

# ROAD SAFETY AUDIT

East Center Street/West Center Street (Route 106) at  
North Main Street/South Main Street (Route 28)  
(Central Square)

Town of West Bridgewater

February 15, 2012

Prepared For:  
MassDOT Highway Division



Prepared By:  
BETA Group, Inc.



ENGINEERING SUCCESS **TOGETHER**

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## Project Data

A Road Safety Audit for the intersection of East Center Street/West Center Street (Route 106) and North Main Street/South Main Street (Route 28), also known as Central Square, was held on January 20, 2012 at the Town Hall in West Bridgewater, MA. As indicated in Table 1, the audit team consisted of representatives from State, Regional and Local agencies and included a cross-section of engineering, planning and emergency response expertise.

**Table 1. Participating Audit Team Members**

<b>Audit Team Member</b>	<b>Agency/Affiliation</b>
Bonnie Polin	MassDOT Highway Division – Safety Section
Beth Faricy	Administrator, Town of West Bridgewater
Peter Vasiliou	Jacobs (Design Engineer)
Bill McNulty	Old Colony Planning Council (OCPC)
Ray Guarino	Old Colony Planning Council (OCPC)
Hugh Hurley	Planning, Town of West Bridgewater
Len Graf	Highway Superintendent, Town of West Bridgewater
Len Hunt	Fire Chief, Town of West Bridgewater
Chris Iannitelli	Forestry Superintendent, Town of West Bridgewater
Victor Flaherty	Police, Town of West Bridgewater
Donald Clark	Police Chief, Town of West Bridgewater
Dominic Caiazzo	MassDOT Highway Division – Safety Section
Douglas Halpert	MassDOT Highway Division – Safety Section
Bill Travers	MassDOT Highway Division – District 5
Al Miller	MassDOT Highway Division – Project Management
Greg Lucas	BETA Group, Inc.
Christine Keches	BETA Group, Inc.

## Background

The Federal Highway Administration defines a Road Safety Audit (RSA) as *the formal safety examination* of an existing or future road or intersection by an *independent, multidisciplinary team*. The purpose of an RSA is to *identify potential safety issues and possible opportunities for safety improvements* considering all roadway users. A Road Safety Audit was scheduled for the intersection of Route 106 and Route 28 as required by MassDOT Highway Safety Improvement Program (HSIP) guidelines. The intersection has been identified as a high crash location in the Old Colony Planning Council (OCPC) region, is on MassDOT's list of Top 200 High Crash Locations, and is scheduled to be reconstructed in 2013 by the MassDOT Highway Division potentially using HSIP funds. 75% design plans for the project were submitted to MassDOT in November 2011, and the proposed improvements were presented and discussed at the audit. The RSA is intended to identify potential short and long term safety improvements that can be made at the intersection, which can then be incorporated into the planned reconstruction project to the greatest extent practicable.

## Project Description

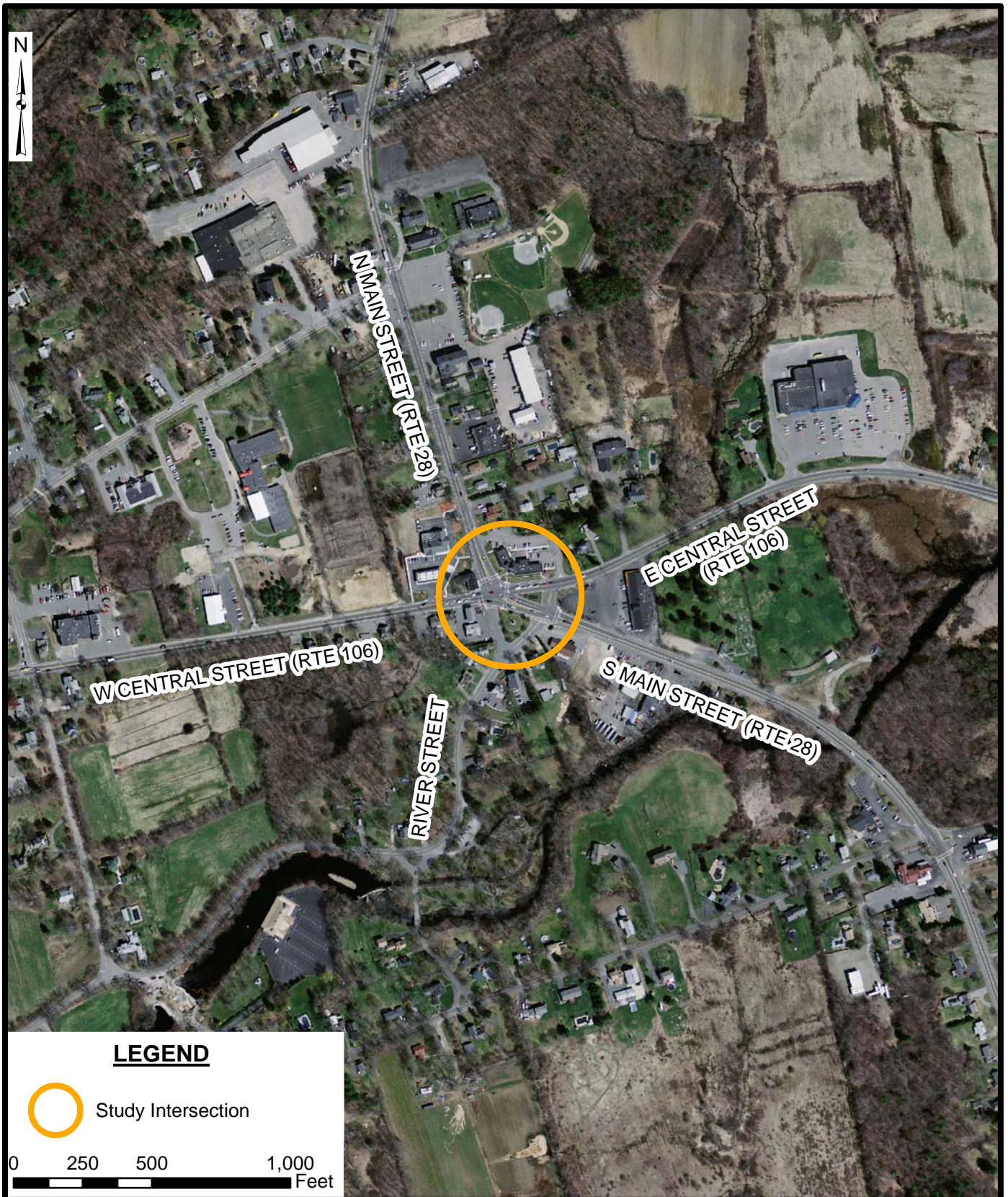
The intersection of East Center Street/West Center Street (Route 106) and North Main Street/South Main Street (Route 28), shown in Figure 1, is also known as Central Square and serves as the town center of the Town of West Bridgewater. West Center Street, North Main Street and South Main Street are functionally classified as Urban Principal Arterials, while East Center Street is functionally classified as an Urban Minor Arterial. River Street approaches the intersection from the south and is classified as a local road. North Main Street and South Main Street (Route 28) are State-owned, while East Center Street and West Center Street (Route 106) and River Street are



**South Main Street (Route 28) at Route 106  
(looking northwest)**

Town-owned. Route 106 and Route 28 are both important regional roadways. Route 106 provides east-west arterial access from East and West Bridgewater to Route 24 and Easton to the west, while Route 28 provides north-south arterial access to Brockton to the north and to Bridgewater to the south. It was noted during the audit that the intersection is part of the preferred commuter route from Bridgewater State University to Route 24, with vehicles turning left from Route 28 northbound to Route 106 westbound in the afternoon when departing the university. Route 106 west of the intersection and Route 28 south of the intersection are both part of the National Highway System.

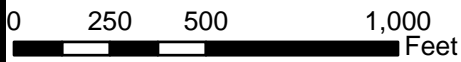
The intersection is a five-legged intersection with a one-way departure roadway to the south providing a connection to River Street. The remaining four legs are under traffic signal control. West Center Street



**LEGEND**



Study Intersection



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Norwood, MA 02062  
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BETA@BETA-inc.com

Route 106 at Route 28  
ROAD SAFETY AUDIT  
WEST BRIDGEWATER, MA

Figure 1  
**Location Map**

approaches from the west and provides a shared lane for left and through vehicles and an exclusive lane for right turns to Route 28 southbound. East Center Street approaches from the east and also provides a shared lane for left and through vehicles and an exclusive lane for right turns to Route 28 northbound. North Main Street and South Main Street both provide two general purpose lanes approaching the intersection. It was noted that the two lane South Main Street approach generally operates as a left turn lane to Route 106 westbound and a through lane to Route 28 northbound, and that the two lane North Main Street approach generally operates as a right turn lane to Route 106 westbound and a shared lane for through and left turning vehicles. The signal provides a right turn overlap phase for both Route 106 approaches in conjunction with split phasing on the Route 28 approaches.

River Street forms a four-way unsignalized intersection with South Main Street (Route 28) approximately 125 feet southeast of the stop line for the northbound approach to the signalized intersection at Route 106. River Street provides a single lane in each direction at this intersection. The north leg of this intersection is formed by a two-way median divided connector between South Main Street and East Center Street, which then forms an unsignalized T-intersection with East Center Street approximately 125 feet east of the stop line for the westbound approach to the signalized intersection at Route 28. Right turns from South Main Street northbound and left turns from East Center Street westbound are accommodated by these two unsignalized intersections and the two-way connector road, as are all turns between these two legs and River Street. River Street also forms an unsignalized intersection with the one-way connector road departing the signalized intersection; therefore, the study area is in fact comprised of one major signalized intersection and three unsignalized intersections, as shown in Figure 2 below.



Figure 2. Location Detail

Land use in the area is primarily commercial. There is a small plaza on the northeast corner with access to both Route 106 and Route 28 which includes a Dunkin' Donuts, a cell phone store and a dry cleaner. The access driveway to Route 106 has a cobblestone island suggesting that this driveway allows only right turns in and out, but no signage is provided to support this restriction. Center Shopping Plaza is located on the east side of the intersection between East Center Street and South Main Street and includes various businesses, including a liquor store and pizza restaurant. Another liquor store recently opened at the former site of a Honey Dew Donuts shop in the parcel on the southeast corner between River Street and South Main Street.

Crosswalks are provided across all five legs of the signalized intersection and across both South Main Street and River Street at the unsignalized intersection to the southeast. No pedestrian indications or exclusive pedestrian phase is provided at the intersection. Handicap ramps appear to have been recently reconstructed with a concrete surface and detectable warning panels meeting current MassDOT and ADA guidelines. Sidewalks are provided on both sides of North Main Street north of the intersection, on the southwest side of South Main Street south of the intersection, and along the north side of West Center Street west of the intersection. Sidewalks on East Center Street do not extend beyond the commercial parcels immediately adjacent to the intersection.

Crash data were provided by the West Bridgewater Police Department and summarized by MassDOT. There were a total of 54 crashes in the study area within the period from January 2009 to November 2011. The study area includes the signalized intersection and the two unsignalized intersections immediately to the east. The crash summary shows that 39% of the crashes were angle crashes and 33% were rear-end crashes. The eastbound West Center Street approach experienced nine rear-end crashes. It was suggested that this may be the result of vehicles in the right-turn lane accelerating in anticipation of the vehicle in front of them moving before that vehicle in fact moves, or could also be the result of a driver unexpectedly stopping to let turning traffic enter the commercial driveways in this area. It was also suggested that drivers use a number of cut-through tactics to avoid congestion at the intersection. Eastbound through vehicles have been observed bypassing left-turning vehicles by using the exclusive right turn lane and then either cutting in front of the left-turning vehicle after entering the intersection, or turning right onto South Main Street and then using either the two-way median divided connector or the Center Shopping Plaza parking lot to continue on Route 106 eastbound.

A significant number of angle crashes occurred in the vicinity of the unsignalized intersections and commercial driveways east of the signalized intersection. Five crashes involved an eastbound through vehicle on East Center Street and a vehicle either turning left or exiting the Dunkin' Donuts plaza towards River Street and South Main Street. Seven crashes involved vehicles entering or exiting the Center Shopping Plaza onto South Main Street. Confusion over lane use or aggressive driving as a result of traffic congestion as discussed above may be a cause of sideswipe crashes on the eastbound, westbound, and southbound approaches to the intersection. It was also noted both during the audit and in the crash summary that usage of the adjacent parking lane and shoulder as a turning lane is a contributing factor in sideswipe crashes on the southbound approach. A Crash data summary and a collision diagram are included in the Appendix.

The intersection ranked 167<sup>th</sup> on MassDOT's statewide list of the Top Crash Intersections from 2007 to 2009, and 37<sup>th</sup> on OCPC's Top 100 Most Hazardous Intersections for 2007 through 2009. The MassDOT

ranking is based on the number of crashes in MassDOT's database which can be georeferenced to a cluster area around the intersection. This cluster area experienced 47 crashes in the three year period, with 15 of the 47 crashes involving an injury. The ranking is based on a weighted system which calculates the Equivalent Property Damage Only (EPDO) rating of the intersection. Fatal crashes are weighted 10 times and injury crashes are weighted 5 times. There were no fatal crashes at the intersection in the period. It should be noted that the automated capabilities of the system cluster crashes based on proximity, and does not include crashes at the unsignalized intersections to the east. This is illustrated on the summary figure included in the Appendix.

Speed regulations maintained by MassDOT Highway Division establish a 25 MPH speed limit for both Route 106 and Route 28 in both directions in the vicinity of the intersection. Complete speed regulations are included in the Appendix.



## Audit Observations

Following a brief introduction to the RSA process and a summary of existing geometry, crash and speed regulation information, the audit participants were asked to discuss safety issues at the intersection of East Center Street/West Center Street and North Main Street/South Main Street. Audit participants then conducted a site visit as a group, at which time they offered observations on safety concerns and deficiencies. A summary of those major safety considerations is as follows:

- **Traffic Congestion & Signal Phasing** – Several safety issues were related to traffic congestion, signal phasing and driver behavior.
  - Protected phases are not provided for left turns from Route 106 in either direction. This creates backups for through vehicles as well because left and through vehicles share a lane on both Route 106 approaches.
  - One tactic used by eastbound through vehicles to avoid stopped left-turning vehicles is to take advantage of the unique intersection geometry and turn right onto South Main Street, then turn left at the unsignalized intersection to the east to turn right onto Route 106 eastbound. Drivers also cut through the Center Shopping Plaza parking lot to avoid the intersection. This may be a contributing factor in rear-end crashes on the eastbound approach as well as in crashes involving turning vehicles entering the connector road or the Center Shopping Plaza.
  - Drivers squeeze into the adjacent parking lane/shoulder on the southbound approach to turn right onto West Center Street. This was specifically mentioned when discussing the three sideswipe crashes on this approach.
- **Signal Equipment** – It was noted that all existing signals are post mounted, which provides less visibility for approaching vehicles than overhead signals. It was also suggested that some signal posts are shorter than the 10’ standard height required for post-mounted vehicle signal heads. Reduced visibility of signal indications may be a contributing factor in rear-end collisions, especially if post heights are below accepted standards.
- **Signage** – A number of safety issues related to signage were discussed during the audit.
  - The existing “Do Not Block Intersection” sign on the northbound South Main Street approach is faded and is missing letters, severely reducing its effectiveness.
  - There is a lack of directional signage for this intersection of two-state numbered routes, both in general and specifically related to the unique turning



patterns created by the two-way median divided connector between East Center Street and South Main Street.



- Existing lane usage signage on the eastbound West Center Street approach is non-standard and may cause confusion for approaching drivers. This confusion may be a contributing factor in crashes on this approach.
- The unsignalized intersections created by the two-way connector road do not have clearly defined traffic control. There are no stop signs or stop lines for the connector at either East Center Street or South Main Street. A stop sign and stop line are provided on the northbound approach from River Street to South Main Street, and a stop line is provided where vehicles are not required to stop on the westbound South Main Street approach to the unsignalized intersection. It was suggested that the stop line on the westbound approach is intended to reinforce the crosswalk and to encourage vehicles to stop before blocking the intersection; it should be noted that the MUTCD states that “stop lines may be used to indicate the point behind which vehicles are required to stop”, and that neither of these conditions require a vehicle to stop. Confusion over traffic control may be a factor in the four angle crashes involving southbound through vehicles at the unsignalized intersection of the connector road and South Main Street.
- Pedestrian Accommodation – The lack of pedestrian signals was noted as a significant safety concern at the intersection. It was suggested that pedestrians generally avoid the intersection because of the lack of safe crossing opportunities.
- Bicycle Accommodations – Existing shoulder widths are inconsistent and typically insufficient for bicycle travel.
- Truck Turns – It was noted that tractor-trailers currently swing wide and encroach on the left lane to make the southbound right turn to West Center Street. It was also noted that trucks have knocked out signal posts at the intersection.
- On-Street Parking – It was reported that the owner and patrons of the business on the northwest corner of the intersection park along the shoulder on the southbound North Main Street approach. This creates a safety concern both from potential conflicts with parking vehicles and from unauthorized use of the parking lane as a turning lane when parked vehicles are not present. It was noted that Route 28 is a State Highway, and that parking should be prohibited. The Town noted that it is aware of the issue but that the property has no associated parking.
- Lane widths – Lane widths were noted as potential safety issues during the audit.
  - Lane widths at the intersection are generally narrow, especially on the two-lane sections of the intersection approaches. It should be noted that exact existing lane widths were not

measured, but that narrow lanes may contribute to the history of sideswipe crashes at the intersection.

- It was noted that the crash history along the South Main Street leg of the intersection may be in part a result of confusion over whether this approach is a one or two lane approach. The approach is striped as a single lane but vehicles are known to stack up in two lanes starting at the Center Shopping Plaza driveway. This may be a contributing factor in crashes when a vehicle in one lane stops for a turning vehicle, but there is an unexpected conflict with a vehicle in the other lane. It was noted that old record plans for the intersection were used in a court appeal and showed that this approach once provided two marked lanes.
- Power Outages – It was noted that a recent power outage knocked out traffic signal control at the intersection for an extended period of time, and suggested that a backup system should be considered given the importance of the signal as an emergency response route. The West Bridgewater Fire Department and Police Department share a building located approximately ¼ mile west of the study intersection.

