

SECTION 01200
TRAFFIC CONTROL

PART 1 GENERAL

1.01 - Section Includes

- A. Construction parking controls.
- B. Flaggers.
- C. Flares and lights.
- D. Haul routes.
- E. Signage.
- F. Temporary Pavement Markings
- G. Removal.

1.02 - Description

- A. The Work specified under this section shall include all labor, material, equipment necessary for full compliance with the applicable Drawings, Specifications and other Contract requirements for the maintenance and protection of vehicular and pedestrian traffic during construction. This includes, but is not limited to, installation, maintenance, removal and staging changes of signs, striping, channelizing devices, pilot cars, flaggers, temporary barrier rail, barricades, lighting devices, temporary traffic signals, temporary floodlighting, temporary pavement markings, and temporary attenuators as set forth in the Contract Documents.

1.03 - Requirements of Regulatory Agencies

- A. In emergency situations or changes to the approved Traffic Control Plan, the Contractor shall fulfill the requirements of the local jurisdiction's Police, Fire, Traffic Engineering, Engineering, and Public Works Departments for all Work on the Project Site.
- B. Applicable requirements of railroads shall apply to Work on the Project Site, when within their jurisdiction.
- C. Applicable requirements for the Iowa Department of Transportation (DOT) shall apply to Work on the Project Site, when within their jurisdiction.
- D. In case of conflicts between jurisdictional requirements, the more stringent requirement shall govern.

1.04 - Quality Assurance

- A. Referenced Standards:
 - 1. U.S. DOT – Manual on Uniform Traffic Control Devices (MUTCD), current edition.
 - 2. Iowa DOT – Flaggers Handbook.

1.05 - Submittals

- A. Traffic Control Plan, when Contract Documents do not include a Traffic Control Plan, or the Contractor desires to alter the Traffic Control Plan in the Contract Documents: Submit a temporary traffic control plan, including a list of signs, barricades, drums, beacons, warning lights, and Flagger, for each stage of construction.
- B. The provider of traffic control shall provide evidence of being an Iowa DOT and American Traffic Safety Services Association (ATSSA) certified traffic control provider.

1.06 - Special Requirements

- A. Before Work is to be performed within the public right-of-way, the Contractor shall make applications to and shall obtain written approval from:
 - 1. For Projects in Cedar Rapids – Traffic Engineer with a copy to the City Engineer
 - 2. For Projects in Marion – City Engineer
 - 3. For Projects in Hiawatha – City Engineer
- B. After receiving all required permits, a minimum of 48 hours notice shall be provided to the Engineer prior to a street restriction and 72 hours notice shall be provided prior to a street closure. (The notice period is measured on business days Monday through Friday and excludes weekends and holidays.) The notice shall include the location of the Work, a schedule with detail acceptable to the Engineer, the type of Work being done, the company name, field representative

and telephone number of the Contractor, the company name, field representative and telephone number of the traffic control Subcontractor, if applicable. The required notice may be waived in the case of emergencies. A minimum 24 hours notice to the departments listed in Paragraph 1.06A, shall be provided prior to street reopening.

- C. The Contractor must obtain all required permits prior to placement of traffic controls, as specified in the General Conditions.
- D. The Contractor shall examine the traffic control plans for applicability at the beginning of construction and as construction progresses. Any necessary changes to the approved traffic control plan shall be subject to prior approval of the appropriate City department listed in Paragraph 1.06.
- E. The Contractor shall be held responsible for any damages that the local jurisdiction, Engineer, Governmental units, or their heirs or assigns may have to pay as a consequence of the Contractor's failure to protect the public from injury, and the same may be deducted from any payments that are due or may become due to the Contractor under this Contract.
- F. Existing permanent traffic control devices shall be removed and re-installed by the Jurisdiction. Contractor shall notify the Jurisdiction at least 72 hours in advance for removals.
- G. The Contractor shall coordinate traffic control with subcontractors, and public and private utilities.
- H. The Contractor shall suspend construction operations and reset traffic control systems when conditions such as darkness, fog, snow or rain reduce visibility of traffic control, flaggers, vehicles and construction operations to less than 500 feet.
- I. The Contractor shall arrange his operations to provide safe access to properties along the street. The Contractor shall provide temporary bridges to driveways, and provide access to fire hydrants, manholes, gate boxes, or other utilities. Whenever any work obstructs traffic in or to any public street, private driveway, or property entrance the Contractor shall take such steps as required to maintain necessary traffic and access to abutting property, unless other arrangements are made with the occupant of the property and approved by the Engineer. The maximum loss of driveway access shall be 12 hours, except during paving operations.
- J. Sidewalks shall be kept open if possible, and, if blocked, an alternate safe path or temporary plank sidewalk shall be provided sidewalk closures and detours shall be clearly marked by signs and barricades.

