

TRANSPORTATION IMPROVEMENT PROJECT

WESTFORD
COMPLETE STREETS IMPROVEMENTS
TITLE SHEET & INDEX
SHEET 1 OF 20

COMPLETE STREETS IMPROVEMENTS OF
TOWN CENTER, ROBINSON SCHOOL, HOWARD ROAD, AND NORMAN E. DAY SCHOOL

IN THE TOWN OF
WESTFORD
MIDDLESEX COUNTY

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE 2014 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 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.

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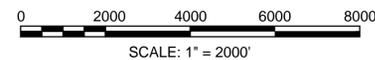
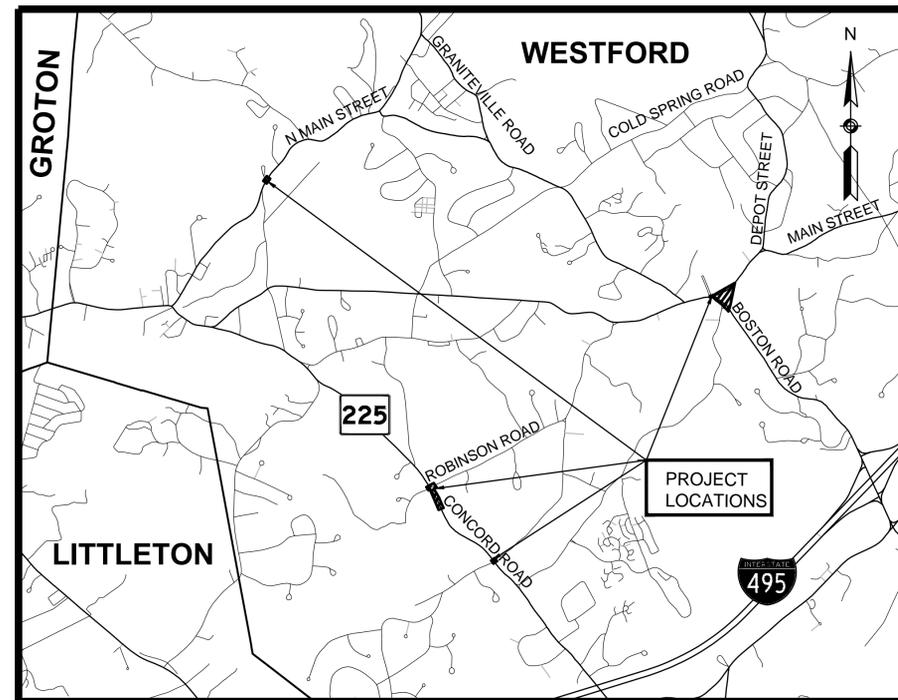
ATTACHED: LINCOLN STREET CURB EXTENSION PLANS
PREPARED & STAMPED BY BETA, INC. DATED 9/20/16

TOWN MANAGER
JODI ROSS

TOWN ENGINEER
PAUL STARRATT, P.E.

HIGHWAY SUPERINTENDENT
RICHARD "CHIP" BARRETT

ISSUED FOR BIDDING



DATE	DESCRIPTION	REV #
2/27/2017	ISSUED FOR BIDDING	-



2-27-17
TEC, Inc.
65 Glenn Street | 169 Ocean Blvd
Lawrence, MA 01843 | Hampton, NH 03842

DESIGNED BY	CHECKED BY	DATE
RJD	MCM	2/27/2017
DRAWN BY	APPROVED BY	PROJECT NO.
RJD	MCM	T0658

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
CB	CB	CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
□	□	POST SQUARE
○	○	POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
○	○	FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
○	○	HYDRANT
*	*	LIGHT POLE
CO.BD.	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	MON	MONUMENT
SB	SB	STONE BOUND
TB	TB	TOWN OR CITY BOUND
△	△	TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP	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
○	○	TREE
○	○	STUMP
○	○	SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
---	---	OVERHEAD CABLE/WIRE
---	---	CURBING
100-99	100-99	CONTOURS (ON-THE-GROUND SURVEY DATA)
100-99	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
---	---	SAWCUT LINE
---	---	TOP OR BOTTOM OF SLOPE
---	---	LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
---	---	BANK OF RIVER OR STREAM
---	---	BORDER OF WETLAND
---	---	100 FT WETLAND BUFFER
---	---	200 FT RIVERFRONT BUFFER
---	---	STATE HIGHWAY LAYOUT
---	---	TOWN OR CITY LAYOUT
---	---	COUNTY LAYOUT
---	---	RAILROAD SIDELINE
---	---	TOWN OR CITY BOUNDARY LINE
---	---	PROPERTY LINE OR APPROXIMATE PROPERTY LINE
---	---	EASEMENT

ABBREVIATIONS

GENERAL	DESCRIPTION
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
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT

ABBREVIATIONS (cont.)

GENERAL	DESCRIPTION
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
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
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
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
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
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	VARIABLE
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

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
↩	↩	PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
---	SL	STOP LINE
---	CW	CROSSWALK
---	SWL	SOLID WHITE LINE
---	SYL	SOLID YELLOW LINE
---	BWL	BROKEN WHITE LINE
---	BYL	BROKEN YELLOW LINE
---	DWL	DOTTED WHITE LINE
---	DYL	DOTTED YELLOW LINE
---	DWLEx	DOTTED WHITE LINE EXTENSION
---	DYLEx	DOTTED YELLOW LINE EXTENSION
---	DBWL	DOUBLE WHITE LINE
---	DBYL	DOUBLE YELLOW LINE

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 1 1/2" HMA SURFACE COURSE OVER
1 3/4" HMA INTERMEDIATE COURSE OVER

BASE: 3 1/2" HMA BASE COURSE OVER

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE b (COMPACTED) (SEE PAVEMENT NOTE 2 BELOW)

PROPOSED HMA DRIVEWAY (TO MATCH EXISTING)

SURFACE: 1 1/2" HMA SURFACE COURSE OVER
2" HMA INTERMEDIATE COURSE OVER

BASE: 8" GRAVEL BORROW, TYPE b (COMPACTED) (SEE PAVEMENT NOTE 2 BELOW)

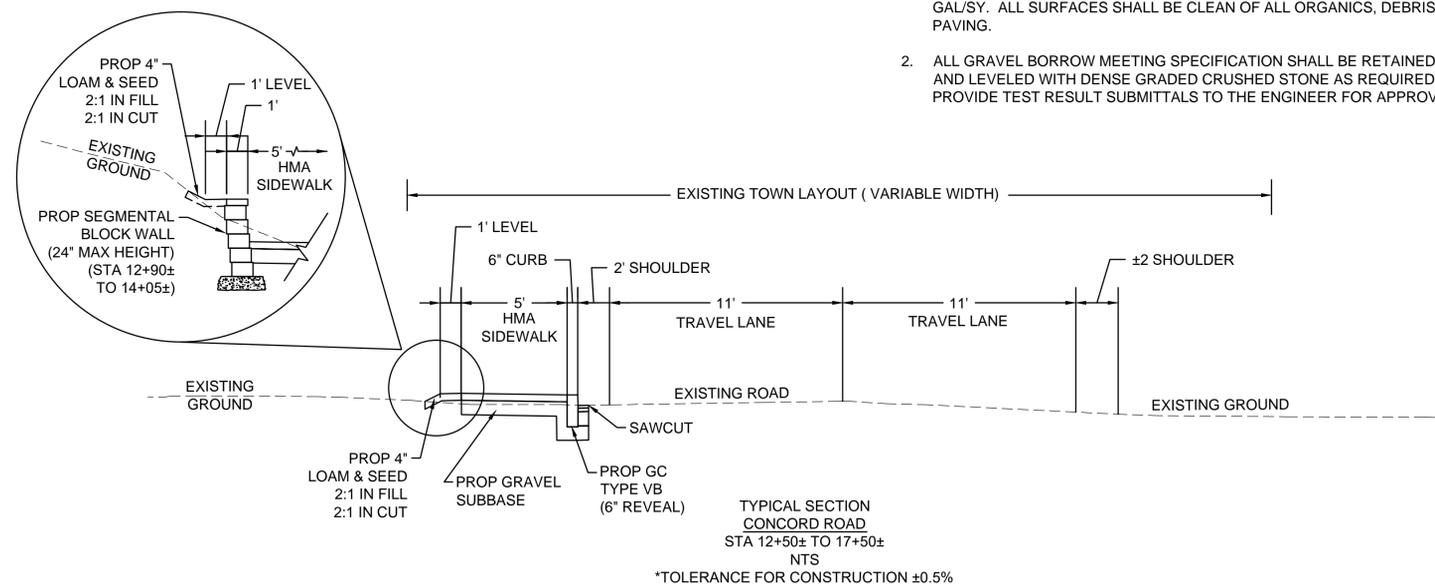
PROPOSED HMA SIDEWALK AND PRIVATE WALK (TO MATCH EXISTING)

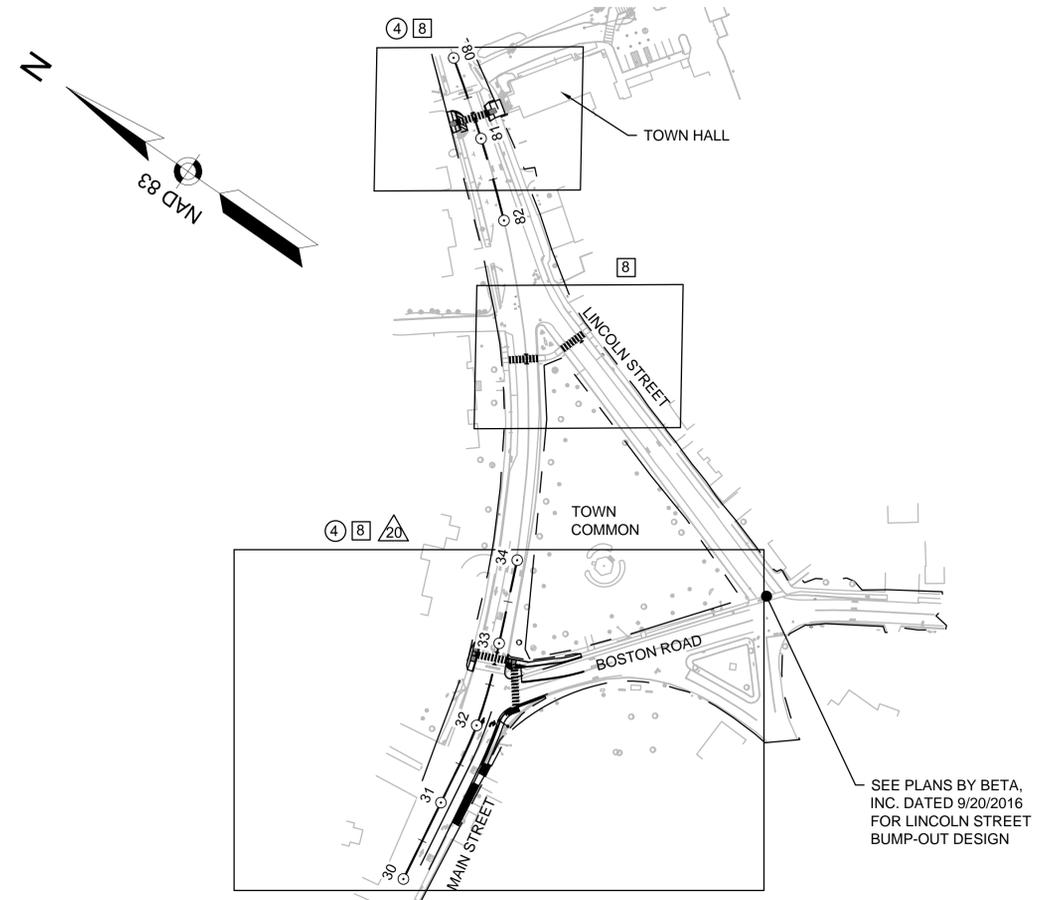
SURFACE: 1 1/2" HMA SURFACE COURSE OVER
2" HMA INTERMEDIATE COURSE OVER

BASE: 8" GRAVEL BORROW, TYPE b (COMPACTED) (SEE PAVEMENT NOTE 2 BELOW)

GENERAL PAVEMENT NOTES:

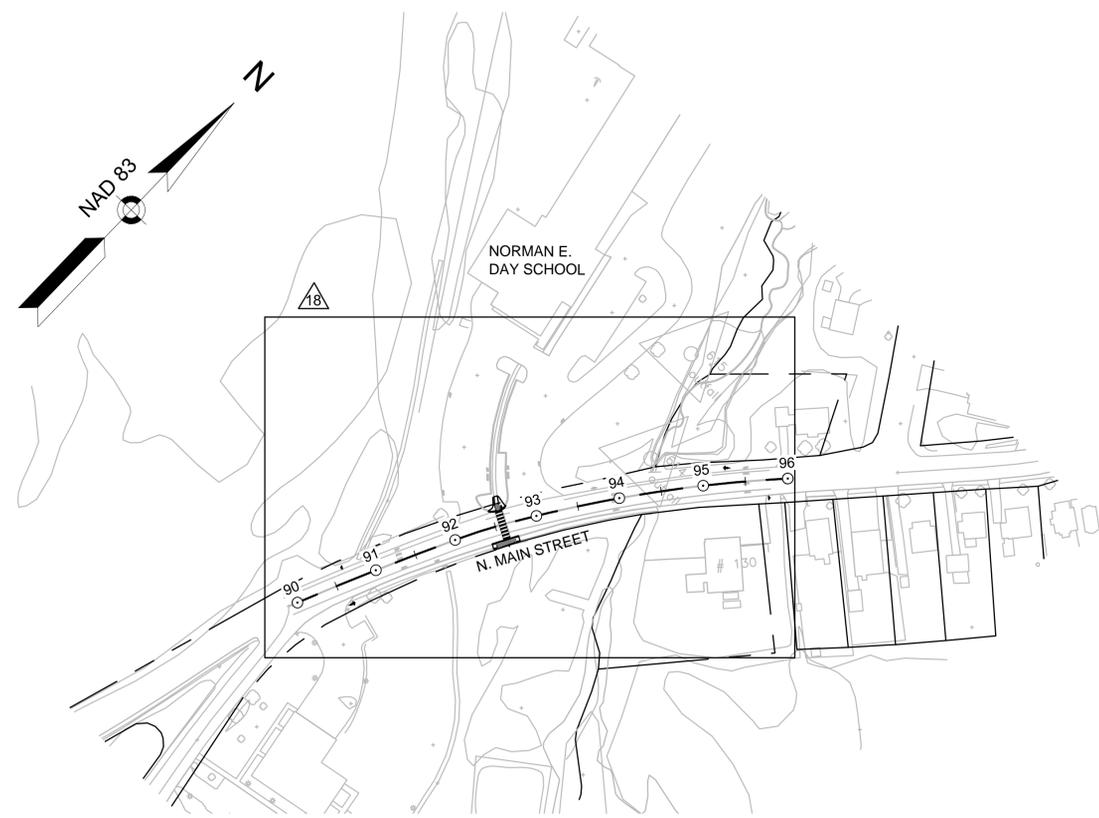
1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND SAWCUT JOINTS BEFORE PAVING. HMA JOINT SEALANT SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED AT A RATE OF 0.05 GAL/SY, EXCEPT OVER MILLED AND CEMENT CONCRETE SURFACES, WHERE THE APPLICATION RATE SHALL BE 0.07 GAL/SY. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED WITH DENSE GRADED CRUSHED STONE AS REQUIRED. CONTRACTOR SHALL PROVIDE TEST RESULT SUBMITTALS TO THE ENGINEER FOR APPROVAL.





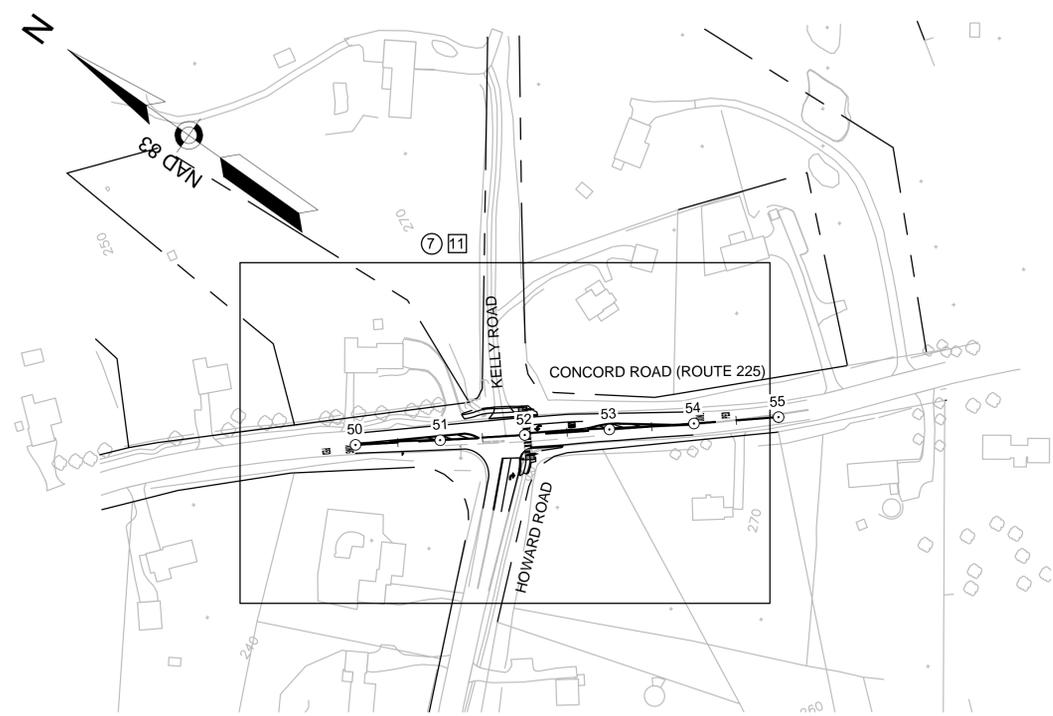
TOWN CENTER KEY PLAN
 (FIELD SURVEY BY TOWN ENGINEERING DEPT. 11/23/2016)

SEE PLANS BY BETA, INC. DATED 9/20/2016 FOR LINCOLN STREET BUMP-OUT DESIGN

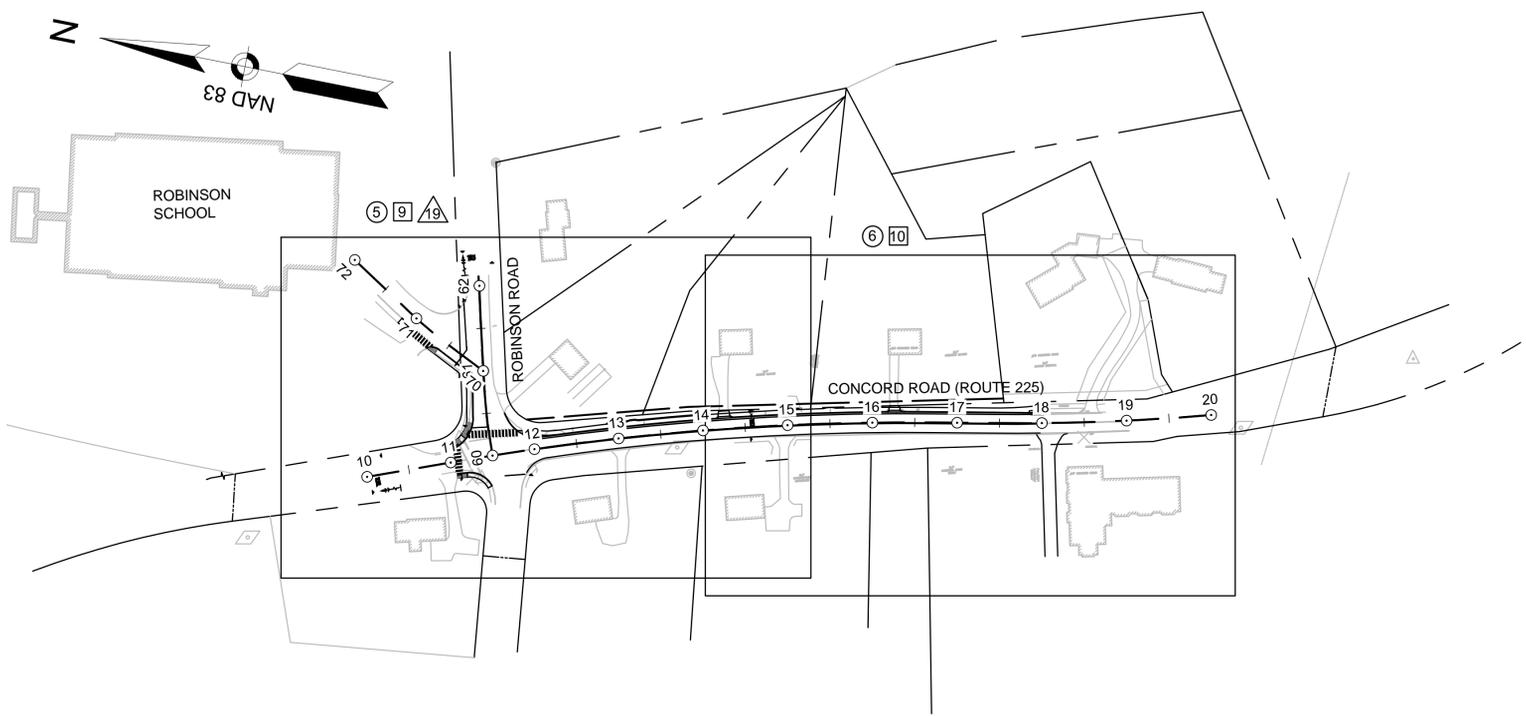


**ADD ALTERNATE 1
 NORMAN E. DAY SCHOOL KEY PLAN**
 (GIS SURVEY INFORMATION)

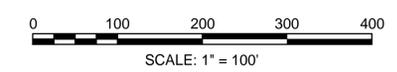
- LEGEND**
- ⊗ = CONSTRUCTION PLANS
 - ⊠ = TRAFFIC SIGN & PAVEMENT MARKING PLANS
 - △ = ADD ALTERNATE PLANS

