

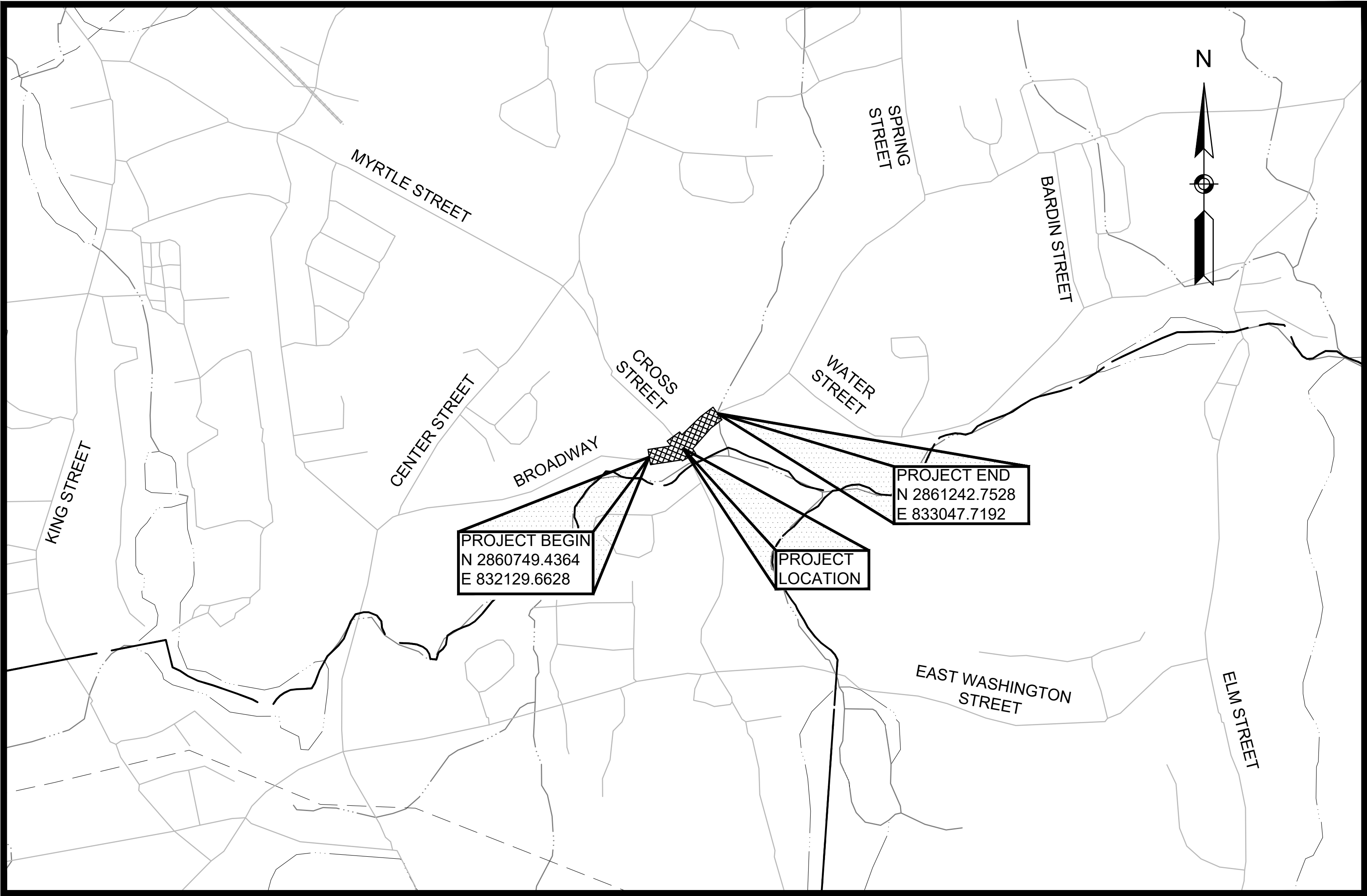
# BROADWAY AT CROSS STREET

## PROPOSED ROADWAY IMPROVEMENTS

### HANOVER, MA

#### INDEX

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14-17	CONSTRUCTION DETAILS


























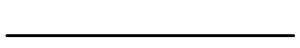








THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATED TO TRAFFIC STANDARD DETAILS ONLY), AND THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS WILL GOVERN.
















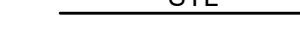

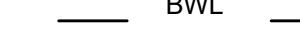

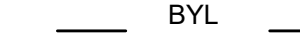

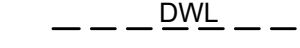

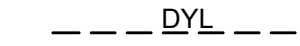

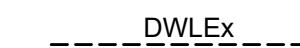




**Vanasse Hangen Brustlin, Inc.**  
101 Walnut St., PO Box 9151  
Watertown, MA 02472  
617.924.1770 FAX 617.924.2286

DESIGNED BY MES	APPROVED BY WPA	SHEET 01	OF 17
DRAWN BY MES	DTFS CHECKED BY SHK	VHB CAD FILE NAME 14392.00_HD(COV2).dwg	
CHECKED BY SHK	DATE 07/10/2019	JOB NO. 14392.00	

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CATCH BASIN
		HYDRANT
		DRAINAGE MANHOLE
		TELEPHONE MANHOLE
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		TREE
		WATER GATE
		BOLLARD
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		OVERHEAD CABLE/WIRE
		BALANCED STONE WALL
		UNDERGROUND DRAIN PIPE
		DRAIN LINE
		TREE LINE

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND "ONLY" - WHITE
		12" STOP LINE
		CROSSWALK (WIDTH AS NOTED)
		4" SOLID WHITE LINE
		4" SOLID YELLOW LINE
		4" BROKEN WHITE LINE
		4" BROKEN YELLOW LINE
		4" DOTTED WHITE LINE
		4" DOTTED YELLOW LINE
		4" DOTTED WHITE LINE EXTENSION
		4" DOTTED YELLOW LINE EXTENSION
		4" DOUBLE WHITE LINE
		4" DOUBLE YELLOW LINE

GENERAL ABBREVIATIONS

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
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS / CONTINUED
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DIA	DIAMETER
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EXIST (or EX)	EXISTING
EXC	EXCAVATION
FDN.	FOUNDATION
FDP	FULL DEPTH PAVEMENT
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HWY	HIGHWAY
JCT	JUNCTION
LOAM	LOAM BORROW
LSA	LANDSCAPED AREA
LT	LEFT
MAHWL	MEAN AVERAGE HIGH WATER LINE
MAX	MAXIMUM
MB	MAILBOX
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MOD	MODIFIED
MSE	MECHANICALLY STABILIZED EARTH
NERR	NEW ENGLAND RAILROAD
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
P.G.L.	PROFILE GRADE LINE
PREV	PREVIOUS/PREVIOUSLY
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PVMT	PAVEMENT
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RD	ROAD
RDWY	ROADWAY
REB	REBUILD
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SHLO/S.H.L.O.	STATE HIGHWAY LAYOUT LINE

GENERAL ABBREVIATIONS (CONT)

ST	STREET
STA	STATION
STD	STANDARD
SW	SIDEWALK
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TRANS	TRANSITION
TRM	TURF REINFORCING MAT
TYP	TYPICAL
VAR	VARIES
VERT	VERTICAL
WCR	WHEEL CHAIR RAMP
WP	WORKING POINT
X-SECT	CROSS SECTION

UTILITY ABBREVIATIONS

CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDW	HEADWALL
HYD	HYDRANT
INV	INVERT
LB	LEACH BASIN
LP	LIGHT POLE
MH	MANHOLE
MW	MONITORING WELL
OHW	OVERHEAD WIRE
PVC	POLYVINYLCHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
SMH	SEWER MANHOLE
TSV&B	TAPPING SLEEVE VALVE & BOX
UP	UTILITY POLE
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN

ALIGNMENT & GRADING ABBREVIATIONS

CC	CENTER OF CURVE
HP	HIGH POINT
I.T.	INTERSECTION OF TANGENT
LP	LOW POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PNT	POINT
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
∠PT	ANGLE POINT
R	RADIUS OF CURVATURE
T	TANGENT DISTANCE OF CURVE
TAN	TANGENT

