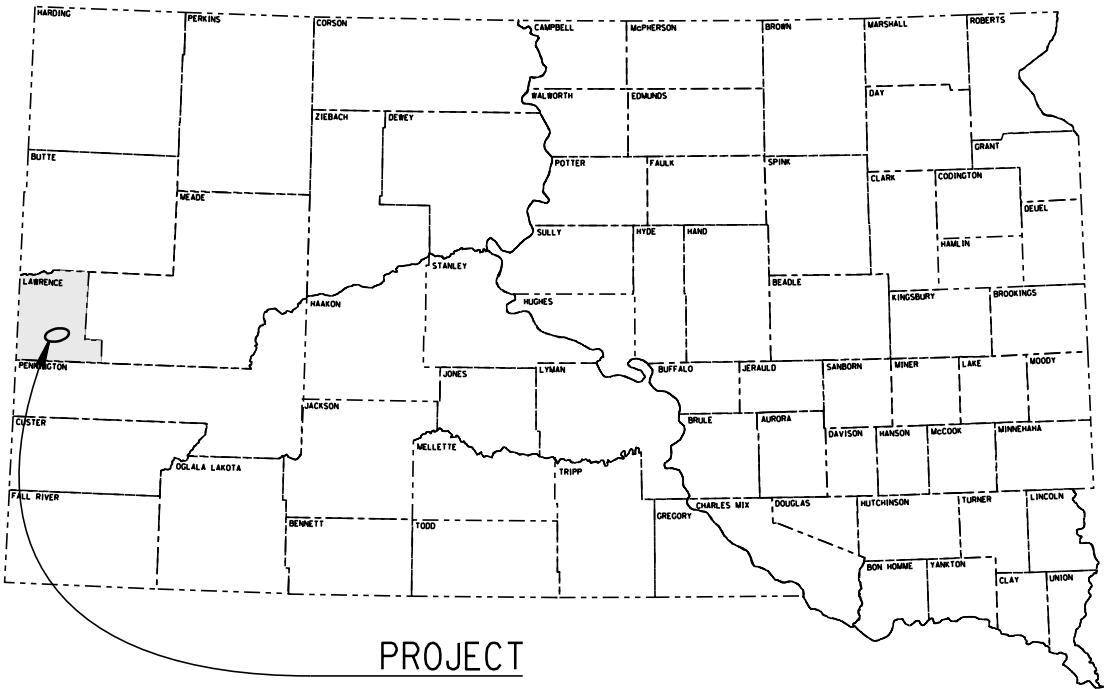


Plot Scale - 1:200

Plotted From - TRRC14622



STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED

PROJECTS 014A-468  
US HIGHWAY 14A  
LAWRENCE COUNTY

Bridge Deck Repair  
PCN i5pv

| STATE OF<br>SOUTH<br>DAKOTA | PROJECT  | SHEET | TOTAL<br>SHEETS |
|-----------------------------|----------|-------|-----------------|
|                             | 014A-468 | 1     | 6               |

