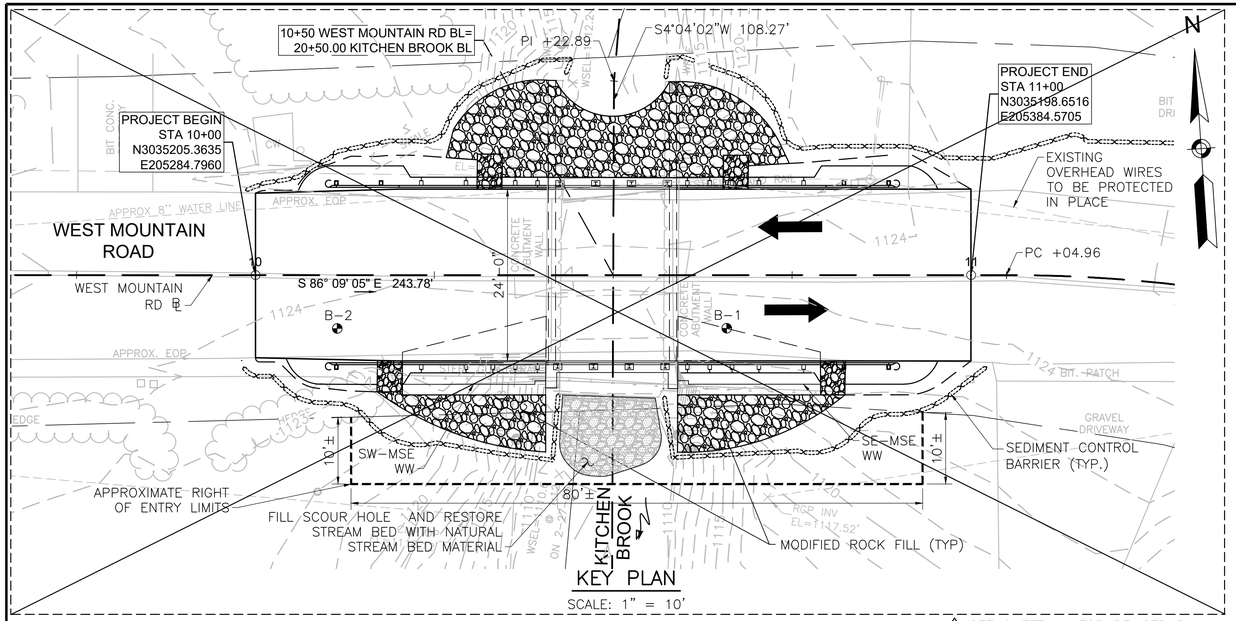
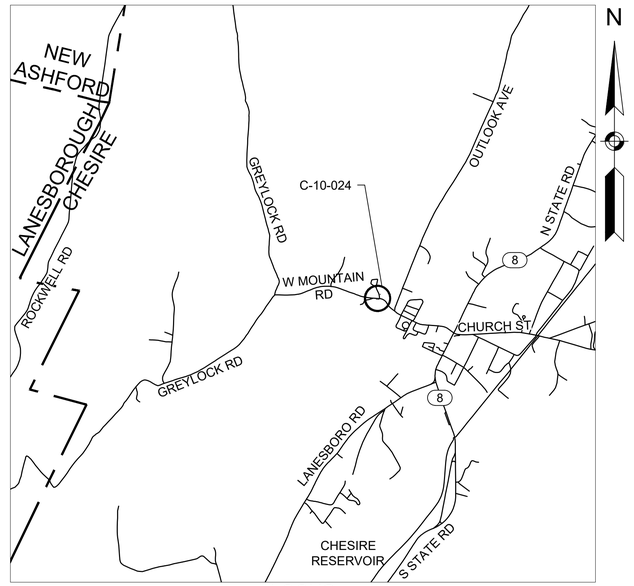


KEY PLAN

SCALE: 1" = 10'

⚠ SEE SHEET 1A FOR REVISED PLAN

INDEX OF SHEETS

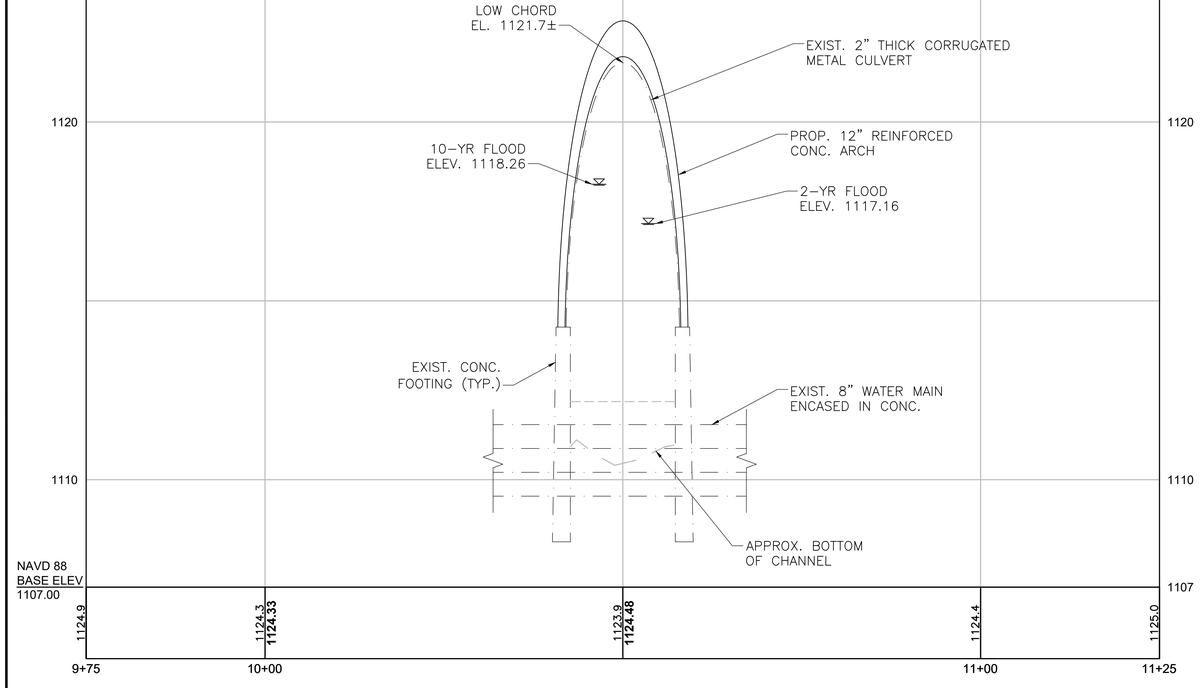


LOCUS

SCALE: 1" = 2000'

MATCH EXIST STA = 10+00.00 ELEV = 1124.33±
GRADE BREAK STA = 10+15.00 ELEV = 1124.25
GRADE BREAK STA = 10+50.00 ELEV = 1124.48
MATCH EXIST STA = 10+90.00 ELEV = 1124.27±

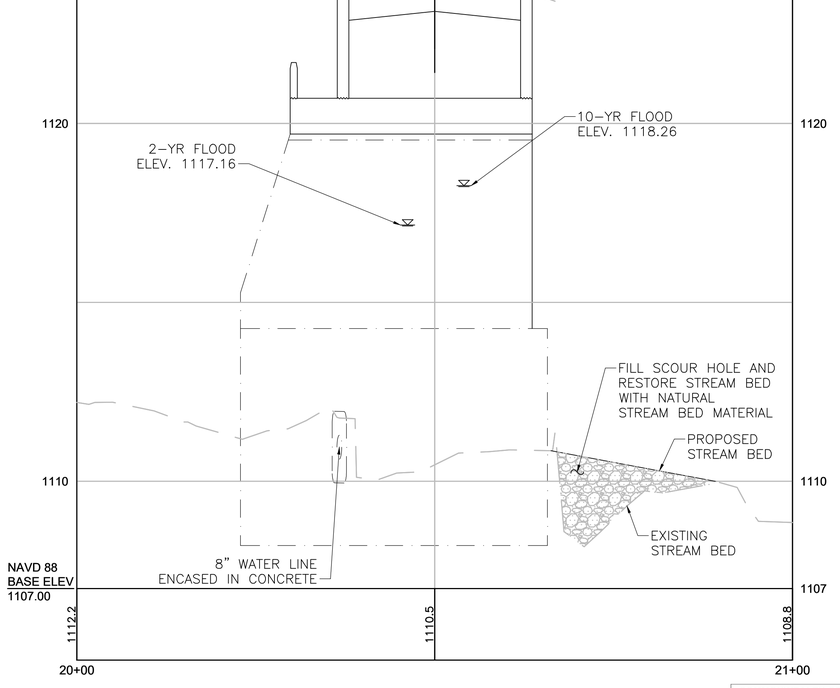
-0.50% 0.64% -0.51%



PROFILE – WEST MOUNTAIN ROAD

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1' = 2'

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER 11/17/2025 DATE



PROFILE – KITCHEN BROOK

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1' = 2'

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER 2/24/2025 DATE

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

GILL ENGINEERING

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
2/21/25	PFO	PFO	JEP	ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL
10/29/25	PFO	PFO	JEP	RIGHT OF WAY AND SEDIMENT CONTROL BARRIER REVISED
10/29/25	MMS	MMS	JFP	REVISED SHEETS 1, 4, 5, 6, 7 & 10 FOR RIGHT OF WAY, SEDIMENT CONTROL BARRIER AND STAGING
⚠				REVISIONS, ADDED SHEETS 1A, 4A, 6A, 7A & 10A

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER JOHN PHELPS STRUCTURAL No. 57216 2/21/2025

CULVERT STRENGTHENING

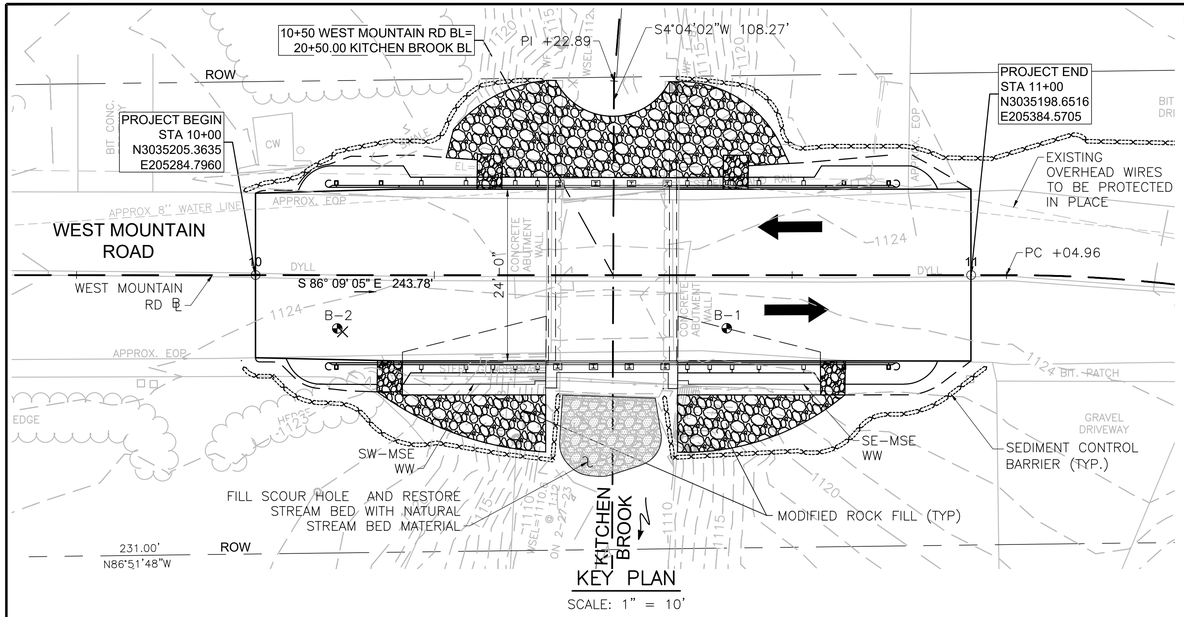
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

KEY PLAN, LOCUS & PROFILES

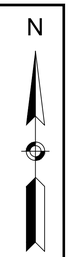
SHEET 1 OF 14

C10224_HD.dwg Plotted on 21-Feb-2025 4:47 PM



KEY PLAN

SCALE: 1" = 10'



COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS, CH 85 S 35
STATE BRIDGE ENGINEER — DATE 11/17/2025

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

GILL ENGINEERING

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/29/25	PFO	PFO	JEP	RIGHT OF WAY AND SEDIMENT CONTROL BARRIER REVISED

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS
JOHN PHELPS
PROFESSIONAL ENGINEER
No. 57716
10/29/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

KEY PLAN

SHEET
1A OF 14

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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: 3035187.321
EASTING: 205373.858
ELEVATION: 1123.782

BENCH MARK 2: MAGNETIC NAIL SET
NORTHING: 3035198.459
EASTING: 205159.342
ELEVATION: 1129.538

ELEVATIONS:
ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING LINE AND GRADE ON THE PROJECT. IF THE EXISTING CONTROL POINTS NEED TO BE REESTABLISHED, THIS SHALL BE PERFORMED AT THE CONTRACTORS EXPENSE.

SCALES:
SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

CONTROL OF WORK:
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"	17"	21"
2. 12" OF CONCRETE BELOW BAR	18"	22"	27"
3. EPOXY COATED BARS, COVER <3d_b, OR CLEAR SPACING<6d_b	21"	26"	31"
4. COATED BARS, ALL OTHER CASES	17"	21"	25"
5. CONDITIONS 2 AND 3	23"	29"	35"
6. CONDITIONS 2 AND 4	21"	27"	32"

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, $\frac{3}{4}$", 685 HP CONCRETE: CONCRETE ARCH, SAFETY CURBS, HEAD WALLS AND RETURN WALLS.

PATCHING MATERIAL FOR CONCRETE REPAIRS SHALL BE A MASSDOT APPROVED PRODUCT LISTED ON THE QCML FOR VERTICAL AND OVERHEAD APPLICATION.

DRILLING AND GROUTING DOWELS:
GROUT TO BE USED FOR DRILLING AND GROUTING DOWELS SHALL BE NON-SHRINK CEMENTITIOUS GROUT LISTED ON THE MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST. THE DEPTH OF THE HOLES SHALL BE THE MORE CONSERVATIVE OF WHAT IS SHOWN ON THESE DRAWINGS OR THE MANUFACTURER'S RECOMMENDATIONS. THE DIAMETER OF THE HOLE SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS WITH A MINIMUM DIAMETER OF 2".

SURVEY NOTES:
1. THE SURVEY WAS PERFORMED BY DAWOOD ENGINEERING, INC., IN FEBRUARY 2023 UTILIZING CONVENTIONAL EQUIPMENT.
2. UNDERGROUND UTILITIES AND FEATURES, AS SHOWN HEREON, WERE COMPILED FROM FIELD EVIDENCE AND/OR AVAILABLE RECORD INFORMATION AND THEIR LOCATIONS ARE ONLY APPROXIMATE. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD. BEFORE CONSTRUCTION CALL "DIG SAFE" 1-888-344-7233.
3. WETLAND RESOURCE AREAS DELINEATED BY SWCA ENVIRONMENTAL CONSULTANTS ON FEBRUARY 15, 2023.
4. COORDINATES, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83).

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

TRAFFIC:
A SINGLE 11' LANE ACCOMMODATING ALTERNATING ONE WAY TRAFFIC SHALL BE MAINTAINED DURING CONSTRUCTION. SEE SHEET 14 FOR TEMPORARY TRAFFIC CONTROL PLAN.

EXCAVATION:
EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE ANY PORTION OF THE EXISTING CORRUGATED STEEL CULVERT DURING EXCAVATION ACTIVITIES. EXCAVATION SHALL PROCEED IN A MANNER THAT DOES NOT CAUSE UNBALANCED LOADING ON THE EXISTING CULVERT BY REMOVING EQUAL AMOUNTS OF FILL FROM BOTH SIDES OF THE CULVERT SIMULTANEOUSLY. ANY PORTION OF THE EXISTING CULVERT TO REMAIN WHICH BECOMES DAMAGED AS A RESULT OF THE CONTRACTORS OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTORS EXPENSE.

TEMPORARY WATER CONTROL:
1. TEMPORARY WATER CONTROL SHALL BE ESTABLISHED TO PERMIT WINGWALL FOUNDATION, STREAMBED RESTORATION, AND FOOTING REPAIR WORK TO OCCUR IN THE DRY.
2. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OR 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.

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

ESTIMATED QUANTITIES
NOT GUARANTEED

NO.	ITEM	QUANT.	UNIT
101.	CLEARING AND GRUBBING	0.05	A
140.	BRIDGE EXCAVATION	620	CY
143.1	CHANNEL EXCAVATION	1	LS
151.	GRAVEL BORROW	95	CY
151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	325	CY
170.	FINE GRADING AND COMPACTING – SUBGRADE AREA	270	SY
281.6	NATURAL STREAM BED MATERIAL	25	CY
452.	ASPHALT EMULSION FOR TACK COAT	20	GAL
460.22	SUPERPAVE SURFACE COURSE – 9.5 (SSC – 9.5)	23	TON
460.31	SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC – 12.5)	38	TON
504.	GRANITE CURB TYPE VA4 – STRAIGHT	27	FT
509.	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS – STRIAGHT	26	FT
620.131	GUARDRAIL, DEEP POST (SINGLE FACED)	50	FT
627.1	TRAILING ANCHORAGE	4	EA
628.25	TRANSITION TO THRIE BEAM	4	EA
630.2	HIGHWAY GUARD REMOVED AND DISCARDED	105	FT
657.	TEMPORARY FENCE	300	FT
698.3	GEOTEXTILE FABRIC FOR SEPARATION	153	SY
715.	RURAL MAIL BOX REMOVED AND RESET	3	EA
751.7	COMPOST BLANKET	1	CY
765.	SEEDING	25	SY
767.121	SEDIMENT CONTROL BARRIER	270	FT
769.	PAVEMENT MILLING AND MULCH UNDER GUARD RAIL	150	FT
852.	SAFETY SIGNING FOR TRAFFIC MANAGEMENT	80	SF
853.2	TEMPORARY BARRIER (TL-2)	170	FT
853.21	TEMPORARY BARRIER REMOVED AND RESET	340	FT
854.016	TEMPORARY PAVEMENT MARKINGS – 6 INCH (PAINTED)	520	FT
854.1	PAVEMENT MARKING REMOVAL	200	SF
859.	REFLECTORIZED DRUM	1800	DAY
986.	MODIFIED ROCK FILL	60	TON
989.2	REPAIRS TO CONCRETE	2	CF
989.3	CONCRETE CRACK REPAIR	10	LF
991.1	CONTROL OF WATER – STRUCTURE NO. C-10-024	1	LS
992.4	CULVERT STRENGTHENING – STRUCTURE NO. C-10-024	1	LS
993.1	TEMPORARY BRIDGE, NO C-10-024	1	LS
996.33	STONE FACED MECHANICALLY STABILIZED EARTH WINGWALLS	44	SY

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — DATE 2/24/2025

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

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DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
2/21/25	MMS	MMS	JEP	ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — JOHN P. HEES — STRUCTURAL — No. 57216 — PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

GENERAL NOTES

Gill Engineering Associates, Inc.
63 Kendrick Street
Needham, MA 02494

Boring No. B-1 | Scale:

City/Town: Cheshire, MA	Bridge Number: C-10-024	Project File Number:	Contract Number:
Location: W. MOUNTAIN RD OVER KITCHEN BROOK		Date & Time Started: 10:15 9/25/23	Total Hours: 4.0
Groundwater Depth (Feet): 15	Date & Time: 11:43 9/25/23	Date & Time Completed: 2:20 9/25/23	
Coordinates (Feet): N3035193.52, E205350.01		Driller's Company & Name: Richard Posa NEBC	
Ground Elevation (Feet): 1124' +/-		Gill Representative: Kyle Coleman	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
-	S1	1-3	9-15-14-19	16"	DRY, LIGHT BROWN-GREY MED. DENSE FINE SAND WITH SOME COARSE SAND	3.0
5	S2	5-7	15-8-4-12	8"	MOIST, LIGHT GREY LOOSE SAND SOME FINE GRAVEL	
10	S3	10-12	10-9-6-4	9"	MOIST, GREY MED. DENSE SAND AND FINE & COARSE GRAVEL	13.0
15	S4	15-17	41-36-50/3"	5"	WET, GREY DENSE TO VERY DENSE SAND AND GRAVEL TRACE CLAY	
20	S5	20-22	24-32-38-37	15"	WET, GREY SILTY-CLAY WITH SOME FINE COBBLES AND COARSE GRAVEL	
25	S6	25-27	50/0" REFUSAL	0"	NO RECOVERY	25.0
		28	ROCK CORE TAKEN			
30						

