

- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.

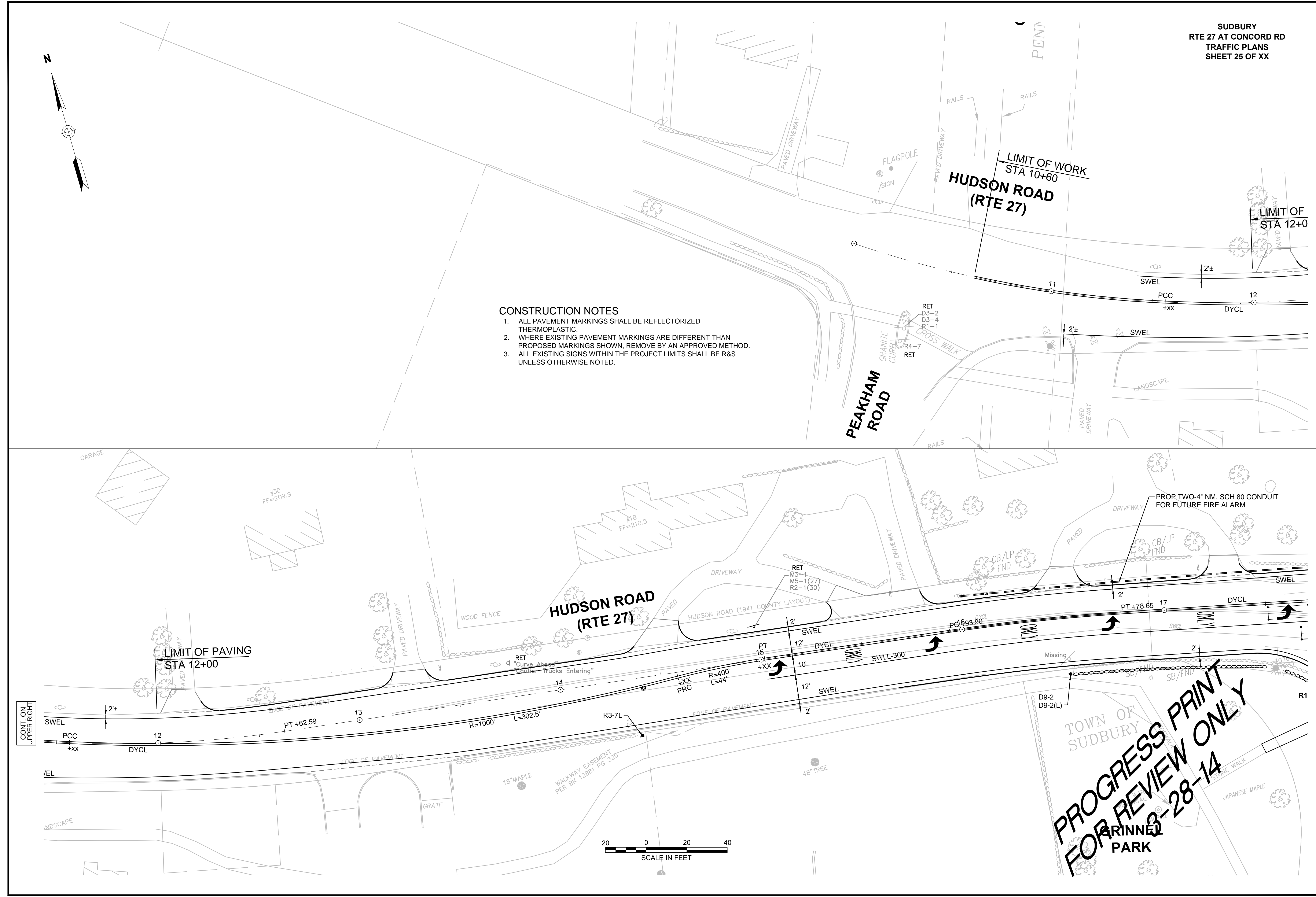
LIMIT OF WORK
 STA 10+60
**HUDSON ROAD
 (RTE 27)**