Plotting Date: 05/31/2019

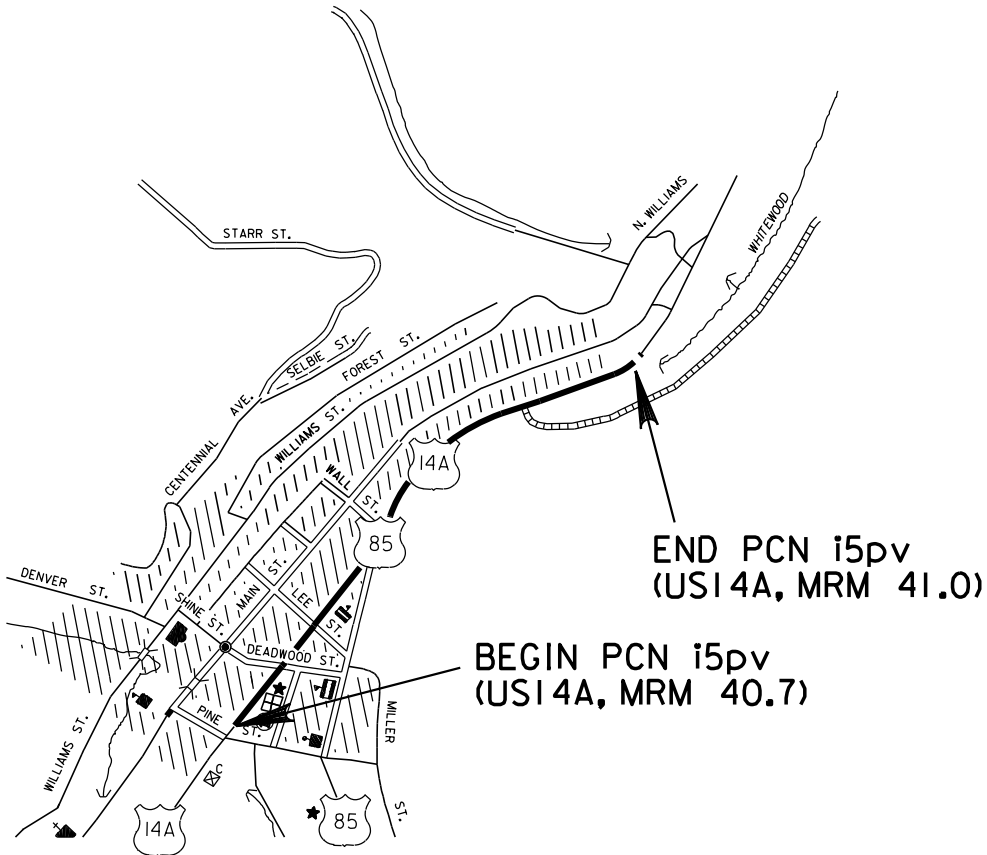
INDEX OF SHEETS

- Sheet 1: Title Sheet
- Sheet 2 - 3: Plan Notes and Quantities
- Sheet 4: Bridge Deck Spall Photos
- Sheet 5 - 6: Standard Plates



|            |        |
|------------|--------|
| US14A/85   |        |
| ADT (2018) | 9888   |
| ADT (2038) | 13379  |
| DHV        | 2114   |
| D          | 51%    |
| T DHV      | 2.1%   |
| T ADT      | 4.6%   |
| V          | 40 mph |

STORM WATER PERMIT  
None Required



ESTIMATE OF QUANTITIES, Bridge Deck Spall Repair (Deadwood, SD)

| ITEM NO. | DESCRIPTION                             | QUANTITY | UNIT |
|----------|---|----------|------|
| 009E0197 | Mobilization 1                          | 2        | Each |
| 480E5000 | Galvanic Anode                          | 100      | Each |
| 491E0172 | Concrete Patching Material, Bridge Deck | 150      | CuFt |
| 550E0105 | Concrete Removal Type 1B                | 70       | SqYd |
| 550E0105 | Concrete Removal Type 1C                | 20       | SqYd |
| 550E0140 | Concrete Removal Type B                 | 200      | FT   |
| 634E0010 | Flagging                                | 10       | Hour |
| 634E0120 | Traffic Control, for Pavement Repair    | 8        | Site |

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

CONTRACT TIME PROVISIONS

When the DOT determines that a given set of repairs are required, the Contractor will be notified. From the time of notification, the Contractor will have 30 calendar days to mobilize and complete the repairs. No work shall be performed during the Sturgis Motorcycle Rally (August 2<sup>nd</sup> – August 12<sup>th</sup>).

The contract may be renewed annually by construction change order if all parties are in agreement.

SCOPE OF BRIDGE WORK

Spall repair on the deck of Str. No. 41-161-156 along US 14A in Deadwood on an on-demand basis. The overall deck is 1,768’ long and the roadway width is 48’.

1. Install traffic control as needed.
2. Begin repair of the bridge deck by removing all loose and delaminated concrete from the bridge deck surface in the locations requested.
3. Clean the surface of the repair area and existing reinforcing steel with abrasive blasting.
4. Install galvanic anodes.
5. Place patch material and cure.
6. Remove traffic control.

The Region Bridge Engineer will provide a general sketch of spall locations when making a request for repairs.

A chart showing spall repair history at this structure has been included on Sheet 4 for informational purposes. This is an estimate and shows the variability from year to year.

MOBILIZATION

If more than one location on the bridge deck is to be repaired, the Contractor will be compensated for only one mobilization to the site.

Mobilization 1 will be paid once each time the Contractor is called to repair spalls, regardless of the number of locations requiring repair within the project limits.

It is expected that the Contractor will be notified for 2 total mobilizations during the length of the contract. One may take place in July, before the Sturgis

Motorcycle Rally and a second may take place in October/November. Each mobilization may or may not require closures in all 4 lanes.

COORDINATION WITH THE CITY OF DEADWOOD

The City of Deadwood shall be contacted 1 week prior to work being scheduled. When work is expected to impact turning movements of intersections along 14A, the City will need to ensure emergency services are aware of the temporary conditions.

Ron Green, Public Works Director - Phone: (605) 578-3082

WORK COORDINATION

The Contractor shall coordinate their work with the City of Deadwood projects under construction adjacent to the Structure Number 41-161-156. The Contractor shall coordinate work such that access is provided to any project site at all times.