Remarks:	Arrow-Board: x Signs: y Cones: y	Protective Device – Stand: x Box: x Well Depth: x Solid Pipe: x Stick Up Pipe: x Screen Pipe: x

Penetration Resistance (N) Guide				
Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)		Type of Drill Rig: B53
Relative Density	Penetration Resistance	Consistency	Penetration Resistance	Casing Type: FJ Size: 4"
Very Loose	0 – 4	Very Soft	0 – 2	Hammer Weight: 140#
Loose	4 – 10	Soft	2 – 4	Fall: 30"
Medium Dense	10 – 30	Medium Stiff	4 – 8	Depth: x
Dense	30 – 50	Stiff	8 – 15	Sampler Type: SS Size: 1-3/8"
Very Dense	Over 50	Very Stiff	15 – 30	Automatic Hammer Weight: 140#
		Hard	Over 30	Safety Hammer Weight: x Donut Hammer Weight: x
N = Sum of Second and Third 6" Blow counts				Fall: 30"
Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less				Core Barrel Type: NQ Size: 1-7/8"

WATER PROPOSED SE WINGWALL BOF
EL. 1109'

BORING B–1

Gill Engineering Associates, Inc.
63 Kendrick Street
Needham, MA 02494

Boring No. B-2 | Scale:

City/Town: Cheshire, MA	Bridge Number: C-10-024	Project File Number:	Contract Number:
Location: W. MOUNTAIN RD OVER KITCHEN BROOK		Date & Time Started: 3:15 9/25/23	Total Hours: 4.5
Groundwater Depth (Feet): 15	Date & Time: 11:35 9/26/23	Date & Time Completed: 2:30 9/26/23	
Coordinates (Feet): N3035197.14, E205295.69		Driller's Company & Name: Richard Posa NEBC	
Ground Elevation (Feet): 1124' +/-		Gill Representative: Kyle Coleman	

Depth (Feet)	Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minutes per Foot	Recovery (inches)	Field Description	Strata Changes
-	S1	1-3	10-10-9-11	11"	DRY, LOOSE TO MED. DENSE BROWN SAND	
5	S2	5-7	10-7-7-10	1"	MOIST, LOOSE DARK GREY SAND	
10	S3	10-12	28-17-11-4	11"	MOIST (NO WATER), MED. DENSE DARK GREY SAND W/ SOME FINE COBBLES	13.0
15	S4	15-17	9-14-17-19	7"	WET, BROWNISH-TAN MED. DENSE SAND AND STIFF CLAY TRACE COARSE SAND	
20	S5	20-22	11-18-20-27	19"	WET, BROWNISH-TAN MED. VERY STIFF CLAY AND MED. DENSE FINE SAND	
25	S6	25-27	13-16-26-26	7"	WET, BROWNISH-TAN WITH LAYERS OF LIGHT GREY VERY STIFF CLAY TRACE MED. DENSE SAND	
30		30	ROCK CORE TAKEN			

Remarks:	Arrow-Board: x Signs: y Cones: y	Protective Device – Stand: x Box: x Well Depth: x Solid Pipe: x Stick Up Pipe: x Screen Pipe: x

Penetration Resistance (N) Guide				
Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)		Type of Drill Rig: B53
Relative Density	Penetration Resistance	Consistency	Penetration Resistance	Casing Type: FJ Size: 4"
Very Loose	0 – 4	Very Soft	0 – 2	Hammer Weight: 140#
Loose	4 – 10	Soft	2 – 4	Fall: 30"
Medium Dense	10 – 30	Medium Stiff	4 – 8	Depth: x
Dense	30 – 50	Stiff	8 – 15	Sampler Type: SS Size: 1-3/8"
Very Dense	Over 50	Very Stiff	15 – 30	Automatic Hammer Weight: 140#
		Hard	Over 30	Safety Hammer Weight: x Donut Hammer Weight: x
N = Sum of Second and Third 6" Blow counts				Fall: 30"
Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less				Core Barrel Type: NQ Size: 1-7/8"

WATER PROPOSED SW WINGWALL BOF
EL. 1109'

BORING B–2

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 9/25/2023 AND 9/26/2023.
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
STATE BRIDGE ENGINEER 2/24/2025 DATE

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

GILL ENGINEERING

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DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
2/21/25	MMS	KFC	JEP	ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL

COMMONWEALTH OF MASSACHUSETTS JOHN PHELPS STRUCTURAL No. 57216 PROFESSIONAL ENGINEER 2/21/2025

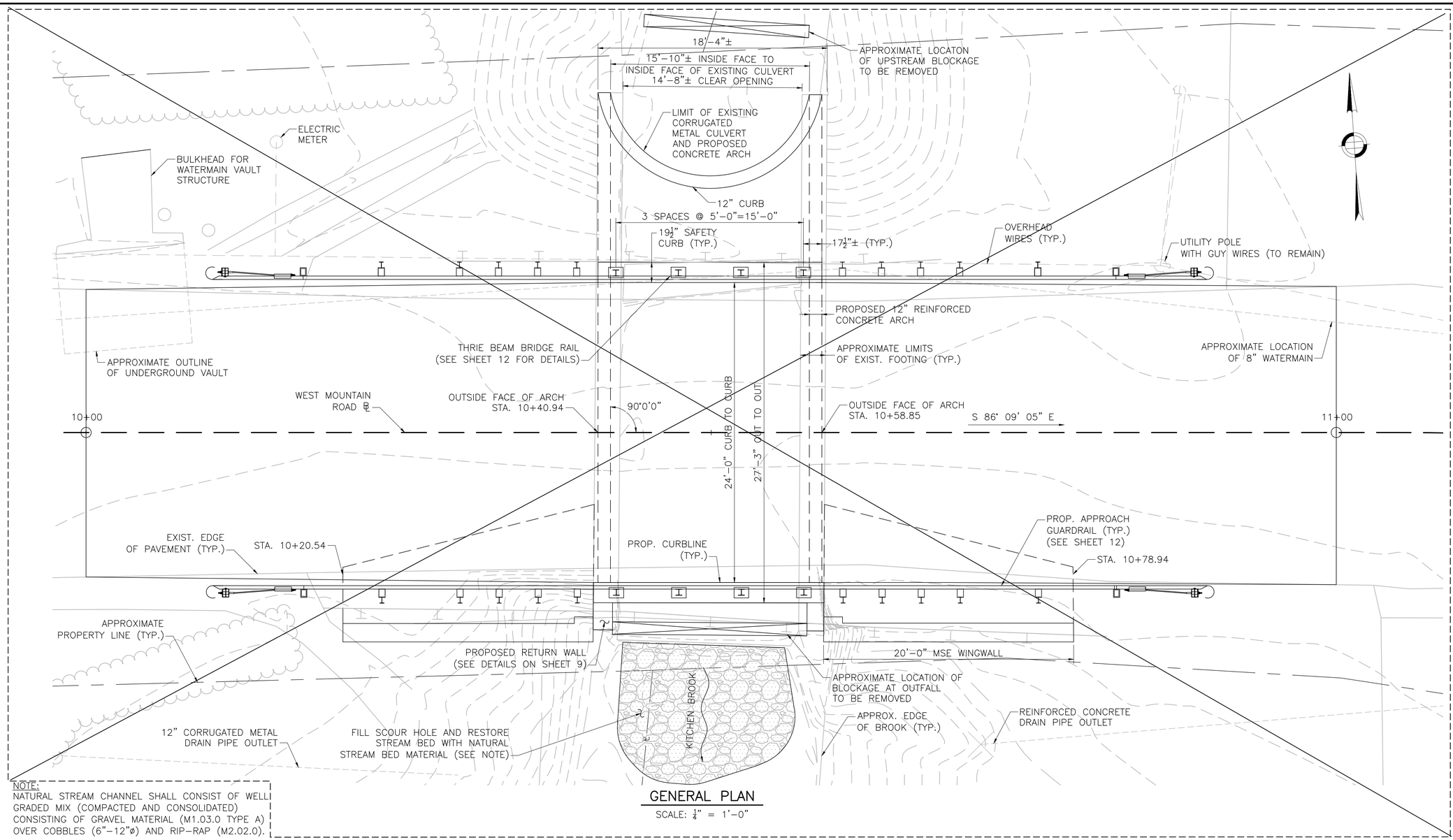
REGISTERED PROFESSIONAL ENGINEER DATE

CULVERT STRENGTHENING
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

BORING LOGS

SHEET
3 OF 14

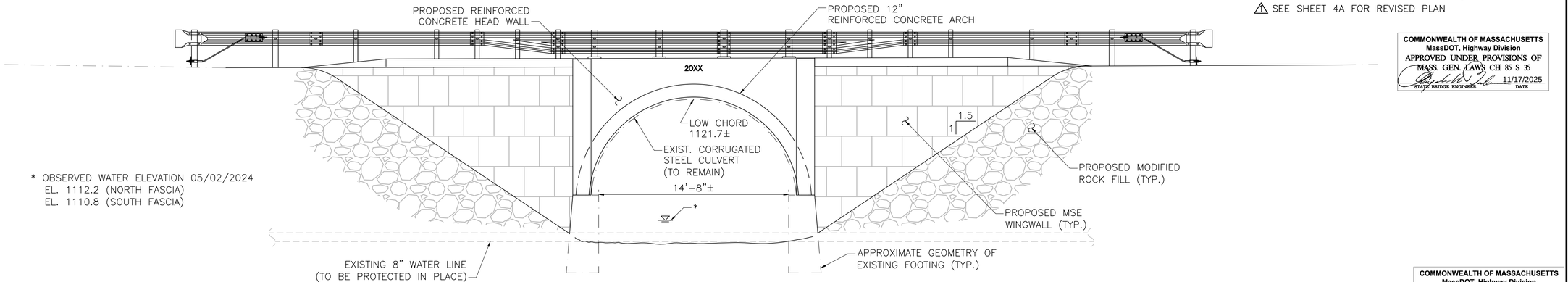


NOTE:
NATURAL STREAM CHANNEL SHALL CONSIST OF WELL GRADED MIX (COMPACTED AND CONSOLIDATED) CONSISTING OF GRAVEL MATERIAL (M1.03.0 TYPE A) OVER COBBLES (6"–12"ø) AND RIP–RAP (M2.02.0).

GENERAL PLAN

SCALE: ¼" = 1'–0"

⚠ SEE SHEET 4A FOR REVISED PLAN



* OBSERVED WATER ELEVATION 05/02/2024
EL. 1112.2 (NORTH FASCIA)
EL. 1110.8 (SOUTH FASCIA)

SOUTH ELEVATION

SCALE: ¼" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — DATE 11/17/2025

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — DATE 2/24/2025

63 KENDRICK STREET
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781-355-7100
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GILL ENGINEERING

C10024_BR4-6.dwg Plotted on 21-Feb-2025 4:47 PM

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
2/21/25	MMS	MMS	JEP	ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL
10/29/25	MMS	MMS	JEP	RIGHT OF WAY REVISED

⚠

REGISTERED PROFESSIONAL ENGINEER — DATE

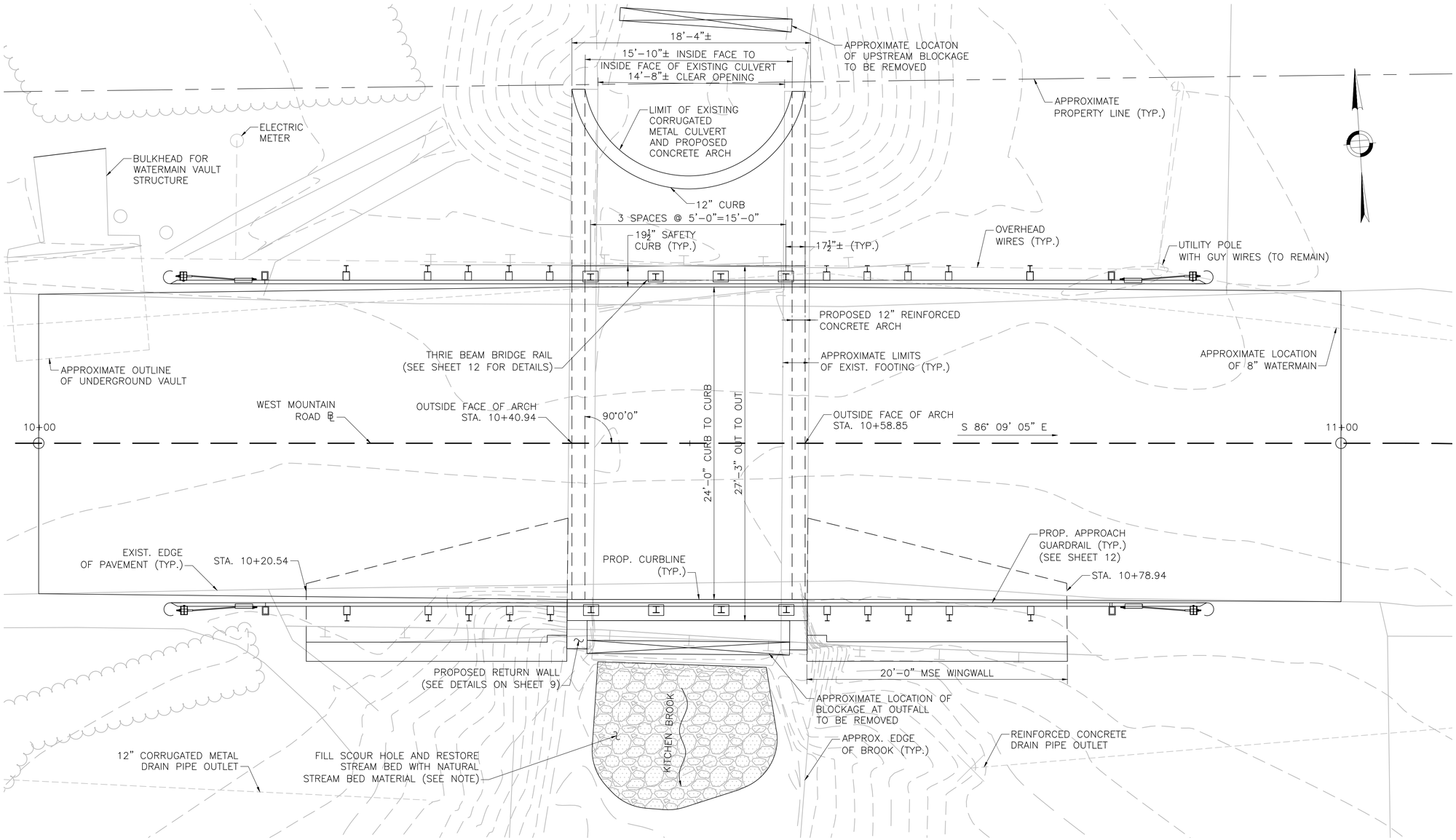
COMMONWEALTH OF MASSACHUSETTS — JOHN PAUL HEUS — STRUCTURAL — No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

GENERAL PLAN AND ELEVATION



GENERAL PLAN

SCALE: ¼" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS, CH. 85 S. 35
STATE BRIDGE ENGINEER — DATE 11/17/2025

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

GILL ENGINEERING

C10024_BR4-6.dwg Plotted on 30-Oct-2025 9:53 AM

DESCRIPTION	DRW. BY	CALC. BY	APPRV. BY	DATE
REVISED RIGHT OF WAY	PFO	PFO	JEP	10/29/25

REGISTERED PROFESSIONAL ENGINEER — DATE

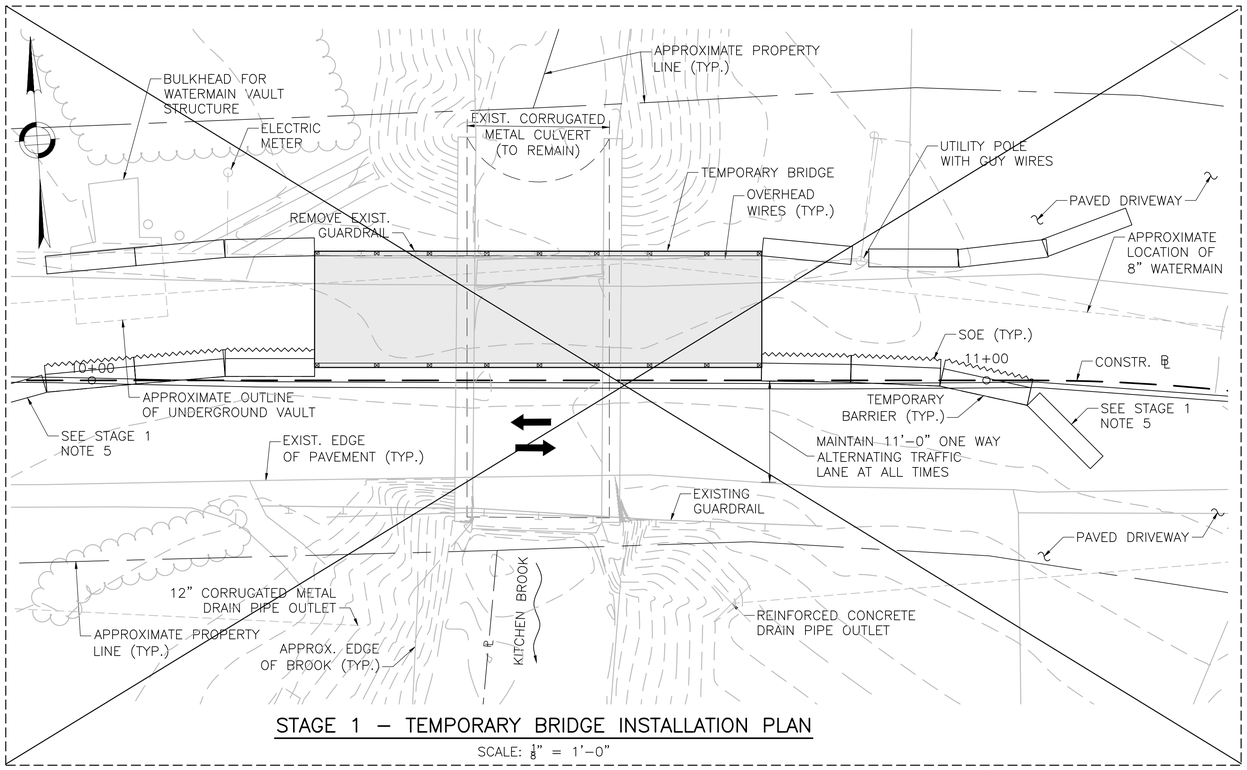
COMMONWEALTH OF MASSACHUSETTS
JOHN PHELPS
STRUCTURAL
No. 57216
PROFESSIONAL ENGINEER
10/29/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

GENERAL PLAN



STAGE 1 – TEMPORARY BRIDGE INSTALLATION PLAN

SCALE: $\frac{1}{8}$" = 1'–0"

⚠ SEE SHEET 6A FOR REVISED PLAN

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — DATE 11/17/2025

GENERAL CONSTRUCTION STAGING NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL STAGING AND SEQUENCING THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION STAGING SHOWN HEREIN SHALL BE CONSIDERED CONCEPTUAL AND IS PROVIDED FOR INFORMATIONAL USE ONLY. THE CONTRACTOR IS REQUIRED TO PROVIDE A DETAILED SEQUENCE PLAN WITH SUFFICIENT DETAIL SHOWING HOW THIS PROJECT WILL BE CONSTRUCTED SAFELY AND IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS.
2. A MINIMUM OF A SINGLE 11' ONE WAY ALTERNATING TRAFFIC LANE SHALL BE MAINTAINED AT ALL TIMES.
3. CONTRACTOR SHALL TAKE NOTE OF THE UTILITIES LOCATED ADJACENT TO THE EXISTING BRIDGE, INCLUDING THE UTILITY POLE AT THE NORTHEAST CORNER AND ASSOCIATED OVERHEAD WIRES, AS WELL AS THE WATER MAIN VAULT LOCATED AT THE NORTHWEST CORNER AND ASSOCIATED 8" WATER LINE. IF THE CONTRACTOR'S PROPOSED CONSTRUCTION STAGING AND/OR MEANS AND METHODS REQUIRE MODIFICATIONS TO AND/OR RELOCATION OF ANY PORTION OF THE EXISTING UTILITIES, ALL COSTS ASSOCIATED WITH THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
4. REFER TO SHEET 14 FOR TEMPORARY TRAFFIC CONTROL PLANS.
5. THE TEMPORARY BRIDGE SHALL MEET THE FOLLOWING DESIGN CRITERIA:

   5.A. DESIGN SHALL BE IN ACCORDANCE WITH AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS, 2ND EDITION.

