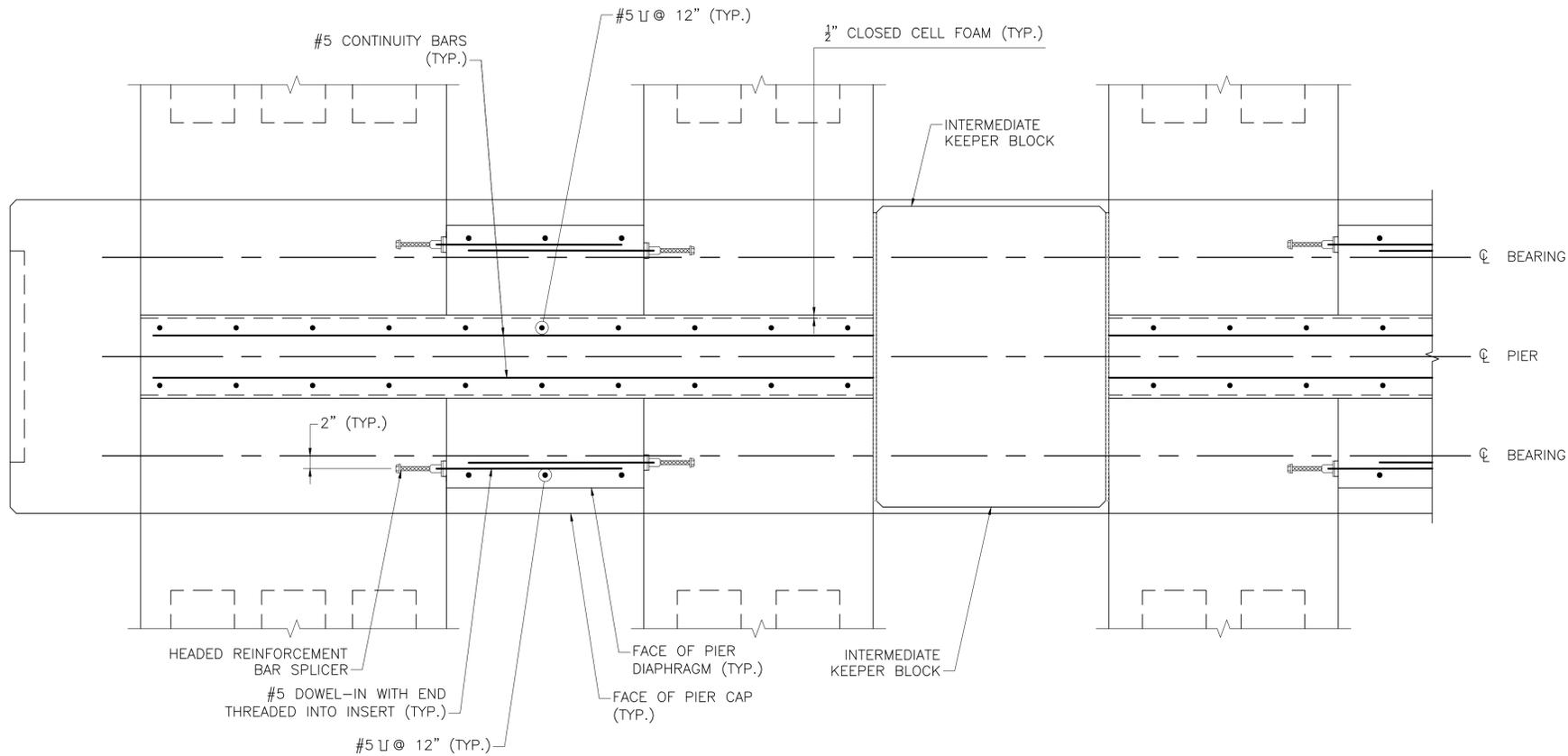
PILE POINT DETAIL
SCALE: 3/4" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
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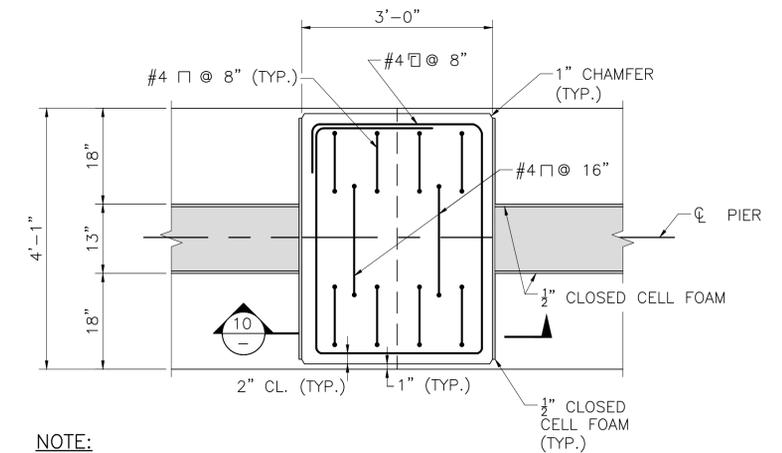
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

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

PIER DIAPHRAGM DETAILS

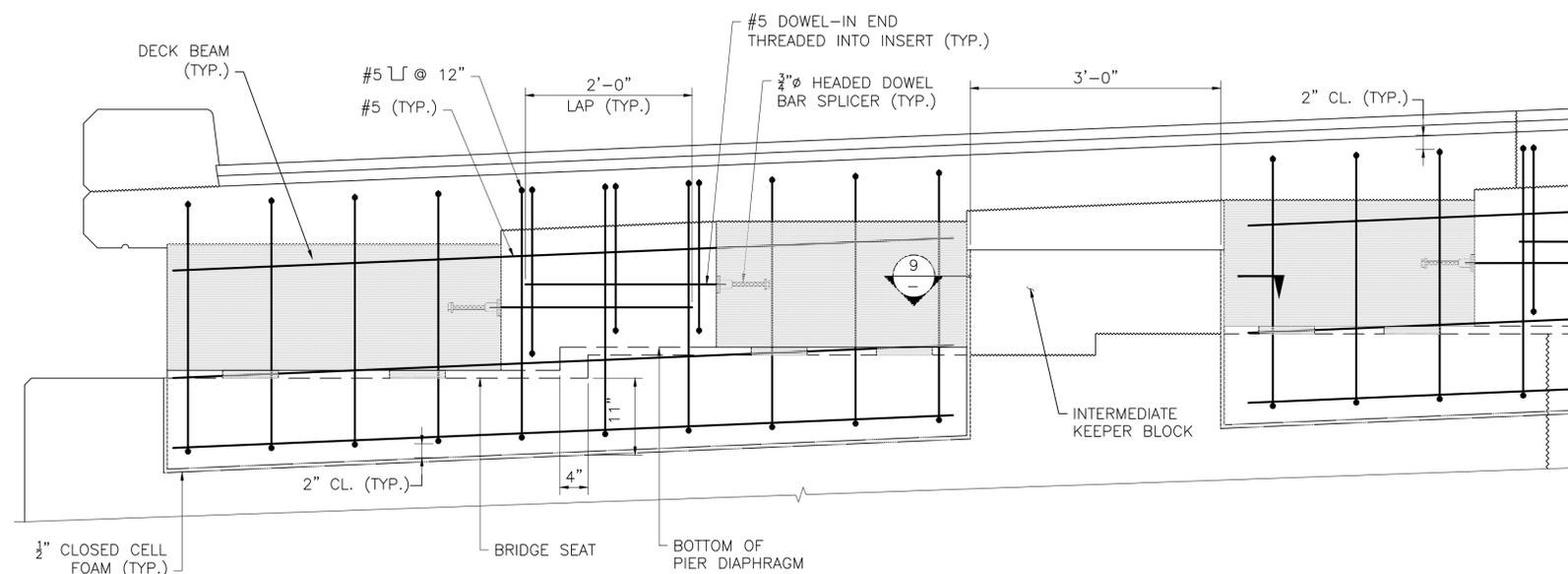


PIER DIAPHRAGM PLAN
SCALE: 1" = 1'-0"

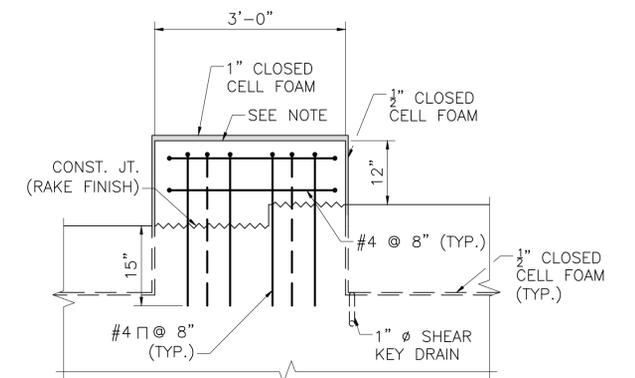


NOTE:
INTERMEDIATE KEEPER BLOCKS SHALL BE CAST BEFORE BEAMS ARE SET AND THE PIER DIAPHRAGM CONCRETE IS PLACED.

SECTION 9
SCALE: 3/4" = 1'-0"



PIER DIAPHRAGM SECTION
SCALE: 1" = 1'-0"



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

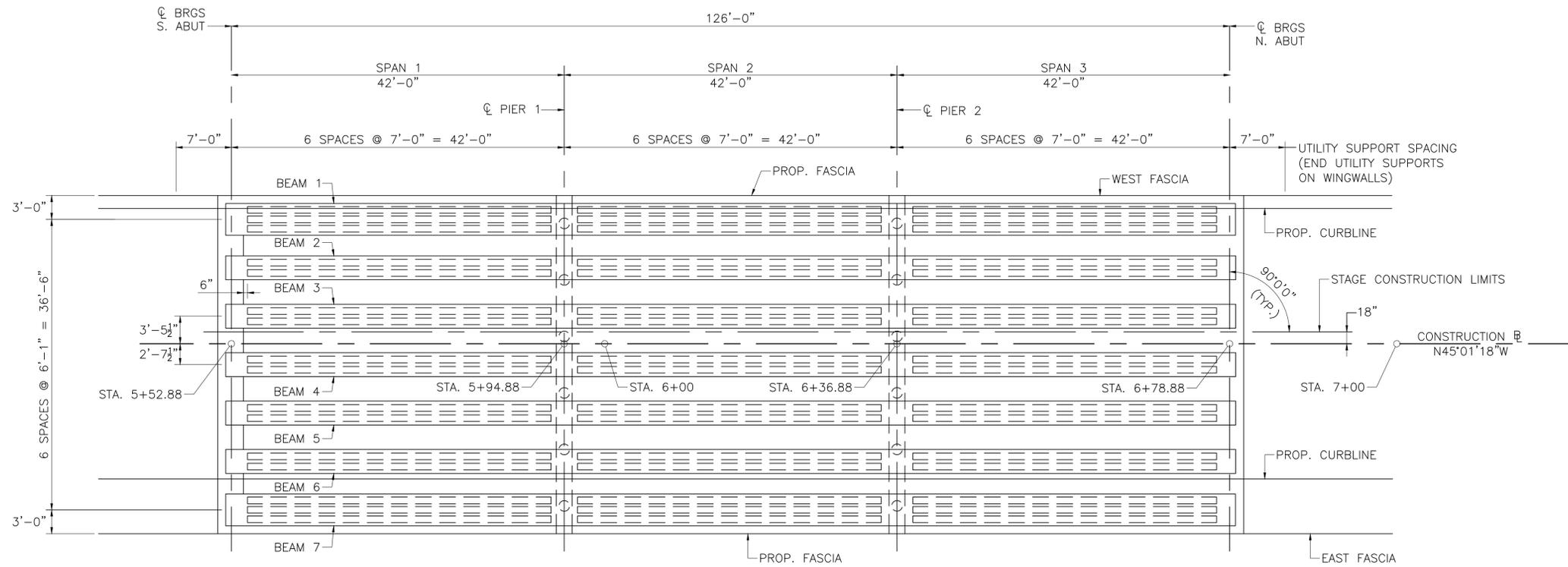
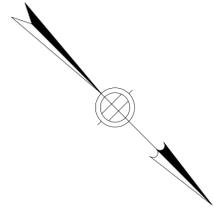
SECTION 10
SCALE: 3/4" = 1'-0"

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	

**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	67	85
PROJECT FILE NO.		608460	

FRAMING PLAN

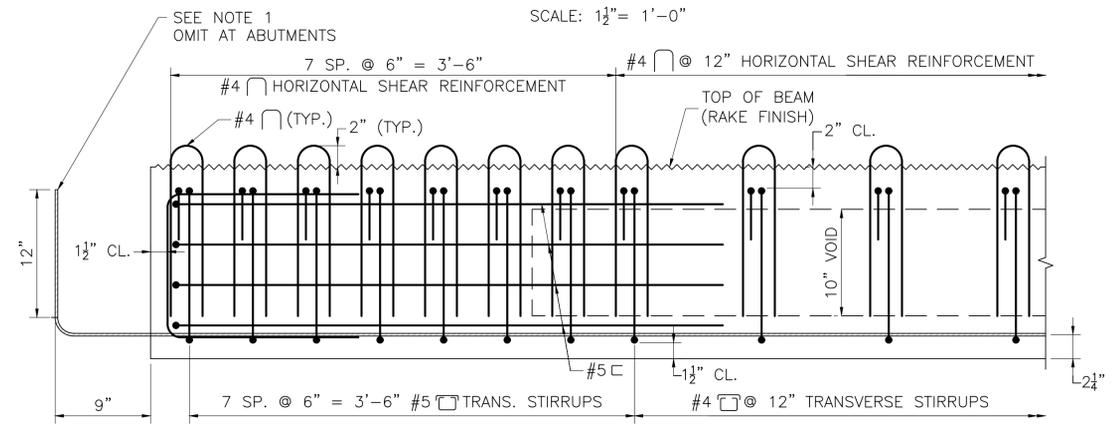
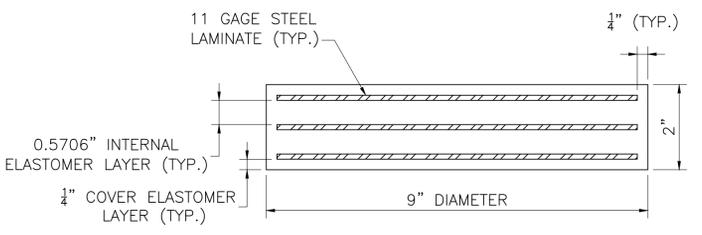
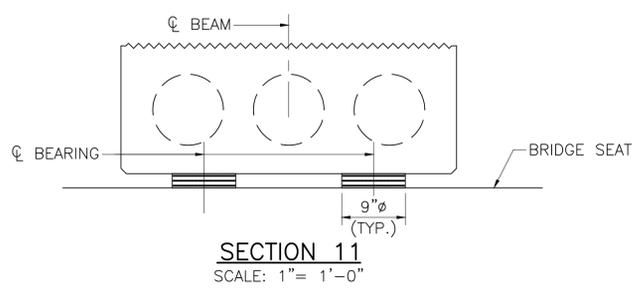
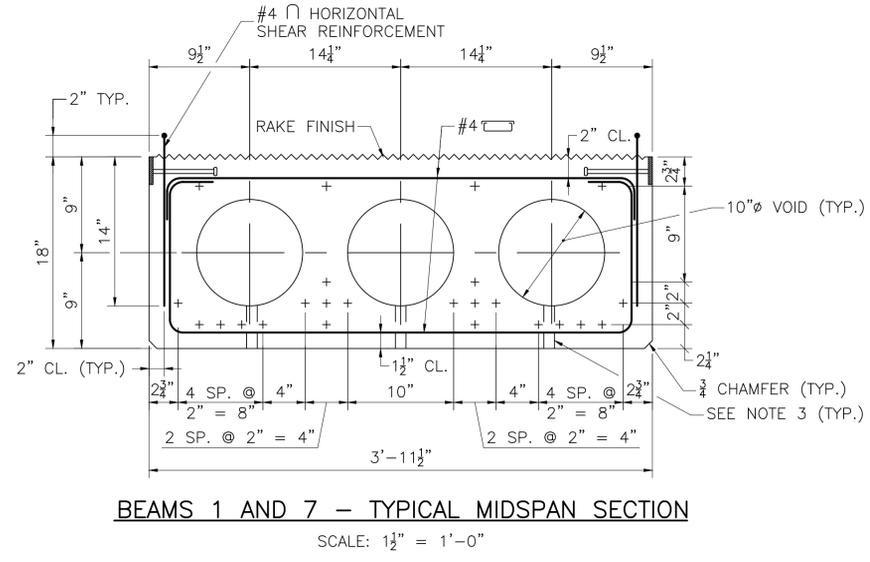
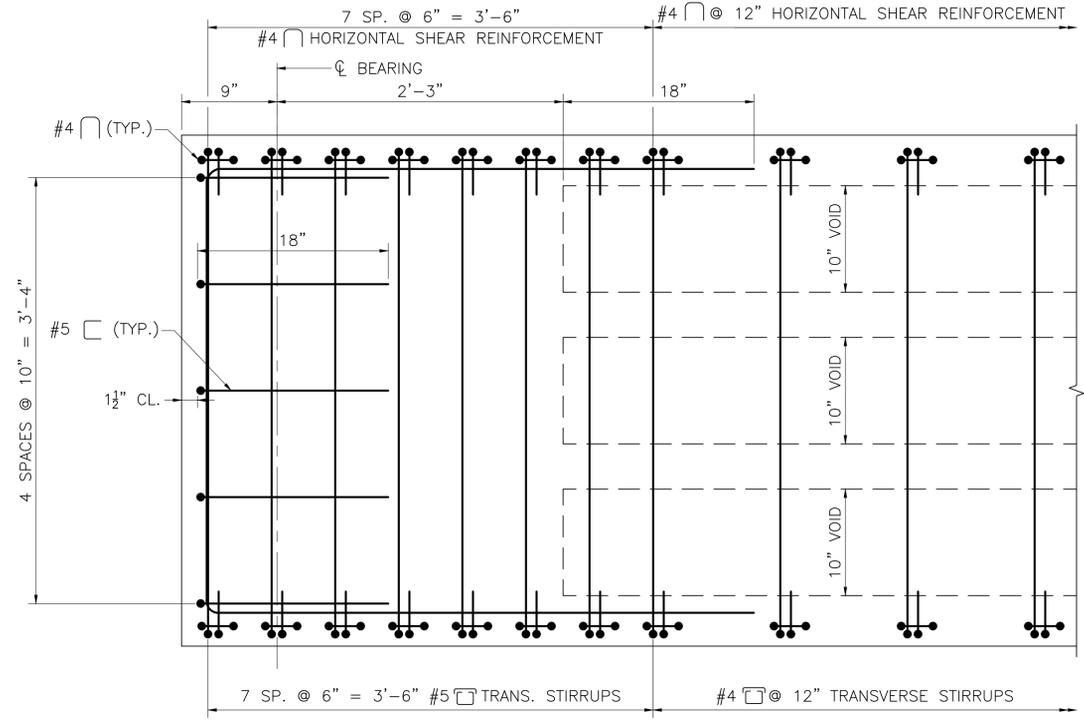
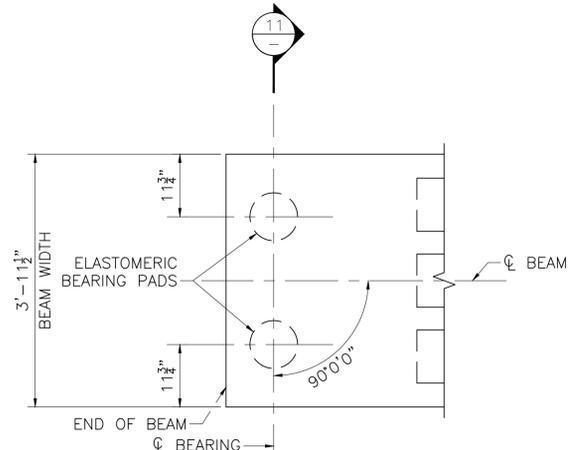
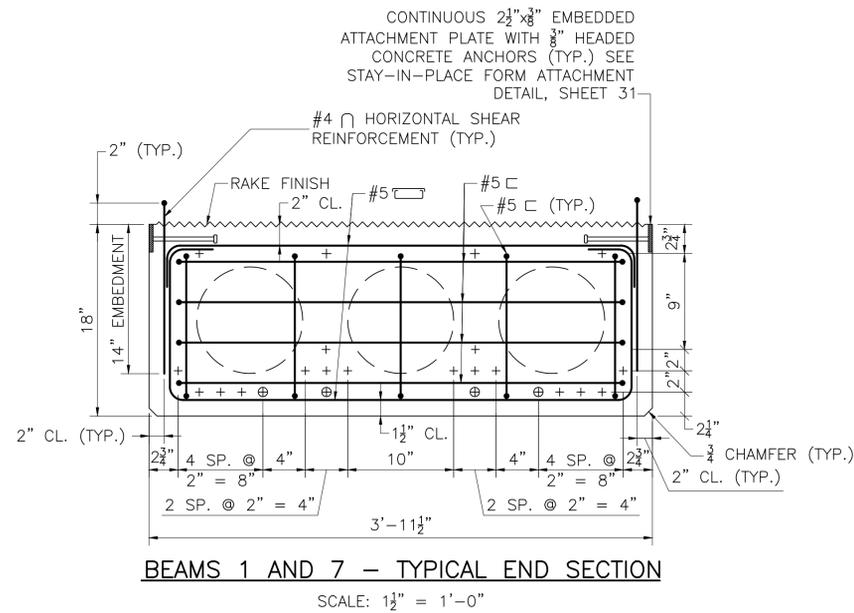


FRAMING PLAN
SCALE: 1/8" = 1'-0"

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	68	85
PROJECT FILE NO.		608460	

BEAM DETAILS I



- BEAM SECTION NOTES:**
- + DENOTES STRAIGHT STRANDS.
 - ⊕ DENOTES DEBONDED STRANDS.
 - 1" ∅ DRAIN, PLACED AT BOTH ENDS OF VOIDS.
 - SEE END OF BEAM PLAN FOR STIRRUP SPACING.
 - THE DEBONDED STRANDS SHALL BE DEBONDED OVER THE BEGINNING AND END 6'-0" OF THE BEAM.

