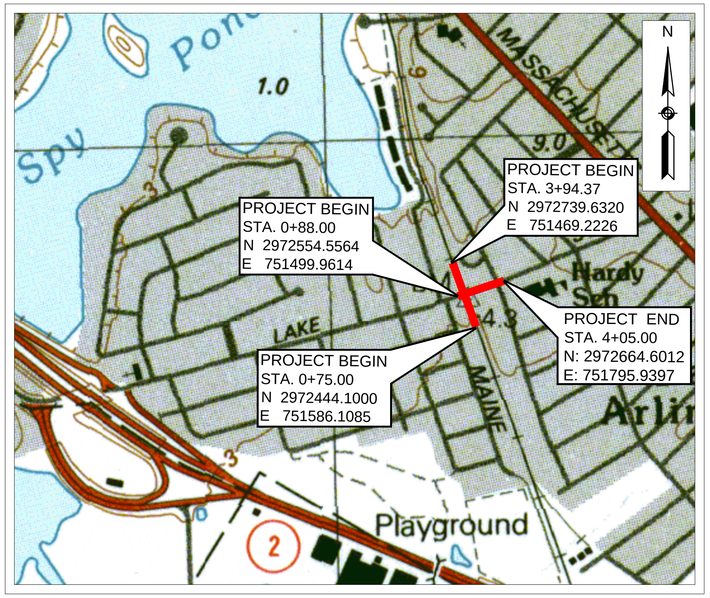
TOWN OF ARLINGTON, MASSACHUSETTS

MINUTEMAN BIKEWAY IMPROVEMENTS

AT

LAKE STREET

INDEX



LOCATION PLAN

500 0 500 1000

SCALE IN FEET

TOTAL LENGTH OF PROJECT = 699.37 FEET = 0.132 MILES

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE 2016 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO TRAFFIC STANDARD DETAILS ONLY), THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE 2009 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.

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TITLE SHEET

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 01 OF 26

F:\Projects\2017\17067\DWG\CURRENT DESIGN\01 TITLE SHEET.dwg Printed: 9/15/2017 2:24 PM

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
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
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
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE

ABBREVIATIONS (cont.)

GENERAL

PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SEDIMENT
TOW	TOP OF WATER
TYP	TYPICAL
UD	UNDERGROUND DRAIN PIPE
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VGC	VERTICAL GRANITE CURB
VLF	VINYL FENCE
WCR	WHEEL CHAIR RAMP
WDF	WOODEN FENCE
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR AMBER
FYL	FLASHING AMBER LEFT ARROW
FYR	FLASHING AMBER RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
		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.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS
		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)
		BALANCE STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		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

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	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

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: PLAN SYMBOLS

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
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Civil and Structural Engineers (978) 923-0400
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SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 02 OF 26

E:\Projects\2017\17067\DWG\CURRENT DESIGN\02 PLAN SYMBOLS.dwg Printed: 9/15/2017 2:25 PM

GENERAL NOTES

1. THE WORK UNDER THIS PROJECT INCLUDES BUT IS NOT LIMITED TO FULL DEPTH BIKEWAY CONSTRUCTION, PAVEMENT RESURFACING, RECONSTRUCTION OF A HOT MIX ASPHALT SIDEWALK, INSTALLATION OF DRAINAGE STRUCTURES AND PIPES, PLACEMENT OF PAVEMENT MARKINGS, PROTECTION OF EXISTING UTILITIES TO REMAIN, GRADING, INSTALLATION OF TRAFFIC SIGNS, INSTALLATION OF NEW SIGNAL EQUIPMENT, AND TRAFFIC MAINTENANCE DURING CONSTRUCTION.

2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL CONFLICTS BETWEEN THE EXISTING UTILITIES AND PROPOSED WORK. THE ENGINEER RESERVES THE RIGHT TO MODIFY THE DESIGN TO REALIGN PIPING AND STRUCTURE LOCATIONS AND INVERTS TO SUIT ACTUAL FIELD CONDITIONS ENCOUNTERED.

3. ALL EXISTING STREET NAME, REGULATORY, GUIDE, AND WARNING SIGNS, INCLUDING POSTS, WITHIN THE LIMITS OF WORK ARE TO BE RETAINED UNLESS OTHERWISE NOTED.

4. THE CONTRACTOR SHALL RETAIN AND PROTECT ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE TOWN.

5. THE CONTRACTOR SHALL PROVIDE ALL SAFETY CONTROL (SIGNS, REFLECTORIZED DRUMS, ETC) FOR CONSTRUCTION OPERATIONS IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLANS INCLUDED HEREIN AND THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PROVIDING SAFETY CONTROLS SHALL BE INCLUDED IN THE COST OF ITEM 852. SAFETY SIGNING FOR TRAFFIC MANAGEMENT, ITEM 859. REFLECTORIZED DRUM, AND ITEM 999.001 POLICE DETAIL.

6. ALL TREES SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED. THE COSTS FOR PROTECTION SHALL BE INCIDENTAL TO THE CONTRACT.

7. ALL GRATES, FRAMES AND COVERS OF STRUCTURES TO BE REMOVED OR ABANDONED SHALL BE DELIVERED BY THE CONTRACTOR TO THE TOWN OF ARLINGTON HIGHWAY DEPARTMENT AND STACKED AT A LOCATION DESIGNATED BY THE TOWN.

8. ALL UTILITIES AND THEIR APPURTENANCES SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED

9. ALL RCP SHALL BE CLASS III UNLESS OTHERWISE NOTED.

PLAN NOTES

1. THE BASE MAP IS COMPILED FROM AN ACTUAL-ON-THE-GROUND TOPOGRAPHIC SURVEY PERFORMED BY GREEN INTERNATIONAL AFFILIATES, INC. JULY, 2017

2. THIS DRAWING WAS PREPARED SOLELY FOR AND IS INTENDED FOR THE WORK ASSOCIATED WITH THIS PROJECT. THE USE OR REUSE OF THESE DRAWINGS FOR OTHER PURPOSES OR BY PARTIES NOT DIRECTLY CONTRACTED TO THIS PROJECT IS PROHIBITED WITHOUT PRIOR WRITTEN PERMISSION.

3. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED BY GREEN ON JULY 21, 2017 WITH STATIC GPS VECTORS CALCULATED BY NATIONAL GEODETIC SURVEY'S OPUS SERVICE. HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD83 (2011) EPOCH 2010.0000, VERTICAL DATUM IS NAVD 88 (COMPUTED USING GEOID12B) CONVERTED TO ARLINGTON TOWN BASE.

4. THE RIGHT OF WAY LINES SHOWN ON THIS BASE MAP ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES HAVE NOT BEEN SURVEYED, THEY ARE COMPILED FROM GIS & RECORD PLAN INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE.

5. UNDERGROUND UTILITIES SHOWN ARE BASED UPON FIELD OBSERVATIONS AND PLANS OF RECORD. THESE UTILITIES ARE NOT WARRANTED TO BE CORRECT NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES ARE SHOWN.

UTILITY NOTES

1. THE CONTRACTOR IS HEREBY MADE AWARE THAT EXISTING UTILITIES, INCLUDING BUT NOT LIMITED TO EXISTING WATER AND DRAIN PIPES; DRAINAGE AND SEWER STRUCTURES; GAS LINES, COMMUNICATION LINES AND UTILITY POLES, MAY NEED TO BE PROTECTED AND/OR SHORED UP DURING THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS UNDER THIS PROJECT. THE COST OF THE WORK REQUIRED FOR THE PROTECTION, MAINTENANCE AND SUPPORT OF THESE OR OTHER EXISTING ABOVEGROUND OR UNDERGROUND UTILITIES IN THE VICINITY OF THE PROPOSED WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE WORK UNDER THIS CONTRACT.

2. THIS PLAN WAS PREPARED IN CONFORMANCE WITH AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARD CI/ASCE 38-02 "STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA", QL"C". REFER TO UTILITY QUALITY LEVEL INFORMATION INDEX. ACCURACY OF UTILITY LOCATIONS IS NOT GUARANTEED.

3. BELOW GROUND STRUCTURES, UNLESS DIMENSIONED, ARE SYMBOLIC ONLY.

4. PRIOR TO THE START OF ANY WORK ON THE SITE, THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION OF ALL UTILITIES, SHOWN OR NOT SHOWN ON THIS PLAN. CONTACT DIG-SAFE AT 1-888-344-7233 (1-888-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO THE START OF EXCAVATION.

5. IF AN EXISTING PIPE TO BE REMOVED EXTENDS OUTSIDE THE PROPOSED ROADWAY LIMIT, IT SHALL BE CUT BEYOND THE ROADWAY AND CAPPED AT NO ADDITIONAL COST.

UTILITY QUALITY LEVEL INFORMATION INDEX (SEE ASCE/CI 38-02):

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER. INFORMATION IS ONLY VALID WITHIN THE VISIBLE LIMITS OF THE TEST HOLE.

UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

DRAINAGE NOTES

1. COMPACTED ¾" CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 12" BENEATH ALL NEW MANHOLES AND CATCH BASINS.

2. COMPACTED ¾" CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 6" BELOW THE INVERT OF ALL DRAINAGE PIPES UP TO THE SPRING LINE OF THE PROPOSED PIPE, AS SHOWN IN THE TYPICAL PIPE TRENCH DETAIL (SEE SHEET 19).

3. ALL OFFSETS TO THE CATCH BASINS ARE TO THE BACK CENTER OF THE GRATE. THE LOCATION AND ORIENTATION OF THE BELOW GRADE STRUCTURE SHALL BE FIELD COORDINATED BY THE CONTRACTOR TO AVOID CONFLICTS WITH EXISTING UTILITIES.

4. ALL STRUCTURES SHALL HAVE ECCENTRIC CONES UNLESS THEY ARE FLAT SLABS OR AS OTHERWISE REQUIRED BY THE ENGINEER.

5. ALL STRUCTURES SHALL MEET HS-25 LOADING.

6. ALL STRUCTURES TO BE MANUFACTURED TO MEET OR EXCEED ASTM C-478 AND AASHTO M199 SPECS.

7. ALL REINFORCING FOR EACH STRUCTURE SHALL CONFORM TO ASTM A-165 AND BE PLACED AS PER ASTM C-478.

8. ALL CONCRETE TO BE 4000 PSI (MINIMUM) CEMENT PER ASTM C-478.

9. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 AND AASHTO M-198. WATERPROOFING PER CONTRACT SPECS.

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: GENERAL NOTES

PREPARED FOR:
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ARLINGTON, MA 02476

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DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	

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N/F
BOSTON & MAINE RAILROAD
MINUTEMAN BIKE TRAIL
BOOK 499 PAGE 154

PROJECT LIMIT
STA 3+94.37
N: 2972739.6320
E: 751468.2226

PROP. SAWCUT AND MATCH EXISTING

4+10

12 +/-

PROTECT TREE

PT +81.12

REM. TREE

N/F
TOWN OF
ARLINGTON
BOOK 10046
PAGE 383

N/F
MARC W. RICHARDSON AND
PATRICIA RICHARDSON
007.0-0004-0005.0
BOOK 52179 PAGE 498
96 ORVIS CIRCLE

(RET)

(REM)

PRC +50.06

PROP. SAWCUT

PROP. EDGE OF BIKEWAY

PROP. SLOPE LIMIT (TYP.)

CONSTRUCTION ℄

PC +69.89

SEE LANDSCAPE PLAN 1
FOR PROP. MATERIALS

N/F
71-73 LAKE STREET
CONDOMINIUM
007.A-0004-0071.0
BOOK 60108 PAGE 340
71-73 LAKE STREET

PROP. COLORED CEM. CONC. SIDEWALK

R&D EXISTING PAVEMENT

PROP. LOAM & SEED (TYP.)

14.00

PROTECT TREE

PROP. SCORED CONCRETE ISLAND

PROP. COLORED CEM.
CONC. SIDEWALK

REMOVE HEDGES
STA. 2+35 - STA. 2+57

N/F
SUSAN M CORKERY
007.0-0005-0013.0
BOOK 32826 PAGE 149
75-77 LAKE STREET

PROJECT LIMIT
STA. 0+88.00
N: 2972554.5564
E: 751499.9614

7.00

(REM)

PROP. TRANSITION CURB (TYP.)

R&D EXISTING CURB (TYP.)

N/F
79-81 LAKE STREET
CONDOMINIUM
007.A-0005-0079.0
BOOK 44825 PAGE 378
79-81 LAKE STREET

LAKE AVENUE

N/F
VIRGINIA E GAVRIS
007.0-0006-0013.0
BOOK 62453 PAGE 251
83-83A LAKE STREET

PROP. SAWCUT AND
MATCH EXISTING

18' - 12" RCP

PROP. CB
STA. 1+41.44
14.9 RT

(R&D)

(ADJ)

PROP. 5' HMA WALK (TYP.)

PROP. HMA DRIVEWAY

PROP. SAWCUT AND
MATCH EXISTING

PT +77.49

PROP. MILL AND OVERLAY

PROP. CEM. CONC.
WHEELCHAIR RAMP

PC +30.43

CONNECT TO EXIST. DRAIN PIPE

PROP. DMH
STA1+40.72 - 8.92 RT

0+00

CONSTRUCTION ℄

LAKE STREET

PROP. SCORED CONCRETE ISLAND

REM. EXIST. BIKE RACK

PROP. COLORED CEM.
CONC. SIDEWALK

REM. EXIST. CONC. SLAB

REM. EXIST. LIGHT
POST FOUNDATION

PROP. COLORED CEM.
CONC. SIDEWALK

PROP. LIMIT OF CLEARING
AND GRUBBING OF TREES

SEE LANDSCAPE PLAN 1
FOR PROP. MATERIALS

N/F
4-6 MARGARET STREET
CONDOMINIUM
013.A-0001-0004.0
BOOK 51043 PAGE 365
4-6 MARGARET STREET

MARGARET STREET

N/F
ALFREDO S. & MARIA SEQUEIRA
TRUSTEES
013.0-0002-0009.0
BOOK 66652 PAGE 449
84 LAKE STREET

N/F
KIMBERLY J VIERSTRA
013.0-0002-0010.0
BOOK 35363 PAGE 154
82 LAKE STREET

R&D EXISTING PAVEMENT

PROP. LOAM & SEED (TYP.)

PROP. EDGE OF BIKEWAY

PROP. SAWCUT AND
MATCH EXISTING

N/F
JOHN J MC DONALD &
KILLEEN VIRGINIA TRUSTEES
013.0-0001-0002.0
BOOK 57903 PAGE 147
8-10 MARGARET STREET

MINUTEMAN BIKEWAY

CONSTRUCTION ℄

N/F
BOSTON & MAINE RAILROAD
MINUTEMAN BIKE TRAIL
BOOK 499 PAGE 154

0+00

PROJECT LIMIT
STA. 0+75.00
N: 2972744.1000
E: 751598.1085

12 +/-

14.00

PT +72.17

PC +51.24

7.00

(REM)

PROP. LIMIT OF CLEARING
AND GRUBBING OF TREES

PROP. SLOPE LIMIT (TYP.)

PROP. EDGE OF BIKEWAY

N/F
HUGH B MORGENBESSER &
AMY COLTON
007.0-0004-0002.0
BOOK 48395 PAGE 138
65 LAKE STREET

N/F
ALFRED J. CASAZZA JR.
007.0-0004-0003.0
BOOK 67653 PAGE 475
67 LAKE STREET

PROP. SAWCUT AND MATCH EXISTING

PROP. LOAM & SEED

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. PRECAST CONC. LOT CURB - 1'-6" REVEAL

PROP. CEM. CONC. WHEELCHAIR RAMP

PROTECT TREE

R&D EXISTING SIDEWALK (TYP.)

PROP. DOUBLE GRATE CB
STA. 1+37.52 - 13.89 LT

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. SAWCUT AND
MATCH EXISTING

PROP. HMA DRIVEWAY

PROP. 5' HMA WALK (TYP.)

(ADJ)

PROP. TRANSITION
CURB (TYP.)

PROP. HMA
DRIVEWAY

PROP. SAWCUT AND
MATCH EXISTING

PROP. LOAM &
SEED (TYP.)

PROP. SAWCUT
LINE (TYP.)

PROP. SAWCUT AND MATCH EXISTING

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. GRAN. CURB TYPE VB

PROP. TRANSITION
CURB (TYP.)

N/F
MARY GAIL GIRAGOSIAN &
PAUL S GIRAGOSIAN
005.0-0001-0002.0
BOOK 52073 PAGE 61
66-68 LAKE STREET

N/F
70-72 LAKE STREET CONDOMINIUM
005.A-0001-0070.0
BOOK 46988 PAGE 447
70-72 LAKE STREET

PROP. COLORED CEM.
CONC. SIDEWALK

N/F
ROBERT D SAN CLEMENTE &
BARBARA C SAN CLEMENTE TRUSTEE
005.0-0001-0003.0
BOOK 63476 PAGE 1
64 LAKE STREET

BROOKS AVENUE

N/F
KATHLEEN M. CONNEILLY
LIFE ESTATE
007.0-0002-0007.0
BOOK 55154 PAGE 567
57 LAKE STREET

N/F
ELLEN M. FITANIDES
007.0-0002-0006.0
BOOK 35889 PAGE 443
55 LAKE STREET

PROP. SAWCUT AND MATCH EXISTING

PROP. LOAM & SEED

PROP. GRAN. CURB TYPE VB

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. GRAN. CURB TYPE VB

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. LOAM & SEED

PROP. SAWCUT AND MATCH EXISTING

4+75

LAKE STREET

CONSTRUCTION ℄

PROJECT LIMIT
STA. 4+05.00
N: 2972664.6012
E: 751795.9397

N/F
TOWN OF ARLINGTON SCHOOL
HARDY SCHOOL
005.0-0001-0001.0
BOOK 130 PAGE 309
54 LAKE STREET

PROP. SAWCUT AND MATCH EXISTING

PROP. LOAM & SEED

PROP. SLOPE LIMIT

PROP. CEM. CONC. WHEELCHAIR RAMP

PROP. SAWCUT AND MATCH EXISTING

R&D EXIST.
GRAN. CURB
(TYP.)

PROP. GRAN.
CURB TYPE
VB (TYP.)

ALL EXISTING TRAFFIC SIGNAL EQUIPMENT IS TO BE REMOVED AT THE LAKE ST / BROOKS AVE INTERSECTION.

PROP. SAWCUT AND MATCH EXISTING

BROOKS AVENUE

N

NAD 83

0 20 50 100

SCALE: 1" = 20'

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: CONSTRUCTION PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO.	
DATE: 09/15/2017	DRAWN BY: JG	04	OF 26
PROJECT NO. 17067.015	CHECKED BY: JS		

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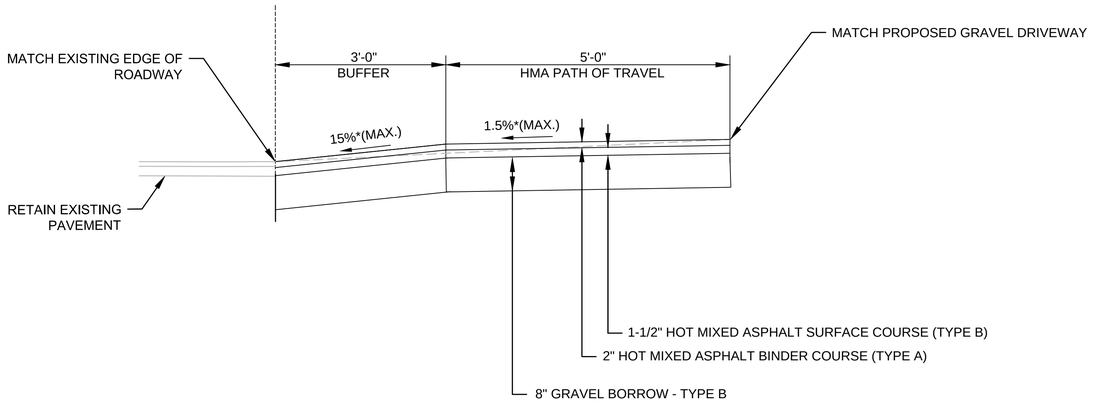
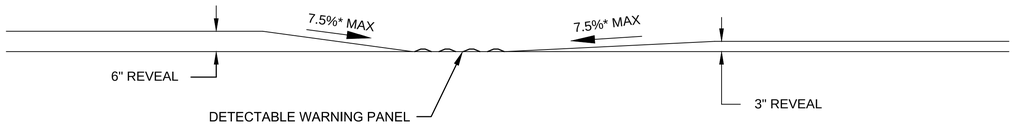
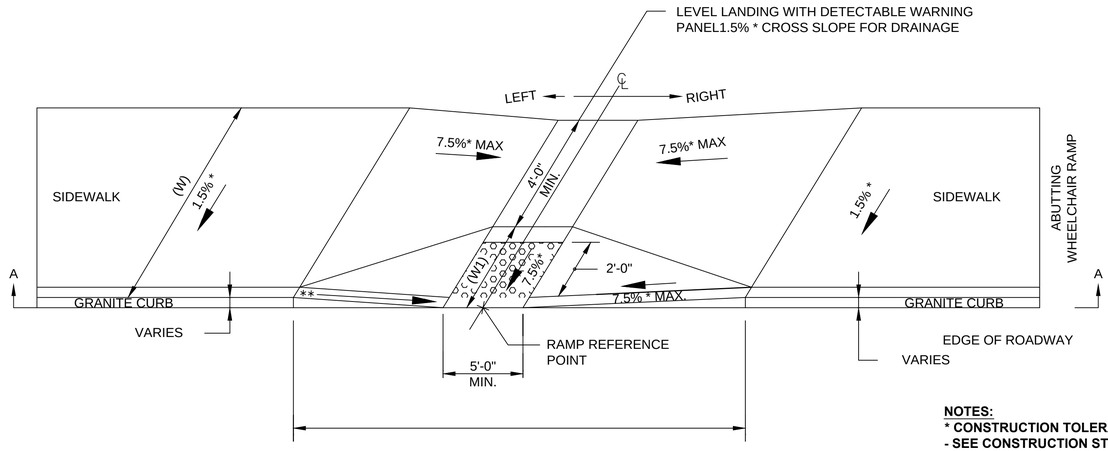


RESIDENTIAL DRIVEWAY DETAIL

NOT TO SCALE



NOTE:
SIDES OF TRANSITION WITH 6" REVEAL AND 3" REVEAL VARY.

