# TRANSPORTATION IMPROVEMENT PROJECT

PLAN OF

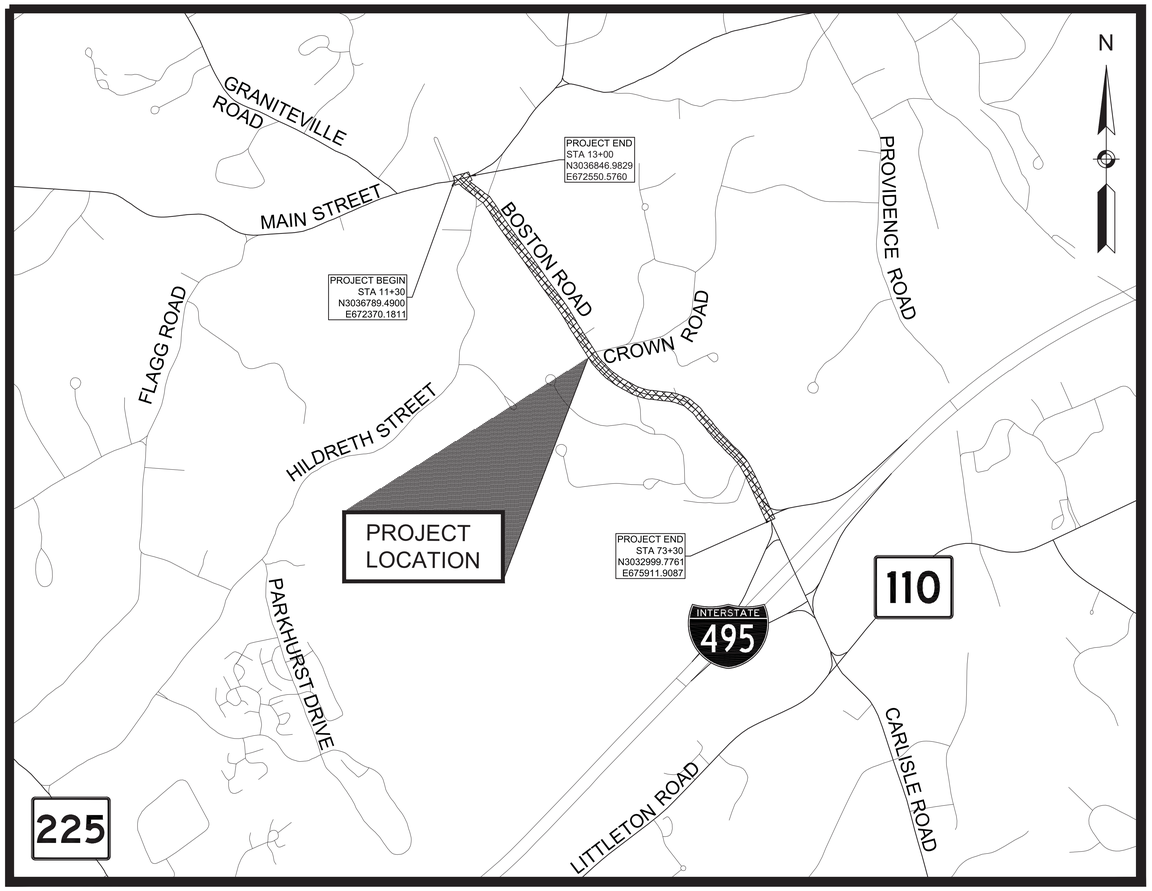
## BOSTON ROAD

IN THE TOWN OF

## WESTFORD

## MIDDLESEX COUNTY

# 15% DESIGN PLANS




0 600 1,200 2,400 3,000

SCALE: 1" = 600'

LENGTH OF PROJECT = 7,520 FEET = 1.44 MILES

## INDEX


| SHEET NO. | DESCRIPTION |
|---|---|
| 1 | TITLE SHEET & INDEX |
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THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WTH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

| DATE | DESCRIPTION | REV # |
|---|---|---|
| 10/16/18 | 15% SUBMITTAL | PLANS |

TEC, Inc.
146 Dascomb Road
Andover, MA 01810
169 Ocean Blvd
Hampton, NH 03842

| DESIGNED BY | CHECKED BY | DATE |
|---|---|---|
| LEN | JPC | 10/16/18 |
| **DRAWN BY** | **APPROVED BY** | **PROJECT NO.** |
| LEN | JAR | T713 |

## GENERAL SYMBOLS

| EXISTING | PROPOSED | DESCRIPTION |
|---|---|---|
| JB | JB | JERSEY BARRIER |
| CB | CB/GI | CATCH BASIN OR GUTTER INLET |
| | CBCI/GICI | CATCH BASIN OR GUTTER INLET W/ 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 |
| | | CABLE MANHOLE |
| | | DRAINAGE MANHOLE |
| | | ELECTRIC MANHOLE |
| | | GAS MANHOLE |
| | | MISC MANHOLE |
| | | SEWER MANHOLE |
| | | TELEPHONE MANHOLE |
| | | 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 |
| WSO | WSO | WATER SHUTOFF/CURB STOP |
| 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 |
| | | CHAIN LINK OR METAL FENCE |
| | | WOOD FENCE |
| | | HAY BALES/SILT FENCE |
| | | TREE LINE |
| | | EDGE OF PAVEMENT |
| | | SAWCUT LINE |
| | | TOP OR BOTTOM OF SLOPE |
| | | LIMIT OF EDGE OF MICROMILLING 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 |
|---|---|---|
| | | CONTROLLER CABINET, FOUNDATION |
| | | CONTROLLER CABINET, FOUNDATION, CONC. PAD |
| | | MAST ARM FOUNDATION (SCALE OF BLOCK = DIAMETER IN INCHES) |
| | | MAST ARM (LENGTH NOTED) |
| | | EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT |
| | | VEHICULAR SIGNAL HEAD |
| | | PEDESTRIAN SIGNAL HEAD |
| | | MAST ARM OR TS POLE MOUNTED SIGN |
| | | EMERGENCY PRE-EMPTION RECEIVER |
| | | EMERGENCY PRE-EMPTION CONFIRMATION STROBE |
| | | PEDESTRIAN PUSH BUTTON |
| | | YAGI ANTENNA |
| | | BICYCLE WIRE LOOP DETECTOR (SIZE AS NOTED) |
| | | WIRE LOOP DETECTOR (SIZE AND TYPE NOTED) |
| | | TRAFFIC SIGN (1 POST) |
| | | TRAFFIC SIGN (2 POST) |
| | | 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 |
| | | BIKE LANE LEGEND - WHITE |
| | SL | STOP LINE |
| | CW | CROSSWALK |
| | SWL | SOLID WHITE LINE |
| | SYL | SOLID YELLOW LINE |
| | BWL | BROKEN WHITE LINE |
| | BYL | BROKEN YELLOW LINE |
| | DWL | 6" DOTTED WHITE LINE (3' LINE W/ 9' GAP) |
| | DYL | 6" DOTTED YELLOW LINE (3' LINE W/ 9' GAP) |
| | DWLEx | 6" DOTTED WHITE LINE EXTENSION (2' LINE W/ 6' GAP) |
| | DYLEx | 6" DOTTED YELLOW LINE EXTENSION (2' LINE W/ 6' GAP) |
| | DBWL | DOUBLE WHITE LINE |
| | DBYL | DOUBLE YELLOW LINE |
| | YGL | 12" YELLOW GORE LINE (3:1, 10' O.C.) |