- NOTES:**
- ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
 - STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
 - 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.

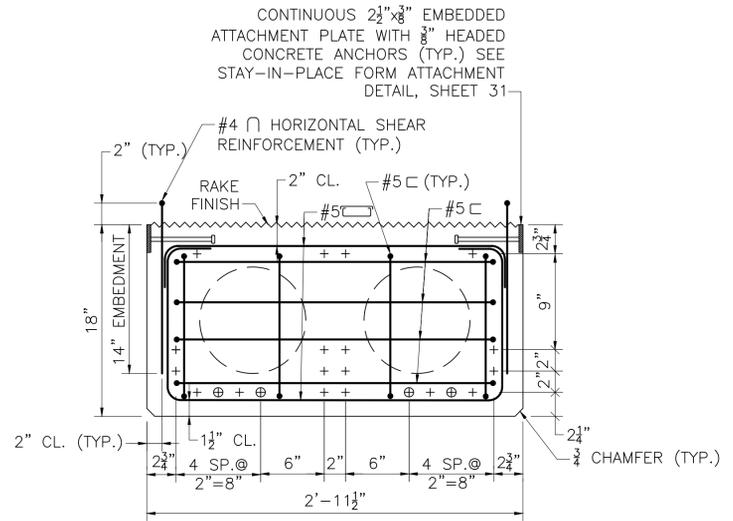
- NOTE:**
- ONLY FULLY BONDED STRANDS IN THE BOTTOM ROW SHALL BE EXTENDED INTO THE CONTINUITY DIAPHRAGM
- PRESTRESS NOTE:**
- SEE SHEET 27 FOR ADDITIONAL NOTES

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
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608460_BEAM DETAILS I(DWG) 14-MARCH-2024

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

BEAM DETAILS II

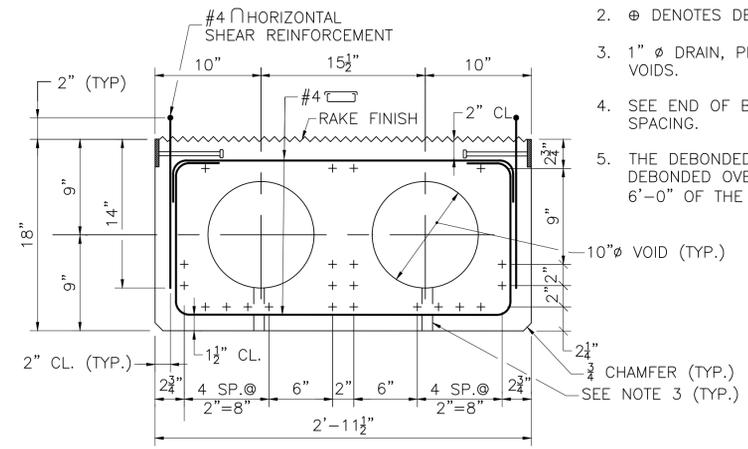


INTERIOR BEAMS 2 THROUGH 6 TYPICAL END SECTION

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

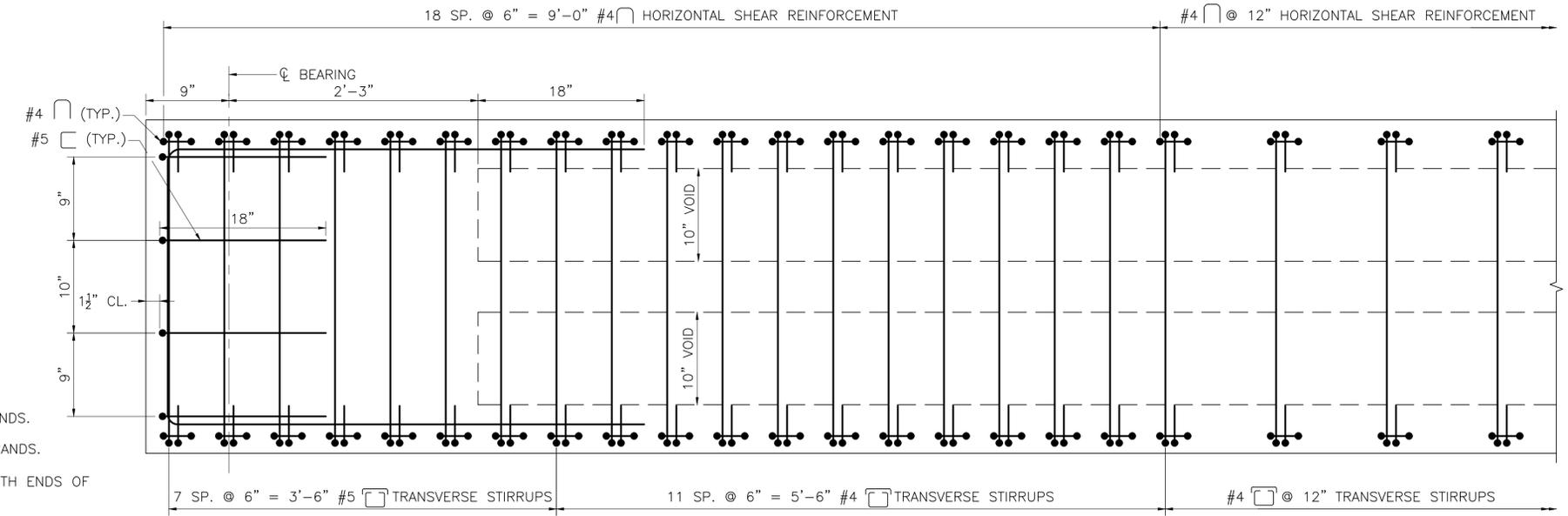
BEAM SECTION NOTES:

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



INTERIOR BEAMS 2 THROUGH 6 TYPICAL MIDSPAN SECTION

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

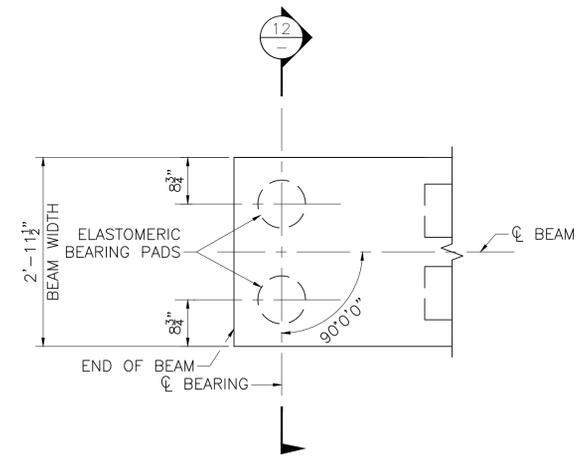


INTERIOR BEAMS 2 THROUGH 6 END OF BEAM PLAN

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

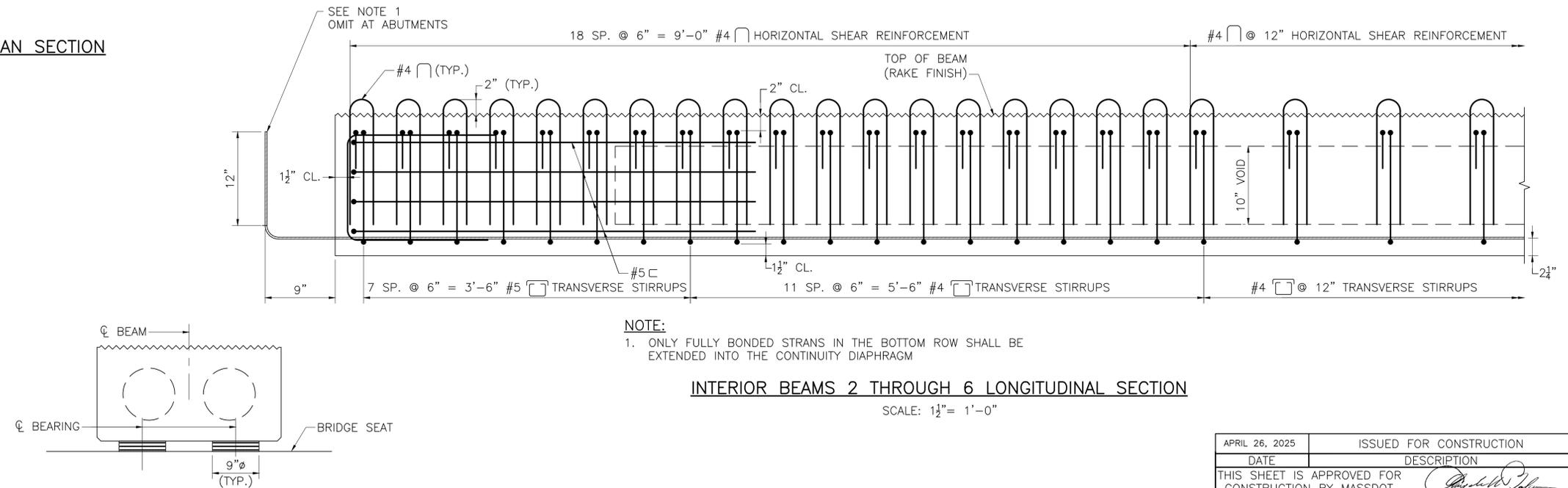
PRESTRESS NOTES:

- ALL PRETENSIONING ELEMENTS SHALL BE 0.6"Ø, UNCOATED, SEVEN-WIRE, LOW RELAXATION STEEL STRANDS AND SHALL CONFORM TO AASHTO M 203.
- THE NOMINAL TENSILE STRENGTH OF THE PRETENSIONING STRANDS SHALL BE 270 KSI.
- THE INITIAL TENSION PER 0.6"Ø STRAND SHALL BE 44 KIPS.
- THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE **6500-PSI**.
- 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.
- THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKED FINISH (1/4" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
- 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.



BEAMS 2 THROUGH 6 BEARING PLAN

SCALE: 3/4" = 1'-0"

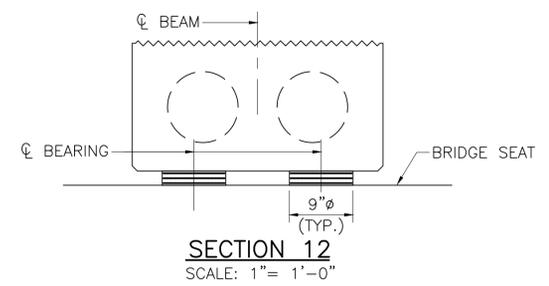


INTERIOR BEAMS 2 THROUGH 6 LONGITUDINAL SECTION

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

NOTE:

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



SECTION 12

SCALE: 1" = 1'-0"

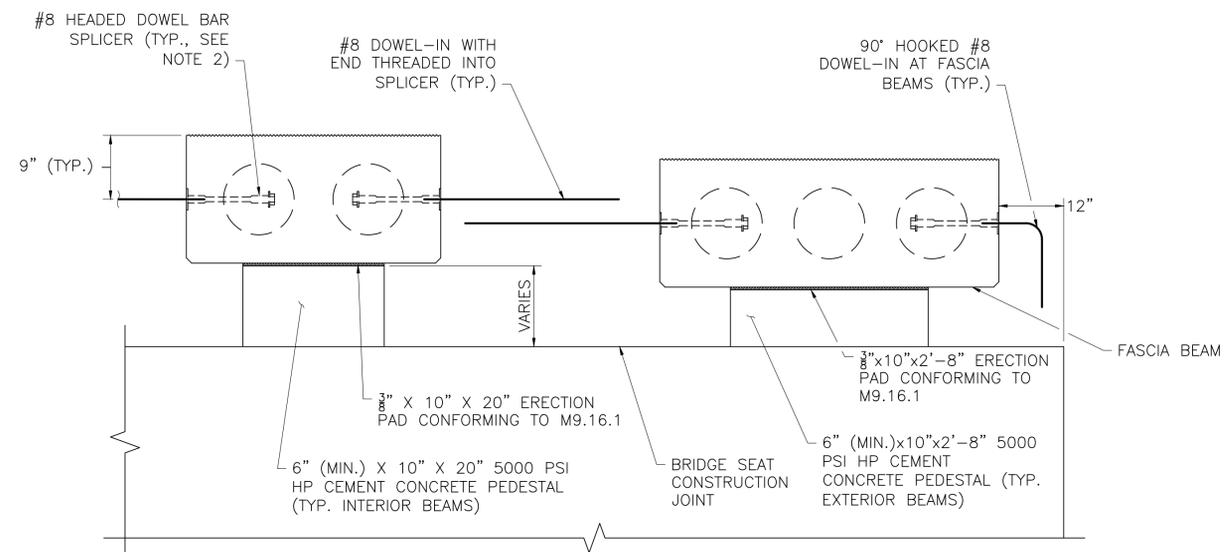
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_BEAM DETAILS II.DWG 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	70	85
PROJECT FILE NO.		608460	

BEAM DETAILS III



BEAM END DETAILS AT ABUTMENTS

SCALE: 1" = 1'-0"

NOTES:

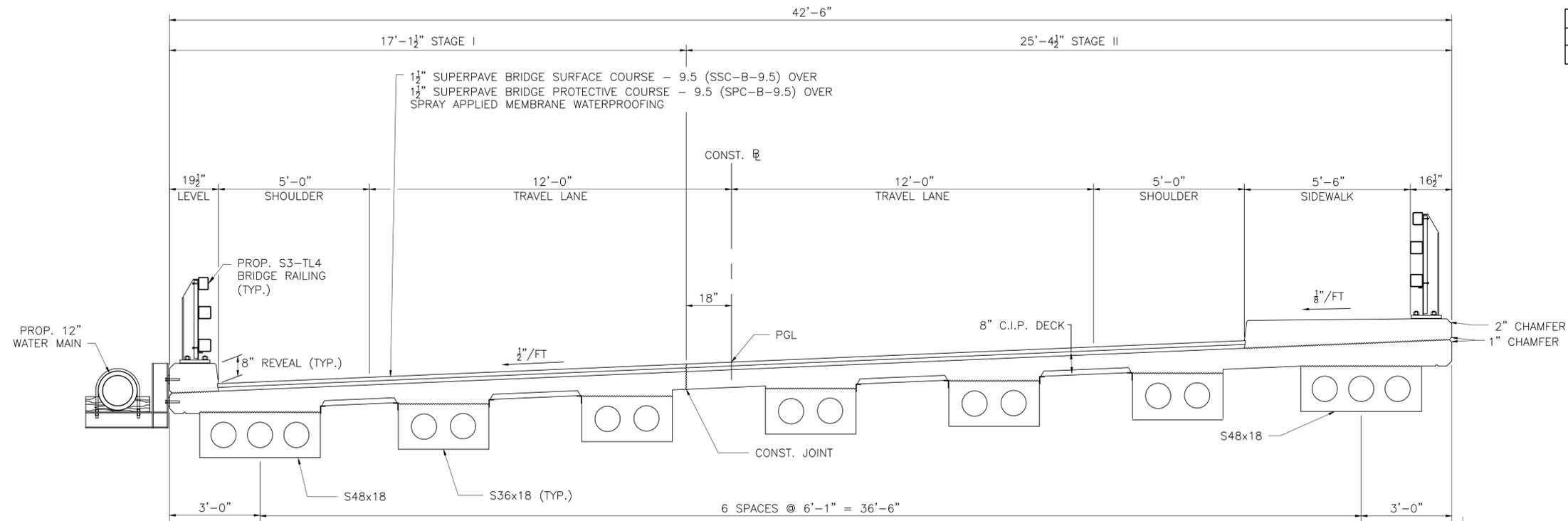
1. THE LATERAL STABILITY OF THE BEAMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR DURING ERECTION AND CONSTRUCTION. A LATERAL SUPPORT SYSTEM SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN AND BRIDGE CONSTRUCTION SPECIFICATIONS.
2. #8 HEADED DOWEL BAR SPLICERS SHALL 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.

APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
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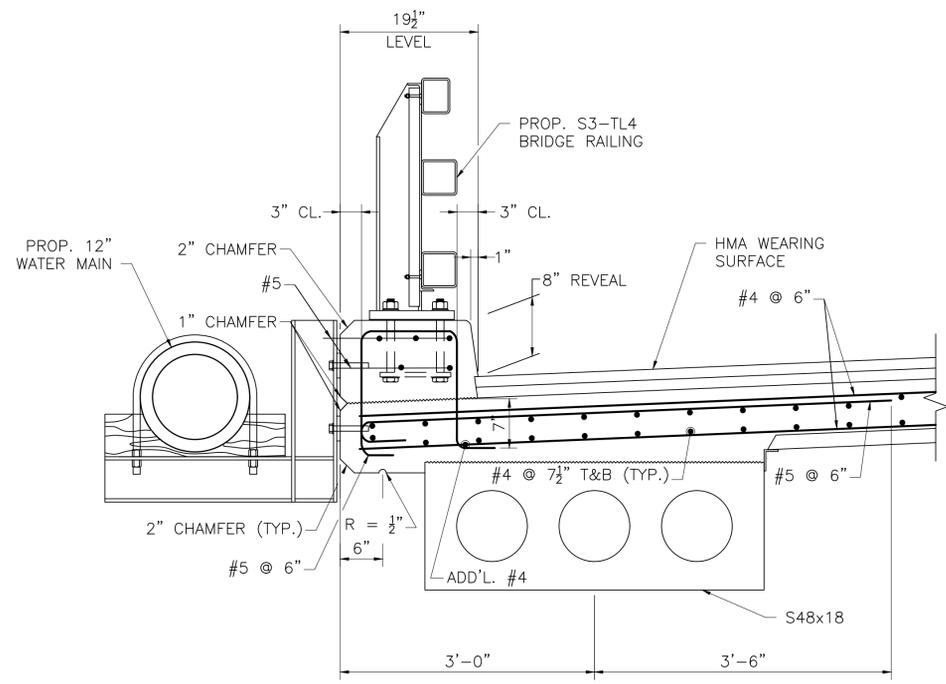
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	71	85
PROJECT FILE NO.		608460	

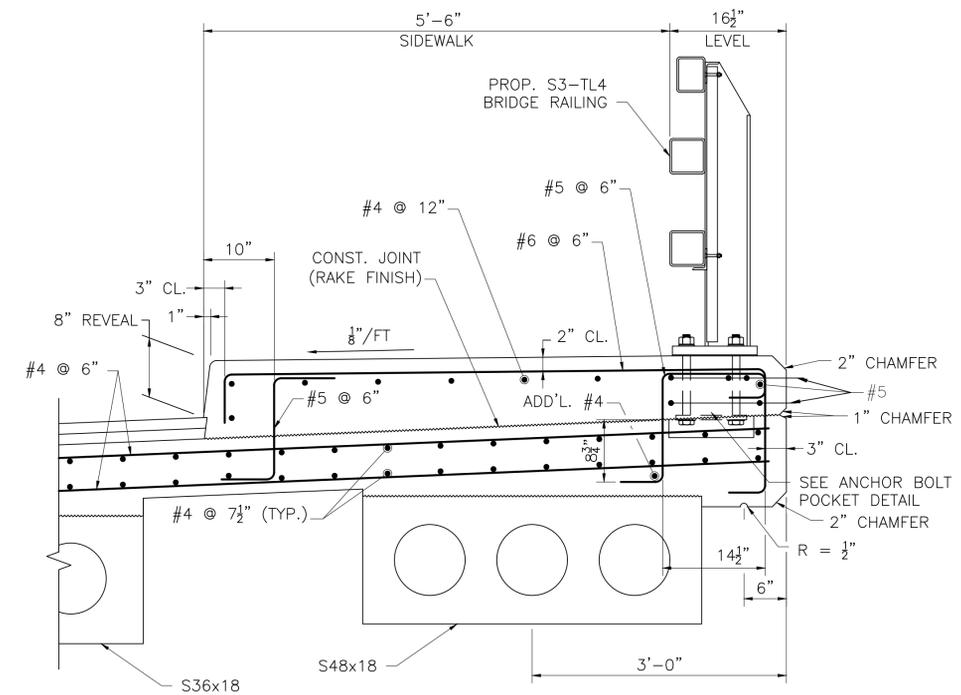
TYPICAL SECTIONS



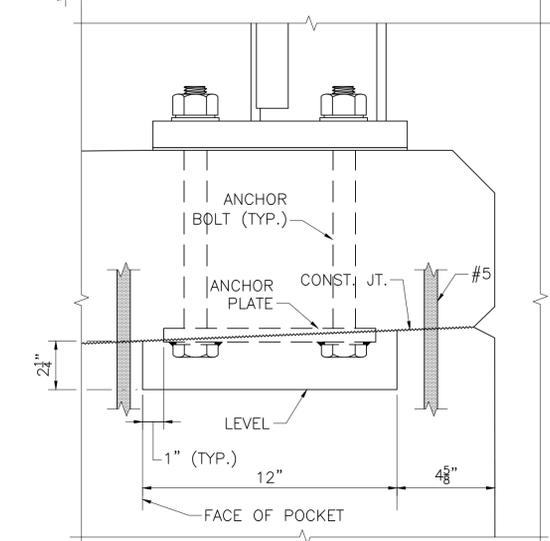
TRANSVERSE SECTION
SCALE: 1/2" = 1'-0"



WEST SAFETY CURB SECTION
SCALE: 1" = 1'-0"



EAST SIDEWALK SECTION
SCALE: 1" = 1'-0"



NOTE:
PROVIDE 15 3/4" LONG, 11 1/4" WIDE, 2 1/4" DEEP POCKET IN THE DECK SLAB AT THE LOCATION OF EACH RAIL POST.

ANCHOR BOLT POCKET AT SIDEWALK
SCALE: 3" = 1'-0"

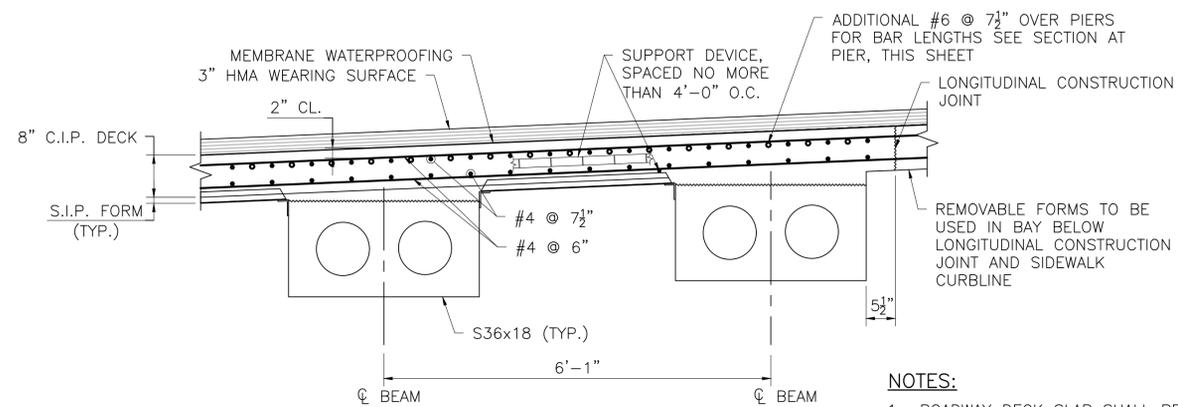
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_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	72	85
PROJECT FILE NO.		608460	

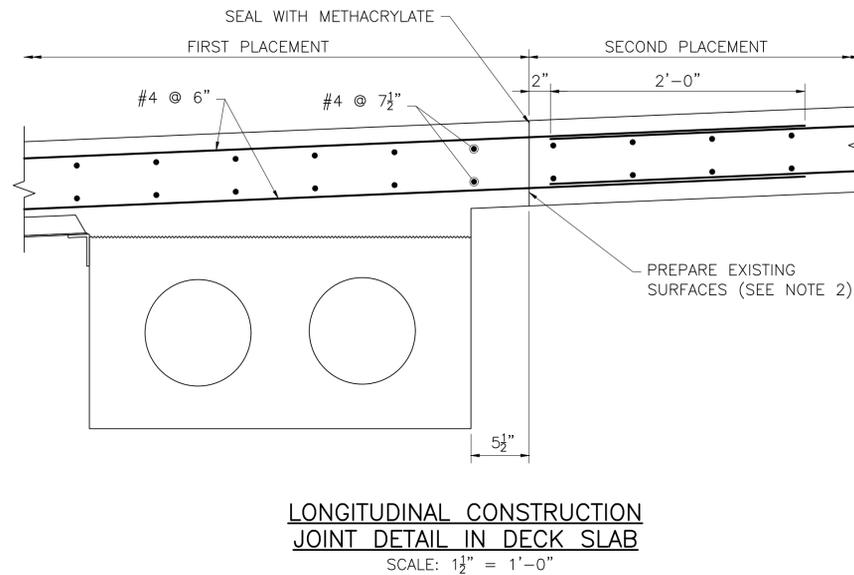
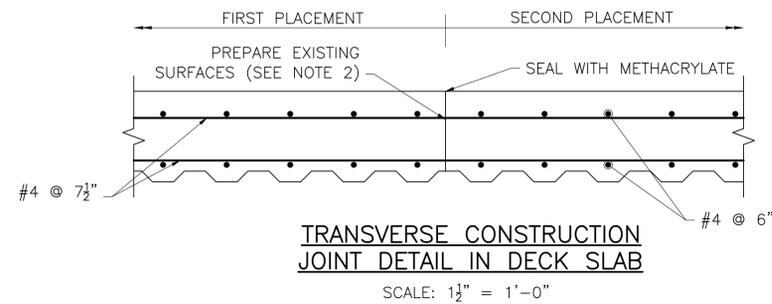
DECK DETAILS I



TYPICAL DECK REINFORCEMENT
SCALE: 3/4" = 1'-0"

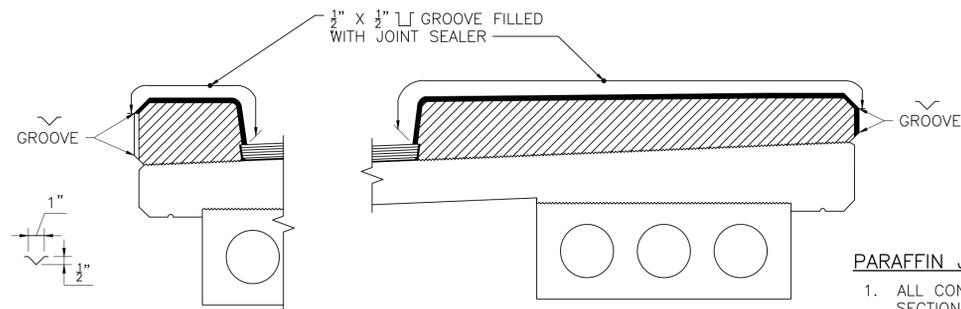
NOTES:

1. ROADWAY DECK SLAB SHALL BE 5000 PSI HP CEMENT CONCRETE.
2. LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE CL OF CONSTRUCTION. TRANSVERSE (PRIMARY) REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE CL 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.



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.



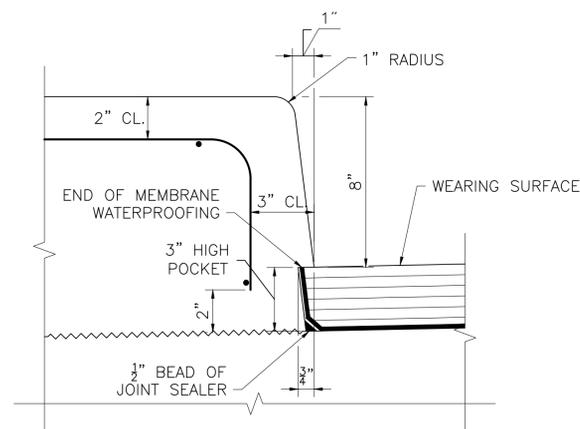
SAFETY CURB

SIDEWALK

PARAFFIN JOINT DETAILS
SCALE: 3/4" = 1'-0"

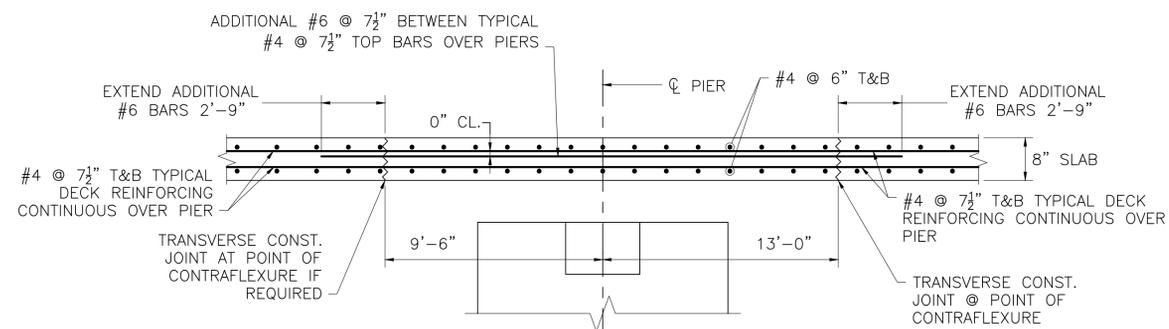
PARAFFIN JOINT NOTES:

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.

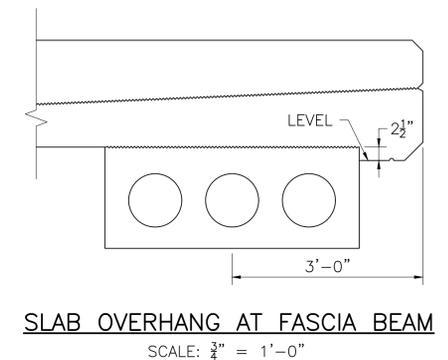


NOTES:
TURN MEMBRANE UP INTO 3" HIGH POCKET.

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



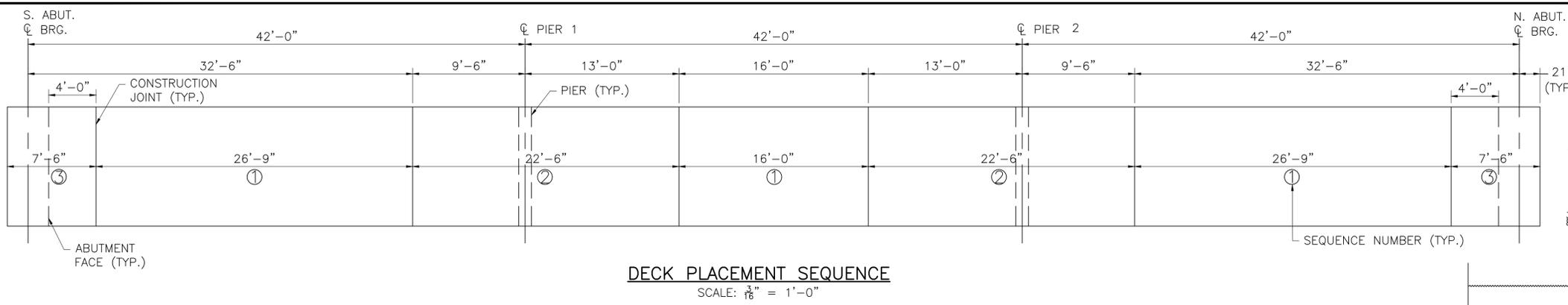
DECK SECTION AT PIER
(PIER 1 SHOWN, PIER 2 MIRRORED)
NOT TO SCALE



SLAB OVERHANG AT FASCIA BEAM
SCALE: 3/4" = 1'-0"

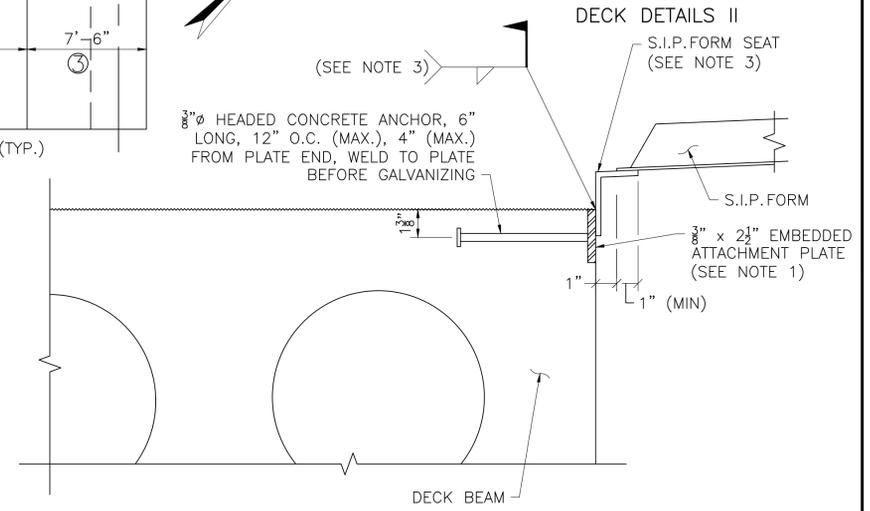
APRIL 26, 2025	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

608460_BR28 (H-01-005)_DECK DETAILS.DWG 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	73	85
PROJECT FILE NO.		608460	



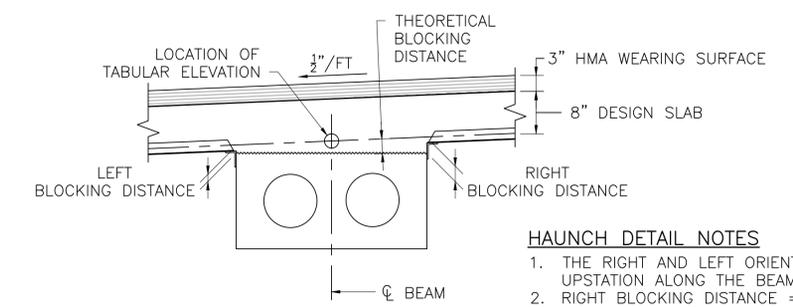
- NOTE:**
- EMBEDDED ATTACHMENT PLATES SHALL BE HOT-DIP GALVANIZED AASHTO M 270 GRADE 36 STEEL. THE PLATES SHALL BE IN LENGTHS FROM 3' TO 12' WITH PIECES BUTTED TOGETHER WITHOUT END CONNECTIONS FOR FULL LENGTH OF BEAM. THE HEADED ANCHORS SHALL BE ATTACHED TO THE PLATES PRIOR GALVANIZING.
 - HEADED ANCHORS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

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

BEAM NO.	INCREASING STATIONS →														
	SPAN 1				SPAN 2					SPAN 3					
	CL BRG. S. ABUT.	1/4 PT.	1/2 PT.	3/4 PT.	CL BRG. PIER 1	CL BRG. PIER 1	1/4 PT.	1/2 PT.	3/4 PT.	CL BRG. PIER 2	CL BRG. PIER 2	1/4 PT.	1/2 PT.	3/4 PT.	CL 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.

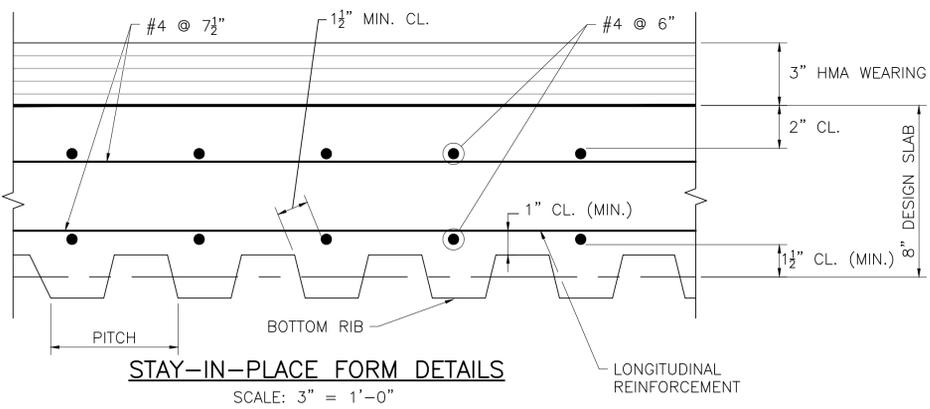
STAY-IN-PLACE FORM ATTACHMENT DETAIL
SCALE: 3" = 1'-0"



- HAUNCH DETAIL NOTES**
- THE RIGHT AND LEFT ORIENTATION IS TAKEN LOOKING UPSTATION ALONG THE BEAM.
 - RIGHT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "R"
 - LEFT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "L"

HAUNCH DETAIL
SCALE: 3/4" = 1'-0"

"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"

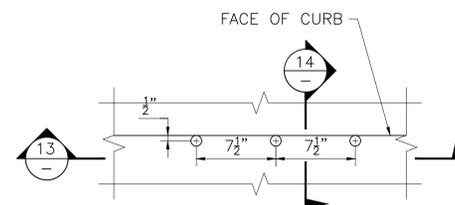


- S.I.P. FORM DETAILS NOTES :**
- FOR 2" S.I.P. FORM, SET BOTTOM OF FORM 1" BELOW ELEVATION GIVEN IN TABLE. FOR 3" S.I.P. FORM, SET BOTTOM OF FORM 1 1/2" BELOW TABLE ELEVATIONS.
 - FORM ENDS SHALL BE CRIMPED CLOSED IN A TAPERED MANNER. SEPARATE END CLOSURE PIECES WILL NOT BE ALLOWED.
 - SUPPORT ANGLES 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.
 - ALL MAIN STEEL REINFORCEMENT IN THE LOWER MAT SHALL BE CENTERED OVER THE VALLEY OF THE S.I.P. FORM.
 - CONTRACTOR SHALL DESIGN AND DETAIL ALL ELEMENTS OF THE FORMING SYSTEM AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.
 - 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.

