

Special Provisions

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SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 2220-02-70, Milwaukee to Green Bay Road, IH 41/USH 45 Split to One Mile North of CTH D located in Washington County, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2020 Edition, as published by the department, and these special provisions.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.

100-005 (20190618)

2. Scope of Work.

The work under this contract shall consist of grading, base aggregate, concrete pavement, diamond grinding, base patching, concrete pavement repair, milling, asphalt pavement, cable guard, guardrail, erosion control items, finishing items, rehabilitation of four bridges - thin polymer overlay on B-66-48, painting girders on B-66-59, wingwall replacement on B-66-54 & B-66-64 - and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

104-005 (20090901)

3. Prosecution and Progress.

Begin work within ten calendar days after the engineer issues a written notice to do so.

Provide the start date to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within ten calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

Be advised that there may be multiple mobilizations and/or remobilizations to complete construction operations, for example, such items as: traffic control, excavation, base aggregate, asphalt pavement, concrete work, milling and resurfacing, signing, pavement marking, and other incidental items related to staging. No additional payment will be made, by the department, for additional mobilizations.

The contract time for completion is based on an expedited work schedule and may require extraordinary forces and equipment.

A Schedule of Operations

The schedule of operations shall conform to the requirements described below, unless modifications are approved in writing by the engineer. The schedule describes the major work areas and is not a complete list of activities that would occur during each stage of work. Refer to the plans for additional details.

- Stage 1
 - Continuous Diamond Grinding Concrete Pavement 8 feet of the northbound and southbound outside lanes.
 - Reconstruct outside HMA shoulder of the northbound and southbound lanes.
 - Install MGS guardrail along the northbound and southbound outside lanes.
- Stage 2
 - Continuous Diamond Grinding Concrete Pavement 8 feet of northbound and southbound median lanes.
 - Reconstruct median HMA shoulder of northbound and southbound lanes.
 - Install MGS guardrail in the median.

- Polymer overlay of Sherman Road structure (B-66-48).
- Construct crossovers south of Paradise Drive and north of CTH D.
- Stage 3A
 - Continuous Diamond Grinding Concrete Pavement 4 feet on each side of the crown lane (8 feet total) for both the northbound and southbound lanes.
 - Paint the Decorah Road structure (B-66-59) under roadway closures.
 - Replace wingwall on Beaver Dam Road structure (B-66-64).
 - Concrete pavement replacement and reconstruct HMA shoulder on the northbound lanes from Paradise Drive to CTH D.
- Stage 3B
 - Remove the crossovers south of Paradise Drive and north of CTH D constructed in stage 2.

B Work Restrictions

Migratory Birds

Swallow and other migratory birds' nests have been observed on or under the existing bridge. All active nests (when eggs or young are present) of migratory birds are protected under the federal Migratory Bird Treaty Act.

The nesting season for swallows and other birds is usually between May 1 and August 30. Either prevent active nests from becoming established, or apply for a depredation permit from the US Fish and Wildlife Service for work that may disturb or destroy active nests. The need for a permit may be avoided by removing the existing bridge structure prior to nest occupation by birds, or clearing nests from all structures before the nests become active in early spring. As a last resort, prevent birds from nesting by installing a suitable netting device on the remaining structure prior to nesting activity. Include the cost for preventing nesting in the cost of Removing Old Structure.

0074 (20090901)

Northern Long-eared Bat (*Myotis septentrionalis*)

Northern Long-eared Bats (NLEB) have the potential to inhabit the project limits because they roost in trees. Roosts may not have been observed on this project, but conditions to support the species exist. The species and all active roosts are protected by the Federal Endangered Species Act. If an individual bat or active roost is encountered during construction operations, stop work and notify the engineer and the WisDOT Regional Environmental Coordinator (REC).

If additional construction activities beyond what was originally specified are required to complete the work, approval from the engineer, following coordination with WisDOT REC, is required prior to initiating these activities.

4. Traffic.

Provide the Washington County Sheriff's Department, the Wisconsin State Patrol, the City of West Bend Police Department, the City of Jackson Police Department, and the project engineer a current telephone number with which the contractor or his representative can be contacted during non-working hours in the event a safety hazard develops.

Do not park or store equipment, contractor's and personal vehicles or construction materials within the clear zone or on any roadway carrying traffic during working and non-working hours except at locations and periods of time approved by the engineer.

Do not permit construction or personnel equipment or vehicles to directly cross the live traffic lanes of USH 45. Yield to all through traffic at all locations. Equip all vehicles or equipment operating in the live traffic lanes with a hazard identification beam (flashing yellow signal light) that is visible from 360 degrees. Operate the flashing yellow beam only when merging or exiting live traffic lanes or when parked or operating on shoulders, except when parked behind barrier wall. Do not park personal vehicles within the access control limits of the highway. Do not cross live traffic lanes of USH 45 with equipment or vehicles.

Obtain prior approval from the engineer for the locations of egress or ingress for construction vehicles to prosecute the work.

Do not disturb, remove or obliterate any traffic control signs, advisory signs, sand barrel array, shoulder delineators or beam guard in place along the traveled roadways without the approval of the engineer.

Ensure that Flagging operations conform to standard spec 104.6.1(4) and chapter 6E of the WMUTCD.

Replace standard spec 643.3.1.(7) with the following:

Provide equipment, forces, and materials to promptly restore any traffic control devices or pavement markings damaged or disturbed within 2 hours of being contacted.

Full Highway Closure Hours

- 9:00 PM to 5:00 AM (Monday PM to Tuesday AM, Tuesday PM to Wednesday AM, Wednesday PM to Thursday AM, Thursday PM to Friday AM)
- 10:00 PM to 7:00 AM (Friday PM to Saturday AM, Saturday PM to Sunday AM)
- 10:00 PM - 5:00 AM (Sunday PM to Monday AM)

Full closure and detouring of freeway roads will be restricted to one direction at a time and to Full Freeway Closure Hours. The freeway may be closed for the diamond grinding of the inside 4 feet of each lane, base patching, bridge painting and marking lines. Provide signed detour routes, as the plans show that are fully open and free of construction during all full freeway closures.

Rolling Closure

Short term freeway mainline rolling closures may be allowed for a maximum of 15 minutes for the removal and erection of sign structures, equipment moves across the road, or other required work as determined by the engineer. The department will allow short term rolling closures only between 2 AM and 4 AM, and they may only be performed by highway law enforcement.

Obtain approval from the engineer before coordinating these closures with highway law enforcement. Coordinate 14 calendar days before closure. Present the scheduled time for the short term rolling closure at the weekly traffic meeting a minimum of one week before the closure.

Work Restrictions

The following are a list of work restrictions which may impact the sequence of construction operations.

- Daytime work zones can be no more than 4 miles in length and there must be a minimum of 2 miles between work zones.
- Nighttime freeway closures are only allowed for one direction of traffic and one segment at a time. The segments for nighttime closures are IH 41 to STH 60, STH 60 to STH 33 and STH 33 to Friendly Drive.
- Consecutive entrance ramps and consecutive exit ramps may not be closed at the same time. Do not close any ramps that are being used for an active detour route.
- Exit ramps to Pleasant Valley Road shall remain open at all times for hospital access.
- During the Washington County Fair (mid-July 2020 and mid-July 2021), the ramps at Pleasant Valley Road shall be fully open, no full freeway closures will be allowed, and project impacts will be communicated to the fair officials.
- The lane closures for the polymer overlay of the Sherman Road Structure are only allowed from 7:00 PM Friday to 5:00 AM Monday.

5. Holiday Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying **USH 45** traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday periods:

- From noon Friday, May 22, 2020 to 6:00 AM Tuesday, May 26, 2020 for Memorial Day;
- From noon Thursday, July 2, 2020 to 6:00 AM Monday, July 6, 2020 for Independence Day;
- From noon Friday, September 4, 2020 to 6:00 AM Tuesday, September 8, 2020 for Labor Day.
- From noon Wednesday, November 25, 2020 to 6:00 AM Monday, November 30, 2020 for Thanksgiving;
- From noon Friday, May 28, 2021 to 6:00 AM Tuesday, June 1, 2021 for Memorial Day;
- From noon Friday, July 2, 2021 to 6:00 AM Tuesday, July 6, 2021 for Independence Day;

- From noon Friday, September 3, 2021 to 6:00 AM Tuesday, September 7, 2021 for Labor Day.
- From noon Wednesday, November 24, 2021 to 6:00 AM Monday, November 29, 2021 for Thanksgiving.

stp-107-005 (20181119)

6. Information to Bidders, U.S. Army Corps of Engineers Section 404 Permit.

The department has obtained a U.S. Army Corps of Engineers Section 404 permit. Comply with the requirements of the permit in addition to requirements of the special provisions. A copy of the permit is available from the regional office by contacting **Enter name of contact at Enter phone number.**

stp-107-054 (20080901)

7. Environmental Protection, Aquatic Exotic Species Control.

Exotic invasive organisms such as VHS, zebra mussels, purple loosestrife, and Eurasian water milfoil are becoming more prolific in Wisconsin and pose adverse effects to waters of the state. Wisconsin State Statutes 30.07, "Transportation of Aquatic Plants and Animals; Placement of Objects in Navigable Waters", details the state law that requires the removal of aquatic plants and zebra mussels each time equipment is put into state waters.

At construction sites that involve navigable water or wetlands, use the follow cleaning procedures to minimize the chance of exotic invasive species infestation. Use these procedures for all equipment that comes in contact with waters of the state and/or infested water or potentially infested water in other states.

Ensure that all equipment that has been in contact with waters of the state, or with infested or potentially infested waters, has been decontaminated for aquatic plant materials and zebra mussels before being used in other waters of the state. Before using equipment on this project, thoroughly disinfect all equipment that has come into contact with potentially infested waters. Guidelines from the Wisconsin Department of Natural Resources for disinfection are available at:

<http://dnr.wi.gov/topic/invasives/disinfection.html>

Use the following inspection and removal procedures:

1. Before leaving the contaminated site, wash machinery and ensure that the machinery is free of all soil and other substances that could possibly contain exotic invasive species;
2. Drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped;
3. Inspect boat hulls, propellers, trailers and other surfaces. Scrape off any attached mussels, remove any aquatic plant materials (fragments, stems, leaves, seeds, or roots), and dispose of removed mussels and plant materials in a garbage can before leaving the area or invested waters; and
4. Disinfect your boat, equipment and gear by either:
 - 4.1. Washing with ~212 F water (steam clean), or
 - 4.2. Drying thoroughly for five days after cleaning with soap and water and/or high pressure water, or
 - 4.3. Disinfecting with either 200 ppm (0.5 oz per gallon or 1 Tablespoon per gallon) Chlorine for 10-minute contact time or 1:100 solution (38 grams per gallon) of Virkon Aquatic for 20- to 30-minute contact time. Note: Virkon is not registered to kill zebra mussel veligers nor invertebrates like spiny water flea. Therefore this disinfect should be used in conjunction with a hot water (>104° F) application.