LIMIT OF
 STA 12+0

CONT. ON
 LOWER LEFT

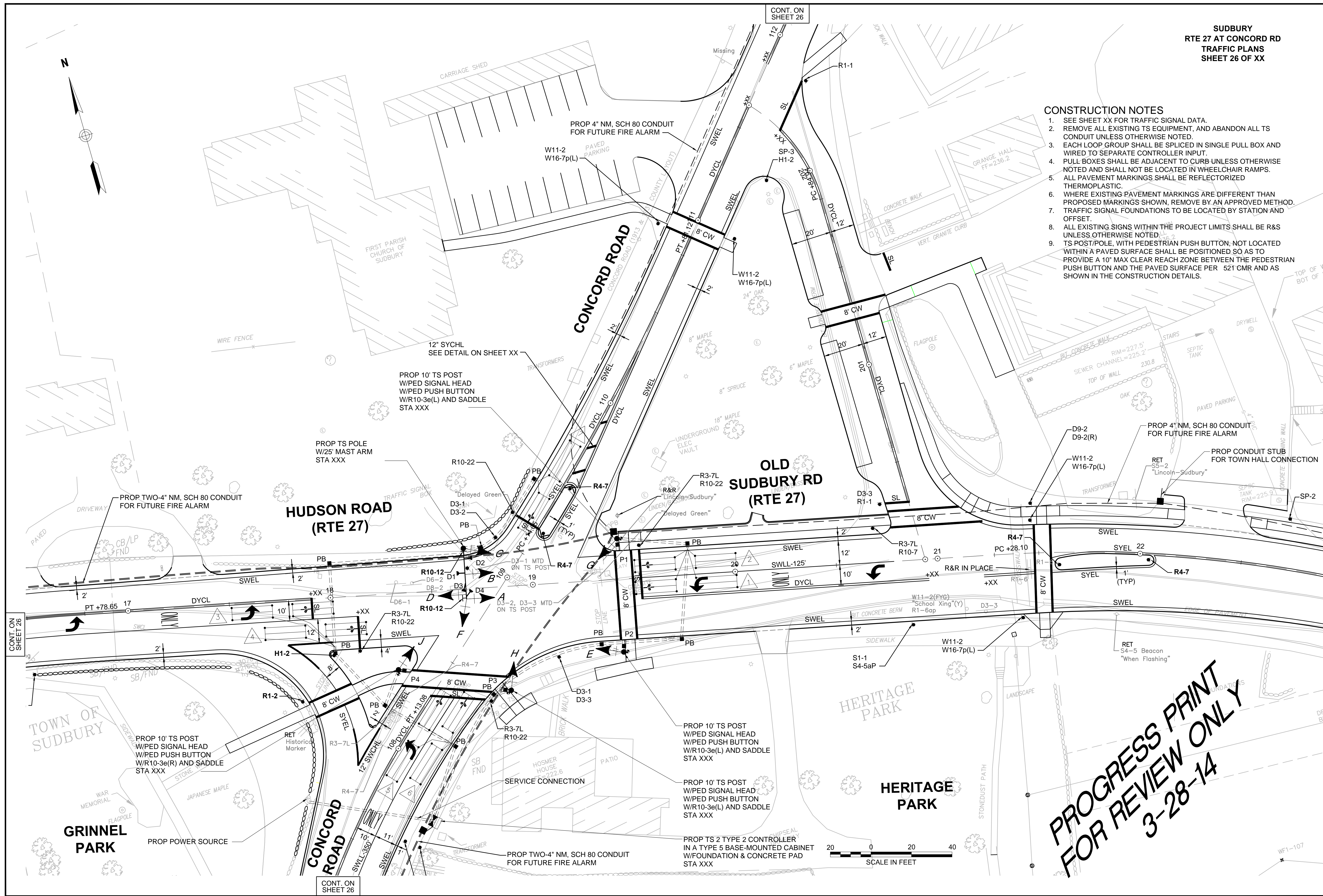
CONT. ON
 SHEET 26

**PROGRESS PRINT
 FOR REVIEW ONLY
 3-28-14**

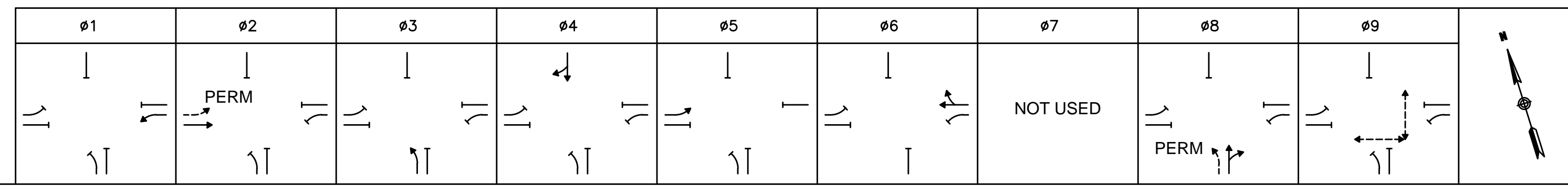


CONSTRUCTION NOTES

1. SEE SHEET XX FOR TRAFFIC SIGNAL DATA.
2. REMOVE ALL EXISTING TS EQUIPMENT, AND ABANDON ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. EACH LOOP GROUP SHALL BE SPLICED IN SINGLE PULL BOX AND WIRED TO SEPARATE CONTROLLER INPUT.
4. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
5. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
6. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
7. TRAFFIC SIGNAL FOUNDATIONS TO BE LOCATED BY STATION AND OFFSET.
8. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
9. TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10' MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS.



