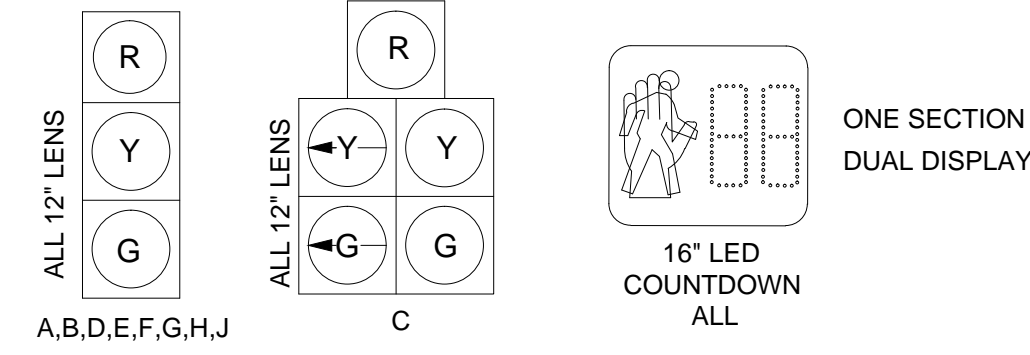


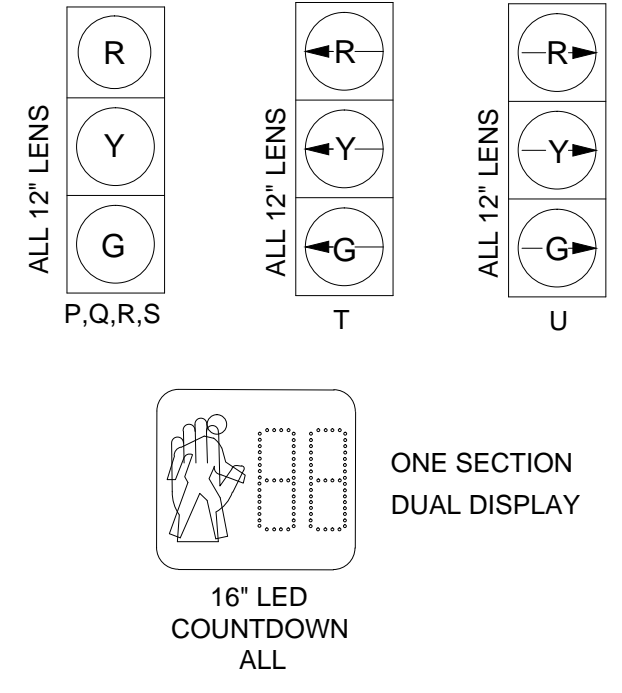
**SIGNAL IDENTIFICATION
 (MANITOBA ROAD)**



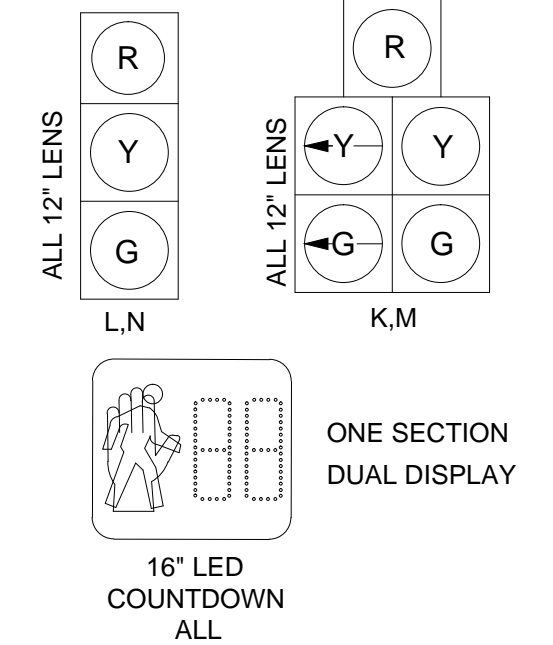
**SIGNAL IDENTIFICATION
 (WABAN CENTER PED XING)**



**SIGNAL IDENTIFICATION
 (COLLINS ROAD)**



**SIGNAL IDENTIFICATION
 (WABAN AVENUE)**



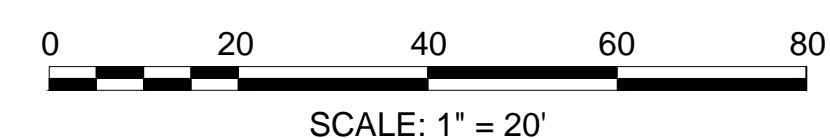
GENERAL NOTES:

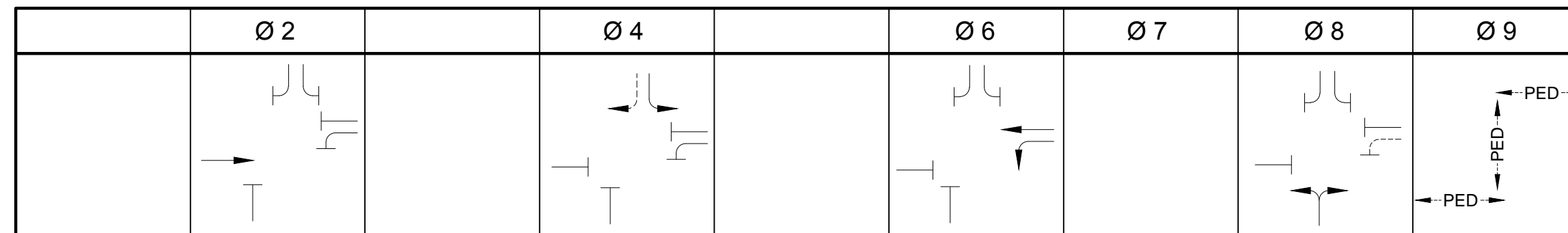
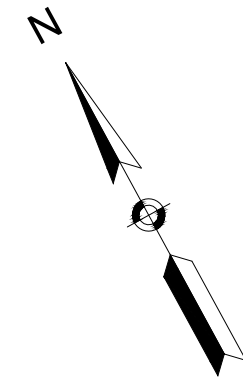
1. THE CONTRACTOR IS TO CONTACT APPROPRIATE UTILITY COMPANIES FOR RELOCATIONS AND ADJUSTMENTS, IF NECESSARY.
2. ALL EXISTING SIGNAL EQUIPMENT IS TO BE REMOVED AND STACKED.

CITY OF NEWTON
 MASSACHUSETTS

DESIGNED BY:
 DRAWN BY:
 CHECKED BY:
 APPROVED BY:

CITY OF NEWTON
 MASSACHUSETTS
 PRELIMINARY PLAN
 FOR THE
 PROPOSED ROADWAY CONSTRUCTION
 OF
 BEACON STREET FROM MANITOBA ROAD
 TO WABAN AVENUE
 SCALE: AS NOTED DATE: 4/20/15





SEQUENCE AND TIMING FOR PEDESTRIAN-ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASHING OPERATION
BEACON STREET	EB	A,B				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FY
BEACON STREET	WB	C				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FY
BEACON STREET	WB	D				R	R	R				R	R	R				GLA	YLA	R				R	R	R	R	R	R	FY
MANITOBA ROAD	NB	E,F				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
ANGIER SCHOOL EXIT DRIVE	SB	G,H,J				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIANS	ALL	P1-P6				DW	DW	DW				DW	DW	DW				DW	DW	DW				DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)												9						10						5									
PASSAGE TIME (VEHICLE)												4						4						4									
MAXIMUM 1												27						27						5									
MAXIMUM 2												27						27						5									
YELLOW CLEARANCE							3						3						3						3								
RED CLEARANCE								3						3						3						3							
WALK (W)																										5							
PEDESTRIAN CLEARANCE																												7	3				
RECALL								SOFT					NONE					SOFT							NONE								
MEMORY								NON-LOCKING					NON-LOCKING					NON-LOCKING							NON-LOCKING								

EMERGENCY ONLY

- NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 MUTCD, AS AMENDED.
 2. STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
 3. 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 WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
 4. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
 5. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
 6. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT SHALL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

COORDINATION DATA
 (ALL ENTRIES IN SECONDS)

CYCLE LENGTH	80 SEC
OFFSET	5
Ø 2	33
Ø 4	21
Ø 6	33
Ø 8	11
Ø 9	15
COORDINATED PHASE	Ø 6

NOTES:

1. OFFSET: BEGINNING OF Ø6 GREEN.
2. PLAN FORCE OFF SHALL BE IN EFFECT.
3. SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
4. INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.

