MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

MAIN STREET (ROUTE 9) AND PLEASANT STREET (ROUTE 31)

IN THE TOWN OF

SPENCER

WORCESTER COUNTY

FEDERAL AID PROJECT NO.

25% SUBMITTAL

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	1	34
PROJECT FILE NO.	606207		

TITLE SHEET & INDEX

606207_HD(COV).DWG 22-Nov-2013

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 12, 2012, THE 2012 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO TRAFFIC STANDARD DETAILS ONLY), THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH 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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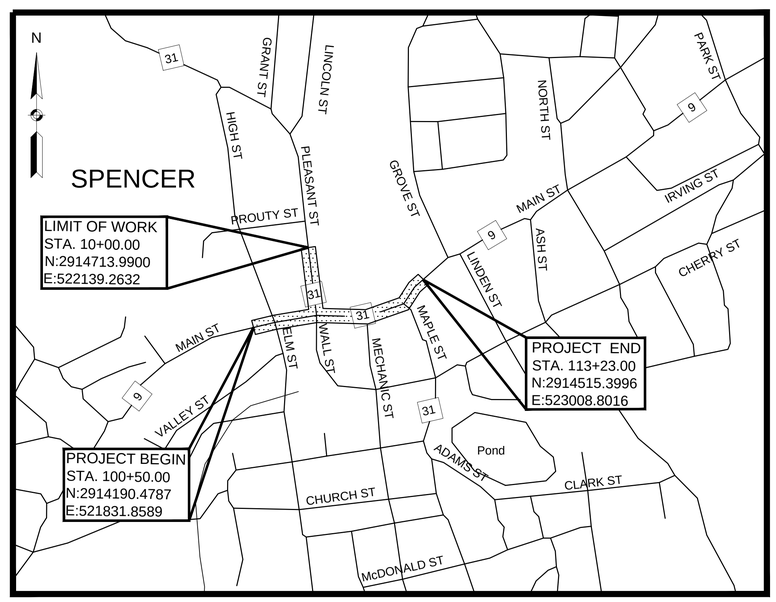

500 0 500 1000

SCALE 1" = 500'

LENGTH OF PROJECT = 1273.00 FEET = 0.241 MILES

NOVEMBER 22, 2013

DESIGN DESIGNATION (MAIN STREET/RTE 9)

DESIGN SPEED	30 MPH
ADT (2011)	14,764 VPD
ADT (2021)	15,909 VPD
K	6%
D	59.4%
T (PEAK HOUR)	1.7%
T (AVERAGE DAY)	1.5%
DHV	1,019 VPH
DDHV	606 VPH
FUNCTIONAL CLASSIFICATION	PRINCIPAL ARTERIAL

DESIGN DESIGNATION (PLEASANT STREET/RTE 31)

DESIGN SPEED	30 MPH
ADT (2011)	5,657 VPD
ADT (2021)	6,096 VPD
K	10%
D	55.6%
T (PEAK HOUR)	1.3%
T (AVERAGE DAY)	1.3%
DHV	595 VPH
DDHV	331 VPH
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL

DATE	DESCRIPTION	REV #

(ERASE IF NOT APPLICABLE)
PE Stamp & Signature
Consultant Name

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**

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
	FPL	FLAG POLE
		GAS PUMP
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 DHWL	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
		OVERHEAD CABLE
		DIRECT BURIAL CABLE
		CURBING
185	185	CONTOURS
		DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		ELECTRIC DUCT " "
		GAS MAIN " "
		SEWER MAIN " "
		TELEPHONE DUCT " "
		WATER MAIN " "
		BALANCE STONE WALL
		CULVERT
		GUARD RAIL
CLF		GUTTER LINE AT DRIVEWAYS
		CHAIN LINK FENCE
		STOCKADE FENCE
		METAL HANDRAIL

GENERAL SYMBOLS (CONT.)

EXISTING	PROPOSED	
		HAY BALES/SILT FENCE
		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
ℙ OR APPROX. ℙ		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6'X 6' TYPICAL UNLESS OTHERWISE SPECIFIED)
		VIDEO SURVEILLANCE 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
		TRAFFIC SIGNAL CONDUIT (TYPE AS NOTED)

PAVEMENT MARKINGS AND SIGNING SYSBOLS

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.)
	SWEL	SOLID WHITE EDGE LINE
	YGL	YELLOW GORE LINE - 12"
	DYCL	DOUBLE YELLOW CENTER LINE
	SWCHL	SOLID WHITE CHANNELIZATION LINE - 8"
	WGL	WHITE GORE LINE - 12"
	SYEL	SOLID YELLOW EDGE LINE
	BYCL	BROKEN YELLOW CENTER LINE (10' LINE, 30' SPACE TYP.) - 4"
	SYCL	SOLID YELLOW CENTER LINE
	DWLL	DOTTED WHITE LANE LINE - 4" (2' LINE, 4' 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
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
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
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
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
PA	PLANTED AREA
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PGL	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	2	34
PROJECT FILE NO.	606207		

LEGEND & ABBREVIATIONS

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
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	OPTICOM
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

22-Nov-2013

606207_HDLEG).DWG

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION FROM A SURVEY PROVIDED BY HANNIGAN ENGINEERING, INC., OF LEOMINSTER, MASSACHUSETTS PERFORMED IN 2005 AND SUPPLEMENTAL SURVEY PERFORMED IN JULY 2013. THE HORIZONTAL COORDINATE SYSTEM IS ON THE MASS GRID SYSTEM NAD83 AND THE VERTICAL COORDINATE SYSTEM IS NAVD 1988.

2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

3. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

4. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK.

5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, CATV AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

6. THE CONTRACTOR SHALL COORDINATE WITH THE TOWN OF SPENCER FORESTRY SUPERVISOR PRIOR TO REMOVAL OF ANY TREES AS SHOWN ON THE PLANS AND WITHIN THE LIMITS OF WORK. THE TOWN OF SPENCER WILL TRANSPLANT VIABLE TREES TO A LOCATION OUTSIDE THE PROJECT LIMITS.

7. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.

8. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).

9. SAWCUT SURFACES ABUTTING THE PAVEMENT TOP COURSE SHALL BE COATED WITH HOT-POURED RUBBERIZED ASPHALT SEALANT.

10. EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED UNLESS INDICATED OTHERWISE ON THE PLANS.

11. LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.

12. ALL EXISTING GRANITE CURB & EDGING SHALL BE REMOVED AND STACKED AT THE TOWN HIGHWAY DEPARTMENT UNLESS NOTED OTHERWISE. ALL PROPOSED WORK SHALL BE GRANITE CURB TYPE VA4 UNLESS NOTED OTHERWISE.

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	3	34
PROJECT FILE NO.	606207		

GENERAL NOTES

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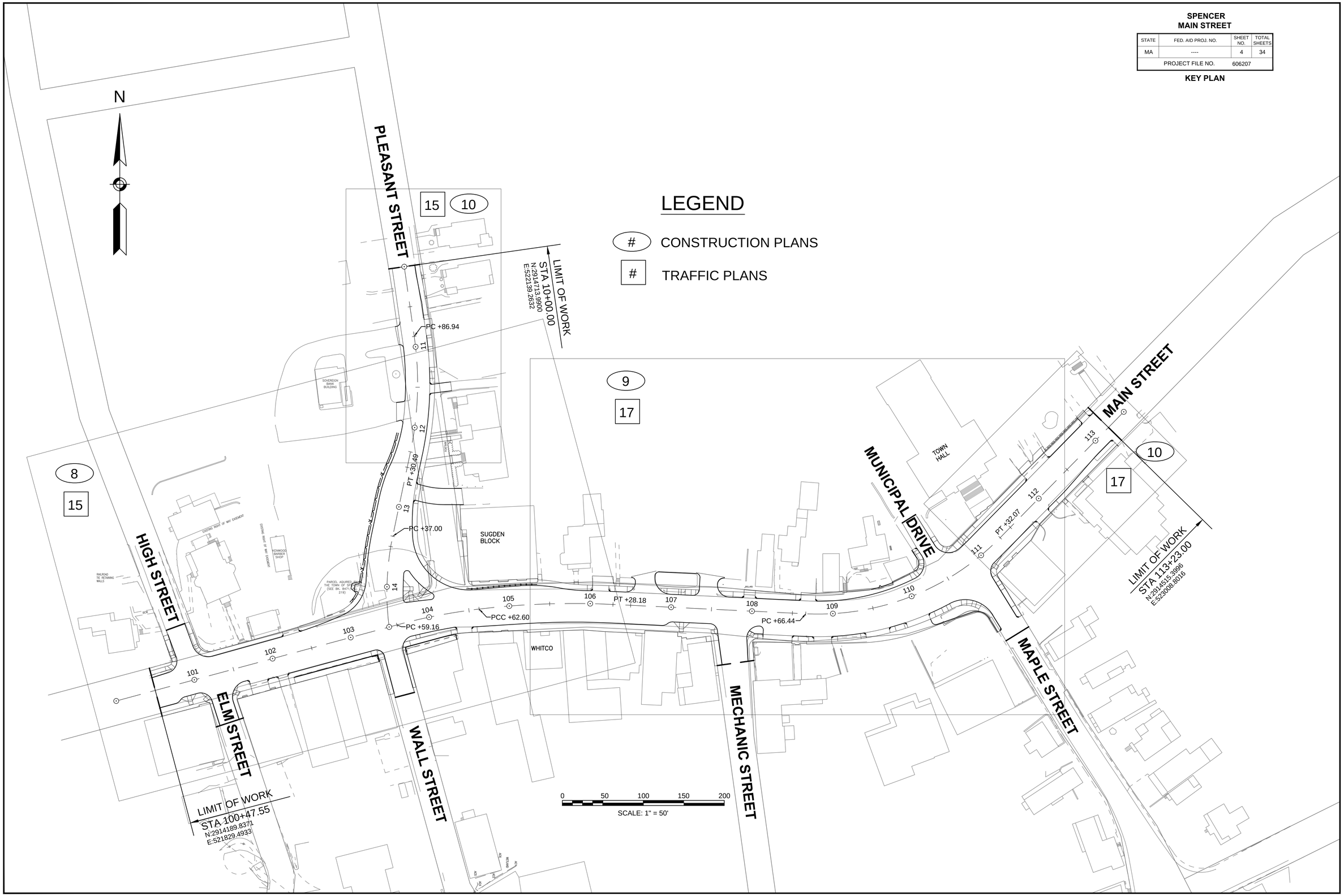
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	4	34
PROJECT FILE NO.	606207		

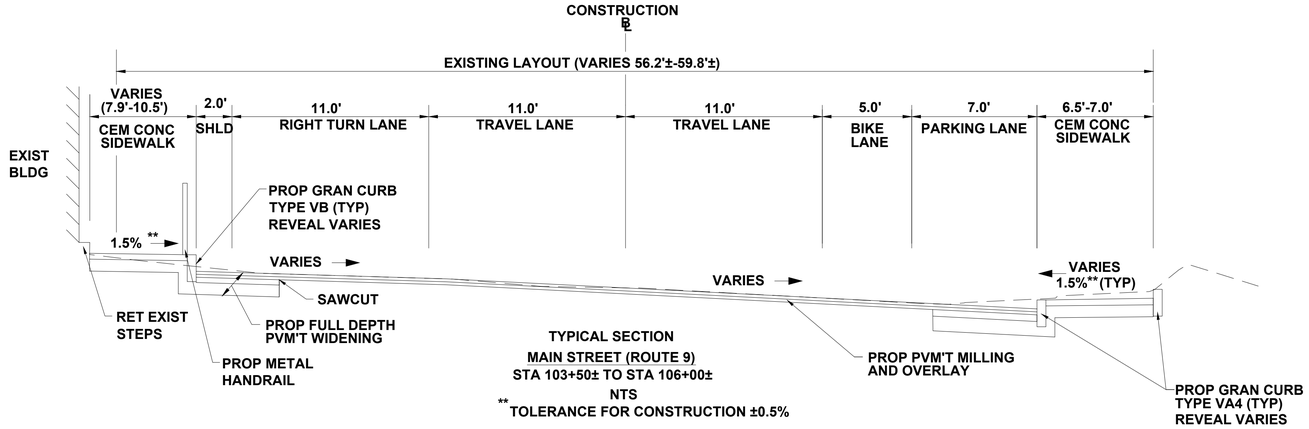
KEY PLAN



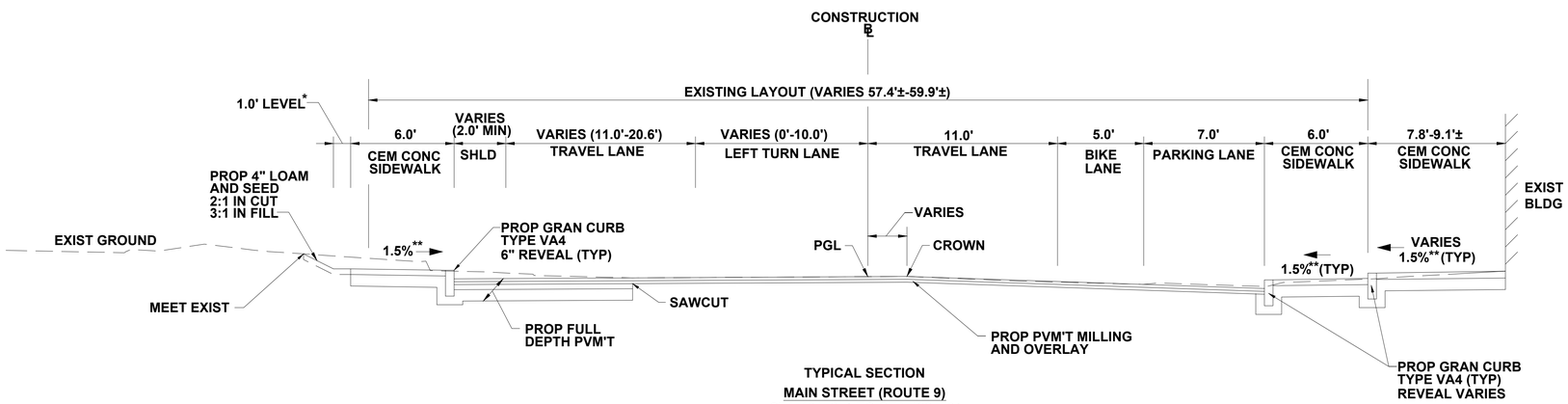
606207_HD(KEY).DWG 22-Nov-2013

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	5	34
PROJECT FILE NO.	606207		

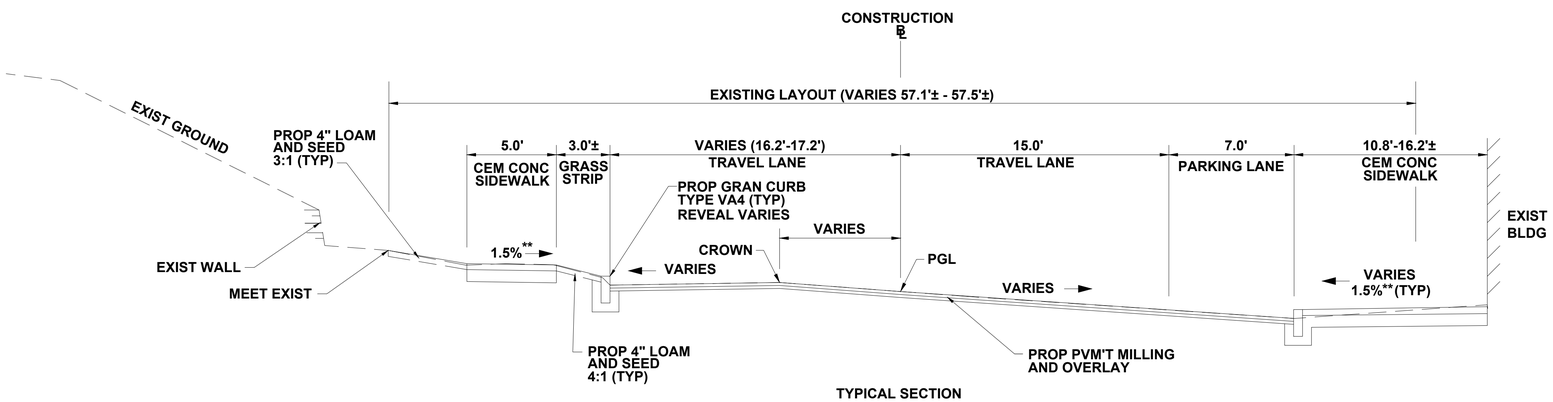
TYPICAL SECTIONS & PAVEMENT NOTES



TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 103+50± TO STA 106+00±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 101+25± TO STA 103+50±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 100+50± TO STA 101+25±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 4" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5)
OVER 2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC 12.5))

BASE: 3.5" HOT MIX ASPHALT
SUPERPAVE BASE COURSE -25.0 (SBC-25.0)

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE b.

PROPOSED FULL DEPTH PAVEMENT - WIDENING (LESS THAN 4.00' WIDE)

SURFACE: 2" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5))

BASE: 6" HIGH EARLY STRENGTH CEMENT
CONCRETE BASE COURSE

SUBBASE: 12" GRAVEL BORROW, TYPE b.

PROPOSED PAVEMENT MILLING & OVERLAY (MAIN STREET/PLEASANT STREET)

SURFACE: 4" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5)
OVER 2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC 12.5))

BITUMEN FOR TACK COAT (RS-1) AT
0.10 GAL/SY OVER EXISTING PAVEMENT.

PAVEMENT MILLING 4" DEPTH

PROPOSED PAVEMENT MILLING & OVERLAY - SIDE STREETS

SURFACE: 2" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5))

BITUMEN FOR TACK COAT (RS-1) AT
0.10 GAL/SY OVER EXISTING PAVEMENT.

