

TRANSPORTATION IMPROVEMENT PROJECT

PLAN OF
PLAIN ROAD SIDEWALK

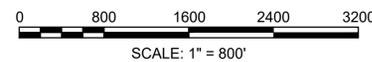
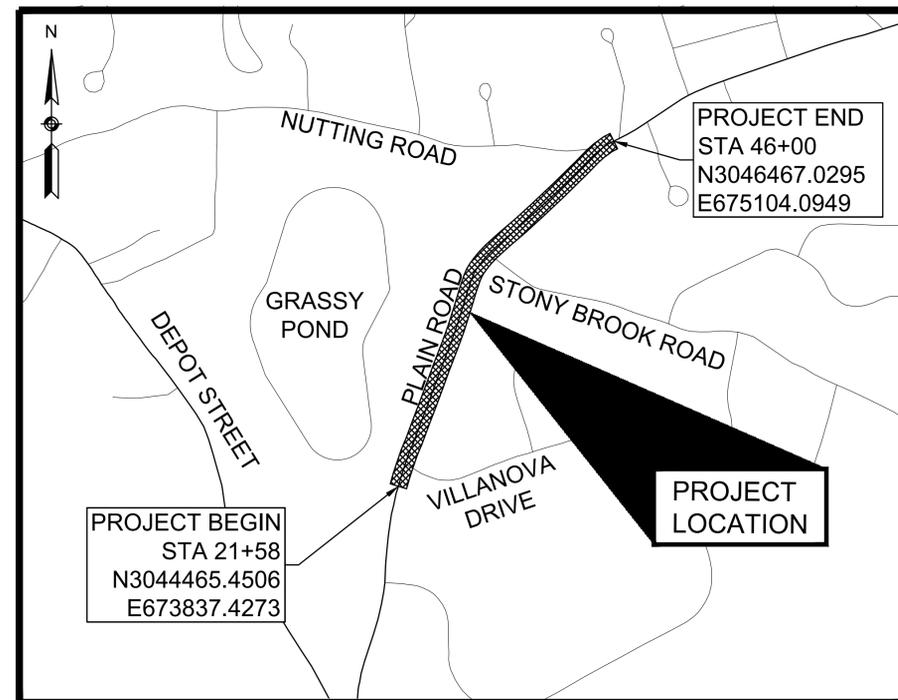
IN THE TOWN OF
WESTFORD
MIDDLESEX COUNTY

WESTFORD
PLAIN ROAD SIDEWALK
TITLE SHEET & INDEX
SHEET 1 OF 34

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2021, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED SEPTEMBER 30, 2021, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH 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.

50% DESIGN PLANS

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18-34	CROSS SECTIONS



LENGTH OF PROJECT = 2,442 FEET = 0.463 MILES

DATE	DESCRIPTION	REV #
11/19/2021	50% DESIGN PLANS	-

TEC
The Engineering Corp.

TEC, Inc.

146 Dascomb Road Andover, MA 01810 978-794-1792	311 Main Street 2nd Floor Worcester, MA 01608 508-868-5104	169 Ocean Blvd, Unit 3 PO Box 249 Hampton, NH 03842 603-601-8154
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GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN OR GUTTER INLET
		CATCH BASIN OR GUTTER INLET W/ CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W/ 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		WATER SHUTOFF/CURB STOP
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE
		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
		SEDIMENT CONTROL BARRIER
		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
		LIMIT OF DEMOLITION
		ABANDON EXIST DRAIN LINE

TRAFFIC SYMBOLS

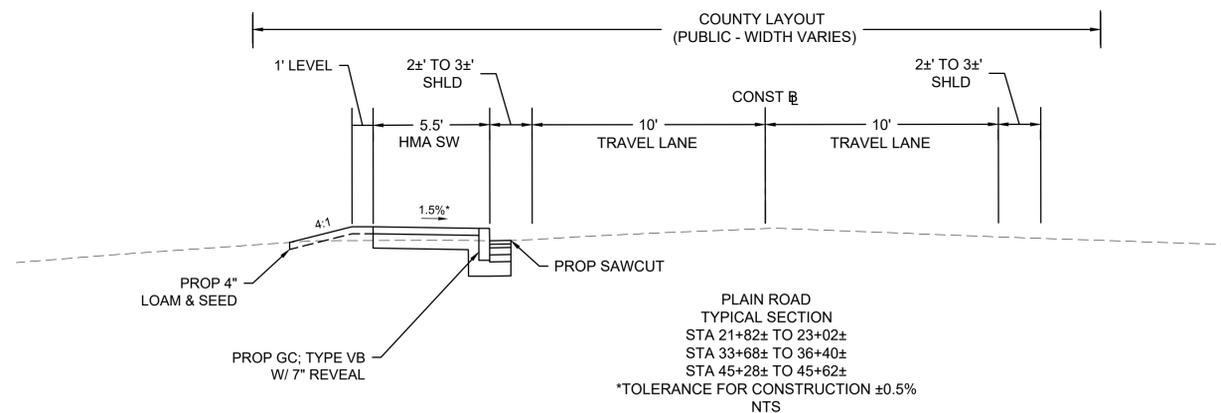
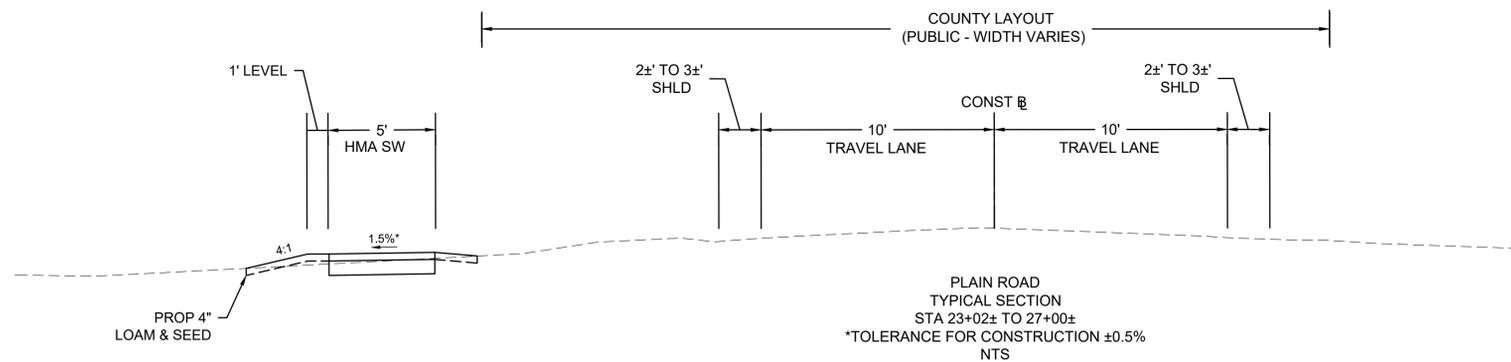
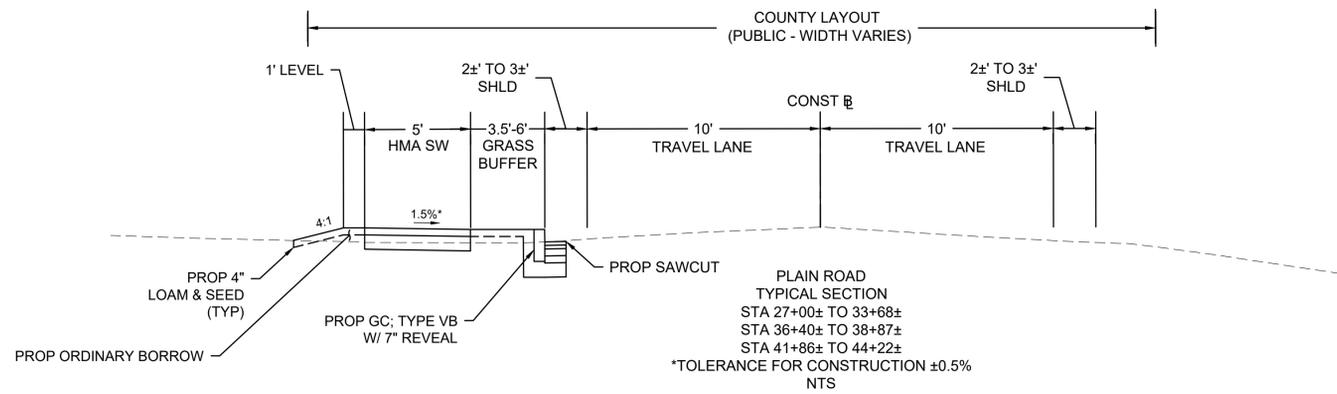
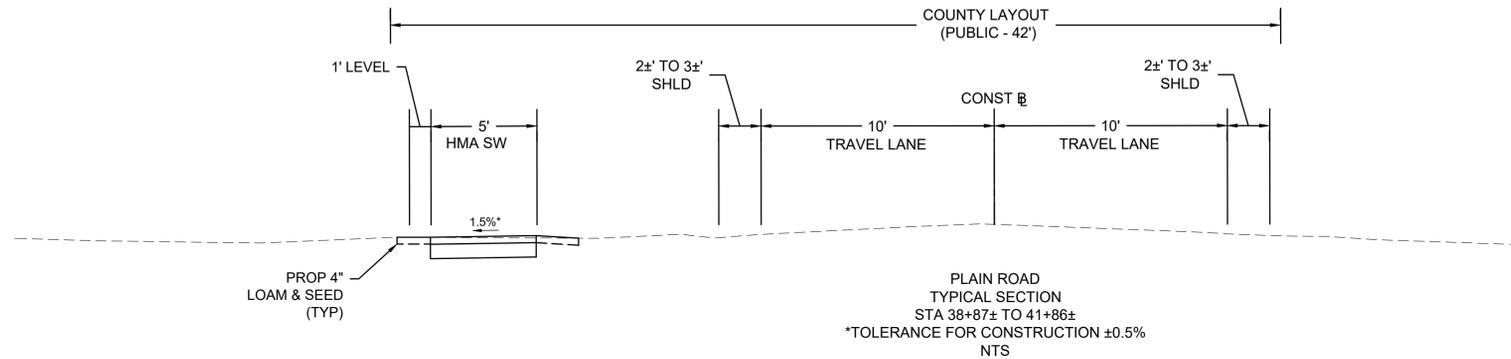
EXISTING	PROPOSED	DESCRIPTION
		TRAFFIC SIGN (1 POST)
		TRAFFIC SIGN (2 POST)

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND "ONLY" - WHITE
		BIKE LANE LEGEND - WHITE
		STOP LINE
		CROSSWALK
		SOLID WHITE LINE
		SOLID YELLOW LINE
		BROKEN WHITE LINE
		BROKEN YELLOW LINE
		6" DOTTED WHITE LINE (3' LINE W/ 9' GAP)
		6" DOTTED YELLOW LINE (3' LINE W/ 9' GAP)
		6" DOTTED WHITE LINE EXTENSION (2' LINE W/ 6' GAP)
		6" DOTTED YELLOW LINE EXTENSION (2' LINE W/ 6' GAP)
		DOUBLE WHITE LINE
		DOUBLE YELLOW LINE
		12" YELLOW GORE LINE (3:1, 10' O.C.)

