SECTION 903

HIGHWAY SIGNING

903.1 Description. This work shall consist of furnishing and installing highway signs as shown on the plans.

903.1.1 Signs. All signs shall conform to the MUTCD. All letters, numerals, arrows, symbols, borders and other features of the sign message shall be as shown on the plans or as approved by the engineer. Any signs not detailed on the plans shall conform to *Standard Highway Signs* by the U.S. Department of Transportation - Federal Highway Administration.

903.2 Material. All material shall conform to Division 1000, Materials Details, and specifically as follows:

Item	Section
Galvanized Coating of Structural Steel, Tubular Steel Sign Supports, Sign Trusses and Appurtenances	712
High-Strength Bolts, Nuts and Washers	712
Low-Carbon Steel Bolts, Nuts and Washers	712
Structural Carbon Steel	712
Structural Low Alloy Steel	712
Low-Carbon Steel Anchor Bolts	901
Reinforcing Steel for Concrete	1036
Highway Sign Material	1042
Delineator, Mile and Marker Posts	1044
Paints for Structural Steel	1045
Electrical Conduit	1060
Electrical Conductors	1061
Pull and Junction Boxes	1062
Expansive Mortars	1066

903.2.1 Sign Posts and Tubular Steel Sign Supports .

Item	Specification
Steel Pipe Posts	ASTM A53, Grade B, or ASTM A 500, Grade B
Galvanizing of Steel Pipe Posts	ASTM A 53
Structural Steel Welding Electrodes	AWS A5.1 or AWS A5.5

903.2.2 Overhead Sign Trusses .

Item	Specification
Aluminum Extruded Tube	ASTM B 221, 6061-T6
Aluminum Permanent Mold Castings	ASTM B 108, A 356.0-T61
Aluminum Sand Castings	ASTM B 26, 356.0-T6
Aluminum Plate	ASTM B 209, 6061-T6
Aluminum Structural Shapes	ASTM B 308, 6061-T6
Aluminum Pipe Handrail	ASTM B 241, 6061-T6 or 6063-T6
Aluminum Pipe Fittings for Schedule 10 Pipe	ASTM B 26, 356.0-T6 or ASTM B 108, A 356.0-T61
Aluminum Grating	
Bearing Bars	ASTM B 211, 6061-T6 or ASTM B 221, 6061-T6 or 6063-T6
Cross Bars	ASTM B 211, 6061-T6 or ASTM B 221, 6061-T6 or 6063-T5 or T6
Aluminum Washers	ASTM B 209, 2024-T4 or Alclad 2024T4
Aluminum Beveled Washers	ASTM B 221, 2024-T4
Filler Wire for Welding Aluminum	AWS A 5.10 ER5356, ER5556
Stainless Steel U-Bolts	ASTM A 276 Chromium-Nickel Grade with Min Yield 30,000 psi (200 MPa)
Stainless Steel Bolts, Nuts, Screws and Washers	ASTM A 320 or SAE J405D, Austenitic Steel, Min Yield 30,000 psi (200 MPa)
Structural Steel Welding Electrodes	AWS A 5.1 or AWS A 5.5

903.2.3 Bolts, nuts and washers specified to be galvanized shall be galvanized in accordance with the requirements of AASHTO M 232 (ASTM A 153), Class C, or mechanically galvanized in accordance with the requirements of AASHTO M 298 (ASTM B 695), Class 55. Except for anchor bolts, galvanizing thickness shall not exceed 6 mils (150 µm). For high strength bolts, the contractor shall furnish to the engineer a copy of the manufacturer's inspection test report for each production lot or shipping lot furnished, and shall certify that the bolts furnished conform to the requirements specified.

903.2.4 Concrete shall be of the class specified in the contract. Material, proportioning, mixing, slump and transporting of concrete shall be in accordance with Sec 501 for the specific class specified. Concrete shall be placed, finished and cured in accordance with the applicable provisions of Sec 703. The entire exposed concrete surface, including sides and top, shall be surface sealed in accordance with the applicable requirements of Sec 703.3.18.

903.2.5 Equipment and material shall be of new stock unless the contract provides for relocation of existing units or use of units furnished by others. New equipment and material shall conform to the National Electrical Code and the regulations of the National Board of Fire Underwriters, as applicable, and meet the approval of the engineer. A list of pre-approved equipment and material is available through the Division Engineer, Traffic.