## ABBREVIATIONS

### GENERAL

| | |
|---|---|
| AADT | ANNUAL AVERAGE DAILY TRAFFIC |
| ABAN | ABANDON |
| ADJ | ADJUST |
| APPROX. | APPROXIMATE |
| A.C. | ASPHALT CONCRETE |
| ACCM PIPE | ASPHALT COATED CORRUGATED METAL PIPE |
| 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 |
| 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 |
| FLDSTN | FIELDSTONE |
| GAR | GARAGE |
| GC | GRANITE CURB |
| 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 |
| JCT | JUNCTION |
| L | LENGTH OF CURVE |
| LB | LEACH BASIN |
| LOG | LIMIT OF GRADING |
| LP | LIGHT POLE |
| L&S | LOAM AND SEED |
| LT | LEFT |
| MAX | MAXIMUM |
| MB | MAILBOX |
| MH | MANHOLE |
| MHB | MASSACHUSETTS HIGHWAY BOUND |
| MIN | MINIMUM |
| NIC | NOT IN CONTRACT |
| NO. | NUMBER |
| 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 |
| PT | POINT OF TANGENCY |
| PVC | POINT OF VERTICAL CURVATURE |
| PVI | POINT OF VERTICAL INTERSECTION |

## ABBREVIATIONS (cont.)

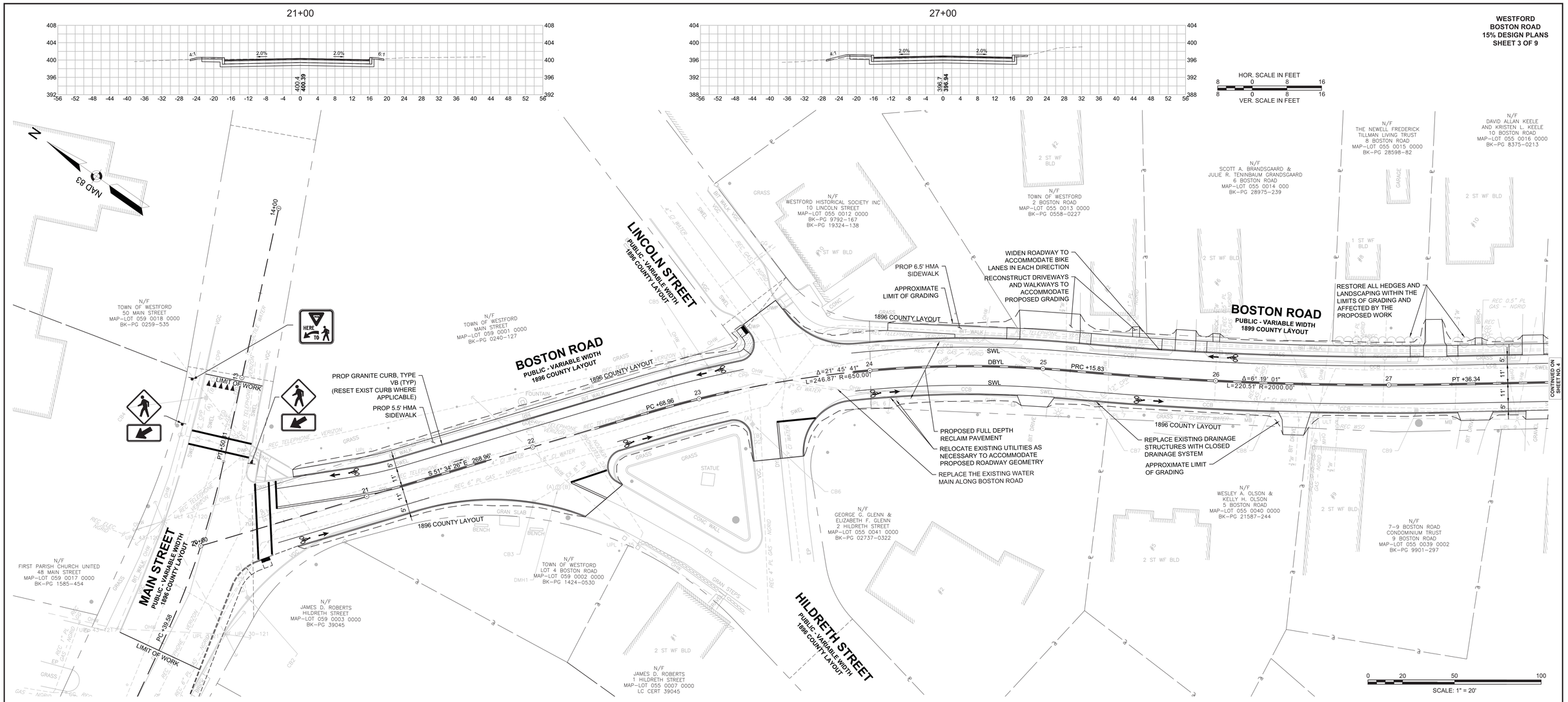
### GENERAL

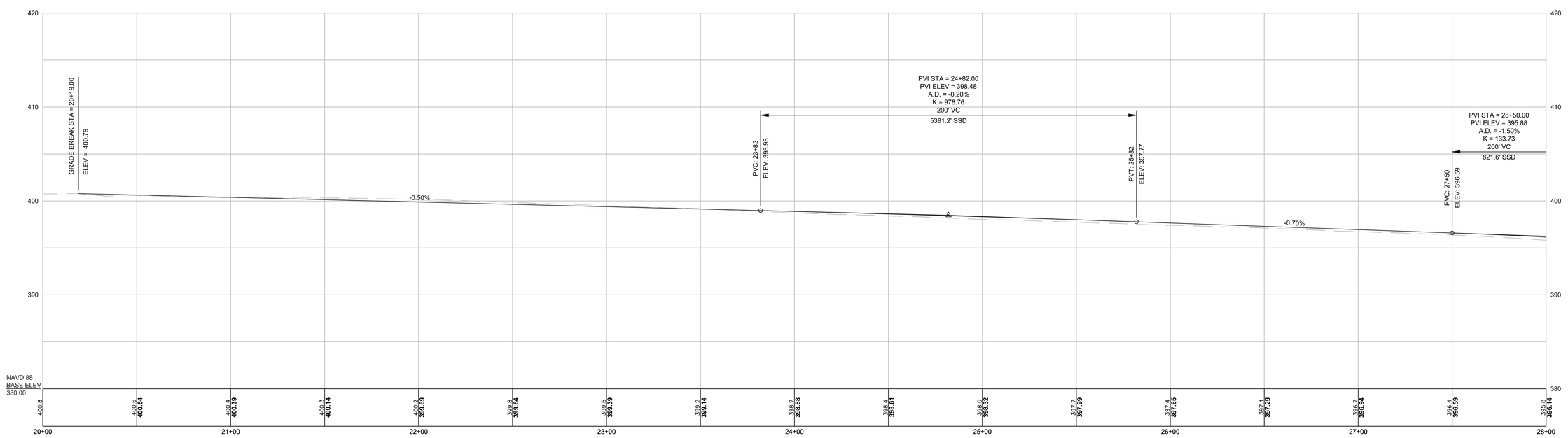
| | |
|---|---|
| PVT | POINT OF VERTICAL TANGENCY |
| PVMT | PAVEMENT |
| PWW | PAVED WATERWAY |
| R | RADIUS OF CURVATURE |
| R&D | REMOVE AND DISPOSE |
| RCP | REINFORCED CONCRETE PIPE |
| RD | ROAD |
| RDWY | ROADWAY |
| REM | REMOVE |
| RET | RETAIN |
| RET WALL | RETAINING WALL |
| ROW | RIGHT OF WAY |
| RR | RAILROAD |
| RRFB | RECTANGULAR RAPID FLASHING BEACON |
| 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

