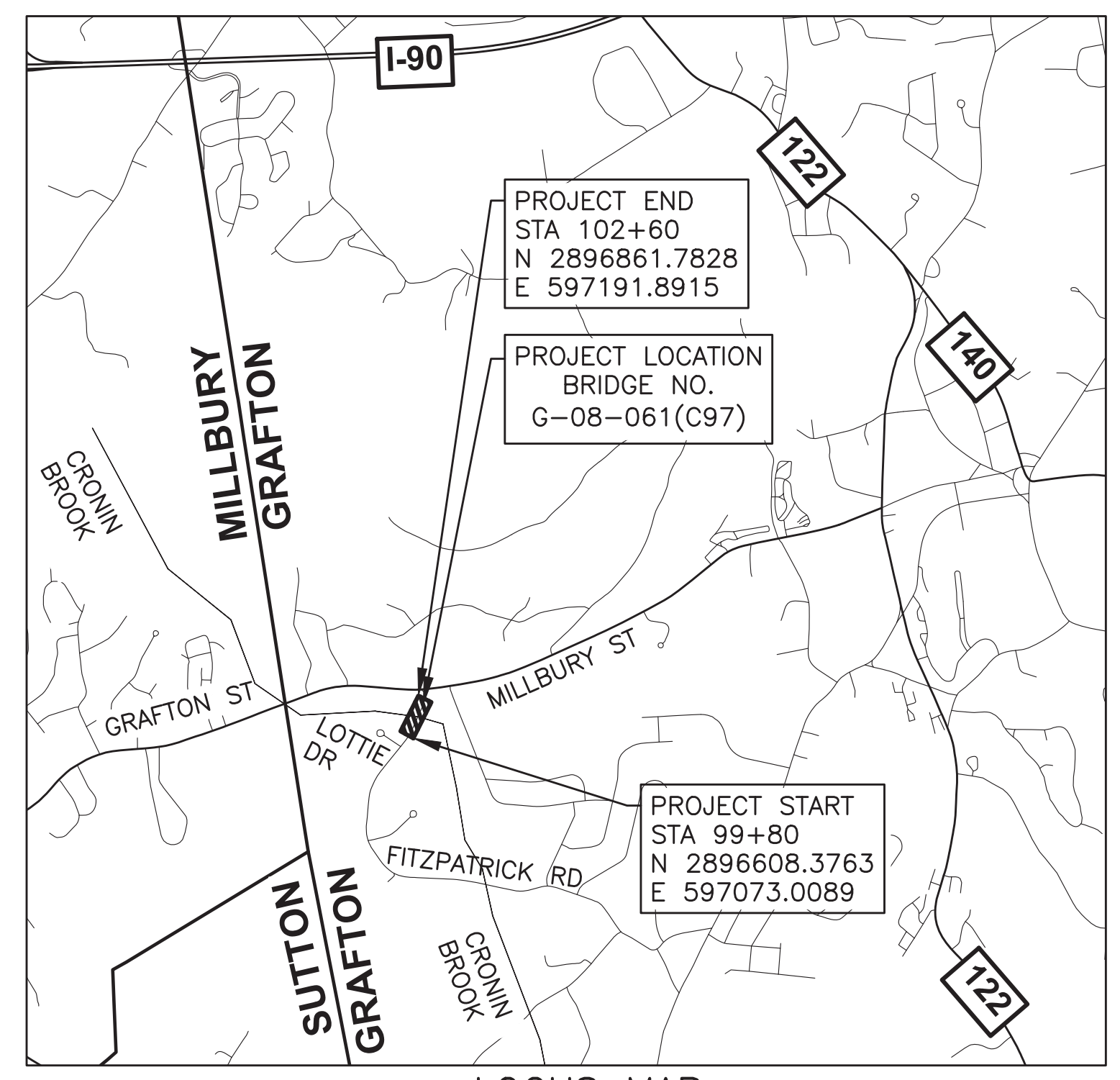


T1060_FITZPATRICK_KEYPLAN_PROF.DWG Printed on 28-Mar-2022 8:35 AM CHAPTER 85 SUBMISSION MARCH 28, 2022

**GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK**

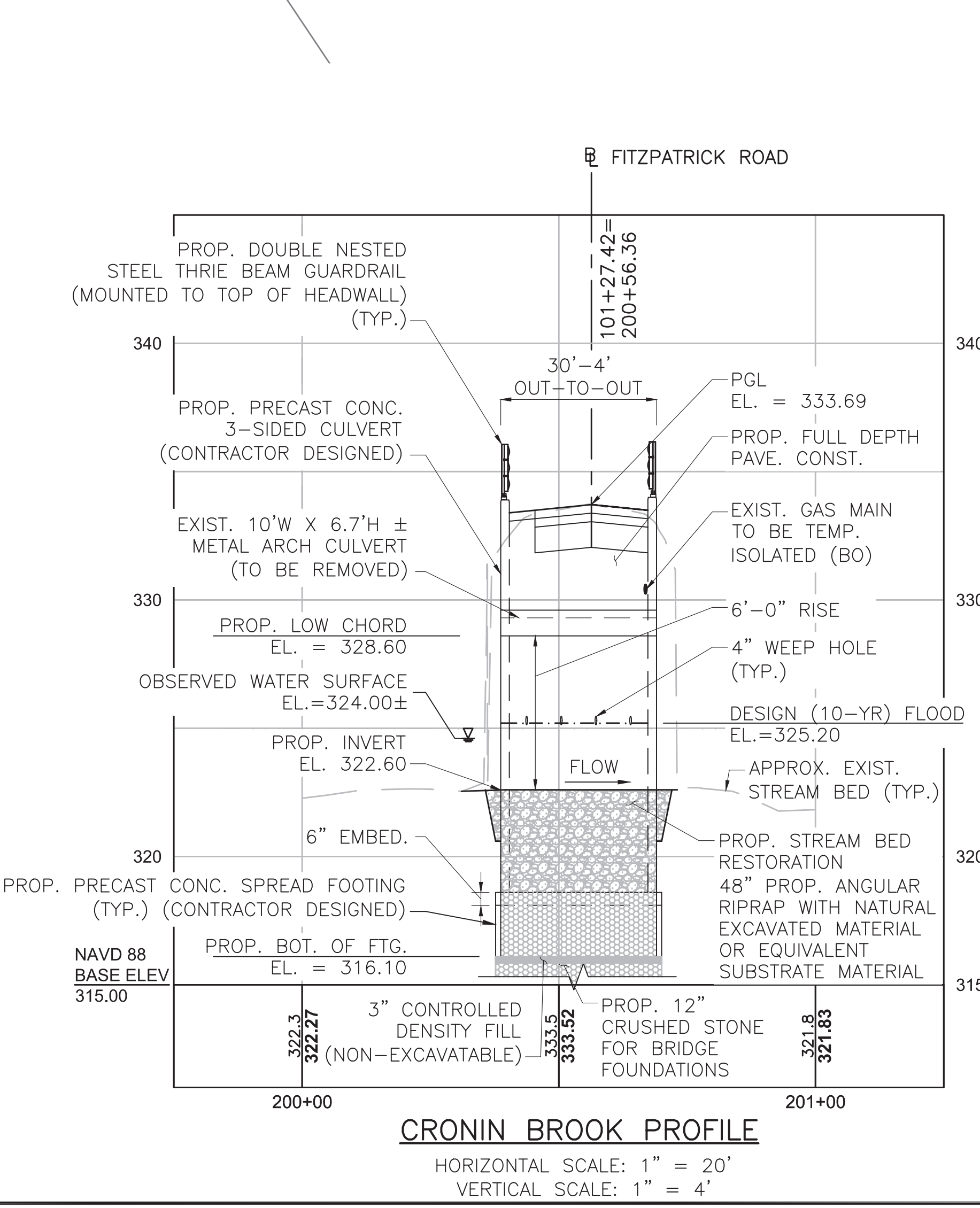
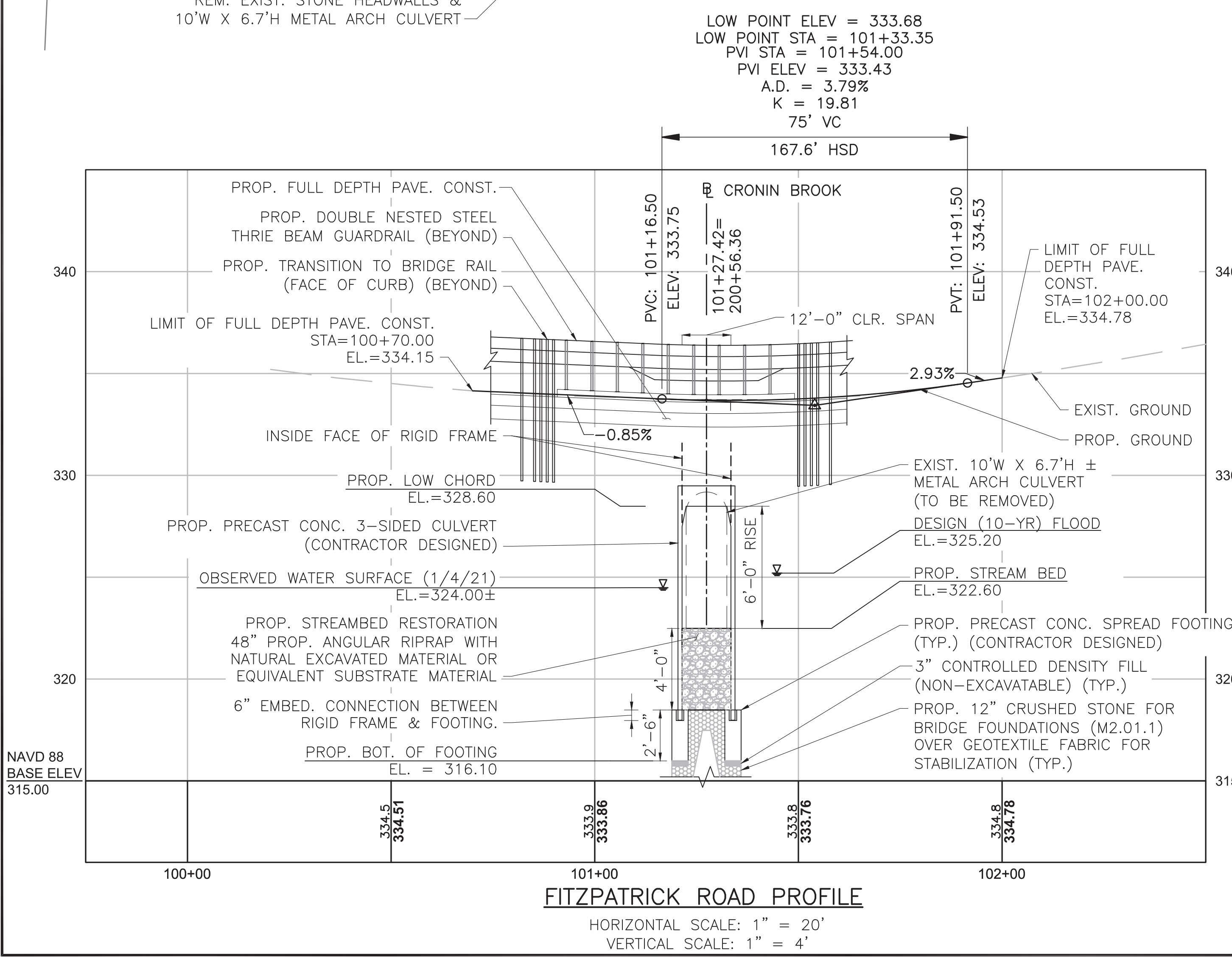
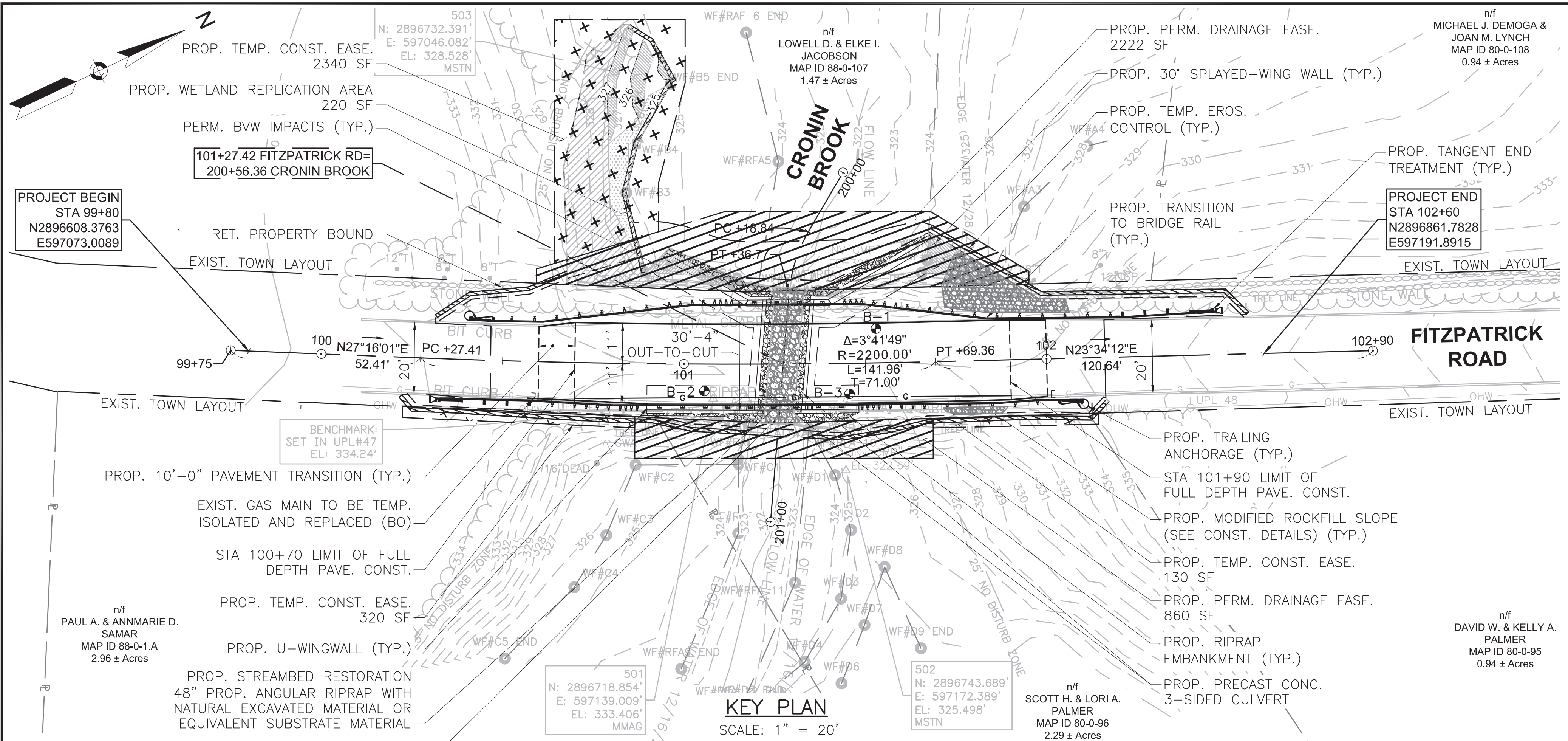
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	9
PROJECT FILE NO.		T1060	

KEY PLAN AND PROFILES



INDEX

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1	KEY PLAN AND PROFILES
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10	PREFABRICATION TOLERANCES
10A	TTCP (DETOUR PLAN)
10B	TTCP (SIGN AND SUMMARY)



**COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING**

DISTRICT 3 BRIDGE ENGINEER _____ **DATE** _____

3/28/2022 ISSUED FOR CONSTRUCTION

TEC
The Engineering Corp
146 Dascomb Road
Andover, MA 01810
169 Ocean Blvd
Hampton, NH 03842

**PROPOSED CULVERT REPLACEMENT
GRAFTON**
FITZPATRICK ROAD
OVER CRONIN BROOK
TOWN OF GRAFTON
30 PROVIDENCE ROAD
GRAFTON, MA 01519

GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	9
PROJECT FILE NO.		T1060	

GENERAL NOTES

GENERAL NOTES

DESIGN:

IN ACCORDANCE WITH THE 2017 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, FOR HL-93 LOADING. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH MASSDOT 2022 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

CHAPTER 85 SECTION 35 REVIEW AND APPROVAL:

IN ACCORDANCE AND COMPLIANCE WITH THE REQUIREMENTS OF CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS, THE CONTRACTOR SHALL SUBMIT TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION ALL CONSTRUCTION DRAWINGS AND DESIGN CALCULATIONS THAT SHALL BE USED TO FABRICATE AND CONSTRUCT THE STRUCTURE DENOTED ON THESE PLANS FOR REVIEW AND APPROVAL. THIS APPROVAL SHALL CONSTITUTE THE FINAL APPROVAL AS STIPULATED BY CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS.

SURVEY BENCHMARKS:

BMRK
SET IN UPL #47
EL: 334.240'

501:
N: 2896718.854
E: 597139.009
EL: 333.406'

502:
N: 2896743.689
E: 597172.389
EL: 325.498'

503:
N: 2896732.391
E: 597046.082
EL: 328.528'

DATE:

TO BE PLACED ON THE OUTSIDE FACE OF BOTH HEADWALLS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HEADWALL IS CONSTRUCTED. BOTH HEADWALLS SHALL FEATURE THE SAME DATE.

SURVEY NOTES:

THE HORIZONTAL DATUM FOR THIS SURVEY IS THE MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE. THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS OBSERVATIONS UTILIZING REALIZATION NAD83(2011) AND GEOID 12A.

THE LIMIT OF BORDERING VEGETATED WETLANDS SHOWN HEREON WAS DELINEATED BY RIMMER ENVIRONMENTAL CONSULTING, LLC. AND FLAGS WERE LOCATED VIA FIELD SURVEY BY BAY COLONY GROUP, INC.

THIS PLAN IS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY BAY COLONY GROUP, INC. IN DECEMBER 2020.

ABUTTING PROPERTY LINES HAVE BEEN COMPILED FROM RECORD INFORMATION.

SCALES:

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

FOUNDATIONS:

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.

UNSUITABLE MATERIAL:

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

ANCHOR BOLTS:

ALL ANCHOR BOLTS SHALL BE SET BY TEMPLATE BEFORE THE CONCRETE IS PLACED.

CONCRETE:

PRECAST ELEMENTS:

THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF LIFT HOOKS FOR ALL PRECAST ELEMENTS. UNDER NO CIRCUMSTANCES WILL THE REBAR ELEMENTS SHOWN ON THE PLANS BE USED TO LIFT THE PRECAST ELEMENTS. FOR ADDITIONAL REQUIREMENTS, REFER TO THE "PRECAST CONCRETE ELEMENTS" PORTION OF ITEM 995.1 IN THE SPECIAL PROVISIONS.

THE FOLLOWING CONCRETE MIX ARE TO BE USED:

5000 PSI, 3/4 IN, 685 HP: PRECAST CULVERT, PRECAST HEADWALL, PRECAST WINGWALLS, AND PRECAST CULVERT FOOTINGS.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED. 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 < 3db, OR CLEAR SPACING < 6db	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2. AND 3.	26"	32"	39"
6. CONDITION 2. AND 4.	24"	30"	36"

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

WATERPROOFING:

ALL WATERPROOFING USED ON TOP SLAB OF PRECAST RIGID FRAME SHALL BE BITUMINOUS DAMP-PROOFING. BITUMINOUS DAMP-PROOFING SHALL EXTEND DOWN TO THE BOTTOM OF THE RIGID FRAME LEGS.

EXISTING CONDITIONS:

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

TRAFFIC:

THE BRIDGE WILL BE CLOSED TO VEHICULAR TRAFFIC DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION. VEHICULAR TRAFFIC WILL BE DETOURED AS SHOWN ON THE PLANS.

UTILITIES:

DURING CONSTRUCTION, THE CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL UTILITIES THAT ARE TO REMAIN. ALL EXISTING UTILITY POLES AND OVERHEAD WIRES SHALL BE LEFT IN PLACE DURING CONSTRUCTION. ANY TEMPORARY UTILITY SUPPORTS OR UTILITY RELOCATIONS REQUIRED AND SHOWN ON THE CONSTRUCTION DRAWINGS SHALL BE COORDINATED WITH THE ENGINEER.

THE EXISTING GAS LINE SHALL BE TEMPORARILY ISOLATED AND CUT AND CAPPED TO ALLOW FOR CONSTRUCTION OF THE STRUCTURE (CULVERT AND WINGWALLS). AFTER THE STRUCTURES ARE CONSTRUCTED AND BACKFILLED, THE EXISTING GAS LINE SHALL BE RELOCATED TO ITS FINAL POSITION.

APPROACH GUARDRAIL IS IN CLOSE PROXIMITY TO THE EXISTING GAS LINE. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF EXISTING GAS LINE PRIOR TO DRIVING GUARDRAIL POSTS. IN CASE OF CONFLICT, THE CONTRACTOR SHALL BE PERMITTED TO USE THE DETAIL TITLED "ENCASED POST FOR SHALLOW MOUNT" (400.5.1). THE CONTRACTOR SHALL CONTACT DIGSAFE WHEN LOCATING THE PROPOSED GUARDRAIL POSTS.

CONTROL OF WATER SYSTEM:

CONTROL OF WATER SYSTEM SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL, PER ITEM 991.1. THE CONTROL OF WATER SYSTEM SHALL BE DESIGNED USING THE 2-YEAR DESIGN FLOOD EVENT OF 52± CFS. APPROXIMATE LIMITS SHOWN ON THIS PLAN ARE CONCEPTUAL AND THE FINAL LOCATION SHALL BE DETERMINED BY THE CONTRACTOR.

