Neighborhood Traffic Circles on Pearl St – Somerville, MA

Site and Treatment Description

Since 2020, Somerville has applied at least 19 traffic calming treatments in the neighborhood bounded by McGrath Highway, Broadway, the city line, and Washington Street, with the primary motivation being Safe Routes to School. Among the treatments are three neighborhood traffic circles installed in 2023 at Pearl St @ Glen St, Pearl St @ Myrtle St, and Oliver St @ Glen St. This treatment was chosen to reinforce the existing all-way Stops at these intersections and thus make it safer for children to cross.

Pearl is classified as a collector street (ADT = 2250) while Glen (ADT = 1550) and Myrtle (ADT = 2350) are locals. The neighborhood traffic circles are small circles (diameter ≈ 12 ft) with concrete curbs between 5 and 7.5inches high. Two have plantings in the middle, while the third cannot have plantings because it has a manhole cover. They are not roundabouts or mini-roundabouts, nor are they signed as a “traffic circle” or “rotary.” This means that larger vehicles turning left such as school buses are allowed to turn left in front of the circle (tracking almost the same as they would if there were no circle). All approaches have Stop signs (as they did before).

Neighborhood Traffic Circle at the Intersection of Glen Street and Oliver Street, Somerville

Before-after Speed Results

Because there were Stop signs on every approach before as well as after, the circles were not intended to reduce general traffic speed, but as a proactive measure to improve pedestrian safety and comfort by preventing violations from driving through the Stop sign at speed, and thus making crossing pedestrians (especially children) certain that approaching vehicles will be stopping or at least slowing to pedestrian speed.

Design Specs and Cost

Tetra Tech, a consultant, designed the neighborhood traffic circles. Detailed construction design plans are provided in Appendix A. The diameter of the outer apron of the traffic circles is 12 ft, with an inner raised circle with 6 ft diameter. The outer apron is 1.5 inches high (one inch beveled curb reveal, and paved with cobble a half-inch higher) and is mountable. The inner circle has a curb that is 16 inches above street level.

Before construction, City staff marked off each circle with cones and paint and had the fire department test it to ensure they could pass. After construction, while the design had provided more than the 12 ft clearance between the corner curbs and inner circle curb requested by the DPW, the DPW realized they actually needed 17 ft between curbs to accommodate their larger snowplows. The contractor rebuilt the inner circle's curbs accordingly, shifting their center so that the inner circle is no longer centered in the apron. This experience has informed the spec which the City intends to apply in the future.

Construction cost per traffic circle was roughly $6,000.

Support Story

From the mayor and City Council, there is a strong commitment to Vision Zero and to Safe Routes to School. While emergency response and DPW staff were skeptical at first, they worked cooperatively with the City's Department of Transportation and Infrastructure to find a design that would meet the project objectives while still providing adequate space for fire and snow-clearance vehicles.

There was some citizen opposition and negative press, but most of the public has been supportive, as well as the mayor and City Council. The Department of Transportation and Infrastructure doesn't take public support for granted, but works hard to earn it by providing information to residents and by being transparent with traffic calming project plans and evaluations through their web site. In recent City Council elections, candidates supporting Safe Streets policies outpolled those against the policies by a margin of 4 to 1.

Maintenance Tips

Additional investigations should be conducted to ensure that largest road users, including fire vehicles, can move around the traffic circle. Greenery implementation in the center of islands should not overlap with any major utility construction. Additionally, reflective signage on the island is highly recommended.

Other Lessons

Working cooperatively with fire and DPW was critical. At the same time, it was equally vital for fire and DPW to embrace the City's traffic calming goals, so that it was not a question of IF the City would install speed management devices, but HOW.