FLAGGING

Flagging has been included for use during spall repair near intersections along 14A. When repairs can be completed without completely closing off cross traffic, a flagger shall be used.

Expect spalls near intersections to be approximately 10% of the total quantity of spalls needing repair.

TRAFFIC CONTROL

The bid item “Traffic Control, for Pavement Repair” shall include all necessary traffic control devices as required by these plans to close a single lane and shall be measured and paid at the contract unit price per “site”. The Contractor shall be compensated each time they are required to close a lane for spall repair. If the Contractor relocates the traffic control devices to a different location within the same lane during the same mobilization, additional compensation will not be made and it shall be considered the same “site”.

The Contractor may choose the length of the lane closures based on locations of repair areas, but lane closures shall not prohibit any movements at intersections unless active work is being performed. A lane closure shall not be intermittent throughout the length of the deck.

1. Requests to deviate from the traffic control specified shall be submitted in writing to the Engineer for review. Approval of alternate traffic control will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
2. No work will be allowed during hours of darkness.
3. All traffic control shall be removed at the end of each work day and all lanes shall be open.
4. Contractor’s employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

|                             |          |       |                 |
|-----------------------------|----------|-------|-----------------|
| STATE OF<br>SOUTH<br>DAKOTA | PROJECT  | SHEET | TOTAL<br>SHEETS |
|                             | 014A-468 | 2     | 6               |

5. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
6. All materials and equipment shall be stored within the lane closure during each work day.
7. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the Contractor’s vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable.
8. All construction operations shall be conducted in the general direction of traffic movement.
9. Traffic approaching the project from intersecting roadways and approaches must be adequately accommodated. Intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.
10. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used.

CONCRETE REMOVAL

Concrete breakout consists of Concrete Removal Type 1B, Type 1C, and Type B over the deck surface where necessary. Such removal shall be in conformance with these plans and Section 550 of the Construction Specifications.

1. The existing deck shall be broken out to the limits of unsound concrete. The Contractor shall sound the area adjacent to the apparent spalled concrete periphery with chain drag or hammer to determine the limits of the loose and delaminated concrete. Breakout limits shall be defined with a 3/4” deep sawcut. The Contractor shall then remove the concrete down to the top layer of reinforcing steel in the deck within this limit. Removal shall be by jackhammers or chipping hammers. Jack hammers and mechanical chipping tools shall not be operated at an angle in excess of 45 degrees measured from the surface of the concrete. The edges of the resulting hole in the deck shall be nearly vertical or tapered inward from the top down to a minimum depth of one inch. A reversed taper will not be permitted. Any reinforcing steel that is exposed by the concrete removal operations shall be thoroughly cleaned by abrasive blasting. Care shall be taken during the removal operations not to nick, gouge or in any other way damage the in-place reinforcing steel. Any damage to the in-place reinforcing steel caused by the removal operations shall be repaired as directed by the Engineer at no cost to the Department.
2. Type B removals shall be performed in all spall repair areas in order to ensure patching material will surround at least one reinforcing bar in order to ensure soundness of patch and for installation of galvanic anodes as necessary.
3. After removing all loose concrete to the defined limits, the area shall be abrasive blast cleaned and blown clean with clean, dry, oil-free compressed air at 90 psi. The abrasive blasting shall be to the extent that all surface latence is removed. Abrasive blasting shall expose the coarse aggregate and remove rust from any exposed reinforcing steel.

- 4. All broken out concrete shall be disposed of by the Contractor.
- 5. During concrete removal operations, no broken-out concrete shall be allowed to fall into Whitewood Creek.
- 6. The contract unit price per square yard for “Concrete Removal Type 1B”, “Concrete Removal Type 1C”, and per linear foot for “Concrete Removal Type B” shall include breaking out concrete, cleaning, and disposal of all broken out material.

CONCRETE PATCHING MATERIAL, BRIDGE DECK

Concrete patching material shall be used to repair the deck areas where loose and delaminated concrete was removed.

- 1. Concrete used in the spall repair areas shall consist of the following product or an approved equal (as approved by the Region Bridge Engineer in the Rapid City Region Office).

Express Repair  
Euclid Chemical  
19215 Redwood Road  
Cleveland, OH, 44110  
Telephone (800) 321-7628  
Fax (216) 531-9596

In all repair areas, extend mix with 3/8” clean, well graded pea gravel as recommended by the Manufacturer.

