MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		1	12
PROJECT FILE NO. 608751			

TITLE SHEET AND INDEX

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

INTERSECTION IMPROVEMENT PLANS

RTE 140 (MAIN STREET) / I-495 RAMPS
ROUTE 140 AT SCHOOL STREET

IN THE TOWN OF

MANSFIELD

BRISTOL COUNTY

FEDERAL AID PROJECT NO.

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE DECEMBER 2016 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WTH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

INDEX

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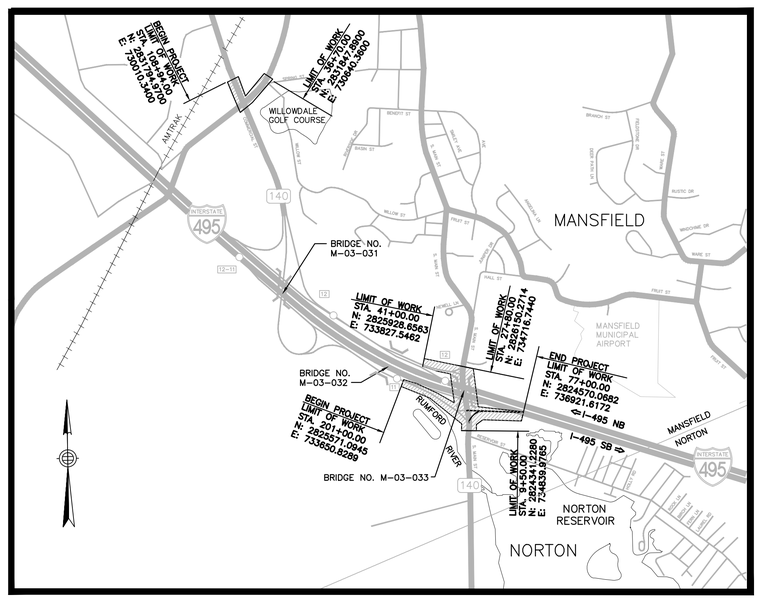

0 2000 4000 6000 8000

SCALE: 1" = 2000'

LENGTH OF PROJECT = 2839 FEET = 0.537 MILES

DESIGN DESIGNATION (ROUTE 140)

DESIGN SPEED	45 MPH
ADT (2017)	23,550 VPD
ADT (2024)	28,000 VPD
K	9.7%
D	59%
T (PEAK HOUR)	3%
T (AVERAGE DAY)	3%
DHV	2,716 VPH
DDHV	1,602 VPH
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL

CONVENTIONAL SIGNS

COUNTY, CITY, OR TOWN BOUNDARY
COUNTY, CITY, OR TOWN SIDE LINE
FENCE LINE
BASE LINE OR SURVEY LINE — N 57°18'41" E 59.57'
RIGHT OF WAY LINE
CULVERT
ELEVATIONS — PROPOSED GROUND / EXIST. GROUND — EXIST. 98.2 / PROP. 102.67 — 74
POLE

PREPARED BY:

JACOBS 343 Congress Street Suite 2100 Boston, MA 02210

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

Jacobs Edwards and Kelcey - P:\MASSDOT\2015\E2X69\123.700 CADD.702-CIVIL\BID Package\01 Title Sheet.dwg August 04, 2017

MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		2	12
PROJECT FILE NO. 608751			

LEGEND AND ABBREVIATIONS

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
JB OR BRJB	JB OR BRJB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
CI	CI	CURB INLET
	BUOY	BUOY
		BORROW PIT OR CONSTRUCTION SITE
	FPL	FLAG POLE
		GOLF COURSE
G		GAS PUMP
		GRAVEL PIT
DI	DI	DROP INLET
MB	MB	MAIL BOX
GR	GRAN POST	GRANITE POST
PLN	PLANTER	PLANTER
PST	POST	POST
TBH	TBH	TELEPHONE BOOTH
VLT	VLT	VAULT
VLV	VLV	VALVE
WELL	WELL	WELL
EHH	EHH	ELECTRIC MANHOLE (HANDHOLE)
FCGA		GATE POST
FL	FL	FLOW LINE
GG		GAS GATE
BH	BH	BORING HOLE
		MONITORING WELL
	TEP	TEST PIT
HC	CONC. HDWL	CONCRETE HEADWALL
HH		HANDHOLE
HS	STONE HDWL	STONE HEADWALL
HYD	HYD	HYDRANT
LPL	LPL	LIGHT POLE
CO. BO.	CO. BD.	COUNTY BOUND
GPS		GPS POINT
CMH		CABLE MANHOLE
DMH	D	DRAINAGE MANHOLE
EMH		ELECTRIC MANHOLE
GMH		GAS MANHOLE
MMH		MISC MANHOLE
OMH		OTHER MANHOLE
SMH	S	SEWER MANHOLE
TMH		TELEPHONE MANHOLE
WMH		WATER MANHOLE
MHB	MHB	MHD BOUND
MON	MON	MONUMENT
SB	SB	STONE BOUND
TOWN OR CITY BD.	TOWN OR CITY BD.	TOWN OR CITY BOUND
	TSN	TRAVERSE OR TRIANGULATION STATION
TPL OR GUY	TPL OR GUY	TROLLEY POLE OR GUY POLE
TRNP		TRANS. POLE
UFB	UFB	UP W ITH FIREBOX
LPDL	LPDL	POLE WITH DOUBLE LIGHT
ULT	ULT	UP W ITH 1 LIGHT
UPL	UPL	UTILITY POLE
	BUSH	BUSH
	TREE	TREE
STUMP		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
FA	FA	FIRE ALARM BOX
PM	PM	PARKING METER
		ELECTRICAL GROUND
	GV	GATE VALVE
		RIP RAP
	OHW	OVERHEAD WIRE
		DIRECT BURIAL CABLE
		CURBING
185	185	CONTOURS
D	D	DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
E	E	ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
G	G	GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
S	S	SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
T	T	TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
W	W	WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCE STONE WALL
		CULVERT
		GUARD RAIL
		GUTTER LINE AT DRIVEWAYS
		CHAIN LINK FENCE
		STOCKADE FENCE

GENERAL SYMBOLS (CONT.)

EXISTING	PROPOSED	
		COMPOST FILTER TUBE
		RETAINING WALL
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLAN & OVERLAY
		BANK OF RIVER OR STREAM
WF-#		BORDER OF WETLAND
		100 FT WETLAND OR 200 FT RIVERFRONT BUFFER
DATE OF LAYOUT		STATE HIGHWAY LAYOUT
DATE OF LAYOUT		TOWN OR CITY LAYOUT
DATE OF LAYOUT		COUNTY LAYOUT
R.R S/L		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
PL OR APPROX. PL		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
Ø1	Ø1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6'X 6' TYPICAL UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		MAGNETOMETER (2 SHOWN)
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		OPTICOM CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD (TYPE AS NOTED OR AS SPECIFIED)
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
		PEDESTRIAN SIGNAL POST AND BASE
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	STEEL OR ALUMINUM MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (TWO POSTS)
	20'	SIGNAL AND LIGHTING MAST ARM (OPTICOM)
		EMERGENCY PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL & METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"X12" (AND AS NOTED)
		ELECTRIC HANDHOLE 12" X 24"
		TRAFFIC SIGNAL INTERCONNECT CONDUIT
		TRAFFFIC SIGNAL CONDUIT (TYPE AS NOTED)

PAVEMENT MARKINGS AND SIGNING SYMBOLS

EXISTING	PROPOSED	
		PAVEMENT ARROW – WHITE
ONLY	ONLY	LEGEND "ONLY" – WHITE
	SL	STOP LINE – 12"
	CW	CROSSWALK
	SWLL	SOLID WHITE LANE LINE
	BWLL	BROKEN WHITE LANE LINE (10' LINE, 30' SPACE TYP.) – 6"
	SWEL	SOLID WHITE EDGE LINE
	YGL	YELLOW GORE LINE – 12"
	DYCL	DOUBLE YELLOW CENTER LINE – 6"
	SWCHL	SOLID WHITE CHANNELIZATION LINE – 12"
	WGL	WHITE GORE LINE – 12"
	SYEL	SOLID YELLOW EDGE LINE – 6"
	BYCL	BROKEN YELLOW CENTER LINE (10' LINE, 30' SPACE TYP.) – 6"
	SYCL	SOLID YELLOW CENTER LINE
	DWLEx (2'-6')	DASHED WHITE LANE LINE EXTENSION – 6" (2' LINE, 6' SPACE)
	DWLL (3'-9')	DASHED WHITE LANE LINE – 12" (3' LINE, 9' SPACE)
		DIRECTION OF TRAFFIC FLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CI.	CLASS (CONCRETE, EXCAVATION, ETC.)
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DSCB	DEEP SUMP CATCH BASIN
DSDMH	DEEP SUMP MANHOLE
DW	STEADY DON'T WALK – PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (OR EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (OR EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HB	HIGHWAY BORING
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
IB	INFILTRATION BASIN BORING
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACHING BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAIL BOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PVC	POINT OF VERTICAL CURVATURE
PT	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

GENERAL (CONT.)