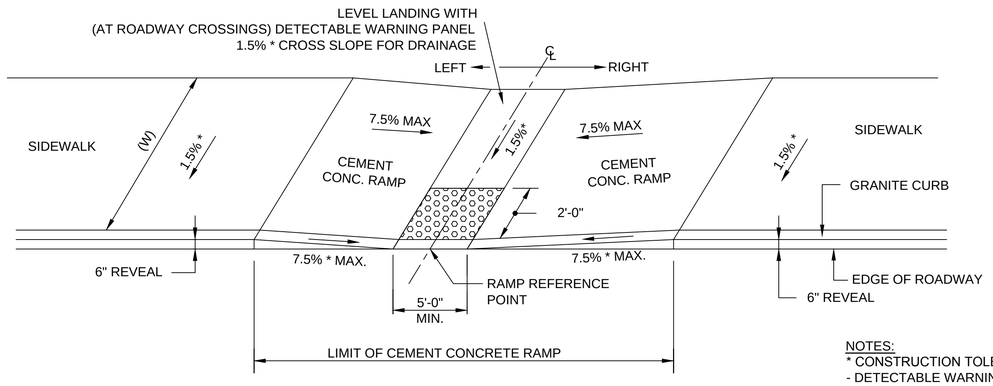


CURB CUT RAMP DETAIL

(LESS THAN 12'–4" SIDEWALK)

NOT TO SCALE

NOTES:
*** CONSTRUCTION TOLERANCE ± 0.5%**
- SEE CONSTRUCTION STANDARD E 107.2.0
**** SEE CONSTRUCTION STANDARD E 107.9.0 - DETECTABLE WARNING PANELS SHALL BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STD E 107.6.5**
- CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR CONSTRUCTING RAMPS COMPLIANT WITH ADA/AAB RULES, REGULATIONS AND STANDARDS. CONTRACTOR SHALL VERIFY RAMPS ARE ADA/AAB COMPLIANT BEFORE POURING CEMENT CONCRETE.



NOTES:
* CONSTRUCTION TOLERANCE ± 0.5%
- DETECTABLE WARNING PANELS SHALL BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STD E 107.6.5

CURB CUT RAMP (NARROW SIDEWALK) DETAIL E 107.2.1

NOT TO SCALE

WCR #	BASELINE	RAMP REFERENCE POINT		WIDTH OF RAMP (FT.)	WIDTH OF SIDEWALK (W) (FT.)	TRANSITION LENGTH		3" REVEAL	6" REVEAL
		STATION	OFFSET			LEFT SIDE	RIGHT SIDE		
7	LAKE ST	03+30.55	38.66 RT	5'-0"	6'-6"	6'-6"	3'-10"	RIGHT SIDE	LEFT SIDE
11	LAKE ST	03+57.09	38.32 LT	5'-0"	6'-6"	6'-6"	3'-10"	RIGHT SIDE	LEFT SIDE

WCR #	BASELINE	RAMP REFERENCE POINT		WIDTH OF RAMP (FT.)	WIDTH OF SIDEWALK (W) (FT.)	TRANSITION LENGTH		3" REVEAL	6" REVEAL
		STATION	OFFSET			LEFT SIDE	RIGHT SIDE		
5	LAKE ST	03+10.56	13.79 LT	5'-0"	10'-0"	6'-6"	5'-6"	RIGHT SIDE	LEFT SIDE
6	LAKE ST	03+11.02	15.93 RT	5'-0"	11'-6"	6'-6"	3'-10"	LEFT SIDE	RIGHT SIDE
8	LAKE ST	03+59.16	38.70 RT	5'-0"	6'-0"	3'-3"	6'-6"	LEFT SIDE	RIGHT SIDE
9	LAKE ST	03+79.08	16.75 RT	5'-0"	11'-0"	9'-0"	3'-3"	RIGHT SIDE	LEFT SIDE
10	LAKE ST	03+78.42	13.63 LT	5'-0"	9'-9"	3'-3"	9'-0"	LEFT SIDE	RIGHT SIDE
12	LAKE ST	03+31.82	36.99 LT	5'-0"	9'-0"	3'-10"	6'-6"	LEFT SIDE	N/A

PAVEMENT NOTES

PROPOSED BIKEWAY

SURFACE: 3 1/2" HOT MIX ASPHALT PAVEMENT PLACED IN TWO LAYERS
1 3/4" TOP COURSE MATERIAL OVER 1 3/4" BINDER COURSE MATERIAL
SUBBASE: 8" GRAVEL BORROW (TYPE B)

PROPOSED PAVEMENT MILLING AND RESURFACING

SURFACE: 2" HOT MIX ASPHALT MODIFIED TOP COURSE
±2" PAVEMENT MILLING
(VARIABLE DEPTH TO MEET PROPOSED GRADING)

NOTE:
ASPHALT EMULSION FOR TACK COAT (RS-1) SHALL BE APPLIED AT A RATE OF 0.05 GAL/SY OVER NEW AND SMOOTH INTERMEDIATE COURSES.
ASPHALT EMULSION FOR TACK COAT (RS-1) SHALL BE APPLIED AT A RATE OF 0.07 GAL/SY OVER MILLED SURFACES.

PAVEMENT NOTES (CONT.)

PROPOSED HMA DRIVEWAY

SURFACE: 1-½" MODIFIED TOP COURSE OVER
INTERMEDIATE: 2" HOT MIX ASPHALT BINDER COURSE
BASE: 8" GRAVEL BORROW (TYPE B)

PROPOSED HMA SIDEWALK

SURFACE: 1" HOT MIX ASPHALT SURFACE COURSE
INTERMEDIATE: 1 1/2" HOT MIX ASPHALT BINDER COURSE
BASE: 8" GRAVEL BORROW (TYPE B)

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: CONSTRUCTION DETAILS

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED | DESIGNED BY: JG
DATE: 09/15/2017 | DRAWN BY: JG
PROJECT NO. 17067.015 | CHECKED BY: JS
SHEET NO. 05 OF 26

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Curve Table				
Curve #	Radius	Length	Tangent	Delta
C1	4.00	5.46	3.255	78°16'11"
C2	50.00	9.90	4.967	11°20'43"
C3	50.00	10.20	5.120	11°41'36"
C4	88.00	35.84	18.170	23°19'57"
C5	81.00	33.72	17.110	23°51'20"
C6	81.00	33.72	17.110	23°51'20"
C7	88.00	36.34	18.435	23°39'49"
C8	35.00	2.01	1.007	3°17'42"
C9	95.00	3.28	1.643	5°22'32"
C10	95.00	38.88	19.718	23°27'07"
C11	88.00	36.49	18.510	23°45'27"
C12	88.00	36.49	18.510	23°45'27"
C13	95.00	38.88	19.718	23°27'07"
C14	50.00	9.95	4.993	11°24'17"
C15	50.00	9.95	4.993	11°24'17"
C16	4.00	5.46	3.255	78°16'11"
C17	4.00	5.46	3.255	78°16'11"
C18	117.00	45.56	23.071	22°18'36"
C19	105.00	40.31	20.408	21°59'53"
C20	107.00	37.30	18.843	19°58'29"
C21	95.00	33.76	17.059	20°21'37"

Line Table	
Line #	Length
L1	52.63
L2	58.17
L3	7.85
L4	34.25
L5	11.31
L6	12.70
L7	5.58
L8	7.35
L9	66.09
L10	23.54
L11	58.49
L12	28.97
L13	10.66
L14	13.18
L15	14.17
L16	17.78
L17	9.85
L18	16.04

Curve Table				
Curve #	Radius	Length	Tangent	Delta
C22	33.00	56.06	37.520	97°20'05"
C23	37.00	49.24	29.036	76°14'45"
C24	17.00	25.97	16.284	87°32'12"
C25	15.00	24.10	15.550	92°03'43"

LAKE ST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L200	0+00.00	2972539.715	751413.222		N80°17'27"E 130.43'	1+30.43	2972561.712	751541.782
C200	1+30.43	2972561.712	751541.782	R=200.00' Δ=13°28'55" L=47.06' T=23.64'		1+77.49	2972575.008	751586.812
L201	1+77.49	2972575.008	751586.812		N66°48'32"E 297.51'	4+75.00	2972692.169	751860.287

MINUTEMAN BIKEWAY CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L100	0+00.00	2972373.323	751610.920		N19°19'06"W 115.24'	1+15.24	2972482.073	751572.797
C100	1+15.24	2972482.073	751572.797	R=200.00' Δ=0°42'48" L=2.49' T=1.25'		1+17.73	2972484.428	751571.988
L101	1+17.73	2972484.428	751571.988		N18°36'18"W 182.96'	3+00.69	2972657.824	751513.617
C101	3+00.69	2972657.824	751513.617	R=130.00' Δ=21°45'43" L=49.38' T=24.99'		3+50.06	2972700.546	751489.459
C102	3+50.06	2972700.546	751489.459	R=89.00' Δ=19°59'43" L=31.06' T=15.69'		3+81.12	2972727.208	751473.836
L102	3+81.12	2972727.208	751473.836		N20°22'18"W 28.88'	4+10.00	2972754.279	751463.784

SCALE: 1" = 20'

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: CURB TIE & LAYOUT PLAN

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

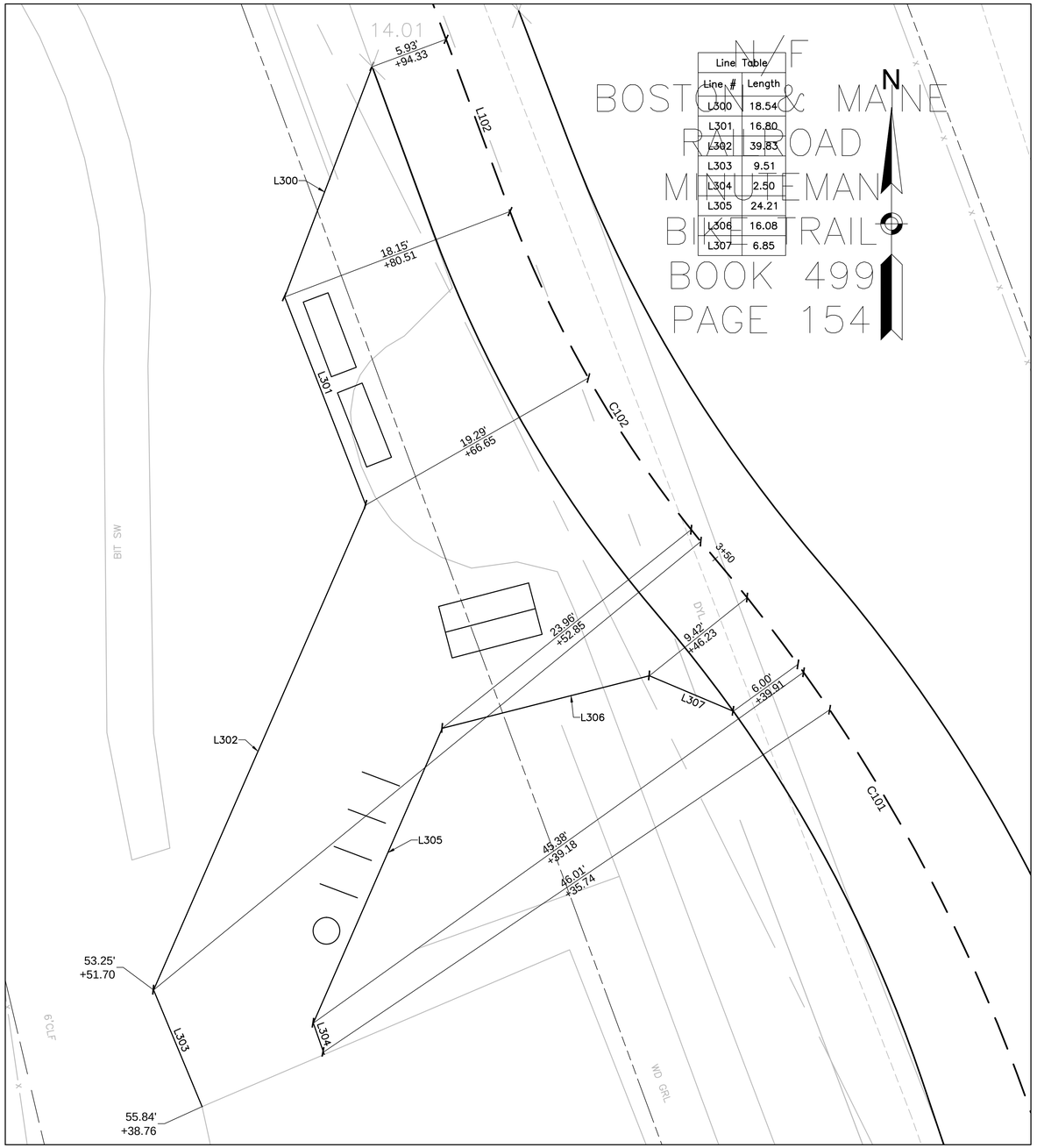
PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

NO.	DATE	REVISIONS

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 06 OF 26

P:\Projects\2017\17067\DWG\CURRENT DESIGN\01 CURB TIE & GRADING PLAN.dwg Printed: 9/15/2017 2:39 PM

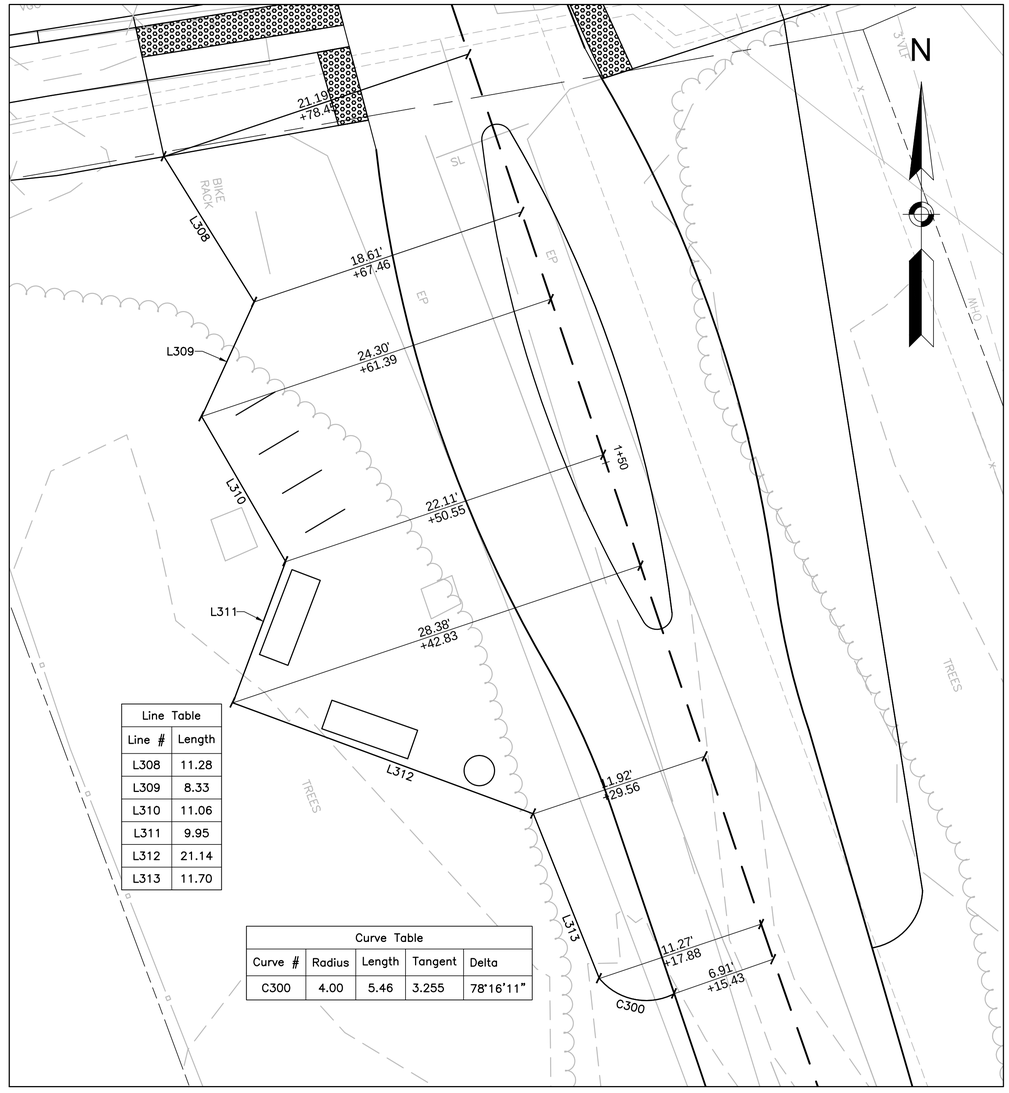


Line Table	
Line #	Length
L300	18.54
L301	16.80
L302	39.83
L303	9.51
L304	2.50
L305	24.21
L306	16.08
L307	6.85

PLAZA LAYOUT PLAN 1

0 5 12.5 25

SCALE: 1" = 5'



Line Table	
Line #	Length
L308	11.28
L309	8.33
L310	11.06
L311	9.95
L312	21.14
L313	11.70

Curve Table				
Curve #	Radius	Length	Tangent	Delta
C300	4.00	5.46	3.255	78°16'11"

PLAZA LAYOUT PLAN 2

0 5 12.5 25

SCALE: 1" = 5'

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: PLAZA LAYOUT PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 07 OF 26

N/F
BOSTON & MAINE
RAILROAD
MINUTEMAN
BIKE TRAIL
BOOK 499
PAGE 154

N/F
MARC W. RICHARDSON AND
PATRICIA RICHARDSON
007.0–0004–0005.0
BOOK 52179 PAGE 498
96 ORVIS CIRCLE

N/F
HUGH B MORGENBESSER &
AMY COLTON
007.0–0004–0002.0
BOOK 48395 PAGE 138
65 LAKE STREET

N/F
KATHLEEN M. CONNEILLY
LIFE ESTATE
007.0–0002–0007.0
BOOK 55154 PAGE 567
57 LAKE STREET

N/F
ELLEN M. FITANIDES
007.0–0002–0006.0
BOOK 35889 PAGE 443
55 LAKE STREET

N/F
ALFRED J. CASAZZA JR.
007.0–0004–0003.0
BOOK 67653 PAGE 475
67 LAKE STREET

N/F
71–73 LAKE STREET
CONDOMINIUM
007.A–0004–0071.0
BOOK 60108 PAGE 340
71–73 LAKE STREET

N/F
TOWN OF
ARLINGTON
BOOK 10046
PAGE 383

N/F
SUSAN M CORKERY
007.0–0005–0013.0
BOOK 32826 PAGE 149
75–77 LAKE STREET

N/F
79–81 LAKE STREET
CONDOMINIUM
007.A–0005–0079.0
BOOK 44825 PAGE 378
79–81 LAKE STREET

N/F
VIRGINIA E GAVRIS
007.0–0006–0013.0
BOOK 62453 PAGE 251
83–83A LAKE STREET

N/F
TOWN OF ARLINGTON SCHOOL
HARDY SCHOOL
005.0–0001–0001.0
BOOK 130 PAGE 309
54 LAKE STREET

N/F
ROBERT D SAN CLEMENTE &
BARBARA C SAN CLEMENTE TRUSTEE
005.0–0001–0003.0
BOOK 63476 PAGE 1
64 LAKE STREET

N/F
MARY GAIL GIRAGOSIAN &
PAUL S GIRAGOSIAN
005.0–0001–0002.0
BOOK 52073 PAGE 61
66–68 LAKE STREET

N/F
70–72 LAKE STREET CONDOMINIUM
005.A–0001–0070.0
BOOK 46988 PAGE 447
70–72 LAKE STREET

N/F
CATHERINE CHIU AND WILLIAM KAPLAN
005.0–0001–0004.0
BOOK 58196 PAGE 44
102–104 BROOKS AVENUE

N/F
MARY JANE BIRMINGHAM
005.0–0001–0005.0
BOOK 20503 PAGE 340
98–100 BROOKS AVENUE

N/F
4–6 MARGARET STREET
CONDOMINIUM
013.A–0001–0004.0
BOOK 51043 PAGE 365
4–6 MARGARET STREET

N/F
ALFREDO S. & MARIA SEQUEIRA
TRUSTEES
013.0–0002–0009.0
BOOK 66652 PAGE 449
84 LAKE STREET

N/F
KIMBERLY J VIERSTRA
013.0–0002–0010.0
BOOK 35363 PAGE 154
82 LAKE STREET

N/F
JOHN J MC DONALD &
KILLEEN VIRGINIA TRUSTEES
013.0–0001–0002.0
BOOK 57903 PAGE 147
8–10 MARGARET STREET

N/F
BOSTON & MAINE
RAILROAD
MINUTEMAN
BIKE TRAIL
BOOK 499
PAGE 154

LAKE STREET
LAKE AVENUE
BROOKS AVENUE
MARGARET STREET
MINUTEMAN BIKEWAY

ELEVATIONS AT CORNERS OF HMA DRIVEWAYS ARE PAVEMENT SURFACE ELEVATIONS (TYP.).