- 2. The existing surface at the time of placement of the concrete patching material shall be at least 40° F (4° C), measured by a thermometer placed against the concrete surface and covered with an insulating blanket. The concrete patching material shall be mixed and placed in accordance with the manufacturer’s technical data sheet. The Contractor shall provide a manufacturer’s technical data sheet to the Engineer prior to performing the work.
- 3. Immediately after finishing the concrete patching material, the surface of the concrete patching material shall be covered with a double layer of wet burlap for a minimum of 60 minutes. Following the wet cure, the burlap shall be removed and the surface allowed to air dry until it is opened to traffic.
- 4. Concrete Patching Material, Bridge Deck will be measured to nearest 0.1 cubic feet as determined from the theoretical yield per bag of Concrete Patching Material, Bridge Deck. Concrete Patching Material, Bridge Deck will be paid for at the contract unit price per cubic foot. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to furnish, place and cure the concrete patching material within the removal areas.

GALVANIC ANODE

- 1. The Contractor shall furnish and place galvanic anodes in the concrete repair areas where epoxy coating is removed from the reinforcing steel.
  - 2. The galvanic anodes shall be supplied as one of the following:
    - a. Galvashield XP2  
Vector Corrosion Technologies  
65114 140<sup>th</sup> Ave.  
Wabasha, MN 55981  
Phone: (507) 259-2481  
Website: [www.vector-corrosion.com](http://www.vector-corrosion.com)
    - b. Sentinel Silver  
Euclid Chemical Company  
19218 Redwood Road  
Cleveland, OH 44110  
Phone: (800) 321-7628  
Website: [www.euclidchemical.com](http://www.euclidchemical.com)
    - c. Sika FerroGard 670  
Sika Corporation US  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Phone: (800) 933-7452  
Website: <http://usa.sika.com>
- The anodes shall be placed in accordance with manufacturer’s recommendations.
- 3. The anodes shall be placed with a minimum ¾” cover and shall be set in embedding mortar per the manufacturer’s recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer’s recommendations to provide sufficient electrical connection and mechanical bond.
  - 4. The electrical continuity of the connections and reinforcing steel shall be confirmed per the manufacturer’s recommendations.
  - 5. In area of concrete repair where anodes are placed according to manufacturer’s recommendations, the epoxy coating on the reinforcing steel will not require touch up.
  - 6. The Contractor shall provide manufacturer’s product literature and installation instructions to the Engineer 10 days prior to installation.
  - 7. All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for Galvanic Anode.

| STATE OF<br>SOUTH<br>DAKOTA | PROJECT  | SHEET | TOTAL<br>SHEETS |
|-----------------------------|----------|-------|-----------------|
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Plotting Date: 05/09/2019