EMERGENCY PRE-EMPTION DATA

APPROACH	PREEMPTION PHASE	DETECTOR
BEACON ST EASTBOUND	2	OP1
BEACON ST WESTBOUND	6	OP2
SCHOOL DRIVE SOUTHBOUND	4	OP4
MANITOBA ROAD NORTHBOUND	8	OP3

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY CITY PRIOR TO OPERATION.

MAJOR ITEMS REQUIRED

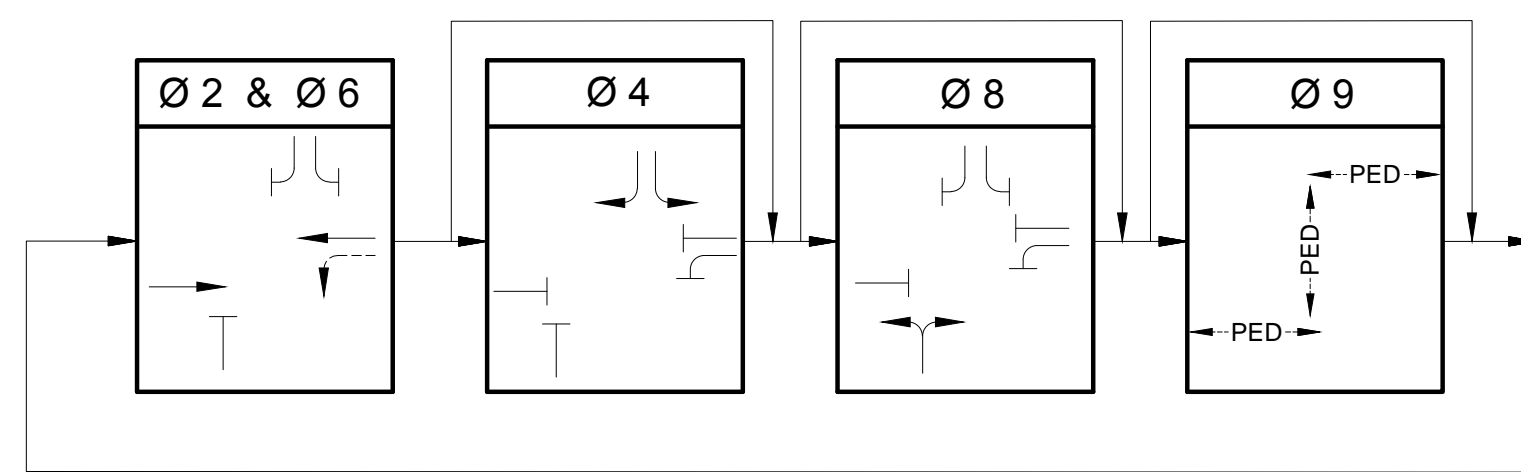
PAY ITEM	QUANTITY	ITEM
	1	CONTROLLER NEMA 8 PHASE TS2-TYPE 1, CAB.& FDN.
	1	SERVICE CONNECTION, TYPE OVERHEAD
	3	8' POLE, BASE, & FDN. (EXCLUSIVELY PED)
	2	10' POLE, BASE, & FDN.
	1	14' POLE, BASE, & FDN.
	1	30 FT MAST ARM ASSEMBLY, BASE & FDN.
	6	1 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.)
	1	2 WAY, 3/5 SECTION, SIGNAL HOUSING (12" L.E.D.)
	6	PEDESTRIAN HOUSING (16" COUNTDOWN L.E.D.)
	6	APS PEDESTRIAN PUSH BUTTON, SIGN & SADDLES
816.01	5	VIDEO DETECTOR CAMERA (1 SPARE)
	1	9" VIDEO MONITOR
	2	4 CHANNEL VIDEO INPUT PROCESSOR (1 SPARE)
	4	PRE-EMPTION RECEIVER-SINGLE CHANNEL
	2	PRE-EMPTION PHASE SELECTOR MODULE-DUAL CHANNEL
	1	PRE-EMPTION CARD RACK
	1	PRE-EMPTION CONFIRMATION STROBE (WHITE)
	1	SPREAD SPECTRUM RADIO
	1	SPREAD SPECTRUM YAGI ANTENNA AND CABLE
	1	REMOVE AND STACK EXISTING TRAFFIC SIGNALS
804.3	284	3 IN. ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)
811.22	3	ELECTRIC HANDHOLE - SD2.022
811.31	6	12" X 12" PULL BOX - SD.031
		PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.

VIDEO DETECTOR DATA

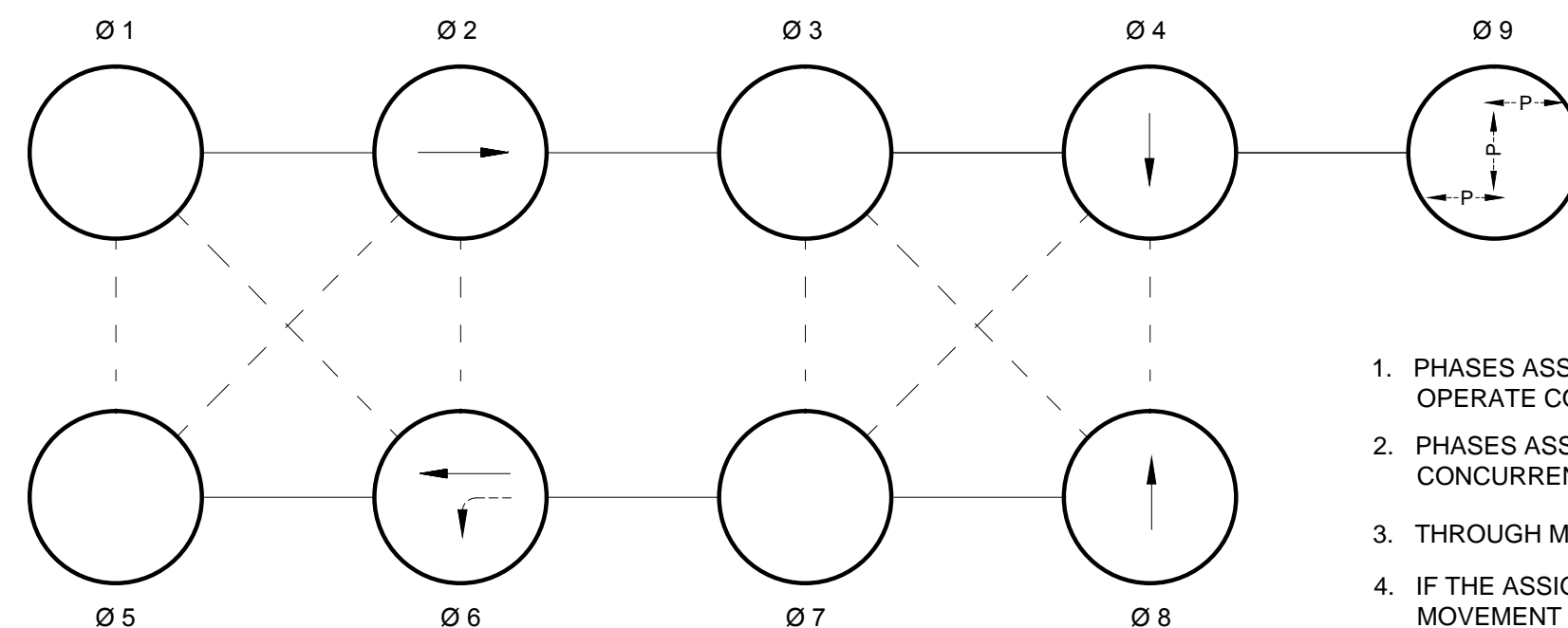
DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED TIME IN SEC.