ABBREVIATIONS

GENERAL		ABBREVIATIONS (cont.)
AADT	ANNUAL AVERAGE DAILY TRAFFIC	PT POINT OF TANGENCY
ABAN	ABANDON	PVC POINT OF VERTICAL CURVATURE
ADJ	ADJUST	PVI POINT OF VERTICAL INTERSECTION
APPROX.	APPROXIMATE	PVT POINT OF VERTICAL TANGENCY
A.C.	ASPHALT CONCRETE	PVMT PAVEMENT
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	PWW PAVED WATERWAY
BIT.	BITUMINOUS	R RADIUS OF CURVATURE
BB	BITUMINOUS BERM	R&D REMOVE AND DISPOSE
BC	BOTTOM OF CURB	RCP REINFORCED CONCRETE PIPE
BD.	BOUND	RD ROAD
BL	BASELINE	RDWY ROADWAY
BLDNG	BUILDING	REM REMOVE
BM	BENCHMARK	RET RETAIN
BO	BY OTHERS	RET WALL RETAINING WALL
BOS	BOTTOM OF SLOPE	ROW RIGHT OF WAY
BR.	BRIDGE	RR RAILROAD
CB	CATCH BASIN	RRFB RECTANGULAR RAPID FLASHING BEACON
CBCI	CATCH BASIN WITH CURB INLET	R&R REMOVE AND RESET
CC	CEMENT CONCRETE	R&S REMOVE AND STACK
CCM	CEMENT CONCRETE MASONRY	RT RIGHT
CEM	CEMENT	SB STONE BOUND
CI	CURB INLET	SGE SLOPED GRANITE EDGING
CIP	CAST IRON PIPE	SHLD SHOULDER
CLF	CHAIN LINK FENCE	SMH SEWER MANHOLE
CL	CENTERLINE	ST STREET
CMP	CORRUGATED METAL PIPE	STA STATION
CSP	CORRUGATED STEEL PIPE	SSD STOPPING SIGHT DISTANCE
CO.	COUNTY	SHLO STATE HIGHWAY LAYOUT LINE
CONC	CONCRETE	SW SIDEWALK
CONT	CONTINUOUS	T TANGENT DISTANCE OF CURVE/TRUCK %
CONST	CONSTRUCTION	TAN TANGENT
CR GR	CROWN GRADE	TEMP TEMPORARY
DHV	DESIGN HOURLY VOLUME	TE-X TEMPORARY EASEMENT
DI	DROP INLET	TC TOP OF CURB
DIA	DIAMETER	TOS TOP OF SLOPE
DIP	DUCTILE IRON PIPE	TYP TYPICAL
DW	STEADY DON'T WALK - PORTLAND ORANGE	UP UTILITY POLE
DWP	DETECTABLE WARNING PANEL	VAR VARIES
DWY	DRIVEWAY	VERT VERTICAL
ELEV (or EL.)	ELEVATION	VC VERTICAL CURVE
EMB	EMBANKMENT	WCR WHEEL CHAIR RAMP
EOP	EDGE OF PAVEMENT	WG WATER GATE
EXIST (or EX)	EXISTING	WIP WROUGHT IRON PIPE
EXC	EXCAVATION	WM WATER METER/WATER MAIN
E-X	PERMANENT EASEMENT	X-SECT CROSS SECTION
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	



PAVEMENT NOTES

PROPOSED CEMENT CONCRETE SIDEWALKS / WALKWAYS / CURB RAMPS

SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED, 4000 PSI, 3/4", 610)

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED HMA SIDEWALK

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER
1 1/4" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE DRIVEWAYS

SURFACE: 6" CEMENT CONCRETE (AIR ENTRAINED, 4000 PSI, 3/4", 610)

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED HMA DRIVEWAY (TO MATCH EXISTING)

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE 9.5 (SSC - 9.5) OVER
2 1/2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC - 12.5) OVER

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

PROPOSED PERMANENT PAVEMENT TRENCH PATCH

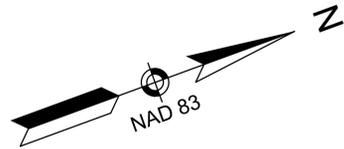
SURFACE: VARIABLE DEPTH HMA FOR PATCHING TO MATCH
EXISTING PAVEMENT PER SECTION 450.53
(COMPACTED IN 2" (MAX) LIFTS TO MATCH EXIST PAVEMENT
THICKNESS OR TO A MIN DEPTH OF 7")

BASE: 8" GRAVEL BORROW, TYPE b OVER

SUBBASE: EXISTING MATERIAL SUITABLE FOR RE-USE (SEE VARIOUS TRENCH DETAILS)

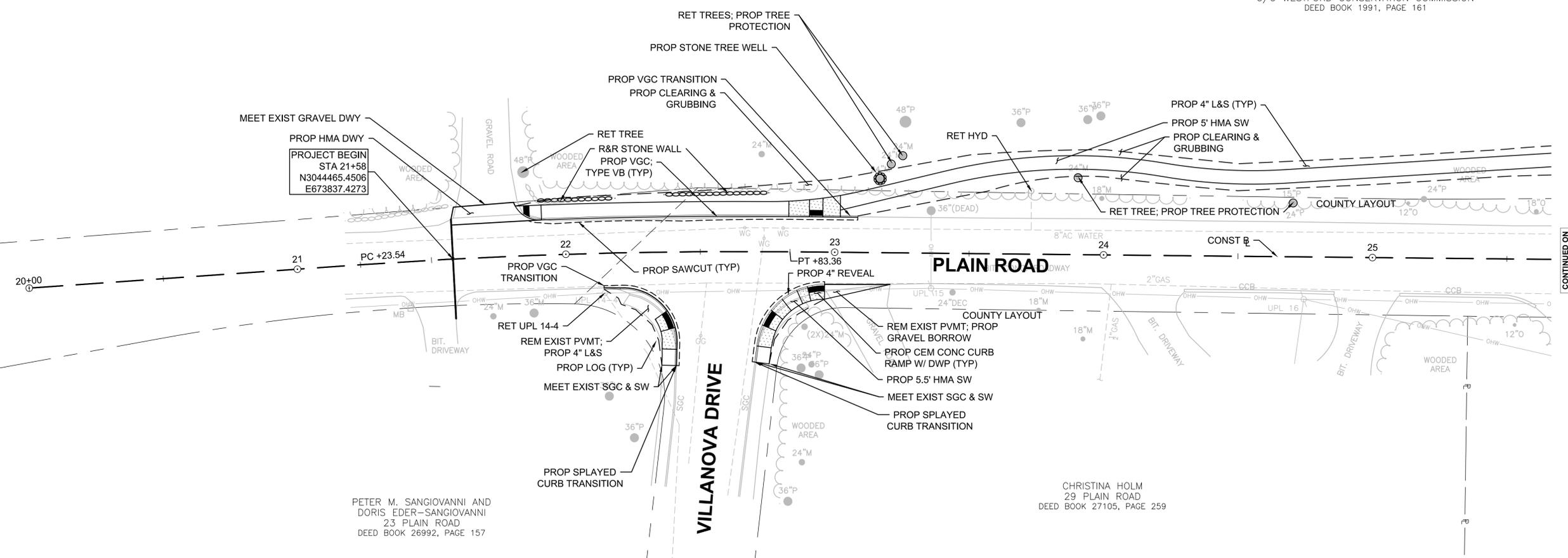
GENERAL PAVEMENT NOTES:

1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND HMA JOINT SEALANT SHALL BE APPLIED ON SAWCUT JOINTS BEFORE PAVING. HMA JOINT SEALANT SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED IN ACCORDANCE WITH SUBSECTION 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 460.
3. ASPHALT EMULSION FOR TACK COAT SHALL BE ANIONIC EMULSION GRADE RS-1H TO RESIST TRACKING OF TACK BY HAUL VEHICLES.
4. HMA FOR WALKS AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH SECTION 702.
5. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED. CONTRACTOR SHALL PROVIDE TEST RESULT SUBMITTALS TO THE ENGINEER FOR APPROVAL.



GRASSY POND

TOWN OF WESTFORD
C/O WESTFORD CONSERVATION COMMISSION
DEED BOOK 1991, PAGE 161



PROJECT BEGIN
STA 21+58
N3044465.4506
E673837.4273

PETER M. SANGIOVANNI AND
DORIS EDER-SANGIOVANNI
23 PLAIN ROAD
DEED BOOK 26992, PAGE 157

CHRISTINA HOLM
29 PLAIN ROAD
DEED BOOK 27105, PAGE 259

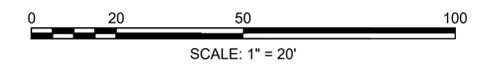
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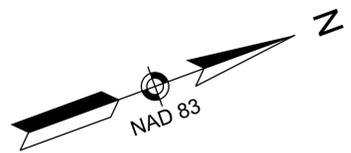
CONSTRUCTION NOTES:

- EXISTING CONDITIONS INFORMATION COMPILED FROM AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY HANCOCK ASSOCIATES. IN MAY, 2021.