**PROGRESS PRINT
 FOR REVIEW ONLY
 3-28-14**



SEQUENCE & TIMING NOTES:

- 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 WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

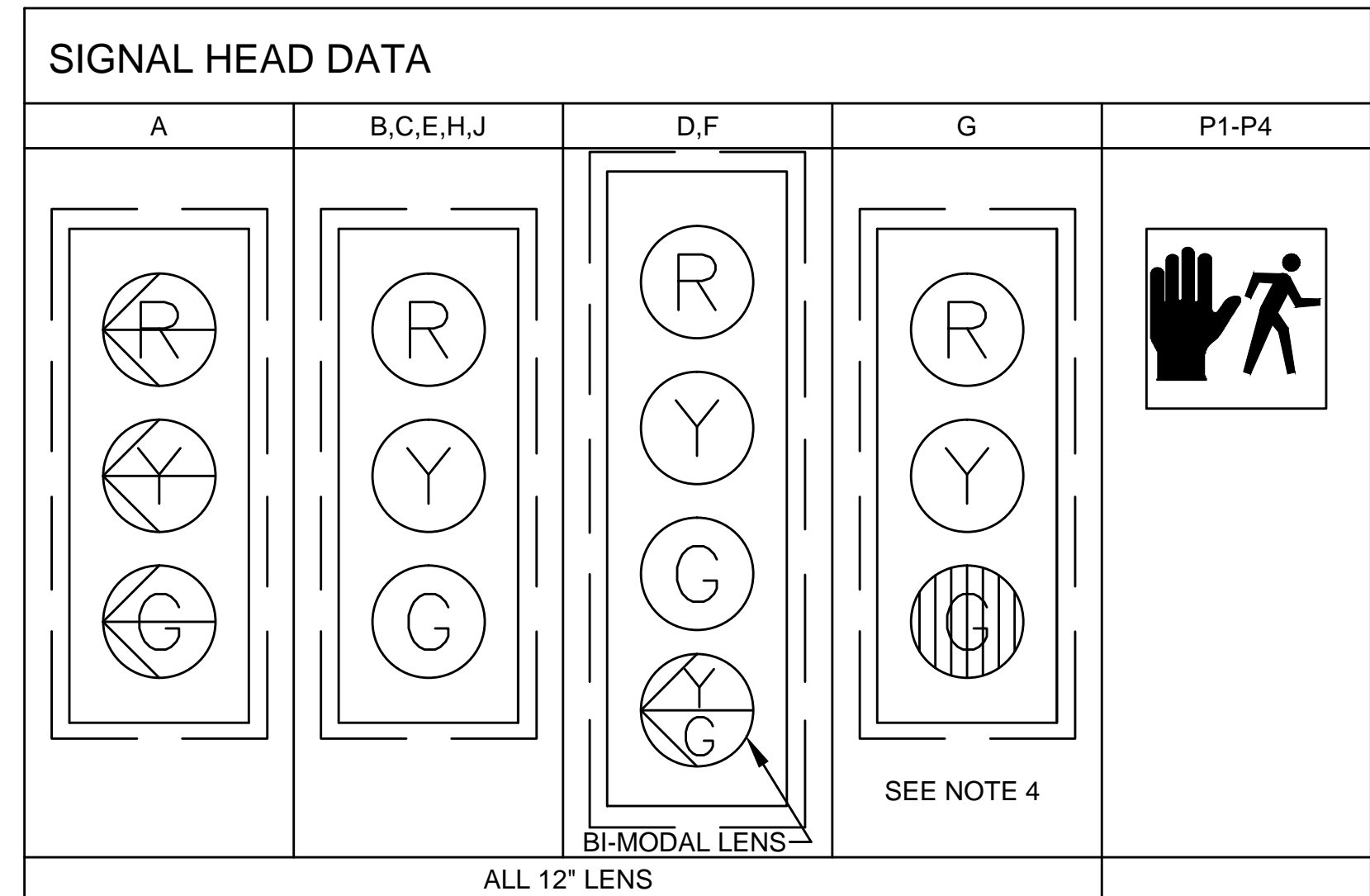
SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (ISOLATED)

APPROACH	DIRECTION	HOUSING	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	FLASH
OLD SUDBURY ROAD	WB	A	←G←	←Y←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←				←R←	←R←	←R←	←R←	←R←	←R←	←R←
OLD SUDBURY ROAD	WB	B,C	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R				R	R	R	R	R	R	FR
HUDSON ROAD	EB	D	R	R	R	G	Y	R	R	R	R	R	R	R	←G←	←Y←	R	R	R	R				R	R	R	R	R	R	FR
HUDSON ROAD	EB	E	R	R	R	G	Y	R	R	R	R	R	R	R	←G←	←Y←	R	R	R	R				R	R	R	R	R	R	FR
CONCORD ROAD	NB	F	R	R	R	R	R	R	←G←	←Y←	R	R	R	R	R	R	R	R	R	R				G	Y	R	R	R	R	FR
CONCORD ROAD	NB	G	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				G	Y	R	R	R	R	FR
CONCORD ROAD	SB	H,J	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN X-ING	NB-SB	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				DW	DW	DW	W/FDW	DW	DW	OUT
PEDESTRIAN X-ING	EB-WB	P3-P4	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				DW	DW	DW	W/FDW	DW	DW	OUT

	TIMING IN SECONDS																													
MINIMUM GREEN (INITIAL)	4			10				6				8													8					
PASSAGE TIME (VEHICLE)	2			2.5				2.5				2													2.5					
MAXIMUM 1	X			X				X				X												X						
MAXIMUM 2	X			X				X				X												X						
YELLOW CLEARANCE		X			X				X				X							X					X				3	
RED CLEARANCE			X				X			X			X			X			X		X				X		X			1
PEDESTRIAN WALK																													7	
PEDESTRIAN CLEARANCE																													12	
DETECTOR MEMORY		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		LOCK		
RECALL		OFF		SOFT		OFF		OFF		OFF		OFF		OFF		SOFT		OFF		OFF		OFF		OFF		OFF		OFF		

COORDINATION DATA			COORDINATION PHASE SPLIT TIMES								
TIMING PLAN	CYCLE	OFFSET	01	02	03	04	05	06	07	08	09
MODE											

- NOTES:
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - * UPON PEDESTRIAN PUSH BUTTON ACTUATION
 - PERM = PERMISSIVE
 - 04 & 08 DUAL ENTRY
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = NOT USED
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
 - DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL NOT BE IN EFFECT.