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	1000
DESIGN SPECTRA	
As	0.104
SDs	0.221
SD1	0.091
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA	
DRAINAGE AREA (SQ. MILES)	2
DESIGN FLOOD DISCHARGE (C.F.S.)	96
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	3.5
DESIGN FLOOD ELEVATION (FEET, NAVD)	325.2
BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	165.0
BASE FLOOD ELEVATION (FEET, NAVD)	325.9
DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	6.4
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	--
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	7.1
CHECK FLOOD PIER SCOUR DEPTH (FEET)	--
FLOOD OF RECORD	
DISCHARGE (C.F.S.)	--
FREQUENCY (IF KNOWN, YEARS)	--
MAXIMUM ELEVATION (FEET, NAVD)	--
DATE (MM/YYYY)	--
HISTORY OF ICE FLOES	--
EVIDENCE OF SCOUR AND EROSION	--

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING

DISTRICT 3 BRIDGE ENGINEER DATE

BORING LOG B-1

TEST BORING LOG														
MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641					Project: <u>Fitzpatrick Rd. - Cronin Brook</u> Grafton, MA Project No: <u>20.230.NH</u> Date Start: <u>01-07-21</u> Date End: <u>01-07-21</u>					Sheet <u>1</u> of <u>1</u> Boring No: <u>B-1</u> Location: <u>See Plan</u> Approx. Surface Elev: <u>333 ±</u>				
GROUNDWATER OBSERVATIONS														
CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period									
Type: HSA	SS	01-07-21	9'	13'	Upon Completion									
Size: 2-1/4" ID	1-3/8" ID													
Hammer: 140 lbs.														
Fall: 30"														
Depth/Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes		
0-333		-	0.0-0.3	4							c. 4" Asphalt			
		S-1	0.9-2.0	13	7		3/1"	19	18		S-1: Brown, fine to coarse sand, some gravel, trace silt (FILL)			
		S-2	2.0-4.0	24	13	11	14	19	22		S-2: Brown, fine to coarse sand, some gravel, trace silt (L21011A) (FILL)			
		S-3	4.0-6.0	24	7	11	15	17	20		S-3: Brown, fine to coarse sand, little gravel, little silt (FILL)			
5-328		S-4	6.0-7.5	18	6	22	18	12			S-4: Brown, fine to coarse sand, little gravel, little silt (FILL)			
		S-4A	7.5-8.0	6	2				33		S-4A: Dark brown, fine to medium sand, some silt, trace gravel (Organic Layer)			
10-323		S-5	9.0-11.0	24	9	63	42	31	26		S-5: Brown, fine to coarse sand, some gravel, trace silt, wet			
		Auger Refusal at 13'												
		BORING TERMINATED AT 13 ft												
15-318		BORING TERMINATED AT 13 ft												
20-313		BORING TERMINATED AT 13 ft												
25-308		BORING TERMINATED AT 13 ft												
30-303		BORING TERMINATED AT 13 ft												
Driller: R. Marcoux		COHESIVE CONSISTENCY (Blows/foot)			COHESIONLESS (Blows/foot)			PROPORTIONS USED						
Helper: J. Donahue		0-2 VERY SOFT			0-4 VERY LOOSE			TRACE 0-10%						
Inspector: T. Young		2-4 SOFT			4-10 LOOSE			LITTLE 10-20%						
		4-8 MEDIUM STIFF			10-30 MEDIUM DENSE			SOME 20-35%						
		8-15 STIFF			30-50 DENSE			AND 35-50%						
		15-30 HARD			50+ VERY DENSE									
NOTES: Auger Refusal at 13', moved 5' south. Auger refusal at 10.5'														
REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.														

EXIST. GROUND SURFACE
EL=333.0±

OBSERVED GROUNDWATER (1/7/21)
EL=324.0±

PROP. BOT. OF FOOTING
EL=316.10

BORING LOG B-2

TEST BORING LOG														
MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641					Project: <u>Fitzpatrick Rd. - Cronin Brook</u> Grafton, MA Project No: <u>20.230.NH</u> Date Start: <u>01-07-21</u> Date End: <u>01-07-21</u>					Sheet <u>1</u> of <u>1</u> Boring No: <u>B-2</u> Location: <u>See Plan</u> Approx. Surface Elev: <u>333 ±</u>				
GROUNDWATER OBSERVATIONS														
CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period									
Type: HSA	SS	01-07-21	11'	26'	Upon Completion									
Size: 2-1/4" ID	1-3/8" ID													
Hammer: 140 lbs.														
Fall: 30"														
Depth/Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes		
0-333		-	0.0-0.3	4							c. 4" Asphalt			
		S-1	0.5-2.0	18	10		21	29	28		S-1: Brown, fine to coarse sand, some gravel, trace silt (FILL)			
		S-2	2.0-4.0	24	9	28	28	55	35		S-2: Brown, fine to coarse sand, some gravel, little silt (FILL)			
		S-3	4.0-6.0	24	9	12	13	9	8		S-3: Brown, fine to coarse sand, some gravel, trace silt (FILL)			
5-328		S-4	6.0-8.0	24	4	7	9	10	10		S-4: Brown, fine to coarse sand, some gravel, trace silt (FILL)			
		S-5	9.0-11.0	24	12	14	16	12	18		S-5: Dark brown, fine sand and organic silt, trace gravel (Organic Layer)			
10-323		S-6	11.0-13.0	24	13	31	23	18	14		S-6: Gray, fine to coarse sand, some gravel, little silt, wet (L21011B)			
		S-7	14.0-16.0	24	7	5	21	13	11		S-7: Brown, fine to coarse sand, some subangular gravel, trace silt, wet			
15-318		S-8	19.0-21.0	24	4	11	22	23	22		S-8: Brown, fine to medium sand, some gravel, some silt, wet	(1)		
20-313		S-9	24.0-26.0	24	5	15	13	12	12		S-9: Brown, silt, some fine sand, wet	(2)		
25-308		BORING TERMINATED AT 26 ft												
30-303		BORING TERMINATED AT 26 ft												
Driller: R. Marcoux		COHESIVE CONSISTENCY (Blows/foot)			COHESIONLESS (Blows/foot)			PROPORTIONS USED						
Helper: J. Donahue		0-2 VERY SOFT			0-4 VERY LOOSE			TRACE 0-10%						
Inspector: T. Young		2-4 SOFT			4-10 LOOSE			LITTLE 10-20%						
		4-8 MEDIUM STIFF			10-30 MEDIUM DENSE			SOME 20-35%						
		8-15 STIFF			30-50 DENSE			AND 35-50%						
		15-30 HARD			50+ VERY DENSE									
NOTES: (1) Rock in tip of split-spoon. (2) 5' of blow-in, in augers.														
REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.														

EXIST. GROUND SURFACE
EL=333.0±

OBSERVED GROUNDWATER (1/7/21)
EL=322.0±

PROP. BOT. OF FOOTING
EL=316.10

BORING LOG B-3

TEST BORING LOG														
MILLER ENGINEERING & TESTING, INC. 100 Sheffield Road - Manchester, NH 03103 Ph. (603) 668-6016 - Fax: (603) 668-8641					Project: <u>Fitzpatrick Rd. - Cronin Brook</u> Grafton, MA Project No: <u>20.230.NH</u> Date Start: <u>01-07-21</u> Date End: <u>01-07-21</u>					Sheet <u>1</u> of <u>1</u> Boring No: <u>B-3</u> Location: <u>See Plan</u> Approx. Surface Elev: <u>333 ±</u>				
GROUNDWATER OBSERVATIONS														
CASING	SAMPLER	Date	Depth	Casing At	Stabilization Period									
Type: HSA	SS	01-07-21	11'	18.5'	Upon Completion									
Size: 2-1/4" ID	1-3/8" ID													
Hammer: 140 lbs.														
Fall: 30"														
Depth/Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes		
0-333		-	0.0-0.3	4							c. 4" Asphalt			
		-	0.3-9.0	104							-- Auger Cuttings - brown, fine to coarse sand, some gravel, little silt (FILL)			
		S-1	9.0-11.0	24	9	2	3	2	3		S-1: Black organic silt, trace fine to medium sand, trace gravel (Organic Layer)			
		S-2	11.0-13.0	24	4	18	17	19	30		S-2: Gray, fine to coarse sand, some gravel, little silt, wet			
		S-3	14.0-16.0	24	6	11	22	32	33		S-3: Gray, fine to coarse sand, some gravel, little silt, wet			
5-328		Auger Refusal at 18.5'												
		BORING TERMINATED AT 18.5 ft												
10-323		BORING TERMINATED AT 18.5 ft												
15-318		BORING TERMINATED AT 18.5 ft												
20-313		BORING TERMINATED AT 18.5 ft												
25-308		BORING TERMINATED AT 18.5 ft												
30-303		BORING TERMINATED AT 18.5 ft												
Driller: R. Marcoux		COHESIVE CONSISTENCY (Blows/foot)			COHESIONLESS (Blows/foot)			PROPORTIONS USED						
Helper: J. Donahue		0-2 VERY SOFT			0-4 VERY LOOSE			TRACE 0-10%						
Inspector: T. Young		2-4 SOFT			4-10 LOOSE			LITTLE 10-20%						
		4-8 MEDIUM STIFF			10-30 MEDIUM DENSE			SOME 20-35%						
		8-15 STIFF			30-50 DENSE			AND 35-50%						
		15-30 HARD			50+ VERY DENSE									
NOTES:														
REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.														

EXIST. GROUND SURFACE
EL=333.0±

OBSERVED GROUNDWATER (1/7/21)
EL=322.0±

PROP. BOT. OF FOOTING
EL=316.10

BORING NOTES:

- LOCATION OF BORINGS SHOWN ON THE PLAN THUS:
- BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
- 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.
- FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 4.25 I.D. HOLLOW STEM AUGER 6" USING A 140 POUND WEIGHT FALLING 30".
- ALL BORINGS WERE MADE IN JANUARY OF 2021 BY MILLER ENGINEERING & TESTING.
- THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING

DISTRICT 3 BRIDGE ENGINEER _____ DATE _____

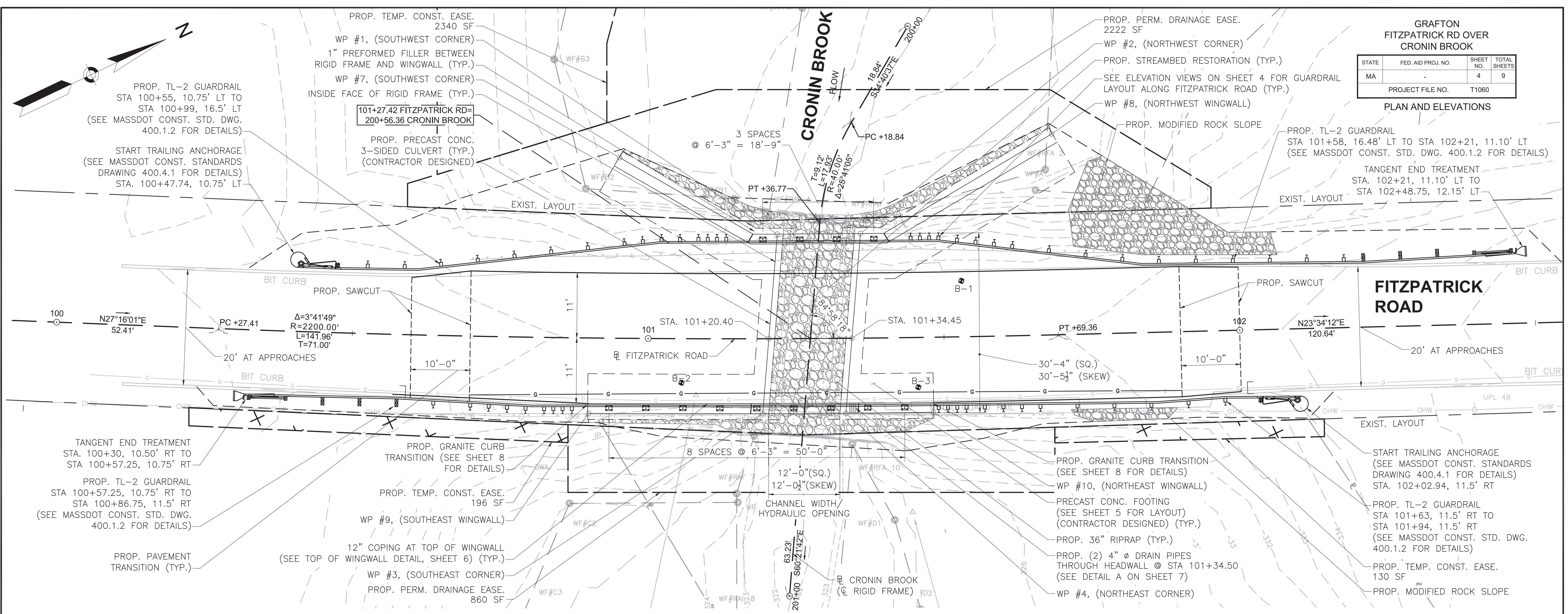
T1060_FITZPATRICK_(BORING LOGS).DWG Picked on: 28-Mar-2022 8:36 AM MARCH 26, 2022 CHAPTER 85 SUBMISSION

**GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	9

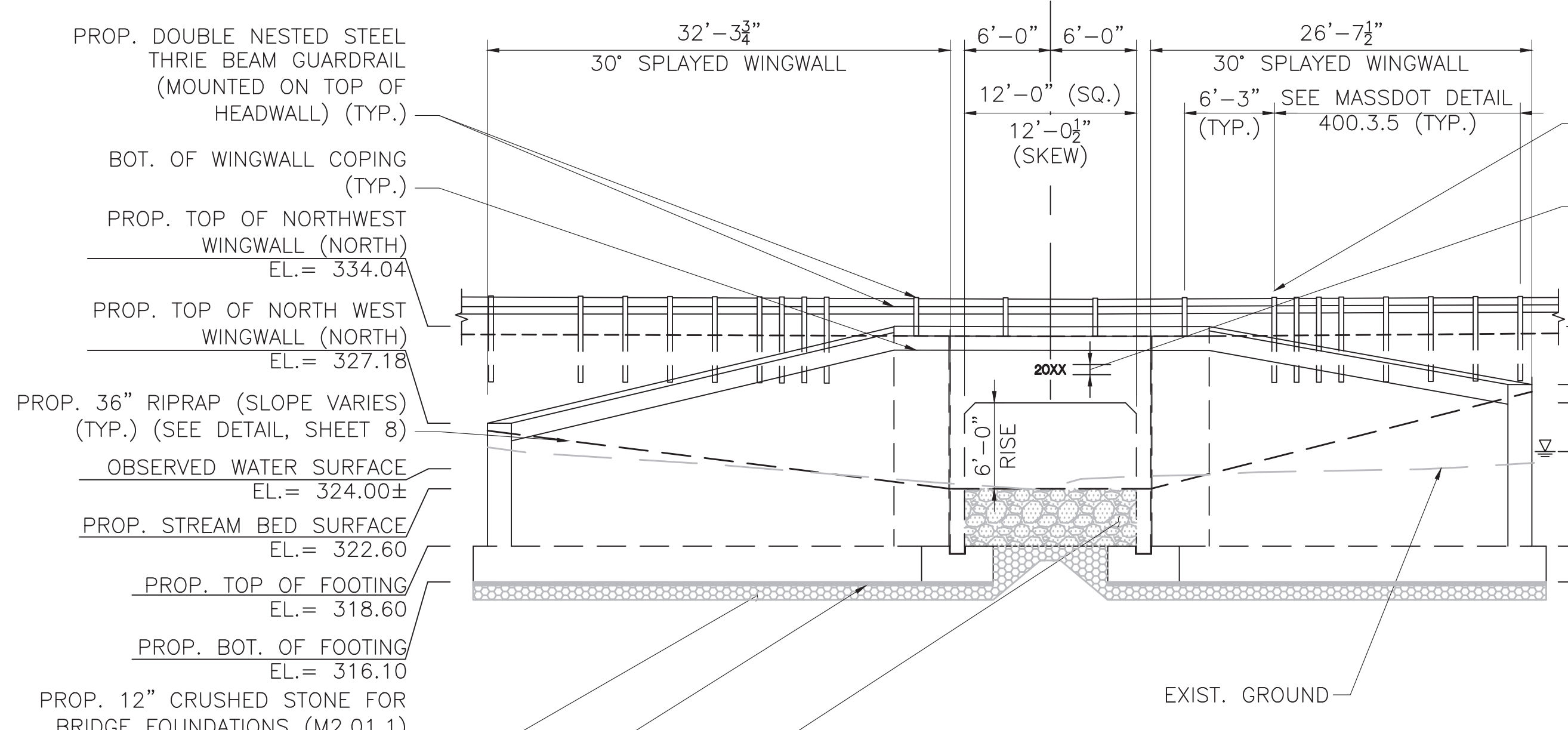
PROJECT FILE NO. T1060

PLAN AND ELEVATIONS



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

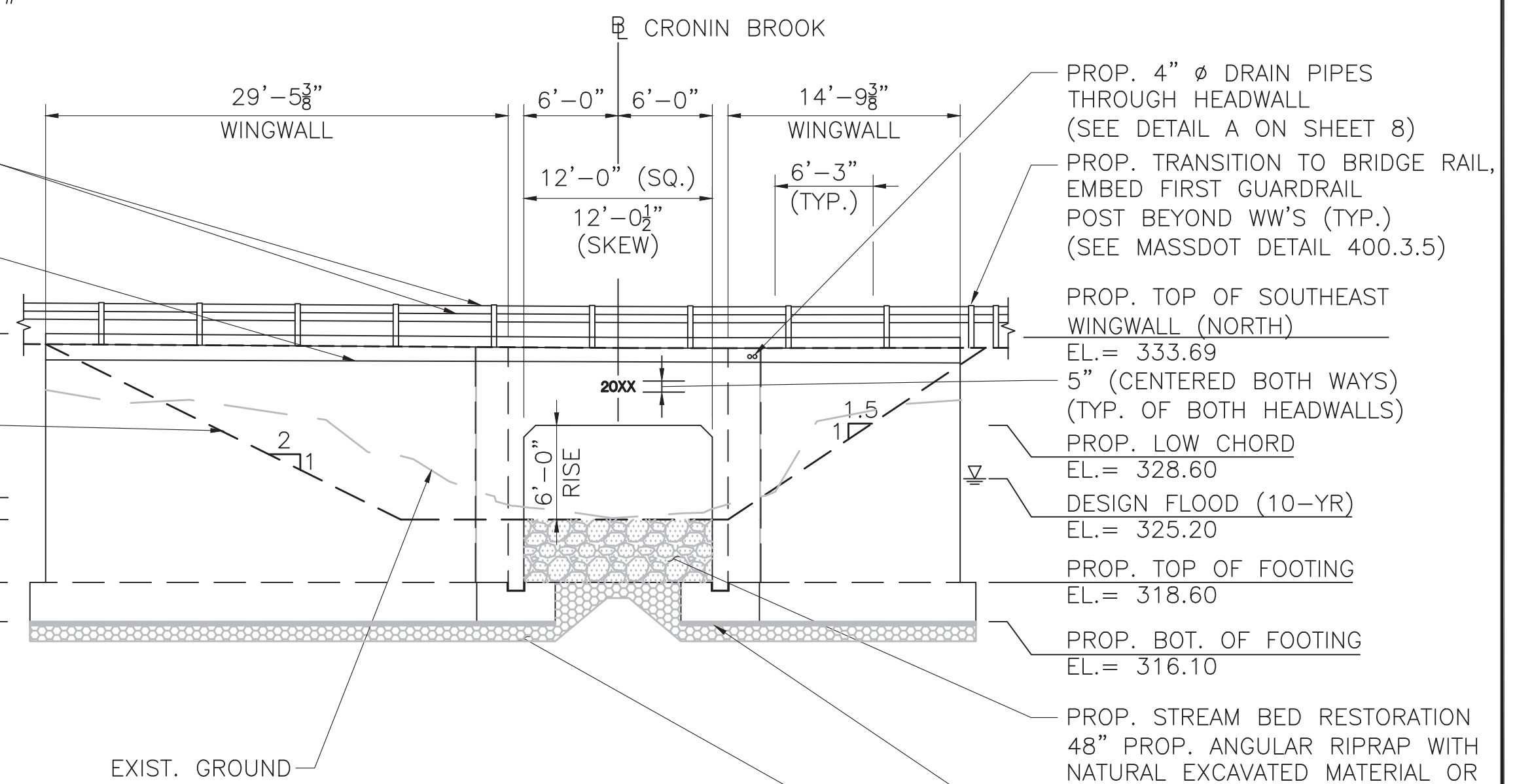
NOTE:
WORKING POINTS #5 AND #6 ARE SHOWN ON SHEET 5.



