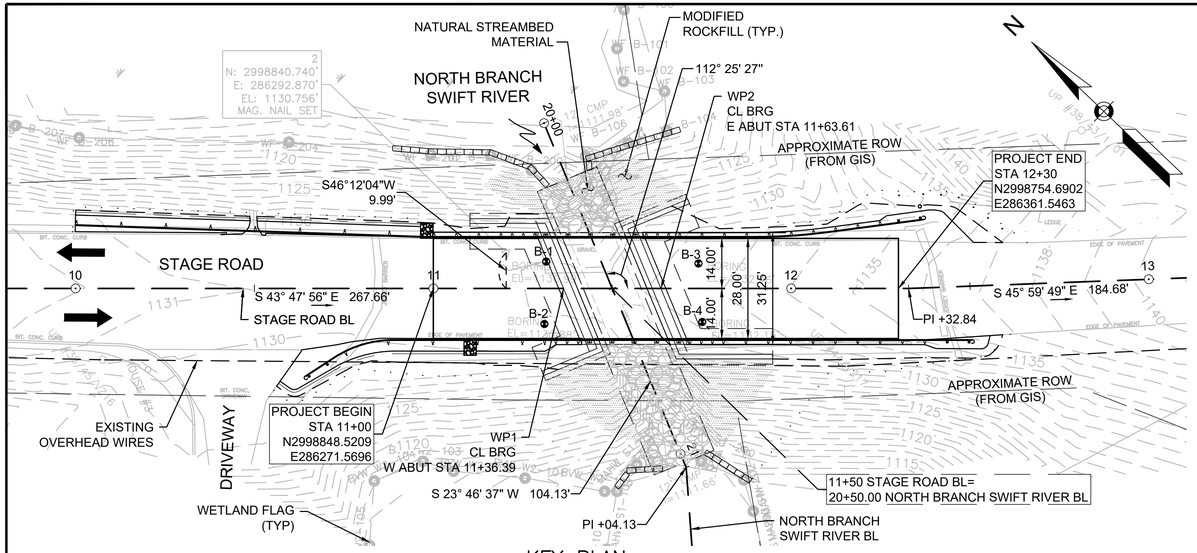
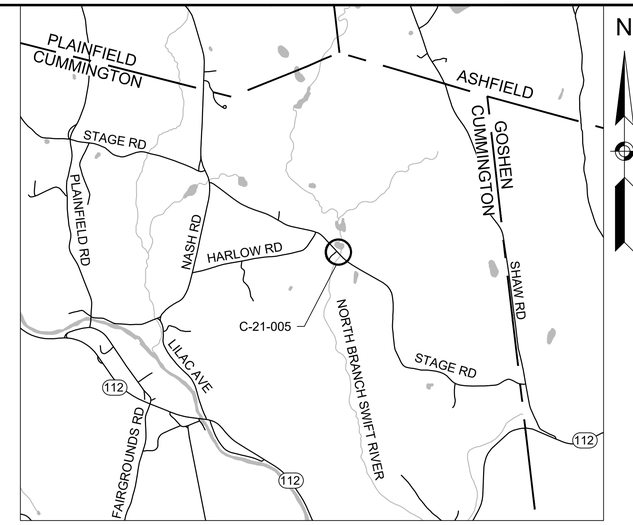


KEY PLAN

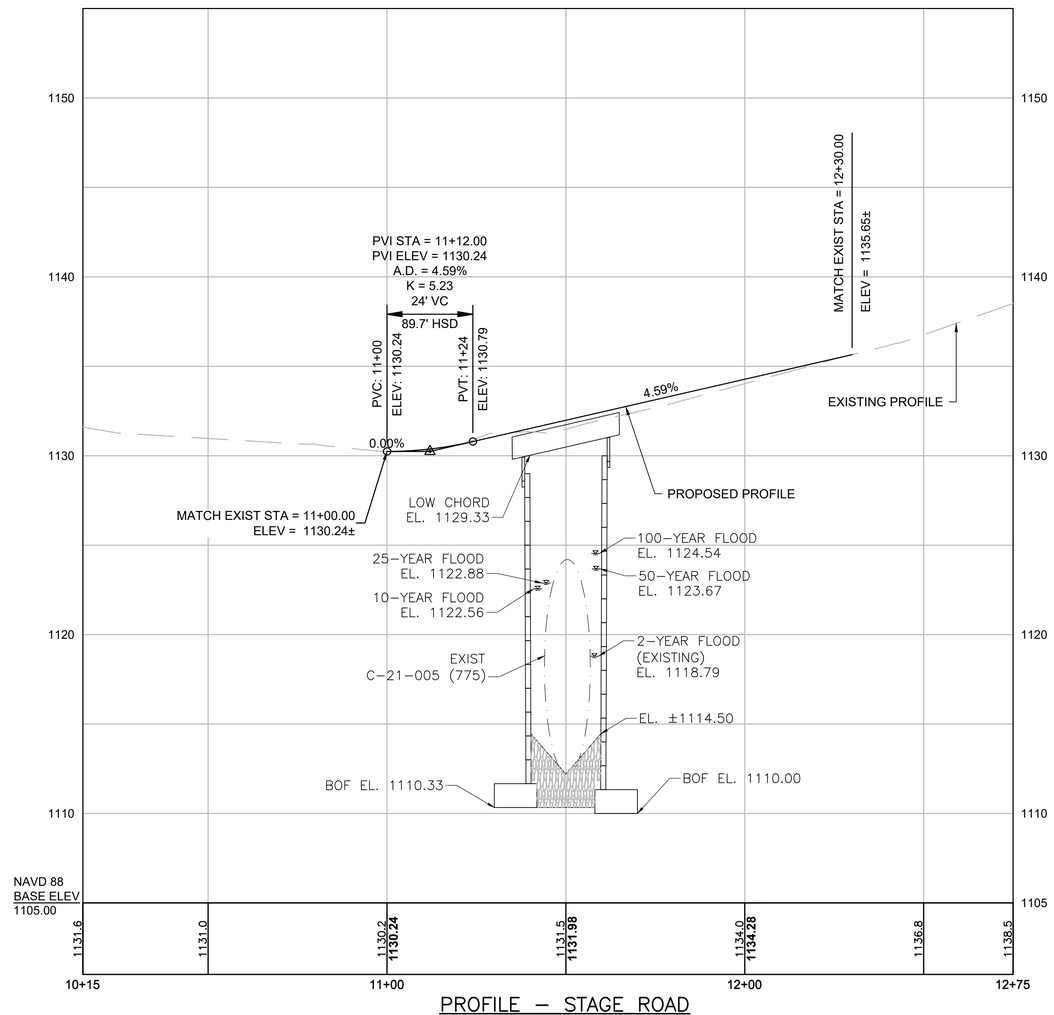
SCALE: 1'' = 20'

INDEX



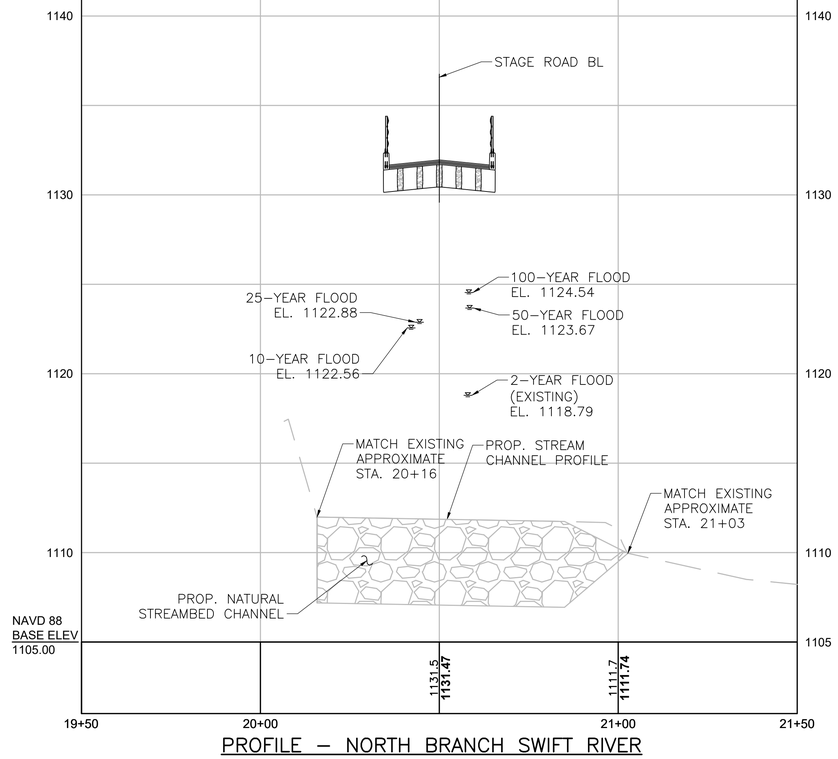
LOCUS

SCALE: 1'' = 2000'



PROFILE – STAGE ROAD

HORIZONTAL SCALE: 1'' = 20'
VERTICAL SCALE: 1" = 4'



PROFILE – NORTH BRANCH SWIFT RIVER

HORIZONTAL SCALE: 1'' = 20'
VERTICAL SCALE: 1" = 4'

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
10/29/2024
BRIDGE ENGINEER — DATE

GILL ENGINEERING
63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/23/24	MS	MS	PAG	ISSUED FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P. GILL
No. 35645
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

KEY PLAN
LOCUS
PROFILE

SHEET 1 OF 15

01_C21005 HD.dwg — Plotted on 24-Oct-2024 10:42 AM

GENERAL NOTES:

DESIGN
IN ACCORDANCE WITH THE 9TH EDITION, 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2024, FOR HL-93 LOADING.

SPECIFICATIONS
STANDARD SPECIFICATIONS, AS REFERRED TO IN THESE DRAWINGS, SHALL REFER TO THE 2024 MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

EXISTING CONDITIONS:
THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUACY AND ACCURACY THEREOF AND SHALL NOT ORDER ANY MATERIALS OR COMMENCE ANY FABRICATION UNTIL THE REQUIRED MEASUREMENTS HAVE BEEN MADE ON THE ACTUAL STRUCTURE AND THE EXTENT OF PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.

PLAN REVISIONS:
IF THERE ARE REVISIONS TO APPROVED PLANS, THE CONTRACTOR SHALL SUBMIT THESE CHANGES TO THE ENGINEER OF RECORD AND MASSDOT FOR THE REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. ONCE THESE REVISIONS ARE APPROVED BY THE MUNICIPALITY'S DESIGNER OF RECORD, THEY SHALL THEN BE SUBMITTED TO MASSDOT FOR FILING.

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

BENCH MARK 1: MAGNETIC NAIL SET
NORTHING: 2998649.580
EASTING: 286461.290
ELEVATION: 1145.754

BENCH MARK 2: MAGNETIC NAIL SET
NORTHING: 2973910.688
EASTING: 1946657.764
ELEVATION: 1372.803

DATE:
THE DATE SHALL BE FORMED INTO THE OUTSIDE FACE OF BOTH SAFETY CURBS AT MIDSPAN. THE DATE USED SHALL BE THE LATEST YEAR OF THE CONTRACT COMPLETION AS OF THE DATE THE FIRST SAFETY CURB IS CONSTRUCTED.

SURVEY NOTES:
1. UNDERGROUND UTILITIES ARE NOT SHOWN. NO RESPONSES FROM UTILITY COMPANIES RECEIVED AT THIS TIME. BEFORE CONSTRUCTION CALL "DIG SAFE" 1-888-344-7233.
2. THE SURVEY WAS PERFORMED BY DAWOOD ENGINEERING, INC., JUNE 2023.
3. WETLAND RESOURCE AREAS DELINEATED BY SWCA ENVIRONMENTAL CONSULTANTS ON AUGUST 25, 2023.
4. ALL ELEVATIONS REFER TO ASSUMED DATUM.
5. COORDINATES, IN U.S. SURVEY FEET, ARE IN THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MCS), MAINLAND ZONE, REFERENCED TO AN APPROXIMATE NORTH AMERICAN DATUM OF 1983 (NAD 83/2011 EPOCH 2010.00).

SCALES:
THESE DRAWINGS WERE FORMATTED FOR 24"x36" PLAN SHEETS. SCALES NOTED ON THE DRAWINGS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS.

DEMOLITION:
1. THE CONTRACTOR SHALL PREVENT CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, AND CONSTRUCTION DEBRIS FROM ENTERING THE WATER.
2. THE CONTRACTOR SHALL DISPOSE OF ANY DEMOLITION DEBRIS, CONSTRUCTION DEBRIS, WOOD WASTES, CONTAMINATED SOILS, HAZARDOUS MATERIALS AND OTHER SPECIAL WASTES IN STRICT ACCORDANCE WITH THE APPLICABLE LAWS AND REGULATIONS.

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

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS
1. NONE	16"	19"	23"
2. 12" OF CONCRETE BELOW BAR	20"	25"	30"
3. EPOXY COATED BARS, COVER <3d_b, OR CLEAR SPACING<6d_b	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITIONS 2 AND 3	26"	32"	39"
6. CONDITIONS 2 AND 4	24"	30"	36"

ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

CONCRETE:
THE FOLLOWING MASSDOT APPROVED CONCRETE MIXES ARE TO BE USED:

5000 PSI, ¾", 685 HP CONCRETE: SAFETY CURB AND CLOSURE POURS

6500 PSI CONCRETE: PRESTRESSED PRECAST SOLID DECK BEAMS

GRS-IBS MATERIALS
SEE SPECIAL PROVISIONS FOR DETAILED REQUIREMENTS:

BACKFILL MATERIALS

A. GEOSYNTHETIC REINFORCED SOIL (GRS) BACKFILL AND REINFORCED SOIL FOUNDATION (RSF) BACKFILL SHALL CONSIST OF CRUSHED STONE MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS TABLE M2.01.0-1, TYPE M2.01.4.

B. INTEGRATED APPROACH BACKFILL SHALL CONSIST OF DENSE GRADED CRUSHED STONE FOR SUB-BASE MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS TABLE M2.01.7-1.

GEOSYNTHETICS

GEOSYNTHETIC REINFORCEMENT FOR THE ABUTMENTS AND WINGWALLS SHALL CONSIST OF WOVEN GEOTEXTILE MANUFACTURED FROM POLYPROPYLENE, HIGH-DENSITY POLYETHYLENE, OR POLYESTER AND MEET THE REQUIREMENTS OF THE SPECIAL PROVISIONS.

A. THE GEOSYNTHETIC SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 4,800 LB/FT AND A MINIMUM TENSILE STRENGTH AT 2% STRAIN OF 1,200 LB/FT IN ACCORDANCE WITH ASTM D4595.

CONCRETE MODULAR BLOCK
1. CONCRETE MODULAR BLOCKS SHALL BE WET CAST WITH A MINIMUM f'_c=4000 PSI.
2. MORTAR SHALL MEET THE REQUIREMENT OF M4.02.15 CEMENT MORTAR

UTILITIES:
CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL EXISTING UTILITIES. THE CONTRACTOR MUST COORDINATE ALL WORK WITH THE TOWN OF CUMMINGTON, ALL UTILITY COMPANIES, AND ANY AFFECTED ABUTTERS.

TEMPORARY WATER CONTROL:
1. TEMPORARY WATER CONTROL SHALL BE ESTABLISHED TO PERMIT FOUNDATION CONSTRUCTION IN THE DRY.
2. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD A PROPOSED WATER DIVERSION AND DEWATERING PLAN DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

TRAFFIC:
SEE SHEET 15 FOR ROAD CLOSURE AND PEDESTRIAN ACCESS PLAN.