## Potential Safety Enhancements

After the site visit, audit participants returned to the meeting location, where the design plans were presented and the audit team was asked to discuss the safety issues and consider improvements. Audit participants were encouraged to consider both short and long term improvements for each issue. Each improvement considered has been categorized as short-term, mid-term, or long-term based on the definitions shown in Table 2. Additionally, a cost category has been assigned to each improvement based on the parameters set forth in Table 2.

**Table 2. Estimated Time Frame and Costs Breakdown**

Time Frame		Costs	
Short-term	<1 year	Low	<\$10,000
Mid-term	1–3 years	Medium	\$10,000–\$50,000
Long-term	>3 years	High	>\$50,000

The following improvements were suggested by audit participants to improve safety issues associated with the intersection of East Center Street/West Center Street and North Main Street/South Main Street.

- Reconstruct the intersection. As previously discussed, the intersection is scheduled for reconstruction in 2013, potentially using HSIP funds. The following safety enhancements discussed during the audit should be included as part of the planned reconstruction. Except where noted, planned improvements are mid-term improvements, with costs incorporated into the proposed reconstruction project.
  - Upgrade the traffic signal with all new equipment, including overhead signal heads with 12” LED lenses and backplates. The existing post-mounted signal heads are not optimally placed for signal visibility. New mast arms and overhead signal heads should be placed for optimal visibility for approaching drivers and according to MUTCD and MassDOT standards. Improved visibility can reduce crashes at the intersection, specifically rear-end crashes.
  - Reconfigure the intersection to eliminate the two-way median divided connector and related unsignalized intersections. Proposed design plans displayed during the audit show a proposed configuration that creates two closely-spaced signalized intersections working in tandem. The first intersection (Location 1) generally replaces the existing signalized intersection with a four-legged intersection with a two-way approach to and from River Street to the south. The second location (Location 2) is a signalized T-intersection with South Main Street (Route 28) approaching East Center Street from the south. Elimination of the connector road and the unsignalized intersections will eliminate crashes resulting from this unique geometry.
  - Provide signal phasing to accommodate turning vehicles. Proposed signal phasing and coordination at the two intersections is designed so that northbound vehicles on Route 28 will clear both intersections during their designated green phase. The proposed signal

- phasing also provides an exclusive advance phase for eastbound left turns, and provides an exclusive southbound left turn via split phasing. This will address sideswipe crashes and other crash types resulting from cut-throughs and other aggressive driving tactics brought on by the existing lack of protected phases for turning vehicles.
- Provide wheelchair ramps, crosswalks and pedestrian signal accommodations. The reconstructed intersection should have pedestrian signals with associated pedestrian phasing. It was noted that the proposed design will accommodate pedestrians with concurrent phasing, which is a reasonable accommodation given the heavy vehicle demands and low pedestrian volumes. Crosswalks should be provided in all directions, and handicap access ramps with grades and cross slopes meeting ADA requirements should be provided at all crosswalk locations. It was noted by Town personnel that the Town's ADA committee should be involved with plan review for this intersection at every phase so that they are assured proper accommodations are being engineered into the final design.
  - Eliminate parking along the southbound approach. The proposed design includes acquisition of the property and demolition of the building on the northwest corner of the intersection. This will eliminate the need for on-street parking, which is prohibited in the proposed design. Shoulder widths are wide enough to accommodate bicycles, but not wide enough to accommodate parking. The elimination of parking was considered as a short-term measure in advance of the proposed project, but it was noted that the business relies on this parking because it has no off-street parking. Elimination of parking on this approach results in a shoulder width that is wide enough to accommodate bicycles but not wide enough to allow vehicles to use the shoulder as a turning lane, which will address the history of sideswipe crashes on this approach.
  - Provide lane widths meeting MassDOT standards. It was suggested that existing lane widths are narrow and may not meet MassDOT minimum standards. Design Plans included in Appendix E show a minimum lane width of 11 feet on all approaches, which meets guidelines set forth in MassDOT's *Project Development and Design Guide*.
  - Widen and/or reconfigure shoulders to provide bicycle accommodation. It was noted that all intersecting streets will have 4-foot minimum shoulders following reconstruction, which meets MassDOT's standard for bicycle accommodation. It was also noted that proposed loop detectors will provide bicycle detection and will have associated signs and pavement markings in accordance with MassDOT standards.
  - Provide updated directional signage. It was noted that new D6/D8 directional signage will be provided on all approaches to the intersection.
  - Provide updated lane usage signage. Lane usage signage should be provided on all approaches to clarify and reinforce new lane configurations established by the proposed reconstruction project. All signs should meet MassDOT and MUTCD standards.

Replacement of the non-standard and potentially confusing lane usage signs on the eastbound approach may reduce sideswipe and rear-end crashes.

- Widen corners to accommodate truck turns. The proposed design has widened corner radii, specifically on the northwest corner of the intersection, where right turns will be accommodated in a right turn lane separated by a channelization island. It was noted that all turns were verified using AutoTURN software with a WB-67 design vehicle, and that the designer coordinated with UPS, who operates a facility north of the intersection.
- Replace “Do Not Block Intersection” sign. The need for this sign will be eliminated with the reconfiguration of the intersection in the proposed design; however, the sign should be replaced as a short-term measure in advance of the proposed reconstruction. This is a short-term, low cost improvement.
- Install STOP signs and STOP lines for the two-way median divided connector road. STOP signs should be installed for the northbound approach at East Center Street and for the southbound approach at South Main Street. This will clarify traffic control and may reduce crashes at the two unsignalized intersections in advance of the proposed reconstruction. This is a short-term, low cost improvement.
- Consider battery backup for the proposed signal. It was noted that a battery backup system would keep the signal system operating during a power outage. The designer should consider the feasibility of such a system in the proposed design. This is a mid-term, medium cost improvement.

## Summary of Road Safety Audit

Table 3 summarizes potential recommendations discussed by the audit team. The recommendations are categorized based on the potential safety payoff, as well as by time frame and cost. The safety payoff is a qualitative judgment of the effectiveness of the potential safety improvements. Each recommendation has a responsibility assigned to it stating whether MassDOT or the Town of West Bridgewater would be responsible for implementing the recommended improvement. “Project” refers to improvements that are assumed to be included or could reasonably be accommodated as part of planned improvements at the intersection. Costs provided for “Project” improvements are an order of magnitude estimate which estimates the cost of the improvement if completed independent of the project.

**Table 3. Potential Safety Enhancement Summary**

Safety Issue	Safety Enhancement	Responsibility	Safety Payoff	Time Frame	Cost
ALL	Reconstruct intersection. Safety enhancements to be included in proposed reconstruction are detailed below.	Project*	High	Mid-term	TBD
Signal Equipment	Upgrade the traffic signal with all new equipment, including overhead signal heads with LED lenses and backplates.	Project*	High	Mid-term	**
Traffic Congestion & Signal Phasing, Lane Widths	Reconfigure the intersection to eliminate the two-way median divided connector and related unsignalized intersections.	Project*	High	Mid-term	**
Traffic Congestion & Signal Phasing	Provide signal phasing to accommodate turning vehicles.	Project*	High	Mid-term	**
Pedestrian Accommodations	Provide wheelchair ramps, crosswalks and pedestrian signal accommodations. Coordinate with the Town's ADA committee for plan review.	Project*	High	Mid-term	**
Traffic Congestion & Signal Phasing, On-Street Parking	Eliminate parking along the southbound approach.	Project*	High	Mid-term	**
Lane Widths	Provide lane widths meeting MassDOT standards.	Project*	High	Mid-term	**
Bicycle Accommodation	Widen and/or reconfigure shoulders to provide bicycle accommodation.	Project*	Medium	Mid-term	**
Signage	Provide updated D6/D8 directional signage for all approaches.	Project*	Medium	Mid-term	**
Signage	Provide updated lane usage signage on all approaches.	Project*	Medium	Mid-term	**
Truck Turns	Widen corner radii to accommodate truck turns.	Project*	Medium	Mid-term	**
Signage	Replace "Do Not Block Intersection" sign.	MassDOT	Medium	Short-term	\$250
Signage	Install STOP signs and STOP lines for the two-way median divided connector road.	MassDOT/ Town	High	Short-term	\$1,000
Power Outages	Consider battery backup for the proposed signal.	Project	Medium	Mid-term	\$20,000

\* These improvements are shown on the Design Plans included as Appendix E.

\*\* Improvements to be incorporated into the proposed project are assumed to be included as part of the overall project cost.

## Appendix A. RSA Meeting Agenda

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# Agenda

## Road Safety Audit

West Bridgewater

Route 106 at Route 28

Meeting Location: W. Bridgewater Town Hall Conference Room  
65 N. Main Street, W. Bridgewater, MA  
Friday, January 20, 2012  
9:30 AM – 11:30 AM

Type of meeting: High Crash Location – Road Safety Audit  
Attendees: Invited Participants to Comprise a Multidisciplinary Team  
Please bring: Thoughts and Enthusiasm!!

9:30 AM Welcome and Introductions

9:45 AM Discussion of Safety Issues

- Crash history, Speed Regulations – provided in advance
- Existing Geometries and Conditions

10:15 AM Site Visit

- Drive to the intersection of Route 106 and Route 28
- As a group, identify areas for improvement

10:45 AM Discussion of Potential Improvements

- Discuss observations and finalize safety issue areas
- Discuss potential improvements and finalize recommendations

11:30 AM Adjourn for the Day – but the RSA has not ended

### Instructions for Participants:

- Before attending the RSA on January 20th, participants are encouraged to walk/drive through the intersection and complete/consider elements on the RSA Prompt List with a focus on safety.
- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.
- After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.

## Appendix B. RSA Audit Team Contact List

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## Participating Audit Team Members

Date: January 20, 2012

Location: West Bridgewater - Route 106/Route 28

Audit Team Member	Agency/Affiliation	Email Address	Phone Number
Greg Lucas	BETA Group	GLUCAS@BETA-INC.COM	781-255-1482
Bob Farey	Administrative Team	EFarey@WestBridgewater.com	1-508-894-1267
Christine Keenes	BETA Group	CKEENES@BETA-INC.COM	781-255-1982
Peter Vasilian	MACSS	PETER.VASILIAN@MACSS.COM	617-242-9222
Bill Mandity	OCPC	wmandity@ocpc.org	508-583-1833x207
Ray Guarino	OCPC	rguarino@ocpc.org	508-583-1833-212
Hugh Harley	WB Planning	hrharley@comcast.net	508-588-9327
Len Graf	W.B. Highway	L.GRAF@W.Bridgewater.com	508-894-1216
Lon Herit	Fire Chief	lherit@wbrdgewater.com	508-894-1286
Chris Iannelli	Facility	c.iannelli@wbrdgewater.com	894-1217
Chae Feanery	P.D.	VFEANERY@WBPD.COM	508-894-4032
Donald Clark	Police	DClark@wbpd.com	508-894-1294
Bonnie Polin	Miss DOT - Safety	bonnie.polin@state.ma.us	617-973-7991
Dominic Carizzo	MassDOT Safety	Dominic.Carizzo@state.ma.us	<del>617-973-7991</del>
Douglas Halpert	MassDOT Safety	Douglas.Halpert@state.ma.us	
Bill Travers	MassDOT DS Projects	Bill.Travers@state.ma.us	908-884-4219
AL MILLER	MassDOT 10 ft	albert.miller@dot.state.ma.us	617-973-7862

