BRIDGE REPLACEMENT PROJECT

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	41
PROJECT FILE NO.	T1256.02		

TITLE SHEET & INDEX

PLAN AND PROFILE OF

CHESTNUT STREET OVER THE IPSWICH RIVER

BRIDGE NO. N-18-003 (CMX)

IN THE TOWN OF

NORTH READING

MIDDLESEX COUNTY

THESE PLANS ARE SUPPLEMENTED BY THE 2024 MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE MASSDOT OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE MASSDOT 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE MASSDOT WORKZONE SAFETY TEMPORARY TRAFFIC CONTROL, THE MASSDOT 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 2023 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, THE TOWN OF NORTH READING SUBDIVISION RULES AND REGULATIONS, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

ISSUED FOR CONSTRUCTION

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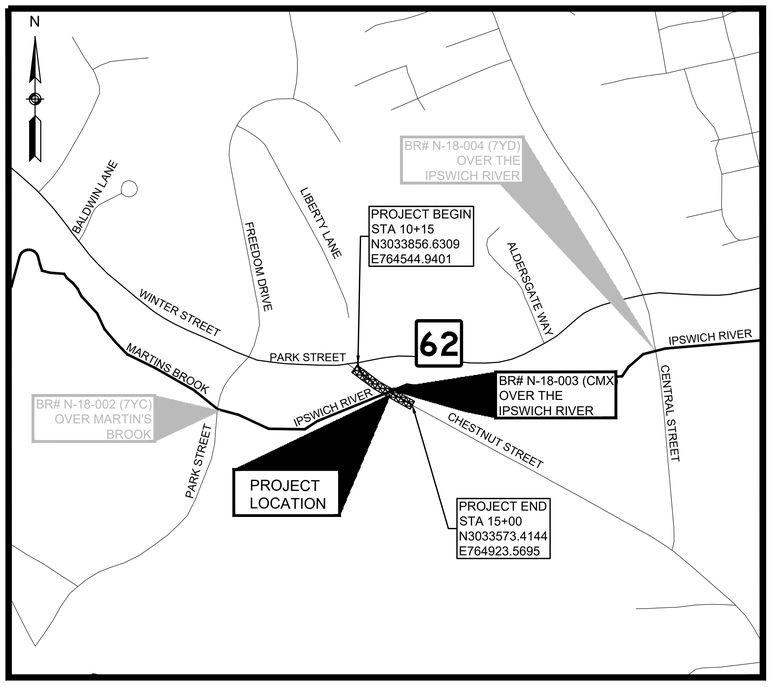

0 500 1000 1500

SCALE 1" = 500'

LENGTH OF PROJECT ALONG CHESTNUT STREET = 485.00 FEET = 0.09 MILES

DATE	DESCRIPTION	REV #
10/22/2024	ISSUED FOR CONSTRUCTION	-

COMMONWEALTH OF MASSACHUSETTS
DYLAN P SKINNER
CIVIL
No. 59185
PROFESSIONAL ENGINEER

FOR SHEETS 1-12 & 40-41

COMMONWEALTH OF MASSACHUSETTS
KASEY PROVOST
CIVIL
No. 58048
PROFESSIONAL ENGINEER
10/22/24

FOR SHEETS 13-39

TEC The Engineering Corp

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2nd Floor
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Worcester, MA 01608
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GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
C	C	CABLE MANHOLE
D	D	DRAINAGE MANHOLE
E	E	ELECTRIC MANHOLE
G	G	GAS MANHOLE
M	M	MISC MANHOLE
S	S	SEWER MANHOLE
T	T	TELEPHONE MANHOLE
W	W	WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		GUARD RAIL - DOUBLE FACE - STEEL POSTS
		GUARD RAIL - DOUBLE FACE - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		SEDIMENT CONTROL BARRIER
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
20'		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE (10' LINE / 30' GAP)
	BYL	BROKEN YELLOW LINE (10' LINE / 30' GAP)
	DWL	DOTTED WHITE LINE (3' LINE / 9' GAP)
	DYL	DOTTED YELLOW LINE (3' LINE / 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION (2' LINE / 6' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION (2' LINE / 6' GAP)
	DBWL	DOUBLE WHITE LINE
	DBYL	DOUBLE YELLOW LINE

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
AP	ANGLE POINT
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCB	CAPE COD BERM
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FDP	FULL DEPTH PAVEMENT
FGS	FLAGSTONE
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
IP	IRON PIPE
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OHW	OVERHEAD WIRES
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	41
PROJECT FILE NO.	T1256.02		

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

T1256.02_HD2LEGEND & ABBREVIATIONS).DWG Plotted on 22-Oct-2024 11:45 AM

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	41
PROJECT FILE NO.	T1256.02		

GENERAL NOTES

GENERAL NOTES:

1. EXISTING CONDITIONS INFORMATION COMPILED FROM SURVEY BY HANCOCK ASSOCIATES, BOSTON,MA PERFORMED IN AUGUST 2022 AND SUPPLEMENTED IN SEPTEMBER 2023. 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 NAD83 (NA2011) EPOCH 2010.00 (MYCS2) AND GEOID 18 ON 8/24/22 AND 9/28/23.

2. UNDERGROUND UTILITIES SHOWN HEREON ARE COMPILED FROM FIELD LOCATIONS OF STRUCTURES AND FROM AVAILABLE RECORD INFORMATION ON FILE AT THE TOWN ENGINEERING OFFICES AND UTILITY COMPANIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION, SIZE & ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO CONTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.

3. LIMITS OF BORDERING VEGETATED WETLANDS, MEAN ANNUAL HIGH WATER (MAHW) ASSOCIATED WITH THE IPSWICH RIVER, & LIMITS OF BORDERING LAND SUBJECT TO FLOODING (BLSF) SHOWN HEREON WERE DELINEATED BY HANCOCK ASSOCIATES ON 8/16/22 AND 9/1/23 AND LOCATED BY FIELD SURVEY.

4. AS SHOWN HEREON, THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE STUDY NUMBER 25017CV005C, REVISED JULY 6, 2016 DESIGNATES SPECIAL FLOOD HAZARD ZONE AE WITH A BASE FLOOD ELEVATION OF 71 FEET (NAVD88) UPSTREAM AND 70 FEET (NAVD88) DOWNSTREAM. ALSO, REFERENCE MAP NUMBER 25017C0303E; EFFECTIVE DATE TO JUNE 4, 2010.

5. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

6. ALL MUNICIPALLY OWNED UTILITY STRUCTURES (CATCH BASINS, DRAIN, ETC.) SHALL BE ADJUSTED BY THE CONTRACTOR TO FINISHED GRADE UNLESS OTHERWISE DIRECTED.

7. ALL PRIVATELY OWNED UTILITY STRUCTURES (GAS GATES, ELECTRIC /TELEPHONE MANHOLES, ETC.) SHALL BE ADJUSTED TO FINISHED GRADE BY THE PRIVATE UTILITY COMPANY, UNLESS DIRECTED OTHERWISE. THE CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES FOR THE ALTERATION AND ADJUSTMENT, AS NECESSARY.

8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE.

9. ALL DISTURBED AREAS OUTSIDE THE CURBLINE SHALL BE STABILIZED WITH 4" LOAM AND SEED, UNLESS OTHERWISE NOTED.

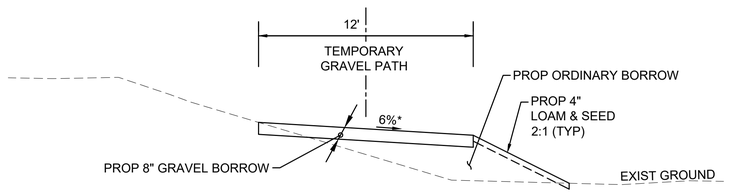
10. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R), AS APPROVED BY THE ENGINEER.

11. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.

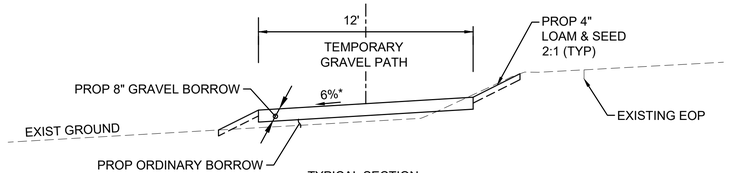
12. ALL EXISTING TREES WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS. ALL PROVIDED DIMENSIONS REFER TO THE DIAMETER AT BREAST HEIGHT.

13. TREE TRIMMING SHALL BE PERFORMED IN ADVANCE OF RELOCATED UTILITY POLES AND OVERHEAD WIRES. CONTRACTOR SHALL COORDINATE WITH NGRID FOR LOCATIONS.

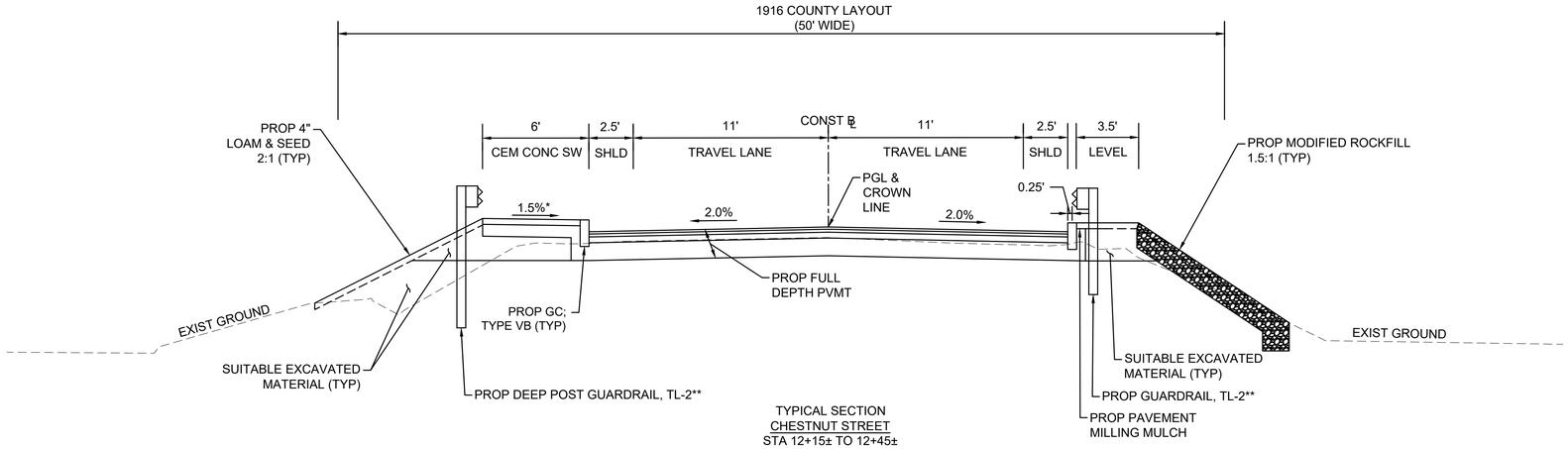
14. CONTRACTOR TO TAKE CARE TO ENSURE PROPOSED GUARDRAIL POSTS DO NOT CONFLICT WITH UNDERGROUND UTILITIES (E.G. RELOCATED GAS LINES).



TYPICAL SECTION
WESTERN TEMPORARY ACCESS PATH
STA 850+00 TO STA 851+00
NTS

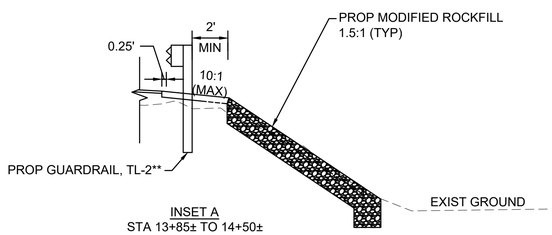


TYPICAL SECTION
EASTERN TEMPORARY ACCESS PATH
STA 750+00 TO STA 750+50
NTS

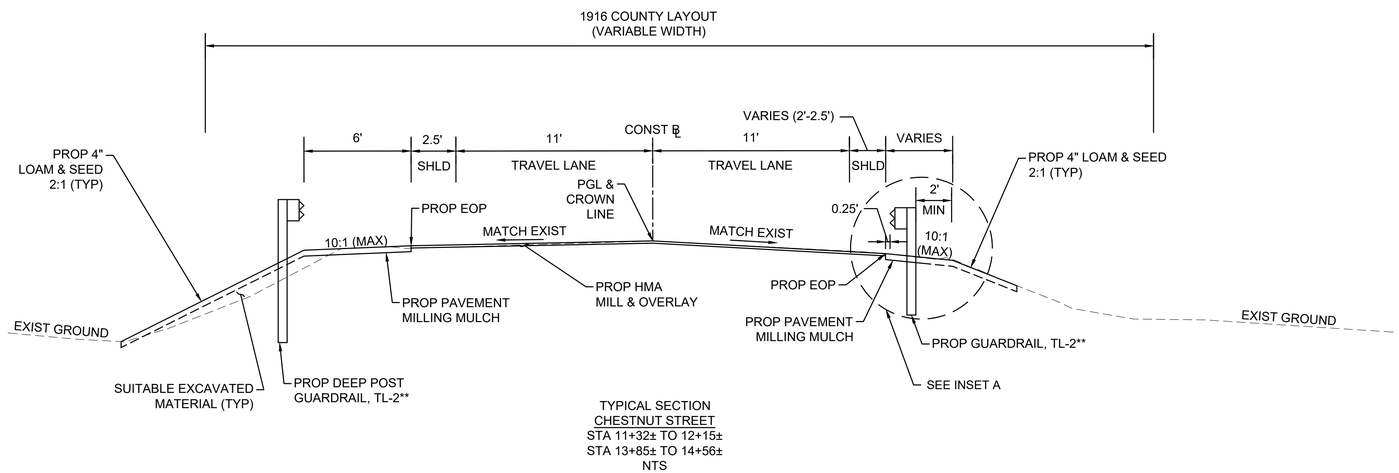


TYPICAL SECTION
CHESTNUT STREET
STA 12+15± TO 12+45±
STA 13+35± TO 13+85±
NTS

*TOLERANCE FOR CONSTRUCTION = ±0.5%
**SEE CONSTRUCTION PLANS FOR STATIONING OF GUARDRAIL



INSET A
STA 13+85± TO 14+50±



TYPICAL SECTION
CHESTNUT STREET
STA 11+32± TO 12+15±
STA 13+85± TO 14+56±
NTS

**SEE CONSTRUCTION PLANS FOR STATIONING OF GUARDRAIL

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	41
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TYPICAL SECTIONS & PAVEMENT NOTES

PAVEMENT NOTES

PROPOSED HMA MILL & OVERLAY

SURFACE: 1½" SUPERPAVE BRIDGE SURFACE COURSE - 9.5 - POLYMER (SSC - B - 9.5 - P) OVER VARIABLE DEPTH (1½" MIN) PAVEMENT FINE MILLING (SEE NOTE 5)

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 1½" SUPERPAVE BRIDGE SURFACE COURSE - 9.5 - POLYMER (SSC - B - 9.5 - P) OVER 2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER

BASE: 4" SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) OVER

SUBBASE: 12" GRAVEL BORROW, TYPE b

PROPOSED BRIDGE PAVEMENT

SEE BRIDGE PLANS (BRIDGE SHEET 18)

PROPOSED CEMENT CONCRETE SIDEWALKS / PEDESTRIAN CURB RAMPS

SURFACE: 4" CEMENT CONCRETE (4000 PSI, ¾", 610)

BASE: 8" SUITABLE EXISTING GRAVEL;
ADD GRAVEL BORROW, TYPE b AS REQUIRED

GENERAL PAVEMENT NOTES

1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND SAWCUT JOINTS BEFORE PAVING. HMA JOINT ADHESIVE SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED AT A RATE CONSISTENT WITH STANDARD SPECIFICATION 450.43. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. ALL HMA SHALL BE IN ACCORDANCE WITH SECTION 450.
3. ASPHALT EMULSION FOR TACK COAT SHALL BE RS-1H TO RESIST TRACKING OF TACK HAUL VEHICLES.
4. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED AS REQUIRED.
5. VARIABLE DEPTH MILLING AS REQUIRED TO MEET PROPOSED LINES AND GRADES WITH RESURFACING OVERLAY.

HIGHWAY GUARD DETAILS

STA 10+67 RT TO STA 10+97 RT TANGENT END TREATMENT, TL-2
STA 10+97 RT TO STA 12+17 RT GUARDRAIL, TL-2 (HALF POST SPACING)
STA 12+17 RT TO STA 12+50 RT TRANSITION TO BRIDGE RAIL

STA 11+02 LT TO STA 11+40 LT TRANSITION TO NCHRP 350 GUARDRAIL
STA 11+40 LT TO STA 12+16 LT GUARDRAIL, TL-2 (DEEP STEEL POSTS)
STA 12+16 LT TO STA 12+50 LT TRANSITION TO BRIDGE RAIL

STA 13+30 RT TO STA 13+64 RT TRANSITION TO BRIDGE RAIL
STA 13+64 RT TO STA 14+45 RT GUARDRAIL, TL-2 (HALF POST SPACING)
STA 14+45 RT TO STA 14+55 RT TRAILING ANCHORAGE

STA 13+30 LT TO STA 13+64 LT TRANSITION TO BRIDGE RAIL
STA 13+64 LT TO STA 14+39 LT GUARDRAIL, TL-2 (DEEP STEEL POSTS)
STA 14+39 LT TO STA 14+76 LT TANGENT END TREATMENT, TL-2

WATER SUPPLY ALTERATIONS

SEE UTILITY PLANS

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	41
PROJECT FILE NO.	T1256.02		

CONSTRUCTION PLAN

T1256.02_HD4(CONSTRUCTION PLANS).DWG Plotted on 22-Oct-2024 11:46 AM

LEGEND
= PROP MODIFIED ROCKFILL SLOPE STABILIZATION
= PROP RIP RAP
= PEDESTRIAN CURB RAMP

N

EASEMENT PLAN 642 OF 2001
PROJECT BEGIN STA 10+15 N3033856.6309 E764544.9401
100' WETLAND BUFFER ZONE
1908 COUNTY LAYOUT
33+50
33
CONST ℄
PARK STREET (PUBLIC – VARIABLE WIDTH)
TOWN OF NORTH READING DEED BOOK 10968 PAGE 293 #254 PARK STREET
TOWN OF NORTH READING DEED BOOK 6551, PAGE 399 #187 CHESTNUT STREET (FORMERLY RAILROAD PROPERTY)
CHRISTOPHER T. BRAIN DEED BOOK 46062, PAGE 195 LOT 1 PLAN No. 216 PF 1979 #185 CHESTNUT STREET
PROP TEMPORARY EASEMENT
PROP SIDEWALK FLUME W/ STONE FOR PIPE ENDS
PROP APPROACH SLAB
N-18-003 (CMX) (SEE BRIDGE PLANS)
PROP FLOATING SILT FENCE
PROP WETLAND REPLICATION AREA; SEE SHEET 12
CONNECT TO EXIST GUARDRAIL; R&D EXIST BURIED END
PROP 6' CEM CONC SW
RET STONE BOUND
102+00
PROP BRIDGE PAVEMENT
PROP GC; TYPE VB (TYP)
PROP 4" LOAM & SEED (TYP)
PROP CEM CONC PED CURB RAMP (TYP)
APPROX LIMIT OF GRADING (TYP)
RET TREE; PROP TREE PROTECTION
PI +50.00
200' RIVERFRONT AREA
10+00
PC +14.06
LIMIT OF HMA MILL & OVERLAY STA 10+70
PCC +18.43
PROP HMA MILL & OVERLAY
RET STONE BOUND
CONST ℄
PROP FDP
PT +39.49
PI +41.21
PT +45.60
PC +14.48
LIMIT OF FDP (STA 13+85)
PROP HMA MILL & OVERLAY
PROP EOP (TYP)
1916 COUNTY LAYOUT
850+00
851+00
750+00
15+00
CHESTNUT STREET (PUBLIC – VARIABLE WIDTH)
PT +46.70
PC +31.78
LIMIT OF FDP (STA 11+65)
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP SAWCUT (TYP)
PROP TANGENT END TREATMENT, TL-2 (TYP)
10+00 CHESTNUT STREET= 31+75.00 PARK STREET
PROP TEMPORARY EASEMENT
TEMP 4" LOAM & SEED; AREA SHALL BE RESTORED TO WETLANDS AFTER POLES ARE PERMANENTLY RELOCATED
12' TEMP GRAVEL ACCESS PATH (MAX GRADE = 15%)
PROP GUARDRAIL TYPE TL-2 (TYP)
BEGIN VGC (+29)
PROP HMA BERM TYPE A - MODIFIED; (SEE DETAIL SHEET 10)
PROP PERM SLOPE EASEMENT
BENCHMARK: OUTSIDE FACE GRANITE CURB (CENTER ISLAND) SQUARE BOX CUT(SET) AT POINT OF CURVATURE EL=72.71'
BENCHMARK: UTILITY POLE #3 MAG NAIL(FD) (2'A.G.) EL=73.80'
A.S.L. REALTY TRUST DEED BOOK 16819, PAGE 150 LOT 3R PLAN No. 285 OF 1986 #268 PARK STREET
IPSWICH RIVER FLOW
100+00
CONST ℄
PI +50.00
END VGC (+51)
1'WIDE BURIED R&D CMP RET. WALL
12+87.55 CHESTNUT STREET= 100+88.05 IPSWICH RIVER
TOWN OF NORTH READING DEED BOOK 11626, PAGE 364 #168 CHESTNUT STREET
750+50
METAL GUARDRAIL R&D
PROP MODIFIED ROCKFILL (TYP)
12' TEMP GRAVEL ACCESS PATH (MAX GRADE = 15%)
PROP PERM SLOPE EASEMENT
PROP TEMPORARY CONSTRUCTION AREA
PROP TRAILING ANCHORAGE
LIMIT OF HMA MILL & OVERLAY (STA 14+56)
TEMP 4" LOAM & SEED; AREA SHALL BE RESTORED TO WETLANDS AFTER POLES ARE PERMANENTLY RELOCATED
PROJECT END STA 15+00 N3033573.4144 E764923.5695
BENCHMARK: HYDRANT RIGHT FRONT BOLT OVER MAIN OUTLET (2'A.G.) EL=71.52'
200' RIVERFRONT AREA

FOR CONSTRUCTION PROFILE: SEE SHEET NO. 6

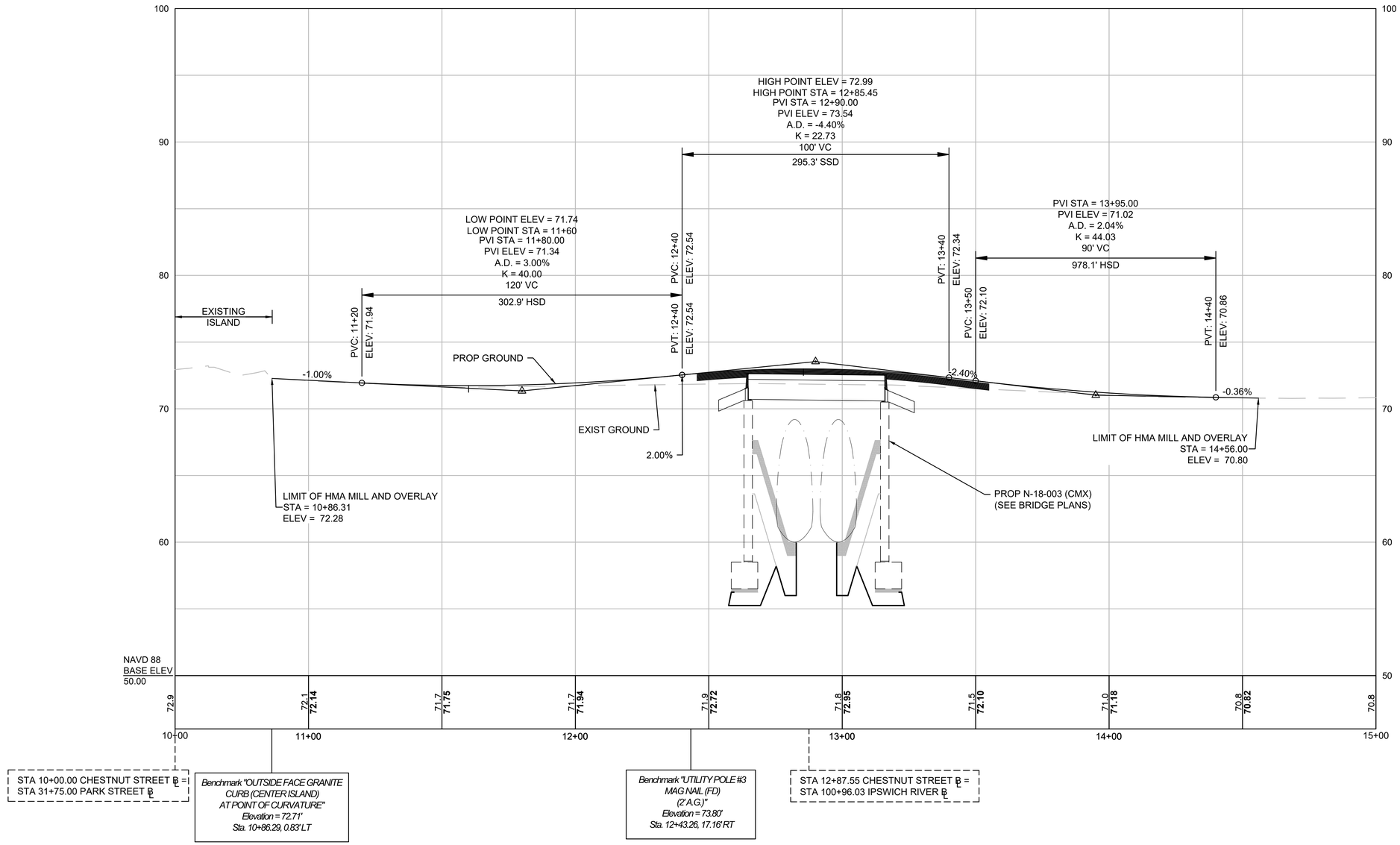
0 20 50 100
SCALE: 1" = 20'

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	41
PROJECT FILE NO.	T1256.02		

PROFILE

CHESTNUT STREET



FOR CONSTRUCTION PLAN: SEE SHEET NO. 5

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	41
PROJECT FILE NO.	T1256.02		

CURB TIE & GRADING PLAN

LEGEND
= PROP MODIFIED ROCKFILL SLOPE STABILIZATION / RIPRAP
(#) = CURVE NUMBER

PARK STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L4	30+00.00	3033849.2797	764368.9025		N88°03'03"E 30.45'	30+30.45	3033850.3153	764399.3319
C4	30+30.45	3033850.3153	764399.3319	R=500.00' Δ=8°44'36" L=76.30' T=38.22'		31+06.75	3033858.7078	764475.0951
L5	31+06.75	3033858.7078	764475.0951		N79°18'26"E 243.25'	33+50.00	3033903.8412	764714.1237

NOTE: L4 AND C4 ARE NOT SHOWN ON THIS PLAN.

PROP BRIDGE CURB TRANSITION DETAILS

STA 12+29 LT TO STA 12+35 LT: TRANSITION (6" TO 8")
STA 13+61 LT TO STA 13+51 LT: TRANSITION (8" TO 0")

STA 12+29 RT TO STA 12+36 RT: TRANSITION (0" TO 8")
STA 13+61 RT TO STA 13+76 RT: TRANSITION (8" TO 0")

PROJECT BEGIN
STA 10+15
N3033856.6309
E764544.9401

10+00 CHESTNUT STREET=
31+75.00 PARK STREET

12+87.55 CHESTNUT STREET=
100+88.05 IPSWICH RIVER

CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C5	19° 31' 51"	150.00	51.13	25.82
C6	8° 35' 43"	1000.00	150.01	75.15
C7	0° 56' 38"	500.00	8.24	4.12

Point Table				
Point #	Northing	Easting	Elevation	Description
1	3033652.394	764749.725	71.827	MTRV HM
2	3033605.964	764896.247	70.485	MTRV HM
3	3032896.370	766115.652	72.063	MTRV MMAG
4	3033886.594	764516.673	74.236	MTRV MMAG
5	3033916.196	764675.557	72.958	MTRV MMAG

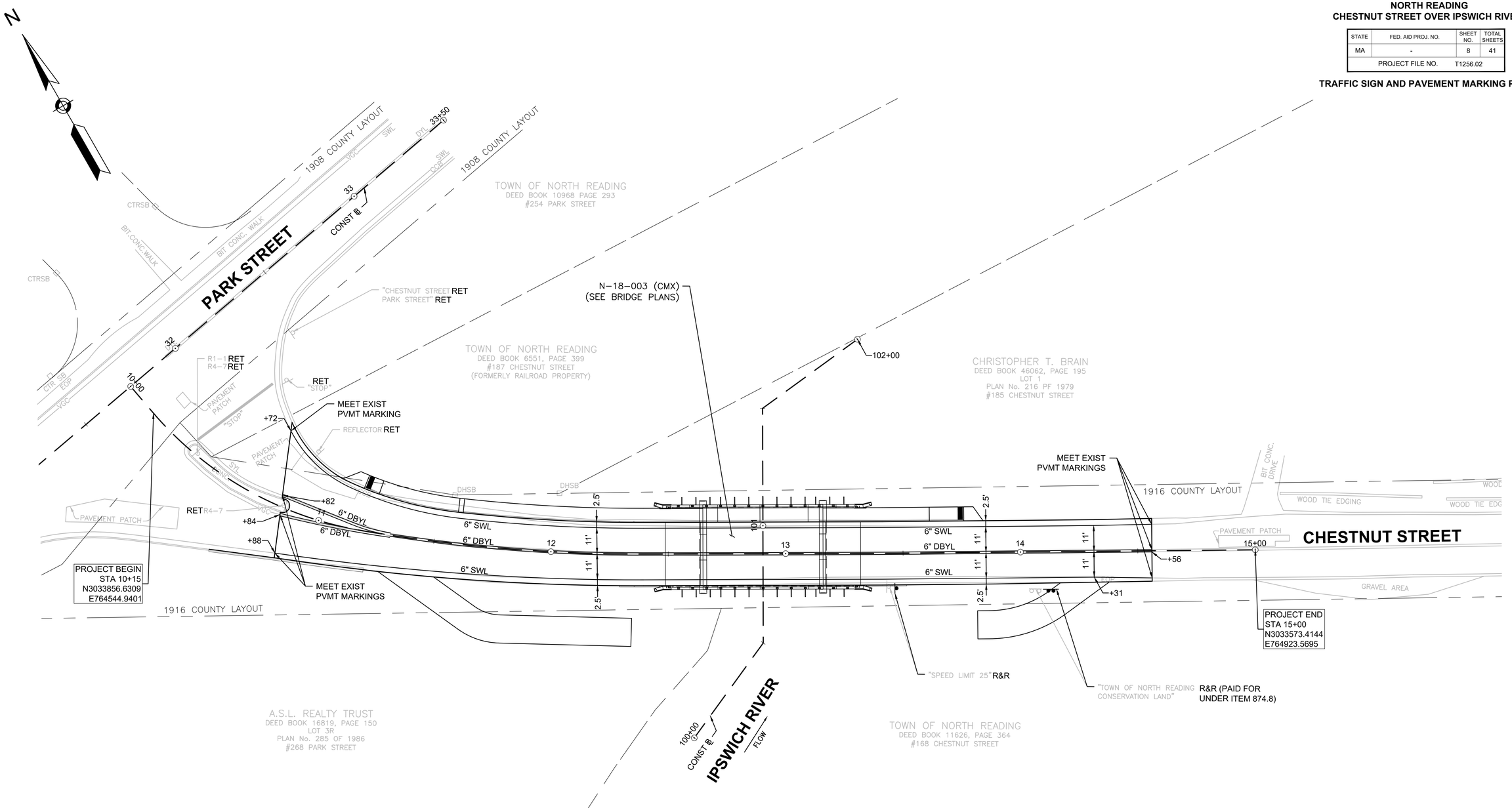
CHESTNUT STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	10+00.00	3033871.3714	764542.1623		S10°39'39"E 14.06'	10+14.06	3033857.5580	764544.7626
C1	10+14.06	3033857.5580	764544.7626	R=150.00' Δ=39°52'06" L=104.37' T=54.40'		11+18.43	3033769.5150	764596.8205
C2	11+18.43	3033769.5150	764596.8205	R=700.00' Δ=9°54'32" L=121.06' T=60.68'		12+39.49	3033701.0026	764696.4453
L2	12+39.49	3033701.0026	764696.4453		S60°26'17"E 101.72'	13+41.21	3033650.8195	764784.9198
L3	13+41.21	3033650.8195	764784.9198		S60°49'35"E 158.79'	15+00.00	3033573.4144	764923.5695

0 20 50 100
SCALE: 1" = 20'

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	41
PROJECT FILE NO.	T1256.02		

TRAFFIC SIGN AND PAVEMENT MARKING PLAN



NOTES:

1. THE MINIMUM MOUNTING HEIGHT OF POST-MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF CURB OR SIDEWALK, OR THE ELEVATION OF THE NEAR EDGE OF TRAVEL WAY, SHALL BE 7 FEET UNLESS OTHERWISE SPECIFIED.
2. A MINIMUM 4'-0" PATH OF TRAVEL CLEARANCE, EXCLUDING CURB, IS REQUIRED WHEN PLACING SIGNS. SIGNS SHALL BE INSTALLED SUCH THAT THE NEAREST EDGE SHALL BE OFFSET A MINIMUM OF 18" FROM THE EDGE OF ROADWAY.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
4. ALL PAVEMENT MARKINGS WITHIN THE LIMITS OF WORK SHALL BE THERMOPLASTIC MATERIALS UNLESS OTHERWISE NOTED.
5. ALL EXISTING PAVEMENT MARKINGS WITHIN DIRECT CONFLICT OF NEW PAVEMENT MARKINGS SHOULD BE ERADICATED BY APPROVED METHODS.