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	1000
DESIGN SPECTRA	
As	0.096
SDs	0.224
SD1	0.096
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA	
DRAINAGE AREA (SQ. MILES)	5.86
DESIGN FLOOD DISCHARGE (C.F.S.)	623
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	7.35
DESIGN FLOOD ELEVATION (FEET, NAVD)	1122.56
BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	1310
BASE FLOOD ELEVATION (FEET, NAVD)	1124.54
DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD SCOUR DEPTH (FEET)	0
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD SCOUR DEPTH (FEET)	0
FLOOD OF RECORD	
DISCHARGE (C.F.S.)	UNKNOWN
FREQUENCY (IF KNOWN, YEARS)	UNKNOWN
MAXIMUM ELEVATION (FEET, NAVD)	UNKNOWN
DATE (MM/YYYY)	UNKNOWN
HISTORY OF ICE FLOES	UNKNOWN
EVIDENCE OF SCOUR AND EROSION	NONE

TEMPORARY WATER CONTROL DESIGN DATA	
DESIGN FLOOD DISCHARGE (C.F.S.)	288
DESIGN FLOOD FREQUENCY (YEARS)	2
DESIGN FLOOD VELOCITY (F.P.S.)	4.30
DESIGN FLOOD ELEVATION (FEET, NAVD)	1120.17

ESTIMATED QUANTITIES
NOT GUARANTEED

NO.	ITEM	QUANT.	UNIT
102.	SELECTIVE CLEARING AND THINNING	.05	A
115.1	DEMOLITION OF BRIDGE C-21-005	1	LS
140.	BRIDGE EXCAVATION	2651	CY
151.	GRAVEL BORROW	108	CY
170.	FINE GRADING AND COMPACTING - SUBGRADE AREA	318	SY
281,6	NATURAL STREAMBED MATERIAL	192	CY
452.	ASPHALT EMULSION FOR TACK COAT	29	GAL
460.22	SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)	35	TON
460.31	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SSC - 12.5)	53	TON
504.	GRANITE CURB TYPE VA4 - STRAIGHT	46	FT
509.	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT	26	FT
594.	CURB REMOVED AND DISCARDED	176	FT
620.12	GUARDRAIL, TL-2 (SINGLE FACED)	161	FT
620.131	GUARDRAIL, DEEP POST (SINGLE FACED)	150	FT
627.1	TRAILING ANCHORAGE	3	EA
628.24	TRANSITION TO BRIDGE RAIL	4	EA
630.2	HIGHWAY GUARDRAIL REMOVED AND DISCARDED	440	FT
657.	TEMPORARY FENCE	400	FT
698.3	GEOTEXTILE FABRIC FOR SEPARATION	6	SY
751.7	COMPOST BLANKET	8	CY
765.	SEEDING	264	SY
767.121	SEDIMENT CONTROL BARRIER	471	FT
769.	PAVEMENT MILLING MULCH UNDER GUARD RAIL	401	FT
852.	SAFETY SIGNING FOR TRAFFIC MANAGEMENT	198	SF
853.1	PORTABLE BREAKAWAY BARRICADE TYPE III	6	EA
853.21	TEMPORARY BARRIER REMOVED AND RESET	90	FT
859.	REFLECTORIZED DRUM	1080	DAY
986.	MODIFIED ROCK FILL	79	TON
991.1	CONTROL OF WATER - STRUCTURE NO. C-21-005	1	LS
995.	BRIDGE SUPERSTRUCTURE, BRIDGE NO. C-21-005	1	LS
996.4	GEOSYNTHETIC REINFORCED SOIL-INTEGRATED BRIDGE SYSTEM	1	LS

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)
GILL ENGINEERING

01_C21005 HD.dwg Plotted on 24-Oct-2024 10:42 AM

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION	

DRW. BY	CALC. BY	APPRV. BY
MS	MS	PAG

DATE 10/23/24

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS JOSEPH P. GILL CIVIL NO. 39686 REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT
TOWN OF CUMMINGTON
BRIDGE REPLACEMENT FOR CUMMINGTON C-21-005 (CP5) STAGE ROAD OVER SWIFT RIVER

GENERAL NOTES

Comprehensive Environmental Inc.

Boring No. B-1

Page 1 of 1

City/Town: Cummington	Bridge Number: C-21-005	Project File Number:	Contract Number:
Location: Stage Road over North Branch of Swift River		Date & Time Started: 6/9/2020 8:00AM	Total Hours: 3
Groundwater Depth (Feet): 20	Date & Time: 6/9/2020 9:30AM	Date & Time Completed: 6/9/2020 11:00AM	
Coordinates: N2998853 E286283		Driller's Name: Mike St. John of New England Boring Contractors	
Ground Elevation (Feet): 1131.0		Inspector's Name: Nick Shaw of CEI	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
- - - - -	S1	0-2	14-10-10-13	8	Dry, medium dense, brown, SAND, some gravel	
5 - - - - -	S2	5-7	5-8-14-18	6	Dry, medium dense, brown, SAND, some gravel	
10 - - - - -	S3	10-12	9-15-14-13	17	Dry, medium dense, brown, SAND some silt	
15 - - - - -	S4	15-17	6-7-7-5	8	Dry, loose to medium dense, brown, SAND. some silt	
20 - - - - -	S5	20-22	12-9-31-80	12	Wet, medium dense to dense, brownish grey, SAND, little gravel	25'
25 - - - - -	S6	25-27	58-43-251/3"	15	Wet, very dense, brownish grey, SAND and GRAVEL, augered through rock to take final sample at 30-32'	30'
30	S7	30-32	130-141/3"	9	Wet, very dense, grey, GRAVEL Practical refusal and end of exploration @ 31'	

W. ABUT. PROP. BOF 1110.33

Remarks: Autohammer used for both split spoon sampler and driving Casing.	Arrow-Board: 0 Signs: 2 Cones: 2	Protective Device – Stand: Box: Well Depth: Solid Pipe: Stick Up Pipe: Screen Pipe:

Penetration Resistance (N) Guide			
Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 – 4	Very Soft	0 – 2
Loose	4 – 10	Soft	2 – 4
Medium Dense	10 – 30	Medium Stiff	4 – 8
Dense	30 – 50	Stiff	8 – 15
Very Dense	Over 50	Very Stiff	15 – 30
		Hard	Over 30
N = Sum of Second and Third 6" Blow counts			

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Type of Drill Rig:

Casing Type: HW Size: 4in
Hammer Weight:140 lbs
Fall: 30in
Depth: 31ft

Sampler Type: Split Spoon Size:2in
Automatic Hammer Weight: 140 lbs
Safety Hammer Weight:
Donut Hammer Weight:
Fall:

Core Barrel Type: NX Size: 2.125in

Comprehensive Environmental Inc.

Boring No. B-2

Page 1 of 1

City/Town: Cummington	Bridge Number: C-21-005	Project File Number:	Contract Number:
Location: Stage Road over North Branch of Swift River		Date & Time Started: 6/9/2020 11:30AM	Total Hours: 3.5
Groundwater Depth (Feet): 17	Date & Time: 6/9/2020 1:00PM	Date & Time Completed: 6/9/2020 3:00PM	
Coordinates: N2998857 E286260		Driller's Name: Mike St. John of New England Boring Contractors	
Ground Elevation (Feet): 1131.0		Inspector's Name: Nick Shaw of CEI	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
- - - - -	S1	0-2	7-8-6-10	12	Dry, medium dense, brown, SAND, some gravel	
5 - - - - -	S2	5-7	7-15-17-14	16	Dry, medium dense, brown, SAND trace gravel	
10 - - - - -	S3	10-12	10-5-5-8	16	Dry, medium dense, brown, SAND some silt	
15 - - - - -	S4	15-17	8-7-6-5	6	Wet, loose to medium dense, brown, SAND some gravel	20'
20 - - - - -	S5	20-22	19-15-12-44	10	Wet, dense to very dense, brown SAND and GRAVEL	25'
25 - - - - -	S6	25-27	23-23-45-16	5	Wet, dense to very dense, grey, GRAVEL	
30	S7	30-32	191-132/4"	10	Wet, very dense, grey, GRAVEL, some till Practical refuse and end of exploration @ 31'	

W. ABUT. PROP. BOF 1110.33

Remarks: Autohammer used for both split spoon sampler and driving Casing.	Arrow-Board: 0 Signs: 2 Cones: 2	Protective Device – Stand: Box: Well Depth: Solid Pipe: Stick Up Pipe: Screen Pipe:

Penetration Resistance (N) Guide			
Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 – 4	Very Soft	0 – 2
Loose	4 – 10	Soft	2 – 4
Medium Dense	10 – 30	Medium Stiff	4 – 8
Dense	30 – 50	Stiff	8 – 15
Very Dense	Over 50	Very Stiff	15 – 30
		Hard	Over 30
N = Sum of Second and Third 6" Blow counts			

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Type of Drill Rig:

Casing Type: HW Size: 4in
Hammer Weight:140 lbs
Fall: 30in
Depth: 31ft

Sampler Type: Split Spoon Size:2in
Automatic Hammer Weight: 140 lbs
Safety Hammer Weight:
Donut Hammer Weight:
Fall:

Core Barrel Type: NX Size: 2.125in

BORING NOTES:

1. LOCATION OF BORINGS ARE SHOWN ON THE PLANS THUS: ⊕
2. BORINGS ARE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT THE BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1⅜" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT GILL ENGINEERING ASSOCIATES, 63 KENDRICK STREET NEEDHAM, MA 02494. THE CONTRACTOR MAY EXAMINE THE SOIL AND SAMPLES BY CONTACTING GILL ENGINEERING ASSOCIATES.
6. BORINGS WERE MADE ON 6/8/2020, 6/9/2020 AND 6/10/2020.
7. ALL BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTORS OF 40 FORDWAY STREET DERRY, NH 03038.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)

GILL ENGINEERING

Plotted on 24-Oct-2024 10:42 AM
03_C21005 BORING LOGS.dwg

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/23/24	MS	MS	PAG	ISSUED FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — JOSEPH P. OVIS — NO. 39545 — REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT
TOWN OF CUMMINGTON
BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

BORING LOGS
1 OF 2

SHEET 3 OF 15

Comprehensive Environmental Inc.

Boring No. B-3

Page 1 of 1

City/Town: Cummington	Bridge Number: C-21-005	Project File Number:	Contract Number:
Location: Stage Road over North Branch of Swift River		Date & Time Started: 6/8/2020 8:00AM	Total Hours: 6.5
Groundwater Depth (Feet): 22	Date & Time:6/8/2020 10:00AM	Date & Time Completed: 6/8/2020 2:30PM	
Coordinates: N2998822 E286311		Driller's Name: Mike St. John of New England Boring Contractors	
Ground Elevation (Feet): 1132.5		Inspector's Name: Nick Shaw of CEI	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
-	S1	0-2	8-8-7-8	22	Dry, medium dense, brown, SAND, trace asphalt	
5	S2	5-7	9-5-4-7	14	Dry, loose to medium dense, brown, SAND, some silt	
10	S3	10-12	13-5-7-8	21	Dry, loose to medium dense, brown, SAND, and silt	
15	S4	15-17	6-24-21-7	7	Dry, medium dense, dark brown, SAND and silt	
20	S5	20-22	43-33-35-65	14	Wet, very dense, dark brown/grey, SAND, some silt	25'
25	S6	25-27	55-230-105-108	19	Wet, very dense, dark brown/grey, TILL/ WEATHERED ROCK, some sand	30'
30	RC1	30-35	4:48 3:11 7:08 8:51 6:27		30'-35' Conglomerate. Clasts are rounded to subangular, primarily cobbled sized but range to fine gravel sized. REC=36"/60"=60%	
35	RC2	36-40	5:46 8:19 6:31 9:52 4:01		36-40' Conglomerate. Clasts are rounded to subangular, primarily cobble sized, but range to fine and gravel sized. REC= 60"/60" = 100%	
40						

E. ABUT.
PROP. BOF
1110.00

Remarks: Autohammer used for both split spoon sampler and driving
Casing.

Arrow-Board: 0
Signs: 2
Cones: 2

Protective Device – Stand: Box:
Well Depth: Solid Pipe:
Stick Up Pipe: Screen Pipe:

Type of Drill Rig:

Casing Type: HW Size: 4in
Hammer Weight:140 lbs
Fall: 30in
Depth: 31ft

Sampler Type: Split Spoon Size:2in
Automatic Hammer Weight: 140 lbs
Safety Hammer Weight:
Donut Hammer Weight:
Fall:

Core Barrel Type: NX Size: 2.125in

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 – 4	Very Soft	0 – 2
Loose	4 – 10	Soft	2 – 4
Medium Dense	10 – 30	Medium Stiff	4 – 8
Dense	30 – 50	Stiff	8 – 15
Very Dense	Over 50	Very Stiff	15 – 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Comprehensive Environmental Inc.

Boring No. B-4

Page 1 of 1

City/Town: Cummington	Bridge Number: C-21-005	Project File Number:	Contract Number:
Location: Stage Road over North Branch of Swift River		Date & Time Started: 6/10/2020 8:00AM	Total Hours: 4
Groundwater Depth (Feet): 21	Date & Time:6/10/2020 9:30AM	Date & Time Completed: 6/10/2020 12:00PM	
Coordinates: N2998802 E286290		Driller's Name: Mike St. John of New England Boring Contractors	
Ground Elevation (Feet): 1132.0		Inspector's Name: Nick Shaw of CEI	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
-	S1	0-2	10-8-7-5	13	Dry, medium dense, brown, SAND, some gravel	
5	S2	5-7	12-11-8-8	19	Dry, medium dense, brown, SAND trace gravel	
10	S3	10-12	4-5-9-16	15	Dry, loose to medium dense, brown, SAND, Some silt	
15	S4	15-17	21-25-20-26	14	Dry, dense, grey, SAND, trace gravel	
20	S5	20-22	28-40-38-39	16	Wet, very dense, brown/grey, SAND and GRAVEL	
25	S6	25-27	43-182/5"	12	Wet, very dense, brown/grey, SAND and GRAVEL, augered through boulder or rock to Take sample at 30-32'	25'
30	S7	30-35	140-162/3"	9	Wet, very dense, grey, GRAVEL Practical refusal and end of exploration at 31'	31'

E. ABUT.
PROP. BOF
1110.00

Remarks: Autohammer used for both split spoon sampler and driving
Casing.

