

Special Provisions

Table of Contents

Article	Description	Page #
1.	General.	2
2.	Scope of Work.	2
3.	Prosecution and Progress.	2
4.	Traffic.	3
5.	Holiday Work Restrictions.....	3
6.	Information to Bidders, U.S. Army Corps of Engineers Section 404 Permit.	3
7.	Information to Bidders, WPDES General Construction Storm Water Discharge Permit.	4
8.	Utilities.....	4
9.	Erosion Control.....	5
10.	Maintaining Drainage	5
11.	Dewatering	5
12.	Notice to Contractor – Contamination Beyond Construction Limits.	6
13.	Public Convenience and Safety.	6
14.	Coordination with Businesses and Residents.....	6
15.	Notice to Contractor – Temporary Limited Easements.....	6
16.	Clearing and Grubbing, Emerald Ash Borer.	6
17.	Concrete Pavement Joint Layout, Item 415.51 10.S.	9
18.	Pond Liner Clay, Item 640.1303.S.....	9
20.	STH 50, Frontage Roads Lighting.	12
21.	Outlet Control Manhole, Item SPV.0060.0200.....	14
22.	Detention Pond Corrugated Metal Anti-Seep Collar, Item SPV.0060.0201.	14
23.	Luminaires LED City of Kenosha CREE LEDWAY Street Light, Item SPV.0060.0300.....	15
24.	Fence Split Rail Three Rail, Item SPV.0090.0200.	15
25.	Construction Staking Pond Layout, Item SPV.0105.0200.....	16
26.	Lighting System Integrator Project 1310-10-72, Item SPV.0105.0301.	16
27.	Maintenance of Lighting Systems Project 1310-10-72, Item SPV.0105.0302.....	17
28.	Lighting System Survey Project 1310-10-72, Item SPV.0105.0303.....	19
29.	Wall Modular Block Mechanically Stabilized Earth R-30-61, Item SPV.0165.0401; R-30-62, Item SPV.0165.0402.	20

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 1310-10-72, 75th Street, C Kenosha / V Pleasant Prairie, Frontage Roads, located in Kenosha 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 excavation common, excavation below subgrade, base aggregate dense, concrete curb and gutter, concrete pavement, concrete sidewalk, storm sewer, pavement marking, permanent signing, street lighting, traffic control, retaining wall structures 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 time frame for construction of the project within the 2020 construction season to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Assure that the time frame is consistent with the contract completion time. Upon approval, the engineer will issue the notice to proceed within ten calendar days before the beginning of the approved time frame.

To revise the time frame, submit a written request to the engineer at least two weeks before the beginning of the intended time frame. 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.

During Stage 2 operations, lane closures on STH 31 shall be in place for a maximum of 14 calendar days.

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).

In accordance to the final 4(d) rule issued for the NLEB, the department has determined that the proposed activity may affect, but will not result in prohibited take of the NLEB. The activity involves tree removal, but will not occur within 0.25 miles of a known hibernacula, nor will the activity remove a known maternity roost tree or any other tree within 150 feet of a known maternity roost tree.

If additional trees need to be removed, no Clearing shall occur without prior approval from the engineer, following coordination with the WisDOT REC. Additional tree removal beyond the area originally specified will require consultation with the United States Fish and Wildlife Service (USFWS) and may require a bat presence/absence survey. Notify the engineer if additional Clearing cannot be avoided to begin coordination with the WisDOT REC. The WisDOT REC will initiate consultation with the USFWS and determine if a survey is necessary.

Submit a schedule and description of Clearing operations with the ECIP 14 days prior to any Clearing operations. The department will determine, based on schedule and scope of work, what additional erosion control measures shall be implemented prior to the start of Clearing operations, and list those additional measures in the ECIP.

4. Traffic.

Complete all work as shown in the traffic control plans. All variations from the traffic control plans shall be approved in writing at least 48 hours prior to any traffic control change. Notify the engineer at least 48 hours prior to any traffic control changes.

74th Street will be closed to through traffic during the project. A short-term lane closure on STH 31 will be necessary at the proposed 74th Street intersection. Limit the duration of the lane closure on STH 31 as described in the prosecution and progress. A temporary lane closure with flagging operations on 60th Avenue may be necessary to complete storm sewer installations. Refer to the standard detail drawings for all traffic control requirements for flagging operations. Flagging operations shall be conducted such that queues do not extend to the STH 50 intersection or affect the STH 50 and 60th Avenue intersection operations. All lanes of traffic shall be reopened on temporary or final pavement at the end of each working day.

Completely backfill open trench excavations to existing or finished grade at the end of each workday. In areas of pavement removals or excavation alongside live traffic lanes (live traffic within 6-feet), grade vertical drop-offs of greater than 3-inches with base aggregate at a 3:1 slope at the end of each work day. Payment for placement and removal of base aggregate used for temporary grading along drop-off areas is incidental to the contract.

Wisconsin Lane Closure System Advance Notification

Provide the following advance notification to the engineer for incorporation into the Wisconsin Lane Closure System (LCS).

TABLE 108-1 CLOSURE TYPE AND REQUIRED MINIMUM ADVANCE NOTIFICATION

Closure type with height, weight, or width restrictions (available width, all lanes in one direction < 16')	MINIMUM NOTIFICATION
Lane and shoulder closures	7 calendar days
Full roadway closures	7 calendar days
Ramp closures	7 calendar days
Detours	7 calendar days
Closure type without height, weight, or width restrictions (available width, all lanes in one direction ≥ 16')	MINIMUM NOTIFICATION
Lane and shoulder closures	3 business days
Ramp closures	3 business days
Modifying all closure types	3 business days

Discuss LCS completion dates and provide changes in the schedule to the engineer at weekly project meetings in order to manage closures nearing their completion date.

5. Holiday Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying STH 31 or STH 50 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;

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 Jason Dahlgren at (414) 750-3278.

stp-107-054 (20080901)

7. 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-SXXXXXX-X Permit pending**). A certificate of permit coverage is available from the regional office by contacting Jason Dahlgren at (414) 750-3278. Post the permit in a conspicuous place at the construction site.

stp-107-056 (20180628)

8. Utilities.

This contract does NOT come under the provisions of Administrative Rule TRANS 220.

AT&T Wisconsin has an overhead telephone line on We Energies poles crossing the proposed roadway and sidewalk along the east side of STH 31. We Energies will relocate the pole at Station 181+24, 14' LT to Station 181+25, 21' LT. AT&T Wisconsin will transfer existing aerial cable to relocated We Energies pole and detach from pole being removed.

AT&T Wisconsin has 2 buried copper cables crossing the proposed roadway at Station 199+75 crossing the proposed roadway and sidewalk along the west side of 60th Ave. AT&T Wisconsin will expose the existing cables around the relocated We Energies pole at Station 199+74, 63' LT to place a new pedestal and cut off out end of cables. The cables from the out end to the existing AT&T pedestal to the south, near 75th St and 60th Ave will be discontinued.

AT&T Wisconsin will complete this work prior to the start of roadway construction; it is anticipated to take 60 working days. This work is dependent on We Energies pole placement and release to transfer. AT&T Wisconsin will transfer within 3 weeks of release. We Energies will coordinate as the pole owner.

Contact Michael VanBoven (262-676-3958) of AT&T Wisconsin 7 days in advance to coordinate locations and any excavation near their facilities.

Charter Communications has an underground television line along the north side of the proposed roadway from Station 198+00 to 199+75. Charter Communications will relocate this line alongside a We Energies relocated electric line. The proposed television line will be approximately 5 feet from the edge of the proposed sidewalk along the north side of 74th Street. The existing television line will be discontinued.

Charter Communications has an overhead line on We Energies poles crossing the proposed roadway and sidewalk along the east side of STH 31. We Energies will relocate the pole at Station 181+24, 14' LT to Station 181+25, 21' LT. AT&T Wisconsin will transfer existing aerial cable to relocated WE Energies pole and detach from pole being removed.

Charter Communications has an overhead line on We Energies poles crossing the proposed roadway and sidewalk along the west side of 60th Ave. We Energies will relocate the pole at Station 199+15, 36' LT to Station 199+74, 63' LT. Charter Communications will transfer existing aerial line to relocated We Energies pole and detach from pole being removed.

The proposed work start date is dependent on We Energies work. Estimated construction time is 30 working days. This work is dependent on We Energies pole placement and release to transfer, and on We Energies completing a requested joint trench for relocated underground facilities. Work will be completed prior to the start of construction.

Contact Neal Long (414-430-7189) of Charter Communications 7 days in advance to coordinate locations and any excavation near their facilities.

Kenosha, City of – Water and Sewer

PENDING

We Energies Gas has an underground 4" polyethene gas line crossing the proposed roadway and sidewalk along the east side of STH 31, Station 181+71. We Energies will relocate this line by directional boring a 4" polyethene gas line at Station 181+68 and tie into existing gas lines at 190' LT and 206' RT. The proposed gas line will be installed at an elevation of 701 feet, 8' below existing grade, and 6' west of the east right-of-way on STH 31. The existing gas line will be discontinued.

We Energies has an underground 4" polyethene gas line crossing the proposed along the west side of 60th Ave, at approximately Station 199+83. We Energies will relocate this line by directional boring a 4" polyethene gas line at approximately Station 199+69 and tie into existing gas lines at approximately 75' LT and 75' RT. The proposed gas line will be installed 8' below existing grade, and below the proposed north-south sidewalk along 60th Ave. The existing gas line will be discontinued.

We Energies – Gas will begin proposed work August 2019, and will complete this work prior to the start of construction. This work is anticipated to take 20 working days.