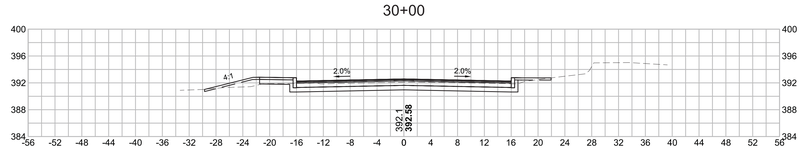
| | |
|---|---|
| CAB. | CABINET |
| CCVE | CLOSED CIRCUIT VIDEO EQUIPMENT |
| DW | STEADY DON'T WALK |
| FDW | FLASHING DON'T WALK |
| FR | FLASHING CIRCULAR RED |
| FRL | FLASHING RED LEFT ARROW |
| FRR | FLASHING RED RIGHT ARROW |
| FY | FLASHING CIRCULAR YELLOW |
| FYL | FLASHING YELLOW LEFT ARROW |
| 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 |

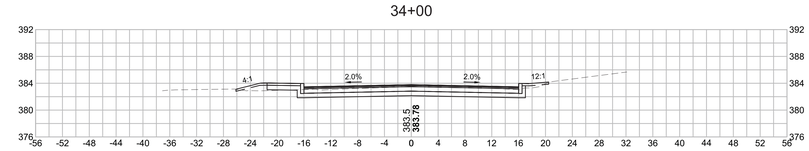
WESTFORD
BOSTON ROAD
15% DESIGN PLANS
SHEET 3 OF 9



**WESTFORD**
**BOSTON ROAD**
**15% DESIGN PLANS**
**SHEET 4 OF 9**

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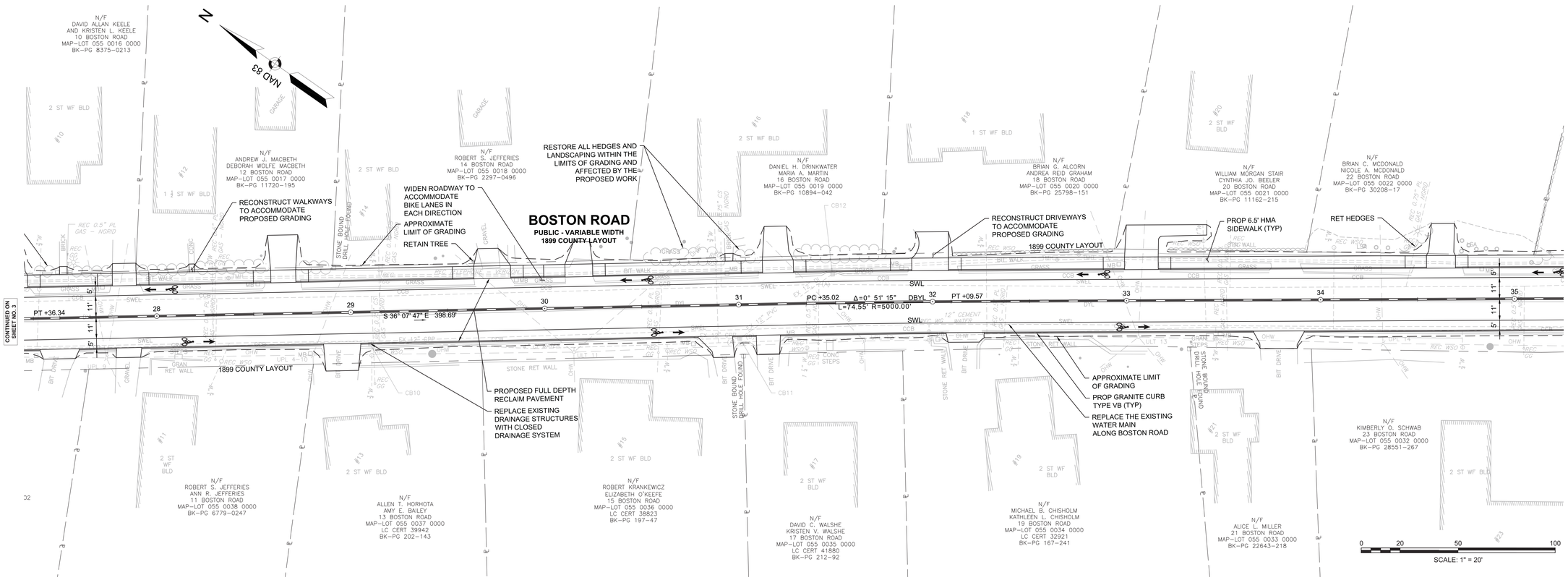


