STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	1	20

SALEM
LAFAYETTE STREET

TITLE SHEET & INDEX

LAFAYETTE STREET IMPROVEMENT PROJECT
LAFAYETTE STREET

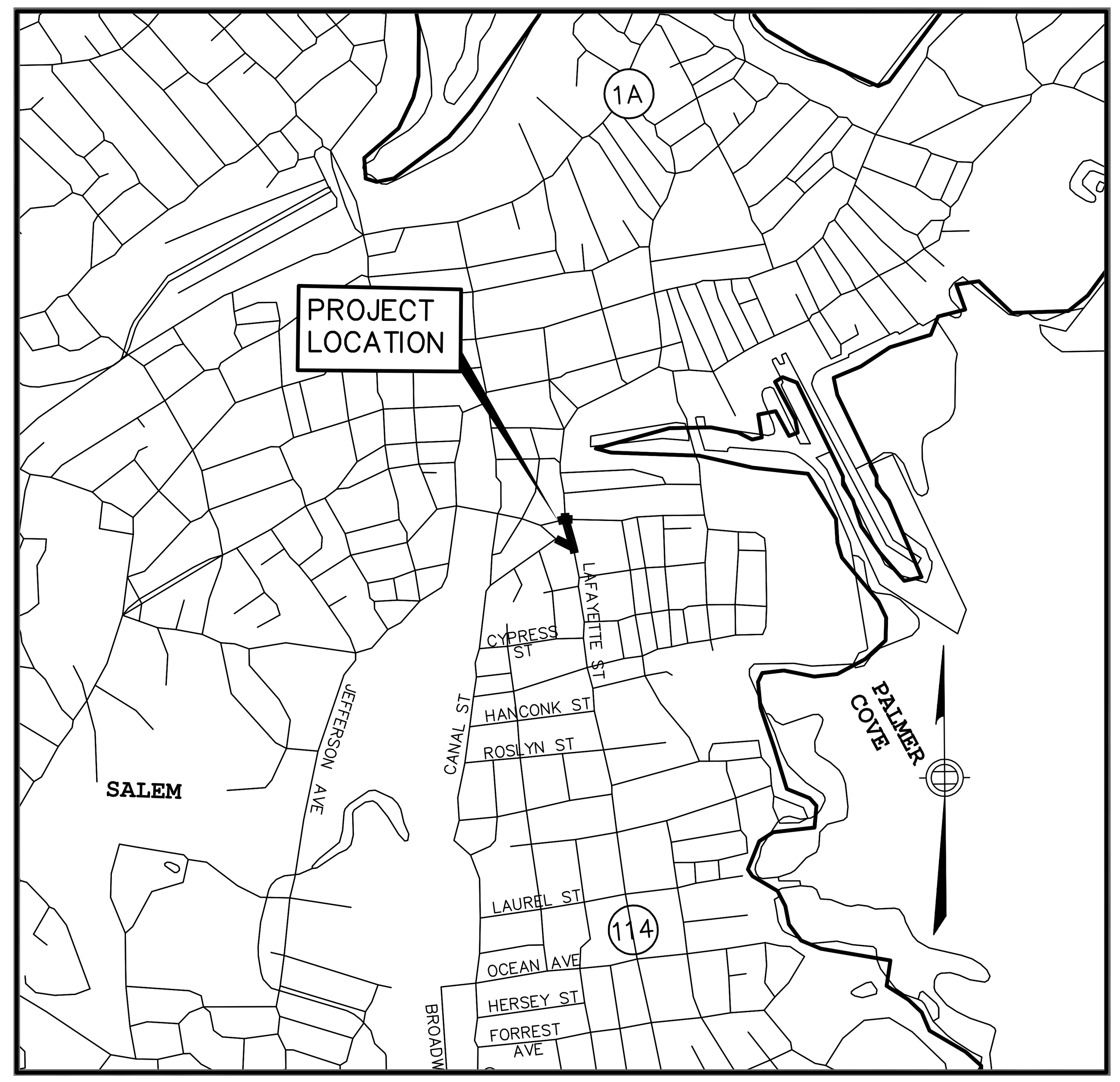
IN THE CITY OF

SALEM

ESSEX COUNTY

THE 1988 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (ENGLISH EDITION), THE SUPPLEMENTAL SPECIFICATIONS (ENGLISH EDITION), DATED FEBRUARY 2010; THE STANDARD SPECIAL PROVISIONS (LATEST EDITION); THE 2010 MASSDOT CONSTRUCTION STANDARD DETAILS; THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" WITH MASSACHUSETTS AMENDMENTS; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; THE 2006 STANDARD DRAWINGS AND DETAILS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS; THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNAL AND HIGHWAY LIGHTING; AND THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z-60.1-2004); AND ALL AMENDMENTS WILL GOVERN.

INDEX



DESIGN DESIGNATION

	NORTH OF WASHINGTON	SOUTH OF WASHINGTON
FUNCTIONAL CLASSIFICATION	PRINCIPAL ARTERIAL	PRINCIPAL ARTERIAL
DESIGN SPEED	=35 mph	=35 mph
ADT	=14,069 vpd	=28,033 vpd
ADT - 2019	=15,541 vpd	=30,966 vpd
K	=0.071	=0.070
D	=64%	=56%
T (PEAK HOUR)	=2%	=2%
T (AVERAGE DAY)	=6%	=6%
DHV	=1,001 vph	=1,956 vph
DDHV	=644 vph	=1,097 vph

FINAL DESIGN PLANS

JANUARY 14, 2011

COUNTY, CITY or TOWN BOUNDARY LINE
COUNTY, CITY or TOWN SIDE LINE
FENCE LINE
BASE or SURVEY LINE 153 S47°-21'-41"E 4336.03'
RIGHT OF WAY LINE
CULVERT
PROPOSED SURFACE
EXIST. SURFACE
ELEVATIONS PRESENT 291.2 292.63 PROPOSED
UTILITY POLE 153

TRANSPORTATION

AECOM

AECOM TECHNICAL SERVICES, Inc.
300 Baker Avenue, Suite 290
Concord, Massachusetts 01742
T 978.371.4000 F 978.371.2468
www.aecom.com

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		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

SALEM			
LAFAYETTE STREET			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	2	20

LEGEND & GENERAL NOTES

GENERAL LEGEND

EXISTING	PROPOSED	
CB	CB	CATCH BASIN
CBCI	CBCI	CATCH BASIN WITH CURB INLET
GI	GI	GUTTER INLET
DI	DI	DROP INLET/DUCTILE IRON
		CURB (OR BERM)
		EDGE OF PAVEMENT
EHH	EHH	ELECTRIC HANDHOLE
EMH	EMH	ELECTRIC MANHOLE
TMH	TMH	TELEPHONE MANHOLE
SMH	SMH	SEWER MANHOLE
DMH	DMH	DRAINAGE MANHOLE
GG	GG	GAS GATE
WG	WG	WATER GATE
WS	WS	WATER SERVICE
HYD	HYD	HYDRANT
FA	FA	FIRE ALARM BOX
PM	PM	PARKING METER
		STREET LIGHT
		UTILITY POLE
		UTILITY POLE WITH LIGHT
		GUY POLE
MB	MB	MAILBOX
		BOUND
		HIGHWAY GUARD
		WOOD/WIRE FENCE
		CHAIN LINK FENCE
		RIGHT OF WAY LINE (APPROX.)
		WHEELCHAIR RAMP
		TREE
D		DRAIN PIPE
S		SEWER MAIN
G		GAS MAIN
W		WATER MAIN
E		ELECTRIC DUCT
T		TELEPHONE DUCT
OHW		OVERHEAD WIRE
(25.00)	25.00	ELEVATION
(25.15)	24.15	TOP OF CURB
(24.50)	24.50	BOTTOM OF CURB
		BORING
		TEST PIT
		SIGN POST
		CEMENT CONCRETE STEP
	GD RL	GUARD RAIL
	FE	FLARED END
	CONST	CONSTRUCT(ION)
	PGL	PROFILE GRADE LINE
	ROE	RIGHT OF ENTRY
		TREE
		RESET TREE

EXISTING	PROPOSED	
		TOP OF SLOPE
		BOTTOM OF SLOPE
		CLEARING AND GRUBBING LIMIT
113.70 X	+ 114.50	SPOT ELEVATION
		RETAINING WALL
		STONE BALANCE WALL
		TREE LINE
		GRADE TO DRAIN (0.5 % MIN. GRADE)
	2%	CROSS SLOPE (%)
	RET	RETAIN
	REM	REMOVE
	REMOD	REMODEL
	ABAN	ABANDON
	ADJ	ADJUST
	EXIST	EXISTING
	R&R	REMOVE AND RESET
	R&S	REMOVE AND STACK
	R&D	REMOVE AND DISCARD OR DISPOSE
	N.I.C.	NOT IN CONTRACT
	RCP	REINFORCED CONCRETE PIPE
	CIT	CHANGE IN TYPE
	WCR	WHEELCHAIR RAMP
	CC	CURB CORNER
	PVC	POLYVINYL CHLORIDE PIPE
	STN	STONE
	BAL	BALANCE
	WL	WALL
	HDWL	HEADWALL
	LB	LOAM BORROW
	L&S	LOAM BORROW & SEED
	WW	WATER WAY
	WK	WALK
	CEM	CEMENT
	CONC	CONCRETE
	BIT	BITUMINOUS
	BSW	BACK OF SIDEWALK
	LP	LOW POINT
	SW	SIDEWALK
	DR	DRIVEWAY
	SP	SPECIAL
	BE	BURIED END
	TE	TERMINAL END
	TRANS	TRANSITION
	PROP	PROPOSED
	PAV'T	PAVEMENT
	HMA	HOT MIX ASPHALT
	MOD	MODIFIED
	BND	BOUND
		GRADE BREAK LINE
	VERT	VERTICAL
	GRAN	GRANITE

TRAFFIC LEGEND

EXISTING	PROPOSED	
		DIRECTION OF FLOW
		TRAFFIC SIGN AND POST
	ONLY	PAVEMENT ARROW AND LEGEND
	CW	CROSSWALK, 2-12 IN WHITE
	SL	STOP LINE, 12 IN WHITE
	BWLL	BROKEN WHITE LANE LINE – 6 IN
	SWLL	SOLID WHITE LANE LINE – 6 IN
	SYCHL	SOLID YELLOW CHANNELIZING LINE – 8 IN
	SWCHL	SOLID WHITE CHANNELIZING LINE – 8 IN
	BYCL	BROKEN YELLOW CENTERLINE – 6 IN
	DYCL	DOUBLE YELLOW CENTERLINE – 6 IN
	SYBL	SOLID YELLOW BARRIER LINE – 6 IN
	SWBL	SOLID WHITE BARRIER LINE – 6 IN
	SYEL	SOLID YELLOW EDGE LINE – 6 IN
	SWEL	SOLID WHITE EDGE LINE – 6 IN
	SYL	SOLID YELLOW LINE – 6 IN
		NO PARKING ANYTIME
		PARKING RESTRICTIONS

EXISTING	PROPOSED	
		CONTROL CABINET GROUND MOUNTED
		CONTROL CABINET POLE MOUNTED
		SIGNAL POST & BASE
	25' MA	MAST ARM, SHAFT & BASE
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD – OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD
		LIMIT OF VISIBILITY – OPTICALLY PROGRAMMED SIGNAL
		PULL BOX
		DETECTOR
		PEDESTRIAN PUSH BUTTON
		CONDUIT
x	x	"X" DUCT (CONC. ENCASED)

GENERAL NOTES

1. LOCATION OF ALL UTILITIES AND SUBSURFACE STRUCTURES ARE FROM SURVEY AND RECORDS OF THE CITY OR PRIVATE UTILITY COMPANIES AND ARE CONSIDERED APPROXIMATE BOTH AS TO SIZE AND LOCATION, AND ARE INDICATED ON THESE DRAWINGS TO GIVE THE CONTRACTOR A GENERAL IDEA OF EXISTING CONDITIONS. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACTOR WILL NOT RELY UPON THESE DRAWINGS FOR SUCH INFORMATION, BUT THAT THE CONTRACTOR SHALL MAKE EXAMINATIONS IN THE FIELD BY VARIOUS AVAILABLE RECORDS, UTILITY CORPORATIONS AND INDIVIDUALS AS TO THE LOCATION OF ALL SUBSURFACE STRUCTURES.
2. ALL ELEVATIONS BASED ON N.A.V.D. OF 1988.
3. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 (NAD83) PROJECTED TO STATE PLANE MASS MAINLAND 2001 M ZONE.
4. PEDESTRIAN AND VEHICLE ACCESS TO ABUTTING PREMISES MUST BE MAINTAINED IN A SAFE CONDITION AT ALL TIMES.
5. GRANITE CURB TO BE REMOVED AND RESET HAS BEEN NOTED ON THE PLANS. NEW GRANITE CURBING TO BE PROVIDED IS TO MEET WITH THE PROPOSED DESIGN.
6. GRANITE CURBING IS TO BE SET SO THAT IT HAS A 6" REVEAL AFTER FINAL PAVING, UNLESS OTHERWISE INDICATED ON PLANS. IN SOME LOCATIONS CONTROL GRADES ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE REQUIRED TO MEET THESE GRADES WHILE PROVIDING A SMOOTH VERTICAL TRANSITION BETWEEN CONTROL ELEVATIONS.
7. EXISTING PAVEMENTS AND/OR SIDEWALKS SHALL BE SAW CUT WHERE THEY MEET PROPOSED SURFACE TREATMENTS. SAW CUTS SHALL BE SMOOTH AND STRAIGHT. WHERE NEW HOT MIX ASPHALT MEETS EXISTING HOT MIX ASHPALT SURFACES OR CEMENT CONCRETE SURFACES, SAW CUT EDGES ARE TO BE SEALED WITH BITUMEN AND BACKSANDED.
8. AREAS OUTSIDE THE LIMITS OF WORK DISTURBED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE EXPENSE OF THE CONTRACTOR.
9. ALL MUNICIPALLY OWNED UTILITY STRUCTURES INCLUDING MANHOLES, CATCH BASINS, AND GATE BOXES SHALL BE ADJUSTED OR REMODELED TO FINISHED GRADE BY THE CONTRACTOR. ALL PRIVATELY OWNED UTILITY STRUCTURES SHALL BE ADJUSTED OR REMODELED BY THE OWNER. CONTRACTOR SHALL COORDINATE THIS EFFORT SO THAT IT DOES NOT ADVERSELY IMPACT THE PROJECT SCHEDULE.
10. FOR BIDDING PURPOSES, LIMITS OF WORK HAVE BEEN SET ON THE PLANS, HOWEVER, THESE MAY BE EXTENDED OR REDUCED AT THE DISCRETION OF THE ENGINEER TO MEET WITH FIELD CONDITIONS.
11. AT ALL POSTS AND POLES, PROPOSED CEMENT CONCRETE SIDEWALK SHALL BE BOXED AND PROVIDED WITH EXPANSION JOINT FILLER. ALSO, EXPANSION JOINT FILLER SHALL BE USED AT ALL BACK OF SIDEWALK LOCATIONS WHERE LOCATIONS MEET EXISTING BUILDINGS, WALLS OR OTHER STRUCTURES AND AS OTHERWISE REQUIRED BY THE ENGINEER.
12. THE CONTRACTOR SHALL FIELD CHECK ALL DIMENSIONS, AND ELEVATIONS BEFORE PROCEEDING WITH NEW WORK. THE CONTRACTOR SHALL EXCAVATE TO VERIFY PERTINENT DRAINAGE INVERTS AND POTENTIAL UTILITY CONFLICTS. ANY DISCREPANCIES OR CONFLICTS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
13. ALL EXISTING SURFACES, i.e. CEMENT CONCRETE, HOT MIX ASPHALT PAVEMENT, BRICK, ETC., SHALL BE COMPLETELY REMOVED FROM AREAS OF PROPOSED WORK INCLUDING PROPOSED PLANTING AREAS.
14. THE CONTRACTOR SHALL COORDINATE AND BE RESPONSIBLE FOR ALL SAFETY SIGNING, BARRIERS AND TEMPORARY PAVEMENT MARKINGS NECESSARY TO PROVIDE A SMOOTH AND PROPER TRANSITION FOR TRAFFIC FLOW.
15. IF REQUIRED BY THE CONTRACTOR, OVERHEAD LINES SHALL BE RELOCATED BY THE UTILITY COMPANY AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL COORDINATE THIS EFFORT SO THAT IT DOES NOT ADVERSELY IMPACT THE PROJECT SCHEDULE.
16. ALL PROPOSED GRANITE CURB SHALL BE TYPE VB OR EXISTING CURB, REMOVED AND RESET, UNLESS OTHERWISE NOTED.
17. ALL CURB TIES WHICH ARE NOTED BY A STATION ARE FROM THE CONSTRUCTION BASELINE.
18. LOCATIONS OF PROPOSED SIGNS AND TREES ARE APPROXIMATE ONLY; THE EXACT LOCATION SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
19. ALL CEMENT CONCRETE SUBBASE SURFACES SHALL BE TREATED WITH A BITUMEN TACK COAT PRIOR TO THE APPLICATION OF A HOT MIX ASPHALT MATERIAL.
20. ALL CATCH BASINS, DROP INLETS, AND DRAIN MANHOLES ARE PRECAST CONCRETE IN ACCORDANCE WITH MASSDOT STANDARD DETAILS UNLESS OTHERWISE NOTED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING CATCH BASIN AND GRATE SO IT IS FLUSH WITH THE CURB FACE AND IN LINE WITH THE GUTTER GRADE.
21. ALL CONCRETE PIPE SHALL BE CLASS III UNLESS OTHERWISE NOTED.
22. PROPOSED CATCH BASIN STATIONING REFERS TO THE CENTER REAR OF THE STRUCTURE.
23. SURVEY WAS PERFORMED BY NORDE-EAST SURVEY. JULY-AUGUST 2010.

ALIGNMENT/GRADING

PI	POINT OF INTERSECTION
PC	POINT OF CURVE
PT	POINT OF TANGENT
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PVC	POINT OF VERTICAL CURVE
PVT	POINT OF VERTICAL TANGENT
PVRC	POINT OF VERTICAL REVERSE CURVE
PVCC	POINT OF VERTICAL COMPOUND CURVE
PVI	POINT OF VERTICAL INTERSECTION
ELEV	ELEVATION
CC	CENTER OF CURVE
PNT	POINT
PGL	PROFILE GRADE LINE
SSD	STOPPING SIGHT DISTANCE
PSD	PASSING SIGHT DISTANCE

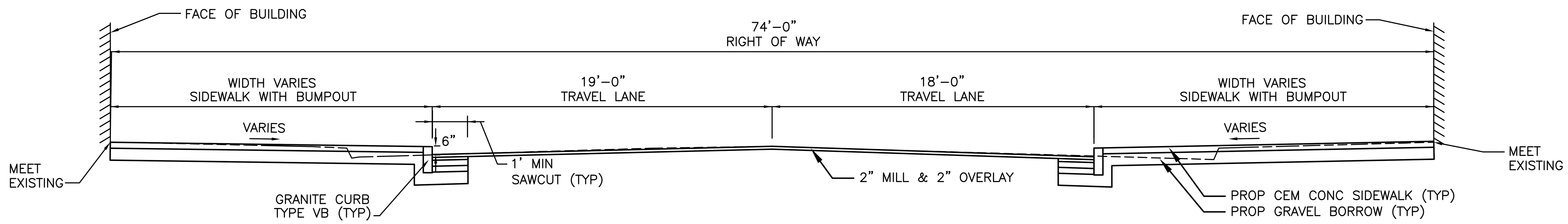
UTILITIES

CIT	CHANGE IN TYPE
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
RCP	REINFORCED CONCRETE PIPE
VCP	VITRIFIED CLAY PIPE
PVC	POLYVINYL CHLORIDE PIPE
ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CIP	CAST IRON PIPE
DIP	DUCTILE IRON PIPE
HYD	HYDRANT
CAP	CORRUGATED ALUMINUM PIPE
INV	INVERT ELEVATION
PWW	PAVED WATER WAY
UP	UTILITY POLE
LP	LIGHT POLE
TSV & B	TAPPING SLEEVE, VALVE AND BOX
COND	CONDUIT

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSG	1-12-11

SALEM			
LAFAYETTE STREET			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	3	20

TYPICAL SECTIONS



LAFAYETTE STREET
HARBOR/LAFAYETTE INTERSECTION–
NORTH OF HARBOR STREET
NTS

PAVEMENT NOTES

MILL & OVERLAY

MILL: 2" ASPHALT PAVEMENT MILLING BY COLD PLANER.

TACK COAT: ASPHALT EMULSION TACK COAT, GRADE RS–1, PLACED OVER EXISTING PAVEMENT AT A RATE OF 0.07 GALLON PER SQ. YD.

SURFACE COURSE: 2" HOT MIX ASPHALT TOP COURSE MATERIAL.

CEMENT CONCRETE SIDEWALK

SURFACE: 4" CEMENT CONCRETE

SUBBASE: 8" GRAVEL BORROW, TYPE B

CEMENT CONCRETE DRIVEWAY

SURFACE: 6" CEMENT CONCRETE

SUBBASE: 8" GRAVEL BORROW, TYPE B

STAMPED COLORED HOT MIX ASPHALT (OVER HMA–CROSSWALK)

MILL: 3/4" ASPHALT PAVEMENT MILLING BY COLD PLANER.