903.2.6 Three copies of the list of electrical equipment and material to be installed will be furnished to the successful bidder, along with the contract for execution. The contractor shall complete the list by writing in the name of the equipment manufacturer and catalog number of each item listed. Two copies of the completed list shall be submitted to the engineer and be approved in writing before the items are installed. Approval of the items on the list does not relieve the contractor of responsibility for satisfactory performance of the installation.

903.3 Construction Requirements.

903.3.1 Footings for Trusses and Posts .

903.3.1.1 Bolt-Down Installations. Class B concrete shall be used to construct all footings and end supports for overhead sign trusses, tubular steel sign supports and posts with bolt-down bases. Footings shall be formed unless in the judgment of the engineer soil conditions permit excavation to be made to the neat lines of the footings and the footings cast against the undisturbed vertical soil face. In all cases the top 12 inches (300 mm) of footings below finished ground line shall be formed. Footings shall be placed on firm, stable, undisturbed soil and to the minimum depth shown on the plans. Backfill shall be thoroughly compacted by mechanical tampers, and care taken to prevent damage to finished concrete. Backfill shall be brought up level with the finished ground line. Anchor bolts shall be firmly held in proper position, supported at the top by a template, during the placing of concrete.

903.3.1.2 Embedded Installations. Class B or B-1 concrete, or concrete of a commercial mixture meeting the requirements of Sec 501 shall be used for the footings for embedded type sign posts. The contractor may use a quick setting polyurethane foam for footings in lieu of concrete. The foam shall have a minimum compressive strength of 80 psi (550 kPa), in the direction of rise, when tested in accordance with ASTM D 1621 and shall have a minimum density of 4 pounds per cubic foot (65 kg/m^3) when tested in accordance with ASTM D 1622. The foam shall not be placed in water. Polyurethane foam shall be mixed in accordance with manufacturer's instructions. Posts shall be supported in proper position until the concrete or foam has set. Excavation and backfill shall meet the requirements of Sec 903.3.1.1, except that no forming will be required unless soil conditions make it necessary. Polyurethane foam will not be permitted if forming is necessary. Top of footings shall be acceptably finished flush with the slope of the ground.

903.3.1.3 Existing Underground Cable. Upon request, any information available to the Commission as to the location of cables will be furnished to the contractor without guarantee of accuracy. The contractor shall locate the cable by hand excavation or other approved means when working in the known vicinity of such cable before completing the excavation with power tools. After locating the cable, it shall, if necessary for the construction of footings, be moved by the contractor at the contractor's expense as directed by the engineer. It shall be the contractor's responsibility to report all damages to underground cables to the resident engineer who will notify the owners or their maintaining agencies and determine whether the repairs or replacements are to be made by the owners or their agents, or by the contractor. Regardless of who makes the repair or replacement, it shall be entirely at the contractor's expense. If it is determined that the contractor is to make repairs to damaged cable, the repairs shall be made as directed by the owner, or the work shall be performed in accordance with the following requirements. If the cable sheath is cut or nicked, but the wire undamaged, a protective plastic case shall be installed around the cable. Ends of the case shall be sealed with plastic tape. The case shall then be poured full of insulating compound mixed according to the manufacturer's recomme ndations. If the conductor is completely severed, it shall be spliced with a pressed sleeve connector or equivalent, and a plastic protective case installed as specified above. If two or more conductors are severed, the contractor shall identify by continuity tests or other satisfactory means the proper ends to splice. Splicing shall be performed by qualified personnel.

903.3.2 Posts for Signs, Delineators and Markers.

903.3.2.1 Post lengths shown on the plans for ground mounted signs are for bidding purposes only. When progress of the work permits, the engineer will authorize the location of each sign, with the station and offset distance from the edge of pavement. The contractor shall be responsible for determination of post lengths to provide the vertical clearance shown on the plans. Field cutting of posts shall be performed by sawing. Flame cutting of posts and appurtenances in accordance with Sec 712.3.3.7 will be permitted.