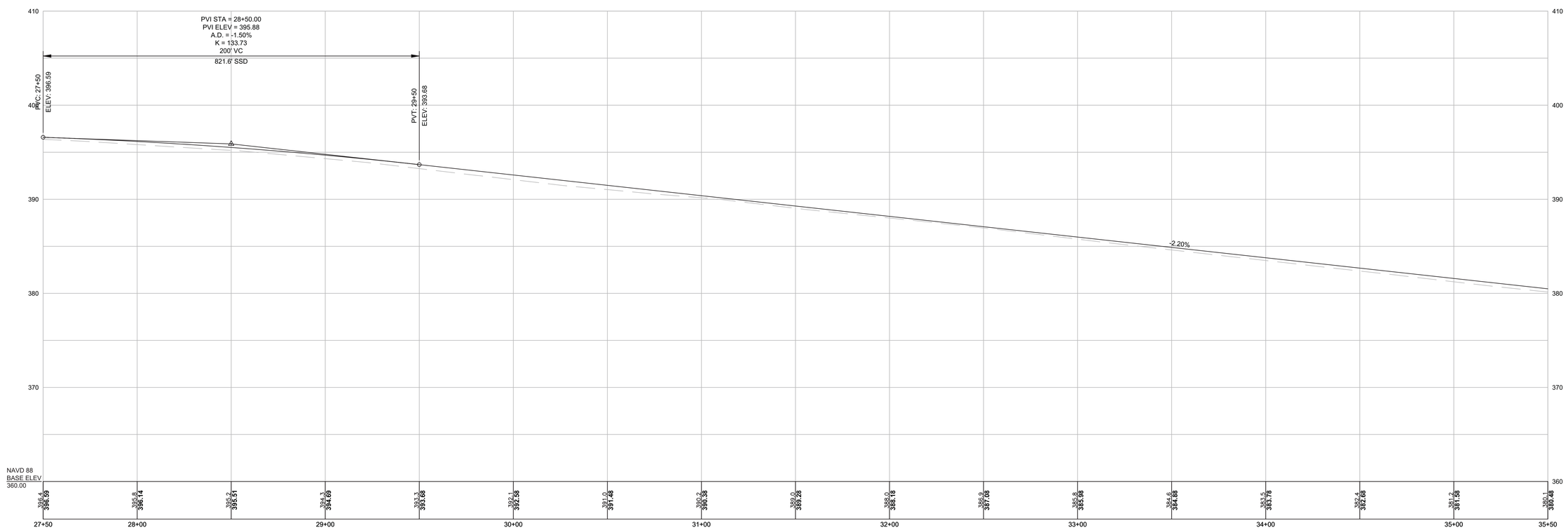


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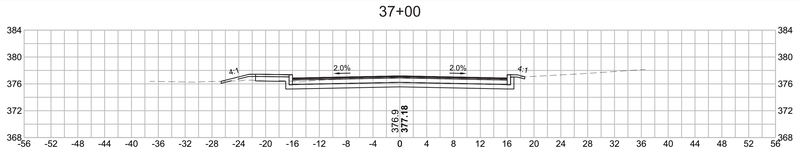
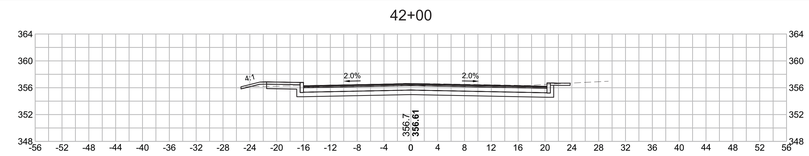
WESTFORD
BOSTON ROAD
15% DESIGN PLANS
SHEET 5 OF 9

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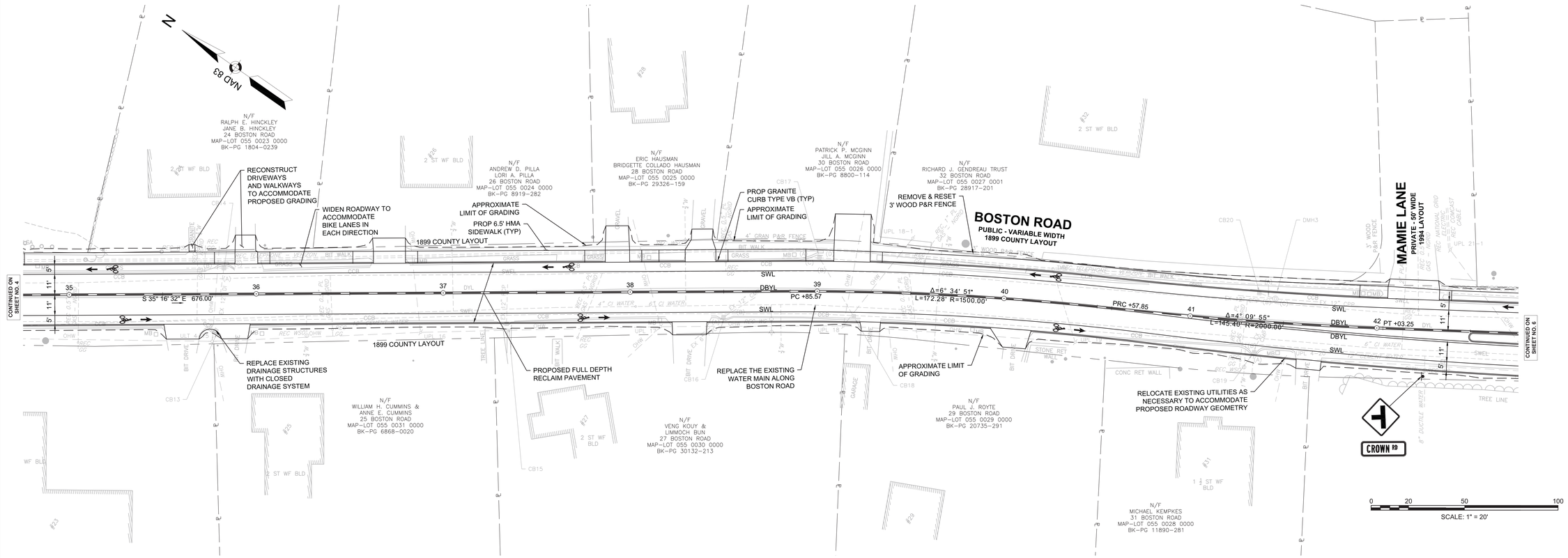