Contact Wesley Nunn (262-886-7030-office, 414-659-4933-mobile) of We Energies – Gas 7 days in advance to coordinate locations and any excavation near their facilities.

stp-107-066 (20080501)

9. Erosion Control.

Supplement standard spec 107.20 with the following:

Erosion control best management practices (BMP's) shown on the plans are at suggested locations. The actual locations will be determined by the contractor's ECIP and by the engineer. Include dust control and each dewatering or by-pass (mechanical pumping) operation in the ECIP submittal. The ECIP will supplement information shown on the plans and not reproduce it. The ECIP will identify how to implement the project's erosion control plan. ECIP will demonstrate timely and diligently staged operations, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, re-application of top soil, and restoration of permanent vegetation to minimize the period of exposure to possible erosion.

Provide the ECIP 14 days prior to the pre-construction meeting. Provide 1 copy of the ECIP to the department and 1 copy of the ECIP to the WDNR Liaison Craig Webster, (262) 574-2141, craig.webster@wisconsin.gov. Do not implement the ECIP without department approval and perform all work conforming to the approved ECIP.

Maintain Erosion Control BMP's until permanent vegetation is established or until the engineer determines that the BMP is no longer required.

Stockpile excess materials or spoils on upland areas away from wetlands, floodplains, and waterways. Immediately install perimeter silt fence protection around stockpiles. If stockpiled materials will be left for more than 14 days, install temporary seed or other temporary erosion control measures the engineer orders.

Re-apply topsoil on graded areas, as the engineer directs, immediately after the grading is completed within those areas. Seed, fertilize, and mulch/erosion mat top-soiled areas, as the engineer directs, 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.

10. Maintaining Drainage

Maintain drainage at and through worksite during construction in accordance to section 107.22, section 204, and section 520 of the standard specifications.

Use existing storm sewers, existing culvert pipes and 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.

11. Dewatering

If dewatering or pumping is required, treat the water to remove suspended solids before allowing it to enter any waterway or wetland. Filter pumped water through a media such as washed stone or allow settling in a sedimentation basin with sufficient capacity and size to provide an efficient means to filter the water from the dewatering operation before it is discharged back into the waterway or wetland. As part of the Erosion Control Implementation Plan (ECIP) submittal, supply all pertinent information and calculations used to determine the best management practice for dewatering at each location it is required.

Refer to the dewatering guidelines of WisDNR Storm Water Management Technical Standards, Code #1061, "Dewatering". This document can be found at the WisDNR website:

<http://dnr.wi.gov/runoff/stormwater/techstds.htm>

The cost of all work and materials associated with water treatment and/or dewatering is incidental to the project.

12. Notice to Contractor – Contamination Beyond Construction Limits.

The department completed testing for soil and ground water contamination for locations within this project where excavation is required. Testing indicated that petroleum-contaminated soil is present at the following sites:

1. Station 181+20 to 183+38 from 280 feet RT of centerline to 400 feet RT of centerline.

The contaminated soils at the above sites are expected to be beyond the excavation limits necessary to complete the work under this project. Control construction operations at these locations to ensure that they do not extend beyond the excavation limits indicated in the plans. If contaminated soils are encountered at these sites or elsewhere on the project during excavation, terminate excavation in the area and notify the engineer.

The Hazardous Materials Report is available by contacting: Jason Dahlgren at (414) 750-3278.

stp-107-100 (20050901)

13. Public Convenience and Safety.

Revise standard spec 107.8(6) as follows:

Check for and comply with local ordinances governing the hours of operation of construction equipment. Do not operate motorized construction equipment from 10:00 PM until the following 7:00 AM, unless prior written approval is obtained from the engineer.

stp-107-001 (20060512)

A noise variance may be obtained from the City of Kenosha. To pursue a noise variance, contact the City of Kenosha Director of Public Works, Shelly Billingsley at (262) 653-5040 or sbillingsley@kenosha.org.

14. Coordination with Businesses and Residents.

The contractor shall arrange and conduct a meeting between the contractor, the department, affected residents, local officials and business people to discuss the project schedule of operations including vehicular and pedestrian access during construction operations. Hold the first meeting at least one week before the start of work under this contract and no further meetings will be required unless directed by the engineer. The contractor shall arrange for a suitable location for meetings that provides reasonable accommodation for public involvement. The department will prepare and coordinate publication of the meeting notices and mailings for meetings. The contractor shall schedule meetings with at least 2 weeks prior notice to the engineer to allow for these notifications.

stp-108-060 (20141107)

15. Notice to Contractor – Temporary Limited Easements.

Do not store equipment or materials on existing driveways or parking lots within Temporary Limited Easements, unless agreed upon with the property owner and the engineer.

16. Clearing and Grubbing, Emerald Ash Borer.

This applies to projects in the emerald ash borer (EAB) quarantined zones to include: Adams, Brown, Buffalo, Calumet, Columbia, Crawford, Dane, Dodge, Door, Douglas, Fond du Lac, Grant, Green, Iowa,

Jackson, Jefferson, Juneau, Kenosha, Kewaunee, La Crosse, Lafayette, Manitowoc, Marquette, Milwaukee, Monroe, Oneida, Outagamie, Ozaukee, Portage, Racine, Richland, Rock, Sauk, Sheboygan, Trempealeau, Vernon, Walworth, Washington, Waukesha, Winnebago and Wood counties.

Supplement standard spec 201.3 with the following:

The emerald ash borer (EAB) has resulted in a quarantine of ash trees (*Fraxinus* sp.) by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and the Wisconsin Department of Natural Resources (DNR).

Ash trees species attacked by emerald ash borer include the following:

1. Green ash (*F. pennsylvanica*) is found throughout the state, but is most common in southern Wisconsin. It may form pure stands or grow in association with black ash, red maple, swamp white oak, and elm. It grows as an associate in upland hardwood stands, but is most common in and around stream banks, floodplains, and swamps.
2. Black ash (*F. nigra*) is distributed over the entire state but is most frequently found in northern Wisconsin. It is most common in swamps, but is also found in other wet forest types.
3. Blue ash (*F. quadrangulata*) is a threatened species that is currently found only at a few sites in Waukesha County. The species is at the edge of its range in Wisconsin, but is common in states farther south. The species is not of commercial importance. Blue ash twigs are 4-sided.
4. White ash (*F. americana*) tends to occur primarily in upland forests, often with *Acer saccharum*.

The quarantine of ash trees includes all horticultural cultivars of the species listed above.

Note that blue ash twigs are 4-sided. All other Wisconsin ash trees have round stems. Also, Mountain ash (*Sorbus americana* and *S. decora*) is not a true ash and is not susceptible to EAB infestation.

The contractor shall be responsible for hiring a certified arborist to identify all ash trees that will be cleared and grubbed for the project. In addition, prior to scheduled clearing and grubbing activities, the arborist shall mark all ash trees with florescent lime flagging tied around the trunk perimeter.

Follow and obey the following Wisconsin Department of Agriculture, Trade, and Consumer Protection order:

ATCP 21.17 Emerald ash borer; import controls and quarantine.

(1) Importing or Moving Regulated Items from Infested Areas; Prohibition.

Except as provided in subsection (3), no person may do any of the following:

- a) Import a regulated item under subsection (2) into this state if that item originates from an emerald ash borer regulated area identified in 7CFR 301.53-3.
- b) Move any regulated item under subsection (2) out of an emerald ash borer regulated area that is identified in 7CFR 301.53-3 and located in this state.

Note: The United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) periodically updates the list of regulated areas in 7CFR 301.53-3. Subsection (1) applies to new regulated areas as those areas are identified in the CFR.

Note: Each year, as a service, the Wisconsin department of agriculture, trade and consumer protection distributes an updated federal CFR listing to nursery license holders and other affected persons in this state. More frequent updates, if any, are available on the department's website at:

www.datcp.state.wi.us.

Subsection (1) applies to new regulated areas as those areas are identified in the CFR, regardless of whether affected persons receive update notices from the department. Persons may request update notices by calling (608) 224-4573, by visiting the department's website, or by writing to the following address:

Wisconsin Department of Agriculture
Trade and Consumer Protection
Division of Agricultural Resource Management
P.O. Box 8911
Madison, WI 53708-8911

(2) Regulated Items. The following are regulated items for purposes of subsection (1)

- a) The emerald ash borer, *Agrilus planipennis* Fairmaire in any living stage.
- b) Ash trees.
- c) Ash limbs, branches, and roots.

- d) Ash logs, slabs or untreated lumber with bark attached.
- e) Cut firewood of all non-coniferous species.
- f) Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter.
- g) Any other item or substance not listed in subsection (2) that may be designated as a regulated item if a pest control official determines that it presents a risk of spreading emerald ash borer and notifies the person in possession of the item or substance that it is subject to the restrictions of the regulations.

(3) Inspected and Certified Items; Exemption.

Subsection (1) does not prohibit the shipment of a regulated item if a pest control official in the state or province of origin does all of the following:

- a) Inspects the regulated item.
- b) Certifies any of the following in a certificate that accompanies the shipment:
 - 1) The regulated item originates from non-infested premises and has not been exposed to emerald ash borer.
 - 2) The regulated item was found, at the time of inspection, to be free of emerald ash borer.
 - 3) The regulated item has been effectively treated to destroy emerald ash borer. The certificate shall specify the date and method of treatment.
 - 4) The regulated item is produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of emerald ash borer.