BROADWAY AT CROSS STREET  
LEGEND & ABBREVIATIONS  
SHEET 02 OF 17

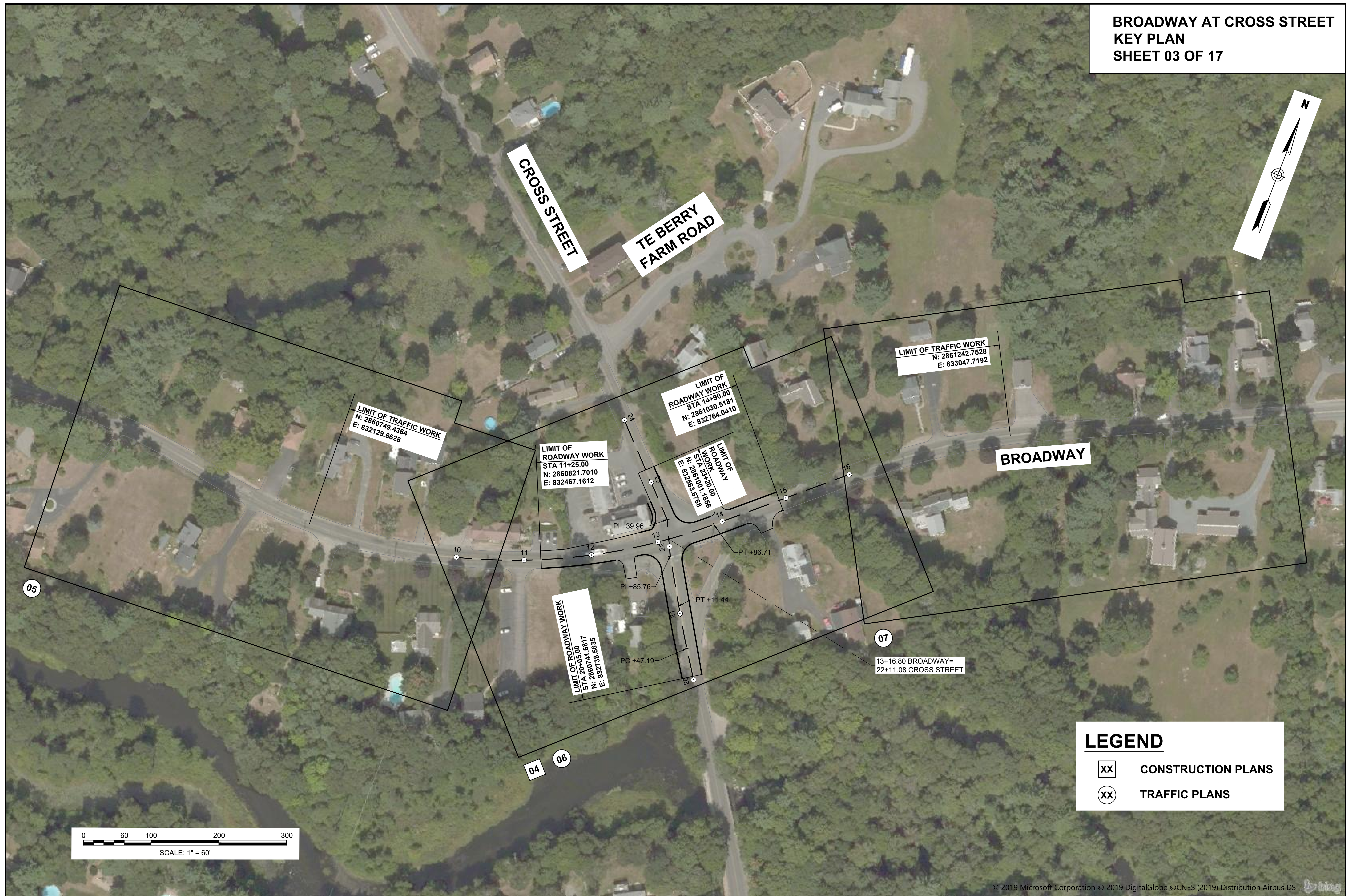
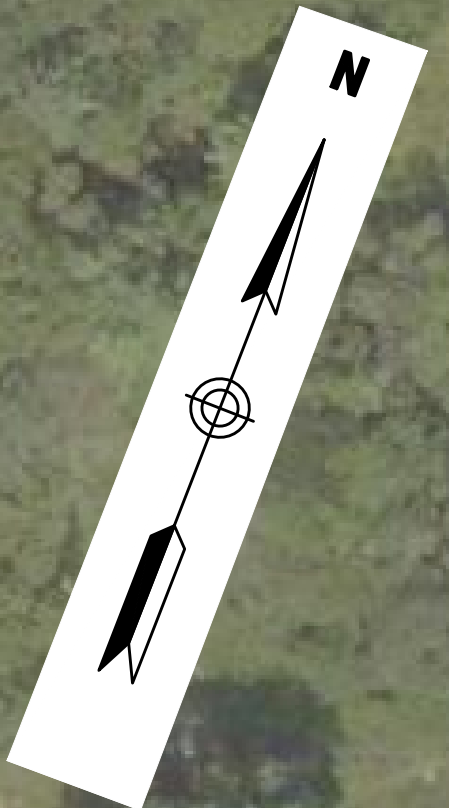
GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
2. NO SURVEY HAS BEEN CONDUCTED FOR THIS PROJECT. ALL DIMENSIONS ARE APPROXIMATE AND NEED TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DETERMINE THE EXACT 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 EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
3. NO UNDERGROUND UTILITIES, ASIDE FROM DRAINAGE, HAVE BEEN SHOWN ON THE PROPOSED PLANS. THE CONTRACTOR SHALL DIGSAFE AND LOCATE ALL UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION.
4. 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.
5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
7. 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).
8. EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
9. THE CONTRACTOR SHALL EXERCISE DUE CARE WHEN WORKING AROUND ALL PROPERTY BOUNDS WHICH ARE TO REMAIN. SHOULD ANY DAMAGE TO A BOUND RESULT FROM THE ACTIONS OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE THE BOUND REPLACED AND/OR REALIGNED BY A LICENSED PROFESSIONAL SURVEYOR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
10. DISPOSAL OF ALL SURPLUS MATERIAL SHALL BE AS APPROVED BY THE ENGINEER AND OWNER.



BROADWAY AT CROSS STREET  
KEY PLAN  
SHEET 03 OF 17

14392.00\_HD(KEY2).DWG Plotted on 10-Jul-2019 10:20 AM









**BROADWAY AT CROSS STREET  
TRAFFIC PLANS  
SHEET 05 OF 17**



LIMIT OF TRAFFIC WORK  
N: 2860749.4364  
E: 832129.6628

**BROADWAY**

W2-1  
(500' FROM SL)

R&S  
"DANGEROUS INTERSECTION"

W3-1  
(250' FROM SL)

CONTINUED ON  
SHEET NO. 06

0 20 50 100  
SCALE: 1" = 20'



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**BROADWAY AT CROSS STREET  
TRAFFIC PLANS  
SHEET 07 OF 17**



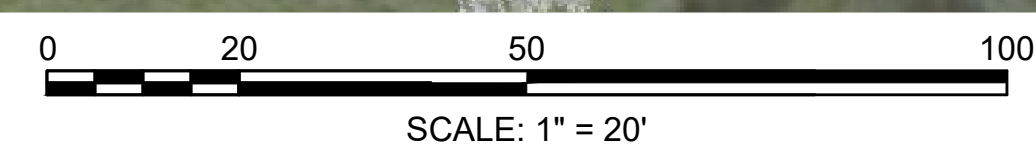
**BROADWAY**





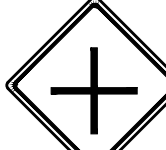

R&S  
"DANGEROUS INTERSECTION"  
W2-1

W3-1  
(250' FROM SL)

CONTINUED ON  
SHEET NO. 06

LIMIT OF TRAFFIC WORK  
N: 2861242.7528  
E: 833047.7192



TRAFFIC SIGN SUMMARY													
IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK- GROUND	LEGEND	BORDER			
R1-1	30"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			2	RED	WHITE	WHITE	P5-2	5.18	10.36
R1-1 WITH LEDS (SEE NOTE 3)	30"	30"					2	RED	WHITE	WHITE	P5-2	5.18	10.36
R7-1	12"	18"					1	WHITE	RED	RED	1 MTD W/ OTHERS	1.50	1.50
R7-1D	12"	18"					2	WHITE	RED	RED	P5-2	1.50	3.00
W2-1	30"	30"					2	YELLOW	BLACK	BLACK	P5-2	6.25	12.50
W3-1	30"	30"					2	YELLOW	RED/ BLACK	BLACK	P5-2	6.25	12.50

NOTES:  
1. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED.  
2. ALL PROP REGULATORY AND WARNING SIGNS SHALL BE 0.08" FLAT SHEET ALUMINUM, WITH HIGH-INTENSITY PRISMATIC REFLECTIVE SHEETING.  
3. R1-1 SIGNS WITH LED SHALL BE SOLAR POWERED.