N

0 20 50 100

SCALE: 1" = 20'

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: GRADING PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO.	
DATE: 09/15/2017	DRAWN BY: JG	08	OF 26
PROJECT NO. 17067.015	CHECKED BY: JS		

F:\Projects\2017\17067\DWG\CURRENT DESIGN\07 CURB TIE & GRADING PLAN.dwg, Printed: 9/15/2017 3:54 PM

N/F
TOWN OF
ARLINGTON
BOOK 10046
PAGE 383

N/F
BOSTON & MAINE RAILROAD
MINUTEMAN BIKE TRAIL
BOOK 499 PAGE 154

N/F
71–73 LAKE STREET
CONDOMINIUM
007.A–0004–0071.0
BOOK 60108 PAGE 340
71–73 LAKE STREET

N/F
ALFRED J. CASAZZA JR.
007.0–0004–0003.0
BOOK 67653 PAGE 475
67 LAKE STREET

N/F
SUSAN M CORKERY
007.0–0005–0013.0
BOOK 32826 PAGE 149
75–77 LAKE STREET

N/F
79–81 LAKE STREET
CONDOMINIUM
007.A–0005–0079.0
BOOK 44825 PAGE 378
79–81 LAKE STREET

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

PROP. 40' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE AND PED. INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER AND INDICATOR, AND VIDEO DETECTION CAMERAS. STA. 1+11.49; 19.32' LT

PROP. NEMA TS-2, TYPE 1 CONTROLLER AND CABINET ON NEW FOUNDATION AND CONCRETE PAD

PROP. 3" ELECTRICAL CONDUIT TYPE NM TO BE INSTALLED WITHIN THE SAME TRENCH

PROP. 3" ELECTRICAL CONDUIT TYPE NM (TYP.)

PROP. VEHICLE DETECTION ZONE (TYP.)

PROP. UNDERGROUND SERVICE CONNECTION

PROP. R10-22

PROP. 8" X 23" PULL BOX (TYP.)

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

PROP. 10' TS POST ON NEW FOUNDATION WITH BICYCLE SIGNAL INDICATION, PED. SIGNAL INDICATION, AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

MOUNTED ON PROP. SIGNAL POST R10-22

ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST SP-1

PROP. 10' TS POST ON NEW FOUNDATION WITH BICYCLE SIGNAL INDICATION, PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

R10-22 PROP.

R10-22 MOUNTED ON PROP. SIGNAL POST

SP-1 ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST

PROP. UNDERGROUND INTERCONNECT TO MASTER SIGNAL CONTROLLER AT LAKE STREET / BROOKS AVENUE.

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

PROP. PED. & BICYCLE DETECTION ZONE (TYP.)

N/F
MARY GAIL GIRAGOSIAN &
PAUL S GIRAGOSIAN
005.0–0001–0002.0
BOOK 52073 PAGE 61
66–68 LAKE STREET

N/F
70–72 LAKE STREET CONDOMINIUM
005.A–0001–0070.0
BOOK 46988 PAGE 447
70–72 LAKE STREET

N/F
4–6 MARGARET STREET CONDOMINIUM
013.A–0001–0004.0
BOOK 51043 PAGE 365
4–6 MARGARET STREET

N/F
BOSTON & MAINE RAILROAD
MINUTEMAN BIKE TRAIL
BOOK 505 PAGE 2

LAKE STREET

MARGARET STREET

MINUTEMAN BIKEWAY

NAD 83

N

0 10 25 50
SCALE: 1" = 10'

NOTE: SEE SHEET 17 FOR ALL PAVEMENT MARKINGS AND SIGNING.

CONTINUED ON SHEET NO. 10

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGNAL PLAN 1

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 09 OF 26

N/F
HUGH B MORGENBESSER &
AMY COLTON
007.0–0004–0002.0
BOOK 48395 PAGE 138
65 LAKE STREET

N/F
KATHLEEN M. CONNEILLY
LIFE ESTATE
007.0–0002–0007.0
BOOK 55154 PAGE 567
57 LAKE STREET

N/F
ELLEN M. FITANIDES
007.0–0002–0006.0
BOOK 35889 PAGE 443
55 LAKE STREET

N/F
ALFRED J. CASAZZA JR.
007.0–0004–0003.0
BOOK 67653 PAGE 475
67 LAKE STREET

N/F
TOWN OF ARLINGTON SCHOOL
HARDY SCHOOL
005.0–0001–0001.0
BOOK 130 PAGE 309
54 LAKE STREET

N/F
MARY GAIL GIRAGOSIAN &
PAUL S GIRAGOSIAN
005.0–0001–0002.0
BOOK 52073 PAGE 61
66–68 LAKE STREET

N/F
ROBERT D SAN CLEMENTE &
BARBARA C SAN CLEMENTE TRUSTEE
005.0–0001–0003.0
BOOK 63476 PAGE 1
64 LAKE STREET

BROOKS AVENUE

LAKE STREET

PROP. NEMA TS-2, TYPE 1 MASTER CONTROLLER AND CABINET ON NEW FOUNDATION AND CONCRETE PAD

PROP. UNDERGROUND SERVICE CONNECTION

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST R10-11b

PROP. 50' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE AND PED. INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER AND INDICATOR, AND VIDEO DETECTION CAMERAS. STA. 3+17.15; 18.30' LT

PROP. UNDERGROUND INTERCONNECT TO SIGNAL CONTROLLER AT LAKE STREET / MINUTEMAN BIKEWAY

PROP. 10' TS POST ON NEW FOUNDATION WITH VEHHICLE AND PED. SIGNAL INDICATIONS AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

R10-11b ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

R10-22 PROP.

PROP. VEHICLE DETECTION ZONE (TYP.)

PROP. BICYCLE DETECTION ZONE (TYP.)

PROP. 10' TS POST ON NEW FOUNDATION WITH VEHICLE SIGNAL INDICATION, PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

R10-11b ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST

PROP. 8" X 23" PULL BOX (TYP.)

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

R10-22 PROP.

PROP. R10-22

PROP. 3" ELECTRICAL CONDUIT TYPE NM (TYP.)

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

PROP. 8' TS POST ON NEW FOUNDATION WITH PED. SIGNAL INDICATION AND ADA COMPLIANT PUSHBUTTON EQUIPPED WITH SIGN AND SADDLE.

ELECTRONIC BLANK-OUT SIGN TO BE MOUNTED ON PROP. SIGNAL POST R10-11b

CONTINUED ON SHEET NO. 8

NOTE: SEE SHEET 16 FOR ALL PAVEMENT MARKINGS AND SIGNING.

0 10 25 50
SCALE: 1" = 10'

N
NAD 83

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGNAL PLAN 2

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 10 OF 26
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	

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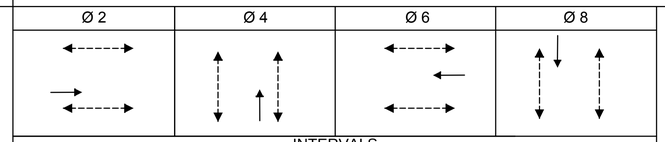
LOCATION 1

SEQUENCE & TIMING FOR FULL ACTUATED CONTROL (COORDINATED)
LAKE STREET AT MINUTEMAN BIKEWAY

APPROX. NORTH



FLASHING OPERATION

INTERVALS

APPROACH	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	
LAKE STREET	EB	A,B	G	Y	R	R	R	R	R	R	R	R	R	R	FY
LAKE STREET	WB	D,E	R	R	R	R	R	R	G	Y	R	R	R	R	FY
MINUTEMAN BIKEWAY	NB	C	R	R	R	G	Y	R	R	R	R	R	R	R	FR
MINUTEMAN BIKEWAY	SB	F	R	R	R	R	R	R	R	R	R	G	Y	R	FR
PEDESTRIAN	EB - WB	P1,P4,P5,P8	W	FDW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	OFF
PEDESTRIAN	NB - SB	P2,P3,P6,P7	DW	DW	DW	W	FDW	DW	DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

EMERGENCY ONLY

MINIMUM GREEN (INITIAL)	5			11.5			5			11.5		
MAX GREEN 1	42.5			13.5			42.5			13.5		
VEHICLE EXTENSION	3			3			3			3		
YELLOW CLEARANCE		3.5			3.5			3.5			3.5	
RED CLEARANCE			1			6			1			6
PED WALK INTERVAL	7	3	3	7	11	3	7	3	3	7	11	3
PED CLEARANCE INTERVAL												
RECALL		SOFT			NONE			SOFT			NONE	
DETECTION (MEMORY)	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK		

COORDINATION DATA

TIMING PLAN	CYCLE LENGTH (SEC.)	REF/OFFSET (SEC.)	COORDINATION PHASE TIMING (SEC.) ø 2	ø 4	ø 6	ø 8
COORDINATION PLAN 1 M–F (6AM–9AM)	70	16	47	23	47	23
COORDINATION PLAN 2 M–F (3PM–7PM)	70	4	47	23	47	23

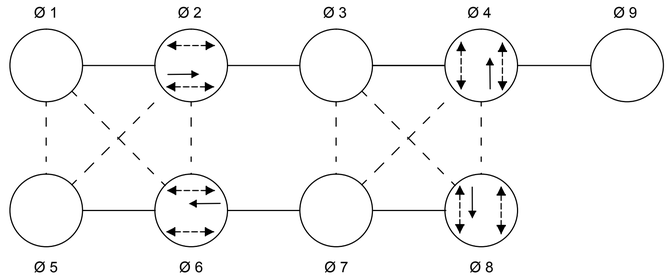
NOTES:
1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. SIGNAL SHALL OPERATE UNDER "COORDINATED" MODE DURING THE TIMES NOTED ABOVE. THE SIGNAL SHALL OPERATE IN "FREE" MODE DURING ALL OTHER TIMES.

LAKE STREET AT MINUTEMAN BIKEWAY
MAJOR ITEMS LIST

1	SERVICE CONNECTION (UNDERGROUND)
1	CONTROLLER NEMA 8 PHASE TS–2 (TYPE–1), CAB. & FDN
1	40 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
5	SIGNAL POLE AND BASE STANDARD, 8 FT. W / FOUNDATION
2	SIGNAL POLE AND BASE STANDARD, 10 FT. W / FOUNDATION
4	12 INCH 1 WAY 3–SECTION LED VEHICLE SIGNAL INDICATION
2	12 INCH 1 WAY 3–SECTION LED BICYCLE SIGNAL INDICATION
8	16 INCH LED PEDESTRIAN INDICATION WITH COUNTDOWN
8	PED. PUSH BUTTON W/ SIGN AND SADDLE (ADA COMPLIANT)
1	VEHICLE VIDEO DETECTION SYSTEM
2	VIDEO DETECTION CAMERA
4	PEDESTRIAN VIDEO DETECTION CAMERA
2	BICYCLE VIDEO DETECTION CAMERA
5	8" X 23" PULLBOX
1	PRE–EMPTION PHASE SELECTOR MODULE FOUR–CHANNEL
1	PRE–EMPTION CARD RACK
1	PRE–EMPTION INDICATOR (STROBE) LIGHT
2	PRE–EMPTION RECEIVER (DETECTOR) ONE–WAY

ALL CABLE, LABOR, MISCELLANEOUS MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON TRAFFIC SIGNAL PLAN (SHEET 09).

NEMA DUAL RING PHASING NOTES:



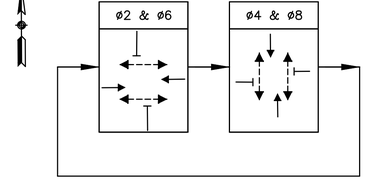
NOTES:
1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

VIDEO DETECTION DATA

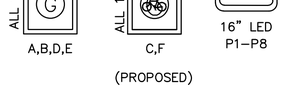
DETECTOR NO.	PHASE CALLED	PHASE EXT.	OPERATIONS	DELAY TIME	EXT. TIME
1	ø2	ø2	PRESENCE	–	–
2	ø2	ø2	PRESENCE	–	–
3	ø4	ø4	PRESENCE	–	–
4	ø4	ø4	PRESENCE	–	–
5	ø6	ø6	PRESENCE	–	–
6	ø6	ø6	PRESENCE	–	–
7	ø6	ø6	PRESENCE	–	–
8	ø8	ø8	PRESENCE	–	–
9	ø8	ø8	PRESENCE	–	–
10	ø2	ø2	PRESENCE	–	–

APPROX. NORTH

PREFERENTIAL PHASING DIAGRAM



SIGNAL IDENTIFICATION



(PROPOSED)

NOTES:
1. ALL VEHICLE AND BICYCLE LENSES SHALL BE LED TYPE.
2. ALL VEHICLE AND BICYCLE SIGNAL HEADS SHALL BE 12 INCHES.
3. ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5–INCH NON–LOUVERED BACKPLATES WITH 3–INCH RETROREFLECTIVE BORDER.
4. ALL HOUSINGS TO BE FIXED MOUNTED.
5. ALL SIGNALHEAD BACKPLATES SHALL BE NON–LOUVERED.
6. SIGNAL HEADS D & E SHALL HAVE DISTANCE–LIMITING LOUVERS TO LIMIT THEIR VISIBILITY TO WITHIN 160 FT. UPSTREAM OF THE PROPOSED STOP LINE.

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: SEQUENCE AND TIMING PLAN 1

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 11 OF 26

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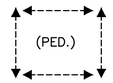
LOCATION 2

SEQUENCE & TIMING FOR FULL ACTUATED CONTROL (COORDINATED) LAKE STREET AT BROOKS AVENUE

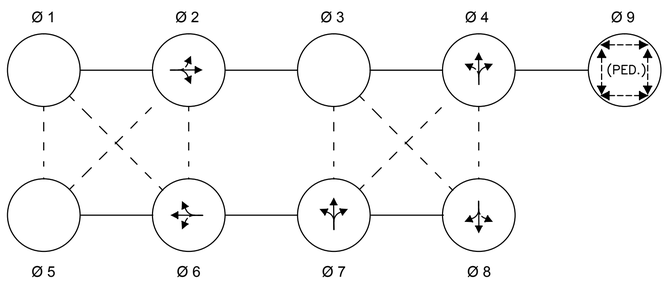
APPROX. NORTH

			Ø 2	Ø 4	Ø 6	Ø 7	Ø 8	Ø 9	FLASHING OPERATION
								 (PED.)	
			INTERVALS						
APPROACH	DIRECTION	HOUSINGS	1 2 3 4 5 6	7 8 9 10 11 12	13 14 15 16 17 18				
LAKE STREET	EB	D,E,H	G Y R R R R	R R R R R R	R R R R R R				FY
LAKE STREET	WB	C,J,K	R R R R R R	G Y R R R R	R R R R R R				FY
BROOKS AVENUE	NB	F	~~◄ R~~ ~~◄ R~~ ~~◄ R~~ ~~◄ FY~~	~~◄ SY~~ ~~◄ R~~ ~~◄ R~~ ~~◄ R~~	~~◄ R~~ ~~◄ R~~ ~~◄ R~~ ~~◄ R~~	~~◄ G~~ ~~◄ SY~~ ~~◄ R~~ ~~◄ R~~	~~◄ R~~ ~~◄ R~~ ~~◄ R~~ ~~◄ R~~	~~◄ R~~ ~~◄ R~~ ~~◄ R~~ ~~◄ R~~	FR
BROOKS AVENUE	NB	G,L	R R R G Y R	R R R R G Y	R R R R R R				FR
BROOKS AVENUE	SB	A,B	R R R R R R	R R R R R R	G Y R R R R				FR
PEDESTRIAN	ALL	P1-P8	DW DW DW DW DW DW	DW DW DW DW DW DW	DW DW DW W FDW DW				OUT
			TIMING IN SECONDS						
MINIMUM GREEN (INITIAL)			5 5 5	5 5 5	5 5 5				EMERGENCY ONLY
MAX GREEN 1			22.5 18.5 22.5	5.5 8.5					
MAX GREEN 2			31.5 9.5 31.5	- 9.5					
VEHICLE EXTENSION			3 3 3	3 3					
YELLOW CLEARANCE			3.5 3 3.5	3 3					
RED CLEARANCE			1 1.5 1	1.5 1.5					
PED WALK INTERVAL					7				
PED CLEARANCE INTERVAL					10 3				
RECALL			SOFT NONE SOFT	NONE NONE	NONE				
DETECTION (MEMORY)			NON-LOCK NON-LOCK NON-LOCK	NON-LOCK NON-LOCK	LOCK				

COORDINATION DATA			COORDINATION PHASE TIMING (SEC.)					
TIMING PLAN	CYCLE LENGTH (SEC.)	REF/OFFSET (SEC.)	ø 2	ø 4	ø 6	ø 7	ø 8	ø 9
COORDINATION PLAN 1 M–F (6AM–9AM)	70	0	27	23	27	10	13	20
COORDINATION PLAN 2 M–F (3PM–7PM);	70	0	36	14	36	–	14	20

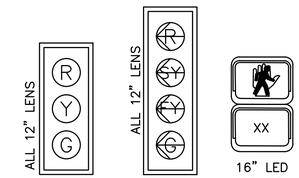
NOTES:
1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. MAXIMUM GREEN 1 SHALL BE IN EFFECT ON WEEKDAYS FROM 6:00AM TO 9:00AM.
3. MAXIMUM GREEN 2 SHALL BE IN EFFECT DURING ALL TIMES EXCEPT AS NOTED ABOVE.
4. SIGNAL SHALL OPERATE UNDER "COORDINATED MODE DURING THE TIMES NOTED ABOVE. THE SIGNAL SHALL OPERATE IN "FREE" MODE DURING ALL OTHER TIMES.

NEMA DUAL RING PHASING NOTES:



NOTES:
1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

SIGNAL IDENTIFICATION



NOTES:
1. ALL VEHICLE AND BICYCLE LENSES SHALL BE LED TYPE.
2. ALL VEHICLE AND BICYCLE SIGNAL HEADS SHALL BE 12 INCHES.
3. ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5–INCH NON–LOUVERED BACKPLATES WITH 3–INCH RETROREFLECTIVE BORDER.
4. ALL HOUSINGS TO BE FIXED MOUNTED.
5. ALL SIGNALHEAD BACKPLATES SHALL BE NON–LOUVERED.
6. SIGNAL HEADS D & E SHALL HAVE DISTANCE–LIMITING LOUVERS TO LIMIT THEIR VISIBILITY TO WITHIN 160 FT. UPSTREAM OF THE PROPOSED STOP LINE.