Regulatory Considerations

- a) The quarantine means that ash wood products may not be transported out of the quarantined area.
- b) Clearing and grubbing includes all ash trees that are to be removed from within the project footprint. If ash trees are identified within clearing and grubbing limits of the project, the following measures are required for the disposal:

Chipped Ash Trees

- a) May be left on site if used as landscape mulch within the project limits. If used as mulch on site, chips may not be applied at a depth greater than standard mulch applications as this will impede germination of seeded areas.
- b) May be buried on site within the right-of-way conforming to standard spec 201.3 (14).
- c) May be buried on adjacent properties to projects within the quarantined zone with prior approval of the engineer conforming to standard spec 201.3 (15).
- d) May be trucked to a licensed landfill within the quarantined zone with the engineer's approval conforming to standard spec 201.3 (15).
- e) Burning chips is optional if in compliance with standard spec 201.3.
- f) Chips must be disposed of immediately if not used for project mulching and may not be stockpiled and left on site for potential transport by others. Chips may be stockpiled **temporarily** if they will be used for project mulching and **are not readily accessible to the public**.
- g) Chipper equipment must be cleaned following post-chipping activities to insure no spread of wood chip debris into non-quarantined counties.

Ash logs, Branches, and Roots

- a) May be buried without chipping within the existing ROW or on adjacent properties conforming to standard spec 201.3 (14) and (15).
- b) May be trucked to a licensed landfill within the quarantined zone with the engineer's conforming to standard spec 201.3 (15).
- c) Burning is optional if in compliance with standard spec 201.3.
- d) Ash logs, branches, and roots must be disposed of immediately and may not stockpile.
- e) All additional costs will be incidental to clearing and grubbing items.
- f) Do not bury or use mulch in an area that will be disturbed again during later phases of the project.
- g) Anyone moving firewood or ash products from the state or these counties is subject to state and federal fines up to \$1,000.00. All fines are the responsibility of the contractor. Obtain updated quarantine information at the DNR Firewood Information Line at 1-800-303-WOOD.

Furnishing and Planting Plant Materials

Supplement standard spec 632.2.2 with the following:

Ash trees may be obtained from inside or outside the quarantine area and planted within the quarantined area. Ash trees from within the quarantine area may not be transported and planted into the non-quarantined area.

SER-201-001 (20160808)

17. Concrete Pavement Joint Layout, Item 415.5110.S.

A Description

This special provision describes providing a concrete pavement or concrete base joint layout design for intersections and marking the location of joints in the field

B (Vacant)

C Construction

Plan and locate all points necessary to establish the horizontal position of the transverse and longitudinal joints in the concrete to prevent uncontrolled cracking. Submit a joint layout design to the engineer at least 7 calendar days before paving each intersection. Do not lay out joints until the engineer has reviewed the joint layout design. Mark the location of concrete joints in the field. Follow the plan details for joints in concrete making adjustments as required to fit field conditions.

D Measurement

The department will measure Concrete Pavement Joint Layout as a single lump sum unit for all joint layout designs and marking 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
415.5110.S	Concrete Pavement Joint Layout	LS

Payment is full compensation for providing the intersection joint layout designs and marking all joints in the field.

The department will adjust pay for crack repairs as specified in standard spec 415.5.3.

stp-415-020 (20170615)

18. Pond Liner Clay, Item 640.1303.S.

A Description

This special provision describes providing low permeable clay in areas the plans show.

B Materials

For each source, before excavating and hauling the low permeable clay to the project, submit the results of the laboratory tests described in Table 1. The laboratory testing shall document that the clay from the source meets or exceeds the requirements.

The sample for the hydraulic conductivity test shall be remolded clay at a minimum dry density of 95% of the maximum dry density as determined by the Standard Proctor test AASHTO T-99 and at a moisture content required to achieve the required hydraulic conductivity, but with a minimum moisture content at or above the optimum moisture content as determined in the Standard Proctor test AASHTO T-99. Conduct the laboratory source testing at the frequency listed in Table 1. Submit the test results to the engineer for review, two weeks before construction.

C Construction

C.1 Low Permeable Clay Placement

C.1.1 Subgrade

Compact the subgrade to a minimum density as defined in standard spec 207.3.6.2, Standard Compaction, or as otherwise specified in the contract requirements.

C.1.2 Erosion Protection

Do not place the low permeable clay until after all adjacent site grading has been completed and only after silt fence has been installed completely around the area of low permeable clay placement.

C.1.3 Low Permeable Clay Placement

After the fine grading is complete, place and compact low permeable clay in completed 6-inch lifts. Place each lift of low permeable clay in one continuous lift. See plans for low permeable clay construction limits. Measure the thickness of the low permeable clay the plans show perpendicular to the surface.

Notify the engineer at least three days before starting construction of low permeable clay.

Table 1

Reference	Number	Test Title	Requirements	Testing Frequency	
				Screening	QA/QC ¹²
AASHTO ¹	T99-01	Moisture–Density Relationships of Soils Using a 2.5-kg (5.5 lb) Rammer a 305 mm (12-in.) Drop (Standard Proctor)	NA ¹¹	1/source	NA
AASHTO	T-88-00	Particle Size Analysis of Soils	$P_{200}^3 \geq 50\%$	2/source	1/lift
AASHTO	T-89-02	Determining the Liquid Limit of Soils	$LL^4 \geq 22\%$	2/source	1/lift
AASHTO	T-90-00	Determining the Plastic Limit and Plasticity Index of Soils	$PI^5 \geq 12\%$	2/source	1/lift
AASHTO	T310-03	In-Place Density and Moisture Content of Soils and Soil-Aggregates by nuclear Methods (Shallow Depth)	$DD^6 \geq 95\%$ of the MDD ⁷	NA	100'x100' Grid/lift
ASTM ²	D5084-03	Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter	$K^8 \leq 1 \times 10^{-7}$ cm/sec	1/source ⁹	1/site ¹⁰
Notes: 1. AASHTO = American Association of State Highway and Transportation Officials 2. ASTM = American Society of Testing and Materials 3. P200 = Percent by weight passing the #200 sieve (%) 4. LL = Liquid Limit (%) 5. PI = Plasticity Index (%) 6. DD = Dry Density (pcf) 7. MDD = Maximum Dry Density (pcf) as determined by the Standard Proctor Test 8. K = Hydraulic Conductivity (cm/sec) 9. The sample for the test shall be remolded at a minimum dry density of 95% of the maximum dry density as determined by the Standard Proctor test and at a moisture content required to achieve the required hydraulic conductivity, but with a minimum moisture content at or above the optimum moisture content as determined in the Standard Proctor test. 10. An undisturbed sample from a thinned walled sampler (Shelby tube) 11. NA = Not applicable 12. QA/QC = Quality Assurance / Quality Control					

Compact the low permeable clay to a minimum of 95% Standard Proctor AASHTO T-99 Maximum Dry Density with a footed compaction equipment having feet at least as long as the loose lift height. As needed, clay shall be disked or otherwise mechanically processed before compaction to break up clods and allow moisture content adjustment. Clod size shall be no greater than 4 inches. All compaction equipment utilized shall have a minimum static weight of 30,000 pounds.

Provide all equipment necessary to adjust low permeable clay to the proper moisture content for compaction.

Make sufficient number of passes of the compaction equipment over each lift of clay to ensure complete remolding of the clay.

Do not proceed with placement of additional lifts until all required low permeable clay testing and documentation has been completed for the previous lift.

During placement of the low permeable clay the minimum moisture content shall be as defined by the testing performed in the source evaluation and with the following limits:

- No drier than the optimum moisture content as determined by the Standard Proctor test.

If the in-place low permeable clay fails to meet the requirements of Table 1, then remove and replace or rework any portion of the low permeable clay not meeting the project requirements until project specifications are met. There shall be no compensation for removing, replacing and reworking low permeable clay not meeting the requirements in Table 1.

C.1.4 QA/QC Testing of the Low Permeable Clay

The department will perform the QA/QC testing at the frequency shown in Table 1. The department will record the thickness of low permeable clay on a 100 foot x 100 foot grid pattern.

Provide the following:

- Access for on-site testing, inspection, and documentation.
- Machinery required to grade/blade density test locations.
- Machinery required to collect undisturbed clay samples (i.e., with Shelby tubes).
- Replace and recompact clay material removed for testing purposes.

D Measurement

The department will measure Pond Liner Clay in volume by the cubic yards 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
640.1303.S	Pond Liner Clay	CY

Payment is full compensation for dewatering areas of site where the low permeable clay is to be placed; for furnishing, placing and compacting the low permeable clay; and for performing all tests.

stp-640-016 (20130615)

19. Traffic Control.

Supplement standard spec 643.3.1 with the following:

Provide the Kenosha County Sheriff's Department, the Wisconsin State Patrol, City of Kenosha Police Department, Village of Pleasant Prairie 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 STH 31 or STH 50. 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 freeway. Do not cross live traffic lanes of STH 31 or STH 50 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.

SER-643-001 (20170808)

20. STH 50, Frontage Roads Lighting.

A General

Add the following to standard specification sections 651, 652, 653, 654, 655, 656, 657 and 659.

All the work necessary to comply with revisions to standards specs mentioned as hereinafter provided shall be incidental to associated pay items or to the project including coordination, materials, and labor. No additional payment shall be made to the Contractor.

Add the following to standard specification subsection 651.2:

Materials indicated to be returned to the Department shall be hauled to one of the following two locations:

1. State Electrical Shop at 935 South 60th street, West Allis, as directed by Miss. Bree Johns-Konkol, (414) 266-1170.
2. Milwaukee County Grounds, 10191 West Watertown Plank Road, Wauwatosa, as directed by Mr. Pat Stoetzel, (414) 750-5306.

Arrange pickups and deliveries a minimum 3 days in advance and during regular business hours (Monday – Thursday 7:00 AM to 3:45 PM).

Add the following to standard specification subsection 651.3.1:

Any circuit that the Contractor does not personally tag out at the disconnect shall be considered live, and will be subject to being activated by another person with no notice to the Contractor. Make tagouts with manufactured tags, and endorse them with the date and the name of the Contractor. Clear tagouts at the end of the workday. The Department does not employ a load dispatcher and has no intent to do so. Each electrical worker is responsible for their own protection from automatic switching and from switching by others.

