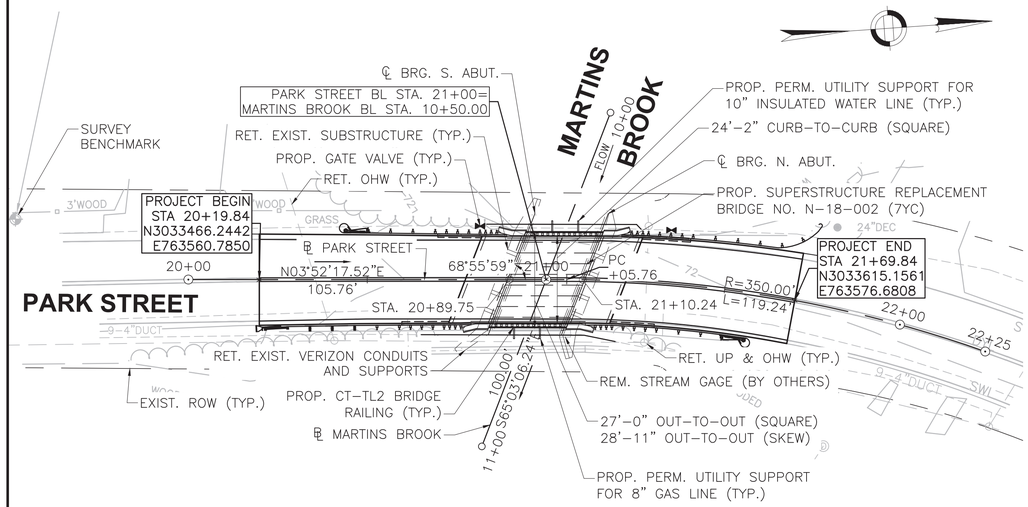
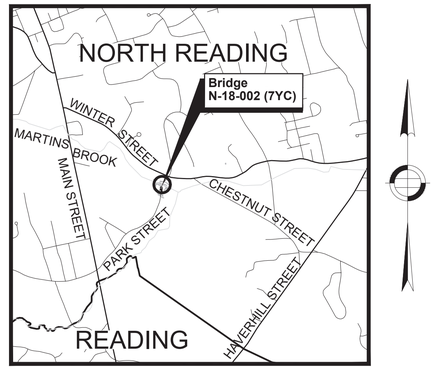
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 1 | 19 |
| PROJECT FILE NO. — — — — | | | |

**KEY PLAN & PROFILE**




KEY PLAN
SCALE: 1" = 20'

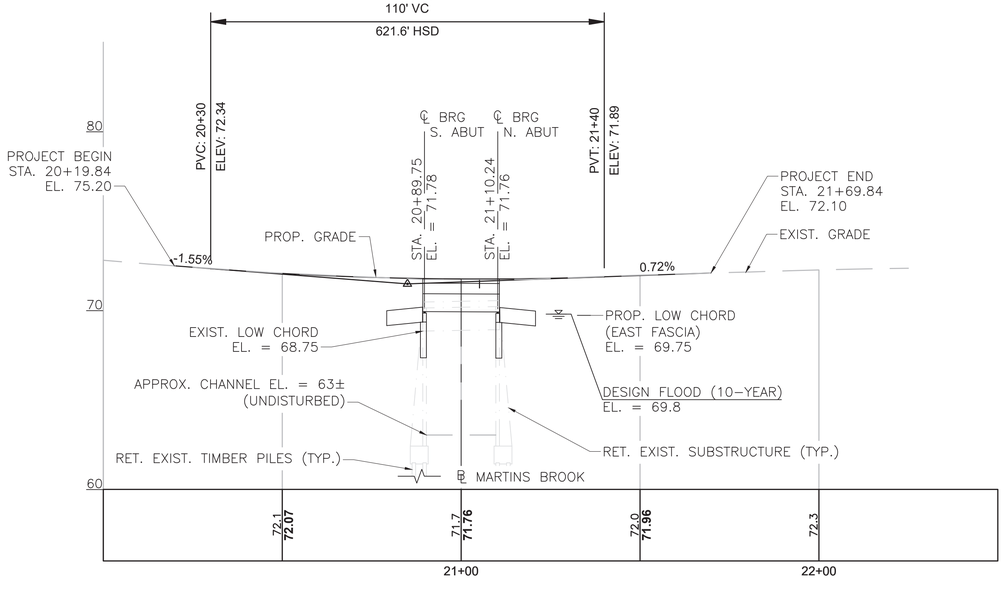



LOCUS
SCALE: 1" = 2000'

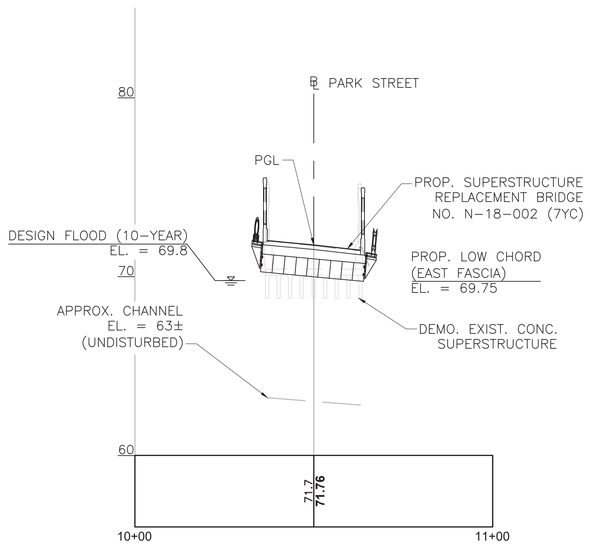
INDEX OF DRAWINGS



LOW POINT ELEV = 71.76
LOW POINT STA = 21+05.14
PVI STA = 20+85.00
PVI ELEV = 71.49
A.D. = 2.27%
K = 48.50
110' VC
621.6' HSD




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




MARTINS BROOK PROFILE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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

3/26/24
DISTRICT 4 BRIDGE ENGINEER — DATE

| MAR 25, 2024 | MGL CH 85 S35 REVIEW SUBMISSION |
|---|---|

COMMONWEALTH OF MASSACHUSETTS
ANDREW J. SPURR
CIVIL
No. 55540
REGISTERED PROFESSIONAL ENGINEER
3/25/24

TEC The Engineering Corp
282 Merrimack Street
Lawrence, MA 01843

SUPERSTRUCTURE REPLACEMENT
**NORTH READING**
PARK STREET
OVER MARTINS BROOK

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

SHEET 1 OF 19 SHEETS BRIDGE NO. N-18-002 (7YC)

T1313_PLAN & PROFILE.DWG Plotted on 10-Jun-2024 11:43 AM
03/25/2024

## GENERAL NOTES

DESIGN:

THE PROPOSED SUPERSTRUCTURE WAS DESIGNED IN ACCORDANCE WITH THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, FOR HL-93 LOADING.

SURVEY BENCH MARK:

HYDRANT X CUT BOLT OVER MAIN OUTLET (1.5' A.G.)
N: 3033399.3746
E: 763539.3053
ELEVATION = 74.80'

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

DATE:

TO BE PLACED ON THE INSIDE FACE OF THE SOUTHEAST AND NORTHWEST 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 DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

UNSUITABLE MATERIAL:

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

CONCRETE MIXES:

DECK, APPROACH SLAB, APPROACH SLAB SHELF, AND ABUTMENT CAP SHALL BE 4000 PSI, ¾ IN., 585 HP CEMENT CONCRETE

CT-TL2 BRIDGE RAIL AND TERMINUS SHALL BE 5000 PSI, ⅜ IN., 710 HP CEMENT CONCRETE

THE MINIMUM 28 DAY COMPRESSIVE STRENGTH FOR THE PRECAST CONCRETE DECK BEAMS SHALL BE 6500 PSI.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

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

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

ALL BARS SHALL BE EPOXY COATED.

MEMBRANE WATERPROOFING:

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

PRECAST BEAMS:

THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING ABUTMENT DIMENSIONS PRIOR TO ORDERING ANY PRECAST ELEMENTS. ALL DIMENSIONS PROVIDED ARE BASED ON EXISTING BRIDGE PLANS AND SURVEY INFORMATION. AS-BUILT DIMENSIONS MAY VARY SLIGHTLY WHICH MAY IMPACT REQUIRED DIMENSIONS FOR PRECAST BEAM FABRICATIONS.

THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF LIFT HOOKS FOR ALL PRECAST ELEMENTS. UNDER NO CIRCUMSTANCE WILL THE REBAR ELEMENTS SHOWN ON THE PLANS BE USED TO LIFT THE PRECAST ELEMENTS. FOR ADDITIONAL REQUIREMENTS, REFER TO THE "PRECAST CONCRETE ELEMENTS" PORTION OF THE ITEM 995. IN THE SPECIAL PROVISIONS.

TRAFFIC CONTROL:

ROADWAY SHALL BE CLOSED FOR THE DURATION OF CONSTRUCTION PER THE TEMPORARY TRAFFIC CONTROL PLAN (TTCP). MASSDOT ACCESS PERMIT FOR ROUTE 28 SHALL BE STRICTLY ADHERED TO AT ALL TIMES DURING CONSTRUCTION.

UTILITIES:

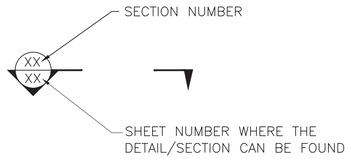
EXISTING 10" WATER MAIN SHALL BE TEMPORARILY RELOCATED TO A TEMPORARY SUPPORT STRUCTURE (CONTRACTOR DESIGNED) TO MAINTAIN SERVICE DURING CONSTRUCTION. THE PERMANENT LINE WILL BE HUNG ON STEEL SUPPORTS ON THE WEST SIDE OF THE BRIDGE. CONTRACTOR SHALL COORDINATE WITH NORTH READING WATER DEPARTMENT FOR TEMPORARY AND PERMANENT RELOCATIONS.

EXISTING 8" GAS MAIN OWNED BY NATIONAL GRID SHALL BE CUT AND CAP DURING CONSTRUCTION. THE PERMANENT LINE WILL BE HUNG ON STEEL SUPPORTS ON THE EAST SIDE OF THE BRIDGE. CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID FOR TEMPORARY CUT AND CAP AND PERMANENT RELOCATION.

EXISTING OVERHEAD WIRES AND EXISTING TELEPHONE CONDUITS (SUPPORTED ON ADJACENT STEEL STRUCTURE) ARE TO REMAIN IN PLACE AND ACTIVE THROUGHOUT THE DURATION OF CONSTRUCTION. CONTRACTOR SHALL USE CAUTION WHILE WORKING AROUND THE EXISTING UTILITIES SCHEDULED TO REMAIN. CONTRACTOR SHALL UTILIZE LOW HEIGHT HOISTING EQUIPMENT TO SET THE PRECAST ELEMENTS IN ORDER TO STAY UNDERNEATH THE EXISTING OVERHEAD WIRES. THIS SHALL BE DESIGNED AND EXPLAINED IN THE CONTRACTOR'S ERECTION PROCEDURE.

EXISTING USGS STREAM GAUGE WILL BE REMOVED BY OTHERS PRIOR TO CONSTRUCTION.

SECTION MARK:




| ESTIMATED QUANTITIES (NOT GUARANTEED) | | | |
|---|---|---|---|
| ITEM | 114.1 | DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. N-18-002 | 1 LS |
| ITEM | 127.1 | REINFORCED CONCRETE EXCAVATION | 10 CY |
| ITEM | 151.2 | GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES | 10 CY |
| ITEM | 450.60 | SUPERPAVE BRIDGE SURFACE COURSE (SSC-B – 9.5) | 40 TON |
| ITEM | 450.70 | SUPERPAVE BRIDGE PROTECTIVE COURSE (SPC-B – 9.5) | 5 TON |
| ITEM | 995.1 | BRIDGE SUPERSTRUCTURE, BRIDGE NO. N-18-002 (7YC) | 1 LS |

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 2 | 19 |
| PROJECT FILE NO. – – – – | | | |

**GENERAL NOTES**

| TRAFFIC DATA | ROADWAY OVER | ROADWAY UNDER |
|---|---|---|
| DESIGN YEAR | 2043 | |
| AVERAGE DAILY TRAFFIC – PRESENT | 11200 | |
| AVERAGE DAILY TRAFFIC – DESIGN YEAR | 13660 | |
| DESIGN HOURLY VOLUME | 1110 | |
| DIRECTIONAL DISTRIBUTION | 62.2 | |
| TRUCK PERCENTAGE – AVERAGE DAY | 4.0 | |
| TRUCK PERCENTAGE – PEAK HOUR | 4.8 | |
| DESIGN SPEED | 35 MPH | |
| DIRECTIONAL DESIGN HOURLY VOLUME | 690 | |

| HYDRAULIC DESIGN DATA | |
|---|---|
| DRAINAGE AREA (SQ. MILES) | 13.2 |
| DESIGN FLOOD DISCHARGE (C.F.S.) | 464 |
| DESIGN FLOOD FREQUENCY (YEARS) | 10 |
| DESIGN FLOOD VELOCITY (F.P.S.) | N/A |
| DESIGN FLOOD ELEVATION (FEET, NAVD) | 69.8 |
| **BASE (100-YEAR) FLOOD DATA** | |
| BASE FLOOD DISCHARGE (C.F.S.) | 868 |
| BASE FLOOD ELEVATION (FEET, NAVD) | 73.3 |
| **DESIGN AND CHECK SCOUR DATA** | |
| DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS) | N/A |
| DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET) | N/A |
| DESIGN FLOOD PIER SCOUR DEPTH (FEET) | N/A |
| CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS) | N/A |
| CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET) | N/A |
| 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 |

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

DISTRICT 4 BRIDGE ENGINEER — DATE: 3/26/24

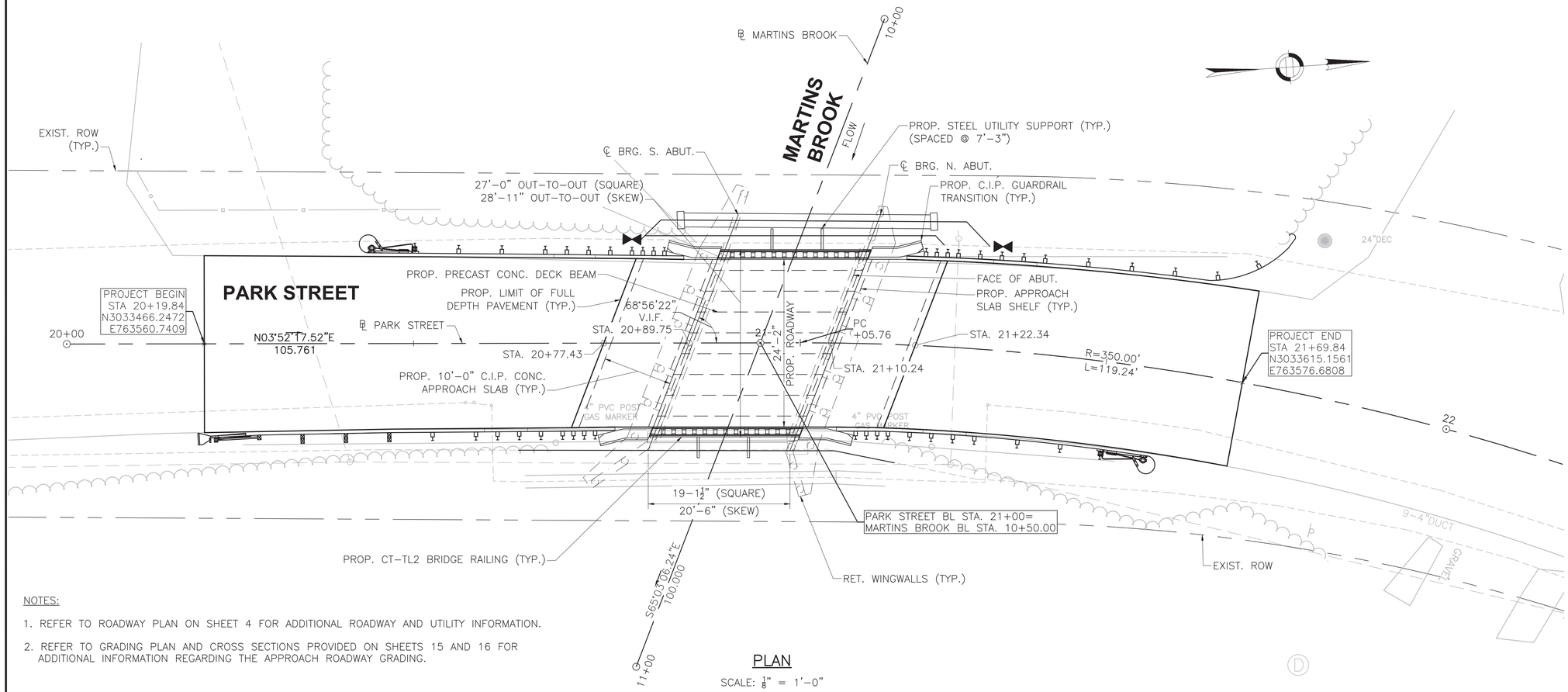


T1313_GENERAL NOTES.DWG Plotted on 10-Jun-2024 11:43 AM
03/25/2024
Xxxxxx Structural Submittal (S#)