PART 2 PRODUCTS

2.01 - Materials

- A. All features of barricades, signs, cones and other safety devices including but not limited to color, size and shape shall conform to requirements of the referenced standards and Iowa DOT Standard Specification 2528 unless otherwise specified herein.
- B. Traffic controls and signs required for the duration of this Project shall conform to Part VI of the MUTCD. All signs, barricades, drums, beacons, warning lights, and flagger shall be subject to prior approval of the local jurisdiction.
- C. All traffic control devices shall be marked with the name and phone number of the agency responsible for placement and maintenance of the traffic control devices. The letters shall be black, a minimum of 1 inch in height, with combined size of name and phone number not to exceed 15 inches square. Lettering shall be conspicuously marked on the rear of the sign blank or rear of the lower barricade panel.
- D. Retroreflectivity
 - 1. Retroreflectivity of all traffic control devices shall meet the requirements of ASTM D4956 and the MUTCD.
 - 2. Retroreflectivity of all traffic control devices used with steady burn lamps shall be:
 - a. Pedestrian/Bike areas – Type I medium intensity enclosed lens glass bead sheeting.
 - b. Vehicular – Type II medium high intensity enclosed lens glass bead sheeting.
 - 3. Retroreflectivity of all traffic control devices used without steady burn lamp shall be either:
 - a. Type III high intensity encapsulated glass bead retroreflective material.
 - b. Type IV high intensity retroreflective unmetalized microprismatic reflective element.

4. Fixed post mounted signs with orange background shall use Type III or IV retroreflective sheeting. Skid mounted signs with orange background shall use Type I or II retroreflective sheeting.
5. Type I or II retroreflective sheeting shall be used on the sign faces of STOP/SLOW and SLOW/SLOW paddles.
- E. Steady burn lights shall be used in conjunction with all traffic control devices in areas of pedestrian or bike traffic, when stated in the Contract Documents.
- F. Barricades
 1. Types are as indicated in the Standard Details for Public Improvements.
 - a. A Type I barricade shall consist of a single horizontal rail. The supports for the rail may be fabricated of lumber, metal or other suitable material properly shaped, and should contain at the prescribed height, a notch or loop into which the horizontal members may be inserted.
 - b. A Type II barricade shall be constructed of wooden, metal, or other components or combinations thereof. The supports should be of A-frame configuration or hinged or otherwise fastened at the top to permit convenient folding and stacking for transporting from one work site to another. No identification shall be placed on the reflectorized surface of either rail.
 - c. A Type III barricade shall consist of three horizontal rails of nominal. The barricade may be of variable length required. Long barricades may be assembled from units of any convenient size. The barricade may be rigid mounted on posts, or movable, on skids.
 - d. All horizontal rails facing traffic shall be reflectorized.
 2. All barricades and channelizing devices used during the hours of darkness to delineate the traveled way through and around obstructions in a construction or maintenance area shall either be equipped with Type C steady-burn electric lamps, or have high intensity retroreflective sheeting. Lamps shall be placed along the entire length of the barricades at an interval no greater than 8 feet, center to center.
 3. When used as a channelizing device or to define a Work area, striping on Type I, or Type II and Type III barricades shall angle down to the open travel lane.
 4. All barricades and channelizing devices shall be provided with reflective sheeting in accordance with Iowa DOT Standard Specification 4186.03. Sheeting shall be Type III or Type IV. Use of reflectorized paint for barricades and channelizing devices is not permitted.
- G. Drums used for traffic warning or channelization shall be as set forth in the Standard Details for Public Improvements. The color and markings of drums shall be alternate orange and white reflectorized stripes. Lights on drums used for delineation purposes shall be steady instead of flashing.
- H. Tubular markers and traffic cones shall be set forth in the Standard Details for Public Improvements. Cones shall be made of rubber or other pliable material to withstand impact without damage to themselves or the striking vehicles. Traffic cones shall be orange in color.
- I. Vertical panels shall be as set forth in the Standard Details for Public Improvements. Each vertical panel used in the right-of-way between the hours of sunset and sunrise shall have a Type C steady burn electric lamp, or high intensity retroreflective sheeting. The vertical panel shall be reflectorized with alternate orange and white stripes slanting downward toward the side of which traffic is to pass. When a vertical panel is used to divide opposing streams of traffic, both sides of the marker shall be striped.
- J. Trench plates in vehicular areas shall be capable of supporting HS-20 loading.