Complete the inspection and removal procedure before equipment is brought to the project site and before the equipment leaves the project site.

stp-107-055 (20130615)

8. Information to Bidders, WPDES General Construction Storm Water Discharge Permit.

The department has obtained coverage through the Wisconsin Department of Natural Resources to discharge storm water associated with land disturbing construction activities of this contract under the Wisconsin Pollutant Discharge Elimination System General Construction Storm Water Discharge Permit (WPDES Permit No. WI-S066796-1). A certificate of permit coverage is available from the regional office by contacting Brian Pluemer (Design Project Manager) at (262) 548-6721. Post the permit in a conspicuous place at the construction site.

stp-107-056 (20180628)

9. Utilities.

This contract comes under the provision of Administrative Rule Trans 220.

stp-107-065 (20080501)

Underground and overhead utility facilities are located within the project limits. Utility adjustments are required for this construction project as noted below. Coordinate construction activities with a call to Diggers Hotline or a direct call to the utilities that have facilities in the area as required per state statute. Use caution to ensure the integrity of underground facilities and maintain code clearances from overhead facilities at all times.

Contact utility companies listed in the plans prior to preparing bids to obtain current information on existing utility locations and the status of any new utility relocation work.

There may be discontinued utility facilities within the project limits. If a conflict with a discontinued utility facility is encountered, contact the appropriate utility owner/representative to coordinate construction activities and proper removal and disposal of said facility as necessary.

Known utilities in the project area are as follows:

WisDOT-ATR has an existing ATR facility at approximate station 128+00. A new ATR facility will be installed at approximate station 150+00 as part of the project.

10. Other Contracts.

Modifications to the traffic control plan may be required by the engineer to be safe and consistent with adjacent work by others.

It is expected that routine maintenance by the city and county personnel may be required at certain times concurrently with the work being done under this contract.

11. Erosion Control

Add the following to standard spec 107.20 as paragraphs nine through fifteen:

- (9) Erosion control best management practices (BMP's) the plans show are at suggested locations. The actual locations shall be determined by the contractor's ECIP and by the engineer. Include each dewatering (mechanical pumping) operation in the ECIP submittal. The ECIP shall supplement information the plans show and not reproduce it. The ECIP shall identify how to implement the project's erosion control plan. ECIP shall demonstrate timely and diligently staged operations, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, and re-application of top soil to minimize the exposure to possible erosion.
- (10) Provide the ECIP 14 days before the pre-construction conference. Provide 1 copy of the ECIP to the department and 1 copy of the ECIP to the WDNR Liaison Craig Webster (262-574-2141 or Craig.Webster@wisconsin.gov). Do not implement the ECIP until department approval, and perform all work conforming to the approved ECIP.
- (11) Maintain Erosion Control BMP's until permanent vegetation is established or until the engineer determines that the BMP is no longer required.
- (12) Stockpile excess materials or spoils on upland areas away from wetlands, floodplains, and waterways. Install perimeter silt fence protection around stockpiles within a timeframe acceptable to the engineer. If stockpiled materials will be left for more than 14 days, install temporary seed and mulch or other temporary erosion control measures the engineer orders.
- (13) Re-apply topsoil on graded areas, as designated by the engineer, within a timeframe acceptable to the engineer after grading is completed within those areas. Seed, fertilize, and mulch/erosion mat top-soiled areas, as designated by the engineer, within 5 days after placement of topsoil. If graded areas are left not completed and exposed for more than 14 days, seed those areas with temporary seed and mulch.
- (14) Do not allow excavation for; structures, utilities, grading, maintaining drainage that requires dewatering (mechanical pumping) of water containing sediments (sand, silt, and clay particles) to leave the work site or discharge to a storm water conveyance system without sediment removal treatment. Before each dewatering operation, submit to the department a separate ECIP amendment describing in words and pictorial format an appropriate BMP for sediment removal, conforming to WisDNR Storm Water Construction Technical Standard, Code 1061, Dewatering. Include reasoning, location, and schedule duration proposed for each operation. Per Code 1061, include all selection criteria: site assessment, dewatering practice selection, calculations, plans, specifications, operations, maintenance,

and location of proposed treated water discharge. Provide a stabilized discharge area. If directing discharge towards or into an inlet structure, provide additional inlet protection for back-up protection.

(15) Dewatering is incidental.

sef-107-010 (20180104)

Maintain drainage at and through worksite during construction conforming to standard specs 107.22, 204, 205 and 520. Use existing storm sewers, existing culvert pipes, existing drainage channels, temporary culvert pipes, or temporary drainage channels to maintain existing surface and pipe drainage. Pumps may be required to drain the surface, pipe, and structure discharges during construction. Costs for furnishing, operating, and maintaining the pumps is considered incidental to the project.

12. Notice to Contractor, Asbestos Containing Materials on Structure.

John Roelke, License Number All-119523, inspected Structure B-66-37 for asbestos on December 22, 2010. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities: The caulk in the parapet expansion joint tested positive for non-friable asbestos. The quantity of caulk is 200 linear feet.

A copy of the inspection report is available from: **Enter name and phone number of regional contact.** Locations of asbestos containing material are noted on the plan set. Do not disturb any asbestos containing material. Should asbestos containing material be disturbed, stop work immediately, notify the engineer, and the engineer will notify the department's Bureau of Technical Services at 608-266-1476 for an emergency response as specified in standard spec 107.24. Keep material wet until it is abated.

stp-107-120 (20120615)

13. Notice to Contractor, Verification of Asbestos Inspection, No Asbestos Found.

John Roelke, License Number All-119523, inspected Structure B-66-46, B-66-48, B-66-49, B-66-50, B-66-51, B-66-52, B-66-53, B-66-54, B-66-55, B-66-56, B-66-57, B-66-58, B-66-59, B-66-60, B-66-61, B-66-62, B-66-63, B-66-64, B-66-65, B-66-66, B-66-67 for asbestos on December 22, 2010. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from: **Enter name and phone number of regional contact.**

John Roelke, License Number All-119523, inspected Structure C-66-24 for asbestos on May 15, 2017. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from: **Enter name and phone number of regional contact.**

stp-107-127 (20120615)

14. Lane Rental Fee Assessment.

A General

The contract designates some lane closures to perform the work. The contractor will not incur a Lane Rental Fee Assessment for closing lanes during the allowable lane closure times. The contractor will incur a Lane Rental Fee Assessment for each lane closure outside of the allowable lane closure times. If a lane is obstructed at any time due to contractor operations, it is considered a closure. The purpose of lane rental is to enforce compliance of lane restrictions and discourage unnecessary closures.

The allowable lane closure times are shown in the Traffic article.

Submit the dates of the proposed lane, ramp, and roadway restrictions to the engineer as part of the progress schedule.

B Lane Rental Fee Assessment

The Lane Rental Fee Assessment incurred for each lane closure, each ramp closure, and each full closure of a roadway, per direction of travel, is as follows:

- Night time- \$1,500 per lane, per direction of travel, per hour broken into 15 minute increments
- Service Ramp- \$500 per lane, per direction of travel, per hour broken into 15 minute increments
- Off Peak- \$1,000 per lane, per direction of travel, per hour broken into 15 minute increments

The Lane Rental Fee Assessment represents a portion of the cost of the interference and inconvenience to the road users for each closure. All lane, roadway, or ramp closure event increments 15 minutes and less will be assessed as a 15-minute increment.

The engineer, or designated representative, will be the sole authority in determining time period length for the Lane Rental Fee Assessment.

Lane Rental Fee Assessments will not be assessed for closures due to crashes, accidents or emergencies not initiated by the contractor.

The department will assess Lane Rental Fee Assessment by the dollar under the administrative item Failing to Open Road to Traffic. The total dollar amount of Lane Rental Fee Assessment will be computed by multiplying the Lane Rental Assessment Rate by the number of 15-minute increments of each lane closure event as described above.

Lane Rental Fee Assessment will be in effect from the time of the Notice to Proceed until the department issues final acceptance. If interim completion time or contract time expires before the completion of specified work in the contract, additional liquidated damages will be assessed as specified in standard spec 108.11 or as specified within this contract.

stp-108-070 (20161130)

15. Removing Apron Endwalls for Pipe Underdrain, Item 204.9060.S.01.

A Description

This special provision describes removing Apron Endwalls for Pipe Underdrain conforming to standard spec 204.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Removing Apron Endwalls for Pipe Underdrain in Each acceptably completed.

E Payment

Add the following to standard spec 204.5:

ITEM NUMBER	DESCRIPTION	UNIT
204.9060.S.01	Removing Apron Endwalls for Pipe Underdrain	EACH
stp-204-025 (20150630)		

16. Removing Underdrain, Item 204.9090.S.01.

A Description

This special provision describes Removing Underdrain conforming to standard spec 204.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Removing Underdrain in Linear Foot acceptably completed.

E Payment

Add the following to standard spec 204.5:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.01	Removing Underdrain	LF
stp-204-025 (20150630)		

17. Temporary Emergency Pullouts, Item 205.3000.S.

A Description

This special provision describes grading, furnishing, and placing crushed aggregate base course and signs to construct temporary emergency pullouts. This item also includes the removal of the pullouts including furnishing and placing finishing items as the plans show.

B (Vacant)

C Construction

Dispose of all surplus and unsuitable material as specified in standard spec 205.3.12.

D Measurement

The department will measure Temporary Emergency Pullouts acceptably completed by the unit.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
205.3000.S	Temporary Emergency Pullouts	EACH

Payment is full compensation for grading, shaping, and compacting; providing and placing crushed aggregate base course; providing and placing signs; removing as required; and for providing and placing topsoil, fertilizer, seed, and mulch.

stp-205-020 (20080902)

stp-305-005

18. Shaping Roadway, Item 305.0502.S.

A Description

This special provision describes blading the existing shoulder aggregates on the prepared foundation across the pavement removal area, and shaping and compacting the aggregate as the plans show and conforming to standard spec 305.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Shaping Roadway by the station along the centerline of each roadway.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
305.0502.S	Shaping Roadway	STA

Payment is full compensation for all blading, shaping, and compacting; and for preparing the foundation.

stp-305-005 (20080902)

19. Sawing Pavement Deck Preparation Areas, Item 509.0310.S.

A Description

This special provision describes sawing around deteriorated areas requiring deck repairs under the Preparation Decks bid items on decks receiving asphalt or polymer overlays and for deck repairs that will not receive an overlay.