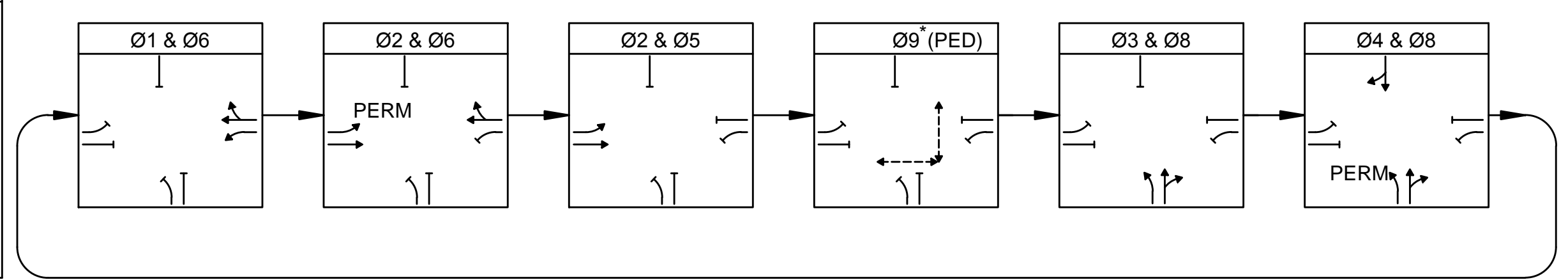


- NOTES:
- ALL SIGNAL HEADS SHALL BE RIGID MOUNTED.
 - ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"± LOUVERED BACKPLATES. ALL BACKPLATES SHALL CONTAIN A 2" WIDE YELLOW REFLECTIVE BORDER.
 - ALL SIGNAL HEADS SHALL BE EQUIPPED WITH TUNNEL VISORS.
 - SIGNAL HEAD G SHALL BE EQUIPPED WITH GEOMETRICALLY PROGRAMMABLE LOUVERS IN THE GREEN INDICATION, SET TO A 42° VIEW ANGLE.
 - ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

LOOP DETECTOR DATA						
DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	2 SEC DELAY	01	SERIES
2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	06	SERIES
3	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	2 SEC DELAY	05 (SEE NOTE 2)	SERIES
4	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	02	SERIES
5	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	2 SEC DELAY	03 (SEE NOTE 3)	SERIES
6	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	08	SERIES
7	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	04	SERIES

- NOTES:
- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY
 - LOOP GROUP 3 SHALL CALL/EXTEND 02, THEN SWITCH TO CALL/EXTEND 05.
 - LOOP GROUP 5 SHALL CALL/EXTEND 03, THEN SWITCH TO CALL/EXTEND 08.

PREFERENTIAL PHASE SEQUENCE



* UPON PEDESTRIAN PUSH BUTTON ACTUATION

PRE-EMPTION PHASING & PRIORITY			
DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1	↔	02&05
D2	2	↔	01&06
D3	3	↔	03&08
D4	4	↔	04