The plans show required disconnections of existing lighting circuits, most in the form of abandoning existing underground conductors in place. The Contractor may need to mobilize several times per each existing lighting distribution center. The Contractor is expected to account for these costs in the various paid items for removals and installations.

Replace all existing slotted junction box cover screws with stainless hex head cover screws at each location where it is required to open the cover of an existing lighting junction box.

Add the following to standard specification subsection 651.5:

Work to disconnect and connect conductors will be incidental to the paid measurement of footage.

Work to disconnect and connect electrical system, splice through, or to connect conductors are incidental to the installation or removal of the freeway lighting pay items included in this contract.

The Department will not measure and pay conductors or conduits that have been abandoned in place or removed for scrap unless covered in the contract bid items. The Department will allow, at the Contractor's discretion, for the salvaging of conductors to be abandoned.

Add the following to standard specification subsection 652.3.1:

Install minimum 3-inch diameter PVC conduit elbows in a ground mounted concrete bases to accommodate Cable in Duct (CID) type cable.

Add the following to standard specification subsection 652.3.1.2:

Furnish and install an UL-listed liquid tight flexible metallic conduit transition wherever a conduit exits from below grade.

Furnish a UL-listed fitting appropriate for the purpose at each transition from one type of conduit to another type. Couplings will not be individually measured for payment.

Add the following to standard specification subsection 652.3.1.4:

Support conductors at the top of the vertical raceway or as close as practical if the vertical rise exceeds 40-feet. Provide additional supports as shown; in no case shall the distance between supports exceed that shown in Table 300.19(A) of the Wisconsin State Electric Code.

Add the following to standard specification subsection 653.3(1):

This provision modifies the standard detail drawing for pull boxes and thereby both the standard items and SPV pay item for pull boxes. Lighting pull box covers shall read "LIGHTING".

Add the following to standard specification subsection 655.3.1:

Wet location splices are not anticipated on this project and not shown in the plans. In the event that the Engineer allows wet location splices, make pull box splices with Engineer approved epoxy kit.

At each pull point or access point, indicate the line side bundle with a lap of blue tape.

Add the following to standard specification subsection 655.3.7(4):

Where two or more wire networks pass through a pull point, tag each circuit network (i.e. A/B/N and C/D/N) with approved all-weather tags.

Add the following to standard specification subsection 657.2:

Non-breakaway poles (mounted on structures, concrete bases or behind noise wall barriers without transformer base), as well as at stems of sign bridges containing electrical wires are to be double nipped and Contractor shall install galvanized rat screen enclosing the bottom of pole area; extra nuts and screen are incidental.

Add the following to standard specification subsections 657.3.1 and 657.3.5:

Corrosion protection measures described in subsections 657.3.1 and 657.3.5 of the standard specifications are invoked for breakaway transformer bases and aluminum light poles. The Contractor shall avoid contact of dissimilar metals in erecting the pole on its foundation and/or breakaway device. Any concern of trapped moisture or potential corrosion cell shall be resolved to the satisfaction of the Engineer.

Manufacturer's Warranty for LED luminaires: The manufacturer shall warrant to the Department that each complete luminaire (consisting of the housing, optical assembly, LED drivers, surge protection and wiring) will be free from defects in material and workmanship for five (5) years from the date that the luminaire are put into service. Luminaires shall be installed within one year of manufacture.

If any luminaires fail to meet the above warranty, the Department shall provide the manufacturer with a written notice of any defect within thirty (30) days after discovery of the defect. The manufacturer shall provide all materials, luminaires, replacement component parts, labor and all incidentals necessary to restore the luminaire to a fully operational, installed condition.

Submittal Requirements for LED luminaires: Considering the rapid advancement in LED technology, the overall project construction and duration of construction, within 10 calendar days after contract execution, the Contractor is responsible to coordinate the lead time for LED luminaires purchase and installation schedule for LED luminaires with the Engineer and the Department's Lighting Engineer, Eric Perea, at eric.perea@dot.wi.gov or (262) 574-5422 prior to order LED luminaires. The LED luminaires purchasing may be done during later stage of construction as directed by the Department which shall not delay the construction.

Add the following to standard specification subsection 659.3:

Provide and install / replace Plaques Light Pole on all poles located in the median at a mounting height of 6-inch above the highest adjacent safety barrier or obstruction.

High mast tower luminaires shall be 1000 Watts, High Pressure Sodium, M-C-II type distribution or LED equivalent.

Add the following to standard specification 659.3.1:

Contractor shall be responsible to provide adequate temporary roadway lighting during all the construction stages not shown on the temporary lighting plans, but which are necessitated by field conditions or by any construction phasing changes. Installation of temporary lighting not shown on temporary lighting plans shall be paid according to appropriate pay items included in this contract. Contractor shall be responsible to submit a redline markup plans for any additional temporary lighting to the Engineer for approval prior to installation.

Add the following to standard specification 659.3.2:

Fuses shall conform to pertinent requirements of section 659.3.2 of the standard specifications except 659.3.2(2) replace 'fast acting fuses' with 'time delay fuses'.

SER-659.1 (20170407)

21. Outlet Control Manhole, Item SPV.0060.0200.

A Description

The special provision describes furnishing and installing manhole structures with baffle walls for storm sewer in-line detention.

B Materials

Furnish concrete manhole structure with baffle wall and restrictor holes that is in accordance to sections 501 and 611 of the standard specifications and as shown on the plans.

C Construction

Field verify all existing connections. Ensure the sump depth as shown on the plans is 2-feet below the lowest pipe invert.

Conform to standard spec 611.

D Measurement

The department will measure Outlet Control Manhole by each 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
SPV.0060.0200	Outlet Control Manhole	EACH

Payment is full compensation for furnishing and installing Outlet Control Manhole and all incidentals to complete the work.

22. Detention Pond Corrugated Metal Anti-Seep Collar, Item SPV.0060.0201.

A Description

This special provision describes furnishing and installing a corrugated metal aluminum coated collar for the pond outlet pipe.

B Materials

Fabrication shall be from Type 2 aluminum coated sheet steel conforming to AASHTO M 274. The steel plate shall be 1/4-inch minimum thickness. Waterproof mastic joint sealer shall conform to section 608.2.1 (2) of the standard specifications.

C Construction

Extend the collar dimensions a minimum of 1 foot vertically above the pipe and 2-1/4 feet in all other directions around the outside of the pipe or beyond the limits of the trench backfill whichever is greater, measured perpendicular to the pipe.

Seal the gap between the Detention Pond Corrugated Metal Anti-Seep Collar and the pipe according to section 608.3.4 (4) of the standard specifications.

Center the Detention Pond Corrugated Metal Anti-Seep Collar in the middle of the detention pond berm as shown on the plans.

D Measurement

The department will measure Detention Pond Corrugated Metal Anti-Seep Collar by each 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
SPV.0060.0201	Detention Pond Corrugated Metal Anti-Seep Collar	EACH

Payment is full compensation for furnishing and installing the aluminum coated corrugated steel collar and all incidentals to complete the work.

23. Luminares LED City of Kenosha CREE LEDWAY Street Light, Item SPV.0060.0300.

A Description

This special provision describes furnishing and installing LED luminaires as shown on the plans and as directed by the Engineer.

B Materials

Luminaire shall be CREE LEDway Series STR-LWY-3M-HT-07-E-UL-SV-700 to match existing stock of City of Kenosha. Luminaire shall be approved by the City of Kenosha.

C Construction

Luminaire shall be installed per manufacturer requirements and installation guides and shall conform to pertinent requirements of Section 659.3 of the standard specifications. The pole plaque shall conform to the requirements for LED luminaires and shall be coordinated with City of Kenosha.

A sticker shall be placed on the bottom of the luminaire to clearly identify the luminaire. The sticker should be visible to a person standing on the ground. Sticker is included in the cost of the luminaire. The luminaire sticker size and content shall be coordinated with City of Kenosha.

D Measurement

The department will measure Luminaires LED City of Kenosha CREE LEDWAY Street Light by the method of Section 659.4(1) of the standard specifications.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0300	Luminaires LED City of Kenosha CREE LEDWAY Street Light	EACH

Payment will be on the basis of Section 659.5(2) of the standard specifications.

24. Fence Split Rail Three Rail, Item SPV.0090.0200.

A Description

Furnish and install at 42" tall cedar wood split rail fencing, with three rails, at locations shown on the plans or as designated by the engineer.

B Materials

All fencing shall be constructed of cedar posts and cedar split rails. The fencing materials shall be as commonly obtained from most landscape contractors.

C Construction

The height of the top rail shall be at least 42" above the finished ground.

All posts shall be spaced at 10 foot intervals and set in and backfilled with earth and be a set minimum of 30 inches below finished grade. Spacing between rails and between the ground and lowest rail shall be 12 inches

D Measurement

Fence Split Rail Wood Three-Rail will be measured by the linear foot in place, measured center to center of end posts, along the fence line at the ground line, with deductions for openings.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0201	Fence Split Rail Three Rail	LF

Payment is full compensation for furnishing all materials; for erecting fence including all hauling, excavation, placing of posts, and backfilling; for removal of excavated materials; and for furnishing all labor, tools equipment and incidentals necessary to complete the work.

25. Construction Staking Pond Layout, Item SPV.0105.0200.

A Description

This special provision describes staking the layout for the GB pond. Conform to standard spec 105.6 and 650 and as hereinafter provided.

B (Vacant)

C Construction

Conform to standard spec 650.3.13 to stake the alignment of the pond.