   5.B. THE BRIDGE SHALL BE DESIGNED FOR HS20 LOADING AT A MINIMUM.

   5.C. THE RAILING SYSTEM ON THE BRIDGE AND THE BARRIER ALONG THE APPROACH ROADWAYS SHALL BE DESIGNED FOR AASHTO TL–2 LOADING AS A MINIMUM.

   5.D. THE ROADWAY WIDTH ON THE APPROACH ROADWAY AND ON THE BRIDGE SHALL BE A MINIMUM OF 11 FEET.

   5.E. THE MAXIMUM ALLOWABLE BEARING PRESSURE IS 4000 PSF. IF THE CONTRACTOR CHOOSES TO EXCEED THE MAXIMUM ALLOWABLE, ADDITIONAL SUBSURFACE EXPLORATION AND GEOTECHNICAL EVALUATION SHALL BE PERFORMED. THE ADDITIONAL BEARING CAPACITY EVALUATION SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL.

   5.F. THE TEMPORARY BRIDGE AND ROADWAY SHOWN ON THE PLANS ARE WITHIN THE APPROXIMATE RIGHT OF WAY LIMITS. IF THE CONTRACTOR CHOOSES TO EXCEED THE ROW LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WRITTEN AGREEMENTS FROM THE TOWN AND APPLICABLE PROPERTY OWNERS.

   5.G. THE TEMPORARY BRIDGE SHOWN HAS A SPAN OF 50'–0"± AND IS LOCATED AS SHOWN. THE CONTRACTOR MAY MODIFY THE GEOMETRY AND LAYOUT OF THE BRIDGE BUT SHALL NOT VIOLATE THE TEMPORARY BRIDGE CRITERIA DESCRIBED IN THE SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR ANY PERMITS REQUIRED RESULTING FROM A CHANGE IN THE GEOMETRY OR LAYOUT OF THE TEMPORARY BRIDGE.

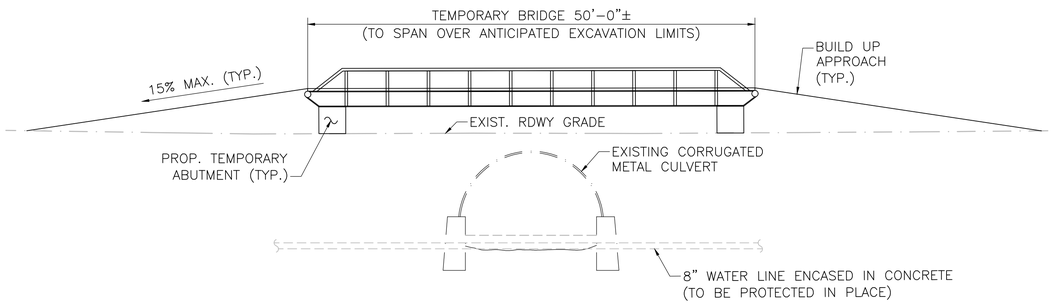
GENERAL CONSTRUCTION STAGING NOTES CONTINUED:

6. THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AND SHOP DRAWINGS FOR THE TEMPORARY BRIDGE TO THE ENGINEER WITH COMPLETE DETAILS, INFORMATION, AND ALL APPLICABLE DRAWINGS OF THE METHODS, MATERIALS, EQUIPMENT, AND PROCEDURES THE CONTRACTOR PROPOSES TO USE. ALL SHOP DRAWINGS AND CALCULATIONS SUBMITTED SHALL BEAR THE SEAL AND SIGNATURE OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MASSACHUSETTS. THE FULL RESPONSIBILITY FOR THE SAFETY AND ADEQUACY OF THE STRUCTURE WILL REST WITH THE CONTRACTOR.
7. IF A PREMANUFACTURED TEMPORARY BRIDGE IS USED, THE MANUFACTURER SHALL WARRANT THEIR STRUCTURE TO BE FREE OF DESIGN, MATERIAL, AND WORKMANSHIP DEFECTS FOR A PERIOD OF TWO YEARS FORM THE DATE OF DELIVERY.

SUGGESTED CONSTRUCTION SEQUENCE:

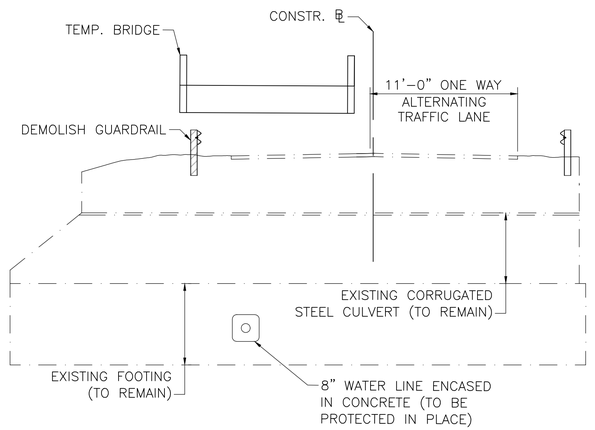
STAGE 1 – TEMPORARY BRIDGE INSTALLATION:

1. REFER TO GENERAL CONSTRUCTION STAGING NOTES.
2. ESTABLISH A SINGLE 11' ONE WAY ALTERNATING TRAFFIC LANE ON THE SOUTH SIDE OF THE EXISTING ROADWAY.
3. DEMOLISH EXISTING GUARDRAIL ON NORTH SIDE OF ROADWAY.
4. INSTALL TEMPORARY BRIDGE (INCLUDING TEMPORARY ABUTMENTS/FOUNDATIONS) OVER THE EXISTING CULVERT ON THE NORTH SIDE OF THE ROADWAY WITH SUFFICIENT LENGTH TO SPAN OVER THE ANTICIPATED EXCAVATION LIMITS. BUILD UP APPROACHES TO PROVIDE HEADROOM TO WORK UNDER THE TEMPORARY BRIDGE AND INSTALL SOE AND TEMPORARY BARRIER AS REQUIRED.
5. REMAINING SECTIONS OF BARRIER TO BE INSTALLED AFTER TRAFFIC HAS BEEN SHIFTED TO TEMPORARY BRIDGE.



STAGE 1 – TEMPORARY BRIDGE INSTALLATION LONGITUDINAL SECTION

SCALE: $\frac{1}{8}$" = 1'–0"



NOTE: SECTION TAKEN LOOKING EAST.

STAGE 1 – TEMPORARY BRIDGE INSTALLATION SECTION

SCALE: $\frac{3}{16}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — DATE 2/24/2025

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

C10024_BR4-6.dwg Plotted on 21-Feb-2025 4:47 PM

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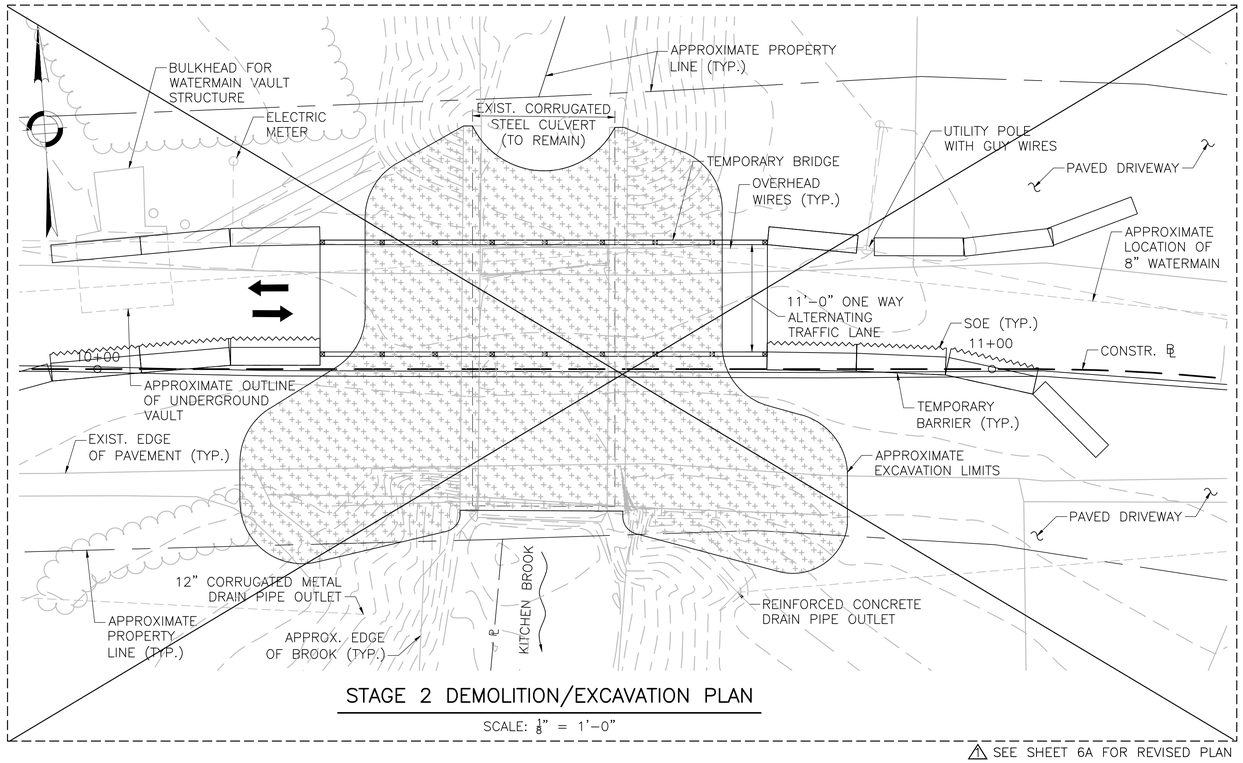
REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — JOHN PHELPS — STRUCTURAL — No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE
CULVERT STRENGTHENING FOR CHESHIRE
C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

CONSTRUCTION STAGING 1 OF 3

SHEET 5 OF 14

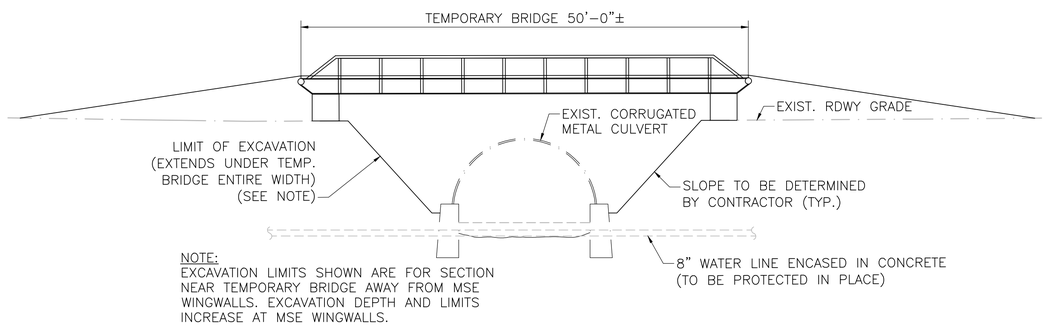


STAGE 2 DEMOLITION/EXCAVATION PLAN

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

⚠ SEE SHEET 6A FOR REVISED PLAN

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE



NOTE:
EXCAVATION LIMITS SHOWN ARE FOR SECTION NEAR TEMPORARY BRIDGE AWAY FROM MSE WINGWALLS. EXCAVATION DEPTH AND LIMITS INCREASE AT MSE WINGWALLS.

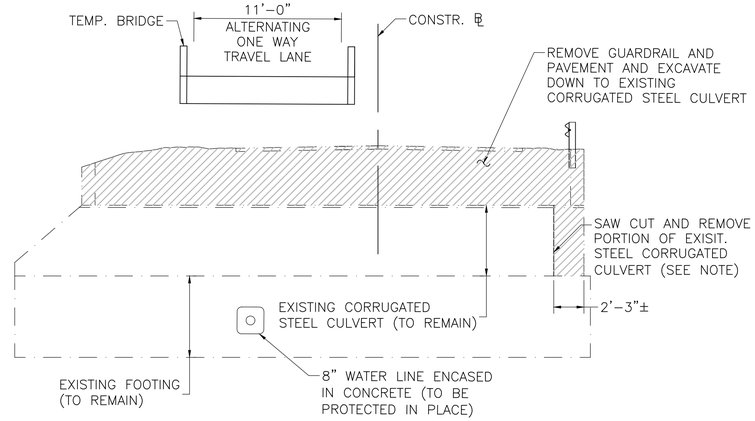
STAGE 2 DEMO/EXCAVATION LONGITUDINAL SECTION

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

SUGGESTED CONSTRUCTION SEQUENCE:

STAGE 2 DEMOLITION/EXCAVATION:

1. REFER TO GENERAL CONSTRUCTION STAGING NOTES ON SHEET 5.
2. ESTABLISH A SINGLE 11' ONE WAY ALTERNATING TRAFFIC LANE ON THE TEMPORARY BRIDGE.
3. REMOVE EXISTING GUARDRAIL AND PAVEMENT AND EXCAVATE DOWN TO THE EXISTING CORRUGATED STEEL CULVERT. AT LOCATION OF PROPOSED MSE WINGWALLS, EXCAVATE TO REQUIRED BOTTOM OF WALL ELEVATION. EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE THE EXISTING CULVERT. HAND EXCAVATION SHALL BE REQUIRED 12" FROM TOP OF STEEL.



NOTES:
1. AFTER SAWCUTTING EXISTING CORRUGATED STEEL CULVERT, TOUCH UP EDGE TO REMAIN WITH ZINC RICH PAINT.
2. SECTION TAKEN LOOKING EAST,

STAGE 2 DEMOLITION/EXCAVATION SECTION

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

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 2/24/2025 DATE

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

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REGISTERED PROFESSIONAL ENGINEER — DATE

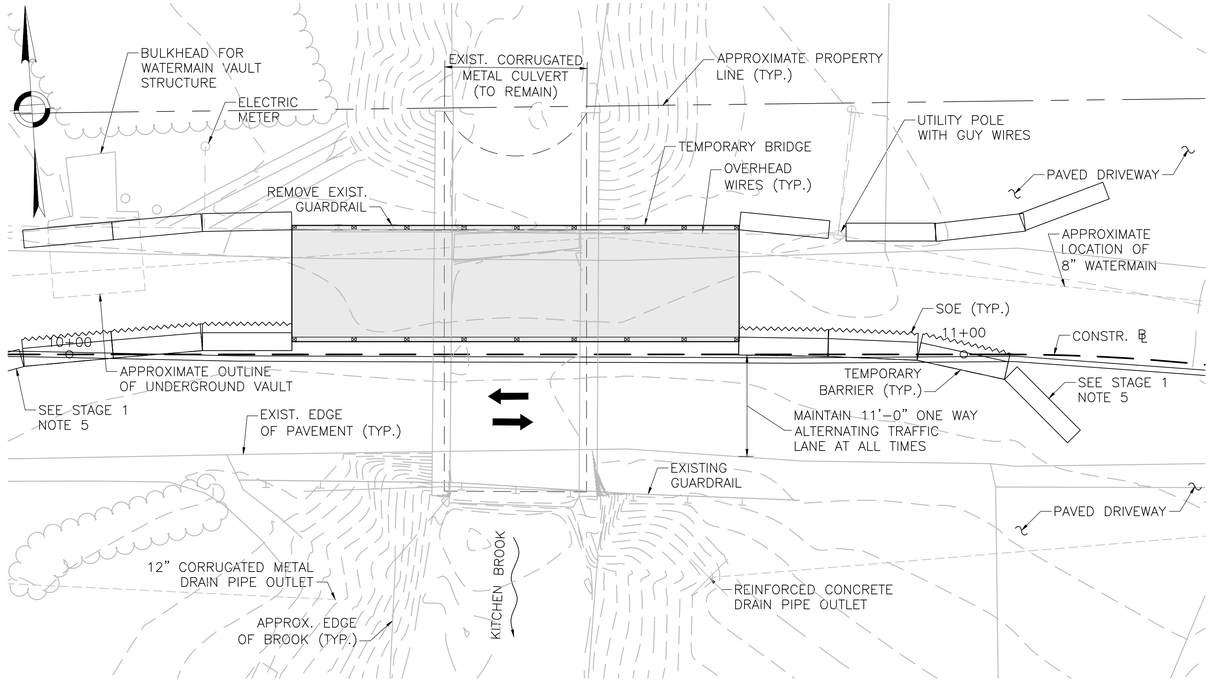
COMMONWEALTH OF MASSACHUSETTS — JOHN PHILIPS — STRUCTURAL — No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/17/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

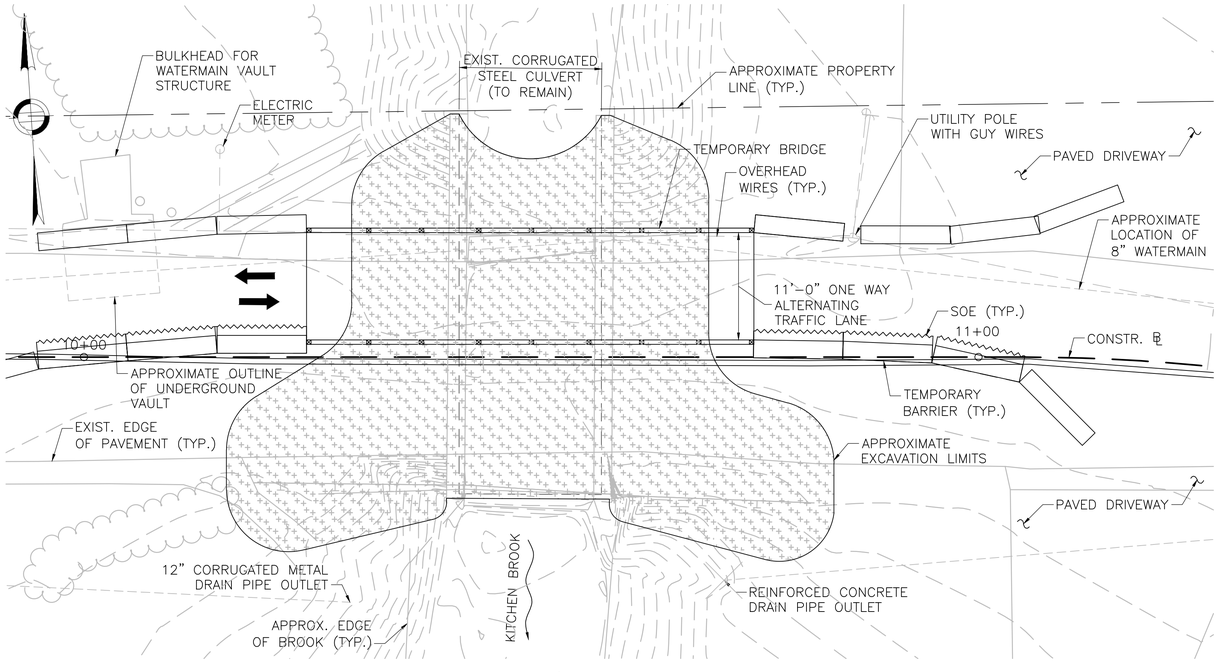
CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

CONSTRUCTION STAGING 2 OF 3



STAGE 1 – TEMPORARY BRIDGE INSTALLATION PLAN

SCALE: $\frac{1}{8}$" = 1'–0"