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 3 | 19 |
| PROJECT FILE NO. | | | |

**BRIDGE PLAN & ELEVATION**

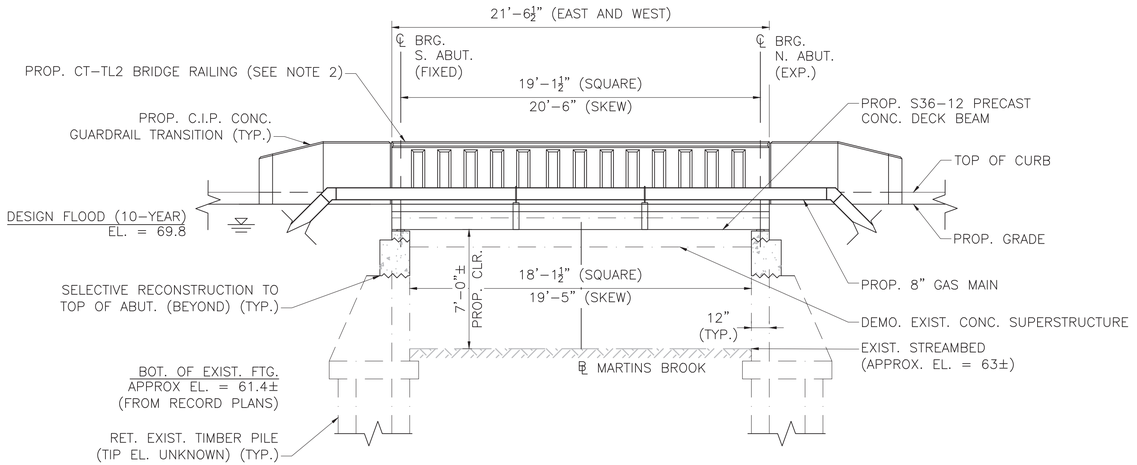



NOTES:

1. REFER TO ROADWAY PLAN ON SHEET 4 FOR ADDITIONAL ROADWAY AND UTILITY INFORMATION.
2. REFER TO GRADING PLAN AND CROSS SECTIONS PROVIDED ON SHEETS 15 AND 16 FOR ADDITIONAL INFORMATION REGARDING THE APPROACH ROADWAY GRADING.

## PLAN

SCALE: ⅛" = 1'–0"




NOTES:

1. FINAL STAGE SHOWN.
2. REFER TO SHEET 11–12 FOR ADDITIONAL CT–TL2 DETAILS, INCLUDING RAILING LAYOUT.

## EAST ELEVATION

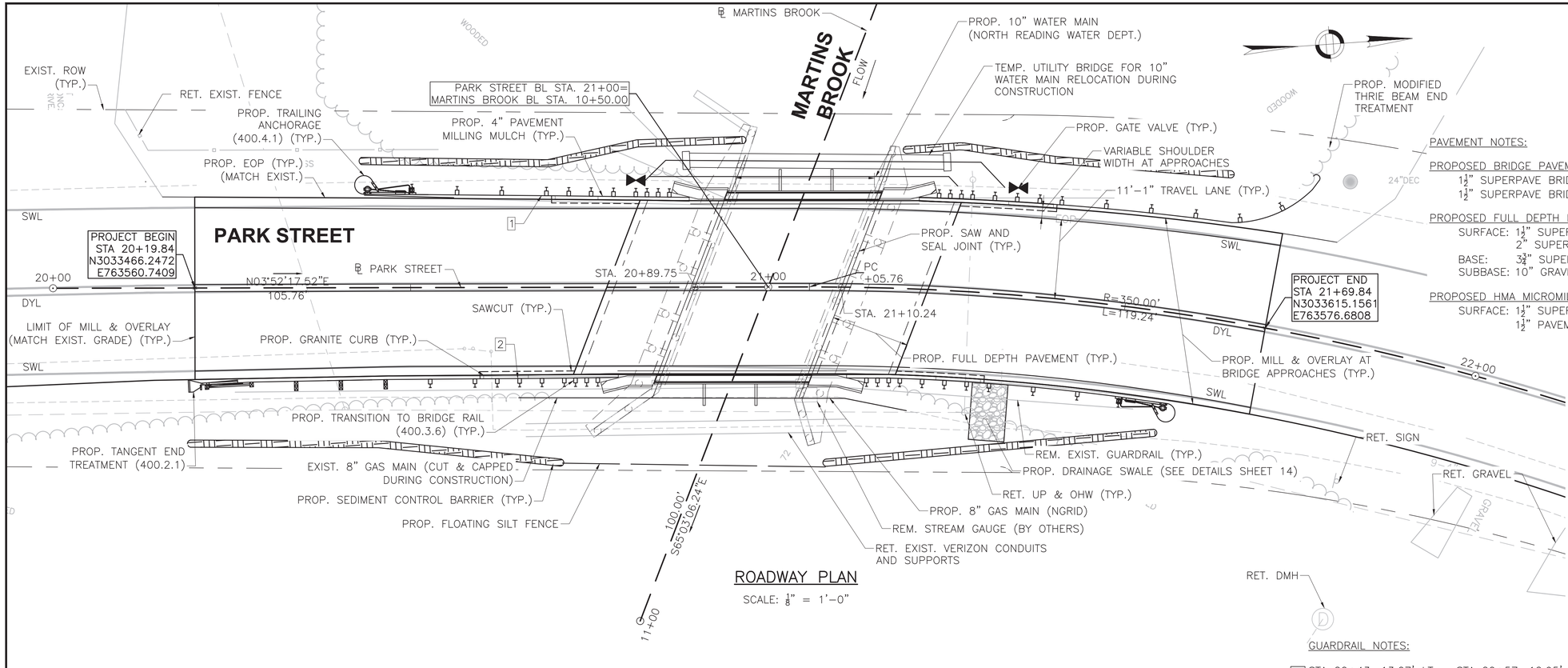
SCALE: ¼" = 1'–0"

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

DISTRICT 4 BRIDGE ENGINEER — DATE: 3/26/24



T1313_PLAN & ELEVATION.DWG Plotted on 10-Jun-2024 11:43 AM
03/25/2024
Xxxxxx Structural Submittal (S#)




## ROADWAY PLAN

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

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 4 | 19 |
| PROJECT FILE NO. – – – – | | | |

**ROADWAY PLAN & PROFILE**

PAVEMENT NOTES:

PROPOSED BRIDGE PAVEMENT
1½" SUPERPAVE BRIDGE SURFACE COURSE 9.5 (SSC-B-9.5) OVER
1½" SUPERPAVE BRIDGE PROTECTIVE COURSE 9.5 (SPC-B-9.5)

PROPOSED FULL DEPTH PAVEMENT
SURFACE: 1½" SUPERPAVE BRIDGE SURFACE COURSE 9.5 (SSC-B-9.5) OVER
2" SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC-12.5)
BASE: 3¾" SUPERPAVE INTERMEDIATE COURSE – 19.0 (SIC-19.0)
SUBBASE: 10" GRAVEL BORROW, TYPE B

PROPOSED HMA MICROMILLING AND OVERLAY
SURFACE: 1½" SUPERPAVE BRIDGE SURFACE COURSE 9.5 (SSC-B-9.5) OVER
1½" PAVEMENT MICROMILLING

LIMITS OF PAVEMENT:

PROPOSED BRIDGE PAVEMENT
STA 20+89 TO STA 21+11

PROPOSED FULL DEPTH PAVEMENT
STA 20+77 TO STA 20+89
STA 21+11 TO STA 21+22

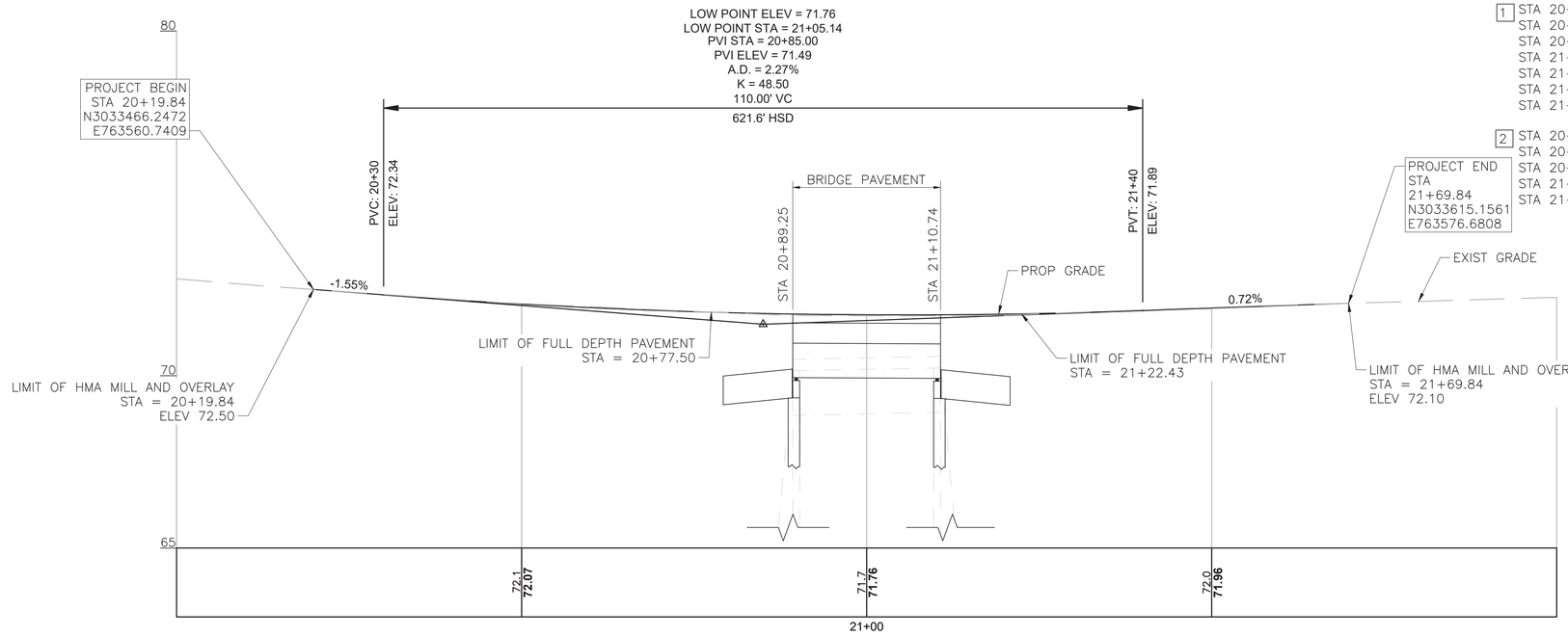
PROPOSED HMA MICROMILLING AND OVERLAY
STA 20+20 TO STA 20+77
STA 21+22 TO STA 21+70

GUARDRAIL NOTES:

1 STA 20+43, 13.07' LT – STA 20+57, 12.95' LT, CONST TRAILING ANCHORAGE END TREATMENT
STA 20+57, 12.95' LT – STA 20+94, 12.04' LT, CONST TRANSITION TO BRIDGE RAIL
STA 20+94, 12.04' LT – STA 21+15, 12.21' LT, CONST CT-TL2 BRIDGE RAIL
STA 21+15, 12.21' LT – STA 21+31, 12.95' LT, CONST TRANSITION TO BRIDGE RAIL (MODIFIED)
STA 21+31, 12.95' LT – STA 21+63, 25.91' LT, CONST THRIE BEAM PANELS
STA 21+63, 13.70' LT – STA 21+74, 25.91' LT, CONST THRIE BEAM PANEL (CURVED; L=12.5', R=16')
STA 21+74, 25.91' LT, CONST THRIE BEAM TERMINAL END UNIT

2 STA 20+19, 12.90' RT – STA 20+46, 12.85' RT, CONST 25' TANGENT END TREATMENT
STA 20+46, 12.85' RT – STA 20+79, 12.10' RT, CONST TRANSITION TO BRIDGE RAIL
STA 20+79, 12.10' RT – STA 21+11, 12.12' RT, CONST CT-TL2 BRIDGE RAIL
STA 21+11, 12.12' RT – STA 21+45, 12.63' RT, CONST TRANSITION TO BRIDGE RAIL
STA 21+45, 12.63' RT – STA 21+58, 12.67' RT, CONST TRAILING ANCHORAGE END TREATMENT

VERTICAL GRANITE CURB:
STA 20+60, 12.26' RT – STA 20+66, 12.22' RT (TRANSITION)
STA 20+66, 12.22' RT– STA 20+79, 12.10' RT
STA 20+70, 12.30' LT – STA 20+76, 12.30' LT (TRANSITION)
STA 20+76, 12.30' LT – STA 20+89, 12.05' LT
STA 21+11, 12.12' RT – STA 21+24, 12.08' RT
STA 21+24, 12.08' RT – STA 21+30, 12.09' RT (TRANSITION)
STA 21+21 12.32' LT – STA 21+33, 12.49' LT
STA 21+33, 12.49' LT – STA 21+39 12.60' LT (TRANSITION)




## PARK STREET – PROFILE

HORIZONTAL SCALE: 1" = 10'-0"
VERTICAL SCALE: 1" = 2'-0"

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

DISTRICT 4 BRIDGE ENGINEER — DATE: 3/26/24

SHEET 4 OF 19 SHEETS BRIDGE NO. N-18-002 (7YC)

T1313_HIGHWAY PLAN.DWG Plotted on 10-Jun-2024 11:43 AM

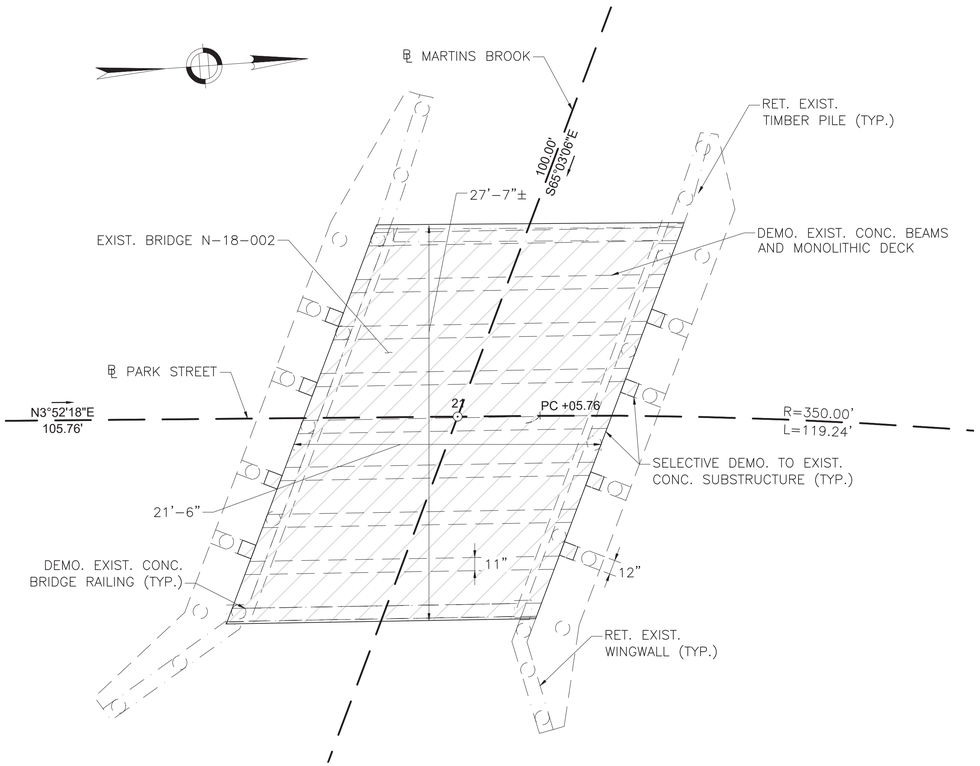
03/25/2024

Xxxxxx Structural Submittal (S#)