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

PROP. DOUBLE NESTED STEEL THRIE BEAM GUARDRAIL (MOUNTED ON TOP OF HEADWALL) (TYP.)
BOT. OF WINGWALL COPING (TYP.)
PROP. TOP OF NORTHWEST WINGWALL (NORTH) EL.= 334.04
PROP. TOP OF NORTH WEST WINGWALL (NORTH) EL.= 327.18
PROP. 36" RIPRAP (SLOPE VARIES) (TYP.) (SEE DETAIL, SHEET 8)
OBSERVED WATER SURFACE EL.= 324.00±
PROP. STREAM BED SURFACE EL.= 322.60
PROP. TOP OF FOOTING EL.= 318.60
PROP. BOT. OF FOOTING EL.= 316.10
PROP. 12" CRUSHED STONE FOR BRIDGE FOUNDATIONS (M2.01.1) OVER GEOTEXTILE FABRIC FOR STABILIZATION (TYP.)
3" CONTROLLED DENSITY FILL (NON-EXCAVATABLE) (TYP.)
PROP. STREAM BED RESTORATION 48" PROP. ANGULAR RIPRAP WITH NATURAL EXCAVATED MATERIAL OR EQUIVALENT SUBSTRATE MATERIAL

PROP. TRANSITION TO BRIDGE RAIL, EMBED FIRST GUARDRAIL POST BEYOND WW'S (TYP.)
5" (CENTERED BOTH WAYS) (TYP. OF BOTH HEADWALLS)
PROP. TOP OF SOUTHWEST WINGWALL (SOUTH) EL.= 334.09
PROP. TOP OF SOUTHWEST WINGWALL (SOUTH) EL.= 329.88
PROP. LOW CHORD EL.= 328.60
DESIGN FLOOD (10-YR) EL.= 325.20
PROP. TOP OF FOOTING EL.= 318.60
PROP. BOT. OF FOOTING EL.= 316.10



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

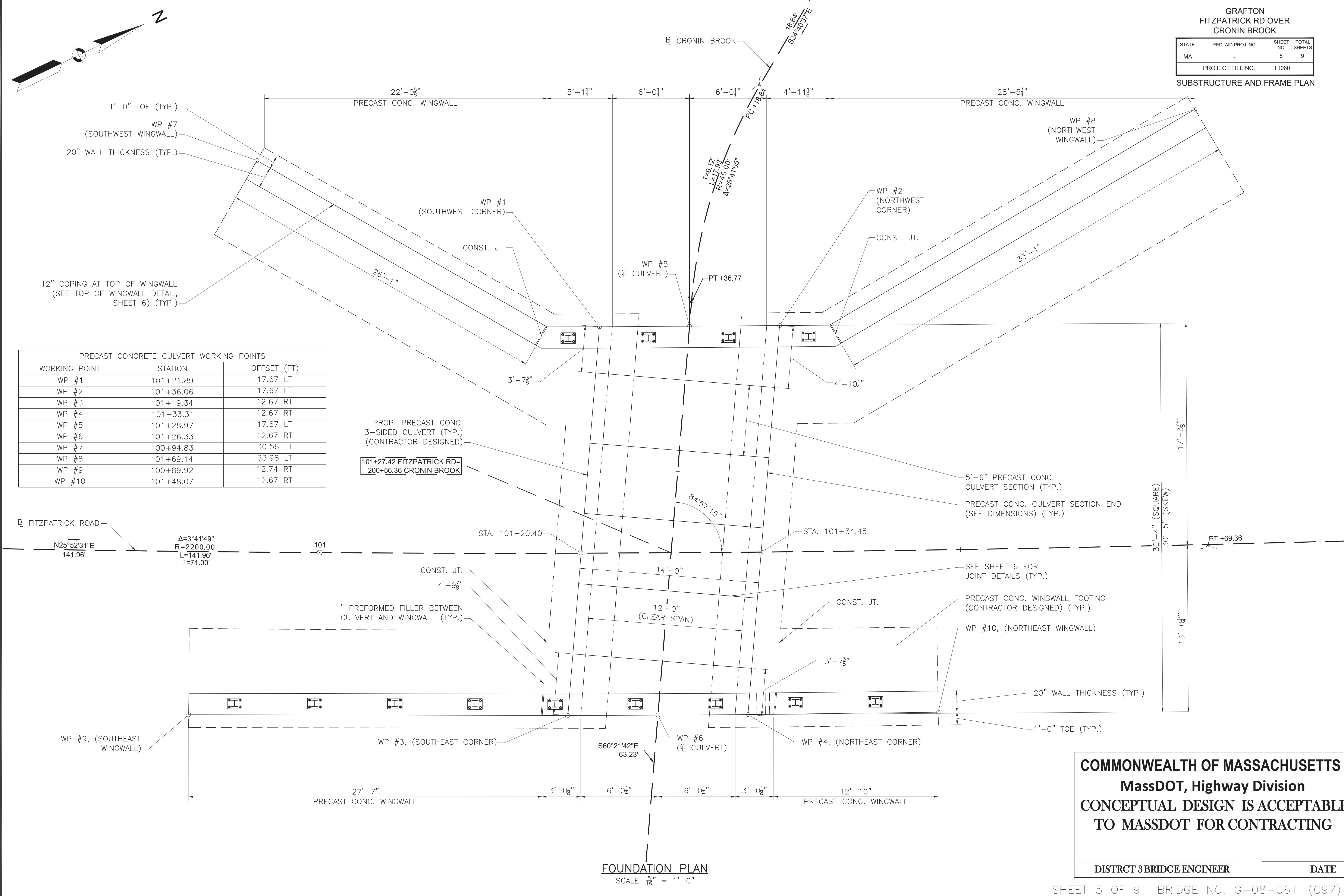
PROP. DOUBLE NESTED STEEL THRIE BEAM GUARDRAIL (MOUNTED ON TOP OF HEADWALL) (TYP.)
BOT. OF WINGWALL COPING (TYP.)
PROP. TOP OF SOUTHWEST WINGWALL (NORTH) EL.= 334.43
PROP. 36" RIPRAP (TYP.) (SEE DETAIL, SHEET 8)
OBSERVED WATER SURFACE EL.= 324.00±
PROP. STREAM BED SURFACE EL.= 322.60
PROP. TOP OF FOOTING EL.= 318.60
PROP. BOT. OF FOOTING EL.= 316.10

PROP. 4" Ø DRAIN PIPES THROUGH HEADWALL (SEE DETAIL A ON SHEET 8)
PROP. TRANSITION TO BRIDGE RAIL, EMBED FIRST GUARDRAIL POST BEYOND WW'S (TYP.) (SEE MASSDOT DETAIL 400.3.5)
PROP. TOP OF SOUTHWEST WINGWALL (NORTH) EL.= 333.69
5" (CENTERED BOTH WAYS) (TYP. OF BOTH HEADWALLS)
PROP. LOW CHORD EL.= 328.60
DESIGN FLOOD (10-YR) EL.= 325.20
PROP. TOP OF FOOTING EL.= 318.60
PROP. BOT. OF FOOTING EL.= 316.10
PROP. STREAM BED RESTORATION 48" PROP. ANGULAR RIPRAP WITH NATURAL EXCAVATED MATERIAL OR EQUIVALENT SUBSTRATE MATERIAL
3" CONTROLLED DENSITY FILL (NON-EXCAVATABLE) (TYP.)
PROP. 12" CRUSHED STONE FOR BRIDGE FOUNDATIONS (M2.01.1) OVER GEOTEXTILE FABRIC FOR STABILIZATION (TYP.)

**COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING**

DISTRICT 3 BRIDGE ENGINEER _____ DATE _____

T1060_FITZPATRICK_PLAN&ELEV.DWG PLOTTED ON 28-MAR-2022 8:36 AM CHAPTER 65 SUBMISSION MARCH 28, 2022



PRECAST CONCRETE CULVERT WORKING POINTS

WORKING POINT	STATION	OFFSET (FT)
WP #1	101+21.89	17.67 LT
WP #2	101+36.06	17.67 LT
WP #3	101+19.34	12.67 RT
WP #4	101+33.31	12.67 RT
WP #5	101+28.97	17.67 LT
WP #6	101+26.33	12.67 RT
WP #7	100+94.83	30.56 LT
WP #8	101+69.14	33.98 LT
WP #9	100+89.92	12.74 RT
WP #10	101+48.07	12.67 RT

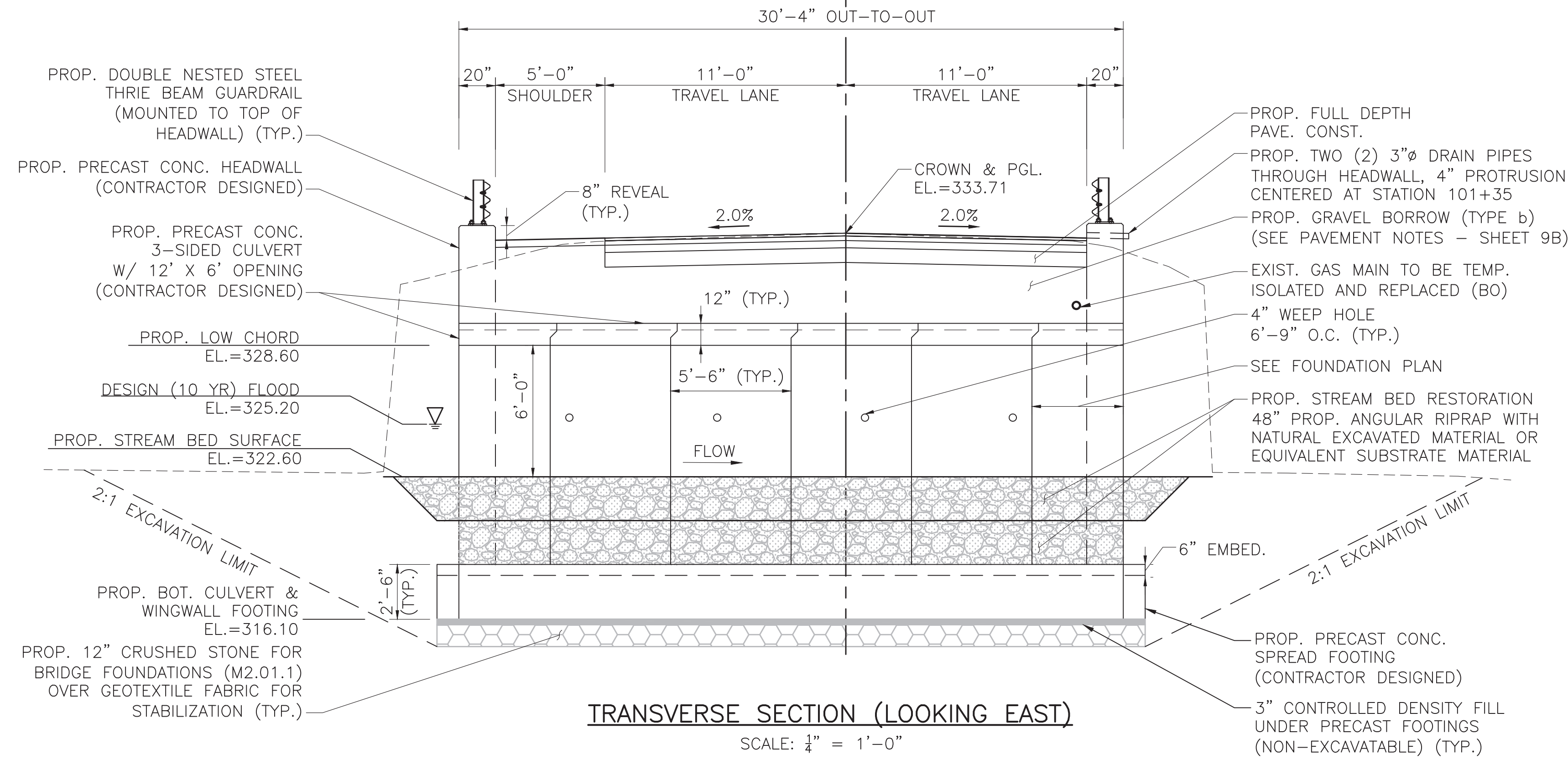
COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING

DISTRICT 3 BRIDGE ENGINEER _____ DATE _____

T1060_FITZPATRICK_(FOUNDATION PLAN).DWG Picked on: 28-Mar-2022 8:36 AM MARCH 28, 2022 CHAPTER 85 SUBMISSION

NOTE:
THE PGL. ELEVATION OF 333.71 WAS MEASURED AT STATION 101+27.42.

FITZPATRICK ROAD



TRANSVERSE SECTION (LOOKING EAST)

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

TRANSVERSE SECTION NOTES:

- EXISTING CULVERT AND HEADWALLS NOT SHOWN FOR CLARITY. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION OF ALL EXISTING CULVERT INFRASTRUCTURE.
- CONTRACTOR SHALL SMOOTHLY TRANSITION ALL PROPOSED ELEMENTS INTO THE EXISTING APPROACHES AND EMBANKMENT SLOPES.

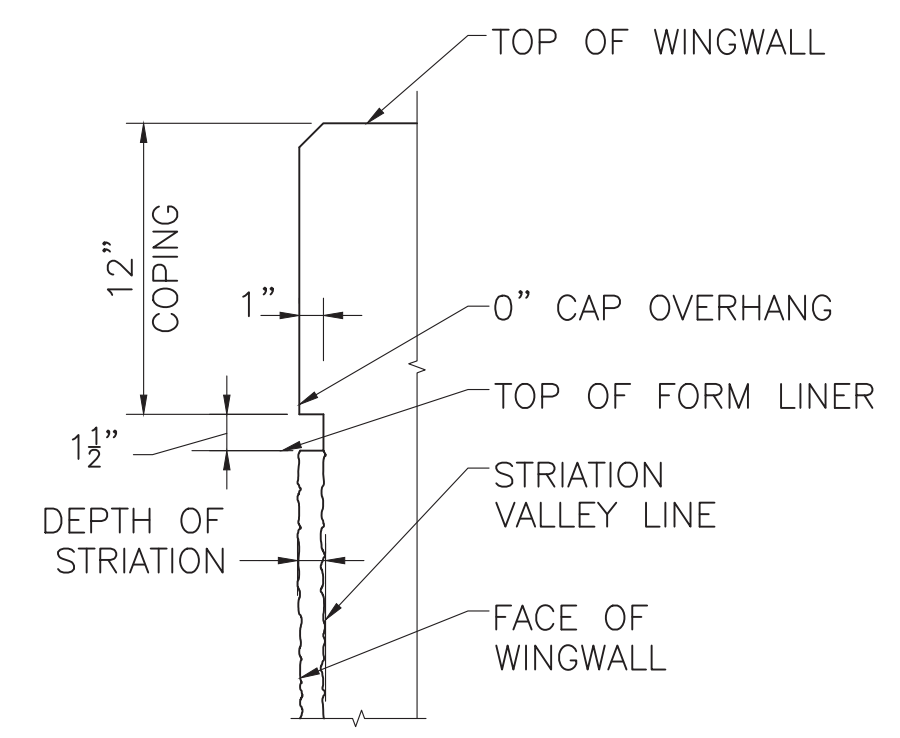
PRECAST CONCRETE CULVERT NOTES:

- CONTRACTOR SHALL SUBMIT PRECAST CONCRETE 3-SIDED CULVERT, FOOTING, AND HEADWALL DESIGN CALCULATIONS AND SHOP DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR APPROVAL PRIOR TO FABRICATION. HEADWALL SHALL BE DESIGNED TO RESIST AASHTO TL-2 GUARDRAIL CRASH LOADING. PRESCRIBED HYDRAULIC OPENING (6'X12') SHALL BE MAINTAINED.
- ALL PRECAST ELEMENTS, CULVERT AND FOOTING, CONCRETE SHALL BE 5000PSI, 3/4", 685 HP CEMENT CONCRETE.
- THE CONTRACTOR SHALL APPROVE ALL ELEVATIONS AND DIMENSIONS OF THE SHOP DRAWINGS PRIOR TO FABRICATION. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- REINFORCEMENT SHALL BE PLACED WITH A MINIMUM OF 1 1/2" COVER. TRANSVERSE REINFORCEMENT SHALL BE PLACED NORMAL TO THE R OF FITZPATRICK STREET.
- ALL PRECAST REINFORCEMENT SHOWN IS CONCEPTUAL FOR BIDDING PURPOSES. THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AS PART OF THE SHOP DRAWINGS.
- DESIGN SHALL BE IN ACCORDANCE WITH THE 2017 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND THE MASSDOT LRFD BRIDGE MANUAL PART 1 CHAPTER 3 FOR HL-93 LOADING.
- A FACTORED BEARING RESISTANCE OF 7.0 KSF AND SERVICE BEARING RESISTANCE OF 9.1 KSF SHALL BE USED IN THE DESIGN OF THE CULVERT FOOTING BASED ON A MINIMUM FOOTING WIDTH OF 5- FEET. THE LRFD STRENGTH AND SERVICE LIMIT FACTORS OF 0.45 AND 1.00 WERE USED, RESPECTIVELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBGRADE PREPARATION. AN ENGINEER WILL BE ON-SITE TO VERIFY THAT THE DESIGN BEARING CAPACITY SHALL BE ACHIEVED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF THIS BEARING CAPACITY CANNOT BE MET.

GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

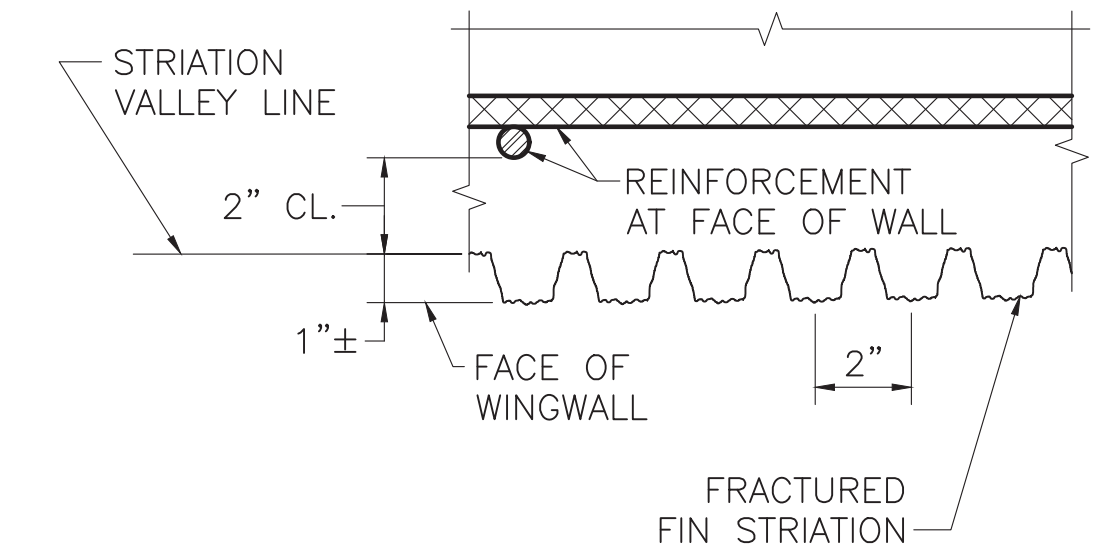
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	9
PROJECT FILE NO.		T1060	

STRUCTURE DETAILS - 1 OF 3



TOP OF WINGWALL DETAIL

SCALE: N.T.S.

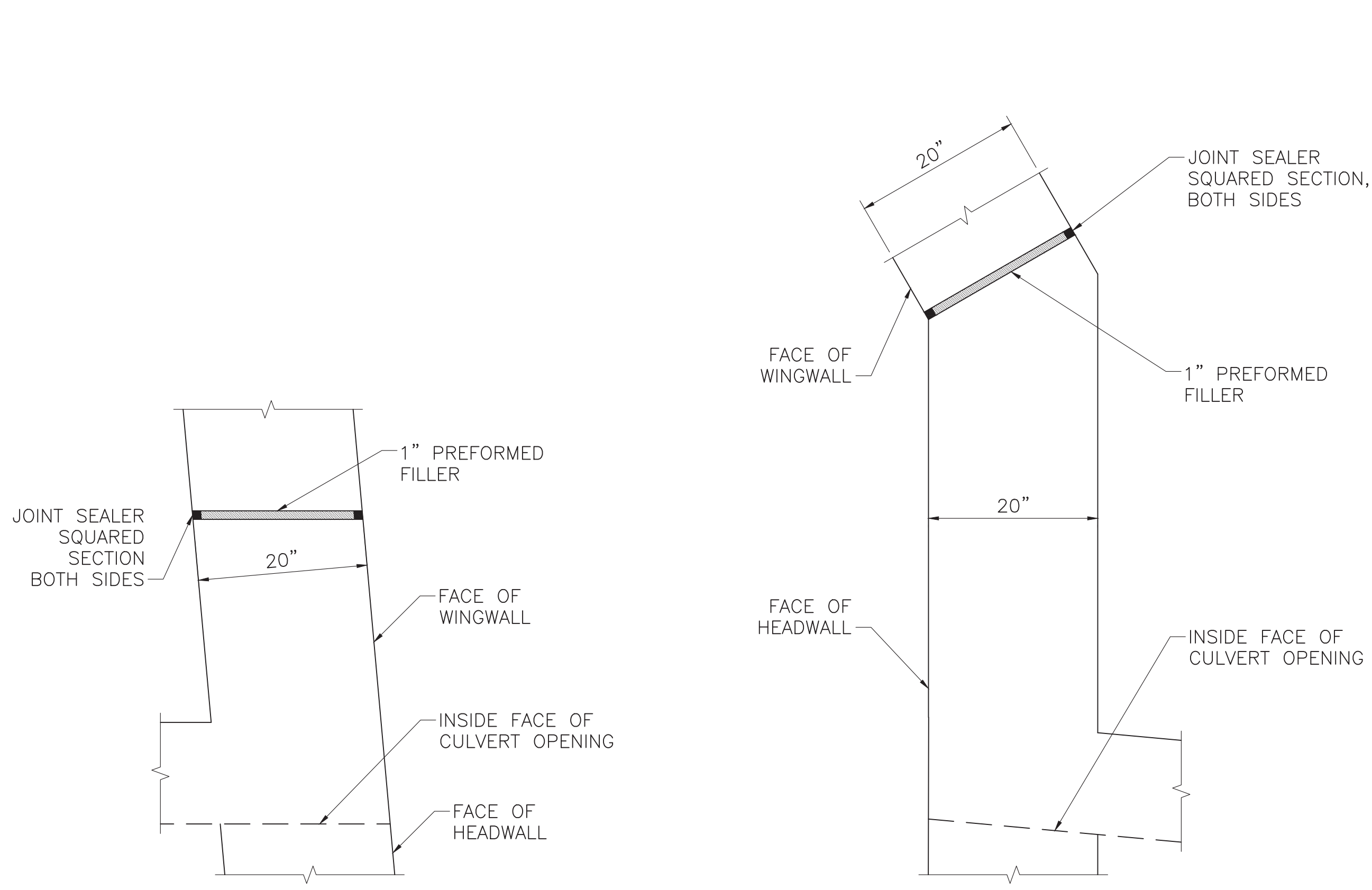


NOTES:

- THE CONTRACTOR SHALL MAKE SURE THAT THE STRIATION FINS ARE PLUMB AND LINED UP VERTICALLY FROM PANEL TO PANEL FOR THE FULL HEIGHT OF THE WALL.
- THE HORIZONTAL JOINT MAY BE OMITTED IF THE CONTRACTOR CAN DEMONSTRATE THAT THE FORM LINER PANELS CAN BE INSTALLED END TO END WITHOUT CREATING A VISIBLE SEAM IN THE FINAL CAST CONCRETE.
- STRIATION DETAILS SHALL ONLY BE INCORPORATED ON THE WINGWALLS.

TYPICAL STRIATION DETAIL

SCALE: 3" = 1'-0"



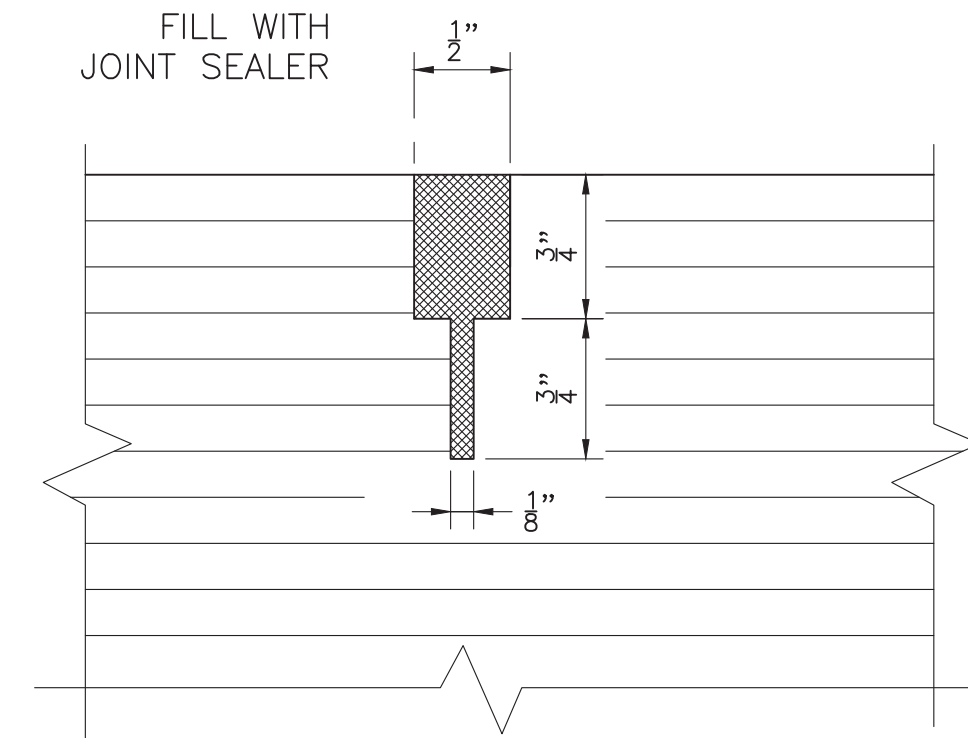
U-WINGWALL JOINT PLAN

SPLAYED WINGWALL JOINT PLAN

NOTE:
REINFORCEMENT NOT SHOWN FOR CLARITY.