STAGE 2 DEMOLITION/EXCAVATION PLAN

SCALE: $\frac{1}{8}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH. 85 S. 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE

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

GILL ENGINEERING

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DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/29/25	PFO	PFO	JEP	RIGHT OF WAY REVISED

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS
JOHN PHELPS STRUCTURAL
No. 57216
PROFESSIONAL ENGINEER
10/29/2025

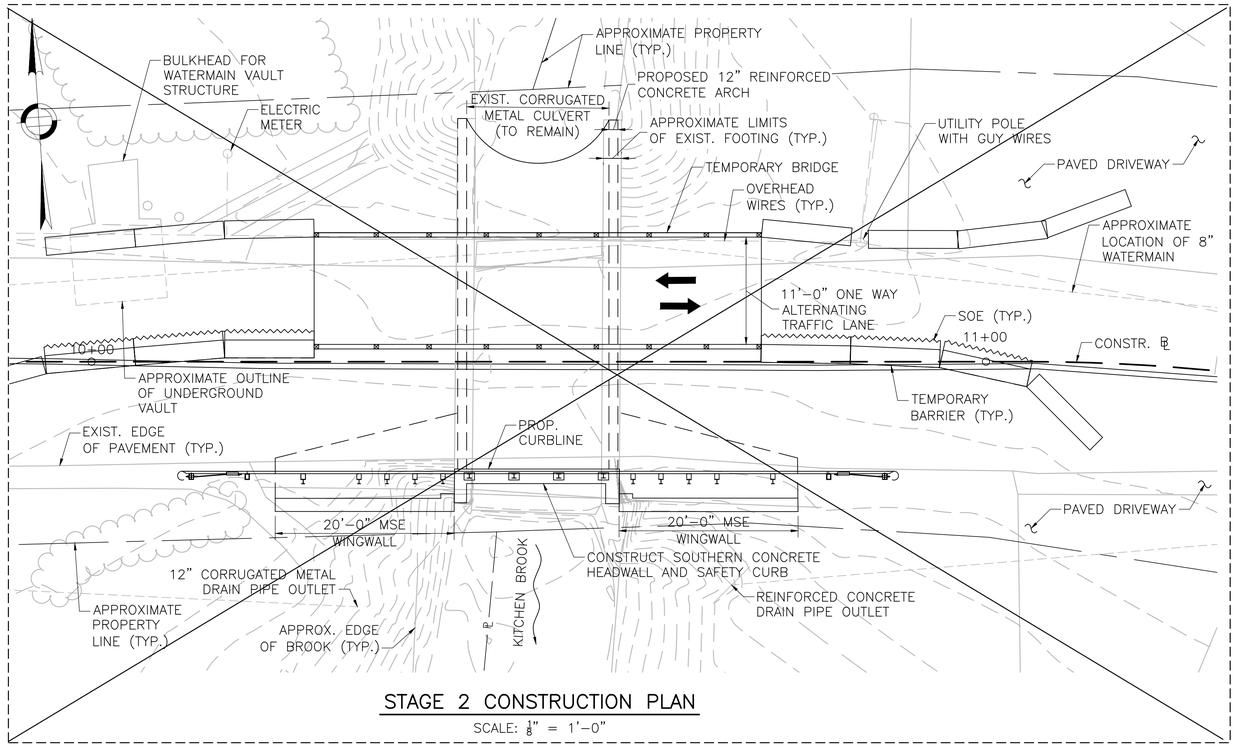
CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

CONSTRUCTION STAGING PLANS
1 OF 2

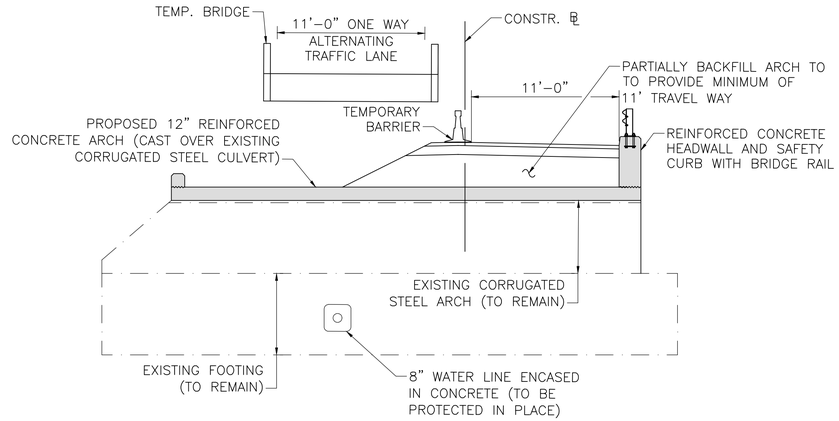
SHEET
6A OF 14



STAGE 2 CONSTRUCTION PLAN

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

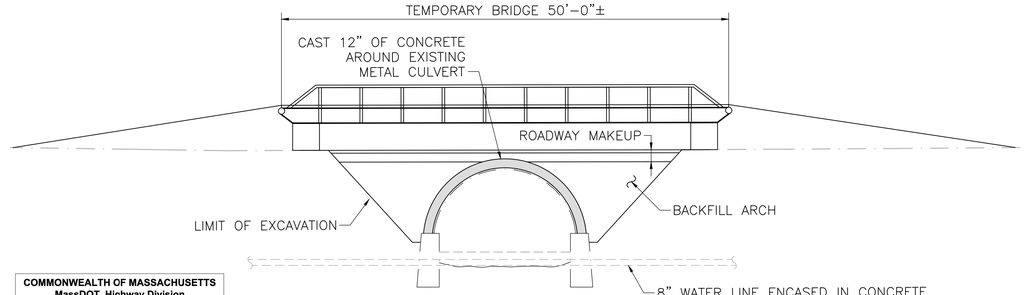
⚠ SEE SHEET 7A FOR REVISED PLAN



NOTE: SECTION TAKEN LOOKING EAST.

STAGE 2 CONSTRUCTION SECTION

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



STAGE 3 CONSTRUCTION LONGITUDINAL SECTION SIMILAR

STAGE 2 CONSTRUCTION LONGITUDINAL SECTION

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

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE

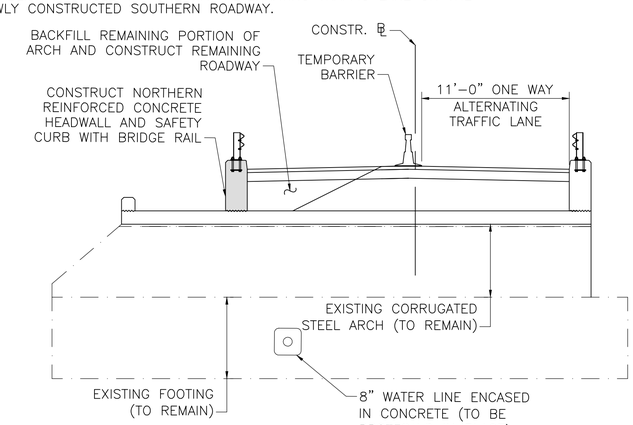
SUGGESTED CONSTRUCTION SEQUENCE:

STAGE 2 CONSTRUCTION:

1. REFER TO GENERAL CONSTRUCTION STAGING NOTES ON SHEET 5.
2. USING THE EXISTING CORRUGATED STEEL CULVERT AS A FORM, CAST 12" OF CONCRETE ALONG THE ENTIRE LENGTH OF THE CULVERT.
3. CONSTRUCT SOUTHERN CONCRETE HEADWALL, RETURN WALLS, SAFETY CURB, AND BRIDGE RAILS.
4. CONSTRUCT MSE WINGWALLS ALONG SOUTHERN EDGE OF ROADWAY.
5. PARTIALLY BACKFILL CULVERT AND PARTIALLY CONSTRUCT ROADWAY.
6. CONSTRUCT SOUTHERN APPROACH GUARDRAILS.
7. INSTALL TEMPORARY BARRIER.
8. ESTABLISH A SINGLE 11' ONE WAY ALTERNATING TRAFFIC LANE ON THE NEWLY CONSTRUCTED SOUTHERN ROADWAY.

STAGE 3 CONSTRUCTION:

1. REFER TO GENERAL CONSTRUCTION STAGING NOTES ON SHEET 5.
2. REMOVE TEMPORARY BRIDGE IN ITS ENTIRETY.
4. CONSTRUCT NORTHERN CONCRETE HEADWALL, SAFETY CURB, AND BRIDGE RAILS.
5. BACKFILL AND CONSTRUCT REMAINING PORTION OF NORTHERN ROADWAY.
6. CONSTRUCT NORTHERN APPROACH GUARDRAILS.
7. REMOVE TEMPORARY BARRIER.
8. PERFORM FINAL PAVING AND STRIPING.

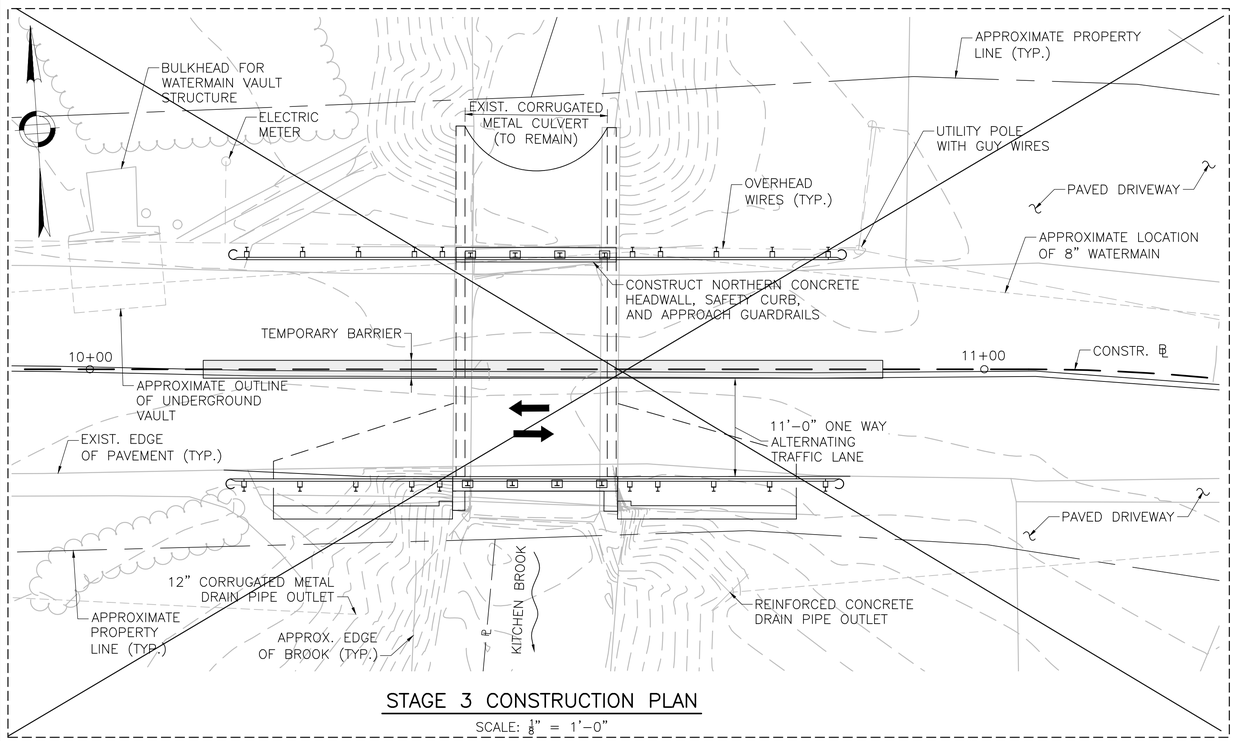


NOTE: SECTION TAKEN LOOKING EAST.

STAGE 3 CONSTRUCTION SECTION

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

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 2/24/2025 DATE



STAGE 3 CONSTRUCTION PLAN

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

⚠ SEE SHEET 7A FOR REVISED PLAN

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

GILL ENGINEERING

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10/29/25	MMS	MMS	JEP	RIGHT OF WAY REVISED

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS
JOHN E. PEIRCE
STRUCTURAL
No. 57216
REGISTERED PROFESSIONAL ENGINEER
2/21/2025

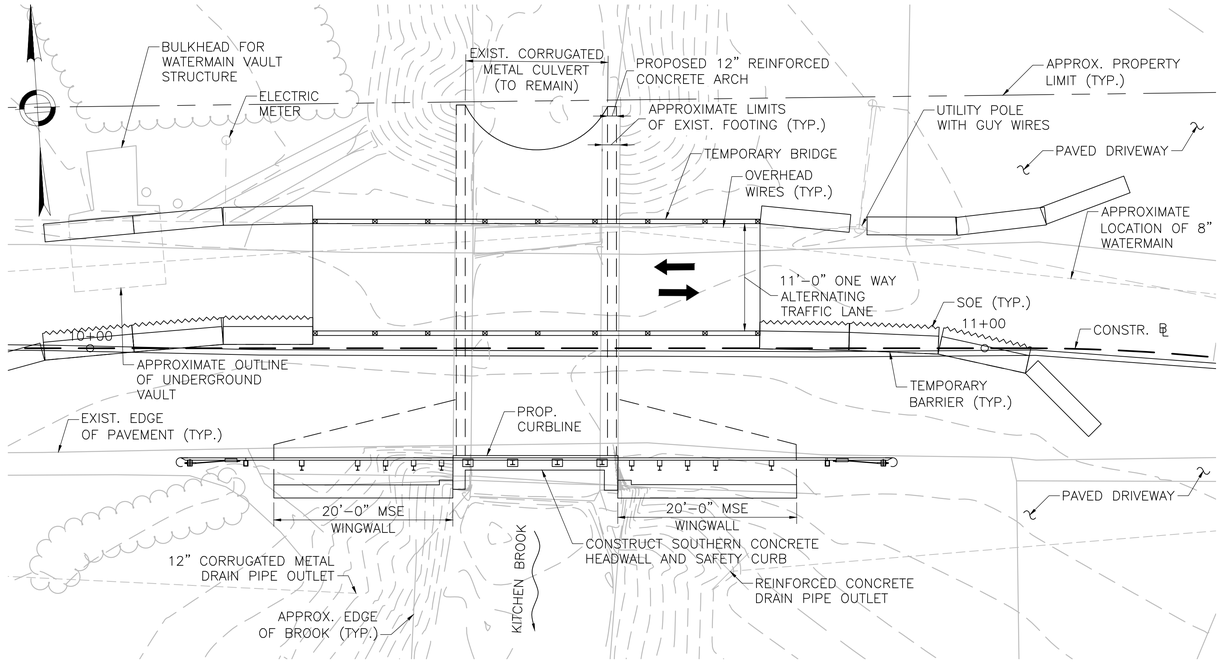
CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

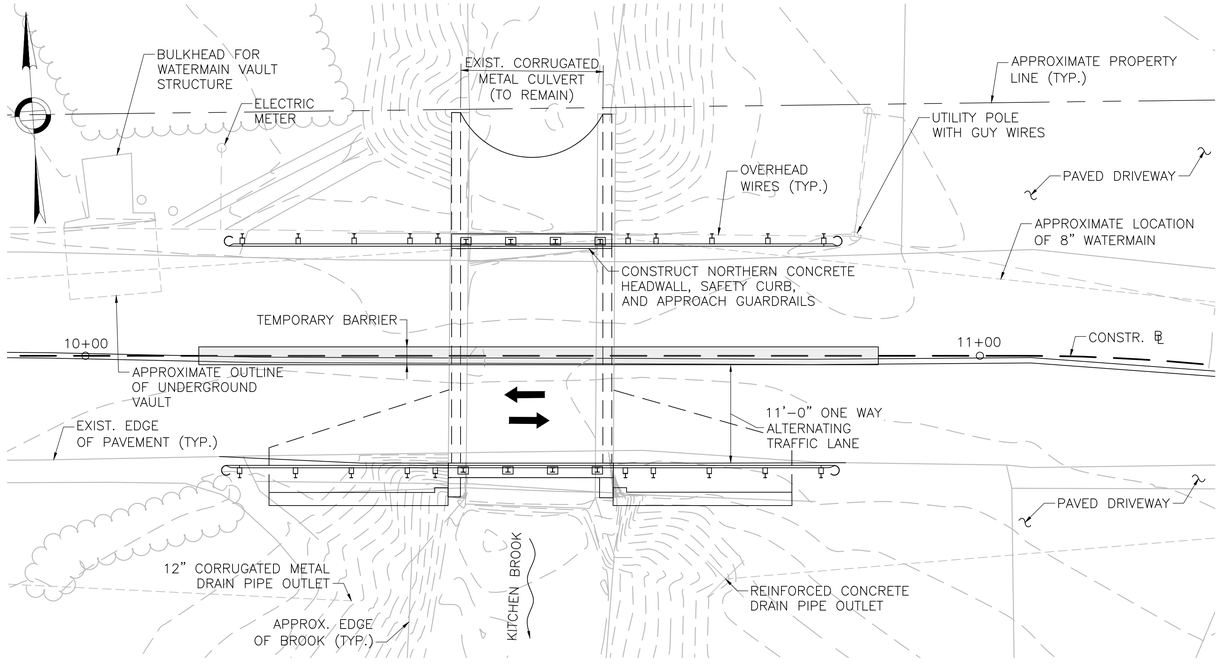
CONSTRUCTION STAGING 3 of 3

SHEET
7 OF 14



STAGE 2 CONSTRUCTION PLAN

SCALE: $\frac{1}{8}$" = 1'–0"



STAGE 3 CONSTRUCTION PLAN

SCALE: $\frac{1}{8}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE

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

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DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/29/25	PFO	PFO	JEP	RIGHT OF WAY REVISED

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — JOHN PHELPS — REGISTERED PROFESSIONAL ENGINEER — No. 57218 — 10/29/2025

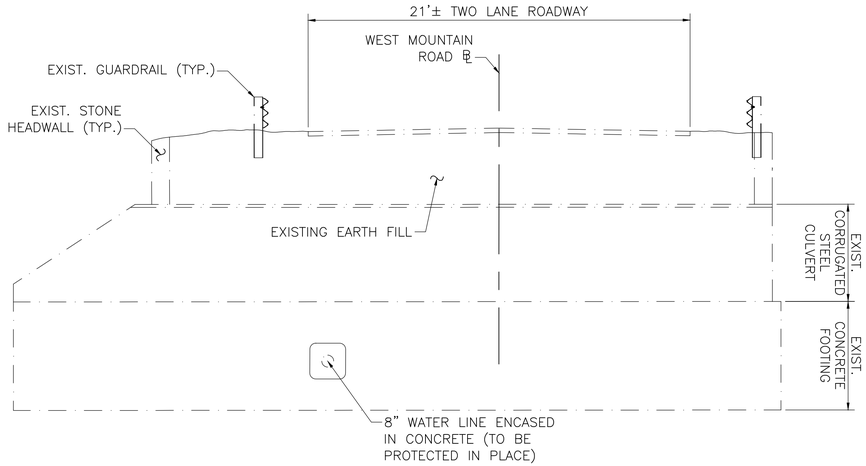
CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

CONSTRUCTION STAGING PLANS
2 OF 2

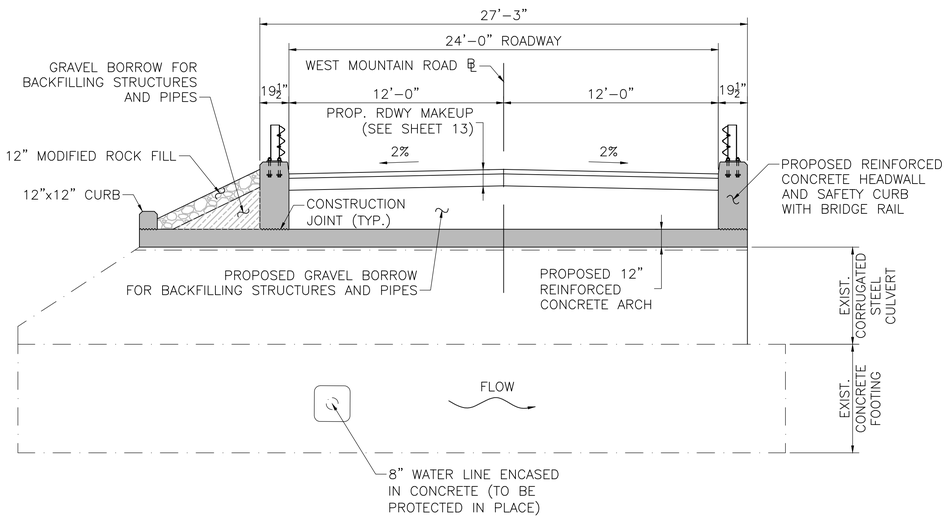
SHEET
7A OF 14



NOTE: SECTION TAKEN LOOKING EAST.