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

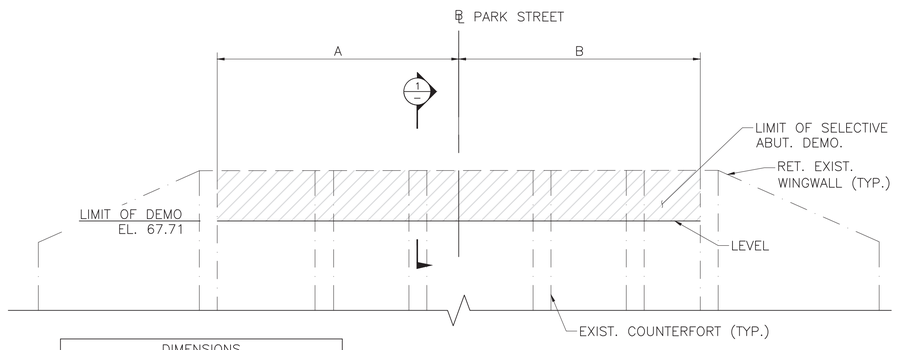
| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 5 | 19 |
| PROJECT FILE NO. — — — — | | | |

**DEMOLITION DETAILS**




DEMOLITION PLAN

SCALE: NOT TO SCALE

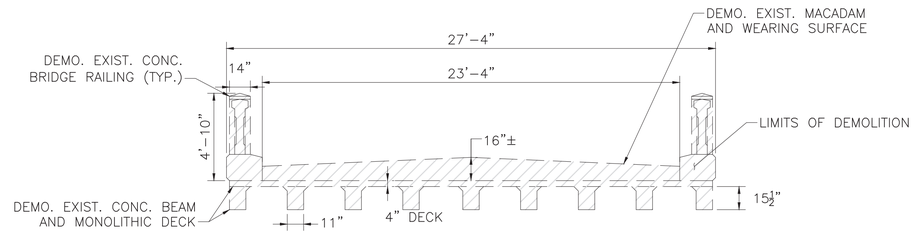



| DIMENSIONS | | |
|---|---|---|
| A | S. ABUT. (SKEW) | 15'-4½" |
| | S. ABUT. (SQUARE) | 14'-4" |
| | N. ABUT. (SKEW) | 14'-5" |
| | N. ABUT. (SQUARE) | 13'-6" |
| B | S. ABUT. (SKEW) | 14'-5" |
| | S. ABUT. (SQUARE) | 13'-6" |
| | N. ABUT. (SKEW) | 15'-1¾" |
| | N. ABUT. (SQUARE) | 14'-1¾" |

NOTE:
DETAIL INTENDED TO ILLUSTRATE ABUTMENT DEMOLITION LIMITS. SUPERSTRUCTURE NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION RELATED TO SUPERSTRUCTURE DEMOLITION LIMITS.

ABUTMENT DEMOLITION LIMITS – ELEVATION

SCALE: NTS




NOTE:
EXISTING UTILITIES NOT SHOWN FOR CLARITY. WATER MAIN WILL BE TEMPORARILY RELOCATED AND GAS MAIN WILL BE PERMANENTLY RELOCATED PRIOR TO DEMOLITION.

EXISTING BRIDGE SECTION

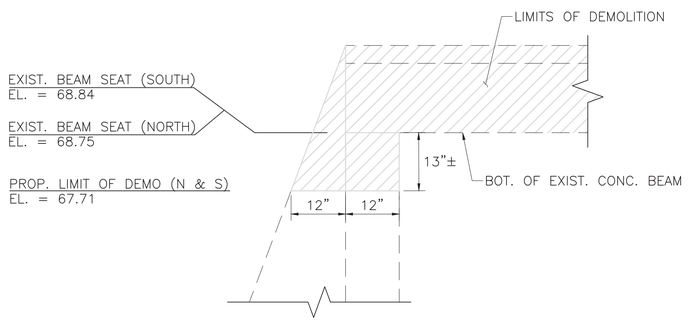
SCALE: NOT TO SCALE

DEMOLITION NOTES:

1. EXISTING BRIDGE GEOMETRY SHOWN THROUGHOUT THIS SHEET IS BASED ON EXISTING BRIDGE PLANS. CONTRACTOR SHALL VERIFY AS-BUILT BRIDGE DIMENSIONS PRIOR TO DEMOLITION.
2. BRIDGE DEMOLITION SHALL NOT BEGIN UNTIL EXISTING UTILITIES ARE RELOCATED TO THEIR TEMPORARY OR PERMANENT LOCATION, THE DETOUR IS IN PLACE, AND DETOUR SIGNAGE IS APPROVED BY ENGINEER.
3. PRIOR TO START OF BRIDGE DEMOLITION, A DEMOLITION AND TEMPORARY SHIELDING PROCEDURE STAMPED BY A REGISTERED ENGINEER IN THE COMMONWEALTH OF MASSACHUSETTS SHALL BE APPROVED BY THE ENGINEER.
4. TEMPORARY SHIELDING SHALL BE INSTALLED BENEATH THE BRIDGE PRIOR TO BEGINNING ANY BRIDGE DEMOLITION.

LEGEND:

LIMITS OF DEMOLITION




SECTION 1

SCALE: NOT TO SCALE

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

DISTRICT 4 BRIDGE ENGINEER — DATE 3/26/24

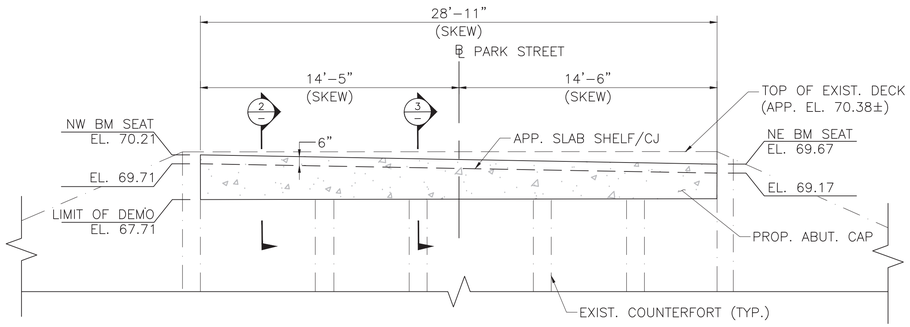


T1313_DEMOLITION PLAN.DWG Plotted on 10-Jun-2024 11:44 AM
03/25/2024
Xxxxxx Structural Submittal (S#)

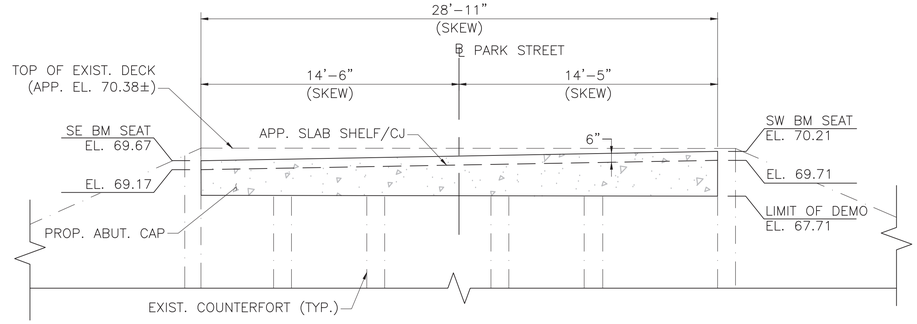
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 6 | 19 |
| PROJECT FILE NO. | | | |

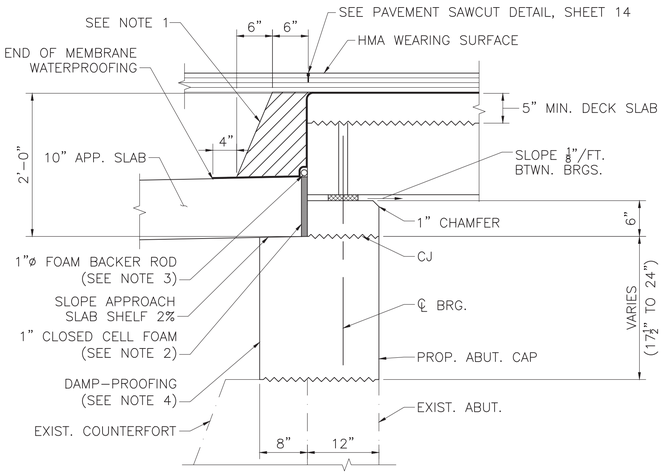
**SUBSTRUCTURE DETAILS**




## NORTH ABUTMENT ELEVATION
SCALE: $\frac{1}{4}$" = 1'–0"



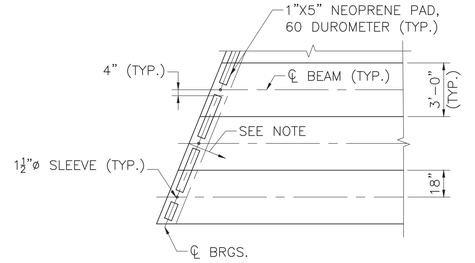

## SOUTH ABUTMENT ELEVATION
SCALE: $\frac{1}{4}$" = 1'–0"




NOTES:

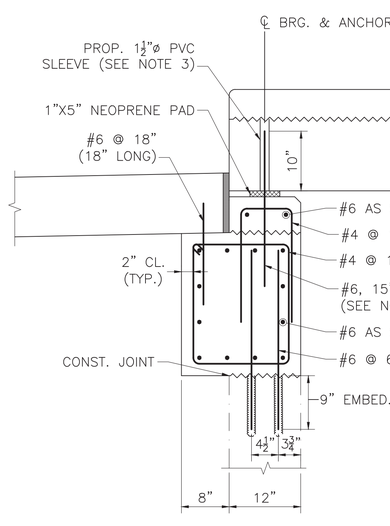
1. PROTECTIVE COURSE TO BE SUPERPAVE BRIDGE PROTECTIVE COURSE (SPC–B–12.5), PLACED IN 2" LAYERS AND COMPACTED WITH A MECHANICAL HAND–GUIDED TAMPER WITHIN 12 HOURS AFTER PLACING MEMBRANE WATERPROOFING.
2. ATTACH CLOSED CELL FOAM TO BACK OF ABUTMENT CAP AND DECK BEAM WITH ADHESIVE.
3. SPRAY MEMBRANE WATERPROOFING OVER CLOSED CELL FOAM BACKER ROD.
4. APPLY DAMP PROOFING TO THE ENTIRE BACKSIDE OF THE NEW ABUTMENT CAP (INCLUDING 6" BELOW DEMO LINE) AND ANY HORIZONTAL FACE OF THE DEMOLISHED COUNTERFORTS.
5. REFER TO SECTIONS 2 AND 3 ON THIS SHEET FOR ABUTMENT CAP REINFORCING.

## DETAIL AT ABUTMENT CAP
SCALE: 1" = 1'–0"

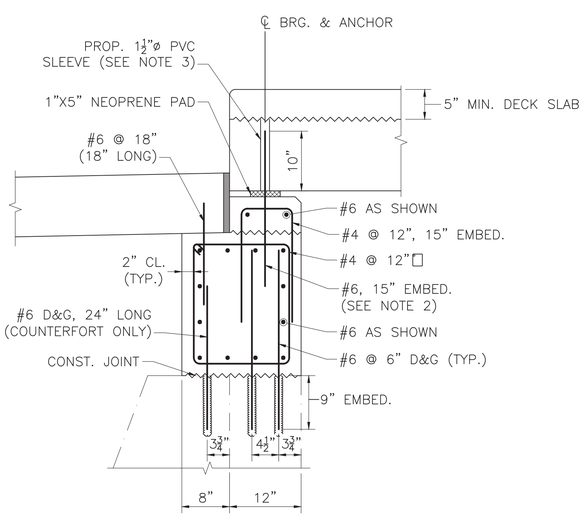



NOTE:
PROVIDE $\frac{1}{8}$"/FT. SLOPE BETWEEN BEARINGS.

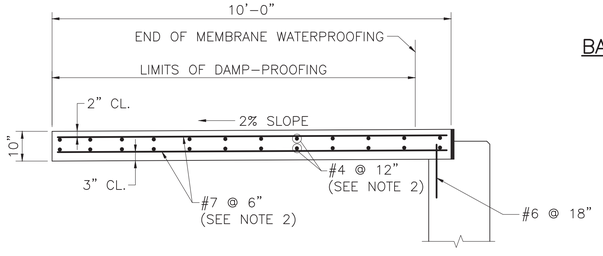
## LAYOUT OF BEARINGS
SCALE: $\frac{1}{4}$" = 1'–0"




## SECTION 2 – ABUTMENT CAP DETAIL
SCALE: 1" = 1'–0"



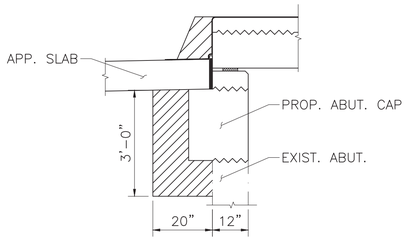

## SECTION 3 – ABUTMENT CAP DETAIL AT COUNTERFORT
SCALE: 1" = 1'–0"




NOTES:

1. APPROACH SLAB TO BE 4000 PSI, ¾ IN, 585 HP CEMENT CONCRETE.
2. PLACE LONGITUDINAL REINFORCEMENT PARALLEL TO CENTERLINE OF CONSTRUCTION. PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT.

## APPROACH SLAB DETAILS
SCALE: ½" = 1'–0"




## LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES
SCALE: ½" = 1'–0"

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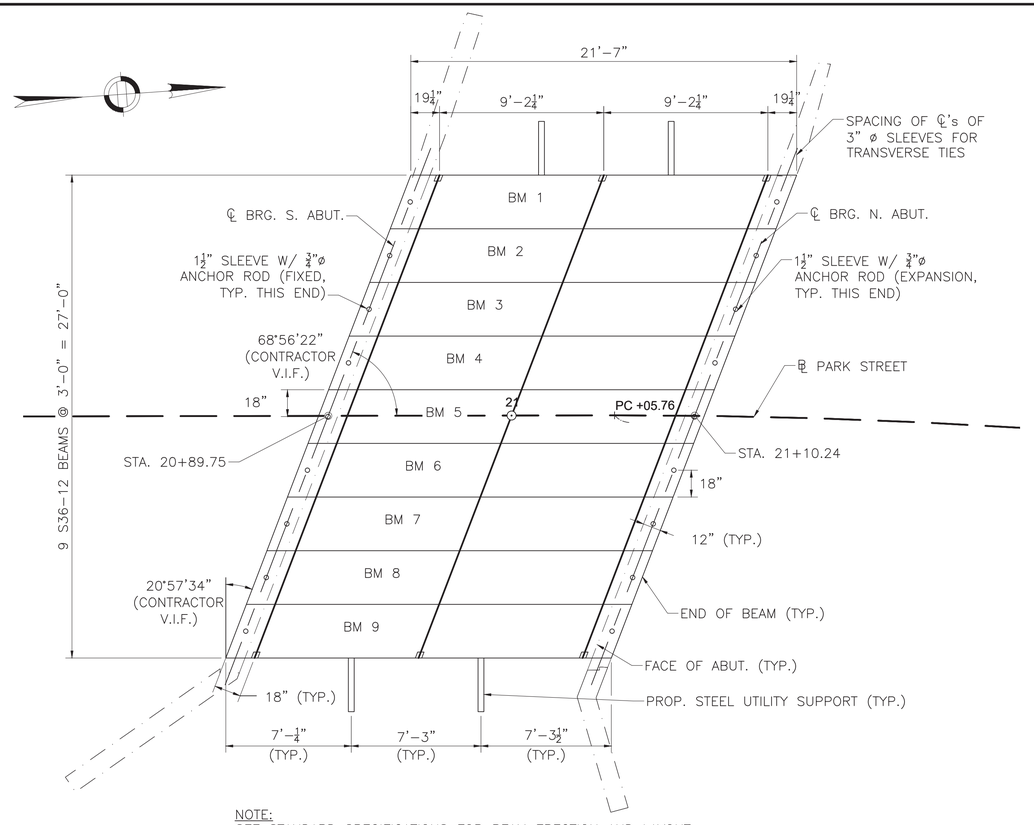
NOTES:

1. ALL REBAR SCHEDULED TO BE DRILLED AND GROUTED SHALL BE GROUTED WITH HILTI HIT–RE 500 V3 EPOXY, OR APPROVED EQUIVALENT.
2. BARS SHALL BE CAST INTO ABUTMENT CAP. SEE FRAMING PLAN (SHEET 7) FOR BAR LAYOUT & SPACING.
3. FILL SLEEVE WITH GROUT AT FIXED END (SOUTH) AND WITH EXPANDED POLYSTYRENE FILLER AT EXPANSION END (NORTH).