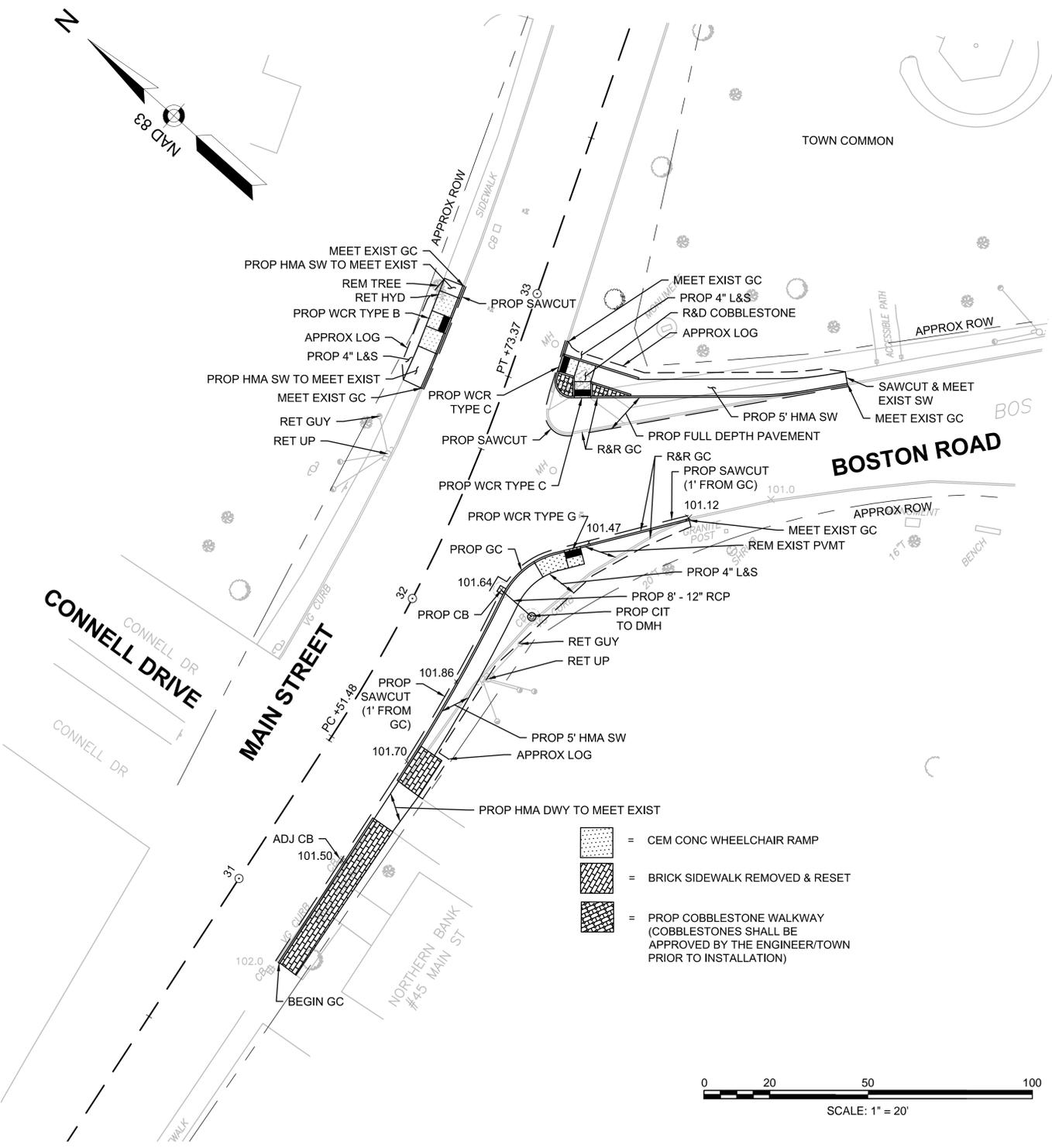
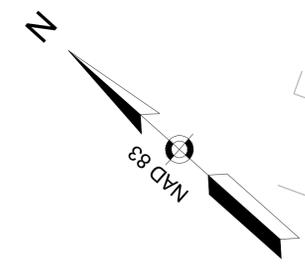
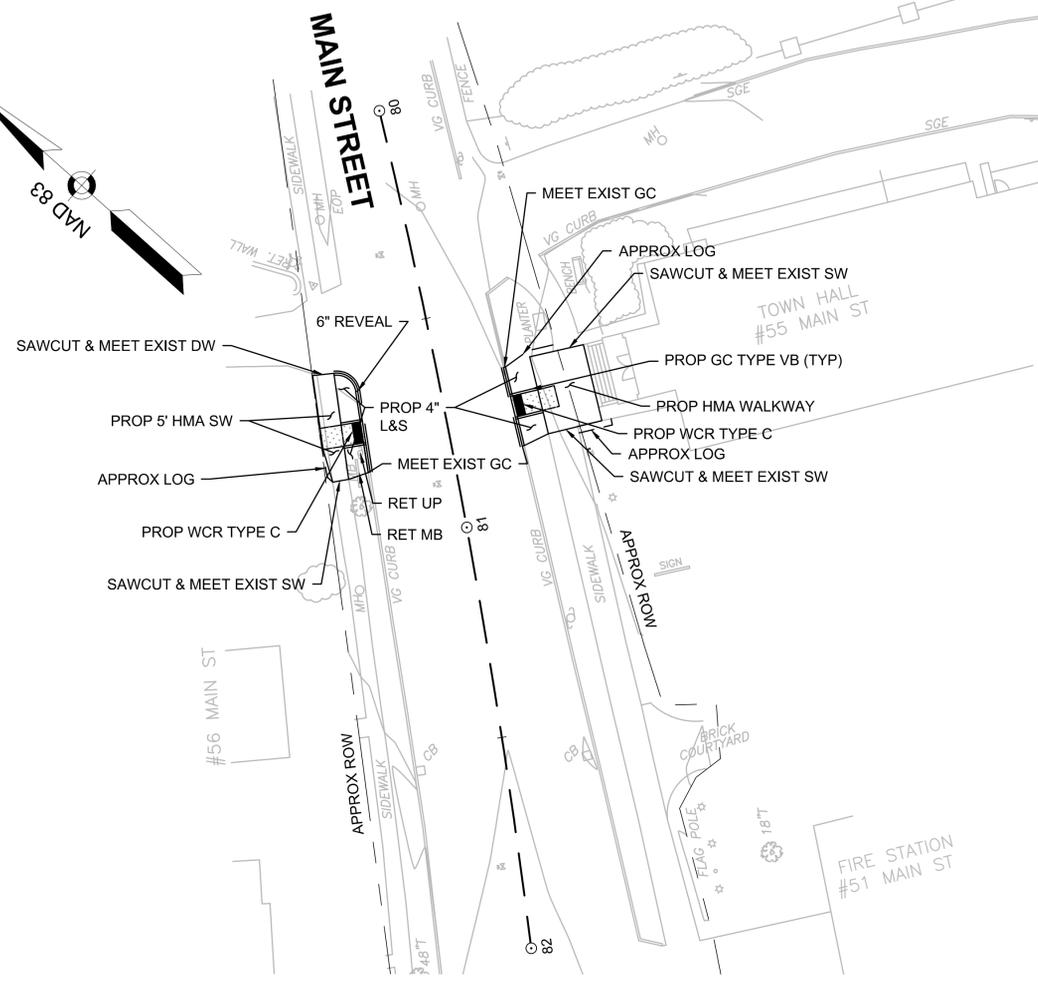
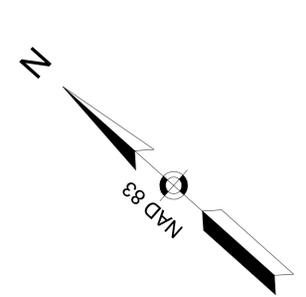


HOWARD ROAD KEY PLAN
 (GIS SURVEY INFORMATION)



ROBINSON SCHOOL/CONCORD ROAD KEY PLAN
 (FIELD SURVEY BY TOWN ENGINEERING DEPT. 11/22/2016)
 (ROW DETERMINATION BY GCG ASSOCIATES)

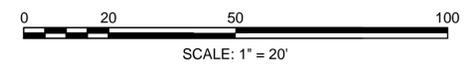


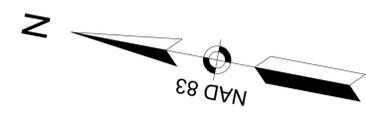
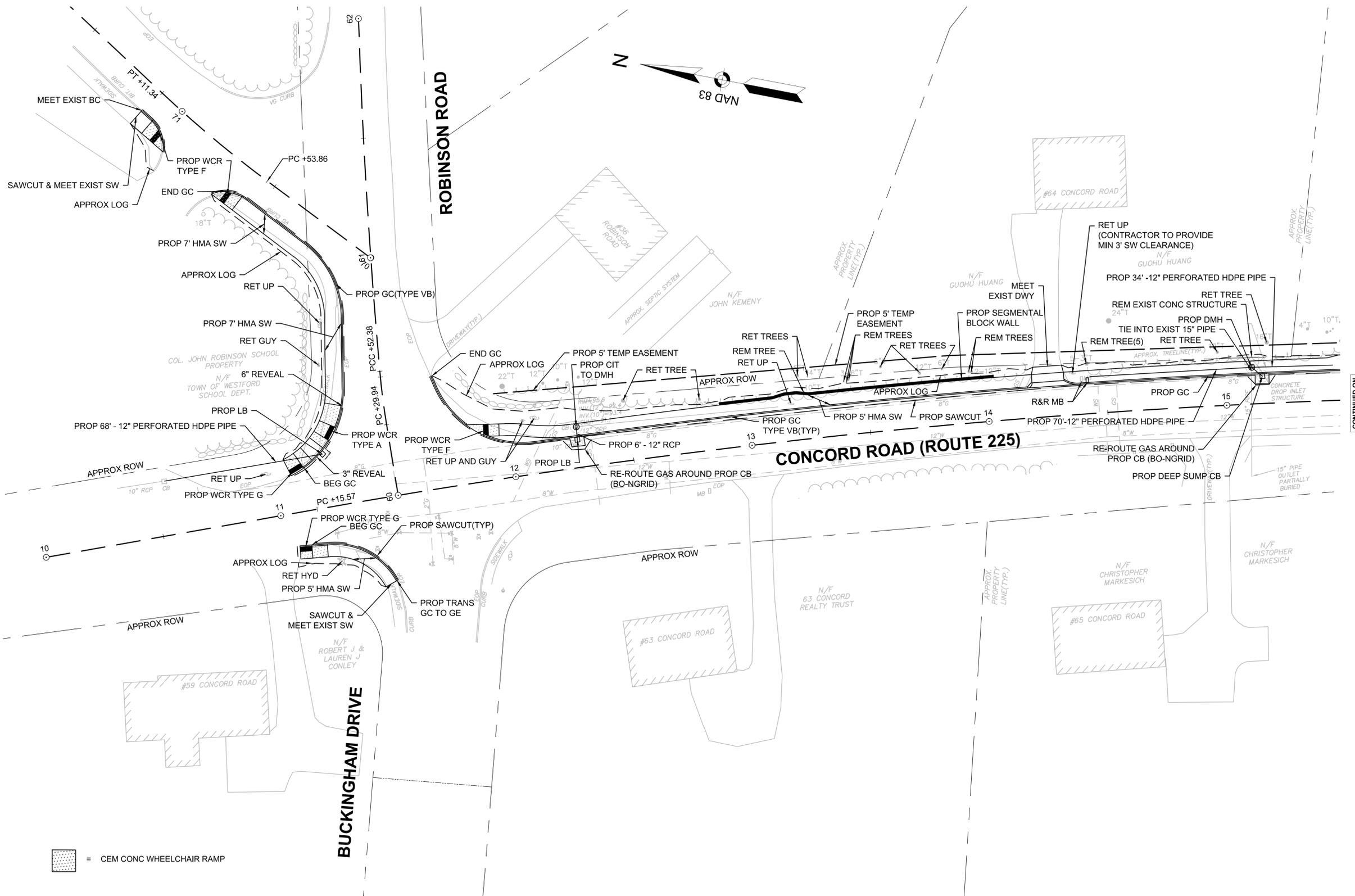


CONSTRUCTION NOTES:

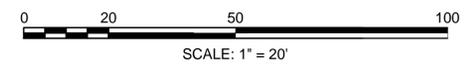
1. HORIZONTAL DATUM = LOCAL COORDINATES
VERTICAL DATUM = VAVD88
2. THE DESIGNER SHALL PROVIDE ALL ELECTRONIC DESIGN FILES FOR LAYOUT PURPOSES AT THE REQUEST OF THE CONTRACTOR.
3. EXISTING STATE, COUNTY, AND TOWN LAYOUT LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM GIS INFORMATION AND SHALL BE CONSIDERED APPROXIMATE.
4. 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 (1-800-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.
5. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
6. ALL UTILITY STRUCTURES (CATCH BASINS, DRAIN MANHOLES, SEWER MANHOLES, WATER GATES, ETC.) SHALL BE ADJUSTED BY THE CONTRACTOR TO FINISHED GRADE UNLESS DIRECTED OTHERWISE.
7. ALL PRIVATELY OWNED UTILITY STRUCTURES (GAS GATES, ELECTRIC/TELEPHONE MANHOLES, ETC.) SHALL BE ADJUSTED TO FINISHED GRADE BY THE PRIVATE UTILITY COMPANY, UNLESS DIRECTED OTHERWISE. THE CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES FOR THE ALTERATION AND ADJUSTMENT, AS NECESSARY.
8. CATCH BASIN FRAMES AND GRATES SHALL BE IN CONFORMANCE WITH TOWN OF WESTFORD STANDARDS.
9. PROPOSED LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 1.0% (MINIMUM) UNLESS OTHERWISE NOTED.
10. 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.
11. ALL DISTURBED AREAS OUTSIDE THE CURBLINE SHALL BE STABILIZED WITH 4" LOAM AND SEED, UNLESS OTHERWISE NOTED.
12. 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).
13. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION. GRANITE TRANSITION CURB SHALL BE USED TO MEET ALL EXISTING EDGE OF PAVEMENT AND BERM.
14. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH FOR ALL DRIVEWAY OPENINGS AND WHEELCHAIR RAMPS SHALL ADHERE WITH CURRENT ADA STANDARDS PAST ALL OBSTRUCTIONS (UTILITY POLES, SIGNS, MAILBOXES, ALONG DRIVEWAY OPENINGS, ETC.)
15. ALL REQUIRED SAWCUTTING SHALL BE INCLUDED IN VARIOUS CONTRACT ITEMS AND SHALL NOT BE PAID FOR SEPARATELY.
16. MAILBOXES CALLED OUT TO BE REMOVED AND RESET (R&R MB) SHALL BE RESET IN ACCORDANCE WITH UNITED STATES POSTAL SERVICE (USPS) GUIDELINES AND REQUIREMENTS.
17. CONTRACTOR TO OBTAIN ALL NECESSARY DRAINAGE INVERTS FOR PROPOSED DRAINAGE IMPROVEMENTS. CONTRACTOR SHALL DETERMINE ALL PROPOSED INVERTS AND PROVIDE TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING STRUCTURES.

- = CEM CONC WHEELCHAIR RAMP
- = BRICK SIDEWALK REMOVED & RESET
- = PROP COBBLESTONE WALKWAY (COBBLESTONES SHALL BE APPROVED BY THE ENGINEER/TOWN PRIOR TO INSTALLATION)

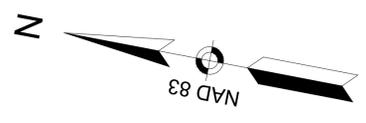




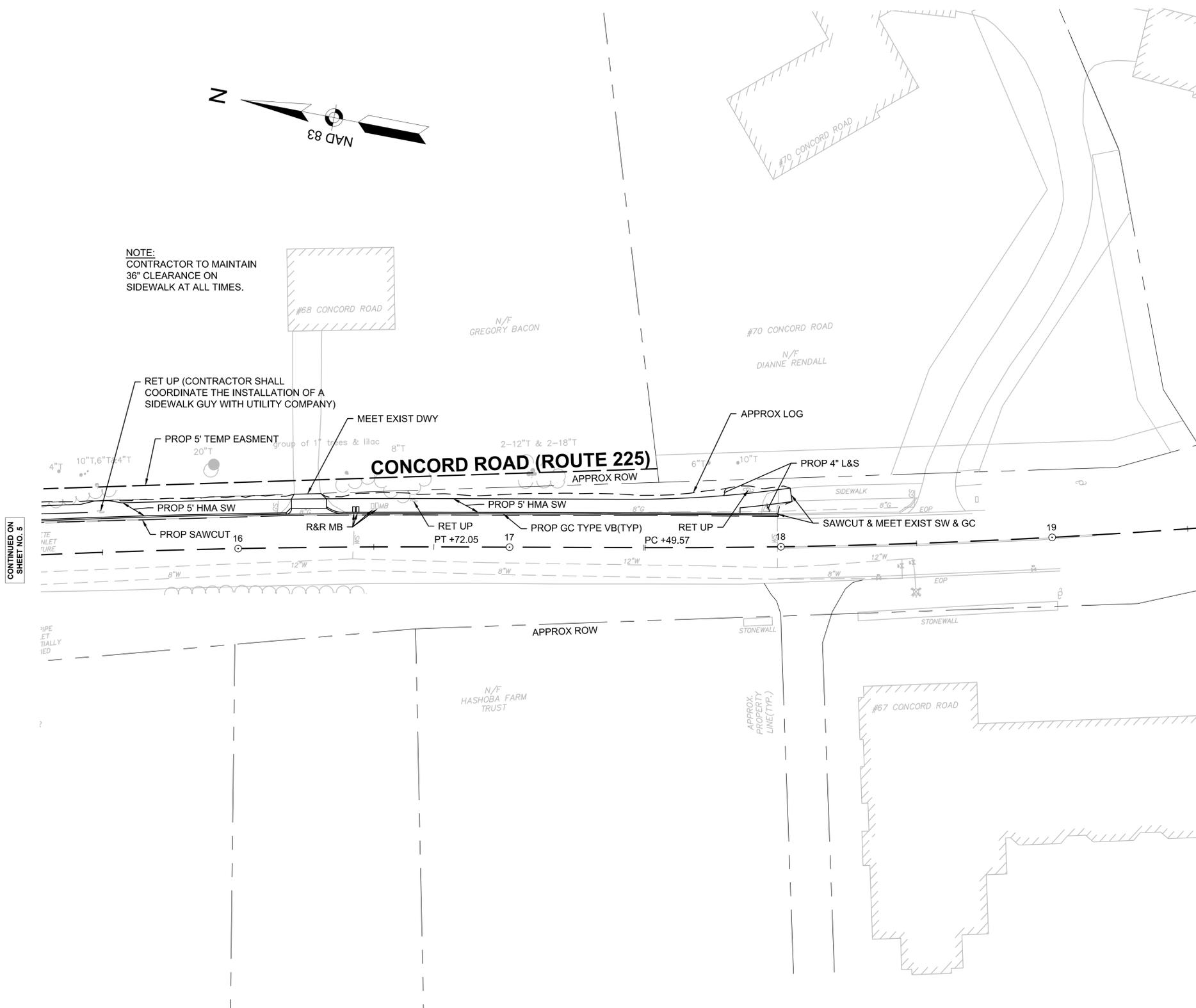
 = CEM CONC WHEELCHAIR RAMP



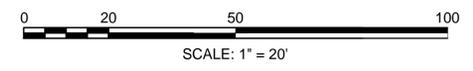
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SHEET NO. 6

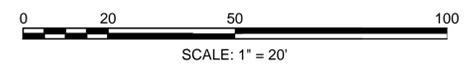
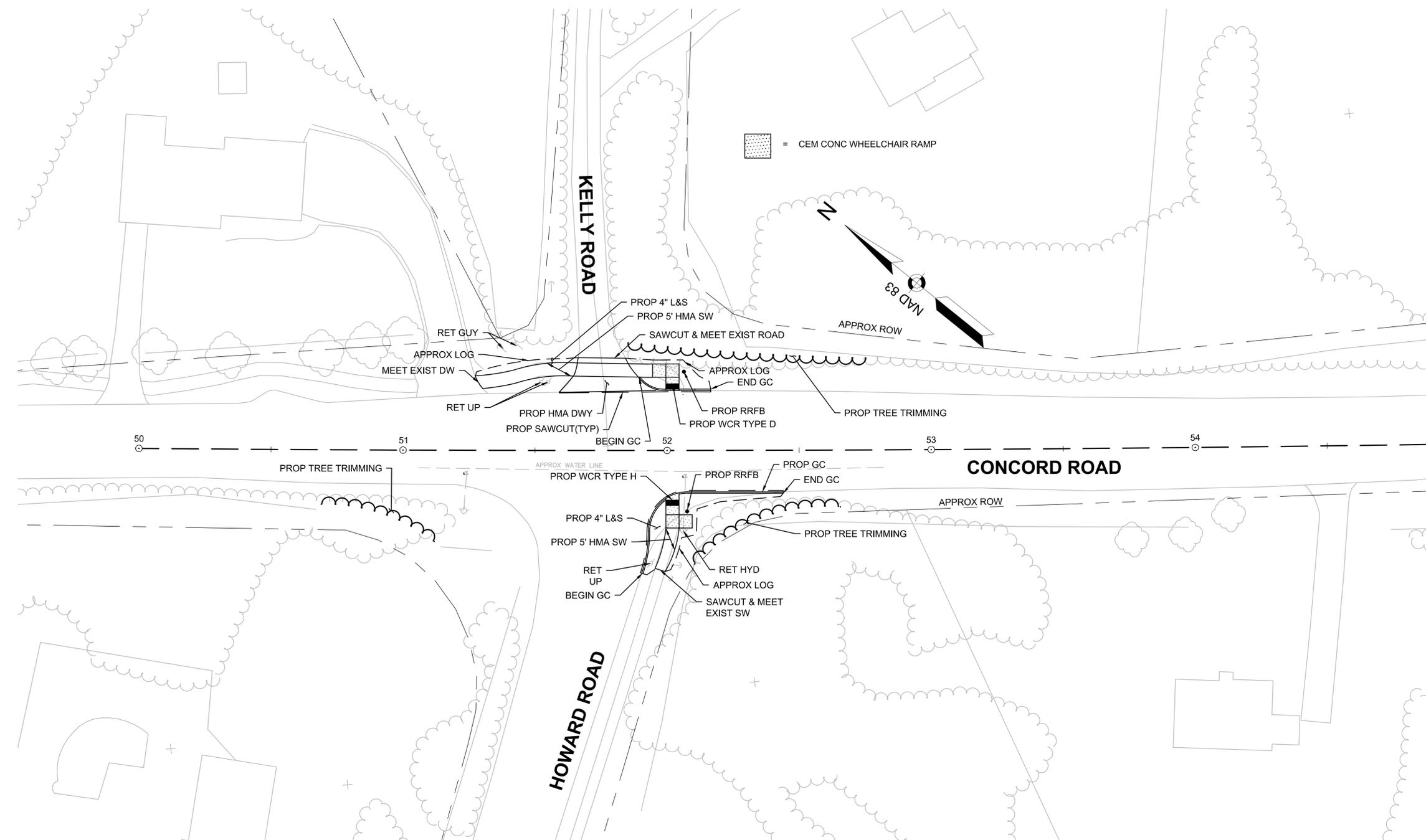