VIDEO DETECTION DATA

DETECTOR NO.	PHASE CALLED	PHASE EXT.	OPERATIONS	DELAY TIME	EXT. TIME
1	ø2	ø2	PRESENCE	–	–
2	ø4	ø4	PRESENCE	–	–
3	ø6	ø6	PRESENCE	–	–
4	ø8	ø8	PRESENCE	–	–

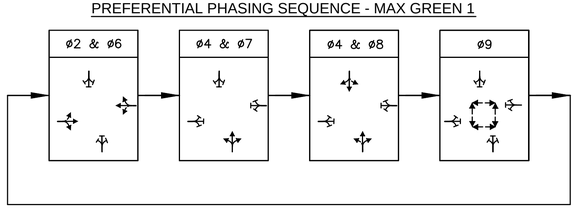
LAKE STREET AT BROOKS AVENUE MAJOR ITEMS LIST

1	SERVICE CONNECTION (UNDERGROUND)
1	MASTER SIGNAL CONTROLLER NEMA 8 PHASE TS–2 (TYPE–1), CAB. & FDN
1	50 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
5	SIGNAL POLE AND BASE STANDARD, 8 FT. W / FOUNDATION
2	SIGNAL POLE AND BASE STANDARD, 10 FT. W / FOUNDATION
10	12 INCH 1 WAY 3–SECTION LED VEHICLE SIGNAL INDICATION
1	12 INCH 1 WAY 4–SECTION LED VEHICLE SIGNAL INDICATION (ALL ARROWS)
8	16 INCH LED PEDESTRIAN INDICATION WITH COUNTDOWN
8	PED. PUSH BUTTON W/ SIGN AND SADDLE (ADA COMPLIANT)
1	VIDEO DETECTION SYSTEM
4	VIDEO DETECTION CAMERA
4	8" X 23" PULLBOX
1	PRE–EMPTION PHASE SELECTOR MODULE FOUR–CHANNEL
1	PRE–EMPTION CARD RACK
1	PRE–EMPTION INDICATOR (STROBE) LIGHT
4	PRE–EMPTION RECEIVER (DETECTOR) ONE–WAY

ALL CABLE, LABOR, MISCELLANEOUS MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON TRAFFIC SIGNAL PLAN (SHEET 10).

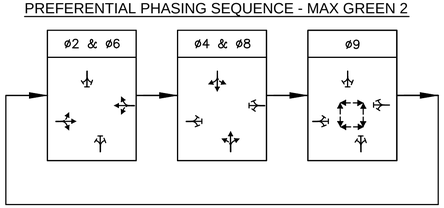
APPROX. NORTH

PREFERENTIAL PHASING SEQUENCE - MAX GREEN 1



APPROX. NORTH

PREFERENTIAL PHASING SEQUENCE - MAX GREEN 2



LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

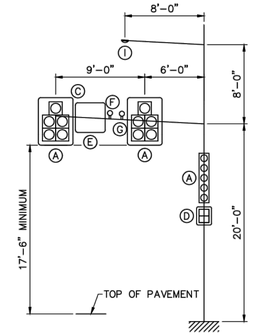
DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: SEQUENCE AND TIMING PLAN 2

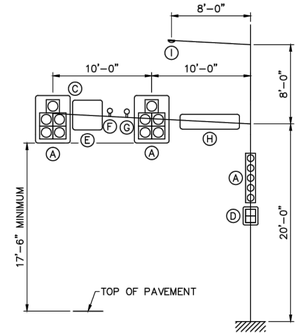
PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

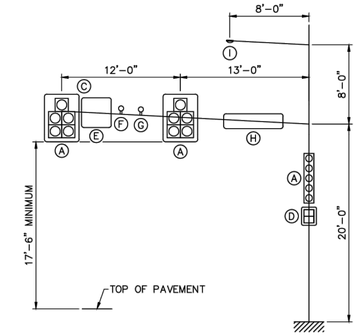
SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 12 OF 26
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	



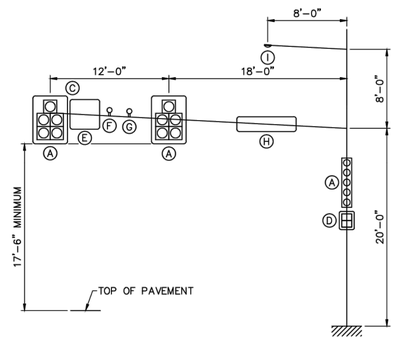
15' SPAN



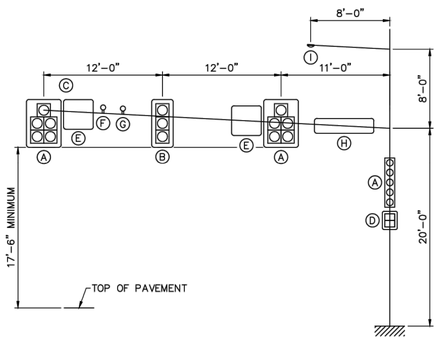
20' SPAN



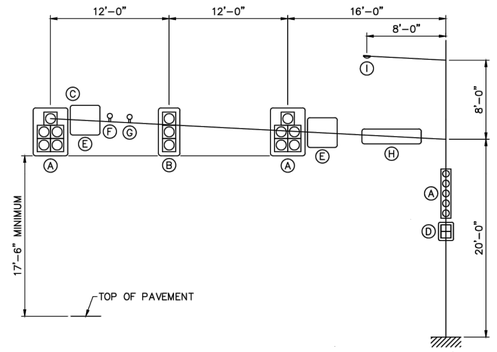
25' SPAN



30' SPAN



35' SPAN



40' SPAN

DESIGN LOADING							
DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)	DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)
(A)	5 SECTION, 1 WAY SIGNAL	13.33	110	(F)	DETECTOR	1.00	10
(B)	3 SECTION, 1 WAY SIGNAL	8.67	74	(G)	STROBE	1.00	10
(C)	DAMPENER PLATE (NOT SHOWN)	0.00	9	(H)	72" X 18" STREET NAME SIGN	9.00	12
(D)	DUAL PEDESTRIAN SIGNAL	8.00	80	(I)	OPTIONAL LUMINAIRE	3.30	75
(E)	36" X 36" REGULATORY SIGN	9.00	12				

NOTE: ALL SIGNALS HAVE 5.0" NON–LOUVERED BACKPLATES WITH REFLECTIVE BORDERS

NOTE:

DETAILS FROM MASSDOT STANDARD DRAWINGS (2015)

massDOT Highway Division

STANDARD DRAWINGS

OVERHEAD SIGNAL STRUCTURE & FOUNDATION
15' – 40' ARM
LOAD DIAGRAMS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

DECEMBER, 2015

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

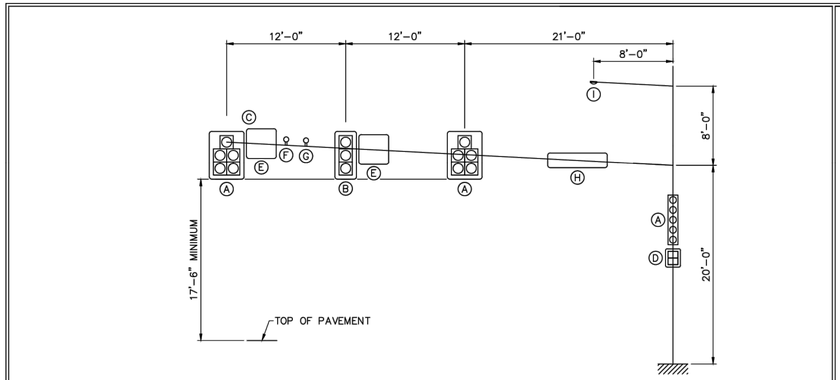
DRAWING TITLE: TRAFFIC SIGNAL DETAILS 1

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

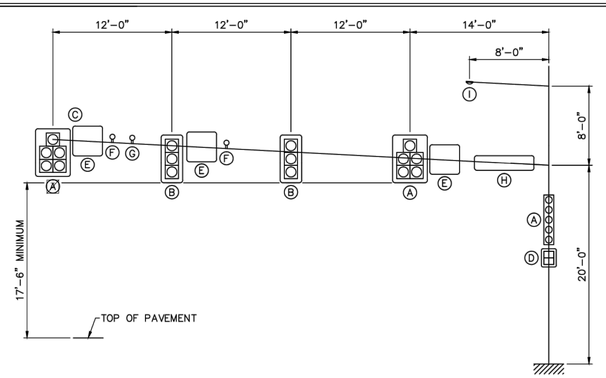
PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 13 OF 26

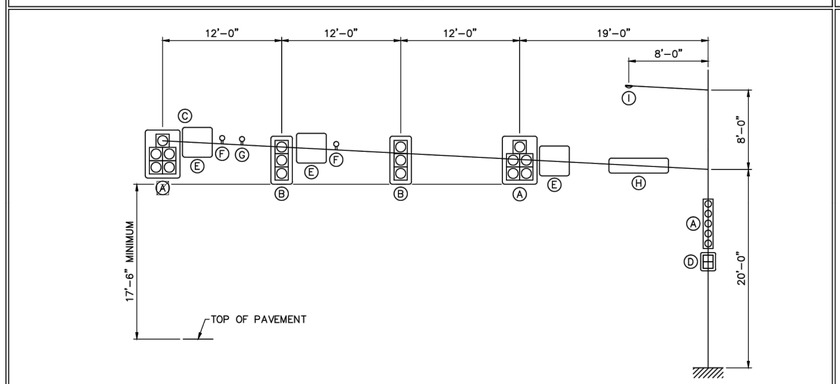
P:\Projects\2017\17067\DWG\CURRENT DESIGN\11 TRAFFIC SIGNAL DETAILS.dwg Printed: 9/15/2017 3:44 PM



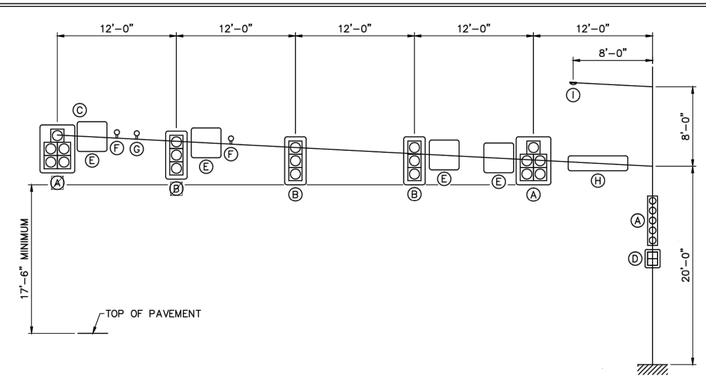
45' SPAN



50' SPAN



55' SPAN



60' SPAN

DESIGN LOADING							
DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)	DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)
(A)	5 SECTION, 1 WAY SIGNAL	13.33	110	(F)	DETECTOR	1.00	10
(B)	3 SECTION, 1 WAY SIGNAL	8.67	74	(G)	STROBE	1.00	10
(C)	DAMPENER PLATE (NOT SHOWN)	0.00	9	(H)	72" X 18" STREET NAME SIGN	9.00	12
(D)	DUAL PEDESTRIAN SIGNAL	8.00	80	(I)	OPTIONAL LUMINAIRE	3.30	75
(E)	36" X 36" REGULATORY SIGN	9.00	12				

NOTE: ALL SIGNALS HAVE 5.0" NON-LOUVERED BACKPLATES WITH REFLECTIVE BORDERS

NOTE:

DETAILS FROM MASSDOT STANDARD DRAWINGS (2015)

massDOT Highway Division

STANDARD DRAWINGS

OVERHEAD SIGNAL STRUCTURE & FOUNDAT
45' – 60' ARM
LOAD DIAGRAMS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATIO
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

DECEMBER, 2015

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGNAL DETAILS 2

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

NO.	DATE	REVISIONS

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 14 OF 26

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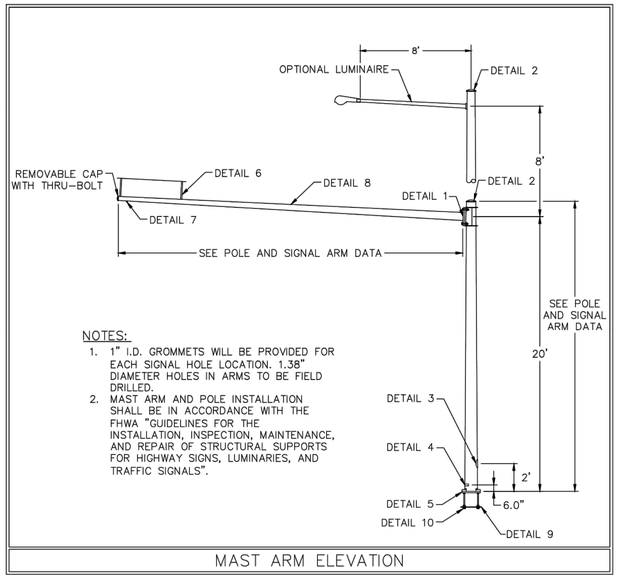
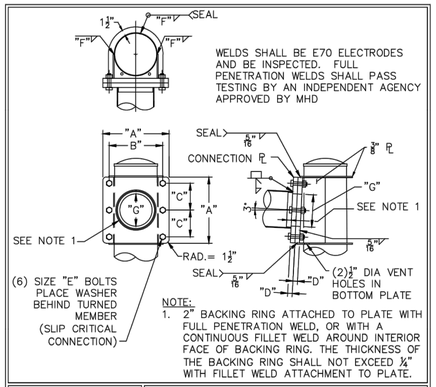


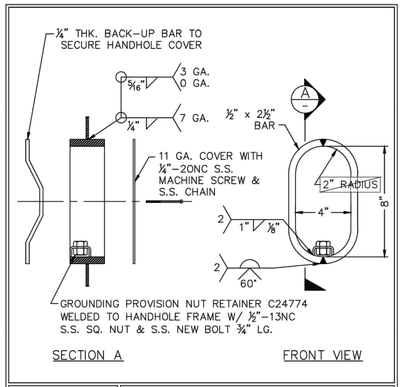
NOTES:
1. 1" I.D. GROMMETS WILL BE PROVIDED FOR EACH SIGNAL HOLE LOCATION. 1.38" DIAMETER HOLES IN ARMS TO BE FIELD DRILLED.
2. MAST ARM AND POLE INSTALLATION SHALL BE IN ACCORDANCE WITH THE FHWA "GUIDELINES FOR THE INSTALLATION, INSPECTION, MAINTENANCE, AND REPAIR OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS".

MAST ARM ELEVATION

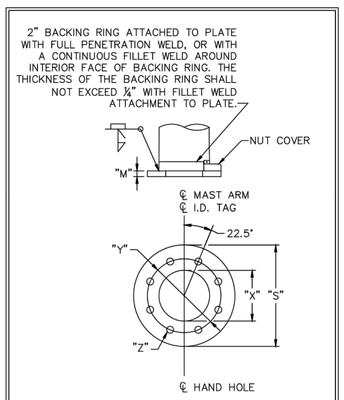


NOTE:
1. 2" BACKING RING ATTACHED TO PLATE WITH FULL PENETRATION WELD, OR WITH A CONTINUOUS FILLET WELD AROUND INTERIOR FACE OF BACKING RING. THE THICKNESS OF THE BACKING RING SHALL NOT EXCEED ¼" WITH FILLET WELD ATTACHMENT TO PLATE.

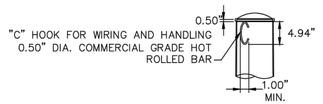
DETAIL 1 | SIGNAL ARM ATTACHMENT



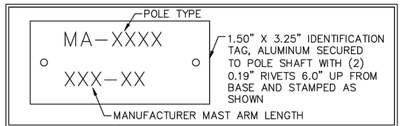
DETAIL 3 | 4"x8" HANDHOLE



DETAIL 5 | POLE BASE



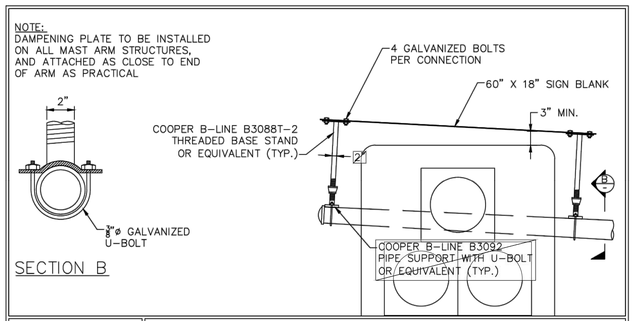
DETAIL 2 | POLE TOP



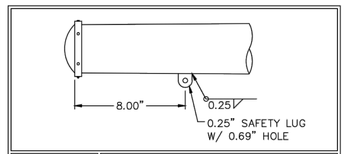
DETAIL 4 | I.D. TAG

NOTE:
DETAILS FROM MASSDOT STANDARD DRAWINGS (2015)

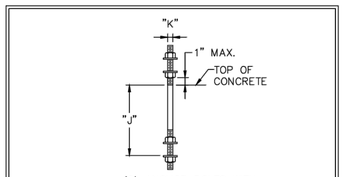
NOTE:
DAMPENING PLATE TO BE INSTALLED ON ALL MAST ARM STRUCTURES, AND ATTACHED AS CLOSE TO END OF ARM AS PRACTICAL



DETAIL 6 | DAMPENER PLATE

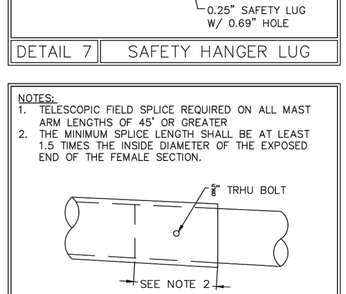


DETAIL 7 | SAFETY HANGER LUG

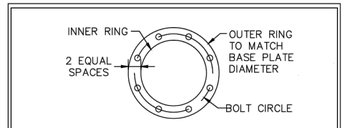


DETAIL 10 | ANCHOR BOLT

NOTES:
1. TELESCOPIC FIELD SPLICE REQUIRED ON ALL MAST ARM LENGTHS OF 45' OR GREATER
2. THE MINIMUM SPLICE LENGTH SHALL BE AT LEAST 1.5 TIMES THE INSIDE DIAMETER OF THE EXPOSED END OF THE FEMALE SECTION.



DETAIL 8 | ARM SPLICE DETAIL



DETAIL 9 | ANCHOR PLATE

MATERIAL DATA		
COMPONENT	DESIGNATION	YIELD (KSI)
POLE TUBE	ASTM A595 GR. A	55
POLE BASE PLATE	AASHTO M270, OR ASTM A709	50
ANCHOR BOLTS	AASHTO M314, OR ASTM A307 GR. C	55
GALVANIZING	AASHTO M111 OR M232	
ARM TUBE	ASTM A595 GR. A	55
ARM CONNECTION PLATE	AASHTO M270, OR ASTM A709	50
ARM CONNECTING BOLTS	AASHTO M164, OR ASTM A325 **	

** BOLTS WHICH ACCUMULATE RUST OR DIRT SHALL BE DISCARDED.

POLE AND SIGNAL ARM DATA

LOCATIONS	SIGNAL ARM TUBE				POLE TUBE				POLE BASE					ANCHOR BOLT		SIGNAL ARM ATTACHMENT DATA						
	SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	WALL THK.	BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	WALL THK.	PLATE CIRCLE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	HOLE "X" (IN)	DIA. "K" (IN)	EMBED. LENGTH "J" (IN)	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)	"G" (IN)
	15.00	9.00	6.90	7 GA.	13.00	9.92	22.00	7 GA.	24.00	19.00	2.00	1.50	10.00	1.25	36.00	17.25	14.00	7.00	2.00	1.00	0.188	7.00
	20.00	9.00	6.20	7 GA.	13.00	9.92	22.00	3 GA.	27.00	22.00	2.00	1.75	10.00	1.50	36.00	17.75	14.50	7.25	2.00	1.00	0.250	7.00
	25.00	10.00	6.50	7 GA.	13.00	9.92	22.00	3 GA.	27.00	22.00	2.00	1.75	10.00	1.50	36.00	18.25	15.00	7.50	2.00	1.00	0.250	7.50
	30.00	11.00	6.80	7 GA.	13.50	10.42	22.00	3 GA.	27.00	22.00	2.00	1.75	10.50	1.50	36.00	18.75	15.50	7.75	2.00	1.00	0.250	8.75
	35.00	12.00	7.10	3 GA.	15.00	11.92	22.00	3 GA.	27.00	22.00	2.00	1.75	12.50	1.50	36.00	20.25	17.00	8.50	2.00	1.25	0.313	6.50
	40.00	13.00	7.40	3 GA.	16.00	12.92	22.00	3 GA.	29.00	24.00	2.00	2.00	12.00	1.75	36.00	21.25	18.00	9.00	2.00	1.25	0.313	6.75
	45.00	13.50	7.20	3 GA.	17.50	14.42	22.00	3 GA.	29.00	24.00	2.00	2.00	12.00	1.75	48.00	22.25	19.00	9.50	2.25	1.25	0.313	8.00
	50.00	14.50	7.50	3 GA.	17.00	13.92	22.00	0 GA.	29.00	24.00	2.00	2.00	12.00	1.75	48.00	22.75	19.50	9.75	2.25	1.25	0.313	8.50
	55.00	16.00	8.30	3 GA.	18.00	14.92	22.00	0 GA.	31.00	26.00	2.00	2.25	12.00	2.00	48.00	23.75	20.00	10.00	2.25	1.25	0.313	8.75
	60.00	16.00	8.00	0 GA.	19.50	16.42	22.00	0 GA.	31.00	26.00	2.00	2.25	14.00	2.00	48.00	25.75	22.00	11.00	2.50	1.50	0.313	7.50