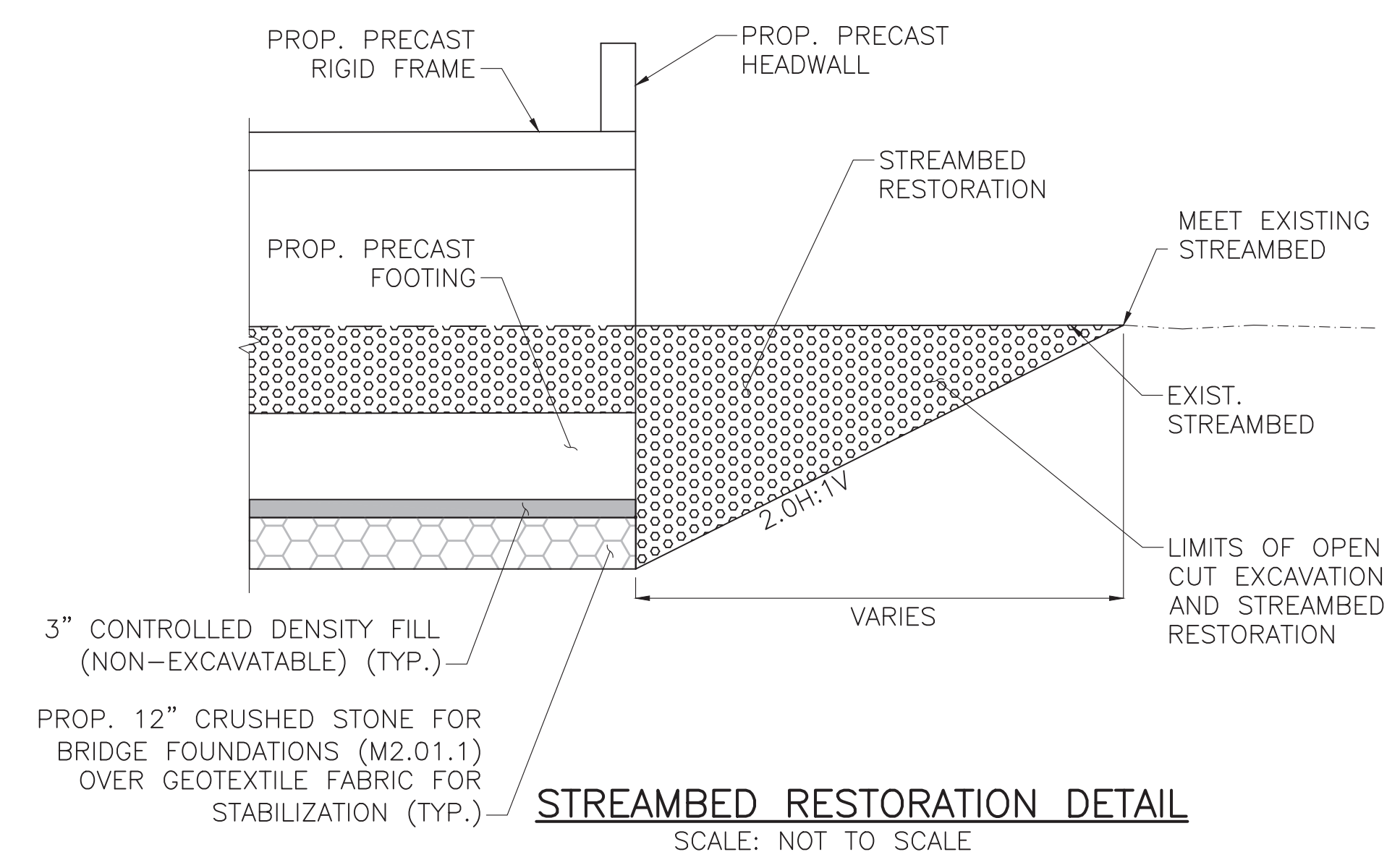
EXPANSION JOINT DETAILS

SCALE: 1" = 1'-0"



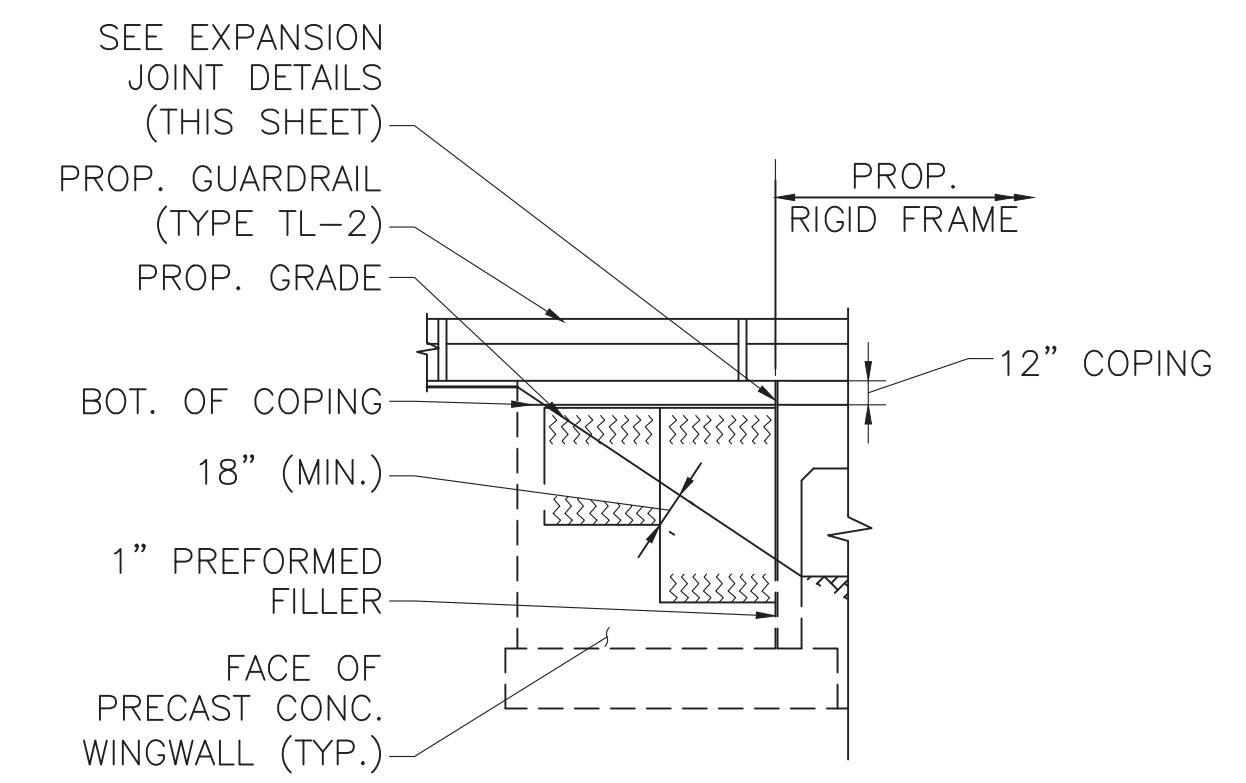
PAVEMENT SAWCUT DETAIL

FULL SIZE



STREAMBED RESTORATION DETAIL

SCALE: NOT TO SCALE



WINGWALL STRIATION - ELEVATION

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

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MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

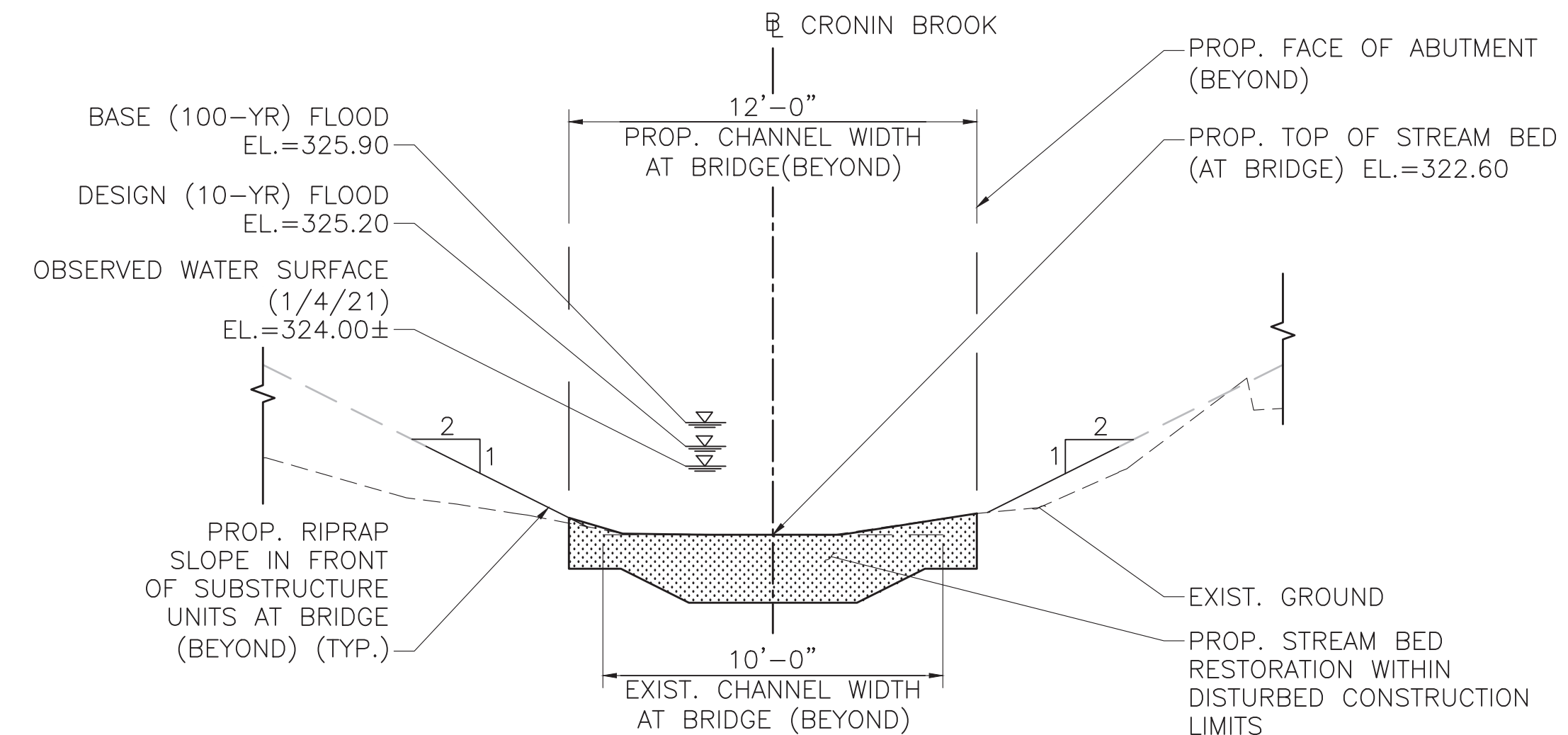
DISTRICT 3 BRIDGE ENGINEER _____ DATE _____

T1060_FITZPATRICK_(STRUCTURE DETAILS).DWG Picked on: 28-Mar-2022 8:36 AM MARCH 26, 2022 CHAPTER 65 SUBMISSION

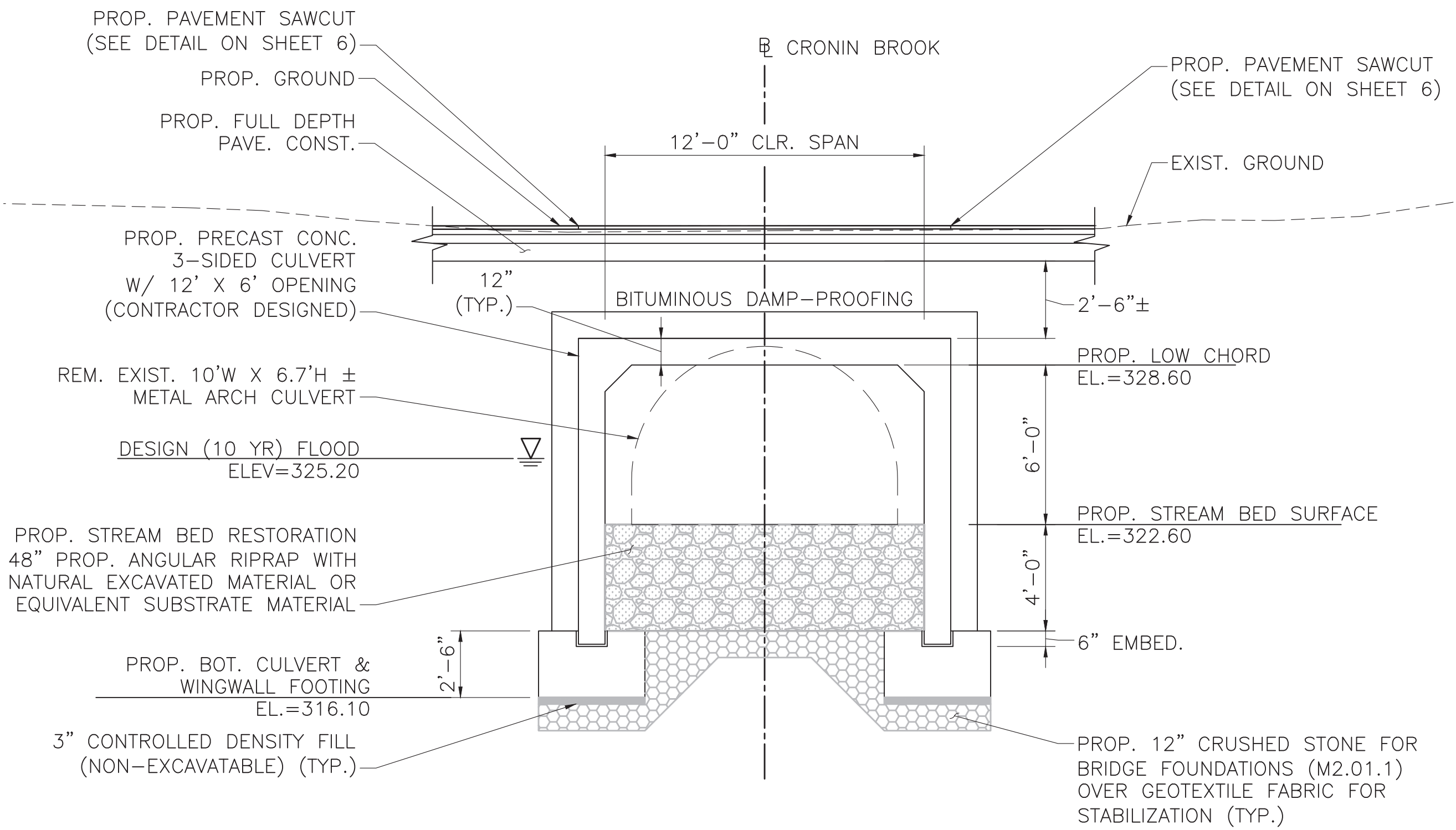
**GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	9

PROJECT FILE NO. T1060
STRUCTURE DETAILS - 2 OF 3



CHANNEL APPROACH SECTION
SCALE: 1/2" = 1'-0"



LONGITUDINAL SECTION (AT C FITZPATRICK ROAD)
SCALE: 1/2" = 1'-0"

NOTE:
SEE NOTE 7 OF THE PRECAST CONCRETE CULVERT NOTES FROM SHEET 6 FOR THE FACTORED BEARING CAPACITY OF THE STRUCTURE.

WINGWALL CONSTRUCTION NOTES:

1. CONTRACTOR SHALL SUBMIT PRECAST CONCRETE WINGWALL AND FOOTING DESIGN CALCULATIONS, INCLUDING DESIGN FOR AASHTO TL-2 CRASH LOADING, AND SHOP DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR APPROVAL PRIOR TO FABRICATION.
2. BITUMINOUS DAMP-PROOFING OR OTHER WATERPROOFING PROTECTIVE COURSE, SHALL BE APPLIED TO THE BACK OF THE STEM AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
3. 4"Ø WEEP HOLES AT FIFTH POINTS OF WALL LENGTHS (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
4. ALL WINGWALL CONCRETE SHALL BE 5000 PSI, 3/4" IN, 685 HP CEMENT CONCRETE.
5. THE FACTORED BEARING RESISTANCE = 4.0 KSF BASED ON A MINIMUM FOOTING WIDTH OF 5- FEET. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.
6. PRE-BED PRECAST ELEMENT WITH NON-SHRINK GROUT WITH THICKNESS MORE THAN SHIM STACK.
7. THE CONTRACTOR SHALL DETERMINE THE SIZE AND SPACING OF THE GROUT PORTS BASED ON THE CDF'S FLOW PROPERTIES AND THE SIZE OF THE FOOTING.

CULVERT CONSTRUCTION NOTES:

1. THE FACTORED BEARING RESISTANCE = 4.0 KSF BASED ON A MINIMUM FOOTING WIDTH OF 5- FEET. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE C OF THE CULVERT.
3. ALL PRECAST CONCRETE SHALL BE 5,000 PSI, 3/4"-IN, 685 HP CEMENT CONCRETE.

LEVELING BOLT ASSEMBLY NOTES:

1. THE LEVELING BOLT ASSEMBLY SHOWN IS SCHEMATIC. DESIGN OF THE LEVELING BOLT ASSEMBLY SHALL BE PERFORMED BY THE CONTRACTOR AND SUBMITTED WITH THE ASSEMBLY PLAN TO THE ENGINEER FOR APPROVAL.
2. BOLT SHALL BE REMOVED AFTER THE CONTROLLED DENSITY FILL (NON-EXCAVATABLE) HAS SET.
3. STEEL PLATES SHALL BE AASHTO M 270 GRADE 36 UNCOATED STEEL.
4. BOLTS SHALL BE H.S. AASHTO M 164 AND UNCOATED.
5. REINFORCEMENT SHALL BE WELDABLE LOW-ALLOW ASTM A 706 BARS.
6. GREASE OF OIL NUT AND BOLT THREADS TO FACILITATE LEVELING AND REMOVAL.

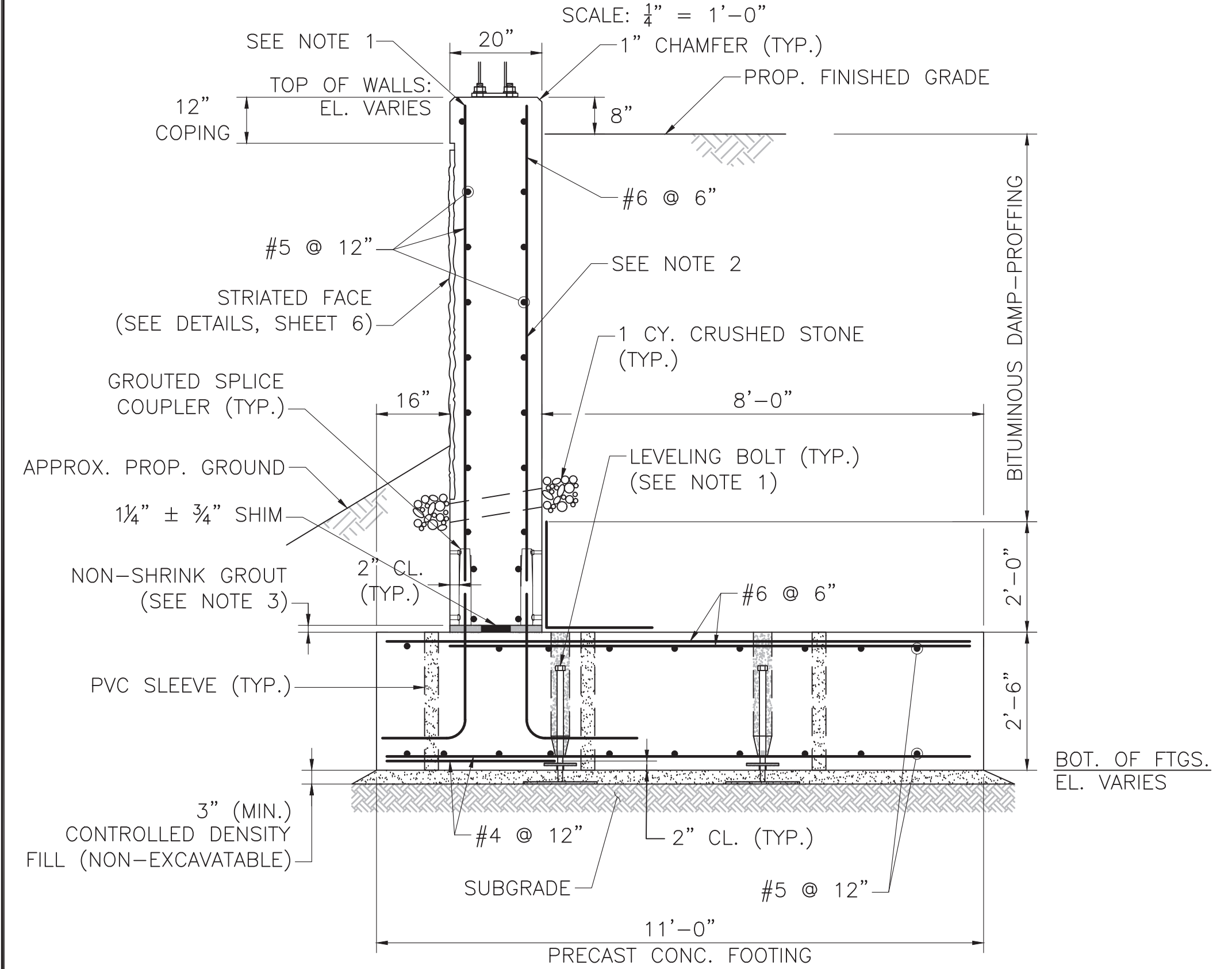
LEVELING BOLT ASSEMBLY NOTES:

1. THE LEVELING BOLT ASSEMBLY SHOWN IS SCHEMATIC. DESIGN OF THE LEVELING BOLT ASSEMBLY SHALL BE PERFORMED BY THE CONTRACTOR AND SUBMITTED WITH THE ASSEMBLY PLAN TO THE ENGINEER FOR APPROVAL.
2. BOLT SHALL BE REMOVED AFTER THE CONTROLLED DENSITY FILL (NON-EXCAVATABLE) HAS SET.
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5. REINFORCEMENT SHALL BE WELDABLE LOW-ALLOW ASTM A 706 BARS.
6. GREASE OF OIL NUT AND BOLT THREADS TO FACILITATE LEVELING AND REMOVAL.

