TOWN OF AYER
DEPARTMENT OF PUBLIC WORKS

PLAN AND PROFILE OF

WEST MAIN STREET OVER NONACOICUS BROOK
BRIDGE NO. A-19-014 (C1R)

IN THE TOWN OF

AYER

MIDDLESEX COUNTY

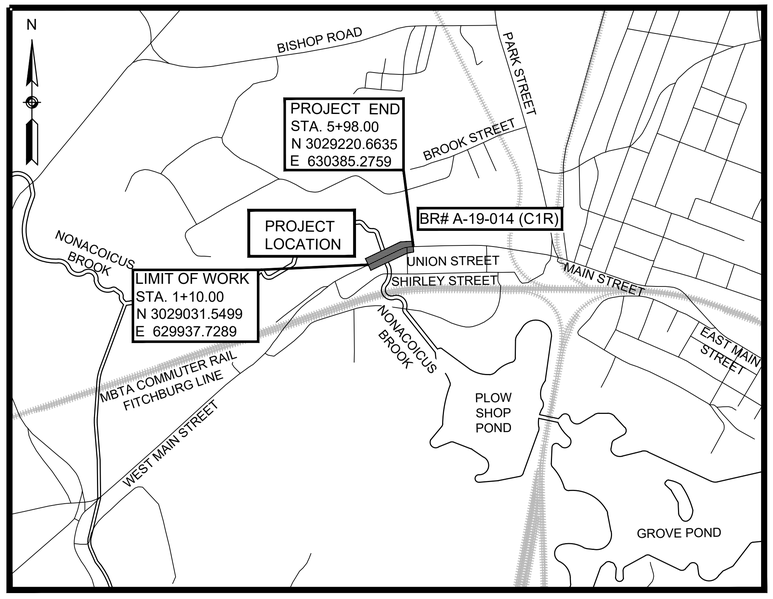
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		1	44
T&B PROJECT FILE NO.	17-023.01		

TITLE SHEET AND INDEX

THESE PLANS ARE SUPPLEMENTED BY THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2024, INCLUDING ALL SUPPLEMENTED EDITIONS, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

INDEX



0 750 1500 2250 3000

SCALE: 1" = 750'

LENGTH OF PROJECT = 488.00 FEET = 0.092 MILES

DESIGN DESIGNATION (WEST MAIN STREET)

DESIGN SPEED	35 MPH
ADT (2018)	9,400
ADT (2038)	11,500
K	9%
D	52%
T (PEAK HOUR)	4%
T (AVERAGE DAY)	4%
DHV	1,030
DDHV	540
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL

COMMONWEALTH OF MASSACHUSETTS
KRISTOPHER J. SURETTE
CIVIL
No. 52635
REGISTERED PROFESSIONAL ENGINEER
12/20/2024

RESPONSIBLE FOR HIGHWAY DESIGN

Tighe&Bond
Engineers | Environmental Specialists
300 TRADE CENTER, SUITE 5580
WOBURN, MA 01801-7433
PHONE: 781-933-4800
FAX: 781-933-4801

COMMONWEALTH OF MASSACHUSETTS
AARON M. LACHANCE
CIVIL
REGISTERED PROFESSIONAL ENGINEER
12-23-2024

RESPONSIBLE FOR BRIDGE DESIGN

HOYLE TANNER
100 INTERNATIONAL DRIVE, SUITE 360
PORTSMOUTH, NH 03801
PHONE: 603-431-2520
FAX: 603-431-8067

1 ADDENDUM #2 - 2/3/2025

LEGEND

GENERAL SYMBOLS

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

GENERAL SYMBOLS (CONT.)

EXISTING	PROPOSED	
		SEDIMENT CONTROL BARRIER
		RETAINING WALL
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLAN & OVERLAY
		BANK OF RIVER OR STREAM
WF-#		BORDER OF WETLAND
		100 FT WETLAND OR 200 FT RIVERFRONT BUFFER
DATE OF LAYOUT		STATE HIGHWAY LAYOUT
DATE OF LAYOUT		TOWN OR CITY LAYOUT
DATE OF LAYOUT		COUNTY LAYOUT
R.R. S/L		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
P OR APPROX. P		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
1	Ø1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6'X 6' TYPICAL UNLESS OTHERWISE SPECIFIED)
		VIDEO SURVEILLANCE CAMERA
		MICROWAVE DETECTOR
		MAGNETOMETER (2 SHOWN)
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	OPTICOM CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD (TYPE AS NOTED OR AS SPECIFIED)
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
		PEDESTRIAN SIGNAL POST AND BASE
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
20'		STEEL OR ALUMINUM MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (TWO POSTS)
20'		SIGNAL AND LIGHTING MAST ARM (OPTICOM)
		EMERGENCY PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL & METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"X12" (AND AS NOTED)
		ELECTRIC HANDHOLE 12" X 24"
		TRAFFIC SIGNAL INTERCONNECT CONDUIT
		TRAFFIC SIGNAL CONDUIT (TYPE AS NOTED)

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
SL		STOP LINE - 12"
CW 8'		CROSSWALK - 12" LINES 8' WIDTH (1' - 3' GAP) 1
	SWL	SOLID WHITE LINE - 4"
	SYL	SOLID YELLOW LINE - 4"
BWL		BROKEN WHITE LINE - 4" (2'-6' GAP)
BYL		BROKEN YELLOW LINE - 4" (2'-6' GAP)
DWL		DOTTED WHITE LINE - 4" (2'-4' GAP)
DYL		DOTTED YELLOW LINE - 4" (2'-4' GAP)
DWLEx		DOTTED WHITE LINE EXTENSION - 4" (2'-4' GAP)
DYLEx		DOTTED YELLOW LINE EXTENSION - 4" (2'-4' GAP)
DBWL		DOUBLE WHITE LINE - 2 - 4" LINES
DBYL		DOUBLE YELLOW LINE - 2 - 4" LINES

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
B.O.	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
FLUOR	FLUORESCENT
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
IT	INTERSECTING TANGENT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACHING BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAIL BOX

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		2	44
T&B PROJECT FILE NO.	17-023.01		

LEGEND, ABBREVIATIONS AND GENERAL NOTES

GENERAL (CONT.)

MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP.	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
RELOC	RELOCATE
REM.	REMOVE
RET.	RETAIN
RET WALL / RETW	RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
RRFB	RECTANGULAR RAPID FLASHING BEACON
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/ TRUCK PERCENTAGE
TAN	TANGENT
TBM	TEMPORARY BENCHMARK
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TRAV	TRAVERSE
TYP.	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
PCR	PEDESTRIAN CURB RAMP
WF	WOOD FENCE
WG	WATER GATE
WGL	WHITE GORE LINE (12 INCH)
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

GENERAL NOTES:

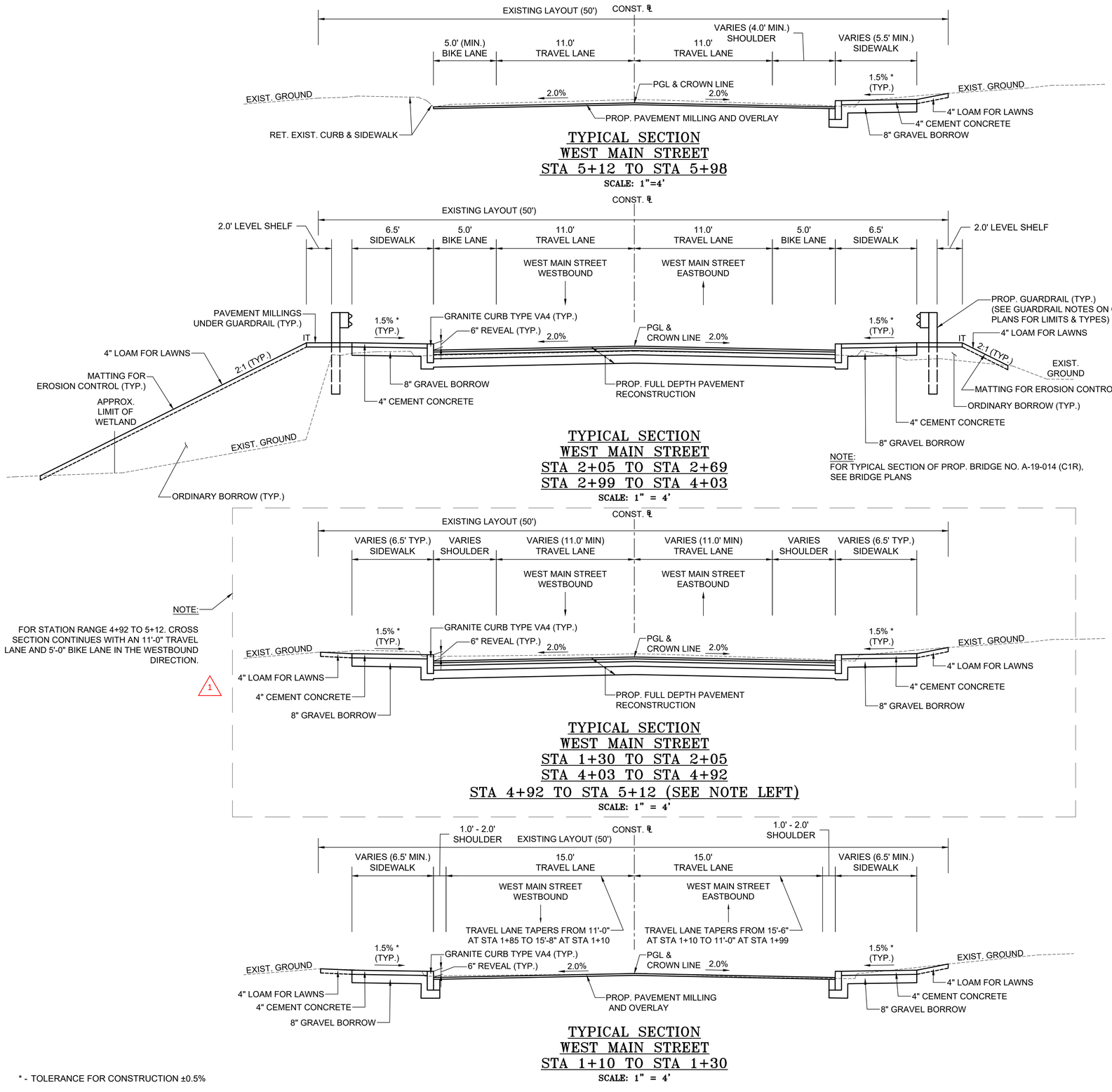
1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. WHERE AN EXISTING 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.
3. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES WITH THE RESPECTIVE UTILITY COMPANIES AND ANY WORK TO BE DONE BY OTHERS.
4. 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.
5. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, REUSING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
6. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
7. JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED IN ACCORDANCE WITH ITEM 453. OF THE SPECIAL PROVISIONS.
8. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
9. FIELD SURVEY PROVIDED BY CHAPPELL ENGINEERING ASSOCIATES, LLC 201 BOSTON POST ROAD W #101, MARLBOROUGH, MA 01752. HORIZONTAL DATUM IS BASED ON MASS GRID SYSTEM NAD 1983. ELEVATIONS SHOWN ON THIS PLAN REFER TO THE NAVD OF 1988.
10. TREE PROTECTION SHALL BE APPROVED IN WALK THROUGH WITH ENGINEER, CONTRACTOR, AND TOWN OF AYER PRIOR TO THE ONSET OF CONSTRUCTION ACTIVITIES.
11. THE CONTRACTOR SHALL CONTACT "DIG SAFE" AT 1-888-DIG-SAFE AT LEAST 72 HOURS PRIOR TO COMMENCING WORK ON THE PROJECT AREA. THE CONTRACTOR SHALL PROVIDE DIGSAFE REPORTING NUMBERS TO THE ENGINEER.

1 ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		3	44
T&B PROJECT FILE NO.	17-023.01		

TYPICAL SECTIONS



TYPICAL SECTION
WEST MAIN STREET
STA 5+12 TO STA 5+98

SCALE: 1"=4'

TYPICAL SECTION
WEST MAIN STREET
STA 2+05 TO STA 2+69
STA 2+99 TO STA 4+03

SCALE: 1" = 4'

NOTE:
FOR TYPICAL SECTION OF PROP. BRIDGE NO. A-19-014 (C1R), SEE BRIDGE PLANS

NOTE:
FOR STATION RANGE 4+92 TO 5+12. CROSS SECTION CONTINUES WITH AN 11'-0" TRAVEL LANE AND 5'-0" BIKE LANE IN THE WESTBOUND DIRECTION.

TYPICAL SECTION
WEST MAIN STREET
STA 1+30 TO STA 2+05
STA 4+03 TO STA 4+92
STA 4+92 TO STA 5+12 (SEE NOTE LEFT)

SCALE: 1" = 4'

TYPICAL SECTION
WEST MAIN STREET
STA 1+10 TO STA 1+30

SCALE: 1" = 4'

* - TOLERANCE FOR CONSTRUCTION ±0.5%

PAVEMENT NOTES:

PROPOSED PAVEMENT MILLING AND OVERLAY:
1 3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER
1 3/4" PAVEMENT FINE MILLING

PROPOSED FULL DEPTH RECONSTRUCTION:
1 3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
2 1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0) OVER
4 1/2" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW TYPE b

PROPOSED CEMENT CONCRETE WALK / SIDEWALK / PEDESTRIAN CURB RAMP:
4" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4" 610 OVER
8" GRAVEL BORROW TYPE b

PROPOSED CEMENT CONCRETE SIDEWALK AT DRIVEWAY:
6" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4" 610 OVER
8" GRAVEL BORROW TYPE b

PROPOSED HMA WALK:
1 1/4" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
1 3/4" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
8" GRAVEL BORROW TYPE b

PROPOSED HMA DRIVEWAYS:
1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
2 1/2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
8" GRAVEL BORROW TYPE b

PROPOSED LOAM FOR LAWNS & ROADSIDES, GRASS, AND SLOPES (FOR SLOPES FLATTER THAN 3:1):
4" LOAM AND SEED

PROPOSED LOAM FOR LAWNS & ROADSIDES, GRASS, AND SLOPES (3:1 SLOPE OR STEEPER):
MATTING FOR EROSION CONTROL (ITEM 767.9) OVER
4" LOAM AND SEED

PROPOSED TEMPORARY TRENCH PATCH (WITHIN ROADWAY LIMITS PAID FOR UNDER ITEM 472.):
3" HOT MIX ASPHALT OVER
12" GRAVEL BORROW TYPE b OVER
SUITABLE BACK FILL MATERIAL (GRAVEL COMPACTED IN MAX. OF 8" LIFTS)

PROPOSED PERMANENT TRENCH PATCH (WITHIN ROADWAY LIMITS PAID FOR UNDER ITEM 451.):
1 3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
2 1/4" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0) OVER
4 1/2" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
12" GRAVEL BORROW OVER
SUITABLE BACK FILL MATERIAL OR
CONTROLLED DENSITY FILL TYPE 1E OR 2E EXCAVATABLE (CONDUIT ONLY)

GENERAL NOTES:

1. ALL GRAVEL BORROW SHALL BE TYPE b, UNLESS OTHERWISE SPECIFIED.
2. PREPARATION OF UNDERLYING SURFACE, ASPHALT EMULSION FOR TACK COAT, HMA FOR PATCHING, AND HMA JOINT SEALANT SHALL BE IN ACCORDANCE WITH SECTION 450.
3. NEW GRAVEL SUBBASE SHALL ONLY BE USED WHEN EXISTING SUBBASE IS DETERMINED TO BE UNSUITABLE PER THE REQUIREMENTS OF M2.01.7 AND M1.03.0 AND AS DIRECTED BY THE ENGINEER.
4. SEE BRIDGE PLANS FOR ADDITIONAL INFORMATION & BRIDGE TYPICAL SECTION.

1 ADDENDUM #2 - 2/3/2025

HIGHWAY GUARD DETAILS

TRANSITION TO BRIDGE RAIL (ITEM 628.24)
STA 2+33.92 LT - STA 2+67.67 LT
STA 2+33.92 RT - STA 2+67.67 RT
STA 3+00.33 LT - STA 3+34.08 LT
STA 3+00.33 RT - STA 3+34.08 RT

GUARDRAIL, TL-3 (SINGLE FACED) (ITEM 620.13)
STA 2+15.17 LT - STA 2+33.92 LT
STA 3+34.08 LT - STA 3+77.93 LT

GUARDRAIL TANGENT END TREATMENT, TL-2 (ITEM 627.82)
STA 2+08.92 RT - STA 2+33.92 RT
STA 3+77.83 LT - STA 4+02.83 LT

TRAILING ANCHORAGE (ITEM 627.1)
STA 2+05.79 LT - STA 2+15.17 LT
STA 3+34.08 RT - STA 3+43.46 RT

TRAFFIC SIGNAL CONDUIT
NONE

DRAINAGE DETAILS
SEE SHEET 9

WATER SUPPLY ALTERATIONS
SEE SHEET 9

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		4	44
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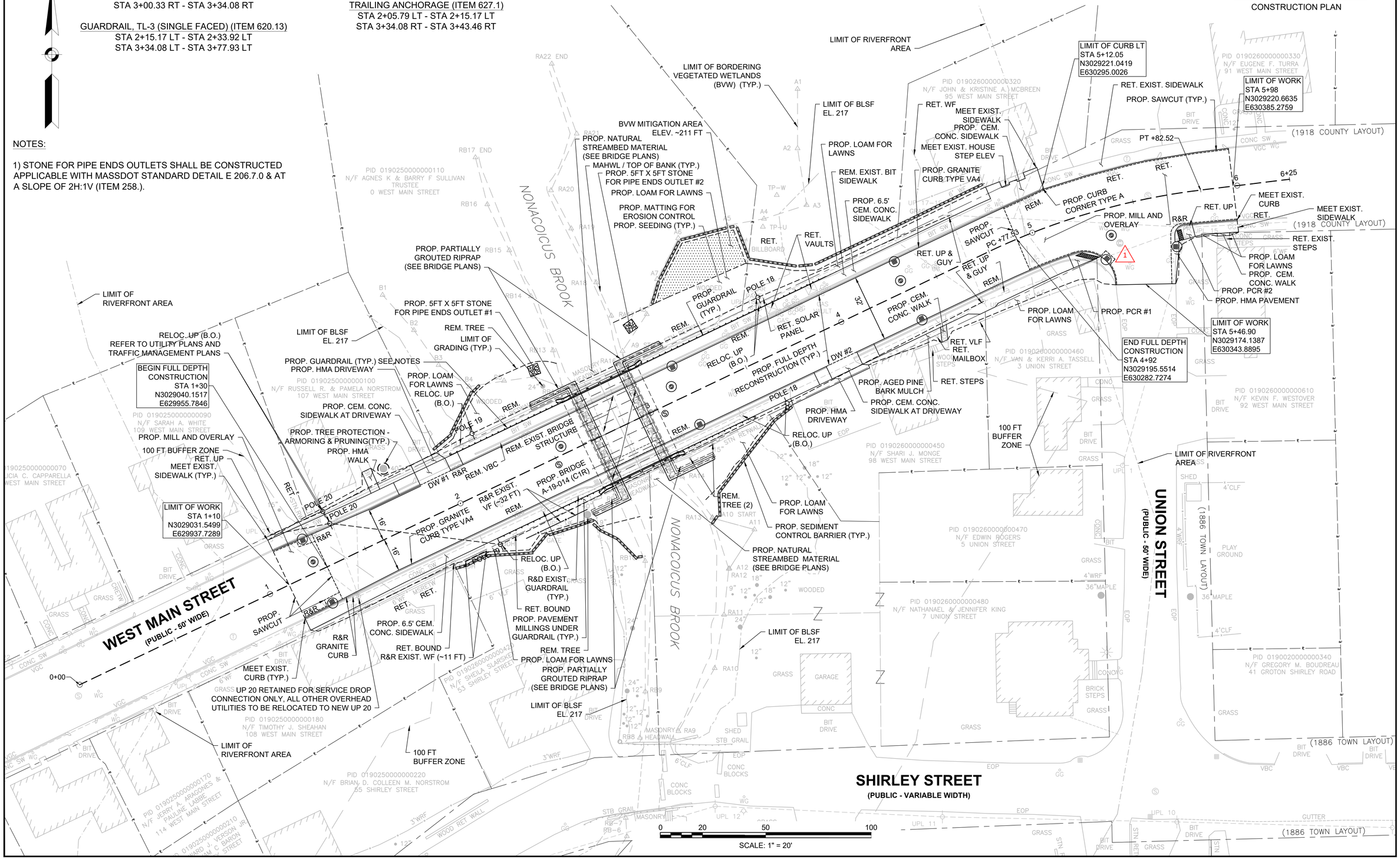
CONSTRUCTION PLAN

NOTES:

1) STONE FOR PIPE ENDS OUTLETS SHALL BE CONSTRUCTED APPLICABLE WITH MASSDOT STANDARD DETAIL E 206.7.0 & AT A SLOPE OF 2H:1V (ITEM 258.).



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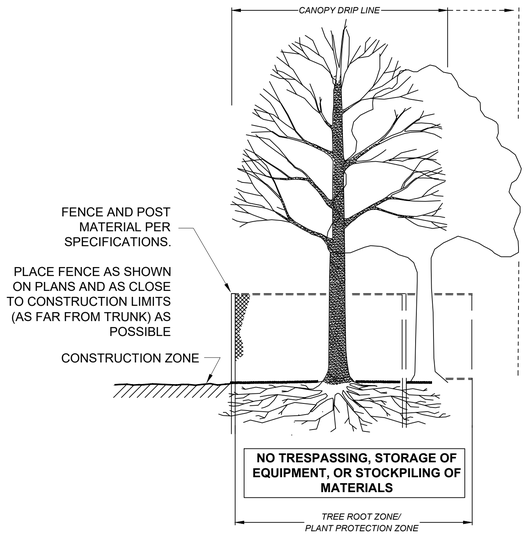
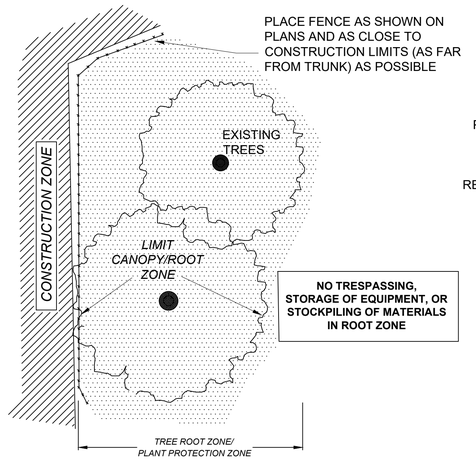
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		5	44
T&B PROJECT FILE NO.	17-023.01		

CONSTRUCTION DETAILS
SHEET 1 OF 2

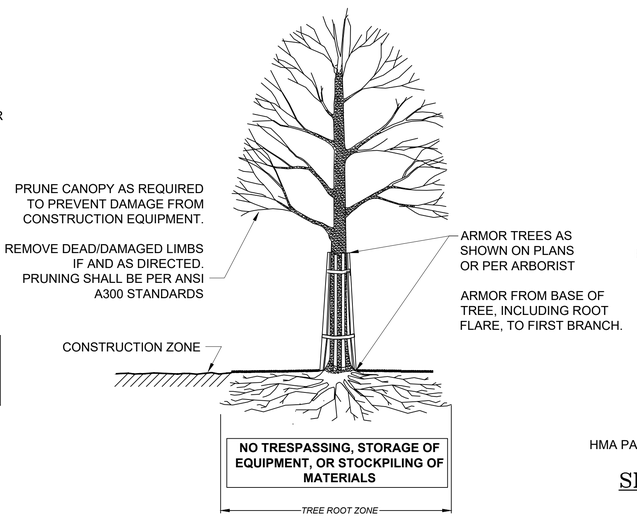


SECTION - FENCE PROTECTION OF ROOT ZONE

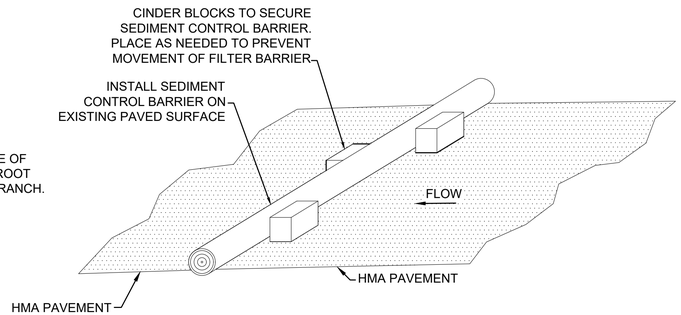


PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

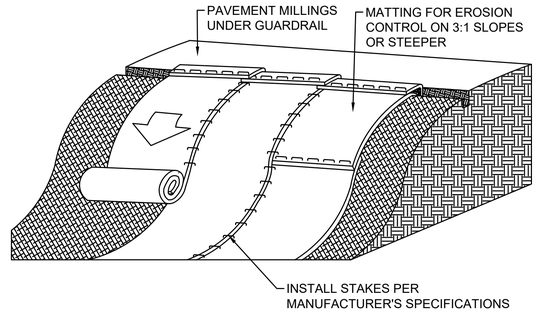
TREE PROTECTION DETAIL
N.T.S.



SECTION - TRUNK ARMORING & PRUNING

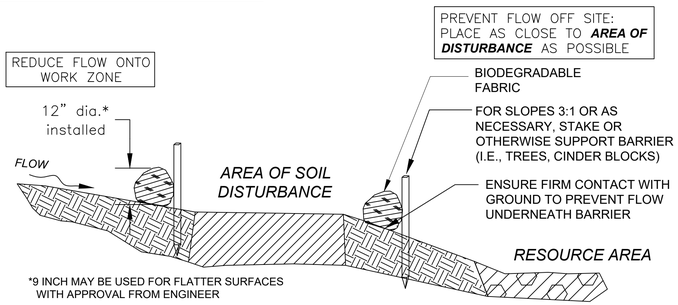


SEDIMENT CONTROL BARRIER ON PAVED SURFACES
N.T.S.

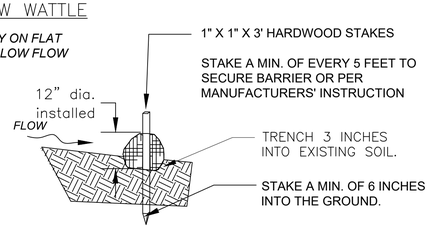


MATTING FOR EROSION CONTROL DETAIL
N.T.S.

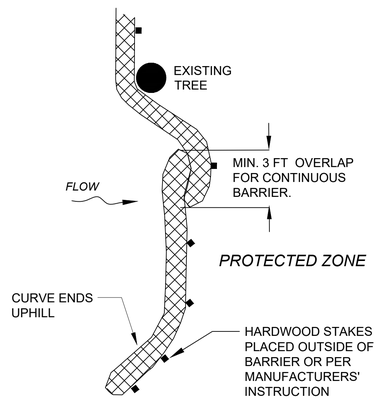
SEDIMENT CONTROL BARRIER



12 INCH STRAW WATTLE



SECTION



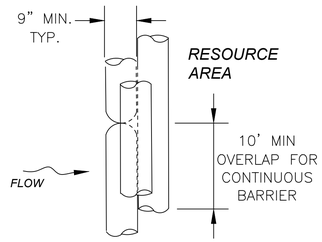
PLACE BARRIER ALONG CONTOURS AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

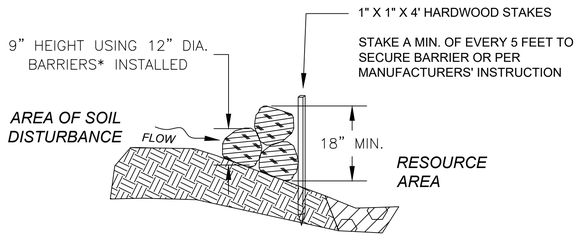
PLACE STAKES AS NEEDED TO SECURE BARRIER IN PLACE.

PLAN VIEW

SEDIMENT CONTROL BARRIER
N.T.S.

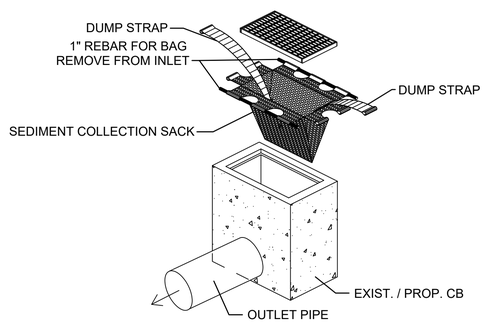


PLAN VIEW

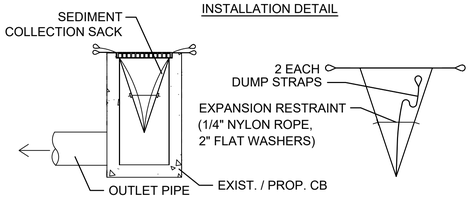


SECTION

SEDIMENT CONTROL BARRIER (SLOPES 2:1 OR STEEPER)
N.T.S.



INSTALLATION DETAIL



BAG DETAIL

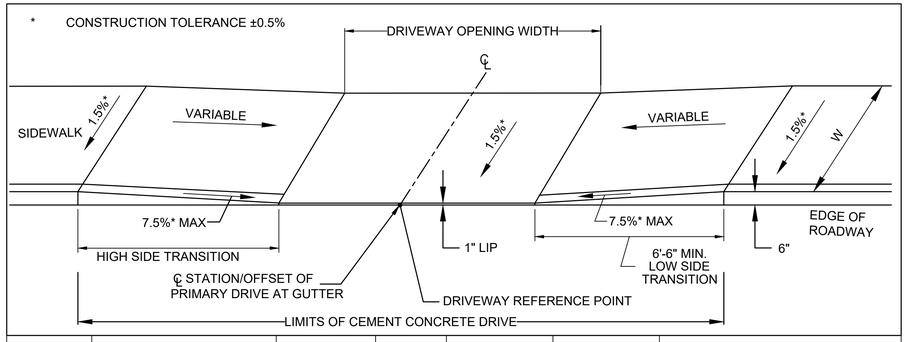
SILT SACK DETAIL (ITEM 697.1)
N.T.S.

1 ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

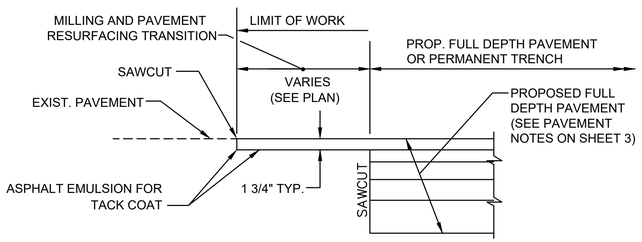
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		6	44
T&B PROJECT FILE NO.	17-023.01		

CONSTRUCTION DETAILS
SHEET 2 OF 2

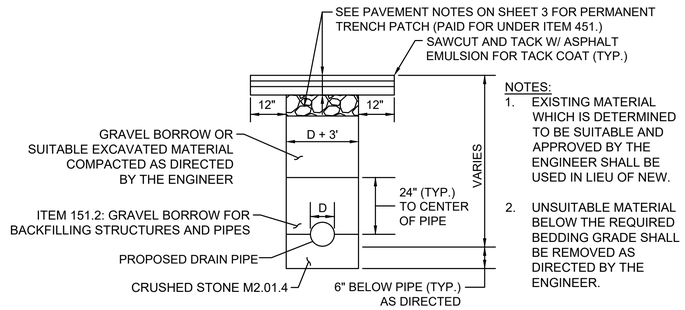


DRIVEWAY NO.	DRIVEWAY REFERENCE POINT ALONG CENTERLINE		WIDTH OF SIDEWALK (W)	PATH OF TRAVEL (4' MIN.)	DRIVEWAY OPENING WIDTH	ROADWAY GUTTER SLOPE (%)	TRANSITION LENGTH	
	STATION	OFFSET					HIGH SIDE	LOW SIDE
DW 1	1+94.52	16.00' LT	6.50'	6.50'	16.0'	-2.8	11.00'	6.50'
DW 2	3+92.47	16.00' RT	6.50'	6.50'	16.0'	1.9	9.00'	6.50'

DRIVEWAY SCHEDULE
N.T.S

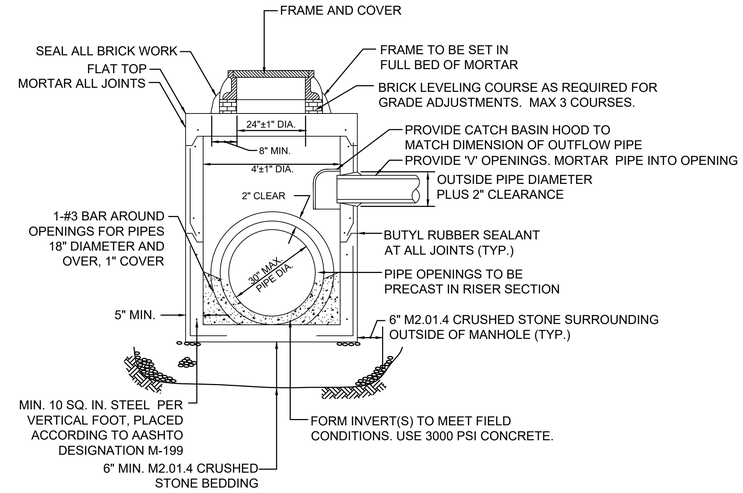


JOINT DETAILS AT PAVING LIMITS
N.T.S.

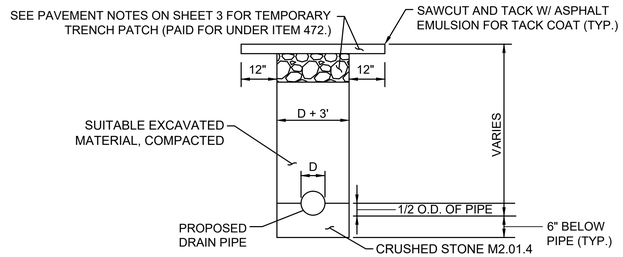


NOTES:
1. EXISTING MATERIAL WHICH IS DETERMINED TO BE SUITABLE AND APPROVED BY THE ENGINEER SHALL BE USED IN LIEU OF NEW.
2. UNSUITABLE MATERIAL BELOW THE REQUIRED BEDDING GRADE SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.

PERMANENT TRENCH PATCH FOR DRAINAGE PIPE (WITHIN PAVEMENT MILLING AREAS) DETAIL
N.T.S.

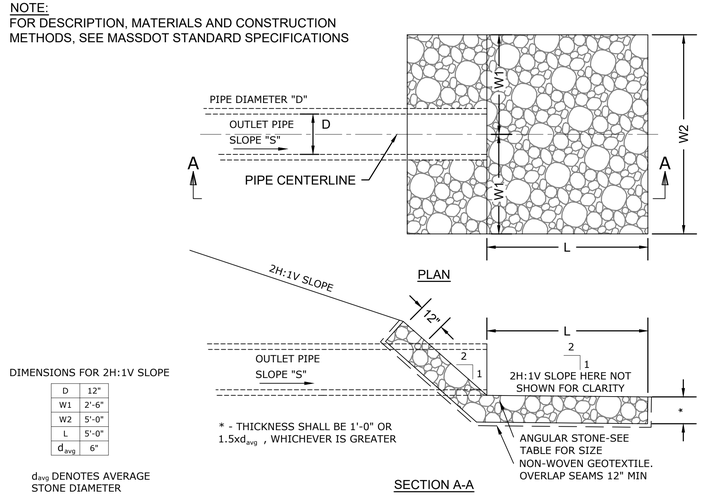


PRECAST FLAT TOP DRAIN MANHOLE
N.T.S.



TEMPORARY TRENCH PATCH FOR DRAINAGE PIPE (WITHIN FULL DEPTH RECONSTRUCTION AREAS) DETAIL
N.T.S.