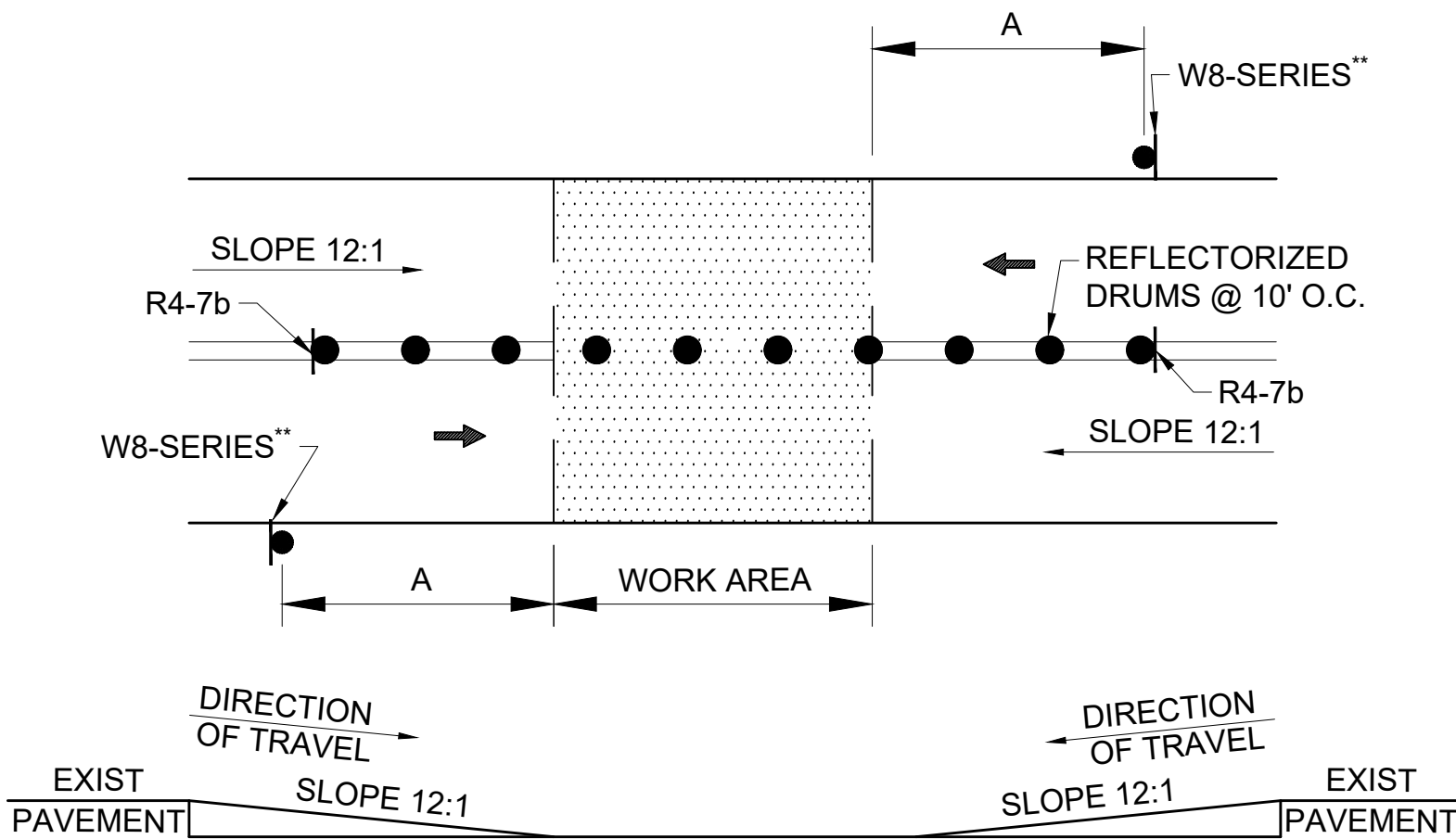
BROADWAY AT CROSS STREET  
TEMPORARY TRAFFIC CONTROL PLANS  
SHEET 09 OF 17

GENERAL NOTES

- ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- WORK HOURS SHALL BE APPROVED BY THE TOWN. NO WORK SHALL BE ALLOWED DURING PEAK PERIODS (MONDAY THRU FRIDAY, 7AM-9AM AND 4PM-6PM).
- NO WORK SHALL OCCUR WITHIN THE PUBLIC WAY ON STATE RECOGNIZED HOLIDAYS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ALL DRUMS OUTSIDE TAPERS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
- ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN SAFE AND REASONABLE ABUTTER ACCESS. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
- REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.
- CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.
- THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OR RESTRICTION OF ACCESS.
- CONTRACTOR SHALL STAGE WORK SUCH THAT A DROP-OFF OF NO MORE THAN 4" AT THE END OF EACH WORK DAY EXISTS WITHIN THE CLEAR ZONE AT ANY TIME AND ENSURE DROP-OFF IS MITIGATED WITHOUT BARRIER PER NOTE 10.
- FOR DROP-OFFS 3" OR LESS WITHIN THE CLEAR ZONE, CONDITION MAY BE MITIGATED WITH W8-9 (LOW SHOULDER) SIGN OR TEMPORARY CHANNELIZATION DEVICES.

4' IF POSTED SPEED IS LESS THAN 35 MPH  
8' IF POSTED SPEED IS 35 MPH
- CONSTRUCTION CLEAR ZONE SHALL BE IN ACCORDANCE WITH MASSDOT BOSTON TRAFFIC GUIDELINES AS FOLLOWS:

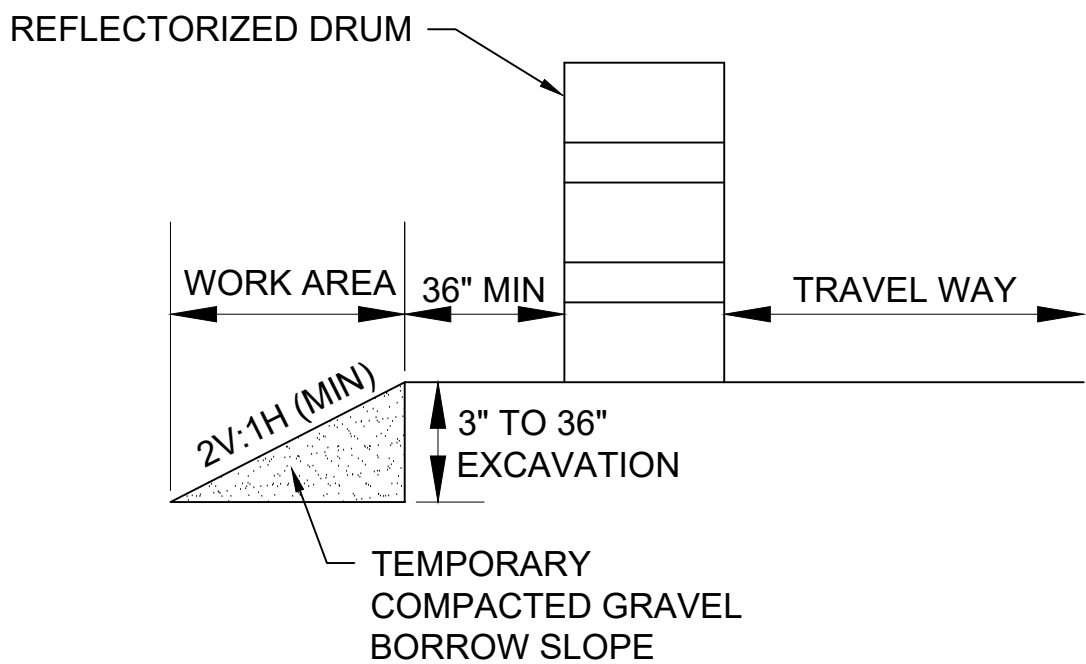
4' IF POSTED SPEED IS LESS THAN 35 MPH  
8' IF POSTED SPEED IS 35 MPH
- 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
- NON-ESSENTIAL TRAFFIC CONTROL DEVICES AND SIGNS SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS WHEN NOT IN USE.
- SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
- SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
- SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN NCHRP 350 AND/OR MASH CRASH TESTED SIGN SUPPORTS AND INSTALLED IN ACCORDANCE WITH THE MUTCD.
- MA-W20-7b SIGNS SHALL BE REPLACED BY W20-7 SIGNS WHEN FLAGGERS ARE USED IN LIEU OF POLICE OFFICER DETAILS.
- CONTRACTOR SHALL SECURE WORK AREAS TO PREVENT UNAUTHORIZED ACCESS AT ALL TIMES.
- THERE IS NO DESIGNATED BICYCLE LANE ON THE ROADWAY WITHIN THE PROJECT LIMITS. BICYCLES ARE EXPECTED TO SHARE THE ROAD WITH GENERAL VEHICULAR TRAFFIC.



- NOTES:
- SQUARE OFF THE FULL WIDTH OF THE ROADWAY AT THE END OF WORK DAY
  - \*\* CONTRACTOR SHALL INSTALL W8-1, W8-3, OR W8-8 SIGN, AS APPROPRIATE, ON ALL ROADWAYS IN ADVANCE OF THE TRANSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TEMPORARY PAVEMENT TRANSITION

SCALE: NTS



- NOTE:
- CONTRACTOR SHALL INSTALL W8-9 SIGN ON ALL ROADWAYS 350 FT IN ADVANCE OF THE START OF DROP-OFF CONDITION.

TYPICAL ROADWAY DROP-OFF PROTECTION

SCALE: NTS

BUFFER SPACING

SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200
35	250
40	305

LEGEND

	FLAGGER
	POLICE OFFICER
	REFLECTORIZED DRUM
	TEMPORARY CONSTRUCTION SIGN
	TRAFFIC CONE
	TYPE III BARRICADE
	WORK AREA (PUBLIC ACCESS RESTRICTED)
	TRANSITION/BUFFER AREAS
	TRAFFIC FLOW
NTS	NOT TO SCALE

ADVANCE SIGN SPACING

ROADWAY	DISTANCE BETWEEN SIGNS (FEET)			
	A	B	C	D
BROADWAY CROSS STREET	500	250	500	500
WATER STREET ADAMS CIRCLE	100	50	-	-

LANE TAPER LENGTH FORMULAS

L= TAPER LENGTH IN FEET

W= WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED IN FEET

S= POSTED SPEED LIMIT IN MPH

POSTED SPEED

40 MPH OR LESS

$$L = \frac{WS^2}{60}$$



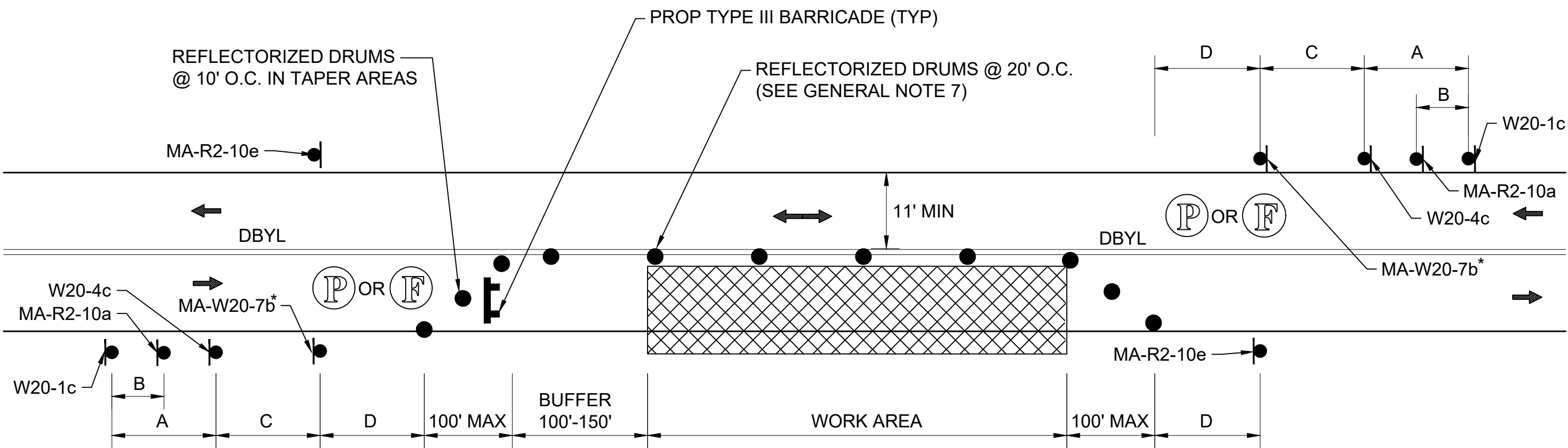
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- SCALE: NTS