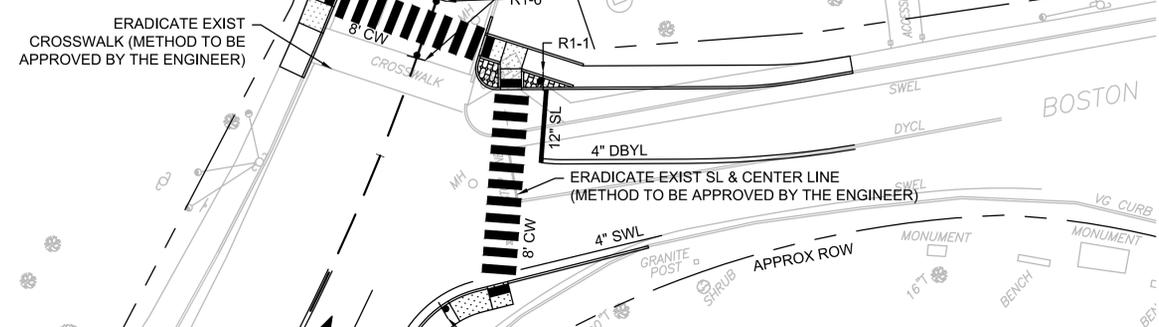
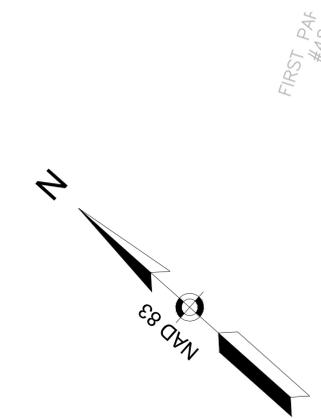
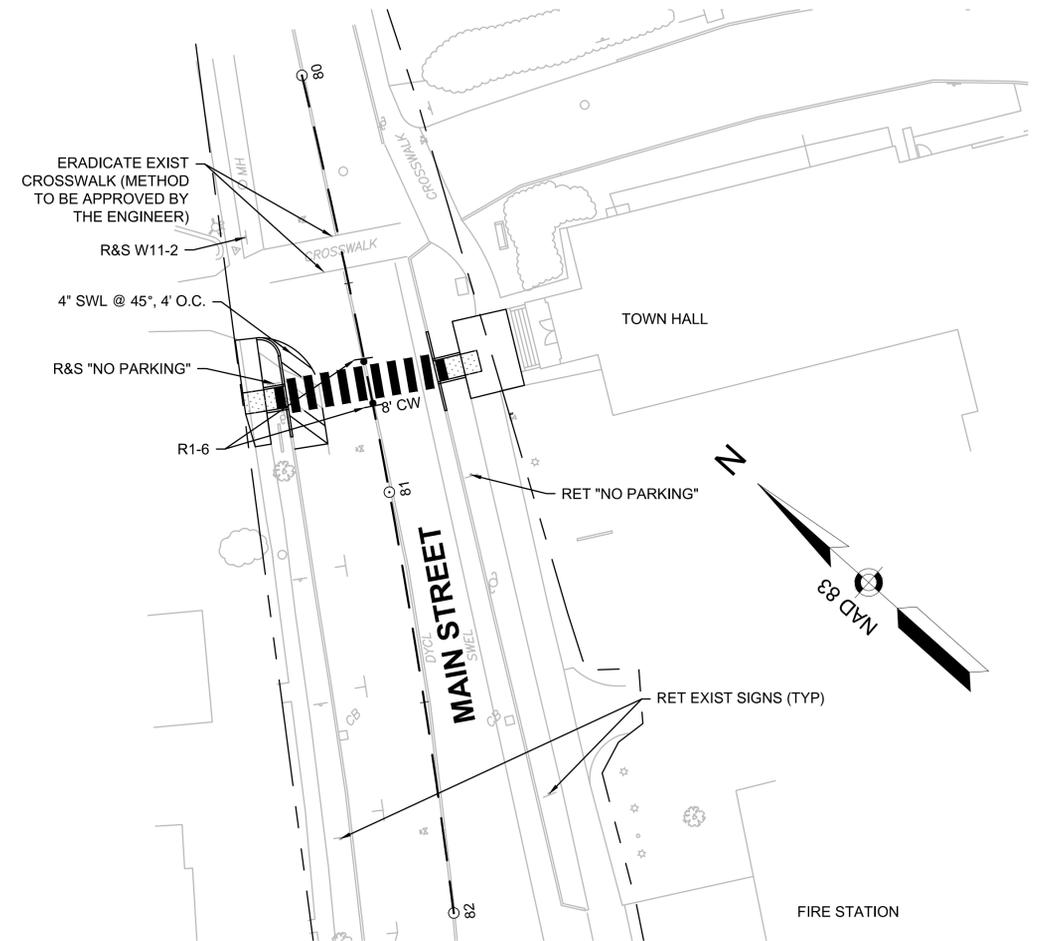
NOTE:
 CONTRACTOR TO MAINTAIN
 36" CLEARANCE ON
 SIDEWALK AT ALL TIMES.



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 SHEET NO. 5

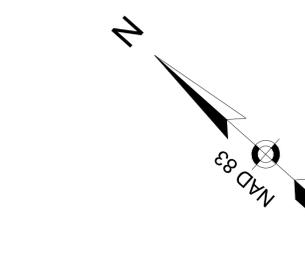
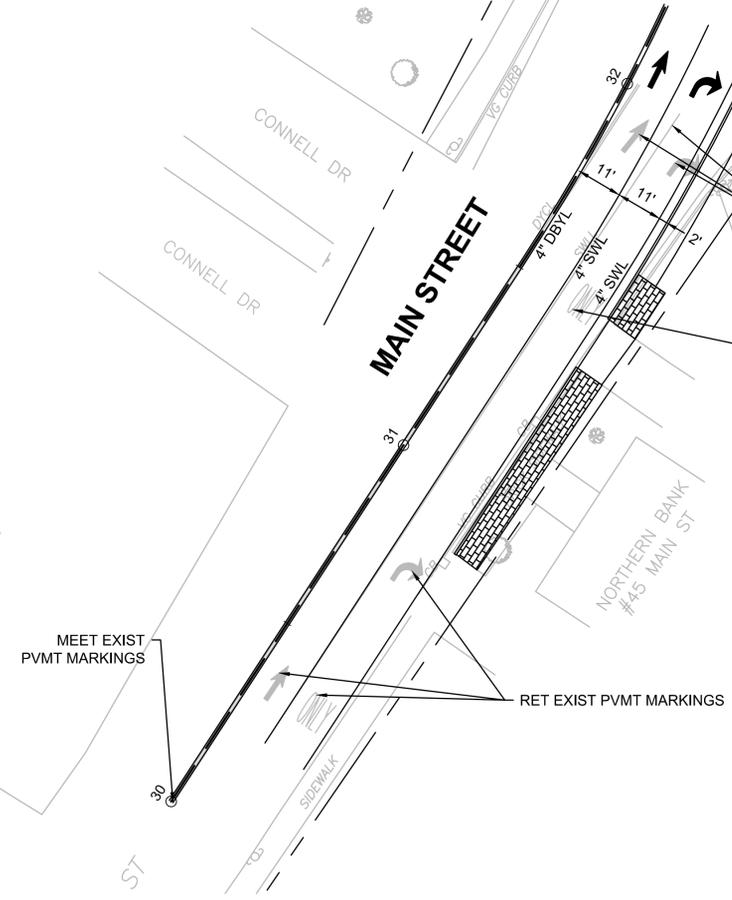
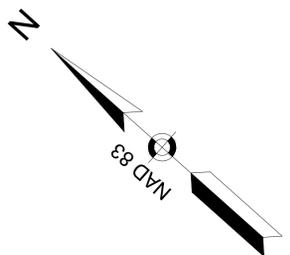
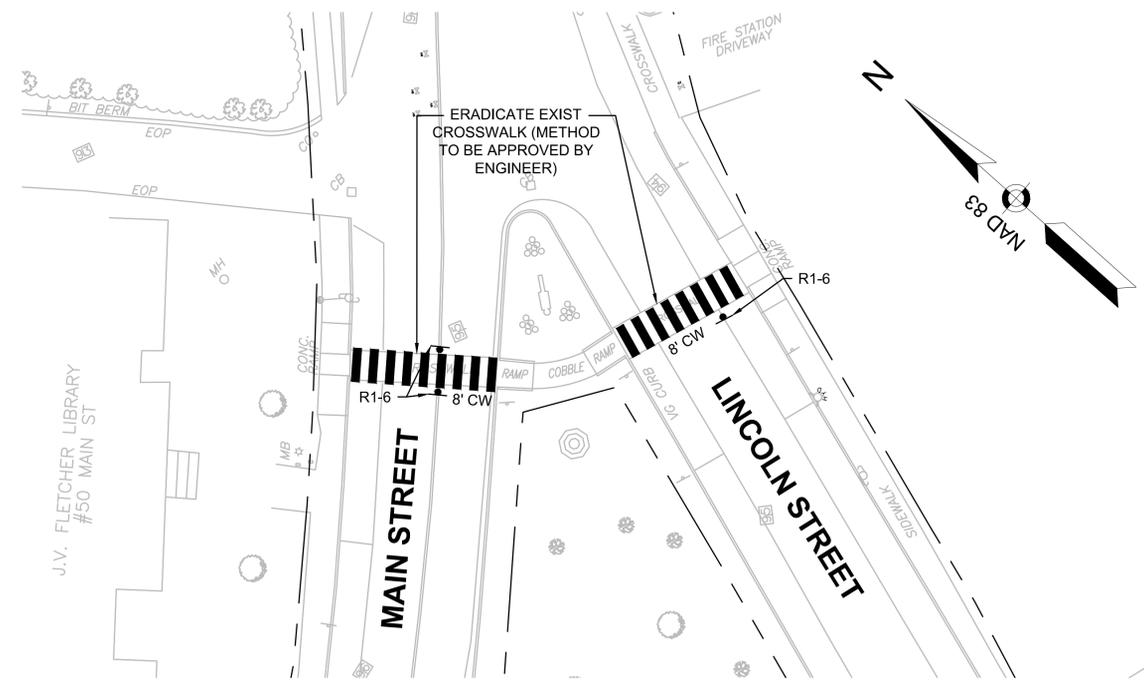
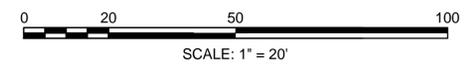


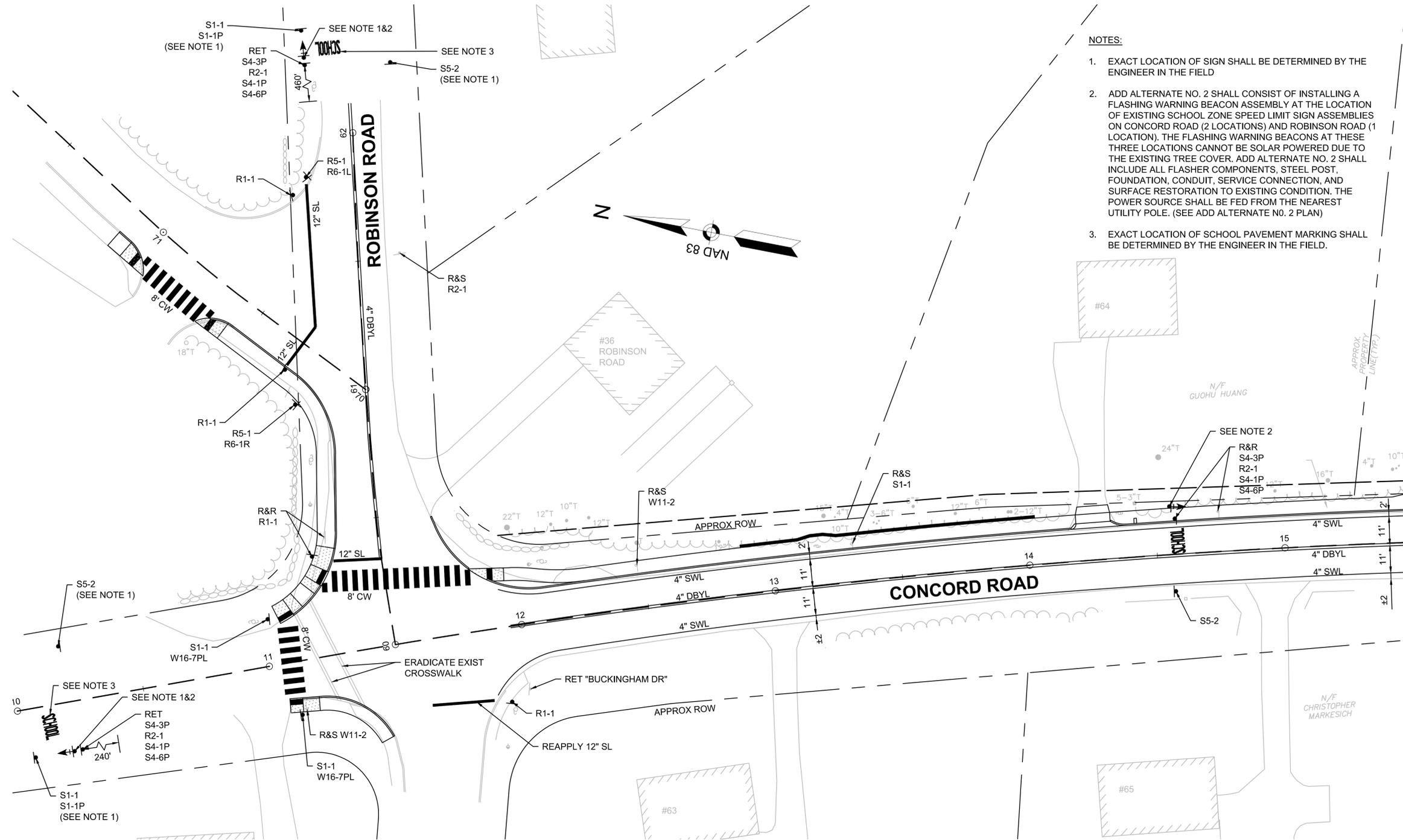




- BOSTON ROAD @ LINCOLN STREET**
 NOTES:
- ERADICATE EXIST CROSSWALK (METHOD TO BE APPROVED BY THE ENGINEER) ON THE CORNER OF BOSTON ROAD AND LINCOLN STREET
 - PROP CROSSWALK SHALL BE 24" BARS, 8' WIDE, SPACED 4' OFF CENTER IN LIEU OF CROSSWALK SHOWN ON BETA, INC. PLANS DATED 9/20/2016; CROSSWALK SHALL HAVE ONE (1) R6-1 SIGN (LOCATION TO BE APPROVED BY THE ENGINEER).

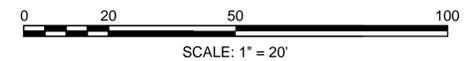
ADD ALTERNATE NOTE:
 ADD ALTERNATE NO. 3 SHALL CONSIST OF INSTALLING TEXTURIZED DECORATIVE PAVEMENT IN LIEU OF THERMOPLASTIC PAVEMENT MARKINGS AT ALL CROSSWALKS SHOWN ON THIS PLAN AND THE INTERSECTION OF BOSTON ROAD AND LINCOLN STREET. TEXTURIZED DECORATIVE PAVEMENT SHALL BE BRICK STAMPED PATTERN, COLOR BRICK RED AND SHALL BE INSTALLED AS SHOWN ON THE ADD ALTERNATE 1 PLAN.

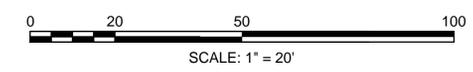
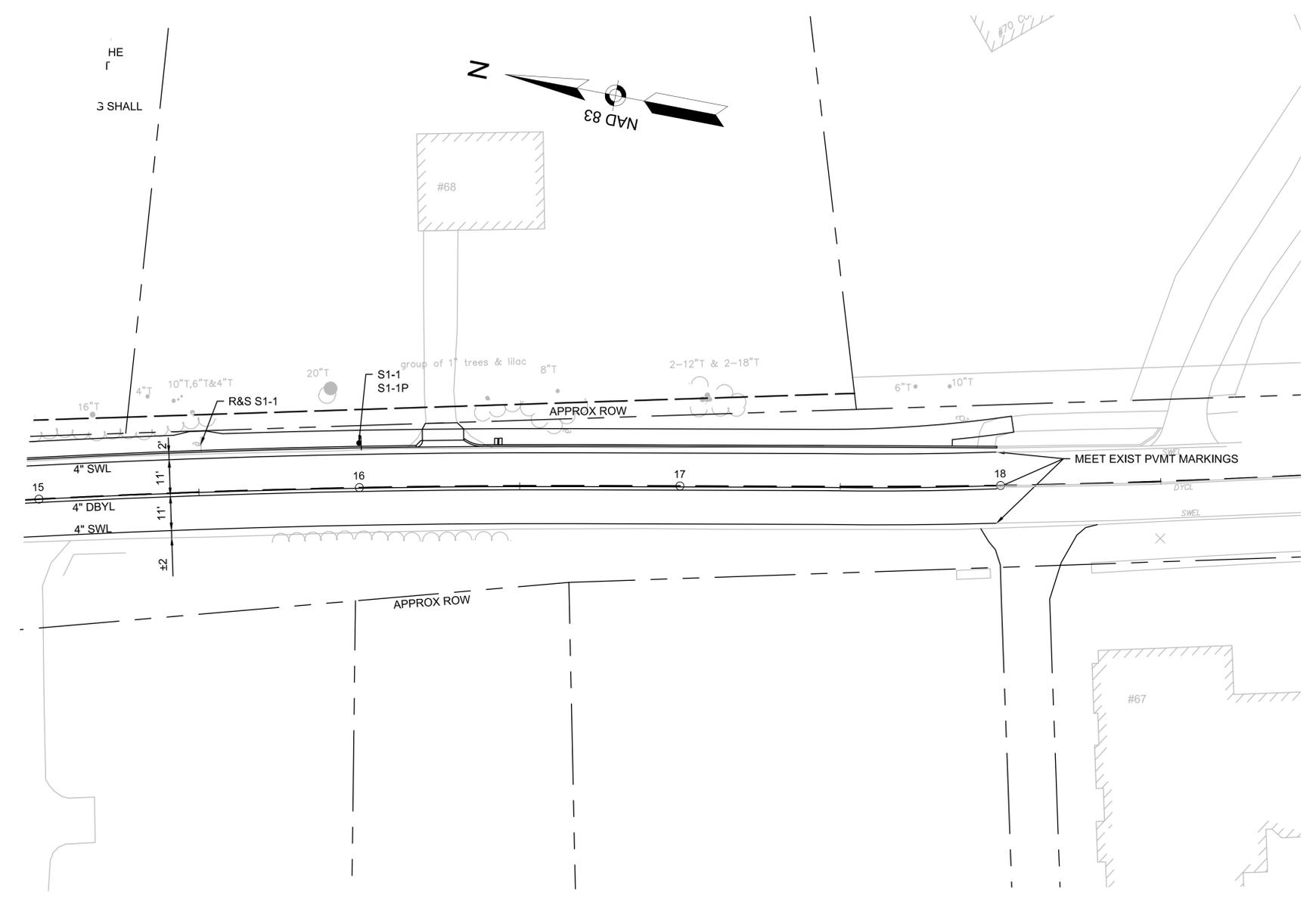


