

# GENERAL NOTES

## 1) SIGNING WORK ZONE

- A) USE 'SURVEY CREW AHEAD' AND 'END SURVEY' SIGNS AS NEEDED TO ESTABLISH THE WORK ZONE.
- B) USE APPROVED COMPOSITE SUBSTRATE WITH TYPE VII, VIII OR IX FLUORESCENT ORANGE SHEETING OR FLUORESCENT ORANGE NCDOT APPROVED ROLL-UP SIGNS.
- C) PORTABLE ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE EOT TO BOTTOM OF SIGN.
- D) REMOVE OR LAY DOWN SIGNS AT THE END OF EACH WORK DAY. WHEN WORK IS NOT PURSUED FOR MORE THAN 30 MINUTES, SIGNS SHOULD BE REMOVED OR LAID DOWN.
- E) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES. SIGN SPACING CAN BE INCREASED ABOVE THE MINIMUM SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE ENGINEER.

## 2) VEHICLE PLACEMENT

- A) IF VEHICLE IS PARKED ADJACENT TO THE ROADWAY, THE LIGHT BAR MUST BE OPERATING AND THE VEHICLE SHOULD NOT OBSTRUCT THE VIEW OF SURVEY CREW OR OF THE APPROACHING TRAFFIC.

- B) PARK VEHICLES A MINIMUM OF 5' (1.5M) FROM THE EDGE OF TRAVEL WAY. PARKED VEHICLES SHOULD NOT OBSTRUCT THE VIEW OF THE SURVEY CREW.

## 3) OBSERVER/SPOTTER

- A) OBSERVER/SPOTTER SHOULD CARRY AN AIR HORN OR MAINTAIN A DISTANCE FROM THE RODMAN TO ALLOW VERBAL COMMUNICATION.
- B) WHEN GETTING EDGE OF PAVEMENT ELEVATIONS OR CENTERLINE SHOTS AN OBSERVER/SPOTTER IS REQUIRED.

## 4) RAMPS AND INTERSECTIONS

- ALL RAMPS AND -Y- LINES SHOULD BE SIGNED WITH 'SURVEY CREW AHEAD' OR 'END SURVEY' SIGNS.

## 5) COORDINATE SURVEYS REQUIRING A LANE CLOSURE OR SPECIALIZED TRAFFIC CONTROL WITH THE REGIONAL TRAFFIC ENGINEER; UTILIZING DIVISION TRAFFIC SERVICES OR WORK ZONE TRAFFIC CONTROL UNIT.

## 6) ANY TIME AN INSTRUMENT IS PLACED WITHIN 10' (3M) OF A TRAVEL LANE, PLACE TRAFFIC CONES (36" TALL FOR FREEWAYS AND EXPRESSWAYS) ON BOTH SIDES OF THE TRIPOD.

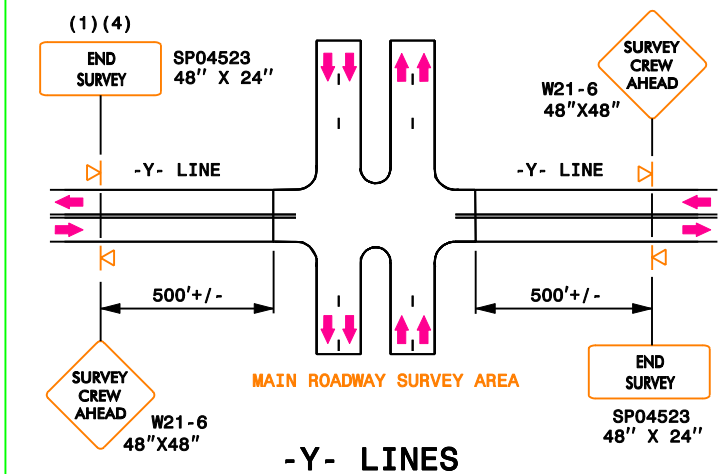
## 7) WHEN PLACING AND REMOVING SIGNS, INSTRUMENTS, ETC. PERFORM ALL WORK ON ONE SIDE OF MULTILANE FACILITY WITHOUT CROSSING MEDIAN, THEN DRIVE TO THE NEXT RAMP AND MAKE LOOP TO PERFORM THE SAME WORK IN THE OPPOSITE DIRECTION.

