

## TRAFFIC CONTROL (CONTINUED)

25. ORANGE SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM D 4956) TYPE VII, VIII OR IX REQUIREMENTS, UNLESS OTHERWISE NOTED.
26. ROLL UP SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM D 4956 TYPE VI.
27. SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
28. FIXED SIGNS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE GUARDRAIL.
29. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND ONE FOOT MINIMUM ABOVE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
30. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED, STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
31. THE NUMBER OF CHANNELIZING DEVICES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS IS FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE, ETC.).
32. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED AT THE DISCRETION OF THE ENGINEER. THE PCMS SHALL BE USED IN ACCORDANCE WITH SECTION 6F.60 OF THE MUTCD.
33. TRAVEL LANES SHALL BE 12 FOOT MINIMUM WIDTH AND HAVE 1 FOOT MINIMUM WIDTH SHOULDERS. SEE SHEET MD-01 FOR ADDITIONAL INFORMATION.
34. THE CONTRACTOR SHALL SHIFT TRAFFIC IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. ALL EQUIPMENT SHALL BE MOVED TO A LOCATION OFF PAVED SHOULDERS DURING NON-WORK PERIODS, AND PROTECTED BY BARRELS OR CONES.
42. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES.
43. THE SIGNAL SYSTEM SHALL INCLUDE THE SETUP AND REMOVAL OF TRAILER, TRAILER POLES, SIGNAL HEADS, SIGNS AND POSTS, DETECTORS, WARNING SIGNS, LUMINAIRES, FLASHING BEACONS, STOP BARS, AND SIGNAL EQUIPMENT TO PROVIDE FOR AN ADEQUATE DESIGN. IT ALSO INCLUDES PERMITS AND COSTS ASSOCIATED WITH PROVIDING ELECTRICAL POWER.
44. INSTALL WIRING BETWEEN SIGNAL POLES TO PROVIDE FOR A SAFE INSTALLATION. ATTACHMENT TO UTILITY POLES TO BE COORDINATED BY THE CONTRACTOR WITH THE UTILITY COMPANY.
45. PLACE TEMPORARY POLES BEHIND GUARDRAIL OR OUTSIDE OF THE CLEAR ZONE.
46. POLES SUPPORTING SPAN WIRES AND/OR MAST ARMS SHALL BE ADEQUATELY BRACED OR GUYED AND SHALL NOT BE PLACED SO AS TO CREATE A HAZARD TO THE TRAVELING PUBLIC.
47. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC., SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR REMOVAL INCLUDING ANY TEMPORARY PAVEMENT MARKINGS, UTILITY POLES, WIRES, ETC.
48. A 250 WATT MER/150 WATT HPS LUMINAIRE AND MAST ARM SHALL BE PROVIDED ON A POLE ON EACH APPROACH AT A MOUNTING HEIGHT OF 30 FEET ABOVE ROADWAY CENTERLINE. THE INTENT IS TO LIGHT UP THE AREA AROUND THE SIGNAL HEADS AND STOP BAR FOR INCREASED VISIBILITY. THE ENGINEER SHALL DETERMINE THE ADEQUACY OF THE LIGHTING AND DIRECT CHANGES IF THE LIGHTING IS INSUFFICIENT.
49. SEE STD. E-121 FOR SIGN PLACEMENT. SEE STDS E-171A AND E-172 FOR ADDITIONAL INFORMATION ON SIGNALS.
50. ALL ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
51. ALL STOP SIGNS AND ANY TRAFFIC SIGNS MADE IRRELEVANT DUE TO THE TEMPORARY SIGNAL SHALL BE COMPLETELY COVERED DURING OPERATION OF THE TEMPORARY SIGNAL OR AT THE DISCRETION OF THE ENGINEER. THE COSTS OF COVERING AND UNCOVERING THESE SIGNS SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
52. CONSTRUCTION APPROACH SIGNS SHALL BE PROVIDED ON EACH APPROACH PER THE "TRAFFIC CONTROL APPROACH SIGN PACKAGE" SHOWN ON THE TRAFFIC CONTROL PLAN SHEETS. ADDITIONAL CONSTRUCTION APPROACH SIGNS SHALL BE INSTALLED AS REQUIRED BY THE ENGINEER. THE COSTS ASSOCIATED WITH THESE SIGNS, THE REFLECTORIZED PLASTIC DRUMS, ETC., SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
53. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF THE PHASING DIAGRAM BY THE ENGINEER.

## TEMPORARY TRAFFIC SIGNAL SYSTEM

35. ALL WORK DESCRIBED HEREIN FOR TEMPORARY TRAFFIC SIGNAL SYSTEM FOR TWO OR MORE APPROACHES, AND NOT SPECIFIED FOR PAYMENT UNDER A SEPARATE CONTRACT ITEM, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.620, "TEMPORARY TRAFFIC SIGNAL SYSTEM, PORTABLE".
36. DESIGN OF THE SIGNAL SUPPORTS AND ANY REQUIRED GUYING IS THE RESPONSIBILITY OF THE CONTRACTOR.
37. SIGNAL TIMING/TIMING ADJUSTMENTS REQUESTED BY THE ENGINEER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND RESPONDED TO WITHIN A 48 HOUR PERIOD.
38. SIGNAL FACES SHALL BE LED AND CONSIST OF 12" LENSES (RED, YELLOW, AND GREEN).
39. THE BOTTOM OF THE HOUSING OF A SIGNAL FACE SUSPENDED OVER A ROADWAY SHALL NOT BE LESS THAN 16.5 FEET NOR MORE THAN 19 FEET ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY. THE BOTTOM OF A SIGNAL FACE NOT MOUNTED OVER A ROADWAY SHALL NOT BE LESS THAN 8 FEET NOR MORE THAN 15 FEET ABOVE THE GROUND. CAUTION SHOULD BE USED TO ASSURE COMPLIANCE WITH THE HEIGHT REQUIREMENTS IN THE EVENT THE NEW APPROACH GRADES DIFFER SIGNIFICANTLY FROM THE OLD ROAD GRADE.
40. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER FACES.
41. SIGNAL HEADS MAY BE HUNG ON A SPAN WIRE OR ON A CANTILEVER MAST ARM; HOWEVER, THE USE OF PORTABLE SIGNALS IS ENCOURAGED. AT LEAST ONE SIGNAL HEAD SHALL BE UNMISTAKABLY IN LINE WITH THE CENTER OF APPROACHING TRAFFIC AT ALL TIMES. THE SECOND SIGNAL HEAD MAY BE POST MOUNTED, LOCATED AT A DISTANCE OF NO GREATER THAN 14.5 FEET FROM THE CENTER OF THE APPROACH LANE WHEN THE STOP BAR IS 40 FEET FROM THE SIGNAL HEAD. CONSULT THE CURRENT EDITION OF THE M. U. T. C. D. FOR ADDITIONAL INFORMATION CONCERNING SIGNAL PLACEMENT.

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