903.3.2.2 Structural steel sign posts for ground mounting of signs shall be fabricated and erected as shown on the plans, and shall be of material in accordance with ASTM A 36, AASHTO M 223 Grade 50 or AASHTO M 222, minimum yield 50,000 pounds per square inch (345 MPa). Preheating of the material to be welded is required in accordance with good welding practice and welds shall be of full section and sound throughout. Dimensional defects and structural discontinuities will be cause for rejection. Posts built up by welding two lengths together will be permitted, provided the welds are ground smooth and flush with the base metal. Steel bases shall be arranged for anchoring to concrete footings with galvanized swedged steel bolts of the number and sizes shown on the plans. Posts and appurtenances, such as zee bars and flats, shall be hot-dip galvanized after fabrication. Posts with breakaway assemblies shall be cut at the hinge prior to galvanizing. Hinge plates shall not be attached to the posts at the time of galvanizing. All welds shall be mechanically cleaned before galvanizing. Shop drawings will not be required for structural steel posts.

903.3.2.3 Steel pipe posts with breakaway assemblies for ground mounting of signs shall be fabricated of black pipe. Steel pipe posts without breakaway assemblies for ground mounting of signs shall be fabricated of galvanized pipe or black pipe hot-dip galvanized after fabrication. Test specimens for galvanized pipe shall be taken at least 6 inches (150 mm) from one end of the pipe instead of at the ends as specified in ASTM A 53 Grade B. Posts with breakaway assemblies shall be fabricated as shown on the plans and shall be hot-dip galvanized after fabrication. Welds shall be of full section and sound throughout. Dimensional defects and structural discontinuities will be cause for rejection. All welds shall be mechanically cleaned before galvanizing. Exposed steel areas and damaged spelter coating shall be repaired in accordance with Sec 712.14, except that edges of drilled holes shall be coated with commercially available zinc-rich paint. Shop drawings will not be required for pipe posts. Friction caps for pipe posts shall be of the dimensions shown on the plans and may be galvanized steel or aluminum alloy.

903.3.2.4 Mile, delineator and object marker posts shall be driven vertical. Any post bent or otherwise damaged to the extent it is considered unfit for use shall be removed and replaced with an acceptable post by and at the contractor's expense.

903.3.2.5 The contractor shall furnish fabricators' certifications in triplicate certifying that the material supplied conforms to all of the requirements specified.

903.3.2.6 Galvanized material shall be handled in a manner to avoid damage to the surfaces. Any galvanized material on which the spelter coating has been bruised or broken will be rejected or may, with approval of the engineer, be repaired in accordance with Sec 712.14.

903.3.3 Tubular Steel Sign Supports .

903.3.3.1 Tubular sign supports for overhead mounting of signs include span, cantilever and butterfly types, complete with poles, beams, mast arms, sign bracket assemblies, sign lights and other specified appurtenances. All steel material shall be hot-dip galvanized after

fabrication. All welds shall be mechanically cleaned before galvanizing. Shop drawings will not be required for these supports.

903.3.3.2 Tapered steel poles and beams shall be a continuous taper tube, fabricated from one length of open hearth sheet steel with one continuous welded longitudinal seam. After fabrication, the material shall have a minimum yield strength of 48,000 pounds per square inch (330 MPa). Straight steel arms shall be standard or extra heavy pipe, of the dimensions and grades shown on the plans. Handholes and wire outlets for sign lighting shall be provided as shown on the plans. Bolts, nuts, washers, clamps and sign bracket assemblies shall be hot-dip galvanized or of stainless steel. Clamps shall be fabricated of low alloy steel.

903.3.3.3 The contractor shall furnish to the engineer manufacturer's certification in triplicate certifying that the tubular steel sign supports conform to all of the requirements specified.

903.3.3.4 Galvanized material shall be handled in a manner to avoid damage to the surfaces. Any galvanized material on which the spelter coating has been bruised or broken will be rejected or may, with approval of the engineer, be repaired in accordance with Sec 712.14.

903.3.4 Overhead Sign Trusses .

903.3.4.1 Overhead sign trusses shall be either steel or aluminum and shall include all structural steel, structural aluminum, aluminum castings, pipe railing, gratings, lighting fixtures, supports, electrical system components and appurtenances above the top surface of the concrete.

903.3.4.2 The general requirements of Sec 712.3.2 will govern, and in addition shop drawings for aluminum members shall be furnished. All drawings shall be furnished to the engineer for approval.

903.3.4.3 The contractor shall furnish a copy of certified mill test reports on all material furnished, giving the actual chemical analysis and the actual results of physical tests. In lieu of mill test reports for secondary members, the contractor may furnish a certification from the fabricator certifying that the material supplied conforms to all of the requirements of the specifications. All test reports and certifications shall be furnished to the engineer before any requests for shop inspection are made.