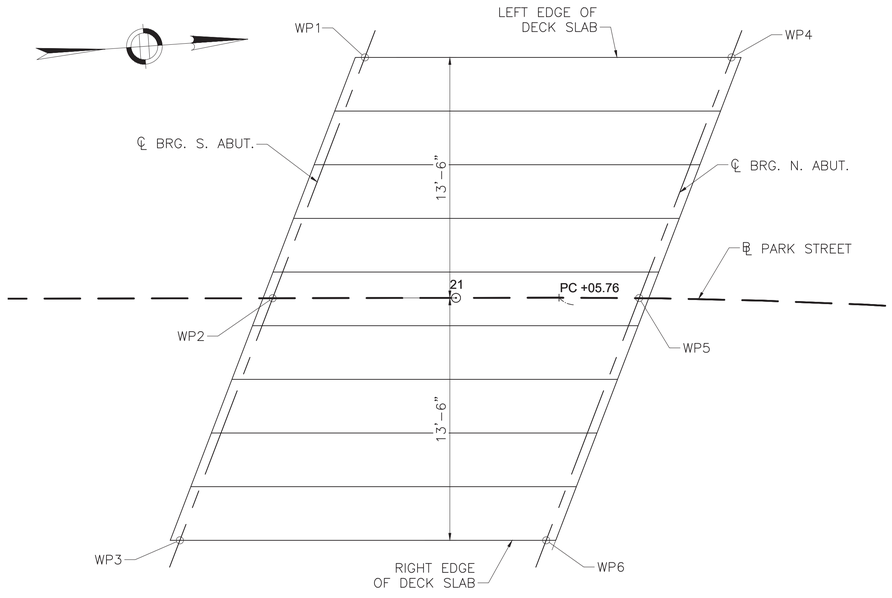
T1313_SUBSTRUCTURE DETAILS.DWG Plotted on 10-Jun-2024 11:44 AM
03/25/2024
Xxxxxx Structural Submittal (S#)




NOTE:
SEE STANDARD SPECIFICATIONS FOR BEAM ERECTION AND LAYOUT.

## FRAMING PLAN

SCALE: ¼" = 1'–0"




## DECK PLAN

SCALE: ¼" = 1'–0"

| | INT. BEAM (BM. 2–8) | DIRECTION | EXT. BEAM (BM. 1 & 9) | DIRECTION |
|---|---|---|---|---|
| AT TRANSFER | ¼" | UP | ¼" | UP |
| AT ERECTION | ½" | UP | ½" | UP |
| AFTER CONSTRUCTION | 0" | UP | 0" | UP |

NOTES:

1. TRANSFER DEFLECTIONS INCLUDE BEAM SELF WEIGHT AND BEAM CAMBER.
2. ERECTION DEFLECTIONS INCLUDE SELF WEIGHT, DECK, SUPERIMPOSED DEAD LOADS, AND BEAM CAMBER WITH PCI ERECTION MULTIPLIERS APPLIED TO THE BEAM SELF WEIGHT AND CAMBER.
3. AFTER CONSTRUCTION DEFLECTIONS INCLUDE SELF WEIGHT, DECK, SUPERIMPOSED DEAD LOADS, AND BEAM CAMBER WITH PCI FINAL MULTIPLIERS APPLIED TO ALL LOADS.

## ESTIMATED INITIAL DEFLECTIONS AT MIDSPAN

| LOCATION | LEFT EDGE OF DECK SLAB | PROFILE GRADE LINE | RIGHT EDGE OF DECK SLAB |
|---|---|---|---|
| ℄ OF BRGS. @ S. ABUT. | 6" | 6⅛" | 5½" |
| MIDSPAN | 5⅞" | 5⅞" | 5⅛" |
| ℄ OF BRGS. @ N. ABUT. | 6" | 5⅞" | 5" |

NOTES:

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

## THEORETICAL DECK SLAB THICKNESS TABLE

| LOCATION | BEAM SEAT EL. | TOP OF CONC. DECK EL. | STATION | OFFSET |
|---|---|---|---|---|
| WP1 | 70.21 | 71.79 | 20+94.95 | LT 13.50 |
| WP2 | 69.94 | 71.53 | 20+89.75 | 0.00 |
| WP3 | 69.67 | 71.22 | 20+84.55 | RT 13.50 |
| WP4* | 70.21 | 71.79 | 21+15.09 | LT 13.63 |
| WP5* | 69.94 | 71.51 | 21+10.24 | 0.00 |
| WP6* | 69.67 | 71.17 | 21+05.04 | RT 13.50 |

NOTE (*):
CONTRACTOR TO NOTE PRESENCE OF PC ON BRIDGE.

## BEAM SEAT ELEVATIONS

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 7 | 19 |
| PROJECT FILE NO. | | | |

**FRAMING PLAN**

## CONSTRUCTION SEQUENCE NOTES:

1. AFTER ALL BEAMS HAVE BEEN ERECTED, TENSION EACH TRANSVERSE TIE TO 5 KIPS.
2. FILL ALL KEYWAYS AND ANCHOR SLEEVES AT SOUTH ABUTMENT WITH MORTAR (M4.04.0). IF THE KEYWAYS AND ANCHOR SLEEVES 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 4000 PSI, ¾ IN, 585 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.

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T1313_FRAMING PLAN.DWG Plotted on 10-Jun-2024 11:44 AM
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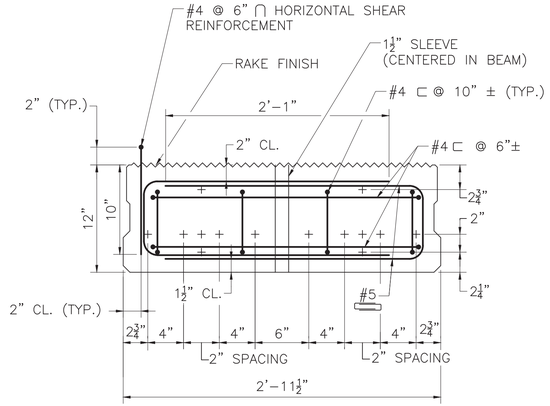
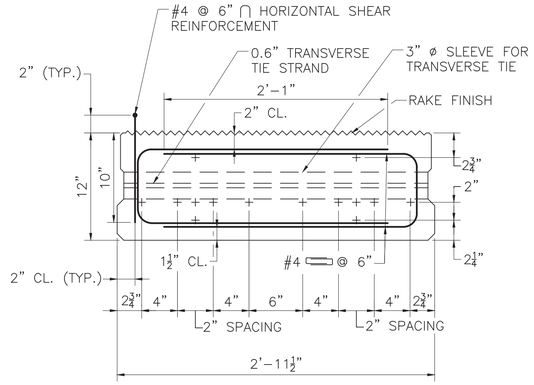



NOTE:
END OF BEAM SECTIONS SHOWN AT THE CENTERLINE OF BEARING. SEE BELOW DETAIL FOR TRANSVERSE TIE LOCATIONS AT BEAM ENDS.

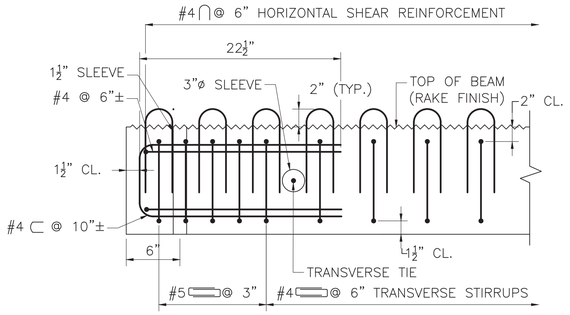
## END OF BEAM SECTION

SCALE: 1½" = 1'-0"




## MIDSPAN SECTION

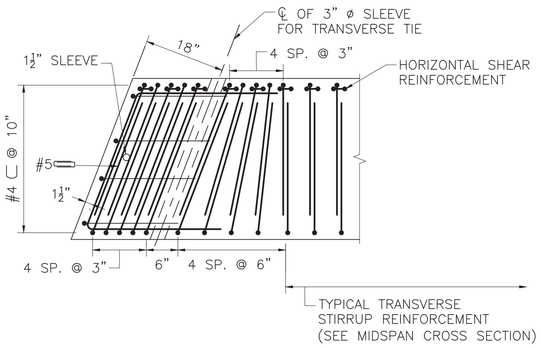
SCALE: 1½" = 1'-0"




NOTE:
THE STRANDS ARE NOT SHOWN FOR CLARITY.

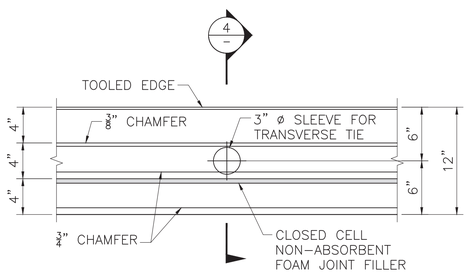
## LONGITUDINAL SECTION

SCALE: 1½" = 1'-0"



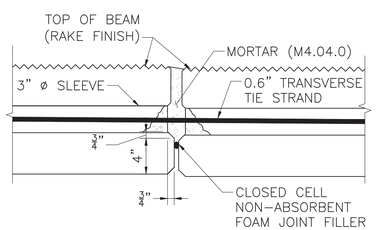

## END OF BEAM PLAN

SCALE: ¾" = 1'-0"



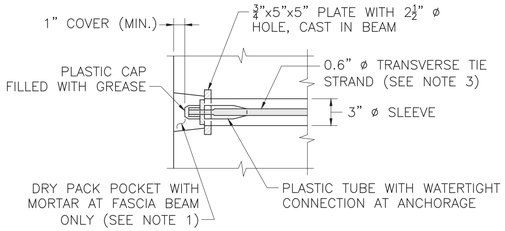

## TYPICAL BEAM ELEVATION AT TRANSVERSE TIE LOCATIONS

SCALE: 1½" = 1'-0"




## SECTION 4

SCALE: 1½" = 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: 1½" = 1'-0"

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 8 | 19 |
| PROJECT FILE NO. | | | |

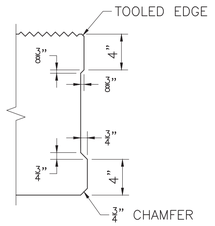
**BEAM DETAILS**

## BEAM SECTION NOTES:

1. + DENOTES STRAIGHT STRANDS.
2. SEE END OF BEAM PLAN FOR STIRRUP SPACING.
3. MAINTAIN ALL CLEARANCES AS SHOWN ON THE PLANS.
4. OMIT SHEAR KEYS FROM FASCIA SIDES OF EXTERIOR BEAMS (BEAMS 1 AND 9).
5. SEE UTILITY ANCHOR NOTES ON SHEET 9.
6. SEE SECTION THROUGH SAFETY CURB DETAIL ON SHEET 12 FOR ADDITIONAL REBAR TO BE CAST INTO BEAMS 1 & 9.

## 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 SHALL BE 270 KSI.
3. THE INITIAL TENSION PER 0.6" ø STRAND SHALL BE 44 KIPS.
4. THE TOP STRANDS SHALL BE PRETENSIONED TO 2 KIPS EACH.
5. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 6500 PSI.
6. 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.
7. THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
8. 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.




## SHEAR KEY DETAIL

SCALE: 1½" = 1'-0"

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DISTRICT 4 BRIDGE ENGINEER — DATE



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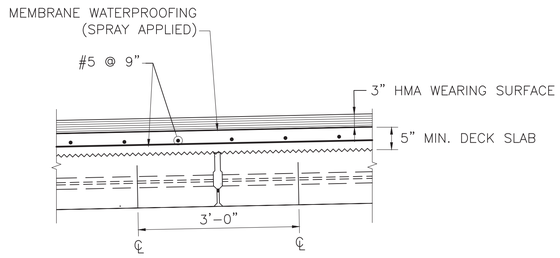
03/25/2024
Xxxxxx Structural Submittal (S#)

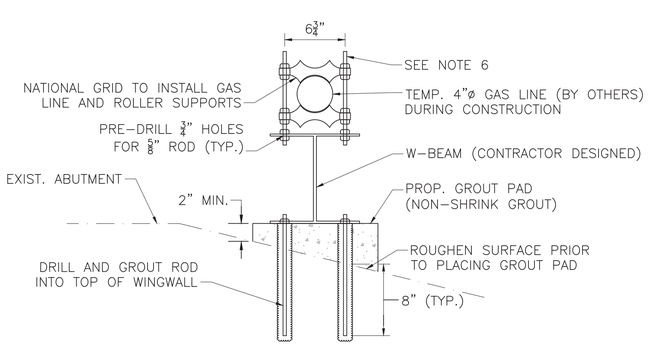



NOTES:

1. ROADWAY DECK SLAB SHALL BE 4000 PSI, ¾ IN, 585 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 EPOXY 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"

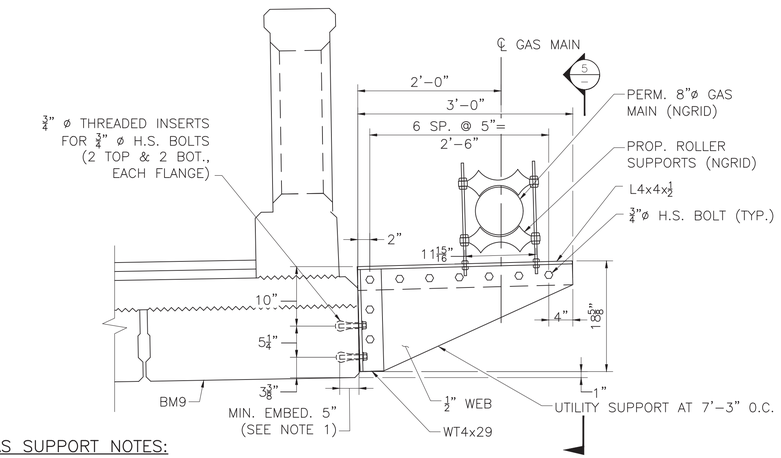



NOTES:

1. THIS DETAIL IS CONCEPTUAL ONLY, ALL TEMPORARY BRIDGE ELEMENTS SHALL BE CONTRACTOR DESIGNED. THIS DETAIL IS PROVIDED FOR CONTINGENCY MEASURES ONLY, AS THE GAS MAIN IS SCHEDULED FOR A CUT AND CAP CURING CONSTRUCTION FOLLOWED BY A PERMANENT RELOCATION. SEE SPECIAL PROVISIONS ITEM 992.321 FOR MORE INFORMATION ON CONTINGENCY MEASURES FOR TEMPORARILY SUPPORTING THE GAS MAIN.
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.
3. NATIONAL GRID GAS WILL PROVIDE AND INSTALL THE TEMPORARY GAS PIPE. NATIONAL GRID WILL PROVIDE THE ROLLER ASSEMBLIES.
4. THE ASSUMED LOADING OF THE STEEL GAS PIPE AND ROLLER SUPPORTS SHALL BE CONSIDERED TO BE 14 PLF. AT A MINIMUM, THE SUPERSTRUCTURE AND SUBSTRUCTURE SHALL BE DESIGNED TO SUPPORT THESE SUPERIMPOSED LOADS.
5. UTILITY RELOCATIONS SHALL OCCUR PRIOR TO DEMOLITION OF THE SUPERSTRUCTURE.
6. ONCE UTILITIES ARE MOVED TO PERMANENT LOCATIONS, THE TEMPORARY SUPPORTS SHALL BE REMOVED AND ANCHOR RODS SHALL BE CUT.