# LEGEND

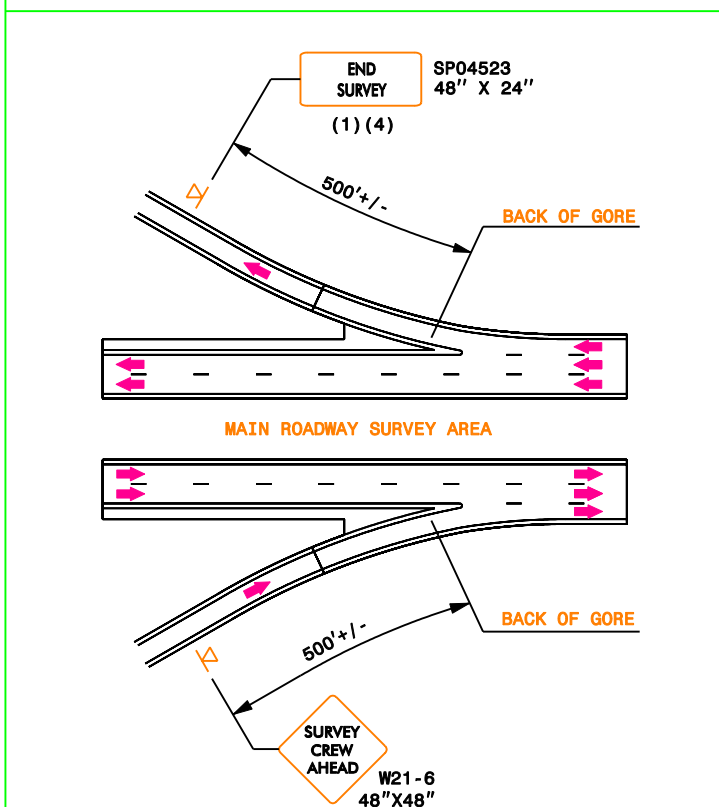
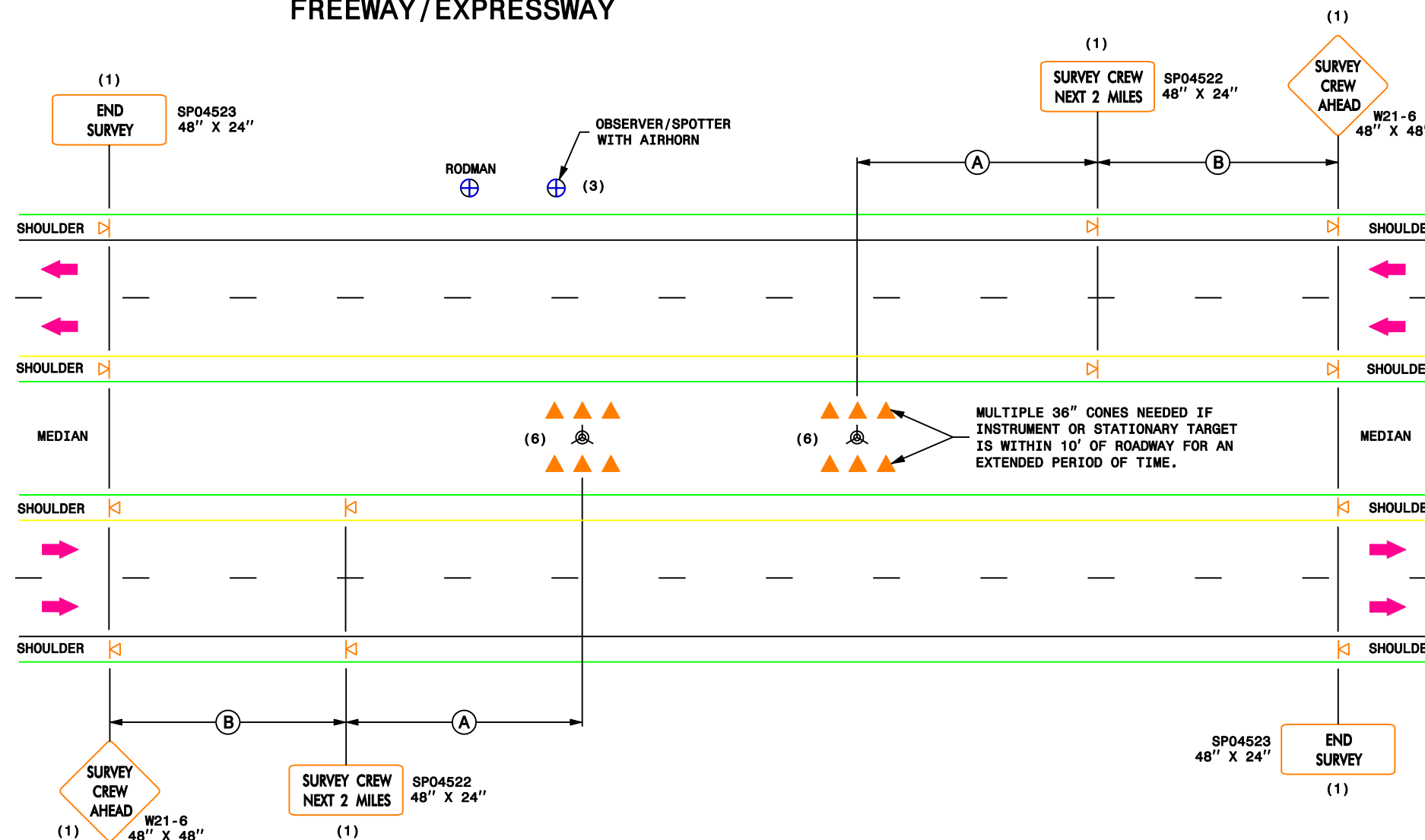
- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- 36" CONE
- CREW MEMBER / RODDING / CHAINING / PAINTING / ETC.
- INSTRUMENT / TARGET LOCATION