CULVERT JOINT DETAIL

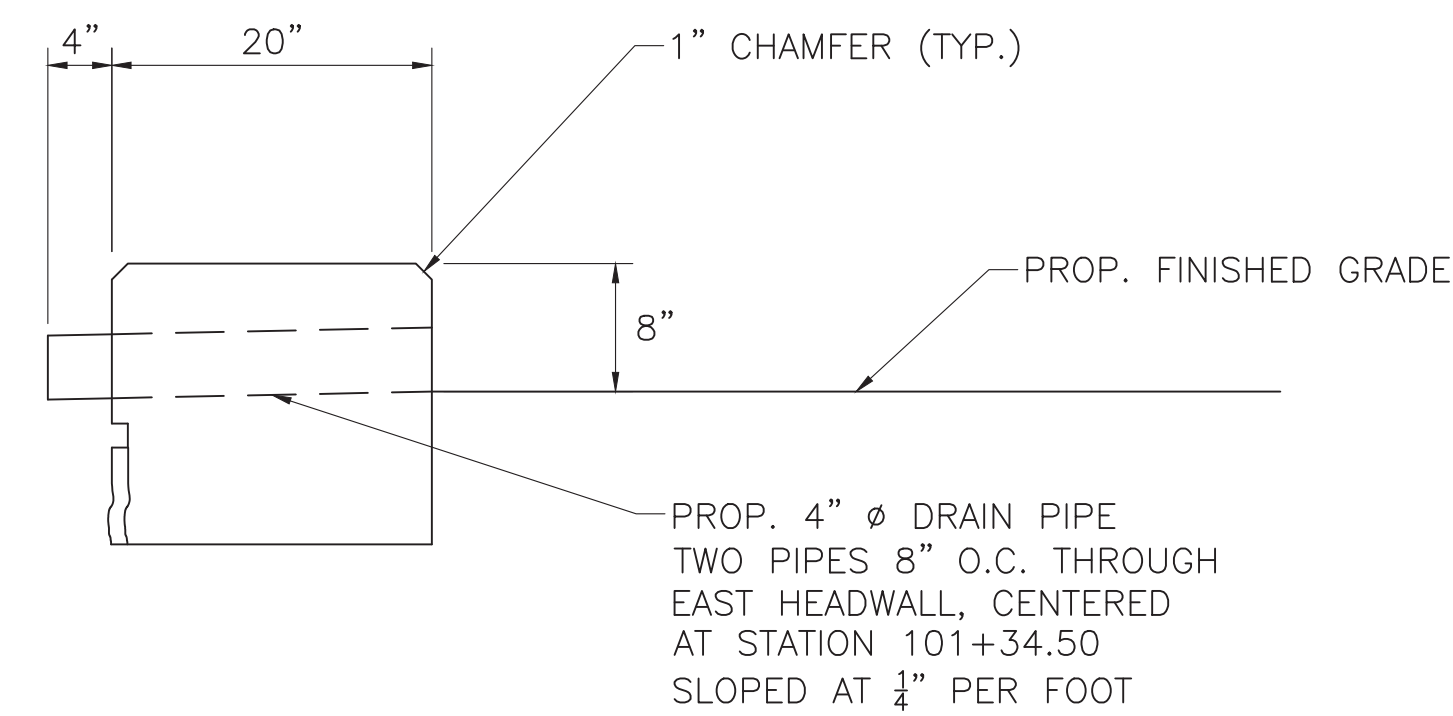
SCALE: 3/4" = 1'-0"

NOTE:
JOINT DIMENSIONS ARE CONCEPTUAL AND SHALL BE CONFIRMED BY THE PRECASTER.



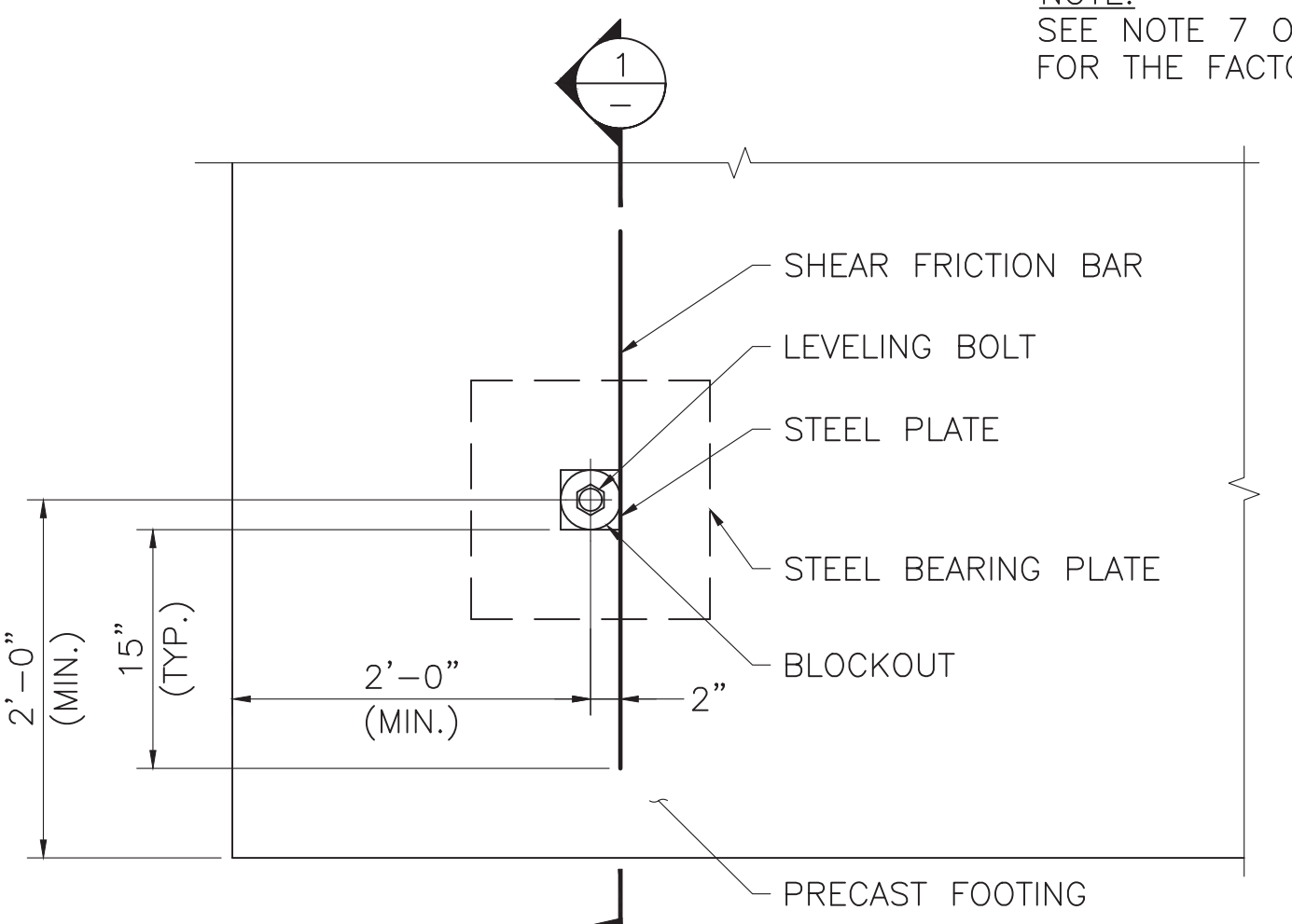
PRECAST WINGWALL SECTION

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

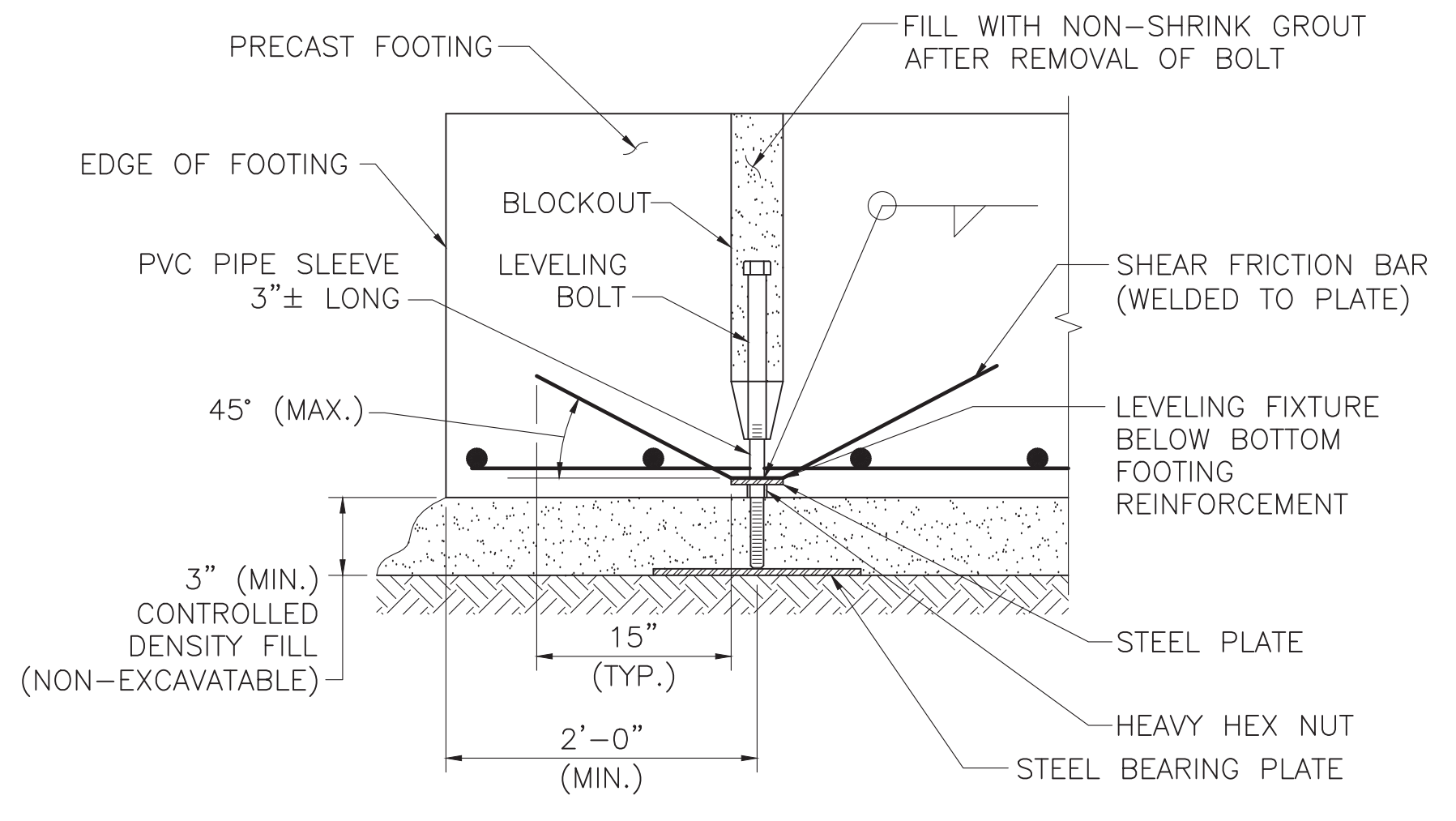


DETAIL A - WINGWALL ROAD DRAIN PIPES

SCALE: 1" = 1'-0"



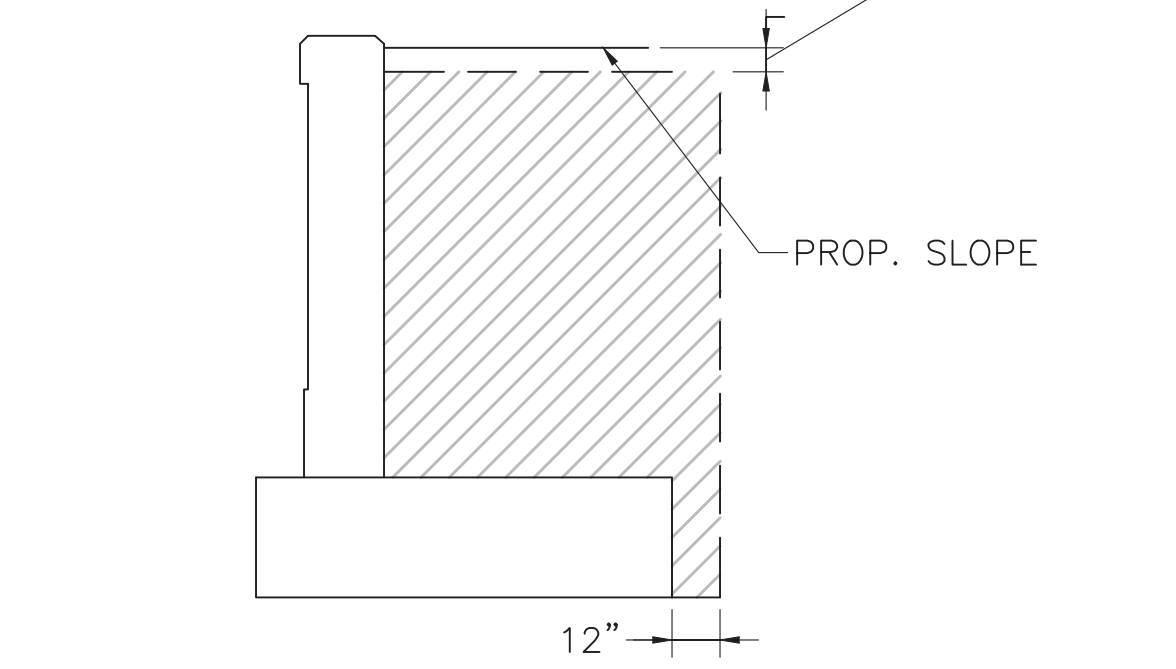
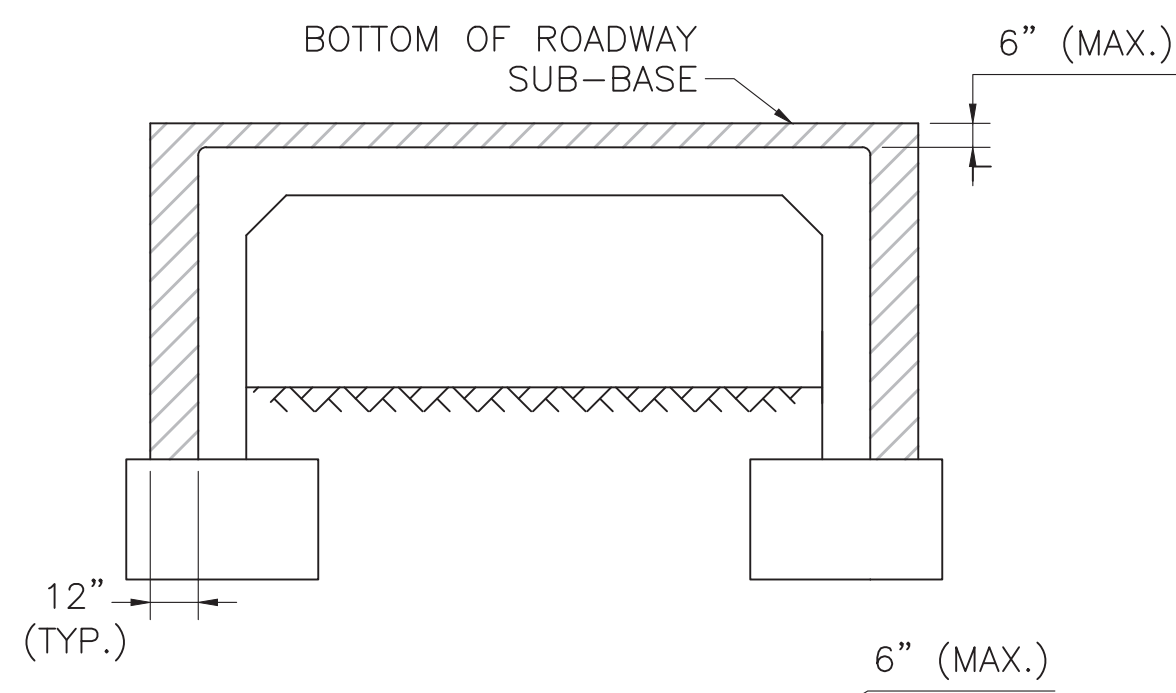
PLAN



SECTION 1

LEVELING BOLT ASSEMBLY

SCALE: 1" = 1'-0"



NOTES:

1. HATCHED AREAS INDICATE THE LIMIT OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
2. THE BACKFILL PLACED AROUND THE STRUCTURE SHALL BE DEPOSITED ON BOTH SIDES TO APPROXIMATELY THE SAME ELEVATION AT THE SAME TIME.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

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

**COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING**

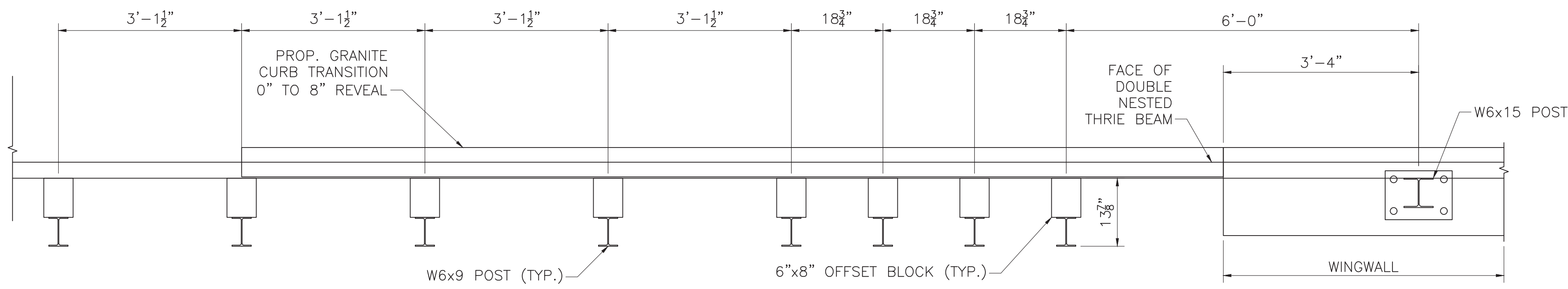
DISTRICT 3 BRIDGE ENGINEER _____ DATE _____

T1060_FITZPATRICK_(STRUCTURE DETAILS).DWG PLOTTED ON 28-MAR-2022 8:36 AM MARCH 26, 2022 CHAPTER 65 SUBMISSION

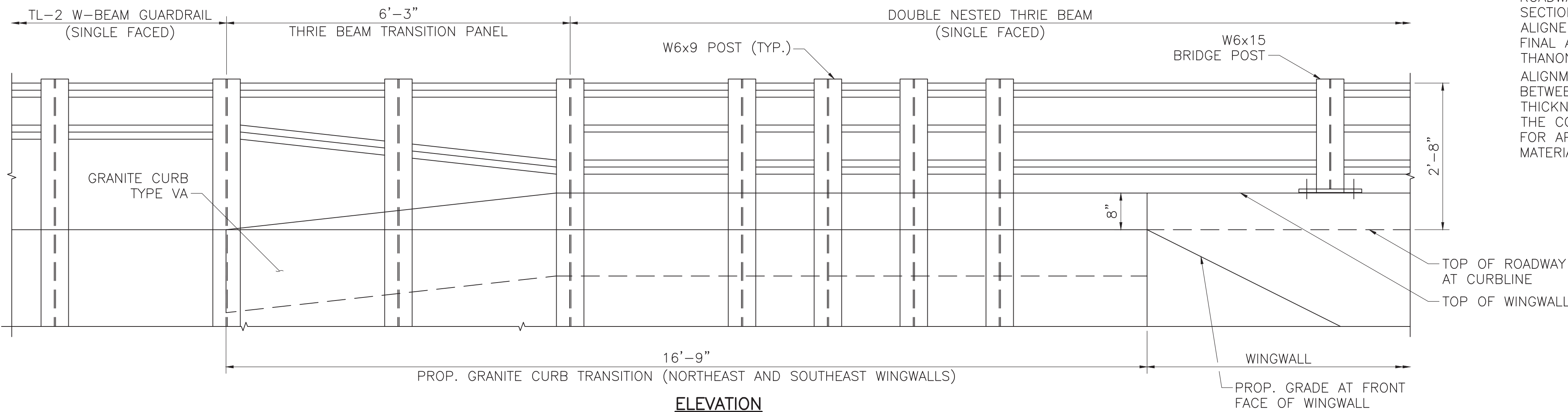
GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	9
PROJECT FILE NO.		T1060	