0 20 50 100

SCALE: 1" = 20'

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9	41
PROJECT FILE NO.	T1256.02		

UTILITY PLAN

T1256.02_HDS\UTILITY PLANS\.DWG Plotted on 22-Oct-2024 11:47 AM

N

EASEMENT PLAN 642 OF 2001

PARK STREET

CONST ℄

1908 COUNTY LAYOUT

TOWN OF NORTH READING
DEED BOOK 10968 PAGE 293
#254 PARK STREET

TOWN OF NORTH READING
DEED BOOK 6551, PAGE 399
#187 CHESTNUT STREET
(FORMERLY RAILROAD PROPERTY)

CHRISTOPHER T. BRAIN
DEED BOOK 46062, PAGE 195
LOT 1
PLAN No. 216 PF 1979
#185 CHESTNUT STREET

1916 COUNTY LAYOUT

A.S.L. REALTY TRUST
DEED BOOK 16819, PAGE 150
LOT 3R
PLAN No. 285 OF 1986
#268 PARK STREET

TOWN OF NORTH READING
DEED BOOK 11626, PAGE 364
#168 CHESTNUT STREET

IPSWICH RIVER
FLOW

CHESTNUT STREET

PROP FLOATING SILT FENCE

N-18-003 (CMX)
(SEE BRIDGE PLANS)

APPROX BRIDGE SHEETING LINE

PROP TEMP UTILITY BRIDGE
(SEE BRIDGE PLANS FOR DETAILS)

PROP TEMPORARY EASEMENT

PROP 4" TEMP GAS RELOCATION (BO)

PROP 4" PERM GAS RELOCATION (BO)

PROP TEMP GUY POLE W/ 15' ANCHOR (BO)

PROJECT BEGIN
STA 10+15
N3033856.6309
E764544.9401

PROJECT END
STA 15+00
N3033573.4144
E764923.5695

PROP 45° BENDS

PROP 8" INSERTION VALVE

PROP 8" CLDI

PROP 12' TEMP GRAVEL PATH
(MAX GRADE = 15%)

PROP PERM SLOPE EASEMENT

PROP TEMPORARY CONSTRUCTION AREA

TEMP OHW TO BE 10' MIN AWAY FROM SHEETING (SEE BRIDGE PLANS); POLES TO BE CANTILEVERED AWAY FROM ROADWAY

RET UPL 2

RET UPL 5

PROP UPL 3 PERMANENT RELOCATION (BO)

PROP UPL 3 TEMP RELOCATION (BO)

PROP UPL 4 PERMANENT RELOCATION (BO)

PROP UPL 4 TEMP RELOCATION (BO)

9.2'±HT. X 15.7'±W ARCHED CMP INV. EL=66.8'(GROUND) TOP OF PIPE=76.0'

9.0'±HT. X 13.7±W ARCHED CMP INV. EL=60.8'(GROUND) TOP OF PIPE=69.8'

1'WIDE BURIED CMP RET. WALL

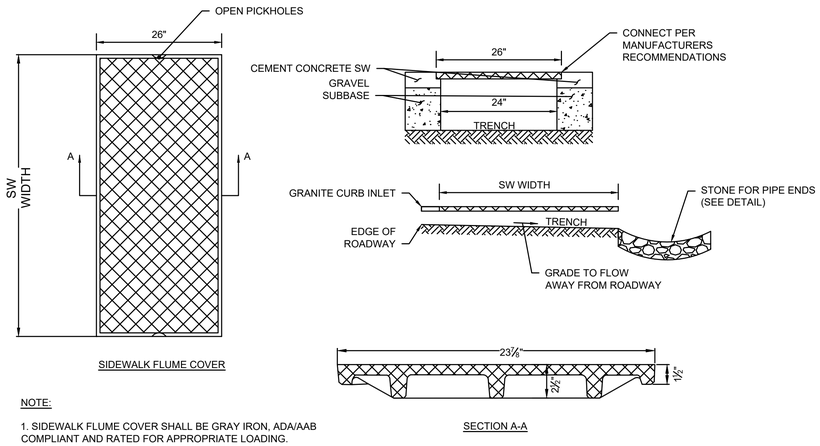
0 20 50 100

SCALE: 1" = 20'

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	10	41
PROJECT FILE NO.	T1256.02		

CONSTRUCTION DETAILS - 1 OF 2

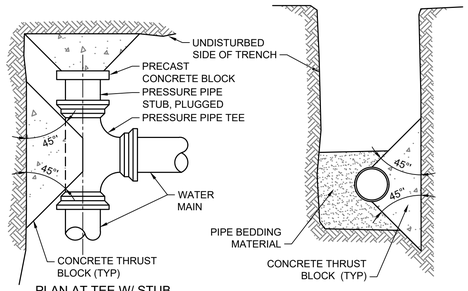


NOTE:

1. SIDEWALK FLUME COVER SHALL BE GRAY IRON, ADA/AAB COMPLIANT AND RATED FOR APPROPRIATE LOADING.

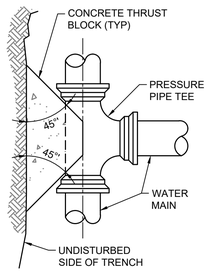
SIDEWALK FLUME

N.T.S.

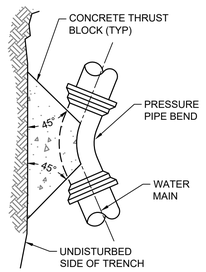


PLAN AT TEE W/ STUB FOR FUTURE USE

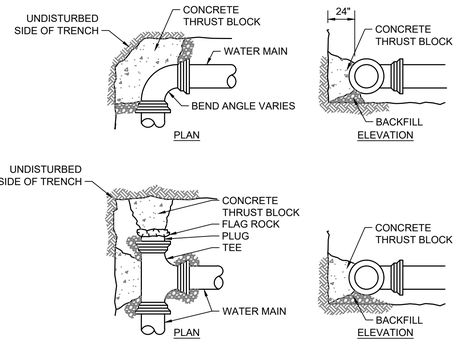
SECTION



PLAN AT TEE



PLAN AT BEND



MINIMUM THRUST BLOCK BEARING AREAS (IN SQ. FT.)*				
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES, PLUGS, CAPS & HYDRANTS
4", 6", 8"	6.0	2.9	2.3	4.5
10"	9.6	5.2	2.3	6.7
12"	13.3	6.7	3.7	9.6
* BASED ON 250 P.S.I. & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY				

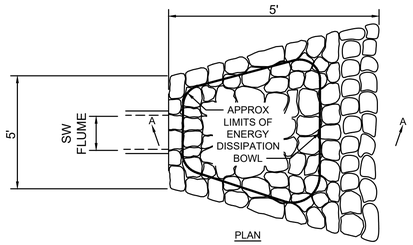
NOTES:

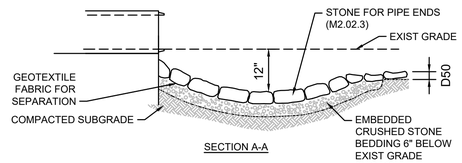
1. ALL WATER MAIN FITTINGS, BENDS, TEES, PLUGS ETC. SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
4. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
5. MINIMUM BEARING AREAS ARE BASED ON 250 P.S.I INTERNAL PIPE PRESSURE & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.
6. MINIMUM PIPE RESTRAINT LENGTH IS BASED ON DUCTILE IRON PIPE WITH A 150 P.S.I INTERNAL PIPE PRESSURE WITH 5.0' OF BURY IN UNIFIED SOIL CLASSIFICATION SM.

MINIMUM PIPE RESTRAINT LENGTH (IN FEET)*					
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES	PLUG/CAP
8"	21.0	9.0	4.0	29.0	38.0
10"	26.0	11.0	5.0	38.0	46.0
12"	33.0	14.0	6.0	48.0	69.0
* BASED ON DUCTILE IRON PIPE WITH A 150 P.S.I. TEST PRESSURE WITH 5.0 FEET OF BURY IN UNIFIED SOIL CLASSIFICATION SM.					
**NOTE: LONGER LENGTHS REQUIRED FOR PIPES WITH PLASTIC SLEEVES					

THRUST BLOCK - HORIZONTAL BENDS & PIPE RESTRAINT DETAILS

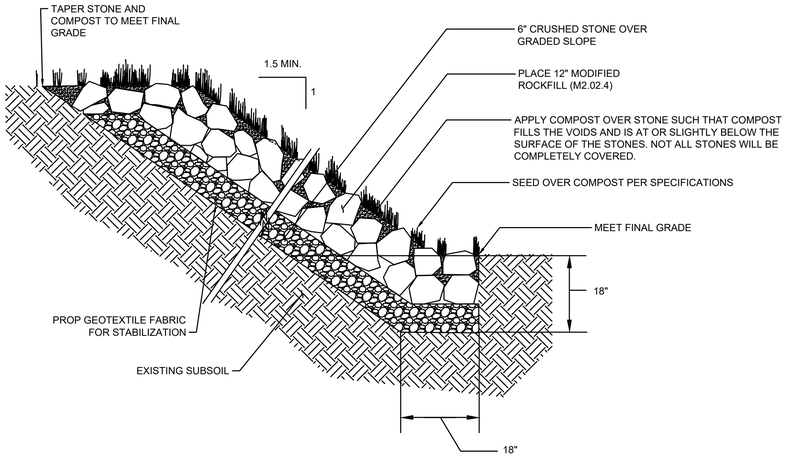
N.T.S.





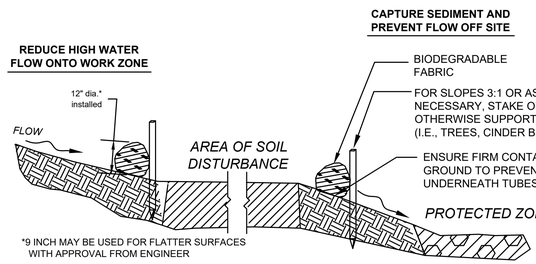
STONE FOR PIPE ENDS

N.T.S.

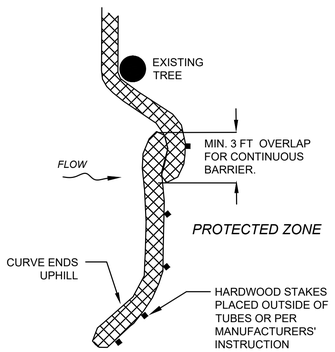


COMPOST AND SEED OVER MODIFIED ROCKFILL (NON-WATERWAY)

N.T.S.



SECTION



PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

PLACE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE

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

PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

PLAN VIEW

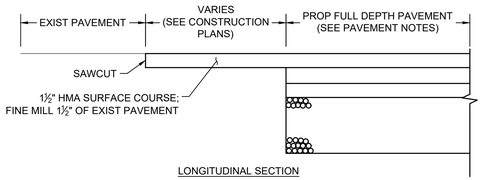
SEDIMENT CONTROL BARRIER

N.T.S.

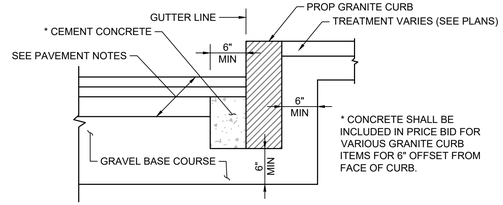
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	41
PROJECT FILE NO.	T1256.02		

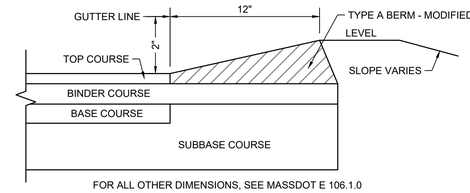
CONSTRUCTION DETAILS - 2 OF 2



FULL DEPTH PAVEMENT TRANSITION
N.T.S.

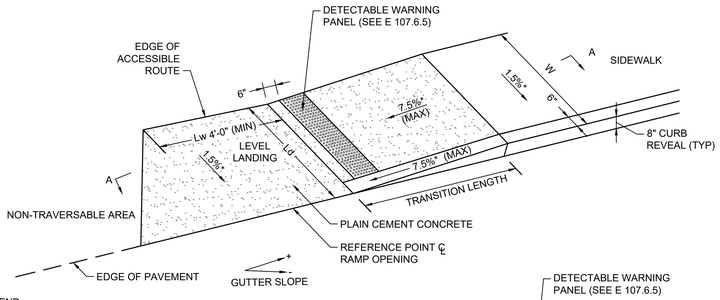


GRANITE CURB IN FULL DEPTH PAVEMENT
N.T.S.



FOR ALL OTHER DIMENSIONS, SEE MASSDOT E 106.1.0

HOT MIX ASPHALT BERM, TYPE A - MODIFIED
N.T.S.



LEGEND:

W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

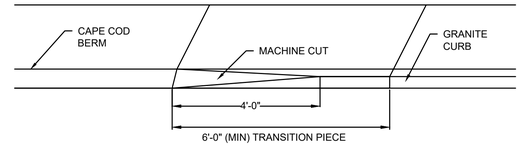
1. USABLE SIDEWALK WIDTH PER AAB = W-6"
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED FROM LEFT TO RIGHT PARALLEL TO RAMP
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

CURB RAMP TYPE A
N.T.S.

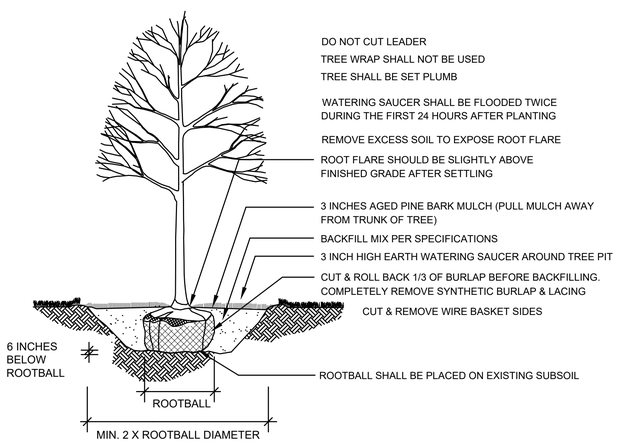
CURB RAMP DATA									
RAMP #	BASELINE REFERENCE	STATION	OFFSET	ROADWAY GUTTER SLOPE	LEVEL LANDING		TRANSITION LENGTH		
					Lw	Ld	TRANSITION LENGTH	CURB REVEAL	SIDEWALK WIDTH
1	CHESTNUT STREET	11+11+1	18.9' LT	-2.5%	4'-0"	6'-0"	14'-8"	8"	6'-0"
2	CHESTNUT STREET	13+80.1	13.5' LT	-1.6%	4'-0"	6'-0"	6'-6"	6"	6'-0"

PEDESTRIAN CURB RAMP NOTES:

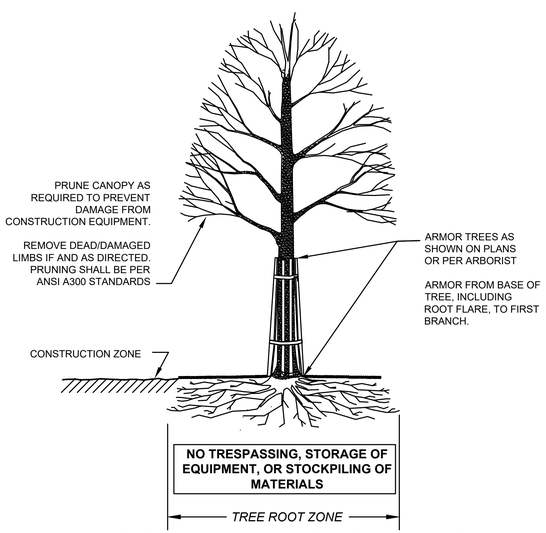
1. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE DESIGNED TO 4.5% ±0.5% (7.5% ±0.5% FOR CURB RAMPS)
2. A MINIMUM OF 4'-0" CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
3. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
4. ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY.
5. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL OF THE PROPOSED PEDESTRIAN CURB RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STANDARD E 107.6.5 (OCTOBER 2017). CONTRACTOR SHALL PROVIDE 6" BETWEEN DETECTABLE WARNING PANEL AND EDGE OF CONCRETE WHERE IT ABUTS LOAM & SEED.
6. PEDESTRIAN CURB RAMP SLOPES AND CROSS SLOPES SHALL HAVE A CONSTRUCTION TOLERANCE OF ±0.5%.
7. DETECTABLE WARNING PANELS SHALL BE YELLOW IN COLOR AS APPROVED BY NORTH READING DEPARTMENT OF PUBLIC WORKS.



GRANITE CURB SPLAYED END
N.T.S.

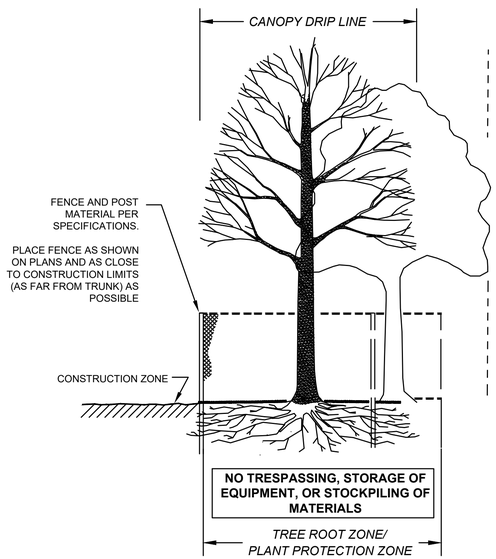


DECIDUOUS TREE PLANTING
N.T.S.

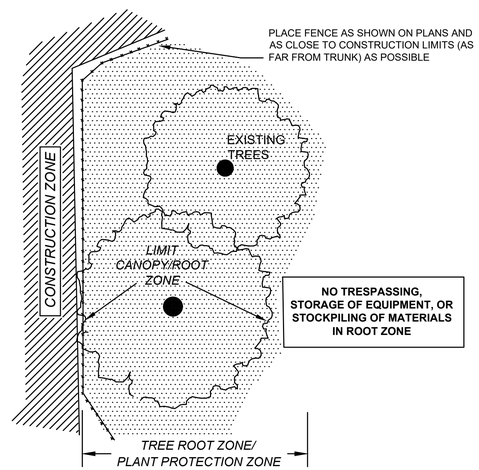


SECTION - TRUNK ARMORING & PRUNING

TREE PROTECTION - TRUNK
N.T.S.



SECTION - FENCE PROTECTION OF ROOT ZONE



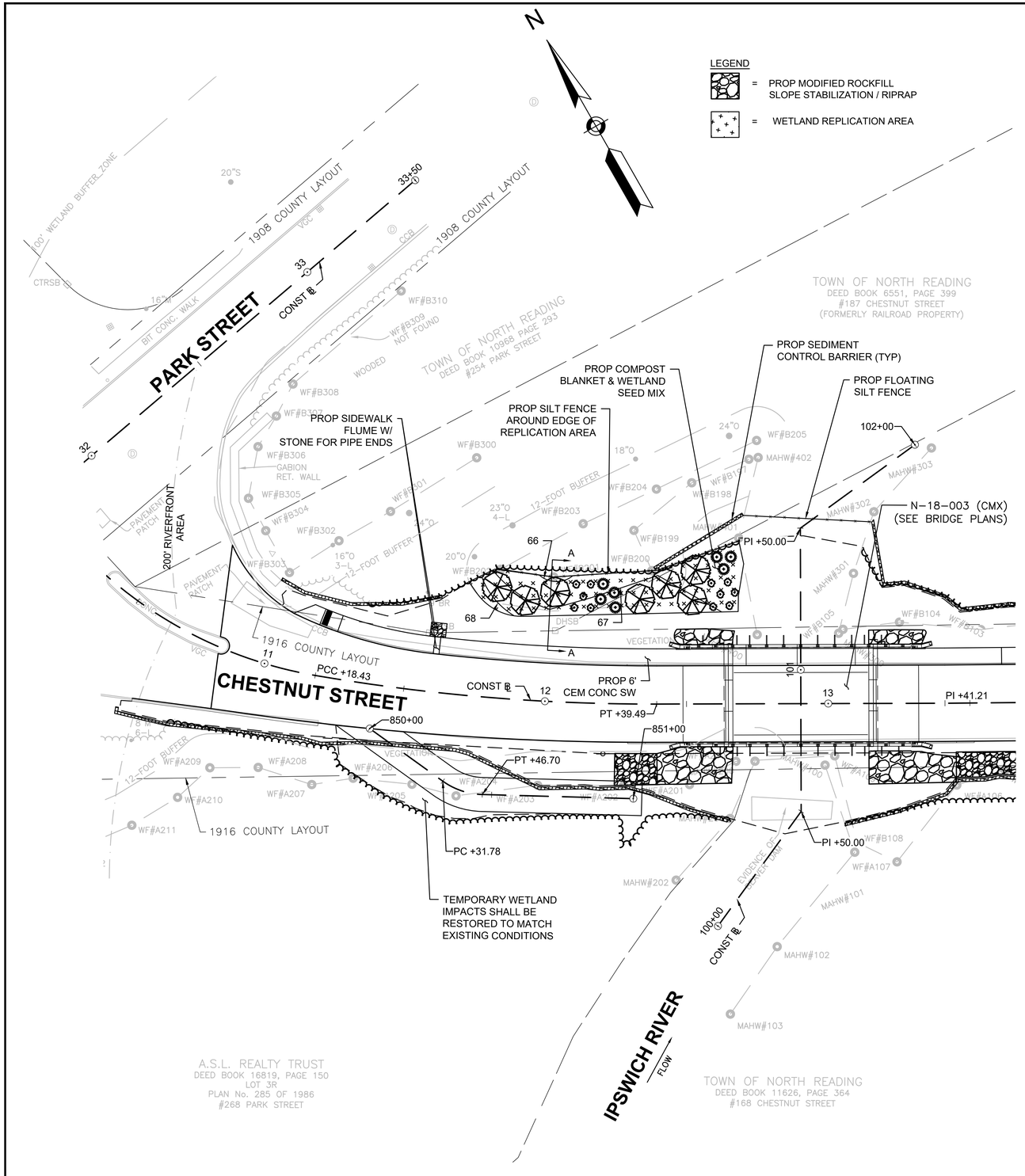
PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

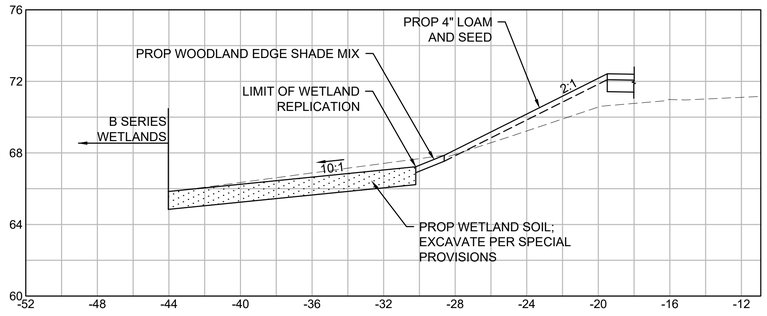
TREE PROTECTION - ROOT ZONE
N.T.S.

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	12	41
PROJECT FILE NO.	T1256.02		

WETLAND REPLICATION PLAN





SECTION A-A

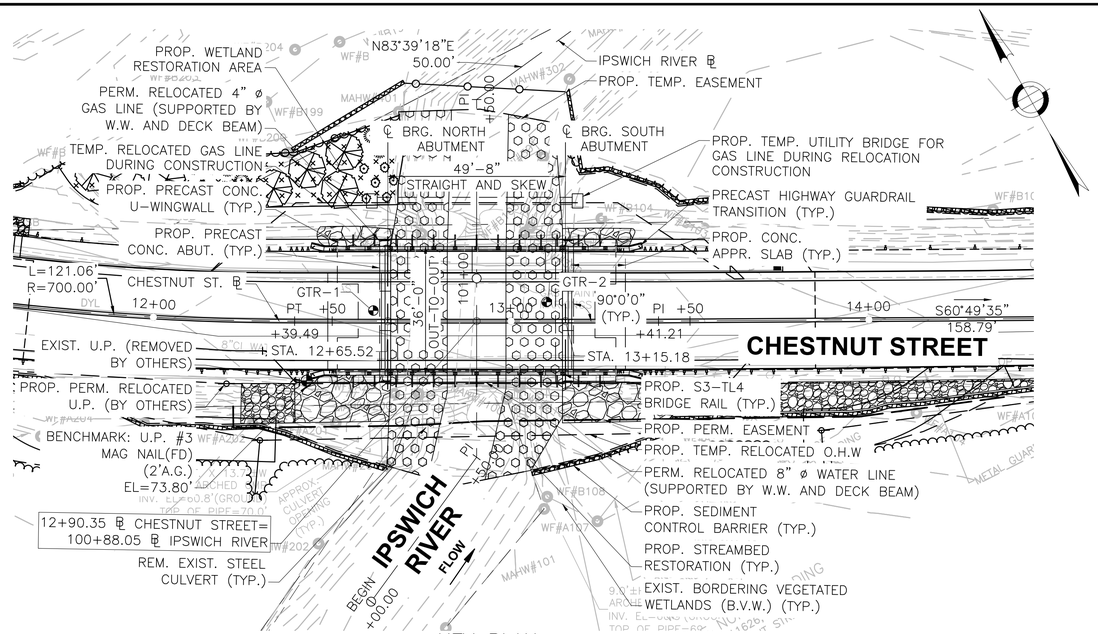
PROPOSED PLANTING SUMMARY TABLE

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	13	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	24" - 36"	5' ON CENTER	CONTAINER
	44	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	24" - 36"	5' ON CENTER	CONTAINER
	12	VIBURNUM DENTATUM	SMOOTH ARROW WOOD	24" - 36"	5' ON CENTER	CONTAINER
	14	ACER RUBRUM	RED MAPLE	MIN 6'	10' ON CENTER	
	2	ULMUS AMERICANA	AMERICAN ELM	MIN 6'	10' ON CENTER	

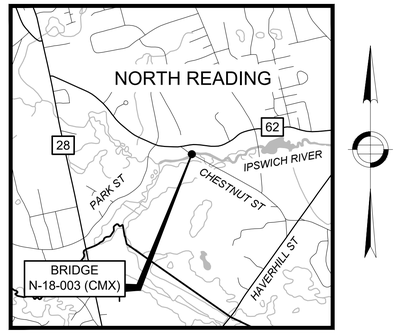
PLANTING NOTES:

1. CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
2. FINAL LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE TOWN PRIOR TO PLANTING.
3. ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME & SIZE. IMMEDIATELY AFTER ACCEPTANCE, TAGS AND RIBBONS SHALL BE REMOVED.
4. ALL PLANTS WILL BE MULCHED PER THE PLANS AND SPECIFICATIONS.
5. IMPORTED SOIL SHALL CONSIST OF EQUAL PARTS ORGANIC MATTER (LEAF COMPOST IS PREFERRED) AND CLEAN LOAM OR ORGANIC RICH LOAM WITH A MINIMUM 20% ORGANIC CARBON BY DRY WEIGHT. SURVEYING OF SUBGRADES AND FINISHED ELEVATIONS SHOULD BE CONDUCTED FREQUENTLY DURING CONSTRUCTION. COMTAMINATION OF THESE SOILS SHOULD BE PREVENTED. THEY SHOULD BE TRANSPORTED IN VEHICLES THAT HAVE BEEN WASHED SO THAT NO EXOTIC/INVASIVE SEEDS FROM OTHER SITES GET MIXED IN WITH THEM.
6. SHRUBS SHALL BE PLANTED IN A RANDOM PATTERN OR IN CLUSTERS TO MIMIC NATURAL CONDITIONS.
7. CONTRACTOR SHALL TAKE EXTREME CARE TO NOT CONTAMINATE THE WETLAND REPLICATION / RESTORATION AREA WITH OUTSIDE INVASIVE SPECIES.
8. ALL PLANTING SHALL OCCUR AT THE BEGINNING OR END OF THE GROWING SEASON. FALL PLANTINGS SHALL BE DONE BEFORE THE FIRST FROST, BUT NO LATER THAN NOVEMBER 15.

0 20 50 100
SCALE: 1" = 20'



KEY PLAN
SCALE: 1"=20'



LOCUS MAP
SCALE: 1"=2000'

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	41
PROJECT FILE NO.		----	

KEY PLAN & PROFILE

INDEX OF DRAWINGS

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3. BORING LOGS
4. PLAN & ELEVATION
5. CONTROL OF WATER PLAN
6. CONTROL OF WATER ELEVATION
7. NORTH ABUTMENT PLAN & ELEVATION
8. SOUTH ABUTMENT PLAN & ELEVATION
9. ABUTMENT & WINGWALL SECTIONS
10. ABUTMENT & WINGWALL DETAILS (1 OF 2)
11. ABUTMENT & WINGWALL DETAILS (2 OF 2)
12. WINGWALL ELEVATION
13. FRAMING PLAN
14. TYPE S48-18 DECK BEAM DETAILS
15. TRANSVERSE TIE DETAILS
16. UTILITY SUPPORT DETAILS
17. SIDEWALK & SAFETY CURB SECTION
18. TRANSVERSE SECTION & DECK DETAILS
19. APPROACH SLAB & MISCELLANEOUS DETAILS
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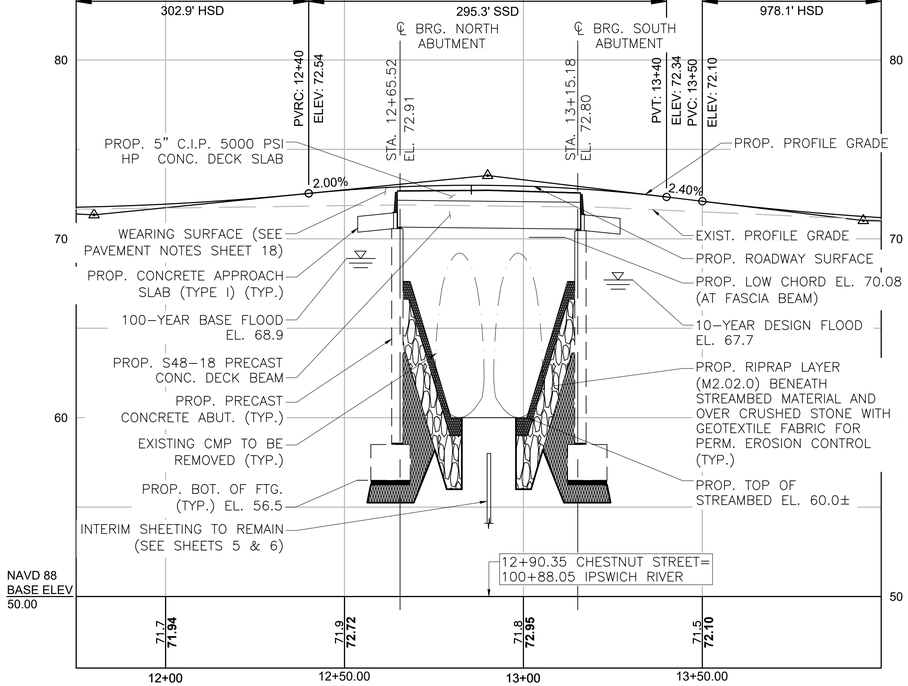
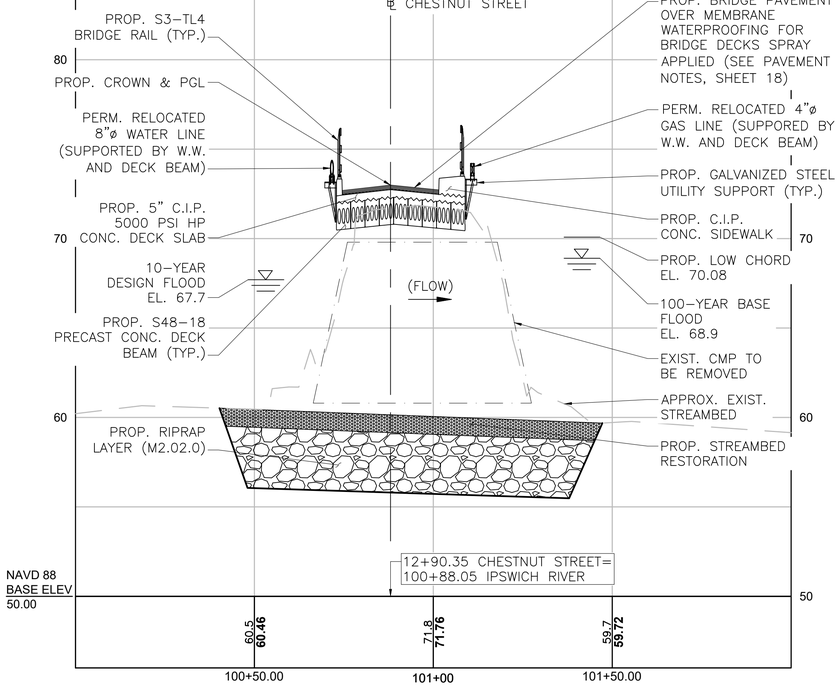
22. S3-TL4 BRIDGE RAIL
23. FABRICATION TOLERANCES (1 OF 2)
24. FABRICATION TOLERANCES (2 OF 2)
25. TEMPORARY TRAFFIC CONTROL PLAN (1 OF 2)
26. TEMPORARY TRAFFIC CONTROL PLAN (2 OF 2)
27. TEMPORARY TRAFFIC CONTROL PLAN SIGN SUMMARY

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024



CHESTNUT STREET ℄ PROFILE
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'



IPSWICH RIVER ℄ PROFILE
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

KASEY PROVOST CIVIL No. 58048 PROFESSIONAL ENGINEER 10/22/24

TEC The Engineering Corp
282 Merrimack Street
Lawrence, MA 01843

10/22/2024	ISSUED FOR CONSTRUCTION

PROPOSED BRIDGE
NORTH READING
CHESTNUT STREET
OVER IPSWICH RIVER

TOWN OF NORTH READING
235 NORTH STREET
NORTH READING, MA 01864

SHEET 1 OF 27 SHEETS BRIDGE NO. N-18-003 (CMX)

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

T1256.02_BR1_(N-18-003).DWG Plotted on 22-Oct-2024 11:37 AM

DESIGN:

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

SURVEY BENCHMARKS:

BENCHMARK 1: OUTSIDE FACE GRANITE CURB (CENTER ISLAND)
N: 3033792.9570'
E: 764575.0324'
ELEVATION = 72.71'

BENCHMARK 2: UTILITY POLE #3 MAG NAIL(FD) (2'A.G.)
N: 3033684.2160'
E: 764691.2547'
ELEVATION = 73.80'

BENCHMARK 3: HYDRANT RIGHT FRONT BOLT OVER MAIN OUTLET (2'A.G.)
N: 3033508.5468'
E: 765002.3612'
ELEVATION = 71.52'

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

DATE:

TO BE PLACED ON THE INSIDE FACE OF THE SOUTHWEST AND NORTHEAST HIGHWAY GUARDRAIL TRANSITIONS. 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 HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED. BOTH HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

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.