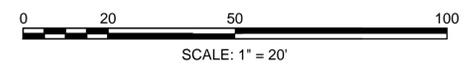
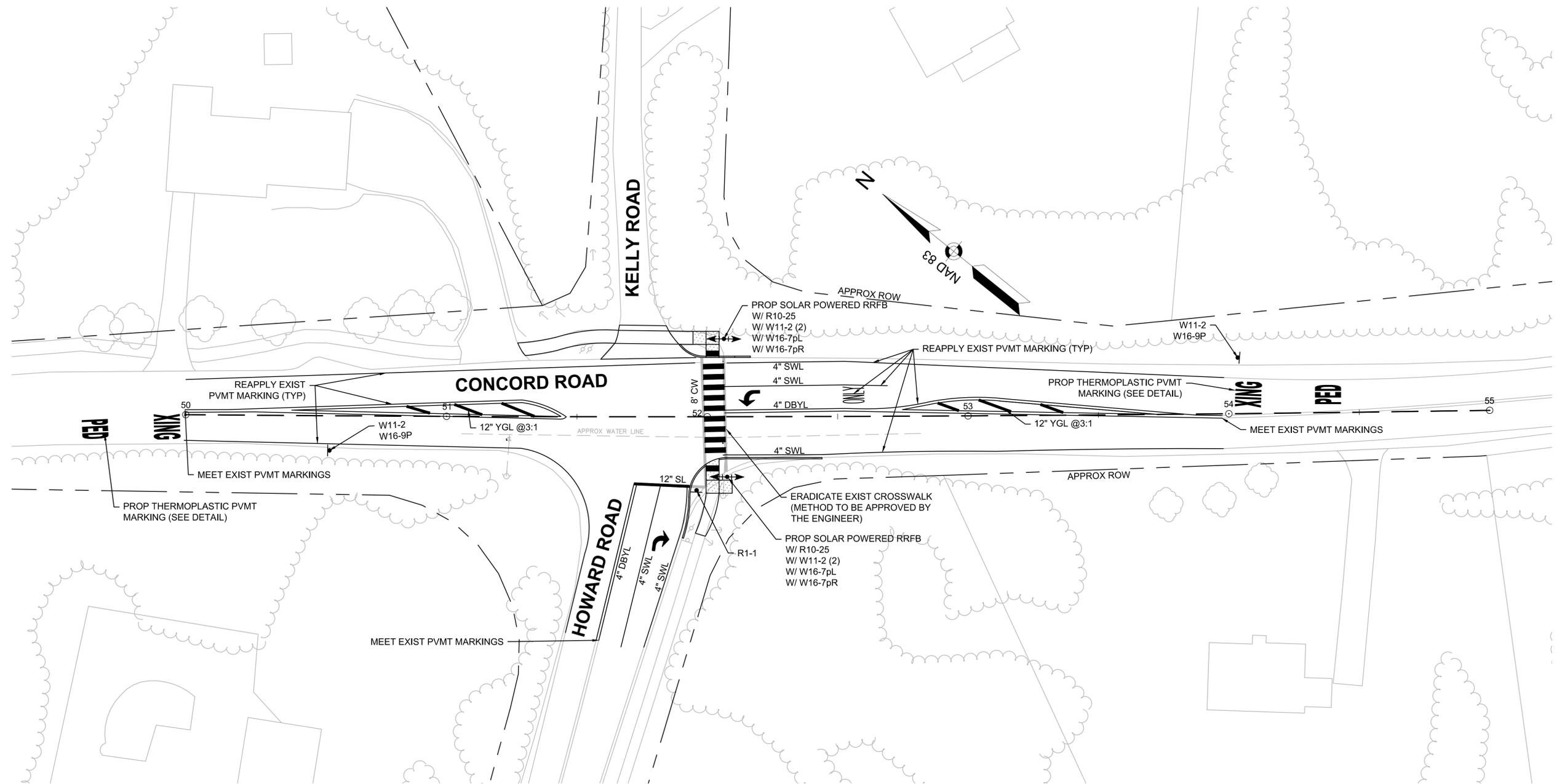


NOTES:

1. EXACT LOCATION OF SIGN SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD
2. ADD ALTERNATE NO. 2 SHALL CONSIST OF INSTALLING A FLASHING WARNING BEACON ASSEMBLY AT THE LOCATION OF EXISTING SCHOOL ZONE SPEED LIMIT SIGN ASSEMBLIES ON CONCORD ROAD (2 LOCATIONS) AND ROBINSON ROAD (1 LOCATION). THE FLASHING WARNING BEACONS AT THESE THREE LOCATIONS CANNOT BE SOLAR POWERED DUE TO THE EXISTING TREE COVER. ADD ALTERNATE NO. 2 SHALL INCLUDE ALL FLASHER COMPONENTS, STEEL POST, FOUNDATION, CONDUIT, SERVICE CONNECTION, AND SURFACE RESTORATION TO EXISTING CONDITION. THE POWER SOURCE SHALL BE FED FROM THE NEAREST UTILITY POLE. (SEE ADD ALTERNATE NO. 2 PLAN)
3. EXACT LOCATION OF SCHOOL PAVEMENT MARKING SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.



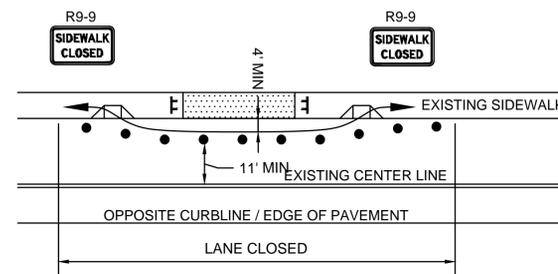
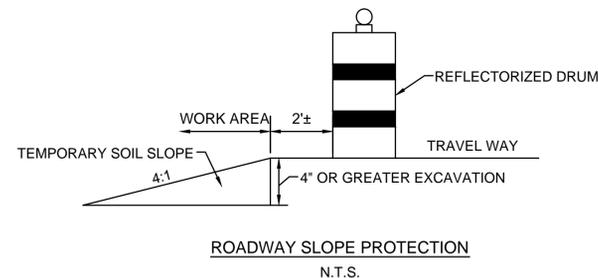




TRAFFIC SIGN SUMMARY													
IDENTIFICATION NUMBER	SIZE OF SIGN (in)		LEGEND	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			NUMBER OF POSTS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK-GROUND	LEGEND	BORDER			
R1-1	36	36		SEE 2009 MUTCD FOR TEXT AND LEGEND DIMENSIONS			5	RED	WHITE	WHITE	5	9.00	45.00
R1-6	12	36					9	FL. YELLOW-GREEN/WHITE	BLACK	BLACK	N/A	PAID FOR UNDER ITEM 832.1	
R5-1	30	30					2	WHITE	RED	WHITE	2	6.25	12.50
R6-1L	36	12					1	WHITE	BLACK	BLACK	0 MOUNT ON R5-1	3.00	3.00
R6-1R	36	12					1	WHITE	BLACK	BLACK	0 MOUNT ON R5-1	3.00	3.00
R10-25	9	12					2	WHITE	BLACK	BLACK	0 MOUNT ON RRFB	0.75	1.50
S1-1	36	36					5	FL. YELLOW-GREEN	BLACK	BLACK	5	9.00	45.00
S1-1P	18	24					3	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT ON S1-1	3.00	9.00
S5-2	24	30					3	WHITE	BLACK	BLACK	3	5.00	15.00
W11-2	36	36					6	FL. YELLOW-GREEN	BLACK	BLACK	2 MOUNT 4 ON RRFB	9.00	54.00
W16-7pL	24	12					2	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT 2 W/ W11-2 MOUNT 2 W/ S1-1	2.00	4.00
W16-7pR	24	12					2	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT ON RRFB	2.00	4.00
W16-9p	24	12					2	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT W/ W11-2	2.00	4.00

LEGEND

- DRUM
- Ⓟ/Ⓡ POLICE OFFICER OR FLAGGER
- ⚡ CONSTRUCTION SIGN
- ▨ WORK AREA
- ← PROPOSED TRAFFIC FLOW
- N.T.S. NOT TO SCALE



PEDESTRIAN BYPASS NOTES:

1. ADDITIONAL ADVANCE "SIDEWALK CLOSED" WARNING SIGNS MAY BE NECESSARY AT ADJACENT INTERSECTIONS.
2. CONTROLS ARE ONLY SHOWN FOR PEDESTRIAN TRAFFIC. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN IN OTHER DETAILS ON THIS SHEET.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. → DIRECTION OF PEDESTRIAN TRAVEL.
5. TEMPORARY WHEELCHAIR RAMPS (WCR) TO MEET ALL ADA/AAB REQUIREMENTS.

TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING AND AS DIRECTED BY THE ENGINEER.

DRUM SPACING NOTES:

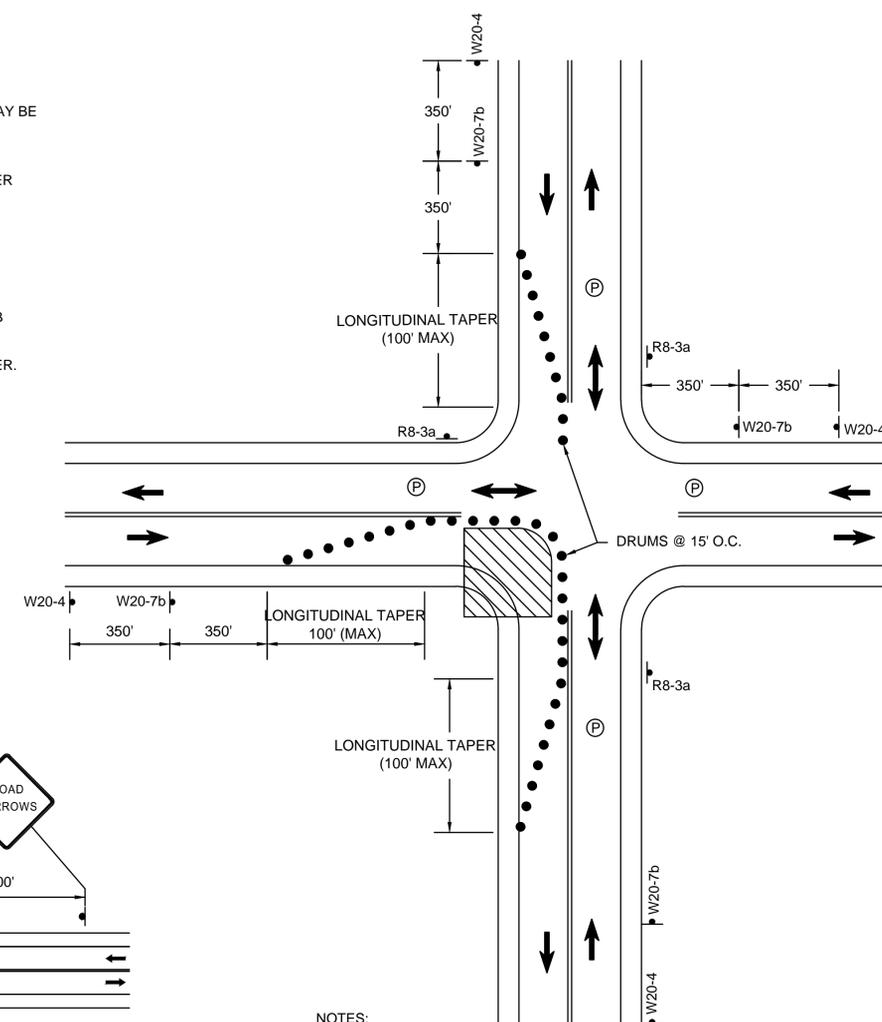
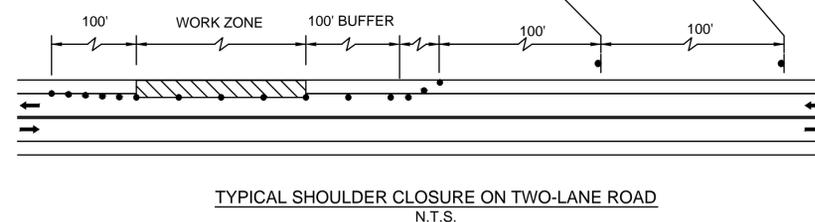
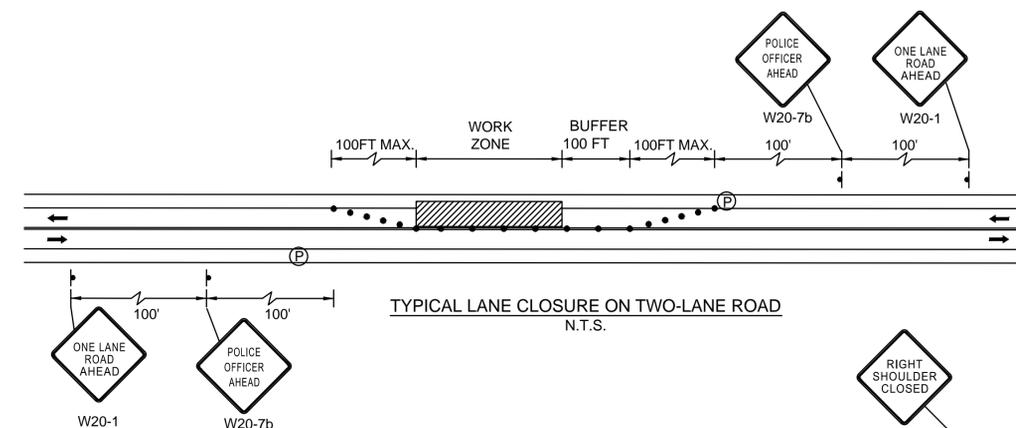
1. DRUM SPACING FOR LONGITUDINAL TAPER SECTION SHALL NOT EXCEED A DISTANCE IN FEET EQUAL TO THE POSTED SPEED.
2. DRUM SPACING FOR TANGENT SECTION SHALL NOT EXCEED A DISTANCE IN FEET EQUAL TO TWICE THE POSTED SPEED.
3. DRUM SPACING FOR TERMINATION TAPER SECTION SHALL NOT EXCEED 20 FEET.

LONGITUDINAL BUFFER

SPEED (mph)	BUFFER (FT)
20	115
25	155
30	200
35	250
40	305
45	360

MERGING TAPER LENGTH (L)

SPEED (mph)	TAPER WIDTH (FT)			
	9	10	11	12
25	95	105	115	125
30	135	150	165	180
35	185	205	225	245
40	240	270	295	320
45	405	450	495	540

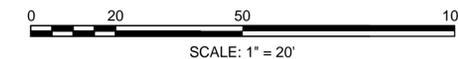
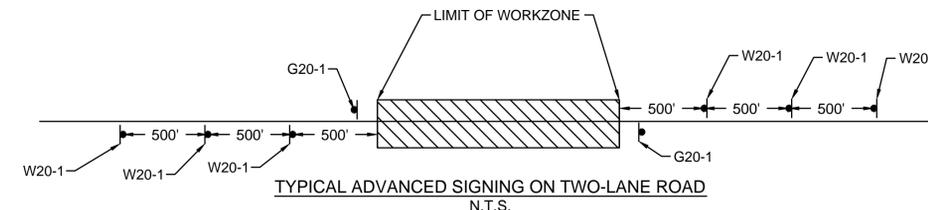


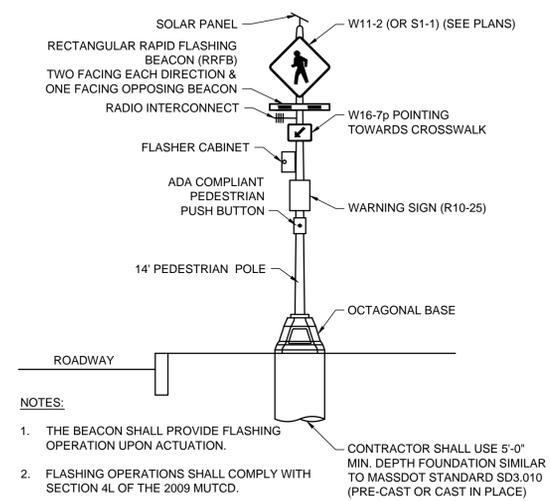
NOTES:

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3. DRUM SPACING FOR TERMINATION TAPER SECTION SHALL NOT EXCEED 20 FEET.

GENERAL NOTES

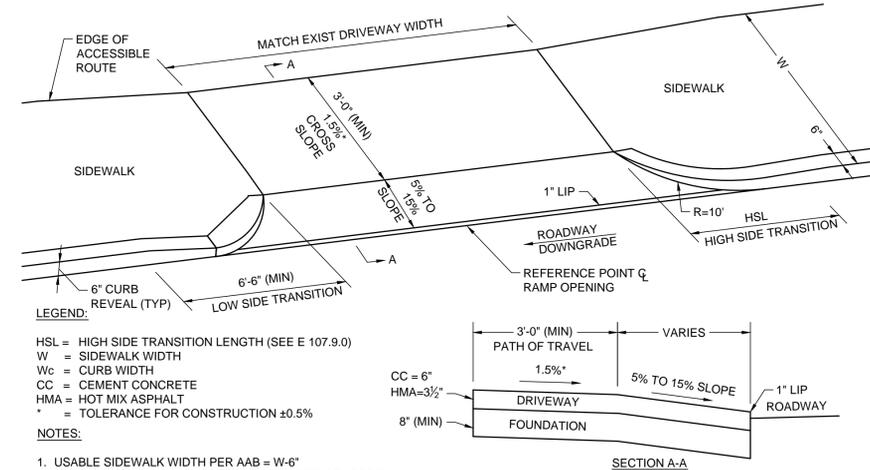
1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. 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.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS 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. CONTRACTORS SHALL NOTIFY EACH ADJUTTER 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.
7. THE FIRST FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET (3.3m) UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.





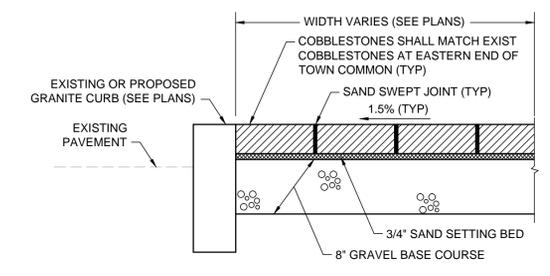
- NOTES:**
1. THE BEACON SHALL PROVIDE FLASHING OPERATION UPON ACTUATION.
 2. FLASHING OPERATIONS SHALL COMPLY WITH SECTION 4L OF THE 2009 MUTCD.
 3. UNIT SHALL BE CAPABLE OF PROVIDING RADIO INTERCONNECT BETWEEN ADJACENT RRFBS LOCATIONS.
 4. SEE SPECIAL PROVISIONS FOR MANUFACTURER DETAILS.
- CONTRACTOR SHALL USE 5'-0" MIN. DEPTH FOUNDATION SIMILAR TO MASSDOT STANDARD SD3.010 (PRE-CAST OR CAST IN PLACE)

RECTANGULAR RAPID FLASHING BEACON
N.T.S.

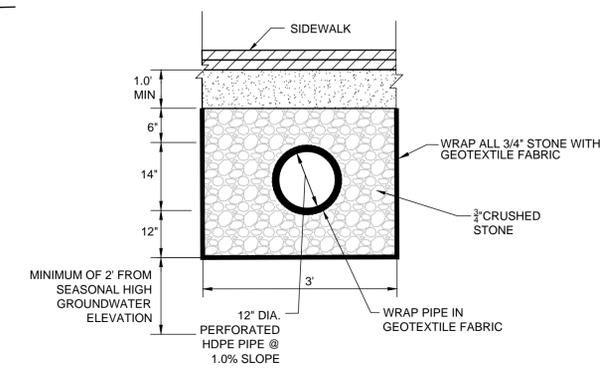


- LEGEND:**
- HSL = HIGH SIDE TRANSITION LENGTH (SEE E 107.9.0)
 - W = SIDEWALK WIDTH
 - Wc = CURB WIDTH
 - CC = CEMENT CONCRETE
 - HMA = HOT MIX ASPHALT
 - * = TOLERANCE FOR CONSTRUCTION ±0.5%
- NOTES:**
1. USABLE SIDEWALK WIDTH PER AAB = W-6"
 2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
 3. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION
 4. SURFACE TREATMENT VARIES; SEE PLANS

SIDEWALK THROUGH DRIVEWAY TYPE B
N.T.S.

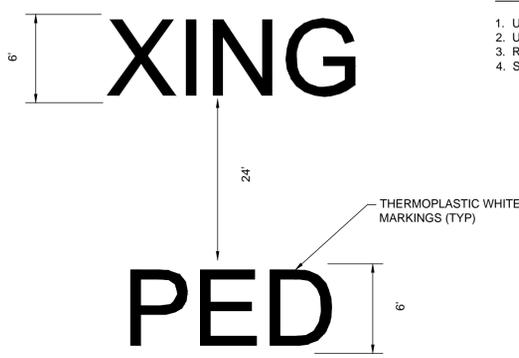


COBBLESTONE WALKWAY
N.T.S.

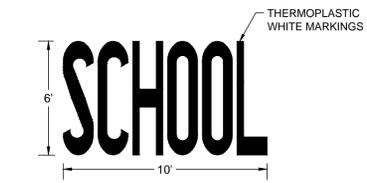


- NOTE:**
1. UNDERGROUND DETENTION SYSTEM TO BE HIGH-DENSITY POLYETHYLENE (HDPE) PERFORATED PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURER'S DESIGN TO ENGINEER FOR APPROVAL.

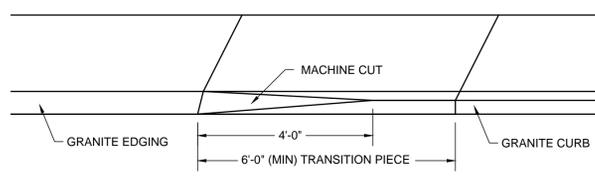
PERFORATED PIPE
N.T.S.



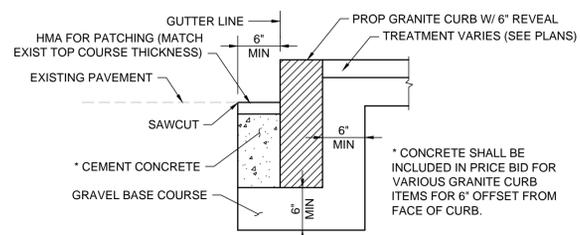
- NOTES:**
1. LAYOUT OF "PED XING" SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
 2. STENCIL TO BE PROVIDED TO THE TOWN OF WESTFORD HIGHWAY DEPARTMENT
- PED XING PAVEMENT MARKING**
N.T.S.