PAVEMENT MILLING 2" DEPTH

PROPOSED CEMENT CONCRETE WALK/ WHEELCHAIR RAMP

SURFACE: 4" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE DRIVEWAY

SURFACE: 6" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED HOT MIX ASPHALT DRIVEWAY

SURFACE: 3 1/2" HOT MIX ASPHALT
(1 3/4" SURFACE COURSE TYPE B OVER
1 3/4" INTERMEDIATE (BINDER) COURSE TYPE B)

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED HOT MIX ASPHALT SIDEWALK

SURFACE: 2 1/2" HOT MIX ASPHALT
(1 1/4" SURFACE COURSE TYPE B OVER
1 1/4" INTERMEDIATE (BINDER) COURSE TYPE B)

FOUNDATION: 8" GRAVEL BORROW, TYPE b

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	6	34
PROJECT FILE NO.	606207		

TYPICAL SECTIONS & PAVEMENT NOTES

SEE SHEET NO. 5
FOR PAVEMENT NOTES

22-Nov-2013

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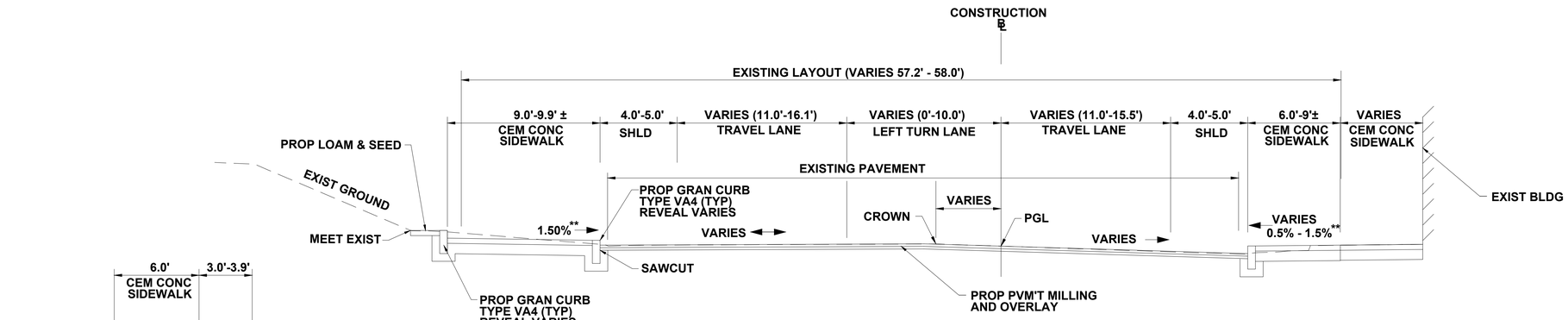
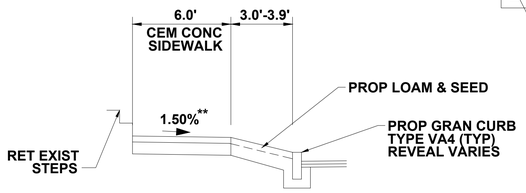
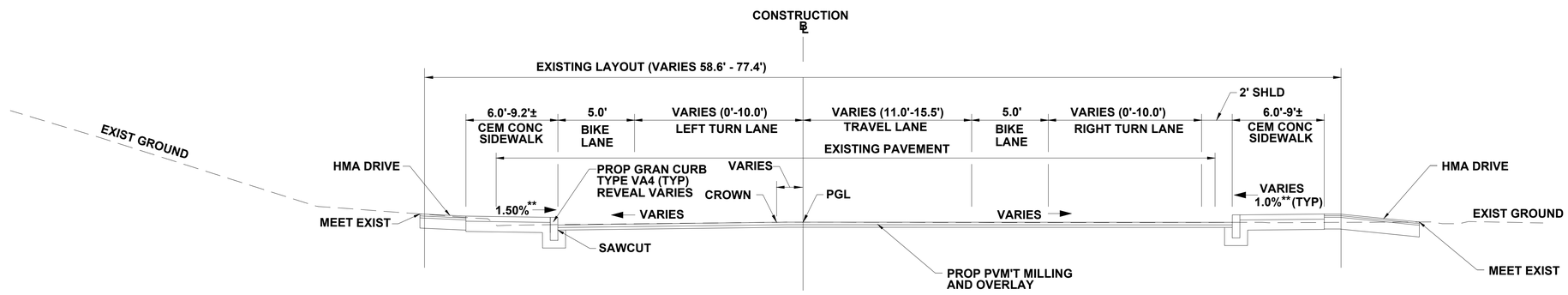


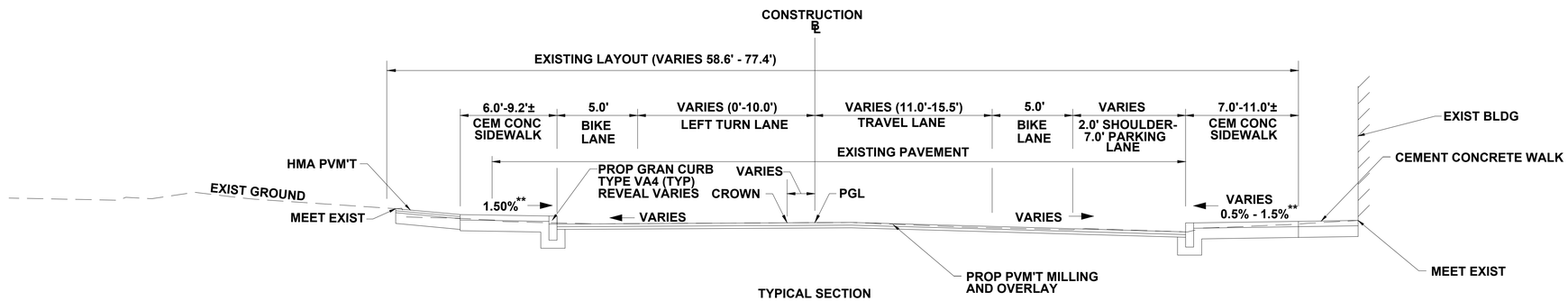
TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 110+50± TO STA 113+14±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
IN FRONT OF TOWN HALL
NTS
TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 108+00± TO STA 110+50±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%



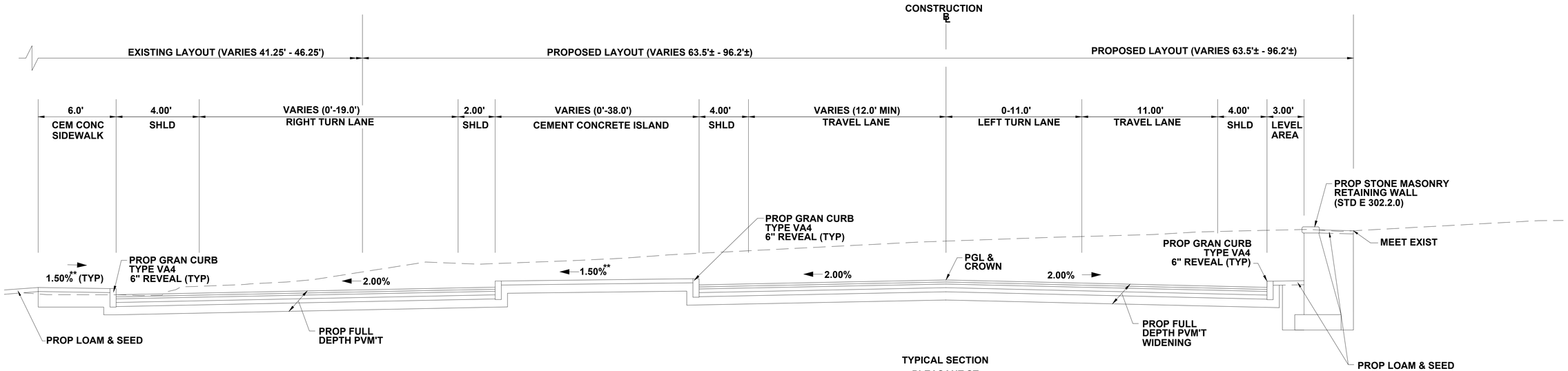
TYPICAL SECTION
MAIN STREET (ROUTE 9)
STA 106+00± TO STA 108+00±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%

SPENCER
MAIN STREET

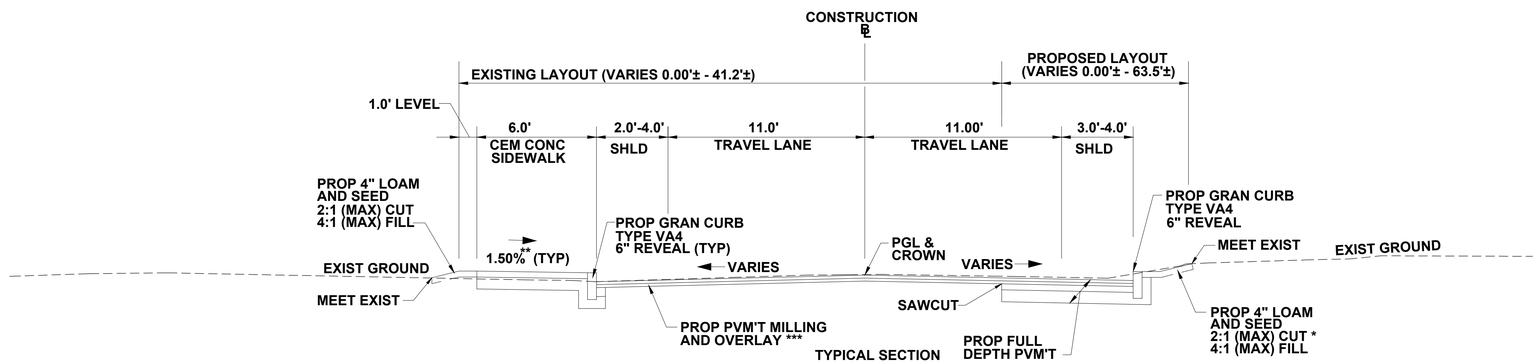
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	7	34
PROJECT FILE NO.	606207		

TYPICAL SECTIONS & PAVEMENT NOTES

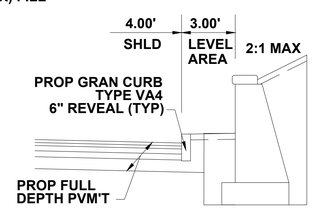
SEE SHEET NO. 5
FOR PAVEMENT NOTES



TYPICAL SECTION
PLEASANT ST
STA 12+95± TO STA14+50±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
PLEASANT ST
STA 10+00± TO STA 12+95±
NTS
** TOLERANCE FOR CONSTRUCTION ±0.5%
*** STA 11+50 TO STA 12+95± PROP FULL DEPTH PVM'T



* STA 12+00 TO STA 12+95±
PROP STONE MASONRY RETAINING WALL
(STD E 302.2.0)

606207_HD(TYP).DWG 22-Nov-2013

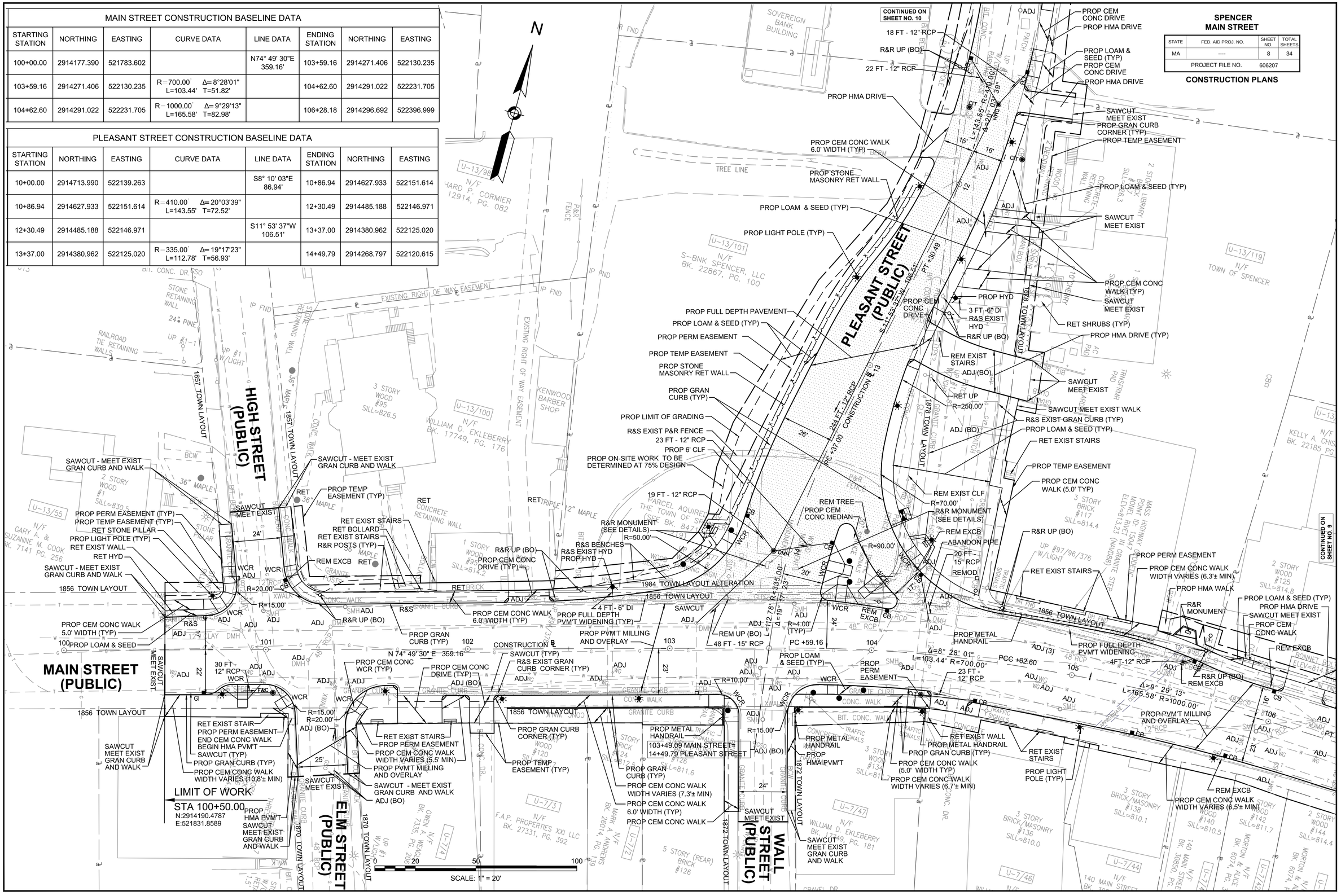
MAIN STREET CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
100+00.00	2914177.390	521783.602		N74° 49' 30"E 359.16'	103+59.16	2914271.406	522130.235
103+59.16	2914271.406	522130.235	R=700.00' Δ=8°28'01" L=103.44' T=51.82'		104+62.60	2914291.022	522231.705
104+62.60	2914291.022	522231.705	R=1000.00' Δ=9°29'13" L=165.58' T=82.98'		106+28.18	2914296.692	522396.999

PLEASANT STREET CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
10+00.00	2914713.990	522139.263		S8° 10' 03"E 86.94'	10+86.94	2914627.933	522151.614
10+86.94	2914627.933	522151.614	R=410.00' Δ=20°03'39" L=143.55' T=72.52'		12+30.49	2914485.188	522146.971
12+30.49	2914485.188	522146.971		S11° 53' 37"W 106.51'	13+37.00	2914380.962	522125.020
13+37.00	2914380.962	522125.020	R=335.00' Δ=19°17'23" L=112.78' T=56.93'		14+49.79	2914268.797	522120.615

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	8	34
PROJECT FILE NO.	606207		

CONSTRUCTION PLANS



606207_HD(GEN).DWG 22-Nov-2013

MAIN STREET CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
100+00.00	2914177.390	521783.602		N74° 49' 30"E 359.16'	103+59.16	2914271.406	522130.235
103+59.16	2914271.406	522130.235	R=700.00' Δ=8°28'01" L=103.44' T=51.82'		104+62.60	2914291.022	522231.705
104+62.60	2914291.022	522231.705	R=1000.00' Δ=9°29'13" L=165.58' T=82.98'		106+28.18	2914296.692	522396.999
106+28.18	2914296.692	522396.999		S87° 13' 16"E 238.26'	108+66.44	2914285.141	522634.978
108+66.44	2914285.141	522634.978	R=315.00' Δ=48°19'00" L=265.64' T=141.29'		111+32.07	2914379.133	522875.069
111+32.07	2914379.133	522875.069		N44° 27' 44"E 217.93'	113+50.00	2914534.670	523027.713

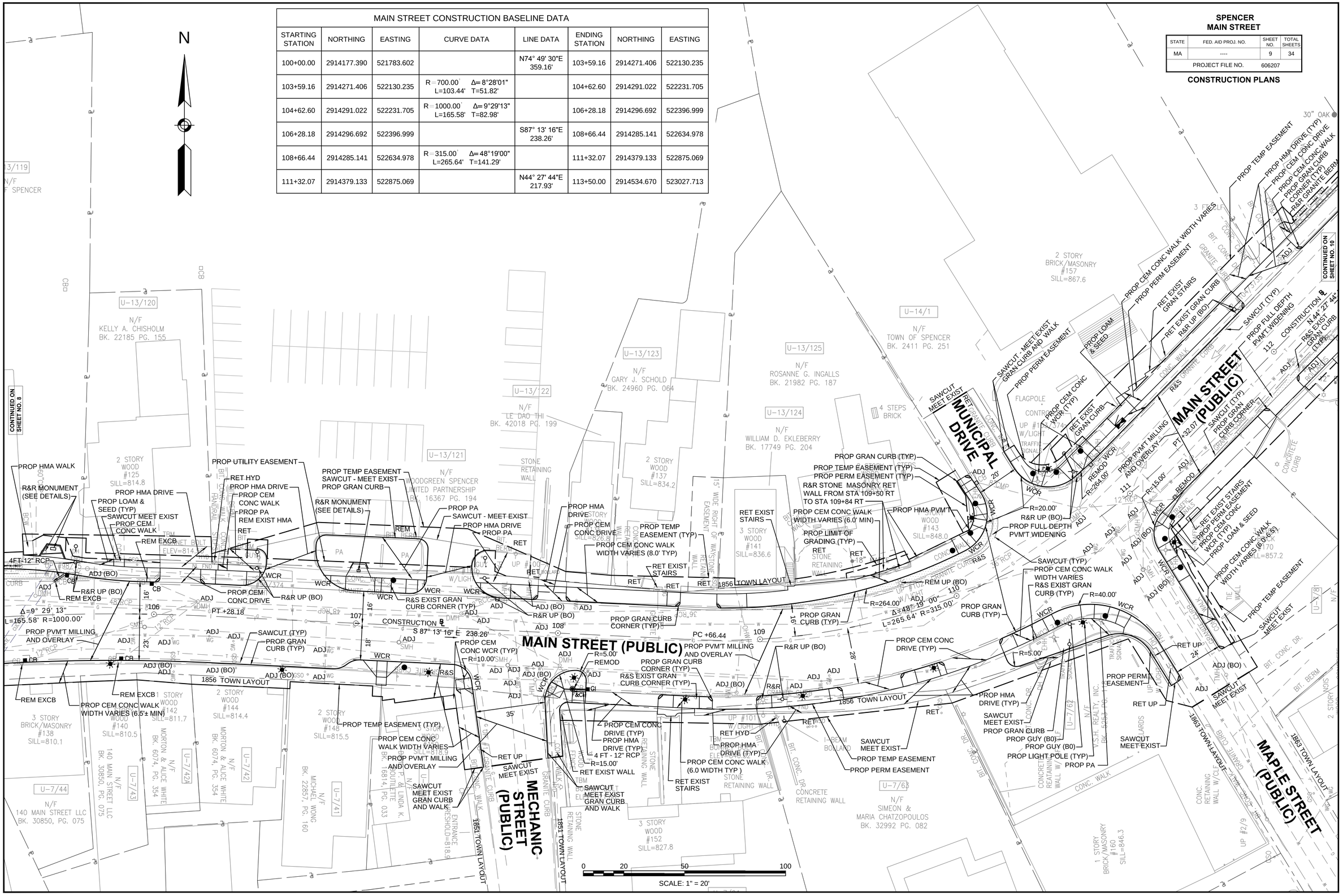
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	9	34
PROJECT FILE NO.	606207		

CONSTRUCTION PLANS

22-Nov-2013

606207_HD(GEN).DWG



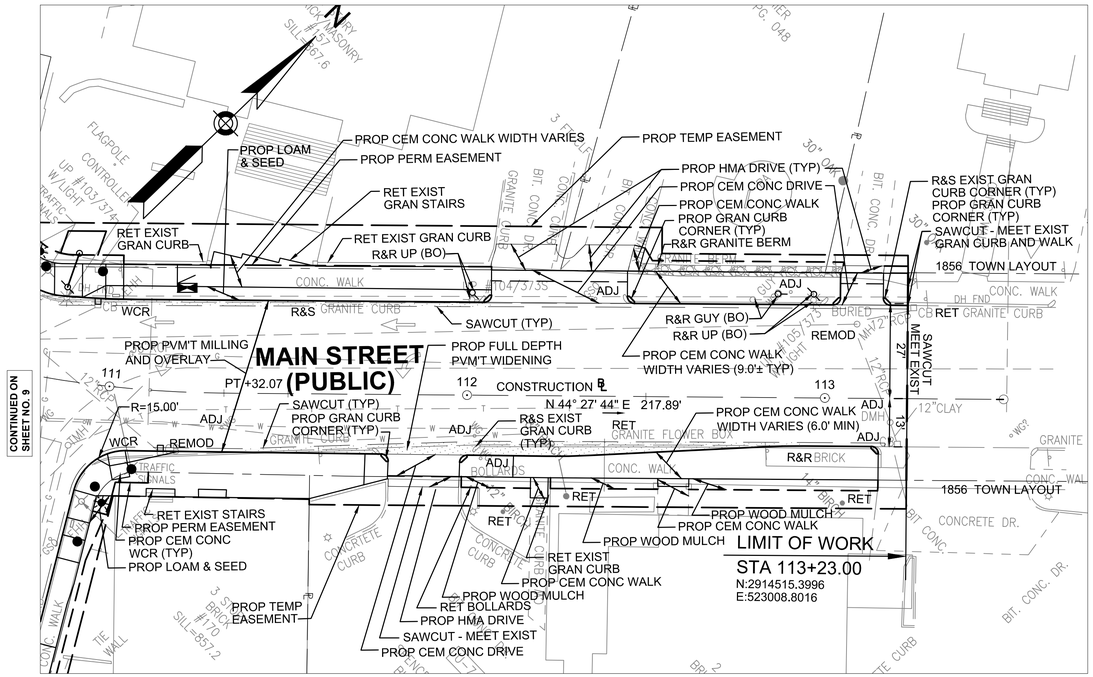
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	10	34
PROJECT FILE NO.	606207		