DETECTOR NUMBER	CAMERA NUMBER	CHANNEL NUMBER	DETECTION ZONE	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRE.	DELAY TIME	EXT. TIME
1	V1	1	2 @ 6'x20'	2	2	B	-	-
2	V2	2	2 @ 6'x20'	6	6	B	-	-
3	V2	1	2 @ 6'x20'	6	6	B	-	-
4	V4	2	1 @ 6'x16'	4	4	B	-	-
5	V4	1	1 @ 6'x16'	4	4	B	-	-
6	V4	1	1 @ 6'x16'	4	4	B	-	-
7	V4	2	1 @ 6'x16'	4	4	B	-	-
8	V3	1	2 @ 6'x20'	8	8	B	-	-

PREFERENTIAL PHASING SEQUENCE

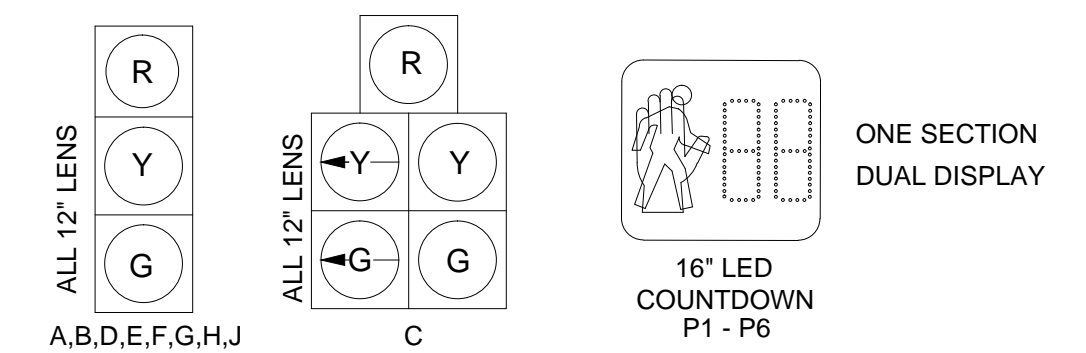


NEMA DUAL RING PHASING NOTES:



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:

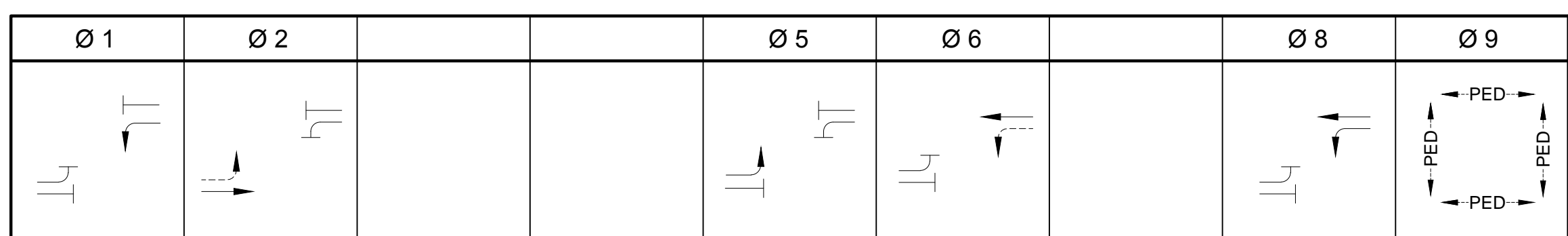
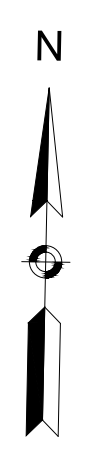
1. ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
2. ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES W/ 2" REFLECTIVE BORDER

CITY OF NEWTON
 MASSACHUSETTS
 PRELIMINARY PLAN

FOR THE
 PROPOSED ROADWAY CONSTRUCTION
 OF
 BEACON STREET FROM MANITOBA ROAD
 TO WABAN STATION

SCALE: AS NOTED

DATE: 4/20/15



SEQUENCE AND TIMING FOR PEDESTRIAN-ACTUATED CONTROL (COORDINATED)																															
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASHING OPERATION	
BEACON STREET	EB	K	R	R	R	G	Y	R								GLA	YLA	R	R	R	R				R	R	R	R	R	R	FY
BEACON STREET	EB	L	R	R	R	GLA	YLA	R								R	R	R	R	R	R				R	R	R	R	R	R	FY
BEACON STREET	WB	M	GLA	YLA	R	R	R	R								R	R	R	G	Y	R				G/GLA	Y/YLA	R	R	R	R	FY
BEACON STREET	WB	N	R	R	R	R	R	R								R	R	R	G	Y	R										FY
PEDESTRIANS	ALL	P7-P14	DW	DW	DW	DW	DW	DW								DW	DW	DW	DW	DW	DW				DW	DW	DW	W	FDW	DW	OFF
TIMING IN SECONDS																															
MINIMUM GREEN (INITIAL)			5			10										5			10						9			12			
PASSAGE TIME (VEHICLE)			3			4										3			4						3			0			
MAXIMUM 1			5			38										5			38						12			12			
MAXIMUM 2			5			38										5			38						12			12			
YELLOW CLEARANCE				3				3									3			3						3			3		
RED CLEARANCE					1				1									1			1						1			1	
WALK (W)																												5			
PEDESTRIAN CLEARANCE																													8	3	
RECALL			NONE		SOFT				NONE		SOFT				NONE		NONE						NONE		NONE						
MEMORY			NON-LOCKING		NON-LOCKING				NON-LOCKING		NON-LOCKING				NON-LOCKING		NON-LOCKING						NON-LOCKING		NON-LOCKING						

- NOTES:
- OPERATES ON SINGLE CONTROLLER WITH BEACON STREET AT COLLINS ROAD INTERSECTION. SEE ADDITIONAL DATA ON SHEET 4.
 - AUTOMATIC FLASHING OPERATION PER 2009 MUTCD, AS AMENDED.
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
 - 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 WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
 - THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
 - IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
 - IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT SHALL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

COORDINATION DATA
(ALL ENTRIES IN SECONDS)

CYCLE LENGTH	80 SEC
OFFSET	0
Ø 1	9
Ø 2	42
Ø 5	9
Ø 6	42
Ø 8	16
Ø 9	16
COORDINATED PHASE	Ø 6

- NOTES:
- OFFSET: BEGINNING OF Ø6 GREEN.
 - PLAN FORCE OFF SHALL BE IN EFFECT.
 - SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
 - INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.

EMERGENCY PRE-EMPTION DATA

APPROACH	PREEMPTION PHASE	DETECTOR
BEACON ST EASTBOUND	2	OP5
BEACON ST WESTBOUND	6	OP6

- EMERGENCY VEHICLE PREEMPTION OPERATION:
- EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
 - PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
 - IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
 - PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
 - NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
 - ACTUAL TIMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY CITY PRIOR TO OPERATION.

MAJOR ITEMS REQUIRED (WABAN AVENUE AND COLLINS ROAD)

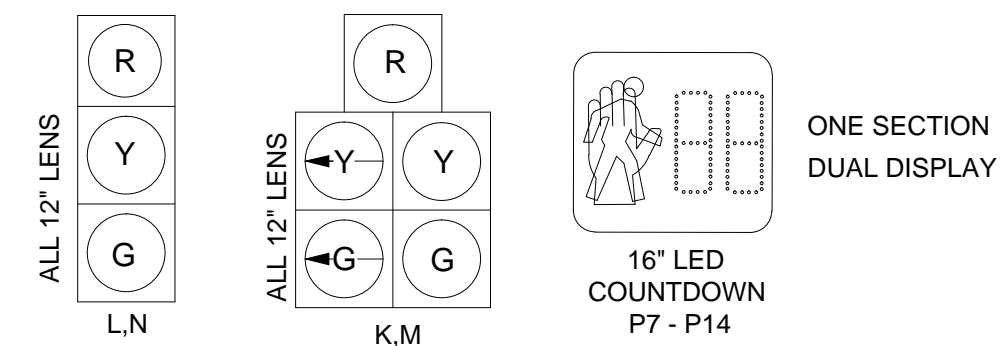
PAY ITEM	QUANTITY	ITEM
	1	CONTROLLER NEMA 8 PHASE TS2-TYPE 1, CAB.& FDN.
	1	SERVICE CONNECTION, TYPE UNDERGROUND
	9	8' POLE, BASE, & FDN.
	2	10' POLE, BASE, & FDN.
	1	25 FT MAST ARM ASSEMBLY, BASE & FDN.
	1	35 FT MAST ARM ASSEMBLY, BASE & FDN.
	6	1 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.)
	1	2 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.)
	1	2 WAY, 5 SECTION, SIGNAL HOUSING (12" L.E.D.)
	10	PEDESTRIAN HOUSING (16" COUNTDOWN L.E.D.)
	10	APS PEDESTRIAN PUSH BUTTON, SIGN & SADDLES
	3	VIDEO DETECTOR CAMERA (1 SPARE)
	1	9" VIDEO MONITOR
	5	4 CHANNEL VIDEO INPUT PROCESSOR (1 SPARE)
	5	PRE-EMPTION RECEIVER-SINGLE CHANNEL
	2	PRE-EMPTION PHASE SELECTOR MODULE-DUAL CHANNEL
	1	PRE-EMPTION CARD RACK
	1	PRE-EMPTION CONFIRMATION STROBE (WHITE)
	1	SPREAD SPECTRUM RADIO
	1	SPREAD SPECTRUM OMNIDIRECTIONAL ANTENNA AND CABLE
	1	SPREAD SPECTRUM YAGI ANTENNA AND CABLE
	1	REMOVE AND STACK EXISTING TRAFFIC SIGNALS
804.3	665	3 IN. ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)
811.22	2	ELECTRIC HANDHOLE - SD2.022
811.31	8	12" X 12" PULL BOX - SD.031
PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.		