## CONTINGENCY TEMPORARY GAS SUPPORT SCHEMATIC

SCALE: N.T.S.

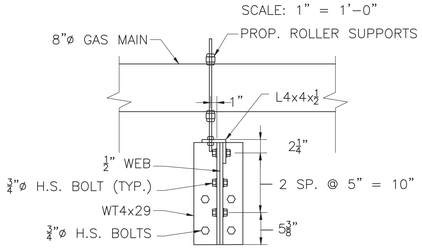



GAS SUPPORT NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING LOCATIONS OF THREADED INSERTS IN PRECAST ELEMENTS PRIOR TO FABRICATION.
2. STRUCTURAL STEEL IN UTILITY SUPPORTS SHALL CONFORM TO AASHTO M270, GRADE 36. ALL STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 AND M232.
3. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL STEEL FOR UTILITY SUPPORTS, AS DETAILED ABOVE.
4. THE ¾"ø THREADED INSERTED FOR ¾"ø BOLTS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR AND SHALL PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE Of 6.0 KIPS AND A MINIMUM NOMINAL SHEAR RESISTANCE OF 6.0 KIPS IN 3000 PSI CONCRETE.

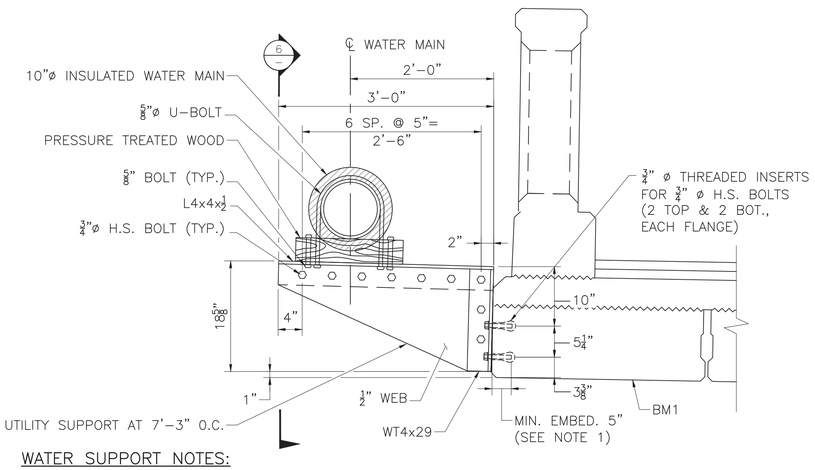
## PERMANENT GAS SUPPORT DETAIL

SCALE: 1" = 1'–0"




## SECTION 5

SCALE: 1" = 1'–0"

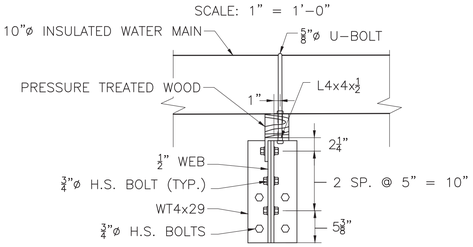



WATER SUPPORT NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING LOCATIONS OF THREADED INSERTS IN PRECAST ELEMENTS PRIOR TO FABRICATION.
2. STRUCTURAL STEEL IN UTILITY SUPPORTS SHALL CONFORM TO AASHTO M270, GRADE 36. ALL STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 AND M232.
3. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL STEEL FOR UTILITY SUPPORTS, AS DETAILED ABOVE.
4. THE ¾"ø THREADED INSERTED FOR ¾"ø BOLTS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR AND SHALL PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE Of 6.0 KIPS AND A MINIMUM NOMINAL SHEAR RESISTANCE OF 6.0 KIPS IN 3000 PSI CONCRETE.

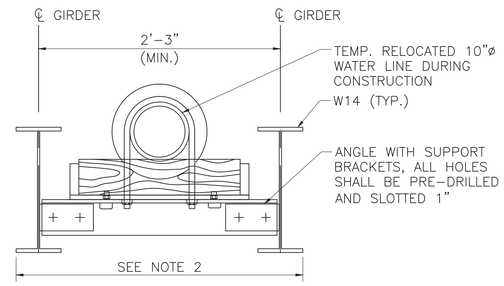
## PERMANENT WATER SUPPORT DETAIL

SCALE: 1" = 1'–0"




## SECTION 6

SCALE: 1" = 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 WATER LINE IS PROTECTED FROM FLOATING DEBRIS AND DEBRIS DURING DEMOLITION.
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.
3. THE ASSUMED UNFACTORED LOADING OF THE TEMPORARY WATER PIPE SHALL BE CONSIDERED TO BE 85 PLF. AT A MINIMUM, THE TEMPORARY SUPERSTRUCTURE AND SUBSTRUCTURE SHALL BE DESIGNED TO SUPPORT THESE SUPERIMPOSED LOADS.
4. TEMPORARY UTILITY RELOCATIONS SHALL OCCUR PRIOR TO DEMOLITION OF THE SUPERSTRUCTURE.

## TEMPORARY UTILITY BRIDGE SCHEMATIC

SCALE: N.T.S.

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 9 | 19 |
| PROJECT FILE NO. | | | |

**DECK & UTILITY SUPPORT DETAILS**

**COMMONWEALTH OF MASSACHUSETTS**
**MassDOT, Highway Division**
APPROVED UNDER PROVISIONS OF
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3/26/24

DISTRICT 4 BRIDGE ENGINEER — DATE



T1313_DECK DETAILS.DWG Plotted on 10-Jun-2024 11:45 AM
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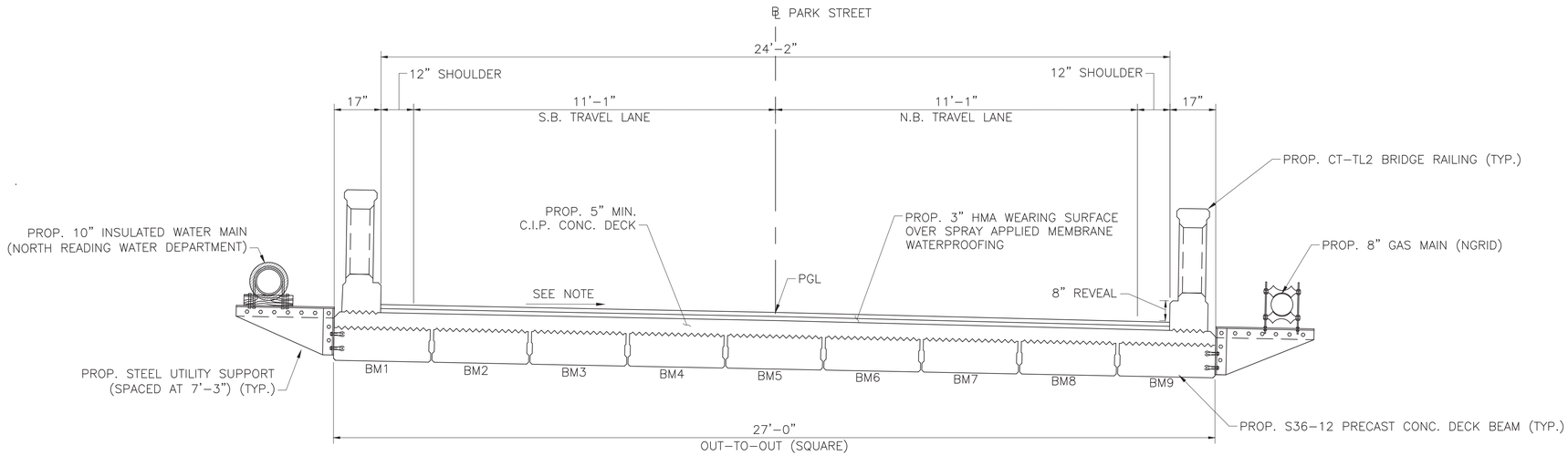
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 10 | 19 |
| PROJECT FILE NO. | — — — — | | |

## TRANSVERSE BRIDGE SECTION

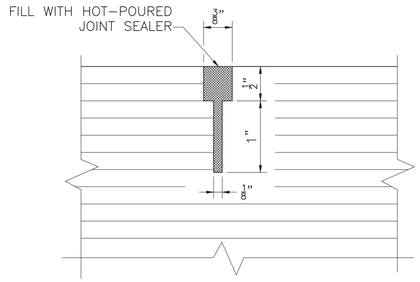



NOTES:

1. TRANSVERSE SECTION IS TAKEN PERPENDICULAR TO THE PARK STREET BASELINE AT STATION 21+00.00, LOOKING UPSTATION.
2. SEE CROSS SECTIONS (SHEET 16) FOR VARIABLE SLOPE.
3. SEE SHEET 7 FOR THEORETICAL DECK SLAB THICKNESS TABLE.

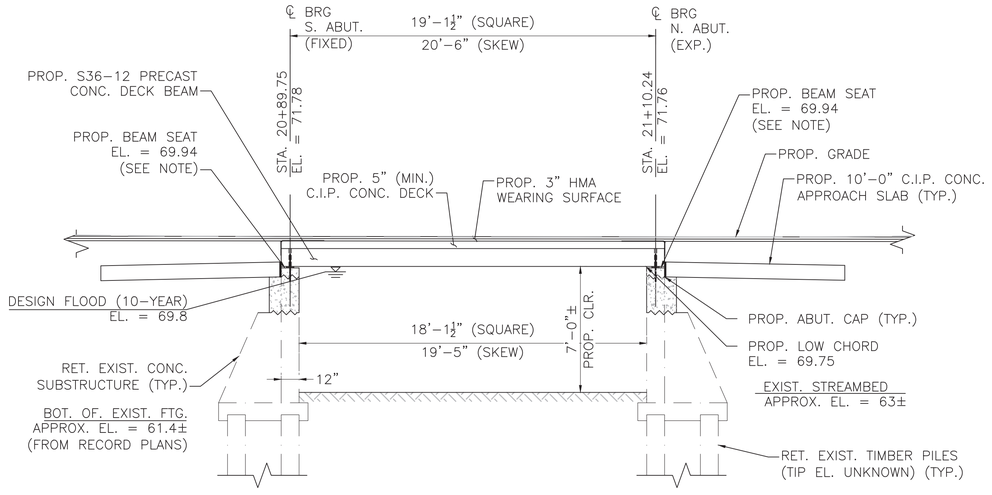
## TRANSVERSE SECTION

SCALE: $\frac{1}{2}$" = 1'–0"




## PAVEMENT SAWCUT DETAIL

N.T.S.

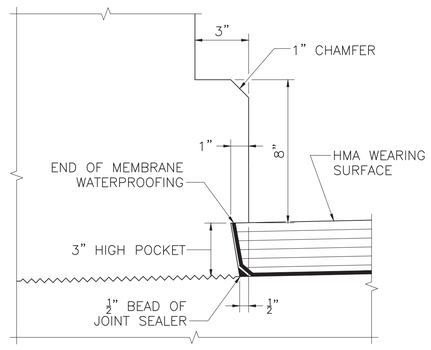



## LONGITUDINAL SECTION

SCALE: $\frac{1}{4}$" = 1'–0"

NOTE:

PROPOSED BEAM SEAT ELEVATIONS WILL VARY TO MATCH THE CROSS SLOPE OF THE PROPOSED BEAMS AND ROADWAY. ELEVATIONS SHOWN IN THIS SECTION REFLECT THE BEAM SEAT ELEVATIONS ALONG THE ℄ PARK STREET.




NOTE:

TURN MEMBRANE UP INTO 3" HIGH POCKET.

## FACE OF SAFETY CURB DETAILS

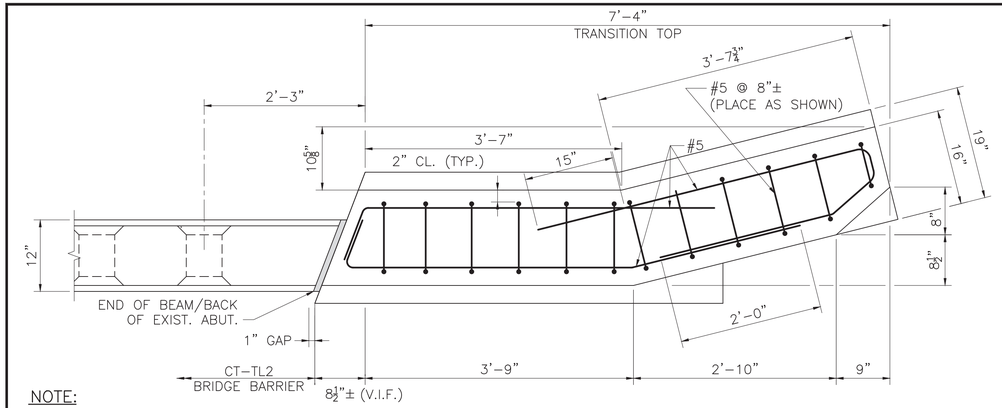
SCALE: 3" = 1'–0"

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

DISTRICT 4 BRIDGE ENGINEER — DATE: 3/26/24



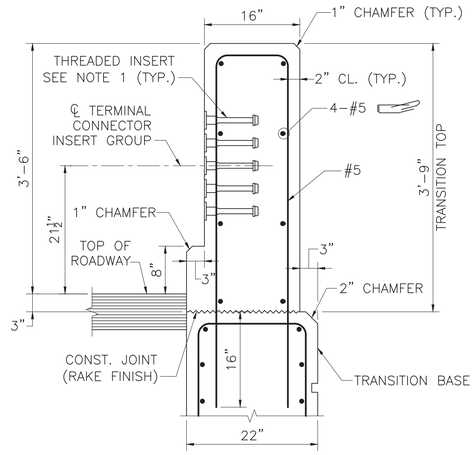
T1313_MISC DETAILS.DWG Plotted on 10-Jun-2024 11:45 AM
03/25/2024
Xxxxxx Structural Submittal (S#)



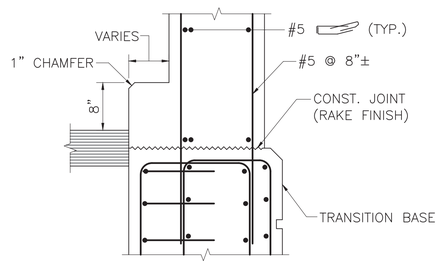

NOTE:

ENDPOST GEOMETRY IN SECTION 6 MATCHES THE NORTHEAST AND SOUTHWEST CORNERS. REINFORCING IN SOUTHEAST AND NORTHWEST ENDPOSTS IS SIMILAR. REFER TO CORRESPONDING "PLAN AT SAFETY CURB" DETAIL FOR ADDITIONAL GEOMETRY INFORMATION.