R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSB	SIGNAL SUPPORTS BORING
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/ TRUCK PERCENTAGE
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEELCHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK – PORTLAND ORANGE
FDW	FLASHING DON'T WALK – PORTLAND ORANGE
FYV	FLASHING AMBER VERTICAL ARROW
FR	FLASHING CIRCULAR RED
FW	FLASHING WALK – LUNAR WHITE
FY	FLASHING CIRCULAR AMBER
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FRV	FLASHING RED VERTICAL ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
OP	OPTICAL DETECTOR
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RV	STEADY RED VERTICAL ARROW
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK – LUNAR WHITE
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW
YR	STEADY AMBER RIGHT ARROW
YV	STEADY AMBER VERTICAL ARROW

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MANSFIELD
RTE 140/ I-495 RAMPS

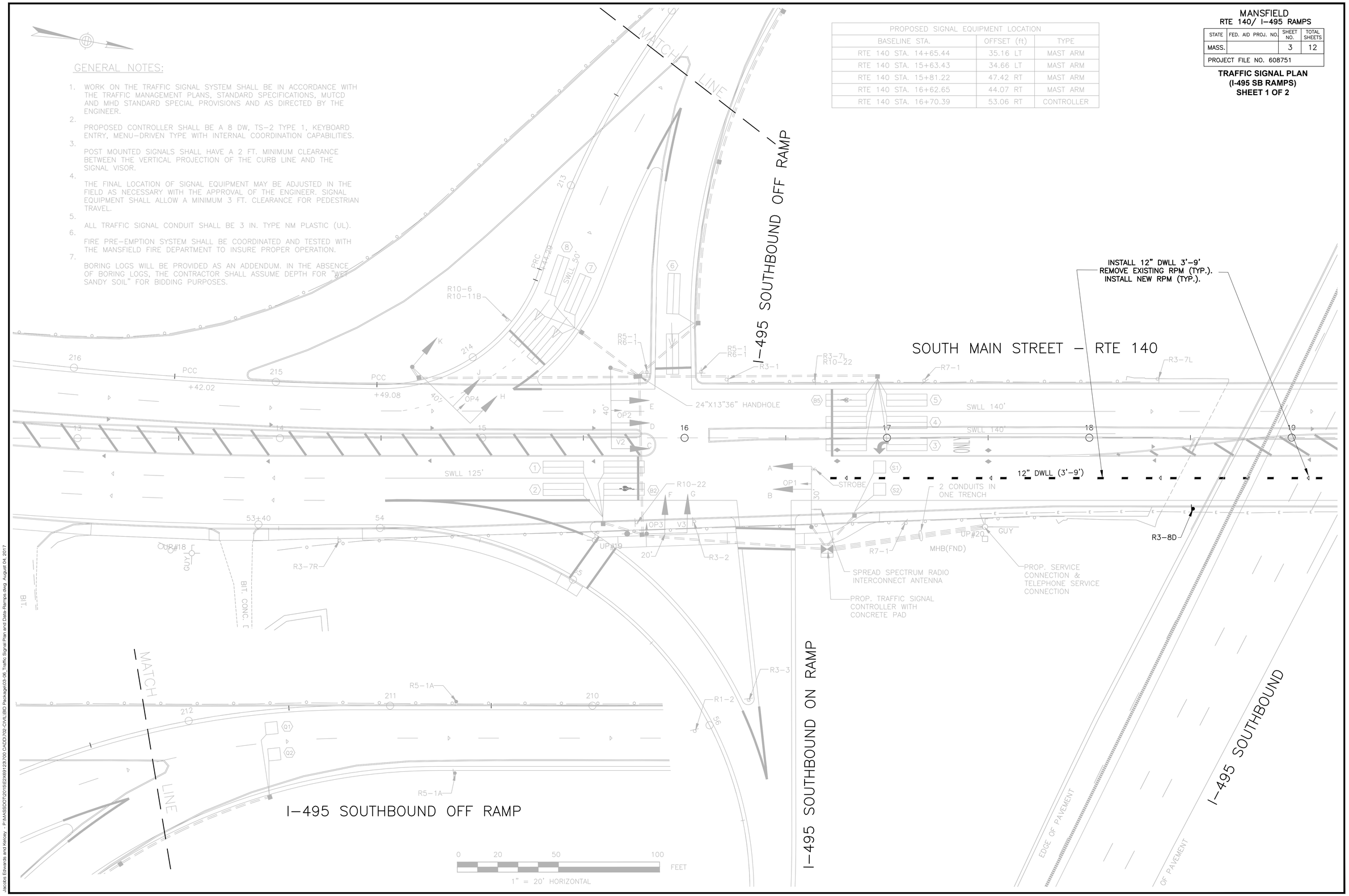
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		3	12
PROJECT FILE NO. 608751			

TRAFFIC SIGNAL PLAN
(I-495 SB RAMPS)
SHEET 1 OF 2

PROPOSED SIGNAL EQUIPMENT LOCATION		
BASELINE STA.	OFFSET (ft)	TYPE
RTE 140 STA. 14+65.44	35.16 LT	MAST ARM
RTE 140 STA. 15+63.43	34.66 LT	MAST ARM
RTE 140 STA. 15+81.22	47.42 RT	MAST ARM
RTE 140 STA. 16+62.65	44.07 RT	MAST ARM
RTE 140 STA. 16+70.39	53.06 RT	CONTROLLER

GENERAL NOTES:

1. WORK ON THE TRAFFIC SIGNAL SYSTEM SHALL BE IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLANS, STANDARD SPECIFICATIONS, MUTCD AND MHD STANDARD SPECIAL PROVISIONS AND AS DIRECTED BY THE ENGINEER.
2. PROPOSED CONTROLLER SHALL BE A 8 DW, TS-2 TYPE 1, KEYBOARD ENTRY, MENU-DRIVEN TYPE WITH INTERNAL COORDINATION CAPABILITIES.
3. POST MOUNTED SIGNALS SHALL HAVE A 2 FT. MINIMUM CLEARANCE BETWEEN THE VERTICAL PROJECTION OF THE CURB LINE AND THE SIGNAL VISOR.
4. THE FINAL LOCATION OF SIGNAL EQUIPMENT MAY BE ADJUSTED IN THE FIELD AS NECESSARY WITH THE APPROVAL OF THE ENGINEER. SIGNAL EQUIPMENT SHALL ALLOW A MINIMUM 3 FT. CLEARANCE FOR PEDESTRIAN TRAVEL.
5. ALL TRAFFIC SIGNAL CONDUIT SHALL BE 3 IN. TYPE NM PLASTIC (UL).
6. FIRE PRE-EMPTION SYSTEM SHALL BE COORDINATED AND TESTED WITH THE MANSFIELD FIRE DEPARTMENT TO INSURE PROPER OPERATION.
7. BORING LOGS WILL BE PROVIDED AS AN ADDENDUM. IN THE ABSENCE OF BORING LOGS, THE CONTRACTOR SHALL ASSUME DEPTH FOR "WET SANDY SOIL" FOR BIDDING PURPOSES.



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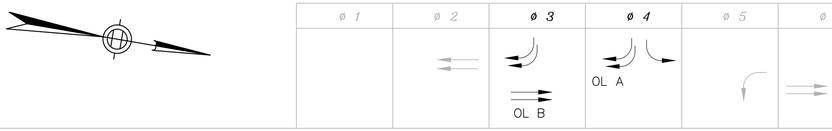
MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		4	12
PROJECT FILE NO. 608751			

TRAFFIC SIGNAL DATA
(I-495 SB RAMPS)
SHEET 2 OF 2



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (COORDINATED)

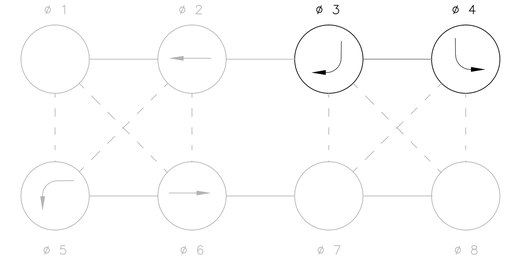
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
SOUTH MAIN STREET	NB	A,B				R	R	R	GV	Y	R	R	R	R	R	R	R	GV	Y	R							FY
SOUTH MAIN STREET	SB	C				RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL							FRL
SOUTH MAIN STREET	SB	D,E				GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R							FY
I-495 SOUTHBOUND OFF RAMP	EB	F,G				RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL							FRL
I-495 SOUTHBOUND OFF RAMP	EB	H,J,K				RR	RR	RR	GR	YR	RR	GR	YR	RR	RR	RR	RR	RR	RR	RR							FRR
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)						10			5			5			5			10									*EMERGENCY ONLY*
PASSAGE TIME (VECHICLE)						3			3			3			3			3									
MAXIMUM 1						34.5			12			9			11			22									
MAXIMUM 2						36.5			10			16			8			25									
YELLOW CLEARANCE							5			4			4			4.5			4								
RED CLEARANCE								2.5			1			1			1.5			1							
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL						SOFT			OFF			OFF			OFF			SOFT									
MEMORY						NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING									

DETECTOR DATA

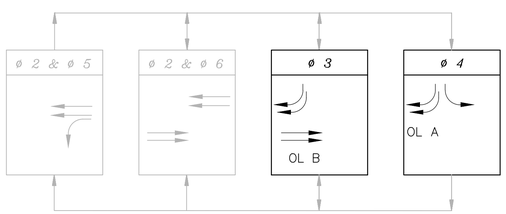
DELAY TIME EFFECTIVE ONLY DURING CALLED ø RED. TIME IN SEC.