SURFACE: 3/4" IMPRINT COLORED POLYMER PAVEMENT OVER 3–1/4" HOT MIX ASHPALT TOP COURSE PLACED IN TWO LAYERS

STAMPED COLORED CONCRETE (SIDEWALK SECTIONS)

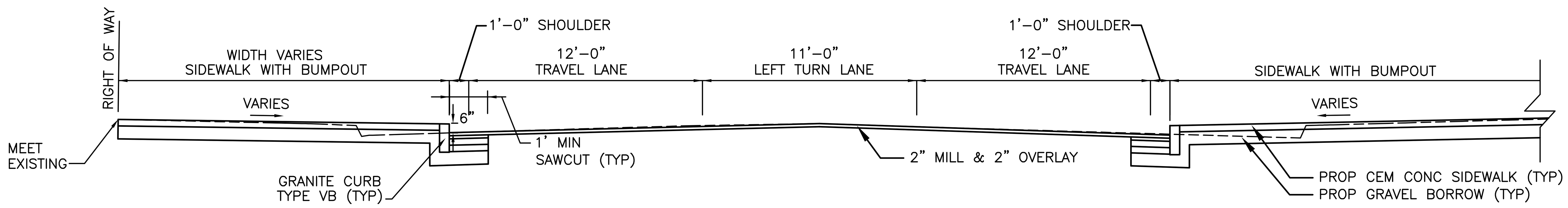
SURFACE: 4" STAMPED COLORED CEMENT CONCRETE – BRICK PATTERN

SUBBASE: 8" GRAVEL BORROW, TYPE B

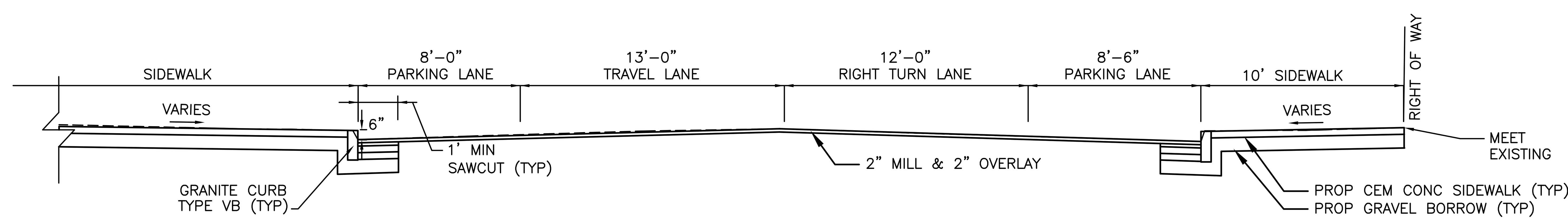
HOT MIX ASPHALT DRIVEWAY

SURFACE: 3–1/2" HOT MIX ASPHALT PLACED IN TWO LAYERS, 1–1/2" TOP COURSE MATERIAL OVER 2" BINDER

SUBBASE: 8" GRAVEL BORROW, TYPE B



LAFAYETTE STREET
WASHINGTON/LAFAYETTE INTERSECTION–
NORTH OF WASHINGTON STREET
NTS



WASHINGTON STREET
WASHINGTON/LAFAYETTE INTERSECTION–
WEST OF LAFAYETTE STREET
NTS

DESIGNED BY	BAM	10–19–10
DRAWN BY	BAM	1–1–11
CHECKED BY	PSC	1–12–11
		DATE

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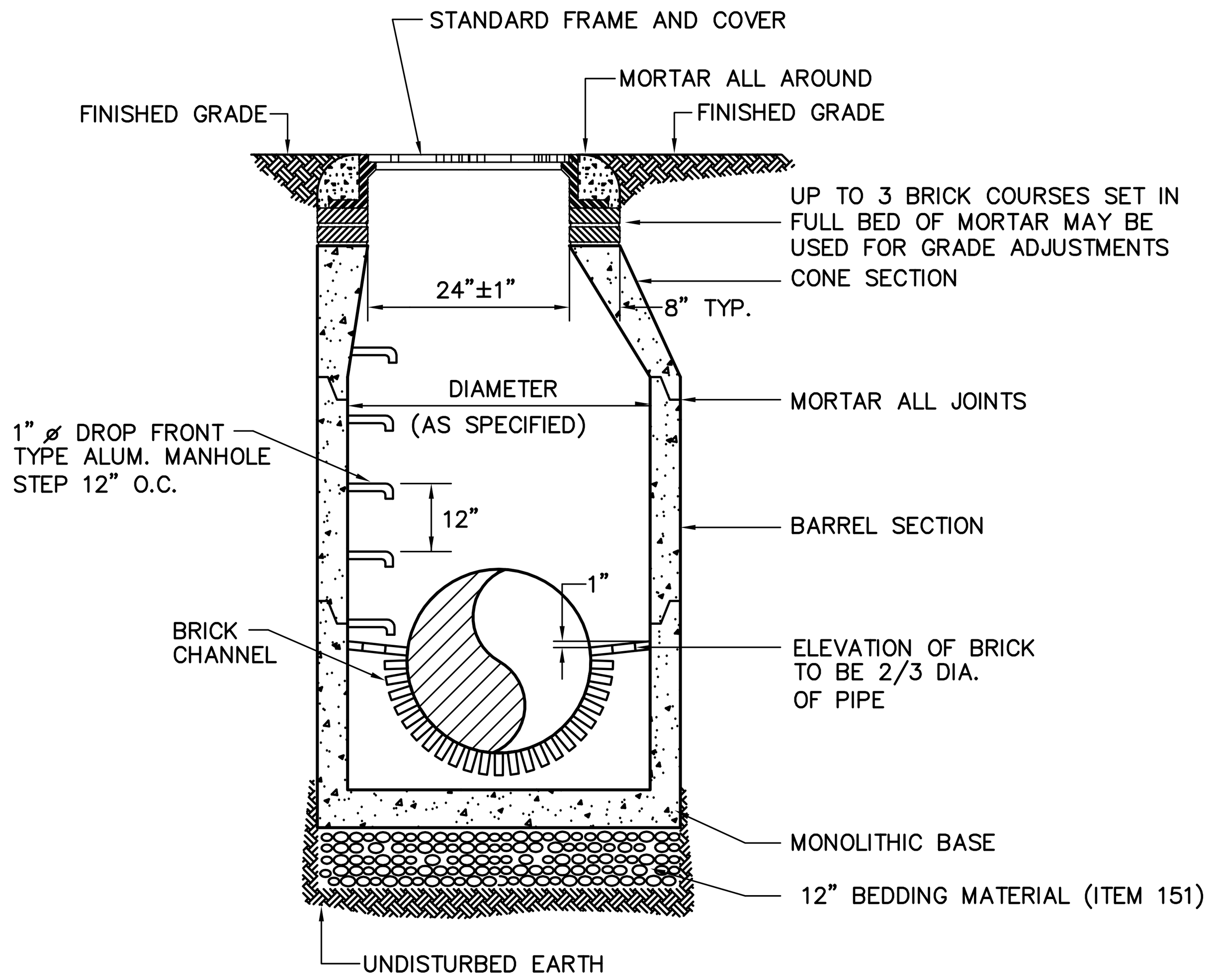
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	4	20

SALEM
LAFAYETTE STREET

CONSTRUCTION DETAILS

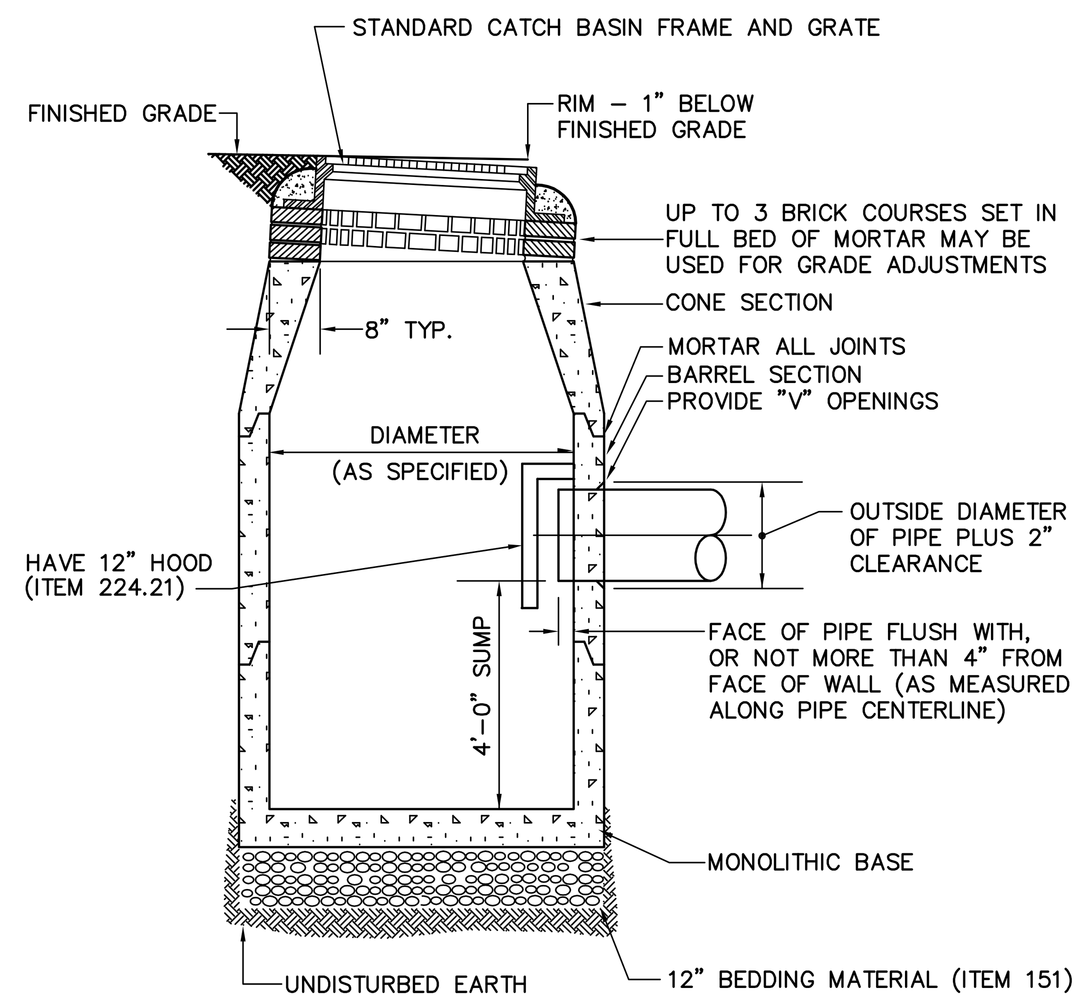
DIAMETER	WALL THICKNESS	FLOOR THICKNESS
4 FT.	5 IN.	6 IN.
5 FT.	6 IN.	7 IN.
6 FT.	7 IN.	8 IN.



PRECAST CONCRETE DRAIN MANHOLE

NOT TO SCALE

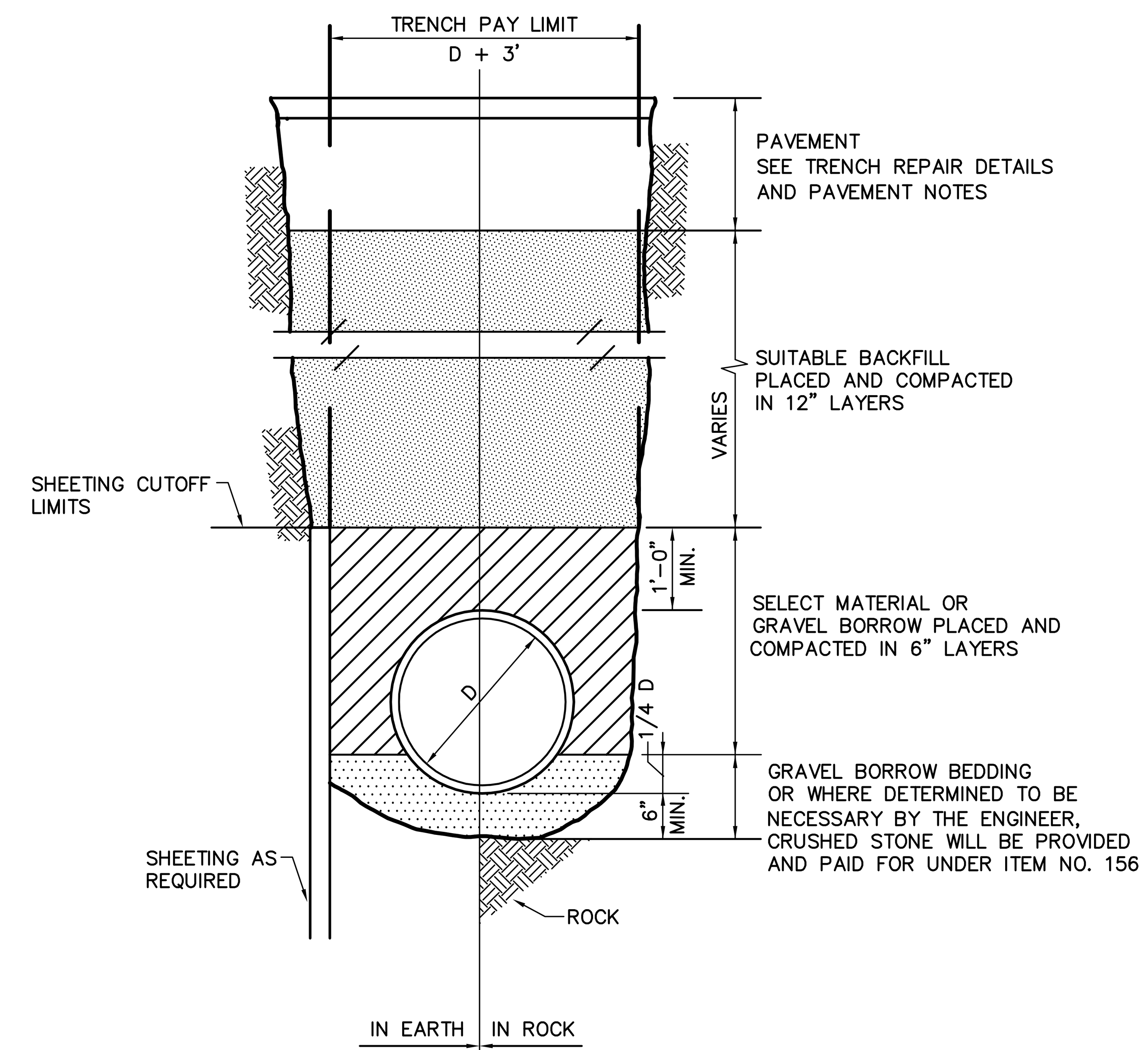
DIAMETER	WALL THICKNESS	FLOOR THICKNESS
4 FT.	5 IN.	6 IN.
5 FT.	6 IN.	7 IN.
6 FT.	7 IN.	8 IN.



1. WHERE FLAT TOP DRAINAGE STRUCTURE IS REQUIRED, CONICAL SECTION SHALL BE REPLACED W/STRAIGHT BARREL SECTION & 8" THICK SLAB SECTION. SEE SPECIFICATIONS.

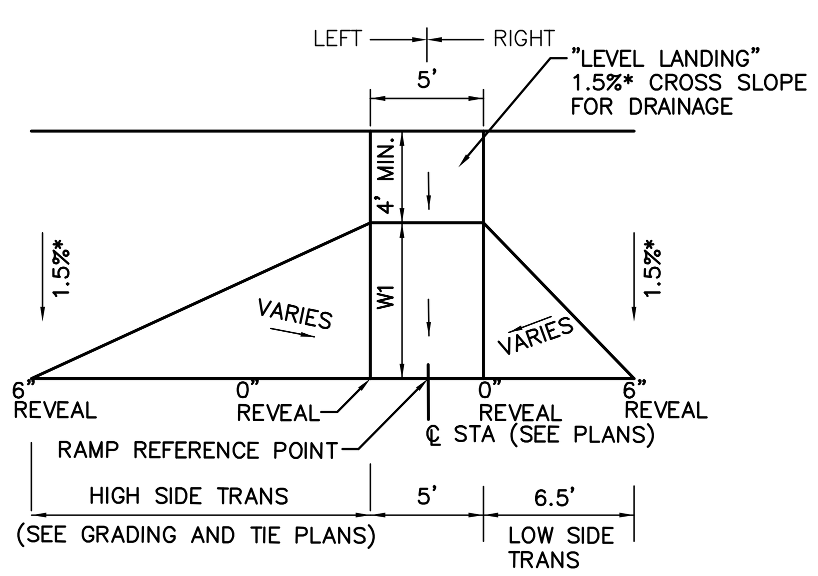
PRECAST CONCRETE CATCH BASIN

NOT TO SCALE



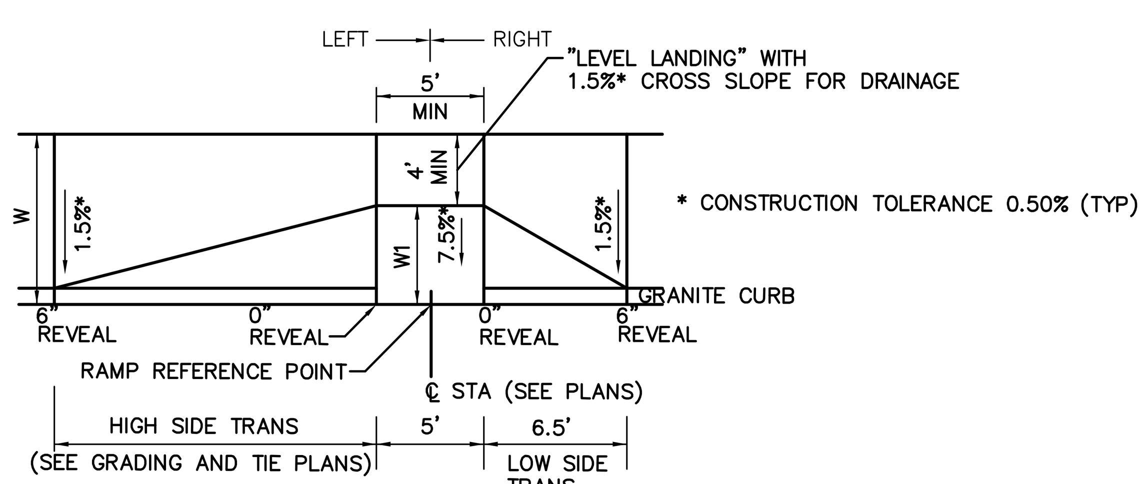
DRAIN PIPE TRENCH DETAIL

NOT TO SCALE



WHEELCHAIR RAMP GREATER THAN 12'–4" SIDEWALK

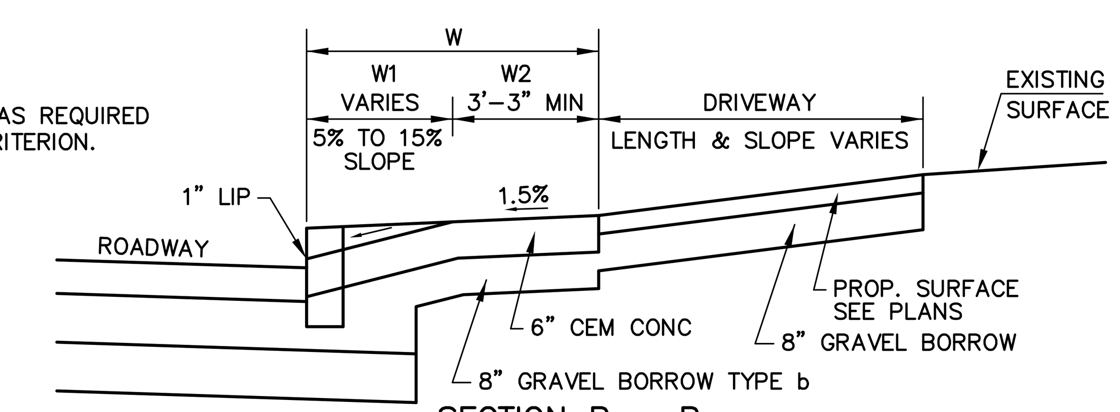
NOTE: SEE MHD CONST STD 107.3.0
SEE MHD CONST STD 107.6.5R
SEE MHD CONST STD 107.9.0



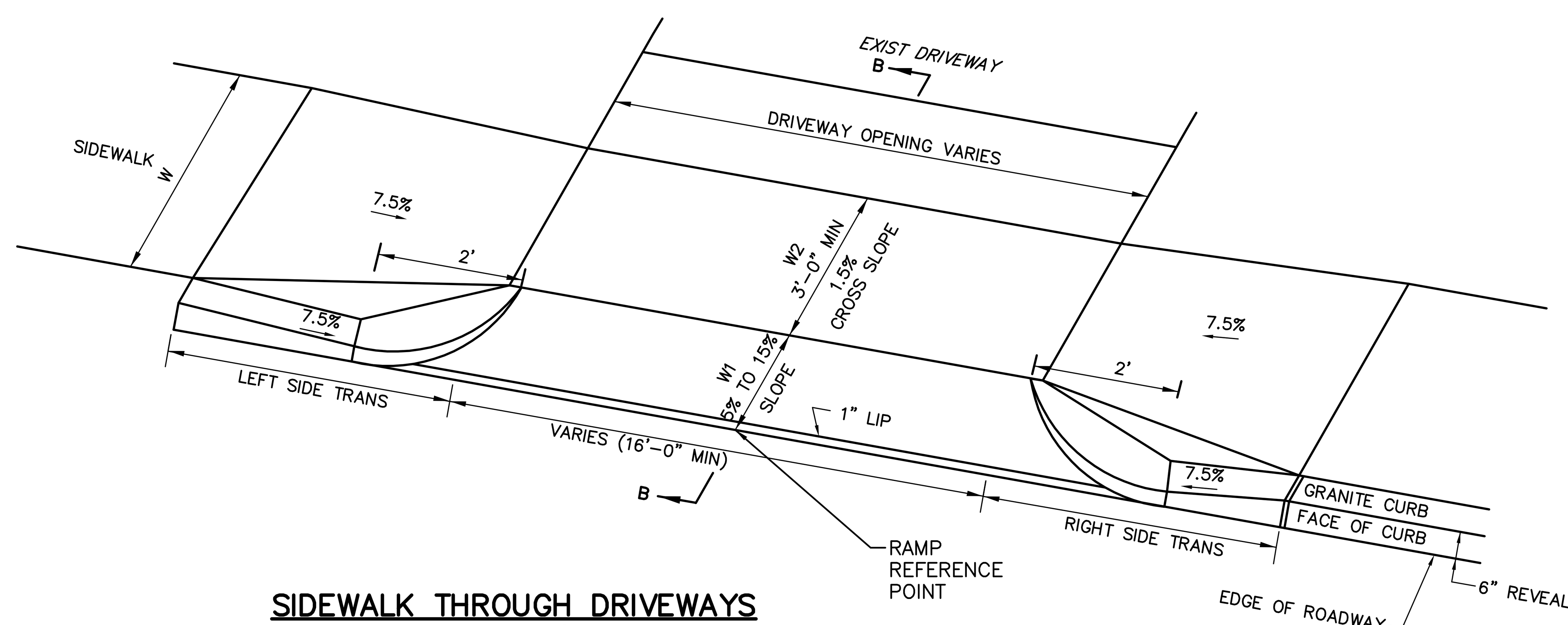
WHEELCHAIR RAMP LESS THAN 12'–4" SIDEWALK

NOTE: SEE MHD CONST STD 107.2.0
SEE MHD CONST STD 107.6.5R
SEE MHD CONST STD 107.9.0

NOTE:
1. PROVIDE TRANSITION SLOPE AS REQUIRED TO MEET MAXIMUM SLOPE CRITERION.



SECTION B – B



SIDEWALK THROUGH DRIVEWAYS WITH CURB RETURNS 2' CURB CORNERS

NOT TO SCALE

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		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

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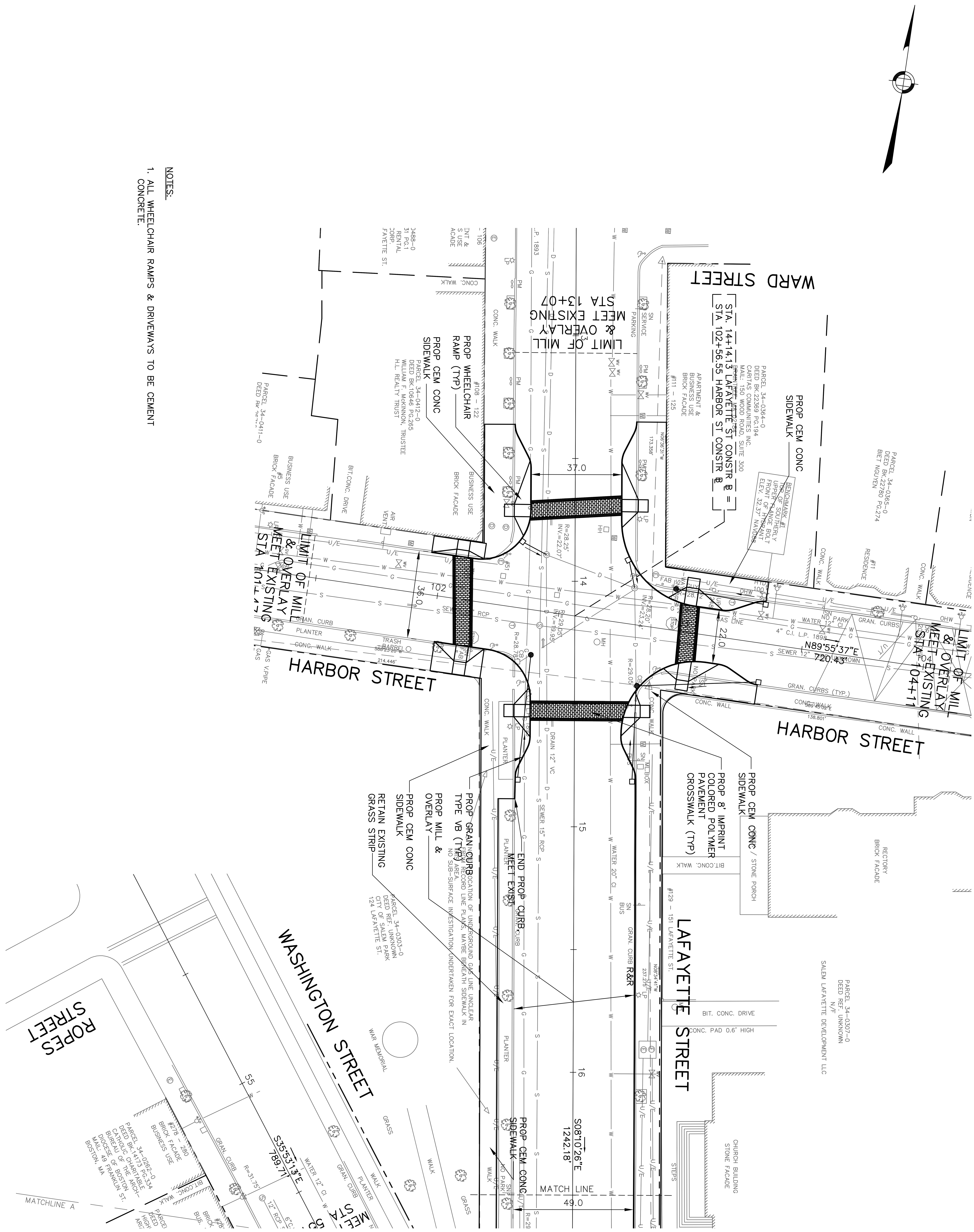
NOTES:

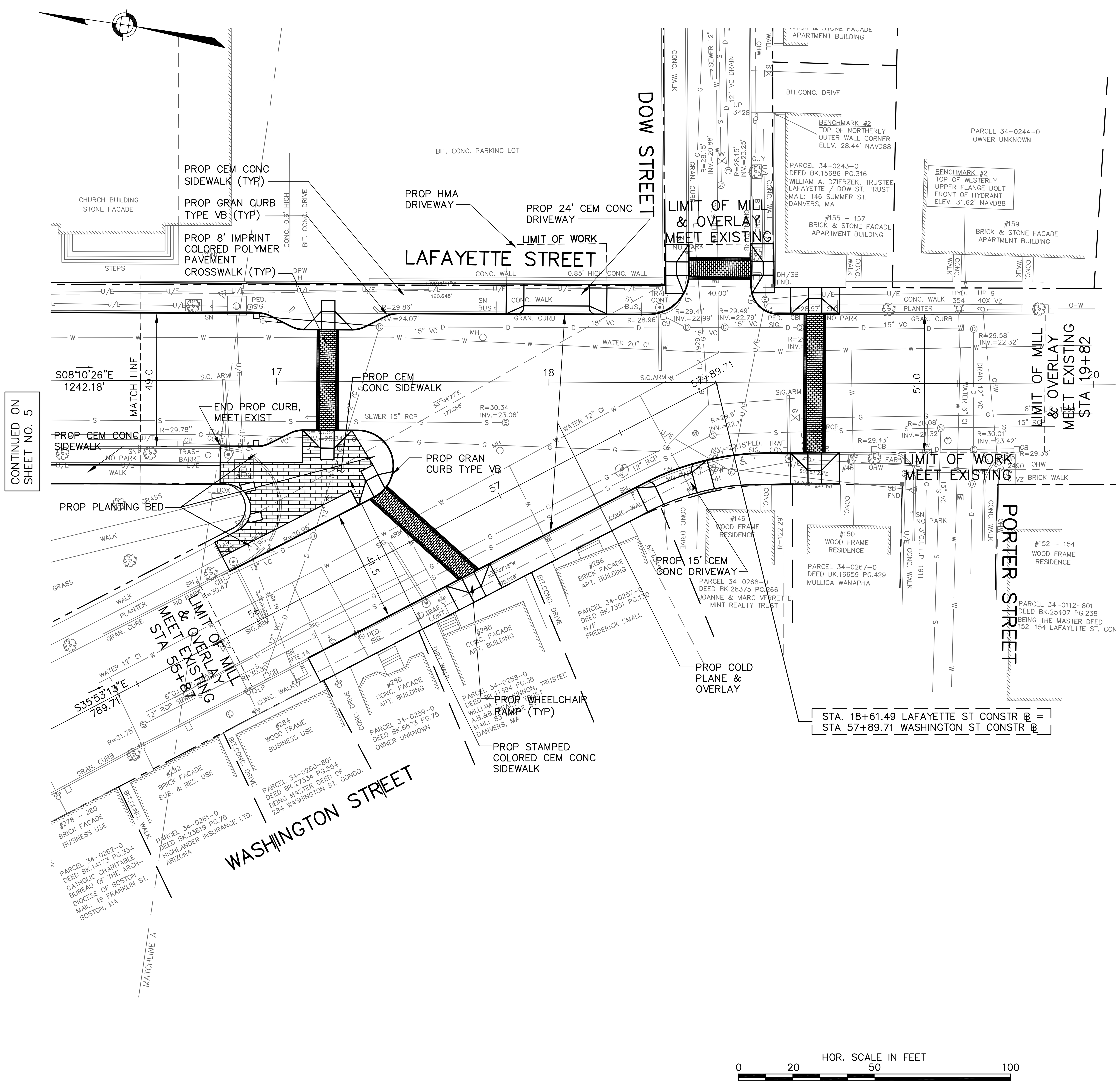
1. ALL WHEELCHAIR RAMPS & DRIVEWAYS TO BE CEMENT CONCRETE.