EXISTING CROSS SECTION

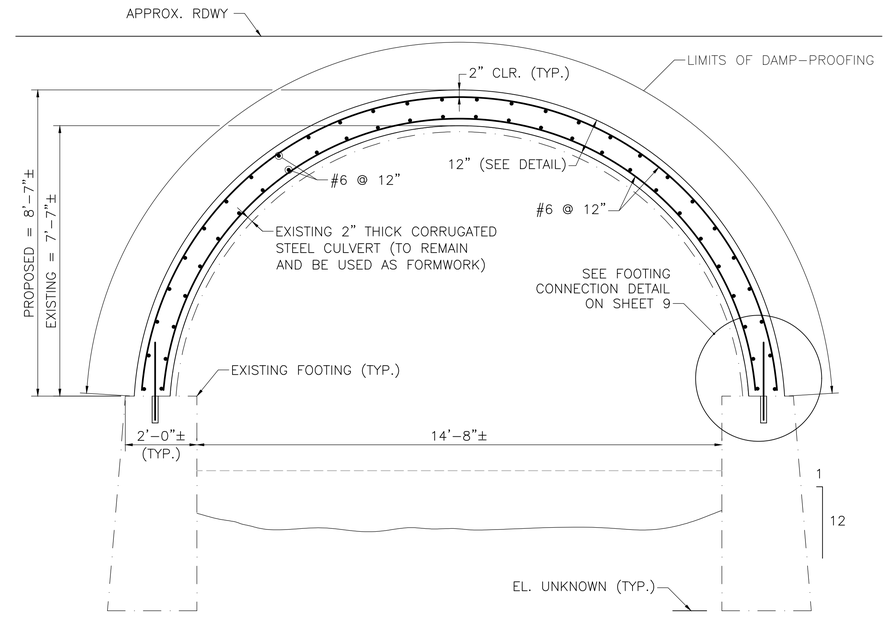
SCALE: $\frac{1}{4}$" = 1'–0"



NOTE: SECTION TAKEN LOOKING EAST.

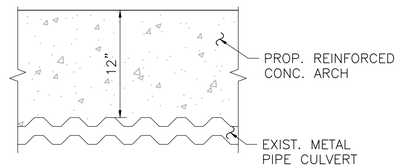
PROPOSED CROSS SECTION

SCALE: $\frac{1}{4}$" = 1'–0"



ARCH LONGITUDINAL SECTION

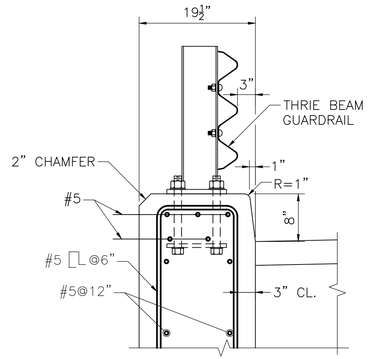
SCALE: $\frac{1}{2}$" = 1'–0"



NOTE:
TOP OF EXISTING STEEL CULVERT SHALL BE THOROUGHLY CLEANED OF ALL DEBRIS PRIOR TO CASTING CONCRETE.

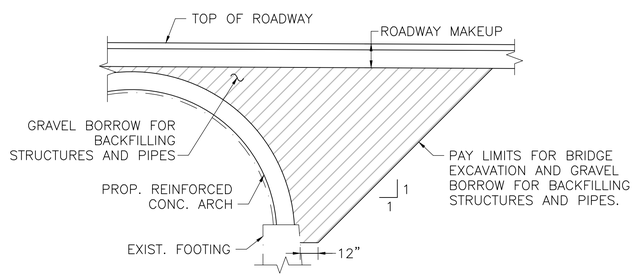
CONCRETE ARCH DETAIL

SCALE: $1\frac{1}{2}$" = 1'–0"



SAFETY CURB DETAIL

SCALE: 1" = 1'–0"



EXCAVATION AND BACKFILL PAY LIMITS

SCALE: $\frac{1}{4}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 2/24/2025 DATE

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

C10024_BR8.dwg Plotted on 21-Feb-2025 4:47 PM

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL	

DRW. BY: MMS | CALC. BY: MMS | APPRV. BY: JEP | DATE: 2/21/25

REGISTERED PROFESSIONAL ENGINEER

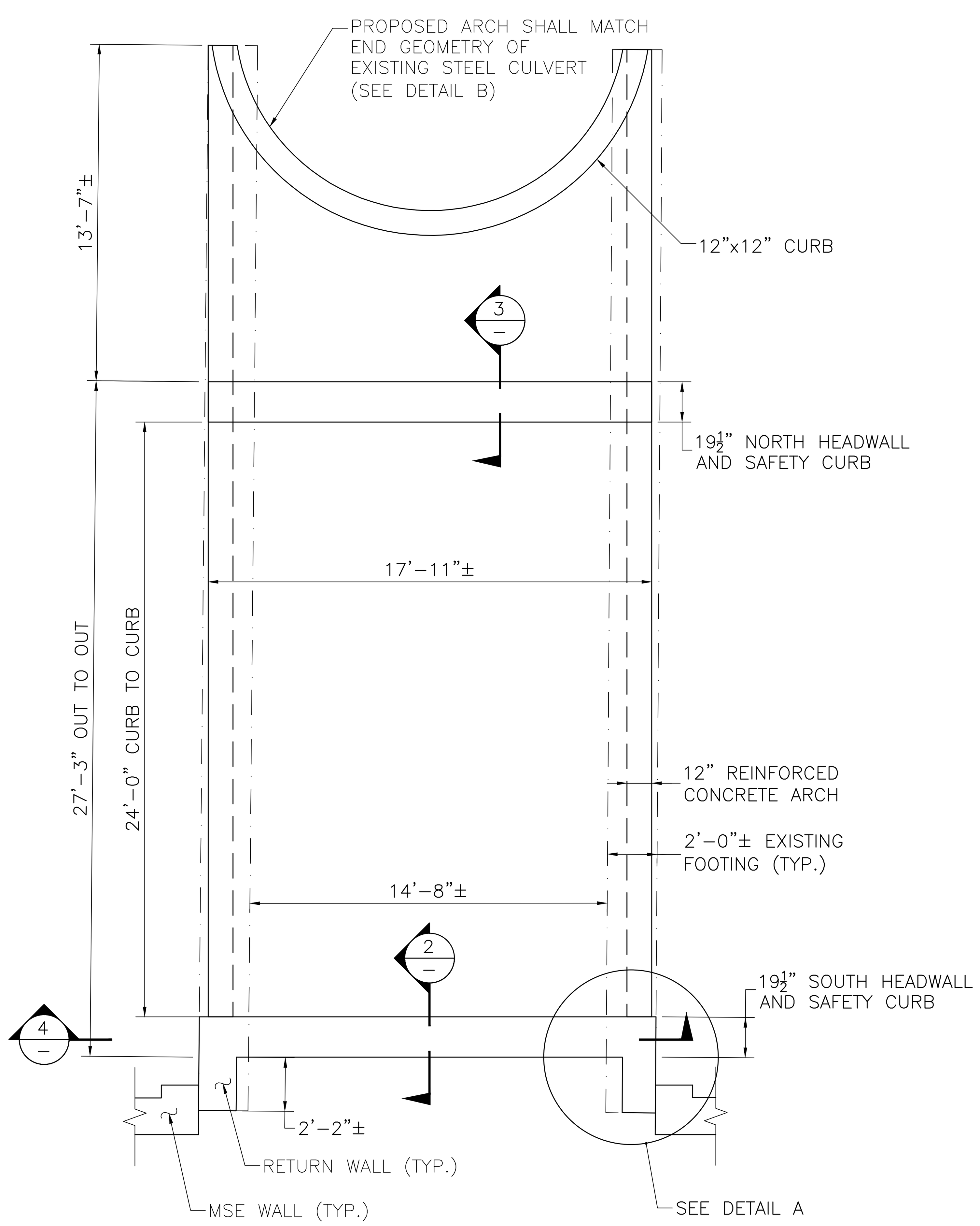
COMMONWEALTH OF MASSACHUSETTS — JOHN PHELPS STRUCTURAL No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE

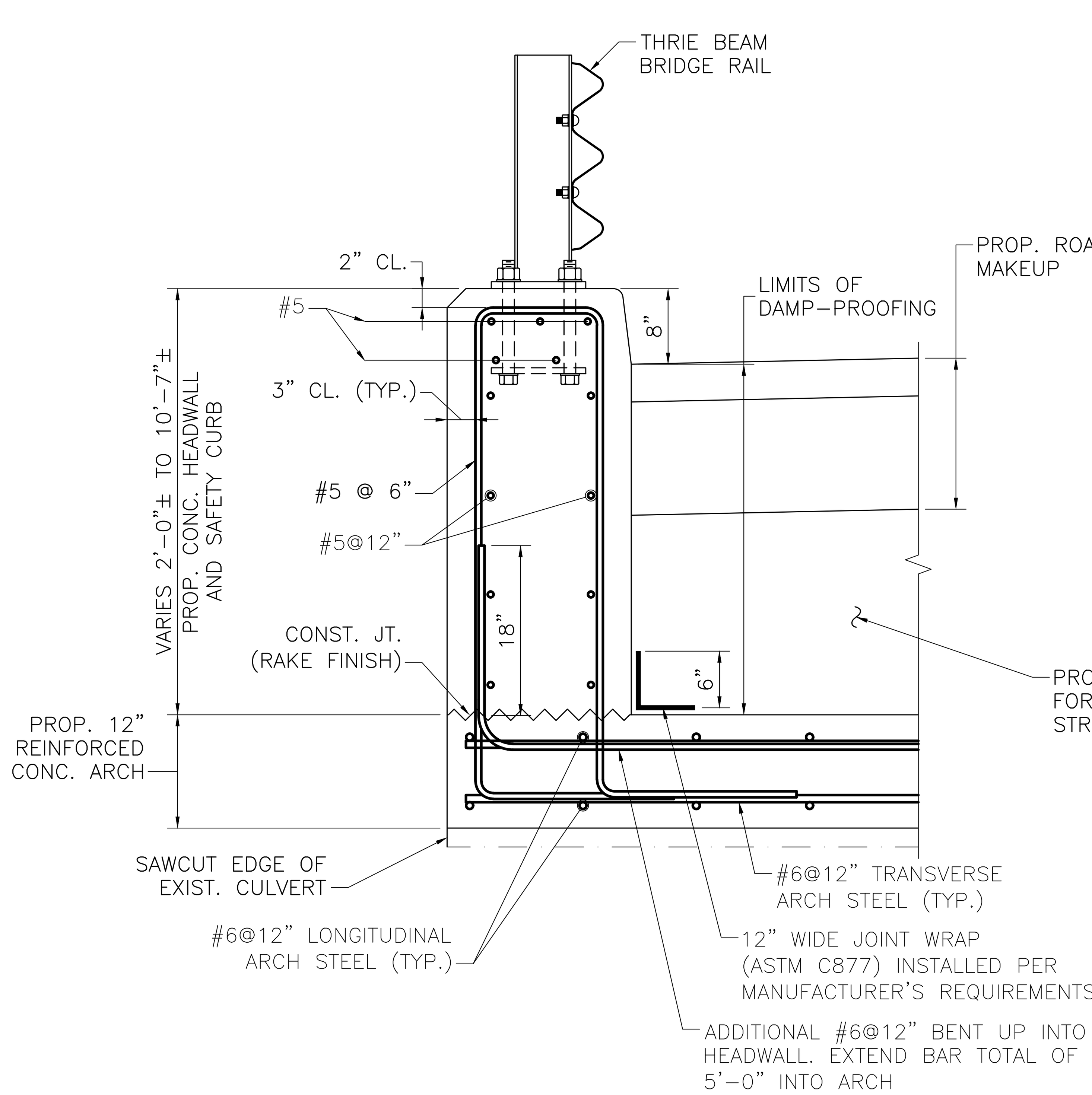
CULVERT STRENGTHENING FOR CHESHIRE C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

TRANSVERSE CROSS SECTIONS

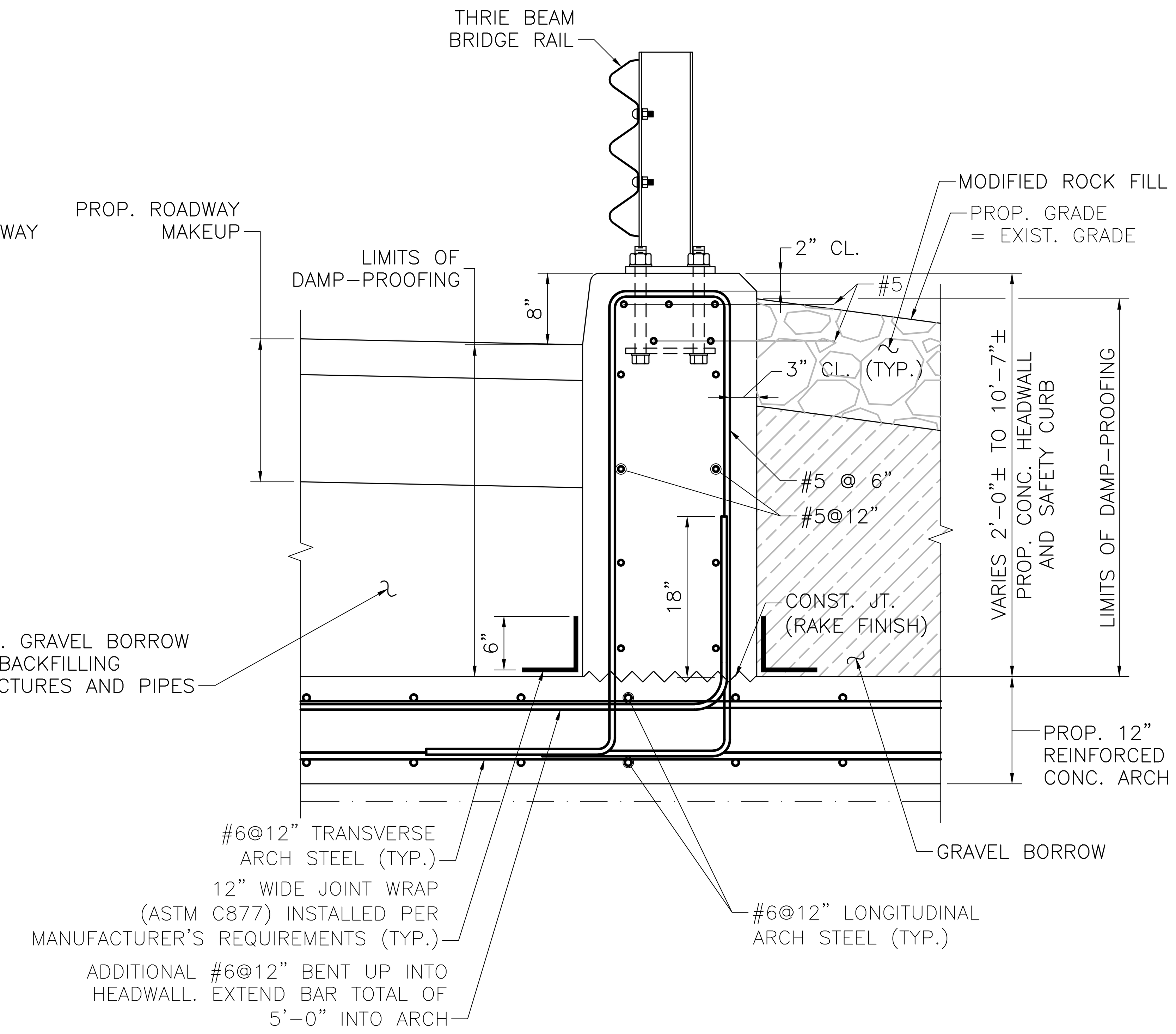
SHEET 8 OF 14



ARCH PLAN
SCALE: ¼" = 1'-0"



SECTION 2
SCALE: ½" = 1'-0"



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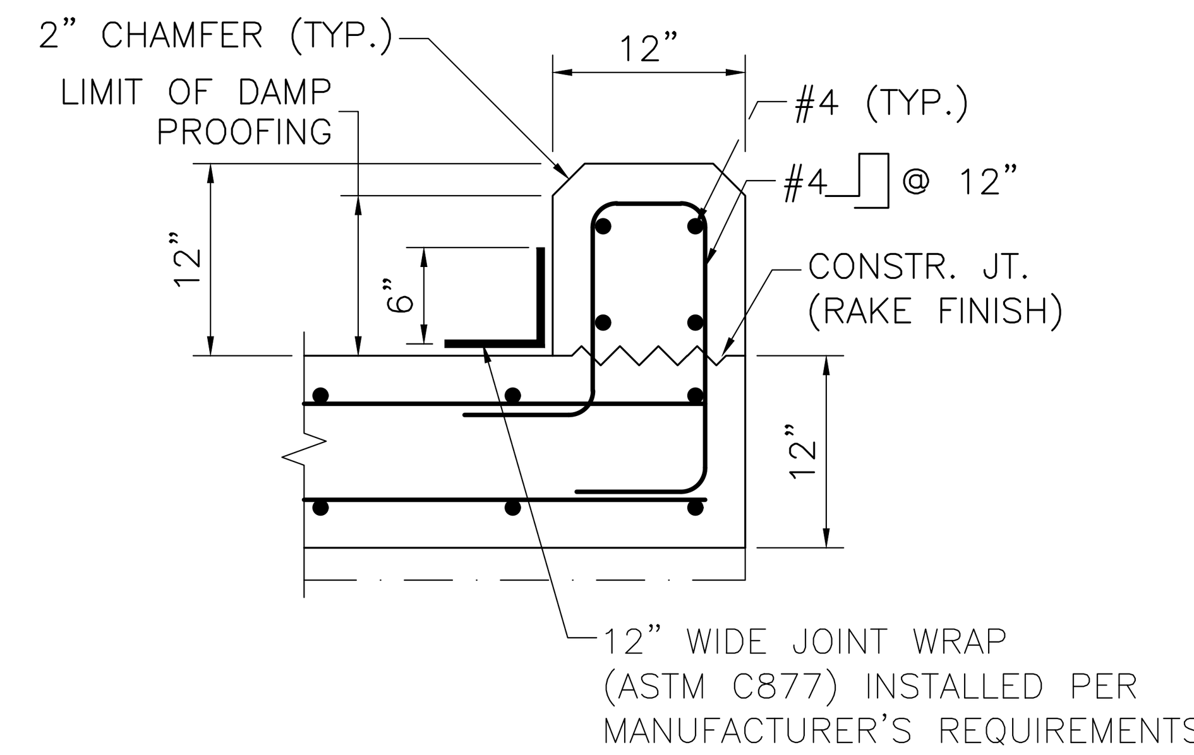