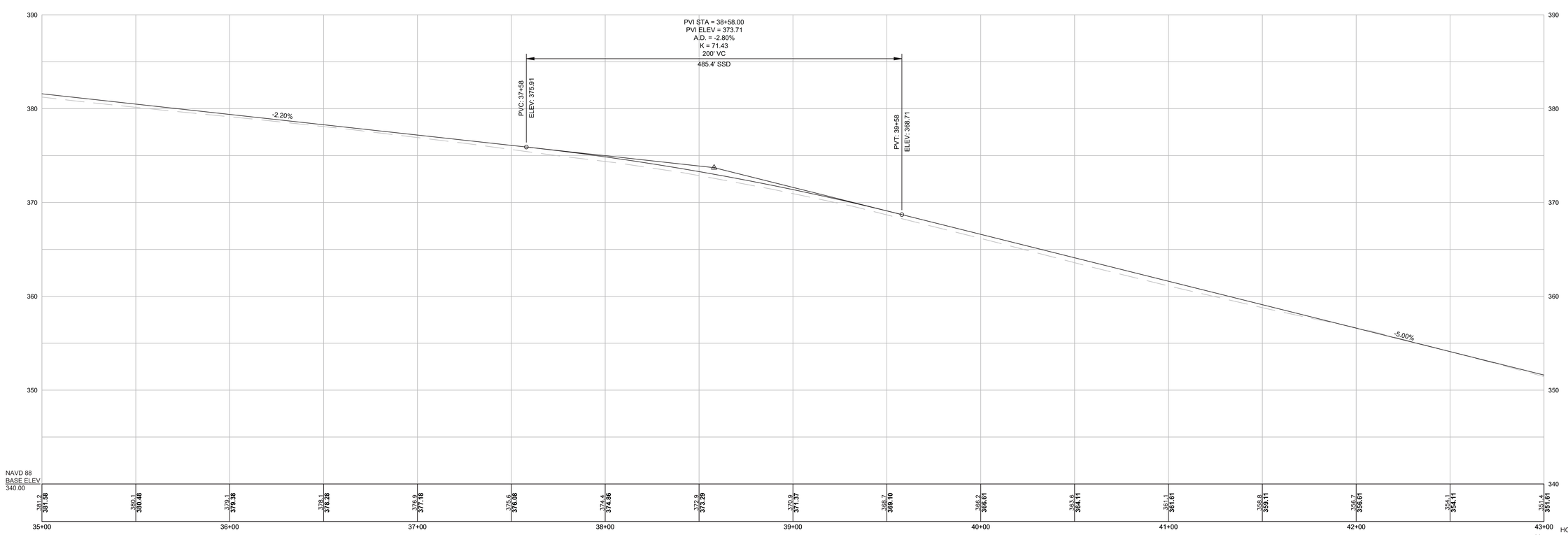


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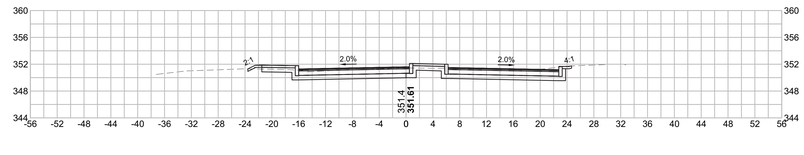
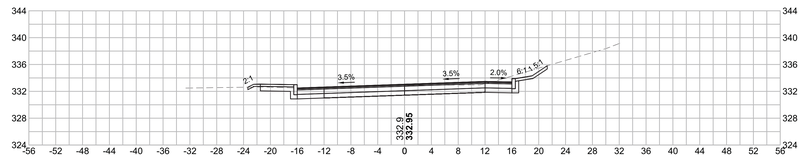
**WESTFORD**
**BOSTON ROAD**
**15% DESIGN PLANS**
**SHEET 6 OF 9**

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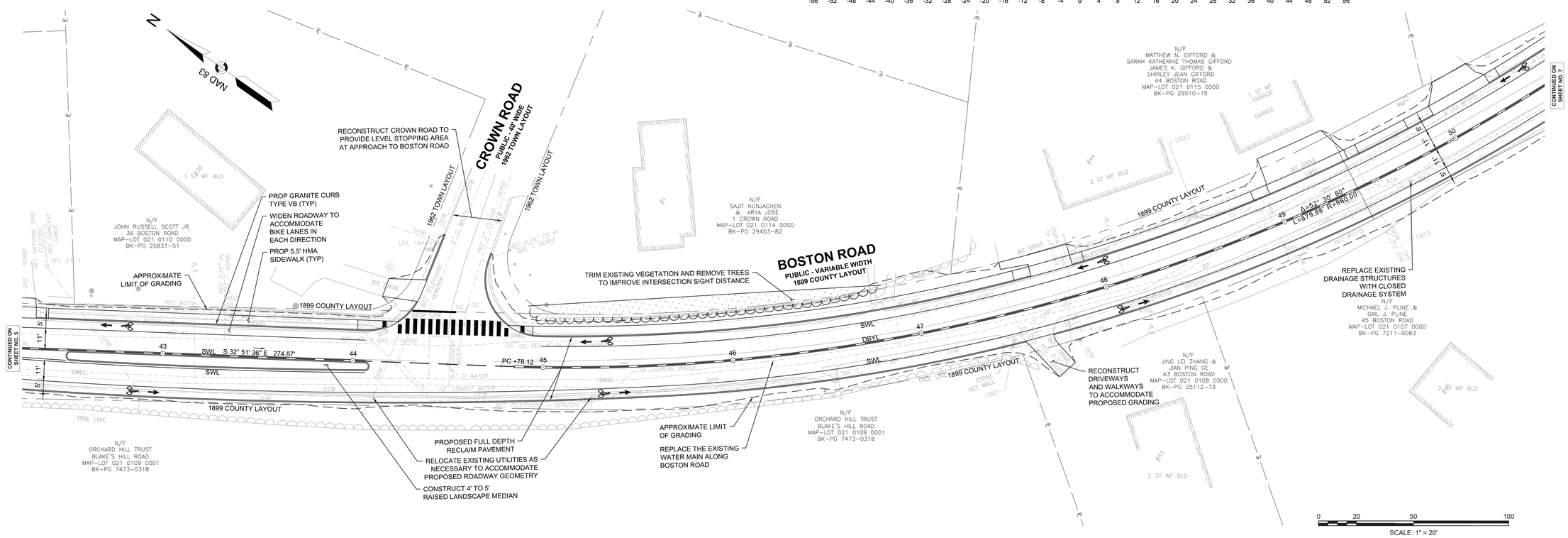
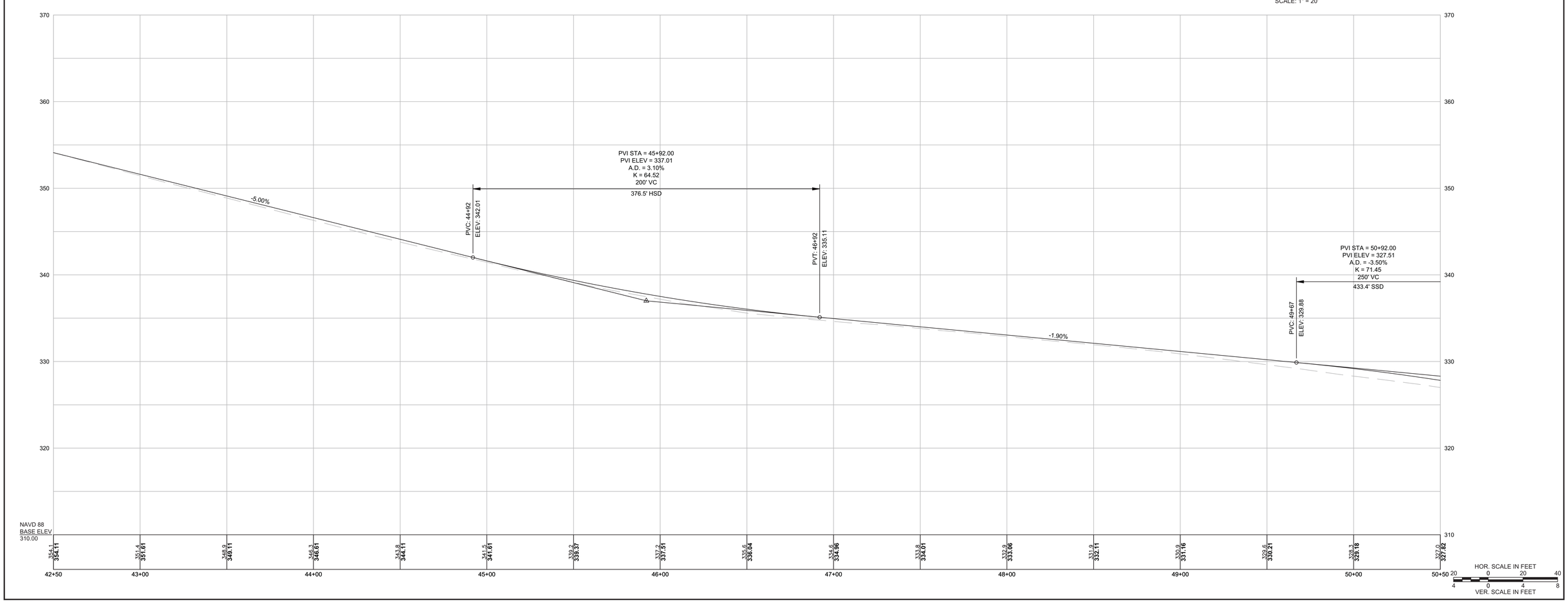
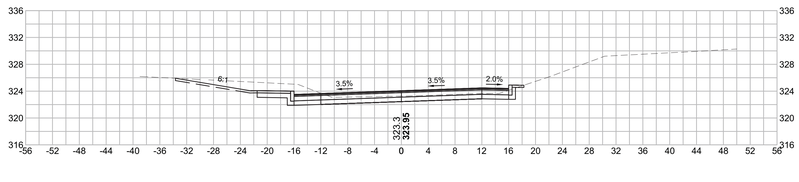
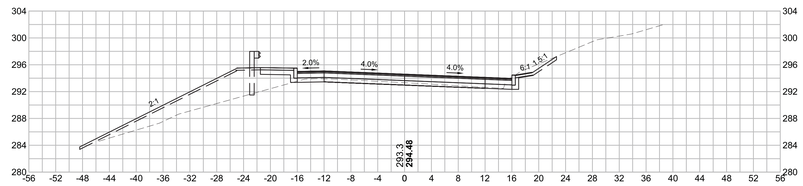