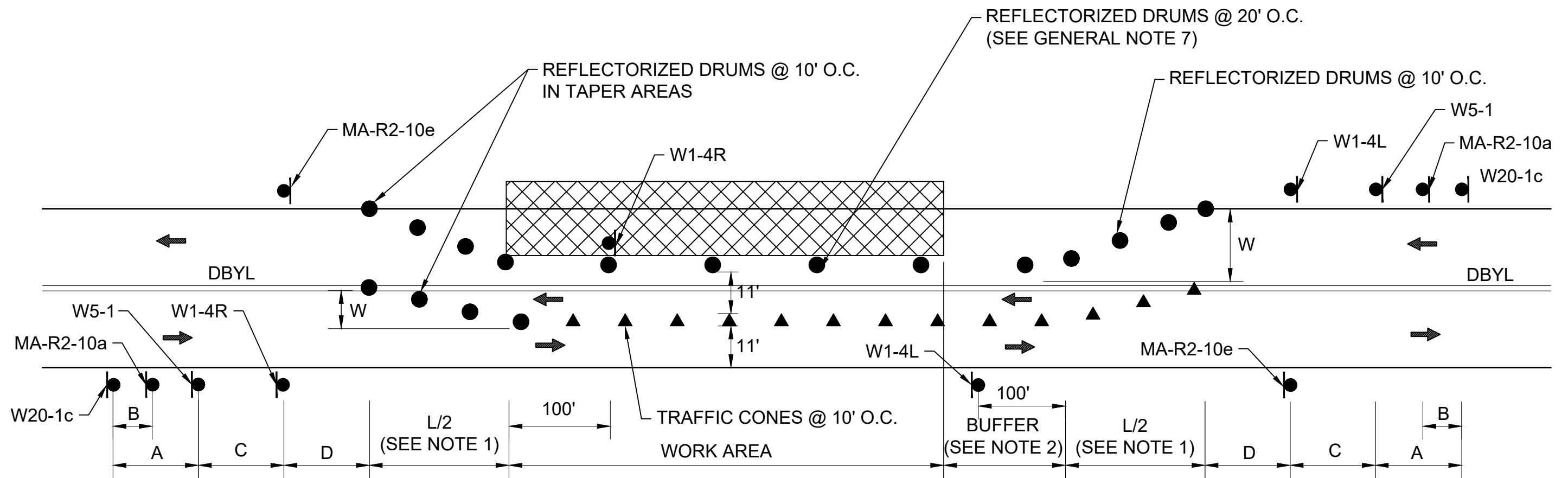




- NOTES:
1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 09.
  2. \* SEE NOTE 18 ON SHEET 09.

TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC

SCALE: NTS



- NOTES:
1. SEE TAPER LENGTH FORMULA ON SHEET 09.
  2. SEE BUFFER SPACING CHART ON SHEET 09.
  3. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 09.

TYPICAL TWO-WAY STREET LANE SHIFT

SCALE: NTS



N



CENTER STREET

CROSS STREET

WATER STREET

BROADWAY

ADAMS CIRCLE

ADVANCE WARNING SIGN PLAN



W20-1c

MA-R2-10a

1500'

250'

MA-R2-10e

500'

PROP WORKZONE (TYP)

1500'

500'

MA-R2-10e

250'

W20-1c

MA-R2-10a

MA-R2-10e

W20-1c

MA-R2-10a

MA-R2-10e

500'

1500'

MA-R2-10a

W20-1c

MA-R2-10e

MA-R2-10a

MA-R2-10a

W20-1c

W20-1c

MA-R2-10e

50'

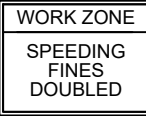
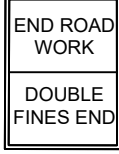












100'

250'

1500'

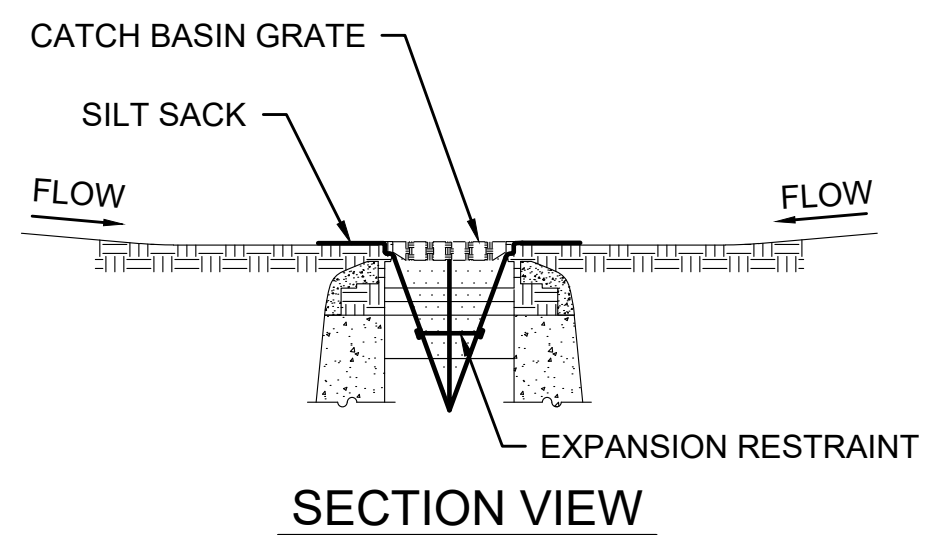
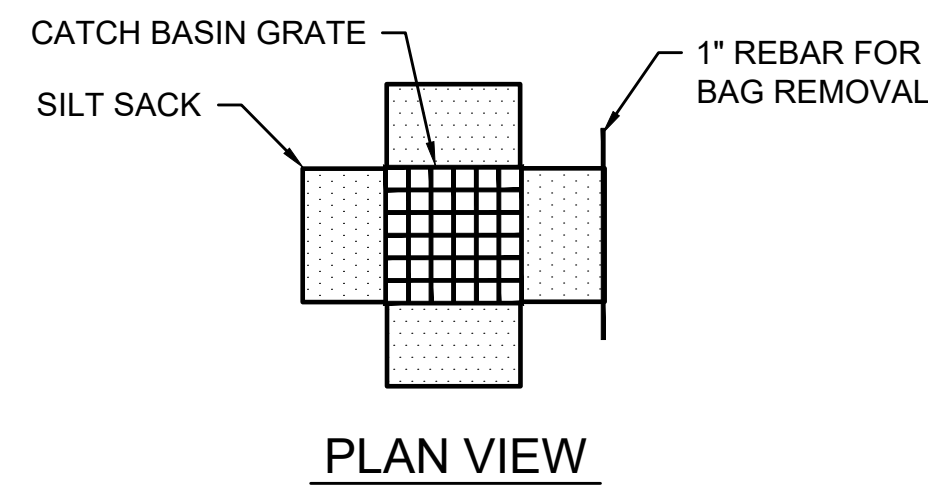
500'



TEMPORARY TRAFFIC CONTROL SIGN SUMMARY								
IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR	
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK- GROUND	BORDER
MA-R2-10a	48"	36"		AS PER MASSDOT STANDARD			FLUOR- ESCENT ORANGE	BLACK
MA-R2-10e	36"	48"		↓			WHITE FLUOR- ESCENT ORANGE	BLACK
R4-7b	24"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK
W1-4L	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W1-4R	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W5-1	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W8-1	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W8-3	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W8-8	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W8-9	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W20-1c	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W20-4c	36"	36"					FLUOR- ESCENT ORANGE	BLACK
W20-7	36"	36"		↓			FLUOR- ESCENT ORANGE	BLACK
MA-W20-7b	36"	36"		AS PER MASSDOT STANDARD			FLUOR- ESCENT ORANGE	BLACK

NOTES:  
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.  
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

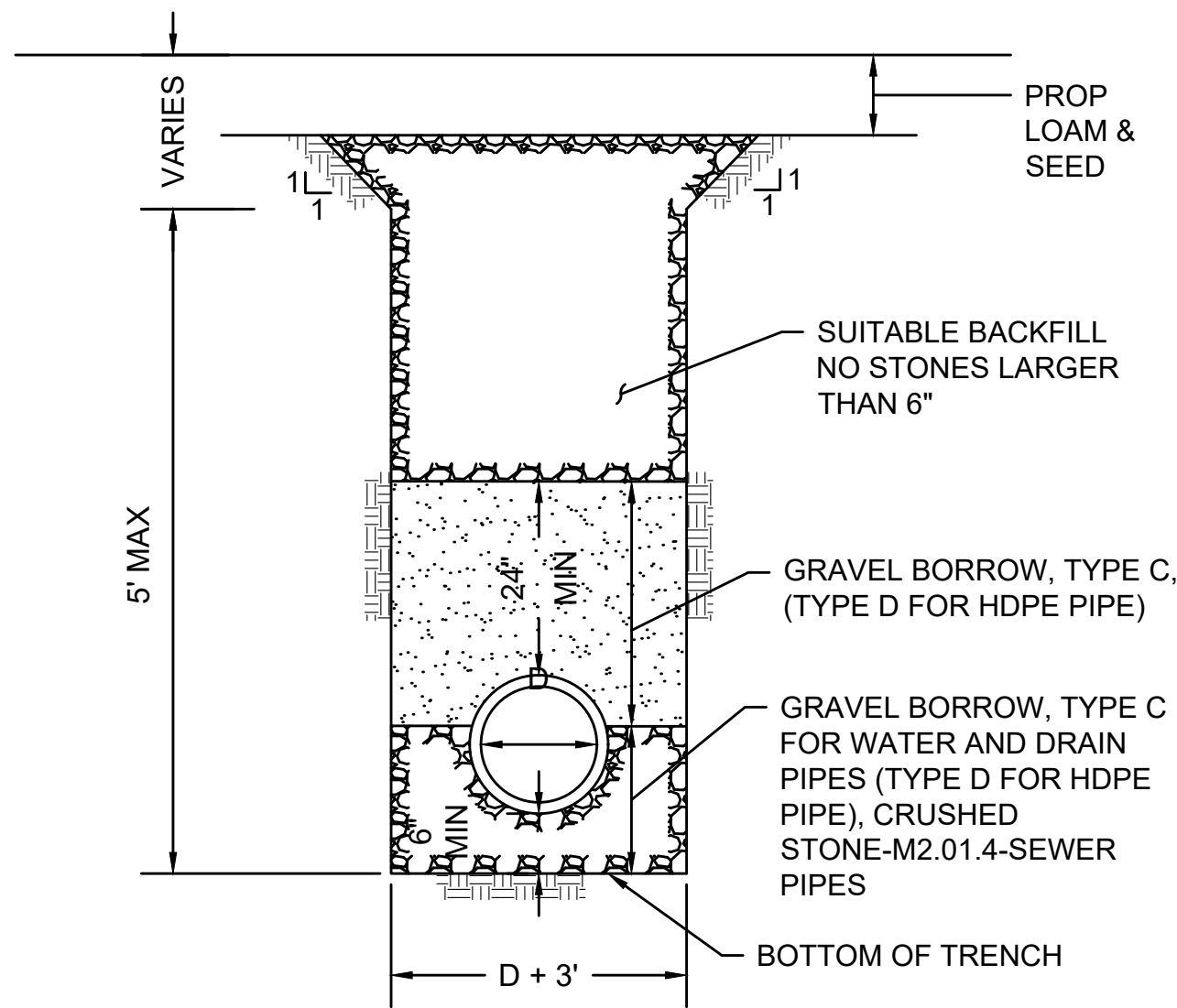




- NOTES:
1. INSTALL SILT SACK IN EXISTING CATCH BASINS WITHIN THE PROJECT AREA, BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
  2. GRATE TO BE PLACED OVER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

**INLET PROTECTION - SILT SACK  
IN CATCH BASIN**

SCALE: N.T.S.

