



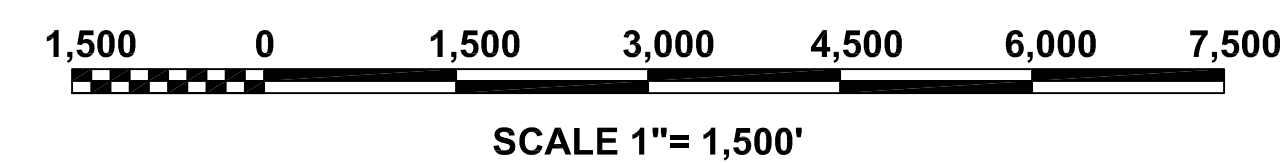
PLAN AND PROFILE OF
ROUTE 2 OVER ROUTE 2A
BRIDGE NO. P-09-004

PHILLIPSTON
WORCESTER COUNTY

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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THE MASSACHUSETTS HIGHWAY DEPARTMENT 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE ENGLISH EDITION OF SUPPLEMENTAL SPECIFICATIONS DATED FEBRUARY 25, 2010, STANDARD SPECIAL PROVISIONS DATED JUNE 18, 2010, THE AMENDMENTS TO THE STANDARD AND SUPPLEMENTAL SPECIFICATIONS, THE 1977 CONSTRUCTION STANDARDS, THE ENGLISH EDITION OF SUPPLEMENTAL DRAWINGS DATED APRIL 2003, THE 2003 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" WITH LATEST REVISIONS, THE 1990 "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS," AND THE 2004 EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004), WILL GOVERN.

		<u>ROUTE 2</u>	<u>ROUTE 2A</u>
DESIGN SPEED	=	55 MPH	40 MPH
ADT (2010)	=	19,720	9,708
ADT (2030)	=	24,062	11,235
K	=	10%	
D	=	55%	
T (PEAK HOUR)	=	5%	
T (AVERAGE DAY)	=	10%	
DHV	=	2,070	
DDHV	=	1,035	
FUNCTIONAL CLASSIFICATION	=	PRINCIPAL ARTERIAL	



CONVENTIONAL SIGNS

Tran Systems
38 CAUNCEY STREET, SUITE 200, BOSTON, MA 02111, (857) 453-5454

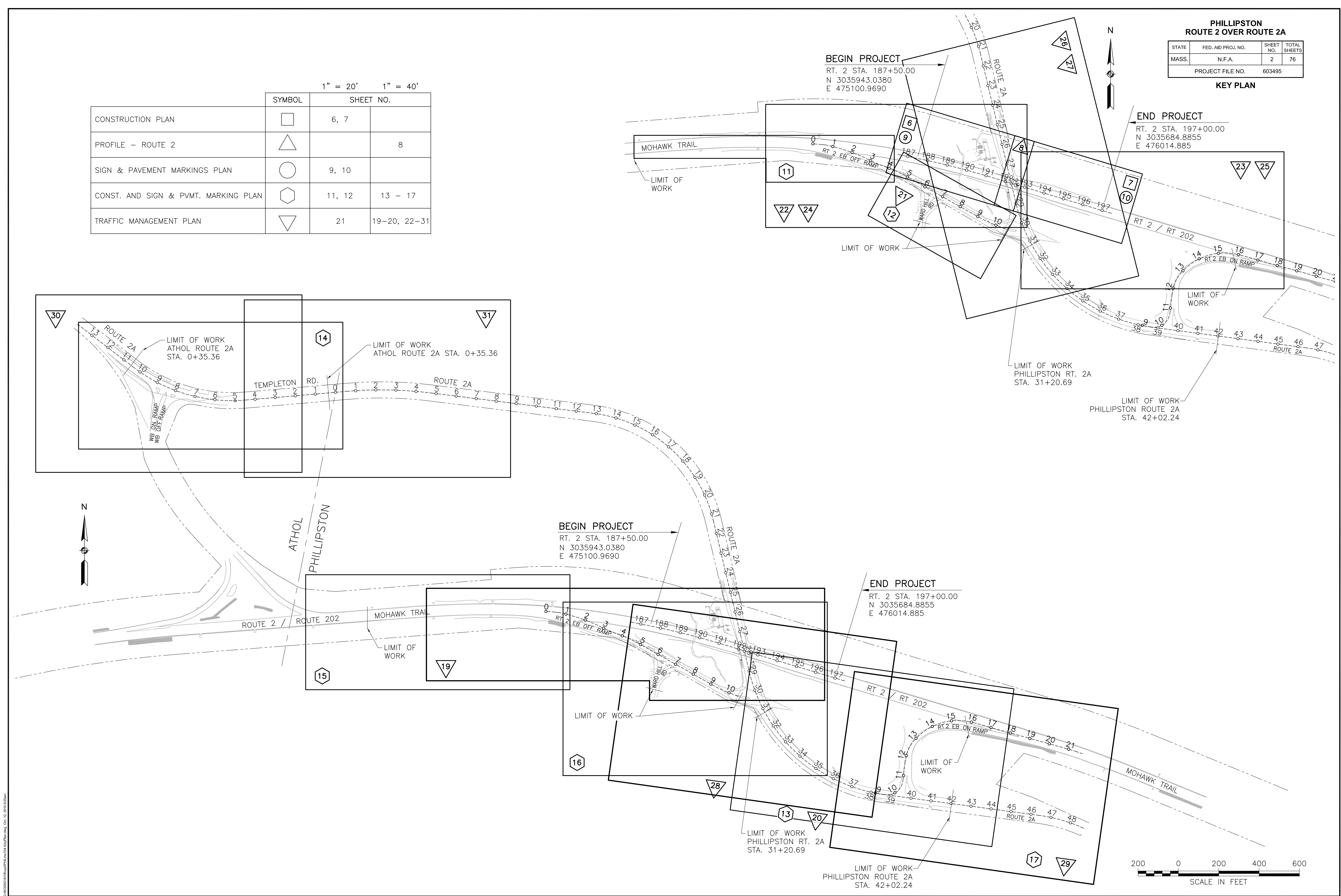
DIVISION ADMINISTRATOR DATE

Moving Massachusetts Forward.
massDOT
 Highway

DIVISION ADMINISTRATOR _____ DATE _____

1" = 20' 1" = 40'

	SYMBOL	SHEET NO.	
CONSTRUCTION PLAN		6, 7	
PROFILE — ROUTE 2			8
SIGN & PAVEMENT MARKINGS PLAN		9, 10	
CONST. AND SIGN & PVMT. MARKING PLAN		11, 12	13 — 17
TRAFFIC MANAGEMENT PLAN		21	19–20, 22–31



GENERAL NOTES

1.

THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE A COMPILATION OF SURVEYS PROVIDED BY CULLINAN ENGINEERING CO., INC., AUBURN/BOSTON/LAKEVILLE, MA AND SUPPLEMENTED BY A FIELD SURVEY COMPLETED BY MERIDIAN ASSOCIATES, INC. JUNE 2010.
2.

HORIZONTAL DATUM REFERENCES NAD83 AND VERTICAL DATUM REFERENCES NAVD88.
3.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK.
4.

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.
5.

THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK CONFORMING TO M4.05.2.
6.

THE CONTRACTOR WILL COORDINATE WITH UTILITY OWNERS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
7.

EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS.
8.

AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
9.

THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
10.

JOINTS BETWEEN NEW HOT MIX ASPHALT ROADWAY AND SAWCUT EXISTING PAVEMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH SUBSECTION 460.65, JOINTS, IN THE MASSDOT SUPPLEMENTAL SPECIFICATIONS.
11.

ALL LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
12.

ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.
13.

THE CONTRACTOR IS REQUIRED TO CONTACT DIGSAFE AND OBTAIN A VALID DIGSAFE NUMBER A MINIMUM OF 72 HOURS PRIOR TO ANY GROUND DISTURBANCE.
14.

SIGNS TO BE REMOVED AND RESET SHALL BE FURNISHED WITH A NEW SIGN POST (P5) IF EXISTING POST IS OLD OR DAMAGED AS DETERMINED BY THE ENGINEER.

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
DI	DI	DROP INLET
MB	MB	MAIL BOX
EHH	EHH	ELECTRIC MANHOLE (HANDHOLE)
FL	FL	FLOW LINE
BH	BH	GAS GATE
BH	BH	BORING HOLE
TEP	TEP	MONITORING WELL
HC	CONC. HDWL	TEST PIT
HH		CONCRETE HEADWALL
HS	STONE DHWL	HANDHOLE
HYD	HYD	STONE HEADWALL
LPL	LPL	HYDRANT
CO. BO.	CO. BD.	LIGHT POLE
GPS		COUNTY BOUND
CMH		GPS POINT
DMH	DMH	CABLE MANHOLE
EMH		DRAINAGE MANHOLE
GMH		ELECTRIC MANHOLE
MMH		GAS MANHOLE
OMH		MISC MANHOLE
SMH	SMH	OTHER MANHOLE
TMH		SEWER MANHOLE
WMH		TELEPHONE MANHOLE
MHB	MHB	WATER MANHOLE
MON	MON	MHD BOUND
SB	SB	MONUMENT
TOWN OR CITY BD.	TOWN OR CITY BD.	STONE BOUND
TSN	TSN	TOWN OR CITY BOUND
TPL OR GUY	TPL OR GUY	TRAVERSE OR TRIANGULATION STATION
ULT	ULT	TROLLEY POLE OR GUY POLE
UPL	UPL	UP WITH 1 LIGHT
BUSH	BUSH	UTILITY POLE
TREE	TREE	BUSH
STUMP	STUMP	TREE
WG	WG	STUMP
FA	FA	SWAMP / MARSH
PM	PM	WATER GATE
GV	GV	FIRE ALARM BOX
RIP RAP	RIP RAP	PARKING METER
OVERHEAD CABLE	OVERHEAD CABLE	ELECTRICAL GROUND
DIRECT BURIAL CABLE	DIRECT BURIAL CABLE	GATE VALVE
CURBING	CURBING	RIP RAP
CONTOURS	CONTOURS	OVERHEAD CABLE
DRAIN PIPE	DRAIN PIPE	DIRECT BURIAL CABLE
ELECTRIC DUCT	ELECTRIC DUCT	CURBING
GAS MAIN	GAS MAIN	CONTOURS
SEWER MAIN	SEWER MAIN	DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
TELEPHONE DUCT	TELEPHONE DUCT	ELECTRIC DUCT
WATER MAIN	WATER MAIN	GAS MAIN
ABANDON DRAIN LINE	ABANDON DRAIN LINE	SEWER MAIN
BALANCE STONE WALL	BALANCE STONE WALL	TELEPHONE DUCT
CULVERT	CULVERT	WATER MAIN
GUARD RAIL	GUARD RAIL	ABANDON DRAIN LINE
GUTTER LINE AT DRIVEWAYS	GUTTER LINE AT DRIVEWAYS	BALANCE STONE WALL
CHAIN LINK FENCE	CHAIN LINK FENCE	CULVERT
STOCKADE FENCE	STOCKADE FENCE	GUARD RAIL
HAY BALES/SILT FENCE	HAY BALES/SILT FENCE	GUTTER LINE AT DRIVEWAYS
RETAINING WALL	RETAINING WALL	CHAIN LINK FENCE
TREE LINE OR LIMIT OF CLEARING AND GRUBBING	TREE LINE OR LIMIT OF CLEARING AND GRUBBING	STOCKADE FENCE
SAWCUT LINE	SAWCUT LINE	HAY BALES/SILT FENCE
TOP OR BOTTOM OF SLOPE	TOP OR BOTTOM OF SLOPE	RETAINING WALL
LIMIT OF EDGE OF PAVEMENT OR COLD PLANE & OVERLAY	LIMIT OF EDGE OF PAVEMENT OR COLD PLANE & OVERLAY	TREE LINE OR LIMIT OF CLEARING AND GRUBBING
BANK OF RIVER OR STREAM	BANK OF RIVER OR STREAM	SAWCUT LINE
BORDER OF WETLAND	BORDER OF WETLAND	TOP OR BOTTOM OF SLOPE
100 FT WETLAND OR 200 FT RIVERFRONT BUFFER	100 FT WETLAND OR 200 FT RIVERFRONT BUFFER	LIMIT OF EDGE OF PAVEMENT OR COLD PLANE & OVERLAY
STATE HIGHWAY LAYOUT	STATE HIGHWAY LAYOUT	BANK OF RIVER OR STREAM
TOWN OR CITY LAYOUT	TOWN OR CITY LAYOUT	BORDER OF WETLAND
COUNTY LAYOUT	COUNTY LAYOUT	100 FT WETLAND OR 200 FT RIVERFRONT BUFFER
RAILROAD SIDELINE	RAILROAD SIDELINE	STATE HIGHWAY LAYOUT
TOWN OR CITY BOUNDARY LINE	TOWN OR CITY BOUNDARY LINE	TOWN OR CITY LAYOUT
PROPERTY LINE OR APPROXIMATE PROPERTY LINE	PROPERTY LINE OR APPROXIMATE PROPERTY LINE	COUNTY LAYOUT
EASEMENT	EASEMENT	RAILROAD SIDELINE

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CEM	CEMENT
CI	CURB INLET
CL	CLASS (CONCRETE, EXCAVATION, ETC.)
CIT	CHANGE IN TYPE
CL	CENTERLINE
CONC	CONCRETE
CONST	CONSTRUCTION
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
ELEV (OR EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
E.R.	EARLY RELEASE
EXIST (OR EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
GG	GAS GATE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
L	LENGTH OF CURVE
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
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
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
REM	REMOVE
RET	RETAIN
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SHLD	SHOULDER
SMH	SEWER MANHOLE
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/ TRUCK PERCENTAGE
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEELCHAIR RAMP

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	3	76
PROJECT FILE NO.		603235	

LEGEND & ABBREVIATIONS

PAVEMENT MARKINGS

SYEL	SOLID YELLOW EDGE LINE
SYGL	SOLID YELLOW GORE LINE
SYTL	SOLID YELLOW TRANSVERSE LINE
DYCL	DOUBLE YELLOW CENTER LINE
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE

PHILLIPSTON ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	4	76
PROJECT FILE NO. 603495			
TYPICAL SECTIONS			

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT ROUTE 2

- SURFACE: 4" SUPERPAVE HMA PAVEMENT
1.5" SUPERPAVE HMA SURFACE COURSE (SCC-12.5)
2.5" SUPERPAVE HMA INT. COURSE (SIC-19.0)
- BASE: 5" SUPERPAVE HMA BASE COURSE (SBC-37.5)
COURSE MATERIAL PLACED IN A SINGLE LIFT
- SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE B,
OR 12" MINIMUM RECLAIMED PAVEMENT BORROW FOR SUB-BASE.
- SUBGRADE: RECLAIMED PAVEMENT BORROW
IF UNSUITABLE MATERIAL IS ENCOUNTERED
24" OF SPECIAL BORROW SHALL BE INSTALLED.

PROPOSED PROFILE PAVEMENT TRANSITION – MILL AND OVERLAY

- SURFACE: 1.5" SUPERPAVE HMA SURFACE COURSE (SCC-12.5)
2.5" SUPERPAVE HMA INT. COURSE (SIC-19.0)
3.0" SUPERPAVE HMA INT. COURSE (SIC-19.0)
1.5" PAVEMENT MILLING PRIOR TO RESURFACING
- BITUMEN FOR TACK COAT (RS-1) AT
0.07 GAL/SYS OVER MILLED SURFACES OR
0.05 GAL/SY OVER SMOOTH PAVEMENTS

CONTROL OF GRADE AND CROSS SECTION

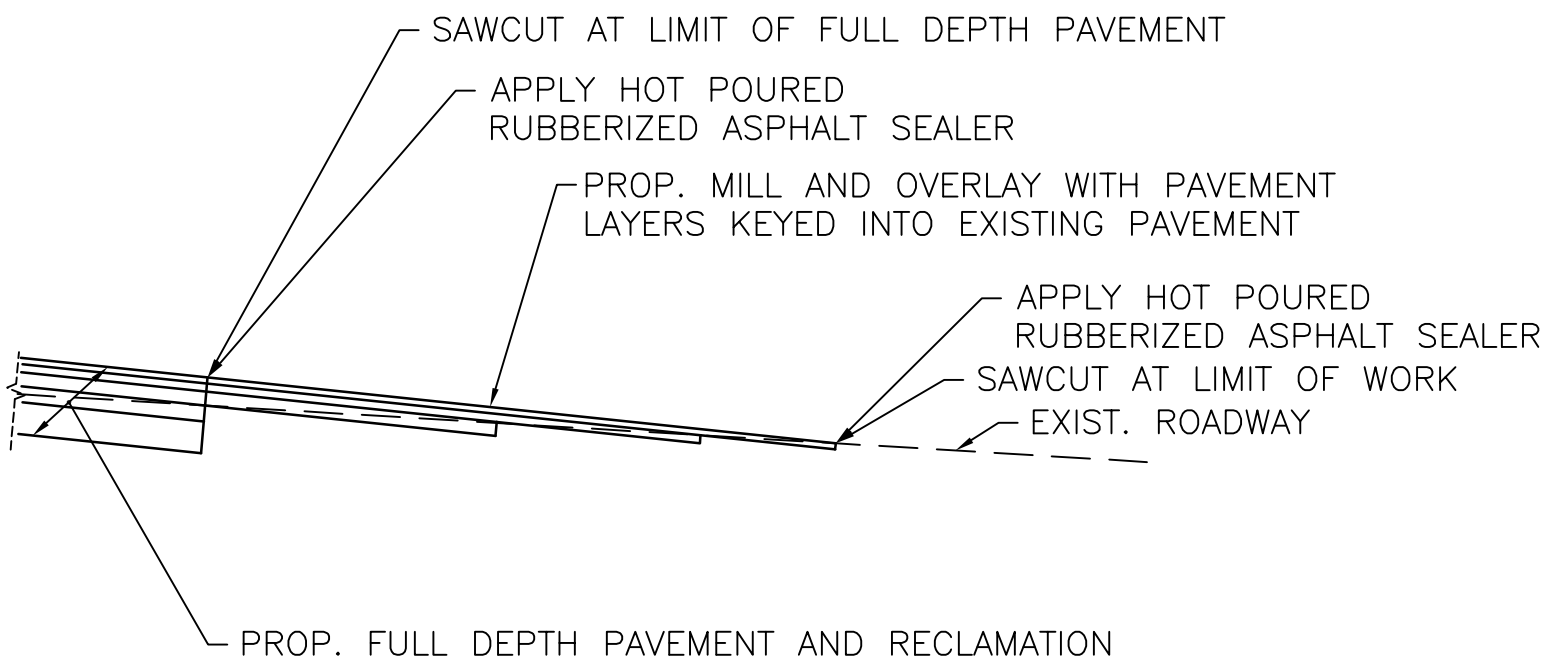
THE CONTRACTOR SHALL FURNISH, SET AND MAINTAIN ALL LINE AND GRADE STAKES TO ENSURE THAT PROPER TRANSITION AND A SMOOTH PROFILE IS ATTAINED.

MILL AND OVERLAY AT LIMITS OF WORK IS AS REQUIRED TO KEY IN HMA LAYER.

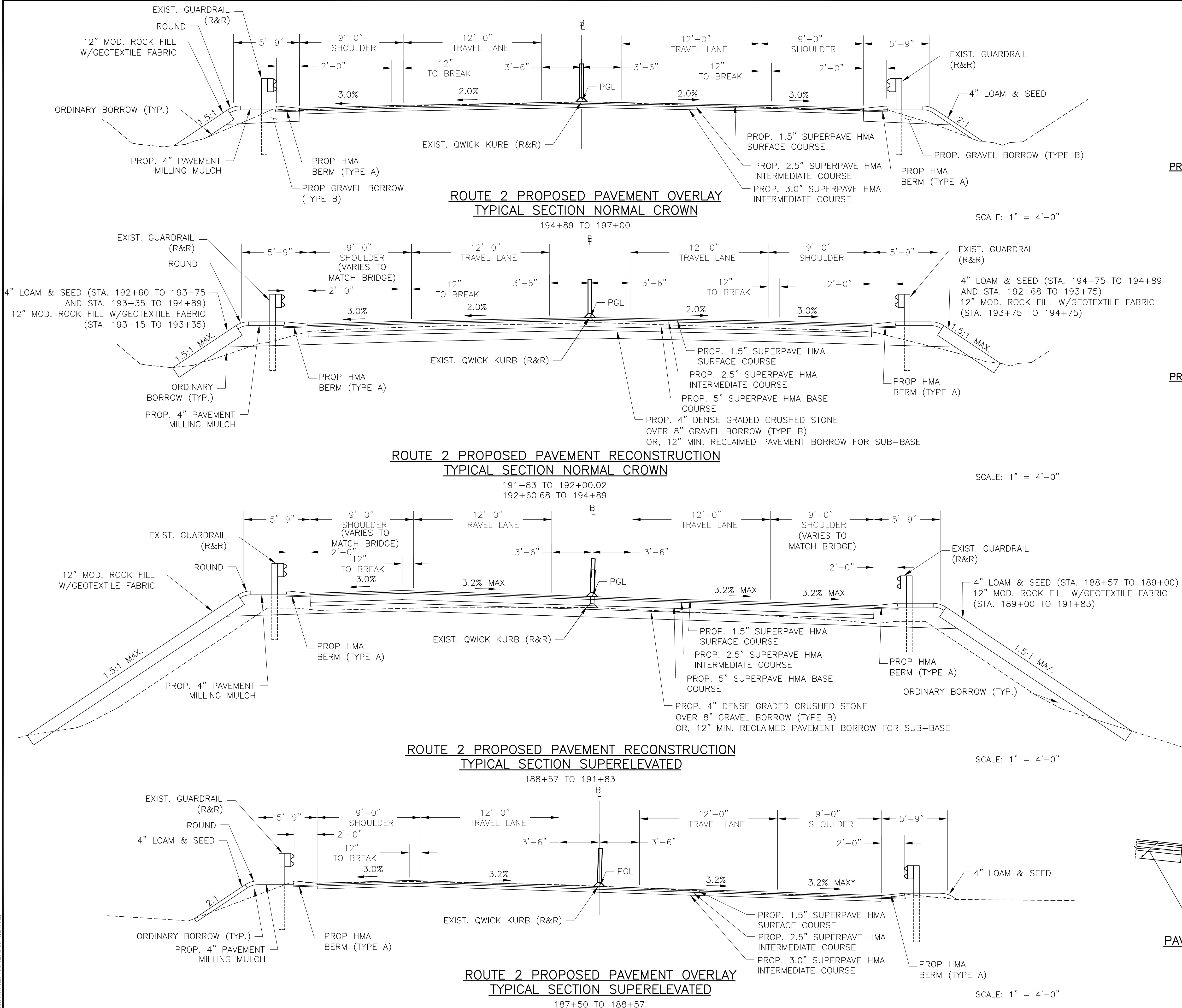
* MIN SHOULDER CROSS SLOPE IS 3.0%. WHEN TRAVEL LANE SLOPE IS GREATER THAN 3.0%, SUPERELEVATE SHOULDER AT THE SAME SLOPE.

AFTER THE EXISTING PAVEMENT HAS BEEN RECLAIMED AND/OR REMOVED FROM WITHIN THE LIMITS OF FULL DEPTH CONSTRUCTION THE SUBGRADE SHALL BE FINE GRADED AND COMPACTED.

NOTE:
SLOPES STEEPER THAN 2:1 SHALL BE PROTECTED WITH 12" MOD. ROCK FILL OVER 12" GEOTEXTILE FABRIC.



PAVEMENT TRANSITION – NOT TO SCALE



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	5	76
PROJECT FILE NO.		603495	

EB ON RAMP TYPICAL SECTION ROUTE 2 DETOUR

TEMPORARY PAVEMENT SECTION

21.5'

TEMPORARY CONCRETE BARRIER

HIGHWAY LANE

TEMPORARY SEPARATOR

SAWCUT

EXIST. GUARDRAIL (TO REMAIN)

VARIES (14.5' MIN.)

±2'

4" LOAM AND SEED (TYP.)

ORDINARY BORROW

PROP. HAYBALE & SED. FENCE

1.5:1 (MAX.)

2" HMA TOP COURSE PAVEMENT

2" HMA INTERMEDIATE COURSE PAVEMENT

8" GRAVEL BORROW (TYPE B)

TEMP. SWEL

MATCH EXIST*

14.5'

TEMP. SYEL

3'

EXIST. GRANITE EDGING (R&S)

EXIST. SWEL

EXIST. GRANITE EDGING (TO REMAIN)

*APPROXIMATE SLOPES ARE NOTED ON INDIVIDUAL CROSS SECTIONS

EB ON RAMP RESTORATION TYPICAL SECTION

TEMP. GRADING AND PAVING

REMOVE TEMP. GRADING AND PAVING REPLACE WITH 4" LOAM AND SEED

4:1 (MATCH EXIST.)

4" LOAM AND SEED

PROP. HAYBALE & SED. FENCE

2'±

1'±

PROP. 6" SYEL

SAWCUT

PROP. 3.75" HOT MIX ASPHALT (1.75" MODIFIED TOP OVER 2" INTERMEDIATE COURSE)

PROP. 8" HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE

PROP. 8" GRAVEL BORROW (TYPE B)

RESET EXIST. GRANITE EDGING REMOVED FOR ROUTE 2 DETOUR

EXIST. SWEL

EXIST. GRANITE EDGING (TO REMAIN)

RAMP WIDTH VARIES (MATCH EXIST.)

EXIST. GUARDRAIL (TO REMAIN)

SURFACE:	4" HOT MIX ASPHALT PAVEMENT PLACED IN TWO (2) LAYERS: 2" SURFACE COURSE MATERIAL OVER 2" INTERMEDIATE COURSE MATERIAL
BASE/SUBBASE:	8" GRAVEL BORROW, TYPE B

PROP. HAYBALE & SED. FENCE

4" LOAM AND SEED (TYP.)

2:1 (MAX)

2" HMA TOP COURSE PAVEMENT

2" HMA INTERMEDIATE COURSE PAVEMENT

8" GRAVEL BORROW (TYPE B)

TEMP. SWEL

TEMPORARY CONCRETE BARRIER

17.5'

2'

MATCH EXIST*

12'

SAWCUT

EXIST. GRANITE EDGING (R&S)

TEMP. SYEL

3'

TEMPORARY HIGHWAY LANE SEPARATOR

12'

±2'

EXIST. SYEL

EXIST. GRANITE EDGING (TO REMAIN)

EB OFF RAMP

TYPICAL SECTION ROUTE 2 DETOUR

TEMPORARY PAVEMENT SECTION
STATION 3+50 TO 6+38
STATION 8+16 TO 9+73

(FOR STATIONS 0+00 TO 3+50 SEE INDIVIDUAL CROSS SECTIONS)

*APPROXIMATE SLOPES ARE NOTED ON INDIVIDUAL CROSS SECTIONS

HIGHWAY GUARDRAIL

MEET EXIST STEEL W BEAM HIGHWAY GUARD
STEEL W BEAM HIGHWAY GUARD
BRIDGE RAIL TO HIGHWAY GUARD RAIL TRANSITION

MEET EXIST STEEL W BEAM HIGHWAY GUARD
STEEL W BEAM HIGHWAY GUARD
BRIDGE RAIL TO HIGHWAY GUARD RAIL TRANSITION

STA 187+50.00 RT
STA 187+50.00 TO STA 191+54.17 RT
STA 191+54.17 TO STA 191+69.80 RT

STA 187+50.00 LT
STA 187+50.00 TO STA 191+20.81 LT
STA 191+20.81 TO STA 191+36.44 LT

DRAINAGE DETAILS

SEE BELOW

WATER SUPPLY DETAILS

NONE

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

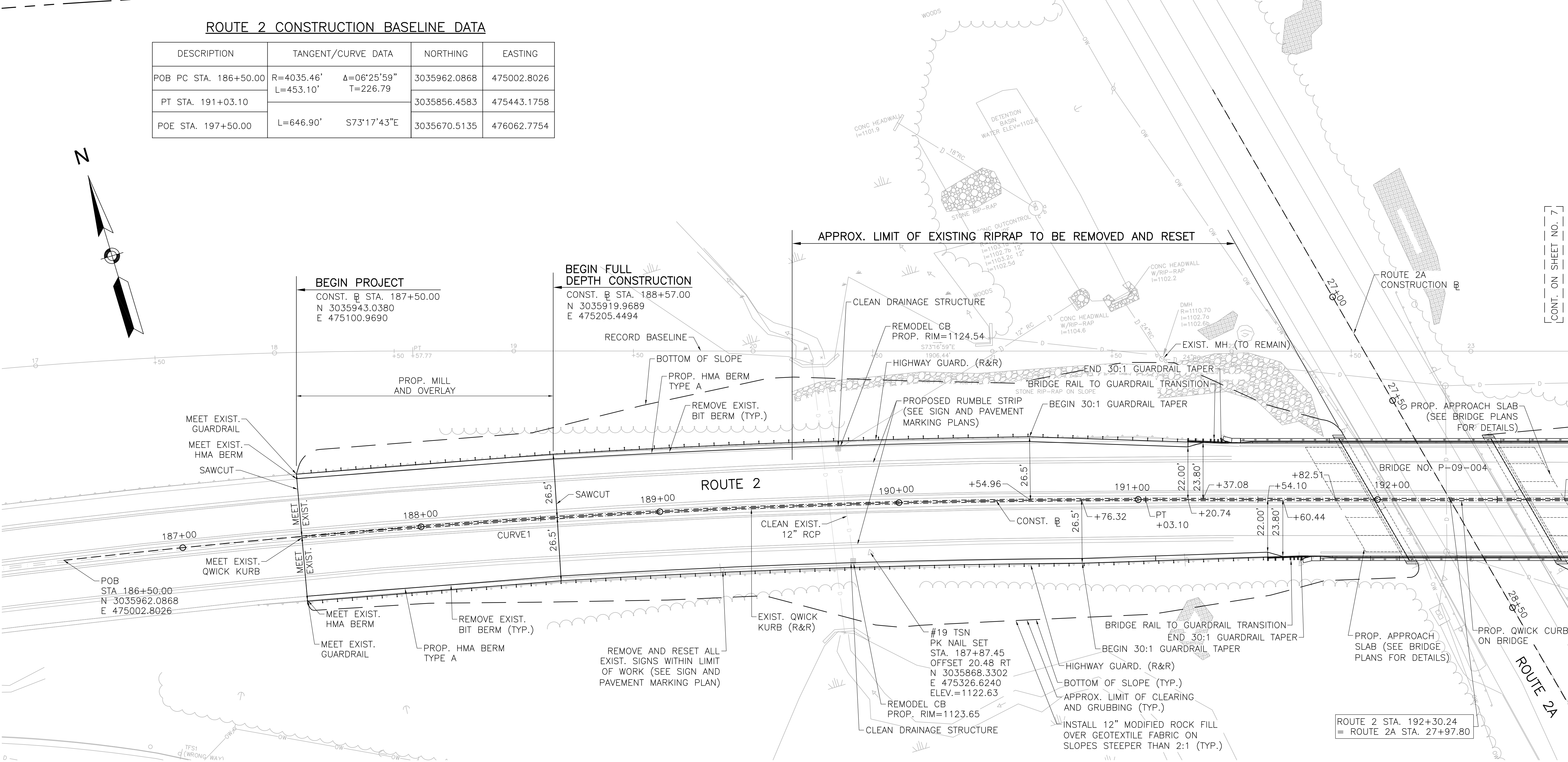
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MASS.	N.F.A.	6	76
PROJECT FILE NO. 603495			

CONSTRUCTION PLAN
ROUTE 2

ROUTE 2 CONSTRUCTION BASELINE DATA

DESCRIPTION	TANGENT/CURVE DATA	NORTHING	EASTING
POB PC STA. 186+50.00	R=4035.46' Δ=06°25'59" L=453.10' T=226.79	3035962.0868	475002.8026
PT STA. 191+03.10		3035856.4583	475443.1758
POE STA. 197+50.00	L=646.90' S73°17'43"E	3035670.5135	476062.7754

1957 STATE HIGHWAY LAYOUT



SURVEY TRAVERSE DATA

POINT	ELEVATION	NORTH	EAST	DESCRIPTION
STKN 26	1109.98	3035907.21	474947.56	PK NAIL
STKN 36	1088.49	3036051.95	E474160.42	PK NAIL
STKN 30	1093.39	3035995.97	474368.35	PK NAIL
TSN 19	1122.63	3035868.33	475326.62	PK NAIL
STKN 31	1157.93	3035444.26	476717.81	PK NAIL

NOTES:

- SEDIMENTATION FENCE AND HAYBALES FOR EROSION CONTROL TO BE INSTALLED AT BOTTOM OF SLOPE PRIOR TO EXCAVATION WORK AS SHOWN ON THE STORMWATER POLLUTION PREVENTION PLAN (TYP.).
- ALL CATCH BASINS WITHIN LIMIT OF WORK ON ROUTE 2 SHALL BE FURNISHED WITH HOOK LOCK TYPE GRATES. ALL EXISTING NON-HOOK LOCK GRATES WITHIN LIMIT OF WORK ON ROUTE 2 SHALL BE REMOVED AND DISCARDED.
- GRANITE CURB TO HMA BERM TRANSITIONS SHALL BE CONSTRUCTED PER STANDARD DRAWING M/E 401.1.1 AND M/E 401.5.1



FOR PROFILE SEE SHEET 8

HIGHWAY GUARDRAIL

BRIDGE RAIL TO HIGHWAY GUARD RAIL TRANSITION
STEEL W BEAM HIGHWAY GUARD
MEET EXIST STEEL W BEAM HIGHWAY GUARD

BRIDGE RAIL TO HIGHWAY GUARD RAIL TRANSITION
STEEL W BEAM HIGHWAY GUARD
MEET EXIST STEEL W BEAM HIGHWAY GUARD

STA 192+98.90 TO STA 193+14.53 LT
STA 193+14.53 TO STA 197+00.00 LT
STA 197+00.00 LT

STA 193+29.25 TO STA 193+44.88 RT
STA 193+44.88 TO STA 197+00.00 RT
STA 197+00.00 RT

DRAINAGE DETAILS

SEE BELOW

WATER SUPPLY DETAILS

NONE

SURVEY TRAVERSE DATA

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PHILLIPSTON
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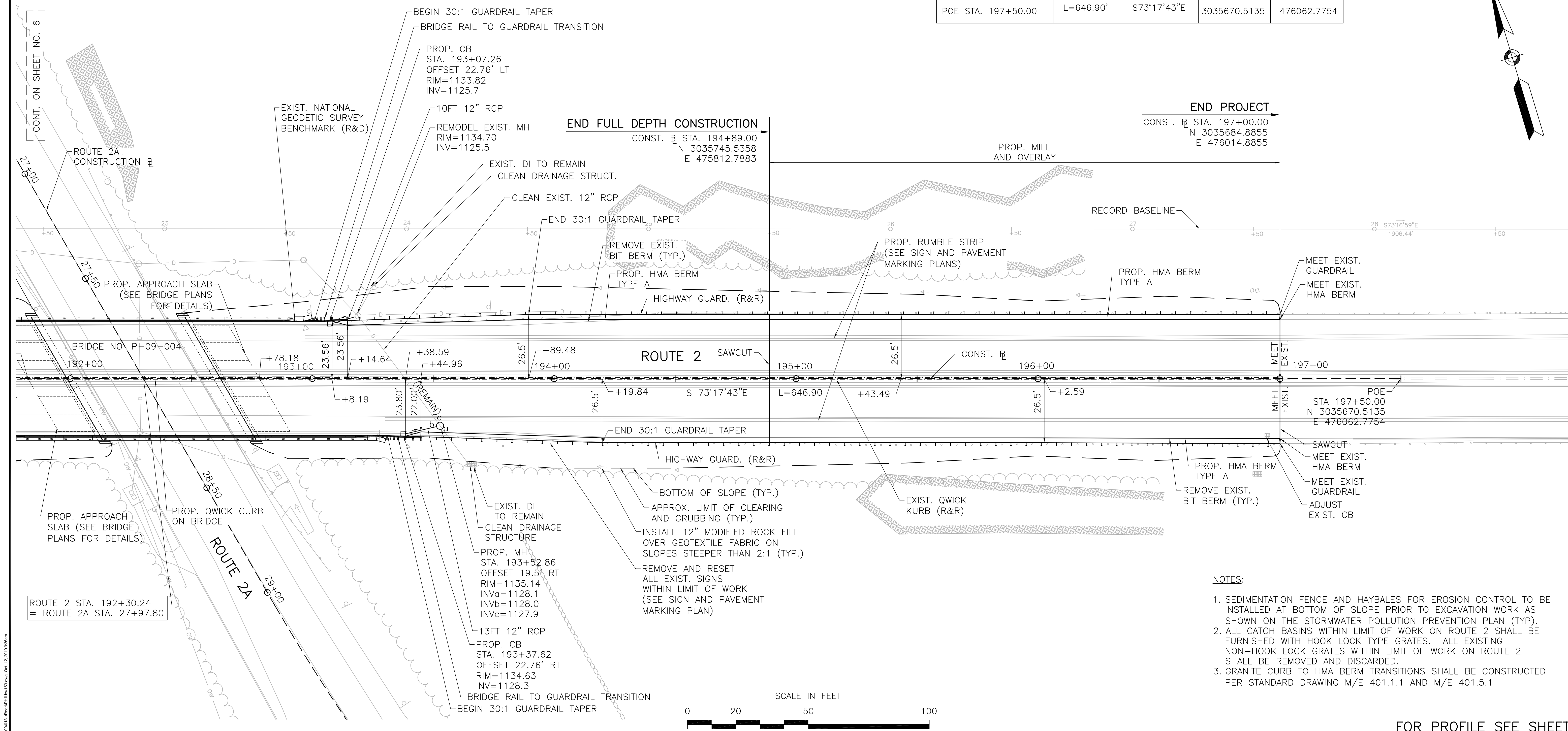
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CONSTRUCTION PLAN
ROUTE 2

1957 STATE HIGHWAY LAYOUT

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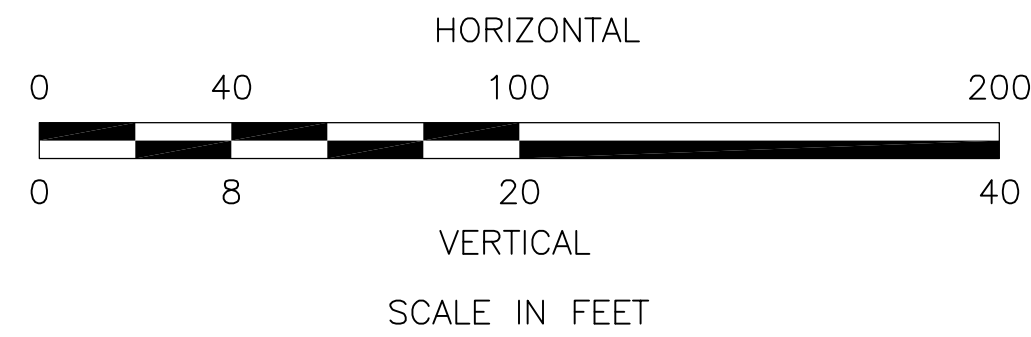
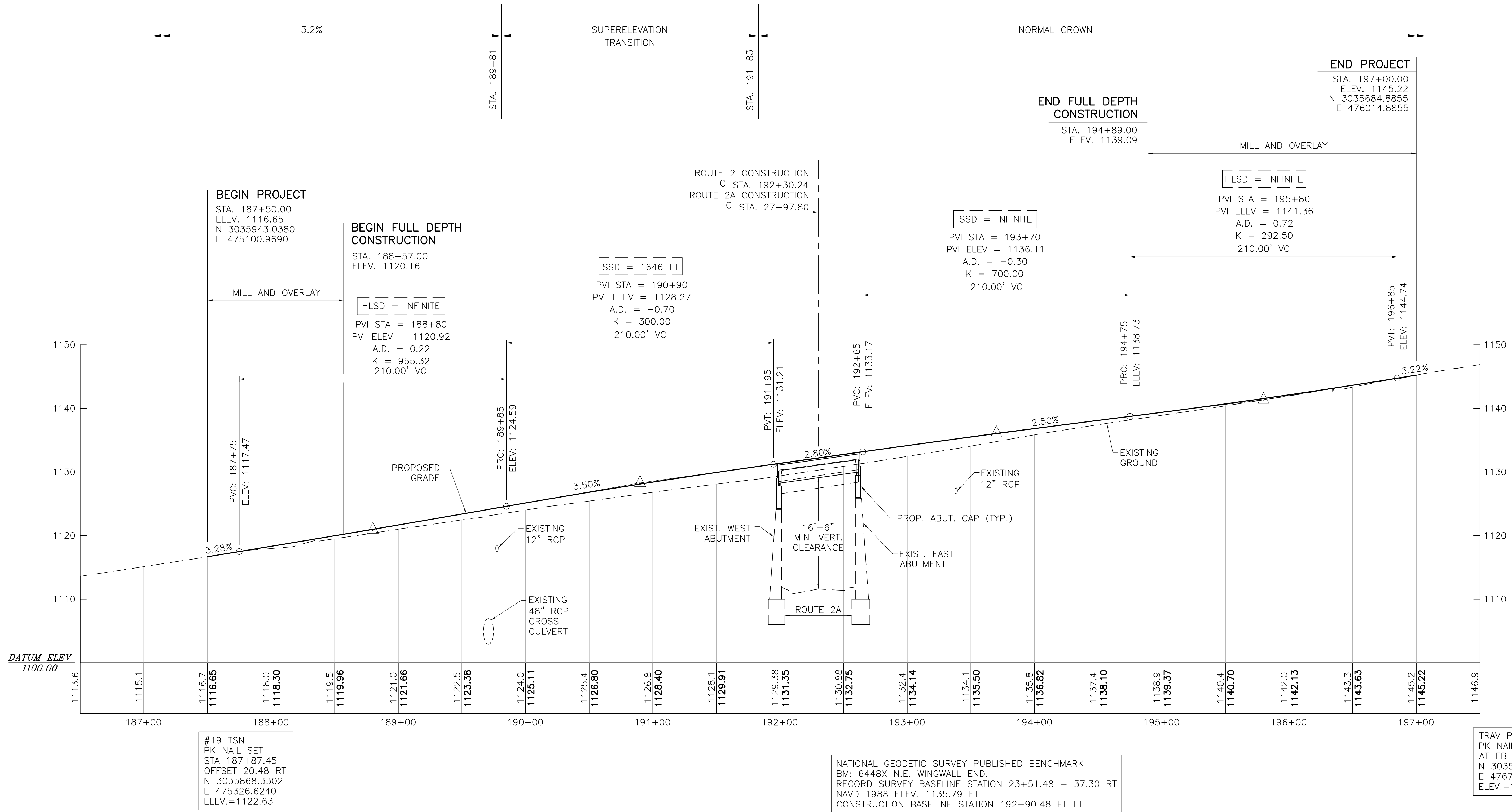
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 - GRANITE CURB TO HMA BERM TRANSITIONS SHALL BE CONSTRUCTED PER STANDARD DRAWING M/E 401.1.1 AND M/E 401.5.1

FOR PROFILE SEE SHEET 8

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

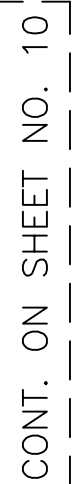
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MASS.	N.F.A.	8	76
PROJECT FILE NO. 603495			

PROFILE
ROUTE 2



FOR CONSTRUCTION PLAN SEE SHEETS 6 AND 7

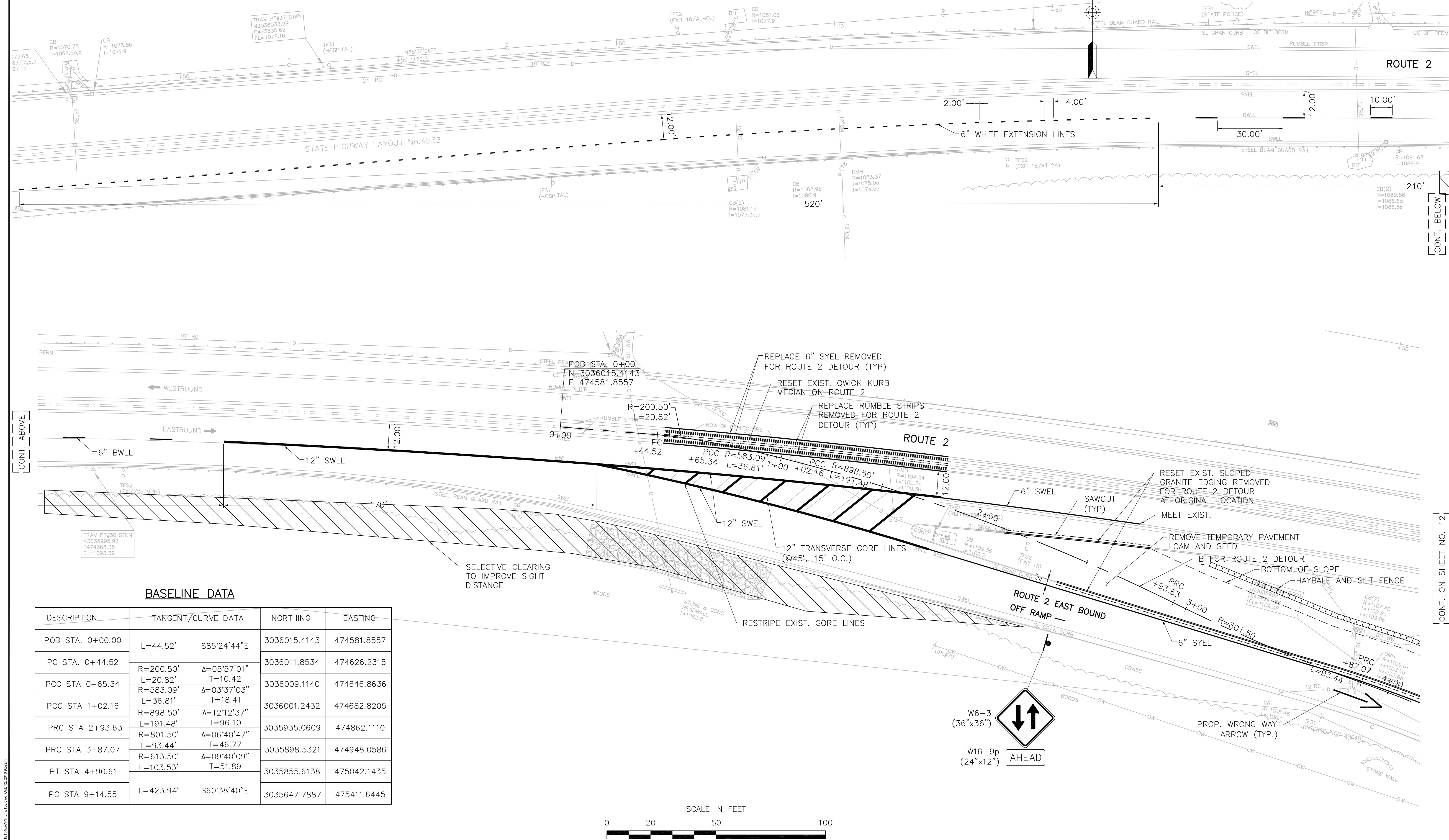
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MASS.	N.F.A.	9	76
PROJECT FILE NO.		603495	



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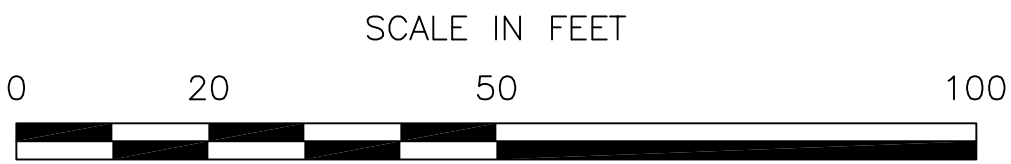
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	10	76
PROJECT FILE NO.		603495	





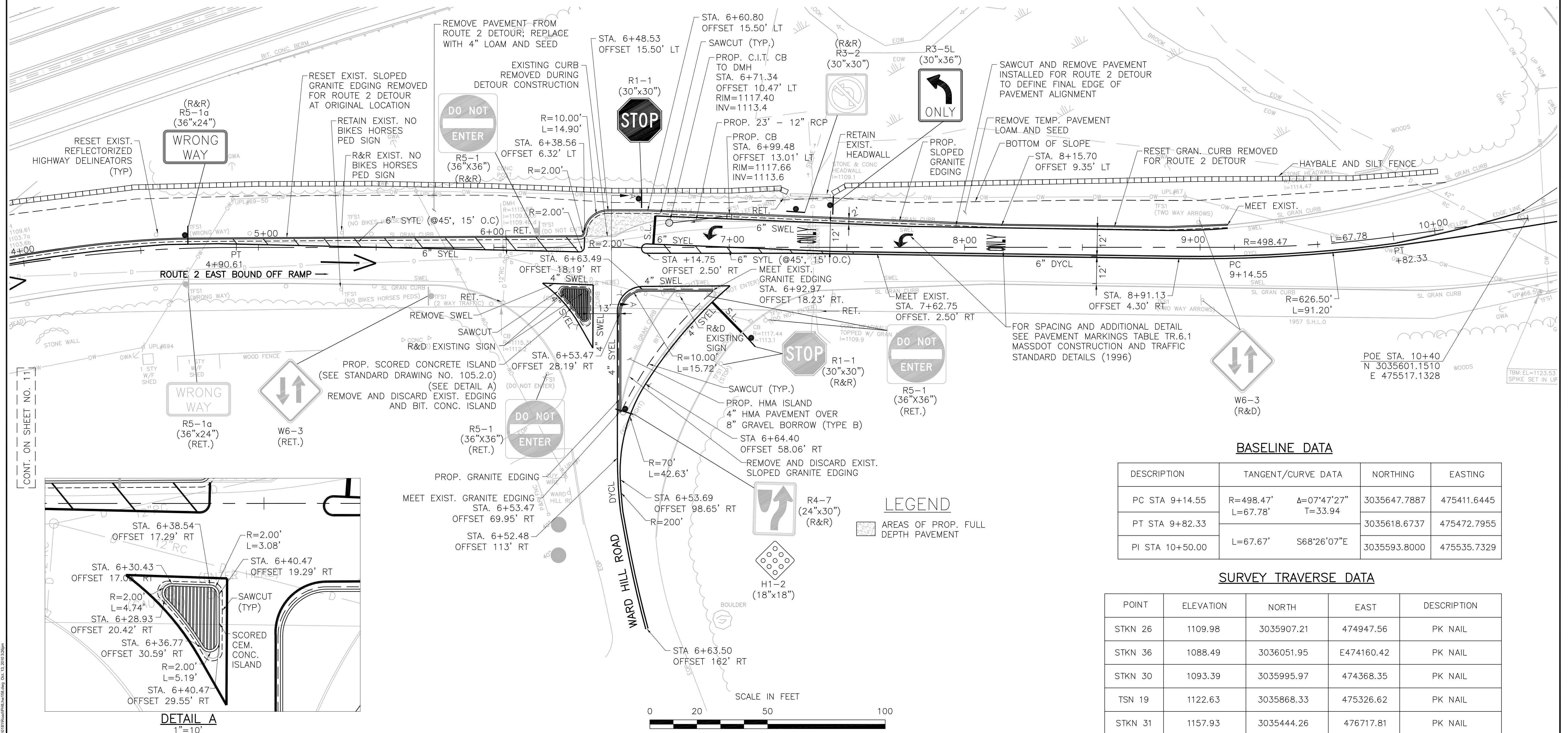
BASELINE DATA

DESCRIPTION	TANGENT/CURVE DATA		NORTHING	EASTING
POB STA. 0+00.00	L=44.52'	S85°24'44"E	3036015.4143	474581.8557
PC STA. 0+44.52	R=200.50'	Δ=05°57'01"	3036011.8534	474626.2315
PCC STA 0+65.34	L=20.82'	T=10.42	3036009.1140	474646.8636
	R=583.09'	Δ=03°37'03"		
PCC STA 1+02.16	L=36.81'	T=18.41	3036001.2432	474682.8205
	R=898.50'	Δ=12°12'37"		
PRC STA 2+93.63	L=191.48'	T=96.10	3035935.0609	474862.1110
	R=801.50'	Δ=06°40'47"		
PRC STA 3+87.07	L=93.44'	T=46.77	3035898.5321	474948.0586
	R=613.50'	Δ=09°40'09"		
PT STA 4+90.61	L=103.53'	T=51.89	3035855.6138	475042.1435
PC STA 9+14.55	L=423.94'	S60°38'40"E	3035647.7887	475411.6445



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	12	76
PROJECT FILE NO.		603495	

A map of Route 2. A north arrow points towards the top-left. A line representing Route 2 runs from the bottom-right towards the top-left. A circle with a cross inside is located on this line, representing the intersection of interest.