B (Vacant)

C Construction

The department will sound and mark areas of deteriorated concrete that require deck preparation. The engineer may identify and mark additional areas as the work is being performed.

Wet cut a minimum of 1 inch deep and at least 2 inches outside of the marked areas. Bound each marked area by providing cuts aligned parallel and perpendicular to the deck centerline.

Remove sawing sludge after completing each area. Do not allow sludge or resulting residue to enter a live lane of traffic, storm sewer, stream, lake, reservoir, marsh, or wetland. Dispose of sludge at an

acceptable material disposal site located off the project limits or, if the engineer allows, within the project limits.

D Measurement

The department will measure Sawing Pavement Deck Preparation Areas by the linear foot acceptably completed, measured as the total linear feet of bounding cuts.

The department will not measure for payment over-cuts or cuts made beyond what is required to bound engineer-marked deterioration limits.

E Payment

The department will pay for the measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
509.0310.S	Sawing Pavement Deck Preparation Areas	LF

Payment is full compensation for making all saw cuts; and for debris disposal.

stp-509-070 (20180628)

20. Concrete Masonry Deck Repair, Item 509.2100.S.

A Description

This special provision describes providing concrete masonry on the sawed deck preparation areas of the concrete bridge deck and in full depth deck, curb, and joint repair areas. Conform to standard spec 502 and standard spec 509.

B Materials

B.1 Neat Cement

Furnish a neat cement bonding grout. Mix the neat cement in a water-cement ratio approximately equal to 5 gallons of water per 94 pounds of cement.

B.2 Concrete

Furnish grade C, C-FA, C-S, C-IS, C-IP, C-IT, or E concrete conforming to standard spec 501 for deck preparation, full-depth deck repair, curb repair and joint repair areas except as follows:

1. The contractor may increase slump of grade E concrete to 3 inches.
2. The contractor may use ready-mixed concrete.

C Construction

C.1 Neat Cement

Immediately before placing the concrete deck patching, coat the prepared surfaces with a neat cement mixture. Ensure the prepared concrete surfaces are moist without any standing water before coating with the neat cement mixture. Brush the neat cement mixture over the prepared concrete surfaces to ensure that all parts receive an even coating, and do not allow excess neat cement to collect in pockets. Apply the neat cement at a rate that ensures the cement does not dry out before being covered with the new concrete.

C.2 Placing Concrete

Place concrete conforming to standard spec 509. As determined by the engineer, consolidate smaller areas by internal vibration, strike them off, and finish the areas with hand floats to produce plane surfaces that conform to the grade and elevation of the adjoining surfaces. Give all deck patching areas a final hand float finish.

C.3 Curing Concrete

Cure the concrete masonry deck patching conforming to standard spec 502.2.6(1).

D Measurement

The department will measure the Concrete Masonry Deck Repair bid item by the cubic yard acceptably completed.

The department will measure concrete used in deck preparation areas and in full depth deck, curb, and joint repair as part of the Concrete Masonry Deck Repair bid item.

The department will not measure wasted concrete.

E Payment

The department will pay for the measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
509.2100.S	Concrete Masonry Deck Repair	CY

Payment is full compensation for furnishing, hauling, preparing, placing, finishing, curing, and protecting all materials.

stp-509-060 (20170615)

21. Polymer Overlay, Item 509.5100.S.

A Description

This special provision describes providing two layers of a two-component polymer overlay system to the bridge decks the plans show.

B Materials

B.1 General

Furnish materials specifically designed for use over concrete bridge decks. Furnish polymer liquid binders from the department's approved product list.

B.2 Polymer Resin

Furnish a polymer resin base and hardener composed of two-component, 100 percent solids, 100 percent reactive, thermosetting compound with the following properties:

Property	Requirements	Test Method
Gel Time ^[1]	15 - 45 minutes @ 73° to 75° F	ASTM C881
Viscosity ^[1]	7 - 70 poises	ASTM D2393, Brookfield RVT, Spindle No. 3, 20 rpm
Shore D Hardness ^[2]	60-75	ASTM D2240
Absorption ^[2]	1% maximum at 24 hr	ASTM D570
Tensile Elongation ^[2]	30% - 70% @ 7 days	ASTM D638
Tensile Strength ^[2]	2000 to 5000 psi @ 7 days	ASTM D638
Chloride Permeability ^[2]	<100 coulombs @ 28 days	AASHTO T277

^[1] Uncured, mixed polymer binder

^[2] Cured, mixed polymer binder

Ensure that the polymer resin when mixed with aggregate has the following properties:

Property	Requirement ^[1]	Test Method
Minimum Compressive Strength	1,000 psi @ 8 hrs 5,000 psi @ 24 hrs	ASTM C579 Method B, Modified ^[2]
Thermal Compatibility	No Delaminations	ASTM C884
Minimum Pull-off Strength	250 psi @ 24 hrs	ASTM C1583

^[1] Based on samples cured or aged and tested at 75°F

^[2] Plastic inserts that will provide 2-inch by 2-inch cubes shall be placed in the oversized brass molds.

B.3 Aggregates

Furnish natural or synthetic aggregate that is non-polishing; clean; free of surface moisture; fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; and conform to the following:

Aggregate Properties

Property	Requirement	Test Method
Moisture Content ^[1]	1/2 of the measured aggregate absorption, %	ASTM C566
Hardness	≥6.5	Mohs Scale
Fractured Faces	100% with at least 1 fractured face & 80% with at least 2 fractured faces of material retained on No.16	ASTM D5821
Absorption	≤1%	ASTM C128

^[1] Sampled and tested by the department before placement.

Gradation

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30 – 75
No. 16	0 – 5
No. 30	0 – 1

B.4 Approval of Bridge Deck Polymer Overlay System

A minimum of 20 working days before application, submit product data sheets and specifications from the manufacturer, and a certified report of test or analysis from an independent laboratory to the engineer for approval. The department will sample and test the aggregates for gradation and moisture content before placement. If requested, supply the department with samples of the polymer for the purpose of acceptance testing.

B.4.1 Product Data Sheets and Specifications

Product data sheets and specifications from the manufacture consists of literature from the manufacturer showing general instructions, application recommendations/methods, product properties, general instructions, or any other applicable information.

B.4.2 Certified Report of Test or Analysis

Conform to the following:

Polymer Binder: Submit a certified report of test or analysis from an independent laboratory dated less than 3 years before the date of the project letting showing the polymer binder meets the requirements of section B.2.

Aggregates: Submit a certified report of test or analysis from an independent laboratory dated less than 6 months before the date of the project letting showing the aggregates meet the requirements of section B.3.

C Construction

C.1 General

Ensure that the overlay system is 1/4 inch thick or thicker.

Conform to the following:

Field Review: Conduct a field review of the existing deck to identify any possible surface preparation and material compatibility issues.

Pre-Installation Meeting: Conduct a pre-installation meeting with the manufacturer's representative and the engineer before construction. Discuss the field review findings, verification testing of the surface preparation and establish procedures for maintaining optimum working conditions and coordination of work. Furnish the engineer a copy of the recommended procedures and apply the overlay system according to the manufacturer's instructions. Supply for the engineer's use for the duration of the project, a Concrete Surface Profile (CSP) chip set of 10 from the International Concrete Repair Institute (ICRI).

Manufacturer's Representative: An experienced manufacturer's representative familiar with the overlay system installation procedures shall be present at all times during surface preparation and overlay placement to provide quality assurance that the work is being performed properly. This requirement may be reduced at the engineer's discretion.

Material Storage: Store and handle materials according to the manufacturer's recommendations. Store resin materials in their original containers in a dry area. Store all aggregates in a dry environment and protect aggregates from contaminants on the job site.

C.2 Deck Preparation

C.2.1 Deck Repair

Remove all asphaltic patches and unsound or disintegrated areas of the concrete decks as the plans show, or as the engineer directs. Work performed to repair the concrete deck will be paid for under other items. Ensure that products used for deck patching are compatible with the polymer overlay system.

NOTE: Some polymer systems require concrete patch material to be in place a minimum of 28-days before overlaying - contact polymer manufacturer before completing deck patching/repair.

C.2.2 Surface Preparation

Determine an acceptable shotblasting machine operation (size of shot, flow of shot, forward speed, and/or number of passes) that provides a surface profile meeting CSP 5 (medium-heavy shotblast) according to the ICRI Technical Guideline No. 310.2. If the engineer requires additional verification of the surface preparation, test the tensile bond strength according to ASTM C1593. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of 1/4 inches or more is greater than 50 percent of the test area. Continue adjustment of the shotblasting machine and necessary testing until the surface is acceptable to the engineer or a passing test result is obtained.

Prepare the entire deck using the final accepted adjustments to the shotblasting machine as determined above. Thoroughly blast clean with hand-held equipment any areas inaccessible by the shotblasting equipment. Do not perform surface preparation more than 24 hours before the application of the overlay system.

Protect drains, expansion joints, access hatches, or other appurtenances on the deck from damage by the shot and sand blasting operations and from materials adhering and entering. Tape or form all construction joints to provide a clean straight edge.

Before shot blasting, remove pavement markings within the treatment area using an approved mechanical or blasting method.

Prepare the vertical concrete surfaces adjacent to the deck a minimum of 2" above the overlay according to SSPC-SP 13 (free of contaminants, dust, and loose concrete) by sand blasting, using wire wheels, or other approved method.

Just before overlay placement, clean all dust, debris, and concrete fines from the prepared surfaces including the vertical surfaces with compressed air. When using compressed air, the air stream must be free of oil. Any grease, oil, or other foreign matter that rests on or has absorbed into the concrete shall be removed completely. If prepared surfaces (including the first layer of the polymer overlay) are exposed to rain or dew, lightly sandblast (brush/breeze blast) the exposed surfaces.

The engineer may consider alternate surface preparation methods per the overlay system manufacture's recommendations. The engineer will approve the final surface profile and deck cleanliness before the contractor placing the polymer overlay.

C.2.3 Transitional Area

If the plans show, create a transitional area approaching transverse expansion joints and ends of the deck using an approved mechanical or blasting method. Remove 1/4 inch to 5/16 inch of concrete adjacent to the joint or end of deck and taper a distance of 3 feet.