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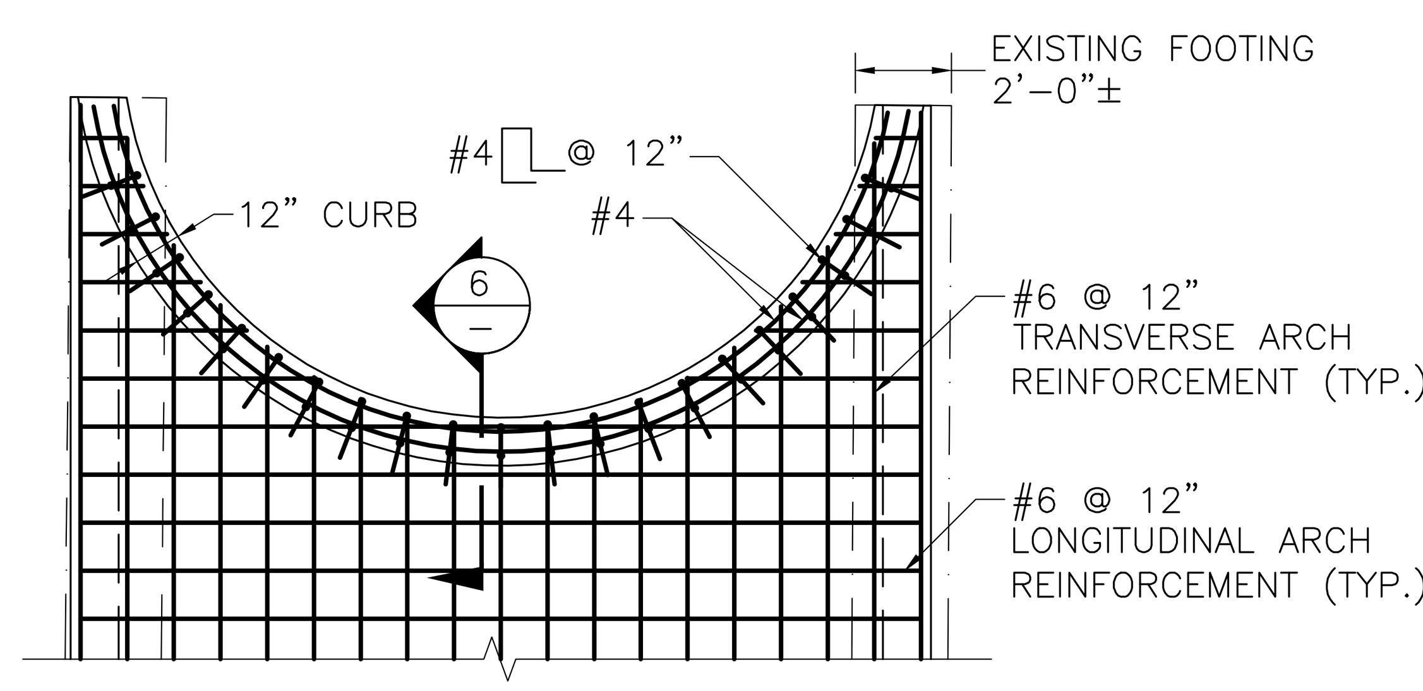
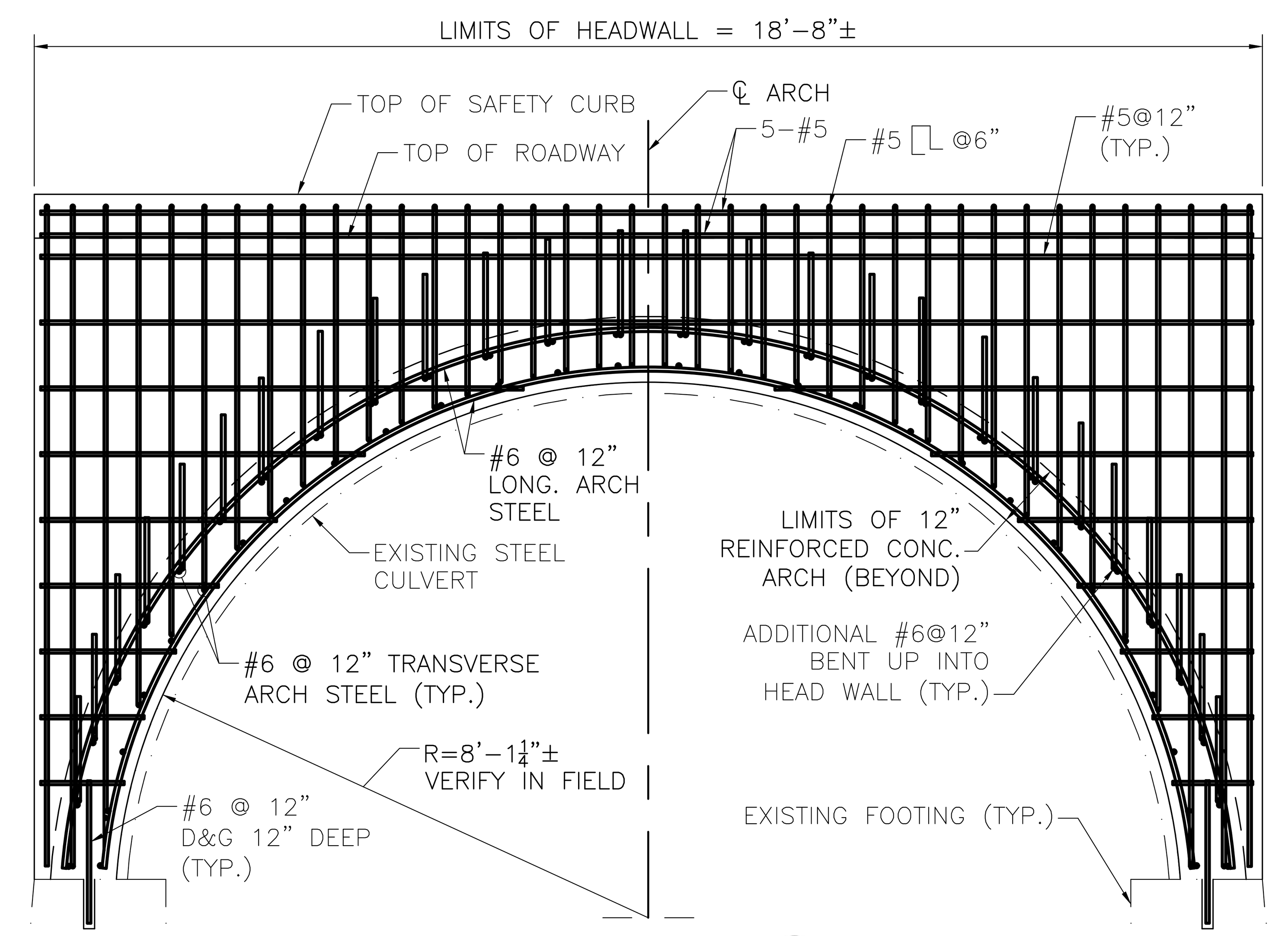
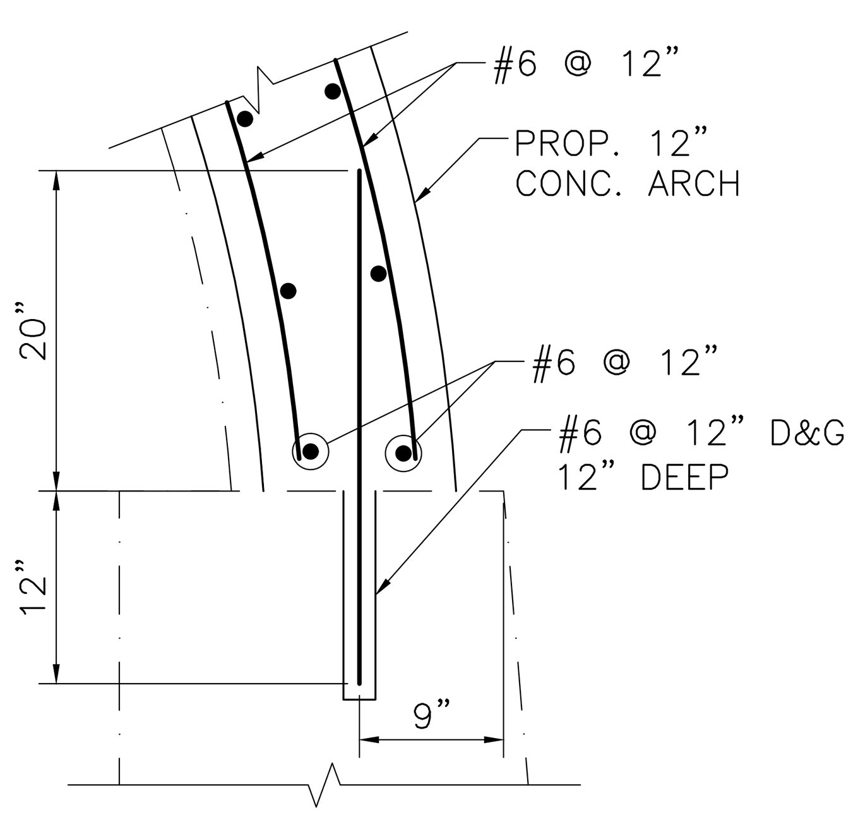
SCALE: 1" = 1'-0"



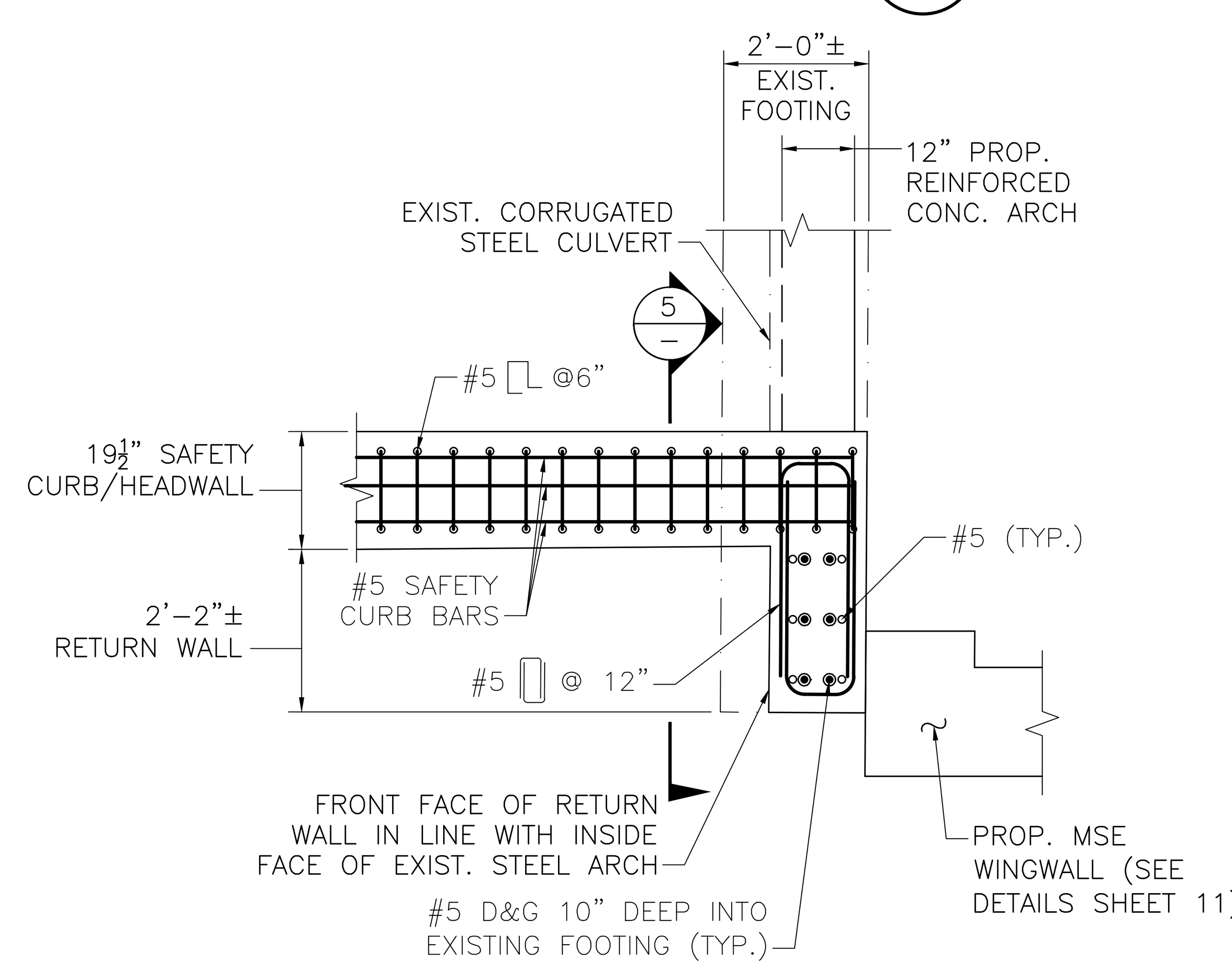
DETAIL B
SCALE: ¼" = 1'-0"



SECTION 4
SCALE: ½" = 1'-0"

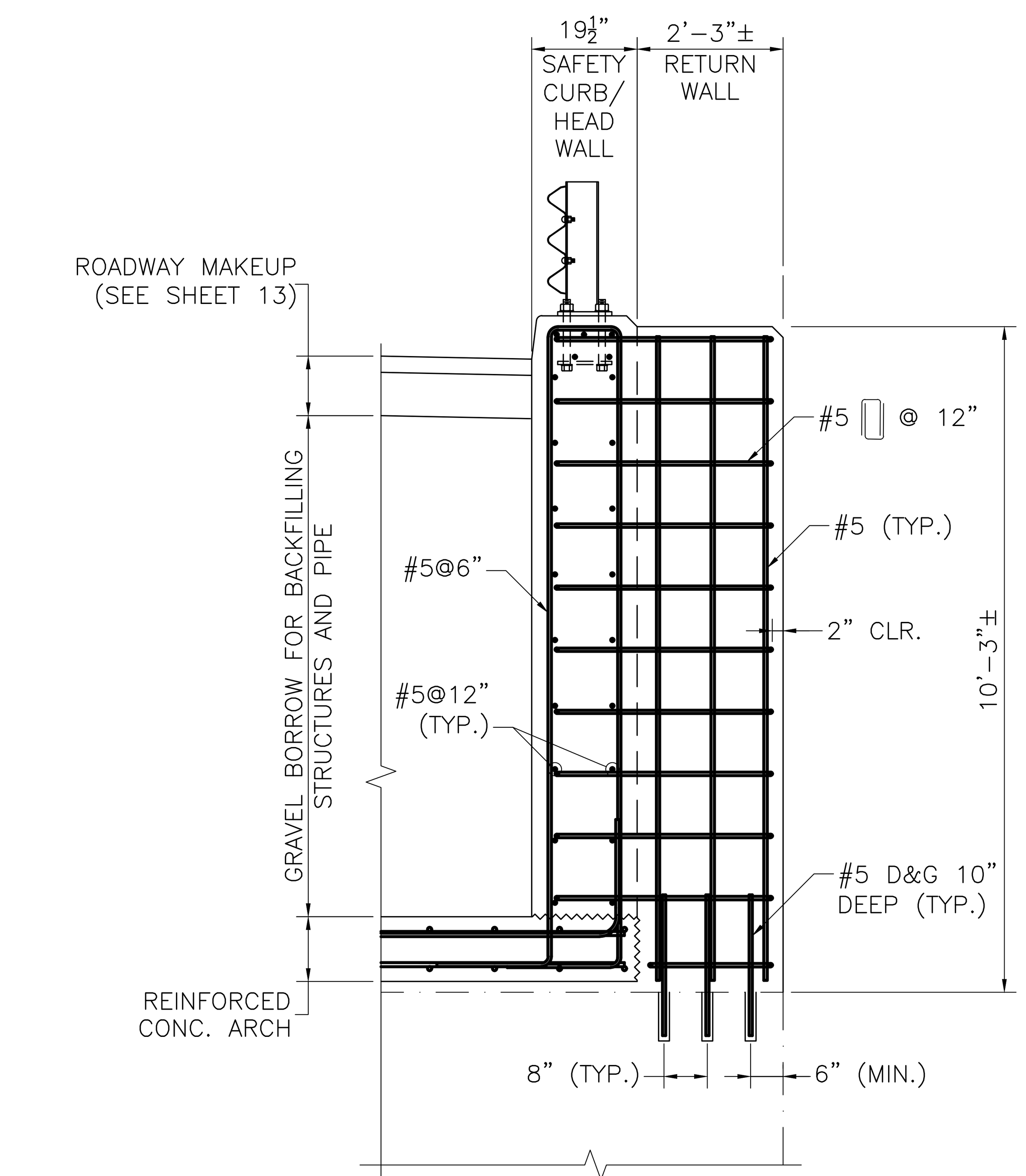


FOOTING CONNECTION DETAIL
SCALE: 1" = 1'-0"



NOTE:
ARCH REINFORCEMENT NOT SHOWN FOR CLARITY

DETAIL A
SCALE: ½" = 1'-0"



SECTION 5
SCALE: ½" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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STATE BRIDGE ENGINEER 2/24/2025
DATE

63 KENDRICK STREET
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GILL ENGINEERING

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DATE

REGISTERED PROFESSIONAL ENGINEER

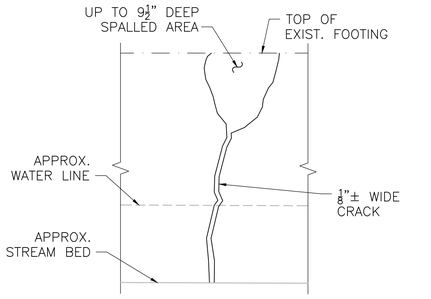
COMMONWEALTH OF MASSACHUSETTS JOHN PHELPS STRUCTURAL No. 57216 PROFESSIONAL ENGINEER
2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

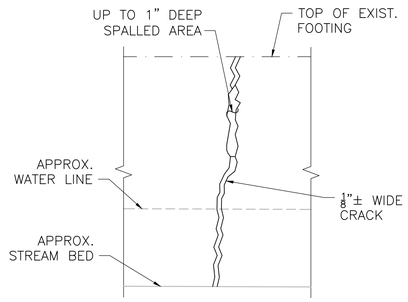
STRUCTURAL DETAILS

SHEET
9 OF 14



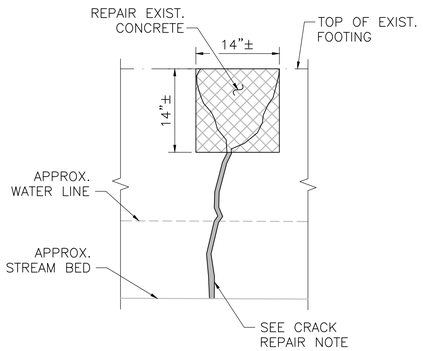
EAST FOOTING EXISTING DETERIORATION

SCALE: 1" = 1'-0"



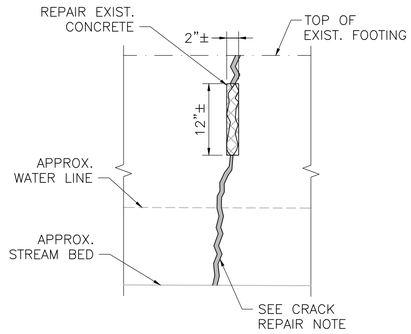
WEST FOOTING EXISTING DETERIORATION

SCALE: 1" = 1'-0"



EAST FOOTING REPAIR DETAIL

SCALE: 1" = 1'-0"



WEST FOOTING REPAIR DETAIL

SCALE: 1" = 1'-0"

CRACK REPAIR NOTE:

FILL IN EXISTING CRACK WITH LOW VISCOSITY AND HIGH EXPANSIVE JOINT MATERIAL. MATERIAL SHALL HAVE LOW ELASTICITY TO ALLOW JOINT MOVEMENTS. SUGGESTED PRODUCTS INCLUDE EITHER SIKAFLEX 1a+ OR DYMONIC 100 OR APPROVED EQUAL.