DESCRIPTION	TANGENT/CURVE DATA	NORTHING	EASTING
PC STA 9+14.55	R=498.47' Δ=07°47'27" L=67.78' T=33.94	3035647.7887	475411.6445
PT STA 9+82.33		3035618.6737	475472.7955
PI STA 10+50.00	L=67.67' S68°26'07"E	3035593.8000	475535.7329

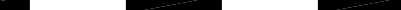
POINT	ELEVATION	NORTH	EAST	DESCRIPTION
STKN 26	1109.98	3035907.21	474947.56	PK NAIL
STKN 36	1088.49	3036051.95	E474160.42	PK NAIL
STKN 30	1093.39	3035995.97	474368.35	PK NAIL
TSN 19	1122.63	3035868.33	475326.62	PK NAIL
STKN 31	1157.93	3035444.26	476717.81	PK NAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	13	76
PROJECT FILE NO.		603495	

[illegible]

SCALE IN FEET

0 40 100 200



LEGEND:

	MILL AND OVERLAY AREA
	SELECTIVE CLEARING

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	14	76
PROJECT FILE NO.		603495	

ATHOL
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	14	76
PROJECT FILE NO.		603495	

CONSTRUCTION AND SIGN & PAVEMENT MARKING PLAN
ROUTE 2A/ROUTE 2 WB RAMP INTERSECTION

POE
N 3037323.1027
E 472410.3454

RT. 2A
N 52°25'19" W 11
L=159.38'

STA: 10+55.43

MEET EXIST. PAVEMENT MARKINGS

STATE HIGHWAY LAYOUT

ROUTE 2 WEST BOUND ON RAMP

ROUTE 2 WEST BOUND OFF RAMP

12" SYTL
SPACED 15' O.C.
45' FROM BASELINE

CC STA: 8+85.98
OFFSET: 1.07 R
R=4.70'

6" DYCL

6" SYTL

6" SWEL

R=800'
L=593.33'

STA: 8+13.41
OFF: 17.37 R

R3-7L
(30"x30")
LEFT LANE
MUST
TURN LEFT

STATE HIGHWAY LAYOUT

PC = 4+47.29

STA: 6+98.05
OFFSET: 14.63

STATE HIGHWAY LAYOUT

CURVE 1
R=800.00'
L=593.33'
Δ=42°29'38" R
T=311.05'

STA: 4+60.60
OFFSET: 3.63 L

CONSTRUCTION BASELINE

MEET EXIST. PAVEMENT MARKINGS

POB
N 3037101.1933
E 473538.7317

STA: 0+35.36

85°05'03" W L=447.29'

TEMPLETON RD / ROUTE 2A

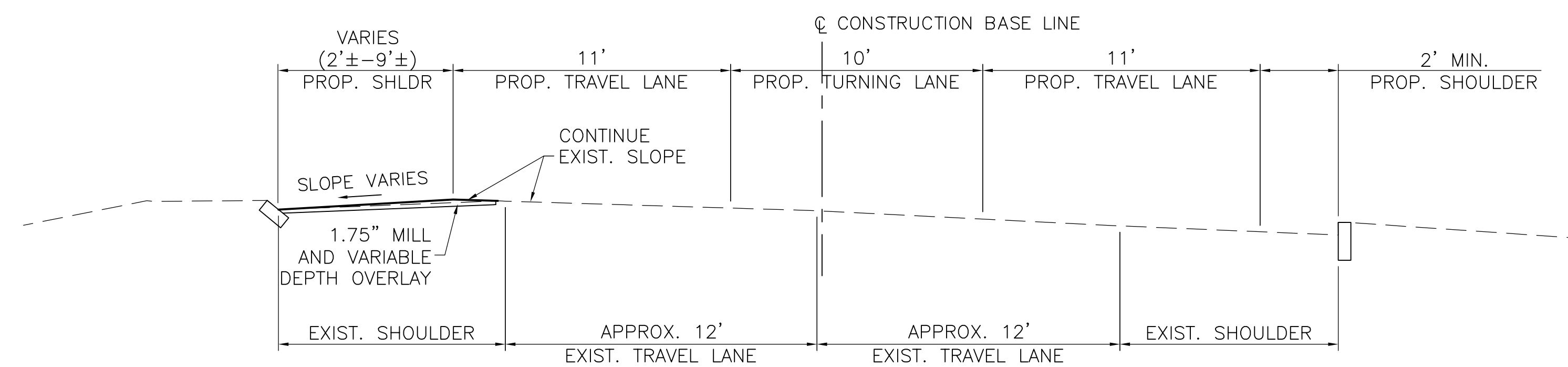
FOR MILL AND OVERLAY AREA
SEE TMP SHEET 30 AND 31

12" SYTL
SPACED 15' O.C.
45' FROM BASELINE

ATHOL
PHILLIPSTON

SCALE IN FEET

0 40 100 200

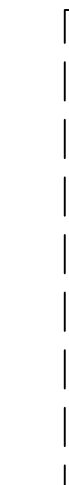


SCALE: 1"=4'

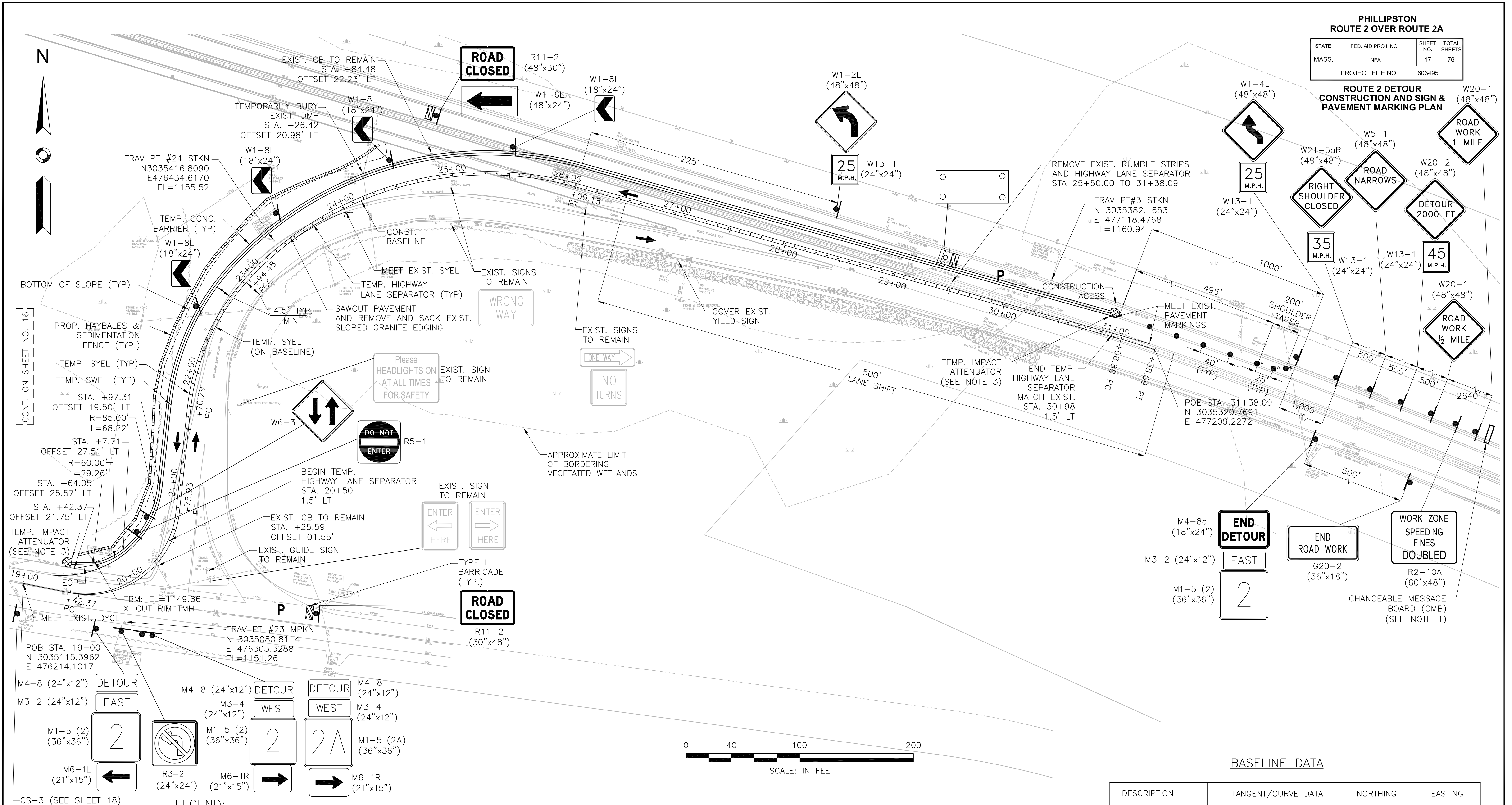
- NOTES:
1. EXISTING PAVEMENT CROSS SLOPES VARY THROUGH SUPERELEVATED SECTION.
 2. BITUMEN FOR TACK COAT (RS-1) AT 0.07 GAL/SYS OVER MILLED SURFACES.
 3. 1.75" MIN. PAVEMENT MILLING THE DEPTH OF PAVEMENT REMOVED SHALL BE LESS THAN OR EQUAL TO THE DEPTH PLACED TO ENSURE NO NET PAVEMENT SECTION LOSS.
 4. OVERLAY PAVEMENT SHALL BE VARIABLE DEPTH HOT MIX ASPHALT PLACED IN ONE COURSE.

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DESCRIPTION	TANGENT/CURVE DATA		NORTHING	EASTING
POB STA. 19+00.00	L=42.37'	S78°40'11"E	3035115.3962	476214.101
PC STA. 19+42.37	R=80.50'	Δ=95°03'39"	3035107.0721	476255.6450
PT STA 20+75.93	L=133.56'	T=87.94	3035177.2119	476351.4791
PC STA 21+70.29	L=94.37'	N06°16'11"E	3035271.0136	476361.7847
PCC STA 22+94.48	R=195.50'	Δ=36°23'48"	3035382.1595	476412.3618
PT STA 26+09.18	L=124.19'	T=64.27	3035463.9365	476700.0740
PC STA 31+06.88	R=286.50'	Δ=62°56'01"	3035330.0960	477179.4408
PT STA 31+38.09	L=314.69'	T=175.34	3035320.7691	477209.2272
	L=497.70'	S74°24'00"E		

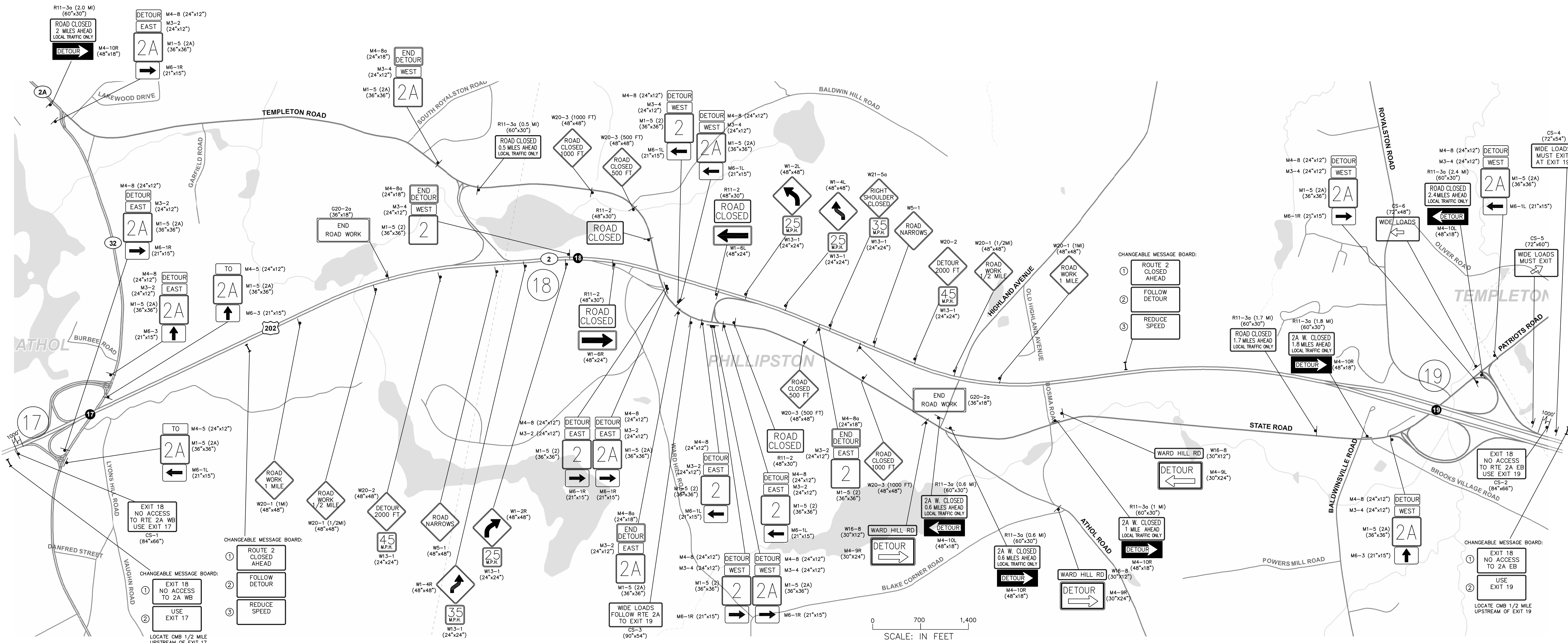
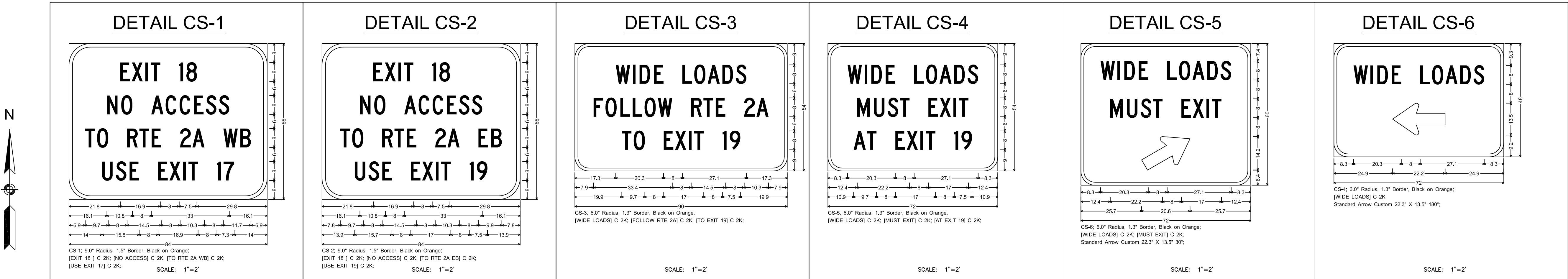
- NOTES:

1. CHANGABLE MESSAGE BOARD (CMB) SHALL BE INSTALLED UPSTREAM OF THE W20-1 SIGN TWO WEEKS PRIOR TO IMPLEMENTATION OF ROUTE 2 DETOUR AND SHALL STATE: "ROUTE 2 CLOSURE STARTS OCT. XX DETOUR VIA EXIT 18" OR AS DIRECTED BY THE ENGINEER. CMB MESSAGE DURING DETOUR SHALL STATE "ROUTE 2 CLOSED AHEAD; FOLLOW DETOUR; REDUCE SPEED" OR AS DIRECTED BY THE ENGINEER.
2. TEMPORARY HIGHWAY LANE SEPARATOR SHALL BE PEXCO DP200 ROUND CHANNELIZER POSTS OR EQUIVALENT, AS APPROVED BY THE ENGINEER. POSTS SHALL BE SPACED 10' ON CENTER, OR AS OTHERWISE REQUIRED BY THE ENGINEER.
3. TEMPORARY IMPACT ATTENUATORS ON ROUTE 2 SHALL BE DESIGNED FOR 70 MPH. OTHER TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED FOR 30 MPH. TEMPORARY IMPACT ATTENUATORS SHALL MEET REQUIREMENTS OF NCHRP 350, TEST LEVEL 3.
4. SEE TYPICAL SECTIONS AND CROSS SECTIONS-ROUTE 2 DETOUR FOR ADDITIONAL DETAIL.

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	18	76
PROJECT FILE NO.		603495	

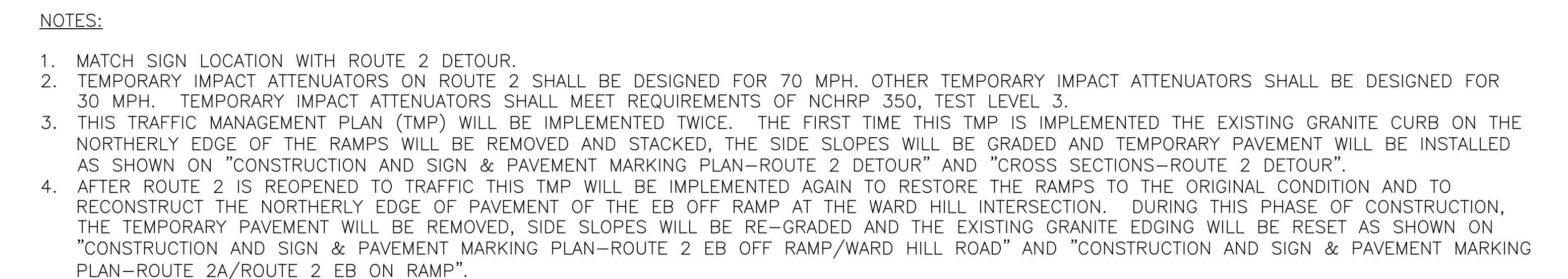
ROUTE 2 / ROUTE 2A
DETOUR SIGNING PLAN

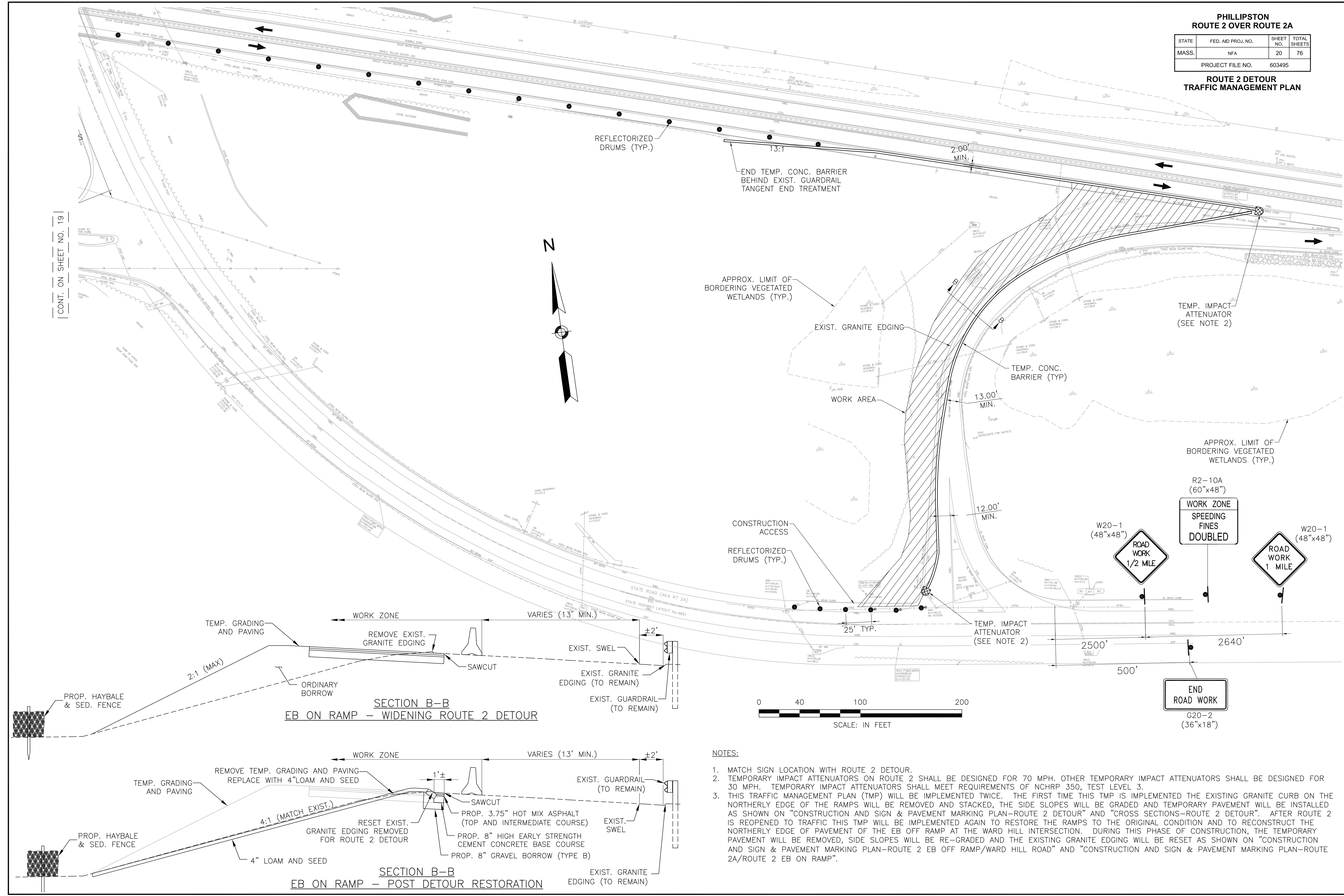


NOTES:

- ALL SIGNS SHALL BE LOCATED A MINIMUM OF 2 FEET OFF THE EDGE OF PAVEMENT.
- SIGN LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER.
- FOR SIGN SPACING ON ROUTE 2 SEE SHEETS 15 AND 17.

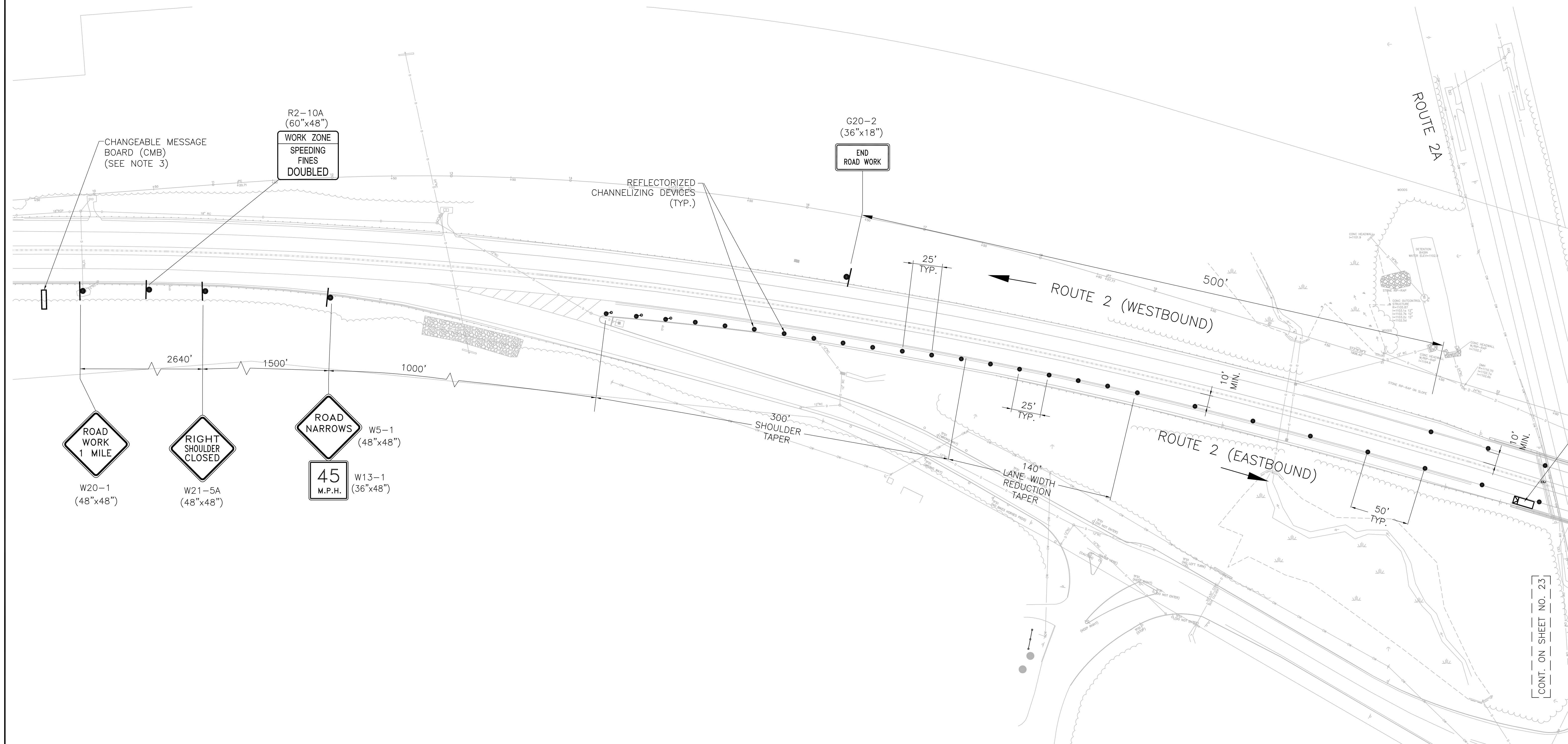
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	19	76
PROJECT FILE NO.		603495	





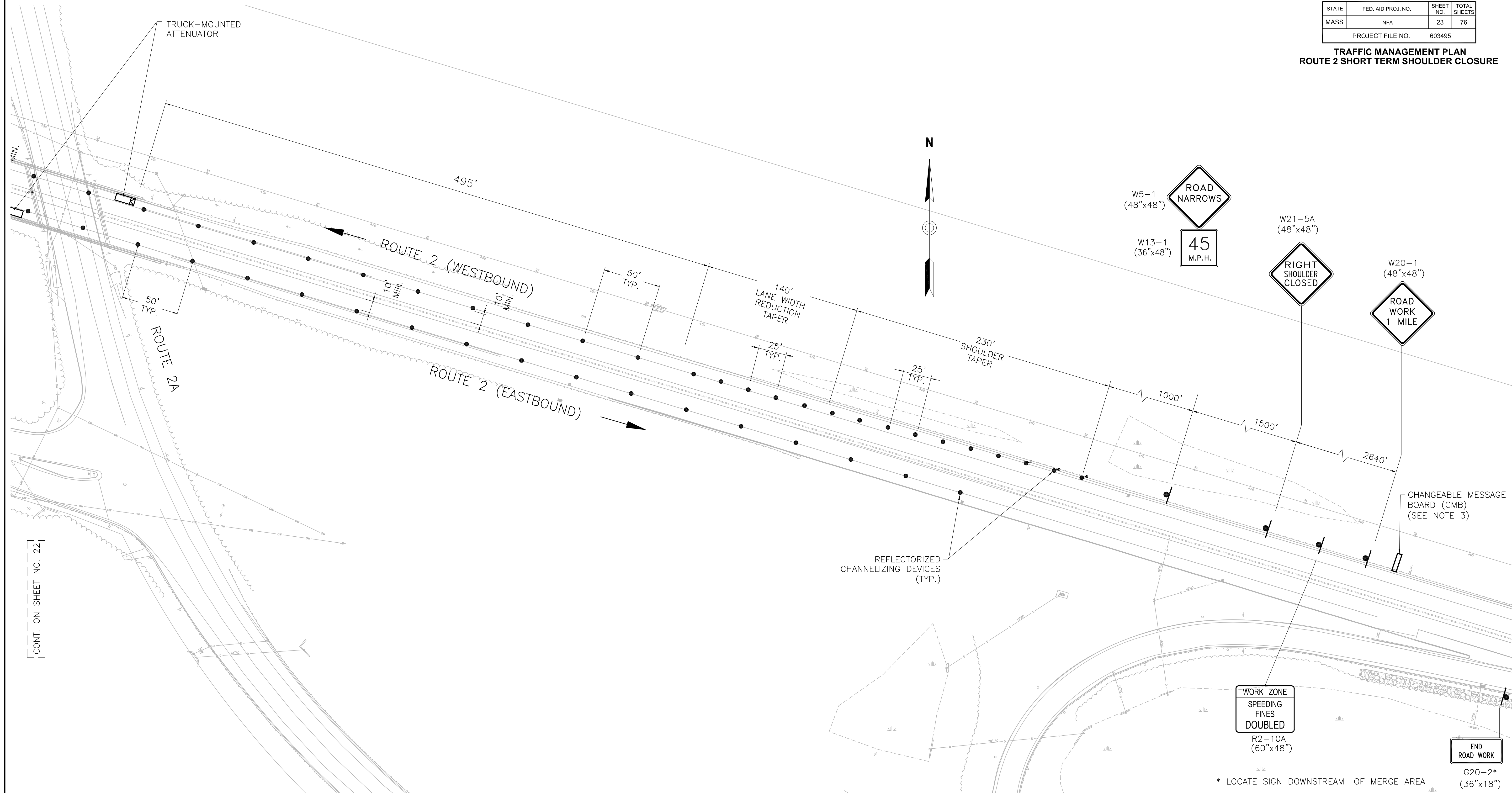
- NOTES:
1. MATCH SIGN LOCATION WITH ROUTE 2 DETOUR.
 2. TEMPORARY IMPACT ATTENUATORS ON ROUTE 2 SHALL BE DESIGNED FOR 70 MPH. OTHER TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED FOR 30 MPH. TEMPORARY IMPACT ATTENUATORS SHALL MEET REQUIREMENTS OF NCHRP 350, TEST LEVEL 3.
 3. THIS TRAFFIC MANAGEMENT PLAN (TMP) WILL BE IMPLEMENTED TWICE. THE FIRST TIME THIS TMP IS IMPLEMENTED THE EXISTING GRANITE CURB ON THE NORTHERLY EDGE OF THE RAMP WILL BE REMOVED AND STACKED, THE SIDE SLOPES WILL BE GRADED AND TEMPORARY PAVEMENT WILL BE INSTALLED AS SHOWN ON "CONSTRUCTION AND SIGN & PAVEMENT MARKING PLAN-ROUTE 2 DETOUR" AND "CROSS SECTIONS-ROUTE 2 DETOUR". AFTER ROUTE 2 IS REOPENED TO TRAFFIC THIS TMP WILL BE IMPLEMENTED AGAIN TO RESTORE THE RAMP TO THE ORIGINAL CONDITION AND TO RECONSTRUCT THE NORTHERLY EDGE OF PAVEMENT OF THE EB OFF RAMP AT THE WARD HILL INTERSECTION. DURING THIS PHASE OF CONSTRUCTION, THE TEMPORARY PAVEMENT WILL BE REMOVED, SIDE SLOPES WILL BE RE-GRADED AND THE EXISTING GRANITE EDGING WILL BE RESET AS SHOWN ON "CONSTRUCTION AND SIGN & PAVEMENT MARKING PLAN-ROUTE 2 EB OFF RAMP/WARD HILL ROAD" AND "CONSTRUCTION AND SIGN & PAVEMENT MARKING PLAN-ROUTE 2A/ROUTE 2 EB ON RAMP".

CONT. ON SHEET NO. 19



NOTES:

1. THIS TRAFFIC MANAGEMENT PLAN IS FOR SHORT TERM SHOULDER CLOSURE ASSOCIATED WITH SOIL BORINGS, TEST PITS AND CLEARING VEGETATION ALONG ROUTE 2 EASTBOUND TO IMPROVE SIGHT DISTANCE.
2. WORK SHALL BE LIMITED TO OFF-PEAK HOURS. NO WORK SHALL BE PERFORMED BETWEEN 6:00 AM AND 10:00 AM ON EASTBOUND ROUTE 2 AND BETWEEN 3:00 PM AND 7:00 PM ON WESTBOUND ROUTE 2.
3. CHANGEABLE MESSAGE BOARD (CMB) SHALL BE INSTALLED UPSTREAM OF THE W20-1 SIGN TWO DAYS PRIOR TO BEGINNING WORK AND SHALL STATE: "ROAD WORK STARTS JUNE XX, 2010" OR AS DIRECTED BY THE ENGINEER.
4. THE FIRST THREE CHANNELIZING DEVICES SHALL BE DRUMS. THE REMAINING MAY BE DRUMS OR CONES (36" MIN HEIGHT).



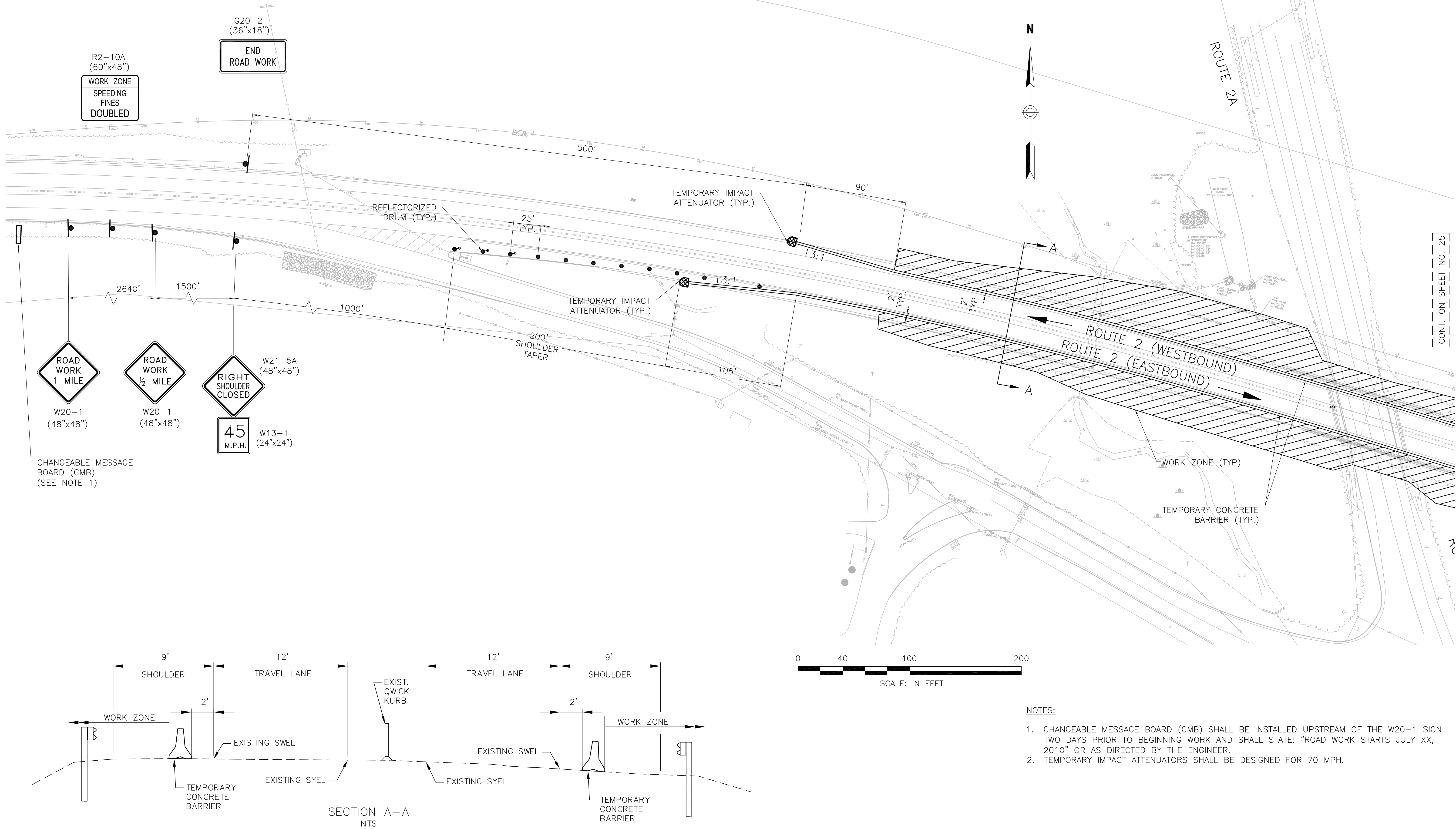
NOTES:

1. THIS TRAFFIC MANAGEMENT PLAN IS FOR SHORT TERM SHOULDER CLOSURE ASSOCIATED WITH SOIL BORINGS, TEST PITS AND CLEARING VEGETATION ALONG ROUTE 2 EASTBOUND TO IMPROVE SIGHT DISTANCE.
2. WORK SHALL BE LIMITED TO OFF-PEAK HOURS. NO WORK SHALL BE PERFORMED BETWEEN 6:00 AM AND 10:00 AM ON EASTBOUND ROUTE 2 AND BETWEEN 3:00 PM AND 7:00 PM ON WESTBOUND ROUTE 2.
3. CHANGEABLE MESSAGE BOARD (CMB) SHALL BE INSTALLED UPSTREAM OF THE W20-1 SIGN TWO DAYS PRIOR TO BEGINNING WORK AND SHALL STATE: "ROAD WORK STARTS JUNE XX, 2010" OR AS DIRECTED BY THE ENGINEER.
4. THE FIRST THREE CHANNELIZING DEVICES SHALL BE DRUMS. THE REMAINING MAY BE DRUMS OR CONES (36" MIN HEIGHT).

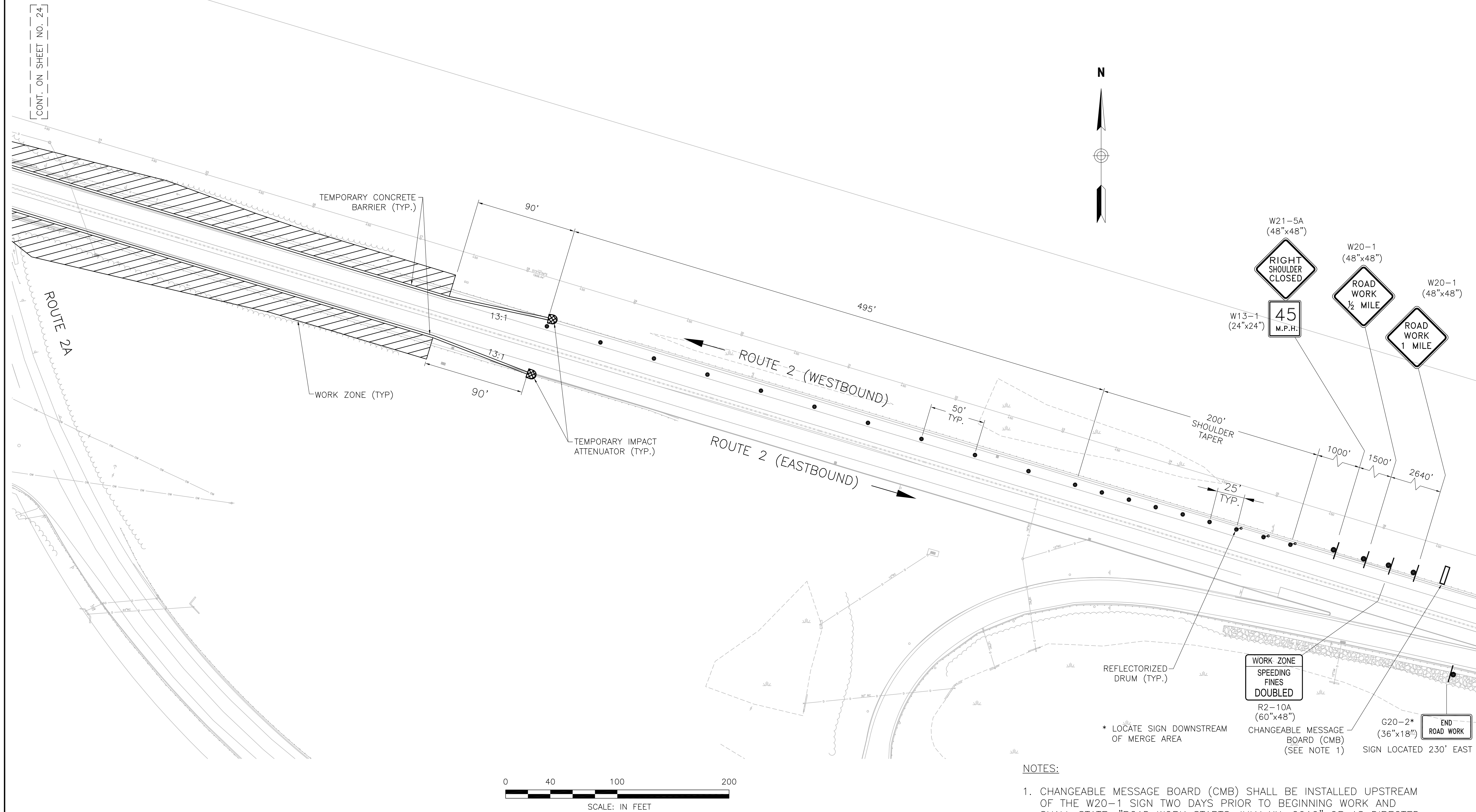
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	24	76
PROJECT FILE NO.		603495	

TRAFFIC MANAGEMENT PLAN
ROUTE 2 LONG TERM SHOULDER CLOSURE



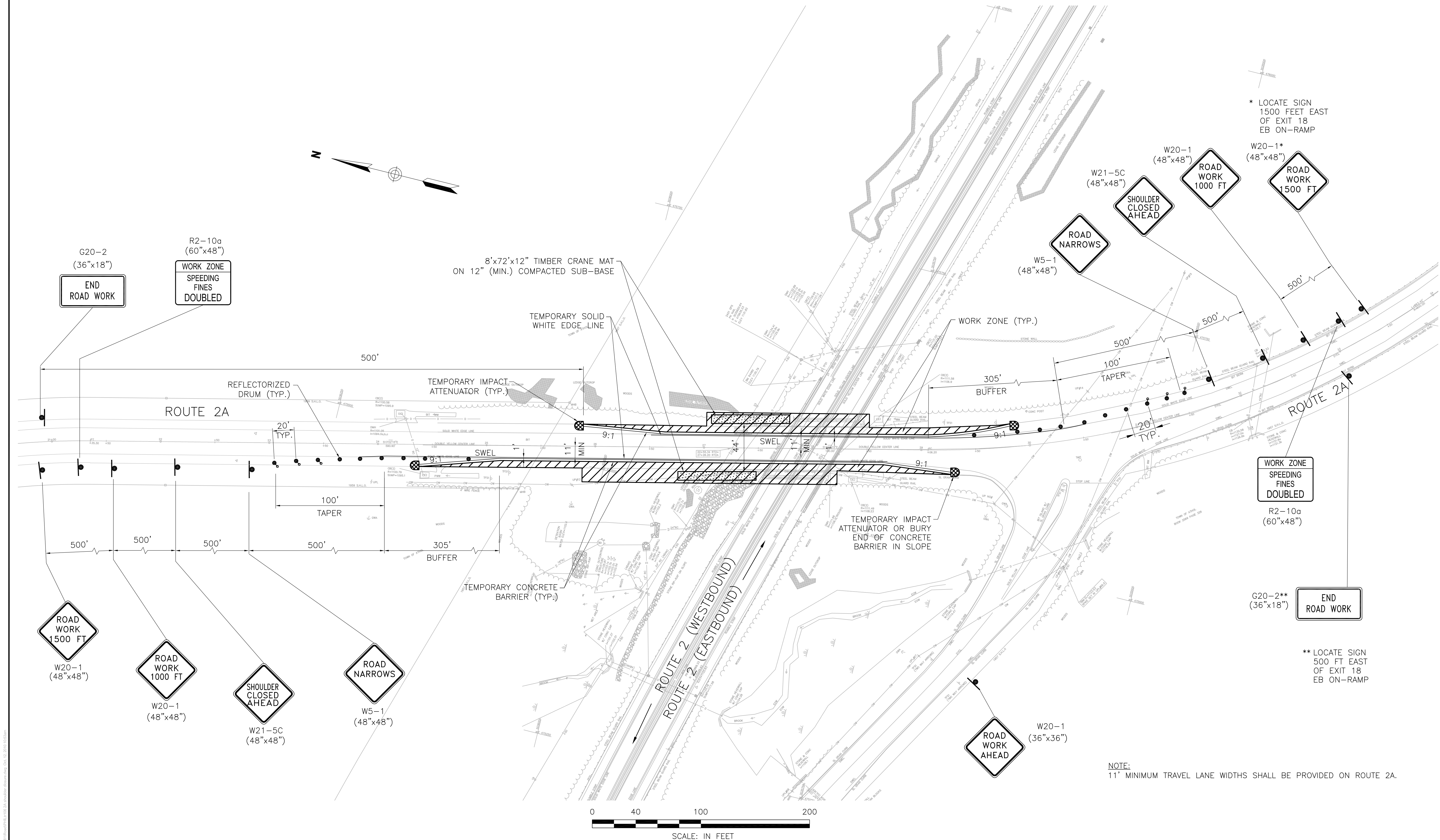
CONT. ON SHEET NO. 25



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N.F.A.	26	76
PROJECT FILE NO.		603495	