If the plans show, create a transitional area on the approach pavement. Prep and place the first lift 3 feet beyond the end of the deck the same width as the deck. Prep and place the second lift 6 feet beyond the end of the deck the same width as the deck.

C.3 Overlay Application

Perform the handling and mixing of the polymer resin and hardening agent in a safe manner to achieve the desired results according to the manufacturer's instructions. Do not apply the overlay system if any of the following exists:

1. Ambient air temperature is below 50 F or above 100 F.
2. Deck temperature is below 50 F.

3. Moisture content in the deck exceeds 4.5 percent when measured by an electronic moisture meter or shows visible moisture after 2 hours when measured in accordance with ASTM D4263.
4. Rain is forecasted during the minimum curing periods listed under C.5.
5. Materials component temperatures below 65 F or above 99 F.
6. Concrete age is less than 28 days unless approved by the engineer.
7. The deck temperature exceeds 100 F.
8. If the gel time is 10 minutes or less at the predicted high air temperature for the day.

After the deck has been shotblasted or during the overlay curing period, only necessary surface preparation and overlay application equipment will be allowed on the deck. Provide appropriate protective measures to prevent contamination from equipment allowed on the deck during preparation and application operations. Begin overlay placement as soon as possible after surface preparation operations.

The polymer overlay shall consist of a two-course application of polymer and aggregate. Each of the two courses shall consist of a layer of polymer covered with a layer of aggregate in sufficient quantity to completely cover the polymer. Apply the polymer and aggregate according to the manufacturer's requirements. Apply the overlay using equipment designed for this purpose. The application machine shall feature positive displacement volumetric metering and be capable of storing and mixing the polymer resins at the proper mix ratio. Disperse the aggregate using a method that provides a uniform, consistent coverage of aggregate and minimizes aggregate rolling or bouncing into final position. First course applications that do not receive enough aggregate before the polymer gels shall be removed and replaced. A second course applied with insufficient aggregate may be left in place, but will require additional applications before opening to traffic.

After completion of each course, cure the overlay according to the manufacturer's instructions. Follow the minimum cure times listed under C.5 or as prescribed by the manufacturer. Remove the excess aggregate from the surface treatment by sweeping, blowing, or vacuuming without tearing or damaging the surface; the material may be re-used if approved by the engineer and manufacturer. Apply all courses of the overlay system before opening the area to traffic. Do not allow equipment or traffic on the treated area until directed by the engineer.

After the first layer of coating has cured to the point where the aggregate cannot be pulled out, apply the second layer. Before applying the second layer, broom and blow off the first layer with compressed air to remove all loose excess aggregate.

Before opening to traffic, clean expansion joints and joint seals of all debris and polymer. A minimum of 3 days following opening to traffic, remove loosened aggregates from the deck, expansion joints, and approach pavement.

C.4 Application Rates

Apply the polymer overlay in two separate courses in accordance with the manufacturer's instructions, but not less than the following rate of application.

Course	Minimum Polymer Rate ^[1] (GAL/100 SF)	Aggregate ^[2] (LBS/SY)
1	2.5	10+
2	5.0	14+

^[1] The minimum total applications rate is 7.5 GAL/100 SF.

^[2] Application of aggregate shall be of sufficient quantity to completely cover the polymer.

C.5 Minimum Curing Periods

As a minimum, cure the coating as follows:

	Average temperature of deck, polymer and aggregate components in degrees F							
Course	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-99
1	6 hrs.	5 hrs.	4 hrs.	3 hrs.	2.5 hrs	2 hrs	1.5 hrs.	1 hr.
2	8 hrs.	6.5 hrs.	6.5 hrs.	5 hrs.	4 hrs.	3 hrs.	3 hrs.	3 hrs.

If faster cure times are desired and achievable, submit to the engineer a certified test report from an independent laboratory showing the material is able to reach a compressive strength of 1000 psi as tested per ASTM C 579 Method B within the temperature ranges and cure times for which the product is

proposed to be placed. Establish ambient air, material, and substrate temperatures from the manufacturer for field applications. Field applications will not be allowed below the documented temperatures.

C.6 Repair of Polymer Overlay

Repair all areas of unbonded, uncured, or damaged polymer overlay for no additional compensation. Submit repair procedures from the manufacturer to the engineer for approval. Absent a manufacturer's repair procedures and with the approval of the engineer, complete repairs according to the following: Saw cut the limits of the area to the top of the concrete; remove the overlay by scarifying, grinding, or other approved methods; shot blast or sand blast and air blast the concrete before placement of polymer overlay; and place the polymer overlay according to section C.3.

D Measurement

The department will measure Polymer Overlay by the square yard acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
509.5100.S	Polymer Overlay	SY

Payment is full compensation for preparing the surface; for tensile bond testing; for creating the transitional area; for providing the overlay; for cleanup; and for sweeping/vacuuming and disposing of excess materials.

The department will pay separately for Concrete Deck Repair.

stp-509-030 (20170615)

22. Removing Polymer Overlay B-66-48, Item 509.9015.S.

A Description

This special provision describes removing the polymer overlay. Perform work conforming to standard spec 204.

B (Vacant)

C Construction

Remove the overlay by scraping, grinding, milling, or other approved method without damaging the underlying concrete. Submit removal procedures to the engineer for approval before beginning. Do not remove more than 1/4" of the existing concrete surface. Leave a uniform textured finish over the entire concrete surface.

D Measurement

The department will measure Removing Polymer Overlay by the square yard acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
509.9015.S	Removing Polymer Overlay B-66-48	SY

Payment for Removing Polymer Overlay is full compensation for removing the polymer; and for properly disposing of all materials.

stp-509-015 (20171130)

23. Structure Repainting General.

A General

A.1 Inspection

On all structures in this contract, notify the engineer of any missing or broken bolts or nuts, any missing or broken rivets, or of any cracks or flaws in the steel members while cleaning or painting.

A.2 Date Painted

At the completion of all painting work, stencil in black paint or contrasting color paint the date of painting the bridge. The numbers shall be three inches (75 mm) in height and shall show the month and year in which the painting was completed: e.g., 11-95 (November 1995). On each bridge painted, stencil the date at two locations. On truss bridges, stencil the date on the cover plates of end posts near and above the top of the railings at the oncoming traffic end. On steel girder bridges, stencil the date on the inside of the outside stringers at the abutments. The date on grade separation bridges shall be readable when going under the structure or at some equally visible surface near the ends of the bridge, as designated by the engineer.

A.3 Graffiti Removal

Remove any graffiti on concrete abutments, piers, pier caps, parapet railings, slope paving or any other location at the direction of the engineer. Use a brush sandblast to remove graffiti.

The above work will not be measured and paid for separately, but will be considered incidental to other items in the contract.

B (Vacant)

C Construction

C.1 Repainting Methods

Do not perform blasting, cleaning and painting on days of high winds. Prevailing winds in excess of 15 mph (25 km/hr) shall be considered high winds.

Place the final field coat of paint on the exterior of the exterior beams as a continuous painting operation. Stop at splices, vertical stiffeners or other appropriate locations so that lap marks are not evident or noticeable.

Completely clean and remove spent abrasive and other waste materials resulting from the contractor's operation from bridge deck surfaces, gutter lines, drains, curbs, bridge seats, pier caps, slope paving, roadway below, and all structural members and assemblies.

C.2 Inspection

Add the following to standard spec 105.9:

Furnish, erect and move scaffolding and other equipment to allow the inspector to closely observe all affected surfaces. The scaffolding, with appropriate safety devices, shall meet the approval of the engineer.

stp-517-005 (20150630)

24. Structure Repainting Recycled Abrasive B-66-59, Item 517.1800.S.

A Description

This special provision describes surface preparation and painting of the metal surfaces according to the manufacturer's recommendations as modified in this special provision.

A.1 Areas to be Cleaned and Painted

All structural metal surfaces of:

1. Structure B-66-59 18,356 SF.

Areas are approximate and given for informational purposes only.

B Materials

B.1 Coating System

Furnish a complete coating system from the department's approved list for "Structure Repainting Recycle Abrasive Structure". The color for the finish coating material shall match the color number the plans show according to Federal Standard Number 595. Supply the engineer with the product data sheets for approval before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, and the minimum drying time between coats.

The color of the primer must be such that a definite contrast between it and the color of the blasted steel is readily apparent. There shall be a color contrast between all subsequent coats for the paint system selected. Submit color samples of the primer and all coats to the engineer for approval before any application of paint.

C Construction

C.1 Surface Preparation

Before blast cleaning, solvent clean all surfaces to be coated according to SSPC-SP1.

All metal surfaces must be blast cleaned in accordance with SSPC-SP10 and verified before painting.

Upon completion of surface preparation, test representative surfaces, which were previously rusted (i.e. pitted steel) for the presence of residual chloride. Perform Surface Contamination Tests (SCAT) in accordance with the manufacturer's recommendations. The tests must be witnessed by the engineer. If chlorides are detected at levels greater than 7ug/cm², continue to clean the affected areas until results are below the specified limit. Submit anticipated testing frequencies and chloride remediation methods to the Engineer for review and approval.

Apply the prime coat the same day that the metal surfaces receive the No. 10 blast or re-blast before application. Cleaned surfaces shall be of the specified condition immediately before paint application. If rust bloom occurs before applying the primer, stop the painting operation in the area of the rust bloom and re-blast and clean the area to SSPC SP-10 before applying the primer.

The steel grit and any associated equipment brought to the site and used for blast cleaning shall be clean. Remove immediately dirty grit or equipment brought to the site at no expense to the department. Furnish an abrasive that has a gradation such that it will produce a uniform surface profile between 1 to 3 mils on the steel surface, as measured in accordance with ISO 8503-5.

The abrasive blasting and recovery system shall be a completely integrated self-contained system for abrasive blasting and recovery. It shall be an open blast and recovery system that will allow no emissions from the recovery operation. The recovery equipment shall be such that the amount of contaminants in the clean recycled steel grit shall be less than 1 percent by weight as per SSPC AB-2.

Remove by grinding all fins, tears, slivers, and burred or sharp edges that are present on any steel member, or that appear during the blasting operation, and re-blast the area to give a 1 to 3 mils surface profile.

Remove all spent material and paint residue from steel surfaces with a good commercial grade vacuum cleaner equipped with a brush-type cleaning tool, and test cleanliness in accordance with ASTM D4285. The airline used for surface preparation shall have an in-line water trap and the air shall be free of oil and water as it leaves the airline.

