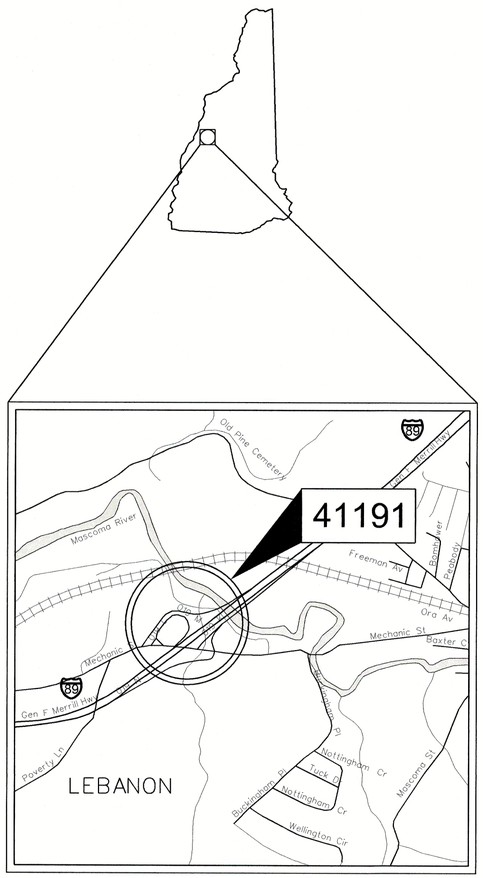
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS
BRIDGE REHABILITATION PROJECT

X-A004(559)
N.H. PROJECT NO. 41191
INTERSTATE 89 NB & SB OVER U.S. ROUTE 4 / MECHANIC STREET
BRIDGE NO. 093/109 & 094/108
INTERSTATE 89 NB & SB OVER MASCOMA RIVER / TRUCK ROAD
BRIDGE NO. 097/112 & 098/111

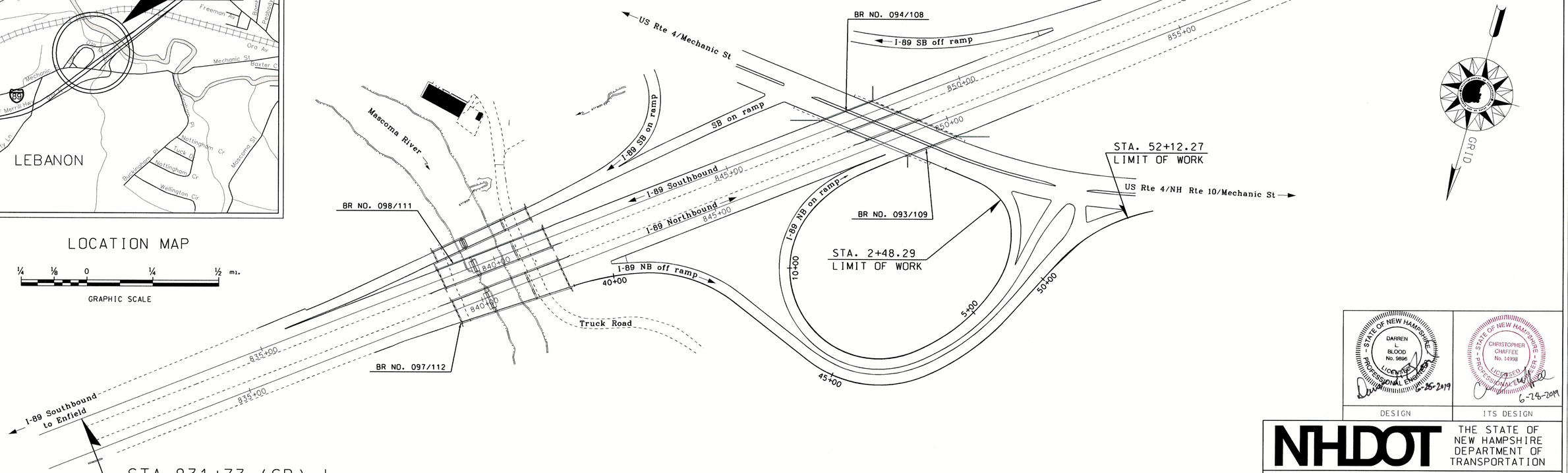
DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 17	42,000
AVERAGE DAILY TRAFFIC 20 37	56,000
PERCENT OF TRUCKS	7.5%
DESIGN SPEED	65 MPH
LENGTH OF PROJECT	0.6 MI



LOCATION MAP

¼ ⅛ 0 ¼ ½ mi.

GRAPHIC SCALE



CITY OF LEBANON
COUNTY OF GRAFTON
SCALE: 1" = 100'

DRAWN BY J. MERCER DATE 06/2019
CHECKED BY D. BLOOD DATE 06/2019

GM2 ASSOCIATES
GM2 Associates, Inc.
197 Loudon Road, Suite 310
Concord, NH 03301
Tel: 603-856-7854
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STATE OF NEW HAMPSHIRE – DARREN L. BLOOD No. 9896 LICENSED PROFESSIONAL ENGINEER – 6-25-2019
DESIGN

STATE OF NEW HAMPSHIRE – CHRISTOPHER CHAFFEE No. 14998 LICENSED PROFESSIONAL ENGINEER – 6-28-2019
ITS DESIGN

NHDOT
THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:
DIRECTOR OF PROJECT DEVELOPMENT — 7/2/2019 DATE

APPROVED:
ASSISTANT COMMISSIONER AND CHIEF ENGINEER — 7/2/19 DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(559)	41191	1	110

INDEX OF SHEETS

GENERAL NOTES

1. FOR STANDARD PLANS, SEE DEPARTMENT OF TRANSPORTATION WEBSITE AT: WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/STANDARDPLANS/INDEX.HTM.
2. HIGH TENSION OVERHEAD TRANSMISSION LINES ARE LOCATED THROUGHOUT THE PROJECT WITH CROSSINGS AT VARIOUS LOCATIONS AND RUNNING ALONG THE ROAD THROUGHOUT THE PROJECT EVEN ON REGULAR POLES. THE CONTRACTOR IS ADVISED THAT EXTREME CAUTION WILL BE REQUIRED IN THE OPERATION OF EQUIPMENT, ESPECIALLY CRANES AND PILE DRIVING EQUIPMENT.
3. MODIFY SUPERELEVATION ON EXISTING CURVES BY THE USE OF A LEVELING COURSE TO THE RATES INDICATED ON THE PLANS OR AS ORDERED.
4. EXISTING DELINEATORS AND WITNESS MARKERS THAT ARE REMOVED AND DETERMINED BY THE ENGINEER TO BE IN ACCEPTABLE CONDITION SHALL BE RESET (SUBSIDIARY). ADDITIONAL DELINEATORS AND WITNESS MARKERS ORDERED WILL BE PAID UNDER THE APPROPRIATE ITEMS OF THE CONTRACT.
5. NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
6. PERFORM ALL WORK WITHIN THE EXISTING RIGHT-OF-WAY, UNLESS OTHERWISE SHOWN ON THE PLANS OR AS ORDERED BY THE ENGINEER.
7. REMOVE UNPROTECTED PROJECT MARKERS (SUBSIDIARY).
8. SURVEY DATA FOR THIS PROJECT WAS COLLECTED BY SDR AND THE FIELD NOTES CAN BE FOUND IN THE FIELD BOOK 13479. COORDINATES ARE NEW HAMPSHIRE STATE PLANE COORDINATES OF NAD83, 2011 ADJUSTMENT AND THE BEARINGS ARE GRID. ELEVATIONS ARE REFERENCED TO NAVD 1988.
9. QUANTITIES FOR EMBANKMENT AND EXCAVATION FOR SLOPE ROUNDINGS AS SHOWN ON THE TYPICALS HAVE NOT BEEN CALCULATED AND ARE NOT INCLUDED IN THE QUANTITY SUMMARIES, AND ARE CONSIDERED SUBSIDIARY TO THE APPROPRIATE 203 ITEMS.

THE FOLLOWING GENERAL NOTES WILL BE USED ON THIS PROJECT:											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

INDEX OF SHEETS AND GENERAL NOTES

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	41191INX	41191	2	110

GENERAL

EDGE OF PAVEMENT — PROPOSED ROADWAY
TRAVELED WAY — existing roadway — (pavement removed outside slope lines)

DRIVEWAYS — (label surface type)

BUILDINGS — (building to be removed) — (label house or type of building)

FOUNDATION — (label type)

LEACH FIELD — leach field

BRIDGE CROSSINGS — STREAM — OVERPASS

STEPS AND WALK — (label type)

INTERMITTENT WATER COURSE

SHORE LINE — river/stream — pond — (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS) — (deciduous) (coniferous) (stump)

TREE OR STUMP (CROSS-SECTIONS) — (show station, circumference in feet & type)

HEDGE — (label type)

MONITORING WELL — mon W

WELL — W

FLAG POLE — fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type) — existing — PROPOSED — bgr — cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE) — (points toward retained ground)

FENCE (LABEL TYPE)

SIGNS — (single post) — (double post)

GAS PUMP — gp

FUEL TANK (ABOVE GROUND) — ft (label size & type)

STORAGE TANK FILLER CAP — fc

SEPTIC TANK — S

GRAVE — gr

MAILBOX — mb

VENT PIPE — vp

SATELLITE DISH ANTENNA — da

PHONE — ph

GROUND LIGHT/LAMP POST — gl — lp

BORING LOCATION — B

TEST PIT — TP

INTERSTATE NUMBERED HIGHWAY — 293

UNITED STATES NUMBERED HIGHWAY — 3

STATE NUMBERED HIGHWAY — 102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE — 2 PUB2E

DELINEATED WETLAND — DW
ORDINARY HIGH WATER — OHW
TOP OF BANK — TOB
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW
NORMAL HIGH WATER — NHW
WIDTH AT BANK FULL — WBF
PRIME WETLAND — PWET
PRIME WETLAND 100' BUFFER — PWET100
NON-JURISDICTIONAL DRAINAGE AREA — NJDA
COWARDIN DISTINCTION LINE — CDL
TIDAL BUFFER ZONE — TBZ
DEVELOPED TIDAL BUFFER ZONE — DTBZ
HIGHEST OBSERVABLE TIDE LINE — HOTL
MEAN HIGH WATER — MHW
MEAN LOW WATER — MLW
VERNAL POOL — VP
SPECIAL AQUATIC SITE — SAS
REFERENCE LINE — REF
WATER FRONT BUFFER — WB50
NATURAL WOODLAND BUFFER — NWB150
PROTECTED SHORELAND — PS250
INVASIVE SPECIES LABEL — I.S. I — I.S. II
INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500
100 YEAR FLOODPLAIN BOUNDARY — FP100
FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE — 30 31 32

PC. PT. POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

CLEARING LINE — SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) — 72.5
FINISHED GRADE ELEVATION (RIGHT) — 79.14

SHEET 1 OF 2

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	STDSYMB 1	41191	3	110

DRAINAGE

MANHOLE

CATCH BASIN — cb

DROP INLET — di

(existing) (PROPOSED)

DRAINAGE PIPE (existing) — (label size & type)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN — fb — (label size & type)

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN

show direction of flow

HEADER (existing & PROPOSED) — (with stone outlet protection)

END SECTION (existing & PROPOSED) — METAL or PLASTIC; RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE — (label type)

RR RIGHT-OF-WAY LINE

PROPERTY LINE

PROPERTY LINE (COMMON OWNER) — Z

TOWN LINE — BOW / CONCORD

COUNTY LINE — COOS / GRAFTON

STATE LINE — MAINE / NEW HAMPSHIRE

NATIONAL FOREST

CONSERVATION LAND — LC

BENCH MARK / SURVEY DISK

BOUND — bnd — (PROPOSED)

STATE LINE/ TOWN LINE MONUMENT — S/L — T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN — ip

DRILL HOLE IN ROCK — dh

TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±

PROPERTY PARCEL NUMBER — 12

HISTORIC PROPERTY — H

UTILITIES

existing PROPOSED

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY — (plot point at face not center of symbol)

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

LIGHT POLE

LIGHT ON POWER POLE

LIGHT ON JOINT POLE

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY
AS APPLICABLE e.g.:

R L — P+04 25.0' — T+04 25.0'

RAILROAD — (label ownership)

RAILROAD SIGN

RAILROAD SIGNAL

UTILITY JUNCTION BOX — jb — JB

OVERHEAD WIRE — OW — (label type)

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned) — W — PW

SEWER — S — PS

TELEPHONE — T — PT

ELECTRIC — E — PE

GAS — G — PG

LIGHTING — L — PL

INTELLIGENT TRANSPORTATION SYSTEM — ITS — PITS

FIBER OPTIC — FO — PFO

WATER SHUT OFF

GAS SHUT OFF

HYDRANT

MANHOLES

SEWER — MHS

TELEPHONE — MHT

ELECTRICAL — MHE

GAS — MHG

UNKNOWN

TRAFFIC SIGNALS / ITS

existing PROPOSED

MAST ARM (existing) — 30' MA (NOTE ANGLE FROM ℄)

OPTICOM RECEIVER

OPTICOM STROBE

TRAFFIC SIGNAL

PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT

SIGNAL CONDUIT — C — PC

CONTROLLER CABINET — cc — CC

METER PEDESTAL — mp — MP

PULL BOX — pb — PB

LOOP DETECTOR (QUADRUPOLE) — (label size)

LOOP DETECTOR (RECTANGULAR) — (label size)

CAMERA POLE (CCTV)

FIBER OPTIC DELINEATOR — fod — FOD

FIBER OPTIC SPLICE VAULT — SVF

ITS EQUIPMENT CABINET — its — ITS

VARIABLE SPEED LIMIT SIGN

DYNAMIC MESSAGE SIGN

ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS — B-1

CURB MARK NUMBER - GRANITE — G-1

CLEARING AND GRUBBING AREA — A

DRAINAGE NOTE — 1

EROSION CONTROL NOTE — A

FENCING NOTE — A

GUARDRAIL NOTE — 1

ITS NOTE — 1

LIGHTING NOTE — A

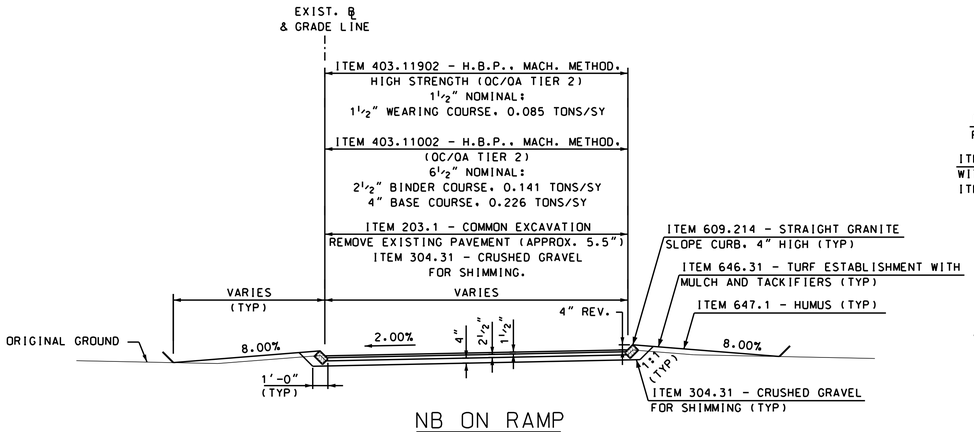
TRAFFIC SIGNAL NOTE — 1

STATE OF NEW HAMPSHIRE

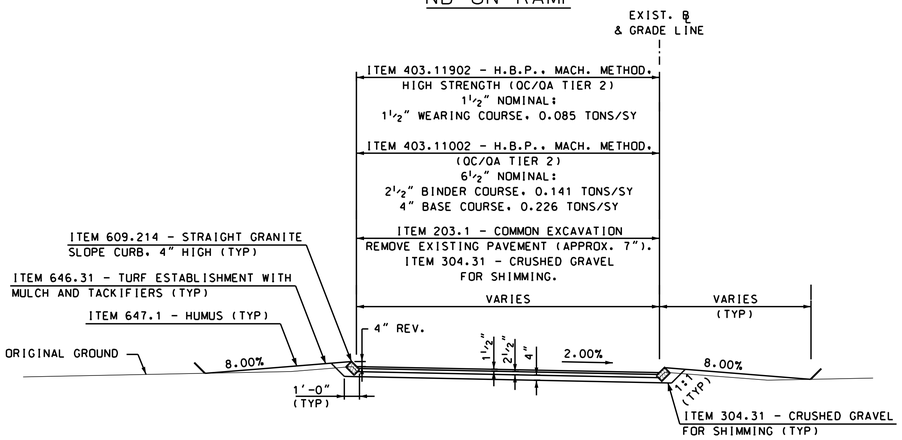
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

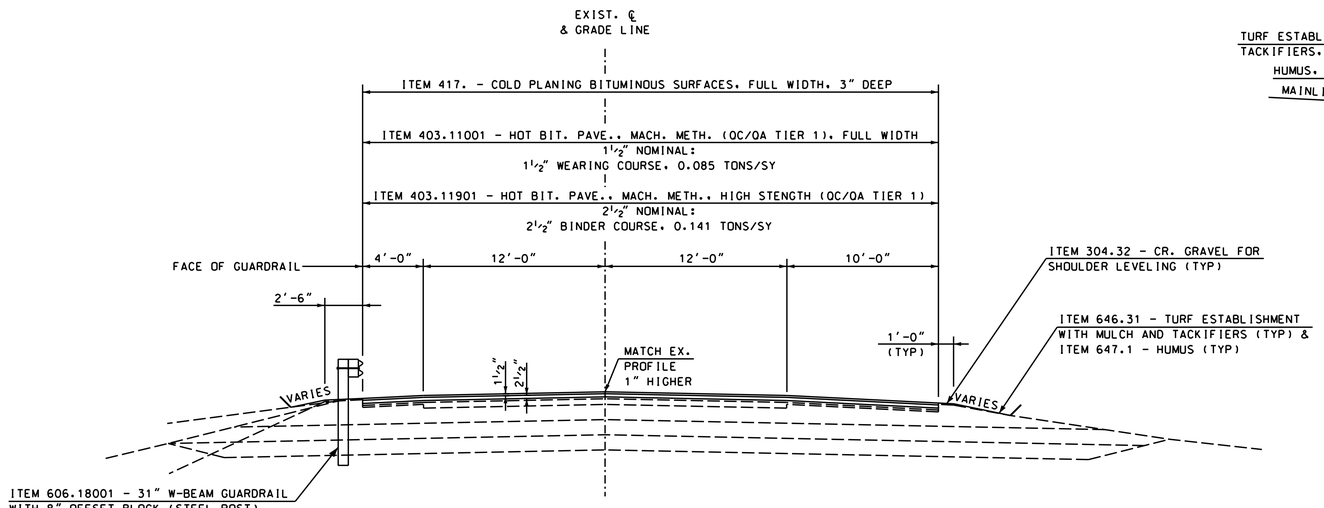
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	STDSYMB 2	41191	4	110



NB ON RAMP



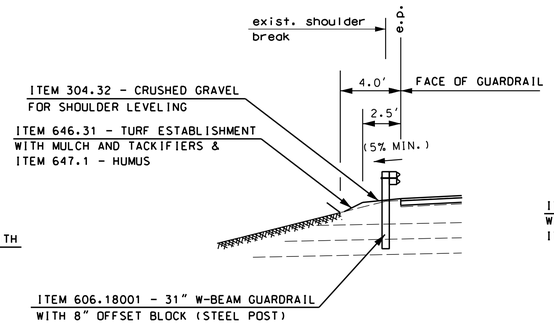
NB OFF RAMP



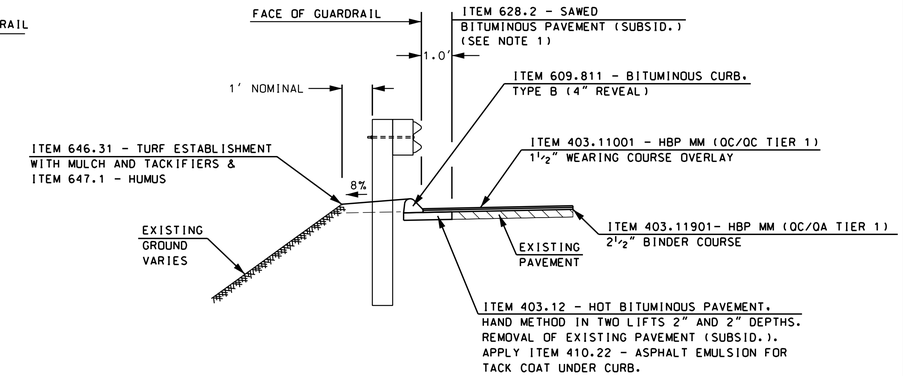
I-89 NB & SB MAINLINE

NOT TO SCALE

STA. 831+93 ± TO STA. 862+00 ± SOUTHBOUND
STA. 832+50 ± TO STA. 862+40 ± NORTHBOUND



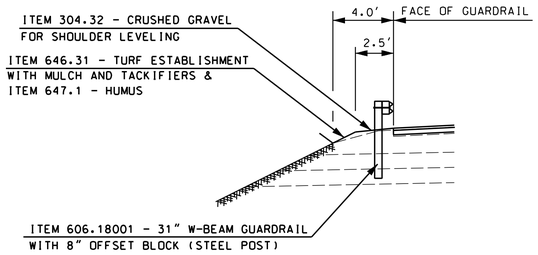
SHOULDER WIDENING FOR NEW GUARDRAIL INSTALLATION



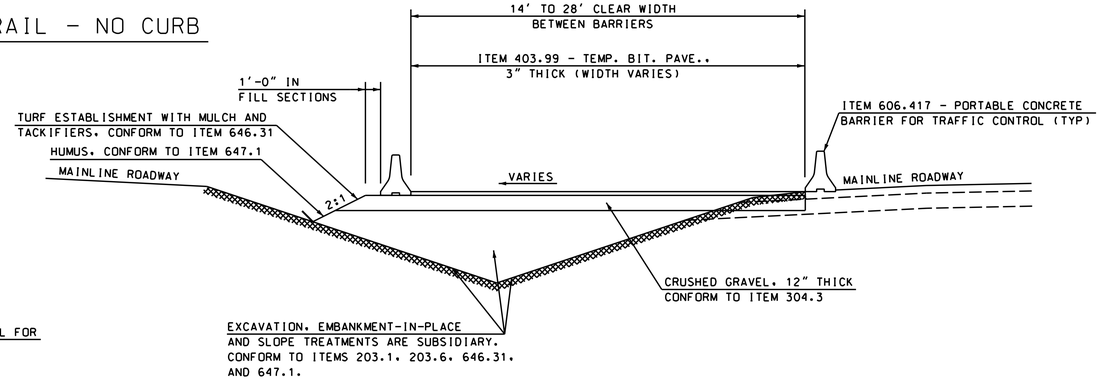
NOTES:

1. IN AREAS OF EXISTING BITUMINOUS CURB TO BE REPLACED, SAWCUT AND EXCAVATE THE EXISTING PAVEMENT 1.0 FOOT FROM THE FACE OF GUARDRAIL. THIS WORK SHALL BE SUBSIDIARY TO ITEM 403.12 - HBP, HAND METHOD.

GUARDRAIL - BITUMINOUS CURB



GUARDRAIL - NO CURB



I-89 NB & SB TEMPORARY DIVERSIONS

ITEM 670.04501 - CONSTRUCT AND REMOVE DIVERSION (SB)
ITEM 670.04502 - CONSTRUCT AND REMOVE DIVERSION (SB ON NB)
ITEM 670.04503 - CONSTRUCT AND REMOVE DIVERSION (NB)

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	J. MERCER	DATE 06/12/19
NEW DESIGN	J. MERCER	DATE 06/12/19
SHEET CHECKED	D. BLOOD	DATE 06/12/19
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TYPICAL SECTIONS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191typ01	41191	5	110

GM2 ASSOCIATES

SUMMARY OF QUANTITIES (ESTIMATE)

THIS INFORMATION IS FOR BIDDING PURPOSES ONLY

DRAINAGE SUMMARY

ITEM NO.	202.31	202.41	206.1	206.2	570.4	585.3	593.411	602.60912	602.60915	602.60924	603.0001	603.00215	603.00218	603.33212	603.33215	603.36115	603.36118	603.36124	603.44212	603.44215	603.80215	603.99012	604.0007	604.124	604.1249	604.242	604.4	604.72	605.506	605.512	605.515	605.79	622.1	
	FILL ABANDONED PIPE	REMOVAL OF EXISTING PIPE 0-24" DIAMETER	COMMON STRUCTURE EXCAVATION	ROCK STRUCTURE EXCAVATION	MORTAR RUBBLE MASONRY (F)	STONE FILL, CLASS C.	GEOTEXTILE, PERM CONTROL CL 1, NON-WOVEN	CLOSE-FIT PIPE LINER 12" PIPE (CONTRACTORS OPTION)	CLOSE-FIT PIPE LINER 15" PIPE (CONTRACTORS OPTION)	CLOSE-FIT PIPE LINER 24" PIPE (CONTRACTORS OPTION)	VIDEO INSPECTION	15" R.C. PIPE, 2000D	18" R.C. PIPE, 2000D	12" CORR. POLYETHYLENE END SECTION	15" CORR. POLYETHYLENE END SECTION	15" ALUMINIZED STEEL END SECTION	18" ALUMINIZED STEEL END SECTION	24" ALUMINIZED STEEL END SECTION	12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE	15" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE	15" PLASTIC PIPE (SMOOTH INTERIOR)	12" TEMPORARY DRAINAGE PIPE	POLYETHYLENE LINER	CATCH BASINS TYPE B, 4-FOOT DIAMETER	TEMPORARY CATCH BASINS TYPE B, 4-FOOT DIAMETER	DROP INLET, TYPE D-B	RECONSTING/ADJUSTING CATCH BASINS & DROP INLET	GRATES & FRAMES, TYPE B	6" PERF. CORR. POLYETHYL PIPE UNDERDRAIN	12" PERF. CORR. POLYETHYL PIPE UNDERDRAIN	15" PERF. CORR. POLYETHYL PIPE UNDERDRAIN	UNDERDRAIN FLUSHING BASIN	STEEL WITNESS MARKERS	REMARKS
UNIT	CY	LF	CY	CY	CY	CY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	LF	LF	LF	LF	EA	U	U	U	LF	EA	LF	LF	LF	EA	EA	
NOTE NO.																																		
1			2.2	2	2	2.2	10.2		116																								1	
2									67																		3	1					1	
2A				314.9																									470					
2B	2.6			241.2																									360			1		
3			1.9			1.9	8.9				25			1					25				1			1							1	
4			1.9			1.9	8.9		55							1							1				2	1					1	
5									49																		3	1					1	
6			1.9			1.9	8.9				30			1					30				1			1							1	
7			1.9			1.9	8.9				50				1						50		1	1									1	
7A									28														1				2	1						
8									49																		3	1					1	
9									69																		3	1					1	
10									50														1				2	1						
11									84														1				2	1						
12									70														1				2	1						
13								88															1				2	1						
14																							1				2	1						
15																											3	1					1	
16									80														1	1										
16A		86	1.9			1.9	8.9				157	157					1							1									2	
17		33	1.9			1.9	8.9				45				1					45			1	1									1	
18																											3	1					1	
19																							1				2	1						
20			1.9			1.9	8.9				40			1					40				1			1							1	
21			1.9			1.9	8.9				58			1					58				1			1							1	
22			2.8	2.0	3	2.8	12.2			228																							1	
23			1.9			1.9	8.9				40			1					40				1	1									1	
24											38	38											1	1										
24A											42										42		1	1										
25											29	29											1	1										
26			1.9			1.9	8.9				64	64					1						1	1									1	
27			4.1			1.9	8.9				60	60					1										2	1					2	
27A			1.9			1.9	8.9				30		30					1																
28			4.1			1.9	8.9				58	58					1						1				2	1					1	
29											29	29															2	1					1	
30											24	24											1				2	1						
31											19	19											1				2	1						
32									93																		3	1					1	
33									142																		2	1					1	
34																							1				2	1						
35									70																		3	1					1	
36				234.5																							2	1			350		1	
37									62																		3	1					1	
38				214.4																							2	1			320		1	
39				201.0																									300					
40			1.9	2.0		1.9	8.9		37																								1	
41									246																								1	
42				30.8																										46			1	
43				134.7																										201			1	
44				201.0																										300				
45				201.0																									300				1	
TRAFFIC CONTROL																																		
T1																						13			1									
T2																						14			1									
T3																						13			1									
SUB-TOTAL	2.6	119.0	36.0	1779.5	5	31.6	147.0	88	1367	228	838	478	30	5	2	1	4	1	193	45	92	40	24	9	3	4	61	26	1430	547	670	2	34	
ROUNDING	0.4	1.0	4.0	10.5	0	3.4	3.0	2	8	2	12	12	5	0	0	0	0	0	7	5	8	5	0	0	0	0	9	0	20	13	5	1	0	
TOTAL	3.0	120.0	40.0	1790	5	35.0	150.0	90	1375	230	850	490	35	5	2	1	4	1	200	50	100	45	24	9	3	4	70	26	1450	560	675	3	34	

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED J. MERCER DATE 06/26/19
NEW DESIGN J. MERCER DATE 06/26/19
SHEET CHECKED D. BLOOD DATE 06/26/19
AS BUILT DETAILS DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
SUMMARY OF QUANTITIES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191sum01	41191	6	110

SUMMARY OF QUANTITIES (ESTIMATE)

THIS INFORMATION IS FOR BIDDING PURPOSES ONLY

SURFACING MATERIALS

ITEM NO.	304.31	304.32	403.11001	403.11002	403.11901	403.11902	403.12	403.4	403.6	403.99	410.22	417.	417.416	417.53	628.2
DESCRIPTION	CRUSHED GRAVEL FOR SHIMMING	CRUSHED GRAVEL FOR SHOULDER LEVELING	HOT BITUMINOUS PAVEMENT, MACHINE METHOD (QC/QA TIER 1)	HOT BITUMINOUS PAVEMENT, MACHINE METHOD (QC/QA TIER 2)	HBP - MACHINE METHOD, HIGH STRENGTH (QC/QA TIER 1)	HBP - MACHINE METHOD, HIGH STRENGTH (QC/QA TIER 2)	HOT BITUMINOUS PAVEMENT, HAND METHOD	MATERIAL TRANSFER VEHICLE	PAVEMENT JOINT ADHESIVE	TEMPORARY BITUMINOUS PAVEMENT	ASPHALT EMULSION FOR TACK COAT	COLD PLANING BITUMINOUS SURFACES	RUMBLE STRIPS, 16" WIDE	REMOVE AND INLAY EXISTING RUMBLE STRIPS	SAWED BITUMINOUS PAVEMENT
UNIT	CY	TON	TON	TON	TON	TON	TON	TON	LF	TON	GAL	SY	LF	LF	LF
LOCATION															
MAINLINE		172	2252.5		3754.1		24.4	6006.7	38152		2355	29439.2	10784		165
RAMPS	161	20	264.6	2147	441	495.5	221.9	705.5	23244		348				147
TRAFFIC CONTROL										2051.1				2575	
NB ROUTE 4 BRIDGE (093/109)										109.7					
SB ROUTE 4 BRIDGE (094/108)										73.6					
NB MASCOMA RIVER BRIDGE (097/112)										162.7					
SB MASCOMA RIVER BRIDGE (098/111)										118.5					
SUBTOTAL	161	192	2517.1	2147	4195.1	495.5	246.3	6712.2	61396	2515.6	2703	29439.2	10784	2575	312
ROUNDING	9	8	32.9	53	14.9	4.5	3.7	37.8	4	24.4	7	60.8	16	25	8
TOTAL	170	200	2550	2200	4210	500	250	6750	61400	2540	2710	29500	10800	2600	320

INCIDENTAL ITEMS

ITEM NO.	DESCRIPTION	UNIT	TOTAL
201.881	INVASIVE SPECIES CONTROL, TYPE I	SY	2550
201.882	INVASIVE SPECIES CONTROL, TYPE II	SY	70
203.1	COMMON EXCAVATION	CY	1010
203.11	COMMON EXCAVATION - LRS	CY	2100
203.92	ROCK SCALING - MACHINE METHOD	HR	12
206.19	COMMON STRUCTURE EXCAVATION EXPLORATORY	CY	6
214.	FINE GRADING	U	1
615.024	RELOCATING TRAFFIC SIGN TYPE B	U	1
618.61	UNIFORMED OFFICERS WITH VEHICLE	$	*
618.7	FLAGGERS	HR	4000
619.1	MAINTENANCE OF TRAFFIC	U	1
619.25	PORTABLE CHANGEABLE MESSAGE SIGN	U	4
619.279	AUTOMATED TRAILER-MOUNTED SPEED LIMIT SIGN	U	2
619.63	TRUCK MOUNTED IMPACT ATTENUATOR, TEST LEVEL 3	U	2
645.512	COMPOST SOCK FOR PERIMETER BERM	LF	3030
645.531	SILT FENCE	LF	4910
645.7	STORMWATER POLLUTION PREVENTION PLAN	U	1
645.71	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROL	HR	840
646.31	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS	SY	7000
647.1	HUMUS	CY	690
670.104	TEMPORARY PORTABLE LIGHTING	U	3
692.	MOBILIZATION	U	1
697.11	INVASIVE SPECIES CONTROL AND MANAGEMENT PLAN	U	1
697.31	PROJECT OPERATIONS PLAN	U	1
697.41	CRITICAL PATH METHOD (CPM) ELECTRONIC SCHEDULE	U	1
698.12	FIELD OFFICE TYPE B	MON	36
699.	MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL	$	*
1008.31	ALTERATIONS AND ADDITIONS AS NEEDED - DRAINAGE ADJUSTMENTS	$	*
1010.15	FUEL ADJUSTMENT	$	*
1010.2	ASPHALT CEMENT ADJUSTMENT	$	*
1010.3	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) ASPHALT	$	*

* NOT A BID ITEM

PAVEMENT MARKINGS

ITEM NO.	632.0106	632.1104	632.3106	632.3112	632.3118	632.71206	632.911
DESCRIPTION	RETROREFLECTIVE PAINT PAVE. MARKING, 6" LINE	PREFORMED RETROREFLECTIVE TAPE, TYPE I (REMOVABLE), 4" LINE	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 6" LINE	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 12" LINE	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 18" LINE	GROOVED RETROREFLECTIVE POLYUREA PAVEMENT MARKING, 6" LINE	OBLITERATE PAVE. MARKING LINE, 12" WIDE & UNDER
UNIT	LF	LF	LF	LF	LF	LF	LF
LOCATION							
MAINLINES	31725	13862	343	2522	17	15863	
RAMPS	9934						
TRAFFIC CONTROL	26950						22250
SUBTOTAL	68609	13862	343	2522	17	15863	22250
ROUNDING	41	38	7	8	3	2	50
TOTAL	68650	13900	350	2530	20	15865	22300

TRAFFIC CONTROL BARRIER

ITEM NO.	606.417	606.9523	606.9612	
DESCRIPTION	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE), TEST LEVEL 3	TEMPORARY GUARDRAIL TO BARRIER TRANSITION (STEEL POST)	REMARKS
UNIT	LF	U	U	
LOCATION				
SB DIVERSION	2570	3	1	
SB ON NB DIVERSION	4000	4		
NB DIVERSION	3230	3	1	
SUBTOTAL	4000	4	2	SB ON NB DIVERSION IS THE CRITICAL PHASE.
ROUNDING	50	0	0	
TOTAL	4050	4	2	SB ON NB DIVERSION IS THE CRITICAL PHASE.

SIDEWALK

ITEM NO.	304.301	608.28
DESCRIPTION	CRUSHED GRAVEL	8" CONCRETE SIDEWALK (F)
UNIT	CY	SY
LOCATION		
EXIT 19 NB OFF RAMP	1.05	37.67
EXIT 19 NB ON RAMP	0.54	19.44
SUBTOTAL	1.59	57.11
ROUNDING	0.41	0.89
TOTAL	2.00	58.00

TEMPORARY DIVERSIONS

DESCRIPTION	COMMON EXCAVATION *	EMBANKMENT-IN-PLACE *	FINE GRADING *	CRUSHED GRAVEL *	TURF ESTABLISHMENT AND STABILIZATION *	REMARKS
UNIT	CY	CY	SY	CY	SY	
ITEM 670.04501 - CONSTRUCT AND REMOVE DIVERSION (1 U)	1220	510	2850	710	550	
SB DIVERSION						
ITEM 670.04502 - CONSTRUCT AND REMOVE DIVERSION (1 U)	490	220	1450	270	300	
SB ON NB DIVERSION						
ITEM 670.04503 - CONSTRUCT AND REMOVE DIVERSION (1 U)	280	70	3200	210	580	
NB DIVERSION						
QUANTITY SUBSIDIARY	1990	800	7500	1190	1430	

*SUBSIDIARY TO CONSTRUCT AND REMOVE DIVERSION ITEM

SUBSIDIARY

DESCRIPTION
STEEL PLATE CONSTRUCTION & REMOVAL
CORE EXISTING CB
PLUG HOLES AFTER PIPE REMOVALS
NOTE: THIS LIST SHOULD NOT BE CONSIDERED THE COMPLETE LIST OF SUBSIDIARY WORK IN THE PROJECT. REFER ALSO TO THE PLANS, PROPOSAL, SPECIAL PROVISIONS, AND STANDARD SPECIFICATIONS.

MATERIALS TO BE SALVAGED

DESCRIPTION
TO HIGHWAY MAINTENANCE DISTRICT 2:
- DRAINAGE FRAMES AND GRATES
TO BRIDGE MAINTENANCE:
- ALL DEBRIS SHIELD PANELS PRESENTLY INSTALLED ON BRIDGES

CLEARING AND GRUBBING

ITEM NO.		201.7
DESCRIPTION		SELECTIVE CLEARING AND THINNING (F)
UNIT		ACRES
LOCATION	DESIGNATED AREA	
STA. 39+62, RT - STA. 42+32, RT	A	0.10
SUBTOTAL		0.10
ROUNDING		0.10
TOTAL		0.20

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

		DATE
SDR PROCESSED	J. MERCER	06/26/19
NEW DESIGN	J. MERCER	06/26/19
SHEET CHECKED	D. BLOOD	06/26/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

SUMMARY OF QUANTITIES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191sum02	41191	7	110

SUMMARY OF QUANTITIES (ESTIMATE)

THIS INFORMATION IS FOR BIDDING PURPOSES ONLY

CURBING

ITEM NO.			609.01	609.214	609.216	609.22	609.234	609.5	609.811	
DESCRIPTION	MARK NUMBER	RADIUS	STRAIGHT GRANITE CURB	STRAIGHT GRANITE SLOPE CURB 4" HIGH	STRAIGHT GRANITE SLOPE CURB 6" HIGH	STRAIGHT GRANITE SLOPE CURB WITH RADIAL JOINTS	CURVED GRANITE SLOPE CURB 4" HIGH	RESET GRANITE CURB	BITUMINOUS CURB, TYPE B (4" REVEAL)	REMARKS
UNIT		FT	LF	LF	LF	LF	LF	LF	LF	
LOCATION										
STA. 835+08.2 LT 41.2' - STA. 835+58.4, LT 42.1'	B-1								50.2	
STA. 841+39.2, LT 20.1' - STA. 846+86.8, LT 20.2'	B-2								547.6	
STA. 848+46.6, LT 20.2' - STA. 850+65.7, LT 20.7'	B-3								219.1	
STA. 837+60.2, RT 20.0' - STA. 837+99.6, RT 20.7'	B-4								39.4	
STA. 842+67.3, RT 21.0' - STA. 847+00.1, RT 21.7'	G-1			432.8				432.8		
STA. 847+00.1, RT 21.7' - STA. 848+57.0, RT 21.2'	G-2			156.9				156.9		
STA. 848+57.0, RT 21.2' - STA. 848+57.1, RT 23.2'	G-3	1					3.1			
STA. 12+45.3, LT 18.0' - STA. 848+57.1, RT 23.2'	G-4			64				64		
STA. 11+45.0, LT 20.0' - STA. 12+45.3, LT 18.0'	G-5	250		107				107		
STA. 11+31.7, LT 20.0' - STA. 11+45.0, LT 20.0'	G-6	320		14.2				14.2		
STA. 6+50.9, LT 20.0' - STA. 11+31.7, LT 20.0'	G-7	199		534.6				534.6		
STA. 3+79.6, LT 33.9' - STA. 6+50.9, LT 20.0'	G-8	420		293.8				293.8		
STA. 3+41.0, LT 48.5' - STA. 3+79.6, LT 33.9'	G-9			49.6				49.6		
STA. 51+20.1, LT 78.5' - STA. 3+41.0, LT 48.5'	G-10	400		101.5				101.5		
STA. 51+20.1, LT 78.5' - STA. 51+30.3, LT 59.3'	G-11	12				29.7				
STA. 51+30.3, LT 59.3' - STA. 50+77.7, LT 27.0'	G-12	100		68.6				68.6		
STA. 50+77.7, LT 27.0' - STA. 50+18.0, LT 24.0'	G-13	760		62.7				62.7		
STA. 50+18.0, LT 24.0' - STA. 49+38.0, LT 20.0'	G-14			80.1				80.1		
STA. 49+38.0, LT 20.0' - STA. 48+91.6, LT 20.0'	G-15			46.4				46.4		
STA. 48+91.6, LT 20.0'- STA. 46+90.0, LT 20.0'	G-16	440		192.8				192.8		
STA. 46+90.0, LT 20.0'- STA. 44+42.1, LT 20.0'	G-17	215		226.8				226.8		
STA. 44+42.1, LT 20.0'- STA. 42+55.4, LT 20.0'	G-18			186.6				186.6		
STA. 42+55.4, LT 20.0'- STA. 41+00.0, LT 20.0'	G-19	295		166.7				166.7		
STA. 41+00.0, LT 20.0'- STA. 40+00.0, LT 24.0'	G-20	450		105.7				105.7		
STA. 39+18.8, RT 0.0' - STA. 40+59.2, RT 0.0'	G-21	535		140.4				140.4		
STA. 40+59.2, RT 0.0' - STA. 42+55.4, RT 0.0'	G-22	275		196.2				196.2		
STA. 42+55.4, RT 0.0' - STA. 44+42.1, RT 0.0'	G-23			186.6				186.6		
STA. 44+42.1, RT 0.0' - STA. 46+90.0, RT 0.0'	G-24	235		247.9				247.9		
STA. 46+90.0, RT 0.0' - STA. 48+91.6, RT 0.0'	G-25	460		201.6				201.6		
STA. 48+91.6, RT 0.0' - STA. 50+37.6, RT 0.0'	G-26			146.0				146.0		
STA. 50+37.6, RT 0.0' - STA. 52+12.3, RT 0.0'	G-27	350		174.7				174.7		
STA. 52+10.3, LT 16.0' - STA. 52+10.8, LT 17.9'	G-28	1					2.8			
STA. 52+10.8, LT 17.9' - STA. 51+52.7, LT 54.3'	G-29	1177			73.6					
STA. 51+52.7, LT 54.3' - STA. 51+48.2, LT 53.0'	G-30	3.5				6.2				
STA. 51+48.2, LT 53.0' - STA. 51+37.5, LT 29.1'	G-31			26.8				26.8		
STA. 51+37.5, LT 29.1' - STA. 51+40.0, LT 24.0'	G-32	3.5				6.8				
STA. 51+40.0, LT 24.0' - STA. 52+10.3, LT 16.0'	G-33	400		74.7				74.7		
STA. 3+77.8, LT 16.0' - STA. 3+78.0, LT 18.0'	G-34	1					3			
STA. 2+93.2, LT 20.1' - STA. 3+77.8, LT 16.0'	G-35	200		93.5				93.5		
STA. 2+51.4, LT 24.4' - STA. 2+93.2, LT 20.1'	G-36	125		52.2				52.2		
STA. 2+50.1, LT 30.6' - STA. 2+51.4, LT 24.4'	G-37	3.5				8.3				
STA. 2+79.9, LT 88.0' - STA. 2+50.1, LT 30.6'	G-38	1177			75.0					
STA. 2+82.9, LT 88.5' - STA. 2+79.9, LT 88.0'	G-39	3.5				6.9				
STA. 3+30.2, LT 35.7' - STA. 2+82.9, LT 88.5'	G-40	880		86.2				86.2		
STA. 3+62.5, LT 21.5' - STA. 3+30.2, LT 35.7'	G-41			40				40		
STA. 3+78.0, LT 18.0' - STA. 3+62.5, LT 21.5'	G-42	404		17.5				17.5		
STA. 2+95.2, RT 0.0' - STA. 2+48.3, RT 0.0'	G-43	90		46.9				46.9		
STA. 4+26.1, RT 0.0' - STA. 2+95.2, RT 0.0'	G-44	178		130.9				130.9		
STA. 6+50.4, RT 0.0' - STA. 4+26.1, RT 0.0'	G-45	360		224.3				224.3		
STA. 11+31.7, RT 0.0' - STA. 6+50.4, RT 0.0'	G-46	179		481.3				481.3		
STA. 12+57.8, RT 0.0' - STA. 11+31.7, RT 0.0'	G-47	300		126.0				126.0		
STA. 13+12.9, RT 0.0' - STA. 12+57.8, RT 0.0'	G-48			55.2				55.2		
US Route 4 Bridge Approach Rails			130.0							
SUBTOTAL				5639.7				5639.7		
30% ESTIMATED BREAKAGE								-1691.9		
FROM RESET				3947.8						
SUBTOTAL			130.0	1691.9	148.6	57.9	8.9	3947.8	856.3	
ROUNDING			10.0	8.1	1.4	2.1	1.1	2.2	43.7	
TOTAL			140.0	1700.0	150.0	60.0	10.0	3950.0	900.0	

GUARDRAIL

	ITEM NO.	202.7	203.5561	606.1208	606.1254	606.1255	606.127	606.18001	606.21208	606.28001	606.41231	606.41239	
NOTE NO.	DESCRIPTION	REMOVAL OF GUARDRAIL	EAGRT PLATFORM PREFFERED	BEAM GUARDRAIL (THRIE BEAM) INCLUDING TRANSITION SECTION	BEAM GUARDRAIL (TERMINAL UNIT EAGRT, TL 3) (STEEL POST)	BEAM GUARDRAIL (TERMINAL UNIT EAGRT, TL 2) (STEEL POST)	BEAM GUARDRAIL (TERMINAL UNIT TYPE G-2) (STEEL POST)	31" W-BEAM GUARDRAIL WITH 8" OFFSET BLOCK (STEEL POST)	DOUBLE-FACED BEAM GUARDRAIL (THRIE BEAM) INCLUDING TRANS. SECTION	31" DOUBLE FACED W-BEAM GUARDRAIL WITH 8" OFFSET BLOCK (STEEL POST)	TRANSITION SINGLE SLOPE CONCRETE BARRIER, PRECAST	MODIFIED TRANSITION SINGLE SLOPE CONCRETE BARRIER, PRECAST	REMARKS
	UNIT	LF	U	LF	U	U	U	LF	LF	LF	U	U	
	LOCATION												
1	STA. 831+20.5 (SB)±, 0' OFF E.P. - STA. 835+58 (SB)±, 0' OFF E.P.	437.5						437.5					CONNECT TO EX. RAIL AT NHDOT PROJECT 15880 LIMITS (SUBSID.) & SB ON RAMP
2	STA. 831+14 (SB)±, 0' OFF E.P. - STA. 834+63 (SB)±, 25.5' OFF E.P.	345					1			337.5			CONNECT TO EX. RAIL AT NHDOT PROJECT 15880 LIMITS (SUBSID.)
2A	STA. 834+99 (NB)±, 23' OFF E.P. - STA. 838+98 (NB)±, 0' OFF E.P.	730					1			387.5			CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
3	STA. 831+66 (NB)±, 0' OFF E.P. - STA. 831+78.5 (NB)±, 0' OFF E.P.						1						CONNECT TO EX. RAIL AT NHDOT PROJECT 15880
4	STA. 831+75 (NB)±, 0' OFF E.P. - STA. 839+01 (NB)±, 0' OFF E.P.	725						725					CONNECT TO EX. BARRIER AT NHDOT PROJECT 15880 & EX. BR. APPR. RAIL (SUBSID.)
5	STA. 838+17 (SB)±, 0' OFF E.P. - STA. 838+42 (SB)±, 0' OFF E.P.	25					1	12.5					CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
6	STA. 841+62 (SB)±, 0' OFF E.P. - STA. 846+98.02 (SB), 0' OFF E.P.	537.5						537.5					CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
7	STA. 841+60 (SB)±, 0' OFF E.P. - STA. 845+34 (SB)±, 28' OFF E.P.	565					1			362.5			CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
7A	STA. 845+66 (NB)±, 18.5' OFF E.P. - STA. 848+31.38 (NB)	600					1		33.15	200	1		CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
7B	STA. 846+82.65 (SB), 0' OFF E.P. - STA. 847+48.30 (SB)			33.15			1				1		CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
8	STA. 842+13 (NB)±, 0' OFF E.P. - STA. 842+25.5 (NB)±, 0' OFF E.P.						1						CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
8A	STA. 849+47.78 (NB) - STA. 850+13.43 (NB), 0' OFF E.P.			33.15			1					1	CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
9	STA. 39+55±, 0' OFF E.P. - STA. 47+05±, 4' OFF F.O.C.	750					1	737.5					CONNECT TO EX. BRIDGE APPR. RAIL (SUBSID.)
10	STA. 6+11.5±, 5' OFF F.O.C. - STA. 848+64.43 (NB), 0' OFF E.P.	700	1			1		637.5					CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
11	STA. 848+51.97 (SB), 0' OFF E.P. - STA. 851+01.97 (SB), 2.5' OFF E.P.	250	1		1			187.5					CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
12	STA. 848+64.70 (SB) - STA. 855+30 (SB)±, 25.5' OFF E.P.	400					1		33.15	600		1	CONNECT TO PR. BRIDGE APPR. RAIL (SUBSID.)
13	STA. 855+70 (NB)±, 26' OFF E.P. - STA. 862+28 (NB)±, 0' OFF E.P.	1162.5					1	400		262.5			CONNECT TO EX. RAIL AT NHDOT PROJECT 15880 LIMITS (SUBSID.)
14	STA. 850+38.38 (NB), 0' OFF E.P. - STA. 862+31 (NB)±, 0' OFF E.P.	1187.5						1187.5					CONNECT TO PR. BR. APPR. RAIL & EX. RAIL AT NHDOT PROJECT 15880 (SUBSID.)
15	STA. 858+12 (SB)±, 0' OFF E.P. - STA. 861+90 (SB)±, 0' OFF E.P.	375					1	362.5					CONNECT TO EX. RAIL AT NHDOT PROJECT 15880 LIMITS (SUBSID.)
	SUBTOTAL	8790	2	66.3	1	1	13	5225	66.3	2150	2	2	
	ROUNDING	10	0	0	0	0	0	15	0	10	0	0	
	TOTAL	8800	2	66.3	1	1	13	5240	66.3	2160	2	2	

DELINEATORS

ITEM NO.	621.1	621.2	621.31	621.32	621.33
DESCRIPTION	RETROREFLECTIVE MEDIAN BARRIER DELINEATOR	REFLECTIVE BEAM GUARDRAIL DELINEATOR	SINGLE DELINEATOR WITH POST	DOUBLE DELINEATOR WITH POST	SINGLE DELINEATOR DOUBLE FACED WITH POST
UNIT	EA	EA	EA	EA	EA
COLOR					
WHITE	0	88	59	16	
YELLOW	4	50	13		10
RED				5	
GREEN			3		
SUBTOTAL	4	138	75	21	10
ROUNDING	1	2	0	0	0
TOTAL	5	140	75	21	10

ITS AND CONDUIT

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
614.331	3" STEEL CONDUIT	LF	20
614.523	MOLDED PULL BOX 17"X30"	EA	1
614.73114	3" PVC CONDUIT, SCHEDULE 40	LF	40
677.41001	CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM FOUNDATION	U	1
677.4101	CCTV SYSTEM	U	1
677.47501	ROADSIDE UNIT (RSU) WITHOUT POLE (5.9 GHZ DSRC)	U	1
677.54201	POLE MOUNTED ITS EQUIPMENT CABINET	U	1
677.6301	METER AND DISCONNECT PEDESTAL	U	1
677.9308	3-CONDUCTOR #8 AWG CABLE	LF	60

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 06/26/19
NEW DESIGN	J. MERCER	DATE 06/26/19
SHEET CHECKED	D. BLOOD	DATE 06/26/19
AS BUILT DETAILS		DATE

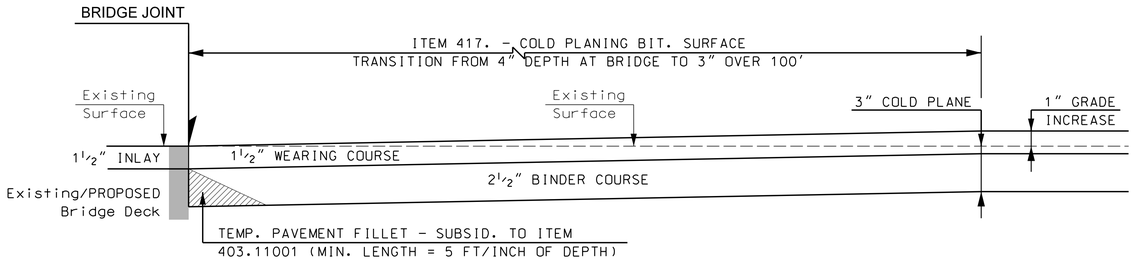
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

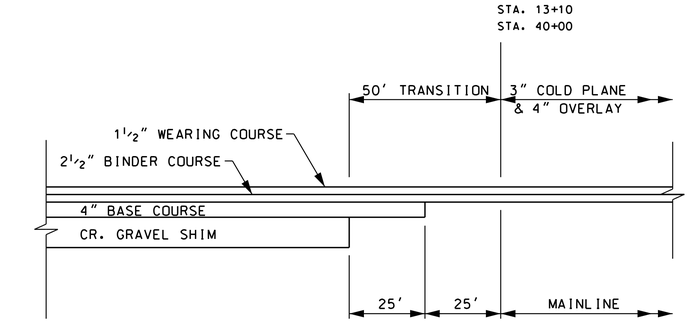
SUMMARY OF QUANTITIES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191sum03	41191	8	110



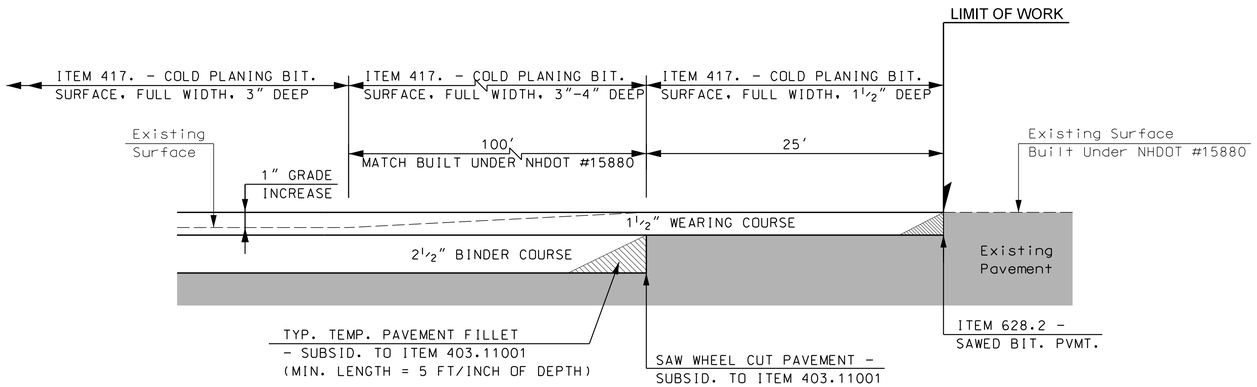
MASCOMA RIVER & US ROUTE 4 BRIDGES PAVEMENT MATCH

NOT TO SCALE



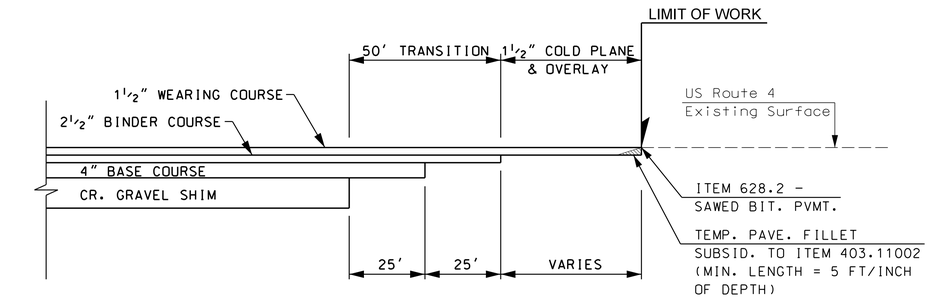
I-89 NB ON & OFF RAMPS PAVEMENT MATCH @ MAINLINE

NOT TO SCALE



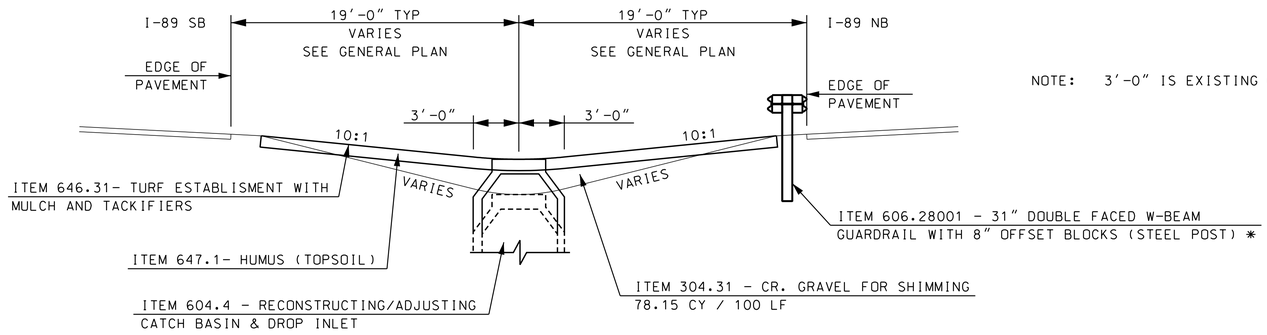
I-89 NB & SB PAVEMENT MATCH

NOT TO SCALE



I-89 NB ON & OFF RAMPS PAVEMENT MATCH @ US ROUTE 4

NOT TO SCALE



NOTE: 3'-0" IS EXISTING GROUND DOWN.

TYPICAL MEDIAN SECTION - INSTALLATION OF FLATTER SLOPES

NOT TO SCALE

STA 831+73 (SB) ± TO STA 838+50 (SB) ±
STA 841+60 (SB) ± TO STA 858+25 (SB) ±

* USE DOUBLE FACED GUARDRAIL AT LOCATIONS WERE THE SB SIDE OF THE MEDIAN IS NOT PROTECTED WITH GUARDRAIL. GUARDRAIL LOCATION RELATIVE TO EDGE OF PAVEMENT VARIES. SEE GENERAL PLAN.

NUMBER	DESCRIPTION	STATION	STATION	DATE
	REVISIONS AFTER PROPOSAL			

SDR PROCESSED	J. MERCER	DATE 06/12/19
NEW DESIGN	J. MERCER	DATE 06/12/19
SHEET CHECKED	D. BLOOD	DATE 06/12/19
AS BUILT DETAILS		DATE

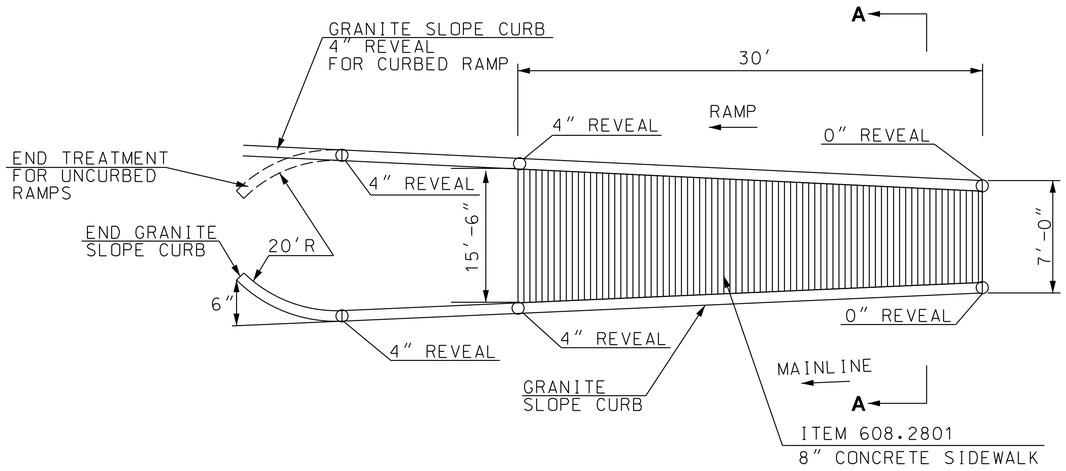
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

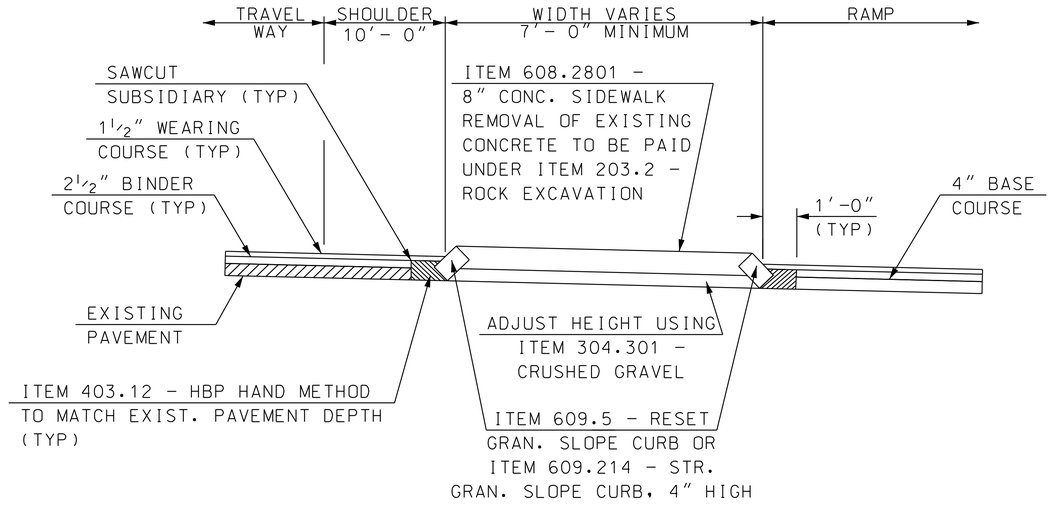
MISCELLANEOUS DETAILS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191dt01	41191	9	110



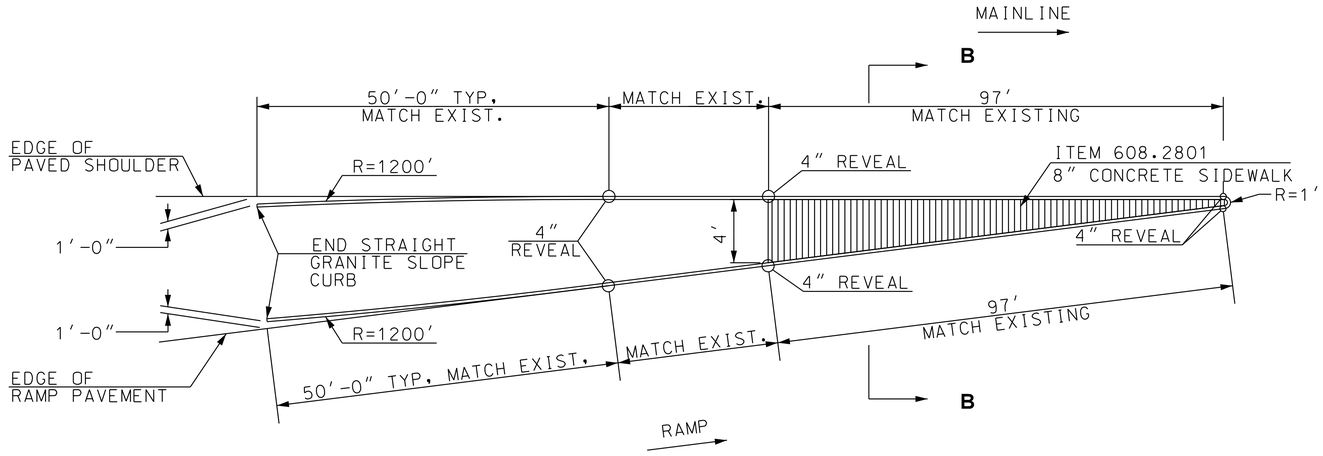
DETAIL OF 8" CONCRETE SIDEWALK AND CURBING AT NB OFF RAMP TERMINAL

NOT TO SCALE



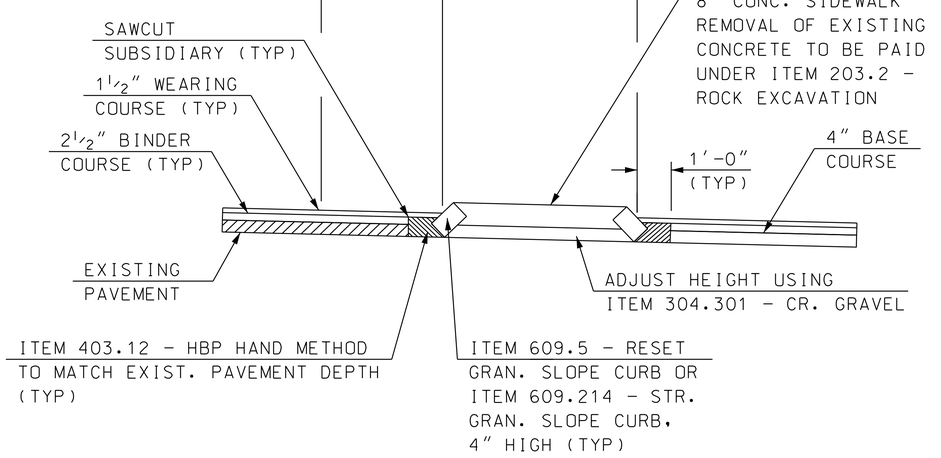
SECTION A-A

NOT TO SCALE



DETAIL OF 8" CONCRETE SIDEWALK AND CURBING AT NB ON RAMP TERMINAL

NOT TO SCALE



SECTION B-B

NOT TO SCALE

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 06/12/19
NEW DESIGN	J. MERCER	DATE 06/12/19
SHEET CHECKED	D. BLOOD	DATE 06/12/19
AS BUILT DETAILS		DATE

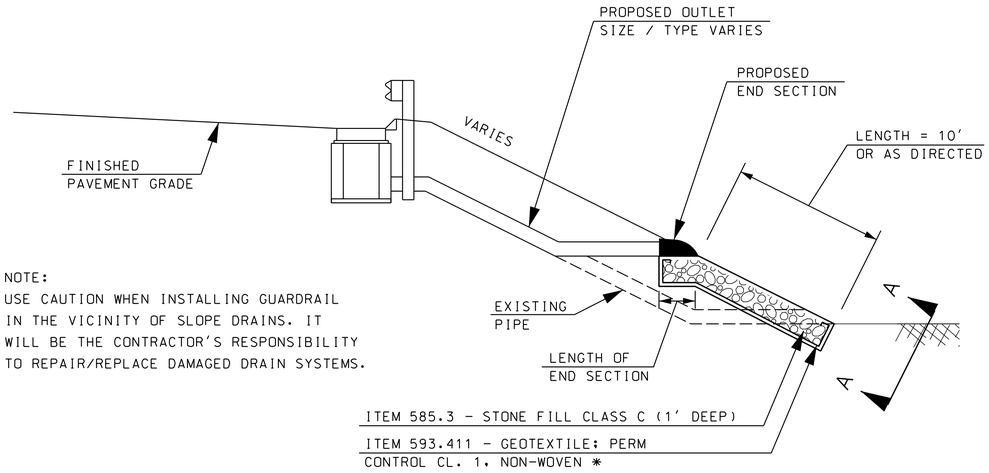
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

CONCRETE RAMP NOSE TERMINAL DETAILS

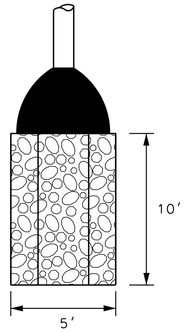
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191dt02	41191	10	110



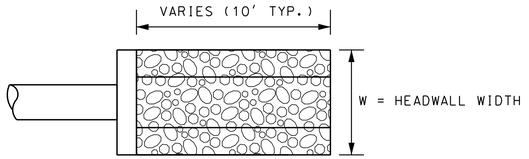
NOTE:
USE CAUTION WHEN INSTALLING GUARDRAIL IN THE VICINITY OF SLOPE DRAINS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR/REPLACE DAMAGED DRAIN SYSTEMS.

TYPICAL SLOPE DRAIN OUTLET PROTECTION

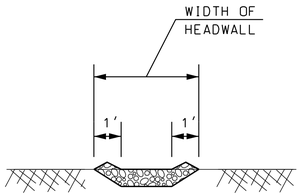
NOT TO SCALE



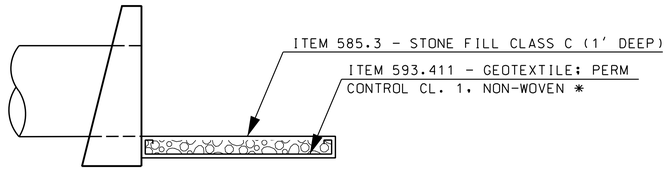
PLAN VIEW



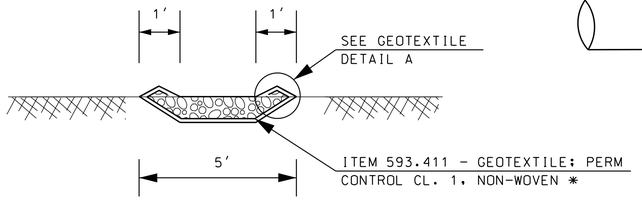
PLAN VIEW



SECTION



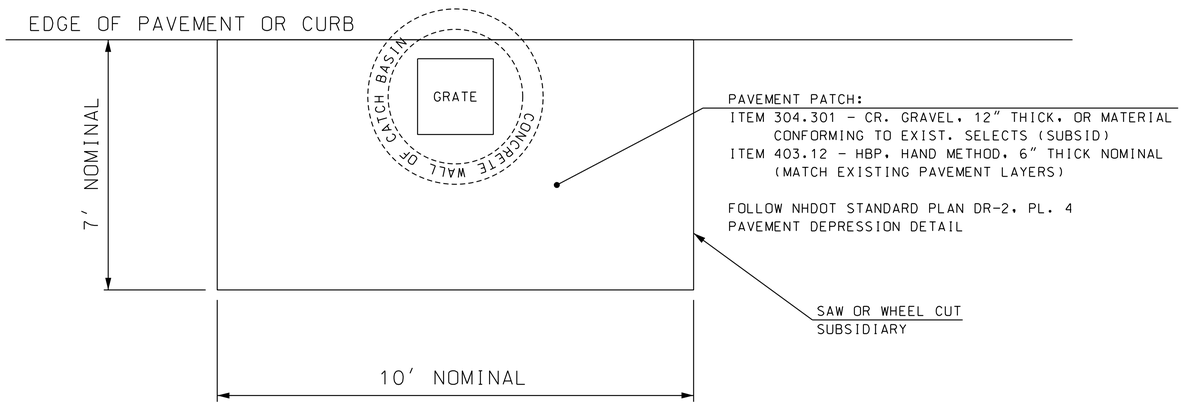
ELEVATION VIEW



SECTION A-A

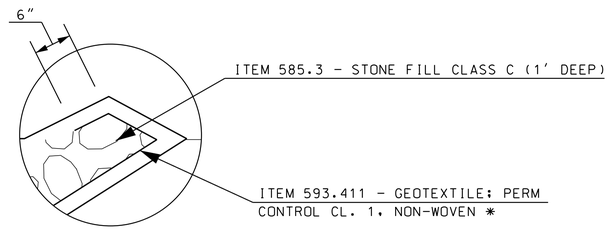
TYPICAL STONE APRON DETAIL

NOT TO SCALE



DRAINAGE PATCH

NOT TO SCALE



GEOTEXTILE DETAIL A

NOT TO SCALE

* PLACE GEOTEXTILE AGAINST THE EXISTING GROUND

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED	J. MERCER	DATE 06/12/19
NEW DESIGN	J. MERCER	DATE 06/12/19
SHEET CHECKED	D. BLOOD	DATE 06/12/19
AS BUILT DETAILS		DATE

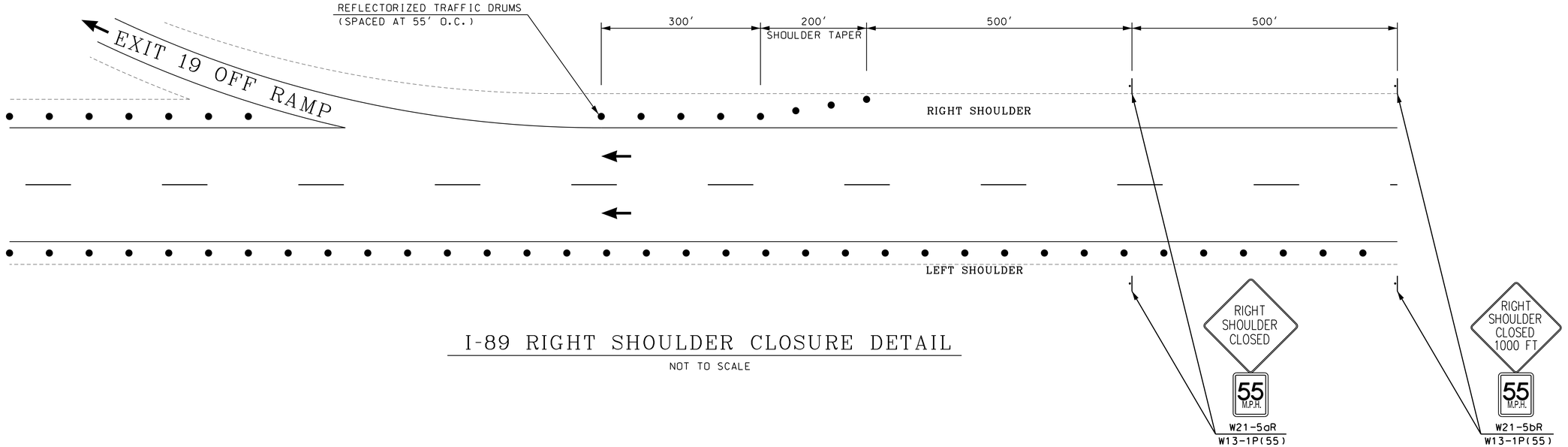
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

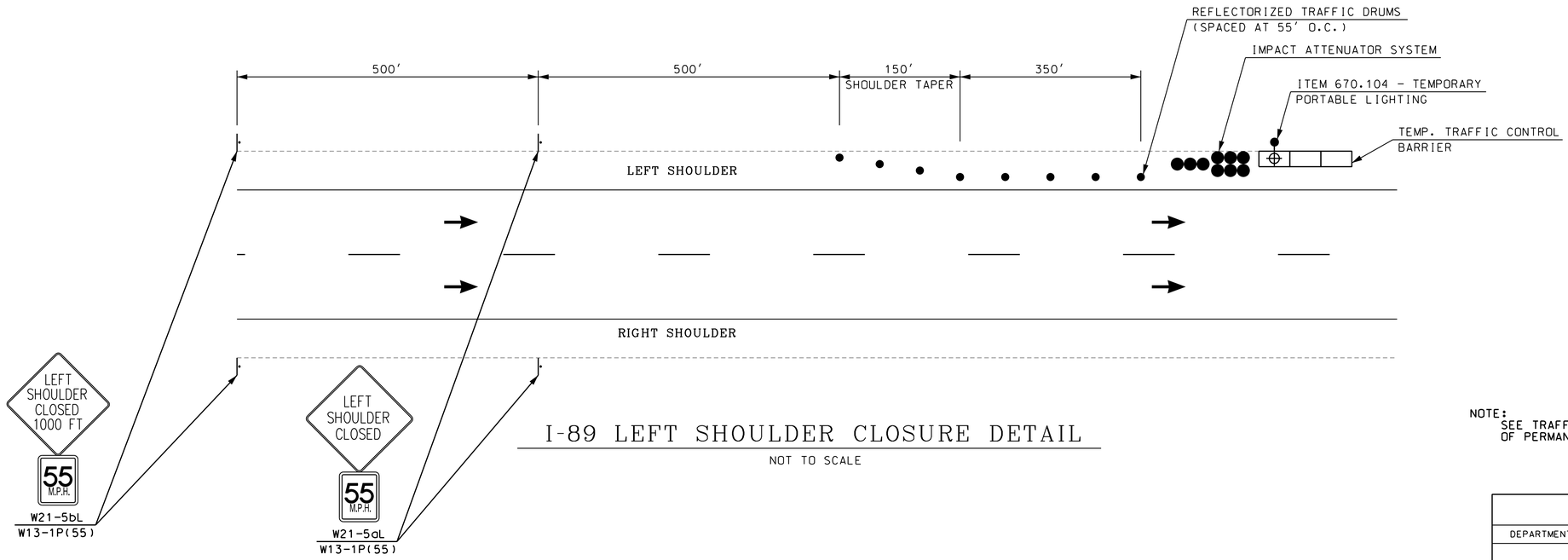
DRAINAGE DETAILS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191dt03	41191	11	110



I-89 RIGHT SHOULDER CLOSURE DETAIL

NOT TO SCALE



I-89 LEFT SHOULDER CLOSURE DETAIL

NOT TO SCALE

NOTE:
SEE TRAFFIC CONTROL PLANS FOR LOCATIONS
OF PERMANENT CONSTRUCTION AND ADVANCE SIGNING.

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 06/12/19
NEW DESIGN	J. MERCER	DATE 06/12/19
SHEET CHECKED	D. BLOOD	DATE 06/12/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

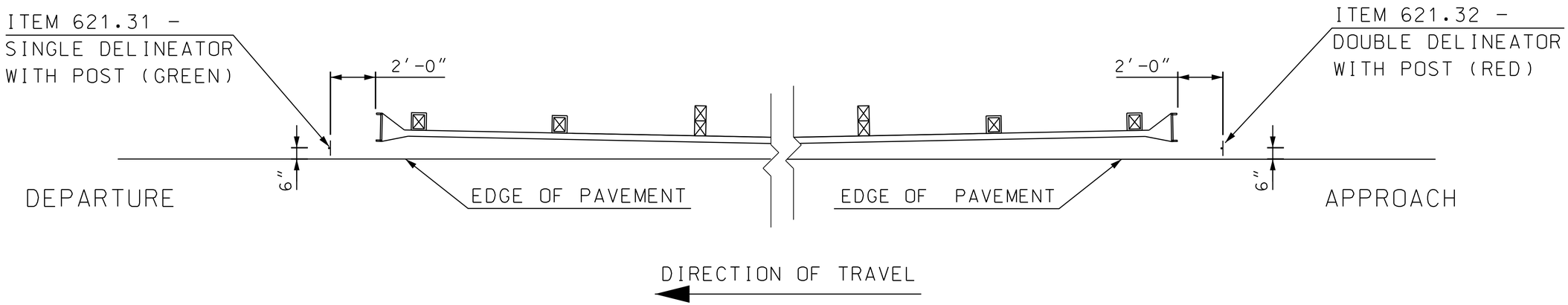
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL DETAILS

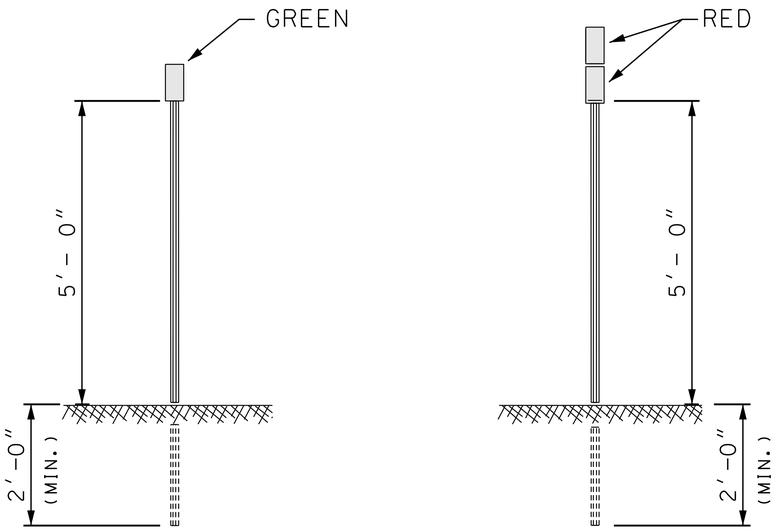
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191dt04	41191	12	110

Terminal Unit Delineation



ITEM 621.31 - SINGLE DELINEATOR WITH POST

ITEM 621.32 - DOUBLE DELINEATOR WITH POST



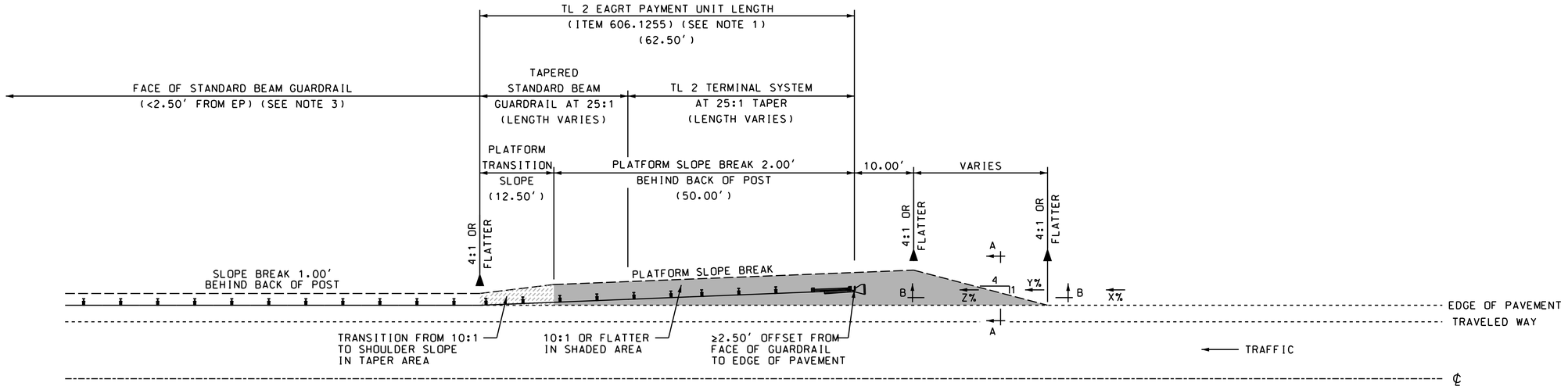
TYPICAL INSTALLATION

STATE OF NEW HAMPSHIRE

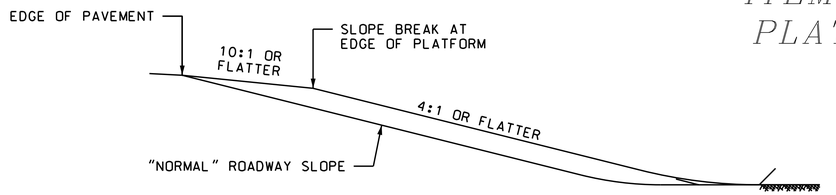
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

Terminal Unit Delineation

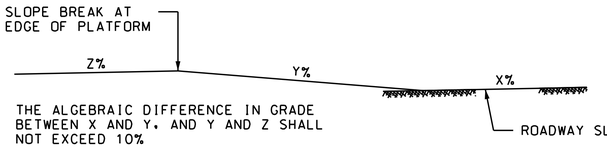
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
09-01-16	term_unit_delin	41191	13	110



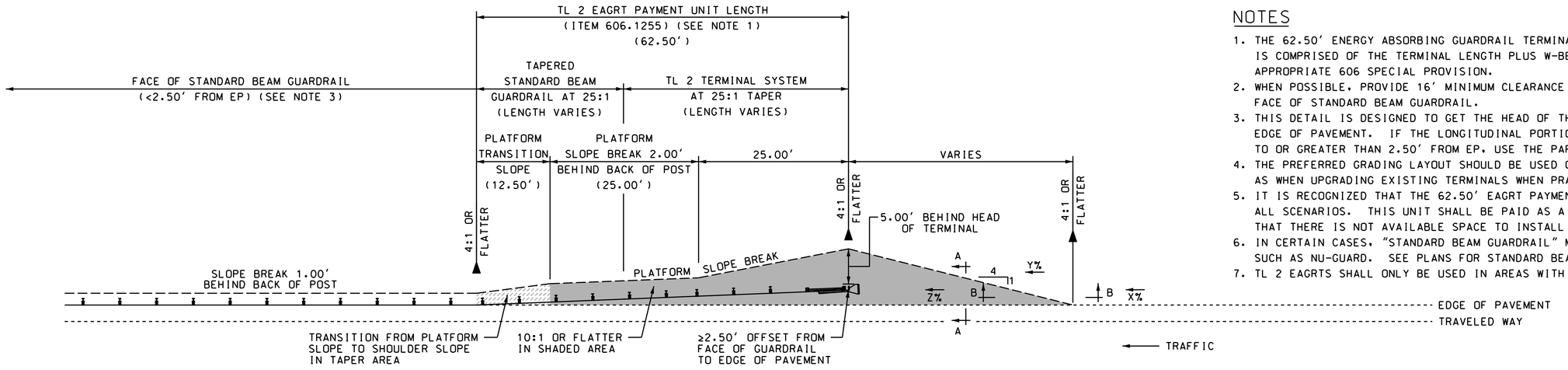
ITEM 203.5562 - EAGRT PLATFORM ALTERNATE



SECTION A-A
PLATFORM SLOPE GRADING



SECTION B-B
PLATFORM APPROACH GRADING



ITEM 203.5561 - EAGRT PLATFORM PREFERRED

NOTES

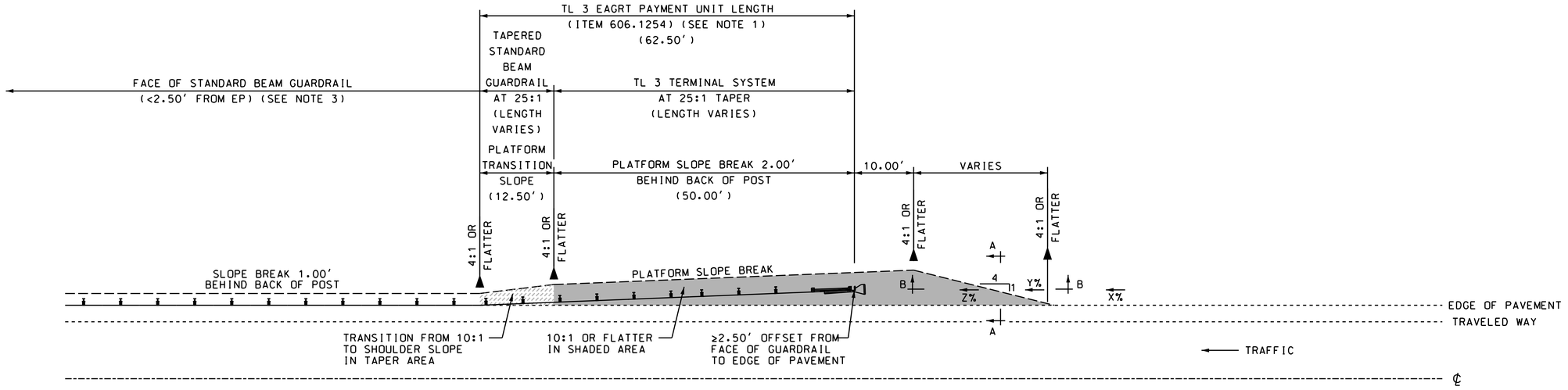
1. THE 62.50' ENERGY ABSORBING GUARDRAIL TERMINAL (EAGRT) PAYMENT UNIT LENGTH IS COMPRISED OF THE TERMINAL LENGTH PLUS W-BEAM RAIL AS DESCRIBED IN THE APPROPRIATE 606 SPECIAL PROVISION.
2. WHEN POSSIBLE, PROVIDE 16' MINIMUM CLEARANCE BETWEEN ROADWAY CENTERLINE AND FACE OF STANDARD BEAM GUARDRAIL.
3. THIS DETAIL IS DESIGNED TO GET THE HEAD OF THE TERMINAL UNIT AWAY FROM THE EDGE OF PAVEMENT. IF THE LONGITUDINAL PORTION OF THE GUARDRAIL RUN IS EQUAL TO OR GREATER THAN 2.50' FROM EP, USE THE PARALLEL EAGRT DETAIL.
4. THE PREFERRED GRADING LAYOUT SHOULD BE USED ON ALL NEW CONSTRUCTION, AS WELL AS WHEN UPGRADING EXISTING TERMINALS WHEN PRACTICAL.
5. IT IS RECOGNIZED THAT THE 62.50' EAGRT PAYMENT UNIT LENGTH MAY NOT FIT ALL SCENARIOS. THIS UNIT SHALL BE PAID AS A COMPLETE INSTALLATION IN THE EVENT THAT THERE IS NOT AVAILABLE SPACE TO INSTALL PER THIS DETAIL.
6. IN CERTAIN CASES, "STANDARD BEAM GUARDRAIL" MAY BE A PROPRIETARY ITEM SUCH AS NU-GUARD. SEE PLANS FOR STANDARD BEAM GUARDRAIL TYPE.
7. TL 2 EAGRTS SHALL ONLY BE USED IN AREAS WITH DESIGN SPEEDS OF 45 MPH AND UNDER.