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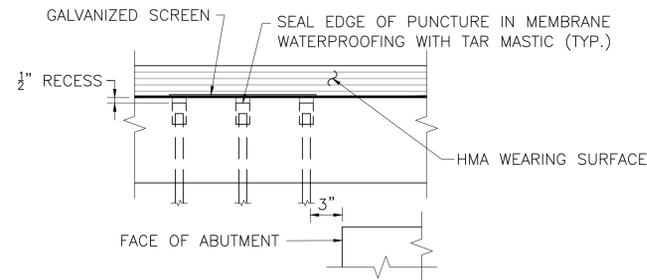
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-0N)-003S(813)X	74	85
PROJECT FILE NO.		608460	

MISCELLANEOUS DETAILS



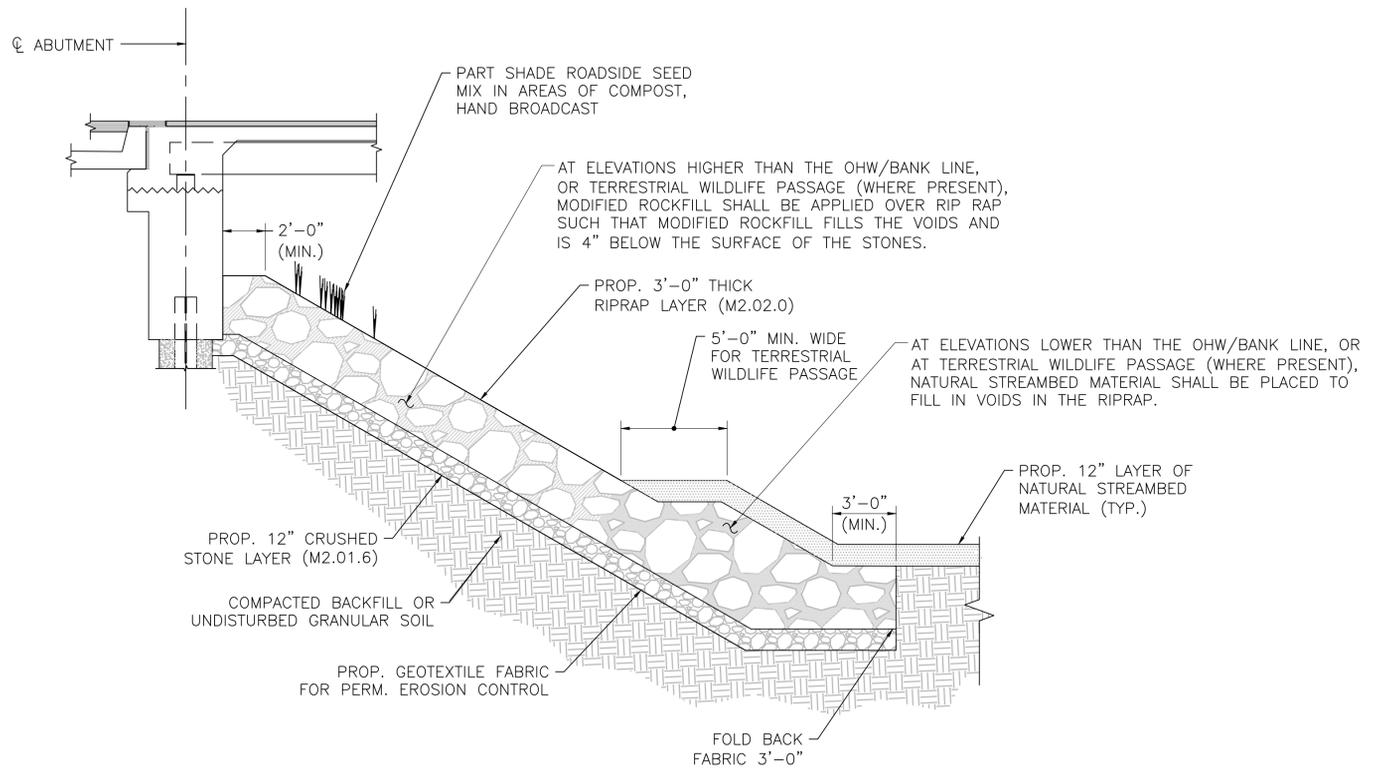
DECK PLAN

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



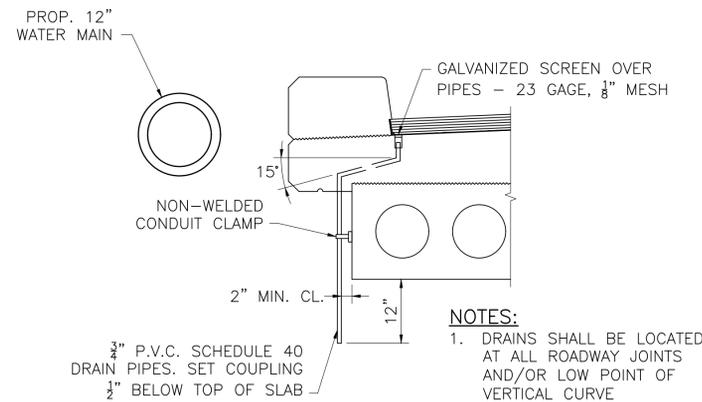
SECTION 13

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



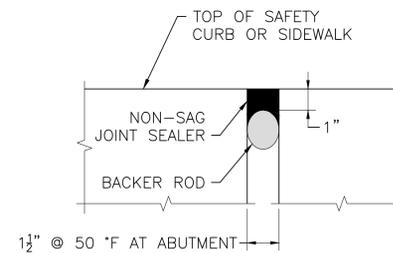
RIPRAP DETAIL

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



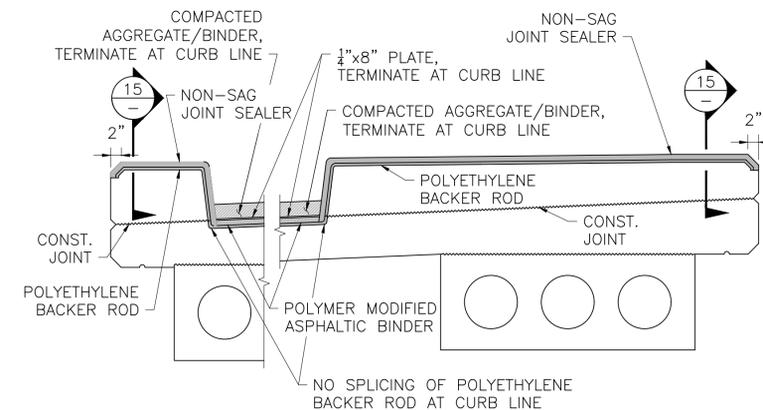
SECTION 14
DECK DRAIN PIPES AT SAFETY CURB

SCALE: 3/4" = 1'-0"



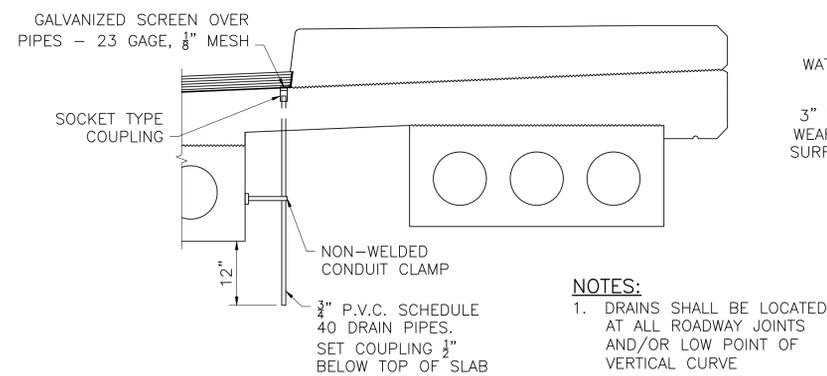
SECTION 15

SCALE: 3" = 1'-0"



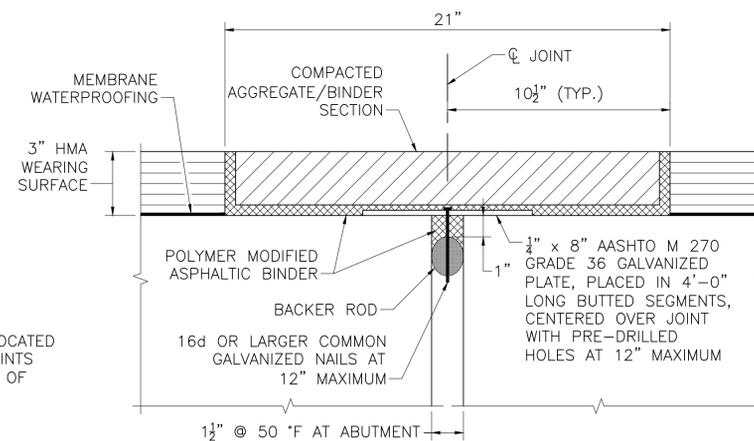
SAFETY CURB JOINT DETAIL AT S3-TL4 RAILING

SCALE: 3/4" = 1'-0"



SECTION 14
DECK DRAIN PIPES AT SIDEWALK

SCALE: 3/4" = 1'-0"



ASPHALTIC BRIDGE JOINT DETAIL

SCALE: 3" = 1'-0"

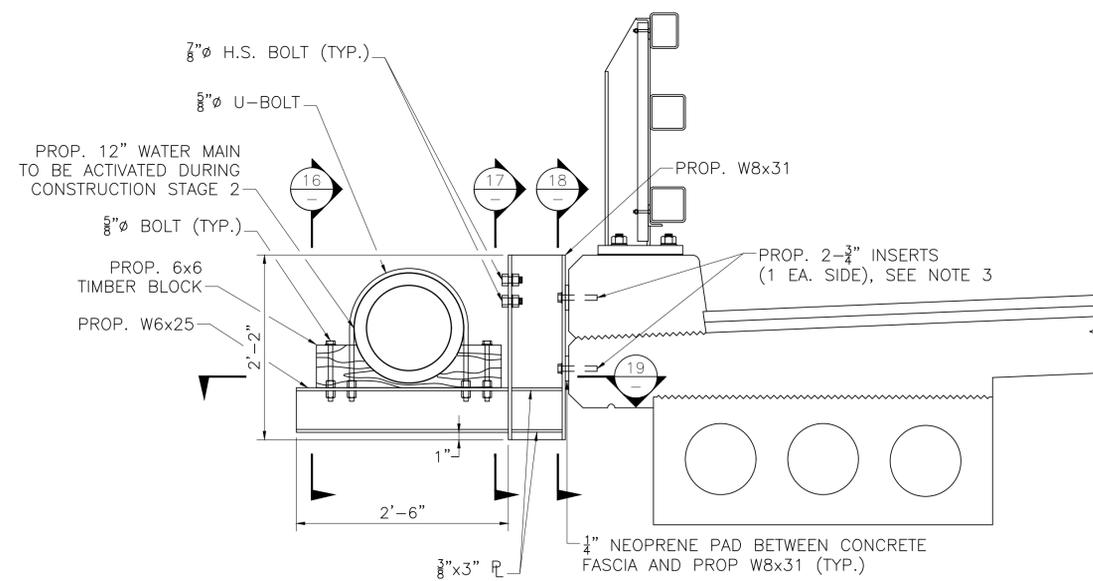
JOINT CONSTRUCTION NOTES:

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.

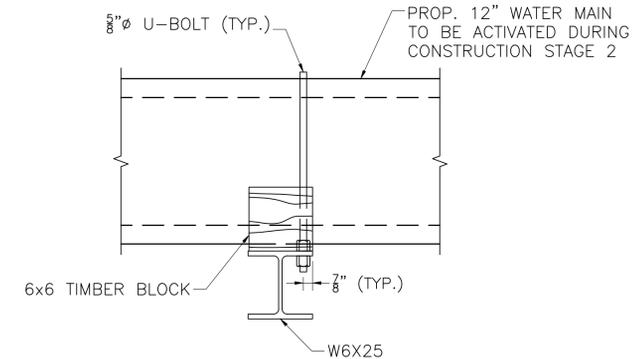
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MA	NHP(BRR-ON)-003S(813)X	75	85
PROJECT FILE NO.		608460	

UTILITY SUPPORT DETAILS

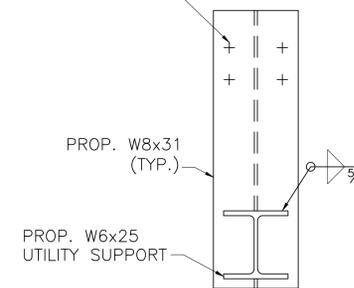


UTILITY SUPPORT DETAIL
SCALE: 1" = 1'-0"

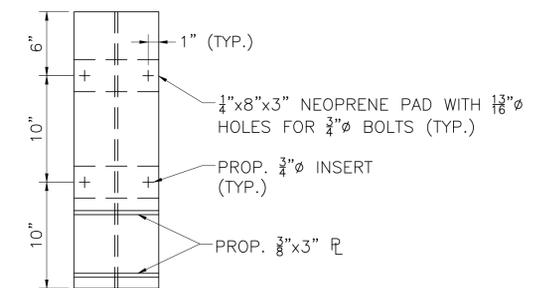


SECTION 16
SCALE: 1 1/2" = 1'-0"

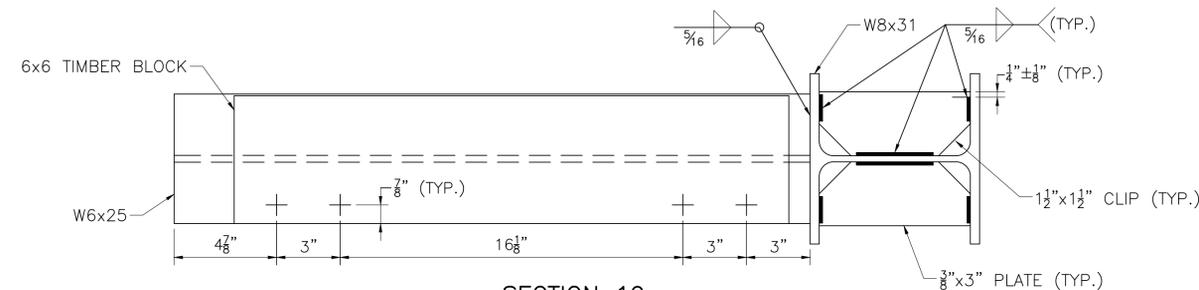
PROP. 7/8 inch H.S. BOLT IN 1 5/8 inch HOLE USED FOR TEMPORARY WALKWAY SUPPORT, SEE NEXT SHEET (TYP.)



SECTION 17
SCALE: 1 1/2" = 1'-0"



SECTION 18
SCALE: 1 1/2" = 1'-0"



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

UTILITY SUPPORT NOTES:

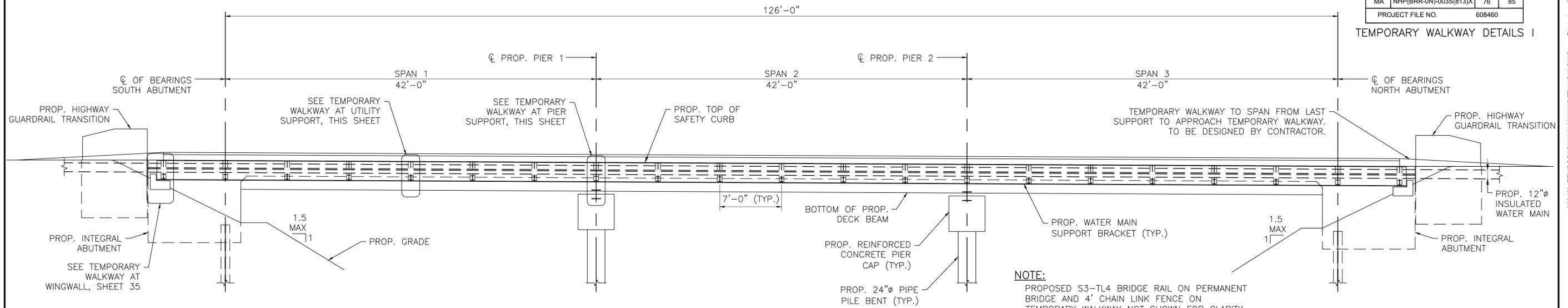
1. ALL STRUCTURAL STEEL SHALL USED IN UTILITY SUPPORT DETAILS CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M270 (ASTM A709) GRADE 50 AND SHALL REQUIRE CHARPY V NOTCH TESTING.
2. ALL UTILITY SUPPORTS SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STANDARD 595B, COLOR NO. 10045).
3. PROPOSED UTILITY SUPPORT INSERTS SHALL BE DESIGNED TO SUPPORT MINIMUM LOAD OF 5 KIPS IN TENSION AND 2 KIPS IN SHEAR.
4. 3/8 inch 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.

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**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