Take care to protect freshly coated surfaces from subsequent blast cleaning operations. Thoroughly wire brush damaged primed surfaces with a non-rusting tool, or if visible rust occurs, re-blast to a near white condition. Clean and re-prime the brushed or blast cleaned surfaces in accordance with this specification.

C.2 Coating Application

Apply paint according to the manufacturer's recommendations in a neat workmanlike manner. Paint application shall normally be by airless spray or inaccessible areas by brush, roller or other methods approved by the engineer.

The engineer may allow the use of conventional spray equipment after satisfactory demonstration by the contractor of the proper application technique and handling of that equipment.

Mix the paint or coatings according to the manufacturer's directions to a smooth lump-free consistency. Keep paint thoroughly mixed during the painting application.

After the inspector approves the entire cleaned surface to be coated, apply a prime coat uniformly to the entire surface. Either before or after applying the prime coat, brush or spray a stripe coat of primer on all plate edges, bolt heads, nuts, and washers. Apply succeeding coats as the product data sheet shows.

Remove all dry spray by vacuuming, wiping, or sanding if necessary.

If the application of the coating at the required thickness in one coat produces runs, bubbles, or sags; apply a "mist-coating" in multiple passes of the spray gun; separate the passes by several minutes. Where excessive coating thickness produces "mud-cracking", remove such coating back to soundly bonded coating and re-coat the area to the required thickness.

The resultant paint film shall be smooth and uniform, without skips or areas of excessive paint in accordance with SSPC PA1.

The coating is supplied for normal use without thinning. If in cool weather it is necessary to thin the coating for proper application, thin according to the manufacturer's recommendations.

During surface preparation and coating application the ambient and steel temperature shall be between 39 degrees F and 100 degrees F. The steel temperature shall be at least 5 degrees F above the dew point temperature. (This requires the steel to be dry and free of any condensation or ice regardless of the actual temperature of the steel.) The relative humidity shall not exceed 85%. The manufacturer's ambient condition requirements must be followed if they are more stringent.

Paint thickness shall be within the requirements for a three coat paint system listed in the department's approved list for Structure Repainting Recycle Abrasive Structure and the paint system being used.

Time to recoat shall be according to the manufacturer's recommendations.

The dry film thickness will be determined by use of a magnetic film thickness gage. The gage shall be calibrated for dry film thickness measurement according to SSPC-PA 2. Dry film thickness in each area measured will be based on an average of three gage readings, after calibration of the gage to account for surface profile of the bare steel as a result of surface preparation.

D Measurement

The department will measure Structure Repainting Recycled Abrasive (Structure) as a single complete lump sum unit of work, completed according to the contract and accepted.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.1800.S	Structure Repainting Recycled Abrasive B-66-59	LS

Payment is full compensation for preparing and cleaning the designated surfaces; furnishing and applying the paint; and for providing the listed equipment.

stp-517-050 (20190618)

25. Labeling and Disposal of Waste Material.

The EPA ID number for Structure B-66-59 is Enter EPA ID #.

The state has an exclusive mandatory use contract with a private waste management contractor to transport and dispose of hazardous waste.

The state's waste management contractor shall furnish and deliver appropriate hazardous waste containers and site-specific labels to each bridge site. The provided containers shall be placed at pre-selected drop-off and pick-up points at each bridge site, and these locations shall be determined at the preconstruction conference. The custody of the containers and labels shall be the responsibility of the painting contractor while they are at the job site.

Contact the waste management contractor a minimum of 10 working days in advance to request container drop-off or pickup. Provide the waste management contractor with the project ID, structure number, EPA ID, and the agreed-upon location for container staging. Contact information for the waste management contractor is located on the WisDOT Internet site at <http://wisconsindot.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/environment/hazwaste-contacts.pdf>.

Report all reportable spills and discharges according to the contingency plan.

Labels are site-specific. Check the labels to ensure that the project ID, structure number, and EPA ID match the structure generating the waste. Apply a label to each drum when it is opened for the first time. Fill in the date on the label the first day material is accumulated in the drum. The following page is an example of a properly filled-in label.

During paint removal operations, continuously monitor and notify the project inspector of the status of waste generation and quantity stored so that timely disposal can be arranged.

stp-517-055 (20190618)

26. Negative Pressure Containment and Collection of Waste Materials, B-66-59, Item 517.4500.S.

A Description

This special provision describes providing a dust collector to maintain a negative air pressure in the enclosure; furnishing and erecting enclosures as required to contain, collect and store waste material resulting from the preparation of steel surfaces for painting, and repainting, including collection of such waste material, and labeling and storing waste material in approved hazardous waste containers.

B (Vacant)

C Construction

Erect an enclosure to completely enclose (surround) the blasting operations. The ground, slope paving, or roadway cannot be used as the bottom of the enclosure unless covered by approved containment materials. So that there are no visible emissions to the air or ground or water, design, erect, operate, maintain and disassemble the enclosures in such a manner to effectively contain and collect dust and waste materials resulting from surface preparation and paint over spray. Suspend all enclosures over water from the structure or as approved by the engineer.

Construct the enclosure of flexible materials such as tarpaulins or of rigid materials such as plywood, or of a combination of flexible and rigid materials and meet SSPC Guide 6 requirements with Level 1 emissions. Systems manufactured and provided by Eagle Industries, Detroit Tarps, or equal, are preferred. The tarpaulins shall be a non-permeable material, either as part of the tarp system or have a separate non-permeable lining. Maintain all materials free of tears, cuts or holes. The vertical sides of the enclosure shall extend from the bottom of the deck down to the level of the covered work platform or covered barge where used for structures over water, and shall be fastened securely to those levels to prevent the wind from lifting them. Bulkheads are required between beams to enclose the blasting area as approved by the engineer. Where bulkheads are required, construct them of plywood and properly seal them. To prevent spent materials and paint over spray from escaping the enclosed area, overlap and fasten together all seams. Place groundcovers under all equipment before operations or as approved by the engineer.

To allow proper cleaning, inspection of structures or equipment, and painting, provide safe adequate artificial lighting in areas where natural light is inadequate.

Provide a dust collector so that there are no visible emissions outside of the enclosure and so that a negative air pressure inside the enclosure is maintained. The dust collector shall be sized to maintain the minimum air flow based on the cross-sectional area of the enclosure.

A combination of positive air input and negative air pressure may be needed to maintain the minimum airflow within the enclosure.

Filter all air exhausted from the enclosure to create a negative pressure within the enclosure so as to remove all hazardous and other particulate matter.

After all debris has been removed and all painting has been approved in the containment area is complete, remove containment in accordance with SSPC Guide 6.

As a safety factor for structures over water, provide for scum control. Provide a plan for corrective measures to mitigate scum forming and list the procedures, labor and equipment needed to assure compliance. Effectively contain the scum that forms on the water and does not sink in place from moving upstream or downstream by the use of floating boom devices.

If in the use of floating boom devices the scum tends to collect at the devices, contain, collect, store the scum, and do not allow it to travel upstream or downstream beyond the devices. Remove the scum at least once a day or more often if needed.

Collect and store at the bridge site for disposal all waste material or scum collected by this operation, or any that may have fallen onto the ground tarps. Collect and store all waste material and scum at the end of each workday or more often if needed. Storage shall be in provided hazardous waste containers. Label each container as it is filled, using the labels provided by the Hazardous Waste Disposal contractor. Check the label and ensure that the project ID, bridge number and EPA ID match the structure. Fill in the generation date when the first material is placed in the container. Secure all containers at the end of each workday. Keep the containers covered at all times except to add or remove waste material. Store the containers in an accessible and secured area, not located in a storm water runoff course, flood plain, or exposed to standing water.

In a separate operation, recover the recyclable abrasive for future application, and collect the paint and/or corrosion particles for disposal.

D Measurement

The department will measure Negative Pressure Containment and Collection of Waste Materials (Structure) as a single complete lump sum unit of work for each structure designated in the contract, completed in accordance with the contract and accepted.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.4500.S	Negative Pressure Containment and Collection of Waste Materials B-66-59	LS

Payment is full compensation for designing, erecting, operating, maintaining, and disassembling the containment devices; providing negative pressure exhaust ventilation; collecting, labeling, and for storing spent materials in provided hazardous waste containers.

stp-517-065 (20140630)

27. Portable Decontamination Facility, Item 517.6001.S.

A Description

This special provision describes furnishing and maintaining weekly, or more often if needed, a single unit portable decontamination facility.

B Materials

Supply and operate all equipment in accordance with OSHA.

Supply adequate heating equipment with the necessary fuel to maintain a minimum temperature of 68° F in the facility.

The portable decontamination facility shall consist of a separate "Dirty Room", "Shower Room" and "Clean Room". The facility shall be constructed so as to permit use by either sex. The facility shall have adequate ventilation.

The "Dirty Room" shall have appropriately marked containers for disposable garments, clothing that requires laundering, worker shoes, and any other related equipment. Each container shall be lined with poly bags for transporting clothing, or for disposal. Benches shall be provided for personnel.

The "Shower Room" shall include self-contained individual showering stalls that are stable and well secured to the facility. Provide showers with a continuous supply of potable hot and cold water. The wastewater must be retained for filtration, treatment, and/or for proper disposal.

The "Clean Room" shall be equipped with secure storage facilities for street clothes and separate storage facilities for protective clothing. The lockers shall be sized to store clothing, valuables and other personal belongings for each worker. Benches shall be provided for personnel.

Supply a separate hand wash facility, either attached to the decontamination facility or outside the containment.

C Construction

Properly contain, store, and dispose of the wastewater.

D Measurement

The department will measure Portable Decontamination Facility by each individual unit acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.6001.S	Portable Decontamination Facility	EACH

Payment is full compensation for furnishing and maintaining a portable decontamination facility.

stp-517-060 (20140630)

28. Slope Paving Repair Crushed Aggregate, Item 604.9010.S.

A Description

This special provision describes providing crushed aggregate slope paving where erosion has occurred. Conform to standard spec 604 as modified in this special provision.

B Materials

Furnish materials conforming to standard spec 604.2.

C Construction

Replace paragraph (1) of standard spec 604.3.2 with the following:

- (1) Place the crushed aggregate on the prepared foundation in areas where erosion has occurred. Shape and consolidate it using mechanical or hand methods to provide a stable, even and uniform surface.

D Measurement

The department will measure Slope Paving Repair Crushed Aggregate by the cubic yard acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
604.9010.S	Slope Paving Repair Crushed Aggregate	CY

Payment is full compensation for all excavating and backfilling required to prepare the foundation; disposing of surplus materials; providing, handling, placing, and consolidating the crushed aggregate; providing, handling, heating, and for applying the asphaltic material.

stp-604-010 (20100709)

29. Reseal Crushed Aggregate Slope Paving, Item 604.9015.S.

A Description

This special provision describes sealing existing crushed aggregate slope paving as the engineer directs and conforming to standard spec 604as modified in this special provision.