CONTINUED ON SHEET NO. 6

SALEM LAFAYETTE STREET			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	5	20

GENERAL PLAN



NOTES:

1. ALL WHEELCHAIR RAMPS & DRIVEWAYS TO BE CEMENT CONCRETE.

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

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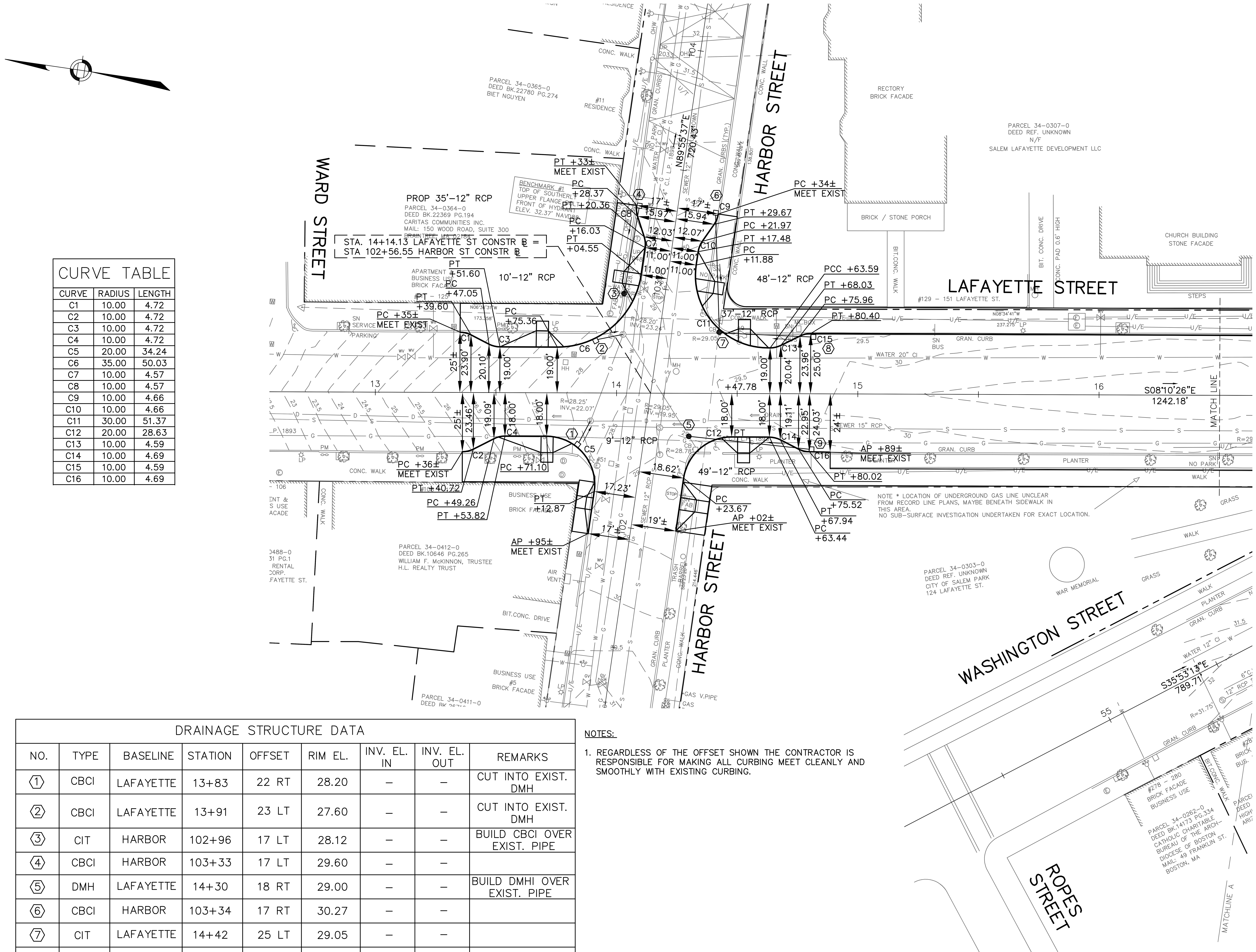
SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	7	20

ALIGNMENT, GRADING AND DRAINAGE PLAN



CONTINUED ON SHEET NO. 8

CURVE TABLE		
CURVE	RADIUS	LENGTH
C1	10.00	4.72
C2	10.00	4.72
C3	10.00	4.72
C4	10.00	4.72
C5	20.00	34.24
C6	35.00	50.03
C7	10.00	4.57
C8	10.00	4.57
C9	10.00	4.66
C10	10.00	4.66
C11	30.00	51.37
C12	20.00	28.63
C13	10.00	4.59
C14	10.00	4.69
C15	10.00	4.59
C16	10.00	4.69

DRAINAGE STRUCTURE DATA

NO.	TYPE	BASELINE	STATION	OFFSET	RIM EL.	INV. EL. IN	INV. EL. OUT	REMARKS
1	CBCI	LAFAYETTE	13+83	22 RT	28.20	–	–	CUT INTO EXIST. DMH
2	CBCI	LAFAYETTE	13+91	23 LT	27.60	–	–	CUT INTO EXIST. DMH
3	CIT	HARBOR	102+96	17 LT	28.12	–	–	BUILD CBCI OVER EXIST. PIPE
4	CBCI	HARBOR	103+33	17 LT	29.60	–	–	
5	DMH	LAFAYETTE	14+30	18 RT	29.00	–	–	BUILD DMHI OVER EXIST. PIPE
6	CBCI	HARBOR	103+34	17 RT	30.27	–	–	
7	CIT	LAFAYETTE	14+42	25 LT	29.05	–	–	
8	CBCI	LAFAYETTE	14+81	25 LT	29.35	–	–	
9	CBCI	LAFAYETTE	14+81	24 RT	29.28	–	–	

NOTES:

1. REGARDLESS OF THE OFFSET SHOWN THE CONTRACTOR IS RESPONSIBLE FOR MAKING ALL CURBING MEET CLEANLY AND SMOOTHLY WITH EXISTING CURBING.

HOR. SCALE IN FEET
0 20 50 100

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
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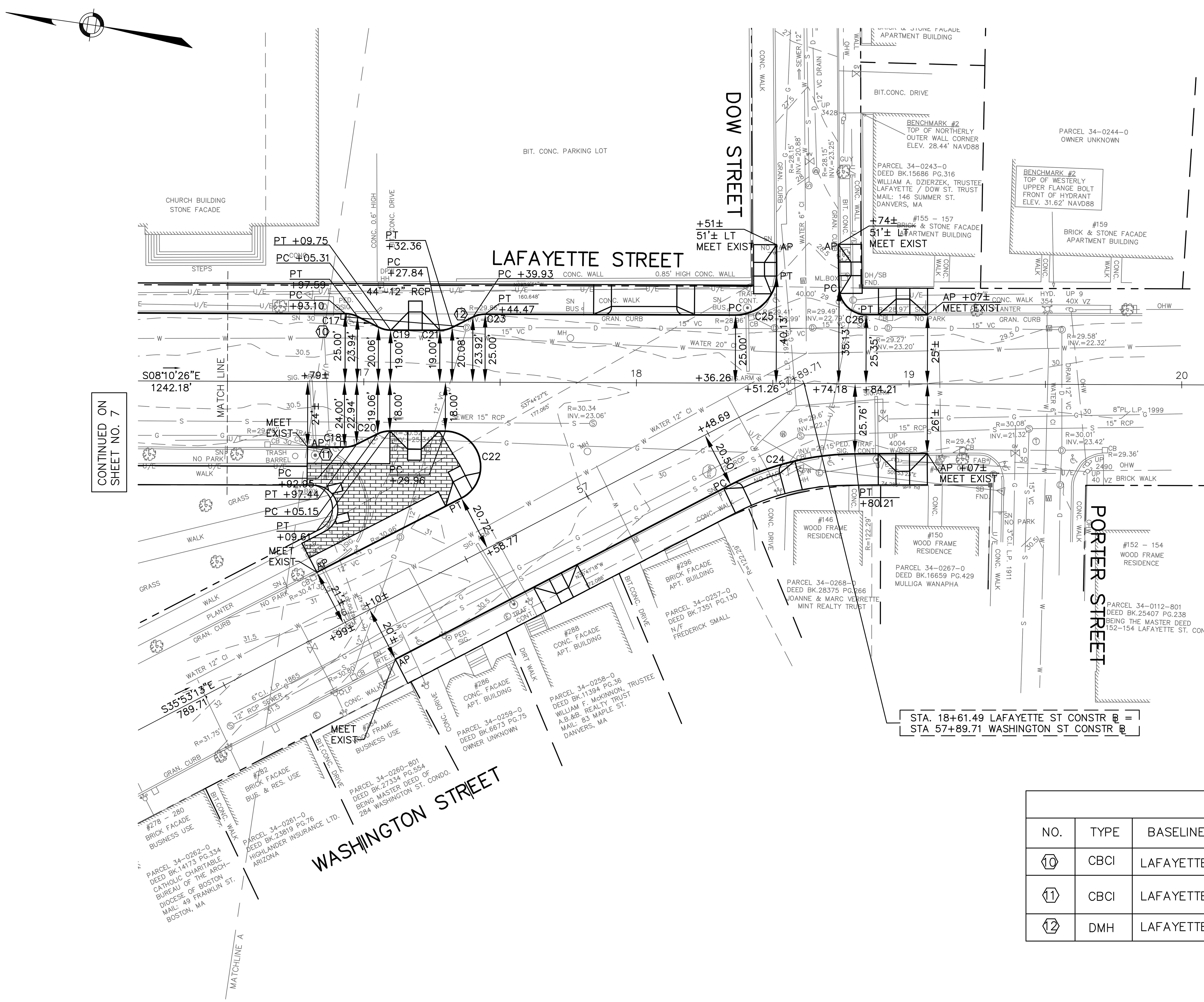
SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	8	20

ALIGNMENT, GRADING AND DRAINAGE PLAN

CONTINUED ON SHEET NO. 7



HOR. SCALE IN FEET
0 20 50 100

CURVE TABLE

CURVE	RADIUS	LENGTH
C17	10.00	4.65
C18	10.00	4.65
C19	10.00	4.69
C20	10.00	4.69
C21	10.00	4.69
C22	13.00	34.63
C23	10.00	4.69
C24	100.00	47.36
C25	15.00	23.69
C26	10.00	15.52

DRAINAGE STRUCTURE DATA

NO.	TYPE	BASELINE	STATION	OFFSET	RIM EL.	INV. EL. IN	INV. EL. OUT	REMARKS
10	CBCI	LAFAYETTE	16+92	25 LT	29.75	–	–	
11	CBCI	LAFAYETTE	16+93	24 RT	30.18	–	–	BUILD CBCI OVER EXIST. PIPE
12	DMH	LAFAYETTE	17+38	20 LT	29.86	–	–	CUT INTO EXIST. DMH

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

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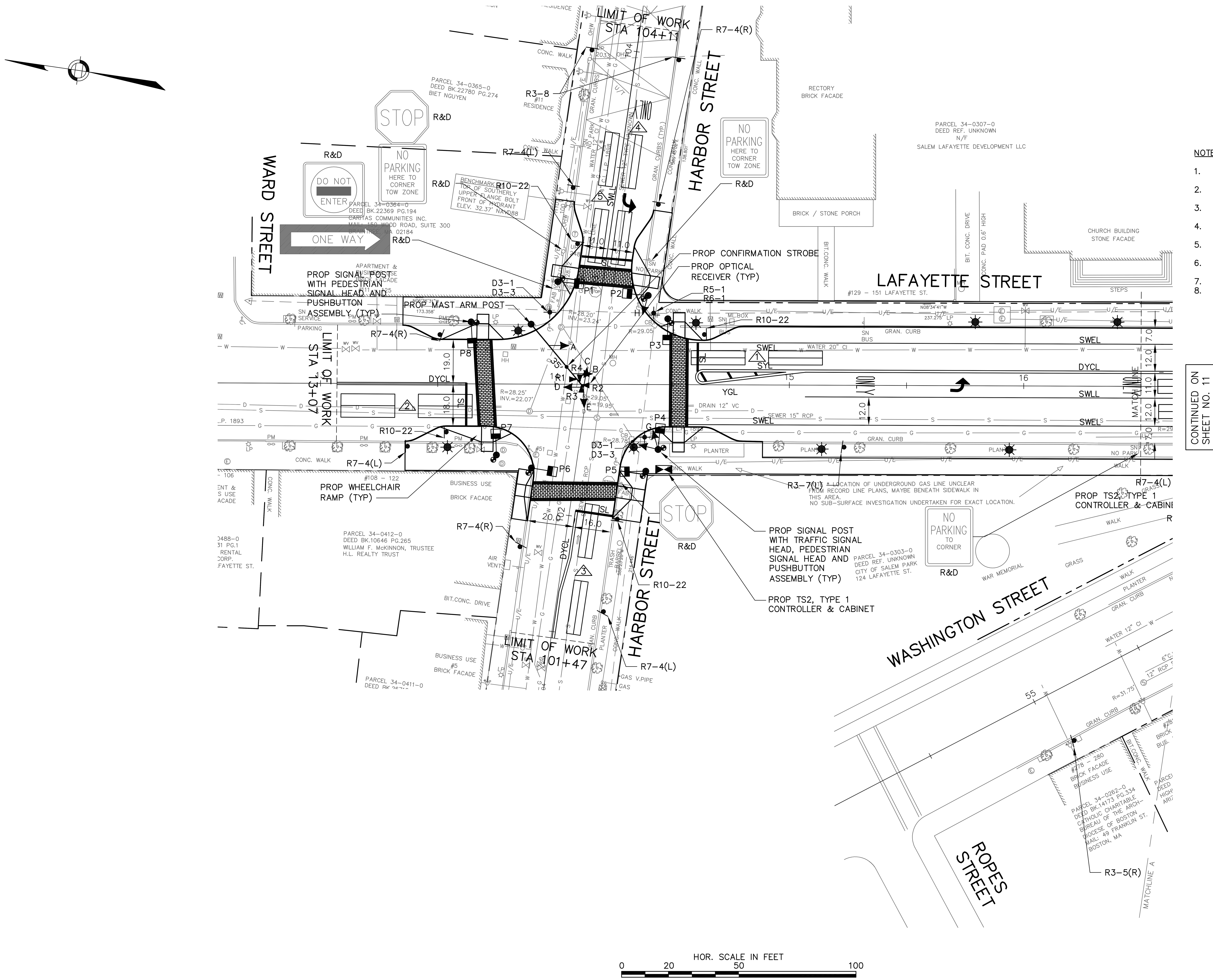
SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	9	20

TRAFFIC SIGNAL PLAN LOCATION 1



NOTES:

1. TRAFFIC SIGNALS SHALL BE FULLY ACTUATED WITH LOOP DETECTION.
2. PROPOSED PULL BOXES AND CONDUIT WILL BE SHOWN ON THE FINAL DESIGN SUBMISSION.
3. TRAFFIC SIGNALS SHALL BE COORDINATED BY WAY OF GPS CLOCK SYNCHRONIZATION.
4. EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE REMOVED AND STACKED.
5. PROPOSED TRAFFIC SIGNAL EQUIPMENT SHALL BE ORNAMENTAL TYPE.
6. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
7. MEET EXISTING PAVEMENT MARKINGS AT LIMITS OF WORK.
8. ALL PARKING SIGNS SHALL BE MOUNTED AT AN ANGLE OF 45 DEGREES WITH THE LINE OF TRAFFIC FLOW.

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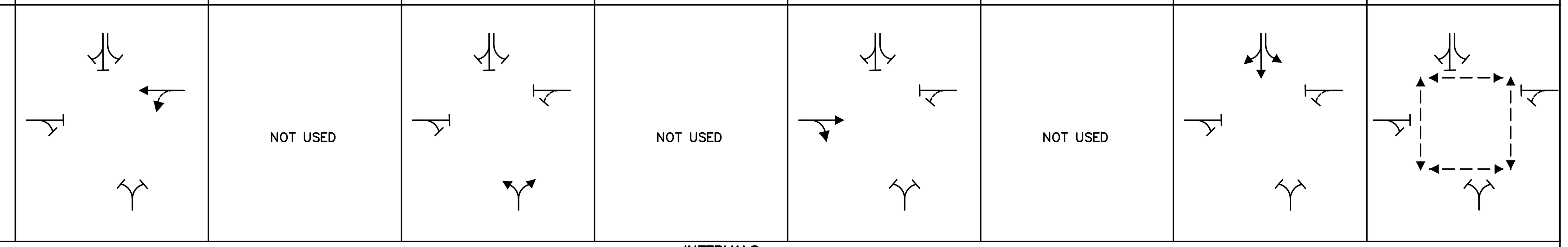
		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

SEQUENCE & TIMING FOR FULLY ACTUATED CONTROL
LAFAYETTE STREET & HARBOR STREET LOCATION 1

	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	OPERATION / FLASHING
	NOT USED		NOT USED		NOT USED		NOT USED			



INTERVALS

APPROACH	DIRECT.	FACES	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
LAFAYETTE STREET	NB	A,B				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	Y
LAFAYETTE STREET	SB	D,F				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	Y
HARBOR STREET	EB	E,H				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	R
HARBOR STREET	WB	C,G				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	R
PEDESTRIAN	ALL	P1–P8				DW	DW	DW				DW	DW	DW				DW	DW	DW				DW	DW	DW	W	FDW	DW	OFF

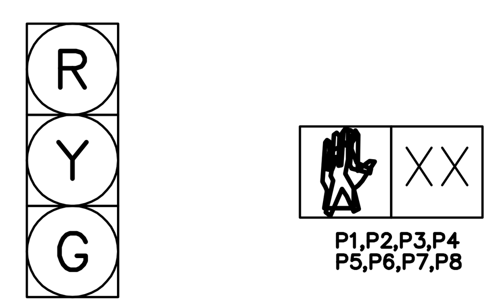
TIMING IN SECONDS

	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	
MINIMUM GREEN				10						5						10						5						EMERGENCY ONLY
MAX GREEN 1 (FREE)				40						25						40						25						
VEHICLE EXTENSION				3						3						3						3						
PED INTERVALS																									7	11		
YELLOW CLEARANCE					3						3						3						3					
RED CLEARANCE						2						2						2						2			1	
DETECTION (MEMORY)					NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK		
RECALL					SOFT						OFF						SOFT						OFF			OFF		

NOTES:

1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. ANY TWO NON–CONFLICTING PHASES MAY RUN CONCURRENTLY. IN PRESENCE OF CALLS ON MULTIPLE PHASES SEQUENCE SHALL CONFORM TO PREFERENTIAL DIAGRAM.
3. THIS SIGNAL SHALL BE COORDINATED WITH THE SIGNAL AT LAFAYETTE STREET & WASHINGTON STREET.

SIGNAL FACES



A,B,C,D E,F,G,H

12" LENSES

P1,P2,P3,P4 P5,P6,P7,P8

16" DUAL PEDESTRIAN W/ COUNTDOWN

NOTES:

1. ALL VEHICLE AND PEDESTRIAN LENSES SHALL BE LED TYPE.
2. ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5" BACKPLATES.
3. ALL HOUSINGS TO BE FIXED MOUNTED.

PRE–EMPTION PHASING & PRIORITY

RECEIVER AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R1	1	SB	ø6
R2	2	NB	ø2
R3	3	EB	ø4
R4	4	WB	ø8

TIMING FOR SIGNAL COORDINATION

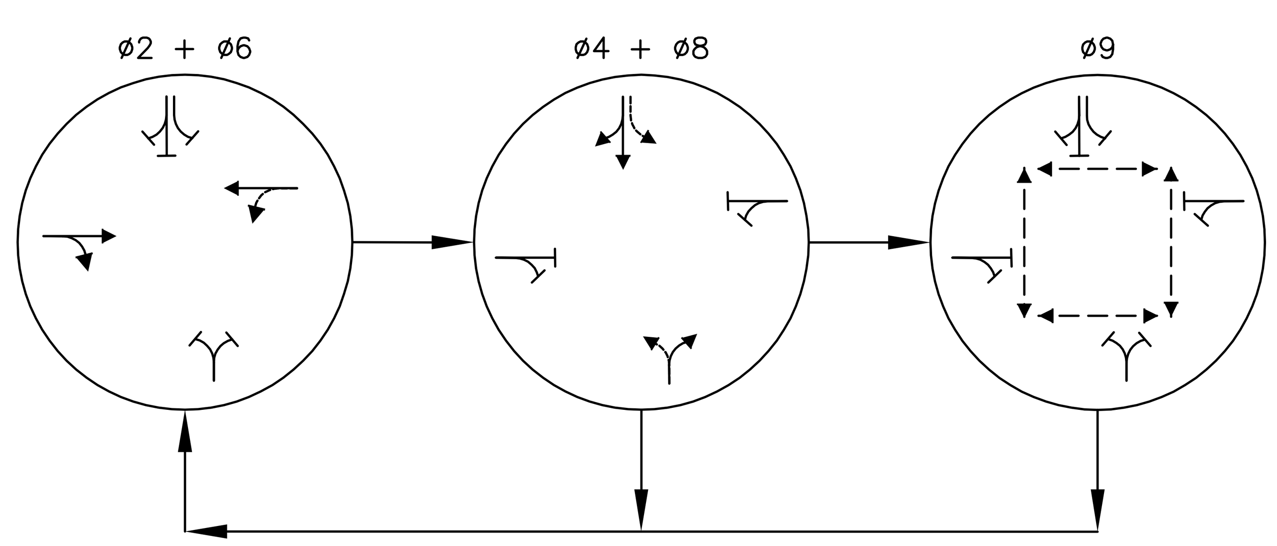
PROGRAM	DAY	TIME	CYCLE LENGTH (SEC)	OFFSET (SEC)	SPLITS* (SEC)				
					ø2	ø4	ø6	ø8	ø9
1	M–F	6AM–9AM	120	31	70	31	70	31	19
2	M–F	4PM–7PM	120	27	68	35	68	35	19
3 ALL OTHER TIMES			FREE	–	–	–	–	–	–

* SPLIT = GREEN + YELLOW + ALL RED TIME FOR PHASE

NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION OR TRANSMITTED DIRECTLY FROM THE FIRE STATION AND RECEIVED AT THE INTERSECTION.
2. PRE–EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (1 HIGHEST AND 4 LOWEST).
3. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R1 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY PRE–EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS, OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN PROVIDE PRE–EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
4. MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
5. EMERGENCY VEHICLE PRE–EMPTION SHALL OVERRIDE COORDINATION.