903.3.4.4 Structural steel fabrication and erection shall meet the applicable requirements of Sec 712, except as hereinafter specified.

903.3.4.5 Before starting fabrication of structural aluminum, all welders shall be qualified by passing, in the presence of the engineer, the requirements of procedure and performance tests of Section 9 of the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers. Welder qualifications shall be renewed annually. Renewal will be based on a letter from the fabricator certifying that the welder has been engaged in the processes for which the welder qualified without an interruption of more than three months or by requalification. Requalification may be required anytime there is some specific reason to question the welder's ability. Qualification test specimens shall be made at the expense of the contractor, but the specimens will be tested by and at the expense of the Commission. These test specimens shall be made using a base metal of aluminum alloy 6061-T6, and using ER5356 or ER5556 filler metal and inert gas shielded arc.

903.3.4.6 Aluminum welding shall be carefully checked by the fabricator by visual inspection of all welds, by proof testing of welds and by sufficient destructive testing of weld samples fabricated during the production welding, to verify the reliability of production. Poor welding workmanship as noted by visual inspection will be sufficient cause for rejection.

903.3.4.7 Contact surfaces of aluminum flange castings shall be finished to give not less than 50 percent contact after assembly, as indicated by the Standard Machinist's Blue Test.

903.3.4.8 Fabrication of aluminum alloy material shall, in general, conform to the manufacturer's recommendations and the following specific requirements. Flame cutting will not be permitted. All holes in castings shall be cored and reamed for final fit. Welding shall be done by the inert gas shielded arc method and no flux shall be used. Precautions shall be taken to avoid scoring or marring of aluminum surfaces, and any such scoring or marring, which in the judgment of the engineer gives an objectionable appearance, will be cause for rejection. Cast parts shall have all casting irregularities removed. Tubing shall be seamless, and exterior and interior surfaces shall be clean, smooth and free from slivers, laminations, grooves, cracks or other defects.

903.3.4.9 Shop inspection will, in general, conform to the requirements of Sec 712.3.1.

903.3.4.10 All steel surfaces except stainless steel and galvanized surfaces, after being inspected and accepted, shall be cleaned and painted with the specified primer in accordance with Sec 712.12. Sandblasting of the inside surface of pipe columns will not be required. All the structural steel may be hot-dip galvanized in lieu of painting. Portions of the steel may be galvanized with the approval of the engineer.

903.3.4.11 Simulated wind-shop test loading for aluminum trusses will be required as shown on the plans. The load in kips (newtons) and location of the point of application shall be shown on the shop drawings.

903.3.4.12 Handling and storage of material shall conform to the requirements of Sec 712.3.6. If galvanized high strength bolts and washers are specified, they shall meet the requirements of Sec 903.2.2. If stainless steel bolts are used, they shall be tightened snugly. Connections in which steel and aluminum are in contact shall be protected as shown on the plans.

903.3.4.13 Field Painting. All exposed steel surfaces, except galvanized or stainless, shall receive an intermediate coat and a gray finish coat in accordance with Sec 712.12. All items requiring field painting that are to be located over the trafficway shall be fully painted before erection. Care shall be taken to prevent paint splatters on the aluminum portion of the truss.

903.3.4.14 Galvanized and aluminum material shall be handled in a manner to avoid damage to the surfaces. Any galvanized material on which the spelter coating has been bruised or broken will be rejected or may, with approval of the engineer, be repaired in accordance with Sec 712.14.

903.3.5 Sign Erection.

903.3.5.1 Storage of Signs. Signs delivered for use on a project shall be stored off the ground and under cover in a manner meeting the approval of the engineer. Any sign damaged, discolored or defaced during transportation, storage or erection may be rejected.

903.3.5.2 Fabricator's Certification. The contractor shall furnish the engineer, prior to sign erection, the fabricator's certification stating, "I hereby certify that only material and manufacturing processes in full compliance with the Missouri Department of Transportation job specification requirements were used in the fabrication of signs for Job _____, Route _____, County _____."

903.3.5.3 Erection of Signs. Sign posts shall be set vertically and true to line so the sign or signs will be level, at the proper angle with the roadway, and with minimum clearances as

shown on the plans. Posts with bolt-down base plates shall be plumbed by use of two nuts and washers on each anchor bolt. The space between the base plate and the concrete footing shall be filled with expansive mortar after the sign has been properly mounted. Exposed edges of the mortar shall be finished to present a neat appearance. The mounted sign shall present a smooth flat surface varying not more than 3/8 inch (9 mm) from a 4-foot (1.2 m) straightedge placed in any position on the face of the sign after erection.