Arrow-Board: 0
Signs: 2
Cones: 2

Protective Device – Stand: Box:
Well Depth: Solid Pipe:
Stick Up Pipe: Screen Pipe:

Type of Drill Rig:

Casing Type: HW Size: 4in
Hammer Weight:140 lbs
Fall: 30in
Depth: 31ft

Sampler Type: Split Spoon Size:2in
Automatic Hammer Weight: 140 lbs
Safety Hammer Weight:
Donut Hammer Weight:
Fall:

Core Barrel Type: NX Size: 2.125in

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 – 4	Very Soft	0 – 2
Loose	4 – 10	Soft	2 – 4
Medium Dense	10 – 30	Medium Stiff	4 – 8
Dense	30 – 50	Stiff	8 – 15
Very Dense	Over 50	Very Stiff	15 – 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

FOR BORING NOTES SEE SHEET 3.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER 10/29/2024 DATE

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)

GILL ENGINEERING

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03_C21005 BORING LOGS.dwg

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION	DATE
10/23/24	MS	MS	PAG	ISSUED FOR CONSTRUCTION	

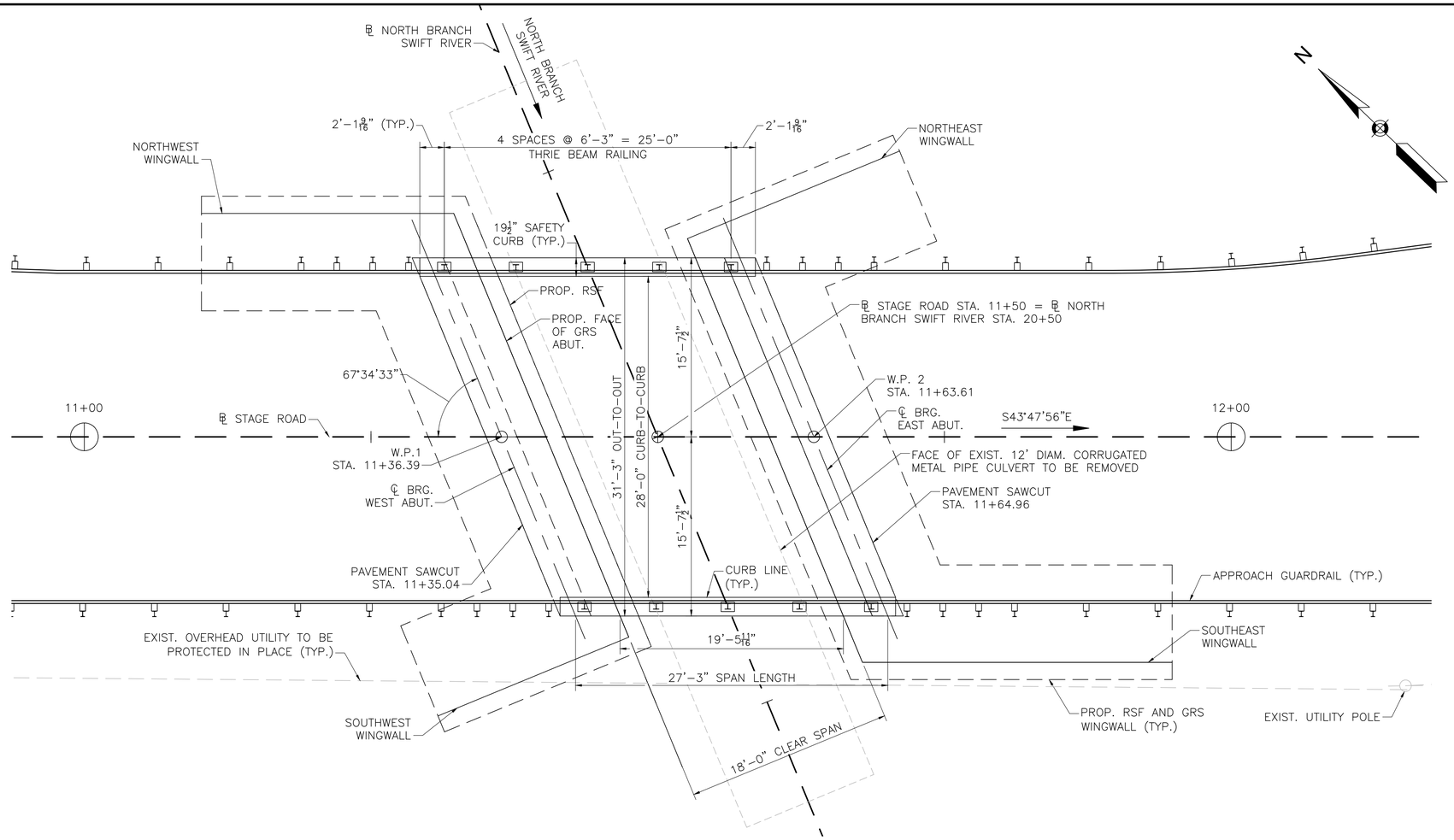
REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P GILL
CIVIL
No. 53455
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT
TOWN OF CUMMINGTON
BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

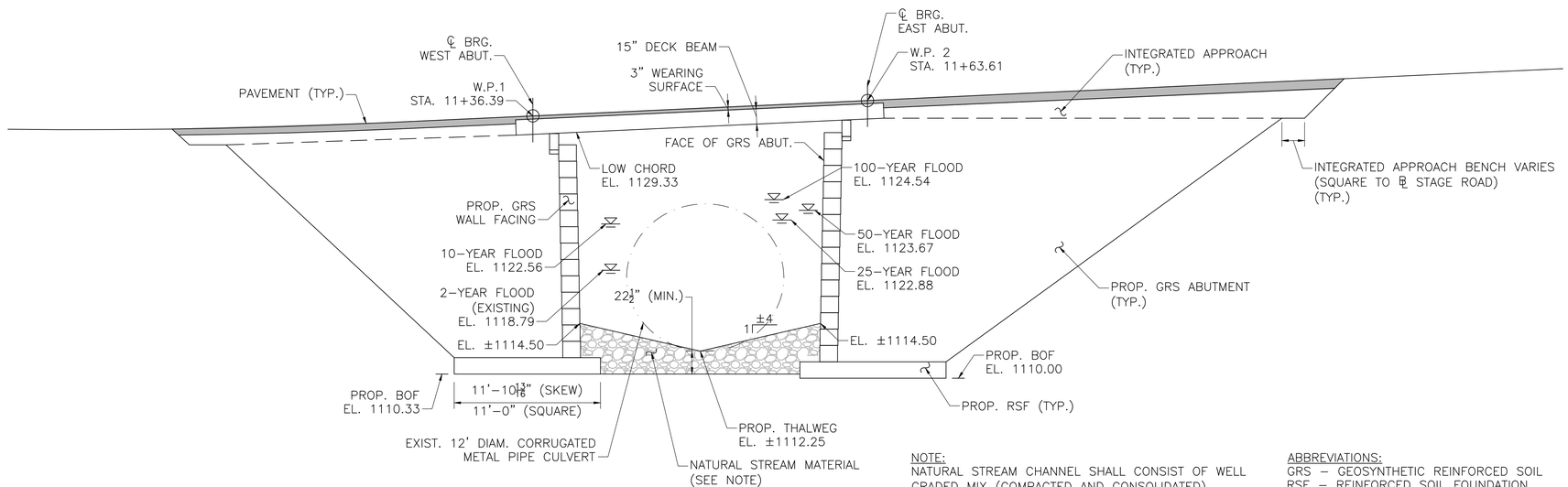
BORING LOGS
2 OF 2

SHEET 4 OF 15



GENERAL PLAN

SCALE: 3/16" = 1'–0"



LONGITUDINAL SECTION

SCALE: 3/16" = 1'–0"

NOTE:
NATURAL STREAM CHANNEL SHALL CONSIST OF WELL GRADED MIX (COMPACTED AND CONSOLIDATED) CONSISTING OF GRAVEL MATERIAL (M1.03.0 TYPE A) OVER COBBLES (6"–12"ø) AND RIP–RAP (M2.02.0).

ABBREVIATIONS:
GRS – GEOSYNTHETIC REINFORCED SOIL
RSF – REINFORCED SOIL FOUNDATION
IBS – INTEGRATED BRIDGE SYSTEM

COMMONWEALTH OF MASSACHUSETTS
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GILL ENGINEERING

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION	DATE
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REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P. GILL
NO. 34545
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C–21–005 (CP5)
STAGE ROAD OVER SWIFT RIVER

PLAN AND ELEV.

SHEET 5 OF 15

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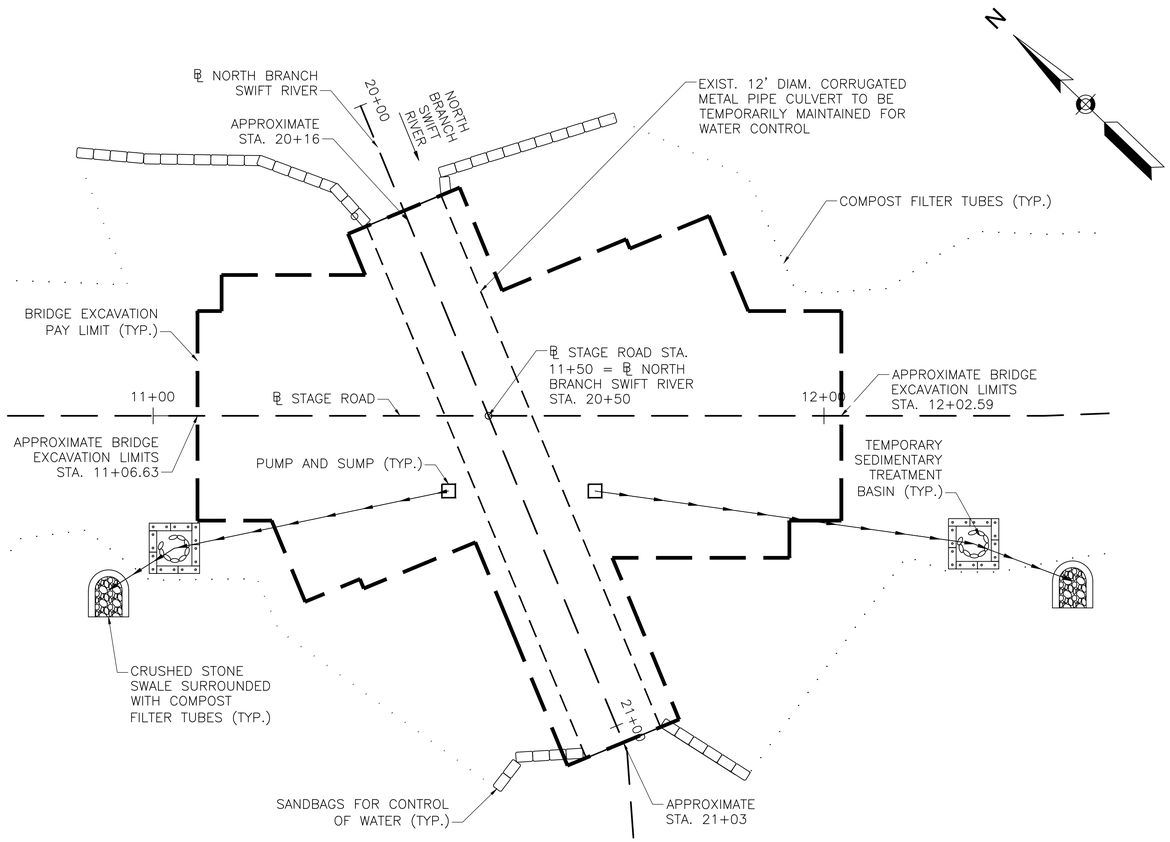
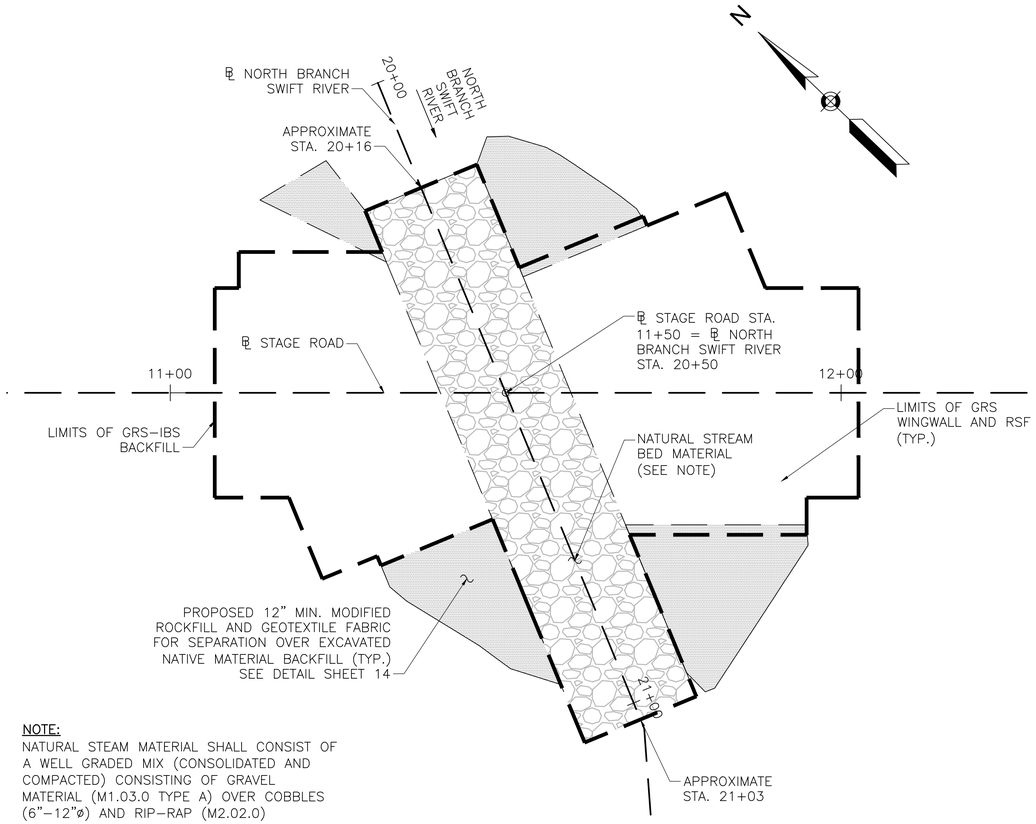
04_C21005 GENERAL PLAN AND SECTION.dwg



EXCAVATION AND TEMPORARY CONTROL OF WATER PLAN

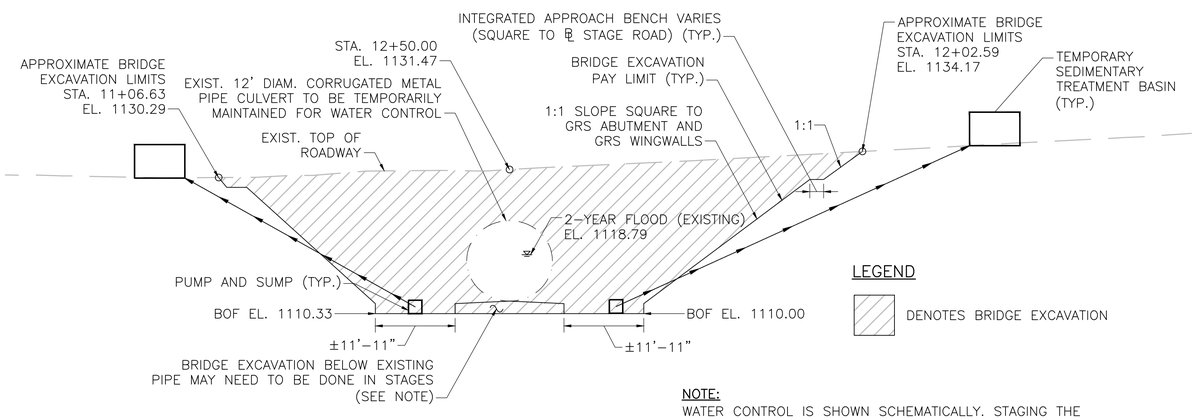
SCALE: $\frac{3}{32}$" = 1'–0"



NOTE:
NATURAL STEAM MATERIAL SHALL CONSIST OF A WELL GRADED MIX (CONSOLIDATED AND COMPACTED) CONSISTING OF GRAVEL MATERIAL (M1.03.0 TYPE A) OVER COBBLES (6"–12"ø) AND RIP–RAP (M2.02.0)

MODIFIED ROCKFILL AND STREAM RESTORATION PLAN

SCALE: $\frac{3}{32}$" = 1'–0"



NOTE:
WATER CONTROL IS SHOWN SCHEMATICALLY. STAGING THE EXCAVATION FOR PLACEMENT OF THE NATURAL STREAM BED MATERIAL IS THE CONTRACTORS RESPONSIBILITY.