D Measurement

The department will measure Construction Staking Pond Layout completed in accordance to the contract and accepted, as a single complete unit of work.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0200	Construction Staking Pond Layout	LS

Payment is full compensation for staking and maintaining alignment reference for the pond.

26. Lighting System Integrator Project 1310-10-72, Item SPV.0105.0301.

A Description

These special provisions describe coordinating lighting with various parties; record keeping, and documentation. Where the Department is responsible for freeway lighting operation, maintenance, or utility locates on existing systems or systems overlapping project boundaries, the contractor's freeway lighting integrator will serve as the contractor's liaison to the Department's electrical operations unit.

B Personnel Qualifications

Assign personnel experienced in underground utility construction and Department lighting specifications and practices.

C Construction

At any one time during the project, the contractor shall assign one individual person as the freeway lighting integrator.

The freeway lighting integrator shall:

1. Familiarize himself with the location and nature of existing lighting circuits. This familiarity shall include the extent of any lighting system that overlaps project limits.
2. Maintain a file of applicable permits or licenses issued to the contractor, and convey copies to the Engineer.
3. Keep with him at all times a contact list of affected lighting personnel.
4. Maintain a record of tagouts and the clearance of tagouts.
5. Interface with Department electrical personnel to determine how contract limits might affect maintenance or operation of existing systems.
6. Maintain ongoing contact with the Department's Diggers' Hotline Coordinator to ensure that each of the two persons knows that all requested utility locates are marked in the field by the

appropriate party. The intent here is to assure coordination. This special provision does not transfer additional utility locating responsibilities to the contractor, beyond those responsibilities already assigned to him by other provisions of the contract.

7. Inform the Department of any lighting outages, including outside the project limits where a lighting system crosses the project boundary.
8. Maintain in any format real-time records of existing, removed and new lighting facilities. Include utility service extensions. Additional required records will include temporary connections and their ultimate removal.
9. Maintain records of tests, including: "meg" tests, amperage draw per circuit leg, voltage reading at the disconnect, and voltage reading at the furthest pole per circuit leg. Convey these records at time of acceptance or partial acceptance.
10. **At the time of acceptance or partial acceptance, convey as-built drawings in both the following formats: plan redlines and .dgn electronic. Include utility service extensions.**
11. Secure copies of operator's manuals, tear sheets, etc. as may be provided by manufacturers of some lighting materials, and convey a minimum of three sets to the Department.
12. Work with the Engineer to notify Department electrical personnel of acceptance or partial acceptance.
13. Perform related duties as may be needed to ensure continuity of freeway lighting during construction, and orderly transfer upon completion.

D Measurement

The Department will measure Lighting System Integrator Project 1031-10-72 as a single lump sum unit for all services acceptably completed under the contract.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0301	Lighting System Integrator Project 1310-10-72	LS

Payment will be full compensation for providing specified expertise, assistance and documents, personnel costs; and for all labor, tools, equipment and incidentals necessary to complete the contract work.

27. Maintenance of Lighting Systems Project 1310-10-72, Item SPV.0105.0302.

A Description

Maintain existing and proposed lighting system beginning on the date that the contractor's activities (electrical or otherwise) at the job site begin. Take responsibility for the proper operation and maintenance of all existing and proposed lighting systems which are part of, or which may be affected by, the work until final acceptance or as otherwise determined by the engineer.

Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, initiate a request for a maintenance transfer and preconstruction inspection, as specified elsewhere herein, to be held in the presence of the engineer and a representative of the party or parties responsible for maintenance of any lighting systems which may be affected by the work. Make the request for the maintenance preconstruction inspection no less than seven calendar days prior to the desired inspection date.

Existing lighting systems, when depicted on the plans, are intended only to indicate the general equipment installation of the systems involved and shall not be construed as an exact representation of the field conditions. Visit the site to confirm and ascertain the exact condition of the electrical equipment and systems to be maintained. Condition issues found during contractor assessment can be discussed and addressed by contacting the SE Region Lighting Engineer (Eric Perea) prior to maintenance responsibility being transferred to the contractor.

B (Vacant)

C Construction

C.1 Existing Lighting Systems

Existing lighting systems are defined as any lighting system or part of a lighting system in service prior to this contract. The contract drawings indicate the general extent of any existing lighting. Ascertain the extent of effort required for compliance with these specifications; failure to do so will not be justification for extra

payment or reduced responsibilities. Clear and replace any knockdowns or damage caused to the existing lighting system, regardless of who causes the damage. Maintain existing lighting system as follows:

Partial Maintenance: Only maintain the affected circuits if the number of circuits affected by the contract is equal to or less than 40% of the total number of circuits in a given controller and the controller is not part of the contract work unless otherwise indicated. Ensure engineer approval to isolate the affected circuits by means of in-line waterproof fuse holders as specified elsewhere.

Full Maintenance: Maintain the entire controller and all associated circuits if the number of circuits affected by the contract is greater than 40% of the total number of circuits in a given controller, or if the controller is modified in any way under the contract work.

C.2 Proposed Lighting Systems

Proposed lighting systems are any temporary or final lighting systems or part of a lighting system to be constructed under this contract.

Maintain all items installed under this contract, including, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, contractor operations, or other means.

Excluding damage due to contractor operations, the contractor will be reimbursed for replaced equipment, materials only, if the invoice paid for the individual piece of equipment is greater than \$500. The cost of maintaining equipment installed under this contract, labor, mobilization, tools and incidentals along with repairs due to contractor operations are incidental to this bid item.

C.3 Maintenance Operations

Maintain lighting units (including sign lighting), cable runs, and lighting controls. In the case of a pole knockdown or sign light damage caused by normal vehicular traffic, promptly clear the lighting unit and circuit discontinuity and restore the system to service. Reinstall the lighting unit (if salvageable), or install a new one.

Provide weekly night-time patrol of the lighting system, with patrol reports filed immediately with the engineer and copied to the region lighting coordinator with deficiencies corrected within timely fashion hours of the patrol. Present patrol reports on standard forms as designated by the engineer. Uncorrected deficiencies may be designated by the engineer as necessitating emergency repairs as described elsewhere herein.

Perform corrective action on specific lighting system equipment according to the following chart. The chart lists the maximum response, service restoration, and permanent repair time (or based on material availability).

Incident or Problem	Service Response Time	Service Restoration Time	Permanent Repair Time
Control cabinet out	12 hour	24 hours	7 Calendar days
Hanging mast arm	1 hour to clear	n/a	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	12 hour	12 hours	n/a
Circuit out – Cable trouble	12 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	12 hour	24 hours	n/a
Outage of 75% of lights on one tower	12 hour	24 hours	n/a
Outage of light nearest RR crossing approach, Islands and gores	12 hour	24 hours	n/a
Outage (single or multiple) found on night outage survey	n/a	n/a	7 Calendar days

C.4 Lighting

1. **Serve Response Time:** The amount of time from the initial notification to the contractor until a patrolman physically arrives at the location.
2. **Service Restoration Time:** The amount of time from the initial notification to the contractor until the time the system is fully operational again. (In cases of motorist-caused damage, the undamaged portions of the system are operational.)
3. **Permanent Repair Time:** The amount of time from initial notification to the contractor until the time permanent repairs are made if the contractor was required to make temporary repairs to meet the service restoration requirement.

Failure to provide this service will result in liquidated damages of \$500 per day per occurrence. In addition, the department reserves the right to assign any work not completed within this timeframe to the State Electrical Engineering and Electronics Unit. Reimburse all costs associated to repair this uncompleted work. Failure to pay these costs to the State Electrical Engineering and Electronics Unit within one month after the incident will result in additional liquidated damages of \$500 per month per occurrence. Unpaid bills will be deducted from the cost of the contract. Repeated failures and/or a gross failure of maintenance shall result in the State's Electrical Engineering and Electronics Unit being directed to correct all deficiencies and the resulting costs deducted from any monies owed the contractor.

C.5 Operation of Lighting

Maintain operational lighting every night, dusk to dawn. Do not operate duplicate lighting systems (such as temporary lighting and proposed new lighting) simultaneously. Do not keep lighting systems in operation during long daytime periods. Ensure that the lighting system is fully operational and approved by the engineer prior to submitting a pay request. Failure to do so will be grounds for denying the pay request.

D Measurement

The department will measure Maintenance of Lighting Systems Project 1031-70-72 as a single lump sum unit, per contract, 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.0105.0302	Maintenance of Lighting Systems Project 1310-10-72	LS

Payment is full compensation for Maintenance of Lighting Systems, both existing and proposed, weekly night-time patrol of the lighting system, mobilization, and filed patrol reports. No payment will be considered for damage or repairs due to contractor operations.

28. Lighting System Survey Project 1310-10-72, Item SPV.0105.0303.

A Description

This special provision describes performing a lighting system survey as-built for STH 50, Frontage Roads, as shown on the plans, and hereinafter provided.

B Vacant

C Construction

Locate and survey all the lighting units, pull boxes, and control cabinets to sub-meter accuracy. Maintain neat, orderly, and complete survey notes. The survey shall be performed in NAD 83, Wisconsin County Coordinate System (WCCS), and Kenosha County Coordinates. The data shall be delivered in a comma delimited text file with metadata including datum, county, and date the survey was performed. Data for each point shall have a point number, northing, easting, and point description including pole, pull box, or cabinet number.

D Measurement

The department will measure Lighting System Survey Project 1310-10-72 for all lighting units, pull boxes, and control cabinets as a single lump sum unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0303	Lighting System Survey Project 1310-10-72	LS

Payment will be full compensation for locating and surveying all the lighting units, pull boxes, and control cabinets and for delivery of the comma delimited data file and all survey notes.