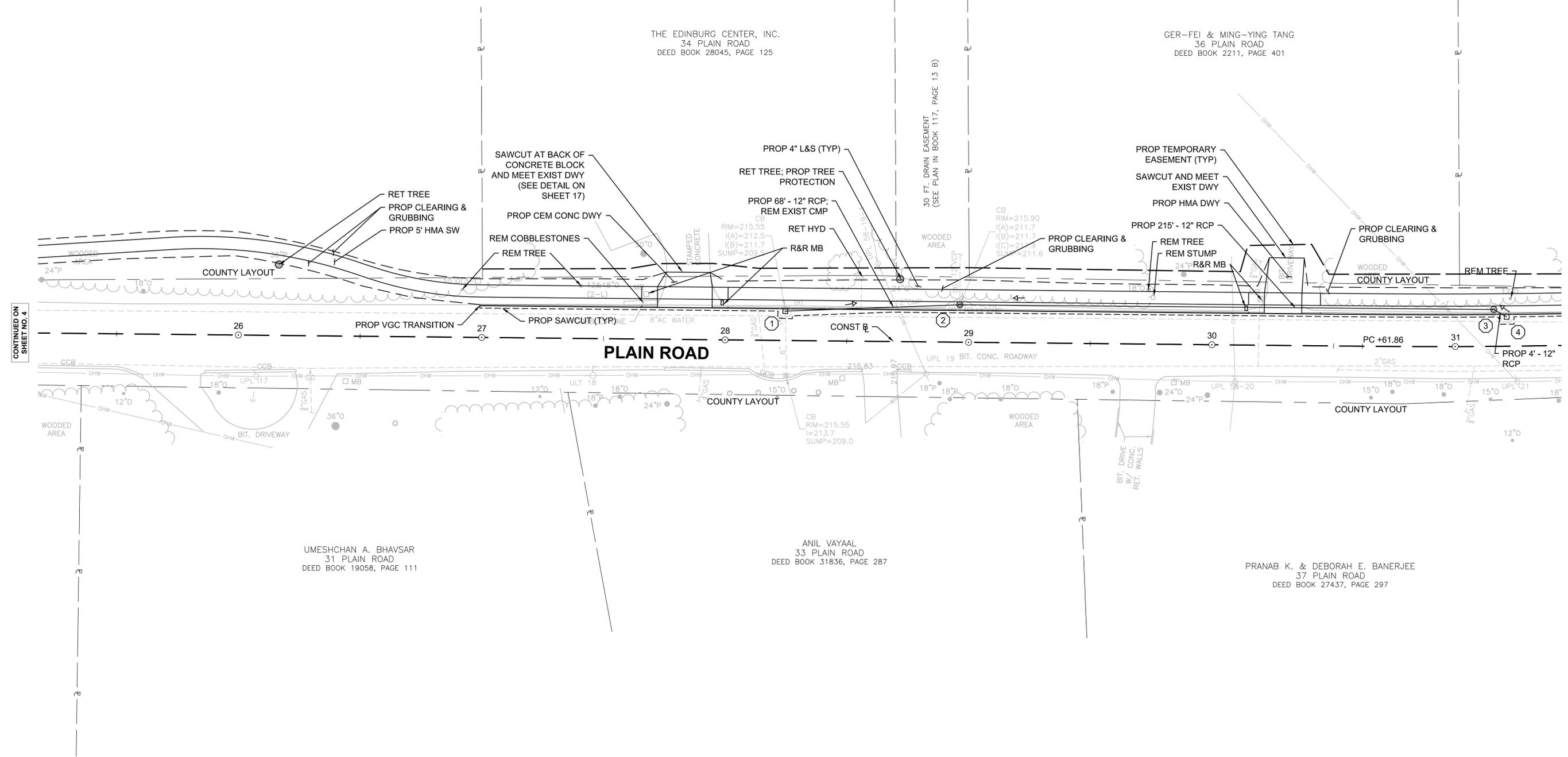
HORIZONTAL DATUM = NAD83 (MASSACHUSETTS STATE PLANE COORDINATES)
VERTICAL DATUM = NAVD88
- ALL EXISTING STATE, COUNTY, AND TOWN LOCATION LINES HAVE BEEN ESTABLISHED FROM AN ACTUAL ON-THE-GROUND SURVEY. ALL PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL CONTACT DIGSAFE (1-888-DIGSAFE) A MINIMUM OF 72 HOURS PRIOR TO ANY CONSTRUCTION TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
- 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.
- 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.

- ALL DISTURBED AREAS OUTSIDE THE CURBLINE SHALL BE STABILIZED WITH 4" LOAM AND SEED, UNLESS OTHERWISE NOTED.
- THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.
- 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 DIRECTED BY THE ENGINEER.
- AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 3'-0" (EXCLUDING THE WIDTH OF CURB) SHALL BE MAINTAINED PAST ALL OBSTRUCTIONS (UTILITY POLES, LIGHT POLES, SIGNS, MAILBOXES, ALONG DRIVEWAY OPENINGS, ETC.)
- DETECTABLE WARNING PANELS ARE REQUIRED ON ALL PROPOSED WHEELCHAIR RAMP AND SHALL BE INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARDS. PANELS SHALL BE BRICK RED.
- PROPOSED SIDEWALK MEASUREMENTS ADJACENT TO CURBING ARE MEASURED FROM THE FACE OF CURB, AND INCLUDE THE 6" CURB WIDTH.
- CURB REVEAL SHALL BE 7" UNLESS OTHERWISE NOTED.



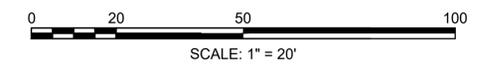


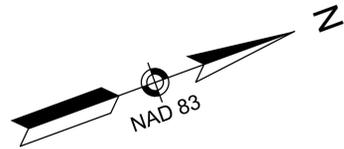
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②	PROP CIT						
③	PROP DMH						
④	PROP CBCI						



CONTINUED ON
SHEET NO. 3

CONTINUED ON
SHEET NO. 6





PROPOSED DRAINAGE STRUCTURE DATA							
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⑤	PROP CBCI						

MICHAEL J. JASINSKI
38 PLAIN ROAD
DEED BOOK 7640, PAGE 139

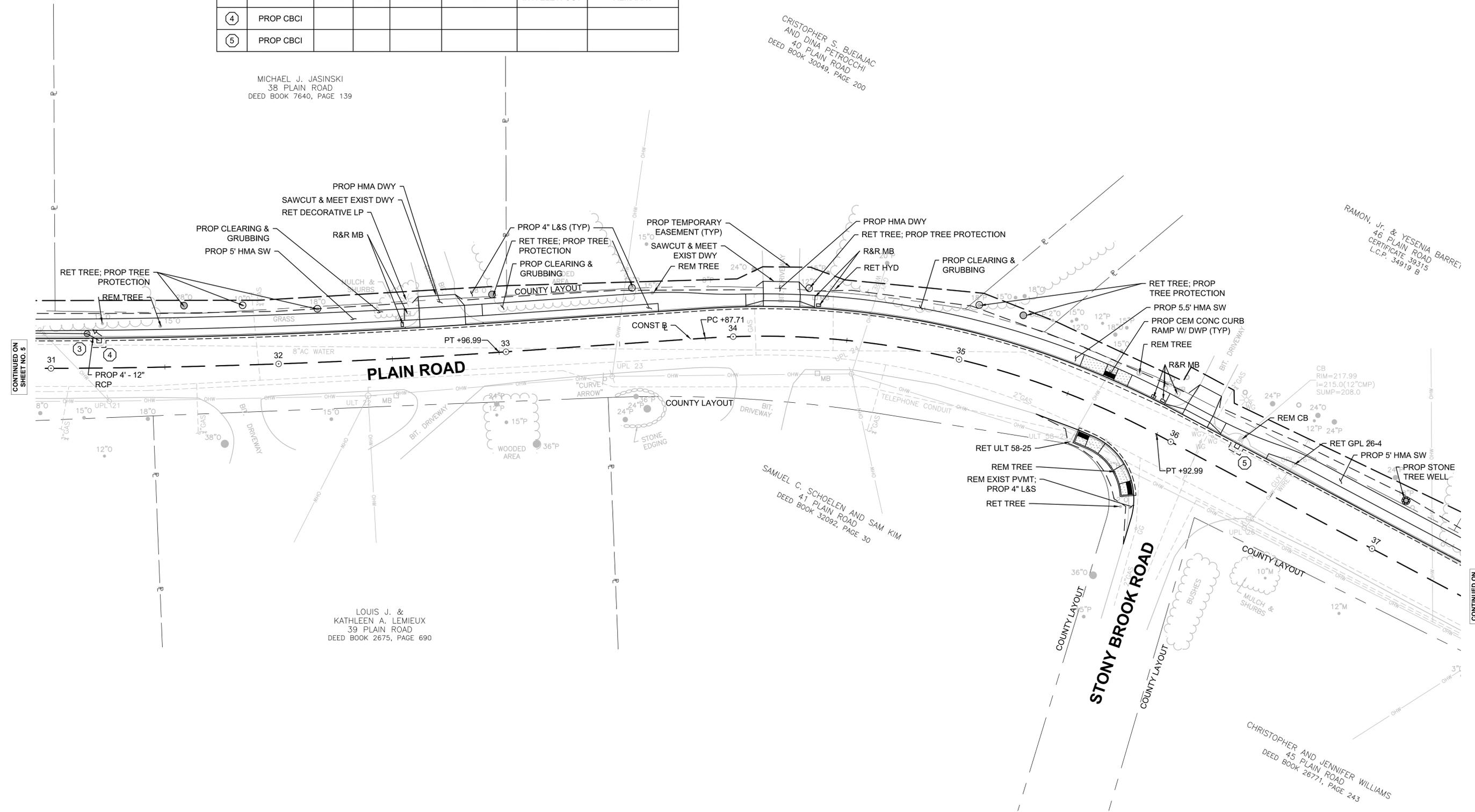
CRISTOPHER S. BUEIAJAC
AND DINA PETROCCHI
40 PLAIN ROAD
DEED BOOK 30049, PAGE 200

RAMON, JR. & YESENIA BARREI
46 PLAIN ROAD
CERTIFICATE 39315
L.C.P. 34919 B

SAMUEL C. SCHOELEN AND SAM KIM
41 PLAIN ROAD
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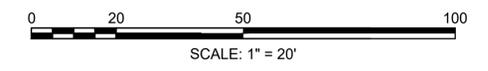
LOUIS J. &
KATHLEEN A. LEMIEUX
39 PLAIN ROAD
DEED BOOK 2675, PAGE 690