## Appendix C. Detailed Crash Data

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**COLLISION DIAGRAM**

CITY/TOWN: WEST BRIDGEWATER

DATE PREPARED: 12/19/2011

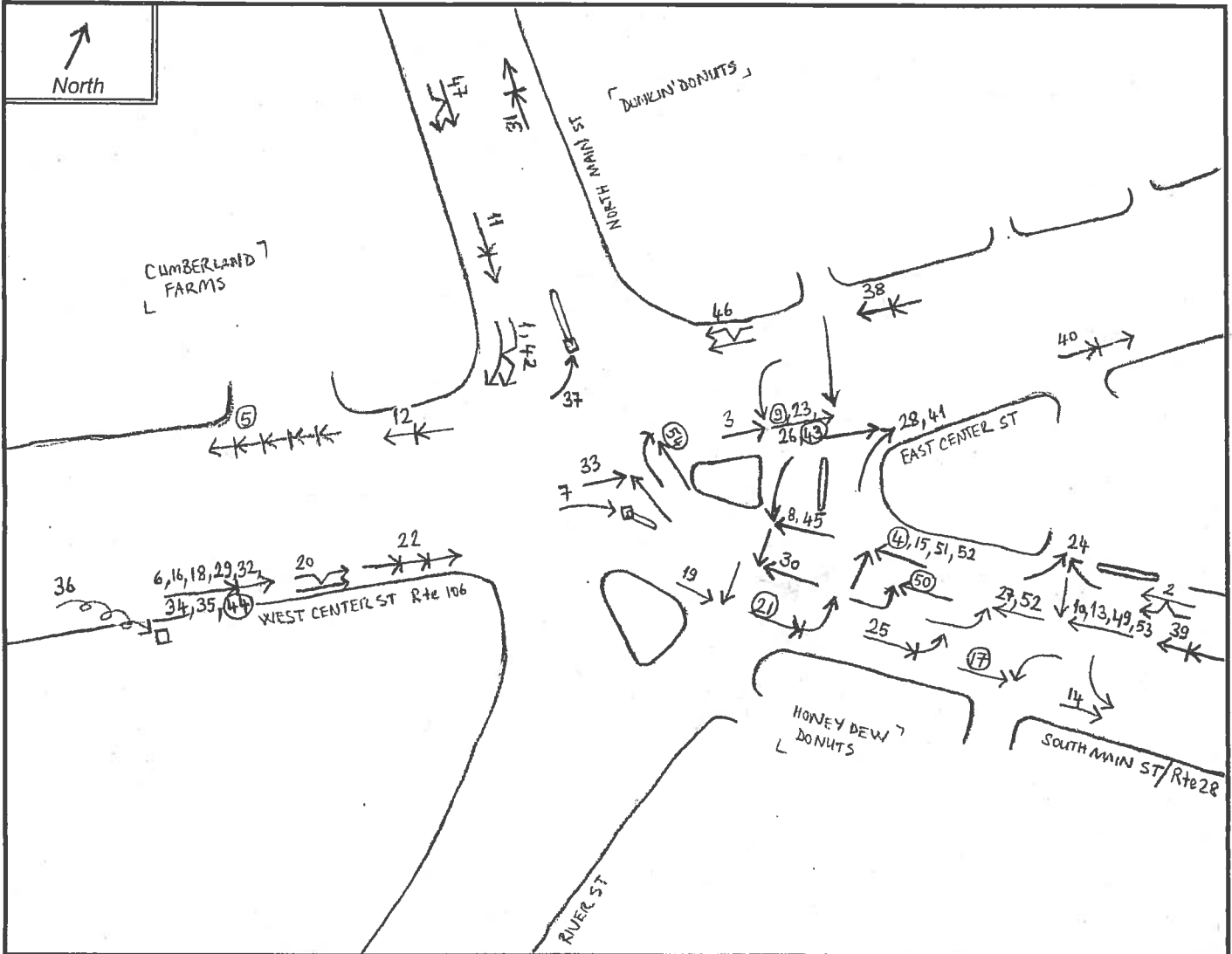
REGION: OCPC












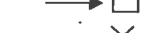




PREPARED BY: CANDAS ESIN

ROADWAY NAMES: ROUTE 106 - ROUTE 28

TIME PERIOD ANALYZED: JANUARY 19th, 2009 - NOVEMBER 30th, 2011

SOURCE OF CRASH REPORTS: WEST BRIDGEWATER POLICE DEPARTMENT



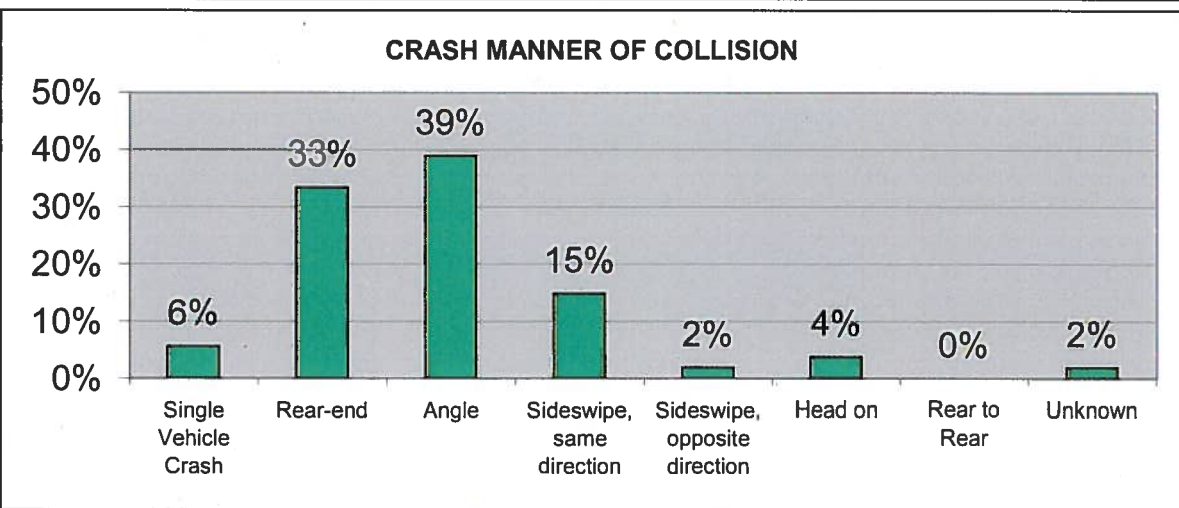
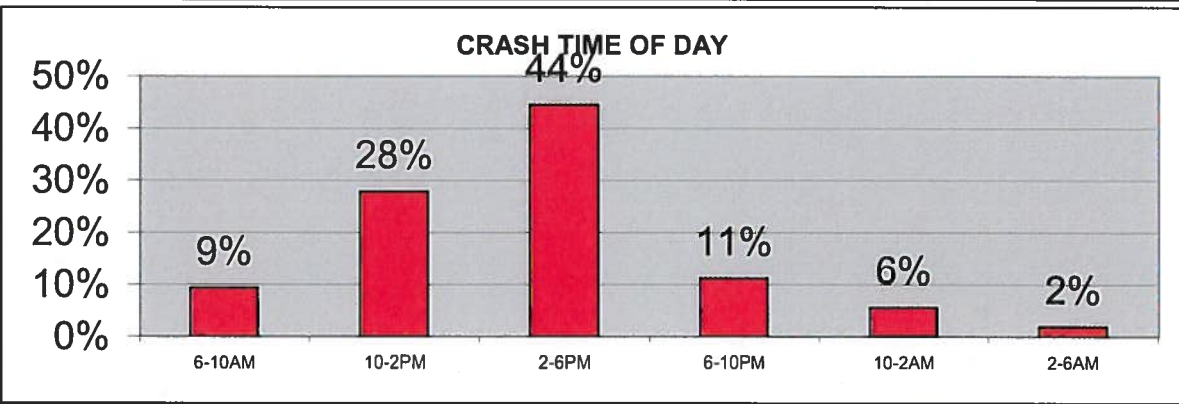
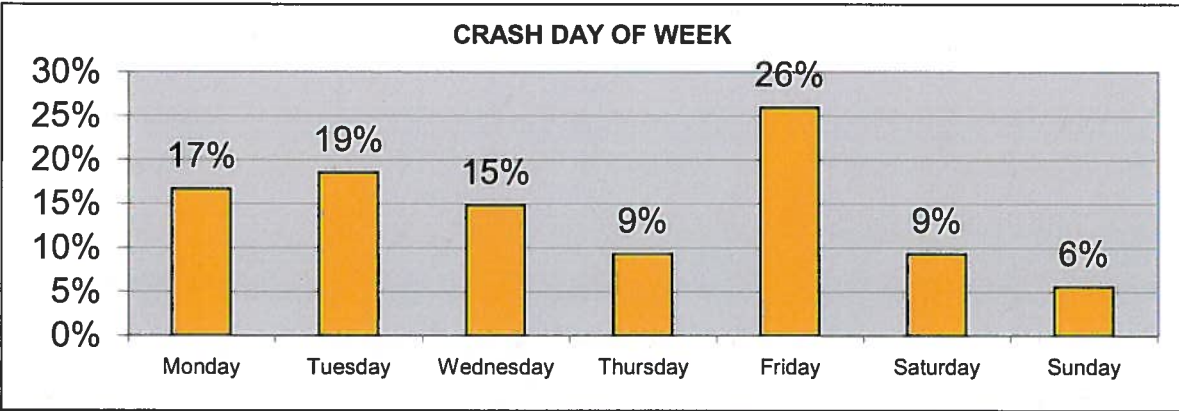
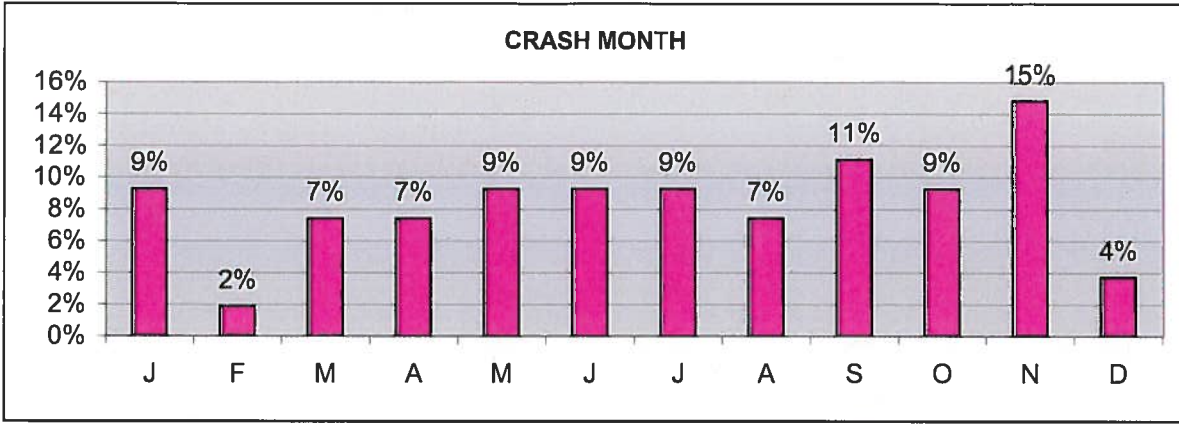
SYMBOLS	TYPES OF CRASH	SEVERITY
 Moving Vehicle	 Head On	
 Backing Vehicle	 Angle	
 Non-Involved Vehicle	 Turning Move	 Injury Accident
 Pedestrian	 Rear End	
 Parked Vehicle	 Sideswipe	
 Fixed Object	 Out of Control	 Fatal Accident
 Bicycle		
 Animal		

# Crash Data Summary Table

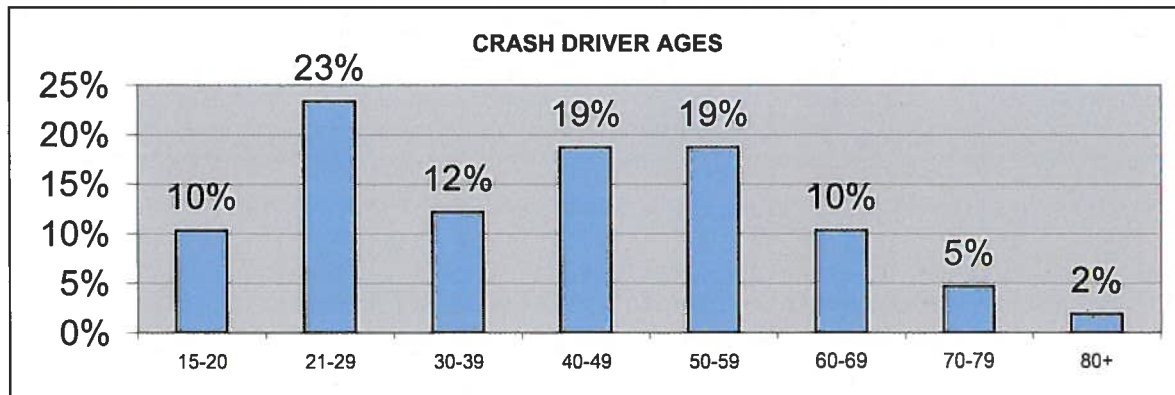
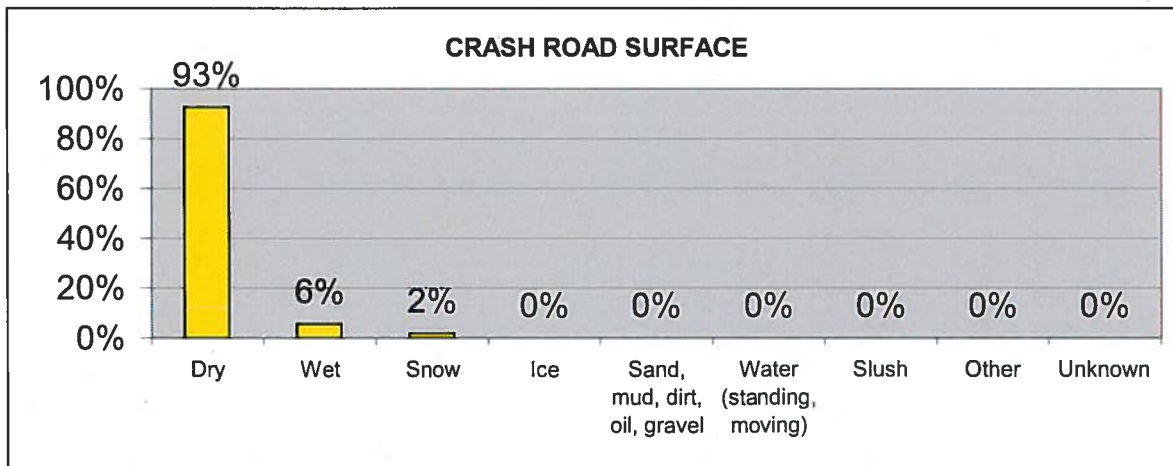
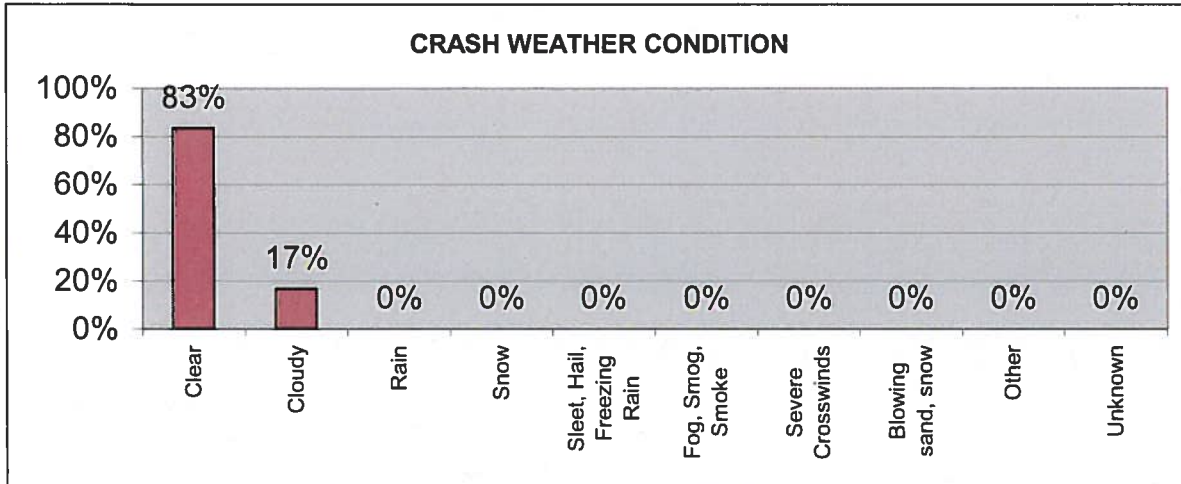
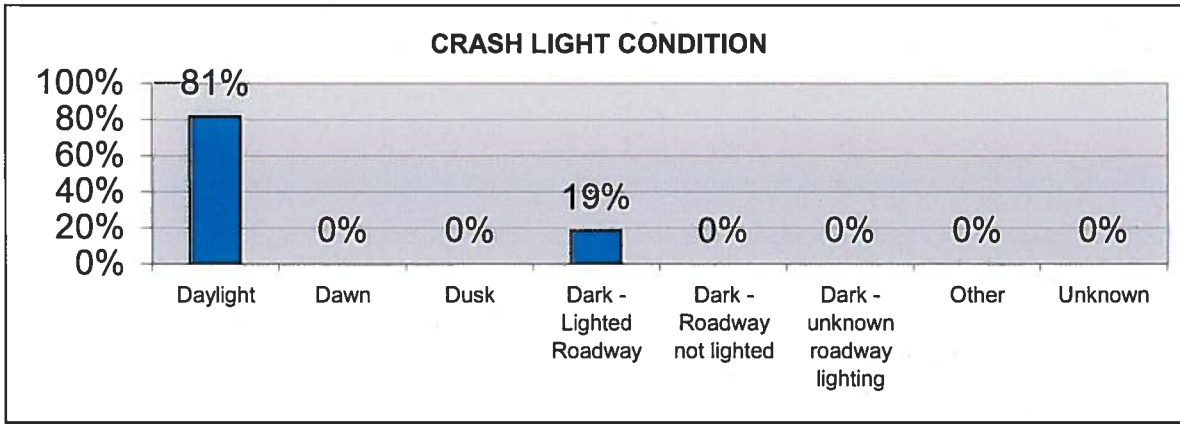
Intersection of Route 106 and Route 28; West Bridgewater, MA  
January 19, 2009 - November 30, 2011

#	Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface		Driver Contributing Code		Agres					Comments
							Type	Type	Type	Type	D1	D2	D3	D4	D5	
1	1/19/09	Monday	10:10 AM	Sideswipe, same direction	Daylight	Clear	Snow	No Improper Driving		59	unk					Hit and run.
2	1/22/09	Thursday	8:47 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Instatention		55	21					
3	3/10/09	Tuesday	9:23 PM	Head on	Dark - lighted roadway	Clear	Dry	Failed to yield to right of way		58	20					
4	4/19/09	Monday	6:44 AM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		18	28					
5	6/5/09	Friday	1:06 PM	Rear-end	Daylight	Cloudy	Dry	Cellular telephone		54	47	20	74	23		
6	7/17/09	Tuesday	6:41 PM	Rear-end	Daylight	Cloudy	Wet	Instatention		45	55					Struck traffic light and highway sign. Operator charged with OUI Liquor.
7	7/17/09	Friday	1:58 AM	Single Vehicle Crash	Dark - lighted roadway	Clear	Dry	Physical Impairment		33						
8	9/20/09	Sunday	4:36 PM	Angle	Daylight	Clear	Dry	Instatention		18	18					
9	12/14/09	Friday	4:27 PM	Angle	Daylight	Clear	Dry	Unknown		41	46					
10	12/18/09	Friday	2:50 PM	Angle	Daylight	Cloudy	Dry	Instatention		47	62					
11	1/31/10	Sunday	1:57 PM	Rear-end	Daylight	Clear	Dry	Instatention		32	46					
12	2/22/10	Monday	5:36 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Followed too closely		50	21					
13	3/24/10	Wednesday	8:47 AM	Angle	Daylight	Cloudy	Dry	Instatention		43	72					
14	3/27/10	Saturday	3:40 PM	Sideswipe, same direction	Daylight	Clear	Dry	Visibility Obstructed		72	80					
15	4/16/10	Friday	3:50 PM	Angle	Daylight	Cloudy	Wet	Disregarded traffic signs, signals, road markings		58	22					
16	4/16/10	Friday	5:35 PM	Rear-end	Daylight	Clear	Dry	Instatention		51	17					
17	5/10/10	Monday	3:14 PM	Head on	Daylight	Clear	Dry	Failed to yield to right of way		54	28					
18	5/17/10	Monday	1:23 PM	Rear-end	Daylight	Clear	Dry	Instatention		27	44					
19	6/19/10	Saturday	9:47 AM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		33	78					Operator fled the scene and continued on S. Main Street then arrested.
20	7/22/10	Thursday	10:10 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner		42	29					
21	7/30/10	Friday	1:23 PM	Rear-end	Daylight	Clear	Dry	Instatention		51	42					
22	8/7/10	Saturday	1:56 AM	Rear-end	Dark - lighted roadway	Clear	Dry	Physical Impairment		21	28	33				Operator charged with OUI liquor.
23	8/16/10	Monday	11:41 AM	Angle	Daylight	Clear	Dry	Visibility Obstructed		19	27					
24	9/21/10	Tuesday	2:10 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		31	80					
25	10/2/10	Saturday	11:43 AM	Rear-end	Daylight	Clear	Dry	Unknown		17	19					
26	10/6/10	Friday	2:54 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		64	49					
27	11/5/10	Friday	12:42 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		21	38					
28	11/8/10	Monday	7:28 PM	Angle	Dark - lighted roadway	Cloudy	Dry	Failed to yield to right of way		24	59					
29	11/9/10	Tuesday	2:16 PM	Rear-end	Daylight	Clear	Dry	Followed too closely		63	58					
30	11/23/10	Tuesday	11:17 AM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		55	20					
31	11/5/11	Wednesday	2:22 PM	Rear-end	Daylight	Clear	Dry	Followed too closely		38	17					
32	1/20/11	Thursday	11:27 AM	Rear-end	Daylight	Clear	Dry	Instatention		24	22					
33	3/9/11	Wednesday	9:47 PM	Sideswipe, same opposite direction	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings		49	66					Operator ran red light. Operator stated that she was looking at a different car crash when she rear ended vehicle in front of her.
34	4/19/11	Tuesday	1:37 PM	Rear-end	Daylight	Cloudy	Dry	Distracted		53	20					Operator was distracted by police cruiser on side of road when she rear ended vehicle in front of her.
35	4/19/11	Tuesday	2:30 PM	Rear-end	Daylight	Clear	Dry	Distracted		47	34					Operator was distracted by police cruiser on side of road when she rear ended vehicle in front of her.
36	5/6/11	Friday	11:33 AM	Single Vehicle Crash	Daylight	Clear	Dry	Instatention		20						Swerved and struck utility pole.
37	5/24/11	Tuesday	2:58 PM	Single Vehicle Crash	Daylight	Clear	Dry	Instatention		52						Traffic light pole struck.
38	6/15/11	Wednesday	3:16 PM	Rear-end	Daylight	Clear	Dry	Instatention		28	45					
39	6/16/11	Thursday	1:21 PM	Rear-end	Daylight	Clear	Dry	Followed too closely		45	32					
40	6/22/11	Wednesday	7:25 AM	Sideswipe, same direction	Daylight	Clear	Dry	No Improper Driving		47	66					
41	7/11/11	Monday	5:30 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		62	17					
42	8/24/11	Wednesday	5:55 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road		64	41					One operator was driving illegally in the breakdown lane.
43	8/27/11	Saturday	2:18 PM	Angle	Daylight	Clear	Dry	Visibility Obstructed		64	33					
44	9/15/11	Thursday	6:47 AM	Rear-end	Daylight	Clear	Dry	Distracted		54	51					
45	9/18/11	Sunday	2:09 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		37	17					School bus involved crash. (No students on board).
46	9/20/11	Tuesday	3:45 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road		53	49					
47	9/21/11	Wednesday	4:23 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road		65	51					Operator driving in breakdown lane.
48	10/11/11	Tuesday	3:55 PM	Angle	Daylight	Clear	Dry	Failed to yield to right of way		43	51					
49	10/14/11	Friday	11:20 AM	Angle	Daylight	Cloudy	Dry	Instatention		37	65					
50	10/14/11	Friday	12:23 PM	Angle	Daylight	Cloudy	Dry	Visibility Obstructed		21	72					
51	11/4/11	Friday	5:01 PM	Unknown	Daylight	Clear	Dry	No Improper Driving		17						Hit and run.
52	11/18/11	Friday	6:12 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield to right of way		46	31					
53	11/21/11	Monday	5:31 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield to right of way		25	21					
54	11/30/11	Wednesday	4:16 PM	Sideswipe, same direction	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings		62	25					Operator was in lane to turn onto W. Center Street but attempted to turn into lane to head onto N. Main St.