TYPICAL SPALL



TYPICAL SPALL



TYPICAL SPALL



TYPICAL SPALL



TYPICAL SPALL



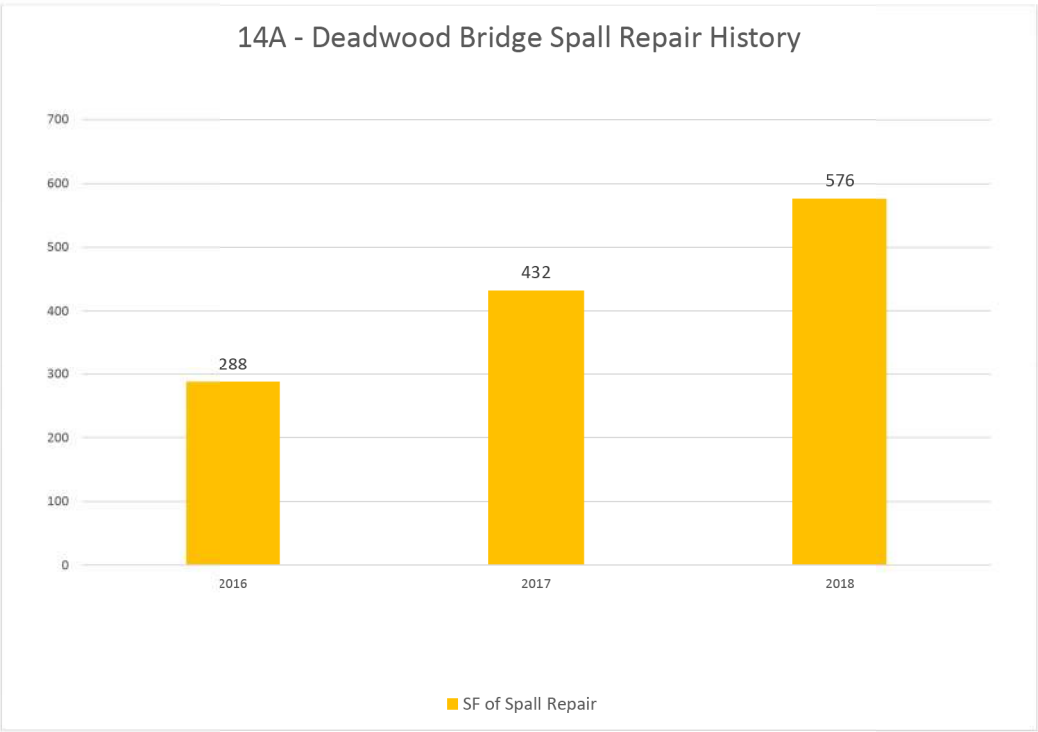
TYPICAL SPALL



TYPICAL REPAIRS



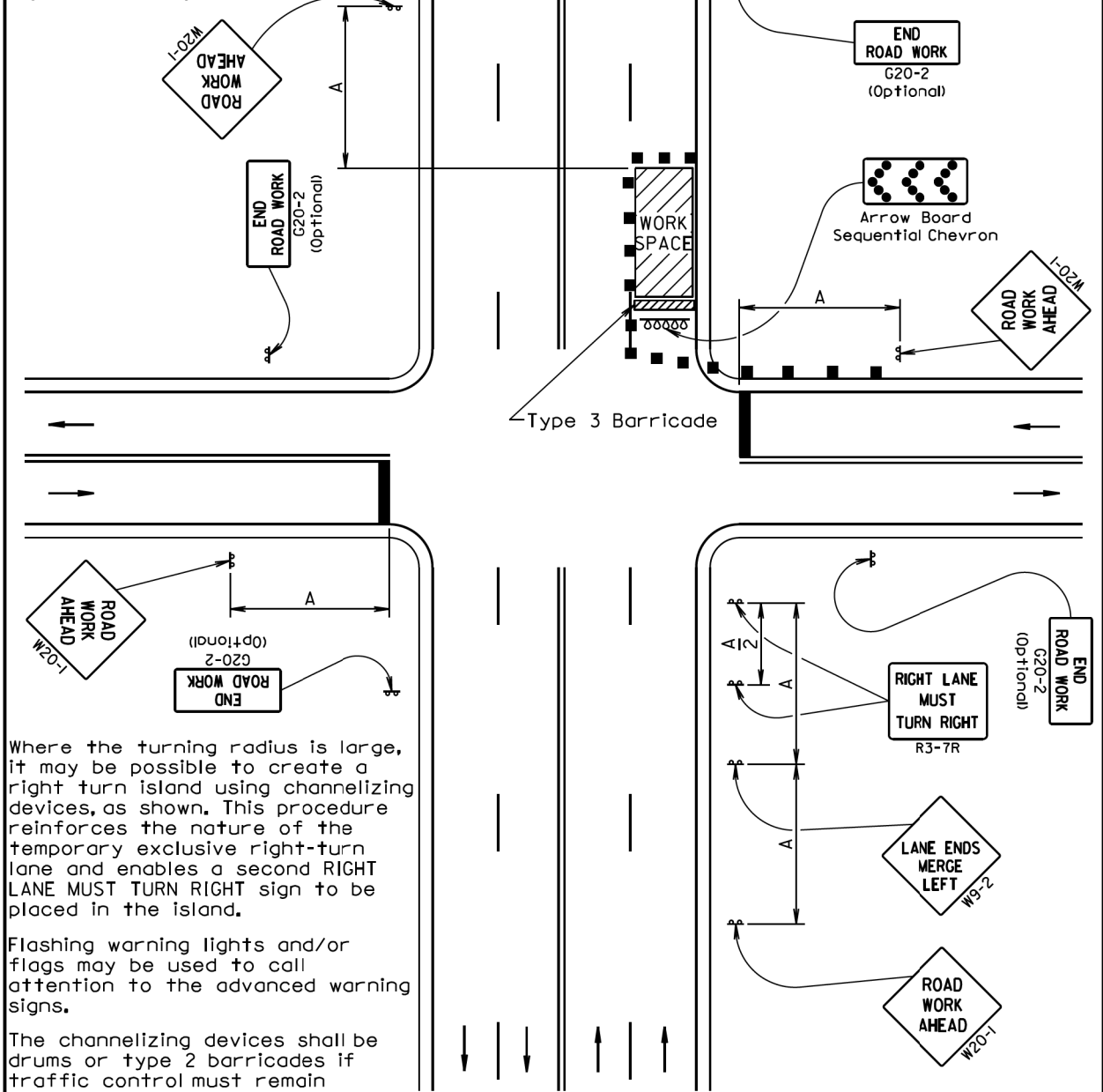
TYPICAL REPAIRS





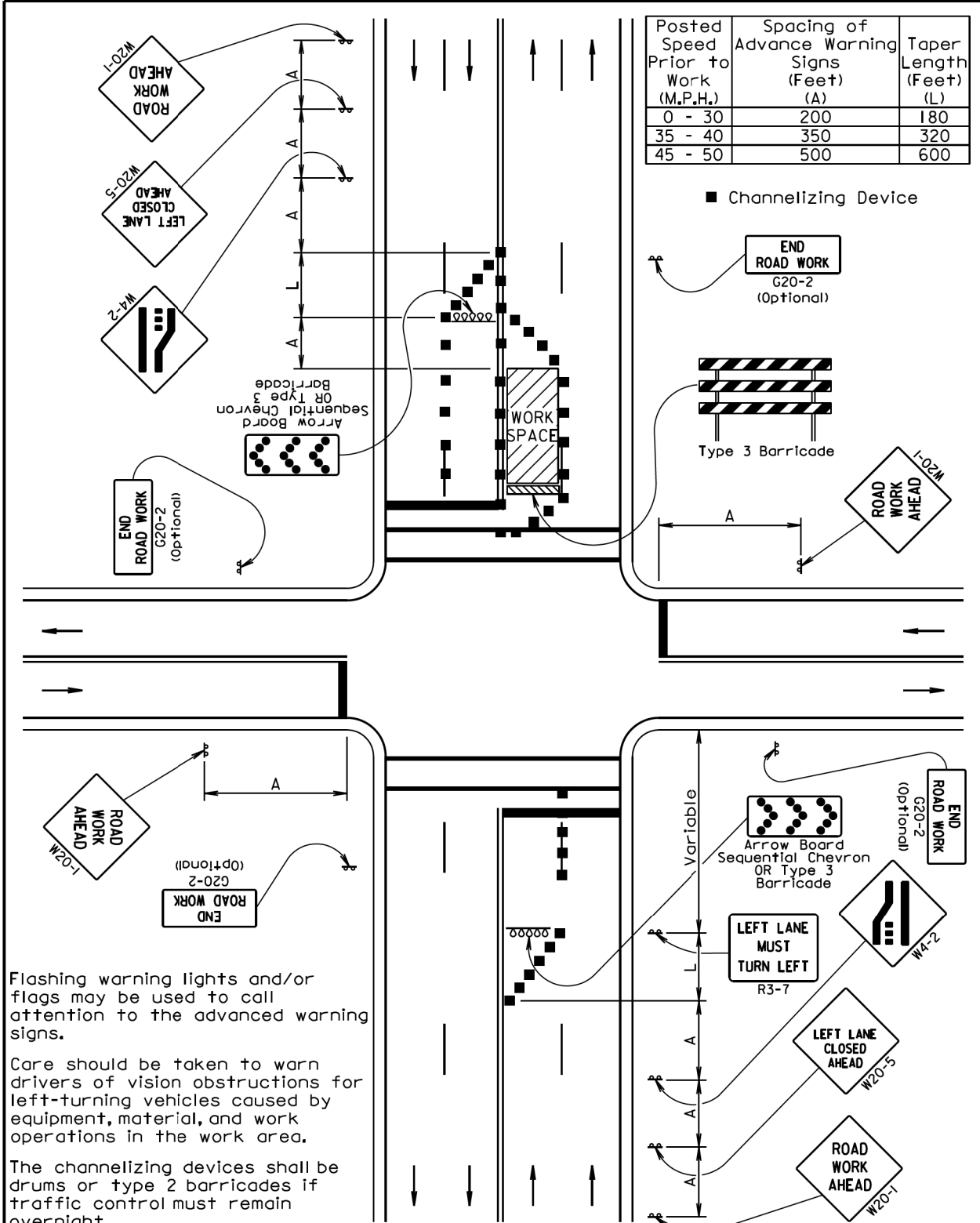
For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through traffic.

The standard procedure is to close on near side of the intersection any lane that is not carried through the intersection. However, when this results in the closing of a right lane having significant right-turning movements, then the right lane may be restricted to right turns only, as shown.