PREFERENTIAL SEQUENCE DIAGRAM (CALLS ON ALL PHASES)



SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	10	20

SEQUENCE AND TIMING PLAN LOCATION 1

MAJOR ITEMS LIST

QUANTITY	ITEM NO.	DESCRIPTION
1	815.1	TS2 TYPE 1 CONTROLLER W/CABINET & FOUNDATION
6		SIGNAL POST & BASE – W/ FDN – 8'
2		SIGNAL POST & BASE – W/ FDN – 10'
1		35' MAST ARM – STEEL, TYPE II W/ FDN
8		1 WAY 3 SECTION VEHICLE SIGNAL HOUSING – 12" LED
8		PEDESTRIAN SIGNAL HOUSING – 16" GRAPHIC LED
8		PEDESTRIAN PUSH–BUTTON – SIGN AND SADDLE
1		SERVICE CONNECTION (UNDERGROUND)
4		OPTICAL RECEIVER (DETECTOR) – ONE WAY
2		OPTICAL PHASE SELECTOR – TWO CHANNELS
1		PREEMPTION CONFIRMATION STROBE (WHITE)
10	811.31	12" x 12" PULLBOX (SD2.031)
2	815.1	DUAL CHANNEL LOOP DETECTOR AMPLIFIER
1		BUS INTERFACE UNIT (SPARE)
10		LOOP DETECTOR SECTIONS (SEE TABLE BELOW)
1		DUAL CHANNEL LOOP DETECTOR AMPLIFIER (SPARE)
1	813.791	GPS SYSTEM FOR CLOCK SYNCHRONIZATION REFERENCE
PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION		

NOTE:
TRAFFIC SIGNAL MAST ARMS, POSTS AND BASES SHALL BE ORNAMENTAL TYPE CONSISTENT WITH CITY OF SALEM STANDARDS

LOOP DETECTORS

NUMBER	NUMBER SECTION	SIZE	NUMBER TURNS	OPERATION	CALL ø	CALL DELAY (SECONDS)	EXTEND ø	LOOP CONNECTION
1	2	6'X23'	**	PRESENCE	2	–	2	SERIES
2	2	10'X23'	**	PRESENCE	6	–	6	SERIES
3	2	6'X23'	**	PRESENCE	4	–	4	SERIES
4	2	6'X23'	**	PRESENCE	8	–	8	SERIES
5	2	6'X23'	**	PRESENCE	8	–	8	SERIES

** THE NUMBER OF TURNS FOR TYPE Q QUADRAPOLE DETECTORS IS 1–2–1 WITH 2 LAYERS

DESIGNED BY	BAM	DATE 10–19–10
DRAWN BY	BAM	1–1–11
CHECKED BY	PSC	1–12–11

	DATE		
DESIGNED BY	BAM	10-19-10	
DRAWN BY	BAM	1-1-11	
CHECKED BY	PSC	1-12-11	

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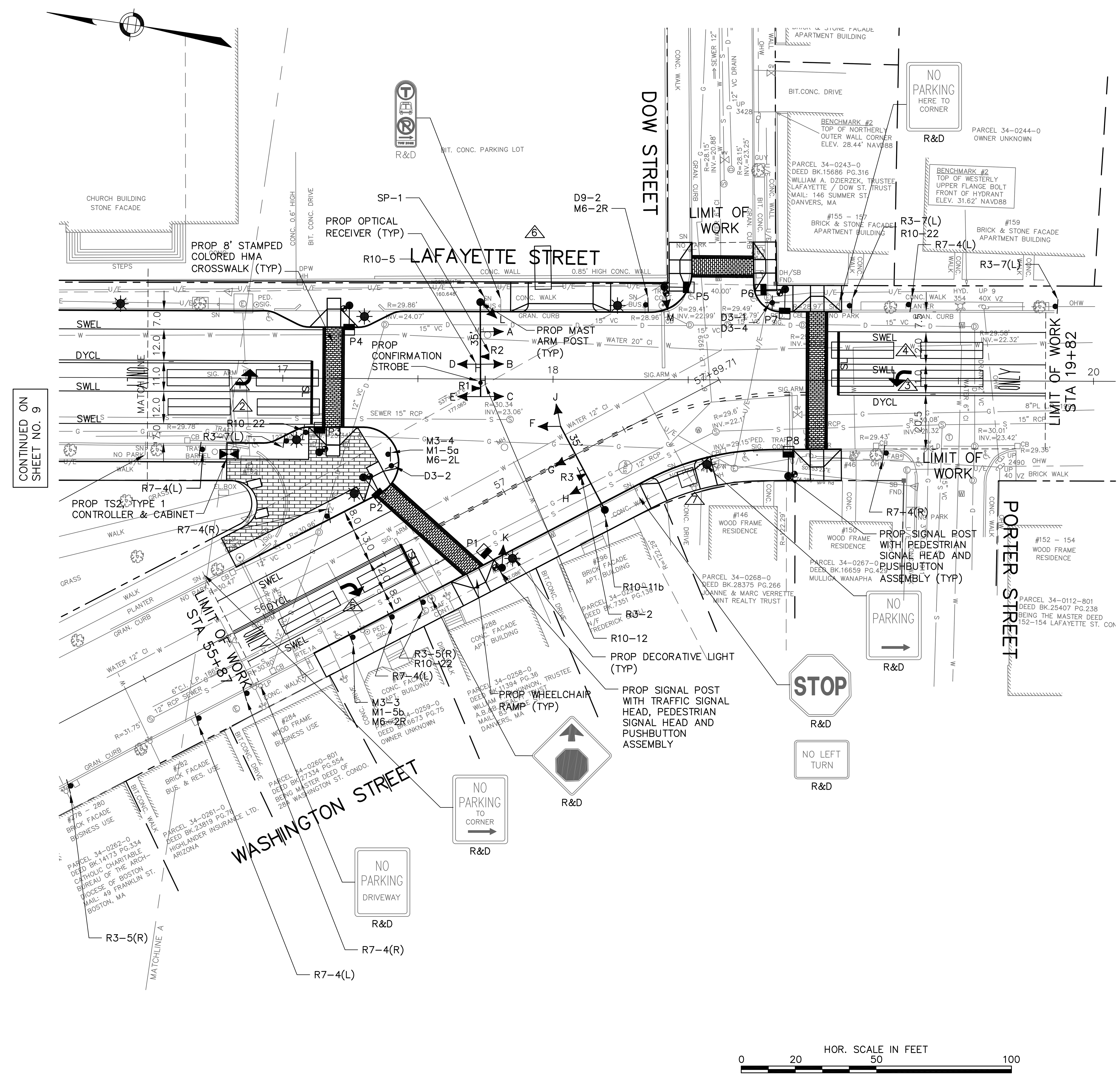
SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	11	20

TRAFFIC SIGNAL PLAN LOCATION 2

CONTINUED ON SHEET NO. 9



NOTES:

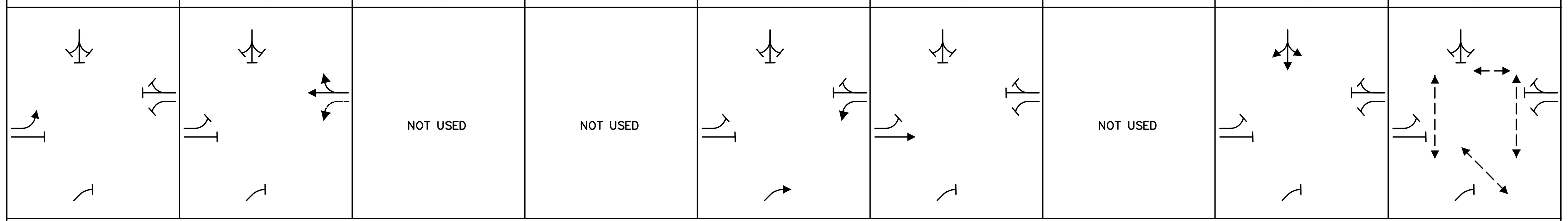
1. TRAFFIC SIGNALS SHALL BE FULLY ACTUATED WITH LOOP DETECTION.
2. PROPOSED PULL BOXES AND CONDUIT WILL BE SHOWN ON THE FINAL DESIGN SUBMISSION.
3. TRAFFIC SIGNALS SHALL BE COORDINATED BY WAY OF GPS CLOCK SYNCHRONIZATION.
4. EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE REMOVED AND STACKED.
5. PROPOSED TRAFFIC SIGNAL EQUIPMENT SHALL BE ORNAMENTAL TYPE.
6. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
7. MEET EXISTING PAVEMENT MARKINGS AT LIMITS OF WORK.
8. ALL PARKING SIGNS SHALL BE MOUNTED AT AN ANGLE OF 45 DEGREES WITH THE LINE OF TRAFFIC FLOW.

SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	12	20

SEQUENCE AND TIMING PLAN LOCATION 2

SEQUENCE & TIMING FOR FULLY ACTUATED CONTROL
LAFAYETTE STREET & WASHINGTON STREET
LOCATION 2



INTERVALS

APPROACH	DIRECT.	FACES	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
			ø1			ø2			ø3			ø4			ø5			ø6			ø7			ø8			ø9			
LAFAYETTE STREET	NB	A,B	R	R	R	G	Y ④	R ④							R	R	R	R	R	R				R	R	R	R	R	R	Y
LAFAYETTE STREET	NB	C	R	R	R	G	Y ④	R ④							R/←G	R/←Y	R	R	R	R				R	R	R	R	R	R	Y
LAFAYETTE STREET	SB	D	←G	←Y	←R	R	R	R							R	R	R	R	R	R				R	R	R	R	R	R	←R
LAFAYETTE STREET	SB	E,F	R	R	R	R	R	R							R	R	R	G	Y	R				R	R	R	R	R	R	Y
WASHINGTON STREET	EB	G,H	R	R	R	R	R	R							G→	Y→	R	R	R	R				R	R	R	R	R	R	R
DRIVEWAYS	WB	J,K,L,M	R	R	R	R	R	R							R	R	R	R	R	R				G	Y	R	R	R	R	R
PEDESTRIAN	ALL	P1–P8	DW	DW	DW	DW	DW	DW							DW	DW	DW	DW	DW	DW				DW	DW	DW	W	FDW	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	5			10									10			10						6						
MAX GREEN 1 (FREE)	20			45									45			35						6						
VEHICLE EXTENSION	3			3									3			3						3						
PED INTERVALS																									7	15		
YELLOW CLEARANCE		3			3									3			3						3					
RED CLEARANCE			3			3									3			3						2			1	
DETECTION (MEMORY)	LOCK			NON-LOCK									NON-LOCK			NON-LOCK						NON-LOCK			LOCK			
RECALL	OFF			SOFT									OFF			SOFT						OFF			OFF			

NOTES:

1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. ANY TWO NON-CONFLICTING PHASES MAY RUN CONCURRENTLY. IN PRESENCE OF CALLS ON MULTIPLE PHASES SEQUENCE SHALL CONFORM TO PREFERENTIAL DIAGRAM.
3. THIS SIGNAL SHALL BE COORDINATED WITH THE SIGNAL AT LAFAYETTE STREET & HARBOR STREET.
4. G IF FOLLOWED BY ø2 + ø5.

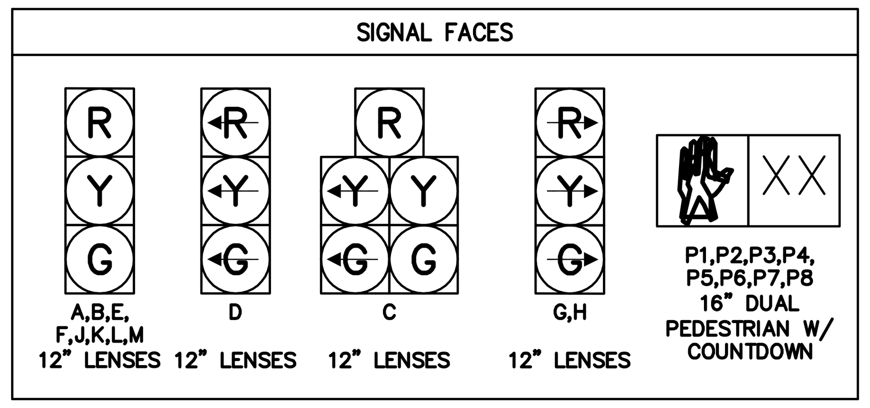
PRE-EMPTION PHASING & PRIORITY

RECEIVER AND PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R1	1	SB	ø6
R2	2	NB	ø2
R3	3	EB	ø5

NOTES:

1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION OR TRANSMITTED DIRECTLY FROM THE FIRE STATION AND RECEIVED AT THE INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (1 HIGHEST AND 3 LOWEST).
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R1 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS, OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
4. MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

SIGNAL FACES



NOTES:

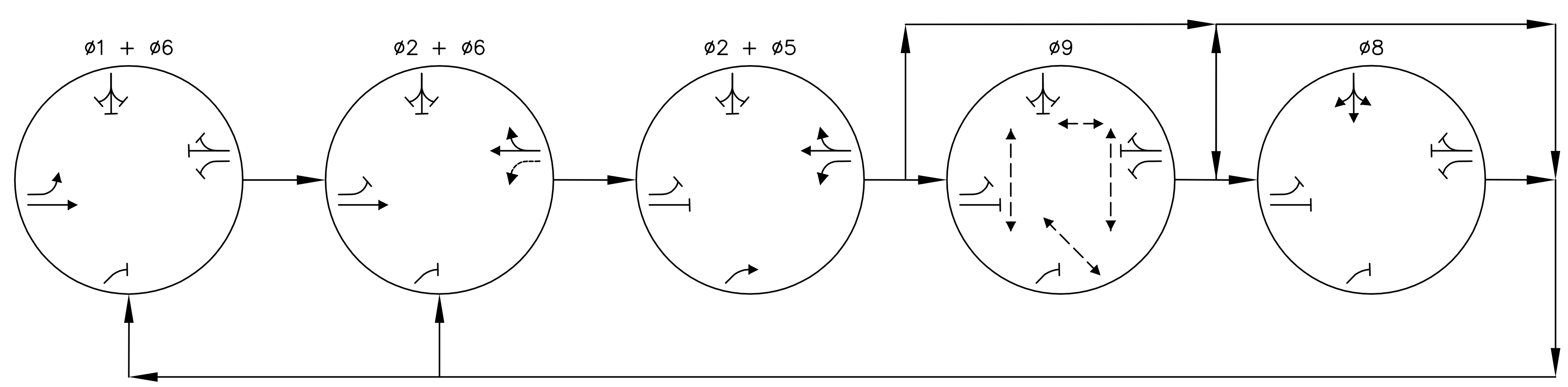
1. ALL VEHICLE AND PEDESTRIAN LENSES SHALL BE LED TYPE.
2. ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5" BACKPLATES.
3. ALL HOUSINGS TO BE FIXED MOUNTED.

TIMING FOR SIGNAL COORDINATION

PROGRAM	DAY	TIME	CYCLE LENGTH (SEC)	OFFSET (SEC)	SPLITS* (SEC) ø1	ø2	ø5	ø6	ø8	ø9
1	M–F	6AM–9AM	120	0	23	63	54	35	11	23
2	M–F	4PM–7PM	120	0	28	58	45	26	11	23
3 ALL OTHER TIMES			FREE	–	–	–	–	–		–

* SPLIT = GREEN + YELLOW + ALL RED TIME FOR PHASE

PREFERENTIAL SEQUENCE DIAGRAM (CALLS ON ALL PHASES)



MAJOR ITEMS LIST

QUANTITY	ITEM NO.	DESCRIPTION
1	815.2	TS2 TYPE 1 CONTROLLER W/CABINET & FOUNDATION
6		SIGNAL POST & BASE – W/ FDN – 8'
1		SIGNAL POST & BASE – W/ FDN – 10'
2		35' MAST ARM – STEEL, TYPE II W/ FDN
8		1 WAY 3 SECTION VEHICLE SIGNAL HOUSING – 12" LED
3		1 WAY 3 SECTION VEHICLE SIGNAL HOUSING – 12" LED (ALL ARROWS)
1		1 WAY 5 SECTION VEHICLE SIGNAL HOUSING – 12" LED
8		PEDESTRIAN SIGNAL HOUSING – 16" GRAPHIC LED
7		PEDESTRIAN PUSH-BUTTON – SIGN AND SADDLE
1		SERVICE CONNECTION (UNDERGROUND)
3		OPTICAL RECEIVER (DETECTOR) – ONE WAY
2		OPTICAL PHASE SELECTOR – TWO CHANNELS
1		PREEMPTION CONFIRMATION STROBE (WHITE)
10	811.31	12" x 12" PULLBOX (SD2.031)
4	815.2	DUAL CHANNEL LOOP DETECTOR AMPLIFIER
1		BUS INTERFACE UNIT (SPARE)
10		LOOP DETECTOR SECTIONS (SEE TABLE BELOW)
1		DUAL CHANNEL LOOP DETECTOR AMPLIFIER (SPARE)
1	813.791	GPS SYSTEM FOR CLOCK SYNCHRONIZATION REFERENCE

PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION

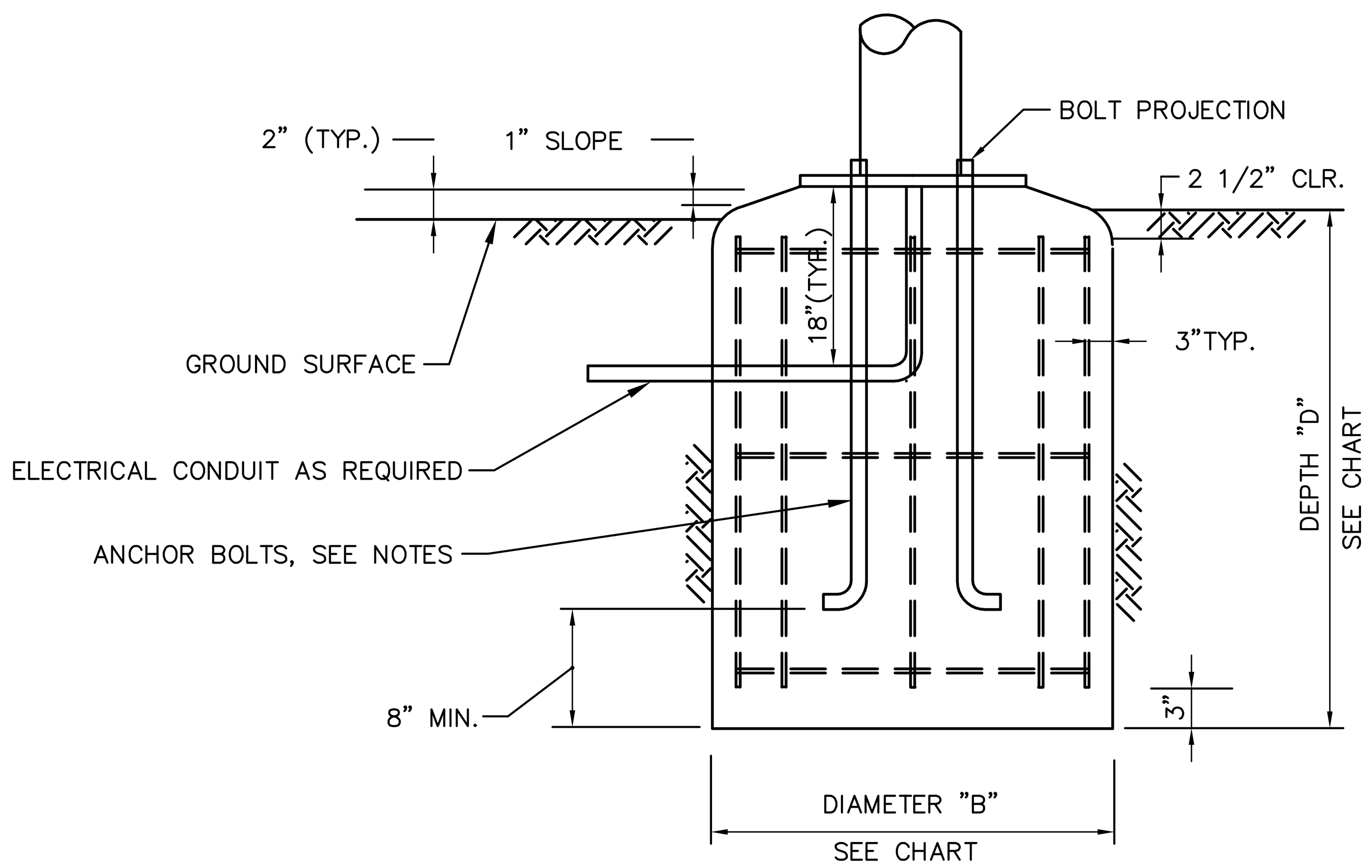
NOTE:
TRAFFIC SIGNAL MAST ARMS, POSTS AND BASES SHALL BE ORNAMENTAL TYPE CONSISTENT WITH CITY OF SALEM STANDARDS

LOOP DETECTORS

NUMBER	NUMBER SECTION	SIZE	NUMBER TURNS	OPERATION	CALL ø	CALL DELAY (SECONDS)	EXTEND ø	LOOP CONNECTION
1	2	6'X23'	**	PRESENCE	1	–	1	SERIES
2	2	6'X23'	**	PRESENCE	6	–	6	SERIES
3	2	6'X23'	**	PRESENCE	5	–	5	SERIES
4	2	6'X23'	**	PRESENCE	2	–	2	SERIES
5	2	6'X23'	**	PRESENCE	5	–	5	SERIES
6	1	6'X10'	3	PRESENCE	8	–	8	SERIES
7	1	6'X6'	3	PRESENCE	8	–	8	SERIES

** THE NUMBER OF TURNS FOR TYPE Q QUADRAPOLE DETECTORS IS 1-2-1 WITH 2 LAYERS

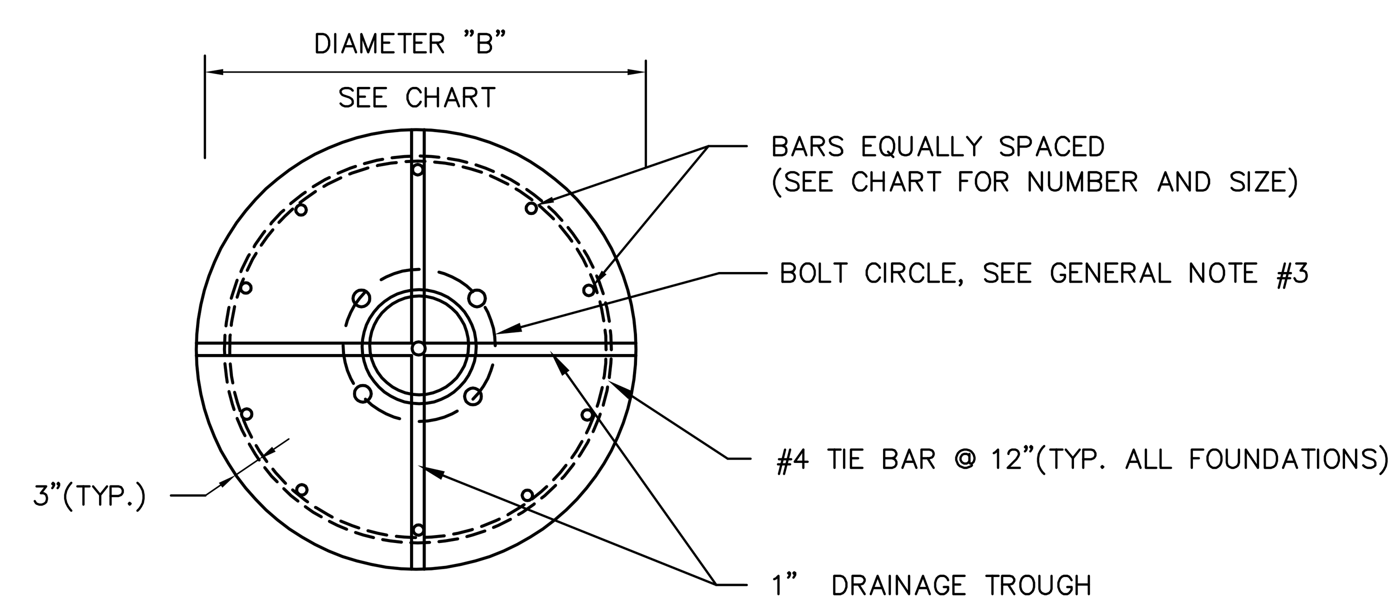
		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSG	1-12-11



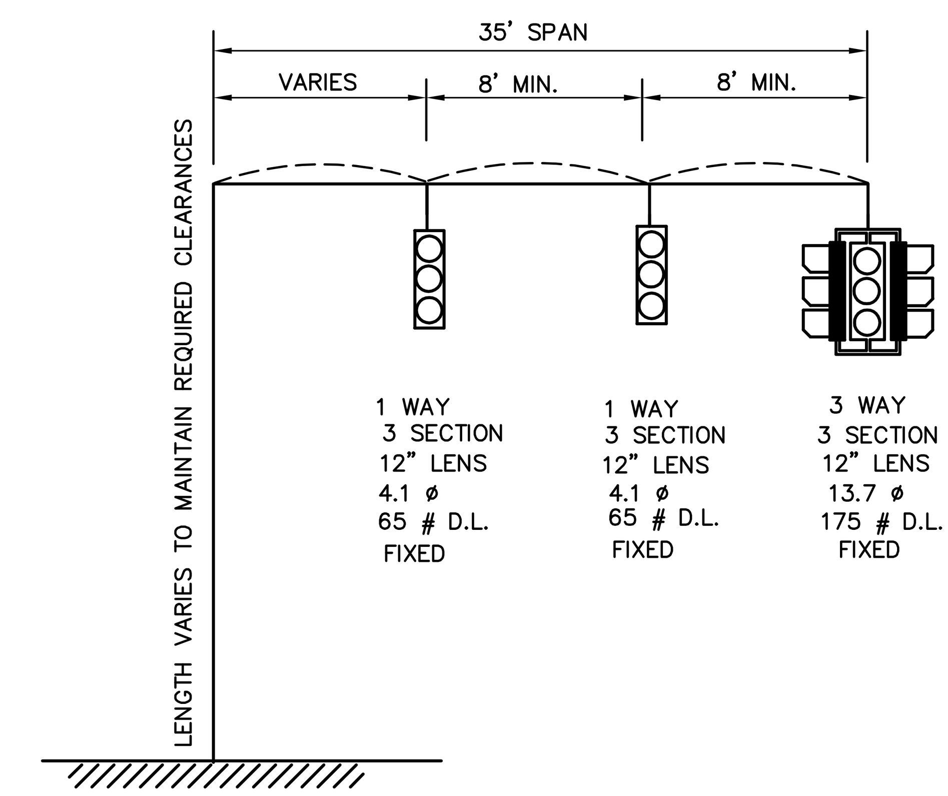
ELEVATION
NOT TO SCALE

NOTES:

1. POLE, BASE PLATE AND ANCHOR BOLTS SHALL BE DESIGNED BY THE POLE MANUFACTURER.
2. MINIMUM FOUNDATION DEPTH SHALL BE CHECKED TO INSURE ADEQUATE ANCHOR BOLT EMBEDMENT – CLEARANCE AND PROJECTION.
3. OPTIONAL END ANCHORAGE FOR ANCHOR BOLTS CAN BE A STEEL PLATE WITH THREADED HOLES DESIGNED BY THE POLE MANUFACTURER.