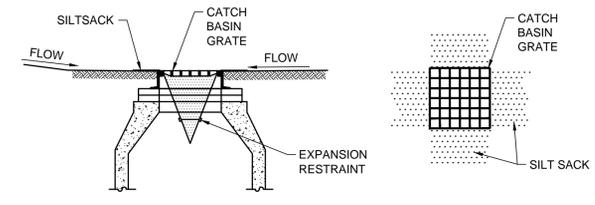
- NOTES:**
1. STENCIL TO BE PROVIDED TO THE TOWN OF WESTFORD HIGHWAY DEPARTMENT
- SCHOOL ZONE PAVEMENT MARKING**
N.T.S.



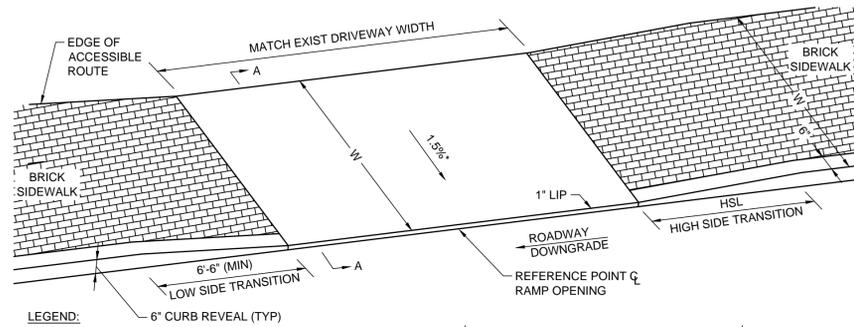
GRANITE CURB SPLOYED END
N.T.S.



GRANITE CURB IN EXISTING PAVEMENT
N.T.S.

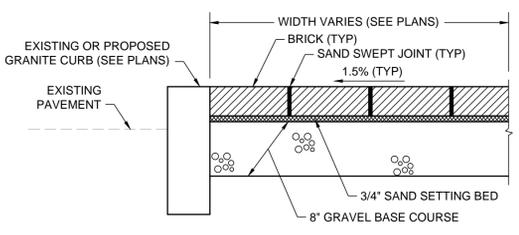


- NOTES:**
1. INSTALL SILT SACK IN EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
 2. GRATE TO BE PLACED OVER SILT SACK.
 3. SILT SACK 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.

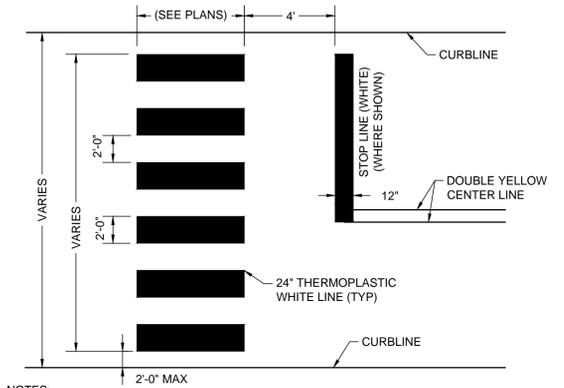


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 - W = SIDEWALK WIDTH
 - Wc = CURB WIDTH
 - CC = CEMENT CONCRETE
 - HMA = HOT MIX ASPHALT
 - * = TOLERANCE FOR CONSTRUCTION ±0.5%
- NOTES:**
1. USABLE SIDEWALK WIDTH PER AAB = W-6"
 2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
 3. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION
 4. SURFACE TREATMENT VARIES; SEE PLANS

SIDEWALK THROUGH DRIVEWAY TYPE A
N.T.S.



BRICK WALK REMOVED AND RELAI
N.T.S.



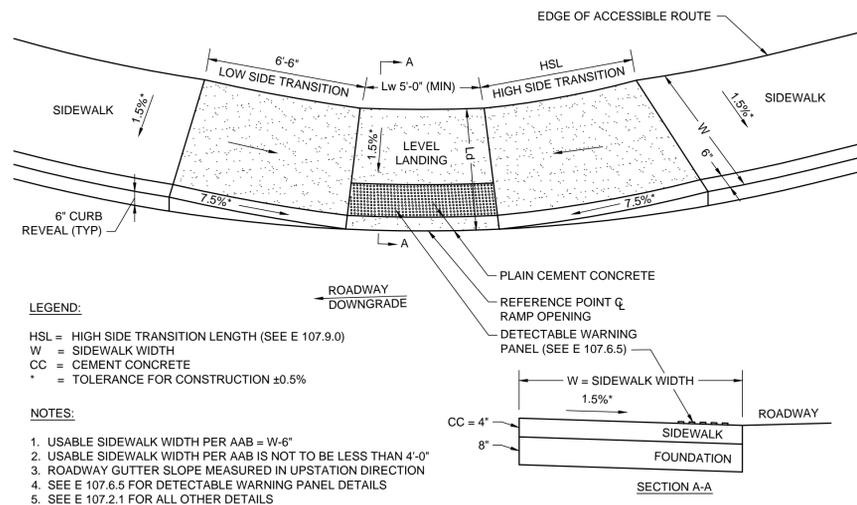
- NOTES:**
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED. ALL 24" LINES MAY BE EITHER ONE 24" LINE OR A COMBINATION OF TWO - 12" LINES.
 2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
 3. CROSSWALK BARS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

WHEELCHAIR 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 5x5' 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 WHEELCHAIR RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STANDARD E 107.6.5 (JUNE 2014). CONTRACTOR SHALL PROVIDE 6" BETWEEN DETECTABLE WARNING PANEL AND EDGE OF CONCRETE WHERE IT ABUTS LOAM & SEED.
8. WHEELCHAIR 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 TOWN OF WESTFORD.

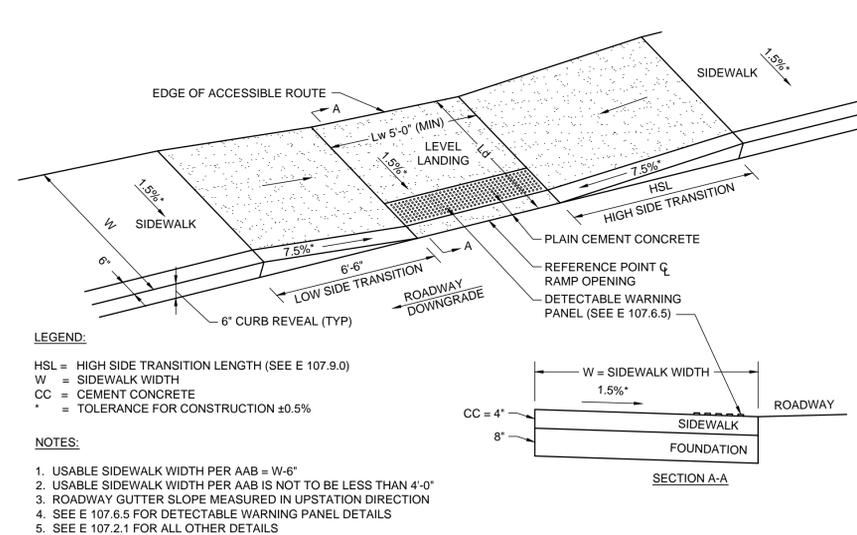
WHEELCHAIR RAMP NOTES

N.T.S.



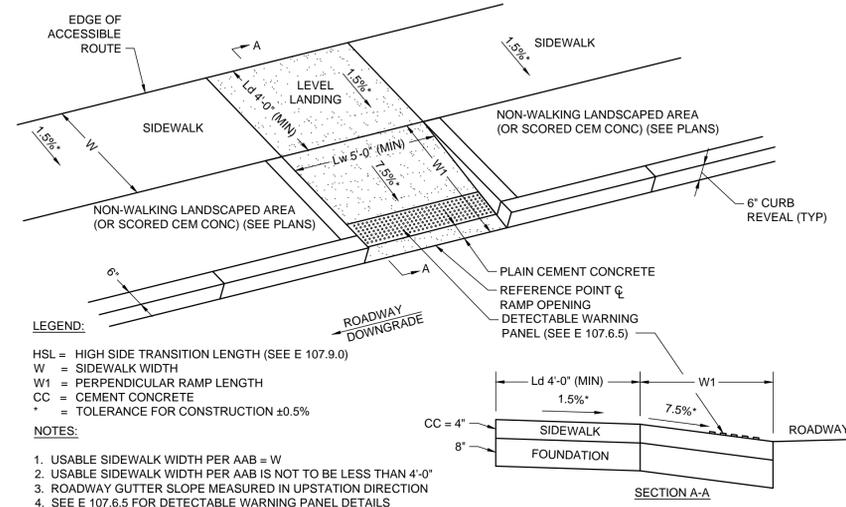
WHEELCHAIR RAMP TYPE A

N.T.S.



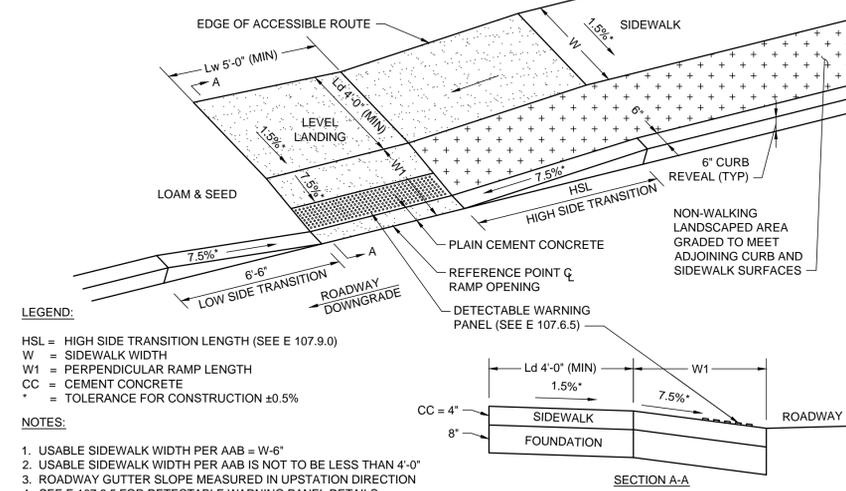
WHEELCHAIR RAMP TYPE B

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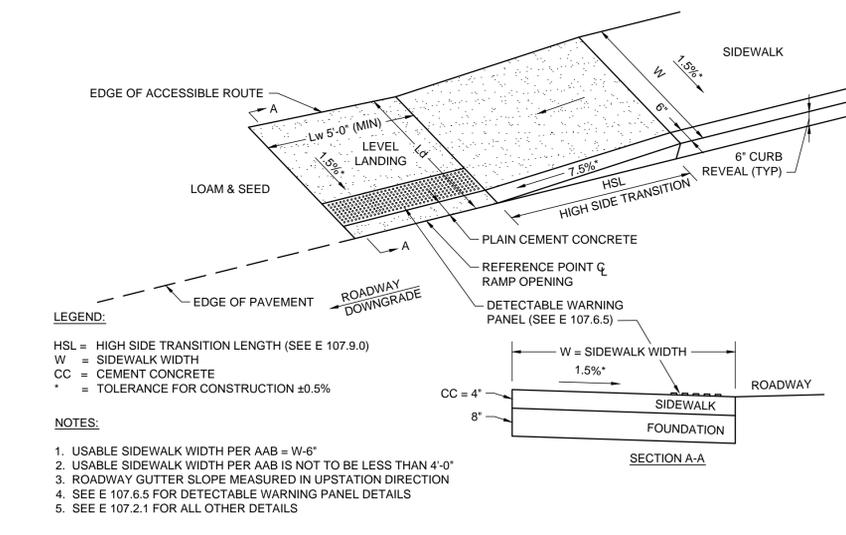
WHEELCHAIR RAMP TYPE C

N.T.S.



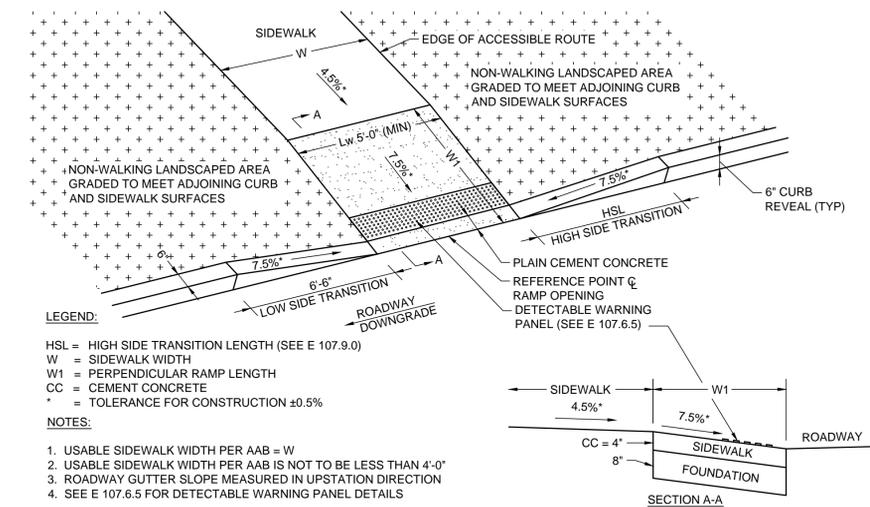
WHEELCHAIR RAMP TYPE D

N.T.S.



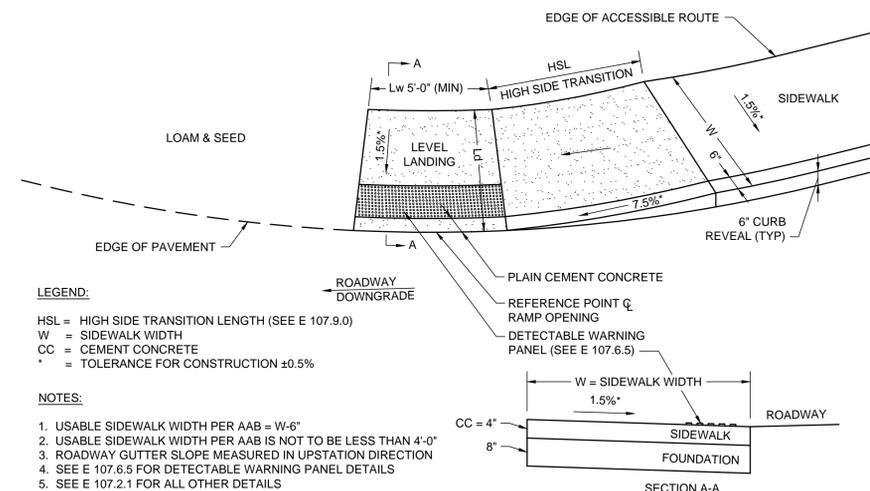
WHEELCHAIR RAMP TYPE E

N.T.S.



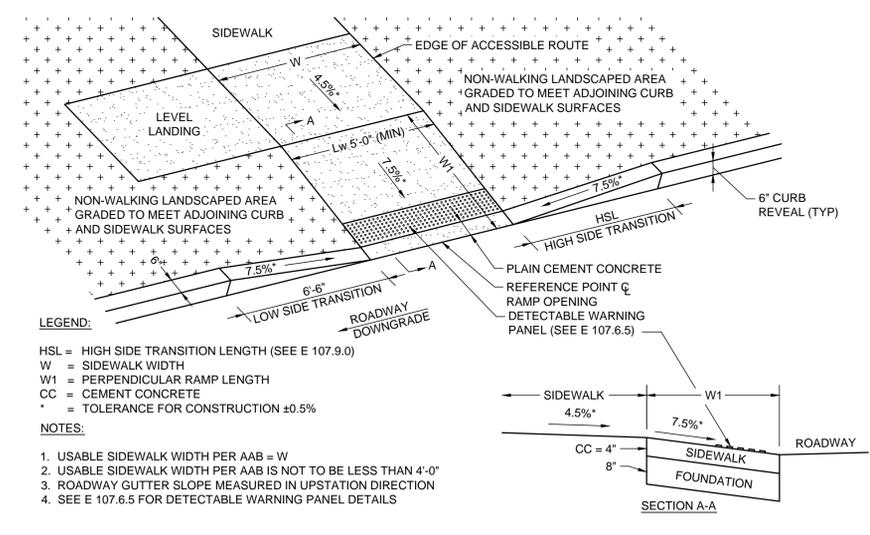
WHEELCHAIR RAMP TYPE F

N.T.S.