CONCRETE REPAIR NOTES:

SURFACE PREPARATION

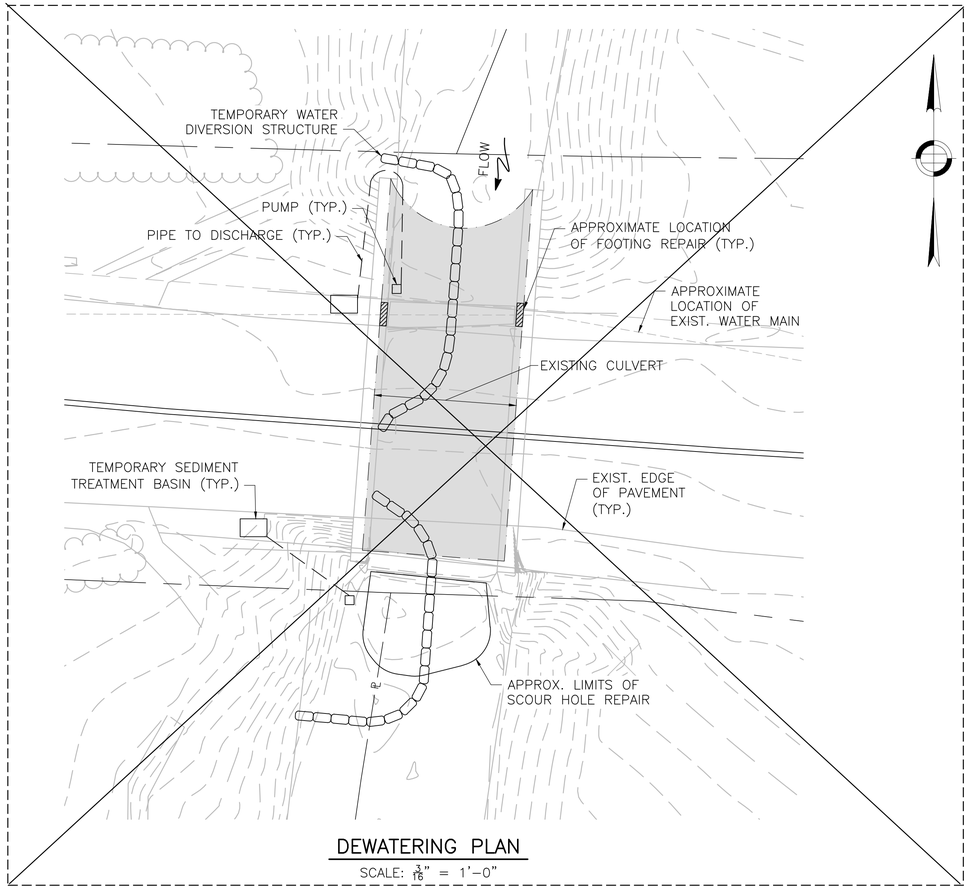
1. THE CONTRACTOR SHALL ESTABLISH LIMITS OF REPAIR AS SHOWN ON THE PLANS AT THE DIRECTION OF THE ENGINEER. THE LOCATIONS SHOWN ON THE PLANS ARE BASED UPON RECORDS OF BRIDGE INSPECTIONS AND OBSERVATION FROM GROUND AND IS NOT GUARANTEED. THE LOCATION AND EXTEND OF THE CONCRETE REPAIR IS TO BE FIELD VERIFIED AND APPROVED BY THE ENGINEER AFTER THE CONTRACTOR HAS SOUNDED AND MARKED OUT THE REPAIR AREAS. REASONABLY FOLLOW OUTLINES OF DETERIORATION AND PREFERABLY WITH SQUARE CORNERS.
2. THE LIMITS OF THE REPAIRS SHALL BE SAWCUT ALONG NEAT LINES TO A DEPTH OF ½" TO PRODUCE A CLEAN EDGE.
3. REMOVE DETERIORATED AND UNSOUND CONCRETE TO SOUND CONCRETE WITH A MINIMUM DEPTH OF 1½" AND MAXIMUM DEPTH OF 6".
4. AFTER REMOVAL AND EDGE PREPARATION ARE COMPLETE, REMOVE BOND INHIBITING MATERIALS (DIRT, GREASE, LOOSELY BOUND AGGREGATE) BY ABRASION BLASTING OR HIGH PRESSURE WATER BLASTING WITH WATER THAN CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. CHECK THE CONCRETE SURFACE AFTER CLEANING TO ENSURE THAT THE SURFACE IS FREE FROM ADDITIONAL LOOSE AGGREGATE OR THAT ADDITIONAL DELAMINATIONS ARE NOT PRESET.
5. PRESOAK CONCRETE SUBSTRATE WITH A WATER HOSE AS LONG AS SITE CONSTRAINTS PERMIT. AT THE TIME OF THE REPIAR CONCRETE PLACEMENT, SUBSTRATE SHALL BE SATURATED SURFACE DRY WITH NO STANDING WATER.

CONCRETE PLACEMENT

6. PATCHING MATERIAL FOR THE CONCRETE REPAIR SHALL BE A MASSDOT APPROVED PRODUCT LISTED ON THE QCML FOR VERTICAL AND OVERHEAD APPLICATION. THE PATCHING MATERIAL TO BE USED SHALL BE SUITABLE FOR THE ANTICIPATED DEPTH OF REPAIR AS SOWN BY PROVIDING MULTIPLE LIFT THICKNESSES OR EXTENDING THE MATERIAL USING AGGREGATE AS RECOMMENDED BY THE MANUFACTURER.

CONCRETE CURING

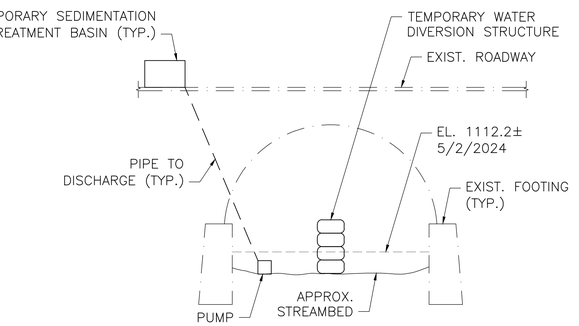
7. CONCRETE REPAIR SHALL BE CURED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.



DEWATERING PLAN

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

⚠ SEE SHEET 10A FOR REVISED PLAN



DEWATERING ELEVATION

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

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE

TEMPORARY WATER CONTROL NOTES:

1. TEMPORARY WATER CONTROL SHALL BE ESTABLISHED TO PERMIT THE CONCRETE REPAIRS, WINGWALLS, AND STREAMBED RESTORATION CONSTRUCTION TO BE PERFORMED IN THE DRY.
2. DEWATERING PLAN AND ELEVATION SHOWN ARE CONCEPTUAL. 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.
3. THE PLAN AND ELEVATION SHOWN IS FOR WORK ON WEST HALF OF THE STREAM. ONCE WORK IS COMPLETED ON THE WEST SIDE OF STREAM THE DIVERSION SHALL BE RESTAGED TO COMPLETE WORK ON THE EAST SIDE OF THE STREAM.
4. ALL DEWATERING AND RELATED EARTHWORK SHALL BE CONDUCTED IN SUCH A MANNER AS TO PREVENT SILTATION OR CONTAMINATION OF THE WATERWAY. THE PUMPING DISCHARGE SHALL BE PUMPED TO A SETTLING BASIN BEFORE BEING DISCHARGED INTO THE WATERWAY.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 2/24/2025 DATE

63 KENDRICK STREET
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GILL ENGINEERING

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DESCRIPTION	DRW. BY	CALC. BY	APPRV. BY	DATE
ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL	MMS	MMS	JEP	2/21/25
RIGHT OF WAY AND SANDBAG LOCATIONS REVISED	MMS	MMS	JEP	10/29/25

REGISTERED PROFESSIONAL ENGINEER — DATE

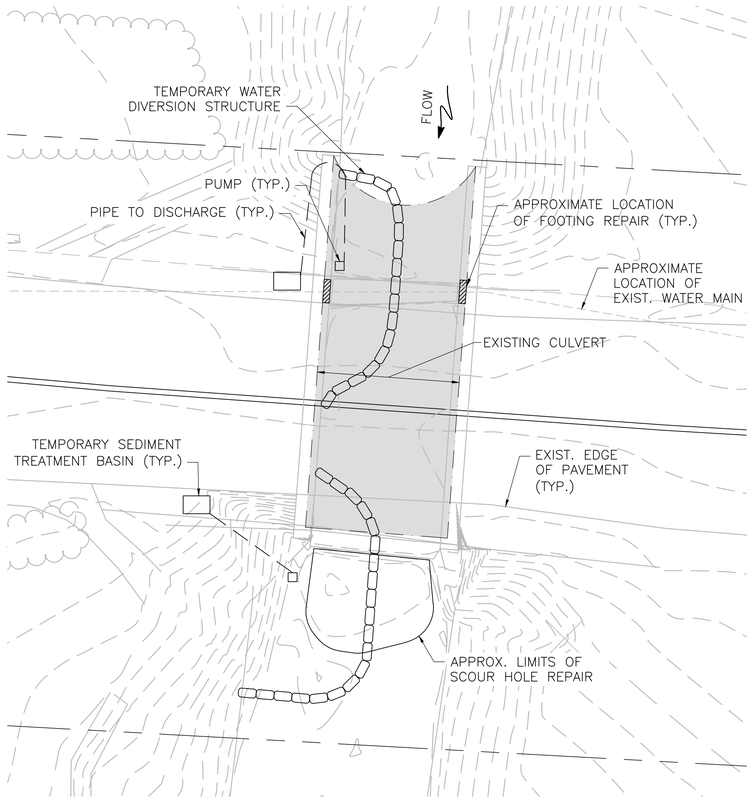
COMMONWEALTH OF MASSACHUSETTS — JOHN PETER RICHARDS — STRUCTURAL No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

FOOTING REPAIR & DEWATERING PLAN

SHEET 10 OF 14



DEWATERING PLAN

SCALE: $\frac{3}{16}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 11/17/2025 DATE

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

GILL ENGINEERING

C:\1024_BRX (FOOTING REPAIR).dwg Plotted on 30-Oct-2025 10:19 AM

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
10/29/25	MMS	MMS	JEP	RIGHT OF WAY AND SANDBAG LOCATIONS REVISED

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS
JOHN PHELPS STRUCTURAL
No. 57216
REGISTERED PROFESSIONAL ENGINEER
10/29/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE C–10–024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

DEWATERING PLAN

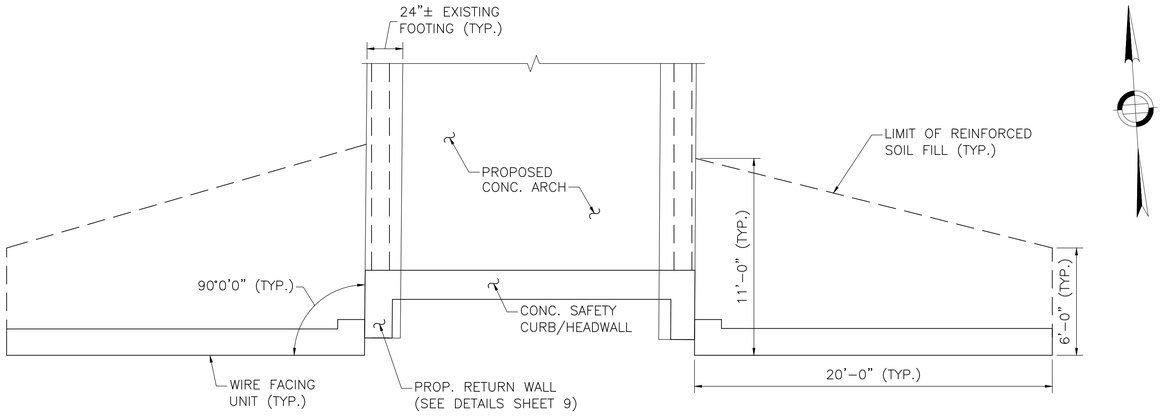
SHEET
10A OF 14

WALL DESIGN TABLE

WALL EXTERNAL STABILITY EVALUATION

DIMENSIONS			
DIMENSION	MAXIMUM	MINIMUM	
WALL HEIGHT (FEET)	15.50	4.00	
BASE WIDTH (FEET)	11.00	6.00	
CAPACITY TO DEMAND RATIO (CDR)			
ECCENTRICITY (CDR>1)	2.90	1.06	
SLIDING RESISTANCE (CDR>1)	2.11	1.48	
BEARING RESISTANCE (CDR>1)	1.43	4.56	
NOMINAL BEARING RESISTANCE (KSF)	12.83	12.83	
RESISTANCE FACTOR	0.45	0.45	
FACTORED BEARING RESISTANCE (KSF)	5.77	5.77	

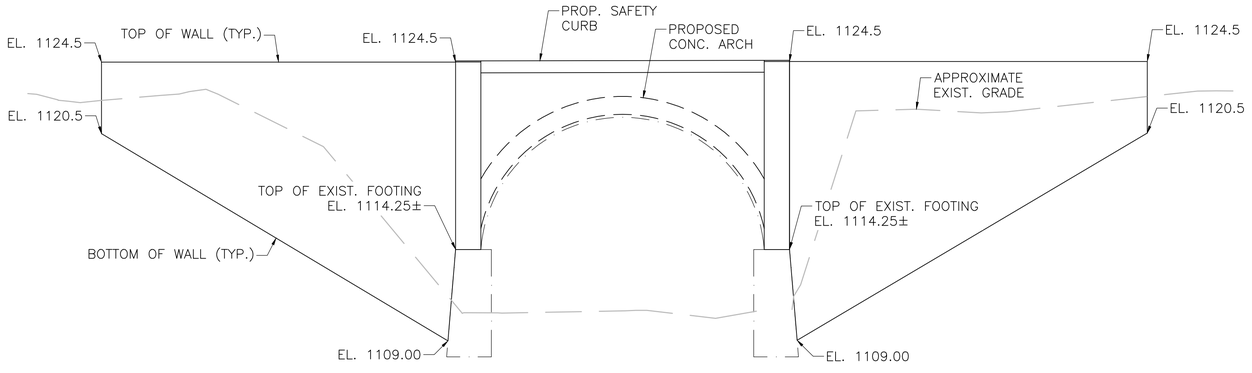
SOIL PARAMETERS			
SOIL DESCRIPTION	TOTAL UNIT WEIGHT (KSF)	FRICTION ANGLE (DEG)	COHESION (KSF)
GRANULAR BACKFILL	0.125	37	0
RETAINED SOIL (SOUTHWEST WALL)	0.125	0	3.25
FOUNDATION SOIL (SOUTHWEST WALL)	0.125	0	3.25
RETAINED SOIL (SOUTHEAST WALL)	0.125	35	0
FOUNDATION SOIL (SOUTHEAST WALL)	0.125	35	0



NOTE: BRIDGE RAIL AND APPROACH GUARDRAIL NOT SHOWN FOR CLARITY.

WINGWALL PLAN

SCALE: ¼" = 1'-0"



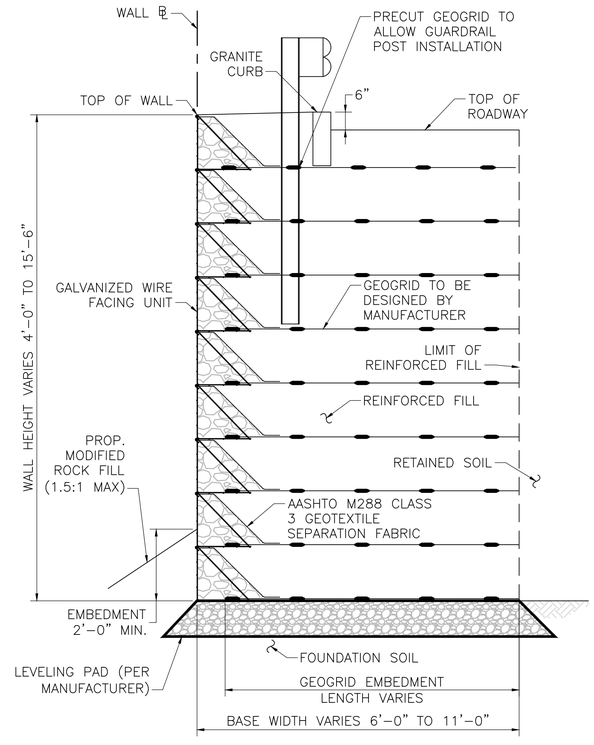
NOTE: BRIDGE RAIL AND APPROACH GUARDRAIL NOT SHOWN FOR CLARITY.

WINGWALL ELEVATION

SCALE: ¼" = 1'-0"

MSE WINGWALL NOTES:

1. THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN CALCULATIONS, SHOP DRAWINGS, AND SPECIFICATIONS IN ACCORDANCE WITH THE CONTRACT SPECIAL PROVISIONS.
2. PLANS, ELEVATIONS, AND DETAILS SHOWN ON THE CONTRACT DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS, HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENT AND DETAILS SHOWN.
3. DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF 2 FEET
4. THE BASE LENGTH PROVIDED IN THE TABLE REPRESENTS THE MINIMUM LENGTH NEEDED FOR EXTERNAL STABILITY AT THE DESIGNATED HEIGHT WHICH SHALL NOT BE CONSIDERED ALL INCLUSIVE.
5. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD AND MASSDOT THE DESIGN CALCULATIONS FOR APPROVAL PRIOR TO CONSTRUCTION.
6. GUARDRAIL POSTS THAT WILL EXTEND INTO THE REINFORCED BACKFILL OF THE MSE WINGWALLS MUST BE CONSTRUCTED WITH VERTICAL PIPE SLEEVES OR GEOGRID MUST BE PRE-CUT IN THE REINFORCED BACKFILL TO PERMIT GUARDRAIL POST INSTALLATION WITHOUT DAMAGE TO THE REINFORCED BACKFILL.
7. AS A MINIMUM, ALL BACKFILL MATERIALS USED IN THE MSE WALL VOLUME SHALL CONFORM TO THE GRADATION REQUIREMENTS FOR GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES, M1.03.0 TYPE C, OR AS SPECIFIED BY THE MSE WALL MANUFACTURER.



TYPICAL WINGWALL SECTION

NOT TO SCALE

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF MASS. GEN. LAWS CH 85 S 35
STATE BRIDGE ENGINEER — 2/24/2025 DATE

63 KENDRICK STREET
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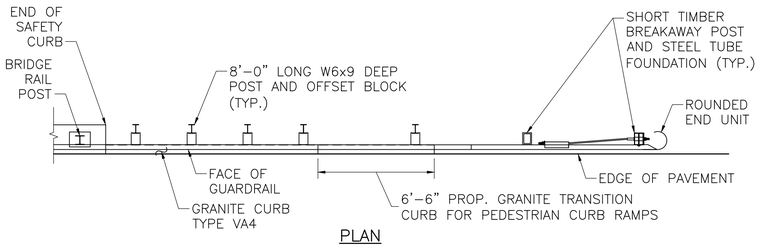
REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS — JOHN P. HILTS — STRUCTURAL — No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

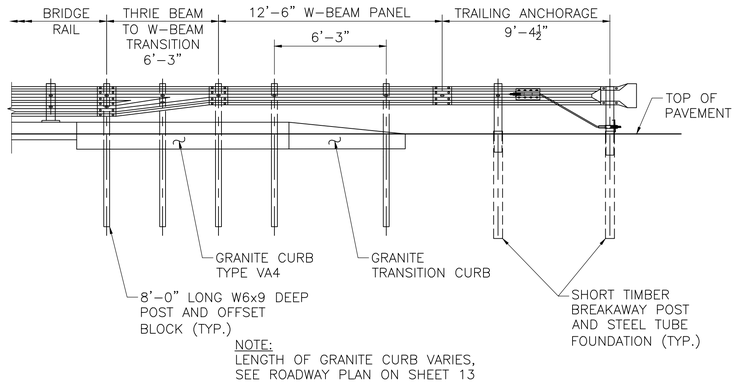
CULVERT STRENGTHENING
TOWN OF CHESHIRE
CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

MSE WINGWALL DETAILS

SHEET 11 OF 14



PLAN

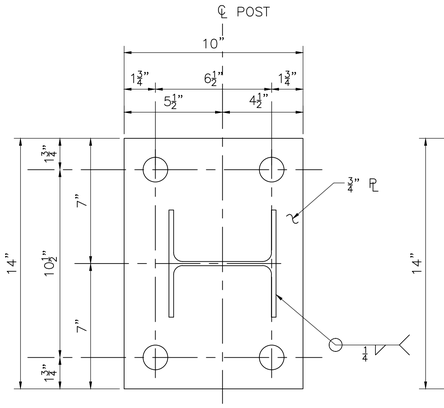


NOTE:
LENGTH OF GRANITE CURB VARIES, SEE ROADWAY PLAN ON SHEET 13

ELEVATION

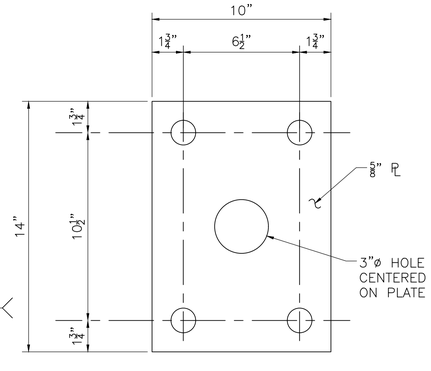
GUARDRAIL APPROACH TRANSITION

SCALE: ¼" = 1'-0"