CONCRETE:

UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 5000 HP CONCRETE.

ALL CIP AND PRECAST CONCRETE POURS SHOWN ON THESE CONSTRUCTION DRAWINGS WHERE ALL VOLUMETRIC DIMENSIONS ARE 4 FEET OR GREATER SHALL BE CONSIDERED TO BE MASS CONCRETE PLACEMENTS AND SHALL REQUIRE A HEAT OF HYDRATION ANALYSIS AND THERMAL CONTROL PLAN, AS SPECIFIED IN THE MASSDOT STANDARD SPECIFICATIONS.

ALL S48–18 DECK BEAMS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 6500 PSI.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. ALL REINFORCING STEEL SHALL BE EPOXY COATED. 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 < 3db, OR CLEAR SPACING < 6db	21"	26"	31"
4. COATED BARS, ALL OTHER CASES	17"	21"	25"
5. CONDITION 2. AND 3.	23"	29"	35"
6. CONDITION 2. AND 4.	21"	27"	32"

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

MEMBRANE WATERPROOFING:

ALL MEMBRANE WATERPROOFING USED ON BRIDGE DECKS SHALL BE MEMBRANE WATERPROOFING BRIDGE DECKS – SPRAY APPLIED

TRAFFIC CONTROL:

ROADWAY SHALL BE CLOSED FOR THE DURATION OF CONSTRUCTION PER THE TEMPORARY TRAFFIC CONTROL PLAN (TTCP).

UTILITIES:

EXISTING 8" WATER MAIN SHALL BE TEMPORARILY CUT ON BOTH SIDES OF THE BRIDGE BY THE CONTRACTOR. THE PERMANENT LINE WILL BE HUNG ON STEEL SUPPORTS ON THE WESTERN SIDE OF THE BRIDGE. THE CONTRACTOR SHALL COORDINATE WITH THE TOWN OF NORTH READING WATER DEPARTMENT FOR TEMPORARY CUT AND PERMANENT RELOCATION.

EXISTING 4" GAS MAIN OWNED BY NATIONAL GRID SHALL BE TEMPORARILY RELOCATED TO A TEMPORARY SUPPORT BRIDGE TO MAINTAIN SERVICE DURING CONSTRUCTION. THE PERMANENT LINE WILL BE HUNG ON STEEL SUPPORTS ON THE EAST SIDE OF THE BRIDGE. THE CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID FOR TEMPORARY AND PERMANENT RELOCATIONS.

EXISTING OVERHEAD WIRES AND EXISTING TELEPHONE CONDUITS (SUPPORTED ON ADJACENT STEEL STRUCTURE) ARE TO PERMANENTLY BE RELOCATED DURING CONSTRUCTION. THE CONTRACTOR SHALL USE CAUTION WHILE WORKING AROUND EXISTING UTILITIES.

FOOTING SUBGRADE:

CRUSHED STONE SHOULD BE PLACED USING CONTROLLED, COMPACTED LIFTS UP TO THE SUBGRADE LEVEL FOR THE NEW FOUNDATIONS. EXCAVATION EQUIPMENT WITH SMOOTH–EDGED BUCKETS SHOULD BE USED TO MINIMIZE DISTURBANCE OF NATURAL SOIL SUBGRADES. EXPOSED FOOTING SUBGRADES SHOULD BE PROTECTED FROM DISTURBANCE. FILL SHOULD NOT BE PLACED OVER FROZEN SOIL. SOIL SUBGRADES SHOULD BE PROTECTED AGAINST FROST DURING CONSTRUCTION.

FILL SHOULD BE PLACED IN LOOSE LAYER NOT MORE THAN 12 INCHES THICK AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D–1557. IN CONFINED AREAS, PLACE ONLY 6–INCH LAYERS AND COMPACT WITH MANUALLY OPERATED, POWERED VIBRATORY COMPACTORS. CRUSHED STONE SHOULD BE COMPACTED TO AN UNYIELDING SURFACE. EXTRA CARE SHOULD BE USED WHEN COMPACTING ADJACENT TO WALLS. COMPACTION WITHIN 5 FEET OF ABUTMENT WALLS SHOULD BE PERFORMED USING A VIBRATORY WALK–BEHIND ROLLER OR PLATE COMPACTOR.

ESTIMATED QUANTITIES
(NOT GUARANTEED)

ITEM	115.1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. N–18–003	1 LS
ITEM	140	BRIDGE EXCAVATION	900 CY
ITEM	148	DREDGING AND DISPOSING OF MATERIAL	550 CY
ITEM	151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	700 CY
ITEM	156	CRUSHED STONE	90 TON
ITEM	156.1	CRUSHED STONE FOR BRIDGE FOUNDATIONS	325 TON
ITEM	450.601	SUPERPAVE BRIDGE SURFACE COURSE – 9.5 – POLYMER (SSC–B – 9.5 – P)	120 TON
ITEM	450.701	SUPERPAVE BRIDGE PROTECTIVE COURSE – 9.5 – POLYMER (SPC–B – 9.5 – P)	20 TON
ITEM	698.4	GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL	150 SY
ITEM	983.1	RIPRAP	375 TON
ITEM	983.521	STREAMBED RESTORATION	5 CY
ITEM	991.1	CONTROL OF WATER – STRUCTURE NO. N–18–003	1 LS
ITEM	992.321	TEMPORARY UTILITY SUPPORT FOR 4" GAS LINE	1 LS
ITEM	995.01	BRIDGE STRUCTURE, BRIDGE NO. N–18–003	1 LS

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	41
PROJECT FILE NO.		----	

GENERAL NOTES

TRAFFIC DATA	ROADWAY OVER	ROADWAY UNDER
DESIGN YEAR	2043	
AVERAGE DAILY TRAFFIC – PRESENT	5280	
AVERAGE DAILY TRAFFIC – DESIGN YEAR	6442	
DESIGN HOURLY VOLUME	530	
DIRECTIONAL DISTRIBUTION	58.2	
TRUCK PERCENTAGE – AVERAGE DAY	6.2	
TRUCK PERCENTAGE – PEAK HOUR	6.3	
DESIGN SPEED	35	
DIRECTIONAL DESIGN HOURLY VOLUME	310	

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	1000
DESIGN SPECTRA	
As	0.13
SDs	0.264
SD1	0.096
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA	
DRAINAGE AREA (SQ. MILES)	37.1
DESIGN FLOOD DISCHARGE (C.F.S.)	688
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	3
DESIGN FLOOD ELEVATION (FEET, NAVD)	67.7
BASE (100–YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	1260
BASE FLOOD ELEVATION (FEET, NAVD)	68.9
DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.3
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.4
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A
FLOOD OF RECORD	
DISCHARGE (C.F.S.)	N/A
FREQUENCY (IF KNOWN, YEARS)	N/A
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	N/A
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR AND EROSION	N/A

TEMPORARY WATER CONTROL DESIGN DATA	
DESIGN FLOOD DISCHARGE (C.F.S.)	403
DESIGN FLOOD FREQUENCY (YEARS)	2
DESIGN FLOOD VELOCITY (F.P.S.)	5.2
DESIGN FLOOD ELEVATION (FEET, NAVD)	67.7

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

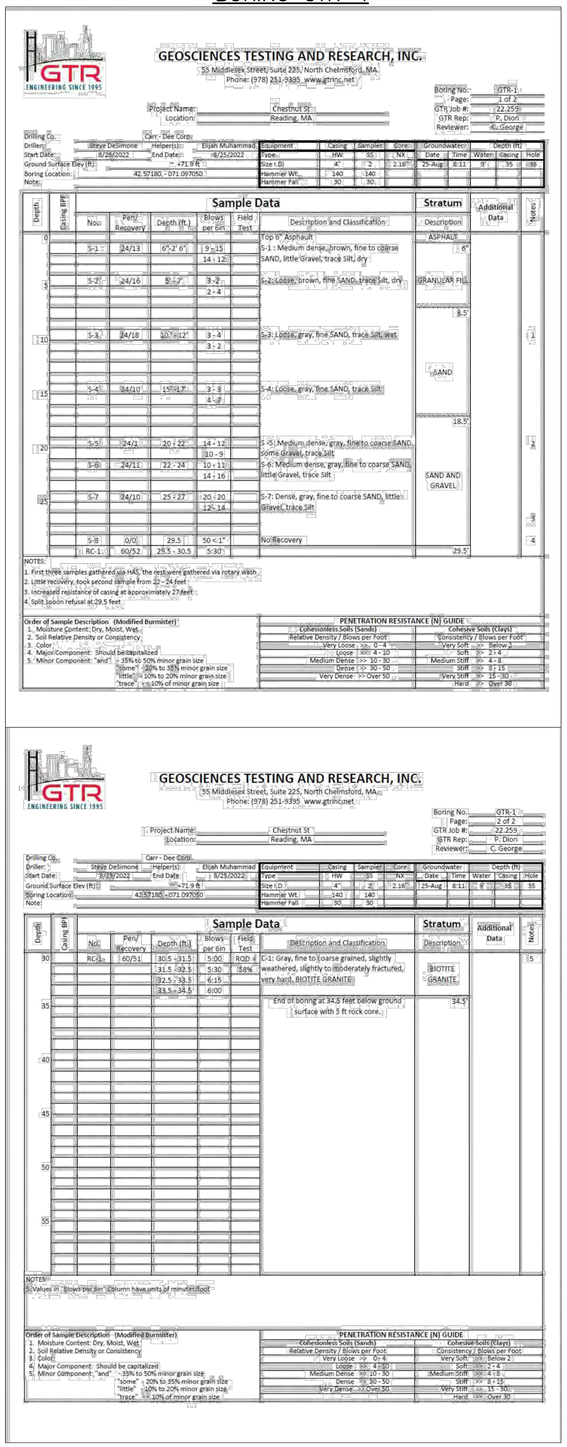
ISSUED FOR CONSTRUCTION
OCTOBER 22, 2024

BORING GTR–1

EXIST. GROUND SURFACE EL. = 71.9

OBS GROUND WATER (8/25/22) EL. = 62.9

PROP. BOT. OF NORTH ABUTMENT FOOTING EL. = 56.5



GEOSCIENCES TESTING AND RESEARCH, INC.
55 Middlesex Street, Suite 225, North Chelmsford, MA
Phone: (978) 251-9395 www.gtrinc.net

Project Name: Chestnut St
Location: Reading, MA
Boring No.: GTR-1
Page: 1 of 2
GTR Job #: 22.259
GTR Rep: P. Dion
Reviewer: C. George

Drilling Co.: Carr - Dee Corp.
Driller: Steve DeSimone | Helper(s): Elijah Muhammad
Start Date: 8/25/2022 | End Date: 8/25/2022
Ground Surface Elev (ft): ~ +71.9 ft
Boring Location: 42.57180, -071.097050
Note:

Equipment	Casing	Sampler	Core
Type:	HW	SS	NX
Size I.D.:	4"	2"	2.16"
Hammer Wt.:	140	140	
Hammer Fall:	30	30	

Groundwater	Depth (ft)		
Date	Time	Water	Casing	Hole
25-Aug	8:11	9'	55	55

Sample Data

Depth	Casing BPF	No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification
0		S-1	24/13	0'-2' 6"	9 - 15 14 - 12		Top 6" Asphalt S-1 : Medium dense, brown, fine to coarse SAND, little Gravel, trace Silt, dry
5		S-2	24/16	5' - 7'	3 - 2 2 - 4		S-2: Loose, brown, fine SAND, trace Silt, dry
10		S-3	24/18	10' - 12'	3 - 4 3 - 2		S-3: Loose, gray, fine SAND, trace Silt, wet
15		S-4	24/10	15' - 17'	3 - 3 4 - 7		S-4: Loose, gray, fine SAND, trace Silt
20		S-5	24/1	20' - 22'	14 - 12 10 - 9		S-5: Medium dense, gray, fine to coarse SAND, some Gravel, trace Silt
		S-6	24/11	22' - 24'	10 - 11 14 - 16		S-6: Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt
25		S-7	24/10	25' - 27'	20 - 20 12 - 14		S-7: Dense, gray, fine to coarse SAND, little Gravel, trace Silt
		S-8	0/0	29.5	50 < 1"		No Recovery
		RC-1	60/52	29.5 - 30.5	5:30		

Stratum Description		Additional Data	Notes
ASPHALT	6"		
GRANULAR FILL	8.5'		
SAND	18.5'		
SAND AND GRAVEL	29.5'		

NOTES:
1. First three samples gathered via HSA, the rest were gathered via rotary wash
2. Little recovery, took second sample from 22' - 24 feet
3. Increased resistance to casing at approximately 27 feet
4. Split spoon refusal at 29.5 feet

Order of Sample Description (Modified Burmister)
1. Moisture Content: Dry, Moist, Wet
2. Soil Relative Density or Consistency
3. Color
4. Major Component: Should be capitalized
5. Minor Component: "and" ≥35% to 50% minor grain size; "some" = 20% to 35% minor grain size; "little" = 10% to 20% minor grain size; "trace" = ≤10% of minor grain size

PENETRATION RESISTANCE (N) GUIDE

Cohesionless Soils (Sands) Relative Density / Blows per Foot		Cohesive Soils (Clays) Consistency / Blows per Foot	
Very Loose	0 - 4	Very Soft	Below 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

GEOSCIENCES TESTING AND RESEARCH, INC.
55 Middlesex Street, Suite 225, North Chelmsford, MA
Phone: (978) 251-9395 www.gtrinc.net

Project Name: Chestnut St
Location: Reading, MA
Boring No.: GTR-1
Page: 2 of 2
GTR Job #: 22.259
GTR Rep: P. Dion
Reviewer: C. George

Drilling Co.: Carr - Dee Corp.
Driller: Steve DeSimone | Helper(s): Elijah Muhammad
Start Date: 8/25/2022 | End Date: 8/25/2022
Ground Surface Elev (ft): ~ +71.9 ft
Boring Location: 42.57180, -071.097050
Note:

Equipment	Casing	Sampler	Core
Type:	HW	SS	NX
Size I.D.:	4"	2"	2.16"
Hammer Wt.:	140	140	
Hammer Fall:	30	30	

Groundwater	Depth (ft)		
Date	Time	Water	Casing	Hole
25-Aug	8:11	9'	55	55

Sample Data

Depth	Casing BPF	No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification
30		RC-1	60/51	30.5 - 31.5	5:00	ROD = 83%	C-1: Gray, fine to coarse grained, slightly weathered, slightly to moderately fractured, very hard, BIOTITE GRANITE
				31.5 - 32.5	5:30		
				32.5 - 33.5	6:15		
				33.5 - 34.5	6:00		
35							End of boring at 34.5 feet below ground surface with 5 ft rock core.
40							
45							
50							
55							

Stratum Description		Additional Data	Notes
BIOTITE GRANITE	34.5'		5

NOTES:
5. Values in "Blows per 6in" column have units of minutes/foot

Order of Sample Description (Modified Burmister)
1. Moisture Content: Dry, Moist, Wet
2. Soil Relative Density or Consistency
3. Color
4. Major Component: Should be capitalized
5. Minor Component: "and" ≥35% to 50% minor grain size; "some" = 20% to 35% minor grain size; "little" = 10% to 20% minor grain size; "trace" = ≤10% of minor grain size

PENETRATION RESISTANCE (N) GUIDE

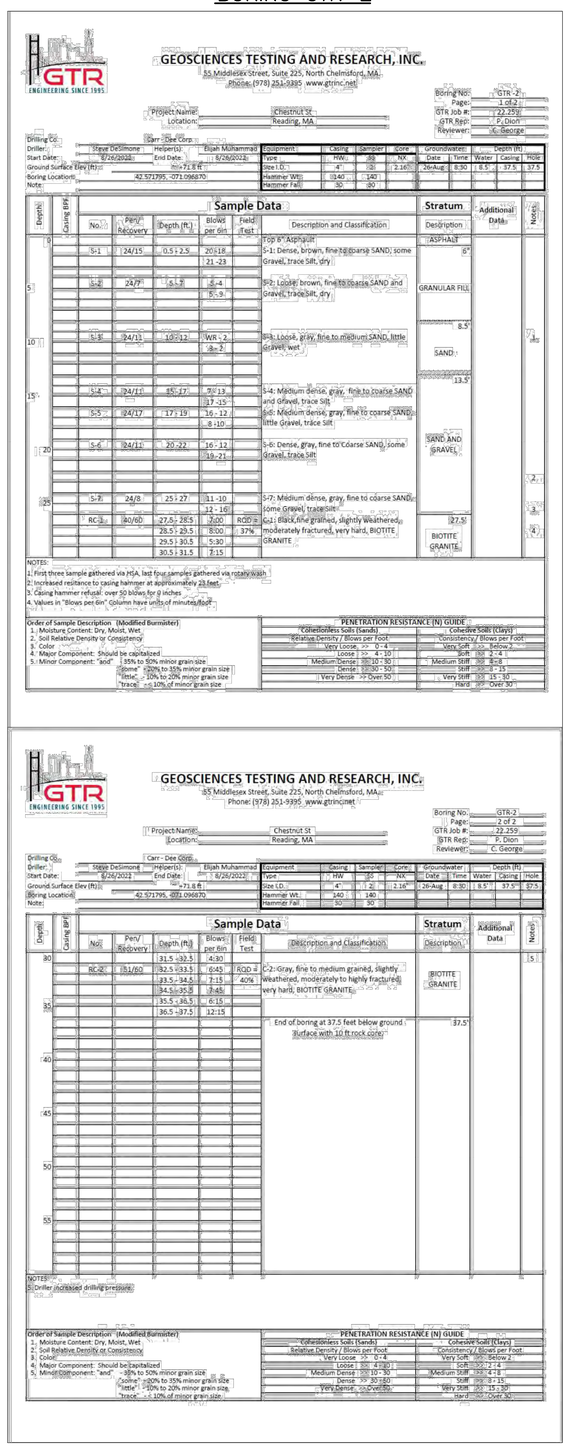
Cohesionless Soils (Sands) Relative Density / Blows per Foot		Cohesive Soils (Clays) Consistency / Blows per Foot	
Very Loose	0 - 4	Very Soft	Below 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

BORING GTR–2

EXIST. GROUND SURFACE EL. = 71.8

OBS GROUND WATER (8/26/22) EL. = 63.3

PROP. BOT. OF SOUTH ABUTMENT FOOTING EL. = 56.5



GEOSCIENCES TESTING AND RESEARCH, INC.
55 Middlesex Street, Suite 225, North Chelmsford, MA
Phone: (978) 251-9395 www.gtrinc.net

Project Name: Chestnut St
Location: Reading, MA
Boring No.: GTR-2
Page: 1 of 2
GTR Job #: 22.259
GTR Rep: P. Dion
Reviewer: C. George

Drilling Co.: Carr - Dee Corp.
Driller: Steve DeSimone | Helper(s): Elijah Muhammad
Start Date: 8/26/2022 | End Date: 8/26/2022
Ground Surface Elev (ft): ~ +71.8 ft
Boring Location: 42.571795, -071.096870
Note:

Equipment	Casing	Sampler	Core
Type:	HW	SS	NX
Size I.D.:	4"	2"	2.16"
Hammer Wt.:	140	140	
Hammer Fall:	30	30	

Groundwater	Depth (ft)			
Date	Time	Water	Casing	Hole
26-Aug	8:30	8.5'	37.5'	37.5

Sample Data

Depth	Casing BPF	No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification
0		S-1	24/15	0.5 - 2.5	20 18 21 - 23		Top 6" Asphalt S-1: Dense, brown, fine to coarse SAND, some Gravel, trace Silt, dry
5		S-2	24/7	5 - 7	6 - 4 5 - 9		S-2: Loose, brown, fine to coarse SAND and Gravel, trace Silt, dry
10		S-3	24/11	10 - 12	WR - 2 WR - 2		S-3: Loose, gray, fine to medium SAND, little Gravel, wet
15		S-4	24/11	15' - 17'	9 - 13 17 - 15		S-4: Medium dense, gray, fine to coarse SAND and Gravel, trace Silt
		S-5	24/17	17 - 19	16 - 12 8 - 10		S-5: Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt
20		S-6	24/11	20 - 22	16 - 12 19 - 21		S-6: Dense, gray, fine to coarse SAND, some Gravel, trace Silt
25		S-7	24/8	25 - 27	11 - 10 12 - 16		S-7: Medium dense, gray, fine to coarse SAND, some Gravel, trace Silt
		RC-1	80/60	27.5 - 28.5 28.5 - 29.5 29.5 - 30.5 30.5 - 31.5	2:00 3:00 5:30 7:15	ROD = 37%	C-1: Black, fine grained, slightly Weathered, moderately fractured, very hard, BIOTITE GRANITE

Stratum Description		Additional Data	Notes
ASPHALT	6"		
GRANULAR FILL	8.5'		
SAND	13.5'		
SAND AND GRAVEL	27.5'		
BIOTITE GRANITE			2 3 4

NOTES:
1. First three sample gathered via HSA, last four samples gathered via rotary wash
2. Increased resitance to casing hammer at approximately 23 feet
3. Casing hammer refusal: over 50 blows for 0 inches
4. Values in "Blows per 6in" column have units of minutes/foot

Order of Sample Description (Modified Burmister)
1. Moisture Content: Dry, Moist, Wet
2. Soil Relative Density or Consistency
3. Color
4. Major Component: Should be capitalized
5. Minor Component: "and" ≥35% to 50% minor grain size; "some" = 20% to 35% minor grain size; "little" = 10% to 20% minor grain size; "trace" = ≤10% of minor grain size

PENETRATION RESISTANCE (N) GUIDE

Cohesionless Soils (Sands) Relative Density / Blows per Foot		Cohesive Soils (Clays) Consistency / Blows per Foot	
Very Loose	0 - 4	Very Soft	Below 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

GEOSCIENCES TESTING AND RESEARCH, INC.
55 Middlesex Street, Suite 225, North Chelmsford, MA
Phone: (978) 251-9395 www.gtrinc.net

Project Name: Chestnut St
Location: Reading, MA
Boring No.: GTR-2
Page: 2 of 2
GTR Job #: 22.259
GTR Rep: P. Dion
Reviewer: C. George

Drilling Co.: Carr - Dee Corp.
Driller: Steve DeSimone | Helper(s): Elijah Muhammad
Start Date: 8/26/2022 | End Date: 8/26/2022
Ground Surface Elev (ft): ~ +71.8 ft
Boring Location: 42.571795, -071.096870
Note:

Equipment	Casing	Sampler	Core
Type:	HW	SS	NX
Size I.D.:	4"	2"	2.16"
Hammer Wt.:	140	140	
Hammer Fall:	30	30	

Groundwater	Depth (ft)			
Date	Time	Water	Casing	Hole
26-Aug	8:30	8.5'	37.5'	37.5

Sample Data

Depth	Casing BPF	No.	Pen/ Recovery	Depth (ft.)	Blows per 6in	Field Test	Description and Classification
30				31.5 - 32.5	4:30		
		RC-2	151/60	32.5 - 33.5	6:45	ROD = 40%	C-2: Gray, fine to medium grained, slightly weathered, moderately to highly fractured, very hard, BIOTITE GRANITE
				33.5 - 34.5	7:15		
				34.5 - 35.5	7:45		
35				35.5 - 36.5	6:15		
				36.5 - 37.5	12:15		
40							End of boring at 37.5 feet below ground surface with 10 ft rock core.
45							
50							
55							

Stratum Description		Additional Data	Notes
BIOTITE GRANITE	37.5'		5

NOTES:
5. Driller increased drilling pressure.

Order of Sample Description (Modified Burmister)
1. Moisture Content: Dry, Moist, Wet
2. Soil Relative Density or Consistency
3. Color
4. Major Component: Should be capitalized
5. Minor Component: "and" ≥35% to 50% minor grain size; "some" = 20% to 35% minor grain size; "little" = 10% to 20% minor grain size; "trace" = ≤10% of minor grain size

PENETRATION RESISTANCE (N) GUIDE

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Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLANS THUS: ◔
2. BORINGS ARE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 3/4" I.D. SPLIT SPOON SAMPLER 4" USING A 140 POUND WEIGHT FALLING 30".
5. BORINGS GTR–1 AND GTR–2 WERE MADE IN AUGUST 2022.
6. BORINGS WERE MADE BY GEOSCIENCES TESTING AND RESEARCH, INC., 55 MIDDLESEX STREET, SUITE 225, NORTH CHELMSFORD, MA 01863.
7. 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

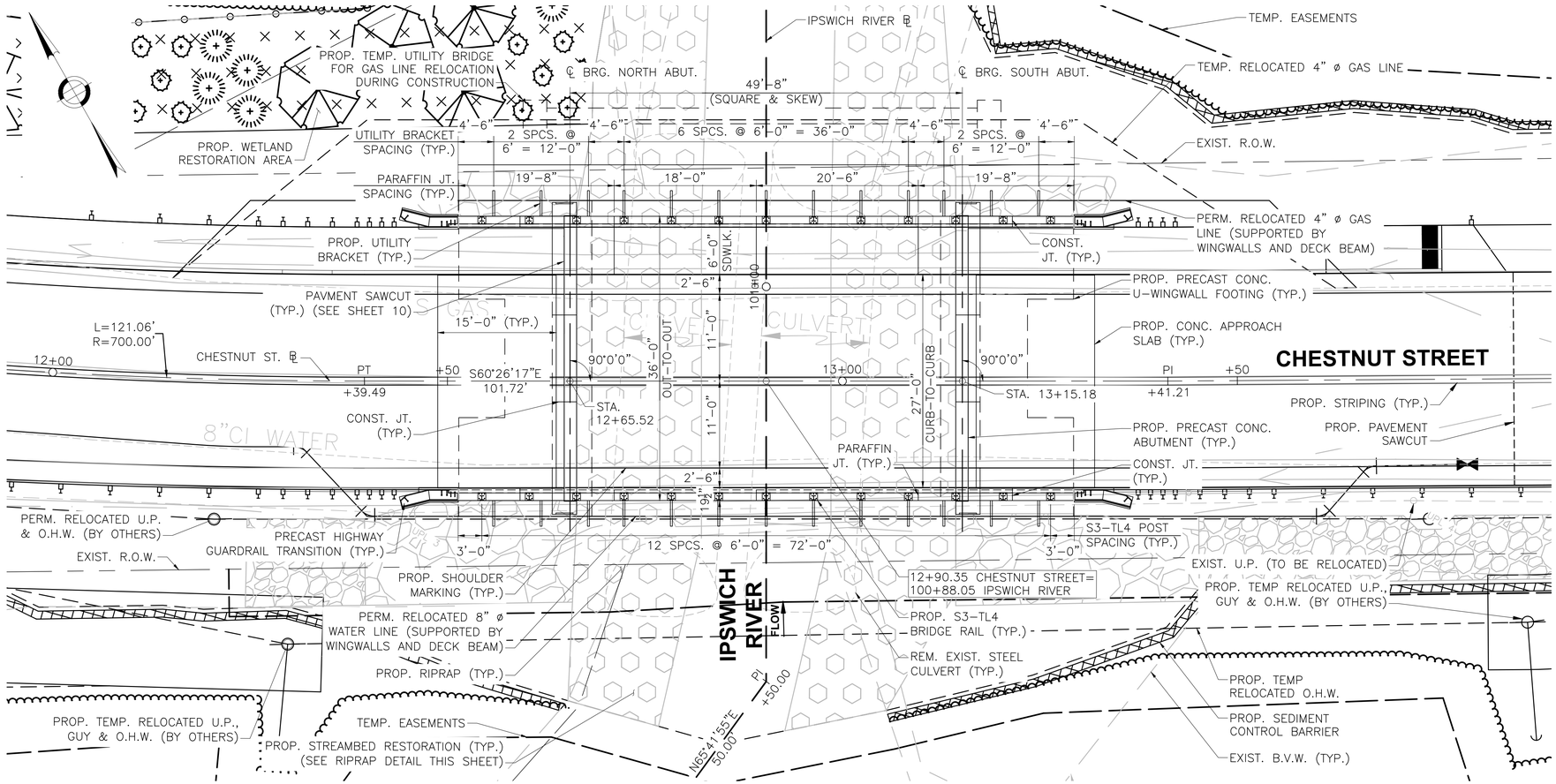
STATE BRIDGE ENGINEER — DATE 10/29/2024

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	41
PROJECT FILE NO.		----	

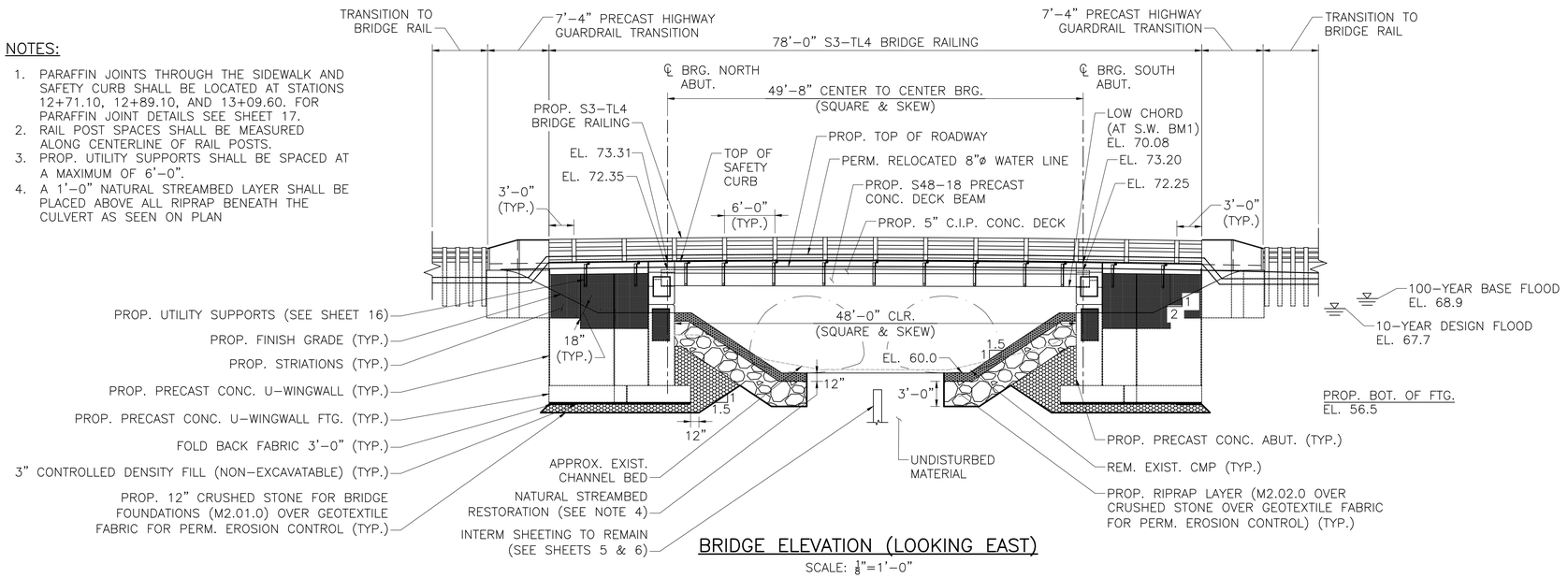
PLAN & ELEVATION



PLAN
SCALE: ⅛"=1'-0"

NOTES:

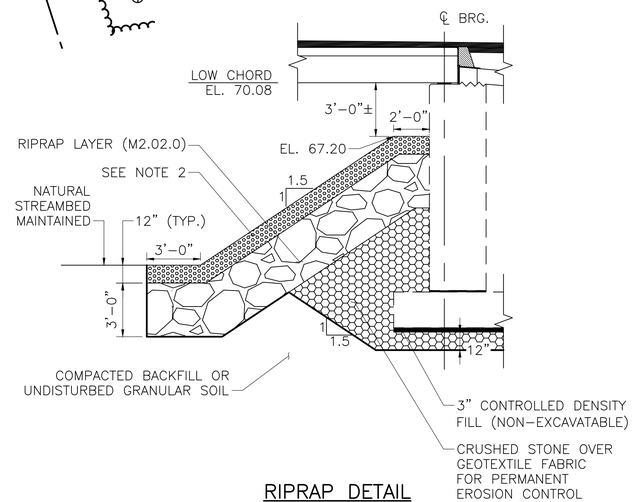
1. PARAFFIN JOINTS THROUGH THE SIDEWALK AND SAFETY CURB SHALL BE LOCATED AT STATIONS 12+71.10, 12+89.10, AND 13+09.60. FOR PARAFFIN JOINT DETAILS SEE SHEET 17.
2. RAIL POST SPACES SHALL BE MEASURED ALONG CENTERLINE OF RAIL POSTS.
3. PROP. UTILITY SUPPORTS SHALL BE SPACED AT A MAXIMUM OF 6'-0".
4. A 1'-0" NATURAL STREAMBED LAYER SHALL BE PLACED ABOVE ALL RIPRAP BENEATH THE CULVERT AS SEEN ON PLAN



BRIDGE ELEVATION (LOOKING EAST)
SCALE: ⅛"=1'-0"

NOTES:

1. IF BEDROCK IS ENCOUNTERED CLOSER THAN 4'-0" TO FINISHED GRADE, ELIMINATE CRUSHED STONE LAYER THICKNESS AND GEOTEXTILE FABRIC.
2. ALL PROPOSED RIPRAP AT OR BELOW ELEVATION 67.20 SHALL BE TOPPED WITH STOCKPILED STREAMBED MATERIAL TO FILL THE VOIDS IN THE RIPRAP TO CREATE A SMOOTH LEVEL PASSAGE SURFACE.