DETECTOR NUMBER	LOOP AMPLIFIER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	QUADRUPOLE 2@6'X20' 2-4-2		6	6	B	–	–
2	1	2	QUADRUPOLE 1@6'X20' 2-4-2		6	6	B	–	–
B2	2	1	QUADRUPOLE 1@6'X20' 2-4-2		6	6	B	–	–
3	2	2	QUADRUPOLE 2@6'X20' 2-4-2		5	5	B	–	–
4	3	1	QUADRUPOLE 2@6'X20' 2-4-2		2	2	B	–	–
5	3	2	QUADRUPOLE 1@6'X20' 2-4-2		2	2	B	–	–
B5	4	1	QUADRUPOLE 1@6'X20' 2-4-2		2	2	B	–	–
6	4	2	QUADRUPOLE 2@6'X20' 2-4-2		4	4	B	–	–
7	5	1	QUADRUPOLE 2@6'X20' 2-4-2		3	3	B	–	–
8	5	2	QUADRUPOLE 2@6'X20' 2-4-2		3	3	B	–	–
S1	6	1	1@6'x6'	3	SYS	SYS	A	–	–
S2	6	2	1@6'x6'	3	SYS	SYS	A	–	–
Q1	7	1	1@6'x6'	3	4	4	B	–	–
Q2	7	2	1@6'x6'	3	4	4	B	–	–

NEMA DUAL RING PHASING NOTES:



PROPOSED SIGNAL PHASING



EMERGENCY PRE-EMPTION DATA

APPROACH	DETECTOR	PHASE	TIME (SEC)
SOUTH MAIN STREET NB	OP1	ø6	MIN. 10 MAX. 120
SOUTH MAIN STREET SB	OP2	ø2 & ø5	MIN. 10 MAX. 120
I-495 SB OFF RAMP EB	OP3	ø4	MIN. 10 MAX. 120
I-495 SB OFF RAMP EB	OP4	ø4	MIN. 10 MAX. 120

NOTE: PHASES 2&6 SHALL BE THE STARTUP PHASES ONCE PRE-EMPTION CLEARS.

MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
816.01	1	CHANGE PHASING PATTERN AND TIMING
	1	REVISE LOOP DETECTOR PHASE
		Plus all necessary duct, cable, labor, miscellaneous material and equipment to complete the installation.

COORDINATION DATA

(ALL ENTRIES IN SECONDS)

CYCLE	TIME PERIOD	OFFSET	CYCLE LENGTH
CYCLE 1	AM PEAK 7:00 AM-9:00 AM	0	80
CYCLE 2	PM PEAK 4:00 PM-6:00 PM	0	80
CYCLE 3	FREE ALL OTHER TIMES		

SPLIT	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9
SPLIT 1		42	21	17	15	27			
SPLIT 2		44	15	21	14	30			
SPLIT 3									

NOTES:

1.) ALL SIGNAL HEADS SHALL HAVE TUNNEL VISORS AND 5 IN. LOUVERED BACK PLATES.
2.) ALL SIGNAL LENS SHALL BE 12 IN. DIA.
3.) ALL RED, AMBER, AND GREEN SIGNALS SHALL BE LED TYPE.

SIGNAL HEAD DATA

NOT TO SCALE

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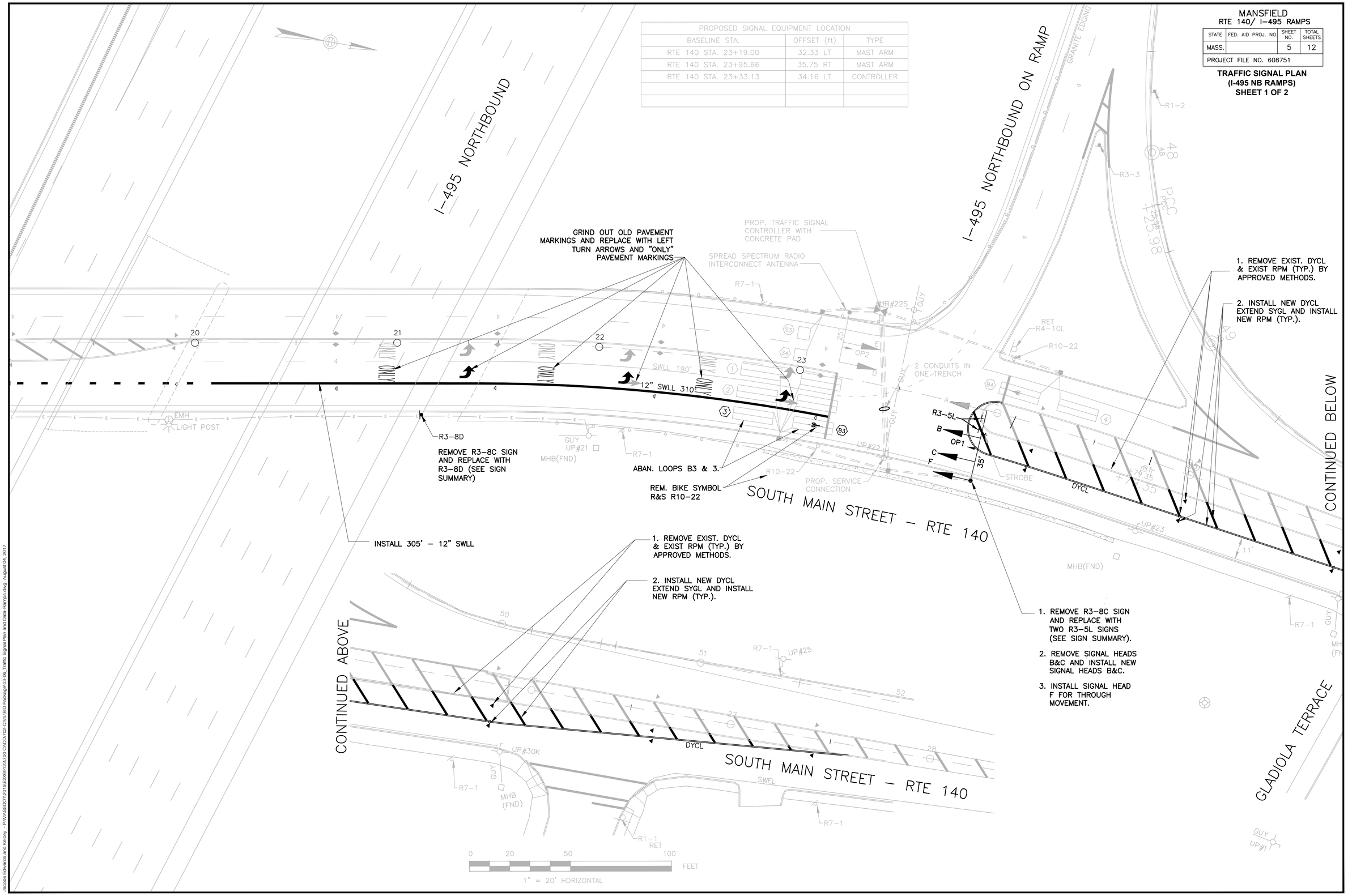
MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		5	12
PROJECT FILE NO. 608751			

TRAFFIC SIGNAL PLAN
(I-495 NB RAMPS)
SHEET 1 OF 2

PROPOSED SIGNAL EQUIPMENT LOCATION		
BASELINE STA.	OFFSET (ft)	TYPE
RTE 140 STA. 23+19.00	32.33 LT	MAST ARM
RTE 140 STA. 23+95.66	35.75 RT	MAST ARM
RTE 140 STA. 23+33.13	34.16 LT	CONTROLLER



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MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		6	12
PROJECT FILE NO. 608751			

TRAFFIC SIGNAL DATA
(I-495 NB RAMPS)
SHEET 2 OF 2

ø 1	ø 2	ø 3	ø 4	ø 5	ø 6	ø 7	ø 8
↑	←				→		

SEQUENCE AND TIMING FOR FULLY-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	FLASH OPER.
SOUTH MAIN STREET	NB	A	GL	YL	RL	RL	RL	RL										RL	RL	RL							FRL
SOUTH MAIN STREET	NB	B	GL	YL	RL	RL	RL	RL										RL	RL	RL							FRL
SOUTH MAIN STREET	NB	C,F	GV	GV	GV	GV	GV	GV										GV	GV	GV							GV
SOUTH MAIN STREET	SB	D,E	R	R	R	GV	Y	R										R	R	R							FY