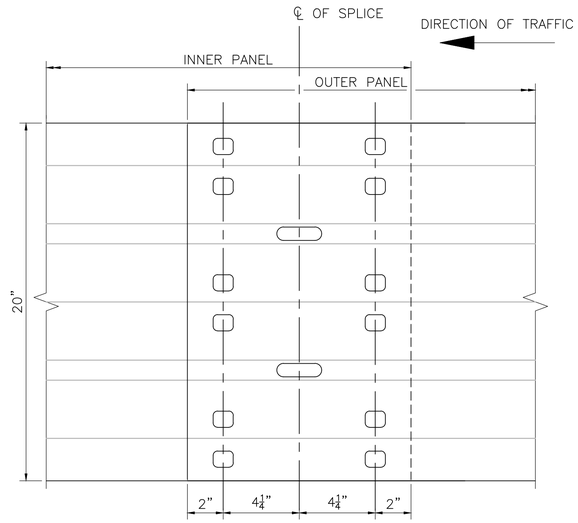
THRIE BEAM POST BASE PLATE DETAIL

SCALE: 3" = 1'-0"



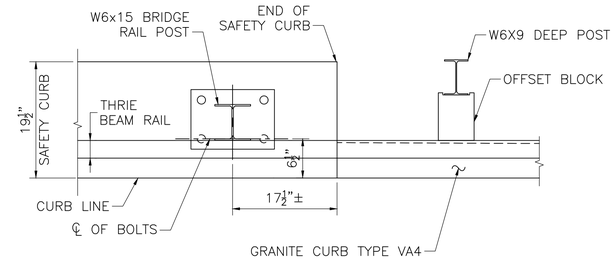
ANCHOR PLATE DETAIL

SCALE: 3" = 1'-0"



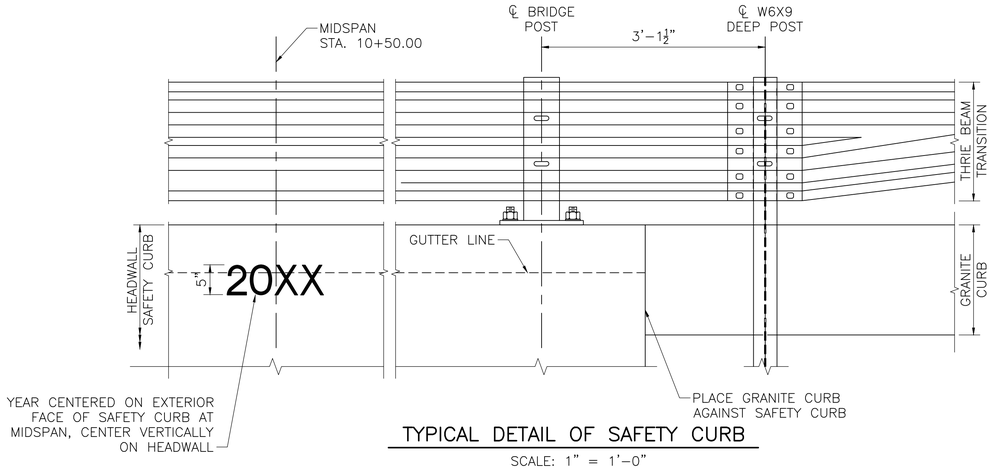
THRIE BEAM RAIL SPLICE ELEVATION

SCALE: 1" = 1'-0"



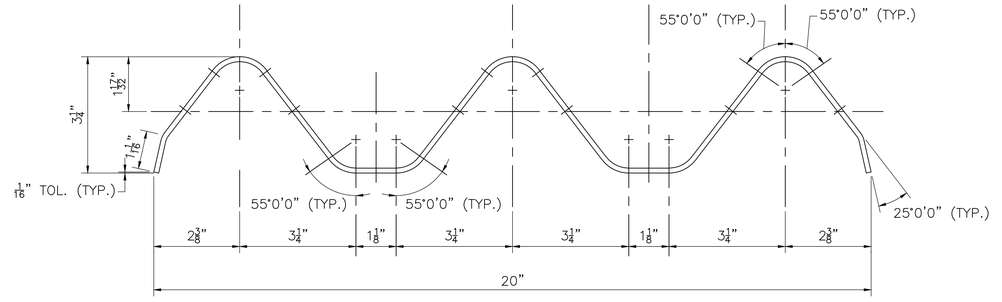
TYPICAL DETAIL END OF SAFETY CURB

SCALE: 1" = 1'-0"



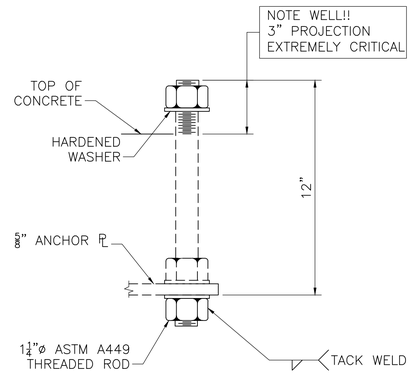
TYPICAL DETAIL OF SAFETY CURB

SCALE: 1" = 1'-0"



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
STATE BRIDGE ENGINEER — 2/24/2025 DATE

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

GILL ENGINEERING

C10024_BR9.DWG Plotted on 21-Feb-2025 4:47 PM

DESCRIPTION	DATE
ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL	

DRW. BY: MMS | CALC. BY: MMS | APPRV. BY: JEP | DATE: 2/21/25

REGISTERED PROFESSIONAL ENGINEER

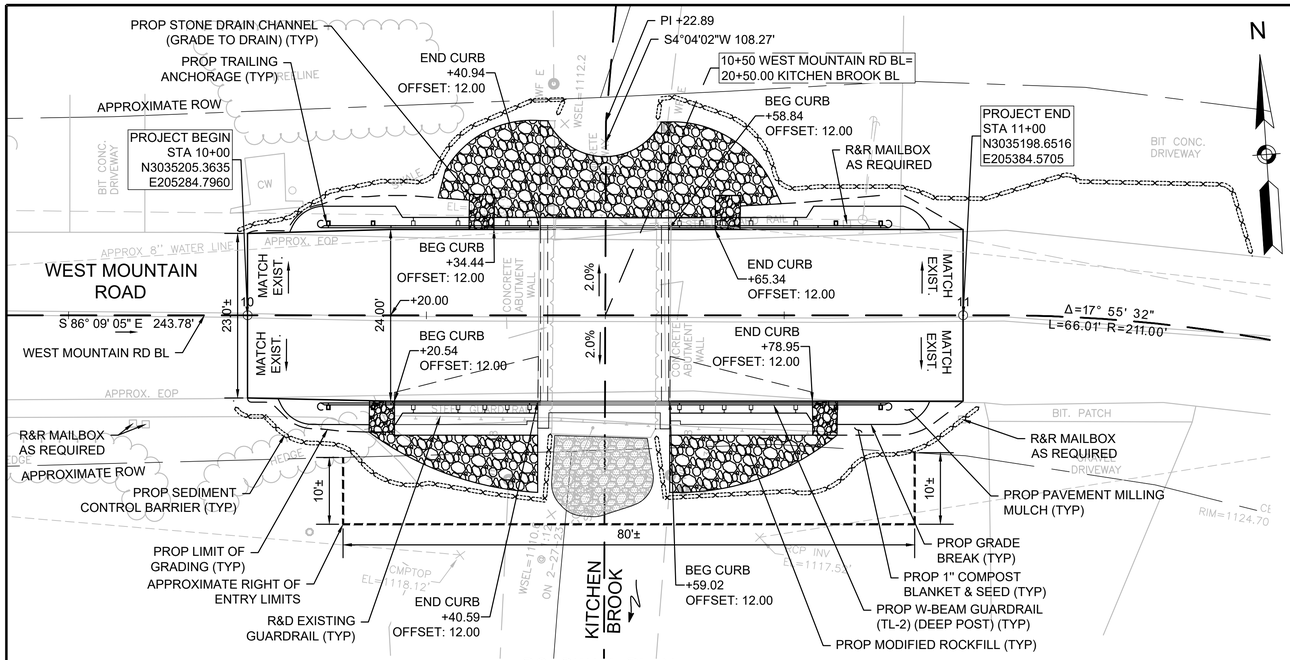
COMMONWEALTH OF MASSACHUSETTS — JOHN PHILIP PRESTES — STRUCTURAL — No. 57216 — REGISTERED PROFESSIONAL ENGINEER — 2/21/2025

CULVERT STRENGTHENING
TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

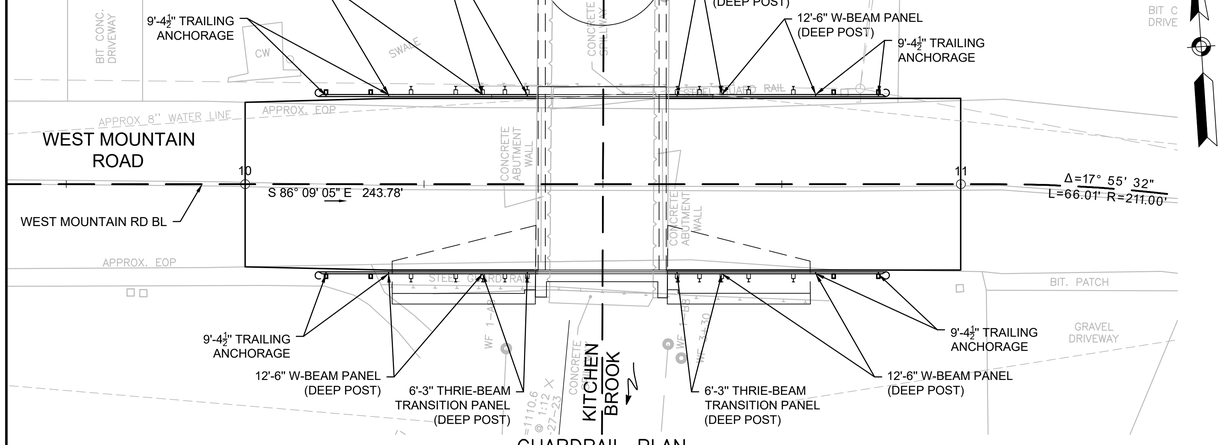
RAILING DETAILS

SHEET
12 OF 14



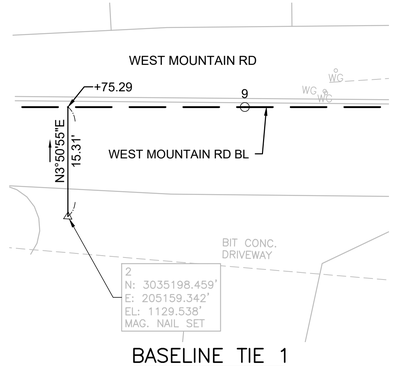
ROADWAY PLAN

SCALE: 1" = 10'



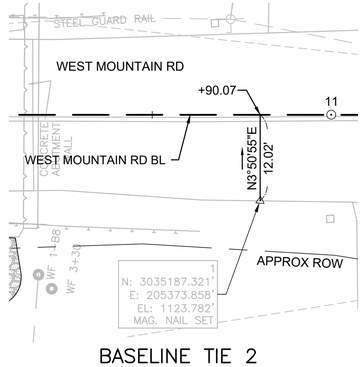
GUARDRAIL PLAN

SCALE: 1" = 10'



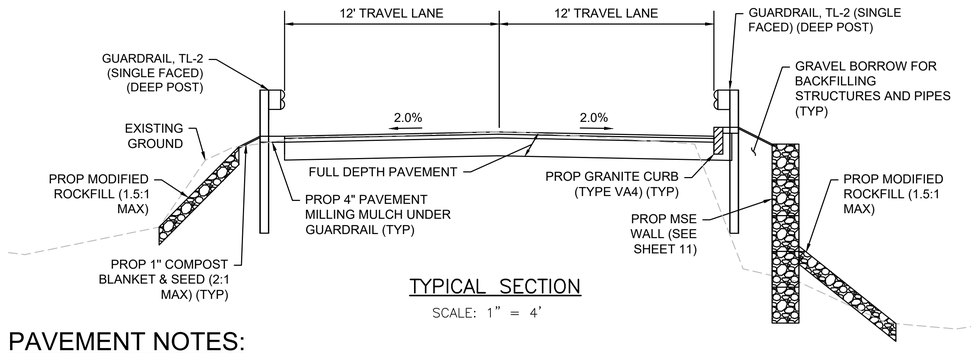
BASELINE TIE 1

SCALE: 1" = 10'



BASELINE TIE 2

SCALE: 1" = 10'



TYPICAL SECTION

SCALE: 1" = 4'

HOR. SCALE IN FEET 4 0 4 8

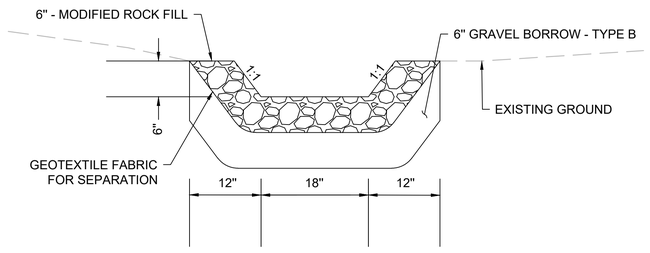
VER. SCALE IN FEET 4 0 4 8

PAVEMENT NOTES:

PROPOSED FULL DEPTH PAVEMENT

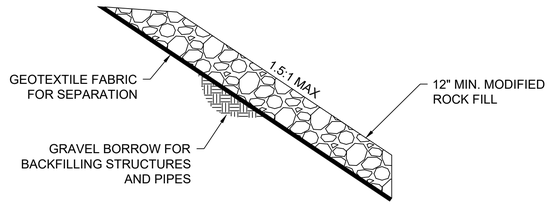
SURFACE COURSE: 1.5" HOT MIX ASPHALT - SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER ASPHALT EMULSION FOR TACK COAT OVER
2.5" HOT MIX ASPHALT - SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5)

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



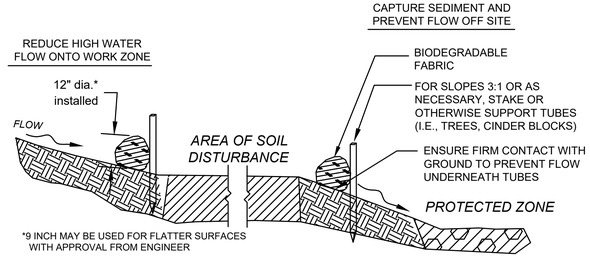
STONE DRAIN CHANNEL

NOT TO SCALE

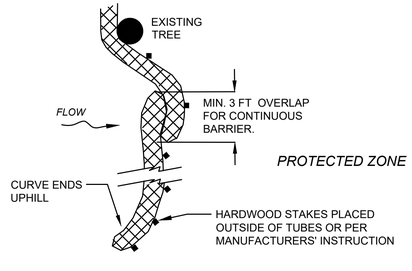


MODIFIED ROCK FILL

NOT TO SCALE



SECTION



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

SEDIMENT BARRIER – COMPOST FILTER TUBE

NOT TO SCALE

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GILL ENGINEERING

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DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION	DATE
2/21/25	PFO	PFO	SBC	ISSUED FOR CONSTRUCTION UPON CHAPTER 85 APPROVAL	

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS JOHN PHELPS STRUCTURAL No. 57216 REGISTERED PROFESSIONAL ENGINEER 2/21/2025

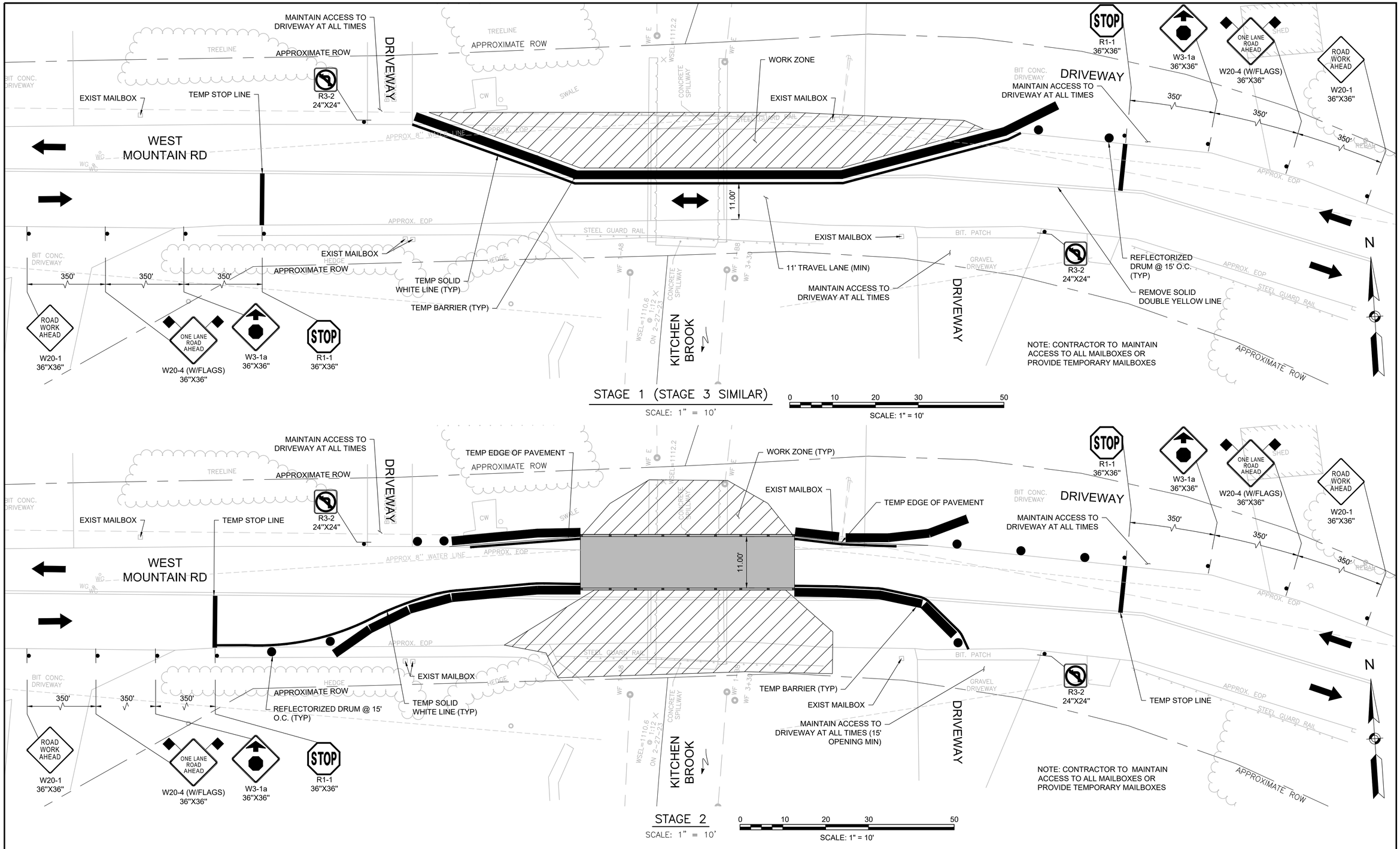
CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

ROADWAY PLAN AND TYPICAL SECTION

SHEET 13 OF 14



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

- REFLECTORIZED DRUM
- WORK ZONE
- DIRECTION OF TRAFFIC
- SIGN
- TEMPORARY BARRIER

GILL ENGINEERING
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COMMONWEALTH OF MASSACHUSETTS JOHN PHELPS STRUCTURAL No. 57216 REGISTERED PROFESSIONAL ENGINEER 2/21/2025

CULVERT STRENGTHENING

TOWN OF CHESHIRE

CULVERT STRENGTHENING FOR CHESHIRE
C-10-024 (AB2)
WEST MOUNTAIN ROAD OVER KITCHEN BROOK

TEMPORARY TRAFFIC CONTROL PLAN

SHEET 14 OF 14