NOT TO SCALE

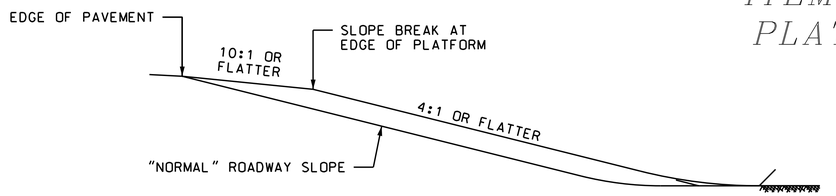
STATE OF NEW HAMPSHIRE
LEBANON
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TL 2 TAPERED EAGRT PLATFORM DETAILS FOR GUARDRAIL < 2.50' FROM EP

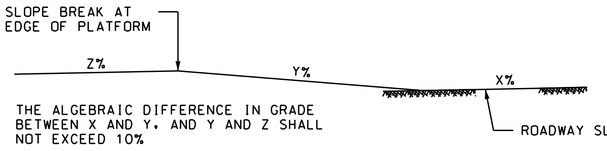
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
01/22/19	tl2_tap_ep	41191	14	110



ITEM 203.5562 - EAGRT PLATFORM ALTERNATE

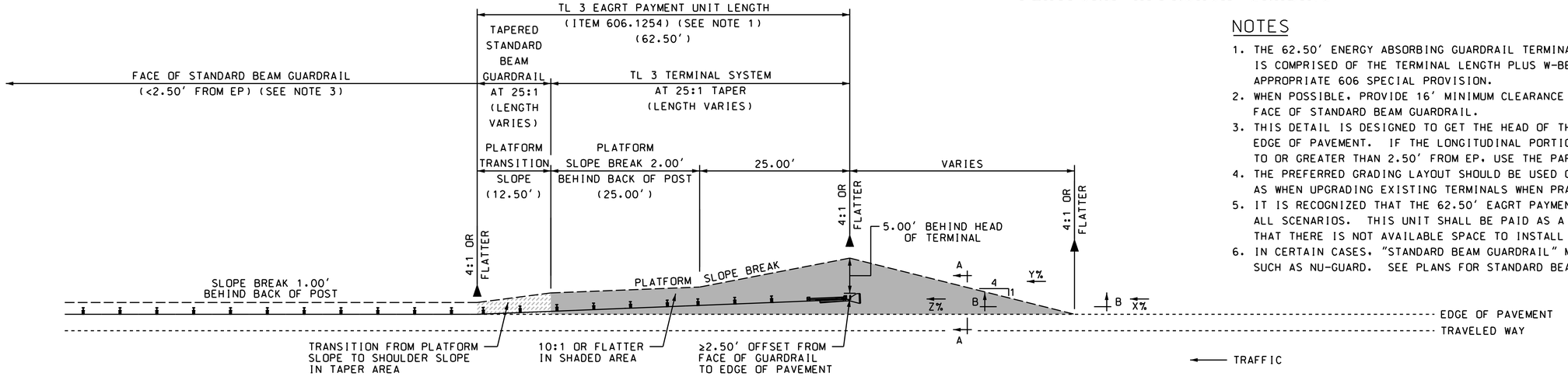


SECTION A-A
PLATFORM SLOPE GRADING



X% = LONGITUDINAL GRADE OF ROADWAY SLOPE IN ADVANCE OF PLATFORM
Y% = LONGITUDINAL GRADE OF PLATFORM APPROACH
Z% = LONGITUDINAL GRADE OF PLATFORM

SECTION B-B
PLATFORM APPROACH GRADING



NOTES

1. THE 62.50' ENERGY ABSORBING GUARDRAIL TERMINAL (EAGRT) PAYMENT UNIT LENGTH IS COMPRISED OF THE TERMINAL LENGTH PLUS W-BEAM RAIL AS DESCRIBED IN THE APPROPRIATE 606 SPECIAL PROVISION.
2. WHEN POSSIBLE, PROVIDE 16' MINIMUM CLEARANCE BETWEEN ROADWAY CENTERLINE AND FACE OF STANDARD BEAM GUARDRAIL.
3. THIS DETAIL IS DESIGNED TO GET THE HEAD OF THE TERMINAL UNIT AWAY FROM THE EDGE OF PAVEMENT. IF THE LONGITUDINAL PORTION OF THE GUARDRAIL RUN IS EQUAL TO OR GREATER THAN 2.50' FROM EP, USE THE PARALLEL EAGRT DETAIL
4. THE PREFERRED GRADING LAYOUT SHOULD BE USED ON ALL NEW CONSTRUCTION, AS WELL AS WHEN UPGRADING EXISTING TERMINALS WHEN PRACTICAL.
5. IT IS RECOGNIZED THAT THE 62.50' EAGRT PAYMENT UNIT LENGTH MAY NOT FIT ALL SCENARIOS. THIS UNIT SHALL BE PAID AS A COMPLETE INSTALLATION IN THE EVENT THAT THERE IS NOT AVAILABLE SPACE TO INSTALL PER THIS DETAIL.
6. IN CERTAIN CASES, "STANDARD BEAM GUARDRAIL" MAY BE A PROPRIETARY ITEM SUCH AS NU-GUARD. SEE PLANS FOR STANDARD BEAM GUARDRAIL TYPE.

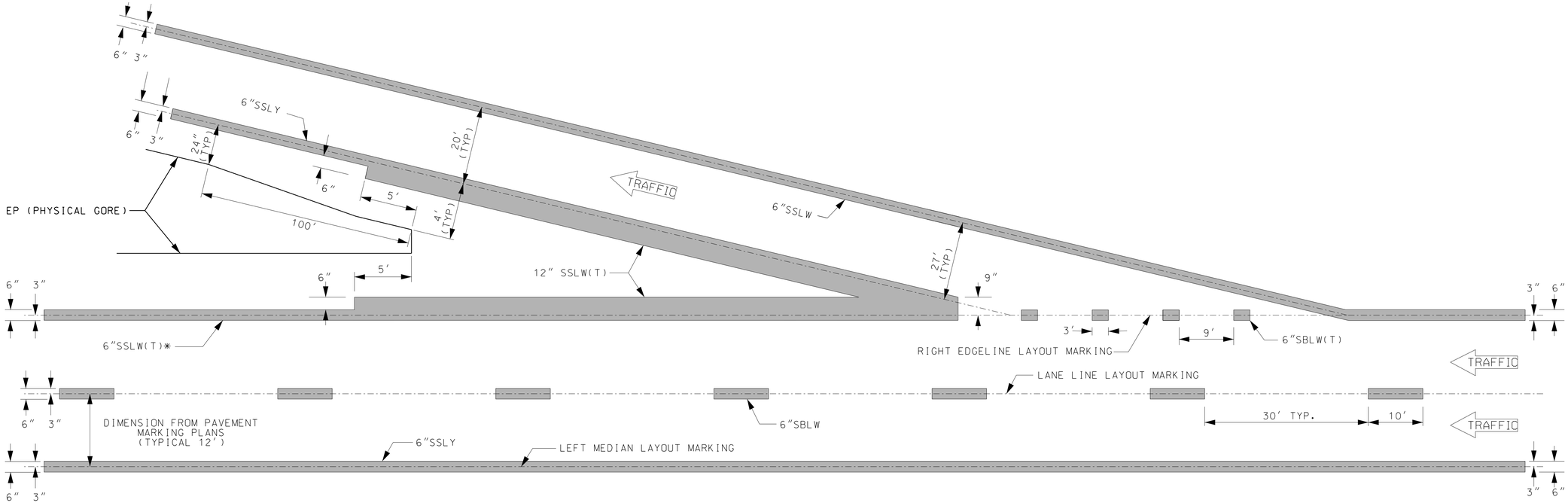
NOT TO SCALE

ITEM 203.5561 - EAGRT PLATFORM PREFERRED

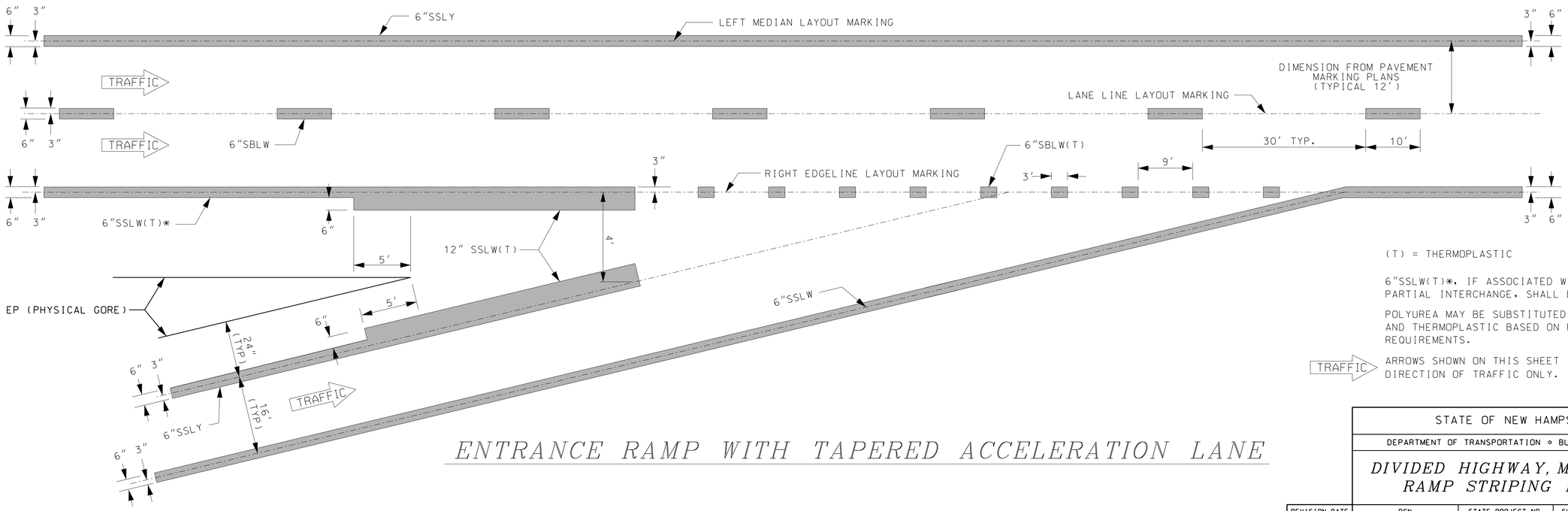
STATE OF NEW HAMPSHIRE
LEBANON
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TL 3 TAPERED EAGRT PLATFORM DETAILS FOR GUARDRAIL < 2.50' FROM EP

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
01/22/19	tl3_tap_ep	41191	15	110



EXIT RAMP WITH TAPERED DECELERATION LANE



ENTRANCE RAMP WITH TAPERED ACCELERATION LANE

(T) = THERMOPLASTIC

6"SSLW(T)*, IF ASSOCIATED WITH A PARTIAL INTERCHANGE, SHALL BE PAINT.

POLYUREA MAY BE SUBSTITUTED FOR PAINT AND THERMOPLASTIC BASED ON PROJECT REQUIREMENTS.

TRAFFIC ARROWS SHOWN ON THIS SHEET INDICATE DIRECTION OF TRAFFIC ONLY.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION	STATION

SDR PROCESSED DATE

NEW DESIGN KFD DATE 01/15/2016

SHEET CHECKED NAME3 DATE DATE3

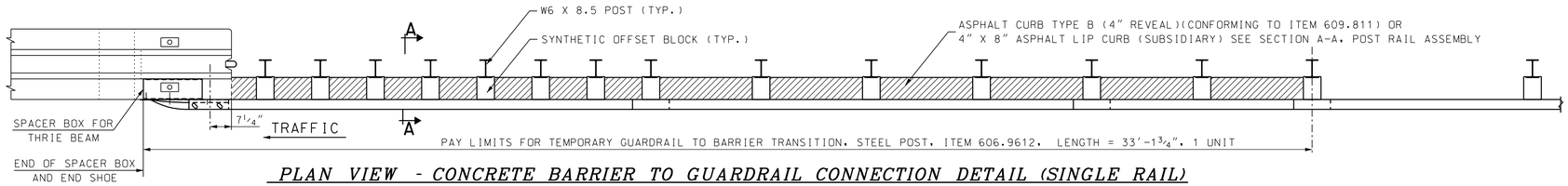
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE

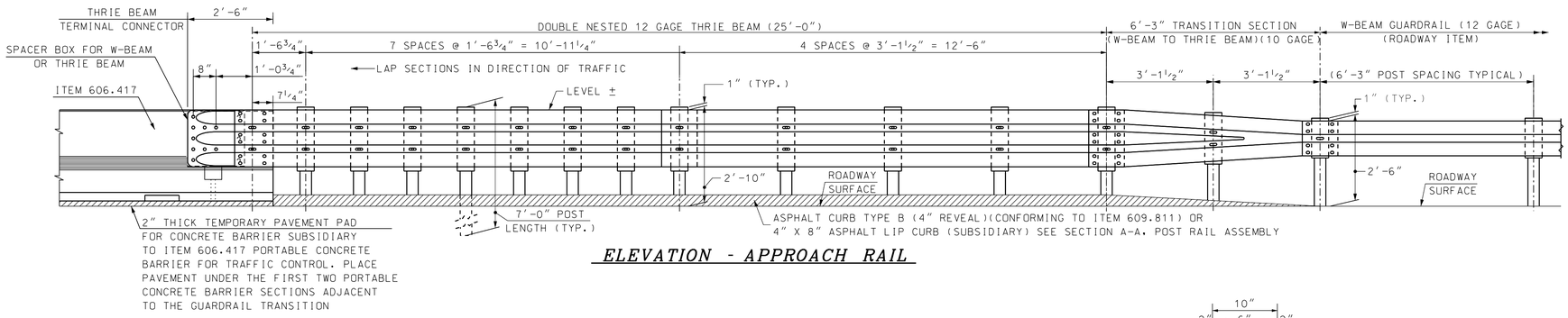
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TRAFFIC

DIVIDED HIGHWAY, MULTI-LANE RAMP STRIPING LAYOUT

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
03-21-17	2017_dh_rs.dgn	41191	16	110



PLAN VIEW - CONCRETE BARRIER TO GUARDRAIL CONNECTION DETAIL (SINGLE RAIL)



ELEVATION - APPROACH RAIL

GENERAL NOTES

(1) ALL THRIE BEAM RAIL, INCLUDING TRANSITION SECTION, SHALL BE GALVANIZED 12 GAUGE. ALL TERMINAL CONNECTORS SHALL BE GALVANIZED 10 GAUGE.

(2) CONNECTIONS TO CONCRETE BARRIER SHALL BE APPROVED 7/8" Φ GALVANIZED HIGH STRENGTH THROUGH BOLTS IN CORE DRILLED HOLES. CHECK ACTUAL HOLE SPACING BEFORE CORING BOLT HOLES.

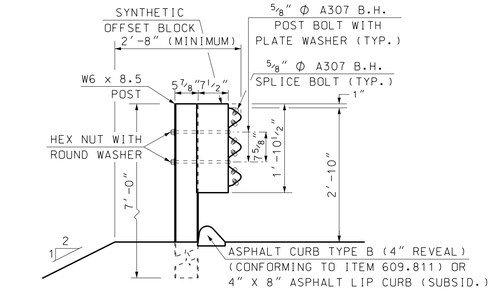
(3) ALL CONNECTIONS FOR THE THRIE BEAM RAIL AND TERMINAL CONNECTOR SHALL LAP IN THE DIRECTION OF TRAFFIC.

(4) ALL STEEL PLATES FOR SPACER BOX SHALL BE 1/4" GALVANIZED STEEL PLATES (TYP.), ASTM A709 GRADE 36 (AASHTO M270 GRADE 36).

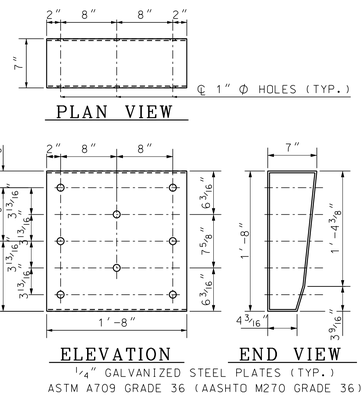
(5) ALL HOLE DIAMETERS FOR SPACER BOXES SHALL BE 1" Φ.

(6) RECTANGULAR AND TRIANGULAR COVER PLATES SHALL BE WELDED TOGETHER WITH A 3 3/16" CONTINUOUS BACK WELD ON BOTH SIDES.

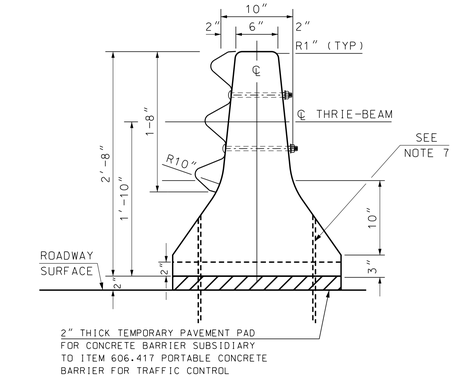
(7) THE FIRST TWO PORTABLE CONCRETE BARRIER SECTIONS, ADJACENT TO THE GUARDRAIL TRANSITION CONNECTION SHALL BE AFFIXED TO THE GROUND. TO PREVENT THE BARRIER FROM SLIDING. EACH SEGMENT IS STAKED WITH FOUR ANCHORS. THE ANCHORS SHALL BE 1 1/4" X 3'-4" LONG GALVANIZED STEEL PINS.



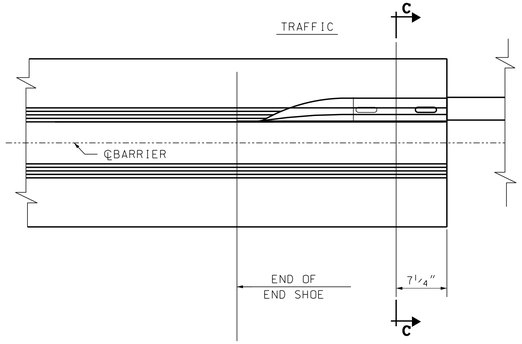
SECTION A-A (POST RAIL ASSEMBLY)



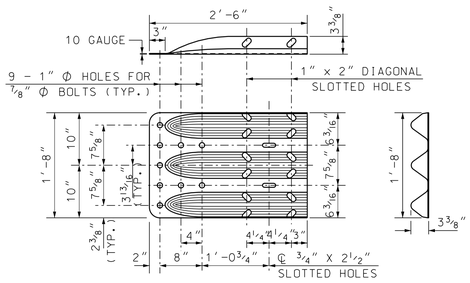
THRIE BEAM TO CONCRETE BARRIER SPACER BLOCK DETAILS



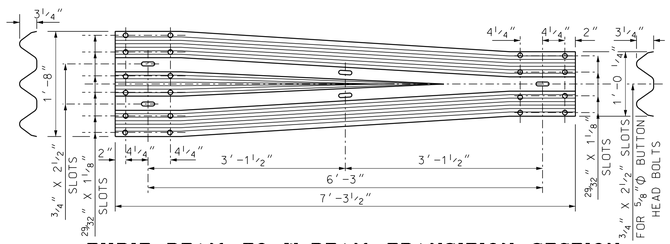
SECTION C-C APPROACH END CONNECTION



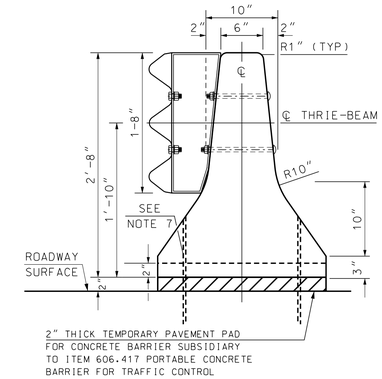
PLAN VIEW - CONCRETE BARRIER TO GUARDRAIL CONNECTION DETAIL (APPROACH END)



THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM TO W-BEAM TRANSITION SECTION



SECTION DEPARTURE END CONNECTION

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TEMPORARY GUARDRAIL TO BARRIER TRANSITION, STEEL POST

NOT TO SCALE

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
07-10-15	41191TBG-PCB	41191	17	110

SCOPE OF WORK

BRIDGE NO. 093/109 & 094/108
- REMOVE AND REPLACE EXISTING BRIDGE SUPERSTRUCTURES OVER U.S. ROUTE 4
- RECONSTRUCT TOP PORTION OF INTERMEDIATE RETAINING WALLS.
- CONSTRUCT APPROACH SLABS IN MEDIAN AREA AT EAST AND WEST ENDS.
- REMOVE AND REPLACE EXISTING EXPANSION JOINTS, REPAIR WEST BACKWALLS.
- REMOVE AND REPLACE EXISTING BRIDGE RAIL AND BRIDGE APPROACH RAIL.
- REMOVE EXISTING BRIDGE SHOES AND REPLACE WITH NEW BEARING ASSEMBLIES.
- GRIND (COLD PLANE) APPROACH PAVEMENT AND PLACE 1 1/2" WEARING COURSE.
- REPAIR SUBSTRUCTURE CONCRETE AS DIRECTED.
- CONSTRUCT NEW BRIDGE MEMBRANE AND PAVEMENT.

BRIDGE NO. 098/111 & 097/112
- REPAIR DECK ON BRIDGES OVER MASCOMA RIVER AS DIRECTED.
- REPLACE BEARINGS AS DIRECTED.
- REMOVE & REPLACE EXPANSION JOINTS.
- PAINT ENDS OF GIRDERS (SEE SPECIAL PROVISION FOR 550).

DESIGN LOADS, MATERIALS AND SPECIFICATIONS

1. DESIGN LOADING:
   HL-93 AASHTO LIVE LOAD

2. DESIGN METHOD:
   LOAD AND RESISTANCE FACTOR DESIGN (LRFD)

3. SPECIFICATIONS:
   AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, 2017

   STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2016, WITH CURRENT ADDITIONS AND MODIFICATIONS BY STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

4. SUPERSTRUCTURE:
   COMPOSITE CAST-IN-PLACE REINFORCED CONCRETE DECK AND STRUCTURAL STEEL GIRDERS AND CROSS FRAMES.

5. NEW REINFORCING STEEL:
   ABUTMENT SEAT AND INTERMEDIATE RETAINING WALL RECONSTRUCTION - AASHTO M31 (ASTM A 615) GRADE 60
   C.I.P. CONCRETE DECK, DECK CURB, APPROACH SLABS, STUB WALLS, AND ABUTMENT BACKWALLS - (ASTM A 615) GRADE 60 EPOXY COATED

6. STRUCTURAL STEEL:
   AASHTO M270 GRADE 50 (ASTM A 709 GRADE 50), METALLIZED DUPLEX COATING (METALLIZING AND SEALER) UNLESS NOTED OTHERWISE (SEE SPECIAL PROVISIONS FOR 550.)

7. NEW CONCRETE:
   BRIDGE DECK, BRUSH CURBS, ABUTMENT SEATS, BACKWALLS, AND PATCHING
   f'c = 4000 psi

8. SEISMIC PERFORMANCE ZONE 1: PGA = 0.10
   SITE CLASS C

BENCHMARK NOTES

ALL EXISTING DISCS REPRESENTING STATE BENCHMARKS OR SURVEY TRIANGULATION POINTS MUST NOT BE DISTURBED. WHEN THE PROPOSED WORK INVOLVES DISTURBING ONE OF THESE DISCS, THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR SUFFICIENTLY IN ADVANCE OF THE WORK TO PERMIT THE STATE TO TEMPORARILY RELOCATE THE AFFECTED MARKER.

TO THE CONTRACTOR

THE CONTRACTOR SHOULD BE AWARE THAT EXISTING STRUCTURE DIMENSIONS AND ELEVATIONS SHOWN ON THESE PLANS WERE TAKEN FROM ORIGINAL BRIDGE PLANS AND FIELD SURVEY INFORMATION. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF THE EXISTING STRUCTURES AND BE PREPARED TO MAKE ANY ADJUSTMENTS REQUIRED TO PROPERLY REHABILITATE THE BRIDGE. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO ADVANCING THE WORK. THE EXISTING PLANS MAY BE VIEWED ONLINE WITH THE PROPOSAL PACKAGE. THE EXISTING PLANS USED THE NGVD 29 DATUM AND THE CURRENT SURVEY USES NAVD 88 DATUM. THE ELEVATIONS ON THESE PLANS WILL USE NAVD 88 DATUM.

SALVAGE

SALVAGE DEBRIS SHIELDING AND ALL APPURTENANCES TO BUREAU OF BRIDGE MAINTENANCE PRIOR TO START OF REMOVAL OPERATIONS. ALL COSTS INCLUDED IN ITEMS 502.101 & 502.102

APPROACH SLAB NOTES

1. CONCRETE FOR THE APPROACH SLABS AND STUB WALLS SHALL BE ITEM 520.0302, CONCRETE CLASS AA, APPROACH SLABS (QC/QA).

2. ALL REINFORCING STEEL SHALL BE 2 1/2" CLEAR FROM CONCRETE SURFACES EXCEPT AS NOTED.

3. REINFORCEMENT IN THE APPROACH SLABS AND STUB WALLS SHALL BE EPOXY COATED, AND PAID UNDER ITEM 544.2, REINFORCING STEEL, EPOXY COATED (F).

4. ITEM 544.7, SYNTHETIC FIBER REINFORCEMENT (F), SHALL BE ADDED TO THE APPROACH SLAB CONCRETE.

DECK REINFORCEMENT NOTES

1. ALL REINFORCING IN THE BRIDGE DECK AND BRUSH CURBS SHALL BE EPOXY COATED AND SHALL BE PAID AS ITEM 544.2, REINFORCING STEEL, EPOXY COATED (F), AND ITEM 544.21, REINFORCING STEEL, EPOXY COATED, MECHANICAL CONNECTORS (F).

2. ALL REINFORCING SHALL BE 2 1/2" FROM CONCRETE SURFACES UNLESS OTHERWISE NOTED.

3. THE REINFORCING LAYOUT IS BASED ON AN ASSUMED EXPANSION JOINT DESIGN. THE REINFORCEMENT MAY REQUIRE ADJUSTMENT IN THE FIELD DURING INSTALLATION OF THE REINFORCING, BASED ON DETAILS AS SHOWN ON THE APPROVED EXPANSION JOINT SHOP DRAWINGS.

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR MAY VIEW THE AVAILABLE EXISTING BRIDGE PLANS ONLINE WITH THE PROPOSAL PACKAGE.

2. PORTABLE CONCRETE BARRIER SHALL BE IN PLACE BEFORE REMOVAL OPERATIONS BEGIN FOR EACH PHASE.

3. PRIOR TO ANY REMOVAL WORK, A DEMOLITION PLAN SHALL BE SUBMITTED FOR DOCUMENTATION.

4. THE WELDING OF ATTACHMENTS TO GIRDERS FOR CONSTRUCTION PURPOSES WILL NOT BE PERMITTED UNLESS APPROVED BY THE NHDOT, BUREAU OF BRIDGE DESIGN.

5. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT EXISTING UTILITY INSTALLATIONS FROM DAMAGE DURING REMOVAL OPERATIONS. A PROTECTION PLAN SHALL BE SUBMITTED FOR DOCUMENTATION. ALL COSTS SUBSIDIARY TO ITEM 502.

6. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL ONTO THE ROADWAY BELOW THE EXISTING STRUCTURE. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 502., AND SHALL INCLUDE THE ERECTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH METHODS AS APPROVED.

7. REMOVAL OF EXISTING BRIDGE STRUCTURES (FOR BR. NO. 093/109 & 094/108) SHALL BE PAID AS ITEM 502.101 AND 502.102, EXCEPT AS OTHERWISE SHOWN IN THE PLANS, SHALL INCLUDE:
   A. SALVAGE DEBRIS SHIELDING
   B. COMPLETE REMOVAL OF THE EXISTING BRIDGE SUPERSTRUCTURES INCLUDING BRIDGE DECK, STRUCTURAL STEEL, AND BRIDGE BEARINGS.
   C. REMOVAL OF EXISTING BRIDGE RAIL, SNOW FENCE, AND BRIDGE APPROACH RAIL.
   D. REMOVAL OF EXPANSION JOINTS.
   E. REMOVAL OF PORTIONS OF THE BACKWALLS, AND INTERMEDIATE RETAINING WALLS.

   REMOVAL OF EXISTING BRIDGE STRUCTURES (FOR BR. NO. 098/111 & 097/112) SHALL BE PAID AS ITEMS 502.103 & 502.104, EXCEPT AS OTHERWISE SHOWN IN THE PLANS, SHALL INCLUDE: REMOVAL OF DECK END HAUNCH, EXPANSION JOINT OVER ABUTMENTS, ABUTMENT BACKWALL AREAS, GRANITE CURBS & BEARINGS TO THE LIMITS SHOWN IN THE PLANS OR DIRECTED. PAVEMENT & MEMBRANE REMOVAL SHALL BE PAID AS ITEMS 511.0001 & 511.0002. REMOVAL LIMITED TO THE PHASE UNDER CONSTRUCTION.

8. ALL EXPOSED EDGES OF PROPOSED CONCRETE SURFACES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.

9. RESEAL JOINTS BETWEEN WINGWALLS AND ABUTMENT WITH SILICONE JOINT SEALANT, ITEM 562.1, AS DIRECTED BY THE CONTRACT ADMINISTRATOR. ALL COSTS FOR REMOVAL, CLEANING, PREPARATION AND MATERIALS SHALL BE PAID UNDER ITEM 562.1.

10. UNLESS OTHERWISE NOTED, HOLES DRILLED INTO EXISTING CONCRETE SHALL BE CORE DRILLED 1/2" DIAMETER LARGER THAN THE BAR DIAMETER AND GROUTED WITH HIGH STRENGTH, NON-SHRINK CEMENTITIOUS GROUT. ALL COSTS FOR DRILLING AND GROUTING SHALL BE PAID FOR UNDER ITEM 520.02.

11. PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR SHALL MAKE A RECORD OF THE EXISTING PAVEMENT MARKINGS. UPON COMPLETION OF THE BRIDGE WORK, THE PAVEMENT MARKINGS SHALL BE REPLACED IN KIND WITH ITEM 632.0108, RETROREFLECTIVE PAINT PAVEMENT MARKING, 8" LINE.

12. NO PROFILE ADJUSTMENTS ARE TO BE MADE UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

13. ALL DISTURBED AREAS SHALL BE TREATED WITH: ITEM 646.41, TURF ESTABLISHMENT WITH MULCH, TACKIFIERS, AND HUMUS (ROADWAY ITEM). SEED SHALL CONFORM WITH SECTION 644.44, SLOPE SEED TYPE 44.

14. ANY CLEARING AND GRUBBING NEEDED TO PERFORM THE WORK SHALL BE SUBSIDIARY TO ITEM 502.

COFFERDAM NOTES

1. THE CONTRACTOR SHALL DETERMINE THE COFFERDAM LIMITS REQUIRED TO SUPPORT EXISTING EMBANKMENTS AND PROPOSED EXCAVATIONS WHILE MAINTAINING TRAFFIC DURING CONSTRUCTION.

2. ALL COSTS FOR DESIGN, INSTALLATION, AND REMOVAL (IF NOT SELECTED TO REMAIN IN PLACE) OF COFFERDAMS SHALL BE INCLUDED IN ITEMS 503.201 (MEDIAN SIDE ADJACENT TO NB BRIDGE) AND 503.202 (MEDIAN SIDE ADJACENT TO SB BRIDGE).

3. THE CONTRACTOR SHALL SUBMIT THE COFFERDAM DESIGN CALCULATIONS, WORKING DRAWINGS, AND PROPOSED METHOD OF CONSTRUCTION TO THE ENGINEER IN ACCORDANCE WITH SECTION 105.02 OF THE NHDOT STANDARD SPECIFICATIONS. COFFERDAM SUBMITTALS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.

4. COFFERDAMS LOCATED WITHIN THE DEFLECTION DISTANCE OF THE TRAFFIC BARRIER SHALL BE DESIGNED TO WITHSTAND A TRAFFIC BARRIER COLLISION LOAD OF 2.7 KIPS PER LINEAR FOOT APPLIED AT 32 INCHES ABOVE THE GROUND SURFACE BEHIND THE COFFERDAM. THIS LOAD MAY BE REDUCED LINEARLY BY THE OFFSET OF THE BARRIER TO THE COFFERDAM, E.G. IF THE BARRIER SYSTEM HAS A 4 FOOT DEFLECTION AND IT IS SET 2 FEET FROM THE FACE OF COFFERDAM, THE COLLISION LOAD MAY BE REDUCED BY ONE HALF. THE COFFERDAM SHALL EXTEND UP TO A HEIGHT THAT IS EQUAL TO OR HIGHER THAN THE TOP OF THE ADJACENT TRAFFIC BARRIER.

DECK SLAB NOTES

1. CONCRETE FOR THE BRIDGE DECK AND BRUSH CURBS SHALL BE ITEM 520.7002, CONCRETE CLASS AA (QC/QA) (F).

2. THE BRIDGE DECK CONCRETE SHALL BE PLACED IN ONE CONTINUOUS POUR PER CONSTRUCTION PHASE AND REMAIN PLASTIC THROUGHOUT THE ENTIRE POUR. THE DECK PLACEMENT SHALL PROCEED UPGRADE. THE BRIDGE DECK POURING SEQUENCE SHALL BE SUBMITTED IN ACCORDANCE WITH 105.02 AND SUBJECT TO APPROVAL OF THE BUREAU OF BRIDGE DESIGN.

3. SCREED RAIL SUPPORTS SHALL BE LOCATED AT THE CENTERLINE OF THE GIRDERS.

MEDIAN BARRIER NOTES

1. THE SINGLE SLOPE CONCRETE MEDIAN BARRIER SHALL BE CAST-IN-PLACE AS DETAILED ON BRIDGE SHEET 22.

2. THE EXPANSION JOINT DETAILED ON BRIDGE SHEET 22 SHALL BE LOCATED AT THE STRIP SEAL EXPANSION JOINT. PAYMENT FOR THE MEDIAN BARRIER EXPANSION JOINT COMPONENTS SHALL BE SUBSIDIARY TO ITEM 606.4239.

SUPERSTRUCTURE NOTES (BR. NO 093/109 & 094/108)

1. ALL STRUCTURAL STEEL SHALL BE PAID UNDER ITEM 550.1, STRUCTURAL STEEL (F), INCLUDING THE GIRDERS, CROSS FRAMES, GUSSET PLATES, FILL PLATES, CONNECTION PLATES, SPLICE PLATES, STIFFENERS AND FASTENERS.

2. THE NHDOT WILL INSPECT THE SHOP FABRICATION OF THE STRUCTURAL STEEL.

3. NOTCH TOUGHNESS REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SHALL APPLY TO THE WEB & FLANGES OF GIRDERS AND SPLICE PLATES.

4. ALL BOLTED CONNECTIONS SHALL BE SLIP-CRITICAL (CLASS-B) MADE WITH 7/8" DIA. HIGH STRENGTH BOLTS IN 15/16" DIA. HOLES. ALL FASTENERS SHALL CONFORM TO REQUIREMENTS FOR AASHTO M164 (ASTM A325) TYPE 1, GALVANIZED (MECHANICALLY).

5. DIRECT TENSION INDICATOR WASHERS SHALL BE INSTALLED WITH HIGH STRENGTH BOLTS.

6. GIRDERS SHALL BE CAMBERED FOR FULL DEAD LOAD DEFLECTION. THE CAMBER SHALL BE ACHIEVED BY CUTTING THE WEB PLATE ACCORDING TO DIMENSIONS SHOWN ON BRIDGE SHEET 18. CAMBER TOLERANCE IS +3/4", -0.

7. BEARING STIFFENERS AND ENDS OF GIRDERS SHALL BE VERTICAL UNDER FULL DEAD LOAD DEFLECTION.

8. THE STRUCTURAL STEEL FABRICATOR SHALL ARRANGE FOR NON-DESTRUCTIVE TESTING OF THE WELDS. ALL COSTS TO BE INCLUDED IN ITEM 550.1.

9. SHOP DRAWINGS SHALL INDICATE THE METHOD AND SEQUENCE TO BE FOLLOWED IN WELDING THE GIRDER COMPONENTS.

10. CROSS FRAMES SHALL BE FABRICATED IN THE SHOP WITH 1/4" FILLET WELDS, UNLESS NOTED OTHERWISE. GRAVITY AXES OF THE MEMBERS SHALL INTERSECT AS NEARLY AS PRACTICABLE AT THE CENTERLINE OF THE GIRDER.

11. LOCATION OF WELDED SHOP SPLICES SHALL BE APPROVED BY THE BUREAU OF BRIDGE DESIGN. WEB SPLICES SHALL BE LOCATED A MINIMUM OF 9" FROM WELDED FLANGE SPLICES. WEB AND FLANGE SPLICES SHALL BE LOCATED A MINIMUM OF 6" FROM TRANSVERSE STIFFENERS OR CONNECTION PLATES.

12. ANY SHOP OR FIELD WELDING OF ATTACHMENTS TO ANY PORTION OF THE PLATE GIRDERS FOR CONSTRUCTION PURPOSES WILL NOT BE PERMITTED, UNLESS APPROVED BY THE BUREAU OF BRIDGE DESIGN.

13. THE CONTRACTOR SHALL SUBMIT A HANDLING AND ERECTION PLAN, IN ACCORDANCE WITH SECTIONS 550.3.14 AND 550.3.15, TO THE ENGINEER PRIOR TO HANDLING THE STRUCTURAL STEEL. THE ERECTION PLAN SHALL INDICATE THE LOCATION AND NUMBER OF LIFTING POINTS.

14. STEEL ERECTION SHALL NOT BE PERMITTED UNTIL THE ABUTMENTS HAVE BEEN BACKFILLED TO THE LEVEL OF THE BRIDGE SEATS.

15. ALL SHEAR CONNECTORS SHALL BE FIELD WELDED TO THE TOP FLANGE WITH AUTOMATICALLY TIMED STUD WELDING EQUIPMENT.

16. ALL STRUCTURAL STEEL, INCLUDING BRIDGE SHOES, SHALL BE COATED WITH THE DUPLEX COATING - METALLIZING AND SEALER, PER SPECIAL PROVISION FOR SECTION 550.

17. THE TOP OF TOP FLANGES SHALL BE COATED WITH METALLIZED/SEALER FULL THICKNESS, EXCEPT MASK AND PRIME PAINT A STRIP FOR EACH LINE OF SHEAR CONNECTORS (SEE 550 SPECIAL PROVISION). SPOT GRIND AT EACH STUD LOCATION AND TOUCH UP BARE STEEL WITH PRIMER PAINT AFTER STUD WELDING.

18. FIELD DRILL (ON ONE SIDE ONLY) TOP AND BOTTOM GUSSET PLATES ON CROSS FRAMES TO ATTACH TO STIFFENERS BETWEEN PHASES, TO ACCOUNT FOR DIFFERENTIAL DEFLECTIONS.

GALVANIC CORROSION PROTECTION NOTES

1. GALVANIC CORROSION PROTECTION SYSTEM (DISCRETE ANODES), ITEM 540.512 SHALL BE PLACED IN THE ABUTMENTS OF THE US ROUTE 4 BRIDGES (093/109 & 094/108) AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISION FOR ADDITIONAL INFORMATION.

2. GALVANIC CORROSION PROTECTION SYSTEMS (DISCRETE ANODES), ITEM 540.512 AND (DISTRIBUTED ANODES), ITEM 540.511 SHALL BE PLACED IN THE DECK OF THE MASCOMA RIVER BRIDGES (098/111 & 097/112) AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISION FOR ADDITIONAL INFORMATION.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/PRELIM	41191_Notes	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4 & MASCOMA RIVER

PROJECT NOTES (1 OF 2)

BRIDGE SHEET 1 OF 48

FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	6/18	CHECKED	BAW	6/18
	DRAWN	TEM	6/18	CHECKED	BAW	6/18
	QUANTITIES	TEM	6/18	CHECKED	BAW	6/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	18	110

SUBSTRUCTURE RECONSTRUCTION NOTES (093/109 & 094/108)

1. CONCRETE ABUTMENT SEATS, INTERMEDIATE RETAINING WALLS, AND BACKWALLS SHALL BE RECONSTRUCTED AS SHOWN IN THE PLANS WITH ITEM 520.02, CONCRETE CLASS AA, ABOVE FOOTINGS (F).

2. FOR ABUTMENT SEAT, INTERMEDIATE RETAINING WALL, AND BACKWALL RECONSTRUCTION, SAWCUT EXISTING CONCRETE 1" DEEP ON ALL EXPOSED SURFACES TO PROVIDE CLEAN REMOVAL LINES. REMOVE EXISTING CONCRETE AS SHOWN IN THE PLANS. ALL COSTS TO BE INCLUDED IN ITEM 502.101, AND 502.102, REMOVAL OF EXISTING BRIDGE STRUCTURE.

3. DETERIORATED AREAS OF CONCRETE ON THE WINGS, ABUTMENTS, INTERMEDIATE RETAINING WALLS, BACKWALLS, AND BRIDGE SEATS SHALL BE REMOVED AS DIRECTED BY THE CONTRACT ADMINISTRATOR UNDER 512.0201, PREPARATION FOR CONCRETE REPAIRS, CLASS II. THE EXISTING SUBSTRUCTURE CONCRETE SURFACES TO BE REPAIRED SHALL BE SAWCUT 1" DEEP TO PROVIDE CLEAN REMOVAL LINES (ALL COSTS TO BE INCLUDED IN ITEM 512.0201). ALL AREAS TO BE PATCHED SHALL BE BLAST-CLEANED AND SATURATED SURFACE DRIED JUST PRIOR TO PATCHING (COSTS INCLUDED IN ITEM 512.0201). PATCH WITH ITEM 520.0201, CONCRETE CLASS AA, ABOVE FOOTINGS.

4. EXISTING REINFORCING STEEL THAT IS TO REMAIN IN PLACE WITHIN THE RECONSTRUCTED AREAS SHALL BE CUT AS REQUIRED TO PROVIDE $2^{1}/_{2}$" MINIMUM CLEAR COVER FROM THE PROPOSED CONCRETE SURFACES, EXCEPT AS OTHERWISE NOTED. ALL COSTS INCLUDED IN ITEM 544.2. ALL NEW REINFORCING BARS SHALL HAVE A MINIMUM CLEAR COVER OF $2^{1}/_{2}$" FROM PROPOSED CONCRETE SURFACES UNLESS NOTED OTHERWISE.

5. ALL REINFORCING SHALL BE PAID AS ITEM 544.2, REINFORCING STEEL - EPOXY COATED (F).

6. ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE) SHALL BE APPLIED TO THE ABUTMENT FROM THE BOTTOM OF THE DECK TO GRADE, THE ENTIRE BRIDGE SEAT, AND THE EXPOSED WINGWALL SURFACES TO GRADE. EXISTING CONCRETE SURFACES SHALL BE LIGHT BLAST-CLEANED PRIOR TO WATER REPELLENT APPLICATION.

7. REMOVE ANY EXISTING LOOSE OR FLAKING EPOXY COATING FROM THE BACKWALL AND SEATS AS DIRECTED. COSTS SUBSIDIARY TO ITEM 502.

SUPERSTRUCTURE RECONSTRUCTION NOTES (BR. NO. 098/111 & 097/112)

1. DURING CONCRETE DECK REMOVAL OPERATIONS, EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE TOP FLANGES OF EXISTING GIRDERS AND DECK REINFORCING STEEL THAT IS TO REMAIN IN PLACE. ANY DAMAGE SHALL BE IMMEDIATELY REPORTED TO THE BUREAU OF BRIDGE DESIGN AND REPAIRED AS DIRECTED, AT THE CONTRACTOR'S EXPENSE.

2. ANY SHEAR CONNECTORS DAMAGED DURING DECK REPAIR AND REMOVAL OPERATIONS SHALL BE REPLACED AT CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL TAKE SPECIAL CARE WHEN PLACING NEW (REPLACEMENT) SHEAR STUDS ON EXISTING GIRDERS. AUTOMATIC STUD WELDING OR INDIVIDUAL STICK WELDING OF STUDS IS PERMISSIBLE. THE TOP FLANGES SHALL BE GROUND TO BASE METAL OR BLAST CLEANED PRIOR TO WELDING STUDS. THE AREA TO BE WELDED SHALL BE FREE OF RUST, OIL OR ANY OTHER FOREIGN MATERIALS. WELDING SHALL NOT BE DONE WHEN THE BASE MATERIAL TEMPERATURE IS BELOW 32°F, OR WHEN THE SURFACE IS WET OR EXPOSED TO ANY PRECIPITATION. WORK SHALL CONFORM TO SECTION 547 AND ALL COSTS INCLUDED IN ITEM 502.

3. FOR PORTIONS OF CONCRETE DECK TO BE REHABILITATED, AFTER THE REMOVAL OF EXISTING PAVEMENT AND MEMBRANE, THE EXISTING CONCRETE BRIDGE DECK SHALL BE "SOUNDED" TO DETERMINE AREAS REQUIRING PARTIAL AND FULL DEPTH REPAIRS (ALL COSTS TO BE INCLUDED IN ITEMS 511.02 AND 511.03). DETERIORATED AREAS SHALL BE PATCHED WITH CONCRETE CLASS AA, ITEMS 520.01 AND 520.0201. PRIOR TO PLACEMENT OF NEW CONCRETE, THE PREPARED AREAS SHALL BE BLAST CLEANED AND SATURATED SURFACE DRY (ALL COSTS TO BE INCLUDED IN ITEM 520.01 AND 520.0201).

4. ANY EXISTING REBAR THAT IS EXPOSED SHALL BE CLEANED OF ALL FOREIGN MATERIAL SUBSIDARY TO ITEM 511.OX (SEE SPECIAL PROVISION FOR ITEM 511.).

5. FOR REPLACEMENT OF DECK JOINT OVER ABUTMENTS, THE EXISTING CONCRETE BRIDGE DECK AND ABUTMENT BACKWALL SHALL BE REMOVED TO LIMITS SHOWN IN THE PLANS UNDER ITEM 502.103 & 502.104, REMOVAL OF EXISTING BRIDGE STRUCTURE. ALL CONCRETE SURFACES SHALL BE SAWCUT 1" DEEP TO PROVIDE CLEAN REMOVAL LINES (ALL COSTS INCLUDED IN ITEM 502.XXX). BACKWALL AND DECK END SHALL BE RECONSTRUCTED WITH ITEM 520.02, CONCRETE CLASS AA, ABOVE FOOTINGS. PRIOR TO PLACING NEW CONCRETE, THE REMOVAL SURFACES SHALL BE BLAST CLEANED AND SATURATED SURFACE DRY (ALL COSTS INCLUDED IN ITEM 520.02).

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/PRELIM	41191_Notes_2	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4 & MASCOMA RIVER

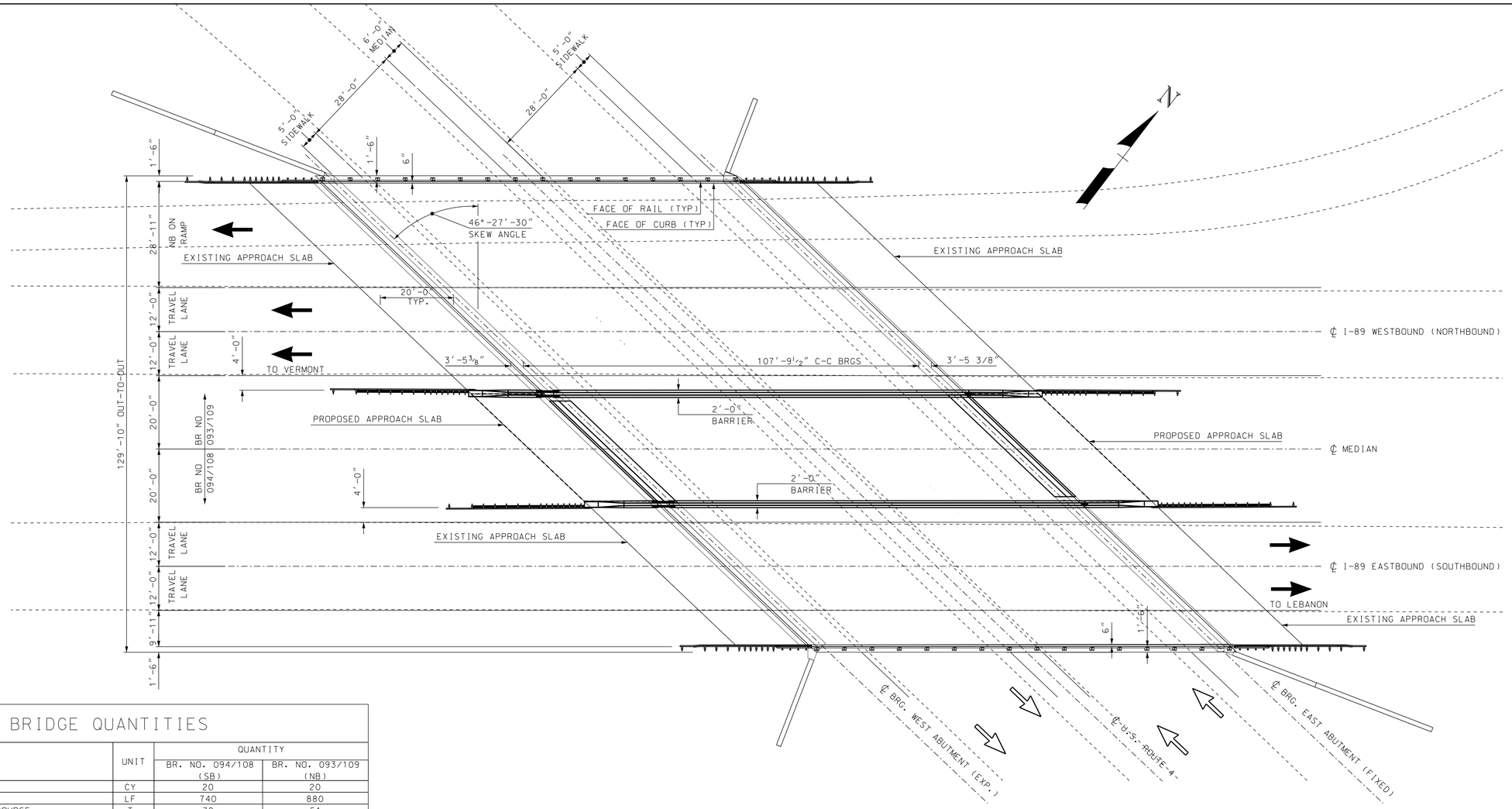
PROJECT NOTES (2 OF 2)

BRIDGE SHEET 2 OF 48

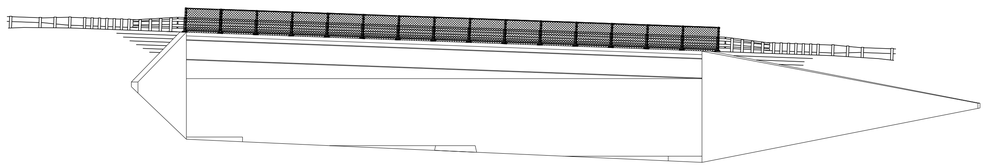
FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
		DESIGNED	TEM	6/18	CHECKED	BAW	6/18
		DRAWN	TEM	6/18	CHECKED	BAW	6/18
		QUANTITIES	TEM	6/18	CHECKED	BAW	6/18

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	19	110



PLAN



ELEVATION

SUMMARY OF BRIDGE QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY	
				BR. NO. 094/108 (SB)	BR. NO. 093/109 (NB)
**	209.201	GRANULAR BACKFILL (BRIDGE) (F)	CY	20	20
**	403.61	PAVEMENT JOINT ADHESIVE (BRIDGE BASE)	LF	740	880
**	403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE	T	38	51
	502.101	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	–	1
	502.102	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	1	–
	503.201	COFFERDAMS	U	–	1
	503.202	COFFERDAMS	U	1	–
**	504.1	COMMON BRIDGE EXCAVATION (F)	CY	290	290
	504.2	ROCK BRIDGE EXCAVATION	CY	30	20
	508	STRUCTURAL FILL	CY	120	160
	512.0201	PREPARATION FOR CONCRETE REPAIRS, CLASS II	SY	92	111
	520.02	CONCRETE CLASS AA, ABOVE FOOTINGS (F)	CY	29	29
**	520.0201	CONCRETE CLASS AA, ABOVE FOOTINGS	CY	9	11
	520.0302	CONCRETE CLASS AA, APPROACH SLABS (QC/QA) (F)	CY	43	46
	520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)	CY	180	238
**	534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	32	32
**	538.2	BARRIER MEMBRANE, PEEL AND STICK - VERTICAL SURFACES (F)	SY	20	20
**	538.6	BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F)	SY	680	540
**	540.512	GALVANIC CORROSION PROTECTION SYSTEM (DISCRETE ANODES)	EA	180	124
**	541.5	PVC WATERSTOPS, NH TYPE 5 (F)	LF	80.5	108
	544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	54890	73660
	544.21	REINFORCING STEEL, EPOXY COATED, MECHANICAL CONNECTORS (F)	LB	4700	4700
	544.7	SYNTHETIC FIBER REINFORCEMENT (F)	LB	250	250
	547	SHEAR CONNECTORS (F)	EA	2904	3267
	550.1	STRUCTURAL STEEL (F)	LB	204370	239190
	550.201	BRIDGE SHOES (F)	EA	16	18
	559.41	ASPHALTIC PLUG FOR CRACK CONTROL (F)	LF	80.5	108
	561.1001	PREFABRICATED STRIP SEAL EXPANSION JOINT (F)	LF	80.5	108
**	562.1	SILICONE JOINT SEALANT (F)	LF	37	37
	563.233	BRIDGE RAIL T3 WITH SNOW SCREENING	LF	108	108
	565.232	BRIDGE APPROACH RAIL T3 (STEEL POSTS)	U	2	2
**	606.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - BRIDGE	LF	208	208
	606.4239	MODIFIED SINGLE SLOPE CONCRETE MEDIAN BARRIER, CAST-IN-PLACE	LF	108	108
	1010.15	FUEL ADJUSTMENT	$	*	*
	1010.41	QUALITY CONTROL / QUALITY ASSURANCE (QC/QA) FOR CONCRETE	$	–	*
	1010.42	QUALITY CONTROL / QUALITY ASSURANCE (QC/QA) FOR CONCRETE	$	*	–

* NOT A BID ITEM
** NOT AN ITEM TOTAL

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\BRSITE	41191_BrGenPlan	1/16"=1'

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

GENERAL PLAN AND ELEVATION

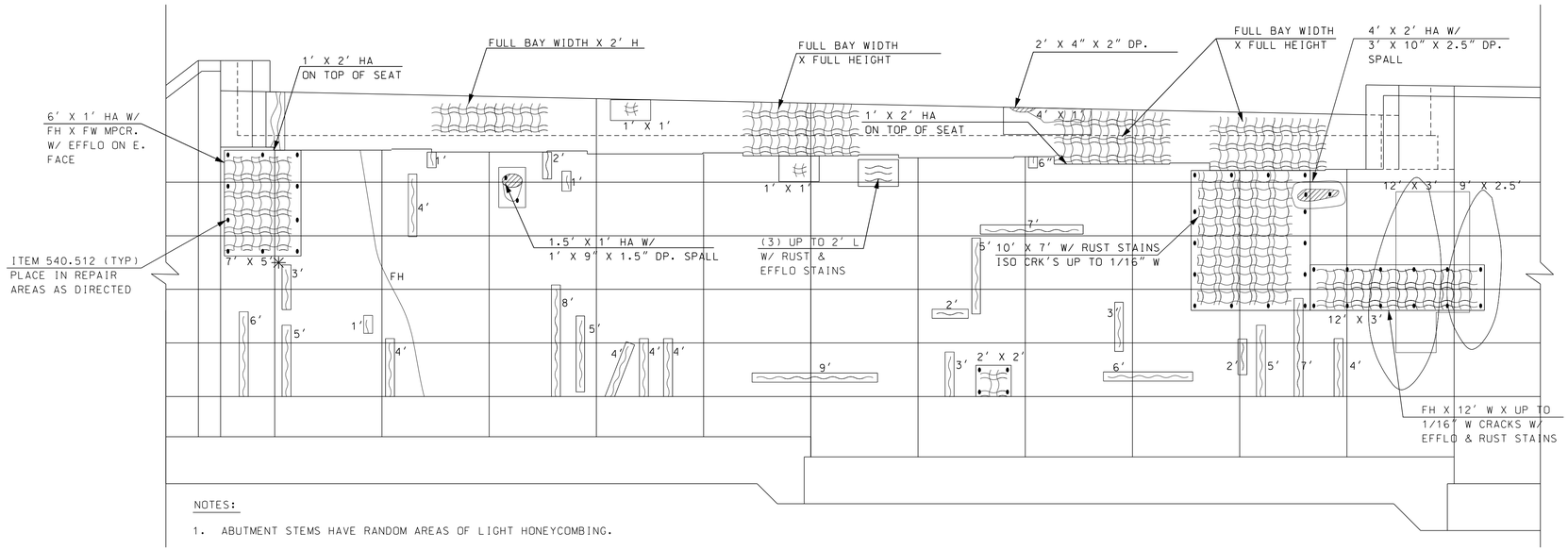
BRIDGE SHEET: 3 OF 48

REVISIONS AFTER PROPOSAL

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	20	110

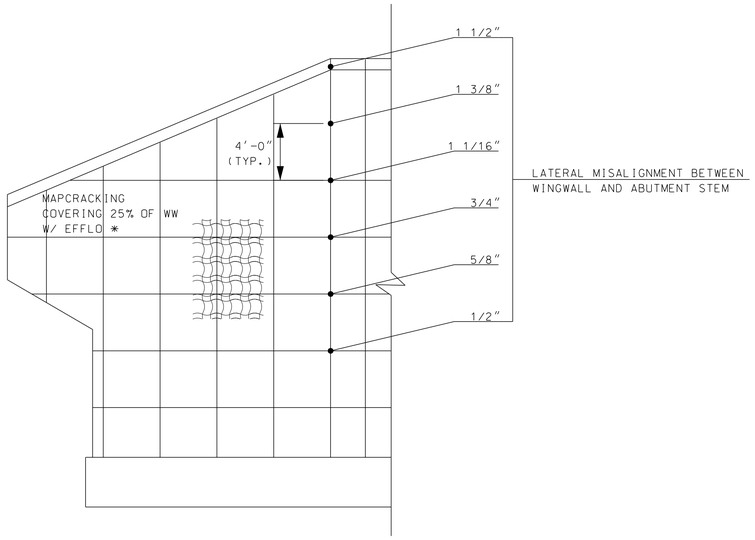
FILE NUMBER: 19-1-5



NOTES:

1. ABUTMENT STEMS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING.
2. BACKWALLS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING, EFFLORESCENCE AND RUST STAINS.
3. RETAINING WALL (BETWEEN BRIDGES) EXHIBITS RANDOM AREAS OF HAIRLINE CRACKING.

SOUTH ABUTMENT WB (NB)



SOUTH ABUTMENT WB (NB) WINGWALL

LEGEND:

- HOLLOW AREA
- SHALLOW AREA
- SPALL
- SPALL WITH EXPOSED REBAR
- MAPCRACKS
- HAIRLINE CRACKS
- EFFLORESCENCE PRESENT
- HONEYCOMB AREA
- SCALE AREA
- ESTIMATED REQUIRED REPAIR AREA

NOTES:

1. APPROXIMATE REPAIR AREAS TO BE INCLUDED IN ITEM 512.0201 ARE SHOWN. THE AREAS SHOWN AND USED FOR ESTIMATING QUANTITIES ARE 4" ± OUTSIDE THE LIMITS OF DETERIORATION.
2. THE CONTRACTOR AND CONTRACT ADMINISTRATOR SHALL VERIFY THESE LOCATIONS AND IDENTIFY ANY OTHER LOCATIONS NEEDING REPAIRS PRIOR TO COMMENCING REPAIR PREPARATIONS.

GM2 ASSOCIATES

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC\ABUTA	41191AbutAWBRepairs	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

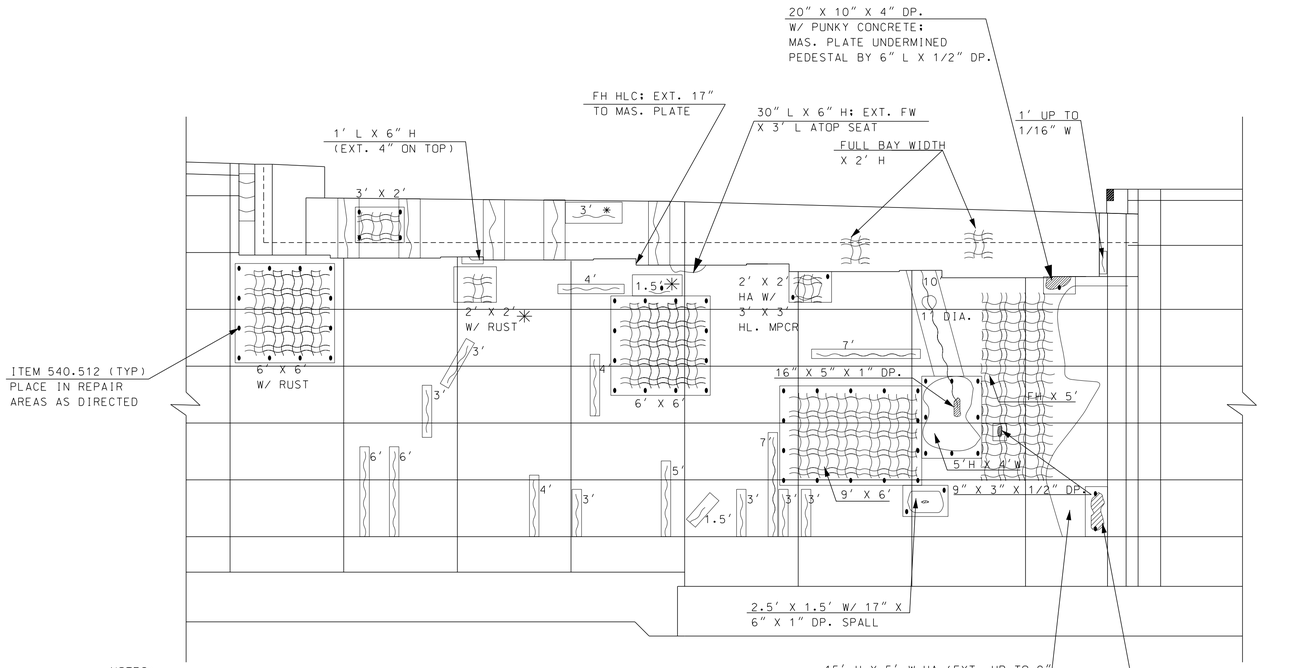
ABUTMENT REPAIRS

BRIDGE SHEET: 4 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TPL	7/18	CHECKED	TEM	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

FILE NUMBER: 19-1-5

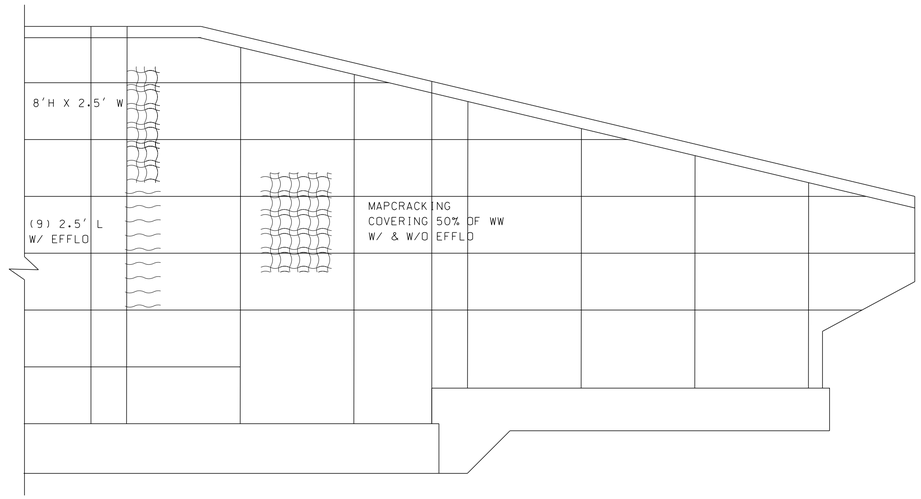
ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	21	110



NOTES:

1. ABUTMENT STEMS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING.
2. RETAINING WALL (BETWEEN BRIDGES) EXHIBITS RANDOM AREAS OF HAIRLINE CRACKING.

SOUTH ABUTMENT EB (SB)



NOTES:

1. APPROXIMATE REPAIR AREAS TO BE INCLUDED IN ITEM 512.0201 ARE SHOWN. THE AREAS SHOWN AND USED FOR ESTIMATING QUANTITIES ARE 4" ± OUTSIDE THE LIMITS OF DETERIORATION.
2. THE CONTRACTOR AND CONTRACT ADMINISTRATOR SHALL VERIFY THESE LOCATIONS AND IDENTIFY ANY OTHER LOCATIONS NEEDING REPAIRS PRIOR TO COMMENCING REPAIR PREPARATIONS.

SOUTH ABUTMENT EB (SB) WINGWALL

LEGEND:

- HOLLOW AREA
- SHALLOW AREA
- SPALL
- SPALL WITH EXPOSED REBAR
- MAPCRACKS
- HAIRLINE CRACKS
- EFFLORESCENCE PRESENT
- HONEYCOMB AREA
- SCALE AREA
- ESTIMATED REQUIRED REPAIR AREA

EM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC\ABUTA	41191AbutAEBRepairs	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

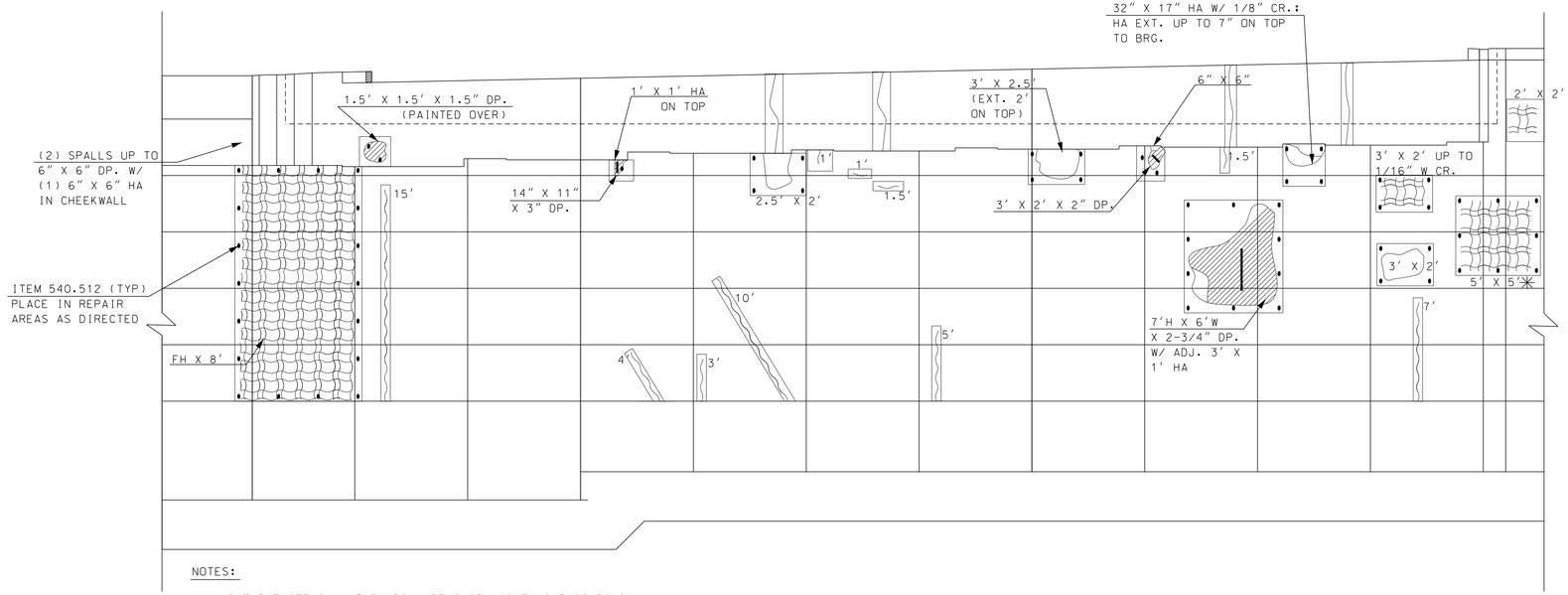
ABUTMENT REPAIRS

BRIDGE SHEET 5 OF 48

FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TPL	7/18	CHECKED	TEM	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

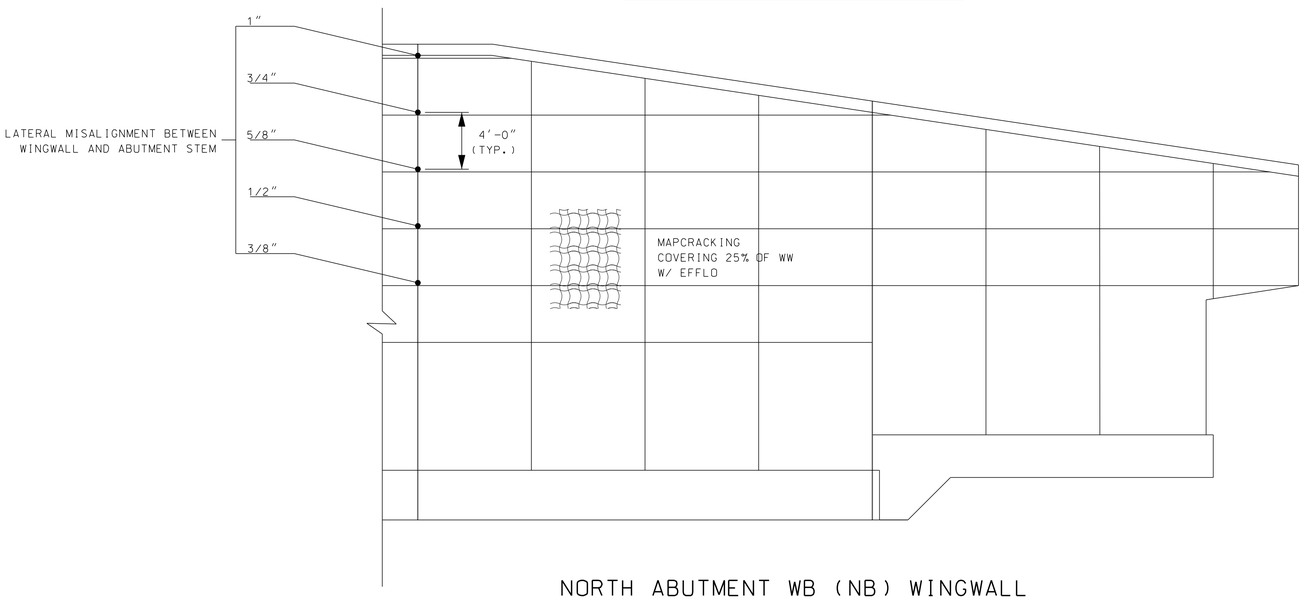
ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	22	110



NOTES:

1. ABUTMENT STEMS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING.
2. BACKWALLS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING. EFFLORESCENCE AND RUST STAINS.
3. RETAINING WALL (BETWEEN BRIDGES) EXHIBITS RANDOM AREAS OF HAIRLINE CRACKING.

NORTH ABUTMENT WB (NB)



NORTH ABUTMENT WB (NB) WINGWALL

NOTES:

1. APPROXIMATE REPAIR AREAS TO BE INCLUDED IN ITEM 512.0201 ARE SHOWN. THE AREAS SHOWN AND USED FOR ESTIMATING QUANTITIES ARE 4" ± OUTSIDE THE LIMITS OF DETERIORATION.
2. THE CONTRACTOR AND CONTRACT ADMINISTRATOR SHALL VERIFY THESE LOCATIONS AND IDENTIFY ANY OTHER LOCATIONS NEEDING REPAIRS PRIOR TO COMMENCING REPAIR PREPARATIONS.

LEGEND:

- HOLLOW AREA
- SHALLOW AREA
- SPALL
- SPALL WITH EXPOSED REBAR
- MAPCRACKS
- HAIRLINE CRACKS
- EFFLORESCENCE PRESENT
- HONEYCOMB AREA
- SCALE AREA
- ESTIMATED REQUIRED REPAIR AREA

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC\ABUTB	41191AbutBWBRepairs	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

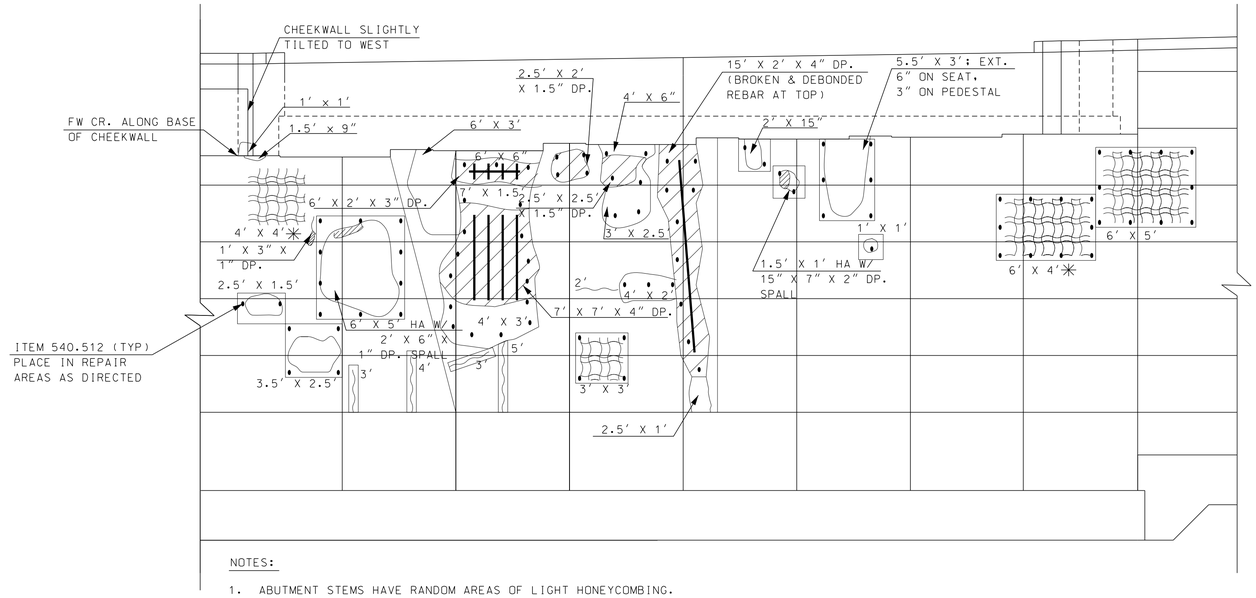
ABUTMENT REPAIRS

BRIDGE SHEET: 6 OF 48

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
			DESIGNED	TPL	7/18	CHECKED	TEM	7/18
			DRAWN	TEM	7/18	CHECKED	TPL	7/18
			QUANTITIES	TEM	7/18	CHECKED	BAW	7/18
			ISSUE DATE			FEDERAL PROJECT NO.		SHEET NO.
			REV. DATE			X-A004(559)		23

FILE NUMBER: 19-1-5

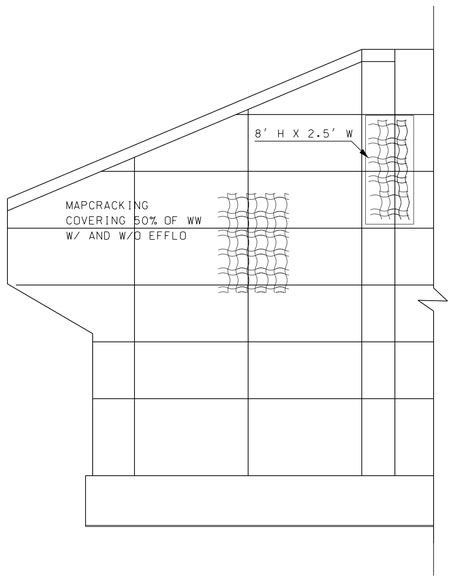
TOTAL SHEETS: 110



NOTES:

1. ABUTMENT STEMS HAVE RANDOM AREAS OF LIGHT HONEYCOMBING.
2. RETAINING WALL (BETWEEN BRIDGES) EXHIBITS RANDOM AREAS OF HAIRLINE CRACKING.