NOTE:
FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE MASSDOT STANDARD SPECIFICATIONS

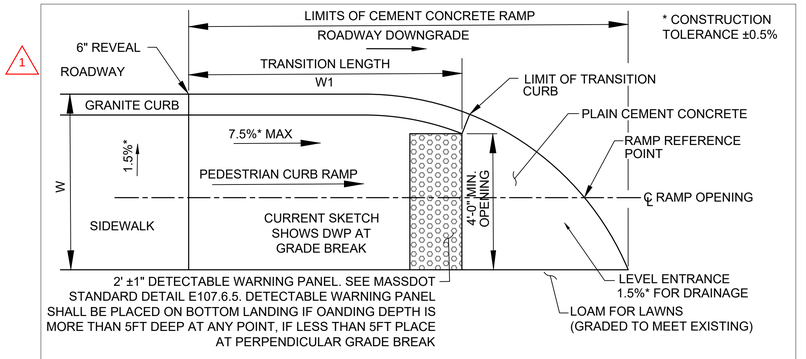


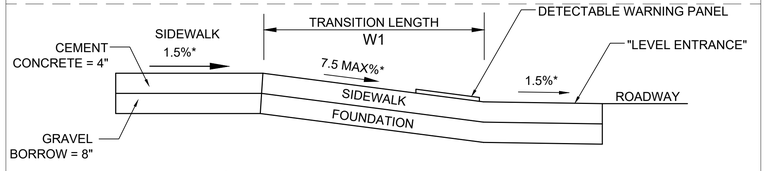
DIMENSIONS FOR 2H:1V SLOPE

D	12"
W1	2'-6"
W2	5'-0"
L	5'-0"
d_{avg}	6"

d_{avg} DENOTES AVERAGE STONE DIAMETER

STONE OUTLET PROTECTION AT OUTLETS #1 & #2 (ITEM 258. – STONE FOR PIPE ENDS)
N.T.S.





SECTION THROUGH CURBLINE
NOT TO SCALE

PED. CURB RAMP NO.	RAMP REFERENCE POINT			RAMP TRANSITION LENGTH (W1)	WIDTH OF SIDEWALK (W)	WIDTH OF RAMP OPENING (MIN. 3')	GUTTER SLOPE %
	BASELINE	STATION	OFFSET				
1	W MAIN	5+25.22	19.02' RT	6.50'	5.0' - 6.5'	5.00'	1.9%
2	W MAIN	5+66.74	20.12' RT	9.00'	5.75'	5.00'	1.8%

PCR SCHEDULE #1 & #2
N.T.S.

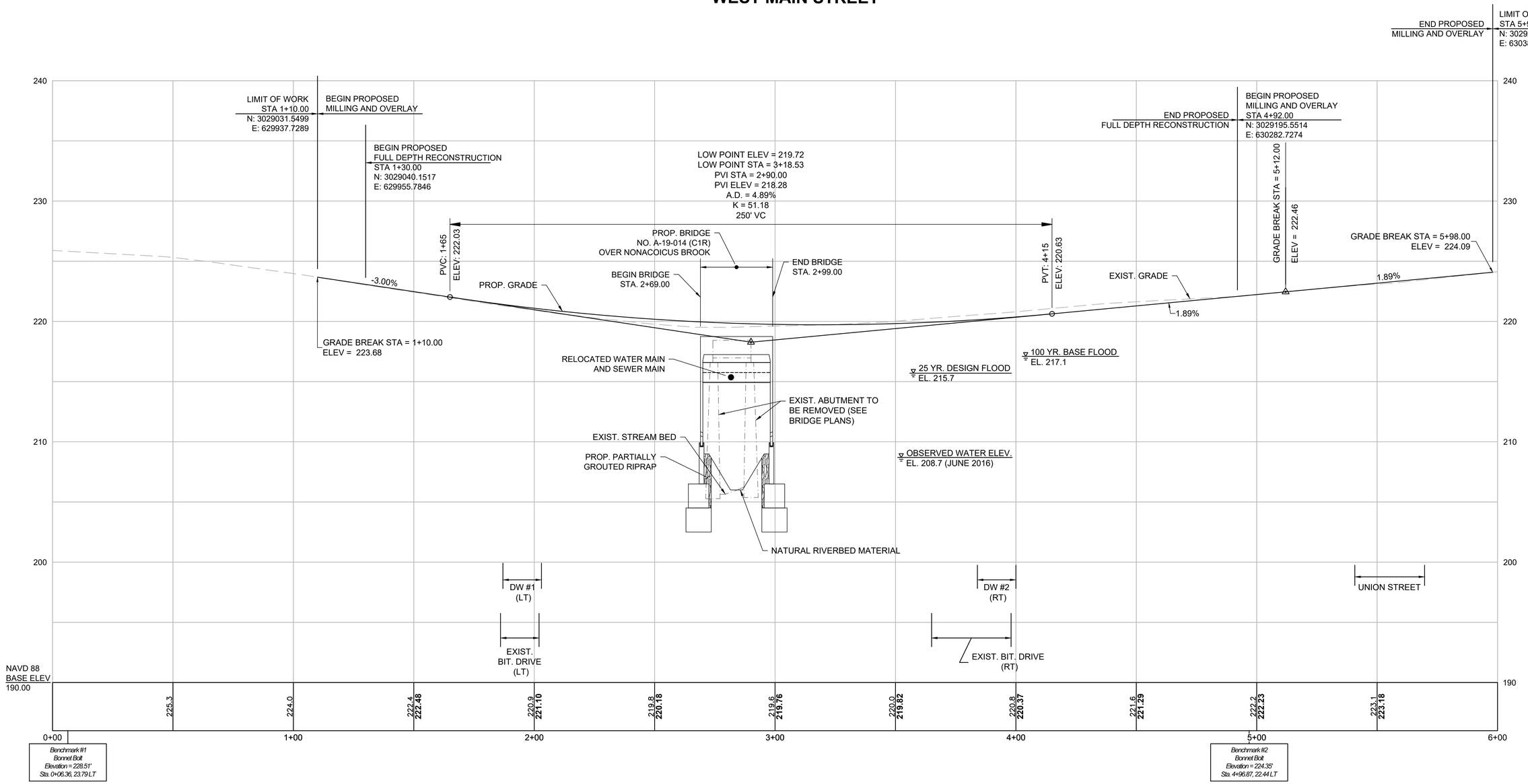
16-005.01_HD\CONSTRUCTIONDETAILS\DWG Plotted on 29-Jan-2025 12:08 PM

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		7	44
T&B PROJECT FILE NO.	17-023.01		

PROFILE - WEST MAIN STREET

WEST MAIN STREET



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

ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		8	44
T&B PROJECT FILE NO.	17-023.01		

CURB TIE AND GRADING PLAN

Plotted on 29-Jan-2025 11:39 AM

16-005.01_HD(CURB TIE).DWG

NOTE:
1) ALL OFFSETS ARE FROM THE WEST MAIN STREET BASELINE
2) ALL ELEVATIONS ARE TO THE CENTER OF THE DRAINAGE STRUCTURE
3) 2'-0" LEVEL SHELF TO BE INSTALLED BEHIND ALL GUARDRAIL AND SLOPED AT 2H:1V TO DAYLIGHT LINE

W MAIN STREET CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	0+00.00	3028984.2400	629838.4225		N64°31'36"E 477.53'	4+77.53	3029189.6229	630269.5335
C1	4+77.53	3029189.6229	630269.5335	R=324.50' Δ=18°32'10" L=104.98' T=52.95'		5+82.52	3029218.7934	630369.9051
L2	5+82.52	3029218.7934	630369.9051		N83°03'47"E 42.48'	6+25.00	3029223.9245	630412.0782

CURVE TABLE

CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C2	0°41'06"	340.50'	4.07'	2.04'
C3	2°12'48"	308.50'	11.92'	5.96'
C4	4°28'46"	308.50'	24.12'	12.07'
C17	107°41'06"	15.00'	28.19'	20.53'
C18	86°14'46"	5.00'	7.53'	4.68'

BOUND LOCATIONS - WEST MAIN STREET

STATION	OFFSET	NORTHING	EASTING
STA. 1+85.04	24.23' RT	3029041.9494	630015.9129
STA. 2+17.05	25.01' RT	3029055.0222	630045.1259

SURVEY TRAVERSE DATA

POINT	ELEVATION	NORTHING	EASTING	DESCRIPTION
TRAV. #1	219.454'	3029136.4880	630111.9010	MAGNAIL
TRAV. #2	223.616'	3029236.5390	630350.5840	MAGNAIL
TRAV. #3	218.762'	3028948.2330	630112.1410	MAGNAIL
TRAV. #4	210.540'	3029068.2790	630139.0950	SPIKE
TBM #1	228.51'	3029008.4520	629833.9290	BONNET BOLT
TBM #2	224.35'	3029176.6216	630295.6550	BONNET BOLT

BENCHMARK LOCATIONS - WEST MAIN STREET

STATION	OFFSET	NORTHING	EASTING	DESCRIPTION
STA. 0+06.36	23.79' LT	3029008.4520	629833.9290	BONNET BOLT
STA. 4+96.87	22.44' RT	3029176.6216	630295.6550	BONNET BOLT

1 ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		9	44
T&B PROJECT FILE NO.	17-023.01		

DRAINAGE AND UTILITY PLAN

Plotted on 29-Jan-2025 1:10 PM

16-005.01_HDUTILITY).DWG

DRAINAGE STRUCTURE DATA

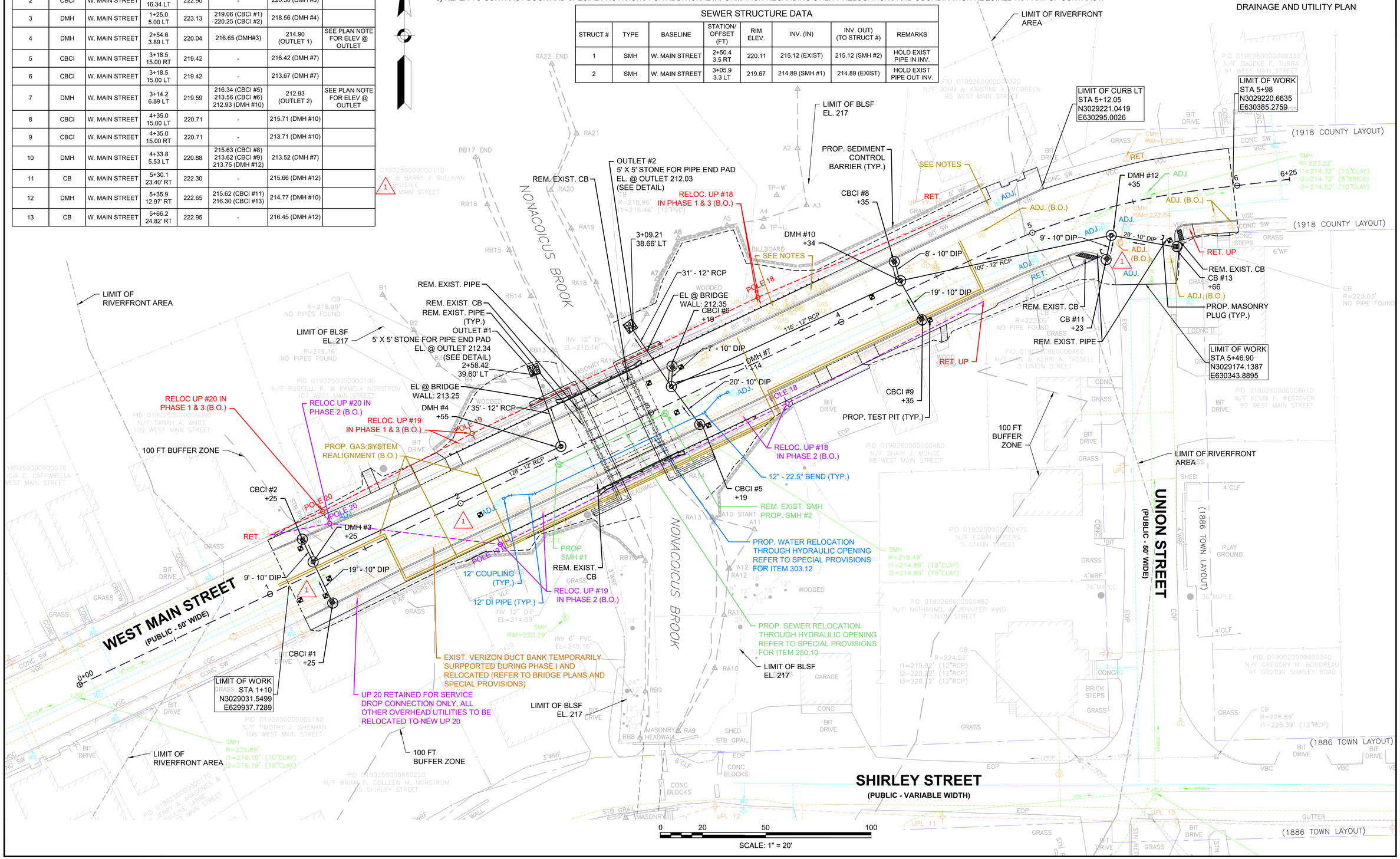
STRUCT #	TYPE	BASELINE	STATION/ OFFSET (FT)	RIM ELEV.	INV. (IN)	INV. OUT) (TO STRUCT #)	REMARKS
1	CBCI	W. MAIN STREET	1+25.0 16.05 RT	222.91	-	219.16 (DMH #3)	
2	CBCI	W. MAIN STREET	1+25.0 16.34 LT	222.90	-	220.30 (DMH #3)	
3	DMH	W. MAIN STREET	1+25.0 5.00 LT	223.13	219.06 (CBCI #1) 220.25 (CBCI #2)	218.56 (DMH #4)	
4	DMH	W. MAIN STREET	2+54.6 3.89 LT	220.04	216.65 (DMH#3)	214.90 (OUTLET 1)	SEE PLAN NOTE FOR ELEV @ OUTLET
5	CBCI	W. MAIN STREET	3+18.5 15.00 RT	219.42	-	216.42 (DMH #7)	
6	CBCI	W. MAIN STREET	3+18.5 15.00 LT	219.42	-	213.67 (DMH #7)	
7	DMH	W. MAIN STREET	3+14.2 6.89 LT	219.59	216.34 (CBCI #5) 213.56 (CBCI #6) 212.93 (DMH #10)	212.93 (OUTLET 2)	SEE PLAN NOTE FOR ELEV @ OUTLET
8	CBCI	W. MAIN STREET	4+35.0 15.00 LT	220.71	-	215.71 (DMH #10)	
9	CBCI	W. MAIN STREET	4+35.0 15.00 RT	220.71	-	213.71 (DMH #10)	
10	DMH	W. MAIN STREET	4+33.8 5.53 LT	220.88	215.63 (CBCI #8) 213.62 (CBCI #9) 213.75 (DMH #12)	213.52 (DMH #7)	
11	CB	W. MAIN STREET	5+30.1 23.40' RT	222.30	-	215.66 (DMH #12)	
12	DMH	W. MAIN STREET	5+35.9 12.97' RT	222.65	215.62 (CBCI #11) 216.30 (CBCI #13)	214.77 (DMH #10)	
13	CB	W. MAIN STREET	5+66.2 24.82' RT	222.95	-	216.45 (DMH #12)	

N

NOTES:
1) ALL EXISTING GAS GATES AND VAULTS WITHIN THE LIMIT OF WORK SHALL BE ADJUSTED BY OTHERS.
2) WORK SHALL BE COORDINATED WITH NATIONAL GRID REGARDING THE ONGOING PROJECT TO REPLACE THE GAS MAIN AND REGULATOR VAULTS/ GATES/ ETC. WITHIN THE PROJECT LIMIT, AS WELL AS THE TEMPORARY RELOCATION OF UTILITY POLES FOR THE REPLACEMENT OF THE BRIDGE.
3) LOCATIONS OF RELOCATED UTILITY POLES HAS BEEN APPROXIMATED AND FINAL LOCATION TO BE COORDINATED IN THE FIELD WITH ALL OVERHEAD UTILITY COMPANIES.
4) EXACT RELOCATION OF UNDERGROUND DUCT BANK IS TO BE DETERMINED BY VERIZON.
5) FOR RELOCATED UTILITY POLE SUGGESTED COORDINATE NORTHINGS & EASTINGS, SEE BRIDGE PLANS.
6) REFER TO CONTRACT BOOK AND SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION REGARDING UTILITY RELOCATIONS AND COORDINATION REQUIRED AS PART OF CONTRACT.

SEWER STRUCTURE DATA

STRUCT #	TYPE	BASELINE	STATION/ OFFSET (FT)	RIM ELEV.	INV. (IN)	INV. OUT) (TO STRUCT #)	REMARKS
1	SMH	W. MAIN STREET	2+50.4 3.5 RT	220.11	215.12 (EXIST)	215.12 (SMH #2)	HOLD EXIST PIPE IN INV.
2	SMH	W. MAIN STREET	3+05.9 3.3 LT	219.67	214.89 (SMH #1)	214.89 (EXIST)	HOLD EXIST PIPE OUT INV.



1 ADDENDUM #2 - 2/3/2025

TRAFFIC SIGN SUMMARY

SIGN ID NUMBER	SIZE WIDTH (IN)	SIZE HEIGHT (IN)	MESSAGE	DIMENSIONS (IN) LETTER HEIGHT	DIMENSIONS (IN) VERTICAL SPACING	DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
R2-1 (25)	24	30	SPEED LIMIT 25	1	1	1	1	WHITE	BLACK	BLACK	P5 (1)	5.00	5.00
R2-1 (35)	24	30	SPEED LIMIT 35				1	WHITE	BLACK	BLACK	P5 (1)	5.00	5.00
R3-17	24	18	BIKE LANE				3	BLACK / WHITE	WHITE / BLACK	WHITE / BLACK	P5 (4)	3.00	9.00
R3-17aP	24	12	AHEAD				1	WHITE	BLACK	BLACK	MOUNT WITH R3-17	2.00	2.00
R3-17bP	24	12	ENDS				1	WHITE	BLACK	BLACK	MOUNT WITH R3-17	2.00	2.00
R1-1	30	30	STOP				1	RED	WHITE	WHITE	P5 (1)	6.25	6.25
											TOTAL AREA OF SIGNS (SQUARE FEET)		29.25

SIGN SUMMARY NOTES:

1. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2009 EDITION, THE 1996 MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS", AND ALL ADMENDMENTS WILL GOVERN.
2. (1) SEE MUTCD 2009 EDITION, 2004 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE LATEST MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.

SIGN LEGEND

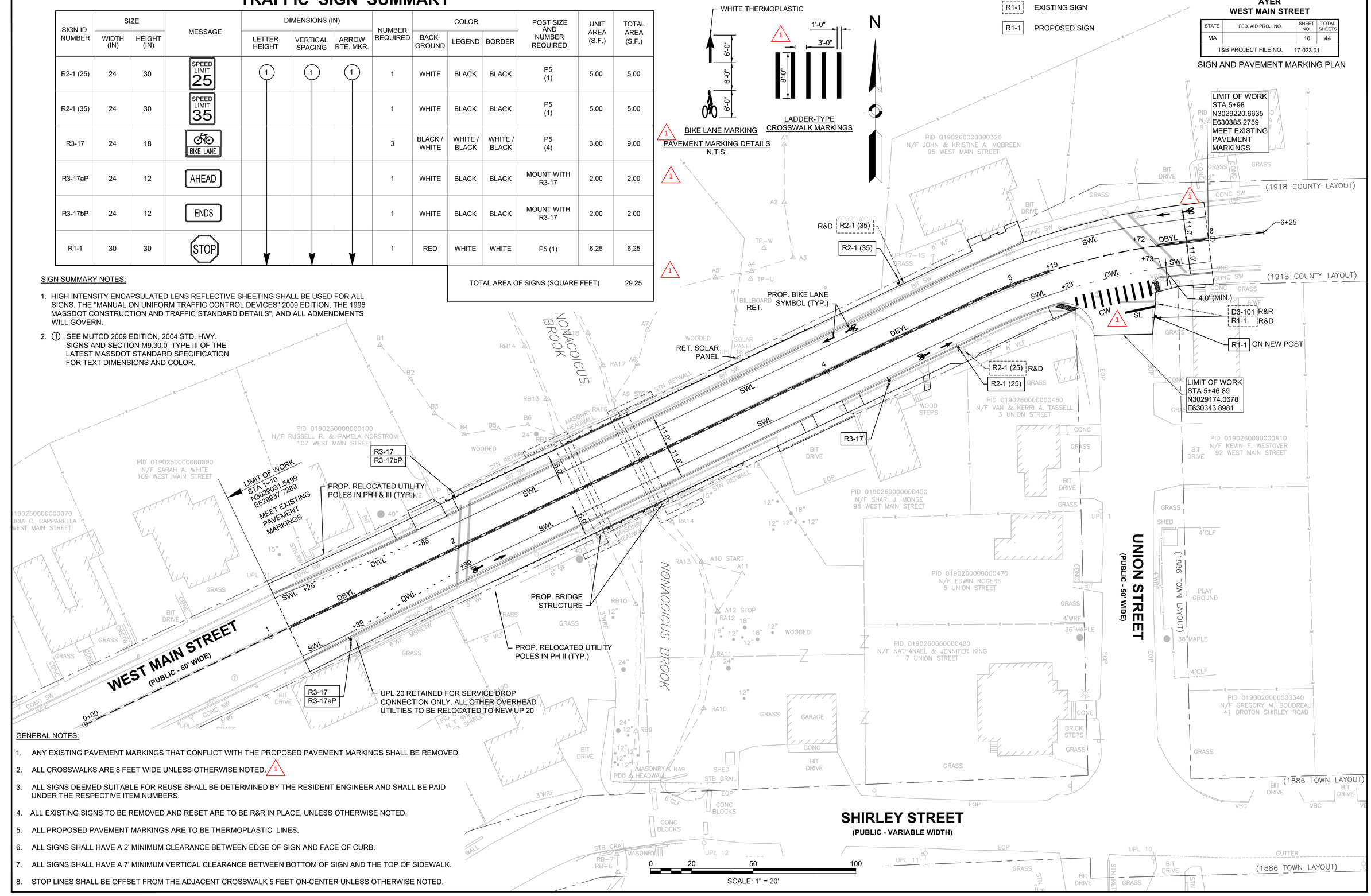
R1-1 EXISTING SIGN

R1-1 PROPOSED SIGN

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		10	44
T&B PROJECT FILE NO.	17-023.01		

SIGN AND PAVEMENT MARKING PLAN



GENERAL NOTES:

1. ANY EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH THE PROPOSED PAVEMENT MARKINGS SHALL BE REMOVED.
2. ALL CROSSWALKS ARE 8 FEET WIDE UNLESS OTHERWISE NOTED. 1
3. ALL SIGNS DEEMED SUITABLE FOR REUSE SHALL BE DETERMINED BY THE RESIDENT ENGINEER AND SHALL BE PAID UNDER THE RESPECTIVE ITEM NUMBERS.
4. ALL EXISTING SIGNS TO BE REMOVED AND RESET ARE TO BE R&R IN PLACE, UNLESS OTHERWISE NOTED.
5. ALL PROPOSED PAVEMENT MARKINGS ARE TO BE THERMOPLASTIC LINES.
6. ALL SIGNS SHALL HAVE A 2' MINIMUM CLEARANCE BETWEEN EDGE OF SIGN AND FACE OF CURB.
7. ALL SIGNS SHALL HAVE A 7' MINIMUM VERTICAL CLEARANCE BETWEEN BOTTOM OF SIGN AND THE TOP OF SIDEWALK.
8. STOP LINES SHALL BE OFFSET FROM THE ADJACENT CROSSWALK 5 FEET ON-CENTER UNLESS OTHERWISE NOTED.

NOTES:

1. ADA COMPLIANT ACCESS MUST BE MAINTAINED AT ALL TIMES, INCLUDING PEDESTRIAN GUIDANCE SYSTEMS AT WORK ZONES. ANY PEDESTRIAN DETOURS OR BYPASSES SHALL INCLUDE ADA COMPLIANT ROUTE WITH PROPER BARRICADES, RAILINGS, RAMPS SIGNAGE ETC.
2. THE CONTRACTOR SHALL NOT PLACE ANY TEMPORARY DRUMS, CONES, POLICE, CHANGEABLE MESSAGE SIGNS, ARROW BOARDS, BARRICADES OR ANY HIGH LEVEL WARNING DEVICES ON THE RAILROAD TRACKS WITHOUT PROPER NOTIFICATIONS/ PERMISSIONS.
3. 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.
4. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
5. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
6. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE ROADWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
7. 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).
8. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 48 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.
9. THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
10. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
11. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER, AND APPROVED BY THE TOWN.
12. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
13. 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.
14. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
15. THE CONTRACTOR SHALL NOTE THE WORK SCHEDULE DENOTED IN THE SPECIAL PROVISION. WORK REQUIRING LANE CLOSURES THAT WILL IMPACT TRAFFIC IN THE JUDGEMENT OF THE ENGINEER SHALL BE ALLOWED FROM 9:00AM TO 3:00PM MONDAY TO FRIDAY. WORK NOT REQUIRING LAND CLOSURES SHALL BE ALLOWED FROM 7:00AM TO 4:00PM. WORK SHALL BE ALLOWED FROM 9:00PM TO 5:00AM ONLY WITH THE APPROVAL OF THE TOWN OF AYER.

LEGEND:

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

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

MEASURED AVERAGE WORK ZONE CAPACITIES

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

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

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

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

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

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

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

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

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

MA-R2-10a, MA-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

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

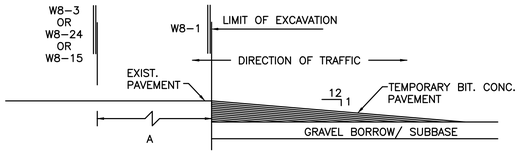
W = WIDTH OF OFFSET IN FEET

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

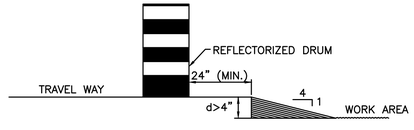
NOTES FOR INSTALLATION:

1. ALL TRAFFIC CONTROL SCENARIOS SHALL CONFORM WITH THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS.
2. ALL CONSTRUCTION SIGNING, DRUMS, BARRICADES AND OTHER DEVICES SHALL CONFORM WITH THE LATEST EDITION, THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.), WITH ALL REVISIONS AND AMENDMENTS.
3. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES.
4. CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 48 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.
5. A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION ON TWO WAY STREETS SHALL BE MAINTAINED AT ALL TIMES, EXCEPT DURING WORKING HOURS, TRAFFIC MAY BE REDUCED TO ONE LANE UNDER POLICE OR FLAGGER CONTROL FOR SHORT TIME PERIODS WHEN REQUIRED FOR THE WORK, AS SHOWN.
6. GRADE SEPARATIONS IN EXCESS OF 2" DURING NON-WORKING HOURS WILL REQUIRE DELINEATION BY USE OF DRUMS.
7. EXCAVATION EDGES IN EXCESS OF 4" DEEP SHALL BE PROTECTED DURING NON-WORKING HOURS BY BACKFILLING WITH A WEDGE OF GRAVEL OR SOIL TO COMPACTED 1:4 SLOPE.
8. 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED.
9. NON-ESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS.
10. ADVISORY SPEED PLATES (W13-1) SHALL BE USED IF APPROPRIATE AND AS DIRECTED BY THE ENGINEER.
11. CONSTRUCTION SIGNS ASSOCIATED WITH THE DAILY LANE CLOSURES AND SHOULDER WORK AREAS WILL NOT BE MEASURED FOR PAYMENT MORE THAN ONCE REGARDLESS OF THE NUMBER OF TIMES THE SIGNS ARE REUSED.
12. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.



LONGITUDINAL DROP-OFF DETAIL

NOT TO SCALE



LATERAL DROP-OFF DETAIL

NOT TO SCALE

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		11	44
T&B PROJECT FILE NO.	17-023.01		

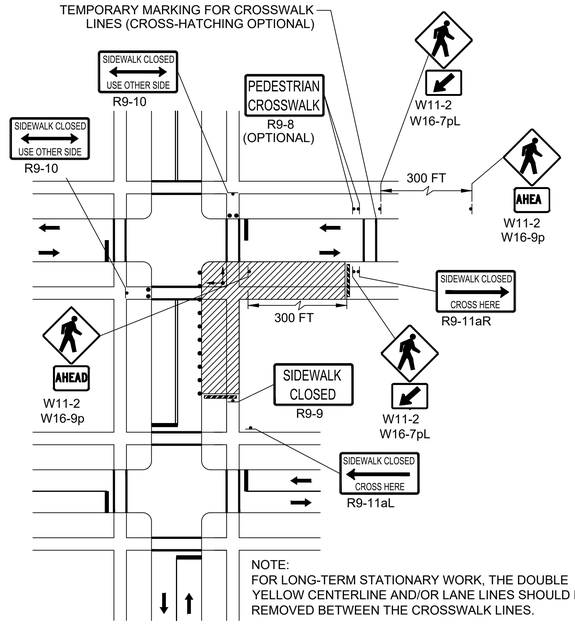
TEMPORARY TRAFFIC CONTROL PLANS
SHEET 1 OF 8

16-005.01_HD(TMPS).DWG Plotted on 19-Dec-2024 5:20 PM

AYER
WEST MAIN STREET

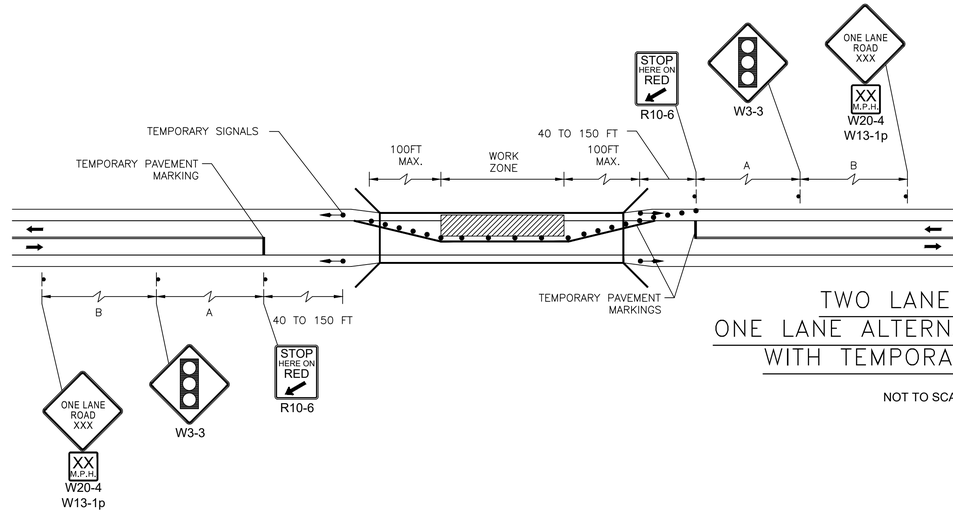
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		12	44
T&B PROJECT FILE NO.	17-023.01		

TEMPORARY TRAFFIC CONTROL PLANS
SHEET 2 OF 8



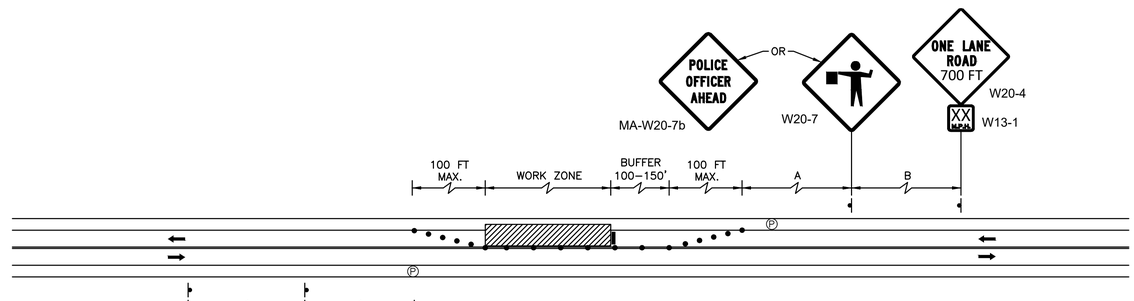
PEDESTRIAN DETOUR

NOT TO SCALE



TWO LANE ROAD
ONE LANE ALTERNATING TRAFFIC
WITH TEMPORARY SIGNAL

NOT TO SCALE



TWO LANE ROAD
ONE LANE ALTERNATING TRAFFIC
WITH POLICE OR FLAGGER DETAIL

NOT TO SCALE

ONE LANE BI–DIRECTIONAL TRAFFIC AT INTERSECTIONS

NOT TO SCALE

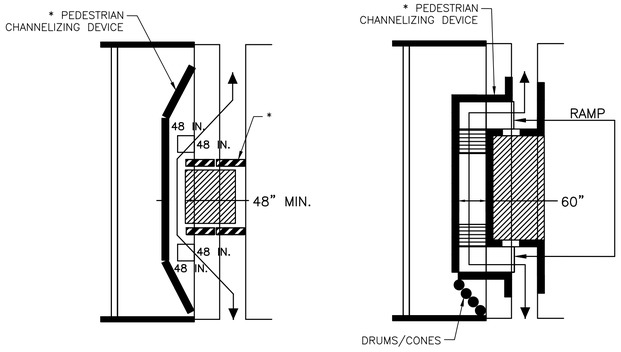
TYPICAL SIDE STREET ADVANCED WARNING SIGN DETAIL

NOT TO SCALE

DRUM SPACING DEPENDENT ON SPEED

TYPICAL SHOULDER CLOSURE

NOT TO SCALE



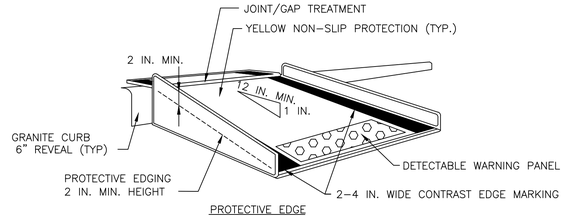
- WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
- A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
- WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT (SEE FIGURES PED-1 & PED-2).
- THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
- THE PROTECTIVE REQUIREMENTS OF A TTC SITUATION HAVE PRIORITY IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN THIS SITUATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
- AUDIBLE INFORMATION DEVICES SHOULD BE CONSIDERED WHERE MIDBLOCK CLOSINGS AND CHANGED CROSSWALK AREAS CAUSE INADEQUATE COMMUNICATION TO BE PROVIDED TO PEDESTRIANS WHO HAVE VISUAL DISABILITIES.

AUDIBLE DEVICES

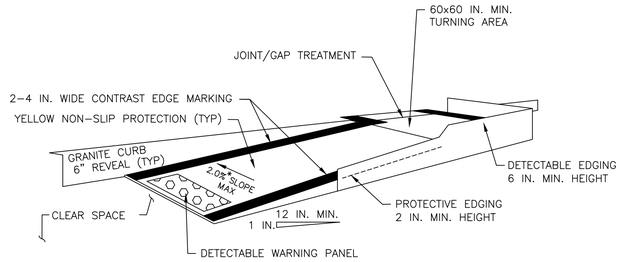
FOR LONG TERM SIDEWALK CLOSURES (AT A MINIMUM OVERNIGHT) A FORM OF SPEECH MESSAGING FOR PEDESTRIANS WITH VISUAL DISABILITIES SHALL BE PROVIDED. AUDIBLE INFORMATION DEVICES SUCH AS DETECTABLE BARRIERS OR BARRICADES AND OTHER PASSIVE PEDESTRIAN ACTIVATION (MOTION ACTIVATED) DEVICES SHOULD BE CONSIDERED FOR THESE CASES. THESE AUDIBLE DEVICES CAN BE MOUNTABLE OR STAND ALONE.

PEDESTRIAN CHANNELIZING DEVICE

NOT TO SCALE



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB



TEMPORARY CURB RAMP-PARALLEL TO CURB

NOTES:

1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.

**COMPENSATION FOR WORK ASSOCIATED WITH HOT MIX ASPHALT FOR TEMPORARY CURB RAMPS AS DETAILED HERE ARE PAID FOR UNDER ITEM 472 – TEMPORARY ASPHALT PATCHING AND AS DIRECTED BY THE ENGINEER.