TIMING IN SECONDS

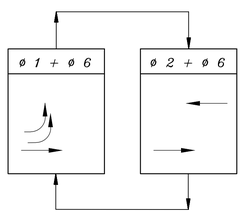
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
MINIMUM GREEN (INITIAL)	10			10																					EMERGENCY ONLY
PASSAGE TIME (VEHICLE)	2			2																					
MAXIMUM 1	35.5			33																					
MAXIMUM 2	35.5			33																					
YELLOW CLEARANCE		4.5			4																				
RED CLEARANCE			2			1																			
WALK (W)																									
PEDESTRIAN CLEARANCE																									
RECALL	OFF			MIN																					
MEMORY	NON-LOCKING			NON-LOCKING																					

DETECTOR DATA

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

DETECTOR NUMBER	LOOP AMPLIFIER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	QUADRUPOLE 2@6'X20' 2-4-2		1	1	B	–	–
2	1	2	QUADRUPOLE 2@6'X20' 2-4-2		1	1	B	–	–
~~3~~	~~2~~	~~1~~	~~QUADRUPOLE 1@6'X20' 2-4-2~~		~~6~~	~~6~~	~~B~~	~~–~~	~~–~~
~~B3~~	~~2~~	~~2~~	~~QUADRUPOLE 1@6'X20' 2-4-2~~		~~6~~	~~6~~	~~B~~	~~–~~	~~–~~
4	3	1	QUADRUPOLE 1@6'X20' 2-4-2		2	2	B	–	–
B4	3	2	QUADRUPOLE 1@6'X20' 2-4-2		2	2	B	–	–
S3	4	1	1@6'x6'	3	SYS	SYS	A	–	–
S4	4	2	1@6'x6'	3	SYS	SYS	A	–	–

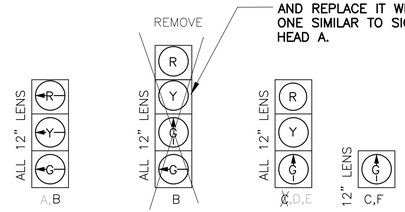
PROPOSED SIGNAL PHASING



EMERGENCY PRE-EMPTION DATA

APPROACH	DETECTOR	PHASE	TIME (SEC)
SOUTH MAIN STREET NB	OP1	ø1+ø6	MIN. 10 MAX. 120
SOUTH MAIN STREET SB	OP2	ø2*	MIN. 10 MAX. 120

* SIGNALS C & F WILL BE DISPLAYING GV.



REMOVE EXISTING 4 SECTION SIGNAL HEAD B AND REPLACE IT WITH ONE SIMILAR TO SIGNAL HEAD A.

REMOVE EXISTING 3 SECTION SIGNAL HEAD C AND REPLACE IT WITH ONE SIMILAR TO SIGNAL HEAD F.

NOTES:

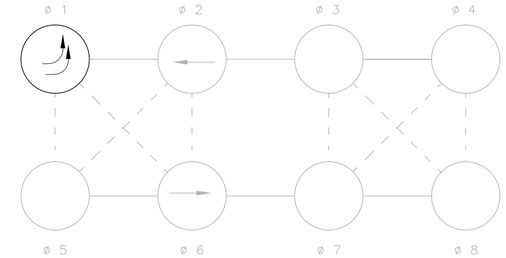
1. ALL NEW SIGNAL HEADS SHALL HAVE TUNNEL VISORS AND 5 IN. LOUVERED RETROREFLECTIVE BACK PLATES.
2. ALL NEW SIGNAL LENS SHALL BE 12 IN. DIA.
3. ALL NEW RED, AMBER, AND GREEN SIGNALS SHALL BE LED TYPE.

SIGNAL HEAD DATA
NOT TO SCALE

MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
816.02	1	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
	~~1~~	~~1 WAY, 4 SECTION, SIGNAL HOUSING (12" LENS)~~
	2	1 WAY, 1 SECTION, SIGNAL HOUSING (12" LENS)
	1	CHANGE PHASING AND TIMING PATTERN
	1	MODIFY MALFUNCTION MANAGEMENT UNIT
	1	ABANDON LOOPS B3 AND 3
		Plus all necessary duct, cable, labor, miscellaneous material and equipment to complete the installation.

NEMA DUAL RING PHASING NOTES:



COORDINATION DATA
(ALL ENTRIES IN SECONDS)

CYCLE	TIME PERIOD	OFFSET	CYCLE LENGTH
CYCLE 1	AM PEAK 7:00 AM-9:00 AM	56	80
CYCLE 2	PM PEAK 4:00 PM-6:00 PM	68	80
CYCLE 3	FREE ALL OTHER TIMES		

SPLIT	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9
SPLIT 1	42	38				80			
SPLIT 2	46	34				80			
SPLIT 3									

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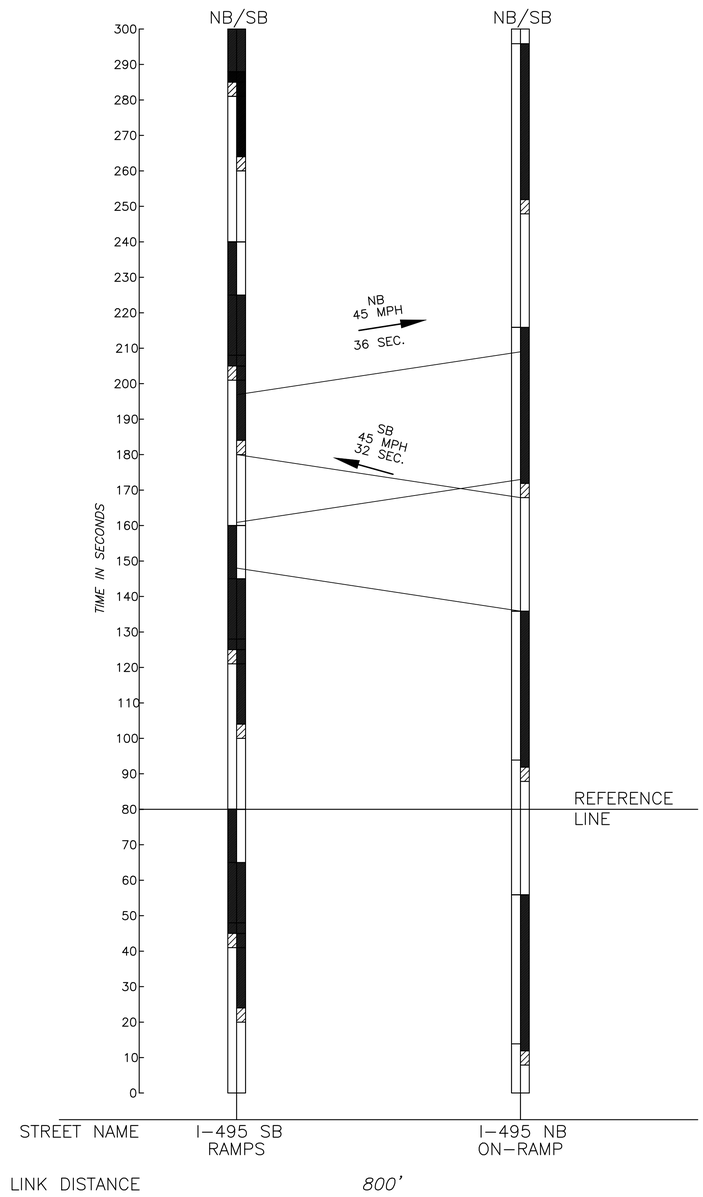
MANSFIELD
RTE 140/ I-495 RAMPS