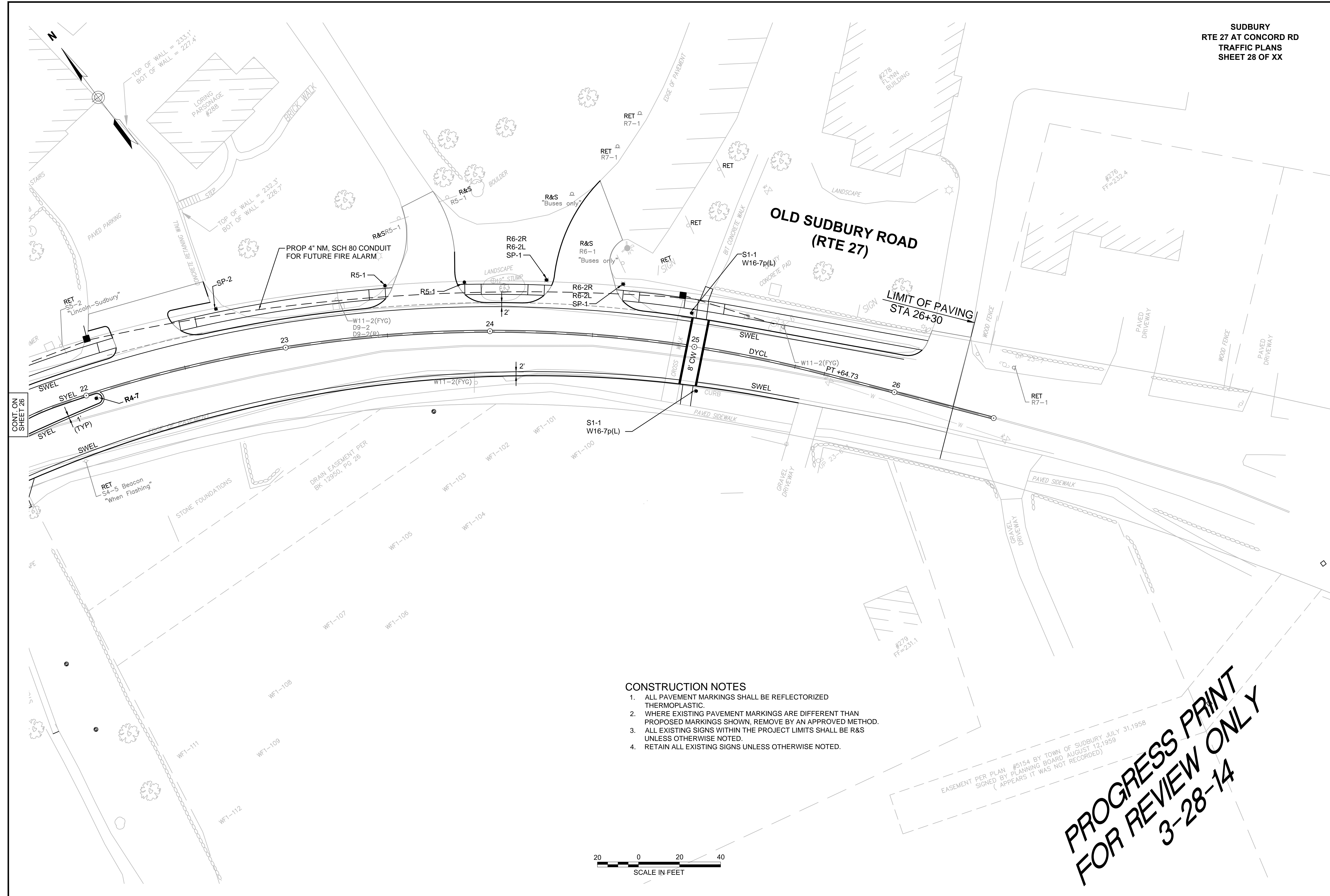
- EMERGENCY VEHICLE PRE-EMPTION OPERATION
- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT THIS INTERSECTION.
 - PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1, D2, D3 OR D4 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D4 LOWEST)
 - IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
 - MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
 - PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

LIST OF MAJOR ITEMS REQUIRED

HUDSON ROAD/OLD SUDBURY ROAD (ROUTE 27) AT CONCORD ROAD		
PAY ITEM	QUANTITY	DESCRIPTION
	1	80 TS 2 TYPE 2 CONTROLLER IN A TYPE 5 BASE MOUNTED CABINET INCLUDING FOUNDATION AND CONCRETE PAD
	X	TS 25' MAST ARM TYPE 2, HEAVY LOADING, STEEL, INCL. FOUNDATION
	X	TS POST 10' STANDARD INCL. FOUNDATION
	X	SIGNAL HEAD, 3-SECTION, 12" LENSES
	X	SIGNAL HEAD, 4-SECTION, 12" LENSES
	X	PEDESTRIAN SIGNAL HEAD (L.E.D.)
	X	PEDESTRIAN PUSH BUTTON W/R10-36(L) AND SIGN SADDLE
	X	PEDESTRIAN PUSH BUTTON W/R10-36(R) AND SIGN SADDLE
	X	TYPE C, 2-CHANNEL CARD RACK LOOP DETECTOR AMPLIFIER
	X	WIRE LOOP DETECTOR
	X	EMERGENCY PRE-EMPTION OPTICAL DETECTORS & DETECTOR CABLE
	X	EMERGENCY PRE-EMPTION 4 CHANNEL PHASE SELECTOR
	X	EMERGENCY PRE-EMPTION SYSTEM CHASSIS
	X	EMERGENCY PRE-EMPTION STROBE (WHITE LENS)
	X	SERVICE CONNECTION (UNDERGROUND)
816.01	X	PULL BOX-12"x12"
804.3	X	3" NM CONDUIT, SCHEDULE 40