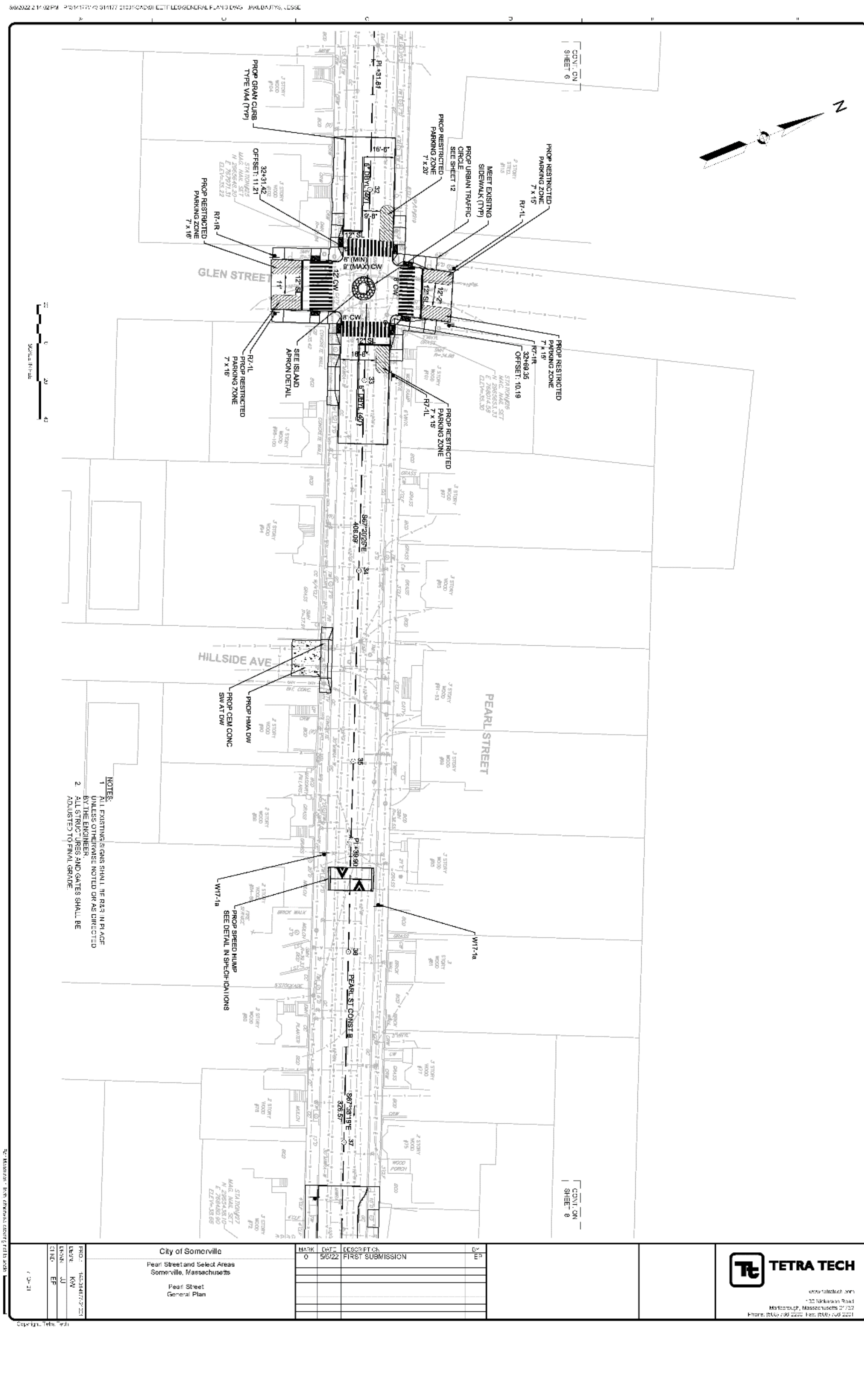
Projects that involve contractors working with concrete, granite, and asphalt require more staff capacity than the City had up to 2019; before that, speed management projects were limited to "signs and lines." The City hired new staff that can manage projects and contractors, and its capacity has scaled up to a pace of about 50 devices (speed humps, curb extensions, crossing islands, and so forth) per year.