# SIGN SPACING CHART

POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET) +/-	
	(A)	(B)
≤ 35	200	200
40 - 50	350	350
55	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500



# CONVENTIONAL SURVEY METHOD FOR TYPICAL MULTILANE-DIVIDED FREEWAY/EXPRESSWAY



**DRAWING NUMBER 1**  
 IMPLEMENTATION DATE: 3/16/05  
 REVISED: 8/09/06

# GENERAL NOTES

## 1) SIGNING WORK ZONE

- A) USE 'SURVEY CREW AHEAD' AND 'END SURVEY' SIGNS AS NEEDED TO ESTABLISH THE WORK ZONE.
- B) USE APPROVED COMPOSITE SUBSTRATE WITH TYPE VII, VIII OR IX FLUORESCENT ORANGE SHEETING OR FLUORESCENT ORANGE NCDOT APPROVED ROLL-UP SIGNS.
- C) PORTABLE ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM THE EOT TO BOTTOM OF SIGN.
- D) REMOVE OR LAY DOWN SIGNS AT THE END OF EACH WORK DAY. WHEN WORK IS NOT PURSUED FOR MORE THAN 30 MINUTES, SIGNS SHOULD BE REMOVED OR LAID DOWN.
- E) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES. SIGN SPACING CAN BE INCREASED ABOVE THE MINIMUM SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE ENGINEER.

## 2) VEHICLE PLACEMENT

- A) IF VEHICLE IS PARKED ADJACENT TO THE ROADWAY, THE LIGHT BAR MUST BE OPERATING AND THE VEHICLE SHOULD NOT OBSTRUCT THE VIEW OF SURVEY CREW OR OF THE APPROACHING TRAFFIC.

- B) PARK VEHICLES A MINIMUM OF 5' (1.5M) FROM THE EDGE OF TRAVEL WAY. PARKED VEHICLES SHOULD NOT OBSTRUCT THE VIEW OF THE SURVEY CREW.

## 3) OBSERVER/SPOTTER

- A) OBSERVER/SPOTTER SHOULD CARRY AN AIR HORN OR MAINTAIN A DISTANCE FROM THE RODMAN TO ALLOW VERBAL COMMUNICATION.
- B) WHEN GETTING EDGE OF PAVEMENT ELEVATIONS OR CENTERLINE SHOTS AN OBSERVER/SPOTTER IS REQUIRED.

## 4) INTERSECTIONS

- ALL -Y- LINES SHOULD BE SIGNED WITH 'SURVEY CREW AHEAD' OR 'END SURVEY' SIGNS.

## 5) COORDINATE SURVEYS REQUIRING A LANE CLOSURE OR SPECIALIZED TRAFFIC CONTROL WITH THE REGIONAL TRAFFIC ENGINEER; UTILIZING DIVISION TRAFFIC SERVICES OR WORK ZONE TRAFFIC CONTROL UNIT.

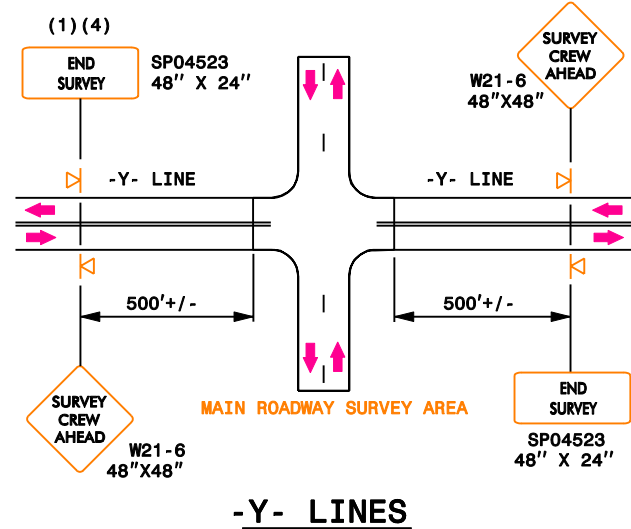
## 6) ANY TIME AN INSTRUMENT IS PLACED WITHIN 10' (3M) OF A TRAVEL LANE, PLACE TRAFFIC CONES (A MINIMUM OF 28" TALL) ON SIDE OF TRIPOD FACING TRAFFIC.