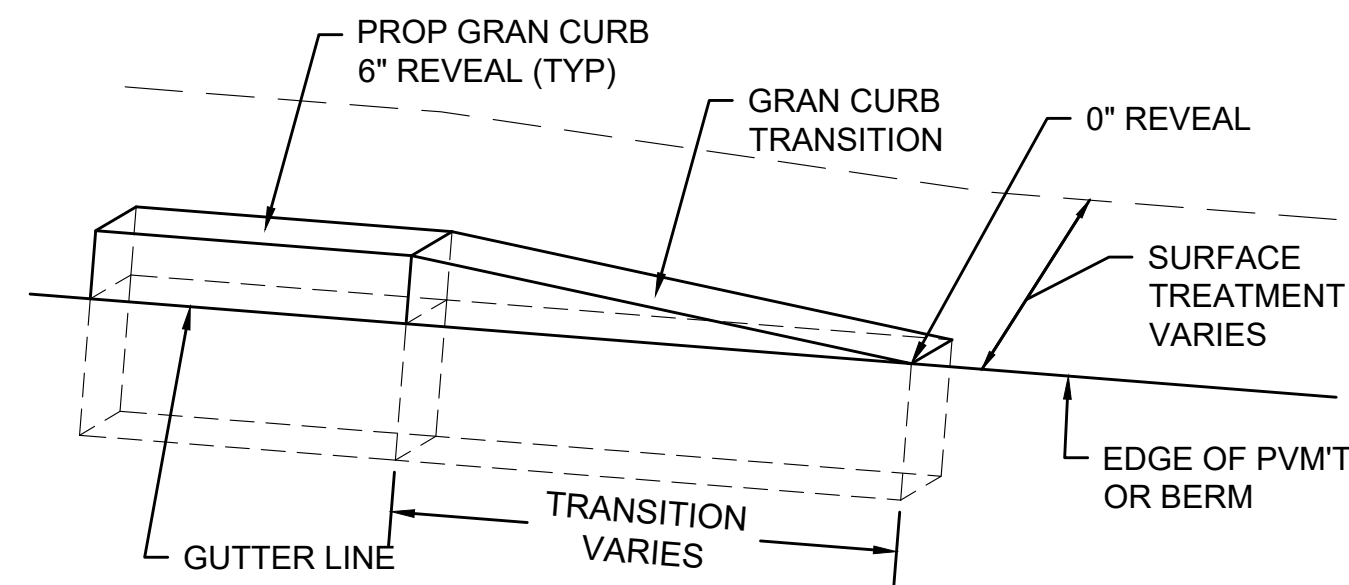


**TRENCH DETAIL**

SCALE: N.T.S.

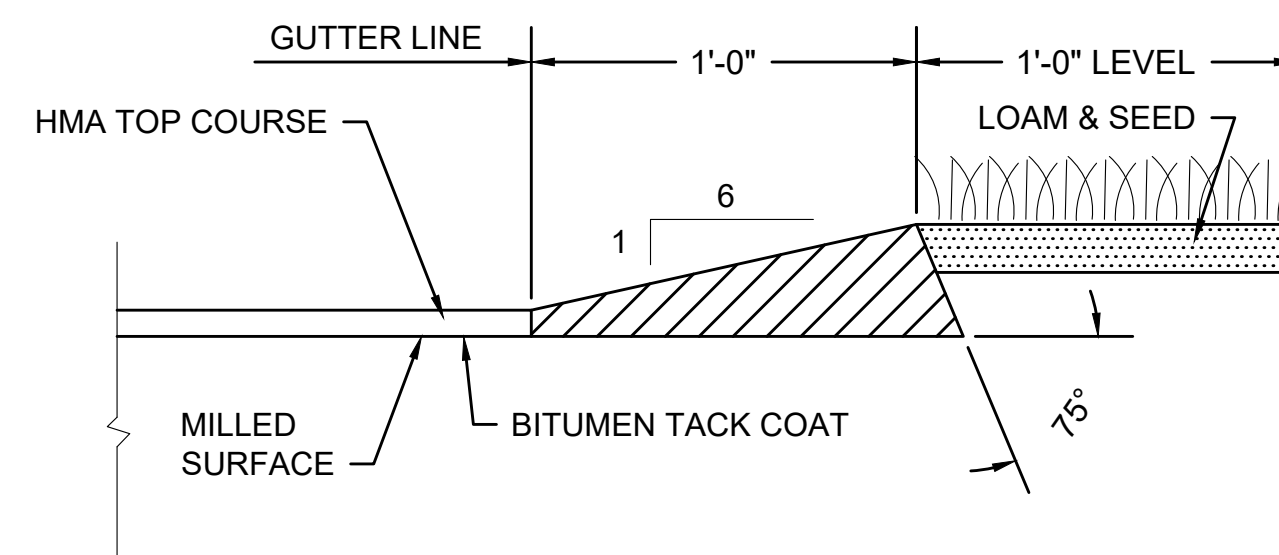
DWG: TRENCH-05

DATE: AUGUST 2018



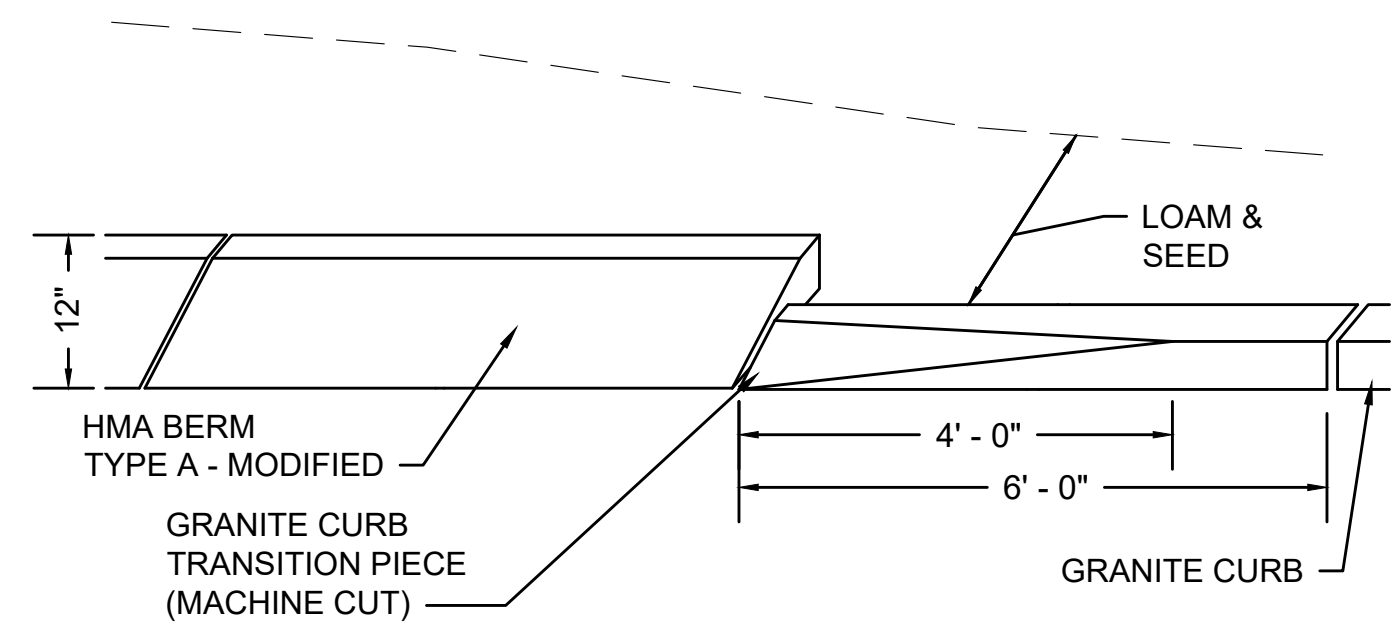
**GRANITE CURB TRANSITION PIECE**

SCALE: N.T.S.