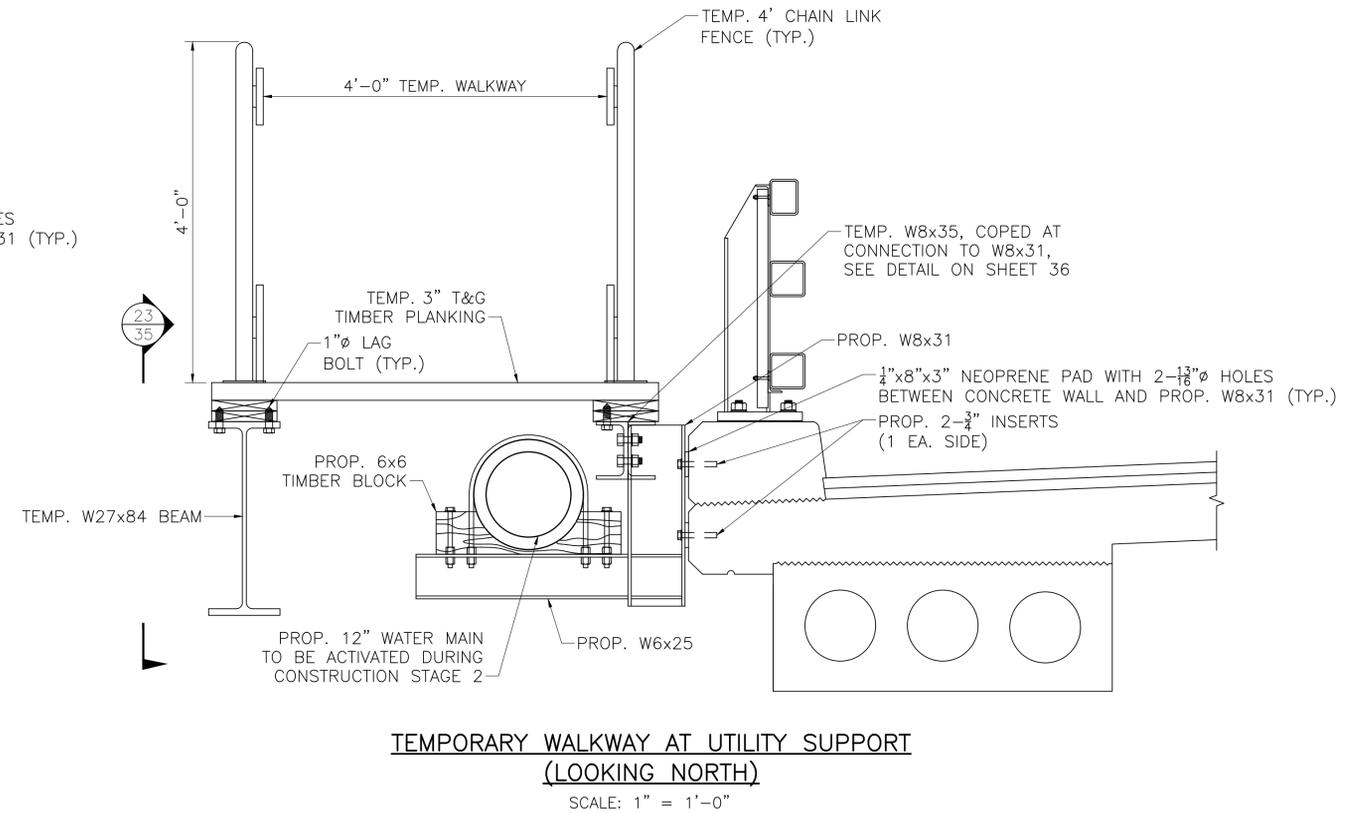
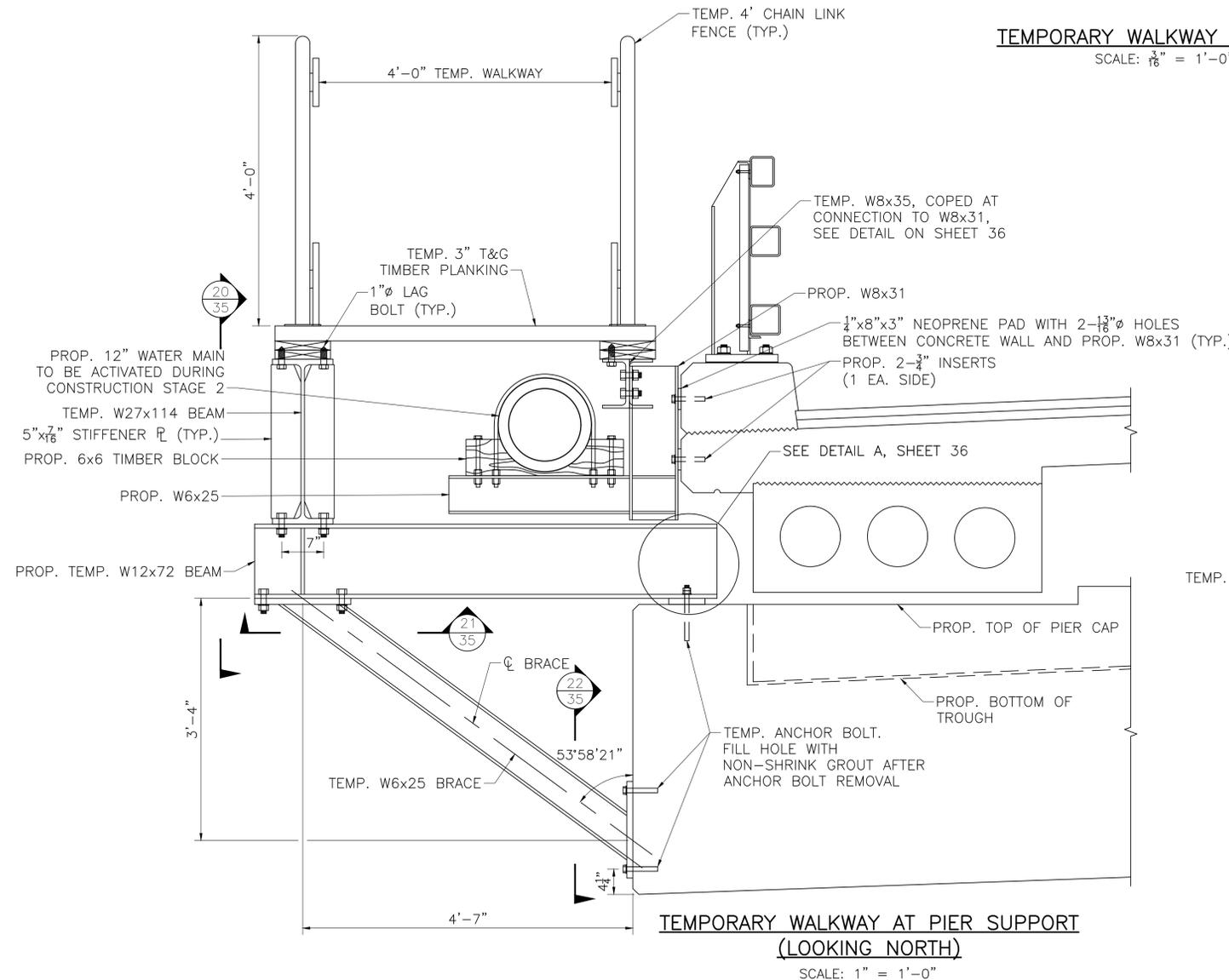
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	76	85
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TEMPORARY WALKWAY DETAILS I



TEMPORARY WALKWAY ELEVATION

SCALE: 1/8" = 1'-0"



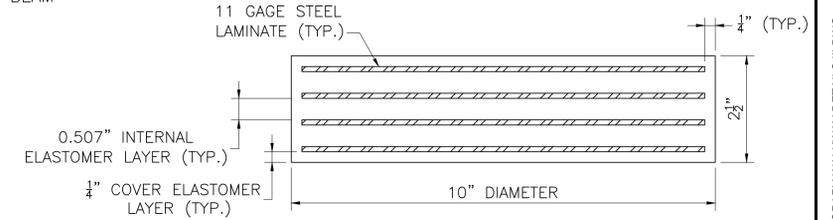
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**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

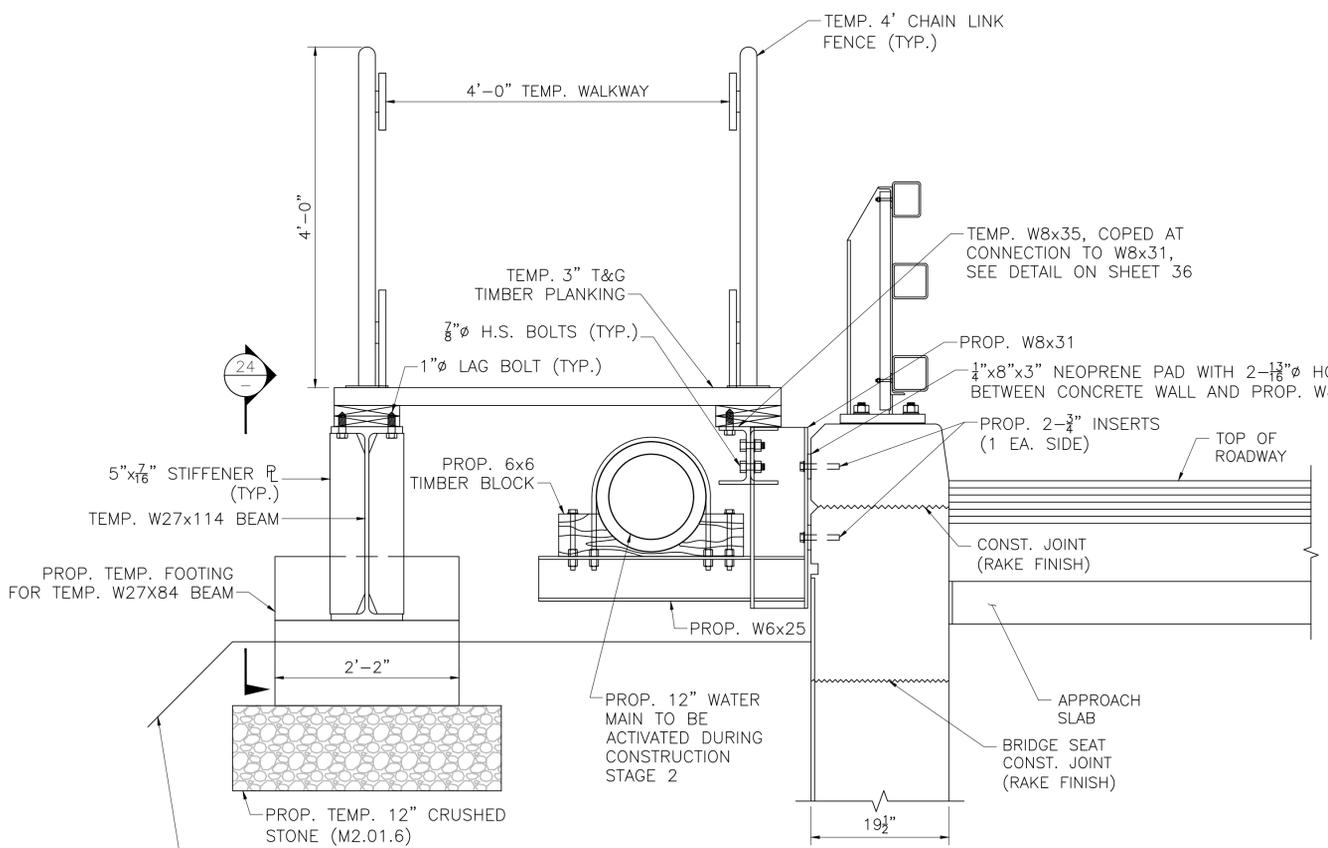
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	77	85
PROJECT FILE NO.		608460	

TEMPORARY WALKWAY DETAILS II



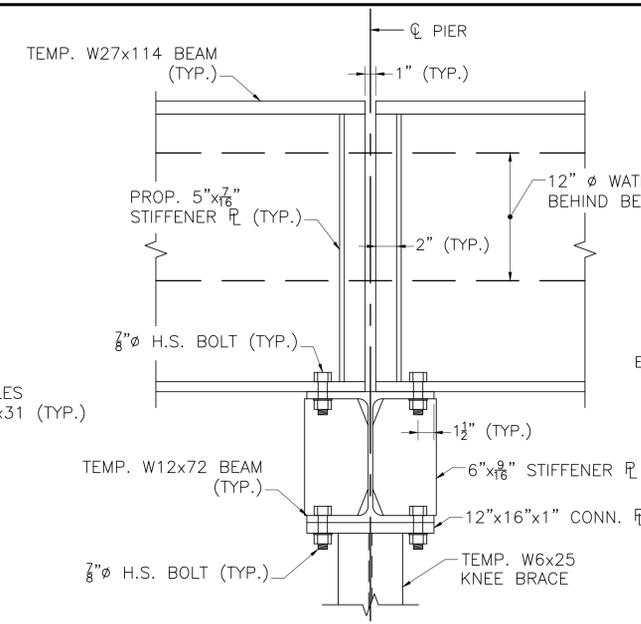
- NOTES:**
- ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
 - STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
 - THE STRENGTH I COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 12.7 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD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

TEMPORARY WALKWAY ELASTOMERIC BEARING PADS
SCALE: 6" = 1'-0"



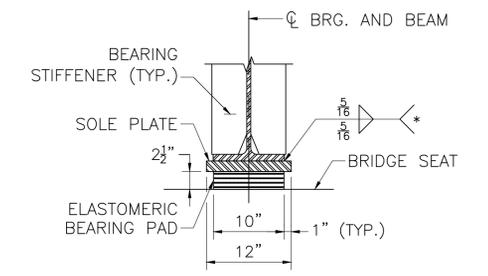
**TEMPORARY WALKWAY AT WINGWALL
(LOOKING NORTH)**

SCALE: 1" = 1'-0"



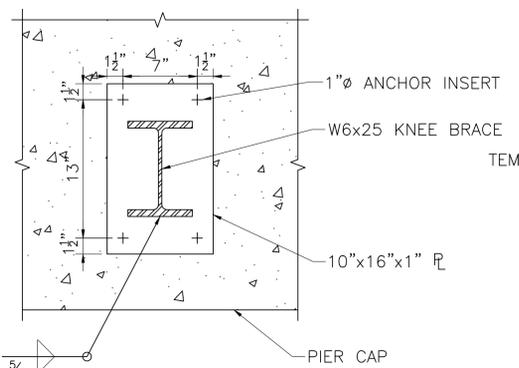
SECTION 20

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



SECTION 21

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

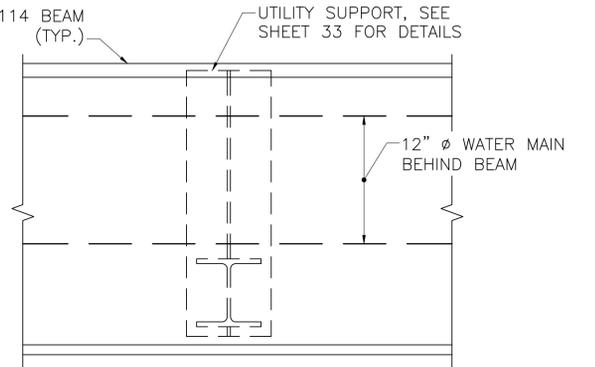


SECTION 22

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

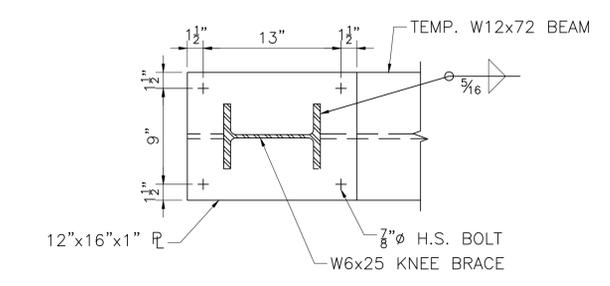
TEMPORARY W27x114 SECTION AT BEARING

SCALE: 1" = 1'-0"



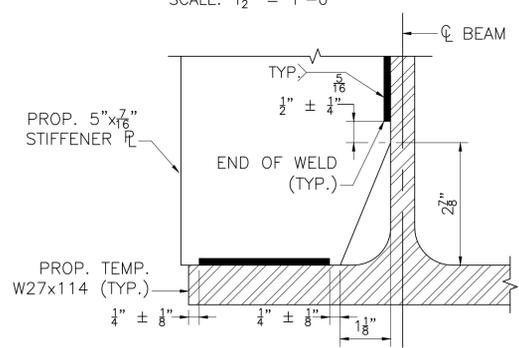
SECTION 23

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



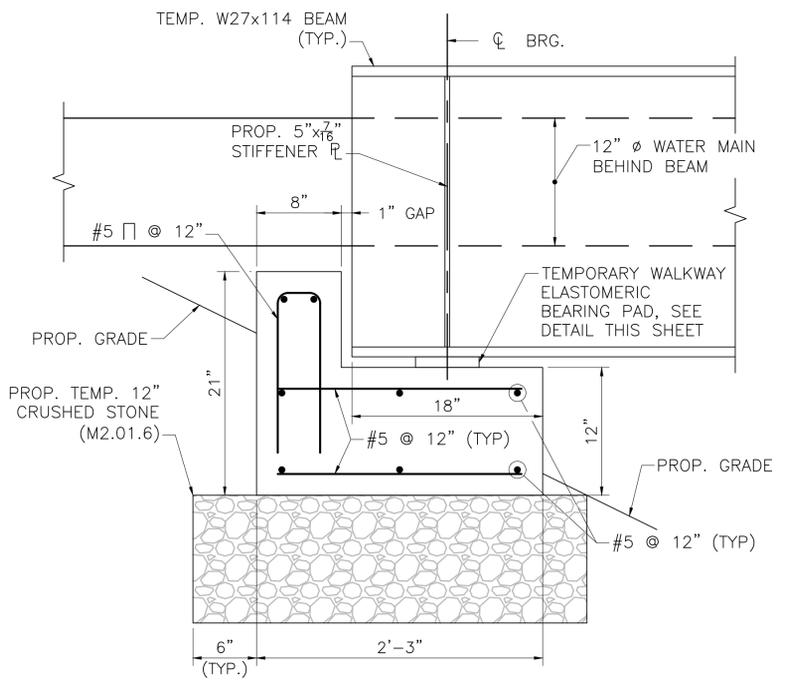
**CLIP DETAIL AT TEMPORARY
W12x72 BEAM STIFFENER PLATES**

SCALE: 6" = 1'-0"



**CLIP DETAIL AT TEMPORARY
W27x114 BEAM STIFFENER PLATES**

SCALE: 6" = 1'-0"



SECTION 24

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

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

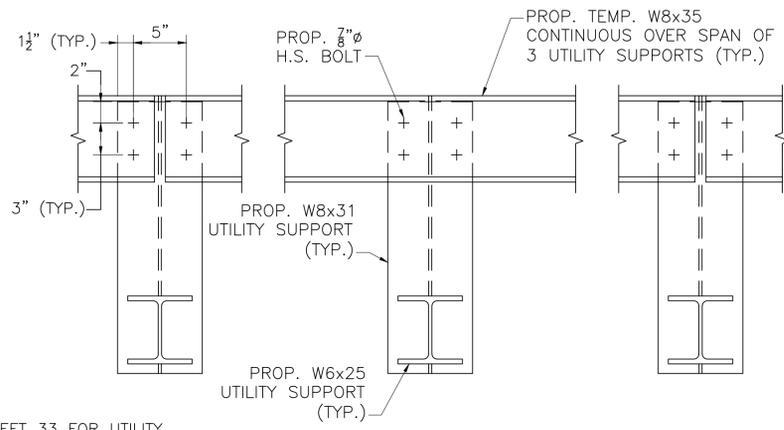
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**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

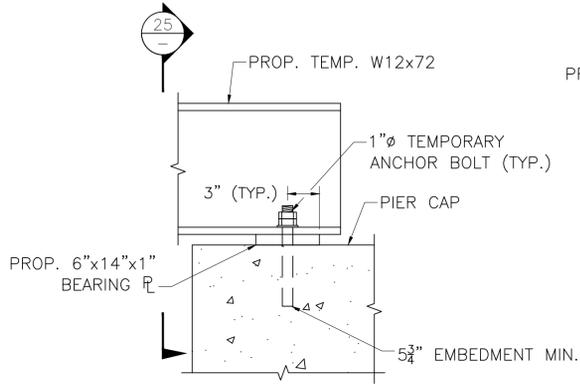
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	78	85
PROJECT FILE NO.		608460	

TEMPORARY WALKWAY DETAILS III

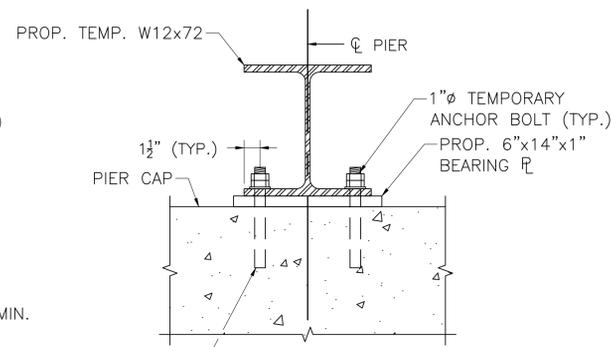


TEMPORARY CONTINUOUS W8X35
SCALE: 1 1/2" = 1'-0"

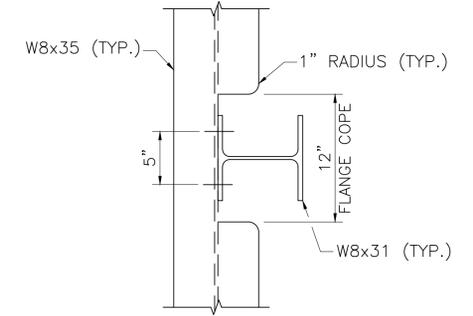
NOTE:
SEE SHEET 33 FOR UTILITY SUPPORT DETAILS



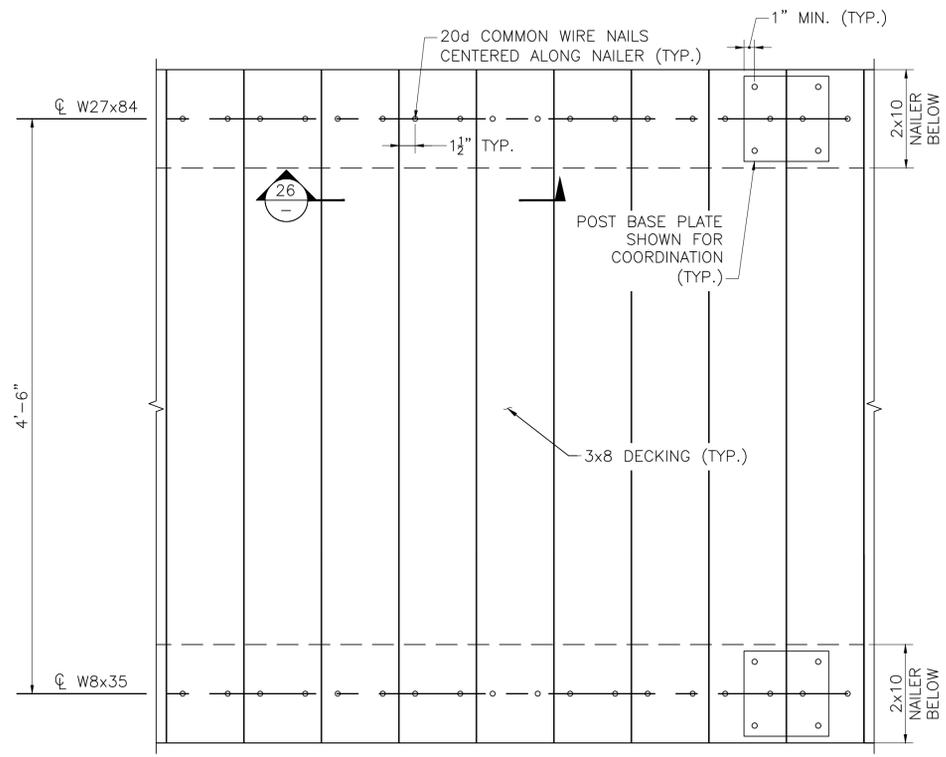
DETAIL A
SCALE: 1 1/2" = 1'-0"