NORTH ABUTMENT EB (SB)



NORTH ABUTMENT EB (SB) WINGWALL

LEGEND:

- HOLLOW AREA
- SHALLOW AREA
- SPALL
- SPALL WITH EXPOSED REBAR
- MAPCRACKS
- HAIRLINE CRACKS
- EFFLORESCENCE PRESENT
- HONEYCOMB AREA
- SCALE AREA
- ESTIMATED REQUIRED REPAIR AREA

NOTES:

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2. THE CONTRACTOR AND CONTRACT ADMINISTRATOR SHALL VERIFY THESE LOCATIONS AND IDENTIFY ANY OTHER LOCATIONS NEEDING REPAIRS PRIOR TO COMMENCING REPAIR PREPARATIONS.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC\ABUTB	41191AbutBEBRepairs	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

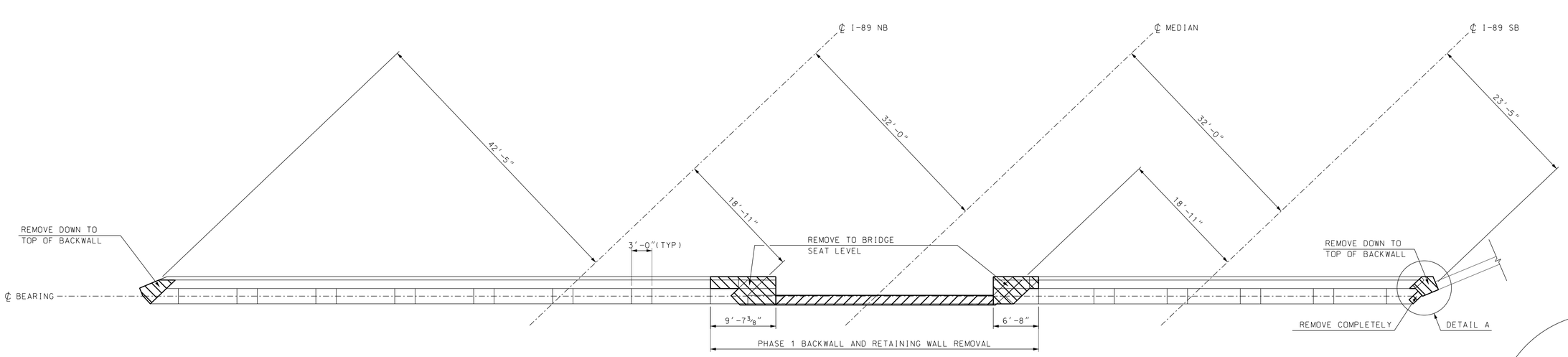
ABUTMENT REPAIRS

BRIDGE SHEET: 7 OF 48

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
		DESIGNED	TPL	7/18	CHECKED	TEM	7/18
		DRAWN	TEM	7/18	CHECKED	TPL	7/18
		QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

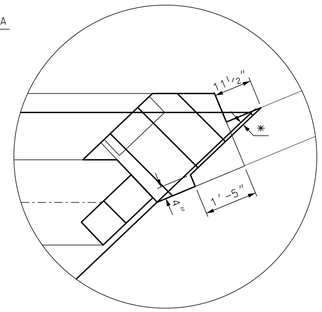
FILE NUMBER: 19-1-5

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	24	110



PLAN - EAST ABUTMENT REMOVAL LIMITS

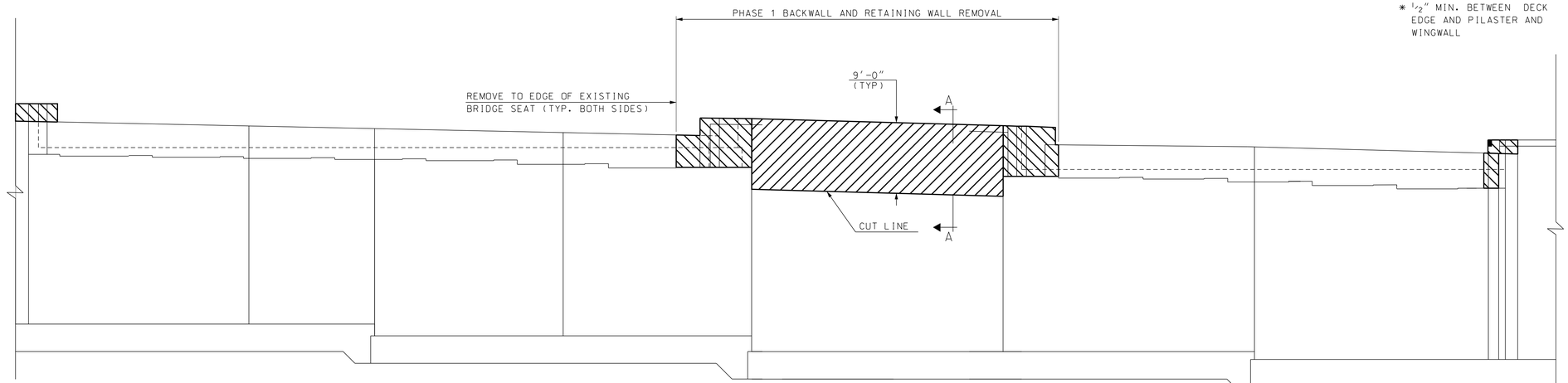
SCALE: 1/8″ = 1′-0″



* 1/2″ MIN. BETWEEN DECK EDGE AND PILASTER AND WINGWALL

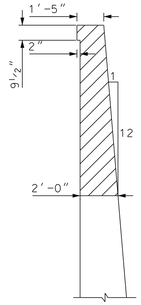
DETAIL A

SCALE: 1/2″ = 1′-0″



ELEVATION - EAST ABUTMENT REMOVAL LIMITS

SCALE: 1/8″ = 1′-0″



SECTION A-A

SCALE: 1/4″ = 1′-0″

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

EAST ABUTMENT REMOVAL LIMITS

BRIDGE SHEET 8 OF 48

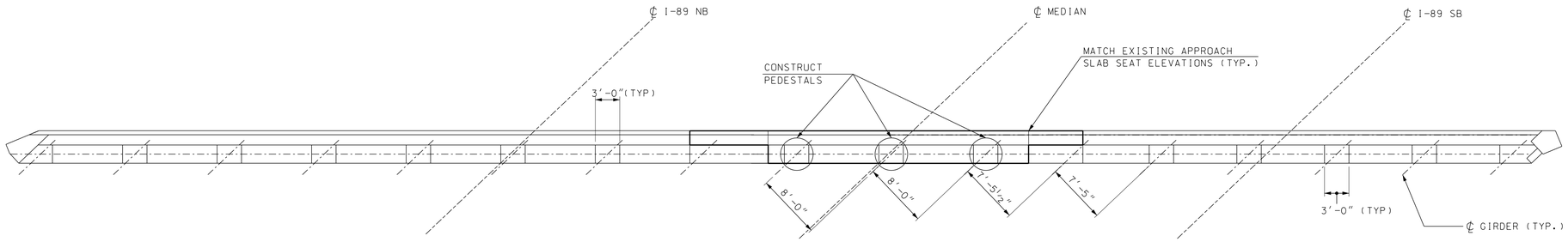
FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	25	110

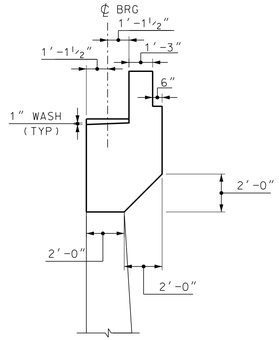
GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\ABUTA	41191AbutEastRem	AS NOTED



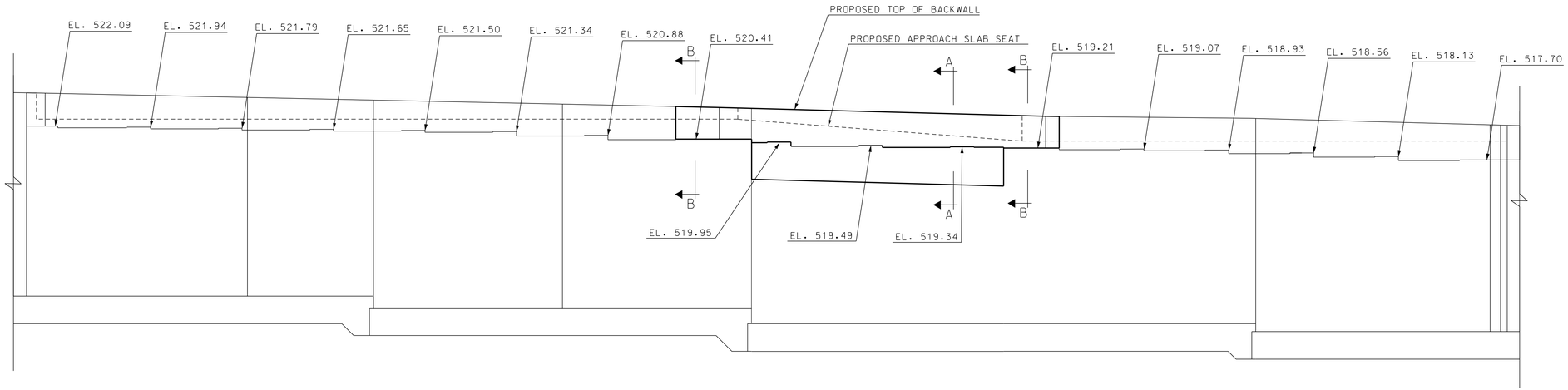
PLAN - EAST ABUTMENT PROPOSED CONSTRUCTION

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



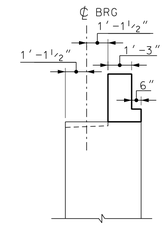
SECTION A-A

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



ELEVATION - EAST ABUTMENT PROPOSED CONSTRUCTION

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



SECTION B-B

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

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

EAST ABUTMENT PROPOSED CONSTRUCTION

BRIDGE SHEET: 9 OF 48

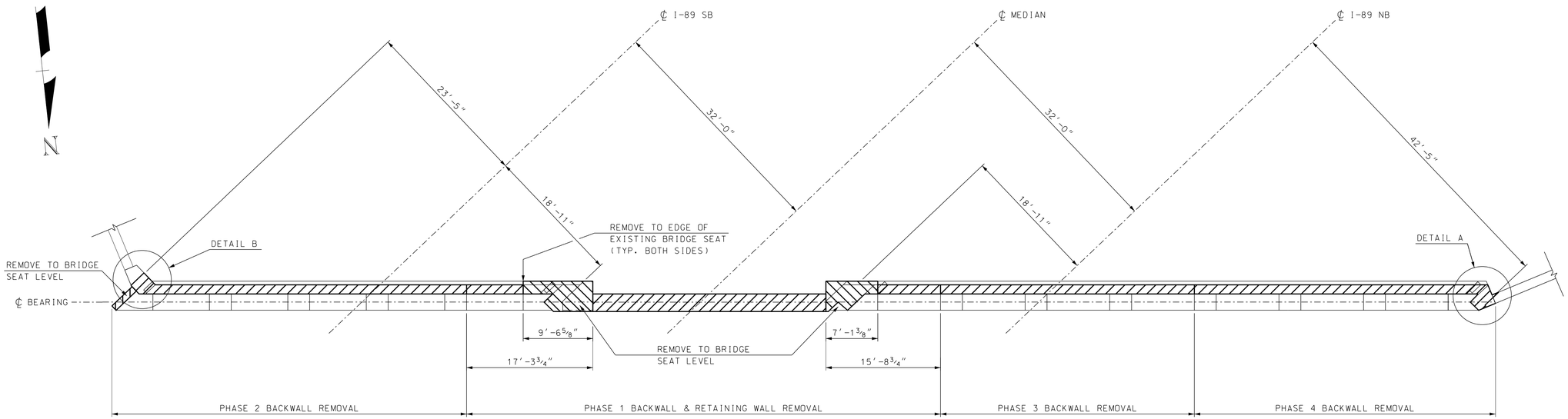
FILE NUMBER: 19-1-5

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
		DESIGNED	TEM	7/18	CHECKED	TPL	7/18
		DRAWN	TEM	7/18	CHECKED	TPL	7/18
		QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

GM2 ASSOCIATES

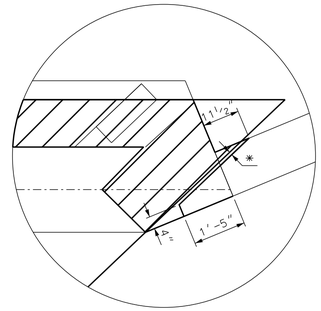
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\ABUTA	41191AbutEastPR	AS NOTED

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	26	110



PLAN - WEST ABUTMENT REMOVAL LIMITS

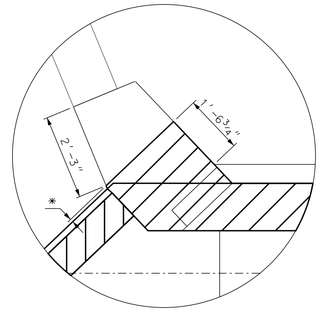
SCALE: 1/8" = 1'-0"



DETAIL A

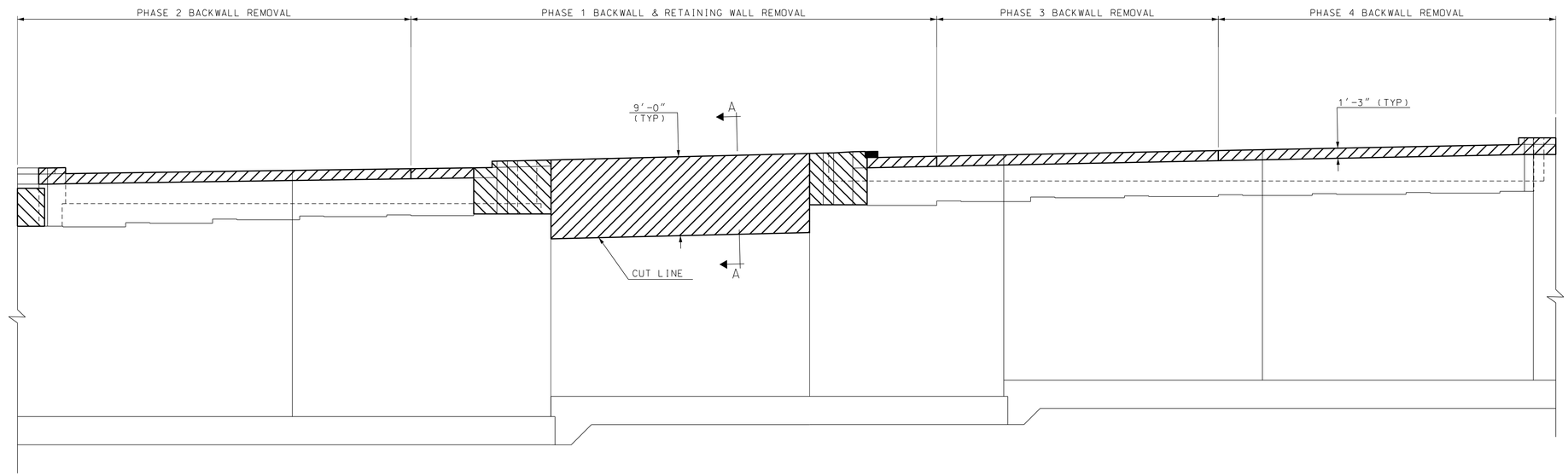
SCALE: 1/2" = 1'-0"

* 1/2" MIN. BETWEEN PROPOSED DECK EDGE AND PILASTER AND WINGWALL



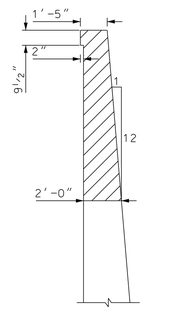
DETAIL B

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



ELEVATION - WEST ABUTMENT REMOVAL LIMITS

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



SECTION A-A

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

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\ABUTB	41191AbutWestRem	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

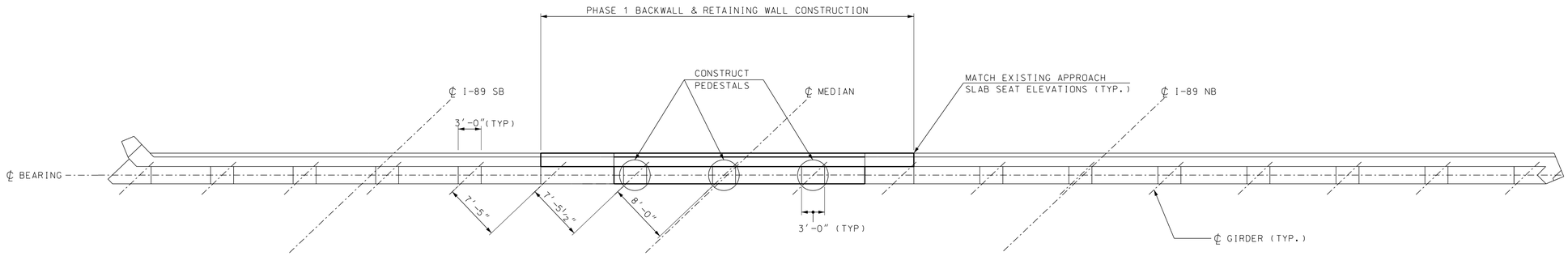
WEST ABUTMENT REMOVAL LIMITS

BRIDGE SHEET: 10 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

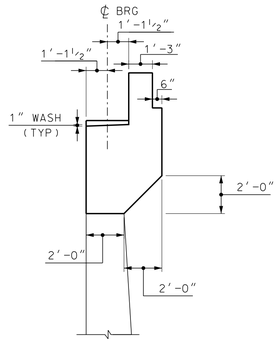
FILE NUMBER: 19-1-5

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	27	110



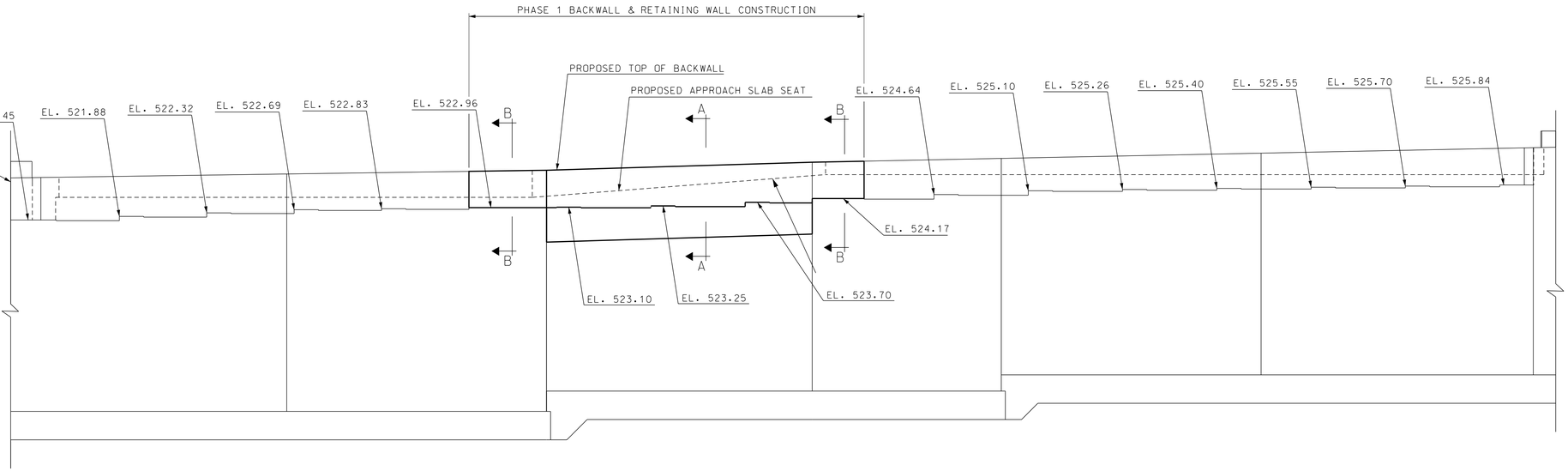
PLAN - WEST ABUTMENT PROPOSED CONSTRUCTION

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



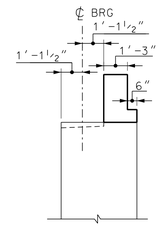
SECTION A-A

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



ELEVATION - WEST ABUTMENT PROPOSED CONSTRUCTION

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



SECTION B-B

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

SUBDIRECTORY	BRD\ABUTB
.DGN LOCATOR	41191AbutWestPR
SHEET SCALE	AS NOTED

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

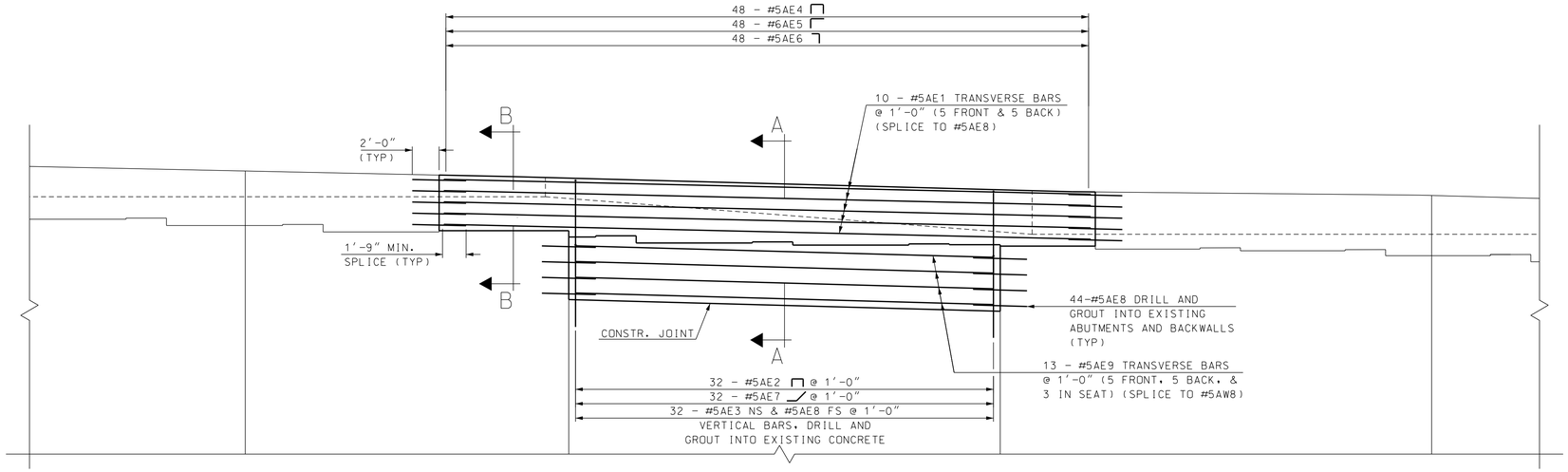
WEST ABUTMENT PROPOSED CONSTRUCTION

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
		DESIGNED	TEM	7/18	CHECKED	TPL	7/18
		DRAWN	TEM	7/18	CHECKED	TPL	7/18
		QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
		ISSUE DATE					
		REV. DATE					

FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(559)	28	110

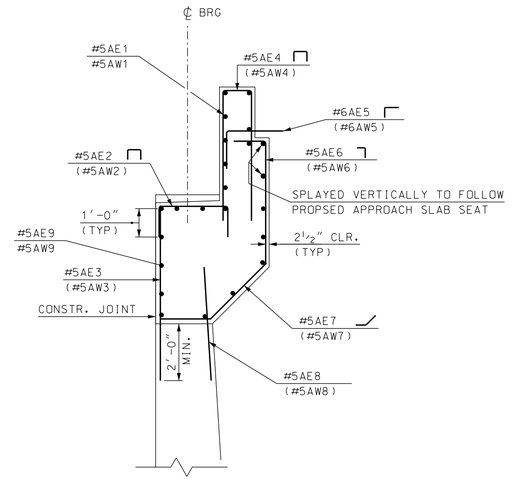
BRIDGE SHEET 11 OF 48

FILE NUMBER 19-1-5



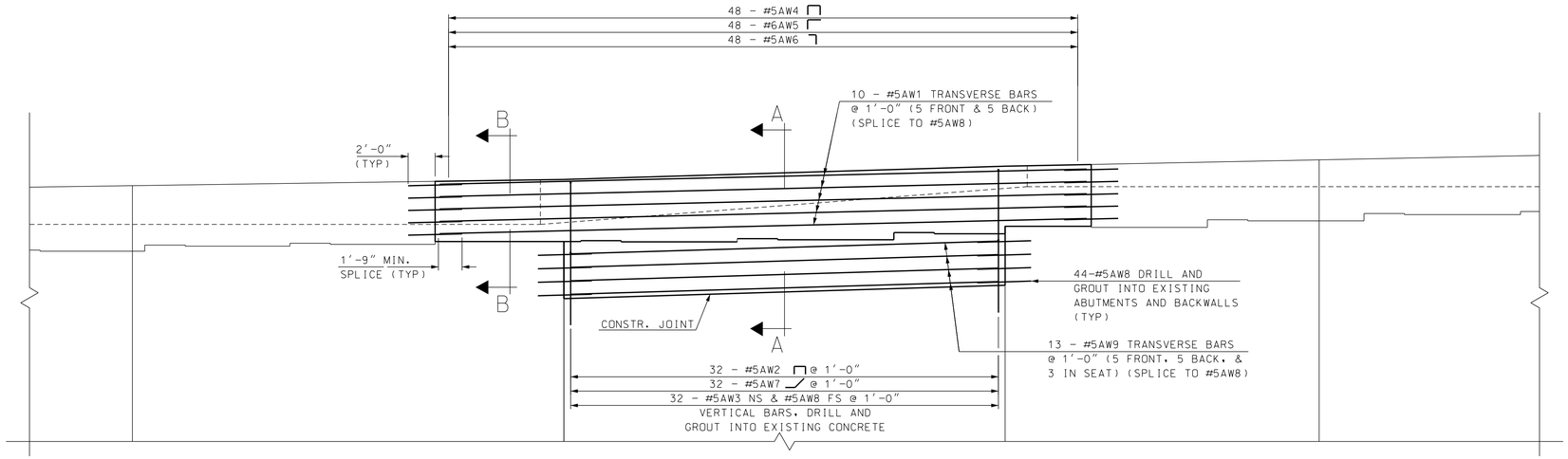
ELEVATION – EAST ABUTMENT REINFORCEMENT

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



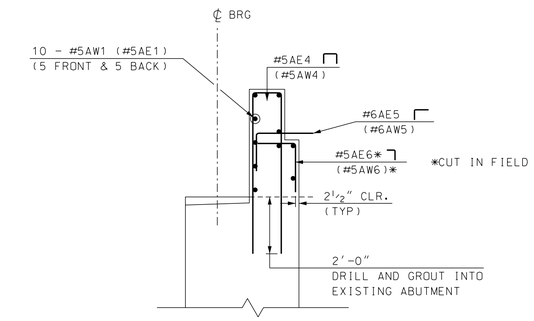
SECTION A–A

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



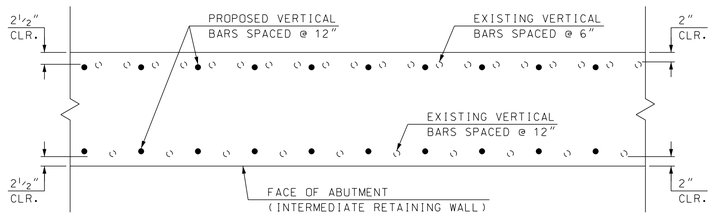
ELEVATION – WEST ABUTMENT REINFORCEMENT

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



SECTION B–B

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



DRILLING PATTERN DETAIL

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

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\ABUTEAST	41191Abut_Reinf	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 — STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

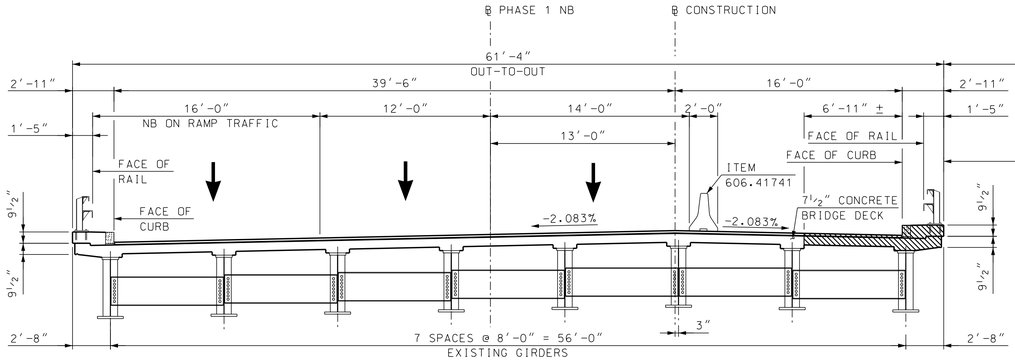
ABUTMENT REINFORCEMENT

BRIDGE SHEET: 12 OF 48

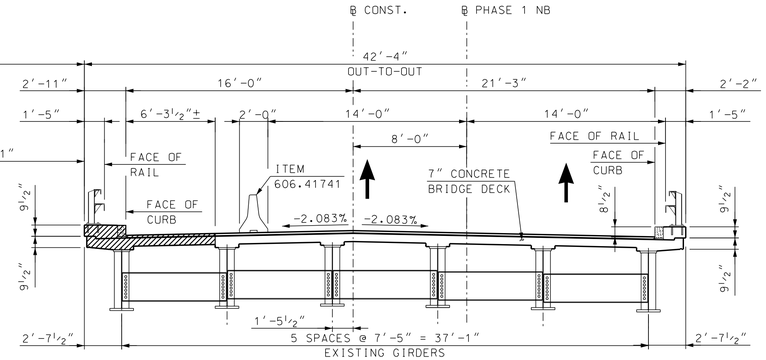
FILE NUMBER: 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	BAW	04/19	CHECKED	TPL	04/19
	DRAWN	BAW	04/19	CHECKED	TPL	04/19
	QUANTITIES	BAW	04/19	CHECKED	TPL	04/19

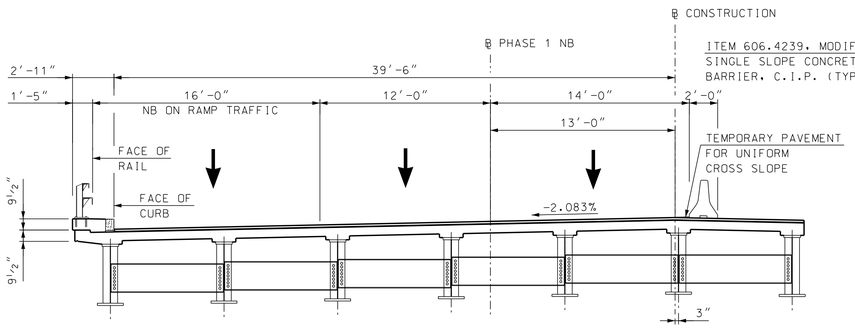
ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	29	110



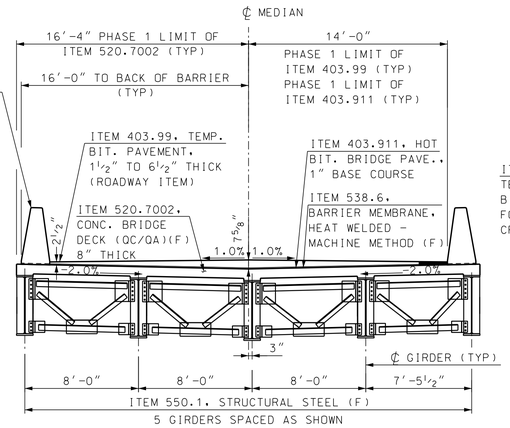
EXISTING BRIDGE SECTION - WB (NB)
PHASE 1 REMOVAL



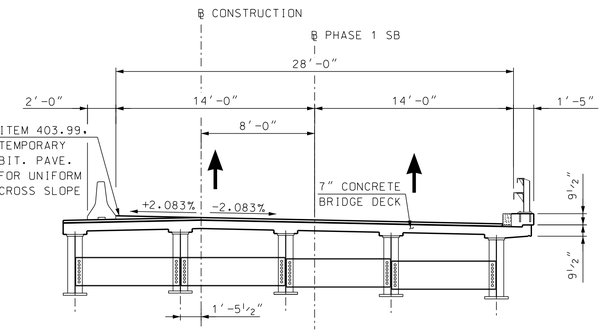
EXISTING BRIDGE SECTION - EB (SB)
PHASE 1 REMOVAL



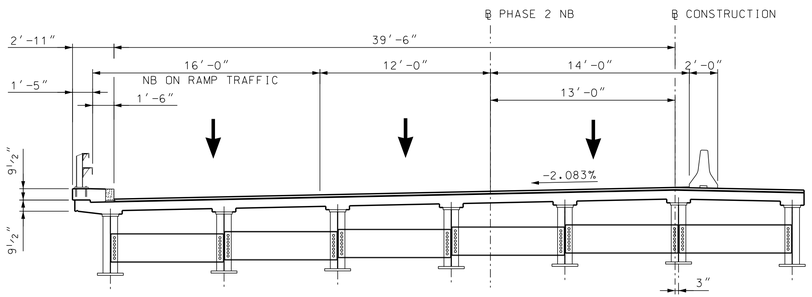
PHASE 1 TRAFFIC - WB (NB)



PHASE 1 CONSTRUCTION



PHASE 1 TRAFFIC - EB (SB)



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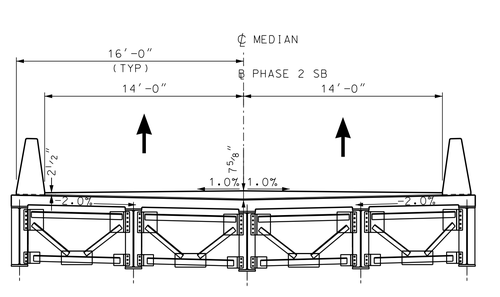
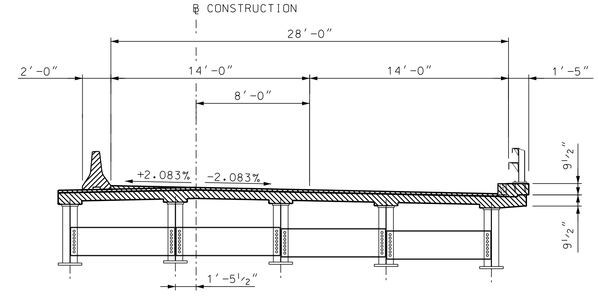


PHASE 2 TRAFFIC - EB (SB)



PHASE 2 REMOVAL

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

TRANSVERSE SECTIONS (1 OF 4)

BRIDGE SHEET 13 OF 48

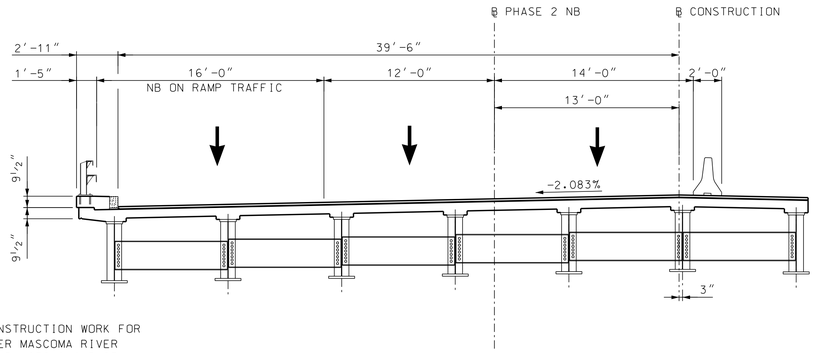
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/PRELIM	41191_PHASE_CONSTR	3/16" = 1'-0"

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	30	110

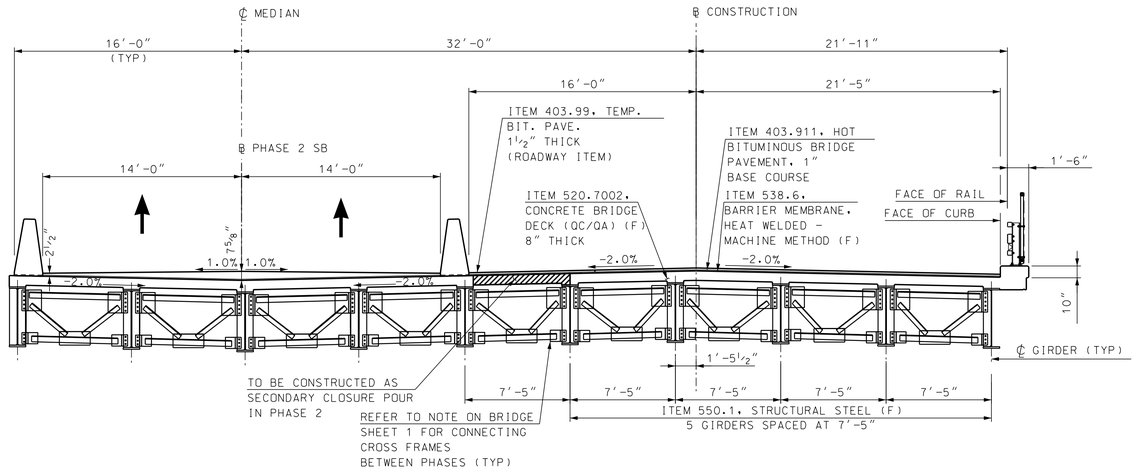
FILE NUMBER 19-1-5

GM2 ASSOCIATES



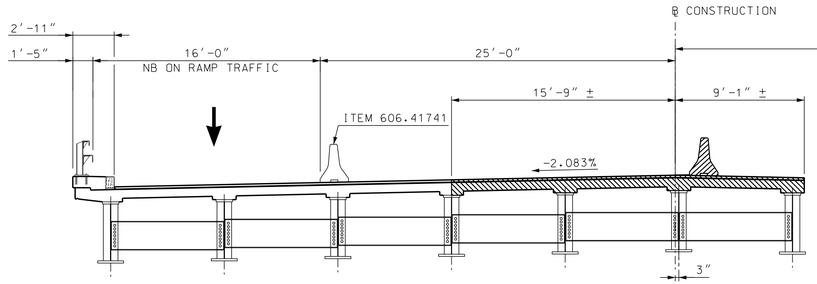
NOTE: THE PRESERVATION CONSTRUCTION WORK FOR THE I-89 BRIDGES OVER MASCOMA RIVER SHALL OCCUR BETWEEN PHASES 2 & 3 OF THE I-89 BRIDGES OVER U.S. ROUTE 4 CONSTRUCTION. PRIOR TO NB TRAFFIC DIVERSION (SEE BRIDGE SHEETS 39 & 40).

PHASE 2 TRAFFIC - WB (NB)



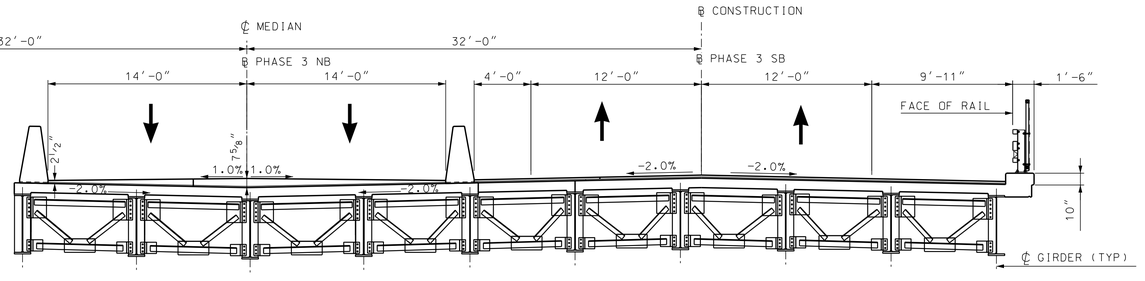
PHASE 2 TRAFFIC - EB (SB)

PHASE 2 CONSTRUCTION



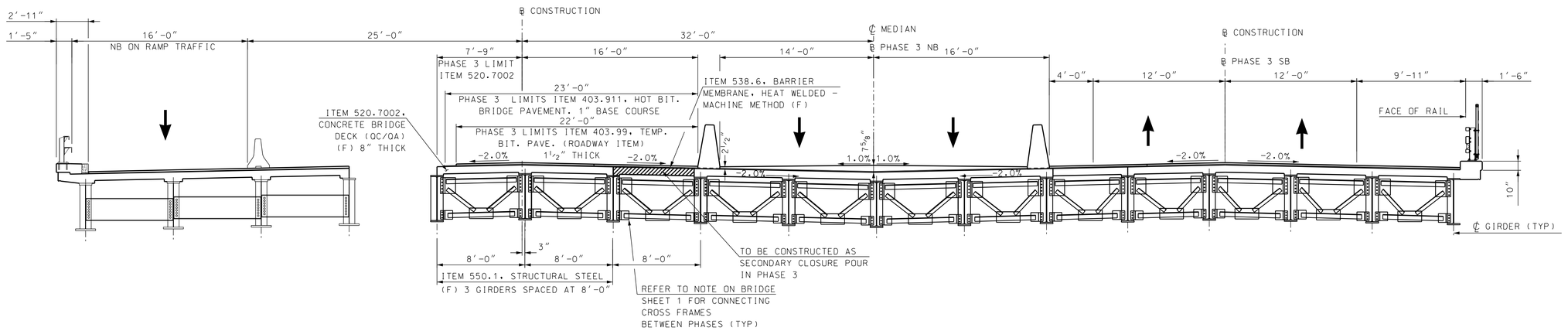
PHASE 3 TRAFFIC - NB ON RAMP

PHASE 3 REMOVAL



PHASE 3 TRAFFIC - WB (NB)

PHASE 3 TRAFFIC - EB (SB)



PHASE 3 TRAFFIC - NB ON RAMP

PHASE 3 CONSTRUCTION

PHASE 3 TRAFFIC - WB (NB)

PHASE 3 TRAFFIC - EB (SB)

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

TRANSVERSE SECTIONS (2 OF 4)

BRIDGE SHEET: 14 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
ISSUE DATE			FEDERAL PROJECT NO.		
REV. DATE			X-A004(559)		

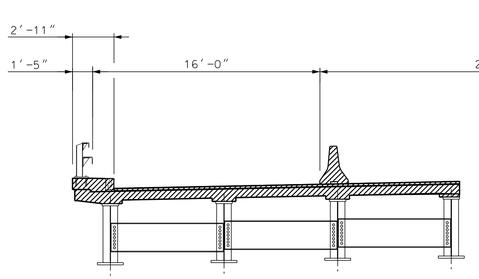
FILE NUMBER: 19-1-5

SHEET NO.: 31

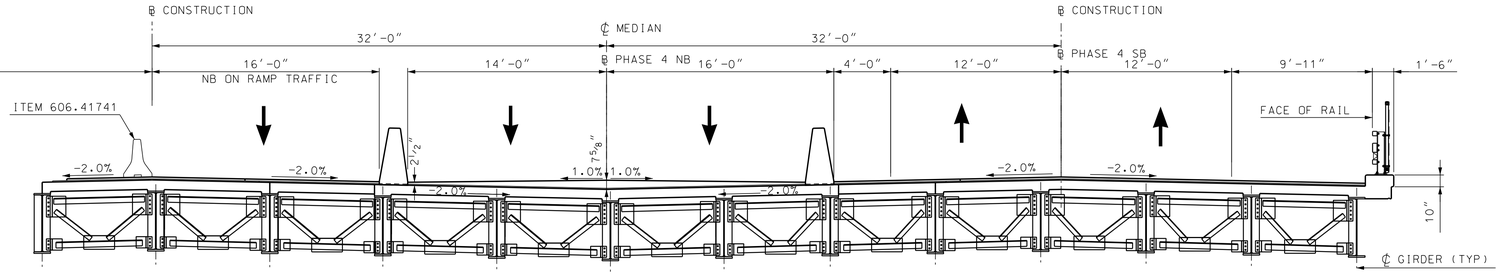
TOTAL SHEETS: 110

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/PRELIM	41191_PHASE_CONSTR	3/16" = 1'-0"



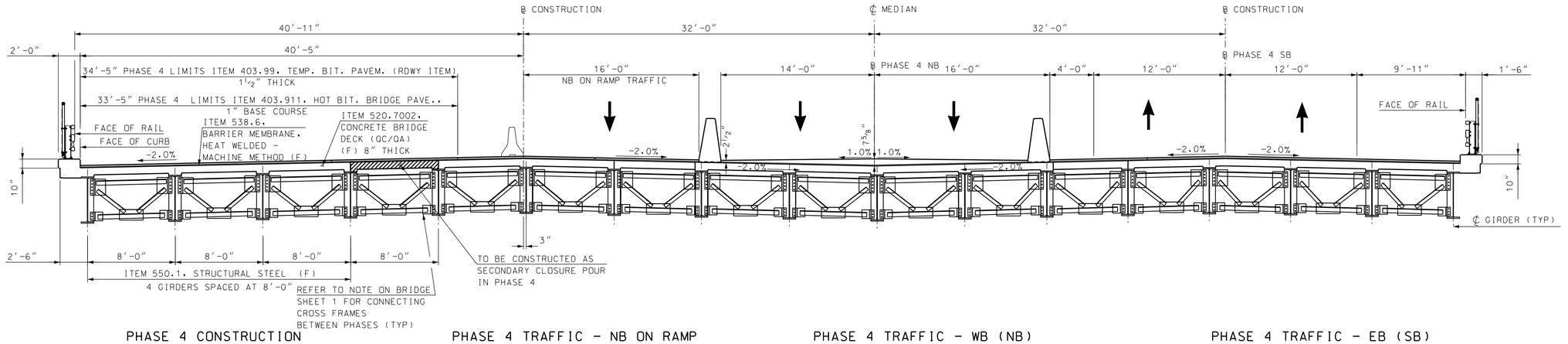
PHASE 4 REMOVAL



PHASE 4 TRAFFIC - NB ON RAMP

PHASE 4 TRAFFIC - WB (NB)

PHASE 4 TRAFFIC - EB (SB)

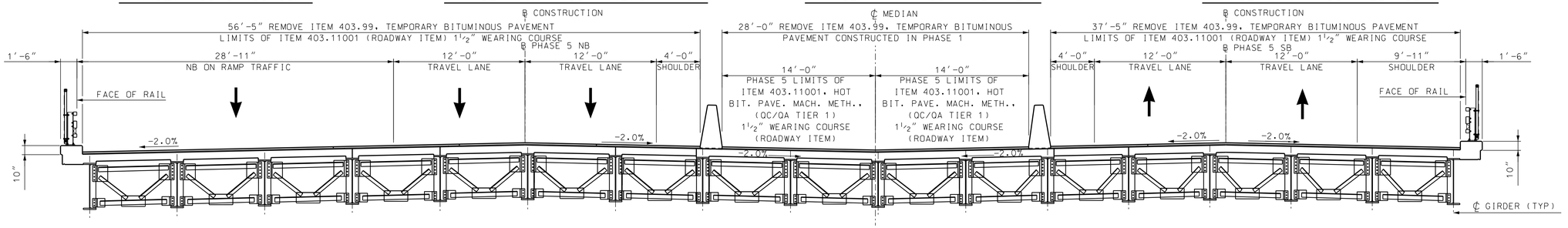


PHASE 4 CONSTRUCTION

PHASE 4 TRAFFIC - NB ON RAMP

PHASE 4 TRAFFIC - WB (NB)

PHASE 4 TRAFFIC - EB (SB)



PHASE 5 TRAFFIC - WB (NB)

PHASE 5 CONSTRUCTION

PHASE 5 TRAFFIC - EB (SB)

NOTE: LANE SHIFTS OR LANE CLOSURES WILL ONLY BE ALLOWED BETWEEN 9:00 AM AND 4:00 PM FOR PHASE 5 CONSTRUCTION.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/PRELIM	41191_PHASE_CONSTR	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

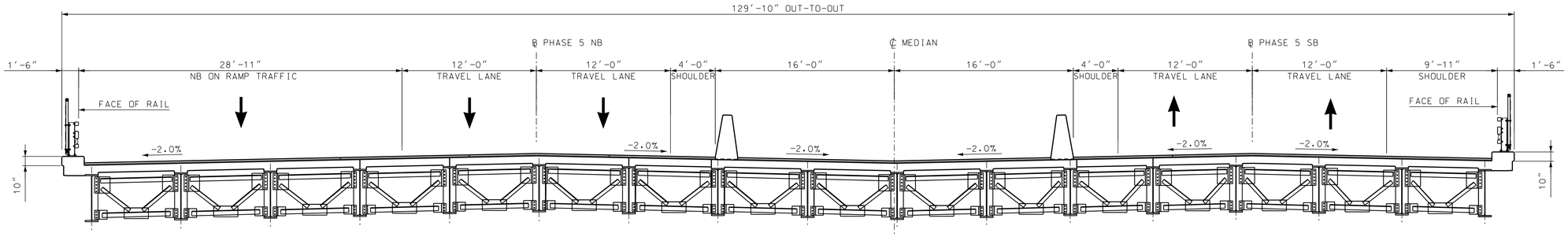
TRANSVERSE SECTIONS (3 OF 4)

BRIDGE SHEET: 15 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	32	110

FILE NUMBER: 19-1-5



FINAL - WB (NB)

FINAL - MEDIAN

FINAL - EB (SB)

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/PRELIM	41191_PHASE_CONSTR	3/16" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

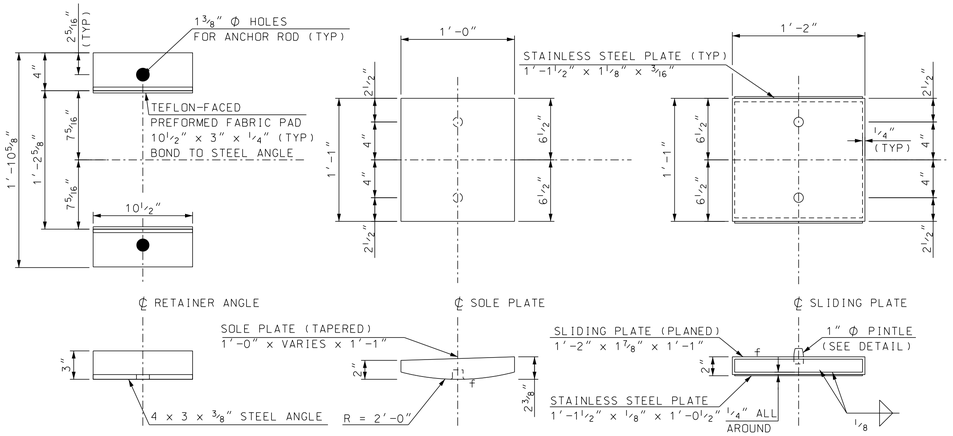
TRANSVERSE SECTIONS (4 OF 4)

BRIDGE SHEET: 16 OF 48

FILE NUMBER: 19-1-5

REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE
		DESIGNED	TEM	7/18	CHECKED	TPL	7/18
		DRAWN	TEM	7/18	CHECKED	TPL	7/18
		QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	33	110



TEMPERATURE ADJUSTMENT TABLE	
TEMPERATURE	"X"
20°F	3/4"
35°F	13/16"
50°F	15/16"
65°F	1"
80°F	1 1/16"
95°F	1 3/16"

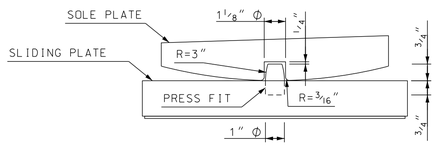
RETAINER ANGLE
SCALE: 1 1/2"=1'-0"

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

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

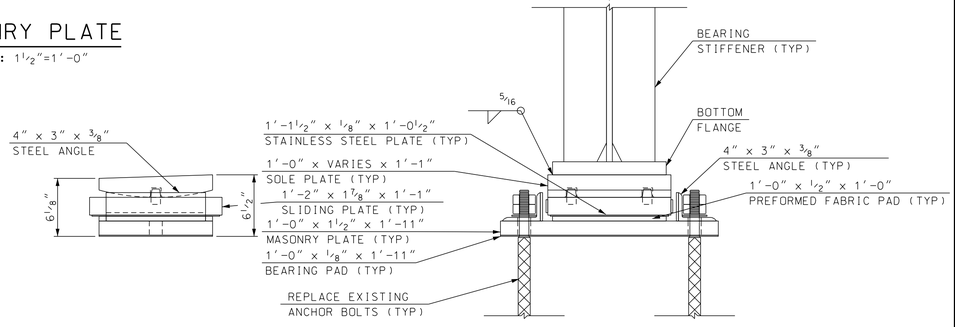
PREFORMED FABRIC PAD
SCALE: 1 1/2"=1'-0"

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



PINTLE DETAIL
SCALE: 3"=1'-0"

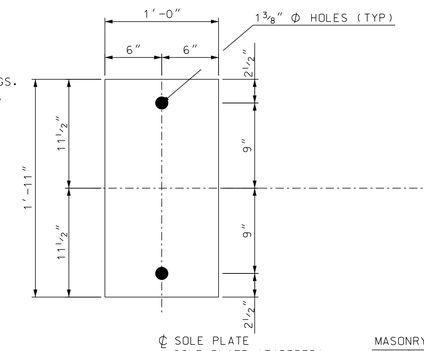
EXPANSION SHOE DETAILS - ABUTMENT (17 REQUIRED)
SCALE: 1 1/2"=1'-0"



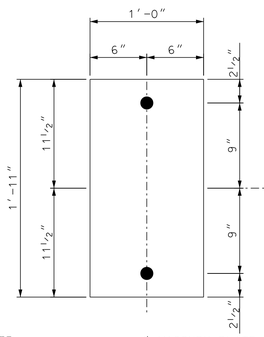
EXPANSION SHOE ASSEMBLY
SCALE: 1 1/2"=1'-0"

BRIDGE SHOE NOTES

1. ALL BEARING ASSEMBLIES SHALL BE REPLACED FOR BRIDGE NO. 093/109 & 094/108. THIS REPLACEMENT INCLUDES THE MASONRY PLATE, SLIDING PLATE, STAINLESS STEEL PLATE, ANCHOR RODS, PREFORMED FABRIC PAD AND SOLE PLATE FOR EXPANSION BEARINGS. THE REPLACEMENT FOR FIXED BEARINGS INCLUDES THE MASONRY PLATE AND SOLE PLATE. ALL WORK NECESSARY TO COMPLETE THE REPLACEMENT WORK SHALL BE PAID UNDER ITEM 550.201, BRIDGE SHOES (F).
2. ALL PLATES SHALL BE FLAT AND TRUE AFTER WELDING.
3. ALL STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 50 (ASTM A709 GRADE 50), METALLIZED DUPLEX COATING (SEE SPECIAL PROVISION FOR 550).
4. BEARINGS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SECTION 18 OF THE AASHTO 2010 LRFD BRIDGE CONSTRUCTION SPECIFICATIONS WITH 2012 INTERIMS.
5. BEARINGS SURFACES MARKED "f", OF SURFACES IN CONTACT TO BE WELDED, SHALL BE FINISHED IN ACCORDANCE WITH TABLE 18.1.4.2-1 OF THE AASHTO 2010 LRFD BRIDGE CONSTRUCTION SPECIFICATIONS WITH 2012 INTERIMS.
6. BEARINGS SHOULD BE INSTALLED AT TEMPERATURES BETWEEN 20°F AND 70°F. INSTALLATION TEMPERATURES OUTSIDE THIS RANGE WILL REQUIRE ADJUSTMENT.
7. ANCHOR RODS SHALL BE GALVANIZED AND FABRICATED IN ACCORDANCE WITH SECTION 550.2.5 OF THE NHDOT STANDARD SPECIFICATIONS, 2010.
8. HOLES DRILLED INTO EXISTING CONCRETE TO REPLACE ANCHOR RODS SHALL BE DRILLED 1/2" DIAMETER LARGER THAN THE ANCHOR ROD DIAMETER AND GROUTED WITH HIGH STRENGTH, NON-SHRINK, NON-FERROUS, CEMENTITIOUS GROUT. ALL COSTS FOR DRILLING AND GROUTING ANCHOR RODS SHALL BE PAID UNDER ITEM 550.201, BRIDGE SHOES.
9. PTFE (TEFLON) SHALL BE FABRICATED AS UNFILLED SHEET AND THE SURFACE SHALL BE DIMPLED-LUBRICATED IN ACCORDANCE WITH AASHTO LFRD DESIGN SPECFICATIONS SECTION 14.7.2.1.
10. THE PTFE SHALL CONFORM TO SECTION 550.2.10 OF THE NHDOT STANDARD SPECIFICATIONS. THE COEFFICIENT OF FRICTION BETWEEN THE PTFE AND STAINLESS STEEL SURFACES SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO LFRD BRIDGE CONSTRUCTION SPECIFICATIONS SECTION 18.1.5.2.3. THE DESIGN COEFFICIENT OF FRICTION SHALL BE PER AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS SECTION 14.7.2.5.
11. THE PTFE SHALL BE BONDED TO THE STEEL BY AN EPOXY RESIN SATISFYING THE REQUIREMENTS OF AASHTO M 235M/M 235 (ASTM C 881/C 881M), FEP FILM, OR EQUAL, AS APPROVED BY THE ENGINEER.
12. THE STAINLESS STEEL SURFACES IN CONTACT WITH THE TEFLON SHALL HAVE A #8 MIRROR FINISH.
13. THE PREFORMED FABRIC PADS SHALL CONFORM TO SECTION 550.2.6 OF THE NHDOT STANDARD SPECIFICATIONS.

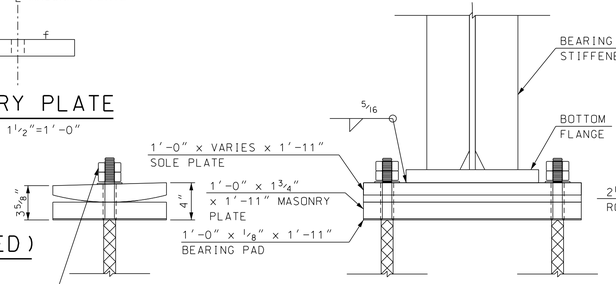


SOLE PLATE
SCALE: 1 1/2"=1'-0"

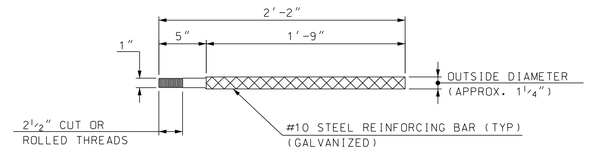


MASONRY PLATE
SCALE: 1 1/2"=1'-0"

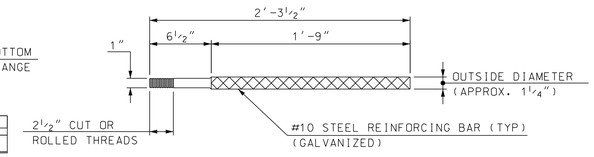
FIXED SHOE DETAILS - ABUTMENT (17 REQUIRED)
SCALE: 1 1/2"=1'-0"



FIXED SHOE ASSEMBLY



ANCHOR ROD DETAIL (EXP. ABUTMENT)
SCALE: 1 1/2"=1'-0"
(34 REQUIRED)



ANCHOR ROD DETAIL (FIXED ABUTMENT)
SCALE: 1 1/2"=1'-0"
(34 REQUIRED)

GM2 ASSOCIATES

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRD\SUPER	41191_BRIDGE_SHOES	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

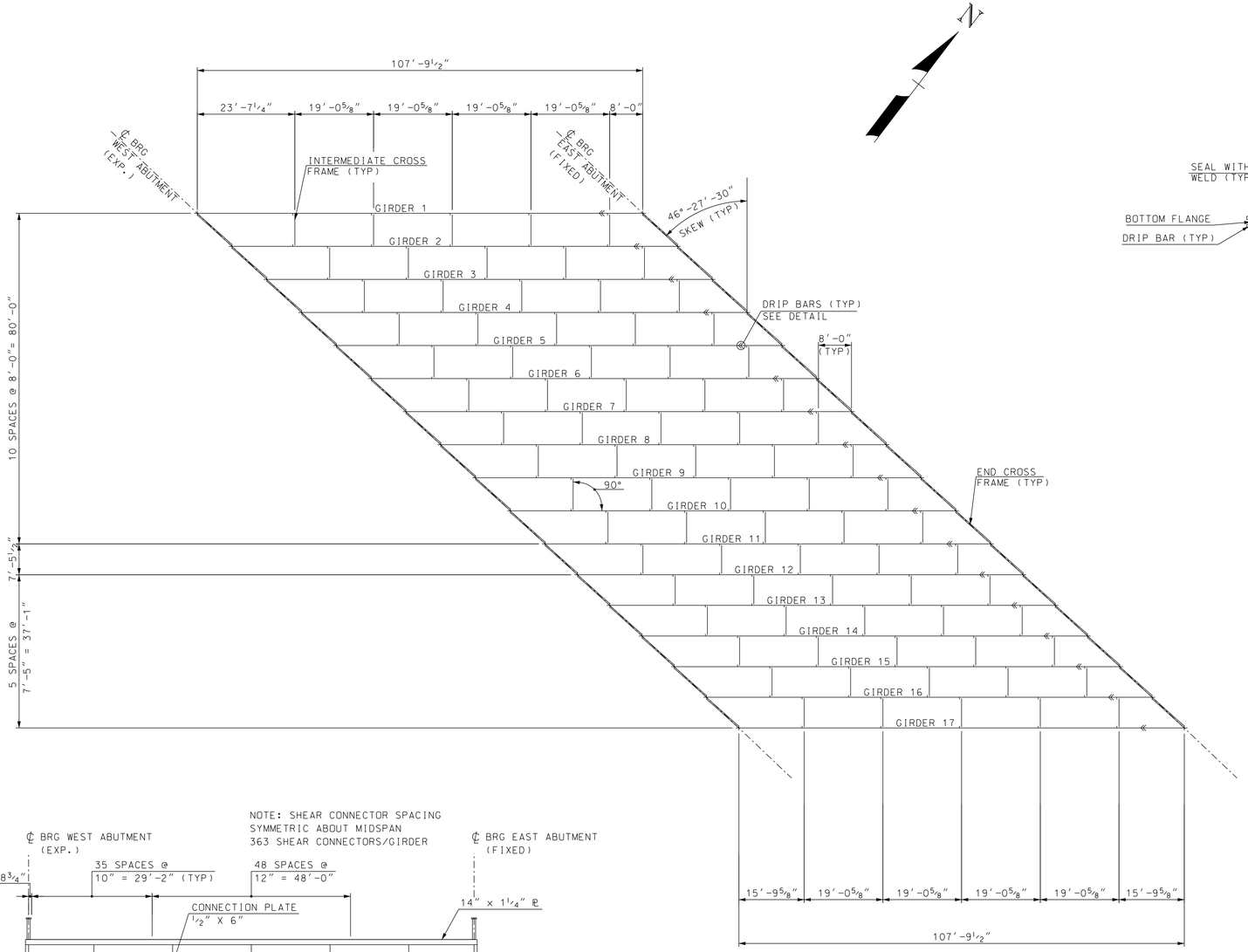
TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

BRIDGE SHOES

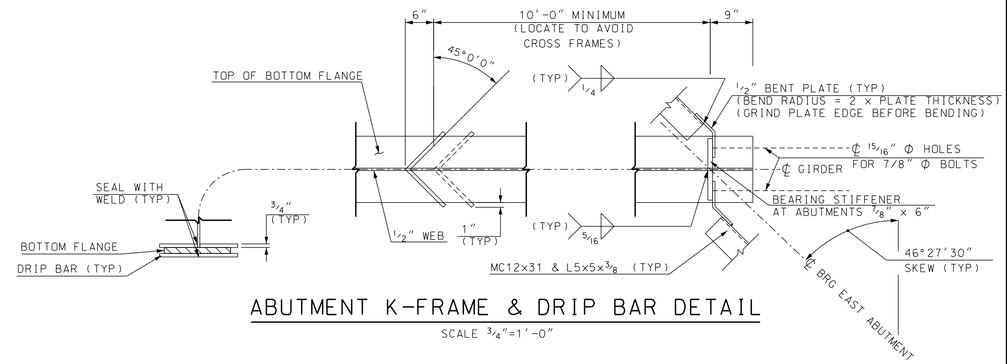
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
	ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	
	REV. DATE		X-A004(559)		34	

BRIDGE SHEET 17 OF 48 — FILE NUMBER 19-1-5 — TOTAL SHEETS 110



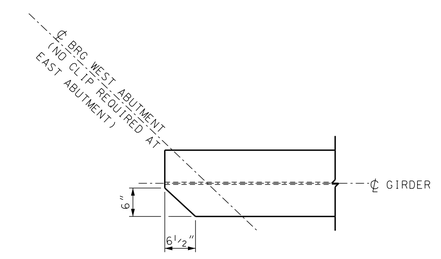
FRAMING PLAN

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



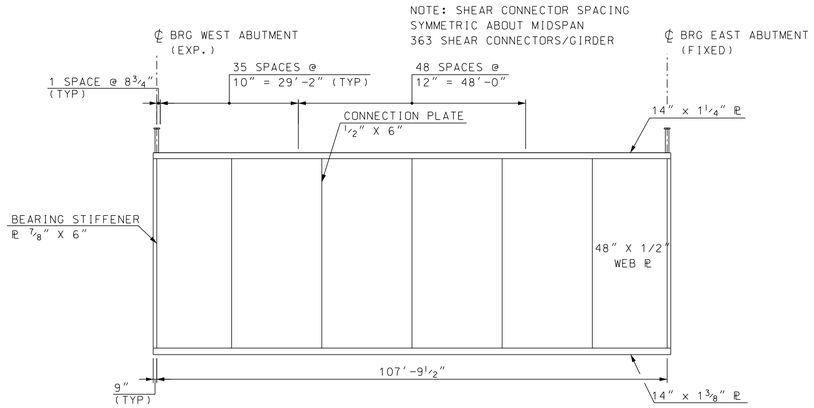
ABUTMENT K-FRAME & DRIP BAR DETAIL

SCALE 3/4"=1'-0"



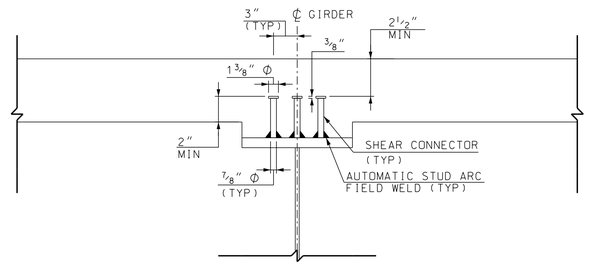
TOP & BOTTOM FLANGE CLIP DETAIL

SCALE 3/4"=1'-0"



GIRDER ELEVATION

N.T.S.



SHEAR CONNECTOR DETAIL

SCALE 1"=1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

FRAMING PLAN

BRIDGE SHEET 18 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE

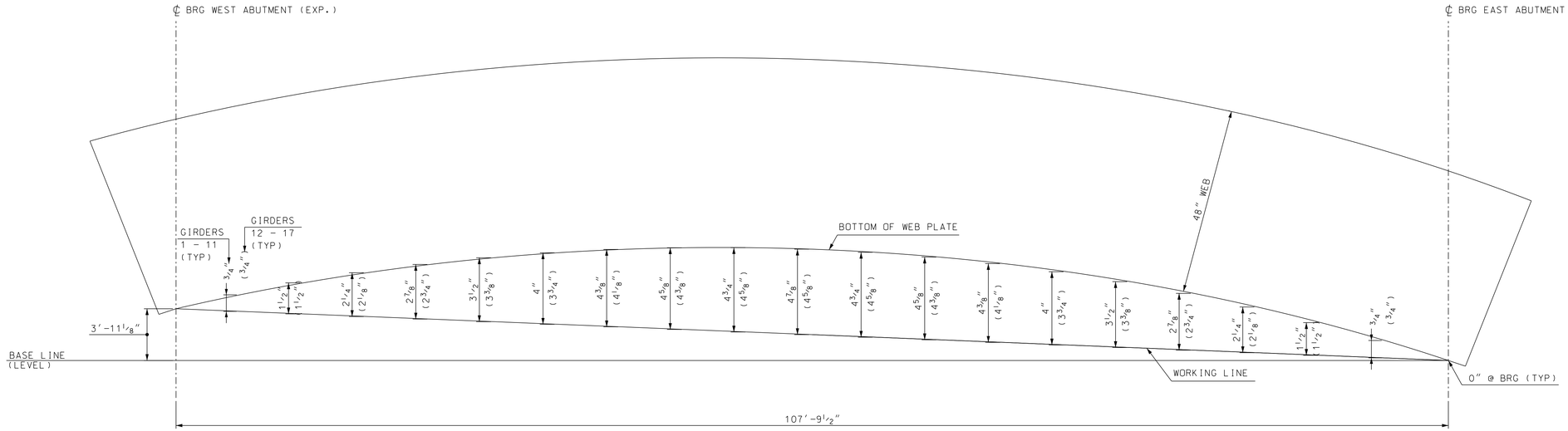
	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

FILE NUMBER 19-1-5

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER	41191_FRAMING_PLAN	AS NOTED

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	35	110



GIRDER WEB LAYOUT

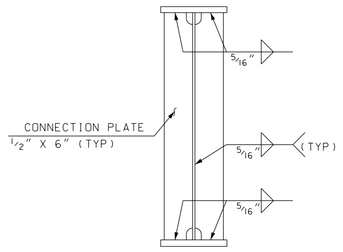
N.T.S.

CAMBER TABLE FOR GIRDERS 1 -11

CAMBER TABLE WITH 8" CIP DECK (INCHES)																				
	WEST ABUTMENT	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	EAST ABUTMENT
BEAM & DIAPHRAGM DL	0.00	-0.14	-0.28	-0.41	-0.54	-0.64	-0.73	-0.81	-0.86	-0.89	-0.90	-0.89	-0.86	-0.81	-0.74	-0.64	-0.54	-0.42	-0.28	-0.14	0.00
CONC SLAB	0.00	-0.52	-1.02	-1.50	-1.93	-2.32	-2.65	-2.91	-3.10	-3.21	-3.25	-3.21	-3.10	-2.91	-2.65	-2.32	-1.93	-1.50	-1.02	-0.52	0.00
SUPERIMPOSED DL	0.00	-0.11	-0.22	-0.32	-0.41	-0.49	-0.56	-0.62	-0.66	-0.68	-0.69	-0.68	-0.66	-0.62	-0.56	-0.49	-0.41	-0.32	-0.22	-0.11	0.00
TOTAL DL DEFLECTION	0.00	-0.77	-1.52	-2.23	-2.88	-3.45	-3.94	-4.33	-4.61	-4.79	-4.85	-4.79	-4.62	-4.33	-3.94	-3.45	-2.88	-2.23	-1.52	-0.77	0.00

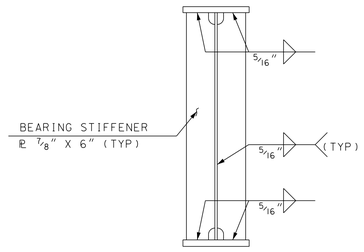
CAMBER TABLE FOR GIRDERS 12 -17

CAMBER TABLE WITH 8" CIP DECK (INCHES)																				
	WEST ABUTMENT	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	EAST ABUTMENT
BEAM & DIAPHRAGM DL	0.00	-0.14	-0.28	-0.41	-0.53	-0.64	-0.73	-0.80	-0.85	-0.89	-0.90	-0.89	-0.85	-0.80	-0.73	-0.64	-0.53	-0.41	-0.28	-0.14	0.00
CONC SLAB	0.00	-0.48	-0.95	-1.39	-1.80	-2.16	-2.46	-2.71	-2.88	-2.99	-3.03	-2.99	-2.88	-2.71	-2.46	-2.16	-1.80	-1.39	-0.95	-0.48	0.00
SUPERIMPOSED DL	0.00	-0.11	-0.23	-0.33	-0.43	-0.51	-0.58	-0.64	-0.68	-0.71	-0.72	-0.71	-0.68	-0.64	-0.58	-0.51	-0.43	-0.33	-0.23	-0.12	0.00
TOTAL DL DEFLECTION	0.00	-0.74	-1.46	-2.13	-2.76	-3.31	-3.77	-4.15	-4.42	-4.59	-4.64	-4.59	-4.42	-4.15	-3.78	-3.31	-2.76	-2.14	-1.46	-0.74	0.00



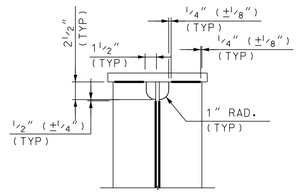
CONNECTION PLATE DETAIL

SCALE 1"=1'-0"



BEARING STIFFENER DETAIL AT ABUTMENTS

SCALE 1"=1'-0"



COPE AND WELD DETAIL

SCALE 1"=1'-0"

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER	41191_GIRDERS	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

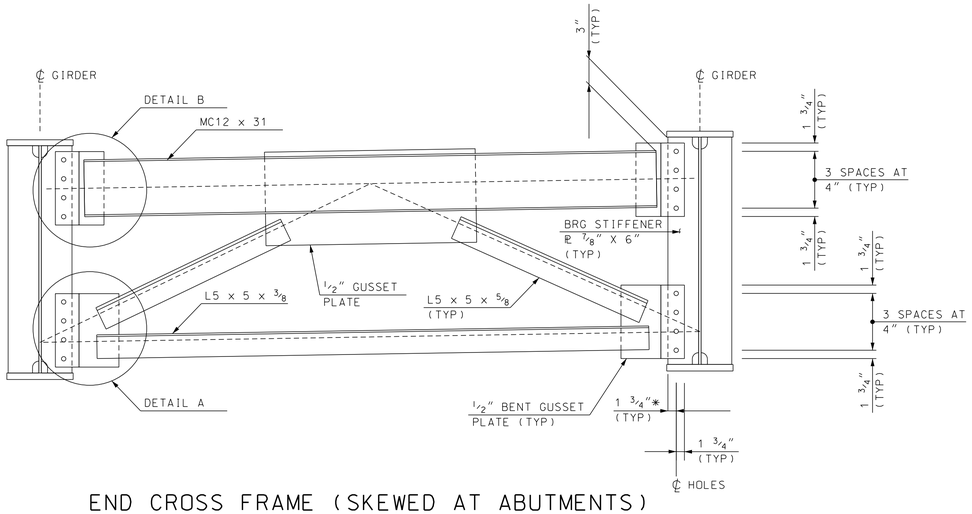
LOCATION INTERSTATE 89 OVER US ROUTE 4

GIRDERS AND DETAILS

BRIDGE SHEET 19 OF 48

FILE NUMBER 19-1-5

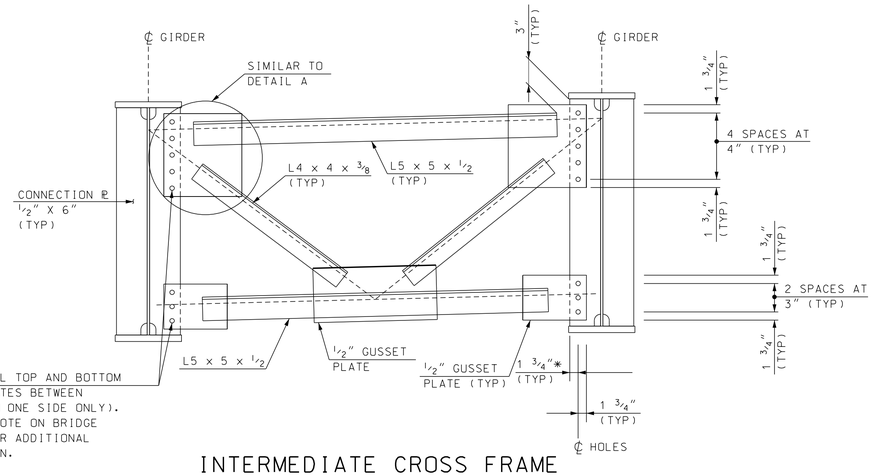
REVISIONS AFTER PROPOSAL							
			BY	DATE		BY	DATE
		DESIGNED	TEM	7/18	CHECKED	TPL	7/18
		DRAWN	TEM	7/18	CHECKED	TPL	7/18
		QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
		ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
		REV. DATE		X-A004(559)		36	110



END CROSS FRAME (SKEWED AT ABUTMENTS)

SCALE 3/4"=1'-0"

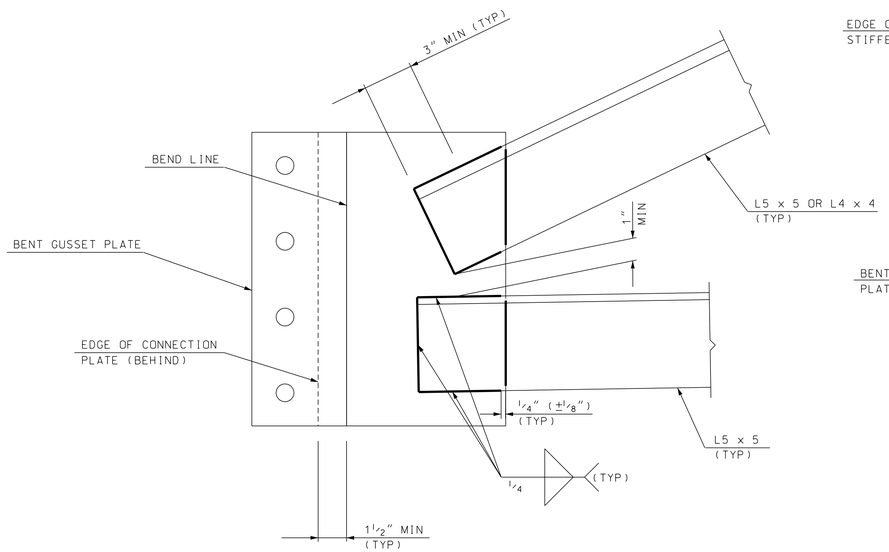
* 1 1/2" (TYP) FOR 7'-5 1/2" SPACED BEAMS



INTERMEDIATE CROSS FRAME

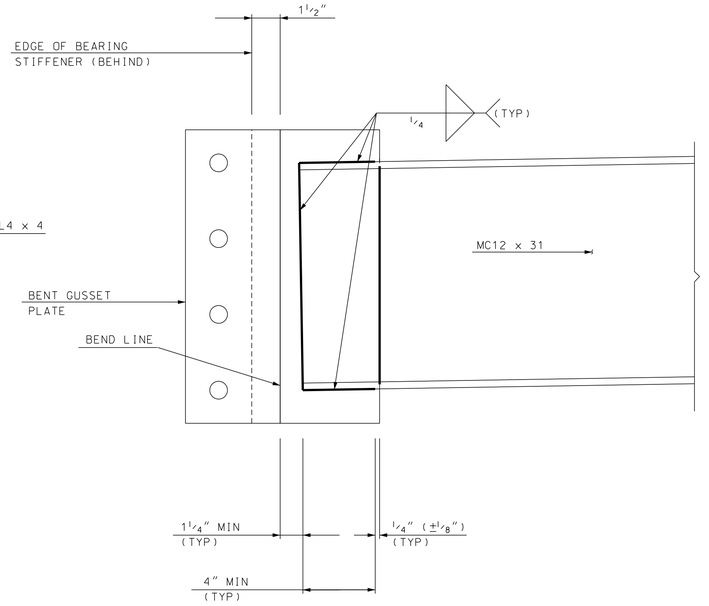
SCALE 3/4"=1'-0"

* 1 1/2" (TYP) FOR 7'-5 1/2" SPACED BEAMS



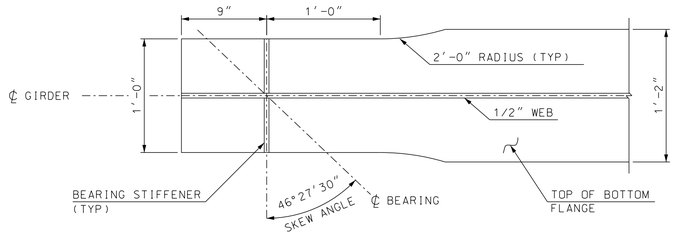
DETAIL A

SCALE 3/4"=1'-0"



DETAIL B

SCALE 3/4"=1'-0"



FLANGE WIDTH TRANSITION (EXPANSION ABUTMENT ONLY)

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

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER	41191_Girder_Cross_Frames	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

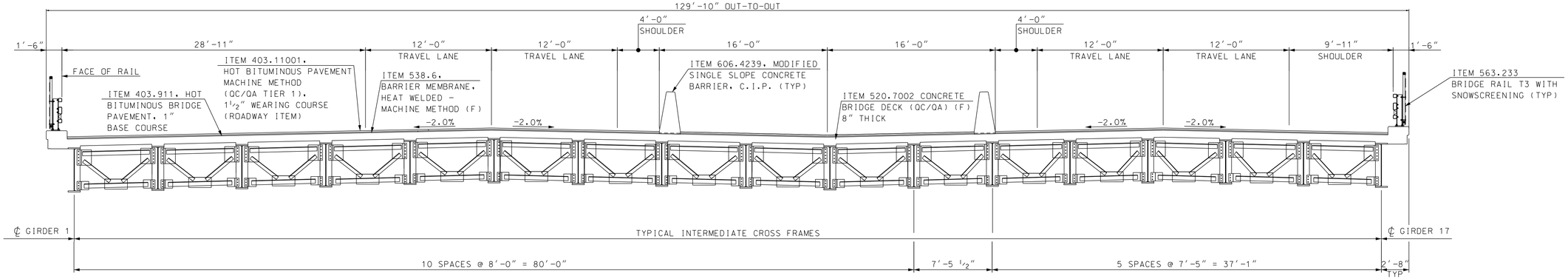
GIRDER CROSS FRAMES

BRIDGE SHEET: 20 OF 48

FILE NUMBER: 19-1-5

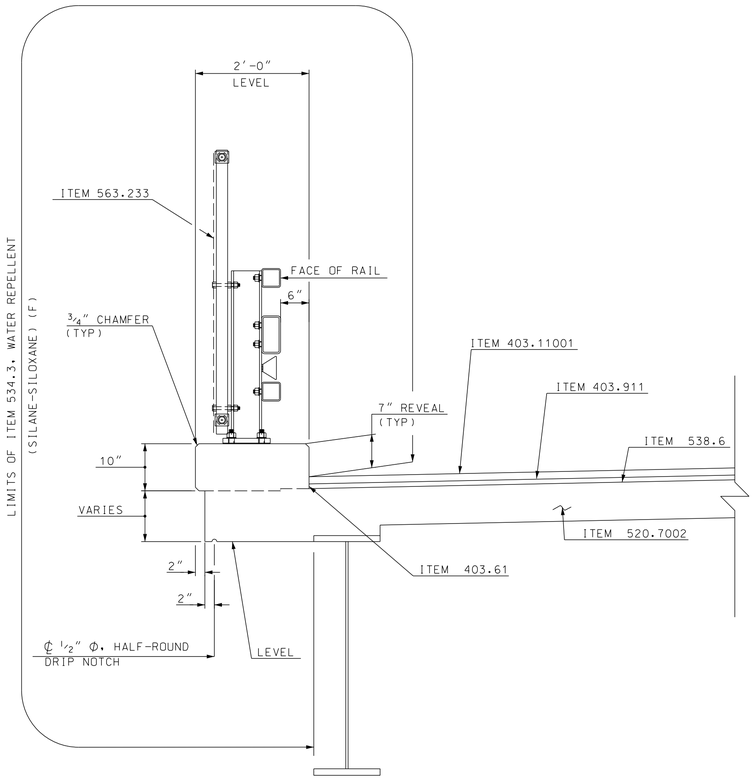
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	37	110



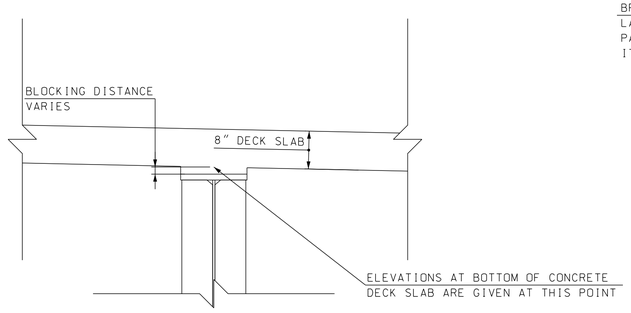
TYPICAL BRIDGE SECTION

SCALE: 3/16″=1′-0″



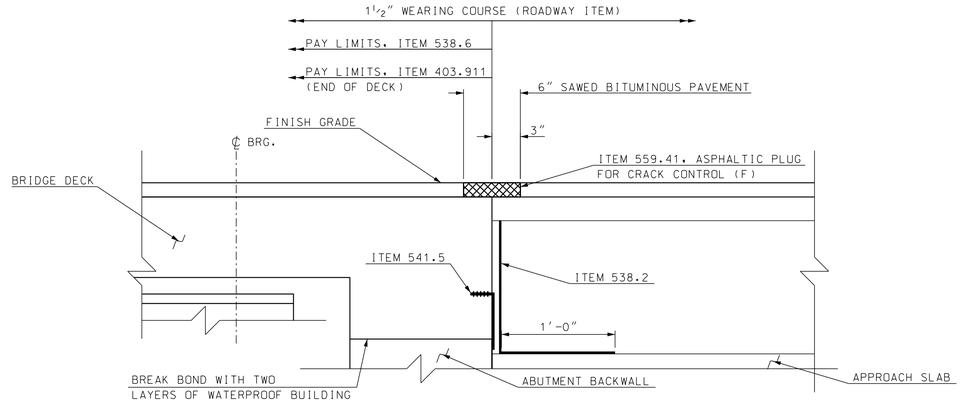
BRUSH CURB FASICA DETAIL

SCALE: ¾″=1′-0″



HAUNCH DETAIL

SCALE: ¾″=1′-0″



FIXED END DETAIL

SCALE: 1½″=1′-0″

Bottom of Deck Slab Elevations

Girder	Abut. A (East) Elevation	0.10L	0.20L	0.30L	0.40L	0.50L	0.60L	0.70L	0.80L	0.90L	Abut. B (West) Elevation
17	526.37	526.07	525.77	525.45	525.10	524.72	524.31	523.88	523.42	522.94	522.45
16	526.80	526.51	526.20	525.88	525.53	525.15	524.74	524.31	523.85	523.37	522.88
15	527.23	526.94	526.63	526.31	525.96	525.58	525.18	524.74	524.28	523.80	523.31
14	527.61	527.31	527.01	526.68	526.34	525.96	525.55	525.11	524.65	524.17	523.68
13	527.74	527.45	527.14	526.82	526.47	526.09	525.69	525.25	524.79	524.31	523.82
12	527.88	527.58	527.28	526.96	526.61	526.23	525.82	525.39	524.93	524.45	523.96
11	528.02	527.73	527.43	527.11	526.76	526.38	525.97	525.54	525.07	524.59	524.09
10	528.16	527.87	527.57	527.25	526.91	526.53	526.12	525.68	525.22	524.73	524.24
9	528.62	528.33	528.03	527.71	527.36	526.99	526.58	526.14	525.67	525.19	524.69
8	529.08	528.80	528.50	528.17	527.83	527.45	527.04	526.61	526.14	525.66	525.16
7	529.55	529.26	528.96	528.64	528.29	527.92	527.51	527.07	526.61	526.12	525.63
6	530.02	529.73	529.43	529.11	528.76	528.38	527.98	527.54	527.07	526.59	526.09
5	530.17	529.88	529.58	529.26	528.92	528.54	528.13	527.69	527.23	526.75	526.25
4	530.32	530.03	529.73	529.41	529.06	528.69	528.28	527.84	527.38	526.89	526.40
3	530.47	530.18	529.88	529.56	529.21	528.83	528.43	527.99	527.52	527.04	526.54
2	530.61	530.32	530.02	529.70	529.36	528.98	528.57	528.13	527.67	527.19	526.69
1	530.76	530.47	530.17	529.85	529.50	529.13	528.72	528.28	527.82	527.33	526.84

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/PRELIM 41191	DECKSECT_GENERAL	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 — STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

GENERAL DECK SECTION

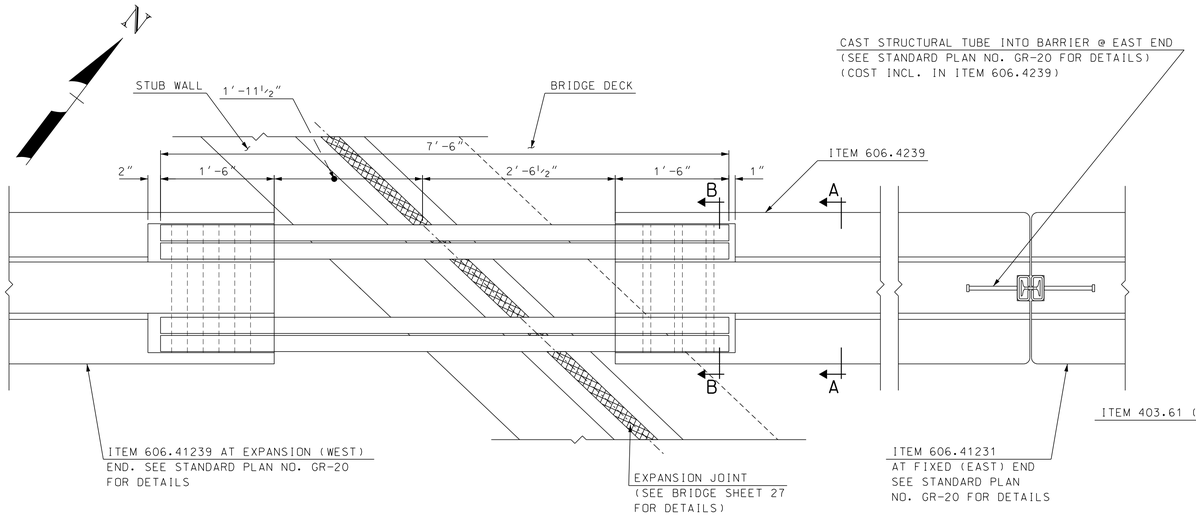
BRIDGE SHEET: 21 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	BAW	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

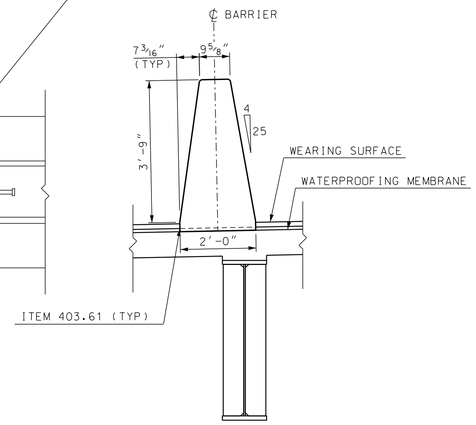
ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	38	110

FILE NUMBER: 19-1-5



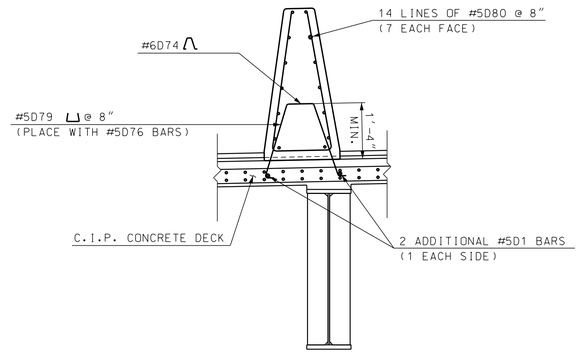
PLAN - ROADWAY BARRIER

SCALE: 1" = 1'-0"



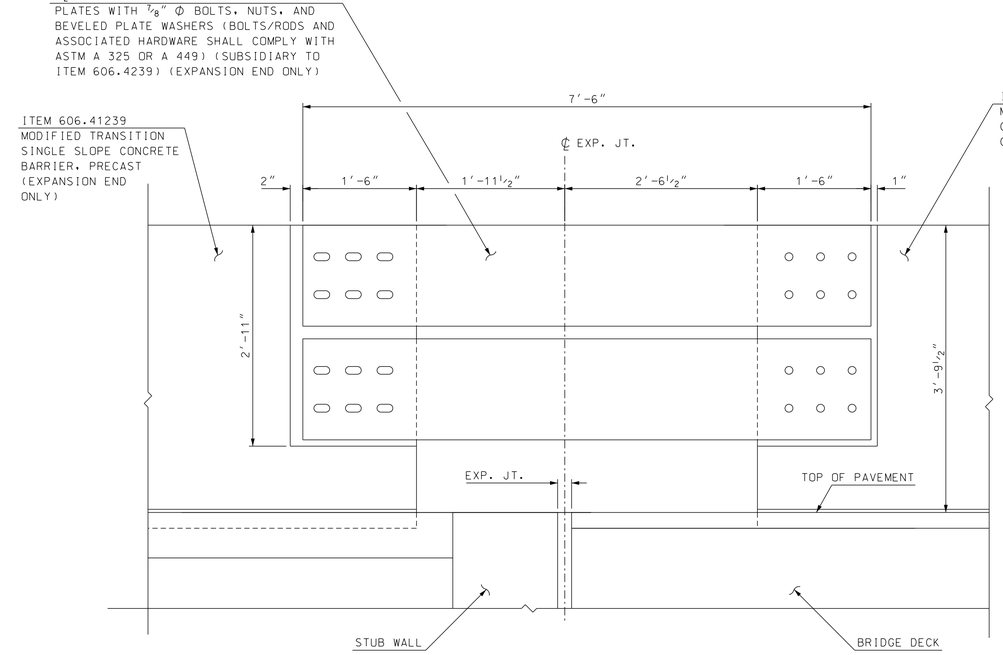
SECTION A-A TYPICAL SECTION

SCALE: ½" = 1'-0"



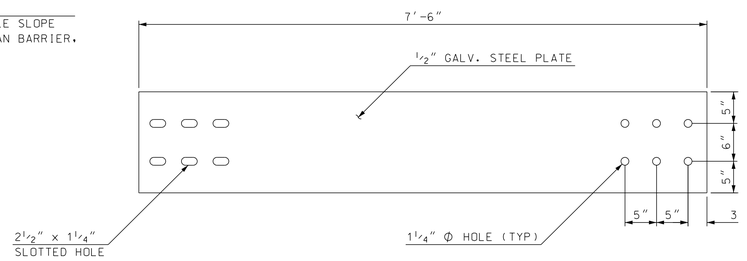
SECTION A-A REINFORCEMENT

SCALE: ½" = 1'-0"



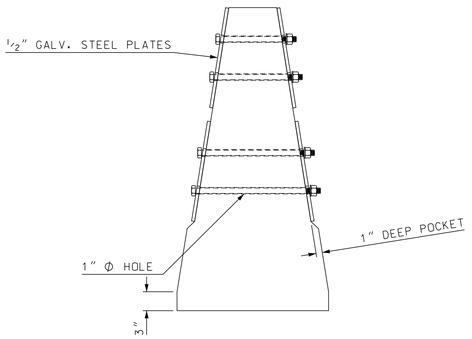
ELEVATION - ROADWAY BARRIER

SCALE: 1" = 1'-0"



STEEL PLATE DETAIL

SCALE: 1" = 1'-0"



SECTION B-B

SCALE: 1" = 1'-0"

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/DETAILS	41191_Barrier_Det	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

BARRIER DETAILS

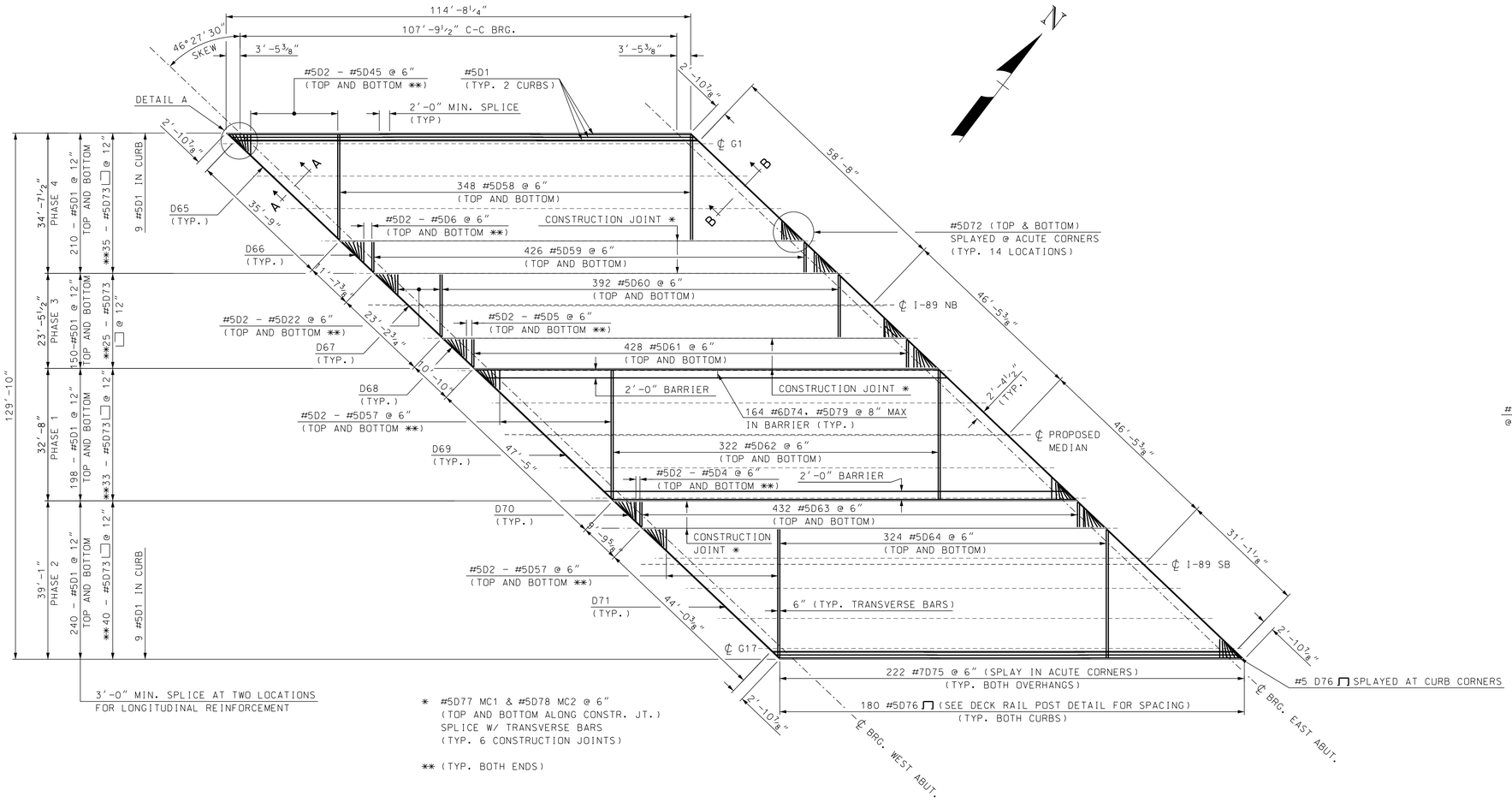
REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	39	110

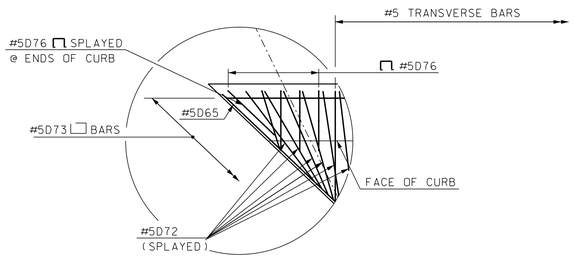
BRIDGE SHEET 22 OF 48

FILE NUMBER 19-1-5



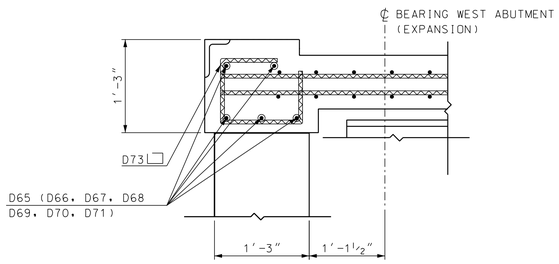
DECK REINFORCING PLAN

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



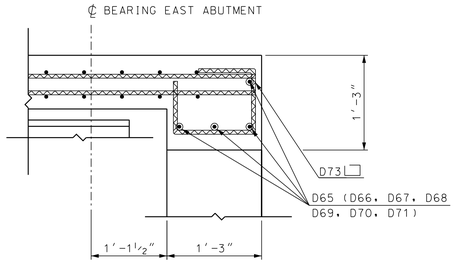
DETAIL A REINFORCEMENT

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



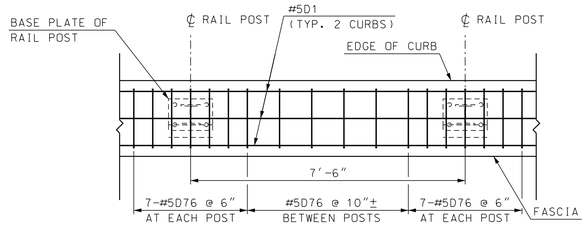
SECTION A-A (EXPANSION END)