# LEGEND

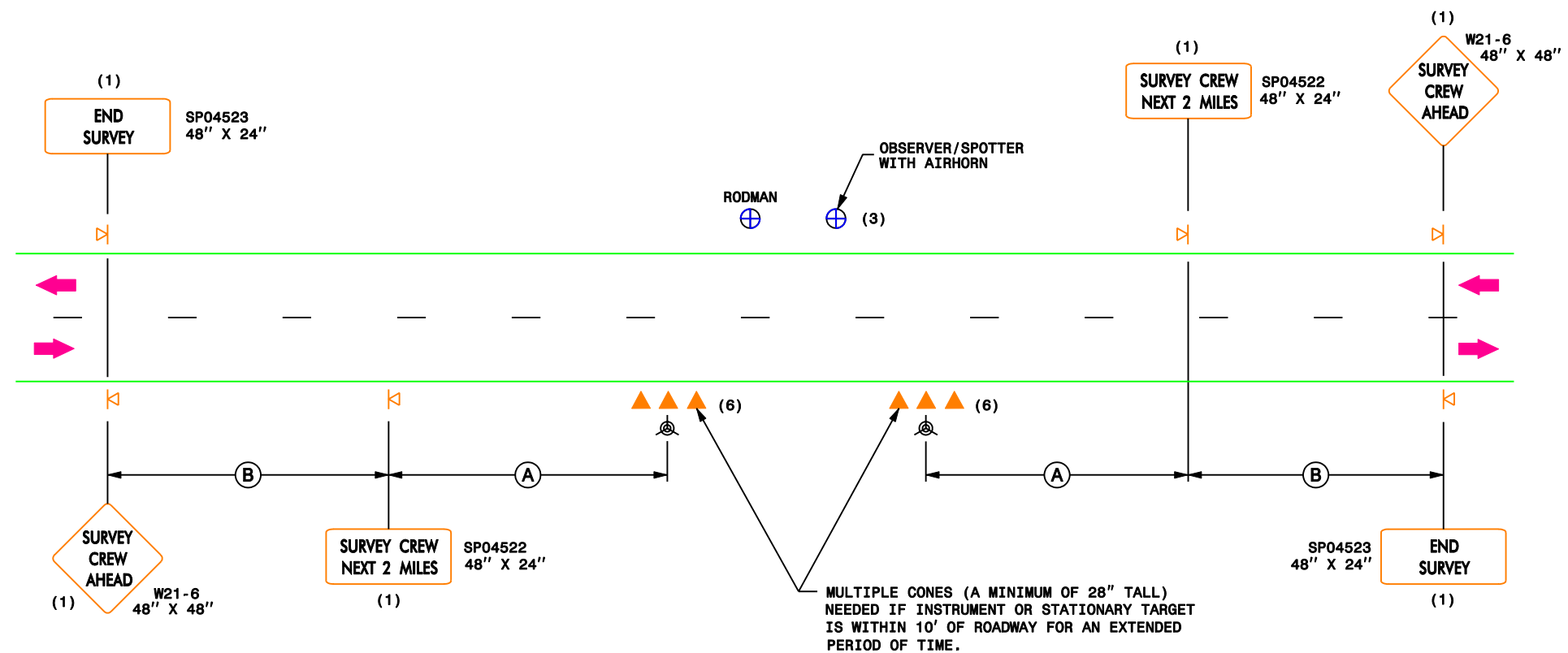
- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- 28" OR 36" CONE
- CREW MEMBER / RODDING / CHAINING / PAINTING / ETC.
- INSTRUMENT / TARGET LOCATION

# SIGN SPACING CHART

POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET) +/-	
	(A)	(B)
≤ 35	200	200
40 - 50	350	350
55	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500



# CONVENTIONAL SURVEY METHOD FOR TYPICAL RURAL TWO-WAY TWO-LANE ROADWAY



**DRAWING NUMBER 2**  
 IMPLEMENTATION DATE: 3/16/05  
 REVISED: 8/09/06

# GENERAL NOTES

## 1) SIGNING WORK ZONE

- A) USE 'SURVEY CREW AHEAD' AND 'END SURVEY' SIGNS AS NEEDED TO ESTABLISH THE WORK ZONE.
- B) USE APPROVED COMPOSITE SUBSTRATE WITH TYPE VII, VIII OR IX FLUORESCENT ORANGE SHEETING OR FLUORESCENT ORANGE NCDOT APPROVED ROLL-UP SIGNS.
- C) PORTABLE ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM THE EOT TO BOTTOM OF SIGN.
- D) REMOVE OR LAY DOWN SIGNS AT THE END OF EACH WORK DAY. WHEN WORK IS NOT PURSUED FOR MORE THAN 30 MINUTES, SIGNS SHOULD BE REMOVED OR LAID DOWN.
- E) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES. SIGN SPACING CAN BE INCREASED ABOVE THE MINIMUM SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE ENGINEER.

## 2) VEHICLE PLACEMENT

- A) IF VEHICLE IS PARKED ADJACENT TO THE ROADWAY, THE LIGHT BAR MUST BE OPERATING AND THE VEHICLE SHOULD NOT OBSTRUCT THE VIEW OF SURVEY CREW OR OF THE APPROACHING TRAFFIC.

- B) PARK VEHICLES A MINIMUM OF 5' (1.5M) FROM THE EDGE OF TRAVEL WAY. PARKED VEHICLES SHOULD NOT OBSTRUCT THE VIEW OF THE SURVEY CREW.

## 3) OBSERVER/SPOTTER

- A) OBSERVER/SPOTTER SHOULD CARRY AN AIR HORN OR MAINTAIN A DISTANCE FROM THE RODMAN TO ALLOW VERBAL COMMUNICATION.
- B) WHEN GETTING EDGE OF PAVEMENT ELEVATIONS OR CENTERLINE SHOTS AN OBSERVER/SPOTTER IS REQUIRED.