VIDEO DETECTOR DATA

DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED TIME IN SEC.

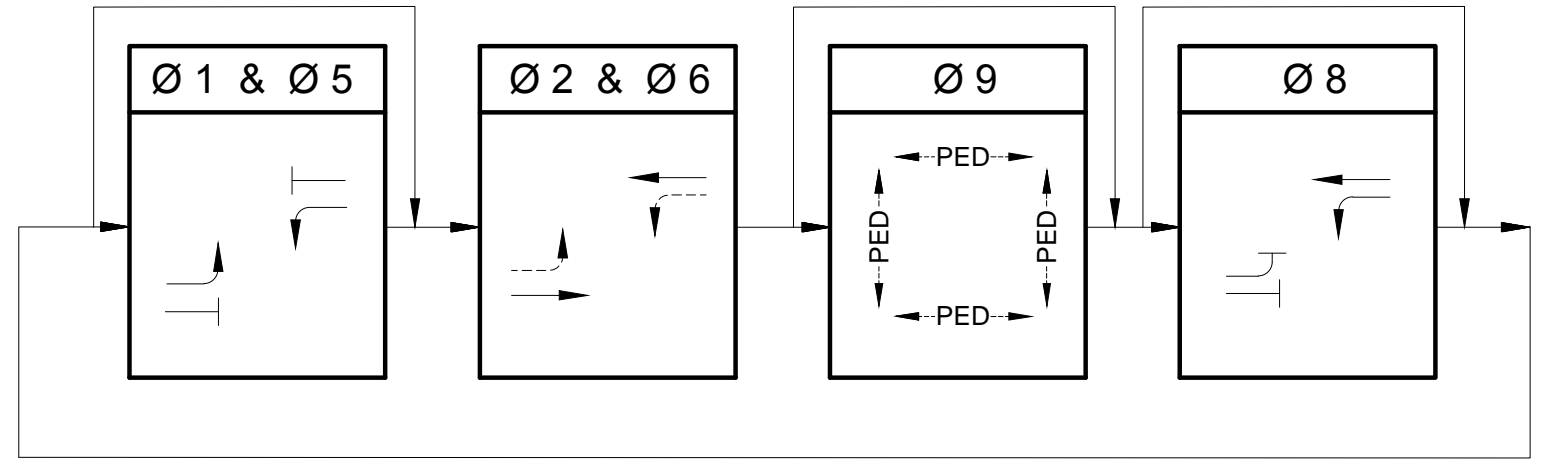
DETECTOR NUMBER	CAMERA NUMBER	CHANNEL NUMBER	DETECTION ZONE	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
9	V5	1	2 @ 6'x20'	2	2	B	-	-
10	V5	2	2 @ 6'x20'	5	5	B	-	-
11	V6	1	2 @ 6'x20'	6	6	B	-	-
12	V6	2	2 @ 6'x20'	1	1	B	-	-

SIGNAL IDENTIFICATION

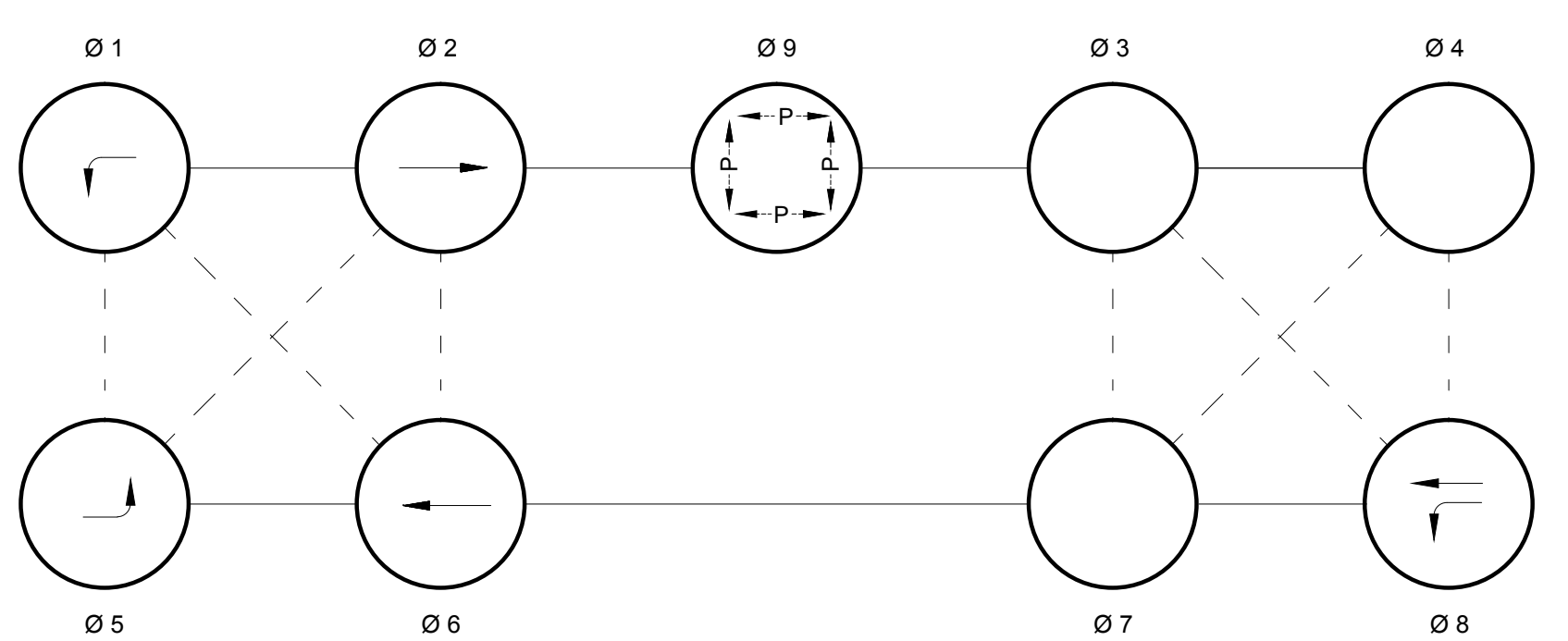


- NOTES:
- ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
 - ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES W/ 2" REFLECTIVE BORDER
 - SIGNAL HEADS M AND N SHALL HAVE A LOUVERED GREEN BALL.

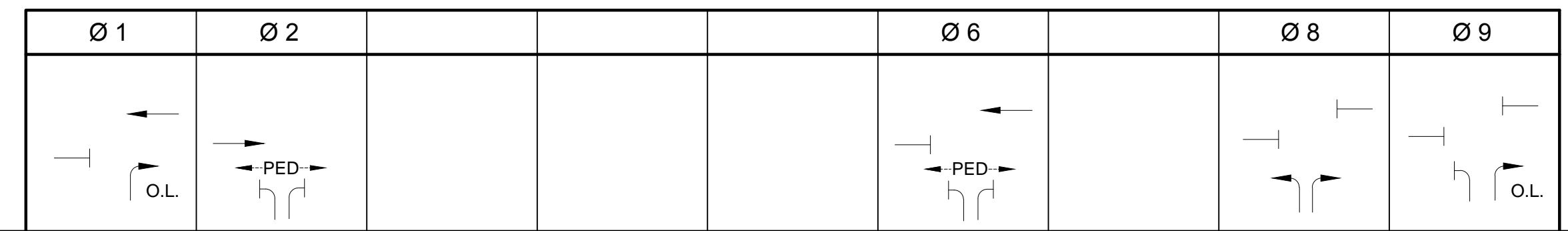
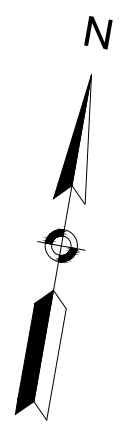
PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



- PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
- PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
- THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
- 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.