RIPRAP DETAIL
SCALE: ¼"=1'-0"

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STATE BRIDGE ENGINEER — DATE: 10/29/2024

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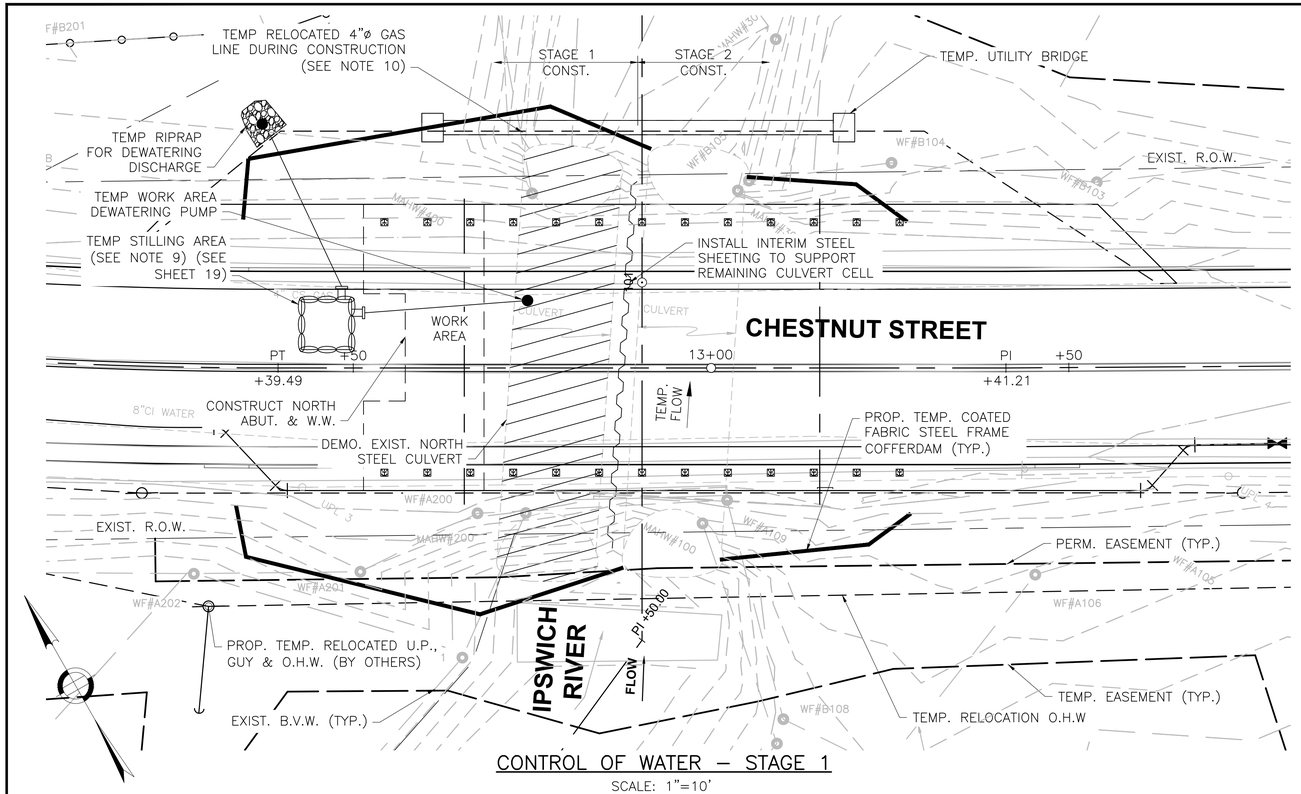
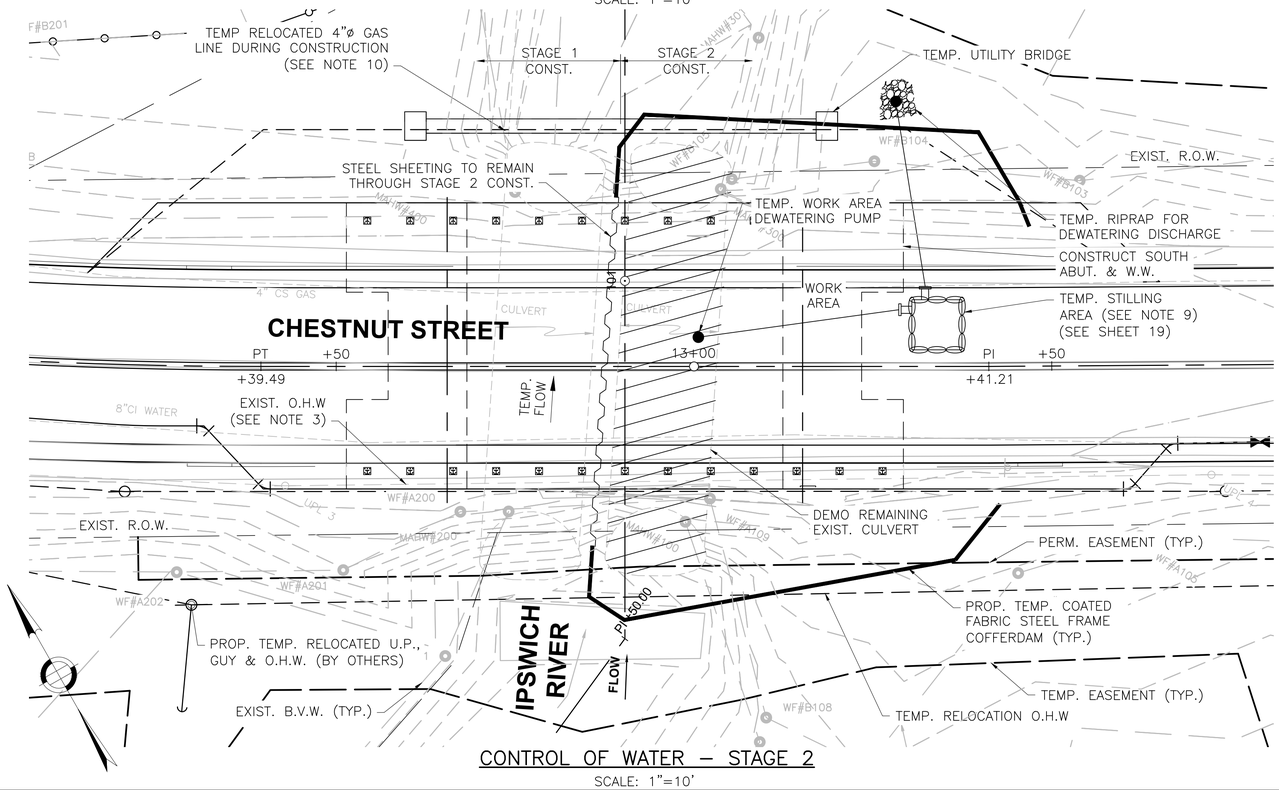


CONTROL OF WATER – STAGE 1

SCALE: 1"=10'



CONTROL OF WATER – STAGE 2

SCALE: 1"=10'

CONTROL OF WATER / STAGING NOTES

GENERAL

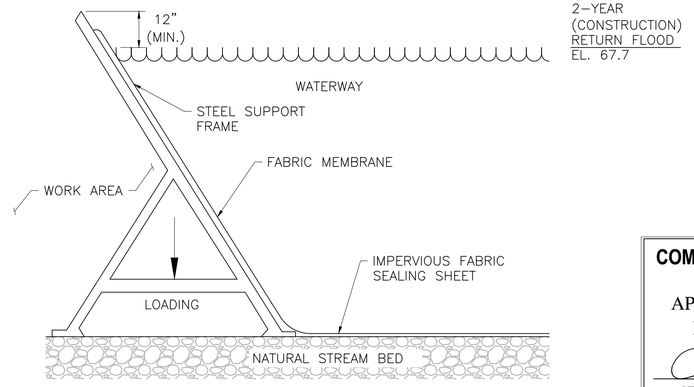
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE CONTROL OF WATER (C.O.W.) SYSTEM AND SHALL SUBMIT A CONTROL OF WATER PLAN TO THE ENGINEER FOR APPROVAL BY THE ENGINEER AND MASS DEP. C.O.W. WILL NOT BE IMPLEMENTED UNTIL APPROVAL IS GRANTED BY THE ENGINEER AND DEP. INTERIM SHEETING SHALL BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS. THE LIMITS AND CONCEPT SHOWN HERE ARE PURELY CONCEPTUAL AND MAY NOT FULLY ENCOMPASS THE LIMITS REQUIRED TO FULLY DE–WATER THE AREA.
2. THE 4"ø GAS LINE SHALL BE TEMPORARILY RELOCATED BY OTHERS AND THE 8"ø WATER LINE SHALL BE CUT AND CAPPED PRIOR TO BEGINNING ANY EXCAVATION. PROPER COORDINATION WITH THE UTILITY OWNERS WILL BE REQUIRED.
3. THE TEMPORARY OVERHEAD WIRES AND TEMPORARY UTILITY POLES SHALL BE INSTALLED AND RELOCATED BY OTHERS PRIOR TO BEGINNING ANY EXCAVATION. PROPER COORDINATION WITH THE UTILITY OWNERS WILL BE REQUIRED. REFER TO THE HIGHWAY PLANS FOR ADDITIONAL INFORMATION REGARDING THE UTILITY AND EASEMENT LAYOUT. THE PERMANENT UTILITY MOVES ARE NOT SHOWN ON THIS PLAN, AS THEY WILL OCCUR AFTER THE BRIDGE IS ERECTED.
4. CHESTNUT STREET 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. SEE THE BRIDGE CLOSURE PLAN.
5. C.O.W. SYSTEM SHALL BE DESIGNED USING A 2–YEAR (CONSTRUCTION) RETURN FREQUENCY FLOOD EVENT ELEVATION OF 67.7. PROVIDED SYSTEM SHALL EXTEND 12" (MIN.) ABOVE STORM ELEVATION.
6. COATED FABRIC STEEL FRAME COFFERDAM SHALL BE REMOVED FROM THE DOWNSTREAM END TO THE UPSTREAM END TO PREVENT UNNECESSARY SEDIMENT FROM ENTERING THE WATERWAY.
7. C.O.W. SYSTEM SHALL BE INSPECTED DAILY FOR WATER LEAKS OR EROSION AND REPAIR PROCEDURES SHALL BE IMPLEMENTED ACCORDINGLY.
8. INSTALL SANDBAGS AS NEEDED TO ASSIST IN SEALING THE COFFERDAM.
9. ALL TEMPORARY STILLING AREA'S, DEWATERING & DISCHARGE PUMPS SHALL BE LOCATED WITHIN THE EXISTING RIGHT OF WAY AND TEMPORARY EASEMENT LINES.
10. THE TEMPORARY UTILITY BRIDGE FOR THE 4"ø GAS LINE SHALL BE DESIGNED TO ENSURE THAT THERE IS NO CONFLICT BETWEEN THE BRIDGE OR UTILITY WITH THE PROPOSED CONTROL OF WATER SYSTEM. NO PROTRUSIONS IN THE CONTROL OF WATER SYSTEM WILL BE ALLOWED. TEMPORARY UTILITY RELOCATIONS SHALL OCCUR PRIOR TO INSTALLATION OF STAGE 1 CONTROL OF WATER SYSTEM.

STAGE 1

1. INSTALL CONTROL OF WATER SYSTEM AS SHOWN CONSISTING OF A COATED FABRIC STEEL FRAME COFFERDAM OR EQUIVALENT.
2. DEWATER STAGE 1 WORK AREA TO INSTALL NORTH ABUTMENT IN THE DRY.
3. DEMOLISH NORTH PORTION OF EXISTING STRUCTURE TO APPROXIMATE CULVERT INVERT ELEVATION.
4. INSTALL INTERIM STEEL SHEETING TO SUPPORT REMAINING CULVERT CELL.
5. EXCAVATE DOWN TO REQUIRED ELEVATION AND CONSTRUCT THE NORTH ABUTMENT.
6. CONSTRUCT THE NORTH PORTION OF THE PROPOSED STREAMBED.

STAGE 2

1. DIVERT BROOK TO FLOW BETWEEN THE NEWLY CONSTRUCTED NORTH ABUTMENT AND PERMANENT SHEETING INSTALLED IN STAGE 1 USING THE CONTROL OF WATER SYSTEM AS SHOWN. CONSISTING OF A COATED FABRIC FRAME COFFERDAM OR EQUIVALENT
2. DEWATER STAGE 2 WORK AREA TO INSTALL SOUTH ABUTMENT IN THE DRY.
3. DEMOLISH REMAINING PORTION OF EXISTING STRUCTURE.
4. EXCAVATE DOWN TO REQUIRED ELEVATION AND CONSTRUCT THE SOUTH ABUTMENT.
5. CONSTRUCT THE REMAINING SOUTH PORTION OF THE PROPOSED STREAMBED.
6. CUT AND LEAVE IN PLACE STEEL SHEETING 2–FEET BELOW PROPOSED STREAMBED ELEVATION AND RESTORE NORMAL RIVER FLOW.
7. REMOVE REMAINING CONTROL OF WATER SYSTEM.



COATED FABRIC STEEL FRAME COFFERDAM

SCALE: N.T.S

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	41
PROJECT FILE NO.		----	

CONTROL OF WATER PLAN

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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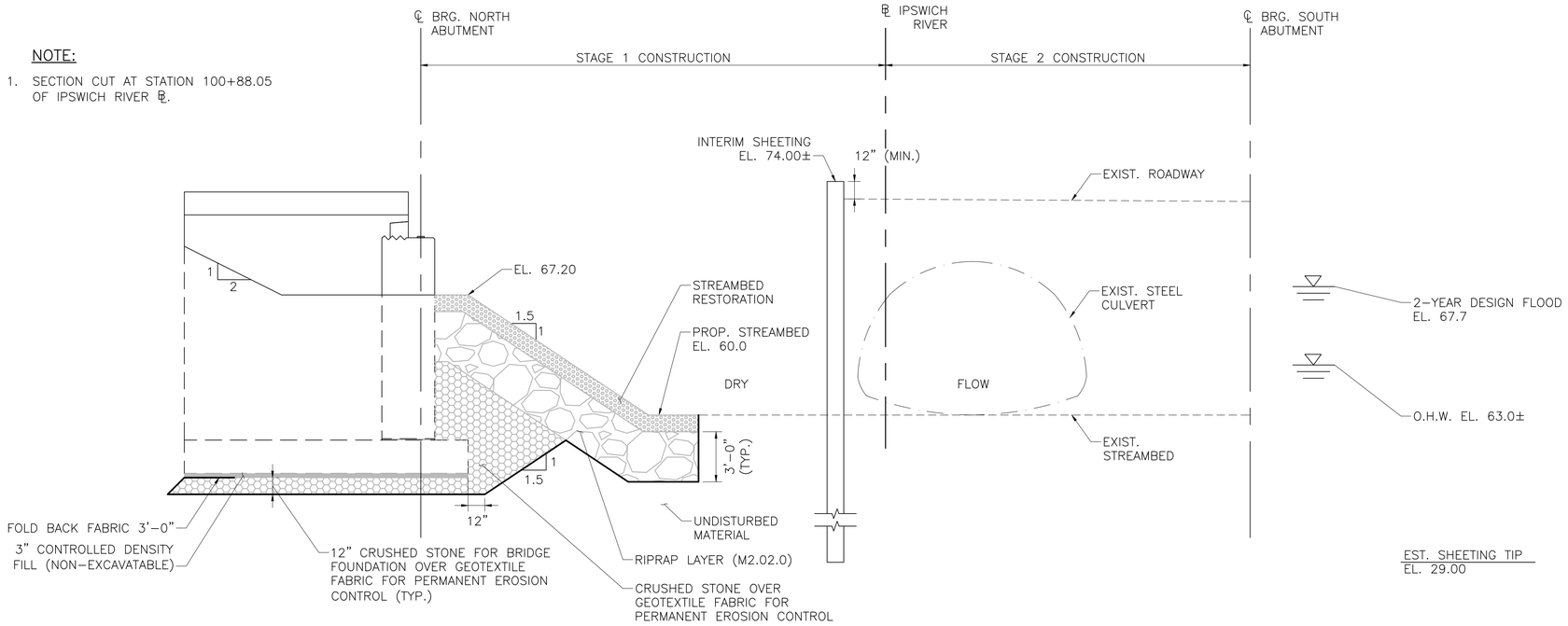
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	41
PROJECT FILE NO.		----	

CONTROL OF WATER ELEVATION

NOTE:

1. SECTION CUT AT STATION 100+88.05 OF IPSWICH RIVER ℄.



CONSTRUCTION STAGE 1 ELEVATION

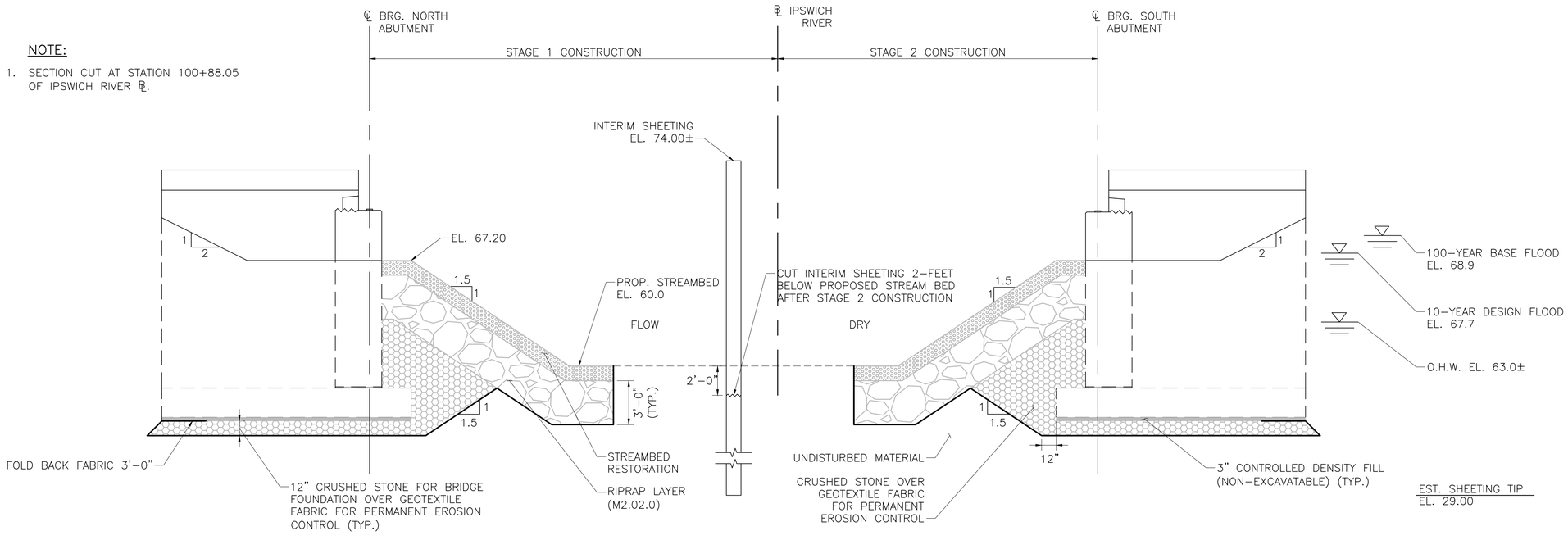
SCALE: ¼" = 1'-0"

NOTES:

1. EXCAVATE/DREDGE TO DEPTH AS REQUIRED FOR PROPER PLACEMENT OF CRUSHED STONE, RIPRAP AND STREAMBED RESTORATION AT CORRECT ELEVATIONS AS SHOWN ON THIS SHEET.
2. EXCAVATE TO DEPTH AS REQUIRED FOR CONSTRUCTION OF ABUTMENTS AND WINGWALLS TO ELEVATIONS SHOWN ON THE PLANS.

NOTE:

1. SECTION CUT AT STATION 100+88.05 OF IPSWICH RIVER ℄.



CONSTRUCTION STAGE 2 ELEVATION

SCALE: ¼" = 1'-0"

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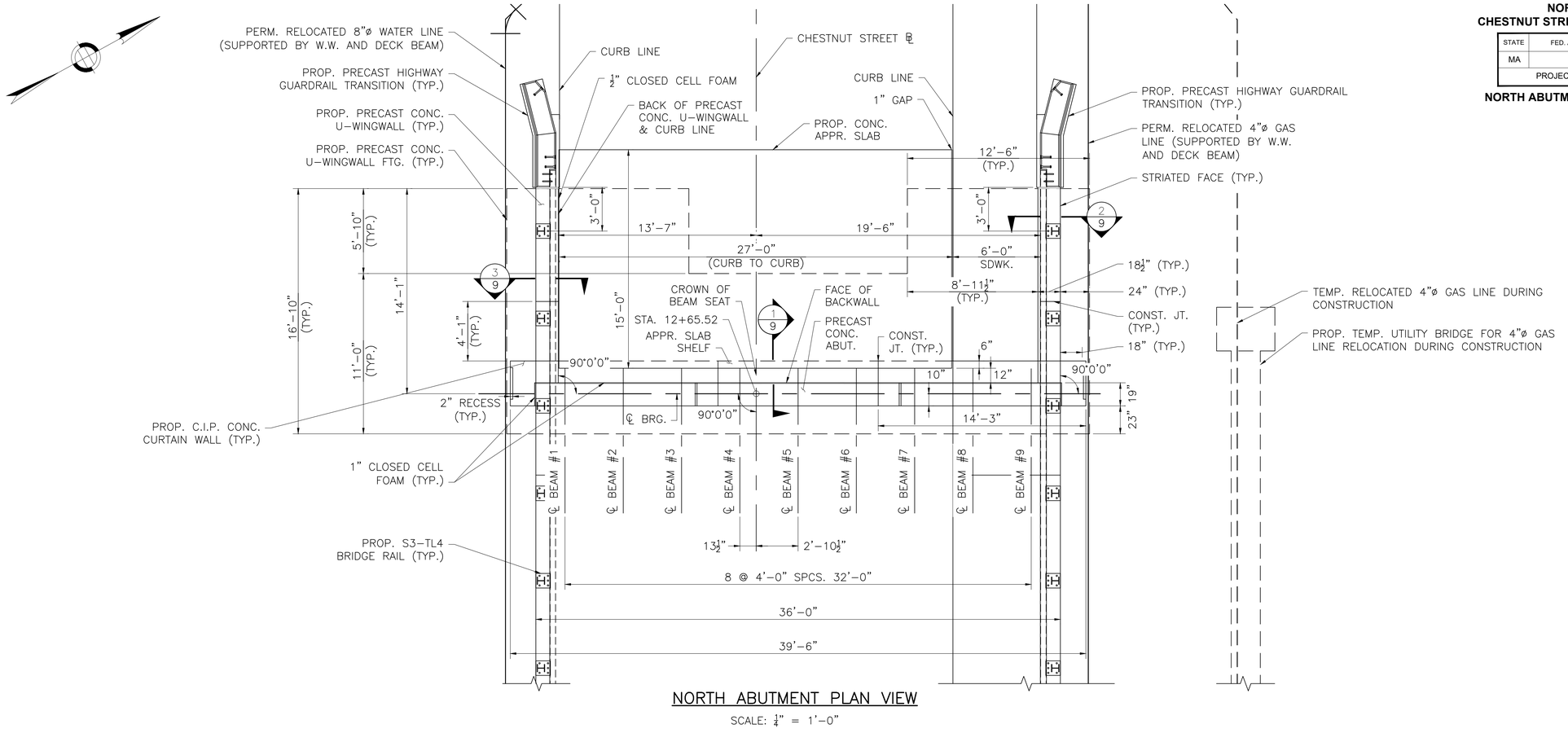
STATE BRIDGE ENGINEER — 10/29/2024 DATE

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

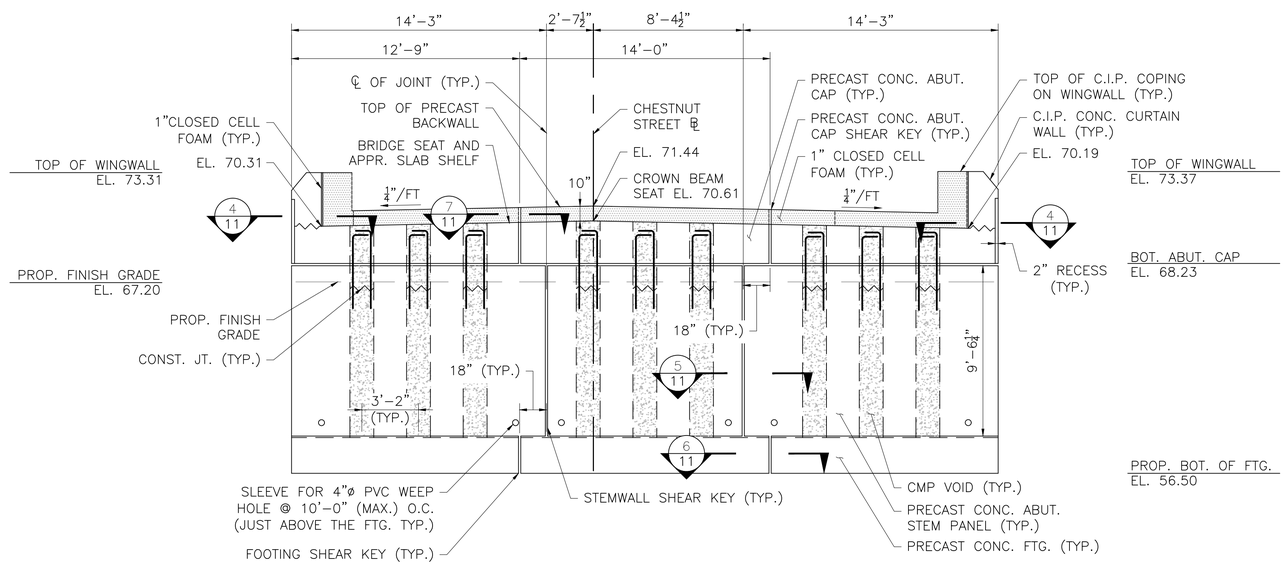
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	41
PROJECT FILE NO.		----	

NORTH ABUTMENT PLAN & ELEVATION



NORTH ABUTMENT PLAN VIEW

SCALE: ¼" = 1'-0"



NORTH ABUTMENT ELEVATION

SCALE: ¼" = 1'-0"

BEAM SEAT ELEVATIONS	
BM #1	70.35
BM #2	70.43
BM #3	70.51
BM #4	70.57
BM #5	70.55
BM #6	70.47
BM #7	70.39
BM #8	70.31
BM #9	70.23

NOTE: THE BEAM SEAT ELEVATIONS PROVIDED ARE TAKEN AT THE CENTERLINE OF THE RESPECTIVE BEAMS.

COMMONWEALTH OF MASSACHUSETTS
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STATE BRIDGE ENGINEER — DATE 10/29/2024

SHEET 7 OF 27 SHEETS BRIDGE NO. N-18-003 (CMX)

T1256.02_BR7-8_(N-18-003).DWG Plotted on 22-Oct-2024 11:38 AM

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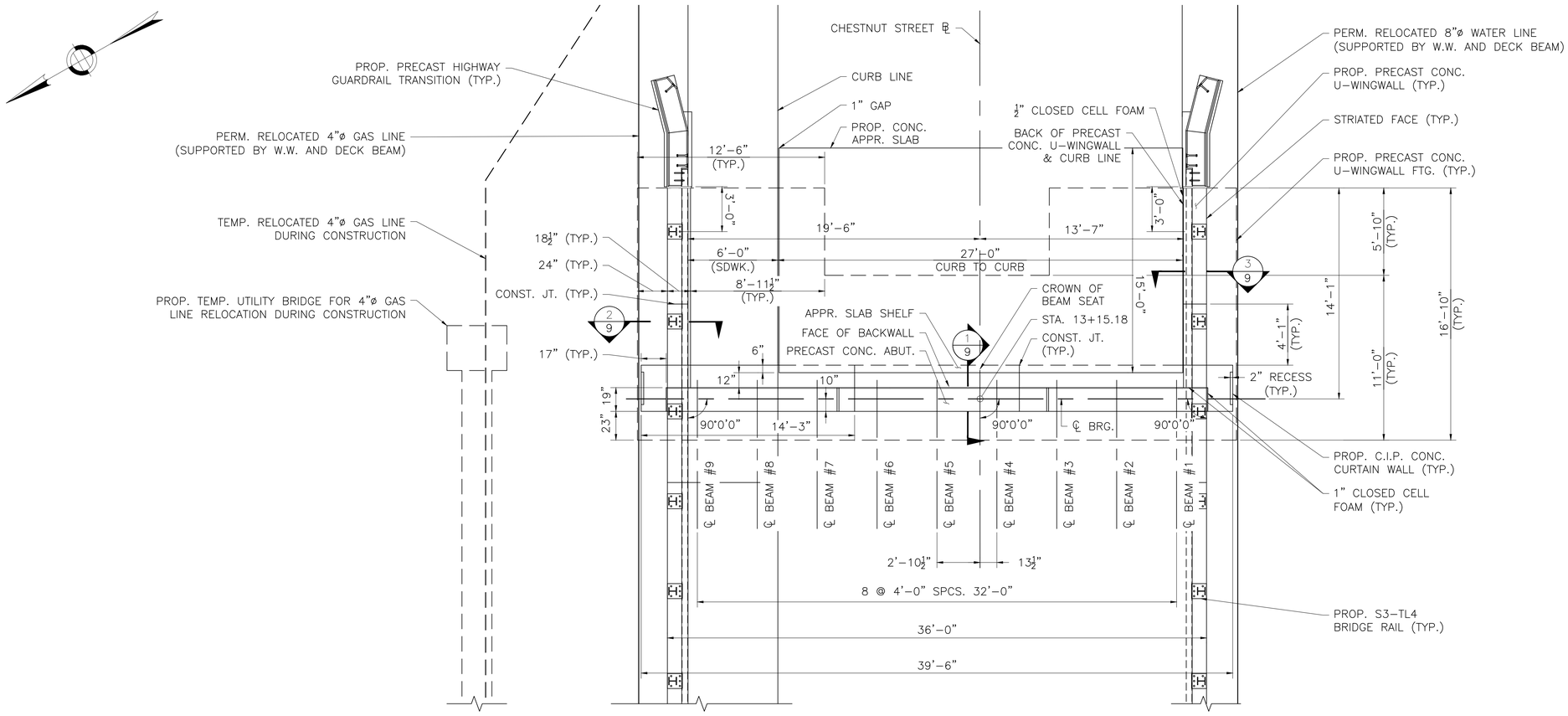
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	41
PROJECT FILE NO.		----	

SOUTH ABUTMENT PLAN & ELEVATION

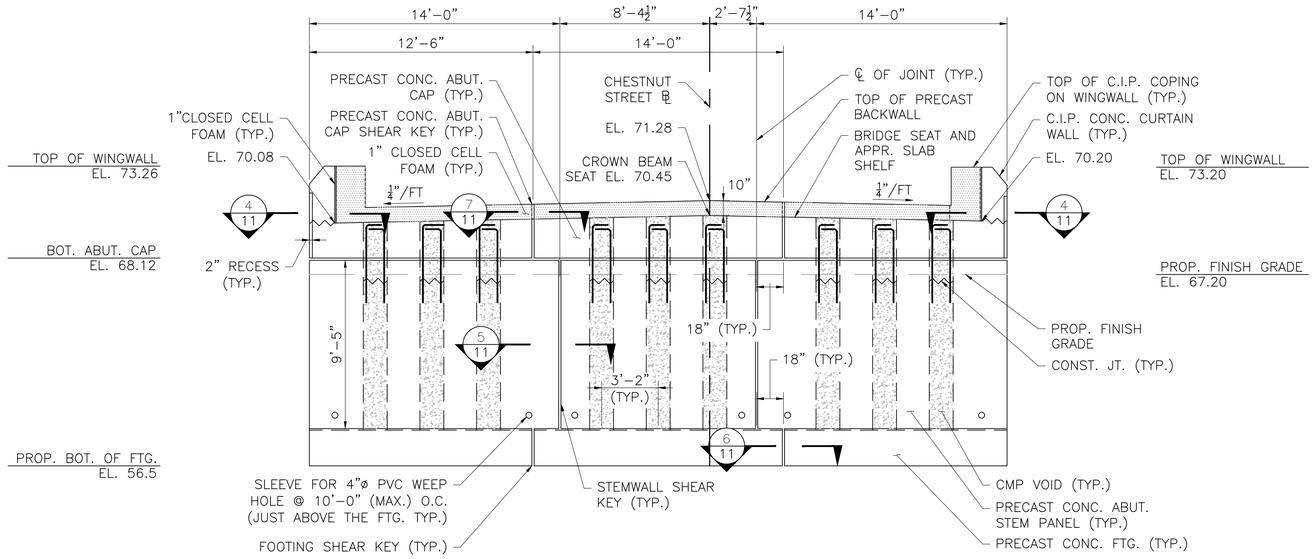


SOUTH ABUTMENT PLAN VIEW

SCALE: ¼" = 1'-0"

BEAM SEAT ELEVATIONS	
BM #1	70.24
BM #2	70.32
BM #3	70.40
BM #4	70.46
BM #5	70.44
BM #6	70.36
BM #7	70.28
BM #8	70.20
BM #9	70.12

NOTE: THE BEAM SEAT ELEVATIONS PROVIDED ARE TAKEN AT THE CENTERLINE OF THE RESPECTIVE BEAMS.