EXCAVATION AND TEMPORARY CONTROL OF WATER LONGITUDINAL SECTION

SCALE: $\frac{3}{32}$" = 1'–0"

SUGGESTED CONSTRUCTION STAGING

1. INSTALL COMPOST FILTER TUBES AROUND PERIMETER OF WORK ZONE.
2. INSTALL SANDBAGS TO DIRECT FLOW THROUGH EXISTING PIPE CULVERT OR OTHER TYPE OF WATER DIVERSION FOR PREPARATION OF EXCAVATION. WATER DIVERSION SHALL BE ABLE TO ACCOMMODATE A 2–YEAR FLOOD ELEVATION.
3. EXCAVATE REQUIRED EXISTING MATERIAL TO INSTALL REINFORCED SOIL FOOTINGS (RSF) INCLUDING REMOVAL OF SMALL TREES (<3" DIAM.). EXCAVATED MATERIAL MAY BE USED FOR BACKFILLING IF IT MEETS SPECIFICATIONS. ANY STOCK PILE MATERIAL SHALL BECOVERED WITH TARPS AND HAVE ONE LAYER OF TARP MATERIAL BELOW. THE PILE SHALL BE SURROUNDED BY COMPOST FILTER TUBES.
4. REMOVE DEBRIS AND DEWATER AS NECESSARY TO PREPARE FOR INSTALLATION OF GRS ABUTMENTS AND WINGWALLS. DEWATERING IF NEEDED WILL REQUIRE FILTERING THE WATER THROUGH A DRAINAGE BASIN OR A SILT SACK PRIOR TO DISCHARGE BACK INTO THE STREAM.
5. INSTALL REINFORCED SOIL FOOTING (RSF).
6. INSTALL GEOSYNTHETIC REINFORCED SOIL ABUTMENT AND WINGWALLS WITH PRECAST CONCRETE BLOCK WALLS.
7. EXCAVATE AND RESTORE CHANNEL WITH NATURAL STREAM BED MATERIAL.
8. RECONSTRUCT ADJACENT BANKS. STABILIZE BANKS WITH RIPRAP AS NECESSARY. LOAM AND SEED SHALL BE ADDED TO THE BANK.
9. REMOVE EXISTING PIPE CULVERT AND SANDBAGS OR OTHER WATER DIVERSION SYSTEM.
10. INSTALL BRIDGE SUPERSTRUCTURE.
11. PLACE INTEGRATED APPROACH.
12. PLACE HMA BRIDGE PAVEMENT AND HMA APPROACH PAVEMENT.
13. INSTALL APPROACH GUARDRAIL.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — 10/29/2024 DATE

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)
GILL ENGINEERING

DESCRIPTION	APPRV. BY	CALC. BY	DRW. BY	DATE
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REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS JOSEPH P GILL NO. 39545 REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

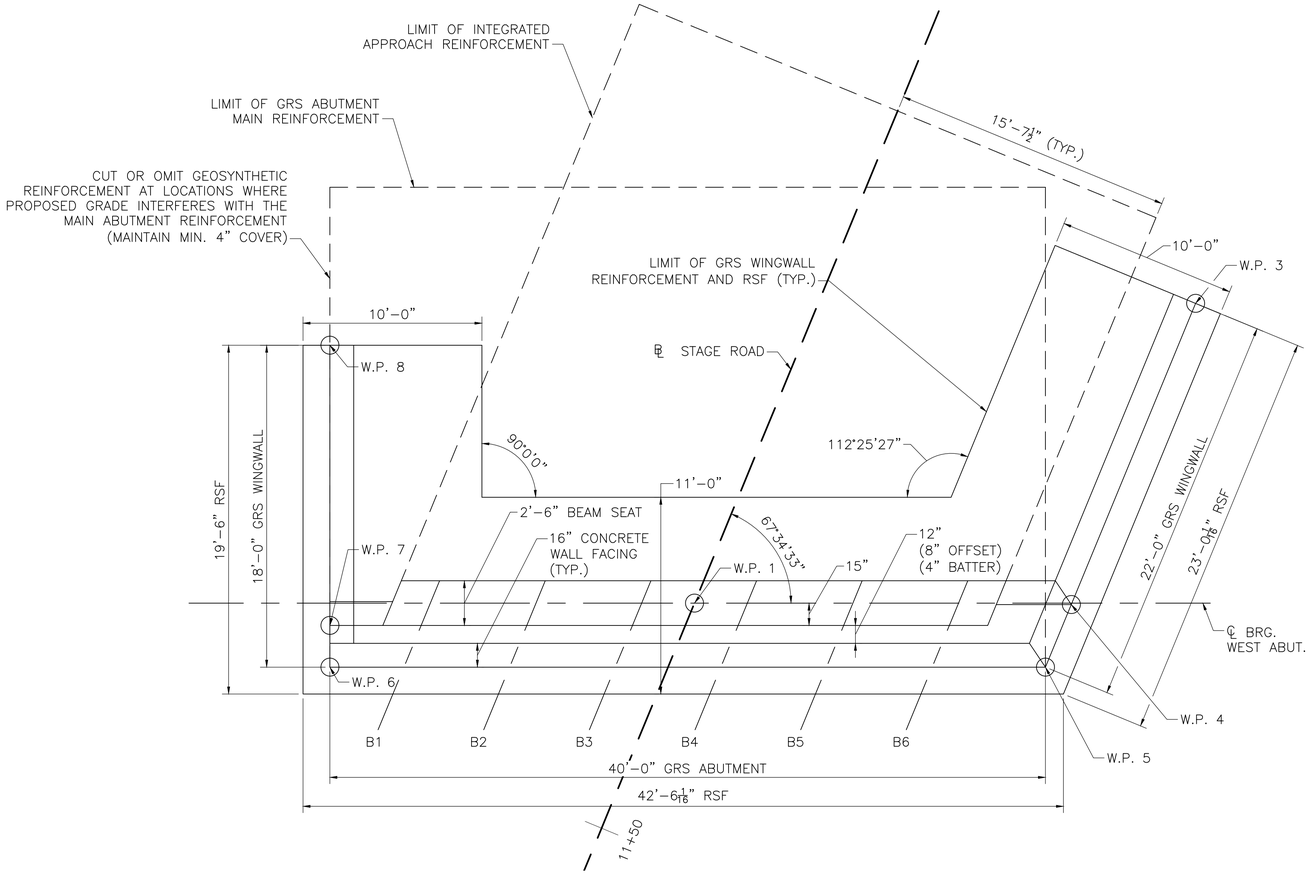
TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C–21–005 (CP5)
STAGE ROAD OVER SWIFT RIVER

DEMO & WATER

SHEET 6 OF 15

05_C21005 DEMO AND WATER CONTROL.dwg Plotted on 24-Oct-2024 10:42 AM

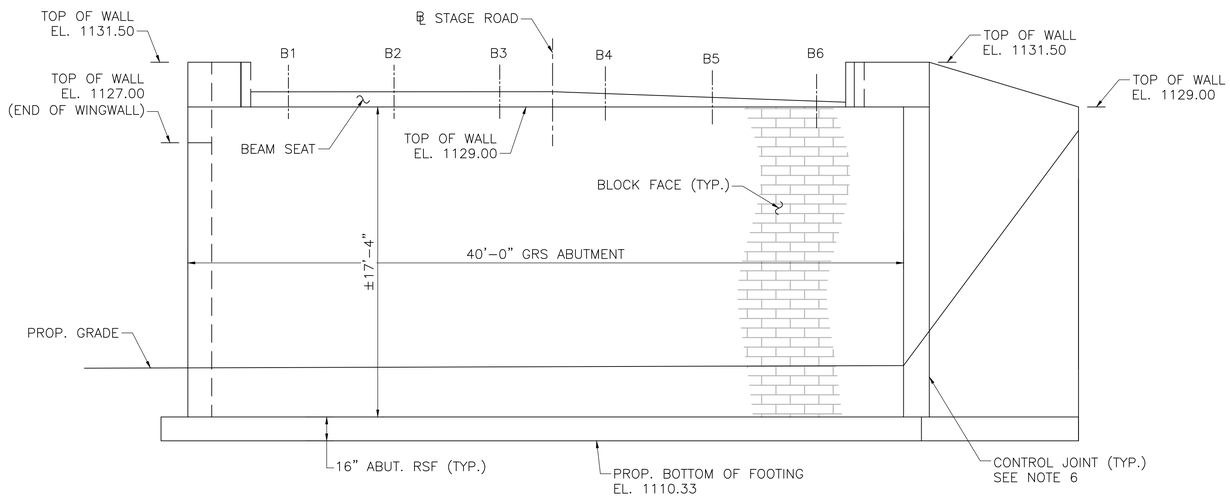


WEST ABUTMENT PLAN

SCALE: ¼" = 1'-0"

WORKING POINT TABLE		
W.P.	STA.	OFFSET
1	11+36.39	–
3	11+10.22	19.50' LT
4	11+28.43	19.50' LT
5	11+32.22	19.50' LT
6	11+47.47	17.46' RT
7	11+45.32	18.39 RT
8	11+30.85	24.34' RT

BEAM SEAT ELEVATIONS	
BEAM	EL.
B1	1129.84
B2	1129.85
B3	1129.85
B4	1129.75
B5	1129.54
B6	1129.33



WEST ABUTMENT ELEVATION

SCALE: ¼" = 1'-0"

GRS-IBS ABUTMENT/WINGWALL NOTES:

1. PRECAST MODULAR BLOCKS ARE TO BE 8" TO 16" DEEP. WALL DIMENSIONS ARE BASED FROM 16"x16" CONCRETE BLOCKS. IF DIFFERENT BLOCKS ARE USED THE OVERALL DIMENSIONS AND ELEVATIONS CAN BE ADJUSTED, WITH THE EXCEPTION OF THE 18'-0" HYDRAULIC OPENING MEASURED PERPENDICULAR FROM THE ABUTMENT FACE.
2. TOP OF GRS ABUTMENT/WALL ELEVATIONS ARE GIVEN TO FINAL COURSE OF PRECAST MODULAR BLOCKS.
3. WORKING POINTS LOCATING THE FACE OF THE GRS ABUTMENT/WALL ARE GIVEN AT THE TOP OF THE REINFORCED SOIL FOUNDATION (BOTTOM OF WALL).
4. PRECAST BLOCK UNITS ARE RUNNING BOND, INCLUDES CORNERS, SO THERE ARE NO VERTICAL JOINTS GREATER THAN ONE COURSE HEIGHT.
5. CONSTRUCT WALLS NEAR VERTICAL WITH MAXIMUM OF 4" TOTAL SETBACK.
6. PROVIDE CONTROL JOINTS TO SEPARATE THE ABUTMENT WALL FROM THE WINGWALLS. JOINT SHALL BE CONTINUOUS FOR THE ENTIRE BLOCK WALL AND SHALL CONTINUTE INTO THE WALL CAP.
7. AT THE WALL CORNERS, CONTRACTOR MAY USE AN ALTERNATIVE CORNER DETAIL THAT UTILIZES A CORNER RADIUS RATHER THAN A SHARP CORNER AS SHOWN HERE.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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GILL ENGINEERING

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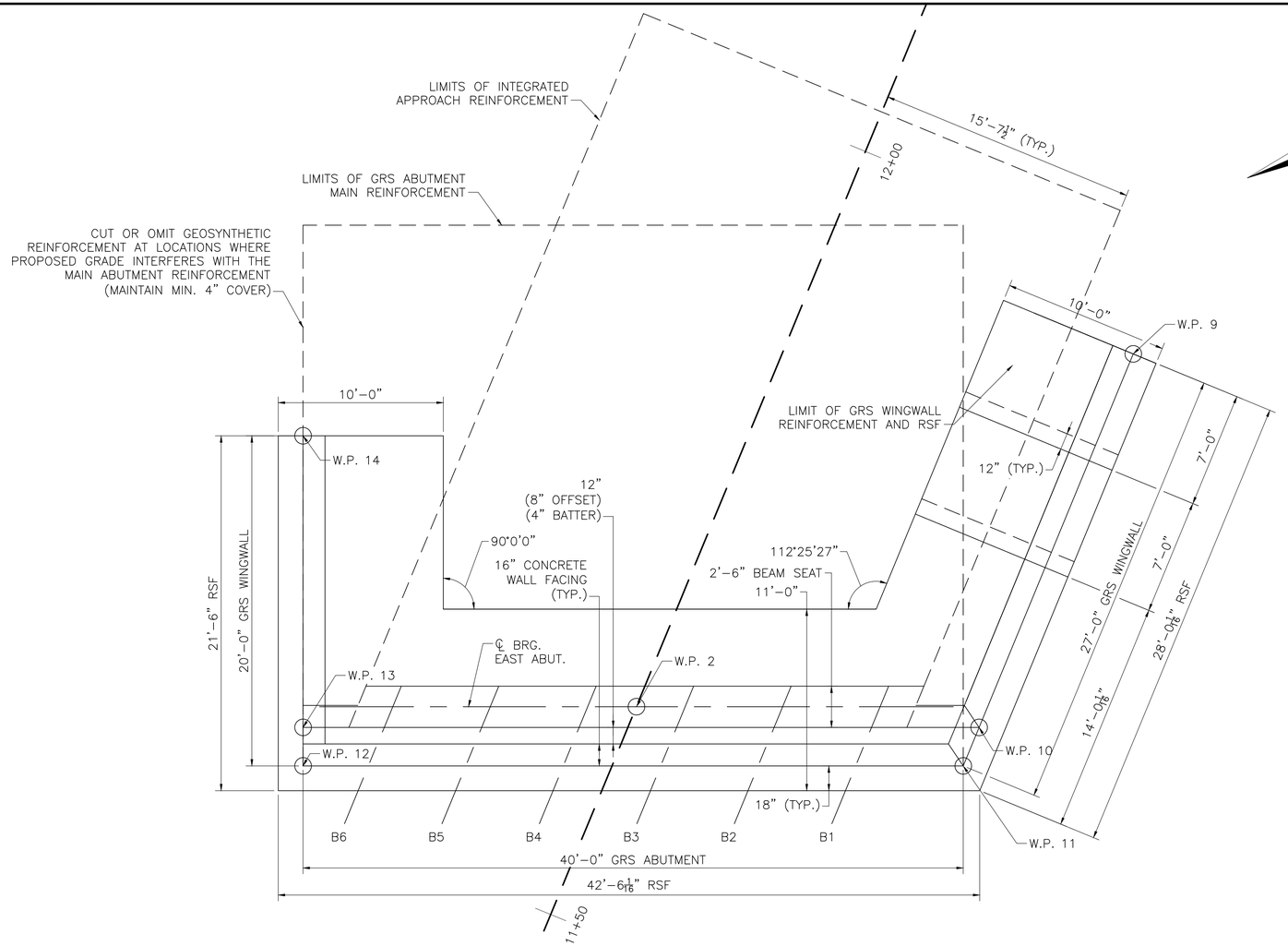
COMMONWEALTH OF MASSACHUSETTS — JOSEPH P GILL — CIVIL — No. 39445 — REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

WEST ABUTMENT

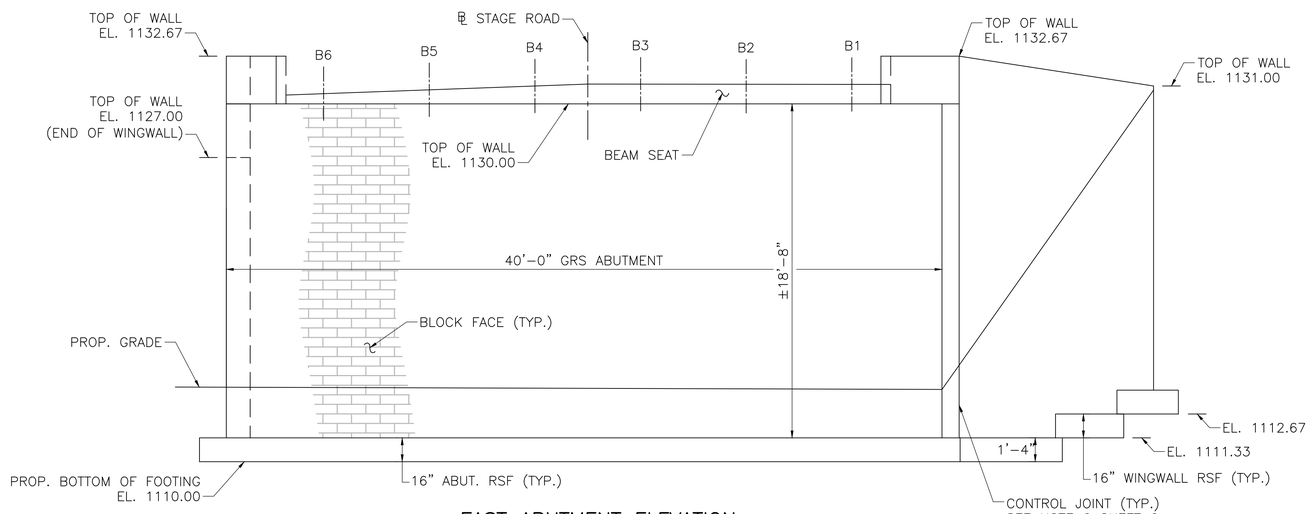


EAST ABUTMENT PLAN

SCALE: ¼" = 1'-0"