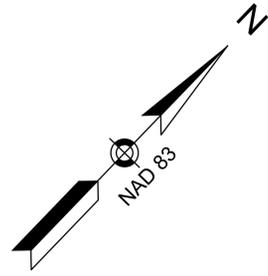
CHRISTOPHER AND JENNIFER WILLIAMS
45 PLAIN ROAD
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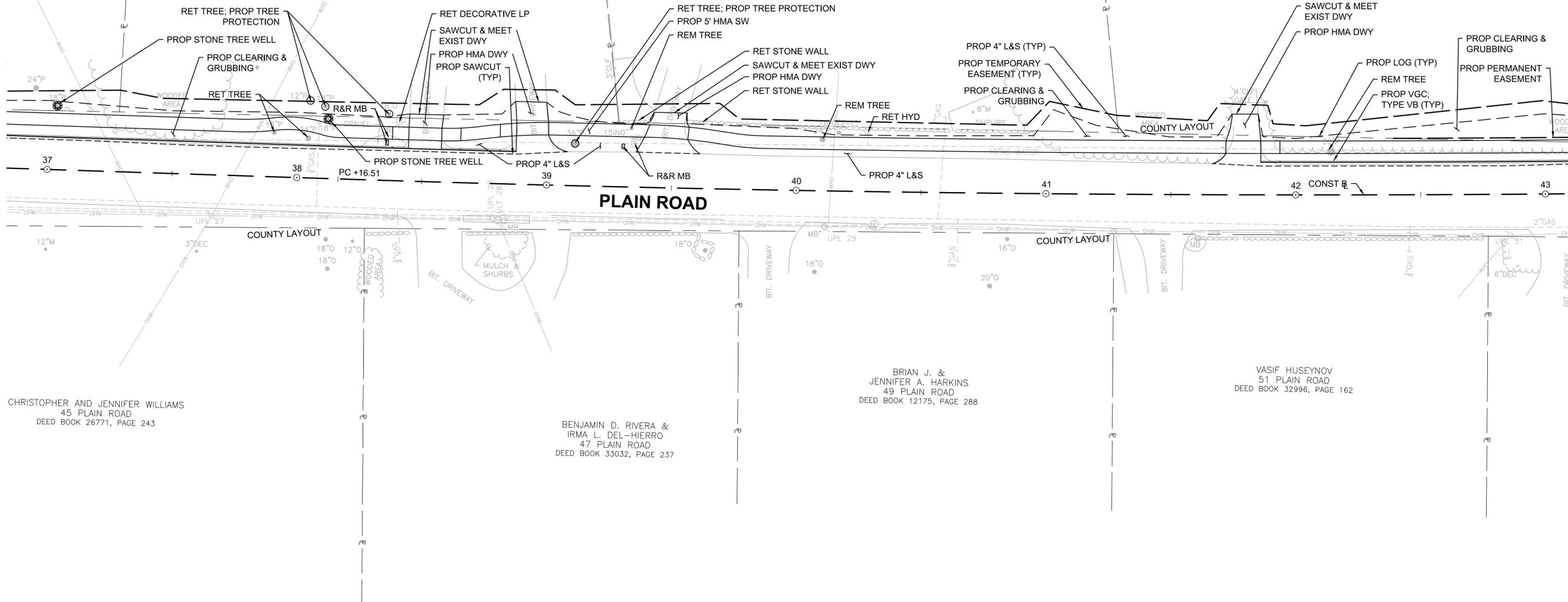




THOMAS & THERESA MORIARTY FAMILY TRUST
48 PLAIN ROAD
CERTIFICATE 45193
L.C.P. 34919 B

RICHARD Z. & PATRICIA M. KARADIZIAN
50 PLAIN ROAD
CERT 32272
L.C.P. 34919 B

DANIEL J DIGIOVINE
6 NUTTING ROAD
CERTIFICATE 41635
L.C.P. 34919 B



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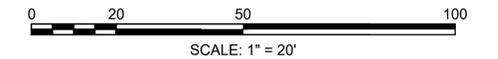
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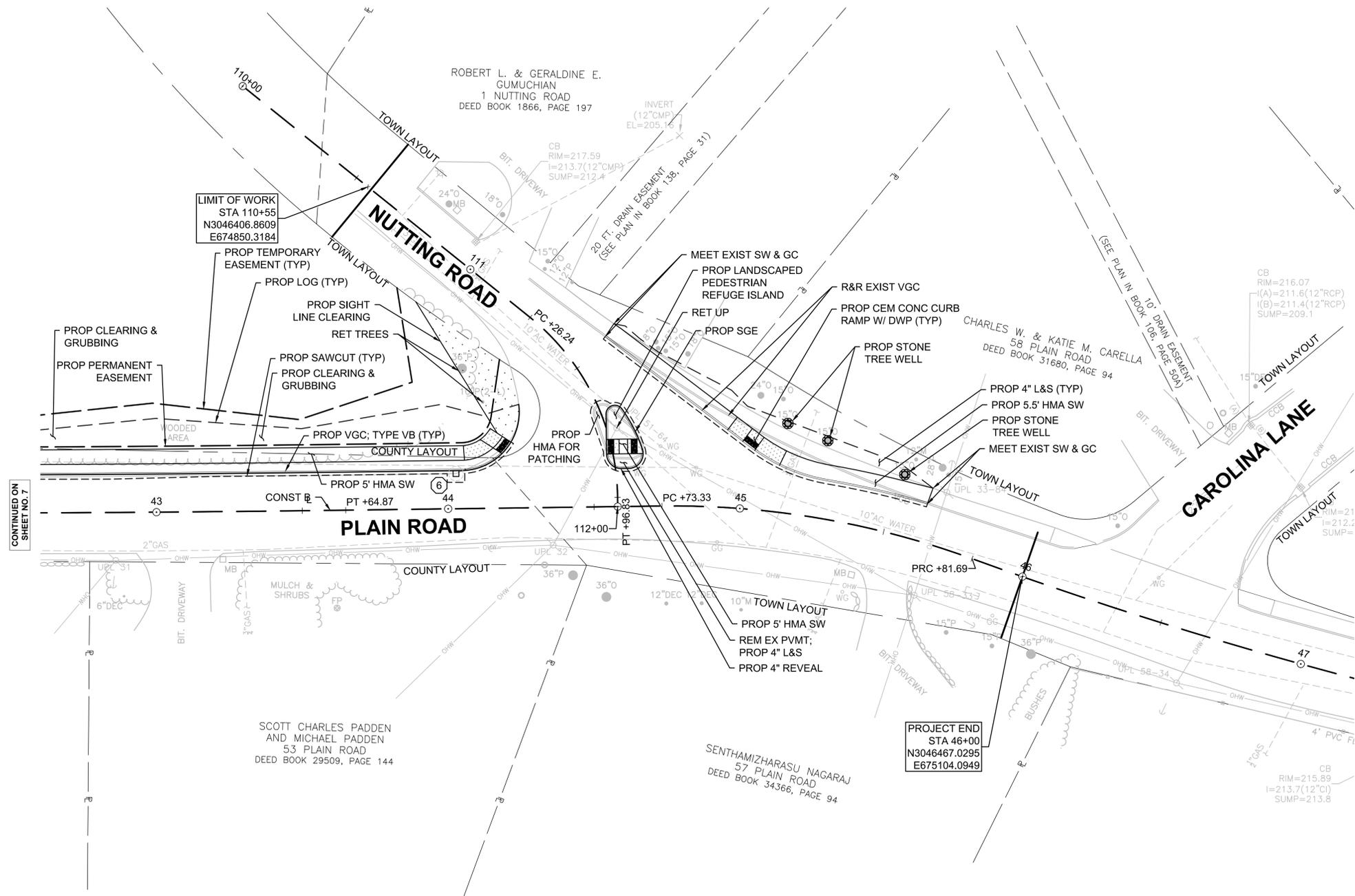
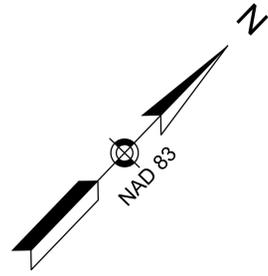
CHRISTOPHER AND JENNIFER WILLIAMS
45 PLAIN ROAD
DEED BOOK 26771, PAGE 243

BENJAMIN D. RIVERA &
IRMA L. DEL-HIERRO
47 PLAIN ROAD
DEED BOOK 33032, PAGE 237

BRIAN J. &
JENNIFER A. HARKINS
49 PLAIN ROAD
DEED BOOK 12175, PAGE 288

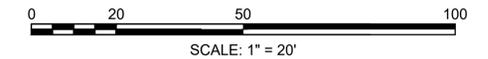
VASIF HUSEYNOV
51 PLAIN ROAD
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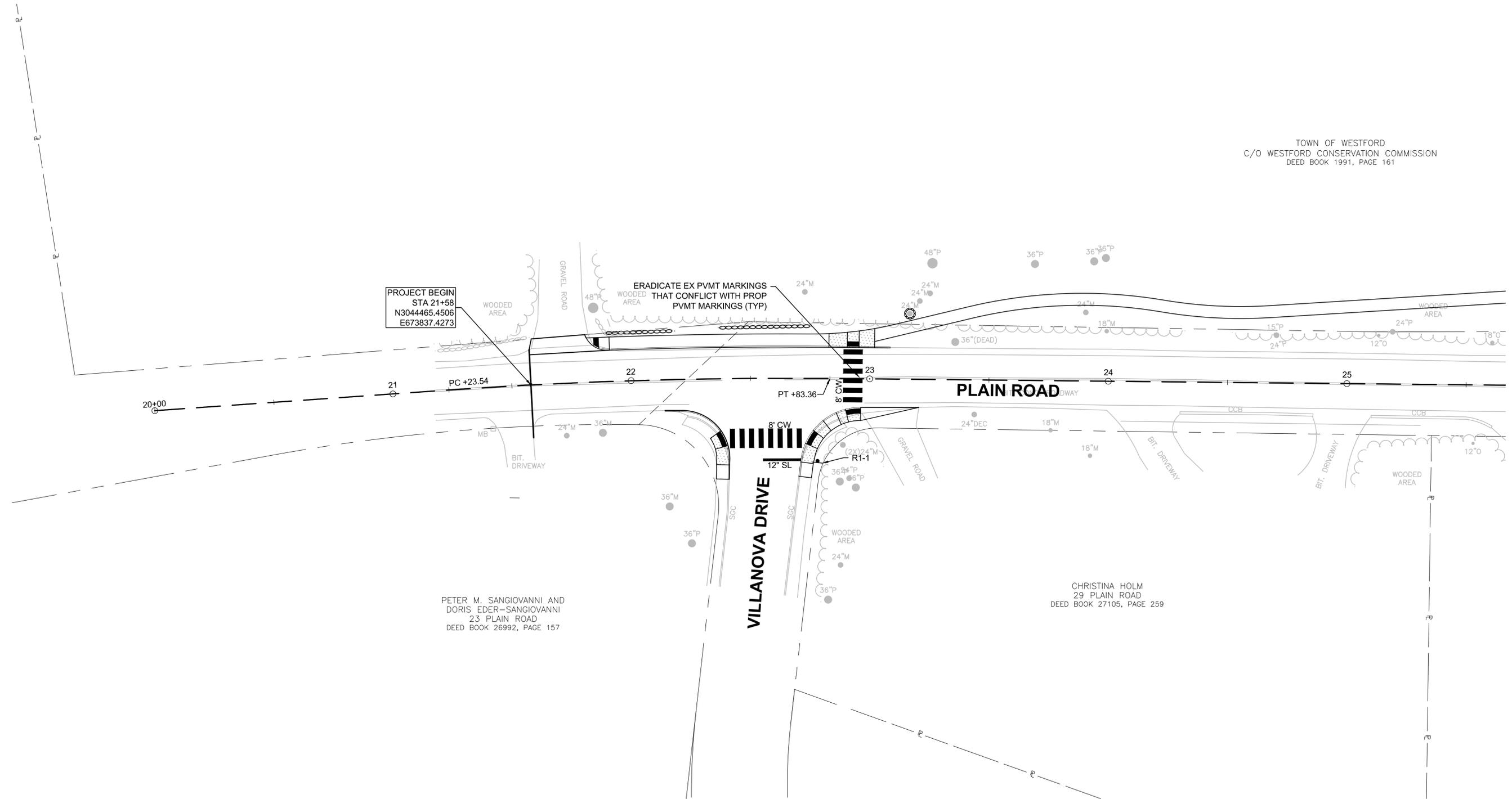
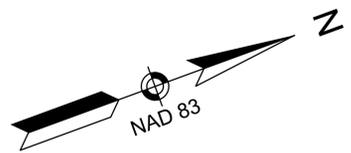