SEQUENCE AND TIMING FOR PEDESTRIAN-ACTUATED CONTROL (COORDINATED)

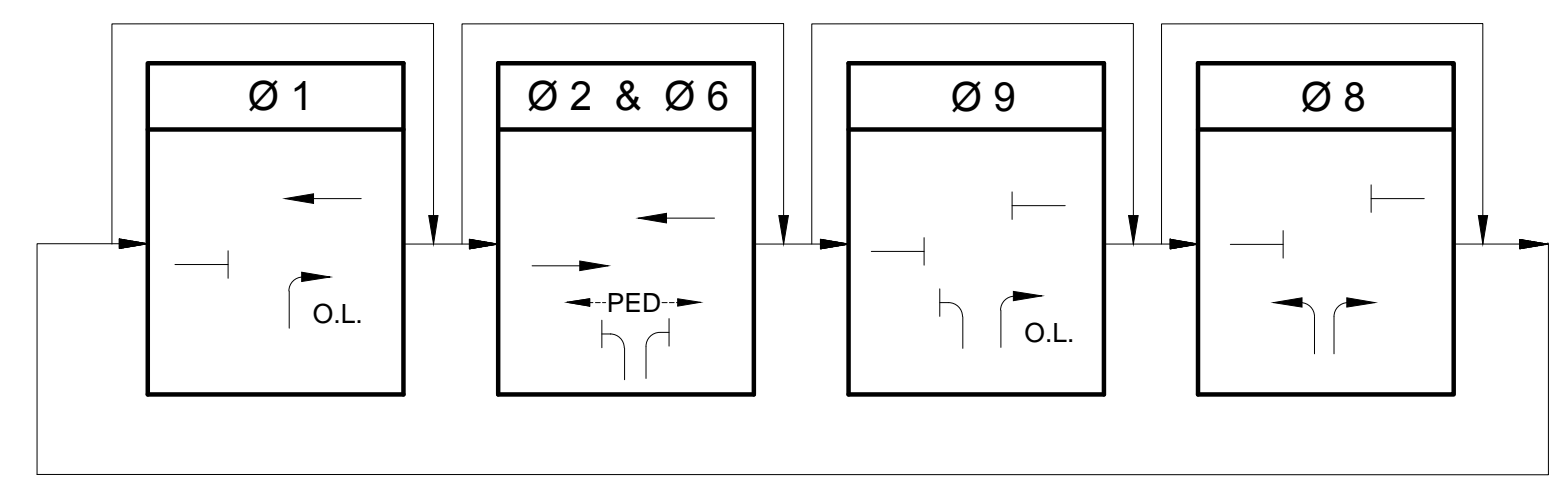
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASHING OPERATION	
BEACON STREET	EB	P,Q	R	R	R	G	Y	R											R	R	R				R	R	R	R	R	R	FY
BEACON STREET	WB	R,S	G	Y	R	G	Y	R											G	Y	R				R	R	R	R	R	R	FY
COLLINS ROAD	NB	T	RLA	RLA	RLA	RLA	RLA	RLA											RLA	RLA	RLA				GLA	YLA*	RLA*	RLA	RLA	RLA	FR
COLLINS ROAD	NB	U	RRA	RRA	RRA	RRA	RRA	RRA											RRA	RRA	RRA				GRA	YRA	RRA	GRA	YRA	RRA	FR
PEDESTRIANS	EB-WB	P15-P16	DW	DW	DW	W	FDW	DW											DW	DW	DW				DW	DW	DW	DW	DW	DW	OFF

TIMING IN SECONDS

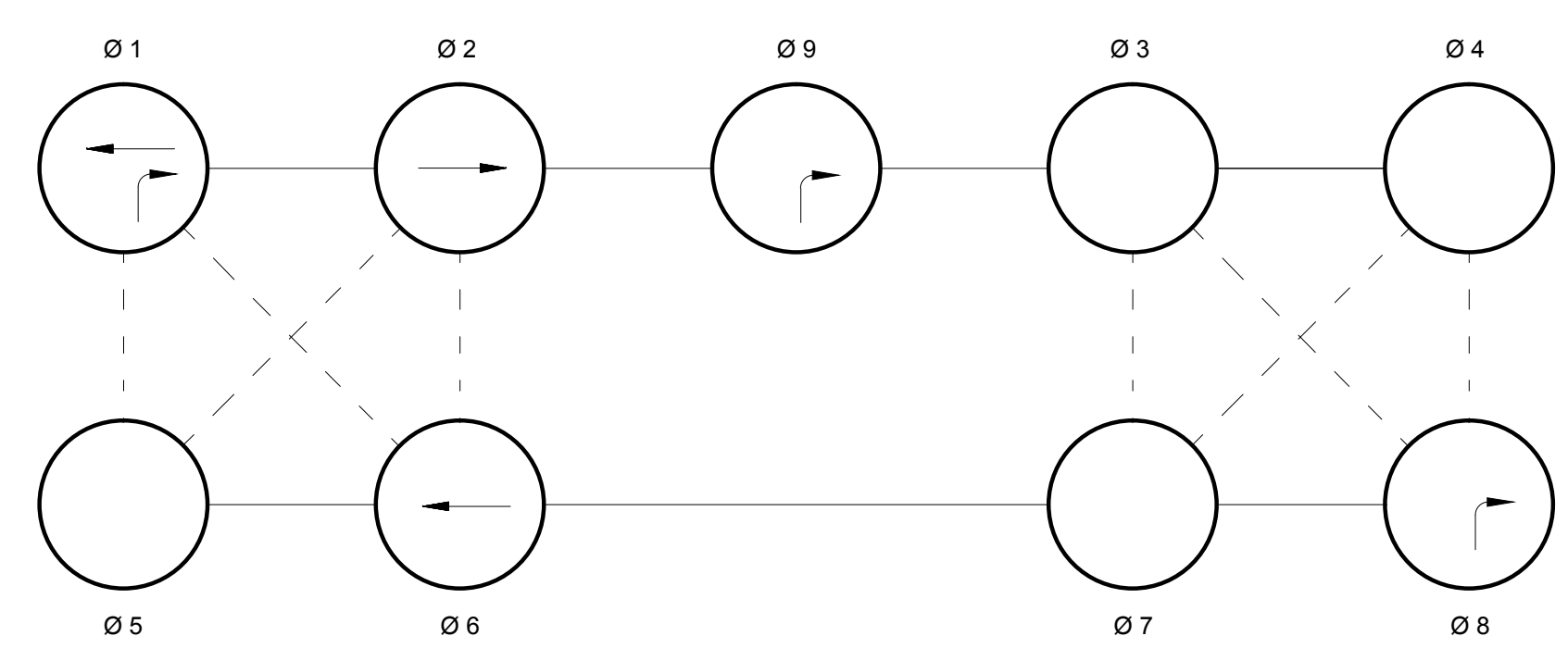
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	EMERGENCY ONLY		
MINIMUM GREEN (INITIAL)			5			10												10						9			12			
PASSAGE TIME (VEHICLE)			3			4												4						3			0			
MAXIMUM 1			5			38												38						12			12			
MAXIMUM 2			5			38												38						12			12			
YELLOW CLEARANCE				3			3												3					3			3			
RED CLEARANCE					1			1												1					1			1		
WALK (W)						5												5						5			8	3		
PEDESTRIAN CLEARANCE							7	3										7	3											
RECALL			NONE		SOFT												SOFT						NONE		NONE					
MEMORY			NON-LOCKING		NON-LOCKING												NON-LOCKING						NON-LOCKING		NON-LOCKING					

- NOTES:
- OPERATES ON SINGLE CONTROLLER WITH BEACON STREET AT WABAN AVENUE INTERSECTION. SEE ADDITIONAL DATA ON SHEET 3.
 - AUTOMATIC FLASHING OPERATION PER 2009 MUTCD, AS AMENDED.
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
 - 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 WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
 - THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
 - IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
 - IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT SHALL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



- PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
- PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
- THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
- 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.

COORDINATION DATA
(ALL ENTRIES IN SECONDS)

CYCLE LENGTH	80 SEC
OFFSET	0
Ø 1	9
Ø 2	42
Ø 6	42
Ø 8	16
Ø 9	16

- NOTES:
- OFFSET: BEGINNING OF Ø 6 GREEN.
 - PLAN FORCE OFF SHALL BE IN EFFECT.
 - SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
 - INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.