K. Temporary Pavement Markings.

1. Traffic paint shall meet the requirements of Specification Section 02850.
2. Removable marking tape shall have a nominal width of 4 inches and shall consist of a yellow or white, weather and traffic resistant film, precoated on one side with a pressure sensitive adhesive. The tape shall be flexible and formable, and following application, shall remain conformed to the texture of the pavement surfaces.
 - a. Thickness: The average thickness of the film, including glass spheres, shall be not less than 30 mils or more than 70 mils.
 - b. Retroreflectance: The white or yellow types shall have the following initial minimum retroreflectance values at 1.05 degree observation angle and 88.76 degree entrance angle, measured by a Retrolux Model 1500 retroreflectometer:

	<u>White</u>	<u>Yellow</u>
Specific luminance (med/sq.ft./ft.-cdl)	550	325

L. Advance Warning or Sequencing Arrow Panels

1. Advance warning arrow panels shall meet the following requirements. Minimum legibility requirements are the distance at which the arrow panel message can be comprehended by a driver on a sunny day or a clear night.

Advance Warning Flashing or Sequencing Arrow Panels			
Type	Minimum Size	Minimum Number of Panel Lamps	Minimum Legibility Distance
A	24" x 48"	12	½ mile
B	30" x 54"	13	¾ mile
C	48" x 96"	15	1 mile

2. Arrow panels shall have the capability of the following mode selection: Left Arrow, Right Arrow, Left and Right Arrow and Caution. The Caution mode consists of four or more lamps, arranged in a pattern which will not indicate a direction.
3. Arrow panels shall be capable of minimum 50-percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 times per minute.

- M. Flashers: Flashers shall be power operated, lens directed, enclosed light units which shall provide intermittent light from 70 to 120 flashes per minute, with the period of light emittance occurring not less than 25 per cent of each on-off cycle, regardless of temperature. The emitted light shall be yellow in color and the area of light on at least one face of the unit shall be not less than 12 square inches. The discernible light shall be bright enough to be conspicuously visible during the hours of darkness at a minimum distance of 800 feet from the unit under normal atmospheric conditions. For units with beam light in one or more directions, the foregoing shall apply: 10 degrees or more to the side and 5 degrees or more above and below the photometric axis.

2.02 - Flaggers

- A. Flagger operations shall conform to Section 6F-1 thru 6F-10 of the U.S. Department of Transportation, Federal Highway Administration, MUTCD and Iowa DOT – Flaggers Handbook.
- B. Flaggers shall be trained in flagging operations in conformance with the requirements of current Iowa DOT specifications section 2528 and Supplements.

2.03 - Pilot Cars

- A. Pilot cars shall be pickup trucks or automobiles carrying the Contractor's company insignia, equipped with G20-4 signs reading: PILOT CAR – FOLLOW ME. Two signs shall be mounted on the vehicle so as to be clearly visible from both directions. The bottoms of the signs shall be mounted at least one foot above the top of the cab.