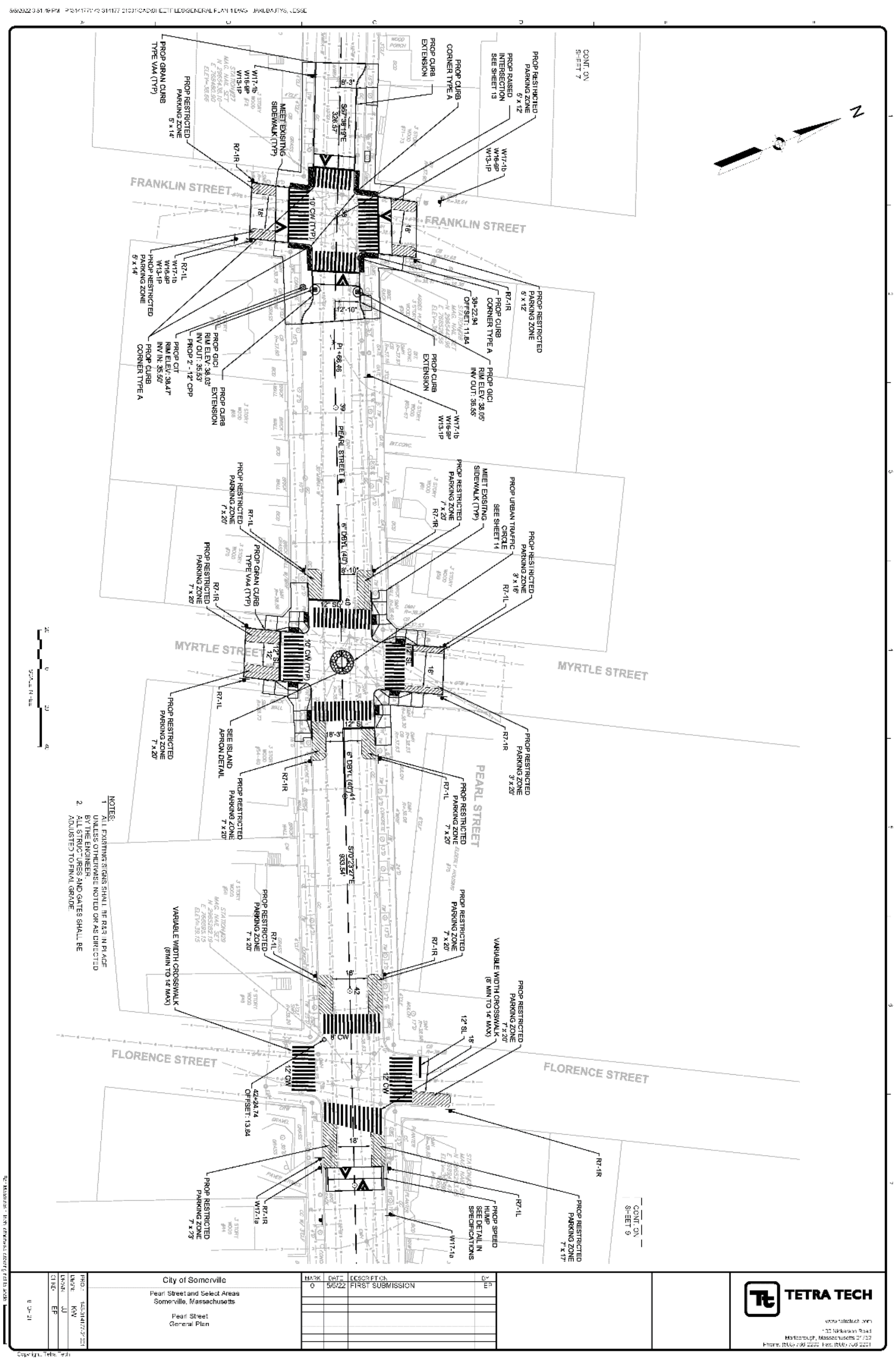
Somerville's Department of Transportation and Infrastructure has an analytics team in house that, among other things, prioritizes streets for speed management and evaluates projects. myrThey make an annual report on policy development; annual reports will be coming out in the next 2-3 months.