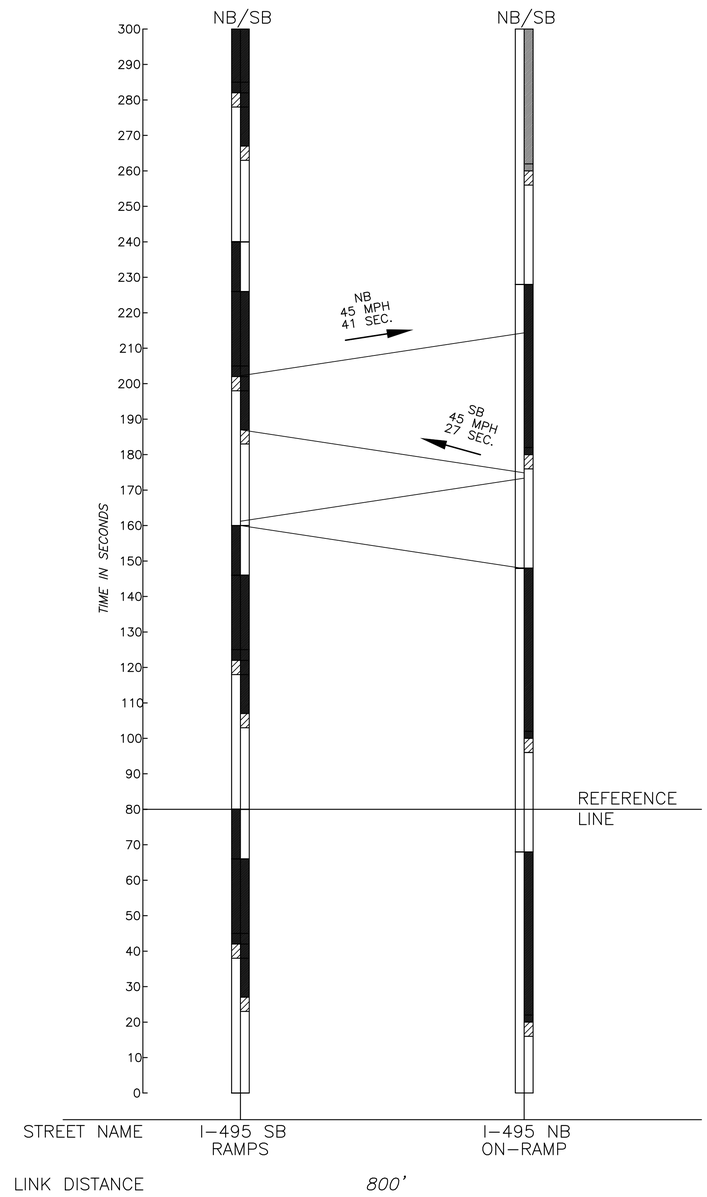
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		7	12
PROJECT FILE NO. 608751			

TIME-SPACE DIAGRAM
(I-495 RAMPS)

AM PEAK TIME-SPACE DIAGRAM
(PLAN 1)



PM PEAK TIME-SPACE DIAGRAM
(PLAN 2)



LEGEND
- RED
- YELLOW
- GREEN

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MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		8	12
PROJECT FILE NO. 608751			

TRAFFIC SIGN SUMMARY (I-495 RAMPS)

REPLACE EXISTING R3-8C SIGN WITH R3-8D SIGN AND R3-5L SIGN

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (IN)	SIZE OF SIGN HEIGHT (IN)	TEXT	TEXT DIMENSIONS (IN) LETTER HEIGHT	TEXT DIMENSIONS (IN) VERTICAL SPACING	TEXT DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
R1-2	36"x36"x36"		YIELD	1	1	1	3	1	1	1	P-5 3 REQ'D	3.90	11.70
R2-1 (45)	24"	30"	SPEED LIMIT 45				1				P-5 1 REQ'D	5.00	5.00
R3-3	24"	24"	NO TURNS				2				P-5 2 REQ'D	4.00	8.00
R3-5L	30"	36"	ONLY				2				MOUNT ON MAST ARM	7.50	15.00
R3-7L	30"	30"	LEFT LANE MUST TURN LEFT				4				P-5 3 REQ'D MOUNT 1 WITH R10-22	9.38	28.14
R3-8D	45"	30"	ONLY ONLY				2				P-5 2 REQ'D MOUNT 1 ON MAST ARM	6.25	12.50
R5-1	30"	30"	DO NOT ENTER				2				P-5 2 REQ'D	6.00	12.00
R5-1A	36"	24"	WRONG WAY				2				P-5 2 REQ'D	3.00	6.00
R6-1 (PBS)	36"	12"	ONE WAY				2				MOUNT WITH R5-1	1.50	13.50
R7-1	12"	18"	NO PARKING ANY TIME				9				P-5 9 REQ'D	4.00	4.00
R10-11b	24"	24"	NO TURN ON RED				1				P-5 1 REQ'D	3.00	9.00
R10-22	18"	24"	TO REQUEST GREEN WAIT ON	3	3	3	3	3	3	3	P-5 3 REQ'D	9.00	27.00
W3-3	36"	36"		1	1	1	3	1	1	1	P-5 3 REQ'D	9.00 16.00	9.00 16.00
W4-1R	36" 48"	36" 48"					1 1				P-5 1 REQ'D P-5 2 REQ'D	9.00	9.00
W4-3	36"	36"					1				P-5 1 REQ'D		

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (IN)	SIZE OF SIGN HEIGHT (IN)	TEXT	TEXT DIMENSIONS (IN) LETTER HEIGHT	TEXT DIMENSIONS (IN) VERTICAL SPACING	TEXT DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
W11-2	30"	30"		1	1	1	2	1	1	1	P-5 2 REQ'D	6.25	12.50
W16-6PR	21"	15"					1				MOUNT 1 W/ W11-2	2.19	2.19
W16-7PL	21"	15"					1				MOUNT WITH W11-2	2.19	2.19
H1-2	24"	24"		2	2	2	3	2	2	2	P-5 3 REQ'D	EACH	EACH
M1-1 (495)	45"	36"	INTERSTATE 495	1	1	1	1	1	1	1	P-5 2 REQ'D	11.25	11.25
M1-5(140)	45"	36"	140	2	2	2	1	2	2	2	P-5 2 REQ'D	11.25	11.25
M3-3	24"	12"	NSEW	1	1	1	2	1	1	1	MOUNT 1 W/ M1-5(140) MOUNT 1 W/ M1-1A(495)	2.00	4.00
R3-1	24"	24"					1				P-5 1 REQ'D	4.00	4.00
R3-2	24"	24"					1				P-5 1 REQ'D	4.00	4.00
R10-6	24"	36"	STOP HERE ON RED				1				MOUNT WITH R10-11b	6.00	6.00
R3-7R	30"	30"	RIGHT LANE MUST TURN RIGHT				2				P-5 2 REQ'D	6.25	12.50
E5-1A(11)	72"	60"	EXIT EXIT#				1				STEEL POST 2 REQ'D	30.00	30.00
D6-1	60"	60"	INTERSTATE 495 SOUTH TAUNTON CAPE COD	18/9D/ 7C/6C 6C 6C 6C	4.5" 4.5" 4.5" 4.5" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-2	60"	60"	INTERSTATE 495 SOUTH TAUNTON CAPE COD NEXT LEFT	18/9D/ 7C/6C 6C 6C 6C	4.5" 4.5" 4.5" 4.5" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-3	60"	60"	INTERSTATE 495 SOUTH TAUNTON CAPE COD	18/9D/ 7C/6C 6C 6C 6C	4.5" 4.5" 4.5" 4.5" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D8-1 D8-2	48" 48"	42" 42"	SOUTH 140 NORTON	7C/6C 18/9D 6C	2.5" 3" 3" 2.5"		1 1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-1 MOUNT W/ D6-2	14.00 14.00	14.00 14.00
D8-3	48"	42"	NORTH 140 MARLBORO	7C/6C 18/9D 6C	2.5" 3" 3" 2.5"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-3	14.00	14.00

NOTES: (PBS = PAINTED BOTH SIDES)

1. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS.

(1) SEE THE 2003 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR THE LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR (ALSO SEE SECTION M9.30.0 TYPE III MHD STANDARD SPECIFICATION).

(2) SEE THE 1996 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD DRAWINGS FOR SIGNS AND SUPPORTS.

(3) SEE MASS. HIGHWAY BICYCLE LOOP DETECTOR DETAIL LATEST REVISION DATE: OCTOBER 3, 2004.