WESTFORD
BOSTON ROAD
15% DESIGN PLANS
SHEET 7 OF 9

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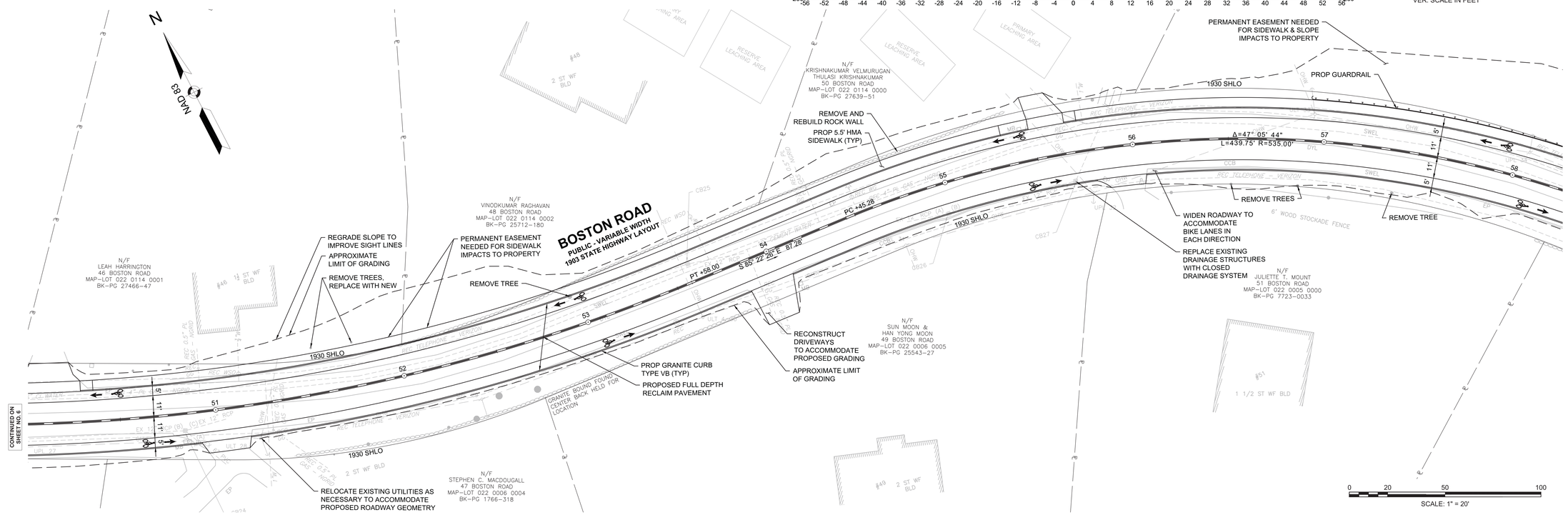
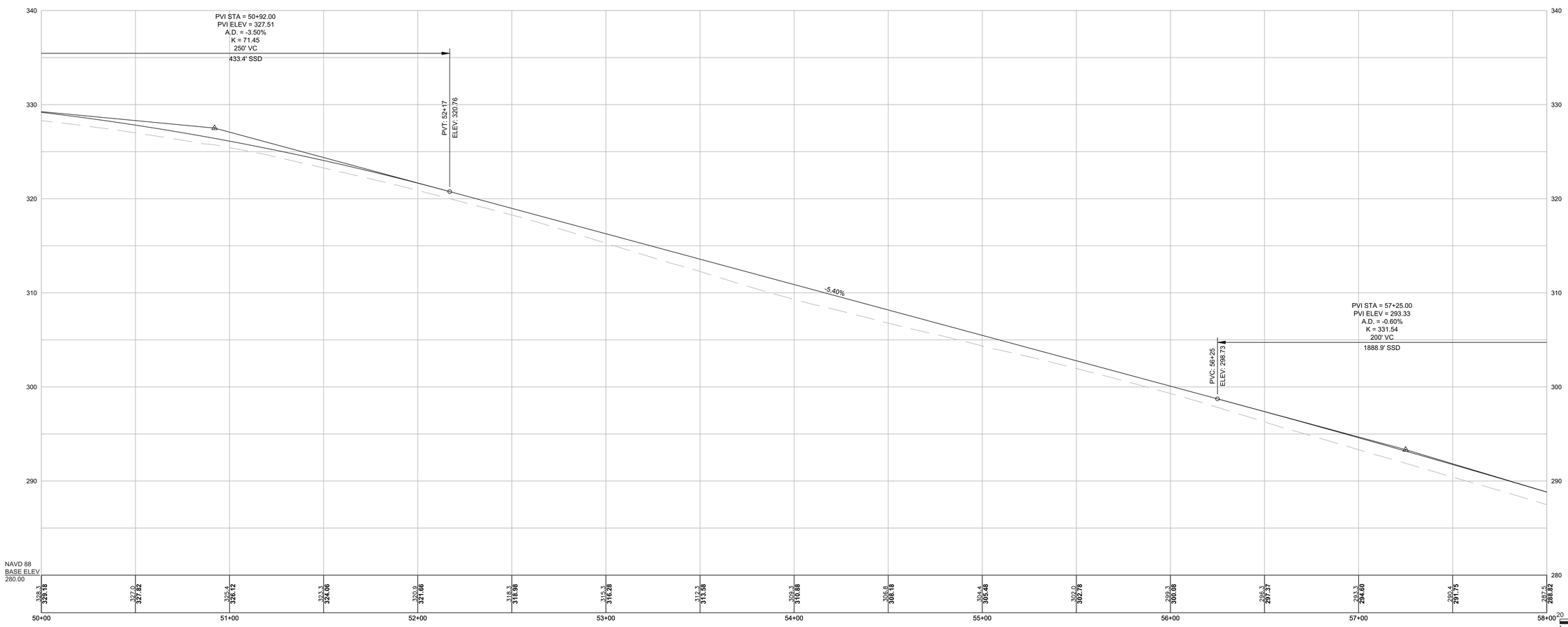
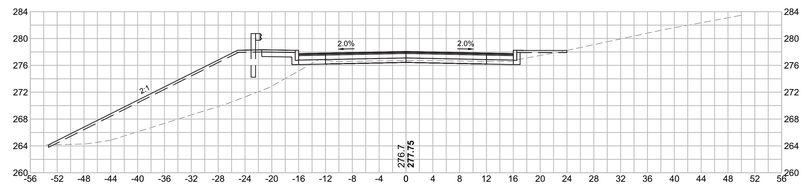
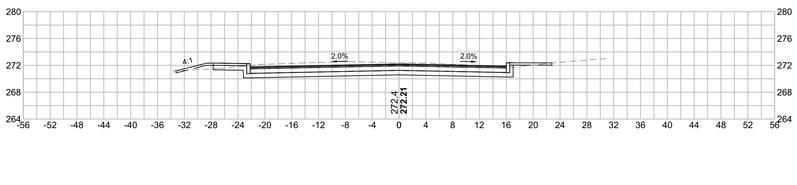