Future Plans

The City plans to install more neighborhood traffic circles as well as other speed management devices.

Appendix


GLEN STREET
HILLSIDE AVE
PEARL STREET
City of Somerville
Pearl Street and Select Areas
Somerville, Massachusetts
Pearl Street
General Plan
FIRST SUBMISSION
TETRA TECH


FRANKLIN STREET
MYRTLE STREET
PEARL STREET
FLORENCE STREET
City of Somerville
Pearl Street and Select Areas
Somerville, Massachusetts
Pearl Street
General Plan
FIRST SUBMISSION
TETRA TECH

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	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
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
Ø1	Ø1	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)
		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		BILLBOARD
		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
	12" SL	12" STOP LINE
	CW	CROSSWALK
	6" SWL	6" SOLID WHITE LINE
	12" SWL	12" SOLID WHITE LINE
	6" SYL	6" SOLID YELLOW LINE
	12" SYL	12" SOLID YELLOW LINE
	6" DBWL	6" DOUBLE WHITE LINE
	6" DBYL	6" DOUBLE YELLOW LINE
	6" BWL	6" BROKEN WHITE LINE
	6" BYL	6" BROKEN YELLOW LINE
	6" DWL	6" DOTTED WHITE LINE
	6" DYL	6" DOTTED YELLOW LINE
	6" DWLEx	6" DOTTED WHITE LINE EXTENSION (2' LINE, 6' GAP)
	6" DYLEx	6" DOTTED YELLOW LINE EXTENSION (2' LINE, 6' GAP)
	12" DWL	12" DOTTED WHITE LINE (3' LINE - 9' GAP)
	12" DYL	12" DOTTED YELLOW LINE (3' LINE - 9' GAP)

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
CPP	CORRUGATED PLASTIC PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DCR	DEPARTMENT OF CONSERVATION & RECREATION
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
FYG	FLUORESCENT YELLOW GREEN
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GICI	GUTTER INLET WITH CURB INLET
GIP	GALVANIZED IRON PIPE
GR	GUARDRAIL
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
LO	LAYOUT
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

ABBREVIATIONS (cont.)

GENERAL

PVC	POINT OF VERTICAL CURVATURE
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
TCS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

TETRA TECH
www.tetratech.com
100 Nickerson Road
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Phone: (508) 786-2200 Fax: (508) 786-2201

MARK	DATE	DESCRIPTION	BY
0	5/6/22	FIRST SUBMISSION	EP

City of Somerville
Pearl Street and Select Areas
Somerville, Massachusetts

Legend and Abbreviations

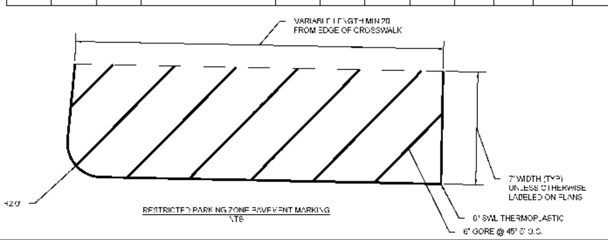
PROJ:	143-314177-21001
DESN:	KW
DRAWN:	JJ
CHKD:	EP

4 OF 21

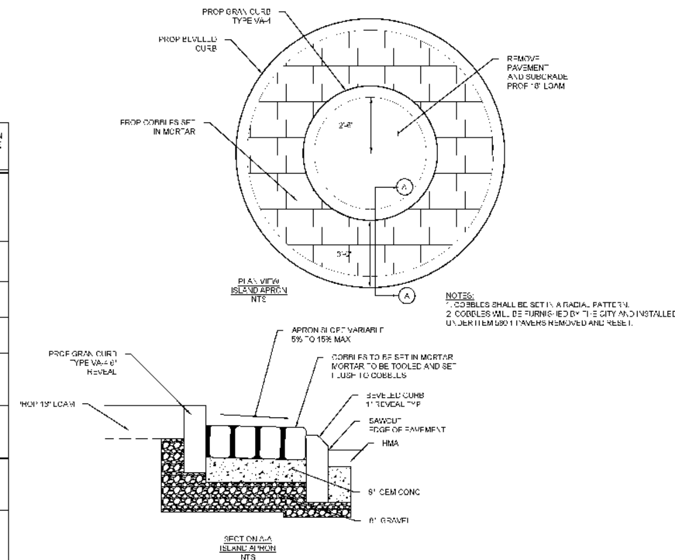
Bar Measures 1 Inch, otherwise drawing not to scale