- 4) COORDINATE SURVEYS REQUIRING A LANE CLOSURE OR SPECIALIZED TRAFFIC CONTROL WITH THE REGIONAL TRAFFIC ENGINEER; UTILIZING DIVISION TRAFFIC SERVICES OR WORK ZONE TRAFFIC CONTROL UNIT.

- 5) ANY TIME AN INSTRUMENT IS PLACED WITHIN 10' (3M) OF A TRAVEL LANE, PLACE TRAFFIC CONES (A MINIMUM OF 28" TALL) ON SIDE OF TRIPOD FACING TRAFFIC.

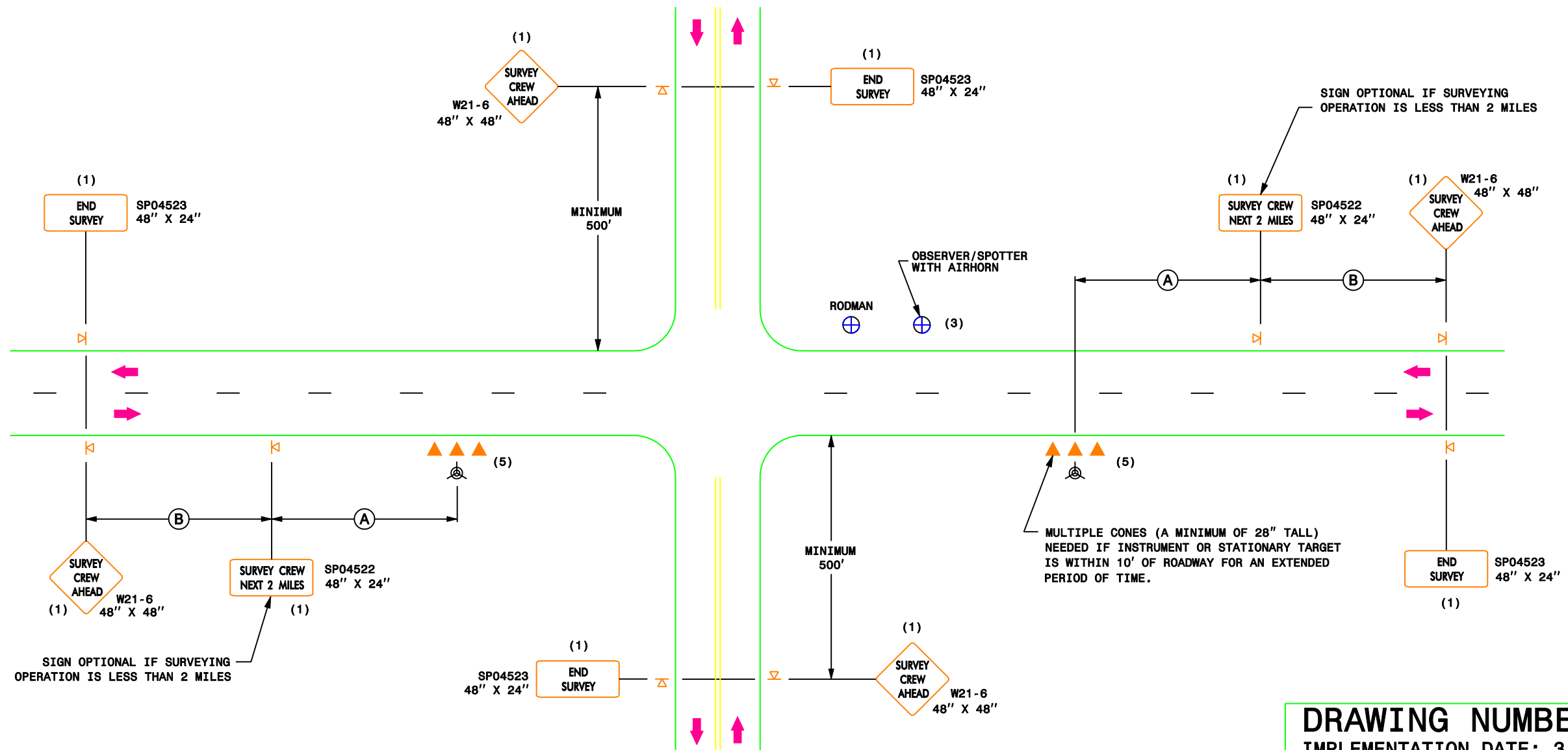
# LEGEND

- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- 28" OR 36" CONE
- CREW MEMBER / RODDING / CHAINING / PAINTING / ETC.
- INSTRUMENT / TARGET LOCATION

# SIGN SPACING CHART

POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET) +/-	
	(A)	(B)
≤ 35	200	200
40 - 50	350	350
55	500	500
CONTROLLED ACCESS ROADS ( ≥ 55 )	1000	1500