903.3.5.4 Signs on traffic signal posts and lighting poles shall be mounted with strap or clamp type sign supports as shown on the plans or as approved by the engineer.

903.3.6 Sign Lighting. Sign lighting includes all work, material, equipment and electrical system components required for lighting signs on overhead structures in accordance with the plans. All electrical equipment and associated construction requirements shall conform to the applicable parts of Sec 901 and the following.

903.3.6.1 Sign Lighting Fixture. Sign lighting fixtures shall be designed for use with lamps burning in a horizontal position and for the type of circuit specified. The luminaire shall have an aluminum housing with two 2-inch (50 mm) slipfitters or one 4-bolt slipfitter, and an internal ballast kit designed for that fixture. The housing shall have a natural aluminum finish or gray baked enamel finish. Reflectors shall have an alzak aluminum finish. The refractor shall consist of prismatic heat resistant glass in a cast aluminum holder. Plastic refractors shall not be used. The refractor shall be shielded on the end facing traffic. The holder shall be secured to the luminaire by means of a hinge and an automatic latch. A silicone rubber or other approved gasket shall be used to form a seal between the refractor and housing. The door and refractor assembly shall be completely sealed so that water cannot enter the housing. All metal parts, such as springs on the latches and hinges, U-bolts and screws, shall be made from non-ferrous metal or stainless steel. Wiring inside the luminaire housing shall be protected by suitable heat resistant insulating material. The reflector-refractor optical assembly and the ballast shall form a single unit. The optical unit shall be sealed at the socket entry. Transformer and capacitor compartments of the ballast shall be separated by either a heat barrier or an air gap for lower capacitor operating temperatures. A pipe stop and bracket for 4-bolt mounting shall be included in the assembly to properly locate the luminaire on the aluminum tracking to provide proper placement and illumation as shown on the plans.

903.3.6.1.1 Lamps shall be mercury vapor or metal halide. Lamp size and type shall be as specified in the contract. The mercury vapor lamp shall have a rated lamp life of not less than 24,000 hours based on a minimum of 10 hours burning time per day. The metal halide lamp shall have a rated lamp life of not less than 10,000 hours based on a minimum of 10 hours burning time per day. The ballast shall be designed for the type of lamp used. The ballast shall be pre-wired to the lamp socket and to a terminal board so that only the connection of the supply leads to the ballast primary terminals is necessary. Ballasts shall be of the constant wattage type for mercury vapor lamps and shall be peak lead auto transformer type for metal halide lamps. Ballasts shall operate satisfactorily over a voltage range of plus or minus 13 percent of its nominal primary voltage rating. The change in lamp wattage over this range shall not exceed 3 percent for mercury vapor and 8 percent for metal halide. The ballast shall start and operate the lamp satisfactorily over a temperature range of -20 F (-29 C) to 105 F (40 C). Ballast efficiency shall not be less than 86 percent. The ballast shall have a power factor of not less than 90 percent. It shall be able to withstand, for at least one minute, twice the rated primary voltage plus 1000 volts at 60 hertz from primary to core, from secondary to core and from primary to secondary.

903.3.6.1.2 The luminaire unit shall provide an illumination level no less than 20 footcandles (215 lux) on any part of the sign when mounted as shown on the plans. The illumination uniformity ratio (maximum/minimum) shall be 6:1 or better. The illumination level shall be based on the type of lamp used at 70 percent of the output of a new luminaire. The contractor

shall supply photometric data and other documentation to demonstrate that these requirements are met. Documentation shall be submitted to the engineer and be approved in writing prior to installation of sign lighting.