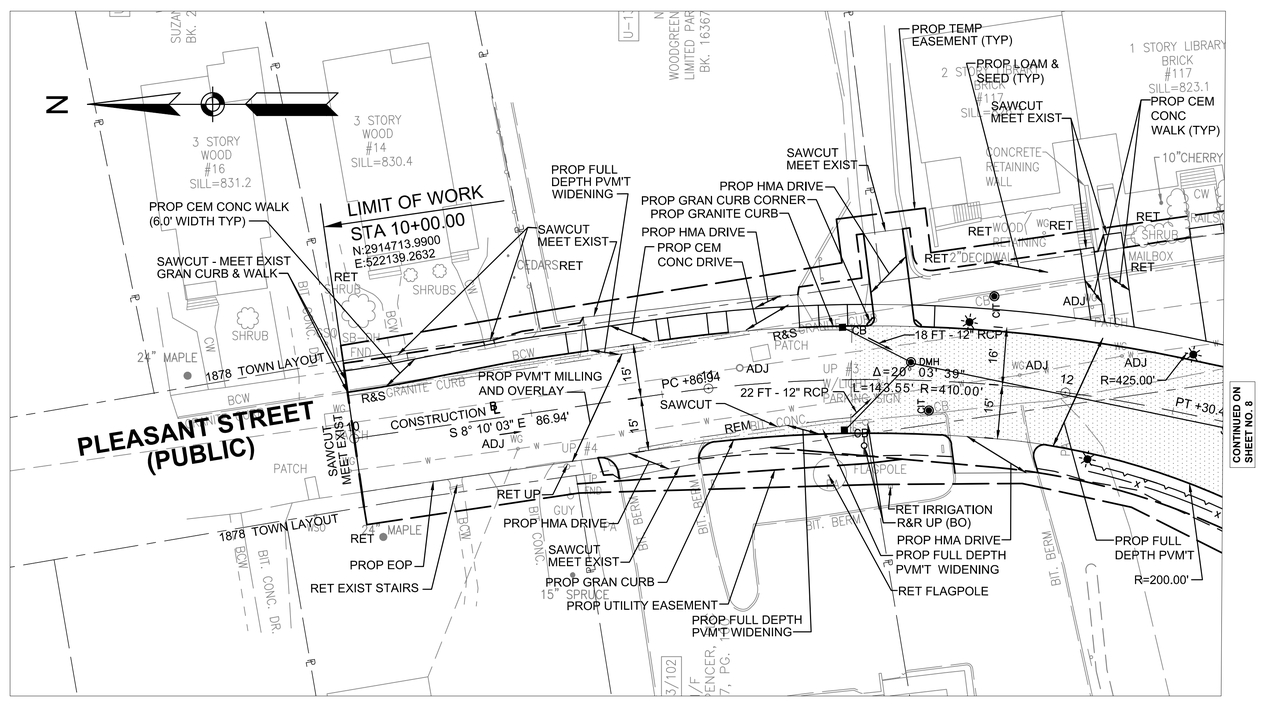
CONSTRUCTION PLANS

606207_HD(GEN).DWG 22-Nov-2013

MAIN STREET CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
100+00.00	2914177.390	521783.602		N74° 49' 30"E 359.16'	103+59.16	2914271.406	522130.235
103+59.16	2914271.406	522130.235	R=700.00' Δ=8°28'01" L=103.44' T=51.82'		104+62.60	2914291.022	522231.705
104+62.60	2914291.022	522231.705	R=1000.00' Δ=9°29'13" L=165.58' T=82.98'		106+28.18	2914296.692	522396.999
106+28.18	2914296.692	522396.999		S87° 13' 16"E 238.26'	108+66.44	2914285.141	522634.978
108+66.44	2914285.141	522634.978	R=315.00' Δ=48°19'00" L=265.64' T=141.29'		111+32.07	2914379.133	522875.069
111+32.07	2914379.133	522875.069		N44° 27' 44"E 217.93'	113+50.00	2914534.670	523027.713



PLEASANT STREET CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
10+00.00	2914713.990	522139.263		S8° 10' 03"E 86.94'	10+86.94	2914627.933	522151.614
10+86.94	2914627.933	522151.614	R=410.00' Δ=20°03'39" L=143.55' T=72.52'		12+30.49	2914485.188	522146.971
12+30.49	2914485.188	522146.971		S11° 53' 37"W 106.51'	13+37.00	2914380.962	522125.020
13+37.00	2914380.962	522125.020	R=335.00' Δ=19°17'23" L=112.78' T=56.93'		14+49.79	2914268.797	522120.615

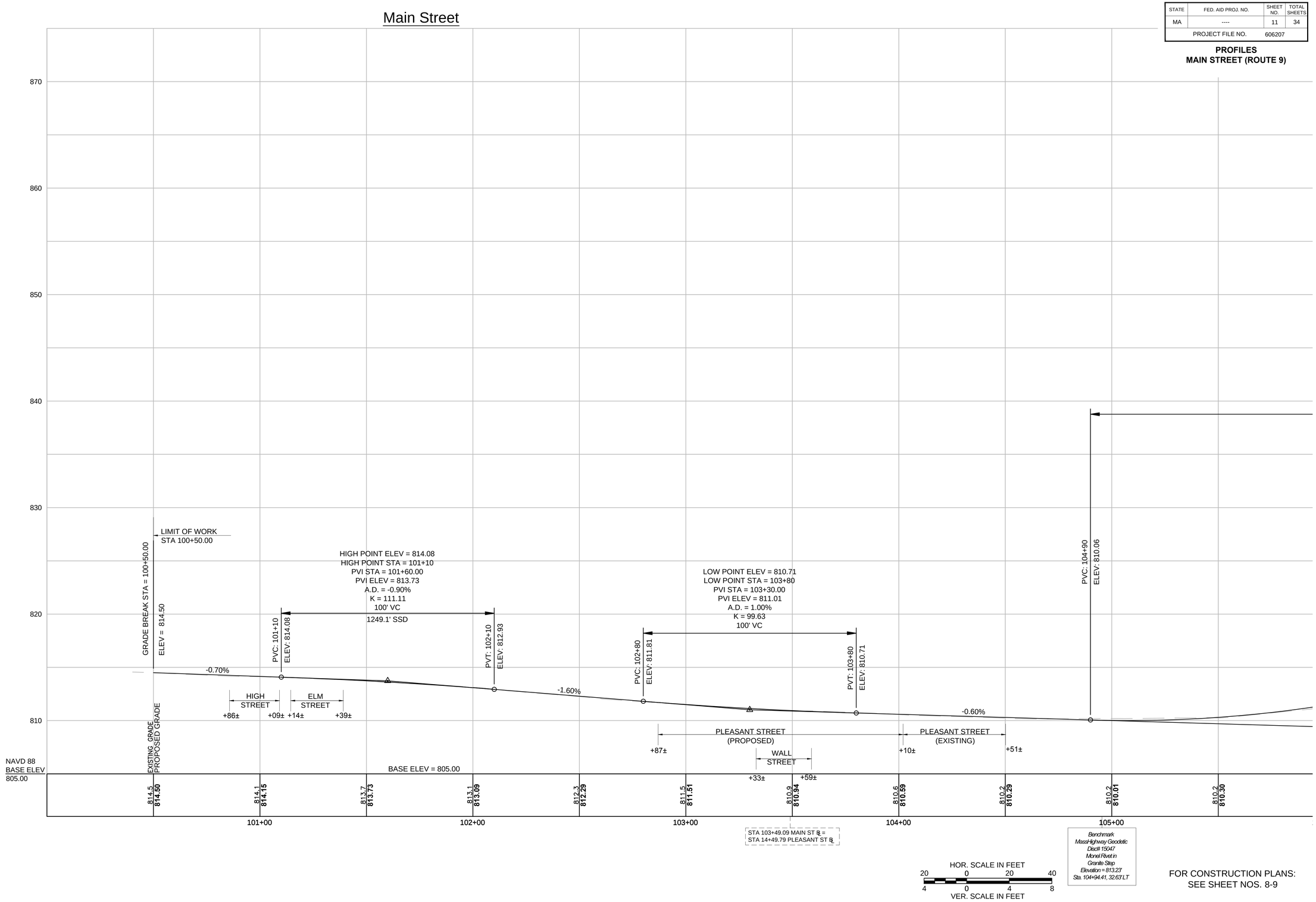


0 20 50 100
SCALE: 1" = 20'

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	11	34
PROJECT FILE NO.	606207		

PROFILES
MAIN STREET (ROUTE 9)



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 8-9

606207_HD(PROF).DWG 22-Nov-2013

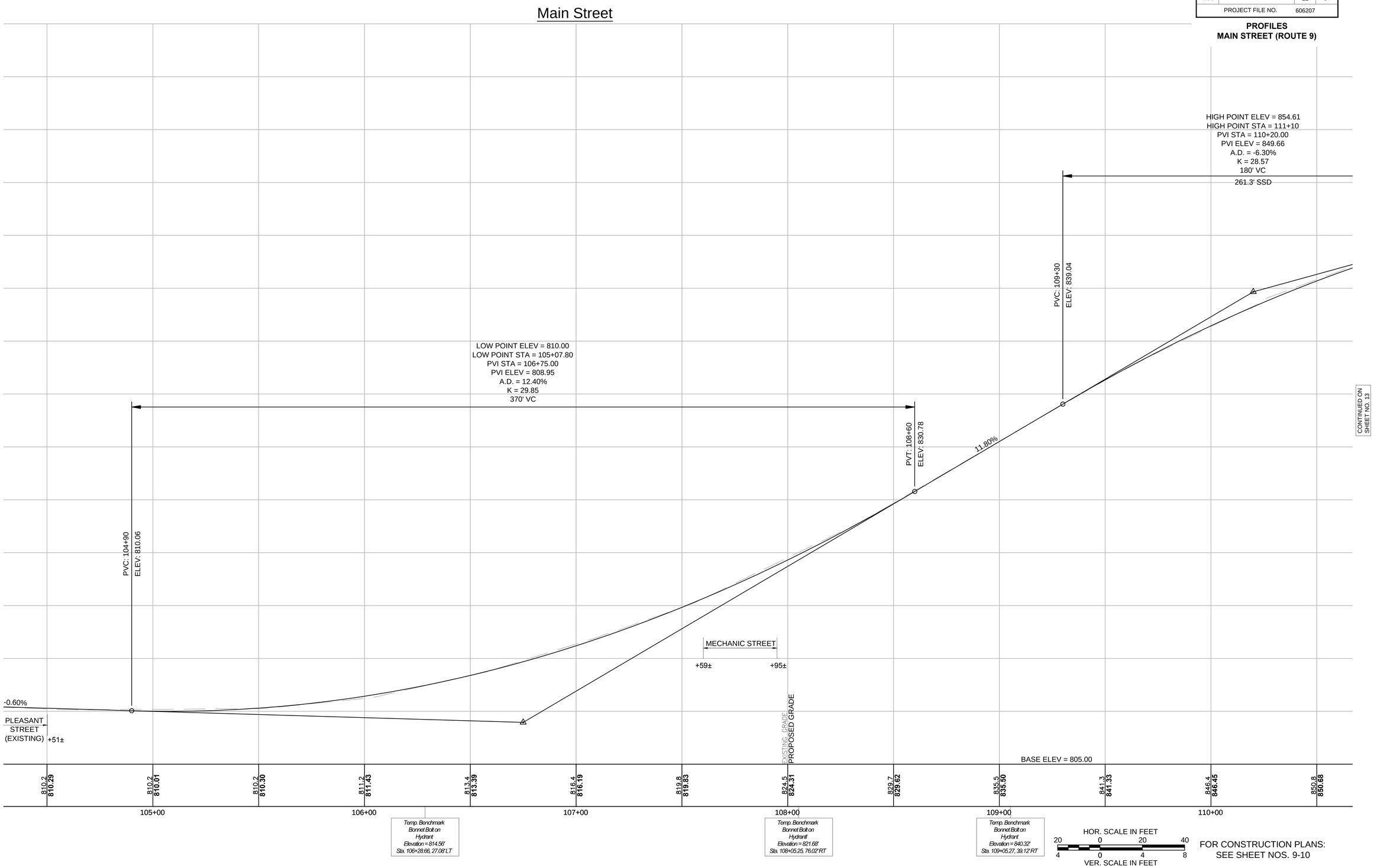
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	12	34
PROJECT FILE NO.	606207		

PROFILES
MAIN STREET (ROUTE 9)

22-Nov-2013

606207_HD(PROF).DWG

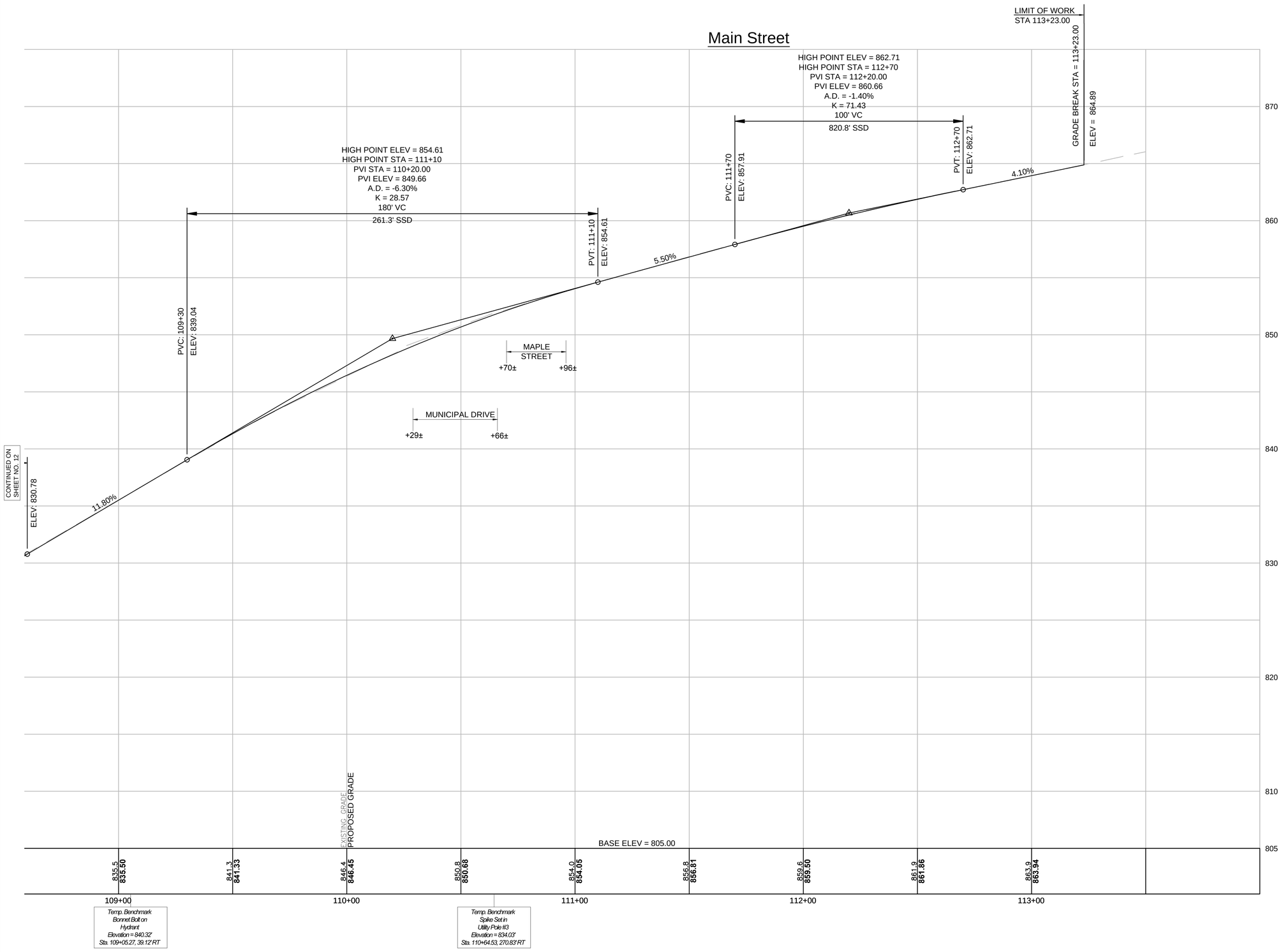


FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 9-10

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	13	34
PROJECT FILE NO.	606207		

PROFILES
MAIN STREET (ROUTE 9)



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NO. 10

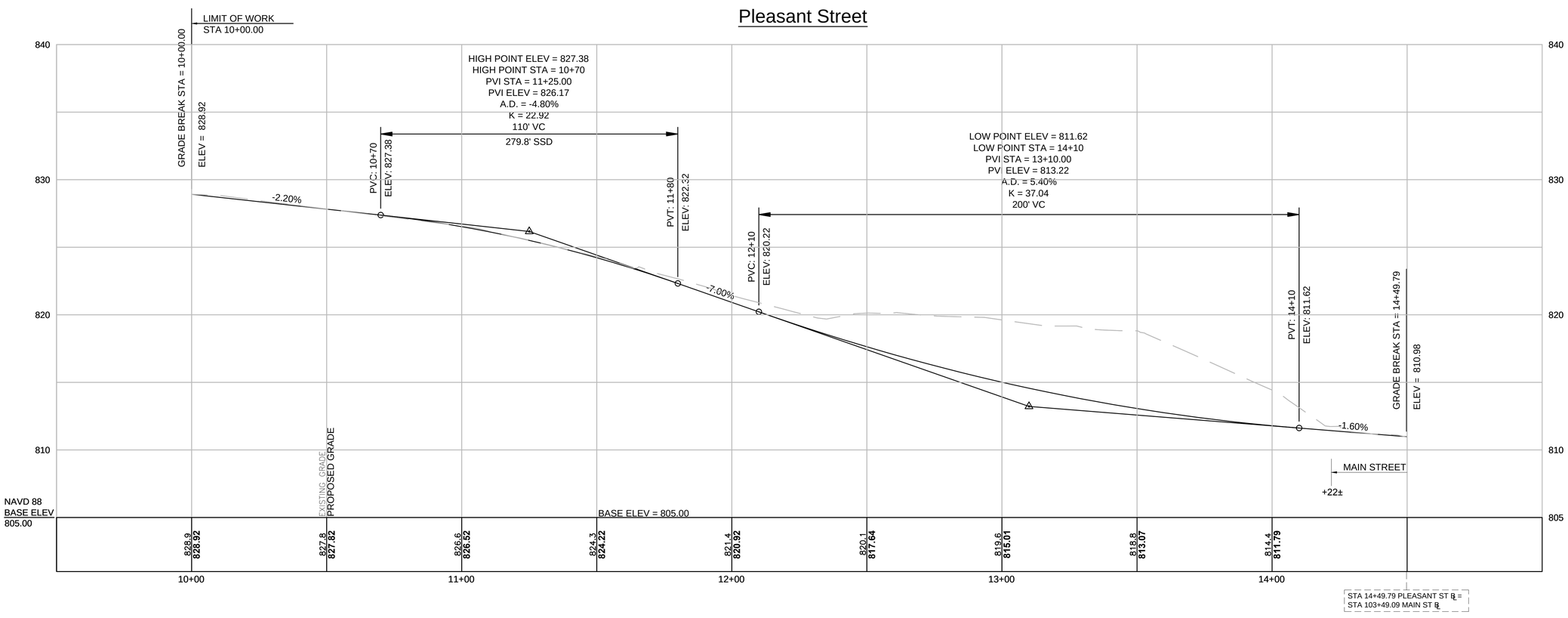
606207_HD(PROF).DWG 22-Nov-2013

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	14	34
PROJECT FILE NO.	606207		