SCALE: 1" = 1'-0"



SECTION B-B (FIXED END)

SCALE: 1" = 1'-0"



DECK RAIL POST DETAIL

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

NOTE: ALL DECK REINFORCEMENT SHALL BE EPOXY COATED

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER	41191_Deck_Reinf_Rev1	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

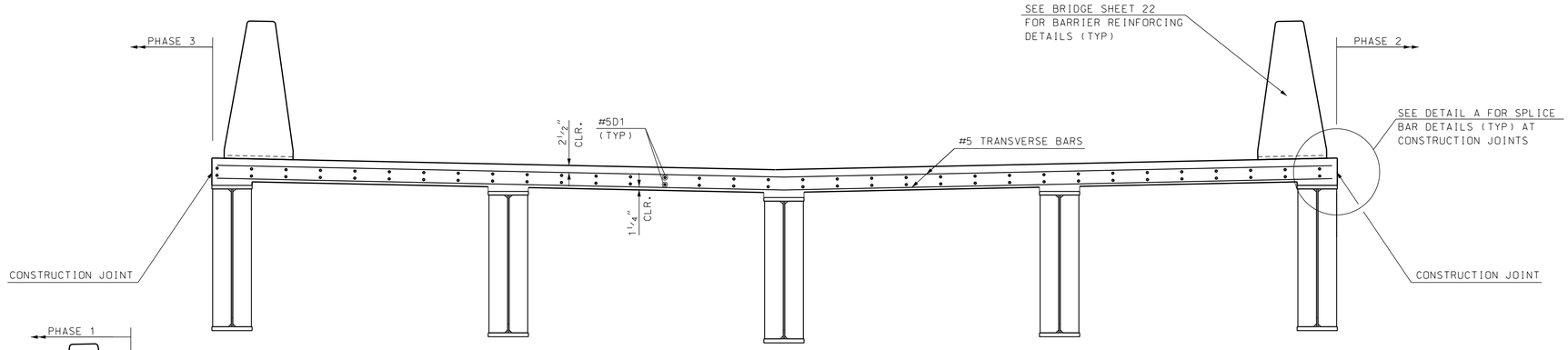
DECK REINFORCEMENT

BRIDGE SHEET: 23 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
			DESIGNED	TEM	7/18
			DRAWN	TEM	7/18
			QUANTITIES	TEM	7/18
			CHECKED	TPL	7/18
			CHECKED	TPL	7/18
			CHECKED	TPL	7/18

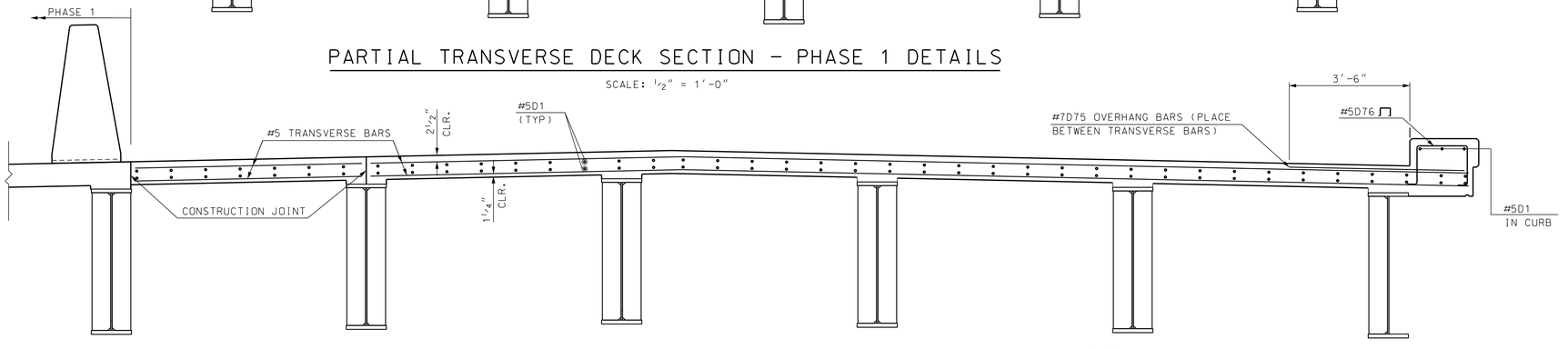
ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	40	110

FILE NUMBER: 19-1-5



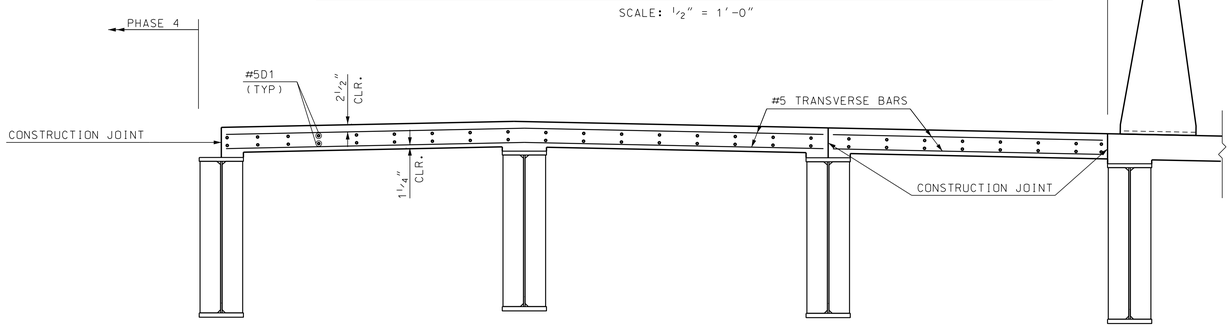
PARTIAL TRANSVERSE DECK SECTION - PHASE 1 DETAILS

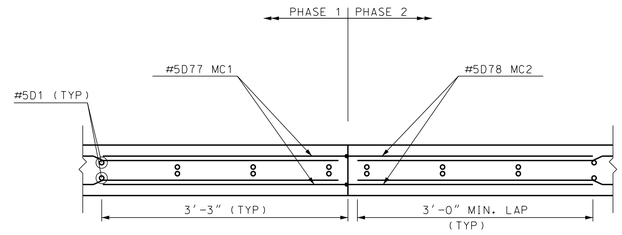
SCALE: ½" = 1'-0"



PARTIAL TRANSVERSE DECK SECTION - PHASE 2 DETAILS

SCALE: ½" = 1'-0"





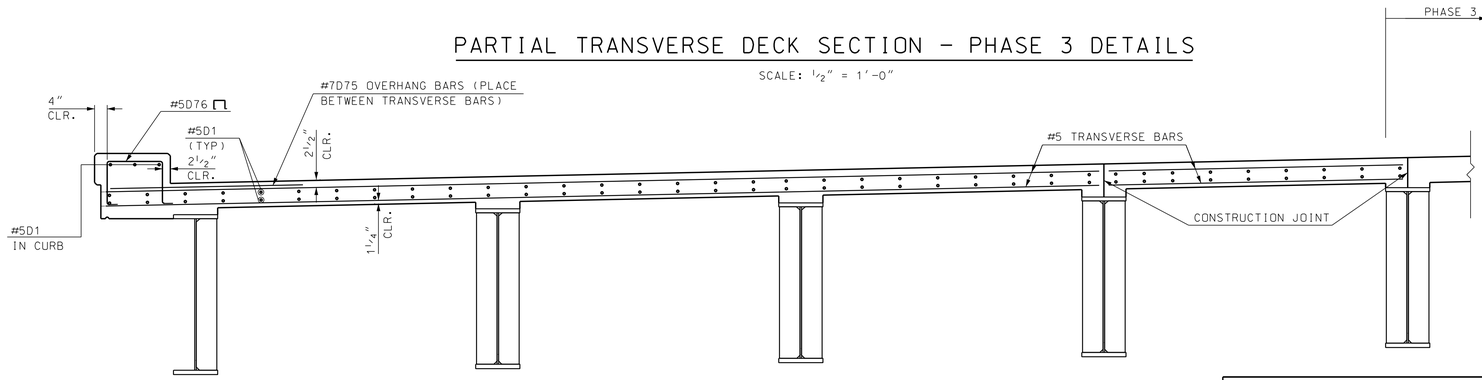
(PHASE 1-2 JOINT SHOWN)
(ALL OTHER PHASE JOINTS SIMILAR)

DETAIL A

SCALE: 1" = 1'-0"

PARTIAL TRANSVERSE DECK SECTION - PHASE 3 DETAILS

SCALE: ½" = 1'-0"



PARTIAL TRANSVERSE DECK SECTION - PHASE 4 DETAILS

SCALE: ½" = 1'-0"

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/SUPER	41191_Deck_Reinf_Det	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

DECK REINFORCEMENT DETAILS

BRIDGE SHEET: 24 OF 48

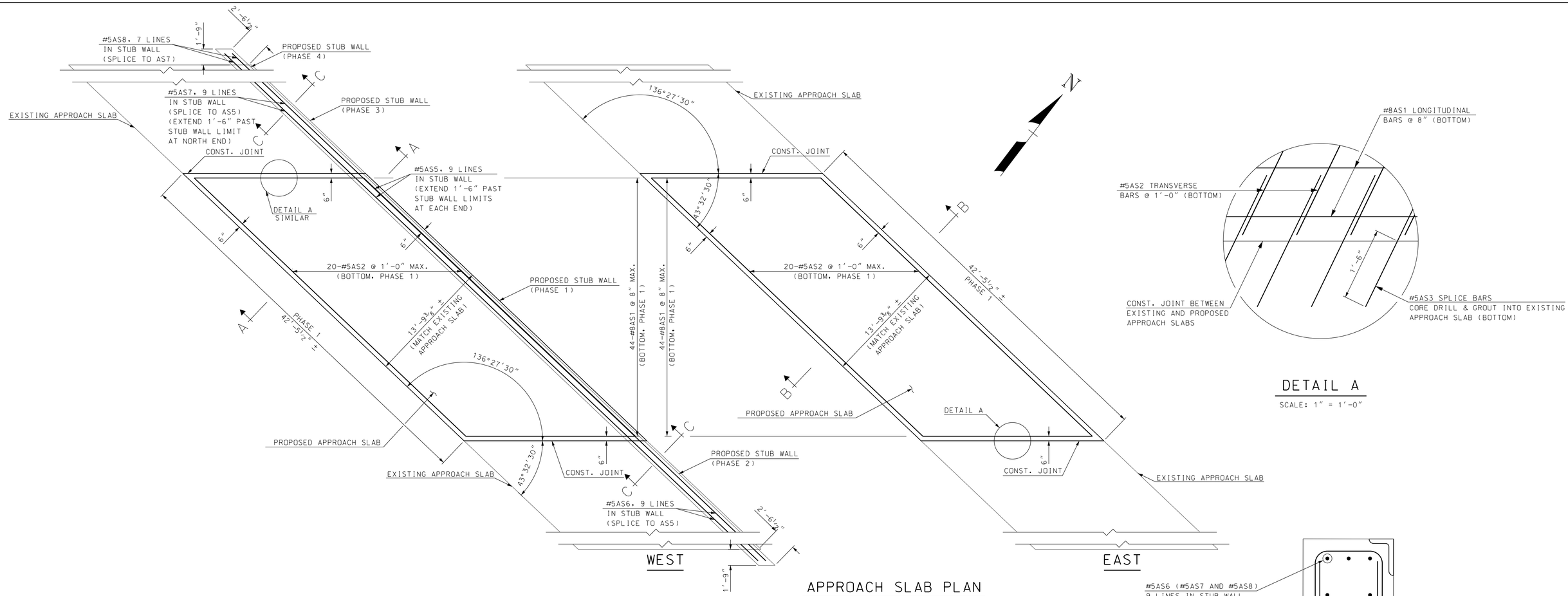
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
	ISSUE DATE					
	REV. DATE					

FEDERAL PROJECT NO.: X-A004(559)

SHEET NO.: 41

FILE NUMBER: 19-1-5

TOTAL SHEETS: 110

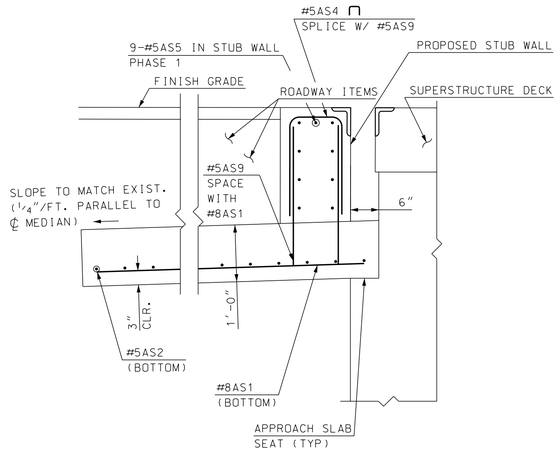


DETAIL A

SCALE: 1" = 1'-0"

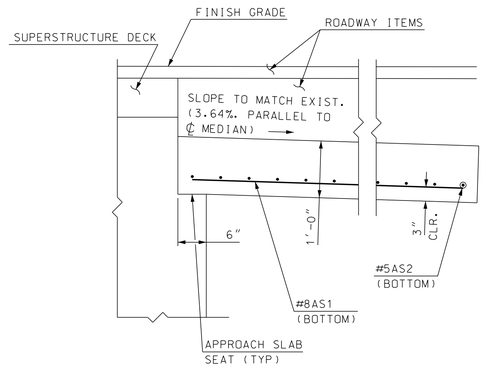
APPROACH SLAB PLAN

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



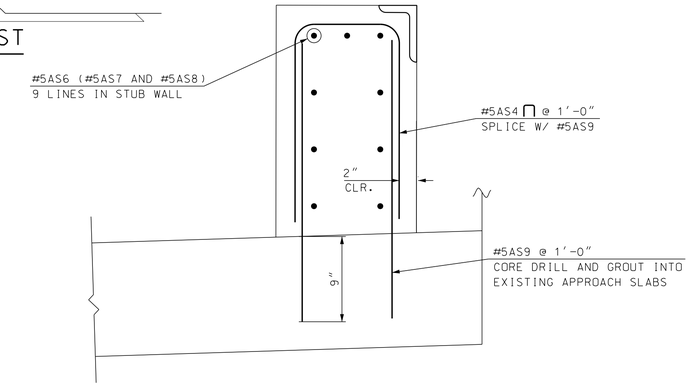
SECTION A-A

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



SECTION B-B

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



SECTION C-C

SCALE: 1½" = 1'-0"

NOTE: ALL APPROACH SLAB & STUB WALL REINFORCEMENT SHALL BE EPOXY COATED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

APPROACH SLABS

BRIDGE SHEET 25 OF 48

FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	42	110

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/SUPER	41191_Approach_Slabs	AS NOTED

APPROACH SLABS

BRIDGE SHEET 25 OF 48

Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	NOTE
AS1	8	19'-5"	88	—													EC
AS2	5	42'-0"	40	—													EC
AS3	5	3'-0"	80	—													EC
AS4	5	4'-5"	192	17		1'-9"	11"	1'-9"									EC
AS5	5	45'-6"	9	—													EC
AS6	5	59'-3"	9	—													EC
AS7	5	36'-4"	9	—													EC
AS8	5	49'-0"	9	—													EC
AS9	5	3'-6"	384	—													EC

SECTION SUMMARY, TOTAL WEIGHT (lbs)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL
544	REINFORCING STEEL												
544.11	MECH. CONNECTOR												
544.2	EPOXY COATED			6074			4770						10844
544.21	EPOXY MECH. CON.												

DECK

BRIDGE SHEET 22, 23 & 24 OF 48

Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	NOTE
D1	5	39'-9"	828	—													EC
D2	5	5'-4"	28	—													EC
D3	5	5'-10"	28	—													EC
D4	5	6'-4"	28	—													EC
D5	5	6'-9"	24	—													EC
D6	5	7'-3"	20	—													EC
D7	5	7'-8"	16	—													EC
D8	5	8'-1"	16	—													EC
D9	5	8'-7"	16	—													EC
D10	5	9'-1"	16	—													EC
D11	5	9'-6"	16	—													EC
D12	5	10'-0"	16	—													EC
D13	5	10'-6"	16	—													EC
D14	5	10'-11"	16	—													EC
D15	5	11'-5"	16	—													EC
D16	5	11'-11"	16	—													EC
D17	5	12'-4"	16	—													EC
D18	5	12'-10"	16	—													EC
D19	5	13'-4"	16	—													EC
D20	5	13'-9"	16	—													EC
D21	5	14'-3"	16	—													EC
D22	5	14'-9"	16	—													EC
D23	5	15'-3"	12	—													EC
D24	5	15'-8"	12	—													EC
D25	5	16'-2"	12	—													EC
D26	5	16'-7"	12	—													EC
D27	5	17'-1"	12	—													EC
D28	5	17'-7"	12	—													EC
D29	5	18'-0"	12	—													EC
D30	5	18'-6"	12	—													EC
D31	5	19'-0"	12	—													EC
D32	5	19'-5"	12	—													EC
D33	5	19'-11"	12	—													EC
D34	5	20'-5"	12	—													EC
D35	5	20'-11"	12	—													EC
D36	5	21'-5"	12	—													EC
D37	5	21'-11"	12	—													EC
D38	5	22'-4"	12	—													EC
D39	5	22'-10"	12	—													EC
D40	5	23'-4"	12	—													EC
D41	5	23'-9"	12	—													EC
D42	5	24'-3"	12	—													EC
D43	5	24'-9"	12	—													EC
D44	5	25'-2"	12	—													EC
D45	5	25'-8"	12	—													EC
D46	5	26'-2"	8	—													EC
D47	5	26'-7"	8	—													EC
D48	5	27'-1"	8	—													EC
D49	5	27'-7"	8	—													EC
D50	5	28'-0"	8	—													EC
D51	5	28'-6"	8	—													EC
D52	5	29'-0"	8	—													EC
D53	5	29'-5"	8	—													EC
D54	5	29'-11"	8	—													EC
D55	5	30'-5"	8	—													EC
D56	5	31'-0"	8	—													EC
D57	5	31'-8"	8	—													EC
D58	5	26'-2"	348	—													EC
D59	5	7'-6"	426	—													EC
D60	5	15'-6"	392	—													EC
D61	5	7'-0"	428	—													EC
D62	5	32'-2"	322	—													EC
D63	5	6'-3"	432	—													EC
D64	5	31'-10"	324	—													EC
D65	5	38'-0"	9	—													EC
D66	5	10'-10"	9	—													EC
D67	5	22'-6"	9	—													EC
D68	5	10'-1"	9	—													EC
D69	5	46'-8"	9	—													EC
D70	5	9'-1"	9	—													EC
D71	5	46'-2"	9	—													EC
D72	5	4'-0"	168	—													EC
D73	5	3'-4"	266	S6		0'-0"	0'-8"	1'-1"	0'-10"			0'-9"					EC
D74	6	5'-4"	328	SP1			4"	2'-0"	8"	2'-0"	4"			1'-11"	1'-11"	7"	EC
D75	7	5'-1"	444	—													EC
D76	5	4'-9"	360	S5		6"	1'-2"	1'-5"	1'-2"	6"							EC
D77	5	3'-3"	1380	C1													EMC
D78	5	3'-3"	1380	C2													EMC
D79	5	9'-0"	328	SP2				3'-8"	1'-7"	3'-8"						7"	EC
D80	5	36'-3"	84	—													EC

SECTION SUMMARY, TOTAL WEIGHT (lbs)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL
544	REINFORCING STEEL												
544.11	MECH. CONNECTOR												
544.2	EPOXY COATED			104962	2628	4614							112204
544.21	EPOXY MECH. CON.			9356									9356

WEST ABUTMENT

BRIDGE SHEET 12 OF 48

Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	NOTE
AW1	#5	48'-0"	10														EC
AW2	#5	4'-5"	32	17		1'-0"	2'-5"	1'-0"									EC
AW3	#5	6'-0"	32														EC
AW4	#5	9'-10"	48	17		4'-6"	10"	4'-6"									EC
AW5	#6	3'-4"	48	N8		2'-0"	1'-4"										EC
AW6	#5	5'-6"	48	N8		4'-3"	1'-3"										EC▲
AW7	#5	4'-5"	32	N7			1'-8"	2'-9"				1'-2"		1'-2"			EC
AW8	#5	4'-0"	78														EC
AW9	#5	31'-0"	13														EC

SECTION SUMMARY, TOTAL WEIGHT (lbs)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL
544	REINFORCING STEEL												
544.11	MECH. CONNECTOR												
544.2	EPOXY COATED			2510	241								2751
544.21	EPOXY MECH. CON.												

EAST ABUTMENT

BRIDGE SHEET 12 OF 48

Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	NOTE
AE1	#5	48'-0"	10														EC
AE2	#5	4'-5"	32	17		1'-0"	2'-5"	1'-0"									EC
AE3	#5	6'-0"	32														EC
AE4	#5	9'-10"	48	17		4'-6"	10"	4'-6"									EC
AE5	#6	3'-4"	48	N8		2'-0"	1'-4"										EC
AE6	#5	5'-6"	48	N8		4'-3"	1'-3"										EC▲
AE7	#5	4'-5"	32	N7			1'-8"	2'-9"				1'-2"		1'-2"			EC
AE8	#5	4'-0"	78														EC
AE9	#5	31'-0"	13														EC

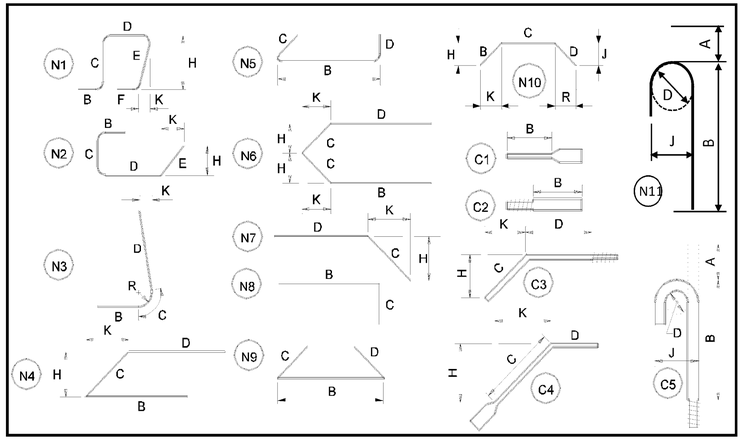
SECTION SUMMARY, TOTAL WEIGHT (lbs)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL
544	REINFORCING STEEL												
544.11	MECH. CONNECTOR												
544.2	EPOXY COATED			2510	241								2751
544.21	EPOXY MECH. CON.												

GRAND SUMMARY, TOTAL WEIGHT (lbs)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL
544	REINFORCING STEEL	0	0	0	0	0	0	0	0	0	0	0	0
544.11	MECH. CONNECTOR	0	0	0	0	0	0	0	0	0	0	0	0
544.2	EPOXY COATED	0	0	116056	3110	4614	4770	0	0	0	0	0	128550
544.21	EPOXY MECH. CON.	0	0	9356	0	0	0	0	0	0	0	0	9356

STANDARD N.H. & SPECIAL BENDS



RECOMMENDED END HOOKS, ALL GRADES (in.)				
BAR SIZE	180° HOOKS			90° HOOKS
	D(∅)	A or G	J	A or G
#3	2 1/4	5	3	6
#4	3	6	4	8
#5	3 3/4	7	5	10
#6	4 1/2	8	6	12
#7	5 1/4	10	7	14
#8	6	11	8	16
#9	9 1/2	15	11 3/4	19
#10	10 3/4	17	13 1/4	22
#11	12	19	14 3/4	24
#14	18 1/4	27	21 3/4	31

ASTM STANDARD REINFORCING BARS (in.)			
BAR SIZE	WEIGHT (lb/ft)	NOM. DIMEN.	
		DIA. (in.)	AREA (in^2)
#3	0.376	0.375	0.11
#4	0.668	0.500	0.20
#5	1.043	0.625	0.31
#6	1.502	0.750	0.44
#7	2.044	0.875	0.60
#8	2.670	1.000	0.79
#9	3.400	1.128	1.00
#10	4.303	1.270	1.27
#11	5.313	1.410	1.56
#14	7.650	1.693	2.25
#18	13.600	2.257	4.00

STIRRUP & TIE HOOK DIMENSIONS, GRADES 40-50-60 ksi (in.)				
BAR SIZE	D(∅)	90° HOOKS	135° HOOKS	
		A or G	A or G	H (approx.)
#3	1 1/2	4	4	2 1/2
#4	2	4 1/2	4 1/2	3
#5	2 1/2	6	5 1/2	3 3/4
#6	4 1/2	12	7 3/4	4 1/4
#7	5 1/4	14	9	5 1/4
#8	6	16	10 1/4	6

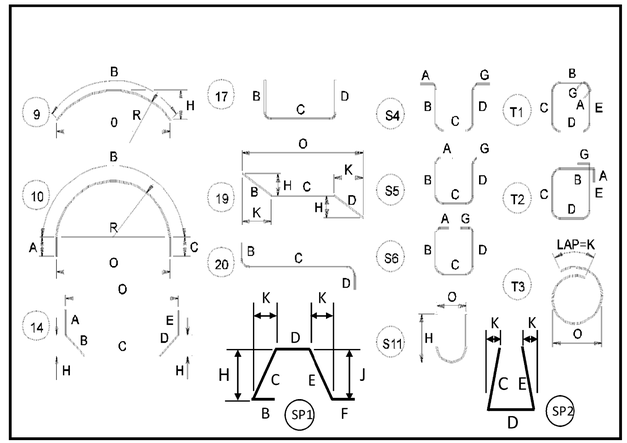
NOTES:

1. FIGURES IN CIRCLE SHOW TYPE OF BEND.
2. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET - STEEL BARS FOR CONCRETE REINFORCEMENT." AASHTO M 31-94 (ASTM A615)
3. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS AND OTHER STANDARD PRACTICE REFER TO THE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDRD PRACTICE."
4. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
5. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180° AND 135° HOOKS.
6. "J" DIMENSION ON 180° HOOKS TO BE SHOWN ONYL WHEN NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE STANDARD HOOKS ARE TO BE USED.
7. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
8. WHERE SLOPE DIFFERS FROM 45° DIMESIONS "H" AND "K" MUST BE SHOWN.

▲ DENOTES BARS TO BE CUT IN FIELD, AS REQUIRED.
△ DENOTES BARS TO BE BENT IN FIELD.

NOTE:
D = finished inside bend d of hook.
See 1997 CRSI Manual p6-3&4.
For additional data on standard bar bends not shown on this sheet see 1997 CRSI Manual p6-3&4.
EC = EPOXY COATED
EMC = EPOXY MECHANICAL CONNECTOR

STANDARD INDUSTRY BENDS, STIRRUPS, & TIES



EM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD/SUPER	41191_Reinf_Sched	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

REINFORCEMENT SCHEDULE

BRIDGE SHEET: 26 OF 48

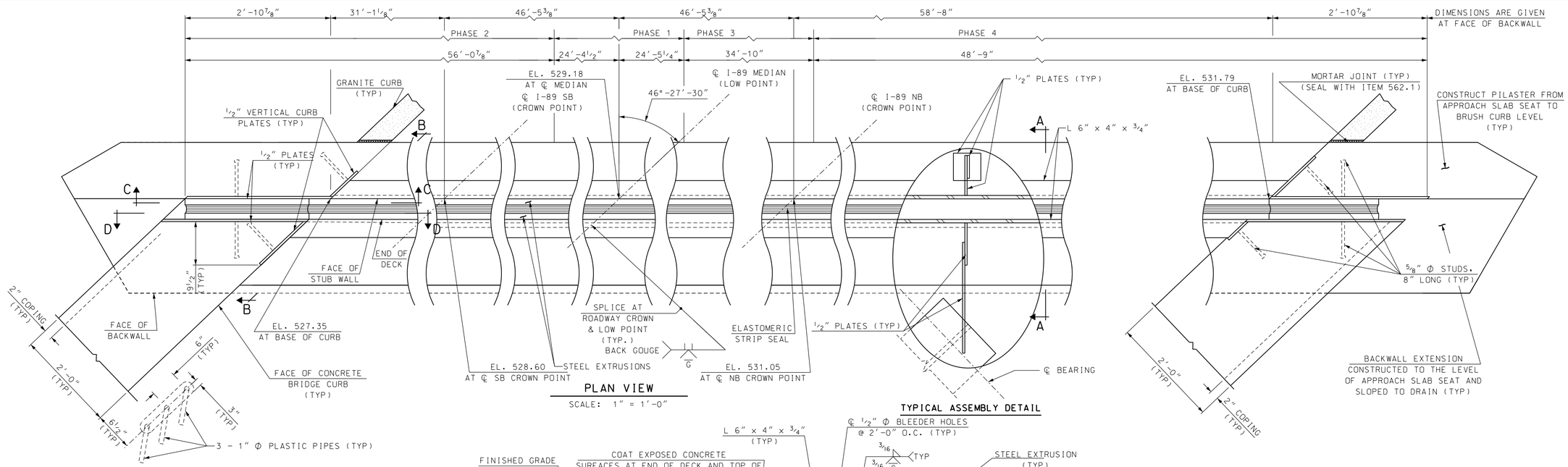
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	BAW	4/19	CHECKED	TPL	4/19
	DRAWN	BAW	4/19	CHECKED	TPL	4/19
	QUANTITIES	BAW	4/19	CHECKED	TPL	4/19
	ISSUE DATE					
	REV. DATE					

FEDERAL PROJECT NO.: X-A004(559)

FILE NUMBER: 19-1-5

SHEET NO.: 43

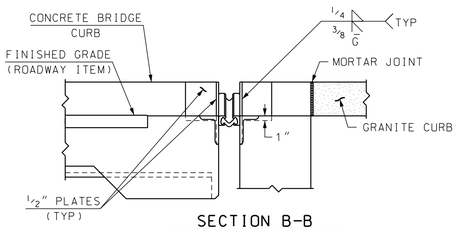
TOTAL SHEETS: 110



PLAN VIEW

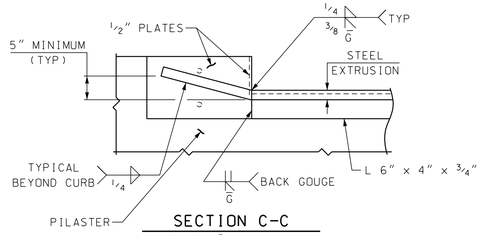
SCALE: 1" = 1'-0"

TYPICAL ASSEMBLY DETAIL



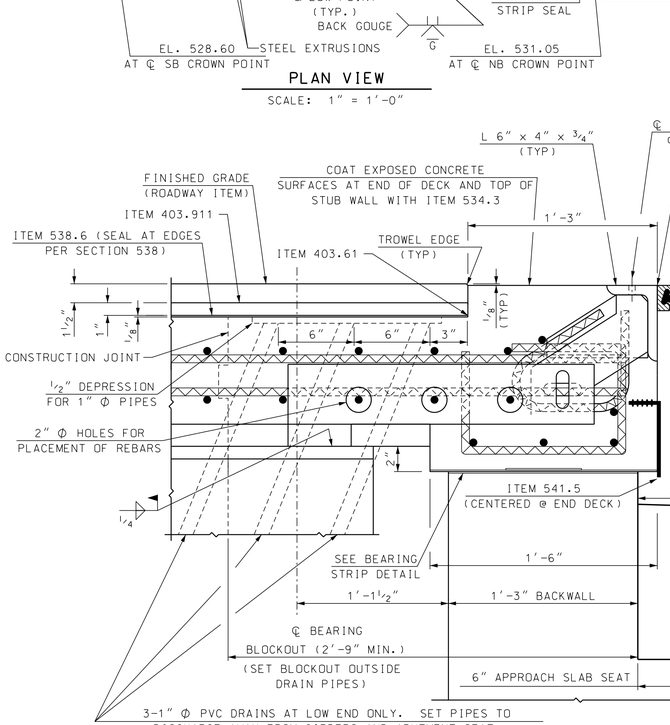
SECTION B-B

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



SECTION C-C

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



3-1" ℄ PVC DRAINS AT LOW END ONLY. SET PIPES TO DISCHARGE AWAY FROM GIRDERS AND ABUTMENT SEAT. PROVIDE BREAKS THROUGH MEMBRANE AND SEAL. ATTACH DRAIN PIPES TO BOTTOM FLANGE WITH CLIP AND EXTEND DRAINS 6" MINIMUM BELOW BOTTOM OF STRUCTURAL STEEL. ALL COSTS SUBSIDIARY TO ITEM 520.7002

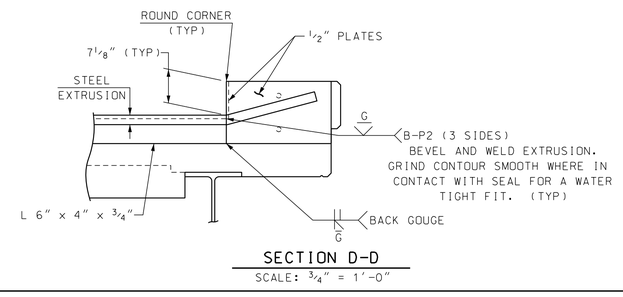
SECTION A-A

SCALE: 2" = 1'-0"

TEMPERATURE ADJUSTMENT TABLE	
TEMPERATURE	"T"
20°F	2"
35°F	1 15/16"
50°F	1 13/16"
65°F	1 3/4"
80°F	1 11/16"
95°F	1 9/16"

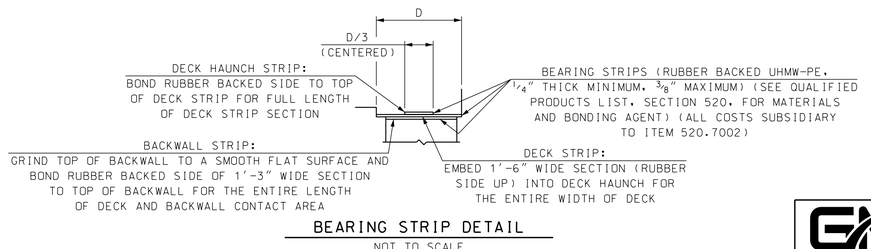
TEMPERATURE ADJUSTMENT NOTES

1. "T" DIMENSIONS ARE PERPENDICULAR TO FACE OF BACKWALL.
2. MINIMUM "T" WIDTH FOR SEAL INSTALLATION = 1 3/4" (APPROXIMATELY 65°F OR LESS).
3. VALUES IN THE TEMPERATURE ADJUSTMENT TABLE ARE FOR SETTING THE EXPANSION JOINT ASSEMBLY IMMEDIATELY PRIOR TO POURING THE DECK BLOCKOUT.



SECTION D-D

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



BEARING STRIP DETAIL

NOT TO SCALE

EM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/EXP-JTS	41191_EXP_JOINT	AS NOTED

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

STRIP SEAL EXPANSION JOINT (1 of 2)

BRIDGE SHEET 27 OF 48

FILE NUMBER 19-1-5

TOTAL SHEETS 110

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
	ISSUE DATE	2/89	FEDERAL PROJECT NO.		SHEET NO.	
	REV. DATE	5/18/16	X-A004(559)		44	

EXPANSION JOINT NOTES

(1) ALL EXPANSION JOINT STEEL, INCLUDING ANCHORS, SHALL BE GALVANIZED. STEEL ANGLES SHALL BE ASTM A572 GRADE 50. MINOR STEEL PLATES MAY CONFORM TO ASTM A36. THE ENTIRE ASSEMBLY, INCLUDING STRIP SEAL, SHALL BE PAID FOR AS ITEM 561.1001, PREFABRICATED STRIP SEAL EXPANSION JOINT (F).

(2) SPLICES FOR STEEL ANGLES SHALL DEVELOP FULL STRENGTH.

(3) EXPANSION JOINT OPENING SHALL BE ADJUSTED TO TEMPERATURE ANTICIPATED JUST PRIOR TO POURING DECK BLOCKOUT. FINAL SETTING IN THE FIELD SHALL BE DETERMINED BY THE CONTRACT ADMINISTRATOR. SEE TEMPERATURE ADJUSTMENT TABLE & NOTES.

(4) STRIP SEAL SHALL BE FURNISHED IN ONE CONTINUOUS LENGTH. NO SPLICES WILL BE ALLOWED. SEAL SHALL BE INSTALLED IN THE FIELD BY THE CONTRACTOR, IN ACCORDANCE WITH THE MANUFACTURER OF THE SEAL, USING AN APPROVED TOOL THAT WILL NOT DAMAGE THE SEAL.

(5) JOINT SUPPORT PLATES AND CURB PLATES SHALL BE SHOP WELDED TO EXPANSION JOINT STEEL AND SHALL BE NORMAL TO GRADE AFTER JOINT ASSEMBLY HAS BEEN ADJUSTED FOR ROADWAY CROSS-SLOPE AND GRADE. STEEL ANGLES AND EXTRUSIONS SHALL BE ASSEMBLED WITH A CONSTANT JOINT OPENING TO ENSURE PROPER PERFORMANCE AND WATER TIGHTNESS.

(6) THE EXPANSION JOINT ASSEMBLY SHALL BE INSTALLED ONLY AFTER BOTH ABUTMENTS HAVE BEEN BACKFILLED TO WITHIN 3'-0" OF FINISHED GRADE.

(7) IMMEDIATELY AFTER THE JOINT HAS BEEN SECURED TO THE STRUCTURAL STEEL AND STUBWALL, REMOVE SHIPPING DEVICES AND GRIND SMOOTH ANY WELDS ON EXPOSED SURFACES. REPAIR ANY DAMAGE TO GALVANIZED SURFACES IN ACCORDANCE WITH SECTION 550.

(8) PROTECT TOP OF EXPANSION JOINT DURING PLACEMENT OF CONCRETE AND BITUMINOUS PAVEMENT.

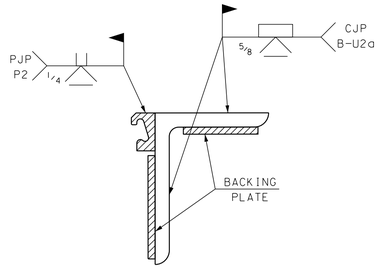
(9) THE STRIP SEAL HAS BEEN DESIGNED FOR A TOTAL FACTORED MOVEMENT OF 1.04 INCHES. DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE, SKEW, SHRINKAGE AND MINIMUM INSTALLATION WIDTH. THE CONTRACTOR SHALL USE AN SE-400 SEAL BY WATSON BOWMAN OR A2R-400 BY D.S. BROWN, AS NOTED IN THE OPL.

(10) ELEVATIONS SHOWN AT TOP OF ANGLES ARE $\frac{1}{8}$" LOWER THAN PROPOSED FINISHED ROADWAY GRADE.

(11) NO "LOW PROFILE" STEEL EXTRUSIONS SHALL BE ALLOWED. SEE OPL FOR APPROVED PRODUCTS.

(12) PRIOR TO INSTALLING THE SEAL, ALL TEMPORARY FORM WORK SHALL BE REMOVED. STEEL ANGLES AND EXTRUSIONS SHALL BE MAINTAINED FREE FROM DIRT, WATER AND ANY OTHER LOOSE DEBRIS, WITH THE USE OF COMPRESSED AIR, TO ENSURE PROPER FIT OF THE SEAL. CARE SHALL BE TAKEN NOT TO DAMAGE GALVANIZED SURFACES.

(13) A TEMPORARY SEAL(S) SHALL BE INSTALLED PRIOR TO THE START OF THE WINTER MAINTENANCE PERIOD FOR ALL JOINT ASSEMBLIES OR PORTIONS THEREOF THAT WILL BE IN PLACE THROUGHOUT THE WINTER. ALL TEMPORARY SEALS SHALL BE REMOVED AND JOINT OPENINGS AND SUBSTRUCTURE SHALL BE CLEANED PRIOR TO INSTALLING THE FINAL SEAL. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 561.1001.



FIELD SPLICE WELD DETAIL-STRIP SEAL

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/EXP-JTS	41191_EXP_JOINT_2	AS NOTED

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

STRIP SEAL EXPANSION JOINT (2 of 2)

BRIDGE SHEET: 28 OF 48

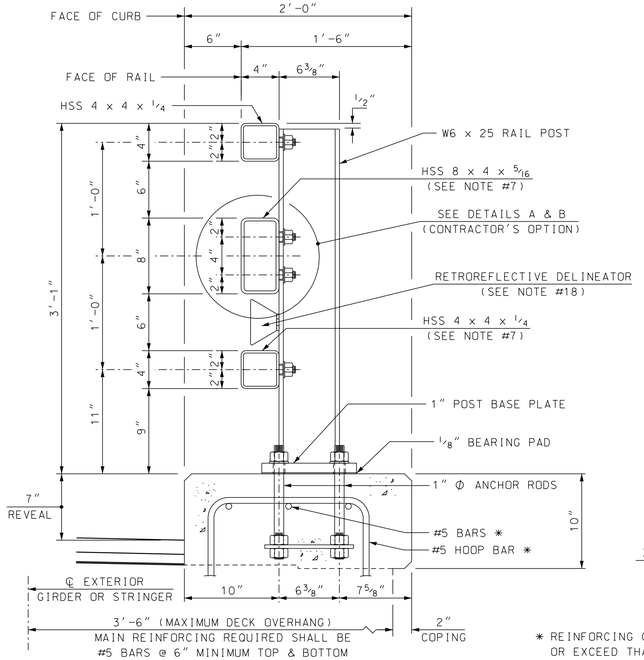
REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TPL	7/18	CHECKED	TEM	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	2/89	FEDERAL PROJECT NO.	SHEET NO.
REV. DATE	5/18/16	X-A004(559)	45

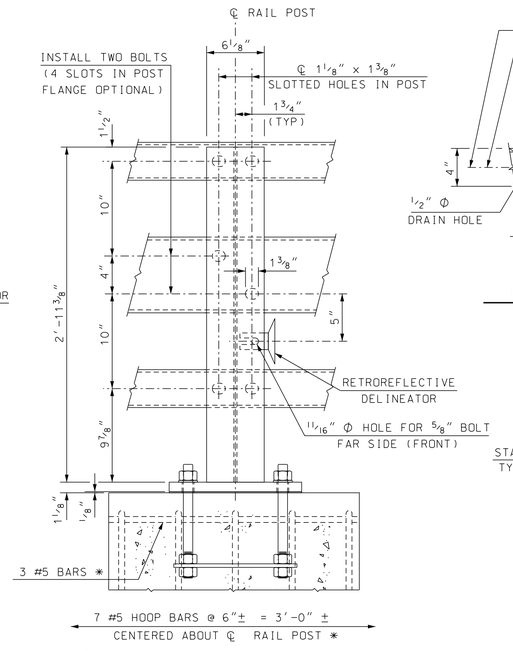
FILE NUMBER: 19-1-5

TOTAL SHEETS: 110



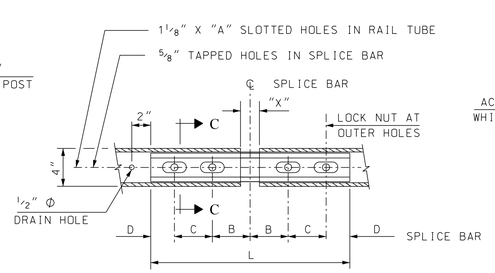
SECTION VIEW

* REINFORCING CAPACITY SHALL MEET OR EXCEED THAT SHOWN



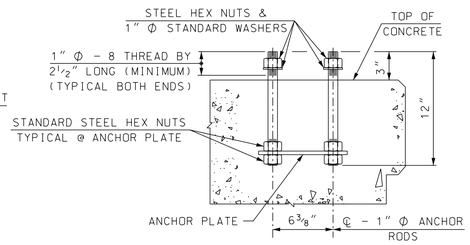
POST ASSEMBLY

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



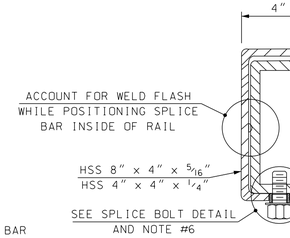
RAIL SPLICE (BOTTOM VIEW)

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

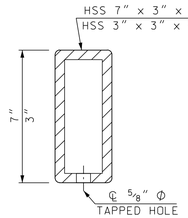


POST ANCHOR ASSEMBLY

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



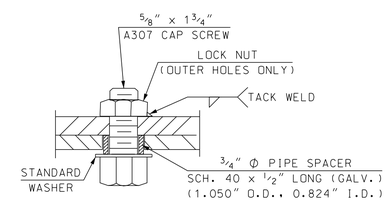
SECTION C-C



SPLICE BAR SECTION

RAIL SPLICE DETAILS

SCALE: 3" = 1'-0"



SPLICE BOLT DETAIL

SCALE: 6" = 1'-0"

RAIL NOTES

(1) ITEM 563.23, BRIDGE RAIL T3, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, AND GALVANIZING.

(2) BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 5% WHERE POSTS SHALL BE SET VERTICAL.

(3) ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.

(4) EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.

(5) BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.

(6) AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. ALL RAILS IN A SPLICE SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.

(7) MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE (SEE SECTION 563.3.2.1).

(8) NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER GALVANIZING, EXCEPT AS ALLOWED IN DETAILS A AND B, AND FOR INSTALLATION OF DELINEATORS. DAMAGED AREAS OF GALVANIZING SHALL BE THOROUGHLY CLEANED, PRETREATED, AND PAINTED WITH TWO COATS OF ORGANIC ZINC-RICH GALVANIZING REPAIR PAINT, HAVING A MINIMUM 92% ZINC BY WEIGHT, TO A THICKNESS EQUAL TO THE ORIGINAL COATING, ACCORDING TO SECTION 550.2.9.1 AND ASTM A780.

(9) NUTS FOR 1" Ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.

(10) THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.

(11) THIS BRIDGE RAIL SYSTEM IS IN COMPLIANCE WITH T2 STEEL BRIDGE RAIL WHICH WAS SUCCESSFULLY CRASH TESTED FOR AASHTO PL2 IN 1994 BY THE NEW ENGLAND TRANSPORTATION CONSORTIUM AND ACCEPTED AS NCHRP 350 TL-4 PER FHWA LETTER HMHS-B50, MARCH 11, 1999.

MATERIAL NOTES

(12) STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 FT. LBS. AT 0°F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.

(13) RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.

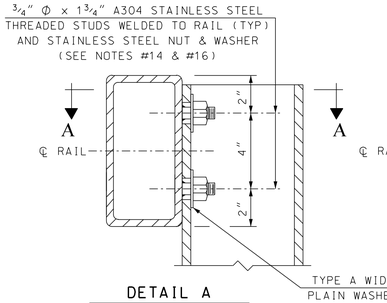
(14) THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL A) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. DETAIL B BOLTS SHALL BE ASTM A325 OR A449. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER, EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22. ANCHOR RODS SHALL CONFORM TO ASTM A449.

(15) ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE GALVANIZED AFTER FABRICATION IN COMPLIANCE WITH AASHTO M232 (ASTM A153) AND AASHTO M111 (ASTM A123). THE GALVANIZING KETTLE SHALL HAVE 0.05 TO 0.09 PERCENT NICKEL. GALVANIZED SURFACES SHALL HAVE A UNIFORM APPEARANCE AND GALVANIZED MATERIAL SHALL BE PROPERLY STORED. IF PAINTING IS REQUIRED SEE SPECIAL PROVISIONS FOR 708.

(16) DETAIL A STUDS SHALL BE WELDED ON AFTER TUBES ARE GALVANIZED BY SPOT GRINDING OFF GALVANIZING, WELDING ON STUDS, THEN TOUCH UP GALVANING PER NOTE #8 ABOVE.

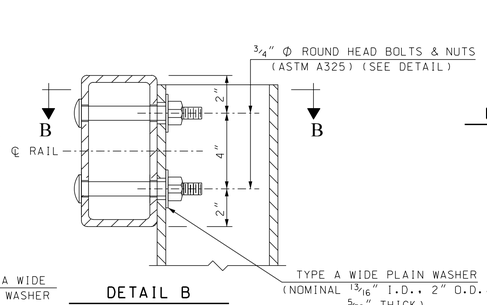
(17) PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

(18) RETROREFLECTIVE DELINEATORS, BOLTS, NUTS, WASHERS AND FIELD DRILLING OF POSTS, INCLUDING GALVANIZING TOUCH-UP, SHALL BE SUBSIDIARY TO ITEM 563.23. SEE STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION (DL-1) FOR ADDITIONAL DETAILS AND SPACING.



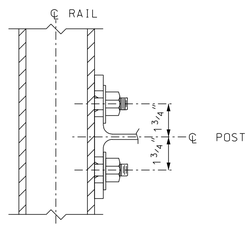
DETAIL A

SCALE: 3" = 1'-0"



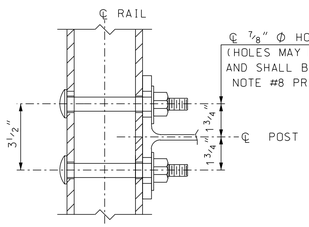
DETAIL B

SCALE: 3" = 1'-0"



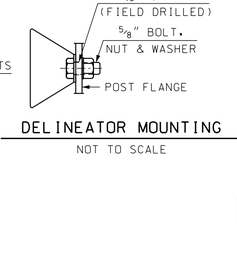
SECTION A-A

SCALE: 3" = 1'-0"



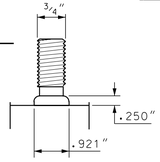
SECTION B-B

SCALE: 3" = 1'-0"



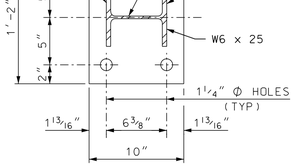
DELINEATOR MOUNTING

NOT TO SCALE



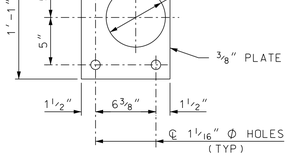
STUD WELD DETAIL

SCALE: 6" = 1'-0"



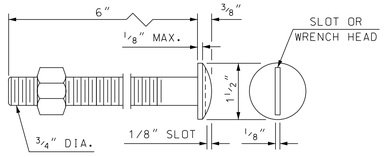
POST BASE PLATE

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



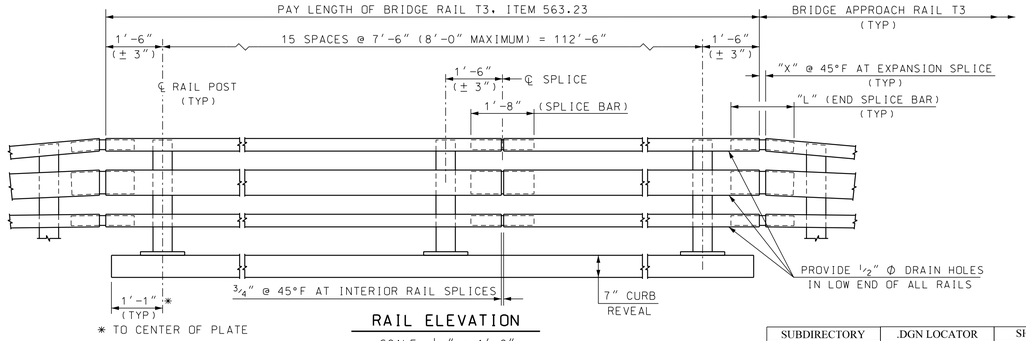
ANCHOR PLATE

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



A325 ROUND HEAD BOLT DETAIL

SCALE: 6" = 1'-0"



RAIL ELEVATION

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

SPLICE BAR DIMENSION TABLE						
T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
** ≤ 3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
** 3 1/4" < T ≤ 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

T = TOTAL MOVEMENT OF BRIDGE
** = END SPLICE BAR

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

T3 STEEL BRIDGE RAIL

BRIDGE SHEET 29 OF 48

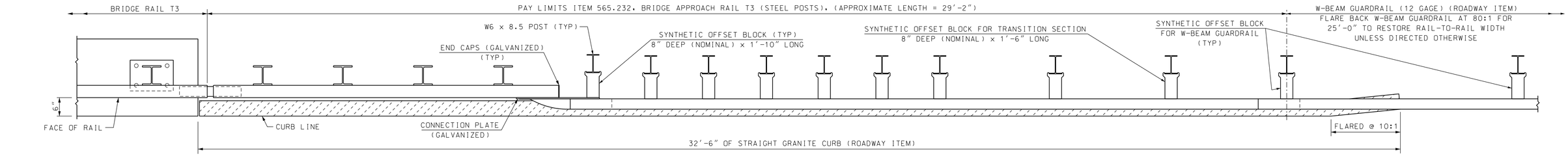
REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	NETC/JSZ	3/02	CHECKED	NHDOT	
DRAWN	PJP	10/05	CHECKED	JSZ	10/05
QUANTITIES			CHECKED		

FILE NUMBER 19-1-5

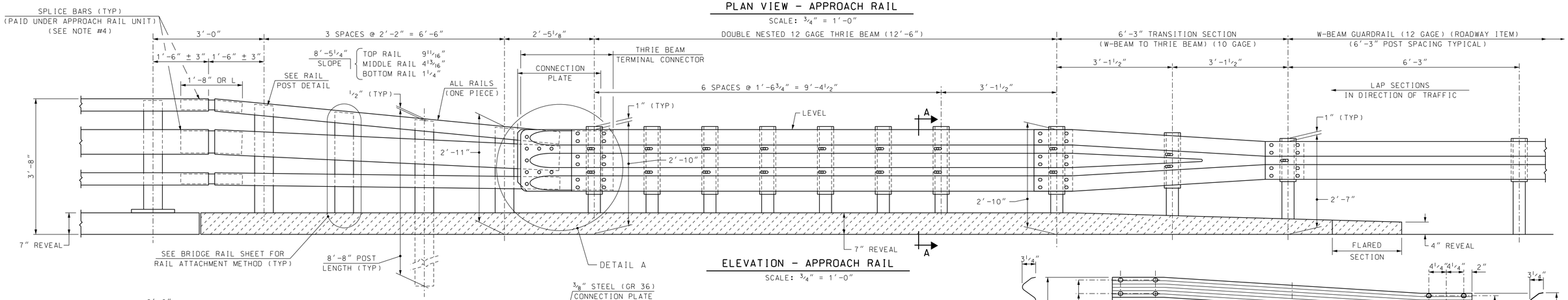
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/Details	41191_T3_BR-RAIL	AS NOTED

ISSUE DATE	11/15/05	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	11/1/16	X-A004(559)	46	110



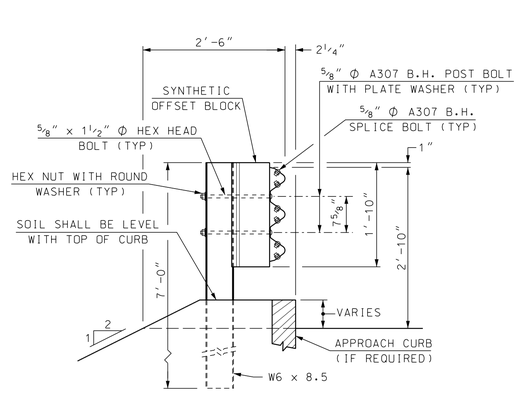
PLAN VIEW - APPROACH RAIL

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



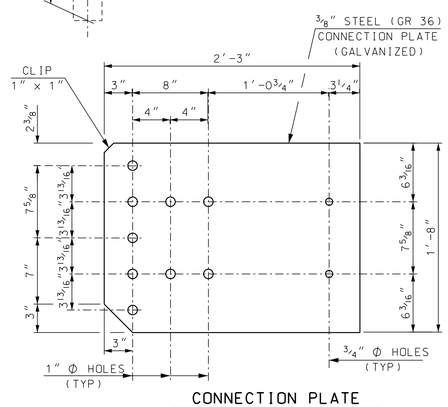
ELEVATION - APPROACH RAIL

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



SECTION A-A (POST RAIL ASSEMBLY)

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

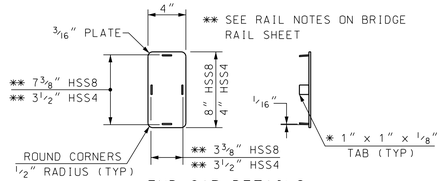


CONNECTION PLATE

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

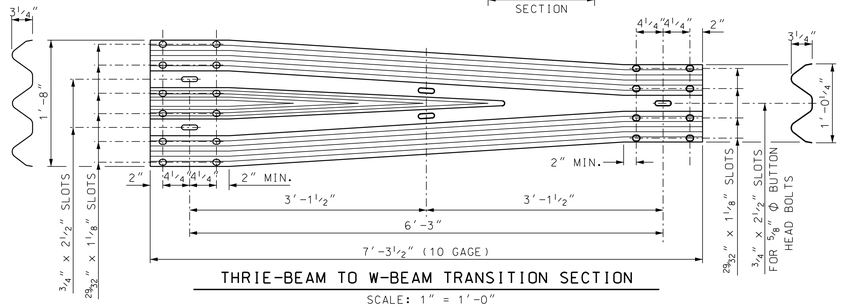
* WELD TABS TO END CAP PLATE IN TAPERED POSITION SO CAP CAN BE JAMMED INTO END OF RAIL TUBE

** SEE RAIL NOTES ON BRIDGE RAIL SHEET



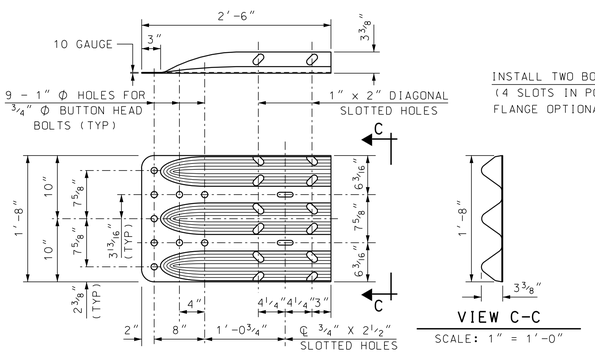
END CAP DETAILS

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



THRIE-BEAM TO W-BEAM TRANSITION SECTION

SCALE: 1" = 1'-0"

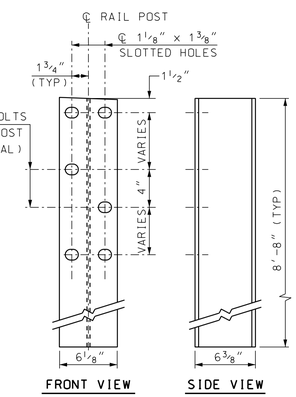


THRIE-BEAM TERMINAL CONNECTOR

SCALE: 1" = 1'-0"

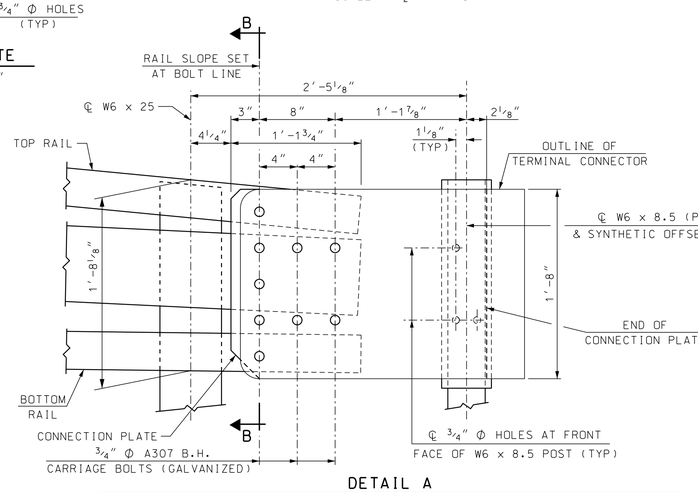
VIEW C-C

SCALE: 1" = 1'-0"



RAIL POST (W6 x 25)

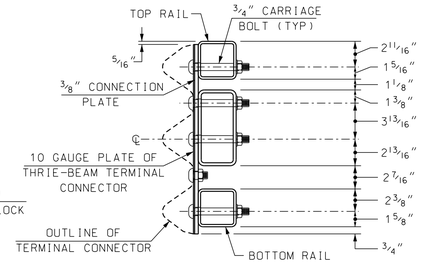
SCALE: 1 1/2" = 1'-0"



DETAIL A

OVERLAPPING OF DOUBLE NESTED THRIE-BEAM NOT SHOWN FOR CLARITY

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



SECTION B-B (CONNECTION PLATE)

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

NOTES:

(1) ALL BRIDGE APPROACH RAIL MATERIALS, DIMENSIONS, SIZES, AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED. SEE BRIDGE RAIL SHEET FOR NOTES AND ADDITIONAL INFORMATION.

(2) W6 x 25 POSTS SHALL BE THE SAME MATERIAL AS THE BRIDGE RAIL POSTS. W6 x 8.5 POSTS SHALL BE THE SAME AS W-BEAM GUARDRAIL POSTS.

(3) CARRIAGE BOLTS SHALL BE ASTM A307, AND NUTS SHALL BE ASTM A563 GRADE A OR BETTER (GALVANIZED).

(4) WELD BARS ADJUSTED FOR SLOPE & BEND. USE COMPLETE JOINT PENETRATION BUTT WELD (B-U2).

(5) THIS BRIDGE RAIL TRANSITION SYSTEM WAS SUCCESSFULLY CRASH TESTED IN APRIL 2005 BY THE NEW ENGLAND TRANSPORTATION CONSORTIUM AND ACCEPTED AS NCHRP 350 TL-3 PER FHWA LETTER HSSD/B-146.

(6) ALL COMPONENTS, EXCEPT TUBULAR RAIL, SHALL CONFORM TO SECTION 606 OF NHDOT SPECIFICATIONS.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

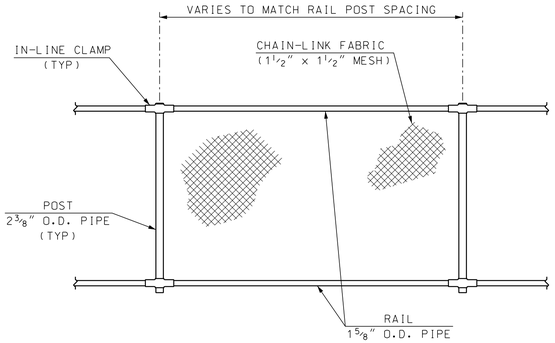
T3 STEEL BRIDGE APPROACH RAIL (STEEL POSTS)

BRIDGE SHEET 30 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
	DESIGNED	NETC/JSZ	3/02	CHECKED NHDOT	
	DRAWN	PJP	10/05	CHECKED JSZ	10/05
	QUANTITIES			CHECKED	
	ISSUE DATE	11/15/05	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
	REV. DATE	3/12/16	X-A004(559)	47	110

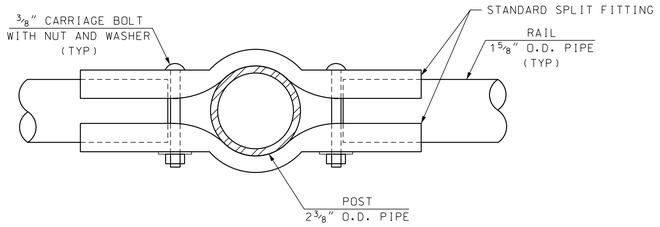
FILE NUMBER 19-1-5

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BR-RAIL	41191_T3SP_APPRAIL	AS NOTED



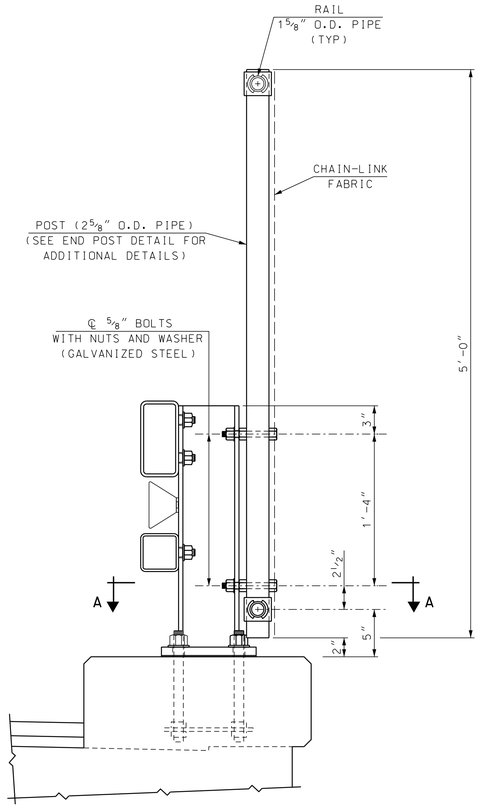
ELEVATION - SNOW SCREENING

SCALE: ½" = 1'-0"



IN-LINE CLAMP DETAIL

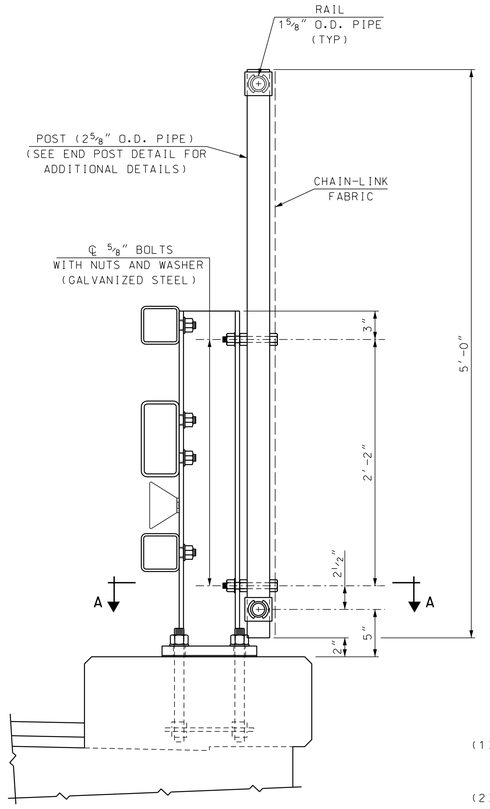
SCALE: 6" = 1'-0"



TYPICAL SECTION

(T2 BRIDGE RAIL)

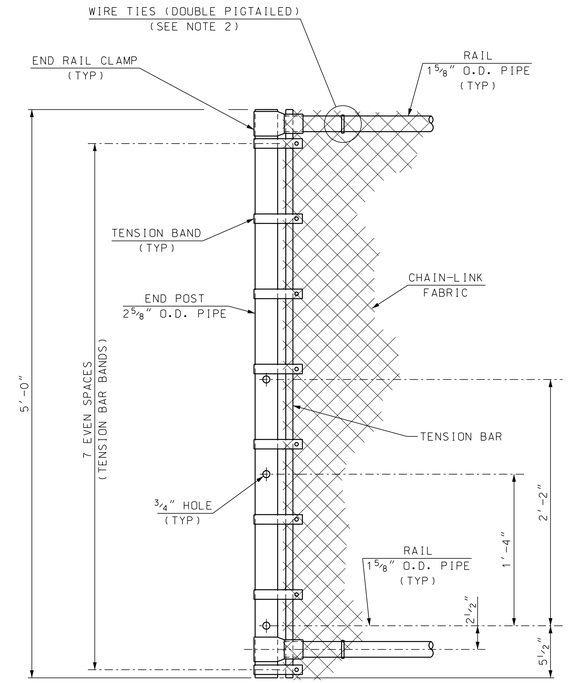
SCALE: 1½" = 1'-0"



TYPICAL SECTION

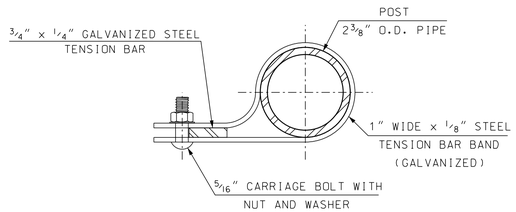
(T3 BRIDGE RAIL)

SCALE: 1½" = 1'-0"



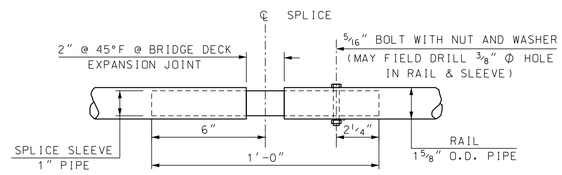
END POST DETAIL

SCALE: 1½" = 1'-0"



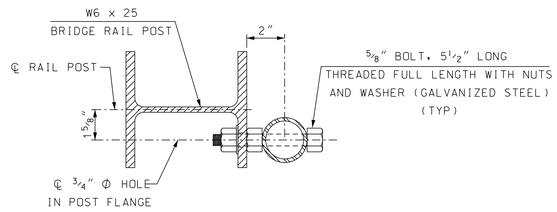
TENSION BAND DETAIL

SCALE: 6" = 1'-0"



RAIL SPLICE DETAIL

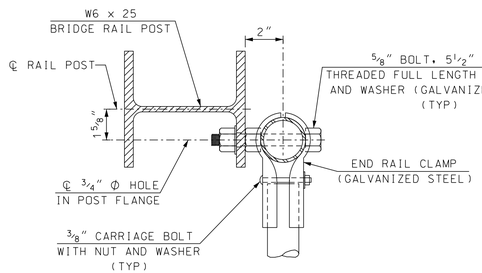
SCALE: 3" = 1'-0"



SECTION A-A

(AT INTERIOR POST)

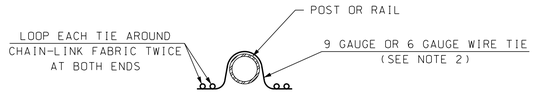
SCALE: 3" = 1'-0"



SECTION A-A

(AT END POST)

SCALE: 3" = 1'-0"



DOUBLE PIGTAILED TIE

NOT TO SCALE

GENERAL NOTES

(1) CHAIN-LINK FABRIC SHALL BE 9 GAUGE STEEL, ALUMINUM-COATED CONFORMING TO ASHTO M 181, TYPE II (ASTM A 491). CHAIN-LINK FABRIC SHALL BE KNUCKLED ON TOP AND BOTTOM. THE SIZE OF WIRE MESH (FABRIC) SHALL BE 1½".

(2) WIRE TIES SHALL BE STANDARD ROUND 9 GAUGE ALUMINUM-COATED STEEL OR 6 GAUGE ALUMINUM ALLOY CONFORMING TO ASTM F 626. ALL TIES SHALL BE WRAPPED AROUND CHAIN-LINK FABRIC TWICE (DOUBLE PIGTAILED) AT BOTH ENDS. SPACE TIES @ 6" O.C. TO BOTTOM RAIL AND @ 12" O.C. TO ALL POSTS AND OTHER RAILS.

(3) POSTS AND RAIL PIPES SHALL BE HOT-DIP GALVANIZED STEEL CONFORMING TO AASHTO M 181, GRADE 1 (ASTM F 1083). ALL PIPES SHALL BE SCHEDULE 40, STANDARD WEIGHT.

(4) TENSION BARS, BAR BANDS, IN-LINE CLAMPS AND END RAIL CLAMPS SHALL BE STEEL. STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE. ALL BAR BANDS SHALL HAVE A BEVELED EDGE.

(5) ALL BOLTS AND NUTS SHALL BE STEEL CONFORMING TO ASTM A 307 AND ASTM A 563 GRADE A RESPECTIVELY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ANSI B18.22. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE.

(6) RAIL SPLICES SHALL BE PROVIDED AT BRIDGE DECK EXPANSION JOINT(S) AND BRIDGE RAIL SPLICES AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

(7) RAIL MAY BE FIELD CUT (SAWN) TO FIT POST SPACING. GALVANIZED RAIL, CUT OR DRILLED AS ALLOWED, SHALL BE TOUCHED-UP IN ACCORDANCE WITH 563.3.2.2.3.

(8) ALL COSTS FOR CHAIN-LINK FABRIC, POSTS, RAILS AND APPURTENANCES SHALL BE INCLUDED IN ITEM 563.223. BRIDGE RAIL T2 WITH SNOW SCREENING, OR ITEM 563.233. BRIDGE RAIL T3 WITH SNOW SCREENING, AS APPLICABLE.

(9) SEE BRIDGE RAIL SHEET FOR ADDITIONAL DETAILS.

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BR-RAIL	41191_BR-SNOWSCREEN	AS NOTED

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON — BRIDGE NO. 093/109 & 094/108 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

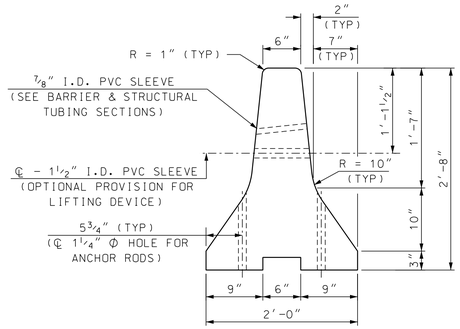
SNOW SCREEN WITH STEEL BRIDGE RAIL

BRIDGE SHEET 31 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	NHDOT	8/10	CHECKED	NHDOT	8/10
	DRAWN	PJP	8/10	CHECKED	MGL	8/10
	QUANTITIES			CHECKED		

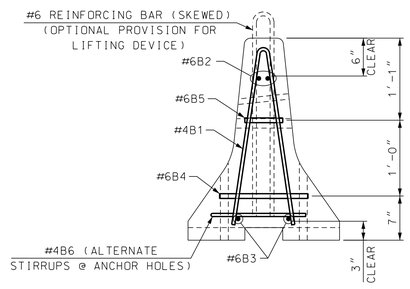
FILE NUMBER 19-1-5

ISSUE DATE	2/98	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	11/1/16	X-A004(559)	48	110



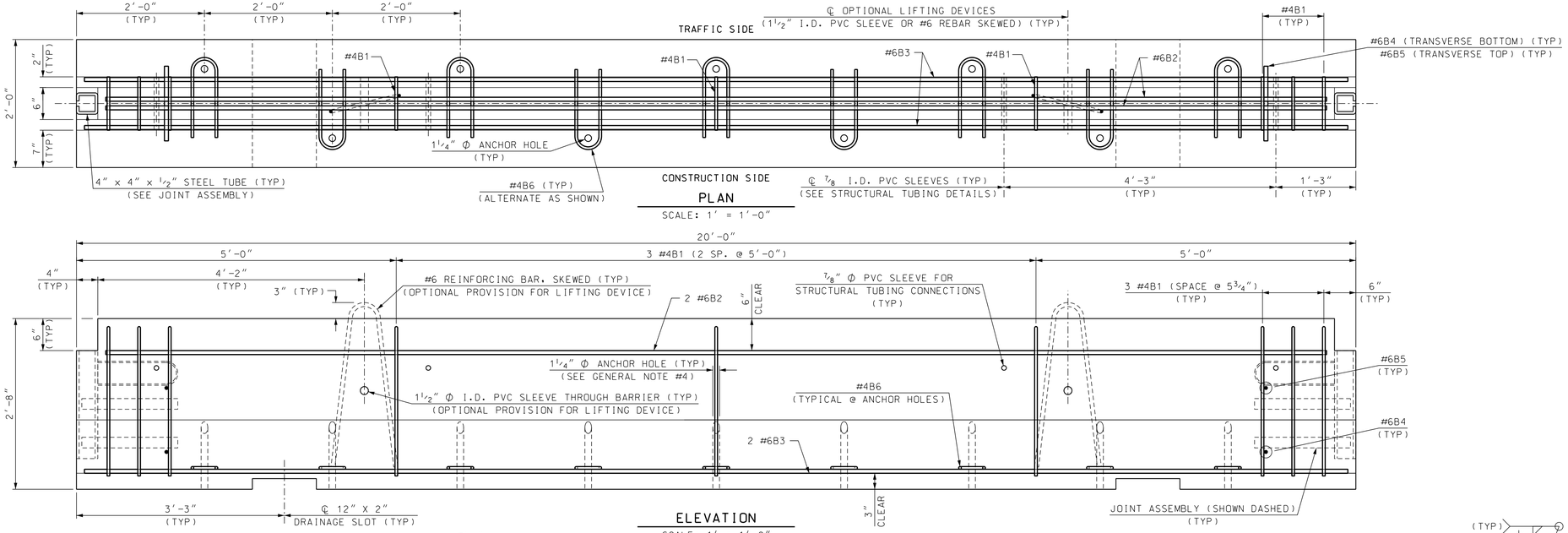
TYPICAL SECTION

SCALE: 1" = 1'-0"



TYPICAL SECTION

SCALE: 1" = 1'-0"

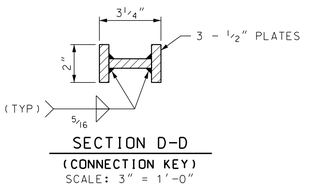


PLAN

SCALE: 1' = 1'-0"

ELEVATION

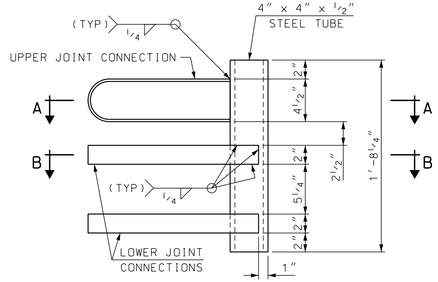
SCALE: 1' = 1'-0"



SECTION D-D

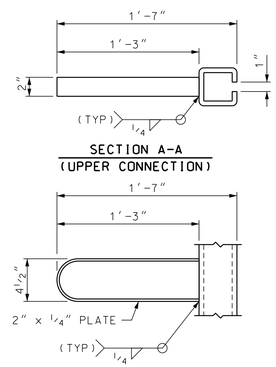
(CONNECTION KEY)

SCALE: 3" = 1'-0"



JOINT ASSEMBLY

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

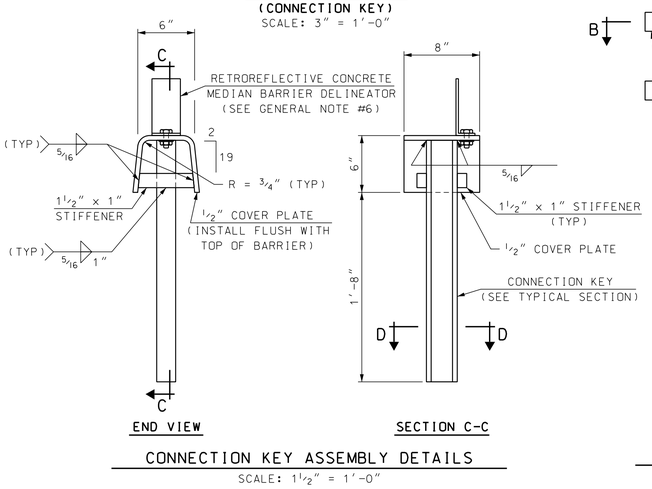


SECTION A-A (UPPER CONNECTION)

SECTION B-B (LOWER CONNECTION)

ELEVATION (UPPER CONNECTION)

SECTION B-B (LOWER CONNECTIONS - ALTERNATE)

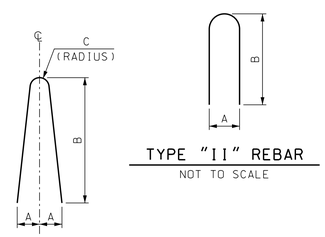


END VIEW

SECTION C-C

CONNECTION KEY ASSEMBLY DETAILS

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

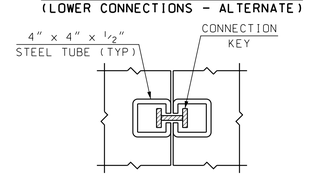


TYPE "I" REBAR

NOT TO SCALE

TYPE "II" REBAR

NOT TO SCALE



CONNECTION JOINT DETAIL

NOT TO SCALE

JOINT CONNECTION DETAILS

SCALE: 1 1/2" = 1'-0" (EXCEPT AS NOTED)

GENERAL NOTES

(1) PORTABLE CONCRETE BARRIER SHALL BE FURNISHED BY THE CONTRACTOR AND PAID FOR AS ITEM 606.41741 PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE). CONCRETE BARRIER AND ALL ATTACHMENTS SHALL BE FABRICATED IN ACCORDANCE WITH SPECIAL PROVISIONS. ALL BARRIER UNITS FOR BRACED SYSTEMS SHALL BE 20' LONG.

(2) PORTABLE CONCRETE BARRIER DETAILS, AS SHOWN IN THESE PLANS, ARE IN COMPLIANCE WITH REQUIREMENTS PER UPDATED NCHRP REPORT 350 FOR TEST NO. 3-11 (MASH TEST LEVEL 3), CRASH TESTED BY MIDWEST ROADSIDE SAFETY: NY BOX BEAM STIFFENING OF UNANCHORED TCB, MARCH 2008, AND ACCEPTED PER FHWA LETTER B-239 (11/1/2012). THE BARRIER SYSTEM HAS BEEN CRASH TESTED WITH A 27.6" DYNAMIC DEFLECTION WHICH WILL ALLOW BRACED BARRIER TO BE PLACED A MINIMUM 12" FROM THE EDGE OF BRIDGE DECK.

(3) A MINIMUM OF TWO BARRIER UNITS, WITH BRACED JOINTS ARE REQUIRED TO BE PLACED BEYOND BOTH ENDS OF THE BRIDGE WORK AREA. FOR SPEEDS GREATER THAN 45 MPH. FOR SPEEDS ≤ 45 MPH, A MINIMUM OF ONE BRACED BARRIER IS REQUIRED TO BE FULLY SET BEYOND EACH END OF BRIDGE WORK AREA.

(4) THE LAST CONCRETE BARRIER UNIT, AT EACH END OF BRACED BARRIER LAYOUT, SHALL BE ANCHORED A MINIMUM 18" BELOW THE ROADWAY SURFACE. REQUIRED 1" Φ ANCHOR RODS (A36 STEEL) SHALL BE INSTALLED WITH 5 ANCHORS ON THE TRAFFIC SIDE OF BARRIER AND 4 ON THE CONSTRUCTION SIDE. IF THE END(S) OF THE BRACED CONCRETE BARRIER SYSTEM EXTENDS 50' OR MORE BEYOND LIMITS OF BRIDGE WORK THE LAST BARRIER UNIT DOES NOT REQUIRE ANCHORAGE.

(5) PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE), ITEM 606.41741, MAY BE INSTALLED WITH A 230' MINIMUM RADIUS. GAPS CREATED BETWEEN STRUCTURAL TUBES AND CONCRETE BARRIER, DURING A RADIAL LAYOUT, SHALL BE SHIMMED WITH 8" x 8" x 1/2" PLATES & FENDER WASHERS TO FIRMLY ATTACH STRUCTURAL TUBING TO BARRIER.

(6) THE CONTRACTOR SHALL FURNISH AND INSTALL APPROVED RETROREFLECTIVE DELINEATORS AT 25-FOOT INTERVALS ALONG TOP AND/OR ONE FOOT DOWN THE SIDE OF PORTABLE CONCRETE BARRIER. SUBSIDIARY TO ITEM 606.41741 (SEE STANDARD NO. DL-1 OF NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION). THE COLOR OF DELINEATORS SHALL, IN ALL INSTANCES, CONFORM TO THE COLOR OF EDGE LINE MARKINGS. DELINEATORS SUPPLEMENT, BUT DO NOT REPLACE, THE NEED FOR RETROREFLECTIVE SOLID EDGE LINE MARKINGS.

MATERIAL NOTES

(1) BARRIERS SHALL BE LIGHT COLORED CLASS AA CONCRETE, WITH MINIMUM COMPRESSIVE STRENGTH OF 4000 psi, AND SHALL HAVE A SMOOTH UNIFORM SURFACE FREE OF DEFECTS AND IRREGULARTIES. CASTING DATE SHALL BE SHOWN ON BARRIER. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.

(2) ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615) GRADE 60. ALL REINFORCEMENT SHALL HAVE 1 1/2" MINIMUM CLEAR COVER, UNLESS OTHERWISE NOTED.

(3) STRUCTURAL STEEL, EXCEPT THE STEEL TUBES, SHALL BE ASTM A36 OR A572. ALL STEEL SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 550.

(4) STEEL TUBES, 6" x 6" x 3/16" & 4" x 4" x 1/2", SHALL BE ASTM A 500 GRADE B OR C. ALL TUBES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

(5) ALL STEEL FOR CONNECTION KEY AND TRANSITION KEY ASSEMBLIES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

(6) A MINIMUM OF 2 LIFTING DEVICES, EACH WITH THE CAPACITY TO LIFT A MASS OF 6 TONS (MINIMUM), SHALL BE INSTALLED TO EACH BARRIER UNIT. TWENTY FOOT LONG CONCRETE BARRIER UNITS ARE APPROXIMATELY 400 LBS./FT.

(7) DELINEATORS SHALL BE ATTACHED TO BARRIER USING AN APPROVED ADHESIVE MATERIAL OR AS SHOWN ON THIS SHEET.