TEMPORARY CURB RAMP

NOT TO SCALE

1 ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		14	44
T&B PROJECT FILE NO.	17-023.01		

ADVANCED SIGNING PLAN
SHEET 4 OF 8

16-005.01_HD(TMPS).DWG Plotted on 30-Jan-2025 3:32 PM

N

PCMS 4

BISHOP ROAD

D3-3 (ROGERS ST)
M4-9bL
MR-9bR

D3-1(UNION ST)
M4-9bL

D3-2 (SHIRLEY ST)
M4-9bR

PARK STREET

SP-1 - " WEST MAIN STREET
BRIDGE UNDER CONSTRUCTION
TRUCKS FOLLOW DETOUR"

WORK ZONE

M4-9L

MACPHERSON ROAD

WEST MAIN STREET

UNION STREET

MECHANIC STREET

ROGERS STREET

R11-4

SHIRLEY STREET

D3-2 (SHIRLEY ST)
M4-9bL

R11-4
M4-9R

D3-1 (UNION ST)
M4-9bL

D3-3 (ROGERS ST)
M4-9bR

SEE SHEETS 15-16 FOR
TEMPORARY TRAFFIC CONTROL
PHASING PLANS

TEMPORARY PEDESTRIAN ACCESS ROUTE DURING CONSTRUCTION SHALL DIRECT PEDESTRIANS DOWN ROGERS STREET, TURN ON TO SHIRLEY STREET, AND BACK UP UNION STREET. PEDESTRIAN PATH SHALL HAVE A 5'-0" CLEAR WIDTH SEPARATED BY BARRELS ALONG THE PATH SPACED AT NO MORE THAN 20' APART WITH TEMPORARY CROSSWALKS AND PEDESTRIAN CURB RAMPS TO BE CONSTRUCTED AS NEEDED. A CLEAR PATH OF TRAVEL MAY BE NARROWED TO 4'-0" ALONG OBSTRUCTIONS FOR NO LONGER THAN 200'.

CENTRAL AVENUE

GROTON-HARVARD ROAD

EAST MAIN STREET

M4-10L

SP-1 - " WEST MAIN STREET
BRIDGE UNDER CONSTRUCTION
TRUCKS FOLLOW DETOUR"

1000'

M4-9R

M4-9R

W20-2C (AHEAD)

W20-2C (AHEAD)

M4-8a

PCMS 3

EAST MAIN STREET

PCMS 2

BARNUM ROAD

500'

WEST MAIN STREET

PCMS 5

W20-2C (AHEAD)

SHERMAN AVE

M4-8a

PCMS 1

SP-1 - "WEST MAIN STREET BRIDGE
UNDER CONSTRUCTION
TRUCKS FOLLOW DETOUR"
M4-10R

M4-9V

SARATOGA BOULEVARD

M4-9L

M4-9R

JACKSON ROAD

JACKSON ROAD

BARNUM ROAD

SP-1 - "WEST MAIN STREET BRIDGE
UNDER CONSTRUCTION
TRUCKS FOLLOW DETOUR"
M4-10R

M4-9V

BARNUM ROAD

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) LEGEND:

*DURING PHASED CONSTRUCTION

W MAIN ST
BRIDGE
CONST

SCREEN 1

SEEK
ALTERNATE
ROUTES

SCREEN 2

*NOTE: PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE IN PLACE TWO WEEKS PRIOR TO THE START OF WORK (TYP.)

0 500 1000 1500 2000

SCALE: 1" = 500'

NOTES:

1. REMOVE EXISTING PAVEMENT MARKINGS FROM TRAVEL PATH WITHIN LIMITS OF PROPOSED TEMPORARY PAVEMENT MARKINGS BY APPROVED METHODS.
2. COVER ALL EXISTING SIGNS THAT CONFLICT WITH CONSTRUCTION SIGNING.
3. SPEED LIMIT IN WORK ZONE TO BE DETERMINED BY THE TOWN.
4. SHIRLEY STREET BRIDGE OVER NONACOICUS BROOK IS CLOSED TO VEHICULAR TRAFFIC.
5. SEE STAGED CONSTRUCTION DETAILS/NOTES ON BRIDGE PLANS.
6. TEMPORARY ADA COMPLAINT PEDESTRIAN CURB RAMPS SHALL BE CONSTRUCTED AT EACH CROSSWALK LOCATION.
7. TEMPORARY PAVEMENT MARKINGS OUTSIDE THE LIMITS OF PAVEMENT RECONSTRUCTION SHALL BE TAPE.
8. VEHICLES SHALL NOT BE PERMITTED TO TAKE A LEFT FROM UNION STREET ON TO WEST MAIN STREET.
9. BARRIERS WITH WARNING LIGHTS SHALL BE PLACED AROUND GAS VAULT AREA AS NEEDED TO ENSURE NO VEHICLES TRAVEL OVER AREA.
10. DRIVEWAY ACCESS SHALL BE PROVIDED TO HOMEOWNERS THROUGH ALL PHASES, AND CORDONED OFF BY BARRELS AND TEMPORARY CHAIN LINK FENCING SET UP BY CONTRACTOR.
11. TRAILER MOUNTED PORTABLE TRAFFIC SIGNAL SHALL BE INSTALLED BY A MASSDOT PREQUALIFIED & APPROVED VENDOR.
12. CONTRACTOR TO CONFIRM BY TEST PIT ANY TIME A PROPOSED UTILITY CROSSES ANOTHER UTILITY.
13. CONTRACTOR TO DIRECTLY COORDINATE WITH NATIONAL GRID REGARDING WORK WITHIN THE VICINITY OF THE GAS REGULATOR VAULT AREA TO ENSURE ALL APPROPRIATE PROTECTIONS ARE IN PLACE ENSURING NO VEHICULAR ACCESS OCCURS WITHIN THE VAULT AREA.
14. BARRIER SHALL BE PLACED IN ACCORDANCE WITH ALL APPLICABLE TAPER CRITERIA BASED ON ASSUMED DESIGN SPEED & AASHTO REQUIREMENTS.
15. FOR RELOCATED UTILITY POLE SUGGESTED COORDINATE NORTHINGS & EASTINGS, SEE BRIDGE PLANS.

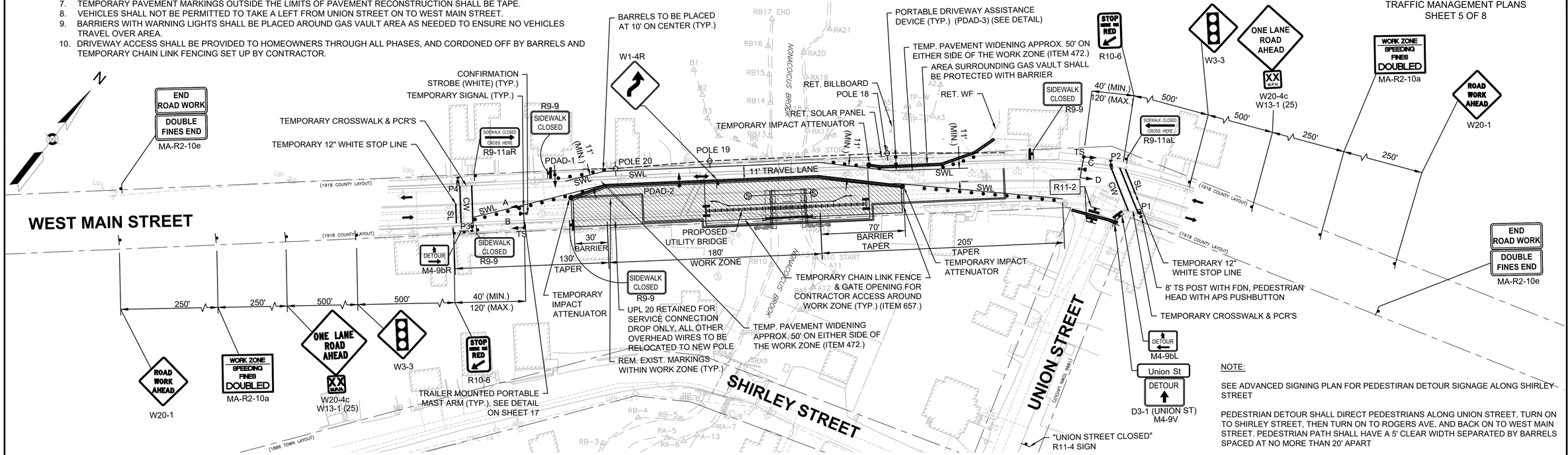
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		15	44
T&B PROJECT FILE NO.	17-023.01		

TRAFFIC MANAGEMENT PLANS
SHEET 5 OF 8

16-005.01_HD(TMPS).DWG Plotted on 19-Dec-2024 6:14 PM

STAGE 1

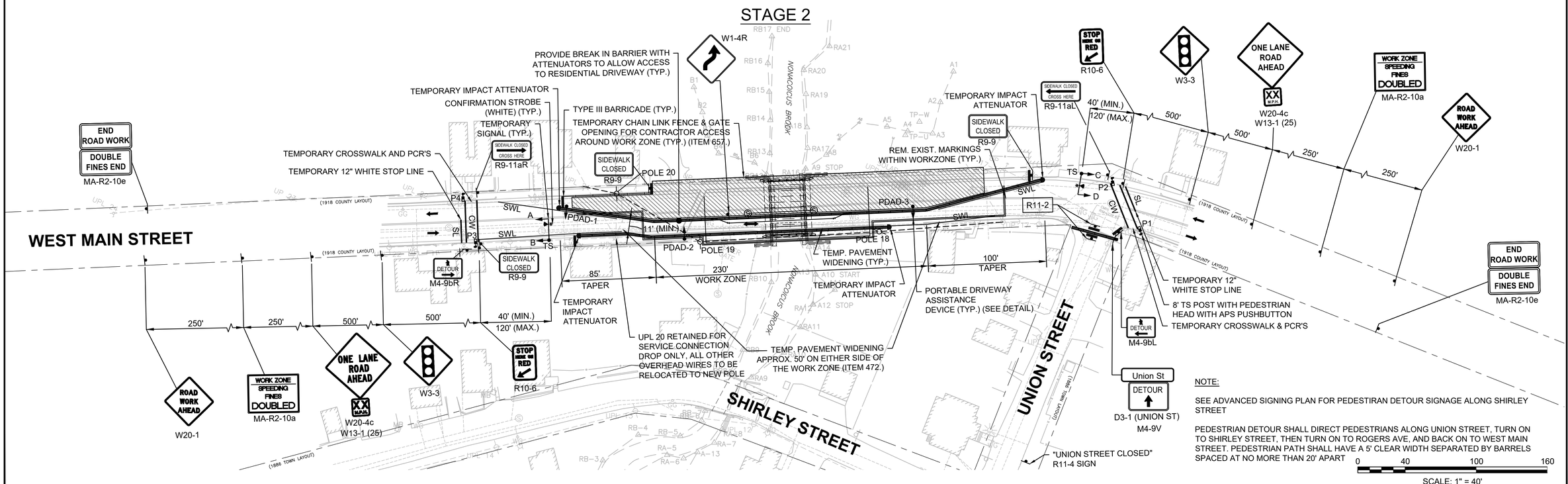


NOTE:

SEE ADVANCED SIGNING PLAN FOR PEDESTIRAN DETOUR SIGNAGE ALONG SHIRLEY STREET

PEDESTRIAN DETOUR SHALL DIRECT PEDESTRIANS ALONG UNION STREET, TURN ON TO SHIRLEY STREET, THEN TURN ON TO ROGERS AVE, AND BACK ON TO WEST MAIN STREET. PEDESTRIAN PATH SHALL HAVE A 5' CLEAR WIDTH SEPARATED BY BARRELS SPACED AT NO MORE THAN 20' APART

STAGE 2



NOTE:

SEE ADVANCED SIGNING PLAN FOR PEDESTIRAN DETOUR SIGNAGE ALONG SHIRLEY STREET

PEDESTRIAN DETOUR SHALL DIRECT PEDESTRIANS ALONG UNION STREET, TURN ON TO SHIRLEY STREET, THEN TURN ON TO ROGERS AVE, AND BACK ON TO WEST MAIN STREET. PEDESTRIAN PATH SHALL HAVE A 5' CLEAR WIDTH SEPARATED BY BARRELS SPACED AT NO MORE THAN 20' APART

0 40 100 160

SCALE: 1" = 40'

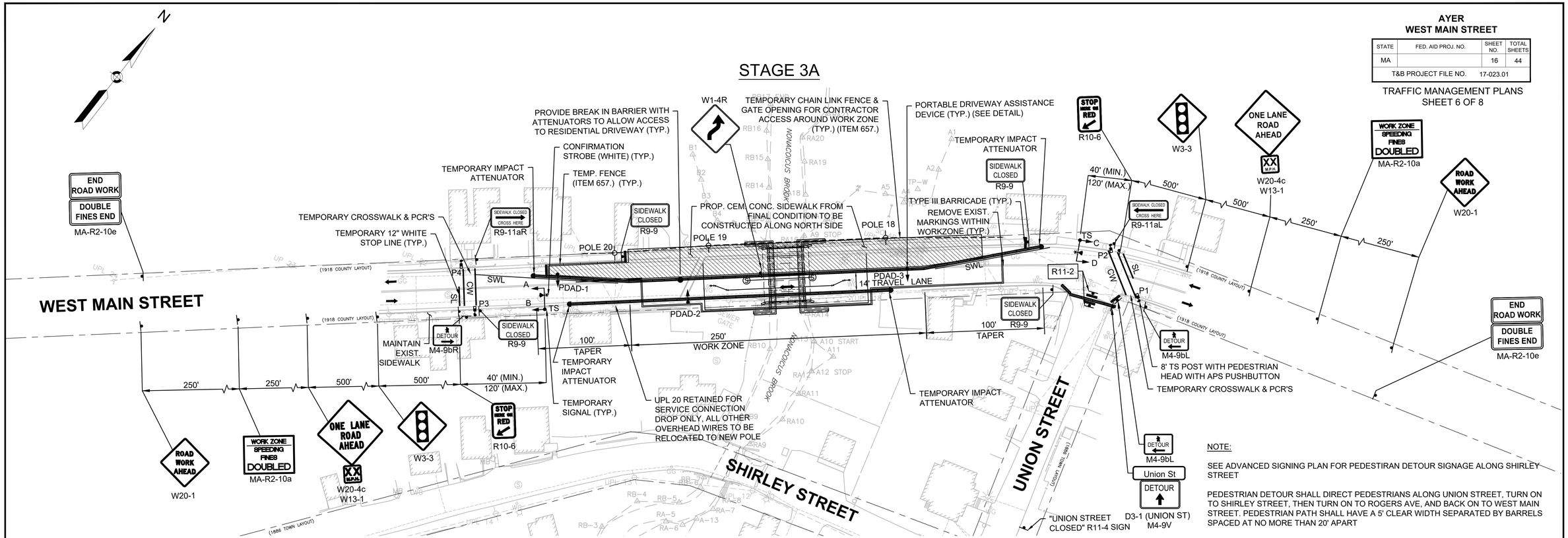
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		16	44
T&B PROJECT FILE NO.	17-023.01		

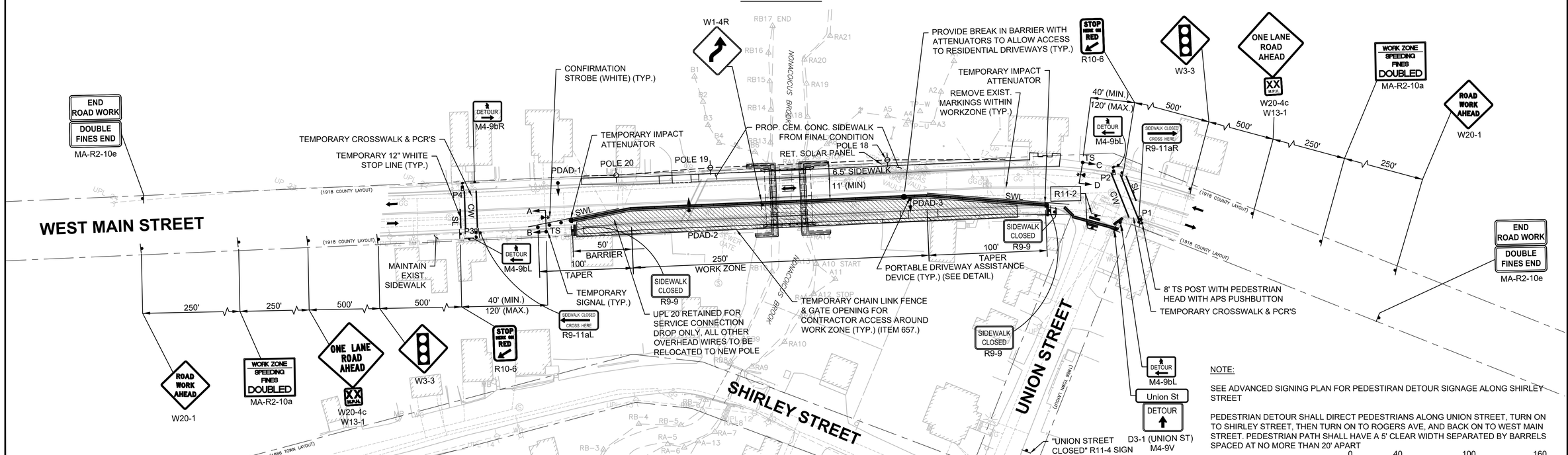
TRAFFIC MANAGEMENT PLANS
SHEET 6 OF 8

16-005.01_HD(TMPS).DWG Plotted on 19-Dec-2024 6:15 PM

STAGE 3A



STAGE 3B

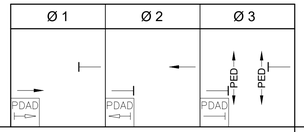


AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		17	44
T&B PROJECT FILE NO.	17-023.01		

TRAFFIC MANAGEMENT PLANS
SHEET 7 OF 8

16-005.01_HD(TMPS).DWG Plotted on 19-Dec-2024 5:20 PM



SEQUENCE AND TIMING FOR ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	FLASH
WEST MAIN ST	EB	A,B	G	Y	R	R	R	R	R	R	R	FY
WEST MAIN ST	WB	C,D	R	R	R	G	Y	R	R	R	R	FY
PEDESTRIANS	ALL	P1 - P4	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF
PDAD (Ø1 & Ø3)	N/A		FRA	Y	R	FLA	Y	R	R	R	R	R
PDAD (Ø2)	N/A		FLA	Y	R	FRA	Y	R	R	R	R	R
TIMING IN SECONDS												
MINIMUM GREEN (INITIAL)			40			40						EMERGENCY ONLY
YELLOW CLEARANCE				3			3					
RED CLEARANCE					17			17				
WALK (W)									5			
PEDESTRIAN CLEARANCE										10	4	
RECALL			ON			ON			OFF			

MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
816.81	1	CONTROLLER NEMA 8 PHASE TS2-TYPE 1
	2	TRAILER MOUNTED PORTABLE MAST ARMS, SOLAR POWERED WITH BATTERY BACKUP, RADAR VEHICLE DETECTION, AND WIRELESS COMMUNICATION
	4	1 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.)
	1	PRE-EMPTION STROBE WITH RELAY
	2	PRE-EMPTION RECEIVER - SINGLE CHANNEL
	2	PRE-EMPTION PHASE SELECTOR - DUAL CHANNEL
	3	PORTABLE DRIVEWAY ASSISTANCE DEVICE INCLUDING: - SELF CONTAINING TRAILER WITH MAST ARM - 1-3 SECTION LED SIGNAL HEAD - 12 VDC BATTERY SYSTEM WITH SOLAR CHARGING - WIRELESS RADIO WORK COMMUNICATION
	4	8 FT TRAFFIC SIGNAL POST, SOLAR POWERED WITH WIRELESS COMMUNICATION
	4	PEDESTRIAN HOUSING (16" COUNTDOWN L.E.D.)
	4	APS PEDESTRIAN PUSH BUTTON, SIGN & SADDLES

EMERGENCY PREEMPTION SCHEDULE

APPROACH	PREEMPTION PHASE	NEXT PHASE CALLED	TIME (SEC.)
EASTBOUND	1	2	MIN. 10 MAX 120
WESTBOUND	2	1	MIN. 10 MAX 120

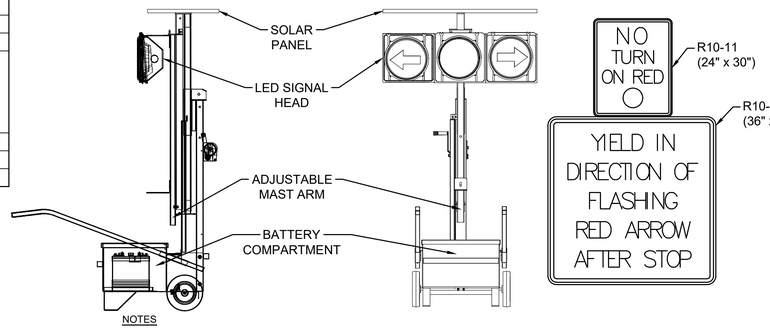
EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAN THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
3. PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
4. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
5. ACTUAL TIMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT.

SEQUENCE & TIMING NOTES:

1. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
2. FLASHING OPERATION IS FOR EMERGENCY ONLY. THE SIGNAL SHALL PROVIDE STOP AND GO OPERATION 24 HOURS DAILY.
4. Ø4, Ø5, Ø6, Ø7, Ø8, & Ø9 SHALL NOT BE USED.
5. THE CONTRACTOR SHALL MONITOR TRAFFIC CONDITIONS DURING CONSTRUCTION AND ADJUST SIGNAL TIMINGS AS NECESSARY AND AS DIRECTED BY THE ENGINEER.

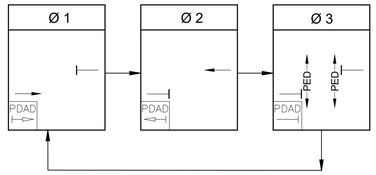
PORTABLE DRIVEWAY ASSISTANCE DEVICE DETAIL (PDAD)



NOTES

1. PORTABLE DRIVEWAY ASSISTANCE DEVICES SHALL DISPLAY A FLASHING RED ARROW IN DIRECTION OF TRAFFIC DURING Ø1 & Ø2 GREEN AND YELLOW CLEARANCE INTERVALS. A SOLID RED BALL SHALL BE DISPLAYED DURING Ø3 AND ALL RED CLEARANCE INTERVALS.
2. AFFIX ONE (1) R10-11 AND ONE (1) R10-27(MOD) SIGN, FACING THE SAME DIRECTION AS THE LENSES, TO EACH PORTABLE DRIVEWAY ASSISTANCE DEVICE.
3. ANY SIGNS MOUNTED TO THE PORTABLE DRIVEWAY ASSISTANCE DEVICES SHALL BE CLEARLY VISIBLE TO THE INTENDED TARGET.

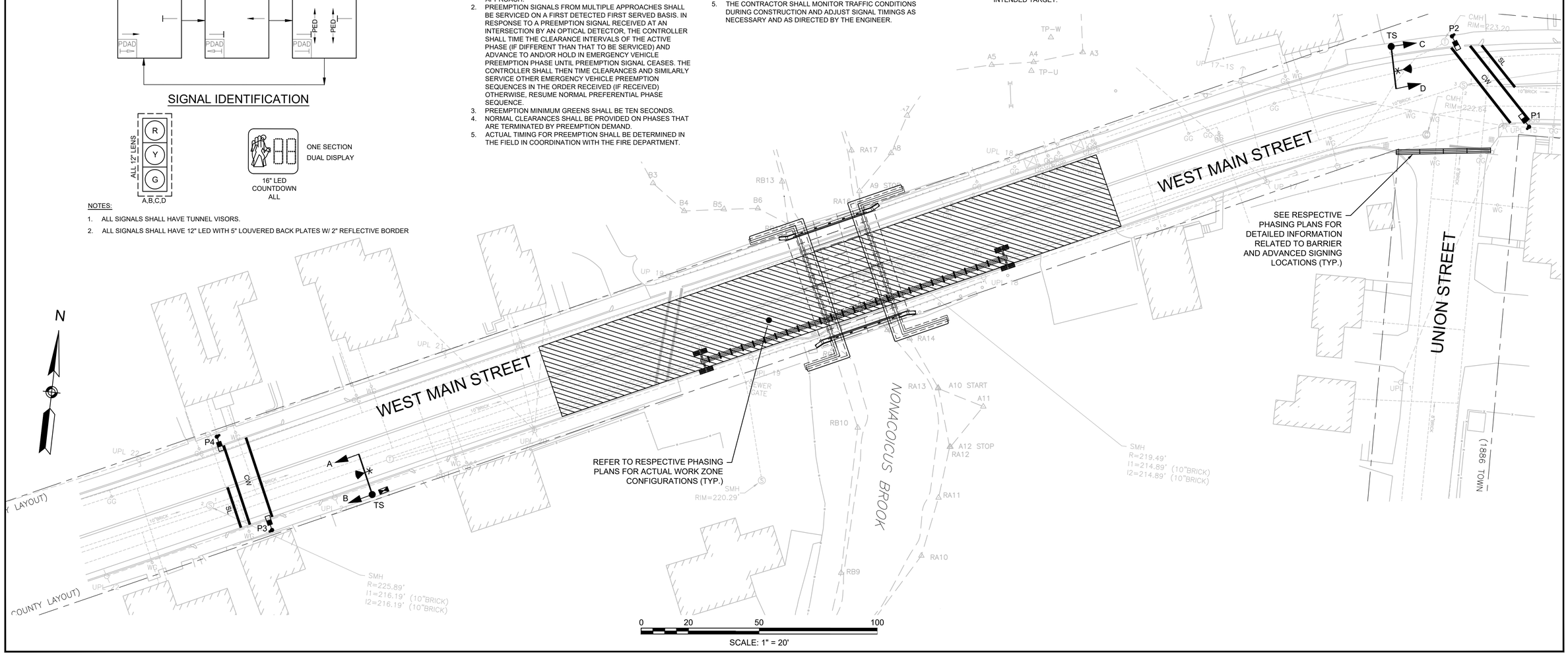
PREFERENTIAL PHASING SEQUENCE



SIGNAL IDENTIFICATION

NOTES:

1. ALL SIGNALS SHALL HAVE TUNNEL VISORS.
2. ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES W/ 2" REFLECTIVE BORDER



1 ADDENDUM #2 - 2/3/2025

TEMPORARY CONSTRUCTION SIGN SUMMARY

SIGN ID NUMBER	SIZE		MESSAGE	DIMENSIONS (IN)			NUMBER REQUIRED	COLOR		
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER
MA-R2-10a	60	48	WORK ZONE SPEEDING FINES DOUBLED	2	2	2	2	ORANGE WHITE	BLACK	BLACK
MA-R2-10e	48	60	END ROAD WORK / DOUBLE FINES END				2	ORANGE WHITE	BLACK	BLACK
M4-8a	24	18	END DETOUR	1	1	1	2	ORANGE	BLACK	BLACK
M4-9L	30	24	DETOUR ←				2	ORANGE	BLACK	BLACK
M4-9R	30	24	DETOUR →				4	ORANGE	BLACK	BLACK
M4-9V	30	24	DETOUR ↑				5	ORANGE	BLACK	BLACK
M4-10L	48	18	← DETOUR				1	BLACK ORANGE	BLACK	BLACK
M4-10R	48	18	DETOUR →				2	BLACK ORANGE	BLACK	BLACK
R10-6	24	36	STOP HERE ON RED				2	WHITE	BLACK	BLACK
M4-9bR	30	24	DETOUR →				3	ORANGE	BLACK	BLACK
M4-9bL	30	24	DETOUR ←				4	ORANGE	BLACK	BLACK
R9-11aR	24	12	SIDEWALK CLOSED → CROSS HERE				1	WHITE	BLACK	BLACK
R9-11aL	24	12	SIDEWALK CLOSED ← CROSS HERE				1	WHITE	BLACK	BLACK
R9-9	24	12	SIDEWALK CLOSED				4	WHITE	BLACK	BLACK
R10-11	24	30	NO TURN ON RED				3	WHITE	BLACK	BLACK
R10-27 (MOD.)	36	36	YIELD IN DIRECTION OF FLASHING RED ARROW AFTER STOP				3	WHITE	BLACK	BLACK
MA-W20-7b	36	36					3	ORANGE	BLACK	BLACK
W5-1	36	36	ROAD NARROWS				1	ORANGE	BLACK	BLACK
W20-4	36	36	ONE LANE ROAD 1000 FT				3	ORANGE	BLACK	BLACK
W21-5a	36	36	RIGHT SHOULDER CLOSED				1	ORANGE	BLACK	BLACK
R11-4	60	30	ROAD CLOSED TO THRU TRAFFIC	1	1	1	1	WHITE	BLACK	BLACK
R11-2	48	30	ROAD CLOSED				2	WHITE	BLACK	BLACK
W1-4R	36	36					1	ORANGE	BLACK	BLACK
W3-3	36	36					2	ORANGE	BLACK	BLACK
W13-1 (25)	24	24	XX MPH				2	ORANGE	BLACK	BLACK
W20-1	36	36	ROAD WORK AHEAD				2	ORANGE	BLACK	BLACK
W20-2c	36	36	DETOUR AHEAD				2	ORANGE	BLACK	BLACK
W20-4c	36	36	ONE LANE ROAD AHEAD				2	ORANGE	BLACK	BLACK
D3-1	32	12	UNION ST				2	ORANGE	BLACK	BLACK
D3-2	36	12	SHIRLEY ST				2	ORANGE	BLACK	BLACK
D3-3	36	12	ROGERS ST				3	ORANGE	BLACK	BLACK
SP-1	-	-	WEST MAIN STREET BRIDGE UNDER CONSTRUCTION TRUCKS FOLLOW DETOUR	2	2	2	4	ORANGE	BLACK	BLACK

1

AYER
WEST MAIN STREET

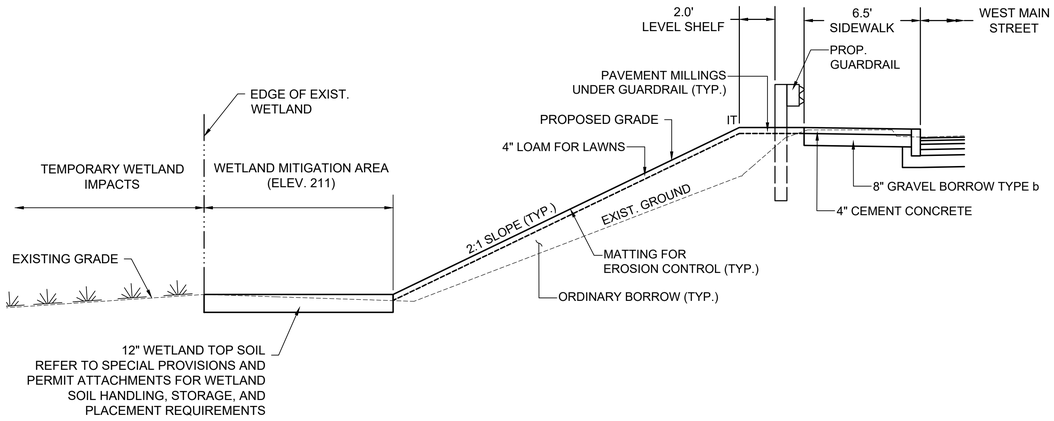
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		18	44
T&B PROJECT FILE NO.	17-023.01		

TRAFFIC MANAGEMENT PLANS
SHEET 8 OF 8

SIGN SUMMARY NOTES:

1. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2009 EDITION, THE 1996 MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS", AND ALL ADMENDMENTS WILL GOVERN.
2. NUMERICAL LIMITS AND JUSTIFICATION FOR SPEED & ADVISORY EXIT SPEED SIGNS SHALL BE DETERMINED BY THE ENGINEER OR THE AYER DPW SUPERINTENDENT.
3. (1) SEE MUTCD 2009 EDITION, 2004 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.

   (2) SEE MASSDOT SIGN STANDARDS.



WETLAND REPLICATION CROSS-SECTION

SCALE: 1"=4'

NEW ENGLAND ROADSIDE WET MEADOW SEED MIX

GRASSES / SEDGES
Elymus riparius / Riverbank Wild Rye
Festuca rubra / Creeping Red Fescue
Elymus virginicus / Virginia Wild Rye
Panicum dichotomiflorum / Smooth Panic Grass
Panicum virgatum / Switch Grass
Carex lurida / Lurid Sedge
Carex scoparia / Blunt Broom Sedge
Agrostis scabra / Rough Bentgrass/Ticklegrass
Scirpus atrovirens / Green Bulrush

WILDFLOWERS
Bidens aristosa / Tickseed Sunflower/Bur Marigold
Verbena hastata / Blue Vervain
Helenium autumnale / Common Sneezeweed
Asclepias incarnata / Swamp Milkweed
Aster novae-angliae / New England Aster
Eupatorium maculatum (Eutrochium maculatum) / Spotted Joe Pye Weed
Eupatorium perfoliatum / Boneset

SHRUBS
Cornus amomum / Silky Dogwood
Viburnum dentatum / Arrow Wood Viburnum
Sambucus canadensis / Elderberry
Cornus sericea / red-osier dogwood

NEW ENGLAND ROADISDE UPLAND SEED MIX

GRASSES / SEDGES
Elymus canadensis / Canada Wild Rye
Schizachyrium scoparium / Little Bluestem
Festuca rubra / Creeping Red Fescue
Andropogon gerardii / Big Bluestem
Sorghastrum nutans / Indian Grass
Panicum virgatum / Switch Grass

WILDFLOWERS
Chamaecrista fasciculata / Partridge Pea
Asclepias syriaca / Common Milkweed
Zizia aurea / Golden Alexanders
Desmodium canadense / Showy Tick Trefoil
Lespedeza capitata / Bush Clover/Roundhead Lespedeza
Heliopsis helianthoides / Ox Eye Sunflower
Monarda fistulosa / Wild Bergamot
Rudbeckia hirta / Black Eyed Susan
Aster laevis / Smooth Blue Aster
Euthamia graminifolia / Grass Leaved Goldenrod
Solidago juncea / Early Goldenrod

SHRUBS
Rhus typhina / Staghorn Sumac
Cornus amomum / Silky Dogwood
Cornus racemosa / Grey Dogwood

CONSTRUCTION NOTES:

1) STONE FOR PIPE ENDS SHALL BE CONSTRUCTED ENTIRELY WITHIN THE PERMANENT IMPACT WETLAND AREA

DETAIL (SEED MIXTURES)

NOTES:

GENERAL
PRIOR TO SEEDING, BOUNDARIES OF SEEDING/ PLANTING AREAS TO BE STAKED BY CONTRACTOR AND APPROVED BY PROJECT MANAGER OR WETLAND SCIENTIST.
INSTALLATION OF SEEDING MIX SHALL NOT TAKE PLACE IN ANY INUNDATED AREAS.
INSTALLATION OF SEEDING MIX SHALL INCLUDE A LIGHT RAKE OR ROLL TO ENSURE PROPER SEED TO SOIL CONTACT.
INSTALLATION OF STRAW MULCH IN SEEDED AREAS WITH SLOPES SHALLOWER THAN 4:1 (HORIZONTAL:VERTICAL).
INSTALLATION OF EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING INSTALLATION OF SEED ON AREAS WITH SLOPES STEEPER THAN 4:1 (HORIZONTAL:VERTICAL).

WETLAND AND UPLAND SEEDING AREAS
WITHIN 48 HOURS OF FINAL GRADING, APPLY SEED (NEW ENGLAND MATRIX ROADSIDE WET MEADOW SEED MIX OR APPROVED EQUAL) IN DESIGNATED WETLAND PLANTING AREAS, AND APPLY SEED (NEW ENGLAND MATRIX ROADSIDE UPLAND SEED MIX OR APPROVED EQUAL) IN DESIGNATED UPLAND AREAS.
PREFERRED TIME OF YEAR FOR WETLAND AND UPLAND SEEDING APPLICATIONS IS SPRING.
NO FERTILIZER SHALL BE USED WITH SEEDING MIX APPLICATIONS IN ANY WETLANDS.
NO FERTILIZER SHALL BE USED WITH SEEDING MIX APPLICATIONS IN UPLANDS AREAS ADJACENT TO WETLANDS.