PROFILES
PLEASANT STREET (ROUTE 31)

606207_HD(PROF).DWG 22-Nov-2013



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 8 & 10

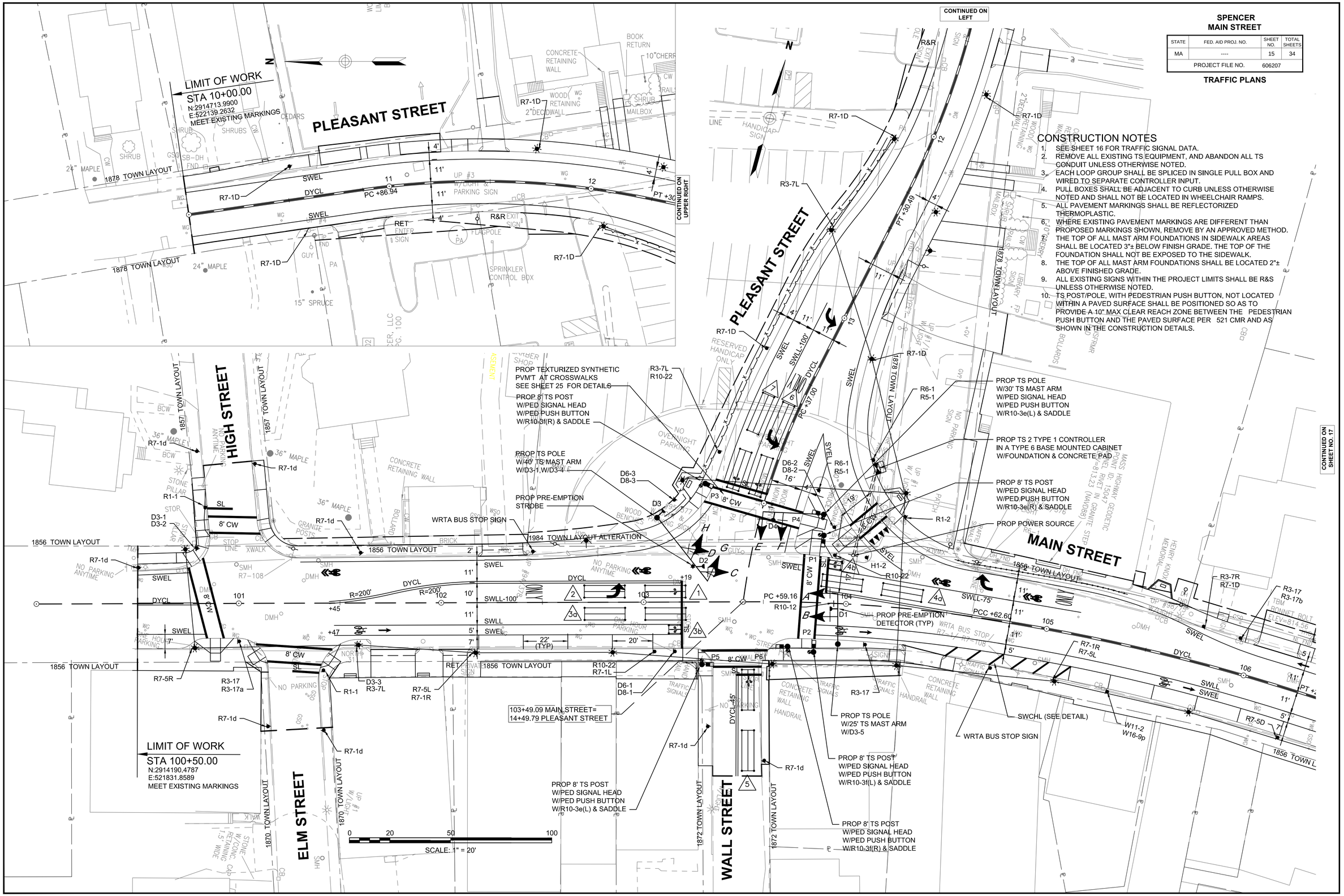
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	15	34
PROJECT FILE NO.	606207		

TRAFFIC PLANS

CONSTRUCTION NOTES

1. SEE SHEET 16 FOR TRAFFIC SIGNAL DATA.
2. REMOVE ALL EXISTING TS EQUIPMENT, AND ABANDON ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. EACH LOOP GROUP SHALL BE SPLICED IN SINGLE PULL BOX AND WIRED TO SEPARATE CONTROLLER INPUT.
4. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
5. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
6. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
7. THE TOP OF ALL MAST ARM FOUNDATIONS IN SIDEWALK AREAS SHALL BE LOCATED 3"± BELOW FINISH GRADE. THE TOP OF THE FOUNDATION SHALL NOT BE EXPOSED TO THE SIDEWALK.
8. THE TOP OF ALL MAST ARM FOUNDATIONS SHALL BE LOCATED 2"± ABOVE FINISHED GRADE.
9. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
10. TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10" MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS.



606207_TR(TSIG).DWG 22-Nov-2013

ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9
	PERM, Y, *		PERM, Y	Y	Y, *, PERM		Y, *, PERM	

SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (ISOLATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH
MAIN STREET	EB	A				G	Y	R				R	R	R	G R	Y R	R	R	R	R				R	R	R				FY
MAIN STREET	EB	B				G	Y	R				R	R	R	R	R	R	R	R	R				R	R	R				FY
MAIN STREET	WB	C,D				R	R	R				R	R	R	R	R	R	G	Y	R				R	R	R				FY
WALL STREET	NB	E,F				R	R	R				R	R	R	R	R	R	R	R	R				G	Y	R				FR
PLEASANT STREET	SB	G,H				R	R	R				G	Y	R	R	R	R	R	R	R				R	R	R				FR
PEDESTRIAN X–ING	NB–SB	P1–P2				DW	DW	DW				DW	DW	DW	DW	DW	DW	DW	DW	DW				W	FDW	DW				OUT
PEDESTRIAN X–ING	EB–WB	P3–P4				DW	DW	DW				DW	DW	DW	DW	DW	DW	W	FDW	DW				DW	DW	DW				OUT
PEDESTRIAN X–ING	EB–WB	P5–P6				W	FDW	DW				DW	DW	DW	DW	DW	DW	DW	DW	DW				DW	DW	DW				OUT

TIMING IN SECONDS																														CONFLICT FLASH OPERATION ONLY
MINIMUM GREEN (INITIAL)						X						X			X			X						X						
PASSAGE TIME (VEHICLE)						X						X			X			X						X						
MAXIMUM 1						X						X			X			X						X						
MAXIMUM 2						X						X			X			X						X						
YELLOW CLEARANCE							X						X			X			X						X					
RED CLEARANCE								X						X			X			X						X				
PEDESTRIAN WALK						X						X			X			X						X						
PEDESTRIAN CLEARANCE						X						X			X			X						X						
DETECTOR MEMORY						NON–LOCK						NON–LOCK			NON–LOCK			NON–LOCK						NON–LOCK						
RECALL						SOFT						OFF			OFF			SOFT						OFF						

COORDINATION DATA			COORDINATION PHASE SPLIT TIMES								
TIMING PLAN	CYCLE	OFFSET	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9
	X	X									
MODE				COORD ø				COORD ø			

NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
2. * NORMALLY DW, W/FDW UPON PEDESTRIAN PUSH BUTTON ACTUATION
3. OL = OVERLAP
4. PERM = PERMISSIVE
5. Y = YIELD CONTROL
6. ø4 & ø8 DUAL ENTRY
7. MAXIMUM 1 = NORMAL OPERATION
8. MAXIMUM 2 = NOT USED
9. STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
10. DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL BE IN EFFECT.
11. INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.

SEQUENCE & TIMING NOTES:

1. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
2. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
3. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
4. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	16	34
PROJECT FILE NO.	606207		

TRAFFIC PLANS

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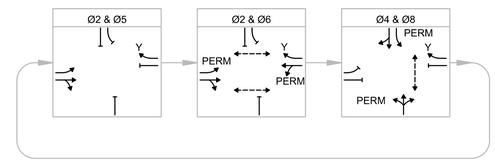
606207_TR(TSIG).DWG

PREFERENTIAL PHASE SEQUENCE



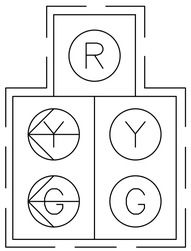
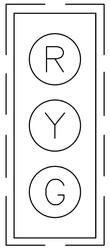
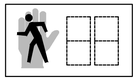
EMERGENCY VEHICLE PRE-EMPTION OPERATION

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

PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2&Ø5
D2	2		Ø6
D3	3		Ø4
D4	4		Ø8

SIGNAL HEAD DATA

A	B,C,D,E,F,G,H	P1-P6
		 W/COUNTDOWN TIMER
ALL 12" LENS		

NOTES:
1. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED.
2. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"± LOUVERED BACKPLATES AND TUNNEL VISORS.
3. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

LOOP DETECTOR DATA

DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø5	SINGLE
2	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
3a	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SERIES
3b	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
4a	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SERIES
4b	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SINGLE
5	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø8	SERIES
6	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	SERIES
7	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	SERIES

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

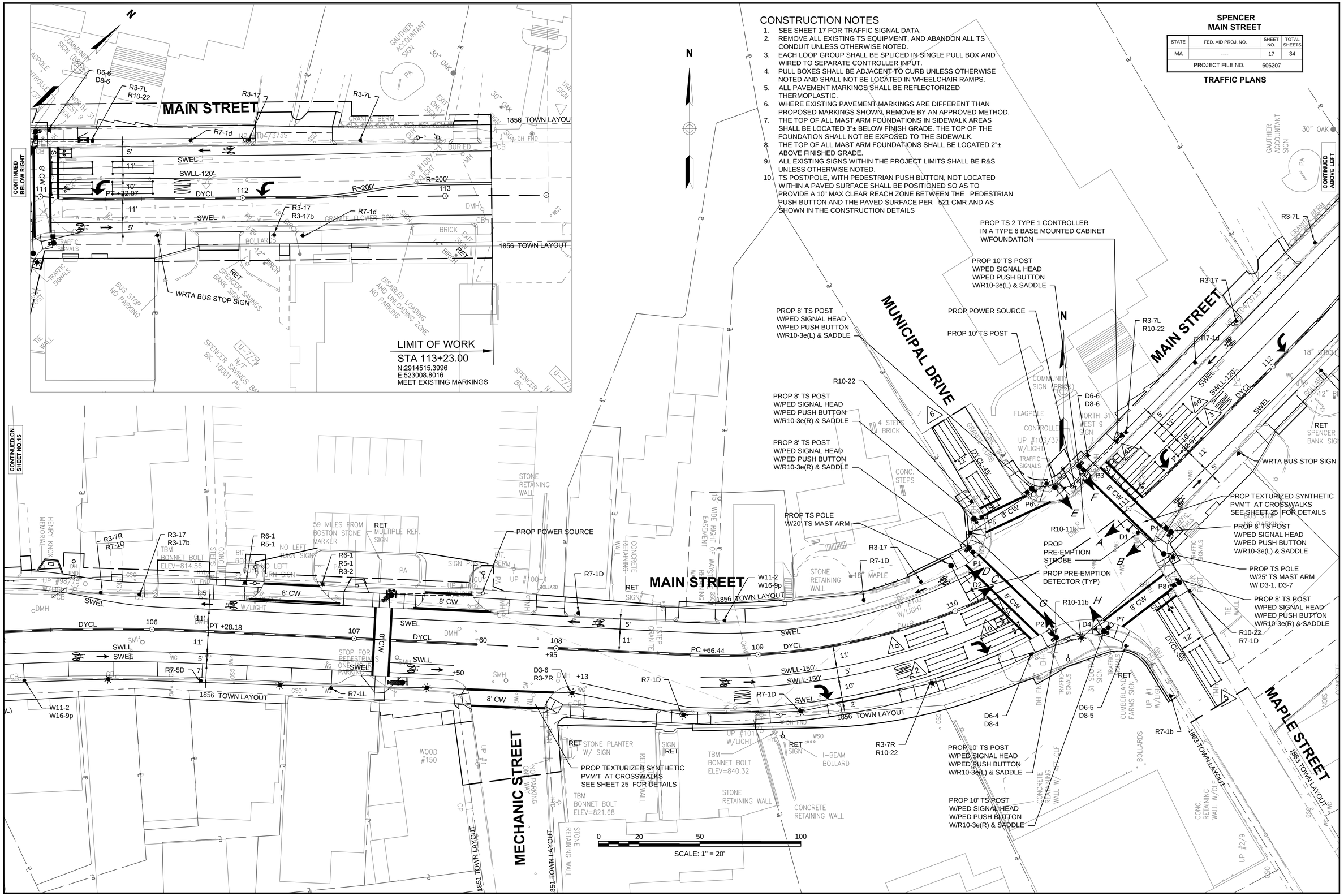
CONSTRUCTION NOTES

1. SEE SHEET 17 FOR TRAFFIC SIGNAL DATA.
2. REMOVE ALL EXISTING TS EQUIPMENT, AND ABANDON ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. EACH LOOP GROUP SHALL BE SPLICED IN SINGLE PULL BOX AND WIRED TO SEPARATE CONTROLLER INPUT.
4. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
5. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
6. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
7. THE TOP OF ALL MAST ARM FOUNDATIONS IN SIDEWALK AREAS SHALL BE LOCATED 3"± BELOW FINISH GRADE. THE TOP OF THE FOUNDATION SHALL NOT BE EXPOSED TO THE SIDEWALK.
8. THE TOP OF ALL MAST ARM FOUNDATIONS SHALL BE LOCATED 2"± ABOVE FINISHED GRADE.
9. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE R&S UNLESS OTHERWISE NOTED.
10. TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10" MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS

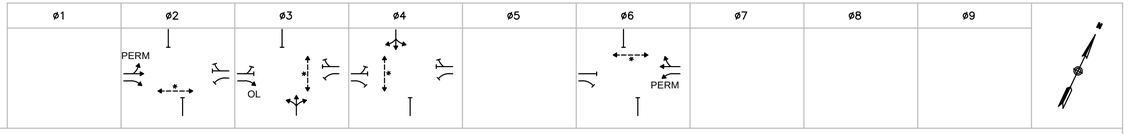
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	17	34
PROJECT FILE NO.	606207		

TRAFFIC PLANS



606207_TR(TSIG).DWG 22-Nov-2013



SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH
MAIN STREET	EB	A				G	Y	R	R	R	R	R	R	R				R	R	R										FY
MAIN STREET	EB	B				G	Y	R	R–G	R–Y	R	R	R	R				R	R	R										FY
MAIN STREET	WB	C,D				R	R	R	G	Y	R	R	R	R				G	Y	R										FY
MAPLE STREET	NB	E				R	R	R	G–G	Y	R	R	R	R				R	R	R										FR
MAPLE STREET	NB	F				R	R	R	G	Y	R	R	R	R				R	R	R										FR
MUNICIPAL DRIVEWAY	SB	G				R	R	R	R	R	R	G	Y	R				R	R	R										FR
MUNICIPAL DRIVEWAY	SB	H				R	R	R	R	R	R	G–G	Y	R				R	R	R										FR
PEDESTRIAN X–ING	NB–SB	P1–P2				DW	DW	DW	DW	DW	DW	W	FDW	DW				DW	DW	DW										OUT
PEDESTRIAN X–ING	NB–SB	P3–P4				DW	DW	DW	W	FDW	DW	DW	DW	DW				DW	DW	DW										OUT
PEDESTRIAN X–ING	EB–WB	P5–P6				DW	DW	DW	DW	DW	DW	DW	DW	DW				DW	DW	DW										OUT
PEDESTRIAN X–ING	EB–WB	P7–P8				W	FDW	DW	DW	DW	DW	DW	DW	DW				W	FDW	DW										OUT

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 (INITIAL)				X			X			X						X												CONFLICT FLASH OPERATION ONLY
PASSAGE TIME (VEHICLE)				X			X			X						X												
MAXIMUM 1				X			X			X						X												
MAXIMUM 2				X			X			X						X												
YELLOW CLEARANCE					X			X			X						X											
RED CLEARANCE						X			X			X						X										
PEDESTRIAN WALK				X			X			X						X												
PEDESTRIAN CLEARANCE				X			X			X						X												

	1	2	3	4	5	6	7	8	9
DETECTOR MEMORY	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK
RECALL	SOFT	OFF	OFF	OFF	SOFT

COORDINATION DATA			COORDINATION PHASE SPLIT TIMES								
TIMING PLAN	CYCLE	OFFSET	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9
	X	X									
MODE				COORD ø				COORD ø			

NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
2. * NORMALLY DW, W/FDW UPON PEDESTRIAN PUSH BUTTON ACTUATION
3. OL = OVERLAP
4. PERM = PERMISSIVE
5. MAXIMUM 1 = NORMAL OPERATION
6. MAXIMUM 2 = NOT USED
7. STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
8. DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL BE IN EFFECT.
9. INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.

SEQUENCE & TIMING NOTES:

1. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
2. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
3. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
4. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	18	34
PROJECT FILE NO.	606207		

TRAFFIC PLANS

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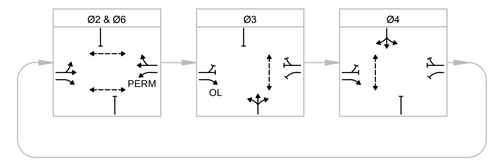
PREFERENTIAL PHASE SEQUENCE



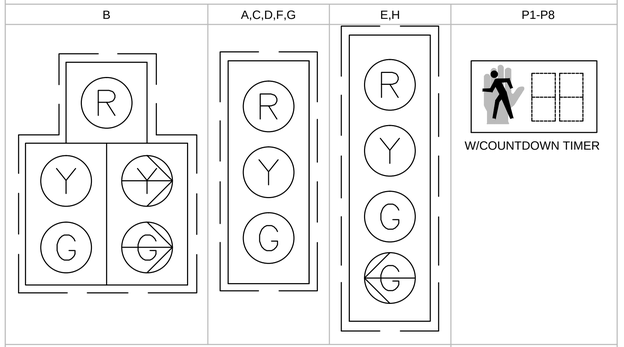
PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø6
D3	3		Ø3
D4	4		Ø4

EMERGENCY VEHICLE PRE-EMPTION OPERATION

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

SIGNAL HEAD DATA



NOTES:
1. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED.
2. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"± LOUVERED BACKPLATES AND TUNNEL VISORS.
3. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

LOOP DETECTOR DATA

DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1a	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SERIES
1b	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
2	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SERIES
3	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SERIES
4a	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SERIES
4b	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SINGLE
5	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø3	SERIES
6	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	SERIES

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	19	34
PROJECT FILE NO.	606207		

SIGN SUMMARY

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
R1-1	30"	30"		SEE FHWA "STANDARD 2004 EDITION"; AS AMENDED HIGHWAY SIGNS,				RED	WHITE	WHITE		5.18	
R1-2	36"	36"						RED	RED/ WHITE	WHITE		3.90	
R3-2	24"	24"						WHITE	RED/ BLACK	BLACK		4.00	
R3-5L	30"	36"						WHITE	BLACK	BLACK		7.50	
R3-5V	30"	36"						WHITE	BLACK	BLACK		7.50	
R3-7L	30"	30"						WHITE	BLACK	BLACK		6.25	
R3-7R	30"	30"						WHITE	BLACK	BLACK		6.25	
R3-17	30"	24"						WHITE	BLACK	BLACK		5.00	
R3-17a	30"	12"						WHITE	BLACK	BLACK		2.50	
R3-17b	30"	12"						WHITE	BLACK	BLACK		2.50	
R4-7	24"	30"						WHITE	BLACK	BLACK		5.00	
R5-1	30"	30"						WHITE	RED/ WHITE	-		6.25	
R6-1	36"	12"						BLACK	WHITE	WHITE		3.00	
R6-1R(POS)	36"	12"						BLACK	WHITE	WHITE		3.00	
R7-1D	12"	18"						WHITE	RED	RED		1.50	
R7-1L	12"	18"						WHITE	RED	RED		1.50	
R7-1R	12"	18"						WHITE	RED	RED		1.50	
R7-5D	12"	18"						WHITE	RED	RED		1.50	
R7-5L	12"	18"						WHITE	RED	RED		1.50	

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
R7-5R	12"	18"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED				WHITE	RED	RED		1.50	
R10-3e(L)	9"	15"						WHITE	WHITE/ BLACK/ ORANGE	BLACK		INCLUDED UNDER ITEMS 816.01 & 816.02	
R10-3e(R)	9"	15"						WHITE	WHITE/ BLACK/ ORANGE	BLACK		INCLUDED UNDER ITEMS 816.01 & 816.02	
R10-11b	30"	30"						WHITE	BLACK	BLACK		6.25	
R10-12	30"	36"						WHITE	BLACK/ GREEN	BLACK		7.50	
R10-22	18"	24"		AS PER MASSDOT STANDARD				WHITE	BLACK	BLACK		3.00	
H1-2	24"	24"		AS PER MASSDOT STANDARD				YELLOW	YELLOW CLUSTER	- - -		INCLUDED UNDER ITEM 827.21	
W11-2	30"	30"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED				YELLOW	BLACK	BLACK		6.25	
W16-7p(L)	24"	12"						YELLOW	BLACK	BLACK		2.00	
W16-7p(R)	24"	12"						YELLOW	BLACK	BLACK		2.00	
W16-9p	24"	12"						YELLOW	BLACK	BLACK		2.00	
SP-1	9"	12"		1"C 1"C 1"C 1"C 1"C	1.5" 1" 1" 1" 1" 1.5"	N/A		YELLOW	BLACK	BLACK		0.75	

NOTES:
1. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE MASSDOT SIGN LISTINGS 1993 EDITION, AS AMENDED.