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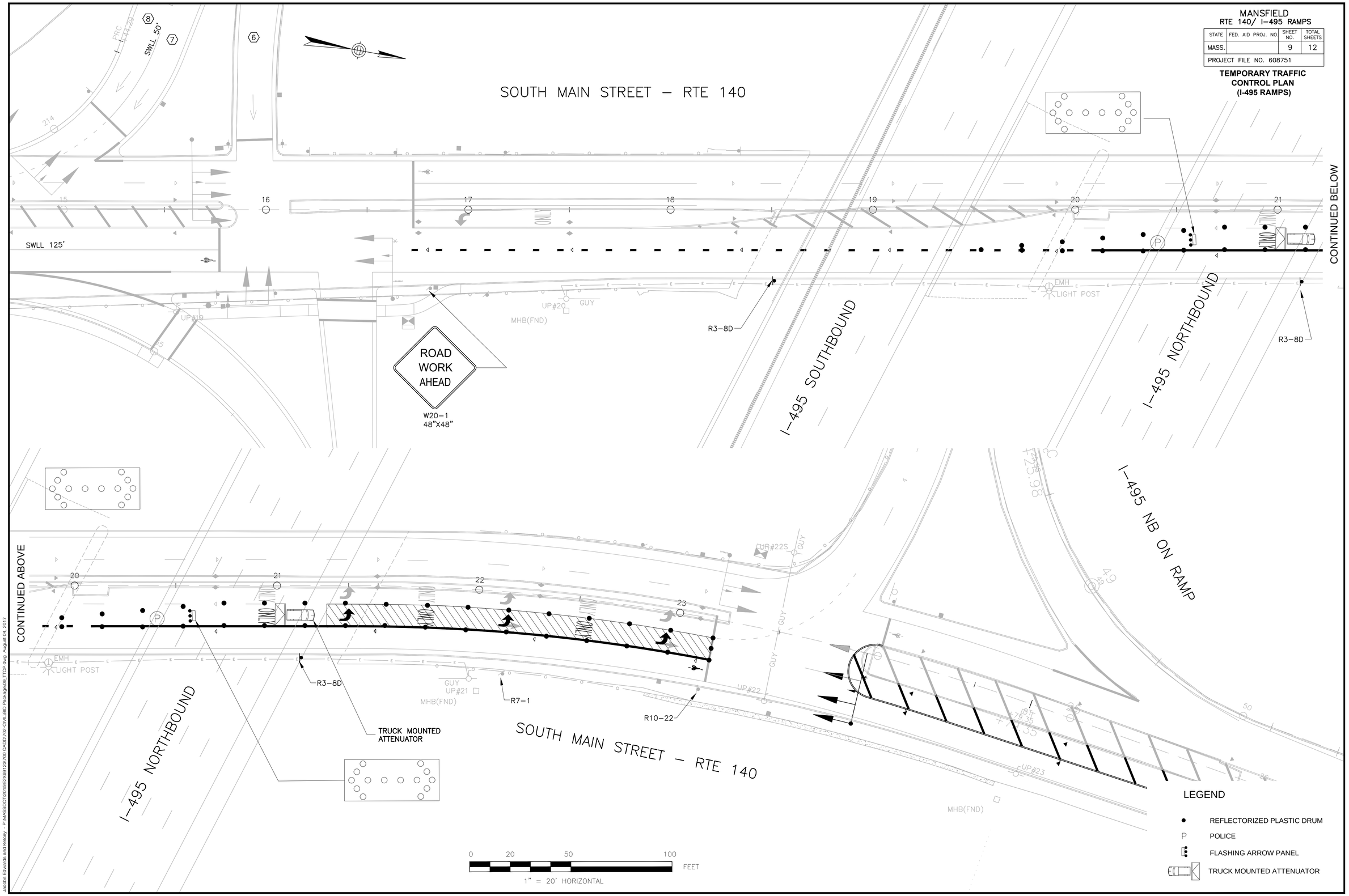
MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		9	12
PROJECT FILE NO. 608751			

TEMPORARY TRAFFIC CONTROL PLAN (I-495 RAMPS)



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MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		10	12
PROJECT FILE NO. 608751			

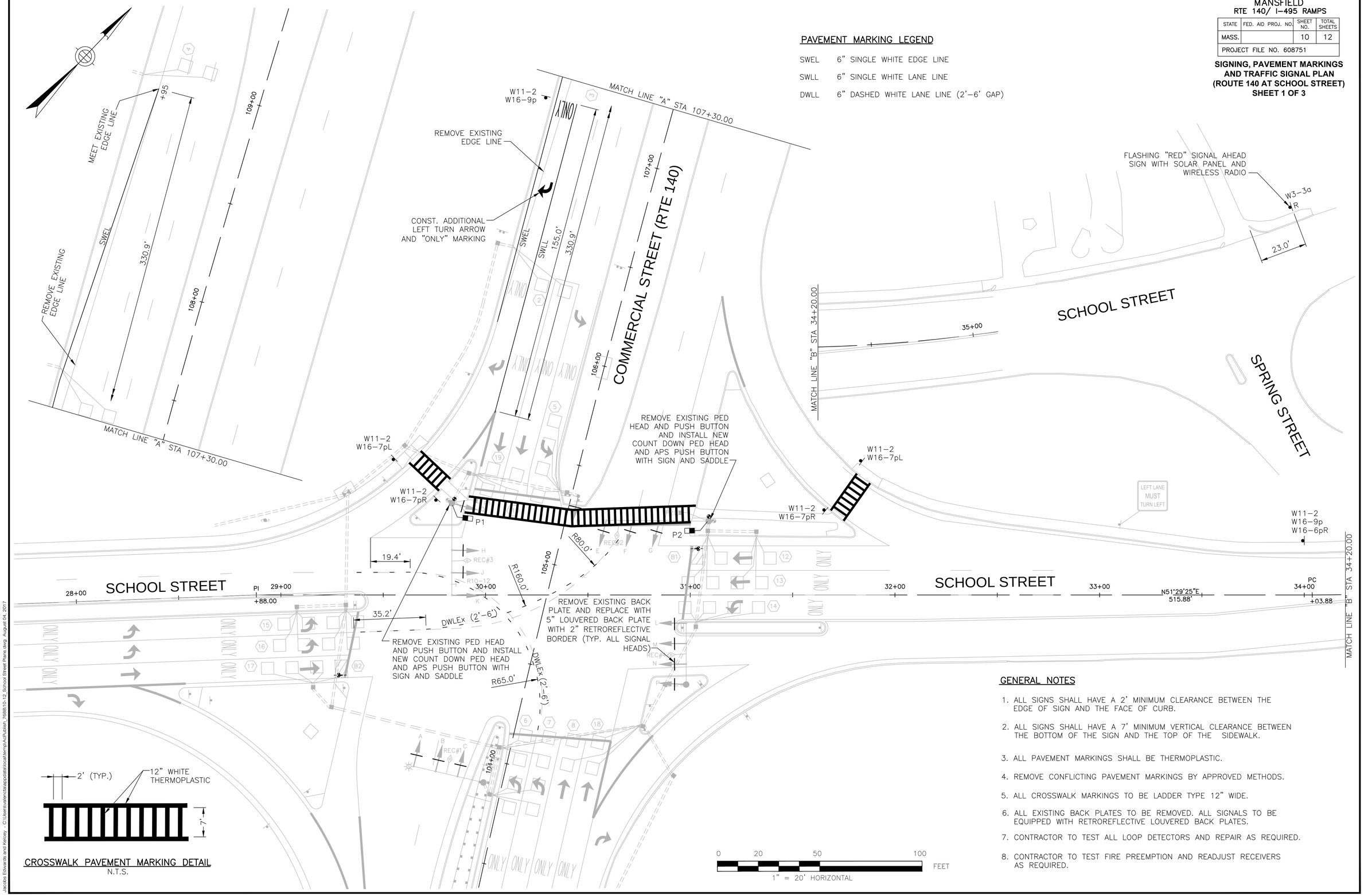
SIGNING, PAVEMENT MARKINGS AND TRAFFIC SIGNAL PLAN (ROUTE 140 AT SCHOOL STREET) SHEET 1 OF 3

PAVEMENT MARKING LEGEND

SWEL 6" SINGLE WHITE EDGE LINE

SWLL 6" SINGLE WHITE LANE LINE

DWLL 6" DASHED WHITE LANE LINE (2'-6' GAP)



CROSSWALK PAVEMENT MARKING DETAIL
N.T.S.

GENERAL NOTES

1. ALL SIGNS SHALL HAVE A 2' MINIMUM CLEARANCE BETWEEN THE EDGE OF SIGN AND THE FACE OF CURB.
2. ALL SIGNS SHALL HAVE A 7' MINIMUM VERTICAL CLEARANCE BETWEEN THE BOTTOM OF THE SIGN AND THE TOP OF THE SIDEWALK.
3. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
4. REMOVE CONFLICTING PAVEMENT MARKINGS BY APPROVED METHODS.
5. ALL CROSSWALK MARKINGS TO BE LADDER TYPE 12" WIDE.
6. ALL EXISTING BACK PLATES TO BE REMOVED. ALL SIGNALS TO BE EQUIPPED WITH RETROREFLECTIVE LOUVERED BACK PLATES.
7. CONTRACTOR TO TEST ALL LOOP DETECTORS AND REPAIR AS REQUIRED.
8. CONTRACTOR TO TEST FIRE PREEMPTION AND READJUST RECEIVERS AS REQUIRED.

Jacobs Edwards and Kelcey - C:\Users\valencia\appdata\local\temp\AcPublish_76880\10-12 School Street Plans.dwg August 04, 2017

MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		11	12
PROJECT FILE NO. 608751			

TRAFFIC SIGNAL DATA
(ROUTE 140 AT SCHOOL STREET)
SHEET 2 OF 3

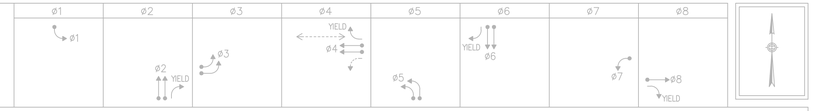
LOOP DETECTOR DATA

DETECTOR NO.	NO. OF SEGMENTS	LOOP SIZE	SPLICE PATTERN	NO. OF TURNS	ø CALLED	ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	2	6'x6'	S	3	ø6	ø6	B	–	–
2	2	6'x6'	S	3	ø6	ø6	A	–	2 SEC.
3	2	6'x6'	S	4	ø6	ø6	A	–	2 SEC.
4	2	6'x6'	S	4	ø6	ø6	A	–	2 SEC.
5	4	6'x6'	P	4	ø1	ø1	B	–	–
6	4	6'x6'	S	3	ø5	ø5	B	–	–
7	4	6'x6'	S	3	ø5	ø5	B	–	–
8	2	6'x6'	S	3	ø2	ø2	B	–	–
9	2	6'x6'	S	3	ø2	ø2	A	–	2 SEC.
10	2	6'x6'	S	4	ø2	ø2	A	–	2 SEC.
11	2	6'x6'	S	4	ø2	ø2	A	–	2 SEC.
12	3	6'x6'	S	3	ø4	ø4	B	–	–
13	4	6'x6'	S	3	ø4	ø4	B	–	–
14	4	6'x6'	S	3	ø7	ø4&ø7	B	–	–
15	4	6'x6'	P	3	ø3	ø3	B	–	–
16	4	6'x6'	P	3	ø3	ø3	B	–	–
17	3	6'x6'	P	4	ø8	ø8	B	–	–
18	2	6'x6'	S	3	ø2	ø2	B	–	–
19	2	6'x6'	S	3	ø6	ø6	B	–	–
B1	1	6'x9'	BICYCLE DETECTOR D-2		ø4	ø4	B	–	–
B2	1	6'x9'	BICYCLE DETECTOR D-2		ø8	ø8	B	–	–