STRUCTURE DETAILS - 3 OF 3



PLAN



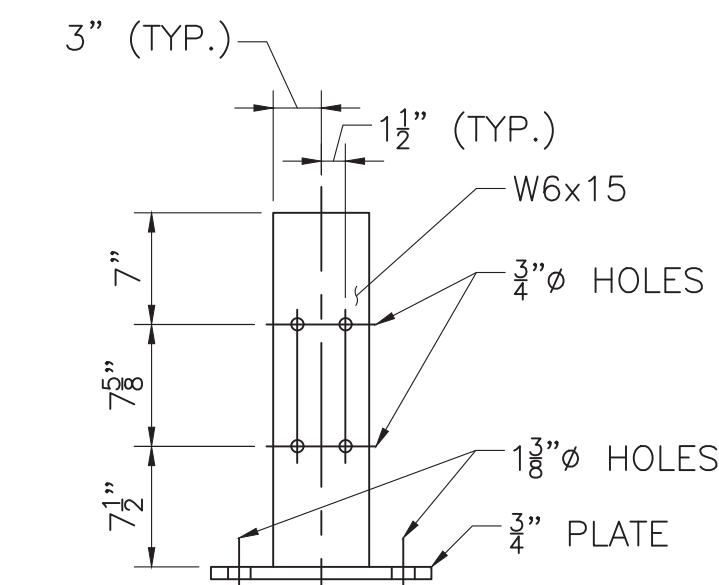
ELEVATION

TRANSITION DETAILS

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

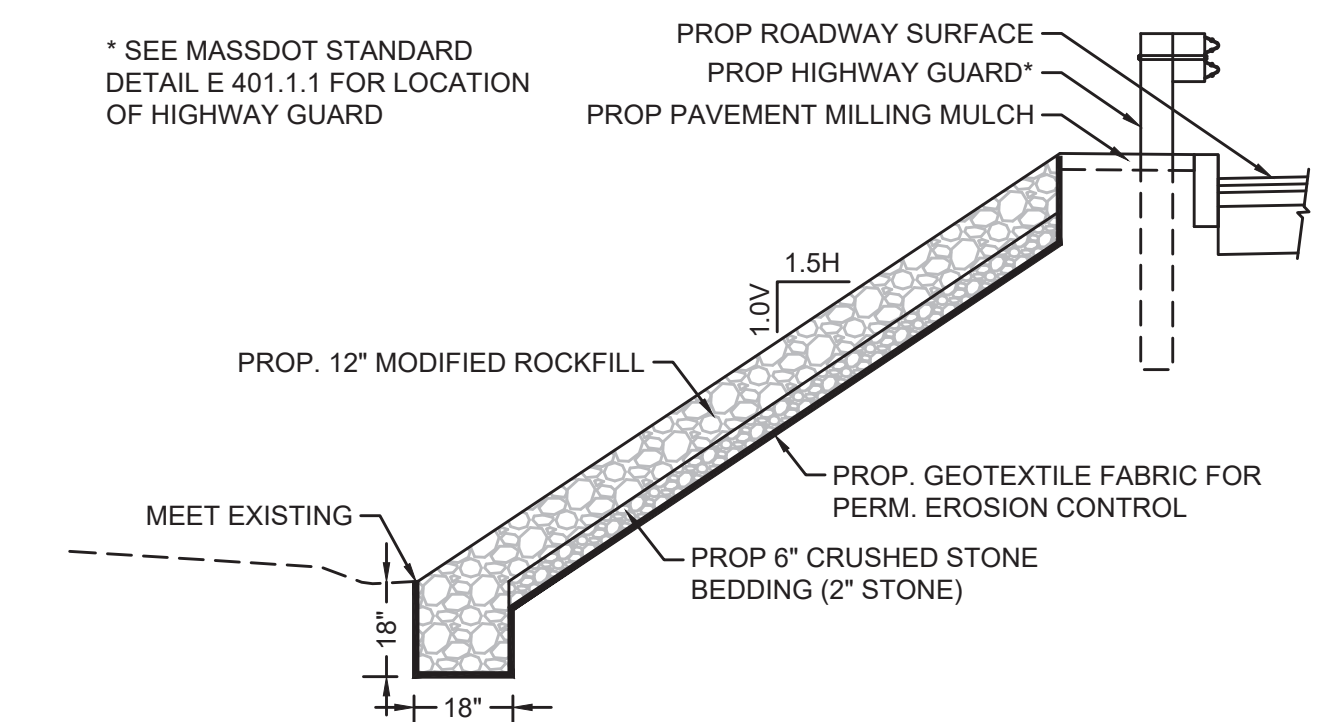
THRIE BEAM NOTES:

- ALL STEEL CONNECTING BOLTS AND FASTENERS FOR POSTS SHALL CONFORM TO ASTM A325 TYPE III. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 105.
- RAIL POSTS AND ANCHOR PLATES SHALL BE SEATED ON MOLDED FABRIC BEARING PADS OR HALF PADS MAY BE USED IN SHIMMING FOR ALIGNMENT.
- RAIL POSTS SHALL BE SET PERPENDICULAR TO ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION, EXCEPT THAT THE RAIL POSTS SHALL BE ALIGNED BY THE USE OF SHIMS SO THAT IN THE FINAL ADJUSTMENT NO PART SHALL DEVIATE MORE THAN ONE HALF INCH FROM TRUE HORIZONTAL ALIGNMENT. THE SHIMS SHALL BE 3"x1 1/2" AND PLACED BETWEEN THE POST AND THE THRIE BEAM RAIL. THE THICKNESS OF THE SHIMS SHALL BE DETERMINED BY THE CONTRACTOR AND SHOWN IN THE SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER BEFORE ORDERING MATERIAL FOR THIS WORK.
- MINIMUM LENGTH OF THE THRIE BEAM SECTIONS IS EQUAL TO TWO POST SPACES.
- THRIE BEAM GUARDRAIL STEEL SHALL BE GALVANIZED AND CONFORM TO THE AASHTO M180, CLASS B, TYPE IV AND SHALL BE 10 GAGE THICK. USE OF 12 GAGE THICK THRIE BEAM IS EXPRESSLY FORBIDDEN.
- POSTS, HAND RAIL STEEL, ANCHOR PLATES AND BASE PLATES SHALL BE FABRICATED FROM STEEL CONFORMING TO AASHTO M270 GRADE 50 STEEL. ALL STEEL TO BE GALVANIZED.
- SPECIAL DRILLING OF THE THRIE BEAM MAY BE REQUIRED AT THE SPLICES. ALL DRILLING DETAILS ARE TO BE SHOWN ON THE SHOP DRAWINGS.
- PLACE A REFLECTORIZED DELINEATOR IN THE UPPER VALLEY OF THRIE BEAM EVERY THIRD POST.
- DETAILS ARE SHOWN FOR THE STEEL THRIE BEAM HIGHWAY GUARD TO BE INSTALLED ALONG THE HEADWALL AND WINGWALLS.



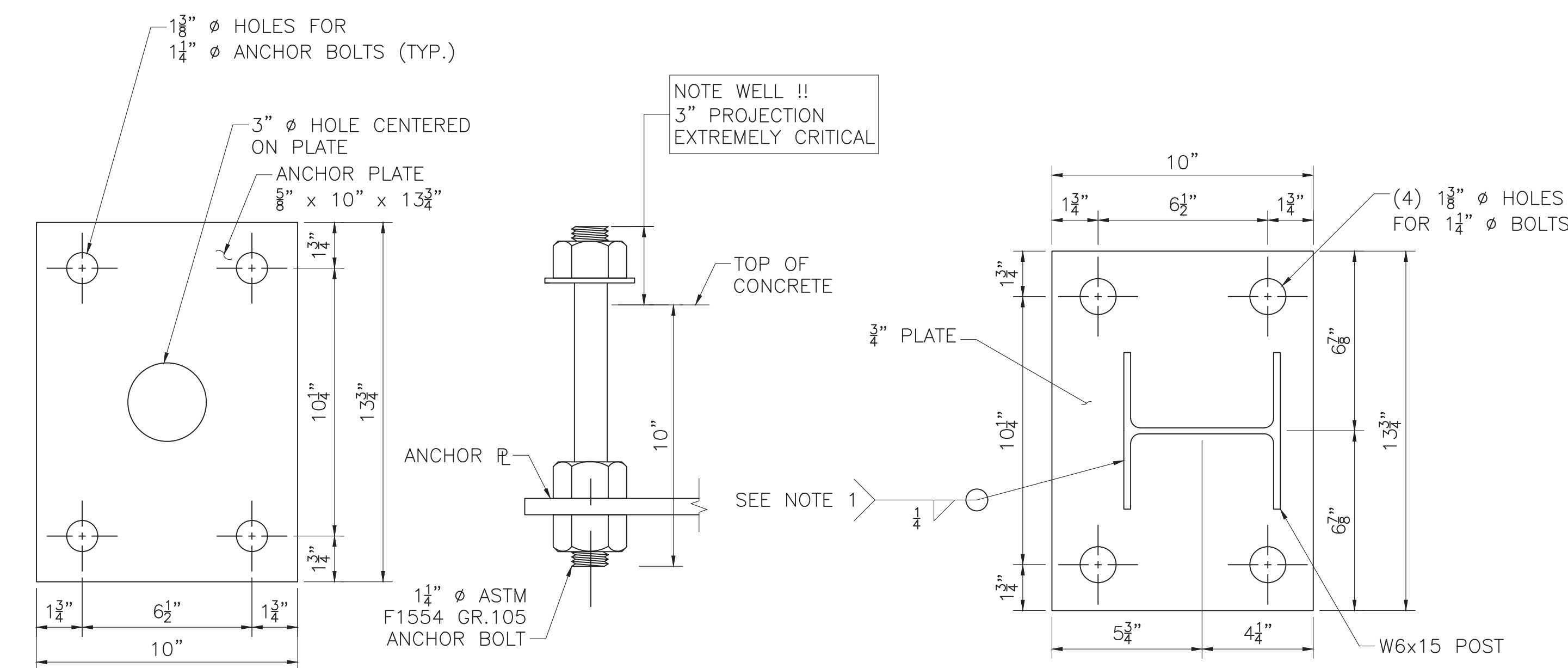
RAIL POST DETAIL (FRONT VIEW)

SCALE: 1" = 1'-0"



MODIFIED ROCKFILL SLOPE STABILIZATION

SCALE: N.T.S.



ANCHOR PLATE

SCALE: 3" = 1'-0"

ANCHOR BOLT

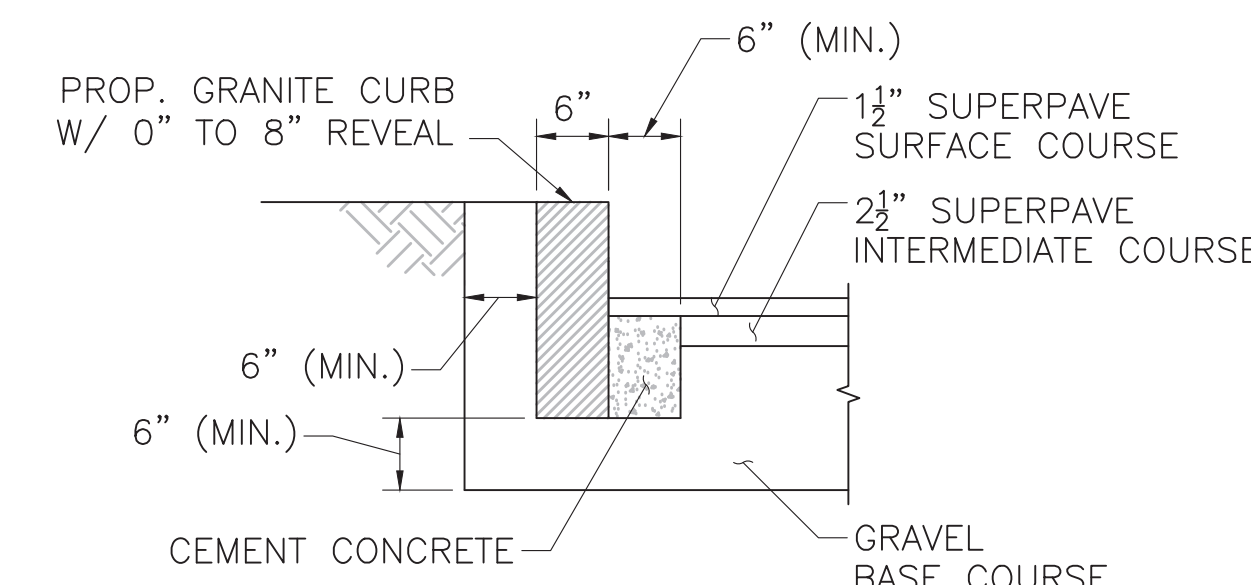
SCALE: 3" = 1'-0"

BASE PLATE

SCALE: 3" = 1'-0"

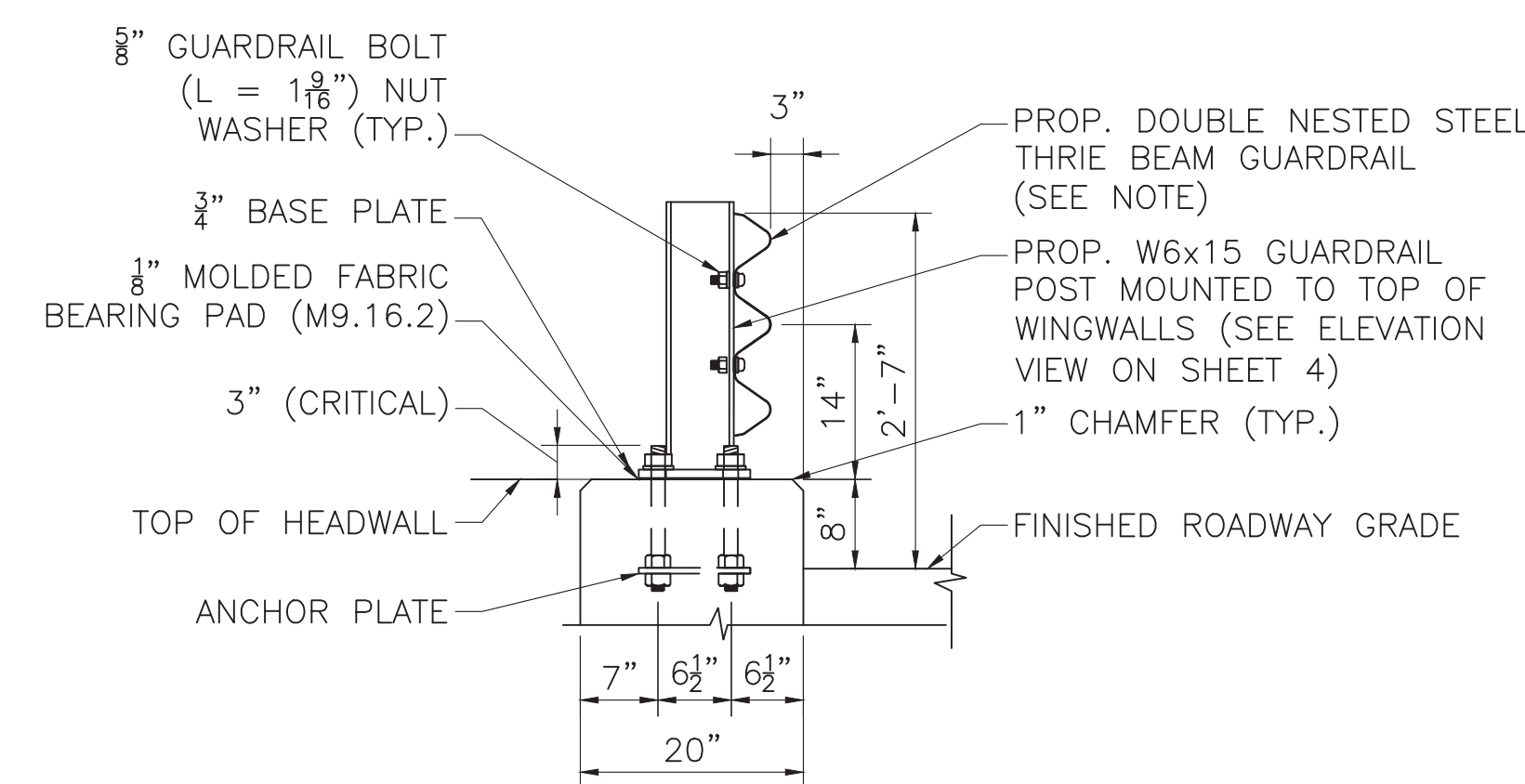
RAILING NOTES:

- POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GOUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES



GRANITE CURB TYPICAL SECTION

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

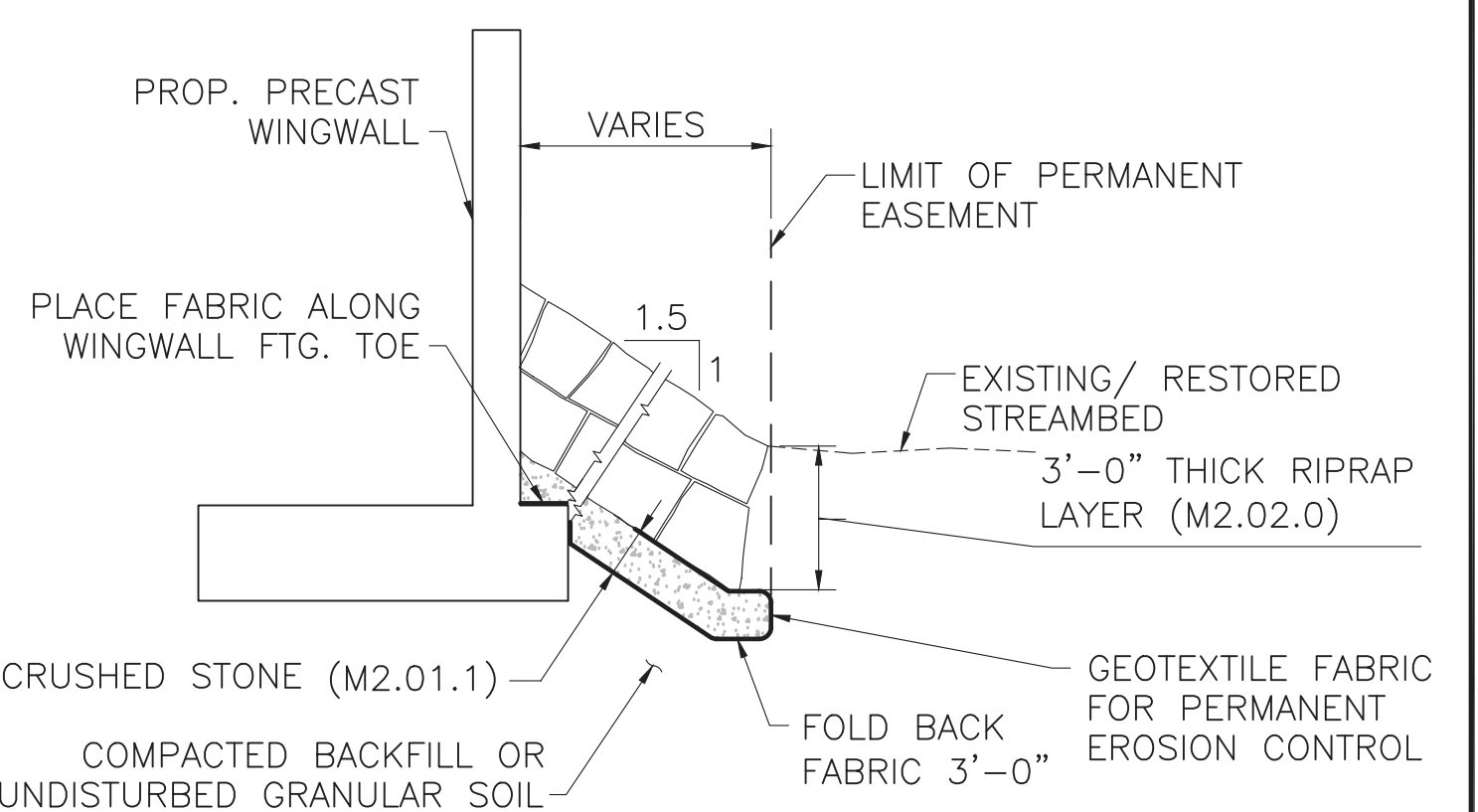


GUARDRAIL SECTION THROUGH TOP OF HEADWALL

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

NOTES:

- REFER TO MASSDOT CONST. STD. DETAILS 400.1.0, 400.1.2 AND 400.1.3 FOR ADDITIONAL INFORMATION REGARDING THE THRIE BEAM GUARDRAIL AND HARDWARE DETAILS.
- SEE BASE PLATE, ANCHOR PLATE AND ANCHOR BOLT DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION.



RIPRAP DETAIL

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

NOTE:

IF BEDROCK IS ENCOUNTERED CLOSER THAN 4'-0" TO FINISHED GRADE, ELIMINATE CRUSHED STONE LAYER AND GEOTEXTILE FABRIC.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING

DISTRICT 3 BRIDGE ENGINEER

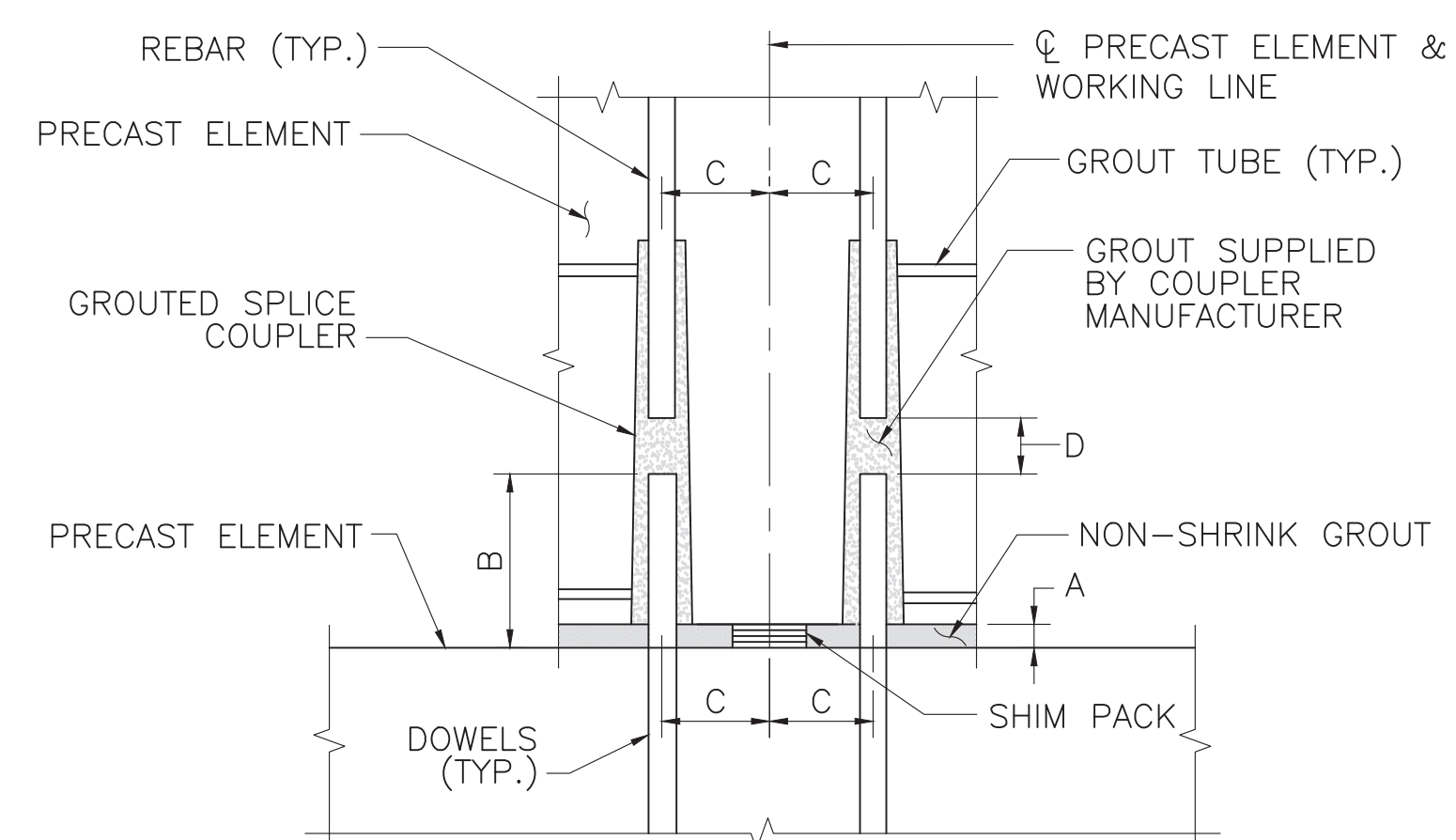
DATE

SHEET 8 OF 9 BRIDGE NO. G-08-061 (C97)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9	9