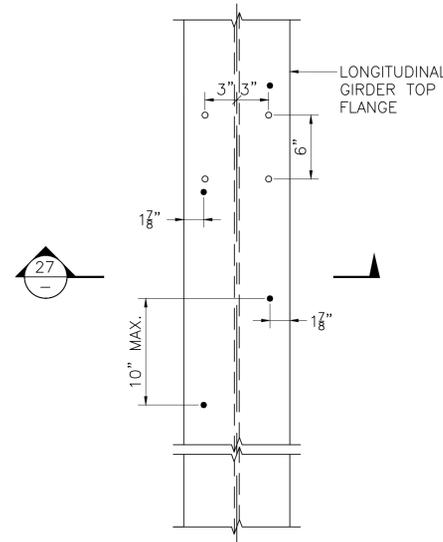
SECTION 25
SCALE: 1 1/2" = 1'-0"



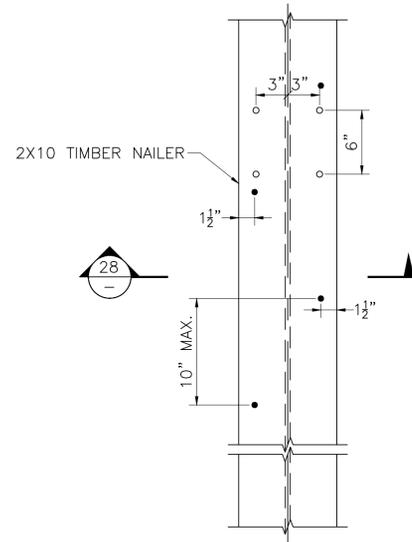
W8X35 FLANGE COPE DETAIL
SCALE: 1 1/2" = 1'-0"



DECK NAILING SCHEDULE
SCALE: 1 1/2" = 1'-0"



GIRDER TOP FLANGE PLAN



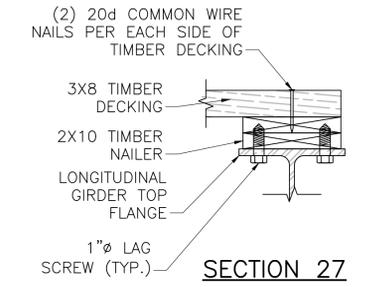
NAILER PLAN

NOTE:

- 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.
- 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.

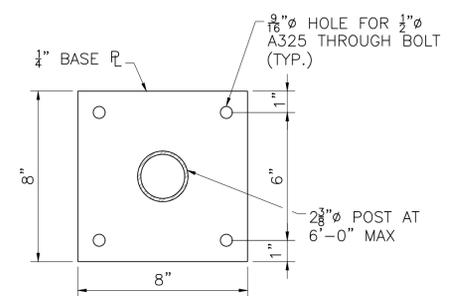
LEGEND:

- 1 1/16" Ø HOLE FOR 1" Ø LAG SCREW
- 9/16" Ø HOLES FOR 1/2" Ø A325 RAILING POST BOLTS

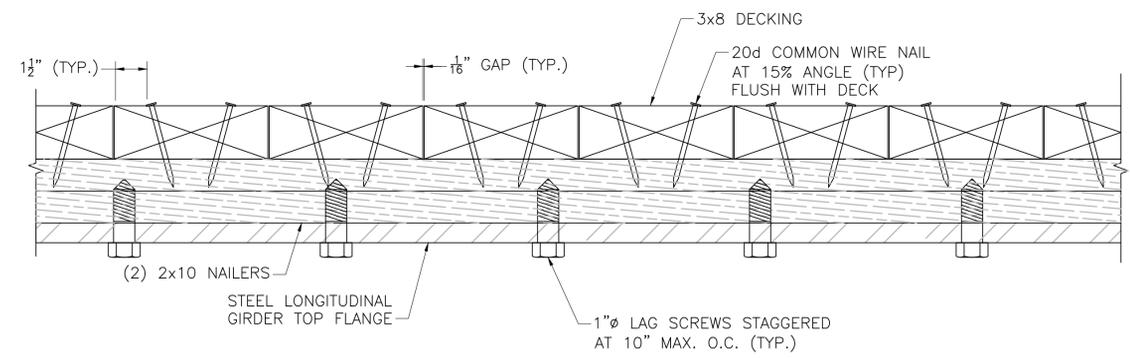


SECTION 27
SCALE: 1 1/2" = 1'-0"

NOTE:
RAILING POST BOLTS NOT SHOWN FOR CLARITY.

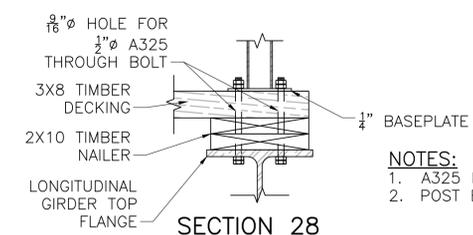


CHAIN LINK FENCE DETAIL
SCALE: 3" = 1'-0"



SECTION 26
SCALE: 3" = 1'-0"

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



SECTION 28
SCALE: 1 1/2" = 1'-0"

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

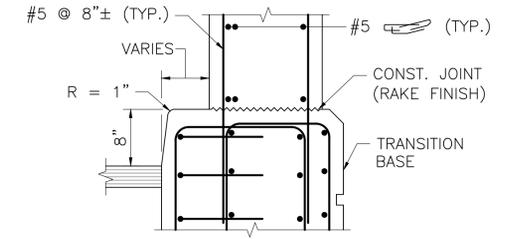
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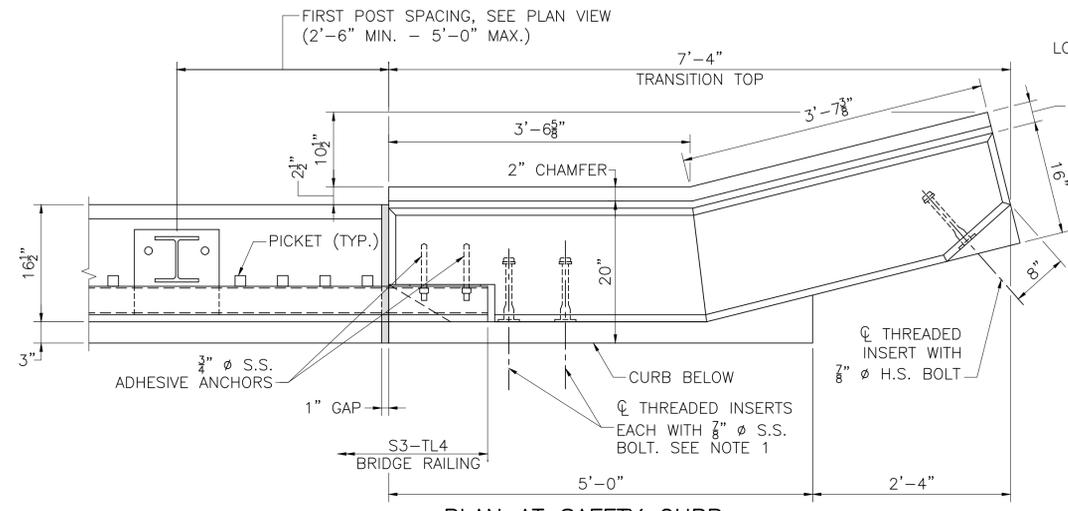
**HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(813)X	79	85
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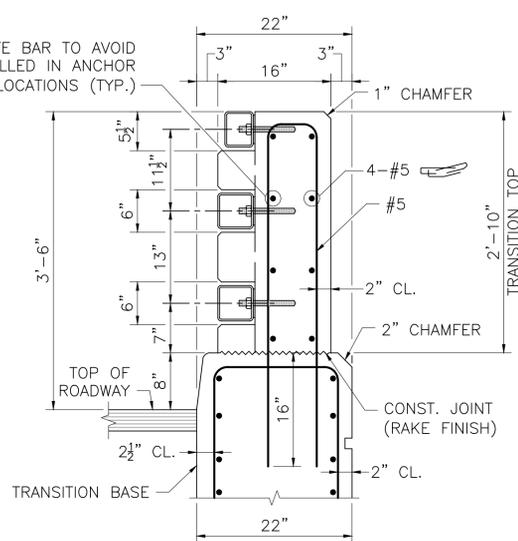
**HIGHWAY GUARDRAIL
TRANSITION DETAILS**



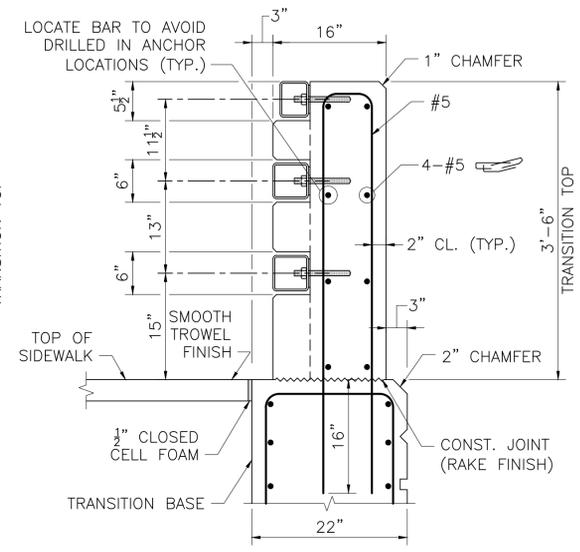
SECTION 32 AT SAFETY CURB
SCALE: 1" = 1'-0"



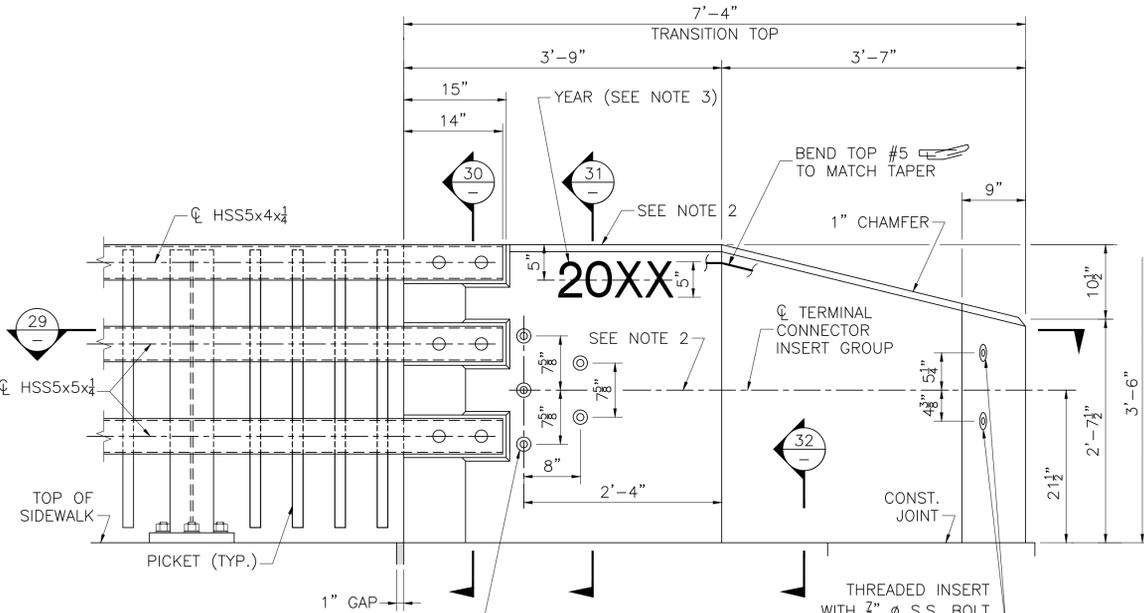
PLAN AT SAFETY CURB
SCALE: 1" = 1'-0"



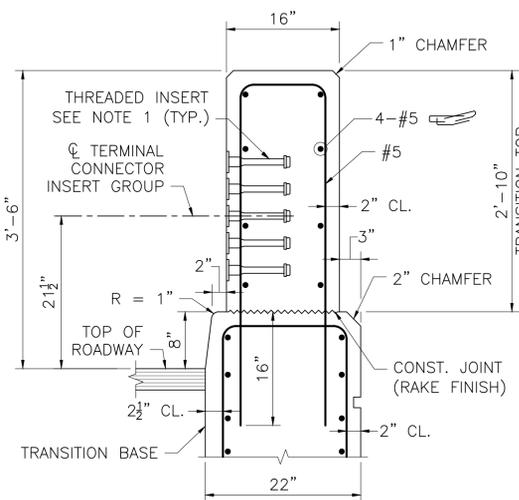
SECTION 30 AT SAFETY CURB
SCALE: 1" = 1'-0"



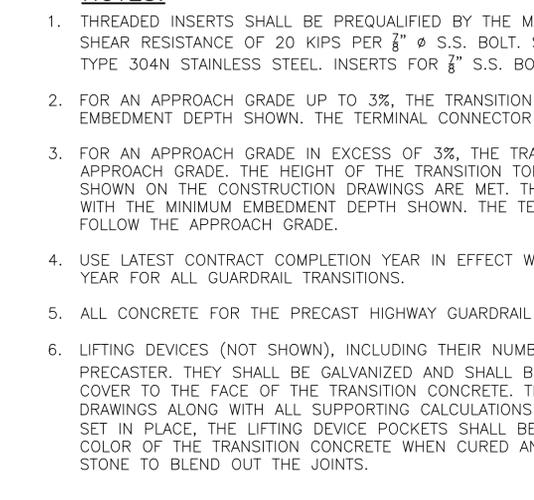
SECTION 30 AT SIDEWALK
SCALE: 1" = 1'-0"



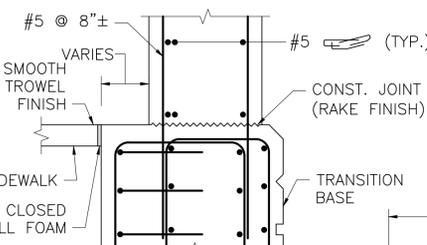
ELEVATION AT SIDEWALK
SCALE: 1" = 1'-0"



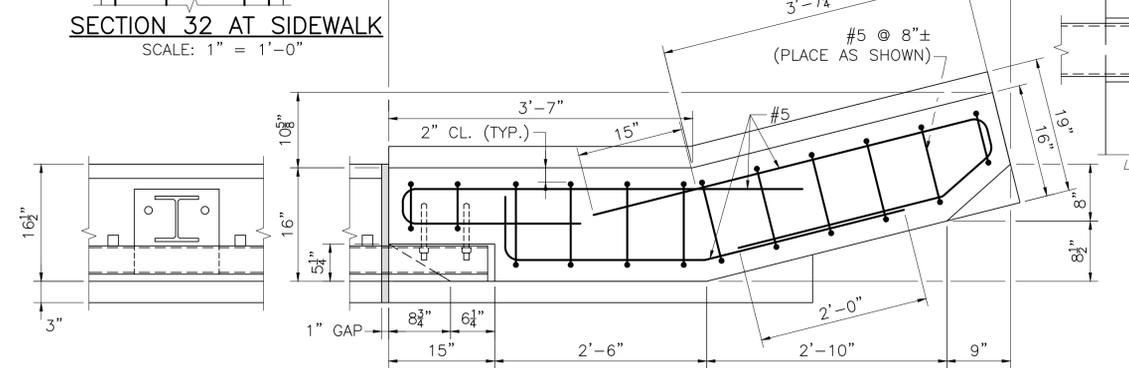
SECTION 31 AT SAFETY CURB
SCALE: 1" = 1'-0"



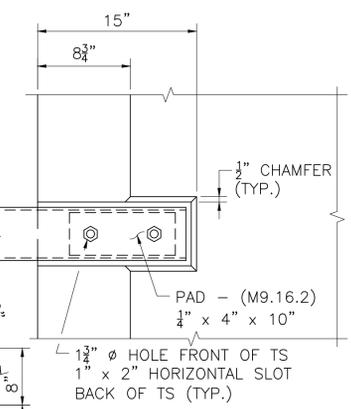
SECTION 31 AT SIDEWALK
SCALE: 1" = 1'-0"



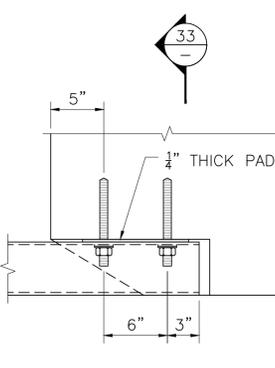
SECTION 32 AT SIDEWALK
SCALE: 1" = 1'-0"



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

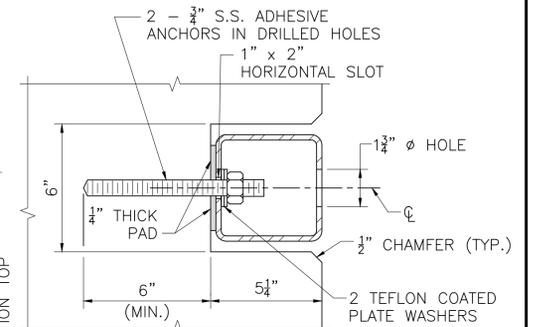


ELEVATION

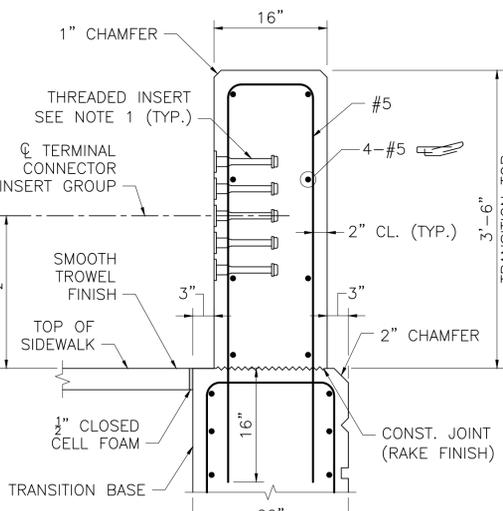


PLAN

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



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



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

NOTES:

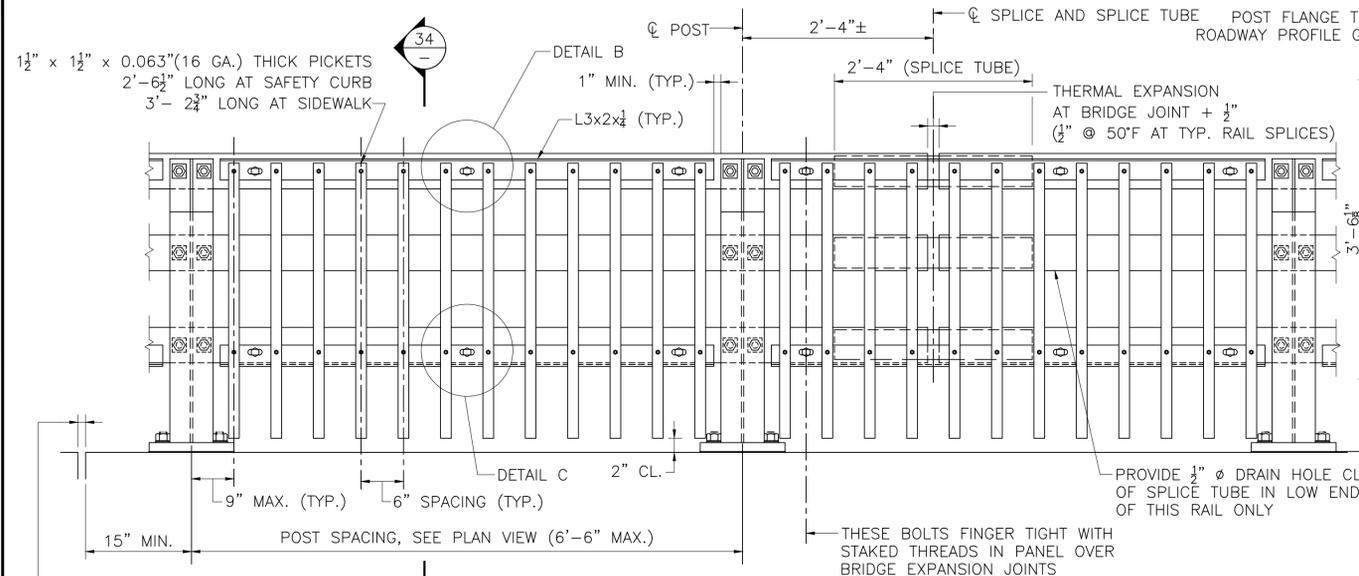
1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER 7/8" Ø S.S. BOLT. S.S. BOLTS SHALL BE 7/8" Ø x 1 1/2" LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR 7/8" S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO 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 1/2" 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.