PART 3 EXECUTION

3.01 - General

- A. Vehicular, bicycle and pedestrian traffic shall be maintained on all the existing roadways for the duration of the Project unless otherwise shown in the Contract Documents. The Contractor shall plan and carry out the Work to provide for the convenient and safe passage of traffic.
- B. The Contractor shall confine occupancy of public or traveled ways to the smallest space compatible with the efficient and safe performance of the Work contemplated by the Contract.
- C. Work performed in the public right-of-way shall be performed with priority given to the safety of the workers and the general public, both pedestrian and vehicular.
- D. All excavations in any public street or public way deeper than 1-1/2 inches shall be barricaded, and applicable traffic control warnings provided.
- E. In accordance with the traffic control plan that has been reviewed and approved by the Contractor, and the Contract Documents, the Contractor shall erect or place, and maintain in good condition, barricades, warning signs, lights, flares, approved flashing electric flasher units, rubber traffic cones, drums and other warning and danger signals and devices, appropriate and adequate for the specific needs and subject to prior approval of the Engineer, at working Sites, open excavations, locations of material storage, standing equipment and other obstructions, at points where the usable traffic width of the roads are reduced, at points where traffic is deflected from its normal courses or lanes, and at other places of danger to vehicular or pedestrian traffic or completed Work. The Contractor shall submit a plan and list of signs to be installed for each phase of construction for approval by the Engineer. Only controls applicable to the Work phase in progress shall be in place.
- F. Provide traffic control for pedestrian and vehicular traffic, including trench cover plates, in Work areas as shown in the Contract Documents.
- G. The Contractor shall have available 24 hour a day monitoring of traffic control devices on the Project. Traffic control devices shall be checked at least every 3 hours during working hours and shall have a 24-hour a day on-call contact available during non-working hours. Defective devices shall be repaired or replaced immediately by the Contractor upon discovery.
- H. During hours of darkness, traffic control devices must be reflectorized or illuminated as specified in the MUTCD. Where there is serious interference from extraneous light sources, an illuminated sign should be used. Sign illumination may be either internal or external. Torches or lanterns are for warning or guidance, and shall not be used for sign illumination. Street or highway lighting is not regarded as meeting the requirements for sign illumination.
- I. Contractor shall provide written notification to the local jurisdiction, when modifying access control, which will affect emergency vehicular passage to either the thoroughfare or private properties.
- J. Temporary construction jobs of one hour or less at a location shall be exempt from providing advance warning signs, lights, or barricades, (subject to Engineer's approval) providing all mobile equipment shall be equipped with flashing beacons and cones to provide warning to moving vehicles and with adequate provisions for the Contractor's safety. The beacons and cones shall be in conformance with the regulations of the MUTCD.
- K. Use 36-in tall traffic cones on all streets except local streets. Traffic cones should be kept clean and checked frequently for location. Traffic cones are for daytime use only.
- L. Necessary signs, barricades or other traffic control devices shall be used in conjunction with the advance warning arrow panel and flaggers.
- M. Signs, barricades, or other traffic control devices that are no longer applicable due to changes in construction staging shall be covered or removed.

3.02 - Parking Control

- A. Control vehicular parking to prevent interference of construction vehicles with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles [in existing facilities]. Maintain vehicular access to and through parking areas.

- C. Prevent parking on or adjacent to access roads or in non-designated areas.
- D. To modify parking configurations, the Contractor shall place signs a minimum of 24 hours in advance of altering any parking patterns.
- E. Whenever possible, all vehicles and equipment should be parked on the same side of the street.