REINFORCING SCHEDULE (PER 20' BARRIER UNIT)

MARK	SIZE	LENGTH	# PIECES	TYPE	A	B	C	LOCATION
B1	#4	4'-10"	9	I	5"	2'-4"	1"	STIRRUPS
B2	#6	19'-1"	2	——				LONGITUDINAL (TOP)
B3	#6	19'-9"	2	——				LONGITUDINAL (BOTTOM)
B4	#6	1'-2"	2	——				TRANSVERSE (BOTTOM)
B5	#6	6"	2	——				TRANSVERSE (TOP)
B6	#4	2'-9"	9	II	5"	1'-3"		STIRRUPS

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BARRIER	PCB-BRACED	AS NOTED

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

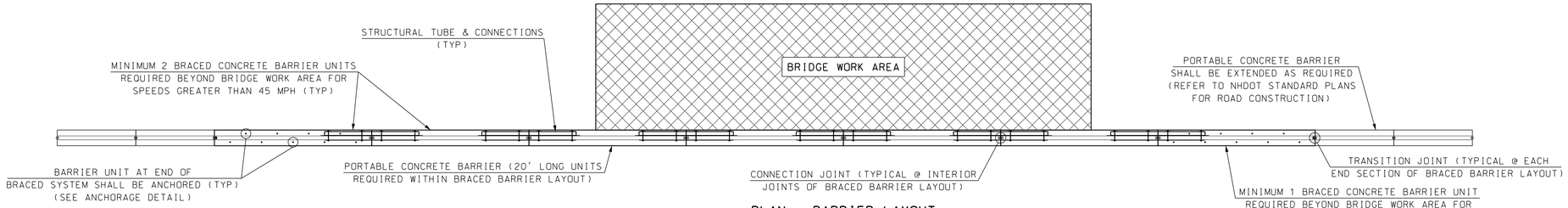
TOWN	BRIDGE NO.	STATE PROJECT
LOCATION		

PORTABLE CONCRETE BARRIER - BRACED (1 OF 2)

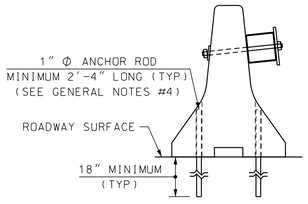
BRIDGE SHEET: 32 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	NHDOT	7/12	CHECKED	ABH	8/12
	DRAWN	PJP	8/12	CHECKED	ABH	8/12
	QUANTITIES			CHECKED		
	ISSUE DATE	8/15/12	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE	5/15/18	X-A004(559)		49	110

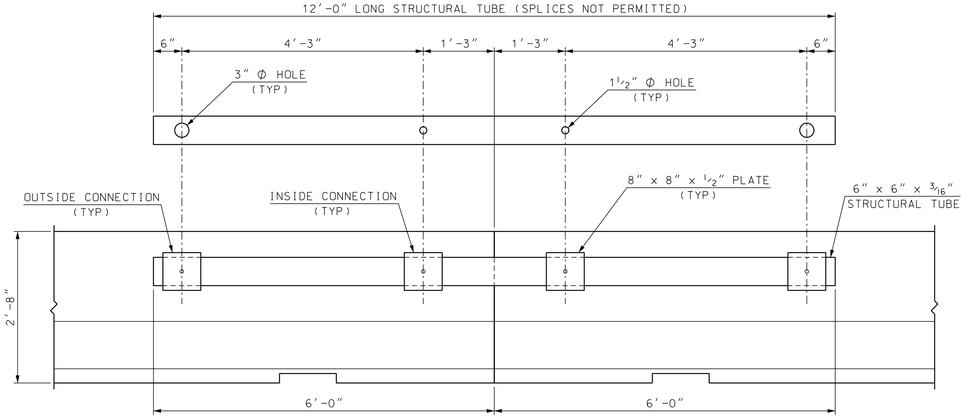
FILE NUMBER: 19-1-5



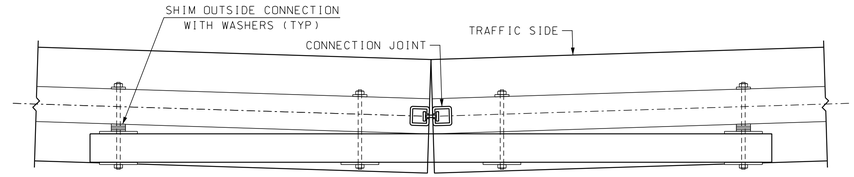
PLAN - BARRIER LAYOUT
NOT TO SCALE



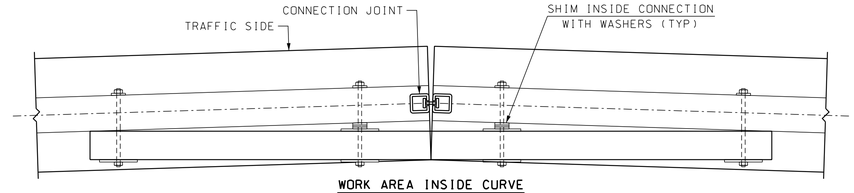
ANCHORAGE DETAIL
SCALE: 3/4" = 1'-0"



STRUCTURAL TUBING DETAILS
SCALE: 3/4" = 1'-0"



WORK AREA OUTSIDE CURVE

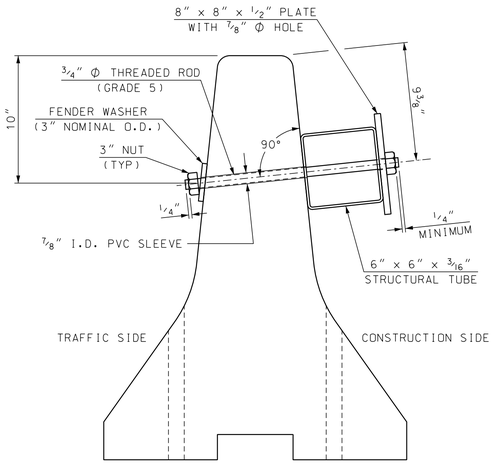


WORK AREA INSIDE CURVE

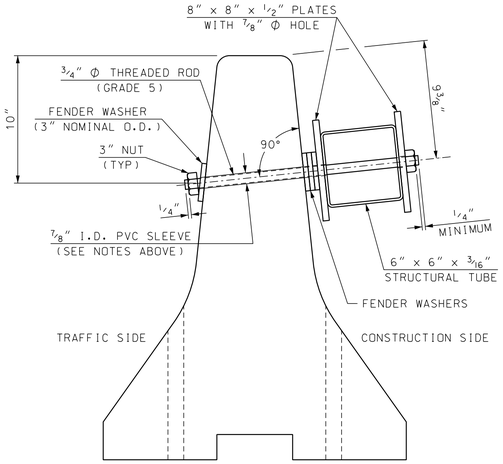
TUBE CONNECTIONS (CURVED ALIGNMENT)
SCALE: 3/4" = 1'-0"

PVC SLEEVE OPENINGS SHALL BE MODIFIED/DRILLED AS REQUIRED TO PROPERLY ALIGN STRUCTURAL TUBE BRACING UNITS FOR CURVED ALIGNMENTS

THE PRESENCE OF NORMAL HOLES WHICH HAVE BEEN MODIFIED/DRILLED WILL NOT AFFECT THE REUSE OF CONCRETE BARRIER UNITS

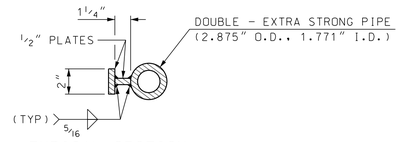


SECTION WITHOUT SHIMS

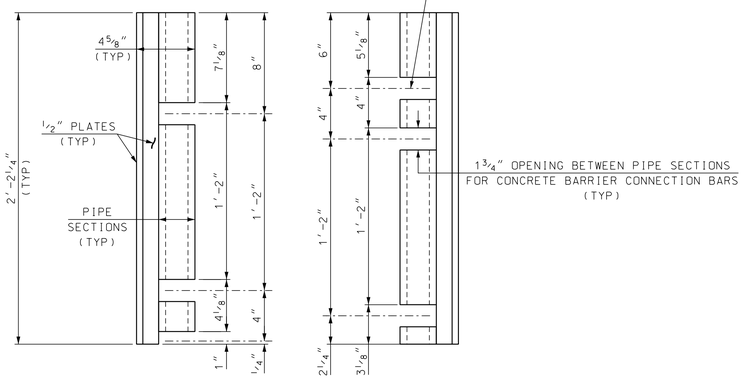


SECTION WITH SHIMS

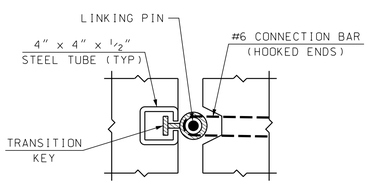
BARRIER & STRUCTURAL TUBING SECTIONS
SCALE: 2" = 1'-0"



TYPICAL SECTION
(TRANSITION KEY)
SCALE: 2" = 1'-0"



TRANSITION KEY ELEVATIONS
SCALE: 2" = 1'-0"



TRANSITION JOINT DETAILS
NOT TO SCALE

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BARRIER	PCB-BRACED	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN | BRIDGE NO. | STATE PROJECT

LOCATION

PORTABLE CONCRETE BARRIER - BRACED (2 OF 2)

BRIDGE SHEET: 33 OF 48

REVISIONS AFTER PROPOSAL

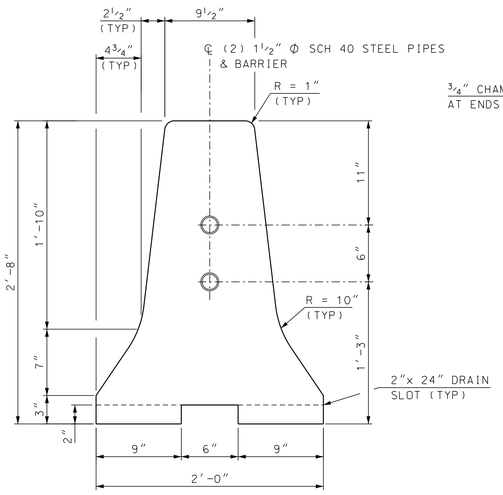
	BY	DATE		BY	DATE
DESIGNED	NHDOT	7/12	CHECKED	ABH	8/12
DRAWN	PJP	8/12	CHECKED	ABH	8/12
QUANTITIES			CHECKED		
ISSUE DATE	8/15/12				
REV. DATE	5/15/18				

FILE NUMBER: 19-1-5

FEDERAL PROJECT NO.: X-A004(559)

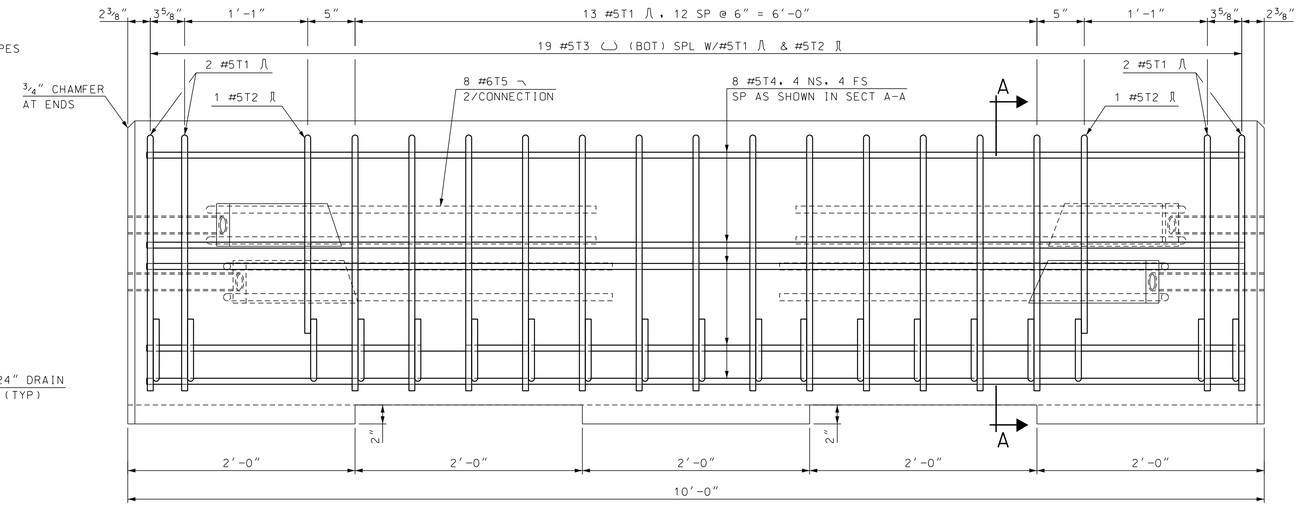
SHEET NO.: 50

TOTAL SHEETS: 110



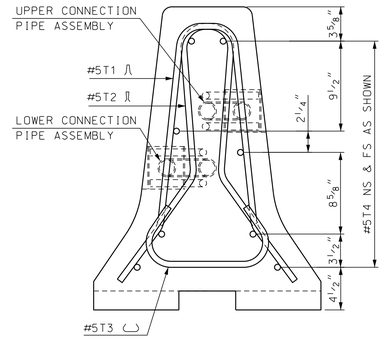
END VIEW

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



ELEVATION

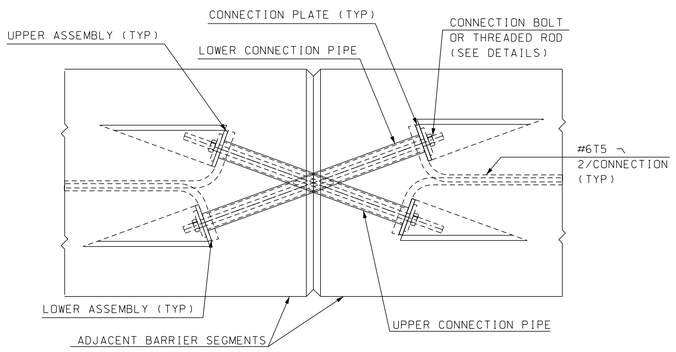
SCALE: 1 1/2" = 1'-0"



SECTION A-A

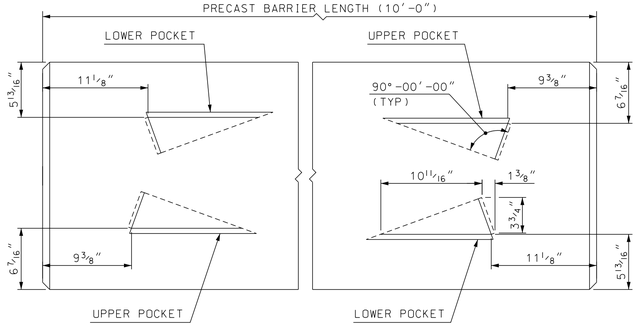
SCALE: 1 1/2" = 1'-0"

NOTE: CONNECTION HARDWARE SHALL NOT EXTEND BEYOND THE CONCRETE FACE OF BARRIER



TYPE X JOINT CONNECTION DETAILS

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



TOP VIEW CONNECTION POCKETS

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

GENERAL NOTES:

1. PORTABLE CONCRETE BARRIER SHALL BE FURNISHED BY THE CONTRACTOR AND PAID FOR AS ITEM 606.41741, PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE). CONCRETE BARRIER AND ALL ATTACHMENTS SHALL BE FABRICATED IN ACCORDANCE WITH SPECIAL PROVISIONS. ALL BARRIER UNITS SHALL BE 10' LONG.
2. PORTABLE CONCRETE BARRIER DETAILS, AS SHOWN ON THESE PLANS, ARE IN COMPLIANCE WITH REQUIREMENTS PER UPDATED NCHRP REPORT 350 FOR TEST NO 3-11 (MASH TEST LEVEL 3), CRASH TESTED BY TEXAS A&M UNIVERSITY SYSTEM, MAY 2005, AND ACCEPTED PER REPORT FHWA/TX-05/0-4692-1.
3. THE BARRIER HAS BEEN CRASH TESTED WITH A 27" DYNAMIC DEFLECTION WHICH WILL ALLOW THE BARRIER TO BE PLACED A MINIMUM 12" FROM THE EDGE OF THE DECK.
4. USAGE OF THE TEXAS X-BOLT BARRIER REQUIRES A MINIMUM OF 100 LINEAR FEET (10 - 10' UNITS). THE X-BOLT BARRIER SHALL EXTEND A MINIMUM OF 50' BEYOND THE BRIDGE AT EACH END, PARALLEL TO THE ROADWAY CENTERLINE. THE ENDS OF THE BARRIER SHALL CONNECT TO THE TRANSITION UNIT AND THEN TO NHDOT PCB FLARED OUT THE REQUIRED CLEAR ZONE AS SHOWN ON SHEET 2 OF 3.
5. THE CONNECTION BOLTS AT THE BARRIER JOINTS SHALL BE TIGHTENED TO THE "TURN OF THE NUT" METHOD IN ACCORDANCE WITH SECTION 550.3.11.6.4 OF NHDOT STANDARD SPECIFICATIONS. AFTER INSTALLATION, ALL X-BOLT JOINTS SHALL BE CHECKED BY THE CONTRACT ADMINISTRATOR CONFIRMING THEY MEET THE TIGHTENED REQUIREMENT.
6. THE TEXAS X-BOLT BARRIER MAY BE INSTALLED WITH A 125' MINIMUM RADIUS OF CURVATURE AND A RELATIVE ANGLE OF 4 DEGREES BETWEEN THE 10' UNITS.
7. THE CONTRACTOR SHALL FURNISH AND INSTALL APPROVED RETROREFLECTIVE DELINEATORS AT 25-FOOT INTERVALS ALONG TOP AND/OR ONE FOOT DOWN THE SIDE OF PORTABLE CONCRETE BARRIER. SUBSIDIARY TO ITEM 606.41741 (SEE STANDARD NO. DL-1 OF NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION). THE COLOR OF THE DELINEATORS SHALL, IN ALL INSTANCES, CONFORM TO THE COLOR OF THE EDGE LINE MARKINGS. DELINEATOR SUPPLEMENT, BUT DO NOT REPLACE, THE NEED FOR RETROREFLECTIVE SOLID EDGE LINE MARKINGS.

MATERIAL NOTES:

1. BARRIERS SHALL BE LIGHT COLORED CLASS AA CONCRETE, WITH COMPRESSIVE STRENGTH OF 4000 psi, AND SHALL HAVE A SMOOTH UNIFORM SURFACE FREE OF DEFECTS AND IRREGULARITIES. CASTING DATE SHALL BE SHOWN ON BARRIER. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.
2. ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615) GRADE 60. ALL REINFORCEMENT SHALL HAVE 1 3/4" MINIMUM CLEAR COVER, UNLESS OTHERWISE NOTED.
3. CONNECTION BOLTS SHALL BE 7/8" Φ GALVANIZED HIGH STRENGTH THREADED RODS CONFORMING TO ASTM A325. STEEL PIPES, PLATE WASHERS, AND CONNECTION PLATES SHALL BE GALVANIZED ASTM A36 STEEL.
4. ALL STEEL FOR CONNECTIONS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

BARRIER WEIGHT APPROX. 2.38 TONS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

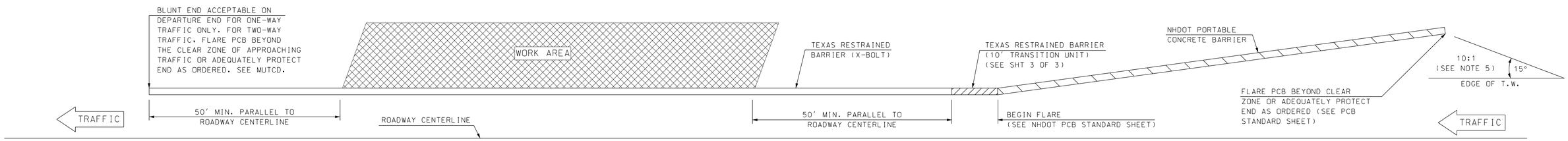
TEXAS RESTRAINED BARRIER (X-BOLT) (1 OF 3)

BRIDGE SHEET 34 OF 48

FILE NUMBER 19-1-5

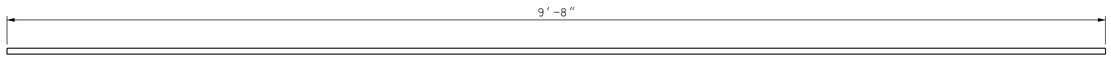
REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
ISSUE DATE	5/15/18	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)		51	110

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED



PLAN - BARRIER LAYOUT

(NTS)



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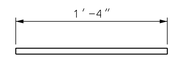

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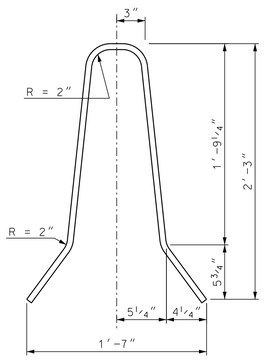

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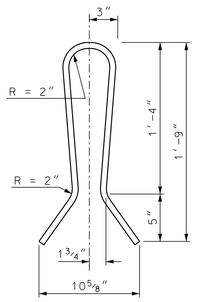

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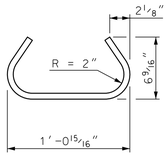

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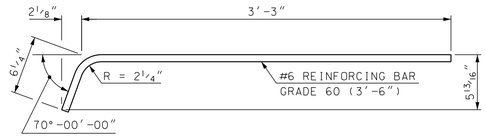

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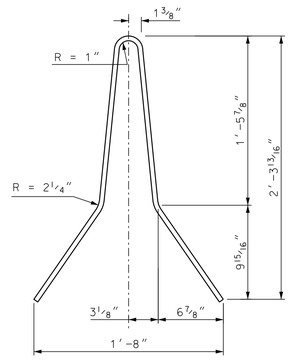

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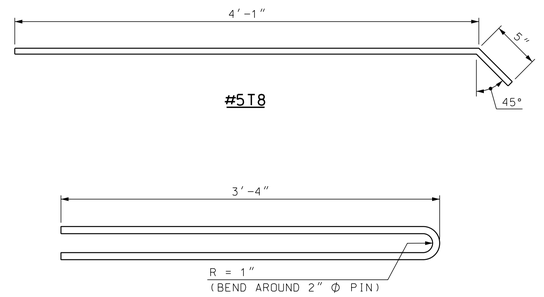
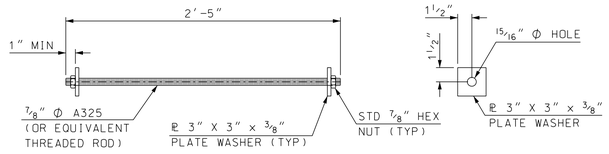


#5T8

#6T9

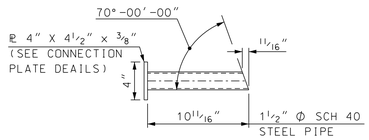
BENDING SCHEDULE

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



CONNECTION BOLT OR THREADED ROD DETAILS

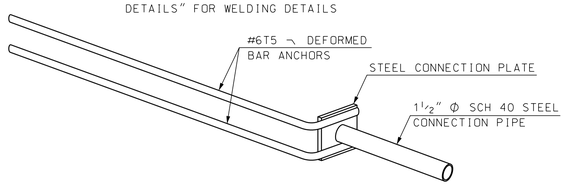
SCALE: 1 1/2" = 1'-0"



UPPER CONNECTION PIPE DETAIL

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

NOTE: SEE "CONNECTION PLATE DETAILS" FOR WELDING DETAILS



ISOMETRIC VIEW OF TYPICAL WELD ASSEMBLY

SCALE: N.T.S.

REBAR SCHEDULE TEXAS X-BOLT (10' BARRIER)			
MK		QTY	LENGTH
T1	#5	17	5'-2"
T2	#5	2	4'-0"
T3	#5	19	2'-1"
T4	#5	8	9'-8"
T5	#6	8	3'-9"

REBAR SCHEDULE TRANSITION (10' BARRIER)			
MK		QTY	LENGTH
T1	#5	9	5'-2"
T2	#5	1	4'-0"
T3	#5	10	2'-1"
T4	#5	8	9'-8"
T5	#6	4	3'-9"
T6	#4	4	5'-2"
T7	#5	4	1'-4"
T8	#5	2	4'-6"
T9	#6	3	6'-10"

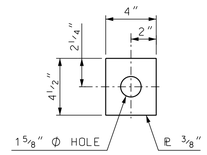
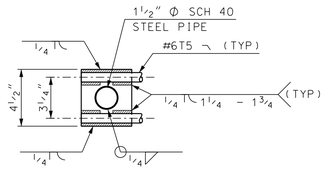


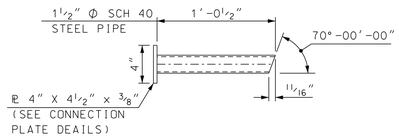
PLATE DIMENSIONS



WELDING DETAILS

CONNECTION PLATE DETAILS

SCALE: 2" = 1'-0"



LOWER CONNECTION PIPE DETAIL

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

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER US ROUTE 4

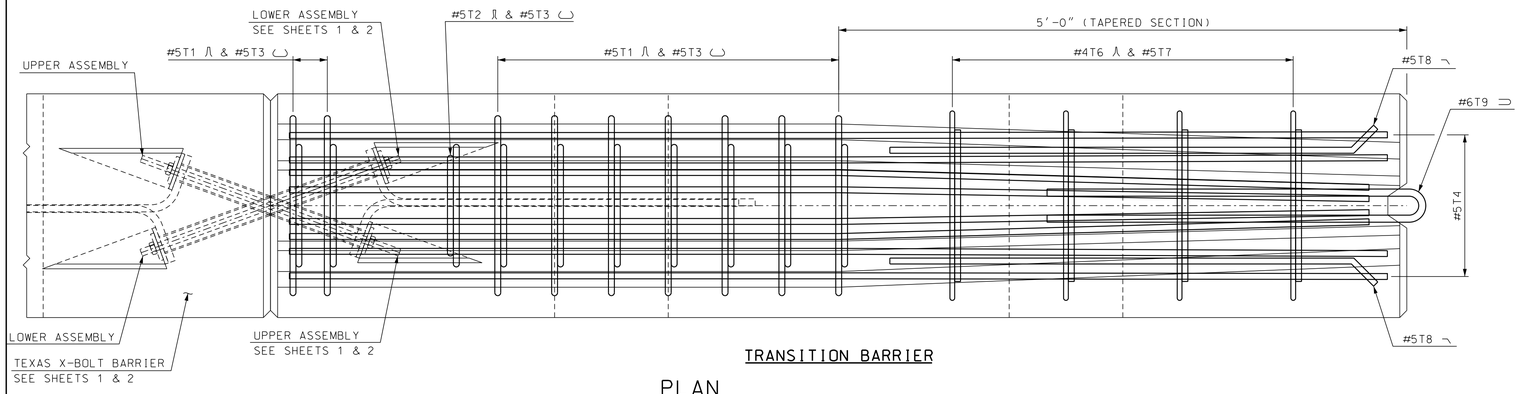
TEXAS RESTRAINED BARRIER (X-BOLT) (2 OF 3)

BRIDGE SHEET 35 OF 48

FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
	DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
	QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
	ISSUE DATE	5/15/18	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		X-A004(559)		52	110

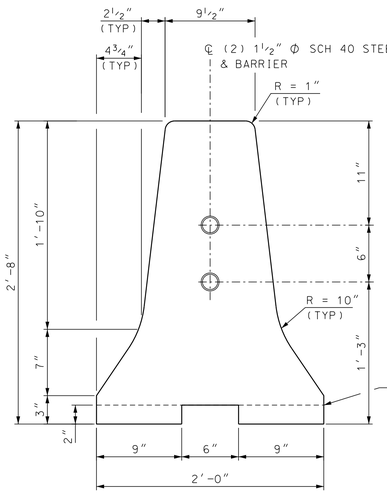
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED



TRANSITION BARRIER

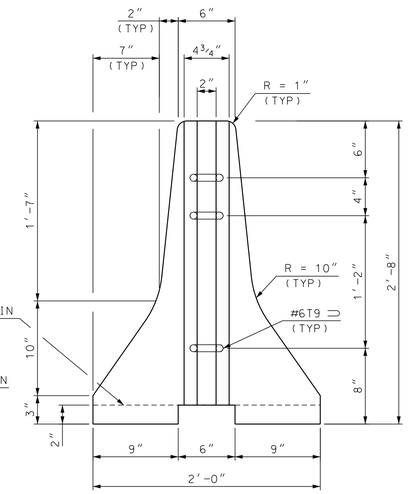
PLAN

SCALE: 1½" = 1'-0"



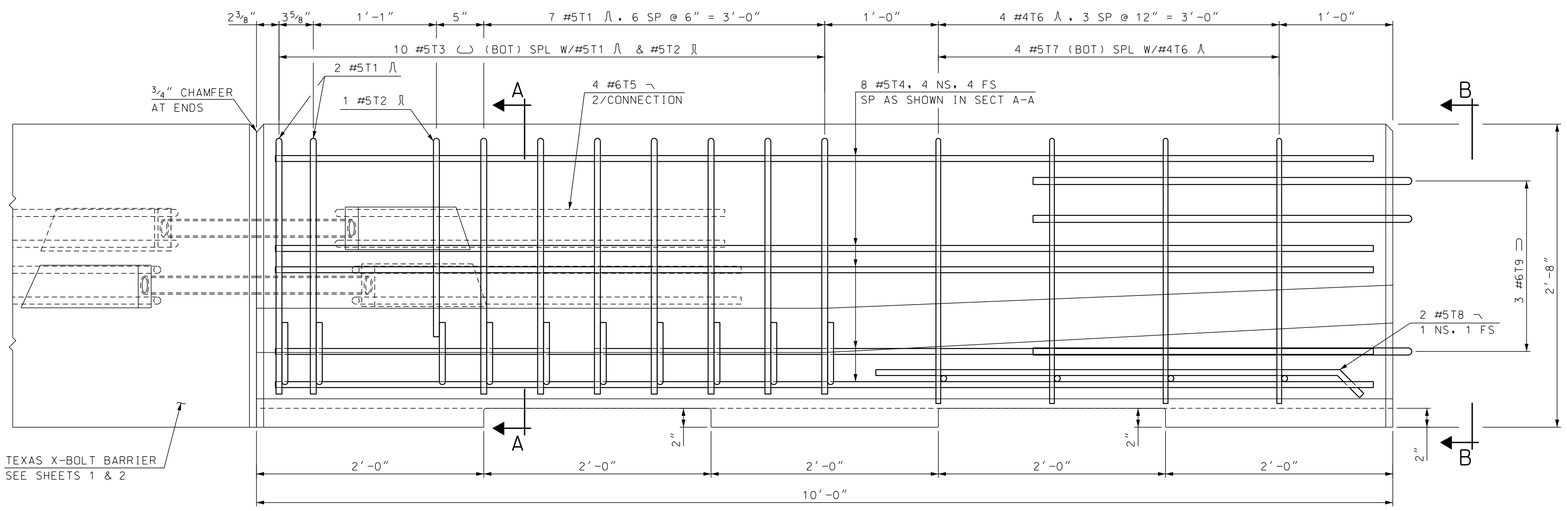
END VIEW SECTION A-A

SCALE: 1½" = 1'-0"



VIEW B-B

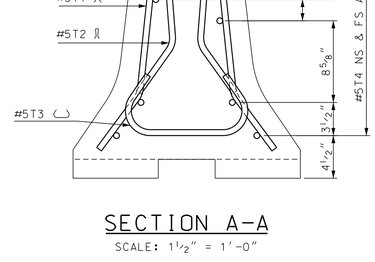
SCALE: 1½" = 1'-0"



TRANSITION BARRIER

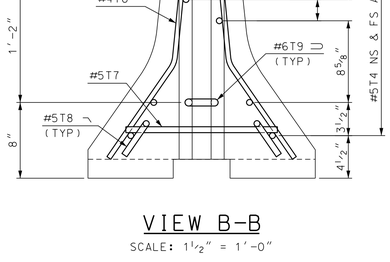
ELEVATION

SCALE: 1½" = 1'-0"



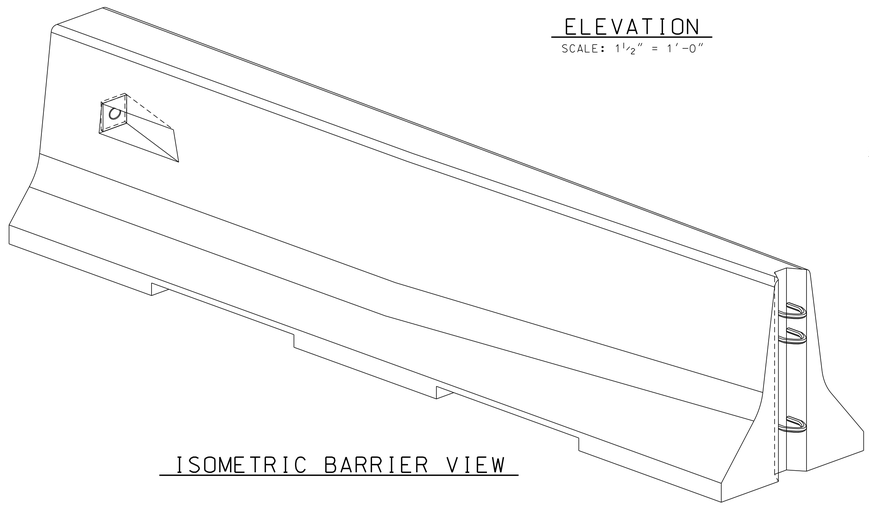
SECTION A-A

SCALE: 1½" = 1'-0"

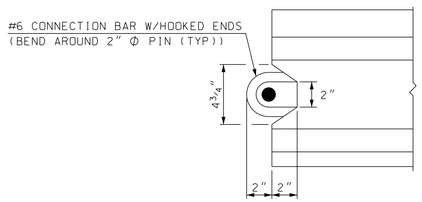


VIEW B-B

SCALE: 1½" = 1'-0"

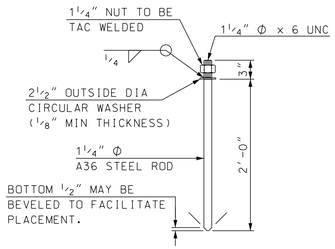


ISOMETRIC BARRIER VIEW



END NOTCH DETAIL (AT VIEW B-B

SCALE: 2" = 1'-0"



CONNECTOR PIN ASSEMBLY

SCALE: 1" = 1'-0"

NOTES

1. TEXAS RESTRAINED BARRIER (TRANSISTION UNIT) SHALL BE PAID FOR UNDER ITEM 606.41741, PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE).
2. SEE SHEET 1 OF 3 FOR NOTES AND SHEET 2 OF 3 FOR REBAR SCHEDULE.

BARRIER WEIGHT APPROX. 2.28 TONS

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. STATE PROJECT 41191

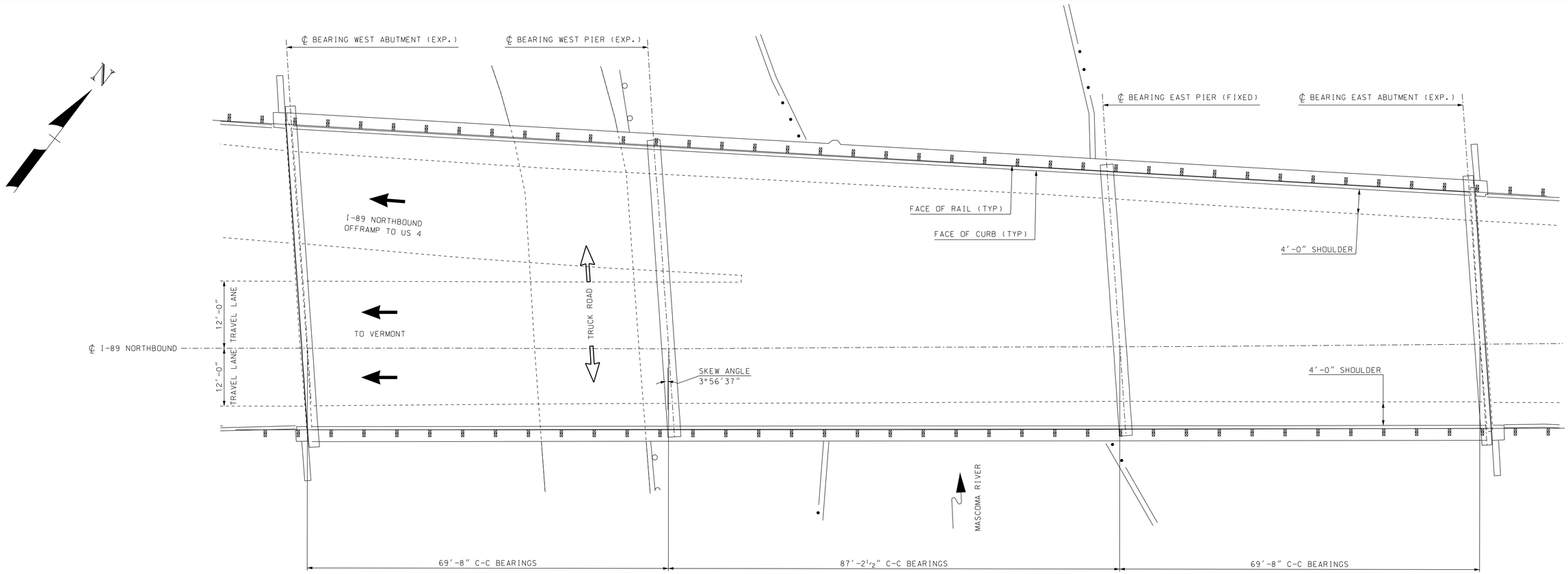
LOCATION INTERSTATE 89 OVER US ROUTE 4

TEXAS RESTRAINED BARRIER (X-BOLT) (3 OF 3)

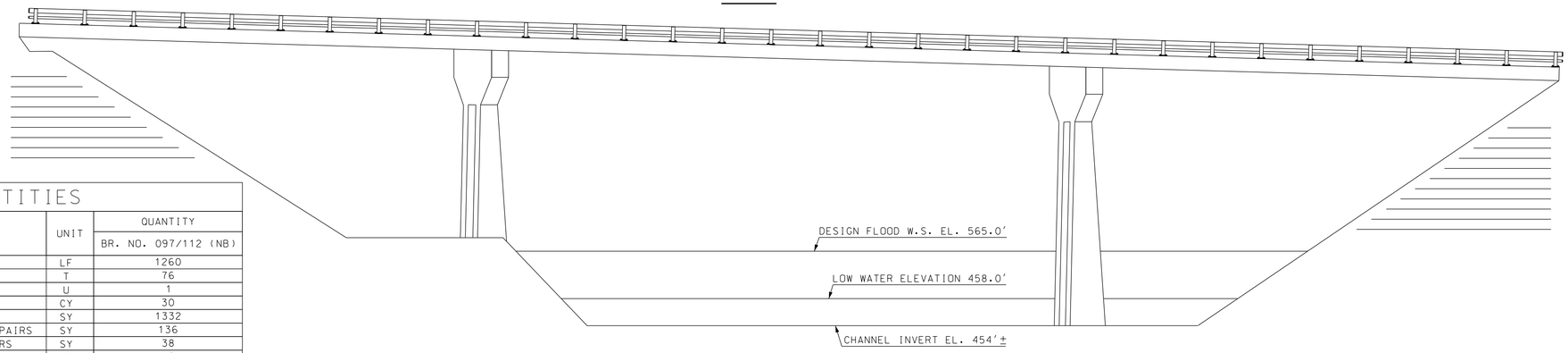
BRIDGE SHEET 36 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
	DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
	QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
	ISSUE DATE	5/15/18	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		X-A004(559)		53	110

FILE NUMBER 19-1-5



PLAN



ELEVATION

SUMMARY OF BRIDGE QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY BR. NO. 097/112 (NB)
**	403.61	PAVEMENT JOINT ADHESIVE (BRIDGE BASE)	LF	1260
**	403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE	T	76
	502.103	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	1
**	504.1	COMMON BRIDGE EXCAVATION (F)	CY	30
	511.0001	CONCRETE BRIDGE DECK PAVEMENT REMOVAL (F)	SY	1332
**	511.02	PREPARATION FOR PARTIAL DEPTH CONCRETE BRIDGE DECK REPAIRS	SY	136
**	511.03	PREPARATION FOR FULL DEPTH CONCRETE BRIDGE DECK REPAIRS	SY	38
**	520.01	CONCRETE CLASS AA	CY	16
**	520.0102	CONCRETE CLASS AA (QC/QA) (F)	CY	18
**	520.0201	CONCRETE CLASS AA, ABOVE FOOTINGS	CY	9
**	534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	34
**	538.2	BARRIER MEMBRANE, PEEL AND STICK - VERTICAL SURFACES (F)	SY	40
**	538.6	BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F)	SY	1340
**	540.511	GALVANIC CORROSION PROTECTION SYSTEM (DISTRIBUTED ANODES)	LF	122
**	540.512	GALVANIC CORROSION PROTECTION SYSTEM (DISCRETE ANODES)	EA	276
**	541.5	PVC WATERSTOPS, NH TYPE 5 (F)	LF	114
**	544.31	REINFORCING STEEL, EPOXY COATED (CONTRACTOR DETAILED)	LB	2970
	550.19101	TEMPORARY GIRDER SUPPORT SYSTEM	U	1
**	550.202	BRIDGE SHOES (F)	EA	18
	556.101	PAINTING EXISTING STRUCTURAL STEEL	U	1
	561.1002	PREFABRICATED STRIP SEAL EXPANSION JOINT (F)	LF	114
**	562.1	SILICONE JOINT SEALANT (F)	LF	109
**	606.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - BRIDGE	LF	660
	1002.1	REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES	$	*
	1010.15	FUEL ADJUSTMENT	$	*
	1010.43	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) FOR CONCRETE	$	*

* NOT A BID ITEM
** NOT AN ITEM TOTAL

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
MR NB/PRELIM	41191_MR_NB_GenPlan	1" = 10'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

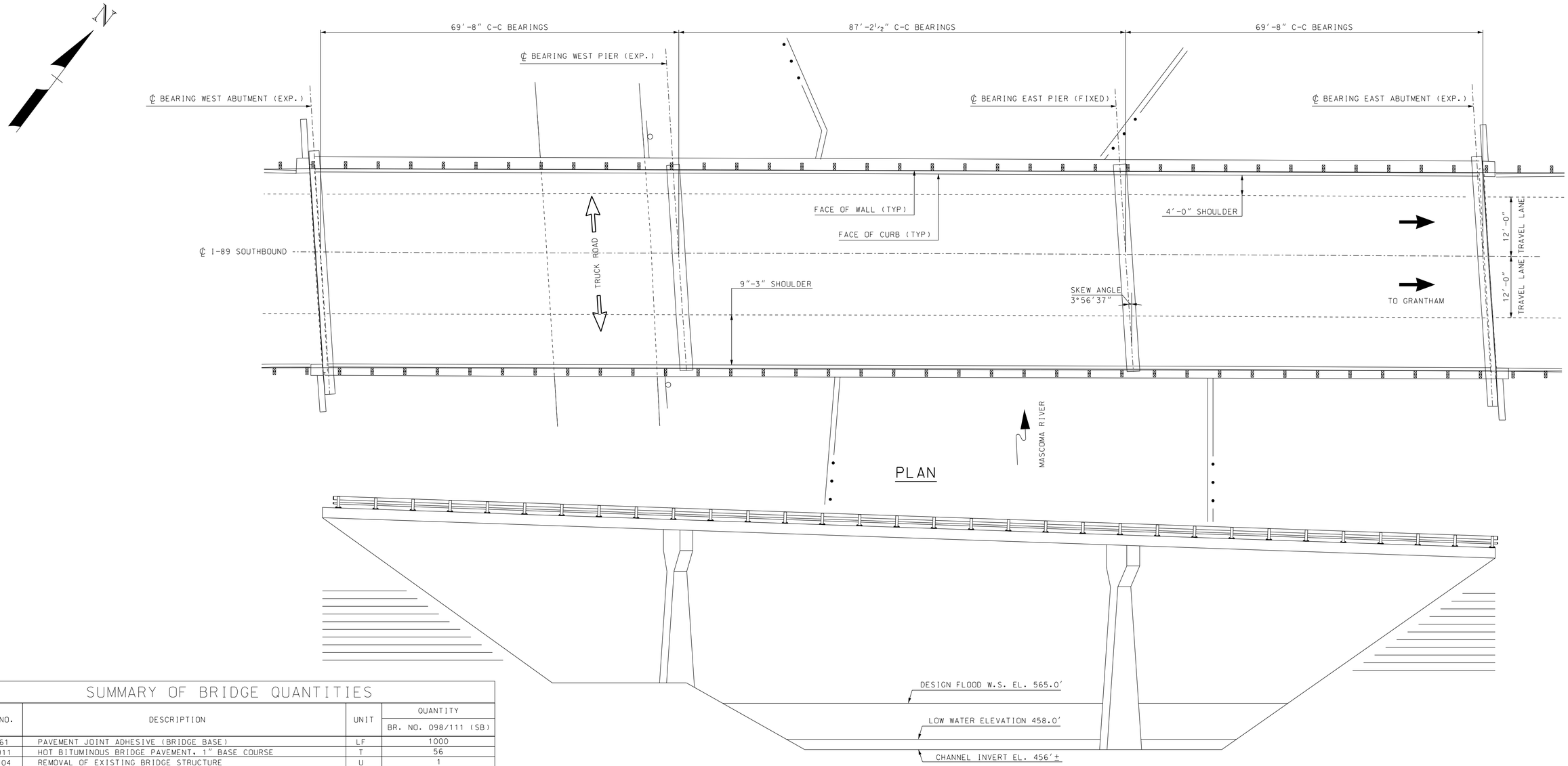
GENERAL PLAN AND ELEVATION (NB)

BRIDGE SHEET 37 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	BAW	7/18	CHECKED	TPL	7/18
	DRAWN	MD	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

FILE NUMBER 19-1-5

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	54	110



SUMMARY OF BRIDGE QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY BR. NO. 098/111 (SB)
**	403.61	PAVEMENT JOINT ADHESIVE (BRIDGE BASE)	LF	1000
**	403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1″ BASE COURSE	T	56
	502.104	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	1
**	504.1	COMMON BRIDGE EXCAVATION (F)	CY	30
	511.0002	CONCRETE BRIDGE DECK PAVEMENT REMOVAL (F)	SY	970
**	511.02	PREPARATION FOR PARTIAL DEPTH CONCRETE BRIDGE DECK REPAIRS	SY	243
**	511.03	PREPARATION FOR FULL DEPTH CONCRETE BRIDGE DECK REPAIRS	SY	30
**	520.01	CONCRETE CLASS AA	CY	16
**	520.0102	CONCRETE CLASS AA (QC/QA) (F)	CY	14
**	520.0201	CONCRETE CLASS AA, ABOVE FOOTINGS	CY	9
**	534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	33
**	538.2	BARRIER MEMBRANE, PEEL AND STICK - VERTICAL SURFACES (F)	SY	30
**	538.6	BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F)	SY	970
**	540.511	GALVANIC CORROSION PROTECTION SYSTEM (DISTRIBUTED ANODES)	LF	89
**	540.512	GALVANIC CORROSION PROTECTION SYSTEM (DISCRETE ANODES)	EA	276
**	541.5	PVC WATERSTOPS, NH TYPE 5 (F)	LF	85
**	544.31	REINFORCING STEEL, EPOXY COATED (CONTRACTOR DETAILED)	LB	2300
	550.19102	TEMPORARY GIRDER SUPPORT SYSTEM	U	1
**	550.202	BRIDGE SHOES (F)	EA	12
	556.102	PAINTING EXISTING STRUCTURAL STEEL	U	1
	561.1003	PREFABRICATED STRIP SEAL EXPANSION JOINT (F)	LF	85
**	562.1	SILICONE JOINT SEALANT (F)	LF	81
**	606.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - BRIDGE	LF	330
	1002.1	REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES	$	*
	1010.15	FUEL ADJUSTMENT	$	*
	1010.44	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) FOR CONCRETE	$	*

* NOT A BID ITEM
** NOT AN ITEM TOTAL

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
MR SB/PRELIM	41191_MR_SB_GenPlan	1" = 10'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 098/111 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MACOMA RIVER

GENERAL PLAN AND ELEVATION (SB)

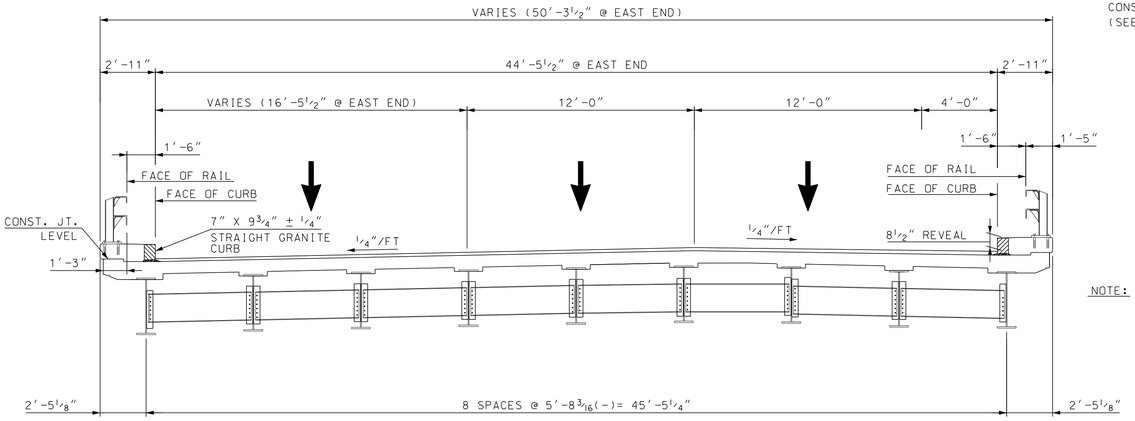
BRIDGE SHEET 38 OF 48

FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL				BY	DATE		BY	DATE
			DESIGNED	BAW	7/18	CHECKED	TPL	7/18
			DRAWN	MD	7/18	CHECKED	TPL	7/18
			QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

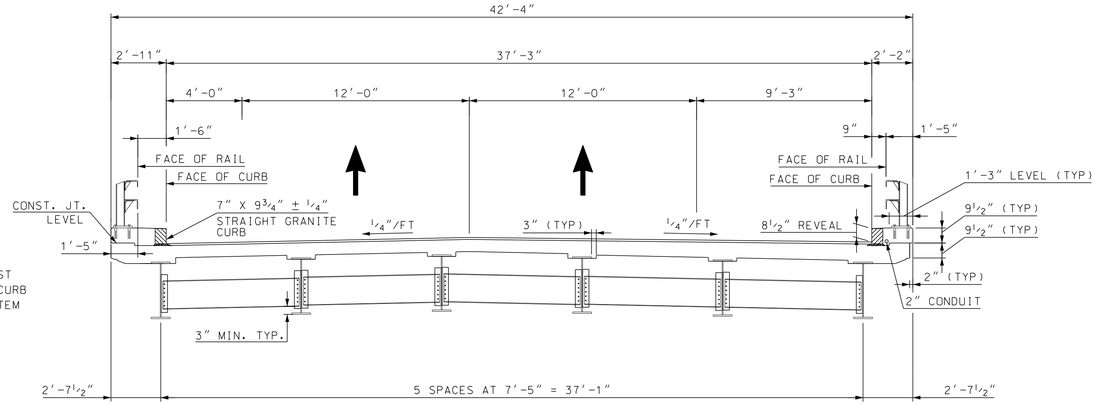
ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	55	110

NOTE: THE PRESERVATION CONSTRUCTION WORK FOR THE I-89 BRIDGES OVER MASCOMA RIVER SHALL OCCUR BETWEEN PHASES 2 & 3 OF THE I-89 BRIDGES OVER U.S. ROUTE 4 CONSTRUCTION. PRIOR TO NB TRAFFIC DIVERSION (SEE BRIDGE SHEET 14).



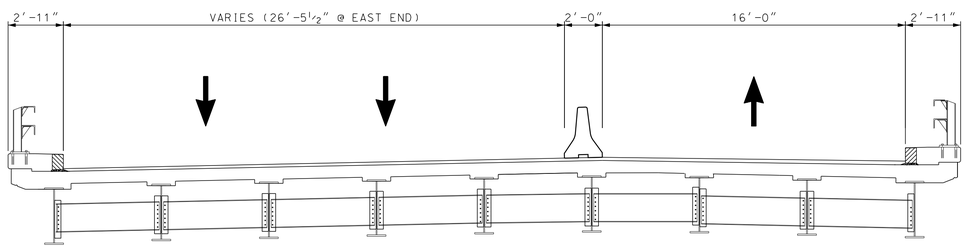
EXISTING BRIDGE SECTION - NB

NOTE: APPLY ITEM 403.61 AGAINST RECONSTRUCTED CONCRETE CURB PRIOR TO CONSTRUCTING ITEM 403.911 (TYP)



EXISTING BRIDGE SECTION - SB

PHASE 1 TRAFFIC - NB & SB

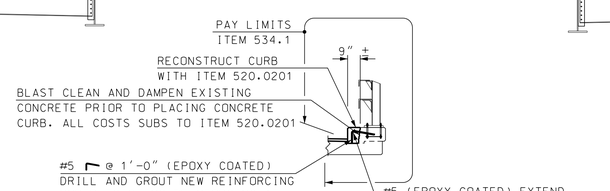


PHASE 2 TRAFFIC - NB & SB

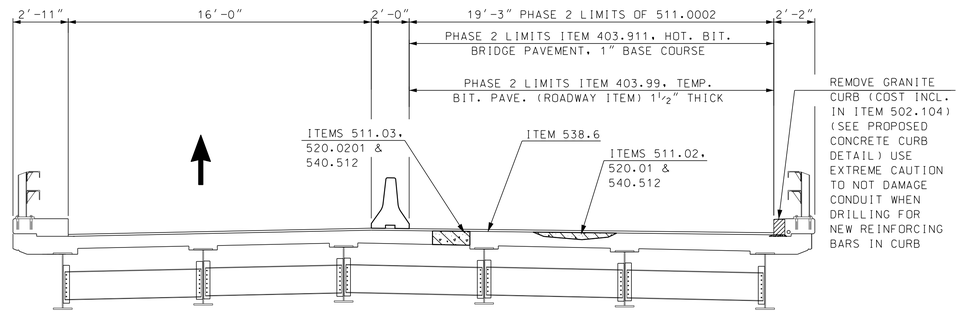
PHASE 1 CONSTRUCTION

PHASE 1 TRAFFIC - SB

PHASE 2 TRAFFIC - NB & SB



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



PHASE 2 TRAFFIC - SB

PHASE 2 CONSTRUCTION

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/MR SB/Prelim	41191TYPSECT_MR1	1/4" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 098/111 & 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

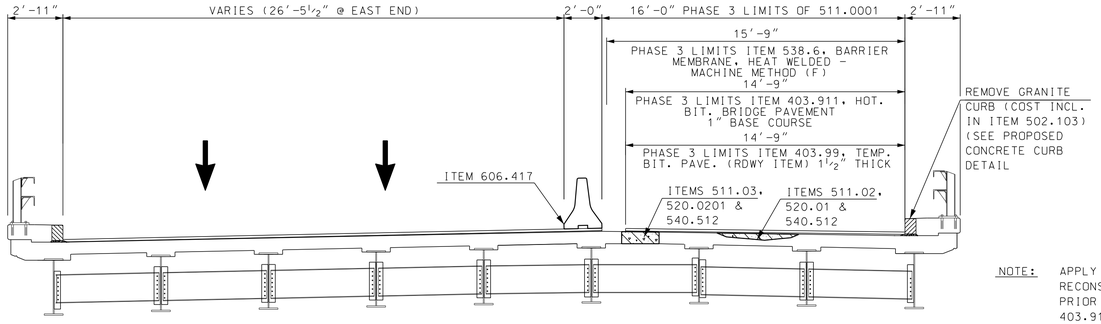
TRANSVERSE SECTIONS (1 OF 2)

BRIDGE SHEET: 39 OF 48

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	BAW	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	BAW	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	56	110

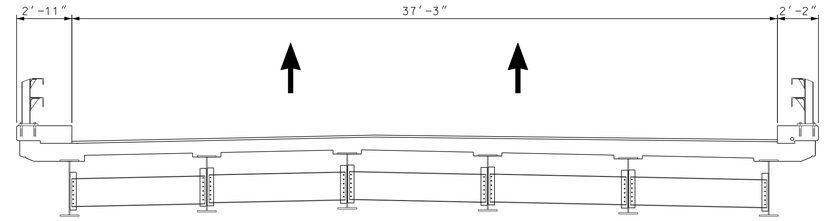
FILE NUMBER: 19-1-5



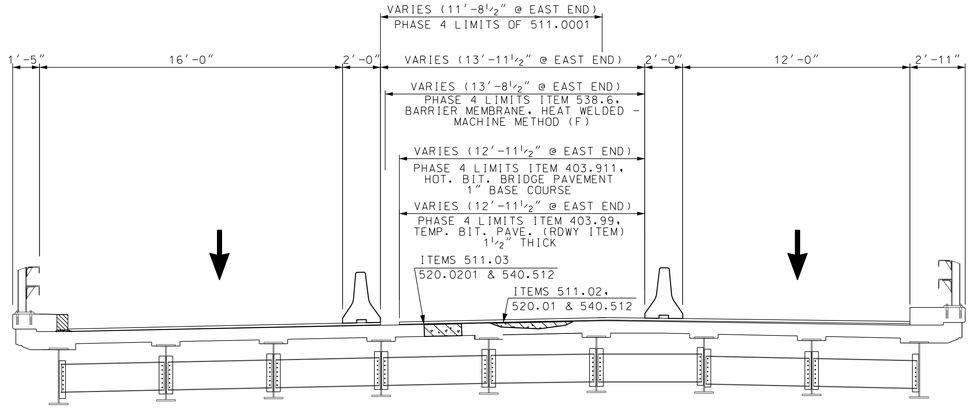
PHASE 3 TRAFFIC – NB

PHASE 3 CONSTRUCTION

NOTE: APPLY ITEM 403.61 AGAINST RECONSTRUCTED CONCRETE CURB PRIOR TO CONSTRUCTING ITEM 403.911 (TYP)



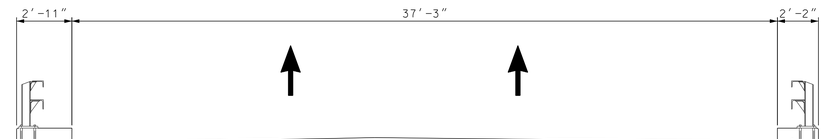
PHASE 3 TRAFFIC – SB



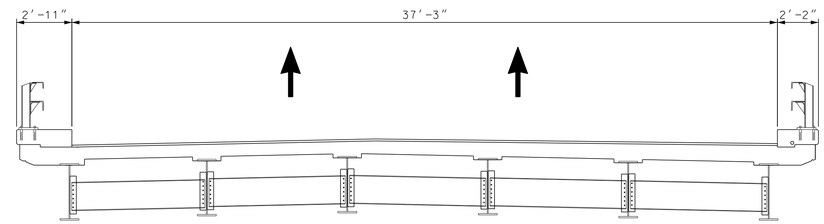
PHASE 4 TRAFFIC – NB

PHASE 4 CONSTRUCTION

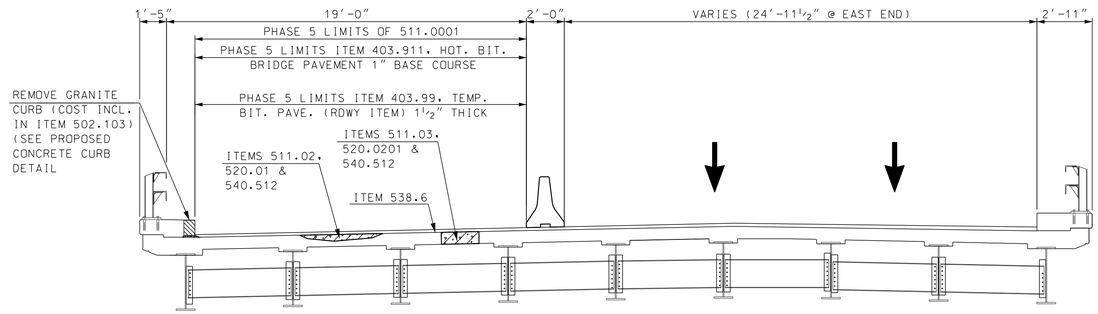
PHASE 4 TRAFFIC – NB



PHASE 4 TRAFFIC – SB



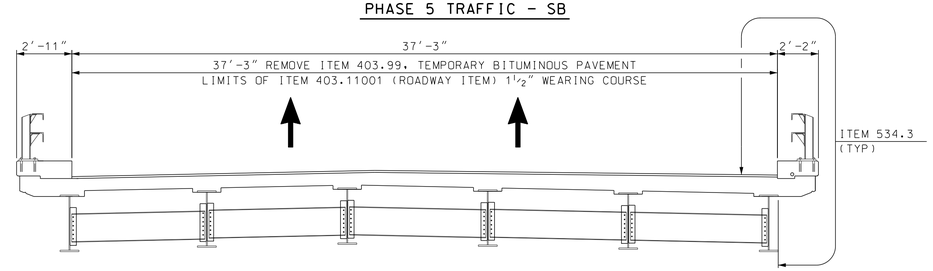
PHASE 5 TRAFFIC – SB



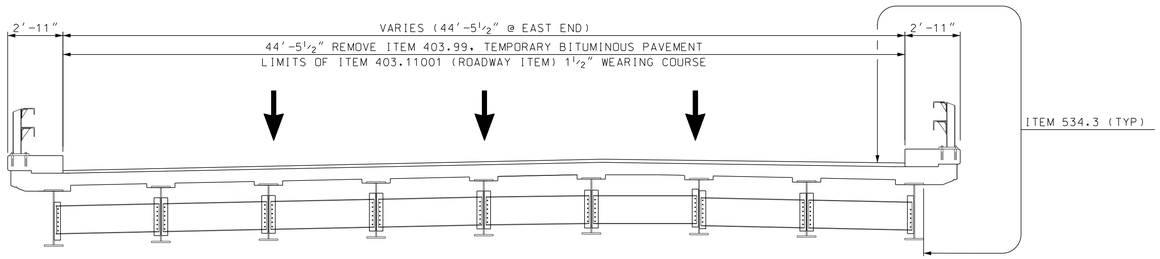
NOTE: NB OFF RAMP CLOSED DURING PHASE 5 CONSTRUCTION

PHASE 5 CONSTRUCTION

PHASE 5 TRAFFIC – NB



FINAL – SB



FINAL – NB

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRC/MR SB/Prelim	41191TYPSECT_MR2	¼″ = 1′-0″

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 098/111 & 097/112 STATE PROJECT 41191

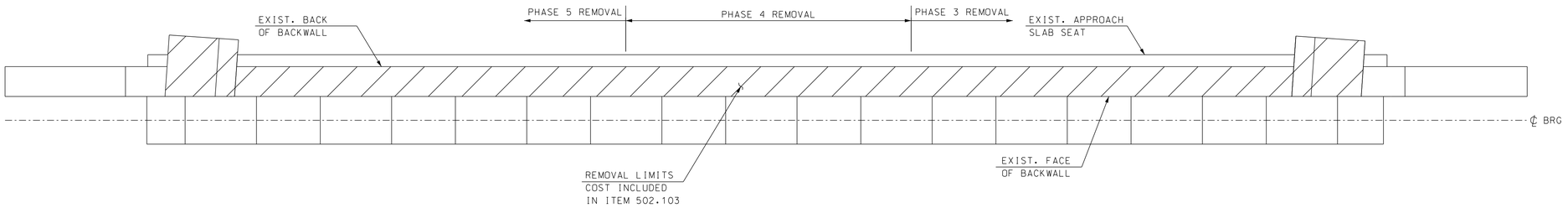
LOCATION INTERSTATE 89 OVER MASCOMA RIVER

TRANSVERSE SECTIONS (2 OF 2)

BRIDGE SHEET 40 OF 48

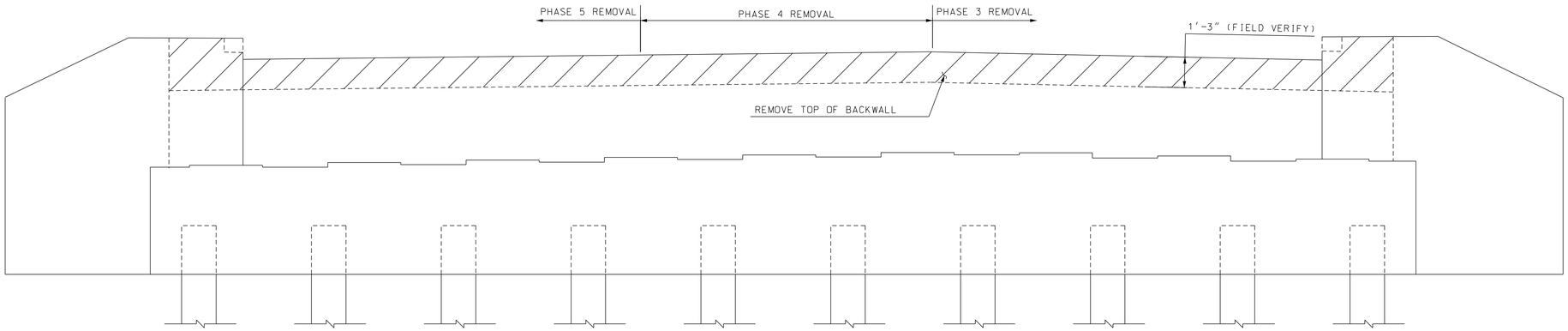
FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	BAW	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	BAW	7/18
	ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		X-A004(559)		57	110



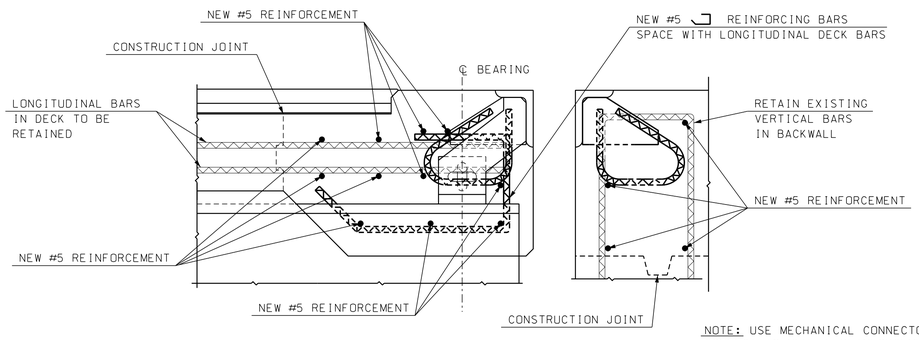
PLAN - EAST ABUTMENT BACKWALL REMOVAL LIMITS (097/112)

SCALE: $^{3}/_{8}$"=1'-0"



ELEVATION - EAST ABUTMENT BACKWALL REMOVAL LIMITS (097/112)

SCALE: $^{3}/_{8}$"=1'-0"



RECONSTRUCTION SECTION

SCALE: $1^{1}/_{2}$"=1'-0"

NOTE: USE MECHANICAL CONNECTORS AT PHASE CONSTRUCTION JOINTS TO CONNECT TO NEW #5 REINFORCEMENT SHOWN IN RECONSTRUCTION SECTION. MALE AND FEMALE MECHANICAL CONNECTORS TO EXTEND 3'-3" PAST CONSTRUCTION JOINT (SIMILAR TO DETAIL A ON BRIDGE SHEET 24). RECONSTRUCTION SECTION TYPICAL FOR WEST ABUTMENT, AS WELL.

NOTE: ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE) SHALL BE APPLIED TO THE ABUTMENT FROM THE BOTTOM OF THE DECK TO GRADE, THE ENTIRE BRIDGE SEAT, AND THE EXPOSED WINGWALL SURFACES TO GRADE. EXISTING CONCRETE SURFACES SHALL BE LIGHT BLAST-CLEANED PRIOR TO WATER REPELLENT APPLICATION.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER41191	BackWall_NB_East_Abutment	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

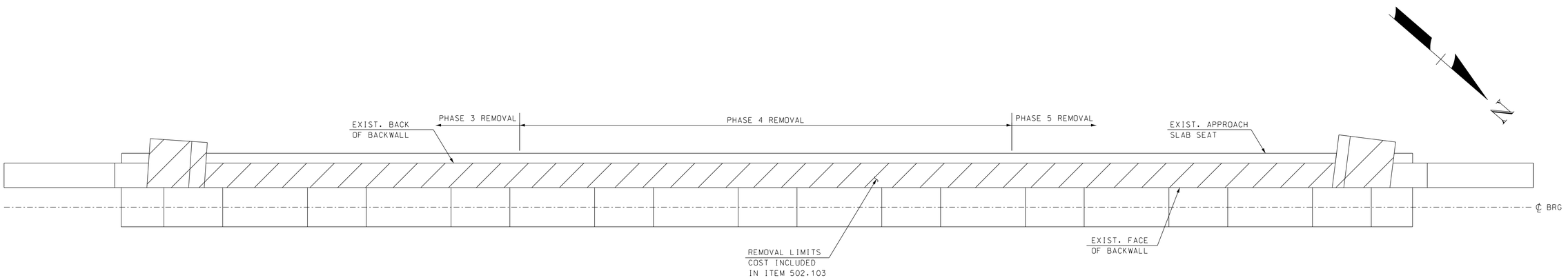
BACKWALL & PILASTER RECONSTRUCTION (1 OF 2)

BRIDGE SHEET: 41 OF 48

FILE NUMBER: 19-1-5

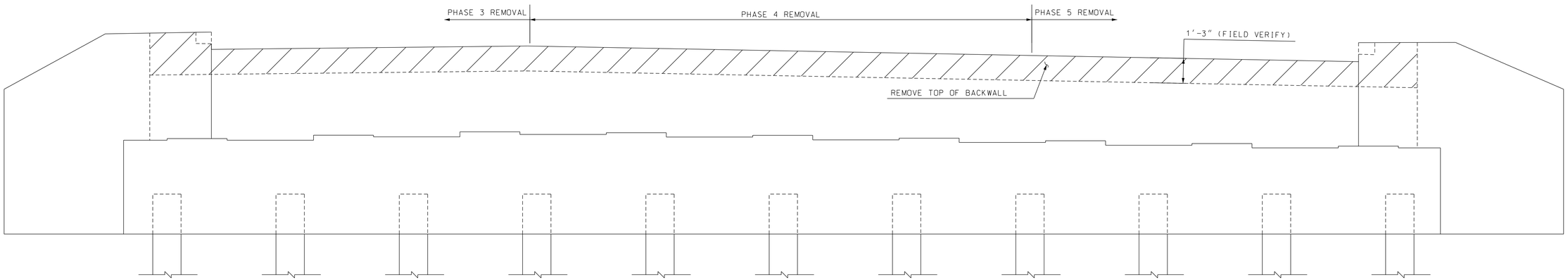
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	58	110



PLAN - WEST ABUTMENT BACKWALL REMOVAL LIMITS (097/112)

SCALE: $^{3}/_{8}$"=1'-0"



ELEVATION - WEST ABUTMENT BACKWALL REMOVAL LIMITS (097/112)

SCALE: $^{3}/_{8}$"=1'-0"

NOTE: ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE) SHALL BE APPLIED TO THE ABUTMENT FROM THE BOTTOM OF THE DECK TO GRADE, THE ENTIRE BRIDGE SEAT, AND THE EXPOSED WINGWALL SURFACES TO GRADE. EXISTING CONCRETE SURFACES SHALL BE LIGHT BLAST-CLEANED PRIOR TO WATER REPELLENT APPLICATION.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

BACKWALL & PILASTER RECONSTRUCTION (2 OF 2)

BRIDGE SHEET 42 OF 48

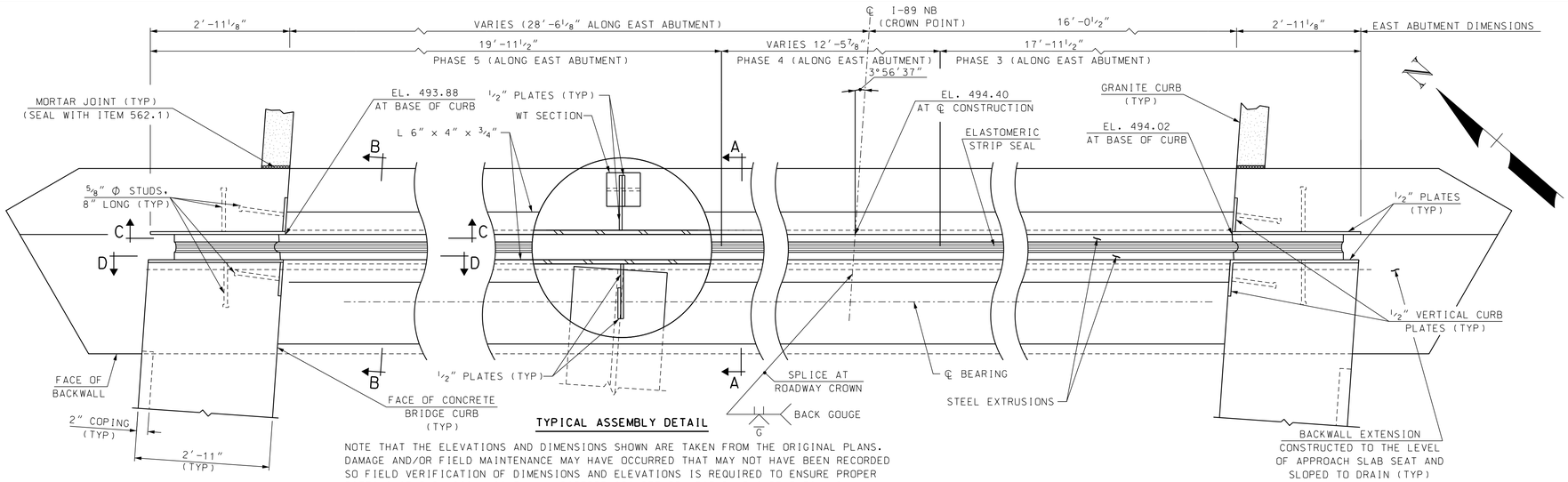
FILE NUMBER 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		X-A004(559)	59	110

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER\41191	BackWall_NB_West_Abutment	AS NOTED

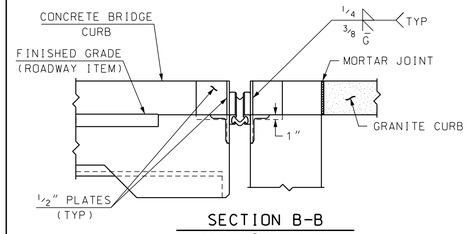


TYPICAL ASSEMBLY DETAIL

NOTE THAT THE ELEVATIONS AND DIMENSIONS SHOWN ARE TAKEN FROM THE ORIGINAL PLANS. DAMAGE AND/OR FIELD MAINTENANCE MAY HAVE OCCURRED THAT MAY NOT HAVE BEEN RECORDED SO FIELD VERIFICATION OF DIMENSIONS AND ELEVATIONS IS REQUIRED TO ENSURE PROPER FITTING OF EXPANSION JOINT. ANY DIFFERENCES BETWEEN FIELD MEASUREMENTS AND DESIGN PLANS SHALL BE NOTED ON THE SHOP DRAWINGS. ALSO, NOTE THAT THE FIELD SURVEY WAS DONE WITH A DIFFERENT DATUM THAN THE ORIGINAL PLANS.

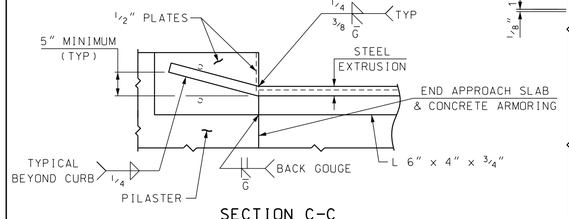
PLAN VIEW

SCALE: 1" = 1'-0"



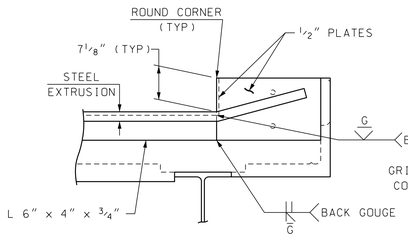
SECTION B-B

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



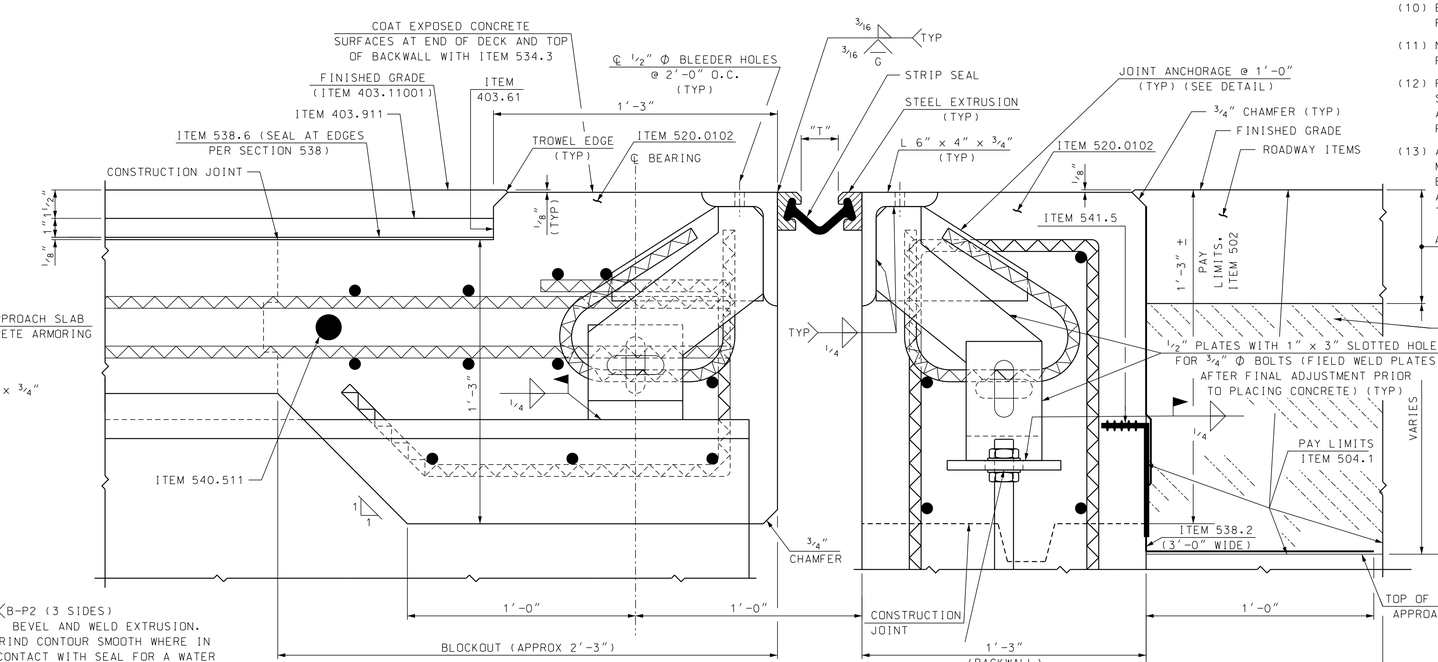
SECTION C-C

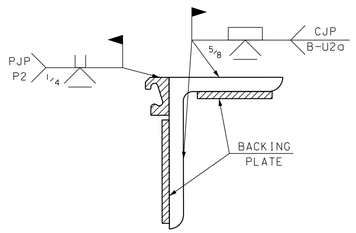
SCALE: 3/4" = 1'-0"



SECTION D-D

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





WT 7 x 19 x 5" LONG WITH A 1" x 3" SLOTTED HOLE FOR 3/4" Φ ADJUSTING BOLT.
USE DOUBLE NUT TO WT FLANGE (DRILL AND GROUT) (1'-0" MIN. EMBEDMENT)
(COST INCLUDED IN ITEM 561.1002)

SECTION A-A

SCALE: 3" = 1'-0"

FIELD SPLICE WELD DETAIL-STRIP SEAL

TEMPERATURE ADJUSTMENT TABLE	
TEMPERATURE	"T" EAST ABUTMENT
20°F	2"
35°F	1 15/16"
50°F	1 13/16"
65°F	1 3/4"
80°F	1 11/16"
95°F	1 9/16"

EXPANSION JOINT NOTES

(1) ALL EXPANSION JOINT STEEL, INCLUDING ANCHORS, SHALL BE GALVANIZED. STEEL ANGLES SHALL BE ASTM A572 GRADE 50. MINOR STEEL PLATES MAY CONFORM TO ASTM A36. THE ENTIRE ASSEMBLY, INCLUDING STRIP SEAL, SHALL BE PAID FOR AS ITEM 561.1002, PREFABRICATED STRIP SEAL EXPANSION JOINT (F).

(2) SPLICES FOR STEEL ANGLES SHALL DEVELOP FULL STRENGTH.

(3) EXPANSION JOINT OPENING SHALL BE ADJUSTED TO TEMPERATURE ANTICIPATED JUST PRIOR TO POURING DECK BLOCKOUT. FINAL SETTING IN THE FIELD SHALL BE DETERMINED BY THE CONTRACT ADMINISTRATOR. SEE TEMPERATURE ADJUSTMENT TABLE & NOTES.

(4) STRIP SEAL SHALL BE FURNISHED IN ONE CONTINUOUS LENGTH. NO SPLICES WILL BE ALLOWED. SEAL SHALL BE INSTALLED IN THE FIELD BY THE CONTRACTOR, IN ACCORDANCE WITH THE MANUFACTURER OF THE SEAL, USING AN APPROVED TOOL THAT WILL NOT DAMAGE THE SEAL.

(5) JOINT SUPPORT PLATES AND CURB PLATES SHALL BE SHOP WELDED TO EXPANSION JOINT STEEL AND SHALL BE NORMAL TO GRADE AFTER JOINT ASSEMBLY HAS BEEN ADJUSTED FOR ROADWAY CROSS-SLOPE AND GRADE. STEEL ANGLES AND EXTRUSIONS SHALL BE ASSEMBLED WITH A CONSTANT JOINT OPENING TO ENSURE PROPER PERFORMANCE AND WATER TIGHTNESS.

(6) THE EXPANSION JOINT ASSEMBLY SHALL BE INSTALLED ONLY AFTER BOTH ABUTMENTS HAVE BEEN BACKFILLED TO WITHIN 3'-0" OF FINISHED GRADE.

(7) IMMEDIATELY AFTER THE JOINT HAS BEEN SECURED TO THE STRUCTURAL STEEL AND BACKWALL, REMOVE SHIPPING DEVICES AND GRIND SMOOTH ANY WELDS ON EXPOSED SURFACES. REPAIR ANY DAMAGE TO GALVANIZED SURFACES IN ACCORDANCE WITH SECTION 550.

(8) PROTECT TOP OF EXPANSION JOINT DURING PLACEMENT OF CONCRETE AND BITUMINOUS PAVEMENT.

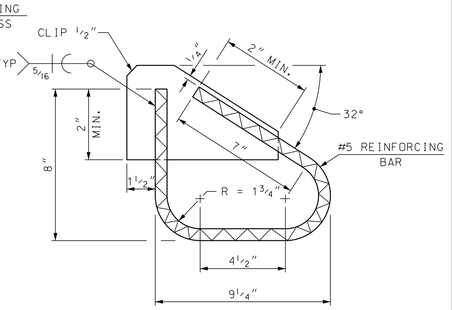
(9) THE STRIP SEAL HAS BEEN DESIGNED FOR A TOTAL FACTORED MOVEMENT OF 0.98 INCHES. DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE, SKEW, SHRINKAGE AND MINIMUM INSTALLATION WIDTH. THE CONTRACTOR SHALL USE AN SE-400 SEAL BY WATSON BOWMAN OR A2R-400 BY D.S. BROWN, AS NOTED IN THE QPL.

(10) ELEVATIONS SHOWN AT TOP OF ANGLES ARE 1/8" LOWER THAN PROPOSED FINISHED ROADWAY GRADE.

(11) NO "LOW PROFILE" STEEL EXTRUSIONS SHALL BE ALLOWED. SEE QPL FOR APPROVED PRODUCTS.

(12) PRIOR TO INSTALLING THE SEAL, ALL TEMPORARY FORM WORK SHALL BE REMOVED. STEEL ANGLES AND EXTRUSIONS SHALL BE MAINTAINED FREE FROM DIRT, WATER AND ANY OTHER LOOSE DEBRIS, WITH THE USE OF COMPRESSED AIR, TO ENSURE PROPER FIT OF THE SEAL. CARE SHALL BE TAKEN NOT TO DAMAGE GALVANIZED SURFACES.

(13) A TEMPORARY SEAL(S) SHALL BE INSTALLED PRIOR TO THE START OF THE WINTER MAINTENANCE PERIOD FOR ALL JOINT ASSEMBLIES OR PORTIONS THEREOF THAT WILL BE IN PLACE THROUGHOUT THE WINTER. ALL TEMPORARY SEALS SHALL BE REMOVED AND JOINT OPENINGS AND SUBSTRUCTURE SHALL BE CLEANED PRIOR TO INSTALLING THE FINAL SEAL. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 561.1001.



ANCHOR DETAIL (90° CROSSING)

SCALE: 3" = 1'-0"

TEMPERATURE ADJUSTMENT NOTES

1. "T" DIMENSIONS ARE PERPENDICULAR TO FACE OF BACKWALL.
2. MINIMUM "T" WIDTH FOR SEAL INSTALLATION = 1 3/4" (APPROXIMATELY 65°F OR LESS).
3. VALUES IN THE TEMPERATURE ADJUSTMENT TABLE ARE FOR SETTING THE EXPANSION JOINT ASSEMBLY IMMEDIATELY PRIOR TO POURING THE DECK BLOCKOUT.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/EXP-JTS	8191_EXP_JOINT_MR_NB_EAST	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

STRIP SEAL EXPANSION JOINT (EAST ABUTMENT)

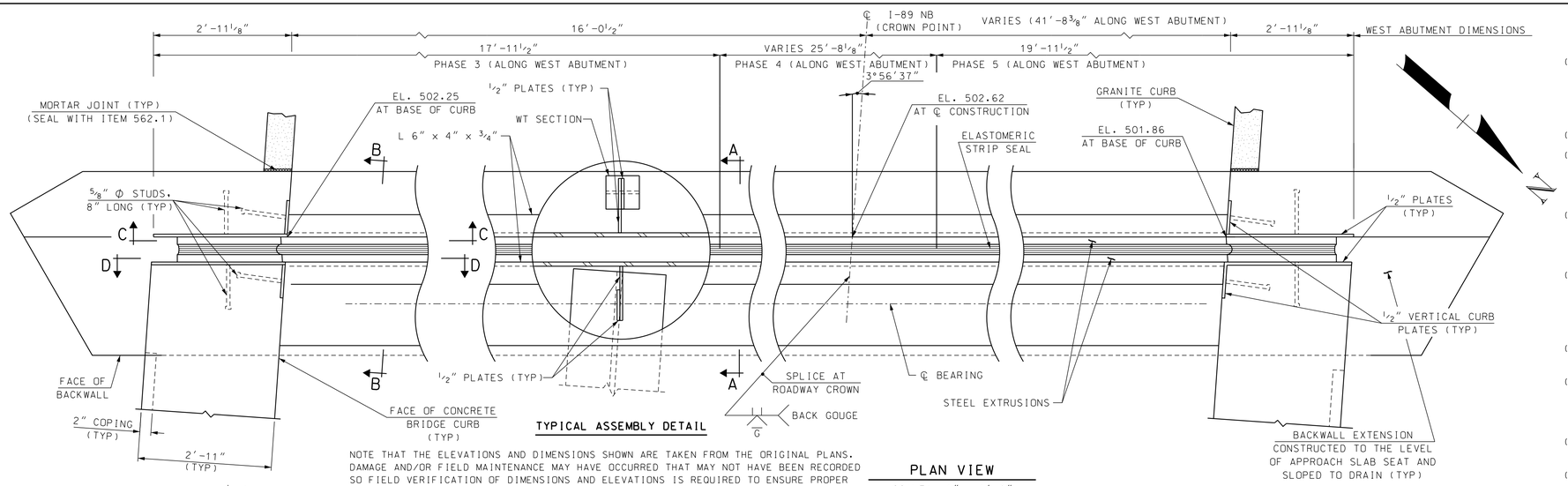
BRIDGE SHEET 43 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

FILE NUMBER 19-1-5

ISSUE DATE	2/89	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	5/18/16	X-A004(559)	60	110

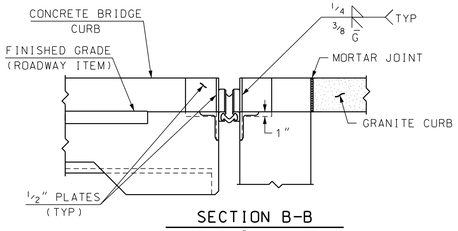


TYPICAL ASSEMBLY DETAIL

NOTE THAT THE ELEVATIONS AND DIMENSIONS SHOWN ARE TAKEN FROM THE ORIGINAL PLANS. DAMAGE AND/OR FIELD MAINTENANCE MAY HAVE OCCURRED THAT MAY NOT HAVE BEEN RECORDED SO FIELD VERIFICATION OF DIMENSIONS AND ELEVATIONS IS REQUIRED TO ENSURE PROPER FITTING OF EXPANSION JOINT. ANY DIFFERENCES BETWEEN FIELD MEASUREMENTS AND DESIGN PLANS SHALL BE NOTED ON THE SHOP DRAWINGS. ALSO, NOTE THAT THE FIELD SURVEY WAS DONE WITH A DIFFERENT DATUM THAN THE ORIGINAL PLANS.