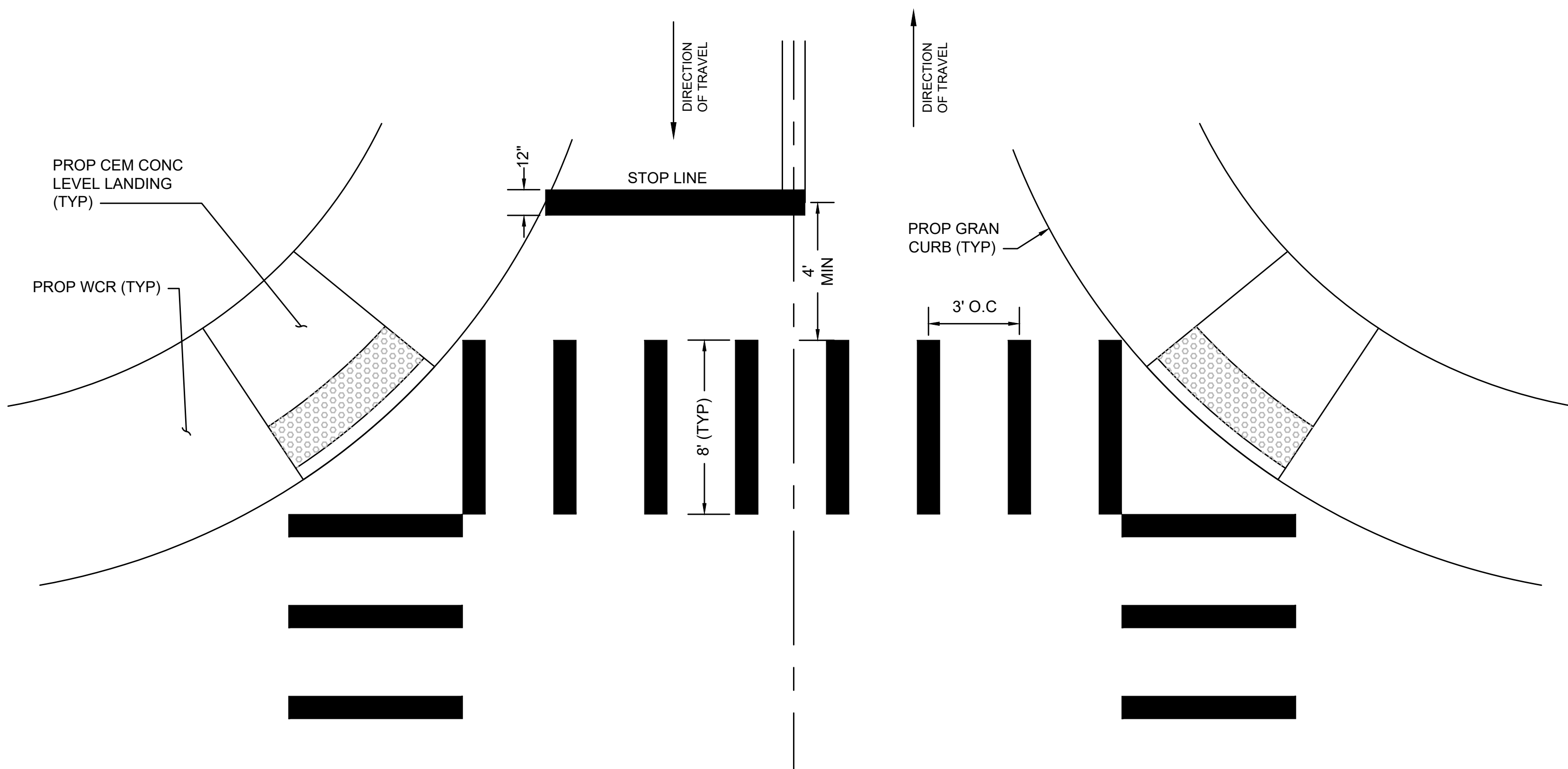
**HMA BERM TYPE A-MODIFIED  
AT PAVEMENT OVERLAY**

SCALE: N.T.S.



**GRANITE CURB SPLAYED END**

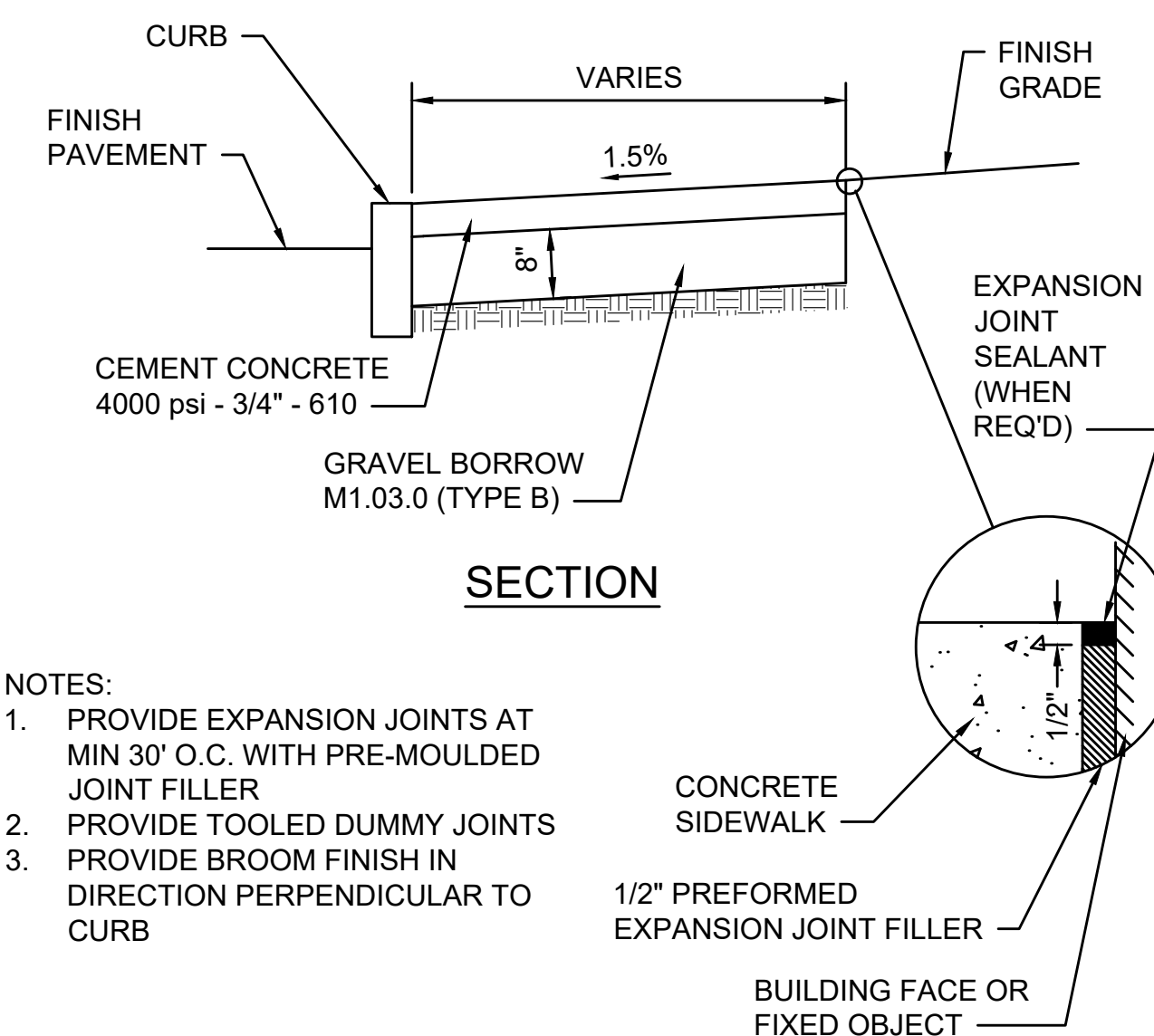
SCALE: N.T.S.



**SPECIAL EMPHASIS CROSSWALK**

SCALE: N.T.S.

- NOTES:
1. ALL 12" REFLECTORIZED THERMOPLASTIC LINES SHALL BE APPLIED IN ONE APPLICATION; NO COMBINATION OF LINES (E.G., TWO 6" LINES) WILL BE ACCEPTED.
  2. ALL CROSSWALKS INSTALLED SHALL CONFORM TO THE RELEVANT PROVISIONS OF THE MASSACHUSETTS HIGHWAY DEPARTMENT "STANDARD SPECIFICATION FOR HIGHWAY AND BRIDGES" DATED 1988, SECTION 860 FOR REFLECTORIZED LINE (THERMO-PLASTIC) & MATERIAL M7.01.20, LATEST REVISIONS.



- NOTES:
1. PROVIDE EXPANSION JOINTS AT MIN 30' O.C. WITH PRE-MOULDED JOINT FILLER
  2. PROVIDE TOOLED DUMMY JOINTS
  3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB

**CEMENT CONCRETE SIDEWALK**

SCALE: N.T.S.