B Materials

Furnish materials conforming to standard spec 604.2.

C Construction

Clean all debris from the surface of the slope paving before applying asphalt. Apply sufficient asphalt so that it penetrates to seal the top 2 inches of aggregate; where existing asphalt is closer to the surface of the aggregate, apply less asphalt.

D Measurement

The department will measure Reseal Crushed Aggregate Slope Paving in area by the square yard of slope paving, acceptably resealed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
604.9015.S	Reseal Crushed Aggregate Slope Paving	SY

Payment is full compensation for cleaning the surface; furnishing and applying the asphalt.

stp-604-015 (20100709)

30. Cable Barrier Type 1, Item 613.1100.S; Cable Barrier End Terminal Type 1 Item 613.1200.S.

A Description

This special provision describes providing socketed high-tension TL-fill in blank with appropriate Test Level (3 or 4). cable guard meeting the National Cooperative Highway Research Program (NCHRP) Report 350, Test Level fill in blank with appropriate Test Level (3 or 4)..

B Materials

Provide a cable barrier system that is on the approved product list for the county in which the system will be installed.

Provide a calibrated tension gauge to each county for the specific system installed in each county.

Provide one copy of video training material on the proper maintenance techniques and recovery of vehicles to each county for the specific system installed in each county. At a minimum, this training is to address, proper tension techniques, proper operation of calibrated tension gauge, proper repair techniques, and proper methods to removed vehicles entrapped in the cable barrier.

B.2 Design Requirements

Thirty days before installation provide the engineer with two sets of manufacturer prepared drawings, Wisconsin P.E. stamped calculations, documentation, notes, plan details, and construction specifications. Provide required information in a PDF format or other in electronic format that the department can review information.

Obtain prior approval from the Bureau of Project Development (Erik Emerson at (608) 266-2842) for all hardware substitutions before delivering the hardware on the project.

If soils information is not in the plan contact **Enter Regional soils or project staff contact information.**

NOTE- If soils information is included in the plan, delete this entire sentence.

C Construction

Construct concrete as specified in standard spec 501.

Construct steel reinforcement as specified in standard spec 505.

Construct terminal units at each end of a run of cable guard as the plans show. The contractor may determine the location of anchors subject to the engineer's approval.

Tension the cable according to the manufacturer's recommendations at the time of installation, and then check and adjust approximately three weeks after installation. If system is not maintaining proper tension, adjust tension and return three weeks later. Provide engineer documentation of date, time, location, tension value, and who checked the tension for each barrier run.

Use only one-half the available adjustment in each turnbuckle or tension adjustment connection to achieve manufacture's recommend tension values.

Certify that the installation was done according to manufacturer's recommendations and the plan requirements.

The engineer will allow the contractor to open the roadway to traffic or remove traffic control devices if concrete attains manufacture's compressive strength. Without compressive strength information, the engineer may allow the contractor to remove traffic control devices after 14 equivalent curing days. Equivalent curing days are defined in standard spec 415.3.

D Measurement

The department will measure Cable Barrier Type 1 by the linear foot acceptably completed, measured from terminal to terminal and rounded to the nearest linear foot.

The department will measure Cable Barrier End Terminal Type 1 as each individual terminal acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
613.1100.S	Cable Barrier Type 1	LF
613.1200.S	Cable Barrier End Terminal Type 1	EACH

Payment is full compensation for designing and providing cable barrier end terminal or cable barrier.

stp-613-010 (20170615)

31. Fence Safety, Item 616.0700.S.

A Description

This special provision describes providing plastic fence at locations the plans show.

B Materials

Furnish notched conventional metal "T" or "U" shaped fence posts.

Furnish fence fabric meeting the following requirements.

Color:	International orange (UV stabilized)
Roll Height:	4 feet
Mesh Opening:	1 inch min to 3 inch max
Resin/Construction:	High density polyethylene mesh
Tensile Yield:	Avg. 2000 lb per 4 ft. width (ASTM D638)
Ultimate Tensile Strength:	Avg. 3000 lb per 4 ft. width (ASTM D638)
Elongation at Break (%):	Greater than 100% (ASTM D638)
Chemical Resistance:	Inert to most chemicals and acids

C Construction

Drive posts into the ground 12 to 18 inches. Space posts at 7 feet.

Use a minimum of three wire ties to secure the fence at each post. Weave tension wire through the top row of strands to provide a top stringer that prevents sagging.

Overlap two rolls at a post and secure with wire ties.

D Measurement

The department will measure Fence Safety by the linear foot along the base of the fence, center-to-center of posts acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
616.0700.S	Fence Safety	LF

Payment is full compensation for furnishing and installing fence and posts; maintaining the fence and posts in satisfactory condition; and for removing and disposing of fence and posts at project completion.

stp-616-030 (20160607)

32. Covering Signs.

Replace standard spec 643.2.3.3(2) with the following:

- (2) Ensure that covers are flat black, blank, and opaque.

Add the following to standard spec 643.3.4.1 as paragraph four:

- (4) If multiple messages on a single sign are required to be covered, minimize the number of holes created by covering the sign with a single rectangular shaped covering. Multiple coverings on a single sign is only permissible where necessary to avoid covering necessary content or as directed by the engineer. Submit sign covering plans to the engineer for single signs requiring multiple coverings 3 days before performing work. Obtain engineer approval before covering signs. Remove sign coverings before placing fixed messages signs unless otherwise directed by the engineer.

sef-643-005 (20180104)

33. Nighttime Work Lighting-Stationary.

A Description

This special provision describes furnishing portable lighting as necessary to complete nighttime work. Nighttime operations consist of work specifically scheduled to occur after sunset and before sunrise.

B (Vacant)

C Construction

C.1 General

This provision shall apply when providing, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for nighttime stationary work operations, for the duration of nighttime work on the contract.

At least 14 days before the nighttime work, furnish a lighting plan to the engineer for review and acceptance. Address the following in the plan:

1. Layout, including location of portable lighting – lateral placement, height, and spacing. Clearly show on the layout the location of all lights necessary for every aspect of work to be done at night.
2. Specifications, brochures, and technical data of all lighting equipment to be used.
3. The details on how the luminaires will be attached.
4. Electrical power source information.
5. Details on the louvers, shields, or methods to be employed to reduce glare.
6. Lighting calculations. Provide illumination with average to minimum uniformity ratio of 5:1 or less throughout the work area.
7. Detail information on any other auxiliary equipment.

C.2 Portable Lighting

Provide portable lighting that is sturdy and free standing and does not require any guy wires, braces, or any other attachments. Furnish portable lighting capable of being moved as necessary to keep up with the construction project. Position the portable lighting and trailers to minimize the risk of being impacted by traffic on the roadway or by construction traffic or equipment. Provide lightning protection for the portable lighting. Portable lighting shall withstand up to 60 mph wind velocity.

If portable generators are used as a power source, furnish adequate power to operate all required lighting equipment without any interruption during the nighttime work. Provide wiring that is weatherproof and installed according to local, state, federal (NECA and OSHA) requirements. Equip all power sources with a ground-fault circuit interrupter to prevent electrical shock.

C.3 Light Level and Uniformity

Position (spacing and mounting height) the luminaires to provide illumination with an average to minimum uniformity ratio of 5:1 or less throughout the work area.

Illuminate the area as necessary to incorporate construction vehicles, equipment, and personnel activities.

C.4 Glare Control

Design, install, and operate all lighting supplied under these specifications to minimize or avoid glare that interferes with all traffic on the roadway or that causes annoyance or discomfort for properties adjoining the roadway. Locate, aim, and adjust the luminaires to provide the adequate level of illumination and the specified uniformity in the work area without the creation of objectionable glare.

Provide louvers, shields, or visors, as needed, to reduce any objectionable levels of glare. As a minimum, ensure the following requirements are met to avoid objectionable glare on the roadways open to traffic in either direction or for adjoining properties:

1. Aim tower-mounted luminaires, either parallel or perpendicular to the roadway, so as to minimize light aimed toward approaching traffic.
2. Aim all luminaires such that the center of beam axis is no greater than 60 degrees above vertical (straight down).

If lighting does not meet above-mentioned criteria, adjust the lighting within 24 hours.

C.5 Continuous Operation

Provide and have available sufficient fuel, spare lamps, generators, and qualified personnel to ensure that the lights will operate continuously during nighttime operation. In the event of any failure of the lighting system, discontinue the operation until the adequate level of illumination is restored. Move and remove lighting as necessary.

D (Vacant)

E Payment

Costs for furnishing a lighting plan, and for providing, maintaining, moving, and removing portable lighting, tower mounted lighting, and equipment-mounted lighting required under this special provision are incidental to the contract.

34. Temporary Portable Rumble Strips, Item 643.0310.S.

A Description

This special provision describes providing, relocating, maintaining, and removing temporary portable rumble strips.

B Materials

Furnish RoadQuake2 or Roadquake2F temporary portable rumble strips, by Plastic Safety Systems. Do not use alternate products or methods without preapproval by the Bureau of Traffic Operations.

C Construction

C.1 Placement

Provide rumble strips where the plans show or the engineer directs as follows:

1. Before placing rumble strips, clean the roadway of sand and other materials that may cause slippage.
2. Place one end of the rumble strips 6 inches from the roadway centerline. Extend the strips perpendicular to the direction of travel. Ensure strips lay flat on the roadway surface.
3. Only one series of rumble strips, placed before the first work zone, is required per direction of travel for multiple work zones spaced 1 mile or less apart. Work zones spaced greater than 1 mile apart require a separate series of rumble strips.

C.2 Maintenance

Maintain rumble strips as follows:

1. If rumble strips slide, become out of alignment, or are no longer in the wheel path of approaching vehicles during the work period, thoroughly clean both sides of the rumble strips and reset on a clean roadway.
2. Repair or replace damaged rumble strips immediately.

D Measurement

The department will measure temporary portable rumble strips as a single lump sum unit of work acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
643.0310.S	Temporary Portable Rumble Strips	LS

Payment is full compensation for providing, relocating, maintaining or replacing, and removing temporary portable rumble strips.

stp-643-020 (20161130)

35. Truck or Trailer-Mounted Attenuator, Item 643.1055.S.

A Description

- (1) This special provision describes protecting work operations with a truck or trailer-mounted attenuator (TMA).