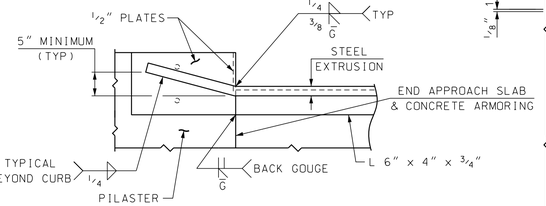
PLAN VIEW

SCALE: 1" = 1'-0"



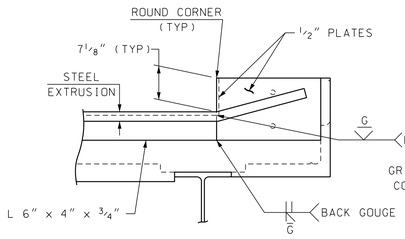
SECTION B-B

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



SECTION C-C

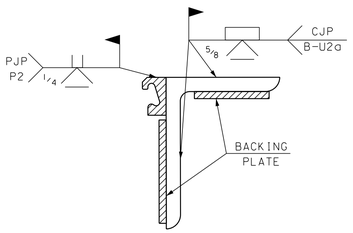
SCALE: 3/4" = 1'-0"



B-P2 (3 SIDES) BEVEL AND WELD EXTRUSION. GRIND CONTOUR SMOOTH WHERE IN CONTACT WITH SEAL FOR A WATER TIGHT FIT. (TYP)

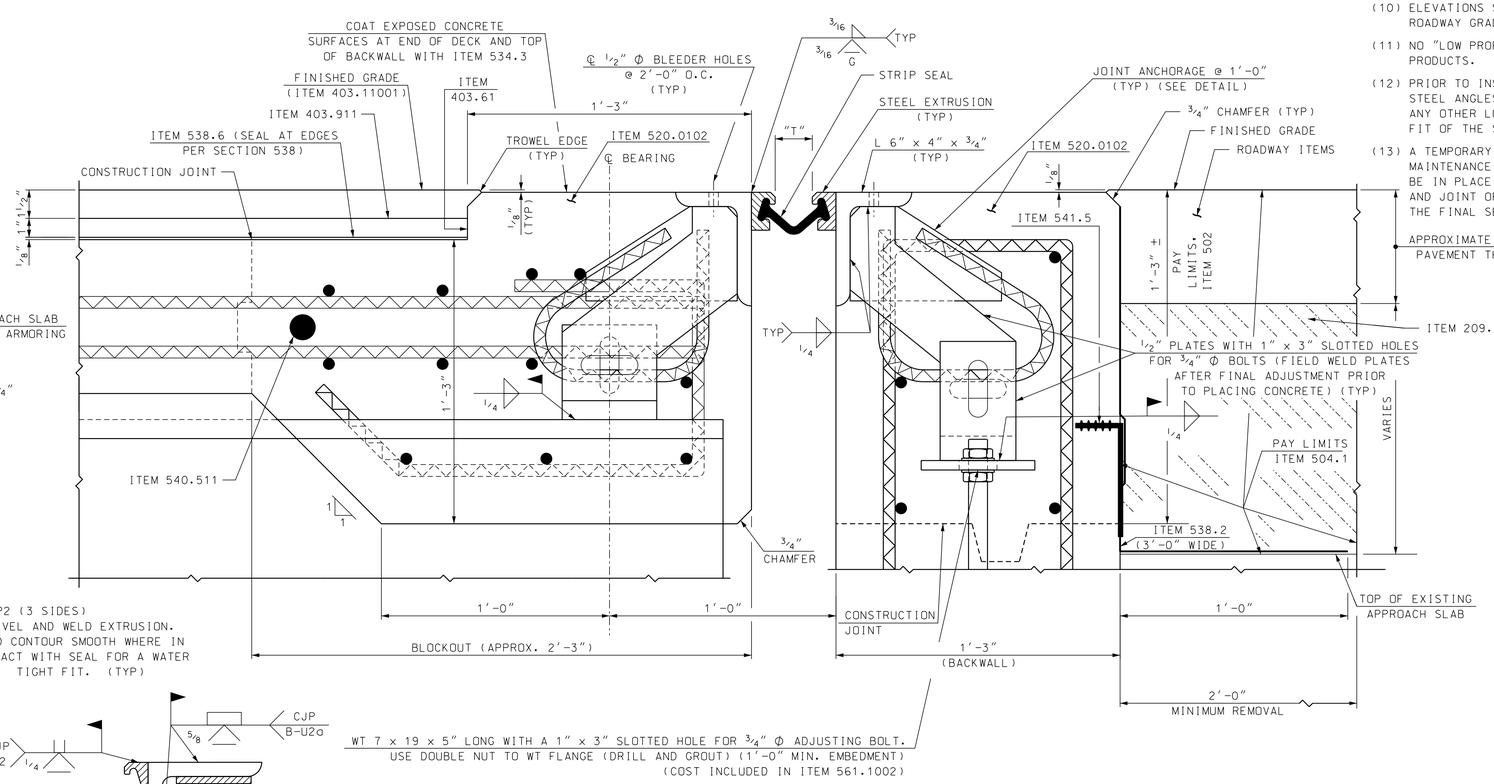
SECTION D-D

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



FIELD SPLICE WELD DETAIL-STRIP SEAL

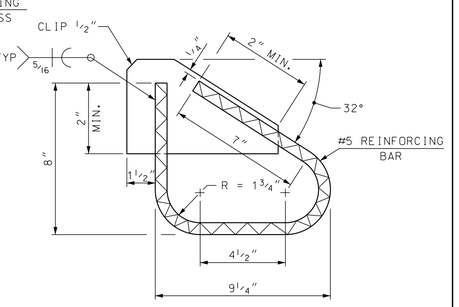
TEMPERATURE ADJUSTMENT TABLE	
TEMPERATURE	"T" WEST ABUTMENT
20°F	2 5/16"
35°F	2 1/8"
50°F	1 15/16"
65°F	1 3/4"
80°F	1 9/16"
95°F	1 3/8"



WT 7 x 19 x 5" LONG WITH A 1" x 3" SLOTTED HOLE FOR 3/4" Φ ADJUSTING BOLT. USE DOUBLE NUT TO WT FLANGE (DRILL AND GROUT) (1'-0" MIN. EMBEDMENT) (COST INCLUDED IN ITEM 561.1002)

SECTION A-A

SCALE: 3" = 1'-0"



ANCHOR DETAIL (90° CROSSING)

SCALE: 3" = 1'-0"

EXPANSION JOINT NOTES

(1) ALL EXPANSION JOINT STEEL, INCLUDING ANCHORS, SHALL BE GALVANIZED. STEEL ANGLES SHALL BE ASTM A572 GRADE 50. MINOR STEEL PLATES MAY CONFORM TO ASTM A36. THE ENTIRE ASSEMBLY, INCLUDING STRIP SEAL, SHALL BE PAID FOR AS ITEM 561.1002, PREFABRICATED STRIP SEAL EXPANSION JOINT (F).

(2) SPLICES FOR STEEL ANGLES SHALL DEVELOP FULL STRENGTH.

(3) EXPANSION JOINT OPENING SHALL BE ADJUSTED TO TEMPERATURE ANTICIPATED JUST PRIOR TO POURING DECK BLOCKOUT. FINAL SETTING IN THE FIELD SHALL BE DETERMINED BY THE CONTRACT ADMINISTRATOR. SEE TEMPERATURE ADJUSTMENT TABLE & NOTES.

(4) STRIP SEAL SHALL BE FURNISHED IN ONE CONTINUOUS LENGTH. NO SPLICES WILL BE ALLOWED. SEAL SHALL BE INSTALLED IN THE FIELD BY THE CONTRACTOR, IN ACCORDANCE WITH THE MANUFACTURER OF THE SEAL, USING AN APPROVED TOOL THAT WILL NOT DAMAGE THE SEAL.

(5) JOINT SUPPORT PLATES AND CURB PLATES SHALL BE SHOP WELDED TO EXPANSION JOINT STEEL AND SHALL BE NORMAL TO GRADE AFTER JOINT ASSEMBLY HAS BEEN ADJUSTED FOR ROADWAY CROSS-SLOPE AND GRADE. STEEL ANGLES AND EXTRUSIONS SHALL BE ASSEMBLED WITH A CONSTANT JOINT OPENING TO ENSURE PROPER PERFORMANCE AND WATER TIGHTNESS.

(6) THE EXPANSION JOINT ASSEMBLY SHALL BE INSTALLED ONLY AFTER BOTH ABUTMENTS HAVE BEEN BACKFILLED TO WITHIN 3'-0" OF FINISHED GRADE.

(7) IMMEDIATELY AFTER THE JOINT HAS BEEN SECURED TO THE STRUCTURAL STEEL AND BACKWALL, REMOVE SHIPPING DEVICES AND GRIND SMOOTH ANY WELDS ON EXPOSED SURFACES. REPAIR ANY DAMAGE TO GALVANIZED SURFACES IN ACCORDANCE WITH SECTION 550.

(8) PROTECT TOP OF EXPANSION JOINT DURING PLACEMENT OF CONCRETE AND BITUMINOUS PAVEMENT.

(9) THE STRIP SEAL HAS BEEN DESIGNED FOR A TOTAL FACTORED MOVEMENT OF 2.20 INCHES. DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE, SKEW, SHRINKAGE AND MINIMUM INSTALLATION WIDTH. THE CONTRACTOR SHALL USE AN SE-400 SEAL BY WATSON BOWMAN OR A2R-400 BY D.S. BROWN, AS NOTED IN THE OPL.

(10) ELEVATIONS SHOWN AT TOP OF ANGLES ARE 1/8" LOWER THAN PROPOSED FINISHED ROADWAY GRADE.

(11) NO "LOW PROFILE" STEEL EXTRUSIONS SHALL BE ALLOWED. SEE OPL FOR APPROVED PRODUCTS.

(12) PRIOR TO INSTALLING THE SEAL, ALL TEMPORARY FORM WORK SHALL BE REMOVED. STEEL ANGLES AND EXTRUSIONS SHALL BE MAINTAINED FREE FROM DIRT, WATER AND ANY OTHER LOOSE DEBRIS, WITH THE USE OF COMPRESSED AIR, TO ENSURE PROPER FIT OF THE SEAL. CARE SHALL BE TAKEN NOT TO DAMAGE GALVANIZED SURFACES.

(13) A TEMPORARY SEAL(S) SHALL BE INSTALLED PRIOR TO THE START OF THE WINTER MAINTENANCE PERIOD FOR ALL JOINT ASSEMBLIES OR PORTIONS THEREOF THAT WILL BE IN PLACE THROUGHOUT THE WINTER. ALL TEMPORARY SEALS SHALL BE REMOVED AND JOINT OPENINGS AND SUBSTRUCTURE SHALL BE CLEANED PRIOR TO INSTALLING THE FINAL SEAL. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 561.1001.

TEMPERATURE ADJUSTMENT NOTES

1. "T" DIMENSIONS ARE PERPENDICULAR TO FACE OF BACKWALL.
2. MINIMUM "T" WIDTH FOR SEAL INSTALLATION = 1 3/4" (APPROXIMATELY 65°F OR LESS).
3. VALUES IN THE TEMPERATURE ADJUSTMENT TABLE ARE FOR SETTING THE EXPANSION JOINT ASSEMBLY IMMEDIATELY PRIOR TO POURING THE DECK BLOCKOUT.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/EXP-JTS	EXP_JOINT_MR_NB_WEST	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

STRIP SEAL EXPANSION JOINT (WEST ABUTMENT)

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
ISSUE DATE	2/89				
REV. DATE	5/18/16				

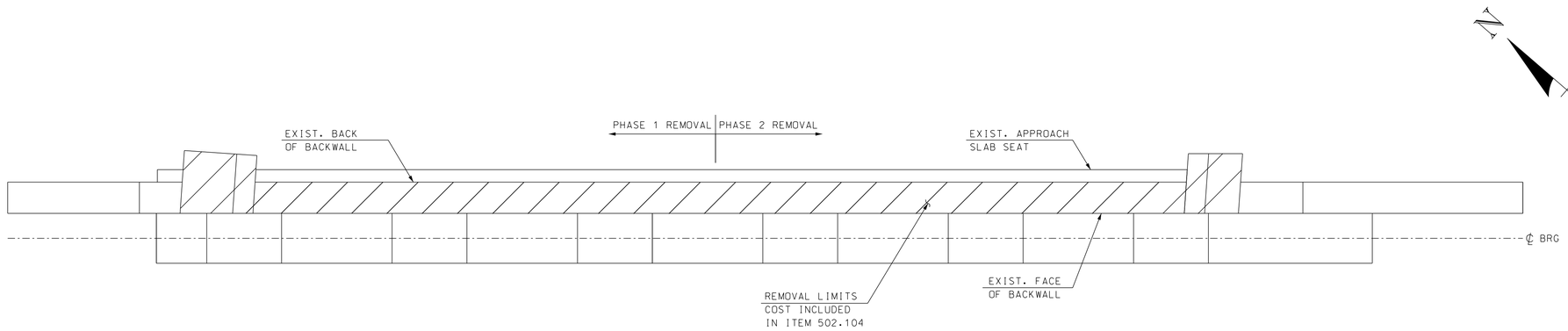
FEDERAL PROJECT NO. X-A004(559)

SHEET NO. 61

BRIDGE SHEET 44 OF 48

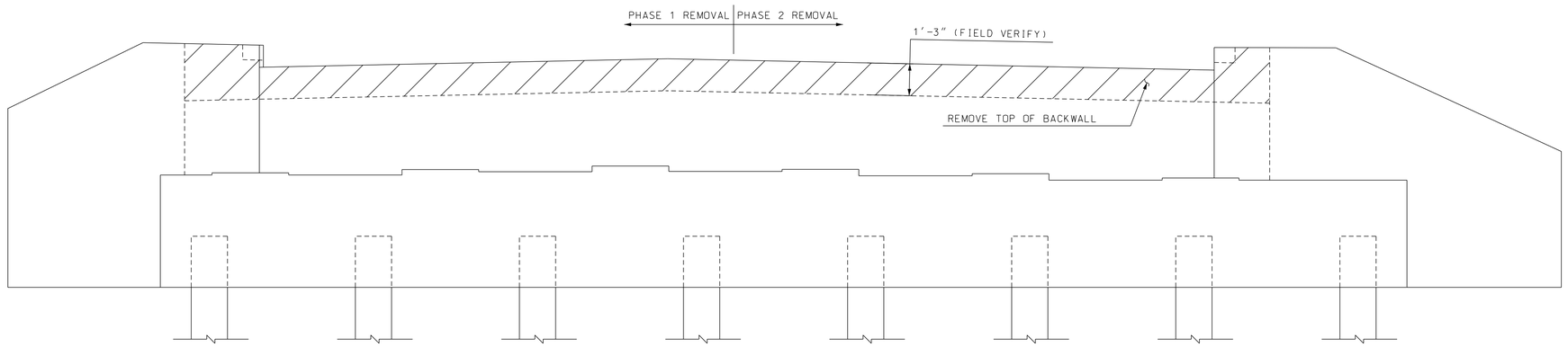
FILE NUMBER 19-1-5

TOTAL SHEETS 110



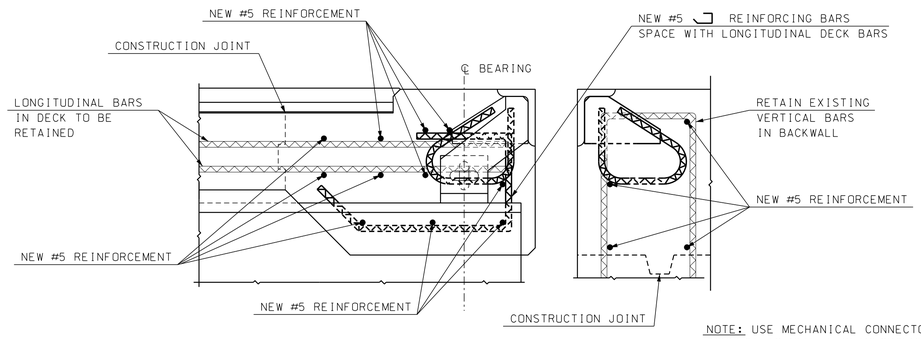
PLAN – EAST ABUTMENT BACKWALL REMOVAL LIMITS (098/111)

SCALE: $^{3}/_{8}$"=1'-0"



ELEVATION – EAST ABUTMENT BACKWALL REMOVAL LIMITS (098/111)

SCALE: $^{3}/_{8}$"=1'-0"



RECONSTRUCTION SECTION

SCALE: $1^{1}/_{2}$"=1'-0"

NOTE: USE MECHANICAL CONNECTORS AT PHASE CONSTRUCTION JOINTS TO CONNECT TO NEW #5 REINFORCEMENT SHOWN IN RECONSTRUCTION SECTION. MALE AND FEMALE MECHANICAL CONNECTORS TO EXTEND 3'-3" PAST CONSTRUCTION JOINT (SIMILAR TO DETAIL A ON BRIDGE SHEET 24). RECONSTRUCTION SECTION TYPICAL FOR WEST ABUTMENT, AS WELL.

NOTE: ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE) SHALL BE APPLIED TO THE ABUTMENT FROM THE BOTTOM OF THE DECK TO GRADE, THE ENTIRE BRIDGE SEAT, AND THE EXPOSED WINGWALL SURFACES TO GRADE. EXISTING CONCRETE SURFACES SHALL BE LIGHT BLAST-CLEANED PRIOR TO WATER REPELLENT APPLICATION.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER41191	BackWall_SB_East_Abutment	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

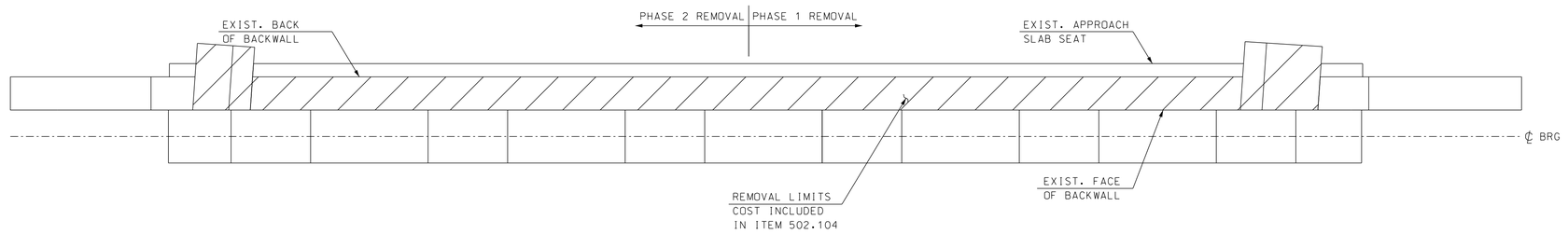
TOWN LEBANON BRIDGE NO. 098/111 STATE PROJECT 41191

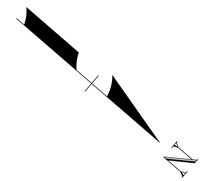
LOCATION INTERSTATE 89 OVER MASCOMA RIVER

BACKWALL & PILASTER RECONSTRUCTION (1 OF 2)

REVISIONS AFTER PROPOSAL				BY	DATE		BY	DATE
			DESIGNED	TEM	7/18	CHECKED	TPL	7/18
			DRAWN	TEM	7/18	CHECKED	TPL	7/18
			QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
			ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	
			REV. DATE		X-A004(559)		62	

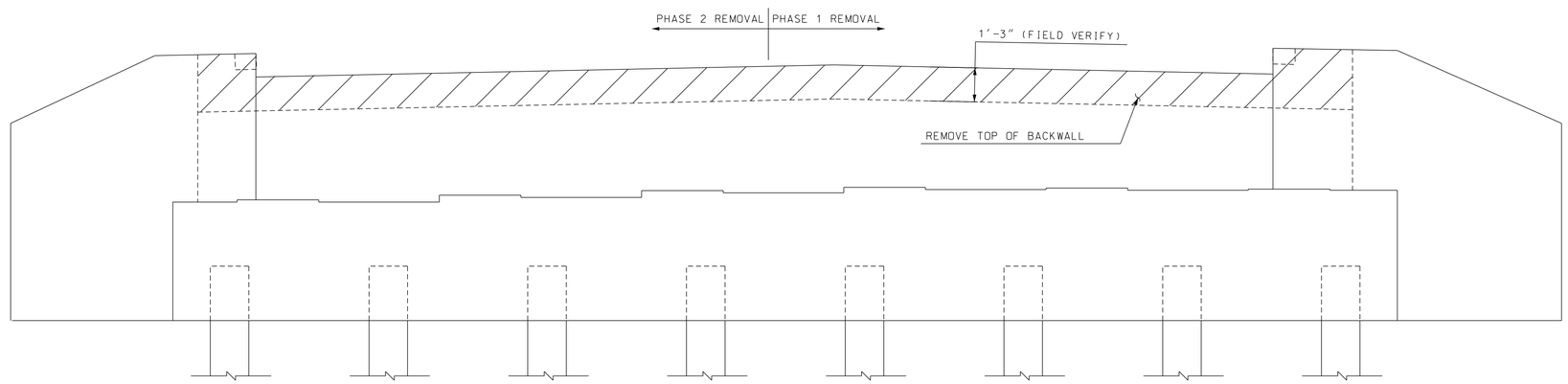
BRIDGE SHEET 45 OF 48
FILE NUMBER 19-1-5
TOTAL SHEETS 110





PLAN – WEST ABUTMENT BACKWALL REMOVAL LIMITS (098/111)

SCALE: $\frac{3}{8}$"=1'-0"



ELEVATION – WEST ABUTMENT BACKWALL REMOVAL LIMITS (098/111)

SCALE: $\frac{3}{8}$"=1'-0"

NOTE: ITEM 534.3. WATER REPELLENT (SILANE-SILOXANE) SHALL BE APPLIED TO THE ABUTMENT FROM THE BOTTOM OF THE DECK TO GRADE. THE ENTIRE BRIDGE SEAT, AND THE EXPOSED WINGWALL SURFACES TO GRADE. EXISTING CONCRETE SURFACES SHALL BE LIGHT BLAST-CLEANED PRIOR TO WATER REPELLENT APPLICATION.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BRD\SUPER\41191	BackWall_SB_West_Abutment	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 098/111 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER & TRUCK ROAD

BACKWALL & PILASTER RECONSTRUCTION (2 OF 2)

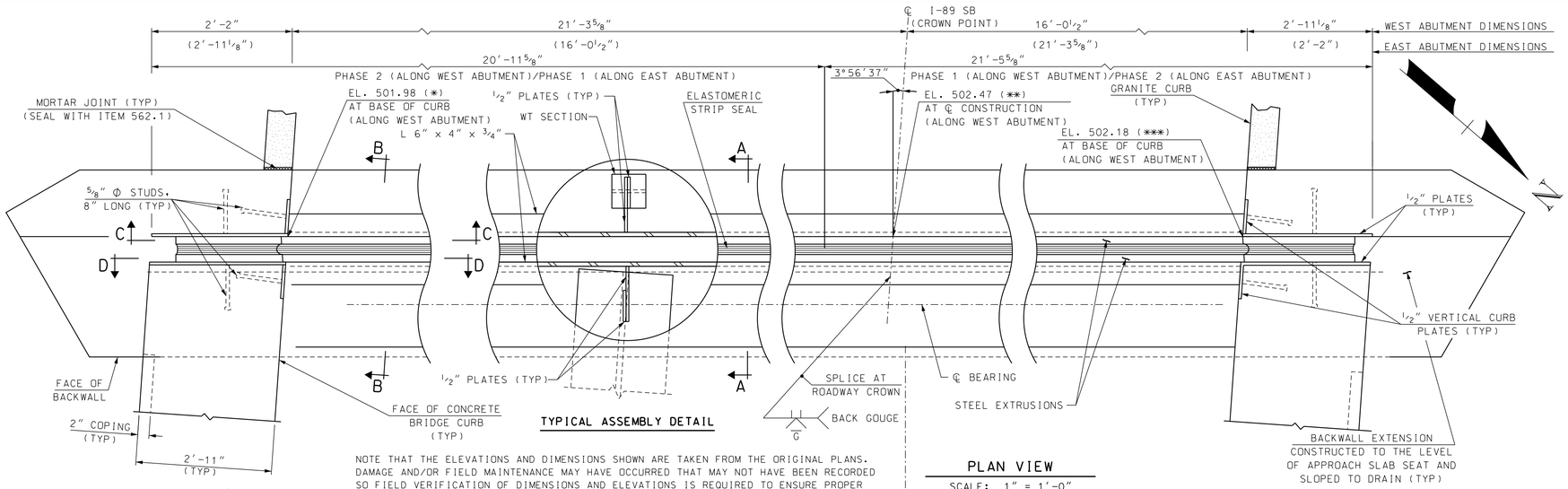
REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18
ISSUE DATE					
REV. DATE					

FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(559)	63	110

BRIDGE SHEET 46 OF 48

FILE NUMBER 19-1-5



TYPICAL ASSEMBLY DETAIL

NOTE THAT THE ELEVATIONS AND DIMENSIONS SHOWN ARE TAKEN FROM THE ORIGINAL PLANS. DAMAGE AND/OR FIELD MAINTENANCE MAY HAVE OCCURRED THAT MAY NOT HAVE BEEN RECORDED SO FIELD VERIFICATION OF DIMENSIONS AND ELEVATIONS IS REQUIRED TO ENSURE PROPER FITTING OF EXPANSION JOINT. ANY DIFFERENCES BETWEEN FIELD MEASUREMENTS AND DESIGN PLANS SHALL BE NOTED ON THE SHOP DRAWINGS. ALSO, NOTE THAT THE FIELD SURVEY WAS DONE WITH A DIFFERENT DATUM THAN THE ORIGINAL PLANS.

PLAN VIEW

SCALE: 1″ = 1′-0″

NOTE: ELEVATIONS FOR EAST ABUTMENT ARE AS FOLLOWS:
* = 493.66
** = 494.15
*** = 493.86

EXPANSION JOINT NOTES

(1) ALL EXPANSION JOINT STEEL, INCLUDING ANCHORS, SHALL BE GALVANIZED. STEEL ANGLES SHALL BE ASTM A572 GRADE 50. MINOR STEEL PLATES MAY CONFORM TO ASTM A36. THE ENTIRE ASSEMBLY, INCLUDING STRIP SEAL, SHALL BE PAID FOR AS ITEM 561.1003, PREFABRICATED STRIP SEAL EXPANSION JOINT (F).

(2) SPLICES FOR STEEL ANGLES SHALL DEVELOP FULL STRENGTH.

(3) EXPANSION JOINT OPENING SHALL BE ADJUSTED TO TEMPERATURE ANTICIPATED JUST PRIOR TO POURING DECK BLOCKOUT. FINAL SETTING IN THE FIELD SHALL BE DETERMINED BY THE CONTRACT ADMINISTRATOR. SEE TEMPERATURE ADJUSTMENT TABLE & NOTES.

(4) STRIP SEAL SHALL BE FURNISHED IN ONE CONTINUOUS LENGTH. NO SPLICES WILL BE ALLOWED. SEAL SHALL BE INSTALLED IN THE FIELD BY THE CONTRACTOR, IN ACCORDANCE WITH THE MANUFACTURER OF THE SEAL, USING AN APPROVED TOOL THAT WILL NOT DAMAGE THE SEAL.

(5) JOINT SUPPORT PLATES AND CURB PLATES SHALL BE SHOP WELDED TO EXPANSION JOINT STEEL AND SHALL BE NORMAL TO GRADE AFTER JOINT ASSEMBLY HAS BEEN ADJUSTED FOR ROADWAY CROSS-SLOPE AND GRADE. STEEL ANGLES AND EXTRUSIONS SHALL BE ASSEMBLED WITH A CONSTANT JOINT OPENING TO ENSURE PROPER PERFORMANCE AND WATER TIGHTNESS.

(6) THE EXPANSION JOINT ASSEMBLY SHALL BE INSTALLED ONLY AFTER BOTH ABUTMENTS HAVE BEEN BACKFILLED TO WITHIN 3′-0″ OF FINISHED GRADE.

(7) IMMEDIATELY AFTER THE JOINT HAS BEEN SECURED TO THE STRUCTURAL STEEL AND BACKWALL, REMOVE SHIPPING DEVICES AND GRIND SMOOTH ANY WELDS ON EXPOSED SURFACES. REPAIR ANY DAMAGE TO GALVANIZED SURFACES IN ACCORDANCE WITH SECTION 550.

(8) PROTECT TOP OF EXPANSION JOINT DURING PLACEMENT OF CONCRETE AND BITUMINOUS PAVEMENT.

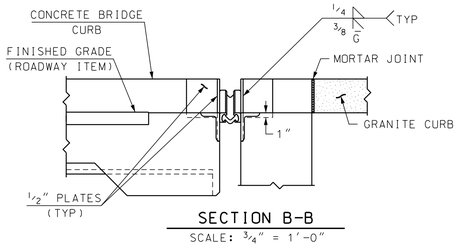
(9) THE STRIP SEAL HAS BEEN DESIGNED FOR A TOTAL FACTORED MOVEMENT OF 0.98″ FOR THE EAST ABUTMENT AND 2.20″ FOR THE WEST ABUTMENT. DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE, SKEW, SHRINKAGE AND MINIMUM INSTALLATION WIDTH. THE CONTRACTOR SHALL USE AN SE-400 SEAL BY WATSON BOWMAN OR A2R-400 BY D.S. BROWN, AS NOTED IN THE OPL.

(10) ELEVATIONS SHOWN AT TOP OF ANGLES ARE 1/8″ LOWER THAN PROPOSED FINISHED ROADWAY GRADE.

(11) NO "LOW PROFILE" STEEL EXTRUSIONS SHALL BE ALLOWED. SEE OPL FOR APPROVED PRODUCTS.

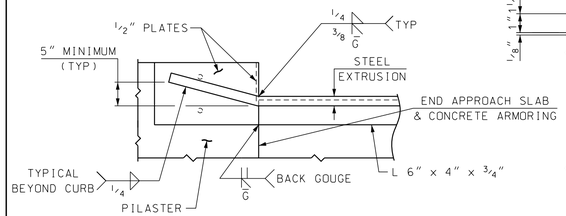
(12) PRIOR TO INSTALLING THE SEAL, ALL TEMPORARY FORM WORK SHALL BE REMOVED. STEEL ANGLES AND EXTRUSIONS SHALL BE MAINTAINED FREE FROM DIRT, WATER AND ANY OTHER LOOSE DEBRIS, WITH THE USE OF COMPRESSED AIR, TO ENSURE PROPER FIT OF THE SEAL. CARE SHALL BE TAKEN NOT TO DAMAGE GALVANIZED SURFACES.

(13) A TEMPORARY SEAL(S) SHALL BE INSTALLED PRIOR TO THE START OF THE WINTER MAINTENANCE PERIOD FOR ALL JOINT ASSEMBLIES OR PORTIONS THEREOF THAT WILL BE IN PLACE THROUGHOUT THE WINTER. ALL TEMPORARY SEALS SHALL BE REMOVED AND JOINT OPENINGS AND SUBSTRUCTURE SHALL BE CLEANED PRIOR TO INSTALLING THE FINAL SEAL. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 561.1001.



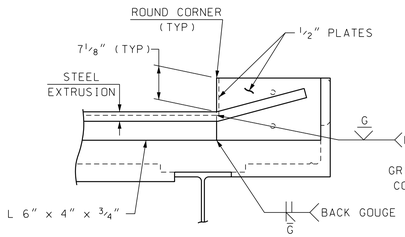
SECTION B-B

SCALE: 3/4″ = 1′-0″



SECTION C-C

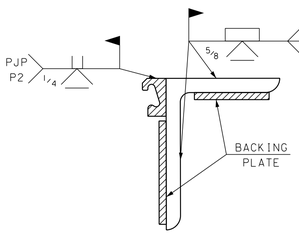
SCALE: 3/4″ = 1′-0″



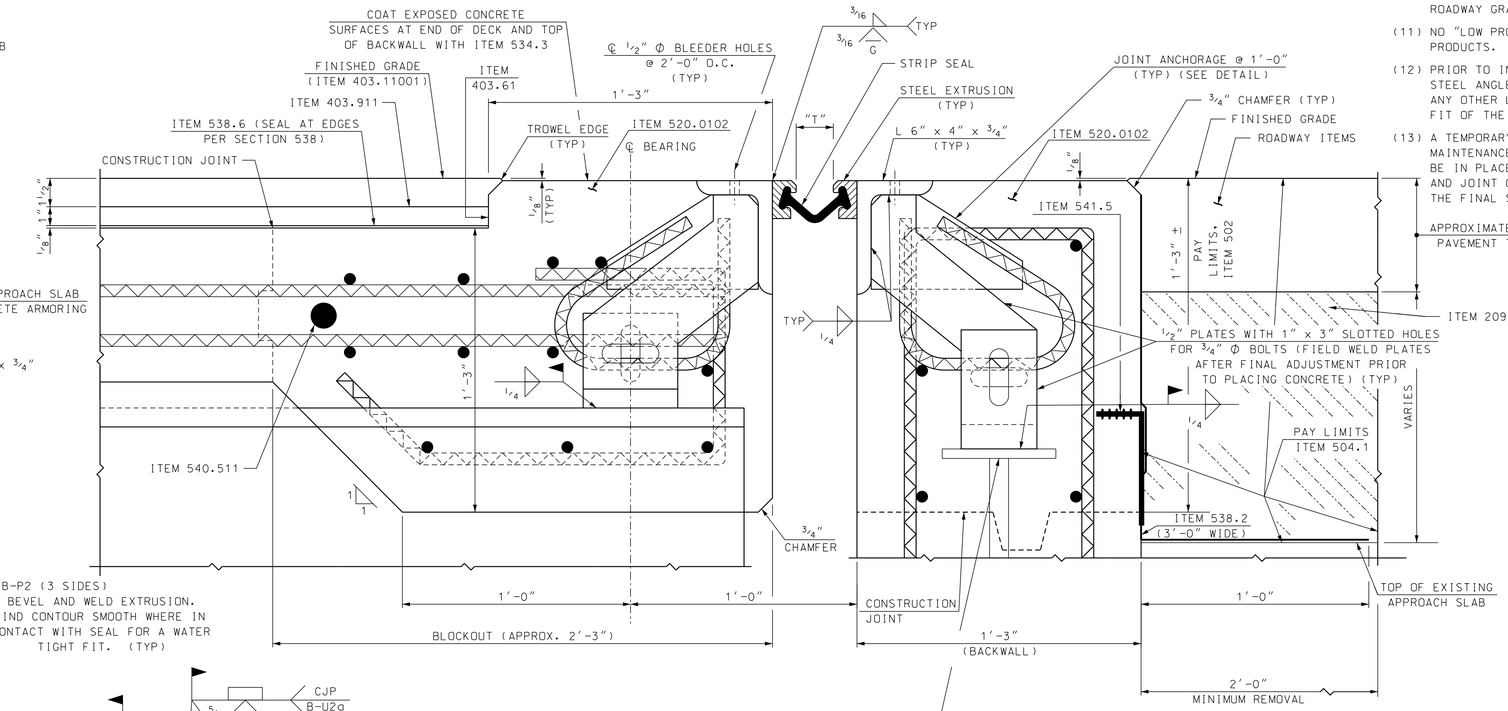
SECTION D-D

SCALE: 3/4″ = 1′-0″

TEMPERATURE ADJUSTMENT TABLE		
TEMPERATURE	"T" EAST ABUTMENT	"T" WEST ABUTMENT
20°F	2″	2 5/16″
35°F	1 15/16″	2 1/8″
50°F	1 13/16″	1 15/16″
65°F	1 3/4″	1 3/4″
80°F	1 11/16″	1 9/16″
95°F	1 9/16″	1 3/8″



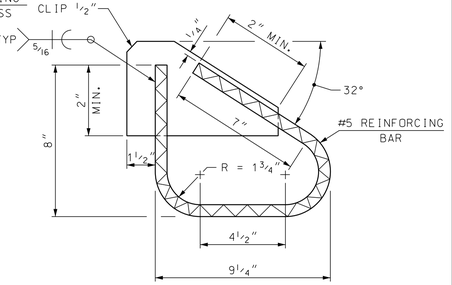
**FIELD SPLICE WELD DETAIL-
STRIP SEAL**



WT 7 x 19 x 5″ LONG WITH A 1″ x 3″ SLOTTED HOLE FOR 3/4″ Φ ADJUSTING BOLT.
USE DOUBLE NUT TO WT FLANGE (DRILL AND GROUT) (1′-0″ MIN. EMBEDMENT)
(COST INCLUDED IN ITEM 561.1003)

SECTION A-A

SCALE: 3″ = 1′-0″



ANCHOR DETAIL (90° CROSSING)

SCALE: 3″ = 1′-0″

TEMPERATURE ADJUSTMENT NOTES

1. "T" DIMENSIONS ARE PERPENDICULAR TO FACE OF BACKWALL.
2. MINIMUM "T" WIDTH FOR SEAL INSTALLATION = 1 3/4″ (APPROXIMATELY 65°F OR LESS).
3. VALUES IN THE TEMPERATURE ADJUSTMENT TABLE ARE FOR SETTING THE EXPANSION JOINT ASSEMBLY IMMEDIATELY PRIOR TO POURING THE DECK BLOCKOUT.

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/EXP-JTS	41191_EXP_JOINT_MR_SB	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 098/111 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

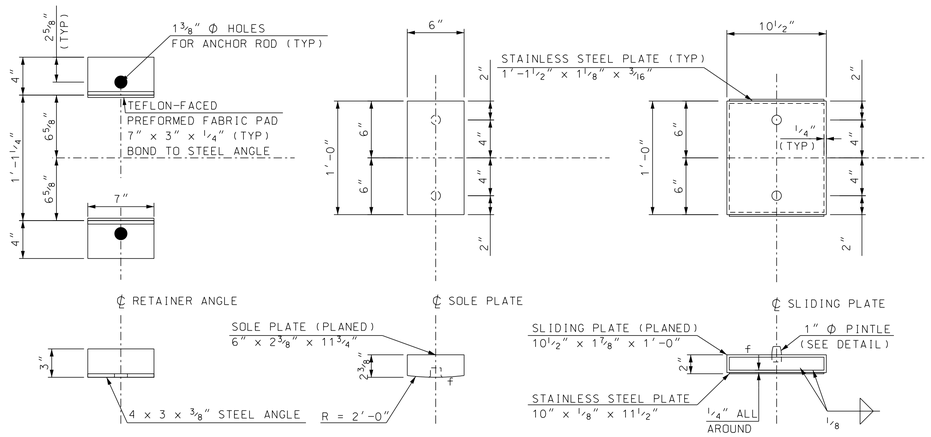
STRIP SEAL EXPANSION JOINT

BRIDGE SHEET: 47 OF 48

FILE NUMBER: 19-1-5

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TEM	7/18	CHECKED	TPL	7/18
	DRAWN	TEM	7/18	CHECKED	TPL	7/18
	QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

ISSUE DATE	2/89	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	5/18/16	X-A004(559)	64	110



TEMPERATURE ADJUSTMENT TABLE FOR BRIDGE NO. 097/112 & 098/111		
TEMPERATURE	"X" EAST ABUTMENT	"X" WEST ABUTMENT
20°F	2 1/2"	2 13/16"
35°F	2 7/16"	2 5/8"
50°F	2 5/16"	2 7/16"
65°F	2 1/4"	2 1/4"
80°F	2 3/16"	2 1/16"
95°F	2 1/16"	1 7/8"

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

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

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

PREFORMED FABRIC PAD
SCALE: 1 1/2"=1'-0"

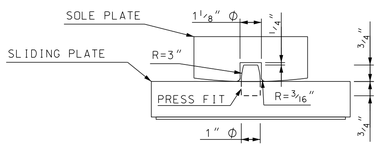
MASONRY PLATE
SCALE: 1 1/2"=1'-0"

BRIDGE SHOE NOTES

1. BEARING ASSEMBLIES SHALL BE REPLACED AT ALL BEARINGS AT EACH ABUTMENT FOR BRIDGE NO. 097/112 (18 LOCATIONS) AS WELL AS AT ALL BEARINGS AT EACH ABUTMENT FOR BRIDGE NO. 098/111 (12 LOCATIONS). THIS REPLACEMENT INCLUDES THE MASONRY PLATE, SLIDING PLATE, STAINLESS STEEL PLATE, ANCHOR RODS, PREFORMED FABRIC PAD AND SOLE PLATE FOR EXPANSION BEARINGS. ALL WORK NECESSARY TO COMPLETE THE REPLACEMENT WORK SHALL BE PAID UNDER ITEM 550.202, BRIDGE SHOES, EXCLUDING JACKING. ALL COSTS FOR JACKING SHALL BE INCLUDED IN ITEM 550.19101 & 550.19102, TEMPORARY GIRDER SUPPORT SYSTEM.
2. ALL PLATES SHALL BE FLAT AND TRUE AFTER WELDING.
3. ALL STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 50 (ASTM A709 GRADE 50), METALLIZED DUPLEX COATING (SEE SPECIAL PROVISION FOR 550).
4. BEARINGS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SECTION 18 OF THE AASHTO 2010 LRFD BRIDGE CONSTRUCTION SPECIFICATIONS WITH 2012 INTERIMS.
5. BEARINGS SURFACES MARKED "f", OF SURFACES IN CONTACT TO BE WELDED, SHALL BE FINISHED IN ACCORDANCE WITH TABLE 18.1.4.2-1 OF THE AASHTO 2010 LRFD BRIDGE CONSTRUCTION SPECIFICATIONS WITH 2012 INTERIMS.
6. BEARINGS SHOULD BE INSTALLED AT TEMPERATURES BETWEEN 20°F AND 70°F. INSTALLATION TEMPERATURES OUTSIDE THIS RANGE WILL REQUIRE ADJUSTMENT.
7. ANCHOR RODS SHALL BE GALVANIZED AND FABRICATED IN ACCORDANCE WITH SECTION 550.2.5 OF THE NHDOT STANDARD SPECIFICATIONS, 2010.
8. HOLES DRILLED INTO EXISTING CONCRETE TO REPLACE ANCHOR RODS SHALL BE DRILLED 1/2" DIAMETER LARGER THAN THE ANCHOR ROD DIAMETER AND GROUTED WITH HIGH STRENGTH, NON-SHRINK, NON-FERROUS, CEMENTITIOUS GROUT. ALL COSTS FOR DRILLING AND GROUTING ANCHOR RODS SHALL BE PAID UNDER ITEM 550.202, BRIDGE SHOES.
9. PTFE (TEFLON) SHALL BE FABRICATED AS UNFILLED SHEET AND THE SURFACE SHALL BE DIMPLED-LUBRICATED IN ACCORDANCE WITH AASHTO LFRD DESIGN SPECFICATIONS SECTION 14.7.2.1.
10. THE PTFE SHALL CONFORM TO SECTION 550.2.10 OF THE NHDOT STANDARD SPECIFICATIONS. THE COEFFICIENT OF FRICTION BETWEEN THE PTFE AND STAINLESS STEEL SURFACES SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO LFRD BRIDGE CONSTRUCTION SPECIFICATIONS SECTION 18.1.5.2.3. THE DESIGN COEFFICIENT OF FRICTION SHALL BE PER AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS SECTION 14.7.2.5.
11. THE PTFE SHALL BE BONDED TO THE STEEL BY AN EPOXY RESIN SATISFYING THE REQUIREMENTS OF AASHTO M 235M/M 235 (ASTM C 881/C 881M), FEP FILM, OR EQUAL, AS APPROVED BY THE ENGINEER.
12. THE STAINLESS STEEL SURFACES IN CONTACT WITH THE TEFLON SHALL HAVE A #8 MIRROR FINISH.
13. THE PREFORMED FABRIC PADS SHALL CONFORM TO SECTION 550.2.6 OF THE NHDOT STANDARD SPECIFICATIONS.

EXPANSION SHOE DETAILS - ABUTMENT (30 REQUIRED)
SCALE: 1 1/2"=1'-0"

ANCHOR ROD DETAIL (EXPANSION ABUTMENT)
SCALE: 1 1/2"=1'-0"
(60 REQUIRED)



PINTLE DETAIL
SCALE: 3"=1'-0"

EXPANSION SHOE ASSEMBLY
SCALE: 1 1/2"=1'-0"

GM2 ASSOCIATES

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
Super	41191_BRIDGE_SHOES	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN LEBANON BRIDGE NO. 097/112 & 098/111 STATE PROJECT 41191

LOCATION INTERSTATE 89 OVER MASCOMA RIVER

BRIDGE SHOES

BRIDGE SHEET 48 OF 48

REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
DESIGNED	TEM	7/18	CHECKED	TPL	7/18
DRAWN	TEM	7/18	CHECKED	TPL	7/18
QUANTITIES	TEM	7/18	CHECKED	TPL	7/18

FILE NUMBER 19-1-5

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A004(559)	65	110

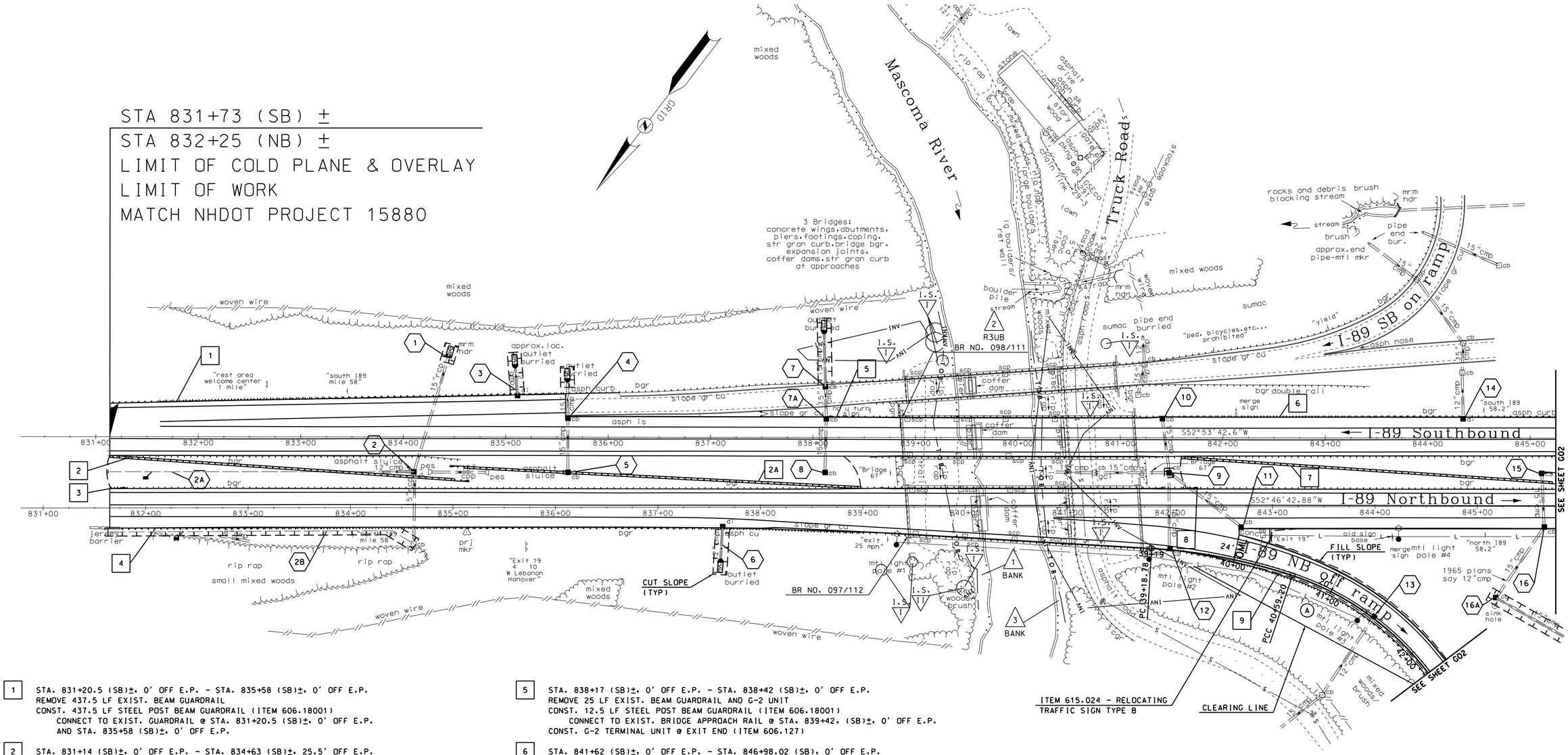
STA 831+73 (SB) ±

STA 832+25 (NB) ±

LIMIT OF COLD PLANE & OVERLAY

LIMIT OF WORK

MATCH NHDOT PROJECT 15880



1 STA. 831+20.5 (SB)±, 0' OFF E.P. - STA. 835+58 (SB)±, 0' OFF E.P.
REMOVE 437.5 LF EXIST. BEAM GUARDRAIL
CONST. 437.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. GUARDRAIL @ STA. 831+20.5 (SB)±, 0' OFF E.P.
AND STA. 835+58 (SB)±, 0' OFF E.P.

2 STA. 831+14 (SB)±, 0' OFF E.P. - STA. 834+63 (SB)±, 25.5' OFF E.P.
REMOVE 345 LF OF EXIST. GUARDRAIL AND END UNIT
CONST. 337.5 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001)
AND G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

2A STA. 834+99 (NB)±, 23' OFF E.P. - STA. 838+98 (NB)±, 0' OFF E.P.
REMOVE 730 LF OF EXIST. GUARDRAIL
CONST. 387.5 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001)(MATCH EXIST. B.A.R.)
AND G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

3 STA. 831+66 (NB)±, 0' OFF E.P. - STA. 831+78.5 (NB)±, 0' OFF E.P.
CONST. G-2 TERMINAL UNIT (ITEM 606.127)

4 STA. 831+75 (NB)±, 0' OFF E.P. - STA. 839+01 (NB)±, 0' OFF E.P.
REMOVE 725 LF EXIST. BEAM GUARDRAIL
CONST. 725 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. BARRIER @ STA. 831+75 (NB)±, 0' OFF E.P. (PROJECT 15880)
CONNECT TO EXIST. BRIDGE APPROACH RAIL @ STA. 839+01 (NB)±, 0' OFF E.P.

5 STA. 838+17 (SB)±, 0' OFF E.P. - STA. 838+42 (SB)±, 0' OFF E.P.
REMOVE 25 LF EXIST. BEAM GUARDRAIL AND G-2 UNIT
CONST. 12.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. BRIDGE APPROACH RAIL @ STA. 839+42. (SB)±, 0' OFF E.P.
CONST. G-2 TERMINAL UNIT @ EXIT END (ITEM 606.127)

6 STA. 841+62 (SB)±, 0' OFF E.P. - STA. 846+98.02 (SB), 0' OFF E.P.
REMOVE 537.5 LF OF EXIST. GUARDRAIL
CONST. 537.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)(MATCH EXIST. & PROP. B.A.R.)

7 STA. 841+60 (SB)±, 0' OFF E.P. - STA. 845+34 (SB)±, 28' OFF E.P.
REMOVE 565 LF OF EXIST. GUARDRAIL
CONST. 362.5 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001)(MATCH EXIST. B.A.R.)
AND G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

8 STA. 842+13 (NB)±, 0' OFF E.P. - STA. 842+25.5 (NB)±, 0' OFF E.P.
CONST. G-2 TERMINAL UNIT (ITEM 606.127)(MATCH EXIST. B.A.R.)

9 STA. 39+55 ±, 0' OFF E.P. - STA. 47+05±, 4' OFF F.O.C.
REMOVE 750 LF EXIST. BEAM GUARDRAIL AND END UNIT
CONST. 737.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. BRIDGE APPROACH RAIL @ STA. 39+55 ±
CONST. G-2 TERMINAL UNIT @ EXIT END (ITEM 606.127)

NOTES:
1. CONTRACTOR SHALL FIELD LOCATE ALL EXISTING DRAINAGE INVERTS AND GRATE ELEVATIONS PRIOR TO CONSTRUCTION.
2. FOR PROPOSED ITS, SEE ITS PLAN & DETAILS.

50 0 50 100
SCALE IN FEET

GM2 ASSOCIATES

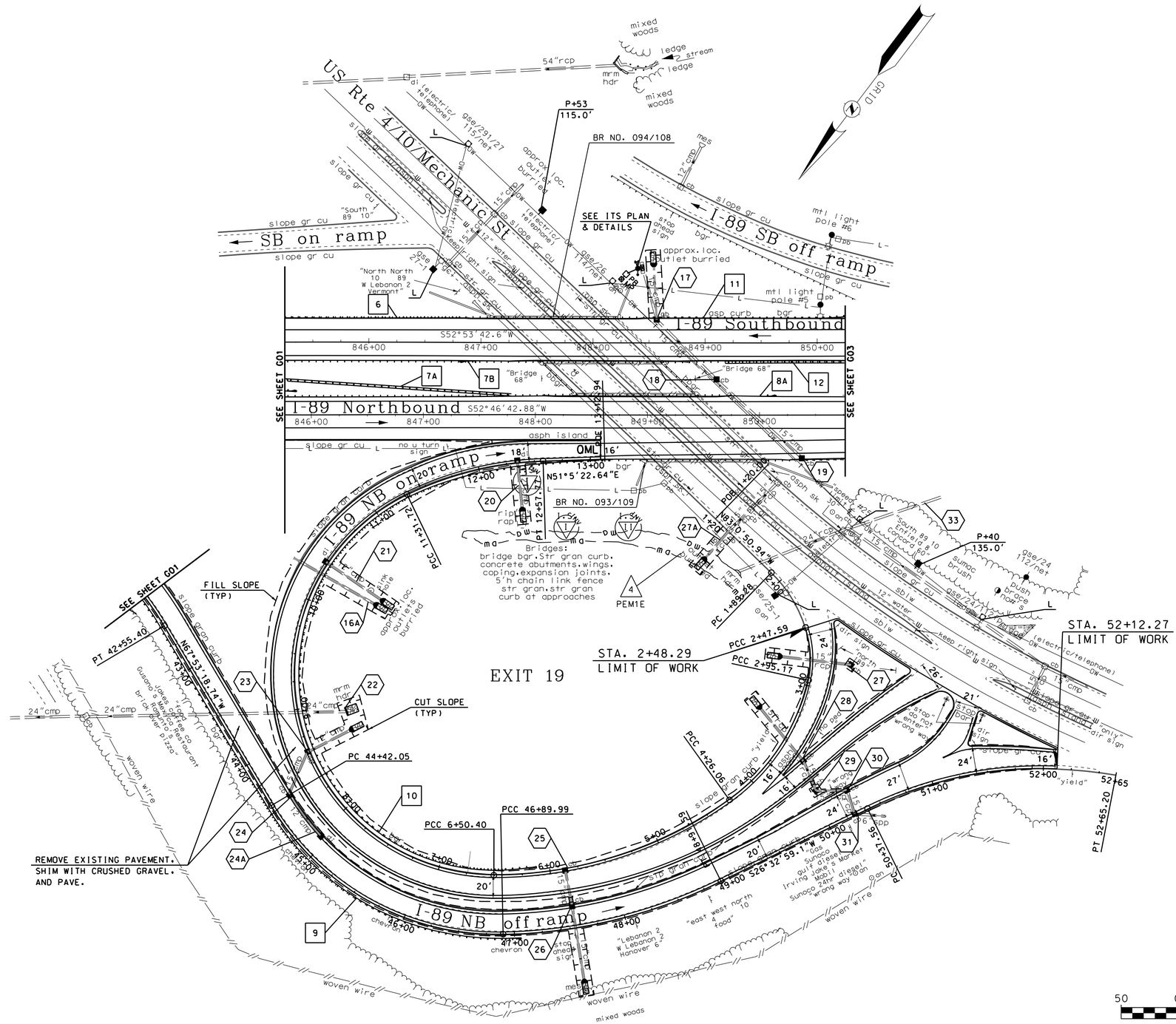
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

GENERAL PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191g01	41191	66	110

NUMBER	DESCRIPTION	DATE	STATION
	REVISIONS AFTER PROPOSAL		

SDR PROCESSED J. MERCER DATE 06/12/19
NEW DESIGN J. MERCER DATE 06/12/19
SHEET CHECKED D. BLOOD DATE 06/12/19
AS BUILT DETAILS DATE



7A STA. 845+66 (NB)±. 18.5' OFF E.P. - STA. 848+31.38 (NB)
REMOVE 600 LF OF EXIST. GUARDRAIL
CONST. TRANSITION SINGLE SLOPE CONCRETE BARRIER (ITEM 606.41231)
CONST. DOUBLE-FACED BEAM GUARDRAIL CONNECTION (ITEM 606.21208)
CONST. 200 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001)
AND G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

7B STA. 846+82.65 (SB). 0' OFF E.P. - STA. 847+48.30 (SB)
CONST. TRANSITION SINGLE SLOPE CONCRETE BARRIER (ITEM 606.41231)
CONST. SINGLE-FACED BEAM GUARDRAIL CONNECTION (ITEM 606.1208)
CONST. G-2 TERMINAL UNIT (ITEM 606.127)

8A STA. 849+47.78 (NB) - STA. 850+13.43 (NB). 0' OFF E.P.
CONST. MODIFIED TRANSITION SINGLE SLOPE CONCRETE BARRIER (ITEM 606.41239)
CONST. SINGLE-FACED BEAM GUARDRAIL CONNECTION (ITEM 606.1208)
CONST. G-2 TERMINAL UNIT (ITEM 606.127)

10 STA. 6+11.5±. 5' OFF F.O.C. - STA. 848+64.43 (NB). 0' OFF E.P.
REMOVE 700 LF OF EXIST. GUARDRAIL AND END UNIT
CONST. 637.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO PROP. BRIDGE APPROACH RAIL @ STA. 848+64.43 (NB)
CONST. TL-2 EAGRT @ APPROACH END (ITEM 606.1255)

11 STA. 848+51.97 (SB). 0' OFF E.P. - STA. 851+01.97 (SB). 2.5' OFF E.P.
REMOVE 250 LF OF EXIST. GUARDRAIL AND END UNIT
CONST. 187.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONST. TL-3 EAGRT @ APPROACH END (ITEM 606.1254)

12 STA. 848+64.70 (SB) - STA. 855+30 (SB)±. 25.5' OFF E.P.
REMOVE 400 LF OF EXIST. GUARDRAIL AND END UNIT
CONST. MODIFIED TRANSITION SINGLE SLOPE CONCRETE BARRIER (ITEM 606.41239)
CONST. DOUBLE-FACED BEAM GUARDRAIL CONNECTION (ITEM 606.21208)
CONST. 600 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001)
(15:1 TAPER STARTS @ STA. 851+80 (SB)±)
CONST. G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

NOTES:
1. CONTRACTOR SHALL FIELD LOCATE ALL EXISTING DRAINAGE INVERTS AND GRATE ELEVATIONS PRIOR TO CONSTRUCTION.
2. FOR PROPOSED ITS. SEE ITS PLAN & DETAILS.

GM2 ASSOCIATES

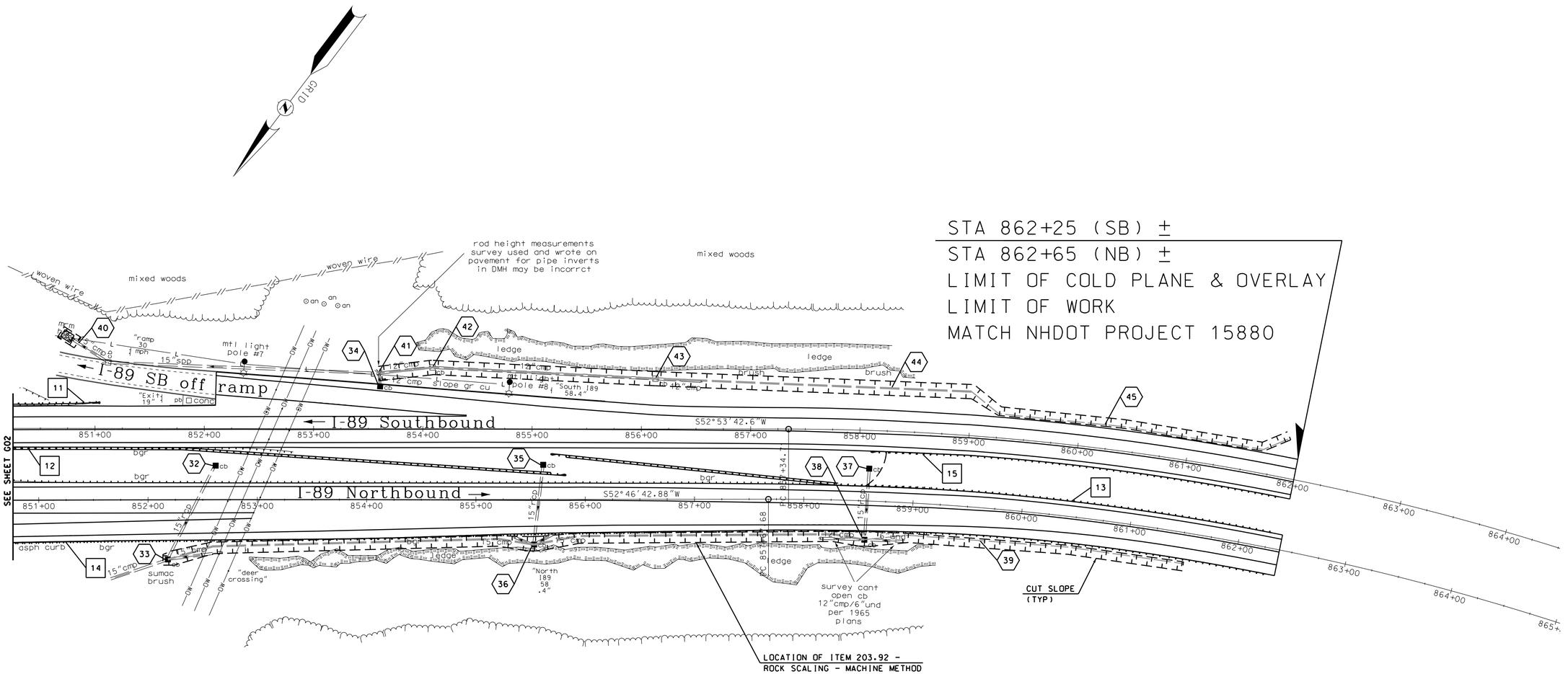
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
GENERAL PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191g02	41191	67	110

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

		DATE
SDR PROCESSED	J. MERCER	06/12/19
NEW DESIGN	J. MERCER	06/12/19
SHEET CHECKED	D. BLOOD	06/12/19
AS BUILT DETAILS		DATE



13 STA. 855+70 (NB)±. 26' OFF E.P. - STA. 862+28 (NB)±. 0' OFF E.P.
REMOVE 1162.5 LF EXIST. BEAM GUARDRAIL AND TERMINAL UNIT
CONST. 262.5 LF DOUBLE FACED W-BEAM GUARDRAIL (ITEM 606.28001) @ 15:1 TAPER
(15:1 TAPER ENDS @ STA. 858+31 (NB)±)
CONST. 400 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. GUARDRAIL @ STA. 862+28 (NB)±. 0' OFF E.P.
CONST. G-2 TERMINAL UNIT (ITEM 606.127) @ 15:1 TAPER

14 STA. 850+38.38 (NB). 0' OFF E.P. - STA. 862+31 (NB)±. 0' OFF E.P.
REMOVE 1187.5 LF OF EXIST. GUARDRAIL
CONST. 1187.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. GUARDRAIL @ STA. 862+31 (NB)±. 0' OFF E.P.

15 STA. 858+12 (SB)±. 0' OFF E.P. - STA. 861+90 (SB)±. 0' OFF E.P.
REMOVE 375 LF EXIST. BEAM GUARDRAIL AND TERMINAL UNIT
CONST. 362.5 LF STEEL POST BEAM GUARDRAIL (ITEM 606.18001)
CONNECT TO EXIST. GUARDRAIL @ STA. 861+90 (SB)±. 0' OFF E.P.
CONST. G-2 TERMINAL UNIT @ EXIT END (ITEM 606.127)

NOTES:
1. CONTRACTOR SHALL FIELD LOCATE ALL EXISTING DRAINAGE INVERTS AND GRATE ELEVATIONS PRIOR TO CONSTRUCTION.
2. FOR PROPOSED ITS, SEE ITS PLAN & DETAILS.

50 0 50 100
SCALE IN FEET

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
GENERAL PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191g03	41191	68	110

NUMBER	DESCRIPTION	DATE	STATION
	REVISIONS AFTER PROPOSAL		

		DATE	STATION
SDR PROCESSED	J. MERCER	06/12/19	
NEW DESIGN	J. MERCER	06/12/19	
SHEET CHECKED	D. BLOOD	06/12/19	
AS BUILT DETAILS		DATE	

(1) STA. 834+44, LT 79' TO STA. 834+11, RT 34'
CONST. 116 LF X 15" CLOSE FIT LINER
REMOVE EXIST OUTLET HEADWALL AT +44, LT 79'
CONST. PC-4 HEADWALL AT +44, LT 79'
CONST. 6' W X 10' L X 1' D STONE FILL (SEE STONE APRON DETAIL)

(2) STA. 834+62, LT 35' TO STA. 834+62, RT 35'
CONST. 67 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(2A) STA. 834+62, LT 35' TO STA. 830+65, LT 40'
REMOVE 470' OF EXIST. 6" UND. (SUBSID.)
CONST. 470 LF X 6" PERF. CORR. POLY. PIPE UND
CONST. FLUSHING BASIN AT 832+00, LT 29'

(2B) STA. 834+62, RT 35' TO STA. 831+10, RT 35'
FILL AND ABANDON 360' OF EXIST. 6" UNDERDRAIN
CONST. 340 LF X 6" PERF. CORR. POLY. PIPE UND.
CONST. FLUSHING BASIN AT 832+30, RT 30'

(3) STA. 835+09, LT 67' TO STA. 835+12, LT 40'
REMOVE 25' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. DI AT +12, LT 40' (SUBSID.)
CONST. 25' X 12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 12" CORR. POLYETHYLENE END SECTION AT +09, LT 67'
INV. AT END SECTION = 471.0 ± (FIELD VERIFY)
CONST. DI-D-B W/POLYETHYLENE LINER AT STA. 835+12, LT 40'
INV. OUT = 478.3 ± (MATCH EXISTING)
GRATE ELEV. = 483.2 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(4) STA. 835+60, LT 54' TO STA. 835+61, LT 18'
CONST. 55 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER
CONST. 15" ALUMINIZED STEEL END SECTION AT +60, LT 54'
INV. AT END SECTION = UNKNOWN (MATCH EXISTING)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(5) STA. 835+61, LT 18' TO STA. 835+61, RT 34'
CONST. 49 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(6) STA. 837+61, RT 50' TO STA. 837+63, RT 19'
REMOVE 30' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. DI AT +63, RT 19' (SUBSID.)
CONST. 30' X 12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 12" CORR. POLYETHYLENE END SECTION AT +61, RT 50'
INV. AT END SECTION = 475.0 ± (FIELD VERIFY)
CONST. DI-D-B W/POLYETHYLENE LINER AT +63, RT 19'
INV. OUT = 483.2 ± (MATCH EXISTING)
GRATE ELEV. = 487.9 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(7) STA. 838+11, LT 101' TO STA. 838+12, LT 50'
REMOVE 50' OF EXIST. 15" CMP (SUBSID.)
CONST. 50 LF X 15" PLASTIC PUPE (SMOOTH INTERIOR)
CONST. 15" CORR. POLYETHYLENE END SECTION AT +11, LT 101'
INV. AT END SECTION = 467.8 ± (MATCH EXISTING)
CONST. CB-B W/POLYETHYLENE LINER AT +12, LT 50'
15" INV. IN = 481.0 ± (MATCH EXISTING)
15" INV. OUT = 480.4 ± (MATCH EXISTING)
GRATE ELEV. = 487.9 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(7A) STA. 838+12, LT 50' TO STA. 838+13, LT 18'
CONST. 28 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(8) STA. 838+13, LT 18' TO STA. 838+12, RT 34'
CONST. 49 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(9) STA. 840+75, RT 34' TO STA. 841+48, RT 34'
CONST. 69 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(10) STA. 841+48, RT 34' TO STA. 841+41, LT 19'
CONST. 50 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(11) STA. 841+48, RT 34' TO STA. 842+69, RT 20'
CONST. 84 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(12) STA. 841+48, RT 34' TO STA. 39+37, LT 1'
CONST. 70 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(13) STA. 41+57, RT 90' TO STA. 41+49, LT 1'
CONST. 88 LF X 12" CLOSE FIT LINER
RECONST./ADJUST 2' DI
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(14) STA. 844+35, LT 19'
RECONST./ADJUST 2' DI
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(15) STA. 845+11, RT 34'
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(16) STA. 845+18, RT 89' TO STA. 845+65, RT 20'
REMOVE EXIST. CB AT +65, RT 20' (SUBSID.)
CONST. 80 LF X 15" CLOSE FIT LINER
CONST. CB-B W/POLYETHYLENE LINER AT +65, RT 20'
INV. IN = 506.5 ± (MATCH EXISTING)
INV. OUT = 506.3 ± (MATCH EXISTING)
GRATE ELEV. = 516.0 ± (FIELD VERIFY)

(16A) STA. 10+27, RT 54' TO STA. 845+18, RT 89'
REMOVE 157' X 15" CMP (71' SUBSID.)
REMOVE EXIST. CB AT +18, RT 89' (SUBSID.)
CONST. 157' X 15" RCP
CONST. 18" ALUMINIZED STEEL END SECTION AT STA. 10+27, RT 54'
INV. AT END SECTION = 594 ± (MATCH EXISTING)
CONST. CB-B AT +25, LT 105'
INV. IN = 493.1 ± (MATCH EXISTING)
INV. OUT = 492.7 ± (MATCH EXISTING)
GRATE ELEV. = 497.0 ± (FIELD VERIFY)
CONST. 5' W X 10'L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(17) STA. 848+54, LT 66' TO STA. 848+57, LT 19'
REMOVE 46' OF EXIST. 15" CMP (13' SUBSID.)
REMOVE EXIST. CB AT +57, LT 19' (SUBSID.)
CONST. 45' X 15" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 15" CORR. POLYETHYLENE END SECTION AT +54, LT 66'
INV. AT END SECTION = 509.2 ±
CONST. CB-B W/POLYETHYLENE LINER AT +57, LT 19'
INV. IN = 522.0 ± (MATCH EXISTING)
INV. OUT = 521.9 ± (MATCH EXISTING)
GRATE ELEV. = 528.7 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(18) STA. 849+10, RT 34'
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(19) STA. 850+38, RT 39'
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(20) STA. 12+34, RT 40' TO STA. 12+35, LT 2'
REMOVE 40' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. DI AT +35, LT 2' (SUBSID.)
CONST. 40' X 12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 12" CORR. POLYETHYLENE END SECTION AT +34, RT 40'
INV. AT END SECTION = 503.4 ± (MATCH EXISTING)
CONST. DI-D-B W/POLYETHYLENE LINER AT +35, LT 2'
INV. OUT = 518.7 ± (MATCH EXISTING)
GRATE ELEV. = 523.6 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(21) STA. 10+36, RT 57' TO STA. 10+37, LT 2'
REMOVE 58' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. DI AT +37, LT 2'(SUBSID.)
CONST. 58'X 12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 12" CORR. POLYETHYLENE END SECTION AT +36, RT 57'
INV. AT END SECTION = 493.0 ± (MATCH EXISTING)
CONST. DI-D-B W/POLYETHYLENE LINER AT +37, LT 2'
INV. OUT = 510.6 ± (MATCH EXISTING)
GRATE ELEV. = 516.0 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(22) STA. 8+88, RT 43'
REMOVE EXIST INLET HEADWALL AT +88, RT 43'
CONST. 228 LF X 24" CLOSE FIT LINER
CONST. PC-2 HEADWALL AT STA. 8+88, RT 43'
INV. AT HEADWALL = 494.0 ± (MATCH EXISTING)
CONST. 7.5' W X 10' L X 1' D STONE FILL (SEE STONE APRON DETAIL)

(23) STA. 8+65, RT 41' TO STA. 8+61, LT 1'
REMOVE 40' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. CB AT +61, LT 1' (SUBSID.)
CONST. 40' X 12" CORR. POLYETHYLENE PIPE FOR SLOPE DRAINAGE
CONST. 12" CORR. POLYETHYLENE END SECTION AT +65, RT 41'
INV. AT END SECTION = 493.2 ± (MATCH EXISTING)
CONST. CB-B W/POLYETHYLENE LINER AT +61, LT 1'
INV. IN = 506.2 ± (MATCH EXISTING)
INV. OUT = 505.0 ± (MATCH EXISTING)
GRATE ELEV. = 512.3 ± (FIELD VERIFY)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(24) STA. 8+61, LT 1' TO STA. 44+43, LT 19'
REMOVE 38' OF EXIST. 15" CMP (SUBSID.)
REMOVE EXIST. CB AT +43, LT 19' (SUBSID.)
CONST. 38' X 15" RCP
CONST. CB-B W/POLYETHYLENE LINER AT +43, LT 19'
INV. IN = 509.2 ± (MATCH EXISTING)
INV. OUT = 508.9 ± (MATCH EXISTING)
GRATE ELEV. = 514.0 ± (FIELD VERIFY)

(24A) STA. 44+43, LT 19' TO STA. 44+93, LT 19'
REMOVE 42' OF EXIST. 12" CMP (SUBSID.)
REMOVE EXIST. DI AT +93, LT 19' (SUBSID.)
CONST. 42' X 15" PLASTIC PIPE (SMOOTH INTERIOR)
CONST. CB-B W/POLYETHYLENE LINER AT +93, LT 19'
INV. OUT = 509.3 ± (MATCH EXISTING)
GRATE ELEV. = 513.9 ± (FIELD VERIFY)

(25) STA. 47+55, LT 19' TO STA. 5+87, LT 1'
REMOVE 29' OF EXIST. 15" CMP (SUBSID.)
REMOVE EXIST. CB AT 87, LT 1' (SUBSID.)
CONST. 29' X 15" RCP
CONST. CB-B W/POLYETHYLENE LINER AT +87, LT 1'
INV. OUT = 508.5 ± (MATCH EXISTING)
GRATE ELEV. = 514.4 ± (FIELD VERIFY)

(26) STA. 47+55, RT 47' TO STA. 47+55, LT 19'
REMOVE 64' OF EXIST. 15" CMP (SUBSID.)
REMOVE EXIST. CB AT +55, LT 19' (SUBSID.)
CONST. 64' X 15" RCP
CONST. 18" ALUMINIZED STEEL END SECTION AT +55, RT 47'
INV. AT END SECTION = 506 ± (MATCH EXISTING GROUND)
CONST. CB-B W/POLYETHYLENE LINER AT +55, LT 19'
INV. IN = 508.2 ± (MATCH EXISTING)
INV. OUT = 508.0 ± (MATCH EXISTING)
GRATE ELEV. = 515.3 ± (FIELD VERIFY)
CONST. 5' W X 10'L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(27) STA. 2+73, RT 25' TO STA. 2+80, LT 36'
REMOVE 60' OF EXIST. 15" RCP (SUBSID.)
CONST. 60 LF X 15" RCP
CONST. 18" ALUMINIZED STEEL END SECTION AT +73, RT 25'
INV. AT END SECTION = 508.9 ± (MATCH EXISTING)
RECONST./ADJUST 2' CB AT +80, LT 36'
CONST. FRAME & GRATE, TYPE B
DREDGE AND CLEAN OUTLET CHANNEL OF DEBRIS AND SILT
CONST. 5' W X 10'L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(27A) STA. 1+38, RT 31' TO STA. 1+36, LT 1'
REMOVE 30' OF EXIST. 18" RCP (SUBSID.)
CONST. 30 LF X 18" RCP
CONST. 24" ALUMINIZED STEEL END SECTON AT +38, RT 31'
INV. AT END SECTION = 502.5 ± (MATCH EXISTING)
CONST. 5' W X 10'L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(28) STA. 3+37, RT 32' TO STA. 3+60, LT 24'
REMOVE 58' OF EXIST. 15" RCP (SUBSID.)
CONST. 58 LF X 15" RCP
CONST. 18" ALUMINIZED STEEL END SECTON AT +37, RT 32'
INV. AT END SECTION = 509.4 ± (MATCH EXISTING)
RECONST./ADJUST 2' CB AT +60, LT 24'
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER
MATCH EXISTING INVERT OUT
DREDGE AND CLEAN OUTLET CHANNEL OF DEBRIS AND SILT
CONST. 5' W X 10'L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(29) STA. 3+60, LT 24' TO STA. 50+04, LT 35'
REMOVE 29' OF EXIST. 15" RCP (SUBSID.)
CONST. 29 LF X 15" RCP
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B
MATCH EXISTING INVERTS

(30) STA. 50+04, LT 35' TO STA. 50+28, LT 23'
REMOVE 24' OF EXIST. 15" RCP (SUBSID.)
CONST. 24 LF X 15" RCP
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER
MATCH EXISTING INVERTS

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION	STATION	DATE	NUMBER

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

DRAINAGE NOTES

GM2 ASSOCIATES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191_DRN_NOTE	41191	69	110

(31) STA. 50+28, LT 23' TO STA. 50+25, LT 1'
REMOVE 19' OF EXIST. 15" RCP (SUBSID.)
CONST. 19 LF X 15" RCP
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER
MATCH EXISTING INVERTS

(32) STA. 852+18, RT 55' TO STA. 852+62, LT 32'
CONST. 93 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(33) STA. 2+02, LT 78' TO STA. 852+18, RT 55'
CONST. 142 LF X 15" CLOSE FIT LINER
RECONST./ADJUST 2'CB
CONST. FRAME & GRATE, TYPE B

(34) STA. 853+61, LT 39'
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B W/POLYETHYLENE LINER

(35) STA. 855+53, RT 41' TO STA. 855+62, LT 32'
CONST. 70 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(36) STA. 852+18, RT 55' TO STA. 855+53, RT 41'
REMOVE 350' OF EXIST. 15" UND. (SUBSID.)
CONST. 350 LF X 15" PERF. CORR. POLY. PIPE UND.
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B

(37) STA. 858+57, RT 36' TO STA. 858+59, LT 30'
CONST. 62 LF X 15" CLOSE FIT LINER
RECONST. 3' EXIST. BARREL BLOCK CB
CONST. FRAME & GRATE, TYPE B

(38) STA. 855+53, RT 41' TO STA. 858+57, RT 36'
REMOVE 320' OF EXIST. 15" UND. (SUBSID.)
CONST. 320 LF X 15" PER. CORR. POLY. PIPE UND.
RECONST./ADJUST 2' CB
CONST. FRAME & GRATE, TYPE B

(39) STA. 858+57, RT 36' TO STA. 861+50, RT 30'
REMOVE 300' OF EXIST. 6" UND. (SUBSID.)
CONST. 300 LF X 6" PER. CORR. POLY. PIPE UND.
CONNECT TO EXIST UND. AT +50, RT 30'

(40) STA. 850+80, LT 81' TO STA. 851+12, LT 60'
CONST. 37 LF X 15" CLOSE FIT LINER
CONST. PC-2 HEADWALL AT +80, LT 81'
15" INV. AT END SECTION = 529.6 ± (MATCH EXISTING)
CONST. 5' W X 10' L X 1' D STONE FILL (SEE SLOPE OUTLET PROTECTION DETAIL)

(41) STA. 851+12, LT 60' TO STA. 853+60, LT 50'
CONST. 246 LF X 15" CLOSE FIT LINER

(42) STA. 853+60, LT 50' TO STA. 854+09, LT 56'
REMOVE 46' OF EXIST. 12" UND (SUBSID.)
CONST. 46 LF X 12" PERF. CORR. POLY. PIPE UND.
12" INV. AT +60, LT 50' = 536.2 ± (MATCH EXISTING)
12" INV. AT +09, LT 56' = 536.4 ± (MATCH EXISTING)

(43) STA. 854+09, LT 56' TO STA. 856+13, LT 46'
REMOVE 201' OF EXIST. 12" UND (SUBSID.)
CONST. 201 LF X 12" PERF. CORR. POLY. PIPE UND.
12" INV. AT +09, LT 56' = 536.6 ± (MATCH EXISTING)
12" INV. AT +13, LT 46' = 540.9 ± (MATCH EXISTING)

(44) STA. 856+13, LT 46' TO STA. 859+05, LT 30' ±
REMOVE 300' OF EXIST. 12" UND (SUBSID.)
CONST. 300 LF X 12" PERF. CORR. POLY. PIPE UND.
12" INV. AT +13, LT 46' = 541.3 ± (MATCH EXISTING)
12" INV. AT +05, LT 30' = UNKNOWN (MATCH EXISTING)

(45) STA. 859+05, LT 30' ± TO STA. 861+95, LT 28' ±
REMOVE 300' OF EXIST. 6" UND (SUBSID.)
CONST. 300 LF X 6" PERF. CORR. POLY. PIPE UND.
6" INV. AT +05, LT 30' = UNKNOWN (MATCH EXISTING)
CONNECT TO EXISTING FB AT +95, LT 28'

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED J. MERCER DATE 04/12/19
NEW DESIGN J. MERCER DATE 04/12/19
SHEET CHECKED D. BLOOD DATE 04/12/19
AS BUILT DETAILS DATE

GM2 ASSOCIATES

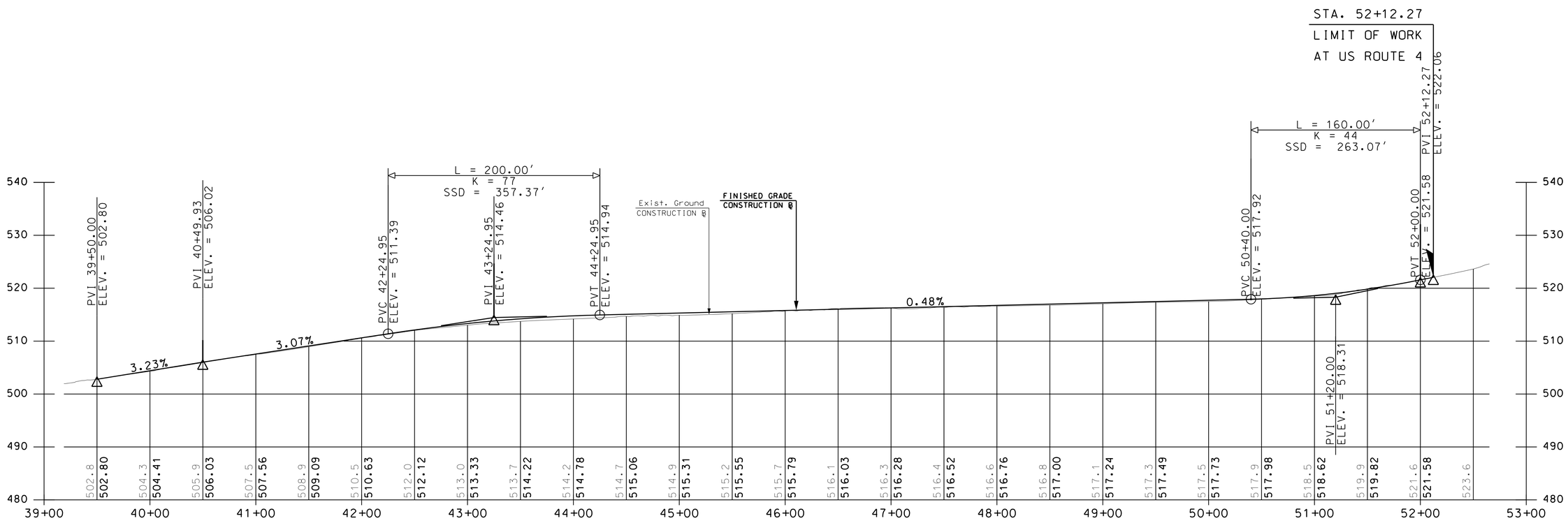
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

DRAINAGE NOTES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191_DRN_NOTE	41191	70	110

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE	STATION



+50	+00	+50		+40	+90	+12
3" COLD PLANE & 4" PAVEMENT	TRANS.	REMOVE EXIST. 7" PAVEMENT. SHIM WITH CR. GRAVEL. AND CONSTRUCT 8" PAVEMENT.		TRANS.	$1\frac{1}{2}$" COLD PLANE & OVERLAY	

NOTE: CONTRACTOR SHALL VERIFY EXISTING SUPERELEVATION PRIOR TO PAVEMENT REMOVAL & MATCH.

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

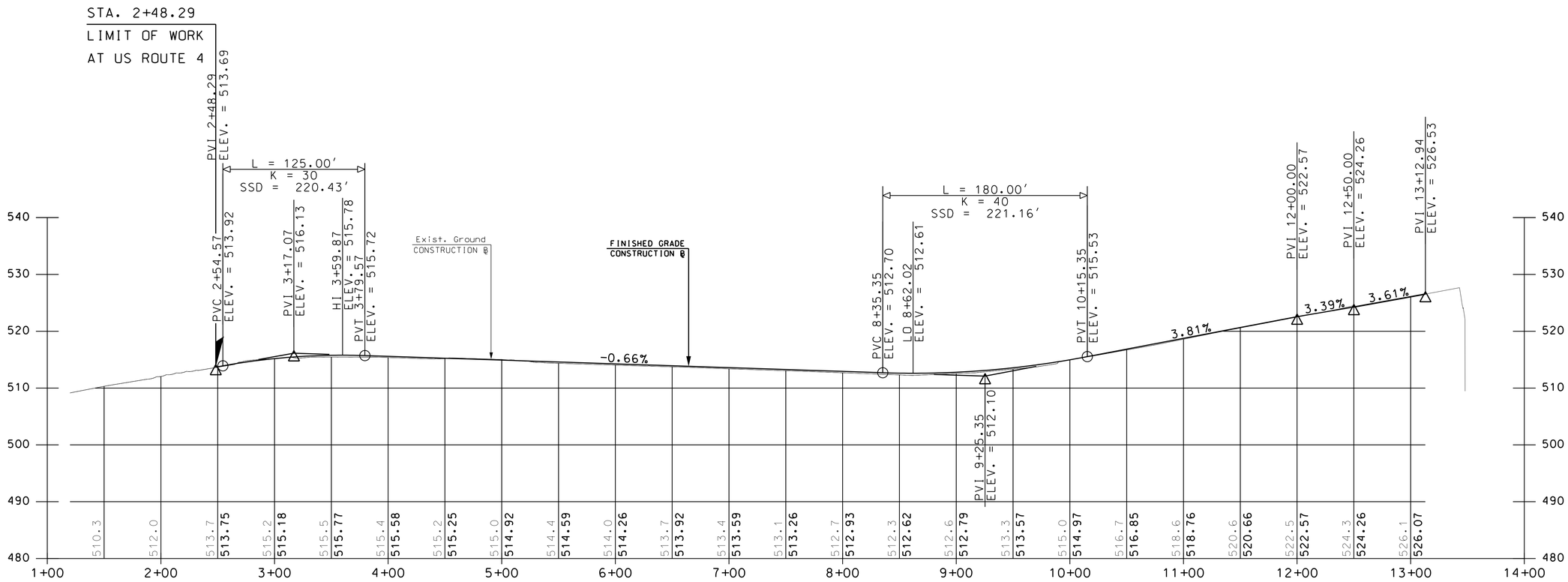
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

NORTHBOUND OFF RAMP PROFILE

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191p01	41191	71	110



+48 +00 +50

$1^1/_2$" COLD PLANE & OVERLAY | TRANS. | REMOVE EXIST. $5^1/_2$" PAVEMENT, SHIM WITH CR. GRAVEL, AND CONSTRUCT 8" PAVEMENT. | +50 TRANS. | +00 3" COLD PLANE & 4" PAVEMENT | +10

NOTE: CONTRACTOR SHALL VERIFY EXISTING SUPERELEVATION PRIOR TO PAVEMENT REMOVAL & MATCH.