SER-650.10 (20170407)

29. Wall Modular Block Mechanically Stabilized Earth R-30-61, Item SPV.0165.0401; R-30-62, Item SPV.0165.0402.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system in accordance to the lines, dimension, elevations and details as shown on the plans and provided in the contract. The design life of the wall and all wall components shall be 75 years minimum.

This special provision describes the quality management program (QMP) for Mechanically Stabilized Earth (MSE) walls. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process that are related to the construction of the MSE wall, which meets all the requirements of this provision.

This special provision describes contractor quality control (QC) sampling and testing for backfill density testing, documenting those results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures.

B Materials

B.1 Proprietary Wall Systems

The supplied wall system must be from the department's approved list of Modular Block Mechanically Stabilized Earth Wall systems. Proprietary wall systems must conform to the requirements of this specification and be pre-approved for use by the department's Bureau of Structures. The department maintains a list of pre-approved proprietary wall systems. The name of the pre-approved proprietary wall system selected shall be furnished to the engineer within 25 days after the award of contract. The location of the plant manufacturing the facing units shall be furnished to the engineer at least 14 days prior to the project delivery.

To be eligible for use on this project, a system must have been pre-approved by the Bureau of Structures and added to that list prior to the bid closing date. To receive pre-approval, the retaining wall system must comply with all pertinent requirements of this provision and be prepared in accordance to the requirements of Chapter 14 of the department's LRFD Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Bureau of Structures, Structures Maintenance Section at the following email address: DOTDLStructuresFabrication@dot.wi.gov.

B.2 Design Requirements

It is the responsibility of the Contractor to submit a design and supporting documentation as required by this special provision, for review and acceptance by the department, to show the proposed wall design is in compliance with the design specifications. The submittal shall include the following items for review: detailed plans and shop drawings, complete design calculations, explanatory notes, supporting materials, and specifications. The detailed plans and shop drawings shall include all details, dimensions, quantities and cross-sections necessary to construct the walls. Submit shop drawings to the engineer conforming to 105.2 with electronic submittal to the fabrication library under 105.2.2. Certify that shop drawings conform to quality control standards by submitting department form DT2329 with each set of shop drawings. Department review does not relieve the contractor from responsibility for errors or omissions on shop drawings. Submit no later than 60 days from the date of notification to proceed with the project and a minimum of 30 days prior to the date proposed to begin wall construction.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the

WisDOT project identification number and structure number. Design calculations and notes shall be on 8 ½ inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

The design of the wall shall be in compliance with the current American Association of State Highway and Transportation Officials LRFD (AASHTO LRFD) Bridge Design Specifications with latest interim specifications for Mechanically Stabilized Earth Walls, WisDOT's current Standard Specifications for Highway and Structure Construction (standard spec), Chapter 14 of the WisDOT LRFD Bridge Manual and standard engineering design procedures as determined by the Department. Loads, load combinations, load and resistance factors shall be as specified in AASHTO LRFD Section 11. The associated resistance factors shall be defined in accordance with Table 11.5.7-1 in AASHTO LRFD.

Design and construct the walls in accordance to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the engineer.

Walls parallel to supporting highway traffic shall be designed for the effects of highway surcharge loading equivalent of 2 feet soil surcharge weight or 240 psf. The design shall also consider the traffic barrier impact where applicable. Walls that do not carry highway traffic shall be designed for a live load surcharge of 100 psf in accordance with Chapter 14 of the WisDOT LRFD Bridge Manual or as stated on the plans.

A maximum value of the angle of internal friction of the wall backfill material used for design shall be assumed to be 30 degrees without a certified report of tests. If a certified report of tests yields an angle of internal friction greater than 30 degrees, the larger test value may be used for design, up to a maximum value of 36 degrees.

An external stability check at critical wall stations showing Capacity Demand Ratio (CDR) for sliding, eccentricity, and bearing checks is provided by the department and are provided on the wall plans.

The design of the wall by the Contractor shall consider the internal and compound stability of the wall mass in accordance with AASHTO LRFD 11.10.6. The internal stability shall include soil reinforcement pullout, soil reinforcement rupture, and wall facing-reinforcement connection failure at each soil reinforcement level. The design shall be performed using the Simplified Method or Coherent Gravity Method. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. Compound stability shall be computed for the applicable strength limits. Sample analyses and hand calculations shall be submitted to verify the output of any software used. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal and external stabilities as defined in AASHTO LRFD.

Wall facing units shall be designed in accordance with AASHTO LRFD 11.10.2.3.

The minimum length of soil reinforcement measured from the back face of the wall shall be equal to 0.7 of the wall height, or as shown on the plan. In no case shall this length be less than 6.0 feet. The soil reinforcement length shall be the same from the bottom to the top of the wall. All soil reinforcement layers shall be connected to facings. The soil reinforcement shall extend a minimum of 3.0 feet beyond the theoretical failure plane in all cases. The maximum vertical spacing of soil reinforcement layers shall be two times the block width (front face to back face) or 32 inches, whichever is less. The first (bottom) layer of reinforcement shall be placed no further than 12 inches above the top of the leveling pad or the height of the block, but at least one block height above the leveling pad. The last (top) layer of soil reinforcement shall be no further than 21 inches below the top of the uppermost block.

All soil reinforcement required for the reinforced soil zone shall be connected to the wall facing.

Soil reinforcement shall be fabricated or designed to avoid piling, drainage structures or other obstacles in the fill without field modifications. Unless approved by the Bureau of Structures cutting or altering of the basic structural section of either the strip or grid at the site is prohibited, a minimum clearance of 3" shall be maintained between any obstruction and reinforcement, and splicing reinforcement is not allowed.

The minimum embedment of the wall shall be 1 foot 6 inches below finished grade, or as given on the plans. All walls shall be provided with a concrete leveling pad. Minimum wall embedment does not include the leveling pad depth. Step the leveling pad to follow the general slope of the ground line. Frost depth shall not be considered in designing the wall for depth of leveling pad.

Wall facing units shall be installed on a concrete leveling pad. The bottom row of blocks shall be horizontal and 100% of the block surface shall bear on the leveling pad.

Concrete leveling pads shall be as wide as the proposed blocks plus six inches, with six inches of the leveling pad extending beyond the front face of the blocks. The minimum thickness of the leveling pad shall be 6-inches.

B.3 Wall System Components

Materials furnished for wall system components under this contract shall conform to the requirements of this specification. All documentation related to material and components of the wall systems specified in this subsection shall be submitted to the engineer.

B.3.1 Wall Facing

Wall facing units shall consist of precast modular concrete blocks. Furnish concrete produced by a dry-cast or wet-cast process. Concrete for all blocks shall not contain less than 565 pounds of cementitious materials per cubic yard. The contractor may use cement conforming to standard spec. 501.2.1 or may substitute for portland cement at the time of batching conforming to standard spec. 501.2.6 for fly, 501.2.7 for slag, or 501.2.8 for other pozzolans. In either case the maximum total supplementary cementitious content is limited to 30% of the total cementitious content by weight.

Dry-cast concrete blocks shall be manufactured in accordance with ASTM C1372 and this specification.

All units shall incorporate a mechanism or devices that develop a mechanical connection between vertical block layers. Units that are broken, have cracks wider than 0.02" and longer than 25% of the nominal height of the unit, chips larger than 1", have excessive efflorescence, or are otherwise deemed unacceptable by the engineer, shall not be used within the wall. A single block front face style shall be used throughout each wall. The color and surface texture of the block shall be as given on the plan.

The top course of facing units shall be as noted on the plans, either;

- Solid precast concrete unit designed to be compatible with the remainder of the wall. The finishing course shall be bonded to the underlying facing units with a durable, high strength, flexible adhesive compound compatible with the block material.
- A formed cast-in-place concrete cap. A cap of this type shall have texture, color, and appearance, as noted on the plans. The vertical dimension of the cap shall not be less than 3 1/2 inches. Expansion joints shall be placed in the cap at a maximum spacing of 20 feet unless noted otherwise on the plan. Use Grade A, A-FA, A-S, A-T, A-IS, A-IP or A-IT concrete conforming to standard spec 501 as modified in standard spec 716. Provide QMP for cast in place cap and coping concrete as specified in standard spec 716, Class II Concrete.

Block dimensions may vary no more than $\pm 1/8$ inch from the standard values published by the manufacturer. Blocks must have a minimum width (front face to back face) of 8 inches. The minimum front face thickness of blocks shall be 4 inches measured perpendicular from the front face to inside voids greater than 4 square inches. The minimum allowed thickness of any other portions of the block is $1\frac{3}{4}$ inches. The front face of the blocks shall conform to plan requirements for color, texture, or patterns.

If pins are used to align modular block facing units, they shall consist of a non-degrading polymer, or hot dipping galvanized steel and be made for the express use with the modular block units supplied, to develop mechanical interlock between facing unit block layers. Connecting pins shall be capable of holding the wall in the proper position during backfilling. Furnish documentation that establishes and substantiates the design life of such devices.

For concrete leveling pad, use Grade A, A-FA, A-S, A-T, A-IS, A-IP, or A-IT concrete conforming to standard spec 501 as modified in standard spec 716. Provide QMP for leveling pad concrete as specified in standard spec 716, Class III Concrete.

B.3.2 Material Testing

Provide independent quality verification testing of project materials according to the following requirements:

Test	Method	Requirement	
		Dry-cast	Wet-cast
Compressive Strength (psi)	ASTM C140	5000 min.	4000 min.
Air Content (%)	AASHTO T152	N/A	6.0 +/-1.5
Water Absorption (%)	ASTM C140	6 max. ^[3]	N/A
Freeze-Thaw Loss (%)	ASTM C1262 ^[1]	1.0 max. ^{[2][3]}	N/A
40 cycles, 5 of 5 samples		1.5 max. ^{[2][3]}	
50 cycles, 4 of 5 samples			

[1] Test shall be run using a 3% saline solution and blocks greater than 45 days old.