SOUTH ABUTMENT ELEVATION

SCALE: ¼" = 1'-0"

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STATE BRIDGE ENGINEER — DATE: 10/29/2024

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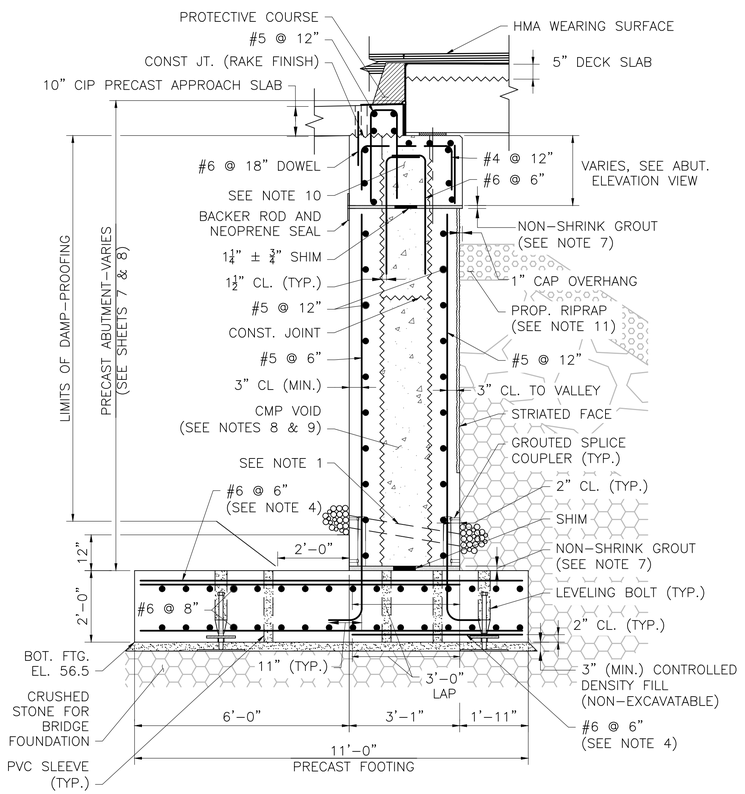
T1256.02_BR7-8_(N-18-003).DWG Plotted on 22-Oct-2024 11:39 AM

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	41
PROJECT FILE NO.		----	

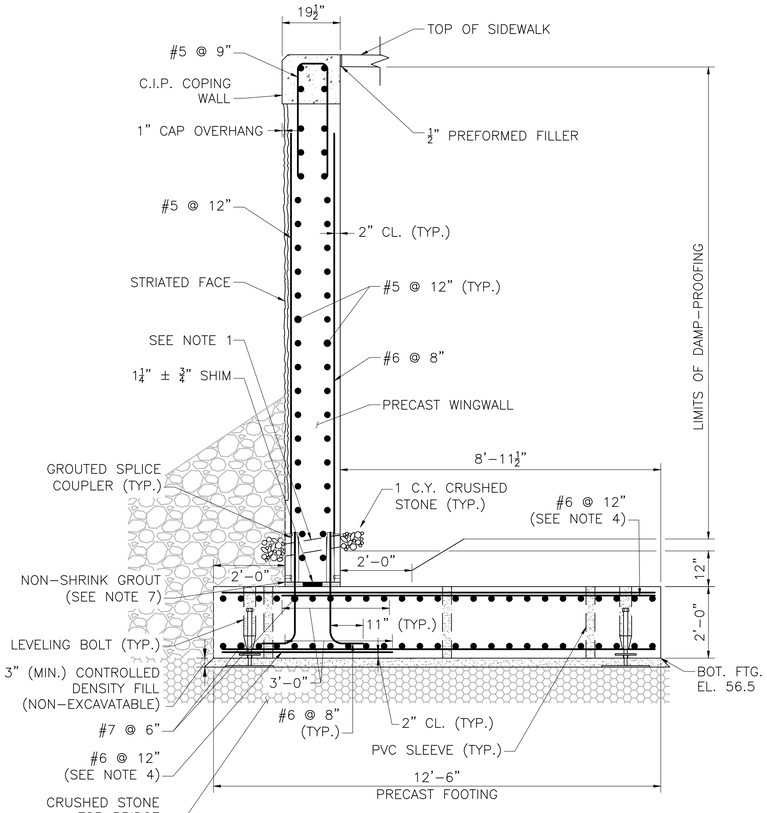
ABUTMENT & WINGWALL SECTIONS



ABUTMENT

SECTION 1 — 7,8

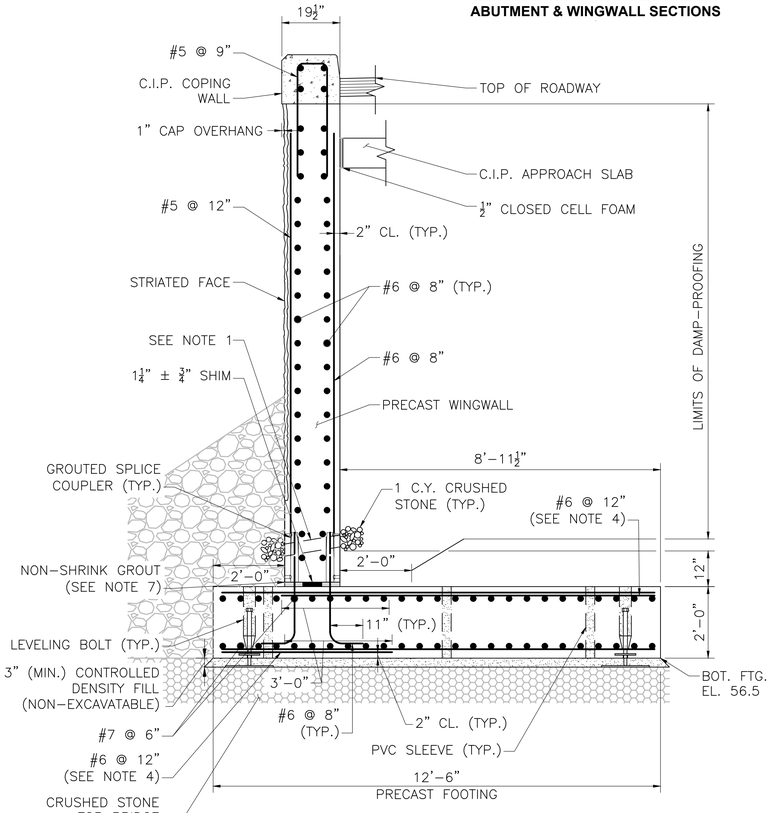
SCALE: ½" = 1'-0"



WINGWALL WITH SIDEWALK

SECTION 2 — 7,8

SCALE: ½" = 1'-0"



WINGWALL WITH SAFETY CURB

SECTION 3 — 7,8

SCALE: ½" = 1'-0"

NOTES:

1. 4" ø WEEP HOLES 10'-0" O.C. LOCATED 12" ABOVE THE HEEL OF THE FOOTING SLOPING 1" PER FOOT TOWARDS THE FRONT FACE. PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. SHEAR KEYS SHALL HAVE AN EXPOSED AGGREGATE FINISH AND SHALL BE CLEANED AND SURFACE SATURATED DRY PRIOR TO PLACING CLOSURE POUR CONCRETE.
3. ALL CONCRETE SHALL BE 5000 PSI HP CEMENT CONCRETE.
4. EXTEND EVERY 2ND BAR FULL LENGTH AS SHOWN.
5. THE ABUTMENT FACTORED BEARING PRESSURE = 7.45 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.

   THE ABUTMENT FACTORED BEARING RESISTANCE = 8.15 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.
6. THE WINGWALL FACTORED BEARING PRESSURE = 4.20 KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION.

   THE WINGWALL FACTORED BEARING RESISTANCE = 8.15 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.
7. PRE-BED PRECAST COMPONENT WITH NON-SHRINK GROUT WITH THICKNESS MORE THAN SHIM STACK.
8. AFTER GROUT REACHES 5000 PSI FILL CMP VOID IN STEM WITH CONCRETE.
9. PRIOR TO PLACEMENT OF CAP FILL CMP VOIDS WITH 5000 PSI HP CEMENT CONCRETE UP TO THE BOTTOM OF THE CAP.
10. AFTER SETTING PRECAST CAP FILL REMAINDER OF CMP VOID WITH CONCRETE.
11. ALL PROPOSED RIPRAP AT OR BELOW ELEVATION 67.20 SHALL BE TOPPED WITH STOCKPILED STREAMBED MATERIAL TO FILL THE VOIDS IN THE RIPRAP TO CREATE A SMOOTH LEVEL PASSAGE SURFACE.
12. BOTTOM OF FOOTING ELEVATION FOR ALL WINGWALLS AND ABUTMENTS SHALL BE 4' BELOW THE PROPOSED SLOPE

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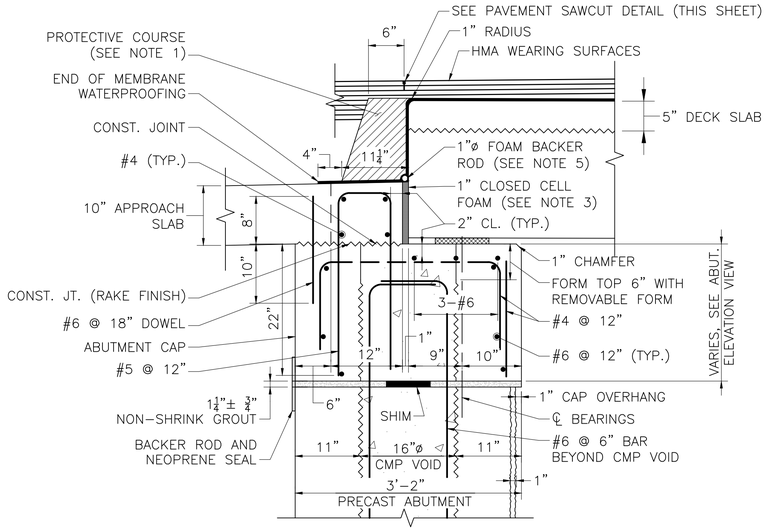
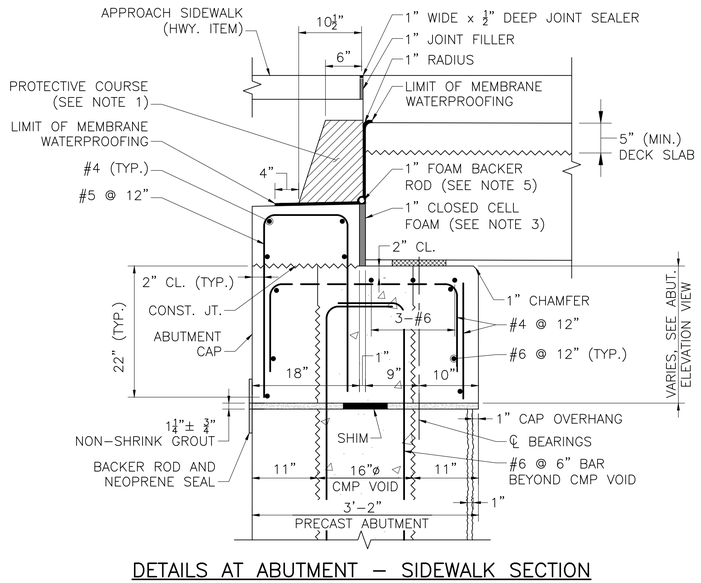
ISSUED FOR CONSTRUCTION OCTOBER 22, 2024



DETAILS AT ABUTMENT – ROADWAY SECTION

SCALE: 1" = 1'–0"

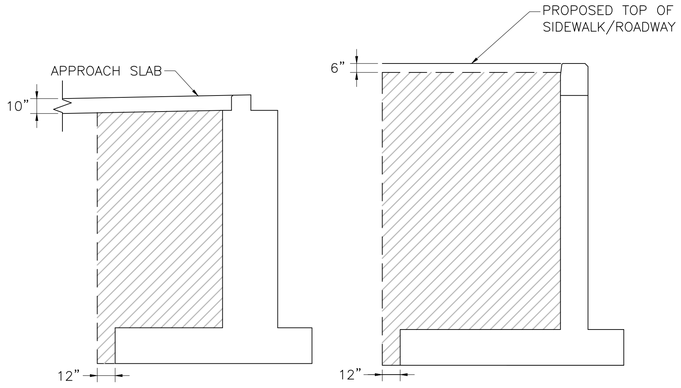


DETAILS AT ABUTMENT – SIDEWALK SECTION

SCALE: 1" = 1'–0"

NOTES:

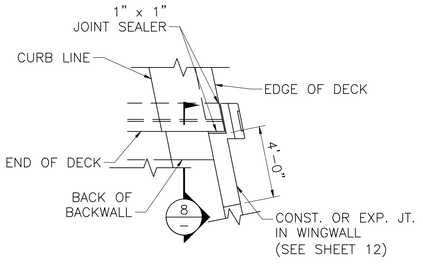
1. PROTECTIVE COURSE TO BE SUPERPAVE BRIDGE PROTECTIVE COURSE – 9.5 – POLYMER (SPC–B–9.5–P) (ITEM 450.701) FOR BRIDGES, PLACED IN 2" LAYERS AND COMPACTED WITH A MECHANICAL HAND–GUIDED TAMPER WITHIN 12 HOURS AFTER PLACING MEMBRANE WATERPROOFING.
2. ALL REINFORCING SHOWN IN THIS DETAIL SHALL BE COATED BARS, EXCEPT FOR APPROACH SLAB REINFORCEMENT.
3. ATTACH CLOSED CELL FOAM TO BACK OF PRECAST BEAM WITH ADHESIVE.
4. ALL BACKWALL CONCRETE SHALL BE 5000 PSI HP CEMENT CONCRETE AND SHALL BE PLACED AFTER ALL BEAMS HAVE BEEN ERECTED.
5. DRAPE MEMBRANE WATERPROOFING OVER CLOSED CELL FOAM BACKER ROD.
6. THE TOP OF BACKWALL SHALL BE TROWELED SMOOTH PARALLEL TO THE PROFILE GRADE.
7. PRE–BED SEAT WITH NON–SHRINK GROUT WITH THICKNESS MORE THAN SHIM STACK.



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

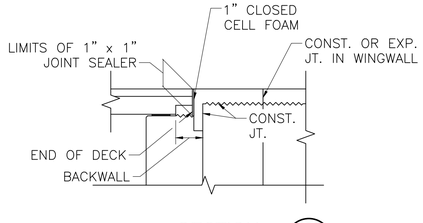
LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

SCALE: ¼" = 1'–0"



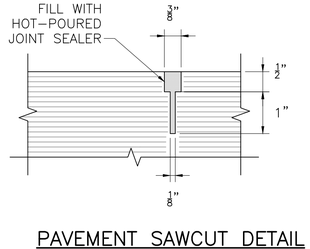
END OF DECK PLAN

SCALE: ¼" = 1'–0"



SECTION 8

SCALE: ¼" = 1'–0"



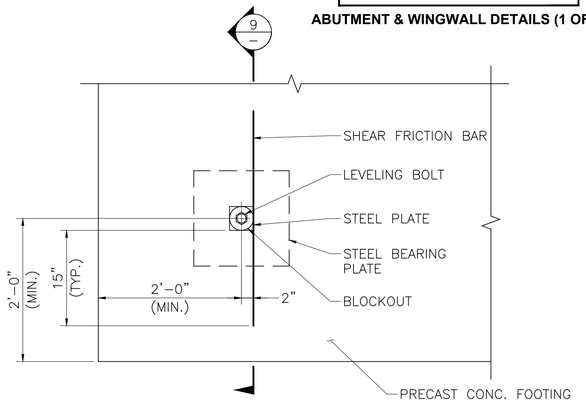
PAVEMENT SAWCUT DETAIL

NOT TO SCALE

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

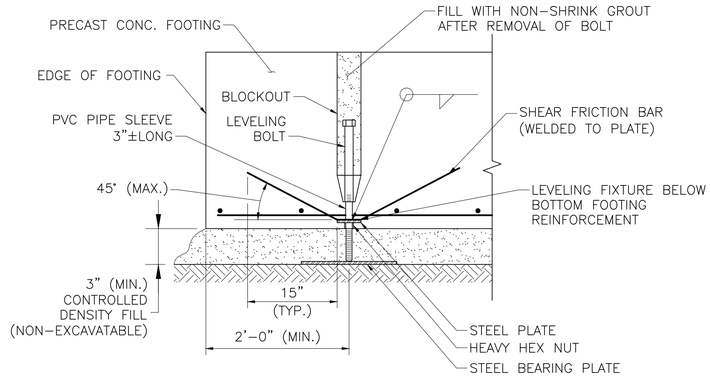
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	41
PROJECT FILE NO.		----	

ABUTMENT & WINGWALL DETAILS (1 OF 2)



PLAN

SCALE: 1" = 1'–0"



SECTION 9

SCALE: 1" = 1'–0"

LEVELING BOLT ASSEMBLY

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 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–ALLOY ASTM A 706 BARS.
6. GREASE OR OIL NUT AND BOLT THREADS TO FACILITATE LEVELING AND REMOVAL.

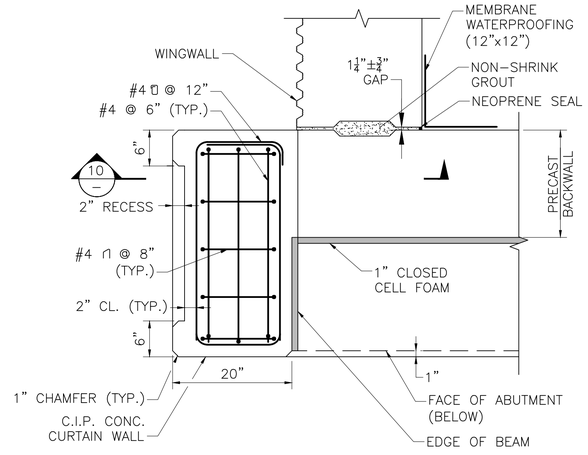
COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

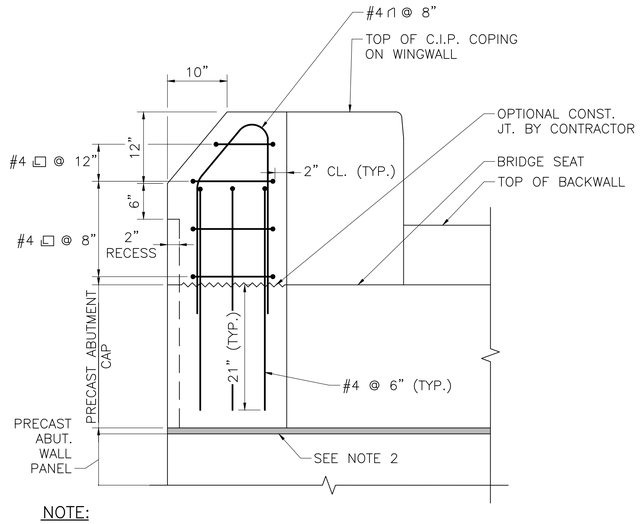
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	41
PROJECT FILE NO.		----	

ABUTMENT & WINGWALL DETAILS (2 OF 2)



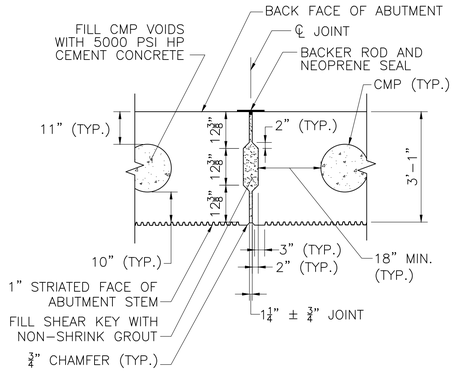
NOTE:
SEE VIEW 1 (THIS SHEET) FOR ELEVATION OF ABUTMENT AT THIS LOCATION

SECTION 4 / SCALE: 1" = 1'-0" / 7,8



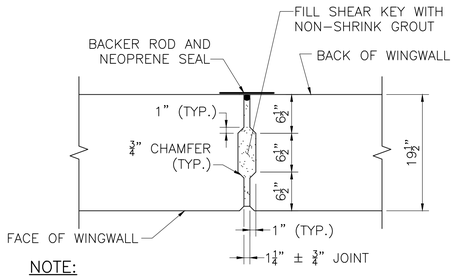
NOTE:
1. REINFORCEMENT BELOW CONSTRUCTION JOINT HAS BEEN OMITTED FOR CLARITY.
2. PRE-BED SEAT WITH NON-SHRINK GROUT WITH THICKNESS SLIGHLTY MORE THAN SHIM STACK.

SECTION 10 / SCALE: 1" = 1'-0" / –



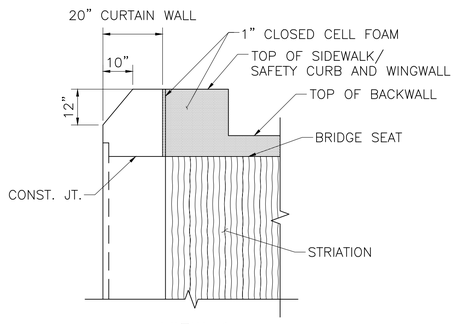
NOTES:
1. FACE OF SHEAR KEYS SHALL BE BLAST CLEANED, ROUGHENED AND WETTED WITH CLEAN WATER PRIOR TO INSTALLATION.
2. REINFORCEMENT IS NOT SHOWN FOR CLARITY.

SECTION 5 / SCALE: ½" = 1'-0" / 7,8

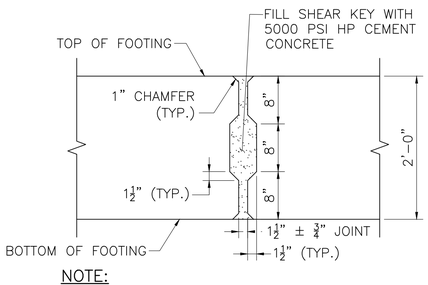


NOTE:
REINFORCEMENT IS NOT SHOWN FOR CLARITY.

SECTION 11 / SCALE: 1" = 1'-0" / 12

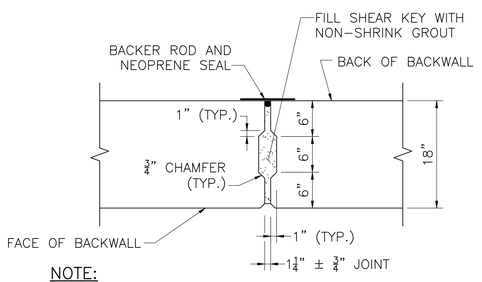


VIEW 1
SCALE: ½" = 1'-0"



NOTE:
FOOTING REINFORCEMENT IS NOT SHOWN FOR CLARITY.

SECTION 6 / SCALE: 1" = 1'-0" / 7,8



NOTE:
REINFORCEMENT IS NOT SHOWN FOR CLARITY.

SECTION 7 / SCALE: 1" = 1'-0" / 7,8

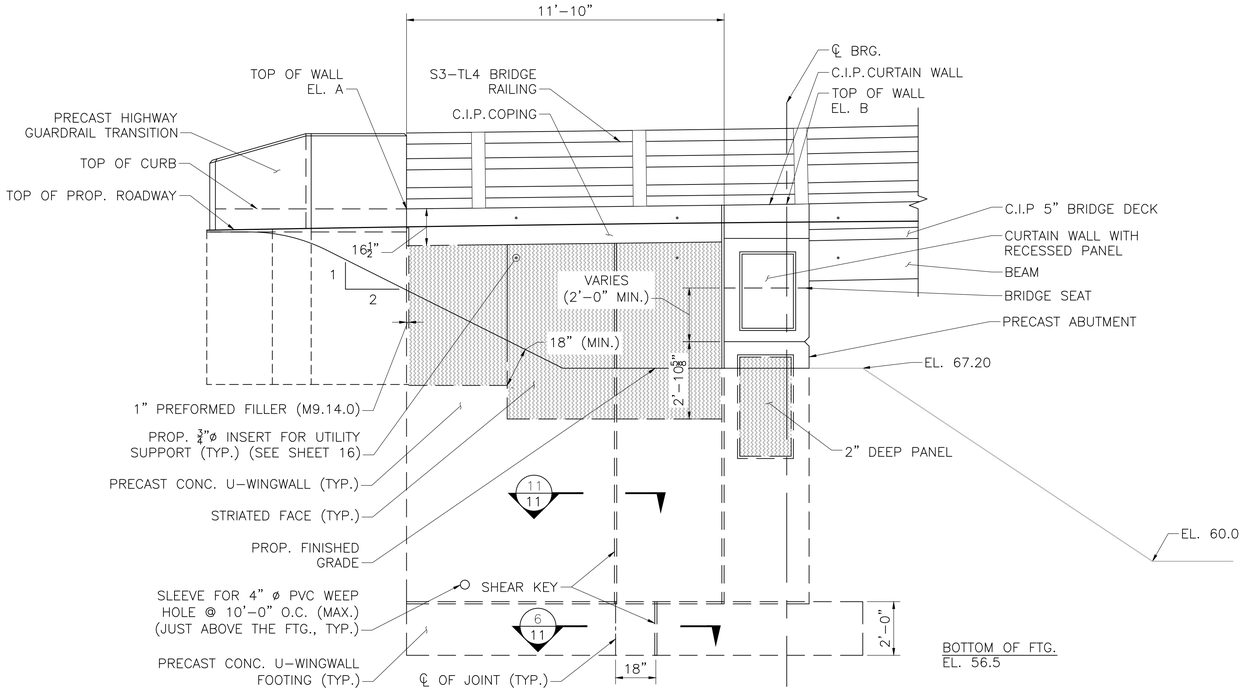
COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	41
PROJECT FILE NO.		----	

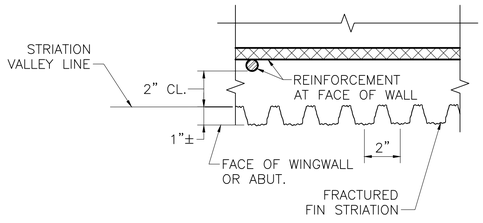
WINGWALL ELEVATION



NOTE:

1. THE NORTHWEST WINGWALL IS SHOWN. OTHERS SIMILAR.
2. THIS DETAIL DEPICTS THE TYPICAL DETAIL FOR THE PROPOSED WINGWALLS AT ALL 4 CORNERS OF THE BRIDGE. SEE BELOW FOR SPECIFIC ELEVATIONS FOR EACH:
   - 2.1. NORTHWEST:
     - 2.1.1. A = EL. 73.14
     - 2.1.2. B = EL. 73.31
   - 2.2. NORTHEAST:
     - 2.1.1. A = EL. 73.23
     - 2.1.2. B = EL. 73.37
   - 2.2. SOUTHWEST:
     - 2.1.1. A = EL. 72.97
     - 2.1.2. B = EL. 73.20
   - 2.2. SOUTHEAST:
     - 2.1.1. A = EL. 73.06
     - 2.1.2. B = EL. 73.26

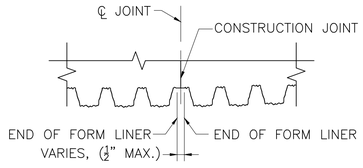
WINGWALL ELEVATION
SCALE: ⅜" = 1'–0"



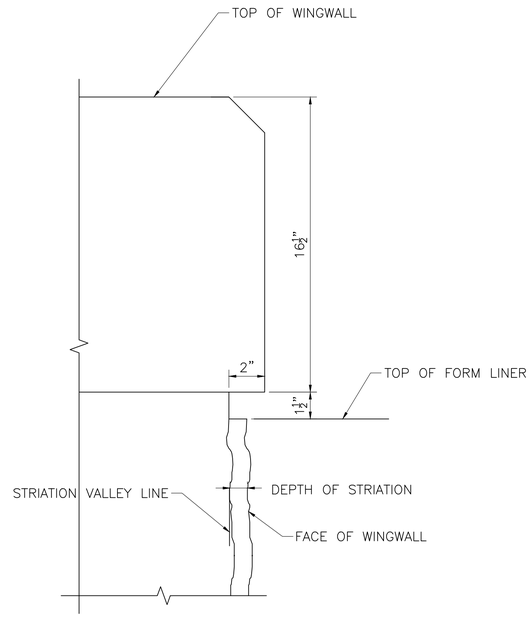
NOTES:

1. 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.
2. 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.

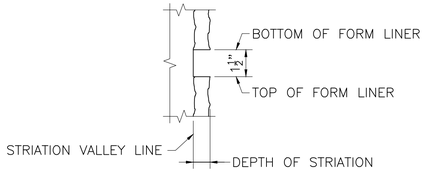
TYPICAL STRIATION DETAIL
SCALE: 3" = 1'–0"



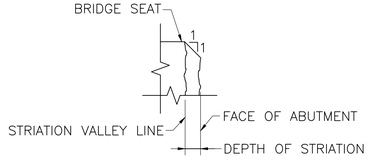
CONSTRUCTION JOINT
SCALE: 3" = 1'–0"



DETAIL AT TOP OF WINGWALL
SCALE 3" = 1'–0"



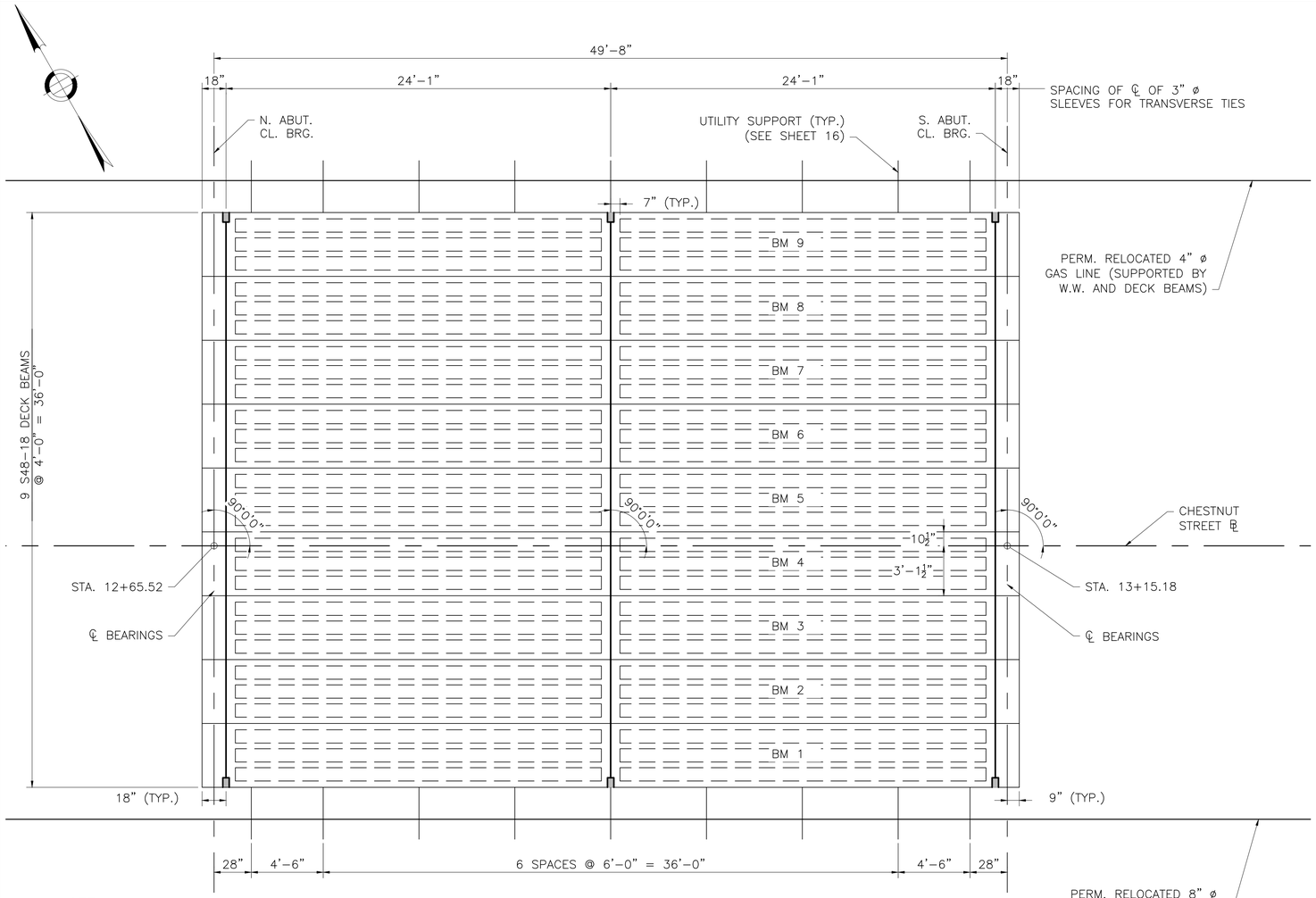
HORIZONTAL PANEL JOINT
SCALE: 3" = 1'–0"



DETAIL AT BRIDGE SEAT
SCALE: 3" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024



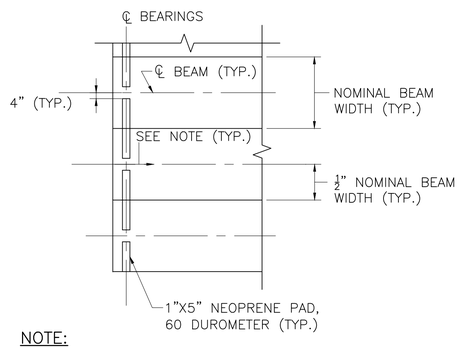
NOTE:

SEE STANDARD SPECIFICATIONS FOR BEAMS ERECTION AND LAYOUT.