# CONVENTIONAL SURVEY METHOD FOR INTERSECTIONS



**DRAWING NUMBER 3**  
 IMPLEMENTATION DATE: 3/16/05  
 REVISED: 8/09/06

# GENERAL NOTES

- 1) THE FOLLOWING OPTIONS MAY BE USED AS THE FIRST ADVANCE WARNING THE MOTORIST SEES:
  - A. TRUCK MOUNTED ADVANCE WARNING SIGNS
  - B. MOVING CHANGEABLE MESSAGE SIGN (CMS)
  - C. PORTABLE ADVANCE WARNING SIGNS (MUST MAKE CIRCLE TO PICK UP SIGNS)
  - D. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS) (MUST MAKE CIRCLE TO PICK UP CMS)
- 2) ALL ADVANCE WARNING SIGNS MUST BE 48" X 48" WITH FLUORESCENT ORANGE TYPE VII, VIII OR IX SHEETING OR NCDOT APPROVED FLUORESCENT ORANGE ROLL-UP SIGNS. IF SPACE LIMITATIONS ON SHOULDER PROHIBIT A 48" X 48" SIGN, A SMALLER SIGN CAN BE USED WITH APPROVAL FROM ENGINEER.
- 3) SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM GROUND AND SHOULD NOT BLOCK THE MOTORISTS SIGHT OF THE FLASHING ARROW PANEL AND/OR ROTATING BEACON.
- 4) PORTABLE ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE EOT TO BOTTOM OF SIGN.

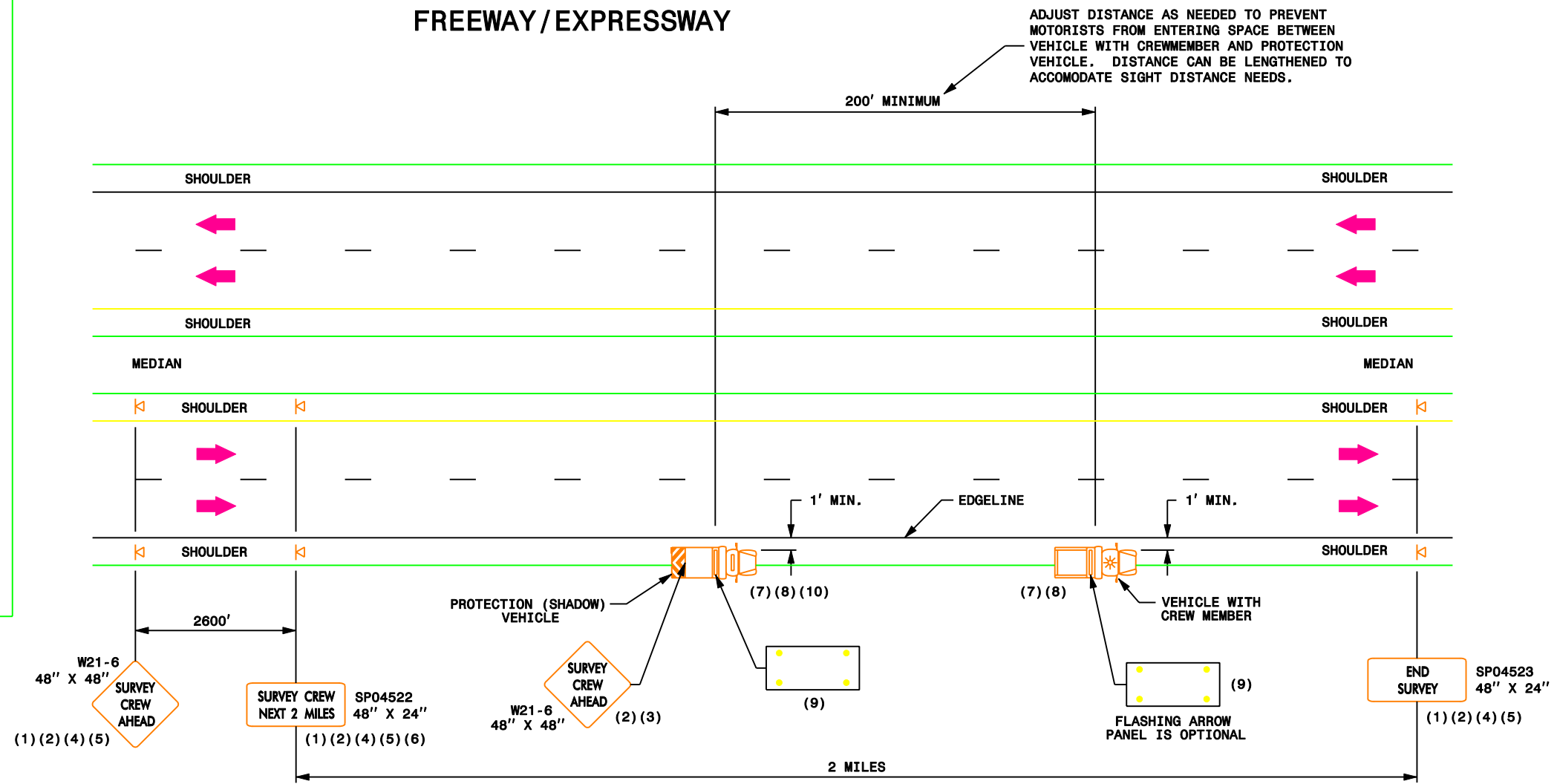
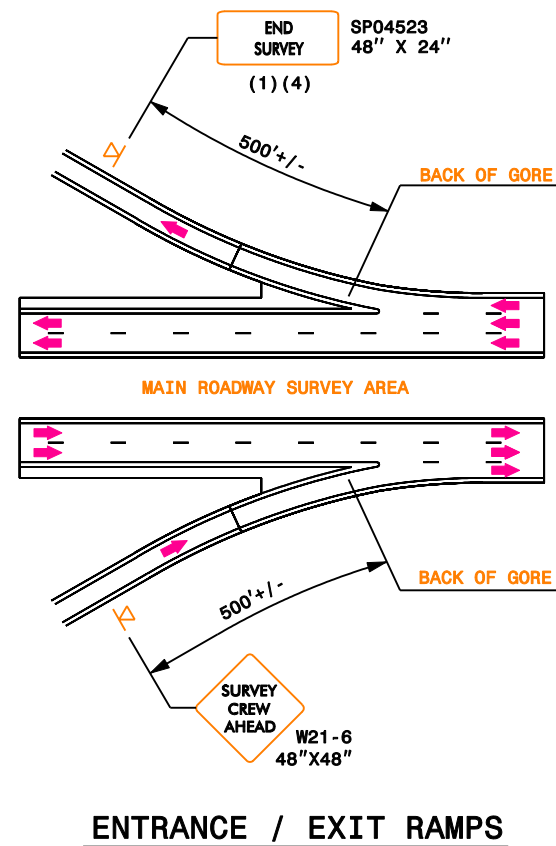
- 5) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES. SIGN SPACING CAN BE INCREASED ABOVE THE MINIMUM SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE ENGINEER.
- 6) ROUND UP MILEAGE TO NEXT WHOLE MILE. SURVEY OPERATION SHOULD NOT EXCEED TWO (2) MILES IN LENGTH.
- 7) RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- 8) USE OF A LIGHT BAR ON VEHICLES IS PREFERRED, BUT A ROTATING BEACON OR STROBE TAIL LIGHTS MAY BE USED INSTEAD.
- 9) USE A TYPE 'B' FLASHING ARROW PANEL.
 