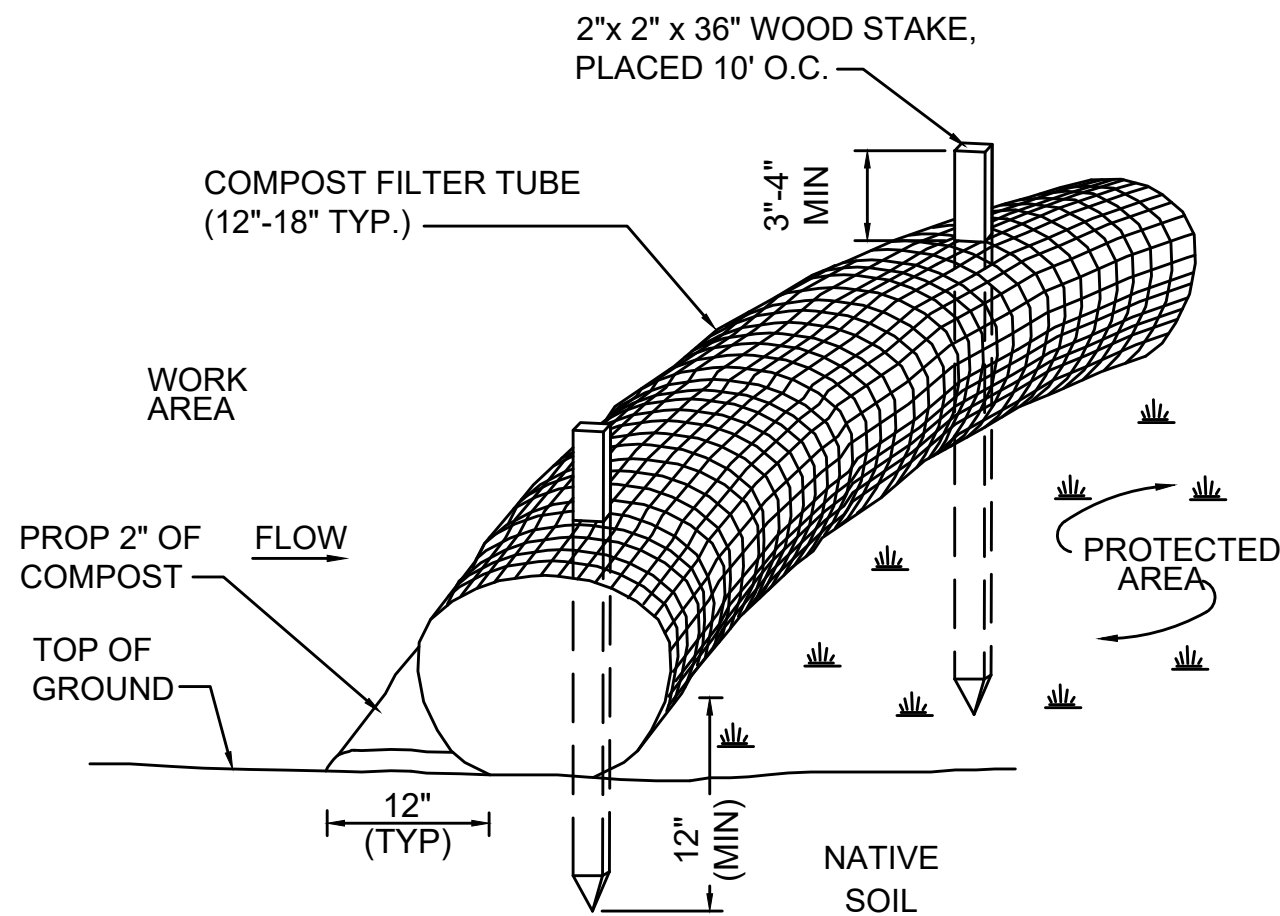
DWG: WALK-01

DATE: MARCH 2013



BROADWAY AT CROSS STREET  
CONSTRUCTION DETAILS  
SHEET 15 OF 17

14392.00\_HD(02T2).DWG      Plotted on 10-Jul-2019 10:18 AM



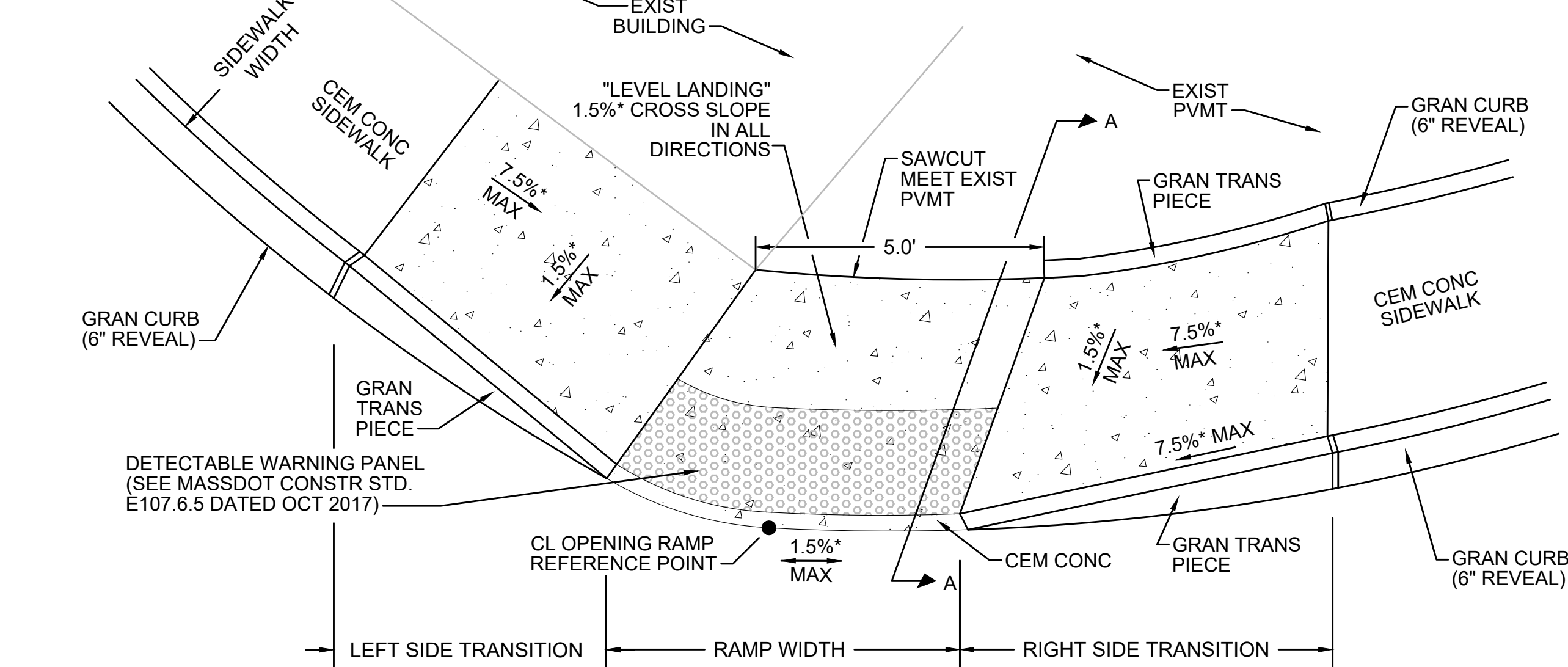
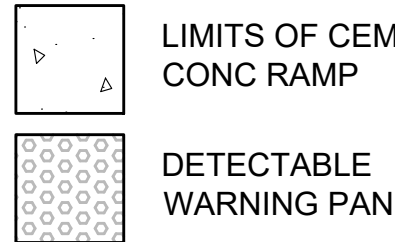
NOTES:

- FILTER TUBE SHALL BE FILLED BY BLOWN IN ORGANIC COMPOST AND PLACED ALONG LIMITS OF DISTURBANCE WITHIN 100' BUFFER ZONE.
- COMPOST FILTER TUBES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIRED OR REPLACED AS NEEDED.
- AT COMPLETION OF PROJECT, COMPOST FILTER TUBES SHALL BE CUT OPEN AND COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
- THE EMPTY FILTER TUBE FABRIC SHALL BE COLLECTED AND DISPOSED OF PROPERLY.

LINEAR SEDIMENTATION AND EROSION CONTROL

SCALE: N.T.S.

LEGEND



\*TOLERANCE FOR CONSTRUCTION ±0.5%

WHEELCHAIR RAMP #4

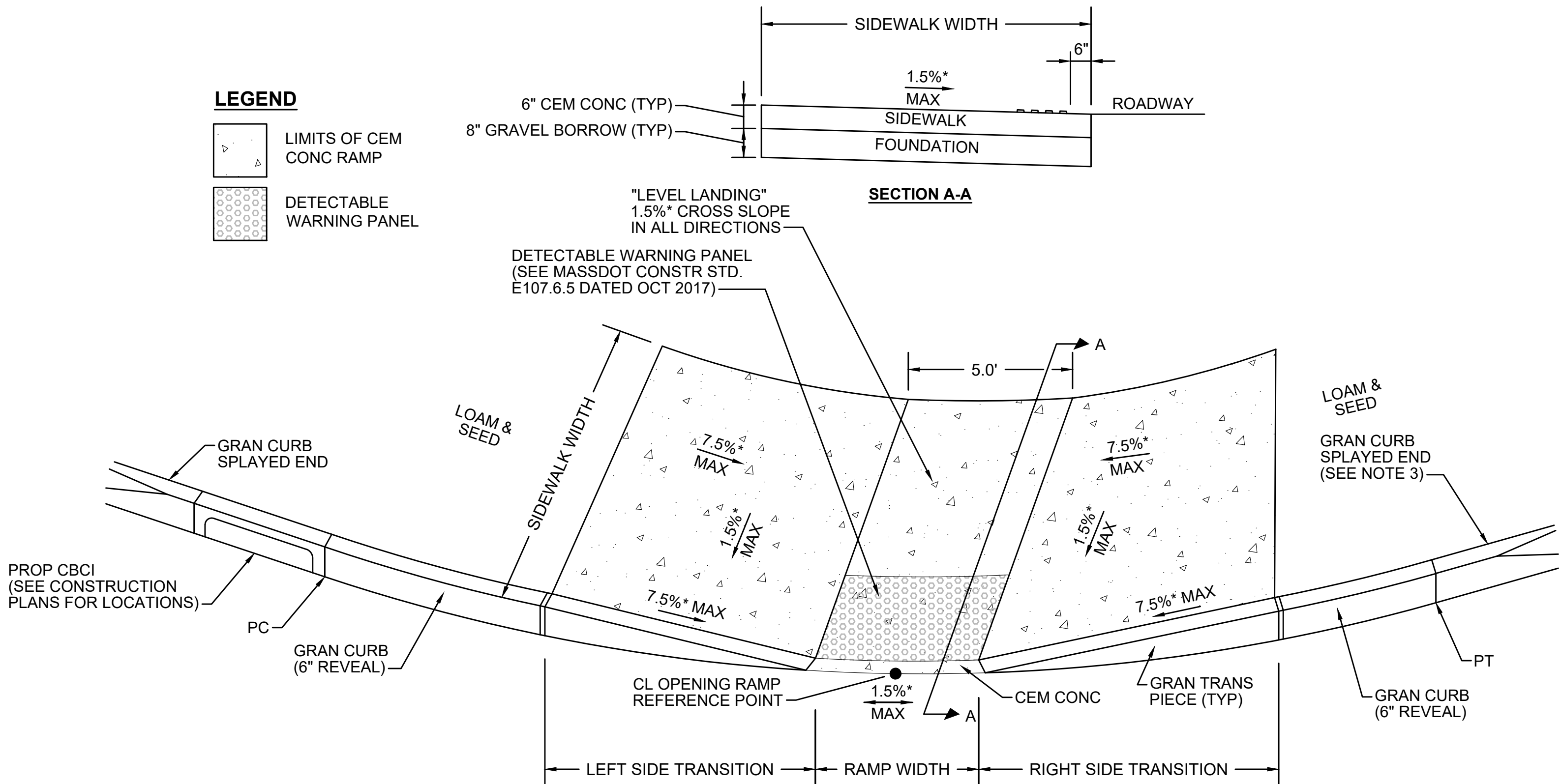
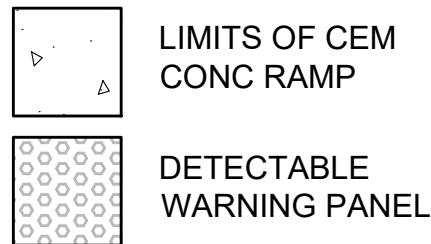
SCALE: NTS

WHEELCHAIR RAMP DATA							
NO.	LOCATION (REF POINT)	SIDEWALK WIDTH	RAMP WIDTH	LEFT SIDE		RIGHT SIDE	
				REVEAL	TRANS	REVEAL	TRANS
BROADWAY							
4	12+98.42 22.54' LT	5.0'	9.8'	6"	SEE NOTE 2	6"	SEE NOTE 2

NOTES:

- NEGATIVE (-) ROADWAY GUTTER MAX DENOTES A LOW SIDE TRANSITION.
- TRANSITION LENGTH TO BE DETERMINED BASED ON MASSDOT CONSTR STD. E107.9.0 DATED OCT 2017 (SEE SHEET 16).