TRAFFIC MANAGEMENT PLAN
ROUTE 2A SHOULDER CLOSURE



* LOCATE SIGN
1500 FEET EAST
OF EXIT 18
EB ON-RAMP

W20-1*
(48"x48")

W20-1
(48"x48")

W21-5C
(48"x48")

W5-1
(48"x48")

** LOCATE SIGN
500 FT EAST
OF EXIT 18
EB ON-RAMP

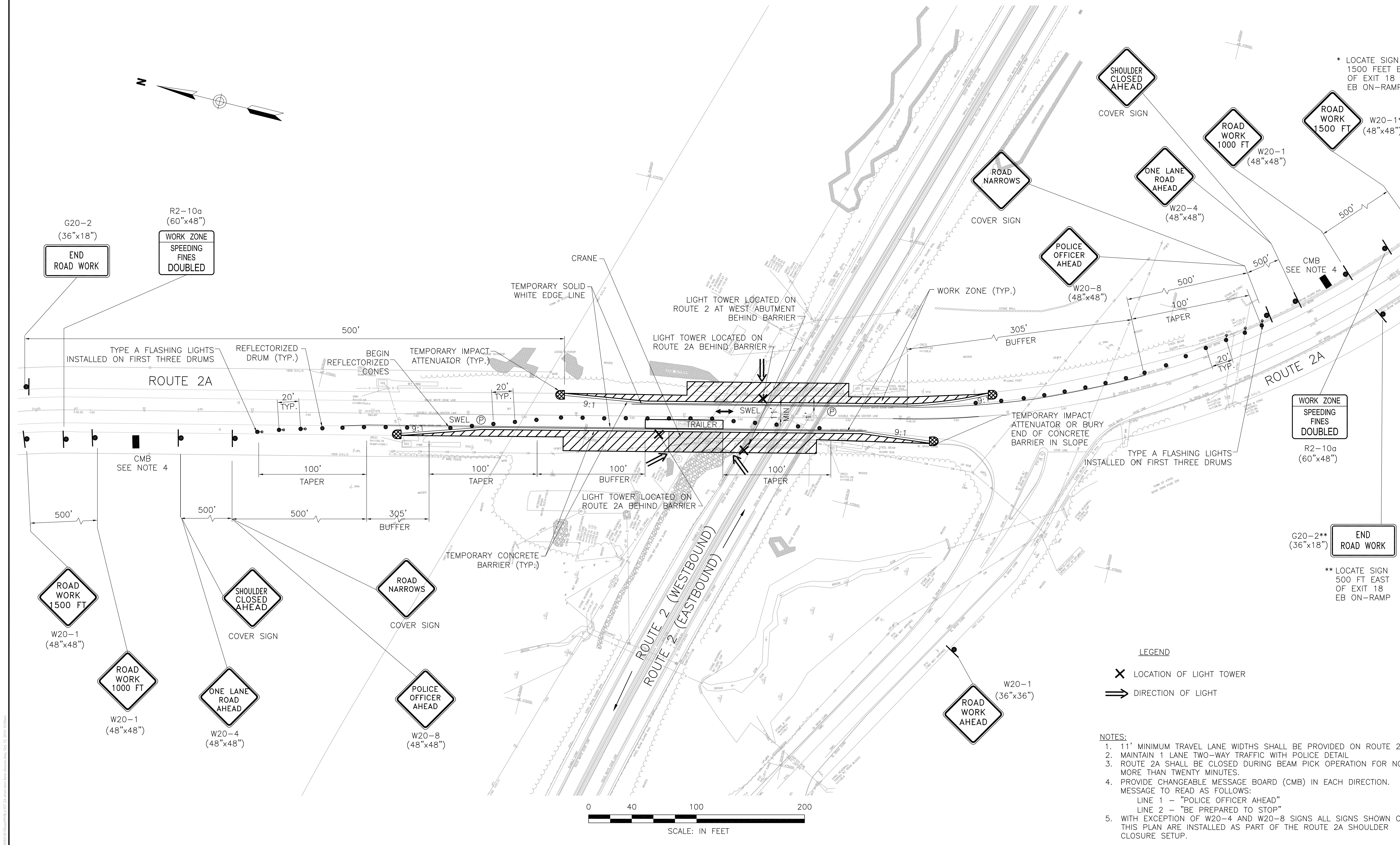
G20-2**
(36"x18")

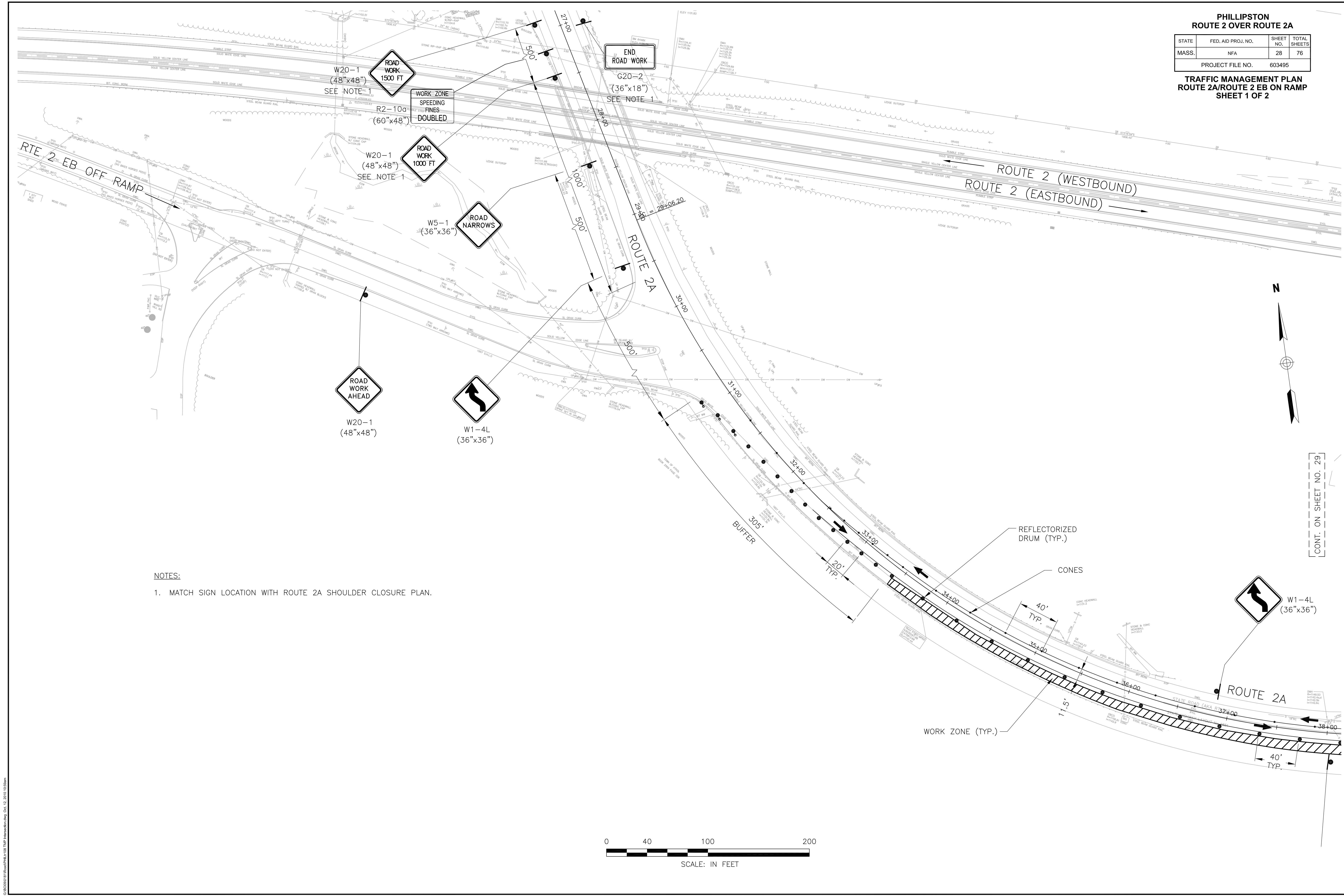
END
ROAD WORK

WORK ZONE
SPEEDING
FINES
DOUBLED

R2-10a
(60"x48")

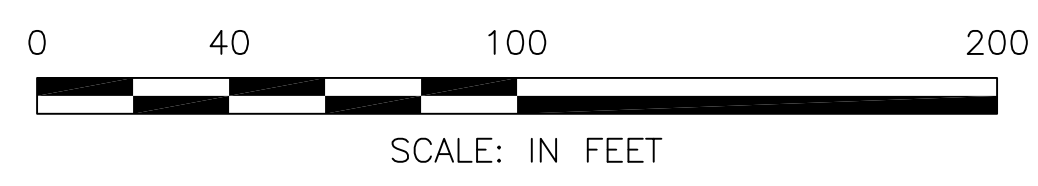
NOTE:
11' MINIMUM TRAVEL LANE WIDTHS SHALL BE PROVIDED ON ROUTE 2A.



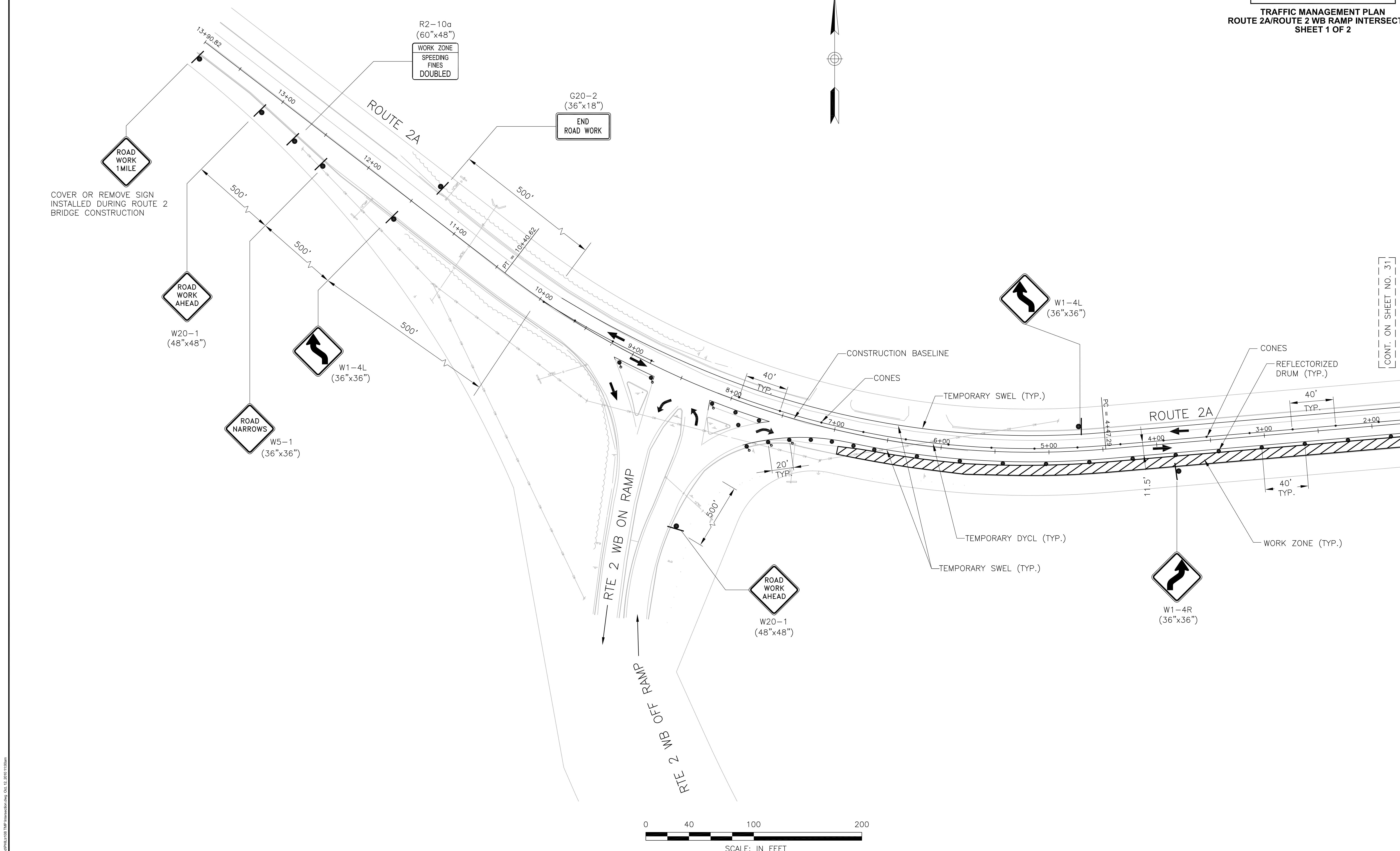


NOTES:

1. MATCH SIGN LOCATION WITH ROUTE 2A SHOULDER CLOSURE PLAN.



CONT. ON SHEET NO. 29



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PHILLIPSTON ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		33	76
PROJECT FILE NO.		603495	

GENERAL NOTES

GENERAL NOTES

DESIGN:

IN ACCORDANCE WITH THE 2007 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2009, FOR HL-93 LOADING.

BENCH MARKS AND ELEVATIONS:

BENCH MARK	2A01 GPS	#19TSN
NGS PUBLISHED BENCHMARK	PK NAIL	PK NAIL
BM: 6448X N.E. WINGWALL END	STA: 23+58.334 41.043 RT	STA: 20+49.056 84.134 RT
STA: 23+51.484 37.295 RT	N 3035820.64, E 475635.23	N 3035868.33, E 475326.62
EL = 1135.79	EL = 1131.83	EL = 1122.63

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

NGS PUBLISHED BENCHMARK LISTED ABOVE SHALL BE REMOVED AND DISCARDED.

DATE:

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

SURVEY NOTEBOOKS:

ELECTRONIC SURVEY BY CULLINAN ENGINEERING. COPIES OF FILES MAY BE OBTAINED FROM MASSDOT.

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 SPECTRA:

A_s = 0.08
S_{ps} = 0.17
S_{p1} = 0.07

SITE CLASS = C

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

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

REINFORCEMENT COATING:

ALL REINFORCING BARS AND SUPPORT DEVICES SHALL BE EPOXY COATED.

CONCRETE MIXES:

	①	②	③	KEY
APPROACH SLABS, HIGHWAY GUARDRAIL TRANSITION BASES, ABUTMENT CAPS, BACKWALLS, AND CURTAIN WALLS	4000	3/4	610	① 28-DAY COMPRESSIVE STRENGTH (PSI)
CF-PL3 BARRIERS, WINGWALL MODIFICATIONS, AND HIGHWAY GUARDRAIL TRANSITIONS	5000	3/4	685	② MAXIMUM AGGREGATE SIZE (INCH)
			HP CEMENT CONCRETE	③ CEMENT CONTENT (LB/CY)
BRIDGE DECK AND END DIAPHRAGMS	4000	3/4	585	
			HP CEMENT CONCRETE	

STEEL AND WELDING:

ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 (ASTM A709), GRADE 50 W UNLESS OTHERWISE NOTED. ALL WELDING, WELDING MATERIAL, PREPARATION AND ASSEMBLY OF MATERIAL FOR WELDING SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, THE AASHTO/AWS BRIDGE WELDING CODE (ANSI/AASHTO/AWS D1.5), AND ALL INTERIM REVISIONS PUBLISHED BY AASHTO AS OF THE BID OPENING DATE.

ALL BOLTED CONNECTIONS SHALL BE CONSIDERED SLIP CRITICAL CONNECTIONS WITH CLASS B FAYING SURFACES.

EXISTING CONDITIONS:

ALL DIMENSIONS AND DETAILS SHOWN FOR THE EXISTING STRUCTURE ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENTS AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY THEREOF AND SHALL NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL HE/SHE HAS MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER. EXISTING STRUCTURE IS SHOWN IN A LIGHTER LINE WEIGHT.

THE WINGWALL MODIFICATIONS INCLUDING A CONCRETE CAP AND CF-PL3 BARRIER WITH TYPE II PROTECTIVE SCREEN THAT SHALL BE CONSTRUCTED ON TOP OF THE EXISTING WALLS. THE CONTRACTOR SHALL DETERMINE ALL THE REQUIRED DIMENSIONS BY FIELD MEASUREMENTS AND SURVEY TO PREPARE THE SHOP DRAWINGS AND FABRICATE THE PROPOSED ELEMENTS SO THEY CAN BE INSTALLED ON TOP OF THE EXISTING WALLS AS SHOWN IN THESE PLANS.

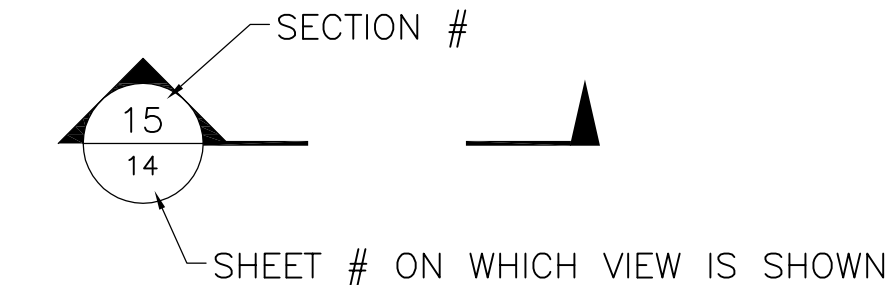
EXISTING PLANS:

EXISTING PLAN TITLED "THE COMMONWEALTH OF MASSACHUSETTS, PROPOSED BRIDGE, PHILLIPSTON, RELOCATED ROUTE NO. 2 OVER RELOCATED CROSS STREET, APRIL 1959" HAVE BEEN USED TO DEVELOP THESE PLANS. EXISTING PLANS ARE AVAILABLE THROUGH THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, PLANS AND RECORDS, 10 PARK PLAZA, ROOM 6262, BOSTON, MA 02116.

TRAFFIC:

THE BRIDGE WILL BE CLOSED TO ALL TRAFFIC DURING BRIDGE DEMOLITION AND MOVEMENT. TRAFFIC WILL BE CONTROLLED AS SHOWN IN THE TRAFFIC MANAGEMENT AND DETOUR PLANS.

SECTION MARK:



ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

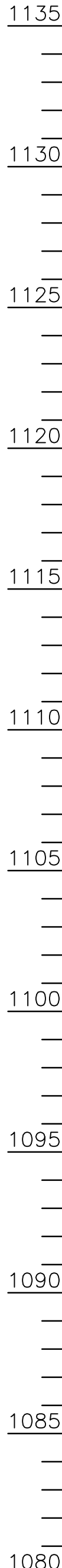
BORING B-101

 Nobis Engineering, Inc.		PROJECT		Boring No.: B-101
		Route 2 Over Route 2A Phillipstone, MA 01331		Boring Location: N: 3035811.58 E: 475522.75, Route 2 Over Route 2A
Contractor: Crawford Drilling Services Inc.		Rig Type / Model: Bombadier CME 55	Ground Surface Elev.: 1129 ft.	
Driller: Pat Goodale		Hammer Type: Automatic Hammer	Checked by: _____ Top-of-Riser Elev.: N/A	
Nobis Rep.: C Thunberg		Hammer Hols: ---	Date Start: June 8, 2010 Date Finish: June 8, 2010 Datum: NAVD89	
Drilling Method		Sampler		
Type	HSA/Coating	Split-Spoon		
Size (in.)	3 Inch	1-3/8 ID		
Advancement		Drive and Wash		
SAMPLE INFORMATION		LITHOLOGY		
ID	Type & No.	Depth (ft.)	Depth (In)	Remarks
1	S-1 12	0.5-2.5	12	(6 inches) Asphalt. S-1(a): (6 inches) Gravel (GW), Dry, <10% Silt, 10% Sand, 1½ in. Gravel, Grey. (CRUSHED STONE) S-1B: Poorly graded sand with gravel (SP); Dry, medium dense, 5% silt, 75% sand, 20% gravel, reddish brown. (FIL) S-2: Similar to S-1B. S-3: Similar to S-1B. S-4: Similar to S-1B, except loose and wet. Poor recovery due to piece of gravel lodged in tip of spoon. S-5: Poorly graded sand (SP); Wet, medium dense, 5% silt, 85% sand, 10% gravel. S-6: No recovery. Bedrock encountered at 18 feet. Rollerbit through bedrock from 18-22 Feet. Boring terminated at 22 feet.
2				
3	S-2 10	2.5-4.5	12	
4				
5	S-3 6	4.5-6.5	6	
6			8	
7			13	
8			7	
9	S-4 3	8-10	11	
10			4	
11			5	
12				
13				
14	S-5 3	13-15	21	
15			13	
16			5	
17			9	
18				
19	S-6 0	18	50/0	
20				
21				
22				
23				
24				
25				
SAMPLE IDENTIFICATION		REMARKS:		
G = Geoprobe	1) Groundwater not measured due to the amount of water induced during drilling. 2) Bulk sample collected from 1.5 to 3 feet. 3) Split Spoon			
S = Split Spoon	4) Hole backfilled with drill cuttings and placed 8 inches crushed stone or subsore material and patched with 8 inches of coldpatch asphalt.			
U = Undisturbed Sample				
R = Core Run				

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS: 
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 1/2" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA 02116-3973 OR 617-973-8836.
6. BORINGS B-1 & B-3 WERE MADE IN JANUARY 2006.
BORINGS B-101 & B-102 WERE MADE IN JUNE 2010.
7. BORINGS B-1 & B-3 WERE MADE BY NEW HAMPSHIRE BORING, INC., P.O. BOX 165, DERRY, NH 03038.
BORINGS B-101 & B-102 WERE MADE BY NOBIS ENGINEERING, INC., 585 MIDDLESEX STREET, LOWELL, MA 01851.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

EL. = 1108.9±
ASSUMED BOT. OF
FOOTING ON ROCK
WEST ABUT., SOUTH



BORING B-1

PHONE: (603) 437-1610				NEW HAMPSHIRE BORING, INC. P. O. BOX 165 DERRY, NH 03038 E MAIL: nhb@nhboring				FAX: (603) 437-0034			
Boring #: 9-1		Bridge: P-9-4		Project File Number: 603495		Contract #: 34475		Station: N925332.97			
Project Address: Route 2 over Route 2A				City: Phillips		State: MA		Offset: E144945.16			
Date Start: 01-04-06		Start Time: 8:30AM		Date End: 01-04-06		End Time: 3:00PM		Elev: 339.27m			
Casing: Type: HW Size: .1m ID Amt: 3.55m Hammer: 136 Kg Fall: .6m					Sampler: S/S Hammer: 63.5 Kg Size: 34.9mm I.D. Fall: 760 mm Length						
GROUNDWATER OBSERVATION - METRIC, SCALE 1:50											
Date: 01-04-06		Time: 2:45PM		Depth: 16m		Amt Casing		Stabilization Per:			
						None					
DP	S.#	DEPTH (m)	PEN (m)	REC	BLOWS/15m	S/C	SAMPLE DESCRIPTION				
_____	S-1	.10 - .71	.60	.25	42-32-30-22	1.10	ASPHALT Dry, very dense, brown, FINE TO COARSE SAND and fine to coarse gravel, some cobble, trace inorganic silt.				
1m											
_____	S-2	1.5 - 2.1	.60	.33	11-13-12-12	1.50	Wet, medium dense, light brown, COARSE SAND, some fine sand, trace inorganic silt.				
2m											
_____	S-3	3.04 - 3.65	.60	.40	20-36-55-65	3.04	Wet, very dense, brownish gray, COARSE TO FINE SAND, some inorganic silt, trace fine gravel.				
3M											
_____	C-1	4.57 - 6.1	1.53	1.45	Coring Times Minutes Per .5m 10 9 10/.53m	4.11	Top of BEDROCK Rebar advanced to 4.57m Begin coating at 4.57m Hard, black-white GRANITE, moderately fractured, some weathering. Percent Recovery = 95%				
4m											
_____	C-2	6.1 - 7.62	1.52	1.22	8 8 11/.52m	7.62	Hard, black-white, GRANITE, moderately fractured, some weathering. Percent Recovery = 80%				
5M											

6M											

7M											

8M											

Driller: Sam Cookley				Helper: Jason Rapals		Inspection: Barry Oulmet					
Remarks: PAGE 1 OF 1 HOURS WORKED: 6.5 hrs TYPE: HW SIZE: .1m USED: 3.55m Type of Corebarrel .54.7mm ID No. Of Road Signs Used: 2 Cone Used: 30											
Note:											
S.#: SAMPLE		PEN: PENETRATION		REC: RECOVERY		S/C: STRATA CHANGE					

338.45m
MHD
CORRECTED
ELEV.

EL. = 1105.4±
ASSUMED BOT. OF
FOOTING ON SOIL
WEST ABUT., NORTH

BORINGS

SCALE: $\frac{1}{4}" = 1'-0"$

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1135
1130
1125
1120
1115
1110
1105
1100
1095
1090
1085
1080

BORING B-3

PHONE: (603) 437-1610		NEW HAMPSHIRE BORING, INC.		FAX: (603) 437-0034	
P. O. BOX 165 DERRY, NH 03038					
E MAIL: nhb@nhboring					
Boring #: B-3		Bridge: P-9-4		Project File Number: 603495	
Contract #: 34475		Station: N925307.80		State: MA	
Offset: E144960.32		City: Phillipston		Date Start: 01-05-06	
Start Time: 8:00AM		Date End: 01-05-06		End Time: 2:00PM	
Elev: 341.11m		Casing: HW		Size: .1m ID	
Amt: 3.35m		S/S		Size: 34.9mm I.D.	
Hammer: 136 Kg		Fall: .6m		Hammer: 63.5 Kg	
Fall: 760 mm Length		S/S		Size: 34.9mm I.D.	
Hammer: 63.5 Kg		Fall: 760 mm Length		Hammer: 63.5 Kg	
GROUNDWATER OBSERVATION - METRIC, SCALE 1:50					
Date: 01-05-06		Time: 1:35PM		Depth: 1.57m	
Amt Casing		Stabilization Per:		1 hour	
DP	S/#	DEPTH (m)	PEN (m)	REC	BLOWS/15m
	S-1	.13 - .73	.60	.30	17-20-16-20
1m					
2m	S-2	1.5 - 2.1	.60	.33	17-30-25-30
3m	S-3	3.04 - 3.34	.30	.18	20-120/.15m
4m					
5m	C-1	4.57 - 6.1	1.53	1.47	Coring Times Minutes Per .5m 8 7 8/.53m
6m	C-2	6.1 - 7.62	1.52	1.45	10 8 10/.53m
7m					
8m					
Driller: Sam Cooley		Helper: Jason Rapsis		Inspection: Barry Oulmet	
Remarks: PAGE 1 OF 1 HOURS WORKED: 6.0 hrs TYPE: HW SIZE: .1m USED: 3.35m Type of Corebarrel: 54.7mm ID					
No. Of Road Signs Used: 2 Cone Used: 30					
Note:					
S/#: SAMPLE		PEN: PENETRATION		REC: RECOVERY	
				S/C: STRATA CHANGE	

339.00m
MWD
CORRECTED
ELEV.

EL. = 1102.0±
ASSUMED BOT. OF
FOOTING ON ROCK
EAST ABUT., SOUTH

BORING B-102

		PROJECT		Boring No.: B-102	
Route 2 Over Route 2A		Phillipstone, MA 01331		Boring Location: N: 3035828.70	
Nobis File No.: 83370.00		Rig Type / Model: Bombardier CME 55		E: 475605.22, Route 2 Over Route 2A	
Contractor: Crawford Drilling Services Inc.		Hammer Type: Automatic Hammer		Checked by: June 9, 2010	
Driller: Pat Goodale		Hammer Holst: ---		Date Start: June 9, 2010	
Nobis Rep.: C. Thunberg		Datum: NAVD88		Date Finish: June 9, 2010	
Ground Surface Elev.: 1131 ft.		Top-of-Riser Elev.: N/A		Groundwater Observations	
Drilling Method		Sampler		Date	
Type		Split-Spoon		Time	
Size (in.)		1-3/8 ID		Depth Below Ground (ft.)	
Advancement		Drive and Wash		Depth of Casing (ft.)	
				Depth to Bottom of Hole (ft.)	
				Stabilization Time	
SAMPLE INFORMATION		LITHOLOGY		SAMPLE DESCRIPTION	
Depth (ft.)	Type & No.	Size (in.)	Depth (ft.)	Blows/5 ft.	Remarks
1			ASPHALT	1130.0	(6 inches) Asphalt.
2			CRUSHED STONE	1129.8	(8 inches) Gravel, (GW), Dry, ~10% fines, 10% sand, 1 1/2 in. gravel, gray. (CRUSHED STONE)
3	S-1	6	2.5-4.5	6	S-1: Poorly graded and (SF), Moist, medium dense, 5% silt, 85% sand, 10% gravel, light reddish brown. (FILL)
4				11	
5	S-2	12	4.5-6.5	8	S-2: Similar to S-1.
6				7	
7	S-3	3	6.5-8.5	12	S-3: Similar to S-1.
8				9	
9	S-4	5	8.5-10.5	7	S-4: Wet, Similar to S-1.
10				8	
11				9	
12				5	
13	S-5	3	12.5-14.5	24	S-5: (3 inches) Silty sand with gravel (SM), Wet, very dense, 20% silt, 60% sand, 20% gravel, gray. (GLACIAL TILL)
14				28	
15	S-6	0	14.5	50/0	S-6: No recovery. Gray/white rock chips in wash water return.
16				19	
17				10	
18					
19	S-7	0	19	50/0	Competent bedrock at 23.5 feet.
20					
21					
22					
23					
24				1107.0	Boring terminated at 24 feet.
25					
SAMPLE IDENTIFICATION		REMARKS:			
C - Seepage		1) Groundwater not measured due to the amount of water induced during drilling.			
S - Split Spoon		2) Bulk sample collected from 1.5 to 3 feet.			
U - Undisturbed Sample		3) Hole backfilled with drill cuttings and placed 8 inches crushed stone as subbase material and patched with 8 inches of coldpatch asphalt.			
R - Core Run		Page No. 1 of 1			

EL. = 1109.7±
ASSUMED BOT. OF
FOOTING ON ROCK
EAST ABUT., NORTH

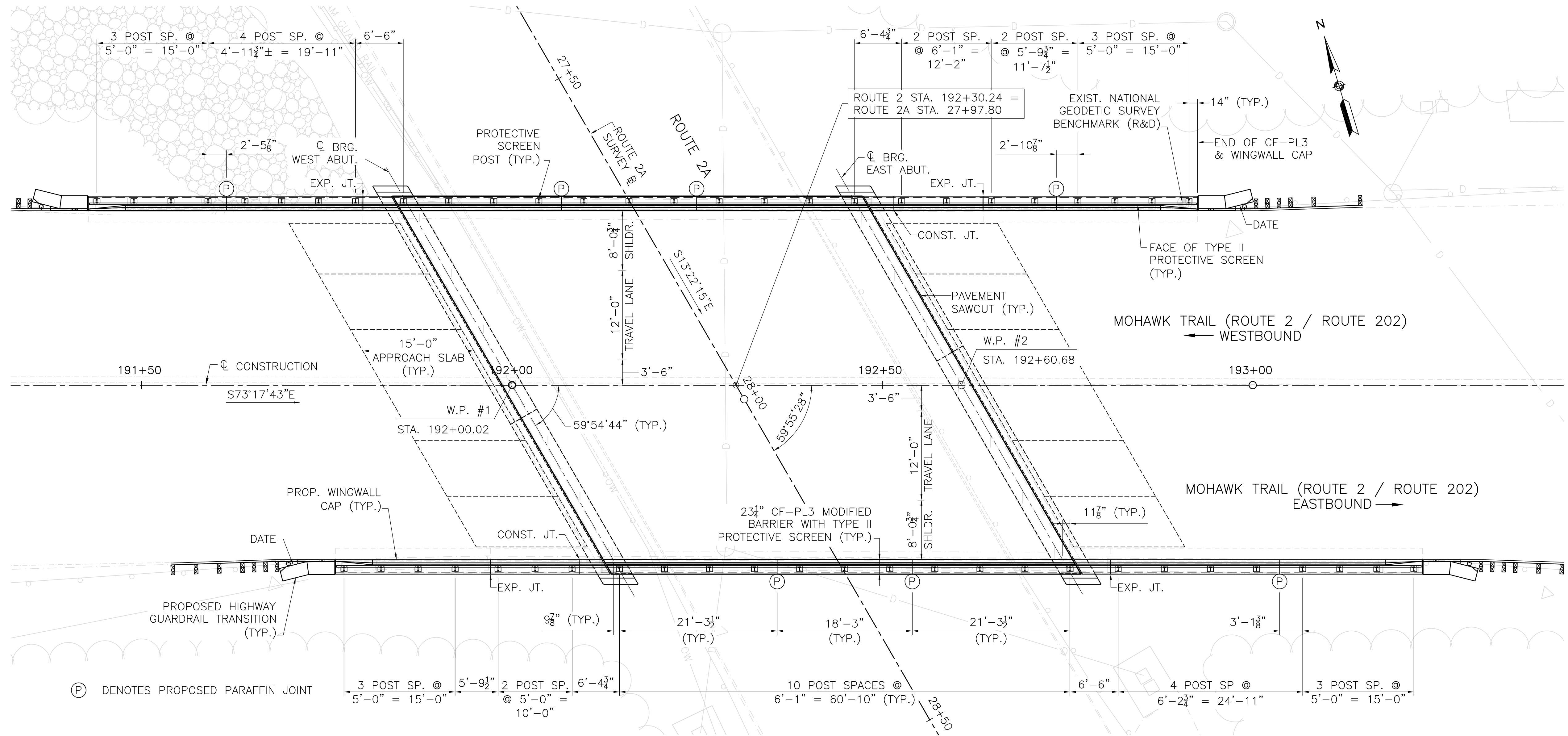
NOTE:
SEE SHEET 3 FOR BORING NOTES.

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

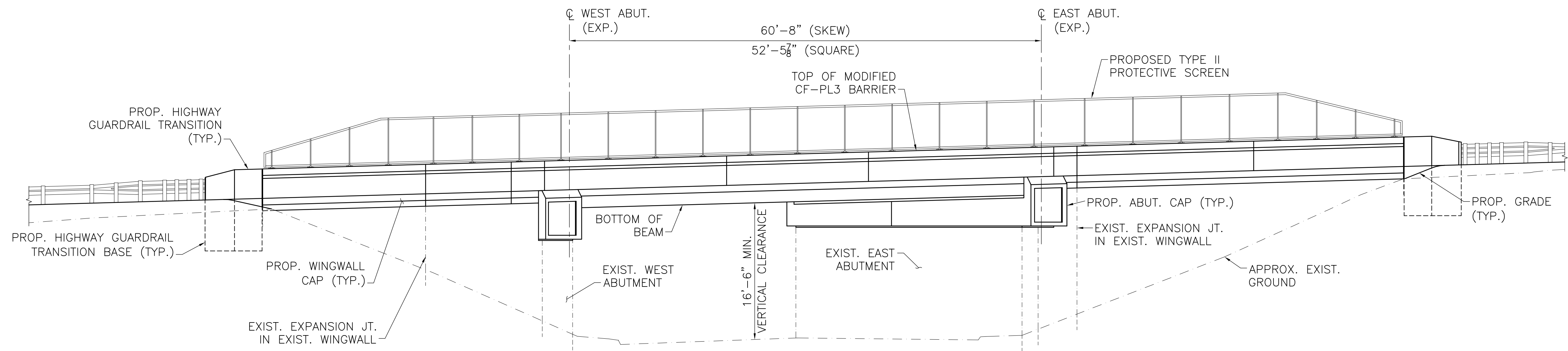
PHILLIPSTON ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		35	76
PROJECT FILE NO. 603495			
BORING LOGS			

ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

PHILLIPSTON			
ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		36	76
PROJECT FILE NO. 603495			
GENERAL PLAN AND ELEVATION			



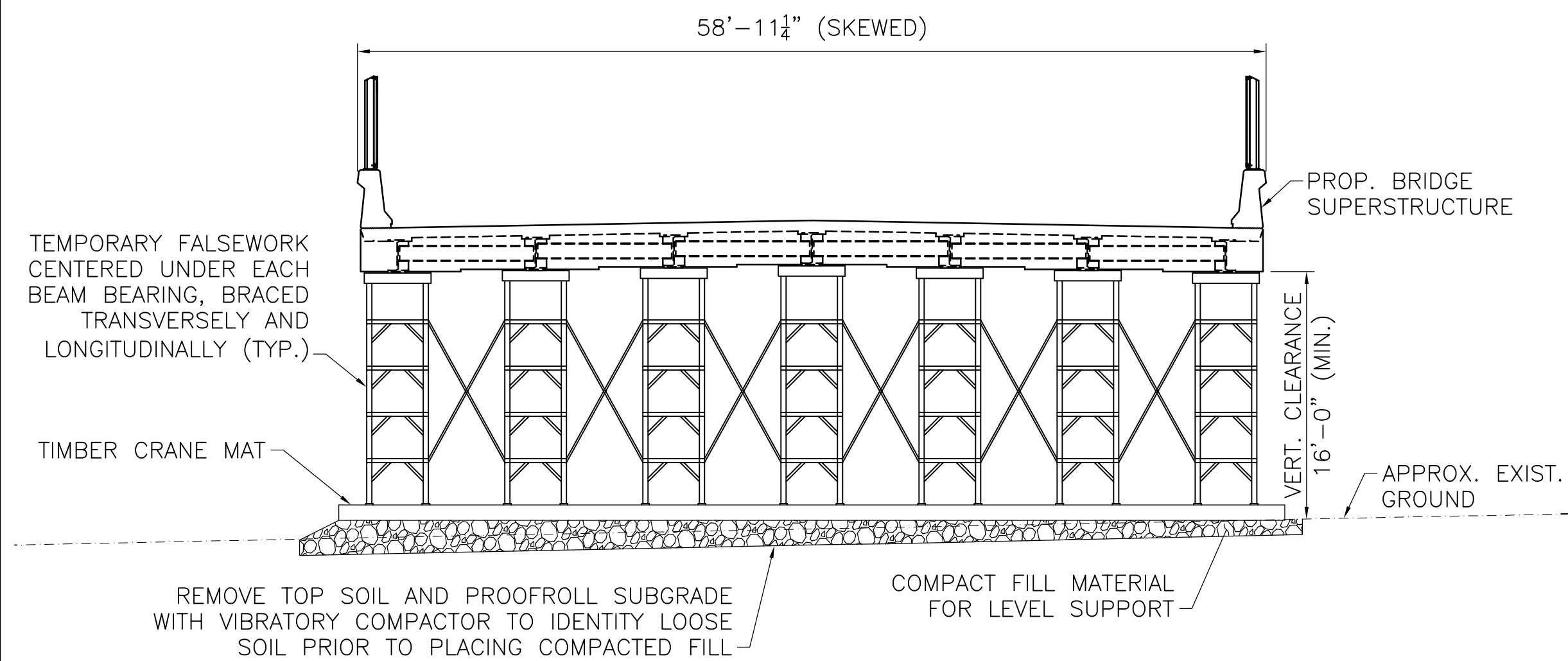
GENERAL PLAN
SCALE: 1/8" = 1'-0"



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

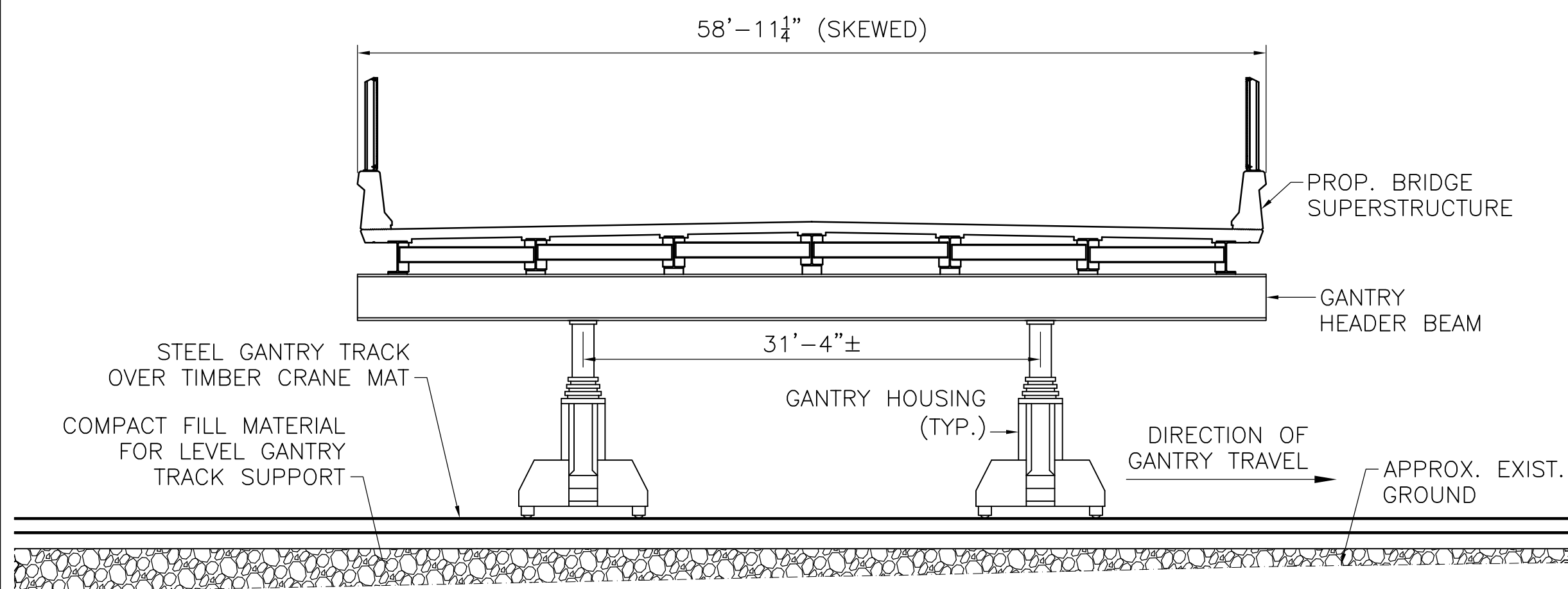
ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
	USE ONLY PRINTS OF LATEST DATE

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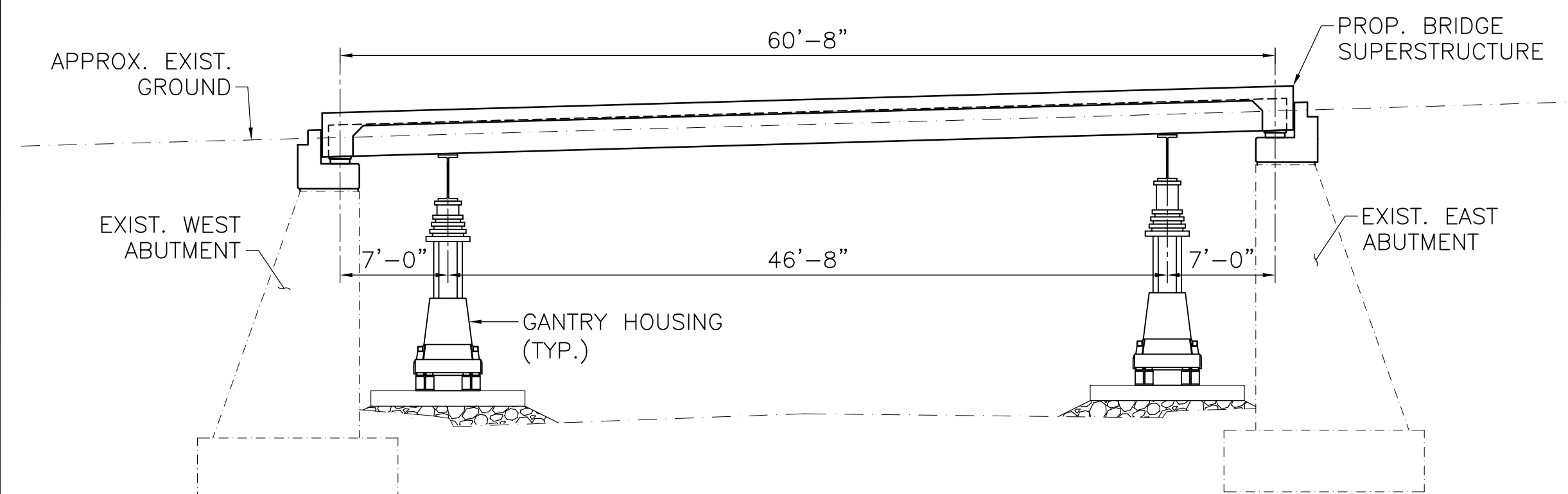
TEMPORARY FALSEWORK ELEVATION

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



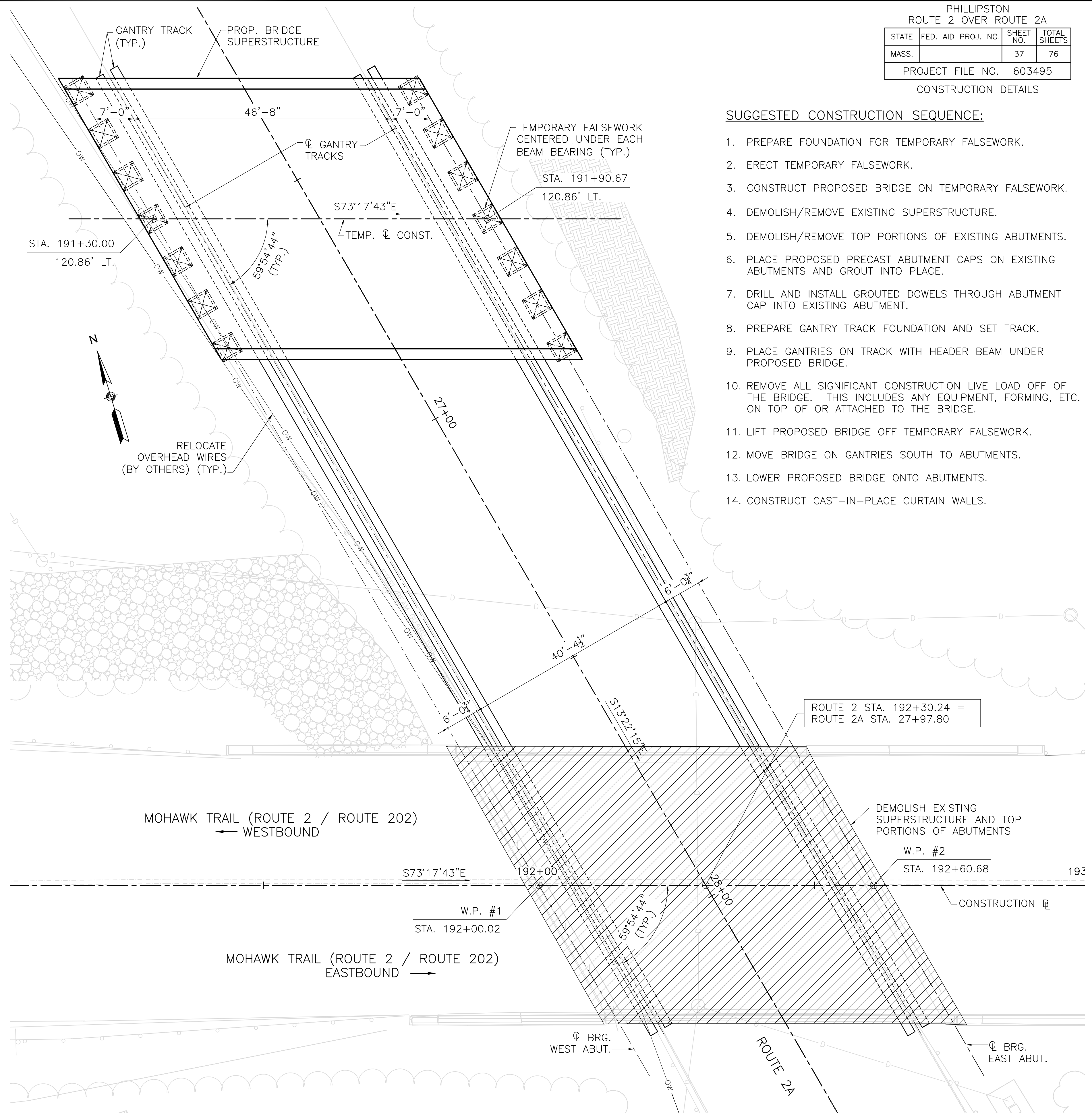
TRANSVERSE SECTION

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



LONGITUDINAL SECTION

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



CONSTRUCTION PLAN

SCALE: 1" = 10'

PHILLIPSTON ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		37	76
PROJECT FILE NO. 603495			
CONSTRUCTION DETAILS			

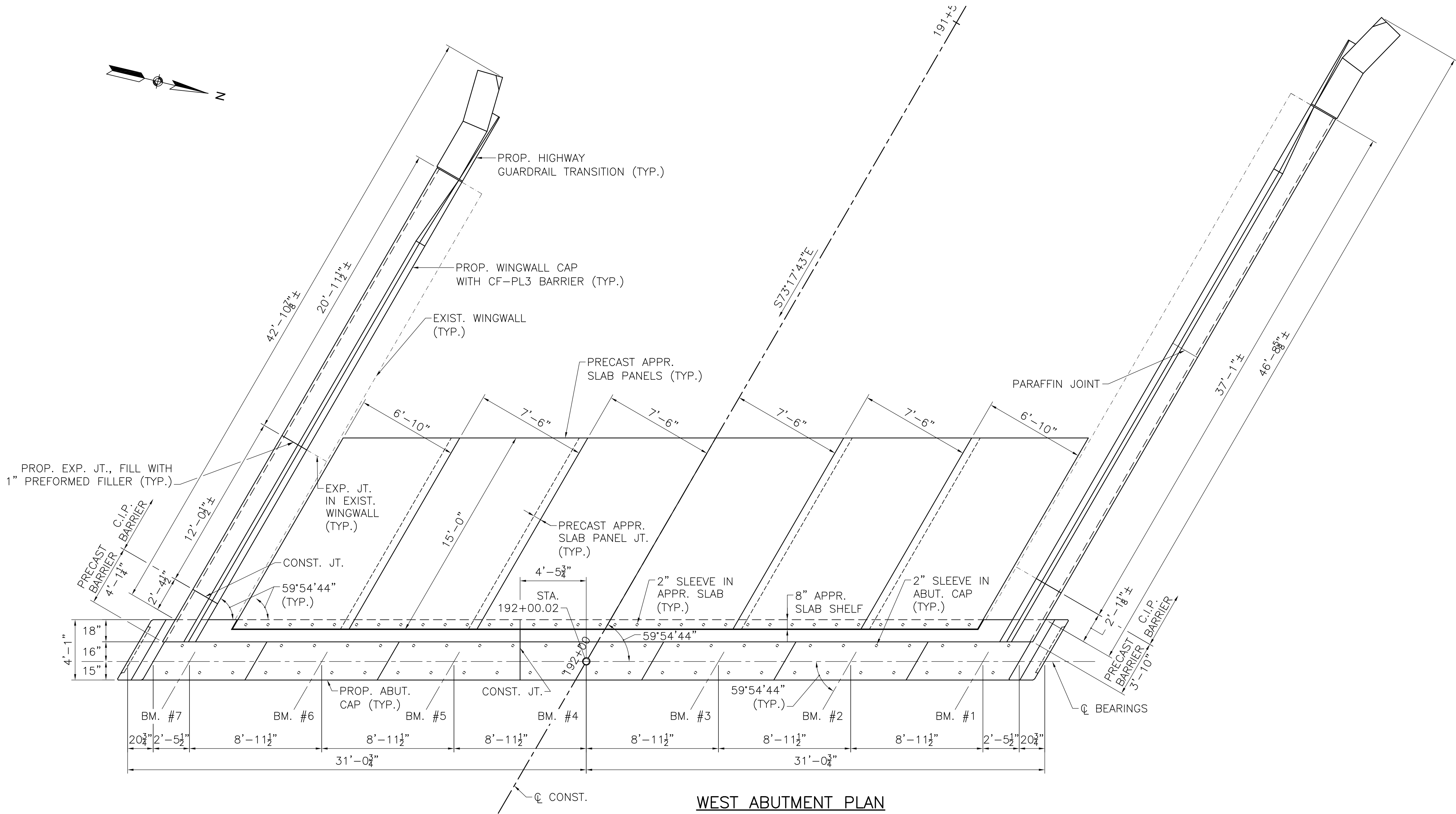
SUGGESTED CONSTRUCTION SEQUENCE:

1. PREPARE FOUNDATION FOR TEMPORARY FALSEWORK.
2. ERECT TEMPORARY FALSEWORK.
3. CONSTRUCT PROPOSED BRIDGE ON TEMPORARY FALSEWORK.
4. DEMOLISH/REMOVE EXISTING SUPERSTRUCTURE.
5. DEMOLISH/REMOVE TOP PORTIONS OF EXISTING ABUTMENTS.
6. PLACE PROPOSED PRECAST ABUTMENT CAPS ON EXISTING ABUTMENTS AND GROUT INTO PLACE.
7. DRILL AND INSTALL GROUTED DOWELS THROUGH ABUTMENT CAP INTO EXISTING ABUTMENT.
8. PREPARE GANTRY TRACK FOUNDATION AND SET TRACK.
9. PLACE GANTRIES ON TRACK WITH HEADER BEAM UNDER PROPOSED BRIDGE.
10. REMOVE ALL SIGNIFICANT CONSTRUCTION LIVE LOAD OFF OF THE BRIDGE. THIS INCLUDES ANY EQUIPMENT, FORMING, ETC. ON TOP OF OR ATTACHED TO THE BRIDGE.
11. LIFT PROPOSED BRIDGE OFF TEMPORARY FALSEWORK.
12. MOVE BRIDGE ON GANTRIES SOUTH TO ABUTMENTS.
13. LOWER PROPOSED BRIDGE ONTO ABUTMENTS.
14. CONSTRUCT CAST-IN-PLACE CURTAIN WALLS.

ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

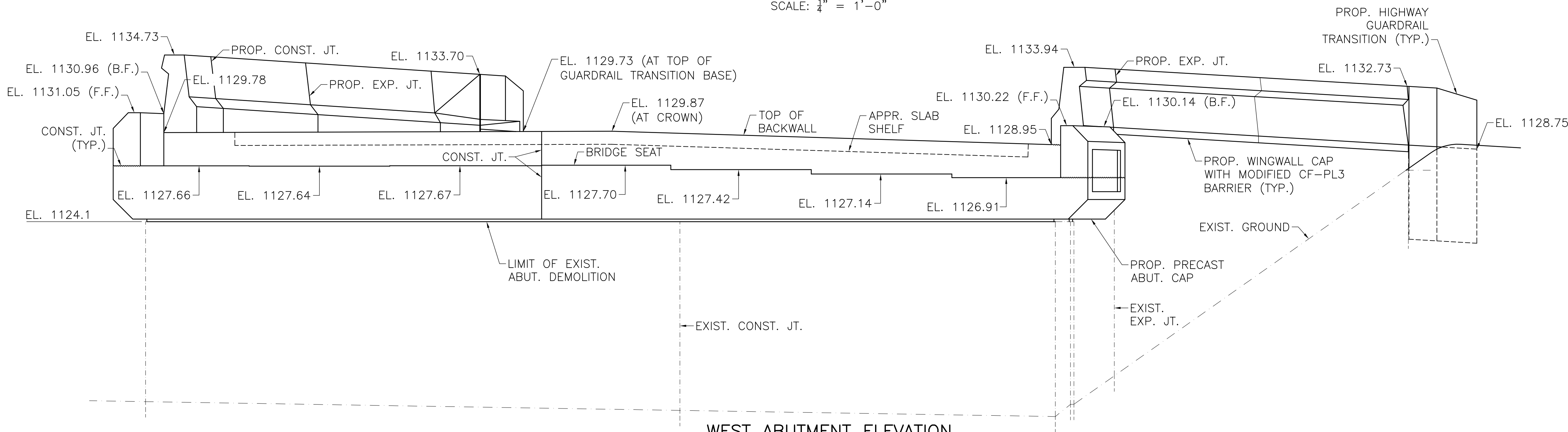
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PHILLIPSTON			
ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		39	76
PROJECT FILE NO. 603495			
WEST ABUTMENT PLAN, ELEVATION AND TYPICAL WINGWALL SECTION			



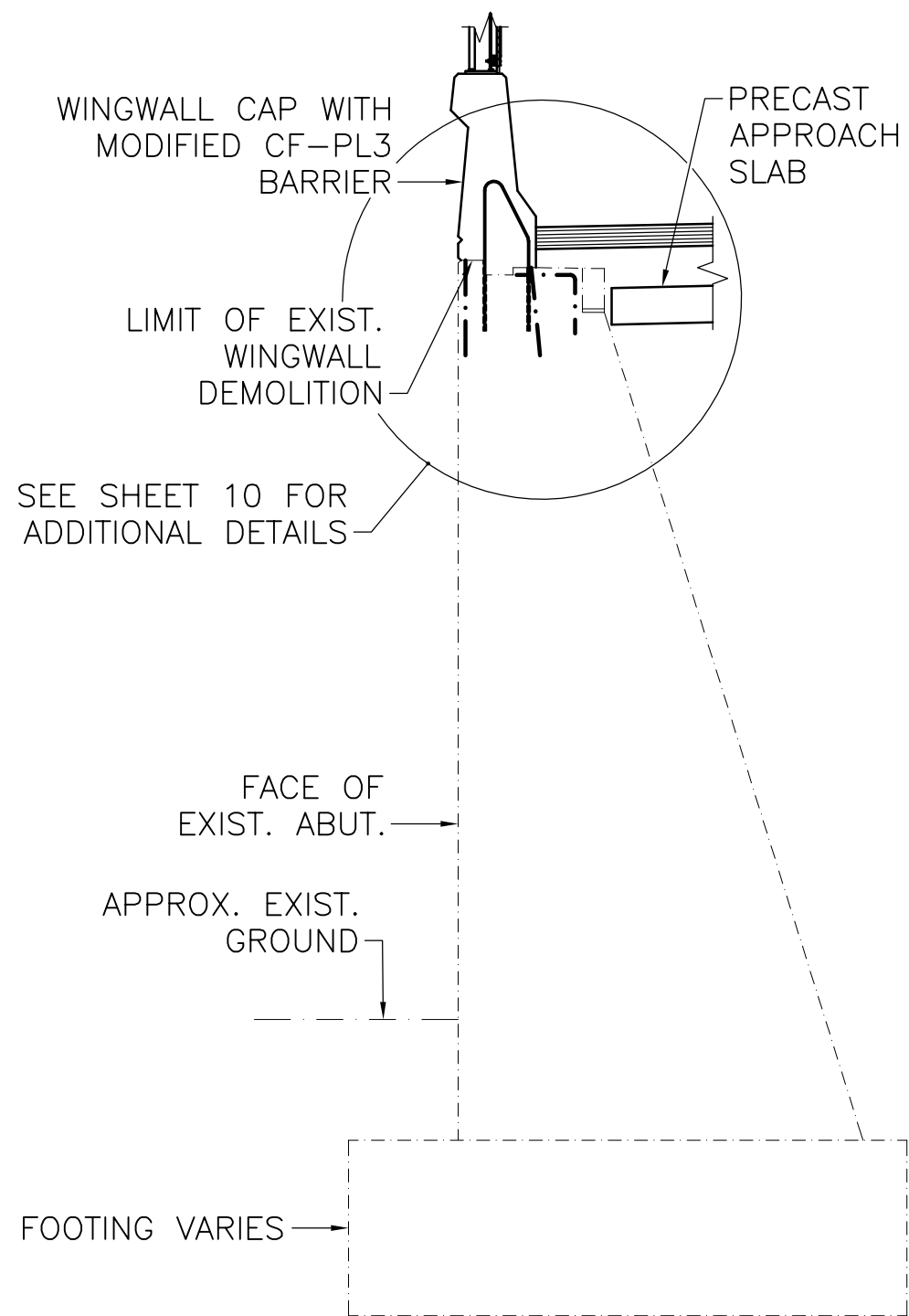
WEST ABUTMENT PLAN

SCALE: $\frac{1}{4}" = 1'-0"$



WEST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}" = 1'-0"$



TYPICAL WINGWALL SECTION

SCALE: $\frac{1}{4}" = 1'-0"$

NOTES:

- CONCRETE FOR THE WINGWALL CAP WITH MODIFIED CF-PL3 BARRIER SHALL BE 5000 PSI, $\frac{3}{4}$ IN, 685 HP CEMENT CONCRETE.
- FOR BEARING ON SOIL:

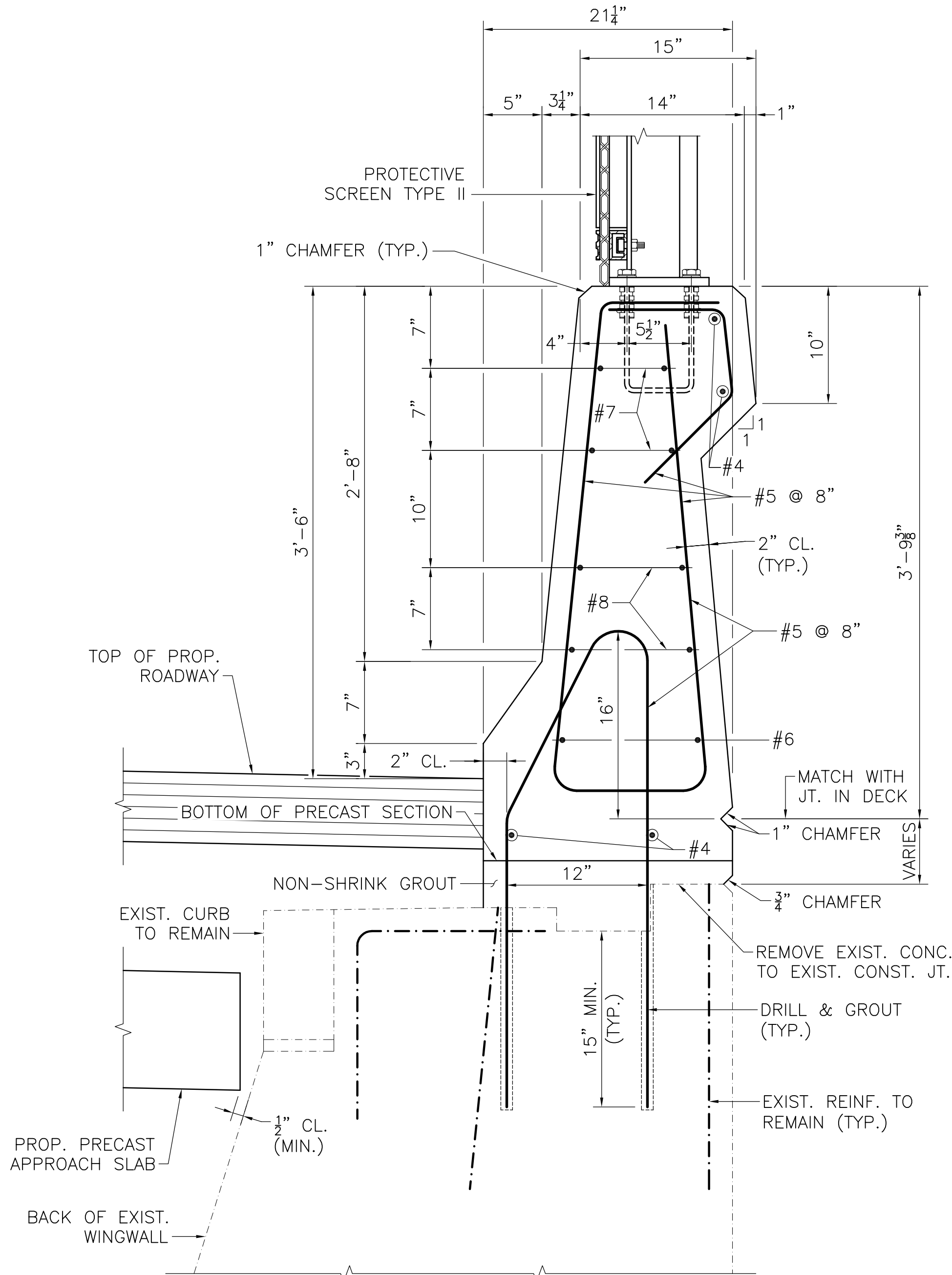
THE FACTORED BEARING PRESSURE = 7.7 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.

FACTORED BEARING RESISTANCE = 9.6 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.55.
- FOR BEARING ON ROCK:

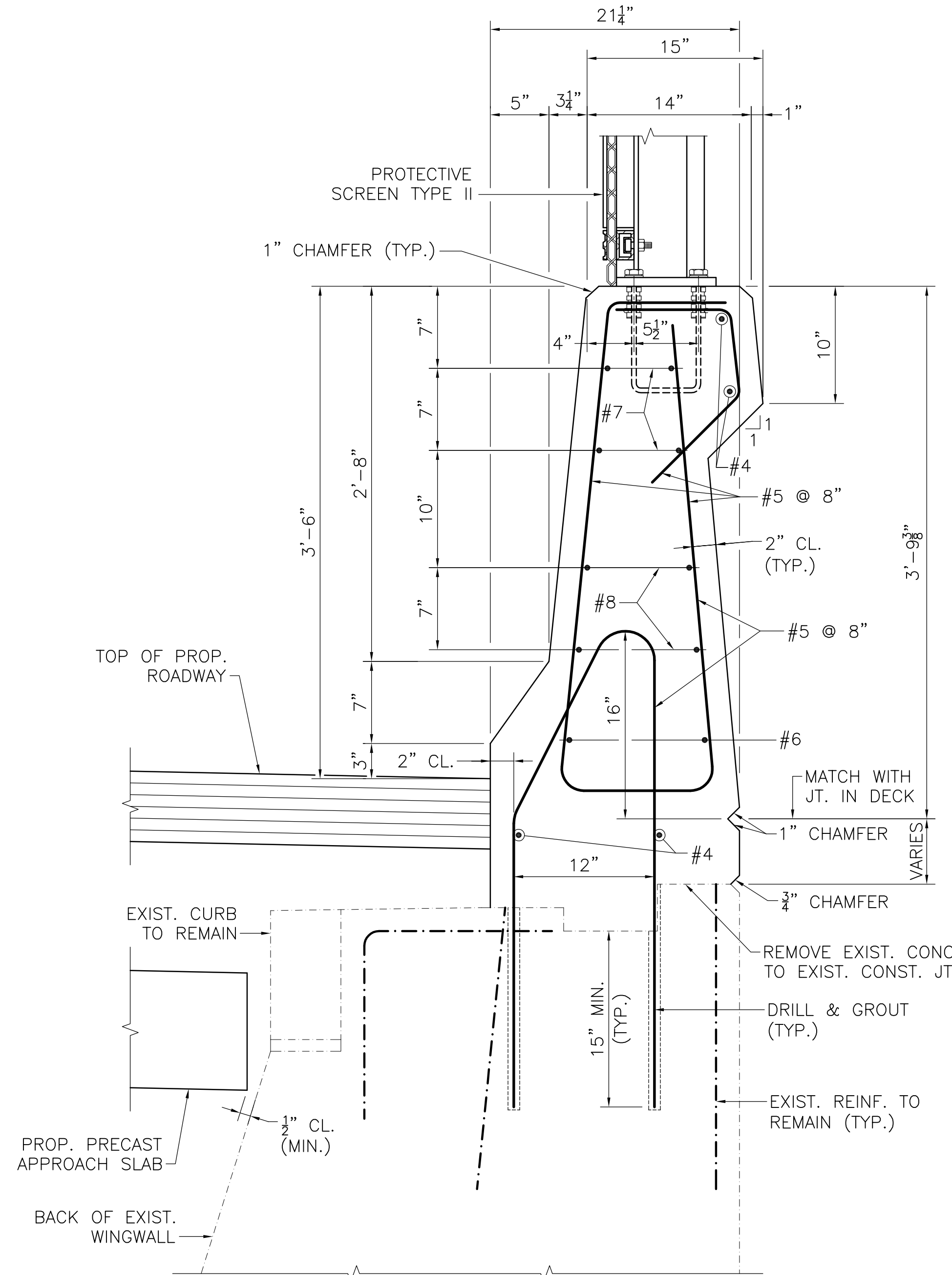
THE FACTORED BEARING PRESSURE = 26.3 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS EXTREME EVENT I LOAD COMBINATION.

FACTORED BEARING RESISTANCE = 29.7 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.55.
- F.F. = FRONT FACE
B.F. = BACK FACE
- REPAIRS TO SIGNIFICANT DEFECTS IN THE EXISTING WINGWALLS TO INCLUDE PRESSURE INJECTING OF CRACKS, RESEALING EXP. JOINTS, AND PATCHING SPALLS SHALL BE PERFORMED AS NEEDED. THE CONTRACTOR AND ENGINEER SHALL COORDINATE SPECIFIC LOCATIONS TO BE ADDRESSED.
- SEE SHEET 7 FOR TYPICAL ABUTMENT SECTION.

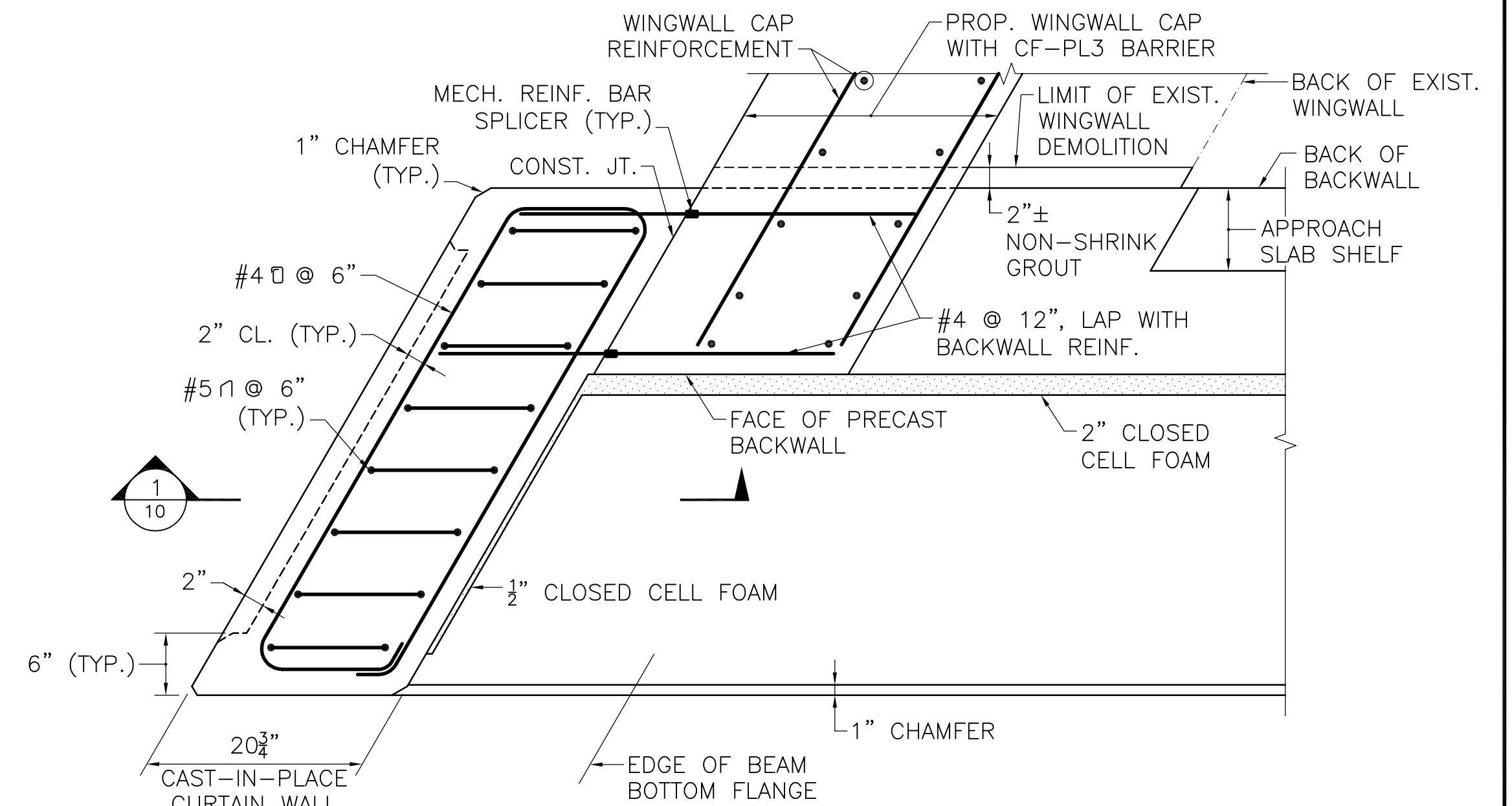
ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	



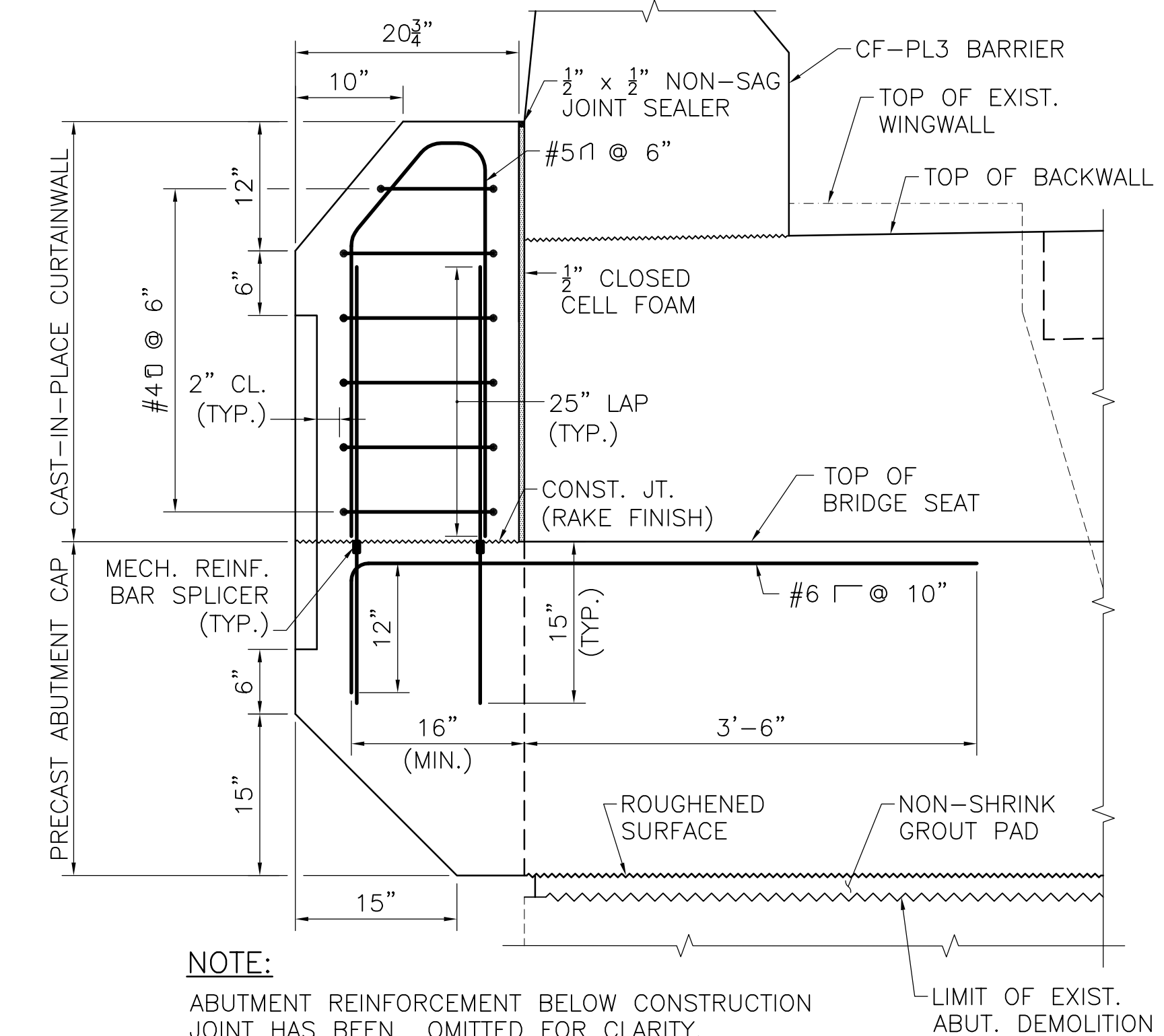
**PRECAST BARRIER
WINGWALL MODIFICATIONS**
SCALE: 1 1/2" = 1'-0"



**C.I.P. BARRIER
WINGWALL MODIFICATIONS**
SCALE: 1 1/2" = 1'-0"

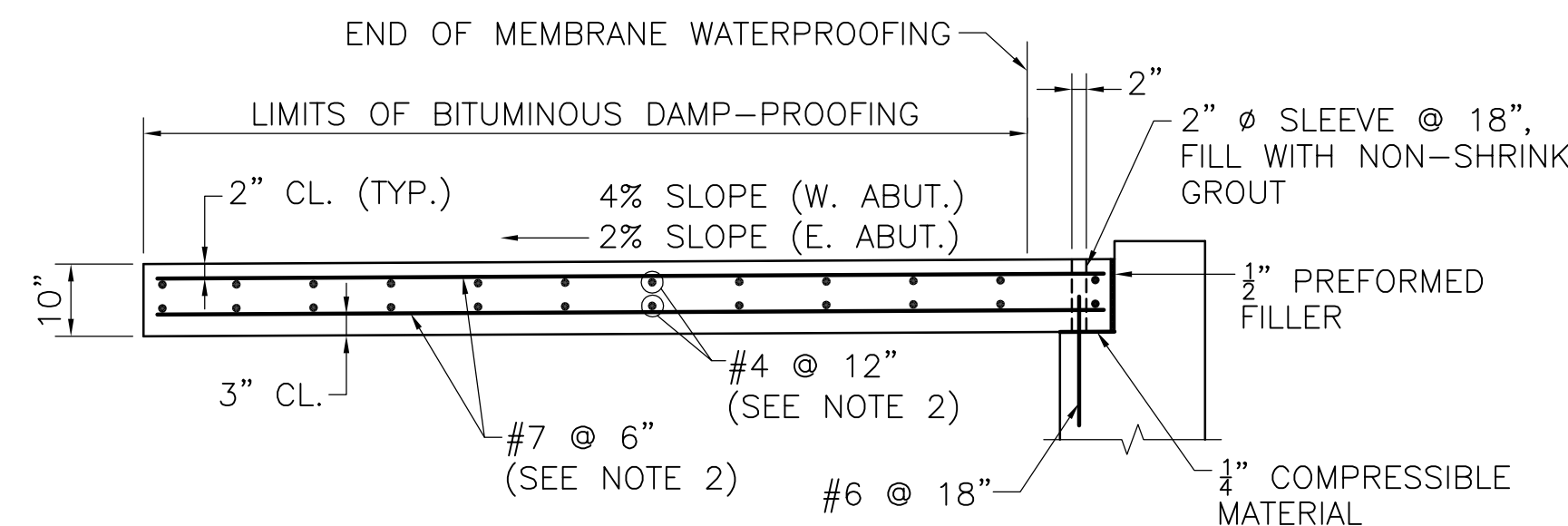


TYPICAL CURTAIN WALL SECTION
SCALE: 1" = 1'-0"

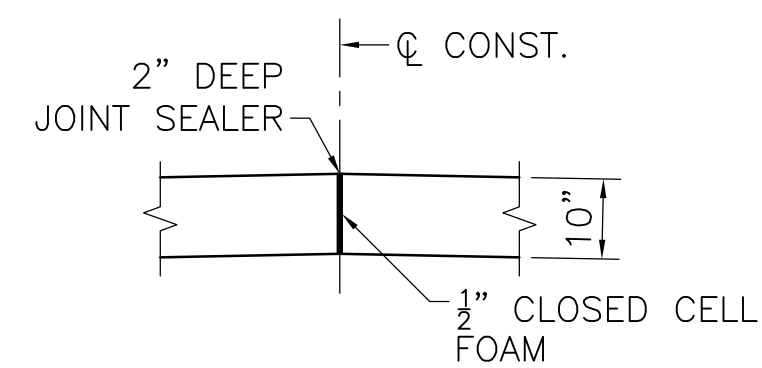


SECTION 1
SCALE: 1" = 1'-0"

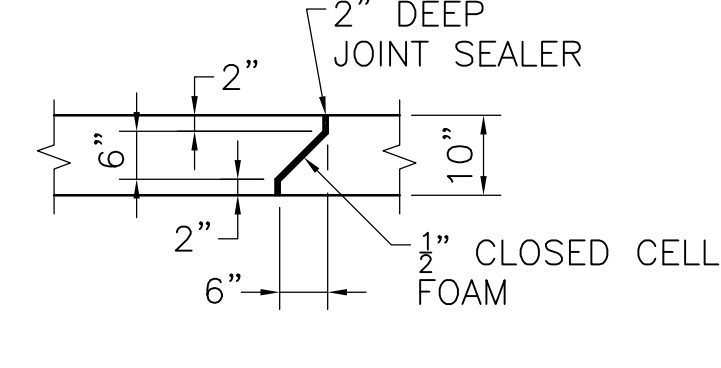
NOTE:
ABUTMENT REINFORCEMENT BELOW CONSTRUCTION JOINT HAS BEEN OMITTED FOR CLARITY.



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



**APPROACH SLAB SECTION
AT CROWN JOINT**
SCALE: 1/2" = 1'-0"

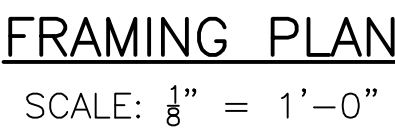


**APPROACH SLAB SECTION
AT CONSTRUCTION JOINT**
SCALE: 1/2" = 1'-0"

- NOTES:
- APPROACH SLAB TO BE 4000 PSI, 3/4 IN, 610 CEMENT CONCRETE.
 - PLACE LONGITUDINAL REINFORCEMENT PARALLEL TO C CONSTRUCTION
PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT.

ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

FRAMING PLAN, TYPICAL BRIDGE SECTION
AND DIAPHRAGM DETAILS

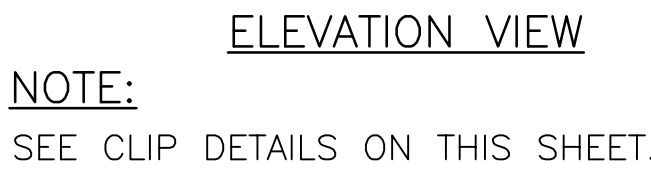
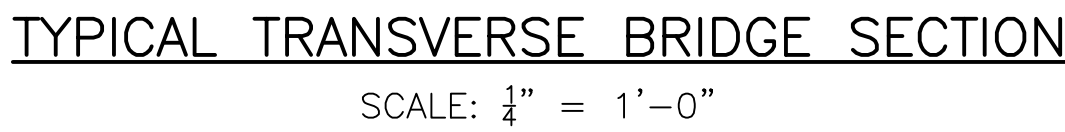
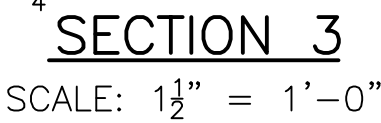


- NOTES:**
1. D1 = C12x20.7 (TYP. END DIAPHRAGM)
 2. D2 = C12x20.7 (TYP. INTERMEDIATE DIAPHRAGM)
 3. SEE THIS SHEET FOR DIAPHRAGM DETAILS.
 4. THE MAIN LOAD CARRYING MEMBERS ARE W24x146.
 5. ALL STEEL SHALL CONFORM TO AASHTO M 270 GRADE 50W



END DIAPHRAGM DETAILS

SCALE: 1" = 1'-0"

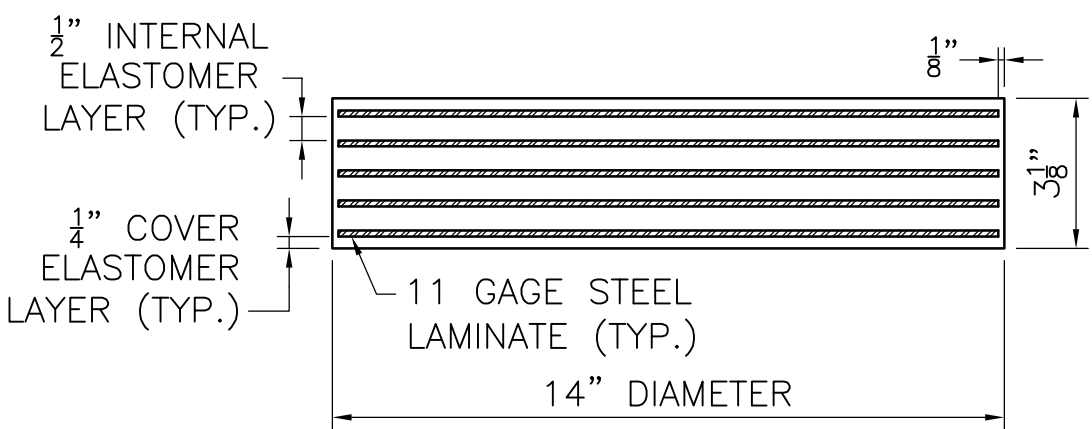


INTERMEDIATE DIAPHRAGM DETAILS

SCALE: 1" = 1'-0"

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

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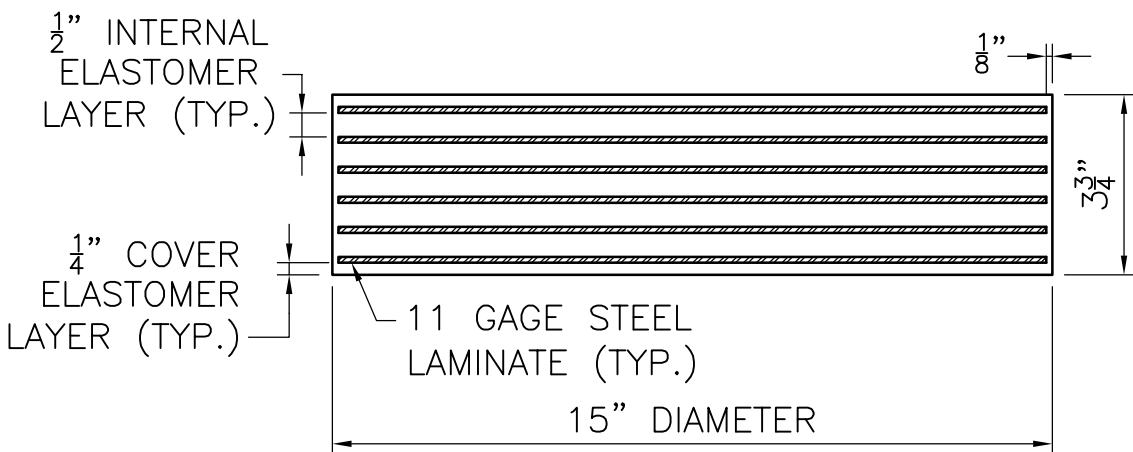


NOTES:

- ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER.
- STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
- THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 99.4 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 0.65 KSI.
- ELASTOMERIC BEARING PAD SHALL NOT BE VULCANIZED TO THE SOLE PLATE.

ELASTOMERIC BEARING PAD (BEAMS 1 & 7)

NOT TO SCALE

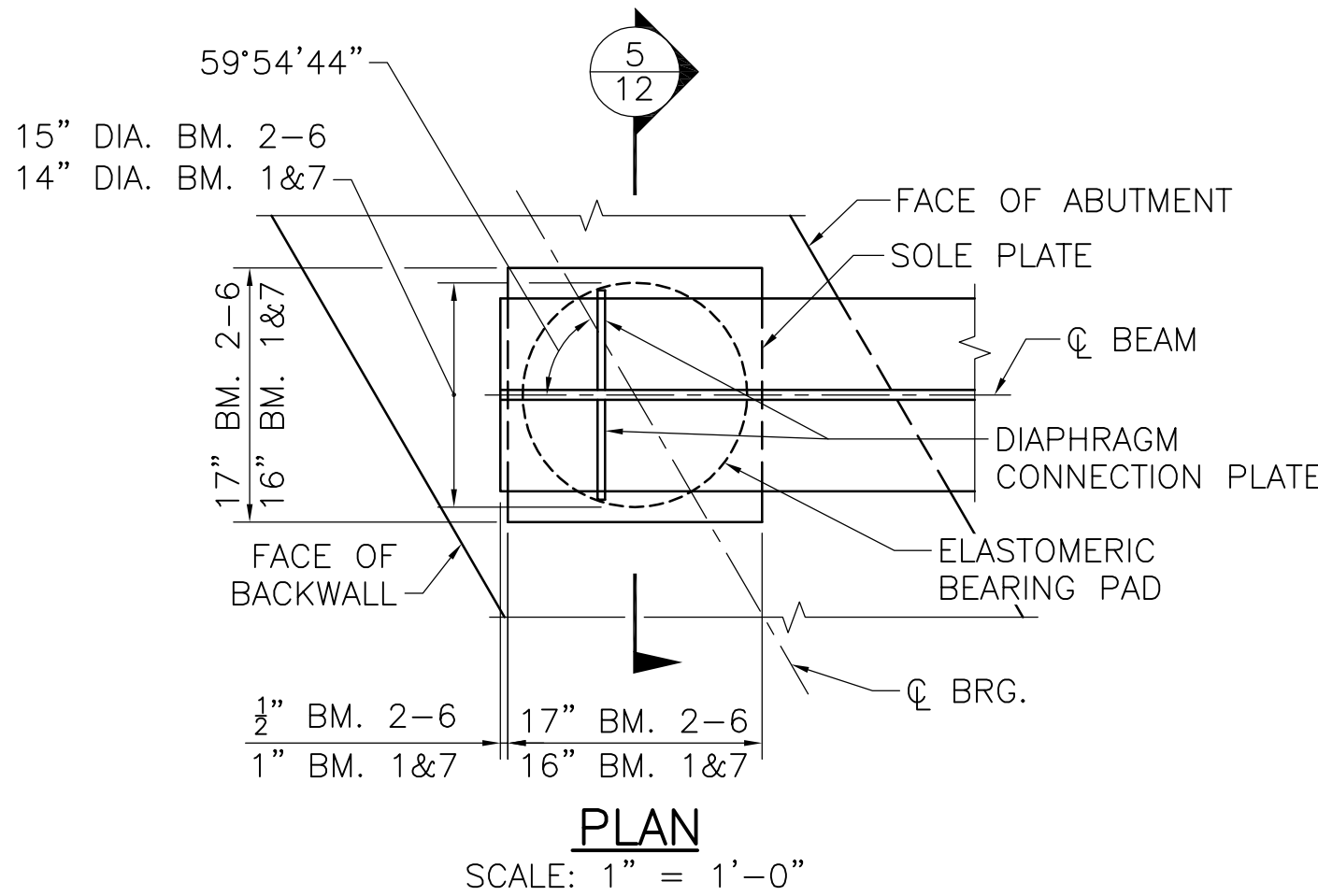


NOTES:

- ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER.
- STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
- THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 122.5 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 0.69 KSI.
- ELASTOMERIC BEARING PAD SHALL NOT BE VULCANIZED TO THE SOLE PLATE.

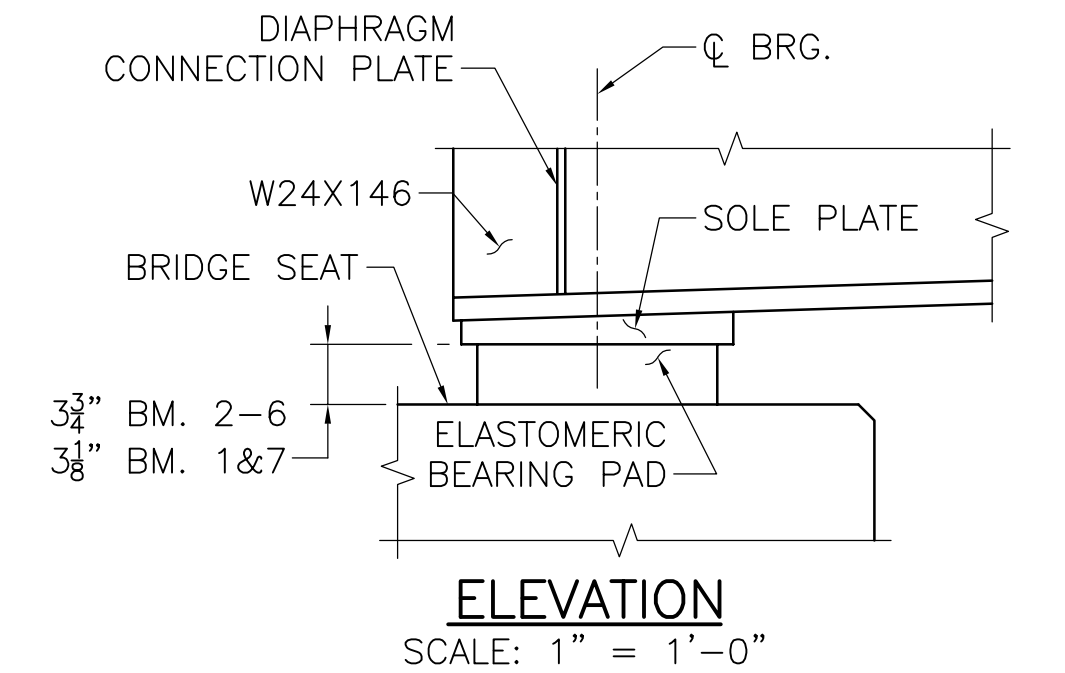
ELASTOMERIC BEARING PAD (BEAMS 2 - 6)

NOT TO SCALE



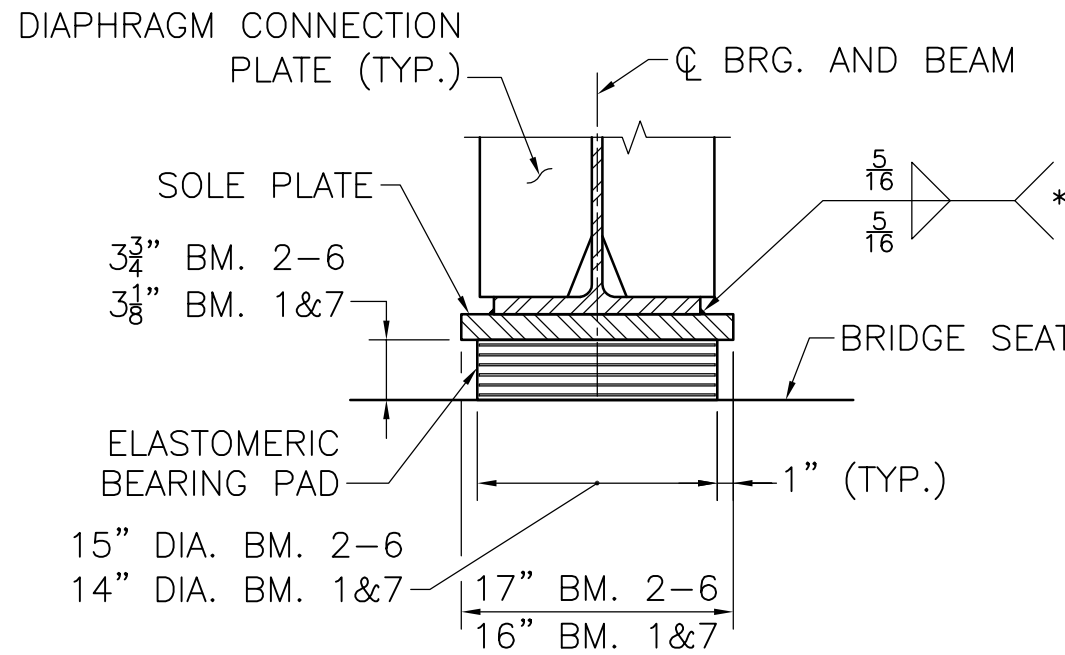
PLAN

SCALE: 1" = 1'-0"



ELEVATION

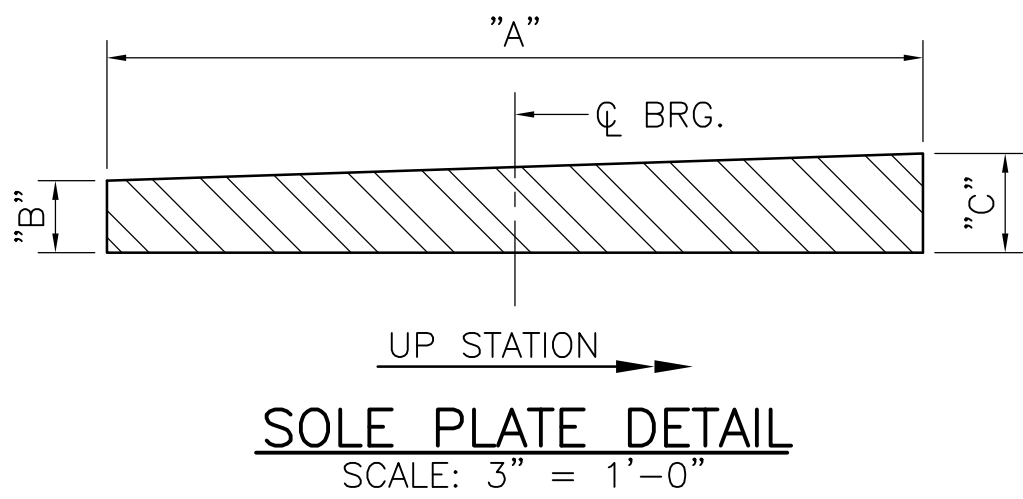
SCALE: 1" = 1'-0"



SECTION 5

SCALE: 1" = 1'-0"

SOLE PLATE TABLE				
BEAM NO.		"A"	"B"	"C"
1 & 7	WEST ABUT.	16"	1 1/2"	2"
	EAST ABUT.	16"	1 1/2"	1 7/8"
2 - 6	WEST ABUT.	17"	1 1/2"	2 1/8"
	EAST ABUT.	17"	1 1/2"	1 7/8"



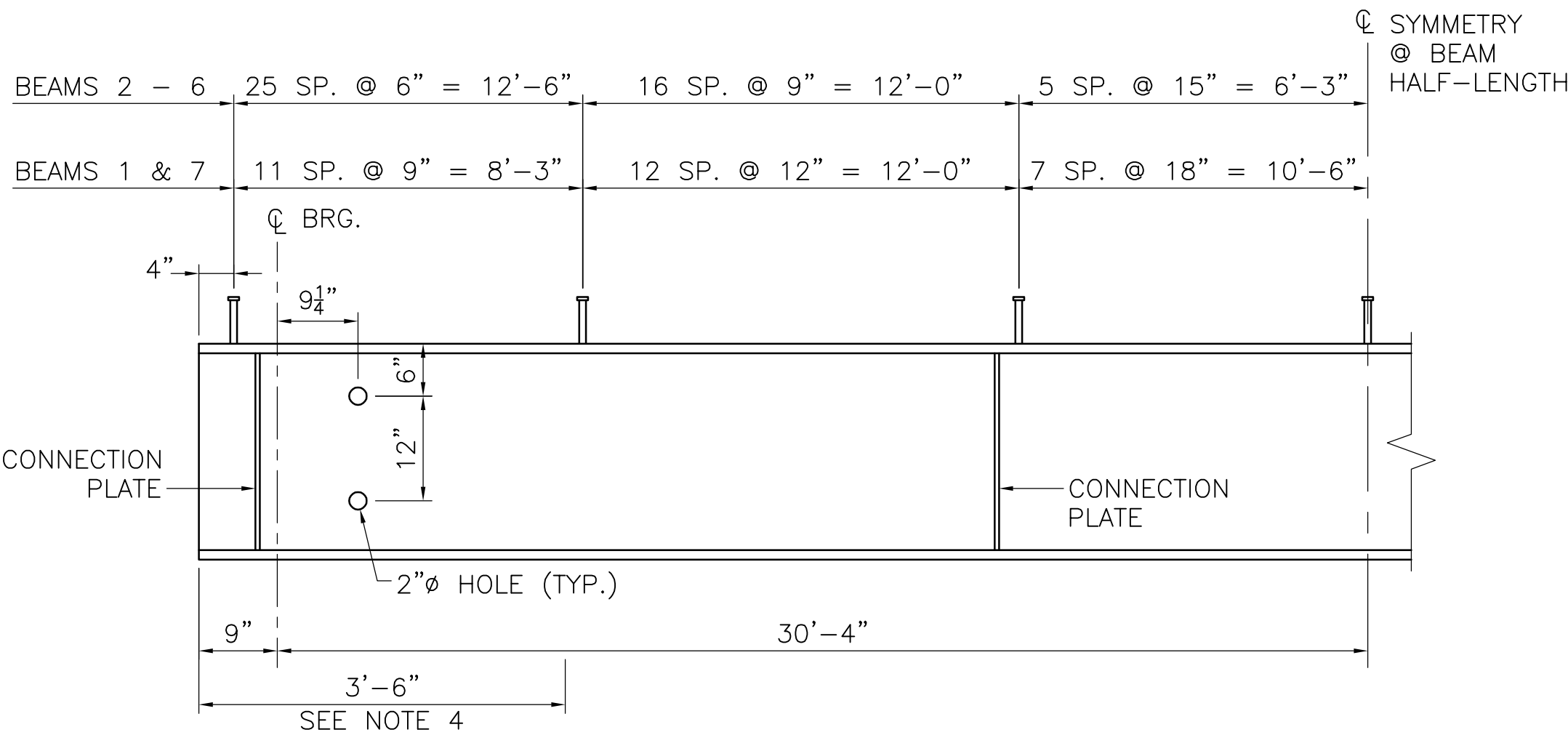
SOLE PLATE DETAIL

SCALE: 3" = 1'-0"

BEARING NOTES:

- STEEL SOLE PLATE SHALL CONFORM TO AASHTO M 270 GRADE 36 AND SHALL BE HOT-DIP GALVANIZED.
- CENTER THE ELASTOMERIC PAD UNDER THE SOLE PLATE DURING PLACEMENT OF SUPERSTRUCTURE ON PROPOSED ABUTMENT CAPS.
- SUPERSTRUCTURE SHALL BE PLACED ON THE PROPOSED ABUTMENT CAPS WHEN THE AMBIENT TEMPERATURE IS BETWEEN 50 °F AND 77 °F. IF THE SUPERSTRUCTURE IS PLACED AT OTHER AMBIENT TEMPERATURES, IT SHALL BE JACKED AND THE ELASTOMERIC BEARINGS RECENTERED WHEN THE TEMPERATURE RETURNS TO THAT RANGE.