PROJECT FILE NO. T1060

PREFABRICATION TOLERANCES



NOTES:

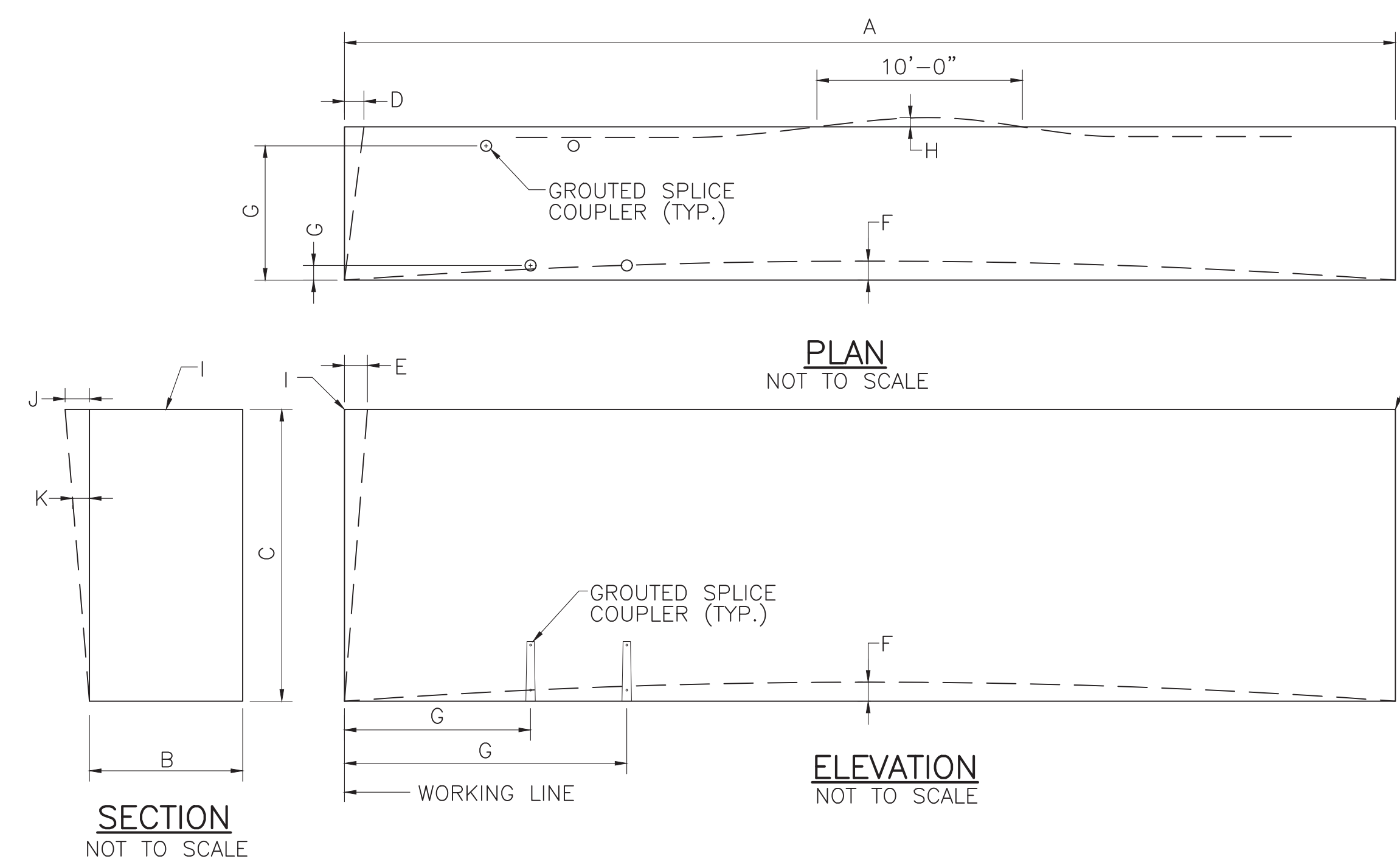
1. USE MATCHING TEMPLATES FOR THE LOCATION OF REINFORCEMENT AND GROUTED SPLICE COUPLER PLACEMENT WITHIN THE ELEMENTS TO CONTROL THE CRITICAL DIMENSION "C".
2. CONSULT MANUFACTURER OF THE GROUTED SPLICE COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCES ON THESE AND ALL DIMENSIONS.
3. BEFORE EXECUTING GROUTED SPLICE COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUTED SPLICE COUPLER USED.

GROUTED SPLICE COUPLER DETAILS

NOT TO SCALE

GROUTED SPLICE COUPLER TOLERANCES

Dimension	Description	Tolerance
A	SHIM PACK HEIGHT	$1\frac{1}{4}'' \pm \frac{3}{4}''$
B	DOWEL HEIGHT	CONSULT MANUFACTURER
C	LOCATION OF REINFORCING, GROUTED SPLICE COUPLER, AND DOWELS MEASURED FROM A WORKING LINE	$\pm 1\frac{1}{4}''$
D	GAP BETWEEN DOWELS AND REINFORCING	CONSULT MANUFACTURER



WALL SEGMENT ELEVATION ERECTION TOLERANCES

Dimension	Description	Tolerance
I	TOP ELEVATION FROM NOMINAL TOP ELEVATION	$\frac{1}{4}''$
J	MAXIMUM PLUMB VARIATION OVER HEIGHT OF PANEL	$\frac{1}{2}''$
K	PLUMB IN ANY 10 FEET OF PANEL HEIGHT	$\frac{1}{4}''$

WALL SEGMENT FABRICATION TOLERANCES

Dimension	Description	Tolerance
A	LENGTH	$\pm \frac{1}{4}''$
B	WIDTH (OVERALL)	$\pm \frac{1}{4}''$
C	DEPTH (OVERALL)	$\pm \frac{1}{4}''$
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	$\pm \frac{1}{2}''$
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	$\pm \frac{1}{2}''$
F	SWEEP OVER MEMBER LENGTH	$\pm \frac{3}{8}''$
G	LOCATION OF GROUTED SPLICE COUPLER MEASURED FROM A WORKING LINE	$\pm \frac{1}{4}''$
H	LOCAL SMOOTHNESS OF ANY SURFACE	$\pm \frac{1}{4}''$ IN 10 FEET

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE
TO MASSDOT FOR CONTRACTING

DISTRICT 3 BRIDGE ENGINEER

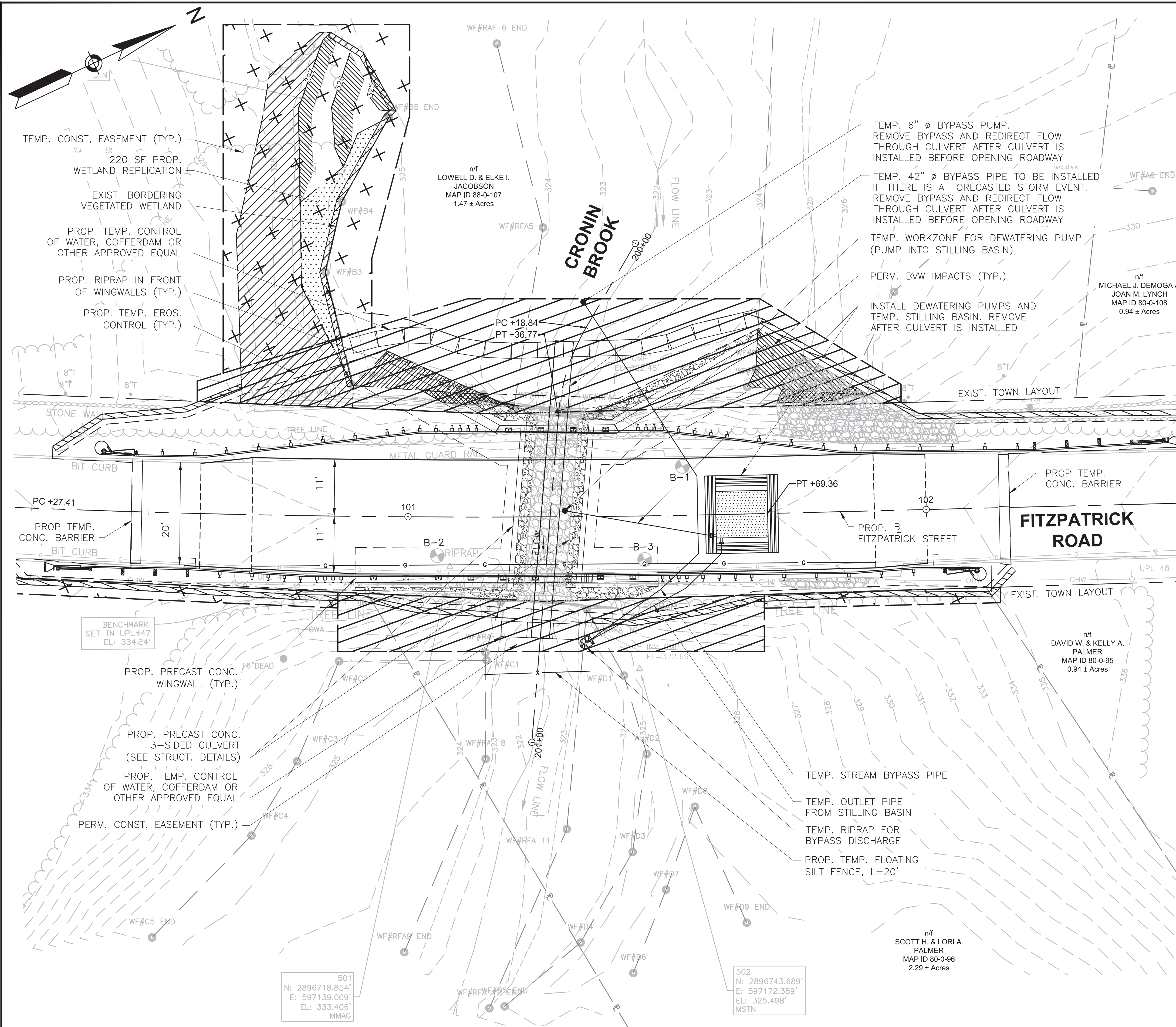
DATE

GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9A	9

PROJECT FILE NO. T1060

CONTROL OF WATER PLAN

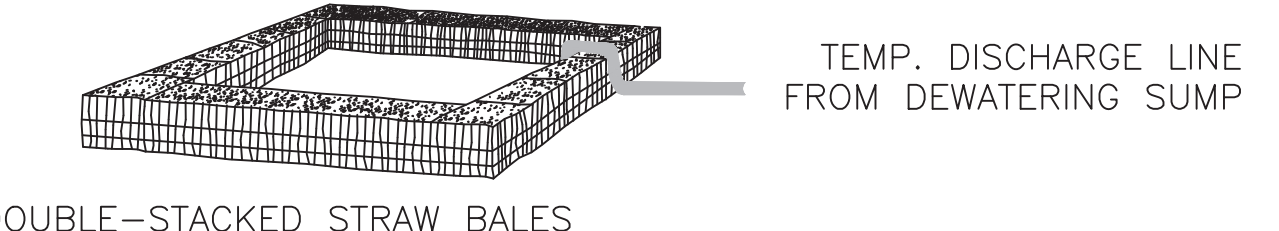


CRONIN BROOK CONTROL OF WATER PLAN

SCALE: 1" = 10'

CONTROL OF WATER NOTES

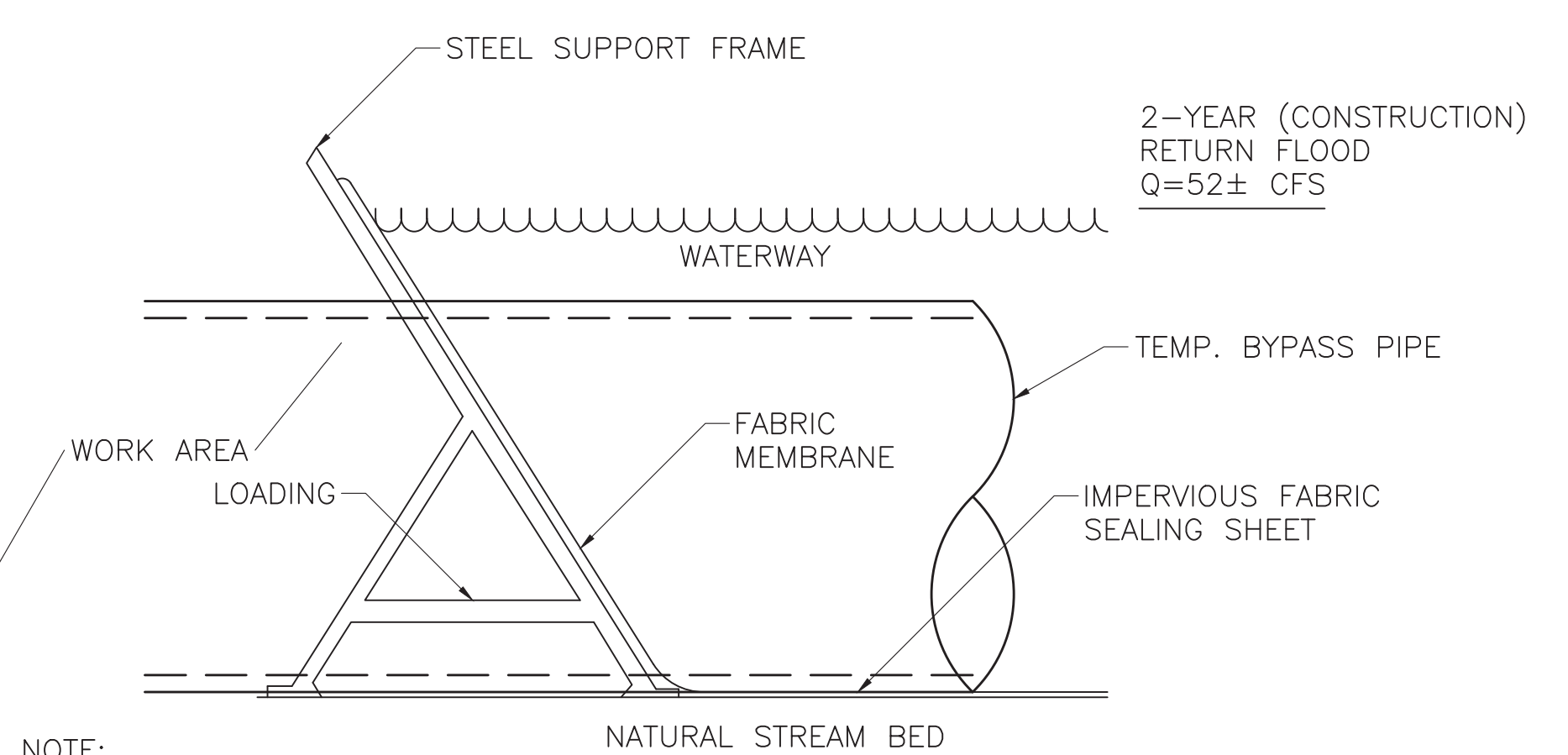
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE CONTROL OF WATER (C.O.W.) SYSTEM AND SHALL SUBMIT A C.O.W. PLAN TO THE ENGINEER FOR APPROVAL. THE C.O.W. SYSTEM SHOWN IS CONCEPTUAL ONLY. THE C.O.W. SYSTEM SHALL BE DESIGNED TO WITHSTAND A 2-YEAR FLOOD ELEVATION (NAVD).
2. FITZPATRICK ROAD SHALL BE CLOSED TO VEHICULAR AND PEDESTRIAN TRAFFIC AT THE BRIDGE CROSSING PRIOR TO BEGINNING EXCAVATION. DETOUR SIGNAGE WILL BE INSTALLED IN ACCORDANCE WITH THE MUTCD AND THE TEMPORARY TRAFFIC CONTROL PLANS INCLUDED IN THESE CONSTRUCTION DRAWINGS.
3. C.O.W. SYSTEM SHALL BE INSPECTED DAILY FOR WATER LEAKS OR EROSION AND REPAIRS PROCEDURES SHALL BE IMPLEMENTED ACCORDINGLY.
4. THE CONSTRUCTION SEQUENCE WITH REGARDS TO THE C.O.W. SYSTEM SHALL BE AS FOLLOWS:
 - 4.1. CLOSE THE ROADWAY TO VEHICULAR AND PEDESTRIAN TRAFFIC AT THE BRIDGE CROSSING.
 - 4.2. INSTALL EROSION CONTROLS: TEMPORARY EROSION CONTROL AROUND PROJECT LIMITS TO PROTECT CRONIN BROOK FROM WORK ZONE SEDIMENT; FLOATING SILT FENCE IN THE DOWNSTREAM OF THE PROJECT LIMITS TO TRAP ANY FLOATING DEBRIS/SILT THAT MAY ENTER THE BROOK.
 - 4.3. INSTALL C.O.W. COFFERDAMS, BYPASS PUMP & PIPE, DEWATERING PUMPS, AND TEMPORARY STILLING BASIN.
 - 4.4. PLACE TEMPORARY RIPRAP AT OUTLET FOR BYPASS DISCHARGE.
 - 4.5. DEWATER THE WORK AREA PRIOR TO (AND THROUGHOUT) EXCAVATION TO FACILITATE INSTALLING THE CULVERT, AND WINGWALLS IN THE DRY CONDITION. ALL DEWATERING FLOW SHALL PASS THROUGH THE STILLING BASIN TO REMOVE SEDIMENT PRIOR TO DEPOSITING BACK INTO THE STREAM.
 - 4.6. INSTALL THE THREE-SIDED RIGID FRAME AND WINGWALLS. RESTORE THE STREAMBED IN ACCORDANCE WITH THESE PLANS. INSTALL RIPRAP EMBANKMENT AND LOAM AND SEED WITH EROSION CONTROL BLANKET IN FRONT OF THE WINGWALLS. INSTALL COIR LOGS ALONG UPLAND SIDES OF STREAMBED.
 - 4.7. REDIRECT STREAM FLOW THROUGH THE CULVERT.
 - 4.8. REMOVE THE C.O.W. COFFERDAMS BYPASS PUMP & PIPE AND TEMPORARY STILLING BASIN.



NOTE:
DISCHARGE TO SEDIMENTATION BASIN (AS SHOWN) OR TO SILTATION/ DEWATERING BAG SUCH AS FLOGARD DEWATERING BAG MODEL SC-DW1215Z, OR APPROVED EQUAL BY GRAFTON CONSERVATION COMMISSION. SYSTEM SHOWN IS CONCEPTUAL ONLY AND IS TO BE DESIGNED BY CONTRACTOR.

TEMPORARY STILLING AREA

SCALE: N.T.S.



NOTE:
THE STEEL FRAME COFFERDAM SHOWN ABOVE IS SHOWN IN CONCEPT ONLY AS ONE OPTION FOR CONTROL OF WATER. THE CONTRACTOR SHALL DETERMINE THE APPROPRIATE SYSTEM FOR CONTROLLING THE WATER (I.E. BULK SANDBAGS, SHEETING, ETC). THE CONTRACTOR SHALL SUBMIT THEIR PROPOSED CONTROL OF WATER DESIGN TO THE ENGINEER FOR REVIEW AND APPROVAL.

TEMPORARY COATED FABRIC STEEL FRAME COFERDAM

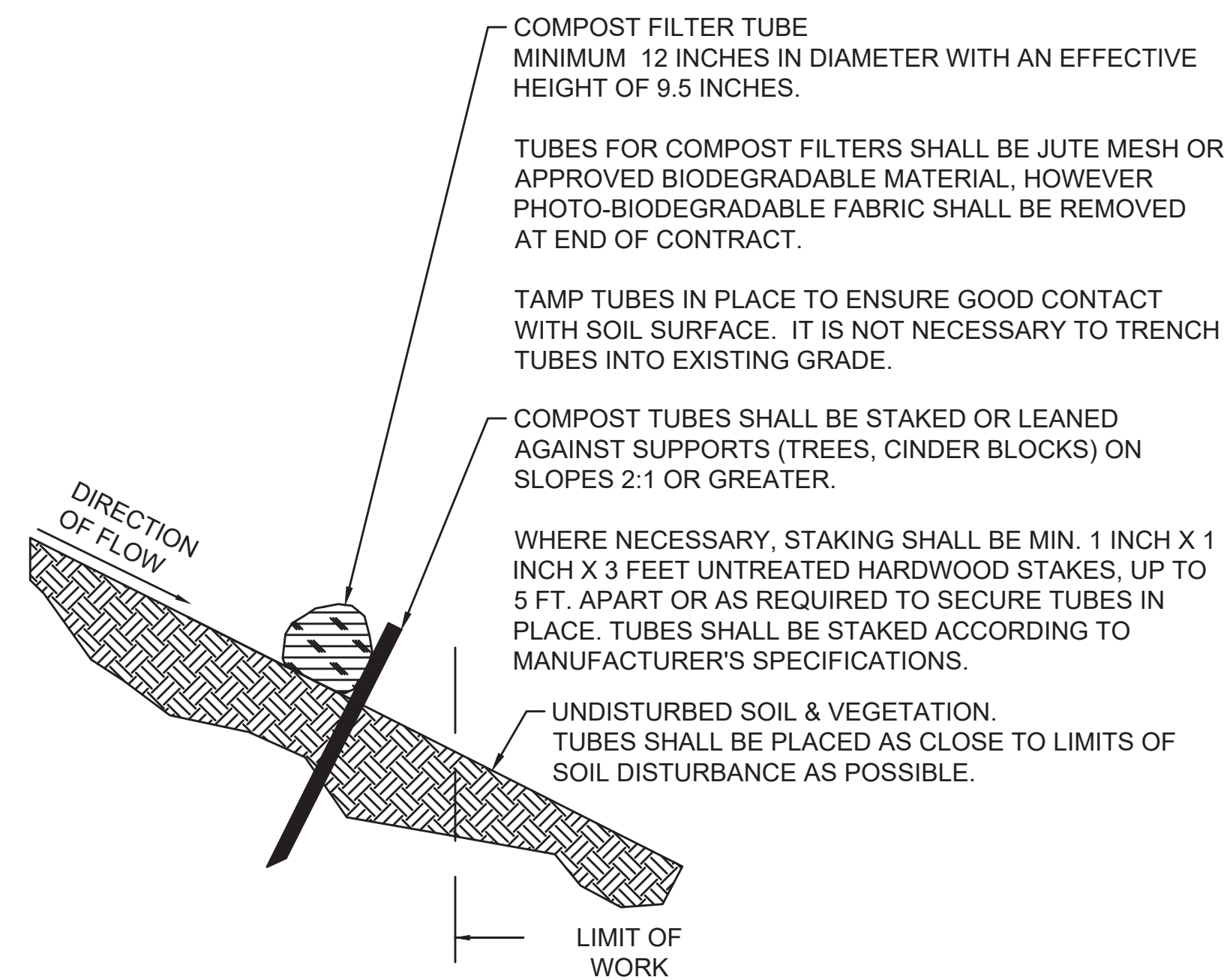
SCALE: N.T.S.