PANEL TYPE	MIN. SIZE
B	60" X 30"
- 10) ALL TMIA's MUST BE RATED AT NCHRP-350 TEST LEVEL 3 (60+ MPH) AND BE APPROVED BY THE WORK ZONE TRAFFIC CONTROL UNIT.

# LEGEND

- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- VEHICLE WITH CREW MEMBER AND ROTATING BEACON
- PROTECTION VEHICLE WITH TRUCK MOUNTED IMPACT ATTENUATOR (TMIA) AND LIGHT BAR (SEE ROADWAY STANDARD NO. 1165.01). TMIA MUST BE NCHRP-350 TEST LEVEL 3 (60+ MPH) APPROVED.
- FLASHING ARROW PANEL, TYPE 'B' 'CAUTION MODE'

## TYPICAL MOBILE SURVEY METHOD FOR TYPICAL MULTILANE-DIVIDED FREEWAY/EXPRESSWAY



LOCATION: IF VEHICLE AND/OR CREW MEMBER IS FOUR FEET (4') OR MORE FROM EDGELINE NO TMIA IS REQUIRED. TMIA IS REQUIRED WHEN VEHICLE AND/OR CREW MEMBER IS LESS THAN FOUR FEET (4') BUT NO CLOSER THAN ONE FOOT (1') FROM EDGELINE.

**DRAWING NUMBER 4**  
 IMPLEMENTATION DATE: 3/16/05  
 REVISED: 8/09/06

# GENERAL NOTES

- 1) THE FOLLOWING OPTIONS MAY BE USED AS THE FIRST ADVANCE WARNING THE MOTORIST SEES:
  - A. TRUCK MOUNTED ADVANCE WARNING SIGNS
  - B. MOVING CHANGEABLE MESSAGE SIGN (CMS)
  - C. PORTABLE ADVANCE WARNING SIGNS (MUST MAKE CIRCLE TO PICK UP SIGNS)
  - D. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS) (MUST MAKE CIRCLE TO PICK UP CMS)
- 2) ALL ADVANCE WARNING SIGNS MUST BE 48" X 48" WITH FLUORESCENT ORANGE TYPE VII, VIII OR IX SHEETING OR NCDOT APPROVED FLUORESCENT ORANGE ROLL-UP SIGNS. IF SPACE LIMITATIONS ON SHOULDER PROHIBIT A 48" X 48" SIGN, A SMALLER SIGN CAN BE USED WITH APPROVAL FROM ENGINEER.
- 3) SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM GROUND AND SHOULD NOT BLOCK THE MOTORISTS SIGHT OF THE FLASHING ARROW PANEL AND/OR ROTATING BEACON.
- 4) PORTABLE ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE EOT TO BOTTOM OF SIGN.