903.3.7 Wiring and Conduit on Overhead Sign Structures. Pole and bracket cable shall be installed between the sign luminaires and the power source at the base of the pole. A premolded fused connector assembly shall be installed on each conductor between the source cable and the pole and bracket cable. The connector assembly and splice shall be insulated with a protective rubber boot designed for the premolded connector. Splices shall only be made in junction boxes or luminaire housings as shown on the plans or as approved by the engineer. Splices in junction boxes shall be accomplished with a splice block with a moulded plastic insulating cover. The splice block shall be designed for the wire size used. The splice block shall have one port per wire and the wires shall be secured with set screws. The set screw holes shall be protected with removable plugs. Any required taping shall be accomplished with a rubber, pressure-sensitive, all weather 30-mil (0.75 mm) splice tape. The tape shall be applied half-lap to a thickness equal to 1 1/2 times the thickness of the factory applied insulation and sheath, and taper off over the sheath neatly to a point approximately 3 inches (75 mm) from the conductor splice. Other wire and cable on overhead sign structures shall be as shown on the plans. All external wiring shall be enclosed in rigid aluminum conduit of the size shown on the plans. If flexible conduit is specified, it shall be liquidtight flexible conduit and fittings conforming to Article 351 of the National Electrical Code. Junction boxes shall be stainless steel boxes conforming to Sec 1062. All attachment hardware for conduit and junction boxes shall be stainless steel. No direct payment will be made for conduit and junction boxes on sign structures and any required hardware.

903.4 Final Clean Up. Final cleaning up of right of way shall be in accordance with Sec 104.11.

903.5 Method of Measurement. For those items on which final payment is based on contract quantities, final measurement will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity.

903.5.1 Measurement of concrete for footings, including all concrete, excavation, backfilling, reinforcing steel, anchor bolts and nuts, electrical conduit, grout and other incidental items as shown on the plans, will be made to the nearest 0.1 cubic yard (0.1 m^3). Contract quantities will be used in final payment.

903.5.2 Measurement of the weight (mass) of structural steel and pipe posts will be computed to the nearest pound (kilogram) for each post and to the nearest 10 pounds (5 kg) for the total, as shown on the plans. These weights (masses) will be computed using the theoretical weight (mass) of the various sections. Contract quantities will be used in final payment.

903.5.3 Measurement of conductor cable and wire will be made to the nearest 10 linear feet (5 m), as shown on the plans. If two-conductor pole and bracket cable is used in lieu of two single conductor cables, measurement will be made as for two single conductor cables. Contract quantities will be used in final payment.

903.5.4 Measurement of sign areas will be made to the nearest 1/10 square foot (0.01 m^2) for each sign and to the nearest square foot (0.1 m^2) for the total. The area of each sign will be that of the smallest rectangular, triangular or trapezoidal shape that will encompass the sign panel. Contract quantities will be used in final payment.

903.6 Basis of Payment.

903.6.1 Payment for breakaway assemblies including base connection, hinge plate and all other fabrication, complete in place, will be made at the contract unit price each regardless of the post size or shape.

903.6.2 Accepted highway signing will be paid for at the unit price for each of the pay items included in the contract. No direct payment will be made for any incidental items necessary to complete the work unless specifically provided as a pay item in the contract.

SECTION 903.10 TEMPORARY GROUND MOUNTED SIGNS

903.11 Description. This work shall consist of removing existing signs from their permanent supports, mounting on temporary sign supports, relocating temporary sign support structures as necessary, sign maintenance and replacement, and placing signs in their permanent location.

903.12 Materials. Temporary ground mounting posts shall be a breakaway wood or steel post design (including hinge plates) as shown on the plans. If the signs are required to be moved several times or are to be placed on new concrete pavement areas, portable structures made of wood and meeting the approval of the engineer may be used.

903.13 Construction Requirements.

903.13.1 Signs shall be mounted on temporary ground supports or, when the signs are required to be moved several times or relocated to improved areas, on a portable support structure. Temporary ground mounted sign supports shall be of a breakaway design conforming to the plans. Portable sign support structures shall be properly secured while in use to prevent signs tipping over due to natural wind or wind from large vehicles. Signs shall be mounted 6 to 12 feet (1.8 to 3.6 m) from the edge of shoulder to the sign edge closest to the shoulder and the bottom of the sign 7 to 8 feet (2.1 to 2.4 m) above the edge of the traveled way.

903.13.2 Signs shall be relocated within a single day and remain visible to and effective for the traveling public during all stages of construction.

903.13.3 The contractor shall maintain the signs during construction and place them in their permanent location when construction is completed. If a sign is damaged because of negligence by the contractor, the sign shall be replaced at the contractor's expense. All maintenance and replacement shall meet with the approval of the engineer.

903.14 Basis of Payment. Payment for temporary ground mounted signs will be made at the contract unit price per each and will be considered full compensation for all labor, equipment and material necessary to complete the described work.