### Crash Data Summary Tables and Charts

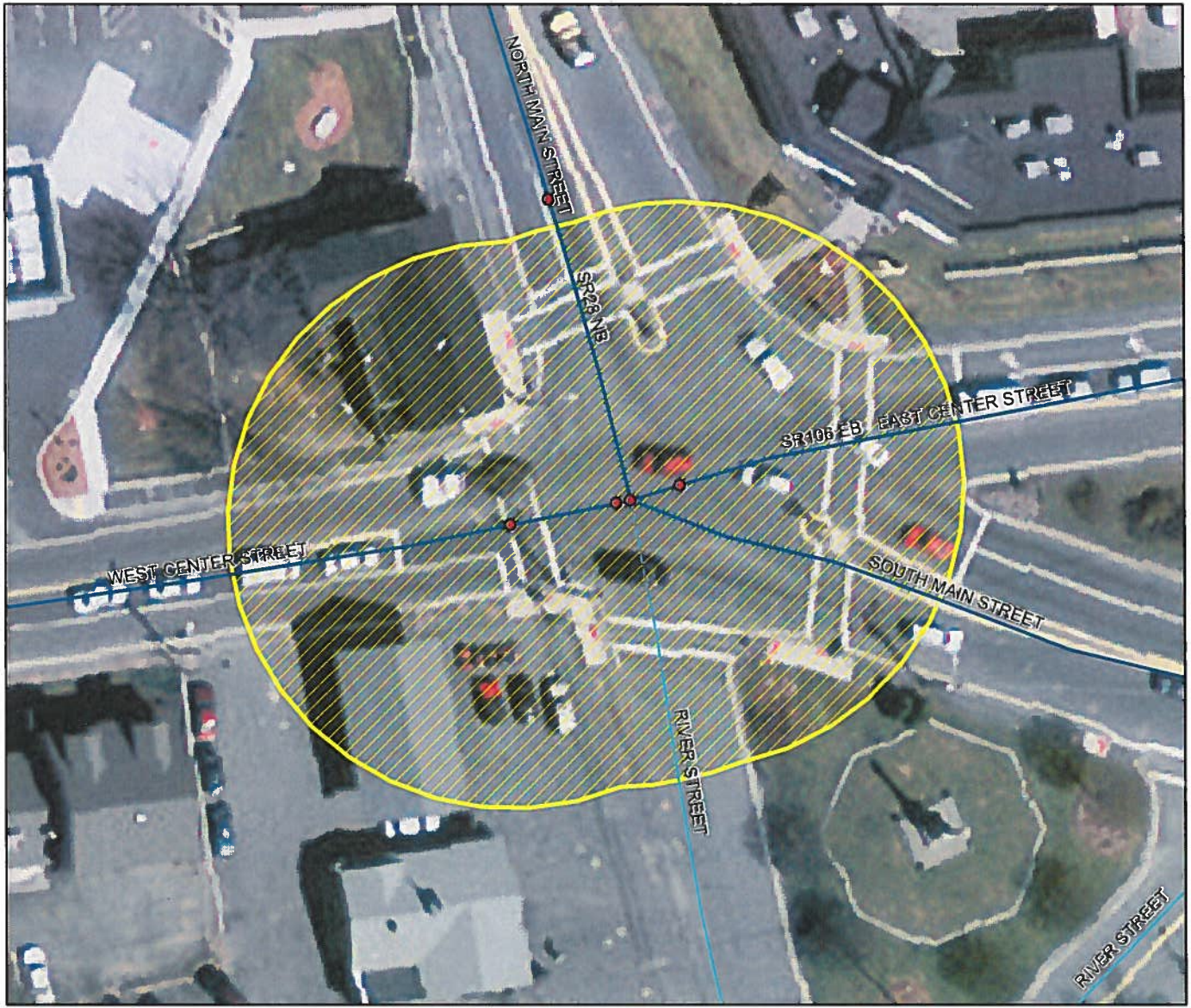


### Crash Data Summary Tables and Charts





# Top Crash Intersections 2007-2009



0 35 70 105 140 Feet



**RANK**  
**167**

## WEST BRIDGEWATER

WEST CENTER STREET ROUTE 106  
NORTH MAIN STREET ROUTE 28

MassDOT District 5  
RPA OCPC  
EPDO 107  
Number of Fatal Crashes 0  
Number of Injury Crashes 15  
Number of Non-Injury Crashes 32  
Total Crashes 47

### Legend

- Crash Locations 2007-2009
- Local Roads
- All Functional Classification Except Local Roads
- Top Crash Intersections

## Appendix D. Speed Regulations

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July 28, 1971

TOWN OF WEST BRIDGEWATER

*Mr. Sullivan*

SPECIAL SPEED REGULATION NO 612

Highway Location: WEST BRIDGEWATER

Authority in Control: TOWN OF WEST BRIDGEWATER

Name of Highway(s): West Center & East Center Streets  
(Route 106)

In accordance with the provisions of Chapter 90, Section 18, of the General Laws (Ter. Ed.) as amended, the following Special Speed Regulation is

hereby Adopted  
by the Board of Selectmen  
of the Town of West Bridgewater

That the following speed limits are established at which motor vehicles may be operated in the areas described:

West Center & East Center Streets (Route 106) - EASTBOUND

Beginning at the Easton-West Bridgewater Line,  
thence easterly

0.67 miles at 45 miles per hour ending at the beginning  
of State Highway west of Route 24

And beginning again at the end of State Highway East of Route 24,  
thence easterly

*1.64 mi*

<del>0.67</del>	<del>miles at 45 miles per hour</del>	*
0.67	" " 35 " " "	
0.20	" " 25 " " "	
0.87	" " 40 " " "	
0.41	" " 35 " " "	ending at the West

Bridgewater-East Bridgewater line; the total distance being 3.79 miles.

East Center & West Center Streets (Route 106) - WESTBOUND

Beginning at the East Bridgewater-West Bridgewater line,  
thence westerly

*1.64 mi*

0.41	miles at 35 miles per hour	
0.87	" " 40 " " "	
0.20	" " 25 " " "	
<del>0.67</del>	<del>" " 35 " " "</del>	*
<del>0.97</del>	<del>" " 40 " " "</del>	ending at the beginning of

State Highway East of Route 24.

\* Speed Reg. 612-A dated 1/11/85

And beginning again at the end of State Highway west of Route 24,  
thence westerly

0.67 miles at 45 miles per hour ending at the West  
Bridgewater-Easton line; the total distance being 3.79 miles.

Operation of a motor vehicle at a rate of speed in excess  
of these limits shall be prima facie evidence that such speed  
is greater than is reasonable and proper.

The provisions of this regulation shall not, however, abro-  
gate in any sense Chapter 90, Section 14, of the General Laws  
(Ter. Ed.).

Date of Passage

Wm. D. Hall  
William E. Wood  
Richard F. King  
Board of Selectmen

Attest

Edward F. Butler  
Town Clerk

COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS

SPECIAL SPEED REGULATION NO. 612

The Department of Public Works and the Registrar of Motor Vehicles,  
acting jointly, do hereby certify that this regulation is consistent with  
public interest.

Standard signs must be erected at the beginning of each zone.

Date: July 28, 1971

By: Edward J. Ribbs  
EDWARD J. RIBBS  
COMMISSIONER

Richard M. Lough  
Registrar of Motor Vehicles

for Highway Engineering

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS

Special Speed Regulation Number 331

1466

Highway Location: MILTON, QUINCY, RANDOLPH, AVON,  
BROCKTON, WEST BRIDGEWATER,  
BRIDGEWATER, MIDDLEBOROUGH,  
ROCHESTER AND WAREHAM

Authority in Control: COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS

Name of Highway: MILTON - Randolph Avenue - Route 28  
QUINCY - Randolph Avenue - Route 28  
RANDOLPH - North Main Street-Route 28  
and South Main Street-Route 28  
AVON - Main Street - Route 28  
BROCKTON - North Montello Road-Route 28  
and Main Street - Route 28  
WEST BRIDGEWATER - Main Street-Route 28  
BRIDGEWATER - Bedford Street-Route 28  
MIDDLEBOROUGH - West Grove - Route 28  
Street and Wareham Street  
Route 28  
ROCHESTER - Tremont Street - Route 28  
WAREHAM - Tremont Road, Route 28  
Sandusky Road and- Route 28  
Elm Street - Route 28

In accordance with the provisions of Section 18 of Chapter 90 of the General Laws (Ter. Ed.) the following Special Speed Regulation is hereby promulgated.

Special Speed Regulation numbered 48 dated June 18, 1952 is hereby amended by striking out the regulation in its entirety and inserting in place thereof the following revision.

The following designated speed limits are established at which motor vehicles may be operated in the areas described.

ROUTE 28 SOUTHBOUND

Beginning in Milton 78 feet south of the beginning of State

Highway

thence southerly	0.28 miles	at	40 miles per hour			
"	1.27	"	45	"	"	"
"	0.24	"	40	"	"	to the Quincy Line

thence southerly in Quincy

	0.02 miles	at	40 miles per hour			
"	1.14	"	50	"	"	"
"	0.08	"	45	"	"	to the Randolph

Line

thence southerly in Randolph

	0.19 miles	at	45 miles per hour			
"	0.35	"	40	"	"	"
"	0.63	"	30	"	"	"
"	0.44	"	35	"	"	"
<del>"</del>	<del>0.39</del>	<del>"</del>	<del>40</del>	<del>"</del>	<del>"</del>	<del>"</del>
<del>"</del>	<del>0.84</del>	<del>"</del>	<del>35</del>	<del>"</del>	<del>"</del>	<del>"</del>

0.36 miles at 40 } see  
0.87 " @ 35 } 311D

to the end of State

Highway North of Town.

Beginning again in Randolph 60 feet south of the beginning of State Highway south of Town

thence southerly	0.12 miles	at	30 miles per hour			
"	0.38	"	35	"	"	"
"	1.30	"	40	"	"	to the Avon Line

thence southerly in Avon

	0.22 miles	at	40 miles per hour			
thence	0.24	"	30	"	"	"
"	1.16	"	40	"	"	to the Brockton Line.

thence southerly in Brockton

	0.37 miles	at	40 miles per hour			
thence	0.22	"	35	"	"	to the end of State

Highway north of City.

And beginning again in Brockton at the beginning of State Highway south of City

thence southerly	0.38 miles	at	40 miles per hour			
"	0.28	"	45	"	"	to the

West Bridgewater Line.

> 0.66 Miles  
✓

thence southerly in West Bridgewater

	<del>0.66</del>	<del>"</del>	<del>"</del>	<del>45</del>	<del>"</del>	<del>"</del>	<del>"</del>
thence	0.68	"	"	40	"	"	"
"	0.33	"	"	35	"	"	"
"	0.21	"	"	25	"	"	"
"	1.28	"	"	45	"	"	"

0.13 mi at 35 mph \*  
 1.21 mi at 40 mph

to the end of State Highway at the Bridgewater Line.

Beginning again in Bridgewater 36 feet south of the beginning of State Highway, south of town

thence southerly	0.20	miles	at	30	miles	per	hour
"	0.30	"	"	35	"	"	"
"	3.12	"	"	50	"	"	"

to the Middleborough Line.

thence southerly in Middleborough

thence	0.19	miles	at	45	miles	per	hour
"	0.20	"	"	40	"	"	"
"	1.84	"	"	50	"	"	"
"	0.30	"	"	25	"	"	"
"	0.60	"	"	45	"	"	"
"	0.42	"	"	40	"	"	"
"	0.77	"	"	50	"	"	"
"	0.43	"	"	40	"	"	"
"	0.41	"	"	35	"	"	"
"	2.23	"	"	50	"	"	"
"	1.58	"	"	45	"	"	"
"	1.83	"	"	50	"	"	"
"	0.36	"	"	45	"	"	"
"	0.51	"	"	40	"	"	"
"	0.65	"	"	45	"	"	"
"	0.68	"	"	50	"	"	"
"	1.01	"	"	45	"	"	"

0.47 @ 35  
 0.79 @ 40  
 1.38 @ 50

2.344 @ 45  
 1.02 @ 45

to the Rochester Line

thence southerly in Rochester

0.80 miles at 45 miles per hour to the Wareham Line.

thence southerly in Wareham

	0.36	miles	at	45	miles	per	hour
"	0.23	"	"	30	"	"	"
"	0.93	"	"	40	"	"	"
"	1.58	"	"	45	"	"	"
"	0.27	"	"	40	"	"	"
"	2.28	"	"	45	"	"	"
"	0.38	"	"	40	"	"	"
"	0.53	"	"	35	"	"	"

ending at the

junction of Routes 28 and 6; the total distance being 38.69

ROUTE 28 NORTHBOUND

Beginning in Wareham at the junction of Routes 6 and 28,  
thence northerly 0.19 miles at 35 miles per hour

"	0.38	"	"	40	"	"	"
"	2.29	"	"	45	"	"	"
"	0.27	"	"	40	"	"	"
"	1.58	"	"	45	"	"	"
"	0.95	"	"	40	"	"	"
"	0.21	"	"	30	"	"	"
"	0.36	"	"	45	"	"	"

to the Rochester

Line.

thence northerly in Rochester

0.80 miles at 45 miles per hour to the Middleborough

Line.

thence northerly in Middleborough

"	2.34 mi @ 45	}	1.01 miles at 45 miles per hour	"	"	"	"	
"	(plus 0.04, 77)		0.68	"	"	50	"	"
"			0.65	"	"	45	"	"
"			0.47	"	"	40	"	"
"			0.41	"	"	45	"	"
"			1.83	"	"	50	"	"
"	1.40 @ 50		1.56	"	"	45	"	"
"	2.4 @ 40		2.35	"	"	50	"	"
"	0.13 @ 35		0.34	"	"	35	"	"
"			0.43	"	"	40	"	"
"			0.77	"	"	50	"	"
"			0.26	"	"	45	"	"
"			0.16	"	"	40	"	"
"			0.60	"	"	45	"	"
"			0.29	"	"	25	"	"
"			1.80	"	"	50	"	"
"			0.20	"	"	40	"	"
"			0.19	"	"	50	"	"

to the Bridgewater

Line.

thence northerly in Bridgewater

3.12 miles at 50 miles per hour

thence 0.31 " " 35 " " "

" 0.22 " " 30 " " "

to the end of

State Highway, south of town.



Beginning again at the Bridgewater-West Bridgewater Line,  
thence northerly in West Bridgewater

	1.34 miles at 45 miles per hour	
"	0.14 " " 25 " " "	
"	0.33 " " 35 " " "	
"	<del>0.65 " " 40 " " "</del>	} 1.21 miles at 40 mph 0.13 mi at 35 mph to the Brockton
"	<del>0.69 " " 45 " " "</del>	

Line

thence northerly in Brockton

	0.28 miles at 45 miles per hour	} 0.66 miles @ 35 M.P.H. to the end of State
"	0.38 " " 40 " " "	

Highway, south of City.

Beginning again in Brockton 265 feet north of the beginning of  
State Highway, north of City

thence northerly	0.17 miles at 35 miles per hour	
"	0.37 " " 40 " " "	to the Avon Line.

thence northerly in Avon

	1.11 miles at 40 miles per hour	
thence	0.29 " " 30 " " "	
"	0.22 " " 40 " " "	to the Randolph

Line.

thence northerly in Randolph

	1.29 miles at 40 miles per hour	
"	0.38 " " 35 " " "	
"	0.13 " " 30 " " "	to the end of State

Highway south of Town.

Beginning again in Randolph at the beginning of State Highway  
north of town

thence northerly	<del>0.84 miles at 35 miles per hour</del>	} 0.87 miles @ 35 mph } Set 0.36 " @ 40 mph } 3110
"	<del>0.43 " " 40 " " "</del>	
"	0.44 " " 35 " " "	
"	0.63 " " 30 " " "	
"	0.35 " " 40 " " "	
"	0.19 " " 45 " " "	to the Quincy Line.

thence northerly in Quincy

	0.08 miles at 45 miles per hour	
"	1.14 " " 50 " " "	
"	0.02 " " 40 " " "	to the Milton Line

\* Revised Speed Reg. - 331-C 9/22/78

thence northerly in Milton  
 " 0.24 miles at 40 miles per hour  
 " 1.24 " " 45 " " "  
 " 0.32 " " 40 " " " to the end of  
 State Highway, the total distance being 38.94 miles.

Operation of a motor vehicle at a rate of speed in excess of these limits shall be prima facie evidence that such speed is greater than is reasonable and proper.

The provisions of this regulation shall not, however, abrogate in any sense Section 14 of Chapter 90.

The Department of Public Works and the Registrar of Motor Vehicles acting jointly, do hereby certify in writing that this regulation is consistent with the public interests.

Standard signs must be erected at the beginning of each zone.

DEPARTMENT OF PUBLIC WORKS

DATE: March 21, 1966

BY: JOHN D. WARNER K.  
 JOHN D. WARNER  
 Associate Commissioner  
 for Highway Engineering

Richard E. McLaughlin  
 Registrar of Motor Vehicles

## Appendix E. Design Plans

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# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

WEST BRIDGEWATER ROUTES 28 & 106			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	1	66
PROJECT FILE NO.		603457	

TITLE SHEET AND INDEX

PLAN AND PROFILE OF  
**ROUTES 28 & 106**  
IN THE TOWN OF  
**WEST BRIDGEWATER**  
**PLYMOUTH COUNTY**

FEDERAL AID PROJECT NO.