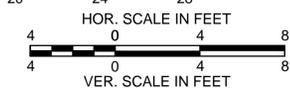
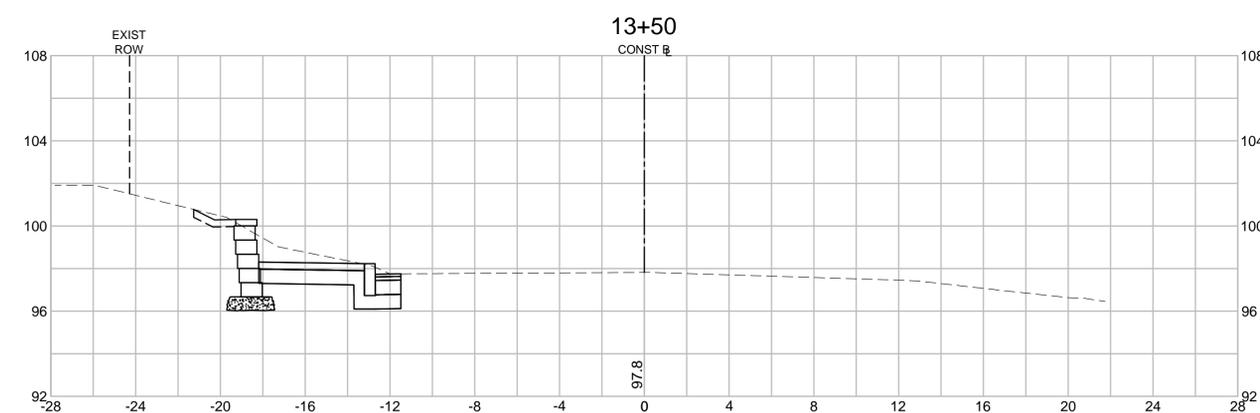
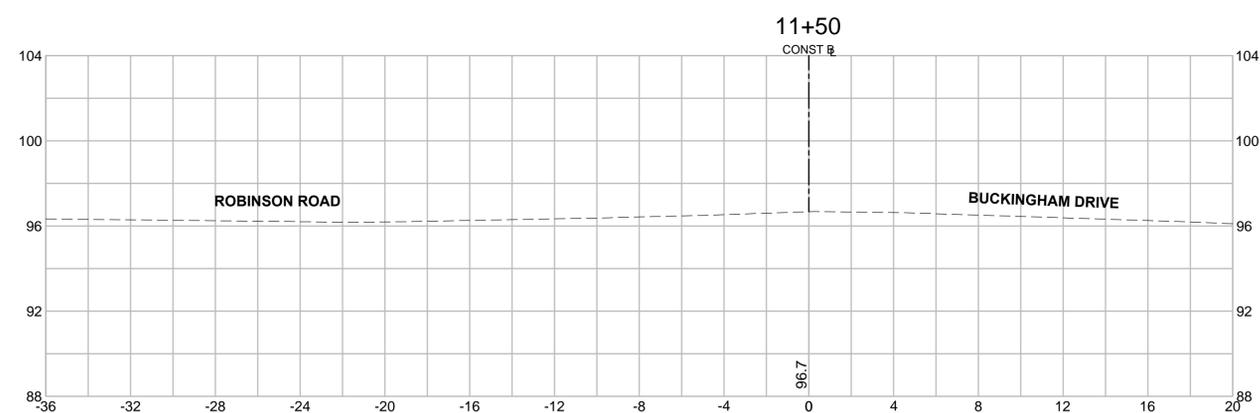
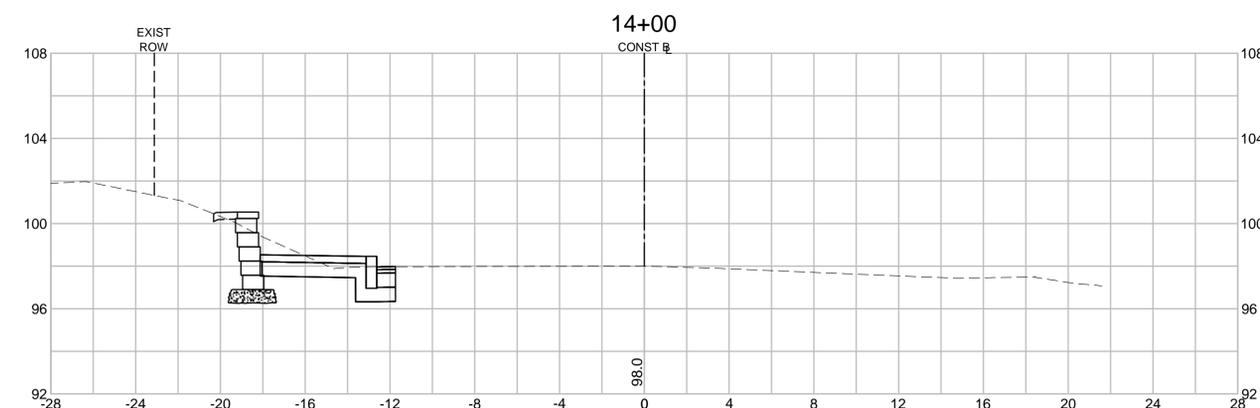
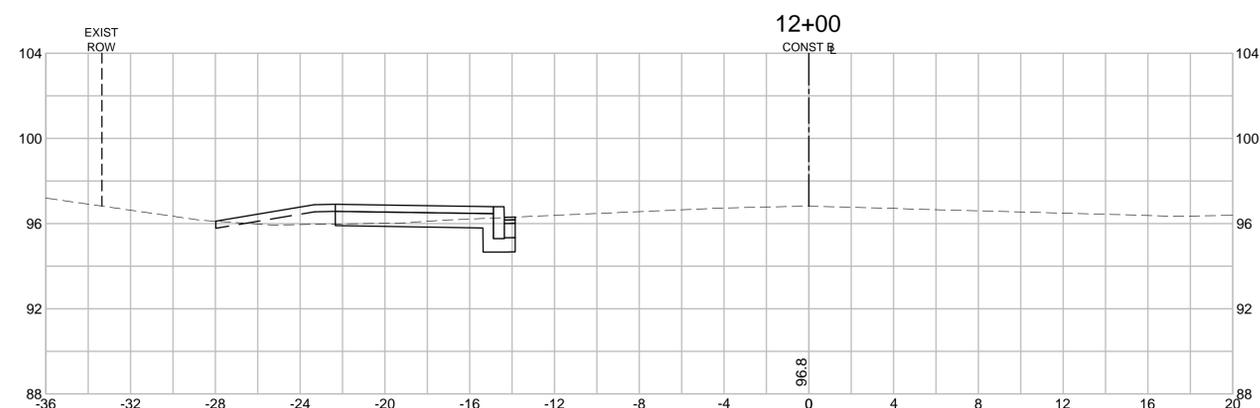
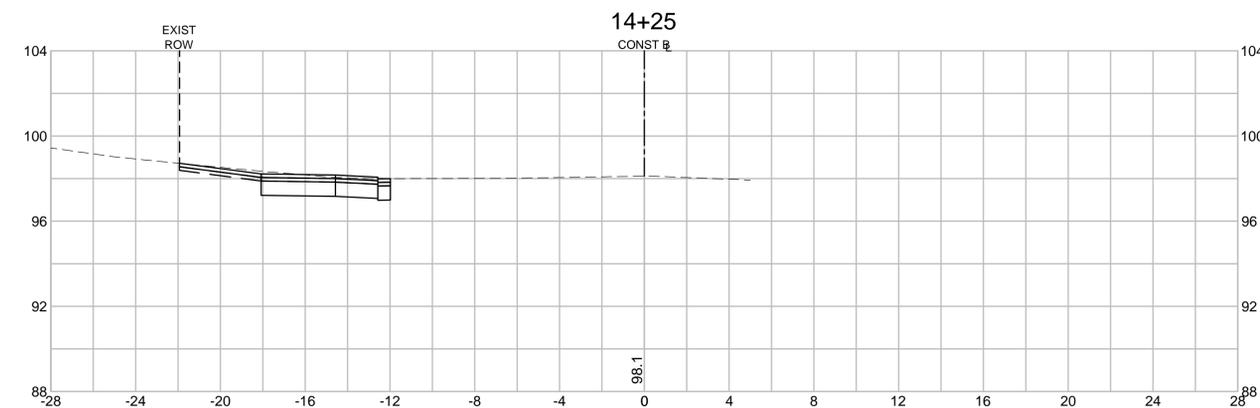
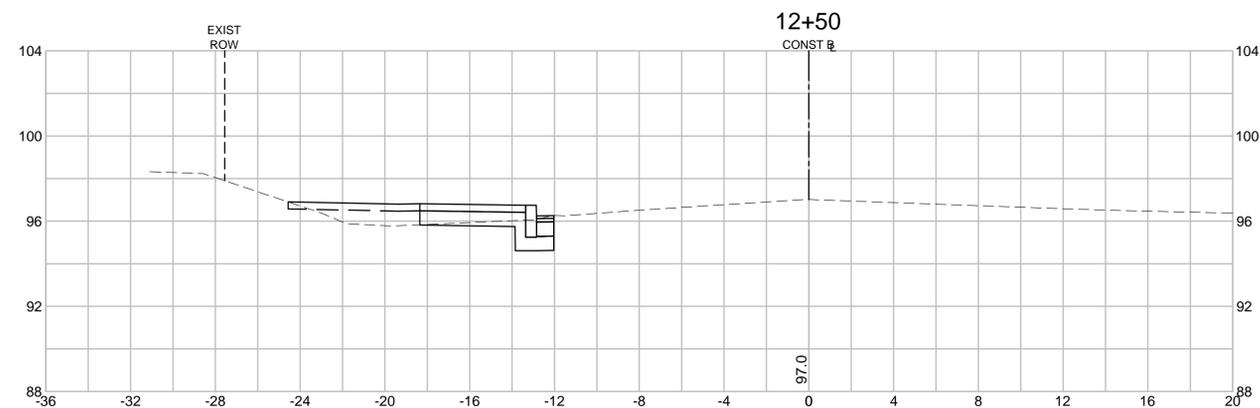
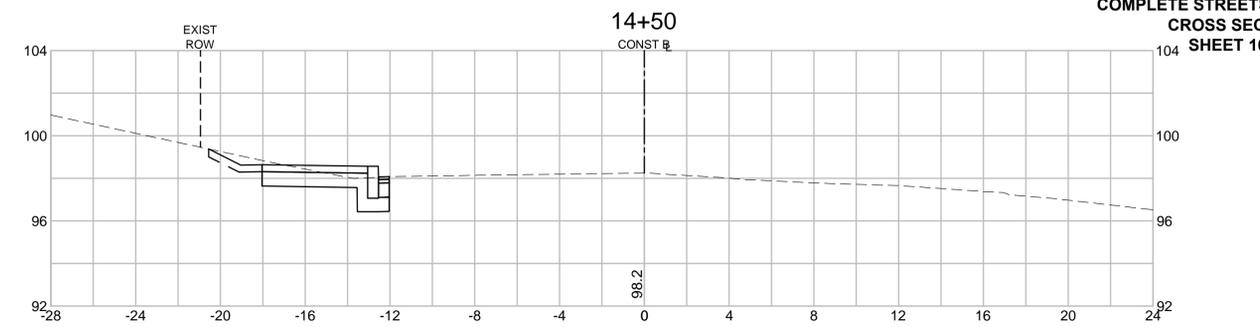
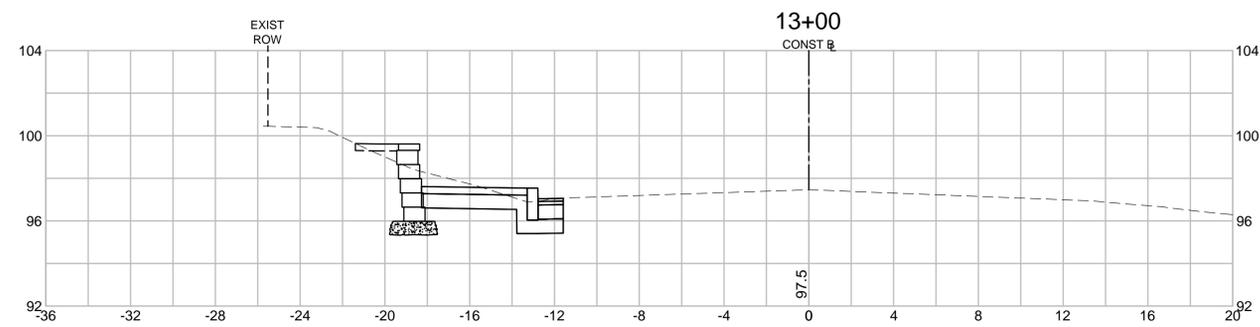
WHEELCHAIR RAMP TYPE G

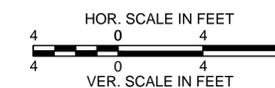
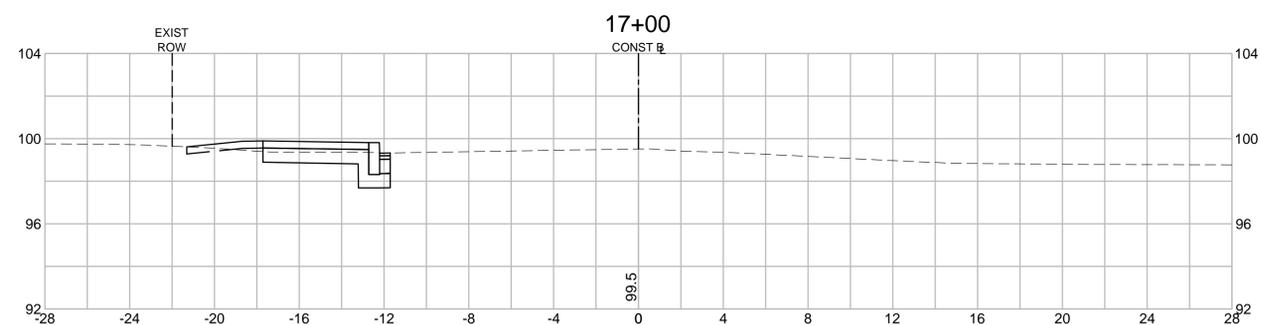
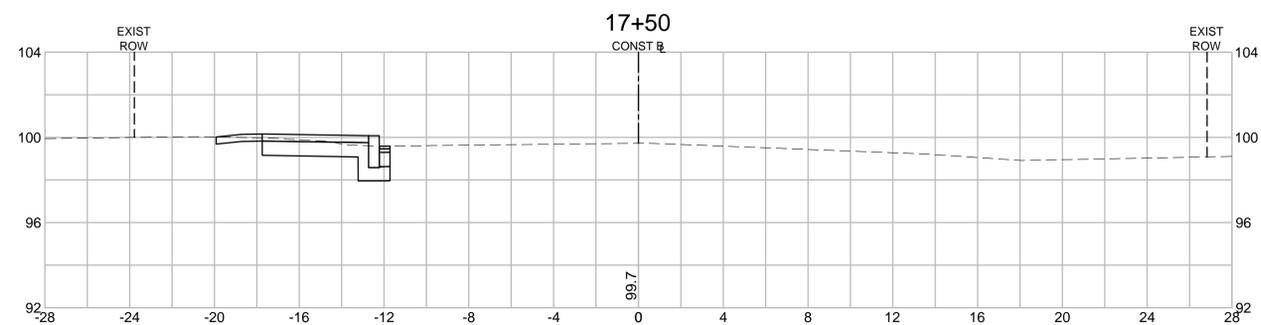
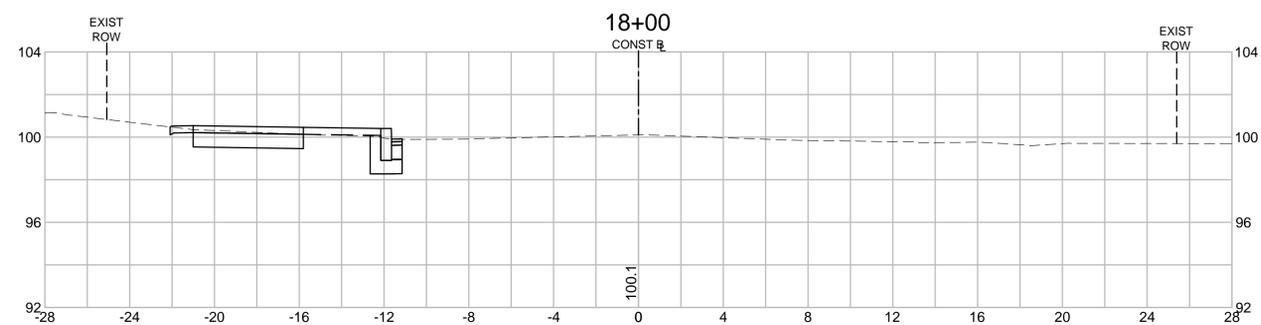
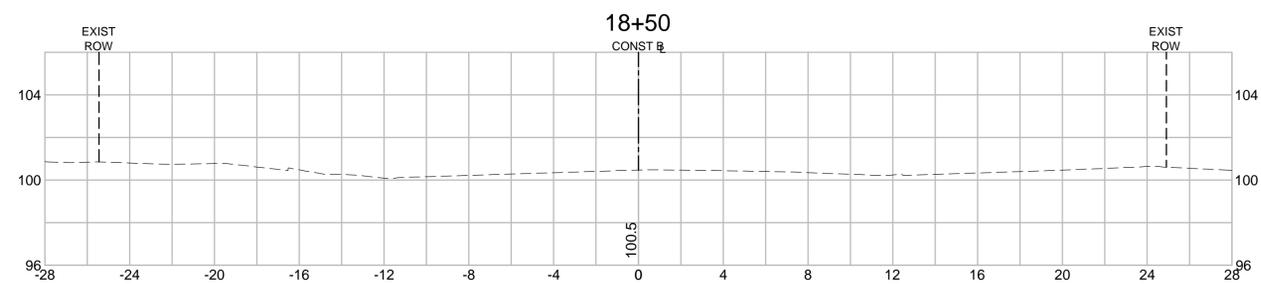
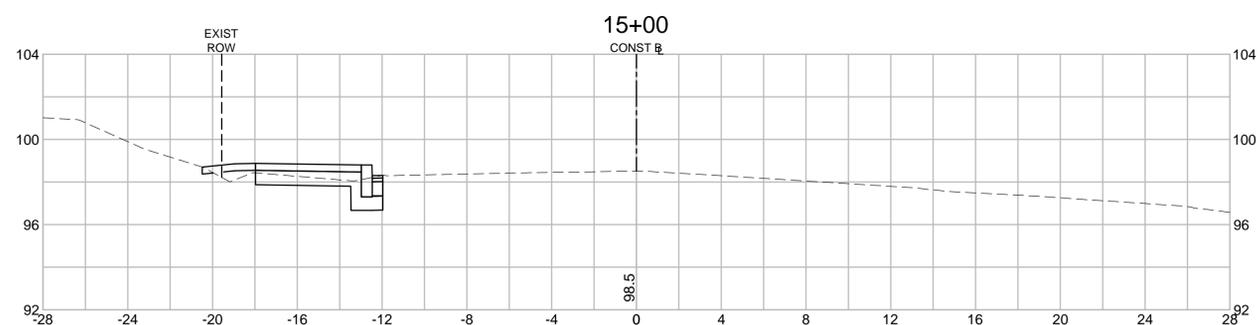
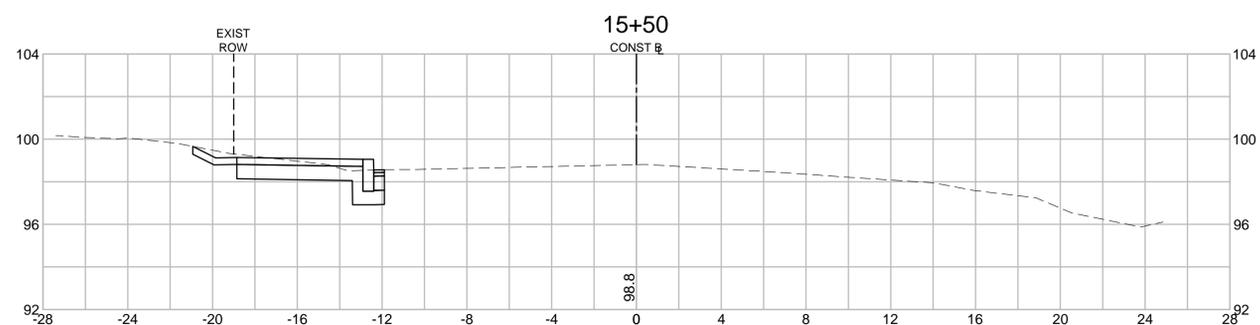
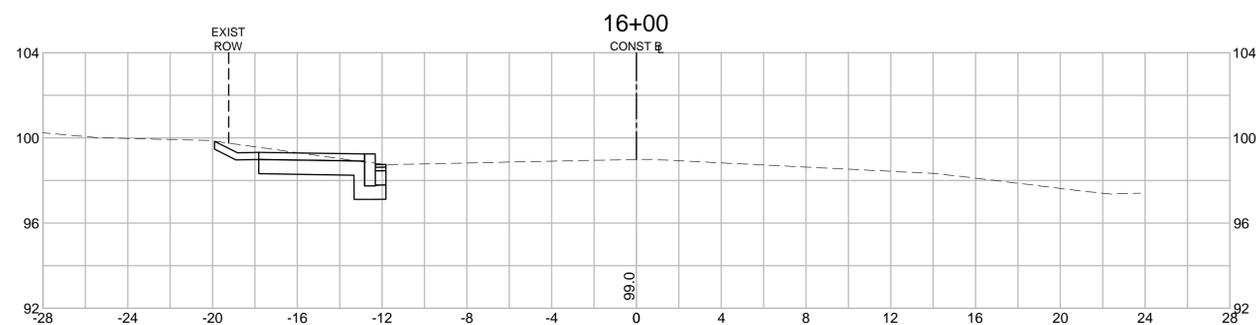
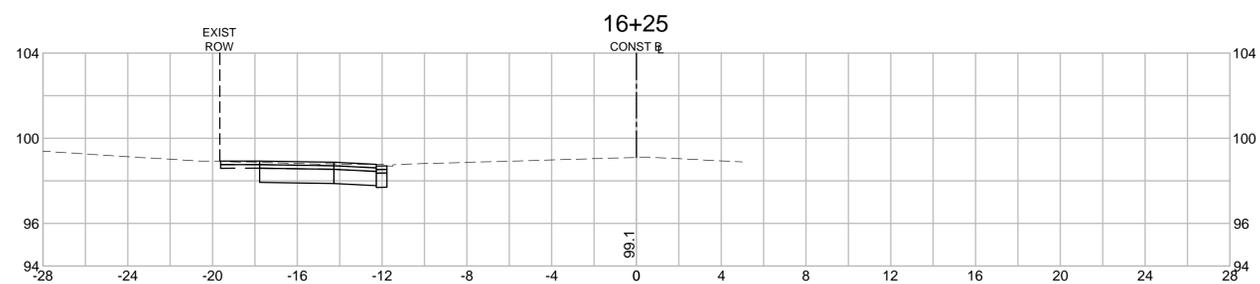
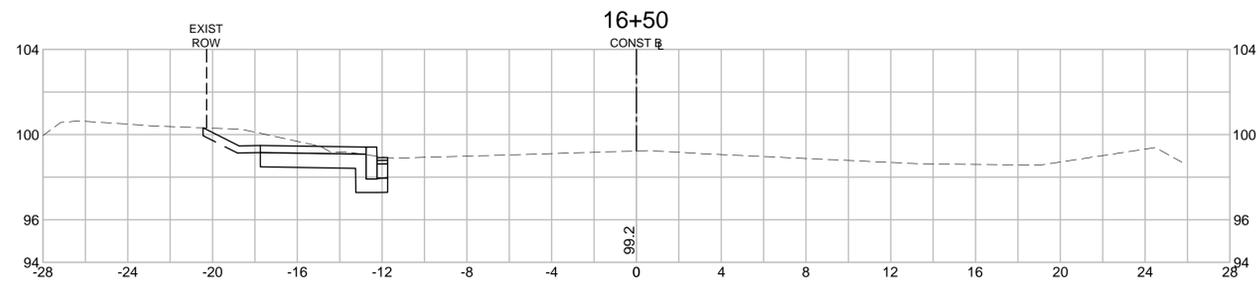
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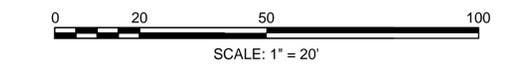
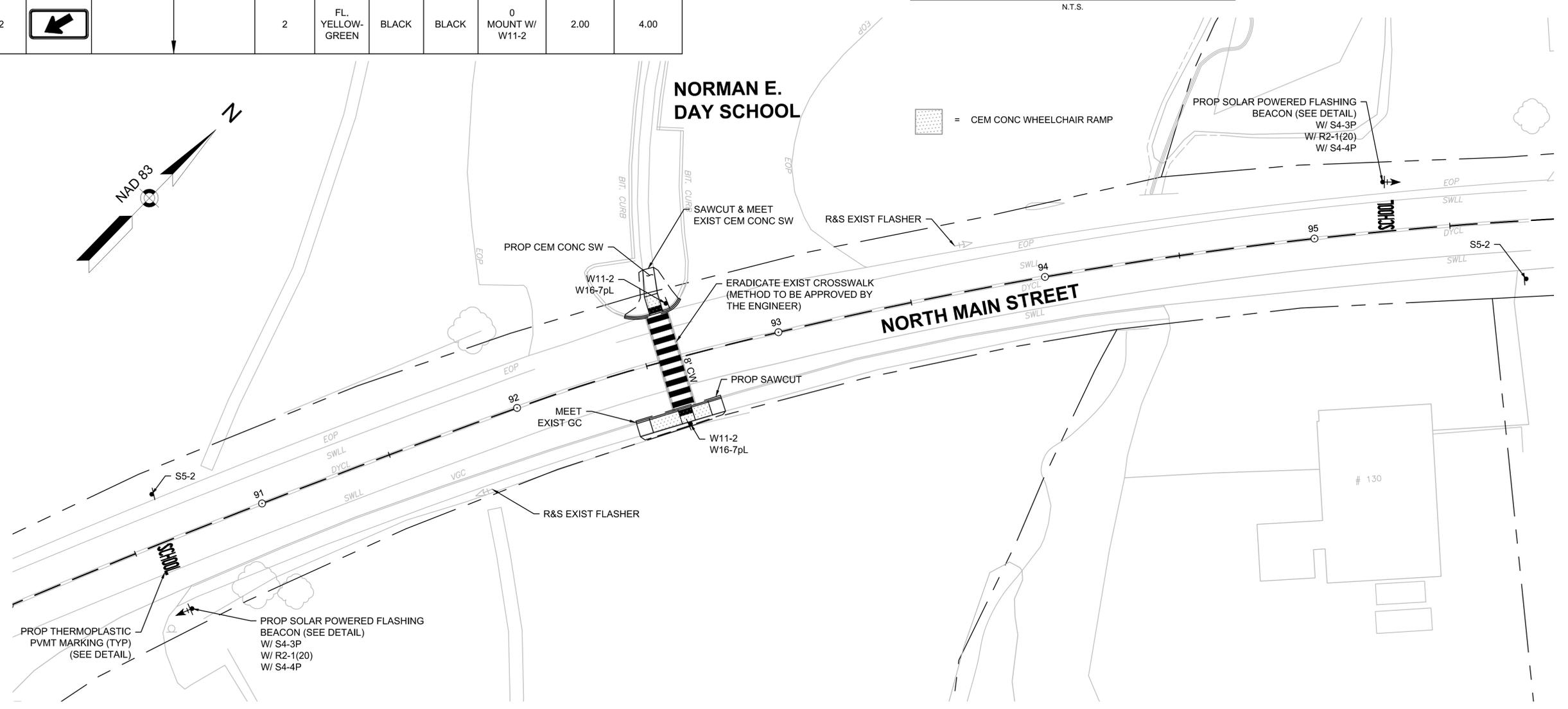
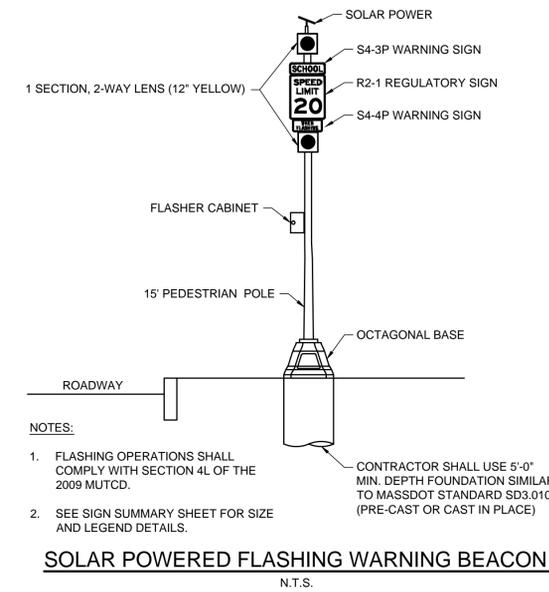
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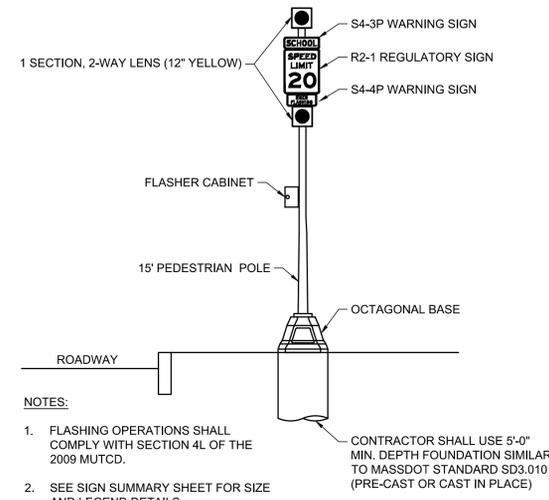
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TRAFFIC SIGN SUMMARY													
IDENTIFICATION NUMBER	SIZE OF SIGN (in)		LEGEND	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			NUMBER OF POSTS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK-GROUND	LEGEND	BORDER			
R2-1	24	30		SEE 2009 MUTCD FOR TEXT AND LEGEND DIMENSIONS			2	WHITE	BLACK	BLACK	0 MOUNT ON FLASHER	5.00	10.00
S4-3P	24	8					2	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT ON FLASHER	1.33	2.67
S4-4P	24	10					2	WHITE	BLACK	BLACK	0 MOUNT ON FLASHER	1.67	3.33
S5-2	24	30					2	WHITE	BLACK	BLACK	2	5.00	10.00
W11-2	36	36					2	FL. YELLOW-GREEN	BLACK	BLACK	2	9.00	18.00
W16-7pL	24	12					2	FL. YELLOW-GREEN	BLACK	BLACK	0 MOUNT W/ W11-2	2.00	4.00