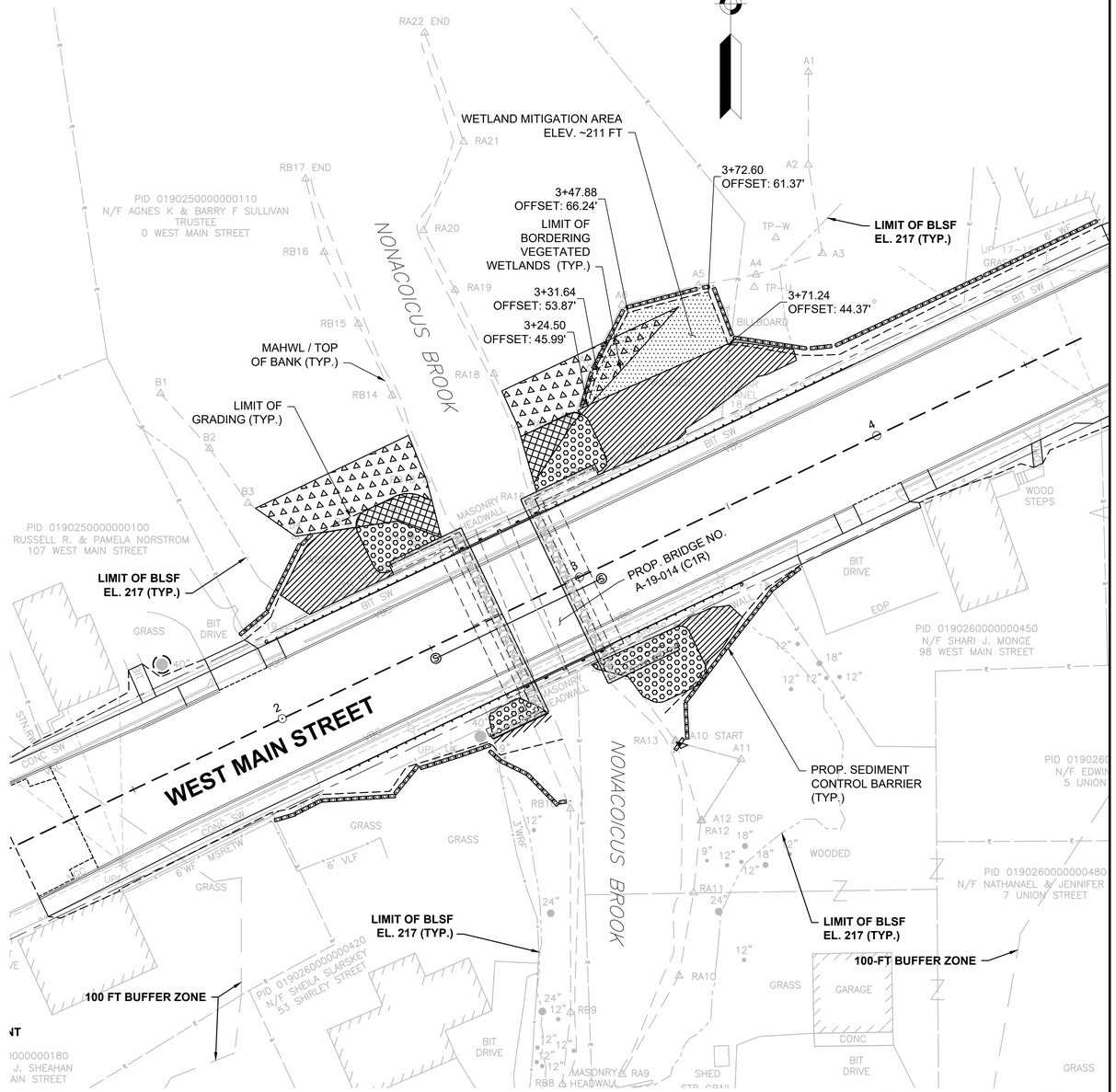
LEGEND
- PERMANENT IMPACT WETLAND, GRADES RESTORED, SEEDED WITH NE WET MIX
- TEMPORARY IMPACT WETLAND, GRADES RESTORED, SEEDED WITH NE WET MIX
- TEMPORARY FLOODPLAIN / BLSF IMPACT, PROPOSED GRADES OR GRADES RESTORED, SEEDED WITH NE UPLAND SEED MIX
- PERMANENT FLOODPLAIN / BLSF IMPACT, WITH LOAM AND SEEDED WITH NE UPLAND SEED MIX
- WETLAND MITIGATION AREA, SEEDED WITH NE WET MIX

N

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		19	44
T&B PROJECT FILE NO.	17-023.01		

WETLAND REPLICATION PLAN & DETAILS



GRADING & PLANTING PLAN

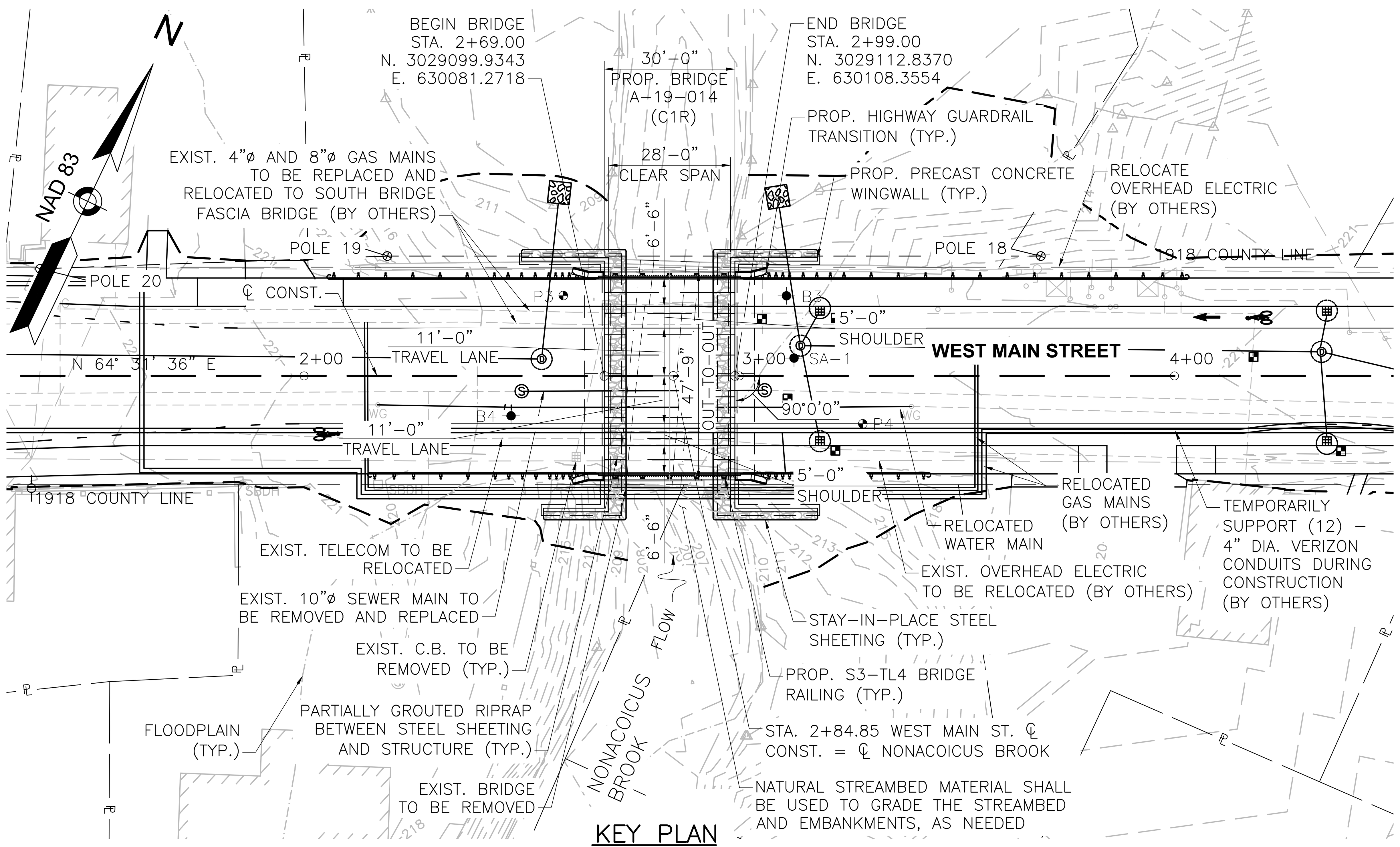
16-005.01_HD(WETLAND).DWG Plotted on 19-Dec-2024 5:30 PM

AYER
WEST MAIN STREET

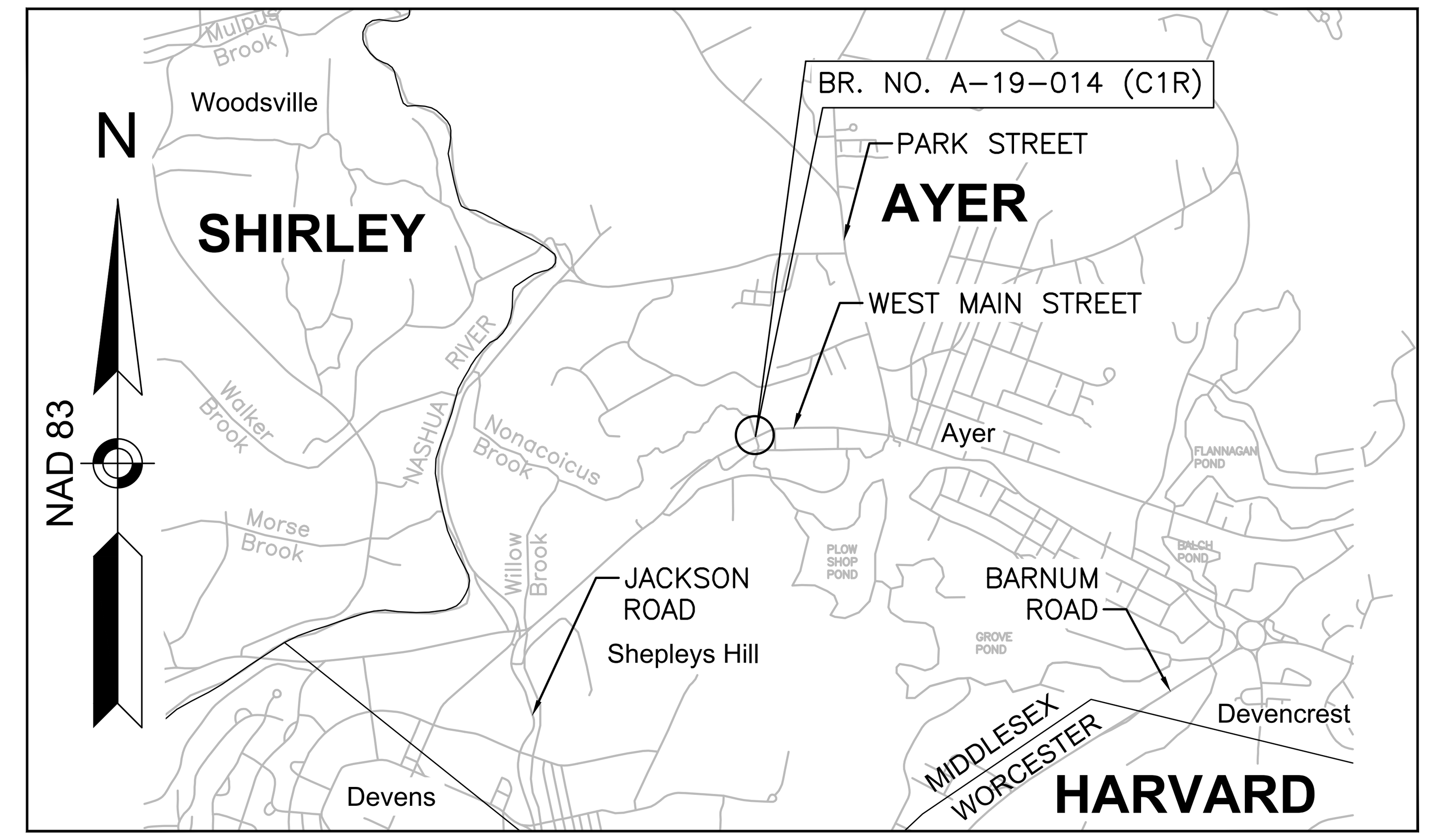
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	20	44

PROJECT FILE NO. 17–023.01

KEY PLAN



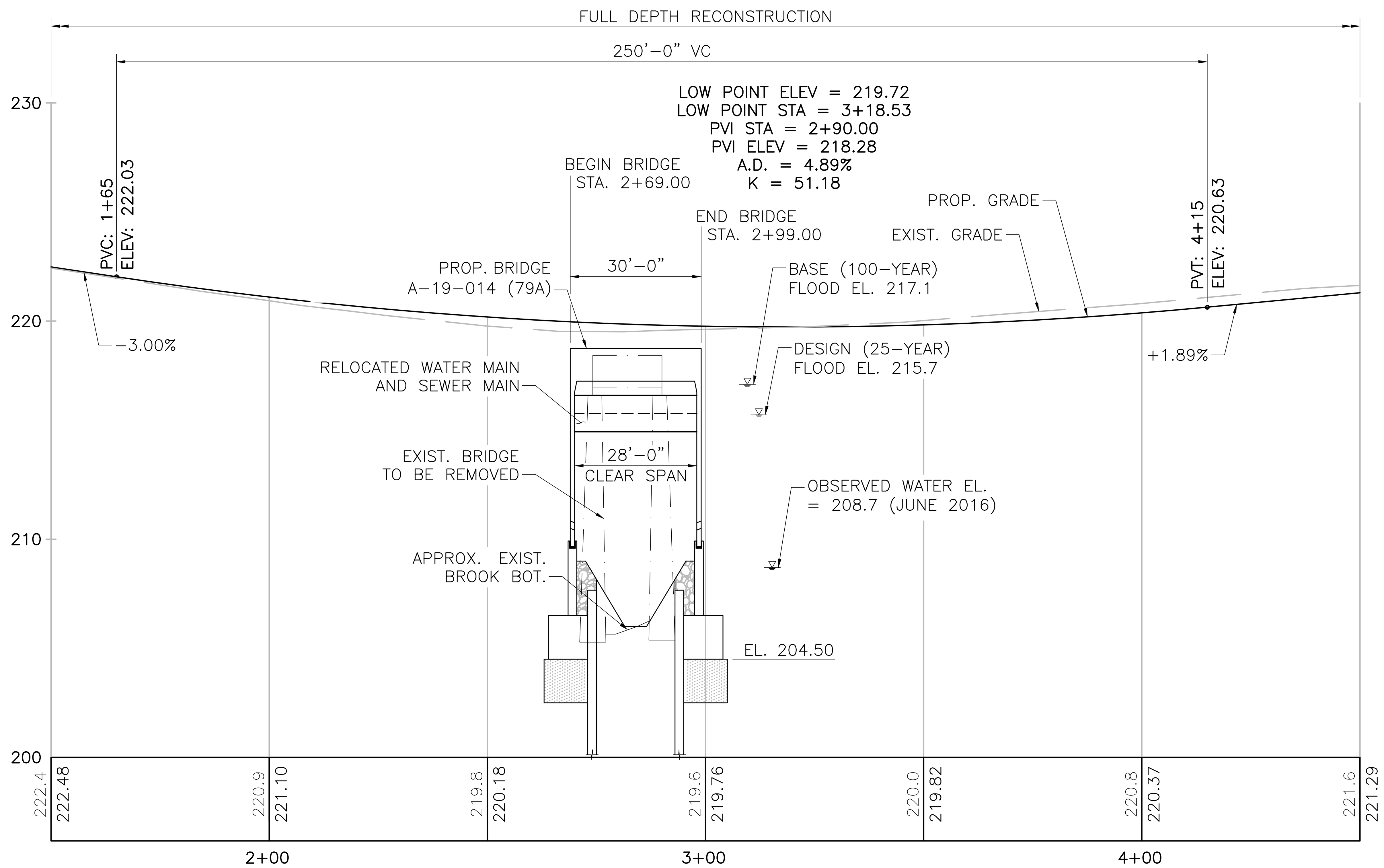
KEY PLAN
SCALE: 1" = 20'



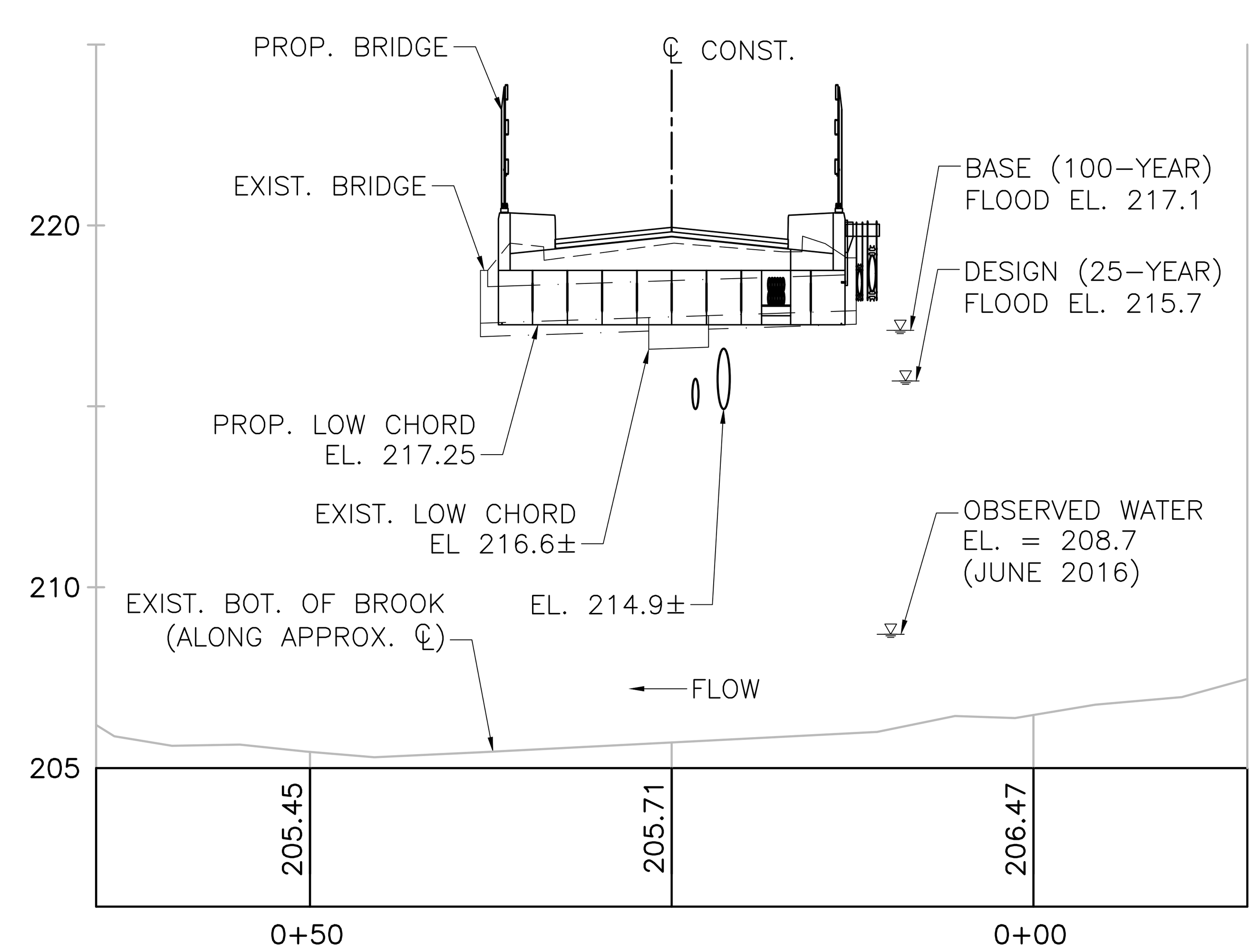
LOCUS
SCALE: 1" = 2000'

BORING LEGEND
- LOCATION OF SAMPLE BORINGS
- LOCATION OF SAMPLE PROBE

INDEX OF BRIDGE DRAWINGS



PROFILE – WEST MAIN STREET
SCALE: 1" = 20' HORIZONTAL
¼" = 1'–0" VERTICAL



PROFILE – NONACOICUS BROOK
SCALE: 1" = 20' HORIZONTAL
¼" = 1'–0" VERTICAL

COMMONWEALTH OF MASSACHUSETTS
AARON M. LACHANCE
CIVIL
No. [illegible]
REGISTERED PROFESSIONAL ENGINEER
12-23-2024

HOYLE TANNER
100 INTERNATIONAL DRIVE, SUITE 360
PORTSMOUTH, NH 03801
PHONE: 603-431-2520
FAX: 603-431-8067

ISSUED FOR CONSTRUCTION

AYER-MASS
AYER LIBRARY
Incorporated Feb. 14, 1871

CONTRACT PLANS OF
PROPOSED BRIDGE
AYER
WEST MAIN STREET
OVER NONACOICUS BROOK

SHEET 1 OF 21 SHEETS BRIDGE NO. A–19–014 (C1R)

16-005.01_BR1(KEY).DWG Plotted on 23-Dec-2024 12:59 PM
924001 Final Structural Submittal (SF) 23 December 2024

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	44
PROJECT FILE NO.	17-023.01		

GENERAL NOTES

GENERAL NOTES

DESIGN

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, FOR HL–93 LOADING.

MASSDOT BENCH MARK

BENCH MARK BM–1 (OUTSIDE OF PLAN LIMITS)
BONNET BOLT, FIRE HYDRANT AT 111 WEST MAIN ST.,
N. 3029008.4520
EL. 629833.9290
EL. 228.51

BENCH MARK BM–2 (OUTSIDE OF PLAN LIMITS)
BONNET BOLT, FIRE HYDRANT WEST MAIN ST. AT 3 UNION ST.,
N. 3029176.6216
E. 630295.6550
EL. 224.35

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

DATE

TO BE PLACED ON THE INSIDE FACE OF THE NORTHWESTERLY AND SOUTHEASTERLY 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 TRANSITIONS IS COMPLETED. BOTH HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

MASSDOT SURVEY NOTEBOOK

EXISTING DETAIL, PROPERTY LINE AND SURVEY BASELINE INFORMATION USED IN THE PREPARATION OF THE CONSTRUCTION DRAWINGS WAS DEVELOPED FROM SURVEY PREPARED BY CHAPPELL ENGINEERING. COPIES OF THE ELECTRONIC SURVEY FILES MAY BE OBTAINED FROM WORLDTECH ENGINEERING LLC.

SCALES

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF–SIZE 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: 1000 YEAR

DESIGN SPECTRA:

As = 0.184
SDS = 0.382
SD1 = 0.142

SITE CLASS = E

SEISMIC DESIGN CATEGORY (SDC) = A

REINFORCEMENT

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BAR	#6 BARS
1. NONE	16"	17"	21"
2. 12" OF CONCRETE BELOW BAR	18"	22"	27"
3. COATED BARS, COVER < $3d_b$, OR CLEAR SPACING < $6d_b$	21"	26"	31"
4. COATED BARS, ALL OTHER CASES	17"	21"	25"
5. CONDITION 2. AND 3.	23"	29"	35"
6. CONDITION 2. AND 4.	21"	27"	32"

EXISTING CONDITIONS

DIMENSIONS AND ELEVATIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE TAKEN FROM SURVEY AND FIELD MEASUREMENTS 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 THEREFORE, AND SHALL NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL THE CONTRACTOR HAS MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE, AND EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES BETWEEN INFORMATION SHOWN ON THE CONSTRUCTION PLANS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR MAY BE REQUIRED TO DOCUMENT EXISTING CONDITIONS IN SKETCHES OR OTHER METHODS AS DIRECTED BY THE ENGINEER.

HYDRAULIC DESIGN DATA

DRAINAGE AREA: 16.72 SQUARE MILES
DESIGN FLOOD DISCHARGE: 605 CUBIC FEET PER SECOND
DESIGN FLOOD FREQUENCY: 25 YEARS
DESIGN FLOOD VELOCITY: 2.2 FEET PER SECOND
DESIGN FLOOD ELEVATION: 215.7 FEET, NAVD

BASE (100 YEAR) FLOOD DATA

BASE FLOOD DISCHARGE: 719 CUBIC FEET PER SECOND
BASE FLOOD ELEVATION: 217.1 FEET, NAVD

DESIGN AND CHECK SCOUR DATA

DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY: 50 YEARS
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY: 100 YEARS

FLOOD OF RECORD

DISCHARGE: UNKNOWN CUBIC FEET PER SECOND
FREQUENCY (IF KNOWN): UNKNOWN YEARS
MAXIMUM ELEVATION: UNKNOWN FEET, NAVD
DATE: UNKNOWN MONTH, YEAR
HISTORY OF ICE FLOES: NONE DOCUMENTED IN NBIS DATABASE
EVIDENCE OF SCOUR AND EROSION: SOUTHEAST CORNER UNDERMINED UP TO 2' DEEP, SEVERE EMBANKMENT EROSION ADJACENT TO SOUTHEAST WINGWALL

CONCRETE

PRECAST CONCRETE RIGID FRAME, CAST–IN–PLACE CLOSURE POUR, PRECAST CONCRETE MODULAR WALLS (WINGWALLS), HEADWALLS, SIDEWALK AND HIGHWAY GUARDRAIL TRANSITION	5,000 PSI, ¾", 685 HP CEMENT CONCRETE
CAST–IN–PLACE CONCRETE PEDESTAL WALLS AND FOOTINGS	4,000 PSI, 1½", 565 CEMENT CONCRETE
CAST–IN–PLACE CONCRETE OVERLAY	5,000 PSI, ¾", 685 HP CEMENT CONCRETE

TRAFFIC:

TRAFFIC WILL BE MAINTAINED VIA STAGED CONSTRUCTION. TRAFFIC MANAGEMENT SHALL BE IN ACCORDANCE WITH THE TEMPORARY TRAFFIC CONTROL PLANS.

UTILITIES:

OVERHEAD UTILITIES ARE PRESENT WITHIN THE PROJECT SITE. THE CONTRACTOR SHALL BE FAMILIAR AND TAKE NECESSARY PRECAUTIONS WITH THE UTILITIES DURING CONSTRUCTION. COORDINATION FOR THE TEMPORARY AND PERMANENT RELOCATIONS OF OVERHEAD UTILITIES, AS WILL BE NECESSARY TO CONSTRUCT THE PROJECT, HAS BEEN INITIATED. HOWEVER, THE CONTRACTOR SHALL CONTINUE TO COORDINATE RELOCATIONS WITH THE IMPACTED UTILITIES, AS MAY BE NECESSARY, UPON RECEIPT OF NOTICE TO PROCEED.

UNDERGROUND UTILITIES ARE PRESENT WITHIN THE PROJECT SITE. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ARE BASED ON SUBSURFACE UTILITY ENGINEERING, QUALITY LEVEL A AND B. THIS INFORMATION IS INCLUDED IN APPENDIX K IN THE CONTRACT DOCUMENTS.

EXISTING COMMUNICATION CONDUITS WILL BE RETAINED AND SUPPORTED DURING CONSTRUCTION WITH A TEMPORARY UTILITY BRIDGE. VERIZON, OR THEIR REPRESENTATIVE/CONTRACTOR, WILL BE RESPONSIBLE FOR THE INSTALLATION, MAINTENANCE, AND REMOVAL OF THIS TEMPORARY UTILITY BRIDGE. REFER TO TEMPORARY UTILITY BRIDGE PLANS INCLUDED IN APPENDIX J OF THE SPECIFICATIONS, AND TO SPECIAL PROVISION FOR ITEM 1000.1 – DATA CONDUIT ACCOMMODATIONS, FOR DETAILED INFORMATION REGARDING THE CONTRACTOR'S RESPONSIBILITIES RELATED TO THIS WORK.

EXISTING GAS FACILITIES ARE LOCATED WITHIN THE PROJECT LIMITS, AND PORTIONS THEREOF WILL BE RELOCATED BY NATIONAL GRID AS PART OF THE PROJECT. THE CONTRACTOR SHALL COMPLY WITH NATIONAL GRID'S GENERAL GUIDELINES FOR WORKING AROUND GAS UTILITIES, SOME OF WHICH ARE OUTLINED IN THE DOCUMENTS INCLUDED IN APPENDIX I OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL ALSO COORDINATE WITH THE PRECAST CONCRETE RIGID FRAME AND THE PRECAST MODULAR WINGWALL PRECASTER(S) FOR SUPPORT OF RELOCATED GAS MAINS, AND TO PROVIDE ADEQUATE OPENINGS FOR UTILITIES AND REINFORCING AROUND OPENINGS. REFER TO THE NATIONAL GRID GAS MAIN RELOCATION PLANS INCLUDED IN APPENDIX M OF THE SPECIFICATIONS, AND TO SPECIAL PROVISION FOR ITEM 1000.2 – GAS MAIN ACCOMMODATIONS, FOR DETAILED INFORMATION REGARDING THE CONTRACTOR'S RESPONSIBILITIES RELATED TO THIS WORK.

COFFERDAMS

1. THE DESIGN AND CONSTRUCTION OF THE BRIDGE REQUIRES STEEL SHEETING FOR THE PURPOSE OF TEMPORARY EARTH SUPPORT AND FOR PERMANENT SCOUR PROTECTION, AS WELL AS A SEPARATE TEMPORARY EXCAVATION SUPPORT SYSTEM THAT IS ANTICIPATED TO BE STEEL SHEETING.

2. ITEM 953., PERMANENT STEEL SHEETING, SHALL BE PAID FOR BY THE LINEAR FOOT AS SHOWN ON THE PLANS. THE QUANTITY MEASURED FOR PAYMENT WILL BE THE HORIZONTAL PROJECTION OF THE SHEETING ON A PLANE PARALLEL TO AND MIDWAY BETWEEN THE FRONT AND REAR FACE OF THE SHEETING WALL. THE PERMANENT STEEL SHEETING SHALL BE DESIGNED AND DETAILED BY THE CONTRACTOR FOR THE TEMPORARY SUPPORT OF EXCAVATION DURING CONSTRUCTION, AND AS A PERMANENT SCOUR COUNTERMEASURE. THE CONTRACTOR SHALL DETERMINE THE STEEL SHEETING SECTION AND EMBEDMENT DEPTH NECESSARY TO SATISFY BOTH THE TEMPORARY AND PERMANENT CONDITIONS. THE DESIGN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. THE QUANTITY OF PERMANENT STEEL SHEETING IS ESTIMATED TO BE APPROXIMATELY 800 SY BASED ON THE ANTICIPATED DEPTH OF EXCAVATION, THE DESIGN SCOUR DEPTH, AND A TYPICAL EMBEDMENT DEPTH OF 1.5 TIMES THE SUPPORTED SOIL HEIGHT. SEE SPECIAL PROVISION FOR ITEM 953., PERMANENT STEEL SHEETING, FOR MORE INFORMATION.

3. ITEM 953.3, EXCAVATION SUPPORT SYSTEM, SHALL BE PAID FOR BY THE SQUARE YARD OF EXPOSED STEEL SHEETING, MEASURED AFTER EXCAVATION IS COMPLETE. THE LOWEST BOTTOM OF SHEETING ELEVATION, FOR MEASUREMENT AND PAYMENT PURPOSES, SHALL BE 2' BELOW THE BOTTOM OF FOOTING. THE CONTRACTOR MAY EXCAVATE TO A LOWER ELEVATION, BUT NO ADDITIONAL PAYMENT WILL BE MADE IF THE DEEPER EXCAVATION IS MADE FOR THE CONTRACTOR'S CONVENIENCE OR TO ACCOMMODATE THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION. IF UNSUITABLE MATERIAL IS ENCOUNTERED AND THE EXCAVATION SUPPORT SYSTEM AND EXCAVATION LIMITS MUST BE ADJUSTED FOR REMOVAL OF UNSUITABLE MATERIALS, THE COST OF SHEETING WILL BE PAID FOR AT THE CONTRACT UNIT PRICE. AT ALL LOCATIONS, THE TEMPORARY EARTH SUPPORT SHALL EXTEND LONGITUDINALLY SUCH THAT THE MAXIMUM SLOPE OF THE EXCAVATED (OR PROPOSED) SURFACE DOES NOT EXCEED 1 VERTICAL TO 2 HORIZONTAL. A MINIMUM SLOPE OF 1 VERTICAL TO 3 HORIZONTAL IS THE SHALLOWEST SLOPE ASSUMED TO BE NECESSARY FOR TRANSITIONING BETWEEN EXISTING GROUND AND THE EXCAVATION INSIDE THE EXCAVATION SUPPORT SYSTEM. THE CONTRACTOR MAY UTILIZE AN EXCAVATION SUPPORT SYSTEM THAT ACCOMMODATES A FLATTER TRANSITION THAN 3:1; HOWEVER, NO ADDITIONAL PAYMENT WILL BE MADE FOR PORTIONS OF THE EXCAVATION SUPPORT SYSTEM NECESSARY TO ACCOMMODATE THE FLATTER SLOPE. SEE SPECIAL PROVISION FOR ITEM 953.3, EXCAVATION SUPPORT SYSTEM, FOR MORE INFORMATION.

4. ANY ADJUSTMENTS TO THE EXTENT OR NATURE OF EITHER ITEM 953. OR ITEM 953.3 RESULTING FROM THE UTILITY RELOCATION WORK OCCURRING CONCURRENTLY WITH THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO ADDITIONAL EXCAVATION SUPPORT MEASURES NECESSARY BECAUSE OF THE PRESENCE OF THE TEMPORARY UTILITY BRIDGE AND/OR THE NEED FOR SPECIALIZED CONSTRUCTION OR SHEETING INSTALLATION PROCEDURES BECAUSE OF THE PRESENCE OF EXISTING OR PROPOSED GAS INFRASTRUCTURE, SHALL BE PAID UNDER EITHER ITEM 1000.1 OR ITEM 1000.2. REFER TO THE SPECIAL PROVISIONS FOR THOSE ITEMS FOR FURTHER INFORMATION.

ESTIMATED QUANTITIES (NOT GUARANTEED)

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
115.1	DEMOLITION OF BRIDGE NO. A–19–014	1	LS
140.	BRIDGE EXCAVATION	700	CY
150.	ORDINARY BORROW	160	CY
151.1	GRAVEL BORROW FOR BRIDGE FOUNDATION	100	CY
151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	230	CY
450.61	SUPERPAVE BRIDGE SURFACE COURSE – 12.5 (SSC–B – 12.5)	10	TON
450.71	SUPERPAVE BRIDGE PROTECTIVE COURSE – 12.5 (SPC–B – 12.5)	10	TON
450.99	TEMPORARY HOT MIX ASPHALT	35	TON
751.	LOAM BORROW	20	CY
765.	SEEDING	170	SY
767.9	MATTING FOR EROSION CONTROL	170	SY
853.33	TEMPORARY BARRIER – LIMITED DEFLECTION (TL–3)	720	FT
853.331	TEMPORARY BARRIER – LIMITED DEFLECTION (TL–3) REMOVED AND RESET	720	FT
950.1	TEMPORARY SHORING	1	LS
953.	PERMANENT STEEL SHEETING	260	FT
953.3	EXCAVATION SUPPORT SYSTEM	400	SY
983.03	PARTIALLY GROUTED RIPRAP	60	CY
983.4	NATURAL STREAMBED MATERIAL	50	CY
991.1	CONTROL OF WATER – STRUCTURE NO. A–19–014	1	LS
995.01	BRIDGE STRUCTURE, BRIDGE NO. A–19–014	1	LS
1000.1	DATA CONDUIT ACCOMMODATIONS	1	LS
1000.2	GAS MAIN ACCOMMODATIONS	1	LS

DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

Northern Test Boring, Inc. Boring Log

Client: HTA	Project Name: West Main Street
Location: Ayer, Ma	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HSA	SS		13.0’
Size	2 ¼”	1 3/8”		Start Date: 4/18/16 Finish Date: 4/18/16
Hammer Wt.		140		
Hammer Fall		30”		

EL. 220.0
EL. 210.0
EL. 200.0
EL. 190.0
EL. 180.0
EL. 170.00

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24”	10”	0’-2’	5	7	4	4		1” Pavement (Sidewalk)
									Brown Fine-Medium Sand Some Gravel Trace Silt
S-2	24”	8”	5’-7’	3	3	3	3	5’	
									Brown Medium Sand Some Silt with Organics
S-3	24”	10”	10’-12’	3	3	2	1	10’	
									GROUND WATER EL. 206.5
S-4	24”	20”	15’-17’	3	6	9	12	15’	Brown Fine-Coarse Sand Some Gravel Trace Silt (Native)
S-5	24”	10”	20’-22’	2	2	2	2	20’	
S-6	24”	12”	25’-27’	2	2	3	3	25’	Brown Fine-Coarse Sand Trace Silt
S-7	24”	10”	30’-32’	6	7	7	8	30’	
S-8	24”	24”	35’-37’	3	3	4	4	35’	Brown Fine-Medium Sand Trace Silt
S-9	24”	24”	40’-42’	3	3	4	4	40’	
S-10	24”	20”	45’-47’	3	3	4	4	45’	Brown Fine-Medium Sand Some Fine Gravel Trace Silt
									Bottom of Exploration @ 47’

GROUND EL. 219.5
BOTTOM OF PROPOSED FOOTING EL. 204.50

BORING B–3
NTS

Northern Test Boring, Inc. Boring Log

Client: HTA	Project Name: West Main Street
Location: Ayer, Ma	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HSA	SS		13.0’
Size	2 ¼”	1 3/8”		Start Date: 4/18/16 Finish Date: 4/18/16
Hammer Wt.		140		
Hammer Fall		30”		

EL. 220.0
EL. 210.0
EL. 200.0
EL. 190.0
EL. 180.0
EL. 170.00

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24”	12”	0’-2’	30	28	9	5		5” Pavement
									Brown Medium-Coarse Sand and Gravel Trace Silt
									Brown Medium Sand Some Gravel and Silt
S-2	24”	12”	5’-7’	3	2	2	1	5’	
									Fine Sand Some Silt and Organics
S-3	24”	20”	10’-12’	1	1	1	1	10’	
									Peet Layer 11’-13.5’ GROUND WATER EL. 206.6
S-4	24”	11”	15’-17’	8	8	9	9	15’	Brown Fine-Coarse Sand Trace Silt (Native)
S-5	24”	24”	20’-22’	2	2	2	2	20’	
S-6	24”	24”	25’-27’	3	4	4	5	25’	Brown Fine-Medium Sand Trace Silt
S-7	24”	24”	30’-32’	2	3	3	4	30’	
S-8	24”	24”	35’-37’	2	2	2	3	35’	
S-9	24”	24”	40’-42’	2	2	2	2	40’	
S-10	24”	24”	45’-47’	2	2	2	3	45’	
									Bottom of Exploration @ 47’

GROUND EL. 219.6
BOTTOM OF PROPOSED FOOTING EL. 204.50

BORING B–4
NTS

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS:
   - LOCATION OF TEST PROBES
   - LOCATION OF SAMPLE BORINGS
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1⅜” I.D. SPLIT SPOON SAMPLER 6” USING A 140 POUND WEIGHT FALLING 30”.
5. BORINGS B–3, B–4 AND TEST PROBES WERE COMPLETED USING HOLLOW STEM AUGERS. BORING SA–1 WAS COMPLETED USING A CASED WASH–BORING (DRIVE–AND–WASH). BORINGS B–3, B–4 AND TEST PROBES WERE MADE IN APRIL 2016. BORING SA–1 WAS MADE IN NOVEMBER 2018.
6. BORINGS AND TEST PROBES WERE MADE BY NORTHERN TEST BORING, INC., 187 MIGHTY ST., GORHAM, ME 04038.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
8. PROBES WERE TAKEN TO A DEPTH OF 20’ WITHOUT ENCOUNTERING REFUSAL.

DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

BORING LOGS II

Groundwater: Depth: ~8 ft. Time: Drilling

Project: Bridge over Nonacoicus Brook, Bridge A-19-14 **Boring No.** SA-1
Location: West Main St, Ayer, MA **Sheet** 1 of 3
Contractor: Northern Test B. **Sampler Type:** Split spoon **ID** 1.375" **OD** 2"
Foreman: Mike Nadeau **Hammer Wt.:** 140 lb **Fall:** 30"
Start Date: 11/16/2018 **Drill Technique:** HSA/Case **ID** 4" **OD** 4.5"
Finish Date: 11/16/2018 **Rig Type:** Rubber Track-Moutned
SACE Staff: RSS **Project Number:** 010-18-011
Surface El.: ± 220 ft **Datum:** NAVD88

Depth (ft.)	Cas. Blows	Sample No.	Pen. (in.)	Rec. (in.)	Blows/6"	Field Tests	Description & Classification	Stratum	Equipment Installed	Remarks
EL. 220.0										
0							~5"Asphalt	Asphalt		1
	0.5		SS-1	24	19	27	~7" Dark gray Sand & Gravel (BASE COURSE)			
						16	Brown, fine to medium Sand, Little Gravel (SUBBASE), moist.	FILL		
						9				
						4				
							Advanced hole by HSA to 15 ft			
5										
	5		SS-2	24	17	5	Medium dense, brown, fine to coarse SAND, Little Gravel, moist.			
						7				
						9	BOT: ~4" Gray, fine to medium, slightly plastic, Organic SAND, wet.			
						8		SAND		
							GROUND WATER EL. 212.0			
EL. 210.0										
10								ORGANIC		
	10		SS-3	24	20	1/12"	TOP: Loose, gray fine to medium Organic SAND, slightly plastic, wet.			
						1	BOT: Loose, brown fine to medium SAND, wet			
						3		SAND		
15							Switched to Drive & Wash			
	15	65	SS-4	24	11	16	Dense, dark brown, fine to coarse SAND & GRAVEL, little Silt, wet.			
		56				14				
						16				
		40				12				
		49								
EL. 200.0		NR								
20	20	30	SS-5	24	5	5	Medium dense, gray, medium to coarse SAND and GRAVEL, trace Silt, wet.			
		29				5				
		52				5				
		65				6				
		52								
25										
	25	18	SS-6	24	10	4	Medium dense, grayish brown, medium to coarse SAND, some Gravel, trace Silt, wet.			
		21				5				
						5				
EL. 192.0		43				7		SAND		

BOTTOM OF PROPOSED FOOTING EL. 204.50

Remarks
1. Driller drove spoon and casing with 140-lb. automatic hammer
NR = Not Recorded
Soil/rock strata and groundwater surface, where indicated, are approximate. Transitions may be gradual.
Variations between exploration locations and over time should be expected.

Stephens Associates Consulting Engineers — Structural, Geotechnical, Hydrology & Hydraulics

Boring No.: SA-1 **Location:** See Exploration Location Plan 668 Main Street, Wilmington, MA 01887 (978) 988-2115

BORING SA–1 (1 OF 3)
NTS

Groundwater: Depth: See Sheet 1 Time:

Project: Bridge over Nonacoicus Brook, Bridge A-19-14 **Boring No.** SA-1
Location: West Main St, Ayer, MA **Sheet** 2 of 3
Contractor: Northern Test B. **Sampler Type:** Split spoon **ID** 1.375" **OD** 2"
Foreman: Mike Nadeau **Hammer Wt.:** 140 lb **Fall:** 30"
Start Date: 11/16/2018 **Drill Technique:** HSA/Case **ID** 4" **OD** 4.5"
Finish Date: 11/16/2018 **Rig Type:** Rubber Track-Moutned
SACE Staff: RSS **Project Number:** 010-18-011
Surface El.: ± 220 ft **Datum:** NAVD88

Depth (ft.)	Cas. Blows	Sample No.	Pen. (in.)	Rec. (in.)	Blows/6"	Field Tests	Description & Classification	Stratum	Equipment Installed	Remarks
EL. 192.0								SAND		
	62									
EL. 190.0	84									
30	30	22	SS-7	24	6	6	Medium dense, brown fine to medium SAND, little Gravel, trace Silt, wet.			
		35				7				
						6				
		56				6				
		68								
		86								
35	35	37	SS-8	24	12	6	Medium dense, brown fine to coarse SAND, little Gravel, trace Silt, wet.			
						6				
		52				6				
		61				6				
		59								
EL. 180.0		75								
40	40	76	SS-9	24	2	7	Medium dense, brown fine to coarse SAND, little Gravel, trace Silt, wet.			
		79				5				
		85				6				
		102				8				
		126								
45	45	Washed ahead to tool above next sample	SS-10	24	12	3	Loose, brown fine to medium SAND, trace Gravel, trace Silt, wet.	GRAVELLY SAND		2
						3				
						4	NOTE: To save drilling time, driller washed boring ahead of casing to 1 ft above next sample interval and then drove the casing to the sample interval			
						4				
EL. 170.0		NR								
50	50	Washed ahead to tool above next sample	SS-11	24	5	6	Medium dense, brown fine to medium SAND, little Gravel, trace Silt, wet.			
						5				
						6				
						7				
								SAND		
	165									
55	55	NR	SS-12	24	11	7	Medium dense, brown fine to coarse SAND, trace Silt, wet.			
EL. 164.0						9				

Remarks
2. To save drilling time, driller washed ahead to 1 ft. above next sample interval for remainder of drilling
NR = Not Recorded
Soil/rock strata and groundwater surface, where indicated, are approximate. Transitions may be gradual.
Variations between exploration locations and over time should be expected.

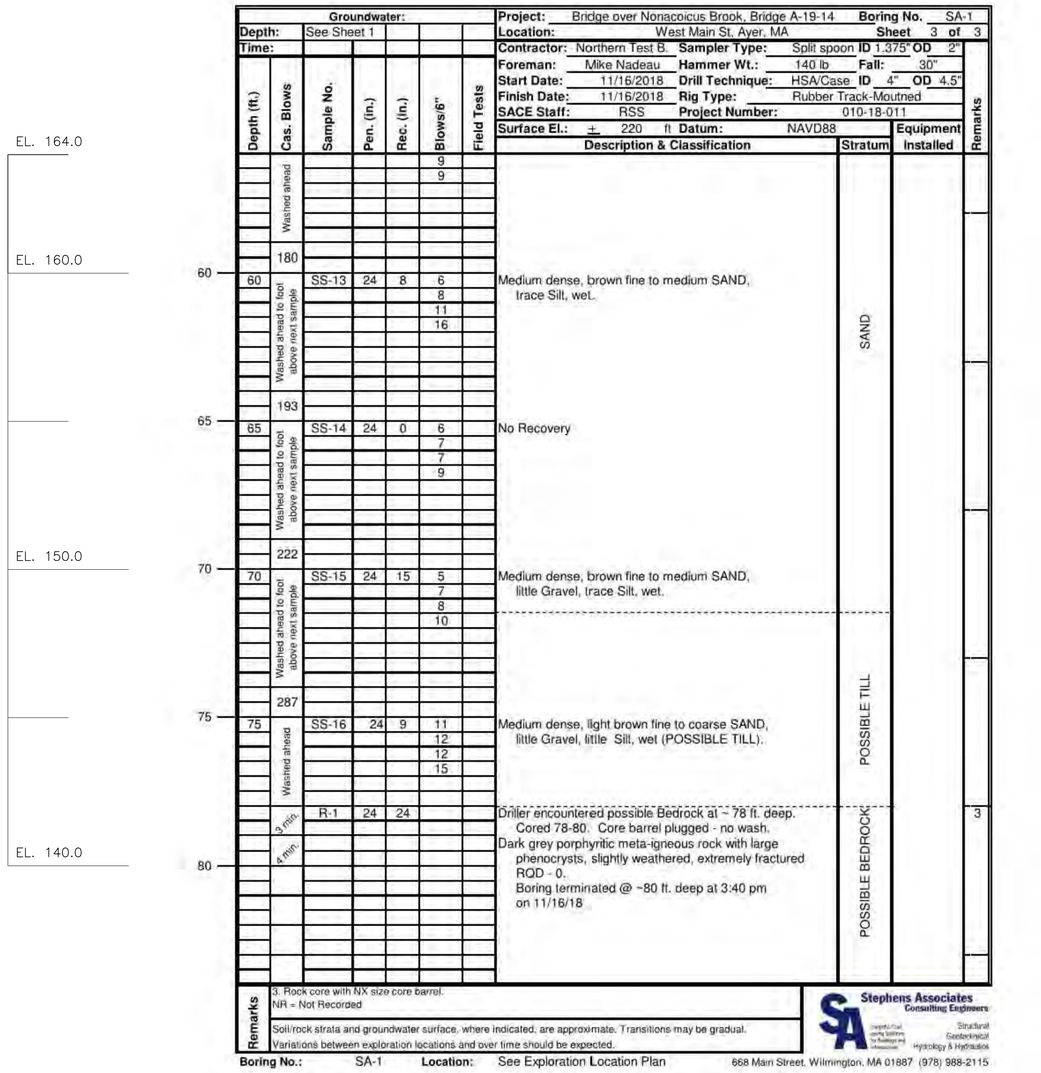
Stephens Associates Consulting Engineers — Structural, Geotechnical, Hydrology & Hydraulics

Boring No.: SA-1 **Location:** See Exploration Location Plan 668 Main Street, Wilmington, MA 01887 (978) 988-2115

BORING SA–1 (2 OF 3)
NTS

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

BORING LOGS III



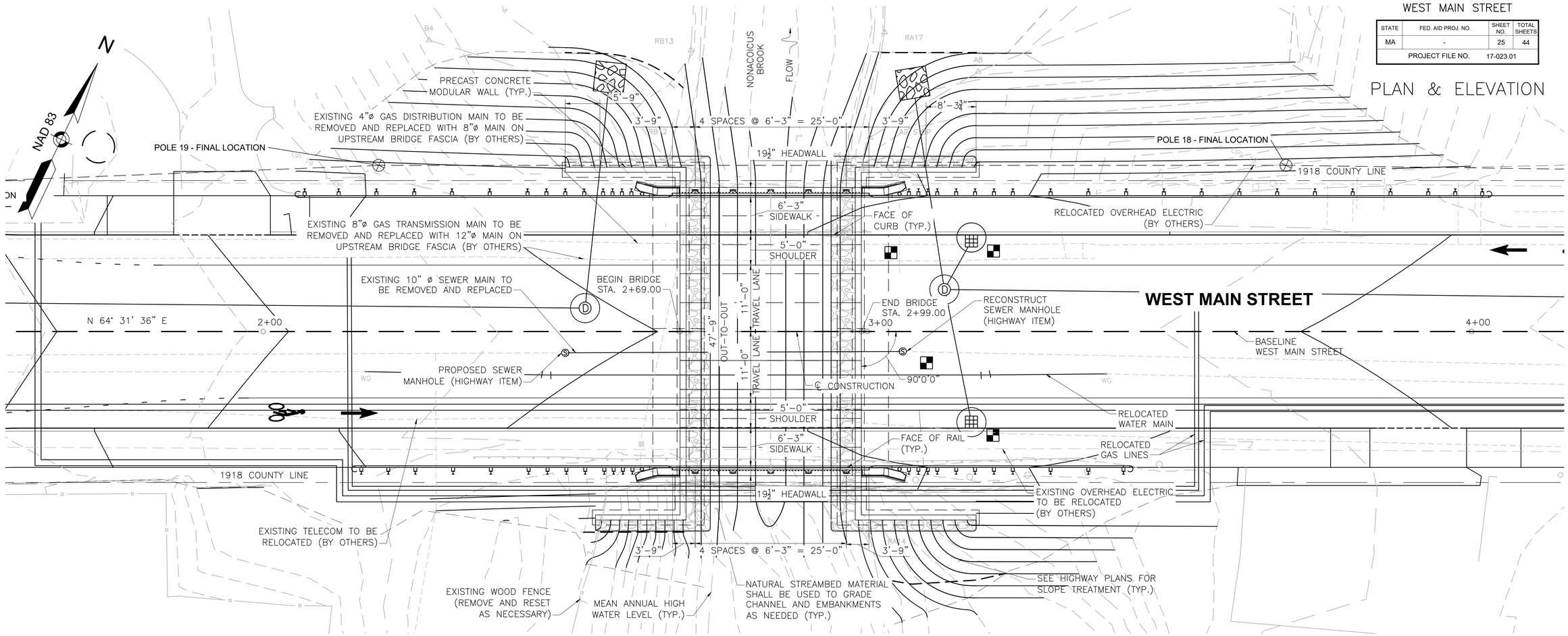
BORING SA–1 (3 OF 3)
NTS

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

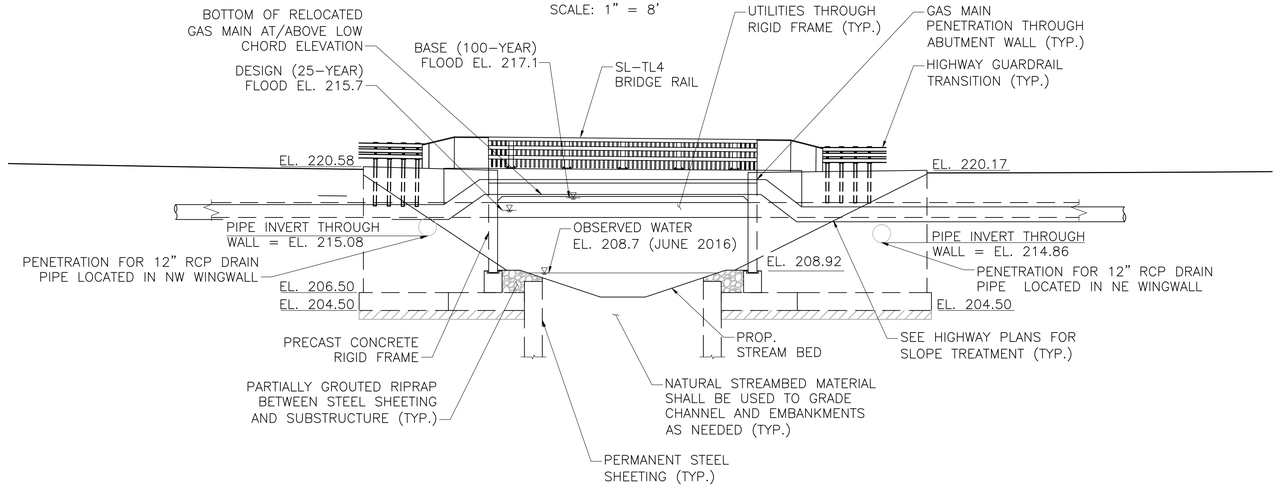
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	44
PROJECT FILE NO.	17-023.01		

PLAN & ELEVATION



PLAN
SCALE: 1" = 8'



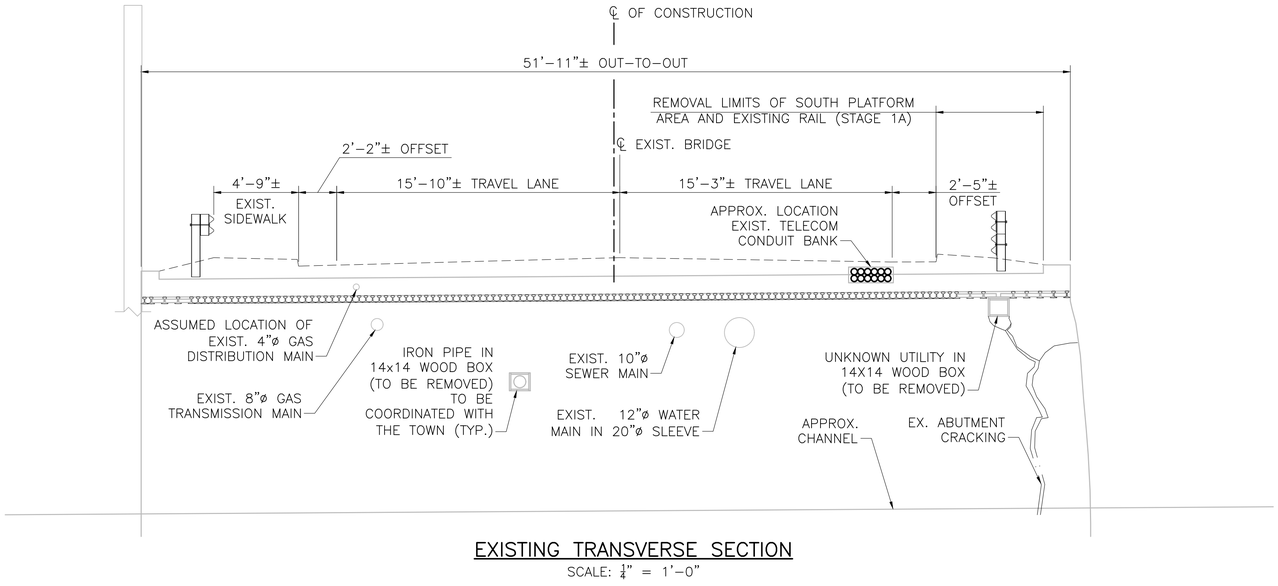
ELEVATION
SCALE: 1" = 8'

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

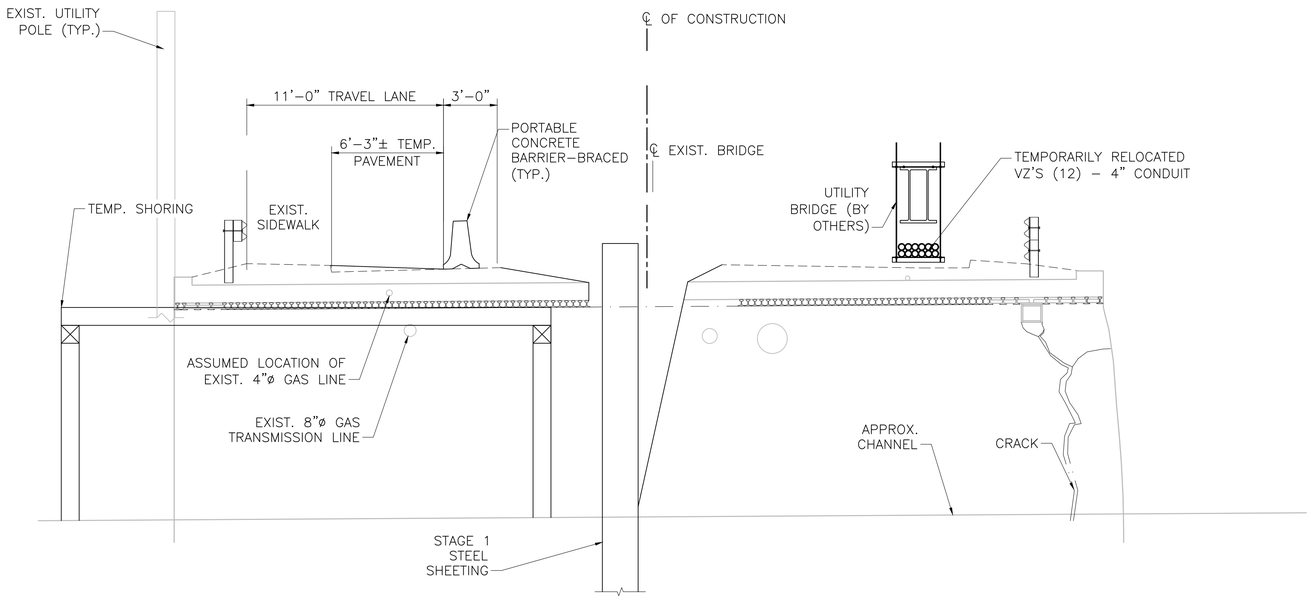
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	26	44
PROJECT FILE NO. 17–023.01			

STAGE CONSTRUCTION SECTION I



EXISTING TRANSVERSE SECTION
SCALE: $\frac{1}{4}$" = 1'–0"



STAGE 1A CONSTRUCTION
SCALE: $\frac{1}{4}$" = 1'–0"

GENERAL STAGE CONSTRUCTION NOTES:

1. THE FOLLOWING IS A SUGGESTED CONSTRUCTION STAGING PLAN. THE FINAL STAGING PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. A MINIMUM OF ONE LANE OF ALTERNATING TWO–WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNTIL SUBSTANTIAL COMPLETION IS ACHIEVED.
3. THE WORK AREA MUST BE PROTECTED AT ALL TIMES UNTIL THE WORK IS COMPLETE.
4. CONTRACTOR SHALL COORDINATE STAGE CONSTRUCTION WITH UTILITY COMPANIES.
5. CONSTRUCTION STAGE LIMITS ARE APPROXIMATE AND MAY BE ADJUSTED FOR ACTUAL PRECAST CONCRETE RIGID FRAME SECTION WIDTHS.

STAGE 1 – CONSTRUCTION

STAGE 1A

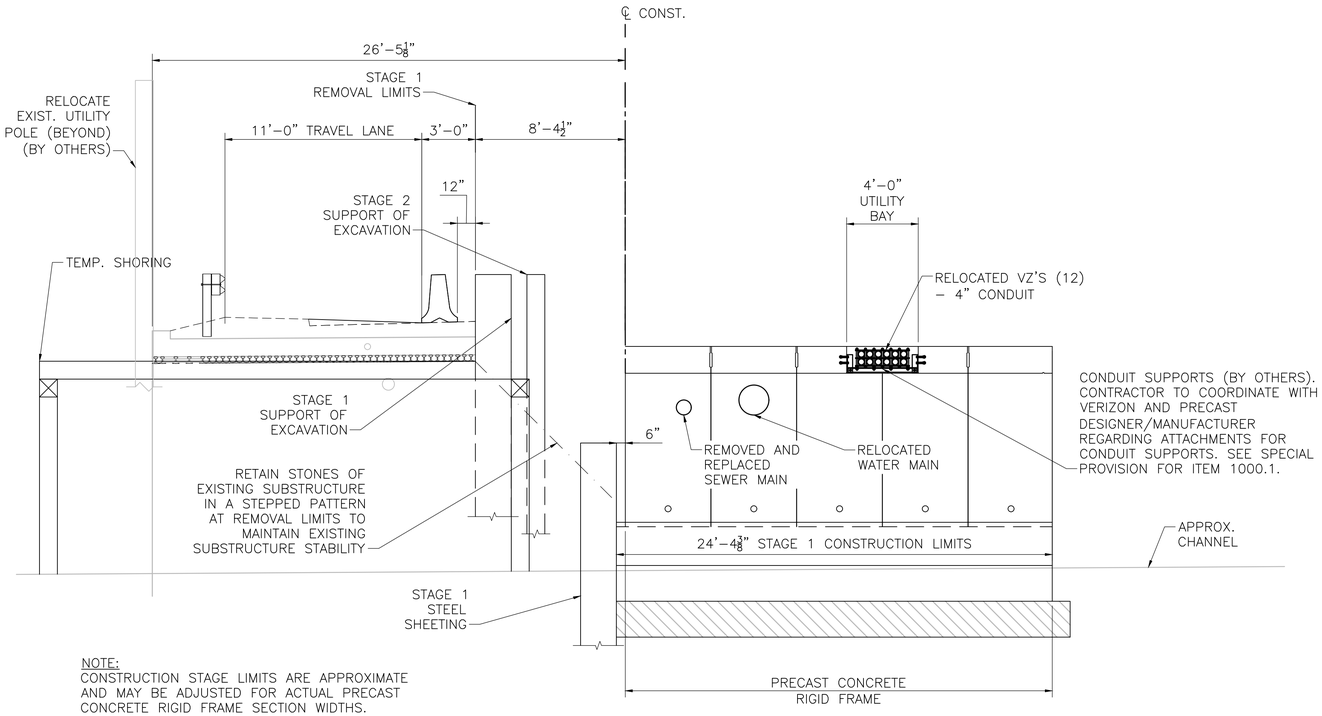
1. SHIFT 2 LANES OF TRAFFIC TO THE SOUTH SIDE OF WEST MAIN STREET AND MAINTAIN TWO–WAY TRAFFIC.
2. INSTALL BRACED PORTABLE CONCRETE BARRIER AT LIMITS OF TRAVEL LANES. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
3. DETOUR PEDESTRIAN TRAFFIC TO SHIRLEY STREET (SEE ROADWAY PLANS).
4. REMOVE EXISTING RAILING ON THE WESTBOUND SIDE OF WEST MAIN STREET.
5. INSTALL TEMPORARY PAVEMENT AND BRACED PORTABLE CONCRETE BARRIER ON WESTBOUND SIDE OF WEST MAIN STREET SO THAT THE EXISTING SIDEWALK CAN BE UTILIZED FOR THE TRAVEL LANE.
6. COORDINATE OVERHEAD UTILITY RELOCATIONS AND INSTALLATION OF WATER DIVERSION SYSTEM.
7. REMOVE UNKNOWN UTILITY IN 14x14 WOOD BOX.
8. INSTALL TEMPORARY SHORING TO SUPPORT NORTH SIDE OF EXISTING BRIDGE. TEMPORARY SHORING TO BE DESIGNED AND DETAILED BY CONTRACTOR AND SHALL BE APPROVED BY ENGINEER PRIOR TO INSTALLATION. SEE SPECIAL PROVISION ITEM 950.1 FOR DESIGN REQUIREMENTS.
9. SHIFT TRAFFIC TO WESTBOUND SIDE OF WEST MAIN STREET AND ACCOMMODATE ONE LANE OF ALTERNATING TWO–WAY TRAFFIC.
10. COORDINATE WITH VERIZON AND SUPPORT THEIR WORK TO REMOVE EXISTING TELECOM CONDUIT FROM DUCT BANK OVER THE BRIDGE AND IN ROADWAY APPROACHES. CONTRACTOR TO COORDINATE WITH VERIZON/OTHERS ON THE REMOVAL LIMITS NEEDED IN BOTH APPROACHES.
11. REMOVE EXISTING SUPERSTRUCTURE AND SUBSTRUCTURE AS NECESSARY AND INSTALL STAGE 1A SHEETING AND STAGE 1 SUPPORT OF EXCAVATION. IF REMOVAL LIMITS IMPACT THE EXISTING WATER AND SEWER LINES, TEMPORARILY RELOCATE WATER AND SEWER BEFORE PARTIAL SUPERSTRUCTURE AND SUBSTRUCTURE REMOVAL.
12. COORDINATE WITH VERIZON AND SUPPORT THEIR WORK TO CONSTRUCT UTILITY BRIDGE AND SUPPORT 12 – 4" CONDUIT ON UTILITY BRIDGE. CONSTRUCTION OF THE UTILITY BRIDGE AND SUPPORT OF THE CONDUIT SHALL BE DONE BY OTHERS. CONTRACTOR IS RESPONSIBLE FOR COORDINATION REQUIRED WITH VERIZON/VERIZON'S REPRESENTATIVE TO COMPLETE THIS WORK.

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

AYER
WEST MAIN STREET

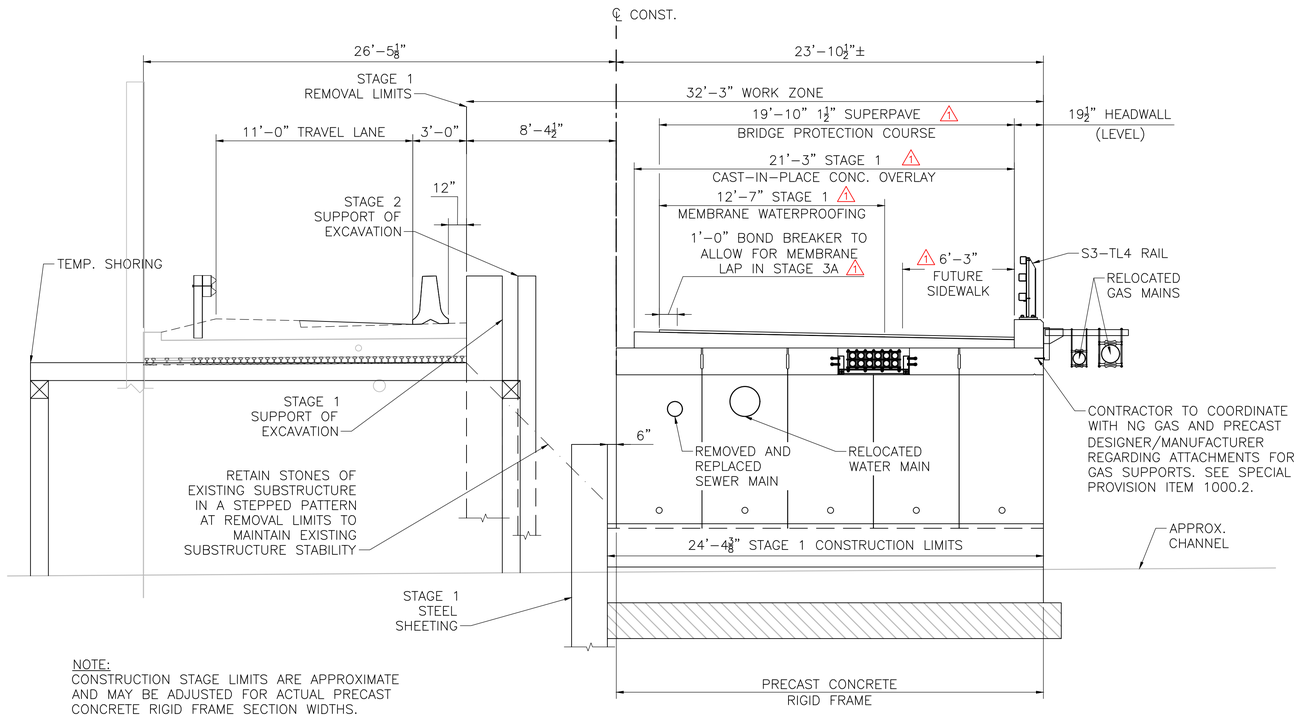
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	27	44
PROJECT FILE NO. 17–023.01			

STAGE CONSTRUCTION SECTION II



NOTE:
CONSTRUCTION STAGE LIMITS ARE APPROXIMATE AND MAY BE ADJUSTED FOR ACTUAL PRECAST CONCRETE RIGID FRAME SECTION WIDTHS.

STAGE 1B CONSTRUCTION
SCALE: ¼" = 1'–0"



NOTE:
CONSTRUCTION STAGE LIMITS ARE APPROXIMATE AND MAY BE ADJUSTED FOR ACTUAL PRECAST CONCRETE RIGID FRAME SECTION WIDTHS.

STAGE 1C CONSTRUCTION
SCALE: ¼" = 1'–0"

STAGE 1 – CONSTRUCTION (CONTINUED)

STAGE 1B

1. IF NOT ALREADY RELOCATED PER STAGE 1A NOTE 11, TEMPORARILY RELOCATE WATER MAIN AND SEWER MAIN.
2. REMOVE SUPERSTRUCTURE TO STAGE 1 REMOVAL LIMITS.
3. REMOVE SUBSTRUCTURE TO THE APPROXIMATE LIMITS INDICATED.
4. INSTALL STAGE 1B STEEL SHEETING, TO BE LEFT IN PLACE, AT STAGE 1 CONSTRUCTION LIMITS OF CAST–IN–PLACE FOOTING AND PEDESTAL. COORDINATE LATERAL ADJUSTMENT OF TEMPORARILY SUPPORTED CONDUIT WITH VERIZON/VERIZON'S REPRESENTATIVE IN ORDER TO INSTALL STAGE 1B SHEETING AND COMPLY WITH NATIONAL GRID GENERAL GUIDELINES FOR WORKING AROUND GAS UTILITIES (TYP.).
5. INSTALL STEEL SHEETING TO BE LEFT IN PLACE ALONG FOOTING TOE, CONSTRUCT CAST–IN–PLACE FOOTINGS AND PEDESTALS UP TO STAGE 1B STEEL SHEETING, AND INSTALL PARTIALLY GROUTED RIPRAP.
6. INSTALL PRECAST RIGID FRAME AND WINGWALLS WITHIN STAGE 1 LIMITS OF CONSTRUCTION.
7. RELOCATE WATER MAIN AND SEWER MAIN TO PERMANENT LOCATIONS.
8. CONSTRUCT PERMANENT UTILITY SUPPORT IN STAGE 1 SEGMENT OF THE BRIDGE AND RELOCATE (12) 4" CONDUITS ONTO THE FINAL SUPPORTS (BY OTHERS).
9. REMOVE UTILITY BRIDGE (BY OTHERS).