FRAMING PLAN

SCALE: ¼"=1'–0"

BEAM NO.	BEAM TYPE
1	S48–18
2	S48–18
3	S48–18
4	S48–18
5	S48–18
6	S48–18
7	S48–18
8	S48–18
9	S48–18

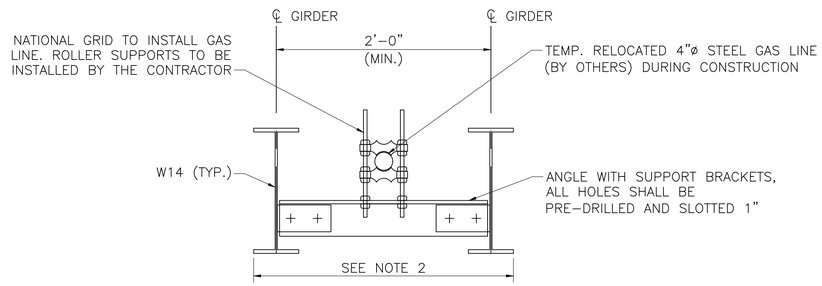


NOTE:

PROVIDE ⅛"/FT. SLOPE BETWEEN BEARINGS.

LAYOUT OF BEARINGS

SCALE: ¼" = 1'–0"



NOTES:

1. THIS DETAIL IS CONCEPTUAL ONLY, ALL BRIDGE ELEMENTS (SUPERSTRUCTURE AND SUBSTRUCTURE) FOR THE TEMPORARY UTILITY BRIDGE SHALL BE CONTRACTOR DESIGNED. THE DESIGN SHALL ENSURE THAT THE TEMPORARY GAS LINE IS PROTECTED FROM FLOATING DEBRIS. THE TEMPORARY UTILITY BRIDGE SHALL BE DESIGNED TO ACCOMMODATE ROLLER ASSEMBLIES TO SUPPORT THE GAS LINE.
2. THE TEMPORARY UTILITY BRIDGE SHALL BE DESIGNED TO ENSURE THAT THE MAXIMUM OUT–TO–OUT WIDTH DOES NOT RESULT IN THE BRIDGE BEING LOCATED BEYOND THE EXISTING R.O.W. OR TEMPORARY EASEMENT LINES.
3. NATIONAL GRID GAS WILL PROVIDE AND INSTALL THE TEMPORARY GAS PIPE. NATIONAL GRID WILL PROVIDE THE TEMPORARY ROLLER ASSEMBLIES. CONTRACTOR SHALL PRE–DRILL 1" SLOTTED HOLES SPACED AT 6¾" O.C. TO ACCOMMODATE THE TEMPORARY ROLLER SUPPORTS.
4. THE TEMPORARY GAS LINE SHALL BE SUPPORTED EVERY 15'–0" O.C. MAXIMUM, UNLESS OTHERWISE COORDINATED WITH NATIONAL GRID.
5. THE ASSUMED NOMINAL LOADING OF THE TEMPORARY STEEL GAS PIPE AND ROLLER SUPPORTS SHALL BE CONSIDERED TO BE 12 PLF. AT A MINIMUM, THE TEMPORARY SUPERSTRUCTURE AND SUBSTRUCTURE SHALL BE DESIGNED TO SUPPORT THESE SUPERIMPOSED LOADS.
6. THE TEMPORARY UTILITY BRIDGE FOR THE 4"ø GAS LINE SHALL BE DESIGNED TO ENSURE THAT THERE IS NO CONFLICT BETWEEN THE BRIDGE OR UTILITY WITH THE PROPOSED CONTROL OF WATER SYSTEM. NO PROTRUSIONS IN THE CONTROL OF WATER SYSTEM WILL BE ALLOWED. TEMPORARY UTILITY RELOCATIONS SHALL OCCUR PRIOR TO INSTALLATION OF STAGE 1 CONTROL OF WATER SYSTEM.

TEMPORARY UTILITY BRIDGE SCHEMATIC

SCALE: 1½" = 1'–0"

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	41
PROJECT FILE NO.		----	

FRAMING PLAN

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

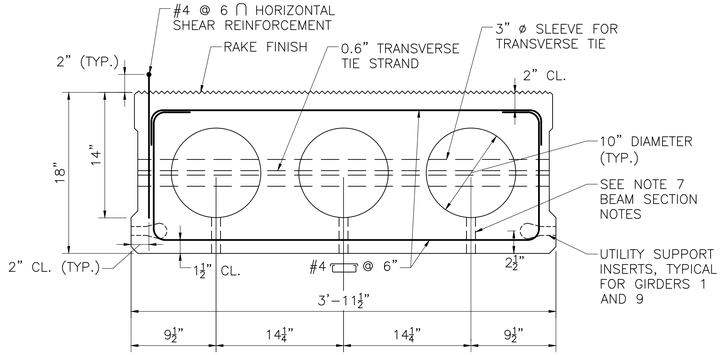
T1256.02_BR13_(N-18-003).DWG Plotted on 22-Oct-2024 11:39 AM

PRESTRESS NOTES:

1. ALL PRETENSIONING ELEMENTS SHALL BE 0.6" ø, UNCOATED, SEVEN–WIRE, LOW RELAXATION STEEL STRANDS AND SHALL CONFORM TO AASHTO M 203.
2. THE TENSILE STRENGTH OF THE PRETENSIONING STRANDS SHALL BE 270 KSI.
3. THE INITIAL TENSION PER 0.6" ø STRAND SHALL BE 44 KIPS.
4. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 6500 PSI.
5. NO PRESTRESS SHALL BE TRANSFERRED TO THE CONCRETE UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH, AS SHOWN BY CYLINDER TEST, OF AT LEAST 5200 PSI.
6. THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKE FINISH ($\frac{1}{4}$" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
7. THE FABRICATOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE LIFTING DEVICES WHICH SHALL BE ADEQUATE FOR THE SAFETY FACTORS REQUIRED BY THE ERECTION PROCEDURE.
8. ALL DENOTED DEBONDED STRANDS SHALL BE DEBONDED FOR A LENGTH OF 7'–0", MEASURED FROM THE END OF THE BEAM.
9. TO CONTROL CRACKING AT THE END OF THE BEAM, THE FABRICATOR SHALL DEBOND APPROMIXATELY 50% OF THE STRANDS FOR THE FIRST 6" FROM THE END OF THE BEAM

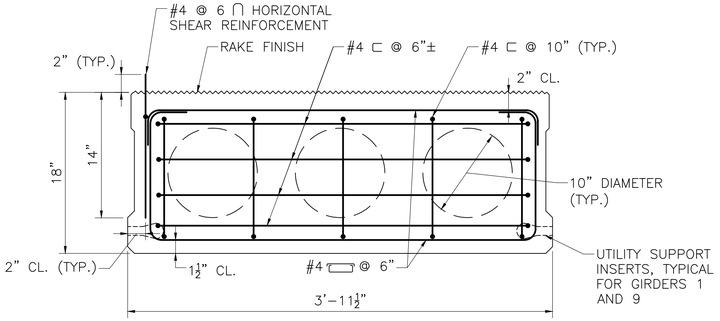
BEAM SECTION NOTES:

1. + DENOTES STRAIGHT STRANDS.
2. ⊕ DENOTES DEBONDED STRANDS.
3. SEE SHEAR KEY DETAIL ON SHEET 15.
4. SEE END OF BEAM PLAN FOR STIRRUP SPACING.
5. MAINTAIN ALL CLEARANCES AS SHOWN ON THE PLANS.
6. SEE SHEET 17 FOR PRESTRESS NOTES.
7. 1"ø DRAIN, PLACED AT BOTH ENDS OF EACH VOIDS
8. INTERIOR BEAM SECTIONS SHOWN. EXTERIOR BEAM SECTIONS (INCLUDING REINFORCING AND STRAND PATTERNS) SIMILAR, WITH NO SHEAR KEY INDENTATION ON THE EXTERIOR FACE.
9. FOR LAYOUT OF UTILITY SUPPORT INSERTS ALONG EXTERIOR BEAM 1 AND BEAM 9, REFER TO SHEET 13.



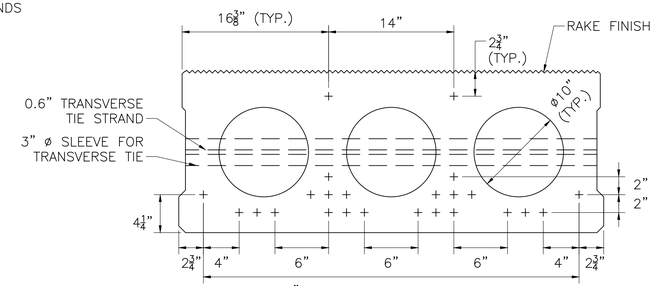
MIDSPAN SECTION – REINFORCEMENT LOCATION

SCALE: 1½" = 1'–0"



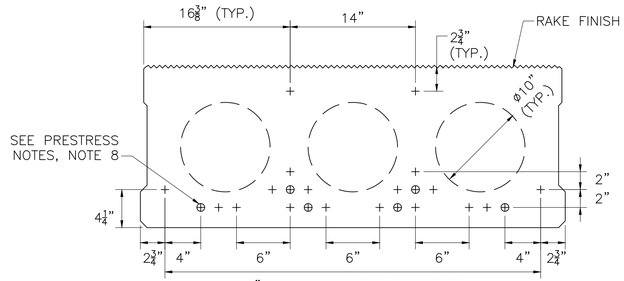
END OF BEAM SECTION – REINFORCEMENT LOCATION

SCALE: 1½" = 1'–0"



MIDSPAN SECTION – STRAND LOCATION

SCALE: 1½" = 1'–0"

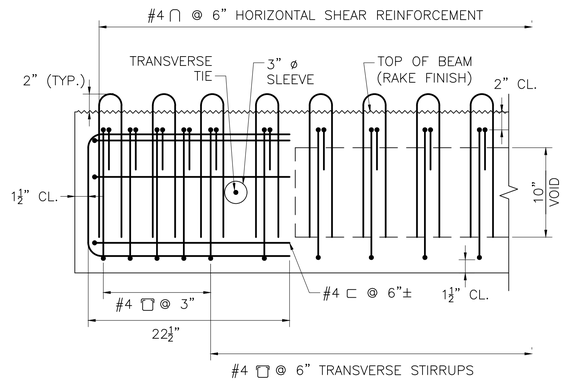


END OF BEAM SECTION – STRAND LOCATION

SCALE: 1½" = 1'–0"

NOTE:

END OF BEAM SECTIONS SHOWN AT THE CENTERLINE OF BEARING. SEE END OF BEAM PLAN (THIS SHEET) FOR TRANSVERSE TIE LOCATIONS AT BEAM ENDS

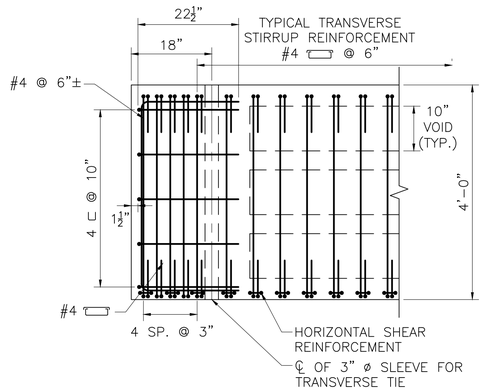


NOTE:

STRANDS ARE NOT SHOWN FOR CLARITY.

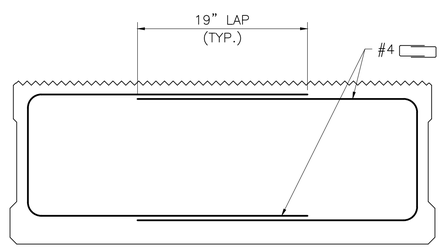
LONGITUDINAL SECTION

SCALE: 1½" = 1'–0"



END OF BEAM PLAN

SCALE: ¾" = 1'–0"



NOTES:

1. CONTRACTOR MAY SUBMIT ABOVE STIRRUP PATTERN TO THE ENGINEER FOR APPROVAL PROVIDED THAT THE ABOVE CRITERIA IS MET.
2. MAINTAIN ALL CLEARANCES AS SHOWN ON THE MIDSPAN SECTION.

ALTERNATE STIRRUP PATTERN

SCALE: 1½" = 1'–0"

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	41
PROJECT FILE NO.		----	

TYPE S48-18 DECK BEAM DETAILS

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

T1256.02_BR14_(N-18-003).DWG Plotted on 22-Oct-2024 11:40 AM

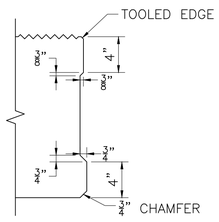
CONSTRUCTION SEQUENCE NOTES:

1. AFTER ALL BEAMS HAVE BEEN ERECTED, TENSION EACH TRANSVERSE TIE TO 5 KIPS.
2. FILL ALL KEYWAYS WITH MORTAR (M4.04.0). IF THE KEYWAYS ARE NOT FILLED WITHIN FIVE (5) DAYS AFTER THE BEAMS ARE ERECTED, THE CONTRACTOR SHALL COVER AND PROTECT THE KEYWAYS FROM WEATHER AND DEBRIS UNTIL THEY ARE FILLED.
3. AFTER THE MORTAR HAS CURED (24 HOURS MINIMUM), TENSION EACH TRANSVERSE TIE TO 44 KIPS.
4. CONCRETE FOR DECK SLAB SHALL BE 5000 PSI, $\frac{3}{4}$ IN, 685 HP CEMENT CONCRETE AND SHALL BE PLACED AFTER THE TRANSVERSE TIES HAVE BEEN FULLY TENSIONED.
5. NO TRAFFIC OR HEAVY EQUIPMENT WILL BE PERMITTED ON THE BRIDGE UNTIL ALL TRANSVERSE TIES HAVE BEEN PROPERLY TENSIONED AND THE DECK HAS BEEN CAST AND CURED PER THE STANDARD SPECIFICATIONS.

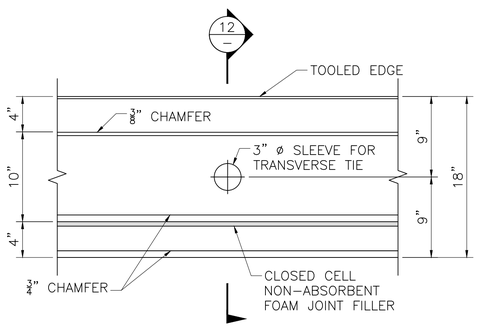
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	41
PROJECT FILE NO.		----	

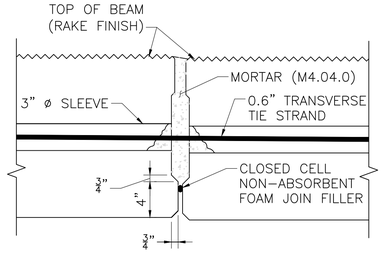
TRANSVERSE TIE DETAILS



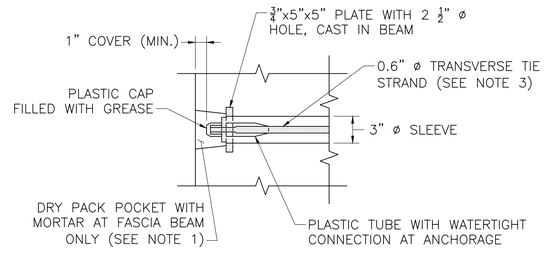
SHEAR KEY DETAIL
SCALE: $1\frac{1}{2}$" = 1'–0"



TYPICAL BEAM ELEVATION AT TRANSVERSE TIE LOCATIONS
SCALE: $1\frac{1}{2}$" = 1'–0"



SECTION 12/–
SCALE: $1\frac{1}{2}$" = 1'–0"



NOTES:

1. MORTAR FOR EXTERIOR POCKETS SHALL CONFORM TO M4.02.15 AND SHALL BE THE SAME COLOR AND TEXTURE AS THE BEAM CONCRETE.
2. OTHER ANCHORAGE SYSTEMS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. ALTERNATE ANCHORAGE SYSTEMS SHALL BE WATERTIGHT AND CORROSION PROOF.
3. TRANSVERSE TIES SHALL BE COVERED BY A SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITING GREASE BETWEEN THE STRAND AND SHEATH) FOR THE FULL LENGTH OF THE STRAND, EXCEPT AT THE ANCHORAGE LOCATION.

TRANSVERSE TIE ANCHORAGE
SCALE: $1\frac{1}{2}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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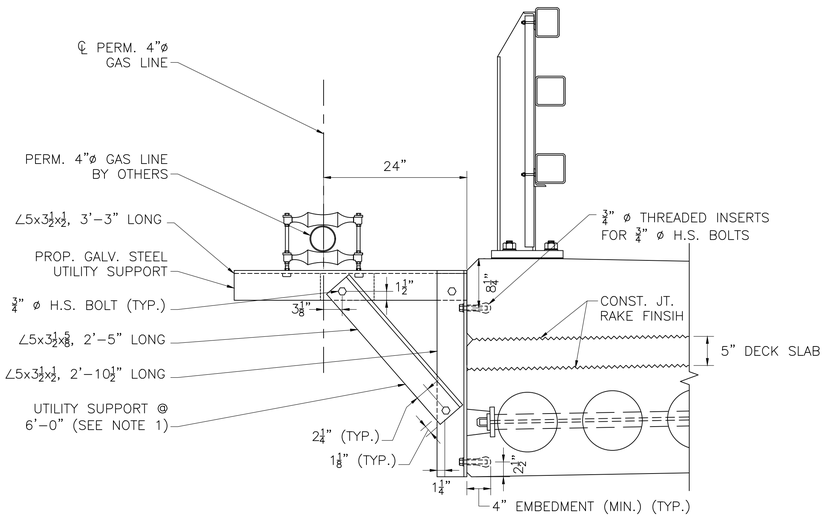
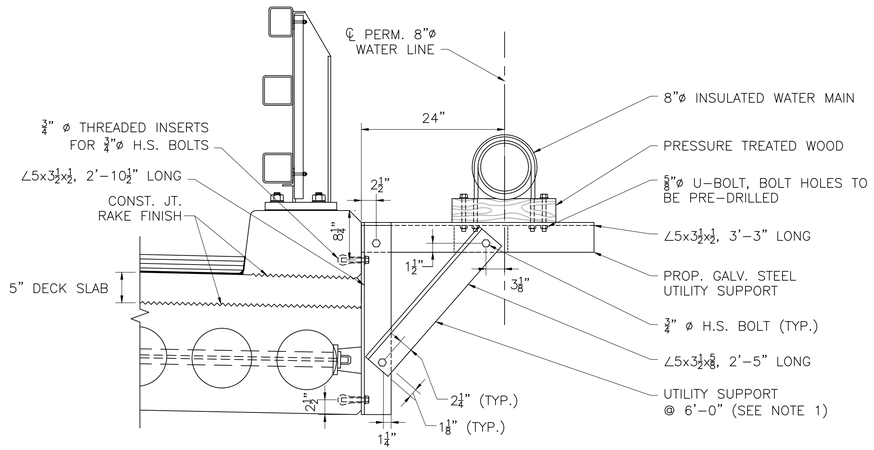
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	28	41
PROJECT FILE NO.		----	

UTILITY SUPPORT DETAILS



EXTERIOR UTILITY SUPPORT
FOR DECK BEAMS: GAS LINE
SCALE: 1" = 1'–0"



EXTERIOR UTILITY SUPPORT
FOR DECK BEAMS: WATER LINE
SCALE: 1" = 1'–0"

UTILITY SUPPORT NOTES:

1. SEE FRAMING PLAN ON SHEET 13 OF 26 FOR UTILITY SUPPORT SPACING. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING LOCATIONS OF THREADED INSERTS IN PRECAST ELEMENTS PRIOR TO FABRICATION.
2. LAYOUT OF THREADED INSERTS FOR UTILITY SUPPORT SHOWN OVER BRIDGE. SPACING/LAYOUT OF INSERTS AT WINGWALLS SIMILAR.
3. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL STEEL FOR UTILITY SUPPORTS, AS DETAILED ABOVE. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTILLATION OF THE WATER MAIN. NATIONAL GRID IS RESPONSIBLE FOR THE INSTILLATION OF THE GAS LINE.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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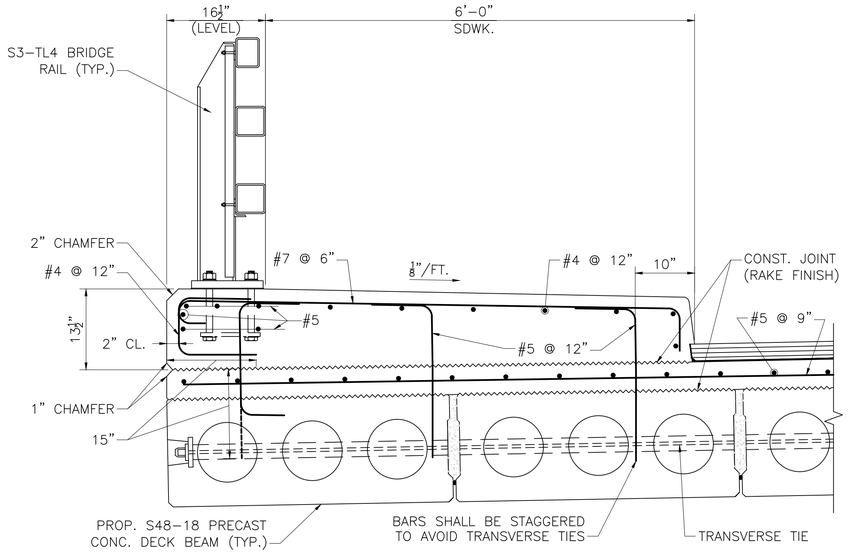
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	29	41
PROJECT FILE NO.		----	

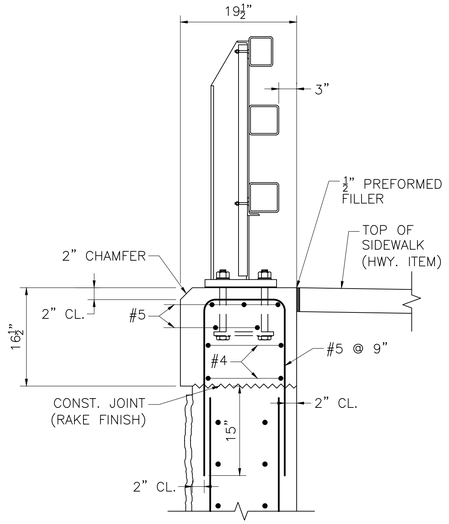
SIDEWALK & SAFETY CURB SECTION



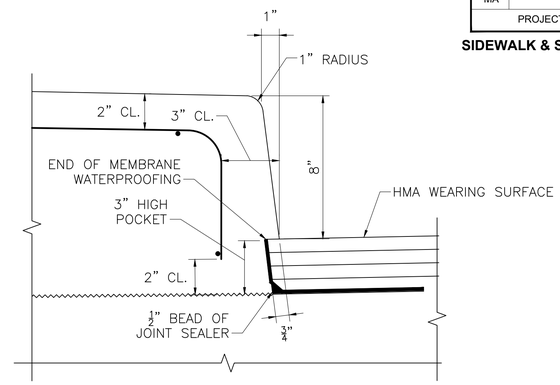
NOTES:

1. DECK SLAB AND SIDEWALK CONCRETE SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.

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



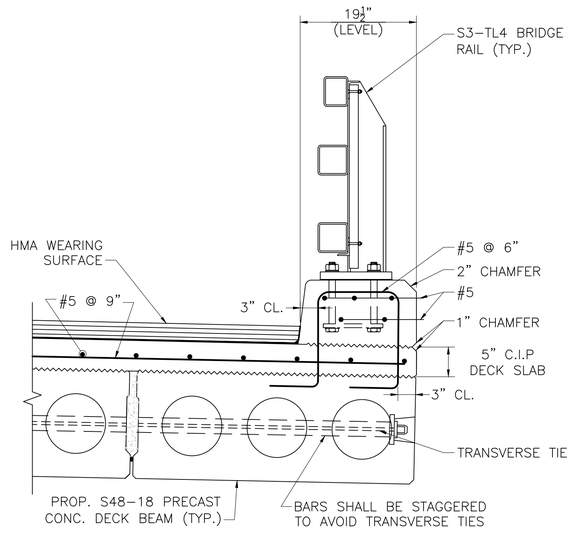
TOP OF U-WINGWALL DETAILS AT SIDEWALK
SCALE: 1" = 1'-0"



NOTES:

1. TURN MEMBRANE UP INTO 3" HIGH POCKET
2. DIMENSIONS AT THE FACE OF CURB ARE THE SAME FOR THE SAFETY CURB

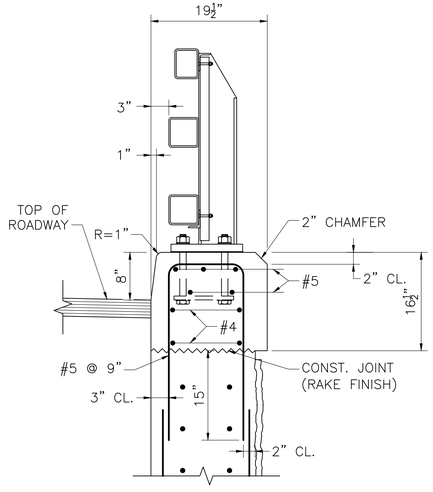
FACE OF SIDEWALK CURB DETAILS
SCALE: 3" = 1'-0"



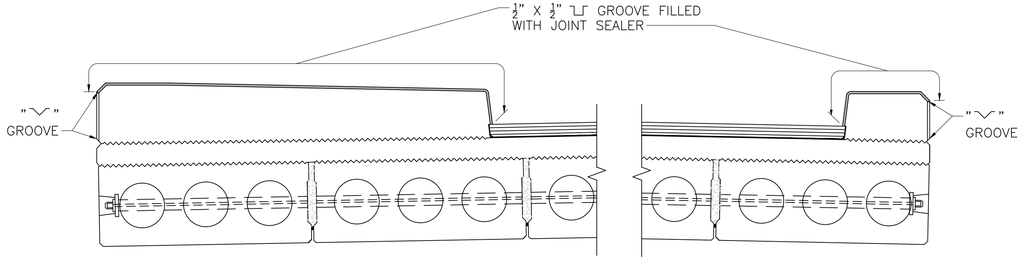
NOTES:

1. DECK SLAB AND SIDEWALK CONCRETE SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.

SECTION THRU SAFETY CURB
SCALE: 1" = 1'-0"



TOP OF U-WINGWALL DETAILS AT SAFETY CURB
SCALE: 1" = 1'-0"



SIDEWALK

SAFETY CURB

PARAFFIN JOINT DETAILS
SCALE: ¾" = 1'-0"

NOTES:

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

COMMONWEALTH OF MASSACHUSETTS
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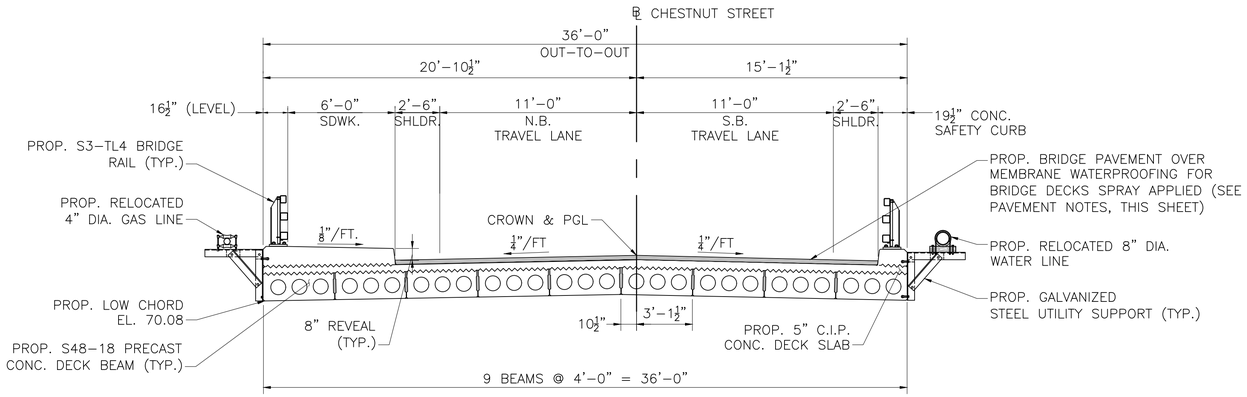
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	30	41
PROJECT FILE NO.		----	

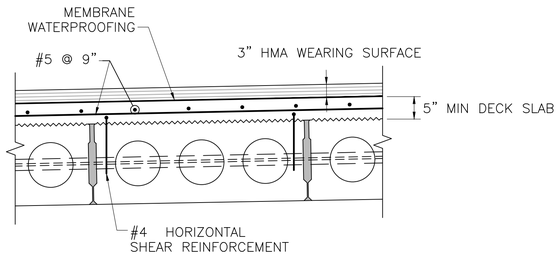
TRANSVERSE SECTION & DECK DETAILS



TRANSVERSE SECTION
SCALE: ¼" = 1'–0"

BRIDGE PAVEMENT NOTES:

SURFACE: 1½" SUPERPAVE BRIDGE SURFACE COURSE 9.5 – POLYMER (SSC–B–9.5–P) OVER
1½" SUPERPAVE BRIDGE PROTECTIVE COURSE 9.5 – POLYMER (SPC–B–9.5–P)



NOTES:

1. ROADWAY DECK SLAB SHALL BE 5000 PSI HP CEMENT CONCRETE.
2. LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE ℄ OF CONSTRUCTION.
   TRANSVERSE (PRIMARY) REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE ℄ OF CONSTRUCTION.
3. ALL REINFORCEMENT AND SUPPORT DEVICES SHALL BE COATED.
4. THE FINISHED SURFACE OF BRIDGE DECK SHALL BE SMOOTH AND WITHOUT ANY PROJECTIONS THAT COULD PUNCTURE THE MEMBRANE WATERPROOFING OR DEPRESSIONS THAT COULD RETAIN WATER.

TYPICAL DECK REINFORCEMENT
SCALE: ¾" = 1'–0"

LOCATION	LEFT EDGE OF DECK SLAB	PROFILE GRADE LINE	RIGHT EDGE OF DECK SLAB
℄ BRGS. @ ABUT.	5.15"	6.08"	5.09"
MIDSPAN	7.17"	7.21"	6.35"
℄ BRGS. @ ABUT.	5.15"	6.08"	5.09"

NOTES:

1. THIS TABLE INDICATES THE THEORETICAL THICKNESS OF THE DECK SLAB IN INCHES BASED UPON ASSUMED BEAM CAMBERS AT ERECTION.
2. TABLE IS PROVIDED TO ASSIST IN ESTIMATING THE REQUIRED CONCRETE VOLUME.
3. THE ACTUAL DECK THICKNESSES WILL BE AS REQUIRED TO MEET THE PROFILE GRADES.