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 14-MARCH-2024

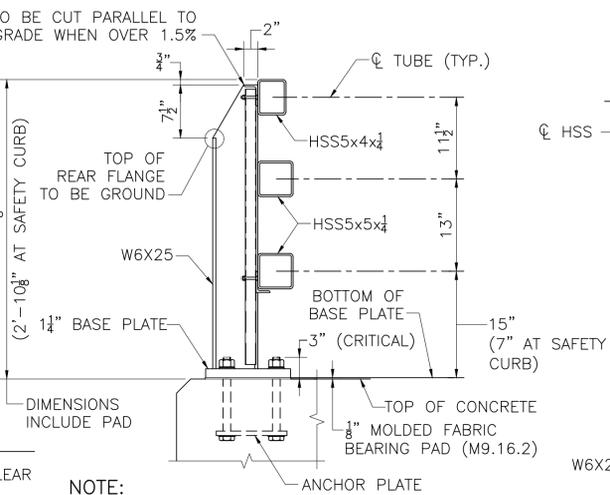
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-003S(819)X	80	85
PROJECT FILE NO.		608460	

S3-TL4 RAIL DETAILS



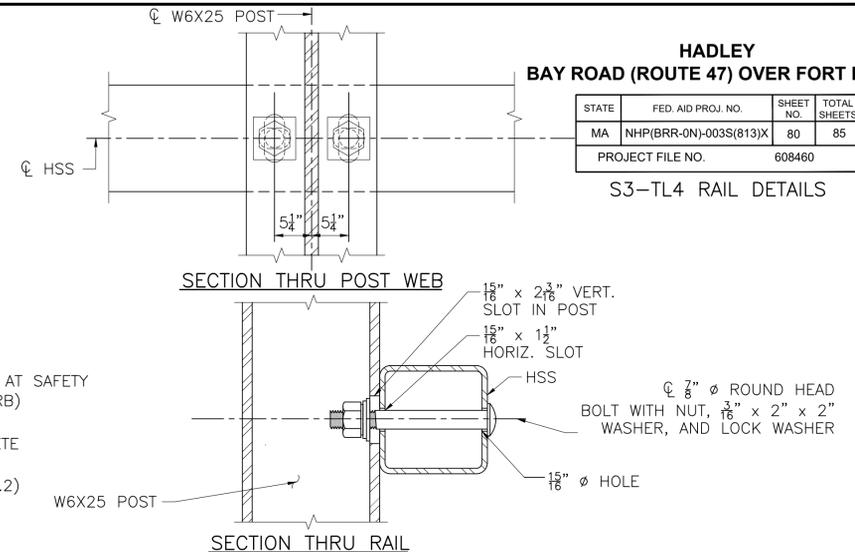
BRIDGE RAILING ELEVATION

SCALE: 1" = 1'-0"



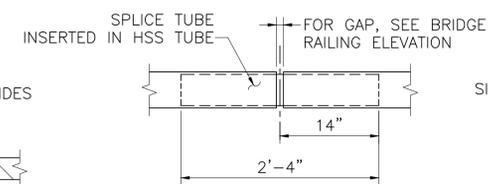
SECTION 34

SCALE: 1" = 1'-0"



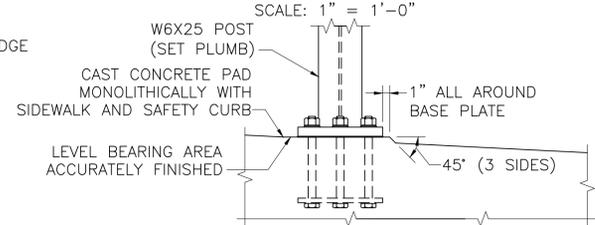
TYPICAL RAIL TO POST CONNECTIONS

SCALE: 1" = 1'-0"



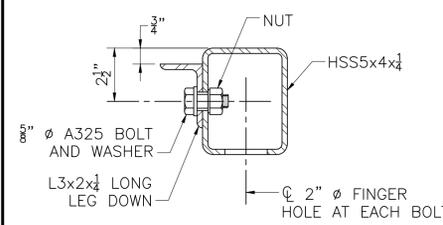
TYPICAL SPLICE

SCALE: 1" = 1'-0"

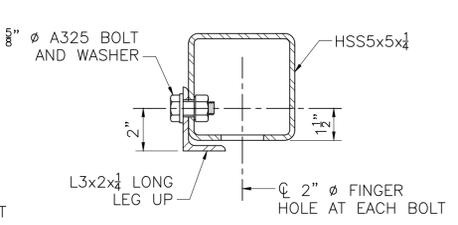


SETTING OF POSTS (PROFILE GRADE OVER 1.5%)

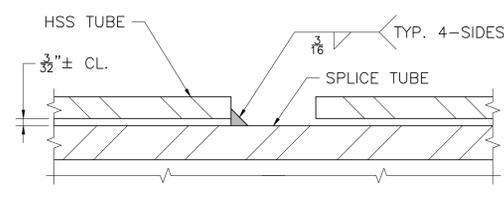
SCALE: 1" = 1'-0"



SECTION 35

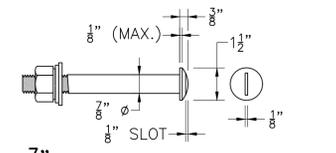


SECTION 37



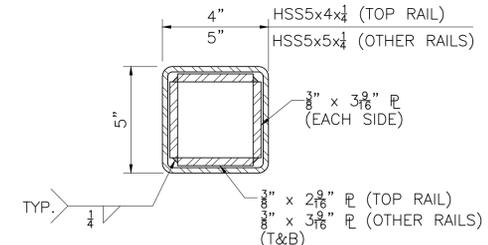
SPLICE DETAIL

FULL SIZE



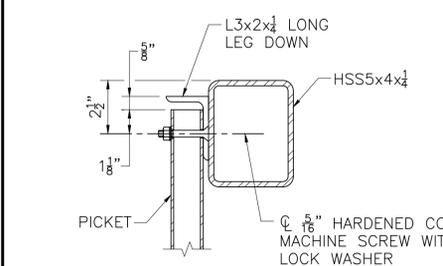
7/8" Ø ROUND HEAD BOLT

SCALE: 3" = 1'-0"

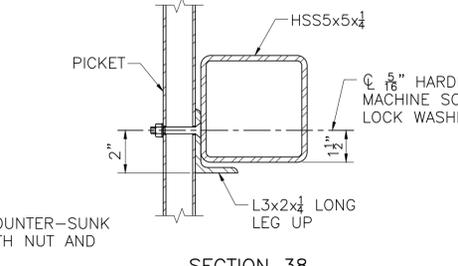


SPLICE TUBE DETAILS

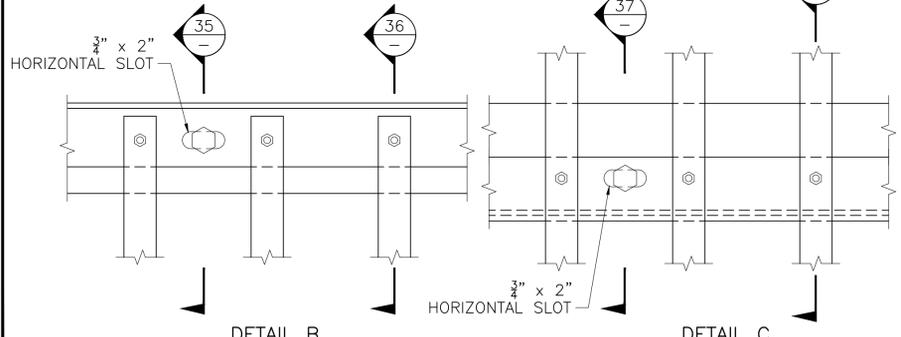
SCALE: 3" = 1'-0"



SECTION 36

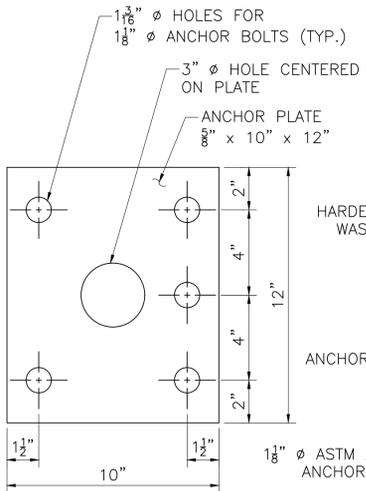


SECTION 38



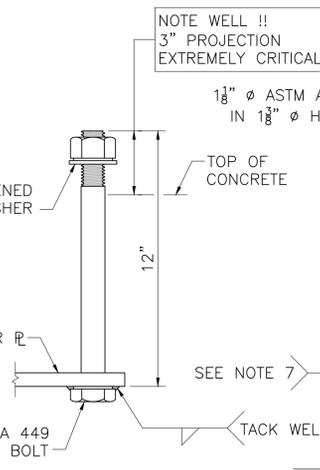
TYPICAL PICKET TO RAIL DETAILS

SCALE: 3" = 1'-0"



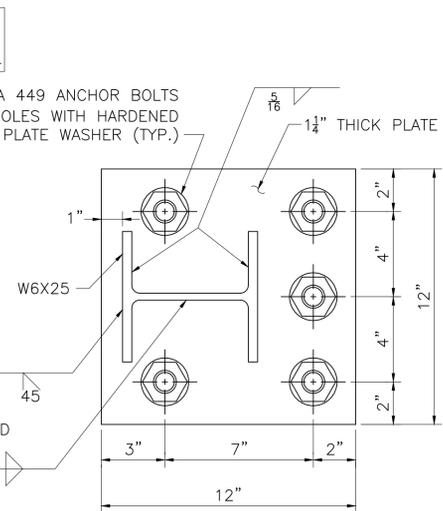
ANCHOR PLATE

SCALE: 3" = 1'-0"



ANCHOR BOLT

SCALE: 3" = 1'-0"



BASE PLATE

SCALE: 3" = 1'-0"

- 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 $F_y = 50$ 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 $F_y = 36$ KSI MIN. OR A 500 GRADE B.
 2. ALL STEEL (EXCEPT THE 5/8" 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 7/8" 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-GROUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
 8. 7/8" Ø ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF AASHTO M 164.

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_FINAL STRUCTURAL SUBMITTAL (SF) 14-MARCH-2024

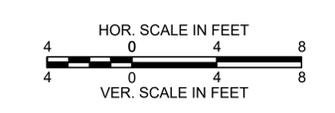
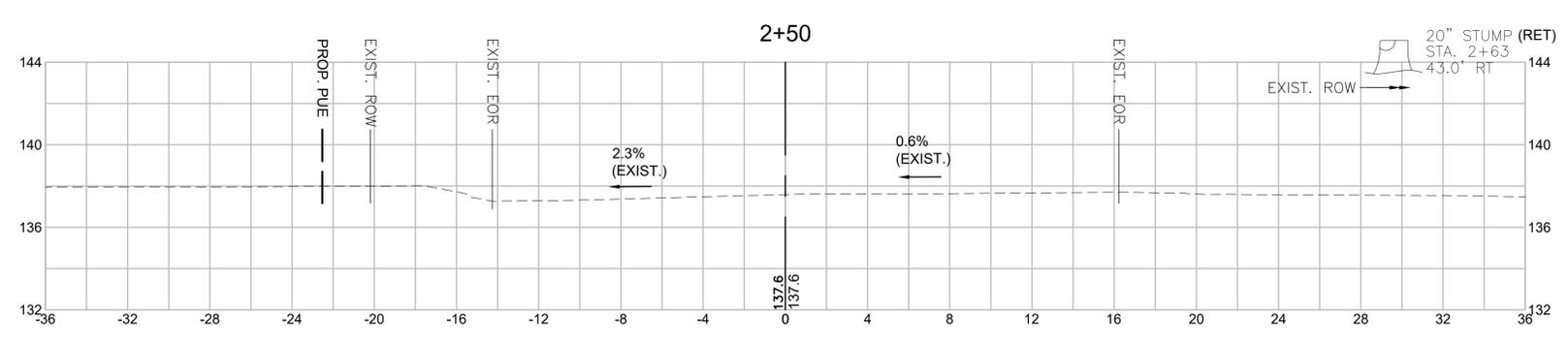
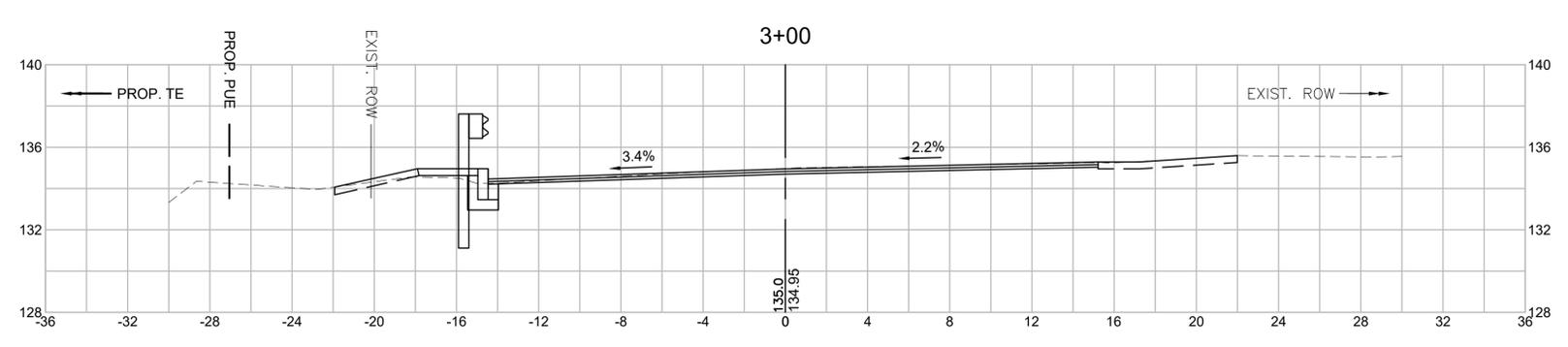
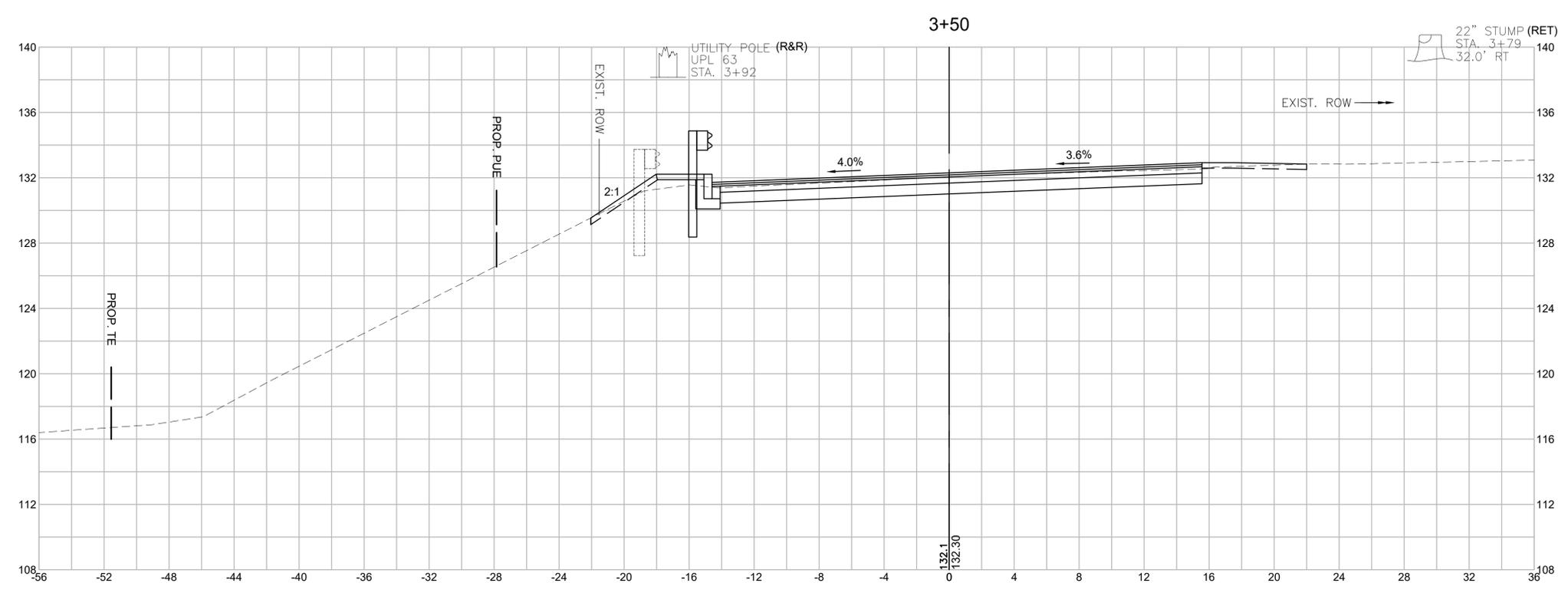
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