WORKING POINT TABLE		
W.P.	STA.	OFFSET
2	11+63.61	–
9	11+94.85	19.67' RT
10	11+70.40	19.67' RT
11	11+67.90	19.67' RT
12	11+52.60	17.31' LT
13	11+54.76	18.19' LT
14	11+71.09	24.93' LT

BEAM SEAT ELEVATIONS	
BEAM	EL.
B1	1131.09
B2	1131.10
B3	1131.10
B4	1131.00
B5	1130.79
B6	1130.57



EAST ABUTMENT ELEVATION

SCALE: ¼" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — 10/29/2024 DATE

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GILL ENGINEERING

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REGISTERED PROFESSIONAL ENGINEER — DATE

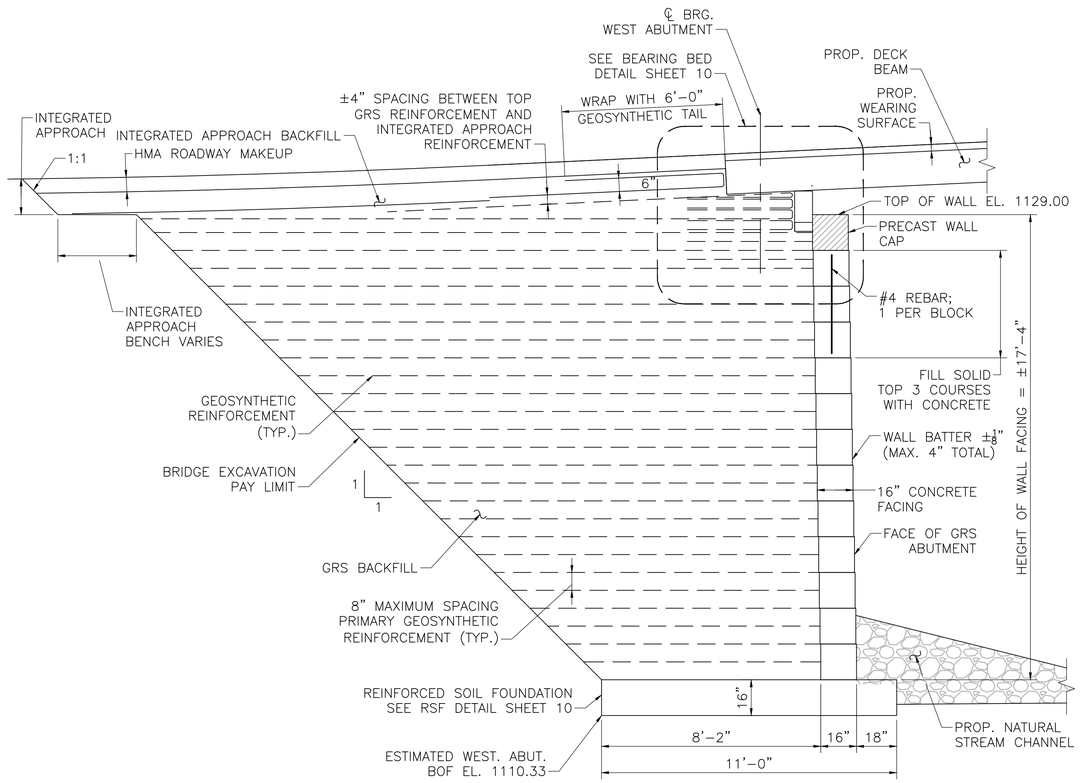
COMMONWEALTH OF MASSACHUSETTS JOSEPH P GILL CIVIL NO. 39455 REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

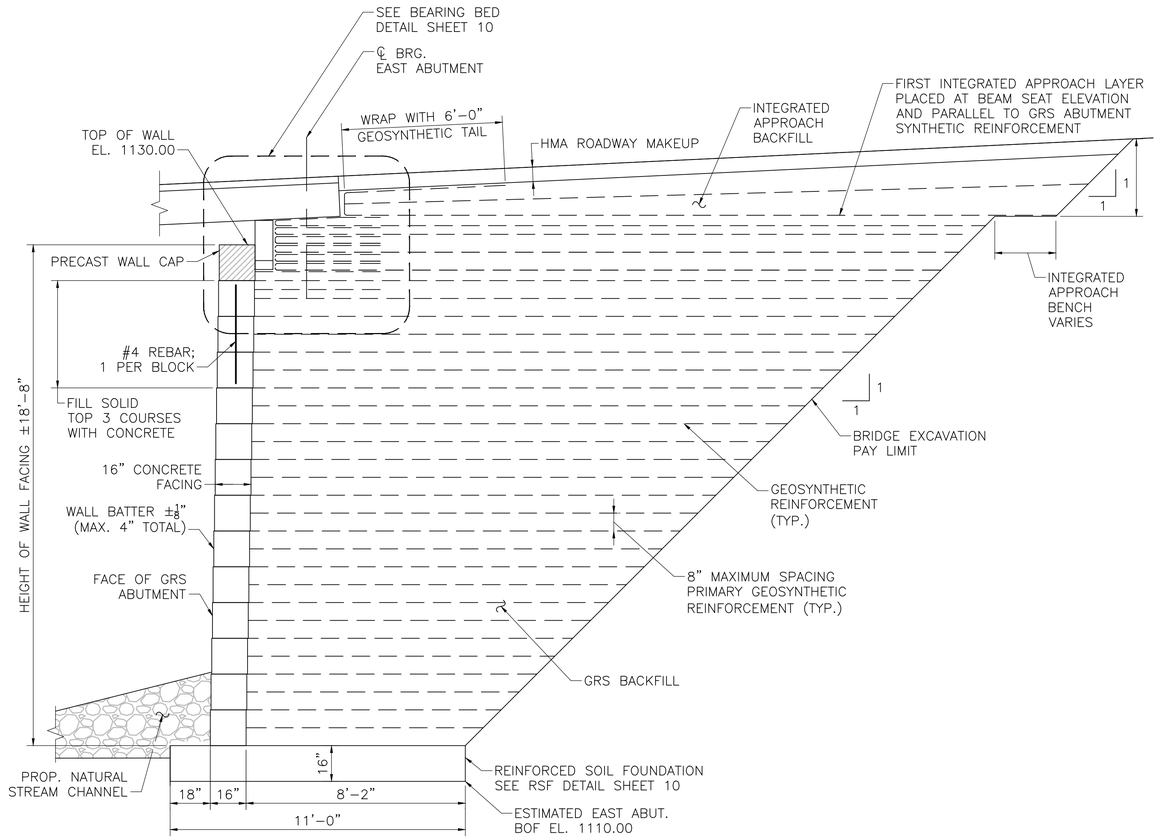
BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

EAST ABUTMENT



WEST ABUTMENT TYPICAL SECTION

SCALE: 3/8" = 1'–0"



EAST ABUTMENT TYPICAL SECTION

SCALE: 3/8" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

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GILL ENGINEERING

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REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS — JOSEPH P. GILL — NO. 35645 — REGISTERED PROFESSIONAL ENGINEER

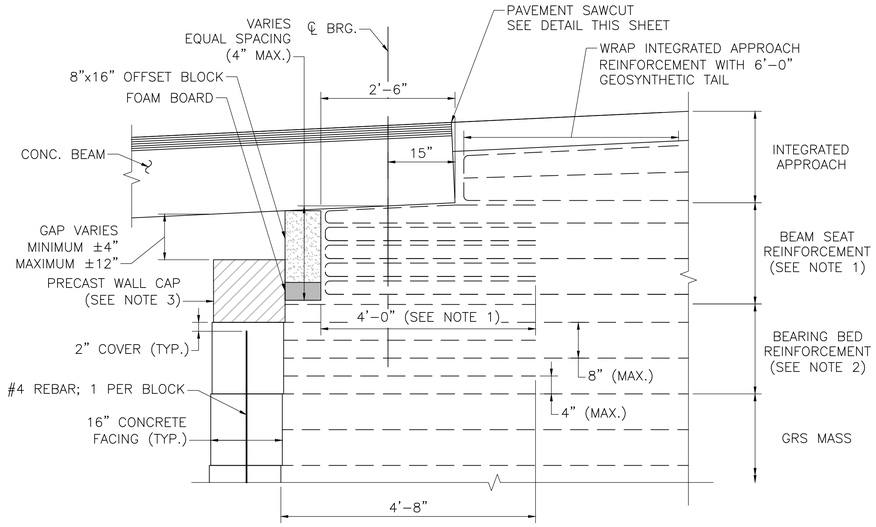
PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

ABUTMENT DETAILS 1 OF 2

SHEET 9 OF 15

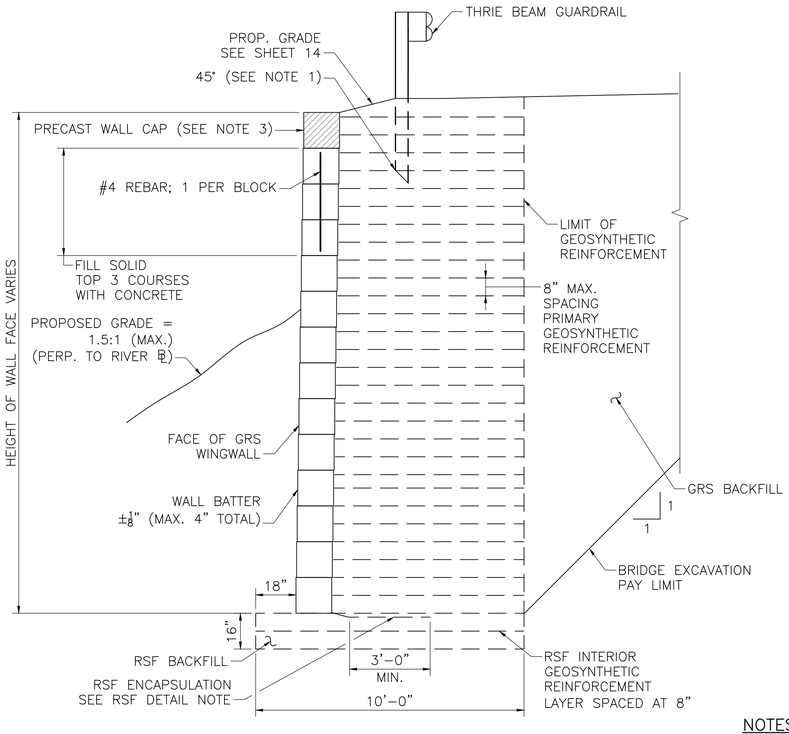


BEAM SEAT AND BEARING BED NOTES:

1. BEAM SEAT REINFORCEMENT IS THE REINFORCEMENT ZONE PLACED AGAINST THE OFFSET BLOCK AND FOAM BOARD. THE BEAM SEAT REINFORCEMENT SHALL BE WRAPPED WITH A 4'-0" TAIL. REINFORCEMENT SHALL BE EQUALLY SPACED WITH A MAXIMUM SPACING OF 4". EVERY OTHER LAYER SHALL EXTEND TO THE CUT SLOPE.
2. BEARING BED REINFORCEMENT TO BE SPACED AT 8" AND ALTERNATE WITH MAIN GRS REINFORCEMENT. PROVIDE 3 LAYERS OF BEARING BED REINFORCEMENT.
3. ATTACH CAP USING A CONCRETE CONSTRUCTION ADHESIVE.

BEARING BED DETAIL DETAIL

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

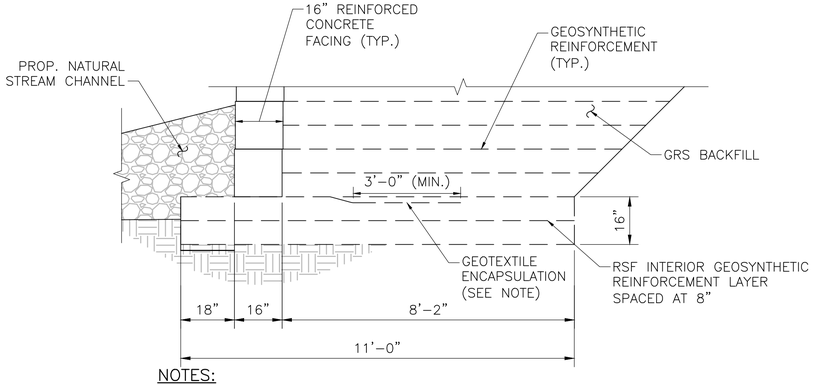


TYPICAL WINGWALL SECTION

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

NOTES:

1. THE TIP OF THE RAIL POST SHALL BE CHAMFERED 45° ANGLE TO MINIMIZE DAMAGE TO THE GEOSYNTHETIC REINFORCEMENT.
2. CUT SLOPE VARIES. EXTEND TO GRADE OR TO INTERSECTION WITH ABUTMENT.
3. ATTACH CAP USING A CONCRETE CONSTRUCTION ADHESIVE.

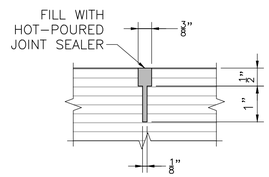


NOTES:

1. RSF SHALL BE COMPLETELY ENCAPSULATED IN ALL DIRECTIONS BY THE GEOSYNTHETIC REINFORCEMENT. THE GEOSYNTHETIC REINFORCEMENT SHALL BE OVERLAPPED A MINIMUM OF 3 FEET.
2. THE FIRST REINFORCEMENT SHEET PLACED IN THE EXCAVATION SHALL BE ON THE UPSTREAM SIDE OF THE RSF WITH SUBSEQUENT SHEETS PLACED ON TOP WITH A MINIMUM 3'-0" OVERLAP. ALL OVERLAPPED SECTIONS OF REINFORCEMENT SHALL BE ORIENTED TO PREVENT RUNNING WATER FROM PENETRATING THE LAYERS OF REINFORCEMENT. THE WRAPPED CORNERS OF THE RSF SHALL BE TIGHT AND WITHOUT EXPOSED SOIL WITHIN THE RSF.