[2] Test results that meet either of the listed requirements for Freeze-Thaw Loss are acceptable.

[3] The independent testing laboratory shall control and conduct all sampling and testing. Prior to sampling, the manufacturer's representative shall identify materials by lot. Five blocks per lot shall be randomly selected for testing. Solid blocks used as a finishing or top course shall not be selected. The selected blocks shall remain under the control of the person who conducted the sampling until shipped or delivered to the testing laboratory. All pallets of blocks within a lot shall be strapped or wrapped to secure the contents and tagged or marked for identification. The engineer will reject any pallet of blocks delivered to the project without intact security measures. At no expense to the department, the contractor shall remove all rejected blocks from the project. If a random sample of five blocks of any lot tested by the department fails to meet any of the above testing requirements, the entire lot will be considered non-conforming.

The contractor and fabricator shall coordinate with the independent testing agency to ensure that strength and air content samples can be taken appropriately during manufacturing. At the time of delivery of materials, furnish the engineer a certified report of test from an AASHTO-registered or ASTM-accredited independent testing laboratory for each lot.

The certified test report shall include the following:

- Project ID
- Production process used (dry-cast or wet-cast)
- Name and location of testing facility
- Name of sampling technician
- Lot number and lot size

Testing of project materials shall be completed not more than 18 months prior to delivery. Independent testing frequency shall not exceed 5000 blocks for dry-cast blocks and the lesser of 150 CY or 1 day's production for wet-cast blocks. The certified test results will represent all blocks within the lot. Each pallet of blocks delivered shall bear lot identification information. Block lots that do not meet the requirements of this specification or blocks without supporting certified test reports will be rejected and shall be removed from the project at no expense to the department.

Nonconforming materials will be subject to evaluation according to standard spec 106.5.

B.3.3 Backfill

Furnish and place backfill for the wall as shown on the plans and as hereinafter provided.

Wall Backfill, Type A, shall comply with the requirements for Coarse Aggregate No. 1 as given in standard spec 501.2.5.4.4. All backfill placed within a zone from the top of the leveling pad to the top of the final layer of wall facing units and within 1 foot behind the back face of the wall shall be Wall Backfill, Type A. This includes all material used to fill openings in the wall facing units.

Wall Backfill, Type B, shall be placed in a zone extending horizontally from 1 foot behind the back face of the wall to 1 foot beyond the end of the reinforcement and extending vertically from the top of the leveling pad to a minimum of 3 inches above the final reinforcement layer.

Use natural sand or a mixture of sand with gravel, crushed gravel or crushed stone. Do not use foundry sand, bottom ash, blast furnace slag, crushed/recycled concrete, crushed/milled asphaltic concrete or other potentially corrosive material.

Provide material conforming to the following gradation requirements as per AASHTO T27.

Sieve Size	% by Weight Passing
1 inch	100
No. 40	0 - 60
No. 200	0 - 15

The material shall have a liquid limit not greater than 25, as per AASHTO T89, and a plasticity index not greater than 6, as per AASHTO T90. Provide the percent by weight, passing the #4 sieve.

In addition, backfill material Type A and Type B shall meet the following requirements.

Test	Method	Value
pH	AASHTO T-289	4.5-9.0
Sulfate content ^[1]	AASHTO T-290	200 ppm max.
Chloride content ^[1]	AASHTO T-291	100 ppm max.
Electrical Resistivity	AASHTO T-288	3000 ohm-cm min.
Organic Content ^[1]	AASHTO T-267	1.0% max.
Angle of Internal Friction	AASHTO T-236 ^[2]	30 degrees min. (At 95.0% of maximum density and optimum moisture, per AASHTO T99, or as modified by C.2)

[1] Requirement does not apply to walls with non-metallic reinforcement.

[2] If the amount of P-4 material is greater than 60%, use AASHTO 236 with a standard-size shear box. Test results of this method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

If the amount of P-4 material is less than or equal to 60%, two options are available to determine the angle of internal friction. The first method is to perform a fractured faces count, per ASTM D5821, on the R-4 material. If more than 90% of the material is fractured on one face and more than 50% is fractured on two faces, the material meets the specifications and the angle of internal friction can be assumed to be 30 degrees. The second method allows testing all P-1" material, as per AASHTO T-236, with a large shear box. Test results of this second method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

Prior to placement of the backfill, obtain and furnish to the engineer a certified report of test results that the backfill material complies with the requirements of this specification. Specify the method used to determine the angle of internal friction. This certified report of test shall be less than 6 months old. Tests will be performed by a certified independent laboratory. In addition, when backfill characteristics and/or sources change, provide a certified report of tests for the new backfill material. Additional certified report of tests are also required. These additional backfill tests may be completed at the time of material production or material placement, with concurrence of the engineer. If this additional testing is completed at the time of material production, complete testing for every 2000 cubic yards of backfill or portion thereof. If this additional testing is completed at the time of material placement, complete testing for every 2000 cubic yards of backfill, or portion thereof, used per wall. For the additional required testing for every 2000 cubic yards of backfill placement, if the characteristic of the backfill and/or the source has not changed then Angle of Internal Friction tests are not included in the additional required testing. All certified reports of test results shall be less than 6 months old and performed by a certified independent laboratory.

B.3.4 Soil Reinforcement

B.3.4.1 Geogrids

Geogrid supplied as reinforcing members shall be manufactured from long chain polymers limited to polypropylene, high-density polyethylene, polyaramid, and polyester. Geogrids shall form a uniform rectangular grid of bonded, formed, or fused polymer tensile strands crossing with a nominal right angle orientation. The minimum grid aperture shall be 0.5 inch. The geogrid shall maintain dimension stability

during handling, placing, and installation. The geogrid shall be insect, rodent, mildew, and rot resistant. The geogrid shall be furnished in a protective wrapping that shall prevent exposure to ultraviolet radiation and damage from shipping or handling. The geogrid shall be kept dry until installed. Each roll shall be clearly marked to identify the material contained.

The wall supplier shall provide the nominal long-term design strength (T_{al}) and nominal long-term connection strength, T_{ac} as discussed below.

Nominal Long-Term Design Strength (T_{al})

The wall supplier shall supply the nominal long-term design strength (T_{al}) used in the design for each reinforcement layer and shall be determined by dividing the Ultimate Tensile Strength (T_{ult}) by the factors RF_{ID} , RF_{CR} , RF_D .

Hence,

$$T_{al} = \frac{T_{ult}}{RF_{ID} \times RF_{CR} \times RF_D}$$

where:

- T_{ult} = Ultimate tensile strength of the reinforcement determined from wide width tensile tests (ASTM D6637) for geogrids based on the minimum average roll value (MARV) for the product.
- RF_{ID} = Strength reduction factor to account for installation damage to the reinforcement. In no case shall RF_{ID} be less than 1.1.
- RF_{CR} = Strength reduction factor to prevent long-term creep rupture of the reinforcement. In no case shall RF_{CR} be less than 1.2.
- RF_D = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation. In no case shall RF_D be less than 1.1.

Values for RF_{ID} , RF_{CR} , and RF_D shall be determined from product specific test results. Guidelines for determining RF_{ID} , RF_{CR} , and RF_D from product specific data are provided in FHWA Publication No. FHWA-NHI-10-024 and FHWA-NHI-10-025 "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes".

Nominal Long-term Connection Strength T_{ac}

The nominal long term connection strength, T_{ac} , shall be based on laboratory geogrid connection tests between wall facing and geogrids. T_{ac} shall be as given below

$$T_{ac} = \frac{T_{ult} \times CR_{cr}}{RF_D}$$

where:

- T_{ac} = Nominal long-term reinforcement facing connection strength per unit reinforcement width at a specified confining pressure.
- T_{ult} = Ultimate tensile strength of the reinforcement for geogrids defined as the minimum average roll value (MARV) for the product.
- CR_{cr} = Long term connection strength reduction factor to account for reduced ultimate strength resulting from connection.
- RF_D = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation.

T_{ac} shall be developed from the tests conducted by an independent laboratory on the same facing blocks and geogrids as proposed for the wall and shall cover a range of overburden pressures comparable to those anticipated in the proposed wall. The connection strength reduction factor CR_{cr} shall be determined in accordance with long-term connection test as described in Appendix B of FHWA Publication No. FHWA-NHI 10-025 "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil

Slopes". CRcr may also be obtained from the short term connection test meeting the requirements of NCMA test method SRWU-1 in Simac et al 1993 or ASTM D4884.

The Contractor shall provide a manufacturer's certificate that the Tult (MARV) of the supplied geogrid has been determined in accordance with ASTM D4595 or ASTM D6637 as appropriate. Contractor shall also provide block to block and block to reinforcement connection test reports prepared and certified by an independent laboratory. Also provide calculations in accordance with AASHTO LRFD, and using the results of laboratory tests, that the block-geogrid connections shall be capable of resisting 100% of the maximum tension load in the soil reinforcements at any level within the wall, for the design life of the wall system.

B.3.4.2 Galvanized Metal Reinforcement

In lieu of polymeric geogrid earth reinforcement, galvanized metal reinforcement may be used. Design and materials shall be in accordance to AASHTO LRFD 11.10.6.4.2. The design life of steel soil reinforcements shall also comply with AASHTO LRFD. Steel soil reinforcement shall be prefabricated into single or multiple elements before galvanizing.

C Construction

C.1 Excavation and Backfill

Excavation and preparation of the foundation for the MSE wall and the leveling pad shall be in accordance to standard spec 206. The volume of excavation covered is limited to the width of the reinforced mass and to the depth of the leveling pad unless shown or noted otherwise on the plan. At the end of each working day, provide good temporary drainage such that the backfill shall not become contaminated with run-off soil or water if it should rain. Do not stockpile or store materials or large equipment within 10 feet of the back of the wall.