September 22, 2014

|                       |   |                               |
|-----------------------|---|-------------------------------|
| S<br>D<br>D<br>O<br>T | GUIDES FOR TRAFFIC CONTROL DEVICES<br>RIGHT LANE CLOSURE FAR SIDE OF INTERSECTION | PLATE NUMBER<br>634.42        |
|                       |   | Sheet 1 of 1                  |
|                       |   | Published Date: 2nd Qtr. 2019 |



September 22, 2014

|                       |  |                               |
|-----------------------|--|-------------------------------|
| S<br>D<br>D<br>O<br>T | GUIDES FOR TRAFFIC CONTROL DEVICES<br>LEFT LANE CLOSURE FAR SIDE OF INTERSECTION | PLATE NUMBER<br>634.43        |
|                       |  | Sheet 1 of 1                  |
|                       |  | Published Date: 2nd Qtr. 2019 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|-------------------------------------|---|-------------------------|--|
| 0 - 30                              | 200   | 180                     | 25   |
| 35 - 40                             | 350   | 320                     | 25   |
| 45                                  | 500   | 600                     | 25   |
| 50                                  | 500   | 600                     | 50 *                                       |
| 55                                  | 750   | 660                     | 50 *                                       |
| 60 - 65                             | 1000  | 780                     | 50 *                                       |

\* Spacing is 40' for 42" cones.

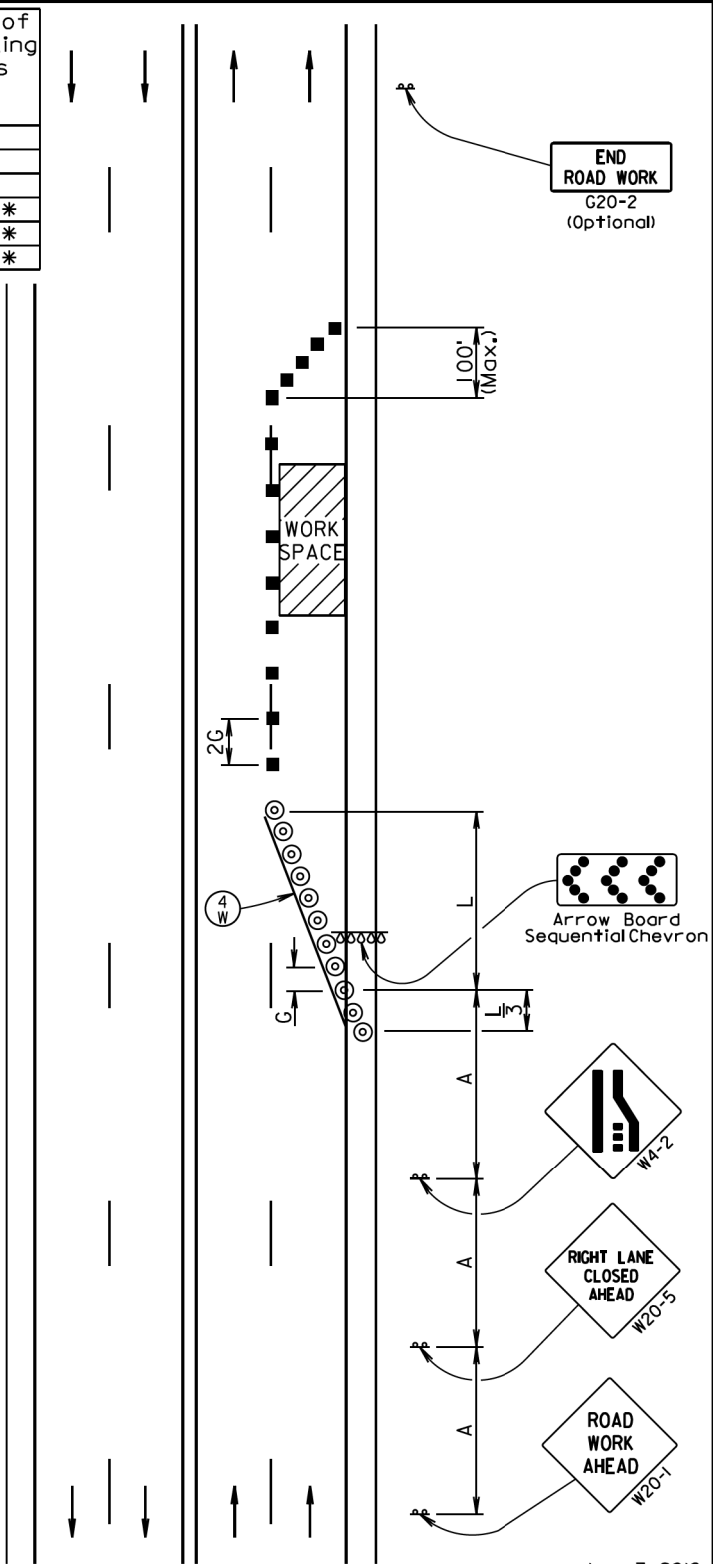
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