TRAFFIC CONTROLLER DATA

PARAMETER	SELECTION
PHASE ASSIGNMENTS	STD. NEMA
OVERLAPS	STD. NEMA
RINGS	DUAL
DUAL ENTRY	ON
SIMULTANEOUS GAP OUT DISABLED	YES
ALL RED REST	OFF
RED REVERT-# OF SECONDS	–
MINIMUM YELLOW IN SECONDS	3
MAX II BY INTERNAL CLOCK	NO
NIGHT TIME FLASH BY INTERNAL CLOCK	NO
TYPE OF INTERCONNECT TO MASTER	WIRE
REMOTE MUTCD FLASH BY MASTER	NO
COORDINATION MODE	PERM
MAXIMUM MODE	INHIBIT
OFFSET SEEK METHOD	SHORTWAY

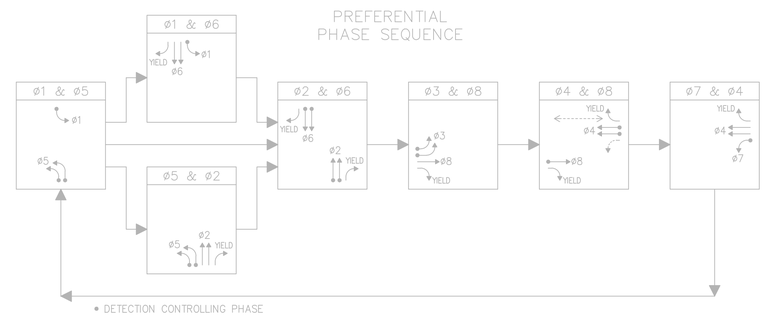
FULLY-ACTUATED ☑ ISOLATED ☐
SEMI-ACTUATED ☐ COORDINATED ☑
PRE-TIMED ☐ WIRE ☑ TBCU ☐



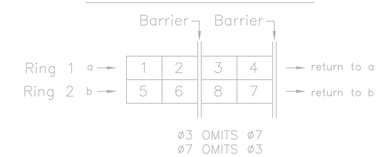
SEQUENCE AND TIMING

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	FLASH OPER.
ROUTE 140	SB	A,B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R	R	R	R	R	R	R	FY
ROUTE 140	SB	C	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FRL
ROUTE 140	NB	D,E	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FRL
ROUTE 140	NB	F,G	R	R	R	GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
SCHOOL STREET	WB	H,J,Q	R	R	R	R	R	R	R	R	R	GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
SCHOOL STREET	WB	K	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL	YL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	FRL
SCHOOL STREET	EB	L,M	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FRL
SCHOOL STREET	EB	N,P	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R	FR
"RED" SIGNAL AHEAD SIGN	WB	R	ON	ON	ON	ON	ON	ON	ON	ON	ON	OUT	OUT	OUT	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	OUT
PEDESTRIAN		P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
TIMING IN SECONDS																											
MINIMUM INITIAL			2			10			4			4			2			10			4			4			EMERGENCY
PASSAGE			3			3			3			3			3			3			3			3			
MAXIMUM 1 (FREE OPERATION)			12			32			20.5			29.5			12			32			19.5			27.5			
MAXIMUM 2 (COORDINATED OPERATION)			*			*			*			*			*			*			*			*			
CHANGE				5.0	1.0		5.0	1.0		4.0	1.5		4.0	1.5		5.0	1.0		5.0	1.0		4.0	1.5		4.0	1.5	
PEDESTRIAN												7/29		3													
RECALL			OFF			SOFT			OFF			OFF			OFF			SOFT			OFF			OFF			
MEMORY			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			

PREFERENTIAL PHASE SEQUENCE



RING STRUCTURE



EMERGENCY VEHICLE PREEMPTION

PREEMPT 1 SB-REC#1	PREEMPT 2 NB-REC#2	PREEMPT 3 WB-REC#3	PREEMPT 4 EB-REC#4

TABLE 2-1 COORDINATION DATA FOR INTERSECTION 1 – ROUTE 140 (SUB-SYSTEM)X

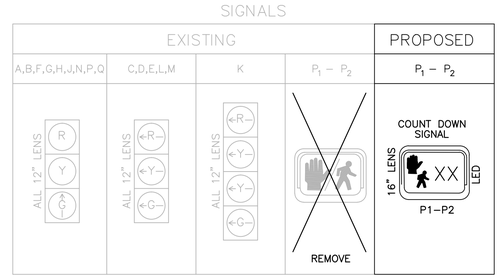
FUNCTION	PURPOSE	OFFSET VALUE IN SECONDS	CYCLE LENGTH	–
OFFSET 1	COORDINATED PATTERN NO. 1	37	100	–
OFFSET 2	COORDINATED PATTERN NO. 2	40	100	–
OFFSET 3	COORDINATED PATTERN NO. 3	40	100	–

COORD POINT SHALL BE AT THE START OF THE GREEN OF THE FIRST PHASE, SHOWN BY * BELOW.

MAXIMUM PHASE TIME IN SECONDS

FUNCTION	PHASE 1	PHASE 2	PHASE 3	PHASE 4
SPLIT 1 AM	16	32	22	30
SPLIT 2 PM	22	29	19	30
SPLIT 3	15	37	20	28
FUNCTION	PHASE 5	PHASE 6	PHASE 7	PHASE 8
SPLIT 1 AM	16	32	16	36
SPLIT 2 PM	22	29	17	32
SPLIT 3	25	27	11	37

SIGNALS



NOTES: 1. ALL VEHICLE & PEDESTRIAN INDICATIONS SHALL BE "LED" TYPE LENS IN ACCORDANCE WITH THE SUPPLEMENTAL TECHNICAL SPECIFICATIONS

2. ALL BACK PLATES SHALL TO BE REPLACED WITH 5" LOUVERED BACK PLATES WITH 2" RETROREFLECTIVE BORDER.

MAJOR ITEMS REQUIRED

	QTY	DESCRIPTION
816.03	2	16" COUNTDOWN PEDESTRIAN SIGNAL & HOUSING
	2	APS PED. PUSH BUTTON, R10-3e SIGN & SADDLE
	14	3-SECTION 5" LOUVERED BACK PLATES WITH 2" RETROREFLECTIVE BORDER.
	1	4-SECTION 5" LOUVERED BACK PLATES WITH 2" RETROREFLECTIVE BORDER.
	1	SOLAR POWERED WIRELESS RADIO WITH 14' SIGNAL POST AND FOUNDATION AND "RED" SIGNAL AHEAD SIGN SYSTEM
	1	LOOP TESTING AND REPAIR
	1	FIRE PREEMPTION TESTING
	1	ADJUST CONTROLLER TIMINGS
		Plus all necessary duct, cable, labor, miscellaneous material and equipment to complete the installation.