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

PROGRESS PRINT
FOR REVIEW ONLY
3-28-14



CONSTRUCTION NOTES

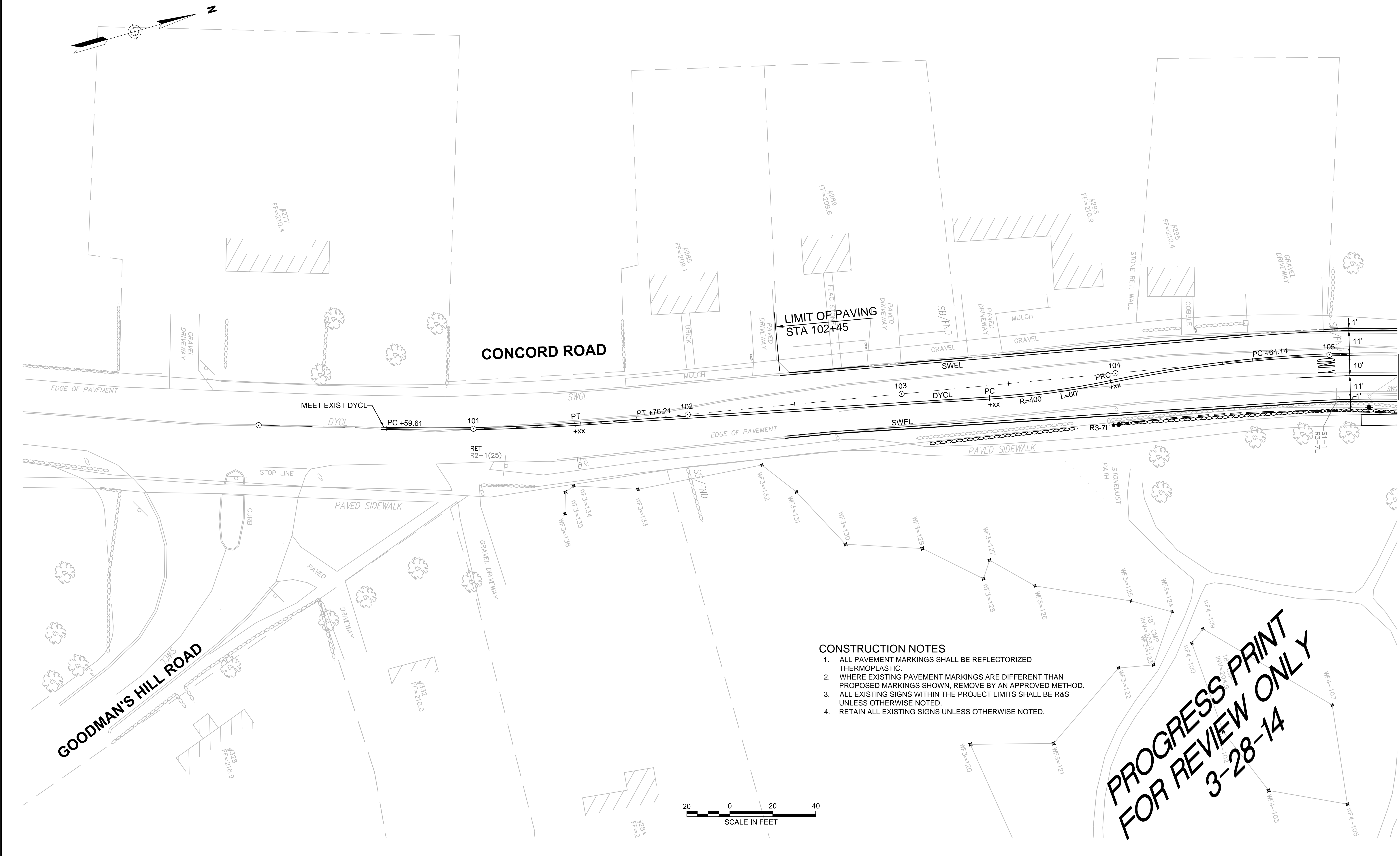
1. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
4. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.



EASEMENT PER PLAN #5154 BY TOWN OF SUDBURY JULY 31, 1958
 SIGNED BY PLANNING BOARD AUGUST 12, 1959
 (APPEARS IT WAS NOT RECORDED)