PLAN
NOT TO SCALE



SOIL TYPE (SEE GENERAL NOTE NO. 7)	DIA. (B) = 2'-6"		DIA. (B) = 3'-0"		DIA. (B) = 3'-6"	
	DEPTH (D)	VERTICAL BARS	DEPTH (D)	VERTICAL BARS	DEPTH (D)	VERTICAL BARS
DRY SANDY SOIL	5'-9"	10 #5	5'-0"	10 #6	4'-9"	10 #7
WET SANDY SOIL	6'-9"	10 #5	6'-0"	10 #6	5'-6"	10 #7
CLAYEY SOIL (MEDIUM STIFF)	9'-9"	10 #5	8'-9"	10 #6	8'-0"	10 #7
ALLUVIAL SOIL	14'-3"	10 #5	12'-9"	10 #6	11'-9"	10 #7

FOUNDATION DESIGN CHART

GENERAL NOTES

1. FOUNDATIONS SHALL BE CLASS "A" CEMENT CONCRETE MASONRY.
2. REINFORCEMENT SHALL BE A.S.T.M. A615-GR. 60
3. BOLT CIRCLE AND ANCHOR BOLTS TO BE PROVIDED BY THE CONTRACTOR THE ANCHOR BOLTS SHALL BE SUPPLIED WITH A TEMPLATE FOR SETTING THE BOLTS AND NECESSARY BOLT PROJECTIONS.
4. PROVIDE FOR ELECTRICAL CONDUIT AS REQUIRED.
5. 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 FOR APPROVAL IF THEY MEET THE REQUIREMQNTS LISTED IN THE GENERAL NOTES OF SHEETS 3 & 4 OF THE SPAN WIRE ASSEMBLY FOUNDATION DETAILS AND DESIGN CHARTS.
6. IF THE SOIL IS DISTURBED OR REMOVED BEYOND THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATION AS SPECIFIED, IT SHALL BE REPLACED WITH CONCRETE. ANY ADDITIONAL COST FOR THE CONCRETE SHALL BE PAID FOR BY THE CONTRACTOR.
7. DETERMINATION OF EXISTING SOIL CONDITIONS SHALL BE APPROVED BY THE DESIGN ENGINEER. CONTRACTOR SHALL PROVIDE SOIL BORING INFORMATION AT STRAIN POLE LOCATIONS.
8. VERTICAL REINFORCEMENT BARS ARE TO BE EVENLY SPACED IN THE FOUNDATION AS SHOWN.
9. THE SMALLEST DIAMETER FOUNDATION SHALL BE USED THAT WILL MEET THE MOMENT REQUIREMENT AND BE AT LEAST 16" GREATER IN DIAMETER THAN THE BOLT CIRCLE DIAMETER.
10. IF A POOR SOIL OR LEDGE IS ENCOUNTERED,(I.E., ONE WHICH DOES NOT APPLY TO THE DESIGN CHARTS SHOWN ON THIS SHEET), AN ALTERNATIVE DESIGN SHALL BE DEVELOPED BY THE DESIGN ENGINEER. DECISIONS MADE IN NOTES #7 & #10, SHALL BE SUBMITTED TO THE M.H.D. FOR APPROVAL. IF UTILITIES OR OTHER UNDERGROUND OBSTRUCTION ARE ENCOUNTERED, THE CONTRACTOR SHALL BACKFILL THE AREA TO ITS ORIGINAL CONDITION UNTIL AN ALTERNATE DESIGN HAS BEEN PROVIDED BY THE DESIGN ENGINEER.
11. THE FOUNDATIONS SHOWN ON THIS DRAWING ARE FOR A 35-FOOT CANTILEVERED TYPE II MAST ARM CARRYING A THREE WAY, THREE SECTION, TWELVE INCH (12") LENS TRAFFIC SIGNAL HOUSING FIXED AT THE END OF THE ARM, AND A ONE-WAY, THREE-SECTION, TWELVE INCH (12") LENS TRAFFIC SIGNAL FIXED TWELVE FEET (12') AWAY, AND ANOTHER ONE-WAY, THREE-SECTION TWELVE INCH (12") LENS TRAFFIC SIGNAL FIXED TWELVE FEET (12') AWAY FROM THAT.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

STANDARD DRAWINGS

35 FOOT – TYPE II MAST ARM
CORED PIER FOUNDATIONS

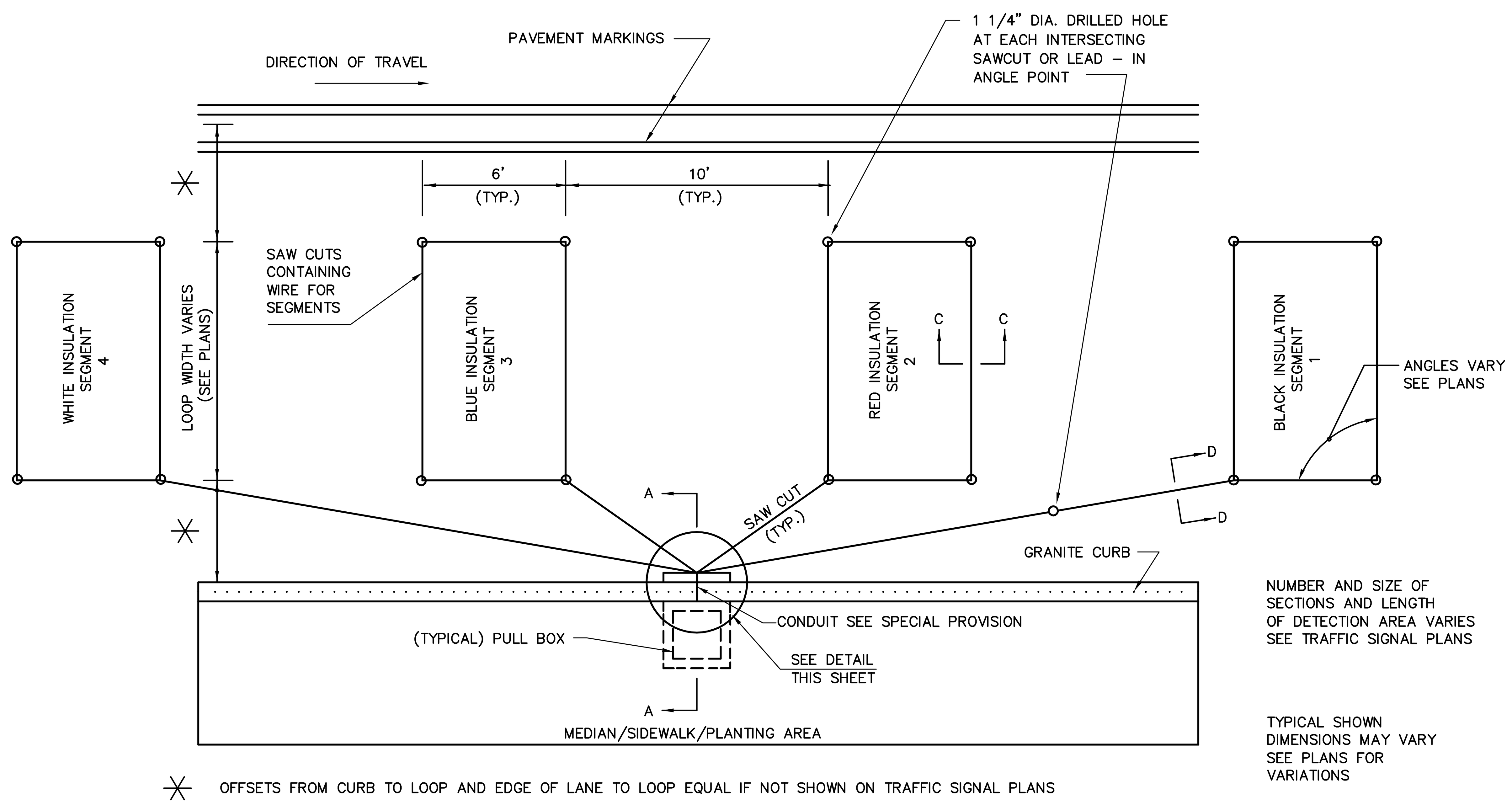
REVISED DATE JANUARY 2, 1985

TRAFFIC ENGINEER — BRIDGE ENGINEER P.E.
DIRECTOR BAP & D — CHIEF ENGINEER P.E.

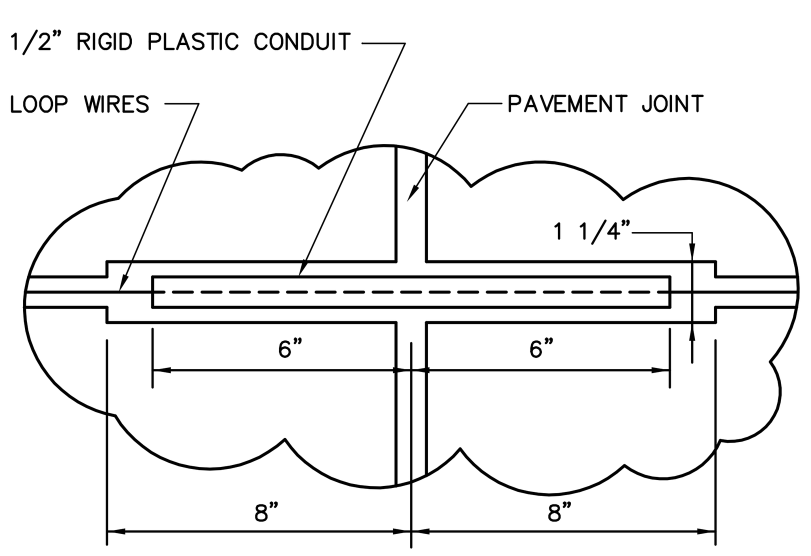
DESIGNED BY BAM 10-19-10
DRAWN BY BAM 1-1-11
CHECKED BY PSC 1-12-11
DATE

SALEM			
LAFAYETTE STREET			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	14	20

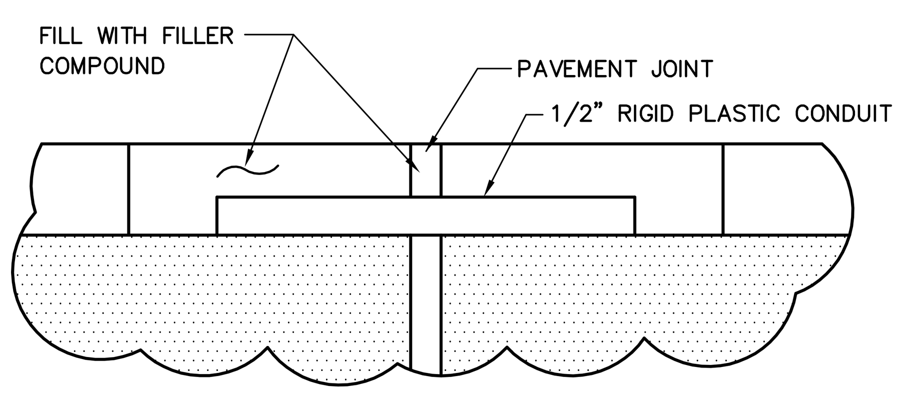
LOOP DETECTOR DETAILS



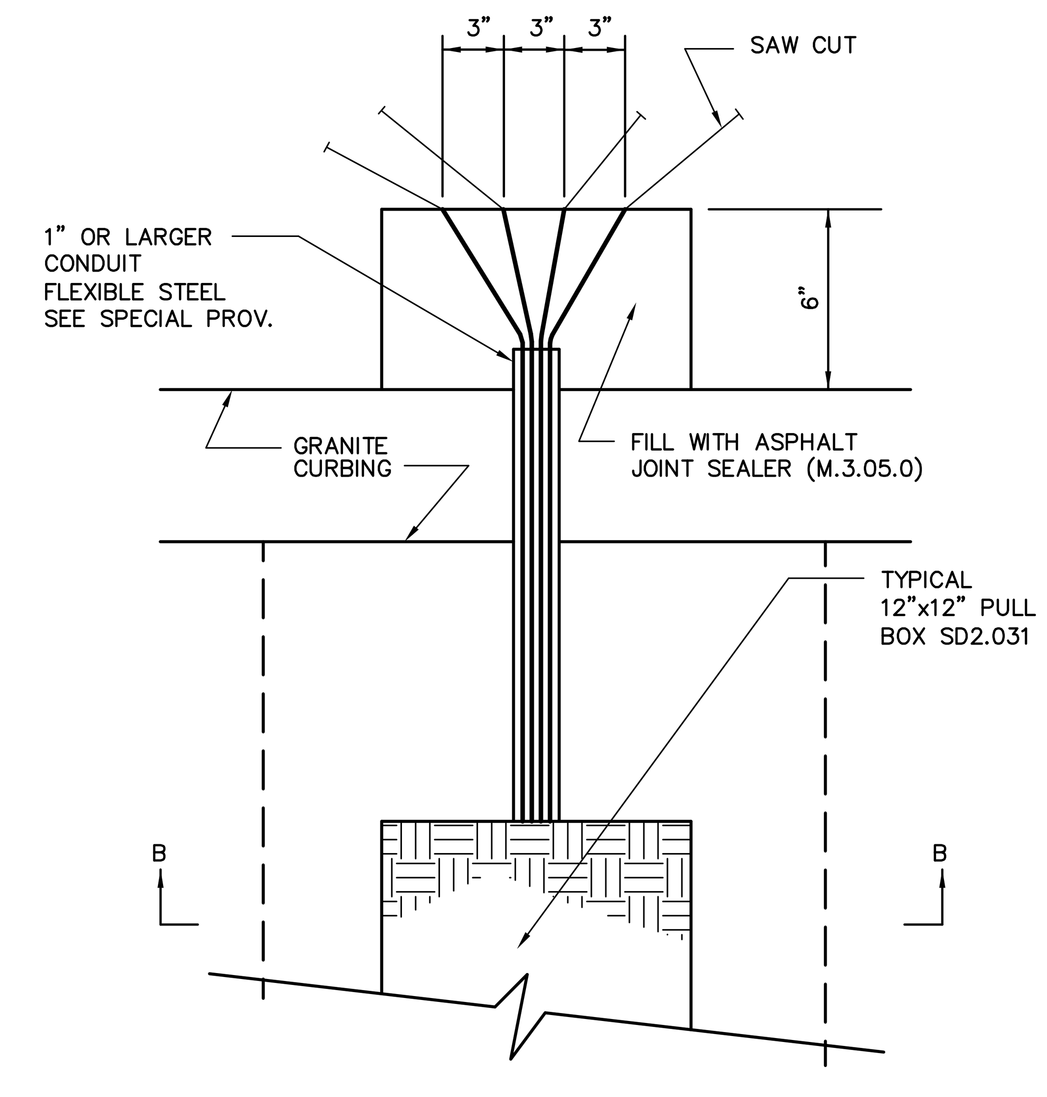
PLAN OF SEGMENTED DETECTOR DETAIL
NOT TO SCALE



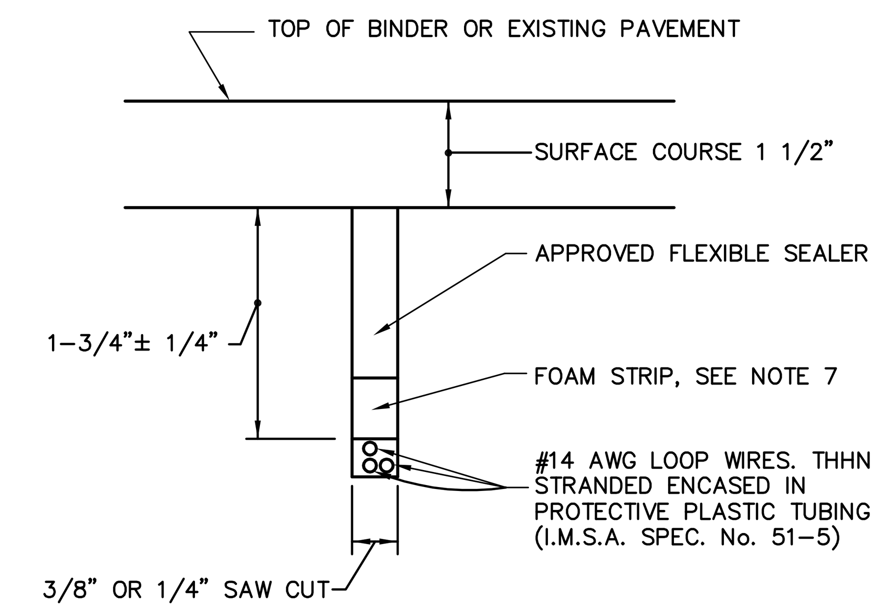
PLAN
TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE



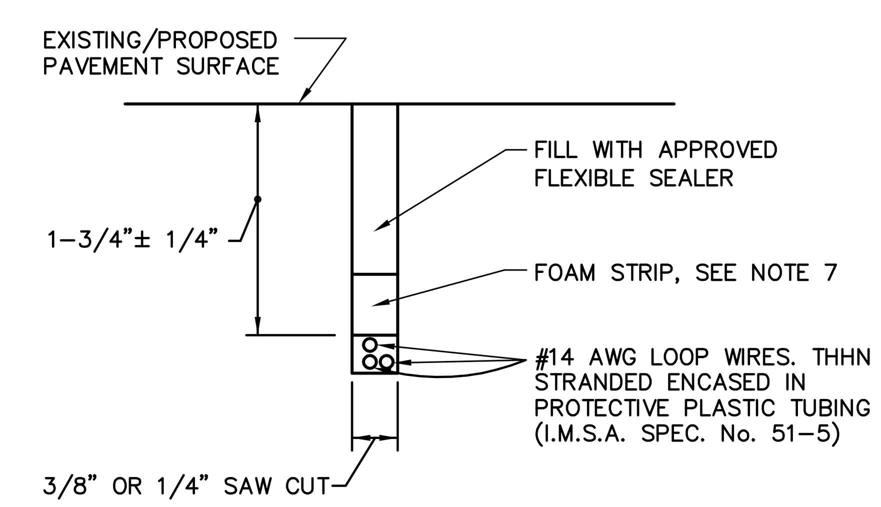
VERTICAL SECTION
TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE



DETAIL - PLAN VIEW
NOT TO SCALE

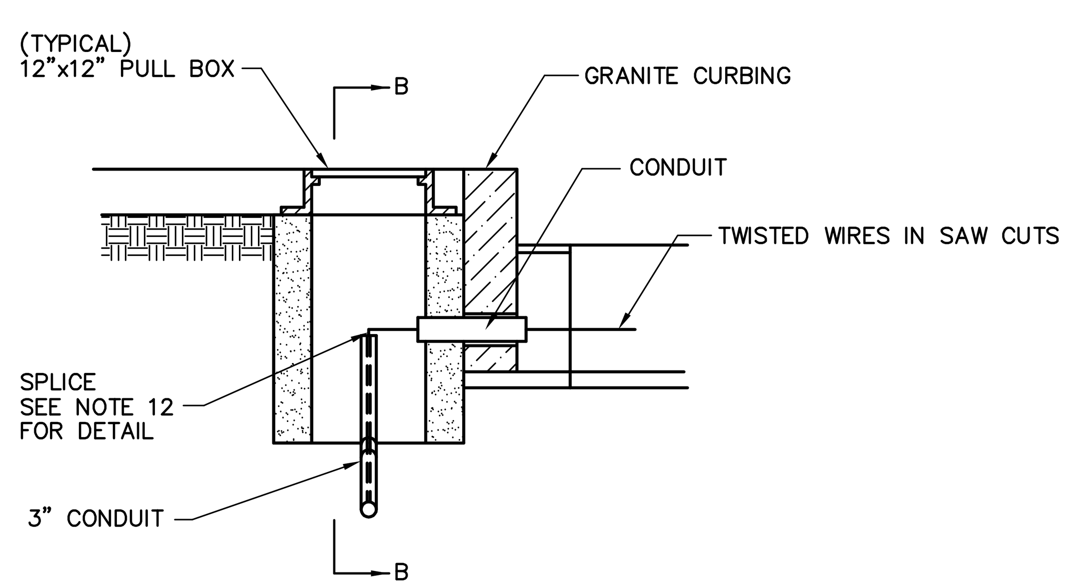


SECTION C-C & D-D
LOOPS IN BINDER COURSE OR EXISTING PAVEMENT TO BE RESURFACED
NOT TO SCALE

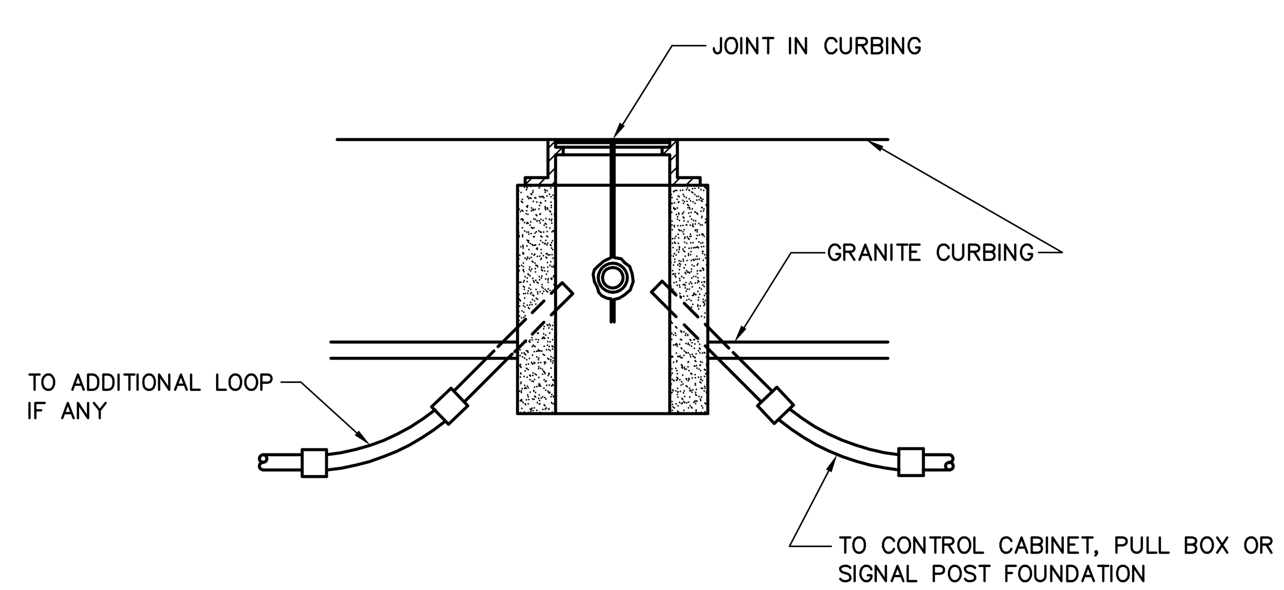


SECTION C-C & D-D
LOOPS IN SURFACE COURSE
NOT TO SCALE

(FOR AREAS OUTSIDE LIMITS OF PAVEMENT WORK ONLY)



SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

DETECTOR NOTES

1. IN HANDHOLE, SPLICE ALL SEGMENTS TO TYPE II-SHIELDED LOOP DETECTOR LEAD-IN CABLE. SEGMENTS SHALL BE SPLICED IN PARALLEL, IN SERIES, OR IN A COMBINATION OF PARALLEL & SERIES AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. NUMBER OF TURNS OF WIRE SHALL ALSO BE AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. SEE NOTE 12.
2. SEE SPECIAL PROVISIONS FOR REQUIREMENTS OF DETECTOR AMPLIFIER.
3. LEAD IN WIRES SHALL BE TWISTED FROM SEGMENT TO SPLICE WITH SHIELDED CABLE FIVE TURNS PER FOOT. LEAD-IN SHALL BE TYPE II (M8. 16. II).
4. BEFORE STARTING ANY SPLICING, THE ELECTRICAL CONTRACTOR SHALL FURNISH DATA SHEETS ON THE MATERIALS AND/OR METHODS TO BE USED IN ACCORDANCE WITH THE DEPARTMENTS STANDARD OPERATING PROCEDURES FOR APPROVAL OF SHOP DRAWINGS SEE SECTION 815.64, ESPECIALLY PARAGRAPH 1.
5. THE METALLIC SHIELD WHICH SHALL ENCASE THE DETECTOR LEADS FROM A SPLICE (TYPICALLY LOCATED IN A PULL BOX NEAR THE ROADWAY COMPONENT OF THE DETECTOR) TO THE CONTROLLER, AND THE DRAIN WIRE UNDER THE METALLIC SHIELD, SHALL NOT BE GROUNDED TO THE EARTH GROUNDING BUSS IN THE CONTROLLER, AND THE SHIELD AND DRAIN WIRE SHALL BE CAREFULLY INSULATED FROM THE TRANSFORMER NEUTRAL OR FROM EARTH GROUND AT ALL POINTS ALONG ITS LENGTH. SPECIFICALLY, THIS INCLUDES CAREFUL INSULATION OF THE EXPOSED PORTION OF THE SHIELD AND THE DRAIN WIRE AT THE END AWAY FROM THE CONTROLLER WHERE IT IS SPLICED TO WIRES LEADING TO THE ROADWAY COMPONENT OF THE DETECTOR. THIS IS IMPORTANT TO AVOID A GROUND RETURN LOOP.
6. FILL ALL CONDUIT OPENINGS WITH DUCT SEAL.
7. AFTER SAW CUTS ARE COMPLETE, BLOW OUT WATER WITH OIL-FREE COMPRESSED AIR UNTIL CUTS ARE CLEAN AND DRY. INSERT WIRE INTO CLEAN SLOT WITH A BLUNT, SMOOTH, ROUND EDGED TOOL OF WOOD OR PLASTIC SUCH AS A PAINT STIRRER. DO NOT USE A SCREWDRIVER. THE INSERT FOAM PLASTIC HOLD DOWN STRIPS, SIMILAR TO ETHA FOAM SB. STRIPS SHALL BE ABOUT 2" LONG, PLACED IN THE SLOT ABOUT EVERY 2 FEET THEN POUR SEALER, TAKING CARE TO ELIMINATE BUBBLES.
8. THE COMBINED ROADWAY LOOP, TWISTED LEAD-IN WIRES, SPLICE AND SHIELDED LEAD-IN CABLE SHALL HAVE A RESISTANCE TO GROUND OF AT LEAST 50 TO 100 MEGOHMS. THE RESISTANCE BE 10 MEGOHMS UNDER WORST CASE CONDITIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
9. FOR INSTALLATION OF SINGLE (ONE SEGMENT) SMALL WIRE LOOP DETECTOR. DETAIL IS THE SAME.
10. CUT LOOPS IN BINDER AND FILL WITH APPROVED FLEXIBLE SEALER.
11. DETECTOR WIRE SHALL BE A DIFFERENT COLOR FOR EACH SEGMENT OF A DETECTOR GROUP. SEE DETAIL
12. SPLICING PATTERN P = SERIES/PARALLEL: SPLICE SEGMENTS 1 AND 3 OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE SEGMENTS 2 AND 4 IN SERIES. SPLICE THE RESULTANT TWO GROUPS IN PARALLEL. SPLICE THE RESULTANT COMBINATION TO ONE LEAD-IN CABLE. CONNECT THIS CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.

    SPLICING PATTERN S = SERIES: SPLICE ALL SEGMENTS (TYPICALLY FOUR, BUT MAY BE LESS) OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE THE RESULTANT COMBINATION TO ONE LEAD-IN CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

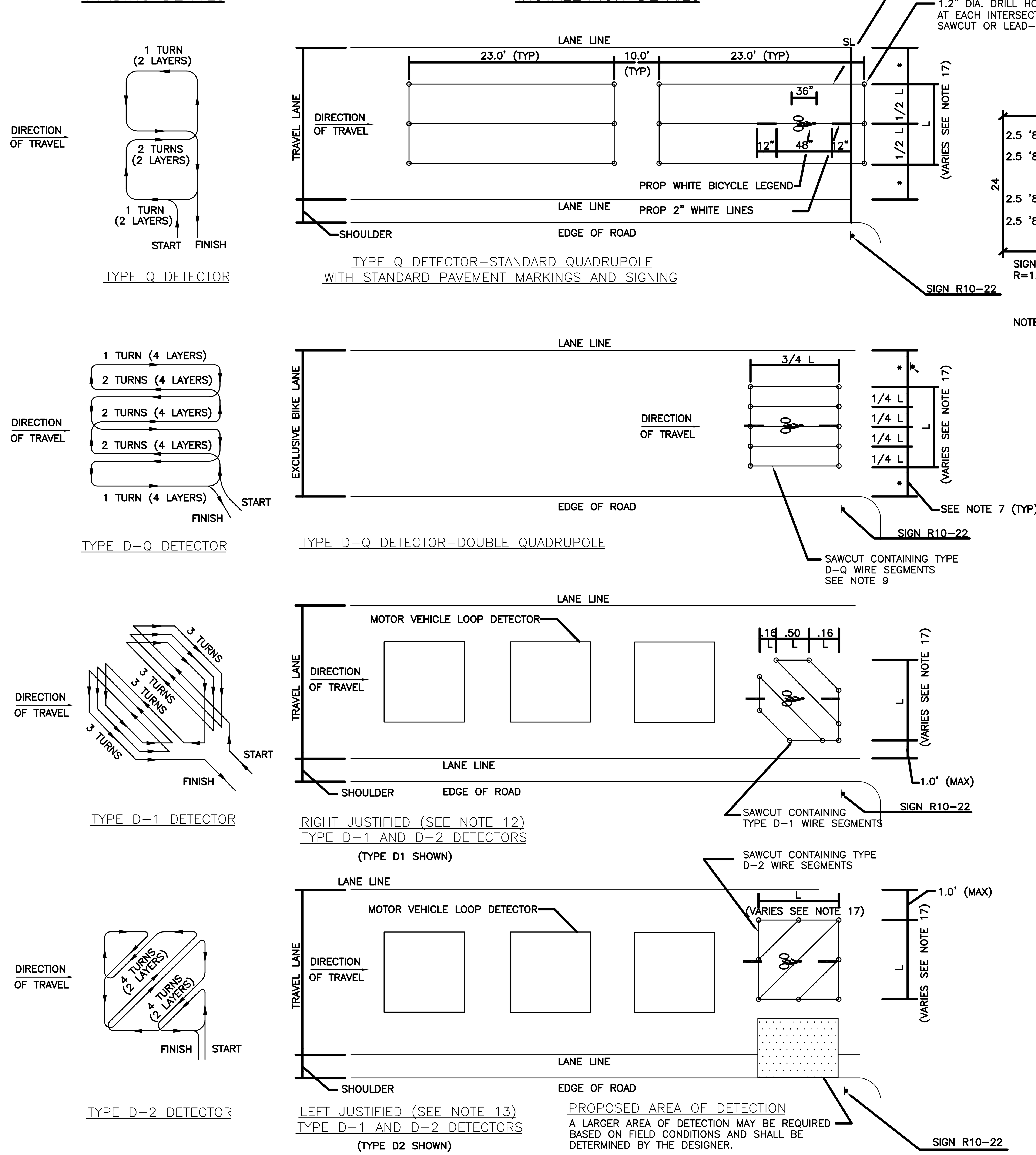
SALEM
LAFAYETTE STREET

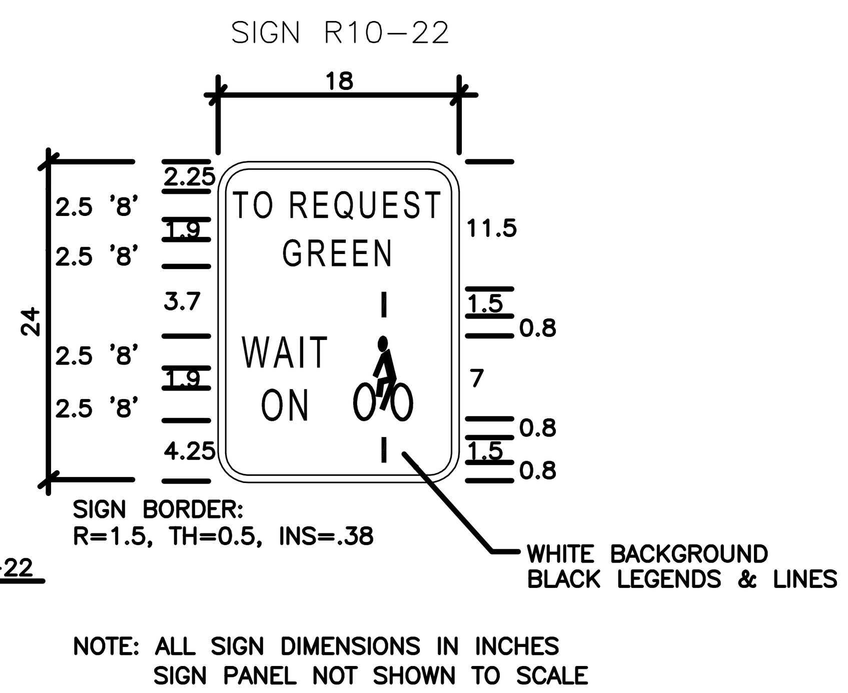
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	15	20

BICYCLE LOOP DETECTOR DETAILS

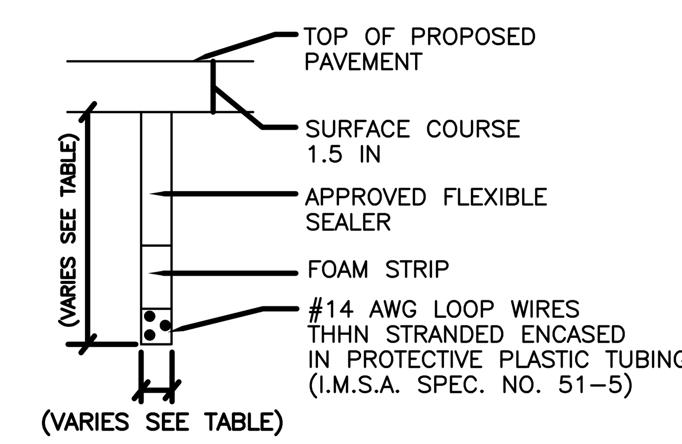
WINDING DETAILS

INSTALLATION DETAILS





NOTE: ALL SIGN DIMENSIONS IN INCHES
SIGN PANEL NOT SHOWN TO SCALE



SECTION THRU LOOP DETECTOR

SAWCUT SLOT DEPTH GUIDE

TURNS OF WIRE	SLOT SIZE	
	DEPTH (IN)	WIDTH(IN)
1	1.5	0.5
2	1.5	0.5
3	1.5	0.5
4	2.0	0.5
5	2.0	0.5
6	2.0	0.5
7	2.0	0.5
8	2.0	0.5

NOTES:

1. REFER TO VEHICLE LOOP DETECTOR DETAIL SHEET FOR ADDITIONAL NOTES AND CONSTRUCTION DETAILS.
2. ALL DETAILS ARE GRAPHICAL WITH NO SCALE.
3. THE NUMBER, SIZE, LOCATION AND LENGTH OF DETECTION AREA VARIES AND SHALL BE DETERMINED BY THE DESIGNER REFER TO TRAFFIC SIGNAL PLAN.
4. BICYCLE LOOPS SHALL BE CONNECTED TO SEPARATE LOOP DETECTOR AMPLIFIERS CAPABLE OF HIGHER LEVELS OF SENSITIVITY.
5. BICYCLE LOOPS SHALL BE INSTALLED IN THE BASE COURSE OF EXISTING PAVEMENT. THE EXISTING PAVEMENT SHALL BE COLD PLANED TO THE BASE COURSE AND SAWCUT FOR LOOP INSTALLATION.
6. SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED FOR ALL BICYCLE DETECTORS TO INFORM CYCLISTS OF THE DETECTION AREA.

* 7. OFFSETS FROM LANE LINE EQUAL UNLESS OTHERWISE NOTED. SEE PLANS.

8. TYPE Q DETECTORS SHALL BE WIRED IN A FIGURE EIGHT PATTERN WITH A DOUBLE LAYER DESIGN ("2-4-2") WITH 2 TURNS IN THE PERIMETER SLOTS AND 4 TURNS IN THE CENTER SLOT AS SHOWN IN THE WINDING DETAIL.
9. BICYCLES WILL BE DETECTED WITHIN 4" OF THE INTERIOR LONGITUDINAL LOOP WIRES FOR TYPE Q AND D-Q DETECTORS.
10. PROVIDE 3 TURNS FOR TYPE D-1 DETECTORS.
11. INSTALL 2 LAYERS OF WIRE WOUND IN THE SAME DIRECTION IN BOTH LAYERS FOR TYPE D-2 DETECTORS. THE RESULT IS 4 TURNS IN EACH DIAGONAL.
12. RIGHT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE RIGHT SIDE OF A THRU TRAVEL LANE.
    b) BICYCLE STOPPING ON THE RIGHT SIDE OF AN EXCLUSIVE LEFT TURN LANE.
13. LEFT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE LEFT SIDE OF A SHARED LEFT/THRU LANE.
    b) BICYCLE STOPPING JUST TO THE RIGHT OF THE CENTERLINE WHEN TURNING LEFT ON A TWO-LANE ROADWAY.
14. RECTANGULAR LOOP DETECTORS SHALL BE CONSIDERED FOR BICYCLES STOPPING ON EITHER THE LEFT OR RIGHT SIDE OF A TWO-LANE ROADWAY. THE MAXIMUM OFFSET FROM LANE LINE AND CURB LINE SHALL BE 1.0'.
15. PAVEMENT CORES OR TEST PITS MAY BE REQUIRED TO DETERMINE THE DEPTH OF EXISTING PAVEMENT AND CONFIRM THAT THE DETECTION OPTION CHOSEN AND CORRESPONDING WINDING PATTERN CAN BE ACCOMMODATED.
16. THESE DETAILS APPLY TO BICYCLE LOOPS INSTALLED IN ROADWAYS. PUSH BUTTON ACTUATION SHALL BE CONSIDERED FOR RECREATIONAL BIKE PATHS.
17. THE MINIMUM DIMENSION FOR L SHALL BE 6' MIN. FOR DETECTORS TYPE D-Q, D-1 & D-2. FINAL DIMENSIONS SHALL BE DETERMINED BY THE DESIGN ENGINEER.

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

TRAFFIC SIGN SUMMARY

SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	16	20

SIGN SUMMARY PLAN

IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	VERTICAL SPACING	ARROW RTE MKR	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	LEGEND	BORDER	P-5[1] POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET
R3-2	3'-0"	3'-0"		SEE	STANDARDS[2]		1	SEE	STANDARDS[2]		MTD ON MA	9.00	9.00
R3-5R	2'-6"	3'-0"	ONLY				2				2	7.50	15.00
R3-7L	3'-0"	3'-0"	LEFT LANE MUST TURN LEFT				4				4	9.00	36.00
R3-8	2'-6"	2'-6"	ONLY				2				2	6.25	12.50
R7-4L	1'-0"	1'-6"	NO PARKING ANY TIME				7				7	1.50	10.50
R7-4R	1'-0"	1'-6"	NO PARKING ANY TIME				6				6	1.50	9.00
R5-1	2'-6"	2'-6"	DO NOT ENTER				1				1	6.25	6.25
R6-1R	3'-0"	1'-0"	ONE WAY				2				2 MTD W/R5-1	3.00	6.00
R10-5	2'-6"	3'-0"	LEFT ON GREEN ARROW ONLY				1				MTD ON MA	7.50	7.50
R10-11b	3'-0"	3'-0"	NO TURN ON RED				1				MTD ON MA	9.00	9.00
R10-12	2'-6"	3'-0"	LEFT TURN YIELD ON GREEN				1				MTD ON MA	7.50	7.50
R10-22	1'-0"	1'-6"	TO REQUEST GREEN WAIT ON				7				5 1 W/ R3-5R 1 W/ R3-7L	1.50	10.50
M1-5a	2'-6"	2'-0"	114				1				1	5.00	5.00
M1-5b	2'-6"	2'-0"	1A				1				1	5.00	5.00
M3-3	2'-0"	1'-0"	SOUTH				1				MTD W/M1-5b	2.00	2.00
M3-4	2'-0"	1'-0"	WEST				1				MTD W/M1-5a	2.00	2.00
M6-2L	1'-9"	1'-2"					1				MTD W/M1-5b	2.18	2.18

IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	VERTICAL SPACING	ARROW RTE MKR	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	LEGEND	BORDER	P-5[1] POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET
M6-2R	1'-9"	1'-2"		SEE	STANDARDS[2]		2	SEE	STANDARDS[2]		1 MTD W/M1-5a 1 MTD W/D9-2	2.18	2.18
D3-1	VARIES	1'-0"	Lafayette St	SEE CITY OF SALEM STANDARDS			1	SEE CITY OF SALEM STANDARDS			1		
D3-2	VARIES	1'-0"	Washington St				1				1		
D3-3	VARIES	1'-0"	Harbor St				1				1		
D3-4	VARIES	1'-0"	Dow St				1				1		
SP-1	2'-0"	2'-6"	WHEN LIT SNOW BAN IN EFFECT				1				MTD ON MA	5.00	5.00
D9-2	2'-0"	2'-0"	H	SEE	STANDARDS[2]		1	SEE	STANDARDS[2]		1	4.00	4.00

(1) UNLESS OTHERWISE NOTED, ALL POSTS TO BE P-5.
(2) PER THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND THE 1996 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD DRAWINGS FOR SIGNS AND SUPPORTS.

DESIGNED BY BAM DATE 10-19-10
DRAWN BY BAM 1-1-11
CHECKED BY PSC 1-12-11

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11

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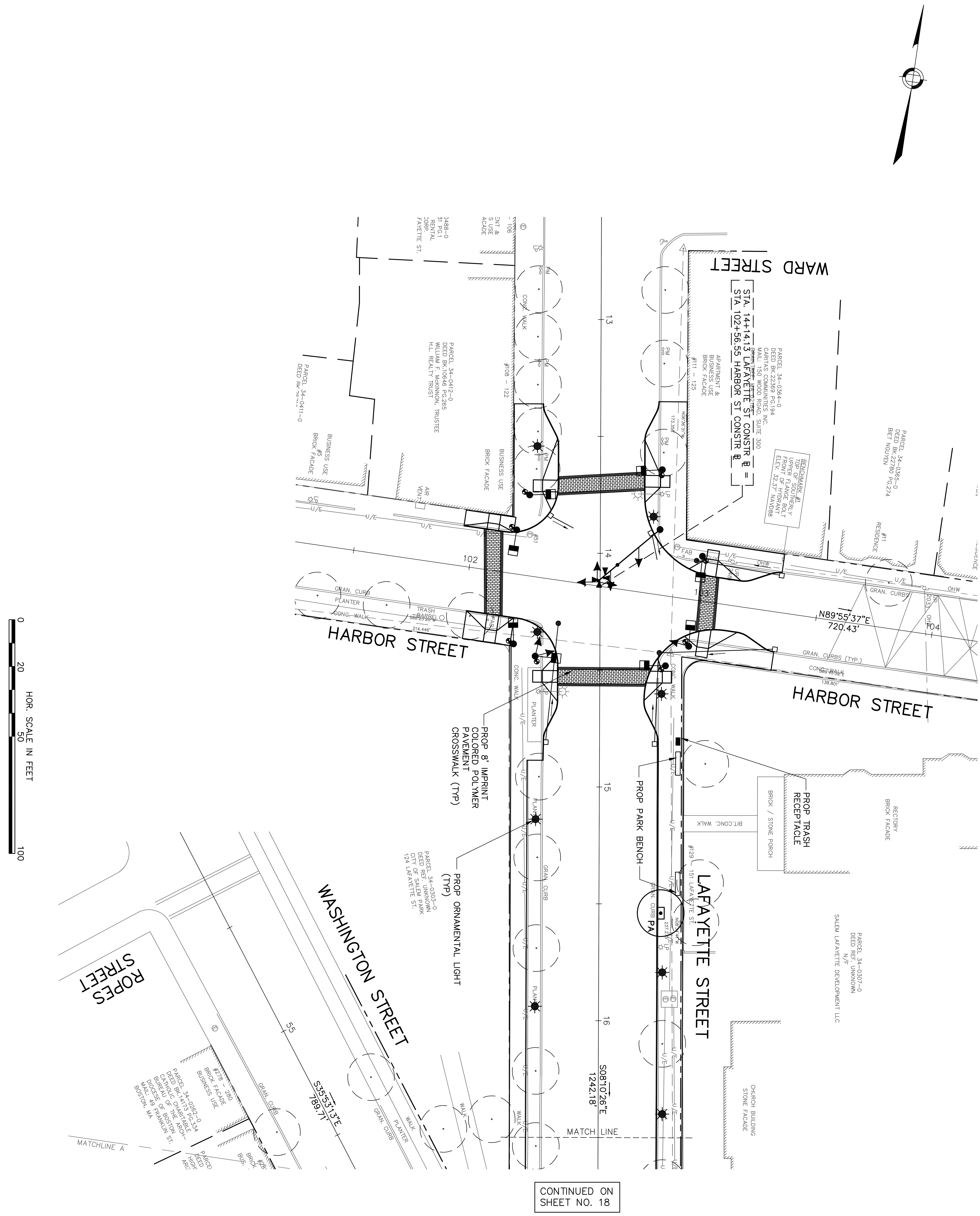

CONTINUED ON SHEET NO. 18

LEGEND

EXISTING TREE
PROPOSED TREE
ORNAMENTAL LIGHT
PARK BENCH
TRASH RECEPTACLE
STAMPED COLORED CONCRETE
RUDBECKIA SEEDING
DAYLILY PLANTING
SHRUB

SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	17	20

LANDSCAPING & LIGHTING PLANS

DESIGNED BY BAM DATE 10-19-10
DRAWN BY BAM 1-1-11
CHECKED BY PSC 1-12-11

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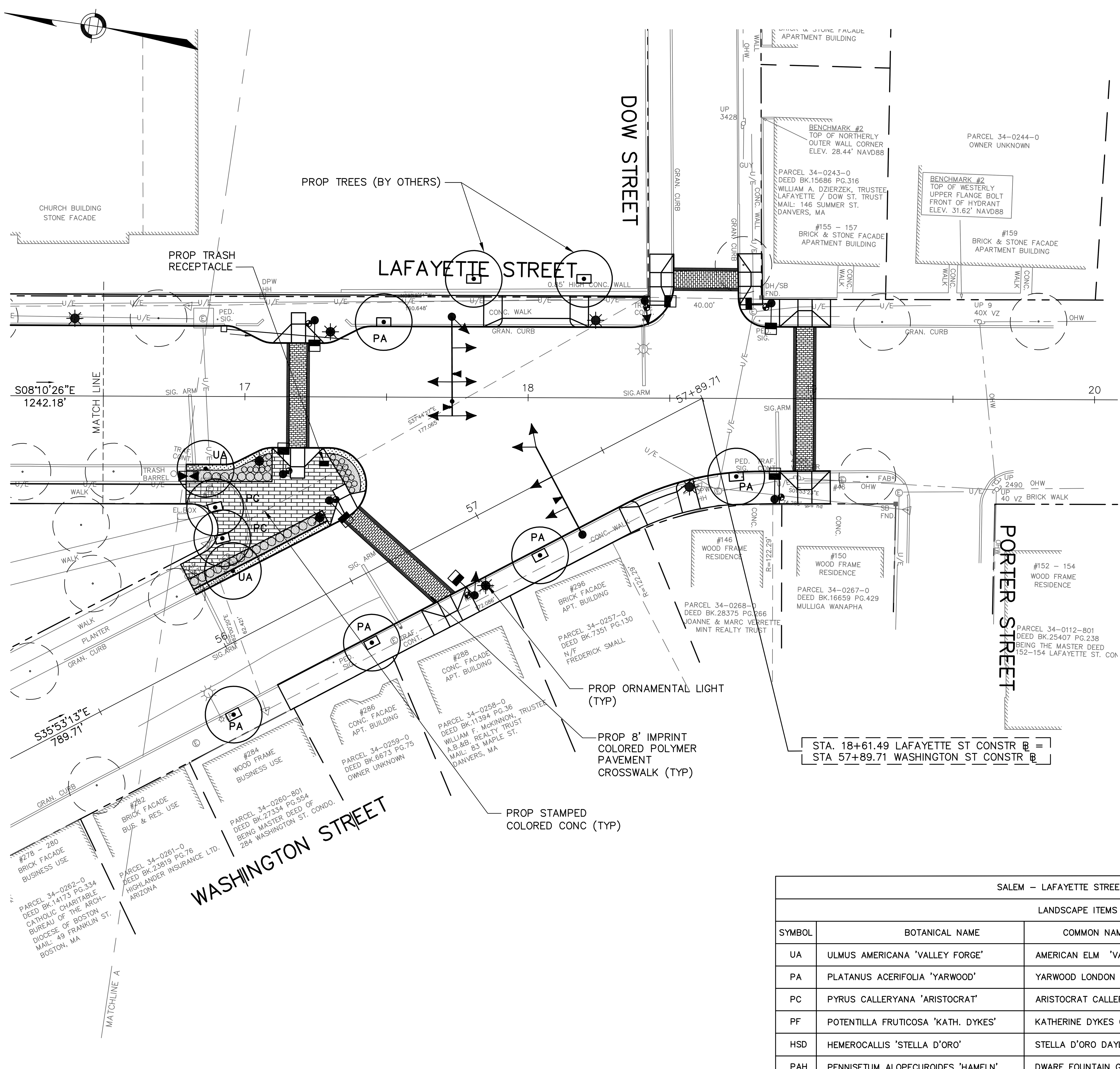
SALEM
LAFAYETTE STREET

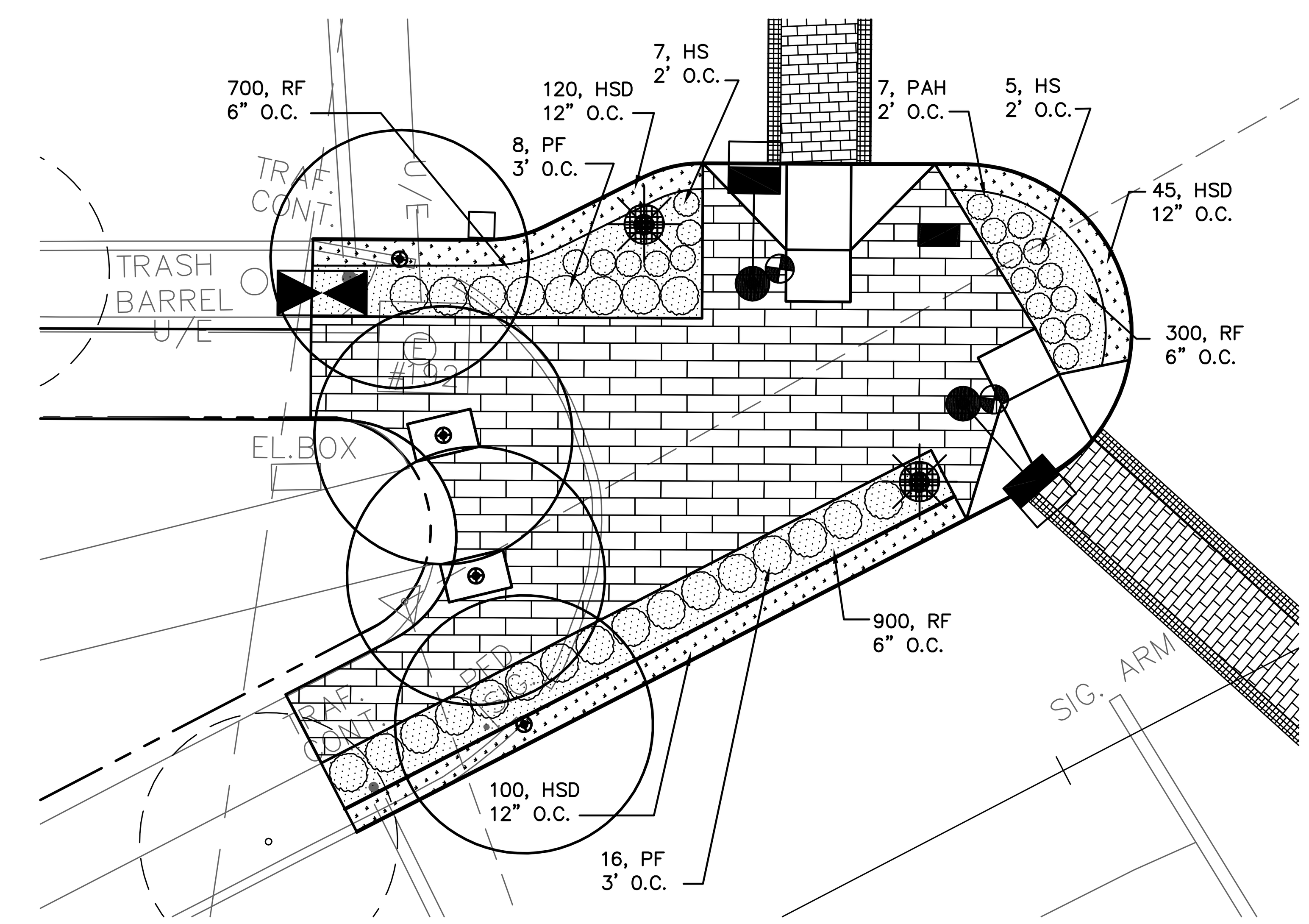
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	18	20

LANDSCAPING & LIGHTING PLANS

CONTINUED ON SHEET NO. 17



HOR. SCALE IN FEET
0 20 50 100



HOR. SCALE IN FEET
0 10 25 50

SALEM - LAFAYETTE STREET						
LANDSCAPE ITEMS LIST						
SYMBOL	BOTANICAL NAME	COMMON NAME	UNIT	SIZE	REMARKS	TOTAL
UA	ULMUS AMERICANA 'VALLEY FORGE'	AMERICAN ELM 'VALLEY FORGE'	EA	2-2.5"	B&B	2
PA	PLATANUS ACERIFOLIA 'YARWOOD'	YARWOOD LONDON PLANETREE	EA	2-2.5"	B&B	6
PC	PYRUS CALLERYANA 'ARISTOCRAT'	ARISTOCRAT CALLERY PEAR	EA	2-2.5"	B&B	2
PF	POTENTILLA FRUTICOSA 'KATH. DYKES'	KATHERINE DYKES CINQUEFOIL	EA	2'-3'	B&B	24
HSD	HEMEROCALLIS 'STELLA D'ORO'	STELLA D'ORO DAYLILY	EA	1 GAL.	POT	265
PAH	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	EA	1 GAL.	POT	7
HS	HELICTOTRICHON SEMPERVIRENS	BLUE OAT GRASS	EA	1 GAL.	POT	12
RF	RUDBECKIA FULGIDA 'GOLDSTURM'	BLACK-EYED SUSAN	EA	2 QT	POT	1900

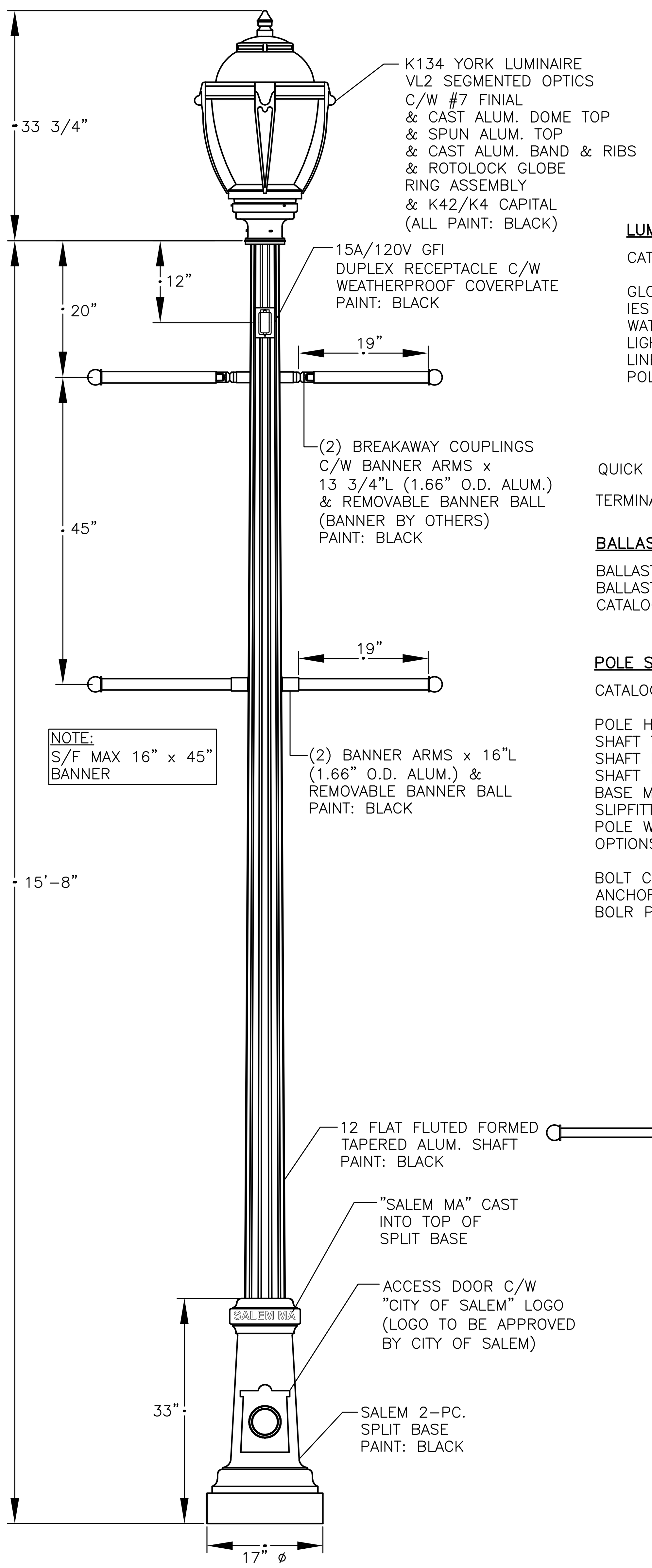
LEGEND

- EXISTING TREE
- PROPOSED TREE
- ORNAMENTAL LIGHT
- PARK BENCH
- TRASH RECEPTACLE
- STAMPED COLORED CONCRETE
- RUDBECKIA SEEDING
- DAYLILY PLANTING
- SHRUB

SALEM
LAFAYETTE STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	19	20

LANDSCAPING & LIGHTING DETAILS



LUMINAIRE SPECIFICATIONS

CATALOGUE NO.:	K134R-SAR-III-175(MOG) -MH-120(MT)-K42/K4
GLOBE MAT'L:	ACRYLIC
IES CLASSIFIC.:	TYPE III
WATTAGE:	175W
LIGHT SOURCE:	METAL HALIDE
LINE VOLTAGE:	120V (MULTI-TAP)
POLE ADAPTOR:	K42/K4

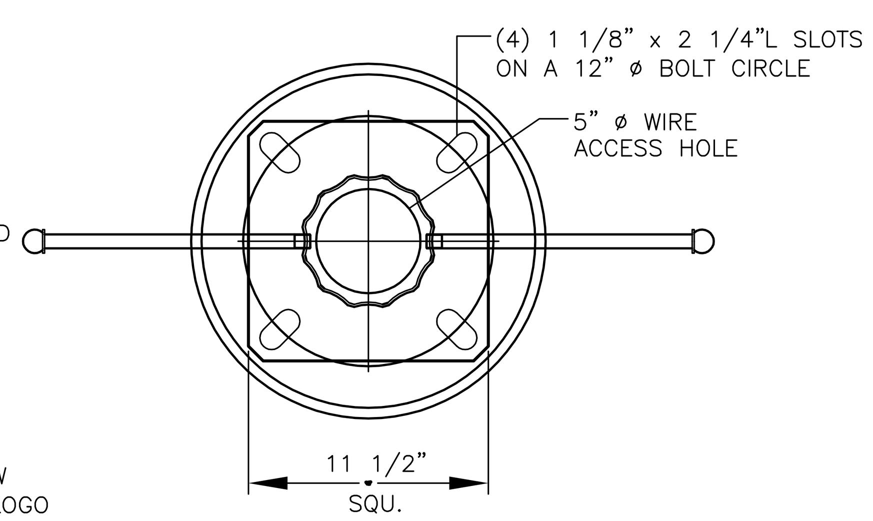
QUICK DISCONNECT ☐
TERMINAL BLOCK ☐ } PLEASE SELECT ONE

BALLAST INFORMATION:

BALLAST TYPE:	CWA
BALLAST MANU.:	ADVANCE / MAGNETEK
CATALOG NUMBER:	71A5590 / M175MLTAC3M

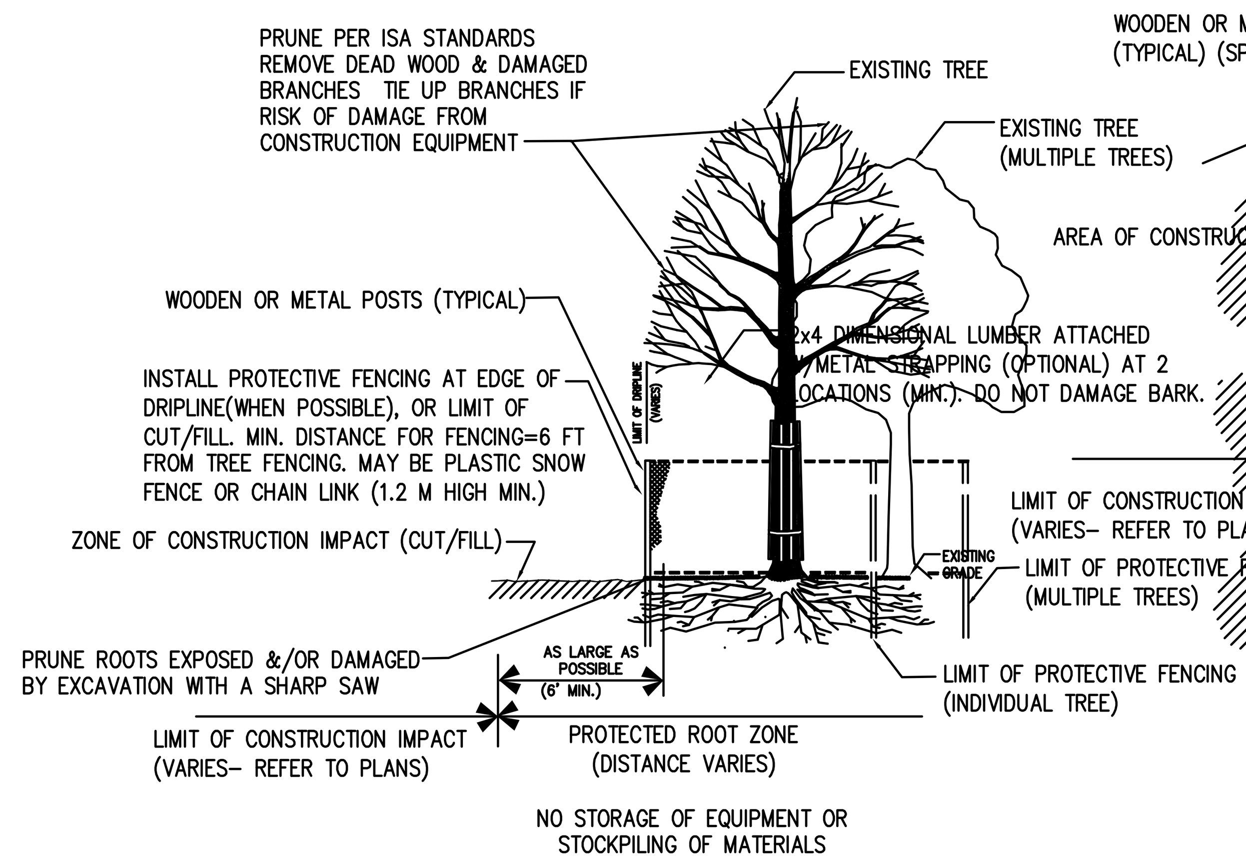
POLE SPECIFICATIONS

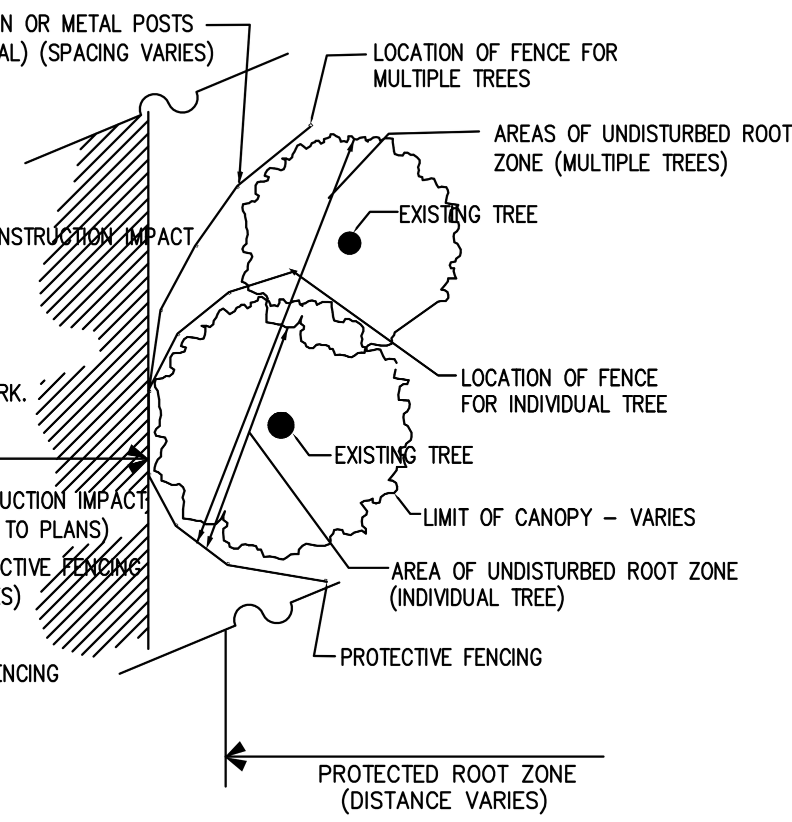
CATALOGUE NO.:	KMFF-15.8-DR-BA C/W SPLIT BASE
POLE HEIGHT:	15'-8"
SHAFT TIP SIZE:	4 1/8"
SHAFT BUTT SIZE:	6 5/16"
SHAFT MATERIAL:	12 FLAT FLUTED FORMED ALUM.
BASE MATERIAL:	CAST ALUMINUM
SLIPFITTER:	3 1/2" O.D. x 3 1/2" LONG
POLE WEIGHT:	T.B.A.
OPTIONS:	DUPLEX RECEPTACLE BANNER ARMS
BOLT CIRCLE:	12" ø
ANCHOR BOLTS:	3/4" ø x 27"L
BOLR PROJECTION:	T.B.A.