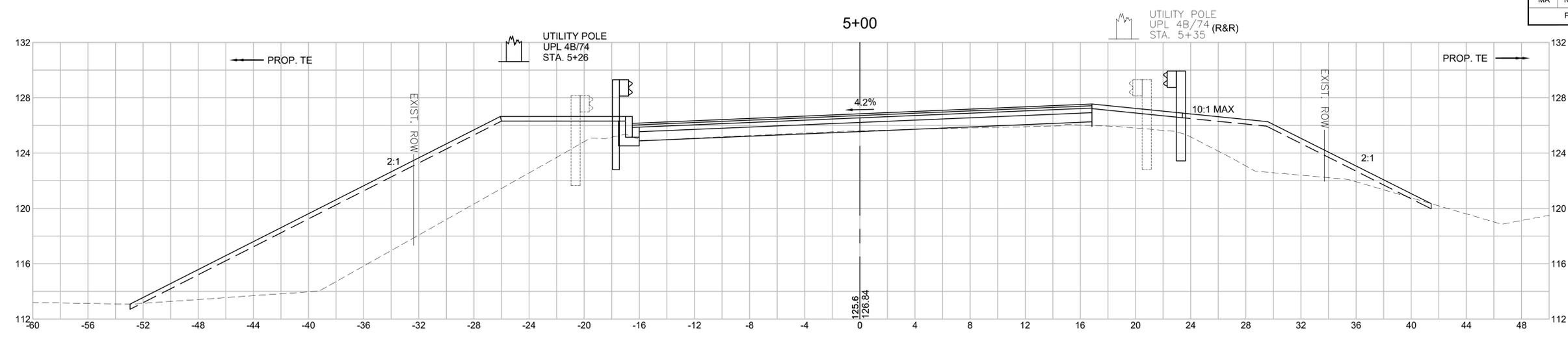
CUT = 11.22 SF
FILL = 0.27 SF



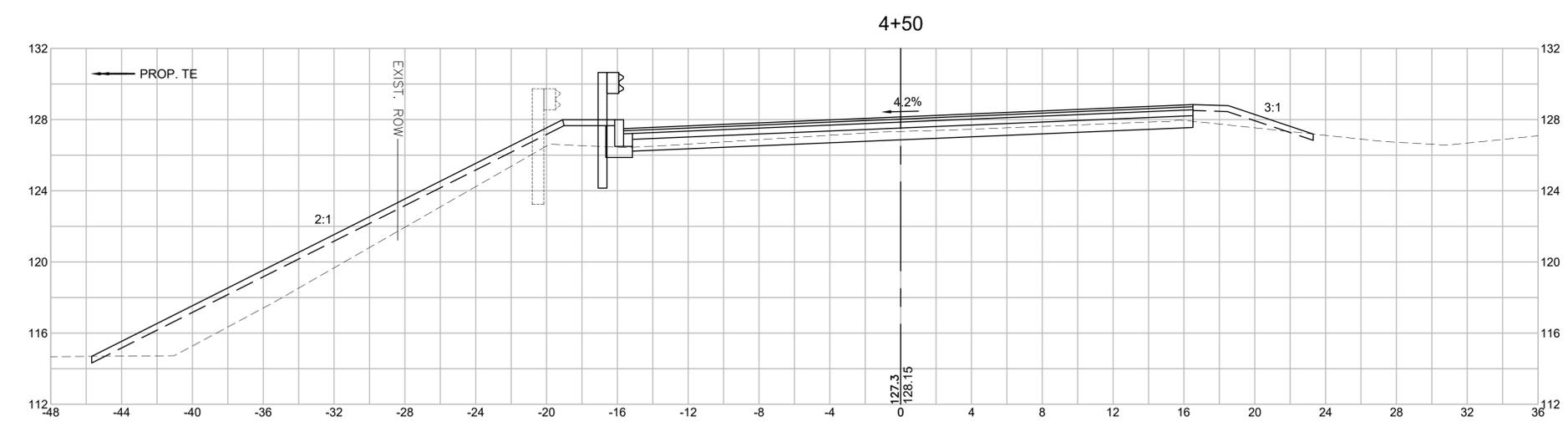
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

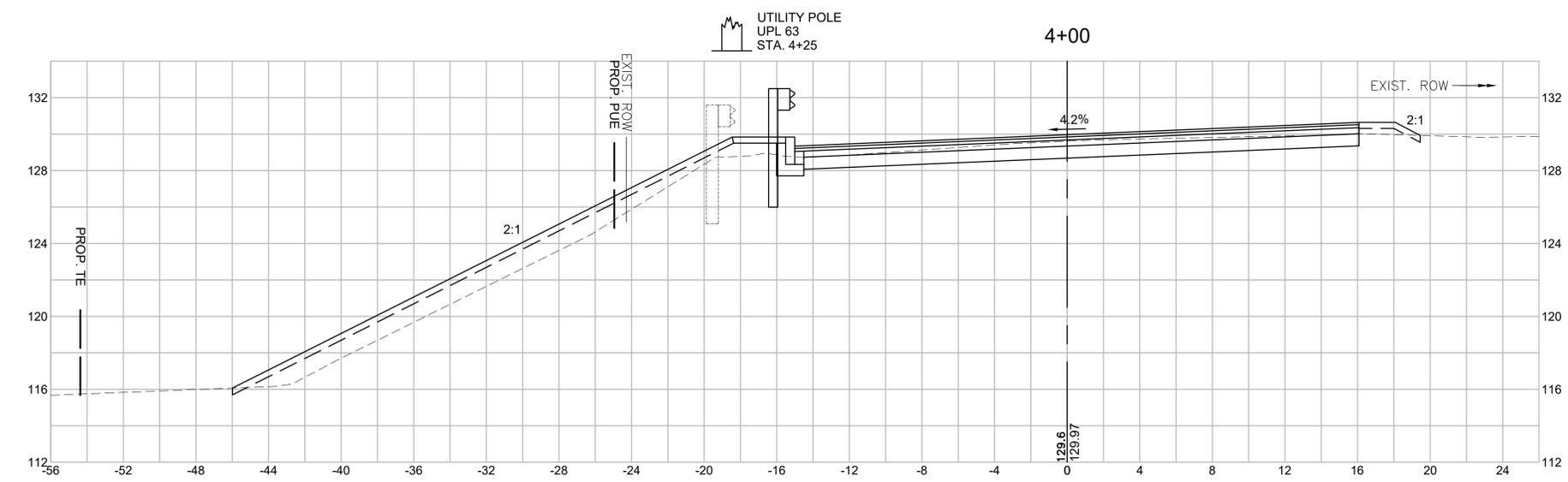
CROSS SECTIONS



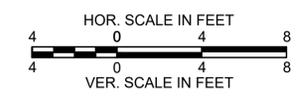
CUT = 1.52 SF
FILL = 165.00 SF



CUT = 1.28 SF
FILL = 38.44 SF



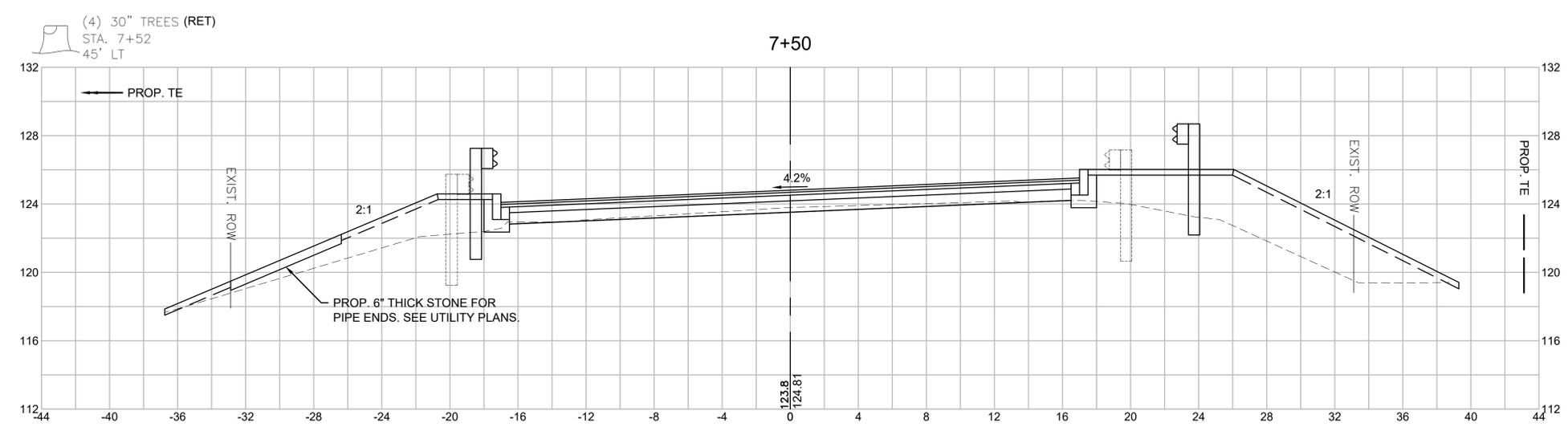
CUT = 1.72 SF
FILL = 25.87 SF



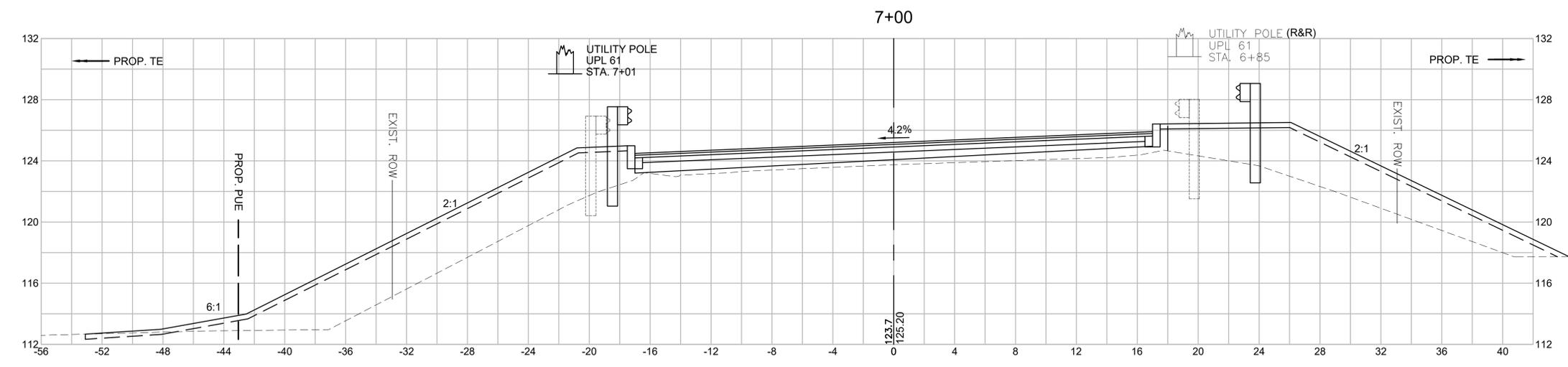
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NHP(BRR-ON)-0035(813)X	83	85
PROJECT FILE NO.		608460	

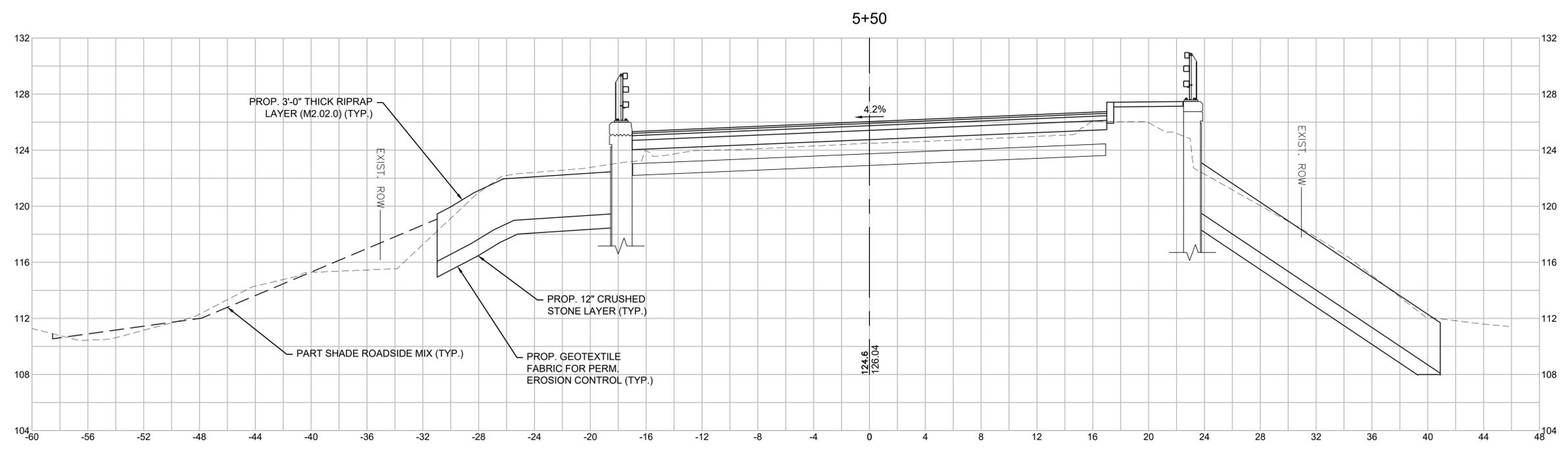
CROSS SECTIONS



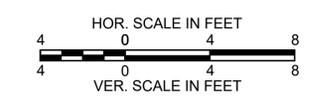
CUT = 1.19 SF
FILL = 63.23 SF



CUT = 1.27 SF
FILL = 72.23 SF



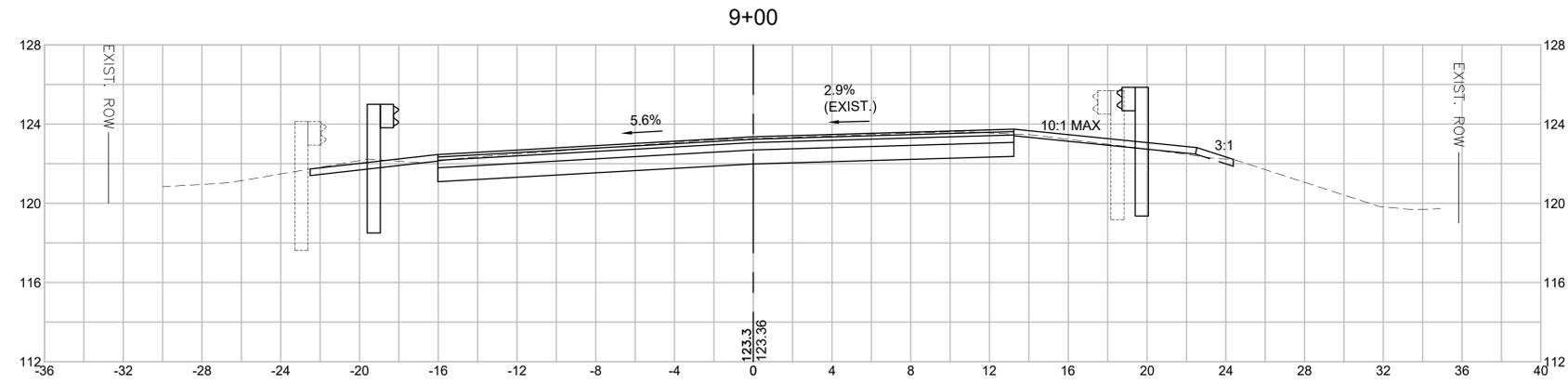
CUT = 5.98 SF
FILL = 8.02 SF



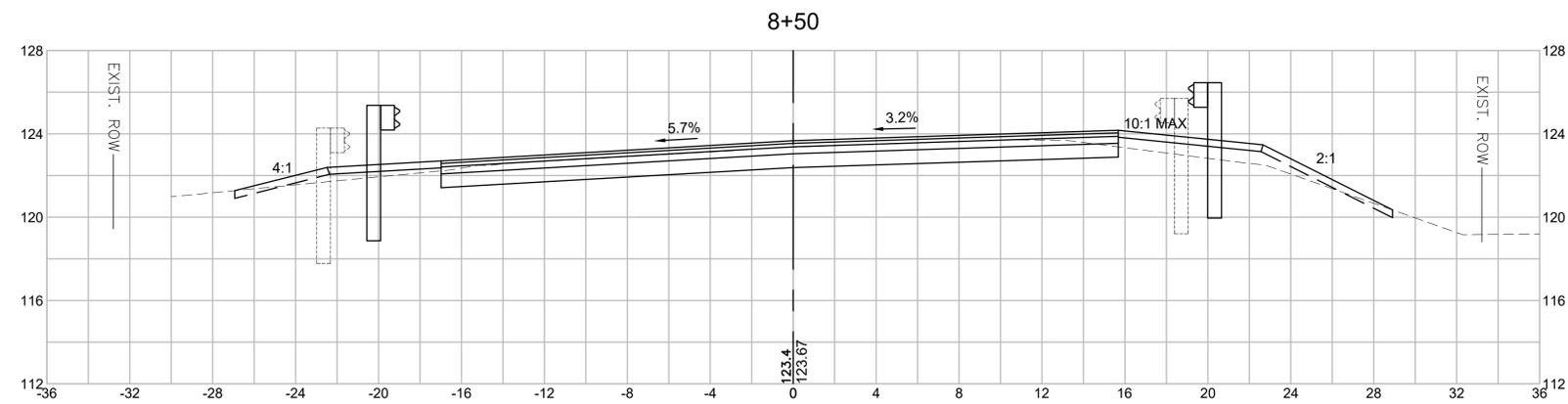
HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

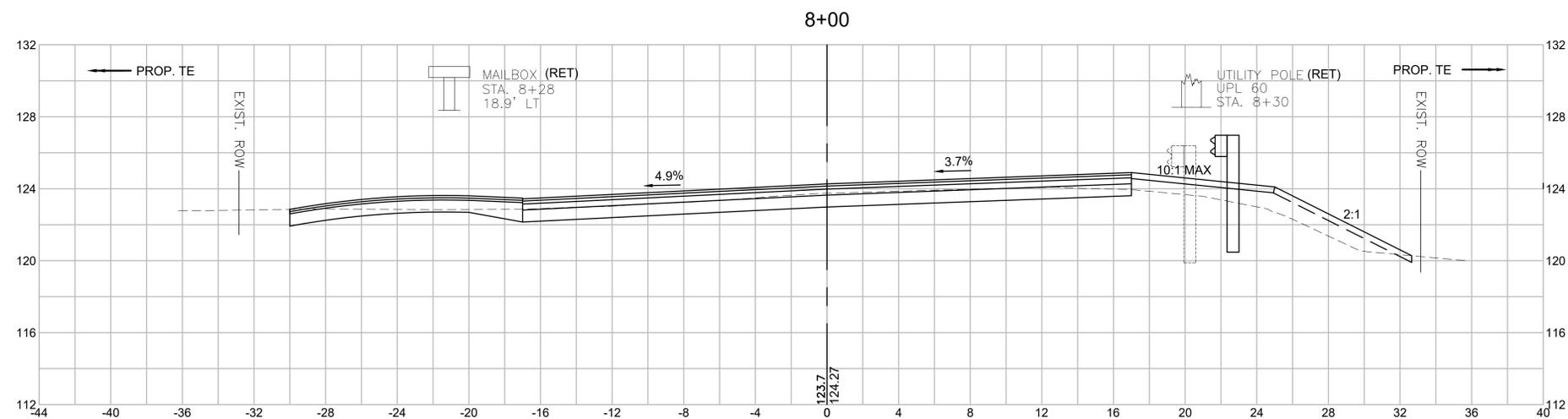
CROSS SECTIONS



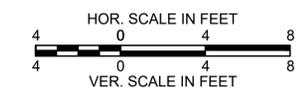
CUT = 18.83 SF
FILL = 0.12 SF



CUT = 13.40 SF
FILL = 6.34 SF



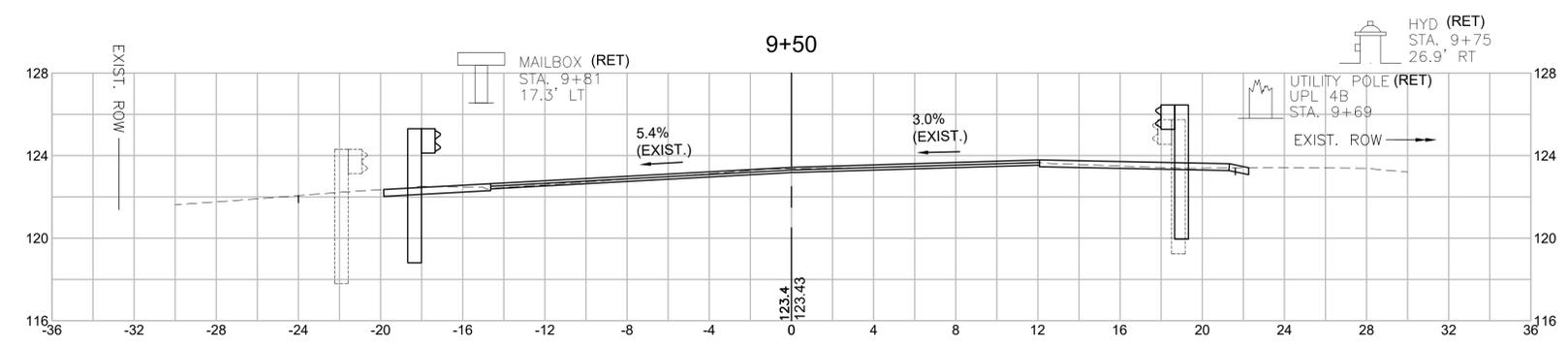
CUT = 5.73 SF
FILL = 10.56 SF



HADLEY
BAY ROAD (ROUTE 47) OVER FORT RIVER

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

CROSS SECTIONS



CUT = 6.13 SF
FILL = 0 SF