TRAFFIC SIGN SUMMARY

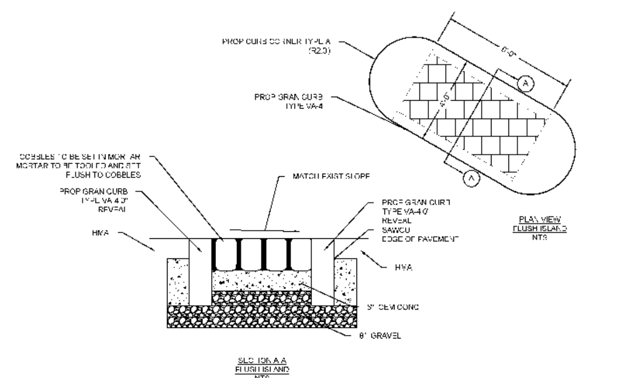
IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
W11-2	30	30	(pedestrian symbol)	SEE 2009 MUTCD			12	FYG	BLACK	BLACK	P5-1(12)	6.25	75.00
W13-1P(10)	18	24	10 MPH	SEE 2009 MUTCD			18	YELLOW	BLACK	BLACK	MOUNT W/ W17-1a(2)/ W17-1b(16)	3.00	54.00
W16-7P	24	18	(arrow)	SEE 2009 MUTCD			12	FYG	BLACK	BLACK	MOUNT W/ W11-2	3.00	36.00
W16-9P	24	18	AHEAD	SEE 2009 MUTCD			16	YELLOW	BLACK	BLACK	MOUNT WITH W17-1(b)	3.00	48.00
W17-1a	30	30	SPEED HUMP	4"C	N.A.	N.A.	8	YELLOW	BLACK	BLACK	P5-1(8)	6.25	50.00
W17-1b	30	30	RAISED CROSSING	4"B	N.A.	N.A.	19	YELLOW	BLACK	BLACK	P5-1(19)	6.25	118.75
R1-1	30	30	STOP	SEE 2009 MUTCD			2	RED	WHITE	WHITE	P5-1 (2)	6.25	12.50
R1-1	18	18	STOP	SEE 2009 MUTCD			1	RED	WHITE	WHITE	P5-1 (1)	2.25	2.25
R4-7	24	30	(keep right symbol)	SEE 2009 MUTCD			4	WHITE	BLACK	BLACK	P5-1 (4)	5.00	20.00
R7-1 (L)	12	18	NO PARKING ANY TIME	SEE 2009 MUTCD			27	WHITE	BLACK	BLACK	P5-1(27)	1.50	40.50
R7-1 (R)	12	18	NO PARKING ANY TIME	SEE 2009 MUTCD			27	WHITE	BLACK	BLACK	P5-1(27)	1.50	40.50
SF-1	18	6	FOR BICYCLES	2"B	2 2	N.A.	1	WHITE	BLACK	BLACK	MOUNT WITH R1-1 18"X18"	0.75	0.75



RESTRICTED PARKING ZONE PAVEMENT MARKING
NTS



NOTES:
1. COBBLES SHALL BE SET IN A RADIAL PATTERN.
2. COBBLES WILL BE FURNISHED BY THE CITY AND INSTALLED UNDER ITEM 5801 PAVERS REMOVED AND RESET.



MARK	DATE	DESCRIPTION	BY
0	5/4/22	FIRST SUBMISSION	EF

City of Somerville
Pearl Street and Select Areas
Somerville, Massachusetts
Traffic Sign Summary and Construction Details

TETRA TECH

PROJ	
DESIGN	KW
DRAWN	JJ
CHKD	EF