REINFORCED SOIL FOUNDATION DETAIL

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



PAVEMENT SAWCUT DETAIL

NOT TO SCALE

NOTE:

FOR THE ABUTMENTS THE FACTORED BEARING PRESSURE EQUALS= 6.73 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION. FACTORED BEARING RESISTANCE = 11.55 KSF. THE FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE OF 17.76 KSF AND A RESISTANCE FACTOR OF 0.65.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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BRIDGE ENGINEER — DATE 10/29/2024

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NEEDHAM, MA 02494
781-355-7100
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GILL ENGINEERING

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION	

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MS	MS	PAG

DATE 10/23/24

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS — JOSEPH P CIVIL No. 39466 — REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

ABUTMENT DETAILS 2 OF 2

SHEET 10 OF 15

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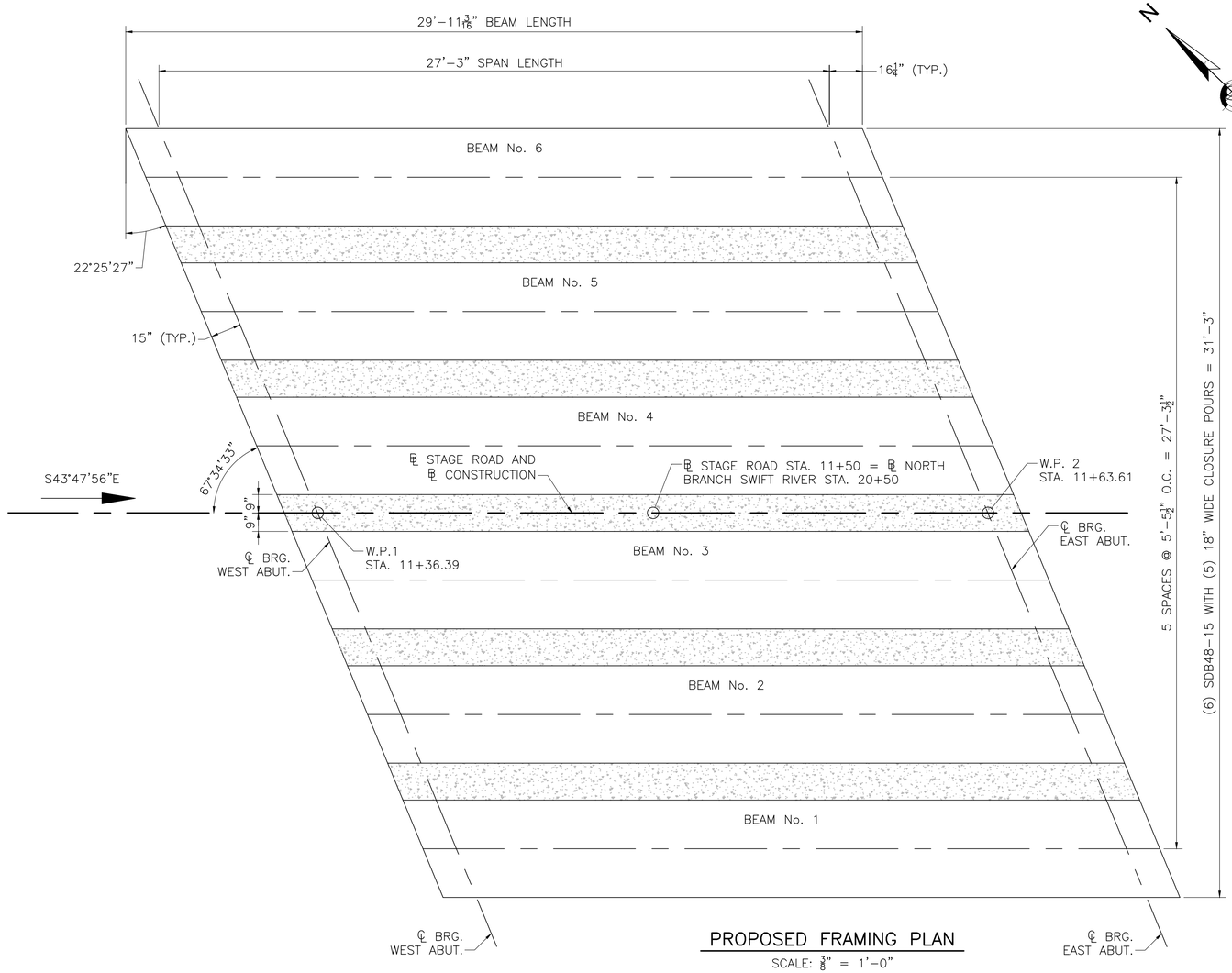
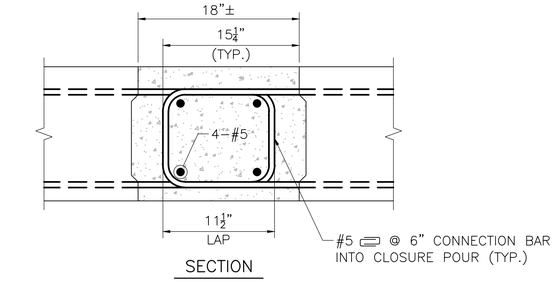
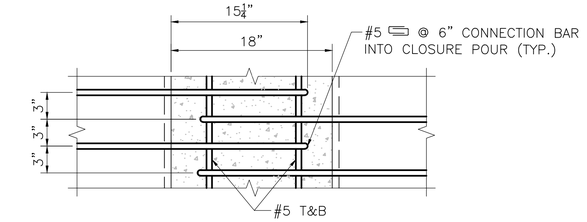


PROPOSED FRAMING PLAN

SCALE: 3/8" = 1'–0"



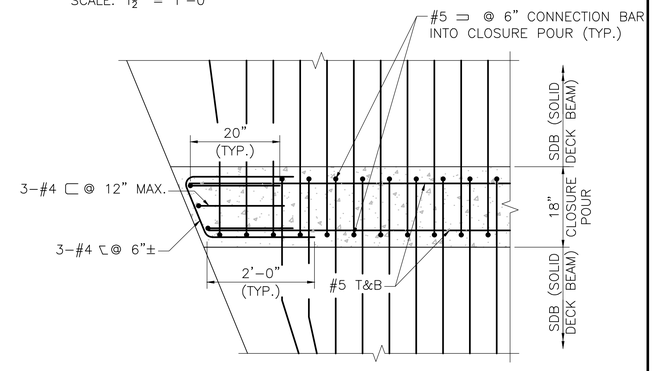
SECTION



PLAN

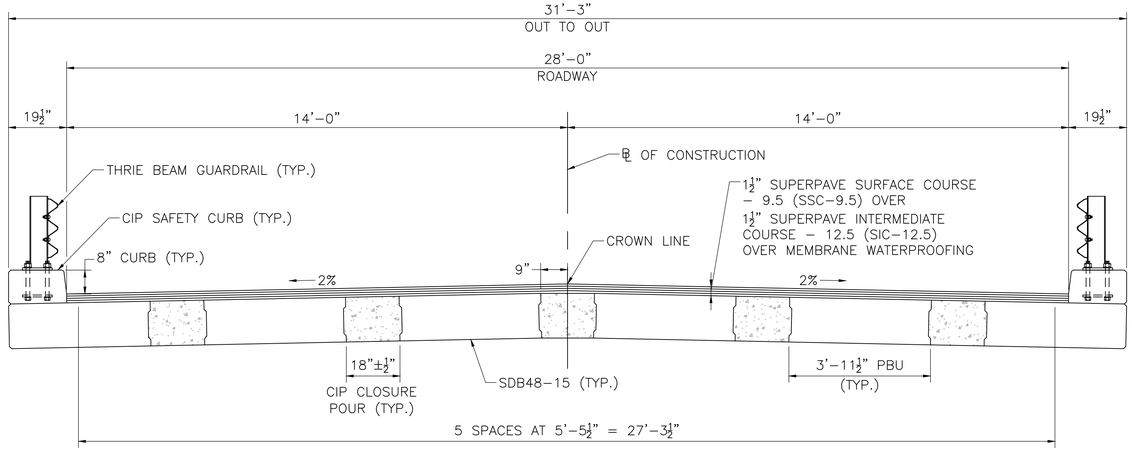
CLOSURE POUR DETAIL

SCALE: 1 1/2" = 1'–0"



CLOSURE POUR DETAIL AT ABUTMENT

SCALE: 3/4" = 1'–0"



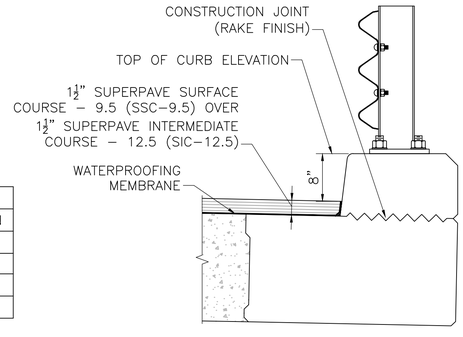
PROPOSED CROSS SECTION

SCALE: 1/2" = 1'–0"

ESTIMATED CAMBER AND DEFLECTIONS AT MIDSPAN (INCHES)		
STATE OF BEAM	TYPICAL BEAM (IN)	DIRECTION
CAMBER AT TRANSFER (NOTE 2)	0.52	UP
CAMBER AT ERECTION	0.66	UP
FINAL NCDL DELECTION (NOTE 3)	0.21	DOWN
FINAL CDL DEFLECTION (NOTE 3)	0.05	DOWN

ESTIMATED CAMBER/DEFLECTION NOTES:

1. CAMBER AND DEFLECTIONS IN THE TABLE ARE NOT GUARANTEED AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
2. THE BEAM CONCRETE MODULUS OF ELASTICITY AT TRANSFER USED IN THE ABOVE CAMBER IS ASSUMED TO BE 4435 KSI.
3. THE BEAM CONCRETE MODULUS OF ELASTICITY USED IN THE ABOVE BEAM DEFLECTION IS ASSUMED TO BE 5008 KSI (AT 28–DAYS).



TOP OF CURB FORM ELEVATION

SCALE: 1" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)
GILL ENGINEERING

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION	

DRW. BY: DRW | CALC. BY: MS | APPRV. BY: PAG | DATE: 10/23/24

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS JOSEPH P GILL 0 DATE NO. 35455 REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

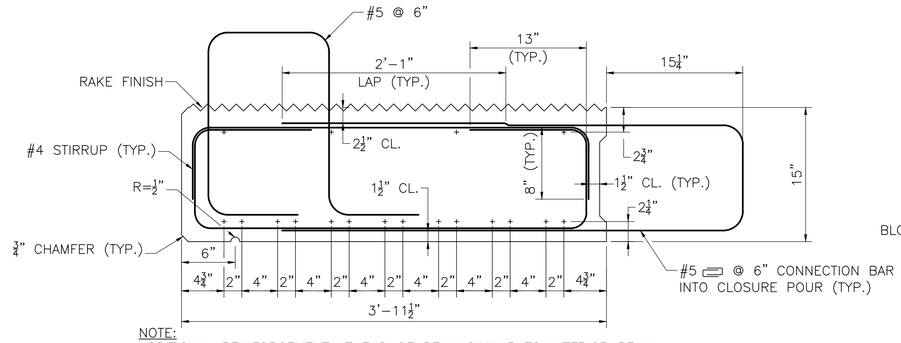
TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C–21–005 (CPS)
STAGE ROAD OVER SWIFT RIVER

FRAMING PLAN AND CROSS SECTION

SHEET 11 OF 15

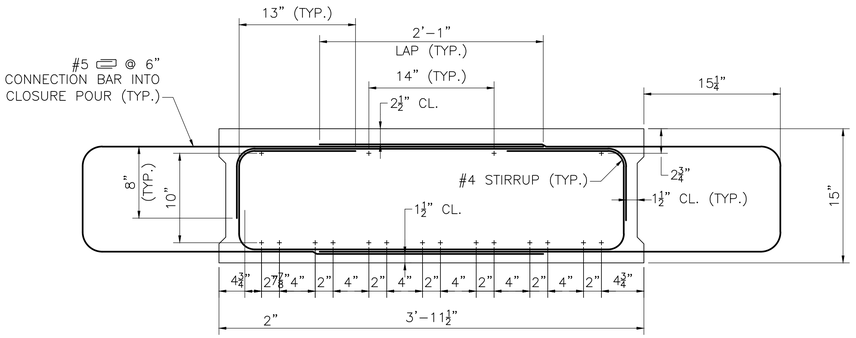
08-09_C21005 FRAMING PLAN AND BEAM DETAILS.dwg Plotted on 24-Oct-2024 10:42 AM



NOTE:
ADDITIONAL REINFORCEMENT AT END OF BEAM SIMILAR TO INTERIOR BEAM.

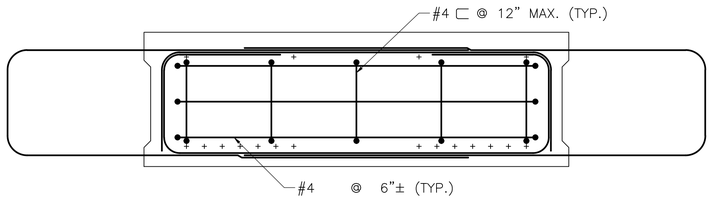
EXTERIOR BEAM MIDSPAN SECTION

SCALE: 1½" = 1'-0"



INTERIOR BEAM MIDSPAN SECTION

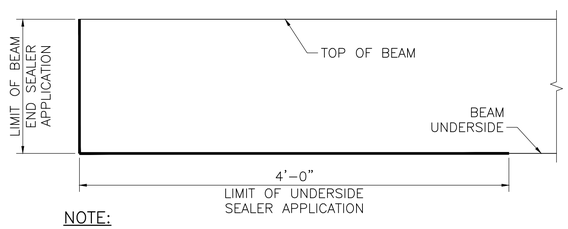
SCALE: 1½" = 1'-0"



NOTE:
1. SEE MIDSPAN SECTION FOR DETAILS AND INFORMATION NOT SHOWN ABOVE.
2. ADDITIONAL REINFORCEMENT AT END OF BEAM SIMILAR TO INTERIOR BEAM.

INTERIOR BEAM END OF BEAM SECTION

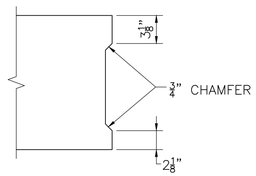
SCALE: 1½" = 1'-0"



NOTE:
1. BEAM SEALER SHALL BE SHOP APPLIED.
2. UNDERSIDE BEAM SEALER LIMITS SHALL EXTEND 4'-0" FROM THE END OF BEAM BY FULL WIDTH OF BEAM.
3. END OF BEAM SEALER LIMITS SHALL EXTEND THE FULL HEIGHT BY THE FULL WIDTH OF BEAM
4. EXTERIOR BEAM FASCIA SEALER LIMITS SHALL EXTEND 4'-0" FROM THE END OF BEAM BY FULL HEIGHT

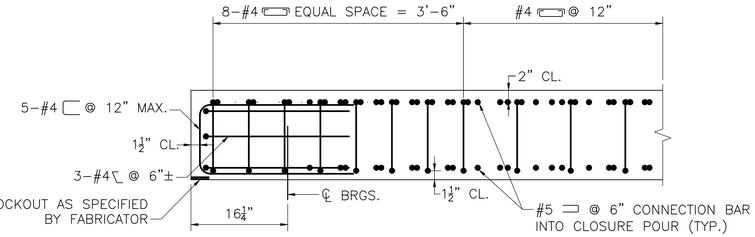
END OF BEAM SEALER DETAIL

SCALE: 1½" = 1'-0"



SHEAR KEY DETAIL

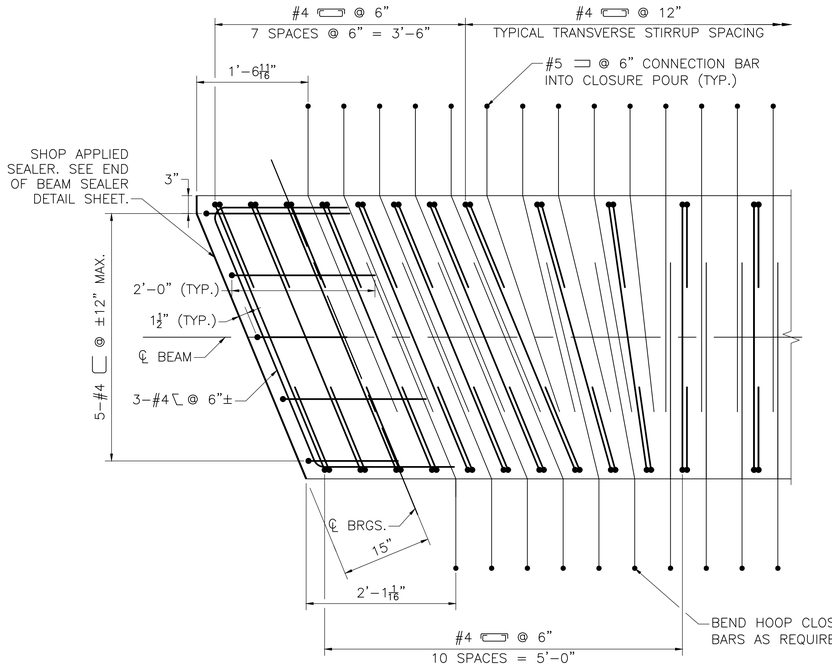
SCALE: 1½" = 1'-0"



NOTES:
1. DETAIL OF EXTERIOR BEAM SIMILAR TO INTERIOR BEAM.
2. PRESTRESSING STRANDS NOT SHOWN FOR CLARITY.