WESTFORD
BOSTON ROAD
15% DESIGN PLANS
SHEET 8 OF 9

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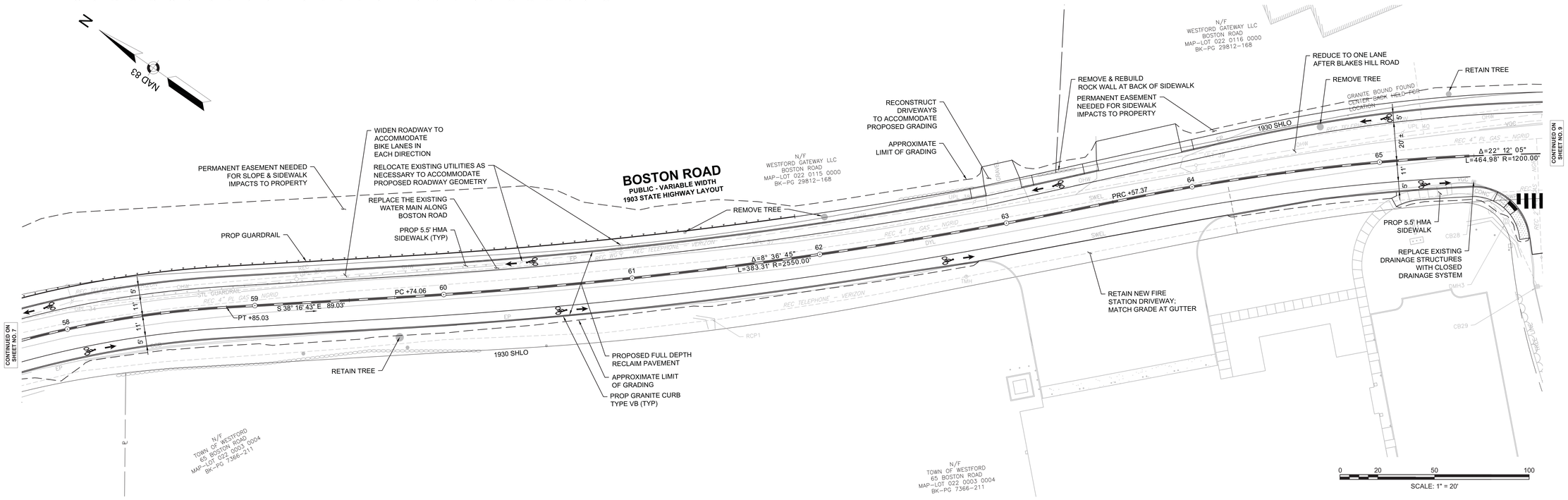
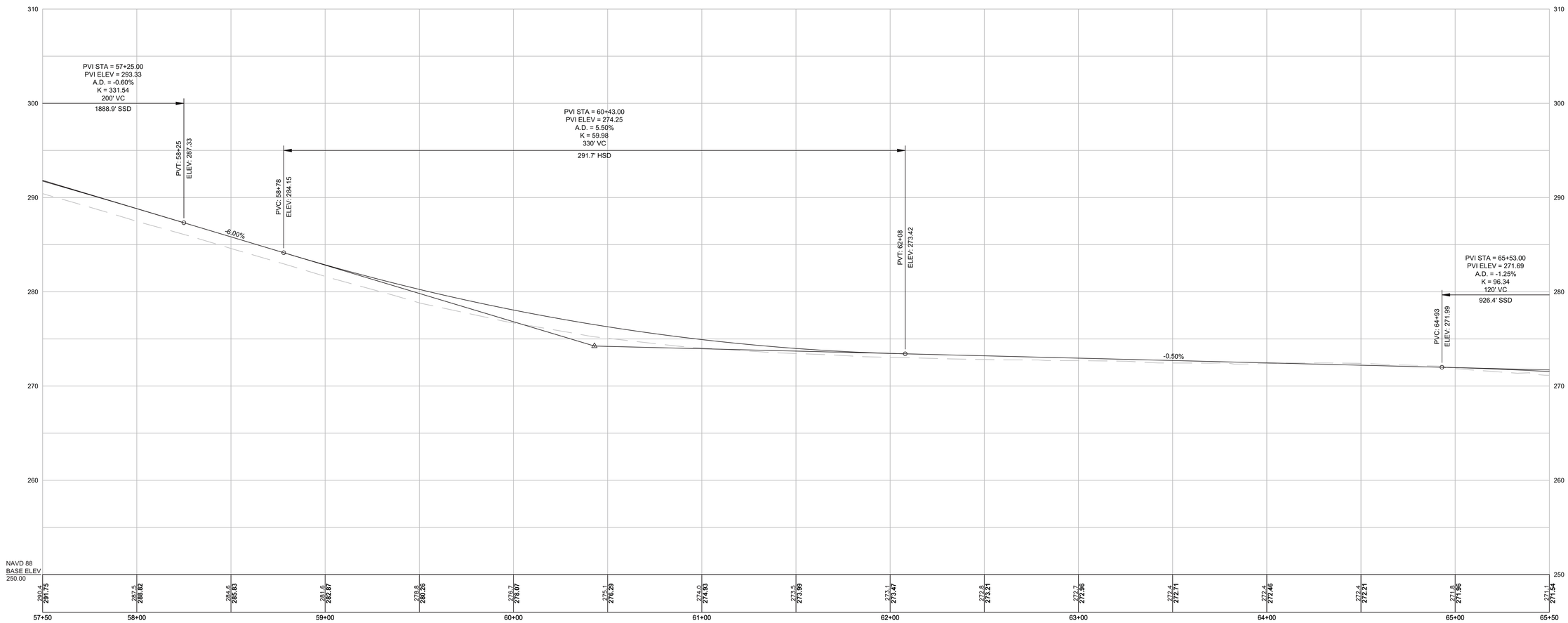
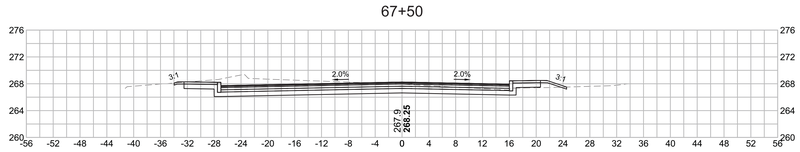
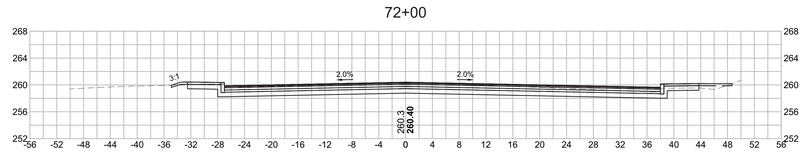