## SECTION 7
SCALE: 1" = 1'–0"




## SECTION 8 AT SAFETY CURB
SCALE: 1" = 1'–0"

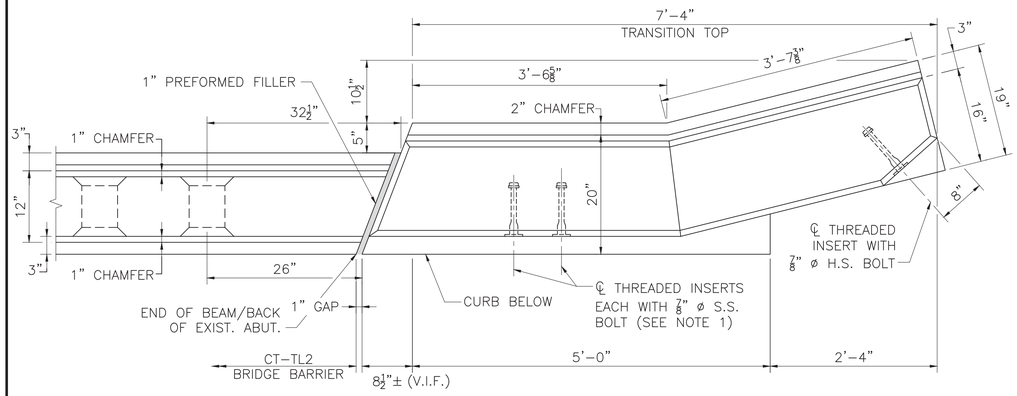



## SECTION 9 AT SAFETY CURB
SCALE: 1" = 1'–0"

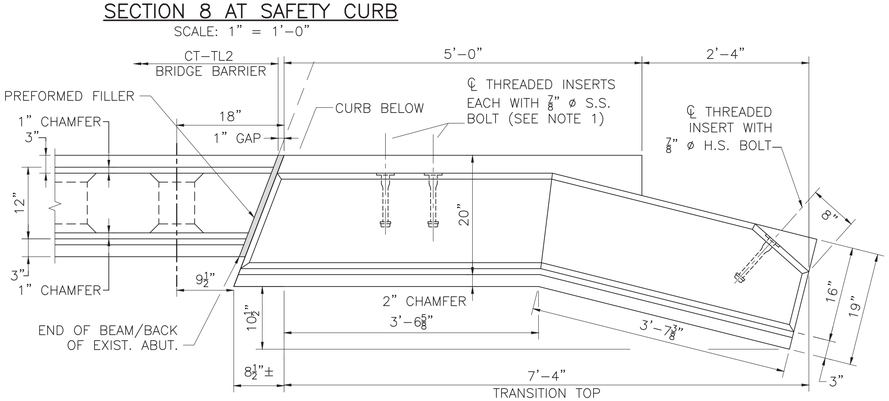
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 11 | 19 |
| PROJECT FILE NO. | | | |

**CT-TL2 BARRIER (1 OF 2)**



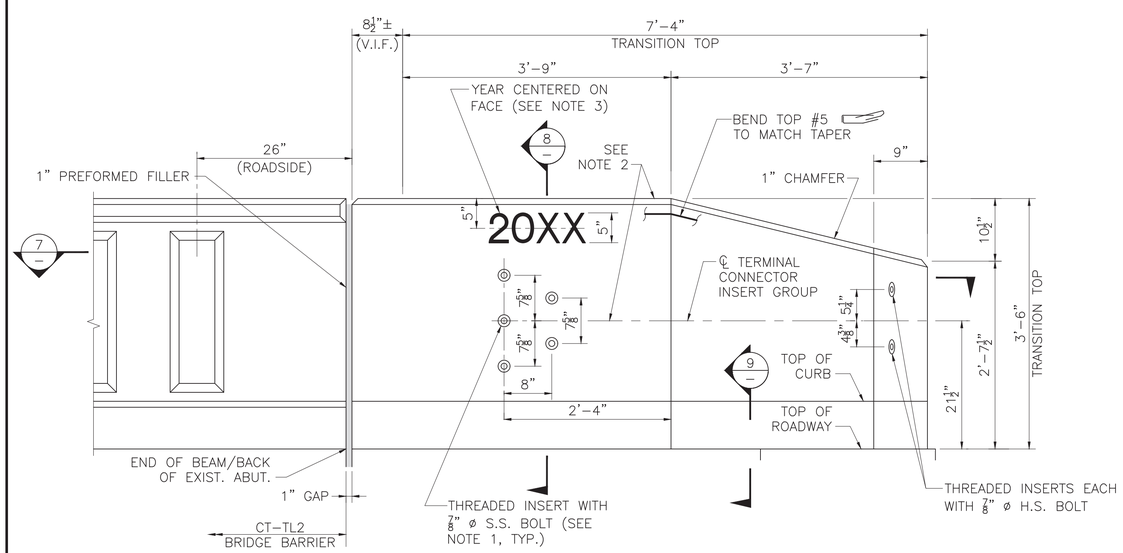

## PLAN AT SAFETY CURB – NE & SW CORNER
SCALE: 1" = 1'–0"



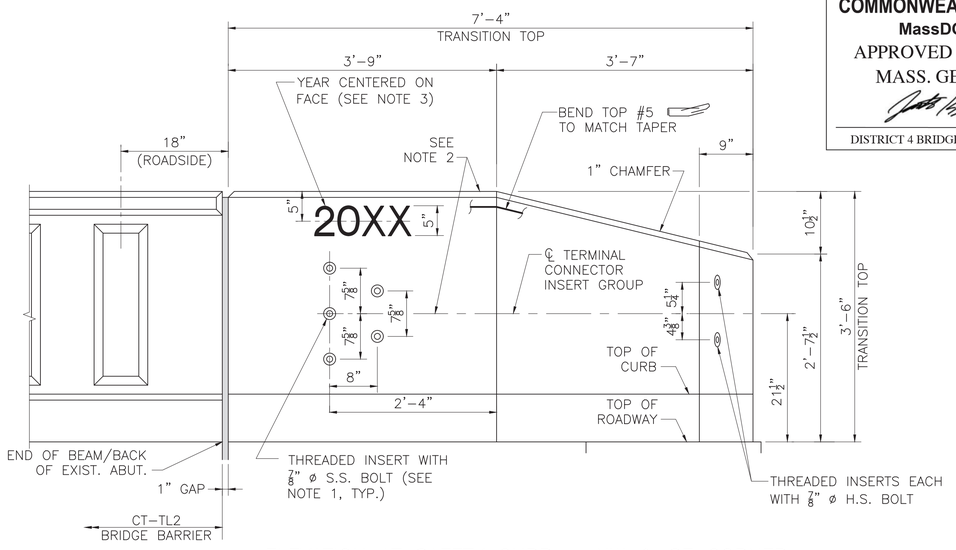

## PLAN AT SAFETY CURB – NW & SE CORNER
SCALE: 1" = 1'–0"

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.
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 HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, ⅜ IN., 710 HP CEMENT CONCRETE.




## ELEVATION AT SAFETY CURB – NE & SW CORNER
SCALE: 1" = 1'–0"




## ELEVATION AT SAFETY CURB – NW & SE CORNER
SCALE: 1" = 1'–0"

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**MassDOT, Highway Division**
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3/26/24
DISTRICT 4 BRIDGE ENGINEER — DATE

# TOP OF CAST–IN–PLACE HIGHWAY GUARDRAIL TRANSITION FOR CT–TL2 BARRIER

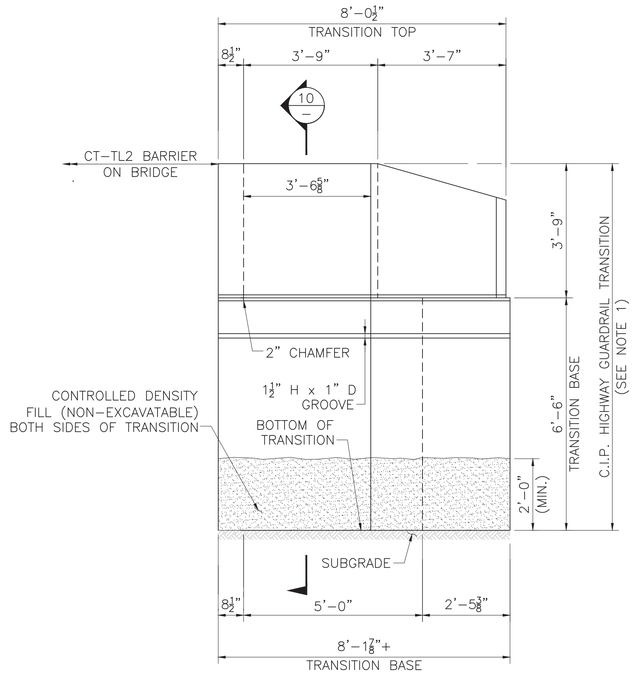


T1313_BARRIER.DWG Plotted on 10-Jun-2024 11:45 AM
Xxxxxx Structural Submittal (S#) 03/25/2024

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | – | 12 | 19 |
| PROJECT FILE NO. | | | |

**CT-TL2 BARRIER (2 OF 2)**

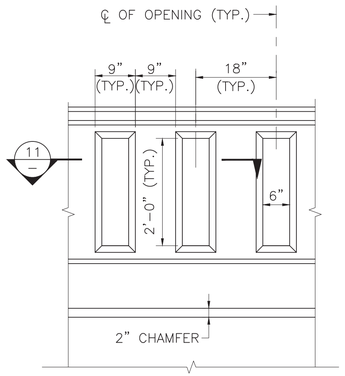



NOTES:

1. CAST–IN–PLACE GUARDRAIL TRANSITION SHALL BE 5000 PSI, ⅜ IN, 710 HP CEMENT CONCRETE.
2. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO A HEIGHT OF 2'–0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE. WHERE NO GRAVEL BORROW IS REQUIRED BELOW THE BASE, IT SHALL BE PLACED ON UNDISTURBED SOIL.
3. CONTRACTOR SHALL CAST THE CAST–IN–PLACE GUARDRAIL TRANSITION TO THE REQUIRED ELEVATION AND ALIGNMENT, AND BACKILL CAST–IN–PLACE GUARDRAIL TRANSITION WITH CONTROLLED DENSITY FILL (NON–EXCAVATABLE) TO THE ELEVATION SHOWN.

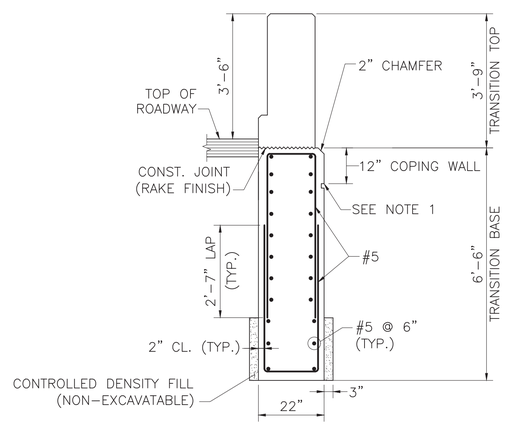
## CAST–IN–PLACE GUARDRAIL TRANSITION ELEVATION

SCALE: ½" = 1'–0"




## EXTERIOR BARRIER ELEVATION

SCALE: ¾" = 1'–0"

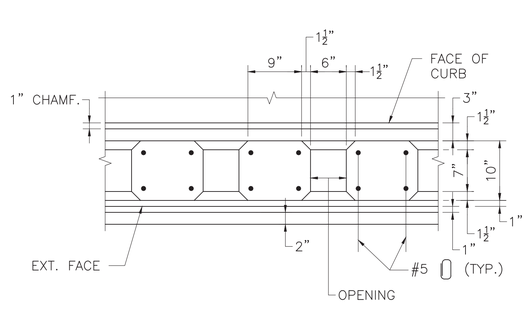



NOTES:

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

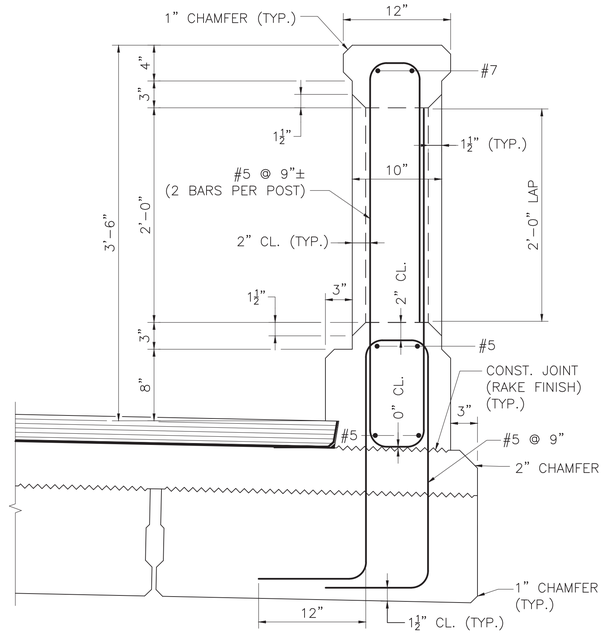
## SECTION 10

SCALE: ½" = 1'–0"




## SECTION 11

SCALE: 1" = 1'–0"




NOTE:

DECK AND BEAM REINFORCEMENT NOT SHOWN FOR CLARITY.

## SECTION THRU SAFETY CURB

SCALE: 1½" = 1'–0"

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**MassDOT, Highway Division**
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3/26/24

DISTRICT 4 BRIDGE ENGINEER — DATE



T1313_BARRIER.DWG Plotted on 10-Jun-2024 11:45 AM
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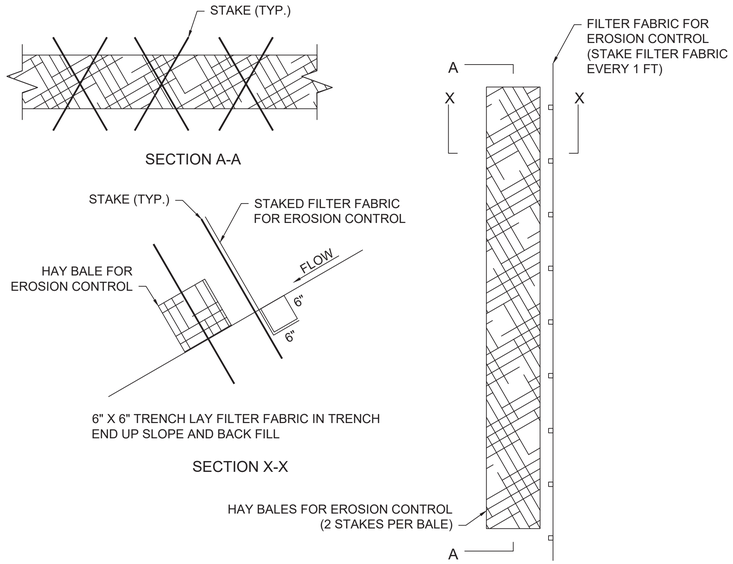
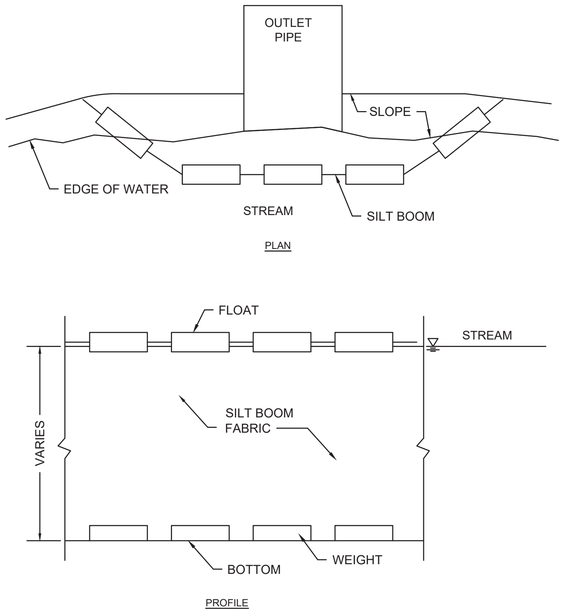
| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 13 | 19 |
| PROJECT FILE NO. — — — — | | | |

**MISC DETAILS**




HAY BALES AND SILT FENCES FOR EROSION CONTROL

N.T.S.

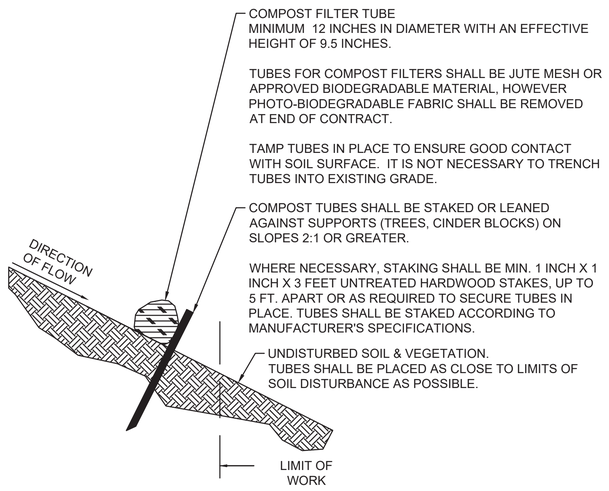


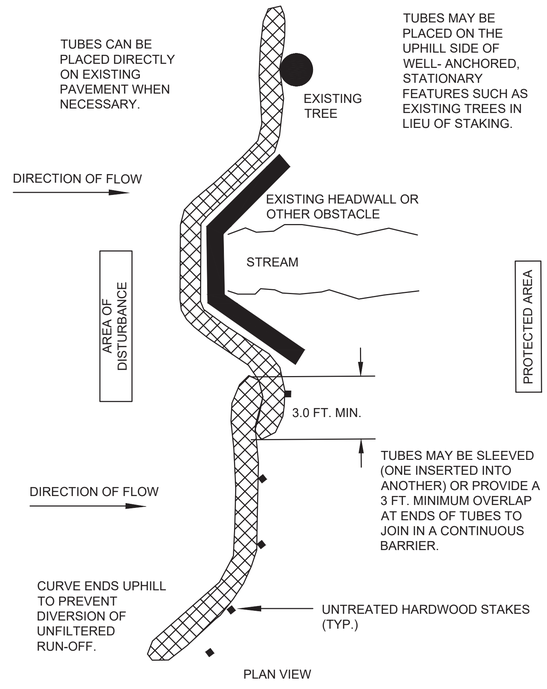

SILT BOOM FENCE

N.T.S.