MAJOR ITEMS REQUIRED

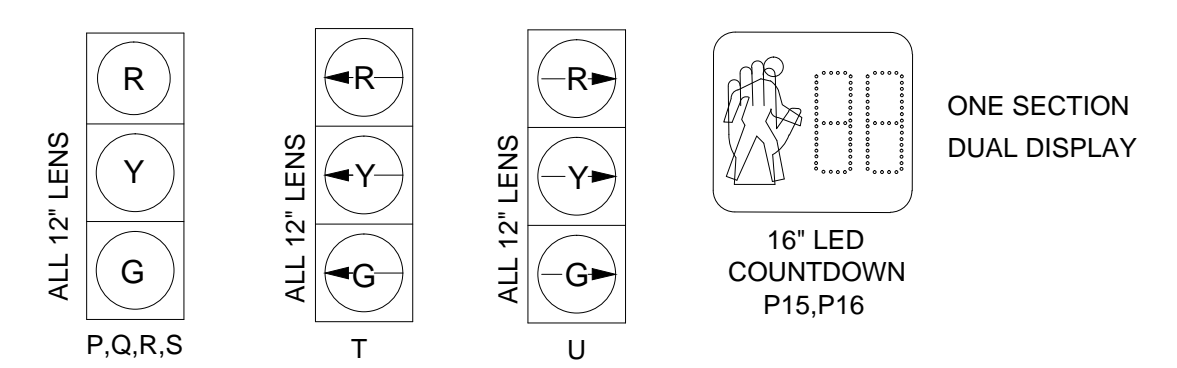
(SEE SHEET 3)

VIDEO DETECTOR DATA

DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED TIME IN SEC.

DETECTOR NUMBER	CAMERA NUMBER	CHANNEL NUMBER	DETECTION ZONE	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
Ø 13	V7	1	2 @ 6'x20'	2	2	B	-	-
Ø 14	V8	2	2 @ 6'x20'	6	6	B	-	-
Ø 15	V8	1	2 @ 6'x20'	1	1	B	-	-
Ø 16	V9	2	2 @ 6'x20'	8	8	B	-	-
Ø 17	V9	1	2 @ 6'x20'	8	8	B	-	-

SIGNAL IDENTIFICATION



- NOTES:
- ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
 - ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES W/ 2" REFLECTIVE BORDER
 - SIGNAL HEADS P AND Q SHALL HAVE A LOUVERED GREEN BALL.

EMERGENCY PRE-EMPTION DATA

APPROACH	PREEMPTION PHASE	DETECTOR
BEACON ST EASTBOUND	2	OP7
BEACON ST WESTBOUND	6	OP8
COLLINS ROAD NORTHBOUND	8	OP9

EMERGENCY VEHICLE PREEMPTION OPERATION:

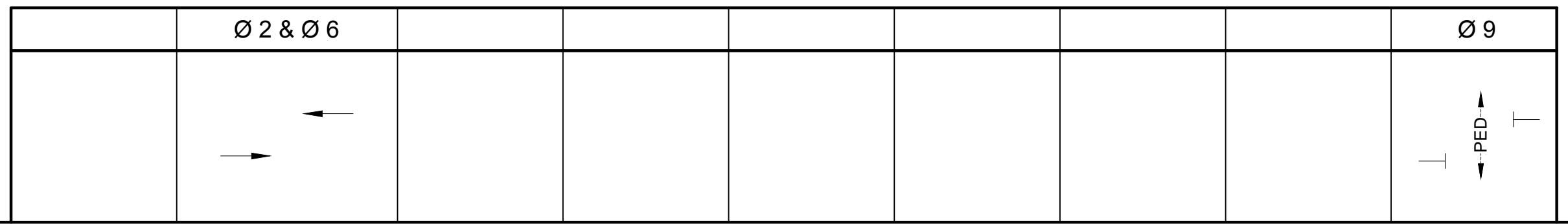
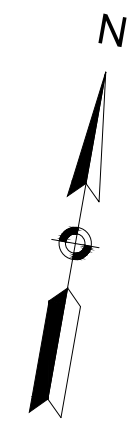
- EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
- PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
- IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
- PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
- NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
- ACTUAL TIMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY CITY PRIOR TO OPERATION.

CITY OF NEWTON
MASSACHUSETTS
PRELIMINARY PLAN
FOR THE
PROPOSED ROADWAY CONSTRUCTION
OF
BEACON STREET FROM MANITOBA ROAD
TO WABAN STATION
SCALE: AS NOTED DATE: 4/20/15



CITY OF NEWTON
MASSACHUSETTS

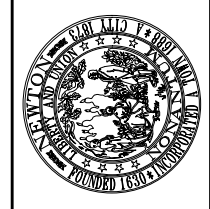
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:



SEQUENCE AND TIMING FOR PEDESTRIAN-ACTUATED CONTROL (ISOLATED)																															
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	FLASHING OPERATION
BEACON STREET	EB	V,W				OFF	FY	Y	R																		R	AR	AR	OFF	
BEACON STREET	WB	X,Y				OFF	FY	Y	R																		R	AR	AR	OFF	
PEDESTRIANS	NB-SB	P17-P18				DW	DW	DW	DW																		W	FDW	DW	OFF	
TIMING IN SECONDS																															
MINIMUM GREEN (INITIAL)						20																									
PASSAGE TIME (VEHICLE)																															
MAXIMUM 1																															
MAXIMUM 2																															
YELLOW CLEARANCE							3	3																							
RED CLEARANCE									1																						
WALK (W)																											5				
PEDESTRIAN CLEARANCE																												9	3		
RECALL									SOFT																					NONE	
MEMORY									NON-LOCKING																					NON-LOCKING	

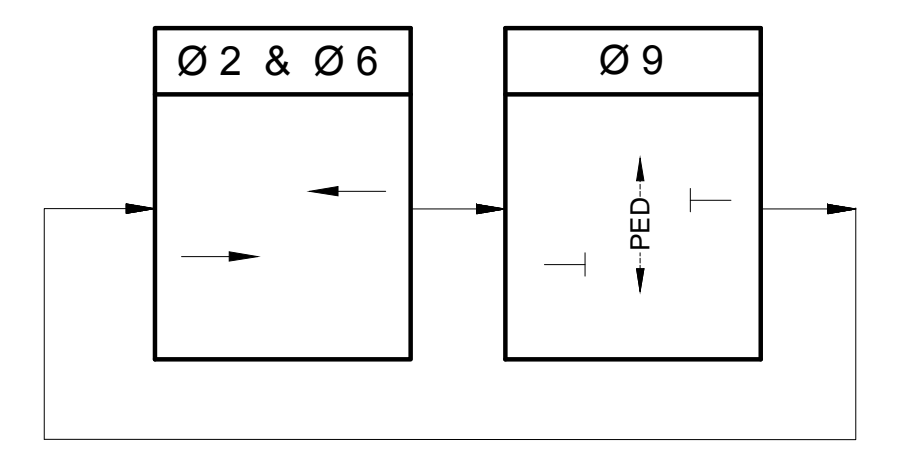
NOTES: 1. AUTOMATIC FLASHING OPERATION PER 2009 MUTCD, AS AMENDED.
2. STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
AR = ALTERNATING RED

MAJOR ITEMS REQUIRED		
PAY ITEM	QUANTITY	ITEM
	1	CONTROLLER NEMA 8 PHASE TS2-TYPE 1
	1	SERVICE CONNECTION, TYPE UNDERGROUND
	2	20 FT MAST ARM ASSEMBLY, BASE & FDN.
	4	1 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.) - HAWK BEACON
	2	PEDESTRIAN HOUSING (16" COUNTDOWN L.E.D.)
	2	APS PEDESTRIAN PUSH BUTTON, SIGN & SADDLES
	2	PRE-EMPTION RECEIVER-SINGLE CHANNEL
	2	PRE-EMPTION PHASE SELECTOR MODULE-DUAL CHANNEL
	1	PRE-EMPTION CARD RACK
816.03	1	PRE-EMPTION CONFIRMATION STROBE (WHITE)
	1	REMOVE AND STACK EXISTING TRAFFIC SIGNALS
804.3	68	3 IN. ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)
811.31	2	12" X 12" PULL BOX - SD.031
PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.		