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SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	20	34
PROJECT FILE NO. 606207			

SIGN SUMMARY

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D3-1	VARIES	12"	Main St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-2	VARIES	12"	High St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-3	VARIES	12"	Elm St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-4	VARIES	12"	Pleasant St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-5	VARIES	12"	Wall St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-6	VARIES	12"	Mechanic St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-7	VARIES	12"	Maple St	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D3-8	VARIES	12"	Municipal Dr	6"/4.5" 3"/2.25"	3" 3"	N/A		GREEN	WHITE	WHITE		INCLUDED UNDER ITEM 874	
D6-1	60"	60"	31 NORTH PAXTON FITCHBURG ←	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	
D6-2	60"	60"	31 NORTH PAXTON FITCHBURG →	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	
D6-3	60"	60"	EAST 9 SOUTH 31 CHARLTON WORCESTER ←	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	
D6-4	60"	60"	31 SOUTH CHARLTON DUDLEY →	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	
D6-5	60"	60"	WEST 9 NORTH 31 BROOKFIELD PAXTON ←	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	
D6-6	60"	60"	31 SOUTH CHARLTON DUDLEY ←	18/9D/7C/6C 6C 6C	6 5 5 6	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		25.00	

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D8-1	36"	48"	↑ 31 SOUTH CHARLTON	6C 6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	
D8-2	36"	48"	ST. JOSEPH'S ABBEY →	6C 6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	
D8-3	36"	48"	9 WEST BROOKFIELD →	6C 6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	
D8-4	36"	48"	HOWE PARK →	6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	
D8-5	36"	48"	9 EAST WORCESTER →	6C 6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	
D8-6	36"	48"	↑ 31 NORTH PAXTON	6C 6C	3.5 4.5 4.5 3.5	8		REFL. GREEN H/I M9.30.0	REFL. WHITE H/I M9.30.0	REFL. WHITE SILVER H/I M9.30.0		12.00	

NOTES:
1. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE MASSDOT SIGN LISTINGS 1993 EDITION, AS AMENDED.

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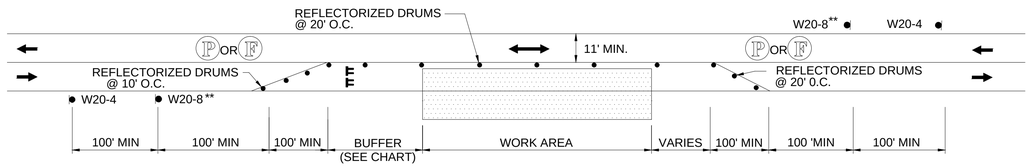
OPERATIONAL SIGNING

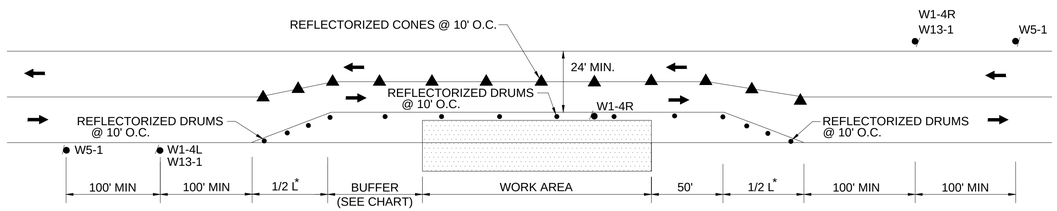
LANE CLOSURES SHOWN ARE FOR TEMPORARY CONSTRUCTION.
ALL DRUMS AND SIGNS ARE SHOWN AS THEY SHOULD APPEAR
DURING THE WORKING DAY, OR WHILE OPERATING IN THE WORK ZONE.



**SEE NOTE 14

TYPICAL TWO WAY STREET LANE CLOSURE

NOT TO SCALE



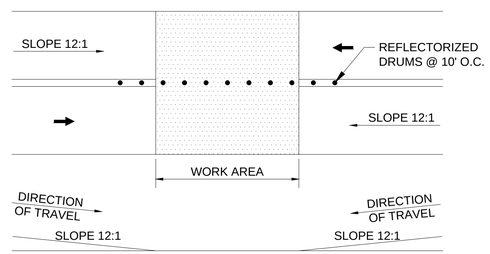
TYPICAL TWO WAY STREET LANE SHIFT

NOT TO SCALE

LEGEND

- REFLECTORIZED DRUM
- REFLECTORIZED CONE
- POLICE OFFICER/FLAGGER
- TEMPORARY TRAFFIC CONTROL SIGN
- TEMPORARY IMPACT ATTENUATOR
- MOVEABLE IMPACT ATTENUATOR
- TEMPORARY CONCRETE BARRIER
- TYPE III BARRICADES
- WORK ZONE
- PROPOSED TRAFFIC FLOW
- ARROWBOARD [AB] (MODE)
- NOT TO SCALE

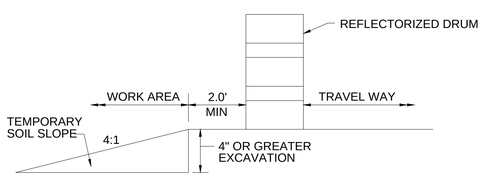
NOTE: THIS DETAIL SHOWS A RIGHT LANE CLOSURE DETAIL. THIS DETAIL CAN ALSO BE USED FOR LEFT LANE CLOSURES, WITH THE SIGN AND DEVICE PLACEMENT REVERSED AS APPROPRIATE.



SQUARE OFF THE FULL WIDTH OF THE ROADWAY AT THE END OF WORK DAY

TEMPORARY PAVEMENT TRANSITION DETAIL

NOT TO SCALE



ROADWAY SLOPE PROTECTION

NOT TO SCALE

FOR POSTED SPEEDS GREATER THAN 40 MPH

$L = W \times S$ *

L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT

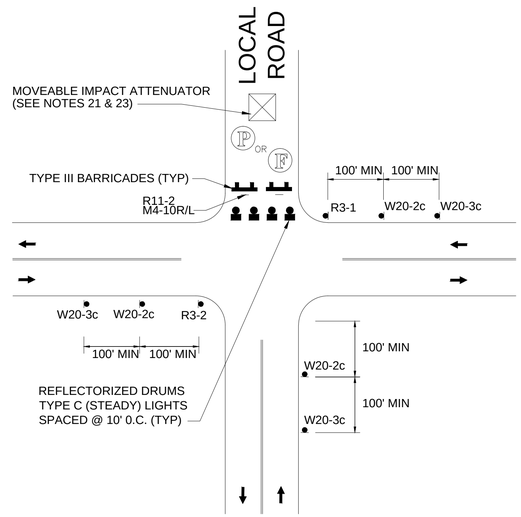
FOR POSTED SPEEDS OF 40 MPH OR LESS

$L = \frac{WS^2}{60}$ *

L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT

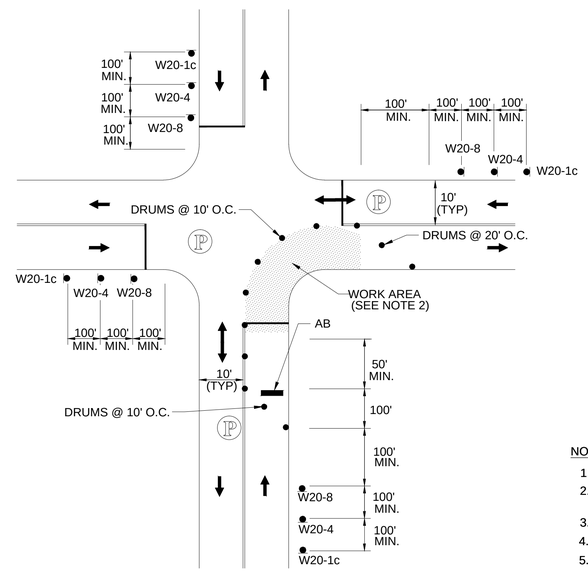
BUFFER SPACING

SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645



TYPICAL LOCAL ROAD CLOSURE

NOT TO SCALE



ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS

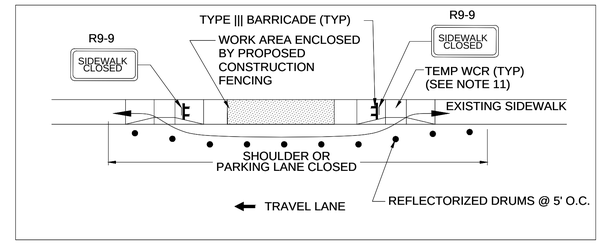
NOT TO SCALE

NOTE:

1. ADVANCE WARNING SIGN PLACEMENT TO BE ADJUSTED AS NECESSARY
2. ANY EXCAVATION GREATER THAN 3' DEEP ADJACENT TO TRAFFIC SHALL BE PROTECTED BY TEMPORARY CONCRETE BARRIER

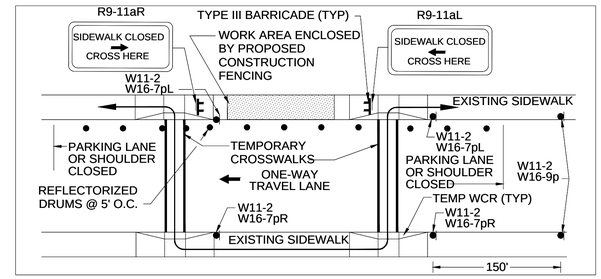
PEDESTRIAN BYPASS

TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING AND AS DIRECTED BY THE ENGINEER.



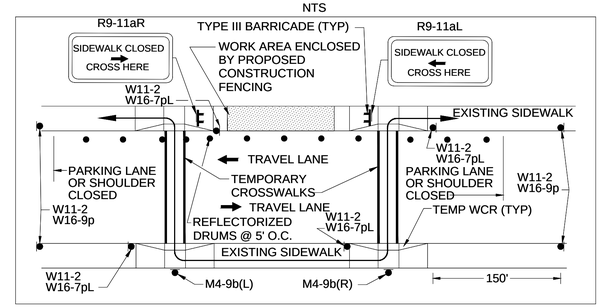
TYPE I

NTS



TYPE II

NTS



TYPE III

NTS

NOTES:

1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. ←——→ INDICATES DIRECTION OF PEDESTRIAN TRAVEL.
5. 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 SHALL BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II AND TYPE III, AND AS DIRECTED BY THE ENGINEER.
6. PROPOSED TEMPORARY CROSSWALKS SHALL BE 12" WIDE SURFACE APPLIED TAPE OR REFLECTORIZED PAINT AS DIRECTED BY THE ENGINEER.
7. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MAAB AND ADAAG REQUIREMENTS.
8. CONTRACTOR SHALL MAINTAIN AS WIDE OF A PEDESTRIAN ACCESS AS POSSIBLE AT ALL TIMES. EXCEPT WHERE NECESSARY, THE CONTRACTOR MAY TEMPORARILY REDUCE PEDESTRIAN PATHWAYS TO 4 FEET IN WIDTH (EXCLUDING CURB) FOR NO MORE THAN 200 LINEAR FEET AT A TIME IN ACCORDANCE WITH ALL STANDARDS.
9. TEMPORARY WHEELCHAIR RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MASSDOT, MAAB, AND ADAAG REQUIREMENTS.
10. W16-7pR OR W16-7pL SIGNS SHALL BE USED IN COMBINATION WITH W11-2 SIGNS AS DIRECTED BY THE ENGINEER.
11. EXISTING WHEELCHAIR RAMPS (WCR) MAY BE USED IN LIEU OF TEMPORARY WHEELCHAIR RAMPS FOR TEMPORARY DETOURS UNLESS OTHERWISE DRIECTED BY THE ENGINEER.

TEMPORARY TRAFFIC CONTROL PLAN GENERAL NOTES

1. ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWIRE (MASH).
2. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) REQUIREMENTS.
3. ALL DRUMS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
4. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
5. THE CONTRACTOR SHALL NOTIFY EACH ABUTTOR AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PLACEMENT AND SIMILAR OPERATIONS.
6. FOR RESTORATIVE WORK ON LOCAL ROADWAYS, A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION ON TWO WAY STREETS SHALL BE MAINTAINED AT ALL TIMES, EXCEPT THAT DURING WORKING HOURS, TRAFFIC MAY BE REDUCED TO ONE LANE UNDER POLICE CONTROL FOR SHORT TIME PERIODS WHEN REQUIRED FOR THE WORK, AS SHOWN UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. GRADE SEPARATIONS IN EXCESS OF 2" DURING NON-WORKING HOURS WILL REQUIRE DELINEATION BY USE OF DRUMS.
8. EXCAVATION EDGES IN EXCESS OF 4 INCHES DEEP SHALL BE PROTECTED DURING NON-WORKING HOURS BY BACKFILLING WITH A WEDGE OF COMPACTED GRAVEL BORROW AT A 4:1 SLOPE PER THE DETAIL SHOWN. EXCAVATIONS IN EXCESS OF 2 FEET SHOULD BE PROTECTED BY A MASSDOT APPROVED TEMPORARY CONCRETE BARRIER WITH A MINIMUM LEVEL LATERAL OFFSET OF 3 FEET FROM THE EDGE OF EXCAVATION. BARRIER PLACED WITH LESS THAN THE RECOMMENDED LATERAL OFFSET TO THE EDGE OF EXCAVATION SHALL BE ANCHORED/RESTRAINED TO PREVENT LATERAL MOVEMENT WHEN STRUCK BY ERRANT VEHICLES TRAVELING AT THE POSTED SPEED.
9. THE CONTRACTOR SHALL PROVIDE TEMPORARY IMPACT ATTENUATORS TO PROTECT ALL BLUNT-ENDS OF TEMPORARY CONCRETE BARRIER OR AS REQUIRED ON THE TRAFFIC MANAGEMENT PLANS. TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF WORK. ALL TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED FOR TEST LEVEL 2 (TL-2) ON ALL ROADWAYS HAVING A POSTED SPEED LESS THAN 45MPH AND TEST LEVEL 3 (TL-3) ON ROADWAYS HAVING A POSTED SPEED IN EXCESS OF 45MPH.
10. 10' MINIMUM LANE WIDTHS SHALL BE MAINTAINED.
11. NON-ESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS.
12. ADVISORY SPEED PLATES (W13-1) SHALL BE USED IF APPROPRIATE AND AS DIRECTED BY THE ENGINEER.
13. SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
14. SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
15. SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN.
16. W20-8 SIGNS SHALL BE REPLACED BY W20-7a SIGNS WHEN FLAGGERS ARE USED IN LIEU OF POLICE OFFICER DETAILS.
17. SPECIAL LIGHTING UNITS (SLU) SHALL BE REQUIRED FOR ALL NIGHT TIME CONSTRUCTION OPERATIONS ONLY IN ACCORDANCE WITH THE MUTCD OR AS REQUESTED BY THE ENGINEER.
18. TEMPORARY MARKINGS SHALL BE WATER-BORNE PAINT.
19. REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.
20. CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.
21. PROVIDE CLEAR ZONES AROUND MOVEABLE IMPACT ATTENUATOR DEVICES AS REQUIRED BY THE THE MANUFACTURER.
22. W20-8a SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF AREAS WHERE UTILITY CASTINGS HAVE BEEN RAISED IN ADVANCE OF PAVING OPERATIONS OR AS REQUESTED BY THE ENGINEER.
23. W8-15 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF PAVEMENT MILLING AREAS OR AS REQUESTED BY THE ENGINEER.
24. ALL TEMPORARY CROSSWALKS AND STOPLINES SHALL BE 6 INCH PAINT.
25. ALL TEMPORARY DOUBLE YELLOW CENTER LINES (DYCL) SHALL BE 4 INCH PAINT.