THE 1988 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, AND THE ENGLISH SUPPLEMENTAL SPECIFICATIONS DATED FEBRUARY 25, 2010; THE STANDARD SPECIAL PROVISION (METRIC/ENGLISH) DATED APRIL 23, 2010; THE 2010 CONSTRUCTION STANDARDS, THE 1996 METRIC CONSTRUCTION AND TRAFFIC STANDARD DETAILS AND THE SUPPLEMENTAL DRAWINGS DATED APRIL 2003; THE 2003 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) WITH MASSACHUSETTS AMENDMENTS; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING; THE MASS HIGHWAY CONSTRUCTION FOR WHEELCHAIR RAMPS DATED DECEMBER 2001 WITH REVISIONS DATED APRIL 2004; AND THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004) AND ALL AMENDMENTS THERETO WILL GOVERN.

INDEX

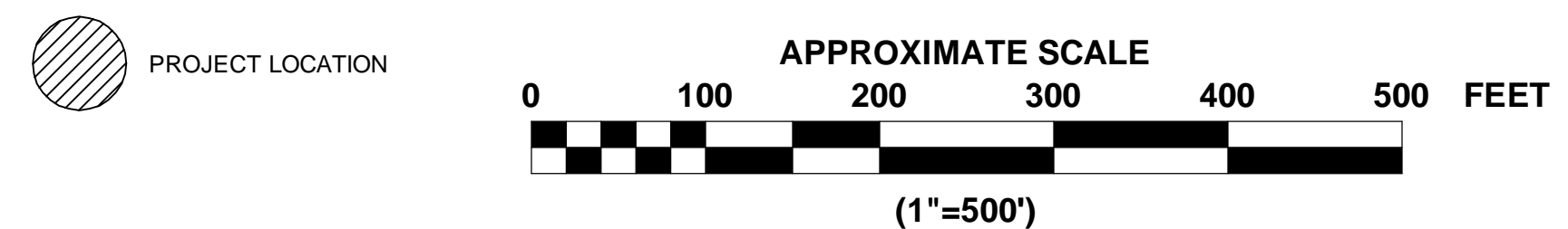
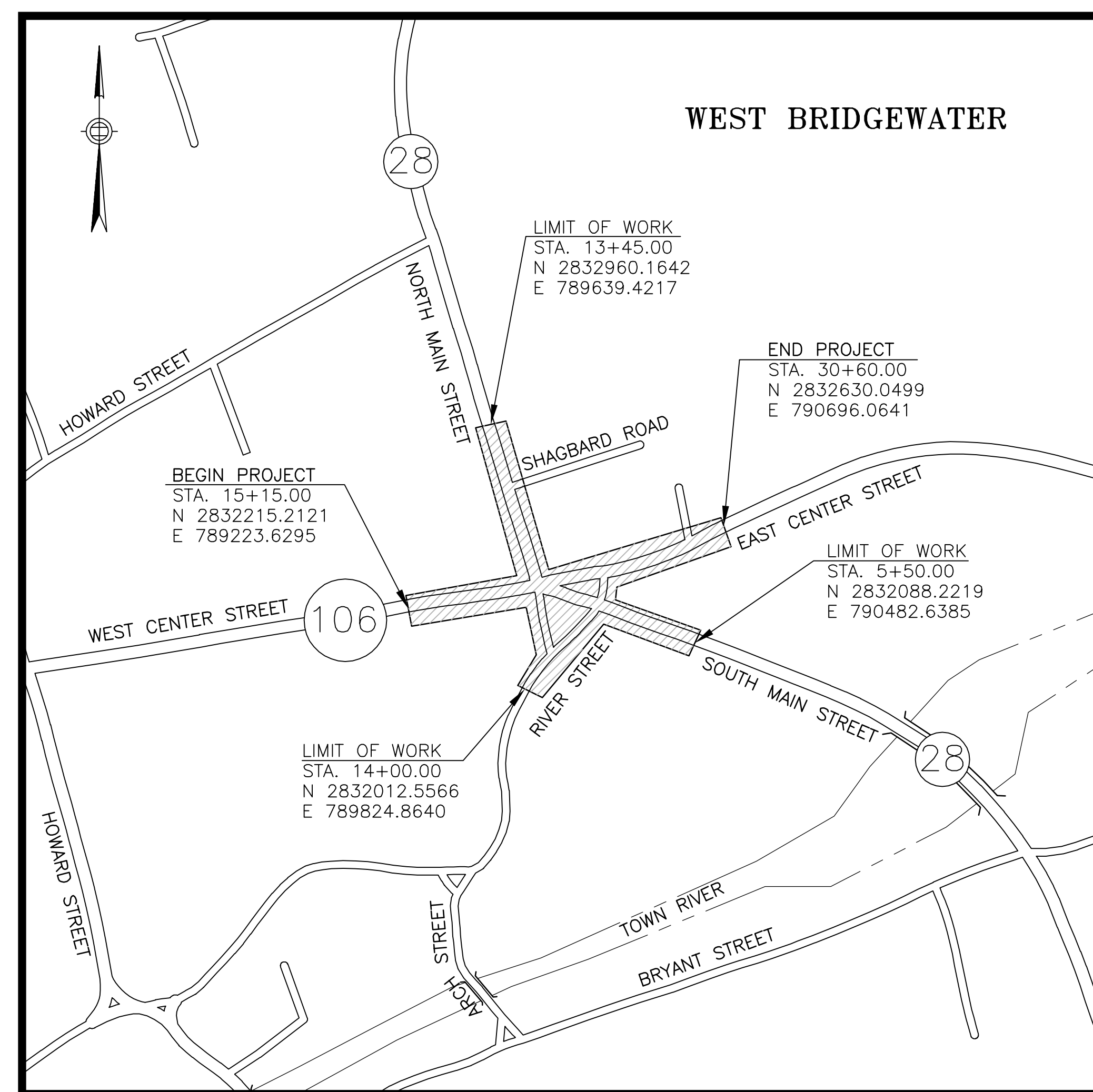
SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	LEGEND AND ABBREVIATIONS
3	GENERAL NOTES
4	KEY PLAN
5-6	SURVEY CONTROL PLAN
7-10	TYPICAL SECTIONS
11-13	CONSTRUCTION DETAILS
14-19	CONSTRUCTION PLANS
20-27	PROFILES
28-33	CURB TIE AND GRADING PLANS
34-39	SIGN AND PAVEMENT MARKING PLANS
40-41	TRAFFIC SIGN SUMMARY
42	TRAFFIC SIGNAL PLAN
43-44	TRAFFIC SIGNAL DATA
45	TIME-SPACE DIAGRAM
46-51	TRAFFIC DETAILS
52-54	TRAFFIC MANAGEMENT PLANS
55-66	CROSS SECTIONS

CONVENTIONAL SIGNS

COUNTY, CITY, OR TOWN BOUNDARY	-----
COUNTY, CITY, OR TOWN SIDE LINE	-----
FENCE LINE	-X-X-X-X-X-
BASE LINE OR SURVEY LINE	S36°04'20"W 53.578
RIGHT OF WAY LINE	-----
CULVERT	=====
RETAINING WALL	-----
GUARD RAIL	-----
STONE WALL	-----
TREE LINE	-----
POLE	○

ELEVATIONS	PROPOSED SURFACE	PRESENT SURFACE
10+20	PRES. 90.7	PROP. 90.91

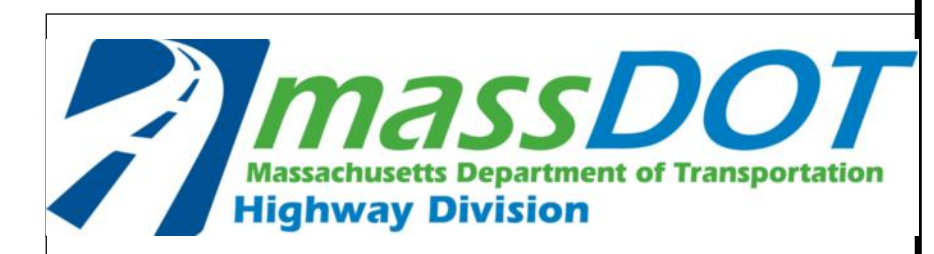


LENGTH OF PROJECT:  
 ROUTE 28 = 833.93 FEET = 0.158 MILES  
 ROUTE 106 = 1545.00 FEET = 0.293 MILES  
 RIVER STREET = 336.67 FEET = 0.064 MILES  
 CENTRAL SQUARE = 225.93 FEET = 0.043 MILES

DESIGN DESIGNATION

MAIN STREET (ROUTE 28)		CENTER STREET (ROUTE 106)	
DESIGN SPEED	35 MPH	DESIGN SPEED	35 MPH
ADT (2009)	20,070 VPD	ADT (2009)	27,300 VPD
ADT (2019)	22,170 VPD	ADT (2019)	30,160 VPD
K	7.5%	K	7.1%
D	58.0%	D	53.8%
T (PEAK HOUR)	1.5%	T (PEAK HOUR)	2.0%
T (AVERAGE DAY)	1.5%	T (AVERAGE DAY)	2.5%
DHV	1,663 VPH	DHV	2,142 VPH
DDHV	965 VPH	DDHV	1,153 VPH
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL/ ARTERIAL	FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL/ ARTERIAL

**75% SUBMISSION**  
November 4, 2011



PREPARED BY:  
**JACOBS** 343 Congress Street  
Suite 2100  
Boston, MA 02210

RECOMMENDED FOR APPROVAL

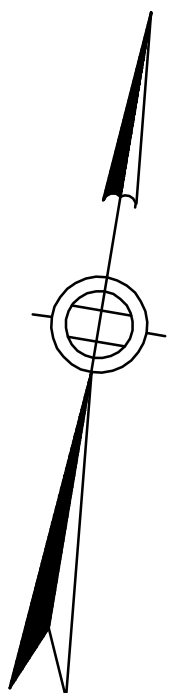
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	APPROVED	CHIEF ENGINEER	DATE
APPROVED:			
DIVISION ADMINISTRATOR	DATE	DIVISION ADMINISTRATOR	DATE

Jacobs - J12004 - Project: 603457 - 04/28/11 - West Bridgewater - C&D - C&D - 001 - 1000 - November 08, 2011

**WEST BRIDGEWATER  
ROUTES 28 & 106**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	34	66
PROJECT FILE NO.		603457	

**SIGN AND PAVEMENT  
MARKING PLAN  
STA. 15+15 TO STA. 20+20**

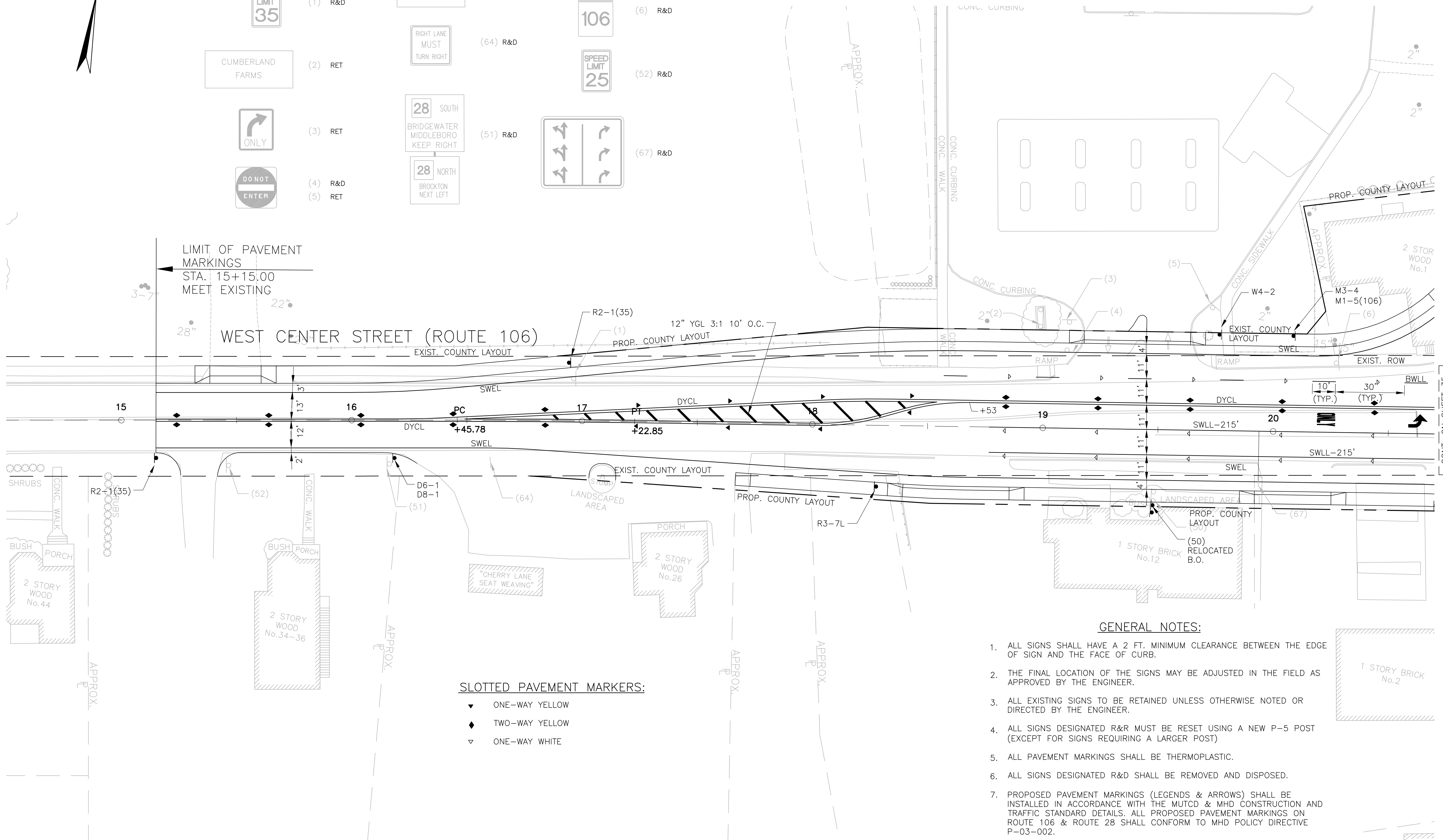


**EXISTING SIGN LEGEND**

	(1) R&D		(50) R&R		(6) R&D
	(2) RET		(64) R&D		(52) R&D
	(3) RET		(51) R&D		(67) R&D
	(4) R&D		(5) RET		

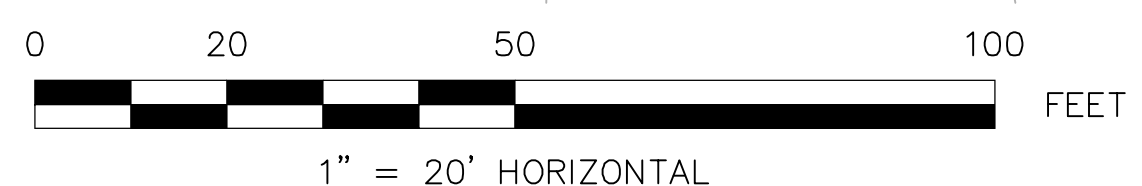
LIMIT OF PAVEMENT MARKINGS  
STA. 15+15.00  
MEET EXISTING

**WEST CENTER STREET (ROUTE 106)**



**SLOTTED PAVEMENT MARKERS:**

- ▼ ONE-WAY YELLOW
- ◆ TWO-WAY YELLOW
- ▽ ONE-WAY WHITE



**GENERAL NOTES:**

1. ALL SIGNS SHALL HAVE A 2 FT. MINIMUM CLEARANCE BETWEEN THE EDGE OF SIGN AND THE FACE OF CURB.
2. THE FINAL LOCATION OF THE SIGNS MAY BE ADJUSTED IN THE FIELD AS APPROVED BY THE ENGINEER.
3. ALL EXISTING SIGNS TO BE RETAINED UNLESS OTHERWISE NOTED OR DIRECTED BY THE ENGINEER.
4. ALL SIGNS DESIGNATED R&R MUST BE RESET USING A NEW P-5 POST (EXCEPT FOR SIGNS REQUIRING A LARGER POST)
5. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
6. ALL SIGNS DESIGNATED R&D SHALL BE REMOVED AND DISPOSED.
7. PROPOSED PAVEMENT MARKINGS (LEGENDS & ARROWS) SHALL BE INSTALLED IN ACCORDANCE WITH THE MUTCD & MHD CONSTRUCTION AND TRAFFIC STANDARD DETAILS. ALL PROPOSED PAVEMENT MARKINGS ON ROUTE 106 & ROUTE 28 SHALL CONFORM TO MHD POLICY DIRECTIVE P-03-002.
8. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350.