WESTFORD
BOSTON ROAD
15% DESIGN PLANS
SHEET 9 OF 9

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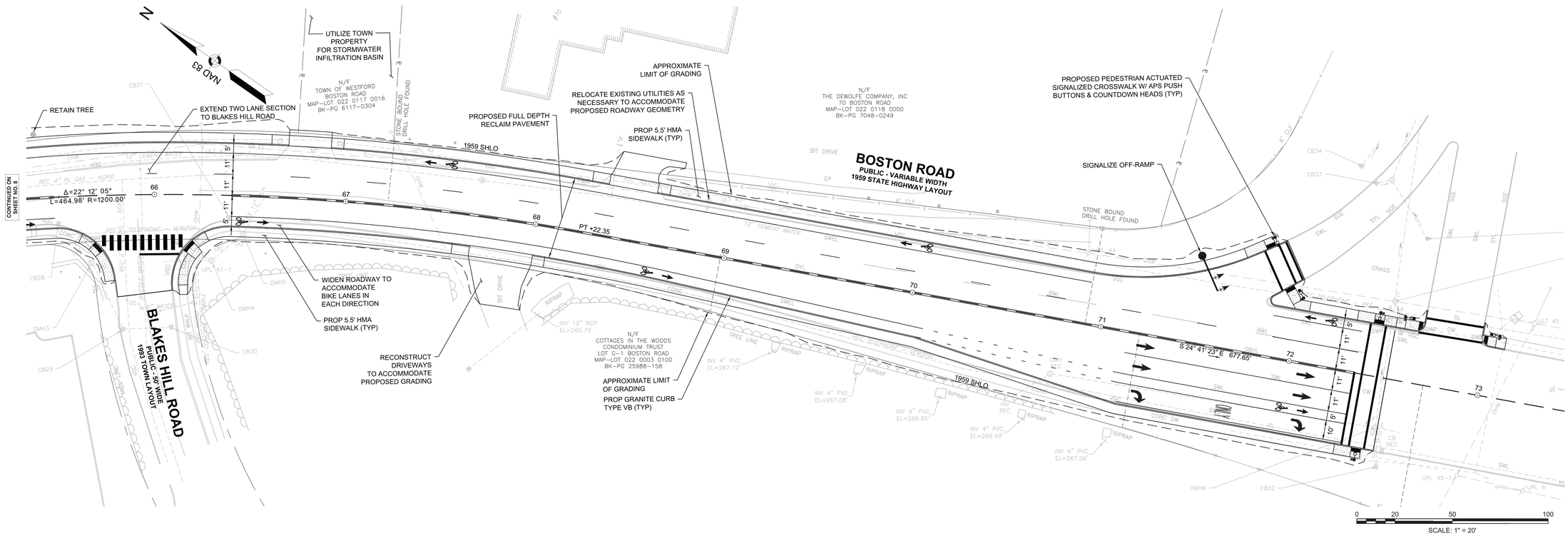
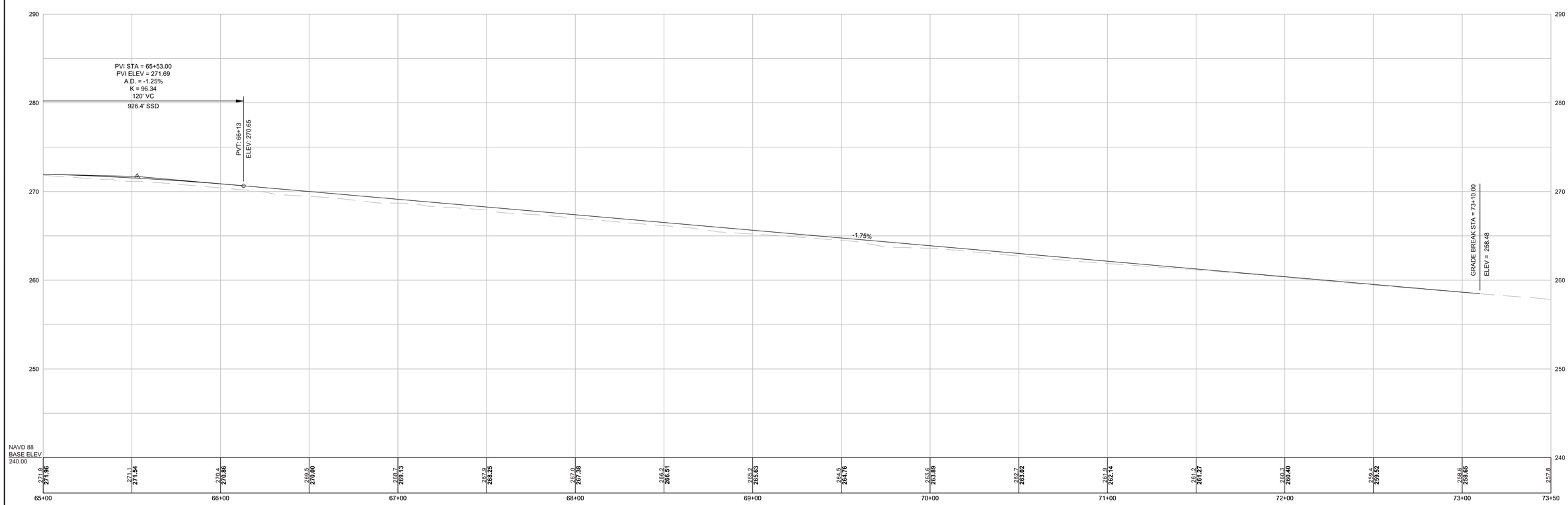
VER. SCALE IN FEET




HOR. SCALE IN FEET
VER. SCALE IN FEET