MassDOT Highway Division

STANDARD DRAWINGS

OVERHEAD SIGNAL STRUCTURE & FOUNDATION MAST ARM DETAILS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

DECEMBER, 2015

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGNAL DETAILS 3

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED | DESIGNED BY: JG
DATE: 09/15/2017 | DRAWN BY: JG
PROJECT NO. 17067.015 | CHECKED BY: JS
SHEET NO. 15 OF 26

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PIER FOUNDATIONS FOR 110 MPH WIND SPEED ZONE

SOIL TYPE	15' & 20' MAST ARMS				25' & 30' MAST ARMS				35' & 40' MAST ARMS				45' & 50' MAST ARMS				55' & 60' MAST ARMS			
	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS
DRY SAND (LOOSE)	3'-6"	8'-6"	18-#8	#5 @ 12"	3'-6"	9'-0"	18-#8	#5 @ 12"	3'-6"	11'-6"	18-#8	#5 @ 9"	4'-0"	12'-0"	18-#9	#5 @ 9"	4'-6"	13'-0"	18-#10	#5 @ 6"
DRY SAND (DENSE)	3'-6"	7'-6"	18-#8	#5 @ 12"	3'-6"	7'-6"	18-#8	#5 @ 12"	3'-6"	8'-6"	18-#8	#5 @ 9"	4'-0"	9'-0"	18-#9	#5 @ 9"	4'-6"	9'-6"	18-#10	#5 @ 6"
WET SAND (LOOSE)	3'-6"	9'-6"	18-#8	#5 @ 12"	3'-6"	11'-6"	18-#8	#5 @ 12"	3'-6"	14'-6"	18-#8	#5 @ 9"	4'-0"	15'-6"	18-#9	#5 @ 9"	4'-6"	16'-6"	18-#10	#5 @ 6"
WET SAND (DENSE)	3'-6"	8'-6"	18-#8	#5 @ 12"	3'-6"	9'-0"	18-#8	#5 @ 12"	3'-6"	10'-6"	18-#8	#5 @ 9"	4'-0"	11'-6"	18-#9	#5 @ 9"	4'-6"	12'-0"	18-#10	#5 @ 6"
CLAY (SOFT TO MEDIUM STIFF)	3'-6"	12'-0"	18-#8	#5 @ 12"	3'-6"	12'-0"	18-#8	#5 @ 12"	3'-6"	13'-0"	18-#8	#5 @ 9"	4'-0"	14'-0"	18-#9	#5 @ 9"	4'-6"	15'-6"	18-#10	#5 @ 6"
CLAY (STIFF)	3'-6"	10'-6"	18-#8	#5 @ 12"	3'-6"	10'-6"	18-#8	#5 @ 12"	3'-6"	11'-0"	18-#8	#5 @ 9"	4'-0"	12'-0"	18-#9	#5 @ 9"	4'-6"	13'-6"	18-#10	#5 @ 6"

PIER FOUNDATIONS FOR 130 MPH WIND SPEED ZONE

SOIL TYPE	15' & 20' MAST ARMS				25' & 30' MAST ARMS				35' & 40' MAST ARMS				45' & 50' MAST ARMS				55' & 60' MAST ARMS			
	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS
DRY SAND (LOOSE)	3'-6"	10'-0"	18-#8	#5 @ 12"	3'-6"	10'-6"	18-#8	#5 @ 12"	3'-6"	13'-6"	18-#8	#5 @ 8"	4'-0"	14'-6"	18-#9	#5 @ 6"	4'-6"	15'-6"	18-#10	#5 @ 5"
DRY SAND (DENSE)	3'-6"	8'-6"	18-#8	#5 @ 12"	3'-6"	9'-0"	18-#8	#5 @ 12"	3'-6"	10'-0"	18-#8	#5 @ 8"	4'-0"	11'-0"	18-#9	#5 @ 6"	4'-6"	11'-6"	18-#10	#5 @ 5"
WET SAND (LOOSE)	3'-6"	11'-6"	18-#8	#5 @ 12"	3'-6"	13'-6"	18-#8	#5 @ 12"	3'-6"	17'-0"	18-#8	#5 @ 8"	4'-0"	18'-6"	18-#9	#5 @ 6"	4'-6"	19'-6"	18-#10	#5 @ 5"
WET SAND (DENSE)	3'-6"	10'-0"	18-#8	#5 @ 12"	3'-6"	10'-0"	18-#8	#5 @ 12"	3'-6"	12'-6"	18-#8	#5 @ 8"	4'-0"	13'-6"	18-#9	#5 @ 6"	4'-6"	14'-6"	18-#10	#5 @ 5"
CLAY (SOFT TO MEDIUM STIFF)	3'-6"	12'-6"	18-#8	#5 @ 12"	3'-6"	13'-0"	18-#8	#5 @ 12"	3'-6"	14'-0"	18-#8	#5 @ 8"	4'-0"	16'-0"	18-#9	#5 @ 6"	4'-6"	17'-6"	18-#10	#5 @ 5"
CLAY (STIFF)	3'-6"	11'-0"	18-#8	#5 @ 12"	3'-6"	11'-0"	18-#8	#5 @ 12"	3'-6"	12'-0"	18-#8	#5 @ 8"	4'-0"	13'-0"	18-#9	#5 @ 6"	4'-6"	14'-0"	18-#10	#5 @ 5"

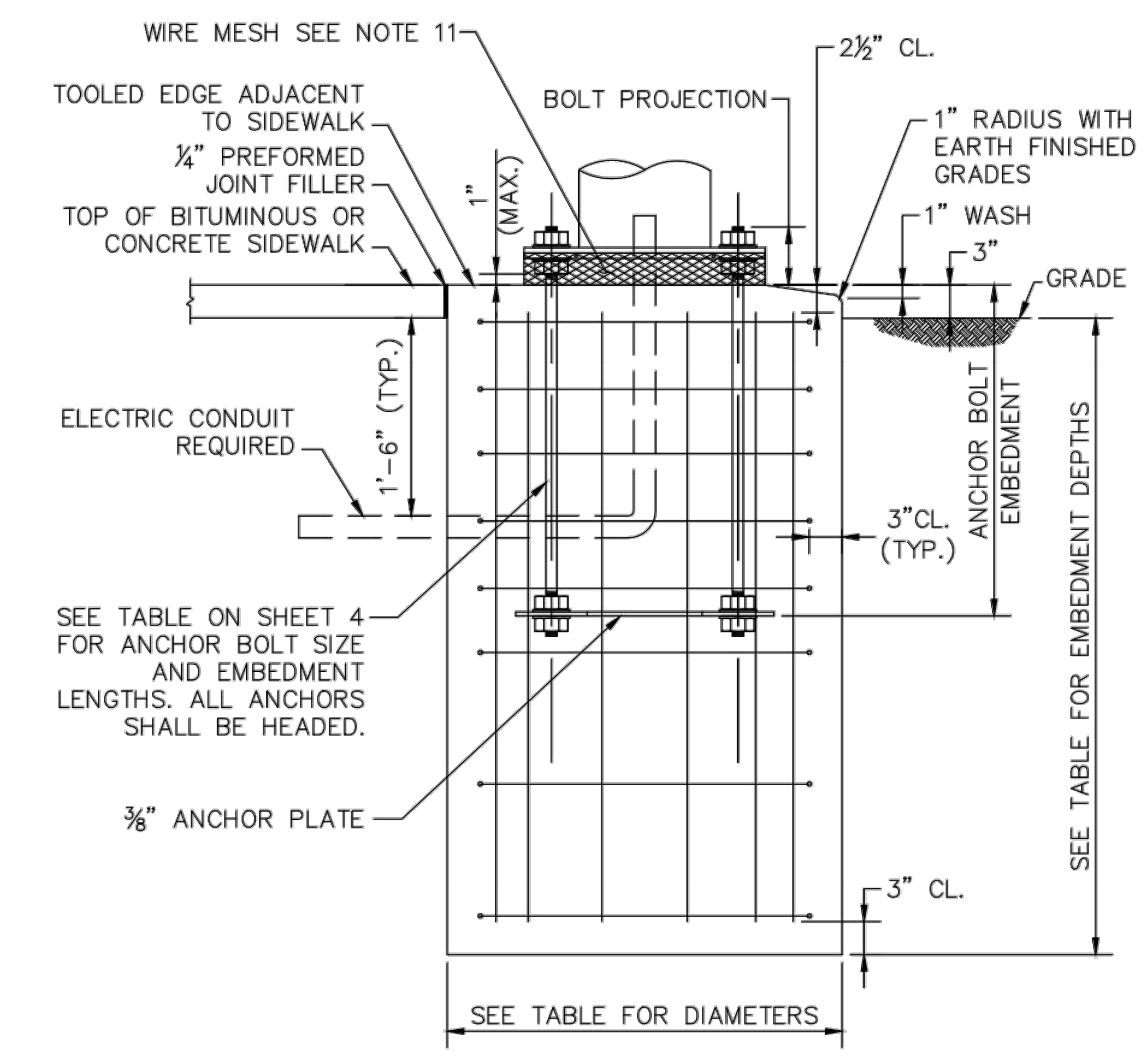
BASIS OF DESIGN

ALL MAST ARM STRUCTURES AND FOUNDATIONS ARE DESIGNED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION 2013, AND THE FOLLOWING PARAMETERS:

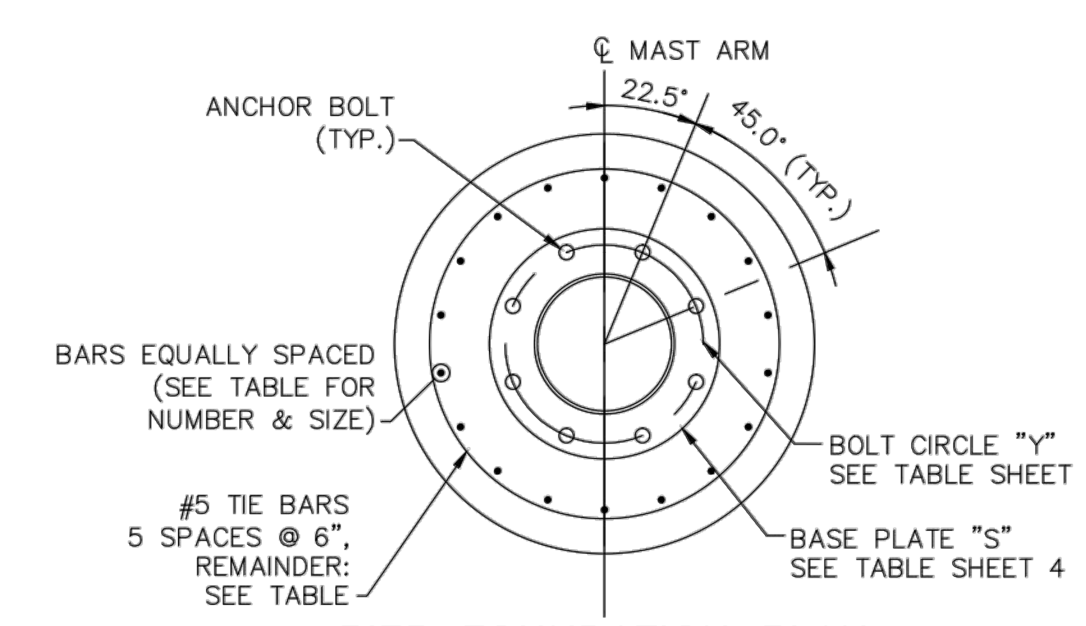
OVERTURNING DESIGN	FOUNDATIONS ARE SIZED TO RESIST OVERTURNING ACCORDING TO BROMS' DESIGN METHOD WITH A SAFETY FACTOR THAT INCLUDES AN OVERLOAD FACTOR OF 2.0 AND A SOIL UNDERSTRENGTH FACTOR OF 0.7.
SOIL PARAMETERS	UNIT WEIGHT / FRICTION ANGLE LOOSE DRY SAND: γ = 102 PCF, ϕ = 33° DENSE DRY SAND: γ = 116 PCF, ϕ = 39° LOOSE WET SAND: γ = 125 PCF, ϕ = 33° DENSE WET SAND: γ = 135 PCF, ϕ = 39° UNIT WEIGHT / SHEAR STRENGTH SOFT TO MEDIUM STIFF CLAY: γ = 113 PCF, S_U = 1.0 KSF STIFF CLAY: γ = 120 PCF, S_U = 1.9 KSF
DEFLECTION LIMITS	MAXIMUM LATERAL DEFLECTION AT TOP OF MAST ARM FOUNDATION SHAFTS: ½"

NOTES:

1. FOUNDATIONS SHALL BE 4000 PSI, 565 MASSDOT APPROVED MIX DESIGN.
2. FOUNDATIONS SHALL BE INSTALLED IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS ITEM 945 – DRILLED SHAFTS
3. REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
4. ANCHOR BOLTS SHALL BE SET BY TEMPLATE.
5. PROVIDE FOR ELECTRICAL CONDUIT.
6. EXCAVATION SHALL BE BY THE AUGER METHOD TO THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATIONS WITHOUT DISTURBING THE SOIL AROUND AND BELOW THE PROPOSED FOUNDATION BOTTOM. ALTERNATE METHODS OF EXCAVATION MAY BE SUBMITTED TO MASSDOT FOR APPROVAL IF THEY MEET THE REQUIREMENTS LISTED IN NOTES 6, 7, AND 8.
7. THE EARTH WALLS OF THE FOUNDATION SHALL BE ADEQUATELY AND SECURELY PROTECTED AT ALL TIMES AGAINST CAVE–INS, DISPLACEMENT OF THE SURROUNDING EARTH AND FOR THE EXCLUSION OF GROUND WATER. THIS MAY BE DONE BY THE USE OF STEEL CYLINDER LINERS OR CASINGS THAT ARE APPROVED BY MASSDOT. IF LINERS ARE USED THEY MAY BE RECLAIMED PROVIDED THAT THEY ARE WITHDRAWN AS THE CONCRETE IS BEING PLACED, MAINTAINING A SUFFICIENT HEAD OF CONCRETE WITHIN THE LINER TO PREVENT REDUCTION IN THE FOUNDATION DIAMETER AND TO PREVENT EXTRANEOUS MATERIAL FROM FALLING IN FROM THE SIDES AND MIXING WITH THE CONCRETE.
8. IF THE SOIL IS DISTURBED OR REMOVED BEYOND THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATION, IT SHALL BE REPLACED WITH CONCRETE. ANY ADDITIONAL COST FOR THE CONCRETE SHALL BE PAID FOR BY THE CONTRACTOR.
9. SPECIAL CARE SHOULD BE GIVEN TO AREAS WHERE WET SOIL IS ENCOUNTERED, TO INSURE THAT THE PREAUGERED HOLE DOES NOT COLLAPSE. THIS MAY REQUIRE THE USE OF STEEL CYLINDER LINERS OR CASINGS TO HOLD THE SOIL IN PLACE UNTIL READY FOR CONCRETE PLACEMENT, UPON APPROVAL FROM THE MASSDOT. THE STEEL CYLINDERS OR CASINGS SHALL BE WITHDRAWN AS THE FOUNDATION CONCRETE IS PLACED.
10. IF LEDGE OR UNSUITABLE SOIL IS ENCOUNTERED (i.e. ONE WHICH DOES NOT APPLY TO THE DESIGN TABLES SHOWN ON THIS SHEET), AN ALTERNATIVE DESIGN SHALL BE PROVIDED BY THE DESIGN ENGINEER. IF UTILITIES OR OTHER UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL BACKFILL THE AREA TO ITS ORIGINAL CONDITION UNTIL AN ALTERNATE DESIGN HAS BEEN PROVIDED BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
11. A GALVANIZED WIRE MESH SCREEN SHALL BE INSTALLED AT BASE OF POLE. SCREEN SHALL BE PRESS–FORMED OF 3 OR 4 MESH, 21 GAGE OR HEAVIER, STAINLESS STEEL OR HOT DIPPED GALVANIZED WIRE SCREEN OR APPROVED EQUIVALENT. SCREEN SHALL BE SCREWED INTO POLE BASE PLATE, AND SHALL BE FLUSH WITH THE TOP OF THE PIER FOUNDATION.
12. SANDY SOILS WITH STANDARD PENETRATION VALUES GREATER THAN 20 BLOWS PER FOOT SHALL BE CLASSIFIED AS DENSE DRY SAND AND DENSE WET SAND. SANDY SOILS WITH STANDARD PENETRATION VALUES RANGING FROM 6 TO 20 BLOWS PER FOOT SHALL BE CLASSIFIED LOOSE DRY SAND AND LOOSE WET SAND. SANDY SOILS WITH FEWER THAN 6 BLOWS PER FOOT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
13. CLAYS WITH STANDARD PENETRATION VALUES GREATER THAN 6 BLOWS PER FOOT SHALL BE CLASSIFIED AS STIFF CLAY. CLAYS WITH STANDARD PENETRATION VALUES RANGING FROM 2 TO 6 BLOWS PER FOOT SHALL BE CLASSIFIED AS SOFT TO MEDIUM STIFF CLAY. CLAYS WITH FEWER THAN 2 BLOWS PER FOOT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
14. A SANDY SOIL SHALL ONLY BE CLASSIFIED AS 'DRY' IF THE ENTIRE DRY SAND SHAFT LENGTH SITS ABOVE WET SOILS ACCORDING TO THE BORING LOGS. IF ANY PART OF THE SHAFT LENGTH IS CAST AT OR BELOW THE GROUNDWATER LEVEL, THE SOIL SHALL BE CLASSIFIED AS 'WET'.
15. WHERE THE PREDOMINATING SOIL TYPE IS INORGANIC SILT, THE SOIL SHOULD BE TREATED AS CLAY OR WET LOOSE SAND, WHICHEVER LEADS TO A MORE CONSERVATIVE FOUNDATION. INORGANIC SILTS WITH STANDARD PENETRATION N–VALUES LESS THAN 2 BLOWS PER FOOT, ORGANIC SILTS, AND PEAT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
16. WHERE FILL CONTAINS CLAY OR SILT, IT SHOULD BE TREATED AS SOFT CLAY.
17. MAST ARM FOUNDATIONS ARE DESIGNED TO SUPPORT MAST ARMS WITH OR WITHOUT OPTIONAL LUMINAIRE.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT FOUNDATION DIAMETER IS AT LEAST 17.5" GREATER THAN BOLT CIRCLE DIAMETER FOR ALL STRUCTURES
19. IN ORDER TO CREATE A FLUSH SURFACE, CONTRACTOR SHALL REFER TO THE FINAL ELEVATIONS SHOWN ON THE DESIGN PLANS WHEN INSTALLING FOUNDATIONS IMMEDIATELY ADJACENT TO OR WITHIN A SIDEWALK AREA.