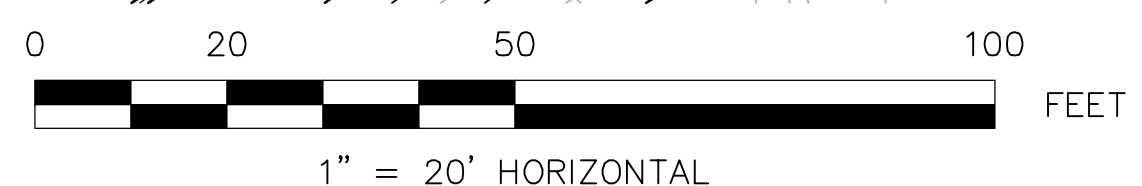
**WEST BRIDGEWATER  
ROUTES 28 & 106**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	35	66
PROJECT FILE NO.		603457	

**SIGN AND PAVEMENT MARKING PLAN  
STA. 19+50 TO STA. 25+00**

EXISTING SIGN LEGEND

EXISTING SIGN LEGEND



J:\2004 Projects\04013\_043\West Bridgewater\Cad\22-27\FPS\_001.dwg November 08, 2011

CONT. ON SHEET 39

CONT. ON SHEET 34

CONT. ON SHEET 36

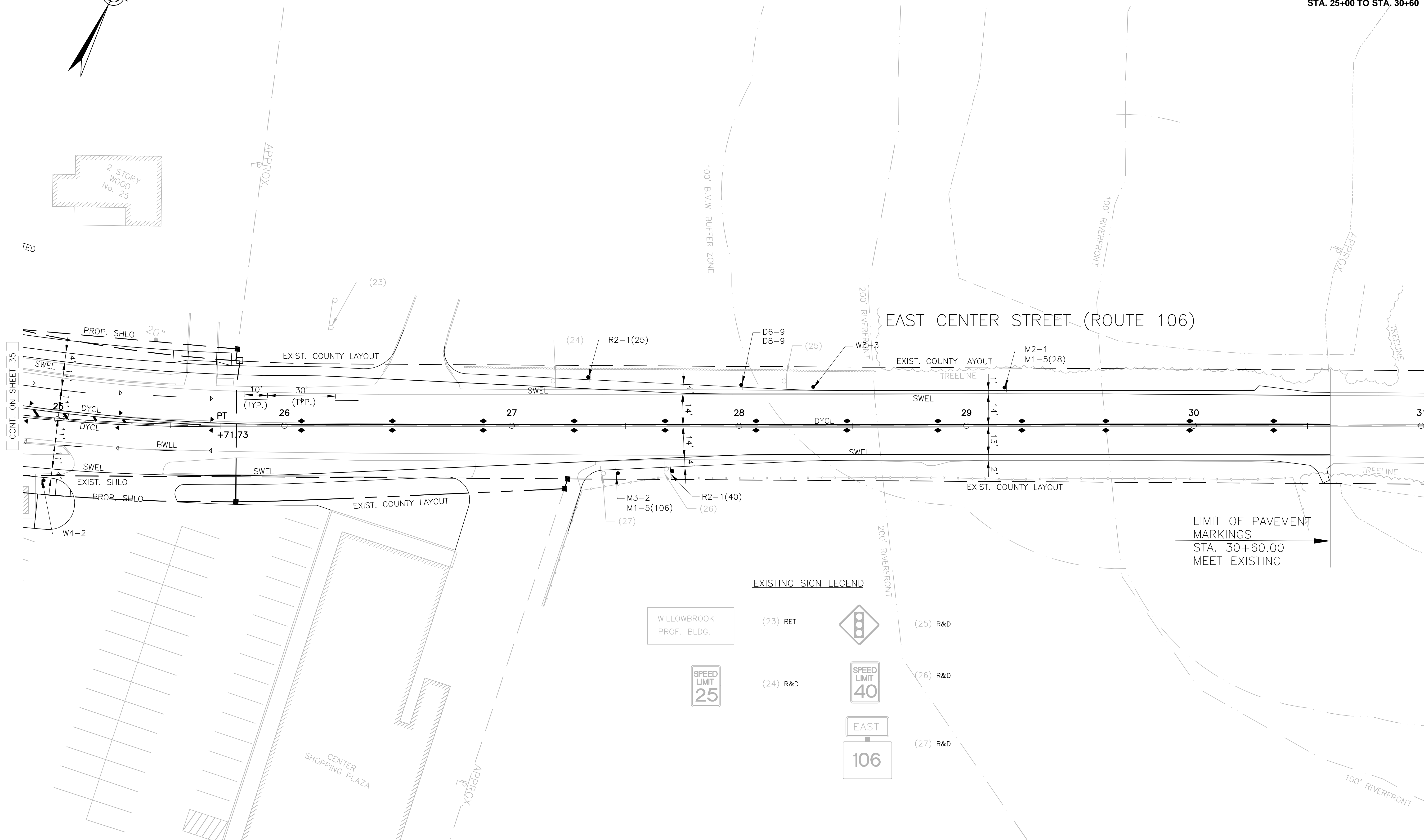
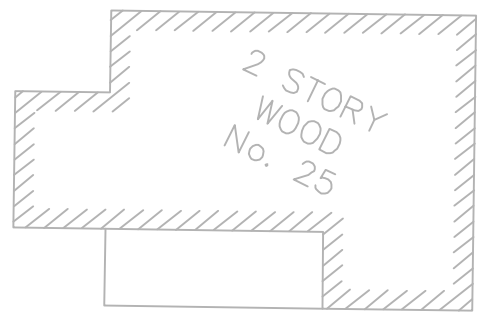
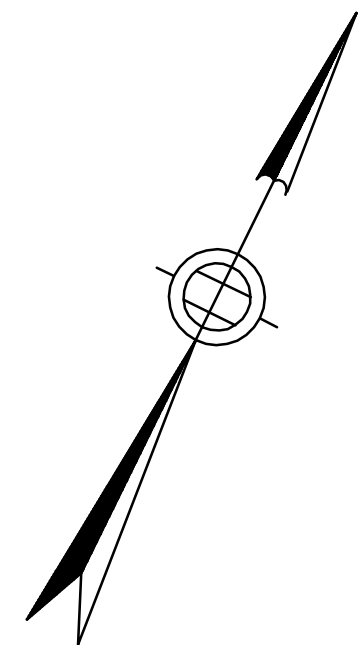
CONT. ON SHEET 37

CONT. ON SHEET 38

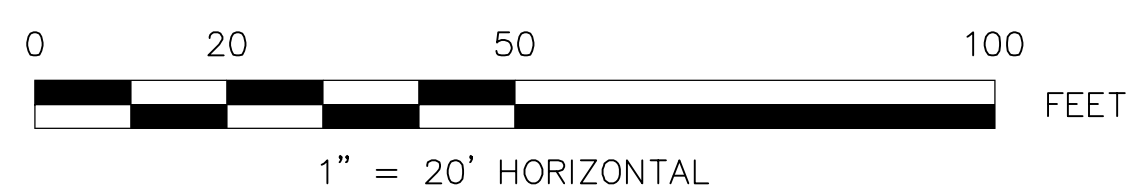
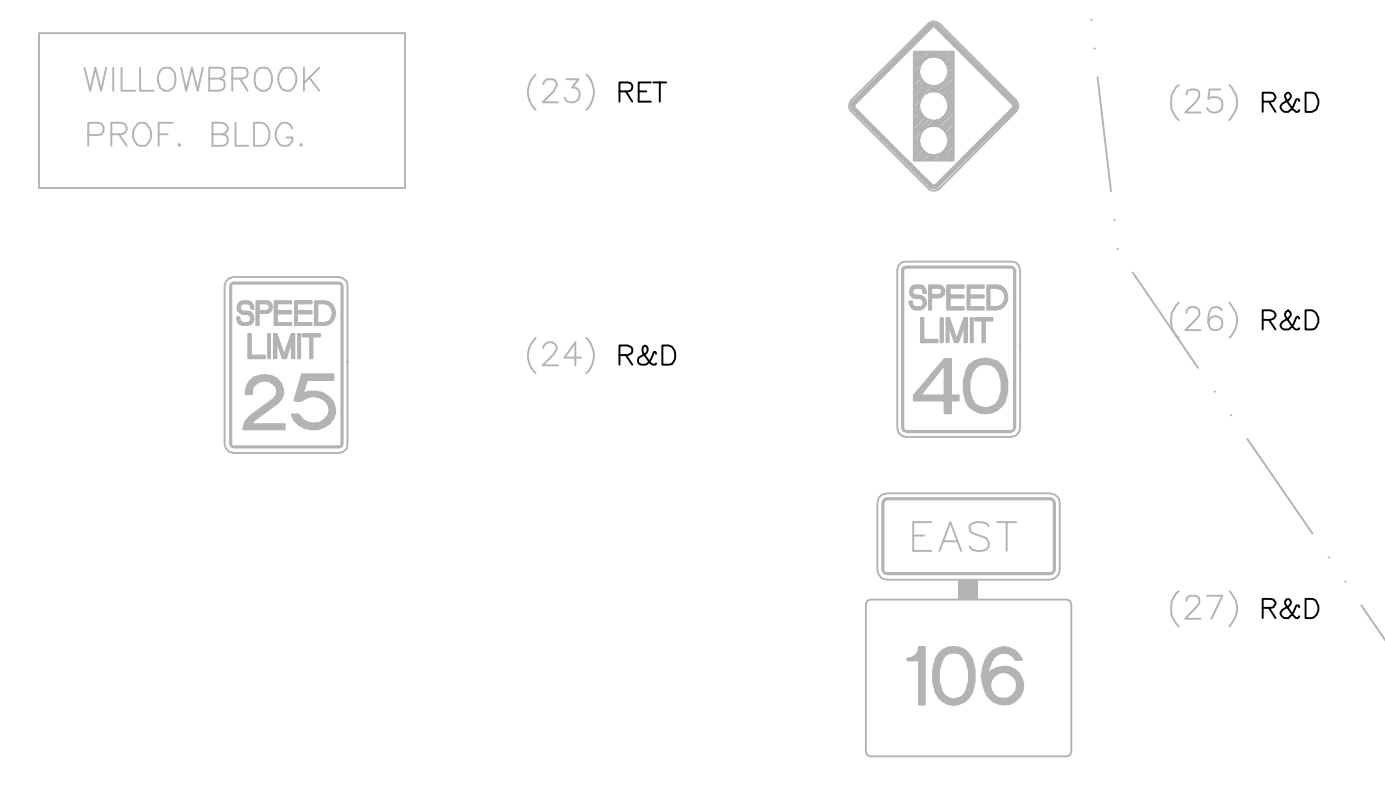
WEST BRIDGEWATER  
ROUTES 28 & 106

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	36	66
PROJECT FILE NO.		603457	

SIGN AND PAVEMENT  
MARKING PLAN  
STA. 25+00 TO STA. 30+60



EXISTING SIGN LEGEND



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**WEST BRIDGEWATER  
ROUTES 28 & 106**

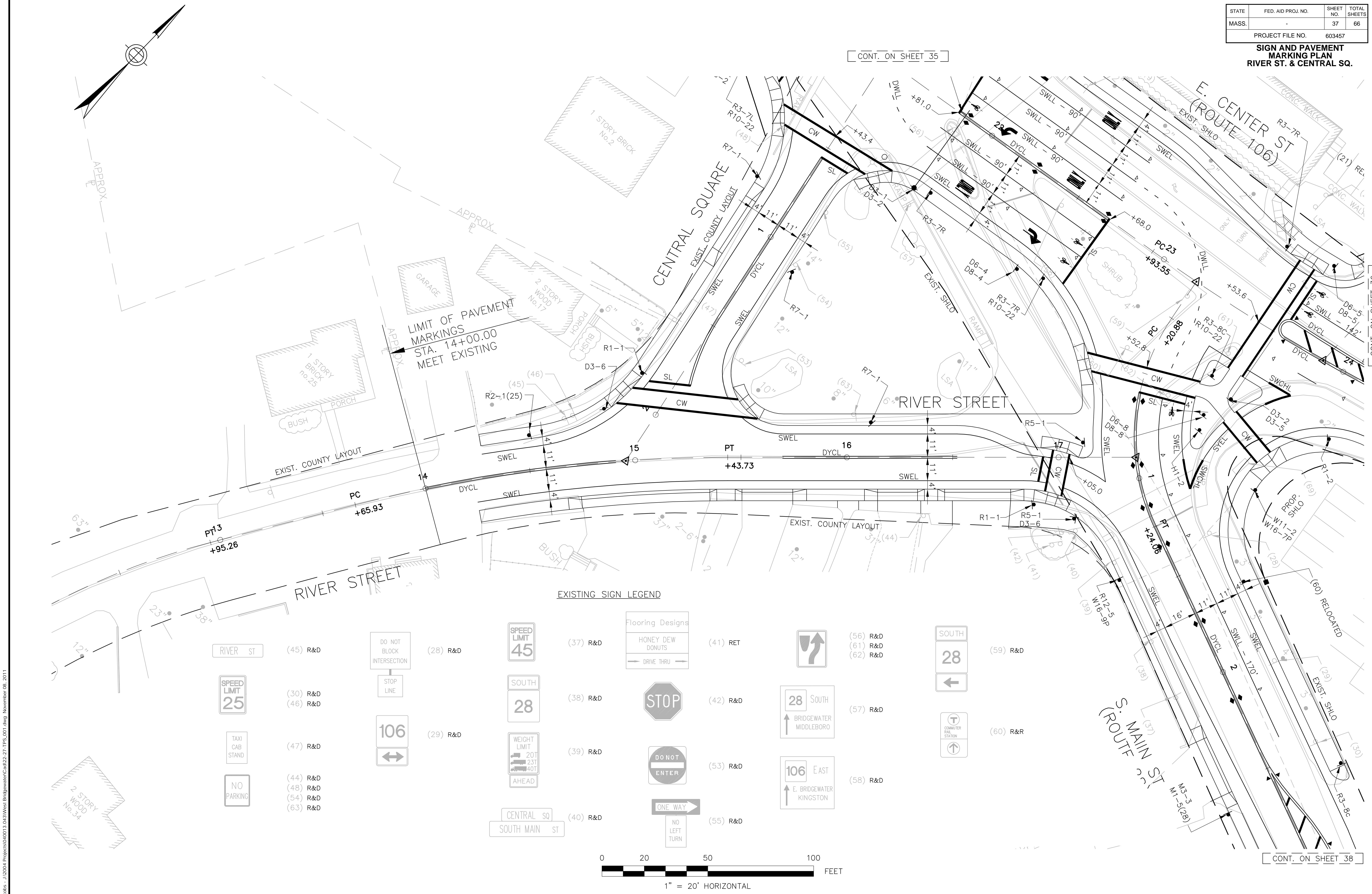
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	37	66
PROJECT FILE NO.		603457	

**SIGN AND PAVEMENT  
MARKING PLAN  
RIVER ST. & CENTRAL SQ.**

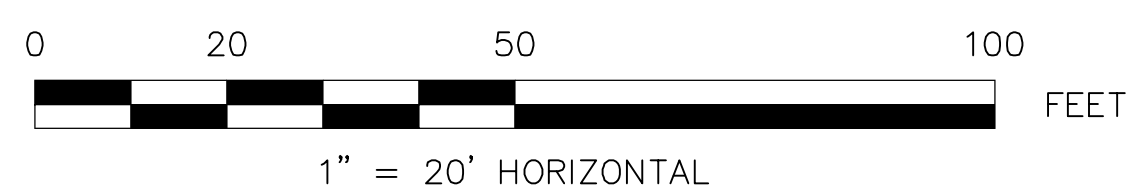
CONT. ON SHEET 35

CONT. ON SHEET 36

CONT. ON SHEET 38



**EXISTING SIGN LEGEND**

J:\2004 Projects\04013.043\West Bridgewater\cad\22-23\TFS\_001.dwg November 08, 2011

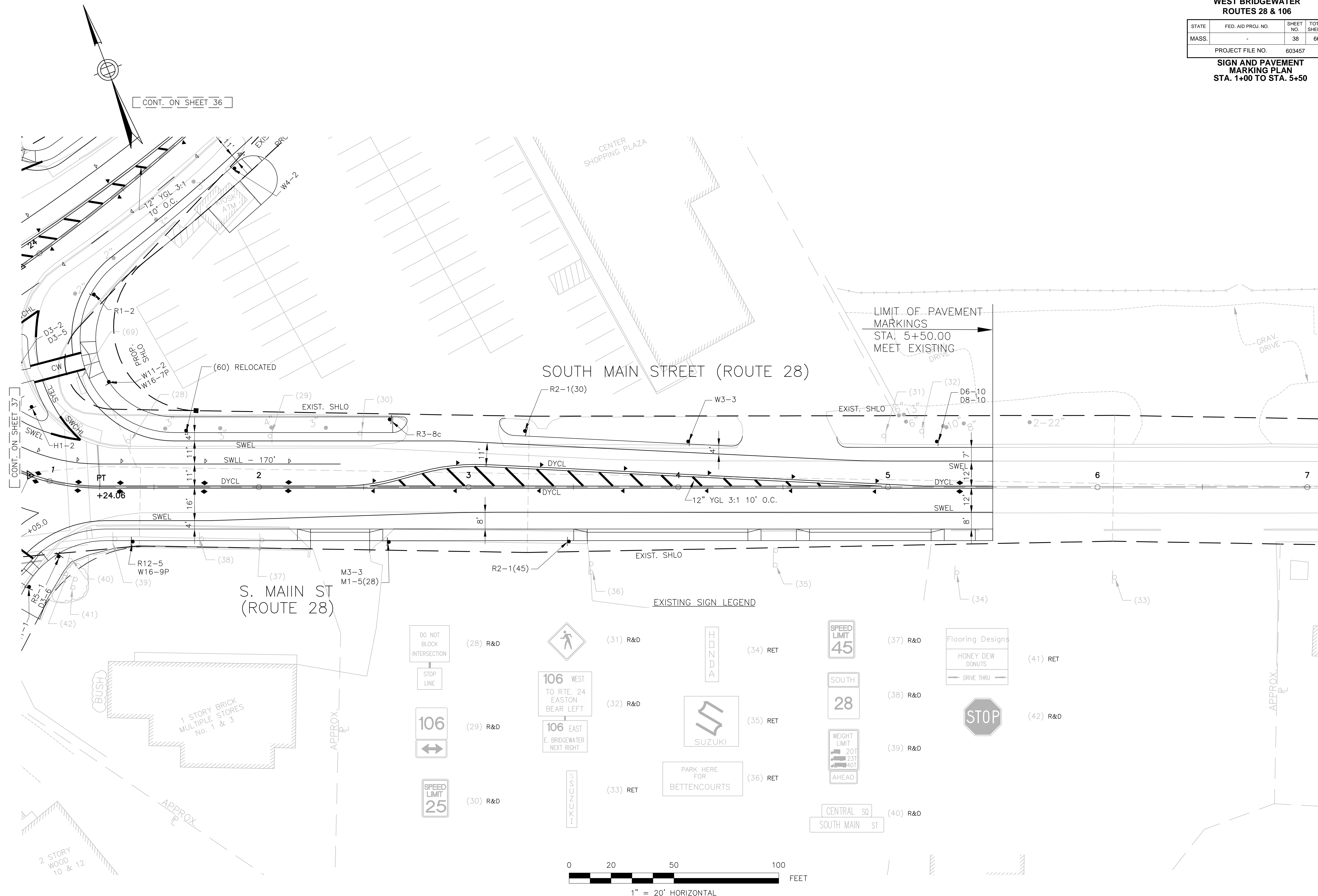


**WEST BRIDGEWATER  
ROUTES 28 & 106**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	38	66
PROJECT FILE NO.		603457	