**PROGRESS PRINT
 FOR REVIEW ONLY
 3-28-14**

CONT. ON
 SHEET 26



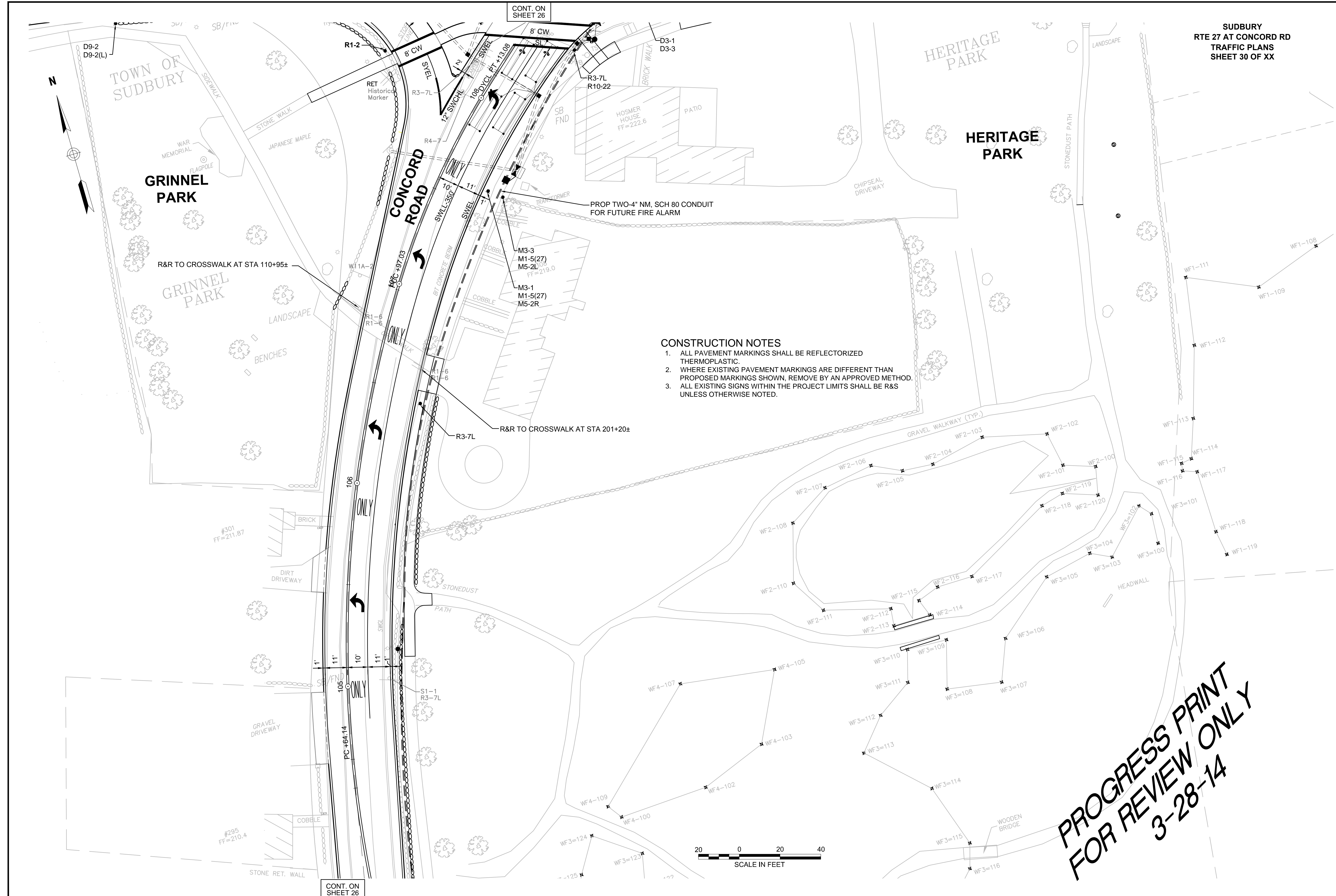
LIMIT OF PAVING
 STA 102+45

- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
 4. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

