NOTES:
1. 5/16" MESSENGER CABLE SHALL BE USED FOR SPANS.
2. ALL LOOSE ENDS OF MESSENGER CABLE SHALL BE SERVED WITH SERVISLEEVE.
3. SIGNAL CABLE SHALL BE ATTACHED TO MESSENGER (SPAN) CABLE WITH LASHING WIRE USING THE CABLE SPINNING METHOD WITH A MINIMUM OF ONE TURN PER FOOT.
4. 3/8" MESSENGER CABLE SHALL BE USED FOR DOWN GUYS.
5. LUMINAIRES SHALL BE ATTACHED TO THE SIGNAL POLE AS APPROVED BY THE ENGINEER.
6. DETERMINE THE MOUNTING HEIGHT OF THE SIGNAL SPAN AND THE PLACEMENT OF THE WEATHER HEADS.
7. ALL SLACK CABLE COILS SHALL BE A MINIMUM OF 6" IN DIAMETER AND SHALL HAVE A MINIMUM OF TWO TURNS.
8. THE SIDEWALK GUY METHOD IS NORMALLY USED WHERE SPACE OR AS DIRECTED BY THE ENGINEER.
9. INSTALL ANCHOR ROD A MAXIMUM OF 6" ABOVE GRADE.
10. TAKE THE TRAFFIC SIGNAL POLE LOCATION FOR VERIFICATION BY THE ENGINEER.
NOTES:
1. 5/16" and 3/16" MESSENER CABLE SHALL BE USED FOR SPANS.
2. ALL LOOSE ENDS OF MESSENER CABLE SHALL BE SERVED WITH SERVISLEEVE.
3. SIGNAL CABLE AND DETECTOR CABLE SHALL BE ATTACHED TO MESSENER SPAN CABLE WITH LASHING WIRE USING THE CABLE SPINNING METHOD WITH A MINIMUM OF ONE TURN PER FOOT.
4. DETERMINE THE MOUNTING HEIGHT OF THE SIGNAL SPAN AND THE PLACEMENT OF THE WEATHER HEADS.
5. ALL SLACK CABLE COILS SHALL BE A MINIMUM OF 6" IN DIAMETER AND SHALL HAVE A MINIMUM OF TWO TURNS.
6. WEATHER HEADS INSTALLED ON THE STRAIN POLE SHALL EQUAL THE SIZE AND NUMBER OF CONDUIT INSTALLED IN THE SIGNAL POLE FOUNDATION.
1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon. See Note 3.

2. See Item 685, “Roadside Flashing Beacon Assemblies” for additional requirements.

3. See Item 685, “Roadside Flashing Beacon Assemblies” for further requirements.

4. See detail E for additional requirements. Install the batteries in a battery box. Place the batteries on a 3/16” thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16” plastic sheet are subsidiary to the top of the cabinet.

5. Per manufacturer’s recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.

6. Conduit in foundation and within 6 in. of foundation is subsidiary to Item 685, “Roadside Flashing Beacon Assemblies.”

7. Connect the battery box to the cabinet. When only one beacon is required, mount the beacon in the upper cabinet. See Note 7.

8. For manufacturer’s recommendations, engage all threads on the conduit pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.

9. When only one beacon is required, mount the beacon in the upper cabinet. See Note 7.

10. See standard sheets ED(1)-ED(4) and ED(13) for additional requirements and as shown on the sign layout sheets.

11. Battery box shall be one piece, schedule 40 aluminum plate, ANSI B309 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and it is not to be used.

12. Unless otherwise shown on the plans, pole shaft shall be one piece, schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and it is not to be used.

13. Locate the Type LB conduit body attachment at the bottom third of the back of the cabinet.

14. See Standard Sheets ED(1)-ED(4) and ED(13) for additional requirements regarding the installation of conduct, cabinets, battery ground boxes, and wood poles.