THEORETICAL DECK SLAB THICKNESS TABLE

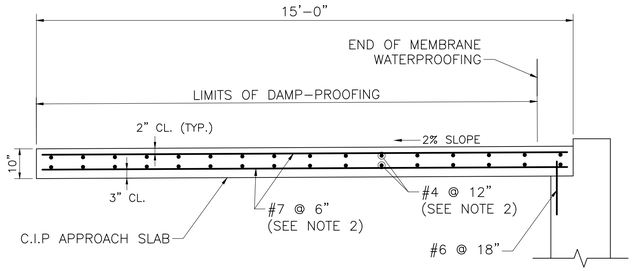
COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	41
PROJECT FILE NO.		----	

APPROACH SLAB & MISCELLANEOUS DETAILS

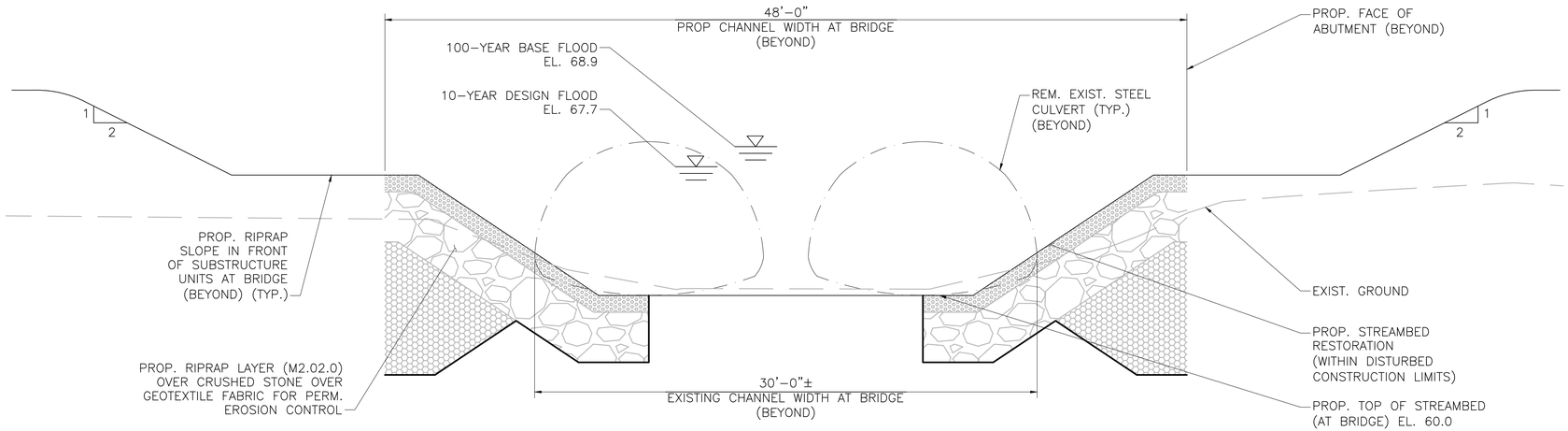


NOTES:

1. APPROACH SLAB TO BE 5000 PSI HP CEMENT CONCRETE.
2. PLACE LONGITUDINAL REINFORCEMENT PARALLEL TO CENTERLINE OF CONSTRUCTION. PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT. ALL REINFORCEMENT SHALL NOT BE COATED.

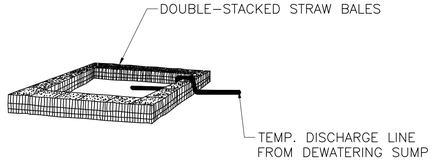
APPROACH SLAB DETAILS

SCALE: $\frac{1}{2}$" = 1'–0"



CHANNEL APPROACH SECTION

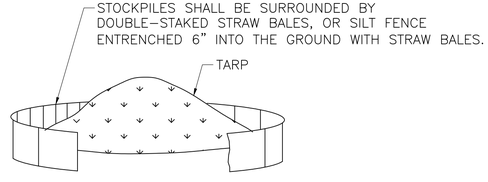
SCALE: $\frac{1}{4}$" = 1'–0"



NOTES:
DISCHARGE TO SEDIMENTATION BASIN (AS SHOWN) OR TO SILTATION/ DEWATERING BAG SUCH AS FLOGARD DEWATERING BAG MODEL SC–DW1215Z, OR APPROVED EQUAL BY TOWN OF NORTH READING CONSERVATION COMMISSIONS. SYSTEM SHOWN IS CONCEPTUAL ONLY AND IS TO BE DESIGNED BY CONTRACTOR.

TEMPORARY STILLING AREA

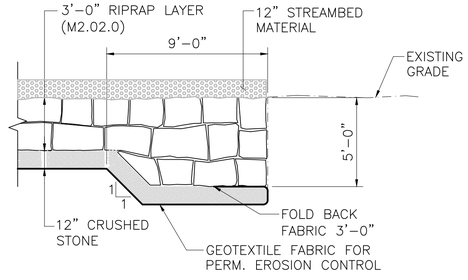
SCALE: N.T.S.



NOTES:
IF STOCKPILE IS PLACE ON PAVEMENT, THEN IT SHALL BE SURROUNDED BY COMPOST FILTER TUBES.

SOIL STOCKPILE

SCALE: N.T.S.



DETAIL AT UPSTREAM/DOWNSTREAM EDGE OF EMBANKMENT

SCALE: $\frac{1}{4}$" = 1'–0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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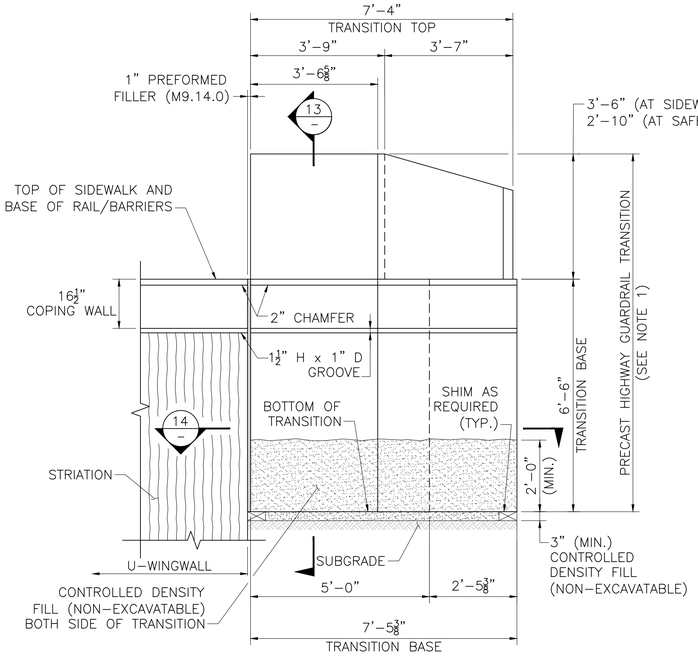
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

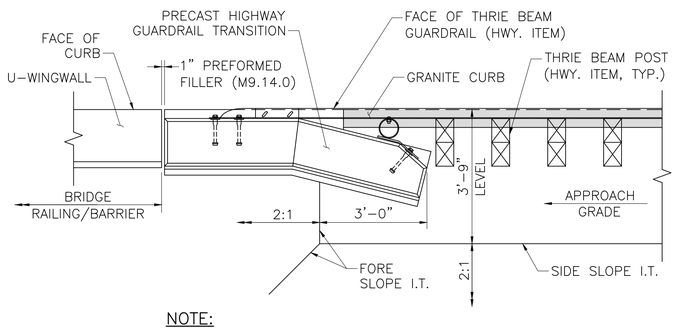


PRECAST GUARDRAIL TRANSITION ELEVATION AT U-WINGWALL

SCALE: ½" = 1'-0"

NOTES:

1. PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.
2. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO THE GRADE OF 3" (MIN.) BELOW THE INTENDED BOTTOM OF THE PRECAST GUARDRAIL TRANSITION BASE AND TO A HEIGHT OF 2'-0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE TO FORM A TRENCH IN WHICH TO SET THE TRANSITION. WHERE NO GRAVEL BORROW IS REQUIRED BELOW THE BASE, IT SHALL BE PLACED ON UNDISTURBED SOIL.
3. CONTRACTOR SHALL SET THE PRECAST GUARDRAIL TRANSITION TO THE REQUIRED ELEVATION AND ALIGNMENT, AND BACKILL PRECAST GUARDRAIL TRANSITION WITH CONTROLLED DENSITY FILL (NON-EXCAVATABLE) TO THE ELEVATION SHOWN.

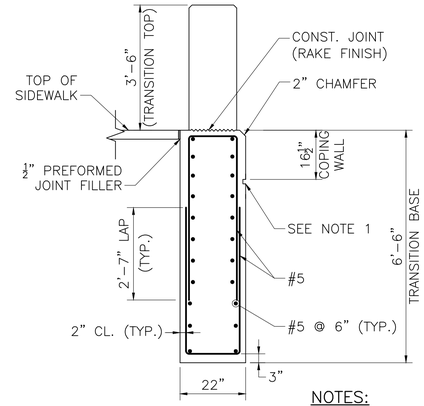


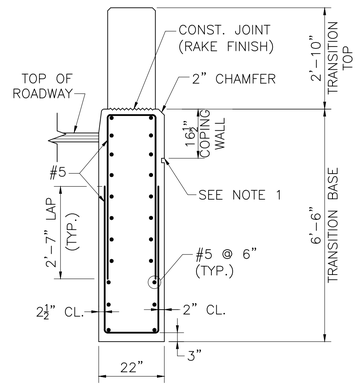
NOTE:

PLAN AT SAFETY CURB IS SHOWN. PLAN AT SIDEWALK IS SIMILAR.

GRADING REQUIREMENTS PLAN

SCALE: ½" = 1'-0"



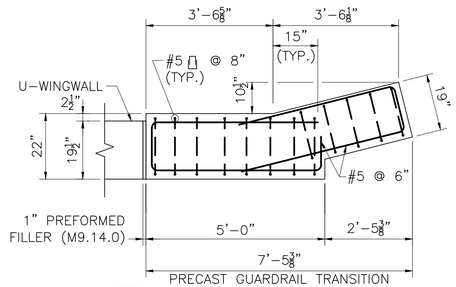


NOTES:

1. 1½" H x 1" D GROOVE. ALIGN WITH GROOVE AT TOP OF STRIATIONS.
2. REINFORCEMENT OF THE TRANSITION TOP IS NOT SHOWN FOR CLARITY.

SECTION 13 AT SIDEWALK

SCALE: ½" = 1'-0"

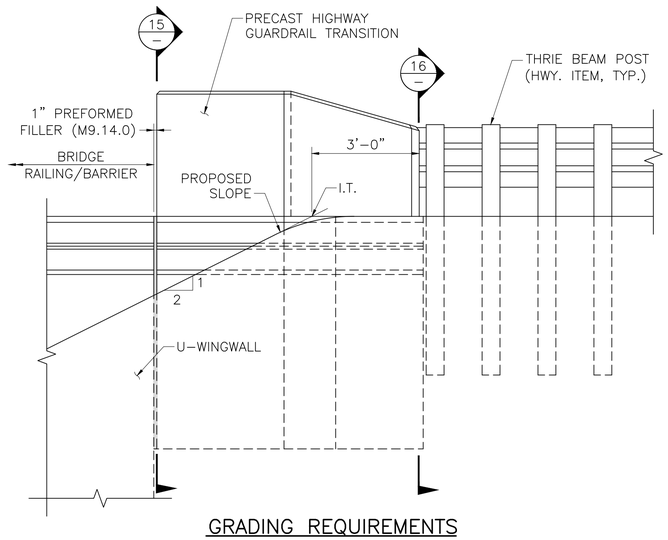


NOTE:

WINGWALL REINFORCEMENT AND STRIATIONS NOT SHOWN FOR CLARITY.

SECTION 14

SCALE: ½" = 1'-0"

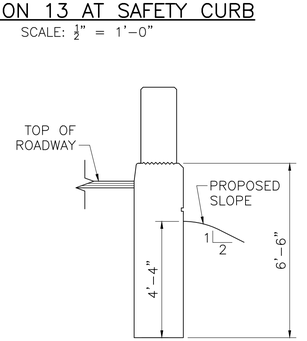


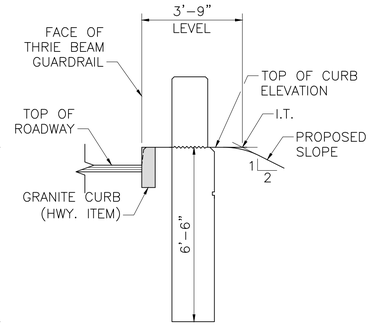
GRADING REQUIREMENTS ELEVATION

SCALE: ½" = 1'-0"

SECTION 13 AT SAFETY CURB

SCALE: ½" = 1'-0"



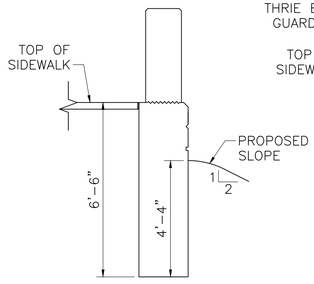


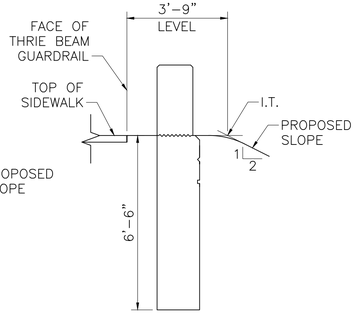
SECTION 15 AT SAFETY CURB

SCALE: ⅜" = 1'-0"

SECTION 16 AT SAFETY CURB

SCALE: ⅜" = 1'-0"





SECTION 15 AT SIDEWALK

SCALE: ⅜" = 1'-0"

SECTION 16 AT SIDEWALK

SCALE: ⅜" = 1'-0"

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	32	41
PROJECT FILE NO.		----	

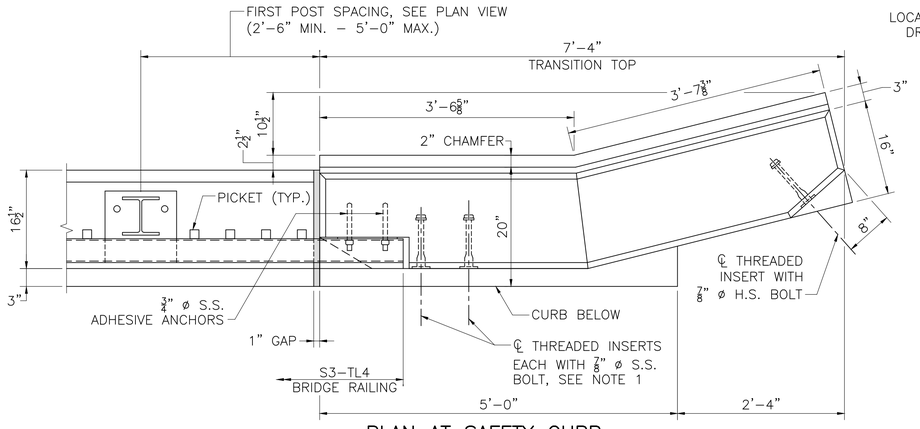
PRECAST HIGHWAY GUARDRAIL TRANSITION DETAILS (1 OF 2)

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

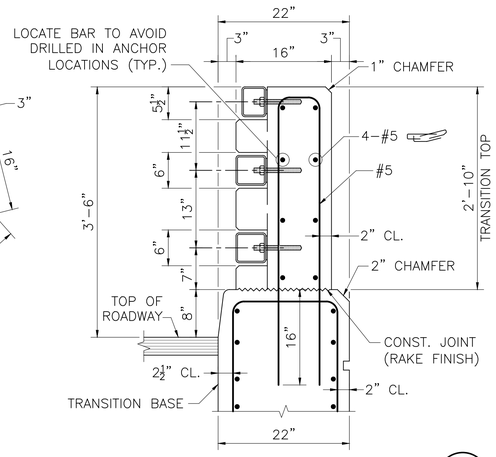
STATE BRIDGE ENGINEER — 10/29/2024 DATE

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

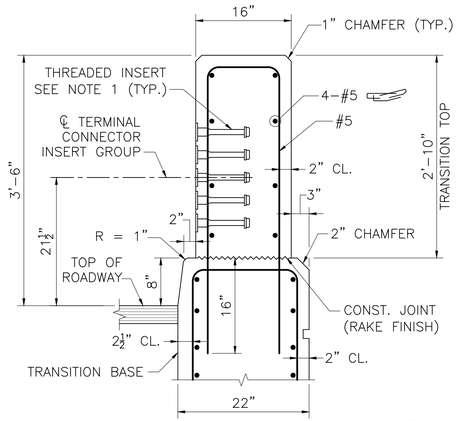
T1256.02_BR20r21_(N-18-003).DWG Plotted on 22-Oct-2024 11:41 AM



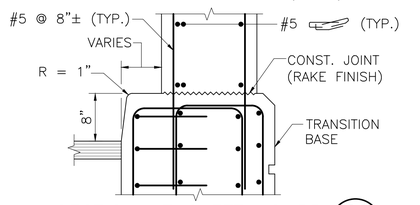
PLAN AT SAFETY CURB
SCALE: 1" = 1'-0"



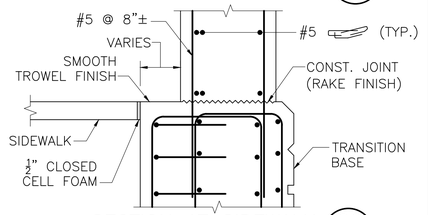
SECTION AT SAFETY CURB (18)
SCALE: 1" = 1'-0"



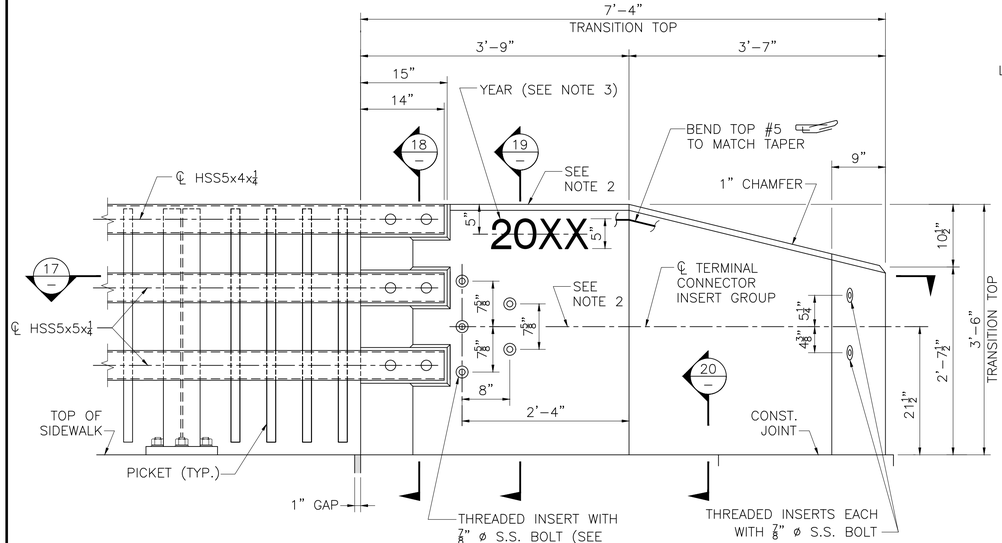
SECTION AT SAFETY CURB (19)
SCALE: 1" = 1'-0"



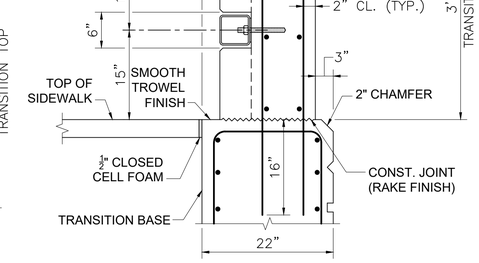
SECTION AT SAFETY CURB (20)
SCALE: 1" = 1'-0"



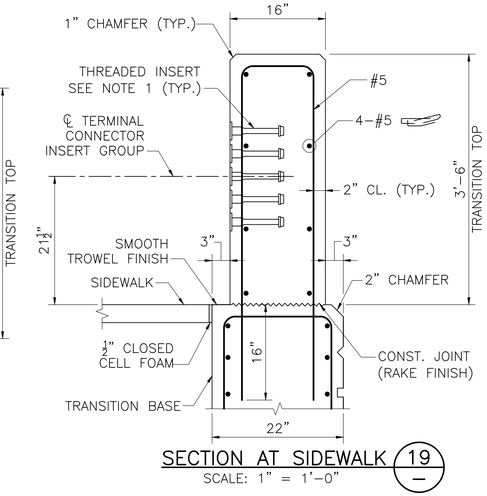
SECTION AT SIDEWALK (20)
SCALE: 1" = 1'-0"



ELEVATION AT SIDEWALK
SCALE: 1" = 1'-0"

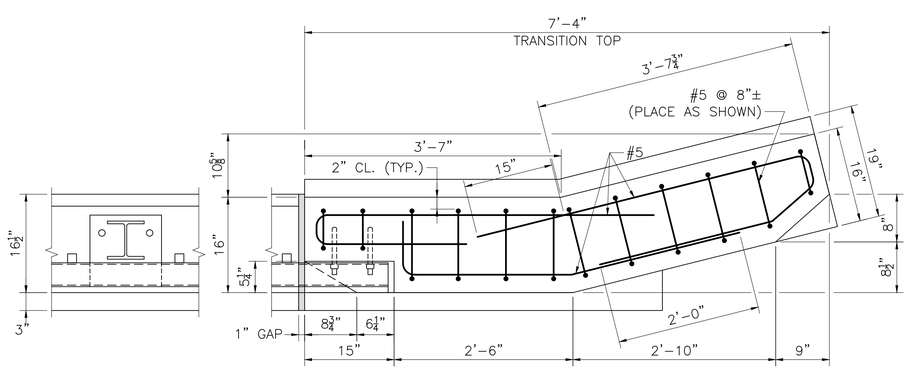


SECTION AT SIDEWALK (18)
SCALE: 1" = 1'-0"

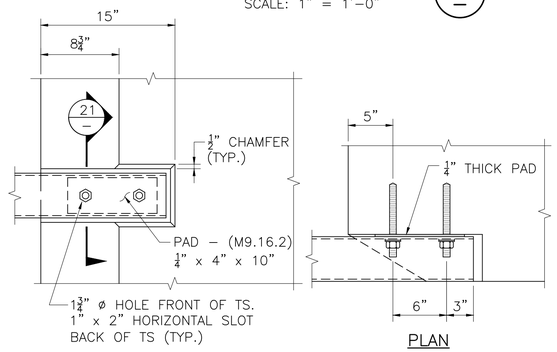


SECTION AT SIDEWALK (19)
SCALE: 1" = 1'-0"

SECTION (21)
SCALE: 3" = 1'-0"



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



ELEVATION

PLAN

RAIL ATTACHMENT
SCALE: 1½" = 1'-0"

NOTES:

1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER ⅞" ø S.S. BOLT. S.S. BOLTS SHALL BE ⅞" ø x 1½" LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR ⅞" S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO THE TRANSITION.
2. FOR AN APPROACH GRADE UP TO 3%, THE TRANSITION MAY BE CAST SQUARE AND SET PLUMB WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SQUARE TO THE POST. FOR AN APPROACH GRADE IN EXCESS OF 3%, THE TRANSITION TOP AND THE TOP OF CURB SHALL FOLLOW THE APPROACH GRADE. THE HEIGHT OF THE TRANSITION TOP SHALL VARY PROVIDED THAT THE MINIMUM DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE MET. THE BOTTOM OF THE TRANSITION BASE SHALL BE SET LEVEL WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SLOPED TO FOLLOW THE APPROACH GRADE.
3. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST GUARDRAIL TRANSITION IS CAST. USE THIS YEAR FOR ALL GUARDRAIL TRANSITIONS.
4. ALL CONCRETE FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾", 685 HP CEMENT CONCRETE.
5. LIFTING DEVICES (NOT SHOWN), INCLUDING THEIR NUMBER AND LOCATION, SHALL BE DESIGNED AND DETAILED BY THE PRECASTER. THEY SHALL BE GALVANIZED AND SHALL BE PLACED AND RECESSED IN POCKETS TO PROVIDE 1½" CLEAR COVER TO THE FACE OF THE TRANSITION CONCRETE. THESE DEVICES SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS ALONG WITH ALL SUPPORTING CALCULATIONS AND/OR CATALOG CUTS. ONCE THE PRECAST TRANSITION IS SET IN PLACE, THE LIFTING DEVICE POCKETS SHALL BE FILLED WITH A NON-SHRINK GROUT THAT MATCHES THE COLOR OF THE TRANSITION CONCRETE WHEN CURED AND THE FILLED POCKETS SHALL BE RUBBED WITH A CORUNDUM STONE TO BLEND OUT THE JOINTS.

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

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	33	41
PROJECT FILE NO.		----	

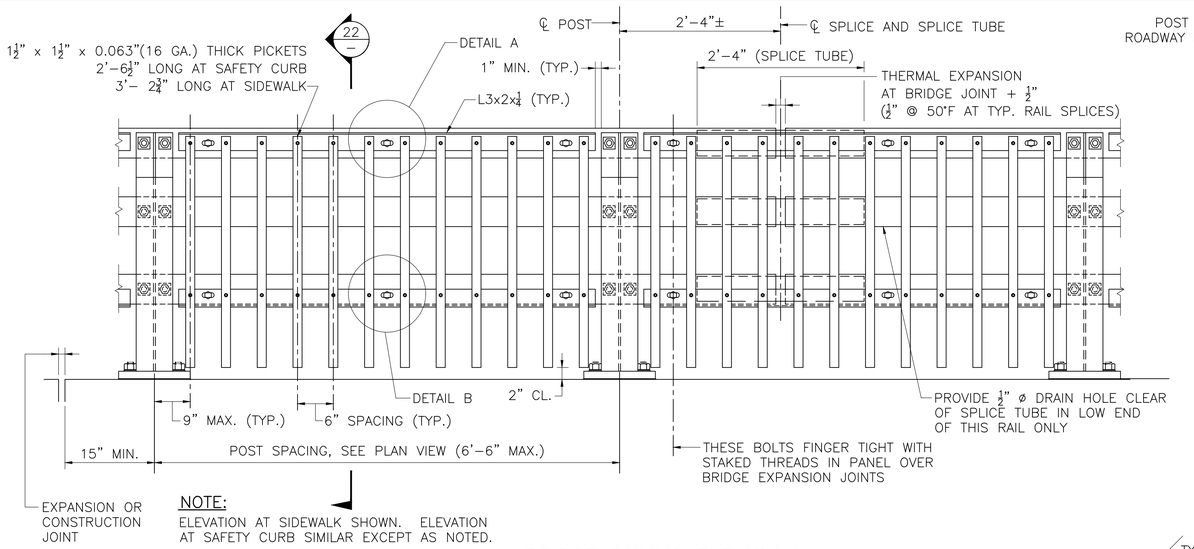
PRECAST HIGHWAY GUARDRAIL TRANSITION DETAILS (2 OF 2)

ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

T1256.02_BR20r21_(N-18-003).DWG Plotted on 22-Oct-2024 11:41 AM

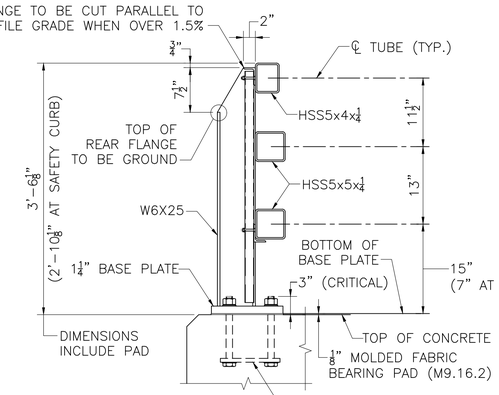
TOP OF PRECAST HIGHWAY GUARDRAIL TRANSITION FOR S3-TL4 RAILING

SHEET 21 OF 27 SHEETS BRIDGE NO. N-18-003 (CMX)



NOTE:
ELEVATION AT SIDEWALK SHOWN. ELEVATION AT SAFETY CURB SIMILAR EXCEPT AS NOTED.

BRIDGE RAILING ELEVATION
SCALE: 1" = 1'-0"



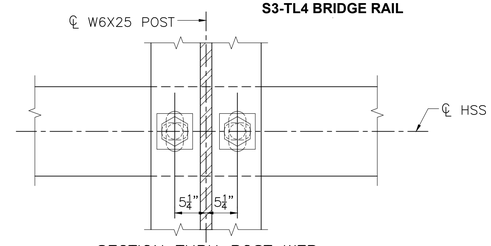
NOTE:
SECTION AT SIDEWALK SHOWN. SECTION AT SAFETY CURB SIMILAR, EXCEPT AS NOTED.

SECTION 22/—
SCALE: 1" = 1'-0"

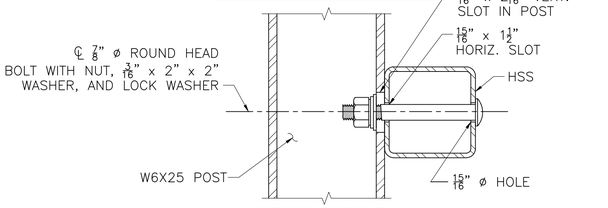
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	41
PROJECT FILE NO.		----	

S3-TL4 BRIDGE RAIL



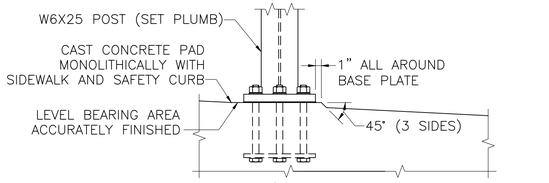
SECTION THRU POST WEB



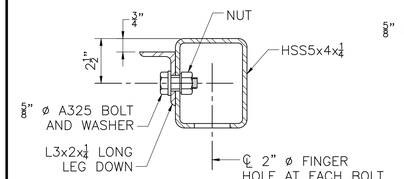
SECTION THRU RAIL

NOTE:
CONNECTIONS AT LOWER RAILS SHOWN.
CONNECTIONS AT TOP RAIL SIMILAR.