INTERIOR BEAM LONGITUDINAL SECTION

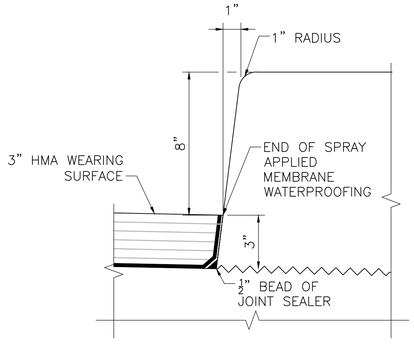
SCALE: 1" = 1'-0"



NOTE:
PRESTRESSING STRANDS NOT SHOWN FOR CLARITY

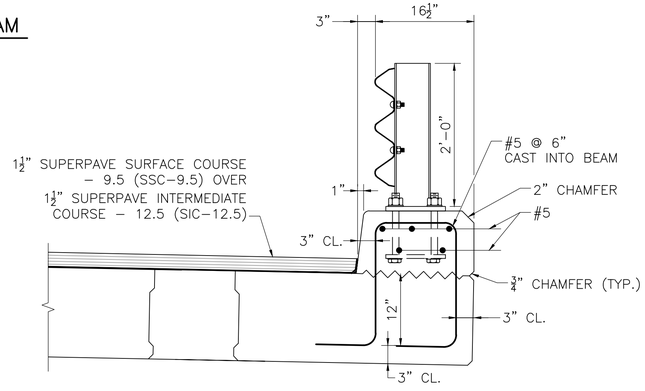
INTERIOR BEAM AT END OF BEAM

SCALE: 1" = 1'-0"



FACE OF SAFETY CURB DETAIL

SCALE: 3" = 1'-0"



SAFETY CURB REINFORCEMENT DETAIL

SCALE: 1" = 1'-0"

PRESTRESS NOTES:

1. + DENOTES STRAIGHT STRANDS.
2. SEE SHEAR KEY DETAIL ON THIS SHEET.
3. SEE END OF BEAM PLAN FOR STIRRUP SPACING.
4. ALL PRETENSIONING ELEMENTS SHALL BE 0.6" ø, UNCOATED, SEVEN-WIRE, LOW RELAXATION STEEL STRANDS AND SHALL CONFORM TO AASHTO M 203.
5. THE TENSILE STRENGTH OF THE PRETENSIONING STRANDS SHALL BE 270 KSI.
6. THE INITIAL TENSION PER 0.6" ø STRAND SHALL BE 44 KIPS.
7. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 6500 PSI.
8. NO PRESTRESS SHALL BE TRANSFERRED TO THE CONCRETE UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH, AS SHOWN BY CYLINDER TEST, OF AT LEAST 4500 PSI.
9. THE TOP OF EXTERIOR BEAMS 1 & 6 SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
10. THE FABRICATOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE LIFTING DEVICES WHICH SHALL BE ADEQUATE FOR THE SAFETY FACTORS REQUIRED BY THE ERECTION PROCEDURE.
11. TO CONTROL CRACKING AT THE END OF THE BEAM, THE FABRICATOR SHALL DEBOND APPROXIMATELY 50% OF THE STRANDS FOR THE FIRST 6" FROM THE END OF BEAM.
12. TO SUPPORT REINFORCING WITH THE REQUIRED MINIMUM COVER THE FABRICATOR, FOR THEIR CONVENIENCE, MAY PLACE AS MANY SUPPORT WIRES AS NEEDED IN THE TOP OF THE BEAM.
13. TO CONTROL CRACKING AT THE END OF THE BEAM, THE FABRICATOR SHALL DEBOND APPROXIMATELY 50% OF THE STRANDS FOR THE FIRST 6" FROM THE END OF BEAM.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

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NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)
GILL ENGINEERING

DESCRIPTION	DATE
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DRW. BY	CALC. BY	APPRV. BY
MS	MS	PAG

DATE 10/23/24

REGISTERED PROFESSIONAL ENGINEER

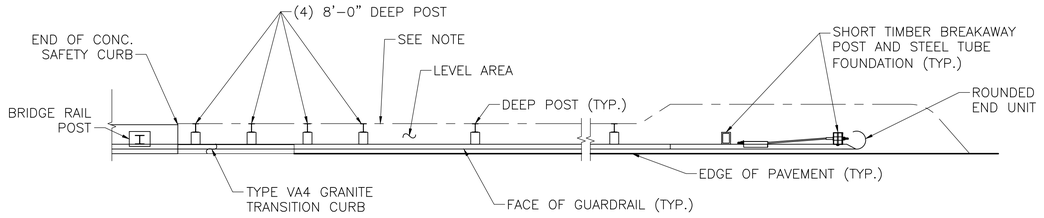
COMMONWEALTH OF MASSACHUSETTS — JOSEPH P CIVIL No. 39465 — REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT
TOWN OF CUMMINGTON
BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

BEAM DETAILS

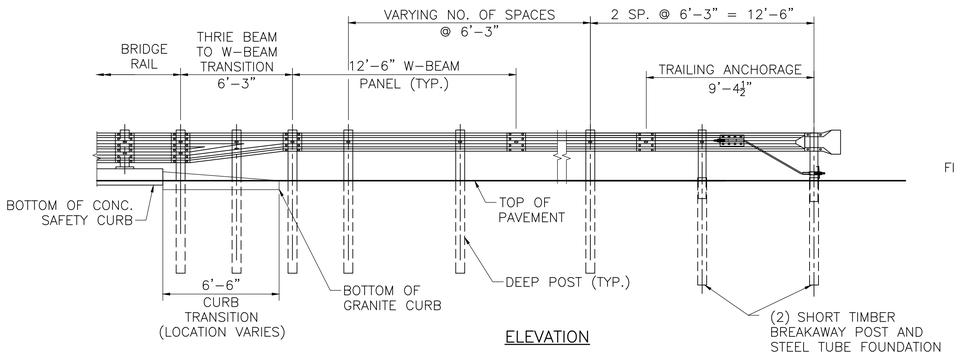
SHEET 12 OF 15

08-09_C21005 FRAMING PLAN AND BEAM DETAILS.dwg Plotted on 24-Oct-2024 10:42 AM



PLAN

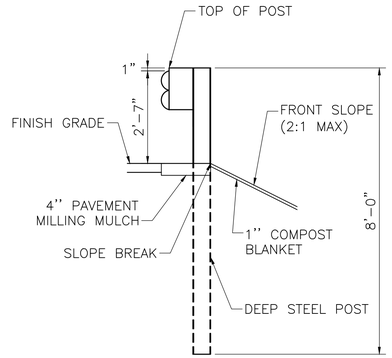
NOTE:
LEVEL BENCH NOT REQUIRED FOR DEEP POSTS. TAPER FROM BACK OF GUARDRAIL POST TO NECESSARY GRADE.



ELEVATION

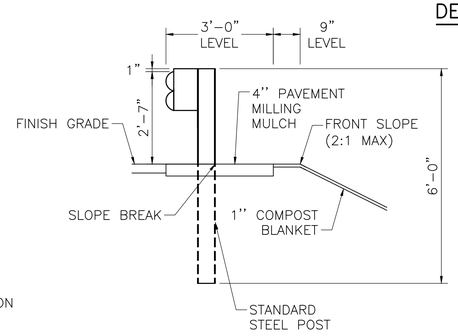
GUARDRAIL APPROACH TRANSITION

SCALE: ¼" = 1'–0"



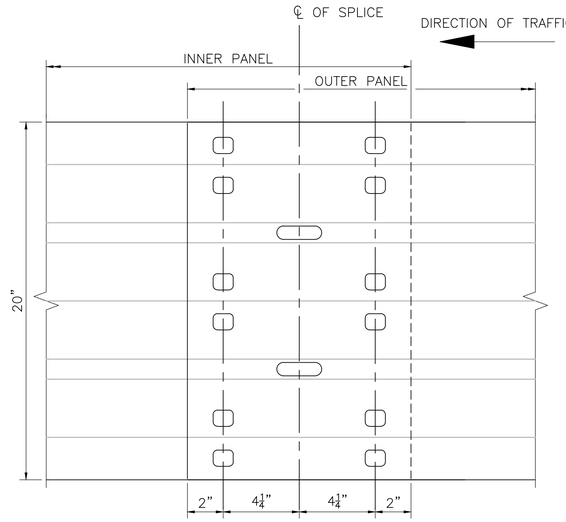
DEEP STEEL POST

SCALE: ½" = 1'–0"



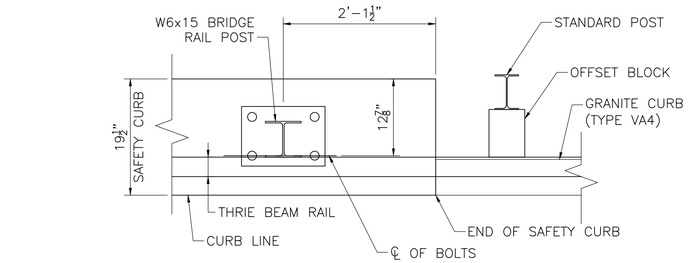
STANDARD STEEL POST

SCALE: ½" = 1'–0"



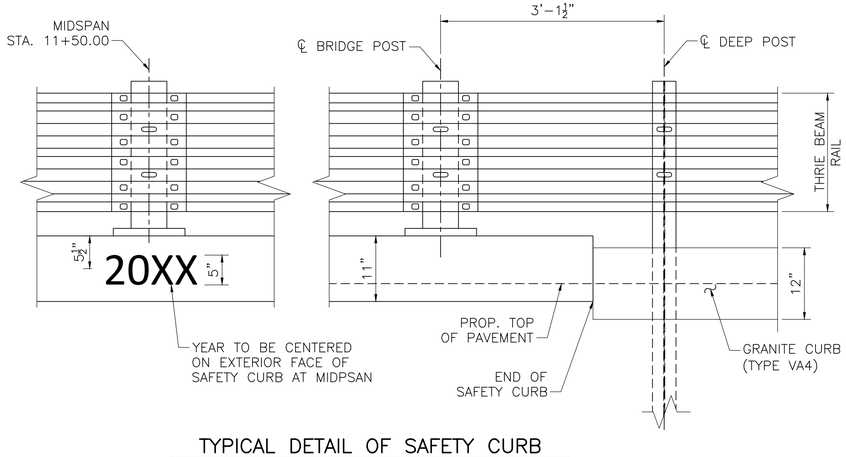
THRIE BEAM RAIL SPLICE ELEVATION

SCALE: 1" = 1'–0"



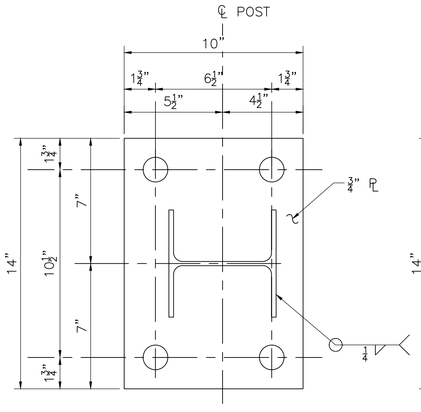
TYPICAL DETAIL END OF SAFETY CURB

SCALE: 1" = 1'–0"



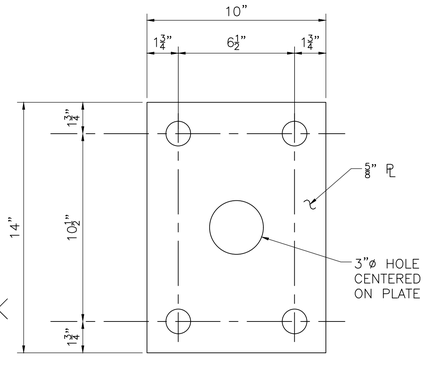
TYPICAL DETAIL OF SAFETY CURB

SCALE: 1" = 1'–0"



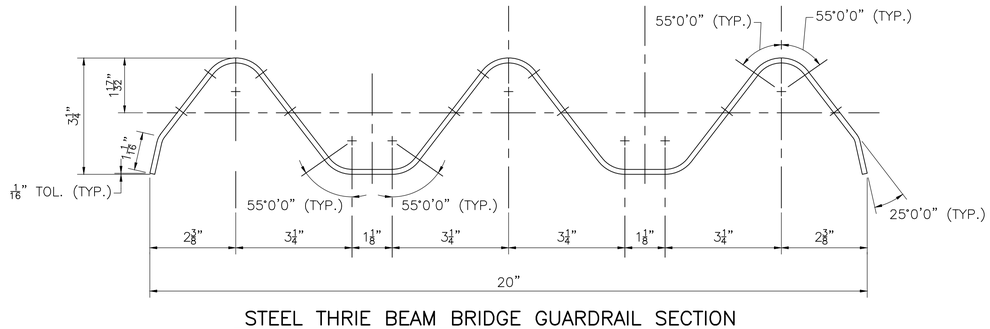
THRIE BEAM POST BASE PLATE DETAIL

SCALE: 3" = 1'–0"



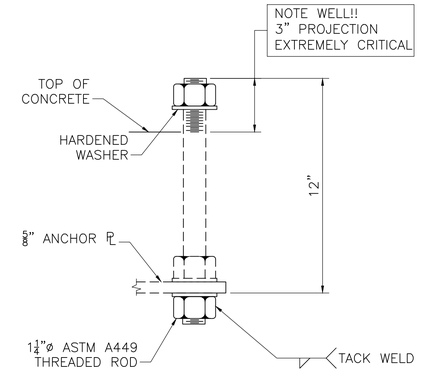
ANCHOR PLATE DETAIL

SCALE: 3" = 1'–0"



STEEL THRIE BEAM BRIDGE GUARDRAIL SECTION

SCALE: 6" = 1'–0"



MATERIALS

1. RAIL POST, BASE PLATES, AND ANCHOR PLATES SHALL BE AASHTO M270 GRADE 50 GALVANIZED.
2. THRIE BEAM BRIDGE RAIL AND THRIE BEAM TO W–BEAM TRANSITION SHALL BE AASHTO M180, CLASS B (10 GAUGE OR DOUBLE NESTED 12 GAUGE), AND GALVANIZED.
3. ALL BOLTS SHALL BE MECHANICALLY GALVANIZED WITH COMPATIBLE NUTS AND WASHERS UNLESS OTHERWISE NOTED.