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SHEET NO. 7

PROPOSED DRAINAGE STRUCTURE DATA							
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TOWN OF WESTFORD
 C/O WESTFORD CONSERVATION COMMISSION
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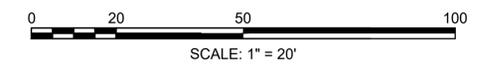


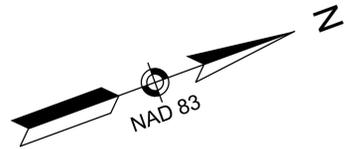
PROJECT BEGIN
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ERADICATE EX PVMT MARKINGS
 THAT CONFLICT WITH PROP
 PVMT MARKINGS (TYP)

PETER M. SANGIOVANNI AND
 DORIS EDER-SANGIOVANNI
 23 PLAIN ROAD
 DEED BOOK 26992, PAGE 157

CHRISTINA HOLM
 29 PLAIN ROAD
 DEED BOOK 27105, PAGE 259





MICHAEL J. JASINSKI
 38 PLAIN ROAD
 DEED BOOK 7640, PAGE 139

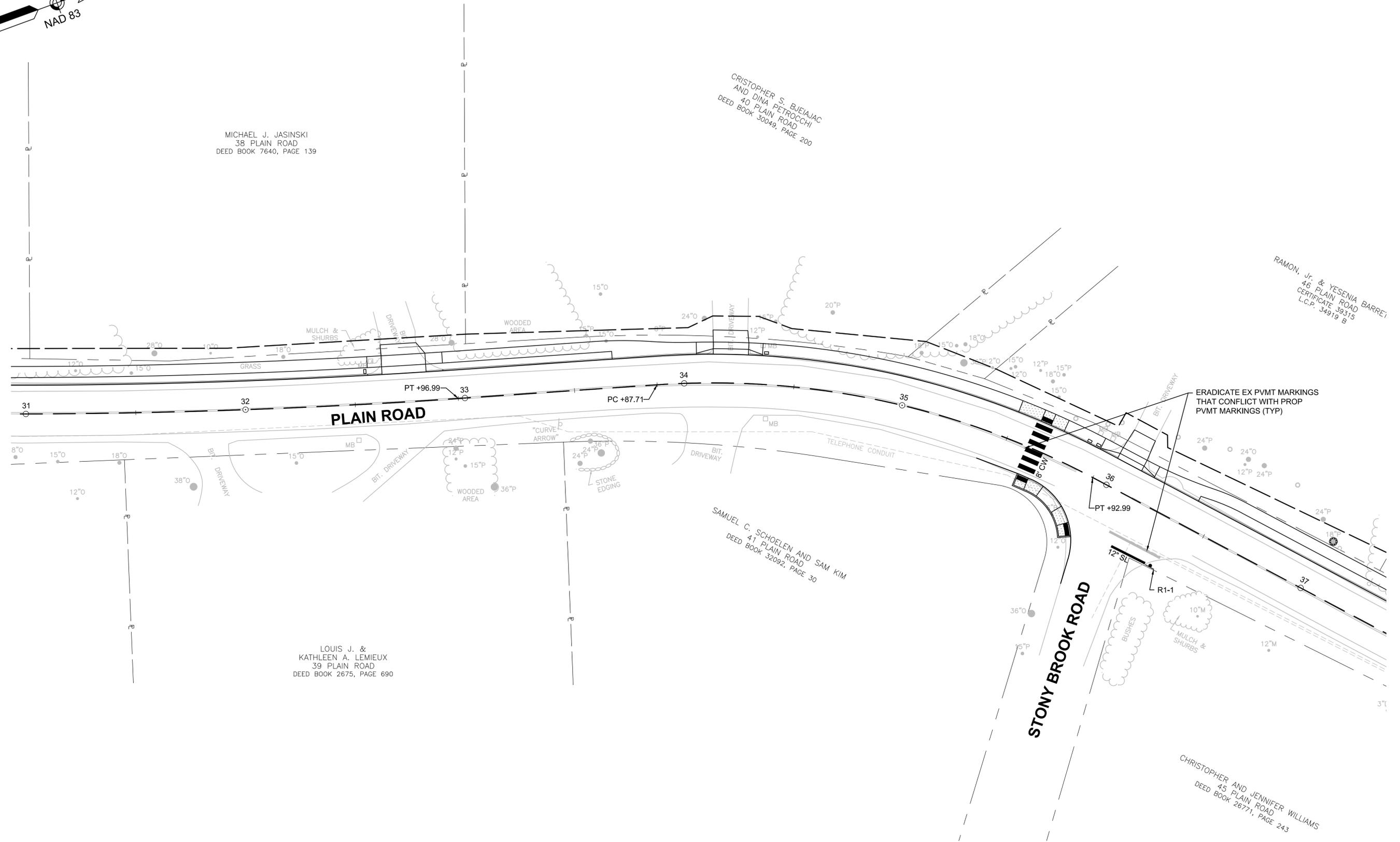
CRISTOPHER S. BJEJAJAC
 AND DINA PETROCCHI
 40 PLAIN ROAD
 DEED BOOK 30049, PAGE 200

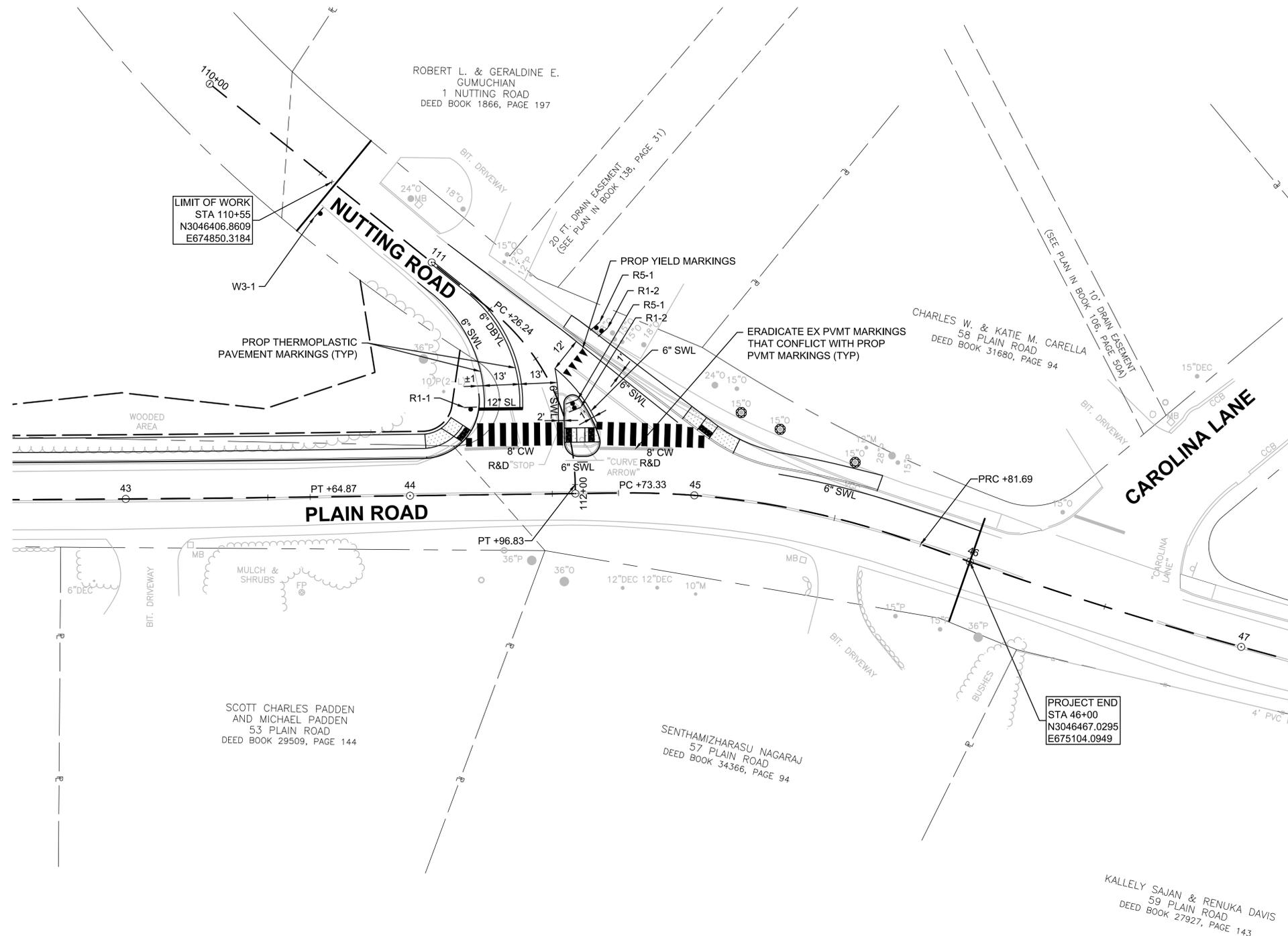
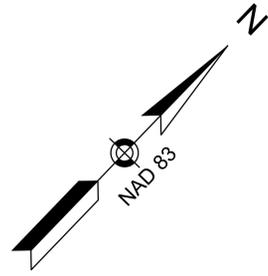
RAMON, JR. & YESENIA BARREI
 46 PLAIN ROAD
 CERTIFICATE 39315
 L.C.P. 34919 B