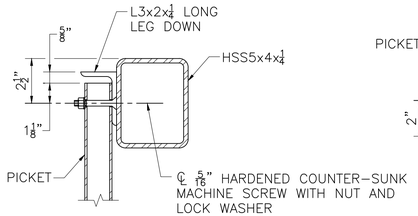
TYPICAL RAIL TO POST CONNECTIONS
SCALE: 1" = 1'-0"



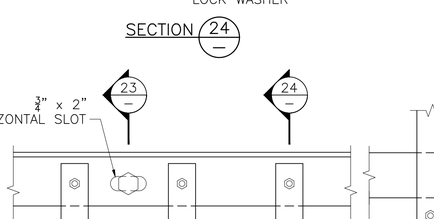
SETTING OF POSTS (PROFILE GRADE OVER 1.5%)
SCALE: 1" = 1'-0"



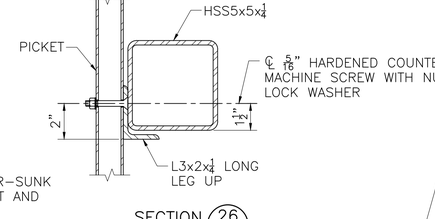
SECTION 23/—



SECTION 25/—



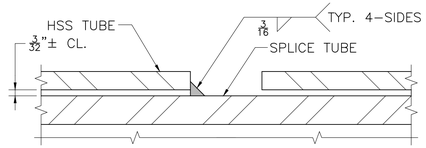
SECTION 24/—



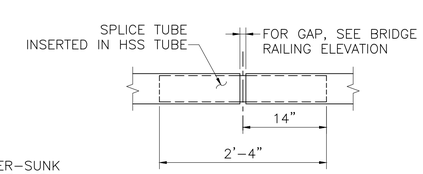
SECTION 26/—

DETAIL A DETAIL B

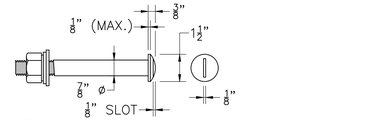
TYPICAL PICKET TO RAIL DETAILS
SCALE: 3" = 1'-0"



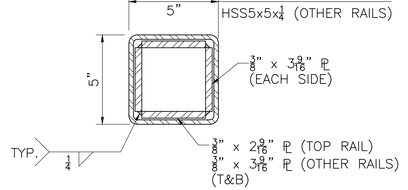
SPLICE DETAIL
FULL SIZE



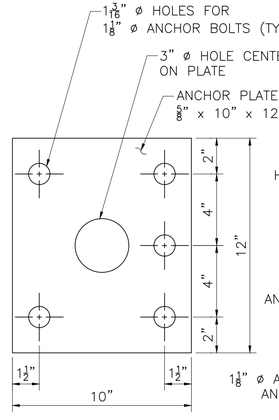
TYPICAL SPLICE
SCALE: 1" = 1'-0"



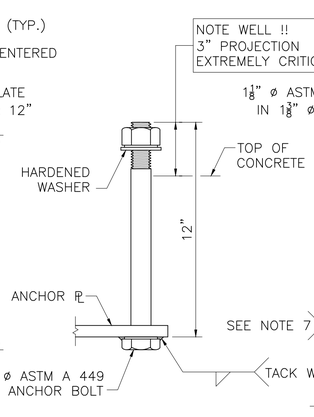
7/8" ø ROUND HEAD BOLT
SCALE: 3" = 1'-0"



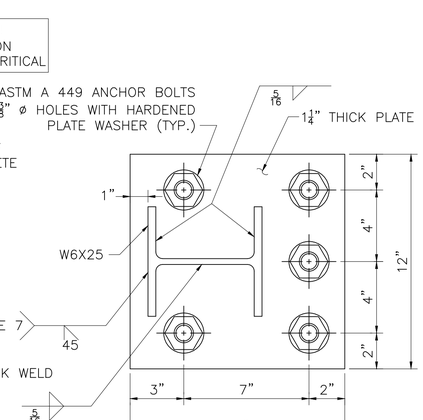
SPLICE TUBE DETIALS
SCALE: 3" = 1'-0"



ANCHOR PLATE
SCALE: 3" = 1'-0"



ANCHOR BOLT
SCALE: 3" = 1'-0"



BASE PLATE
SCALE: 3" = 1'-0"

S3-TL4 BRIDGE RAILING

RAILING NOTES:

1. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING (HSS) SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 WITH A CERTIFIED Fy = 50 KSI MINIMUM. THE MINIMUM HORIZONTAL BENDING RADII OF THE HSS TUBING SHALL BE 8 FEET. PICKET CARRIER ANGLES, ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 36. PICKET TUBING SHALL CONFORM TO ASTM A 513 WITH Fy = 36 KSI MIN. OR A 500 GRADE B.
2. ALL STEEL (EXCEPT THE ⅝" ANCHOR PLATE AND FASTENERS) SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STD. 595B COLOR NO. 10045). ANCHOR PLATE SHALL BE GALVANIZED ONLY. HEADS OF ⅞" ø ROUND HEAD BOLTS SHALL BE PAINTED TO MATCH RAIL.
3. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR (4) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN THE PANELS OVER EXPANSION JOINT.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. ALL POSTS TO BE PLUMB WHEN PROFILE GRADE EXCEEDS 1.5%. FOR PROFILE GRADES LESS THAN 1.5%, POSTS SHALL BE SET PERPENDICULAR TO GRADE.
7. 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.
8. ⅞" ø ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF AASHTO M 164.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

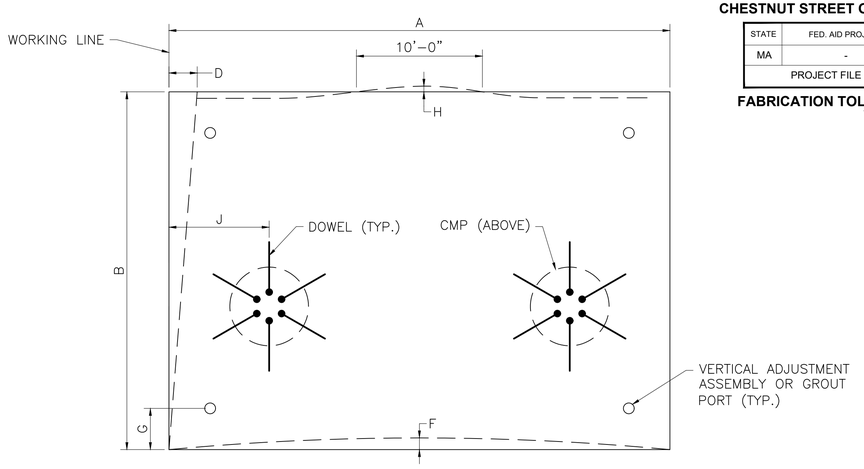
ISSUED FOR CONSTRUCTION OCTOBER 22, 2024

T1256.02_BR22_(N-18-003).DWG Plotted on 22-Oct-2024 11:41 AM

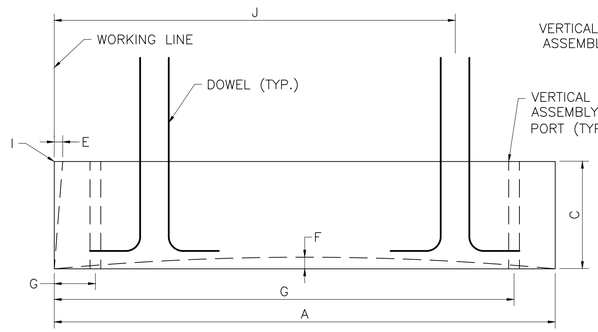
NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	35	41
PROJECT FILE NO.		----	

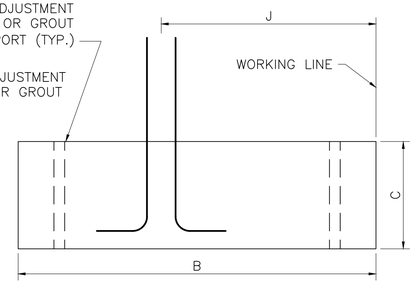
FABRICATION TOLERANCES (1 OF 2)



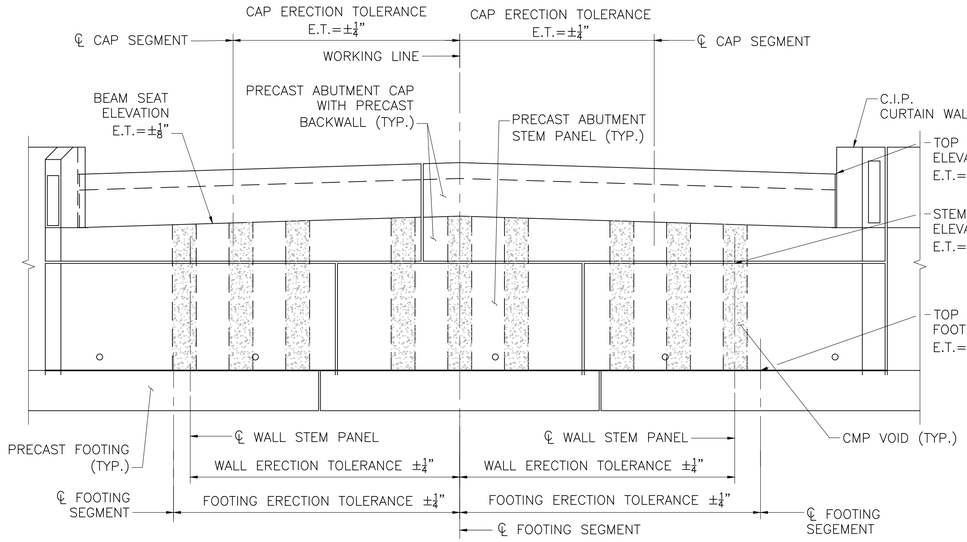
PLAN
NOT TO SCALE



ELEVATION
NOT TO SCALE



SECTION
NOT TO SCALE



ABUTMENT ELEVATION
SCALE: ¼" = 1'–0"

FOOTING FABRICATION TOLERANCES

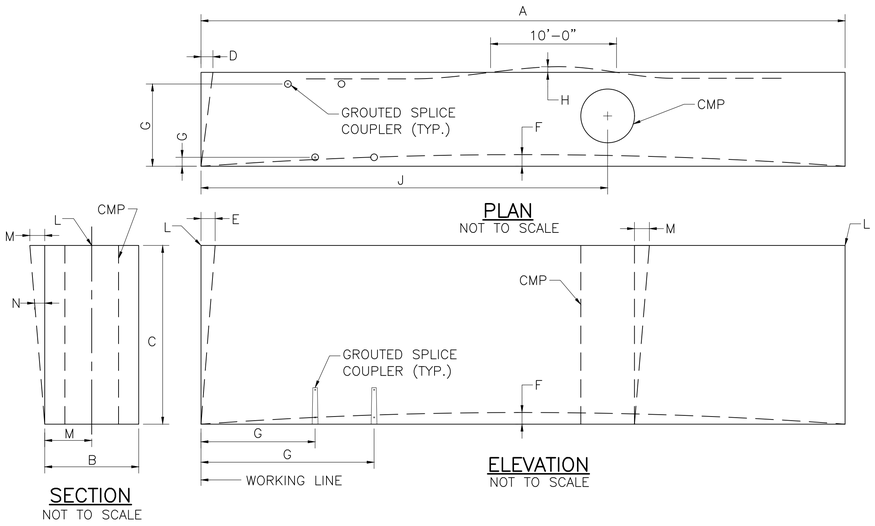
A	LENGTH (OVERALL)	±½"
B	WIDTH (OVERALL)	±¼"
C	DEPTH (OVERALL)	±¼"
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±⅛" PER 12" WIDTH ±½" MAXIMUM
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±⅛" PER 12" WIDTH ±½" MAXIMUM
F	SWEEP OVER MEMBER LENGTH	±½"
G	LOCATION OF LEVELING DEVICE OR GROUT PORT MEASURED FROM A WORKING LINE	±2"
H	LOCAL SMOOTHNESS OF ANY SURFACE	±⅛" IN 10 FEET
J	LOCATION OF PROJECTING DOWELS MEASURED FROM A WORKING LINE	±1"

FOOTING ERECTION TOLERANCES

I	ERECTION ELEVATION TOLERANCE	±¼"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
APPROVED UNDER PROVISIONS OF
MASS. GEN. LAWS CH 85 S 35

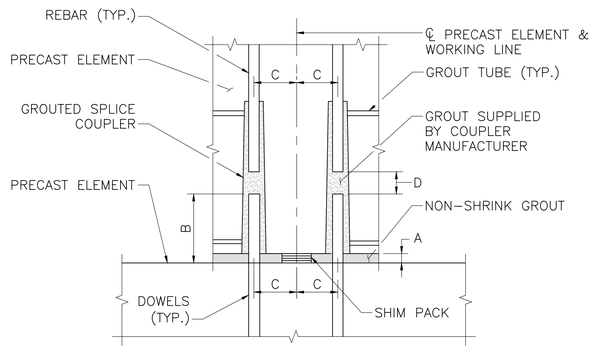
STATE BRIDGE ENGINEER — DATE 10/29/2024



PLAN
NOT TO SCALE

SECTION
NOT TO SCALE

ELEVATION
NOT TO SCALE



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

WALL SEGMENT FABRICATION TOLERANCES

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
J	LOCATION OF BLOCKOUT FOR PILES OR VOIDS	$\pm\frac{1}{2}$"
K	MAXIMUM PLUMB VARIATION OVER HEIGHT OF CMP VOID	$\pm\frac{1}{2}$"

WALL SEGMENT ELEVATION ERECTION TOLERANCES

L	TOP ELEVATION FROM NOMINAL TOP ELEVATION	$\frac{1}{4}$"
M	MAXIMUM PLUMB VARIATION OVER HEIGHT OF PANEL	$\frac{1}{2}$"
N	PLUMB IN ANY 10 FEET OF PANEL HEIGHT	$\frac{1}{4}$"

GROUTED SPLICE COUPLER TOLERANCES

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	$\pm\frac{1}{4}$"
D	GAP BETWEEN DOWELS AND REINFORCING	CONSULT MANUFACTURER

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
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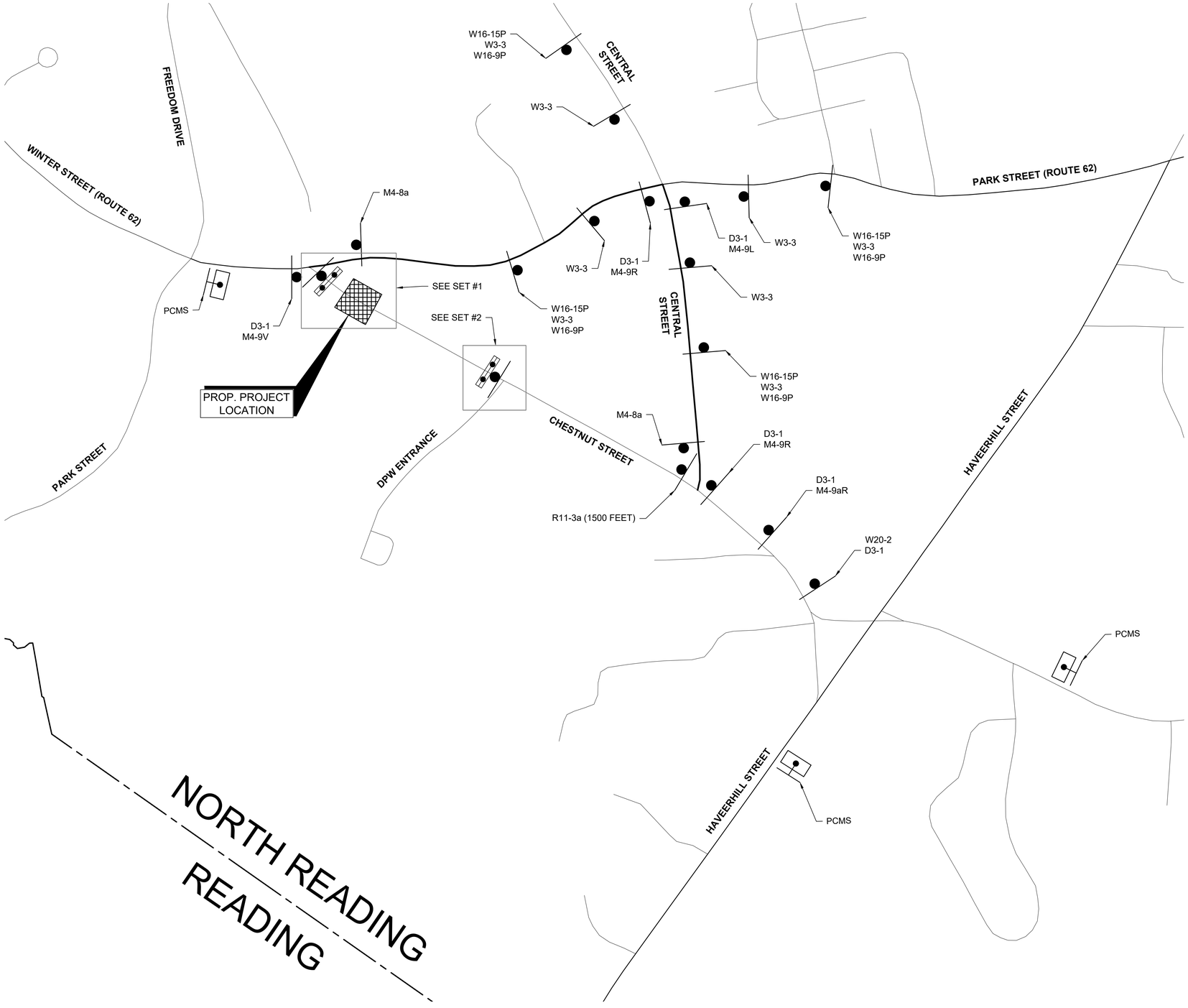
MASS. GEN. LAWS CH 85 S 35

STATE BRIDGE ENGINEER — DATE 10/29/2024

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	41
PROJECT FILE NO.		----	

TEMPORARY TRAFFIC CONTROL PLAN (1 OF 2)



DETOUR PLAN & SIGNAGE SCHEMATIC - CHESTNUT STREET
SCALE: 1" = 300'

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 LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (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. ALL THE PLASTIC DRUMS, BARRICADES, AND BARRIERS SHALL BE MOUNTED WITH SEQUENTIAL WARNING FLASHING LIGHTS.
6. ALL DRUMS SHALL BE SET AT 20 FEET O.C. MAXIMUM UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
7. 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).
8. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
9. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS AT THE DISCRETION OF THE ENGINEER.

PORTABLE CHANGEABLE MESSAGE SIGNS TEXT
(DIMENSIONS ARE APPROX.)

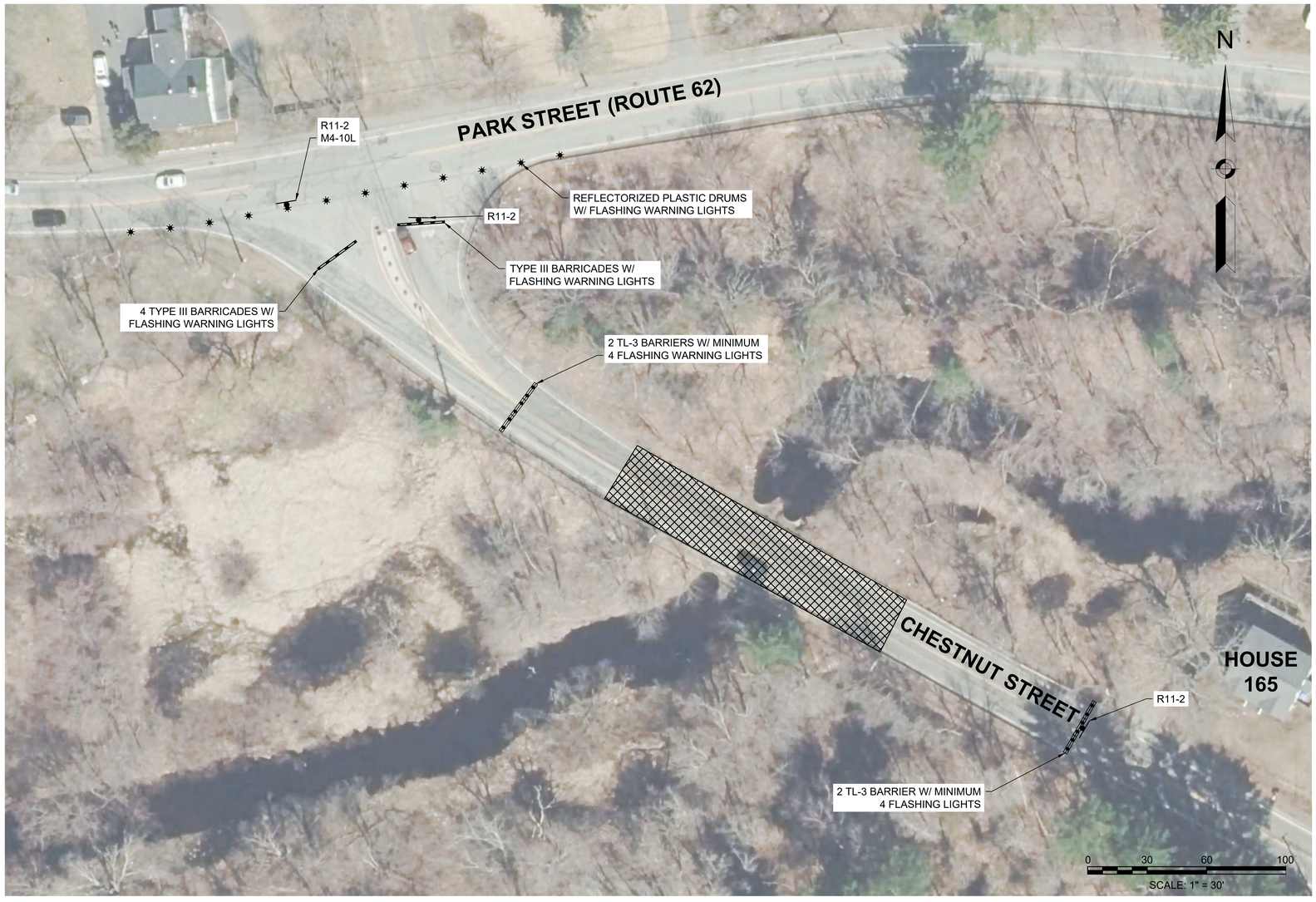
TEMPORARY TRAFFIC CONTROL LEGEND

- WORK ZONE
- SIGN
- CONSTRUCTION BARRIER W/ REFLECTORS OR WARNING LIGHTS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	41
PROJECT FILE NO.		----	

TEMPORARY TRAFFIC CONTROL PLAN (2 OF 2)



CHESTNUT STREET CLOSURE SET-UP #1

SCALE: 1"=30'

CHESTNUT STREET CLOSURE SET-UP #2

SCALE: 1"=20'

TEMPORARY TRAFFIC CONTROL LEGEND

- WORK ZONE
- SIGN
- REFLECTORIZED DRUM W/ SEQUENTIAL FLASHING LIGHTS
- CONSTRUCTION BARRIER W/ REFLECTORS OR WARNING LIGHTS
- TYPE 3 BARRICADE

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	41
PROJECT FILE NO.	----		

TEMPORARY TRAFFIC CONTROL PLAN SIGN 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	ROAD CLOSED	(1)			4	WHITE	BLACK	BLACK	0 1 ON BARRIER 2 ON BARRICADE 1 ON DRUM	10.00	40.00
R11-3a(1500 FT)	60	30	ROAD CLOSED 1500 FT AHEAD LOCAL TRAFFIC ONLY				1	WHITE	BLACK	BLACK	1	12.50	12.50
R11-3SP	60	30	ROAD CLOSED OPEN FOR I95 CHESTNUT ST ONLY				1	WHITE	BLACK	BLACK	0 ON BARRICADE	12.50	12.50
W3-3	36	36					8	FL. ORANGE	BLACK	BLACK	8	9.00	72.00
W16-9p	24	12	AHEAD				4	FL. ORANGE	BLACK	BLACK	0 W/ W3-3	2.00	8.00
W16-15p	24	12	NEW				4	FL. ORANGE	BLACK	BLACK	0 W/ W3-3	2.00	8.00
W20-2	36	36	DETOUR AHEAD				1	FL. ORANGE	BLACK	BLACK	0 W/ D3-1	9.00	9.00
M4-8a	24	18	END DETOUR				2	FL. ORANGE	BLACK	BLACK	2	3.00	6.00
M4-9L	30	24	DETOUR				1	WHITE	BLACK	BLACK	0 W/ D3-1	5.00	5.00
M4-9aR	30	30	DETOUR				1	WHITE	BLACK	BLACK	0 W/ D3-1	6.25	6.25
M4-9R	30	24	DETOUR				2	WHITE	BLACK	BLACK	0 W/ D3-1	5.00	10.00
M4-9V	30	24	DETOUR				1	WHITE	BLACK	BLACK	0 W/ D3-1	5.00	5.00
M4-10L	48	18	DETOUR				1	FL. ORANGE	BLACK	BLACK	0 ON DRUM	6.00	6.00
D3-1	50	12	Chestnut St	6D/4D	2.75 3.25	NA	6	FL. ORANGE	BLACK	BLACK	6	4.17	25.00

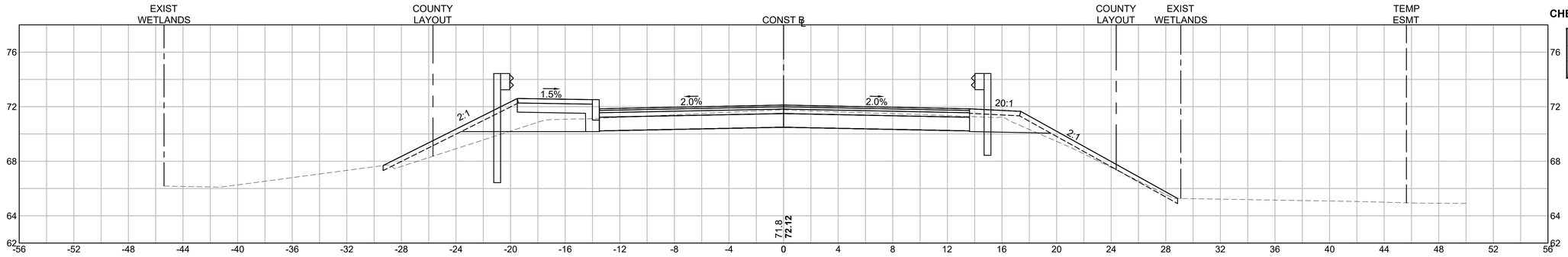
NOTES:

(1.) CONTRACTOR TO FURNISH SIGNS CONSISTENT WITH 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (OR LATEST EDITION). SEE MANUAL FOR TEXT AND LEGEND DIMENSIONS.

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	41
PROJECT FILE NO.	T1256.02		

CROSS SECTIONS - 1 OF 2



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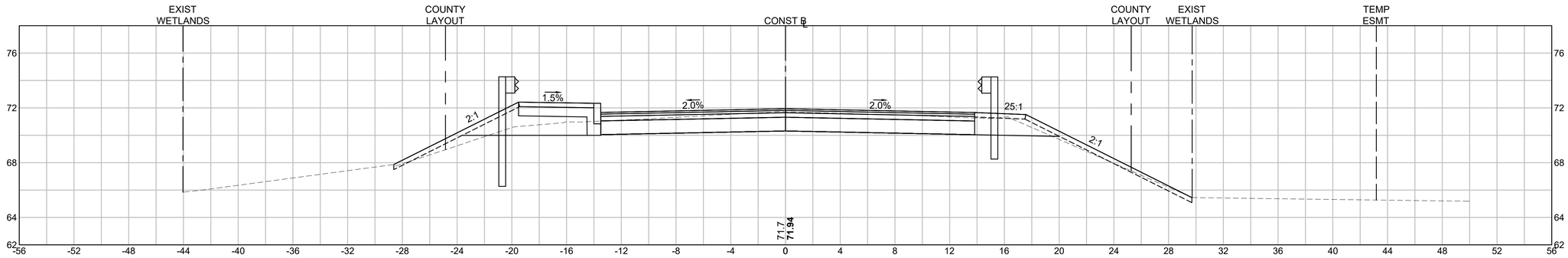

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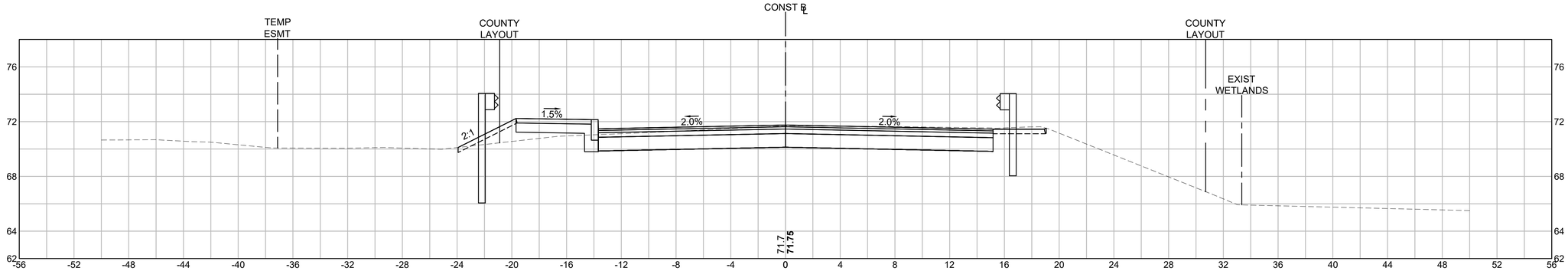

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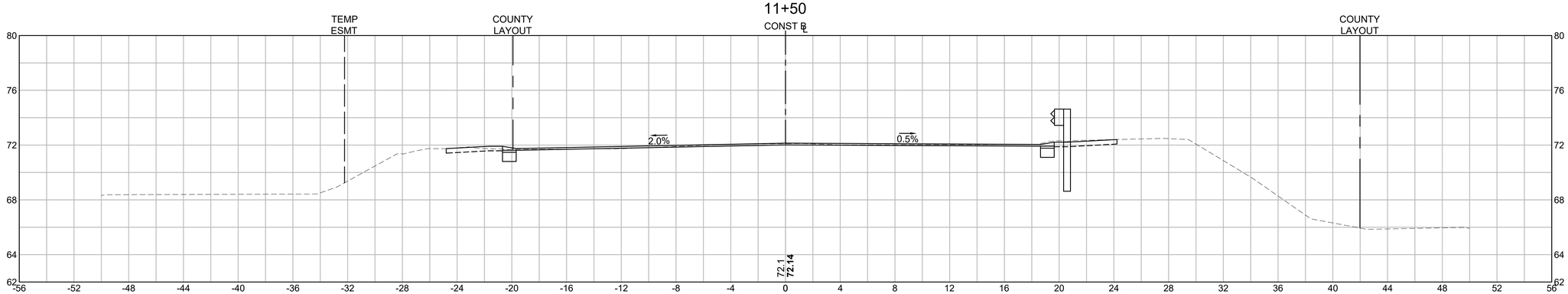


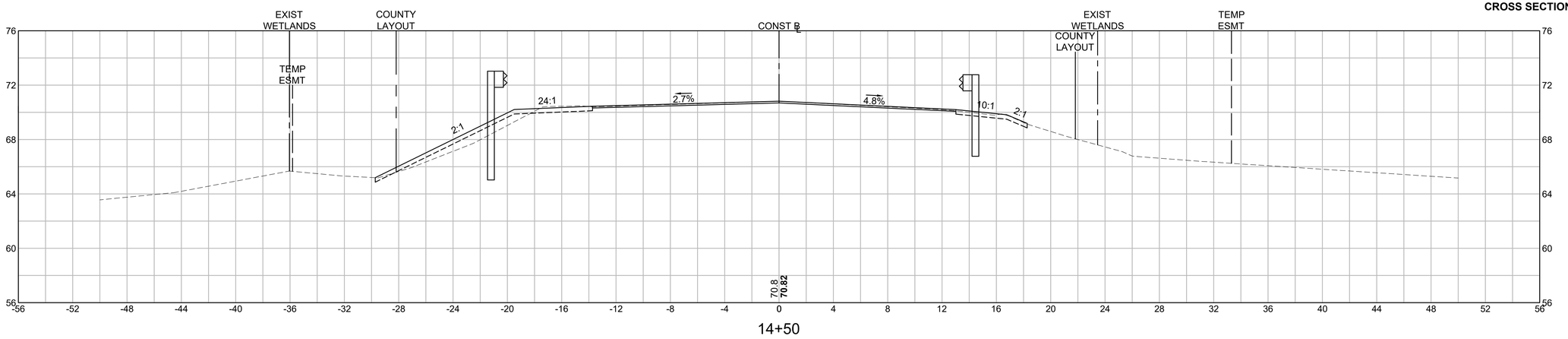
11+00

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

NORTH READING
CHESTNUT STREET OVER IPSWICH RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	41
PROJECT FILE NO.	T1256.02		

CROSS SECTIONS - 2 OF 2



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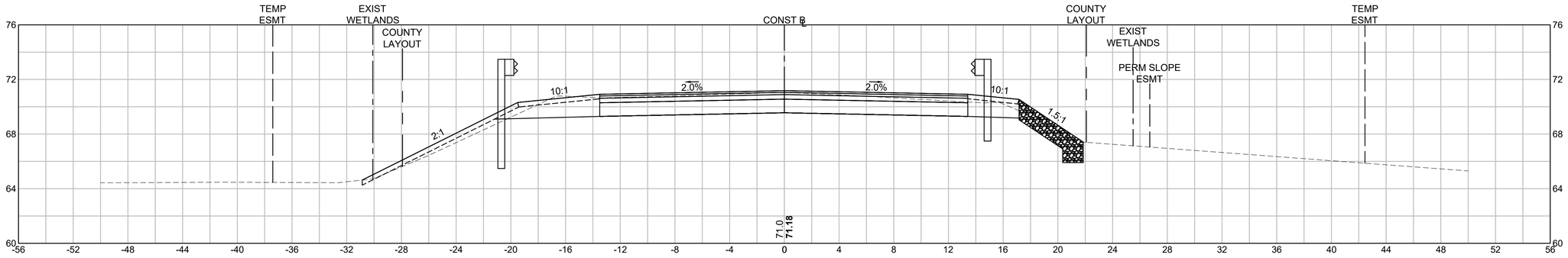

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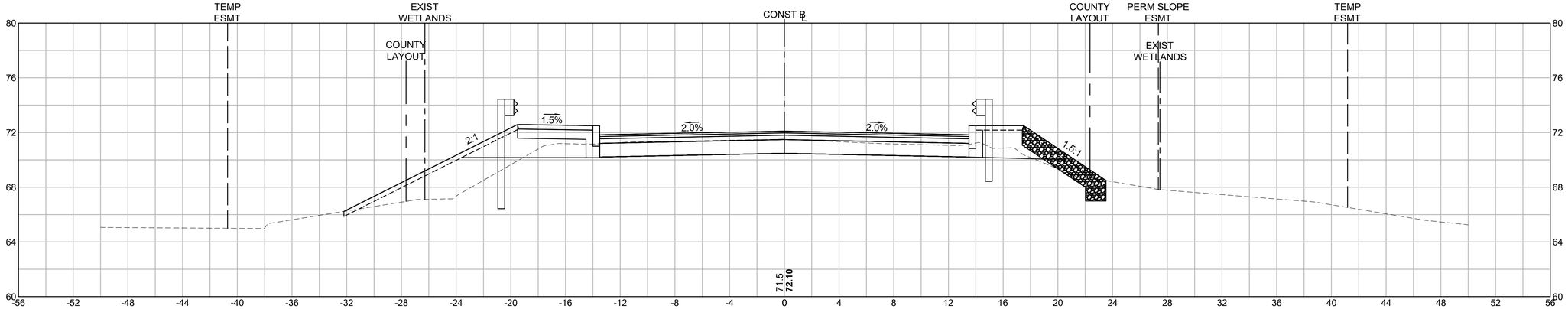

13+50

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

T1256.02_HD11(CROSS SECTIONS).DWG Plotted on 22-Oct-2024 1:28 PM