STAGE 1C

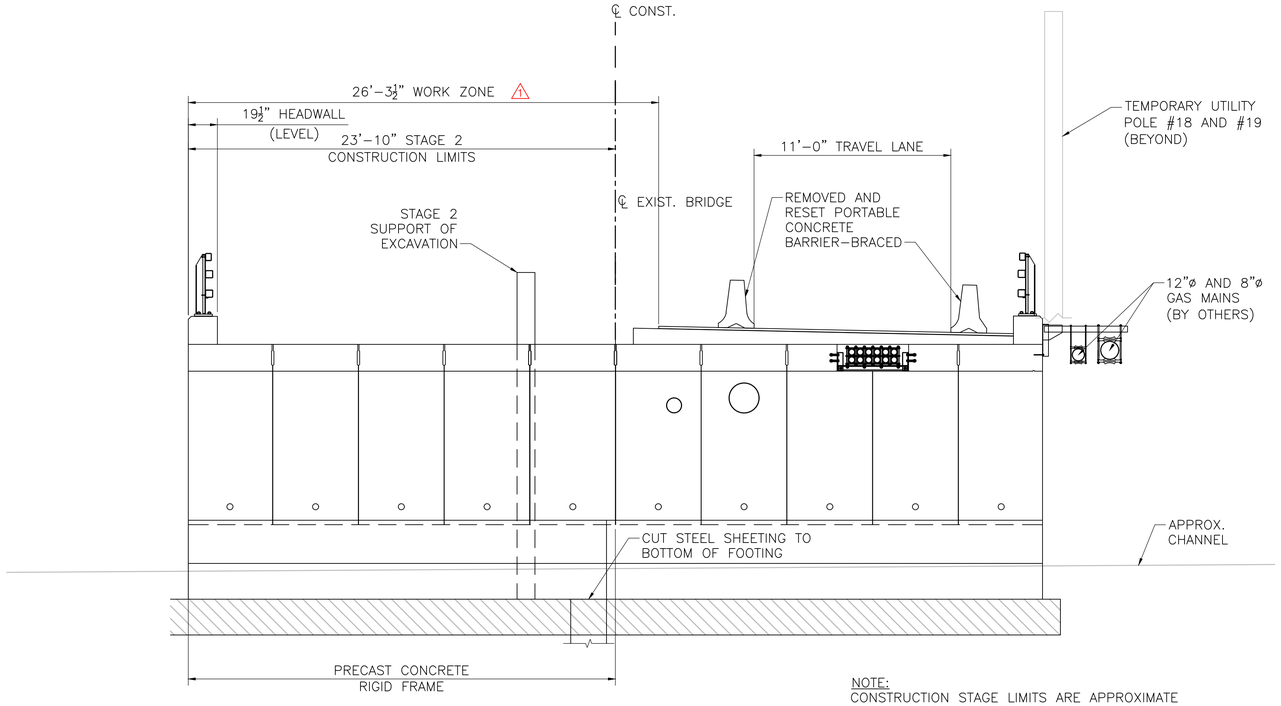
1. CONSTRUCT HEADWALL PORTION OF THE SOUTH CAST–IN–PLACE SIDEWALK.
2. INSTALL STAGE 2 SUPPORT OF EXCAVATION AND BACKFILL RIGID FRAME.
3. INSTALL EASTBOUND BRIDGE RAILING AND APPROACH RAILING.
4. COORDINATE RELOCATION OF OVERHEAD UTILITIES AND POLE #18 AND #19 AS SHOWN.
5. CONSTRUCT CAST–IN–PLACE CONCRETE OVERLAY AND INSTALL MEMBRANE WATERPROOFING TO THE STAGE 1 LIMITS SHOWN. INSTALLATION AND PROTECTION OF MEMBRANE WATERPROOFING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
6. INSTALL NEW 8" AND 12" DIAMETER GAS LINE, TO REPLACE EXISTING 4" AND 8" DIAMETER GAS LINE, IN PERMANENT LOCATION (BY OTHERS). INSTALL TO STAGE 1 LIMITS AND CAP TO BE CONNECTED AND BROUGHT ONLINE DURING STAGE 2 (TO BE COORDINATED WITH GAS UTILITY).
7. REMOVE AND RESET BRACED PORTABLE CONCRETE BARRIER.

DATE	DESCRIPTION
FEBRUARY 14, 2025	1 ADJUSTMENT TO OVERLAY JOINT AND MEMBRANE WATERPROOFING LIMITS
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	28	44
PROJECT FILE NO. 17–023.01			

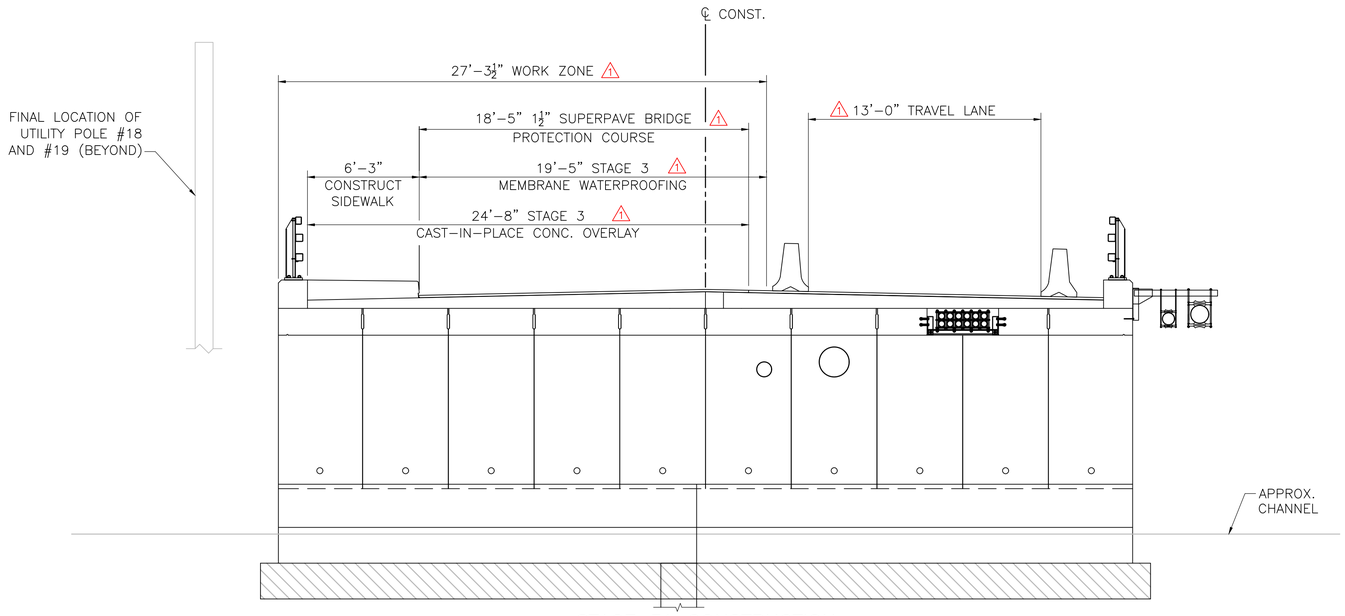
STAGE CONSTRUCTION SECTION III



STAGE 2 CONSTRUCTION

SCALE: ¼" = 1'–0"

NOTE:
CONSTRUCTION STAGE LIMITS ARE APPROXIMATE AND MAY BE ADJUSTED FOR ACTUAL PRECAST CONCRETE RIGID FRAME SECTION WIDTHS.



STAGE 3A CONSTRUCTION

SCALE: ¼" = 1'–0"

STAGE 2 – CONSTRUCTION

STAGE 2

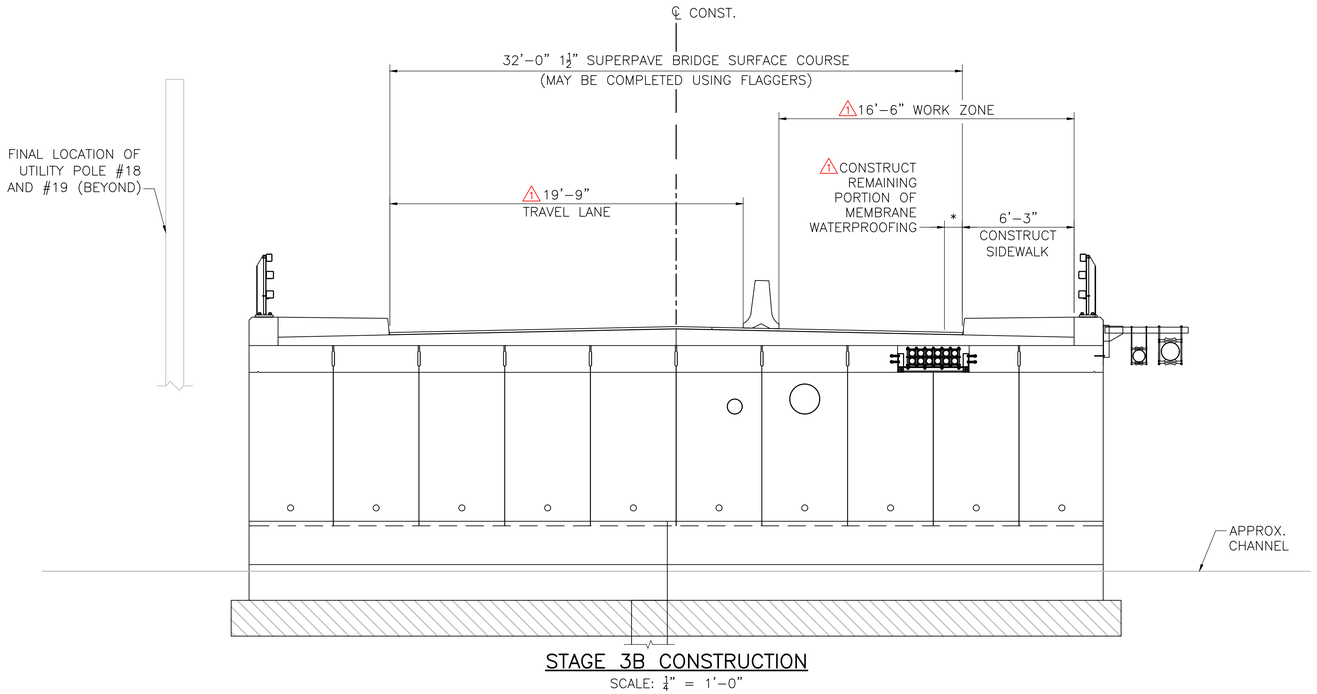
1. SHIFT TRAFFIC TO THE EASTBOUND SIDE OF WEST MAIN STREET AND ACCOMMODATE ONE LANE OF ALTERNATING TWO–WAY TRAFFIC.
2. EXCAVATE FOR STAGE 2 CONSTRUCTION AND REMOVE STAGE 1 SUPPORT OF EXCAVATION. COORDINATE WITH GAS UTILITY FOR CONNECTION AND REMOVAL OF ABANDONED GAS LINES.
3. REMOVE ABANDONED PORTIONS OF 4" AND 8" DIAMETER GAS MAINS. COORDINATE WITH GAS UTILITY FOR CONNECTION AND REMOVAL OF ABANDONED GAS LINES.
4. REMOVE TEMPORARY SHORING, REMAINING PORTION OF SUPERSTRUCTURE AND REMAINING PORTION OF SUBSTRUCTURE.
5. CUT STAGE 1 STEEL SHEETING AT PHASE CONSTRUCTION JOINT TO BOTTOM OF FOOTING.
6. INSTALL REMAINING SECTIONS OF STEEL SHEETING TO BE LEFT IN PLACE ALONG FOOTING TOE, CONSTRUCT REMAINING PORTIONS OF CAST–IN–PLACE FOOTING AND PEDESTAL, AND INSTALL PARTIALLY GROUTED RIPRAP.
7. INSTALL PRECAST RIGID FRAME WITHIN STAGE 2 LIMITS OF CONSTRUCTION.
8. BACKFILL BEHIND STAGE 2 RIGID FRAMES AND REMOVE STAGE 2 SUPPORT OF EXCAVATION.
9. REMOVE WATER DIVERSION.
10. CONSTRUCT NORTH CURB AND INSTALL BRIDGE AND APPROACH RAILING.
11. COORDINATE THE RELOCATION OF OVERHEAD UTILITIES AND POLE #18 AND #19 TO THE FINAL LOCATIONS SHOWN.
12. CONSTRUCT CAST–IN–PLACE CONCRETE OVERLAY AND INSTALL MEMBRANE WATERPROOFING TO THE STAGE 2 LIMITS SHOWN. INSTALLATION AND PROTECTION OF MEMBRANE WATERPROOFING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
13. PAVE SUPERPAVE BRIDGE PROTECTIVE COURSE TO THE STAGE 2 LIMITS SHOWN.

STAGE 3 – REMAINING WORK

STAGE 3A

1. CONSTRUCT CAST–IN–PLACE CONCRETE OVERLAY TO THE STAGE 3A LIMITS SHOWN. CONSTRUCT THE NORTH SIDEWALK AND INSTALL MEMBRANE WATERPROOFING TO THE STAGE 3A LIMITS SHOWN. INSTALLATION AND PROTECTION OF MEMBRANE WATERPROOFING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
2. MAINTAIN TRAFFIC TO THE EASTBOUND SIDE OF WEST MAIN STREET AND ACCOMMODATE ONE LANE OF ALTERNATING TWO–WAY TRAFFIC.
3. CONSTRUCT REMAINING PORTION OF NORTH SIDEWALK AND CAST–INPLACE CONCRETE OVERLAY.

DATE	DESCRIPTION
FEBRUARY 14, 2025	1 MINOR ADJUSTMENT TO OVERLAY JOINT AND STAGING LIMITS
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	



STAGE 3B CONSTRUCTION

SCALE: ¼" = 1'–0"

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	–	29	44
PROJECT FILE NO. 17–023.01			

STAGE CONSTRUCTION SECTION IV

STAGE 3 – REMAINING WORK (CONTINUED)

STAGE 3B

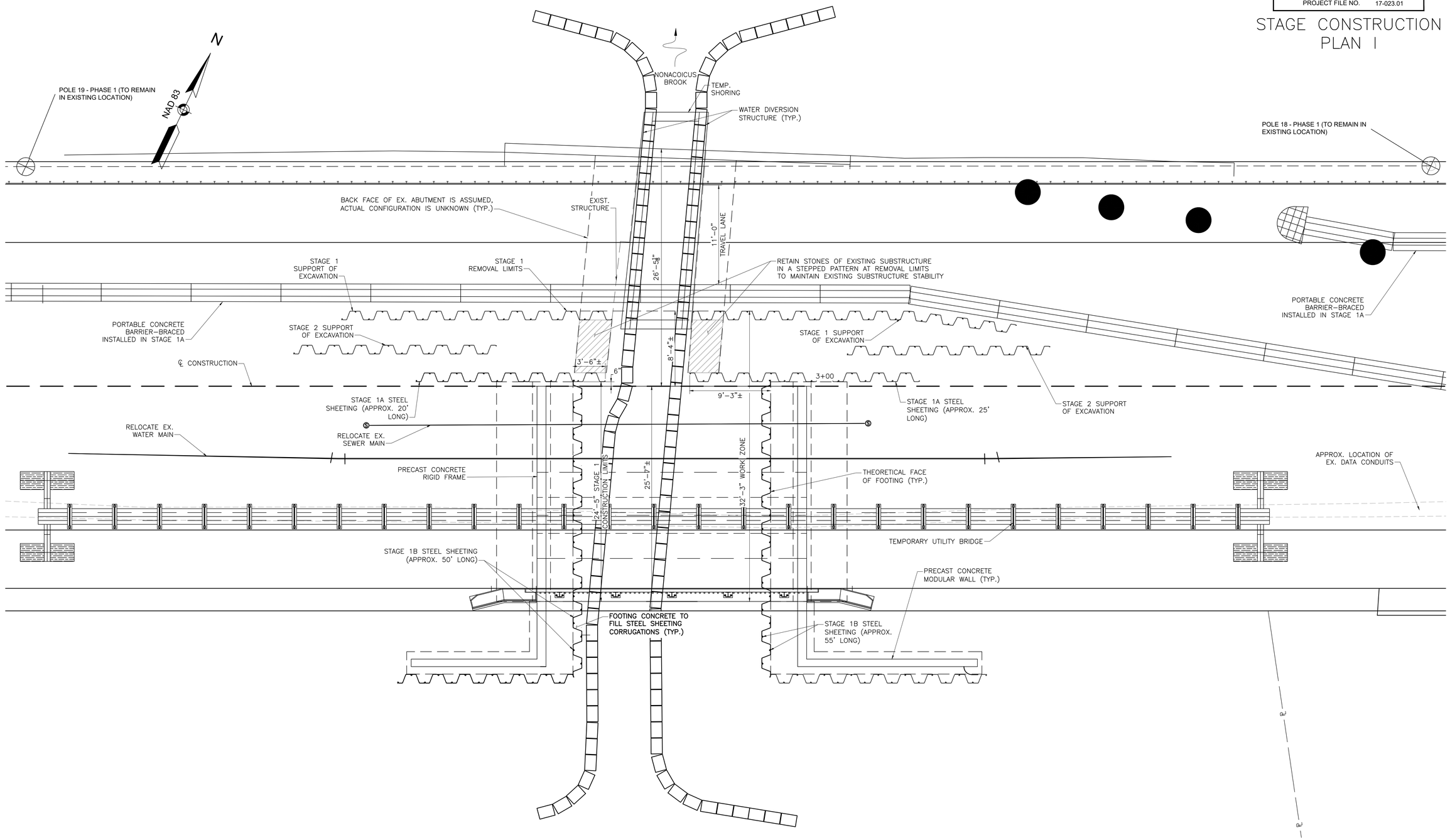
1. ACCOMMODATE PEDESTRIAN TRAFFIC ON THE NORTH SIDEWALK
2. SHIFT TRAFFIC TO THE WESTBOUND SIDE OF WEST MAIN STREET AND ACCOMMODATE ONE LANE OF ALTERNATING TWO–WAY TRAFFIC.
3. CONSTRUCT THE SOUTH SIDEWALK.
4. REMOVE PORTABLE CONCRETE BARRIER–BRACED AND RESTORE TWO–WAY TRAFFIC.
1. INSTALL REMAINING PORTION OF MEMBRANE WATERPROOFING TO THE CONSTRUCTED SIDEWALK SHOWN. INSTALLATION AND PROTECTION OF MEMBRANE WATERPROOFING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
6. PAVE SUPERPAVE BRIDGE SURFACE COURSE. FLAGGERS MAY BE NEEDED FOR PAVING OPERATIONS.

DATE	DESCRIPTION
FEBRUARY 14, 2025	1 ADDITIONAL MEMBRANE WATERPROOFING AND NOTE
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	30	44
PROJECT FILE NO.	17-023.01		

STAGE CONSTRUCTION PLAN I



STAGE 1 CONSTRUCTION

(STAGE 1B SHOWN)
SCALE: 1" = 5'

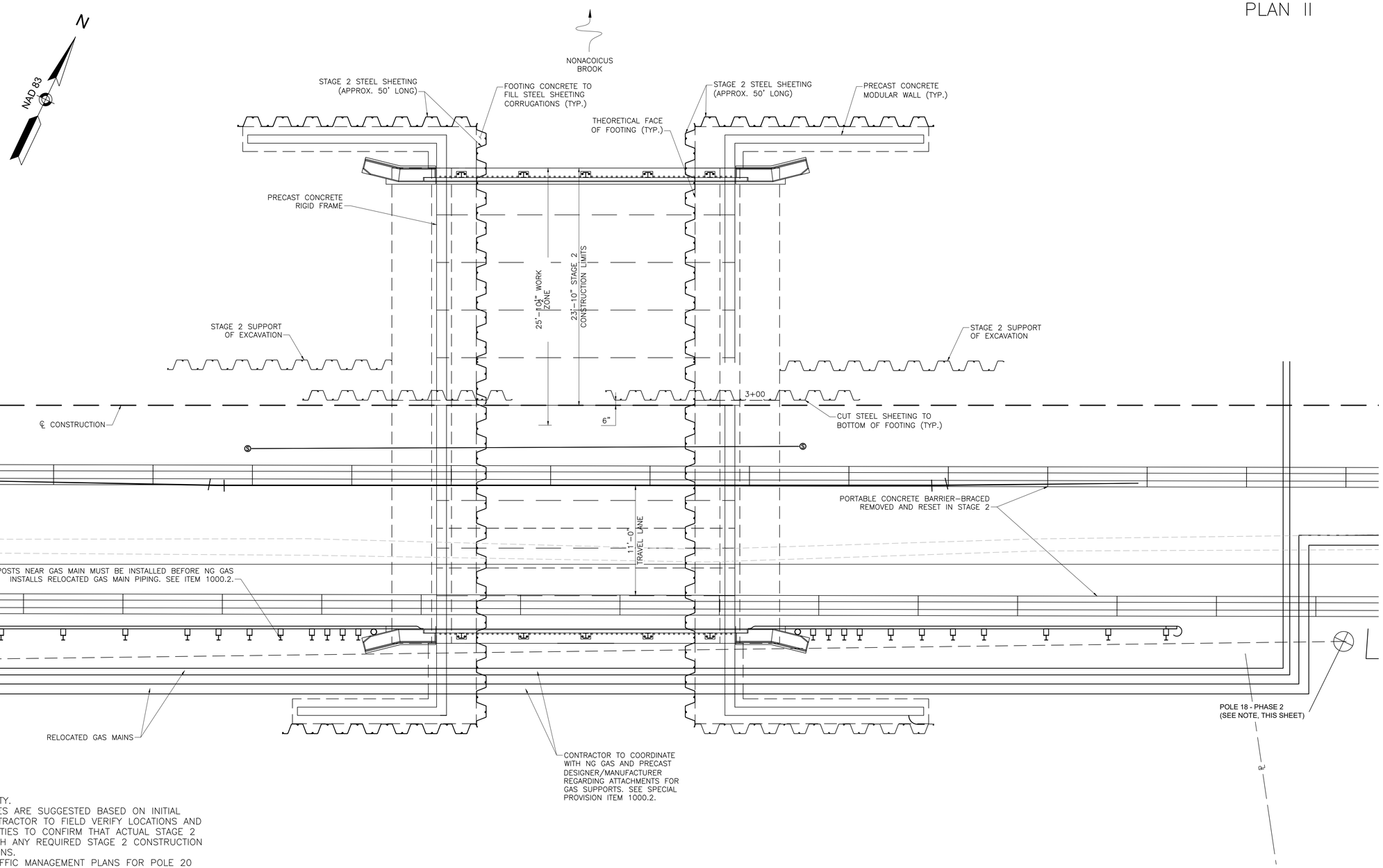
NOTE:
1. EXISTING WATER AND SEWER MUST REMAIN IN SERVICE DURING CONSTRUCTION. TEMPORARY WATER AND SEWER PIPING (AS REQUIRED), AS WELL AS OTHER UTILITIES ARE NOT SHOWN FOR CLARITY.
2. STAGE 1A SHOWN.

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	44
PROJECT FILE NO.	17-023.01		

STAGE CONSTRUCTION PLAN II



NOTE:
1. SOME UTILITIES NOT SHOWN FOR CLARITY.
2. COORDINATES OF STAGE 2 UTILITY POLES ARE SUGGESTED BASED ON INITIAL COORDINATION WITH NG ELECTRIC. CONTRACTOR TO FIELD VERIFY LOCATIONS AND COORDINATE WITH ALL NECESSARY UTILITIES TO CONFIRM THAT ACTUAL STAGE 2 POLE LOCATIONS DO NOT CONFLICT WITH ANY REQUIRED STAGE 2 CONSTRUCTION OPERATIONS PRIOR TO POLE RELOCATIONS.
3. POLE 20 IS NOT SHOWN, SEE THE TRAFFIC MANAGEMENT PLANS FOR POLE 20 LOCATIONS THROUGH STAGED CONSTRUCTION.

SUGGESTED STAGE 2 UTILITY POLE WORKING POINT COORDINATES		
POLE	NORTHING	EASTING
18	3029117.7203	630173.8616
19	3029050.7581	630037.8629

STAGE 2 CONSTRUCTION
SCALE: 1" = 5'

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

SHEET 12 OF 21 SHEETS BRIDGE NO. A-19-014 (C1R)

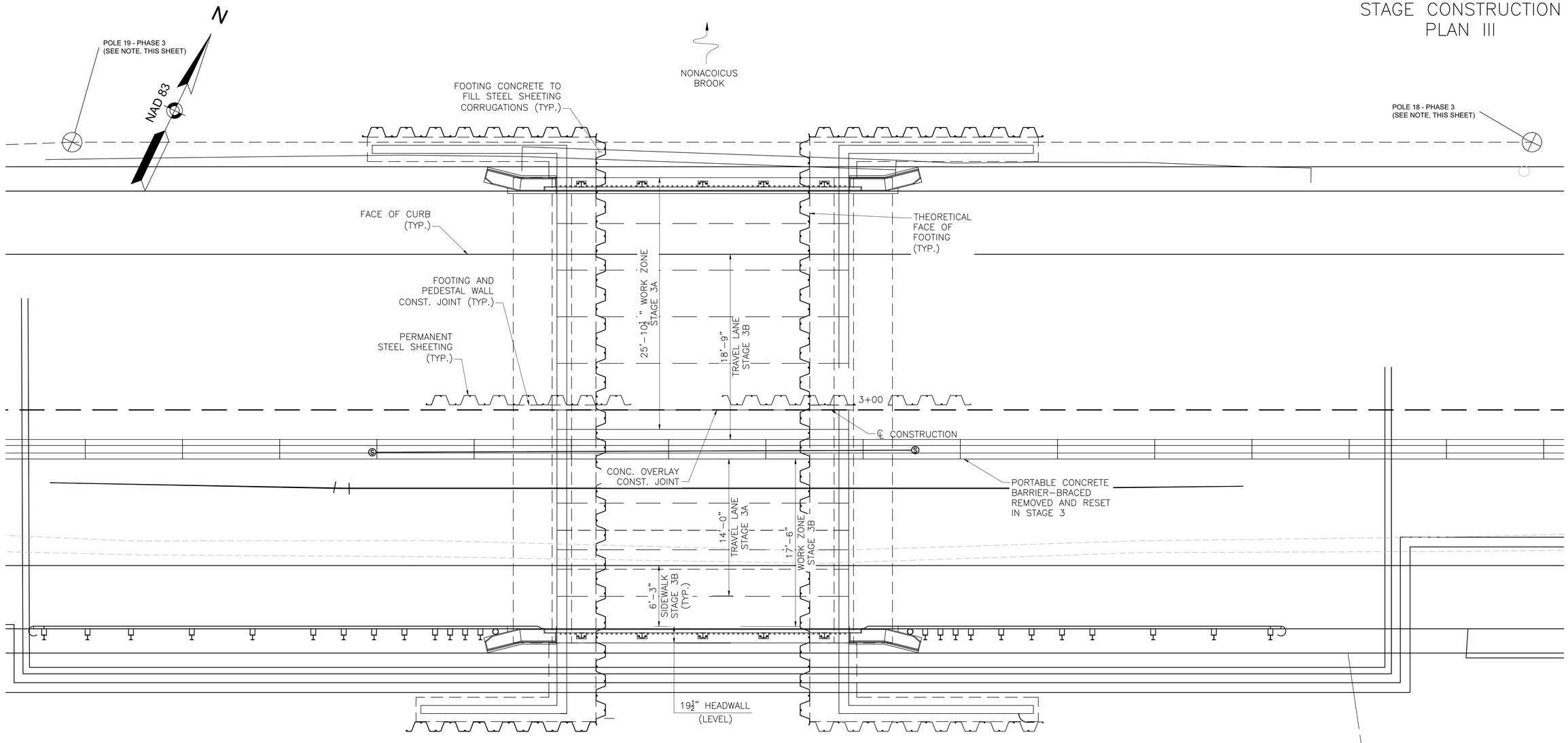
STAGE CONSTRUCTION PLAN III.DWG Plotted on 23-Dec-2024 1:03 PM

924001 Final Structural Submittal (SF) 23 December 2024

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	32	44
PROJECT FILE NO.	17-023.01		

STAGE CONSTRUCTION PLAN III



NOTE:
1. SOME UTILITIES NOT SHOWN FOR CLARITY.
2. STAGE 3B SHOWN.
2. COORDINATES FOR STAGE 3 UTILITY POLES ARE SUGGESTED BASED ON INITIAL COORDINATION WITH NG ELECTRIC. CONTRACTOR TO FIELD VERIFY LOCATIONS AND COORDINATE WITH ALL NECESSARY UTILITIES TO CONFIRM THAT ACTUAL STAGE 3 POLE LOCATIONS DO NOT CONFLICT WITH ANY REQUIRED STAGE 3 CONSTRUCTION OPERATIONS, AND THAT POLES ACHIEVE THE REQUIRED CLEARANCE FROM PERMANENT BRIDGE AND APPROACH ROADWAY GUARDRAIL. COORDINATION MUST OCCUR PRIOR TO POLE RELOCATIONS.
3. POLE 20 IS NOT SHOWN, SEE THE TRAFFIC MANAGEMENT PLANS FOR POLE 20 LOCATIONS THROUGH STAGED CONSTRUCTION.

SUGGESTED STAGE 3 UTILITY POLE WORKING POINT COORDINATES		
POLE	NORTHING	EASTING
18	3029167.9087	630159.9588
19	3029103.3361	630024.4172

STAGE 3 CONSTRUCTION
SCALE: 1" = 5'

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

SHEET 13 OF 21 SHEETS BRIDGE NO. A-19-014 (C1R)

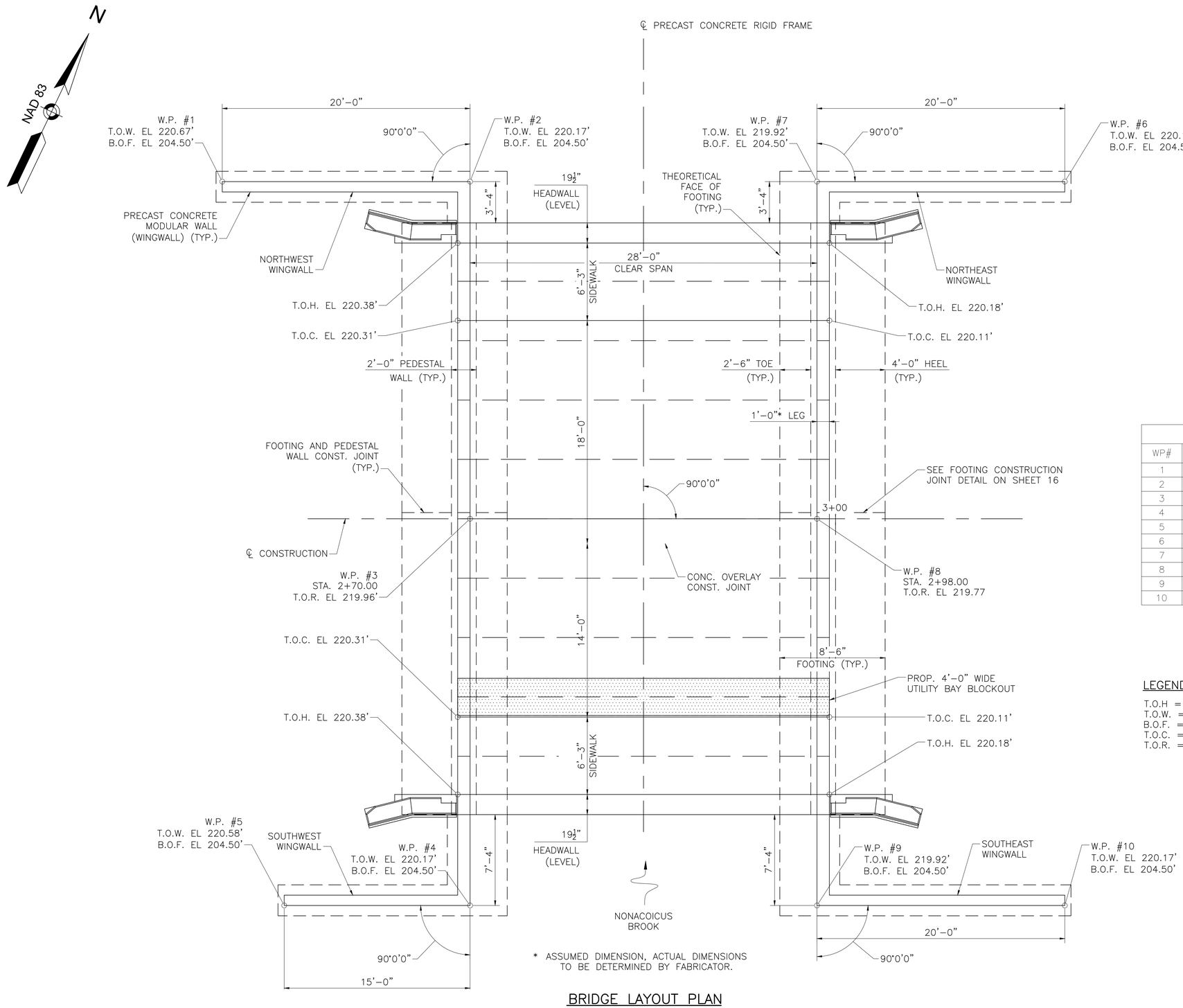
STAGE CONSTRUCTION PLAN III.DWG Plotted on 23-Dec-2024 1:03 PM

924001 Final Structural Submittal (SF) 23 December 2024

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	33	44
PROJECT FILE NO.	17-023.01		

BRIDGE LAYOUT PLAN



* ASSUMED DIMENSION, ACTUAL DIMENSIONS TO BE DETERMINED BY FABRICATOR.

BRIDGE LAYOUT PLAN
SCALE: ¼" = 1'–0"

WORKING POINT COORDINATES		
WP#	NORTHING	EASTING
1	3029116.3259	630052.4169
2	3029124.9277	630070.4726
3	3029100.3644	630082.1746
4	3029072.1900	630095.5970
5	3029065.7386	630082.0552
6	3029145.5721	630113.8063
7	3029136.9702	630095.7506
8	3029112.4069	630107.4526
9	3029084.2325	630120.8750
10	3029092.8343	630138.9308

LEGEND

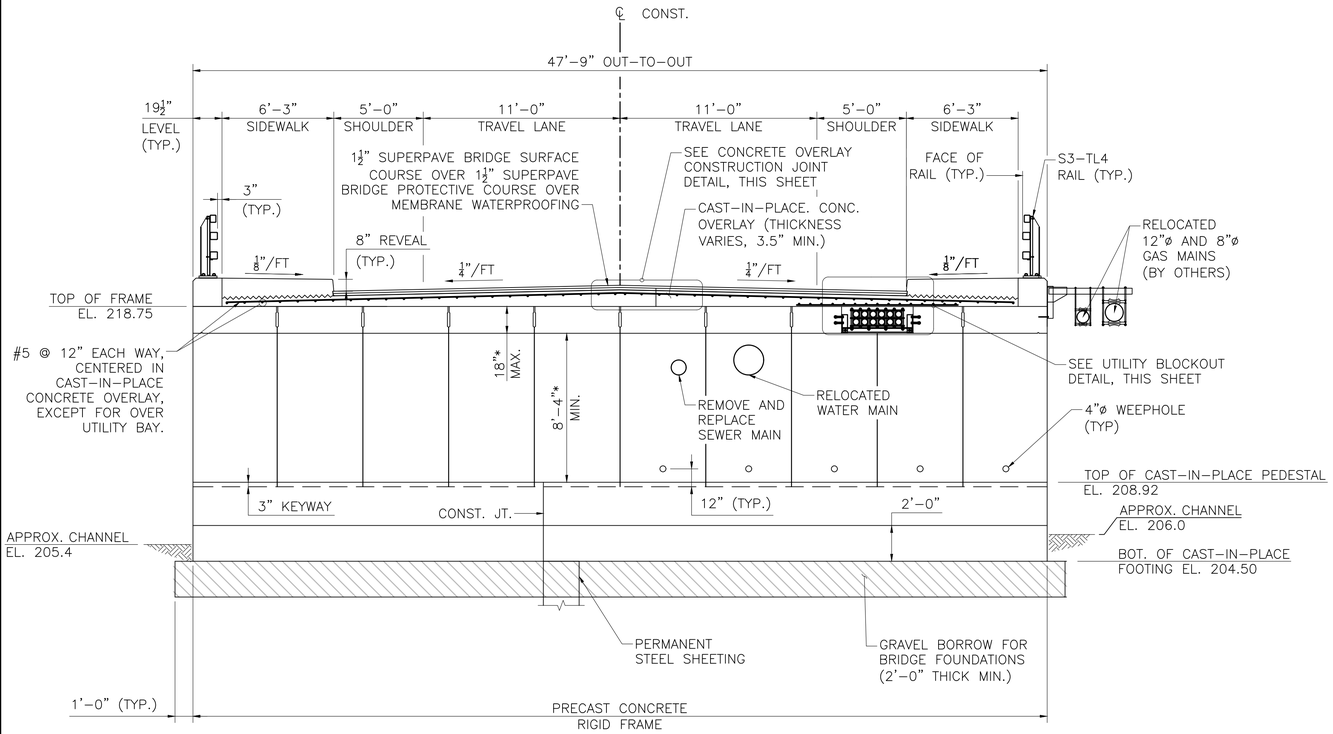
T.O.H = TOP OF HEADWALL
T.O.W. = TOP OF WINGWALL
B.O.F. = BOTTOM OF FOOTING
T.O.C. = TOP OF CURB
T.O.R. = TOP OF ROADWAY

DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	44
PROJECT FILE NO.	17-023.01		

PRECAST CONCRETE RIGID FRAME DETAILS I

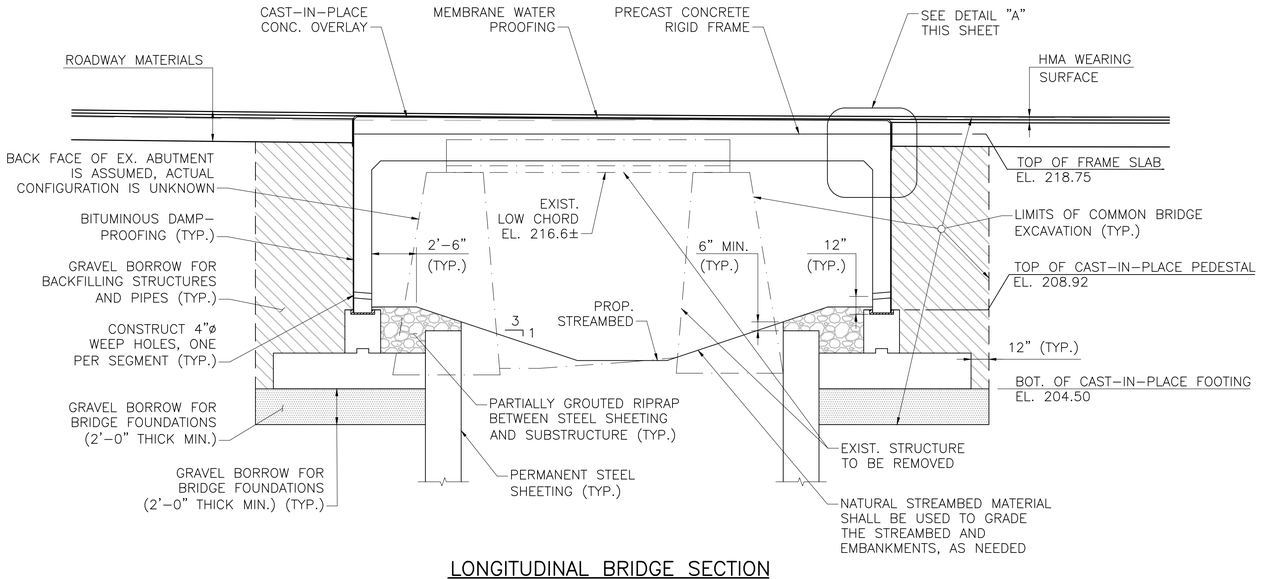


* ASSUMED DIMENSIONS, ACTUAL DIMENSIONS TO BE DETERMINED BY THE FABRICATOR.