NOTES:

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



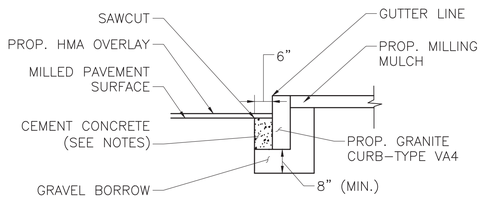




COMPOST FILTER TUBE

N.T.S.

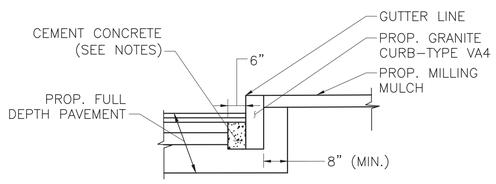


T1313_MISC DETAILS.DWG Plotted on 10-Jun-2024 11:45 AM
Xxxxxx Structural Submittal (S#) 03/25/2024



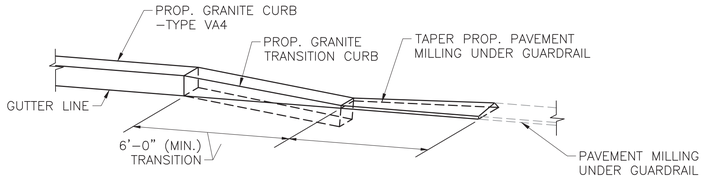

GRANITE CURB IN HMA MILL AND OVERLAY

SCALE: N.T.S.



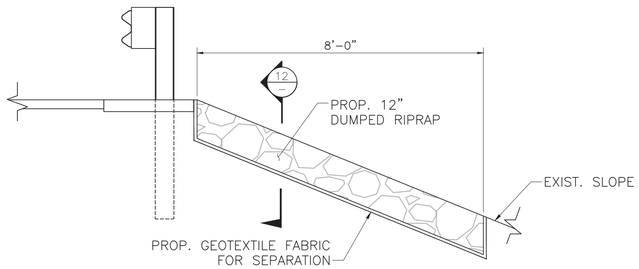

GRANITE CURB IN FULL DEPTH PAVEMENT

SCALE: N.T.S.



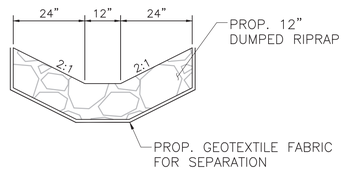

GRANITE CURB TRANSITION

SCALE: N.T.S.




DRAINAGE SWALE DETAIL

SCALE: $\frac{1}{2}$" = 1'–0"

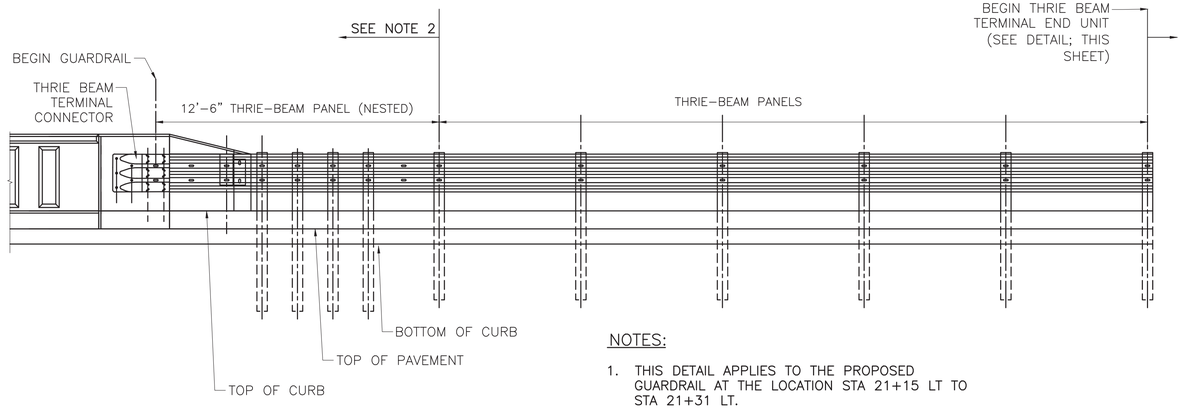



SECTION 12

SCALE: $\frac{1}{2}$" = 1'–0"

NOTES:

1. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB.
2. FOR MILL AND OVERLAY DETAIL, SAWCUT 6" AWAY FROM CURBLINE AND REMOVE EXISTING PAVEMENT AND GRAVEL. REPLACE WITH CEMENT CONCRETE.
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

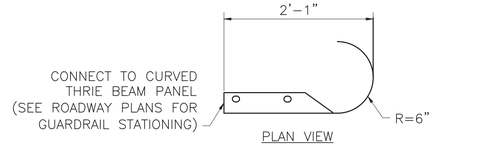



NOTES:

1. THIS DETAIL APPLIES TO THE PROPOSED GUARDRAIL AT THE LOCATION STA 21+15 LT TO STA 21+31 LT.
2. REFER TO MASSDOT CONSTRUCTION STANDARD DETAIL 400.3.6 FOR CONSTRUCTION OF NESTED THRIE BEAM, THRIE BEAM TERMINAL CONNECTOR AND ALL HARDWARE ASSOCIATED THEREWITH.

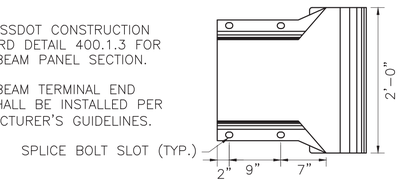
TRANSITION TO BRIDGE RAIL (MODIFIED)

SCALE: N.T.S.




NOTES:

1. SEE MASSDOT CONSTRUCTION STANDARD DETAIL 400.1.3 FOR THRIE BEAM PANEL SECTION.
2. THRIE BEAM TERMINAL END UNIT SHALL BE INSTALLED PER MANUFACTURER'S GUIDELINES.




THRIE BEAM TERMINAL END UNIT

SCALE: N.T.S.



T1313_MISC DETAILS.DWG Plotted on 10-Jun-2024 11:46 AM
03/25/2024
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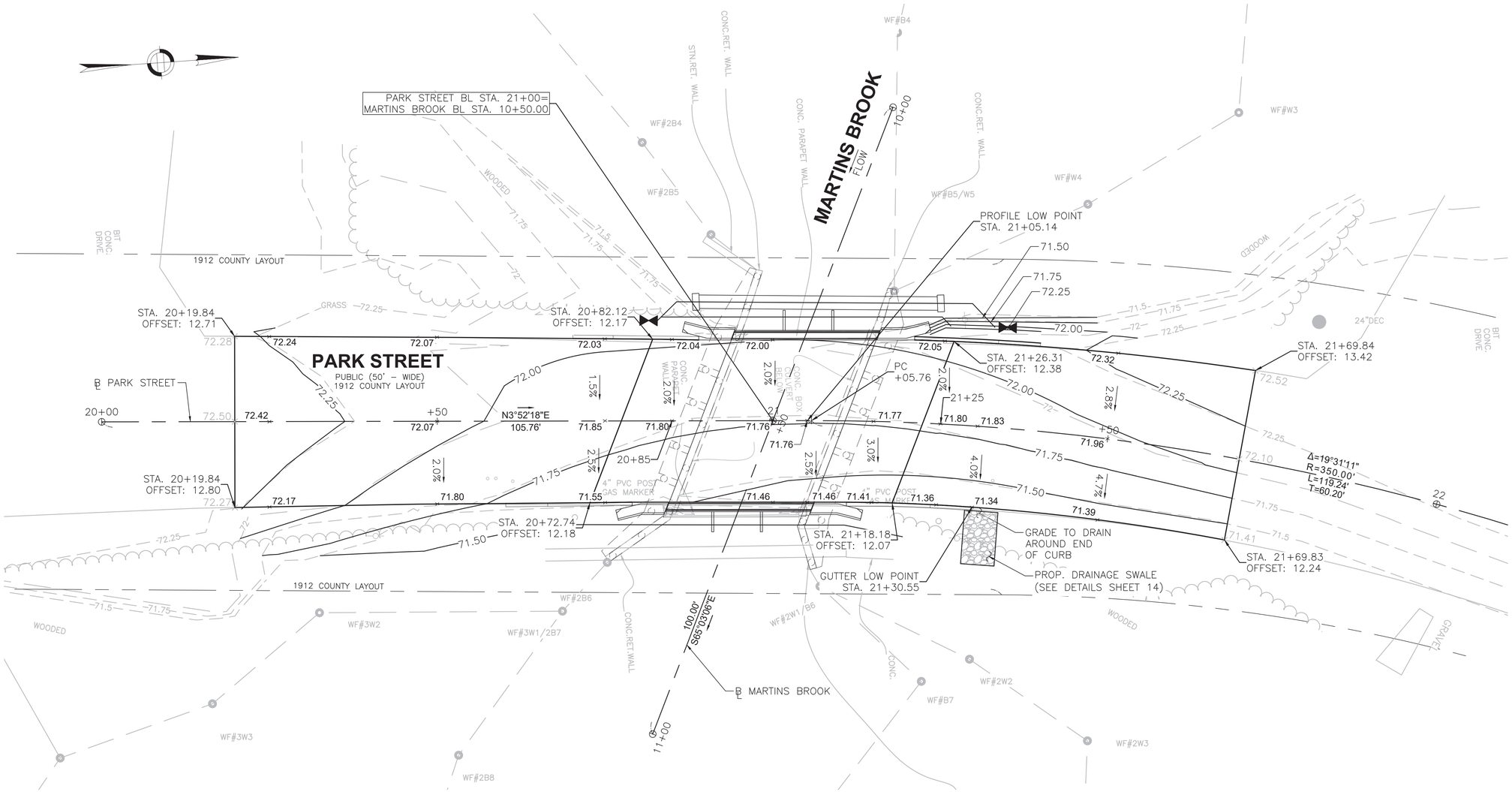
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | - | 15 | 19 |
| PROJECT FILE NO. | | ---- | |

**GRADING PLAN**




GRADING PLAN

SCALE: 1" = 8'

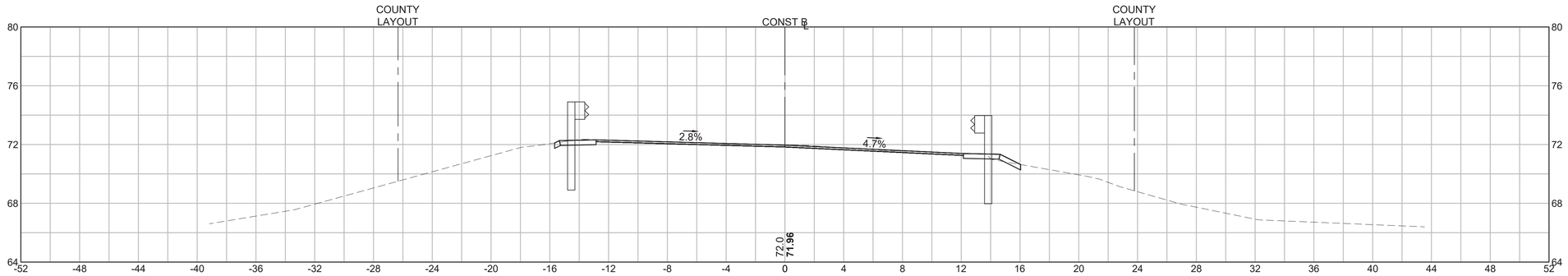


T1313_GRADING PLAN.DWG Plotted on 10-Jun-2024 11:46 AM
03/25/2024
Xxxxxx Structural Submittal (S#)

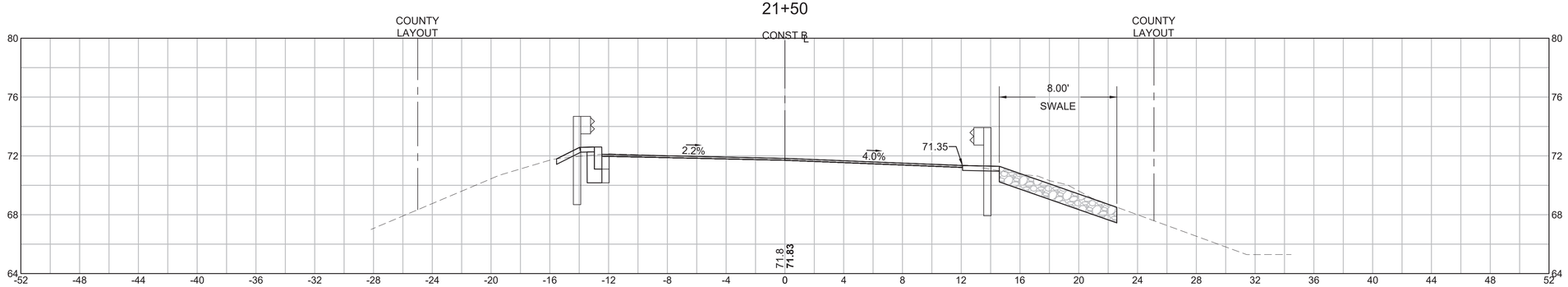
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | - | 16 | 19 |
| PROJECT FILE NO. | | - | |