LEGEND



\*TOLERANCE FOR CONSTRUCTION ±0.5%

WHEELCHAIR RAMP - LESS THAN 6.5 FEET - CURVED

SCALE: NTS

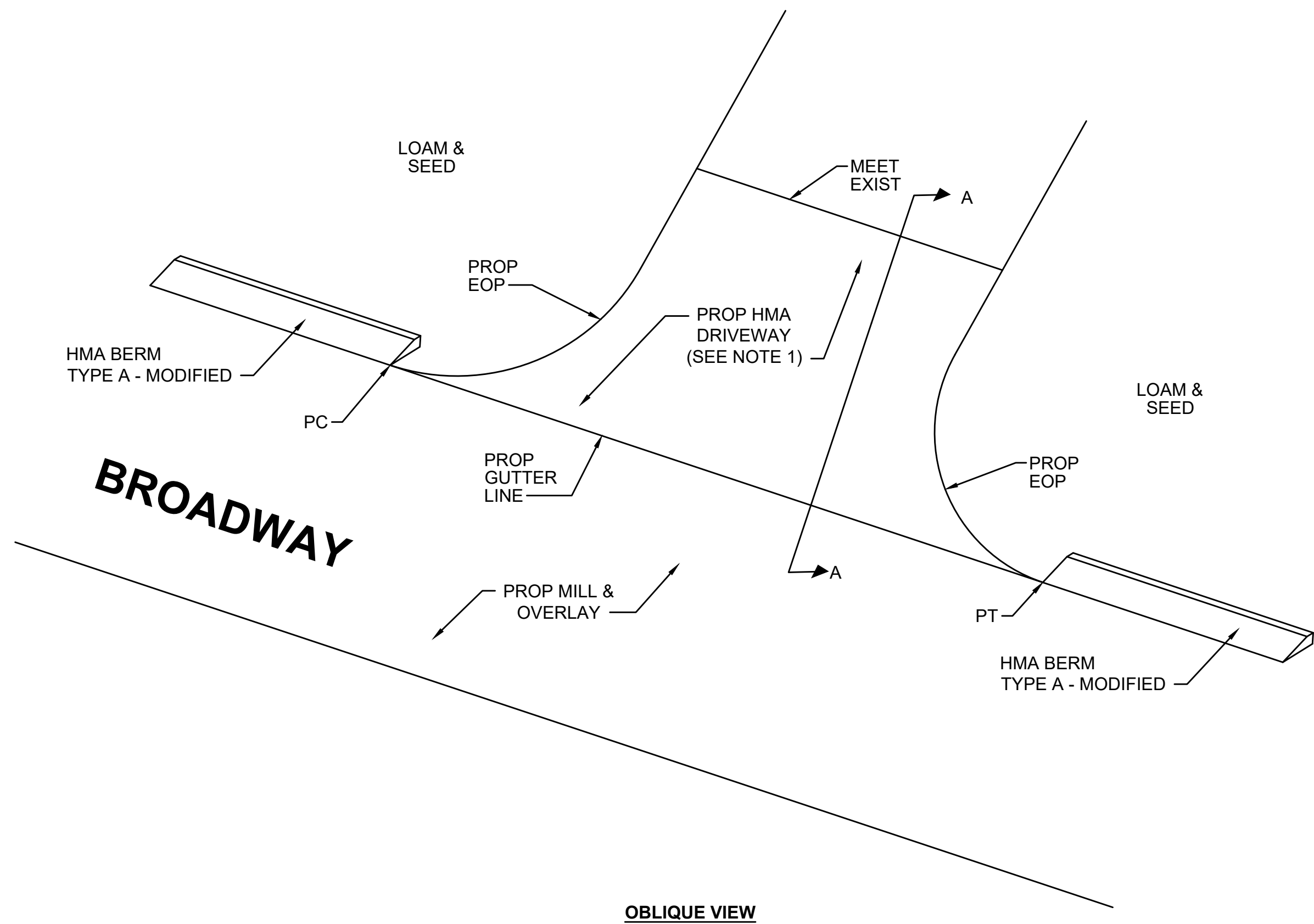
WHEELCHAIR RAMP DATA							
NO.	LOCATION (REF POINT)	SIDEWALK WIDTH	RAMP WIDTH	LEFT SIDE		RIGHT SIDE	
				REVEAL	TRANS	REVEAL	TRANS
BROADWAY							
1	12+89.28 20.97' RT	5.0'	6.3'	6"	SEE NOTE 2	6"	SEE NOTE 2
2	13+34.08 22.28' RT	5.0'	6.3'	6"		6"	
3	13+43.78 19.38' LT	5.0'	6.3'	6"		6"	

NOTES:

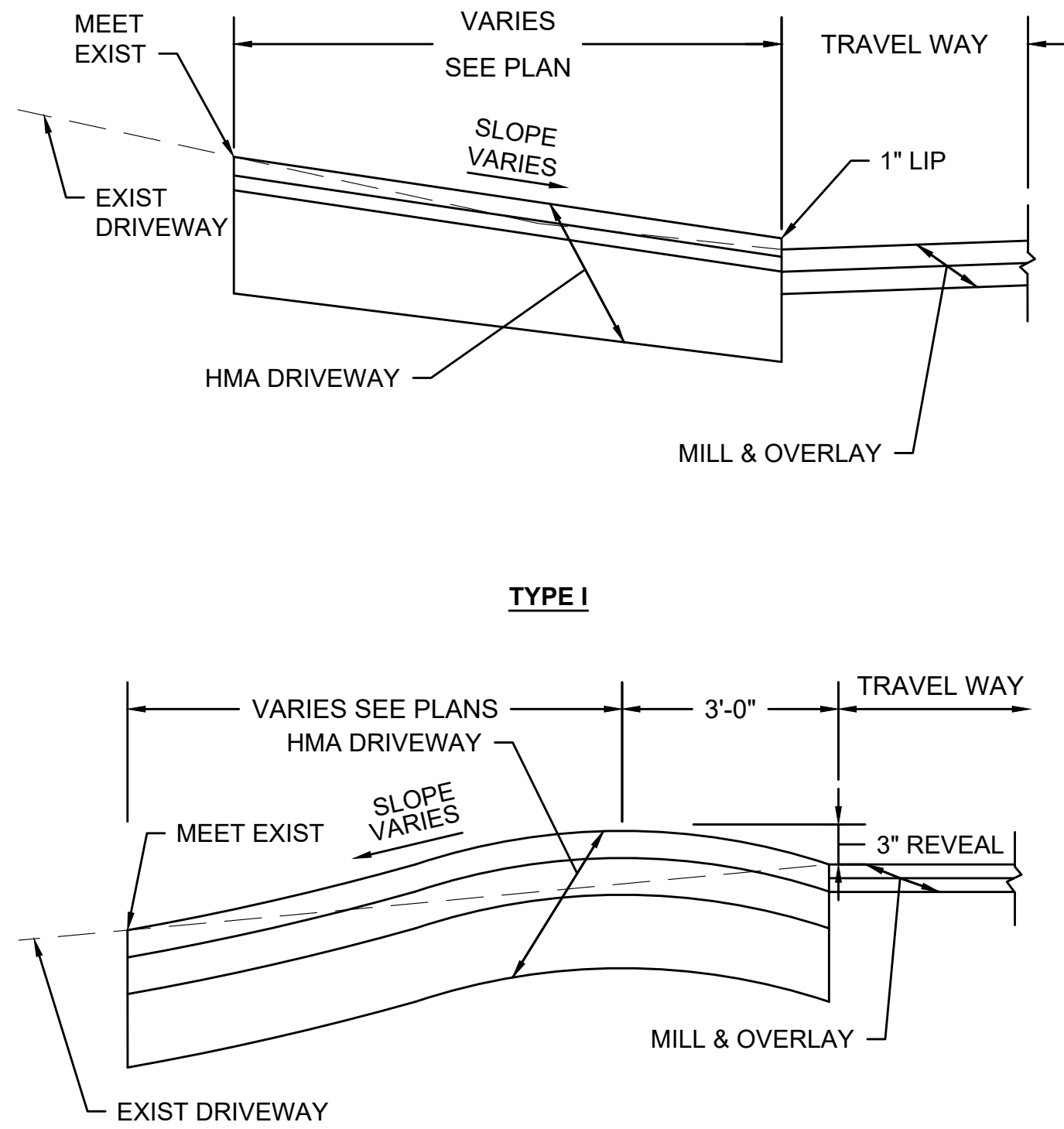
- NEGATIVE (-) ROADWAY GUTTER MAX DENOTES A LOW SIDE TRANSITION.
- TRANSITION LENGTH TO BE DETERMINED BASED ON MASSDOT CONSTR STD. E107.9.0 DATED OCT 2017 (SEE SHEET 16).
- GRAN CURB TRANSITION PIECE PROPOSED FOR WCR #1 (SEE CONSTRUCTION PLANS).



BROADWAY AT CROSS STREET  
CONSTRUCTION DETAILS  
SHEET 16 OF 17



OBLIQUE VIEW



TYPE I

TYPE II

SECTION A-A

- NOTES:
1. DRIVEWAYS TO BE CONSTRUCTED WITH THE FOLLOWING PAVEMENT DESIGN:  
  
SURFACE: 1 ¾" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)  
  
INTERMEDIATE: 1 ¾" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5)  
  
SUBBASE: 8" GRAVEL BORROW
  2. CONTRACTOR TO USE SECTION TYPE I OR TYPE II DEPENDING ON EXISTING CONDITIONS TO ENSURE THAT ROADWAY DRAINAGE FLOWS ALONG THE PROPOSED GUTTER LINE.

DRIVEWAYS

SCALE: NTS





MassDOT  
Massachusetts Department of Transportation  
Highway Division

CONSTRUCTION  
STANDARDS

CURB TRANSITION LENGTH  
FOR WHEELCHAIR RAMPS

DATE OF ISSUE  
OCTOBER 2017

DRAWING NUMBER  
E 107.9.0

ROADWAY PROFILE GRADE	* HIGH SIDE TRANSITION LENGTH
%	ENGLISH UNITS
=0%	6'-6"
>0% TO 1%	7'-8"
>1% TO 2%	9'-0"
>2% TO 3%	11'-0"
>3% TO 4%	14'-0"
>4% TO 5%	15'-0" Max

NOTE:

\* BASED ON A DESIGN SLOPE OF 7.5% AND A REVEAL OF 6".