3.03 - Flaggers

- A. Provide trained and equipped flaggers to regulate traffic when construction operations or construction traffic encroach on public traffic lanes.
- B. Vests of bright orange, yellow, high-visibility yellow-green, or fluorescent version of these colors with reflective stripes shall be required for flaggers. For nighttime conditions similar outside garments shall be reflectorized. Flaggers are provided at Work Sites to stop traffic intermittently as necessitated by Work progress or to maintain continuous traffic past a Work Site at reduced speeds to help protect the Work crew. For both of these functions the flagger must, at all times, be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorist to the flagging instructions, and to permit traffic to reduce speed before entering the Work Site.
- C. Appropriate signs MUST be used in conjunction with flaggers as defined in the current edition of the MUTCD.
- D. Reference Iowa DOT Flaggers Handbook for procedures.

3.04 - Barricades

- A. Provide Type I, II, or III Barricades or Breakaway Barricades with flashing warning lights to control vehicular traffic. Suitably lighted barricades shall be placed on open ditches, trenches, excavations, or other Work which must be barred to the general public. Barricades shall be properly painted to the satisfaction of the Engineer in order to retain a high degree of visibility to vehicular and pedestrian traffic. Suitably lighted barricades shall be defined as barricades lit by flashers in accordance with Paragraph 3.04B. or other lighting methods approved by the Engineer in lieu thereof.
- B. The Contractor shall furnish and securely fasten flashing units to signs, barricades, and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic, or as the Engineer may request. The flasher shall be in operation during all hours between sunset and sunrise, and during periods of low visibility. Lights may be used in either a steady burn or flashing mode. The Contractor shall maintain, relocate and operate barricades and flashers throughout the life of the Contract.
- C. On construction Projects, when a road section is closed to traffic, Type III barricades shall be erected at the points of closure. They shall extend completely across a roadway and its shoulders (as a fence) or from curb to curb. Where provisions must be made for access of equipment and authorized vehicles, the Type III barricades shall be staggered or should be provided with gates or movable sections that can be closed when Work is not in progress. Where access is provided through the Type III barricades, responsibility should be assigned to a person to assure closure at the end of the each working day.
- D. When a road or street is legally closed, but access must still be allowed for local traffic, the Type III barricade cannot be erected completely across a roadway. Instead, an arrangement should be devised that will permit local use but effectively discourage use by through traffic. A sign with the appropriate legend concerning permissible use by local traffic should be installed.
- E. During nighttime hours Type I or Type II barricades shall be used to define the Work area when traffic is maintained through the area being constructed and/or reconstructed.
- F. Contractor shall take measures required to maintain reflectivity of barricades and channelizing devices. If reflectivity is reduced, devices shall be cleaned, repaired or replaced.
- G. Barricades shall be weighted with sandbags, or other approved means, for stability. Sandbags shall not be allowed to obscure striping.

3.05 - Signage

- A. At approaches to Site and on Site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

- B. Relocate as Work progresses, to maintain effective traffic control.
- C. Existing traffic signs and control devices must remain in place until Contractor's activities begin.
- D. Signs shall be located on the right-hand side of the street as indicated in the Standard Details for Public Improvements. Where special emphasis is deemed necessary, or on one-way streets, dual installations may be made which consist of duplicate signs opposite each other on the left and right sides of the roadway, respectively.
- E. Where permitted by the Engineer, signs may be mounted on barricades.
- F. Signs wider than 36 inches or larger than 10 square feet shall be mounted on two posts.
- G. Construction and maintenance signs shall not be mounted on existing traffic signs, posts or other utility structures within the public right-of-way.
- H. Signs shall be kept clean and in good repair.