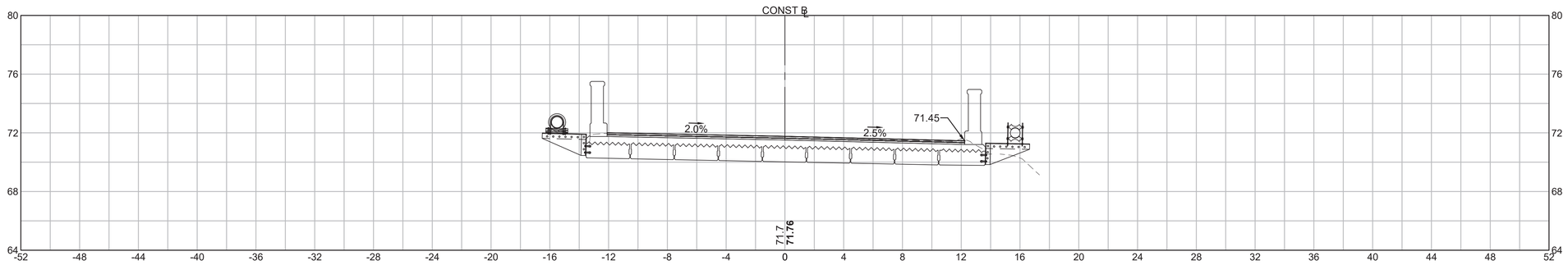
**CROSS SECTIONS**



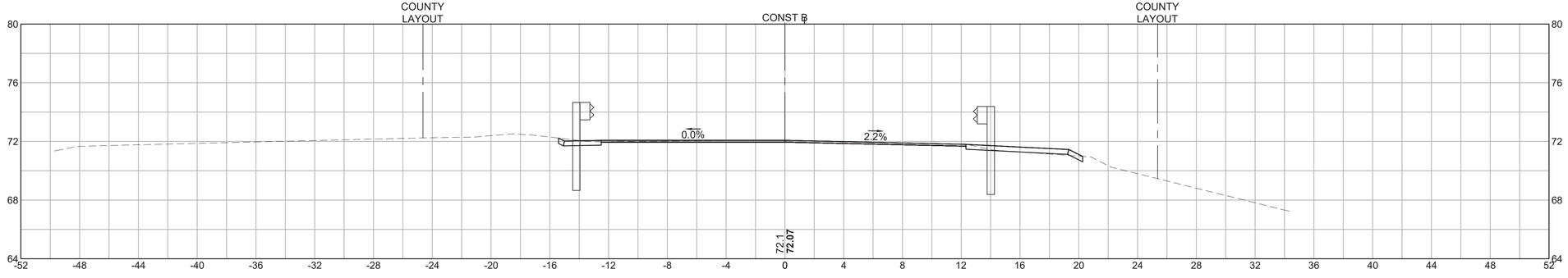

21+50




21+31 – RT GUTTER LOW POINT




21+05.14




20+50

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

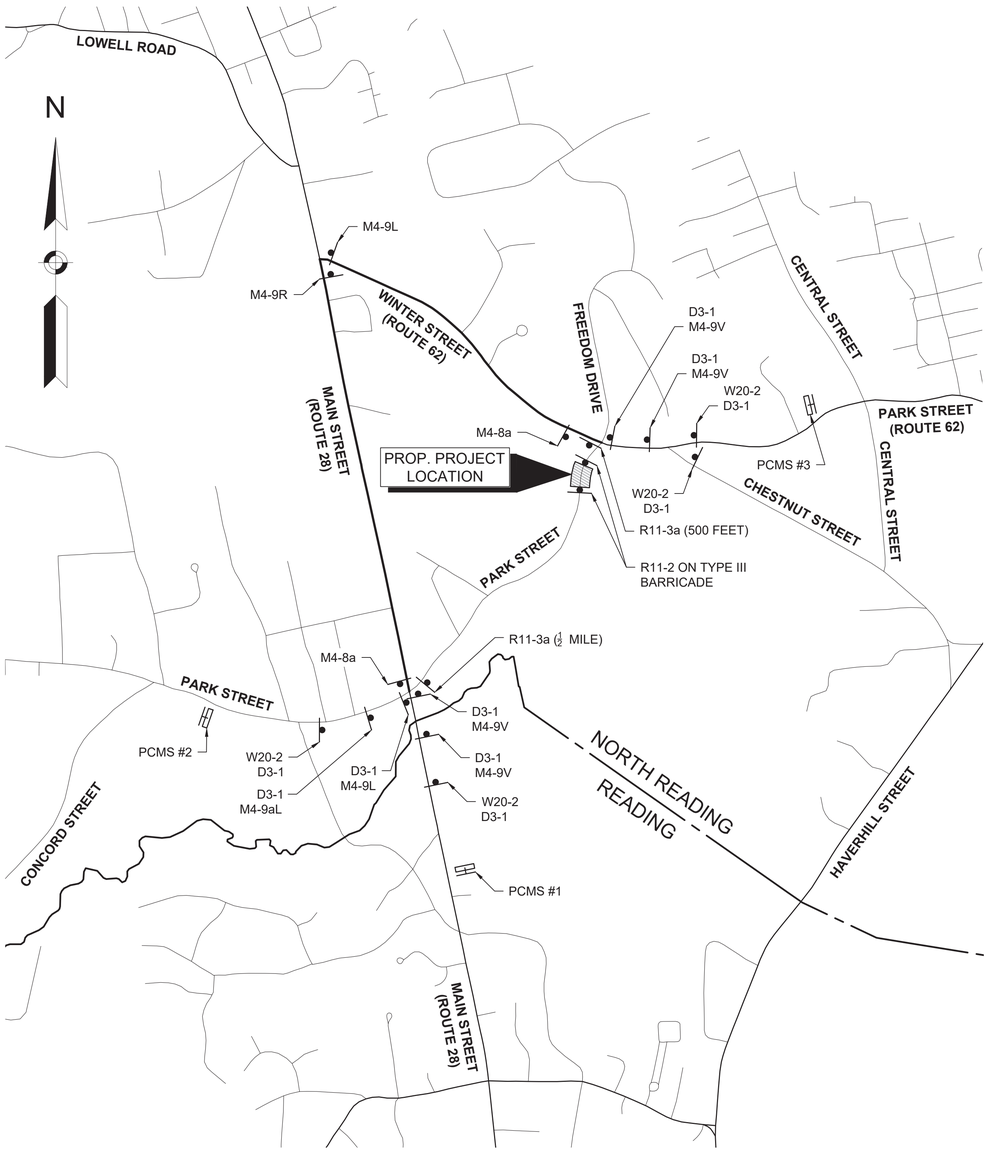


T1313_CROSS SECTIONS.DWG Plotted on 10-Jun-2024 11:46 AM
03/25/2024

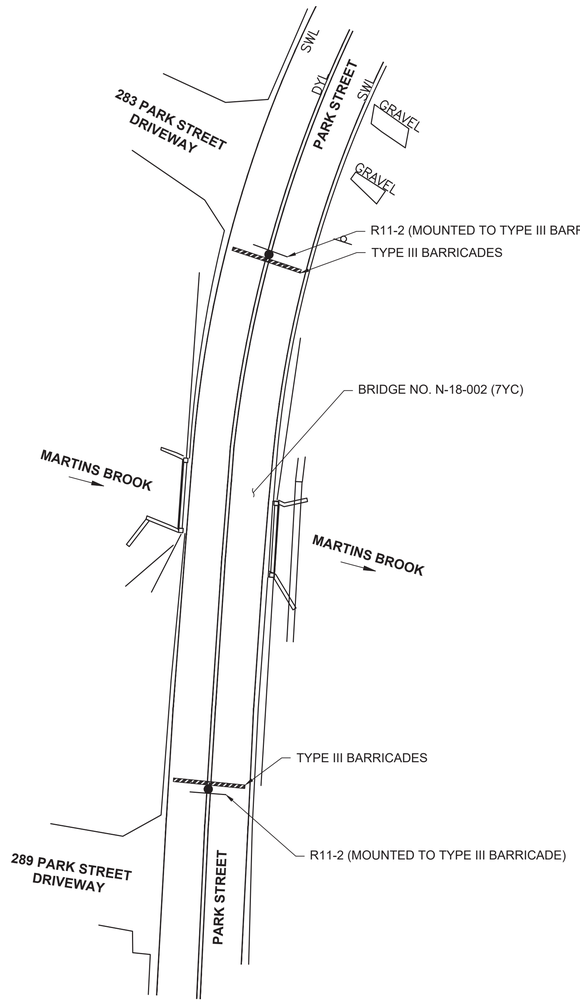
**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 17 | 19 |
| PROJECT FILE NO. | — — — — | | |

**TEMPORARY TRAFFIC CONTROL PLANS**
**SHEET 1 OF 3**




DETOUR PLAN & SIGNAGE SCHEMATIC - PARK STREET
SCALE: 1"=750'




PARK STREET CLOSURE SET-UP
SCALE: 1"=20'

0 20 50 100
SCALE: 1" = 20'

GENERAL NOTES:

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

TEMPORARY TRAFFIC CONTROL LEGEND

- WORK ZONE
- SIGN
- TYPE III BARRICADES
- PORTABLE CHANGEABLE MESSAGE BOARD



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**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

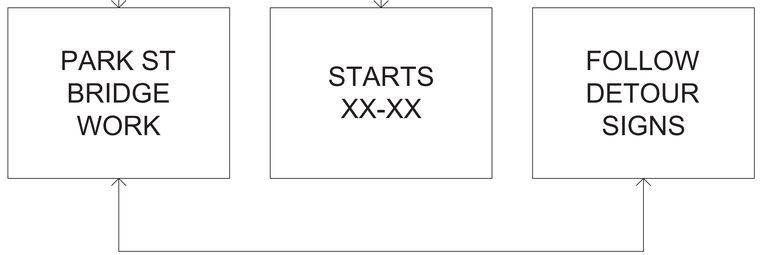
| STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| MA | — | 18 | 19 |
| PROJECT FILE NO. | — — — — | | |

**TEMPORARY TRAFFIC CONTROL PLANS**
**SHEET 2 OF 3**

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) | | | 2 | WHITE | BLACK | BLACK | 0 ON TYPE III BARRICADE | 10.00 | 20.00 |
| R11-3a( 500 FT) | 60 | 30 | ROAD CLOSED 500 FT AHEAD LOCAL TRAFFIC ONLY | | | | 1 | WHITE | BLACK | BLACK | 1 | 12.50 | 12.50 |
| R11-3a(½ MI) | 60 | 30 | ROAD CLOSED ½ MILE AHEAD LOCAL TRAFFIC ONLY | | | | 1 | WHITE | BLACK | BLACK | 1 | 12.50 | 12.50 |
| W20-2 | 36 | 36 | DETOUR AHEAD | | | | 4 | FL. ORANGE | BLACK | BLACK | 0 W/ D3-1 | 9.00 | 36.00 |
| M4-8a | 24 | 18 | END DETOUR | | | | 2 | FL. ORANGE | BLACK | BLACK | 2 | 3.00 | 6.00 |
| M4-9L | 30 | 24 | DETOUR ← | | | | 2 | WHITE | BLACK | BLACK | 1 1 W/ D3-1 | 5.00 | 10.00 |
| M4-9R | 30 | 24 | DETOUR → | | | | 1 | WHITE | BLACK | BLACK | 1 | 5.00 | 5.00 |
| M4-9aL | 30 | 24 | DETOUR ↰ | | | | 1 | WHITE | BLACK | BLACK | 0 W/ D3-1 | 5.00 | 5.00 |
| M4-9V | 30 | 24 | DETOUR ↑ | | | | 4 | WHITE | BLACK | BLACK | 0 W/ D3-1 | 5.00 | 20.00 |
| D3-1 | 35 | 12 | Park St | 6D / 4D | 2.75 3.25 | NA | 10 | FL. ORANGE | BLACK | BLACK | 10 | 2.92 | 29.17 |

STARTING 14 DAYS PRIOR TO DETOUR




DURING ALL TIME PERIOD OF DETOURS

PORTABLE CHANGE MESSAGE SIGNS #1, #2 & #3

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.



T1313_TMP.DWG Plotted on 10-Jun-2024 11:46 AM
03/25/2024 Xxxxxx Structural Submittal (S#)

**NORTH READING**
**PARK STREET OVER MARTINS BROOK**

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

**TEMPORARY TRAFFIC CONTROL PLANS**
**SHEET 3 OF 3**

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL [ISOLATED INTERSECTION]

MAIN STREET (ROUTE 28) AT PARK STREET
(NORTH READING, MASSACHUSETTS)


| APPROACH | DIRECTION | HOUSING | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | FLASHING OPERATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINIMUM INTERVAL | | | 5 | | | 10 | | | | | | 8 | | | | | | 10 | | | 5 | | | 6 | | | |
| VEHICLE EXTENSION | | | 3 | | | 3 | | | | | | 3 | | | | | | 3 | | | 3 | | | 3 | | | |
| MAXIMUM 1 | | | 15 | | | 35 | | | | | | 30 | | | | | | 35 | | | 20 | | | 10 | | | |
| MAXIMUM 2 | | | 10 | | | 30 | | | | | | 40 | | | | | | 30 | | | 25 | | | 10 | | | |
| YELLOW CLEARANCE | | | | 3.5 | | | 4.5 | | | | | | 4.0 | | | | | | 4.5 | | | 4.0 | | | 4.0 | | |
| RED CLEARANCE | | | | | 2.0 | | | 2.0 | | | | | | 3.0 | | | | | | 2.0 | | | 3.0 | | | 3.0 | |
| WALK | | | | | | | | | 8.0 | | | | | | | | | | | | | | | | | | |
| PEDESTRIAN CLEARANCE | | | | | | | | | | 12.0 | | | | | | | | | | | | | | | | | |
| RECALL | | | OFF | | | MIN | | | OFF | | | OFF | | | | | | MIN | | | OFF | | | OFF | | | |
| DETECTOR | | | NON-LOCK | | | NON-LOCK | | | LOCK | | | NON-LOCK | | | | | | NON-LOCK | | | NON-LOCK | | | NON-LOCK | | | |

SEQUENCE & TIMING NOTES:
1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.12.
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. PM = PERMITTED, Y = YIELD, OL = OVERLAP
4. MAXIMUM 1 = M-F 6:00 AM TO 10:00 AM
   MAXIMUM 2 = FREE OPERATION
5. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
6. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.
7. THE RIGHT-OF-WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
8. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
9. DEACTIVATE DUAL ENTRY FOR PHASES 4 AND 8

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL [INACTIVATED COORDINATION]

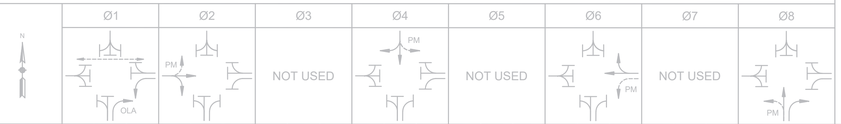
MAIN STREET (ROUTE 28) AT WINTER STREET (ROUTE 62)
(NORTH READING, MASSACHUSETTS)


| APPROACH | DIRECTION | HOUSING | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | FLASHING OPERATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINIMUM INTERVAL | | | 6 | | | 6 | | | | | | 6 | | | | | | 6 | | | | | | | | | |
| VEHICLE EXTENSION | | | 2 | | | 2 | | | | | | 2 | | | | | | 2 | | | | | | | | | |
| MAXIMUM 1 | | | 10 | | | 30 | | | | | | 30 | | | | | | 30 | | | | | | | | | |
| MAXIMUM 2 | | | 20 | | | 40 | | | | | | 20 | | | | | | 40 | | | | | | | | | |
| YELLOW CLEARANCE | | | | 4.0 | | | 5.0 | | | | | | 3.0 | | | | | | 5.0 | | | | | | | | |
| RED CLEARANCE | | | | | 2.0 | | | 1.0 | | | | | | 1.0 | | | | | | 1.0 | | | | | | | | |
| WALK | | | | | | | | | 5.0 | | | | | | | | | | | | | | | | | | |
| PEDESTRIAN CLEARANCE | | | | | | | | | | 25.0 | | | | | | | | | | | | | | | | | |
| RECALL | | | OFF | | | MIN | | | OFF | | | OFF | | | | | | MIN | | | | | | | | | |
| DETECTOR | | | NON-LOCK | | | NON-LOCK | | | LOCK | | | NON-LOCK | | | | | | NON-LOCK | | | | | | | | | |

SEQUENCE & TIMING NOTES:
1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.12.
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. PM = PERMITTED
4. MAXIMUM 1 = FREE OPERATION
   MAXIMUM 2 = M-F 3:00 PM TO 7:00 PM
5. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
6. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.
7. THE RIGHT-OF-WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
8. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.

SEQUENCE AND TIMING CHART FOR FULLY-ACTUATED TRAFFIC SIGNAL CONTROL [ISOLATED INTERSECTION]

WINTER STREET (ROUTE 62) AT PARK STREET (ROUTE 62) / FREEDOM DRIVE
(NORTH READING, MASSACHUSETTS)




| APPROACH | DIRECTION | HOUSING | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | FLASHING OPERATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINIMUM INTERVAL | | | 5 | | | 6 | | | | | | 5 | | | | | | 6 | | | | | | 5 | | | |
| VEHICLE EXTENSION | | | 2 | | | 3 | | | | | | 2 | | | | | | 3 | | | | | | 2 | | | |
| MAXIMUM 1 | | | 22 | | | 35 | | | | | | 10 | | | | | | 35 | | | | | | 10 | | | |
| MAXIMUM 2 | | | 22 | | | 35 | | | | | | 10 | | | | | | 35 | | | | | | 10 | | | |
| YELLOW CLEARANCE | | | | 4.0 | | | 4.0 | | | | | | 3.0 | | | | | | 4.0 | | | | | | 3.0 | | |
| RED CLEARANCE | | | | | 1.0 | | | 1.0 | | | | | | 1.0 | | | | | | 1.0 | | | | | | | 1.0 |
| WALK | | | 6.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| PEDESTRIAN CLEARANCE | | | 16.0 | 4.0 | 1.0 | | | | | | | | | | | | | | | | | | | | | | |
| RECALL | | | OFF | | | MIN | | | | | | OFF | | | | | | MIN | | | | | | OFF | | | |
| DETECTOR | | | NON-LOCK | | | NON-LOCK | | | | | | NON-LOCK | | | | | | NON-LOCK | | | | | | NON-LOCK | | | |

SEQUENCE & TIMING NOTES:
1. AUTOMATIC FLASHING OPERATION PER M.U.T.C.D. SECTION 4D.12.
2. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY.
3. PM = PERMITTED
4. MAXIMUM 1 = FREE OPERATION
   MAXIMUM 2 = M-F 3:00 PM TO 7:00 PM
5. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
6. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.
7. THE RIGHT-OF-WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
8. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.



T1313_TMP.DWG Plotted on 10-Jun-2024 11:46 AM
03/25/2024
Xxxxxx Structural Submittal (S#)