B Materials

- (1) Furnish and maintain a TMA conforming to NCHRP Report 350 test level 3 or to MASH crashworthiness criteria. Submit written certification from the manufacturer that the host vehicle/attenuator configuration provided conforms to crashworthiness criteria. Include the federal-aid reimbursement eligibility letter with that submittal.
- (2) Provide a host vehicle and mount the attenuator conforming to the attenuator manufacturer's specifications. Provide the engineer a copy of the manufacturer's specifications and installation instructions.

C Construction

- (1) Coordinate with the engineer at least 72 hours before its intended use so the engineer can determine if the work operation requires TMA protection.

- (2) Position the attenuator at a manufacturer-recommended location in advance of a stationary work operation. Position and maintain the attenuator consistently at the manufacturer-recommended distance from a mobile work operation. Ensure that an operator stays with the host vehicle while protecting a mobile work operation.

D Measurement

- (1) The department will measure Truck or Truck-Trailer-Mounted Attenuator by the day acceptably completed, measured to the 1/2-day based on the engineer-determined time the attenuator is required to protect work operations. The department will measure 4 or less hours per calendar day as a half day and over 4 hours as a full day.

E Payment

- (1) The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
643.1055.S	Truck or Trailer-Mounted Attenuator	DAY

- (2) Payment is full compensation for providing the portable attenuator, host vehicle, and operator.

stp-643-015 (20140630)

36. Traffic Control Interim Lane Closure, Item 643.4100.S

A Description

This special provision describes closing a freeway/expressway traffic lane.

B (Vacant)

C Construction

Install and reposition traffic control devices as required to close a traffic lane. Remove and return the devices to their previous configuration when the closure is no longer required.

D Measurement

The department will measure Traffic Control Interim Lane Closure as each individual reposition/return cycle acceptably completed. The department will not measure additional moves or configuration changes as might be required solely to accommodate the contractor's operations.

The department will measure the closures by traffic lane and roadway. The department will not measure multiple closures in the same traffic lane on a project.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
643.4100.S	Traffic Control Interim Lane Closure	EACH

Payment is full compensation for closing and re-opening the affected traffic lane.

stp-643-030 (20170615)

37. Digital Speed Limit Sign Assembly.

A Description

This special provision describes providing, relocating, operating, maintaining, monitoring, and removing a digital speed limit (DSL) sign assembly at engineer-allowed locations, in place of covering/uncovering speed limit signs, at the contractor's option.

B Materials

Lay out signs according to the plans.

Use materials and methods specified in standard spec 637 to manufacture the sign.

Provide a digital speed display legend with a minimum of 18-inch-tall numbers.

Use posts from the FHWA list of accepted breakaway sign supports.

Provide a control unit that can be accessed remotely.

Provide a battery power supply with a solar powered charging system and a backup power source.

C Construction

C.1 General

Provide, install, maintain, operate and remove DSL sign assemblies and related signage.

Mount the sign so that the bottom is a minimum 7 feet above the roadway.

Install and operate DSL sign assembly 7 days in advance of the start of temporary speed declaration start date. Perform a successful field test for each sign.

Provide in-person training to the department on the use and operation of the field hardware and the website for the DSL sign assembly.

Ensure the system operates continuously when deployed on the project.

Provide a local specialist, to respond to emergency situations within 2 hours of being notified and who is equipped with sufficient resources to correct deficiencies in the system.

C.2 Programming

Program the DSL sign assembly to ensure the following operations are performed:

- The digital display portion automatically adjusts the brightness under varying light conditions to maintain legibility.
- Speed limit values shown on the digital display legend continuously displays without animation. Brief blanking may be experienced, up to 10 seconds, only during digital display legend user input utilizing the hard-wired hand control.
- The digital display changes between the original posted speed limit and the approved temporary speed limit when directed by the engineer.
- The system autonomously restarts in case of power failure in any part of the system.

D Measurement

The department will not measure the work performed under this special provision.

E Payment

The department will not pay directly for providing the digital speed limit assembly. Providing digital speed limit assembly shall be incidental to the Traffic Control Signs bid item.

stp-643-035 (20180628)

38. Dynamic Late Merge System, Item 643.1100.S.

A Description

This special provision describes providing, repositioning, operating, maintaining, monitoring, calibrating, testing and removing a dynamic late merge system (DLMS) capable of measuring vehicular speeds at downstream sections of the roadway and activating the system.

B Materials

Provide DLMS components and software that is National Transportation Communications for ITS Protocol (NCTIP) compliant.

B.1 Portable Changeable Message Signs (PCMS)

Provide PCMS conforming to standard spec 643. Ensure each PCMS is integrated with a portable traffic sensor, modem, and other equipment (e.g. automated system manager) mounted on it, and acts as a single device for the purpose of communicating with similarly integrated devices and displaying real-time traffic conditions.

B.2 Portable Traffic Sensors (PTS)

Provide PTS that are non-intrusive and capable of capturing vehicle speed in mph.

B.3 Static Traffic Control Signs with Temporary Flashing Beacons

Provide static traffic control signs with temporary flashing beacons conforming to standard spec 658.2.2, Traffic Signal Faces.

B.4 Automated System Manager (ASM)

Provide an ASM that assesses current traffic data captured by the PTS, determines the appropriate merging strategy based upon pre-determined speed thresholds, and communicates appropriate messages to the motorists through the PCMS.

B.5 System Communications

Ensure DLMS communications meet the following requirements:

1. Perform required configuration of the DLMS communication system automatically during system initialization.
2. Communication between the server and any individual PCMS or PTS are independent through the full range of deployed locations, and do not rely upon communications with any other PCMS or PTS.
3. Incorporate an error detection/correction mechanism into the DLMS communication system to ensure the integrity of all traffic condition data and motorist information messages.

B.6 System Acceptance

Submit vendor verification to the engineer that the system will adequately perform the functions specified in this special provision 14 calendar days before the pre-construction meeting. Adequate verification includes past successful performance of the system, literature and references from successful use of the system by other agencies, and/or demonstration of the system.

Provide contact information for a designated representative responsible for monitoring the performance of the system and for making modifications to the operational settings as the engineer directs.

Provide all testing and calibration equipment.

C Construction

C.1 General

Number the devices in chronological order so they are visible from the shoulder with 6inch white high reflective sheeting.

Provide technical personnel for all system calibration, operation, maintenance, and timely on-call support services.

Promptly correct the system within 24 hours of becoming aware of a deficiency in the operation or individual part of the system.

A minimum of seven days before deployment, place the DLMS and demonstrate to the department that the DLMS is operational.

Maintain the DLMS for the duration of the project. Ensure the system operates continuously (24 hours, 7 days a week) in the automated mode throughout the duration of the project.

Remove the system upon project completion.

C.2 Reports

Provide an electronic copy of a weekly summary report via email to the engineer. Ensure the report includes, at a minimum, the average speed per sensor, traffic volume, vehicle classification, time in congestive state per sensor and number of triggers per day.

C.3 Meetings

Attend mandatory in-person pre-construction meetings with the department. Attend additional meetings the department may require on a periodic basis. These meetings may be held in person or via teleconference, as scheduled by the department.

C.4 Programming

C.4.1 General

Program the DLMS to ensure that the following general operations are performed:

1. Provide a password protected login to the ASM, website and all other databases.
2. The DLMS operates as a unit where the flashing beacons and the PCMS activate at the same time for the same scenario. System operation may be based on as few as one PTS.
3. The ASM ensures that messages sent to the connected PCMS and flashing beacons are synchronized so that all the messages on all the PCMS are for the same traffic conditions.

4. Provide real-time data from the ASM to a website with a full color mapping feature and refresh every 60 seconds. Make data on website available to the department at all times for the duration of the work zone activity. Ensure website includes at a minimum:
 - Vehicle speeds
 - PCMS messaging
 - Device locations
 - Traffic volume
 - Occupancy
 - Vehicle Classification
5. Archive all traffic data and PCMS messages in a Microsoft excel format with date and time stamps.
6. Configure the website to quantify system failures which includes communication disruption between any devices in the system configuration, PCMS malfunctioning, PTS malfunction, loss of power, low battery, etc.
7. Provide default and advisory messages automatically based on traffic conditions.
8. Ensure the system autonomously restarts in case of any power failure.
9. Provide the department access to manually override PCMS messages for a user-specified duration, after which automatic operation will resume display of messages appropriate to the prevailing traffic conditions. Document all override messages.

C.4.2 System Operation Strategy

Arrange for the vendor/manufacturer to coordinate system operation, detection, trends/thresholds, and messaging parameters with the engineer.

Free Flow:

Input the free flow traffic conditions as the department directs. Typical traffic conditions that warrant this strategy may include:

1. Trend of vehicle speeds at one or more point above an adjustable parameter. Set this parameter as the engineer directs for optimal results based on on-site monitoring and review. Typically, greater than 50 mph may be utilized as a guideline.
2. A trend of vehicle volume at one or more point below an adjustable parameter. Set this parameter as the engineer directs for optimal results based on on-site monitoring and review. Typically, less than 1000 vehicles/hour/lane may be utilized as a guideline.
3. A trend including increased vehicle speeds together with reduced volume. Set these parameters as the engineer directs for optimal results based on on-site monitoring and review.

During free flow conditions, display no lane use messages, and therefore allow traffic to resume typical early merge operation.

Congestion:

The congestion traffic conditions will be determined by the department, but typical traffic condition warrants may include:

1. A trend of vehicle speeds at one or more points below an adjustable parameter. Set this parameter as the engineer directs for optimal results based on on-site monitoring and review. Typically, less than 40 mph may be utilized as a guideline.
2. A trend of vehicle volume at one or more point above an adjustable parameter. Set this parameter as the engineer directs for optimal results based on on-site monitoring and review. Typically, greater than 1500 vehicles/hour/lane may be utilized as a guideline.
3. A trend including reduced vehicle speeds together with increased volume. Set these parameters as the engineer directs for optimal results based on on-site monitoring and review.

When traffic conditions warrant a change to the late merge strategy, activate the temporary flashing beacons and display lane use messages on the PCMS together. Example messages for congestion traffic conditions are below. Locate the PCMS in advance of the lane closure as determined by the engineer and system provider based upon estimated queue lengths and project geometry.

Quantity and approximate locations of PCMS for various stages are shown in the plans.