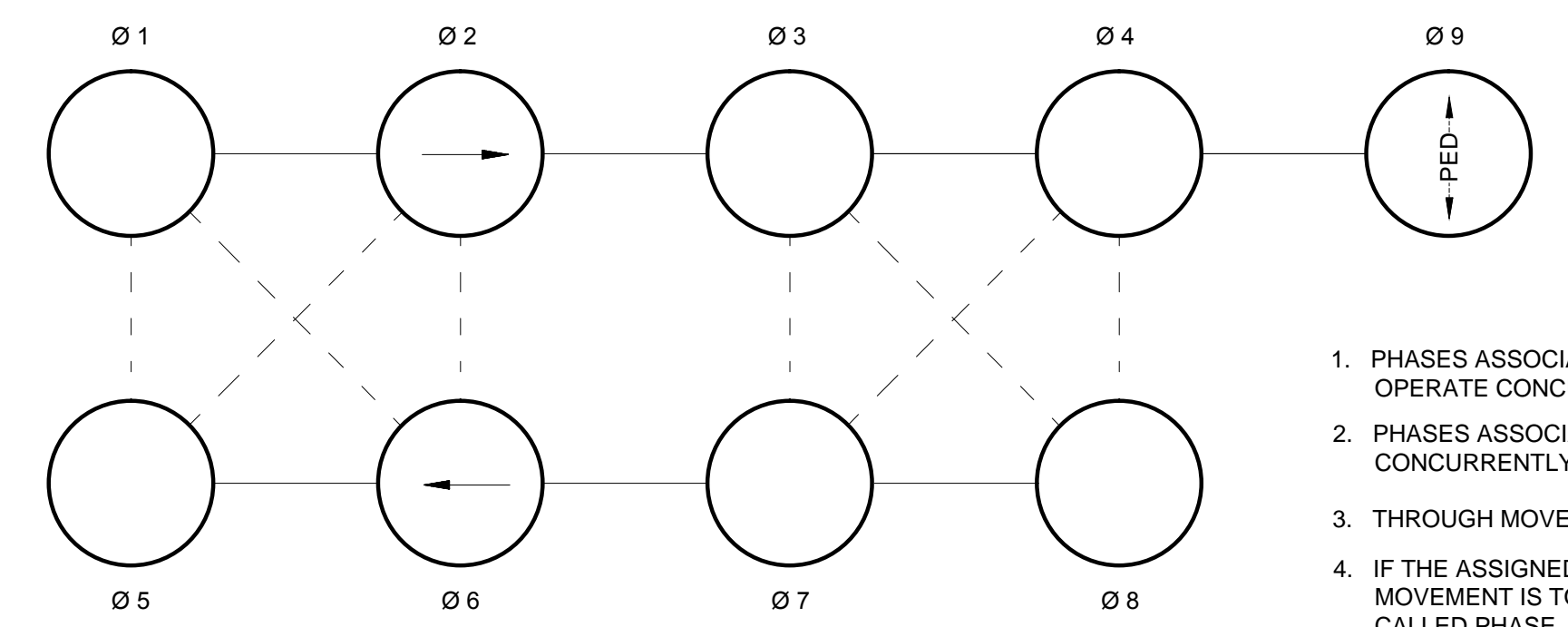


CITY OF NEWTON
MASSACHUSETTS

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



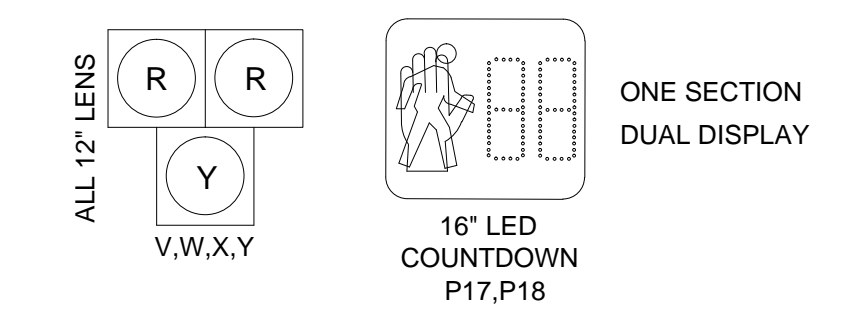
- PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
- PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
- THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS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

EMERGENCY PRE-EMPTION DATA

APPROACH	PREEMPTION PHASE	DETECTOR
BEACON ST EASTBOUND	2	OP10
BEACON ST WESTBOUND	6	OP11

- EMERGENCY VEHICLE PREEMPTION OPERATION:
- EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
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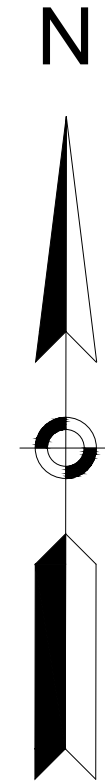
SIGNAL IDENTIFICATION



- NOTES:
- ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
 - ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES W/ 2" REFLECTIVE BORDER

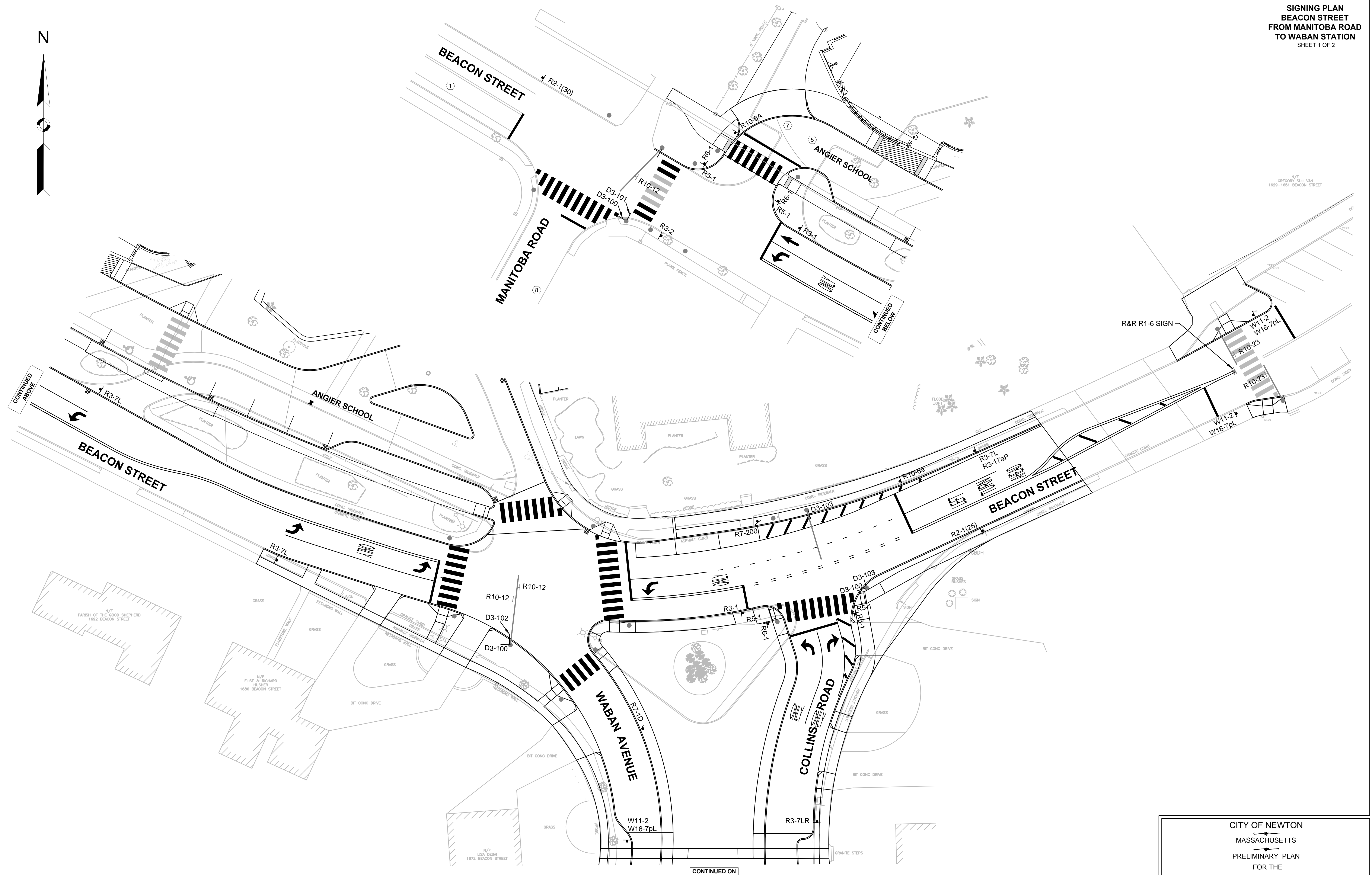
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DRAWN BY:
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APPROVED BY:

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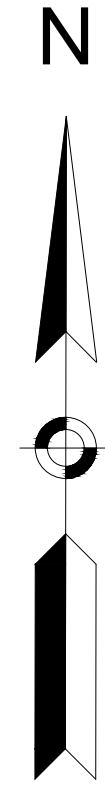
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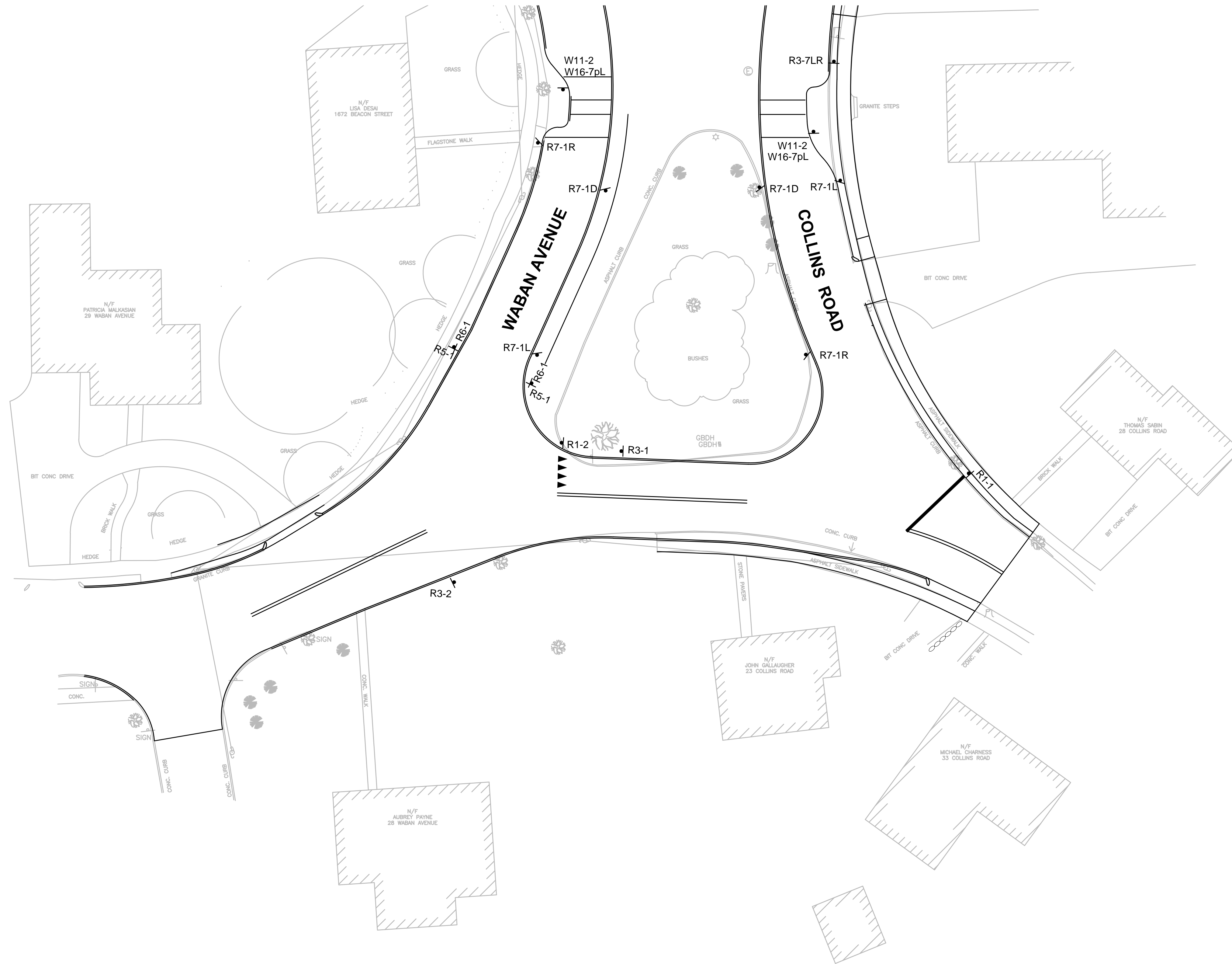


CONTINUED ON
 SHEET 2 OF 2

CITY OF NEWTON
 MASSACHUSETTS
 PRELIMINARY PLAN
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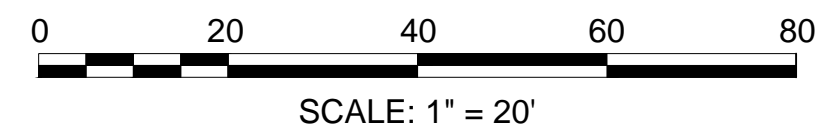


CONTINUED ON
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TRAFFIC SIGN SUMMARY

SIGN ID NUMBER	SIZE		MESSAGE	DIMENSIONS (IN)			NUMBER REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D3-100	VARIES	12		4D / 3D 3D / 2.25D	3" 3"	N/A	3	GREEN	WHITE	WHITE	P5 (48)	EACH	EACH
D3-101	VARIES	12		4D / 3D 3D / 2.25D	3" 3"	N/A	1	GREEN	WHITE	WHITE	MAST ARM POLE MOUNT (18)	EACH	EACH
D3-102	VARIES	12		4D / 3D 3D / 2.25D	3" 3"	N/A	1	GREEN	WHITE	WHITE	P5 (1)	EACH	EACH
D3-103	VARIES	12		4D / 3D 3D / 2.25D	3" 3"	N/A	1	GREEN	WHITE	WHITE	P5 (1)	EACH	EACH
R1-1	30	30		1	1	1	1	RED	WHITE	WHITE	P5 (1)	6.25	6.25
R1-2	36x36x36						1	WHITE	RED	WHITE	P5 (1)	8.30	8.30
R2-1 (25)	24	30					1	WHITE	BLACK	BLACK	P5 (1)	5.00	5.00
R2-1(30)	24	30					1	WHITE	BLACK	BLACK	P5 (1)	5.00	5.00
R3-1	24	24					3	WHITE	RED BLACK	BLACK	P5 (3)	4.00	12.00
R3-2	24	24					2	WHITE	RED BLACK	BLACK	P5 (2)	4.00	8.00
R3-7L	30	30					3	WHITE	BLACK	BLACK	P5 (3)	6.25	18.75
R3-7LR	30	30		2	2	2	1	WHITE	BLACK	BLACK	P5 (1)	6.25	6.25
R3-17aP	30	12		1	1	1	1	WHITE	BLACK	BLACK	MOUNT (1) W/ R3-7L	2.50	2.50

PBS = PRINTED BOTH SIDES
 * BASED ON MUTCD STANDARD SIGN R3-8 DIMENSIONS

TRAFFIC SIGN SUMMARY (CONTINUED)

SIGN ID NUMBER	SIZE		MESSAGE	DIMENSIONS (IN)			NUMBER REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
R5-1	30	30		1	1	1	6	WHITE	RED WHITE	N/A	P5 (6)	6.25	37.50
R6-1	36	12					6	WHITE	BLACK	WHITE	MOUNT (6) W/ R3-7L	3.00	18.00
R7-1D	12	18					3	WHITE	RED	RED	P5 (3)	1.50	4.50
R7-1L	12	18					2	WHITE	RED	RED	P5 (2)	1.50	6.00
R7-1R	12	18					2	WHITE	RED	RED	P5 (2)	1.50	3.00
R7-200	24	18					1	WHITE	GREEN/ RED	GREEN/ RED	P5 (1)	3.00	3.00
R10-6a	24	30					2	WHITE	BLACK	BLACK	P5 (2)	5.00	10.00
R10-12	24	30					3	WHITE	BLACK GREEN	BLACK	MOUNT (3) ON MAST ARM	5.00	15.00
R10-23	24	30					2	WHITE	BLACK RED	BLACK	MOUNT (2) ON MAST ARM	5.00	10.00
W11-2	30	30					3	YELLOW	BLACK	BLACK	P5 (3)	6.25	18.75
W16-7pL	24	12					3	YELLOW	BLACK	BLACK	MOUNT (3) W/ W11-2	2.00	6.00

SIGN SUMMARY NOTES:

1. NUMERICAL LIMITS AND JUSTIFICATION FOR SPEED & ADVISORY EXIT SPEED SIGNS SHALL BE OBTAINED FROM THE SPEED ZONING UNIT OF THE TRAFFIC ENGINEERING SECTION, MASSDOT, BEFORE FABRICATION AND/OR ERECTION.
2. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2009 EDITION, THE 1996 MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AND ALL ADMENDMENTS WILL GOVERN.
3. ① SEE MUTCD 2009 EDITION, 1979 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.
 ② SEE MASSDOT SIGN STANDARDS.



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