GENERAL NOTES:

1. SET POSTS PERPENDICULAR TO TOP OF ROADWAY.
2. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BAST PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ⅛ TURN AFTER STEEL IS IN PLACE.
3. WELDING SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AASHTO/AWS D.1.5.
4. PLACE A REFLECTORIZED WASHER IN THE UPPER VALLEY OF EVERY THRIE BEAM POST.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
BRIDGE ENGINEER — DATE 10/29/2024

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
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GILL ENGINEERING

Plotted on 24-Oct-2024 10:42 AM
10_C21005 RAILING DETAILS.DWG

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION	

DRW. BY	CALC. BY	APPRV. BY
MS	MS	PAG

DATE 10/23/24

REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
JOSEPH P GILL
No. 38465
REGISTERED PROFESSIONAL ENGINEER

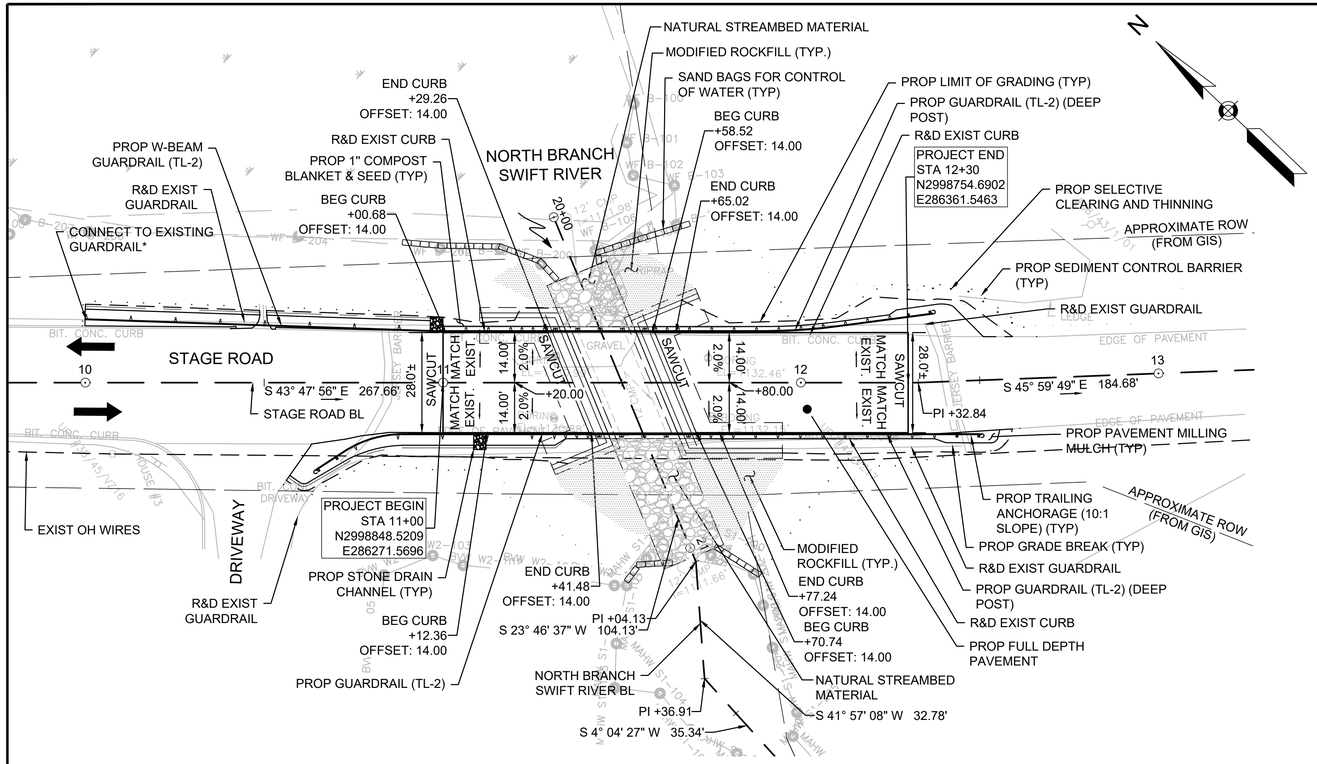
PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C–21–005 (CPS)
STAGE ROAD OVER SWIFT RIVER

RAILING DETAILS

SHEET 13 OF 15



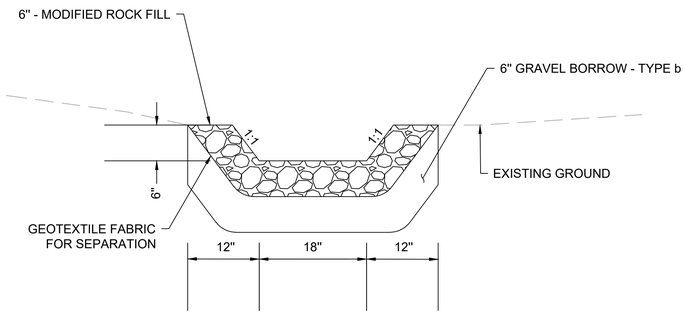
ROADWAY PLAN

SCALE: 1'' = 20'

* CONTRACTOR TO ENSURE POST SPACING AND RAIL PANEL INTEGRATION IS ACHIEVABLE PRIOR TO ORDERING GUARDRAIL MATERIALS. AN ADDITIONAL POST MAY BE REQUIRED TO PROVIDE APPROXIMATELY 6'-3" SPACING AT TRANSITION TO EXISTING.

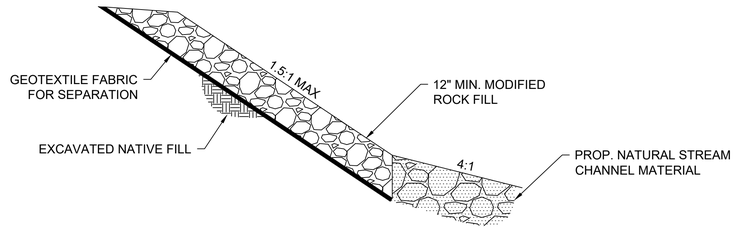
HIGHWAY GUARD DETAILS

GUARDRAIL (TL-2) (SINGLE FACED): STA 10+00, 17.6' LT TO STA 11+00, 14.3' LT
TRAILING ANCHORAGE: STA 10+64, 24.8' RT TO STA 10+73, 19.0' RT
GUARDRAIL (TL-2) (SINGLE FACED): STA 10+73, 19.0' RT TO STA 11+34, 14.3' RT
GUARDRAIL (TL-2) (DEEP POST) (SINGLE FACED): STA 11+00, 14.3' LT TO STA 11+22, 14.3' LT
TRANSITION TO THRIE BEAM: STA 11+22, 14.3' LT TO 11+28, 14.3' LT
TRANSITION TO THRIE BEAM: STA 11+34, 14.3' RT TO 11+41, 14.3' RT
TRANSITION TO THRIE BEAM: STA 11+60, 14.3' LT TO 11+66, 14.3' LT
GUARDRAIL (TL-2) (DEEP POST) (SINGLE FACED): STA 11+66, 14.3' LT TO STA 12+28 18.0' LT
TRANSITION TO THRIE BEAM: STA 11+72, 14.3' RT TO 11+72, 14.3' RT
GUARDRAIL (TL-2) (DEEP POST) (SINGLE FACED): STA 11+78, 14.3' RT TO STA 12+40 14.6' RT
TRAILING ANCHORAGE: STA 12+28, 18.0' LT TO STA 12+38, 19.7' LT
TRAILING ANCHORAGE: STA 12+40, 14.6' RT TO STA 12+50, 15.0' RT



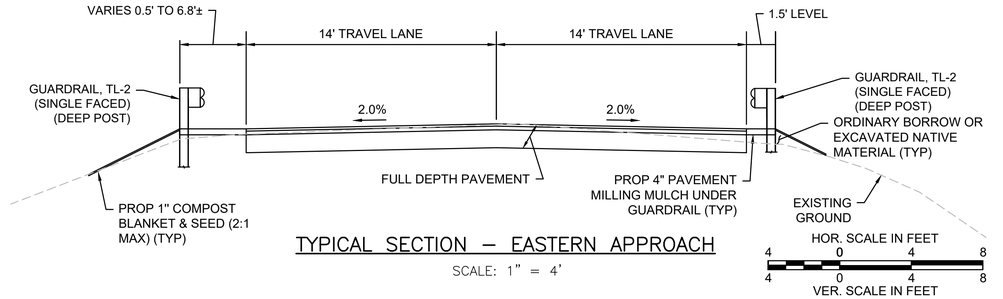
STONE DRAIN CHANNEL

NOT TO SCALE



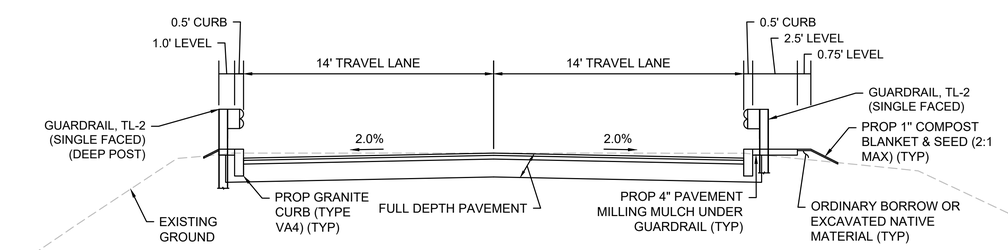
MODIFIED ROCK FILL AND STREAM CHANNEL SECTION

NOT TO SCALE



TYPICAL SECTION – EASTERN APPROACH

SCALE: 1" = 4'



TYPICAL SECTION – WESTERN APPROACH

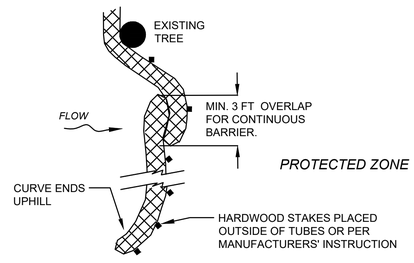
SCALE: 1" = 4'

PAVEMENT NOTES:

PROPOSED FULL DEPTH PAVEMENT

SURFACE COURSE: 1.5" HOT MIX ASPHALT - SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER ASPHALT EMULSION FOR TACK COAT OVER 2.5" HOT MIX ASPHALT - SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5)

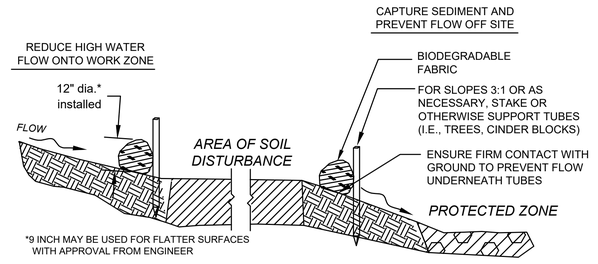
BASE: 12" GRAVEL BORROW, TYPE B (EXISTING BASE MATERIAL MAY REMAIN IF SUITABLE AS DETERMINED BY THE ENGINEER)



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

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

PLAN VIEW



SECTION

SEDIMENT BARRIER – COMPOST FILTER TUBE

NOT TO SCALE

63 KENDRICK STREET
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GILL ENGINEERING

01_C21005 HD.dwg Plotted on 24-Oct-2024 10:42 AM

DESCRIPTION	DATE
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MS	MS	PAG

DATE 10/23/24

REGISTERED PROFESSIONAL ENGINEER

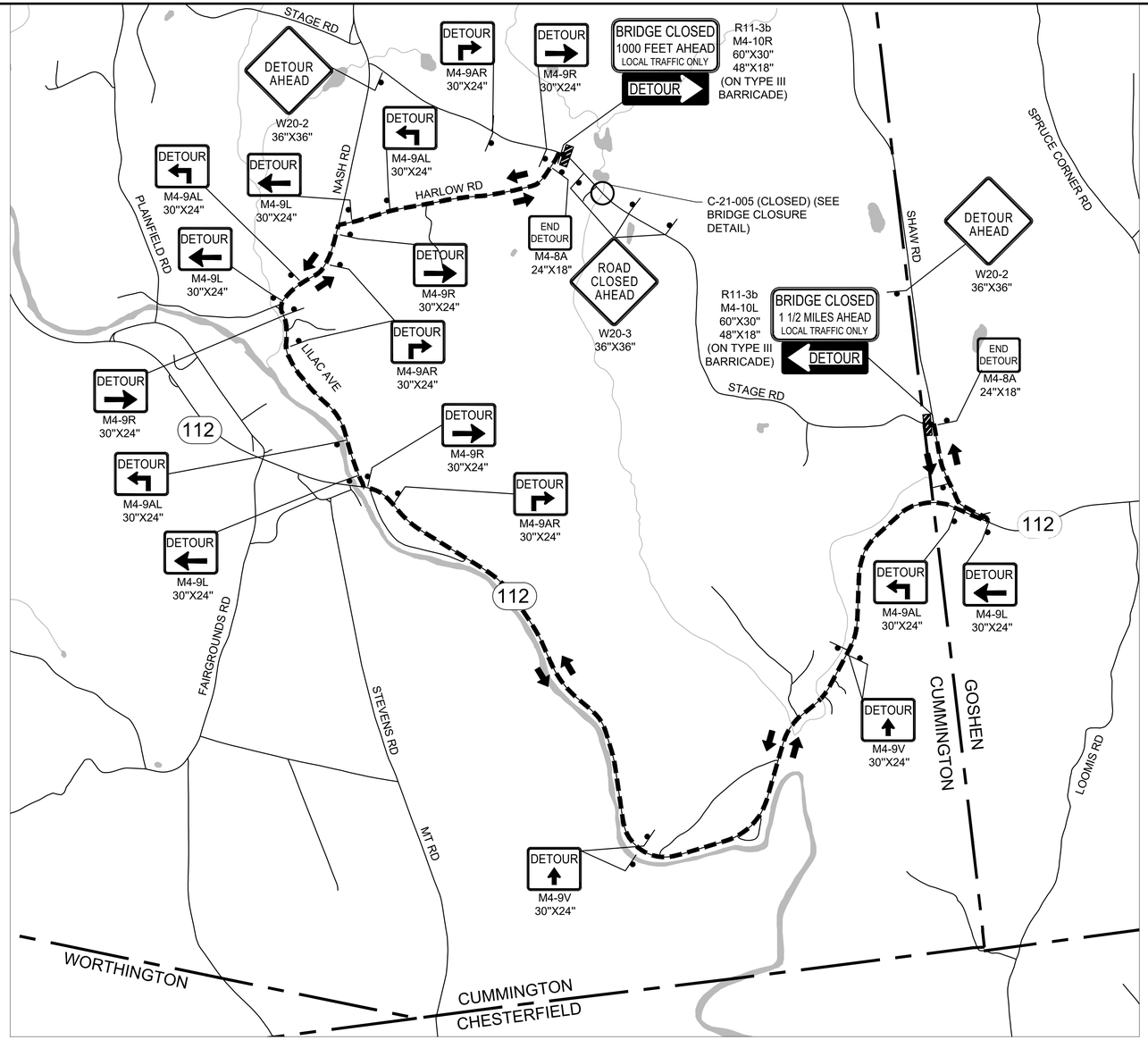
COMMONWEALTH OF MASSACHUSETTS JOSEPH P OVIA NO. 39545 REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON C-21-005 (CP5) STAGE ROAD OVER SWIFT RIVER

ROADWAY PLAN AND TYPICAL SECTION



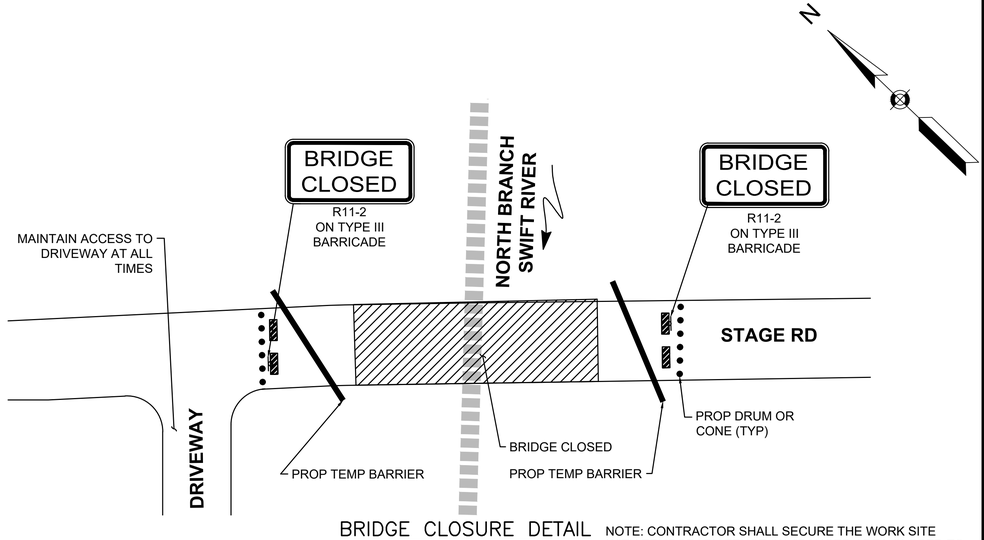
DETOUR
NOT TO SCALE

NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
6. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
7. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
8. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS.
9. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND

- TYPE III BARRICADE
- DIRECTION OF TRAFFIC
- WORK ZONE
- SIGN
- DETOUR ROUTE
- TEMPORARY BARRIER
- REFLECTORIZED DRUM OR CONE



BRIDGE CLOSURE DETAIL
NOT TO SCALE

NOTE: CONTRACTOR SHALL SECURE THE WORK SITE WITH TEMPORARY FENCE (W/ "DANGER AREA CLOSED TO VEHICLE, BICYCLE, AND PEDESTRIAN TRAFFIC" SIGN)

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)

GILL ENGINEERING

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/23/24	MS	MS	PAG	ISSUED FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER

DATE

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P GILL
CIVIL
No. 35466
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BRIDGE REPLACEMENT

TOWN OF CUMMINGTON

BRIDGE REPLACEMENT FOR CUMMINGTON
C-21-005 (CP5)
STAGE ROAD OVER SWIFT RIVER

TEMPORARY TRAFFIC CONTROL PLAN

SHEET 15 OF 15

01_C21005 HD.dwg Plotted on 24-Oct-2024 10:42 AM