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	22	34
PROJECT FILE NO.	606207		

TEMPORARY TRAFFIC CONTROL PLANS

TEMPORARY TRAFFIC CONTROL SIGNS

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	COLOR		
	WIDTH	HEIGHT		BACK-GROUND	LEGEND	BORDER
M4-9L	24"	30"	DETOUR	ORANGE	BLACK	BLACK
M4-9R	24"	30"	DETOUR	ORANGE	BLACK	BLACK
R2-10a	36"	48"	WORK ZONE SPEEDING FINES DOUBLED	WHITE	BLACK	BLACK
R2-10e R2-10c	24"	48"	END ROAD WORK DOUBLE FINES END	ORANGE WHITE	BLACK BLACK	BLACK BLACK
R3-1	30"	30"		WHITE	RED/ BLACK	BLACK
R3-2	30"	30"		WHITE	RED/ BLACK	BLACK
R9-9	18"	30"	SIDEWALK CLOSED	WHITE	BLACK	BLACK
R9-11L	24"	48"	SIDEWALK CLOSED AHEAD CROSS HERE	WHITE	BLACK	BLACK
R9-11R	24"	48"	SIDEWALK CLOSED AHEAD CROSS HERE	WHITE	BLACK	BLACK
W1-4R	30"	30"		ORANGE	BLACK	BLACK
W1-4L	30"	30"		ORANGE	BLACK	BLACK
W3-4	36"	36"	BE PREPARED TO STOP	ORANGE	BLACK	BLACK
W5-1	36"	36"	ROAD NARROWS	ORANGE	BLACK	BLACK
W8-15	48"	48"	GROOVED PAVEMENT	ORANGE	BLACK	BLACK

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	COLOR		
	WIDTH	HEIGHT		BACK-GROUND	LEGEND	BORDER
W11-2	30"	30"		ORANGE	BLACK	BLACK
W13-1(XX)	36"	36"	XX MPH	ORANGE	BLACK	BLACK
W16-7pL	12"	24"		ORANGE	BLACK	BLACK
W16-7pR	12"	24"		ORANGE	BLACK	BLACK
W16-9p	12"	24"	AHEAD	ORANGE	BLACK	BLACK
W20-1a	36"	36"	ROAD WORK 500 FT	ORANGE	BLACK	BLACK
W20-1b	36"	36"	ROAD WORK 250 FT	ORANGE	BLACK	BLACK
W20-1c	36"	36"	ROAD WORK AHEAD	ORANGE	BLACK	BLACK
W20-2c	36"	36"	DETOUR AHEAD	ORANGE	BLACK	BLACK
W20-3c	36"	36"	ROAD CLOSED AHEAD	ORANGE	BLACK	BLACK
W20-4	36"	36"	ONE LANE ROAD AHEAD	ORANGE	BLACK	BLACK
W20-7a	36"	36"		ORANGE	BLACK	BLACK
W20-8	36"	36"	POLICE OFFICER AHEAD	ORANGE	BLACK	BLACK
W20-8a	36"	36"	CAUTION RAISED CASTINGS	ORANGE	BLACK	BLACK

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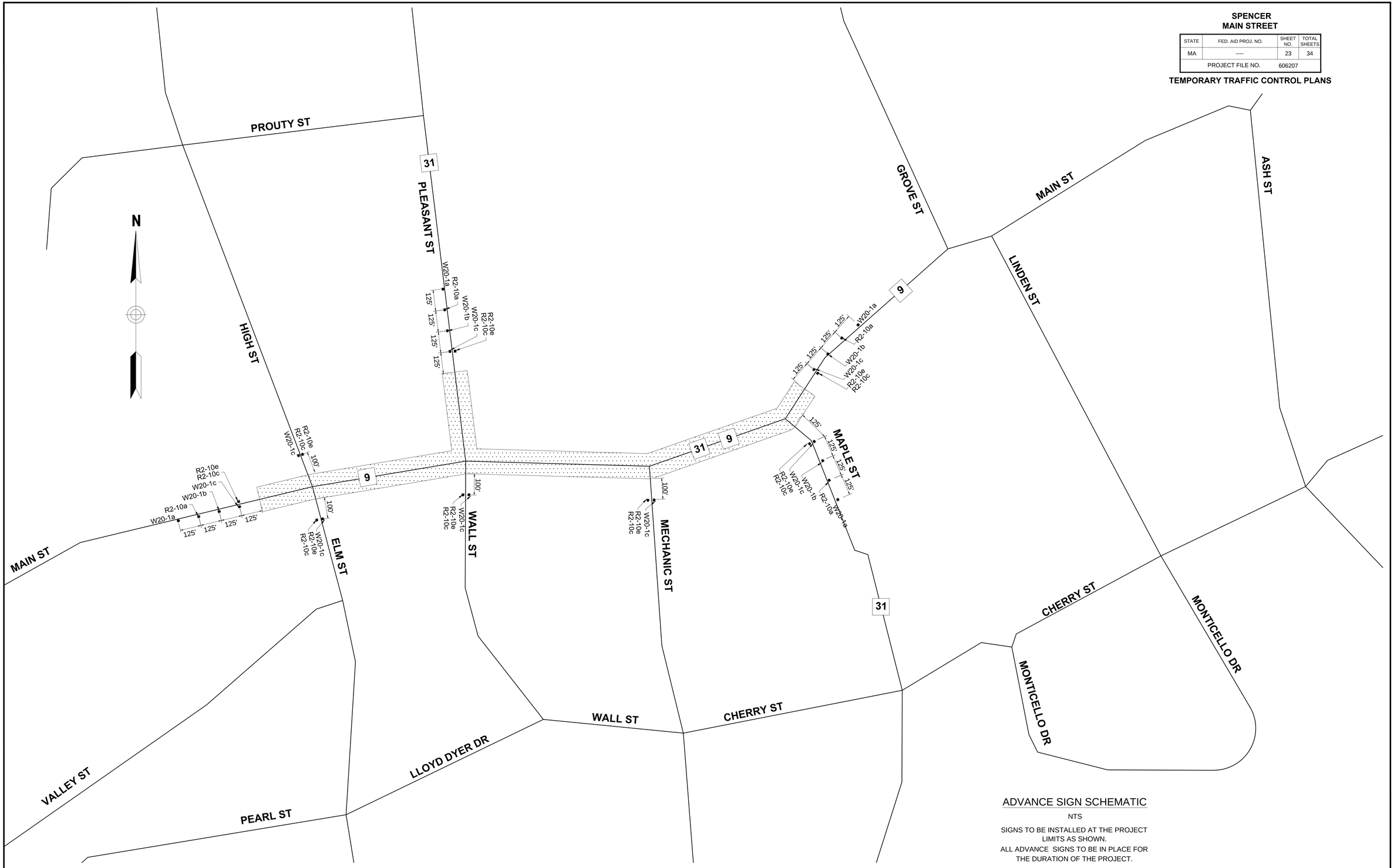
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	23	34
PROJECT FILE NO.	606207		

TEMPORARY TRAFFIC CONTROL PLANS



ADVANCE SIGN SCHEMATIC

NTS

SIGNS TO BE INSTALLED AT THE PROJECT LIMITS AS SHOWN.
ALL ADVANCE SIGNS TO BE IN PLACE FOR THE DURATION OF THE PROJECT.

NOTE: THE CONTRACTOR SHALL COVER ANY ADVANCE SIGNAGE IF THE SIGNAGE FROM A DAILY OPERATIONAL SETUP INTERFERES WITH THE ADVANCE SIGNING.

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SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	24	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS

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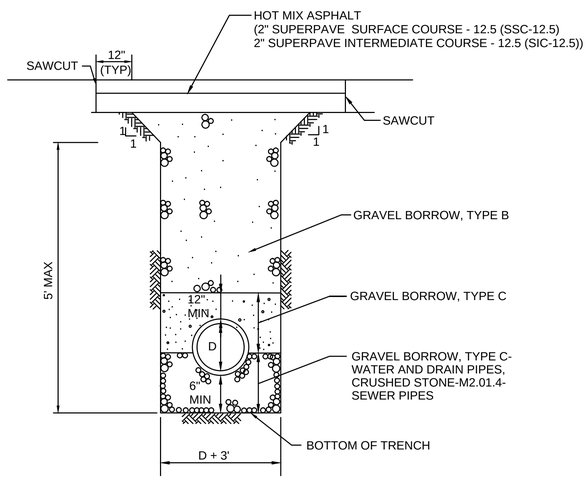
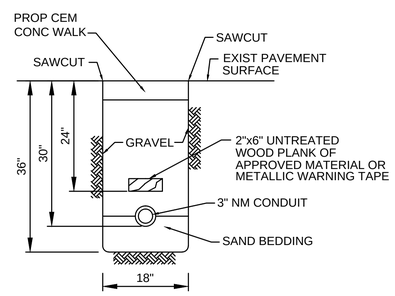


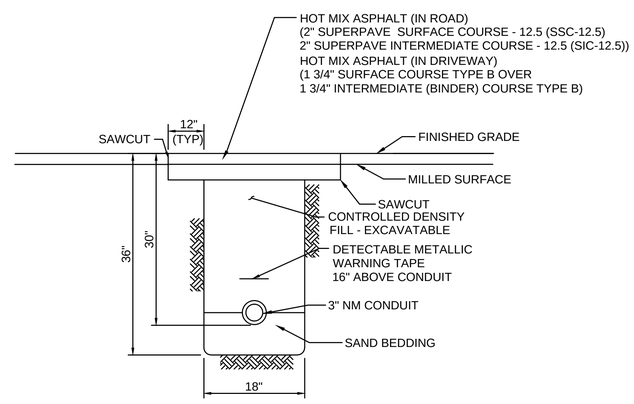
TRENCH DETAIL

SCALE: NOT TO SCALE
DATE: -
DWG: TRENCH-05



CONDUIT IN SIDEWALK

SCALE: NOT TO SCALE
DATE:
DWG: TRENCH-03



CONDUIT CROSSING ROADWAY/DRIVEWAY

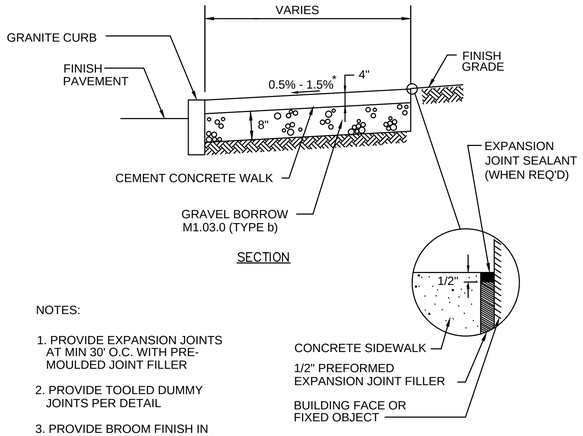
SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: TRENCH-01

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	25	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS

606207_HD(DET).DWG 22-Nov-2013



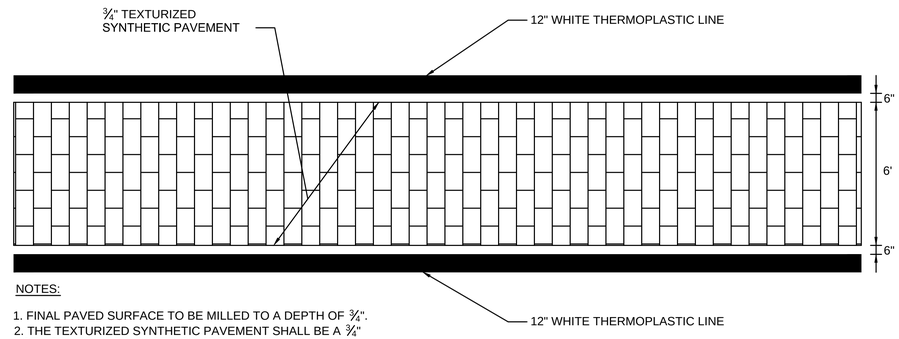
NOTES:

1. PROVIDE EXPANSION JOINTS AT MIN 30' O.C. WITH PRE-MOULDED JOINT FILLER
2. PROVIDE TOOLED DUMMY JOINTS PER DETAIL
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB

* 0.5% CONSTRUCTION TOLERANCE

CEMENT CONCRETE SIDEWALK

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: WALK-01

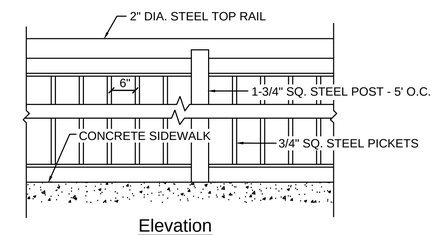


NOTES:

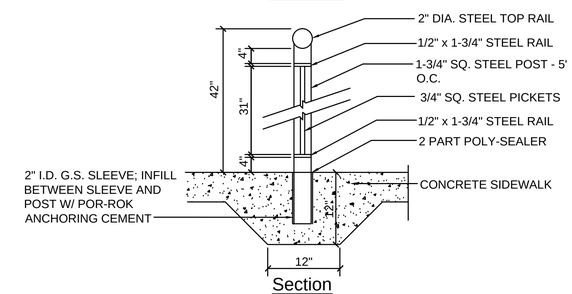
1. FINAL PAVED SURFACE TO BE MILLED TO A DEPTH OF ¾".
2. THE TEXTURIZED SYNTHETIC PAVEMENT SHALL BE A ¾" HOT-APPLIED RESIN BASED COMPOUND WITH BRICK RED COLOR THROUGHOUT.

TEXTURIZED SYNTHETIC PAVEMENT AT CROSSWALKS

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: CURB-09



Elevation



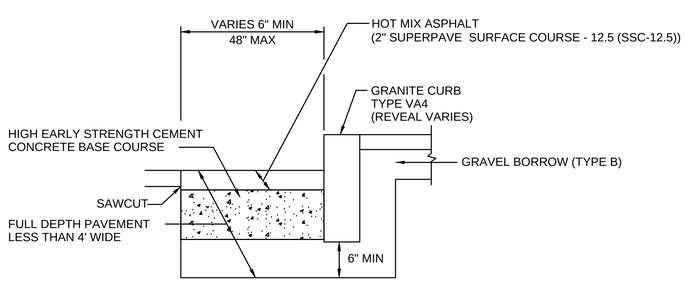
Section

Notes:

1. ALL RAILS TO BE WELDED STEEL CONSTRUCTION.
2. ALL RAILS TO BE CLEANED, PRIMED AND RECEIVE 2 COATS POWDER COAT PAINT. PAINT AND COLOR TO BE APPROVED BY THE ENGINEER.
3. CONTRACTOR TO TOUCH UP ANY MINOR BLEMISHES UPON COMPLETION AND INSTALLATION.

METAL RAILING ON SIDEWALK

SCALE: NOT TO SCALE
DATE: --
DWG: --

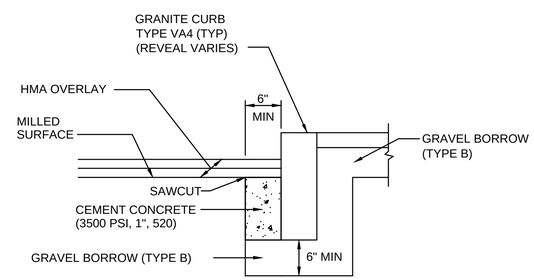


NOTES:

1. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

GRANITE CURB IN FULL DEPTH PAVEMENT LESS THAN 4' WIDE

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: CURB-06



NOTES:

1. SAWCUT 6" FROM CURB LINE AND REMOVE EXISTING PAVEMENT AND GRAVEL. REPLACE WITH CEMENT CONCRETE.
2. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

GRANITE CURB IN PAVEMENT MILLING AND OVERLAY

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: CURB-04

SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	26	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS

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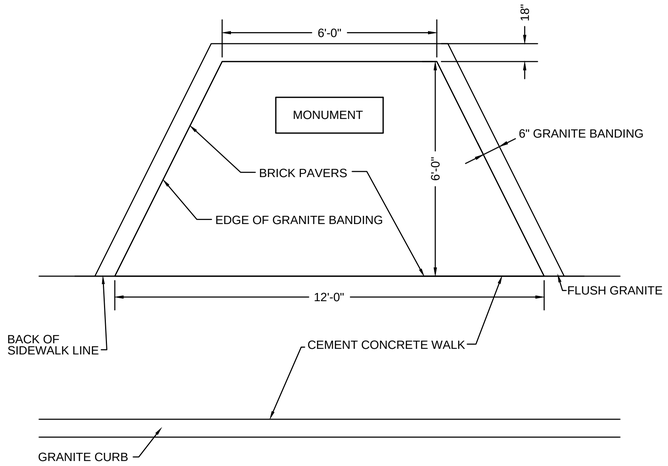
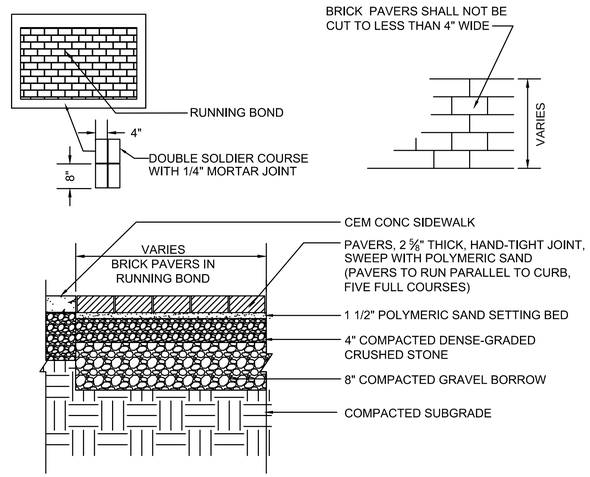
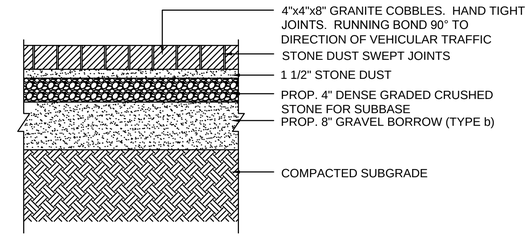


PLAN

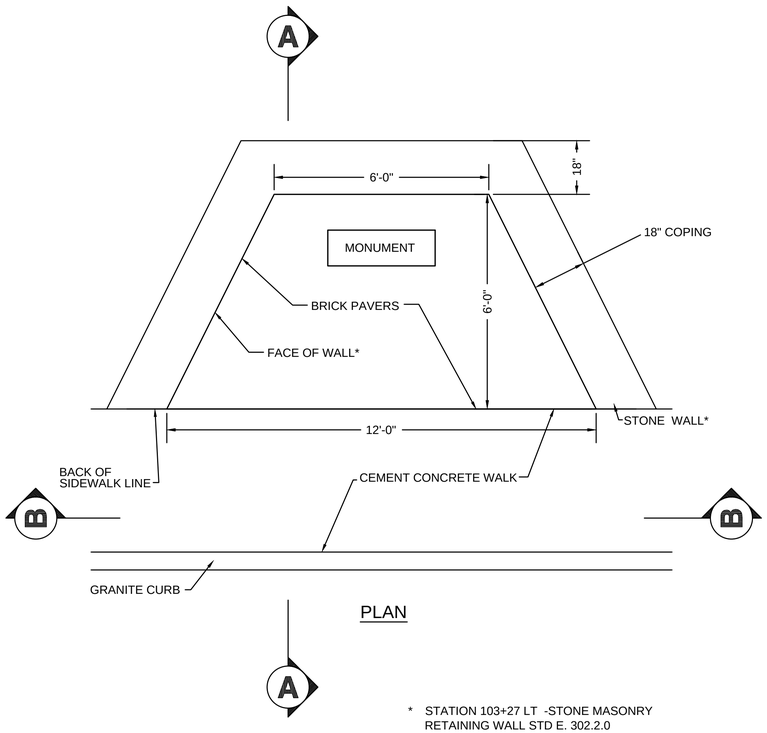
MONUMENT PLAZA WITH GRANITE BANDING STA. 105+51 LT AND STA. 107+00 LT	
SCALE:	
DATE:	
DWG:	



BRICK PAVERS AT MONUMENT LOCATIONS	
SCALE:	
DATE:	
DWG:	



FLUSH GRANITE BANDING AT MONUMENT LOCATIONS	
SCALE:	
DATE:	
DWG:	

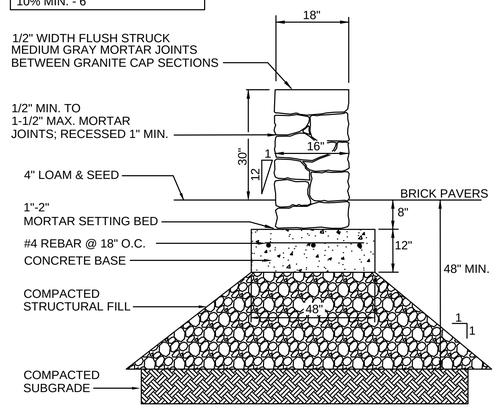


PLAN

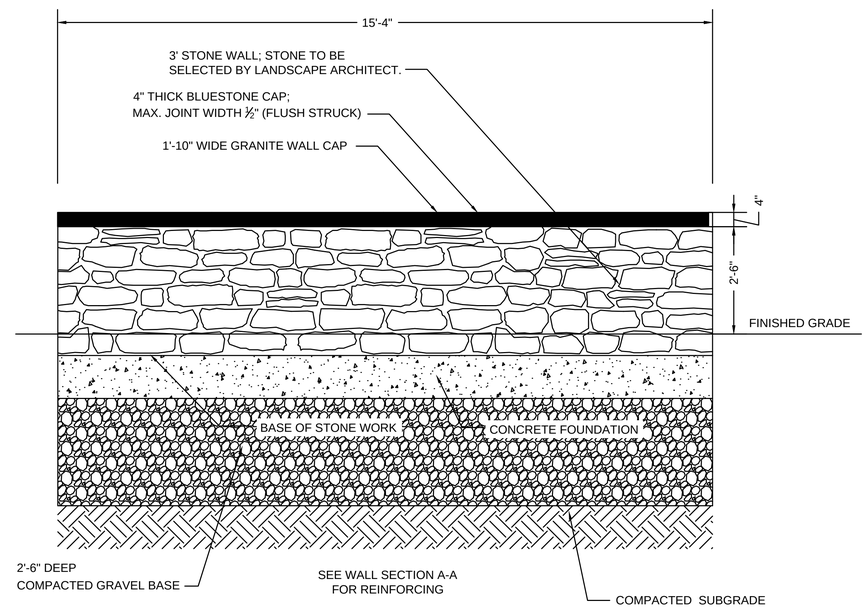
* STATION 103+27 LT -STONE MASONRY
RETAINING WALL STD E. 302.2.0
STATION 104+21 LT -
REFER TO STONE FEATURE WALL DETAIL