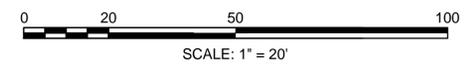
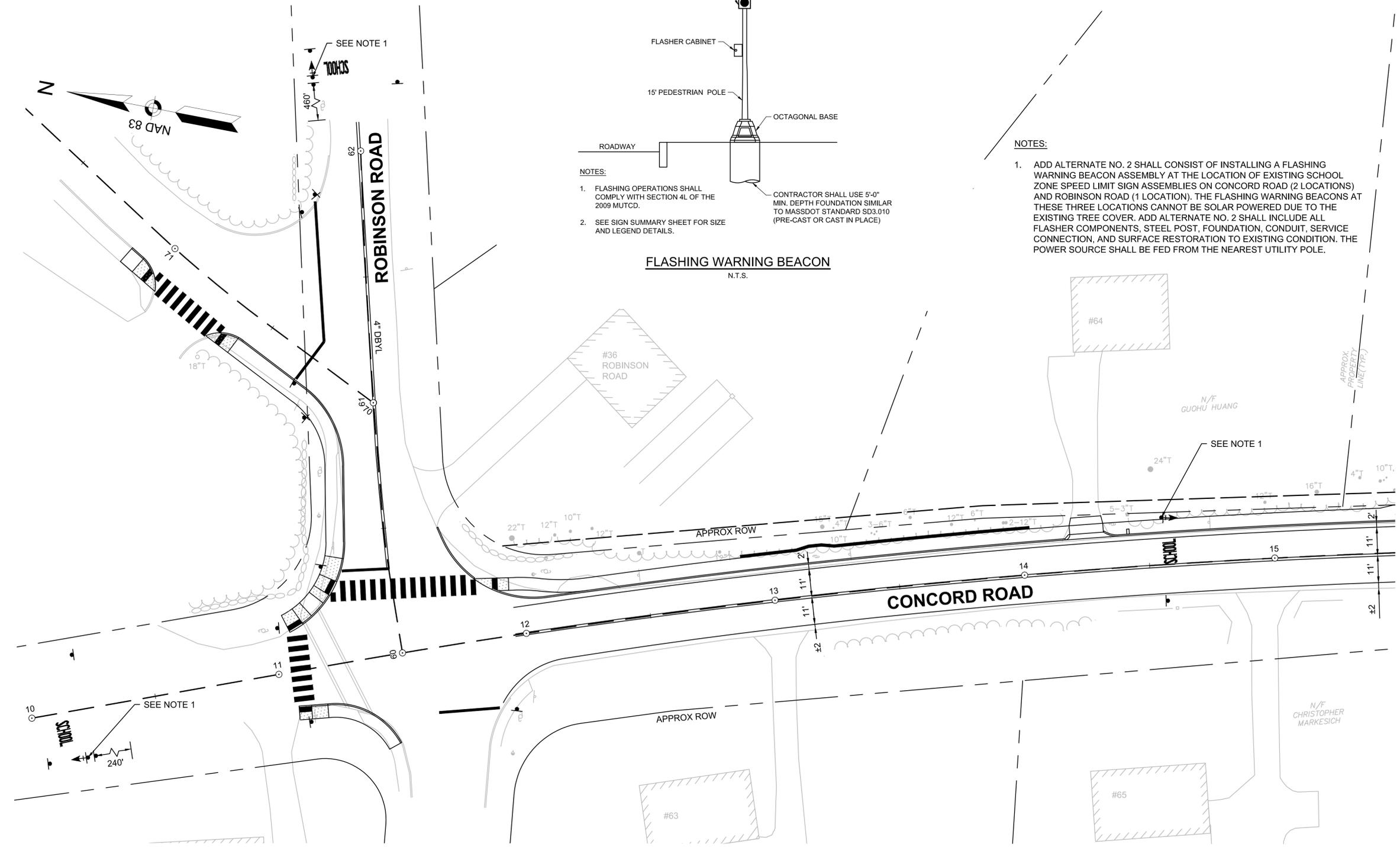


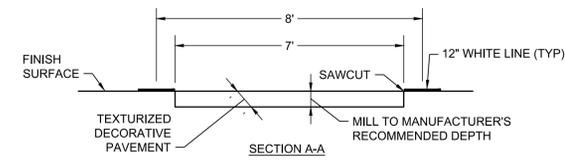
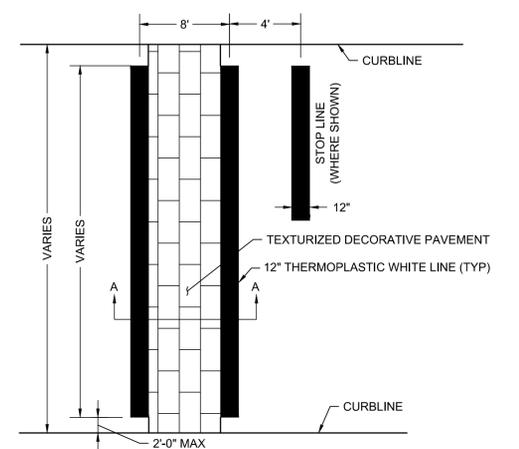
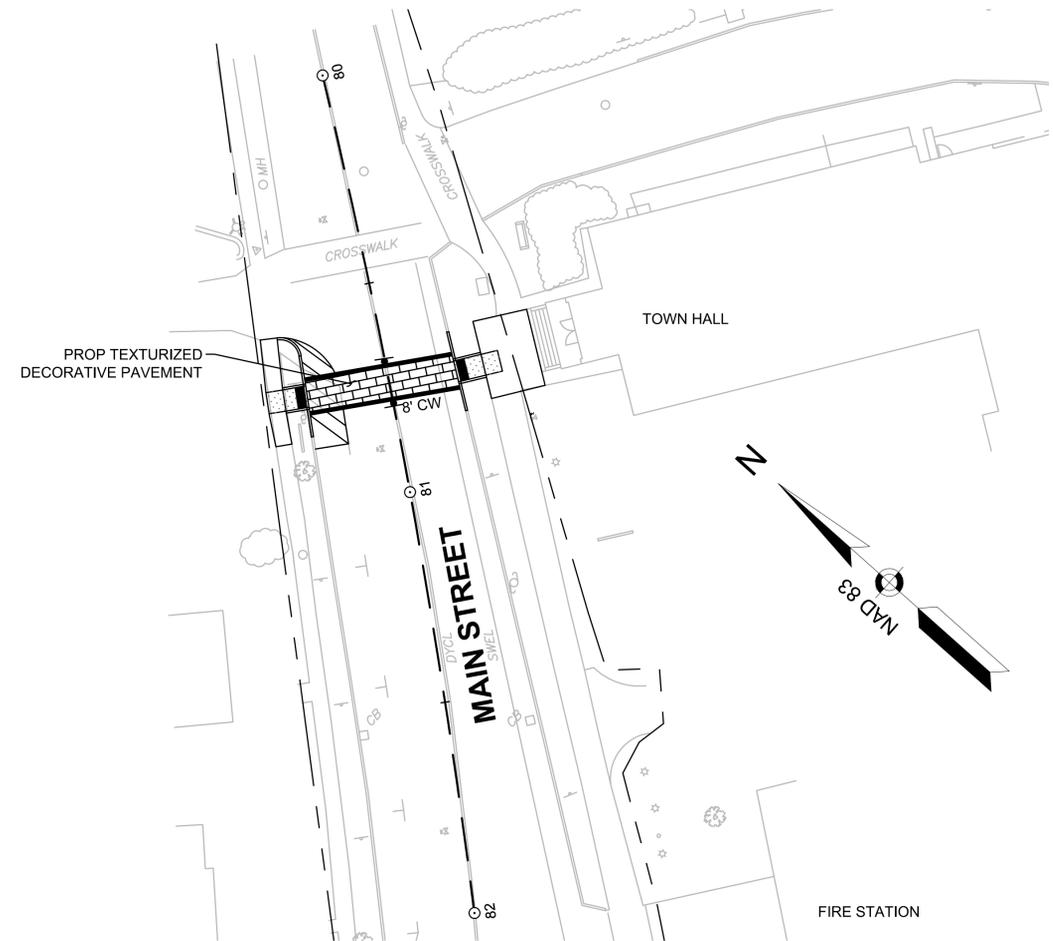


FLASHING WARNING BEACON
N.T.S.

NOTES:

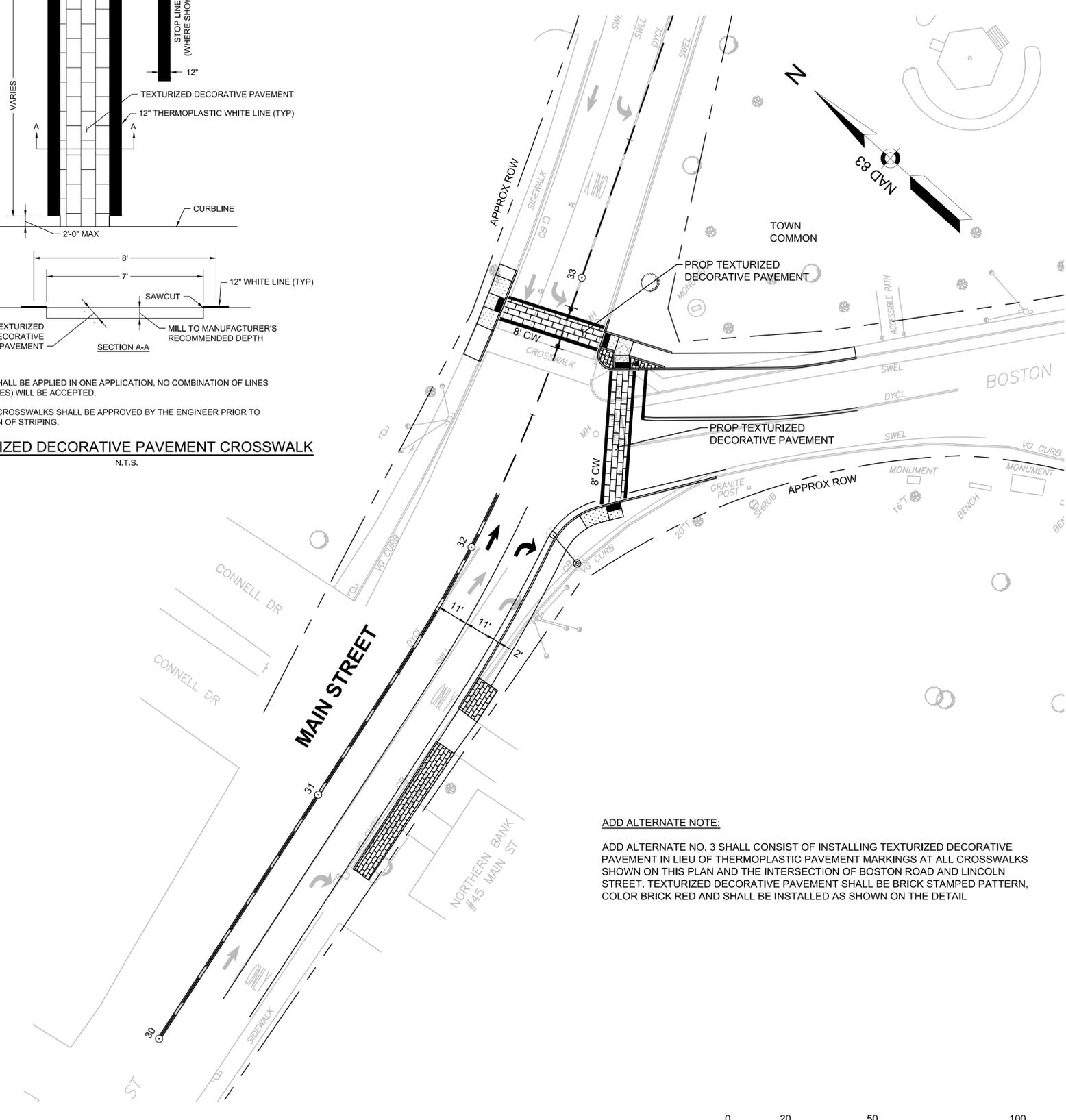
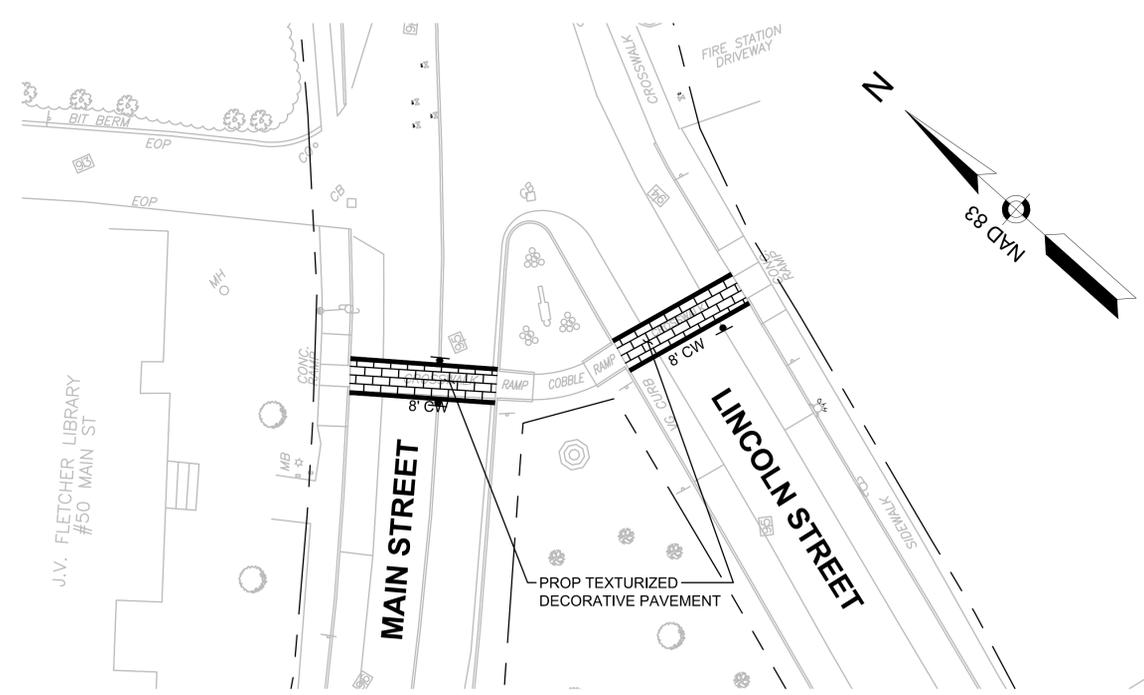
- ADD ALTERNATE NO. 2 SHALL CONSIST OF INSTALLING A FLASHING WARNING BEACON ASSEMBLY AT THE LOCATION OF EXISTING SCHOOL ZONE SPEED LIMIT SIGN ASSEMBLIES ON CONCORD ROAD (2 LOCATIONS) AND ROBINSON ROAD (1 LOCATION). THE FLASHING WARNING BEACONS AT THESE THREE LOCATIONS CANNOT BE SOLAR POWERED DUE TO THE EXISTING TREE COVER. ADD ALTERNATE NO. 2 SHALL INCLUDE ALL FLASHER COMPONENTS, STEEL POST, FOUNDATION, CONDUIT, SERVICE CONNECTION, AND SURFACE RESTORATION TO EXISTING CONDITION. THE POWER SOURCE SHALL BE FED FROM THE NEAREST UTILITY POLE.



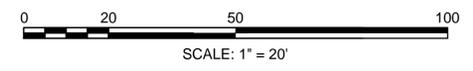


- NOTES:
1. ALL LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
 2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION OF STRIPING.

TEXTURIZED DECORATIVE PAVEMENT CROSSWALK
N.T.S.