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MANSFIELD
RTE 140/ I-495 RAMPS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		12	12
PROJECT FILE NO. 608751			

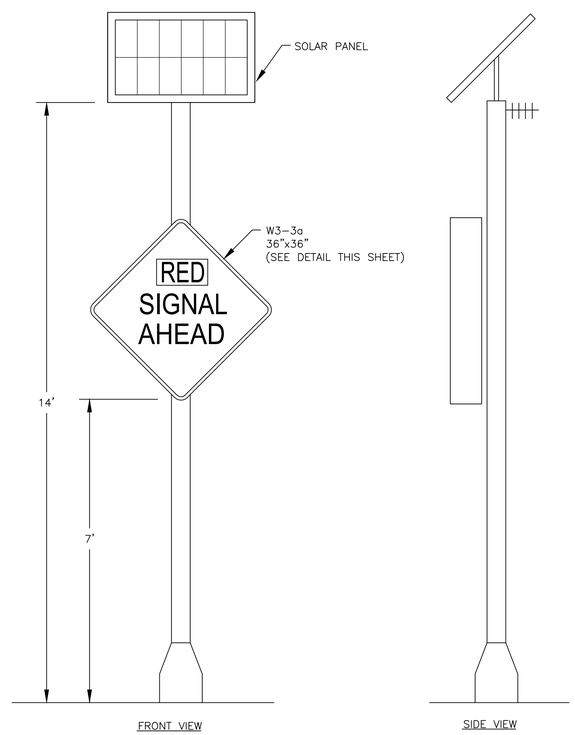
TRAFFIC SIGN SUMMARY
(ROUTE 140 AT SCHOOL STREET)
SHEET 3 OF 3

TRAFFIC SIGN SUMMARY

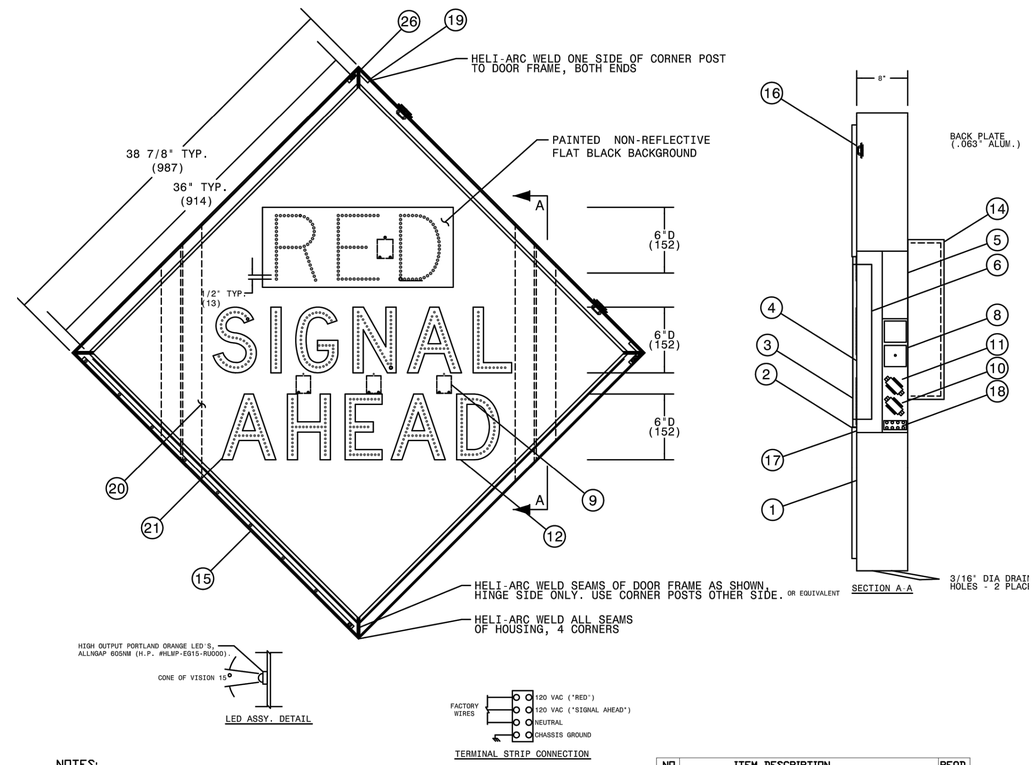
SIGN ID NUMBER	SIZE WIDTH (IN)	SIZE HEIGHT (IN)	MESSAGE	DIMENSIONS (IN) LETTER HEIGHT	DIMENSIONS (IN) VERTICAL SPACING	DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
W3-3a	36	36	RED SIGNAL AHEAD	1	1	1	1	YELLOW	RED/ BLACK	BLACK	14' SIGNAL POST	ITEM 816.03	
W11-2	30	30					6	YELLOW	BLACK	BLACK	P5 5 REQ'D	6.25	37.5
W16-6pR	24	18					1	YELLOW	BLACK	BLACK	MOUNT WITH W11-2	3.00	3.00
W16-7pL	24	12					2	YELLOW	BLACK	BLACK	MOUNT WITH W11-2	2.00	4.00
W16-7pR	24	12					2	YELLOW	BLACK	BLACK	MOUNT WITH W11-2	2.00	4.00
W16-9p	24	12	AHEAD				2	YELLOW	BLACK	BLACK	MOUNT 1 WITH W11-2	2.00	4.00

SIGN SUMMARY NOTES:

1. NUMERICAL LIMITS AND JUSTIFCATION 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.



"RED" SIGNAL AHEAD SIGN MOUNTING DETAIL
(N.T.S.)



NOTES:

1. MESSAGES SHALL BE FORMED BY ROWS OF HIGH OUTPUT PORTLAND ORANGE LED'S SPACED AT 1/2" O.C. (NOMINAL).
2. "RED" PORTION OF LEGEND SHALL BE 6" SERIES "D" LETTERS PLACED WITHIN A BLACK RECTANGULAR BACKGROUND WHICH SHALL COMPLETELY BLANK OUT WHEN NOT ENERGIZED.
3. "SIGNAL AHEAD" PORTION OF LEGEND SHALL BE 6" SERIES "D" BLACK LETTERS WITH ROWS OF LED'S PLACED ALONG THE CENTER LINES OF EACH LETTER AND SHALL BE CONTINUOUSLY ILLUMINATED TO ENHANCE LEGIBILITY.
4. BACKGROUND OF FACE PLATE SHALL BE OVERLAID WITH ENGINEER GRADE REFLECTIVE YELLOW SHEETING
5. ENTIRE FACE PLATE SHALL BE PROTECTED BY A MATTE/CLEAR POLYCARBONATE LENS AND SHALL MINIMIZE ANY UNWANTED REFLECTIONS.
6. CABLES SHALL BE PROVIDED TO HOLD THE DOOR IN THE OPEN POSITION FOR SERVICING.
7. SIGN SHALL BE FULLY GASKETED TO PROVIDE A WATERTIGHT SEAL.
8. HINGE AND FASTENERS SHALL BE STAINLESS STEEL.
9. HOUSING TO BE FIELD DRILLED FOR POWER ENTRY.
10. SIGN SHALL BE EQUIPPED WITH TWO (2) 3/16" (4) DIA. WEEP HOLES LOCATED AT THE LOWER CORNER OF THE HOUSING
11. ENTIRE HOUSING ASSY SHALL BE ACID ETCHED AND PAINTED WITH TWO COATS OF ZINC-CHROMATE PRIMER, DOOR FRAME, FACE PLATE, AND INTERIOR OF HOUSING SHALL BE PAINTED WITH TWO COATS OF NON-REFLECTIVE FLAT BLACK ENAMEL. EXTERIOR OF HOUSING SHALL BE PAINTED WITH TWO COATS OF GLOSS BLACK ENAMEL.
12. VALUS IN PARENTHESIS REPRESENTS MILIMETERS.
13. APPROXIMATE WEIGHT OF SIGN ASSY. - 90 LBS (40.5 KG)

NO.	ITEM DESCRIPTION	REQ'D.
1	HOUSING, .125" (3) EXTRUDED ALUM	1
2	DOOR FRAME, .125" (3) EXTRUDED ALUM	1
3	FACEPLATE, .080" (2) ALUM	1
4	MATTE/CLEAR POLYCORBONATE LENS, .125" (3) THK	1
5	BACKPLATE, .063" (1.5) ALUM	1
6	LED ENCLOSURE, .063" (1.5) ALUM	1
7	TRANSFORMER SHELF, .063 (1.5) ALUM	1
8	POWER SUPPLY ASSY. 101-1010 (W/TRANSFORMERS)	1
9	RESISTOR BOARD ASSY. 102-1010	2
10	TRANSFORMER 118-1030	2
11	TRANSFORMER 118-1050	3
12	HIGH OUTPUT PORTLAND ORANGE LED'S, ALLNGAP	1
	605NM (H.P. #HLMP-EG15-RU000), OR EQUIVALENT	1
13	FIXING CLIPS (LED HOLDERS) BLACK NYLON	518
14	Z-BARS, 3" X 2 11/16" X 1/4" X 24" LONG, ALUM.	518
16	CONTINUOUS HING, 1 1/4" (OPEN) 5.5	
17	1/4 - TURN LINX LOCKS SS	1
18	NEOPRENE GASKET 1" (25) X 3/16" (1)	2
19	TERMINAL BLOCK (4 POSITION)	1
20	CORNER POSTS, ALUM	1
21	ENGINEER GRADE REFLECTIVE YELLOW SHEETING	2
22	HIGH PERFORMANCE BLACK VINYL SHEETING ASSY.	1
23	8-32 X 2 1/2" SS ROUND HEAD MACHINE SCREW	1
24	8-32 SS HEX NUT	
25	8-32 X 1/4" ROUND HEAD MACHINE SCREW	
26	8-32 THREADED STANDOFF	
27	#8 X 5/16" SS SLOTTED HEX HEAD INDENTED	
	SHEET METAL SCREWS	
28	#10 X 1/2" SS PAN HEAD SHEET METAL SCREWS	
29	1/8" POP RIVETS SS	
30	3/16" MACHINE RIVETS, ALUM	

"RED" SIGNAL AHEAD SIGN DETAIL
(N.T.S.)

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