MONUMENT PLAZA WITH STONE WALL STA. 103+27 LT AND STA. 104+21 LT	
SCALE:	
DATE:	
DWG:	

STONE SIZE TABLE
MIN. DIMENSION 6" MAX. DIMENSION 24"
60% MIN. - 18" 30% MIN. - 12" 10% MIN. - 6"



WALL SECTION A-A



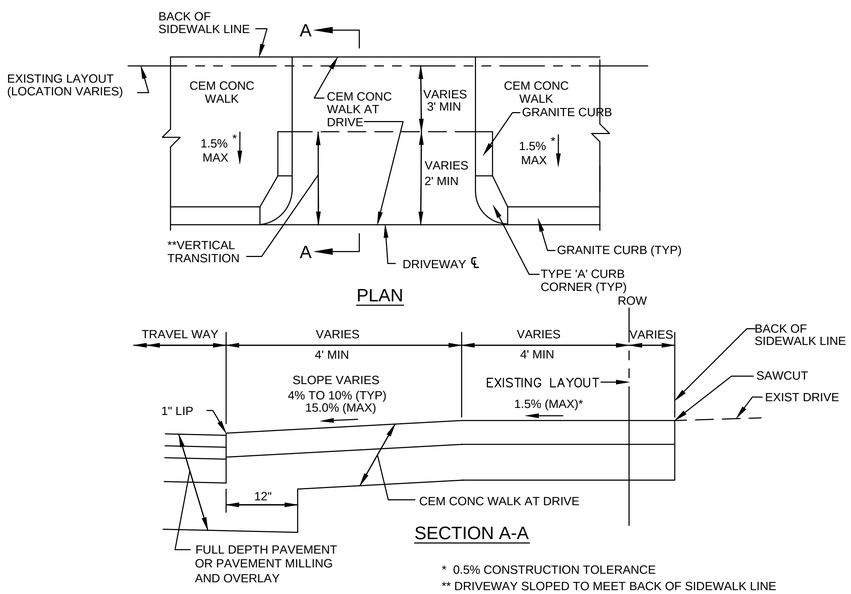
FRONT WALL ELEVATION B-B

DETAIL FOR STONE FEATURE WALL AT STATION 104+21 LT	
SCALE:	
DATE:	
DWG:	

SPENCER
MAIN STREET

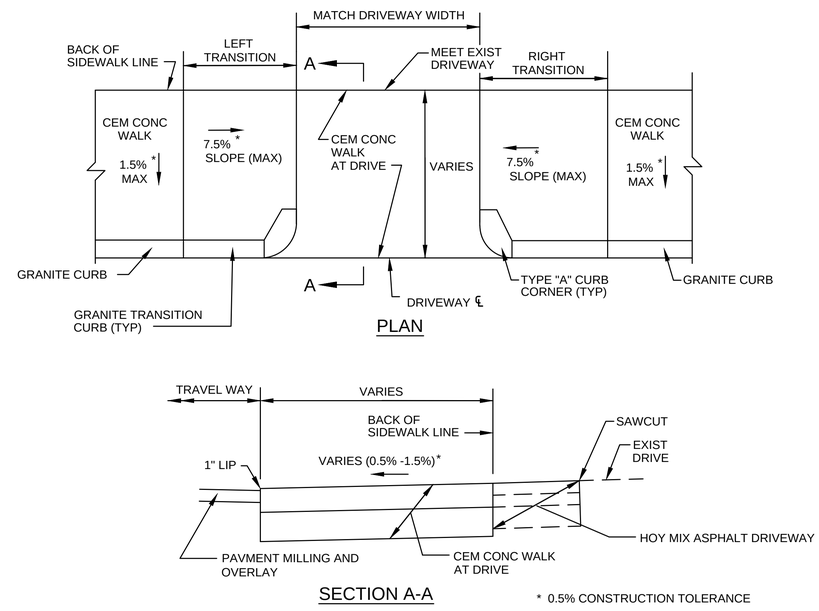
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	27	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS



TYPICAL CEMENT CONCRETE WALK AT DRIVE WITH CURB CORNERS

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: DRIVE-06



TYPICAL CEMENT CONCRETE WALK AT DRIVE WITH RAMPS

SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG:

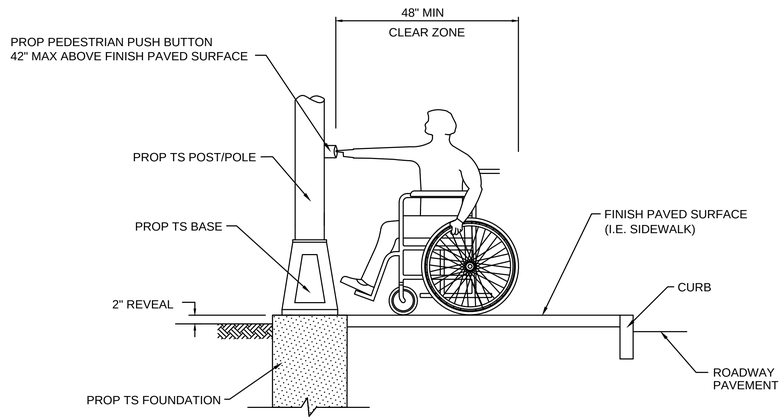
606207_HD(DET).DWG 22-Nov-2013

SPENCER
MAIN STREET

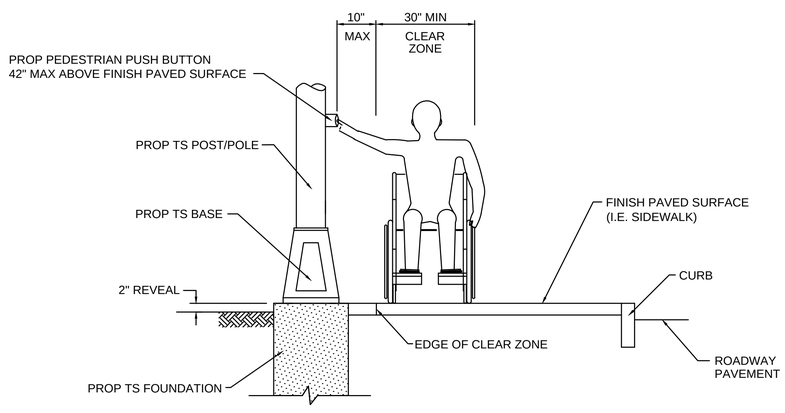
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	28	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS

606207_HD(DET).DWG 22-Nov-2013



FORWARD APPROACH (FORWARD REACH)



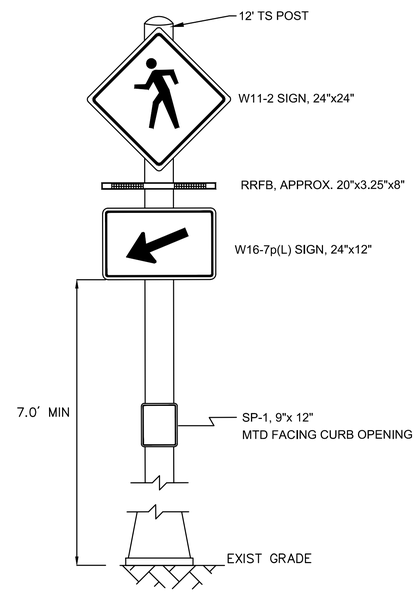
PARALLEL APPROACH (SIDE REACH)

NOTE 1: A CLEAR GROUND SPACE SHALL CONSIST OF A STABLE AND FIRM AREA, COMPLYING WITH 521 CMR 6.5 (FORWARD REACH) OR 521 CMR 6.6 (SIDE REACH) AND SHALL BE PROVIDED AT EACH OF THE PEDESTRIAN PUSH BUTTONS.

a) WHERE A FORWARD APPROACH IS PROVIDED, PEDESTRIAN PUSH BUTTONS SHALL ABUT AND BE CENTERED ON THE CLEAR GROUND SPACE.

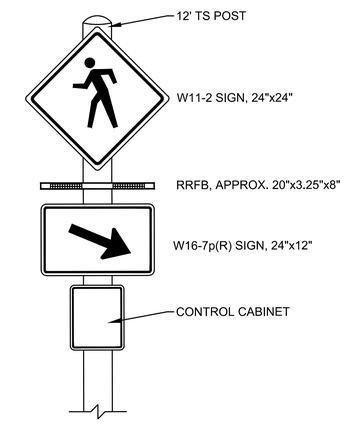
b) WHERE A PARALLEL APPROACH IS PROVIDED, PEDESTRIAN PUSH BUTTONS SHALL BE WITHIN TEN INCHES (10") HORIZONTALLY OF AND CENTERED ON THE CLEAR GROUND SPACE.

	PEDESTRIAN PUSH BUTTON CLEAR ZONE
	SCALE: NOT TO SCALE
	DATE:
	DWG:



FRONT VIEW (FACING ON-COMING TRAFFIC)

NOT TO SCALE



BACK VIEW

NOT TO SCALE

NOTE S:

1. RECTANGULAR RAPID FLASHING BEACON (RRFB) SHALL WIG-WAG FLASH WHEN ACTIVATED BY PASSIVE PEDESTRIAN DETECTION.
2. DURATION OF RRFB UPON RECEIPT OF VALID PEDESTRIAN ACTUATION SHALL BE INITIALLY SET FOR 15 SECONDS.
3. THE SYSTEM SHALL BE CAPABLE OF PROVIDING A FLASHING RATE OF 70 TO 80 CYCLES PER MINUTE. SEE SPECIAL PROVISIONS FOR MORE DETAILS.

	RECTANGULAR RAPID FLASHING BEACON POST DETAIL
	SCALE: NOT TO SCALE
	DATE:
	DWG:

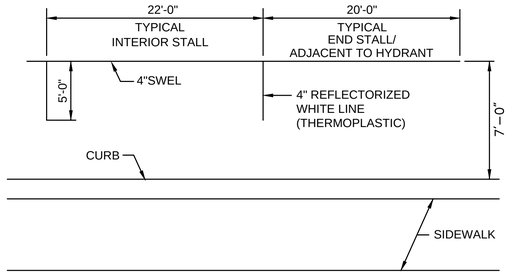
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	29	34
PROJECT FILE NO. 606207			

CONSTRUCTION DETAILS

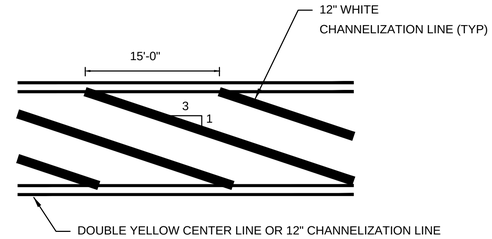
22-Nov-2013

606207_HD(DET).DWG



PARKING STALL MARKINGS

SCALE: NOT TO SCALE
DATE:
DWG:

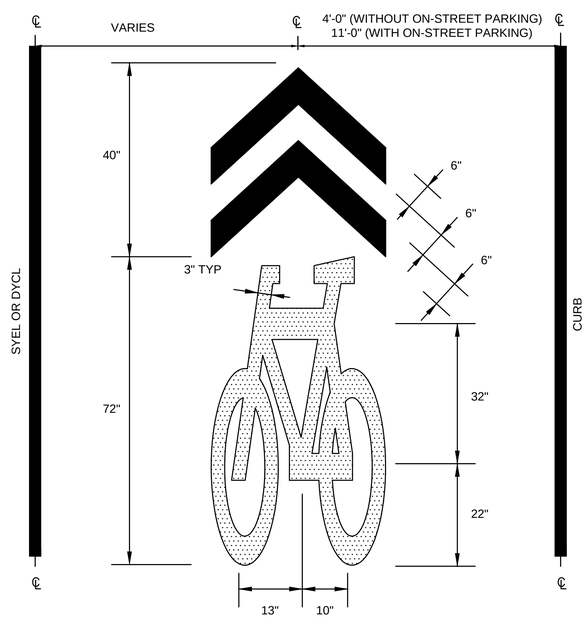


NOTES:

1. ALL 12" THERMOPLASTIC LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF GORE LINES SHALL BE APPROVED BY A MASSDOT ENGINEER PRIOR TO APPLICATION OF THERMOPLASTIC.
3. ALL GORE LINES INSTALLED SHALL CONFORM TO THE RELEVANT PROVISIONS OF THE MASSACHUSETTS DOT - HIGHWAY DIVISION "STANDARD SPECIFICATION FOR HIGHWAY AND BRIDGES" DATED 1988, SECTION 860 FOR REFLECTORIZED LINE (THERMO-PLASTIC) & MATERIAL M7.01.20, LATEST REVISIONS.

GORE AREA PAVEMENT MARKINGS

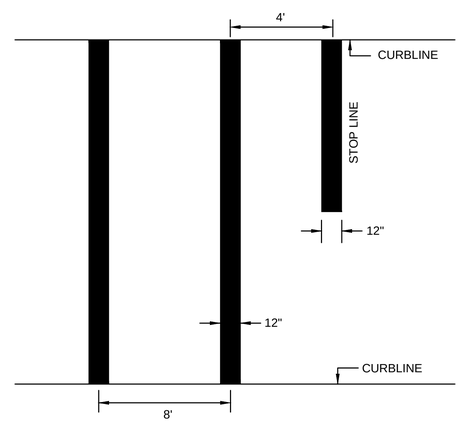
SCALE: NOT TO SCALE
DATE: DECEMBER 2008
DWG: PM-09



NOTE S: 1. REFER TO FIGURE 9C-9 IN THE MUTCD FOR MORE DETAIL.
2. SHARED LANE MARKINGS SHALL BE PREFORMED THERMOPLASTIC.

SHARED LANE PAVEMENT MARKING LAYOUT

SCALE: NOT TO SCALE
DATE: JUNE 2010
DWG: PM-11



NOTES:

1. ALL 12" THERMOPLASTIC LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION OF THERMOPLASTIC.
3. ALL CROSSWALKS INSTALLED SHALL CONFORM TO THE RELEVANT PROVISIONS OF THE MASSACHUSETTS HIGHWAY DEPARTMENT "STANDARD SPECIFICATION FOR HIGHWAY AND BRIDGES" DATED 1988, SECTION 860 FOR REFLECTORIZED LINE (THERMO-PLASTIC) & MATERIAL M7.01.20, LATEST REVISIONS.

STANDARD CROSSWALK

SCALE: NOT TO SCALE
DATE:
DWG:

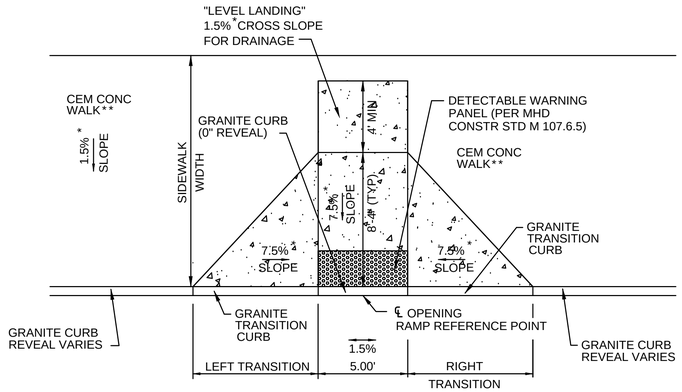
WORCESTER
HARDING STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	----	30	34
PROJECT FILE NO.	606888		

CONSTRUCTION DETAILS

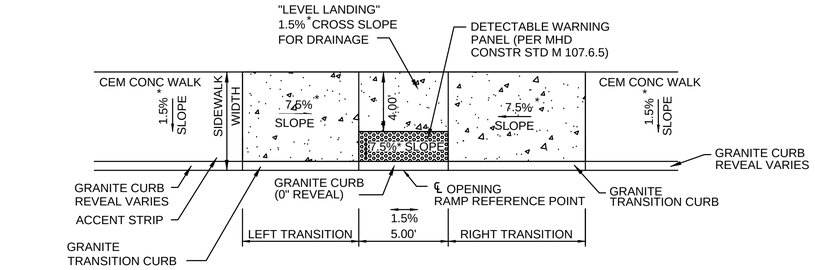
22-Nov-2013

606207_HD(DET).DWG



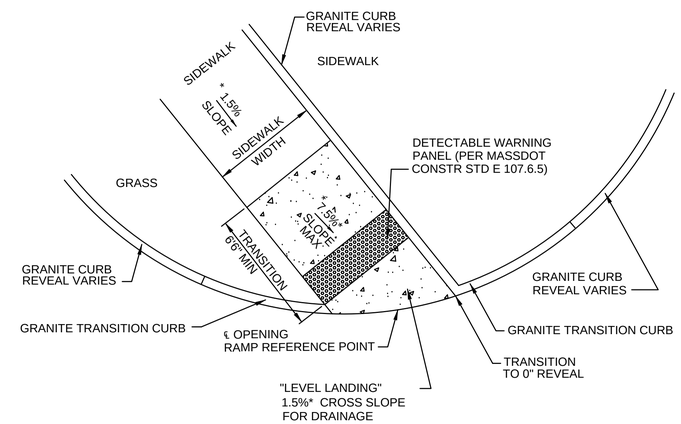
WHEEL CHAIR RAMP

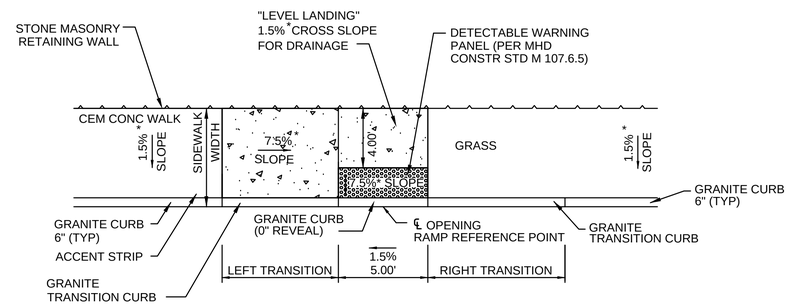
SCALE: NOT TO SCALE
DATE:
DWG:



WHEEL CHAIR RAMP SIDEWALK LESS THAN 6.5 FT

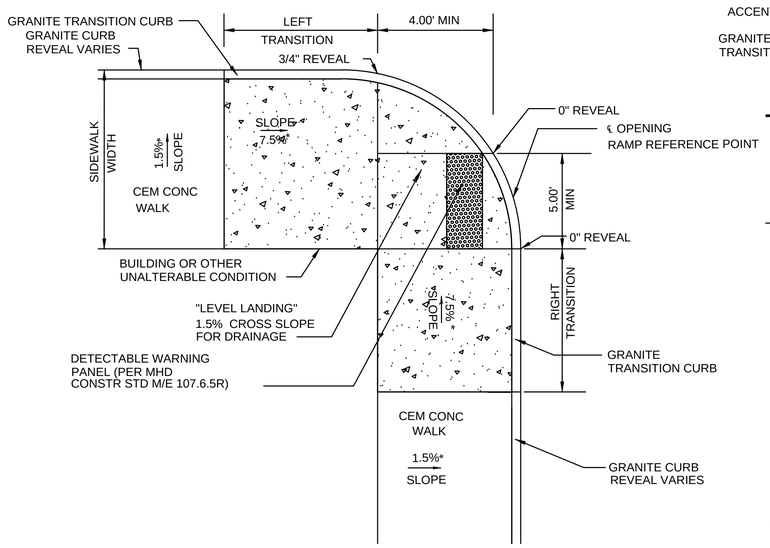
SCALE: NOT TO SCALE
DATE:
DWG:





WHEEL CHAIR RAMP – SINGLE DIRECTION GRASS ADJACENT

SCALE: NOT TO SCALE
DATE:
DWG:



* TOLERANCE FOR CONSTRUCTION ±0.5%

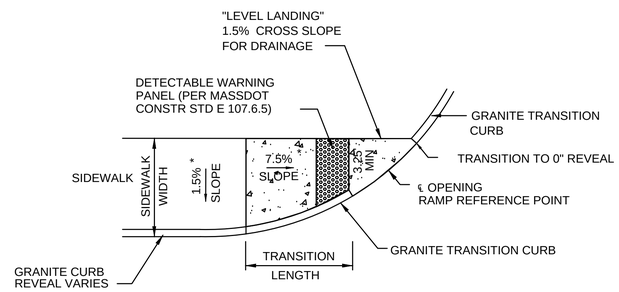
WHEEL CHAIR RAMP AT T-INTERSECTIONS

SCALE: NOT TO SCALE
DATE:
DWG:

* TOLERANCE FOR CONSTRUCTION ±0.5%

WHEEL CHAIR RAMP-ONE WING SIDEWALK LESS THAN 6.5 FT

SCALE: NOT TO SCALE
DATE:
DWG:



* TOLERANCE FOR CONSTRUCTION ±0.5%

WHEEL CHAIR RAMP SINGLE DIRECTION

SCALE: NOT TO SCALE
DATE:
DWG:

DETECTABLE WARNING PANELS

NTS

NOTES:

1. DETECTABLE WARNING PANELS ARE REQUIRED TO BE CONSTRUCTED ON ALL PROPOSED WHEELCHAIR RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARD E 107.6.5R.
2. PANELS MAY BE CONCRETE PRECAST OR CAST IN PLACE OR OTHER SUITABLE MATERIAL PERMANENTLY APPLIED TO THE RAMP. THERE MUST BE A MINIMUM 70% CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE.
3. NO SEPARATE PAYMENT SHALL BE MADE FOR DETECTABLE WARNING PANELS, BUT ALL COSTS IN CONNECTION THERE WITH SHALL BE INCLUDED IN THE VARIOUS ITEMS BID.