**SIGN AND PAVEMENT  
MARKING PLAN  
STA. 1+00 TO STA. 5+50**

CONT. ON SHEET 36

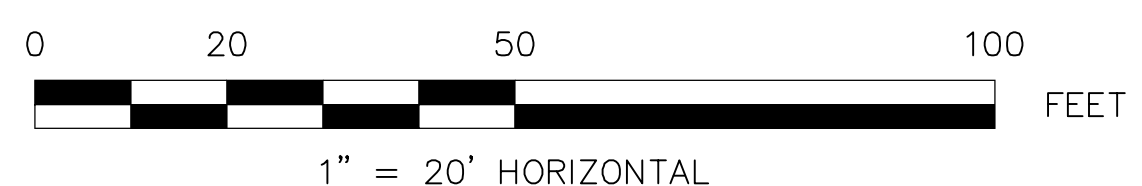


LIMIT OF PAVEMENT MARKINGS  
STA. 5+50.00  
MEET EXISTING

SOUTH MAIN STREET (ROUTE 28)

S. MAIN ST (ROUTE 28)

EXISTING SIGN LEGEND

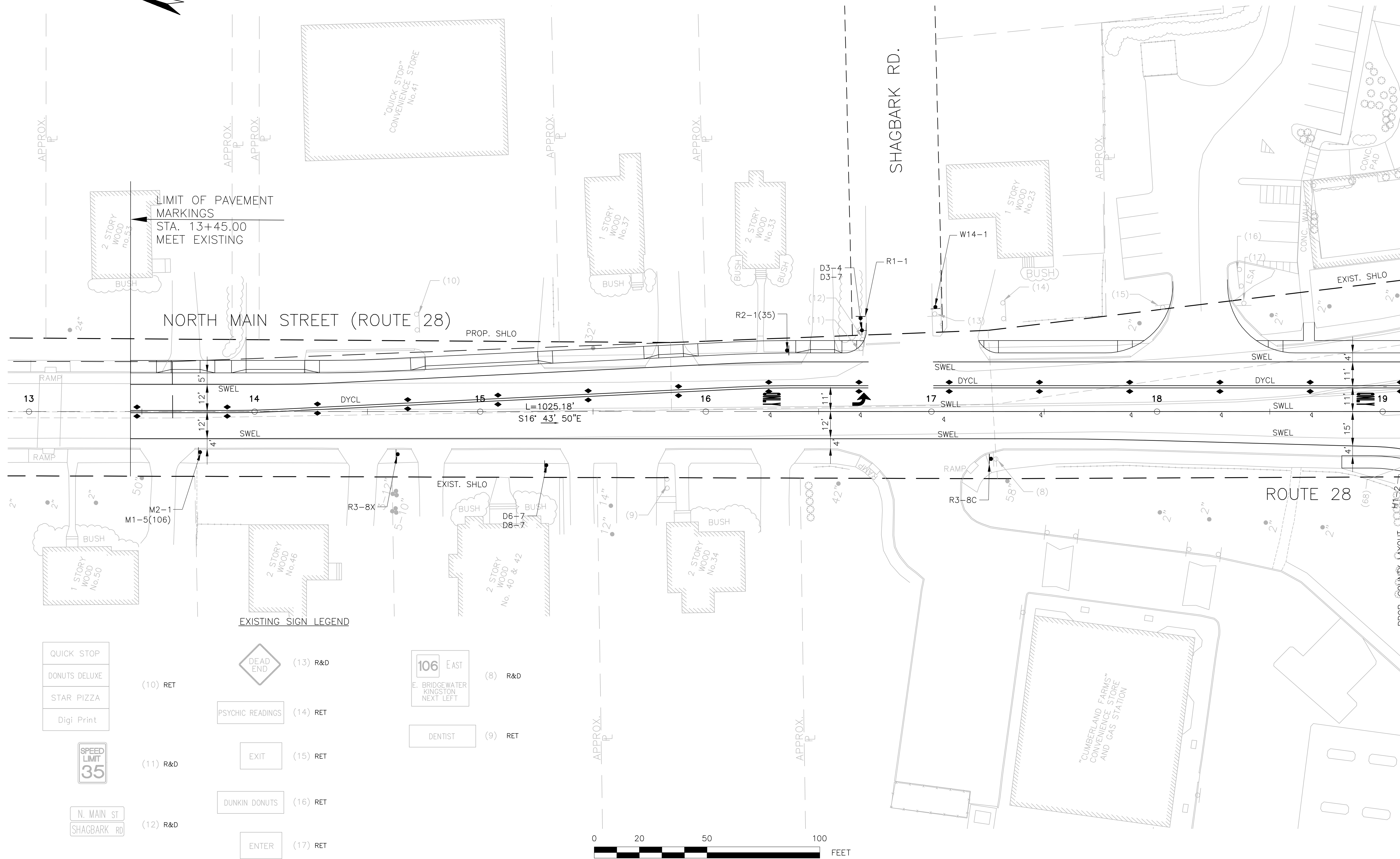
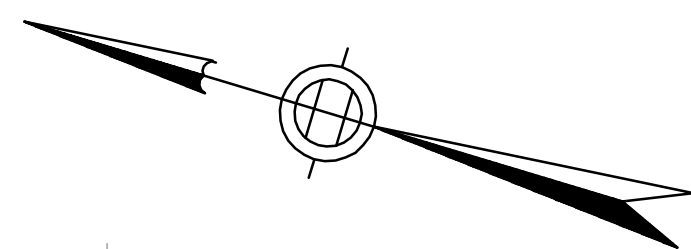


Jacobs - J13004 - Project 040013 - 043 West Bridgewater - Cad 22-27 - F05\_001.dwg November 08, 2011

WEST BRIDGEWATER  
ROUTES 28 & 106

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	39	66
PROJECT FILE NO.		603457	

SIGN AND PAVEMENT  
MARKING PLAN  
STA. 13+45 TO STA. 19+00



EXISTING SIGN LEGEND

- QUICK STOP
- DONUTS DELUXE
- STAR PIZZA
- Digi Print

(10) RET



(11) R&D



(12) R&D



(13) R&D

PSYCHIC READINGS (14) RET



(15) RET

DUNKIN DONUTS (16) RET



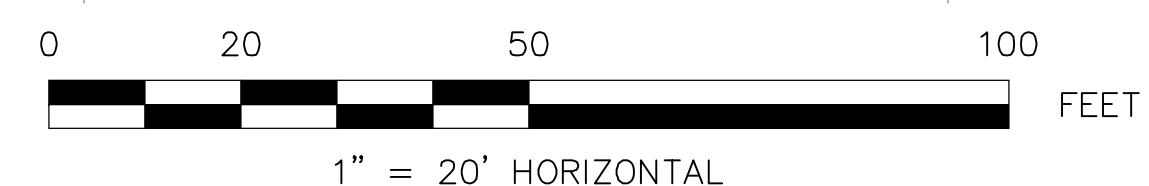
(17) RET



(8) R&D



(9) RET



CONT. ON SHEET 35

# TRAFFIC SIGN SUMMARY

## WEST BRIDGEWATER ROUTES 28 & 106

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	40	66
PROJECT FILE NO. 603457			

### TRAFFIC SIGN SUMMARY SHEET 1 OF 2

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	VERTICAL	ARROW		BACK-GROUND	LEGEND	BORDER			
R1-1	30"	30"		①	①	①	3	①	①	①	P5 3 REQ'D	6.25	18.75
R1-2	36"X36"X36"						1				P5 1 REQ'D	9.00	9.00
R2-1(25) R2-1(30) R2-1(35) R2-1(40) R2-1(45)	24"	30"		XX = 25			2				P5 2 REQ'D	5.00	10.00
				XX = 30			1				1 REQ'D	5.00	5.00
				XX = 35			3				3 REQ'D	5.00	15.00
				XX = 40			1				1 REQ'D	5.00	5.00
				XX = 45			1				1 REQ'D	5.00	5.00
R3-7L	30"	30"					2				P5 1 REQ'D MOUNT 1 W/ R10-22	6.25	12.50
R3-7R	30"	30"					4				P5 2 REQ'D MOUNT 3 W/ R10-22	6.25	25.00
R3-8C	36"	30"					4				P5 2 REQ'D MOUNT 2 W/ R10-22	7.50	30.00
R3-8X	36"	30"					1				P5 1 REQ'D	7.50	7.50
R5-1	30"	30"					2				P5 2 REQ'D	6.25	12.50
R7-1	12"	18"					3				P5 3 REQ'D	1.50	4.50
R10-12	24"	30"		↓	↓	↓	1	↓	↓	↓	MOUNT ON MAST ARM	5.00	5.00
R10-22	18"	24"		③	③	③	7	③	③	③	P5 7 REQ'D	3.00	21.00
R12-5	24"	36"		①	①	①	1	①	①	①	P5 1 REQ'D	6.00	6.00
W3-3	36"	36"					2				P5 2 REQ'D	9.00	18.00
W4-2	36"	36"		↓	↓	↓	2	↓	↓	↓	P5 2 REQ'D	9.00	18.00

**NOTES:**

1. ALL STOP AND YIELD SIGNS PROPOSED IN THIS CONTRACT ARE SUBJECT TO FIELD INVESTIGATION BY THE DISTRICT OFFICE OF THE MASSACHUSETTS HIGHWAY DEPARTMENT TO JUSTIFY WARRANTS BEFORE INSTALLATION.
2. NUMERICAL LIMITS AND JUSTIFICATION FOR SPEED & ADVISORY EXIT SPEED SIGNS SHALL BE OBTAINED FROM THE SPEED ZONING UNIT OF THE TRAFFIC ENGINEERING SECTION, MASSACHUSETTS HIGHWAY DEPARTMENT, BEFORE FABRICATION AND/OR ERECTION.
3. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2003 EDITION, THE 1996 MHD CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AND ALL ADMENDMENTS WILL GOVERN.
4. PBS = PRINT BOTH SIDES
5. ① SEE MUTCD 2003 EDITION, 1979 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE MHD STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.  
 ② SEE MASS. HIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, 1996.  
 ③ SEE MHD BICYCLE LOOP DETECTOR DETAIL SHEET

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	VERTICAL	ARROW		BACK-GROUND	LEGEND	BORDER			
W11-2	30"	30"		①	①	①	1	①	①	①	P5 1 REQ'D	6.25	6.25
W14-1	30"	30"					1				P5 1 REQ'D	6.25	6.25
W16-7P	21"	15"					1				MOUNT 1 W/ W11-2	2.19	2.19
W16-9P	24"	12"		↓	↓	↓	1	↓	↓	↓	MOUNT 1 W/ R12-5	2.00	2.00
M1-5(106)	45"	36"		②	②	②	3	②	②	②	P-5 6 REQ'D	11.25	33.75
M1-5(28)	36"	36"					2				P-5 4 REQ'D	9.00	18.00
M2-1	21"	15"		①	①	①	2	①	①	①	MOUNT 1 W/ M1-5(106) MOUNT 1 W/ M1-5(28)	2.19	4.38
M3-2	24"	12"					1				MOUNT 1 W/ M1-5(106)	2.00	2.00
M3-3	24"	12"					1				MOUNT 1 W/ M1-5(28)	2.00	2.00
M3-4	24"	12"		↓	↓	↓	1	↓	↓	↓	MOUNT 1 W/ M1-5(106)	2.00	2.00
H1-2	24"	24"		②	②	②	2	②	②	②	P5 2 REQ'D	EACH	EACH
D3-1	VARIABLE	12"		6"	3"	3"	1	①	①	①	MOUNT 1 ON MAST ARM	EACH	EACH
D3-2	VARIABLE	12"		6"	3"	3"	2				MOUNT 1 W/ D3-1 MOUNT 1 W/ D3-5	EACH	EACH
D3-3	VARIABLE	12"		6"	3"	3"	1				MOUNT 1 ON MAST ARM	EACH	EACH
D3-4	VARIABLE	12"		6"	3"	3"	2				MOUNT 1 W/ D3-3 MOUNT 1 W/ D3-7	EACH	EACH
D3-5	VARIABLE	12"		6"	3"	3"	1				MOUNT 1 ON MAST ARM	EACH	EACH
D3-6	VARIABLE	12"		6"	3"	3"	2				P5 1 REQ'D MOUNT 1 W/ R5-1	EACH	EACH
D3-7	VARIABLE	12"		6"	3"	3"	1	↓	↓	↓	P5 1 REQ'D	EACH	EACH

# TRAFFIC SIGN SUMMARY

## WEST BRIDGEWATER ROUTES 28 & 106

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	41	66
PROJECT FILE NO.		603457	

### TRAFFIC SIGN SUMMARY SHEET 2 OF 2

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	VERTICAL	ARROW		BACK-GROUND	LEGEND	BORDER			
D6-1	60"	60"		18/9D/7C/6C 6C 6C	8" 7" 7" 8"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-2	60"	60"		18/9D/7C/6C 6C	7" 7" 7" 8"	8"	1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-3	60"	60"		18/9D/7C/6C 6C 6C	8" 7" 7" 8"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-4	60"	60"		18/9D/7C/6C 6C 6C	8" 7" 7" 8"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-5	60"	60"		18/9D/7C/6C 6C	7" 7" 7" 8"	8"	1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-6	60"	60"		18/9D/7C/6C 6C 6C 6C	6" 4" 4" 4" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-7	60"	60"		18/9D/7C/6C 6C 6C 6C	6" 4" 4" 4" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-8	60"	60"		18/9D/7C/6C 6C 6C 6C	6" 4" 4" 4" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-9	60"	60"		18/9D/7C/6C 6C 6C	8" 7" 7" 8"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D6-10	60"	60"		18/9D/7C/6C 6C 6C 6C	6" 4" 4" 4" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	5" NOMINAL STEEL	25.00	25.00
D8-1	48"	42"		18/9D/7C/6C 6C	6" 6" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-1	14.00	14.00
D8-2	48"	42"		18/9D/7C/6C 6C 6C	3" 3" 3" 3"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-2	14.00	14.00
D8-3	48"	42"		18/9D/7C/6C 6C	2.5" 2.5" 2.5" 2.5"	8"	1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-3	14.00	14.00
D8-4	48"	42"		18/9D/7C/6C 6C	2.5" 2.5" 2.5" 2.5"	8"	1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-4	14.00	14.00
D8-5	48"	42"		18/9D/7C/6C 6C	3" 3" 3" 3"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-5	14.00	14.00

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	VERTICAL	ARROW		BACK-GROUND	LEGEND	BORDER			
D8-6	48"	42"		18/9D/7C/6C 6C	2.5" 2.5" 2.5" 2.5"	8"	1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-6	14.00	14.00
D8-7	48"	42"		18/9D/7C/6C 6C 6C	3" 3" 3" 3"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-7	14.00	14.00
D8-8	48"	42"		18/9D/7C/6C 6C 6C	3" 3" 3" 3"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-8	14.00	14.00
D8-9	48"	42"		18/9D/7C/6C 6C	6" 6" 6"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-9	14.00	14.00
D8-10	48"	42"		18/9D/7C/6C 6C 6C	3" 3" 3" 3"		1	GREEN	SILVER WHITE	SILVER WHITE	MOUNT W/ D6-10	14.00	14.00

**WEST BRIDGEWATER  
ROUTES 28 & 106**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		42	66

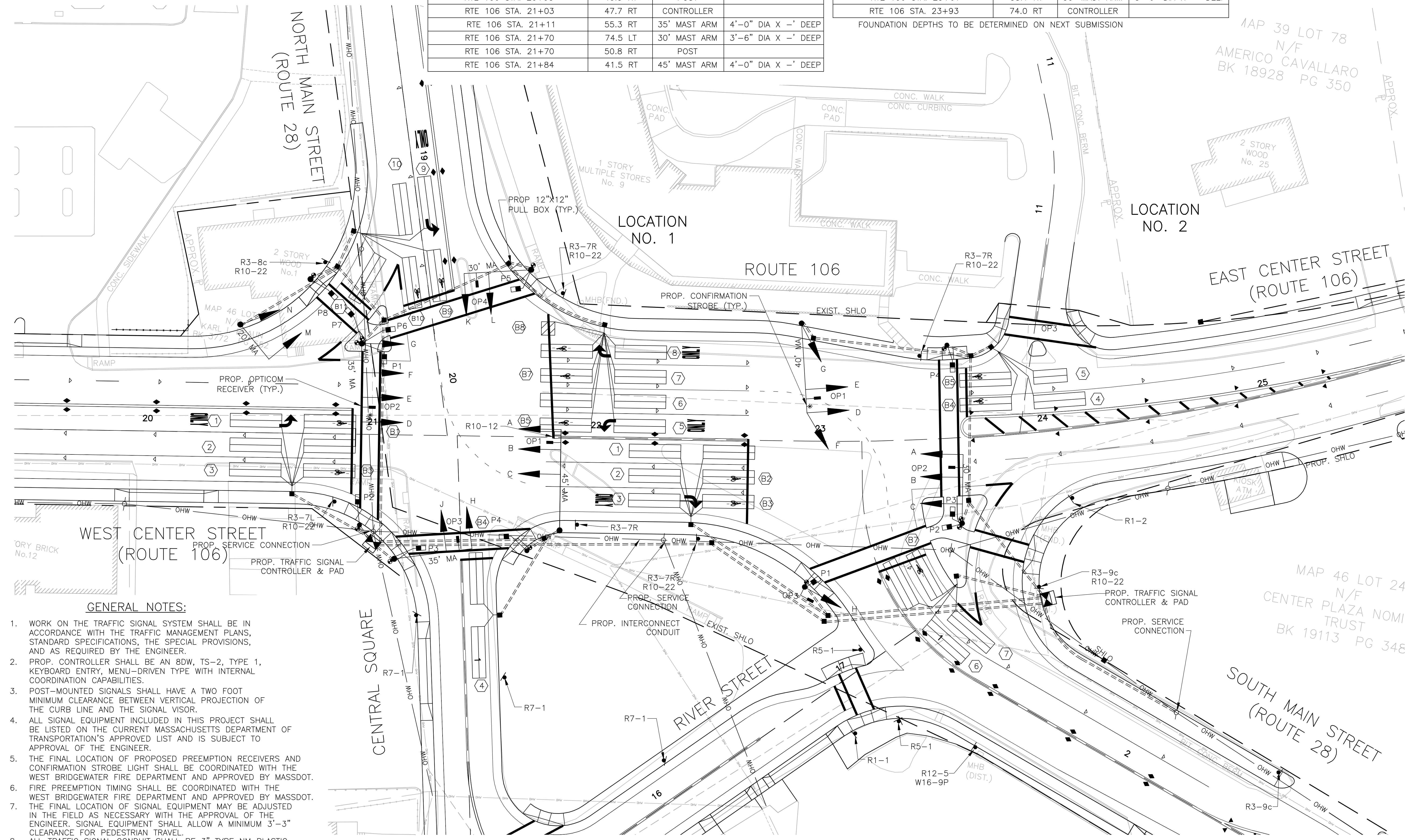
PROJECT FILE NO. 603457

**TRAFFIC SIGNAL PLAN**

PROPOSED SIGNAL EQUIPMENT LOCATION			
BASILINE STA.	OFFSET (ft)	TYPE	FOUNDATION
RTE 106 STA. 20+41	48.1 LT	20' MAST ARM	3'-6" DIA X -' DEEP
RTE 106 STA. 20+72	68.9 LT	POST	
RTE 106 STA. 20+95	40.4 LT	35' MAST ARM	4'-0" DIA X -' DEEP
RTE 106 STA. 20+95	40.5 RT	POST	
RTE 106 STA. 21+03	47.7 RT	CONTROLLER	
RTE 106 STA. 21+11	55.3 RT	35' MAST ARM	4'-0" DIA X -' DEEP
RTE 106 STA. 21+70	74.5 LT	30' MAST ARM	3'-6" DIA X -' DEEP
RTE 106 STA. 21+70	50.8 RT	POST	
RTE 106 STA. 21+84	41.5 RT	45' MAST ARM	4'-0" DIA X -' DEEP