BASE DETAIL

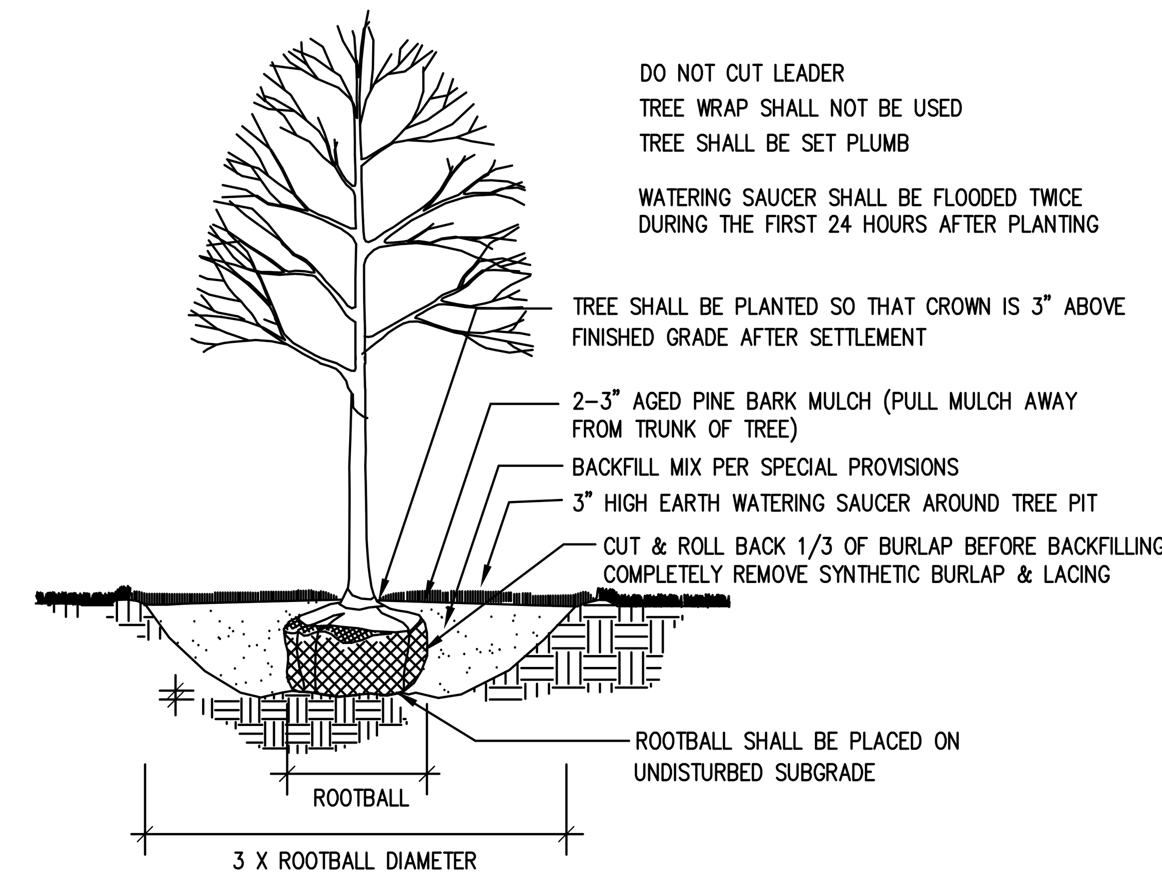
ORNAMENTAL LIGHT POLE AND FIXTURE
NOT TO SCALE



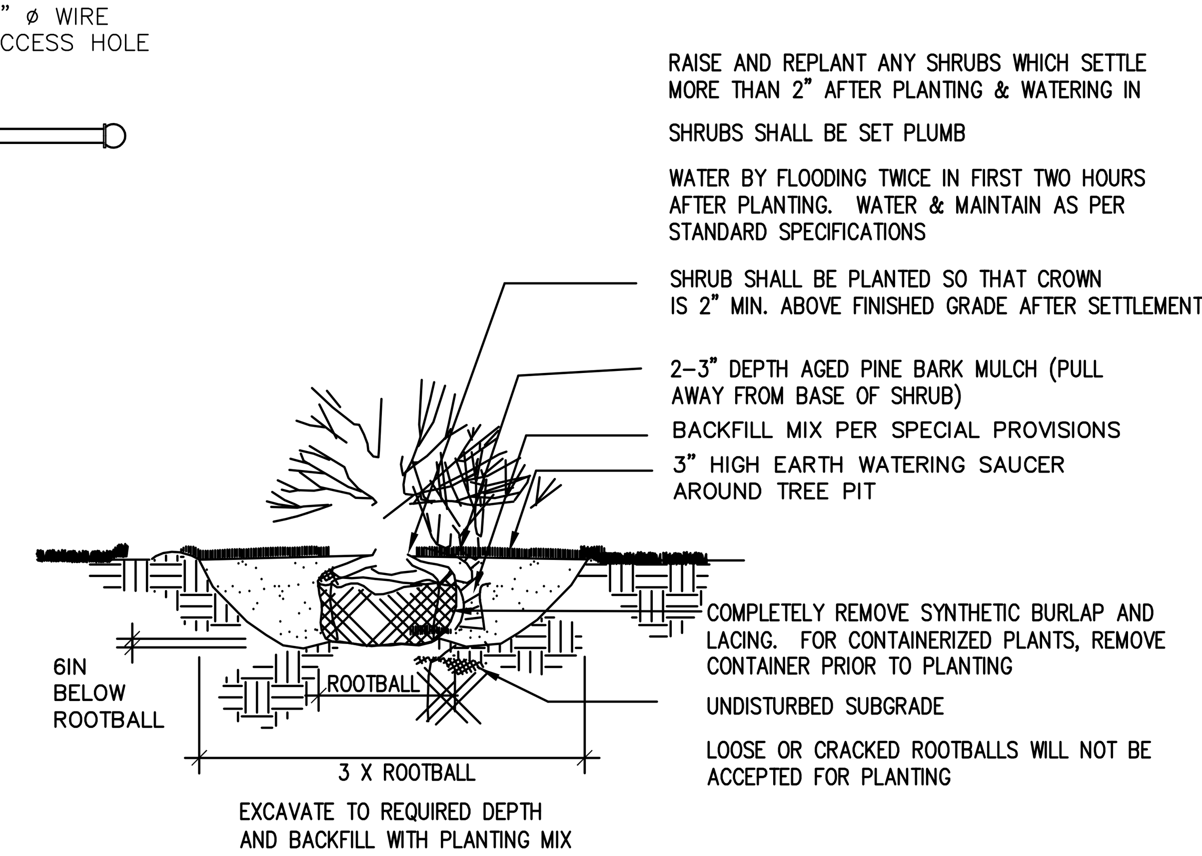


PLAN VIEW

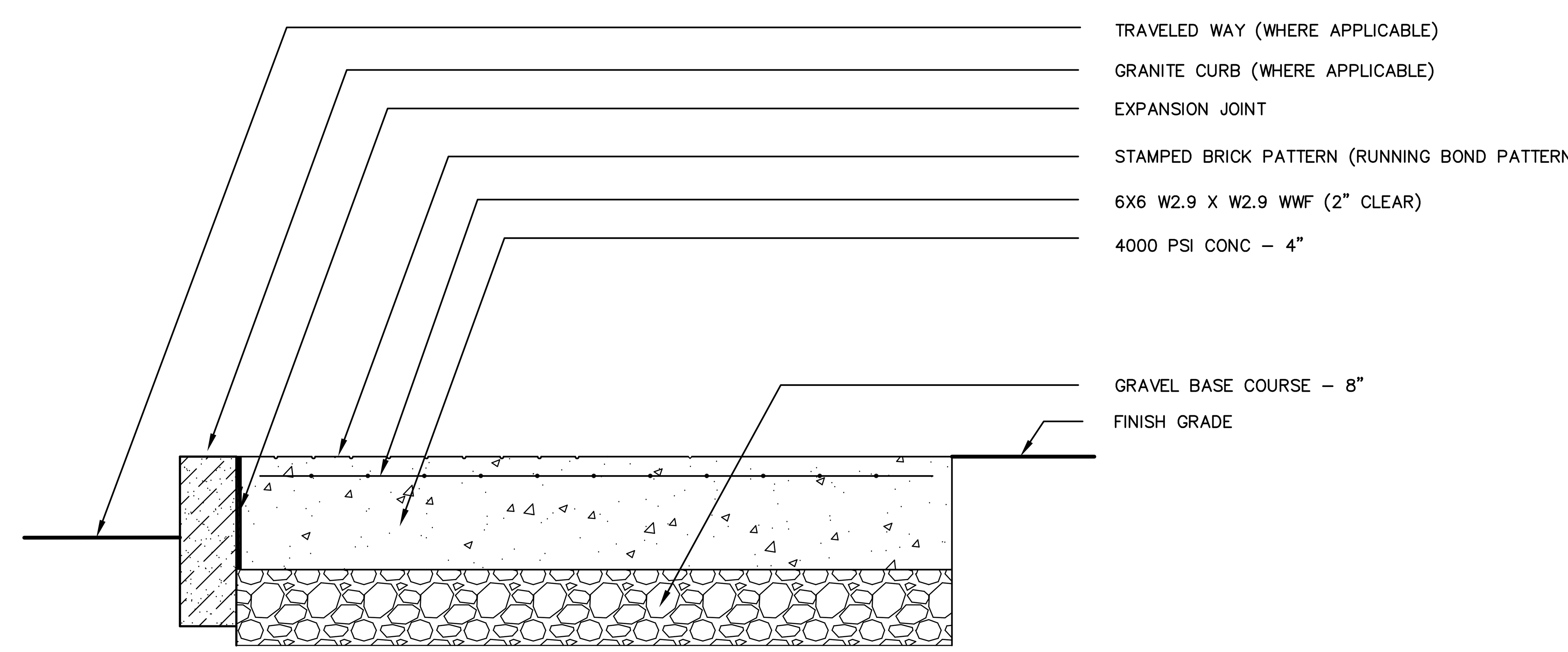
TREE PROTECTION-EXISTING TREE(S)
NOT TO SCALE



DECIDUOUS TREE PLANTING
NOT TO SCALE



SHRUB PLANTING
NOT TO SCALE

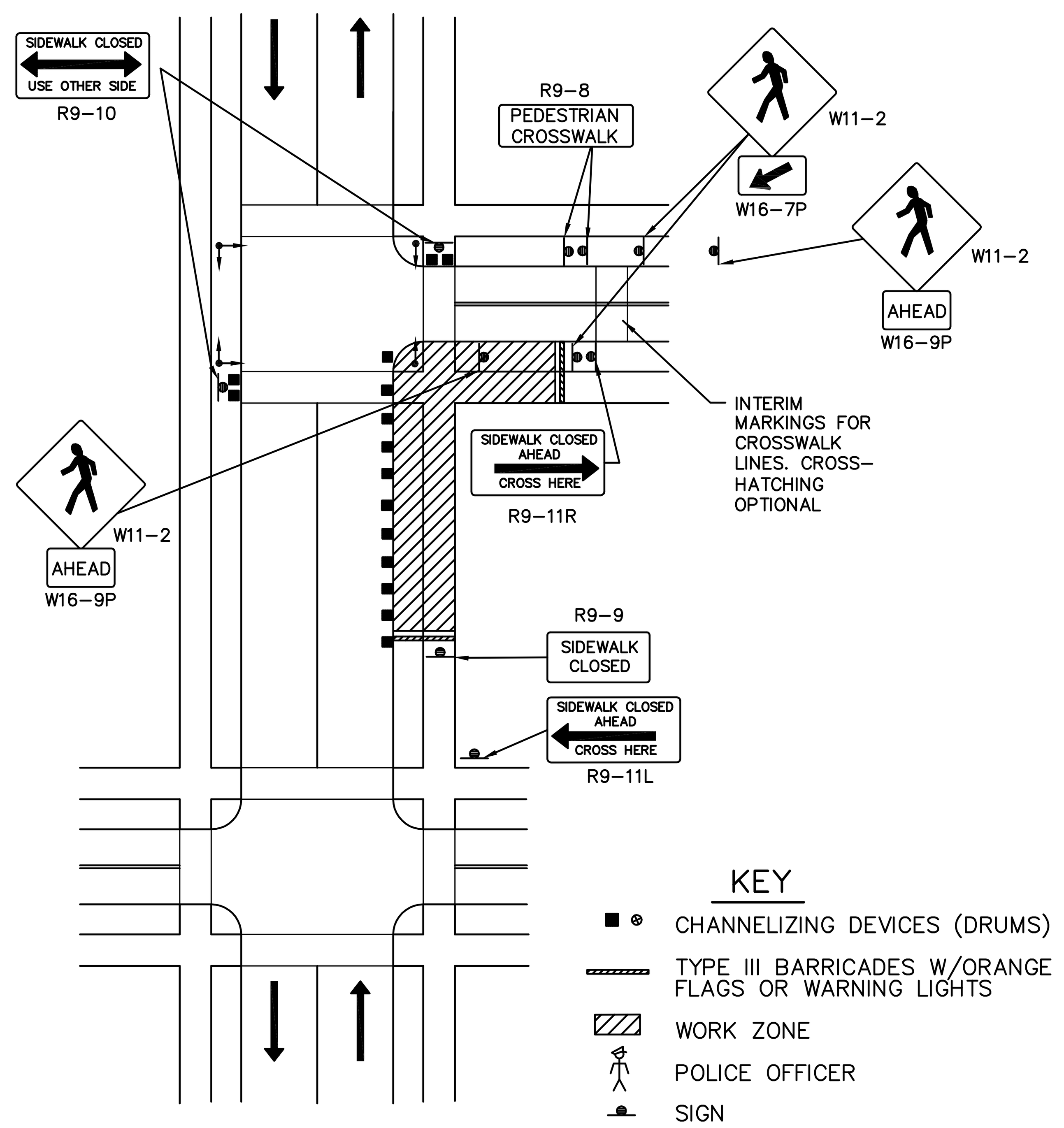


CROSS SECTION

COLORED STAMPED (PATTERNED) CONCRETE DETAIL
NOT TO SCALE

L:\work\97384\CAD\Lafayette St Improvements\Final Design\97384 LANDS DET.dwg 1/11/2011 9:54:17 AM EST

		DATE
DESIGNED BY	BAM	10-19-10
DRAWN BY	BAM	1-1-11
CHECKED BY	PSC	1-12-11



TYPICAL CROSSWALK CLOSURE AND PEDESTRIAN DETOUR PLAN

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TABLE 1
ADVANCED WARNING SIGN PLACEMENT

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (LOW SPEED)	200	200	200
URBAN (HIGH SPEED)	350	350	350
RURAL	500	500	500

TABLE 2
BUFFER LENGTHS

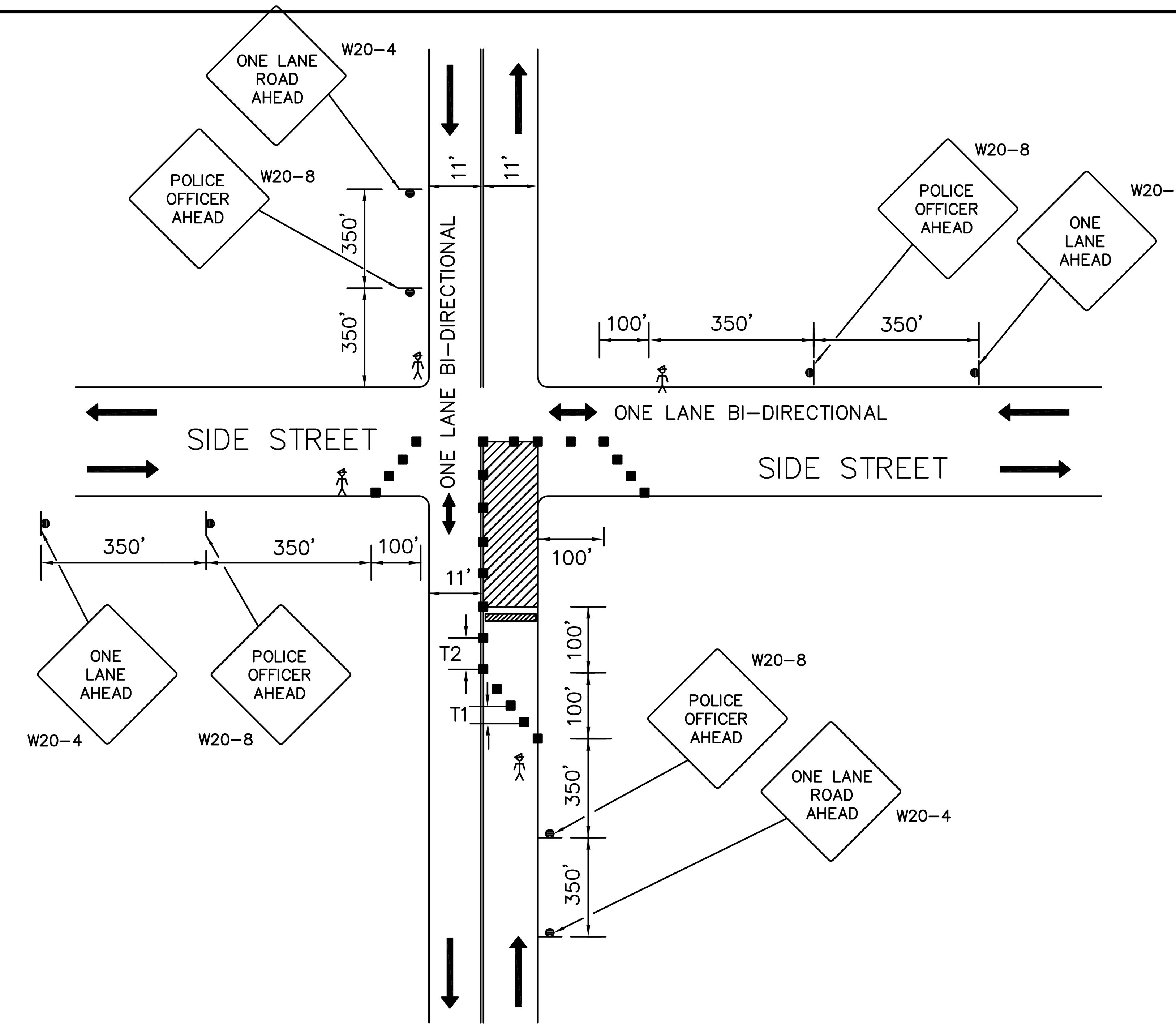
SPEED* (mph)	LENGTH (ft)
25	155
30	200
35	250
40	305
45	360

* POSTED SPEED, OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH.

FORMULAS FOR L **

SPEED	FORMULA
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or greater	$L = W \times S$

* SPEED CATEGORY TO BE DETERMINED BY STATE HIGHWAY AGENCY IN COOPERATION WITH LOCAL JURISDICTIONS.
** L = TAPER LENGTH IN FEET.
W = WIDTH OF OFFSET IN FEET.
S = POSTED SPEED, THE OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH.

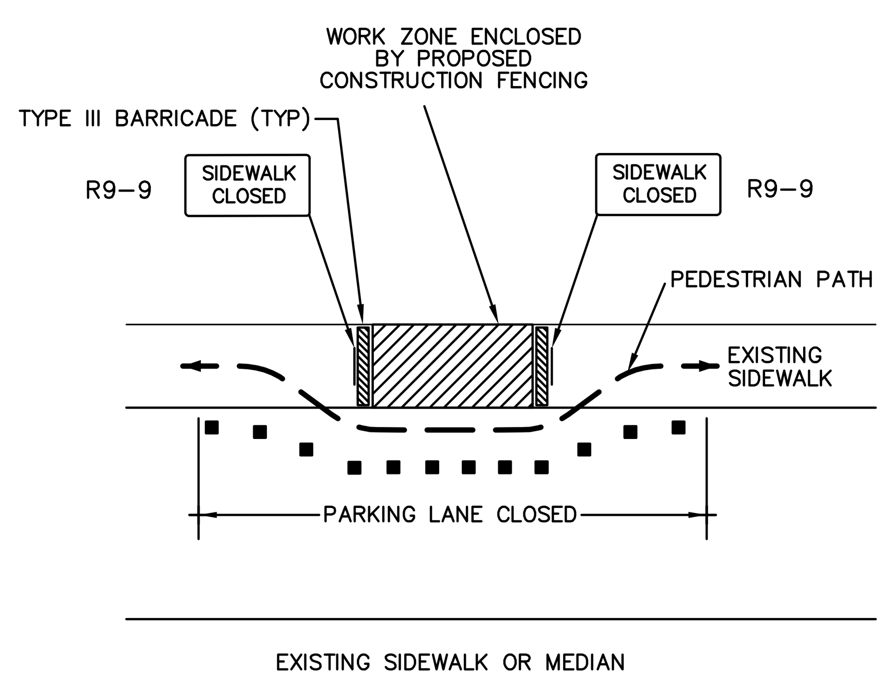


TYPICAL TRAFFIC MANAGEMENT PLAN INTERSECTION WORK (BI-DIRECTIONAL)

NOT TO SCALE

NOTES FOR TYPICAL TRAFFIC MANAGEMENT PLANS

1. REFERENCE TABLE 2 ABOVE FOR RECOMMENDED BUFFER LENGTHS.
2. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER (T1) SHOULD BE APPROXIMATELY EQUAL IN FEET TO 1.0 TIMES THE SPEED LIMIT (MPH).
3. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES ON THE TANGENT (T2) SHOULD BE APPROXIMATELY EQUAL IN FEET TO 2.0 TIMES THE SPEED LIMIT (MPH).



PEDESTRIAN BYPASS-TYPE I

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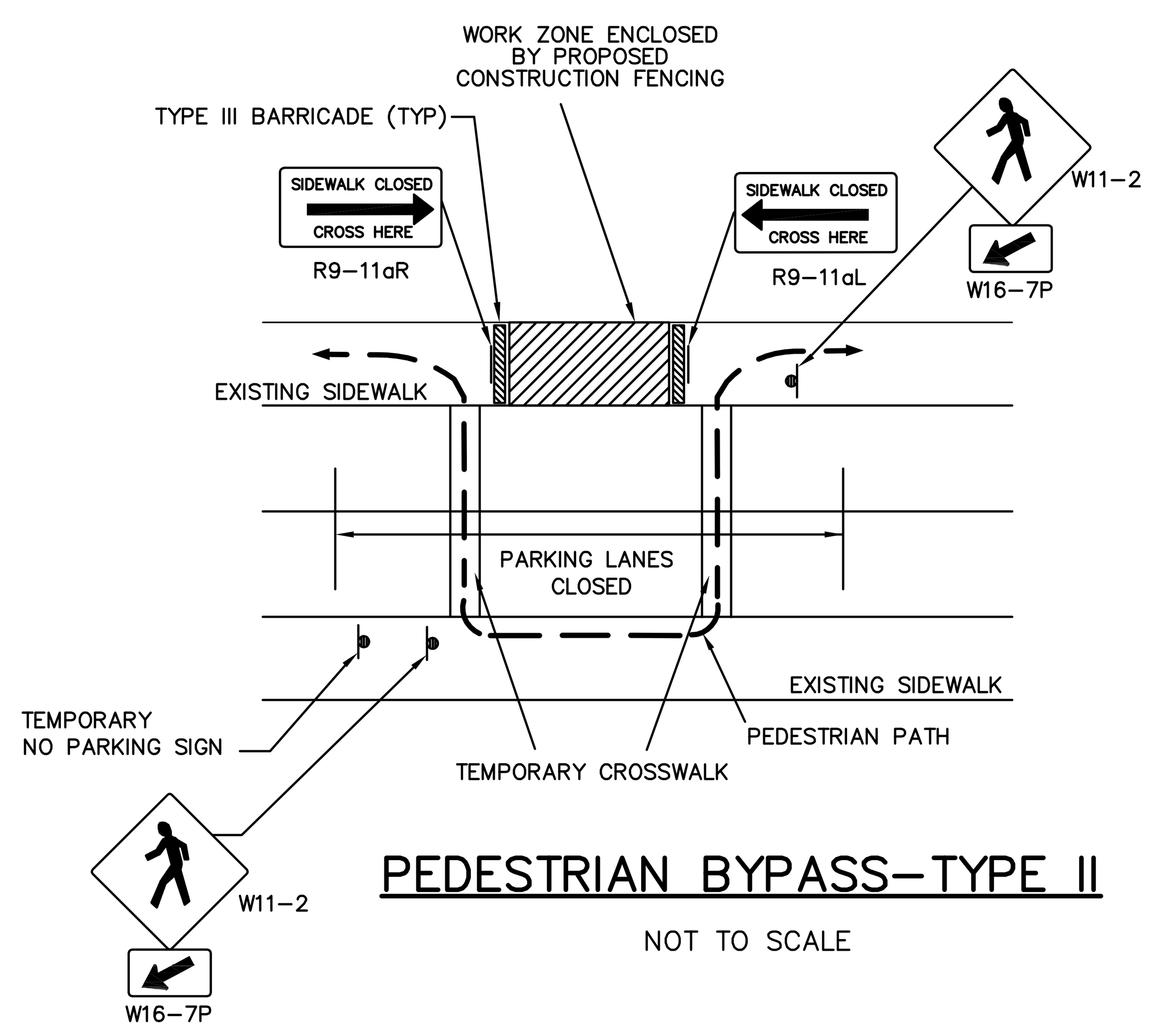

PEDESTRIAN BYPASS-TYPE II

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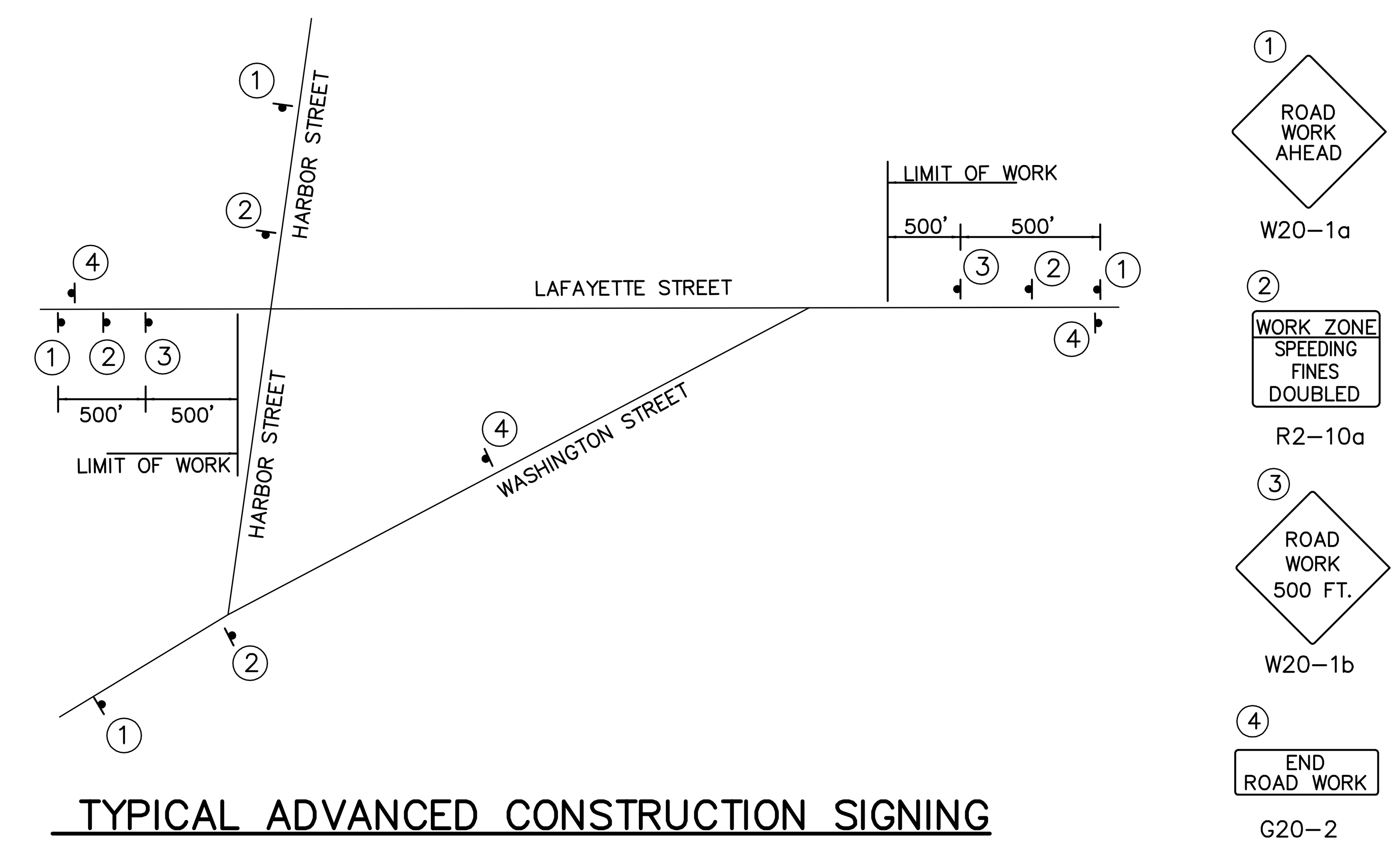
NOTES FOR PEDESTRIAN DETOUR PLAN:

1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE.
3. — — — DIRECTION OF PEDESTRAIN TRAVEL.
4. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHOULD BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.
5. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
6. BYPASS TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DIRECTED BY THE ENGINEER.
7. ALL TEMPORARY PEDESTRIAN CROSSINGS MUST BE HANDICAP ACCESSIBLE.



TYPICAL ADVANCED CONSTRUCTION SIGNING

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