LOUIS J. &
 KATHLEEN A. LEMIEUX
 39 PLAIN ROAD
 DEED BOOK 2675, PAGE 690

SAMUEL C. SCHOELEN AND SAM KIM
 41 PLAIN ROAD
 DEED BOOK 32092, PAGE 30

CHRISTOPHER AND JENNIFER WILLIAMS
 45 PLAIN ROAD
 DEED BOOK 26771, PAGE 243





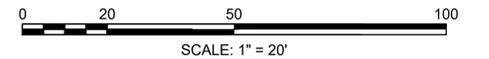
LIMIT OF WORK
 STA 110+55
 N3046406.8609
 E674850.3184

PROJECT END
 STA 46+00
 N3046467.0295
 E675104.0949

SCOTT CHARLES PADDEN
 AND MICHAEL PADDEN
 53 PLAIN ROAD
 DEED BOOK 29509, PAGE 144

SENTHAMIZHARASU NAGARAJ
 57 PLAIN ROAD
 DEED BOOK 34366, PAGE 94

KALLELY SAJAN & RENUKA DAVIS
 59 PLAIN ROAD
 DEED BOOK 27927, PAGE 143



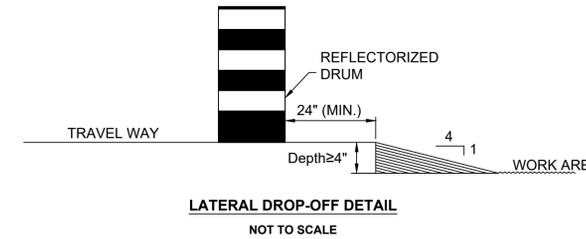
TRAFFIC SIGN SUMMARY													
IDENTIFICATION NUMBER	SIZE OF SIGN (in)		LEGEND	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			SIZE AND NUMBER OF POSTS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK-GROUND	LEGEND	BORDER			
R1-1	30	30			①		3	RED	WHITE	WHITE	P5 3	6.25	18.75
R1-2	30	30					2	RED	WHITE	WHITE	P5 2	3.13	6.25
R5-1	30	30					2	RED	WHITE	WHITE	P5 2	6.25	12.50
W3-1	30	30			↓		1	YELLOW	WHITE/ RED	BLACK	P5 1	6.25	6.25

NOTES:

- SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS FOR TEXT AND LEGEND DIMENSIONS.
- 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.
- A MINIMUM OF 3'-0" PATH OF TRAVEL CLEARANCE, EXCLUDING CURB, IS REQUIRED WHEN PLACING SIGNS.

NOTES:

- ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- 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.
- SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN THE "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
- CONTRACTORS SHALL NOTIFY EACH ADJUTANT AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
- THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A SEQUENTIAL WARNING LIGHTS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- MINIMUM LANE WIDTH IS TO BE 10 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.



LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- ▨ WORK ZONE
- 🚚 WORK VEHICLE
- ➔ DIRECTION OF TRAFFIC
- 🚚 TRUCK MOUNTED ATTENUATOR
- P/F POLICE/FLAGGER DETAIL
- 🚧 TYPE III BARRICADE
- 🚧 IMPACT ATTENUATOR
- ➔ TRAFFIC OR PEDESTRIAN SIGNAL
- 📄 CHANGEABLE MESSAGE SIGN
- 📄 MEDIAN BARRIER
- 📄 MEDIAN BARRIER WITH WARNING LIGHTS
- ➔ ARROW BOARD
- 📄 SIGN

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (I.E. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (I.E. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

R2-10a, R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

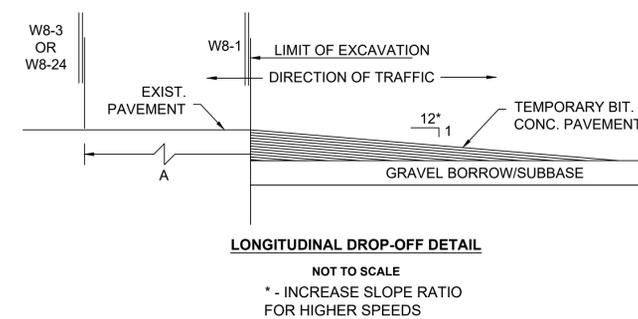
FORMULAS FOR DETERMINING TAPER LENGTHS

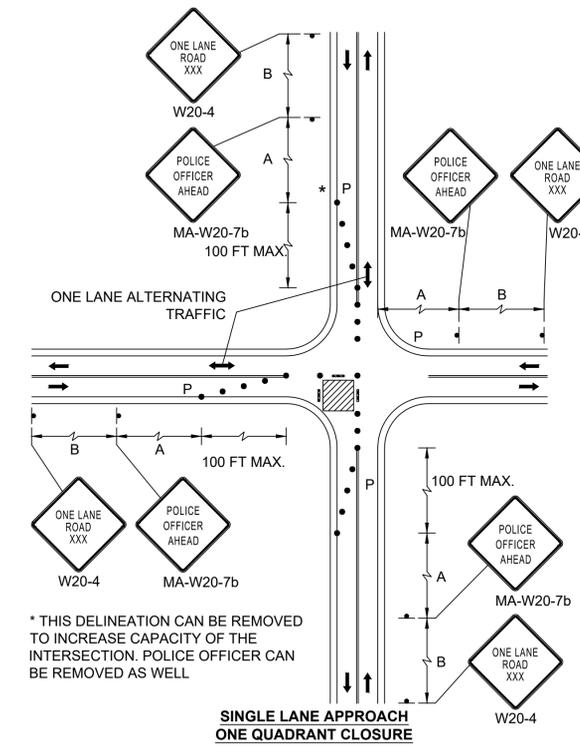
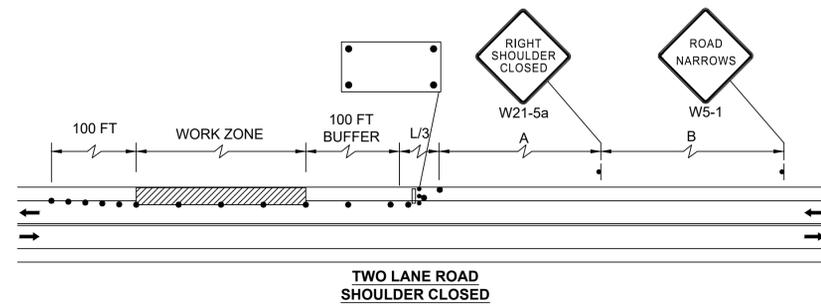
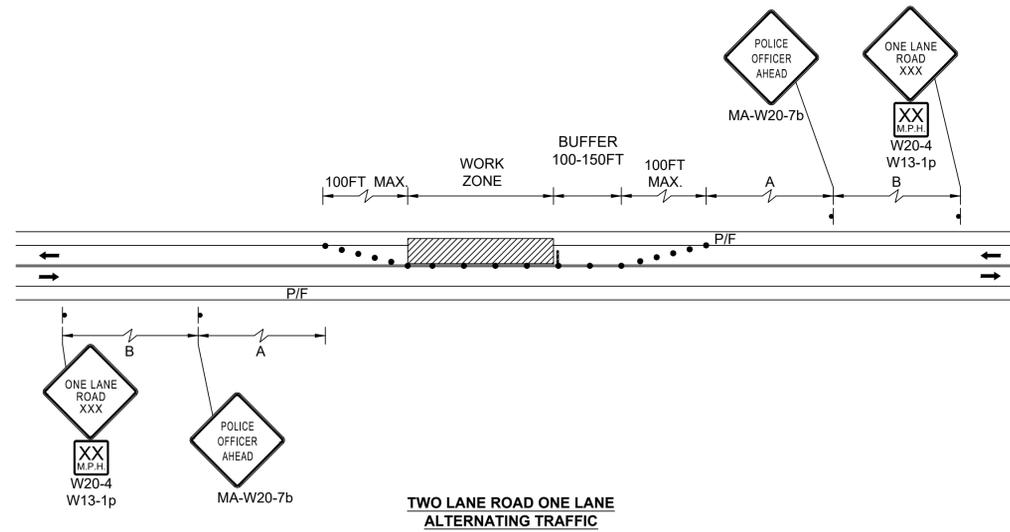
SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

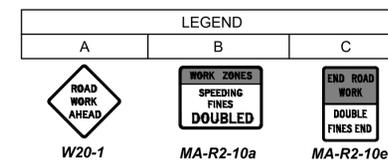
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH





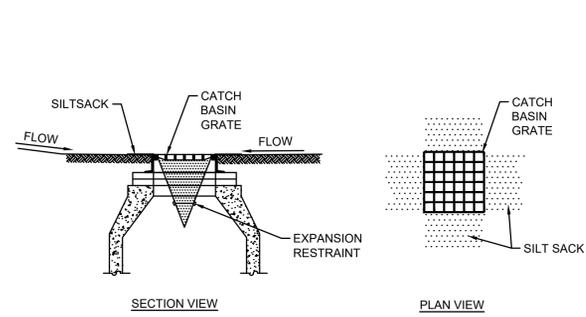
* THIS DELINEATION CAN BE REMOVED TO INCREASE CAPACITY OF THE INTERSECTION. POLICE OFFICER CAN BE REMOVED AS WELL.