T1060_FITZPATRICK_CO(W)DWG Picked on: 28-Mar-2022 8:36 AM MARCH 26, 2022 CHAPTER 85 SUBMISSION

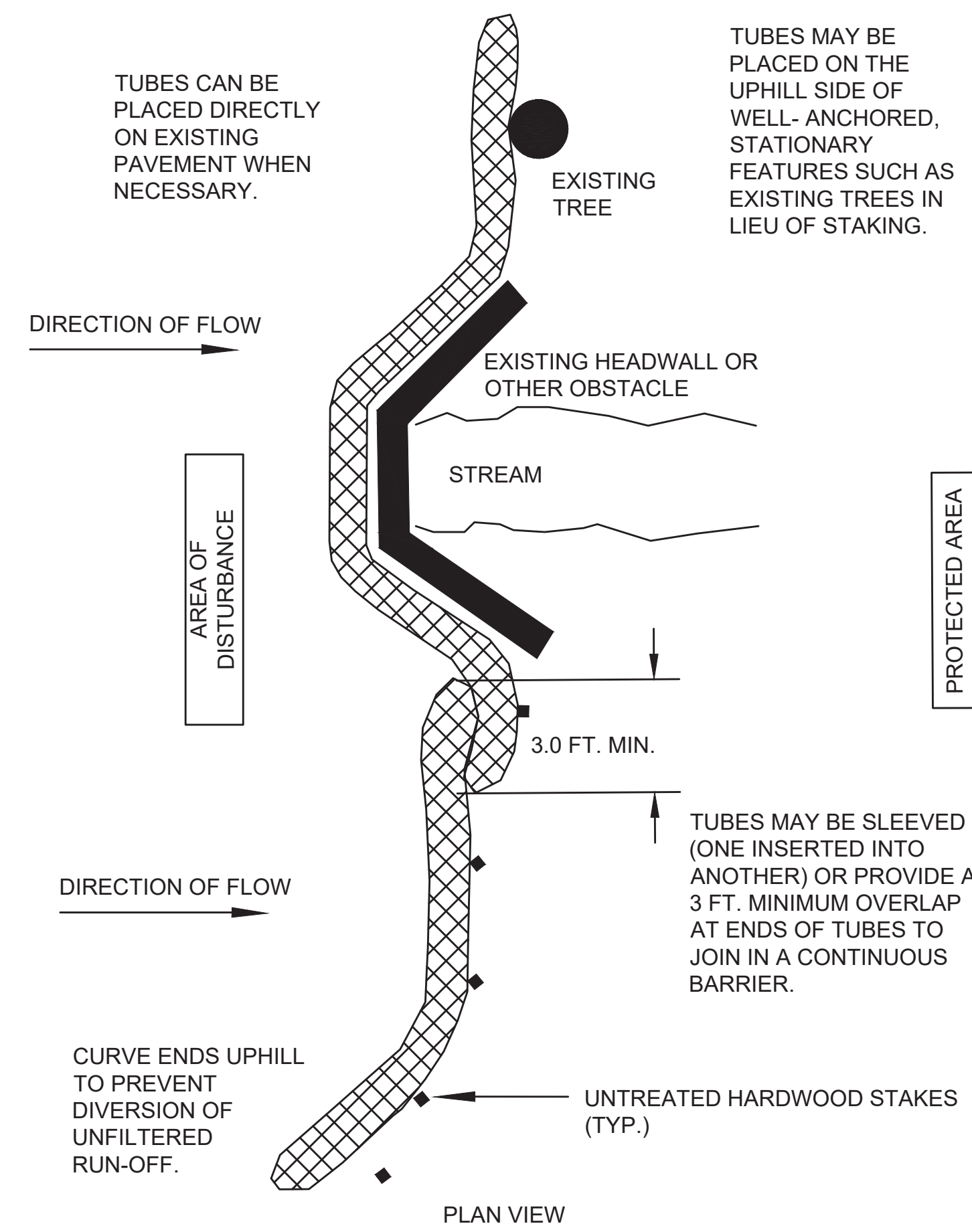
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9B	9
PROJECT FILE NO.		T1060	

NOTES:

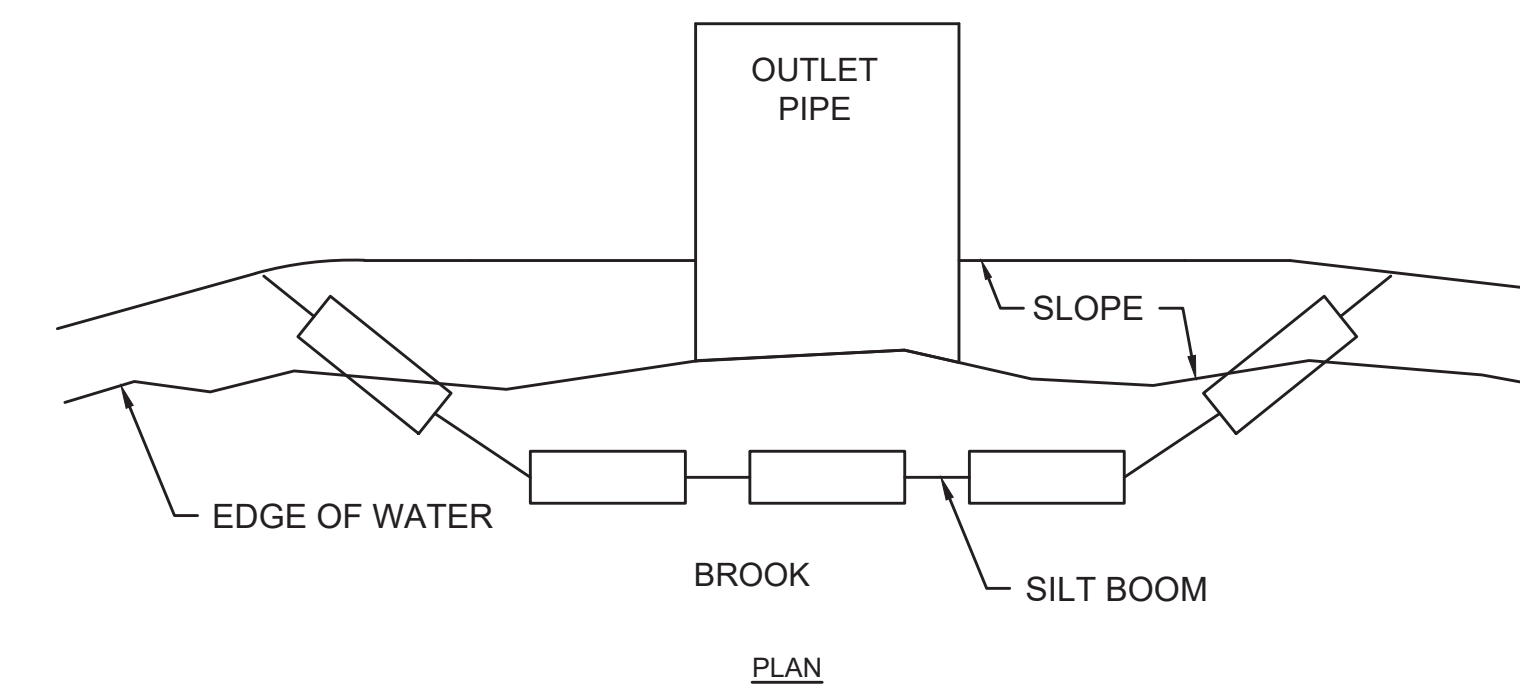
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.



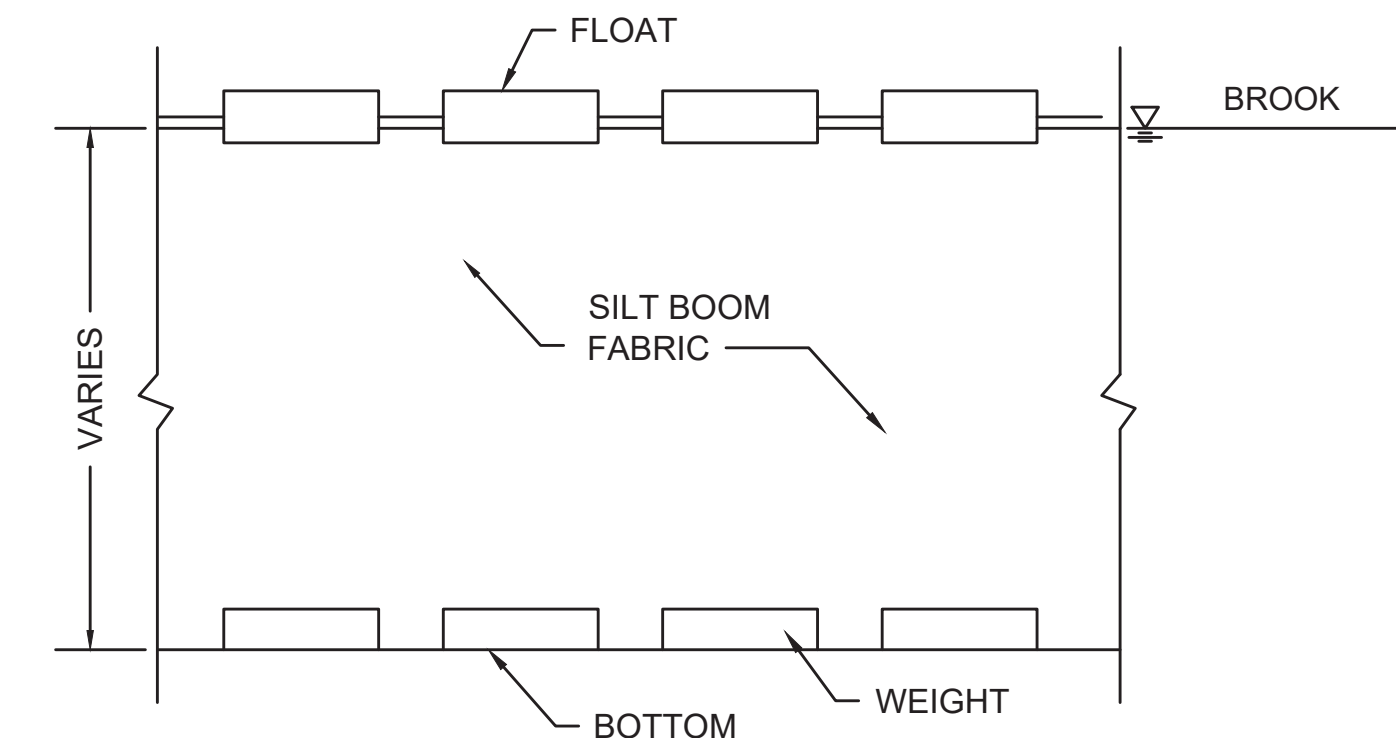
COMPOST FILTER TUBE
SCALE: N.T.S.



PLAN VIEW

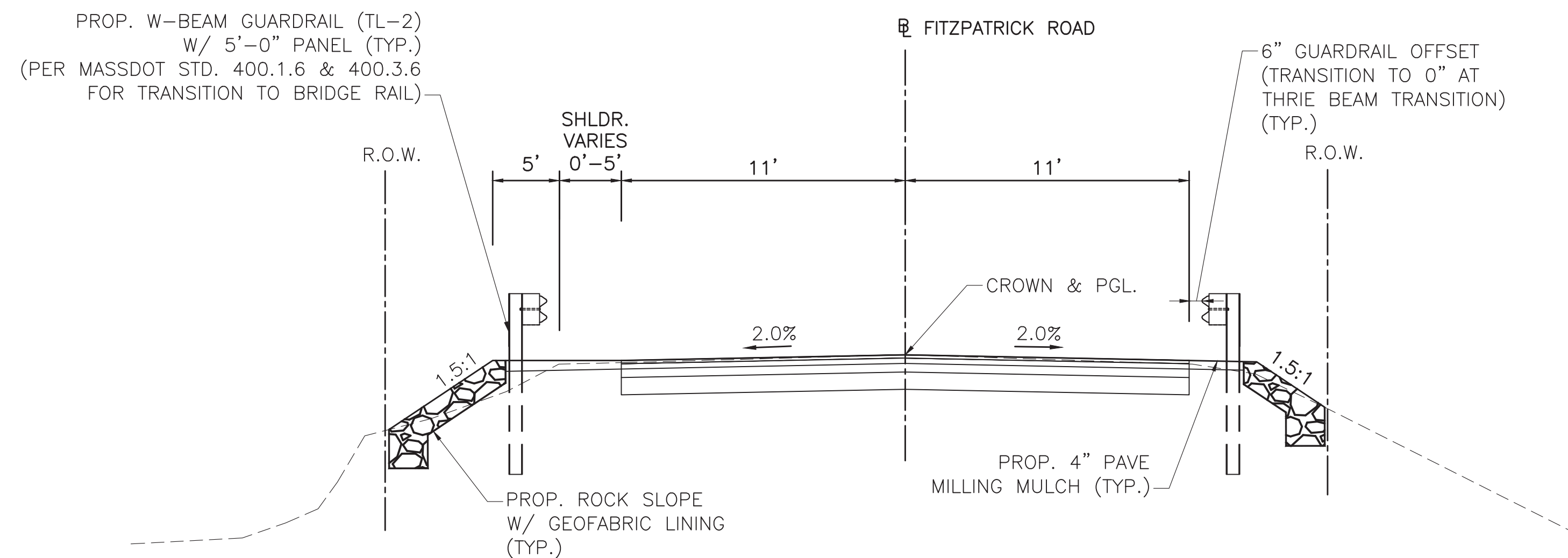


PLAN

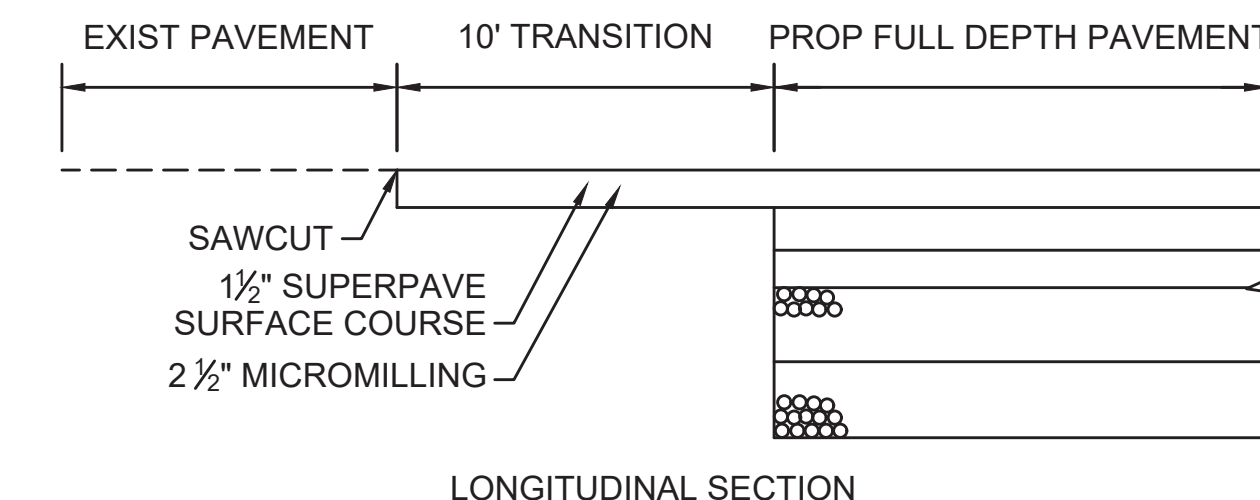


PROFILE

SILT BOOM FENCE
SCALE: N.T.S.



TYPICAL APPROACH SECTION
SCALE: N.T.S.



LONGITUDINAL SECTION
FULL DEPTH PAVEMENT TRANSITION
SCALE: N.T.S.

PAVEMENT NOTES:

PROPOSED FULL DEPTH PAVEMENT (ROADWAY):

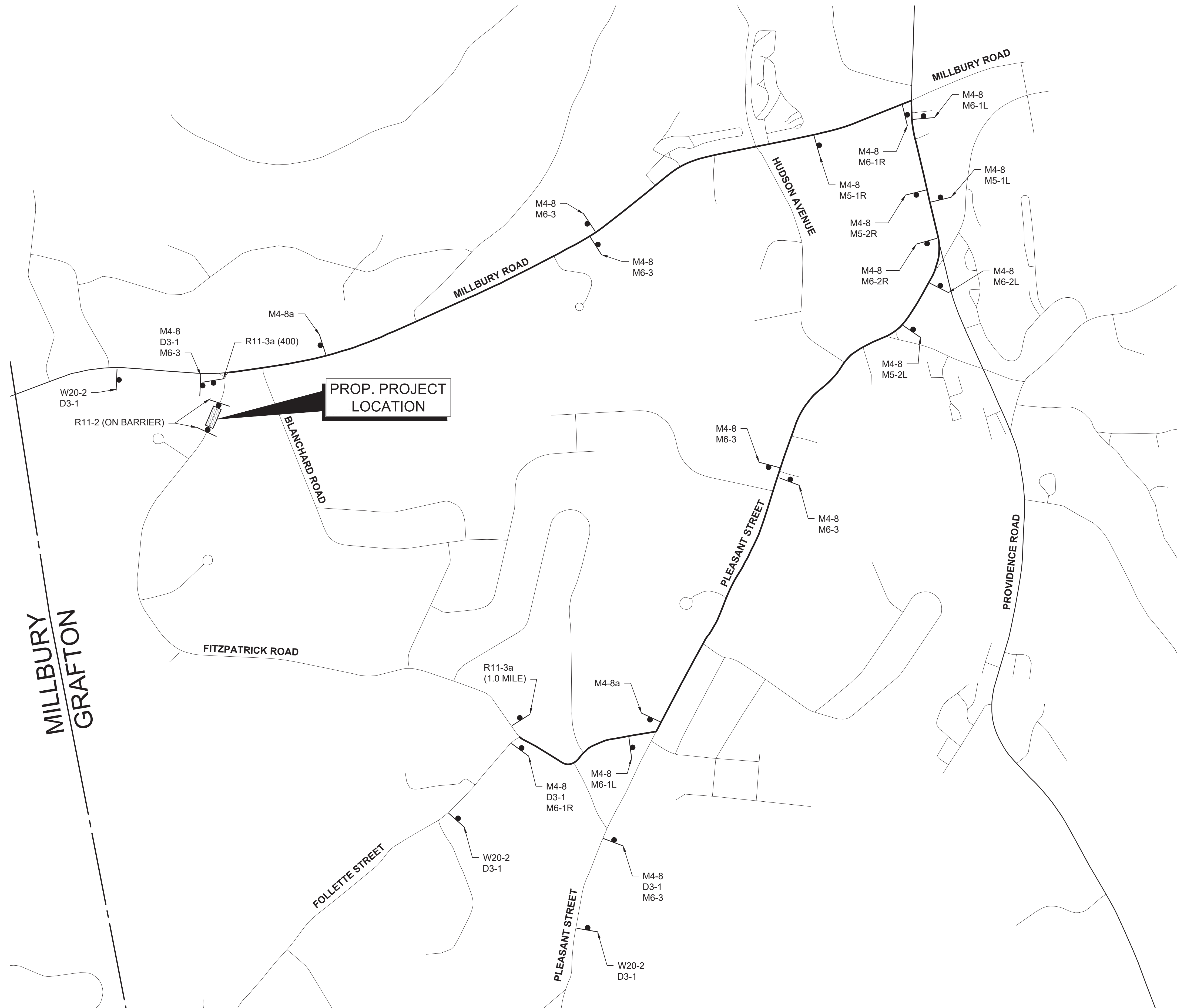
SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE 12.5 (SSC - 12.5) OVER 2 1/2" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC - 19.0)

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW, TYPE b OVER GRAVEL BORROW OR EXISTING MATERIAL MEETING TYPE b SPECIFICATIONS

GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9C	9
PROJECT FILE NO.		T1060	

TTCP (DETOUR PLAN)



GENERAL NOTES:

1. ALL WORK ZONES AND DETOURS ARE ESTABLISHED FOR 24-HOURS A DAY. 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.
2. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL (M.U.T.C.D.) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
3. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE M.U.T.C.D.
4. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
7. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS AT THE DISCRETION OF THE CONTRACTOR.
8. ALL DRUMS AND/OR CONES SHALL BE SET @ 20' O.C. MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.



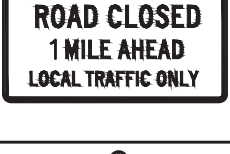






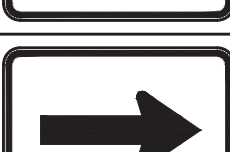






**DETOUR PLAN & ADVANCED SIGNAGE
SCHEMATIC FITZPATRICK ROAD**

SCALE: 1"=500'

GRAFTON
FITZPATRICK RD OVER
CRONIN BROOK

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9D	9

PROJECT FILE NO. T1060
TTCP (SIGN AND SUMMARY)

TRAFFIC SIGN SUMMARY													
IDENTIFICATION NUMBER	SIZE OF SIGN (INCHES)		LEGEND	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			NUMBER OF SUPPORTS REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACKGROUND	LEGEND	BORDER			
R11-2	48	30			①		2	WHITE	BLACK	BLACK	0 ON BARRIER	10.00	20.00
R11-3a(400)	60	30					1	WHITE	BLACK	BLACK	1	12.50	12.50
R11-3a(1.0 MILE)	60	30					1	WHITE	BLACK	BLACK	1	12.50	12.50
W20-2	36	36					3	ORANGE	BLACK	BLACK	3	9.00	27.00
M4-8	24	12					16	ORANGE	BLACK	BLACK	16	2.00	32.00
M4-8a	24	18					2	ORANGE	BLACK	BLACK	2	3.00	6.00
M5-1R	21	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.19	2.19
M5-1L	21	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.19	2.19
M5-2R	22	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.29	2.29
M5-2L	23	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.40	2.40
M6-1R	21	15					2	WHITE	BLACK	BLACK	0 W/ M4-8	2.19	4.38
M6-1L	21	15					2	WHITE	BLACK	BLACK	0 W/ M4-8	2.19	4.38
M6-2R	22	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.29	2.29
M6-2L	23	15					1	WHITE	BLACK	BLACK	0 W/ M4-8	2.40	2.40
M6-3	21	15					6	WHITE	BLACK	BLACK	0 W/ M4-8	2.19	13.13
D3-1	36	12			↓		6	ORANGE	BLACK	BLACK	0 W/ M4-8 W/ W20-1	3.00	18.00

NOTES:

- CONTRACTOR TO FURNISH SIGNS CONSISTENT WITH 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS. SEE MANUAL FOR TEXT AND LEGEND DIMENSIONS.