LEGEND

LIMITS OF CEMENT CONCRETE WHEELCHAIR RAMP

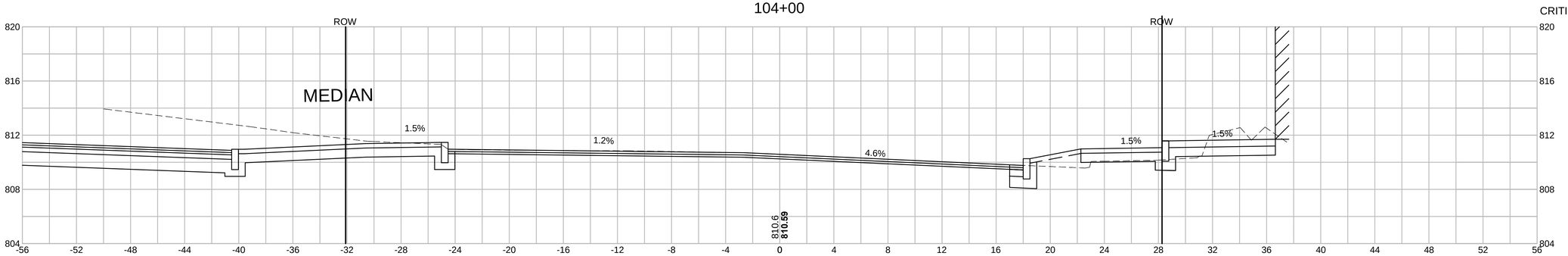
LIMITS OF DETECTABLE WARNING PANEL (SEE SPECIFICATIONS FOR COLOR)

SPENCER
MAIN STREET

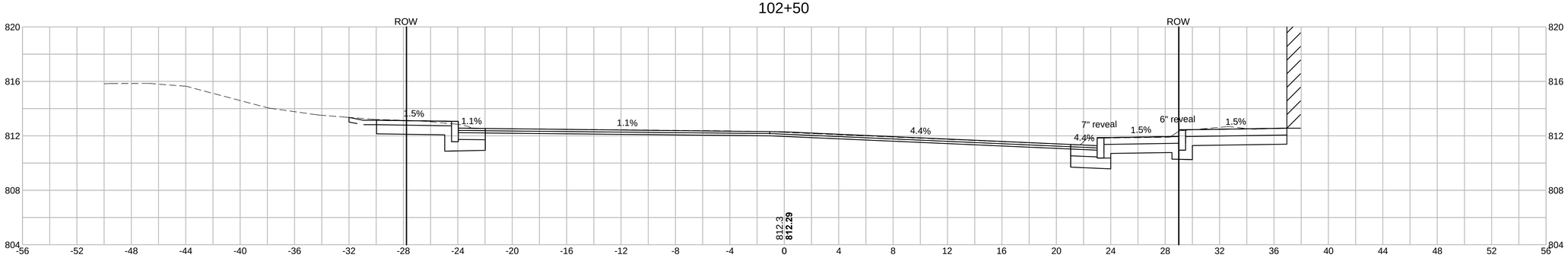
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	31	34
PROJECT FILE NO. 606207			

CRITICAL CROSS SECTIONS

104+00



102+50



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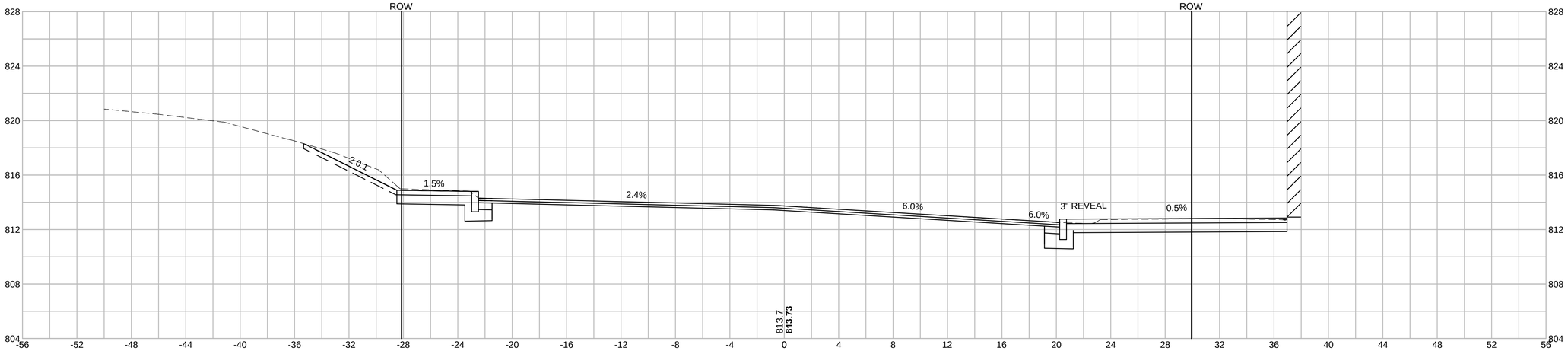


HORIZONTAL
4 0 4 8
4 0 4 8
VERTICAL
SCALE IN FEET

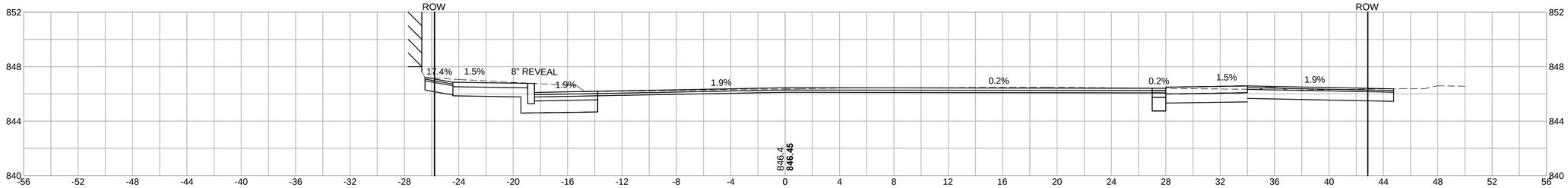
606207_HD(XSEC-CRITICAL).DWG 22-Nov-2013

SPENCER
MAIN STREET

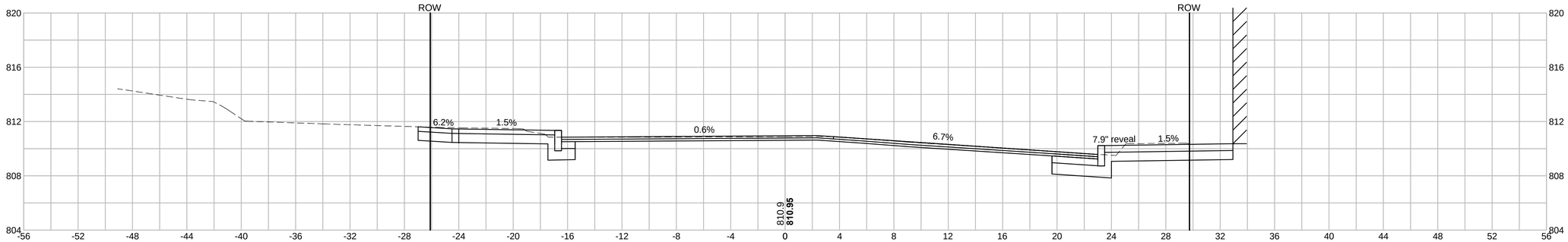
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	32	34
PROJECT FILE NO. 606207			

CRITICAL CROSS SECTIONS

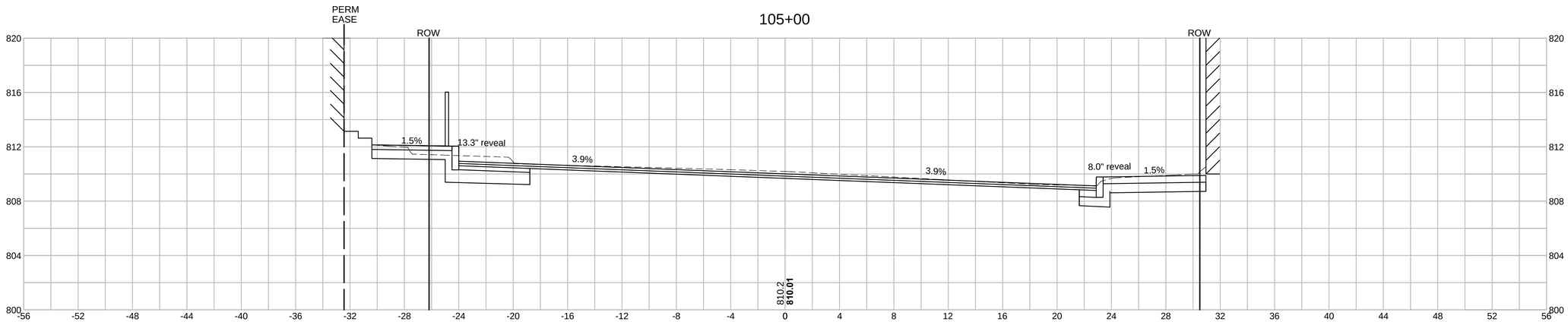
110+00



105+83



105+00



HORIZONTAL
4 0 4 8
4 0 4 8
VERTICAL
SCALE IN FEET

606207_HD(XSEC-CRITICAL).DWG 22-Nov-2013

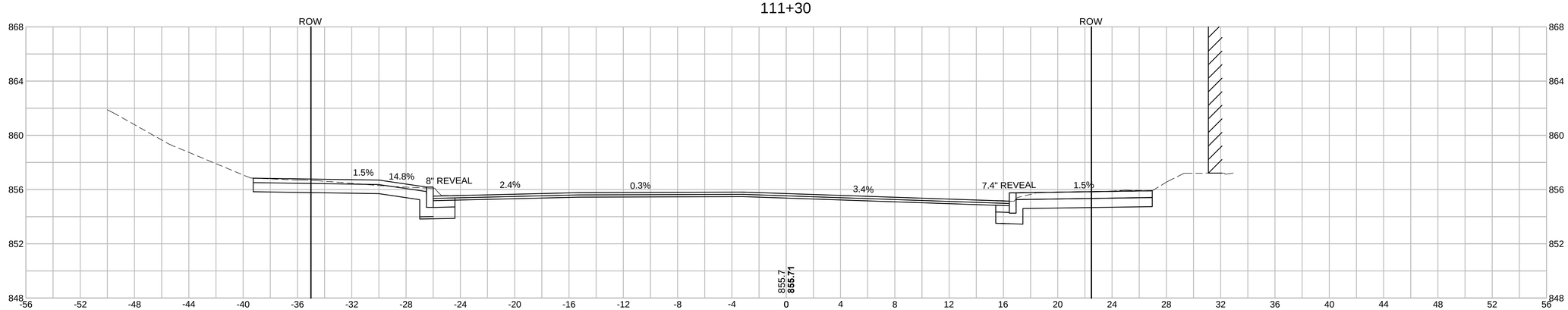
SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	33	34
PROJECT FILE NO. 606207			

CRITICAL CROSS SECTIONS

606207_HD(XSEC-CRITICAL).DWG 22-Nov-2013

111+30



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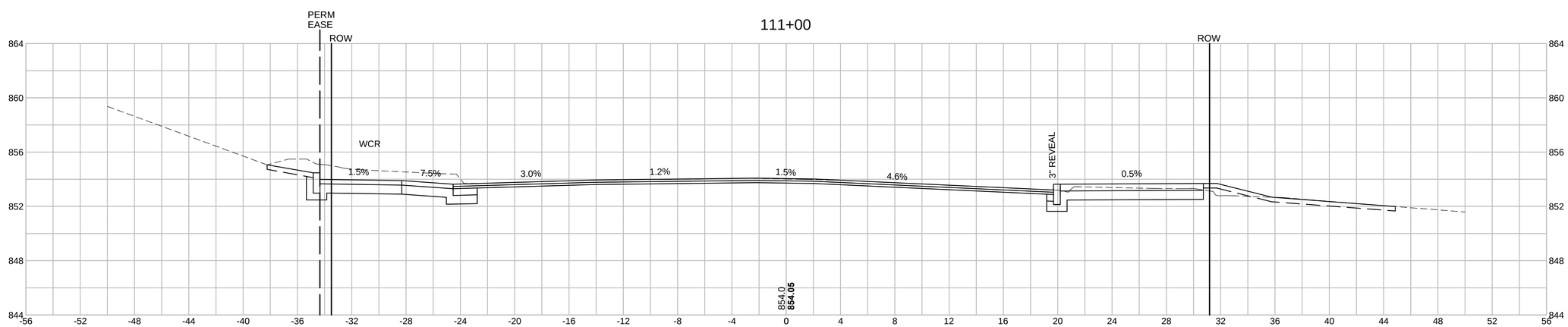
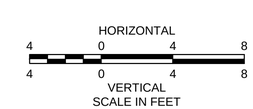


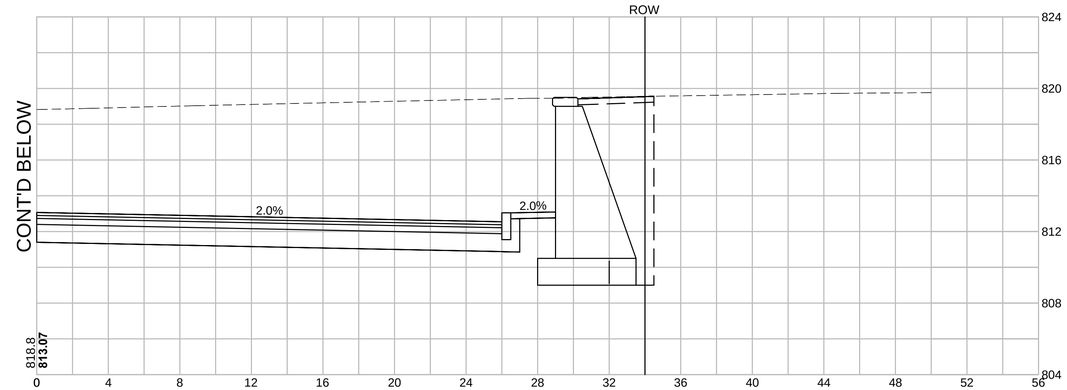


SPENCER
MAIN STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	----	34	34
PROJECT FILE NO. 606207			

CRITICAL CROSS SECTIONS

13+50 RT



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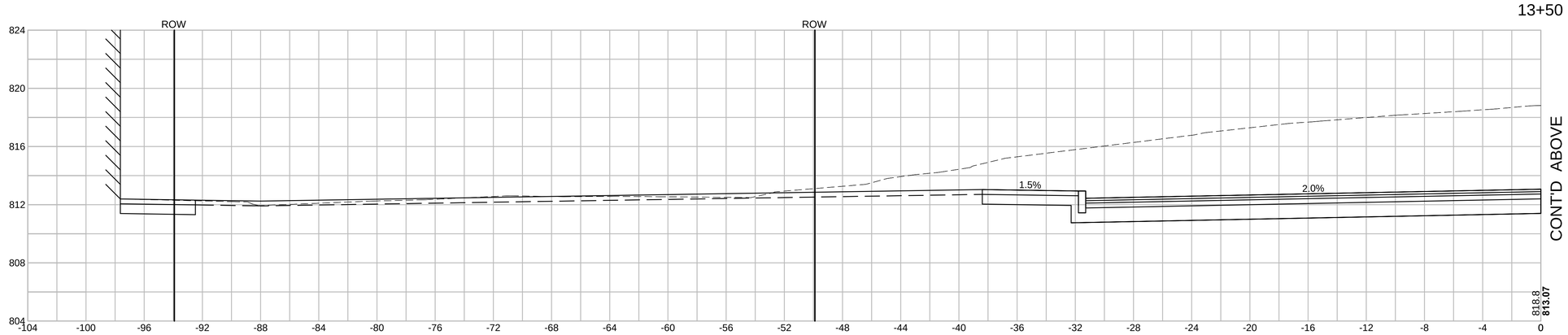
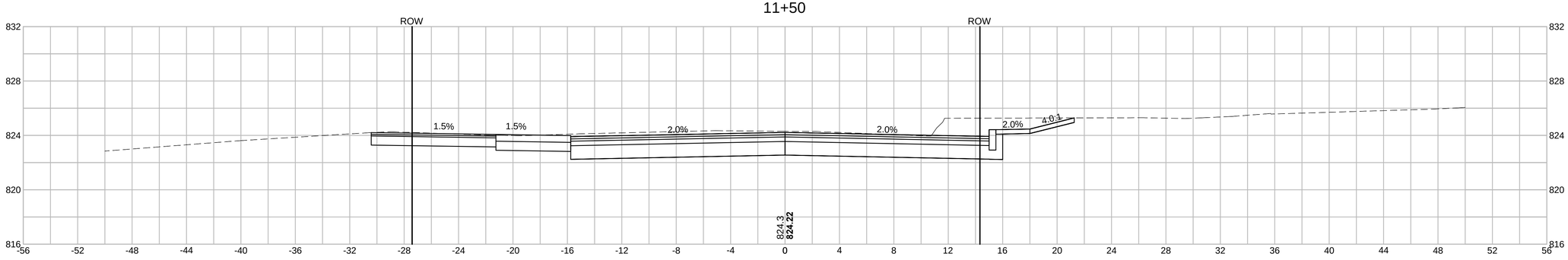


11+50



HORIZONTAL
4 0 4 8
4 0 4 8
VERTICAL
SCALE IN FEET

606207_HD(XSEC-CRITICAL).DWG 22-Nov-2013