TRANSVERSE BRIDGE SECTION

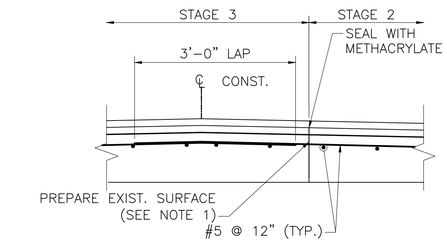
SCALE: ¼" = 1'–0"

NOTE
PARTIALLY GROUTED RIPRAP NOT SHOWN FOR CLARITY.



LONGITUDINAL BRIDGE SECTION

SCALE: ¼" = 1'–0"

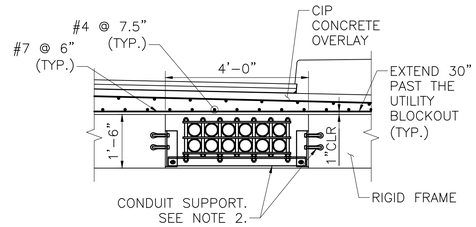


NOTES:

1. 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.
2. 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.
3. DOWEL BAR SPLICERS SHALL BE USED WHERE USE OF LAP SPLICES IS NOT FEASIBLE.

CONCRETE CONSTRUCTION JOINT OVERLAY DETAIL

SCALE: ¾" = 1'–0"

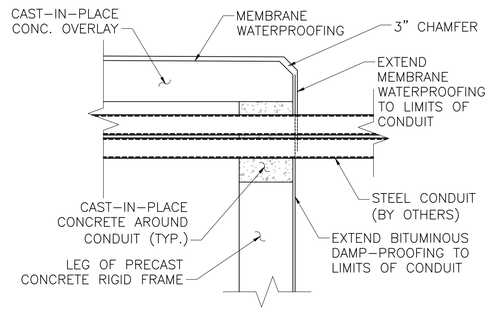


UTILITY BLOCKOUT DETAIL

SCALE: ½" = 1'–0"

NOTES:

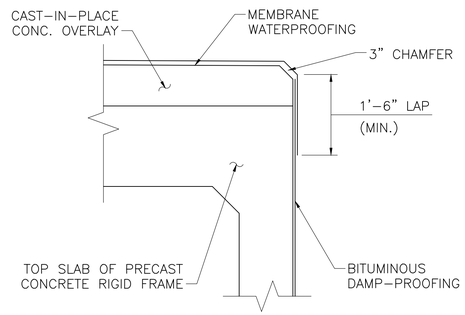
1. FORMWORK FOR DECK OVERPOUR OVER UTILITY BLOCK OUT MUST BE REMOVED AFTER CONCRETE PLACEMENT; STAY–IN–PLACE FORMS NOT PERMITTED.
2. COORDINATE UTILITY SUPPORT DETAILS WITH VERIZON AND PRECAST MANUFACTURER. REFER TO SPECIAL PROVISION FOR ITEM 1000.1 FOR FURTHER INFORMATION.



THROUGH CONDUIT BLOCKOUT

DETAIL A

SCALE: ¾" = 1'–0"



TYPICAL FRAME SECTION

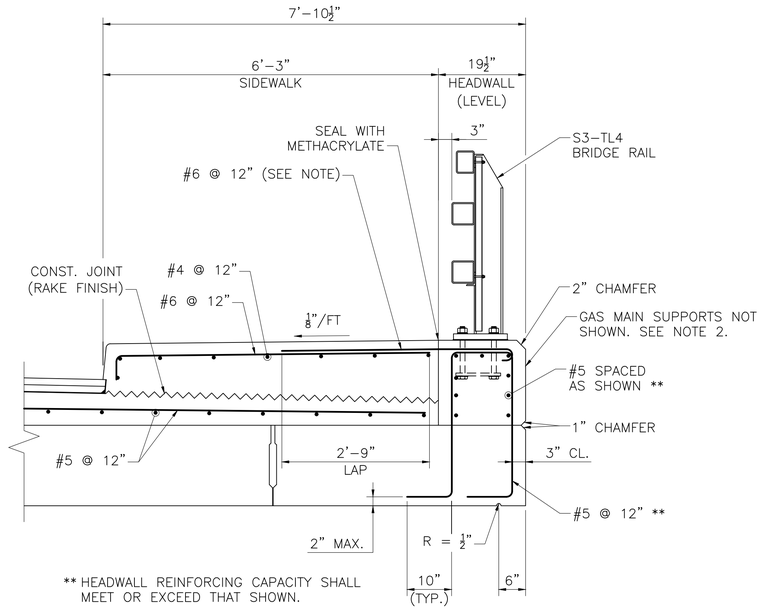
DETAIL A

SCALE: ¾" = 1'–0"

NOTES:

1. 4" DIAMETER WEEP HOLES IN EACH PRECAST CONCRETE RIGID FRAME SECTION (1'–0" ABOVE PEDESTAL WALL KEYWAY). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. CONCRETE FOR PEDESTAL WALL AND FOOTING SHALL BE 4000 PSI, 1 1/2 IN, 565 CEMENT CONCRETE.
3. CONCRETE FOR PRECAST CONCRETE RIGID FRAME SHALL BE 5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE.
4. CONCRETE FOR CAST–IN–PLACE CONCRETE OVERLAY, SIDEWALKS AND HEADWALLS SHALL BE 5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE.
5. ALL REINFORCEMENT AND SUPPORT DEVICES FOR THE PRECAST CONCRETE RIGID FRAME, CAST–IN–PLACE CONCRETE CLOSURE POUR, CAST–IN–PLACE OVERLAY, SIDEWALK AND HEADWALLS SHALL BE COATED.
6. REINFORCEMENT FOR THE CAST–IN–PLACE CONCRETE OVERLAY SHALL BE PLACED TO PROVIDE 2" OF CLEAR COVER. LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE CENTERLINE OF CONSTRUCTION. TRANSVERSE REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE CENTERLINE OF CONSTRUCTION.
7. THE FINISHED SURFACE OF THE CAST–IN–PLACE CONCRETE OVERLAY SHALL BE SMOOTH AND WITHOUT ANY PROJECTIONS THAT COULD PUNCTURE THE MEMBRANE WATERPROOFING OR DEPRESSIONS THAT COULD RETAIN WATER.
8. THE FACTORED BEARING PRESSURE = 3.8 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH 1 LOAD COMBINATION.
9. FACTORED BEARING RESISTANCE = 6.8 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

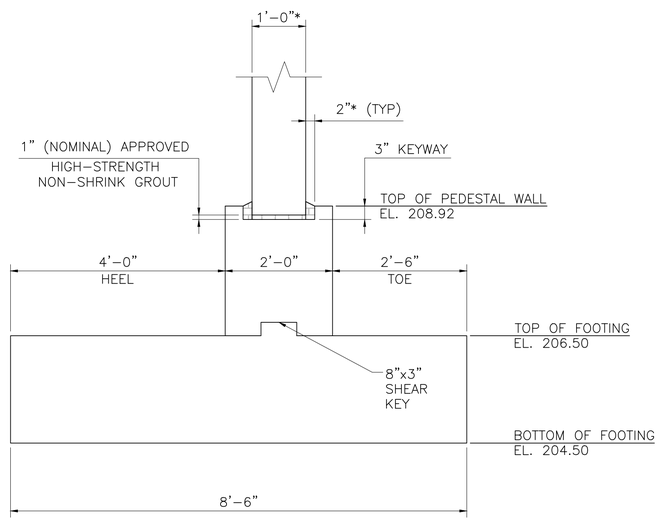


** HEADWALL REINFORCING CAPACITY SHALL MEET OR EXCEED THAT SHOWN.

NOTE:
1. #6 DOWEL BAR AT SOUTH HEADWALL. #6 MECHANICAL SPLICER AT NORTH SIDEWALK.
2. COORDINATE UTILITY SUPPORT DETAILS WITH NG GAS AND PRECAST MANUFACTURER. REFER TO SPECIAL PROVISION FOR ITEM 1000.2 FOR FURTHER INFORMATION.

HEADWALL AND SIDEWALK DETAIL

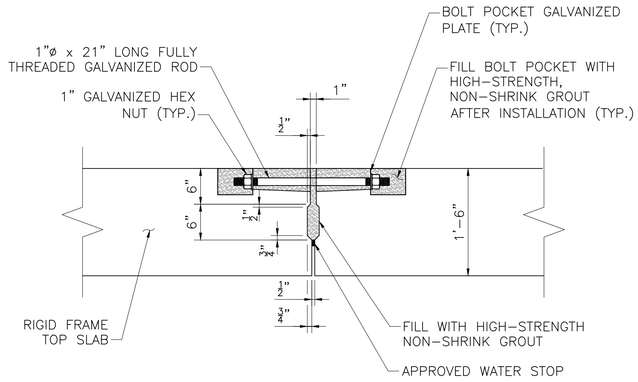
(SOUTH SIDE SHOWN, NORTH SIDE SIMILAR)
SCALE: ¾" = 1'–0"



* ASSUMED DIMENSION, ACTUAL DIMENSION TO BE DETERMINED BY FABRICATOR.

FOOTING AND PEDESTAL WALL MASONRY

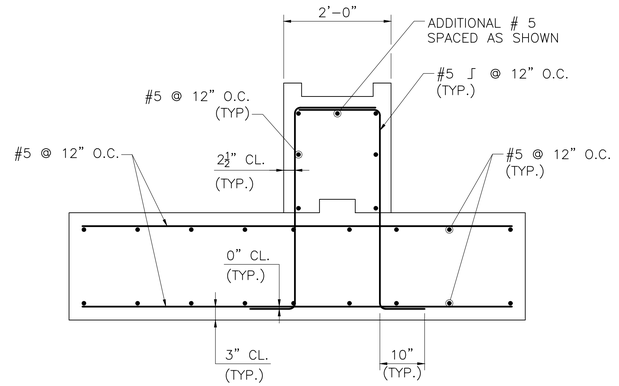
SCALE: ¾" = 1'–0"



NOTES:
1. 3"x3¼"x4½" DEEP MOLDED GLASS REINFORCED POLYOLEFIN PLASTIC BOLT POCKETS CAST IN TOP AND LEGS TO ACCEPT 1" DIAMETER GALVANIZED THREADED ROD, NUTS AND WASHERS FOR PERMANENT ASSEMBLY IN FIELD. UPON SUCCESSFUL INSTALLATION, ALL POCKETS SHALL BE THOROUGHLY FILLED IN WITH AN APPROVED, HIGH–STRENGTH NON–SHRINK GROUT AND STRUCK LEVEL.
2. A MINIMUM OF 4 MECHANICAL CONNECTORS ARE REQUIRED FOR EACH INTERIOR AND EXTERIOR SEGMENT (2 TOP SLAB AND 1 ON EACH LEG).
3. TOP SLAB SHOWN, USE SIMILAR DETAIL FOR RIGID FRAME LEGS.

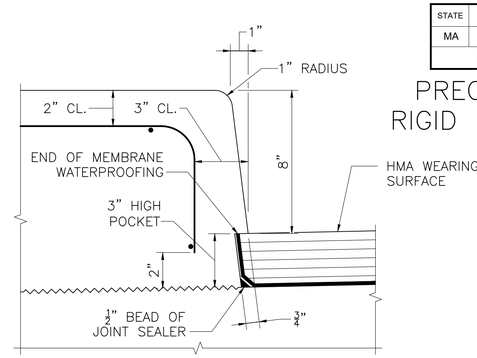
RIGID FRAME MECHANICAL CONNECTION DETAIL

NOT TO SCALE



FOOTING AND PEDESTAL WALL REINFORCING

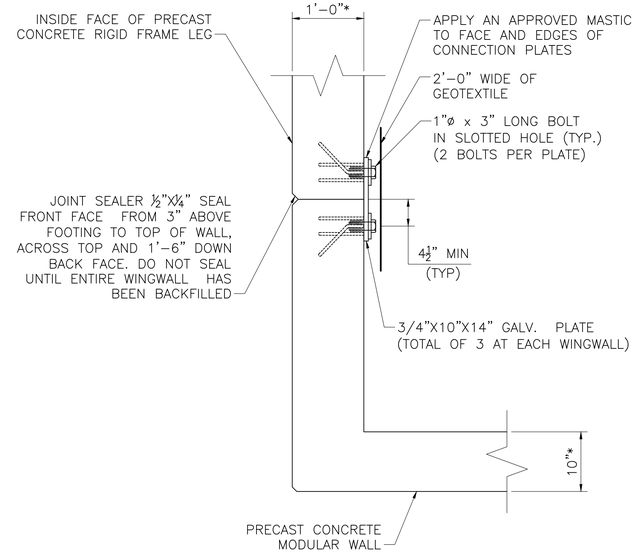
SCALE: ¾" = 1'–0"



NOTE:
1. TURN MEMBRANE UP INTO 3" HIGH POCKET.

FACE OF SIDEWALK CURB DETAILS

SCALE: 3" = 1'–0"



* ASSUMED DIMENSION, ACTUAL DIMENSION TO BE DETERMINED BY FABRICATOR.

NOTES:
1. CONNECTION PLATES MUST BE POSITIONED WITH SMALL DIA. HOLES TOWARD STRUCTURE.
2. ALL HARDWARE TO BE HOT–DIPPED GALVANIZED.
3. FABRICATOR TO DESIGN ALL CONNECTION PLATES BUT IN NO CASE SHALL BE SMALLER THAN SHOWN IN DETAIL ABOVE.

TYPICAL WINGWALL TO RIGID FRAME CONNECTION DETAIL

SCALE: 1" = 1'–0"

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	35	44
PROJECT FILE NO.	17-023.01		

PRECAST CONCRETE RIGID FRAME DETAILS II

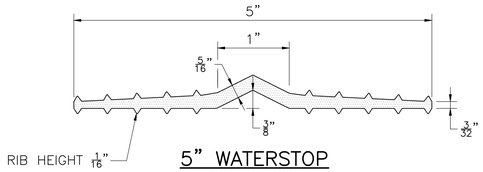
DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

PRECAST CONCRETE RIGID FRAME DETAILS III.DWG Plotted on 23-Dec-2024 1:04 PM
924001 Final Structural Submittal (SF) 23 December 2024

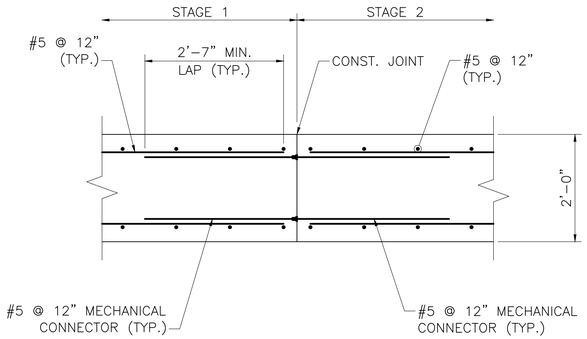
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	44
PROJECT FILE NO.	17-023.01		

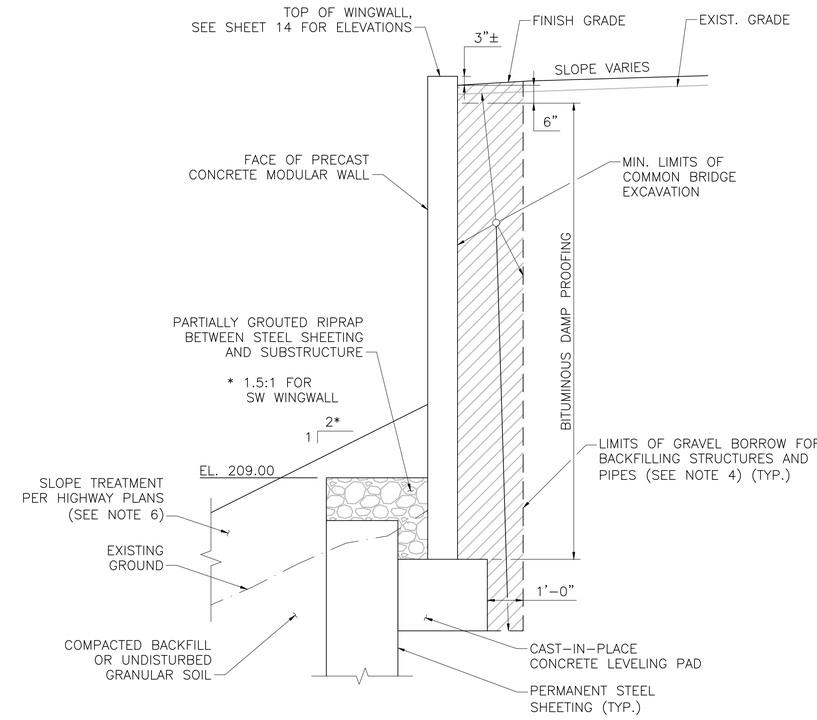
PRECAST CONCRETE RIGID FRAME DETAILS III



5" WATERSTOP
NOT TO SCALE



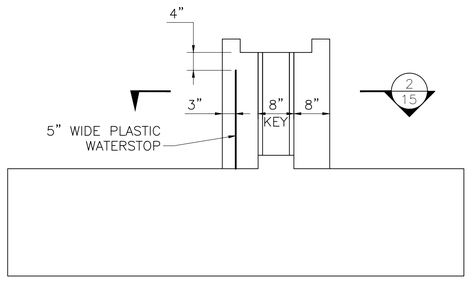
FOOTING CONSTRUCTION JOINT DETAIL
SCALE: 3/4" = 1'-0"



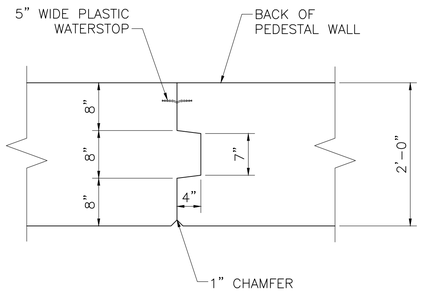
NOTES:

1. 4" DIAMETER WEEP HOLES 10'-0" O.C. PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. CONCRETE FOR PRECAST CONCRETE MODULAR WALL SHALL BE 5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE.
3. ALL REINFORCEMENT AND SUPPORT DEVICES FOR THE PRECAST CONCRETE MODULAR WALL SHALL BE COATED.
4. GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES SHALL BE 1'-0" BEYOND ANCHOR SYSTEM, IF USED.
5. ALL EXCAVATION, SUPPORT OF EXCAVATION, BACKFILL MATERIAL, BITUMINOUS DAMP-PROOFING AND LEVELING PAD MATERIAL FOR THE INSTALLATION OF THE PRECAST CONCRETE MODULAR WALL (PCM) IS INCIDENTAL TO THE PCM WALL.
6. NATIVE MATERIAL OR NATURAL STREAMBED MATERIAL SHALL BE USED TO ESTABLISH PROPOSED GRADES BELOW MEAN ANNUAL HIGH WATER.

TYPICAL PRECAST CONCRETE MODULAR WALL SECTION
SCALE: 1/2" = 1'-0"



VERTICAL SECTION THROUGH CONSTRUCTION JOINT
SCALE: 3/4" = 1'-0"



NOTES:

1. REINFORCEMENT SHALL BE CONTINUOUS THRU CONSTRUCTION JOINT.

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

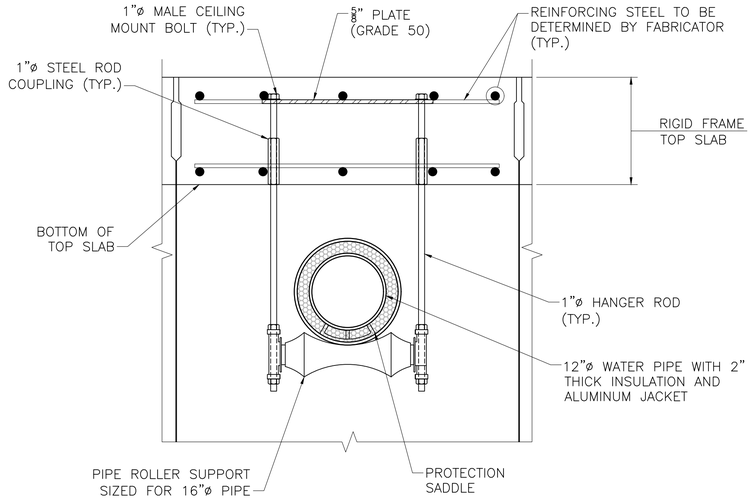
	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

PRECAST CONCRETE RIGID FRAME DETAILS III.DWG Plotted on 23-Dec-2024 1:05 PM
92401 Final Structural Submittal (SF) 23 December 2024

AYER
WEST MAIN STREET

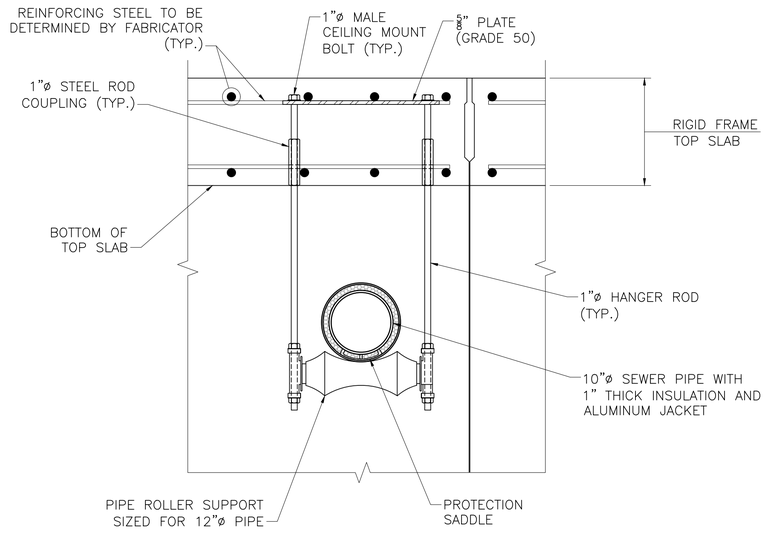
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	44
PROJECT FILE NO.	607550		

UTILITY SUPPORT DETAILS



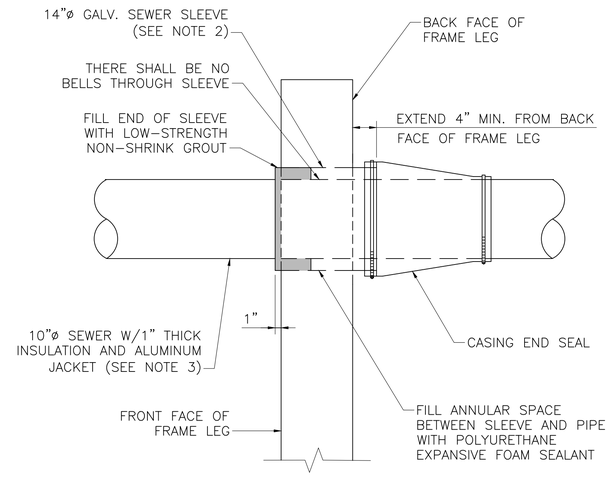
NOTE
1. PROVIDE 3 UTILITY SUPPORT HANGERS EQUALLY SPACED ACROSS BRIDGE SPAN.

UTILITY SUPPORT AT WATER MAIN
SCALE: 1" = 1'–0"



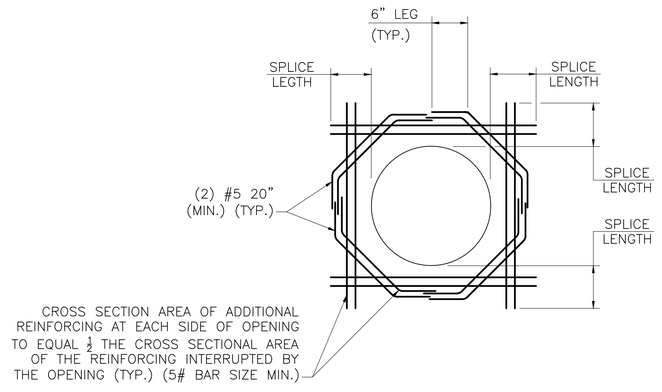
NOTE
1. PROVIDE 3 UTILITY SUPPORT HANGERS EQUALLY SPACED ACROSS BRIDGE SPAN.

UTILITY SUPPORT AT SEWER MAIN
SCALE: 1" = 1'–0"



NOTES
1. SEWER MAIN LONGITUDINAL SHOWN, WATER MAIN LONGITUDINAL SECTION SIMILAR.
2. 18"ø GALV. WATER SLEEVE.
3. 12"ø WATER W/2" THICK INSULATION AND ALUMINUM JACKET.
4. FOR LOCATIONS AND ADDITIONAL INFORMATION REGARDING PENETRATIONS NECESSARY FOR RELOCATED GAS MAINS, SEE THE WALL PENETRATIONS SHEET OF THE NATIONAL GRID GAS MAIN RELOCATION PLANS IN APPENDIX M OF THE SPECIFICATIONS.

PENETRATION SLEEVE LONGITUDINAL SECTION
SCALE: ¾" = 1'–0"



NOTES:

1. THIS DETAIL APPLIES TO THE PENETRATION THROUGH THE PRECAST CONCRETE RIGID FRAME LEG DUE TO THE WATER MAIN, GAS MAIN, AND SEWER MAIN UTILITIES.
2. THIS DETAIL APPLIES TO THE PENETRATION THROUGH THE NORTHEAST AND NORTHWEST PRECAST CONCRETE MODULAR WALLS DUE TO DRAINAGE PIPES.
3. REINFORCING SHALL MEET OR EXCEED THAT SHOWN.

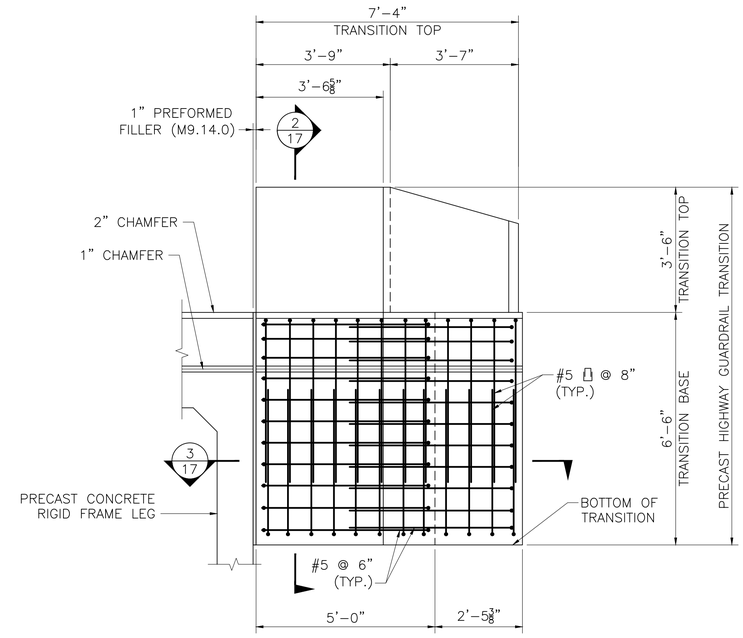
ADDITIONAL REINFORCING AT PIPE PENETRATIONS
SCALE: 1" = 1'–0"

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

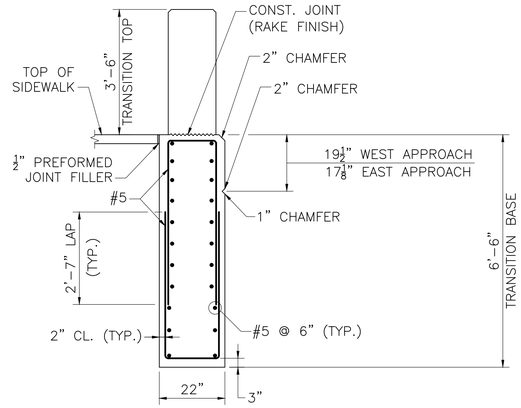
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	44
PROJECT FILE NO.	17-023.01		

HIGHWAY GUARDRAIL TRANSITION BASE DETAILS

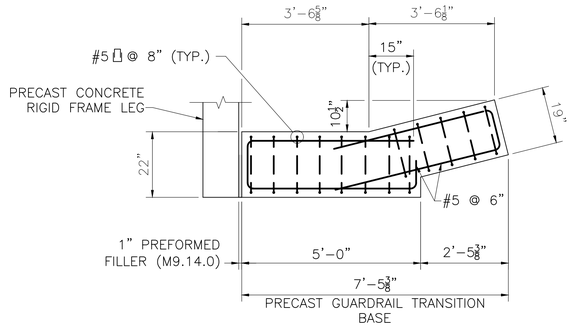


PRECAST GUARDRAIL TRANSITION ELEVATION AT U-WINGWALL
SCALE: ½" = 1'-0"



NOTE:
REINFORCEMENT OF THE TRANSITION TOP IS NOT SHOWN FOR CLARITY.

SECTION 2
SCALE: ½" = 1'-0"



SECTION 3
SCALE: ½" = 1'-0"

NOTES:

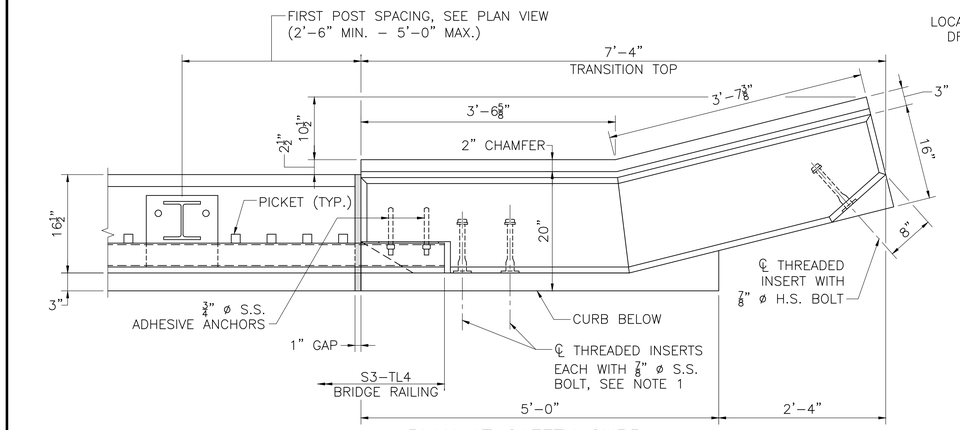
1. PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.
2. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO THE GRADE OF 3" (MIN.) BELOW THE INTENDED BOTTOM OF THE PRECAST GUARDRAIL TRANSITION BASE AND TO A HEIGHT OF 2'-0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE TO 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.
3. 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.

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

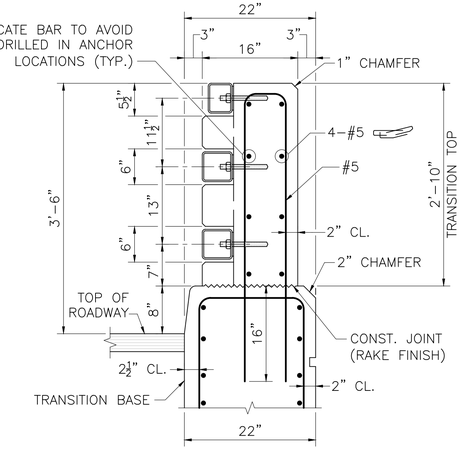
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	44
PROJECT FILE NO.	17-023.01		

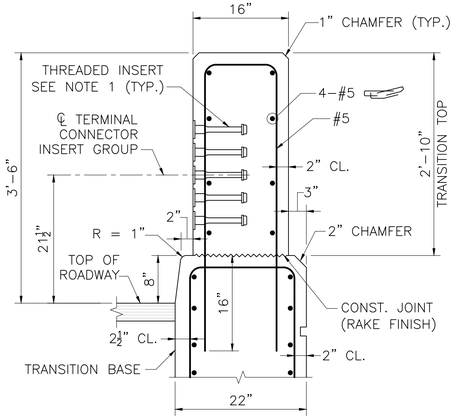
HIGHWAY GUARDRAIL TRANSITION DETAILS



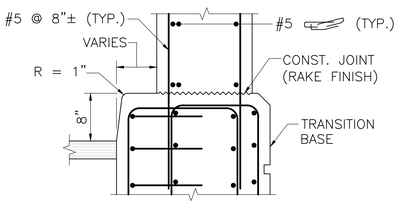
PLAN AT SAFETY CURB
SCALE: 1" = 1'-0"



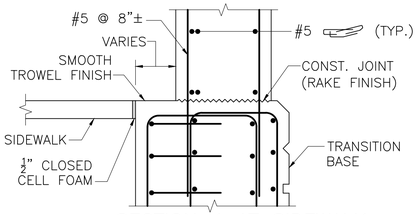
SECTION 2 AT SAFETY CURB
SCALE: 1" = 1'-0"



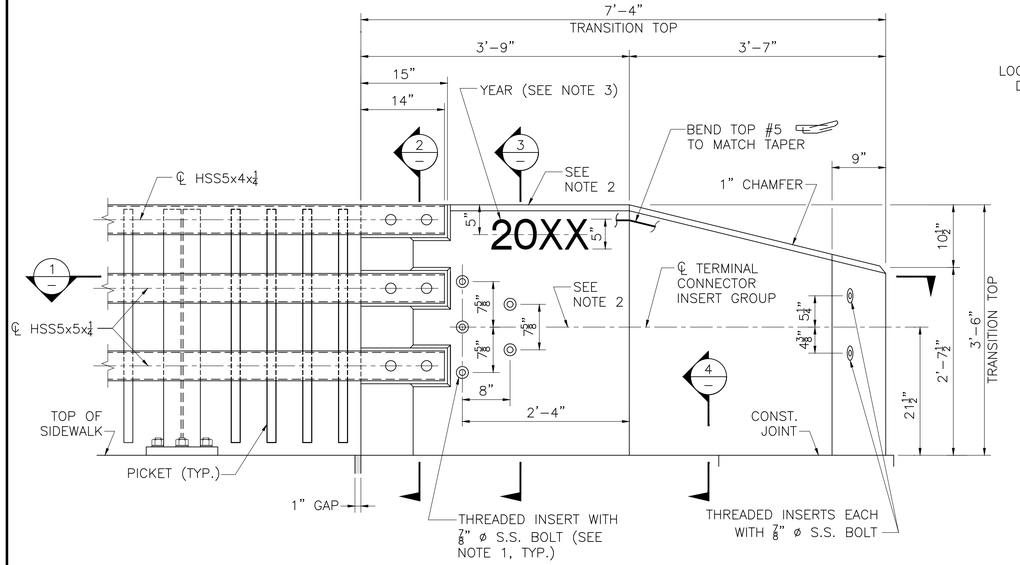
SECTION 3 AT SAFETY CURB
SCALE: 1" = 1'-0"



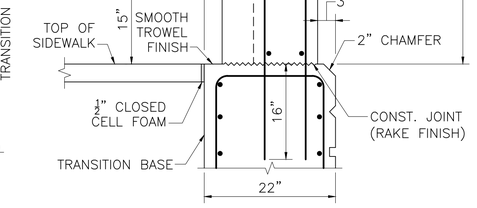
SECTION 4 AT SAFETY CURB
SCALE: 1" = 1'-0"



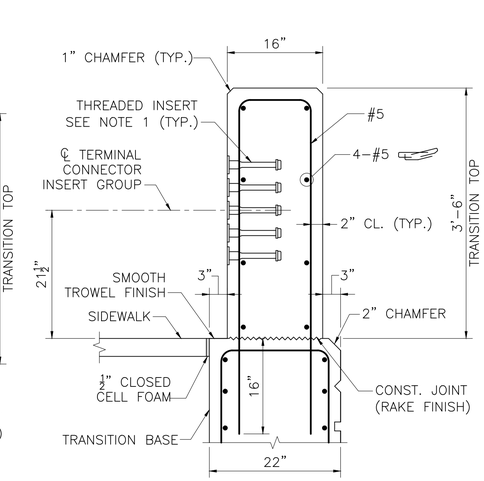
SECTION 4 AT SIDEWALK
SCALE: 1" = 1'-0"



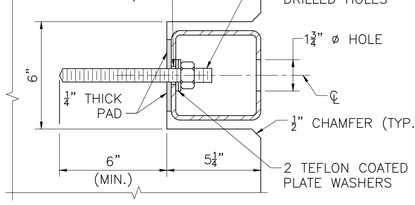
ELEVATION AT SIDEWALK
SCALE: 1" = 1'-0"



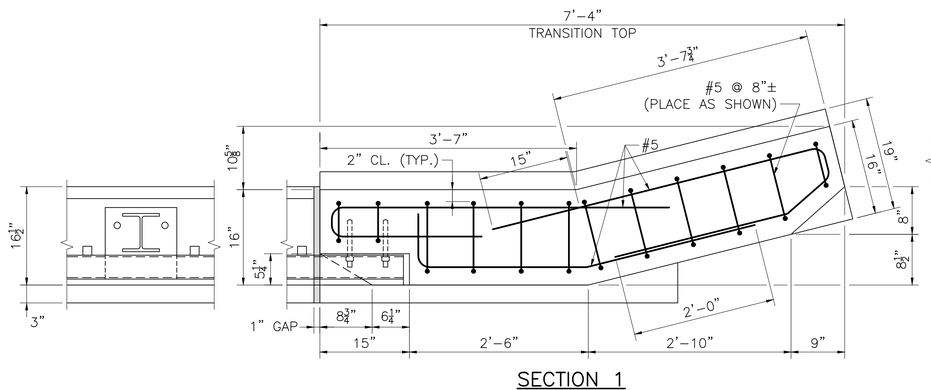
SECTION 2 AT SIDEWALK
SCALE: 1" = 1'-0"



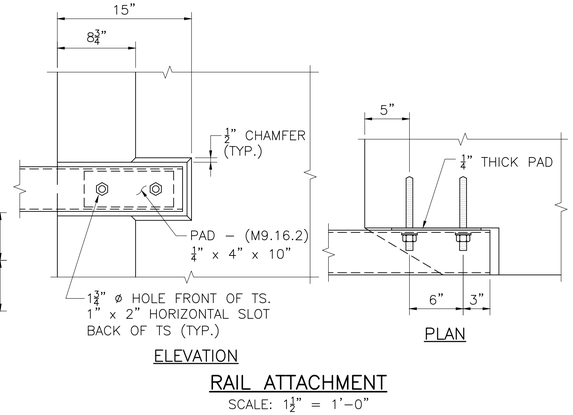
SECTION 3 AT SIDEWALK
SCALE: 1" = 1'-0"



SECTION 5
SCALE: 3" = 1'-0"



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



RAIL ATTACHMENT
SCALE: 1½" = 1'-0"

NOTES:

1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER ⅞" ø S.S. BOLT. S.S. BOLTS SHALL BE ⅞" ø x 1½" LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR ⅞" S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO THE TRANSITION.