TRAFFIC SIGN SUMMARY												
IDENTIFICATION NUMBER	SIZE OF SIGN (in)		LEGEND	TEXT DIMENSIONS (in)			COLOR			NUMBER OF SIGNS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR	BACK-GROUND	LEGEND	BORDER			
MA-R2-10a	48	36		MASSDOT STANDARD SIGN			FL. ORANGE	BLACK	BLACK	5	12.00	60.00
MA-R2-10e	36	48		↓			FL. ORANGE	BLACK	BLACK	5	12.00	60.00
R9-9	24	12		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			WHITE	BLACK	BLACK	2	2.00	4.00
R9-11aL	24	12					WHITE	BLACK	BLACK	1	2.00	2.00
R9-11aR	24	12					WHITE	BLACK	BLACK	1	2.00	2.00
W1-4L	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W1-4R	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W5-1	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-1	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-3	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W8-24	36	36					FL. ORANGE	BLACK	BLACK	2	9.00	18.00
W20-1	36	36					FL. ORANGE	BLACK	BLACK	5	9.00	45.00
W20-4	36	36					FL. ORANGE	BLACK	BLACK	4	9.00	36.00
MA-W20-7b	36	36		MASSDOT STANDARD SIGN			FL. ORANGE	BLACK	BLACK	4	9.00	36.00
W21-5a	36	36		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			FL. ORANGE	BLACK	BLACK	1	9.00	9.00



ADVANCED SIGNING SCHEMATIC
N.T.S.

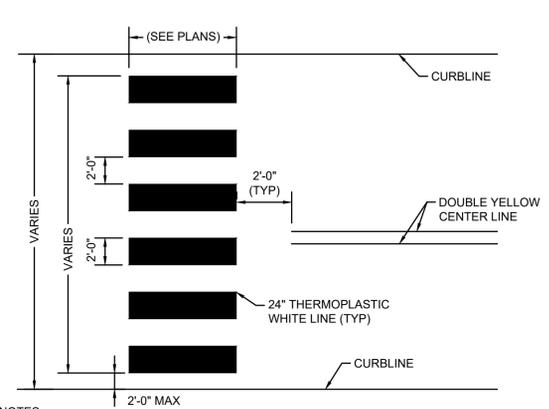
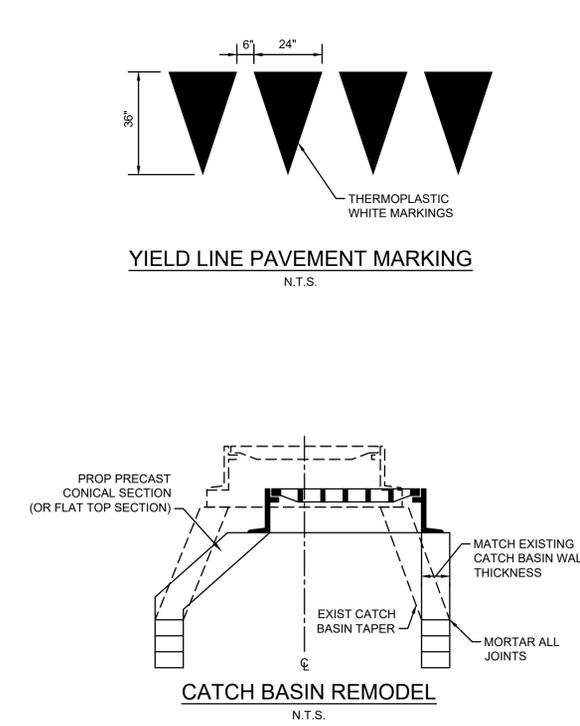
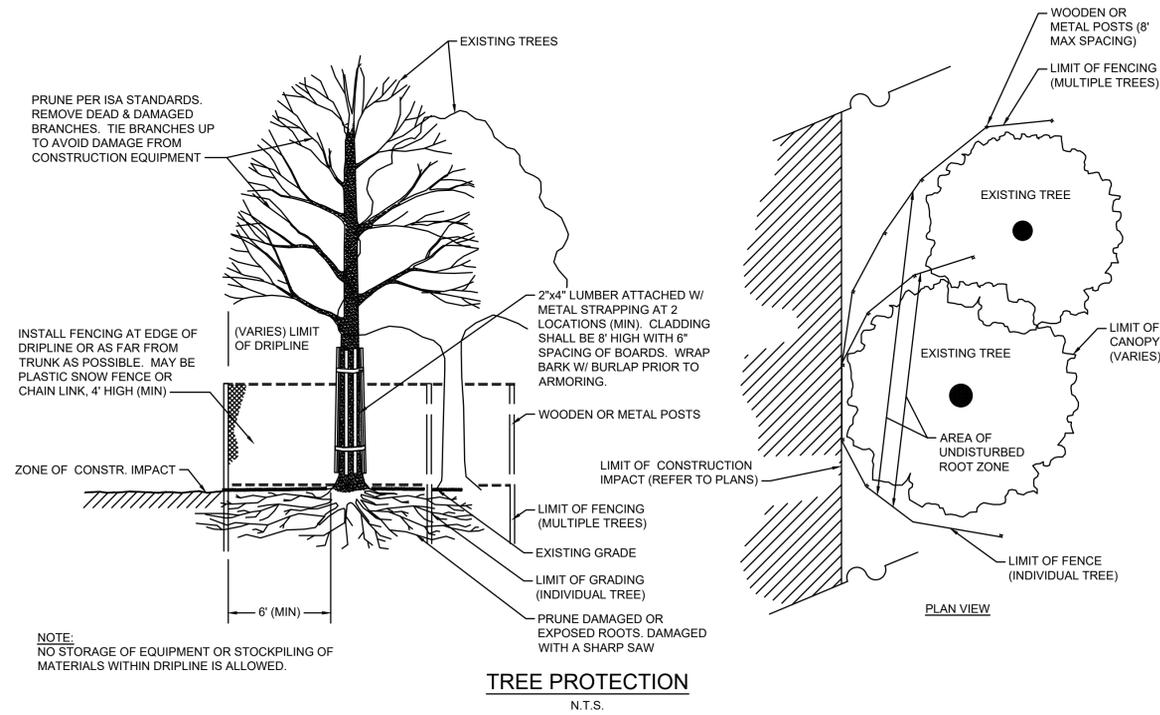
NOTE: "B" & "C" SIGNS ON SIDE-STREETS SHALL BE PLACED APPROXIMATELY 50' FROM PLAIN ROAD, AND "A" SIGNS SHALL BE PLACED APPROXIMATELY 350' FROM PLAIN ROAD.



NOTES:

1. INSTALL SILT SACK IN EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
2. GRATE TO BE PLACED OVER SILT SACK.
3. SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

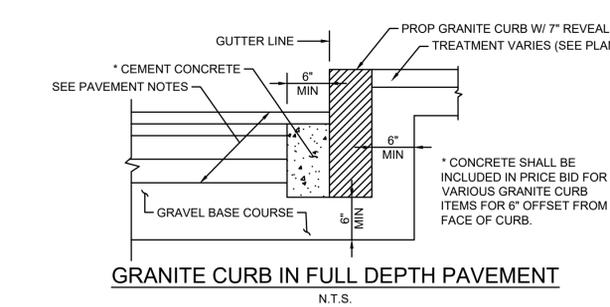
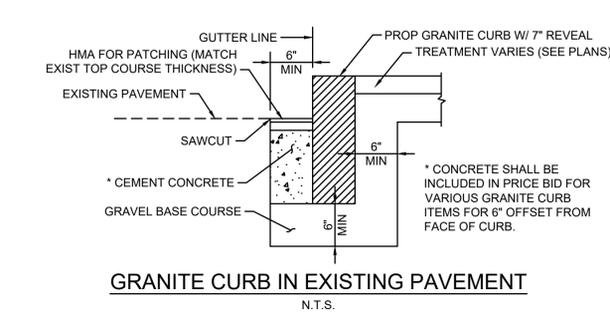
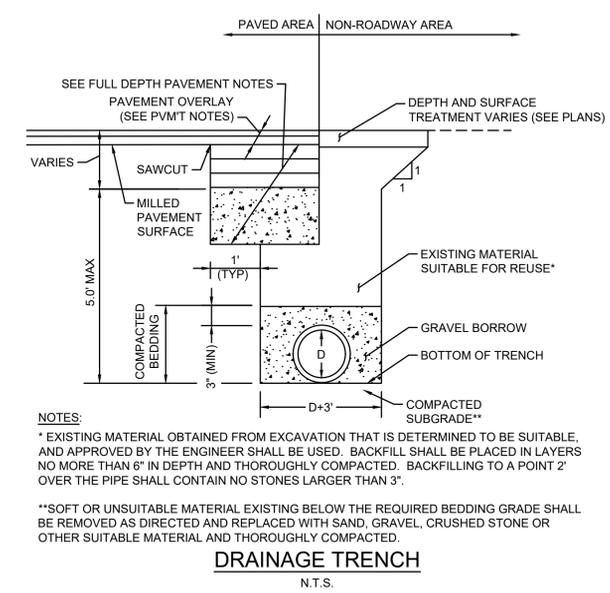
INLET PROTECTION SILT SACK IN CATCH BASIN
N.T.S.

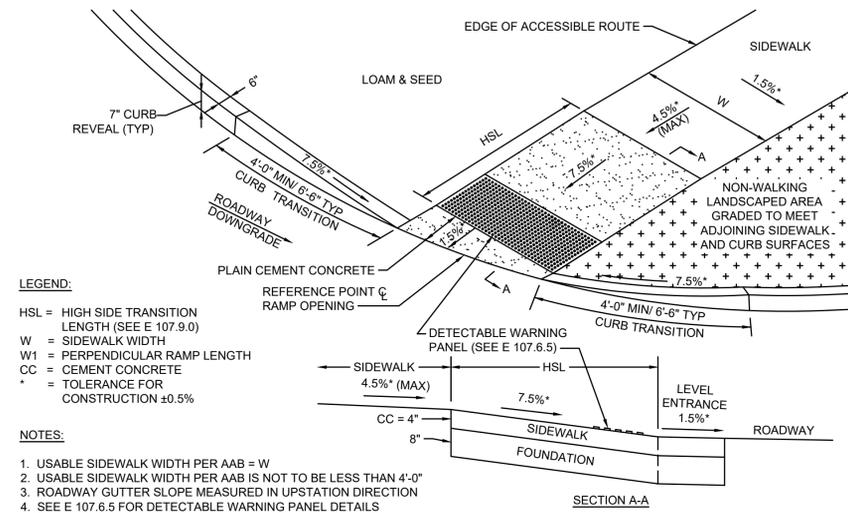


NOTES:

1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION. NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED. ALL 24" LINES MAY BE EITHER ONE 24" LINE OR A COMBINATION OF TWO - 12" LINES.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
3. CROSSWALK BARS SHALL BE PLACED OUTSIDE THE VEHICULAR WHEEL PATH WHEREVER POSSIBLE.

CROSSWALK PAVEMENT MARKING
N.T.S.