**PROGRESS PRINT
 FOR REVIEW ONLY
 3-28-14**



CONT. ON
 SHEET 28

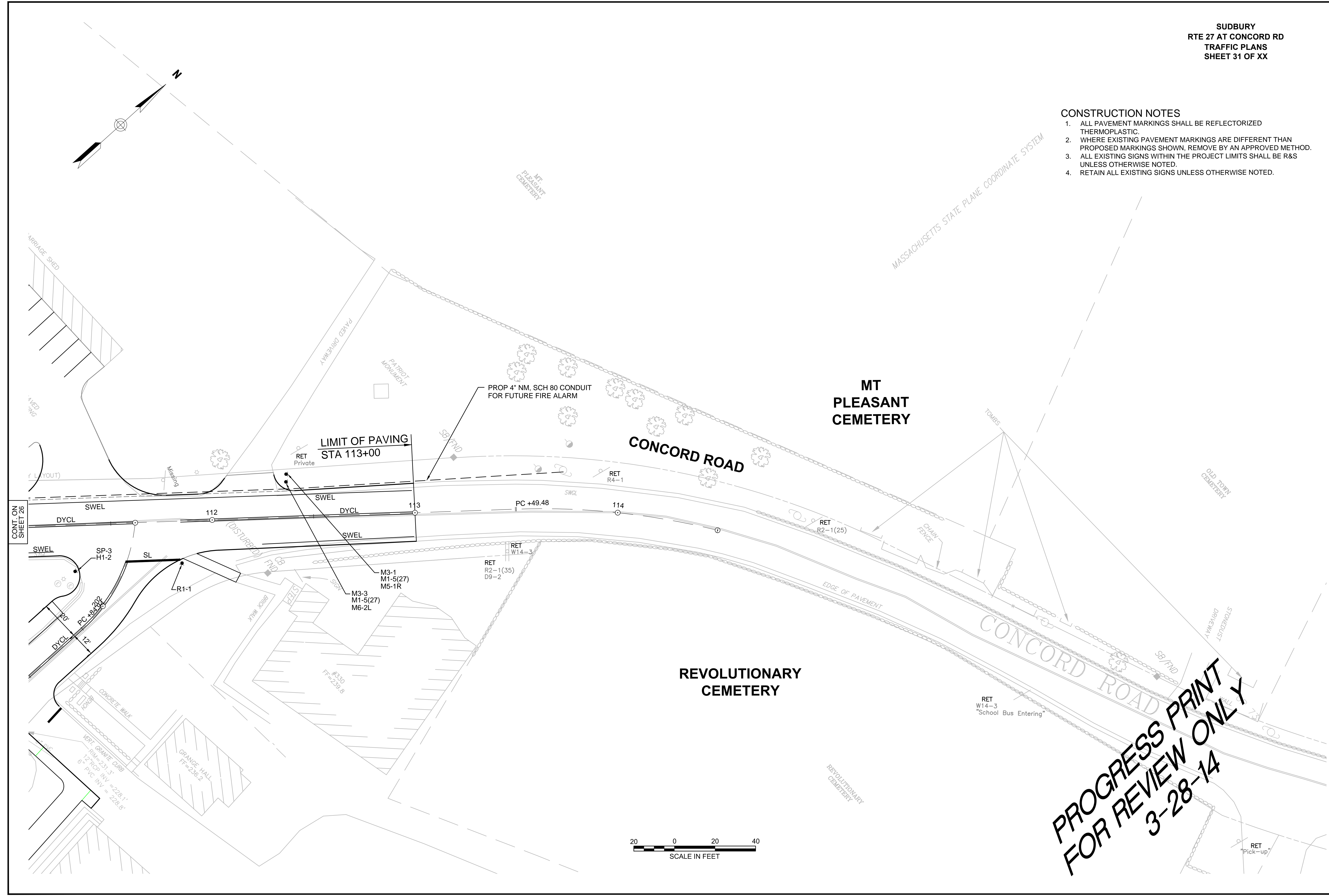


**PROGRESS PRINT
FOR REVIEW ONLY
3-28-14**

CONT. ON SHEET 26

CONT. ON SHEET 26

- CONSTRUCTION NOTES**
1. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
 2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
 3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
 4. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.



**PROGRESS PRINT
 FOR REVIEW ONLY
 3-28-14**



TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			NUMBER OF POSTS REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
R1-1	30"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION", AS AMENDED				RED	WHITE	WHITE		5.18	
R1-2	30"X30"X30"							WHITE	RED	WHITE		2.70	
R3-7L	30"	30"						WHITE	BLACK	BLACK		6.25	
R4-7	24"	30"						WHITE	BLACK	BLACK		5.00	
R5-1	30"	30"						WHITE	RED/WHITE	-		6.25	
R6-2L	24"	30"						WHITE	BLACK	BLACK		5.00	
R6-2R	24"	30"						WHITE	BLACK	BLACK	X MTD W/OTHERS	5.00	
R7-1d	12"	18"						WHITE	RED	RED		1.50	
R10-3e(L)	9"	15"		AS PER MASSDOT STANDARD				WHITE	WHITE/BLACK/ORANGE	BLACK	X MTD ON TS POST	INCLUDED UNDER ITEM 816.01	
R10-3e(R)	9"	15"		AS PER MASSDOT STANDARD				WHITE	WHITE/BLACK/ORANGE	BLACK	X MTD ON TS POST	INCLUDED UNDER ITEM 816.01	
R10-12	24"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION", AS AMENDED				WHITE	BLACK/GREEN	BLACK	X MTD ON TS POST	5.00	
R10-22	18"	24"		AS PER MASSDOT STANDARD				WHITE	BLACK	BLACK		3.00	
W11-2	30"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION", AS AMENDED				YELLOW	BLACK	BLACK		6.25	
W16-7p(L)	24"	12"						YELLOW	BLACK	BLACK	X MTD W/OTHERS	2.00	

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			NUMBER OF POSTS REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D9-2	24"	24"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION", AS AMENDED				BLUE	WHITE	WHITE		4.00	
D9-2(L)	24"	6"						BLUE	WHITE	WHITE	X MTD W/OTHERS	1.00	
D9-2(R)	24"	6"						BLUE	WHITE	WHITE	X MTD W/OTHERS	1.00	
M3-1	24"	12"						WHITE	BLACK	BLACK		2.00	
M3-3	24"	12"						WHITE	BLACK	BLACK		2.00	
M1-5(27)	24"	24"						WHITE	BLACK	BLACK	X MTD W/OTHERS	4.00	
M6-1(L)	21"	15"						WHITE	BLACK	BLACK	X MTD W/OTHERS	2.19	
M6-1(R)	21"	15"						WHITE	BLACK	BLACK	X MTD W/OTHERS	2.19	
S1-1				AS PER MASSDOT STANDARD				FLUORESCENT YELLOW/GREEN	BLACK	BLACK			
S4-5aP	30"	30"		AS PER MASSDOT STANDARD				FLUORESCENT YELLOW/GREEN	BLACK	BLACK	X MTD W/OTHERS	6.25	
H1-2	24"	24"		AS PER MASSDOT STANDARD				YELLOW	YELLOW CLUSTER	---		INCLUDED UNDER ITEM 827.21	
SP-1	36"	30"		4"D 4"D 3"C	3" 1.5" 1.5" 1.5" 3"	N/A		WHITE	BLACK	BLACK	X MTD W/OTHERS	7.50	
SP-2	36"	36"						WHITE	BLACK	BLACK			
SP-3	48" or 36"	36"						WHITE	BLACK	BLACK			
D3-1	VARIES	12"		6"/4.5"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-2	VARIES	12"		6"/4.5"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-3	VARIES	12"		6"/4.5"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	

NOTE: HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; AND THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED.

PROGRESS PRINT
FOR REVIEW ONLY
3-28-14