PIER FOUNDATION DETAIL
NO SCALE



PIER FOUNDATION PLAN
NO SCALE

NOTE:
DETAILS FROM MASSDOT STANDARD DRAWINGS (2015)

massDOT
STANDARD DRAWINGS
OVERHEAD SIGNAL STRUCTURE & FOUNDATION MAST ARM CORED PIER FOUNDATIONS
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS
DECEMBER, 2015

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

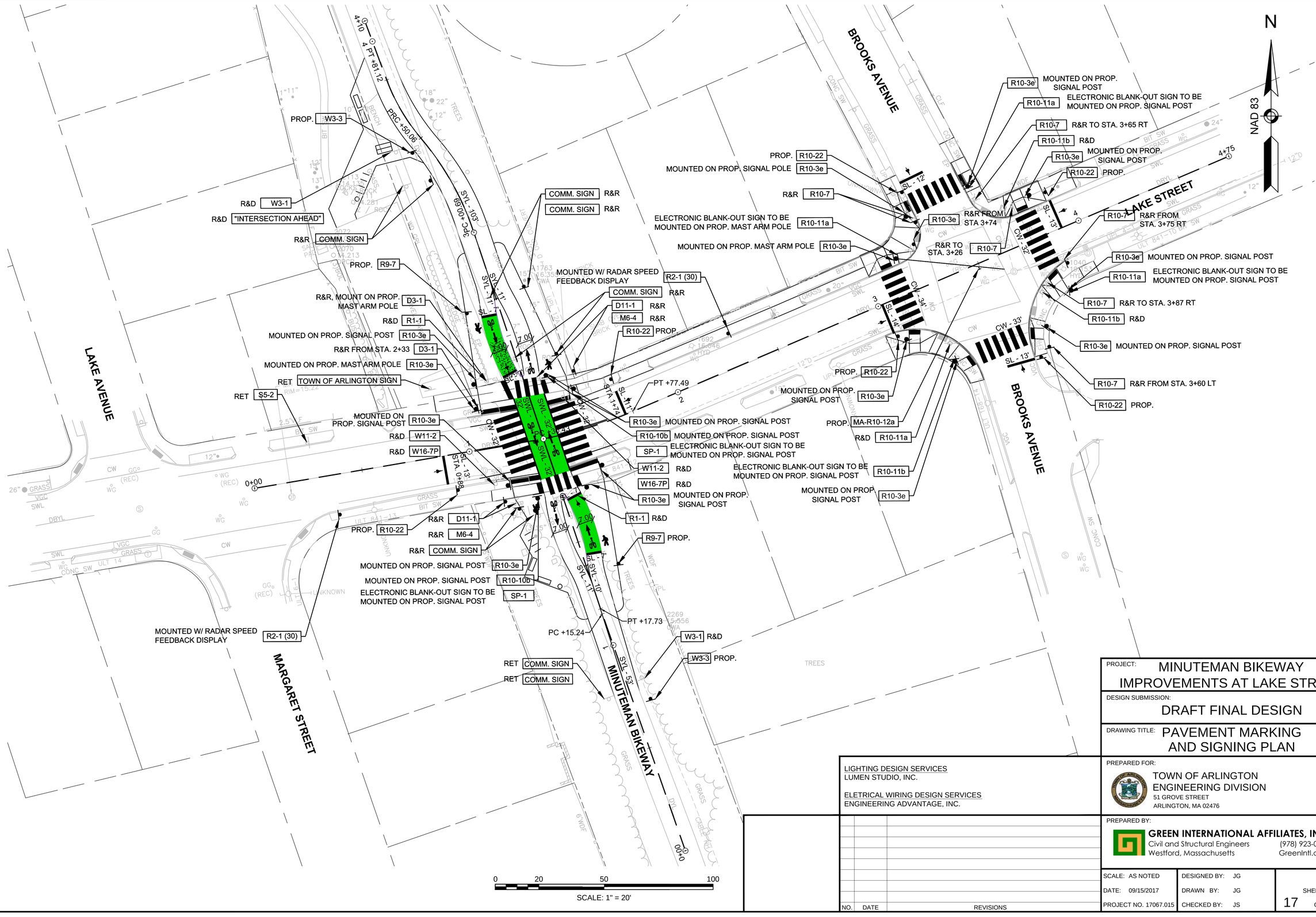
DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGNAL DETAILS 4

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO.
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	16 OF 26



LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: PAVEMENT MARKING AND SIGNING PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 17 OF 26
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	

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TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NO. REQ'D.	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET
R2-1*	24"	30"	SPEED LIMIT 30	SEE MUTCD STANDARDS			2	SEE MUTCD STANDARDS			P5 0**	5.00	10.00*
R9-7	12"	18"	KEEP LEFT RIGHT				2				P5 2	1.50	3.00
R10-3e	9"	15"	ONE CROSS STREET AT A TIME WHEN SIGNAL IS GREEN DON'T CROSS WHEN SIGNAL IS FLASHING DON'T CROSS PUSH BUTTON TO CROSS				16				P5 0 MOUNTED OVER PUSH-BUTTONS	0.94	15.04
R10-22	12"	18"	TO REQUEST GREEN WAIT ON				6				P5 6	1.50	9.00
R10-10b	12"	18"	SIGNAL	SEE MUTCD INTERIM APPROVAL FOR OPTIONAL USE OF A BICYCLE SIGNAL FACE (IA-16)			2	SEE MUTCD INTERIM APPROVAL FOR OPTIONAL USE OF A BICYCLE SIGNAL FACE (IA-16)			P5 0 2 MOUNTED ON PROP. SIGNAL POSTS	3.00	6.00
MA-R10-12a	30"	36"	LEFT TURN YIELD ON FLASHING	SEE MASSDOT STANDARD SIGNS			1	WHITE	BLACK / YELLOW	BLACK	P5 0 MOUNTED ON MAST ARM	7.50	7.50
W3-3	18"	18"		SEE MUTCD STANDARDS			2	SEE MUTCD STANDARDS			P5 2	2.25	4.50
													45.04

NOTES:

SEE THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ITS REVISIONS, THE 2012 MASSACHUSETTS AMENDMENTS TO THE 2009 MUTCD, AND THE STANDARD MUNICIPAL TRAFFIC CODE FOR LATEST SPECIFICATION ON TEXT, DIMENSIONS AND COLOR. ALSO REFER TO 2015 MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) SUPPLEMENTAL SPECIFICATIONS.

ELECTRONIC BLANK-OUT SIGN TO BE INCLUDED IN COST OF OUTDOOR BLANK-OUT LED DIRECT-VIEW SIGNS

*R2-1 SIGNS TO BE INCLUDED IN COST OF RADAR SPEED FEEDBACK DISPLAY SIGN ASSEMBLY

ELECTRONIC BLANK-OUT SIGNS

R10-11a

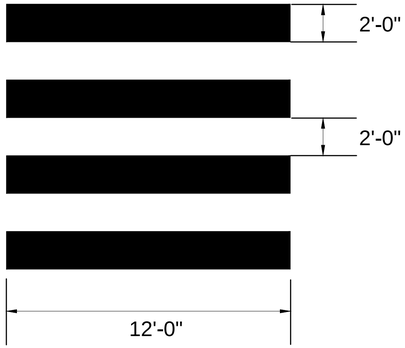
SP-1

NOTES:

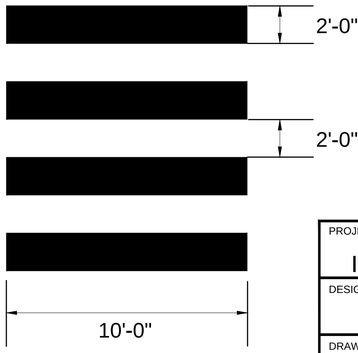
ELECTRONIC BLANK-OUT SIGN TO BE INCLUDED IN COST OF SPECIAL PROVISION ITEM 815.11.

SEE SPECIAL PROVISION ITEM 815.11 FOR ELECTRONIC BLANK-OUT SIGN SPECIFICATIONS.

PEDESTRIAN CROSSWALK DETAIL
LAKE STREET AT MINUTEMAN BIKEWAY



PEDESTRIAN CROSSWALK DETAIL
LAKE STREET AT BROOKS AVENUE



LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

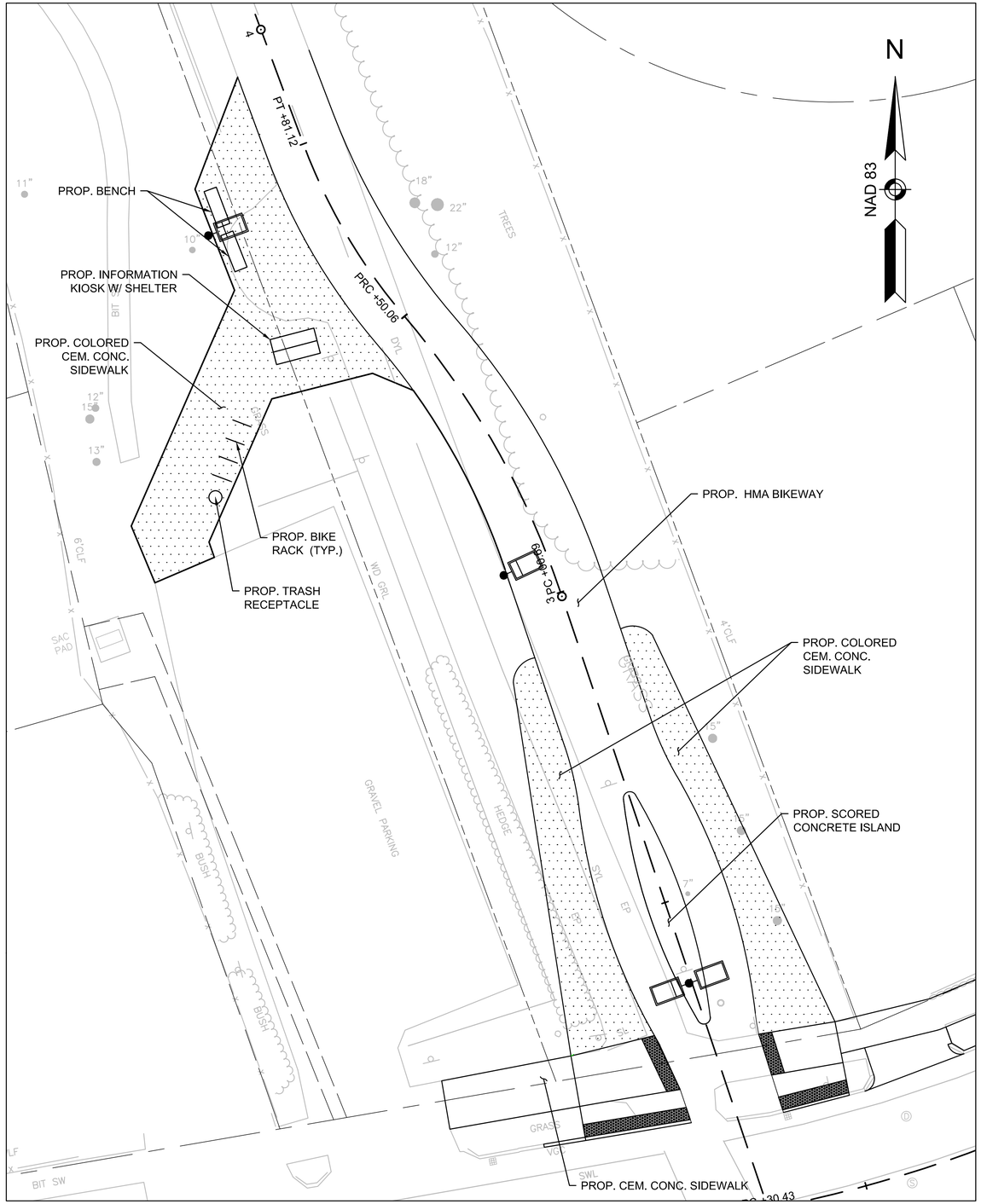
DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC SIGN SUMMARY

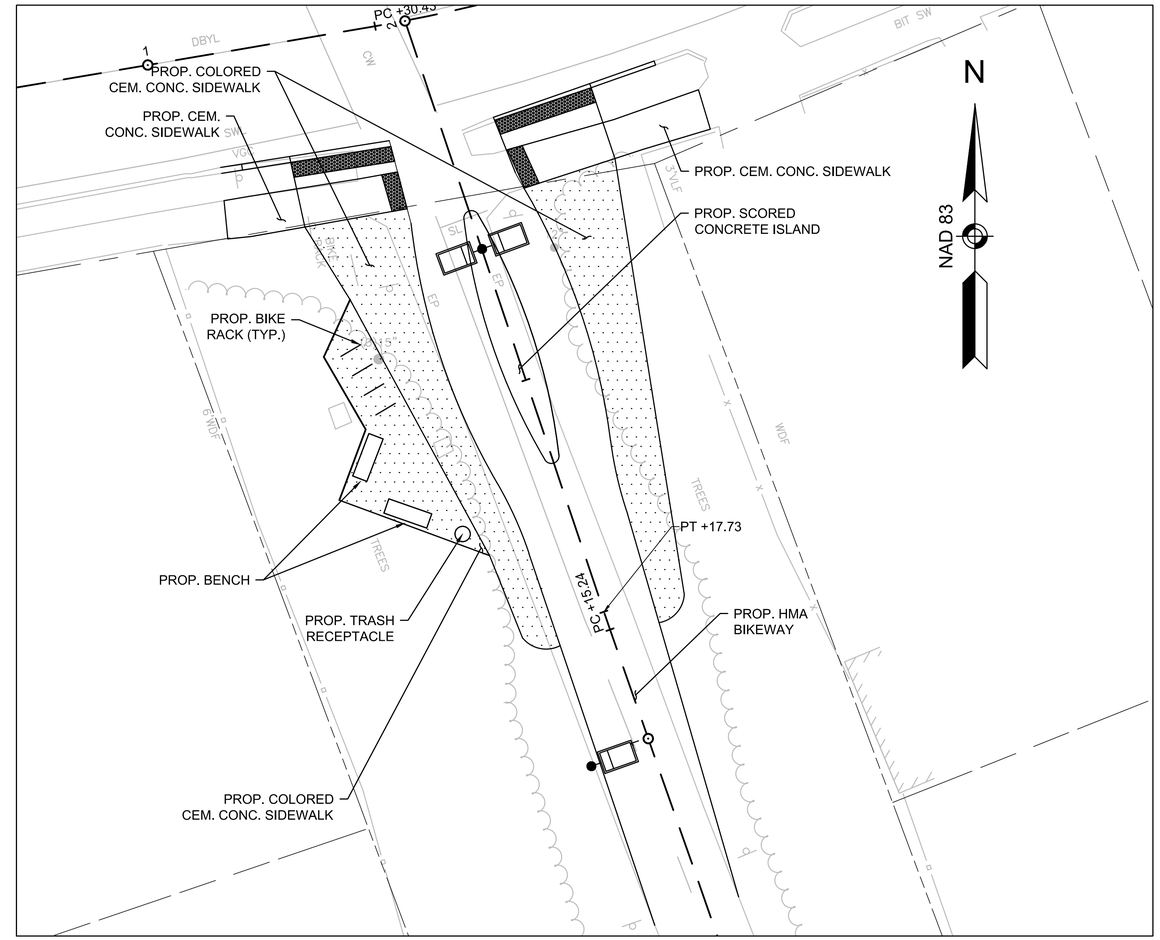
PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS



1 MATERIALS AND LAYOUT PLAN NORTH OF LAKE STREET



2 MATERIALS AND LAYOUT PLAN SOUTH OF LAKE STREET

0 10 25 50

SCALE: 1" = 10'

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: LANDSCAPE MATERIALS AND LAYOUT PLAN

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
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Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

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DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
DRAWN BY: JG
CHECKED BY: JS
SHEET NO. 19 OF 26

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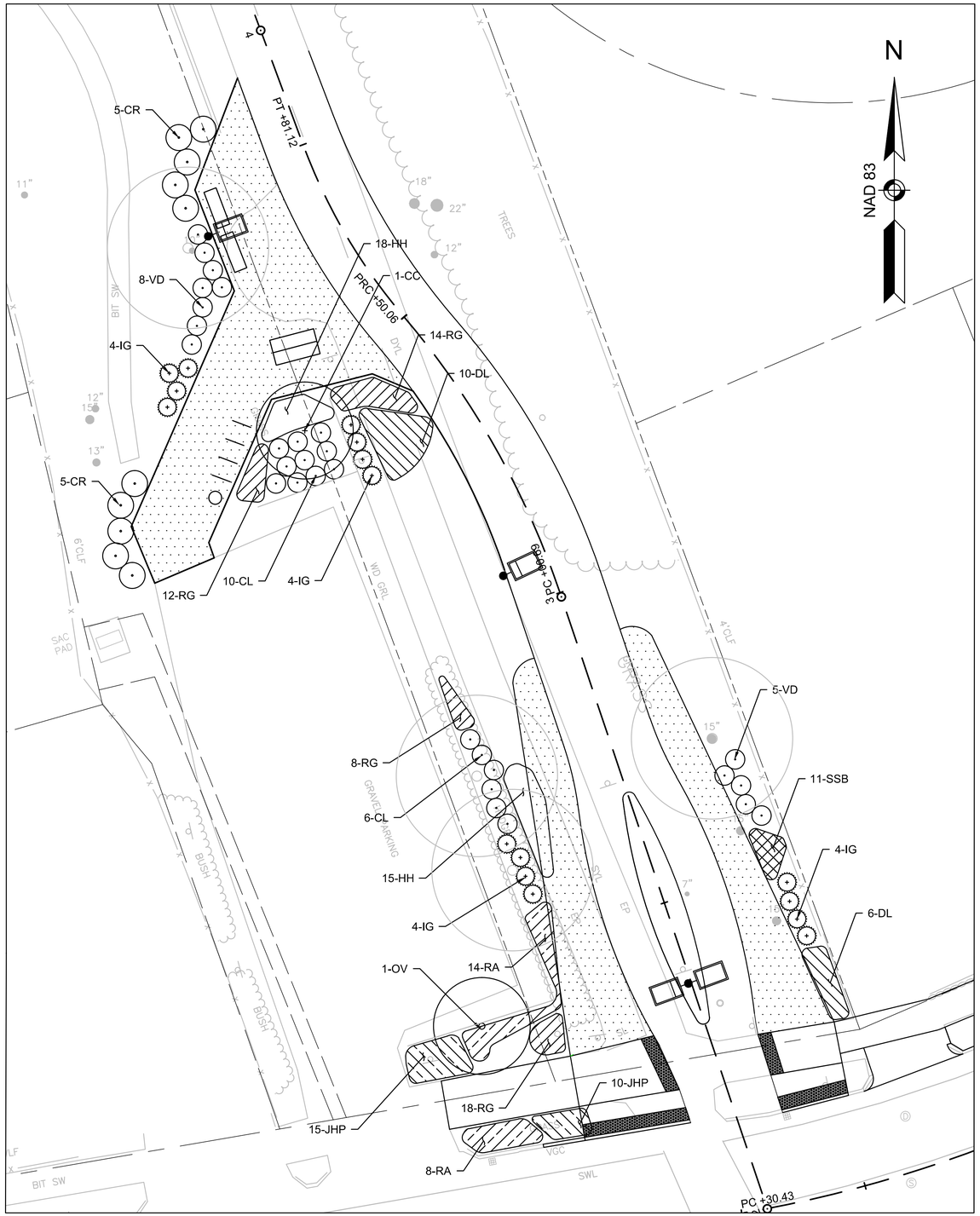
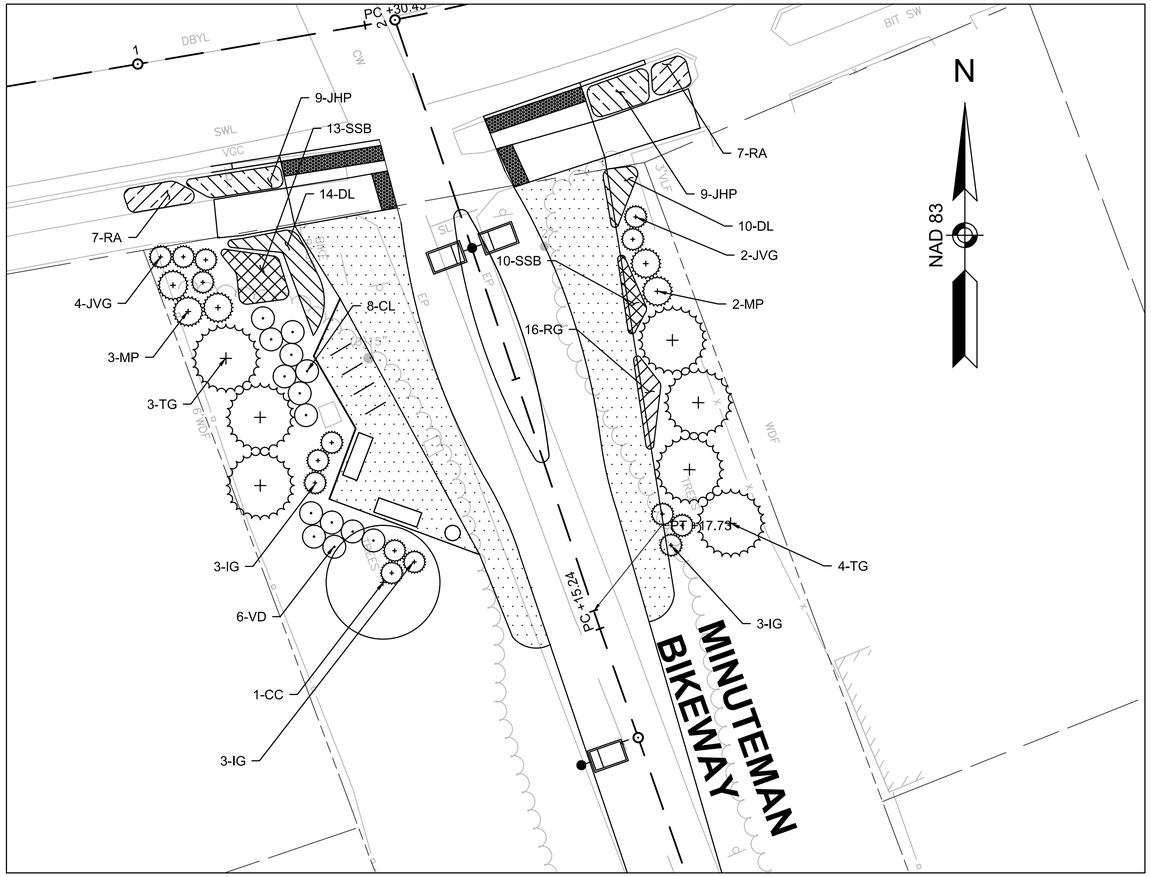