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

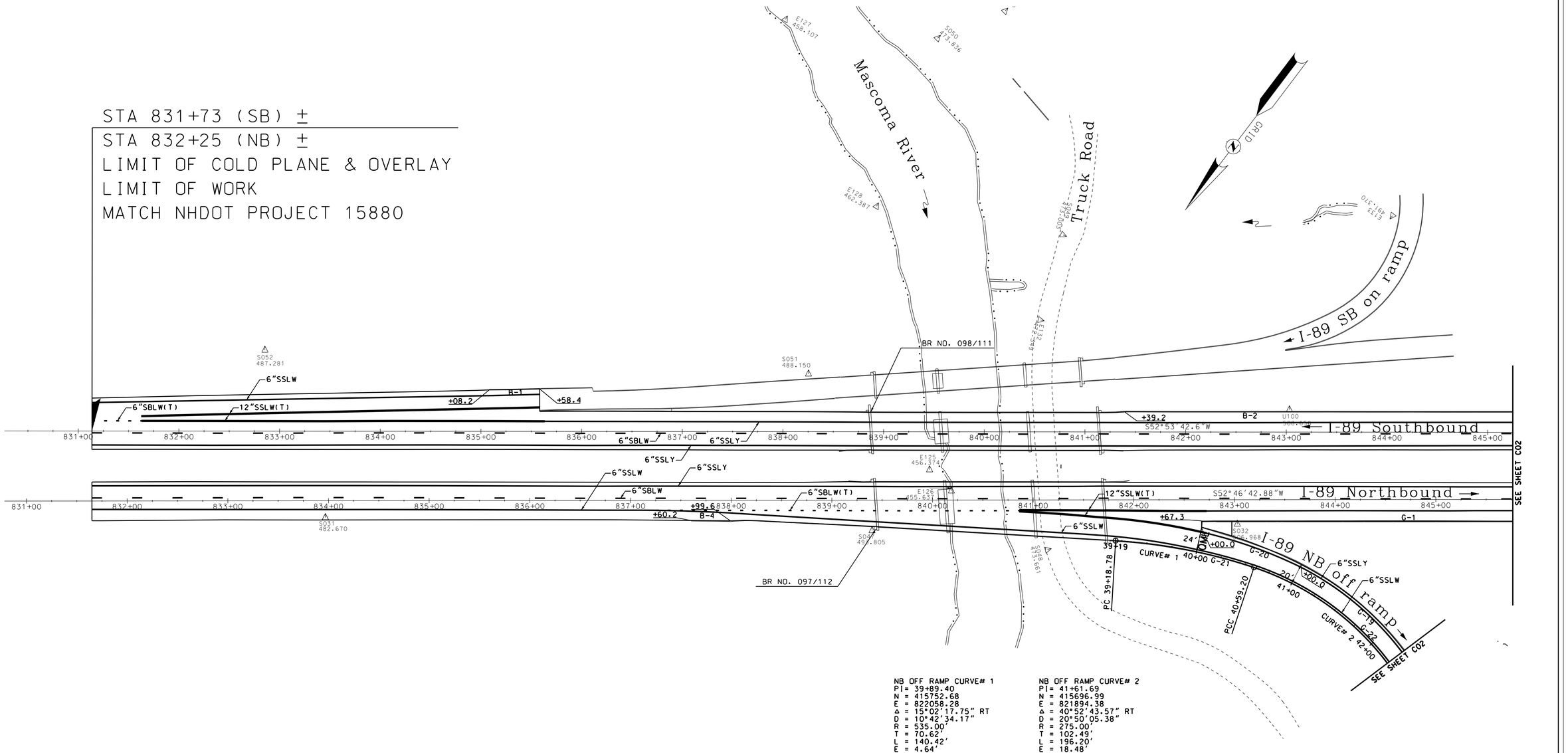
NORTHBOUND ON RAMP PROFILE

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191p02	41191	72	110

REVISIONS AFTER PROPOSAL			
NUMBER	DESCRIPTION	STATION	STATION

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

STA 831+73 (SB) ±
STA 832+25 (NB) ±
LIMIT OF COLD PLANE & OVERLAY
LIMIT OF WORK
MATCH NHDOT PROJECT 15880



NB OFF RAMP CURVE# 1
PI= 39+89.40
N = 415752.68
E = 822058.28
Δ = 15°02'17.75" RT
D = 10°42'34.17"
R = 535.00'
T = 70.62'
L = 140.42'
E = 4.64'

NB OFF RAMP CURVE# 2
PI= 41+61.69
N = 415696.99
E = 821894.38
Δ = 40°52'43.57" RT
D = 20°50'05.38"
R = 275.00'
T = 102.49'
L = 196.20'
E = 18.48'

PAVEMENT MARKING LEGEND

( ) SSLW - (SIZE) SINGLE SOLID LINE WHITE
( ) SSLY - (SIZE) SINGLE SOLID LINE YELLOW
( ) SBLW - (SIZE) SINGLE BROKEN LINE WHITE
(10' LONG, 30' SPACED) (LANE LINE)
(8' LONG, 2' SPACED) (TURNING MOVEMENT)
( ) DSLY - (SIZE) DOUBLE SOLID LINE YELLOW
( ) SB - (SIZE) STOP BAR
(T) - THERMOPLASTIC

PAVEMENT MARKING NOTE

1. ALL SYMBOLS, WORDS AND TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS) SHALL BE THERMOPLASTIC.

50 0 50 100
SCALE IN FEET

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

CURBING & PAVEMENT MARKING PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191c01	41191	73	110

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

NB ON RAMP CURVE# 1
PI= 2+19.02
N = 415374.26
E = 821366.96
Δ = 27°50'28.52" RT
D = 47°44'47.34"
R = 120.00'
T = 29.74'
L = 58.31'
E = 3.63'

NB ON RAMP CURVE# 2
PI= 2+71.95
N = 415405.15
E = 821322.55
Δ = 30°17'11.42" RT
D = 63°39'43.12"
R = 90.00'
T = 24.36'
L = 47.57'
E = 3.24'

NB ON RAMP CURVE# 3
PI= 3+63.73
N = 415489.45
E = 821283.45
Δ = 42°08'02.11" RT
D = 32°11'19.10"
R = 178.00'
T = 68.57'
L = 130.90'
E = 12.75'

NB ON RAMP CURVE# 4
PI= 5+42.01
N = 415665.66
E = 821338.15
Δ = 35°42'15.33" RT
D = 15°54'55.78"
R = 360.00'
T = 115.94'
L = 224.34'
E = 18.68'

NB ON RAMP CURVE# 5
PI= 14+27.73
N = 416203.85
E = 822051.10
Δ =154°03'52.54" RT
D = 32°00'31.74"
R = 179.00'
T = 777.33'
L = 481.32'
E = 618.68'

NB ON RAMP CURVE# 6
PI= 11+95.69
N = 415454.35
E = 821668.95
Δ = 24°04'23.65" RT
D = 19°05'54.94"
R = 300.00'
T = 63.97'
L = 126.05'
E = 6.74'

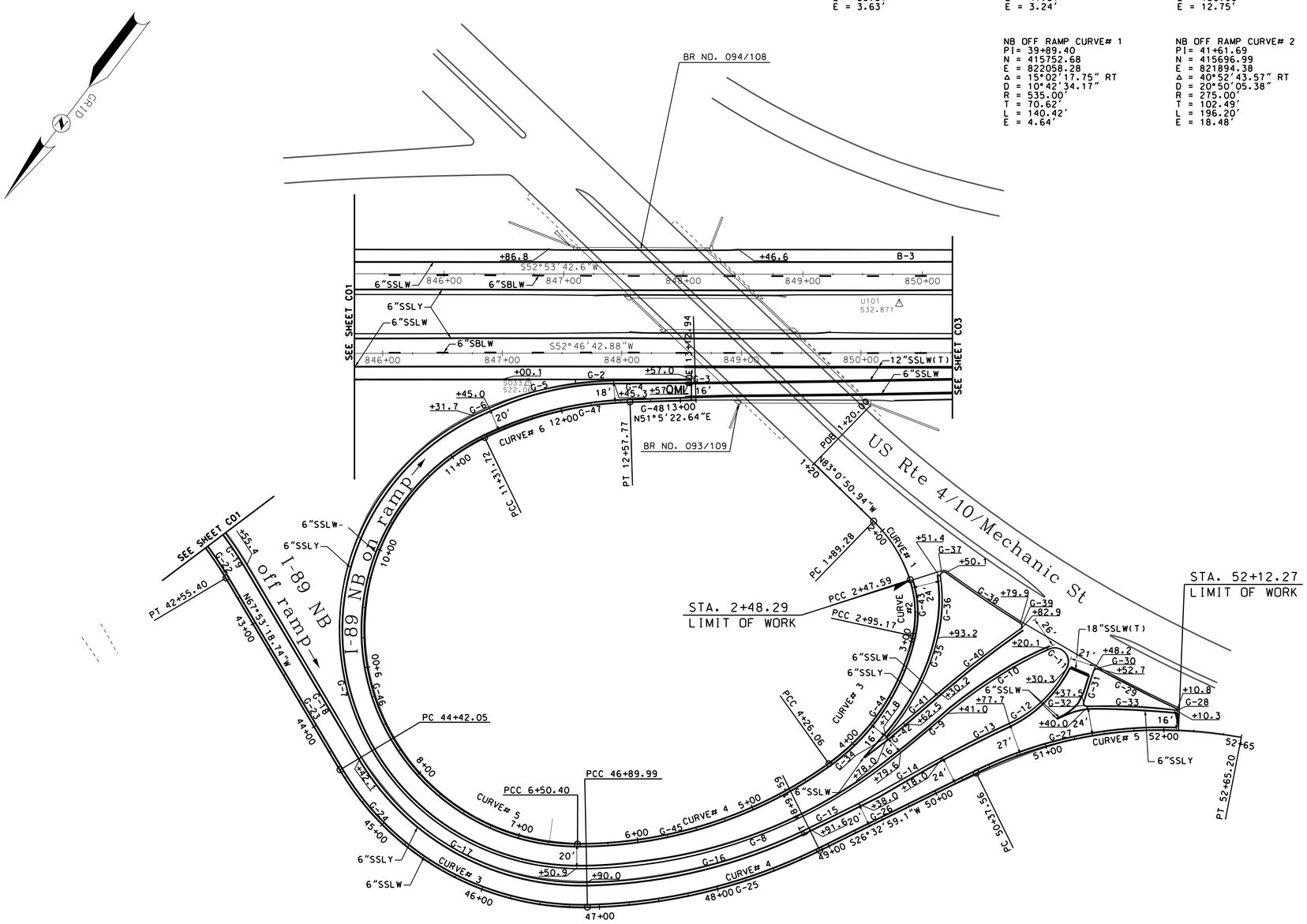
NB OFF RAMP CURVE# 1
PI= 39+89.40
N = 415752.68
E = 822058.28
Δ = 15°02'17.75" RT
D = 10°42'34.17"
R = 535.00'
T = 70.62'
L = 140.42'
E = 4.64'

NB OFF RAMP CURVE# 2
PI= 41+61.69
N = 415696.99
E = 821894.38
Δ = 40°52'43.57" RT
D = 20°50'05.38"
R = 275.00'
T = 102.49'
L = 196.20'
E = 18.48'

NB OFF RAMP CURVE# 3
PI= 45+78.96
N = 415857.36
E = 821499.67
Δ = 60°27'04.43" LT
D = 24°22'52.26"
R = 235.00'
T = 136.91'
L = 247.94'
E = 36.98'

NB OFF RAMP CURVE# 4
PI= 47+92.43
N = 415708.88
E = 821311.93
Δ = 25°06'37.72" LT
D = 12°27'20.18"
R = 460.00'
T = 102.44'
L = 201.60'
E = 11.27'

NB OFF RAMP CURVE# 5
PI= 51+55.57
N = 415381.10
E = 821148.15
Δ = 37°15'57.57" RT
D = 16°22'12.80"
R = 350.00'
T = 118.01'
L = 227.64'
E = 19.36'



50 0 50 100
SCALE IN FEET

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

CURBING & PAVEMENT MARKING PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191c02	41191	74	110

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19

AS BUILT DETAILS DATE

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

GRID N

I-89 SOUTHBOUND CURVE# 1
PI= 864+38.95
N = 414313.33
E = 820341.04
Δ = 33°21'52.51" RT
D = 2°26'17.23"
R = 2350.00'
T = 704.24'
L = 1368.46'
E = 103.25'

STA 862+25 (SB) ±
STA 862+65 (NB) ±
LIMIT OF COLD PLANE & OVERLAY
LIMIT OF WORK
MATCH NHDOT PROJECT 15880

I-89 SB off ramp

B-3 +65.7

I-89 Southbound

I-89 Northbound

SEE SHEET G02

12"SSLW(T)
6"SSLW
6"SBLW(T)
6"SSLY
6"SBLW
S52°53'42.6"W
S52°46'42.88"W
PC 857+34.68
851+00 852+00 853+00 854+00 855+00 856+00 857+00 858+00 859+00 860+00 861+00 862+00 863+00 864+00 865+
CURVE# 1
S034 541.233
S035 553.019
S036 554.965
CUT SLOPE (TYP)

LOCATION OF ITEM 203.92 - ROCK SCALING - MACHINE METHOD

I-89 NORTHBOUND CURVE# 1
PI= 864+52.50
N = 414386.23
E = 820333.32
Δ = 32°29'37.26" RT
D = 2°26'17.23"
R = 2350.00'
T = 684.82'
L = 1332.74'
E = 97.75'

50 0 50 100
SCALE IN FEET

SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

CURBING & PAVEMENT MARKING PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191c03	41191	75	110

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
619.1	CS-01	144	120	SOUTH SOUTH 89 89 EXIT 19 4 10 120 WIDE LOADS TRAFFIC SPLIT AHEAD			10/8D 8D 6C 8D	24		14C 11B	4	120.00	480.00	4*					BLACK/FLUORESCENT ORANGE/WHITE/YELLOW *MOUNT SIGN ON PRESSURE TREATED 6"X8" WOOD POSTS, WITH 2(3") DRILLED HOLES FOR BREAKAWAY FEATURES
619.1	CS-03	72	87	THRU TRAFFIC LEFT LANE EXIT 19 USE RIGHT LANE			7D 7D 7D 7D 7D 7D				2	43.50	87.00	2*					BLACK/ORANGE *MOUNT SIGN ON PRESSURE TREATED 6"X8" WOOD POSTS, WITH 2(3") DRILLED HOLES FOR BREAKAWAY FEATURES
619.1	CS-04	78	18	RAMP CLOSED			8C				1	9.75	9.75						BLACK/ORANGE MOUNT WITH M4-9R
619.1	CS-05	36	36	LANES SHIFT LEFT			5D 5D 5D				1	9.00	9.00					1	BLACK/ORANGE
619.1	CS-06	48	96	DETOUR NORTH INTERSTATE 89			8C 8C 2.5C	36 X 36		10D	2	32.00	64.00					1	BLACK/ORANGE WHITE/RED/BLUE
619.1	CS-07	48	96	DETOUR NORTH INTERSTATE 89			8C 8C 2.5C	36 X 36		10D	2	32.00	64.00					1	BLACK/ORANGE WHITE/RED/BLUE
619.1	CS-08	48	96	END DETOUR INTERSTATE 89 NORTH			8C 8C 2.5C 8C	36 X 36		10D	1	32.00	32.00					1	BLACK/ORANGE WHITE/RED/BLUE
619.1	CS-09	54	60	EXIT 19 CLOSED DETOUR EXIT 20			8D 8D 8D 8D				1	22.50	22.50						BLACK/ORANGE
619.1	CS-10	90	48	WIDE LOADS USE RIGHT LANE			8D 7D 7D				2	28.00	56.00					2	USED IN STAGES 5A, 5B BLACK/ORANGE
619.1	CS-11	60	36	I-89 NB RAMP CLOSED USE DETOUR			6B 6B 6B				2	15.00	30.00					2	BLACK/ORANGE

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
619.1	CS-12	48	96	DETOUR NORTH INTERSTATE 89			8C 8C 2.5C	36 X 36		10D	3	32.00	96.00					1	BLACK/ORANGE WHITE/RED/BLUE
619.1	E5-1	72	60	EXIT			12E		29.25 X 29.25		1	30.00	30.00					2	BLACK/ORANGE
619.1	G20-2a	48	24	END ROAD WORK			6C 6C				8	8.00	64.00					2	BLACK/ORANGE
619.1	M4-8a	24	18	END DETOUR			4D 4D			6D	1	3.00	3.00					1	BLACK/ORANGE
619.1	M4-9S	48	36	DETOUR			8D				2	12.00	24.00						BLACK/ORANGE (MOUNT ON EASELS)
619.1	M4-9L	48	36	DETOUR			8D				2	12.00	24.00						BLACK/ORANGE (MOUNT ON EASELS)
619.1	M4-9R	48	36	DETOUR			8D				3	12.00	36.00						BLACK/ORANGE (MOUNT ON EASELS)
619.1	R50-1	72	48	N.H. LAW WORK ZONE SPEEDING FINES $250-$500			7D 7C 7C 7C				4	24.00	96.00					2	BLACK/WHITE

GENERAL NOTES

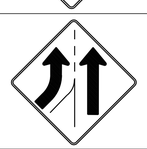
1. REFER TO THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION PUBLISHED BY THE NHDOT.
2. NOTE NEW REFLECTIVITY REQUIREMENTS IN THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 718 PUBLISHED BY THE NHDOT.
3. REFER TO THE LATEST EDITION OF THE STANDARD PLANS FOR ROAD CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS AND NHDOT SPECIFIC SIGNS.
4. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
5. THE ALUMINUM OR U-CHANNEL POST SHALL BE FLUSH WITH THE TOP OF THE SIGN ON ALL SINGLE POST ASSEMBLIES.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN CONSTRUCTION SIGN SUMMARY

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
TCP_SIGNSUMMARY.DGN	41191	76	110

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
619.1	W1-4bL	48	48								2	16.00	32.00					2	BLACK/ORANGE
619.1	W1-4bR	48	48								2	16.00	32.00					2	BLACK/ORANGE
619.1	W1-4L	48	48								1	16.00	16.00					2	BLACK/ORANGE
619.1	W1-4R	48	48								2	16.00	32.00					2	BLACK/ORANGE
619.1	W4-3L	48	48								2	16.00	32.00					2	BLACK/ORANGE
619.1	W6-1	48	48								2	16.00	32.00					2	BLACK/ORANGE
619.1	W12-1	36	36								1	9.00	9.00					2	BLACK/ORANGE
619.1	W13-1P(55)	30	30				5E			12E	5	6.25	31.25						BLACK/ORANGE
619.1	W20-1a	48	48				7D 7D 7D				4	16.00	64.00					2	BLACK/ORANGE
619.1	W20-1e	48	48				7C 7C 7C				4	16.00	64.00					2	BLACK/ORANGE
619.1	W20-1f	48	48				7C 7C 7C				4	16.00	64.00					2	BLACK/ORANGE
619.1	W21-5aL	48	48				7C 7C 7C				4	16.00	64.00					2	BLACK/ORANGE
619.1	W21-5aR	48	48				7C 7C 7C				4	16.00	64.00					2	BLACK/ORANGE
619.1	W21-5bL	48	48				6C 6C 6C 6C				4	16.00	64.00					2	BLACK/ORANGE
619.1	W21-5bR	48	48				6C 6C 6C 6C				4	16.00	64.00					2	BLACK/ORANGE

GENERAL NOTES

1. REFER TO THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION PUBLISHED BY THE NHDOT.
2. NOTE NEW REFLECTIVITY REQUIREMENTS IN THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 718 PUBLISHED BY THE NHDOT.
3. REFER TO THE LATEST EDITION OF THE STANDARD PLANS FOR ROAD CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS AND NHDOT SPECIFIC SIGNS.
4. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
5. THE ALUMINUM OR U-CHANNEL POST SHALL BE FLUSH WITH THE TOP OF THE SIGN ON ALL SINGLE POST ASSEMBLIES.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN CONSTRUCTION SIGN SUMMARY

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
TCP_SIGNSUMMARY.DGN	41191	77	110

US ROUTE 4 BRIDGE TRAFFIC CONTROL (SEE US ROUTE 4 TRANSVERSE SECTIONS FOR PHASING DIAGRAMS):

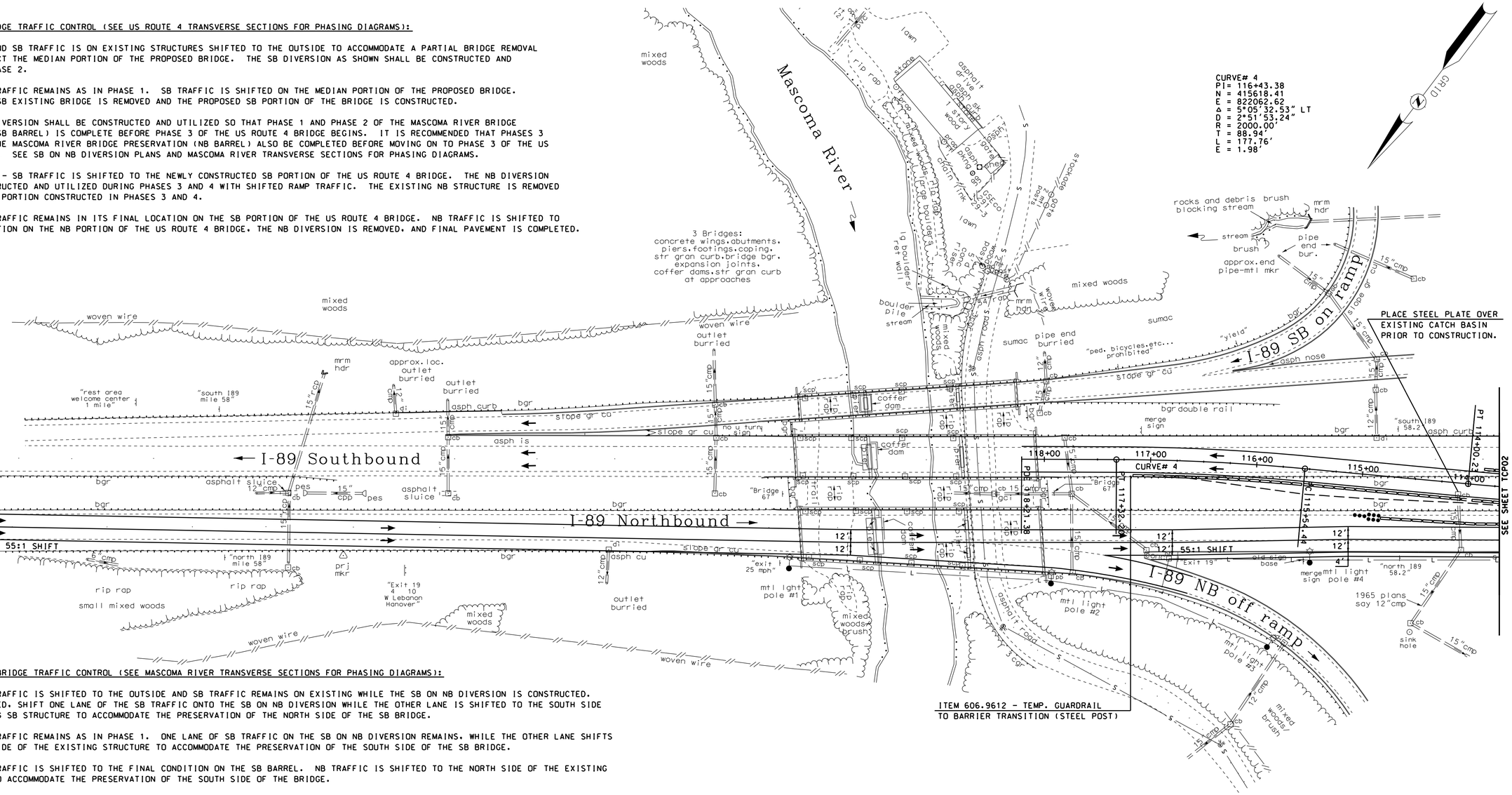
PHASE 1 - NB AND SB TRAFFIC IS ON EXISTING STRUCTURES SHIFTED TO THE OUTSIDE TO ACCOMMODATE A PARTIAL BRIDGE REMOVAL AND TO CONSTRUCT THE MEDIAN PORTION OF THE PROPOSED BRIDGE. THE SB DIVERSION AS SHOWN SHALL BE CONSTRUCTED AND UTILIZED IN PHASE 2.

PHASE 2 - NB TRAFFIC REMAINS AS IN PHASE 1. SB TRAFFIC IS SHIFTED ON THE MEDIAN PORTION OF THE PROPOSED BRIDGE. THE REMAINING SB EXISTING BRIDGE IS REMOVED AND THE PROPOSED SB PORTION OF THE BRIDGE IS CONSTRUCTED.

THE SB ON NB DIVERSION SHALL BE CONSTRUCTED AND UTILIZED SO THAT PHASE 1 AND PHASE 2 OF THE MASCOMA RIVER BRIDGE PRESERVATION (SB BARREL) IS COMPLETE BEFORE PHASE 3 OF THE US ROUTE 4 BRIDGE BEGINS. IT IS RECOMMENDED THAT PHASES 3 THROUGH 5 OF THE MASCOMA RIVER BRIDGE PRESERVATION (NB BARREL) ALSO BE COMPLETED BEFORE MOVING ON TO PHASE 3 OF THE US ROUTE 4 BRIDGE. SEE SB ON NB DIVERSION PLANS AND MASCOMA RIVER TRANSVERSE SECTIONS FOR PHASING DIAGRAMS.

PHASES 3 AND 4 - SB TRAFFIC IS SHIFTED TO THE NEWLY CONSTRUCTED SB PORTION OF THE US ROUTE 4 BRIDGE. THE NB DIVERSION SHALL BE CONSTRUCTED AND UTILIZED DURING PHASES 3 AND 4 WITH SHIFTED RAMP TRAFFIC. THE EXISTING NB STRUCTURE IS REMOVED AND THE NEW NB PORTION CONSTRUCTED IN PHASES 3 AND 4.

PHASE 5 - SB TRAFFIC REMAINS IN ITS FINAL LOCATION ON THE SB PORTION OF THE US ROUTE 4 BRIDGE. NB TRAFFIC IS SHIFTED TO ITS FINAL LOCATION ON THE NB PORTION OF THE US ROUTE 4 BRIDGE. THE NB DIVERSION IS REMOVED, AND FINAL PAVEMENT IS COMPLETED.



ITEM 606.9612 - TEMP. GUARDRAIL TO BARRIER TRANSITION (STEEL POST)

MASCOMA RIVER BRIDGE TRAFFIC CONTROL (SEE MASCOMA RIVER TRANSVERSE SECTIONS FOR PHASING DIAGRAMS):

PHASE 1 - NB TRAFFIC IS SHIFTED TO THE OUTSIDE AND SB TRAFFIC REMAINS ON EXISTING WHILE THE SB ON NB DIVERSION IS CONSTRUCTED. ONCE CONSTRUCTED, SHIFT ONE LANE OF THE SB TRAFFIC ONTO THE SB ON NB DIVERSION WHILE THE OTHER LANE IS SHIFTED TO THE SOUTH SIDE OF THE EXISTING SB STRUCTURE TO ACCOMMODATE THE PRESERVATION OF THE NORTH SIDE OF THE SB BRIDGE.

PHASE 2 - NB TRAFFIC REMAINS AS IN PHASE 1. ONE LANE OF SB TRAFFIC ON THE SB ON NB DIVERSION REMAINS, WHILE THE OTHER LANE SHIFTS TO THE NORTH SIDE OF THE EXISTING STRUCTURE TO ACCOMMODATE THE PRESERVATION OF THE SOUTH SIDE OF THE SB BRIDGE.

PHASE 3 - SB TRAFFIC IS SHIFTED TO THE FINAL CONDITION ON THE SB BARREL. NB TRAFFIC IS SHIFTED TO THE NORTH SIDE OF THE EXISTING NB STRUCTURE TO ACCOMMODATE THE PRESERVATION OF THE SOUTH SIDE OF THE BRIDGE.

PHASE 4 - SB TRAFFIC REMAINS IN THE FINAL CONDITION ON THE SB BARREL. NB TRAFFIC IS SPLIT, ONE LANE TO THE NORTH SIDE AND ONE LANE TO THE SOUTH SIDE OF THE EXISTING STRUCTURE, TO ACCOMMODATE THE PRESERVATION OF THE MIDDLE OF THE BRIDGE.

PHASE 5 - SB TRAFFIC REMAINS IN THE FINAL CONDITION ON THE SB BARREL. NB TRAFFIC IS SHIFTED TO THE SOUTH SIDE OF THE EXISTING STRUCTURE AND THE EXIT 19 NB OFF RAMP WILL BE CLOSED TO ACCOMMODATE THE PRESERVATION OF THE NORTH SIDE OF THE BRIDGE. DURING THIS TIME, THE NB ON RAMP WILL ALSO BE CLOSED SO WORK ON BOTH RAMPS CAN BE COMPLETED. ONCE THE PRESERVATION IS COMPLETE, NB TRAFFIC IS SHIFTED TO ITS FINAL LOCATION ON THE NB STRUCTURE AND THE OFF RAMP IS REOPENED.

LEGEND

- UNDER CONSTRUCTION
- TEMPORARY LIGHTING
- IMPACT ATTENUATOR - TL 3
- TRAFFIC
- PORTABLE CONCRETE BARRIER
- TRAFFIC BARRELS (LAYOUT PER MUTCD)

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN SB DIVERSION US ROUTE 4 BRIDGE-PHASE 2

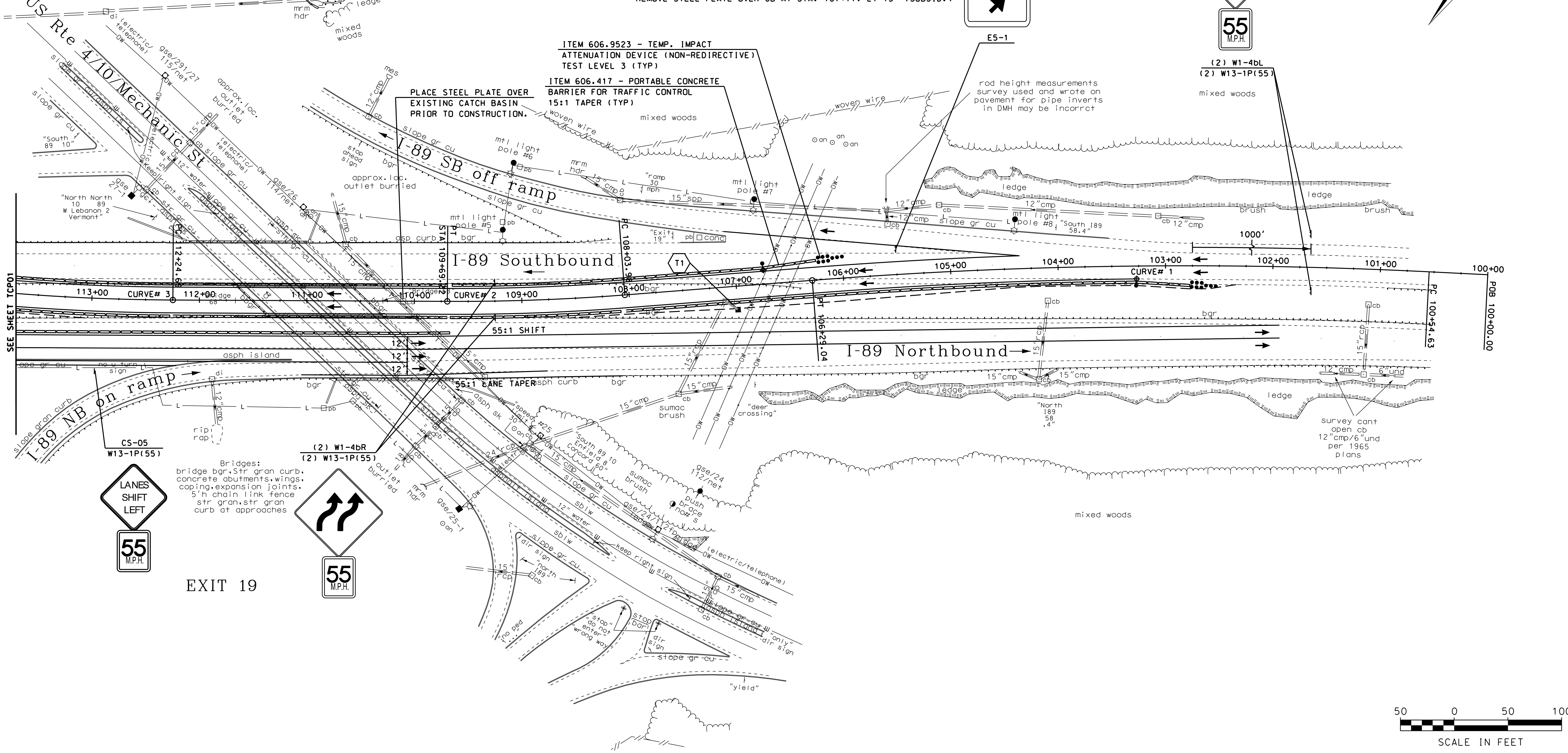
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp01	41191	78	110

CURVE# 3
PI= 113+12.51
N = 415443.79
E = 821781.46
Δ = 5°01'44.05" RT
D = 2°51'53.24"
R = 2000.00'
T = 87.83'
L = 175.54'
E = 1.93'

CURVE# 2
PI= 108+86.70
N = 415188.24
E = 821440.74
Δ = 4°44'11.45" RT
D = 2°51'53.24"
R = 2000.00'
T = 82.71'
L = 165.34'
E = 1.71'

(T1) STA. 107+11, LT 13' - STA. 107+00, LT 22'
CONST. TEMP. CB-B AT STA. 107+00, LT 22'
GRATE ELEV = 539.25
12" INV OUT = 534.50
CONST. 13 LF 12" TEMPORARY PIPE
CONNECT TO CB AT STA. 107+11, LT 13' (SUBSID.)
12" INV IN = 534.25
PLACE STEEL PLATE OVER CB AT STA. 107+11, LT 13' (SUBSID.)
FILL OVER CB AT STA. 107+11, LT 13' (ITEM 670.0451)
REMOVE TEMP. CB-B AT STA. 107+00, LT 22'
PLUG HOLE FROM 12" TEMPORARY PIPE (SUBSID.)
REMOVE STEEL PLATE OVER CB AT STA. 107+11, LT 13' (SUBSID.)

CURVE# 1
PI= 103+42.22
N = 414826.17
E = 821033.05
Δ = 7°18'49.19" LT
D = 1°16'23.66"
R = 4500.00'
T = 287.60'
L = 574.41'
E = 9.18'



EXIT
55 M.P.H.
E5-1
(2) W1-4bL
(2) W13-1P(55)
GRID
N
US Rte 4/10/Mechanic St
ITEM 606.9523 - TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3 (TYP)
ITEM 606.417 - PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL 15:1 TAPER (TYP)
PLACE STEEL PLATE OVER EXISTING CATCH BASIN PRIOR TO CONSTRUCTION.
rod height measurements survey used and wrote on pavement for pipe inverts in DMH may be incorrct
I-89 SB off ramp
I-89 Southbound
I-89 Northbound
I-89 NB on ramp
SEE SHEET TCP01
113+00 CURVE# 3 112+00 111+00 110+00 CURVE# 2 109+00 108+00 107+00 106+00 105+00 104+00 103+00 CURVE# 1 102+00 101+00 100+00
PC 112+24.68
STA 109+69.72
PC 108+03.98
PT 106+25.04
PC 100+54.63
POB 100+00.00
1000'
55:1 SHIFT
55:1 LANE TAPER
12'
CS-05
W13-1P(55)
LANES SHIFT LEFT
55 M.P.H.
(2) W1-4bR
(2) W13-1P(55)
55 M.P.H.
Bridges: bridge bgr,Str gran curb, concrete abutments,wings, coping,expansion joints, 5'h chain link fence str gran,str gran curb at approaches
EXIT 19
mixed woods
ledge
brush
survey cant open cb 12"cmp/6"und per 1965 plans

50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
TRAFFIC CONTROL PLAN
SB DIVERSION
US ROUTE 4 BRIDGE-PHASE 2

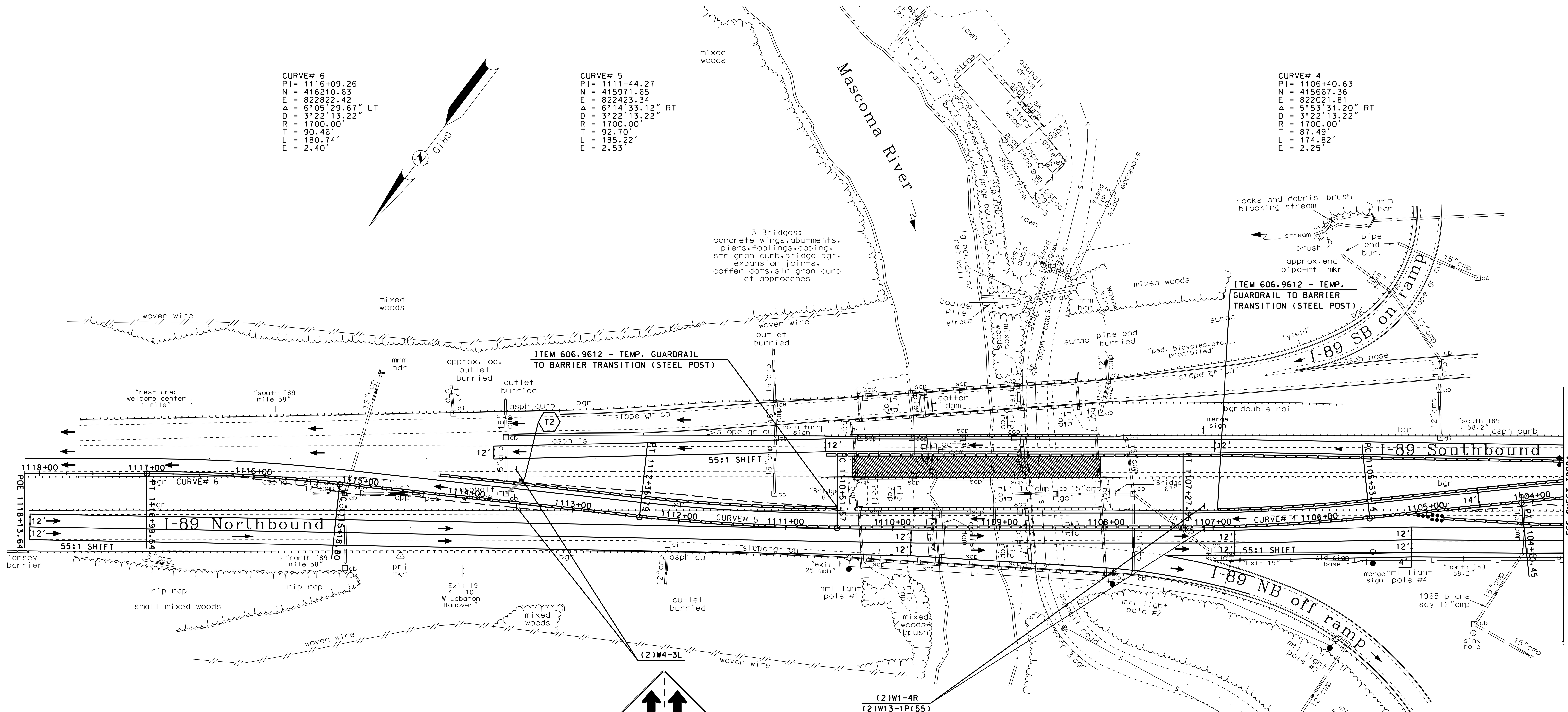
GM2 ASSOCIATES

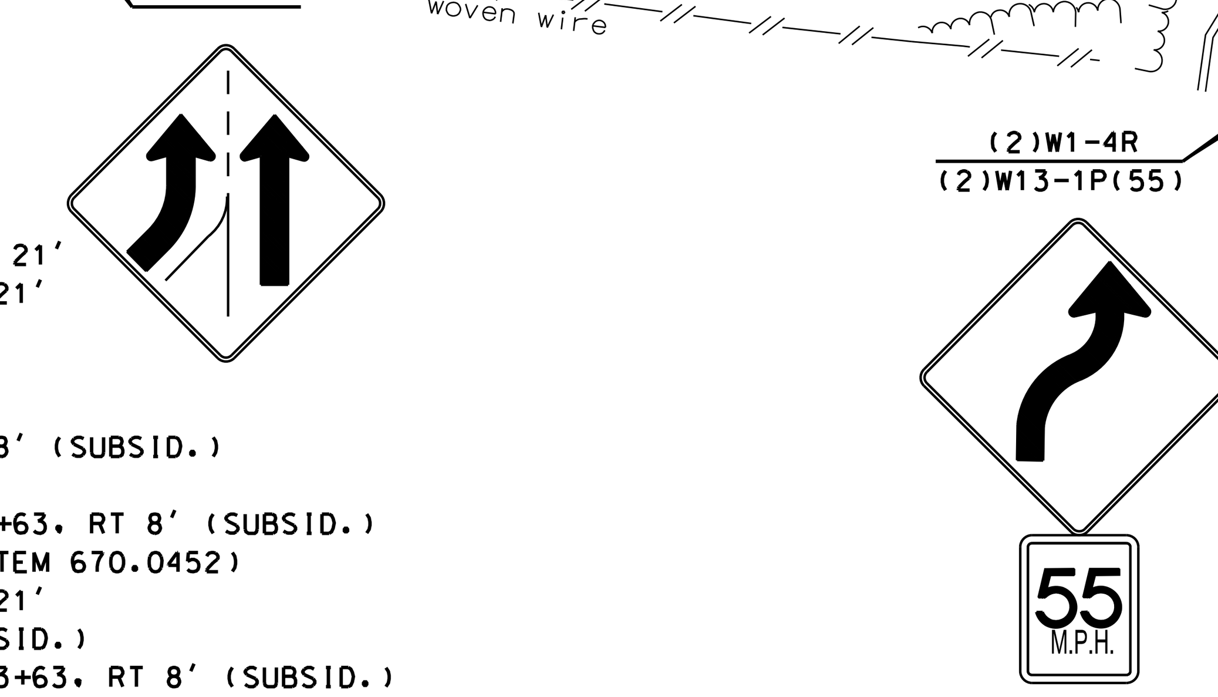
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp02	41191	79	110

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE





T2 STA. 1113+63, RT 8' - STA. 1113+50, RT 21'
CONST. TEMP. CB-B AT STA. 1113+50, RT 21'
GRATE ELEV = 484.25
12" INV OUT = 480.00
CONST. 14 LF 12" TEMPORARY PIPE
CONNECT TO CB AT STA. 1113+63, RT 8' (SUBSID.)
12" INV IN = 479.00
PLACE STEEL PLATE OVER CB AT STA. 1113+63, RT 8' (SUBSID.)
FILL OVER CB AT STA. 1113+63, RT 8' (ITEM 670.0452)
REMOVE TEMP. CB-B AT STA. 1113+50, RT 21'
PLUG HOLE FROM 12" TEMPORARY PIPE (SUBSID.)
REMOVE STEEL PLATE OVER CB AT STA. 1113+63, RT 8' (SUBSID.)

LEGEND

Symbol	Description
(hatched box)	UNDER CONSTRUCTION
(symbol)	TEMPORARY LIGHTING
(symbol)	IMPACT ATTENUATOR - TL 3
→	TRAFFIC
(symbol)	PORTABLE CONCRETE BARRIER
. . .	TRAFFIC BARRELS (LAYOUT PER MUTCD)

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

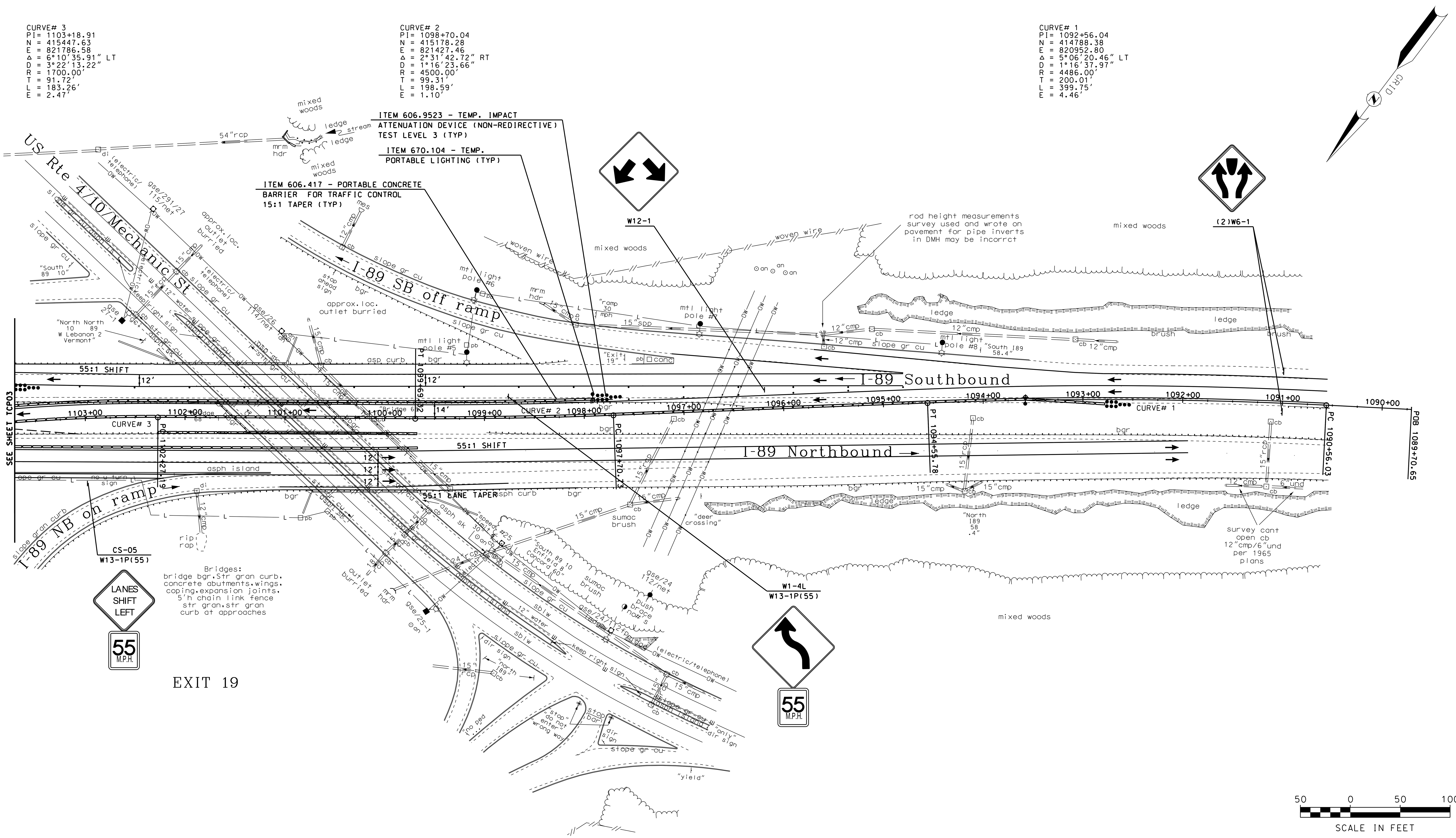
TRAFFIC CONTROL PLAN
SB ON NB DIVERSION
MASCOMA RIVER BRIDGE-PHASE 1

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp03	41191	80	110

CURVE# 3
PI= 1103+18.91
N = 415447.63
E = 821786.58
Δ = 6°10'35.91" LT
D = 3°22'13.22"
R = 1700.00'
T = 91.72'
L = 183.26'
E = 2.47'

CURVE# 2
PI= 1098+70.04
N = 415178.28
E = 821427.46
Δ = 2°31'42.72" RT
D = 1°16'23.66"
R = 4500.00'
T = 99.31'
L = 198.59'
E = 1.10'

CURVE# 1
PI= 1092+56.04
N = 414788.38
E = 820952.80
Δ = 5°06'20.46" LT
D = 1°16'37.97"
R = 4486.00'
T = 200.01'
L = 399.75'
E = 4.46'



ITEM 606.9523 - TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3 (TYP)
ITEM 670.104 - TEMP. PORTABLE LIGHTING (TYP)
ITEM 606.417 - PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL 15:1 TAPER (TYP)
W12-1
(2)W6-1
rod height measurements survey used and wrote on pavement for pipe inverts in DMH may be incorrct
US Rte 4/10/Mechanic St
I-89 SB off ramp
I-89 Southbound
I-89 Northbound
I-89 NB on ramp
55:1 SHIFT
55:1 LANE TAPER
CURVE# 1
CURVE# 2
CURVE# 3
PC 1090+56.03
POB 1089+70.65
PT 1094+55.78
PC 1097+70.73
PT 1099+69.32
PC 1102+27.19
SEE SHEET TCP03
CS-05
W13-1P(55)
W1-4L
W13-1P(55)
LANES SHIFT LEFT
55 M.P.H.
EXIT 19
Bridges: bridge bgr.Str gran curb. concrete abutments.wings. coping.expansion joints. 5'h chain link fence str gran.str gran curb at approaches
survey cant open cb 12"cmp/6"und per 1965 plans
mixed woods
ledge
GRID

50 0 50 100
SCALE IN FEET

SDR PROCESSED J. MERCER	DATE 06/25/19
NEW DESIGN J. MERCER	DATE 06/25/19
SHEET CHECKED D. BLOOD	DATE 06/25/19
AS BUILT DETAILS	DATE

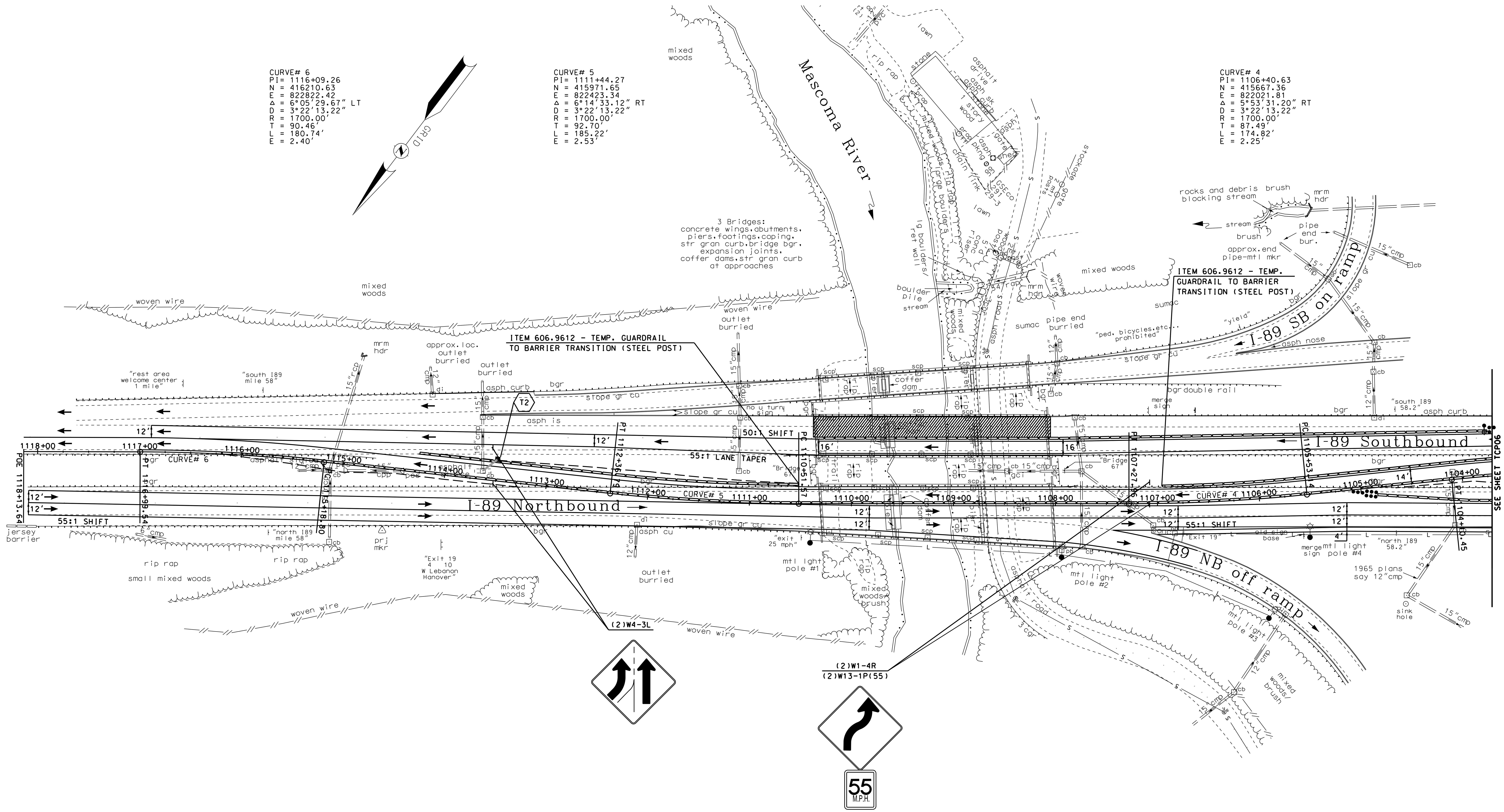
REVISIONS AFTER PROPOSAL — NUMBER | DATE | STATION | STATION | DESCRIPTION

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
SB ON NB DIVERSION
MASCOMA RIVER BRIDGE-PHASE 1

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp04	41191	81	110



CURVE# 6
PI= 1116+09.26
N = 416210.63
E = 822822.42
Δ = 6°05'29.67" LT
D = 3°22'13.22"
R = 1700.00'
T = 90.46'
L = 180.74'
E = 2.40'
CURVE# 5
PI= 1111+44.27
N = 415971.65
E = 822423.34
Δ = 6°14'33.12" RT
D = 3°22'13.22"
R = 1700.00'
T = 92.70'
L = 185.22'
E = 2.53'
CURVE# 4
PI= 1106+40.63
N = 415667.36
E = 822021.81
Δ = 5°53'31.20" RT
D = 3°22'13.22"
R = 1700.00'
T = 87.49'
L = 174.82'
E = 2.25'
GRID
Mascoma River
3 Bridges:
concrete wings, abutments, piers, footings, coping, str gran curb, bridge bgr, expansion joints, coffer dams, str gran curb at approaches
ITEM 606.9612 - TEMP. GUARDRAIL TO BARRIER TRANSITION (STEEL POST)
ITEM 606.9612 - TEMP. GUARDRAIL TO BARRIER TRANSITION (STEEL POST)
I-89 Southbound
I-89 Northbound
I-89 SB on ramp
I-89 NB off ramp
50:1 SHIFT
55:1 LANE TAPER
55:1 SHIFT
55:1 SHIFT
(2)W4-3L
(2)W1-4R
(2)W13-1P(55)
55 M.P.H.
SEE SHEET TCP06

LEGEND

(hatched box)	UNDER CONSTRUCTION
	TEMPORARY LIGHTING
	IMPACT ATTENUATOR - TL 3
	TRAFFIC
	PORTABLE CONCRETE BARRIER
	TRAFFIC BARRELS (LAYOUT PER MUTCD)

50 0 50 100
SCALE IN FEET

SDR PROCESSED	J. MERCER	DATE	06/25/19
NEW DESIGN	J. MERCER	DATE	06/25/19
SHEET CHECKED	D. BLOOD	DATE	06/25/19
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
SB ON NB DIVERSION
MASCOMA RIVER BRIDGE-PHASE 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp05	41191	82	110

CURVE# 3
PI= 1103+18.91
N = 415447.63
E = 821786.58
Δ = 6°10'35.91" LT
D = 3°22'13.22"
R = 1700.00'
T = 91.72'
L = 183.26'
E = 2.47'

CURVE# 2
PI= 1098+70.04
N = 415178.28
E = 821427.46
Δ = 2°31'42.72" RT
D = 1°16'23.66"
R = 4500.00'
T = 99.31'
L = 198.59'
E = 1.10'

CURVE# 1
PI= 1092+56.04
N = 414788.38
E = 820952.80
Δ = 5°06'20.46" LT
D = 1°16'37.97"
R = 4486.00'
T = 200.01'
L = 399.75'
E = 4.46'

GRID

ITEM 606.9523 - TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3 (TYP)

ITEM 670.104 - TEMP. PORTABLE LIGHTING (TYP)

ITEM 606.417 - PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL 15:1 TAPER (TYP)

US Rte 4/10/Mechanic St

I-89 SB off ramp

I-89 NB on ramp

I-89 Southbound

I-89 Northbound

W12-1

(2)W6-1

W1-4L
W13-1P(55)

CS-05
W13-1P(55)

LANES SHIFT LEFT

55 M.P.H.

Bridges:
bridge bgr,Str gran curb, concrete abutments,wings, coping,expansion joints, 5'h chain link fence str gran,str gran curb at approaches

EXIT 19

55:1 SHIFT

55:1 LANE TAPER

SEE SHEET TCP05

PC 1102+27.19

PC 1097+70.73

PT 1084+55.78

PC 1090+56.03

POB 1089+70.65

rod height measurements survey used and wrote on pavement for pipe inverts in DMH may be incorrct

"deer crossing"

survey cant open cb 12"cmp/6"und per 1965 plans

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL	STATION	DATE	NUMBER
DESCRIPTION			

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
SB ON NB DIVERSION
MASCOMA RIVER BRIDGE-PHASE 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp06	41191	83	110

REVISIONS AFTER PROPOSAL	STATION	DATE	NUMBER
DESCRIPTION			

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

ITEM 632.0104 - RETROFLECTIVE PAINT PAVE. MARKING, 4" LINE (TYP.) WHITE

3 Bridges: concrete wings,abutments, piers,footings,coping, str gran curb,bridge bgr, expansion joints, coffer dams,str gran curb at approaches

Mascoma River

Truck Road 5

I-89 SB on ramp

I-89 Southbound

704.5'

I-89 Northbound

I-89 NB off ramp

55:1 LANE SHIFT

40:1 LANE SHIFT

687.5'

102.5'

W6-1

W12-1

ITEM 606.9523 - TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3 (TYP)

ITEM 670.104 - TEMP. PORTABLE LIGHTING (TYP)

ITEM 606.417 - PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (24:1 FLARE RATE)

SEE SHEET TCP06b

LEGEND

- UNDER CONSTRUCTION
- TEMPORARY LIGHTING
- IMPACT ATTENUATOR - TL 3
- TRAFFIC
- PORTABLE CONCRETE BARRIER
- TRAFFIC BARRELS (LAYOUT PER MUTCD)

50 0 50 100

SCALE IN FEET

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

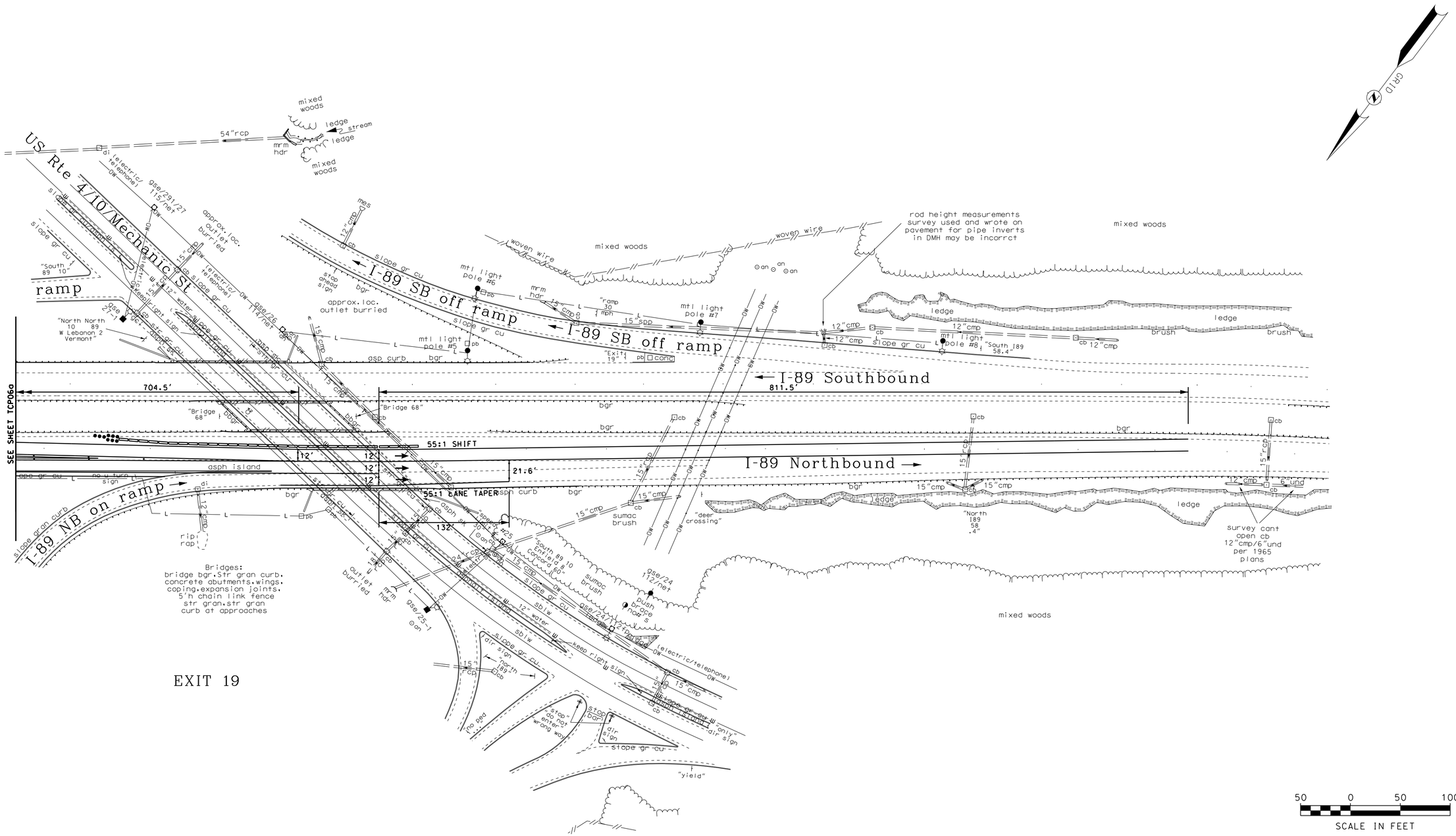
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN NB MAINLINE MASCOMA RIVER BRIDGE-PHASE 4

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp06a	41191	84	110

REVISIONS AFTER PROPOSAL	DESCRIPTION	STATION	NUMBER	DATE

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE



STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
NB MAINLINE
MASCOMA RIVER BRIDGE-PHASE 4

GM2 ASSOCIATES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp06b	41191	85	110

REVISIONS AFTER PROPOSAL			
DESCRIPTION	DATE	NUMBER	
STATION			
STATION			

CURVE# 3
PI = 215+91.74
N = 415667.36
E = 822021.81
Δ = 5°53'31.20" RT
D = 3°22'13.22"
R = 1700.00'
T = 87.49'
L = 174.82'
E = 2.25'

3 Bridges:
concrete wings,abutments, piers,footings,coping, str gran curb,bridge bgr, expansion joints, coffer dams,str gran curb at approaches

Mascoma River

I-89 Northbound

I-89 Southbound

I-89 SB on ramp

I-89 NB off ramp

ITEM 606.9612 - TEMP. GUARDRAIL TO BARRIER TRANSITION (STEEL POST)

ITEM 606.9523 - TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3 (TYP)

ITEM 606.417 - PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL 15:1 TAPER (TYP)

(2)W1-4bL
(2) W13-1P(55)

55 M.P.H.

SEE SHEET TCP08

LEGEND

- UNDER CONSTRUCTION
- TEMPORARY LIGHTING
- IMPACT ATTENUATOR - TL 3
- TRAFFIC
- PORTABLE CONCRETE BARRIER
- TRAFFIC BARRELS (LAYOUT PER MUTCD)

50 0 50 100
SCALE IN FEET

SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

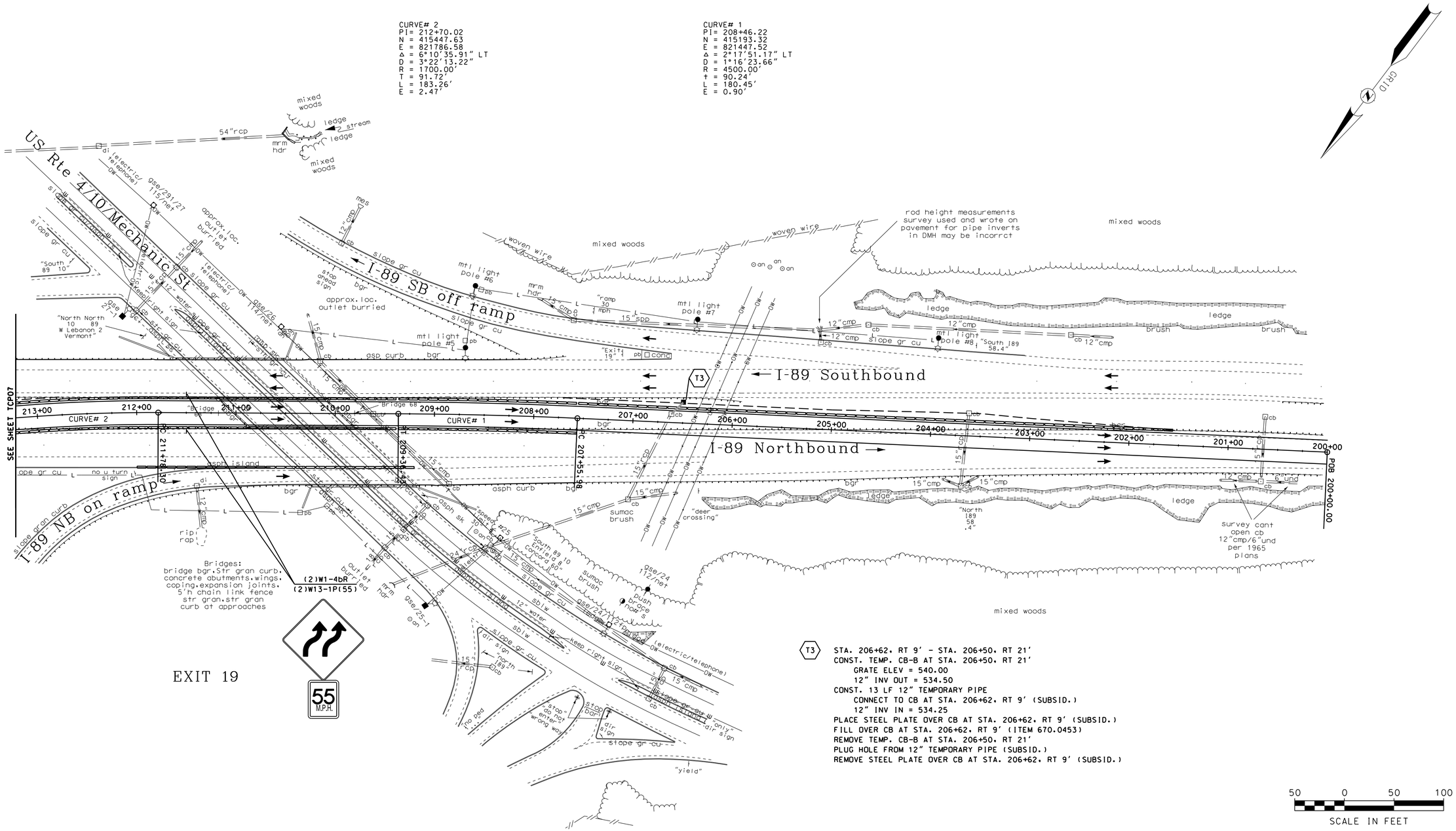
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
NB DIVERSION
US ROUTE 4 BRIDGE-PHASE 3

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp07	41191	86	110

CURVE# 2
PI= 212+70.02
N = 415447.63
E = 821786.58
Δ = 6°10'35.91" LT
D = 3°22'13.22"
R = 1700.00'
T = 91.72'
L = 183.26'
E = 2.47'

CURVE# 1
PI= 208+46.22
N = 415193.32
E = 821447.52
Δ = 2°17'51.17" LT
D = 1°16'23.66"
R = 4500.00'
T = 90.24'
L = 180.45'
E = 0.90'



T3 STA. 206+62. RT 9' - STA. 206+50. RT 21'
CONST. TEMP. CB-B AT STA. 206+50. RT 21'
GRATE ELEV = 540.00
12" INV OUT = 534.50
CONST. 13 LF 12" TEMPORARY PIPE
CONNECT TO CB AT STA. 206+62. RT 9' (SUBSID.)
12" INV IN = 534.25
PLACE STEEL PLATE OVER CB AT STA. 206+62. RT 9' (SUBSID.)
FILL OVER CB AT STA. 206+62. RT 9' (ITEM 670.0453)
REMOVE TEMP. CB-B AT STA. 206+50. RT 21'
PLUG HOLE FROM 12" TEMPORARY PIPE (SUBSID.)
REMOVE STEEL PLATE OVER CB AT STA. 206+62. RT 9' (SUBSID.)

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION	NUMBER	DATE

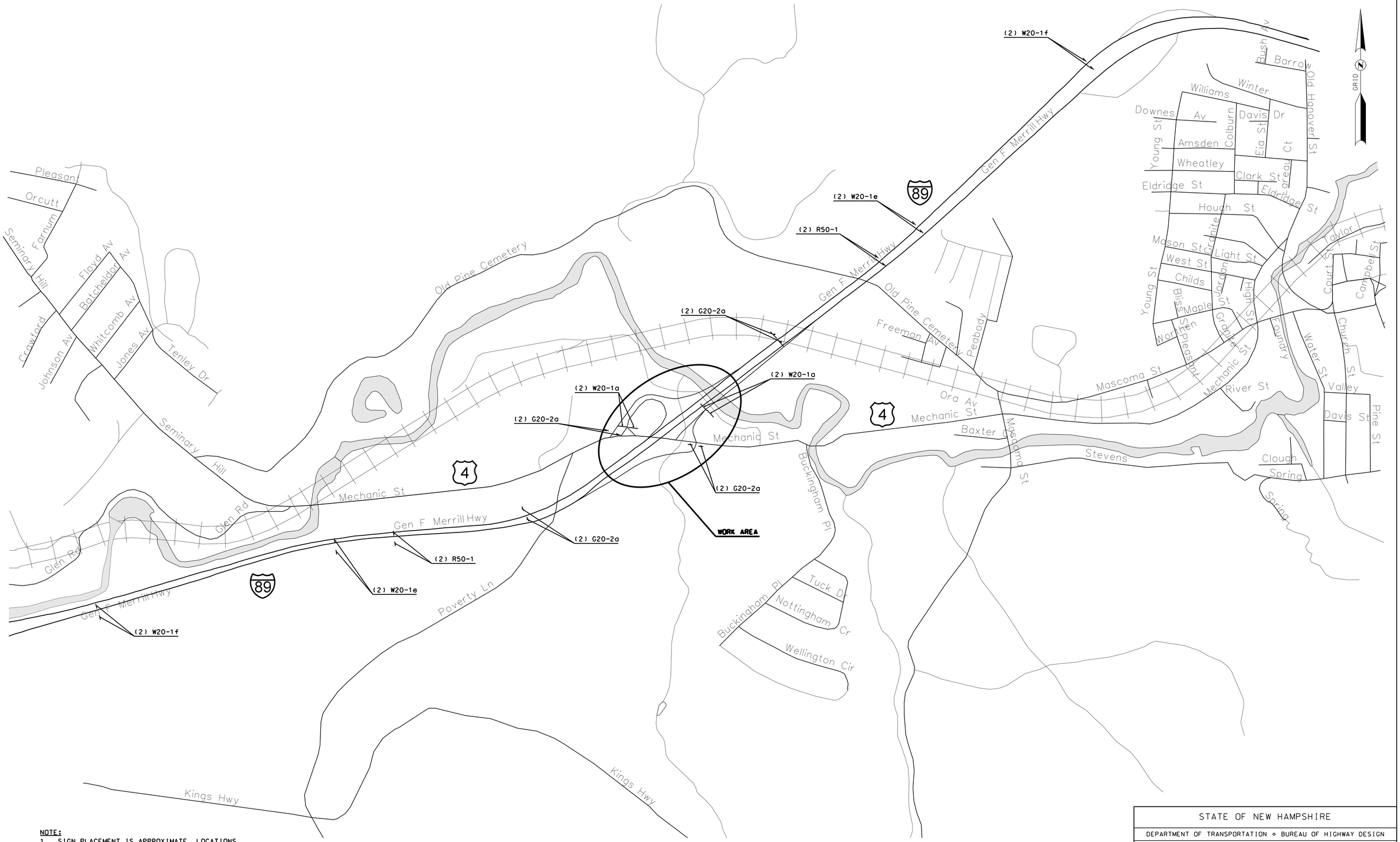
SDR PROCESSED	J. MERCER	DATE 06/25/19
NEW DESIGN	J. MERCER	DATE 06/25/19
SHEET CHECKED	D. BLOOD	DATE 06/25/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLAN
NB DIVERSION
US ROUTE 4 BRIDGE-PHASE 3

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp08	41191	87	110



NOTE:
1. SIGN PLACEMENT IS APPROXIMATE. LOCATIONS SUBJECT TO CHANGE PER RECOMMENDATION OF THE ENGINEER.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SOR PROCESSED	E. ROLSER	DATE 03/27/19
NEW DESIGN	J. MERCER	DATE 03/27/19
SHEET CHECKED	J. MERCER	DATE 03/27/19
AS BUILT DETAILS		DATE

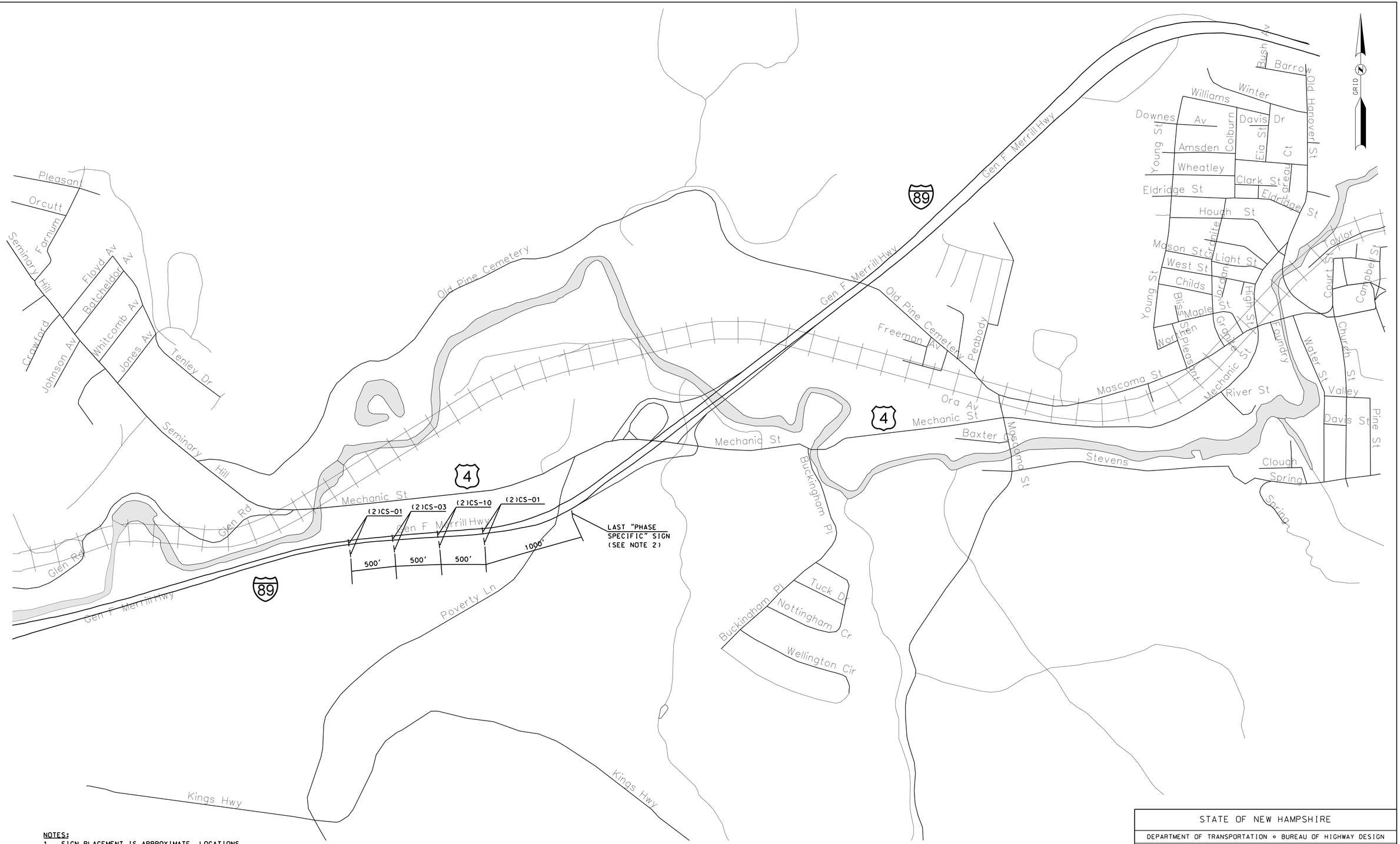
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

PERMANENT CONSTRUCTION SIGNING

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191Perm_Const_Sign	41191	88	110

GM2 ASSOCIATES



NOTES:
1. SIGN PLACEMENT IS APPROXIMATE. LOCATIONS SUBJECT TO CHANGE PER RECOMMENDATION OF THE ENGINEER.
2. SEE TRAFFIC CONTROL PLAN FOR "PHASE SPECIFIC" SIGNS.

1/8 1/16 0 1/8 1/4 mi.

GRAPHIC SCALE

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	E. ROLSER	DATE 03/27/19
NEW DESIGN	J. MERCER	DATE 03/27/19
SHEET CHECKED	J. MERCER	DATE 03/27/19
AS BUILT DETAILS		DATE

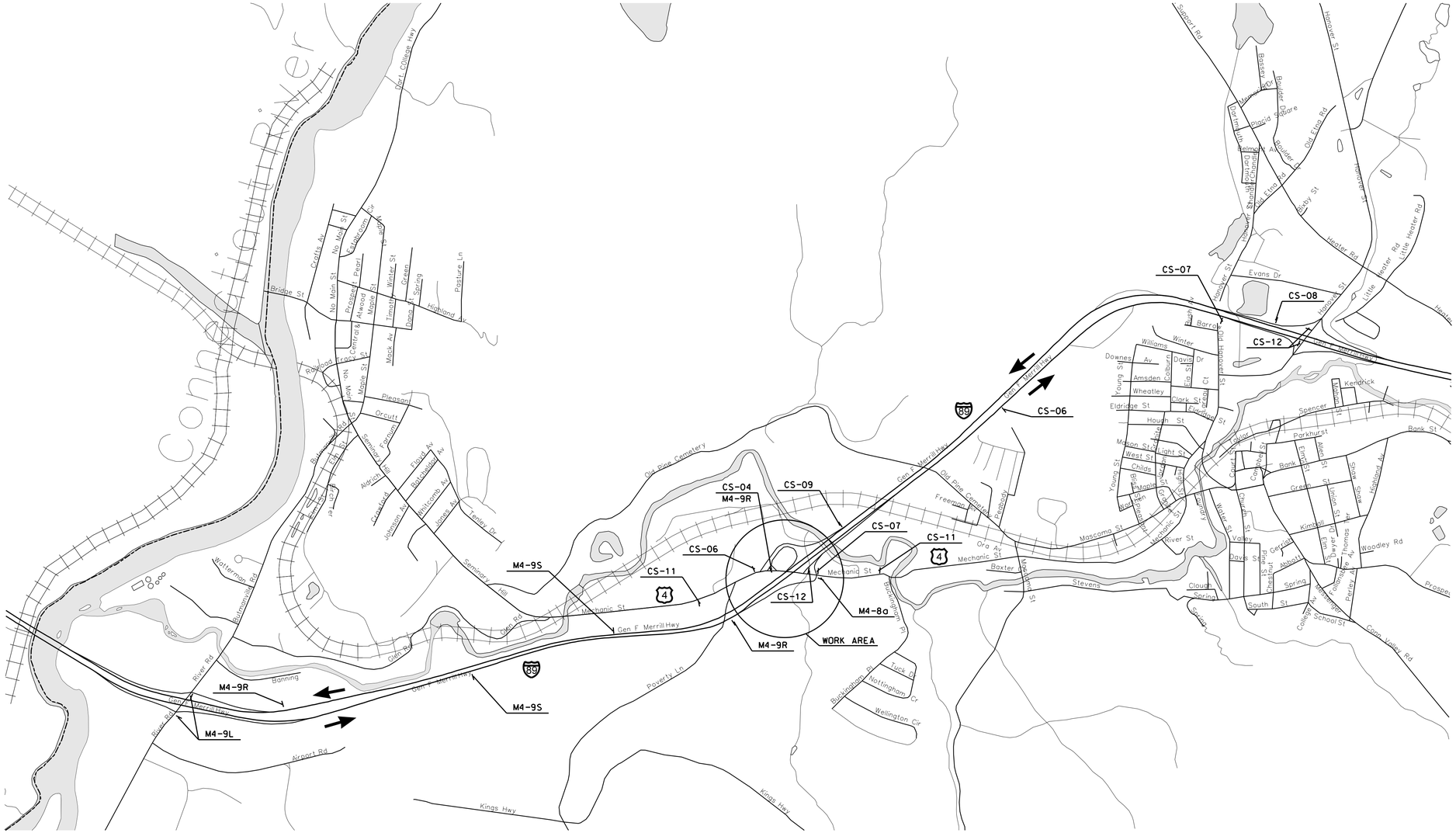
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

ADVANCE WARNING SIGNS SB ON NB DIVERSION

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp_AWS	41191	89	110



REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

SDR PROCESSED E. ROLSER DATE 03/27/19
NEW DESIGN J. MERCER DATE 03/27/19
SHEET CHECKED J. MERCER DATE 03/27/19
AS BUILT DETAILS DATE

NOTE:
1. SIGN PLACEMENT IS APPROXIMATE. LOCATIONS SUBJECT TO CHANGE PER RECOMMENDATION OF THE ENGINEER.