3.06 - Temporary Pavement Markings

- A. For painted and taped pavement markings, or symbols and legends, the pavement surface shall be cleaned so it is free of dirt, oil, and other foreign materials.
- B. Temporary pavement marking shall be replaced if center lines or lane lines or both have been obliterated on sections of roadway for a distance of 50 feet or more on curves with a radius of 300 feet or less, 90 feet or more on curves with a radius of 300 feet to 1,000 feet, and 300 feet or more on curves with a radius of more than 1,000 feet or on straight sections.
- C. When construction Work necessitates the utilization of vehicle paths other than the lanes normally used, daytime and nighttime drive-through checks shall be made to evaluate the path and the possibility that the pavement markings might inadvertently lead drivers from the intended path.
- D. Markings no longer applicable shall be removed or obliterated as soon as practicable. Inappropriate existing pavement markings shall be removed and the new delineation placed before opening the affected lane or lanes to traffic. Conflicting pavement markings must be obliterated to prevent confusion to vehicle operators. Painting over existing stripes is not considered to meet the requirements for removal or obliteration.
- E. Traffic shifts from one path to another should not be attempted unless there is sufficient time, equipment, materials, and personnel available to properly complete it before the end of the workday.
- F. The intended vehicle path shall be clearly defined during day, night, and twilight periods under both wet and dry pavement conditions.
- G. Where stage construction requires changes in barricades or channelization, similar day-night checks and evaluations of the existing pavement marking shall accompany each change. When a temporary roadway is constructed to bypass a closed portion of highway, appropriate reflectorized pavement markings shall be placed on the approach to, and throughout the length of hard-surfaced temporary roadways.
- H. Removal of pavement markings may be by vacuum blasting, vacuum dry grinding, wet grinding, shot blasting, or high pressure water blasting. Open abrasive blasting or dry grinding without containment will not be allowed.
- I. Removal processes shall not cause functional damage to the transverse or longitudinal joint sealant materials. Pavement marking removal operations shall be conducted in a manner so that the finished pavement surface is not damaged or left in a pattern that may mislead or misdirect the motorist. When the operations are completed, the pavement surface shall be power broomed and any marking removal debris shall be removed from the pavement surface before the pavement is open to public traffic.
- J. Material collected shall be removed and disposed of in accordance with all applicable federal and state regulations.
- K. During application of temporary marking, the surface shall be clean and dry and the atmospheric and surface temperature shall be above 40 degrees F.
- L. If, due to unavoidable circumstances, the Contractor is not able to complete the temporary pavement marking or removal specified for that day, the Contractor shall provide or continue to provide traffic control until the pavement marking work is completed.

- M. Short-term expendable pavement markings can be provided by use of pressure sensitive traffic marking tape or raised pavement markers.
- N. Temporary pavement markings shall be used in combination with appropriate warning signs, channelizing devices and delineation to clearly indicate the required vehicle paths.

3.07 - Haul Routes

- A. Consult with authority having jurisdiction; establish public thoroughfares to be used for haul routes and Site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- D. Haul route shall be cleaned continuously of debris due to hauling operations until construction ceases.

3.08 - Lighting Devices

- A. Hazard Identification Beacons (Flashing Electric Lights)
 - 1. When used, the flashing beacon shall operate 24 hours a day.
 - 2. During normal daytime maintenance operations, flashing beacons may be provided for by the lighting equipment on maintenance vehicles, either the emergency flashers, the rotating dome light, or both.
 - 3. At locations where the daytime maintenance activity requires an obstruction to remain in the roadway at night, flashing beacons shall be installed at the point of hazard.
- B. Advance Warning Flasher or Sequencing Arrow Panels: The advance warning arrow panel may be used for day or night closures, slow moving maintenance or construction activities on the traveled way, or extremely hazardous high density and/or speed conditions.
- C. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.09 - Maintenance

If the Contractor's operations or occupancy of any public sidewalk, street or highway, or the uneven surfaces over any trenches being maintained by the Contractor shall interfere with the removal or sanding of snow or ice by the public authorities or adjoining land owners, in any ordinary manner with regular highway equipment, the Contractor shall be required to perform such services for the public authorities or adjoining owners without charge. If the Contractor fails to do so, the Contractor shall reimburse the adjoining owners or the local jurisdiction for any additional cost for doing such Work occasioned by conditions arising from the Contractor's operations, occupancy, or trench surfaces.

3.10 - Removal

- A. Remove equipment and devices when:
 - 1. No longer required.
 - 2. After receiving approval from the local jurisdiction.
 - 3. After permanent signage and markings are in place.
- B. Repair damage caused by installation and/or removal.

END OF SECTION 01200