1 PLANTING PLAN NORTH OF LAKE STREET



1 PLANTING PLAN SOUTH OF LAKE STREET

0 10 25 50

SCALE: 1" = 10'

NOTES:

1. SEE SHEET 21 FOR PLANT LIST.
2. LOCATION OF PLANT MATERIAL SHALL BE APPROVED IN THE FIELD BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: LANDSCAPE PLANTING PLAN

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
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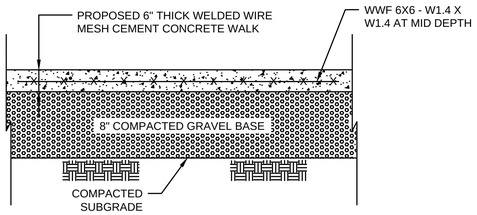
CHECKED BY: JS

SHEET NO. 20 OF 26

NOTE:

1. CONCRETE PAD BENEATH BENCHES AND GAME TABLES TO BE 6" THICK.
2. SEE DETAIL #1 ON SHEET C-6 FOR JOINT DETAIL

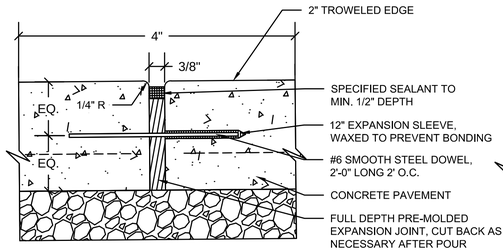


CEMENT CONCRETE PAVEMENT NOTES

1. CEMENT CONCRETE PAVEMENT SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI WITH 6% AIR-ENTRAINMENT AND MINIMUM CEMENT CONTENT OF 610 LBS/C.Y.
2. CONTRACTOR SHALL SUBMIT CONCRETE JOINT LAYOUT PLAN FOR APPROVAL. EXPANSION JOINTS SHALL BE TRANSVERSE PREFORMED EXPANSION JOINT FILLER (AASHTO M-213-65) ½ IN. THICKNESS.
3. PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED ADJACENT TO OR AROUND EXISTING STRUCTURES AND WALKWAYS.
4. EXPANSION JOINTS SHALL BE CONSTRUCTED WITH DOWELS, AS INDICATED IN DETAIL #2.
5. AFTER CONSOLIDATION, CONCRETE DEPTH SHALL BE 4 INCHES IN DEPTH.
6. ENSURE THAT NO BLED WATER OR WATER SHEEN EXISTS ON THE SURFACE OF THE CONCRETE AND THAT CONCRETE HAS STARTED TO STIFFEN BEFORE ANY FINISHING OPERATIONS ARE PERFORMED.
7. AFTER TROWELING, SURFACE SHALL BE BRUSHED BY DRAWING A SOFT-BRISTLED PUSHBROOM WITH A LONG HANDLE OVER THE SURFACE OF THE CONCRETE TO PRODUCE A NON-SLIP SURFACE.
8. TOOLED CONTROL JOINTS SHALL BE CONSTRUCTED AS INDICATED IN DETAIL #2.
9. THE FINISHING OF CONCRETE SURFACE SHALL BE DONE BY EXPERIENCED AND COMPETENT CEMENT CONCRETE FINISHERS.
10. FINISHING SHALL BE BROOM FINISH WITH A 2" SMOOTH TROWELED EDGE.
11. WHEN COMPLETED, WALKWAYS SHALL BE KEPT MOIST AND PROTECTED FROM TRAFFIC AND WEATHER FOR AT LEAST 3 DAYS.
12. WELDED WIRE MESH SHALL BE 6"x6" No. 10 GAUGE AND SHALL BE SHEET MESH ONLY NOT ROLLED. MESH SHALL REST ON CONCRETE BLOCKS AND BE INSTALLED AT MID DEPTH IN CONCRETE.

1 CEMENT CONCRETE PAVEMENT

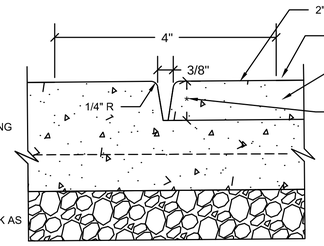
NOT TO SCALE



EXPANSION JOINT REQUIRED FOR EVERY +/- 225 SF OF PAVING OR EVERY 20FT ALONG WALKWAYS

EXPANSION JOINT NOTES:

1. DOWEL IS TYPICAL AT ALL EXPANSION JOINTS EXCEPT AGAINST VERTICAL JOINTS WITH WALLS, CURBS OR SITE IMPROVEMENTS.



TOOLED CONTROL JOINT REQUIRED FOR EVERY 36 SF OF PAVING.

TOOLED JOINT NOTES:

1. TOOLED MARGIN IS TYPICAL AT ALL JOINTS AND PANEL EDGES.

GENERAL NOTES:

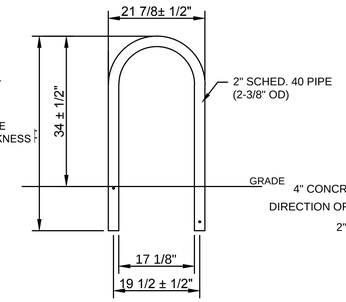
1. SUBMIT SHOP DRAWINGS FOR APPROVAL OF ALL CONCRETE JOINTING LAYOUT

NOTE:

CONTRACTOR SHALL COORDINATE CONCRETE JOINTS WITH BUILDING PIERS AND FOOTINGS AND SUBMIT A JOINT LAYOUT PLAN FOR ALL CONCRETE PAVED AREAS.

2 CONCRETE JOINTS

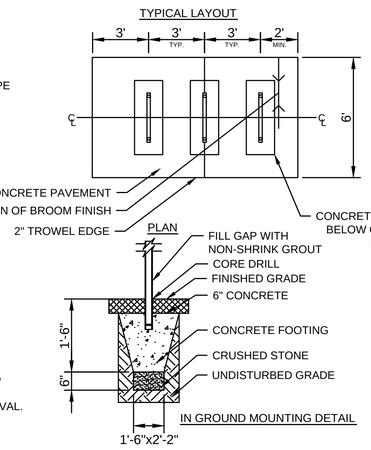
NOT TO SCALE



ELEVATION VIEW

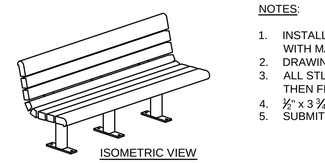
NOTES:

1. INSTALL BIKE RACKS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
2. SUBMIT SHOP DRAWING FOR APPROVAL.

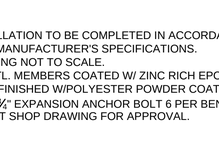


3 BIKE RACK

NOT TO SCALE



FRONT VIEW



SURFACE MOUNT

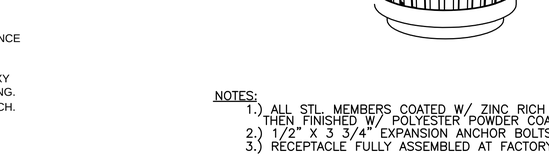
ISOMETRIC VIEW

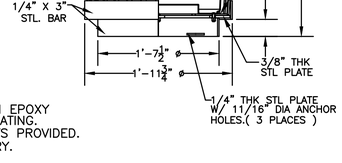
NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DRAWING NOT TO SCALE.
3. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/POLYESTER POWDER COATING.
4. ½" x 3 ¾" EXPANSION ANCHOR BOLT 6 PER BENCH.
5. SUBMIT SHOP DRAWING FOR APPROVAL.

4 RECYCLED PLASTIC BENCH

NOT TO SCALE



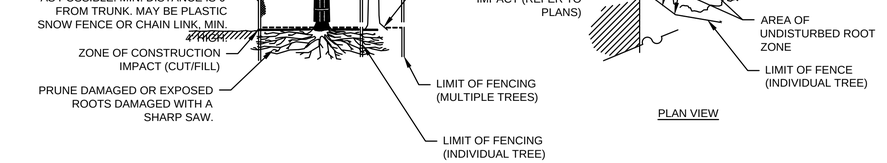


NOTES:

1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.
3.) RECEPTACLE FULLY ASSEMBLED AT FACTORY.

5 TRASH RECEPTACLE

NOT TO SCALE



PLAN VIEW

6 TREE PROTECTION OF EXISTING TREES

NOT TO SCALE

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: LANDSCAPE DETAILS

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
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SCALE: AS NOTED
DATE: 09/15/2017
PROJECT NO. 17067.015
DESIGNED BY: JG
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CHECKED BY: JS
SHEET NO. 21 OF 26

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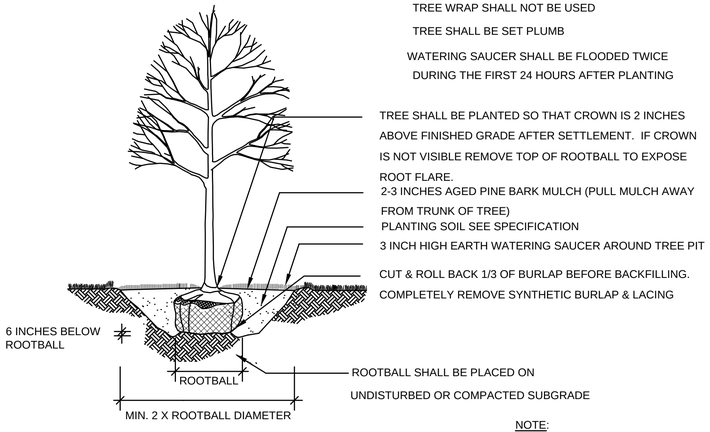
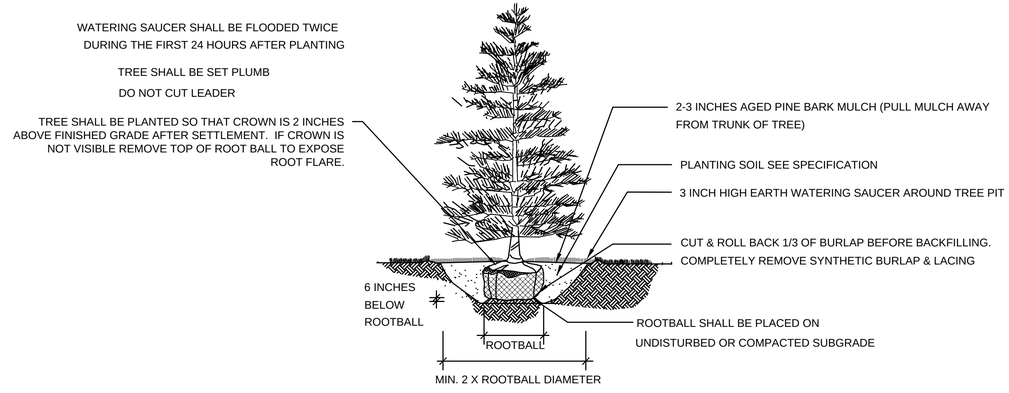


NOTE:

PROVIDE AND INSTALL TREE WATERING BAG

1 DECIDUOUS TREE PLANTING

NOT TO SCALE



NOTE:

PROVIDE AND INSTALL TREE WATERING BAG

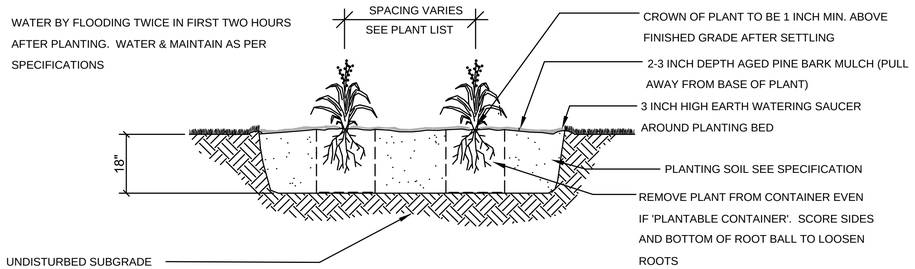
5 EVERGREEN PLANTING

NOT TO SCALE

EXCAVATE TO REQUIRED DEPTH
AND BACKFILL WITH PLANTING SOIL

RAISE AND REPLANT ANY PLANTS THAT SETTLE
MORE THAN 2 INCHES AFTER PLANTING AND WATERING IN

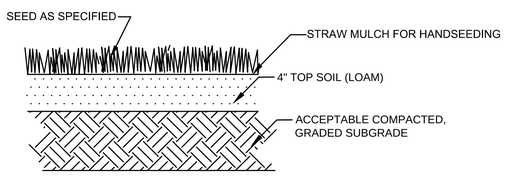
WATER BY FLOODING TWICE IN FIRST TWO HOURS
AFTER PLANTING. WATER & MAINTAIN AS PER
SPECIFICATIONS



2 PERENNIAL

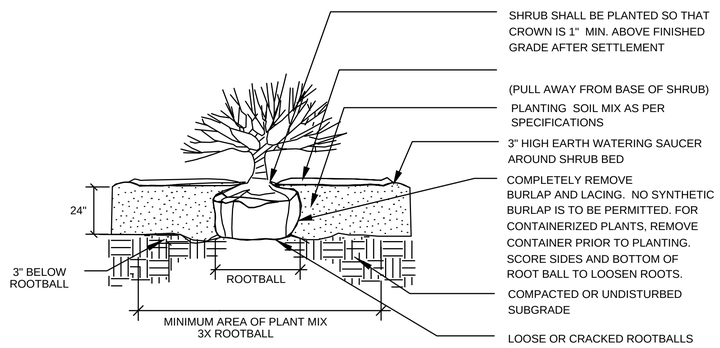
NOT TO SCALE

PLANT LIST					
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
CC	2	CARPINUS CAROLINIANA	IRONWOOD	2-2 1/2" CAL	TREE FORM	B&B
OV	1	OSTRYA VIRGINIANA	AMERICAN HOPHORNBEAM	2-2 1/2" CAL	TREE FORM	B&B
		EVERGREEN TREES				
TG	7	THUJA PLICATA'GREEN GIANT'	GREEN GIANT ARBORVITEA	6-7' HT		B&B
		DECIDUOUS SHRUBS				
CR	10	CORNUS RACEMOSA	GRAY TWIG DGWOOD	3-4' HT	4. O.C.	CONT #7
CL	23	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET	2-3' FT	3' O.C.	CONT #5
DL	64	DIERVILLA LONICERA	BUSH HONEYSUCKLE	18-24" SP.	18" O.C.	CONT 3
RA	36	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	18-24" SP.	2.5' O.C.	CONT #3
VD	19	VIBURNUM DENTATUM 'CHRISTOM'	BLUE MUFFIN VIBURNUM	3-4' HT	4. O.C.	CONT #7
		EVERGREEN SHRUBS				
IG	21	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	2-3' FT	3' O.C.	CONT #5
JHB	15	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	2' O.C.	CONT #2
JHP	28	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	2' O.C.	CONT #2
JVG	6	JUNIPERUS VIRGINIANA 'GREY OWL'	GREY OWL JUNIPER	2-2.5' SP.	3' O.C.	CONT #3
MP	5	MYRICA PENSYLVANICA	BAYBERRY	3-4' HT	4' O.C.	B&B
		PERENNIALS AND GRASSES				
RG	68	RUDBECKIA FULVA 'GOLDSTRM'	BLACK EYED SUSAN	CONT #2	12" O.C.	CONT #2
HH	33	HEMEROCALLIS 'HAPPY RETURNS'	HAPPY RETURNS DAYLILLY	CONT #2	9" O.C.	CONT #2
SSB	34	SCHIZACHYIUM SCOPARIUM 'THE BLUES'	THE BLUES LITTLE BLUESTEM	CONT #2	12" O.C.	CONT #2



3 LOAM & SEED

NOT TO SCALE



4 SHRUB PLANTING DETAIL

NOT TO SCALE

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

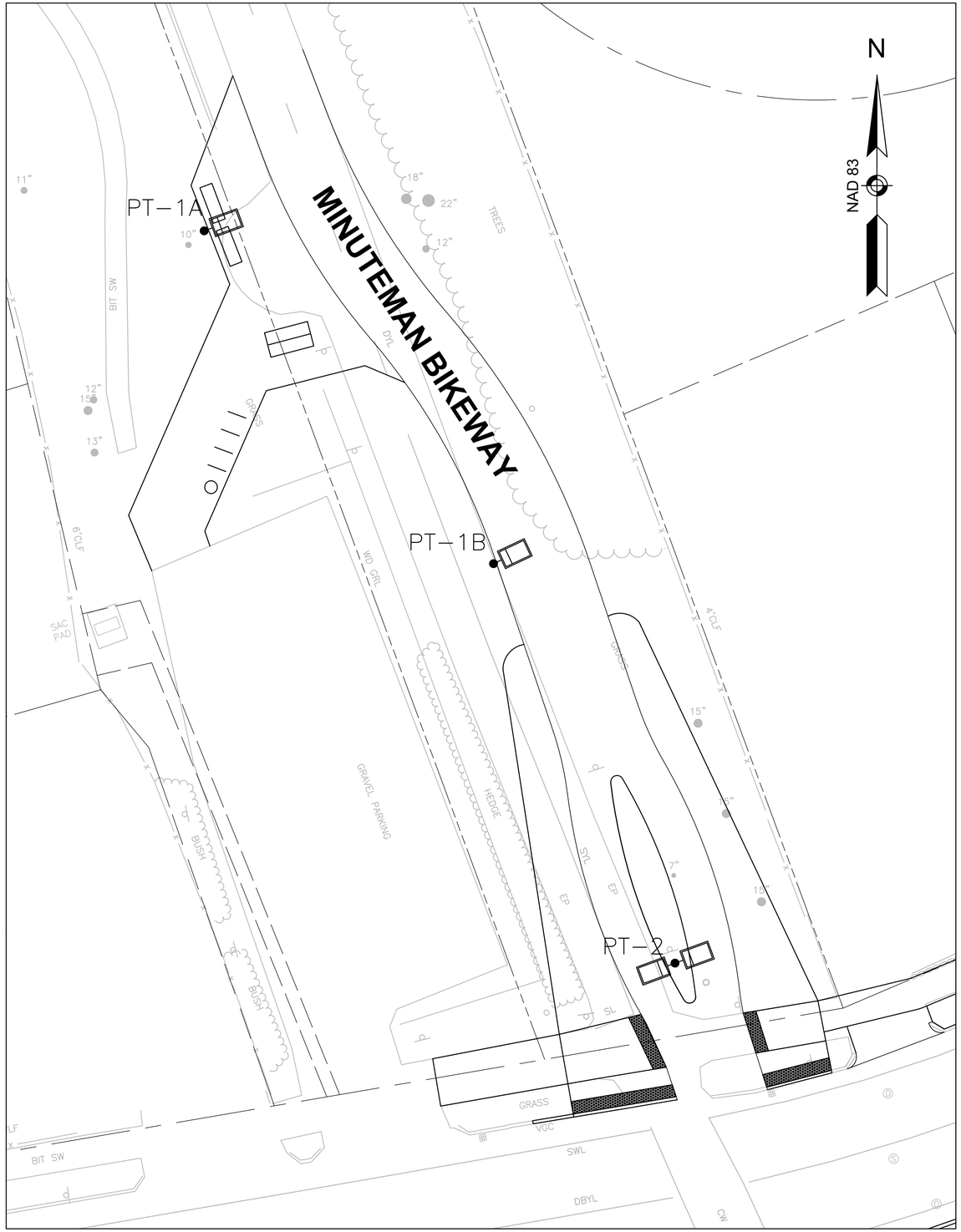
DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: LANDSCAPE DETAILS 2