Place backfill materials in the areas as indicated on the plans and as detailed in this specification. Backfill lifts shall be no more than 8-inches in depth, after compaction. Backfilling shall closely follow erection of each course of wall facing units.

Conduct backfilling operations in such a manner as to prevent damage or misalignment of the wall facing units, soil reinforcement, or other wall components. At no expense to the department, correct any such damage or misalignment as directed by the engineer. A field representative of the wall supplier shall be available during wall construction to provide technical assistance to the contractor and the engineer.

Place and compact the MSE backfill to the level of the next higher layer of MSE reinforcement before placing the MSE reinforcement or connecting it to the wall facing. Place and compact material beyond the reinforced soil zone to allow for proper compaction of material within the reinforced zone. The MSE reinforcement shall lay horizontally on top of the most recently placed and compacted layer of MSE backfill.

Do not operate tracked or wheeled equipment on the backfill within 3 feet from the back face of modular blocks. The engineer may order the removal of any large or heavy equipment that may cause damage or misalignment of the wall facing units.

C.2 Compaction

Compact wall backfill Type A with at least three passes of lightweight manually operated compaction equipment acceptable to the engineer.

Compact all backfill Type B as specified in standard spec 207.3.6. Compact the backfill Type B to 95.0% of maximum dry density as determined by AASHTO T-99 (modified to compute densities to the nearest 0.1 pcf).

Ensure adequate moisture is present in the backfill during placement and compaction to prevent segregation and to help achieve compaction.

Compaction of backfill within 3 feet of the back face of the wall should be accomplished using lightweight compaction devices. Use of heavy compaction equipment or vehicles should be avoided within 3 feet of the modular blocks. Do not use sheepfoot or padfoot rollers within the reinforced soil zone.

A minimum of 6 inches of backfill shall be placed over the MSE reinforcement prior to working above the reinforcement.

C.3 Wall Components

C.3.1 General

Erect wall facing units and other associated elements according to the wall manufacturer's construction guide and to the lines, elevations, batter, and tolerances as shown on the plans. Center the initial layer of facing units on the leveling pad; then level them and properly align them. Fill formed voids or openings in the facing units with wall backfill, Type A. Remove all debris on the top of each layer of facing units, before placing the next layer of facing units.

Install all pins, rods, clips, or other devices used to develop mechanical interlock between facing unit layers in accordance with the manufacturer's directions.

The MSE reinforcement shall lay horizontally on the top of the most recently placed and compacted layer of MSE backfill. Bending of MSE reinforcement that result in a kink in the reinforcement shall not be allowed. If skewing of the reinforcement is required due to obstructions in the reinforced fill, the maximum skew angle shall not exceed 15 degrees from the normal position unless a greater angle is shown on the plans. The adequacy of the skewed reinforcement in such a case shall be addressed by supporting calculations.

C.3.2 Soil Reinforcement

C.3.2.1 Geogrid Layers

Place soil reinforcement at the positions and to the lengths as indicated on the accepted shop drawings. Take care that backfill placement over the positioned soil reinforcement elements does not cause damage or misalignment of these elements. Correct any such damage or misalignment as directed by the engineer. Do not operate wheeled or tracked equipment directly on the soil reinforcement. A minimum cover of 6 inches is required before such operation is allowed.

Place and anchor geogrid material between wall unit layers in the same manner as used to determine the Geogrid Block-to-Connection Strength. Place the grid material so that the machine direction of the grid is perpendicular to the wall face. Each grid layer shall be continuous throughout the lengths indicated on the plans. Join grid strips with straps, rings, hooks or other mechanical devices to prevent movement during backfilling operations. Prior to placing backfill on the grid, pull the grid taut and hold in position with pins, stakes or other methods approved by the engineer.

C.3.2.2 Steel Layers

Place the steel reinforcement full width in one piece as shown on the plans. No splicing will be allowed. Maintain elements in position during backfilling.

C.4 Quality Management Program

C.4.1 Quality Control Plan

Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not perform MSE wall construction work before the engineer reviews and accepts the plan. Construct the project as the plan provides.

Do not change the quality control plan without the engineer's review and acceptance. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.
3. A list of source locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
4. Descriptions of stockpiling and hauling methods.
5. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
6. Location of the QC laboratory, retained sample storage, and other documentation.
7. A summary of the locations and calculated quantities to be tested under this provision.

8. A proposed sequencing plan of wall construction operations and random test locations.

C.4.2 Quality Control Personnel

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a HTCP Grading Technician I (GRADINGTEC-I); or Assistant Certified Technician, Grading (ACT-GRADING); or Aggregate Technician I (AGGTEC-I); or Assistant Certified Technician, Aggregate (ACT-AGG) present at the each grading site during all wall backfill placement, compaction, and nuclear testing activities. Have a HTCP Nuclear Density Technician I (NUCDENSITYTEC-I) or Assistant Certified Technician, Nuclear Density Gauge Operator (ACT-NUC) perform field density and field moisture content testing.

If an Assistant Certified Technician (ACT) is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician Ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

C.4.3 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and maintain a calibration record at the laboratory.

Furnish nuclear gauges from the department's approved product list at:

<http://wisconsdot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrcs/tools/appr-prod/default.aspx>

Ensure that the nuclear gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.

Conform to ASTM D6938 and CMM 8-15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter or direct transmission position. Perform each test for 4 minutes of nuclear gauge count time.

Split each Proctor sample and identify so as to provide comparison with the department's test results. Unless the engineer directs otherwise, retain the QC split samples for 14 calendar days and promptly deliver the department's split samples to the department.

C.4.4 Documentation

- (1) Document all observations, inspection records, and process adjustments daily. Submit test results to the department's project materials coordinator on the same day they become available.
- (2) Use forms provided in CMM Chapter 8. Note other information in a permanent field record and as a part of process control documentation enumerated in the contractor's quality control plan. Enter QC data and backfill material certified report results into the applicable materials reporting system (MRS) software within 5 business days after results are available.
- (3) Submit final testing records and other documentation to the engineer electronically within 10 business days after all contract-required information becomes available. The engineer may allow submission of scanned copies of hand-written documentation.

C.4.5 Quality Control (QC) Testing

Perform compaction testing on the backfill. Conform to CMM 8-15 for testing and gauge monitoring methods. Conduct testing at a minimum frequency of 1 test per 150 cubic yards of backfill, or major portion thereof in each lift. A minimum of one test for every lift is required. Deliver documentation of all compaction testing results to the engineer at the time of testing.

Perform 1 gradation test every 750 cubic yards of fill and one 5-point Proctor test (or as modified in C.2) every 2,250 cubic yards of fill. Provide the region split samples of both within 72 hours of sampling, at the region laboratory. Test sites shall be selected using ASTM Method D3665. Provide Proctor test results to the engineer within 48 hours of sampling. Provide gradation test results to the engineer within 24 hours of sampling.

C.4.6 Department Testing

C.4.6.1 General

The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a

listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

C.4.6.2 Quality Verification (QV) Testing

- (1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in C.4.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.
- (2) The department will conduct QV tests at the minimum frequency of 30% of the required contractor density, Proctor and gradation tests.
- (3) The department will locate density tests and gradation samples randomly, at locations independent of the contractor's QC work. The department will split each Proctor and gradation QV sample, testing half for QV, and retaining the remaining half for 10 business days.
- (4) The department will conduct QV Proctor and gradation tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.
- (5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to this special provision, the department will take no further action. If density QV test results are nonconforming, the area shall be reworked until the density requirements of this special provision are met. If the gradation test results are nonconforming, standard spec 106.5 will apply. Differing QC and QV nuclear density values of more than 1.5 pcf will be investigated and resolved. QV density tests will be based on the appropriate QC Proctor test results, unless the QV and QC Proctor result difference is greater than 3.0 pcf. Differing QC and QV Proctor values of more than 3.0 pcf will be investigated and resolved.

C.4.6.3 Independent Assurance (IA)

- (1) Independent assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing, including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:
 1. Split sample testing.
 2. Proficiency sample testing.
 3. Witnessing sampling and testing.
 4. Test equipment calibration checks.
 5. Reviewing required worksheets and control charts.
 6. Requesting that testing personnel perform additional sampling and testing.
- (2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in C.4.6.4.

C.4.6.4 Dispute Resolution

- (1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E178 to evaluate potential statistically outlying data.
- (2) Production test results, and results from other process control testing, may be considered when resolving a dispute.
- (3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product or work, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable

materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C.5 Geotechnical Information

Geotechnical data to be used in the design of the wall is given on the wall plan. After completing wall excavation of the entire reinforced soil zone, notify the department and allow the Regional Soils Engineer two working days to review the foundation.

D Measurement

The department will measure Wall Modular Block Mechanically Stabilized Earth by the square foot acceptably completed. The department will compute the measured quantity from the theoretical pay limits the contract plans show. The department will make no allowance for wall area constructed above or below the theoretical pay limits. All work beyond the theoretical pay limits is incidental to the cost of work. The department will make no allowance for as-built quantities.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.0401	Wall Modular Block Mechanically Stabilized Earth R-30-61	SF
SPV.0165.0402	Wall Modular Block Mechanically Stabilized Earth R-30-62	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; supplying all necessary wall components to produce a functional wall system including cap, copings, leveling pad, and leveling pad steps; constructing the retaining system and providing temporary drainage; providing backfill, backfilling, compacting, developing/completing/documenting the quality management program, and performing compaction testing.

The department will pay separately for parapets, traffic barriers, railings, and other items above the wall cap or coping.

SPV.0165.XX (20181023)