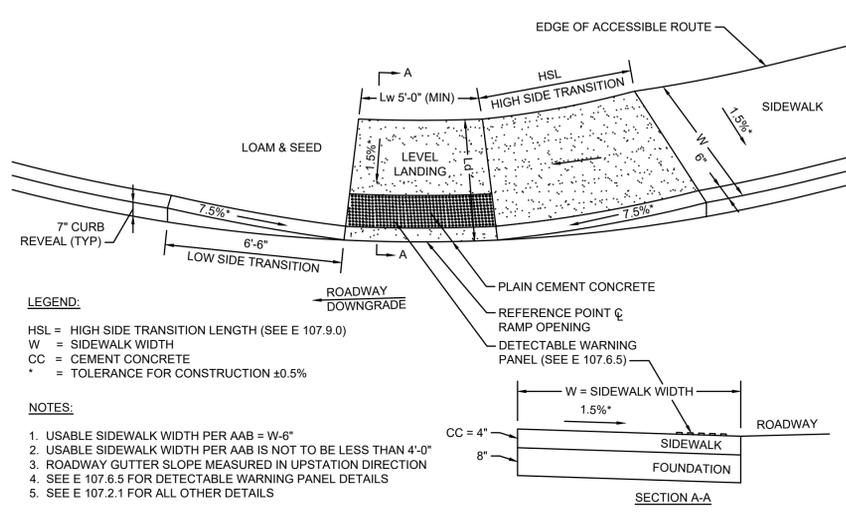




LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
W1 = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:
1. USABLE SIDEWALK WIDTH PER AAB = W
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS

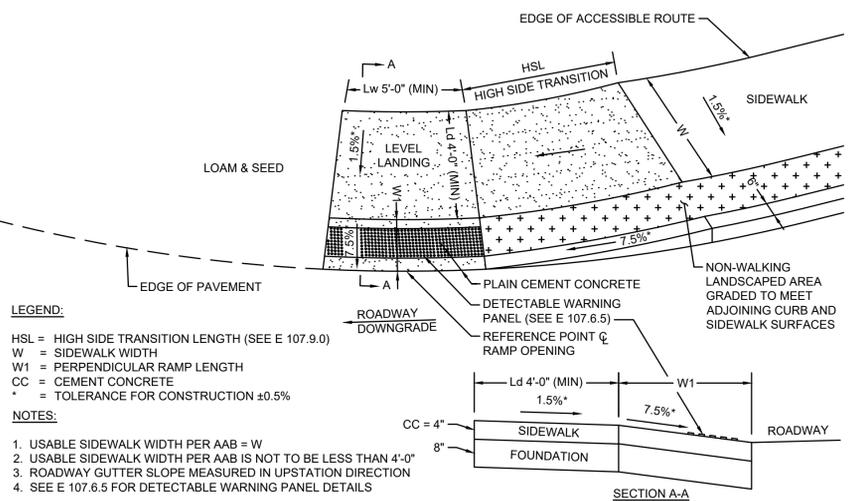
CURB RAMP TYPE A
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
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 IN UPSTATION DIRECTION
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

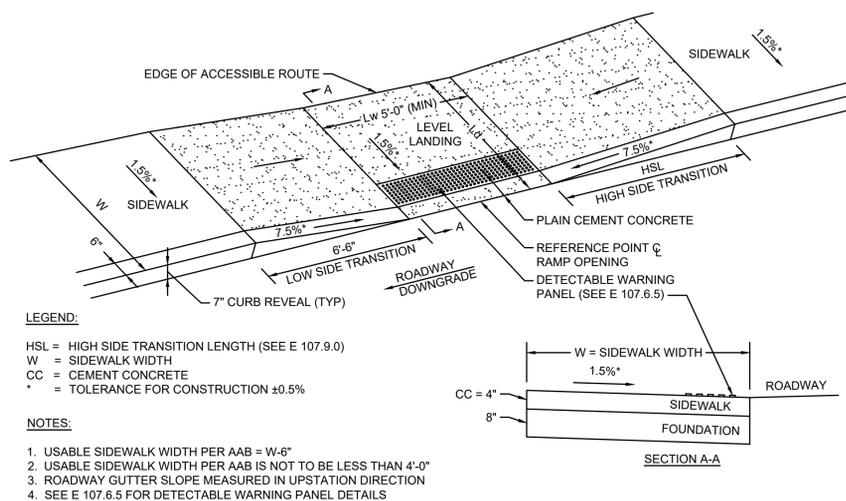
CURB RAMP TYPE B
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
W1 = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:
1. USABLE SIDEWALK WIDTH PER AAB = W
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
3. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS

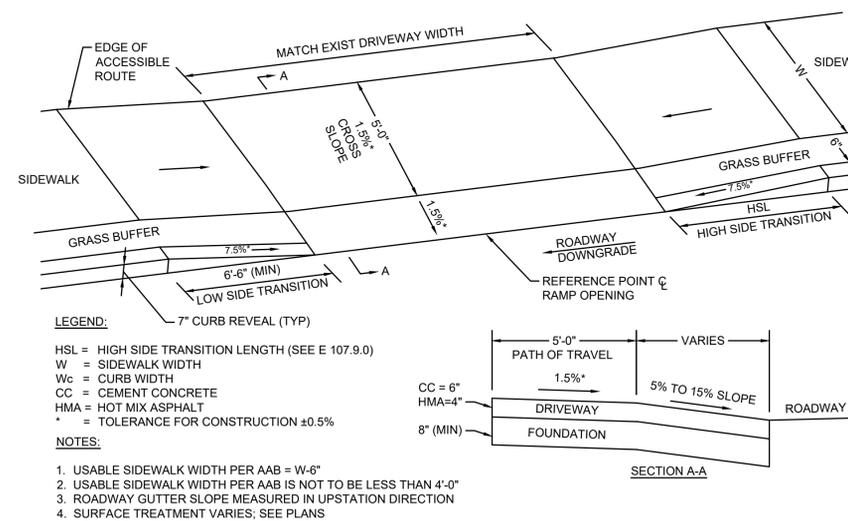
CURB RAMP TYPE C
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
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 IN UPSTATION DIRECTION
4. SEE E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS
5. SEE E 107.2.1 FOR ALL OTHER DETAILS

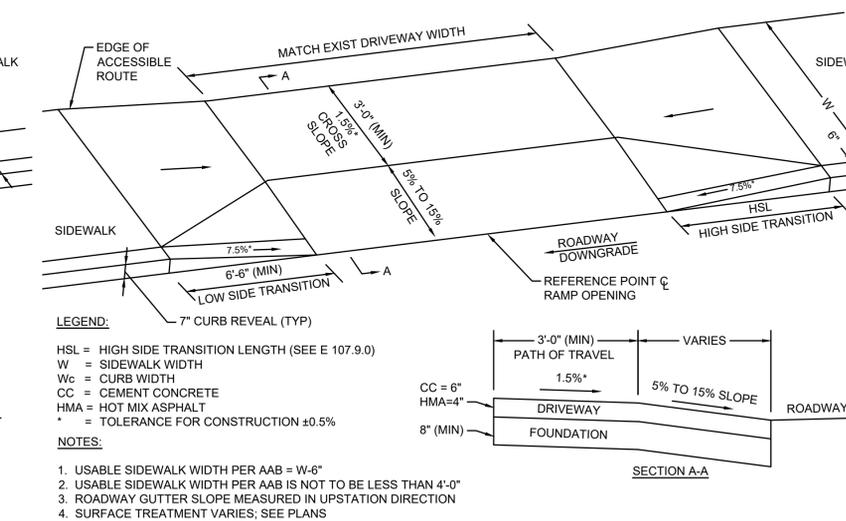
CURB RAMP TYPE D
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
Wc = CURB WIDTH
CC = CEMENT CONCRETE
HMA = HOT MIX ASPHALT
* = 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 IN UPSTATION DIRECTION
4. SURFACE TREATMENT VARIES; SEE PLANS

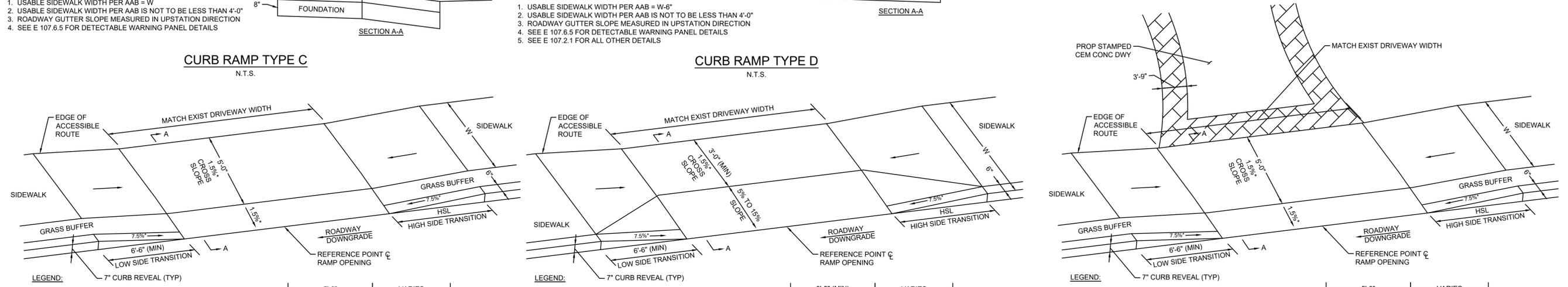
SIDEWALK THROUGH DRIVEWAY TYPE A
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
Wc = CURB WIDTH
CC = CEMENT CONCRETE
HMA = HOT MIX ASPHALT
* = 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 IN UPSTATION DIRECTION
4. SURFACE TREATMENT VARIES; SEE PLANS

SIDEWALK THROUGH DRIVEWAY TYPE B
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
W = SIDEWALK WIDTH
Wc = CURB WIDTH
CC = CEMENT CONCRETE
HMA = HOT MIX ASPHALT
* = 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 IN UPSTATION DIRECTION
4. SURFACE TREATMENT VARIES; SEE PLANS

SIDEWALK THROUGH DRIVEWAY TYPE C
N.T.S.

- 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 3'-0" CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.)
 3. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
 4. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 5. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5'x5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FT.
 6. ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY.
 7. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL OF THE PROPOSED 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.
 8. CURB RAMP SLOPES AND CROSS SLOPES SHALL HAVE A CONSTRUCTION TOLERANCE OF ±0.5%.
 9. DETECTABLE WARNING PANELS SHALL BE BRICK RED IN COLOR AS APPROVED BY THE WESTFORD DPW.

CURB RAMP NOTES
N.T.S.