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

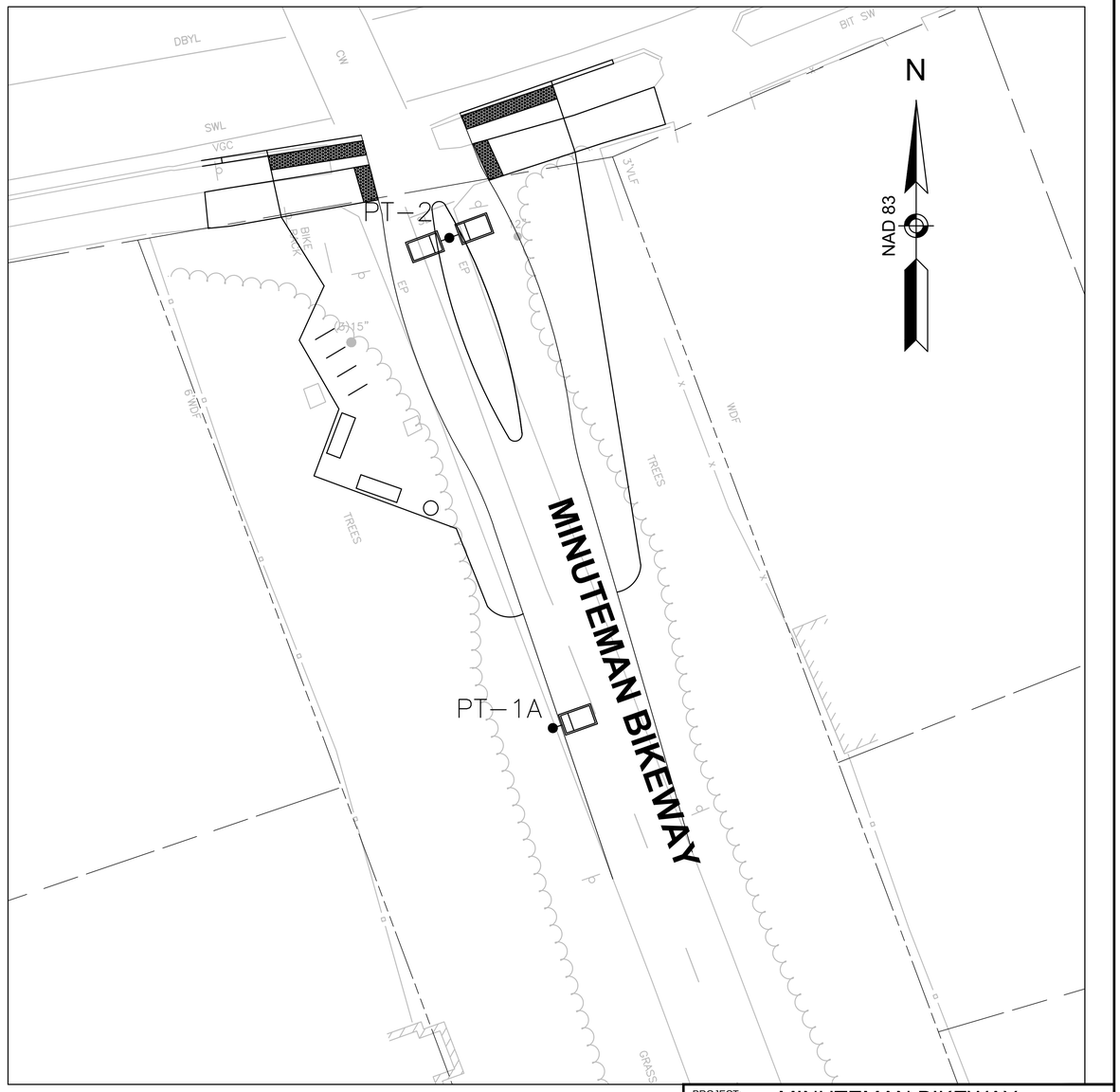
PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED | DESIGNED BY: JG
DATE: 09/15/2017 | DRAWN BY: JG
PROJECT NO. 17067.015 | CHECKED BY: JS
SHEET NO. 22 OF 26



0 10 25 50

SCALE: 1" = 10'



LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

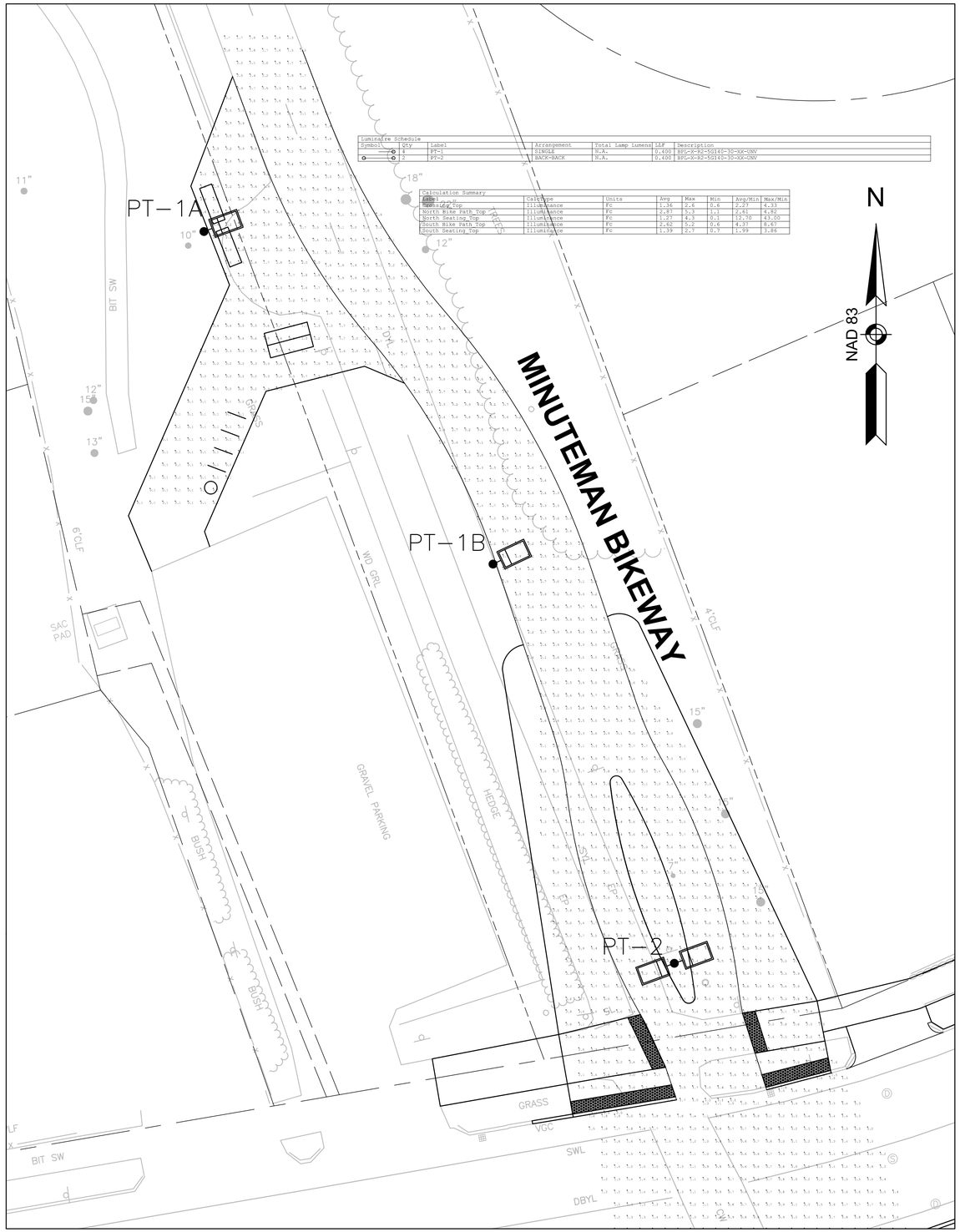
DESIGN SUBMISSION: DRAFT FINAL DESIGN

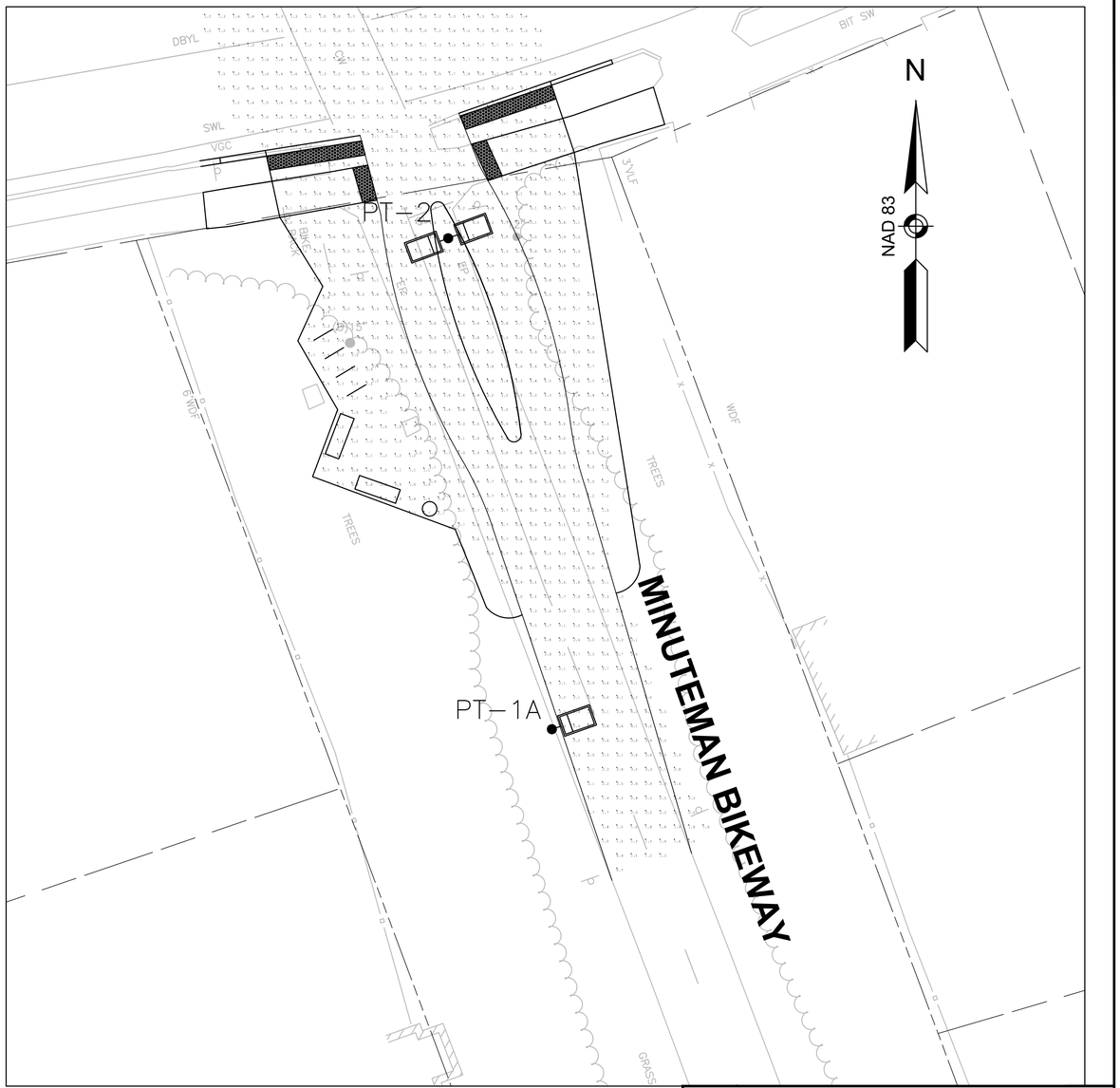
DRAWING TITLE: LIGHTING PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 23 OF 26
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	





LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: LIGHTING PHOTOMETRICS PLAN

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 24 OF 26
DATE: 09/15/2017	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: JS	

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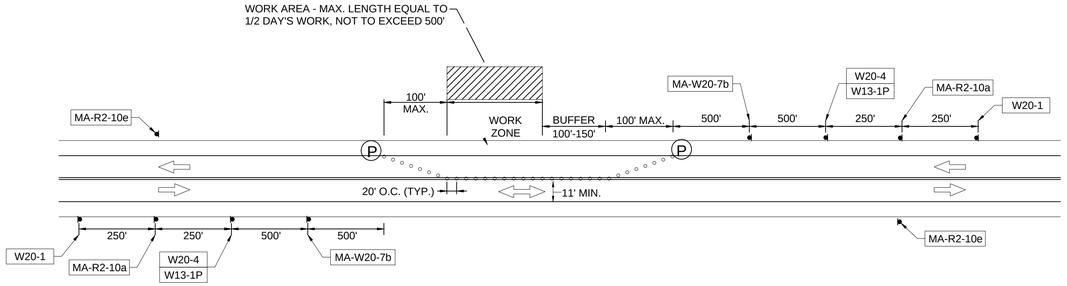
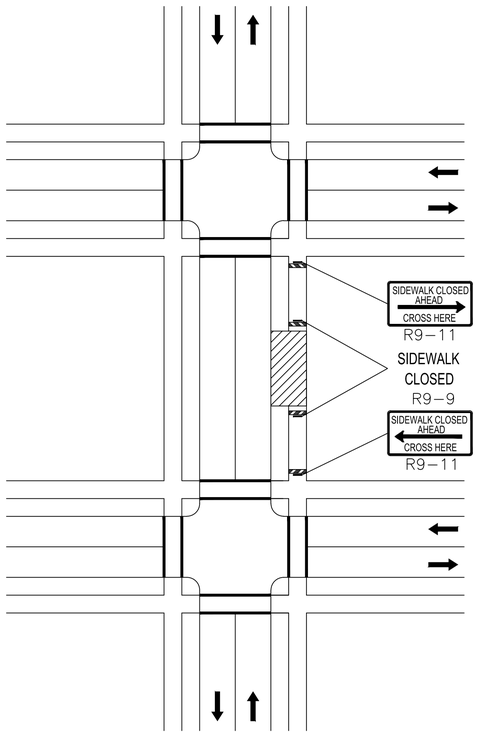


TYPICAL APPLICATION - TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC

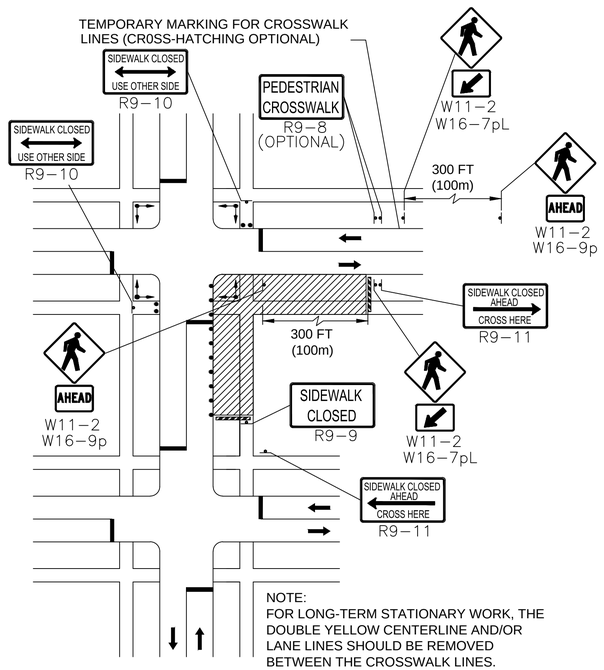
NOT TO SCALE



NOTE: IF A MINIMUM WIDTH OF 48" OF SOLID SMOOTH UNOBSTRUCTED SURFACE REMAINS ALONG THE WORK AREA THEN THE DETAIL CAN BE DISREGARDED. DELINEATION OF THE WORK AREA WILL STILL BE REQUIRED. All PEDESTRIAN DETOUR ROUTES SHALL BE ADA/MAAB COMPLIANT IN THEIR ENTIRETY.

SIDEWALK CLOSED WITHOUT DETOUR

NOT TO SCALE



NOTE:
FOR LONG-TERM STATIONARY WORK, THE DOUBLE YELLOW CENTERLINE AND/OR LANE LINES SHOULD BE REMOVED BETWEEN THE CROSSWALK LINES.

PEDESTRIAN DETOUR

NOT TO SCALE

TEMPORARY TRAFFIC CONTROL NOTES:

1. MINIMUM LANE WIDTH OF 11 FEET SHALL BE MAINTAINED ALL THE TIME.
2. THESE PLANS ARE NOT INTENDED TO LIMIT THE CONTRACTOR'S APPROACH TO SCHEDULE THE WORK BUT TO OUTLINE ONE WAY OF PROGRESSING. THE CONTRACTOR IS EXPECTED TO USE KNOWLEDGE AND EXPERIENCE TO PERFORM THE WORK IN THE MOST EFFICIENT AND SAFE MANNER IN COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS.
3. PLACE ALL SAFETY DEVICES AND CONSTRUCTION SIGNING BEFORE ACTUAL CONSTRUCTION WORK BEGINS.
4. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.
5. EXISTING SIGNS NO LONGER APPLICABLE SHALL BE TEMPORARILY COVERED DURING CONSTRUCTION OR REMOVED AND RESET UPON COMPLETION OF CONSTRUCTION. THE COST SHALL BE INCIDENTAL TO THE CONTRACTOR.
6. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN THE NCHRP 350 REPORT.
7. TEMPORARY PAVEMENT MARKINGS, NO LONGER APPLICABLE, SHALL BE REMOVED. CONTRACTOR SHALL RECORD EXISTING PAVEMENT MARKINGS AND RESTORE ALL MARKINGS TO EXISTING CONDITIONS AT THE CONCLUSION OF CONSTRUCTION AT EACH LOCATION.
8. ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED IMMEDIATELY WHEN NO LONGER NEEDED.
9. UNLESS OTHERWISE NOTED, ALL PAVEMENT MARKINGS, SIGNS AND OTHER TRAFFIC EQUIPMENT REMOVED OR DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN CONFORMANCE WITH THE CONTACT DOCUMENTS.
10. CONTRACTOR SHALL INSTALL, RENEW AND MAINTAIN ALL TRAFFIC CONTROL DEVICES AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
11. ACCESS/EGRESS TO ALL ABUTTERS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN EMERGENCY PASSAGE AT ALL TIMES TO BUILDINGS WITHIN AND ADJACENT TO THE PROJECT LIMITS AS WELL AS A LARGER AREA IF AFFECTED BY CONSTRUCTION CONDITIONS. CONTRACTOR SHALL MAINTAIN 24 HOUR EMERGENCY VEHICLE ACCESS TO CONSTRUCTION AREAS.
12. SIDEWALK ACCESS SHALL BE MAINTAINED AT ALL TIMES ON AT LEAST ONE SIDE OF THE STREET
13. CONTRACTOR SHALL COORDINATE WITH ABUTTERS FOR THE PROPOSED WORK AND SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF THE WORK THAT WILL REQUIRE TEMPORARY CLOSURE OF ACCESS TO THEIR PROPERTY.
14. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL ABUTTING PROJECTS.

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC MANAGEMENT PLAN 1

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED | DESIGNED BY: JG
DATE: 09/15/2017 | DRAWN BY: JG
PROJECT NO. 17067.015 | CHECKED BY: JS
SHEET NO. 25 OF 26

CONSTRUCTION SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN (INCHES)		TEXT	TEXT DIMENSIONS (INCHES)			COLOR			POST SIZE AND NUMBER REQUIRED	NUMBER OF SIGNS REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER				
MA-R2-10a	48	36	WORK ZONE / SPEEDING FINES DOUBLED	SEE MASSDOT STANDARD DETAIL			SEE MASSDOT STD. DETAIL			MASSDOT SPEC. MOUNT ON POST	2	12.00	24.00
MA-R2-10e	36	48	END ROAD WORK / DOUBLE FINES END								2	12.00	24.00
MA-W20-7b	36	36	POLICE OFFICER AHEAD								2	9.00	18.00
R9-8	36	18	PEDESTRIAN CROSSWALK	SEE MUTCD STANDARD DETAIL			SEE MUTCD STD. DETAIL			MUTCD SPEC. MOUNT ON POST	2	4.50	9.00
R9-9	24	12	SIDEWALK CLOSED								2	2.00	4.00
R9-10	24	12	SIDEWALK CLOSED / USE OTHER SIDE								2	2.00	4.00
R9-11L	24	18	SIDEWALK CLOSED AHEAD / CROSS HERE								2	3.00	6.00
R9-11R	24	18	SIDEWALK CLOSED AHEAD / CROSS HERE								2	3.00	6.00
W11-2	30	30									4	6.25	25.00
W16-7P	24	12									2	2.00	4.00
W16-9P	24	12	AHEAD								2	2.00	4.00
W13-1P	24	24	25 M.P.H.								2	4.00	8.00
W20-1	36	36	ROAD WORK AHEAD								2	9.00	18.00
W20-4	36	36	ONE LANE ROAD AHEAD								2	9.00	18.00
													297.50

NOTES:

- SEE THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ITS REVISIONS, THE 2012 MASSACHUSETTS AMENDMENTS TO THE 2009 MUTCD, AND THE STANDARD MUNICIPAL TRAFFIC CODE FOR LATEST SPECIFICATION ON TEXT, DIMENSIONS AND COLOR. ALSO REFER TO 2015 MASSACHUSETTS DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL SPECIFICATIONS.
- UNLESS OTHERWISE NOTED, ALL POSTS TO BE P-5.

LIGHTING DESIGN SERVICES
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: DRAFT FINAL DESIGN

DRAWING TITLE: TRAFFIC MANAGEMENT PLAN 2

PREPARED FOR:
TOWN OF ARLINGTON
ENGINEERING DIVISION
51 GROVE STREET
ARLINGTON, MA 02476

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers (978) 923-0400
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO.
DATE: 09/15/2017	DRAWN BY: JG	26 OF 26
PROJECT NO. 17067.015	CHECKED BY: JS	

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