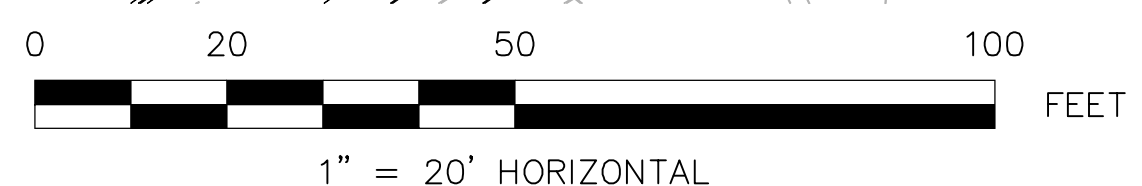
PROPOSED SIGNAL EQUIPMENT LOCATION			
BASILINE STA.	OFFSET (ft)	TYPE	FOUNDATION
RTE 106 STA. 22+90	51.4 LT	40' MAST ARM	4'-0" DIA X -' DEEP
RTE 106 STA. 22+94	64.4 RT	POST	
RTE 106 STA. 23+59	41.5 LT	POST	
RTE 106 STA. 23+61	38.1 RT	30' MAST ARM	3'-6" DIA X -' DEEP
RTE 106 STA. 23+93	74.0 RT	CONTROLLER	

FOUNDATION DEPTHS TO BE DETERMINED ON NEXT SUBMISSION



**GENERAL NOTES:**

1. WORK ON THE TRAFFIC SIGNAL SYSTEM SHALL BE IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLANS, STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND AS REQUIRED BY THE ENGINEER.
2. PROP. CONTROLLER SHALL BE AN 8DW, TS-2, TYPE 1, KEYBOARD ENTRY, MENU-DRIVEN TYPE WITH INTERNAL COORDINATION CAPABILITIES.
3. POST-MOUNTED SIGNALS SHALL HAVE A TWO FOOT MINIMUM CLEARANCE BETWEEN VERTICAL PROJECTION OF THE CURB LINE AND THE SIGNAL VISOR.
4. ALL SIGNAL EQUIPMENT INCLUDED IN THIS PROJECT SHALL BE LISTED ON THE CURRENT MASSACHUSETTS DEPARTMENT OF TRANSPORTATION'S APPROVED LIST AND IS SUBJECT TO APPROVAL OF THE ENGINEER.
5. THE FINAL LOCATION OF PROPOSED PREEMPTION RECEIVERS AND CONFIRMATION STROBE LIGHT SHALL BE COORDINATED WITH THE WEST BRIDGEWATER FIRE DEPARTMENT AND APPROVED BY MASSDOT.
6. FIRE PREEMPTION TIMING SHALL BE COORDINATED WITH THE WEST BRIDGEWATER FIRE DEPARTMENT AND APPROVED BY MASSDOT.
7. 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'-3" CLEARANCE FOR PEDESTRIAN TRAVEL.
8. ALL TRAFFIC SIGNAL CONDUIT SHALL BE 3" TYPE NM PLASTIC (UL) UNLESS OTHERWISE NOTED.
9. UTILIZE ONE TRENCH FOR MULTIPLE CONDUITS WHEREVER POSSIBLE.



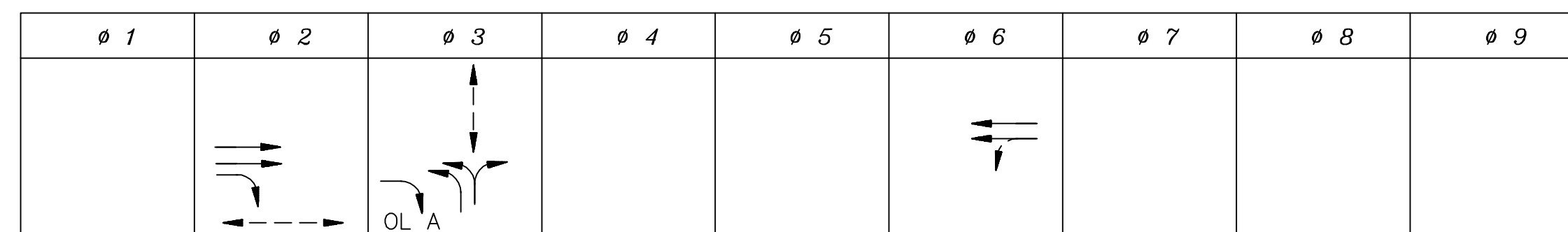
Jacobs - J13204 - Project: 040113 - 0431 West Bridgewater, CA 01906 - 08/2011



**WEST BRIDGEWATER  
ROUTES 28 & 106**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	44	66
PROJECT FILE NO.		603457	

**TRAFFIC SIGNAL DATA  
LOCATION NO. 2**



**SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (COORDINATED) LOCATION NO. 2**

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH OPER
E. CENTER STREET (RTE. 106)	EB	A,B				G	Y	R	R	R	R							R	R	R									FY	
E. CENTER STREET (RTE. 106)	EB	C				G	Y	R	R/GR	R/YR	R							R	R	R									FY	
E. CENTER STREET (RTE. 106)	WB	D,E				R	R	R	R	R	R							G	Y	R									FY	
S. MAIN STREET (RTE. 28)	NB	F,G,H				RL	RL	RL	GL	YL	RL							RL	RL	RL									FRL	
PEDESTRIAN	E-W	P1-P2					W/FDW	FDW	DW	DW	DW							DW	DW	DW									OFF	
PEDESTRIAN	N-S	P3-P4					DW	DW	DW	W/FDW	FDW	DW						DW	DW	DW									OFF	

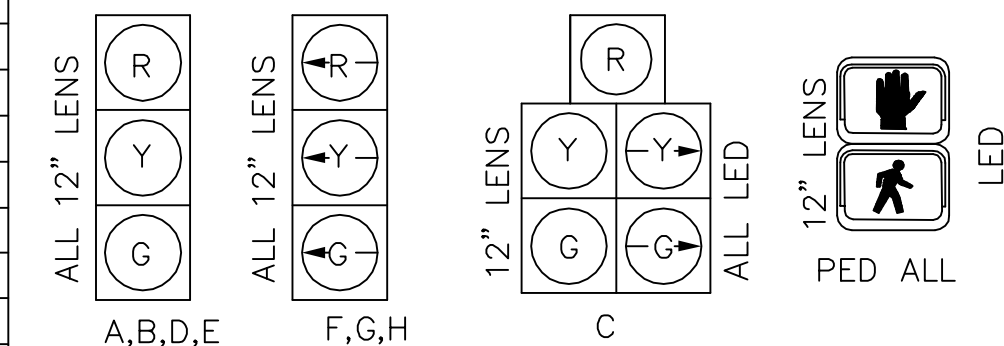
  

TIMING IN SECONDS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
MINIMUM GREEN (INITIAL)					10				10									10											
PASSAGE TIME (VEHICLE)					2				2									2											
MAXIMUM 1 (ALL OTHER TIMES)					35				43									35											
MAXIMUM 2 (4:00-6:00 PM BACK-UP)					40				38									40											
YELLOW CLEARANCE							4			4								4											
RED CLEARANCE								2			2								2										
WALK (W)					7				7											2									
PEDESTRIAN CLEARANCE					15				15																				
RECALL							MIN		OFF									MIN											
MEMORY							NON-LOCKING		NON-LOCKING									NON-LOCKING											

EMERGENCY ONLY

PAY ITEM	QUANTITY	ITEM
816.02	1	CONTROLLER 8DW, TS-2, TYPE 1 CAB.& FDN.
	1	SERVICE CONNECTION, TYPE OVERHEAD
	1	30 FT MAST ARM, TYPE II STEEL, BASE & FDN.
	1	40 FT MAST ARM, TYPE II STEEL, BASE & FDN.
	1	10 FT SIGNAL POST, BASE & FDN.
	1	8 FT SIGNAL POST, BASE & FDN.
	8	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
	1	1 WAY, 5 SECTION, SIGNAL HOUSING (12" LENS)
	15	6'x23' QUADRUPOLE ROADWAY LOOP DETECTORS
	1	6'x15' QUADRUPOLE ROADWAY LOOP DETECTORS
	7	DUAL CHANNEL LOOP DETECTOR AMPLIFIER(1 SPARE)
	4	UNIDIRECTIONAL SINGLE CHANNEL OPTICAL DETECTOR
	1	4 CHANNEL PHASE SELECTOR
	1	PREEMPTION CARD RACK
	1	CONFIRMATION STROBE (WHITE)
4	PEDESTRIAN HOUSING (LED)	
4	PEDESTRIAN PUSH BUTTON, SIGN & SADDLE	
811.31	9	12" X 12" PULL BOX
		Plus all necessary duct, cable, labor, miscellaneous material and equipment to complete the installation.

**SIGNAL IDENTIFICATION**



**NOTES:**

1. ALL SIGNALS SHALL HAVE TUNNEL AWAY VISORS.
2. ALL SIGNALS SHALL HAVE 5" LOUVERED BACK PLATES.
3. ALL SIGNALS SHALL HAVE RED, YELLOW AND GREEN LEDS.

**COORDINATION DATA  
(ALL ENTRIES IN SECONDS)**

D/S/O	TIME PERIOD	OFFSET	CYCLE LENGTH
1/1/1	AM PEAK	84	90
2/1/1	ALL OTHER TIMES	86	90
-/-/-			
-/-/-			

D/S/O	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9
1/1/1		41	49			41			
2/1/1		46	44			46			
-/-/-									
-/-/-									

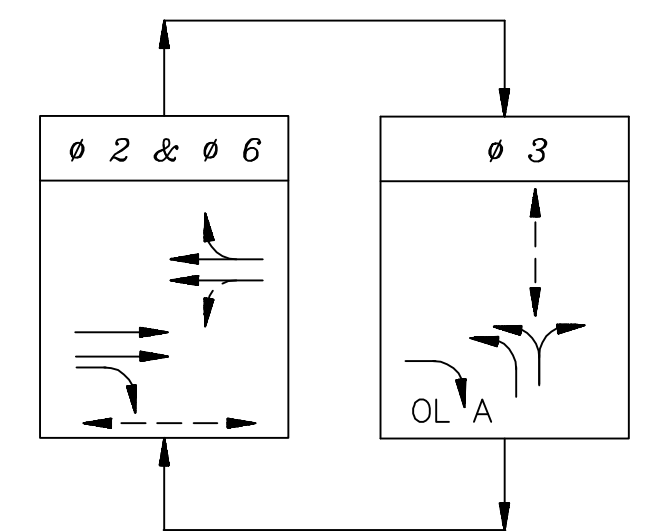
D/S/O = DIAL/SPLIT/OFFSET

**LOOP DETECTOR DATA**

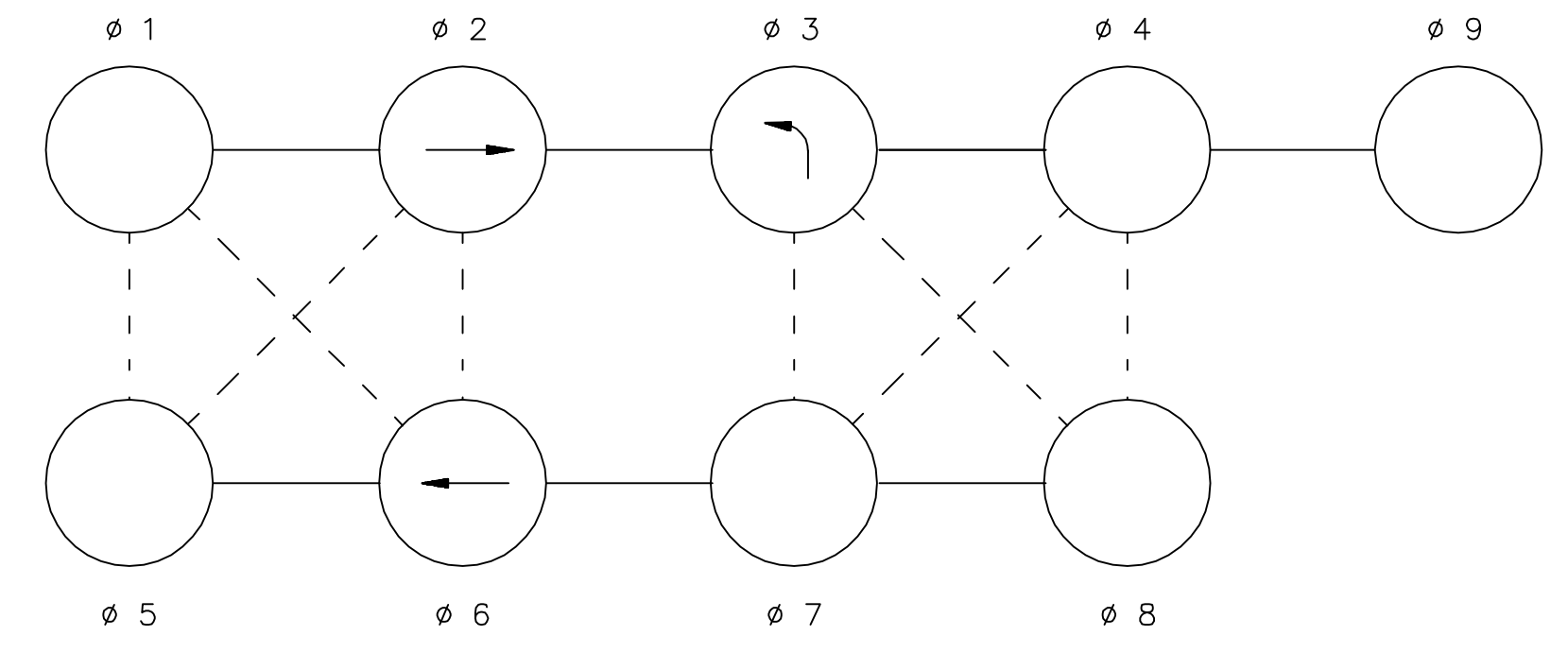
DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED TIME IN SEC.

DETECTOR NUMBER	AMPLIFIER NUMBER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	Ø CALLED	Ø EXT.	MODE A=PULSE B=PREL.	DELAY TIME	EXT. TIME
Ø1	1	1	2Ø6'X23' 2-4-2	2	2	2	B	-	-
Ø2	1	2	1Ø6'X23' 2-4-2	2	2	2	B	-	-
Ø3	2	1	1Ø6'X23' 2-4-2	2	2	2	B	-	-
Ø4	2	2	1Ø6'X23' 2-4-2	2	2	2	B	-	-
Ø5	3	1	1Ø6'X23' 2-4-2	2	2	2	B	-	-
Ø6	3	2	1Ø6'X23' 2-4-2	6	6	6	B	-	-
Ø7	4	1	1Ø6'X23' 2-4-2	6	6	6	B	-	-
Ø8	4	2	1Ø6'X23' 2-4-2	6	6	6	B	-	-
Ø9	5	1	1Ø6'X15' 2-4-2	6	6	6	B	-	-
Ø10	5	2	2Ø6'X23' 2-4-2	3	3	3	B	-	-
Ø11	6	1	1Ø6'X23' 2-4-2	3	3	3	B	-	-
Ø12	6	2	1Ø6'X23' 2-4-2	3	3	3	B	-	-

**PREFERENTIAL PHASING SEQUENCE**



**NEMA DUAL RING PHASING NOTES:**



**EMERGENCY PRE-EMPTION DATA**

APPROACH	PHASE	TIME (SEC)
E. CENTER STREET (RTE. 106) WB	OP1	MIN. 10 MAX. 120
E. CENTER STREET (RTE. 106) EB	OP2	MIN. 10 MAX. 120
S. MAIN STREET (RTE. 28) NB	OP3	MIN. 10 MAX. 120