CAMBER TABLE													
BEAM NO.		CL BRG. ABUT.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG. ABUT.	
1 & 7	STEEL DL DEFLECTION	0.00"	0.11"	0.21"	0.29"	0.34"	0.35"	0.34"	0.29"	0.21"	0.11"	0.00"	
	CONC. DL DEFLECTION	0.00"	0.48"	0.91"	1.24"	1.46"	1.53"	1.46"	1.24"	0.91"	0.48"	0.00"	
	S.D.L. DEFLECTION	0.00"	0.26"	0.49"	0.67"	0.78"	0.82"	0.78"	0.67"	0.49"	0.26"	0.00"	
	ADDITIONAL CAMBER	0.00"	0.24"	0.45"	0.62"	0.72"	0.76"	0.72"	0.62"	0.45"	0.24"	0.00"	
	TOTAL CAMBER	0.00"	1.09"	2.06"	2.82"	3.30"	3.46"	3.30"	2.82"	2.06"	1.09"	0.00"	
2 - 6	STEEL DL DEFLECTION	0.00"	0.12"	0.22"	0.30"	0.36"	0.37"	0.36"	0.30"	0.22"	0.12"	0.00"	
	CONC. DL DEFLECTION	0.00"	0.57"	1.08"	1.48"	1.74"	1.82"	1.74"	1.48"	1.08"	0.57"	0.00"	
	S.D.L. DEFLECTION	0.00"	0.12"	0.23"	0.32"	0.37"	0.39"	0.37"	0.32"	0.23"	0.12"	0.00"	
	ADDITIONAL CAMBER	0.00"	0.24"	0.45"	0.62"	0.72"	0.76"	0.72"	0.62"	0.45"	0.24"	0.00"	
	TOTAL CAMBER	0.00"	1.05"	1.98"	2.72"	3.19"	3.34"	3.19"	2.72"	1.98"	1.05"	0.00"	

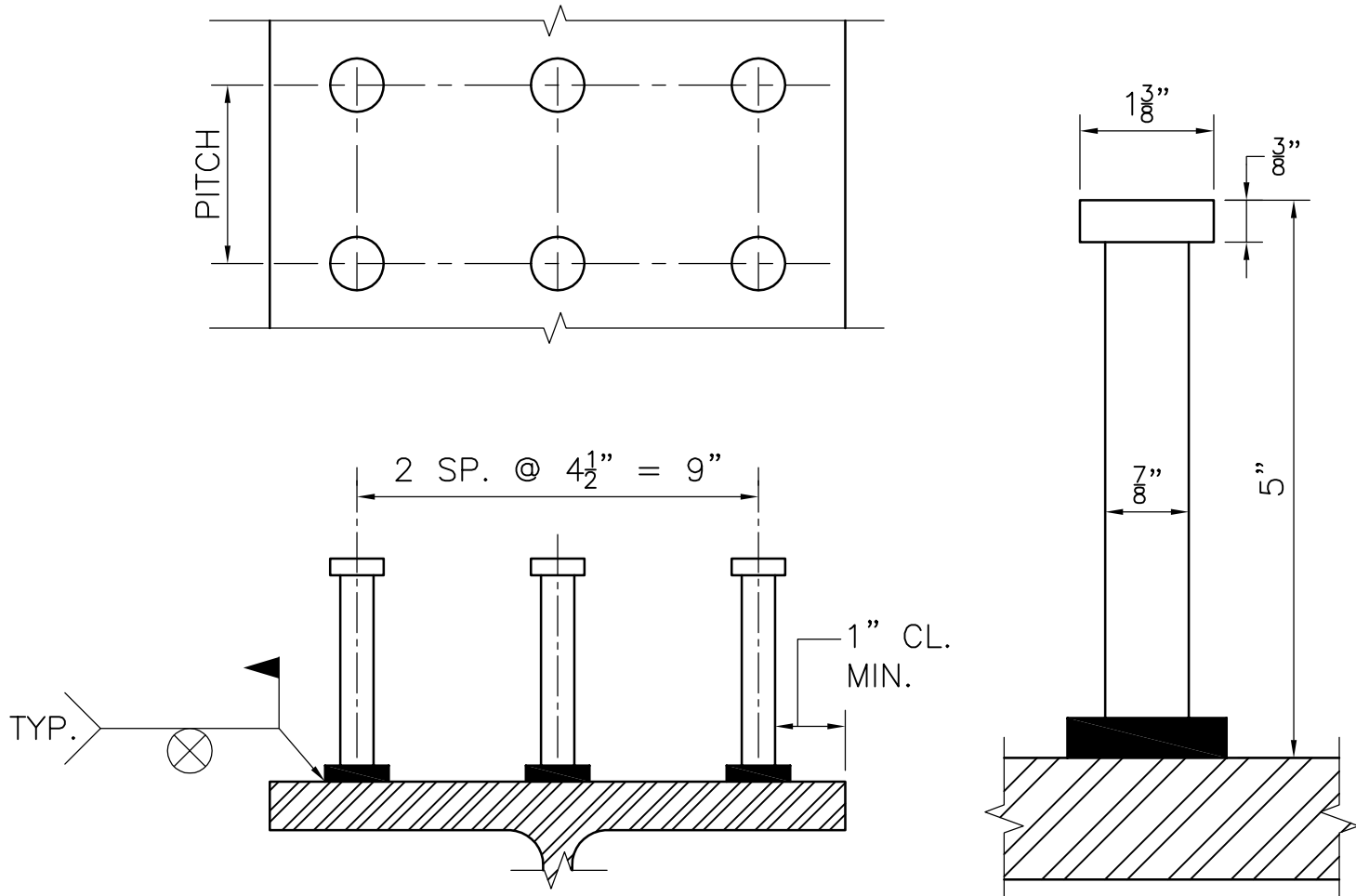


NOTES:

- ALL INTERMEDIATE CONNECTION PLATES SHALL BE PERPENDICULAR TO THE BEAM FLANGES.
- ALL CONNECTION PLATES AT BEARING LOCATIONS SHALL BE PLUMB.
- ENDS OF BEAMS SHALL BE FABRICATED SO THAT UNDER FULL DEAD LOAD THE ENDS WILL BE PLUMB.
- THE UNPAINTED WEATHERING STEEL BEAMS AND ATTACHED PLATES EMBEDDED IN THE END DIAPHRAGM AND WITHIN 12" OF THE FACE OF END DIAPHRAGM SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FINISH COAT COLOR SHALL MATCH COLOR CHIP NO. 30045 OF FEDERAL STANDARD 595B. THE STEEL DIAPHRAGM SHALL NOT BE PAINTED.

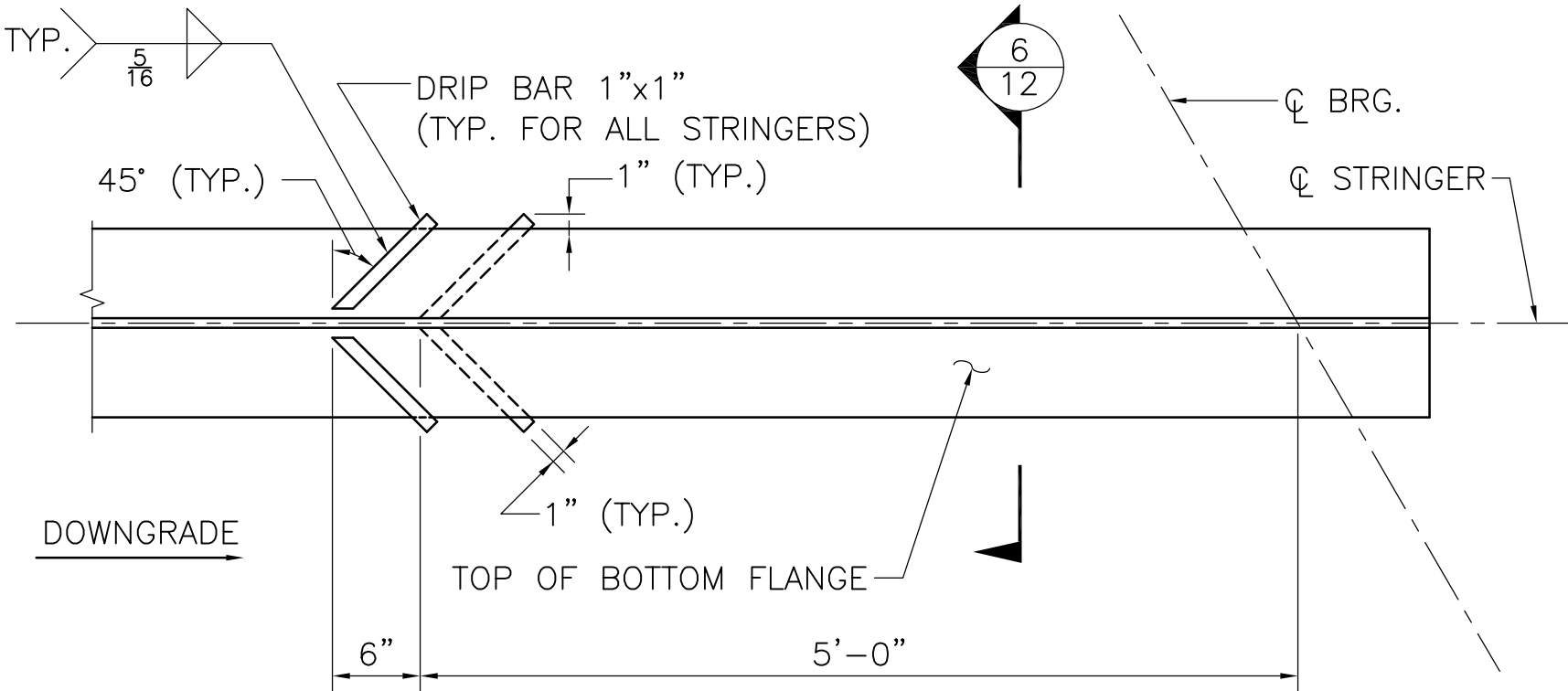
BEAM ELEVATION

NOT TO SCALE



STUD SHEAR CONNECTORS

NOT TO SCALE

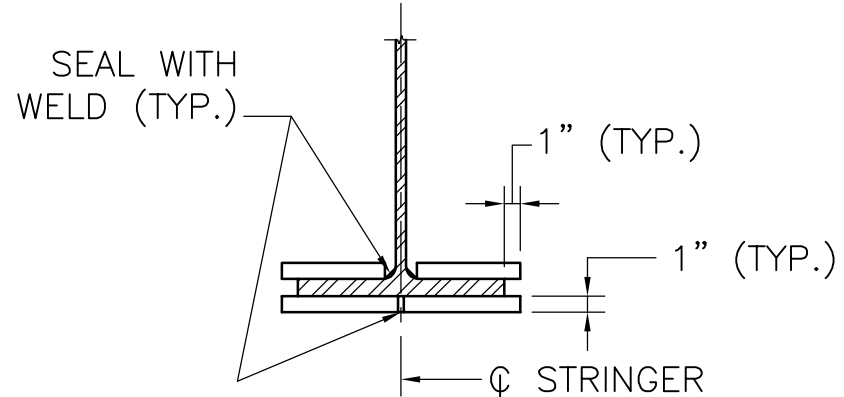


NOTE:

DRIP BARS SHALL BE LOCATED ON THE LOW END OF ALL STRINGERS

DRIP BAR DETAIL

SCALE: 1" = 1'-0"

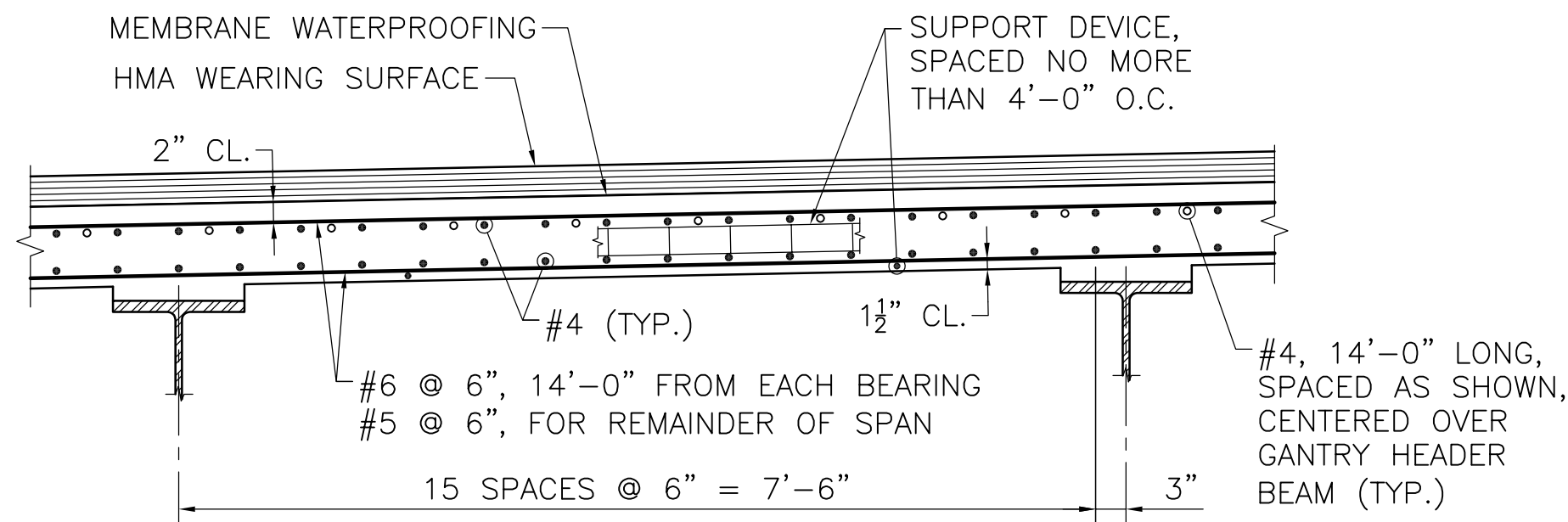


SECTION 6

SCALE: 1" = 1'-0"

	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
	USE ONLY PRINTS OF LATEST DATE

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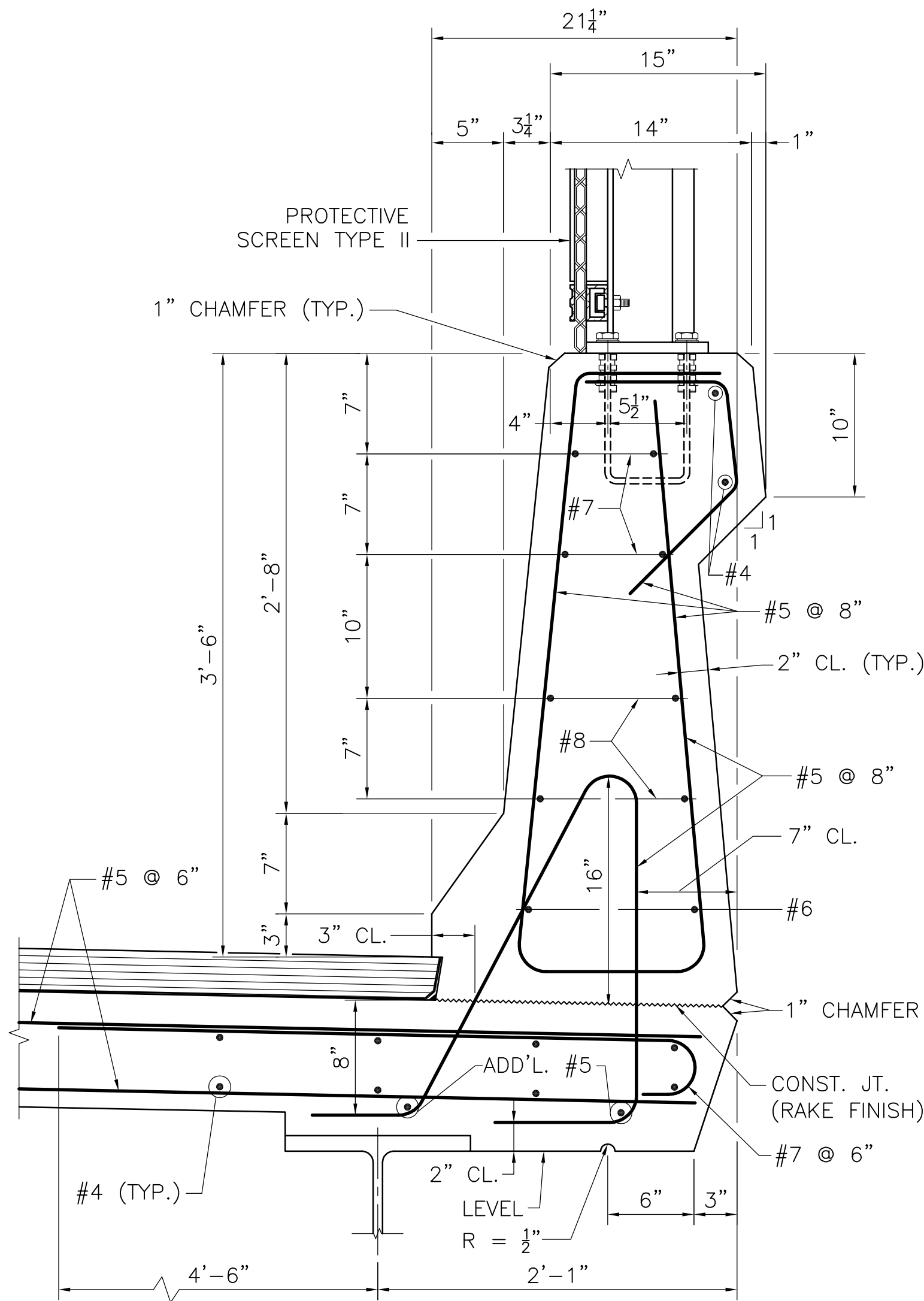


NOTES:

- BRIDGE DECK SLAB SHALL BE 4000 PSI, 3/4 IN, 585 HP CEMENT CONCRETE.
- LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE C OF CONSTRUCTION. TRANSVERSE (PRIMARY) REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE C OF CONSTRUCTION.
- ALL REINFORCEMENT AND SUPPORT DEVICES SHALL BE EPOXY COATED.
- THE FINISHED SURFACE OF BRIDGE DECK SHALL BE SMOOTH AND WITHOUT ANY PROJECTIONS THAT COULD PUNCTURE THE MEMBRANE WATERPROOFING OR DEPRESSIONS THAT COULD RETAIN WATER.

TYPICAL DECK REINFORCEMENT

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



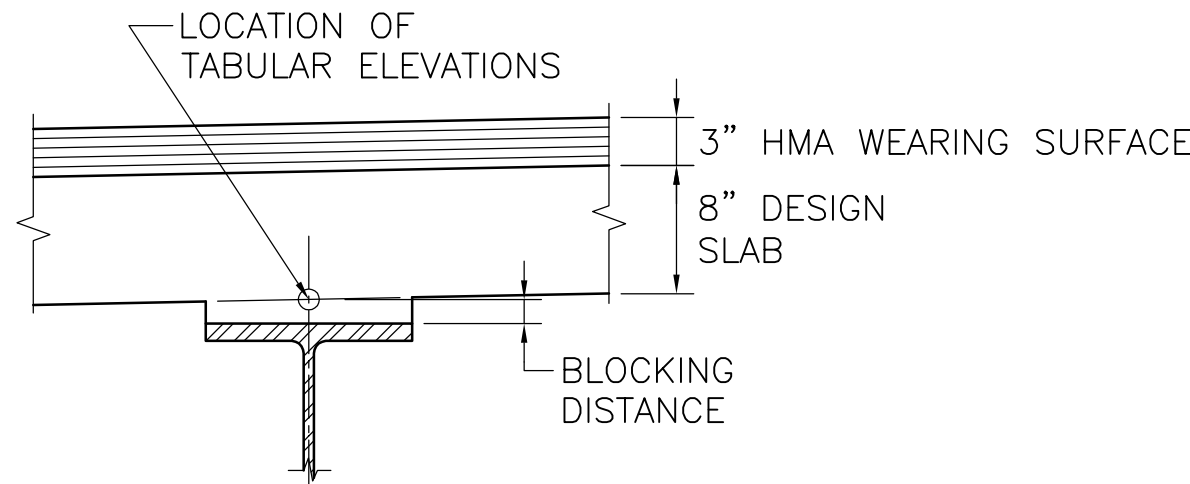
SECTION THRU MODIFIED CF-PL3 BARRIER

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

BEAM NO.	TOP OF FORM ELEVATIONS FOR DECK SLAB PRIOR TO PLACEMENT OF CONCRETE									
	INCREASING STATIONS →									
	C BRG.	1/8 PT.	1/4 PT.	3/8 PT.	1/2 PT.	5/8 PT.	3/4 PT.	7/8 PT.	C BRG.	
1	1129.56	1129.85	1130.13	1130.38	1130.61	1130.81	1130.98	1131.13	1131.26	
2	1129.85	1130.13	1130.40	1130.65	1130.88	1131.08	1131.25	1131.40	1131.55	
3	1130.13	1130.41	1130.68	1130.94	1131.16	1131.36	1131.53	1131.69	1131.83	
4	1130.41	1130.69	1130.96	1131.22	1131.44	1131.64	1131.81	1131.97	1132.11	
5	1130.38	1130.66	1130.93	1131.19	1131.41	1131.61	1131.78	1131.94	1132.08	
6	1130.35	1130.63	1130.91	1131.16	1131.38	1131.58	1131.75	1131.91	1132.05	
7	1130.32	1130.61	1130.88	1131.14	1131.37	1131.56	1131.73	1131.89	1132.02	

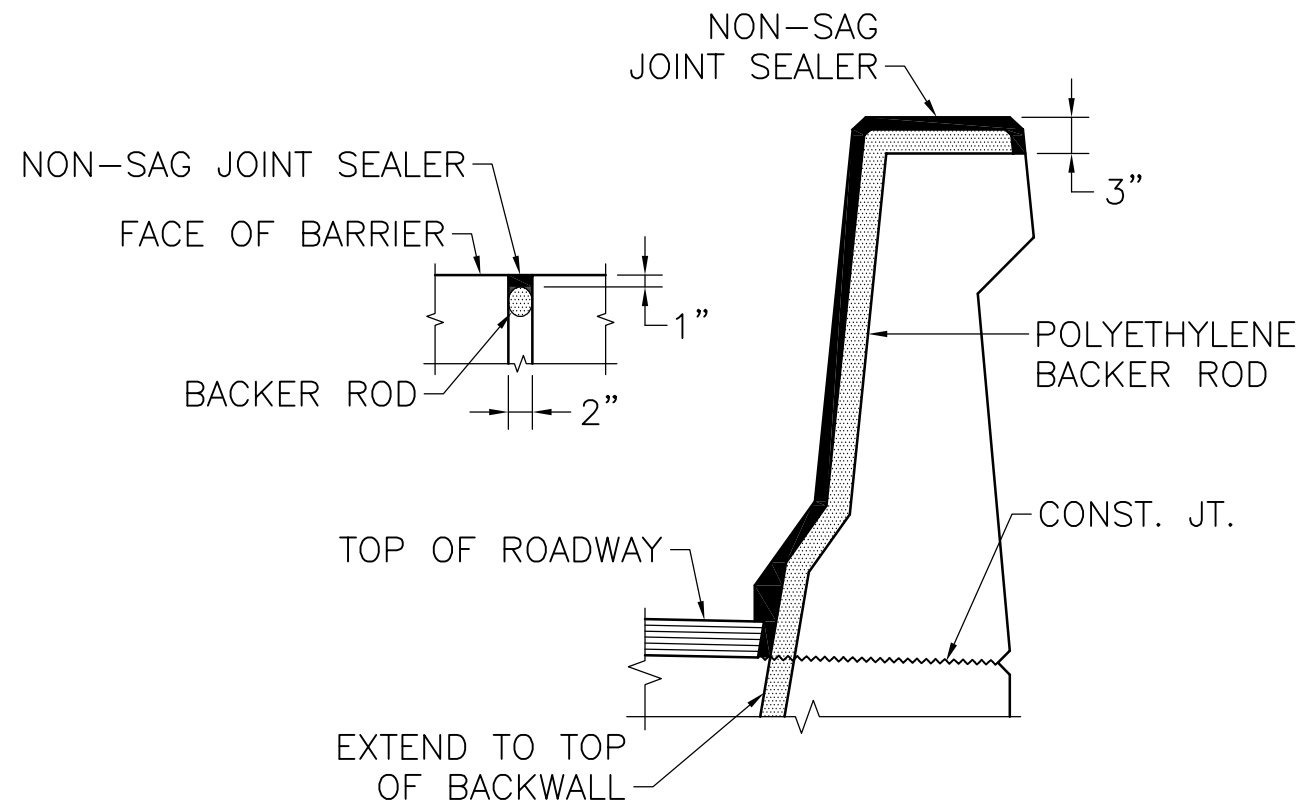
NOTES:

- AFTER THE BEAMS ARE ERECTED BUT BEFORE THE FORMS ARE BUILT, ELEVATIONS ON TOP OF THE FLANGE OF THE BEAMS ARE TO BE OBTAINED AT THE POINTS INDICATED IN THE TABLE. THE DIFFERENCE BETWEEN THE ELEVATIONS OBTAINED AND THOSE SHOWN IN THE TABLE GIVES THE ACTUAL BLOCKING DISTANCE FROM THE TOP OF BEAM TO THE BOTTOM OF THE SLAB AT CENTER LINE OF BEAM.
- THE ELEVATIONS IN THE TABLE ARE BASED ON THE FINAL BEARING SEAT ELEVATIONS. THE ELEVATIONS SHALL BE ADJUSTED AS NECESSARY BASED ON THE BEARING ELEVATIONS ON TOP OF THE TEMPORARY SHORING TOWERS.



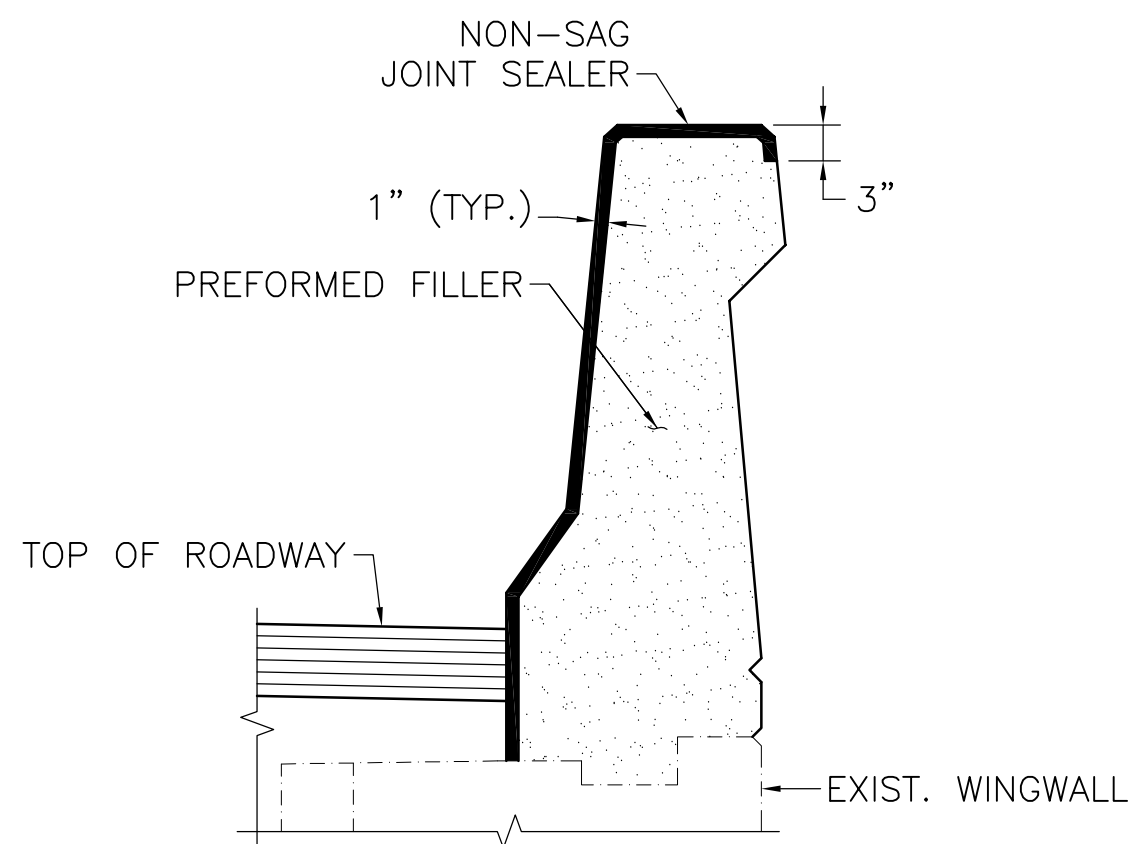
HAUNCH DETAIL

NOT TO SCALE



END OF DECK EXP. JOINT DETAILS

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

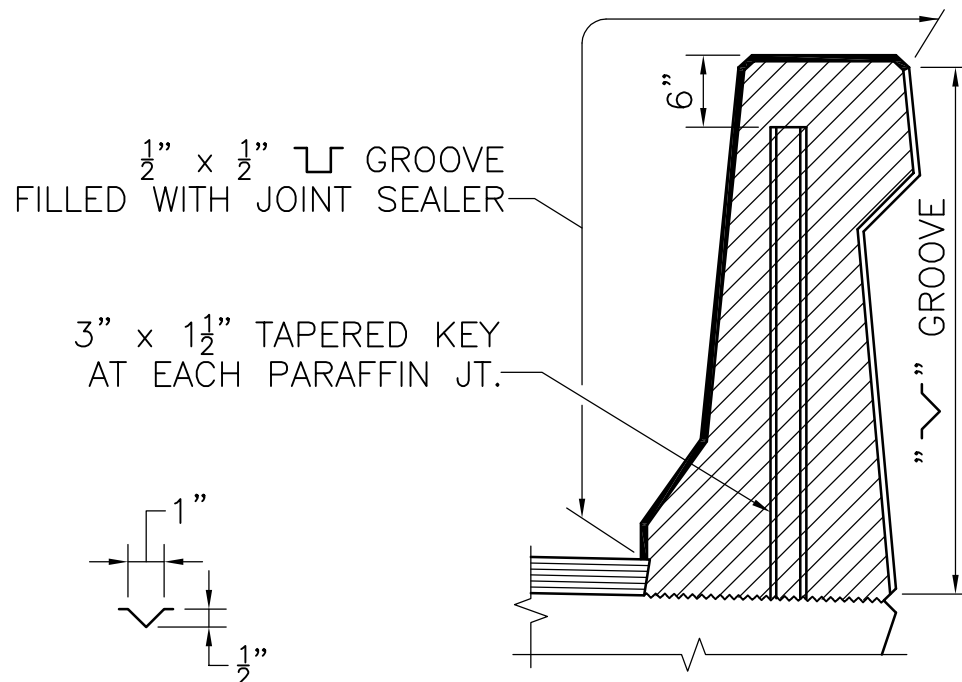


NOTES:

- LONGITUDINAL REINFORCEMENT SHALL END 2" CLEAR OF EXPANSION JOINT.
- PREFORMED FILLER SHALL BE IN ACCORDANCE WITH M9.14.0.
- FILLER MATERIAL SHALL BE FASTENED SECURELY TO ONE SIDE OF JOINT.

WINGWALL EXP. JOINT DETAIL

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



NOTES:

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

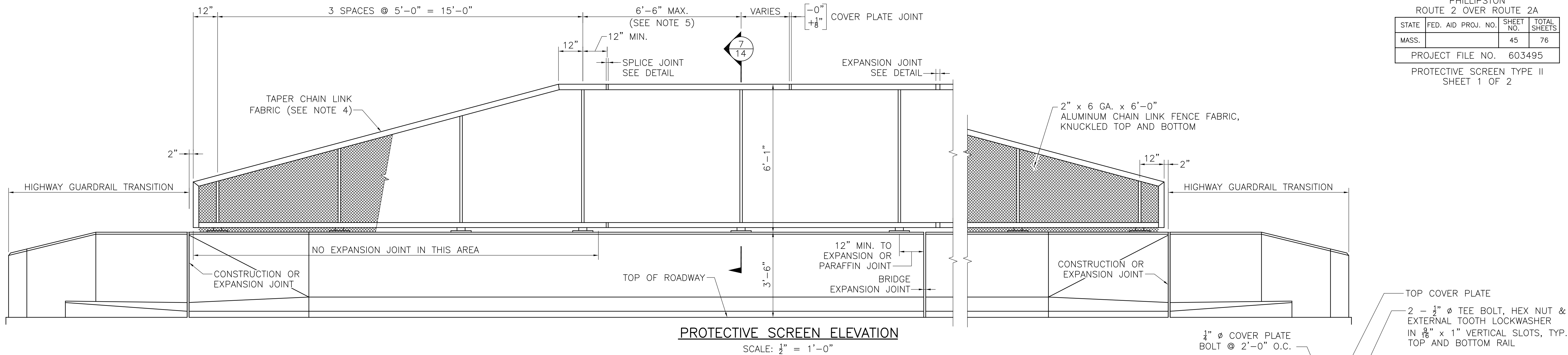
PARAFFIN JOINT DETAILS

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

ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

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PHILLIPSTON			
ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		45	76
PROJECT FILE NO. 603495			
PROTECTIVE SCREEN TYPE II			
SHEET 1 OF 2			



GENERAL NOTES:

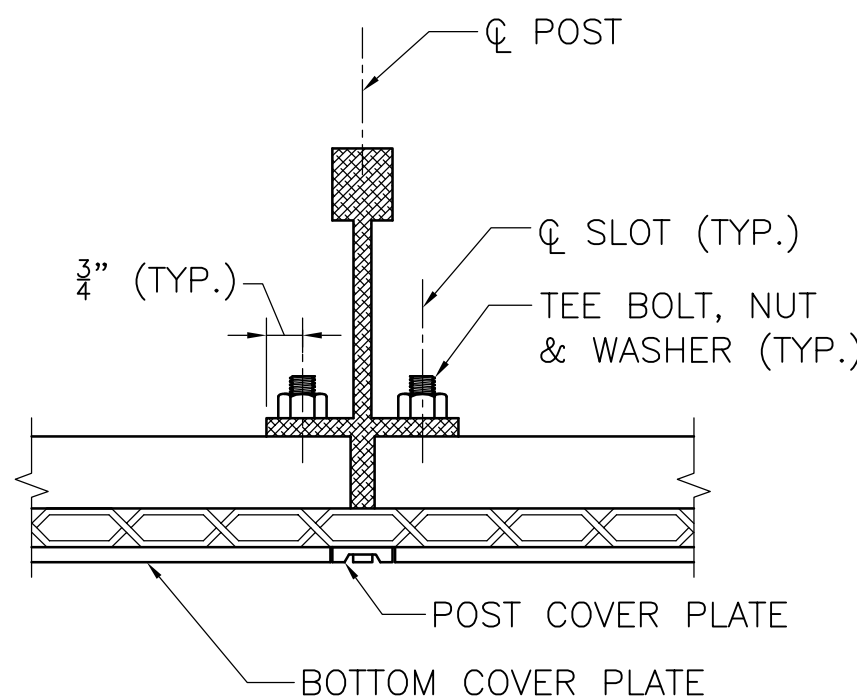
- RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR POSTS, IF POSSIBLE.
- RAILS SHALL HAVE AN EXPANSION JOINT IN THE PANEL OVER A BRIDGE EXPANSION JOINT AND AT 30 FOOT MAXIMUM SPACING ELSEWHERE.
- BOTTOM OF POST BASE PLATE TO BE SET ON A $\frac{1}{8}"$ MOLDED FABRIC BEARING PAD (M9.16.2). THE THICKNESS OF THE PAD SHALL BE IGNORED BY THE DETAILER.
- THE CHAIN LINK FABRIC SHALL BE SECURED BY KNUCKLING TOGETHER THE CUT ENDS OF THE FABRIC WIRE IN A MANNER SIMILAR TO THE ORIGINALLY MANUFACTURED END.
- POST SPACING SHALL BE UNIFORM BETWEEN TAPERED ENDS UNLESS SHOWN OTHERWISE.
- SET POSTS PERPENDICULAR TO GRADE FOR GRADES UP TO 1.5%. SET POSTS PLUMB FOR GRADES GREATER THEN 1.5%.

FINISHES:

- POSTS, RAILS, COVER PLATES AND SPLICE PLATES SHALL RECEIVE A DARK BRONZE ANODIZED FINISH.
- CHAIN LINK FABRIC SHALL RECEIVE A 4 ± 1 MIL POLYESTER POWDER COAT FINISH. THE COLOR SHALL BE DARK BRONZE TO MATCH COLOR OF ANODIZED ALUMINUM FRAMEWORK.
- #17 SELF TAPPING SCREWS AND $\frac{1}{4}"$ ϕ COVER PLATE BOLTS TO BE COLORED TO MATCH THE ANODIZED EXTRUSIONS.

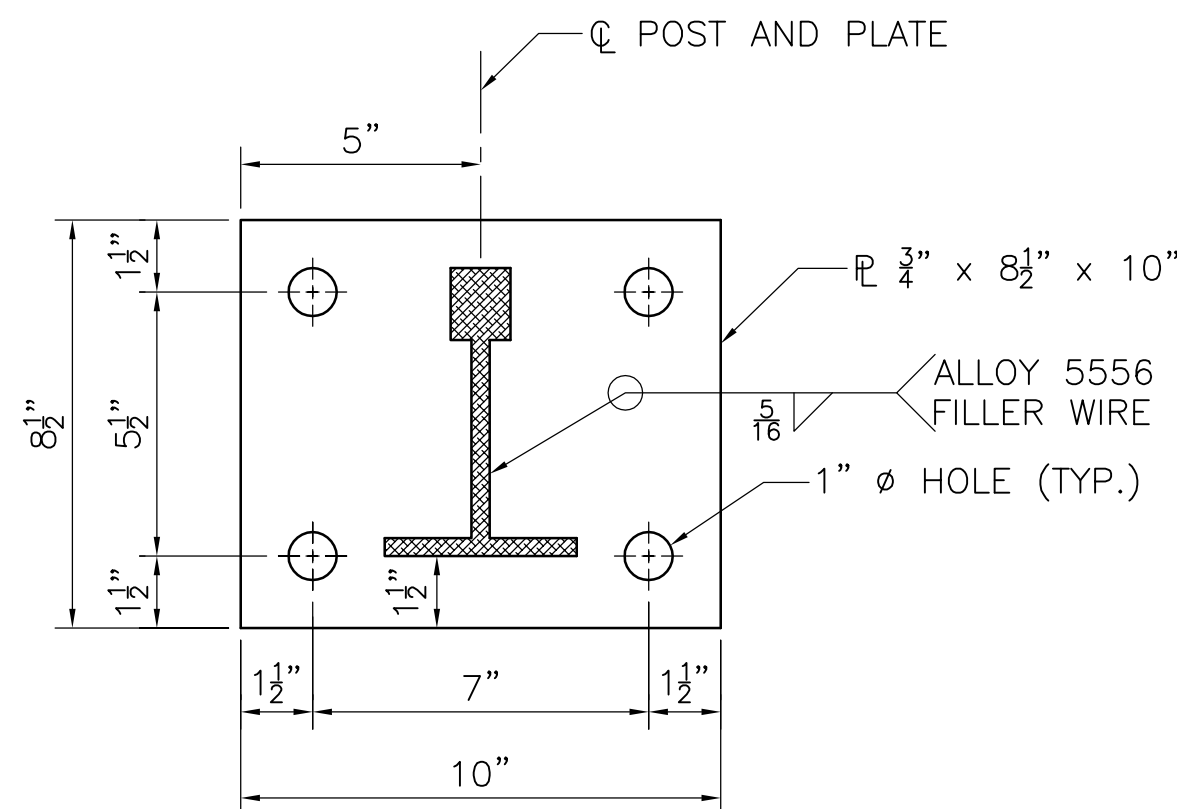
MATERIALS:

- EXTRUSIONS & PLATES _____ ASTM B 221, ALLOY 6061-T6
- CHAIN LINK FABRIC _____ AASHTO M 181 TYPE III (ALLOY 6061-T89 OR T94)
- SELF TAPPING SCREWS _____ TYPE 304 STAINLESS STEEL WITH $\frac{1}{4}"$ THICK EPDM (ETHYLENE PROPYLENE DIENE MONOMER) WASHERS
- ANCHOR BOLTS _____ AASHTO M 164 GALVANIZED (ROTATION CAPACITY TEST NOT REQUIRED)
- TEE BOLTS _____ ASTM A 307 GALVANIZED OR TYPE 304 STAINLESS STEEL
- COVER PLATE BOLTS _____ TYPE 304 STAINLESS STEEL WITH OVERSIZED STAINLESS WASHER AND STAINLESS NUT WITH NYLON INSERT



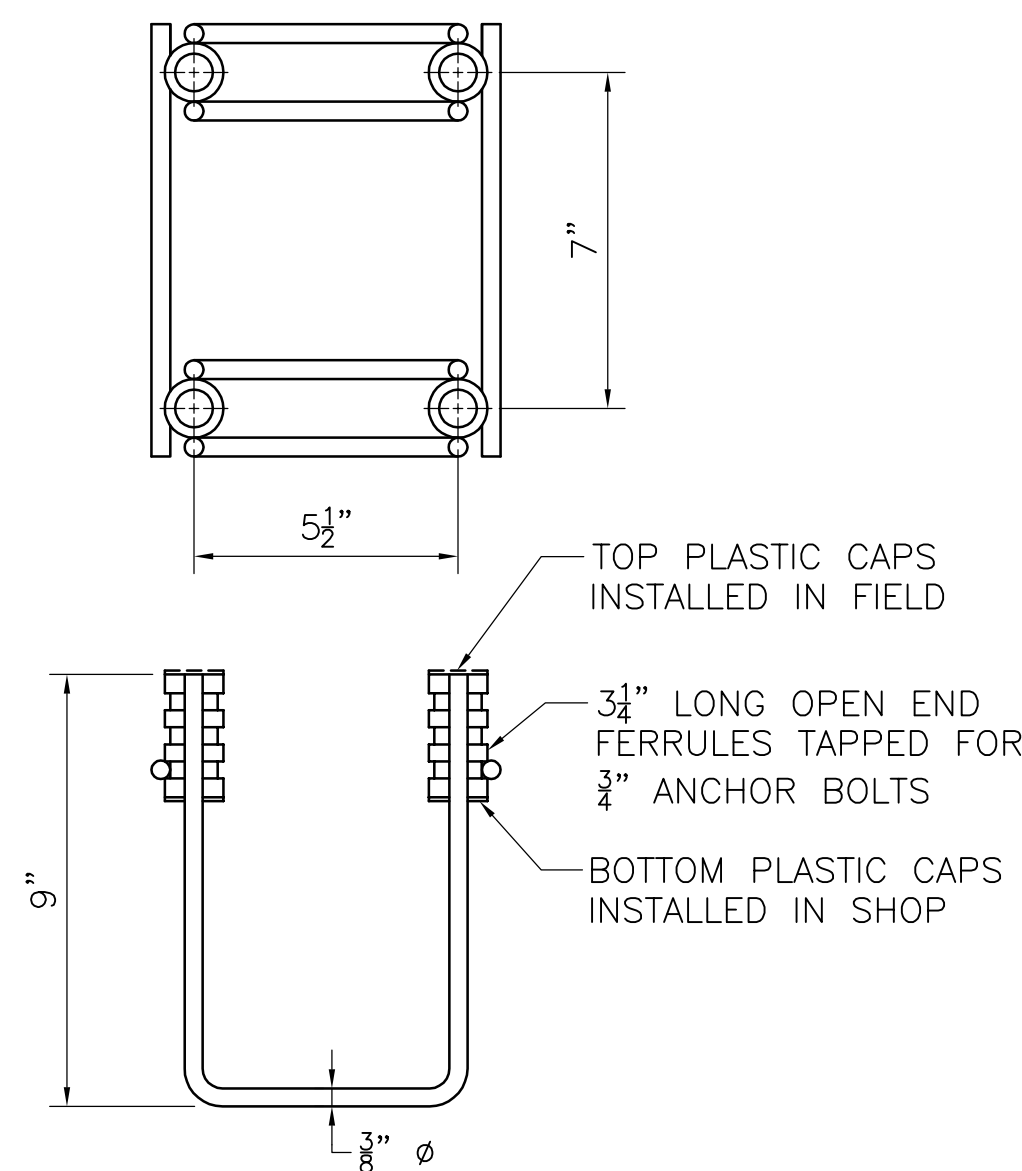
SECTION 8

SCALE: 3" = 1'-0"



BASE PLATE DETAIL

SCALE: 3" = 1'-0"

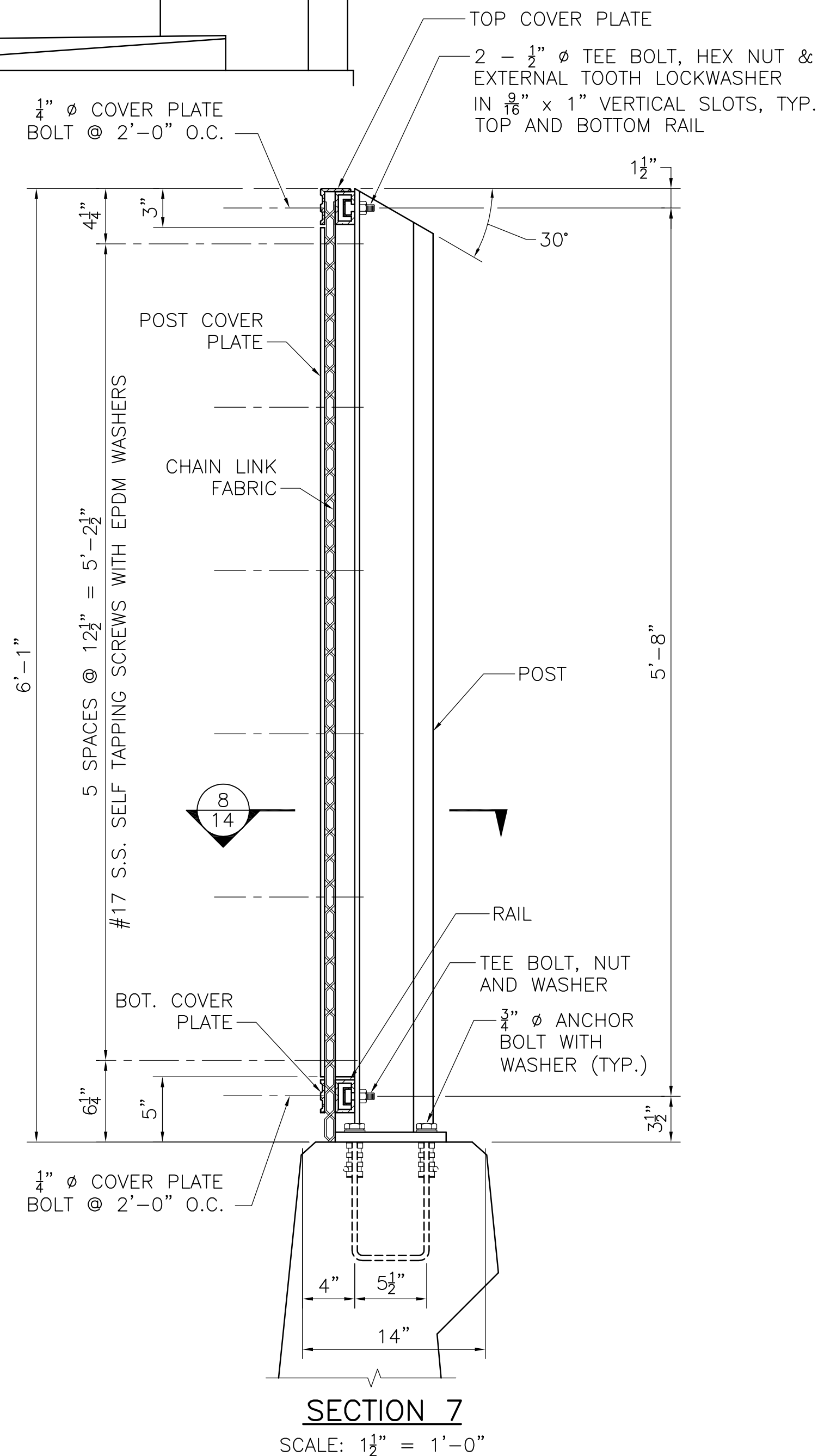


NOTE:

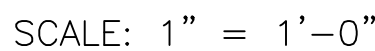
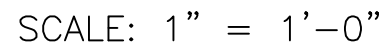
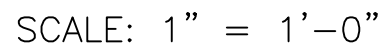
GALVANIZED OR ELECTROPLATE FINISH.