15. See standard sheets ED(1)-ED(4) and ED(13) for additional requirements regarding the installation of conduct, cabinets, battery ground boxes, and wood poles.
NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details.
4. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
5. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
6. Pole shaft shall be one piece, schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
7. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.
8. Provide non-fused watertight breakaway electrical connectors for breakaway poles. (Bussmann HET, Littelfuse LET, Ferraz-Shawmut FEBN, or approved equal).
9. Provide lateral and vertical clearances as shown above the sidewalks or pavement grade at the edge of the road. When a bottom beacon is not used, mount the sign at least 1 ft. above the sidewalks or pavement grade at the edge of the road.
10. Liquidtight flexible metal conduit may be used when near and service enclosures are mounted 50 to 150 degrees to each other.
11. LNMC shall not exceed 3 ft., and shall be securely supported within one ft. of each end.
12. Each end of LNMC must have a grounding bushing or be terminated with a grounding fitting.
13. A neutral conductor must be incorporated within the LNMC.
15. A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.
16. Liquidtight flexible metal conduit, may be used when near and service enclosures are mounted 50 to 150 degrees to each other.
17. LNMC shall not exceed 3 ft., and shall be securely supported within one ft. of each end.
18. Each end of LNMC must have a grounding bushing or be terminated with a grounding fitting.
19. A neutral conductor must be incorporated within the LNMC.
20. Bend in Liquidtight flexible metal conduit shall not exceed 180°.
21. A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.
LEAD - IN CABLE FROM CONTROLLER TO SIGNAL HEAD,  
CAST ALUMINUM SPAN WIRE CLAMP AND CLEVIS ADAPTER,  
SECURE CLEVIS PIN WITH A WASHER (BOTH ENDS) AND HUMP  
BACK COTTER PIN, OR CLEVIS PIN OPENINGS AND FIT WITH A  
SPLIT BUSHING, CLEVIS PIN, WASHER, COTTER PIN, AND SPLIT  
BUSHING TO BE STAINLESS STEEL.  
B) BREAKAWAY TETHER ASSEMBLY,  
1 1/2" ALUM.Pipe (Typ).  
ALL SLACK CABLE COILS SHALL BE A MINIMUM OF 6" IN  
DIAMETER AND SHALL HAVE A MINIMUM OF TWO TURNS.  
NOTE: BACKPLATES OMITTED FOR CLARITY,  
SETSCREWS SHALL BE INSTALLED IN ALL PIPE FITTINGS,  
SIGNAL CABLE AND DETECTOR CABLE SHALL BE ATTACHED  
TO MESSER (SPAN) CABLE WITH LASHING WIRE USING  
THE CABLE SPINNING METHOD WITH A MINIMUM OF ONE TURN  
PER FOOT.  
SEE FLASHING BEACON STRAIN POLE OR TIMBER POLE  
INSTALLATION DETAILS FOR ADDITIONAL INFORMATION.
**Loop Detector Placement Details**

**Video Detection Placement Details**

**Loop Detector General Notes (35 MPH to 50 MPH):**
- Loops 1 and 2 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).
- Loops 3 and 4 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).
- Loops 5 and 6 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).
- Loops 7 and 8 shall be connected to the controller cabinet by means of individual loop lead-in (2/C #14 AWG).
- Loops 9 shall be placed only when a left turn lane exists.

**Loop Detector General Notes (55 MPH to 70 MPH):**
- Loops 1 and 2 shall be connected to the controller cabinet by means of individual loop lead-in (2/C #14 AWG).
- Loops 3 and 4 shall be connected to the controller cabinet by means of individual loop lead-in (2/C #14 AWG).
- Loops 5 and 6 shall be connected to the controller cabinet by means of an individual loop lead-in (2/C #14 AWG).
- Loops 7 and 8 shall be connected to the controller cabinet by means of an individual loop lead-in (2/C #14 AWG).
- Loops 9 shall be placed only when a left turn lane exists.

**Loop Detector General Notes (45 MPH):**
- Loops 1 and 2 shall be connected to the controller cabinet by means of individual loop lead-in (2/C #14 AWG).
- Loops 3 and 4 shall be connected to the controller cabinet by means of an individual loop lead-in (2/C #14 AWG).
- Loops 5 and 6 shall be connected to the controller cabinet by means of individual loop lead-in (2/C #14 AWG).

**Setback Detection Zone Spacing**
(Speeds greater than or equal to 45 MPH)

- 45 MPH (A=210', B=350')
- 50 MPH (A=235', B=390')
- 55 MPH (A=255', B=430')
- 60 MPH (A=280', B=470')
- 65 MPH (A=305', B=510')
- 70 MPH (A=330', B=550')

**Note:** Speeds equal or greater than 45 MPH will require the use of two VIVD cameras.

**STOP BAR DETECTION ZONES SHALL BE PROVIDED FOR EACH LANE OF EACH APPROACH.**

**IN ADDITION, DETECTORS IN EXCLUSIVE TURN LANE SHOULD DRIVE A SEPARATE DETECTOR INPUT INTO THE CONTROLLER.**

**SETBACK DETECTION ZONE SPACING**
(Speeds greater than or equal to 45 MPH)

- 30 MPH (A=210', B=350')
- 40 MPH (A=305', B=510')
- 50 MPH (A=400', B=650')
- 60 MPH (A=500', B=800')
- 70 MPH (A=600', B=950')
- 80 MPH (A=700', B=1100')

**Note:** Setsback Detection Zones should be provided for each lane of each approach.

**Video Detection Placement Details**

**Detector Input #1**

**Detector Input #2**

**Detector Input #3**

**Detector Input #4**