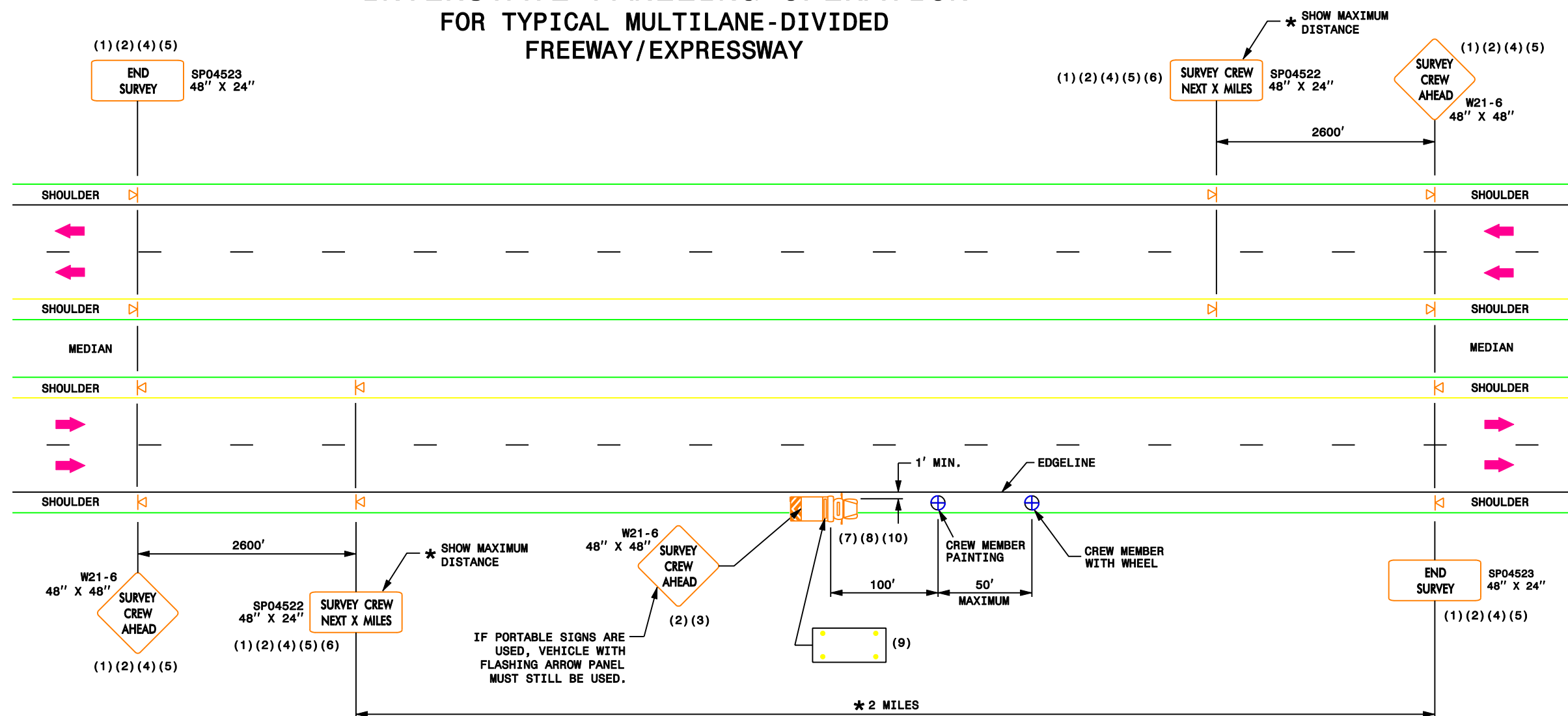
- 5) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES. SIGN SPACING CAN BE INCREASED ABOVE THE MINIMUM SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE ENGINEER.
- 6) ROUND UP MILEAGE TO NEXT WHOLE MILE. SURVEY OPERATION SHOULD NOT EXCEED TWO (2) MILES IN LENGTH.
- 7) RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- 8) USE OF A LIGHT BAR ON VEHICLES IS PREFERRED, BUT A ROTATING BEACON OR STROBE TAIL LIGHTS MAY BE USED INSTEAD.
- 9) USE A TYPE 'B' FLASHING ARROW PANEL.
 

PANEL TYPE	MIN. SIZE
B	60" X 30"
- 10) ALL TMIA's MUST BE RATED AT NCHRP-350 TEST LEVEL 3 (60+ MPH) AND BE APPROVED BY THE WORK ZONE TRAFFIC CONTROL UNIT.

# LEGEND

- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- CREW MEMBER / RODDING / CHAINING / PAINTING / ETC.
- PROTECTION VEHICLE WITH TRUCK MOUNTED IMPACT ATTENUATOR (TMIA) AND LIGHT BAR (SEE ROADWAY STANDARD NO. 1165.01). TMIA MUST BE NCHRP-350 TEST LEVEL 3 (60+ MPH) APPROVED.

## INTERSTATE PANELING OPERATION FOR TYPICAL MULTILANE-DIVIDED FREEWAY/EXPRESSWAY



**LOCATION: VEHICLE AND/OR CREW MEMBER IS LESS THAN FOUR FEET (4')  
BUT NO CLOSER THAN ONE FOOT (1') FROM EDGELINE.**

**DRAWING NUMBER 5**  
IMPLEMENTATION DATE: 3/16/05  
REVISED: 8/09/06