ANCHOR CAGE

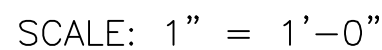
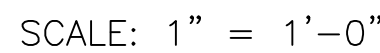
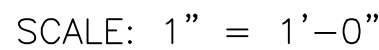
SCALE: 3" = 1'-0"



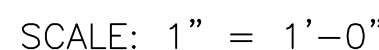
ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	



SCALE: 1" = 1'-0"

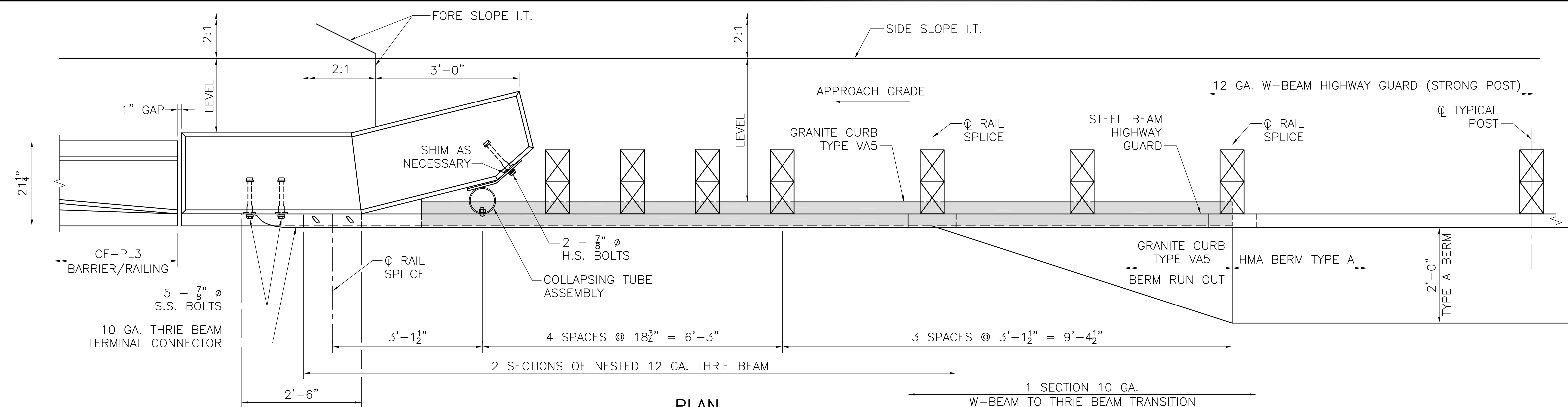


1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING AN NOMINAL SHEAR RESISTANCE OF 20 KIPS PER $\frac{7}{8}$ " ϕ S.S. BOLT. S.S. BOLTS SHALL BE $\frac{7}{8}$ " ϕ x $1\frac{1}{2}$ " LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR $\frac{7}{8}$ " S.S. BOLTS SHALL BE CAST-IN-PLACE AND GALVANIZED.
2. TOP OF GUARDRAIL TRANSITION AND TERMINAL CONNECTOR INSERT GROUP SHALL BE SLOPED TO MATCH THE PROFILE 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 HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, $\frac{3}{4}$ ", 685 HP CEMENT CONCRETE.

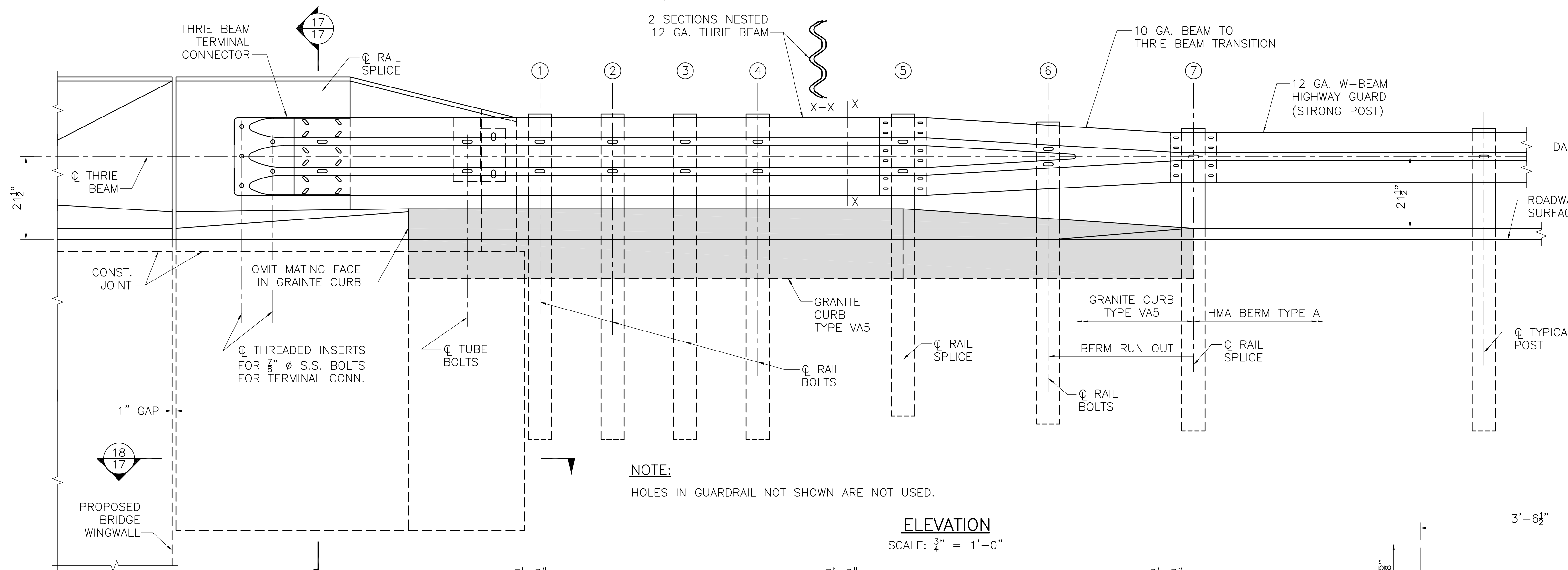


SHEET 16 OF 18 SHEETS BRIDGE NO. P-09-004 (19B)

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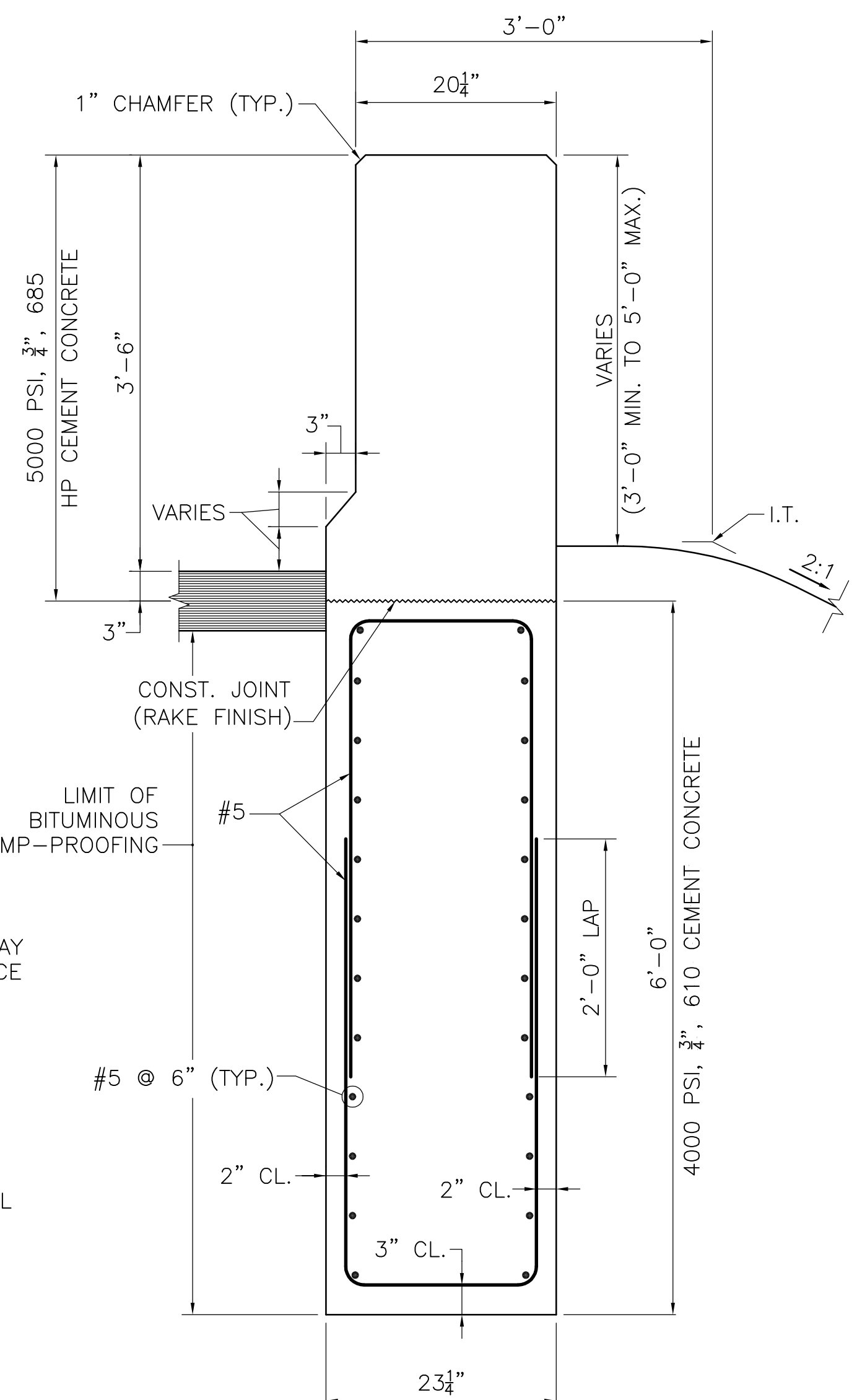


PLAN
SCALE: $\frac{3}{4}$ " = 1'-0"

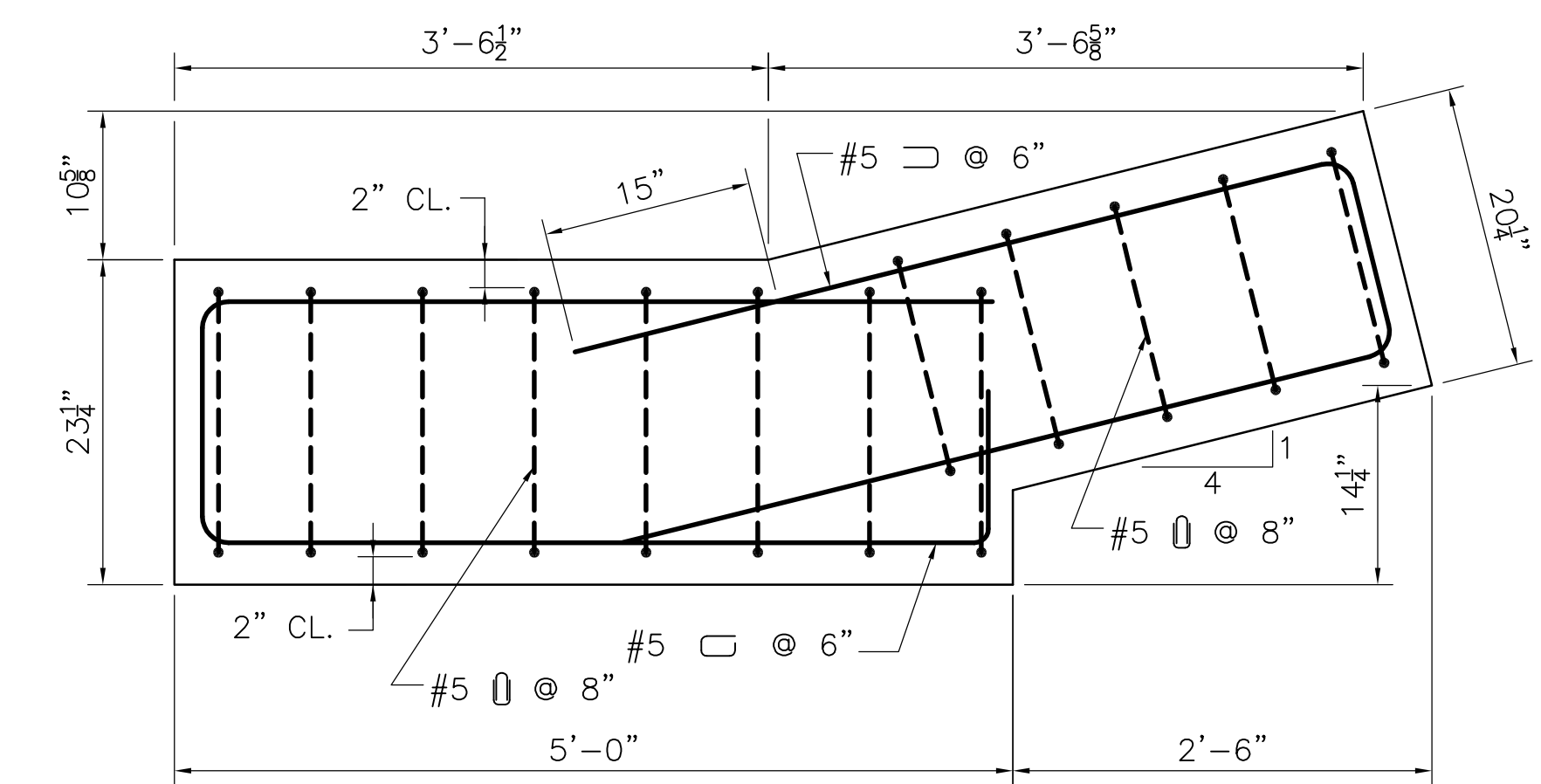


NOTE:
HOLES IN GUARDRAIL NOT SHOWN ARE NOT USED.

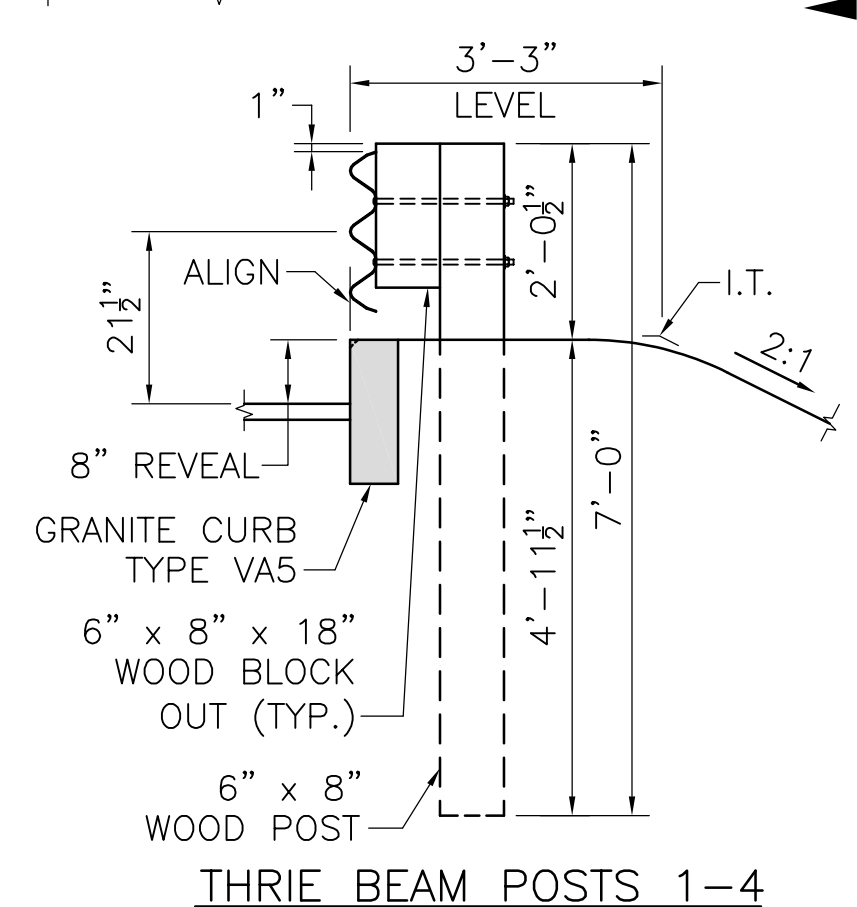
ELEVATION
SCALE: $\frac{3}{4}$ " = 1'-0"



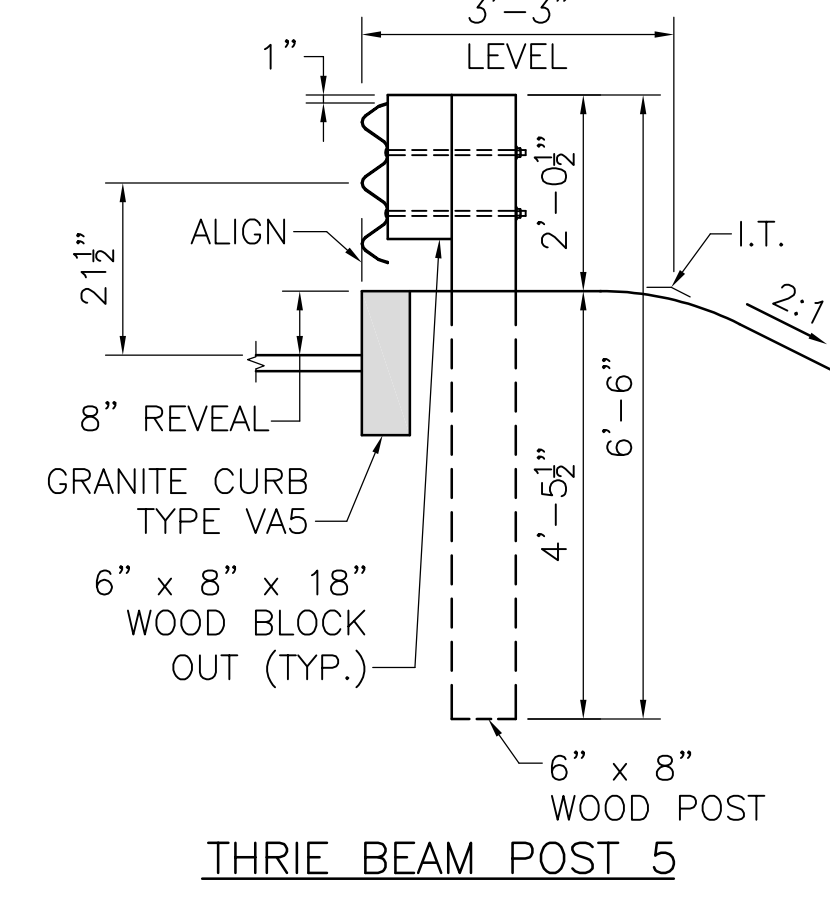
SECTION 17
SCALE: 1" = 1'-0"



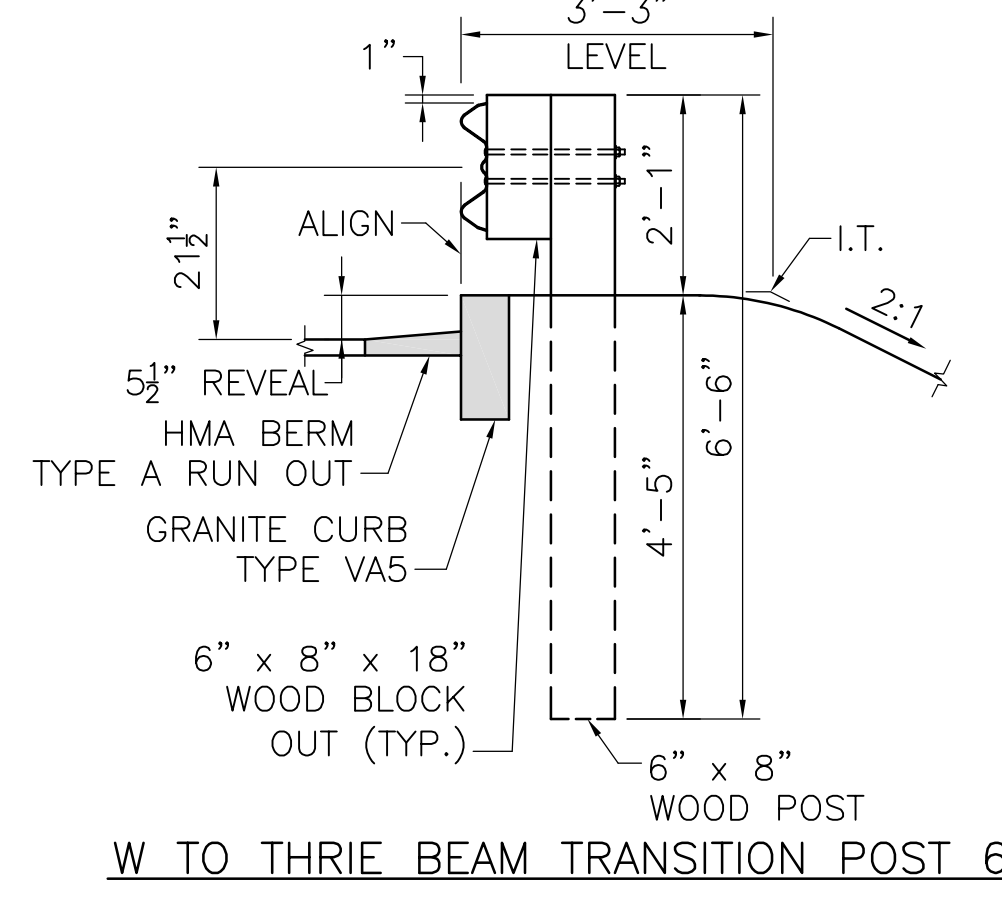
SECTION 18
SCALE: 1" = 1'-0"



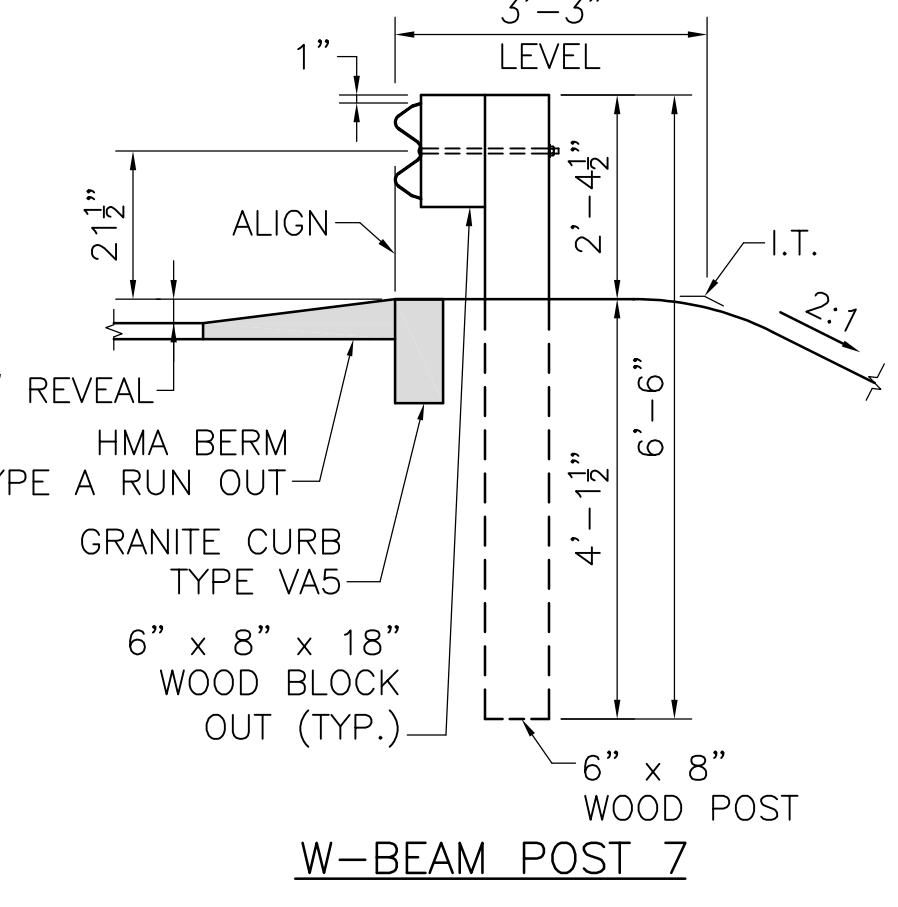
THRIE BEAM POSTS 1-4



THRIE BEAM POST 5



W TO THRIE BEAM TRANSITION POST 6

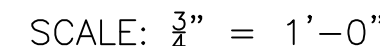
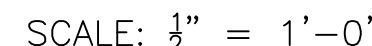
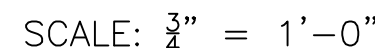


W-BEAM POST 7

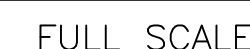
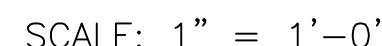
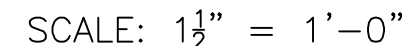
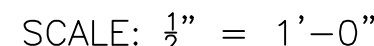
SECTIONS AT NUMBERED POSTS

SCALE: $\frac{1}{2}$ " = 1'-0"

ISSUED FOR CONSTRUCTION	
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

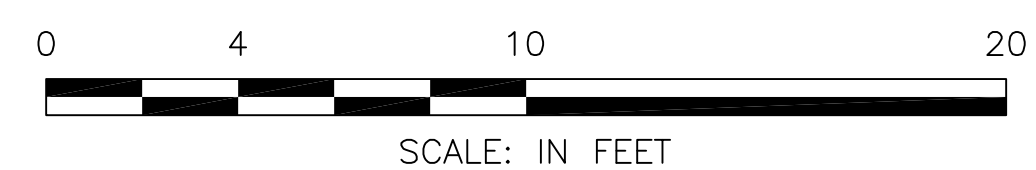
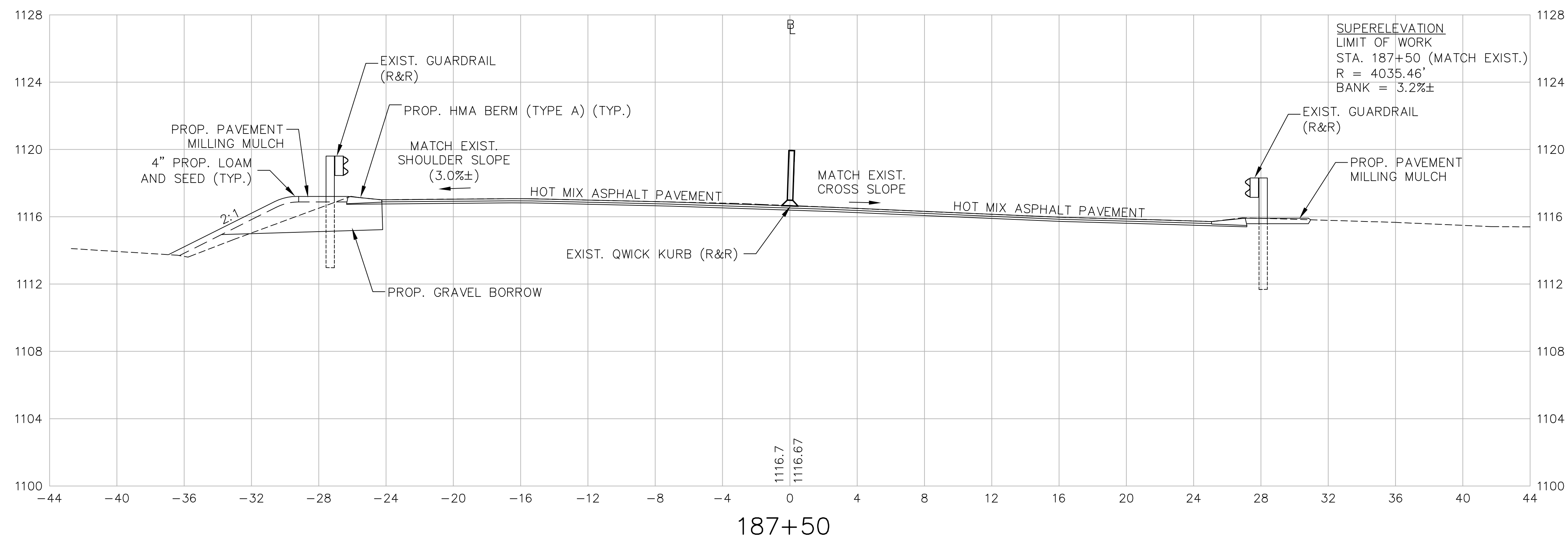


SCALE: $\frac{1}{8}" = 1'-0"$



SHEET 18 OF 18 SHEETS BRIDGE NO. P-09-004 (19B)

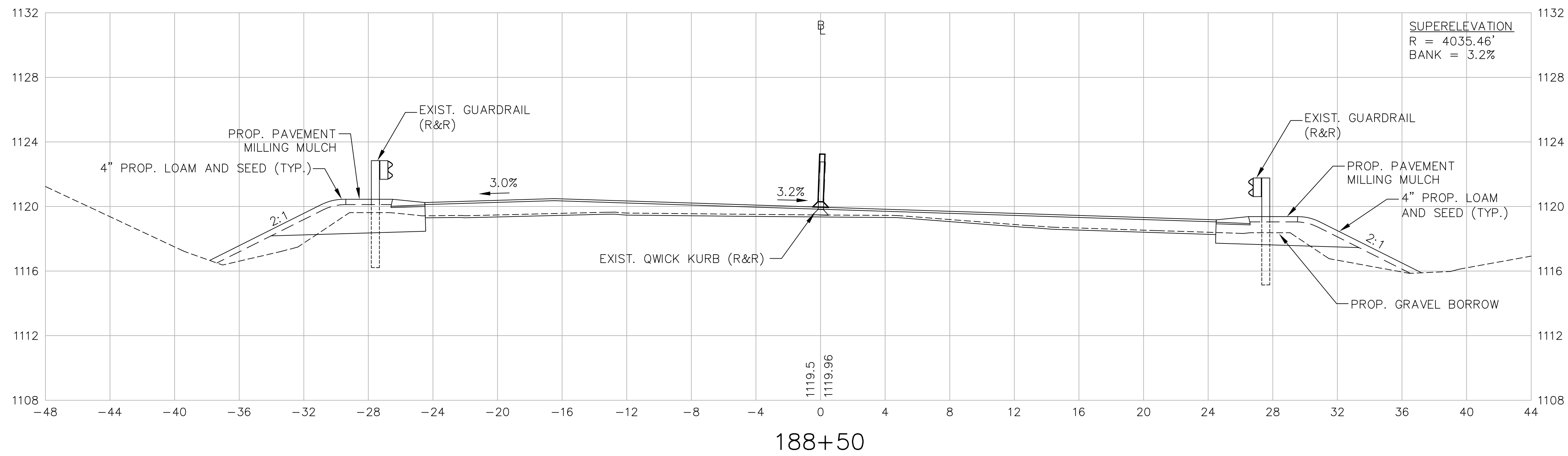
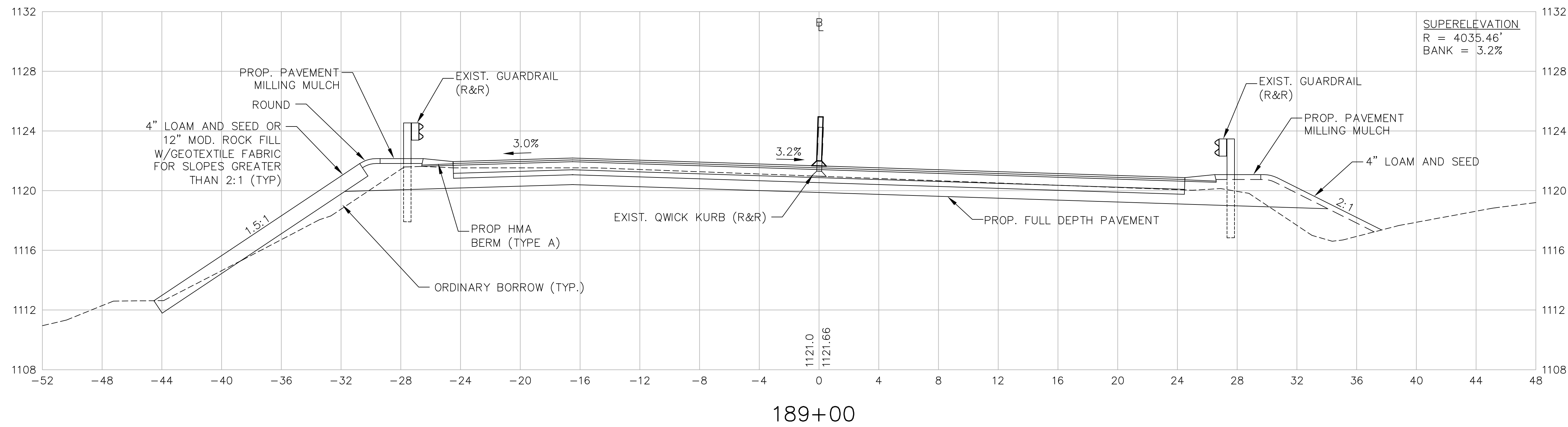
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	50	76
PROJECT FILE NO.		603495	



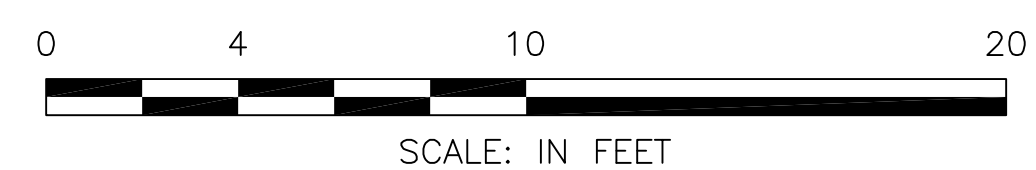
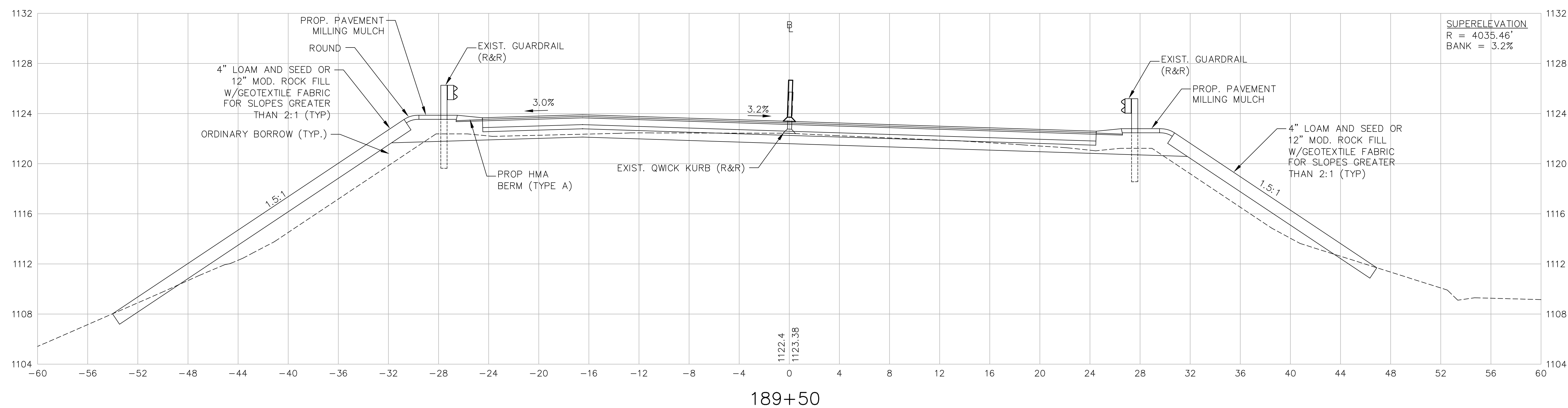
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	51	76
PROJECT FILE NO.		603495	

CROSS SECTIONS
ROUTE 2



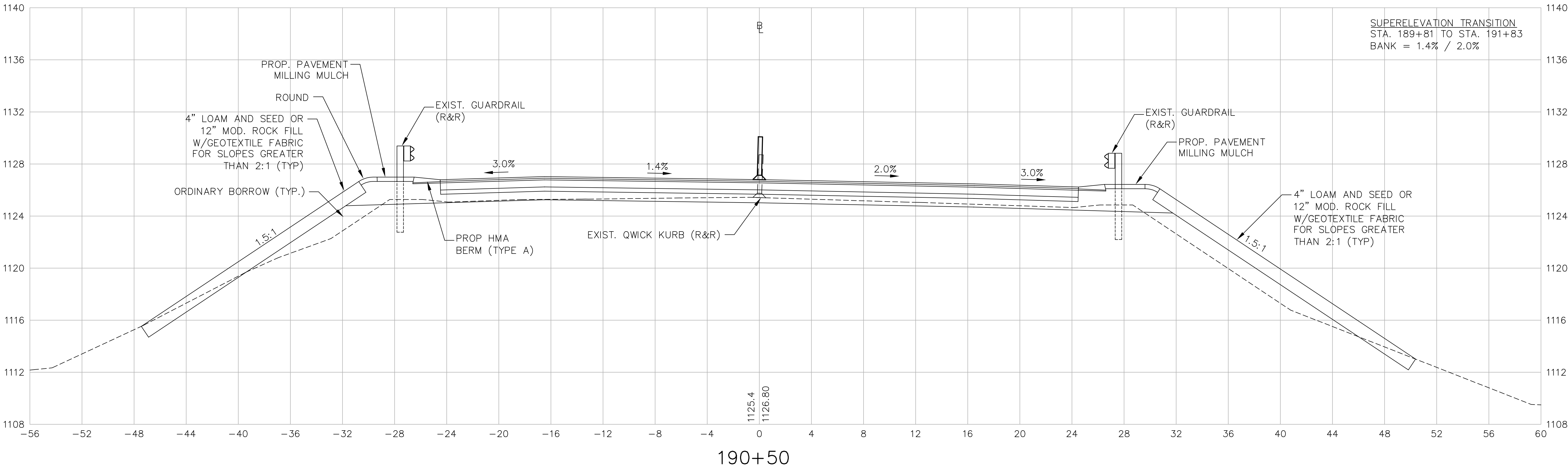
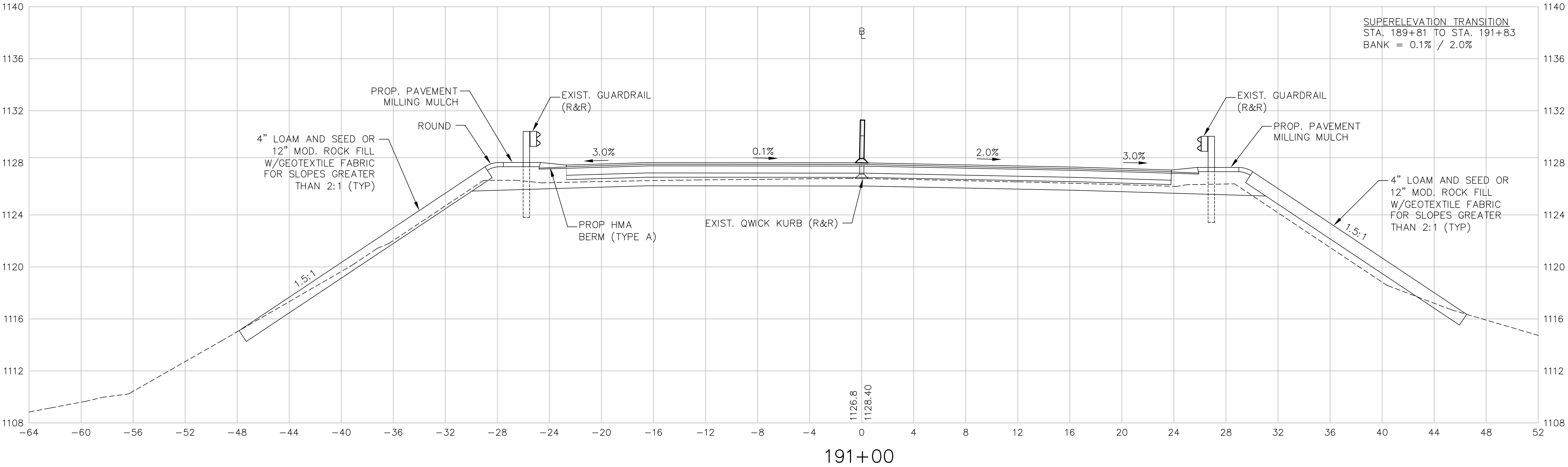
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	52	76
PROJECT FILE NO.		603495	



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	53	76
PROJECT FILE NO.		603495	

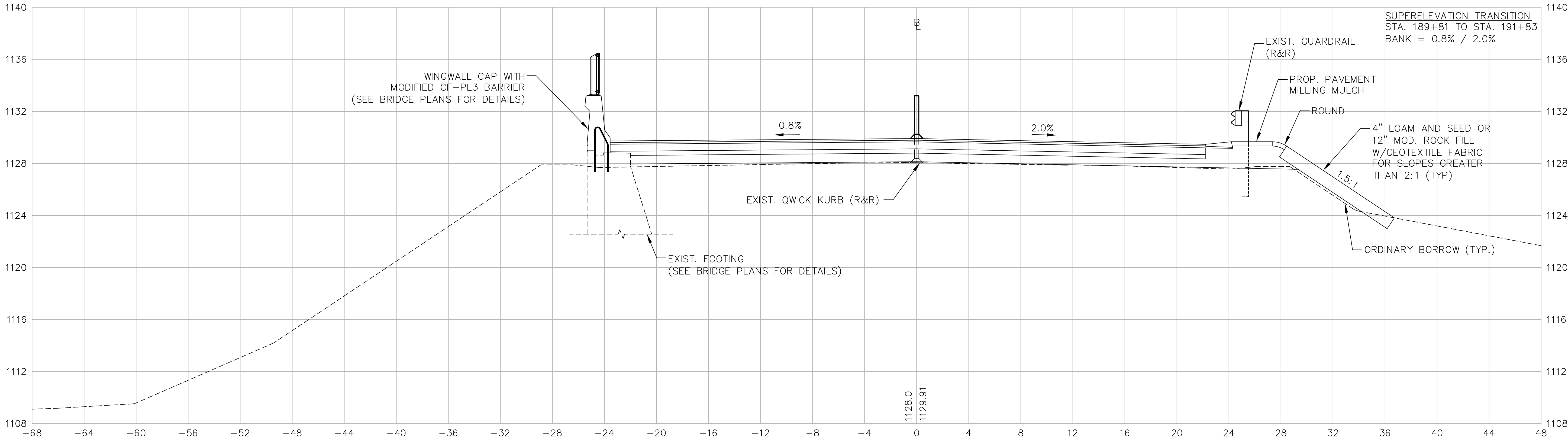
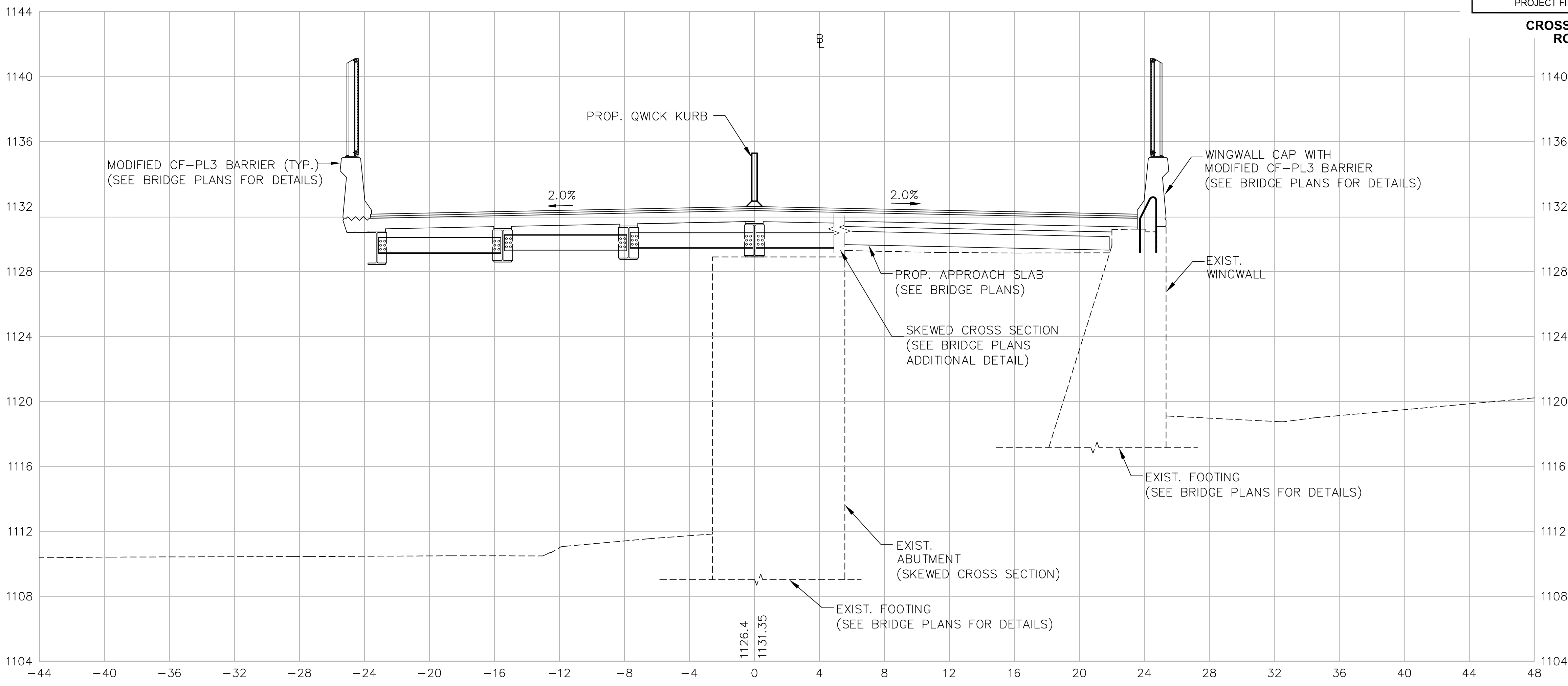
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	54	76
PROJECT FILE NO.		603495	