2. FOR AN APPROACH GRADE UP TO 3%, THE TRANSITION MAY BE CAST SQUARE AND SET PLUMB WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SQUARE TO THE POST.

   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.

3. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST GUARDRAIL TRANSITION IS CAST. USE THIS YEAR FOR ALL GUARDRAIL TRANSITIONS.

4. ALL CONCRETE FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾", 685 HP CEMENT CONCRETE.

5. LIFTING DEVICES (NOT SHOWN), INCLUDING THEIR NUMBER AND LOCATION, SHALL BE DESIGNED AND DETAILED BY THE PRECASTER. THEY SHALL BE GALVANIZED AND SHALL BE PLACED AND RECESSED IN POCKETS TO PROVIDE 1½" CLEAR COVER TO THE FACE OF THE TRANSITION CONCRETE. THESE DEVICES SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS ALONG WITH ALL SUPPORTING CALCULATIONS AND/OR CATALOG CUTS. ONCE THE PRECAST TRANSITION IS SET IN PLACE, THE LIFTING DEVICE POCKETS SHALL BE FILLED WITH A NON-SHRINK GROUT THAT MATCHES THE COLOR OF THE TRANSITION CONCRETE WHEN CURED AND THE FILLED POCKETS SHALL BE RUBBED WITH A CORUNDUM STONE TO BLEND OUT THE JOINTS.

DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

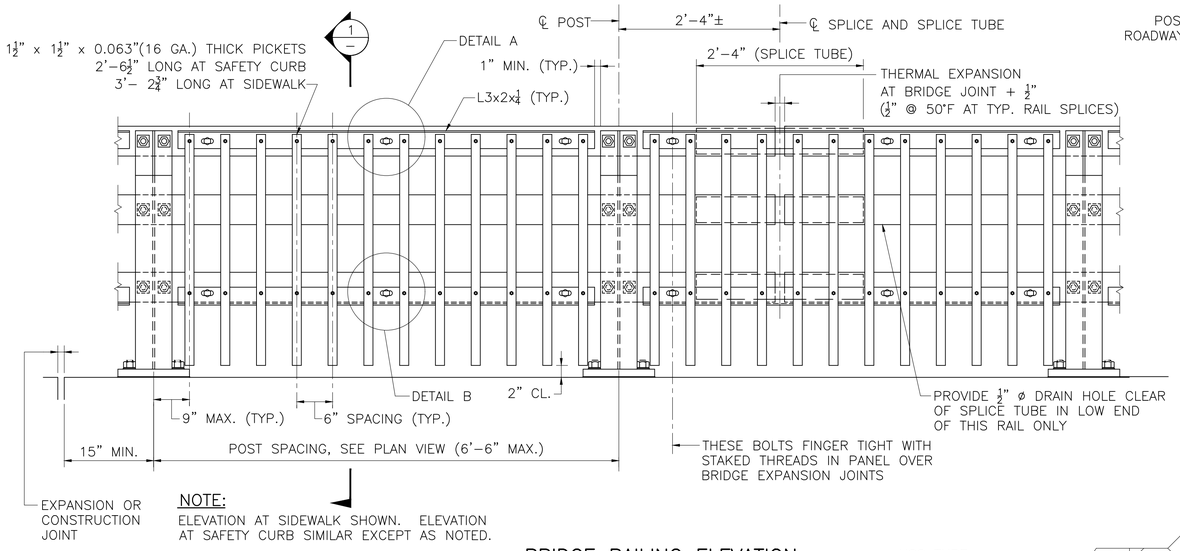
TOP OF PRECAST HIGHWAY GUARDRAIL TRANSITION FOR S3-TL4 RAILING

HIGHWAY GUARDRAIL TRANSITION DETAILS.DWG 5-Dec-2013
924001 Final Structural Submittal (SF) ---

AYER
WEST MAIN STREET

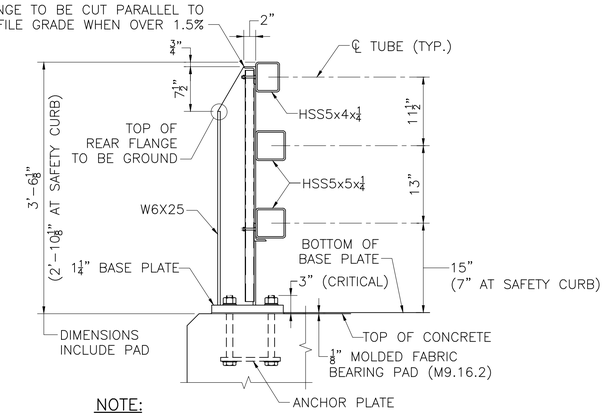
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	44
PROJECT FILE NO.	17-023.01		

S3-TL4 BRIDGE RAIL



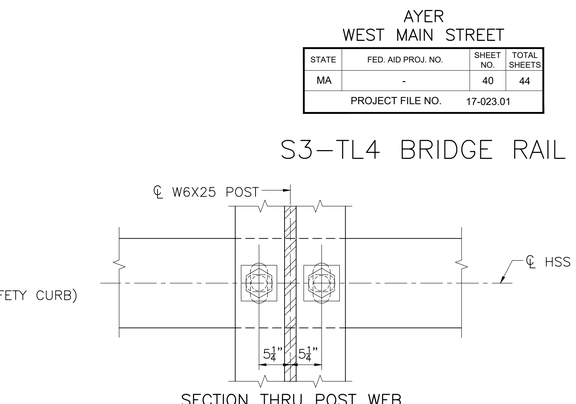
NOTE:
ELEVATION AT SIDEWALK SHOWN. ELEVATION AT SAFETY CURB SIMILAR EXCEPT AS NOTED.

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



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

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

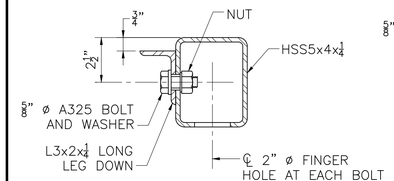


SECTION THRU POST WEB

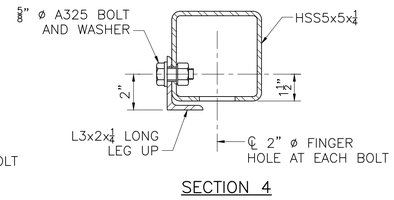
SECTION THRU RAIL

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

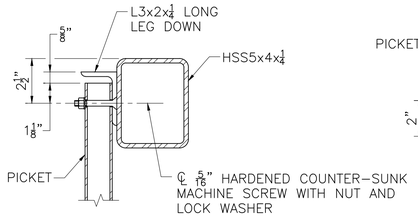
TYPICAL RAIL TO POST CONNECTIONS
SCALE: 1" = 1'-0"



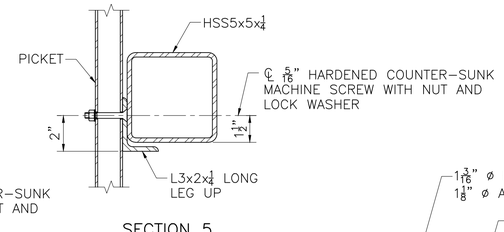
SECTION 2



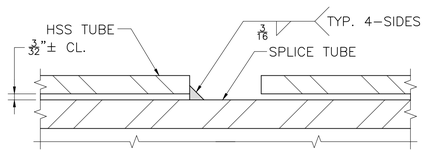
SECTION 4



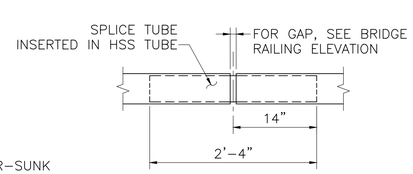
SECTION 3



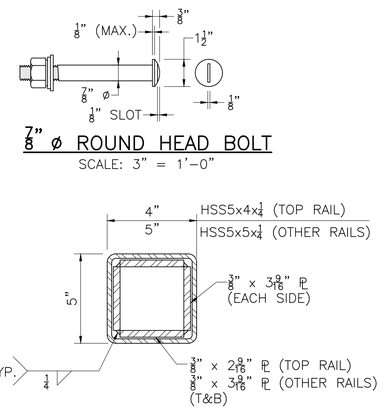
SECTION 5



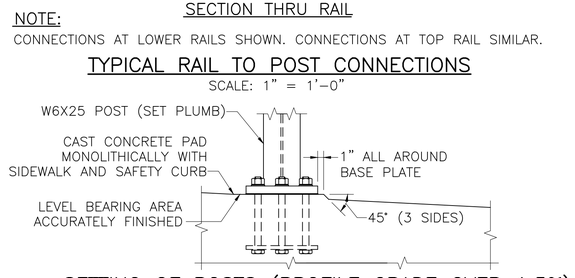
SPLICE DETAIL
FULL SIZE



TYPICAL SPLICE
SCALE: 1" = 1'-0"



SPLICE TUBE DETIALS
SCALE: 3" = 1'-0"

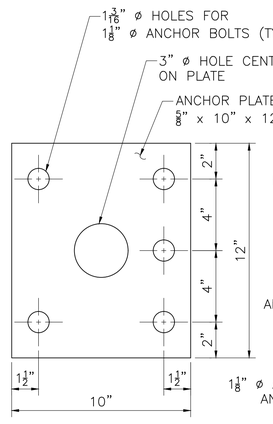


SETTING OF POSTS (PROFILE GRADE OVER 1.5%)
SCALE: 1" = 1'-0"

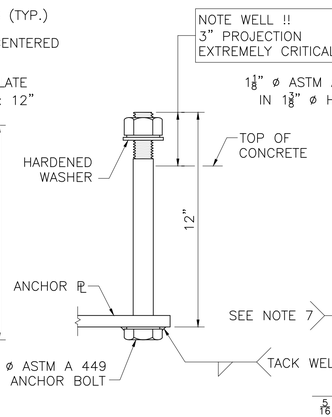
DETAIL A

DETAIL B

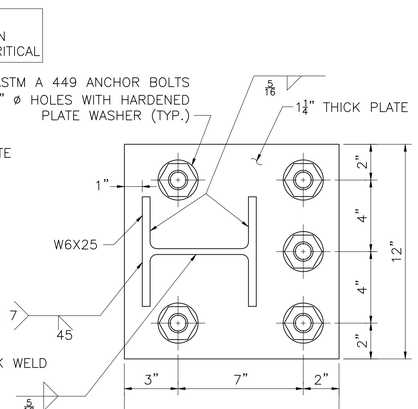
TYPICAL PICKET TO RAIL DETAILS
SCALE: 3" = 1'-0"



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

DATE	DESCRIPTION
	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

S3-TL4 BRIDGE RAILING

S3-TL4 BRIDGE RAIL.DWG 23-Dec-2024
924001 Final Structural Submittal (SF) 23 December 2024

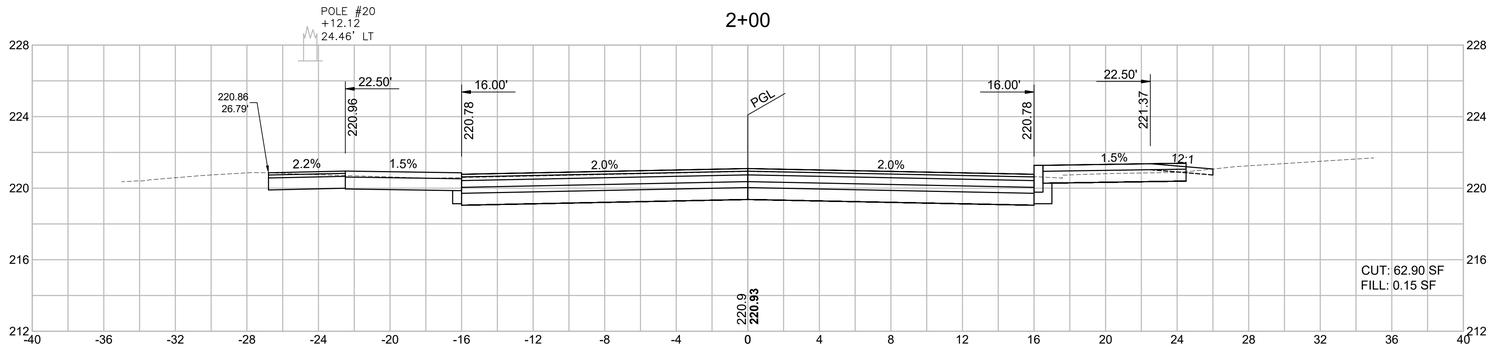
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		41	44
T&B PROJECT FILE NO.	17-023.01		

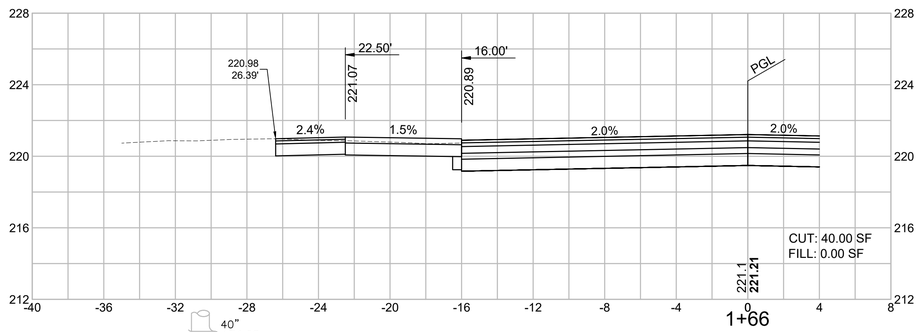
CROSS SECTIONS - WEST MAIN STREET
SHEET 1 OF 4

16-005.01_HD(LAYOUT).DWG Plotted on 19-Dec-2024 5:21 PM

2+00



1+95



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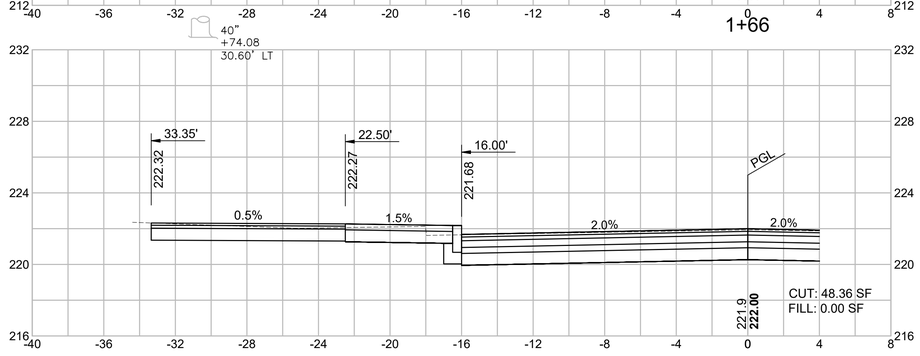

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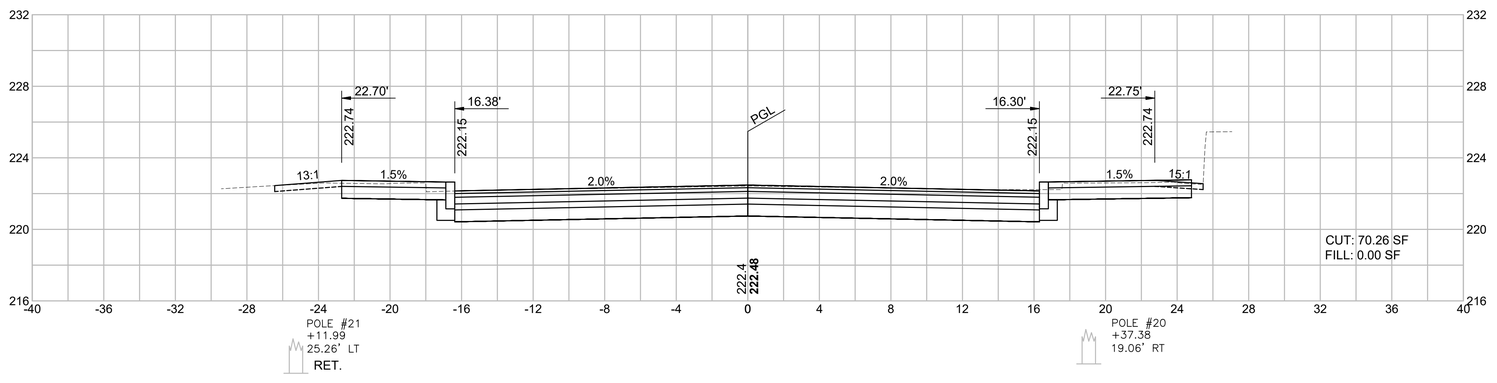


4 0 4 8
SCALE IN FEET

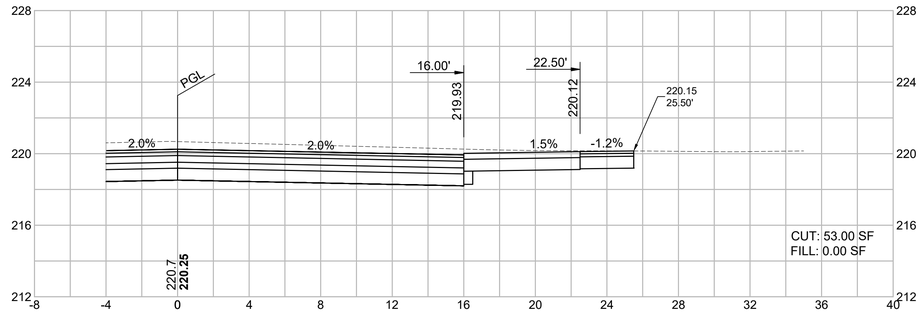
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		42	44
T&B PROJECT FILE NO.	17-023.01		

CROSS SECTIONS - WEST MAIN STREET
SHEET 2 OF 4

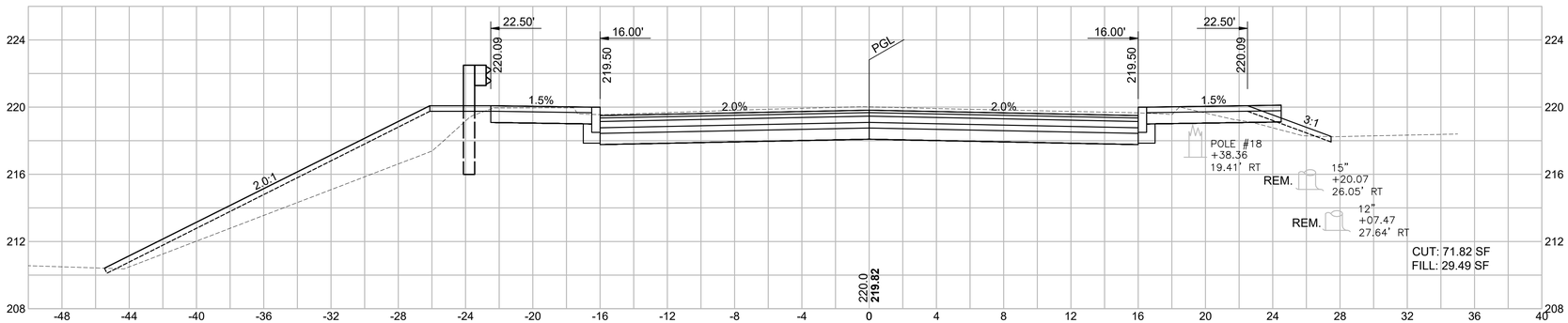
Plotted on 19-Dec-2024 5:21 PM
16-005.01_HD(LAYOUT).DWG

3+92



POLE #19
+68.47
24.54' LT

3+50



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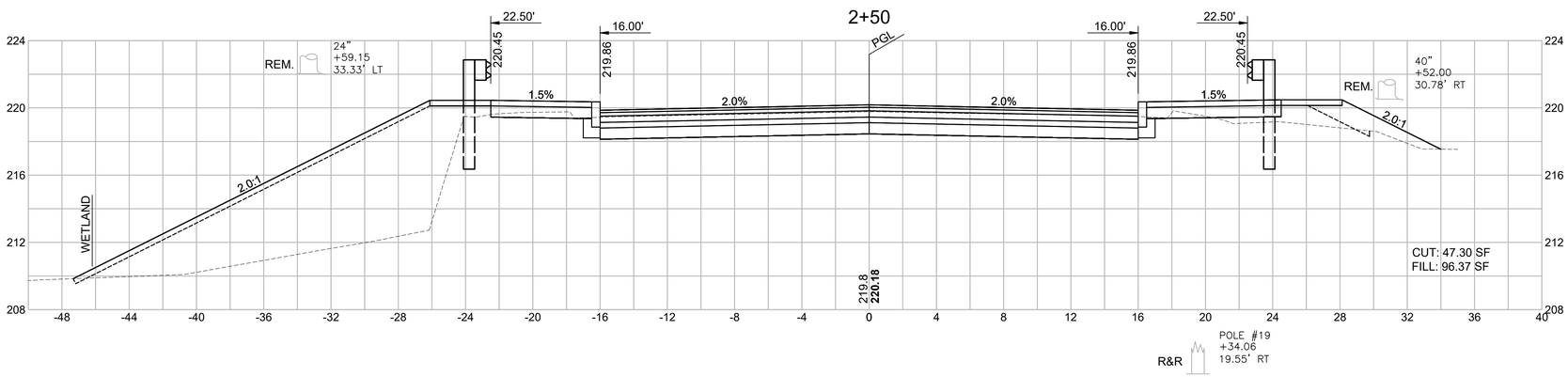


R&R POLE #19
+34.06
19.55' RT

4 0 4 8
SCALE IN FEET

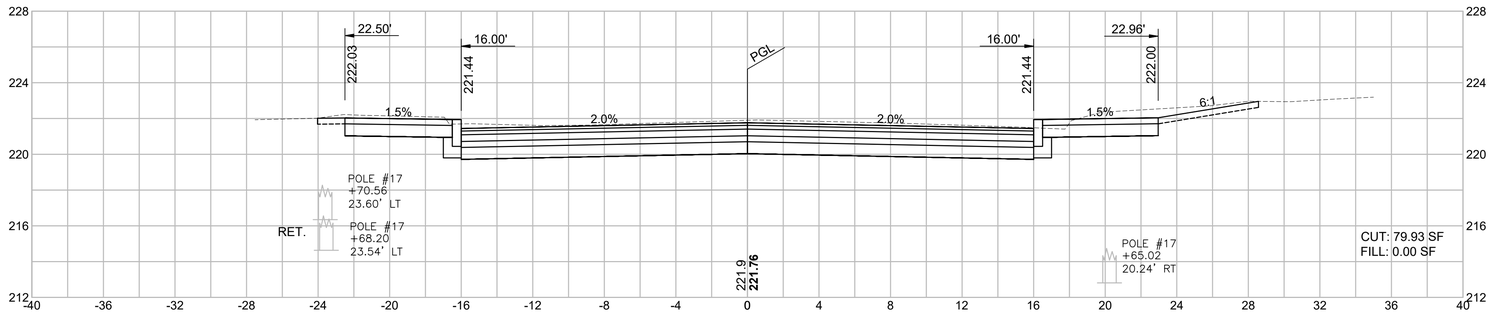
AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		43	44
T&B PROJECT FILE NO.	17-023.01		

CROSS SECTIONS - WEST MAIN STREET
SHEET 3 OF 4

16-005.01_HD(LAYOUT).DWG Plotted on 19-Dec-2024 5:21 PM

4+75



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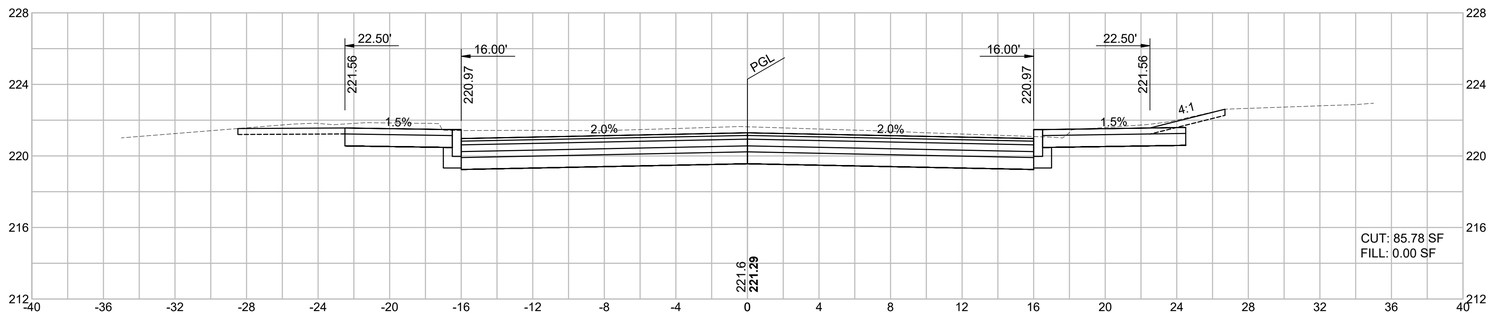
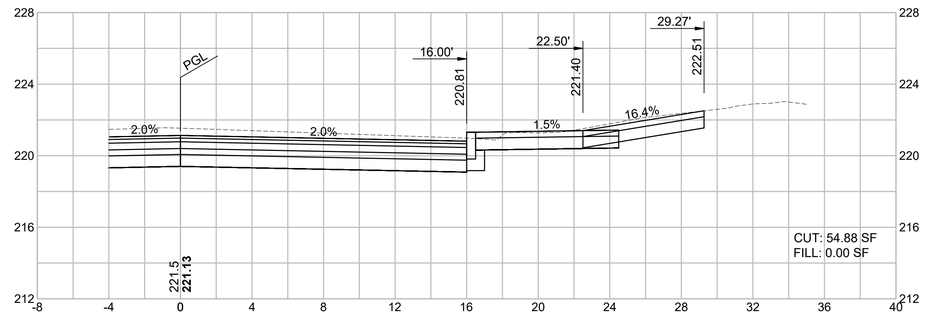
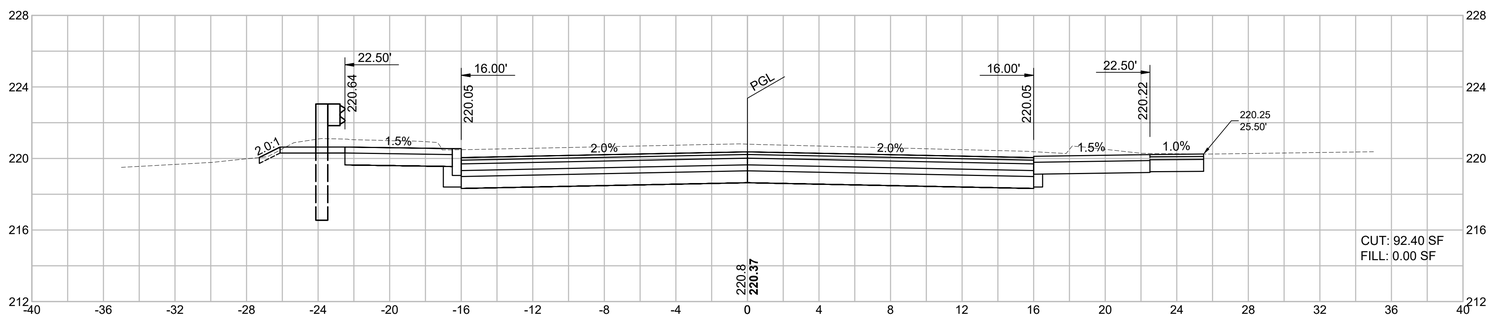


4+41.50



4+00



4 0 4 8
SCALE IN FEET

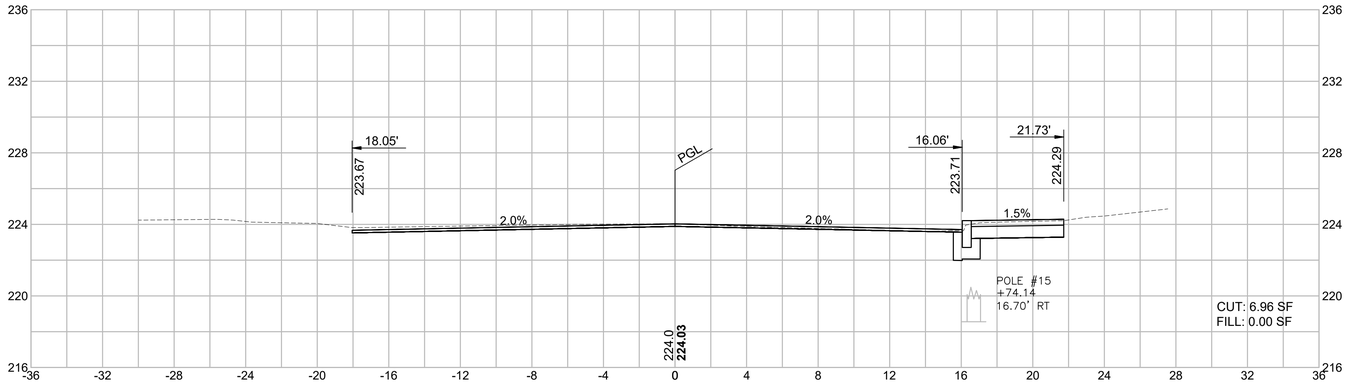
1 ADDENDUM #2 - 2/3/2025

AYER
WEST MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		44	44
T&B PROJECT FILE NO.	17-023.01		

CROSS SECTIONS - WEST MAIN STREET
SHEET 4 OF 4

5+95



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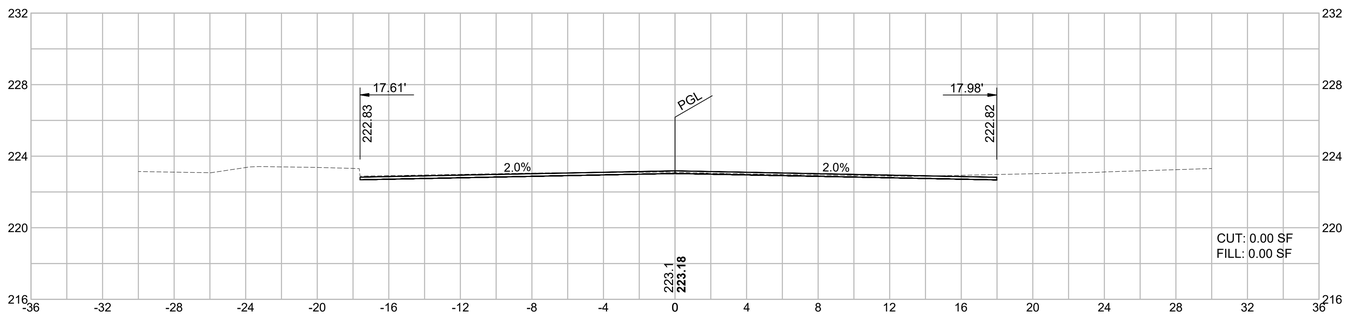

5+00

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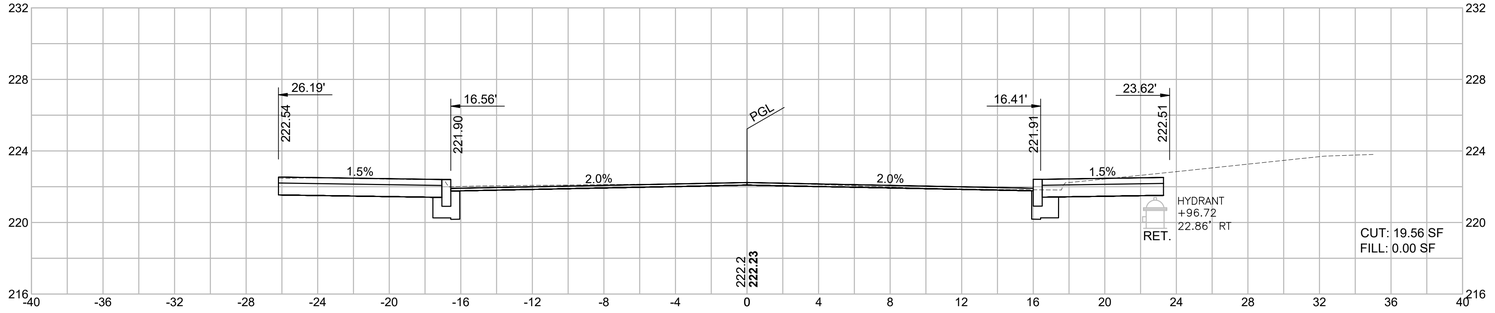

4 0 4 8
SCALE IN FEET