The individual PCMS in the system shall initially display the following messages and can be adjusted by the engineer at their discretion:

- Point of merge:

FRAME 1	FRAME 2
MERGE HERE	TAKE TURNS

- Intermediate PCMS:

FRAME 1	FRAME 2
STAY IN LANE	DO NOT MERGE

- PCMS located beyond estimated maximum queue length:

FRAME 1	FRAME 2
STOPPED TRAFFIC AHEAD	USE ALL LANES

C.5 Calibration and Testing

At the beginning of the project and monthly throughout the duration of the project, perform a successful field test and calibration at the DLMS location to verify the system is detecting accurate vehicle speeds and volumes, and accurately relaying the information to the ASM and the PCMS.

Send email of successful calibration and testing to the engineer.

D Measurement

The department will measure Dynamic Late Merge System by the day acceptably completed, measured as each complete system per roadway.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
643.1100.S	Dynamic Late Merge System	DAY

Payment is full compensation for providing, repositioning, operating, maintaining, monitoring, calibrating, testing, and removing the complete system consisting of PCMS, PTS, ASM, and system communications.

Failure to correct a deficiency to the PCMS, PTS, or AMS within 24 hours after notification from the engineer or the department will result in a one day deduction of the measured quantity for each day in which the deficiency is not corrected.

Failure to correct the website within 24 hours after notification from the engineer will result in a 10% reduction of the day quantity for each day the website is down.

It is the engineer's sole discretion to assess the deductions for an improperly working DLMS.

stp-643-040 (20181119)

39. Connecting Pipe Underdrain to Existing Inlet, Item SPV.0060.01.

A Description

This special provision describes excavating, drilling/coring, removing debris from the work, installing pipe underdrain, and backfilling at inlets in locations where the engineer directs. The intent is to provide positive drainage in the proposed pipe underdrain between the existing inlet and existing base aggregate beneath the roadway shoulder.

B Materials

Furnish mortar conforming to Section 501 of the Standard Specifications.

C Construction

Install in accordance with the plan details for the intended use, as directed by the engineer in the field. Connect new Pipe Underdrain 4-Inch or Pipe Underdrain 6-Inch to existing inlets where directed by the

engineer. This typically will be at median locations where the median ditch is being filled to an elevation higher than the pipe underdrain outfall and where an existing inlet is located nearby.

Provide an excavation adjacent to existing inlet structure large enough to complete the required work.

Core or drill a hole in sidewall of the existing inlet structure, of sufficient diameter to accommodate Pipe Underdrain 4-Inch or 6-Inch. Install Pipe Underdrain 4-Inch or 6-Inch the full thickness of the concrete inlet wall, plus 4-inches extending into the inlet box. Mortar the space between the pipe underdrain and the inside of the hole in the inlet wall. Place the hole at least 1 foot below the top of the inlet structure, or as directed by the engineer. Holes deeper than 1-foot may be required for positive drainage.

Backfill the excavation in lifts of 8 inches and compact each lift prior to placing the next lift, to prevent settlement of the material supporting the pipe underdrain, or settlement of the completed ground surface adjacent to the inlet. Meet the pertinent requirements as set forth in section 612.3.5 (2) of the Standard Specifications amended as follows: The contractor may backfill Pipe Underdrain 4-inch or 6-Inch at the inlet and within the right-of-way or freeway median beyond the roadway and shoulder limits, with suitable material from the trench or roadway excavation unless granular backfill is specified.

D Measurement

The department will measure Connecting Pipe Underdrain to Existing Inlet by Each unit placed and accepted in accordance with the contract.

E Payment

The department will pay for the measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Connecting Pipe Underdrain to Existing Inlet	EACH

Payment for the item is full compensation for excavating at the inlet, coring or drilling, cleaning, including removal of the concrete core from hole drilled in the wall of the inlet; for any checking of elevations; for any associated dewatering; for providing and placing mortar, providing and placing all backfill; for maintaining temporary drainage; and for disposing of surplus material. The Pipe Underdrain Unperforated 4-inch, Pipe Underdrain Unperforated 6-Inch, Base Aggregate Dense 1 1/4-Inch, Base Aggregate Dense 3/4-Inch, and/or Breaker Run items are paid separately as part of the roadway work and use of these materials for Connecting Pipe Underdrain to Existing Inlet are incidental to the Connecting Pipe Underdrain to Existing Inlet bid item.

40. Survey Project 2220-02-70, Item SPV.0105.01.

A Description

This special provision describes modifying standard spec 105.6 and 650 to define the requirements for construction staking for this contract. Conform to standard spec 105.6 and 650 except as modified in this special provision.

Replace standard spec 650.1 with the following:

This section describes the contractor-performed construction staking required under individual contract bid items to establish the horizontal and vertical position for all aspects of construction including:

- storm sewer
- subgrade
- base
- curb
- gutter
- curb and gutter
- curb ramps
- pipe culverts
- drainage structures
- structure layout
- bridges
- all retaining wall layout
- pavement
- pavement markings (temporary and permanent)
- barriers (temporary and permanent)

- overhead signs
- freeway and local street lighting
- electrical installations
- supplemental control
- slope stakes
- detention ponds
- traffic signals
- ITS
- FTMS
- paths
- utilities
- conduit
- landscaping elements
- installation of community sensitive design elements
- traffic control items
- fencing
- multi-use path

B (Vacant)

C Construction

Supplement standard spec 650.3.1 (5) with the following:

Global positioning methods will not be allowed to establish the following:

1. Structure layout horizontal or vertical locations.
2. Concrete pavement vertical locations.
3. Curb, gutter, and curb and gutter vertical locations.
4. Concrete barrier vertical locations.
5. Storm Sewer layout horizontal or vertical locations, including structure centers, offsets, access openings, rim and invert elevations.

Replace standard spec 650.3.1(6) with the following:

(6) Maintain neat, orderly, and complete survey notes, drawings, and computations used in establishing the lines and grades. This includes:

- Raw data files
- Digital stakeout reports
- Control check reports
- Supplemental control files (along with method used to establish coordinates and elevation)
- Calibration report

Make the survey notes and computations available to the engineer within 24 hours as the work progresses unless a longer period is approved by the engineer.

Replace standard spec 650.3.3.1 with the following:

Under the Survey Project bid item, global positioning system (GPS) machine guidance for conventional subgrade staking on all or part of the work may be substituted. The engineer may require reverting to conventional subgrade staking methods for all or part of the work at any point during construction if the GPS machine guidance is producing unacceptable results.

Replace standard spec 650.3.3.4.1 with the following:

The department will provide the contractor staking packet as described in the Construction and Materials Manual (CMM) 7.10. At any time after the contract is awarded, the available survey and design information may be requested. The department will provide that information within 5 business days of receiving the contractor's request. The department incurs no additional liability beyond that specified in standard spec 105.6 or standard spec 650 by having provided this additional information.

Add the following to standard spec 650.3.3.6.2 as paragraph (4):

Record all subgrade elevation checks and submit a hard copy to the engineer within 24 hours or as requested by the engineer.

D Measurement

Replace standard spec 650.4 with the following:

- (1) The department will measure Survey Project (project ID) as a single lump sum unit of work, acceptably completed.

E Payment

Replace standard spec 650.5 with the following:

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.01	Survey Project 2220-02-70	LS

Payment is full compensation for performing all survey work required to lay out and construct all work under this contract and for adjusting stakes to ensure compatibility with existing field conditions. The department will not make final payment for this item until the contractor submits all survey notes and computations used to establish the required lines and grades to the engineer within 24 hours of completing this work. Re-staking due to construction disturbance and knock-outs will be performed at no additional cost to the department.

sef-650-005 (20180104)

41. Removing Loose Concrete Overhead, Item SPV.0165.01.

A Description

This special provision describes removing overhead deteriorated concrete on structures as identified by the engineer, shown on the plans and applying a migrating corrosion inhibitor to areas of exposed steel reinforcing and concrete. Perform work in accordance to the pertinent parts of standard spec 517 and the details as shown in the plans.

B Materials

B.1 General

Furnish corrosion inhibitor that is in accordance to the pertinent requirements of standard spec 517. The corrosion inhibitor will be: MCI - 2020 V/O, migrating corrosion inhibitor for vertical and overhead applications, with the following typical physical properties:

- Color appearance: clear yellow viscous liquid,
- pH: 9.0 - 9.7 (neat),
- Density: 8.6 - 8.8 lb./gal. (1.03 - 1.05 kg/liter),
- Viscosity (or flow) similar to syrup and higher than water.
- Odor: slight ammonia smell.
- Non-volatile content: 20 - 27 %.

Migrating corrosion inhibitor provided in this section shall conform to the requirements for each type and class of concrete required, with the following typical physical properties and requirements:

- Organic liquid
- Water-based
- Non-flammable
- Non-vapor barrier
- Non-toxic, oral LD 50 2000 g/kg maximum, or lower
- Protects both anodic and cathodic areas
- Does not contain calcium nitrite
- Non-polluting after flushing or dilution
- Non-harmful to plant life after flushing or dilution
- Approved for potable water applications by NSF Standard 61
- Certified for potable water applications by Underwriters Laboratories
- Not carcinogenic under Occupational Safety and Health Agency, NTP, or IARC
- Seven year minimum usage experience as a migrating corrosion inhibitor,
- Confirmed effective by ASTM G – 109

- Proven effective as reported by the Strategic Highway Research Program funded by the United States of America, Department of Transportation (DOT), federal government and state DOT's.

C Construction

C.1 Preparation

Remove all deteriorated concrete. Sawcutting of edges is not needed. Concrete and adjacent surfaces should be dry, clean, and free of all dirt, oil, grease, efflorescence, sealers, coatings, curing compounds, membranes, rubber tire marks, and asphalt. Clean surface by steam cleaning, water blasting, sandblasting, or shot blasting. Use an air compressor with water and oil trap to ensure the cleaning method does not apply materials intended for removal. Use brush, broom, sweeper, or air compressor on surfaces as final cleaning before application. Use brush, broom, sweeper, or air compressor to chase cracks as final cleaning before application. Do not apply if the ambient temperature near the applied concrete surface is expected to be below freezing water temperature within 12 hours of application.

C.2 Surface Application

Use se MCI - 2020 V/O for vertical or overhead surface applications. Apply the solution by spray (conventional airless or hand pressure spray equipment), roller, squeegee, or paintbrush. Apply at rate of 150 square feet per gallon (3.7 square meters per liter). Minimal dry time is required and is usually minutes after treatment. Use of concrete substrate, such as for traffic, may resume when treatment is dry to touch.

D Measurement

The department will measure Remove Loose Concrete Overhead by the square foot acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.01	Removing Loose Concrete Overhead	SF

Payment is full compensation for concrete removal and disposal, cleaning preparation, furnishing, and applying the product.