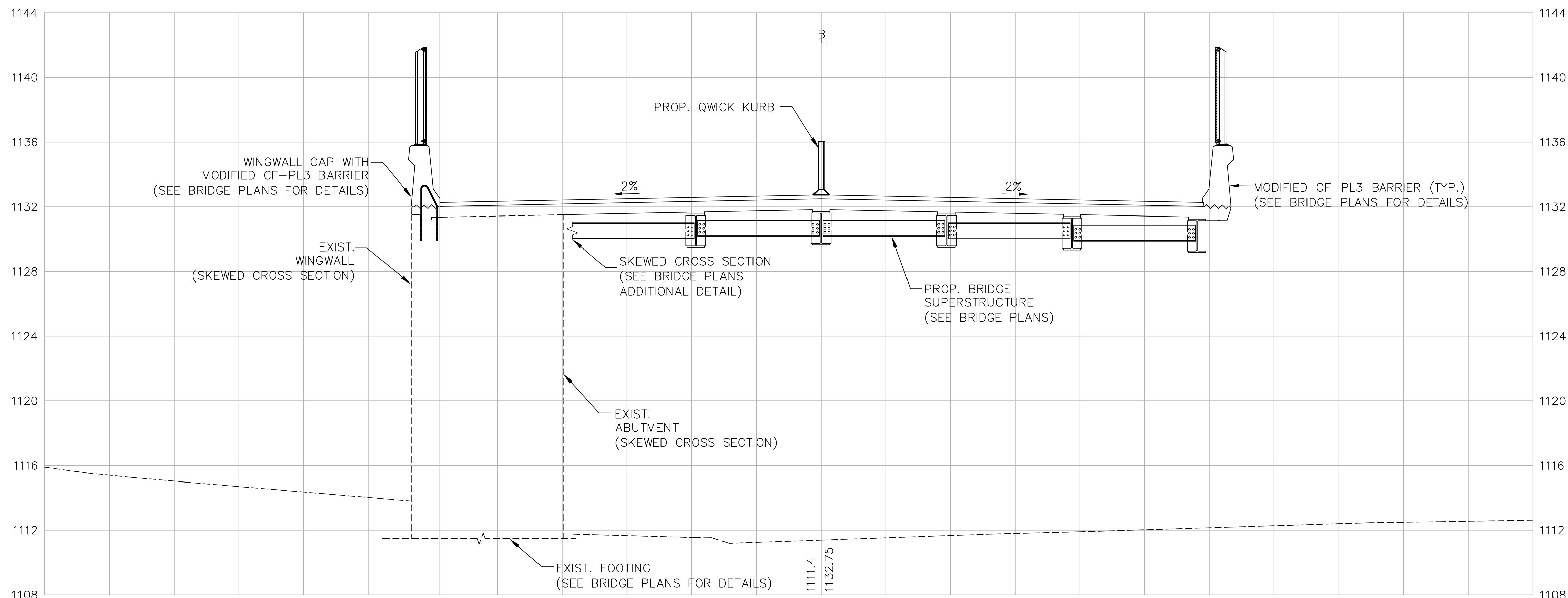
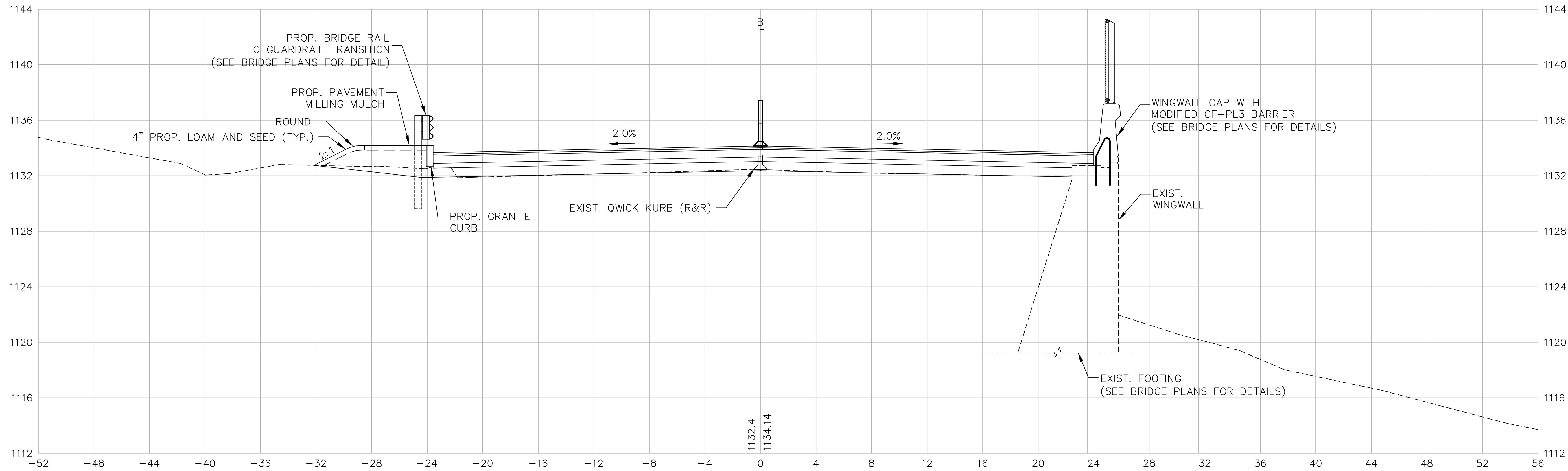
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	55	76
PROJECT FILE NO.		603495	

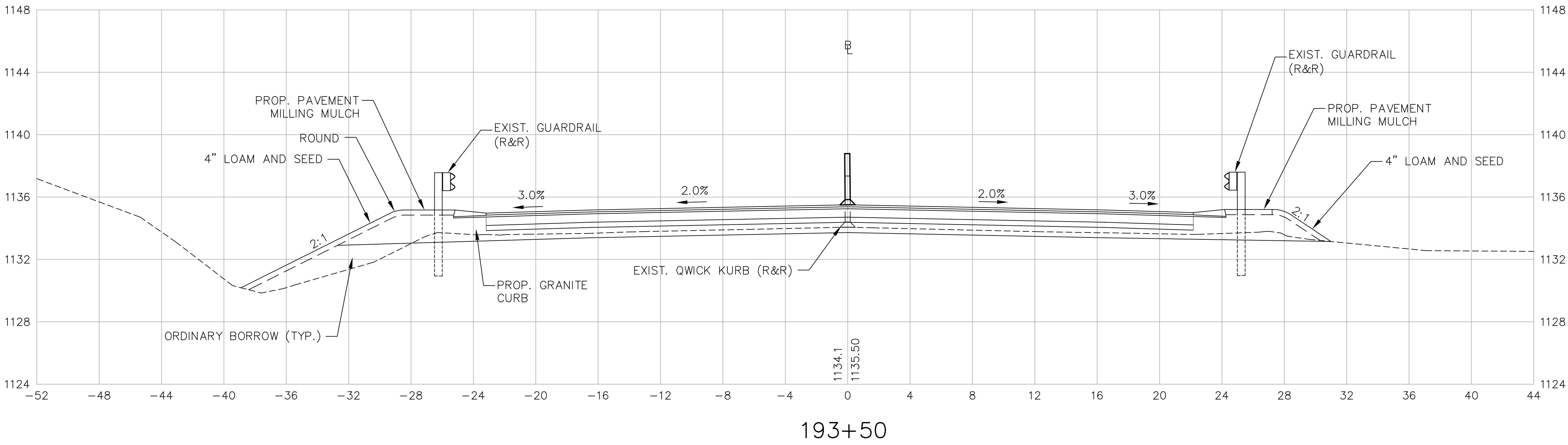
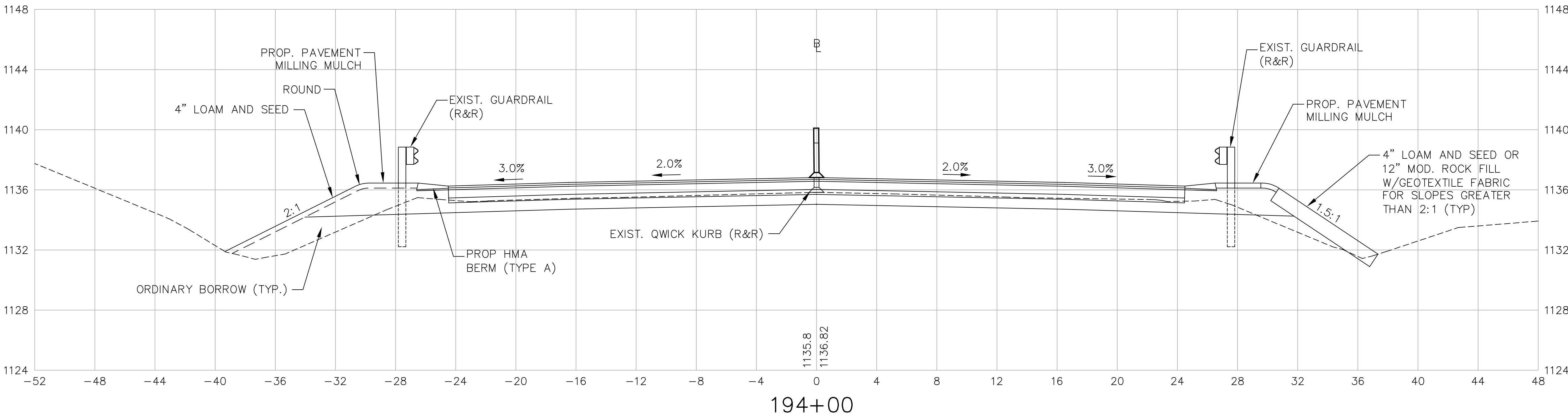
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	56	76
PROJECT FILE NO. 603495			

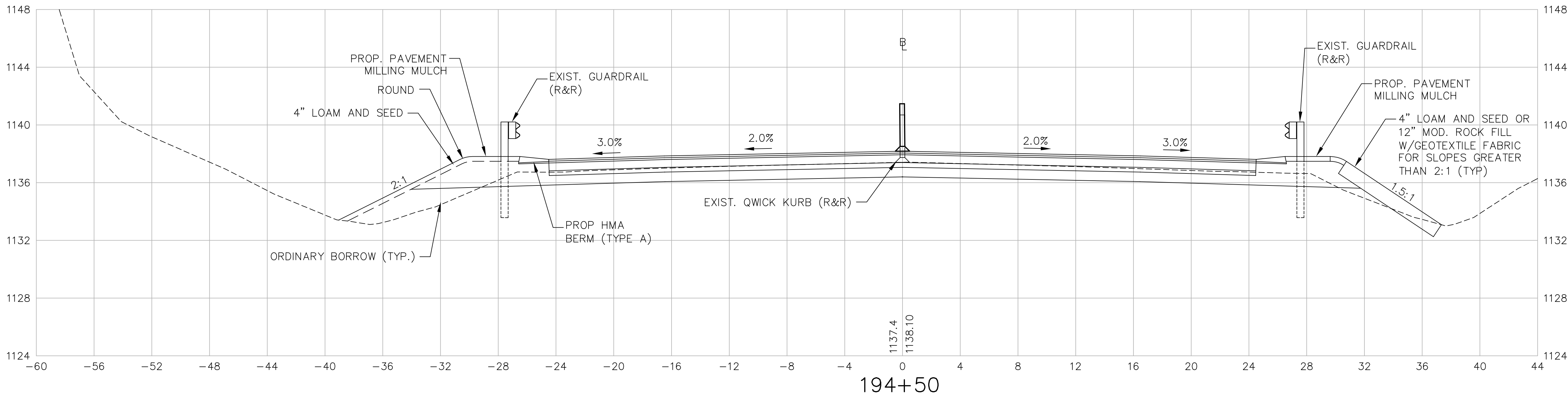
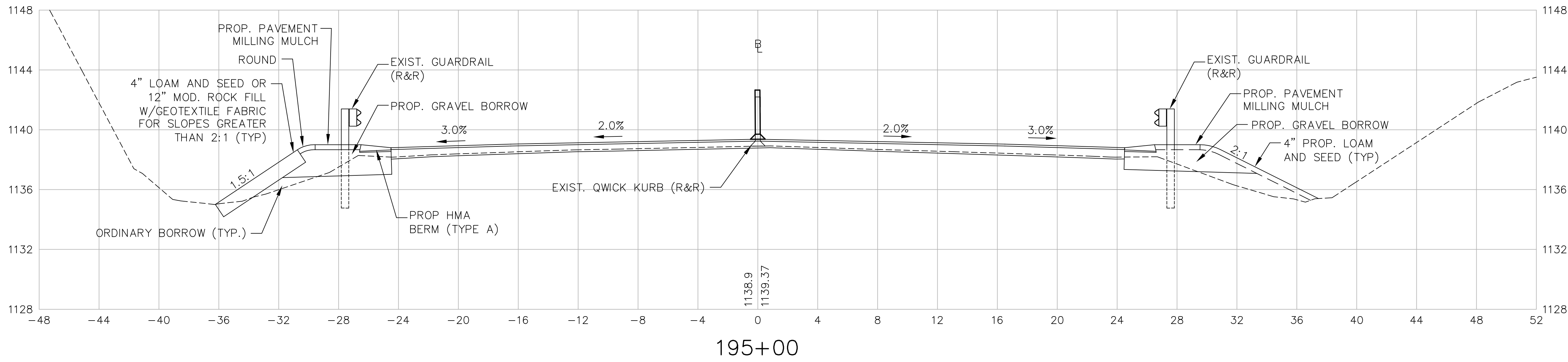
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

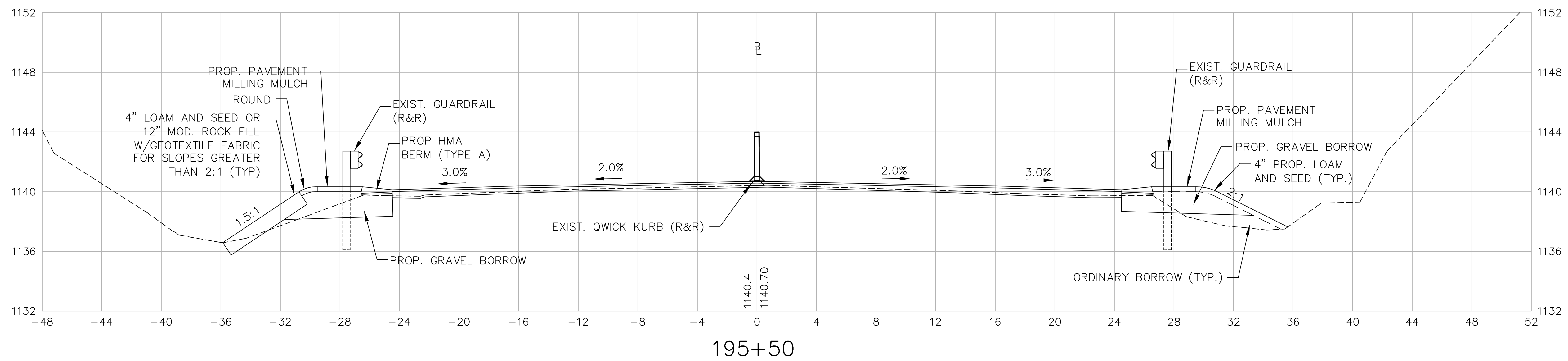
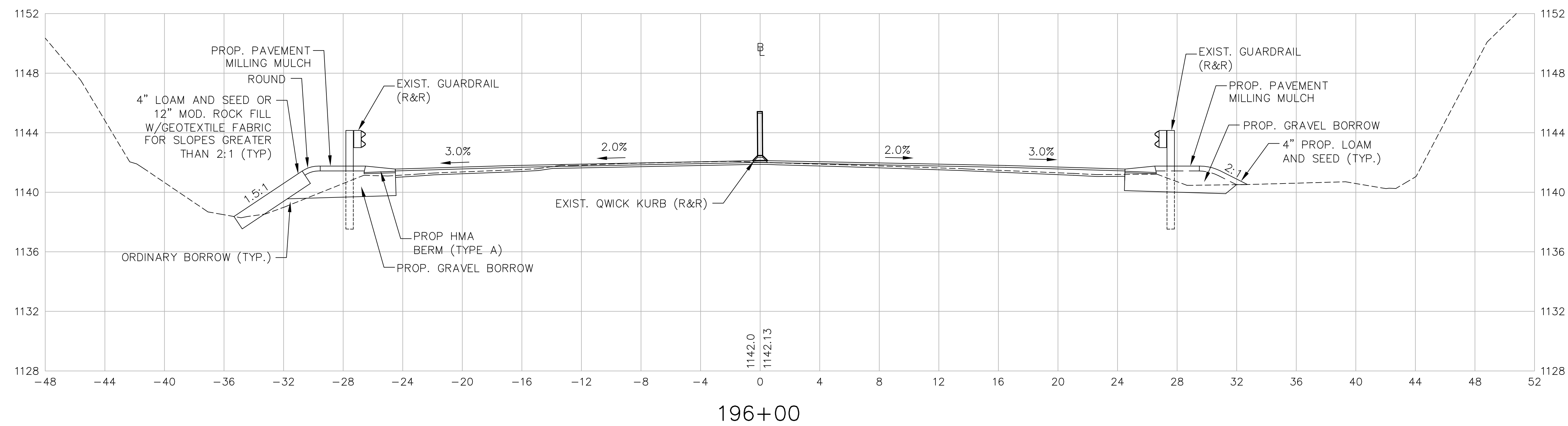
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	57	76
PROJECT FILE NO.		603495	

CROSS SECTIONS
ROUTE 2



PHILLIPSTON ROUTE 2 OVER ROUTE 2A			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	58	76
PROJECT FILE NO.		603495	

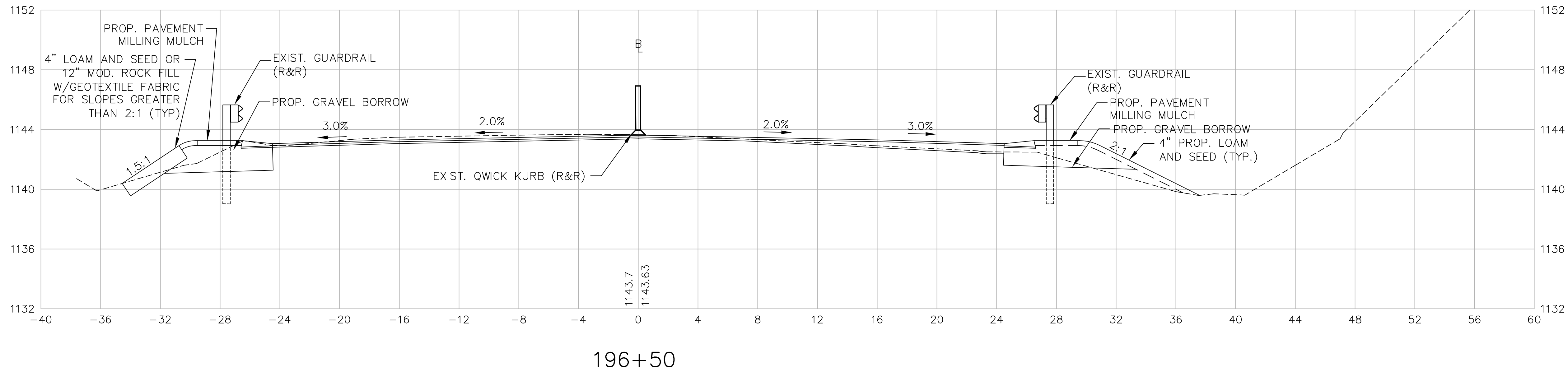
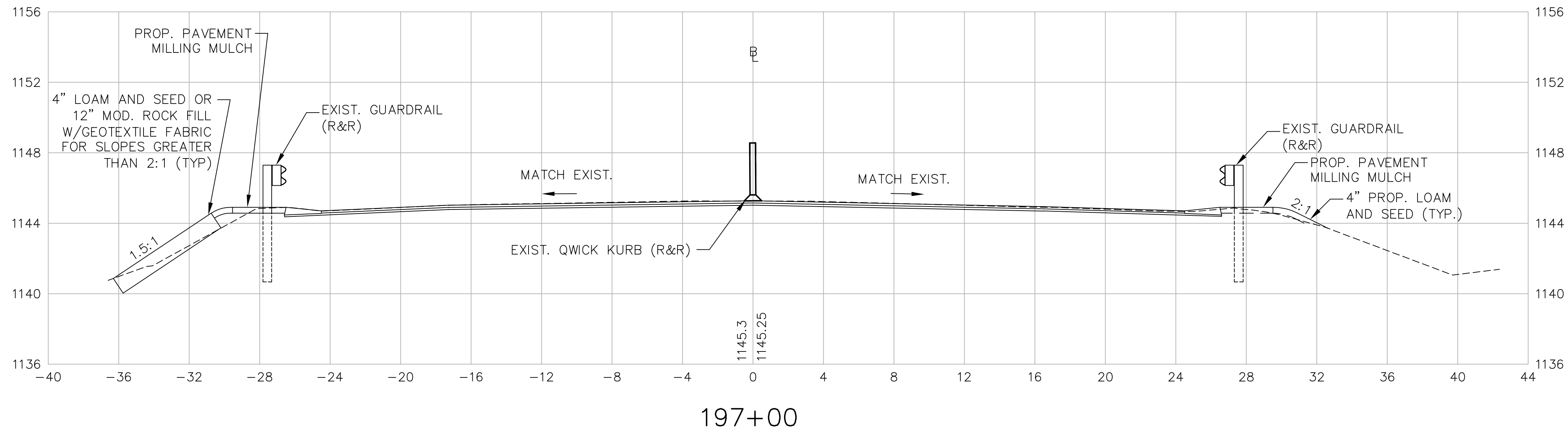
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	59	76
PROJECT FILE NO.		603495	

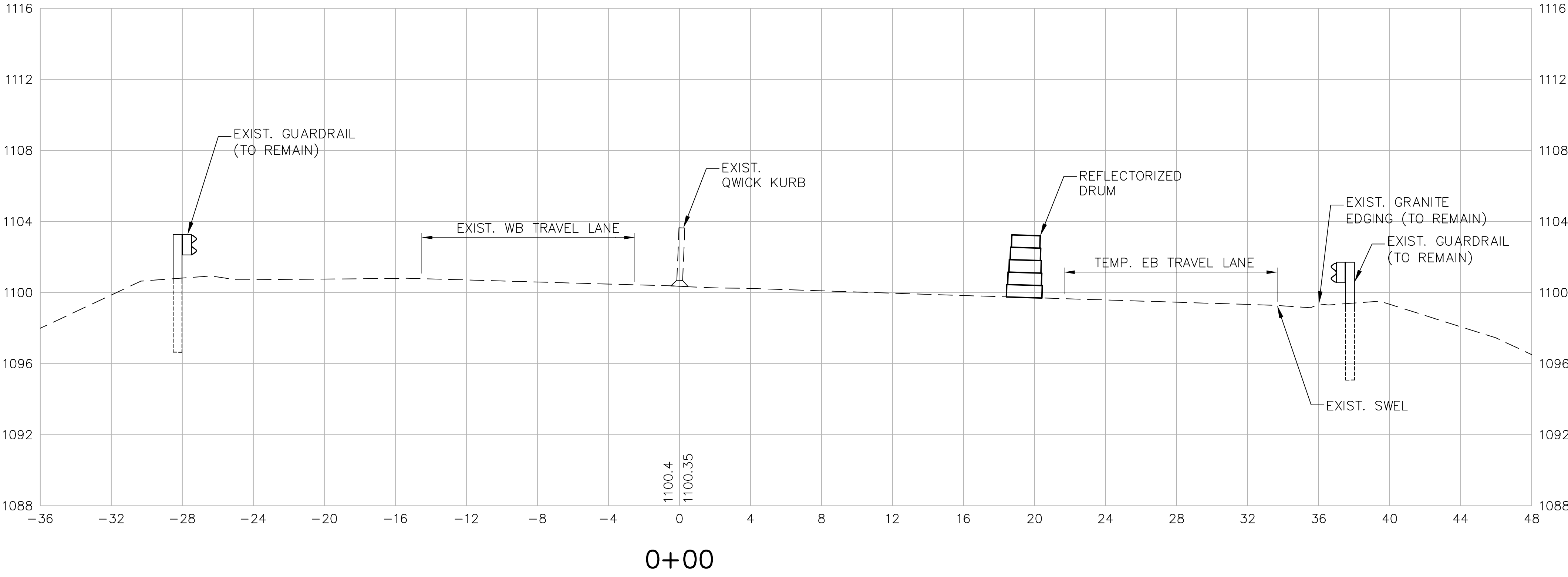
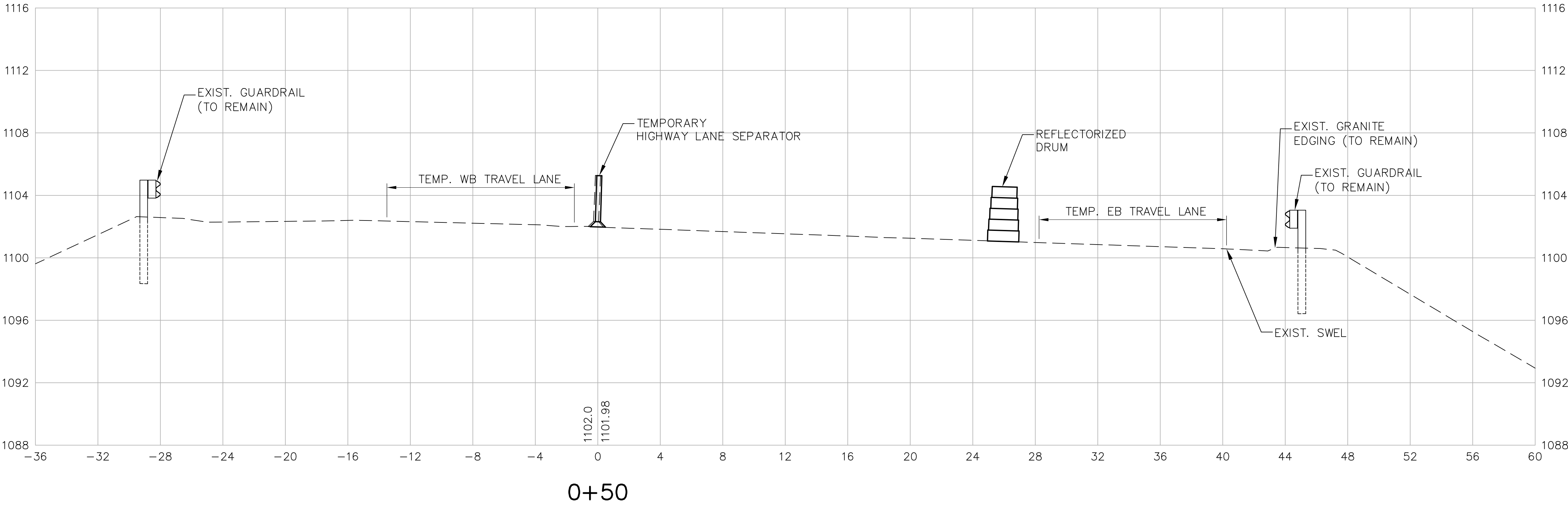
CROSS SECTIONS
ROUTE 2



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	60	76
PROJECT FILE NO.		603495	

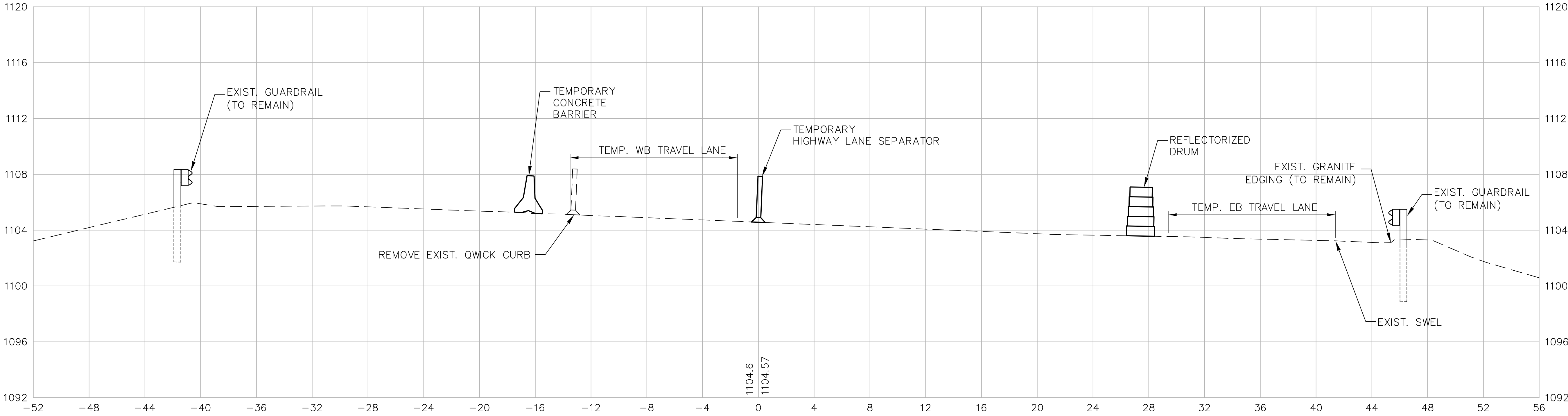
ROUTE 2 DETOUR
CROSS SECTIONS



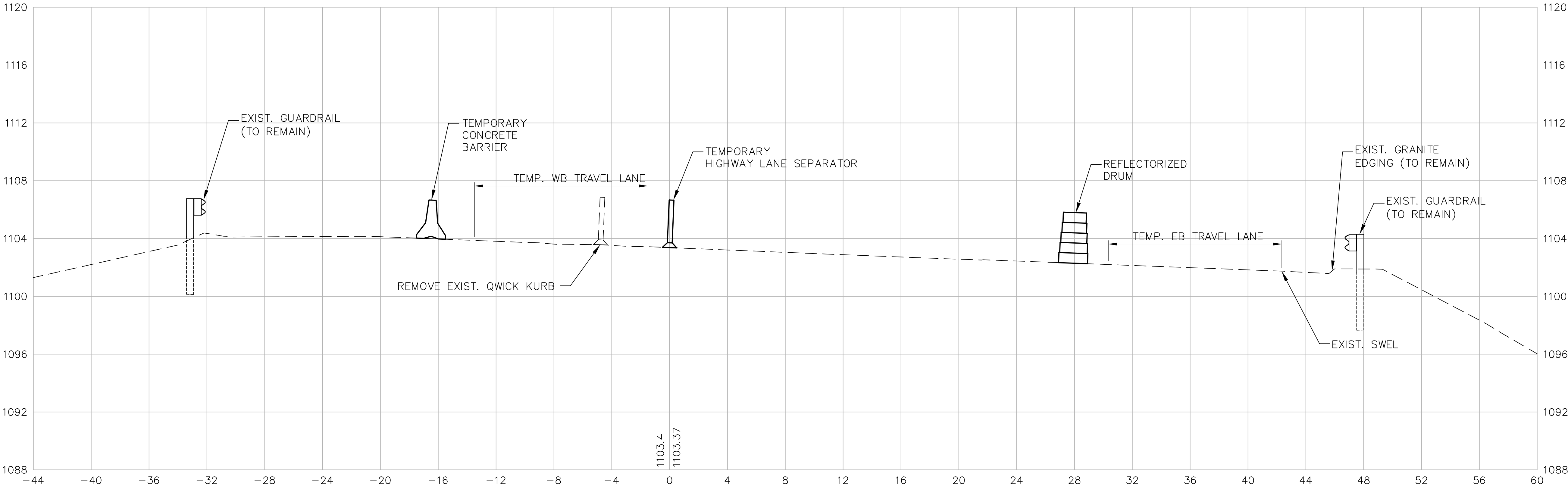
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	61	76
PROJECT FILE NO.		603495	

ROUTE 2 DETOUR
CROSS SECTIONS



1+50

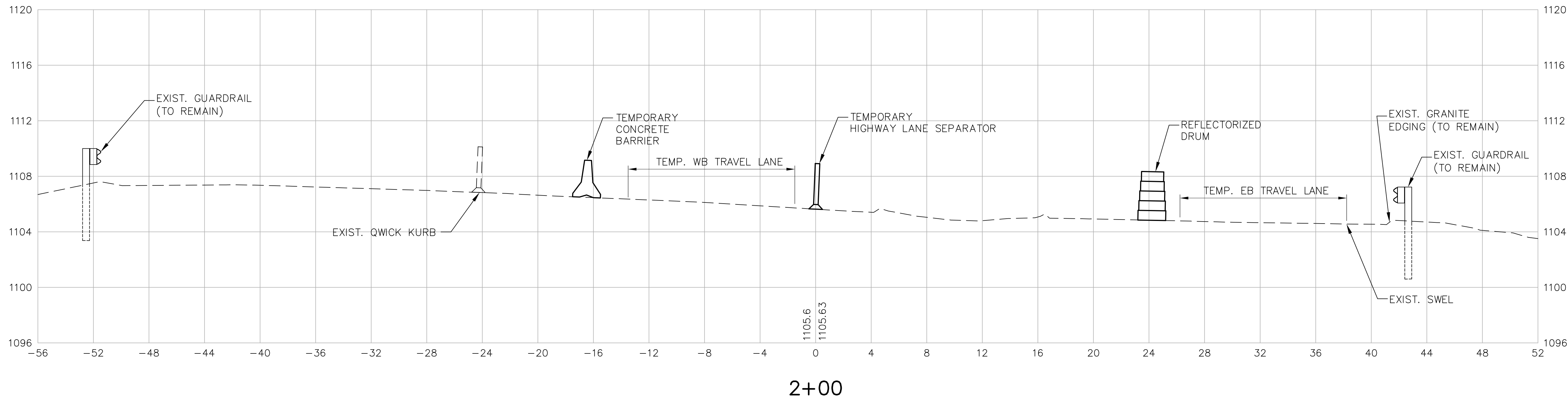
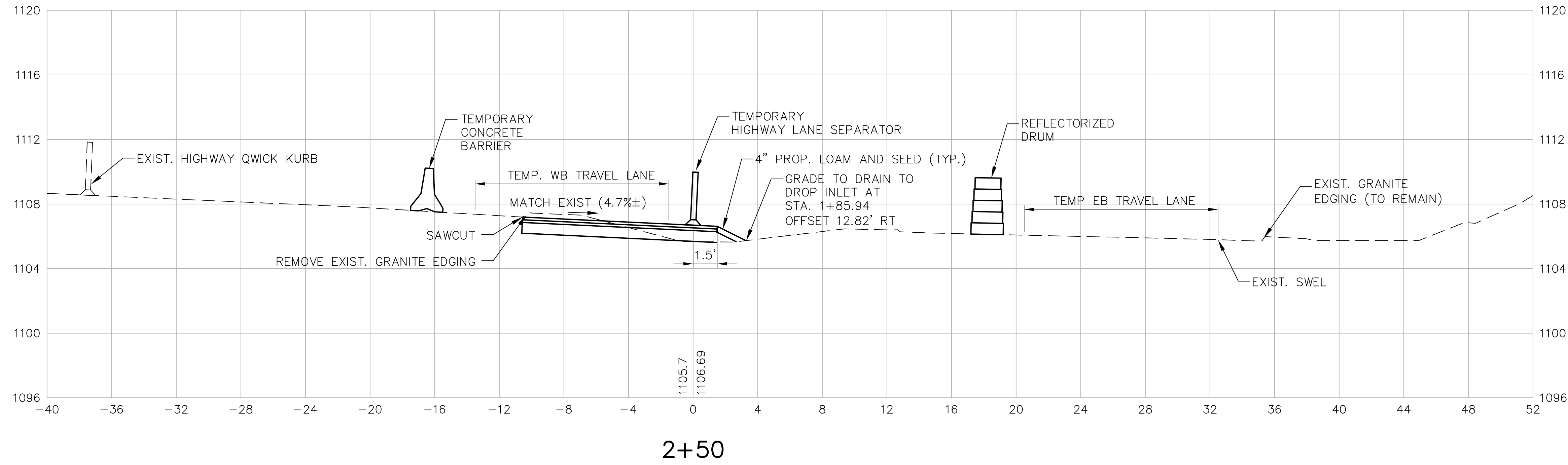


1+00

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	62	76
PROJECT FILE NO.		603495	

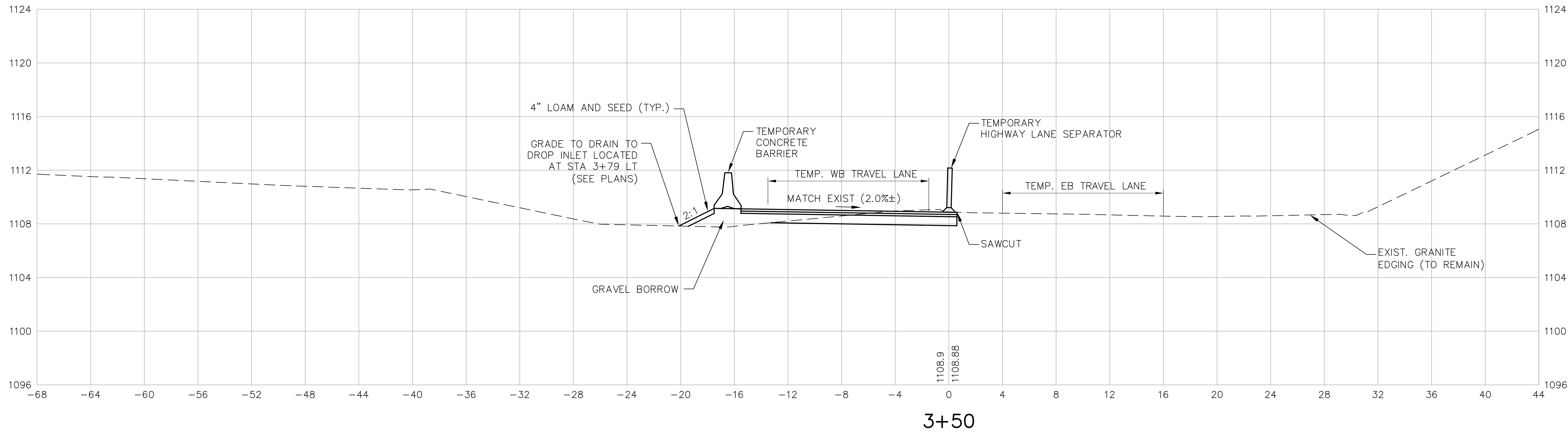
ROUTE 2 DETOUR
CROSS SECTIONS



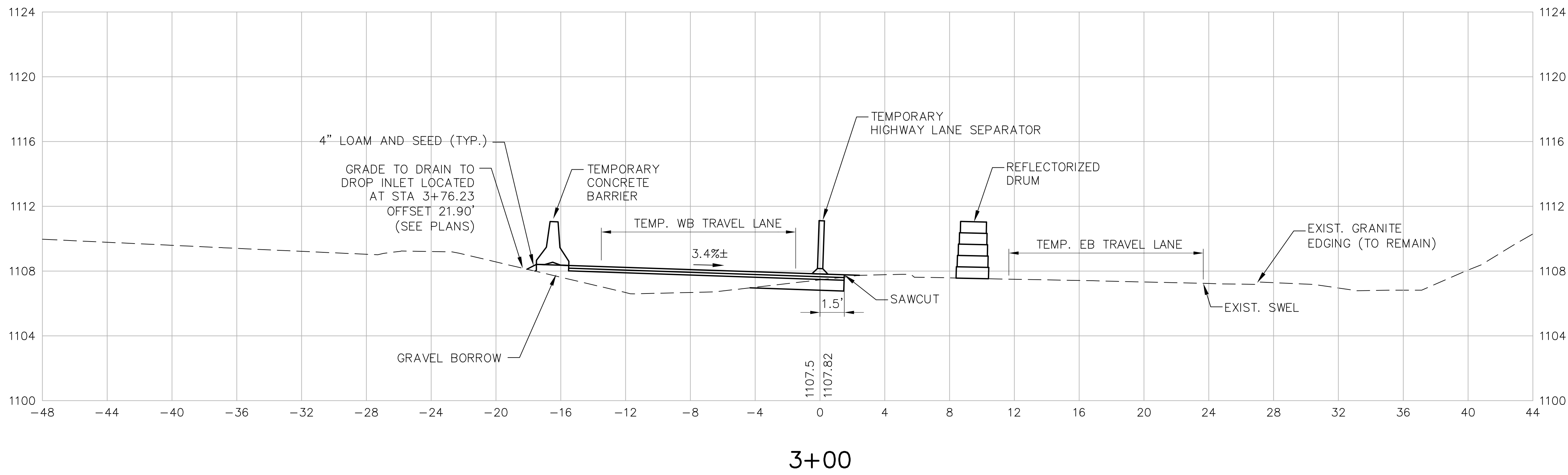
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	63	76
PROJECT FILE NO.		603495	

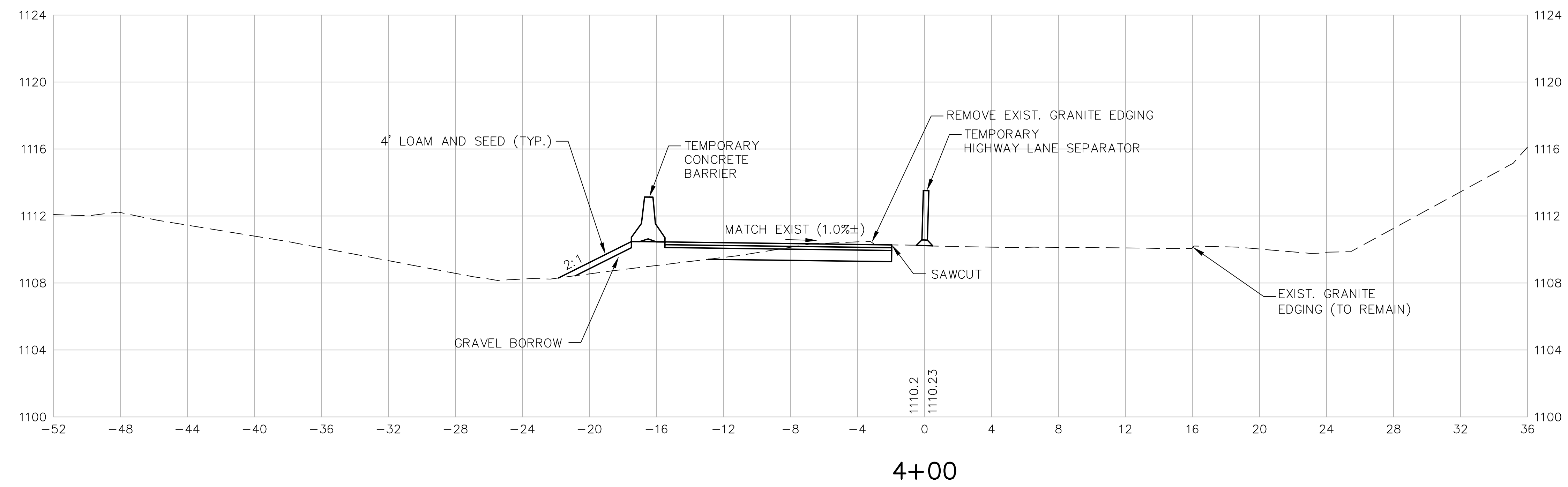
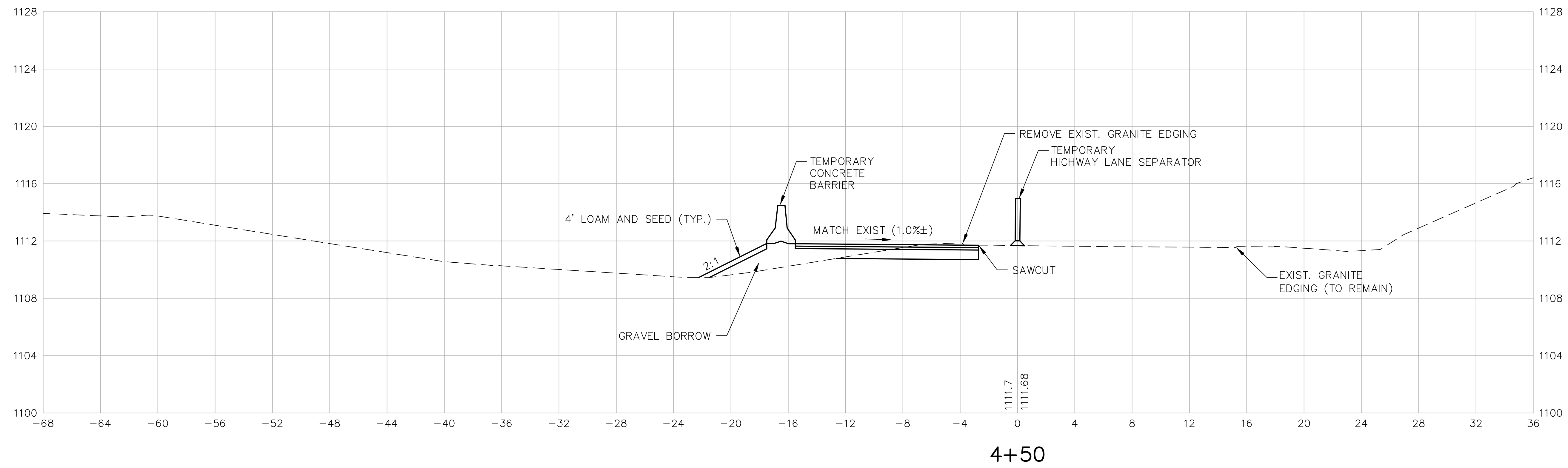
ROUTE 2 DETOUR
CROSS SECTIONS