ADD ALTERNATE NOTE:
ADD ALTERNATE NO. 3 SHALL CONSIST OF INSTALLING TEXTURIZED DECORATIVE PAVEMENT IN LIEU OF THERMOPLASTIC PAVEMENT MARKINGS AT ALL CROSSWALKS SHOWN ON THIS PLAN AND THE INTERSECTION OF BOSTON ROAD AND LINCOLN STREET. TEXTURIZED DECORATIVE PAVEMENT SHALL BE BRICK STAMPED PATTERN, COLOR BRICK RED AND SHALL BE INSTALLED AS SHOWN ON THE DETAIL



TOWN OF WESTFORD, MASSACHUSETTS LINCOLN STREET CURB EXTENSION

SEPTEMBER 2016

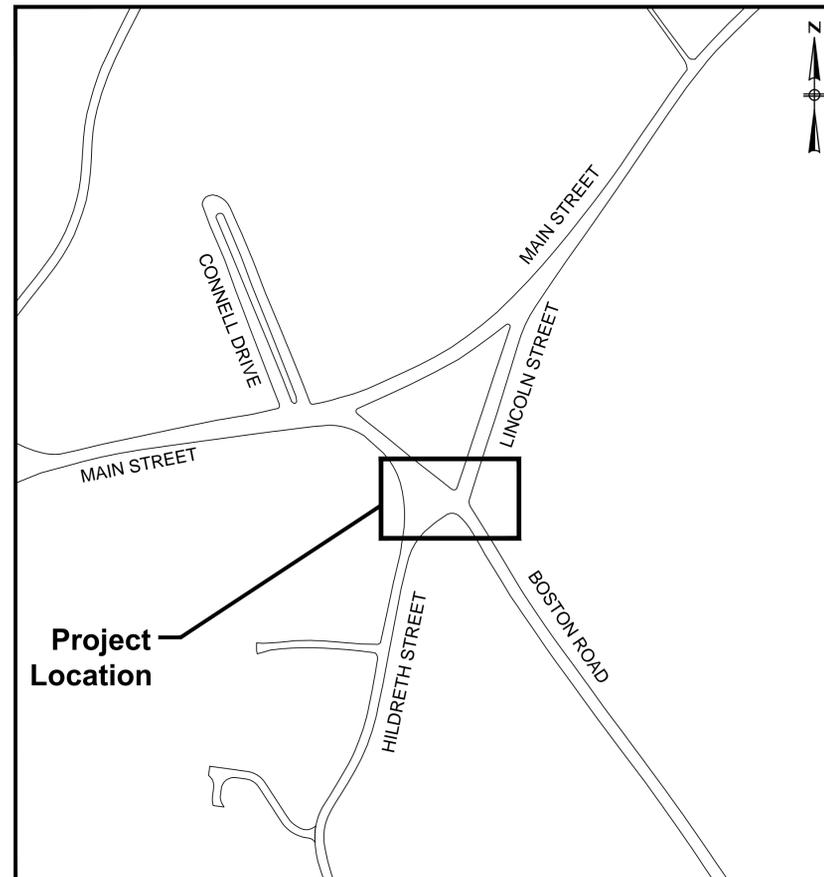


BOARD OF SELECTMEN

KELLY J ROSS, CHAIRMAN
ANDREA PERANER-SWEET, VICE CHAIRMAN
DON SIRIANI, CLERK
MARK D KOST
SCOTT HAZELTON

TOWN MANAGER

JODI ROSS



LOCATION MAP
SCALE: 1"=200'

PLAN INDEX

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	COVER SHEET
2	LEGEND & ABBREVIATIONS
3	GENERAL NOTES AND PAVEMENT NOTES
4	CONSTRUCTION PLAN
5	CONSTRUCTION DETAILS

ISSUED FOR CONSTRUCTION



LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CURB OR BERM (TYPE AS NOTED)
		EDGE OF PAVEMENT
		CATCH BASIN (OR GUTTER INLET, LEACHING BASIN, DROP INLET, CATCH BASIN CURB INLET)
		ELECTRIC HANDHOLE (NUMBER AS NOTED)
		ELECTRIC MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		SEWER MANHOLE
		DRAINAGE MANHOLE
		GAS GATE
		WATER GATE
		CURB STOP
		HYDRANT
		FIRE ALARM BOX
		PARKING METER
		STREET LIGHT POLE
		UTILITY POLE
		UTILITY POLE w/ LIGHT
		SIGN
		GUY POLE
		DRAIN PIPE (SIZE AS NOTED)
		SEWER MAIN (SIZE AS NOTED)
		ELECTRIC DUCT
		GAS MAIN (SIZE AS NOTED)
		WATER MAIN (SIZE AS NOTED)
		TELEPHONE DUCT (SIZE AS NOTED)
		OVERHEAD WIRE
		MAIL BOX
		WOOD GUARD RAIL STEEL BEAM GUARD, WOOD OR STEEL POSTS (TYPE AS NOTED)
		STEEL GUARD RAIL, STEEL POSTS (TYPE NOTED)
		STONE WALL
		RETAINING WALL (TYPE NOTED)
		HIGHWAY/PROPERTY BOUND (TYPE AS NOTED)
		STATE HIGHWAY LAYOUT LINE (SHLO)
		CITY, TOWN OR COUNTY LAYOUT LINE (R.O.W.)
		CITY, TOWN, COUNTY OR STATE BOUNDARY LINE
		PROPERTY LINE
		EASEMENT LINE (TYPE NOTED)
		CONSTRUCTION BASELINE
		SURVEY LINE
		RAILROAD OR STREET RAILWAY TRACKS WITH SIDELINES
		WHEELCHAIR RAMP
		TREE (SIZE AND TYPE AS NOTED)
		HEDGE/SHRUBS
		FENCE (SIZE AND TYPE AS NOTED)
		EDGE OF WETLAND w/ FLAGGED NUMBER
		EDGE OF RIVER/STREAM LINE
		100-FT. WETLAND BUFFER LIMIT
		100-FT. RIVER FRONT LIMIT
		200-FT. RIVER FRONT LIMIT
		WOODED AREA / LIMIT OF CLEARING
		SPOT GRADE
		SAW CUT LINE
		TEST PIT
		BORING
		EROSION CONTROL BARRIER/COMPOST FILTER TUBES

ABBREVIATIONS

GENERAL

ABAN.	ABANDON
ADJ.	ADJUST
ALT.	ALTERATION
APPROX.	APPROXIMATE
	BASELINE
B.B.	BITUMINOUS BERM
B.C.	BITUMINOUS CURB
BD OR BND	BOUND
BLDG.	BUILDING
B.O.	BY OTHERS
BOS	BOTTOM OF SLOPE
BOW	BOTTOM OF WALL
BSW	BACK OF SIDEWALK
C.C.	CONCRETE CURB
CEM.	CEMENT
CLF	CHAIN LINK FENCE
CONC.	CONCRETE
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
DWY	DRIVEWAY
E.P., EOP	EDGE OF PAVEMENT
EL.	ELEVATION
ESMT.	EASEMENT
EXIST.	EXISTING
FDN.	FOUNDATION
GRAN.	GRANITE
GC	GRANITE CURB
HOR.	HORIZONTAL
IP	IRON PIPE
JCT	JUNCTION
LP	LOW POINT
MB	MAIL BOX
MHB	MASSACHUSETTS HIGHWAY BOUND
O.C.	ON CENTER
PCC	POINT OF COMPOUND CURVATURE
PC	POINT OF CURVATURE
PRC	POINT OF REVERSE CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PERM.	PERMANENT
PGL	PROFILE GRADE LINE
PROP.	PROPOSED
PVC	POINT OF VERTICAL CURVATURE
PVMT.	PAVEMENT
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
REM.	REMOVE
REMOD.	REMODEL
RET.	RETAIN
RR	RAILROAD
RT.	RIGHT
SB	SOUTH BOUND OR STONE BOUND
SDWK.	SIDEWALK
SHT.	SHEET
SHLD.	SHOULDER
STA.	STATION
TEMP.	TEMPORARY
TOS	TOP OF SLOPE
TOW	TOP OF WALL
TYP.	TYPICAL
VAR.	VARIABLE
VERT.	VERTICAL
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP

TRAFFIC SIGNAL SYSTEMS

R	STEADY CIRCULAR RED
Y	STEADY CIRCULAR AMBER
G	STEADY CIRCULAR GREEN
FR	FLASHING CIRCULAR RED
FY	FLASHING CIRCULAR AMBER
+FY	FLASHING YELLOW LEFT ARROW
R-	STEADY RED RIGHT ARROW
Y-	STEADY AMBER RIGHT ARROW
G-	STEADY GREEN RIGHT ARROW
+R	STEADY RED LEFT ARROW
+Y	STEADY AMBER LEFT ARROW
+G	STEADY GREEN LEFT ARROW
W	STEADY WALK (PERSON WALKING) - LUNAR WHITE
DW	STEADY DON'T WALK (HAND) - PORTLAND ORANGE
FDW	FLASHING DON'T WALK (FLASHING HAND) - PORTLAND ORANGE

UTILITIES

ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CI	CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
C	CONDUIT
CPP	CORRUGATED PLASTIC PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FM	FORCE MAIN
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GG	GAS GATE
HDW	HEADWALL
HYD.	HYDRANT
INV.	INVERT ELEVATION
LP	LIGHT POLE
MH	MANHOLE
PVC	POLY-VINYL-CHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE (CLASS III UNLESS NOTED)
SD	SUBDRAIN
SMH	SEWER MANHOLE
TS	TRAFFIC SIGNAL
TSV&B	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE
UPL	UTILITY POLE w/ LIGHT
UPT	UTILITY POLE w/ TRANSFORMER
VCP	VITRIFIED CLAY PIPE
WIP	WROUGHT IRON PIPE
WG	WATER GATE
WM	WATER METER/WATER MAIN

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CONTROL CABINET GROUND MOUNTED WITH FOUNDATION
		CONTROL CABINET POLE MOUNTED
		CONTROLLER PHASE
		MAST ARM, SHAFT & BASE (ARM LENGTH AS NOTED)
		VEHICULAR SIGNAL HEAD (ALPHA-NUMERIC DESIGNATION AS NOTED)
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		VEHICULAR SIGNAL HEAD (REMOVED & RESET)
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
		PULL BOX 12"x12" OR HANDHOLE
		LOOP DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		PRE-EMPTION DETECTOR
		PRE-EMPTION CONFIRMATION STROBE
		SIGNAL CONDUIT (SINGLE RUN)
		SIGNAL CONDUIT (DOUBLE RUN)
		SIGNAL POST & BASE
		MAGNETIC DETECTOR
		SCHOOL ZONE SPEED LIMIT SIGN
		MICROWAVE OR ULTRASONIC DETECTOR
		VIDEO DETECTION CAMERA
		VIDEO DETECTION ZONE

PAVEMENT MARKINGS AND SIGNING SYMBOLS

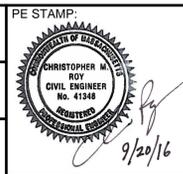
PROPOSED

CW	CROSSWALK, 2 - 12" WHITE LINES (8" WIDTH)
SL	STOP LINE - 12" WHITE LINE 4' BEHIND CW (TYP.)
SWEL	SOLID WHITE EDGE LINE - 4"
SWCHL	SOLID WHITE CHANNELIZING LINES - 12" (SPACING NOTED)
SWGL	SOLID WHITE GORE LINE 12" @ 33", (SPACING NOTED)
SWLL	SOLID WHITE LANE LINE - 4"
SWPL	SOLID WHITE PARKING LINE - 4"
BWLL	BROKEN WHITE LANE LINE - 4"
DWLEx	DOTTED WHITE LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
DYLEx	DOTTED YELLOW LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
BYCL	BROKEN YELLOW CENTERLINE - 4"
DYCL	DOUBLE YELLOW CENTERLINE - 2 - 4" LINES
SYEL	SOLID YELLOW EDGE LINE - 4"
SYGL	SOLID YELLOW GORE LINE 12" @ 33", (SPACING NOTED)
SYLL	SOLID YELLOW LANE LINE - 4"
SYCTEL	SOLID YELLOW CYCLE TRACK EDGE LINE - 4"
DYCTCL	DOTTED YELLOW CYCLE TRACK CENTERLINE - 4" (3' LINE & 9' GAP)
SCHOOL	SCHOOL ZONE - WHITE
	HANDICAP SYMBOL - WHITE
	PAVEMENT ARROW - WHITE
ONLY	LEGEND "ONLY" - WHITE

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NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
REVISIONS				

DRAWN BY:	CJT
DESIGNED BY:	CJT
CHECKED BY:	CR



PREPARED BY:	
SCALE:	NONE

SCALE:	NONE
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**LINCOLN STREET CURB EXTENSION
WESTFORD, MA**

LEGEND AND ABBREVIATIONS

BETA JOB No.	4162
PLOT DATE:	9/20/2016 9:26 AM
ISSUE DATE:	9/13/2016
SHEET No.	2 OF 5
File:	4162 LEGEND.dwg

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

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BOSTON RD

LINCOLN ST

HILDRETH ST

BOSTON RD



Curve Table				
Curve #	Delta	Radius	Length	Tangent
C1	7°04'45"	400.00	49.42	24.74
C2	57°03'35"	45.00	44.81	24.46
C3	34°01'57"	20.00	11.88	6.12
C4	34°47'02"	20.00	12.14	6.26
C5	4°00'32"	400.00	27.99	14.00
C6	113°47'18"	9.00	17.87	13.80
C7	33°21'05"	20.00	11.64	5.99
C8	33°47'14"	20.00	11.79	6.07
C10	48°58'48"	30.00	25.65	13.67

Line Table		
Line #	Direction	Length
L6	S77°17'28"W	26.71
L7	S22°01'48"E	50.22
L8	S71°12'12"E	32.58

LINCOLN STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L5	0+00.00	4953.4590	5018.8462		N18°25'24"E 110.00'	1+10.00	5057.8209	5053.6099

BOSTON ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	0+00.00	5019.5077	4941.9051		S51°47'50"E 40.88'	0+40.88	4994.2282	4974.0263
C9	0+40.88	4994.2282	4974.026	R = 425.00' Δ = 18°29'03" L = 137.11' T = 69.16'		1+77.99	4893.6670	5066.3515
L2	1+77.99	4893.6670	5066.3515		S33°18'46"E 22.02'	2+00.00	4875.2685	5078.4430

LEGEND

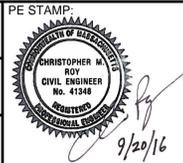
- XX.XX BC PROP. BOTTOM OF CURB GRADE
- XX.XX PROP. SPOT GRADE
- (XX.XX BC) EXIST. BOTTOM OF CURB GRADE
- (XX.XX) EXIST. GRADE
- PROPOSED WCR
- PROPOSED HMA SIDEWALK

NOTE:

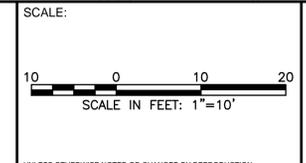
1. CURB REVEAL TO BE 6" EXCEPT AT TRANSITIONS
2. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC
3. PROPOSED CROSSWALK SHALL BE YELLOW MATCHING TOWN STANDARDS
4. GRADES ARE GIVEN AT EVEN 50 FOOT STATIONS UNLESS OTHERWISE NOTED

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS	DESCRIPTION

DRAWN BY: CJT
DESIGNED BY: CJT
CHECKED BY: CR

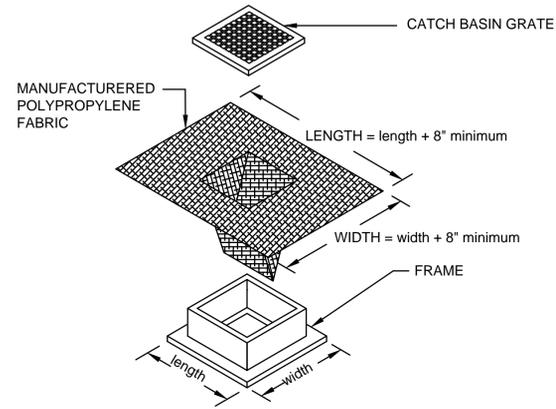


PREPARED BY: [Signature]
DATE: 9/20/16



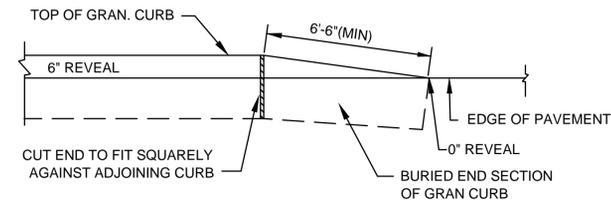
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WESTFORD, MA
CONSTRUCTION PLAN**

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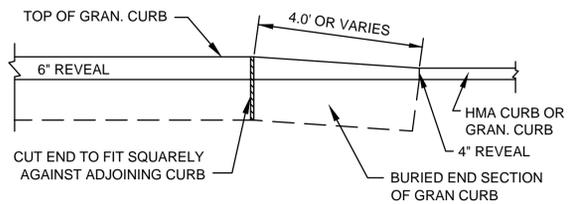


- NOTES**
1. LENGTH AND WIDTH OF POLYPROPYLENE FABRIC MUST EXCEED EXISTING CATCH BASIN FRAME DIMENSIONS BY A MINIMUM OF 8".
 2. REMOVE CATCH BASIN GRATE AND INSTALL POLYPROPYLENE FABRIC OVER CATCH BASIN FRAME. REPLACE CATCH BASIN GRATE TO SECURE POLYPROPYLENE FABRIC IN PLACE.
 3. CATCH BASIN EROSION CONTROL TO BE PLACED AT ALL CATCH BASIN WITHIN PROJECT LIMITS.

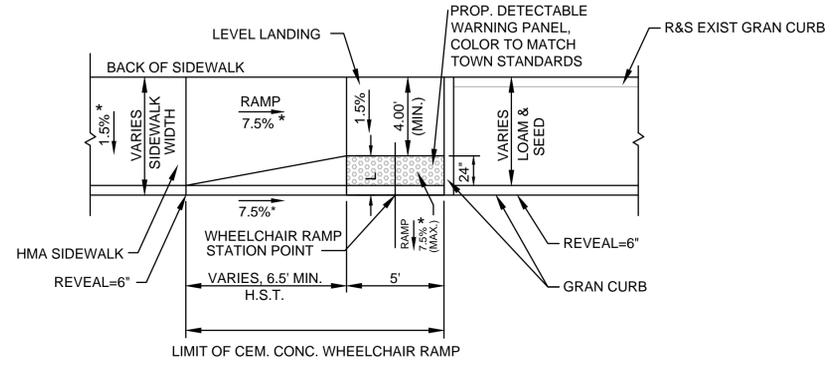
CATCH BASIN EROSION CONTROL PROTECTION - SILT SACK
NOT TO SCALE



TRANSITION CURB (6" TO 0" REVEAL) CURB TO EDGE OF PAVEMENT
NOT TO SCALE



TRANSITION CURB (6" TO 4" REVEAL) CURB TO EXISTING CURB
NOT TO SCALE

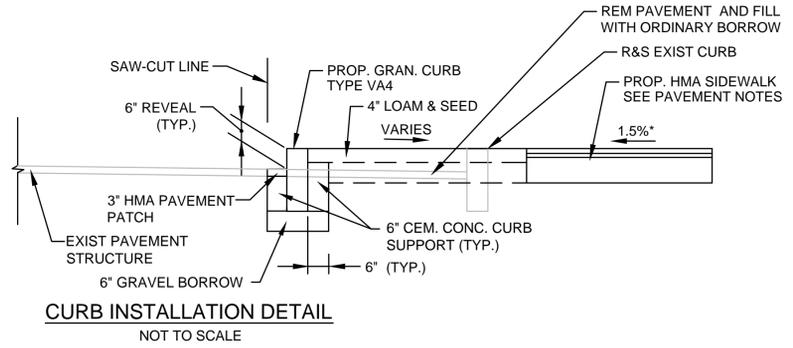


WHEELCHAIR RAMP DETAIL STA 0+40.75 LT
NOT TO SCALE

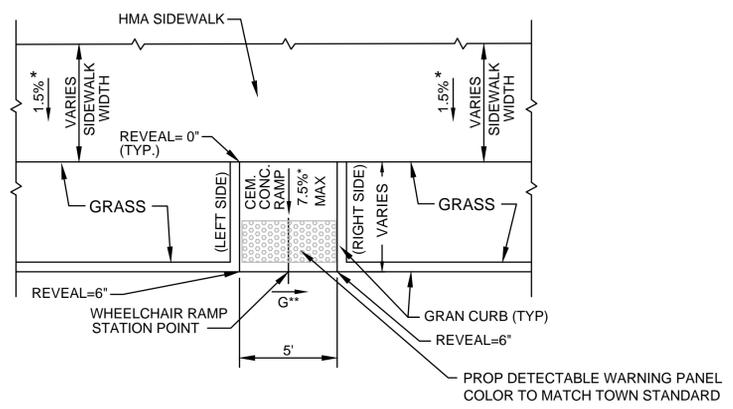
PROFILE GRADE	HIGH SIDE TRANSITION LENGTH FOR 7.5% DESIGN SLOPE (FEET)
%	
0	6'-6"
>0-1	7'-8"
>1-2	9'-0"
>2-3	11'-0"
>3-4	14'-0"
>4	15'-0" MAX.

WHEELCHAIR RAMP HIGH SIDE TRANSITION LENGTHS

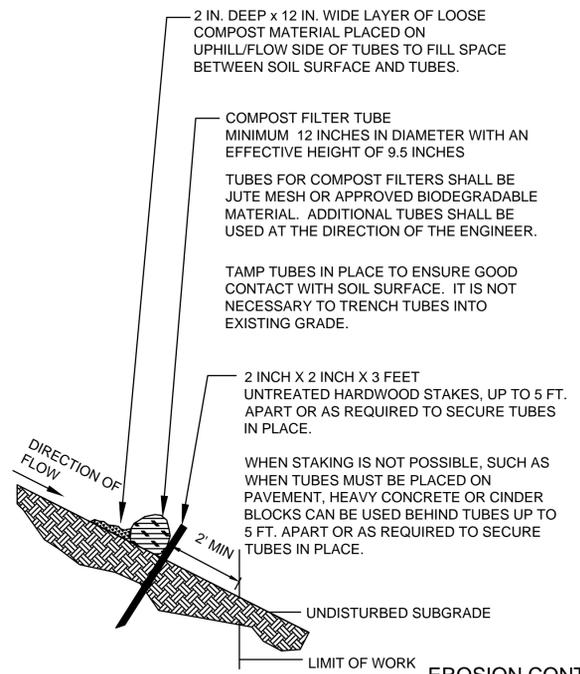
FIGURES ARE BASED ON A DESIGN SLOPE OF 7.5% AND A REVEAL OF 6".



CURB INSTALLATION DETAIL
NOT TO SCALE



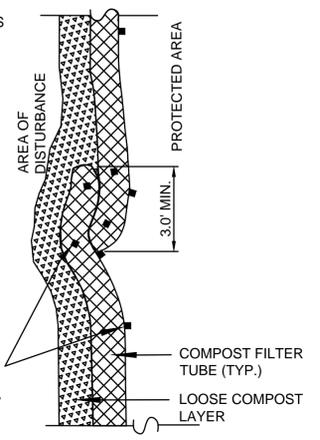
WHEELCHAIR RAMP DETAIL STA 0+40.75 RT
NOT TO SCALE



EROSION CONTROL BARRIER (ECB) - COMPOST FILTER TUBE DETAIL
NOT TO SCALE

PROVIDE A 3 FT. MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.

SECURE ENDS OF TUBES WITH STAKES SPACED 18 IN. APART THROUGH TOPS OF TUBES.



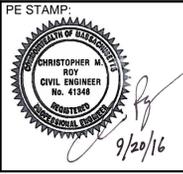
NOTE: UNLESS SHOWN OTHERWISE INSIDE EDGE OF COMPOST FILTER TUBE TO BE SET AT EDGE OF SLOPE.

*TOLERANCE FOR CONSTRUCTION ±0.5%

0:\41005\4162 - WESTFORD ON-CALL TRAFFIC TASK 08 TOWN CENTER STUDY\DRAWING FILES\PLANS\4162 DETAILS.DWG

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
REVISIONS				

DRAWN BY: CJT
DESIGNED BY: CJT
CHECKED BY: CR



PREPARED BY:
SCALE: NONE

SCALE: NONE

**LINCOLN STREET CURB EXTENSION
WESTFORD, MA**
CONSTRUCTION DETAILS

BETA JOB No. 4162
PLOT DATE: 9/20/2016 9:28 AM
ISSUE DATE: 9/13/2016
SHEET No. 5 OF 5
File: 4162 DETAILS.dwg