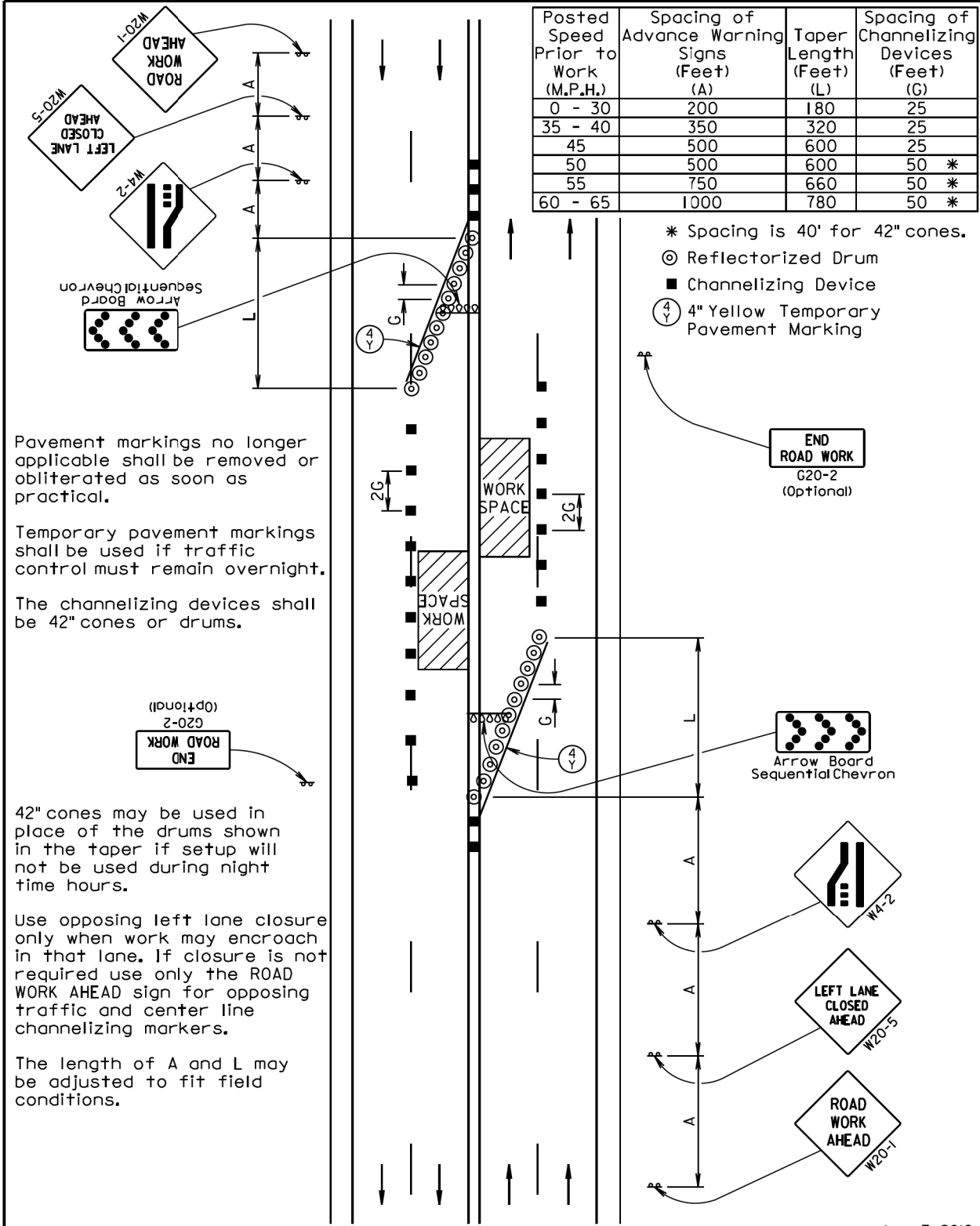
Temporary pavement markings shall be used if traffic control must remain overnight.

The length of A and L may be adjusted to fit field conditions.



June 3, 2016

|                               |                       |   |                        |
|-------------------------------|-----------------------|---|------------------------|
| Published Date: 2nd Qtr. 2019 | S<br>D<br>D<br>O<br>T | GUIDES FOR TRAFFIC CONTROL DEVICES<br>4-LANE UNDIVIDED, RIGHT LANE CLOSED | PLATE NUMBER<br>634.47 |
|                               |                       | Sheet 1 of 1  |                        |



June 3, 2016

|                               |                       |  |                        |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 2nd Qtr. 2019 | S<br>D<br>D<br>O<br>T | GUIDES FOR TRAFFIC CONTROL DEVICES<br>4-LANE UNDIVIDED, LEFT LANE CLOSED | PLATE NUMBER<br>634.48 |
|                               |                       | Sheet 1 of 1   |                        |