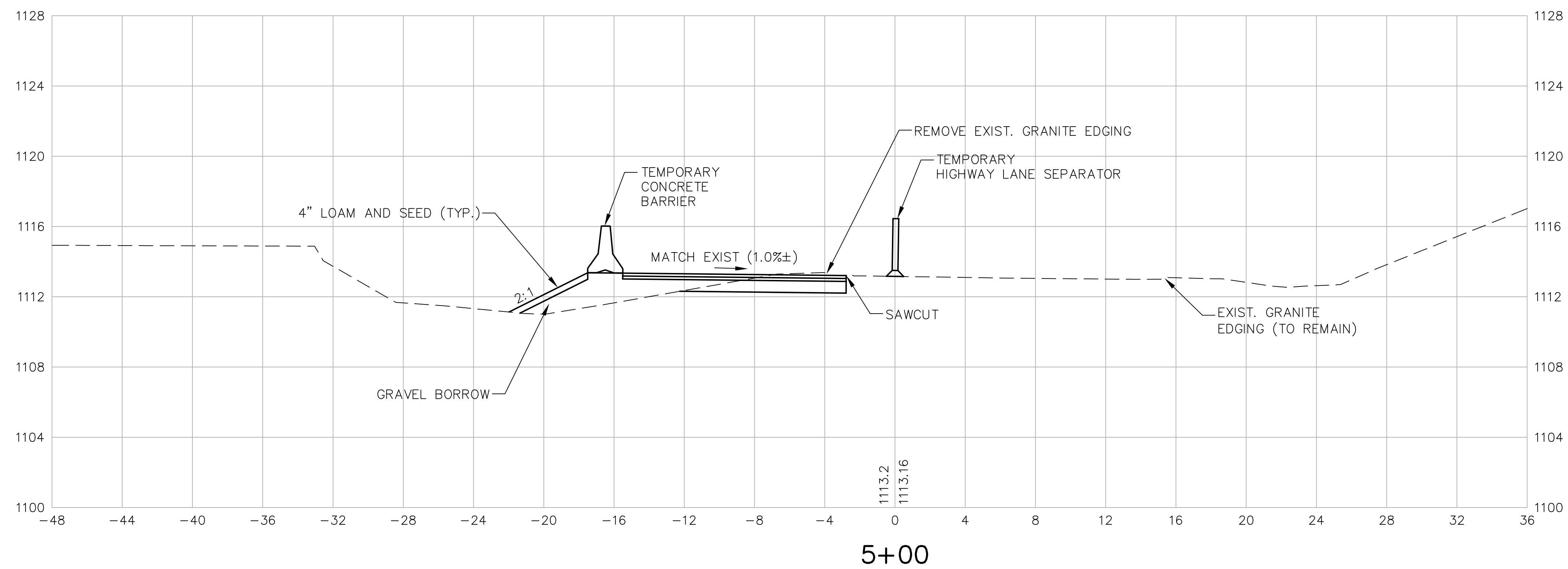
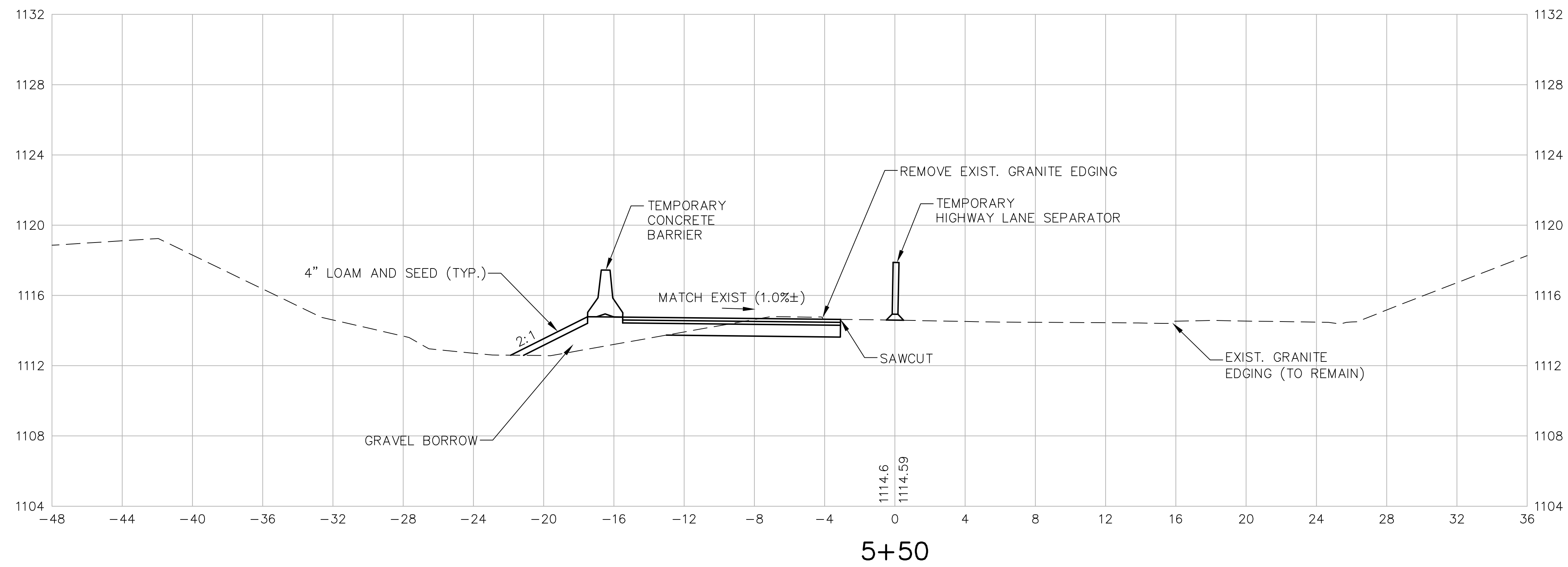


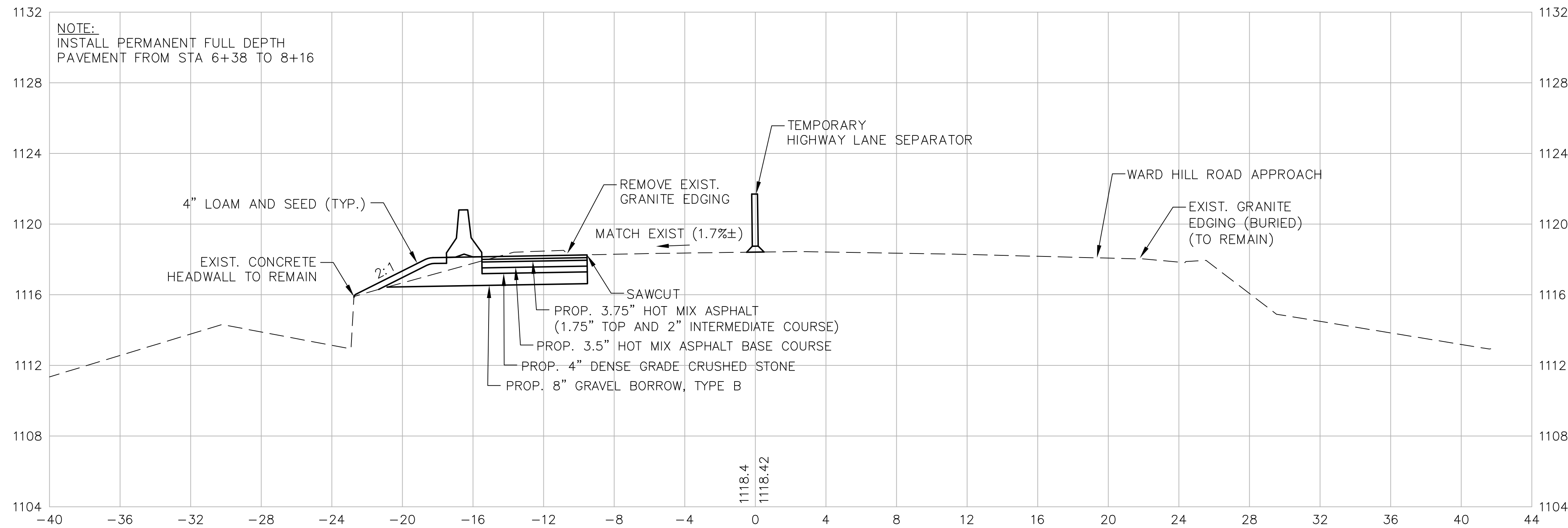
3+50



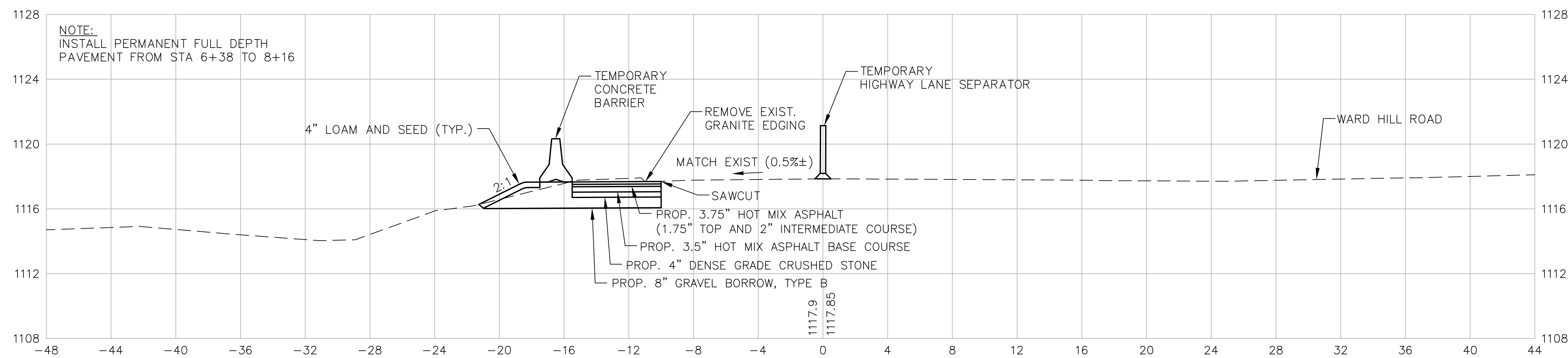
3+00







7+30

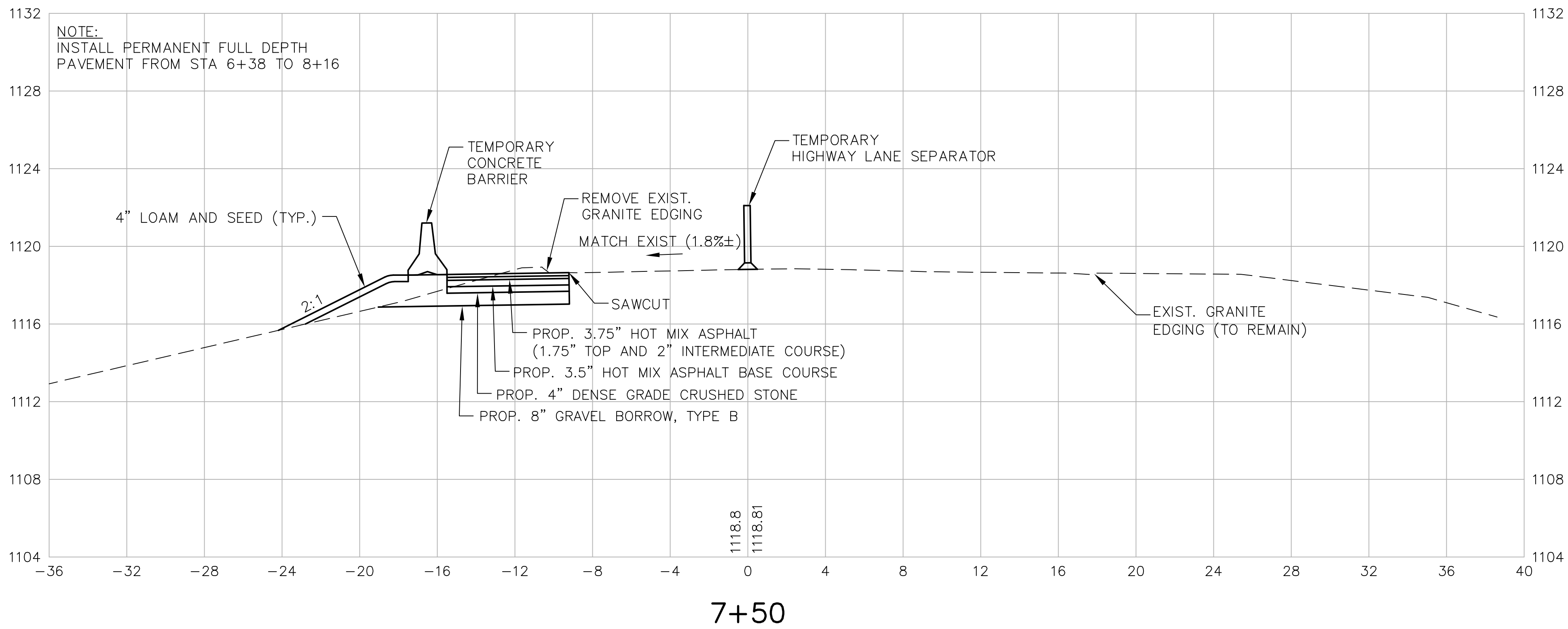
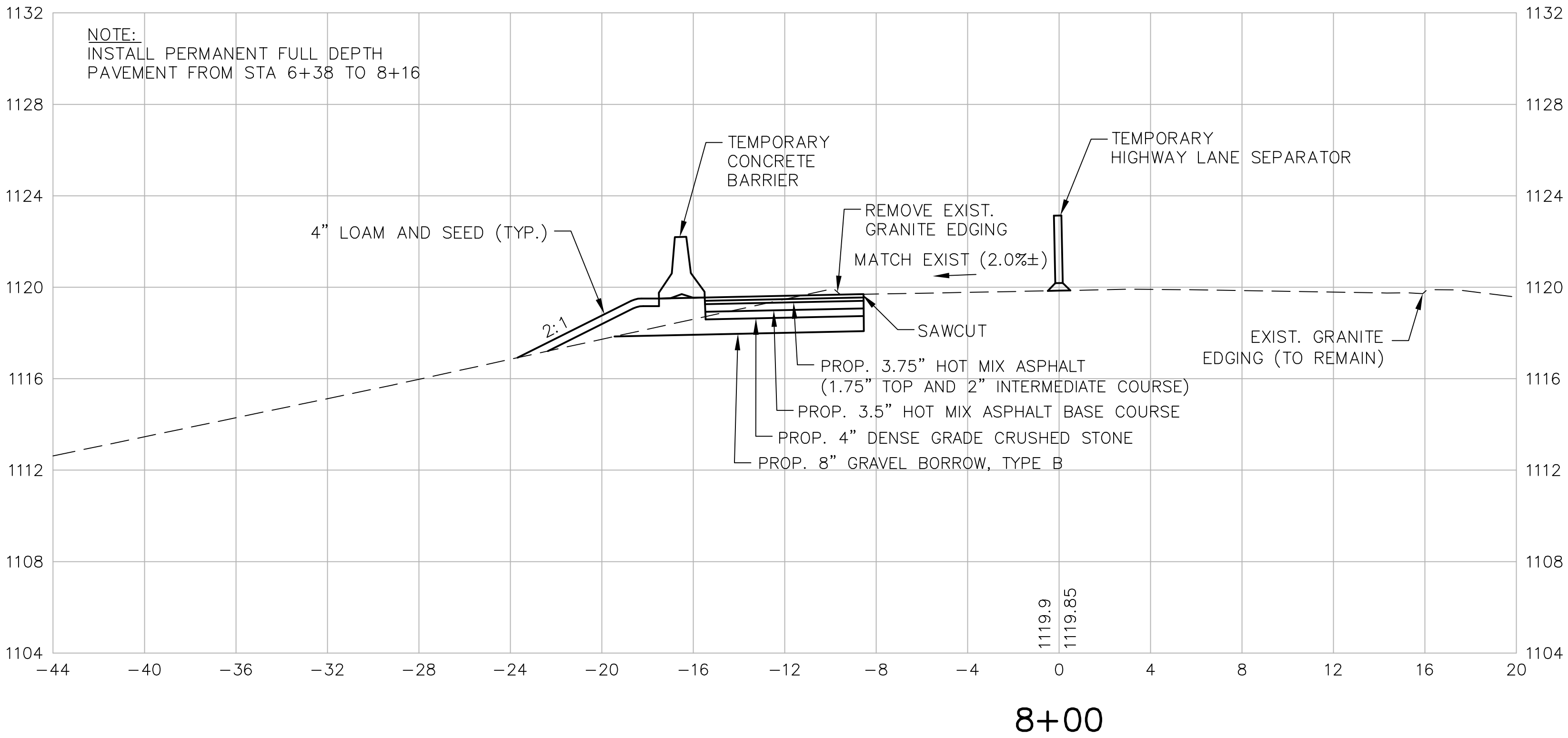


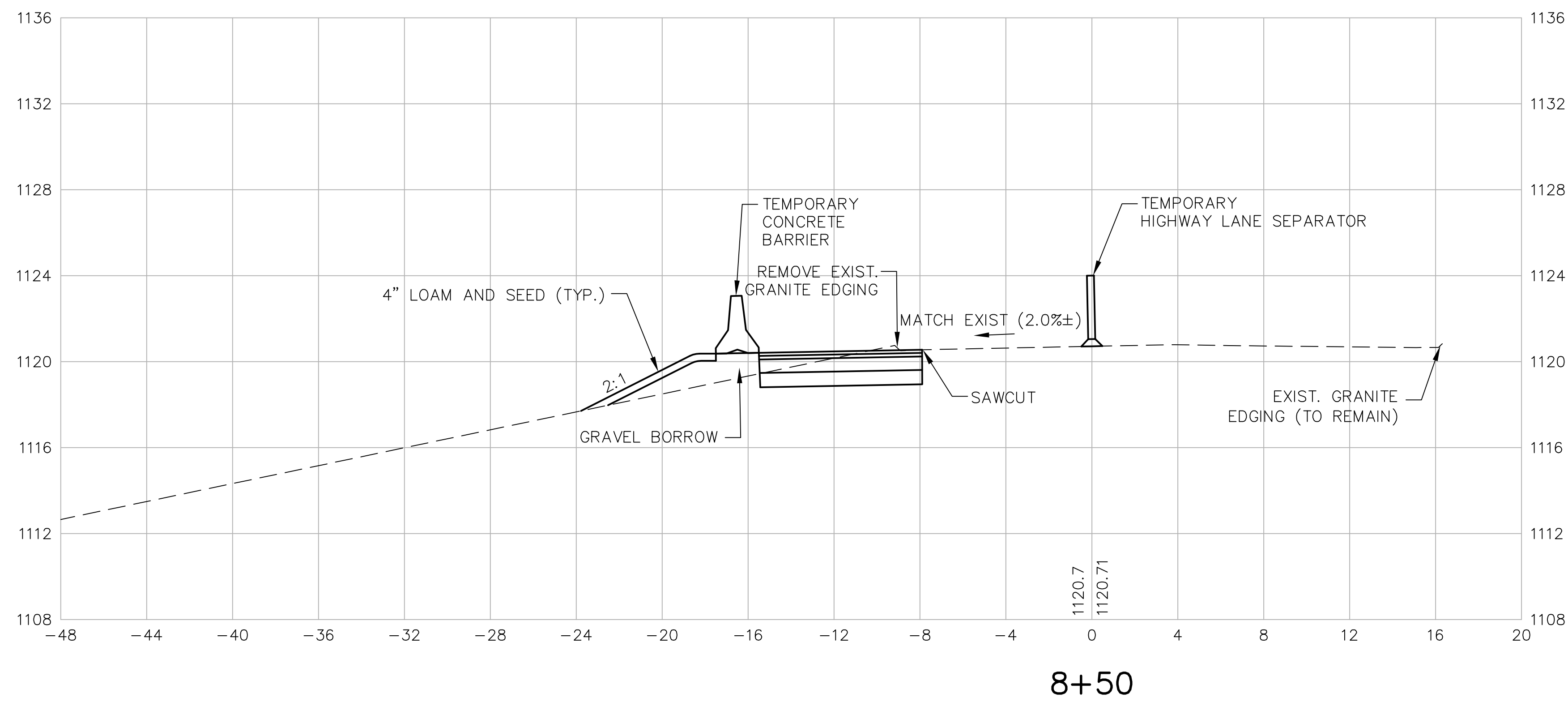
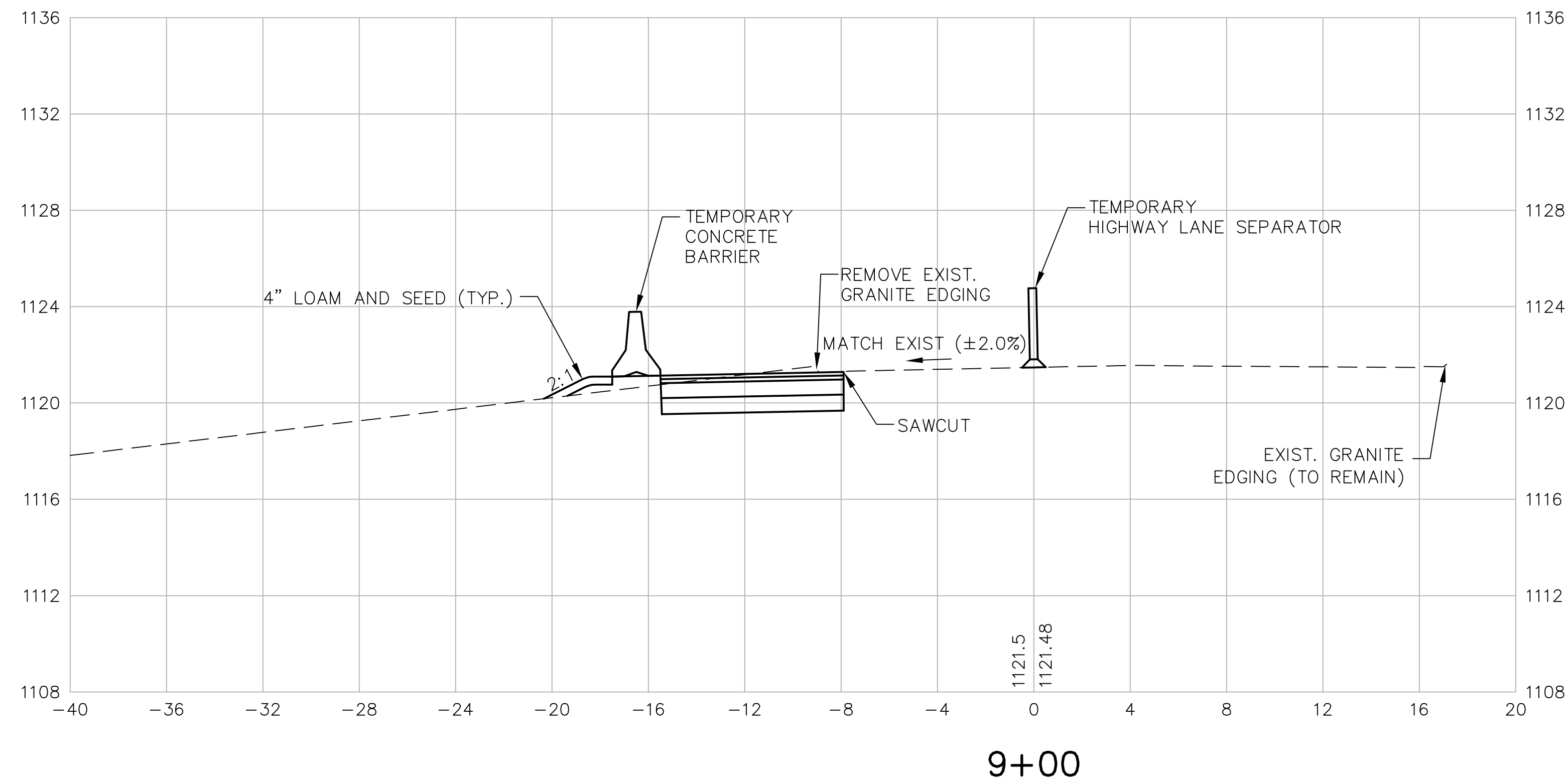
7+00

PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	68	76
PROJECT FILE NO.		603495	

ROUTE 2 DETOUR
CROSS SECTIONS

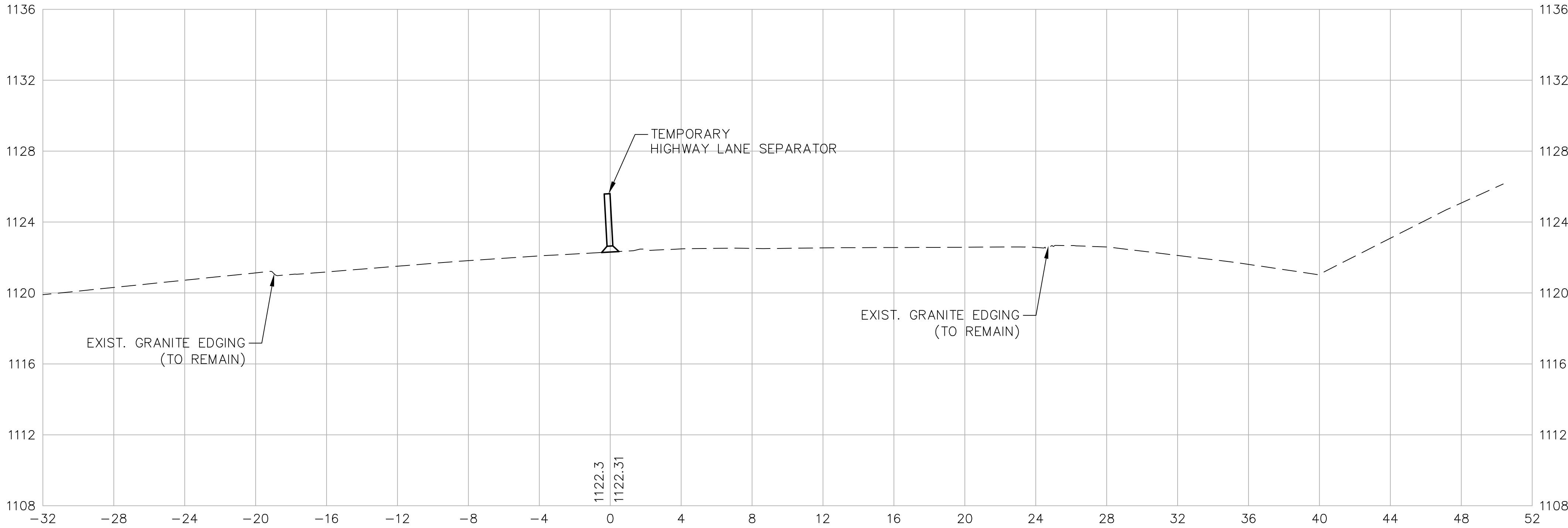




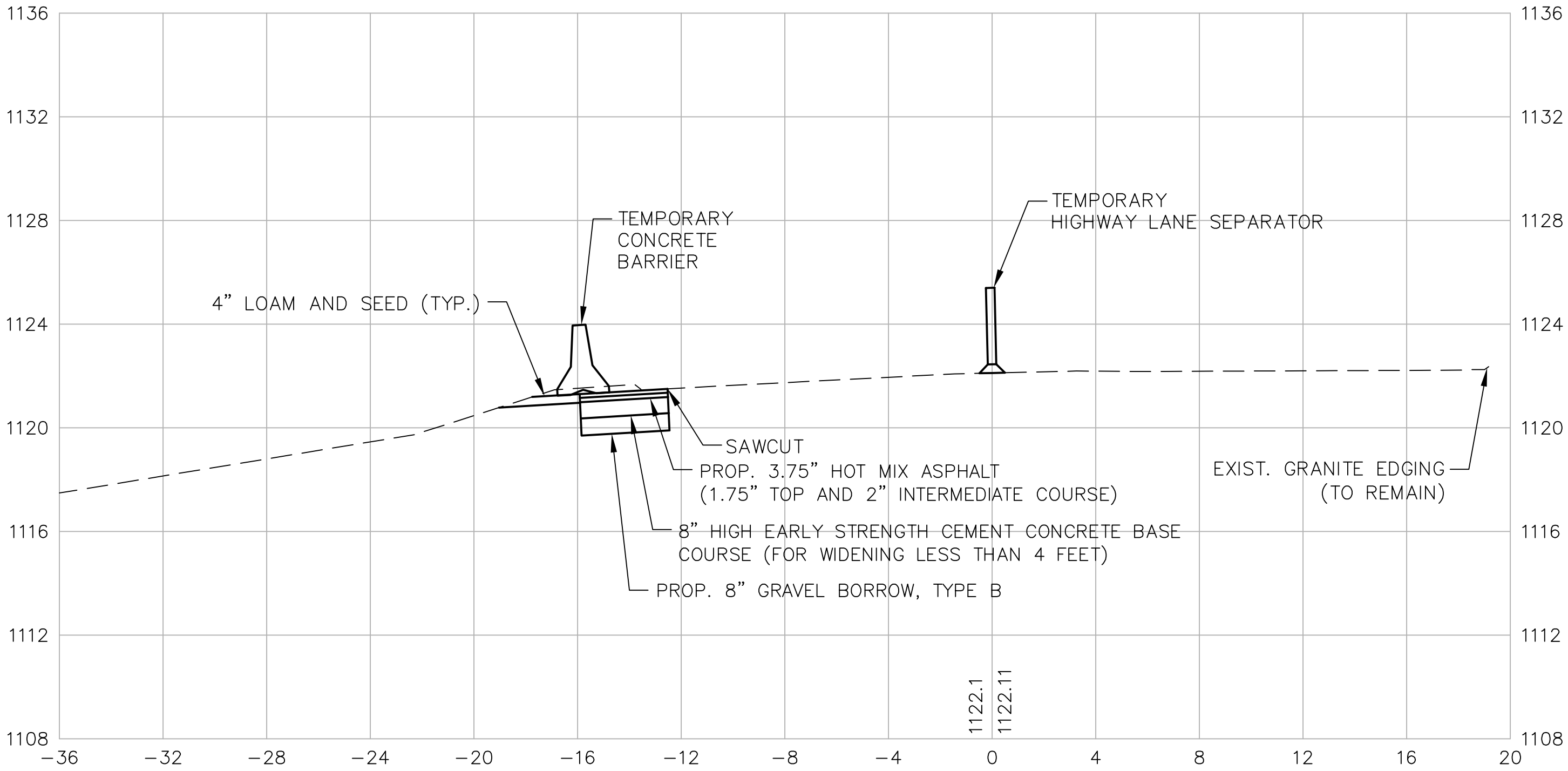
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	70	76
PROJECT FILE NO.		603495	

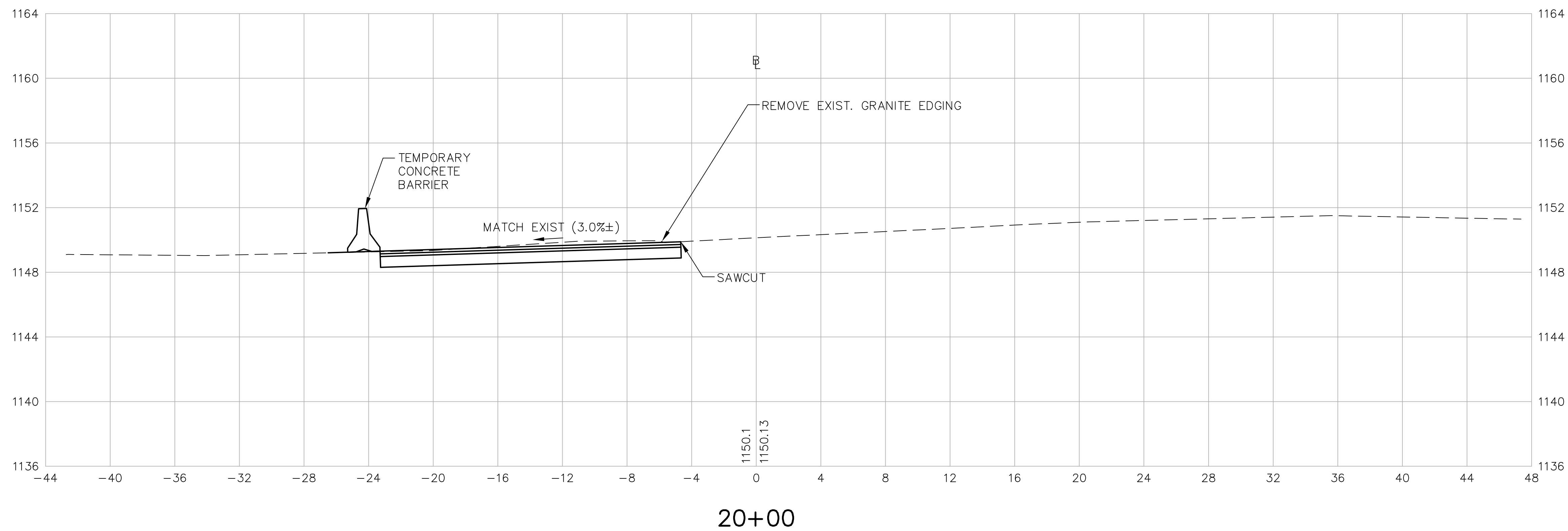
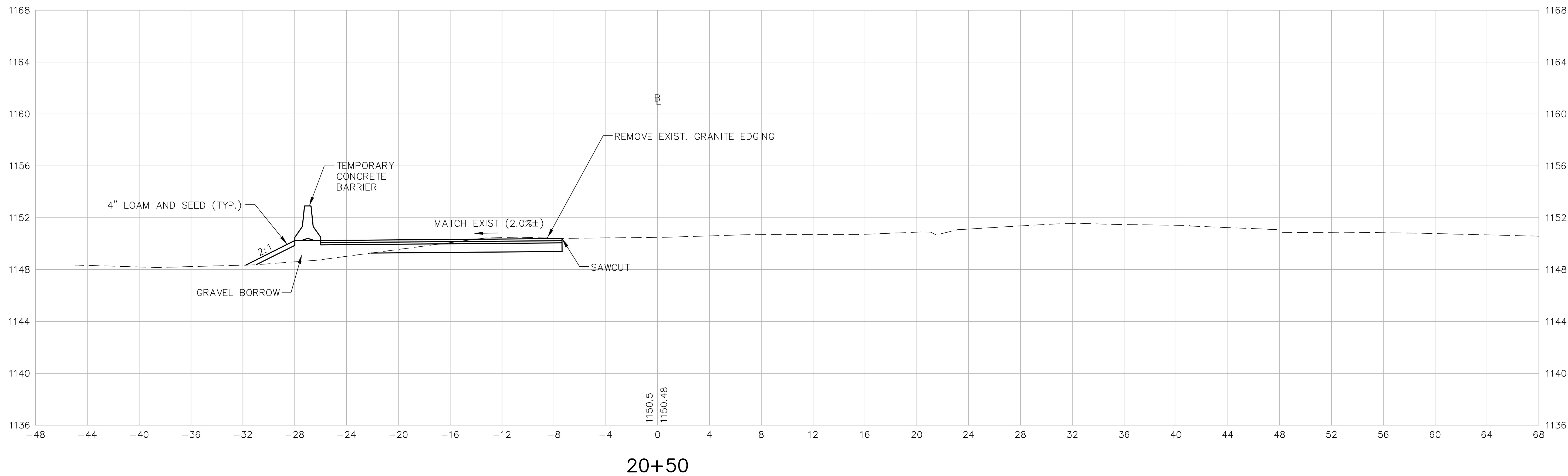
ROUTE 2 DETOUR
CROSS SECTIONS

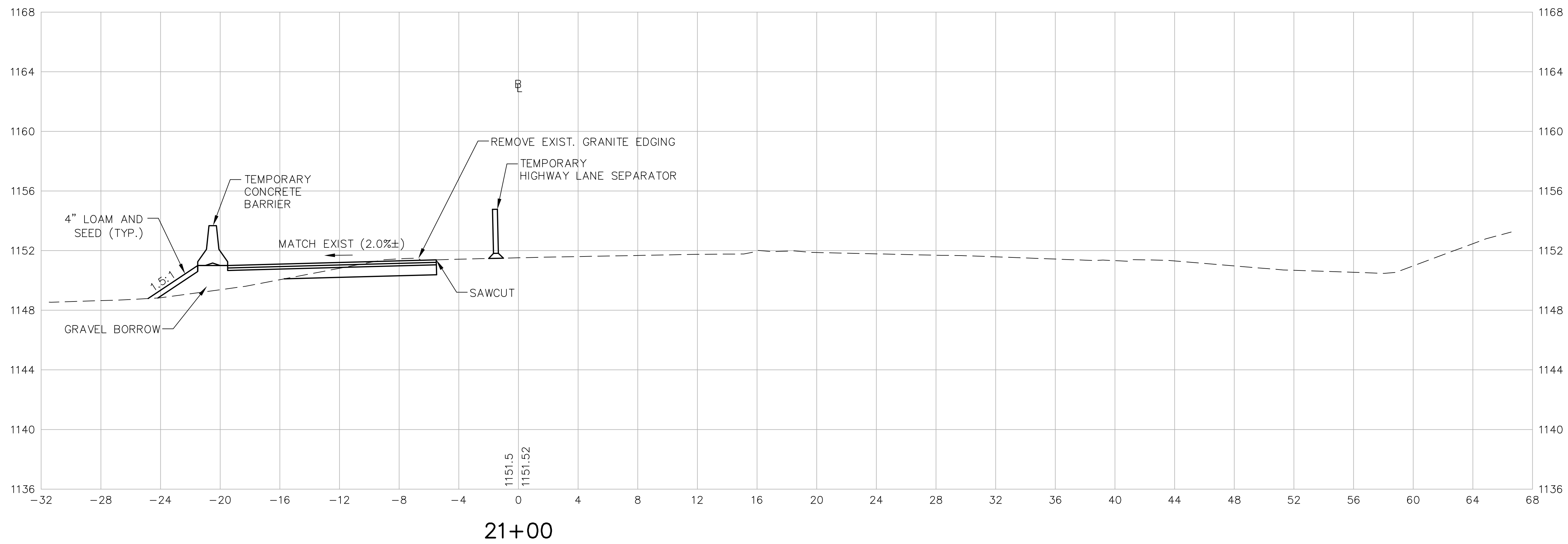
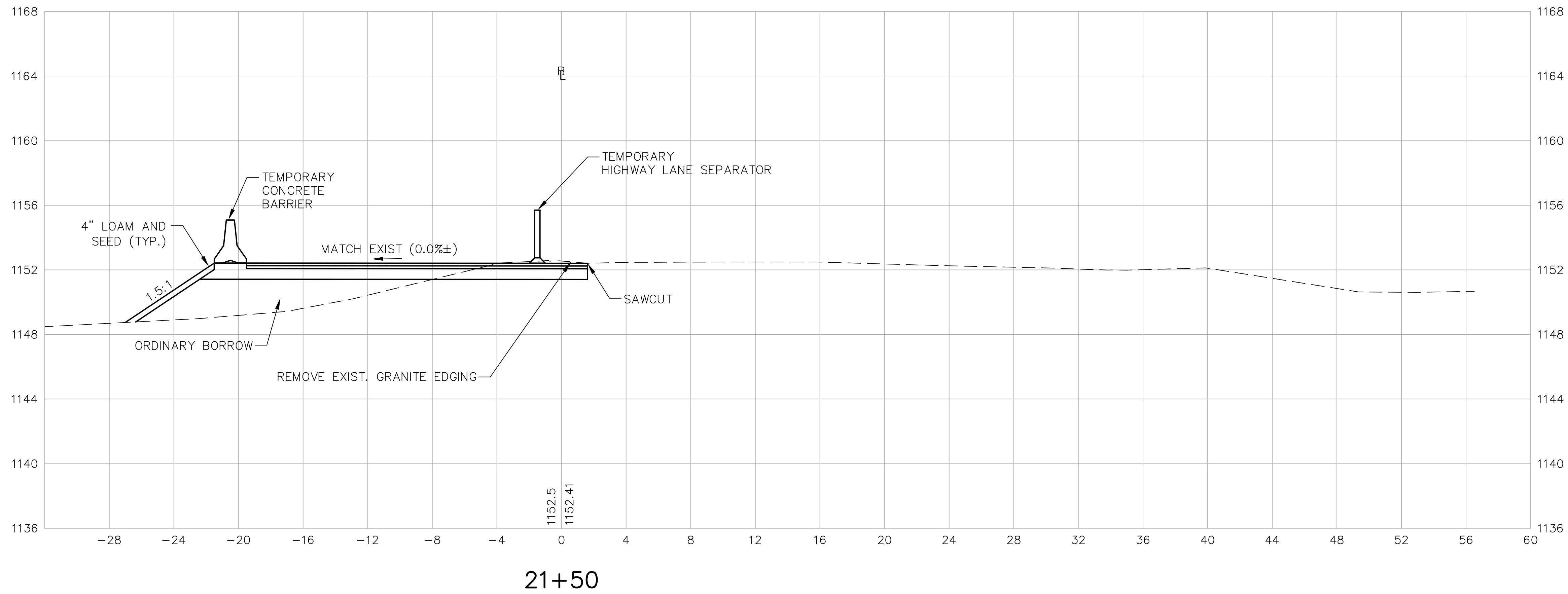


10+00



9+50

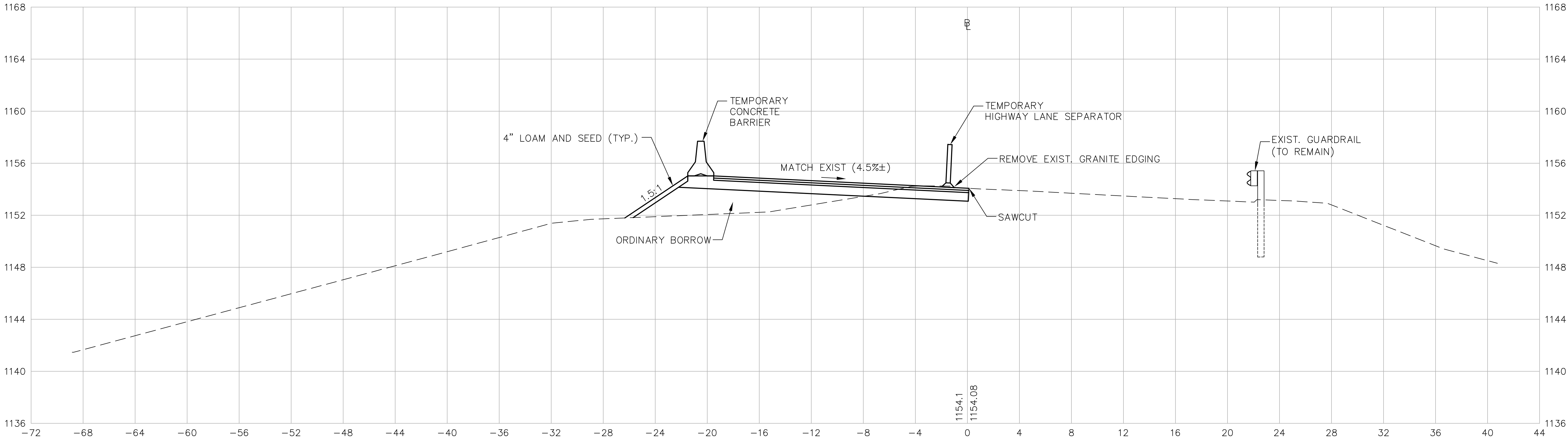




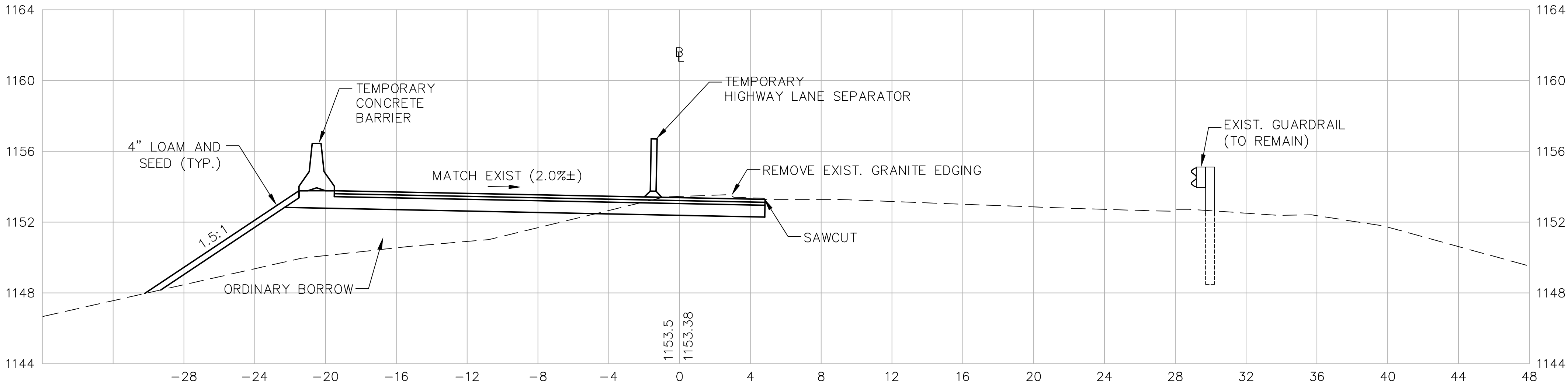
PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	73	76
PROJECT FILE NO.		603495	

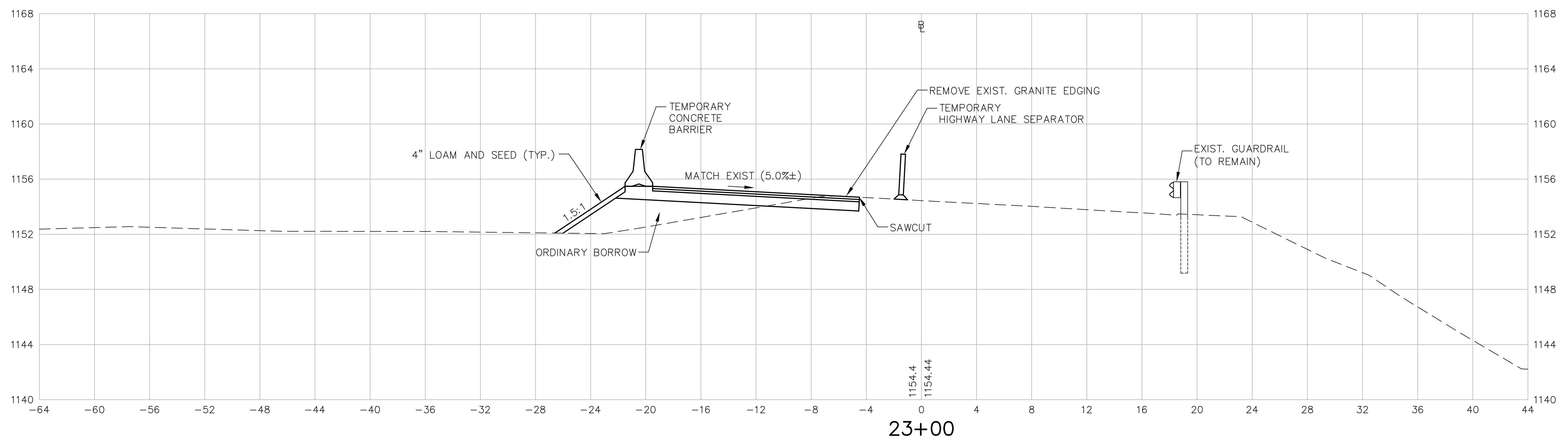
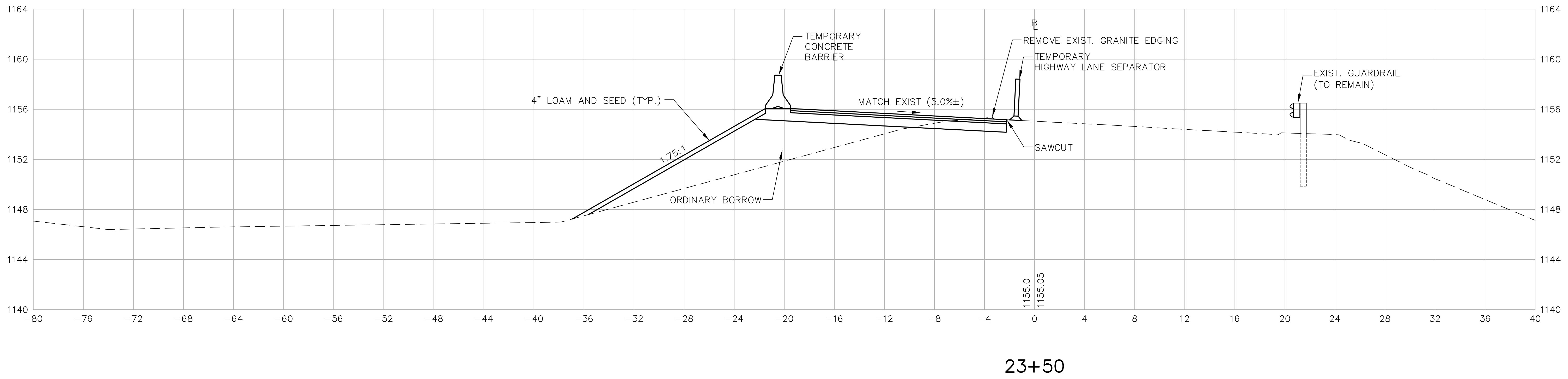
ROUTE 2 DETOUR
CROSS SECTIONS



22+50



22+00



PHILLIPSTON
ROUTE 2 OVER ROUTE 2A

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	NFA	75	76
PROJECT FILE NO.		603495	

ROUTE 2 DETOUR
CROSS SECTIONS