GRAPHIC SCALE

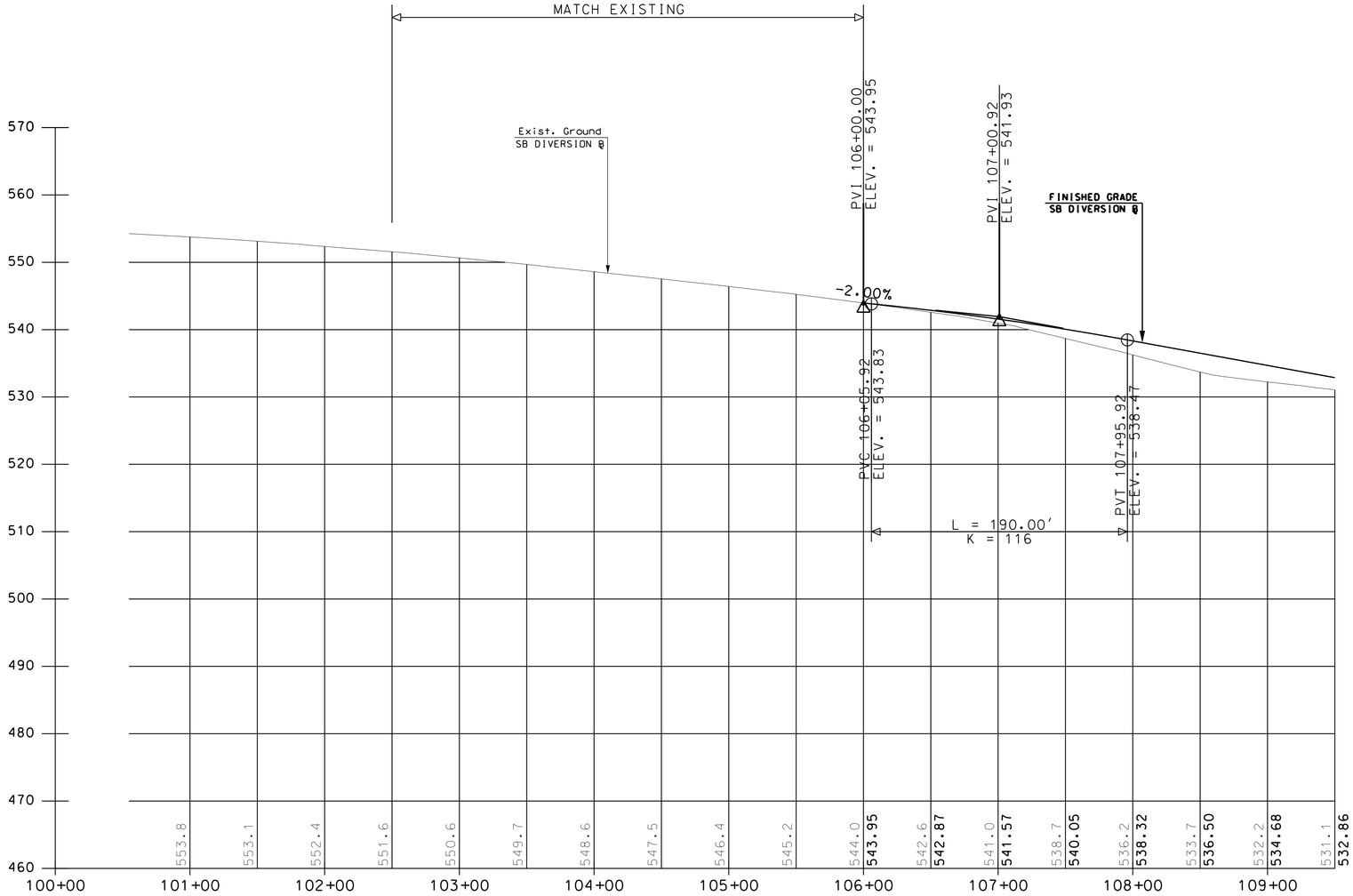
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

DETOUR PLAN
EXIT 19 NB RAMP CLOSURES

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcp_NB_Ramp	41191	90	110



+50		+00	+64	+32		+76	+10
MATCH EXISTING/EXTEND EXISTING CROSS SLOPE		TRANSITION	NORMAL CROWN	TRANSITION		e= 3.60%	TRANS

+50		+00		+00	
COLD PLANE & OVERLAY		COLD PLANE & OVERLAY WITH STEP BOX WIDENING		STEP BOX WIDENING	

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

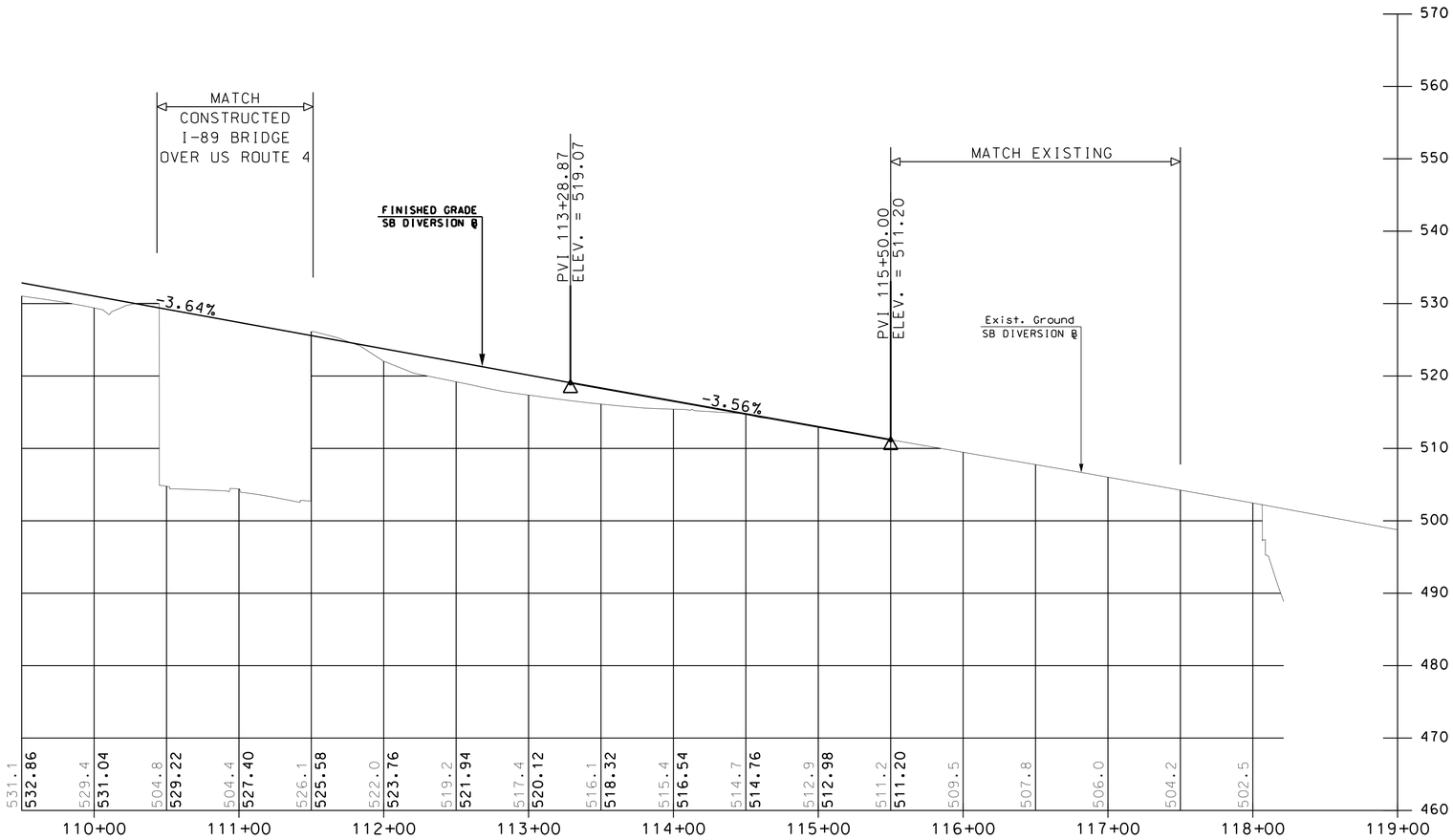
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SOUTHBOUND DIVERSION PROFILE (1 of 2)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpsbp01	41191	91	110



+28	+66	+84	+18	+50	+50
TRANSITION	NORMAL CROWN = 1.00%	TRANSITION	e= 3.60%	TRANSITION	MATCH EXISTING/EXTEND EXISTING CROSS SLOPE

+43	+51	+00	+00	+50
STEP BOX WIDENING	I-89 BRIDGE OVER US ROUTE 4	STEP BOX WIDENING	COLD PLANE & OVERLAY WITH STEP BOX WIDENING	COLD PLANE & OVERLAY

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

NUMBER	DESCRIPTION	DATE	STATION	STATION
	REVISIONS AFTER PROPOSAL			

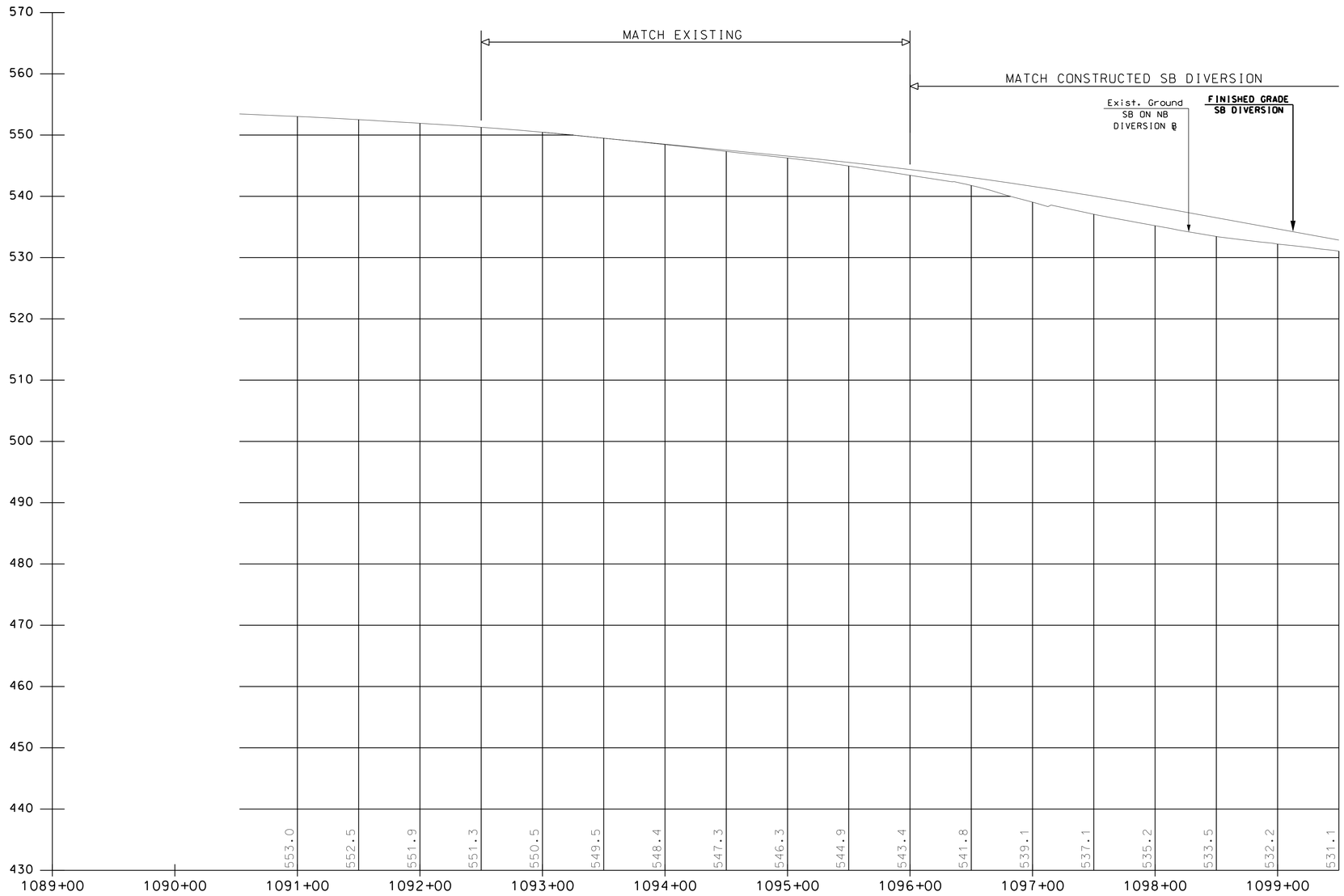
SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SOUTHBOUND DIVERSION PROFILE (2 of 2)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpsbp02	41191	92	110



+50	MATCH EXISTING/EXTEND EXISTING CROSS SLOPE	+00
+50	MATCH EXISTING	+50 COLD PLANE & OVERLAY +00 MATCH CONSTRUCTED SB DIVERSION

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

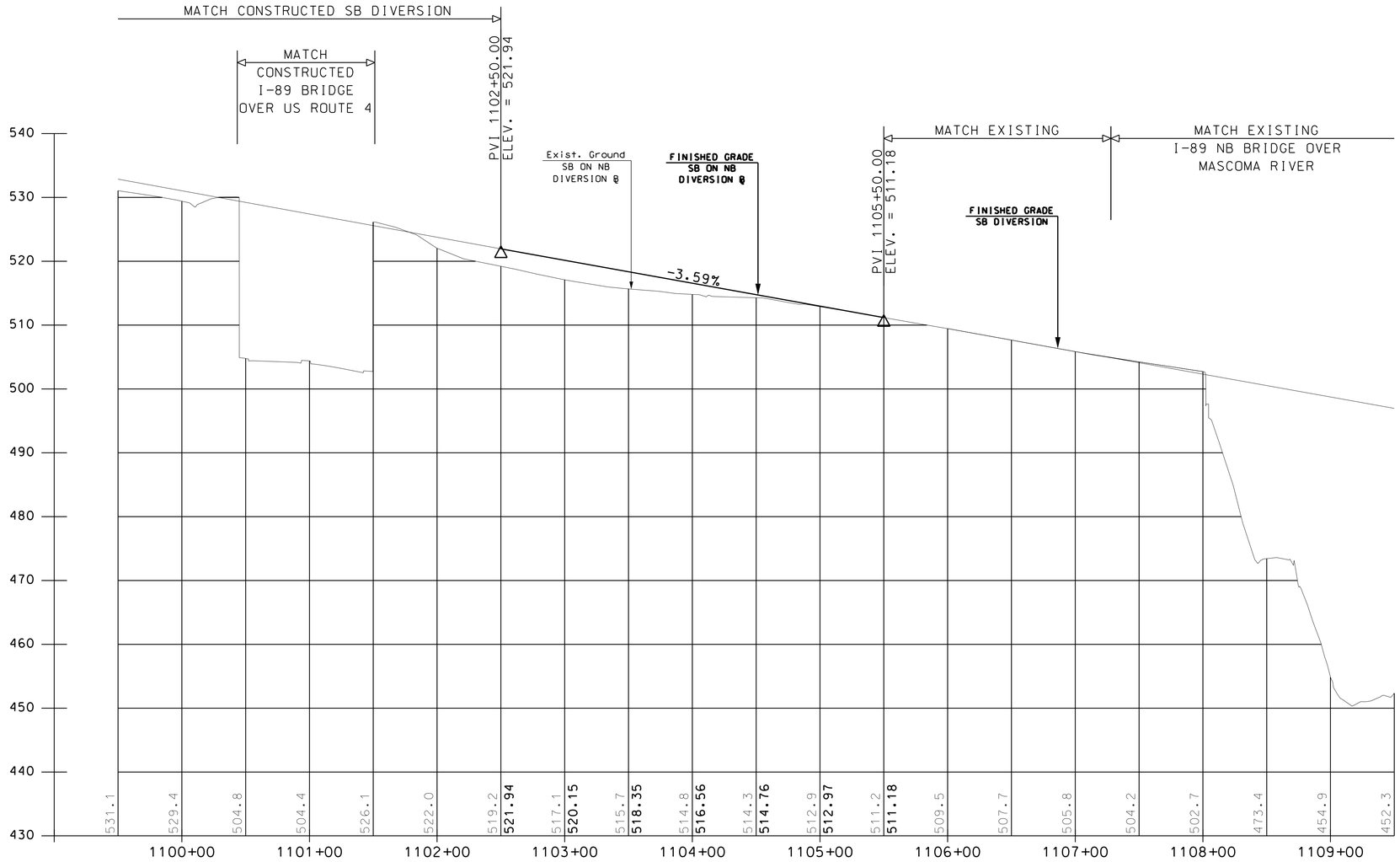
GM2 ASSOCIATES

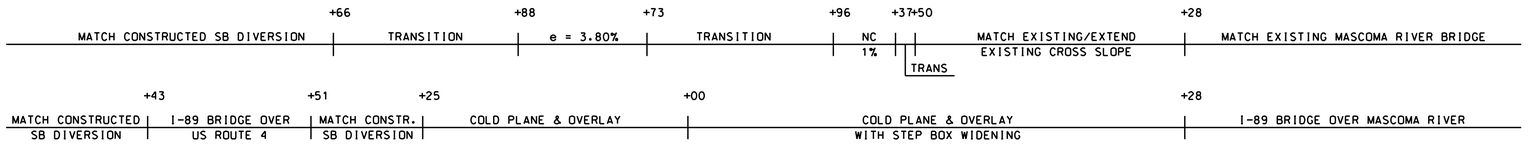
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SB ON NB DIVERSION
PROFILE (1 OF 3)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpsbp03	41191	93	110





SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

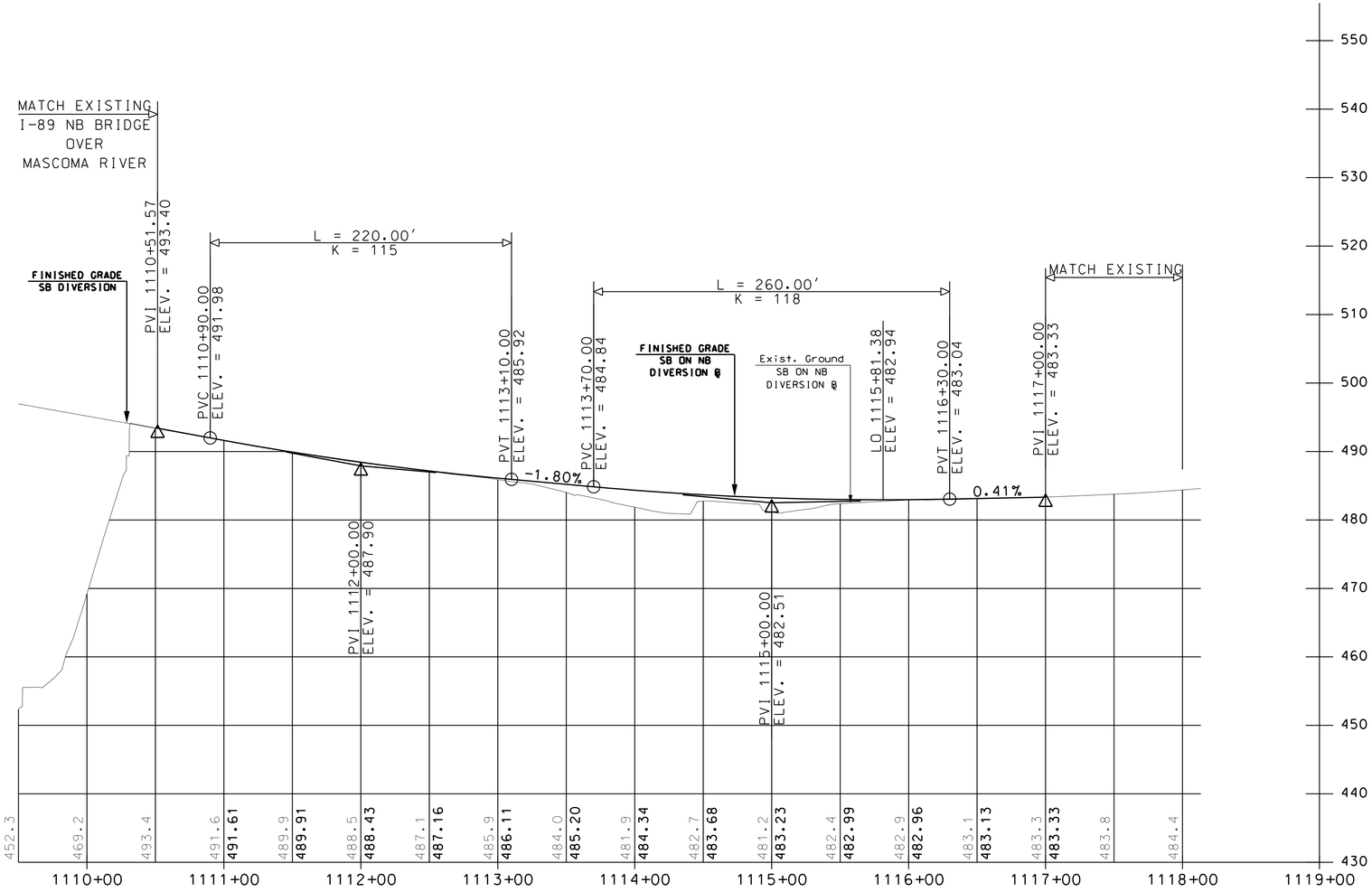
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SB ON NB DIVERSION PROFILE (2 OF 3)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpsbp04	41191	94	110



+52		+00	+16	+00	+00
MATCH EXISTING MASCOMA RIVER BRIDGE	MATCH EXISTING/EXTEND EXISTING CROSS SLOPE	NORMAL CROWN = 2.00%	TRANSITION	MATCH EXISTING/EXTEND EXISTING CROSS SLOPE	

+52		+00	+00
I-89 BRIDGE OVER MASCOMA RIVER	COLD PLANE & OVERLAY WITH STEP BOX WIDENING	COLD PLANE & OVERLAY	

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

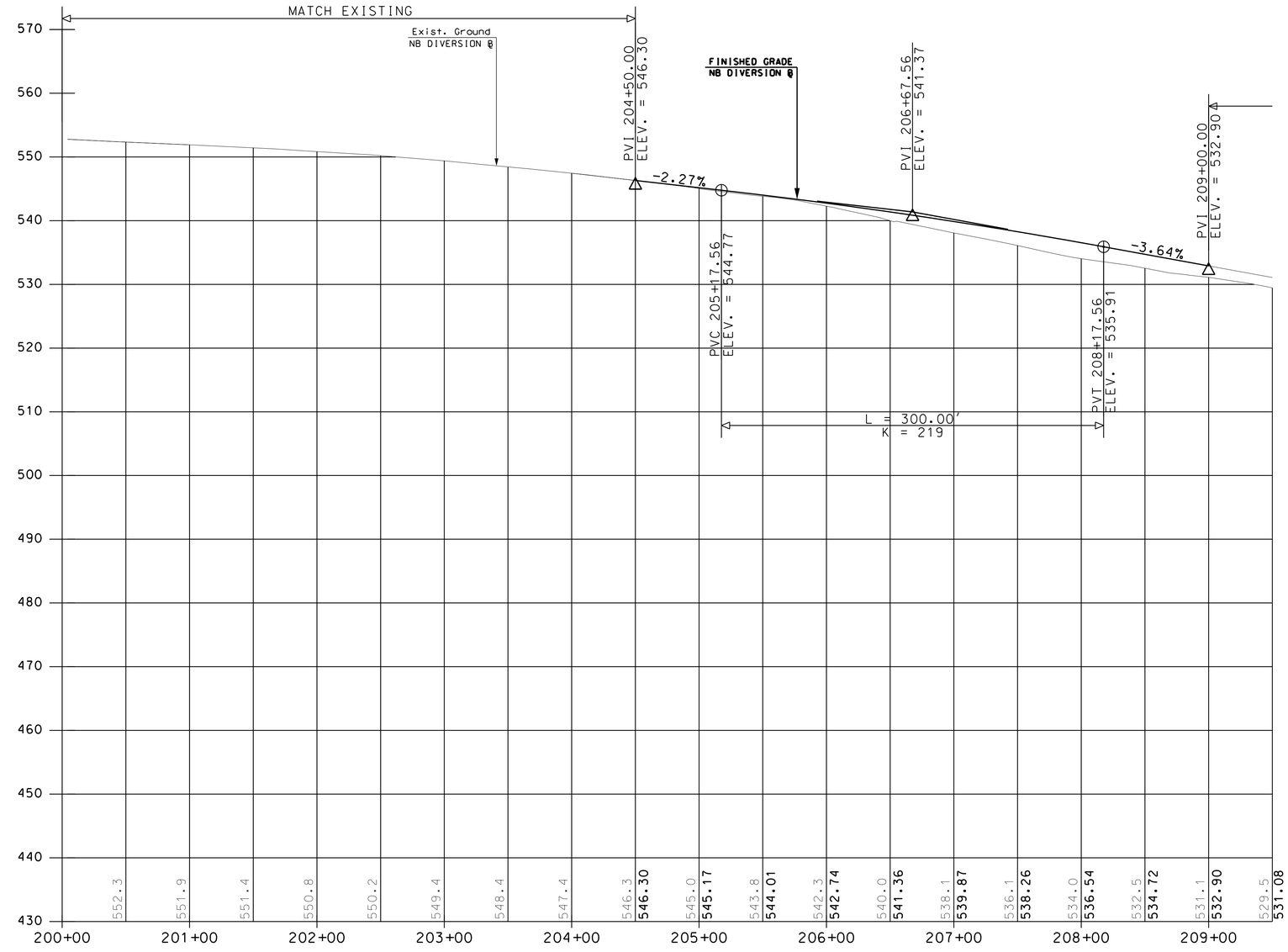
GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SB ON NB DIVERSION PROFILE (3 OF 3)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpsbp05	41191	95	110



+00		+50	+93		+00		+12	+93
MATCH EXISTING/EXTEND EXISTING CROSS SLOPE		TRANS	NORMAL CROWN		TRANSITION		e= 2.40%	TRANS

+00	+50	+50	+00
COLD PLANE & OVERLAY	COLD PLANE & OVERLAY WITH STEP BOX WIDENING	STEP BOX WIDENING	MATCH CONSTR. SB DIV.

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

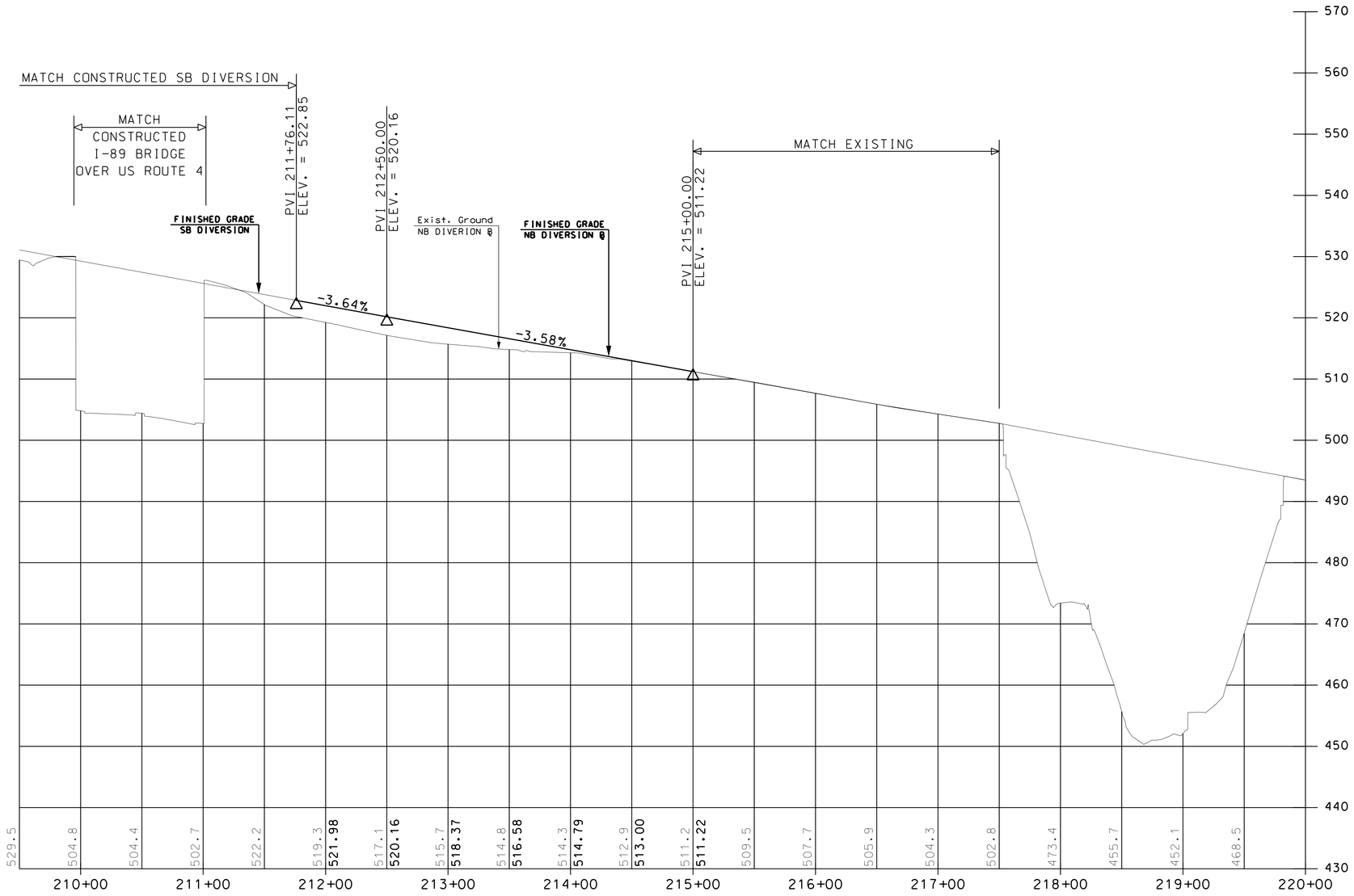
SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

NORTHBOUND DIVERSION PROFILE (1 of 2)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpnbp01	41191	96	110



+80	+17	+40	+00	+23	+43	+00	+50
TRANS | MATCH CONST. SB DIVERSION	TRANSITION	e= 3.80%	TRANSITION	NC= 1%	TRANSITION	MATCH EXISTING/EXTEND EXISTING CROSS SLOPE	

+95	+02	+00	+50	+50
MATCH CONSTR. SB DIV.	I-89 BRIDGE OVER US ROUTE 4	MATCH CONSTRUCTED SB DIVERSION	COLD PLANE & OVERLAY WITH STEP BOX WIDENING	COLD PLANE & OVERLAY

SCALE:
1"= 50' HORIZ.
1"= 10' VERT.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION	STATION

SDR PROCESSED	J. MERCER	DATE 04/12/19
NEW DESIGN	J. MERCER	DATE 04/12/19
SHEET CHECKED	D. BLOOD	DATE 04/12/19
AS BUILT DETAILS		DATE

GM2 ASSOCIATES

STATE OF NEW HAMPSHIRE

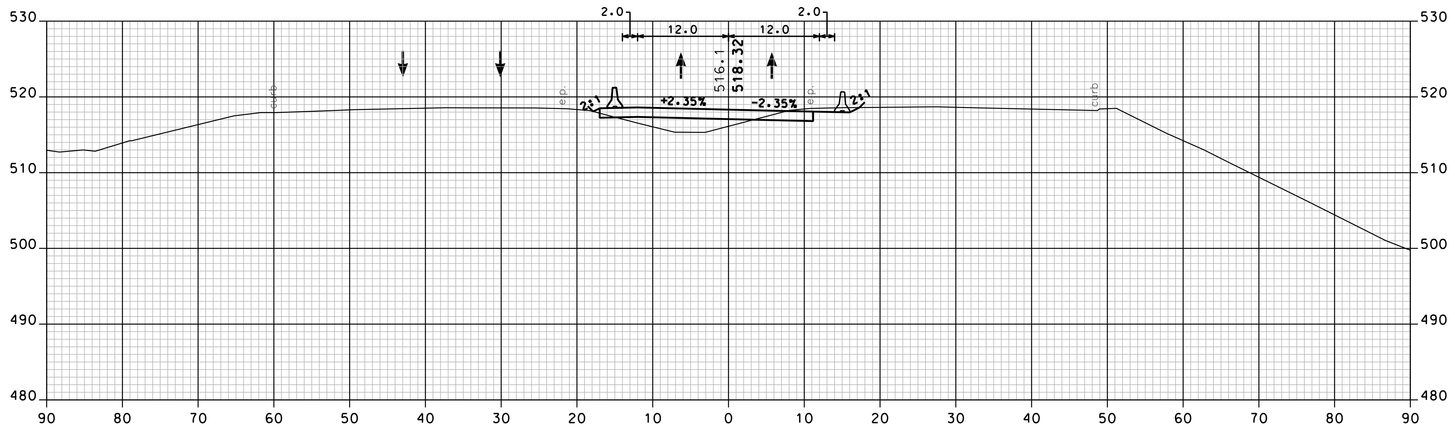
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

NORTHBOUND DIVERSION PROFILE (2 of 2)

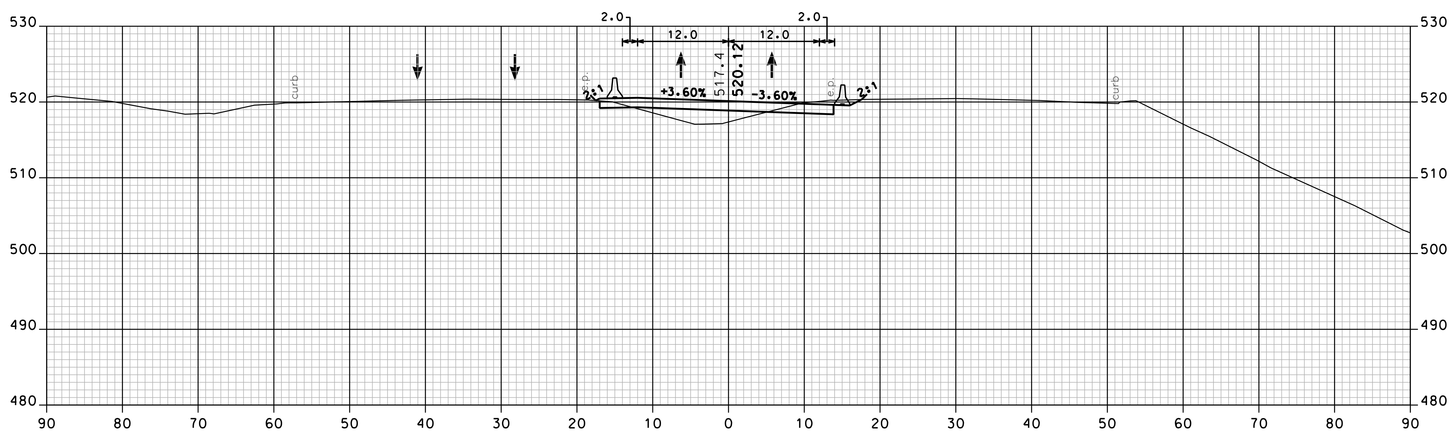
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191tcpnbp02	41191	97	110

SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

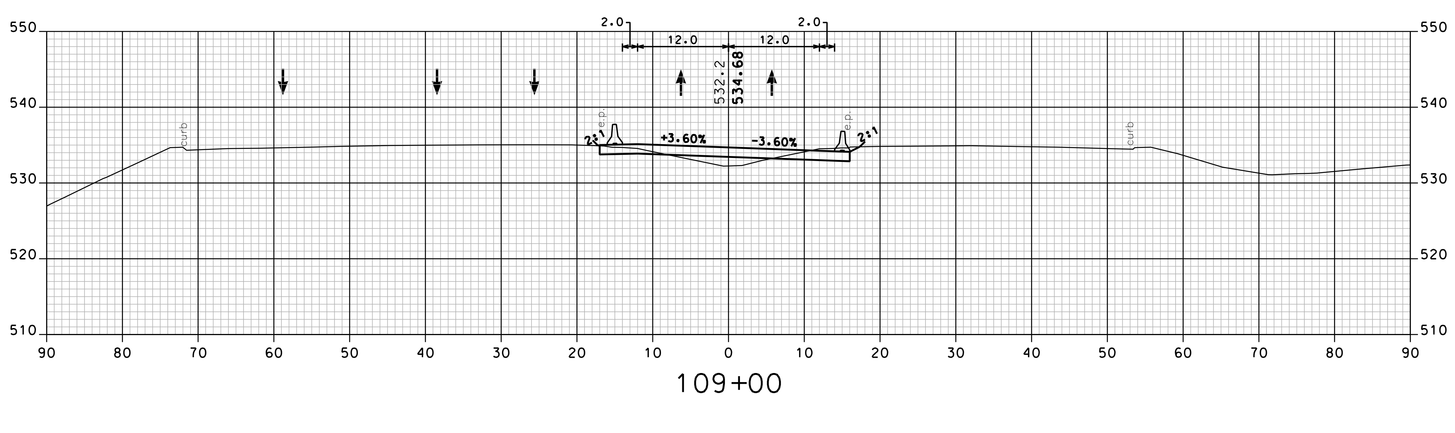
REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION



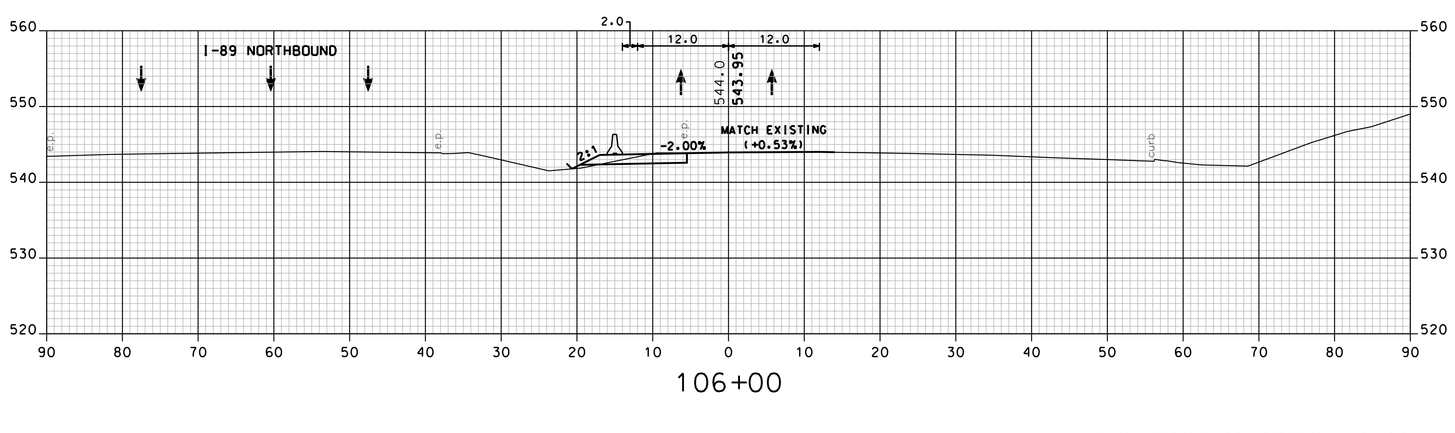
113+50



113+00



109+00



106+00

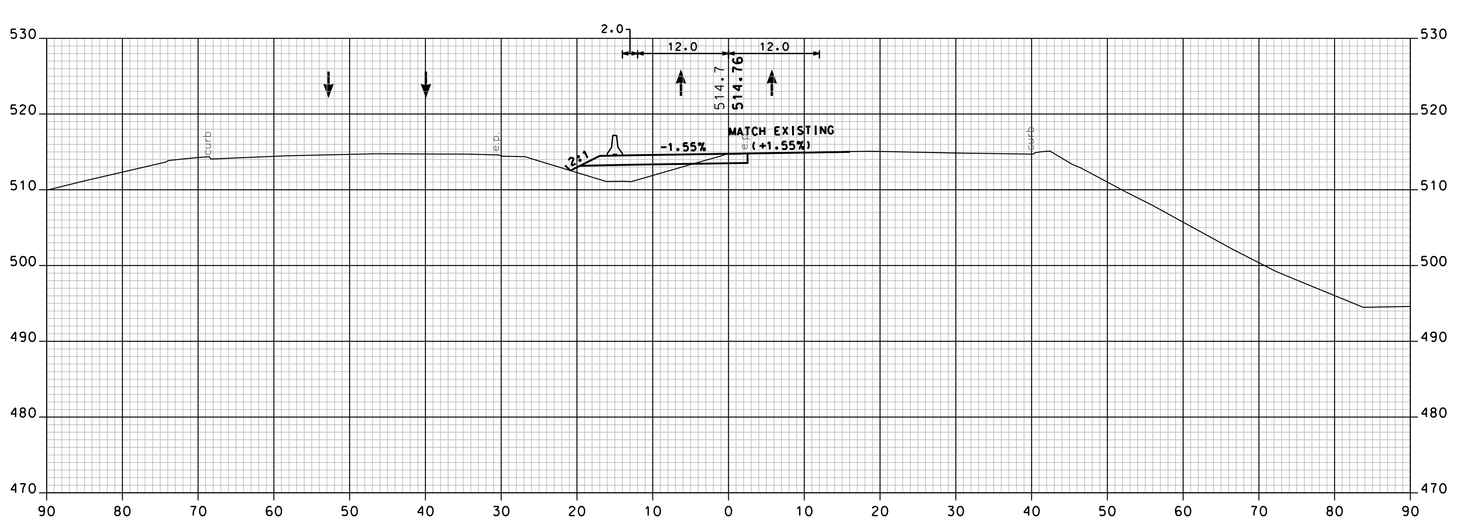
I-89 SOUTHBOUND DIVERSION
CRITICAL CROSS SECTIONS

GM2 ASSOCIATES

SHEET TOTALS			
COMMON EXCAV. – C.Y.		ROCK EXCAV. – C.Y.	
FILL – C.Y.		MUCK EXCAV. – C.Y.	
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191xs01_crit	41191	98	110

SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION



114+50

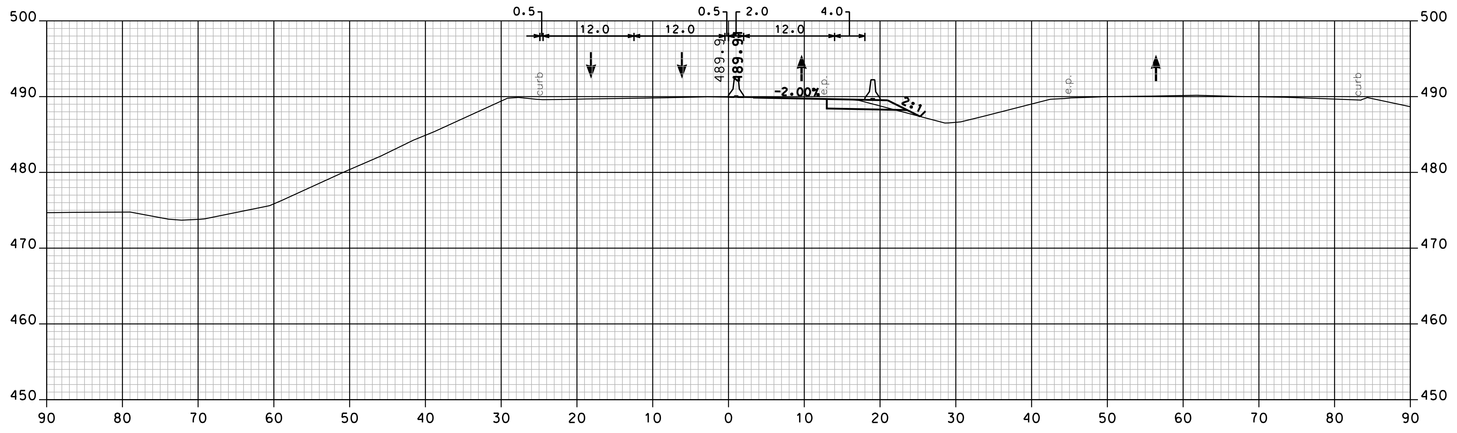
I-89 SOUTHBOUND DIVERSION
CRITICAL CROSS SECTIONS

GM2 ASSOCIATES

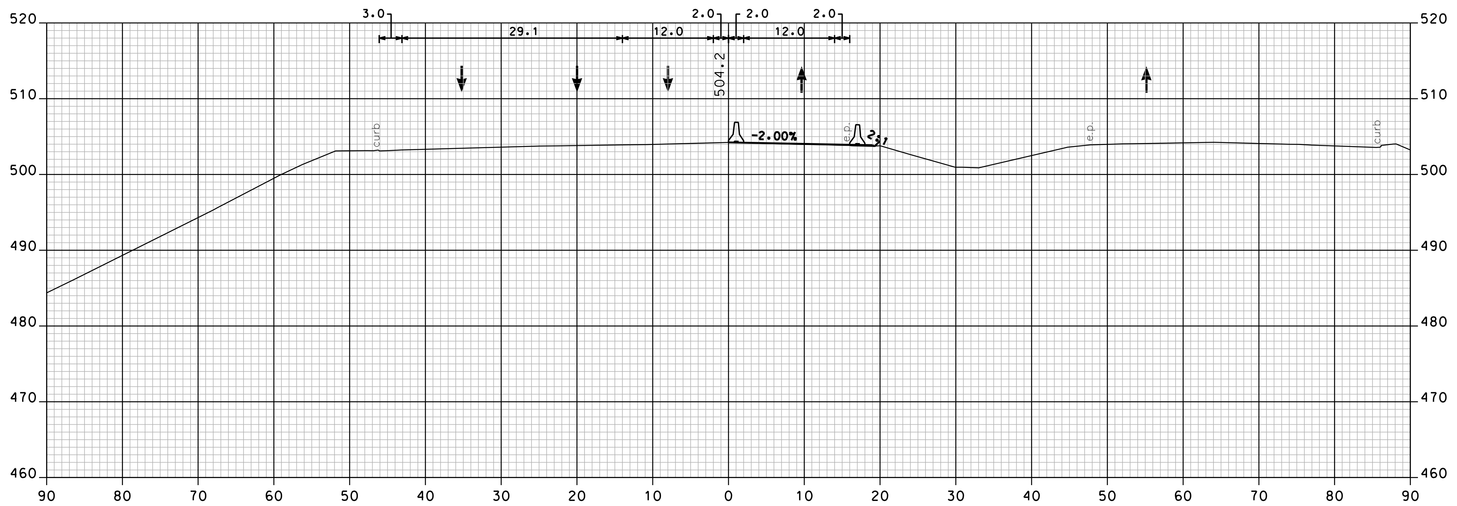
SHEET TOTALS			
COMMON EXCAV. – C.Y.		ROCK EXCAV. – C.Y.	
FILL – C.Y.		MUCK EXCAV. – C.Y.	
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191xs02_crit	41191	99	110

SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

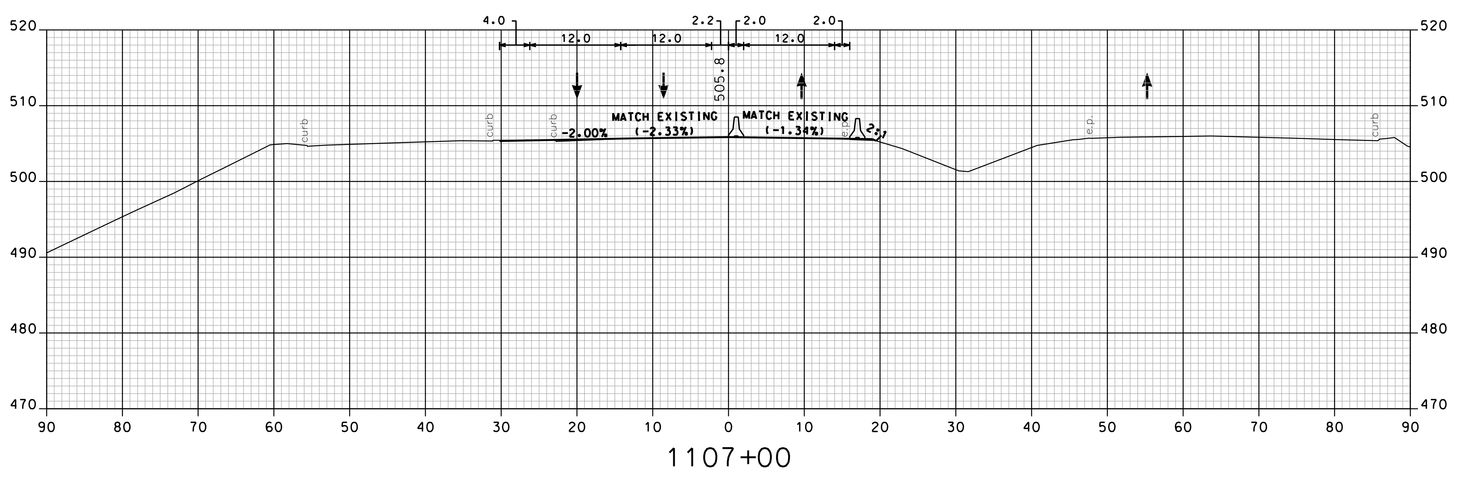
REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION



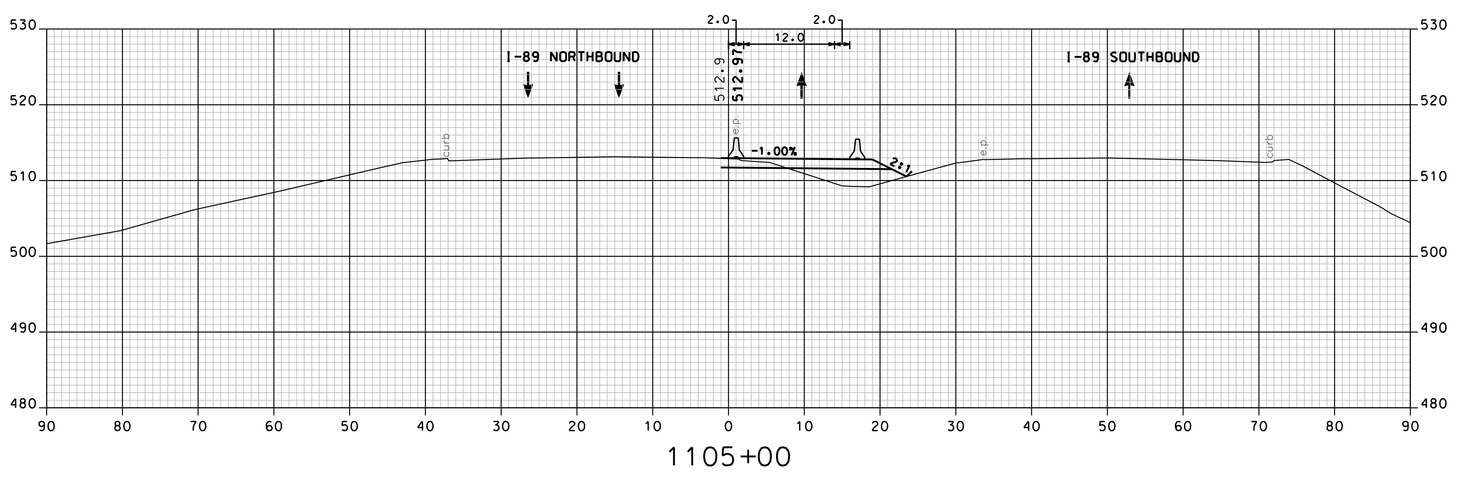
1111+50



1107+50



1107+00



1105+00

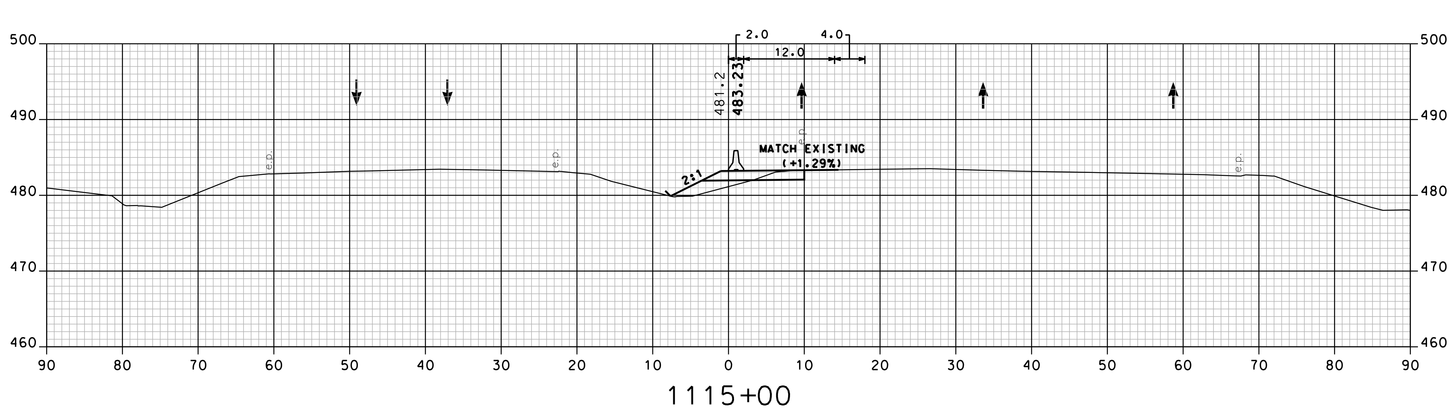
I-89 SB ON NB DIVERSION
CRITICAL CROSS SECTIONS

GM2 ASSOCIATES

SHEET TOTALS			
COMMON EXCAV. – C.Y.	ROCK EXCAV. – C.Y.		
FILL – C.Y.	MUCK EXCAV. – C.Y.		
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191xs03_crit	41191	100	110

SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION



1115+00

I-89 SB ON NB DIVERSION
CRITICAL CROSS SECTIONS

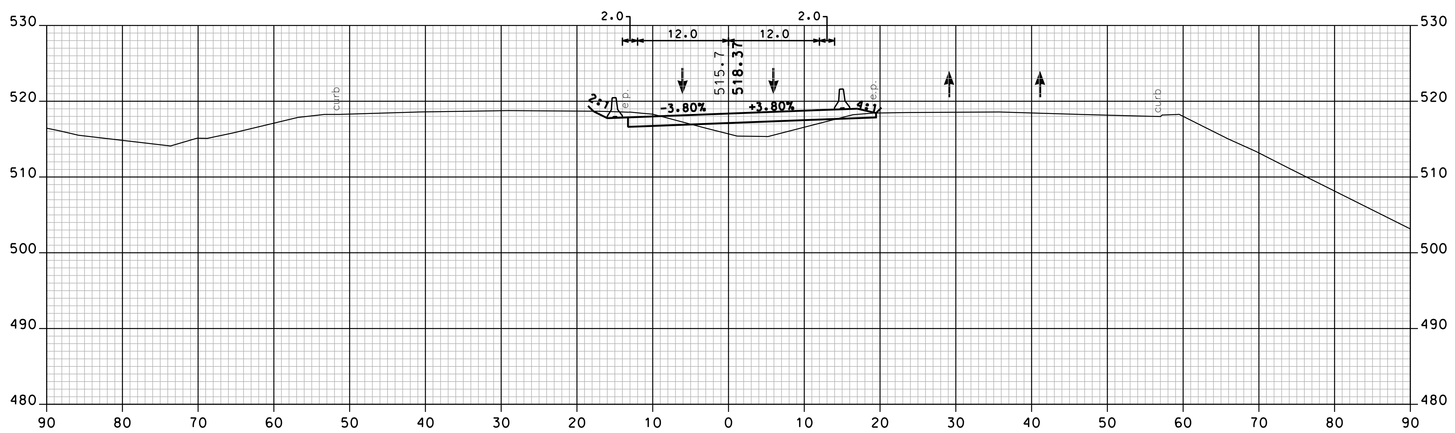
GM2 ASSOCIATES

SHEET TOTALS			
COMMON EXCAV. – C.Y.		ROCK EXCAV. – C.Y.	
FILL – C.Y.		MUCK EXCAV. – C.Y.	
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191xs04_crit	41191	101	110

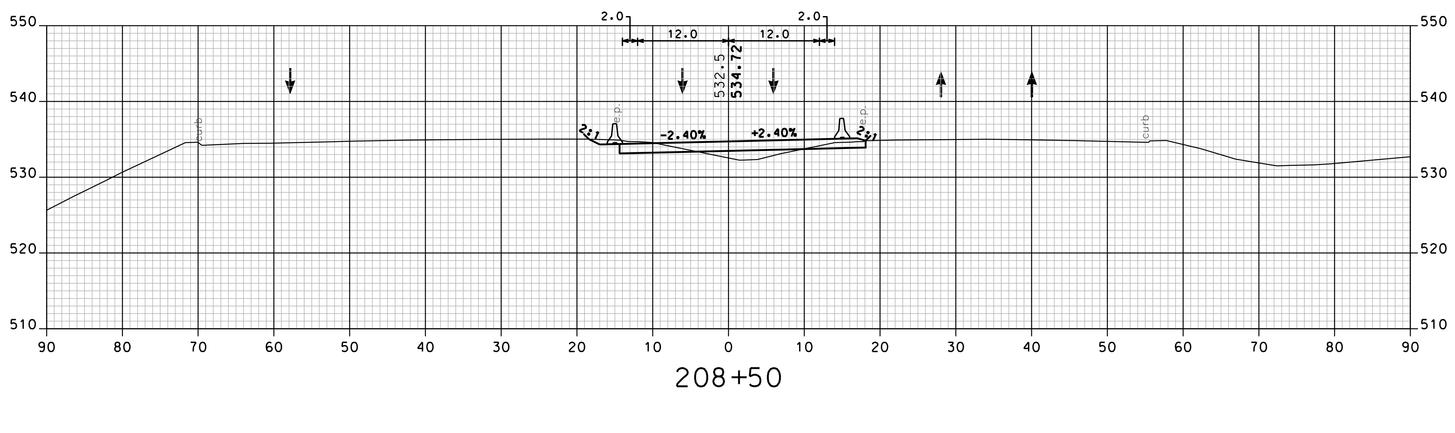
SDR PROCESSED	J. MERCER	DATE	04/12/19
NEW DESIGN	J. MERCER	DATE	04/12/19
SHEET CHECKED	D. BLOOD	DATE	04/12/19
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION

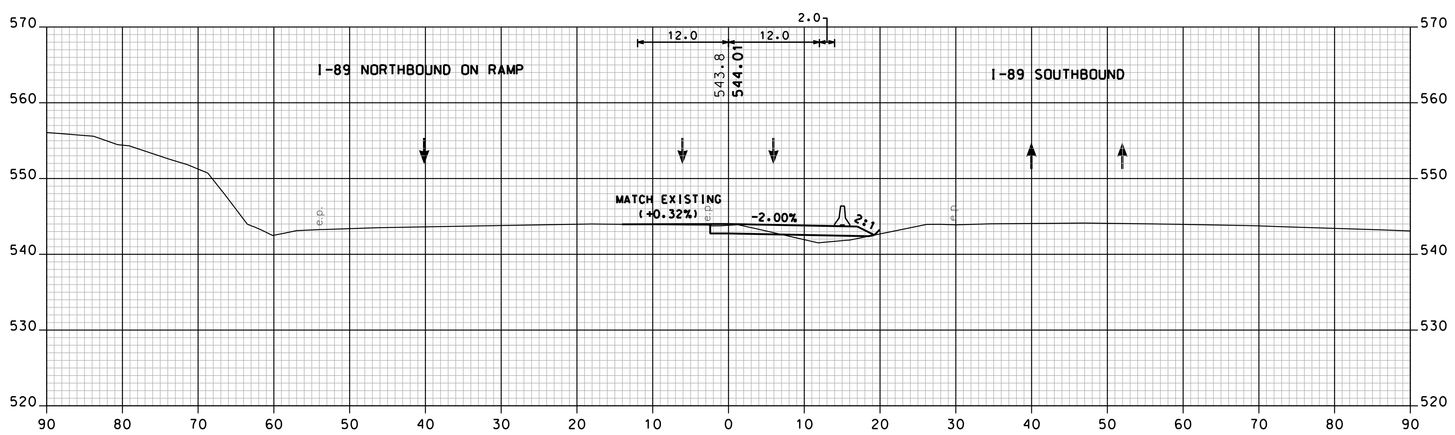
215+00



213+00



208+50



205+50

I-89 NORTHBOUND DIVERSION
CRITICAL CROSS SECTIONS

GM2 ASSOCIATES

SHEET TOTALS			
COMMON EXCAV.	– C.Y.	ROCK EXCAV.	– C.Y.
FILL	– C.Y.	MUCK EXCAV.	– C.Y.

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41191xs05_crit	41191	102	110

I-89 SB EXIT 19 OFF RAMP

MATCH TO A-A

GRID

EXISTING TRANSFORMER
PROP POWER SOURCE
POLE G.S.E. CO. 29

PROP POLE MOUNTED ITS CABINET
PAY ITEM 677.54201

CONCRETE WORKMANS PAD
SUBSIDIARY TO ITEM 677.54201

SEE NOTE 2

PROP ROADSIDE UNIT.
NON-INTERSECTION 5.9
GHZ RADIO
PAY ITEM 677.47501

PROP CCTV
STA 848+40, LT 58'
LATITUDE: 43° 38'15.47" N
LONGITUDE: 72°16'51.10" W
PAY ITEM 677.4101

3" PVC CONDUIT, SCHEDULE 40,
UNDERGROUND CONDUIT, PROP
3-CONDUCTOR #8 AWG CABLE
PAY ITEM 614.73114
PAY ITEM 677.9308

STEEL SWEEPS (3 FT) AND
STEEL CONDUIT RISER (10 FT)
FROM THE UTILITY POLE TO MP
PAY ITEM 614.331

MECHANIC ST

I-89 SB

I-89 NB

gse 27-1

gse/26 114/net

mtl light pole #5

outlet buried

LEGEND

- CAMERA POLE (CCTV)
- DSRC ROADSIDE UNIT (RSU)
- ITS EQUIPMENT CABINET

NOTES

1. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST INFORMATION AVAILABLE AND ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CORRECTNESS AND COMPLETENESS OF THIS INFORMATION IS NOT GUARANTEED.

2. EXISTING DRAINAGE OUTLET TO BE RELOCATED PRIOR TO THE CCTV POLE AND FOUNDATION CONSTRUCTION.

3. ITS EQUIPMENT CABINET TO BE MOUNTED SUCH THAT WORKERS ARE FACING I-89 SB TRAFFIC WHEN WORKING IN THE CABINET.

20 0 20 40
SCALE IN FEET

REVISIONS AFTER PROPOSAL

DESCRIPTION	STATION	NUMBER	DATE	STATION

SDR PROCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

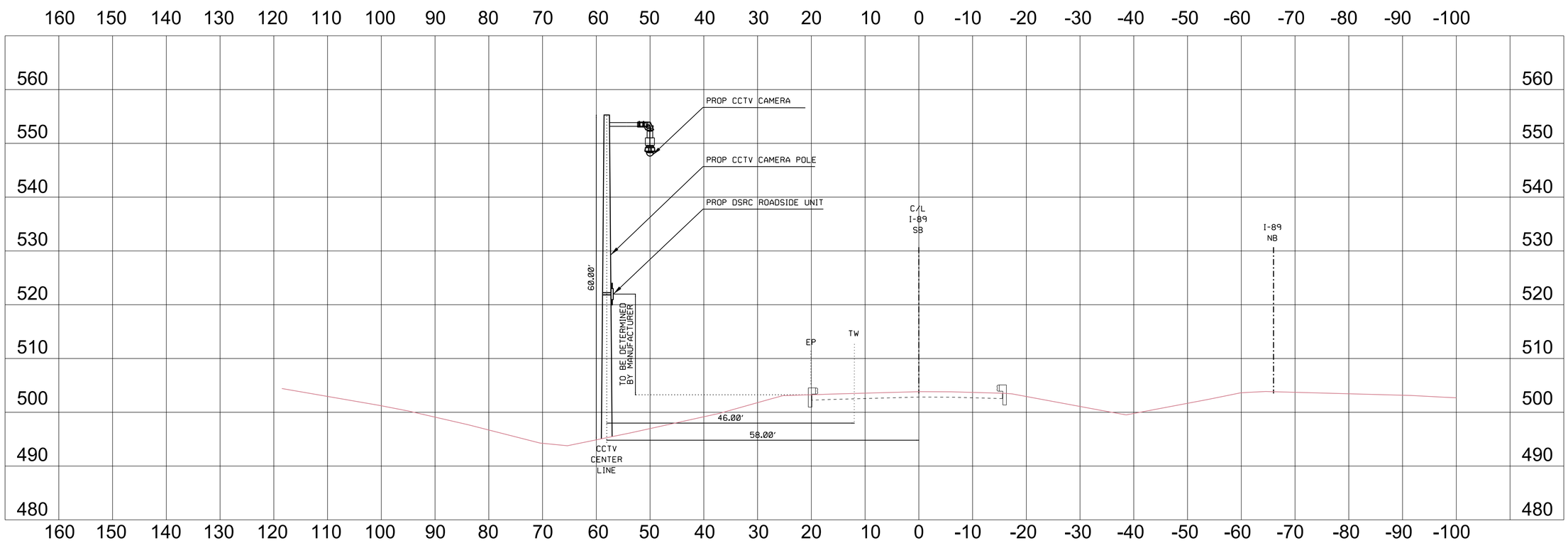
AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

CCTV/RSU PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Plan	41191	103	110



STA 848+40

REVISIONS AFTER PROPOSAL

DESCRIPTION	STATION	DATE	NUMBER

SDR PROCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

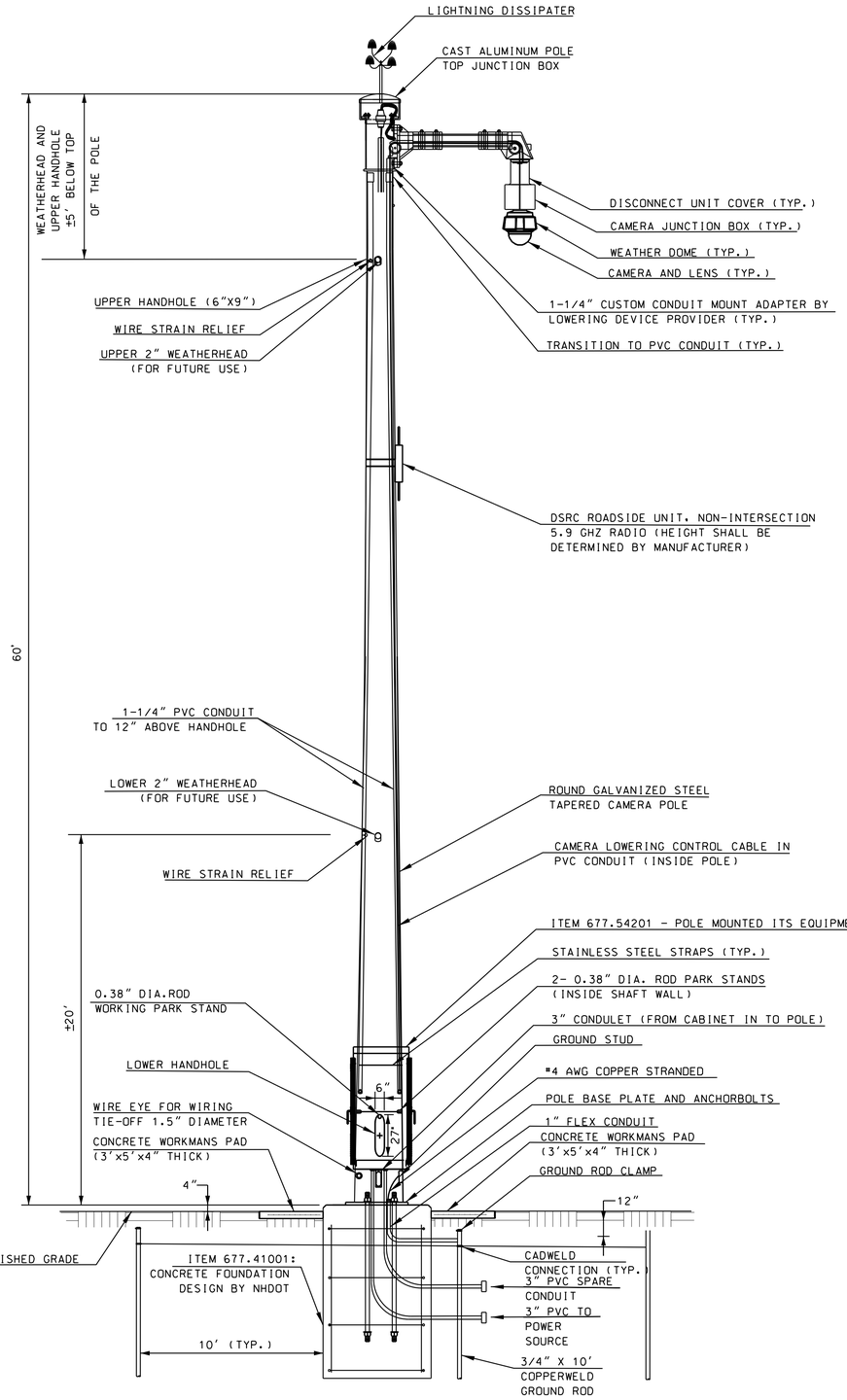
AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

CCTV/RSU CROSS SECTION

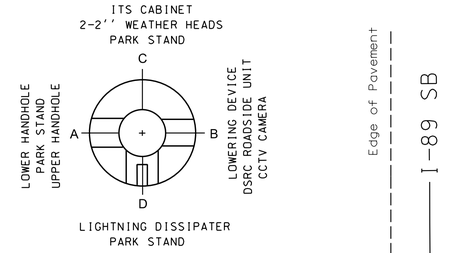
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Geolines	41191	104	110



ITEM 677.4101 - CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM

ITEM 677.41001 - CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM FOUNDATION

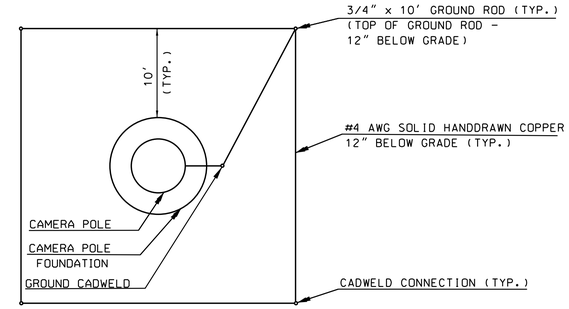
NOT TO SCALE



EQUIPMENT AXIS TOP VIEW

NOTES:

1. SEE GROUND ROD ARRAY DETAIL (THIS SHEET).
2. CAMERA WIRING INSIDE POLE NOT SHOWN.
3. ALL WEATHERHEADS, HANDHOLES, CONDUIT ACCESS POINTS SHALL BE FACTORY INSTALLED. NO FIELD DRILLING OF POLE IS ALLOWED.
4. POWER AND COMMUNICATIONS CONDUIT ENTERING THE CABINET SHALL BE INSTALLED EXTERNAL TO THE POLE FOUNDATION AND DIRECTLY INTO THE BASE OF THE CABINET.
5. THE PROPOSED CCTV SYSTEM POLE AND FOUNDATION SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE CCTV SYSTEM SPECIAL PROVISIONS, AND TO ACCOMODATE INSTALLATION OF THE EQUIPMENT LISTED IN TABLE 1 BELOW.



GROUND ROD ARRAY DETAIL

NOT TO SCALE

TABLE 1: POLE ATTACHMENTS

DESCRIPTION	QUANTITY	NOTES/LOCATION
LIGHTNING DISSIPATOR	1	AS SHOWN IN CCTV DETAIL AND AS DESCRIBED IN SPECIAL PROVISIONS.
CAMERA LOWERING DEVICE	1	AS SHOWN IN CCTV DETAIL AND AS DESCRIBED IN SPECIAL PROVISIONS.
CCTV CAMERA	1	AS SHOWN IN CCTV DETAIL AND AS DESCRIBED IN SPECIAL PROVISION.
DSRC ROADSIDE UNIT	1	AS SHOWN IN CCTV DETAIL (HEIGHT SHALL BE DETERMINED BY MANUFACTURER).
ITS POLE MOUNTED EQUIPMENT CABINET	1	AS SHOWN IN CCTV DETAIL AND AS DESCRIBED IN SPECIAL PROVISIONS.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

CCTV POLE DETAIL

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Details	41191	105	110

ITEM 677.41001 (FOR ESTIMATING PURPOSES ONLY - NOT A FINAL DESIGN)

QUANTITIES					
ITEM NO.*	ITEM DESCRIPTION	UNIT	QUANTITY (BY SHAFT Ø)		
			3'-6"	4'-0"	4'-6"
520.1**	CONCRETE CLASS A	CY/FT	0.36	0.47	0.59
534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	1	1	1
544.**	REINFORCING STEEL	LB/FT	31.1	39.3	47.5

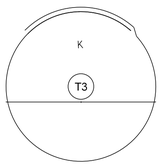
* ITEM NUMBERS ARE FOR SPECIFICATION REFERENCE ONLY. NO SEPARATE PAYMENT WILL BE MADE FOR THESE ITEMS.

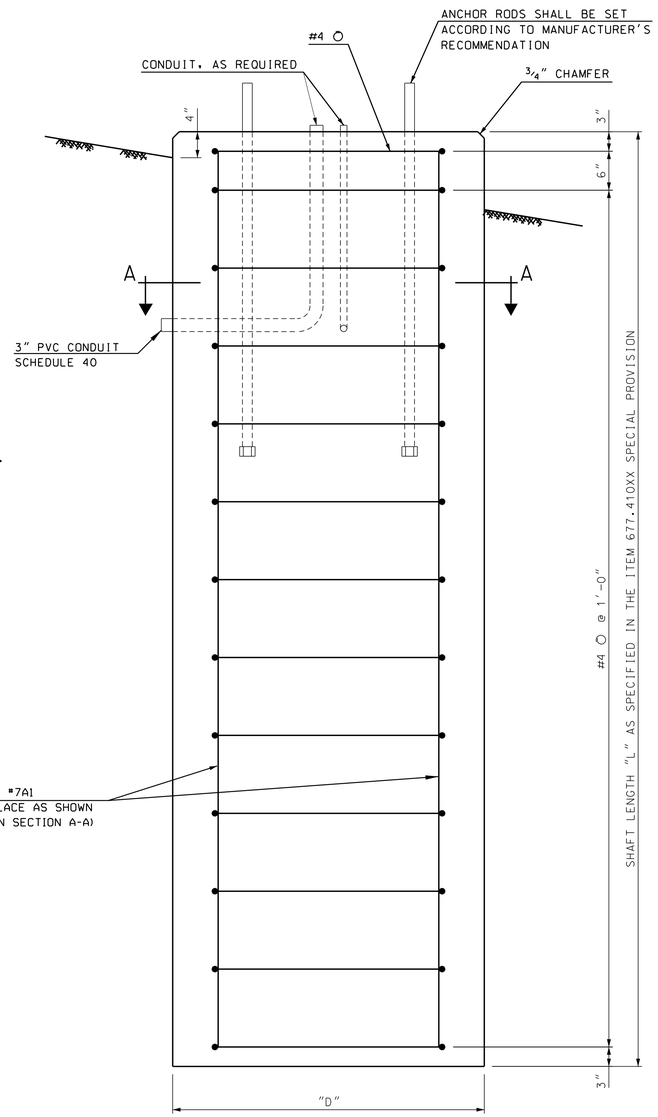
** ITEM QUANTITY IS PER FOOT LENGTH OF DRILLED SHAFT.

GENERAL NOTES

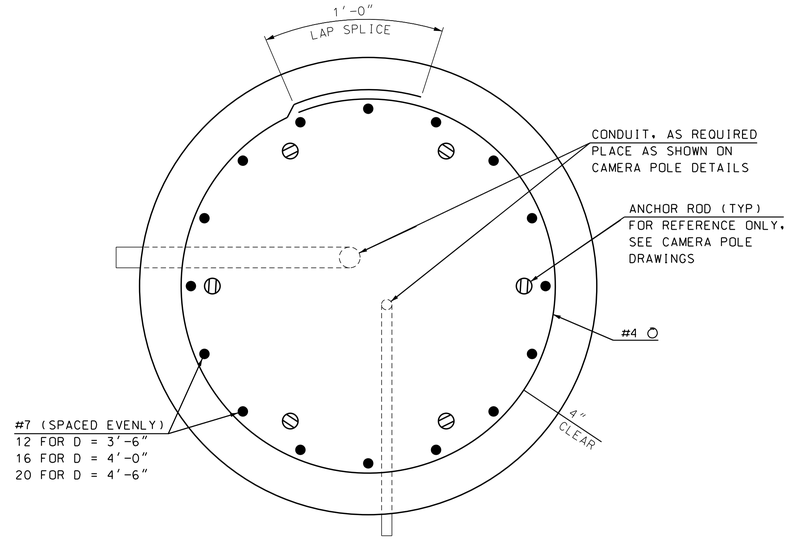
1. THE FOUNDATION DESIGN IS PRELIMINARY AND IS BASED ON ESTIMATED POLE LOADS AS CALCULATED PER THE SPECIFICATIONS LISTED IN NOTE 12, BELOW. THE CONTRACTOR SHALL SUBMIT THE POLE DESIGN WITH LRFD DESIGN LOADS IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001. WHEN THE DESIGN LOADS ARE RECEIVED, NHDOT WILL VERIFY OR MODIFY THE PRELIMINARY FOUNDATION DESIGN FOR FINAL DESIGN IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED. (2014) AS AMENDED.
2. THE CIRCULAR SHAFT FOUNDATION SHALL BE CONSTRUCTED IN A DRILLED HOLE IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001, AND THE CONTRACT PLANS. ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 677.41001, CCTV FOUNDATION, AND SHALL COMPLY WITH THE SPECIFICATIONS FOR THE FOLLOWING ITEMS, AS APPLICABLE:
   - ITEM 520.1, CONCRETE CLASS A
   - ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE)
   - ITEM 544, REINFORCING STEEL
3. WHERE FILL EMBANKMENT IS TO BE CONSTRUCTED ABOVE THE EXISTING GROUND, THE EMBANKMENT SHALL BE BUILT PRIOR TO CONSTRUCTING THE SHAFTS. PLACEMENT AND COMPACTION OF THE FILL SHALL BE IN ACCORDANCE WITH SECTION 203 OF THE STANDARD SPECIFICATIONS.
4. WHERE BEDROCK IS ENCOUNTERED WITHIN THE SPECIFIED SHAFT LENGTH, THE SHAFT SHALL EXTEND A MINIMUM OF 4 FEET INTO SOUND BEDROCK. IT IS NOT NECESSARY TO EXTEND THE SHAFT IN BEDROCK BEYOND THE SPECIFIED SOIL-BASED LENGTH GIVEN ON THIS PLAN.
5. THE FOUNDATION SHALL HAVE AN EXPOSED LENGTH NO GREATER THAN 4 INCHES MEASURED ON THE HIGH GROUND SIDE OF THE SHAFT.
6. CAST-IN-PLACE CONCRETE SHALL BE IN ACCORDANCE WITH ITEM 677.41001 SPECIAL PROVISION. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR VISUAL INSPECTION OF THE REINFORCING BARS AND ANCHOR BOLTS PRIOR TO CONCRETE PLACEMENT.
7. COAT ALL SURFACES OF THE DRILLED SHAFT TO 1'-0" BELOW FINISHED GRADE WITH WATER REPELLENT (SILANE-SILOXANE) IN ACCORDANCE WITH SECTION 534.
8. TRENCHES FOR THE CONDUITS SHALL BE HAND DUG NEAR THE PROPOSED FOUNDATION, DISTURBING AS LITTLE SOIL AS POSSIBLE IN PLACING OF THE CONDUITS (APPROXIMATELY 2.5 FT MAXIMUM DOWN FROM THE GROUND SURFACE). THE RESULTING TRENCHES SHALL BE BACKFILLED WITH STRUCTURAL FILL CONFORMING TO SECTION 508.
9. ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31/M31M, GRADE 60 (420), AND SHALL HAVE CLEAR COVER AS NOTED ON DETAILS.
10. THE EXPOSED LENGTH OF THE ANCHOR ROD BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE ROD DIAMETER (MAXIMUM) OR 1-INCH (PREFERRED).
11. THE SCREEN SHALL BE STAINLESS STEEL STD. GR. WIRE CLOTH. ¼" MAX OPENING WITH MIN. WIRE DIA. OF AWG NO. 16 WITH 2" LAP. SECURE WITH ¾" STAINLESS STEEL BANDING AFTER ANCHOR RODS ARE FULLY TIGHTENED AND TESTED. NO GROUT SHALL BE PLACED BETWEEN FOUNDATION AND BOTTOM OF BASE PLATE.
12. SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST ED. (2015) AS AMENDED; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED. (2014) AS AMENDED; NHDOT 2016 STANDARD SPECIFICATIONS AS AMENDED; AND THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001.

REINFORCING SCHEDULE				
MARK	TYPE	BAR #	NO. OF BARS	UNBENT LENGTH
A1	—	#7	20	12'-6"
A2	T3	#4	14	13'-1"

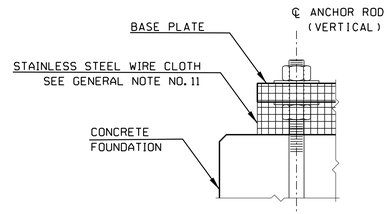




ELEVATION
NOT TO SCALE



SECTION A-A
NOT TO SCALE



SCREEN DETAIL
NOT TO SCALE

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

AECOM

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

CCTV FOUNDATION ITEM 677.41001 DRILLED SHAFT

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Details	41191	106	110

ITEM 677.41001 (FOR ESTIMATING PURPOSES ONLY - NOT A FINAL DESIGN)

QUANTITIES			
ITEM NO.*	ITEM DESCRIPTION	UNIT	QUANTITY
206.1	COMMON STRUCTURE EXCAVATION	CY	70
508.	STRUCTURAL FILL (1' DEPTH ONLY)	CY	9
520.213	CONCRETE CLASS B, FOOTINGS (ON SOIL)	CY	16.1
534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	1
544.	REINFORCING STEEL	LB	1814

* ITEM NUMBERS ARE FOR SPECIFICATION REFERENCE ONLY. NO SEPARATE PAYMENT WILL BE MADE FOR THESE ITEMS, EXCEPT AS NOTED IN GENERAL NOTE #4.

GENERAL NOTES

1. THE FOUNDATION DESIGN IS PRELIMINARY AND IS BASED ON ESTIMATED POLE LOADS AS CALCULATED PER THE SPECIFICATIONS LISTED IN NOTE 12, BELOW. THE CONTRACTOR SHALL SUBMIT THE POLE DESIGN WITH LRFD DESIGN LOADS IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001. WHEN THE DESIGN LOADS ARE RECEIVED, NHDOT WILL VERIFY OR MODIFY THE PRELIMINARY FOUNDATION DESIGN FOR FINAL DESIGN IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED. (2014) AS AMENDED.

2. THE SPREAD FOOTING FOUNDATION SHALL BE CONSTRUCTED IN AN EXCAVATED HOLE IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001, AND THE CONTRACT PLANS. ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 677.41001, CCTV FOUNDATION, EXCEPT AS NOTED IN NOTE #4. ALL WORK AND MATERIALS SHALL COMPLY WITH THE SPECIFICATIONS FOR THE APPLICABLE ITEMS.

3. BEARING RESISTANCE IS BASED ON LOAD AND RESISTANCE FACTOR DESIGN (LRFD). THE NOMINAL BEARING RESISTANCE IS 7.5 TONS/SF WITH A RESISTANCE FACTOR OF 0.45.

4. FOOTING CONCRETE SHALL BE PLACED ON A 1'-0" LAYER OF STRUCTURAL FILL AS SHOWN ON THE PLANS, SUBSIDIARY TO ITEM 677.41001. UNSUITABLE MATERIAL FOUND AT A DEPTH GREATER THAN 1'-0" BELOW THE PROPOSED BOTTOM OF FOOTING ELEVATION SHALL BE REMOVED AND REPLACED WITH STRUCTURAL FILL AS DIRECTED BY THE ENGINEER, PAID UNDER ITEMS 206.1 AND 508. ALL STRUCTURAL FILL SHALL BE PLACED IN ACCORDANCE WITH SECTION 508.

5. THE COLUMN SHALL HAVE AN EXPOSED LENGTH NO GREATER THAN 4 INCHES MEASURED ON THE HIGH GROUND SIDE OF THE SHAFT, AND THE SPREAD FOOTING SHALL HAVE A MINIMUM EMBEDMENT DEPTH OF 5'-0".

6. CAST-IN-PLACE CONCRETE SHALL BE IN ACCORDANCE WITH ITEM 677.41001 SPECIAL PROVISION. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR VISUAL INSPECTION OF THE EXCAVATION, INCLUDING THE ARRANGEMENT OF THE REINFORCING BARS AND ANCHOR BOLTS, PRIOR TO CONCRETE PLACEMENT.

7. COAT ALL SURFACES OF THE CONCRETE COLUMN TO 1'-0" BELOW FINISHED GRADE WITH WATER REPELLENT (SILANE-SILOXANE) IN ACCORDANCE WITH SECTION 534.

8. TRENCHES FOR THE CONDUITS SHALL BE HAND DUG NEAR THE PROPOSED FOUNDATION, DISTURBING AS LITTLE SOIL AS POSSIBLE IN PLACING OF THE CONDUITS (APPROXIMATELY 2.5 FT MAXIMUM DOWN FROM THE GROUND SURFACE). THE RESULTING TRENCHES SHALL BE BACKFILLED WITH STRUCTURAL FILL CONFORMING TO SECTION 508.

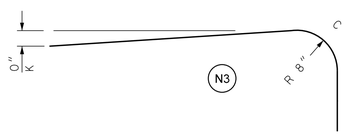
9. ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31/M31M, GRADE 60 (420). ALL REINFORCING STEEL SHALL HAVE A MINIMUM CLEAR COVER OF 3".

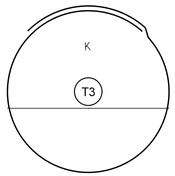
10. THE EXPOSED LENGTH OF THE ANCHOR ROD BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE ROD DIAMETER (MAXIMUM) OR 1-INCH (PREFERRED).

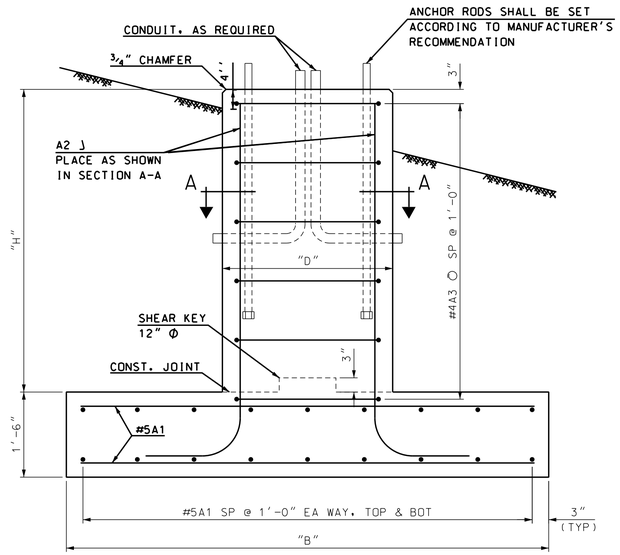
11. THE SCREEN SHALL BE STAINLESS STEEL STD. GR. WIRE CLOTH. 1/4" MAX OPENING WITH MIN. WIRE DIA. OF AWG NO. 16 WITH 2" LAP. SECURE WITH 3/4" STAINLESS STEEL BANDING AFTER ANCHOR RODS ARE FULLY TIGHTENED AND TESTED. NO GROUT SHALL BE PLACED BETWEEN FOUNDATION AND BOTTOM OF BASE PLATE.

12. SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST ED. (2015) AS AMENDED; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED. (2014) AS AMENDED; NHDOT 2016 STANDARD SPECIFICATIONS AS AMENDED; AND THE SPECIAL PROVISIONS FOR ITEMS 677.4101 AND 677.41001.

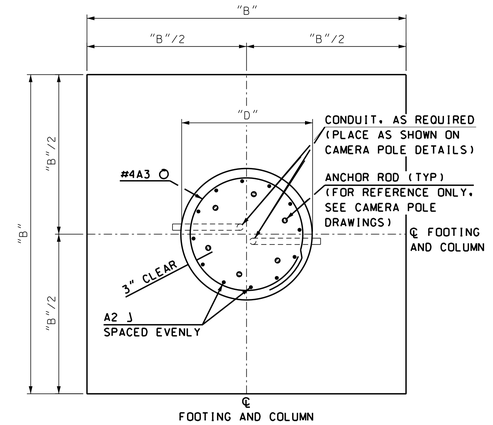
REINFORCING SCHEDULE				
MARK	TYPE	BAR #	NO. OF BARS	UNBENT LENGTH
A1	—	#7	56	13'-0"
A2	N3	#7	16	8'-3"
A3	T3	#4	7	12'-0"



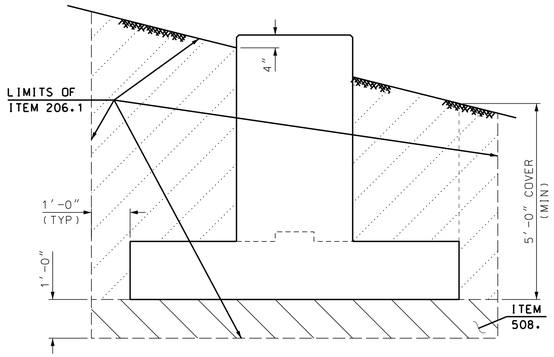




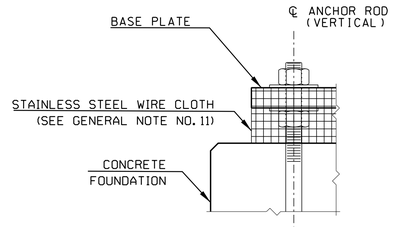
MASONRY AND REINFORCING ELEVATION
NOT TO SCALE



SECTION A-A
NOT TO SCALE



EARTHWORK ELEVATION
NOT TO SCALE



SCREEN DETAIL
NOT TO SCALE

AECOM

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

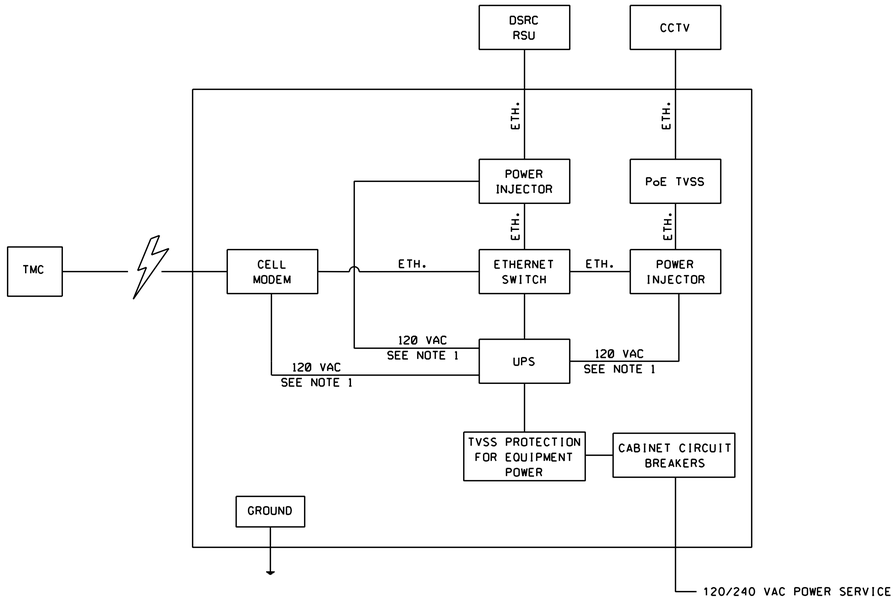
CCTV FOUNDATION ITEM 677.41001

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Details	41191	107	110

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE



CCTV/ DSRC ROAD SIDE UNIT

LEGEND:

ETH - ETHERNET CABLE
PoE - POWER OVER ETHERNET
UPS - UNINTERRUPTED POWER SUPPLY
TVSS - TRANSIENT VOLTAGE SURGE SUPRESSOR
DSRC - DEDICATED SHORT RANGE COMMUNICATIONS
RSU - ROADSIDE UNIT
VAC - VOLTAGE ALTERNATING CURRENT

NOTES:

1. WIRE SIZE TO BE DETERMINED BY CONTRACTOR.

REVISIONS AFTER PROPOSAL

STATION	DESCRIPTION	STATION	NUMBER	DATE

SDR PROCCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

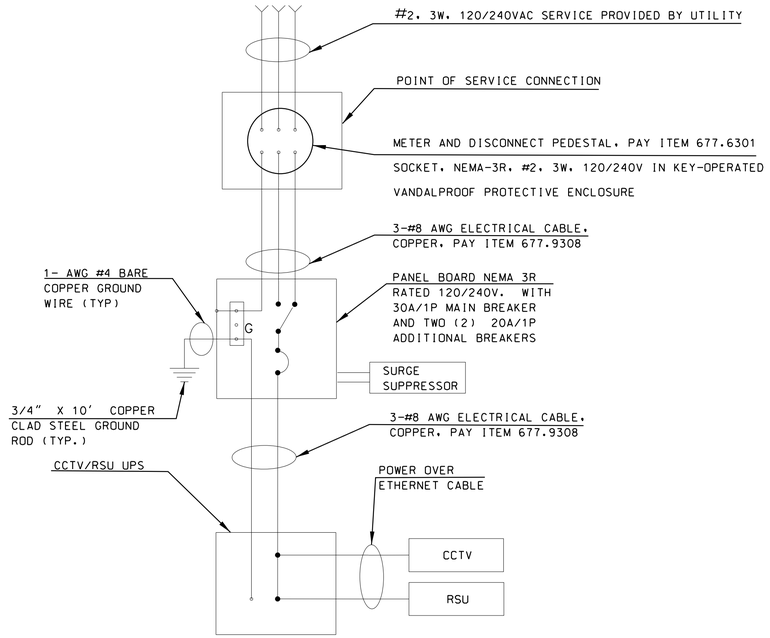
AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

COMMUNICATION SCHEMATIC

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Comms	41191	108	110



CCTV/RSU ELECTRIC SERVICE SCHEMATIC

N.T.S.

CCTV/RSU NOTES:

1. UNLESS OTHERWISE NOTED, ITEMS PAID FOR UNDER 677.4101

LEGEND

SWITCH BREAKER GROUND

REVISIONS AFTER PROPOSAL

STATION	DESCRIPTION	STATION	NUMBER	DATE

SDR PROCCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

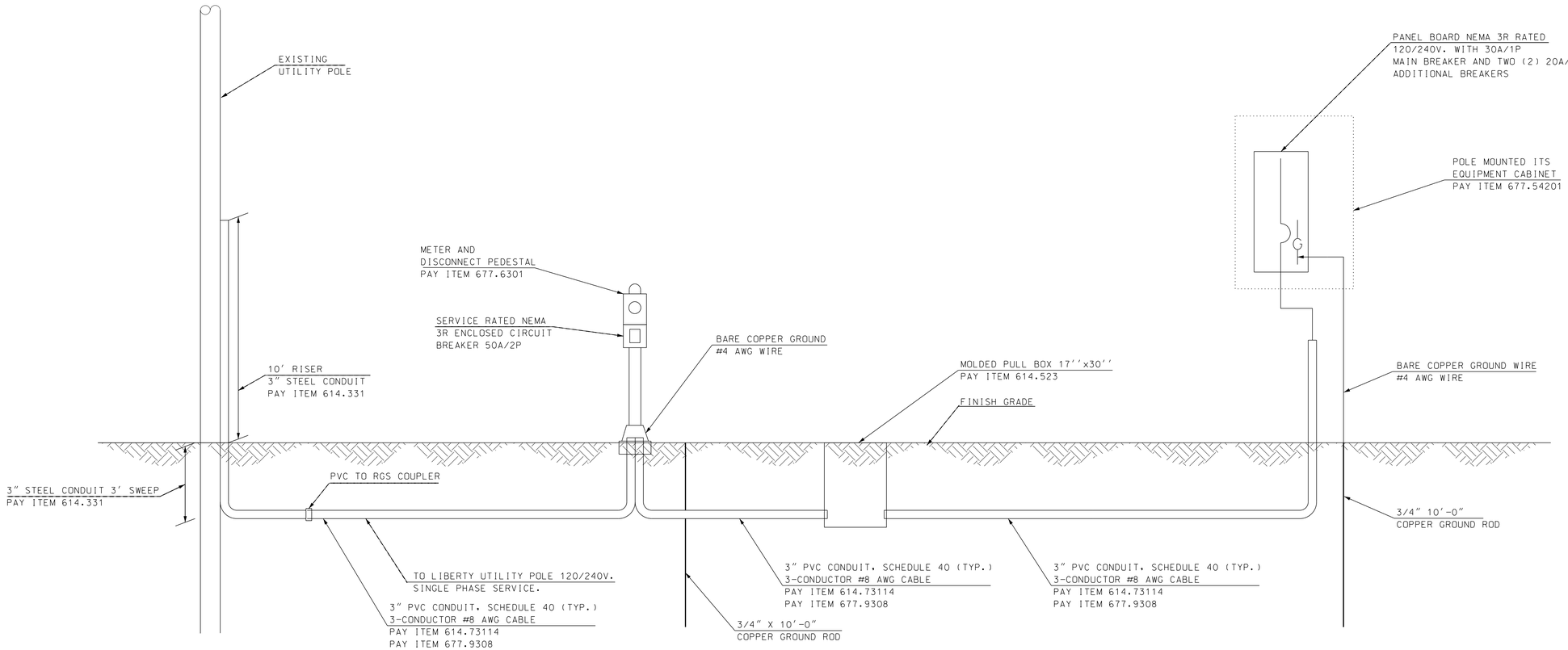
AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

ELECTRIC SCHEMATIC DETAIL

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Utilities	41191	109	110



ONE-LINE DIAGRAM

N.T.S.

NOTES:

1. UNLESS OTHERWISE NOTED, ITEMS PAID FOR UNDER ITEM 677.4101

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION	STATION

SDR PROCESSED	AECOM	DATE 07/2017
NEW DESIGN	AECOM	DATE 07/2017
SHEET CHECKED	CC	DATE 07/2017
AS BUILT DETAILS		DATE

AECOM

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

CCTV/RSU
UTILITY SERVICE DETAIL

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Exit 19 Utilities	41191	110	110